



August 21, 2009

Mr. Frank Hagar
Northgate Environmental Management, Inc.
1100 Quail St., Suite 102
Newport Beach, California 92660

Re: Tronox Henderson
Work Order: 233960

Dear Mr. Hagar:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on July 23, 2009, July 24, 2009 and July 25, 2009. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4453.

Sincerely,

Edith Kent
Project Manager

Chain of Custody: 2027.001.00392, 2027.001.00397, 2027.001.00399, 2027.001.00401, 2027.001.00407,
2027.001.00411, 2027.001.00415 and 2027.001.00421
Enclosures

Tronox LLC
Tronox Henderson
SDG:233960

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Case Narrative

CASE NARRATIVE
for
Tronox LLC
Tronox Henderson
SDG:233960

August 21, 2009

Laboratory Identification:

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

Summary

Sample receipt

The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on July 23, 2009, July 24, 2009 and July 25, 2009 for analysis. Shipping container temperatures were checked, documented, and within specifications. The samples were delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

Items of Note

All samples under this SDG were logged as an open SDG until a sufficient amount of samples were received by the lab. The client was notified that the SDG was closed on July 27, 2009 and the turnaround time would start from then. Please refer to the attached e-mail for further details.

QC Issues

The following samples did not meet the Tronox QA program sample result uncertainty limit of <30% for Ra-226 with the results between 2 and 5 times the MDA and were counted for the maximum time: 233960005, 233960008, 233960010, 233960012, 233960016, 233960019 and 233960020. The following samples did not meet the Tronox QA program sample result uncertainty limit of <30% for Alpha Spec Uranium with the results between 2 and 5 times the MDA and were counted for the maximum time: 233960001, 233960003, 233960005, 233960006, 233960007, 233960011, 233960012, 233960013 and 233960017. The following samples did not meet the Tronox QA program sample result uncertainty limit of <30% for Alpha Spec Thorium with the results between 2 and 5 times the MDA and were counted for the maximum time: 233960008, 233960009 and 233960018. The following samples did not meet the Tronox QA program sample tracer yield requirements of 70-120% for Alpha Spec Uranium due to matrix issues: and 233960004. The following samples did not meet the Tronox QA program sample tracer yield requirements of 70-120% for Alpha Spec Thorium due to matrix issues: 233960001, 233960002, 233960005, 233960006, 233960007, 233960008, 233960009, 233960010, 233960011, 233960012, 233960013, 233960015, 233960016, 233960017, 233960018, 233960019 and 233960020. Please refer to the attached e-mail for further details on QC issues. The following samples did not meet the Tronox QA program sample result uncertainty limit of <30% for Alpha Spec Uranium with the results greater than 5 times the MDA and were counted for the maximum time: and 233960020. The following samples did not meet the Tronox QA program required detection limits for Alpha Spec Thorium due to limited sample volume and were counted for the maximum time: 233960004 and 233960014. The following samples did not meet the Tronox QA program required detection limits for Alpha Spec Uranium due to limited sample volume and were counted for the maximum time: and 233960014.

Sample Identification

The laboratory received the following samples:

<u>Laboratory ID</u>	<u>Client ID</u>
233960001	SA182-10B
233960002	SA182-25B
233960003	SA182-38B
233960004	EB072209-SO
233960005	SA71-10B
233960006	SA71-25B
233960007	SA71-36B
233960008	SA131-0.5B
233960009	SA131009-0.5B
233960010	SA131-10B
233960011	SA131-27B
233960012	SA145-10B
233960013	SA145-24B
233960014	EB072309-SO
233960015	RSAH3-0.5B
233960016	RSAH3009-0.5B
233960017	RSAH3-10B
233960018	RSAH3-20B
233960019	RSAH3-32B
233960020	RSAI5-0.5B

Case Narrative

Sample analyses were conducted using methodology as outlined in GEL Laboratories, LLC (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

Data Package

The enclosed data package contains the following sections: Case Narrative, Chain of Custody, Cooler Receipt Checklist, Data Package Qualifier Definitions and data from the following fractions: Radiochemistry.

This data package, to the best of my knowledge, is in compliance with technical and administrative requirements.



Edith Kent

Project Manager

**Chain of Custody
and
Supporting
Documentation**

233960%



1100 Quail Street, Suite 102, Newport Beach, CA 92660
(949) 260-9293

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate.

COC No. 2027.001.00392
Page: 1 of 2
Cooler # _____

Required Ship to Lab:		Required Project Information:		Required Invoice Information:		TAT: Standard 30 day		Rush		Mark One								
Lab Name: GEL Laboratories, LLC		Site ID #: TRONOX LLC, HENDERSON		Send Invoice to: Susan Crowley Tronox LLC		If Rush, Date due												
Address: 2040 Savage Road		Project #: 2027.001		Address: PO Box 55		QC level Required: Standard		Special EPA Stage 4		Mark one								
Charleston, SC 29407		Site Address: 560 W. Lake Mead Drive		City/State: Henderson, NV 89009		Phone #: (949)260-9293		NJ Reduced Deliverable Package?										
Lab PM: Edith M. Kent		City: Henderson		State: NV		Reimbursement project? <input checked="" type="checkbox"/>		MA MCP Cert?		CT RCP Cert?								
Phone/Fax: (843)556-8171		Site PM Name: Derrick Willis		Send EDD to: frank.haga@ngem.com		Non-reimbursement project? <input type="checkbox"/>		MA MCP Cert?		Mark One								
Lab PM email: emk@gel.com		Phone/Fax: 949-375-7004		CC Hardcopy report to: PDF Electronic Version Only		Send EDD to: frank.haga@ngem.com		MA MCP Cert?		Mark One								
Applicable Lab Quote #:		Site PM Email: derrick.willis@ngem.com		CC Hardcopy report to: see additional comments below		CC Hardcopy report to: see additional comments below		MA MCP Cert?		Mark One								
ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9 / r)	MATRIX	Valid Matrix Codes	MATRIX CODE	SAMPLE TYPE	G-RAB C-COMP	SAMPLE DATE	SAMPLE TIME	#OF CONTAINERS	FIELD FILTERED? (Y/N)	Preservatives	Requested	DATE	TIME	Sample Receipt Conditions	Samples on Ice?	Temp in OC	Trip Blank?
1	SA182-10B	DRINKING WATER	WP	SO	G		7/22/2009	7:07	1	N	Unpreserved	Requested	7-22	1700	Y/N	25	Y/N	Y/N
2	SA182-25B	WATER	WV	SO	G		7/22/2009	7:38	1	N	H2SO4	Requested	7-22	0840	Y/N			Y/N
3	SA182-38B	WATER	WV	SO	G		7/22/2009	7:56	1	N	H2SO4	Requested	7-22	1156	Y/N			Y/N
4																		
5																		
6																		
7																		
8																		
9																		
10																		
11																		
12																		
13																		

Additional Comments/Special Instructions:
FULL DIGESTION SPECIFICATION
Radionuclides* includes Thorium (isotopic) and Uranium (isotopic)
by EML HASL 300 modified(alpha spectroscopy)

All PDF reports and EDDs will be uploaded to:
 Northgate Environmental Management, Inc.
 FTP site address provided to labs
 Notifications provided to:
 cindy.amold@ngem.com
 frank.haga@ngem.com

SHIPPING METHOD: (mark as appropriate)
 UPS COURIER SAMPLER NAME AND SIGNATURE
 SIGNATURE OF SAMPLER: Patrick Ferringer
 DATE SIGNED: 7-22 Time: 1156



Client: <u>Kerr/NorKente</u>		SDG/ARCOC/Work Order: <u>2339601</u>	
Received By: <u>MK</u>		Date Received: <u>7-23-09</u>	
Suspected Hazard Information	Yes	No	*If Counts > x2 area background on samples not marked "radioactive", contact the Radiation Safety Group of further investigation.
COC/Samples marked as radioactive?		<input checked="" type="checkbox"/>	Maximum Counts Observed*: <u>cpm 20</u>
Classified Radioactive II or III by RSO?		<input checked="" type="checkbox"/>	
COC/Samples marked containing PCBs?		<input checked="" type="checkbox"/>	
Shipped as a DOT Hazardous?		<input checked="" type="checkbox"/>	Hazard Class Shipped: UN#:
Samples identified as Foreign Soil?		<input checked="" type="checkbox"/>	

Sample Receipt Criteria		Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: seals broken damaged container leaking container other (describe)
2	Samples requiring cold preservation within 0 ≤ 6 deg. C?		<input checked="" type="checkbox"/>		Preservation Method: ice bags blue ice dry ice <u>none</u> other (describe) <u>25°</u>
3	Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>			
4	Sample containers intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: seals broken damaged container leaking container other (describe)
5	Samples requiring chemical preservation at proper pH?		<input checked="" type="checkbox"/>		Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6	VOA vials free of headspace (defined as < 6mm bubble)?		<input checked="" type="checkbox"/>		Sample ID's and containers affected:
7	Are Encore containers present?			<input checked="" type="checkbox"/>	(If yes, immediately deliver to Volatiles laboratory)
8	Samples received within holding time?	<input checked="" type="checkbox"/>			Id's and tests affected:
9	Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>			Sample ID's and containers affected:
10	Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>			Sample ID's affected:
11	Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>			Sample ID's affected:
12	COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>			

Comments:

Fx 7967 9868 7778

PM (or PMA) review: Initials ERP

Date 7/23/09



SAMPLE RECEIPT & REVIEW FORM

Client: <u>Kerr Northrup</u>		SDG/ARCOC/Work Order: <u>2339601</u>	
Received By: <u>mk</u>		Date Received: <u>7/23/09</u>	
Suspected Hazard Information	Yes	No	*If Counts > x2 area background on samples not marked "radioactive", contact the Radiation Safety Group of further investigation.
COC/Samples marked as radioactive?		<input checked="" type="checkbox"/>	Maximum Counts Observed*: <u>4m 20</u>
Classified Radioactive II or III by RSO?		<input checked="" type="checkbox"/>	
COC/Samples marked containing PCBs?		<input checked="" type="checkbox"/>	
Shipped as a DOT Hazardous?		<input checked="" type="checkbox"/>	Hazard Class Shipped: UN#:
Samples identified as Foreign Soil?		<input checked="" type="checkbox"/>	

Sample Receipt Criteria		Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: seals broken damaged container leaking container other (describe)
2	Samples requiring cold preservation within 0 ≤ 6 deg. C?		<input checked="" type="checkbox"/>		Preservation Method: ice bags blue ice dry ice <u>none</u> other (describe) <u>24°</u>
3	Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>			
4	Sample containers intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: seals broken damaged container leaking container other (describe)
5	Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>			Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6	VOA vials free of headspace (defined as < 6mm bubble)?		<input checked="" type="checkbox"/>		Sample ID's and containers affected:
7	Are Encore containers present?			<input checked="" type="checkbox"/>	(if yes, immediately deliver to Volatiles laboratory)
8	Samples received within holding time?	<input checked="" type="checkbox"/>			id's and tests affected:
9	Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>			Sample ID's and containers affected:
10	Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>			Sample ID's affected:
11	Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>			Sample ID's affected:
12	COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>			

Comments:

FX 7977 8573 6320

PM (or PMA) review: Initials EP Date 7/23/09

20090702361

233960%



1100 Quail Street, Suite 102, Newport Beach, CA 92660
(949) 260-9293

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate.

COC No. 2027.001.00397
Page: 1 of 1
Cooler # 1 of 1

Required Ship to Lab:		Required Project Information:		Required Invoice Information:		TAT: Standard 30 day		Rush		Mark One																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
Lab Name: GEL Laboratories, LLC		Site ID #: TRONOX LLC, HENDERSON		Send Invoice to: Susan Crowley		Address: PO Box 56		TronoX LLC																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
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Lab PM email: emk@gel.com		Site PM Name: Derrick Willis		Site PM Phone/Fax: (843)556-8171		Send EDD to: frank.hagar@ngem.com		Frank Hagar Northgate Environmental Management, Inc		Mark one																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
Applicable Lab Quote #:		Site PM Email: derrick.willis@ngem.com		CC Hardcopy report to: see additional comments below		CC Hardcopy report to: see additional comments below		MA MCP Cert? <input type="checkbox"/>		CT RCP Cert? <input type="checkbox"/>																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
#	ITEM	SAMPLE ID Character per box. (A-Z, 0-9 / -)	MATRIX CODES	MATRIX	W	WP	WQ	WS	WT	WV	WZ	WAA	WAB	WAC	WAD	WAE	WAF	WAG	WAH	WAI	WAJ	WAK	WAL	WAM	WAN	WAO	WAP	WAQ	WAR	WAS	WAT	WAV	WAW	WAX	WAY	WAZ	WBA	WBB	WBC	WBD	WBE	WBF	WBG	WBH	WBI	WBJ	WBK	WBL	WBM	WBN	WBO	WBP	WBQ	WBR	WBS	WBT	WBV	WBW	WBX	WBZ	WCA	WCB	WCC	WCD	WCE	WCF	WCG	WCH	WCI	WCJ	WCK	WCL	WCM	WCN	WCO	WCP	WCQ	WCR	WCS	WCT	WCV	WCW	WCX	WCY	W CZ	WDA	WDB	WDC	WDD	WDE	WDF	WDG	WDH	WDI	WDJ	WDK	WDL	WDM	WDN	WDO	WDP	WDQ	WDR	WDS	WDT	WDV	WDW	WDX	WDY	W DZ	WEA	WEB	WEC	WED	WEE	WEF	WEG	WEH	WEI	WEJ	WEK	WEL	WEM	WEN	WEO	WEP	WEQ	WER	WES	WET	WEV	WEW	WEX	WEY	WEZ	WEA	WEB	WEC	WED	WEE	WEF	WEG	WEH	WEI	WEJ	WEK	WEL	WEM	WEN	WEO	WEP	WEQ	WER	WES	WET	WEV	WEW	WEX	WEY	WEZ	WEA	WEB	WEC	WED	WEE	WEF	WEG	WEH	WEI	WEJ	WEK	WEL	WEM	WEN	WEO	WEP	WEQ	WER	WES	WET	WEV	WEW	WEX	WEY	WEZ	WEA	WEB	WEC	WED	WEE	WEF	WEG	WEH	WEI	WEJ	WEK	WEL	WEM	WEN	WEO	WEP	WEQ	WER	WES	WET	WEV	WEW	WEX	WEY	WEZ	WEA	WEB	WEC	WED	WEE	WEF	WEG	WEH	WEI	WEJ	WEK	WEL	WEM	WEN	WEO	WEP	WEQ	WER	WES	WET	WEV	WEW	WEX	WEY	WEZ	WEA	WEB	WEC	WED	WEE	WEF	WEG	WEH	WEI	WEJ	WEK	WEL	WEM	WEN	WEO	WEP	WEQ	WER	WES	WET	WEV	WEW	WEX	WEY	WEZ	WEA	WEB	WEC	WED	WEE	WEF	WEG	WEH	WEI	WEJ	WEK	WEL	WEM	WEN	WEO	WEP	WEQ	WER	WES	WET	WEV	WEW	WEX	WEY	WEZ	WEA	WEB	WEC	WED	WEE	WEF	WEG	WEH	WEI	WEJ	WEK	WEL	WEM	WEN	WEO	WEP	WEQ	WER	WES	WET	WEV	WEW	WEX	WEY	WEZ	WEA	WEB	WEC	WED	WEE	WEF	WEG	WEH	WEI	WEJ	WEK	WEL	WEM	WEN	WEO	WEP	WEQ	WER	WES	WET	WEV	WEW	WEX	WEY	WEZ	WEA	WEB	WEC	WED	WEE	WEF	WEG	WEH	WEI	WEJ	WEK	WEL	WEM	WEN	WEO	WEP	WEQ	WER	WES	WET	WEV	WEW	WEX	WEY	WEZ	WEA	WEB	WEC	WED	WEE	WEF	WEG	WEH	WEI	WEJ	WEK	WEL	WEM	WEN	WEO	WEP	WEQ	WER	WES	WET	WEV	WEW	WEX	WEY	WEZ	WEA	WEB	WEC	WED	WEE	WEF	WEG	WEH	WEI	WEJ	WEK	WEL	WEM	WEN	WEO	WEP	WEQ	WER	WES	WET	WEV	WEW	WEX	WEY	WEZ	WEA	WEB	WEC	WED	WEE	WEF	WEG	WEH	WEI	WEJ	WEK	WEL	WEM	WEN	WEO	WEP	WEQ	WER	WES	WET	WEV	WEW	WEX	WEY	WEZ	WEA	WEB	WEC	WED	WEE	WEF	WEG	WEH	WEI	WEJ	WEK	WEL	WEM	WEN	WEO	WEP	WEQ	WER	WES	WET	WEV	WEW	WEX	WEY	WEZ	WEA	WEB	WEC	WED	WEE	WEF	WEG	WEH	WEI	WEJ	WEK	WEL	WEM	WEN	WEO	WEP	WEQ	WER	WES	WET	WEV	WEW	WEX	WEY	WEZ	WEA	WEB	WEC	WED	WEE	WEF	WEG	WEH	WEI	WEJ	WEK	WEL	WEM	WEN	WEO	WEP	WEQ	WER	WES	WET	WEV	WEW	WEX	WEY	WEZ	WEA	WEB	WEC	WED	WEE	WEF	WEG	WEH	WEI	WEJ	WEK	WEL	WEM	WEN	WEO	WEP	WEQ	WER	WES	WET	WEV	WEW	WEX	WEY	WEZ	WEA	WEB	WEC	WED	WEE	WEF	WEG	WEH	WEI	WEJ	WEK	WEL	WEM	WEN	WEO	WEP	WEQ	WER	WES	WET	WEV	WEW	WEX	WEY	WEZ	WEA	WEB	WEC	WED	WEE	WEF	WEG	WEH	WEI	WEJ	WEK	WEL	WEM	WEN	WEO	WEP	WEQ	WER	WES	WET	WEV	WEW	WEX	WEY	WEZ	WEA	WEB	WEC	WED	WEE	WEF	WEG	WEH	WEI	WEJ	WEK	WEL	WEM	WEN	WEO	WEP	WEQ	WER	WES	WET	WEV	WEW	WEX	WEY	WEZ	WEA	WEB	WEC	WED	WEE	WEF	WEG	WEH	WEI	WEJ	WEK	WEL	WEM	WEN	WEO	WEP	WEQ	WER	WES	WET	WEV	WEW	WEX	WEY	WEZ	WEA	WEB	WEC	WED	WEE	WEF	WEG	WEH	WEI	WEJ	WEK	WEL	WEM	WEN	WEO	WEP	WEQ	WER	WES	WET	WEV	WEW	WEX	WEY	WEZ	WEA	WEB	WEC	WED	WEE	WEF	WEG	WEH	WEI	WEJ	WEK	WEL	WEM	WEN	WEO	WEP	WEQ	WER	WES	WET	WEV	WEW	WEX	WEY	WEZ	WEA	WEB	WEC	WED	WEE	WEF	WEG	WEH	WEI	WEJ	WEK	WEL	WEM	WEN	WEO	WEP	WEQ	WER	WES	WET	WEV	WEW	WEX	WEY	WEZ	WEA	WEB	WEC	WED	WEE	WEF	WEG	WEH	WEI	WEJ	WEK	WEL	WEM	WEN	WEO	WEP	WEQ	WER	WES	WET	WEV	WEW	WEX	WEY	WEZ	WEA	WEB	WEC	WED	WEE	WEF	WEG	WEH	WEI	WEJ	WEK	WEL	WEM	WEN	WEO	WEP	WEQ	WER	WES	WET	WEV	WEW	WEX	WEY	WEZ	WEA	WEB	WEC	WED	WEE	WEF	WEG	WEH	WEI	WEJ	WEK	WEL	WEM	WEN	WEO	WEP	WEQ	WER	WES	WET	WEV	WEW	WEX	WEY	WEZ	WEA	WEB	WEC	WED	WEE	WEF	WEG	WEH	WEI	WEJ	WEK	WEL	WEM	WEN	WEO	WEP	WEQ	WER	WES	WET	WEV	WEW	WEX	WEY	WEZ	WEA	WEB	WEC	WED	WEE	WEF	WEG	WEH	WEI	WEJ	WEK	WEL	WEM	WEN	WEO	WEP	WEQ	WER	WES	WET	WEV	WEW	WEX	WEY	WEZ	WEA	WEB	WEC	WED	WEE	WEF	WEG	WEH	WEI	WEJ	WEK	WEL	WEM	WEN	WEO	WEP	WEQ	WER	WES	WET	WEV	WEW	WEX	WEY	WEZ	WEA	WEB	WEC	WED	WEE	WEF	WEG	WEH	WEI	WEJ	WEK	WEL	WEM	WEN	WEO	WEP	WEQ	WER	WES	WET	WEV	WEW	WEX	WEY	WEZ	WEA	WEB	WEC	WED	WEE	WEF	WEG	WEH	WEI	WEJ	WEK	WEL	WEM	WEN	WEO	WEP	WEQ	WER	WES	WET	WEV	WEW	WEX	WEY	WEZ	WEA	WEB	WEC	WED	WEE	WEF	WEG	WEH	WEI	WEJ	WEK	WEL	WEM	WEN	WEO	WEP	WEQ	WER	WES	WET	WEV	WEW	WEX	WEY	WEZ	WEA	WEB	WEC	WED	WEE	WEF	WEG	WEH	WEI	WEJ	WEK	WEL	WEM	WEN	WEO	WEP	WEQ	WER	WES	WET	WEV	WEW	WEX	WEY	WEZ	WEA	WEB	WEC	WED	WEE	WEF	WEG	WEH	WEI	WEJ	WEK	WEL	WEM	WEN	WEO	WEP	WEQ	WER	WES	WET	WEV	WEW	WEX	WEY	WEZ	WEA	WEB	WEC	WED	WEE	WEF	WEG	WEH	WEI	WEJ	WEK	WEL	WEM	WEN	WEO	WEP	WEQ	WER	WES	WET	WEV	WEW	WEX	WEY	WEZ	WEA	WEB	WEC	WED	WEE	WEF	WEG	WEH	WEI	WEJ	WEK	WEL	WEM	WEN	WEO	WEP	WEQ	WER	WES	WET	WEV	WEW	WEX	WEY	WEZ	WEA	WEB	WEC	WED	WEE	WEF	WEG	WEH	WEI	WEJ	WEK	WEL	WEM	WEN	WEO	WEP	WEQ	WER	WES	WET	WEV	WEW	WEX	WEY	WEZ	WEA	WEB	WEC	WED	WEE	WEF	WEG	WEH	WEI	WEJ	WEK	WEL	WEM	WEN	WEO	WEP	WEQ	WER	WES	WET	WEV	WEW	WEX	WEY	WEZ	WEA	WEB	WEC	WED	WEE	WEF	WEG	WEH	WEI	WEJ	WEK	WEL	WEM	WEN	WEO	WEP	WEQ	WER	WES	WET	WEV	WEW	WEX	WEY	WEZ	WEA	WEB	WEC	WED	WEE	WEF	WEG	WEH	WEI	WEJ	WEK	WEL	WEM	WEN	WEO	WEP	WEQ	WER	WES	WET	WEV	WEW	WEX	WEY	WEZ	WEA	WEB	WEC	WED	WEE	WEF	WEG	WEH	WEI	WEJ	WEK	WEL	WEM	WEN	WEO	WEP	WEQ	WER	WES	WET	WEV	WEW	WEX	WEY	WEZ	WEA	WEB	WEC	WED	WEE	WEF	WEG	WEH	WEI	WEJ	WEK	WEL	WEM	WEN	WEO	WEP	WEQ	WER	WES	WET	WEV	WEW	WEX	WEY	WEZ	WEA	WEB	WEC	WED	WEE	WEF	WEG	WEH	WEI	WEJ	WEK	WEL	WEM	WEN	WEO	WEP	WEQ	WER	WES	WET	WEV	WEW	WEX	WEY	WEZ	WEA	WEB	WEC	WED	WEE	WEF	WEG	WEH	WEI	WEJ	WEK	WEL	WEM	WEN	WEO	WEP	WEQ	WER	WES	WET	WEV	WEW	WEX	WEY	WEZ	WEA	WEB	WEC	WED	WEE	WEF	WEG	WEH	WEI	WEJ	WEK	WEL	WEM	WEN	WEO	WEP	WEQ	WER	WES	WET	WEV	WEW	WEX	WEY	WEZ	WEA	WEB	WEC	WED	WEE	WEF	WEG	WEH	WEI	WEJ	WEK	WEL	WEM	WEN	WEO	WEP	WEQ	WER	WES	WET	WEV	WEW	WEX	WEY	WEZ	WEA	WEB	WEC	WED	WEE	WEF	WEG	WEH	WEI	WEJ	WEK	WEL	WEM	WEN	WEO	WEP	WEQ	WER	WES	WET	WEV	WEW	WEX	WEY	WEZ	WEA	WEB	WEC	WED	WEE	WEF	WEG	WEH	WEI	WEJ	WEK	WEL	WEM	WEN	WEO	WEP	WEQ	WER	WES	WET	WEV	WEW	WEX	WEY	WEZ	WEA	WEB	WEC	WED	WEE	WEF	WEG	WEH	WEI	WEJ	WEK	WEL	WEM	WEN	WEO	WEP	WEQ	WER	WES	WET	WEV	WEW	WEX	WEY	WEZ	WEA	WEB	WEC	WED	WEE	WEF	WEG	WEH	WEI	WEJ	WEK	WEL	WEM	WEN	WEO	WEP	WEQ	WER	WES	WET	WEV	WEW	WEX	WEY	WEZ	WEA	WEB	WEC	WED	WEE	WEF	WEG	WEH	WEI	WEJ	WEK	WEL	WEM	WEN	WEO	WEP	WEQ	WER	WES	WET	WEV	WEW	WEX	WEY	WEZ	WEA	WEB	WEC</



1100 Quail Street, Suite 102, Newport Beach, CA 92660
(949) 260-9293

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate.

COC No. 2027.001.00399
Page: 1 of 1
Cooler # 1 of 1

Required Ship to Lab:		Required Project Information:		Required Invoice Information:		TAT: Standard 30 day		Rush		Mark One																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
Lab Name: GEL Laboratories, LLC		Site ID #: TRONOX LLC, HENDERSON		Send Invoice to: Susan Crowley Tronox, LLC				<input checked="" type="checkbox"/>																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
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Charleston, SC 29407		Site Address: 560 W. Lake Mead Drive		City/State: Henderson, NV 89009		Phone #: (949)260-9293		QC level Required: Standard		Special EPA Stage 4 Mark one																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
Lab PM: Edith M. Kent		City: Henderson		State: NV		Reimbursement project? <input checked="" type="checkbox"/>		Non-reimbursement project? <input type="checkbox"/>		Mark one																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
Phone/Fax: (843)556-8171		Site PM Name: Derrick Willis		Derrick Willis		Send EDD to: Frank Hagar Northgate Environmental Management, Inc frank.hagar@ngem.com		MA MCP Cert? <input type="checkbox"/>		CT RCP Cert? <input type="checkbox"/>																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
Lab PM email: emk@gel.com		Phone/Fax: 949-375-7004		Derrick.willis@ngem.com		CC Hardcopy report to: PDF Electronic Version Only																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
Applicable Lab Quote #:		Site PM Email: derrick.willis@ngem.com				CC Hardcopy report to: see additional comments below																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
ITEM #	SAMPLE ID	MATRIX	W	WS	WV	WQ	WY	WZ	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12	W13	W14	W15	W16	W17	W18	W19	W20	W21	W22	W23	W24	W25	W26	W27	W28	W29	W30	W31	W32	W33	W34	W35	W36	W37	W38	W39	W40	W41	W42	W43	W44	W45	W46	W47	W48	W49	W50	W51	W52	W53	W54	W55	W56	W57	W58	W59	W60	W61	W62	W63	W64	W65	W66	W67	W68	W69	W70	W71	W72	W73	W74	W75	W76	W77	W78	W79	W80	W81	W82	W83	W84	W85	W86	W87	W88	W89	W90	W91	W92	W93	W94	W95	W96	W97	W98	W99	W100	W101	W102	W103	W104	W105	W106	W107	W108	W109	W110	W111	W112	W113	W114	W115	W116	W117	W118	W119	W120	W121	W122	W123	W124	W125	W126	W127	W128	W129	W130	W131	W132	W133	W134	W135	W136	W137	W138	W139	W140	W141	W142	W143	W144	W145	W146	W147	W148	W149	W150	W151	W152	W153	W154	W155	W156	W157	W158	W159	W160	W161	W162	W163	W164	W165	W166	W167	W168	W169	W170	W171	W172	W173	W174	W175	W176	W177	W178	W179	W180	W181	W182	W183	W184	W185	W186	W187	W188	W189	W190	W191	W192	W193	W194	W195	W196	W197	W198	W199	W200	W201	W202	W203	W204	W205	W206	W207	W208	W209	W210	W211	W212	W213	W214	W215	W216	W217	W218	W219	W220	W221	W222	W223	W224	W225	W226	W227	W228	W229	W230	W231	W232	W233	W234	W235	W236	W237	W238	W239	W240	W241	W242	W243	W244	W245	W246	W247	W248	W249	W250	W251	W252	W253	W254	W255	W256	W257	W258	W259	W260	W261	W262	W263	W264	W265	W266	W267	W268	W269	W270	W271	W272	W273	W274	W275	W276	W277	W278	W279	W280	W281	W282	W283	W284	W285	W286	W287	W288	W289	W290	W291	W292	W293	W294	W295	W296	W297	W298	W299	W300	W301	W302	W303	W304	W305	W306	W307	W308	W309	W310	W311	W312	W313	W314	W315	W316	W317	W318	W319	W320	W321	W322	W323	W324	W325	W326	W327	W328	W329	W330	W331	W332	W333	W334	W335	W336	W337	W338	W339	W340	W341	W342	W343	W344	W345	W346	W347	W348	W349	W350	W351	W352	W353	W354	W355	W356	W357	W358	W359	W360	W361	W362	W363	W364	W365	W366	W367	W368	W369	W370	W371	W372	W373	W374	W375	W376	W377	W378	W379	W380	W381	W382	W383	W384	W385	W386	W387	W388	W389	W390	W391	W392	W393	W394	W395	W396	W397	W398	W399	W400	W401	W402	W403	W404	W405	W406	W407	W408	W409	W410	W411	W412	W413	W414	W415	W416	W417	W418	W419	W420	W421	W422	W423	W424	W425	W426	W427	W428	W429	W430	W431	W432	W433	W434	W435	W436	W437	W438	W439	W440	W441	W442	W443	W444	W445	W446	W447	W448	W449	W450	W451	W452	W453	W454	W455	W456	W457	W458	W459	W460	W461	W462	W463	W464	W465	W466	W467	W468	W469	W470	W471	W472	W473	W474	W475	W476	W477	W478	W479	W480	W481	W482	W483	W484	W485	W486	W487	W488	W489	W490	W491	W492	W493	W494	W495	W496	W497	W498	W499	W500	W501	W502	W503	W504	W505	W506	W507	W508	W509	W510	W511	W512	W513	W514	W515	W516	W517	W518	W519	W520	W521	W522	W523	W524	W525	W526	W527	W528	W529	W530	W531	W532	W533	W534	W535	W536	W537	W538	W539	W540	W541	W542	W543	W544	W545	W546	W547	W548	W549	W550	W551	W552	W553	W554	W555	W556	W557	W558	W559	W560	W561	W562	W563	W564	W565	W566	W567	W568	W569	W570	W571	W572	W573	W574	W575	W576	W577	W578	W579	W580	W581	W582	W583	W584	W585	W586	W587	W588	W589	W590	W591	W592	W593	W594	W595	W596	W597	W598	W599	W600	W601	W602	W603	W604	W605	W606	W607	W608	W609	W610	W611	W612	W613	W614	W615	W616	W617	W618	W619	W620	W621	W622	W623	W624	W625	W626	W627	W628	W629	W630	W631	W632	W633	W634	W635	W636	W637	W638	W639	W640	W641	W642	W643	W644	W645	W646	W647	W648	W649	W650	W651	W652	W653	W654	W655	W656	W657	W658	W659	W660	W661	W662	W663	W664	W665	W666	W667	W668	W669	W670	W671	W672	W673	W674	W675	W676	W677	W678	W679	W680	W681	W682	W683	W684	W685	W686	W687	W688	W689	W690	W691	W692	W693	W694	W695	W696	W697	W698	W699	W700	W701	W702	W703	W704	W705	W706	W707	W708	W709	W710	W711	W712	W713	W714	W715	W716	W717	W718	W719	W720	W721	W722	W723	W724	W725	W726	W727	W728	W729	W730	W731	W732	W733	W734	W735	W736	W737	W738	W739	W740	W741	W742	W743	W744	W745	W746	W747	W748	W749	W750	W751	W752	W753	W754	W755	W756	W757	W758	W759	W760	W761	W762	W763	W764	W765	W766	W767	W768	W769	W770	W771	W772	W773	W774	W775	W776	W777	W778	W779	W780	W781	W782	W783	W784	W785	W786	W787	W788	W789	W790	W791	W792	W793	W794	W795	W796	W797	W798	W799	W800	W801	W802	W803	W804	W805	W806	W807	W808	W809	W810	W811	W812	W813	W814	W815	W816	W817	W818	W819	W820	W821	W822	W823	W824	W825	W826	W827	W828	W829	W830	W831	W832	W833	W834	W835	W836	W837	W838	W839	W840	W841	W842	W843	W844	W845	W846	W847	W848	W849	W850	W851	W852	W853	W854	W855	W856	W857	W858	W859	W860	W861	W862	W863	W864	W865	W866	W867	W868	W869	W870	W871	W872	W873	W874	W875	W876	W877	W878	W879	W880	W881	W882	W883	W884	W885	W886	W887	W888	W889	W890	W891	W892	W893	W894	W895	W896	W897	W898	W899	W900	W901	W902	W903	W904	W905	W906	W907	W908	W909	W910	W911	W912	W913	W914	W915	W916	W917	W918	W919	W920	W921	W922	W923	W924	W925	W926	W927	W928	W929	W930	W931	W932	W933	W934	W935	W936	W937	W938	W939	W940	W941	W942	W943	W944	W945	W946	W947	W948	W949	W950	W951	W952	W953	W954	W955	W956	W957	W958	W959	W960	W961	W962	W963	W964	W965	W966	W967	W968	W969	W970	W971	W972	W973	W974	W975	W976	W977	W978	W979	W980	W981	W982	W983	W984	W985	W986	W987	W988	W989	W990	W991	W992	W993	W994	W995	W996	W997	W998	W999	W1000

Additional Comments/Special Instructions:
FULL DIGESTION SPECIFICATION
 Radionuclides* includes Thorium (isotopic) and Uranium (isotopic)
 by EML HASL 300 modified(alpha spectroscopy)

All PDF reports and EDDs will be uploaded to:
 Northgate Environmental Management, Inc.
 FTP site address provided to labs
 Notifications provided to:
 cindy.amoid@ngem.com
 frank.hagar@ngem.com

RELINQUISHED BY/AFFILIATION: [Signature]
 DATE: 7-23-09
 TIME: 11:42
 ACCEPTER: [Signature]
 AFFILIATION: [Signature]
 DATE: 7-23-09
 TIME: 1443

SHIPPING METHOD: (mark as appropriate)
 UPS COURIER FEDEX
 SIGNATURE OF SAMPLER: [Signature]
 PRINT NAME OF SAMPLER: Patrick Farringer
 DATE SIGNED: 7-23
 TIME: 1443

Requested Analyses: EPA8081 Radium-226, EPA8090 Radium-228, Technetides*
 Comments/Lab Sample I.D.: 250 ml Plastic jar



Client: <u>Kepp / not Keate</u>		SDG/ARCOC/Work Order: <u>2339601</u>	
Received By: <u>MK</u>		Date Received: <u>7-24-09</u>	
Suspected Hazard Information	Yes	No	*If Counts > x2 area background on samples not marked "radioactive", contact the Radiation Safety Group of further investigation.
COC/Samples marked as radioactive?		<input checked="" type="checkbox"/>	Maximum Counts Observed*: <u>cpm 20</u>
Classified Radioactive II or III by RSO?		<input checked="" type="checkbox"/>	
COC/Samples marked containing PCBs?		<input checked="" type="checkbox"/>	
Shipped as a DOT Hazardous?		<input checked="" type="checkbox"/>	Hazard Class Shipped: UN#:
Samples identified as Foreign Soil?		<input checked="" type="checkbox"/>	

Sample Receipt Criteria		Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: seals broken damaged container leaking container other (describe)
2	Samples requiring cold preservation within 0 ≤ 6 deg. C?		<input checked="" type="checkbox"/>		ice bags blue ice dry ice Preservation Method: <u>none</u> other (describe) <u>ddc</u>
3	Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>			
4	Sample containers intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: seals broken damaged container leaking container other (describe)
5	Samples requiring chemical preservation at proper pH?		<input checked="" type="checkbox"/>		Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6	VOA vials free of headspace (defined as < 6mm bubble)?		<input checked="" type="checkbox"/>		Sample ID's and containers affected:
7	Are Encore containers present?			<input checked="" type="checkbox"/>	(if yes, immediately deliver to Volatiles laboratory)
8	Samples received within holding time?	<input checked="" type="checkbox"/>			Id's and tests affected:
9	Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>			Sample ID's and containers affected:
10	Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>			Sample ID's affected:
11	Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>			Sample ID's affected:
12	COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>			

Comments:

Fx 7968 0263 1418

PM (or PMA) review: Initials EP

Date 7/24/09



Client: <u>Kerr/Northgate</u>		SDG/ARCOC/Work Order: <u>2339601</u>	
Received By: <u>MK</u>		Date Received: <u>7-24-09</u>	
Suspected Hazard Information	Yes	No	*If Counts > x2 area background on samples not marked "radioactive", contact the Radiation Safety Group of further investigation.
COC/Samples marked as radioactive?		<input checked="" type="checkbox"/>	Maximum Counts Observed*: <u>OK 20</u>
Classified Radioactive II or III by RSO?		<input checked="" type="checkbox"/>	
COC/Samples marked containing PCBs?		<input checked="" type="checkbox"/>	
Shipped as a DOT Hazardous?		<input checked="" type="checkbox"/>	Hazard Class Shipped: _____ UN#: _____
Samples identified as Foreign Soil?		<input checked="" type="checkbox"/>	

Sample Receipt Criteria		Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: seals broken damaged container leaking container other (describe)
2	Samples requiring cold preservation within 0 ≤ 6 deg. C?		<input checked="" type="checkbox"/>		Preservation Method: ice bags blue ice dry ice <u>none</u> other (describe) <u>27°</u>
3	Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>			
4	Sample containers intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: seals broken damaged container leaking container other (describe)
5	Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>			Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6	VOA vials free of headspace (defined as < 6mm bubble)?		<input checked="" type="checkbox"/>		Sample ID's and containers affected:
7	Are Encore containers present?			<input checked="" type="checkbox"/>	(If yes, immediately deliver to Volatiles laboratory)
8	Samples received within holding time?	<input checked="" type="checkbox"/>			ID's and tests affected:
9	Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>			Sample ID's and containers affected:
10	Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>			Sample ID's affected:
11	Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>			Sample ID's affected:
12	COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>			

Comments:

FX 7977 8945 5275

PM (or PMA) review: Initials EM Date 7/24/09



1100 Quail Street, Suite 102, Newport Beach, CA 92660
(949) 260-9293

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate.

COC No. 2027.001.00421
Page: 1 of 1
Cooler # 1 of 1

Required Ship to Lab:		Required Project Information:		Required Invoice Information:		TAT: Standard 30 day		Rush	Mark One					
Lab Name:	GEL Laboratories, LLC	Site ID #:	TRINOX LLC, HENDERSON	Send Invoices to:	Susan Crowley Troxox, LLC	Address:	PO Box 55							
Address:	2040 Savage Road	Project #:	2027.001	City/State:	Henderson, NV 89009	Phone #:	(949) 260-9293							
Lab P/N:	Edith M. Kent	Site Address:	560 W. Lake Mead Drive	Reimbursement project?	X	Non-reimbursement project?								
Phone/Fax:	(949) 666-8171	City:	Henderson	Send EDD to:	frank.hagar@ngem.com	CC Hardcopy report to:	PDF Electronic Version Only							
Lab PM email:	emk@gel.com	Site PM Name:	Derrick Willis	CC Hardcopy report to:	see additional comments below									
Applicable Lab Quote #:		Site PM Email:	derrick.willis@ngem.com											
SAMPLE ID Character per box. (A-Z, 0-9 /) Samples IDs MUST BE UNIQUE	Matrix Code WATER WASTE WATER WASTE PRODUCT SLURRY SLUDGE OTHER AS PER LOCAL TRENDS	Matrix WATER WASTE WATER WASTE PRODUCT SLURRY SLUDGE OTHER AS PER LOCAL TRENDS	Matrix Code WATER WASTE WATER WASTE PRODUCT SLURRY SLUDGE OTHER AS PER LOCAL TRENDS	SAMPLE TYPE G-GRAB C-COMP	MATRIX CODE	SAMPLE DATE	SAMPLE TIME	# OF CONTAINERS	FIELD FILTERED? (Y/N)	Preservatives				Comments/Lab Sample I.D.
										H2SO4	HNO3	HCl	NaOH	
1	One	One	One	G	SO	7-24-09	12:39	1	N	X	X	X	X	250 ml Plastic Jar
2	One	One	One	G	SO	7-24-09	13:31	1	N	X	X	X	X	250 ml Plastic Jar
3	One	One	One	G	SO	7-24-09	13:31	1	N	X	X	X	X	250 ml Plastic Jar
4	One	One	One	G	SO	7-24-09	13:53	1	N	X	X	X	X	250 ml Plastic Jar
5														
6														
7														
8														
9														
10														
11														
12														
13														

Additional Comments/Special Instructions:
FULL DIGESTION SPECIFICATION
 Radionuclides* includes Thorium (isotopic) and Uranium (isotopic) by EML
 HASL 300 modified(alpha spectroscopy)

All PDF reports and EDDs will be uploaded to:
 Northgate Environmental Management, Inc.
 FTP site address provided to labs
 Notifications provided to:
 cindy.armold@ngem.com
 frank.hagar@ngem.com

RELEASING BY: ATILUTION
 DATE: 7-24-09
 TIME: 16:00

RELEASING BY: ATILUTION
 DATE: 7-24-09
 TIME: 16:00

SHIPPING METHOD (mark as appropriate)
 UPS COURIER FEDEX
 SIGNATURE OF SAMPLER: Patrick Ferringer
 DATE SIGNED: 7/24/09
 TIME: 1:54P

Temp in OC	Samples on Ice?	Sample Intact?	Temp Blank?
Y/N	Y/N	Y/N	Y/N
Y/N	Y/N	Y/N	Y/N
Y/N	Y/N	Y/N	Y/N
Y/N	Y/N	Y/N	Y/N



SAMPLE RECEIPT & REVIEW FORM

Client: <u>Kerr/NORTHGATE</u>		SDG/ARCOC/Work Order: <u>2339001</u>	
Received By: <u>MK</u>		Date Received: <u>7-25-09</u>	
Suspected Hazard Information		Yes	No
COC/Samples marked as radioactive?			<input checked="" type="checkbox"/>
Classified Radioactive II or III by RSO?			<input checked="" type="checkbox"/>
COC/Samples marked containing PCBs?			<input checked="" type="checkbox"/>
Shipped as a DOT Hazardous?			<input checked="" type="checkbox"/>
Samples identified as Foreign Soil?			<input checked="" type="checkbox"/>

*If Counts > x2 area background on samples not marked "radioactive", contact the Radiation Safety Group of further investigation.
 Maximum Counts Observed*: OM 30
 Hazard Class Shipped: _____ UN#: _____

Sample Receipt Criteria		Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: seals broken damaged container leaking container other (describe)
2	Samples requiring cold preservation within 0 ≤ 6 deg. C?		<input checked="" type="checkbox"/>		Preservation Method: ice bags blue ice dry ice <u>none</u> other (describe) <u>21°</u>
3	Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>			
4	Sample containers intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: seals broken damaged container leaking container other (describe)
5	Samples requiring chemical preservation at proper pH?		<input checked="" type="checkbox"/>		Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6	VOA vials free of headspace (defined as < 6mm bubble)?		<input checked="" type="checkbox"/>		Sample ID's and containers affected:
7	Are Encore containers present?		<input checked="" type="checkbox"/>		(If yes, immediately deliver to Volatiles laboratory)
8	Samples received within holding time?	<input checked="" type="checkbox"/>			Id's and tests affected:
9	Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>			Sample ID's and containers affected:
10	Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>			Sample ID's affected:
11	Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>			Sample ID's affected:
12	COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>			

Comments:

FX 7977 93529516

PM (or PMA) review: Initials OB Date 7.27.09

Subject: GEL Closed SDG 233960

From: Heather Shaffer <Heather.Shaffer@gel.com>

Date: Mon, 27 Jul 2009 08:15:50 -0400

To: Cindy Arnold <Cindy.Arnold@ngem.com>, Frank Hagar <Frank.Hagar@ngem.com>, Edie Kent <emk@gel.com>, Derrick Willis <Derrick.Willis@ngem.com>

CC: Heather Shaffer <hea01394@gel.com>

With Saturday receipts, we closed soil SDG 233960. Attached is a list of the samples in the SDG. As soon as we have completed the login review, you will receive the full receipt package for this SDG.

--
Heather Shaffer
Project Manager Assistant
GEL Laboratories, LLC
2040 Savage Road
Charleston, SC (USA) 29407
Main: 843.556.8171 x 4505
Fax: 843.766.1178
E-mail: heather.shaffer@gel.com
Web: www.gel.com

233960.xls	Content-Type: application/msexcel Content-Encoding: base64
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Subject: SDG 233960 QC Issues - Alpha Spec Th, Alpha Spec U, Ra-226

From: Edie Kent <emk@gel.com>

Date: Fri, 21 Aug 2009 15:37:45 -0400

To: Cindy Arnold <Cindy.Arnold@ngem.com>, Frank Hagar <Frank.Hagar@ngem.com>, Derrick Willis <Derrick.Willis@ngem.com>, Team Kent <Team.Kent@gel.com>

CC: Martha Harrison <Martha.Harrison@gel.com>

The following are the QC issues regarding this SDG for Alpha Spec Th, Alpha Spec U and Ra 226:

Ra 226 Issues:

The following samples do not meet the Tronox QA program sample result uncertainty limit of <30% with activity between 2 and 5 times the MDA and were counted for the maximum possible count time: SA71-10B (233960005), SA131-0.5B (233960008), SA131-10B (233960010), SA145-10B (233960012), RSAH3009-0.5B (233960016), RSAH3-32B (233960019), RSAI5-0.5B (233960020).

Soil Thorium Issues:

The following samples do not meet the Tronox QA program sample result uncertainty limit of <30% with activity between 2 and 5 times the MDA for Th-228 and were counted for the maximum possible count time: SA131-0.5B (233960008), RSAH3-20B (233960018).

The following samples do not meet the Tronox QA program sample result uncertainty limit of <30% with activity between 2 and 5 times the MDA for Th-232 and were counted for the maximum possible count time: SA131009-0.5B (233960009).

The following samples do not meet the Tronox QA program tracer yield requirements of 70-120% due to matrix: SA182-10B (233960001), SA182-25B (233960002), SA71-10B (233960005), SA71-25B (233960006), SA71-36B (233960007), SA131-0.5B (233960008), SA131009-0.5B (233960009), SA131-10B (233960010), SA131-27B (233960011), SA145-10B (233960012), SA145-24B (233960013), RSAH3-0.5B (233960015), RSAH3009-0.5B (233960016), RSAH3-10B (233960017), RSAH3-20B (233960018), RSAH3-32B (233960019), RSAI5-0.5B (233960020), and the lab duplicate. The samples met GEL's standard tracer requirements of 15 to 125%. The blank and the LCS met the contract tracer yield requirements.

Water Thorium Issues:

Samples EB072209-SO (233960004) and EB072309-SO (233960014) did not meet the Tronox QA program required detection limits for Th228 due to limited sample volume. The blank did not meet the required detection limit for Th228 due to keeping the blank aliquot size consistent with the sample aliquots. The samples met the tracer yield and uncertainty requirements. The samples were counted the maximum count time to achieve the best MDA possible.

***Soil Uranium Issues: ***

The following samples do not meet the Tronox QA program sample result uncertainty limit of <30% with activity between 2 and 5 times the MDA for U235/236 and were counted for the maximum possible count time: SA182-10B(233960001), SA182-38B (233960003), SA71-10B (233960005), SA71-25B (233960006), SA71-36B (233960007), SA131-27B (233960011), SA145-10B (233960012), SA145-24B (233960013), RSAH3-10B (233960017), and the lab duplicate.

Sample RSAI5-0.5B (233960020) does not meet the Tronox QA program sample result uncertainty limit of <30% with activity greater than 5 times the MDA for U235/236 and was counted for the maximum possible count time.

Water Uranium Issues:

Sample EB072309-SO (233960014) did not meet the Tronox QA program required detection limits for U233/234 or U235/236. An aliquot of 800 mL was used for the analysis. A larger aliquot would result in low tracer yields. The blank did not meet the required detection limits for

U233/234 or U238 due to keeping the blank aliquot size consistent with the samples.

Sample EB072209-SO (233960004) did not meet the Tronox QA program tracer yield requirements of 70-120%. The sample met GEL's standard tracer requirement with a value of 66.8%. The blank and the laboratory control sample met the contract tracer yield requirements.

This will be noted in the case narrative.

Edie

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Laboratory Certifications

List of current GEL Certifications as of 21 August 2009

State	Certification
Arizona	AZ0668
Arkansas	88-0651
CLIA	42D0904046
California – NELAP	01151CA
Colorado	GEL
Connecticut	PH-0169
Dept. of Navy	NFESC 413
EPA Region 5	WG-15J
Florida – NELAP	E87156
Georgia	E87156 (FL/NELAP)
Georgia DW	967
Hawaii	N/A
ISO 17025	2567.01
Idaho	SC00012
Illinois – NELAP	200029
Indiana	C-SC-01
Kansas – NELAP	E-10332
Kentucky	90129
Louisiana – NELAP	03046
Maryland	270
Massachusetts	M-SC012
Nevada	SC00012
New Jersey – NELAP	SC002
New Mexico	FL NELAP E87156
New York – NELAP	11501
North Carolina	233
North Carolina DW	45709
Oklahoma	9904
Pennsylvania – NELAP	68-00485
South Carolina	10120001/10120002
Tennessee	TN 02934
Texas – NELAP	T104704235-07B-TX
U.S. Dept. of Agriculture	S-52597
Utah – NELAP	GEL
Vermont	VT87156
Virginia	00151
Washington	C1641

RADIOLOGICAL ANALYSIS

**Radiochemistry Case Narrative
Tronox LLC (KERR)
SDG 233960**

Method/Analysis Information

Product: Alphaspec Th, Liquid
Analytical Method: DOE EML HASL-300, Th-01-RC Modified
Analytical Batch Number: 891790

Sample ID	Client ID
233960004	EB072209-SO
233960014	EB072309-SO
1201896963	Method Blank (MB)
1201896964	Laboratory Control Sample (LCS)
1201896965	Laboratory Control Sample Duplicate (LCSD)

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-038 REV# 12.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

Standard solution(s) for these analyses are NIST traceable and used before the expiration date(s).

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

The blank volume is representative of the sample volume in this batch.

Designated QC

A laboratory control sample and a laboratory control sample duplicate, 1201896964 (LCS) and

1201896965 (LCSD), were run with the batch instead of a sample duplicate per client requirement.

QC Information

Refer to Non-Conformance Report.

Technical Information:

Holding Time

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

Samples were repped due to low carrier/tracer yield.

Miscellaneous Information:

NCR Documentation

Nonconformance reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. The following NCR was generated for this SDG: NCR 721639 was generated due to RDL less than MDA. 1. Sample 233587021 does not meet the required detection limit for Th228 or Th232. Sample 233612013 does not meet the required detection limit for Th232. Samples 233612014, 233960004, 233960014 and 234120018 do not meet the required detection limit for Th228. Sample 233612021 does not meet the required detection limit for Th228, Th230 or Th232. Samples do not meet the required detection limits due to limited sample volume. The blank, 1201896963, does not meet the required detection limit for Th228 due to keeping the blank aliquot consistent with the samples. 1. Project manager notified. Samples counted for maximum count time to achieve best MDA possible. Reporting results.

Manual Integration

No manual integrations were performed on data in this batch.

Additional Comments

Additional comments were not required for this sample set.

Qualifier information

Manual qualifiers were not required.

Method/Analysis Information

Product:	Alphaspec Th, Solid
Analytical Method:	DOE EML HASL-300, Th-01-RC Modified
Prep Method:	Dry Soil Prep
Analytical Batch Number:	895332
Prep Batch Number:	888410

Sample ID	Client ID
233960001	SA182-10B
233960002	SA182-25B
233960003	SA182-38B
233960005	SA71-10B
233960006	SA71-25B
233960007	SA71-36B
233960008	SA131-0.5B
233960009	SA131009-0.5B
233960010	SA131-10B
233960011	SA131-27B
233960012	SA145-10B
233960013	SA145-24B
233960015	RSAH3-0.5B
233960016	RSAH3009-0.5B
233960017	RSAH3-10B
233960018	RSAH3-20B
233960019	RSAH3-32B
233960020	RSAI5-0.5B
1201905854	Method Blank (MB)
1201905855	233960012(SA145-10B) Sample Duplicate (DUP)
1201905856	233960012(SA145-10B) Matrix Spike (MS)
1201905857	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-038 REV# 12.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

Standard solution(s) for these analyses are NIST traceable and used before the expiration date(s).

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

The blank volume is representative of the sample volumes in this batch.

Designated QC

The following sample was used for QC: 233960012 (SA145-10B).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

Sample 1201905854 (MB) was recounted due to a negative result greater than three times the error. Second count being reported. Samples were repped due to Th-230 matrix blank hit and high RER.

Miscellaneous Information:**NCR Documentation**

Nonconformance reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. The following NCR was generated for this SDG: NCR 725028 was generated due to Other. 1. The uncertainty is greater than 30% of the Th-228 result and the activity is between 2X and 5X the MDA for samples 233960008 and 233960018. The uncertainty is greater than 30% of the Th-230 and Th-232 results and the activity is between 2X and 5X the MDA for sample 233960009. 2. Samples 233960001, 233960002, 233960005, 233960006, 233960007, 233960008, 233960009, 233960010, 233960011, 233960012, 233960013, 233960015, 233960016, 233960017, 233960018, 233960019, 233960020, and 1201905855 do not meet the client's tracer yield requirement of 70 - 120%. However, samples do meet the GEL standard tracer requirements of 15 to 125 %. The blank and the laboratory control sample do meet the client's tracer yield requirements. 1. Samples were counted for the maximum count time of 1000 minutes to achieve the best Uncertainties possible. Project Manager notified. Reporting results. 2. Project Manager notified. Reporting results

Manual Integration

No manual integrations were performed on data in this batch.

Additional Comments

The blank activity for Th-230 is greater than MDA but less than the RDL, also less than 5% of the least active sample in the batch. 1201905854 (MB). The sample and the duplicate, 1201905855 (SA145-10B) and 233960012 (SA145-10B) , did not meet the relative percent difference requirement for Th-230, however they do meet the relative error ratio requirement with a value of 1.76.

Qualifier information

Manual qualifiers were not required.

Method/Analysis Information

Product: Alphaspec U, Liquid
Analytical Method: DOE EML HASL-300, U-02-RC Modified
Analytical Batch Number: 888842

Sample ID	Client ID
233960004	EB072209-SO
233960014	EB072309-SO
1201890124	Method Blank (MB)
1201890131	Laboratory Control Sample (LCS)
1201890138	Laboratory Control Sample Duplicate (LCSD)

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-011 REV# 17.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

Standard solution(s) for these analyses are NIST traceable and used before the expiration date(s).

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

The blank volume is representative of the sample volume in this batch.

Designated QC

A laboratory control sample and a laboratory control sample duplicate, 1201890131 (LCS) and 1201890138 (LCSD), were run with the batch instead of a sample duplicate per client requirement.

QC Information

Refer to Non-Conformance Report.

Technical Information:

Holding Time

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

Samples 233960004 (EB072209-SO) were recounted to verify results.

Miscellaneous Information:

NCR Documentation

Nonconformance reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. The following NCR was generated for this SDG: NCR 720544 was generated due to RDL less than MDA, Failed Recovery for Surrogate or Tracer and Other. 1. Sample 233587015 does not meet the required detection limit for U233/234 or U238. Sample 233587021 does not meet the required detection limit for U233/234. Sample 233612013 and 233960014 do not meet the required detection limit for U233/234 or U235/236. Sample 233612021 does not meet the required detection limit for U233/234, U235/236 or U238. The blank, 1201890124, does not meet the required detection limit for U233/234 or U238 due to keeping the blank aliquot consistent with the samples. Samples do not meet the required detection limits due to the aliquot size and the RDL; a reasonable aliquot of 800 mL was used for analysis and using larger aliquots would result in low tracer yields. 2. Sample 233960004 does not meet the client's tracer yield requirement of 70 - 120%. However, with a value of 66.8%, sample does meet the GEL standard tracer requirement. The blank and the laboratory control sample do meet the client's tracer yield requirements. 3. The uncertainty is greater than 30% of the U238 activity for sample 233612013. The U238 result is between 2X and 5X the MDA, and the sample was counted for the maximum count time to reduce uncertainty. 1. Samples counted for 1000 minutes to achieve the best MDA possible. Group leader consulted. Project manager notified. Reporting results. 2. Project manager notified. Reporting results. 3. Samples counted for 1000 minutes to achieve the lowest uncertainty possible. Project manager notified. Reporting results.

Manual Integration

No manual integrations were performed on data in this batch.

Additional Comments

Additional comments were not required for this sample set.

Qualifier information

Manual qualifiers were not required.

Method/Analysis Information

Product:	Alphaspec U, Solid
Analytical Method:	DOE EML HASL-300, U-02-RC Modified
Prep Method:	Dry Soil Prep
Analytical Batch Number:	890375
Prep Batch Number:	888410

Sample ID	Client ID
233960001	SA182-10B
233960002	SA182-25B
233960003	SA182-38B
233960005	SA71-10B
233960006	SA71-25B
233960007	SA71-36B
233960008	SA131-0.5B
233960009	SA131009-0.5B
233960010	SA131-10B
233960011	SA131-27B
233960012	SA145-10B
233960013	SA145-24B
233960015	RSAH3-0.5B
233960016	RSAH3009-0.5B
233960017	RSAH3-10B
233960018	RSAH3-20B
233960019	RSAH3-32B
233960020	RSAI5-0.5B
1201893646	Method Blank (MB)
1201893647	233960012(SA145-10B) Sample Duplicate (DUP)
1201893648	233960012(SA145-10B) Matrix Spike (MS)
1201893649	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-011 REV# 17.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

Standard solution(s) for these analyses are NIST traceable and used before the expiration date(s).

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

The blank volume is representative of the sample volume in this batch.

Designated QC

The following sample was used for QC: 233960012 (SA145-10B).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:

Holding Time

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Miscellaneous Information:

NCR Documentation

Nonconformance reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. The following NCR was generated for this SDG: NCR 724536 was generated due to Other. 1. Samples 233960001, 233960003, 233960005, 233960006, 233960007, 233960011, 233960012, 233960013, 233960017 and duplicate 1201893647 have U-235/236 activity between two and five times the MDA and uncertainty greater than 30% of that respective activity. Sample 233960020 has U-235/236 activity greater than five times the MDA and uncertainty greater than 30% of that activity. 1. Samples were all counted the maximum count time of 1000 minutes to achieve the best possible uncertainties. PM notified, reporting results.

Manual Integration

No manual integrations were performed on data in this batch.

Additional Comments

The U-235/236 blank result is greater than the MDA but less than the RDL.

Qualifier information

Manual qualifiers were not required.

Method/Analysis Information

Product: GFPC, Ra228, Liquid

Analytical Method: EPA 904.0/SW846 9320 Modified

Analytical Batch Number: 888441

Sample ID	Client ID
233960004	EB072209-SO
233960014	EB072309-SO
1201889163	Method Blank (MB)
1201889164	Laboratory Control Sample (LCS)
1201889165	Laboratory Control Sample Duplicate (LCSD)

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-009 REV# 15.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

Standard solution(s) for these analyses are NIST traceable and used before the expiration date(s).

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

The blank volume is representative of the sample volume in this batch.

Designated QC

A laboratory control sample and a laboratory control sample duplicate, 1201889164 (LCS) and 1201889165 (LCSD), were run with the batch instead of a sample duplicate per client requirement.

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:

Holding Time

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Chemical Recoveries

All chemical recoveries meet the required acceptance limits for this sample set.

Miscellaneous Information:

NCR Documentation

Nonconformance reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A nonconformance report (NCR) was not generated for this SDG.

Additional Comments

The laboratory control sample and the laboratory control sample duplicate, 1201889164 (LCS) and

1201889165 (LCSD), did not meet the relative percent difference requirement. However they do meet the recovery requirement.

Qualifier information

Manual qualifiers were not required.

Method/Analysis Information

Product: Gas Flow Radium 228
Analytical Method: EPA 904.0/SW846 9320 Modified
Prep Method: Dry Soil Prep
Analytical Batch Number: 888747
Prep Batch Number: 888410

Sample ID	Client ID
233960001	SA182-10B
233960002	SA182-25B
233960003	SA182-38B
233960005	SA71-10B
233960006	SA71-25B
233960007	SA71-36B
233960008	SA131-0.5B
233960009	SA131009-0.5B
233960010	SA131-10B
233960011	SA131-27B
233960012	SA145-10B
233960013	SA145-24B
233960015	RSAH3-0.5B
233960016	RSAH3009-0.5B
233960017	RSAH3-10B
233960018	RSAH3-20B
233960019	RSAH3-32B
233960020	RSAI5-0.5B
1201889923	Method Blank (MB)
1201889924	233960012(SA145-10B) Sample Duplicate (DUP)
1201889925	233960012(SA145-10B) Matrix Spike (MS)
1201889926	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories

LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-009 REV# 15.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

Standard solution(s) for these analyses are NIST traceable and used before the expiration date(s).

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

The blank volume is representative of the sample volume in this batch.

Designated QC

The following sample was used for QC: 233960012 (SA145-10B).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:

Holding Time

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

Samples 233960001 (SA182-10B), 233960002 (SA182-25B), 233960003 (SA182-38B), 233960009 (SA131009-0.5B), 233960011 (SA131-27B), 233960012 (SA145-10B) and 233960019 (RSAH3-32B) recounted due to uncertainty requirements. Samples were reprecipitated due to uncertainty requirements. Samples 1201889923 (MB), 1201889926 (LCS) and 233960019 (RSAH3-32B) were re-eluted to meet MDA.

Chemical Recoveries

All chemical recoveries meet the required acceptance limits for this sample set.

Miscellaneous Information:

NCR Documentation

Nonconformance reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A nonconformance report (NCR) was not generated for this SDG.

Additional Comments

Additional comments were not required for this sample set.

Qualifier information

Manual qualifiers were not required.

Method/Analysis Information

Product: Lucas Cell, Ra226, liquid

Analytical Method: EPA 903.1 Modified

Analytical Batch Number: 889473

Sample ID	Client ID
233960004	EB072209-SO
233960014	EB072309-SO
1201891551	Method Blank (MB)
1201891552	Laboratory Control Sample (LCS)
1201891553	Laboratory Control Sample Duplicate (LCSD)

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-008 REV# 12.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

Standard solution(s) for these analyses are NIST traceable and used before the expiration date(s).

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

The blank volume is representative of the sample volume in this batch.

Designated QC

A laboratory control sample and a laboratory control sample duplicate, 1201891552 (LCS) and 1201891553 (LCSD), were run with the batch instead of a sample duplicate per client requirement.

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:

Holding Time

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Miscellaneous Information:

NCR Documentation

Nonconformance reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A nonconformance report (NCR) was not generated for this SDG.

Additional Comments

Additional comments were not required for this sample set.

Qualifier information

Manual qualifiers were not required.

Method/Analysis Information

Product:	Lucas Cell, Ra226, solid
Analytical Method:	EPA 903.1 Modified
Prep Method:	Dry Soil Prep
Analytical Batch Number:	891163
Prep Batch Number:	888410

Sample ID	Client ID
233960001	SA182-10B
233960002	SA182-25B
233960003	SA182-38B
233960005	SA71-10B
233960006	SA71-25B
233960007	SA71-36B
233960008	SA131-0.5B
233960009	SA131009-0.5B
233960010	SA131-10B
233960011	SA131-27B
233960012	SA145-10B
233960013	SA145-24B
233960015	RSAH3-0.5B
233960016	RSAH3009-0.5B
233960017	RSAH3-10B
233960018	RSAH3-20B
233960019	RSAH3-32B
233960020	RSAI5-0.5B
1201895479	Method Blank (MB)
1201895480	233960012(SA145-10B) Sample Duplicate (DUP)
1201895481	233960012(SA145-10B) Matrix Spike (MS)
1201895482	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-008 REV# 12.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

Standard solution(s) for these analyses are NIST traceable and used before the expiration date(s).

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

The blank volume is representative of the sample volume in this batch.

Designated QC

The following sample was used for QC: 233960012 (SA145-10B).

COMPANY - WIDE NONCONFORMANCE REPORT

Mo.Day Yr. 12-AUG-09	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: ALPHA SPECTROMETER	Test / Method: DOE EML HASL-300, U-02-RC Modified	Matrix Type: Liquid	Client Code: KERR
Batch ID: 888842	Sample Numbers: See Below		

Potentially affected work order(s)(SDG): 233587,233612,233960

Application Issues:

- RDL less than MDA
- Failed Recovery for Surrogate or Tracer
- Other

Specification and Requirements Nonconformance Description:	NRG Disposition:
<p>1. Sample 233587015 does not meet the required detection limit for U233/234 or U238. Sample 233587021 does not meet the required detection limit for U233/234. Sample 233612013 and 233960014 do not meet the required detection limit for U233/234 or U235/236. Sample 233612021 does not meet the required detection limit for U233/234, U235/236 or U238. The blank, 1201890124, does not meet the required detection limit for U233/234 or U238 due to keeping the blank aliquot consistent with the samples. Samples do not meet the required detection limits due to the aliquot size and the RDL; a reasonable aliquot of 800 mL was used for analysis and using larger aliquots would result in low tracer yields.</p> <p>2. Sample 233960004 does not meet the client's tracer yield requirement of 70 - 120%. However, with a value of 66.8%, sample does meet the GEL standard tracer requirement. The blank and the laboratory control sample do meet the client's tracer yield requirements.</p> <p>3. The uncertainty is greater than 30% of the U238 activity for sample 233612013. The U238 result is between 2X and 5X the MDA, and the sample was counted for the maximum count time to reduce uncertainty.</p>	<p>1. Samples counted for 1000 minutes to achieve the best MDA possible. Group leader consulted. Project manager notified. Reporting results.</p> <p>2. Project manager notified. Reporting results.</p> <p>3. Samples counted for 1000 minutes to achieve the lowest uncertainty possible. Project manager notified. Reporting results.</p>

Originator's Name:
Joseph Moulden 12-AUG-09

Data Validator/Group Leader:
Scott Moreland 15-AUG-09

COMPANY - WIDE NONCONFORMANCE REPORT

Mo.Day Yr. 14-AUG-09	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: ALPHA SPECTROMETER	Test / Method: DOE EML HASL-300, Th-01-RC Modified	Matrix Type: Liquid	Client Code: KERR
Batch ID: 891790	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 233587,233612,233960,234120			
Application Issues: RDL less than MDA			
Specification and Requirements Nonconformance Description:		NRG Disposition:	
<p>1. Sample 233587021 does not meet the required detection limit for Th228 or Th232. Sample 233612013 does not meet the required detection limit for Th232. Samples 233612014, 233960004, 233960014 and 234120018 do not meet the required detection limit for Th228. Sample 233612021 does not meet the required detection limit for Th228, Th230 or Th232. Samples do not meet the required detection limits due to limited sample volume. The blank, 1201896963, does not meet the required detection limit for Th228 due to keeping the blank aliquot consistent with the samples.</p>		<p>1. Project manager notified. Samples counted for maximum count time to achieve best MDA possible. Reporting results.</p>	

Originator's Name:
Joseph Moulden 14-AUG-09

Data Validator/Group Leader:
Scott Moreland 15-AUG-09

COMPANY - WIDE NONCONFORMANCE REPORT

Mo.Day Yr. 20-AUG-09	Division: Radiochemistry	Quality Criteria: Specifications	Type: Product
Instrument Type: ALPHA SPECTROMETER	Test / Method: DOE EML HASL-300, U-02-RC Modified	Matrix Type: Solid	Client Code: KERR
Batch ID: 890375	Sample Numbers: See Below.		
Potentially affected work order(s)(SDG): 233960			
Application Issues: Other			
Specification and Requirements Nonconformance Description:		NRG Disposition:	
<p>1. Samples 233960001, 233960003, 233960005, 233960006, 233960007, 233960011, 233960012, 233960013, 233960017 and duplicate 1201893647 have U-235/236 activity between two and five times the MDA and uncertainty greater than 30% of that respective activity. Sample 233960020 has U-235/236 activity greater than five times the MDA and uncertainty greater than 30% of that activity.</p>		<p>1. Samples were all counted the maximum count time of 1000 minutes to achieve the best possible uncertainties. PM notified, reporting results.</p>	

Originator's Name:
Eric Brimstin 20-AUG-09

Data Validator/Group Leader:
Scott Moreland 21-AUG-09

COMPANY - WIDE NONCONFORMANCE REPORT

Mo.Day Yr. 21-AUG-09	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: LUCAS CELL DETECTOR	Test / Method: EPA 903.1 Modified	Matrix Type: Solid	Client Code: KERR
Batch ID: 891163	Sample Numbers: See below		
Potentially affected work order(s)(SDG): 233960			
Application Issues: Other			
Specification and Requirements		NRG Disposition:	
Nonconformance Description:			
<p>1. Samples 233960005, 233960008, 233960010, 233960012, 233960016, 233960019, 233960020, and 1201895480 have activity between 2 and 5 times the MDA. Uncertainty is greater than 30 percent and the samples counted the maximum count time.</p>		<p>1. Reporting results.</p>	

Originator's Name:

Lyndsey Pace 21-AUG-09

Data Validator/Group Leader:

Lesley Anderson 21-AUG-09

COMPANY - WIDE NONCONFORMANCE REPORT

Mo.Day Yr. 22-AUG-09	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: ALPHA SPECTROMETER	Test / Method: DOE EML HASL-300, Th-01-RC Modified	Matrix Type: Solid	Client Code: KERR
Batch ID: 895332	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 233960			
Application Issues: Other			
Specification and Requirements Nonconformance Description:		NRG Disposition:	
<p>1. The uncertainty is greater than 30% of the Th-228 result and the activity is between 2X and 5X the MDA for samples 233960008 and 233960018. The uncertainty is greater than 30% of the Th-230 and Th-232 results and the activity is between 2X and 5X the MDA for sample 233960009.</p> <p>2. Samples 233960001,233960002, 233960005, 233960006, 233960007, 233960008, 233960009, 233960010, 233960011, 233960012, 233960013, 233960015, 233960016, 233960017, 233960018, 233960019, 233960020, and 1201905855 do not meet the client's tracer yield requirement of 70 - 120%. However, samples do meet the GEL standard tracer requirements of 15 to 125 %. The blank and the laboratory control sample do meet the client's tracer yield requirements.</p>		<p>1. Samples were counted for the maximum count time of 1000 minutes to achieve the best Uncertainties possible. Project Manager notified. Reporting results.</p> <p>2. Project Manager notified. Reporting results</p>	

Originator's Name:
Scott Moreland 22-AUG-09

Data Validator/Group Leader:
Theresa Austin 22-AUG-09

SAMPLE DATA SUMMARY

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis Report for

KERR003 Tronox LLC

Client SDG: 233960 GEL Work Order: 233960

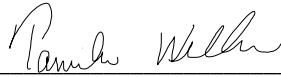
The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a surrogate compound
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

The designation ND, if present, appears in the result column when the analyte concentration is not detected above the detection limit.

This data report has been prepared and reviewed in accordance with GEL Laboratories LLC standard operating procedures. Please direct any questions to your Project Manager, Edith Kent.



Reviewed by

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company : Northgate Environmental
Management, Inc.
Address : 1100 Quail St., Suite 102
Newport Beach, California 92660

Report Date: August 22, 2009

Contact: Mr. Frank Hagar
Project: **Tronox Henderson**

Client Sample ID:	SA182-10B	Project:	KERRHenderson
Sample ID:	233960001	Client ID:	KERR003
Matrix:	SO		
Collect Date:	22-JUL-09 07:07		
Receive Date:	23-JUL-09		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
<i>Alphaspec Th, Solid "Dry Weight Corrected"</i>												
Thorium-228		1.87	+/-0.301	0.216	0.050	pCi/g		MXA	08/20/09	2036	895332	1
Thorium-230		0.852	+/-0.194	0.105	0.050	pCi/g						
Thorium-232		1.93	+/-0.288	0.105	0.100	pCi/g						
<i>Alphaspec U, Solid "Dry Weight Corrected"</i>												
Uranium-233/234		0.794	+/-0.114	0.0747	0.040	pCi/g		MXA	08/08/09	1553	890375	2
Uranium-235/236		0.0513	+/-0.0303	0.014	0.040	pCi/g						
Uranium-238		0.880	+/-0.115	0.0465	0.040	pCi/g						
Rad Gas Flow Proportional Counting												
<i>Gas Flow Radium 228 "Dry Weight Corrected"</i>												
Radium-228		1.55	+/-0.315	0.427	0.500	pCi/g		JXC5	08/10/09	1544	888747	3
Rad Radium-226												
<i>Lucas Cell, Ra226, solid "Dry Weight Corrected"</i>												
Radium-226		0.466	+/-0.217	0.269	0.500	pCi/g		KSD1	08/21/09	1230	891163	4

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	MXM5	07/27/09	1759	888410

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	DOE EML HASL-300, Th-01-RC Modified	
2	DOE EML HASL-300, U-02-RC Modified	
3	EPA 904.0/SW846 9320 Modified	
4	EPA 903.1 Modified	

Surrogate/Tracer recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Actinium-227 Tracer	Alphaspec Th, Solid "Dry Weight Corrected"			62.4	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			95.7	(15%-125%)
Barium-133 Tracer	Gas Flow Radium 228 "Dry Weight Corrected"			83.0	(25%-125%)

GEL LABORATORIES LLC

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Certificate of Analysis

Company : Northgate Environmental Management, Inc.
 Address : 1100 Quail St., Suite 102
 Newport Beach, California 92660

Report Date: August 22, 2009

Contact: Mr. Frank Hagar
 Project: **Tronox Henderson**

Client Sample ID:	SA182-25B	Project:	KERRHenderson
Sample ID:	233960002	Client ID:	KERR003
Matrix:	SO		
Collect Date:	22-JUL-09 07:38		
Receive Date:	23-JUL-09		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
<i>Alphaspec Th, Solid "Dry Weight Corrected"</i>												
Thorium-228		1.01	+/-0.233	0.208	0.050	pCi/g		MXA	08/20/09	2036	895332	1
Thorium-230		3.39	+/-0.386	0.108	0.050	pCi/g						
Thorium-232		1.26	+/-0.240	0.125	0.100	pCi/g						
<i>Alphaspec U, Solid "Dry Weight Corrected"</i>												
Uranium-233/234		3.32	+/-0.218	0.0592	0.040	pCi/g		MXA	08/08/09	1553	890375	2
Uranium-235/236		0.0996	+/-0.0486	0.0557	0.040	pCi/g						
Uranium-238		2.99	+/-0.206	0.0405	0.040	pCi/g						
Rad Gas Flow Proportional Counting												
<i>Gas Flow Radium 228 "Dry Weight Corrected"</i>												
Radium-228		1.58	+/-0.410	0.622	0.500	pCi/g		JXC5	08/10/09	1544	888747	3
Rad Radium-226												
<i>Lucas Cell, Ra226, solid "Dry Weight Corrected"</i>												
Radium-226		2.32	+/-0.431	0.287	0.500	pCi/g		KSD1	08/21/09	1230	891163	4

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	MXM5	07/27/09	1759	888410

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	DOE EML HASL-300, Th-01-RC Modified	
2	DOE EML HASL-300, U-02-RC Modified	
3	EPA 904.0/SW846 9320 Modified	
4	EPA 903.1 Modified	

Surrogate/Tracer recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Actinium-227 Tracer	Alphaspec Th, Solid "Dry Weight Corrected"			62.6	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			99.4	(15%-125%)
Barium-133 Tracer	Gas Flow Radium 228 "Dry Weight Corrected"			86.6	(25%-125%)

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Certificate of Analysis

Company : Northgate Environmental Management, Inc.
 Address : 1100 Quail St., Suite 102
 Newport Beach, California 92660

Report Date: August 22, 2009

Contact: Mr. Frank Hagar
 Project: **Tronox Henderson**

Client Sample ID:	SA182-38B	Project:	KERRHenderson
Sample ID:	233960003	Client ID:	KERR003
Matrix:	SO		
Collect Date:	22-JUL-09 07:56		
Receive Date:	23-JUL-09		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
<i>Alphaspec Th, Solid "Dry Weight Corrected"</i>												
Thorium-228		1.60	+/-0.250	0.151	0.050	pCi/g		MXA	08/20/09	2036	895332	1
Thorium-230		2.59	+/-0.308	0.103	0.050	pCi/g						
Thorium-232		1.37	+/-0.223	0.0713	0.100	pCi/g						
<i>Alphaspec U, Solid "Dry Weight Corrected"</i>												
Uranium-233/234		2.63	+/-0.194	0.0355	0.040	pCi/g		MXA	08/08/09	1553	890375	2
Uranium-235/236		0.142	+/-0.0545	0.0506	0.040	pCi/g						
Uranium-238		3.37	+/-0.219	0.0283	0.040	pCi/g						
Rad Gas Flow Proportional Counting												
<i>Gas Flow Radium 228 "Dry Weight Corrected"</i>												
Radium-228		1.36	+/-0.264	0.327	0.500	pCi/g		JXC5	08/10/09	1544	888747	3
Rad Radium-226												
<i>Lucas Cell, Ra226, solid "Dry Weight Corrected"</i>												
Radium-226		1.55	+/-0.361	0.297	0.500	pCi/g		KSD1	08/21/09	1230	891163	4

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	MXM5	07/27/09	1759	888410

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	DOE EML HASL-300, Th-01-RC Modified	
2	DOE EML HASL-300, U-02-RC Modified	
3	EPA 904.0/SW846 9320 Modified	
4	EPA 903.1 Modified	

Surrogate/Tracer recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Actinium-227 Tracer	Alphaspec Th, Solid "Dry Weight Corrected"			75.8	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			96.4	(15%-125%)
Barium-133 Tracer	Gas Flow Radium 228 "Dry Weight Corrected"			83.8	(25%-125%)

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Certificate of Analysis

Company : Northgate Environmental
Management, Inc.
Address : 1100 Quail St., Suite 102
Newport Beach, California 92660

Report Date: August 22, 2009

Contact: Mr. Frank Hagar
Project: **Tronox Henderson**

Client Sample ID: EB072209-SO
Sample ID: 233960004
Matrix: W
Collect Date: 22-JUL-09 11:40
Receive Date: 23-JUL-09
Collector: Client
Project: KERRHenderson
Client ID: KERR003

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Rad Alpha Spec Analysis											
<i>Alphaspec Th, Liquid "As Received"</i>											
Thorium-228	U	0.0147	+/-0.019	0.0324	0.030	pCi/L		JXD2 08/12/09 1905	891790	1	
Thorium-230	U	0.00292	+/-0.00992	0.0224	0.030	pCi/L					
Thorium-232	U	0.00	+/-0.00573	0.00876	0.030	pCi/L					
<i>Alphaspec U, Liquid "As Received"</i>											
Uranium-233/234		0.0409	+/-0.0218	0.025	0.030	pCi/L		JXD2 08/11/09 1121	888842	2	
Uranium-235/236	U	0.014	+/-0.0145	0.0214	0.030	pCi/L					
Uranium-238		0.0226	+/-0.0154	0.0173	0.030	pCi/L					
Rad Gas Flow Proportional Counting											
<i>GFPC, Ra228, Liquid "As Received"</i>											
Radium-228		3.22	+/-1.98	3.13	3.00	pCi/L		JXC5 07/31/09 1609	888441	3	
Rad Radium-226											
<i>Lucas Cell, Ra226, liquid "As Received"</i>											
Radium-226	U	0.397	+/-0.357	0.543	1.00	pCi/L		KSD1 08/14/09 1415	889473	4	

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	DOE EML HASL-300, Th-01-RC Modified	
2	DOE EML HASL-300, U-02-RC Modified	
3	EPA 904.0/SW846 9320 Modified	
4	EPA 903.1 Modified	

Surrogate/Tracer recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Actinium-227 Tracer	Alphaspec Th, Liquid "As Received"			73.5	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Liquid "As Received"			66.8	(15%-125%)
Barium-133 Tracer	GFPC, Ra228, Liquid "As Received"			73.9	(15%-125%)

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Certificate of Analysis

Company : Northgate Environmental Management, Inc.
 Address : 1100 Quail St., Suite 102
 Newport Beach, California 92660

Report Date: August 22, 2009

Contact: Mr. Frank Hagar
 Project: **Tronox Henderson**

Client Sample ID:	SA71-10B	Project:	KERRHenderson
Sample ID:	233960005	Client ID:	KERR003
Matrix:	SO		
Collect Date:	23-JUL-09 06:53		
Receive Date:	24-JUL-09		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
<i>Alphaspec Th, Solid "Dry Weight Corrected"</i>												
Thorium-228		1.84	+/-0.353	0.276	0.050	pCi/g		MXA	08/20/09	2036	895332	1
Thorium-230		1.51	+/-0.294	0.0448	0.050	pCi/g						
Thorium-232		1.82	+/-0.334	0.184	0.100	pCi/g						
<i>Alphaspec U, Solid "Dry Weight Corrected"</i>												
Uranium-233/234		1.07	+/-0.123	0.0395	0.040	pCi/g		MXA	08/08/09	1553	890375	2
Uranium-235/236		0.0663	+/-0.0336	0.0133	0.040	pCi/g						
Uranium-238		1.03	+/-0.120	0.0274	0.040	pCi/g						
Rad Gas Flow Proportional Counting												
<i>Gas Flow Radium 228 "Dry Weight Corrected"</i>												
Radium-228		1.93	+/-0.488	0.555	0.500	pCi/g		JXC5	08/10/09	1116	888747	3
Rad Radium-226												
<i>Lucas Cell, Ra226, solid "Dry Weight Corrected"</i>												
Radium-226		0.651	+/-0.231	0.216	0.500	pCi/g		KSD1	08/21/09	1230	891163	4

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	MXM5	07/27/09	1759	888410

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	DOE EML HASL-300, Th-01-RC Modified	
2	DOE EML HASL-300, U-02-RC Modified	
3	EPA 904.0/SW846 9320 Modified	
4	EPA 903.1 Modified	

Surrogate/Tracer recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Actinium-227 Tracer	Alphaspec Th, Solid "Dry Weight Corrected"			46.1	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			98.9	(15%-125%)
Barium-133 Tracer	Gas Flow Radium 228 "Dry Weight Corrected"			77.1	(25%-125%)

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Certificate of Analysis

Company : Northgate Environmental Management, Inc.
 Address : 1100 Quail St., Suite 102
 Newport Beach, California 92660

Report Date: August 22, 2009

Contact: Mr. Frank Hagar
 Project: **Tronox Henderson**

Client Sample ID:	SA71-25B	Project:	KERRHenderson
Sample ID:	233960006	Client ID:	KERR003
Matrix:	SO		
Collect Date:	23-JUL-09 07:29		
Receive Date:	24-JUL-09		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
<i>Alphaspec Th, Solid "Dry Weight Corrected"</i>												
Thorium-228		2.17	+/-0.327	0.218	0.050	pCi/g		MXA	08/20/09	2036	895332	1
Thorium-230		2.56	+/-0.337	0.109	0.050	pCi/g						
Thorium-232		1.64	+/-0.269	0.087	0.100	pCi/g						
<i>Alphaspec U, Solid "Dry Weight Corrected"</i>												
Uranium-233/234		1.69	+/-0.126	0.0267	0.040	pCi/g		MXA	08/08/09	1553	890375	2
Uranium-235/236		0.107	+/-0.0361	0.0229	0.040	pCi/g						
Uranium-238		1.58	+/-0.122	0.0231	0.040	pCi/g						
Rad Gas Flow Proportional Counting												
<i>Gas Flow Radium 228 "Dry Weight Corrected"</i>												
Radium-228		1.93	+/-0.532	0.675	0.500	pCi/g		JXC5	08/10/09	1116	888747	3
Rad Radium-226												
<i>Lucas Cell, Ra226, solid "Dry Weight Corrected"</i>												
Radium-226		1.85	+/-0.384	0.290	0.500	pCi/g		KSD1	08/21/09	1230	891163	4

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	MXM5	07/27/09	1759	888410

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	DOE EML HASL-300, Th-01-RC Modified	
2	DOE EML HASL-300, U-02-RC Modified	
3	EPA 904.0/SW846 9320 Modified	
4	EPA 903.1 Modified	

Surrogate/Tracer recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Actinium-227 Tracer	Alphaspec Th, Solid "Dry Weight Corrected"			58.8	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			99.5	(15%-125%)
Barium-133 Tracer	Gas Flow Radium 228 "Dry Weight Corrected"			81.7	(25%-125%)

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Certificate of Analysis

Company : Northgate Environmental Management, Inc.
 Address : 1100 Quail St., Suite 102
 Newport Beach, California 92660

Report Date: August 22, 2009

Contact: Mr. Frank Hagar
 Project: **Tronox Henderson**

Client Sample ID:	SA71-36B	Project:	KERRHenderson
Sample ID:	233960007	Client ID:	KERR003
Matrix:	SO		
Collect Date:	23-JUL-09 07:46		
Receive Date:	24-JUL-09		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
<i>Alphaspec Th, Solid "Dry Weight Corrected"</i>												
Thorium-228		1.30	+/-0.316	0.308	0.050	pCi/g		MXA	08/20/09	2036	895332	1
Thorium-230		1.37	+/-0.291	0.167	0.050	pCi/g						
Thorium-232		1.24	+/-0.274	0.145	0.100	pCi/g						
<i>Alphaspec U, Solid "Dry Weight Corrected"</i>												
Uranium-233/234		1.13	+/-0.105	0.0241	0.040	pCi/g		MXA	08/08/09	1553	890375	2
Uranium-235/236		0.103	+/-0.0361	0.0238	0.040	pCi/g						
Uranium-238		1.19	+/-0.108	0.0241	0.040	pCi/g						
Rad Gas Flow Proportional Counting												
<i>Gas Flow Radium 228 "Dry Weight Corrected"</i>												
Radium-228		1.51	+/-0.404	0.391	0.500	pCi/g		JXC5	08/10/09	1116	888747	3
Rad Radium-226												
<i>Lucas Cell, Ra226, solid "Dry Weight Corrected"</i>												
Radium-226		0.413	+/-0.220	0.290	0.500	pCi/g		KSD1	08/21/09	1305	891163	4

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	MXM5	07/27/09	1759	888410

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	DOE EML HASL-300, Th-01-RC Modified	
2	DOE EML HASL-300, U-02-RC Modified	
3	EPA 904.0/SW846 9320 Modified	
4	EPA 903.1 Modified	

Surrogate/Tracer recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Actinium-227 Tracer	Alphaspec Th, Solid "Dry Weight Corrected"			46.2	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			96.2	(15%-125%)
Barium-133 Tracer	Gas Flow Radium 228 "Dry Weight Corrected"			76.7	(25%-125%)

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company : Northgate Environmental Management, Inc.
 Address : 1100 Quail St., Suite 102
 Newport Beach, California 92660

Report Date: August 22, 2009

Contact: Mr. Frank Hagar
 Project: **Tronox Henderson**

Client Sample ID:	SA131-0.5B	Project:	KERRHenderson
Sample ID:	233960008	Client ID:	KERR003
Matrix:	SO		
Collect Date:	23-JUL-09 08:17		
Receive Date:	24-JUL-09		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
<i>Alphaspec Th, Solid "Dry Weight Corrected"</i>												
Thorium-228		0.786	+/-0.246	0.231	0.050	pCi/g		MXA	08/20/09	2036	895332	1
Thorium-230		0.817	+/-0.224	0.0481	0.050	pCi/g						
Thorium-232		0.833	+/-0.227	0.0481	0.100	pCi/g						
<i>Alphaspec U, Solid "Dry Weight Corrected"</i>												
Uranium-233/234		5.37	+/-0.229	0.0556	0.040	pCi/g		MXA	08/08/09	1553	890375	2
Uranium-235/236		0.254	+/-0.055	0.0093	0.040	pCi/g						
Uranium-238		4.23	+/-0.203	0.0361	0.040	pCi/g						
Rad Gas Flow Proportional Counting												
<i>Gas Flow Radium 228 "Dry Weight Corrected"</i>												
Radium-228		1.25	+/-0.369	0.392	0.500	pCi/g		JXC5	08/10/09	1116	888747	3
Rad Radium-226												
<i>Lucas Cell, Ra226, solid "Dry Weight Corrected"</i>												
Radium-226		0.602	+/-0.250	0.295	0.500	pCi/g		KSD1	08/21/09	1305	891163	4

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	MXM5	07/27/09	1759	888410

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	DOE EML HASL-300, Th-01-RC Modified	
2	DOE EML HASL-300, U-02-RC Modified	
3	EPA 904.0/SW846 9320 Modified	
4	EPA 903.1 Modified	

Surrogate/Tracer recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Actinium-227 Tracer	Alphaspec Th, Solid "Dry Weight Corrected"			42.0	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			92.1	(15%-125%)
Barium-133 Tracer	Gas Flow Radium 228 "Dry Weight Corrected"			80.5	(25%-125%)

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Certificate of Analysis

Company : Northgate Environmental Management, Inc.
 Address : 1100 Quail St., Suite 102
 Newport Beach, California 92660

Report Date: August 22, 2009

Contact: Mr. Frank Hagar
 Project: **Tronox Henderson**

Client Sample ID:	SA131009-0.5B	Project:	KERRHenderson
Sample ID:	233960009	Client ID:	KERR003
Matrix:	SO		
Collect Date:	23-JUL-09 08:17		
Receive Date:	24-JUL-09		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
<i>Alphaspec Th, Solid "Dry Weight Corrected"</i>												
Thorium-228		1.17	+/-0.318	0.260	0.050	pCi/g		MXA	08/20/09	2036	895332	1
Thorium-230		0.756	+/-0.266	0.260	0.050	pCi/g						
Thorium-232		0.698	+/-0.234	0.148	0.100	pCi/g						
<i>Alphaspec U, Solid "Dry Weight Corrected"</i>												
Uranium-233/234		5.24	+/-0.220	0.0387	0.040	pCi/g		MXA	08/08/09	1553	890375	2
Uranium-235/236		0.263	+/-0.0553	0.0226	0.040	pCi/g						
Uranium-238		3.90	+/-0.190	0.0295	0.040	pCi/g						
Rad Gas Flow Proportional Counting												
<i>Gas Flow Radium 228 "Dry Weight Corrected"</i>												
Radium-228		1.50	+/-0.282	0.358	0.500	pCi/g		JXC5	08/10/09	1544	888747	3
Rad Radium-226												
<i>Lucas Cell, Ra226, solid "Dry Weight Corrected"</i>												
Radium-226		0.594	+/-0.270	0.331	0.500	pCi/g		KSD1	08/21/09	1305	891163	4

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	MXM5	07/27/09	1759	888410

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	DOE EML HASL-300, Th-01-RC Modified	
2	DOE EML HASL-300, U-02-RC Modified	
3	EPA 904.0/SW846 9320 Modified	
4	EPA 903.1 Modified	

Surrogate/Tracer recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Actinium-227 Tracer	Alphaspec Th, Solid "Dry Weight Corrected"			36.4	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			96.8	(15%-125%)
Barium-133 Tracer	Gas Flow Radium 228 "Dry Weight Corrected"			82.6	(25%-125%)

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Certificate of Analysis

Company : Northgate Environmental Management, Inc.
 Address : 1100 Quail St., Suite 102
 Newport Beach, California 92660

Contact: Mr. Frank Hagar
 Project: **Tronox Henderson**

Report Date: August 22, 2009

Client Sample ID:	SA131-10B	Project:	KERRHenderson
Sample ID:	233960010	Client ID:	KERR003
Matrix:	SO		
Collect Date:	23-JUL-09 09:05		
Receive Date:	24-JUL-09		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
<i>Alphaspec Th, Solid "Dry Weight Corrected"</i>												
Thorium-228		2.02	+/-0.288	0.136	0.050	pCi/g		MXA	08/20/09	2036	895332	1
Thorium-230		1.51	+/-0.247	0.112	0.050	pCi/g						
Thorium-232		1.82	+/-0.267	0.0776	0.100	pCi/g						
<i>Alphaspec U, Solid "Dry Weight Corrected"</i>												
Uranium-233/234		0.982	+/-0.118	0.0278	0.040	pCi/g		MXA	08/10/09	1411	890375	2
Uranium-235/236		0.036	+/-0.0279	0.0344	0.040	pCi/g						
Uranium-238		0.898	+/-0.113	0.0348	0.040	pCi/g						
Rad Gas Flow Proportional Counting												
<i>Gas Flow Radium 228 "Dry Weight Corrected"</i>												
Radium-228		1.74	+/-0.407	0.378	0.500	pCi/g		JXC5	08/10/09	1116	888747	3
Rad Radium-226												
<i>Lucas Cell, Ra226, solid "Dry Weight Corrected"</i>												
Radium-226		0.994	+/-0.309	0.309	0.500	pCi/g		KSD1	08/21/09	1305	891163	4

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	MXM5	07/27/09	1759	888410

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	DOE EML HASL-300, Th-01-RC Modified	
2	DOE EML HASL-300, U-02-RC Modified	
3	EPA 904.0/SW846 9320 Modified	
4	EPA 903.1 Modified	

Surrogate/Tracer recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Actinium-227 Tracer	Alphaspec Th, Solid "Dry Weight Corrected"			68.9	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			96.3	(15%-125%)
Barium-133 Tracer	Gas Flow Radium 228 "Dry Weight Corrected"			83.4	(25%-125%)

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Certificate of Analysis

Company : Northgate Environmental Management, Inc.
 Address : 1100 Quail St., Suite 102
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Report Date: August 22, 2009

Contact: Mr. Frank Hagar
 Project: **Tronox Henderson**

Client Sample ID:	SA131-27B	Project:	KERRHenderson
Sample ID:	233960011	Client ID:	KERR003
Matrix:	SO		
Collect Date:	23-JUL-09 09:28		
Receive Date:	24-JUL-09		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
<i>Alphaspec Th, Solid "Dry Weight Corrected"</i>												
Thorium-228		0.941	+/-0.239	0.249	0.050	pCi/g		MXA	08/20/09	2036	895332	1
Thorium-230		5.08	+/-0.470	0.124	0.050	pCi/g						
Thorium-232		0.895	+/-0.199	0.0856	0.100	pCi/g						
<i>Alphaspec U, Solid "Dry Weight Corrected"</i>												
Uranium-233/234		4.60	+/-0.261	0.0698	0.040	pCi/g		MXA	08/10/09	1411	890375	2
Uranium-235/236		0.215	+/-0.0648	0.0448	0.040	pCi/g						
Uranium-238		4.10	+/-0.245	0.0466	0.040	pCi/g						
Rad Gas Flow Proportional Counting												
<i>Gas Flow Radium 228 "Dry Weight Corrected"</i>												
Radium-228		1.64	+/-0.397	0.592	0.500	pCi/g		JXC5	08/10/09	1545	888747	3
Rad Radium-226												
<i>Lucas Cell, Ra226, solid "Dry Weight Corrected"</i>												
Radium-226		3.44	+/-0.460	0.242	0.500	pCi/g		KSD1	08/21/09	1305	891163	4

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	MXM5	07/27/09	1759	888410

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	DOE EML HASL-300, Th-01-RC Modified	
2	DOE EML HASL-300, U-02-RC Modified	
3	EPA 904.0/SW846 9320 Modified	
4	EPA 903.1 Modified	

Surrogate/Tracer recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Actinium-227 Tracer	Alphaspec Th, Solid "Dry Weight Corrected"			61.2	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			95.8	(15%-125%)
Barium-133 Tracer	Gas Flow Radium 228 "Dry Weight Corrected"			92.3	(25%-125%)

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Certificate of Analysis

Company : Northgate Environmental Management, Inc.
 Address : 1100 Quail St., Suite 102
 Newport Beach, California 92660

Report Date: August 22, 2009

Contact: Mr. Frank Hagar
 Project: **Tronox Henderson**

Client Sample ID:	SA145-10B	Project:	KERRHenderson
Sample ID:	233960012	Client ID:	KERR003
Matrix:	SO		
Collect Date:	23-JUL-09 11:42		
Receive Date:	24-JUL-09		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
<i>Alphaspec Th, Solid "Dry Weight Corrected"</i>												
Thorium-228		1.59	+/-0.302	0.241	0.050	pCi/g		MXA	08/20/09	2036	895332	1
Thorium-230		1.21	+/-0.246	0.120	0.050	pCi/g						
Thorium-232		1.76	+/-0.294	0.0962	0.100	pCi/g						
<i>Alphaspec U, Solid "Dry Weight Corrected"</i>												
Uranium-233/234		1.77	+/-0.129	0.0323	0.040	pCi/g		MXA	08/08/09	1553	890375	2
Uranium-235/236		0.0626	+/-0.028	0.0228	0.040	pCi/g						
Uranium-238		1.37	+/-0.113	0.0231	0.040	pCi/g						
Rad Gas Flow Proportional Counting												
<i>Gas Flow Radium 228 "Dry Weight Corrected"</i>												
Radium-228		1.44	+/-0.672	0.979	0.500	pCi/g		JXC5	08/10/09	1545	888747	3
Rad Radium-226												
<i>Lucas Cell, Ra226, solid "Dry Weight Corrected"</i>												
Radium-226		0.754	+/-0.236	0.168	0.500	pCi/g		KSD1	08/21/09	1335	891163	4

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	MXM5	07/27/09	1759	888410

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	DOE EML HASL-300, Th-01-RC Modified	
2	DOE EML HASL-300, U-02-RC Modified	
3	EPA 904.0/SW846 9320 Modified	
4	EPA 903.1 Modified	

Surrogate/Tracer recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Actinium-227 Tracer	Alphaspec Th, Solid "Dry Weight Corrected"			53.7	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			96.0	(15%-125%)
Barium-133 Tracer	Gas Flow Radium 228 "Dry Weight Corrected"			87.5	(25%-125%)

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Certificate of Analysis

Company : Northgate Environmental Management, Inc.
 Address : 1100 Quail St., Suite 102
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Report Date: August 22, 2009

Contact: Mr. Frank Hagar
 Project: **Tronox Henderson**

Client Sample ID:	SA145-24B	Project:	KERRHenderson
Sample ID:	233960013	Client ID:	KERR003
Matrix:	SO		
Collect Date:	23-JUL-09 12:28		
Receive Date:	24-JUL-09		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
<i>Alphaspec Th, Solid "Dry Weight Corrected"</i>												
Thorium-228		1.51	+/-0.287	0.186	0.050	pCi/g		MXA	08/20/09	2036	895332	1
Thorium-230		2.33	+/-0.342	0.0986	0.050	pCi/g						
Thorium-232		1.22	+/-0.249	0.0986	0.100	pCi/g						
<i>Alphaspec U, Solid "Dry Weight Corrected"</i>												
Uranium-233/234		1.93	+/-0.137	0.0382	0.040	pCi/g		MXA	08/08/09	1553	890375	2
Uranium-235/236		0.123	+/-0.0401	0.0296	0.040	pCi/g						
Uranium-238		1.77	+/-0.131	0.0276	0.040	pCi/g						
Rad Gas Flow Proportional Counting												
<i>Gas Flow Radium 228 "Dry Weight Corrected"</i>												
Radium-228		1.21	+/-0.478	0.675	0.500	pCi/g		JXC5	08/10/09	1117	888747	3
Rad Radium-226												
<i>Lucas Cell, Ra226, solid "Dry Weight Corrected"</i>												
Radium-226		1.11	+/-0.314	0.275	0.500	pCi/g		KSD1	08/21/09	1335	891163	4

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	MXM5	07/27/09	1759	888410

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	DOE EML HASL-300, Th-01-RC Modified	
2	DOE EML HASL-300, U-02-RC Modified	
3	EPA 904.0/SW846 9320 Modified	
4	EPA 903.1 Modified	

Surrogate/Tracer recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Actinium-227 Tracer	Alphaspec Th, Solid "Dry Weight Corrected"			52.7	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			92.0	(15%-125%)
Barium-133 Tracer	Gas Flow Radium 228 "Dry Weight Corrected"			78.5	(25%-125%)

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Certificate of Analysis

Company : Northgate Environmental
Management, Inc.
Address : 1100 Quail St., Suite 102
Newport Beach, California 92660

Report Date: August 22, 2009

Contact: Mr. Frank Hagar
Project: **Tronox Henderson**

Client Sample ID:	EB072309-SO	Project:	KERRHenderson
Sample ID:	233960014	Client ID:	KERR003
Matrix:	W		
Collect Date:	23-JUL-09 10:45		
Receive Date:	24-JUL-09		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Rad Alpha Spec Analysis											
<i>Alphaspec Th, Liquid "As Received"</i>											
Thorium-228	U	0.0173	+/-0.0253	0.0442	0.030	pCi/L		JXD2 08/12/09	1905	891790	1
Thorium-230	U	0.00288	+/-0.00564	0.00864	0.030	pCi/L					
Thorium-232	U	0.00576	+/-0.0113	0.022	0.030	pCi/L					
<i>Alphaspec U, Liquid "As Received"</i>											
Uranium-233/234	U	-0.0142	+/-0.0211	0.0488	0.030	pCi/L		JXD2 07/31/09	1925	888842	2
Uranium-235/236	U	-0.00327	+/-0.0143	0.0362	0.030	pCi/L					
Uranium-238	U	0.0106	+/-0.0127	0.0203	0.030	pCi/L					
Rad Gas Flow Proportional Counting											
<i>GFPC, Ra228, Liquid "As Received"</i>											
Radium-228		2.76	+/-1.72	2.68	3.00	pCi/L		JXC5 07/31/09	1609	888441	3
Rad Radium-226											
<i>Lucas Cell, Ra226, liquid "As Received"</i>											
Radium-226	U	0.00	+/-0.327	0.706	1.00	pCi/L		KSD1 08/14/09	1415	889473	4

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	DOE EML HASL-300, Th-01-RC Modified	
2	DOE EML HASL-300, U-02-RC Modified	
3	EPA 904.0/SW846 9320 Modified	
4	EPA 903.1 Modified	

Surrogate/Tracer recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Actinium-227 Tracer	Alphaspec Th, Liquid "As Received"			74.9	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Liquid "As Received"			83.6	(15%-125%)
Barium-133 Tracer	GFPC, Ra228, Liquid "As Received"			82.5	(15%-125%)

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Certificate of Analysis

Company : Northgate Environmental Management, Inc.
 Address : 1100 Quail St., Suite 102
 Newport Beach, California 92660

Report Date: August 22, 2009

Contact: Mr. Frank Hagar
 Project: **Tronox Henderson**

Client Sample ID:	RSAH3-0.5B	Project:	KERRHenderson
Sample ID:	233960015	Client ID:	KERR003
Matrix:	SO		
Collect Date:	24-JUL-09 08:08		
Receive Date:	25-JUL-09		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
<i>Alphaspec Th, Solid "Dry Weight Corrected"</i>												
Thorium-228		1.66	+/-0.270	0.144	0.050	pCi/g		MXA	08/20/09	2036	895332	1
Thorium-230		1.29	+/-0.230	0.0322	0.050	pCi/g						
Thorium-232		2.00	+/-0.290	0.103	0.100	pCi/g						
<i>Alphaspec U, Solid "Dry Weight Corrected"</i>												
Uranium-233/234		1.04	+/-0.101	0.0487	0.040	pCi/g		MXA	08/08/09	1553	890375	2
Uranium-235/236		0.0531	+/-0.0306	0.0396	0.040	pCi/g						
Uranium-238		1.04	+/-0.099	0.0366	0.040	pCi/g						
Rad Gas Flow Proportional Counting												
<i>Gas Flow Radium 228 "Dry Weight Corrected"</i>												
Radium-228		1.48	+/-0.380	0.358	0.500	pCi/g		JXC5	08/10/09	1117	888747	3
Rad Radium-226												
<i>Lucas Cell, Ra226, solid "Dry Weight Corrected"</i>												
Radium-226		0.608	+/-0.264	0.317	0.500	pCi/g		KSD1	08/21/09	1335	891163	4

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	MXM5	07/27/09	1759	888410

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	DOE EML HASL-300, Th-01-RC Modified	
2	DOE EML HASL-300, U-02-RC Modified	
3	EPA 904.0/SW846 9320 Modified	
4	EPA 903.1 Modified	

Surrogate/Tracer recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Actinium-227 Tracer	Alphaspec Th, Solid "Dry Weight Corrected"			64.2	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			99.3	(15%-125%)
Barium-133 Tracer	Gas Flow Radium 228 "Dry Weight Corrected"			80.1	(25%-125%)

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Certificate of Analysis

Company : Northgate Environmental Management, Inc.
 Address : 1100 Quail St., Suite 102
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Report Date: August 22, 2009

Contact: Mr. Frank Hagar
 Project: **Tronox Henderson**

Client Sample ID:	RSAH3009-0.5B	Project:	KERRHenderson
Sample ID:	233960016	Client ID:	KERR003
Matrix:	SO		
Collect Date:	24-JUL-09 08:08		
Receive Date:	25-JUL-09		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
<i>Alphaspec Th, Solid "Dry Weight Corrected"</i>												
Thorium-228		2.00	+/-0.365	0.239	0.050	pCi/g		MXA	08/20/09	2036	895332	1
Thorium-230		1.12	+/-0.267	0.150	0.050	pCi/g						
Thorium-232		1.70	+/-0.322	0.119	0.100	pCi/g						
<i>Alphaspec U, Solid "Dry Weight Corrected"</i>												
Uranium-233/234		0.895	+/-0.0965	0.0418	0.040	pCi/g		MXA	08/08/09	1553	890375	2
Uranium-235/236		0.048	+/-0.0259	0.0245	0.040	pCi/g						
Uranium-238		0.924	+/-0.0962	0.0198	0.040	pCi/g						
Rad Gas Flow Proportional Counting												
<i>Gas Flow Radium 228 "Dry Weight Corrected"</i>												
Radium-228		2.73	+/-0.585	0.663	0.500	pCi/g		JXC5	08/10/09	1117	888747	3
Rad Radium-226												
<i>Lucas Cell, Ra226, solid "Dry Weight Corrected"</i>												
Radium-226		0.929	+/-0.346	0.385	0.500	pCi/g		KSD1	08/21/09	1335	891163	4

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	MXM5	07/27/09	1759	888410

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	DOE EML HASL-300, Th-01-RC Modified	
2	DOE EML HASL-300, U-02-RC Modified	
3	EPA 904.0/SW846 9320 Modified	
4	EPA 903.1 Modified	

Surrogate/Tracer recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Actinium-227 Tracer	Alphaspec Th, Solid "Dry Weight Corrected"			44.5	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			94.6	(15%-125%)
Barium-133 Tracer	Gas Flow Radium 228 "Dry Weight Corrected"			81.8	(25%-125%)

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Certificate of Analysis

Company : Northgate Environmental
Management, Inc.
Address : 1100 Quail St., Suite 102
Newport Beach, California 92660

Report Date: August 22, 2009

Contact: Mr. Frank Hagar
Project: **Tronox Henderson**

Client Sample ID:	RSAH3-10B	Project:	KERRHenderson
Sample ID:	233960017	Client ID:	KERR003
Matrix:	SO		
Collect Date:	24-JUL-09 08:38		
Receive Date:	25-JUL-09		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
<i>Alphaspec Th, Solid "Dry Weight Corrected"</i>												
Thorium-228		1.93	+/-0.351	0.264	0.050	pCi/g		MXA	08/20/09	2036	895332	1
Thorium-230		1.34	+/-0.280	0.158	0.050	pCi/g						
Thorium-232		1.64	+/-0.303	0.109	0.100	pCi/g						
<i>Alphaspec U, Solid "Dry Weight Corrected"</i>												
Uranium-233/234		1.77	+/-0.132	0.0387	0.040	pCi/g		MXA	08/08/09	1553	890375	2
Uranium-235/236		0.078	+/-0.0318	0.0239	0.040	pCi/g						
Uranium-238		1.31	+/-0.117	0.0574	0.040	pCi/g						
Rad Gas Flow Proportional Counting												
<i>Gas Flow Radium 228 "Dry Weight Corrected"</i>												
Radium-228		1.69	+/-0.497	0.635	0.500	pCi/g		JXC5	08/10/09	1122	888747	3
Rad Radium-226												
<i>Lucas Cell, Ra226, solid "Dry Weight Corrected"</i>												
Radium-226		0.545	+/-0.236	0.284	0.500	pCi/g		KSD1	08/21/09	1335	891163	4

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	MXM5	07/27/09	1759	888410

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	DOE EML HASL-300, Th-01-RC Modified	
2	DOE EML HASL-300, U-02-RC Modified	
3	EPA 904.0/SW846 9320 Modified	
4	EPA 903.1 Modified	

Surrogate/Tracer recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Actinium-227 Tracer	Alphaspec Th, Solid "Dry Weight Corrected"			48.1	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			91.7	(15%-125%)
Barium-133 Tracer	Gas Flow Radium 228 "Dry Weight Corrected"			83.9	(25%-125%)

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Certificate of Analysis

Company : Northgate Environmental Management, Inc.
 Address : 1100 Quail St., Suite 102
 Newport Beach, California 92660

Contact: Mr. Frank Hagar
 Project: **Tronox Henderson**

Report Date: August 22, 2009

Client Sample ID: RSAH3-20B	Project: KERRHenderson
Sample ID: 233960018	Client ID: KERR003
Matrix: SO	
Collect Date: 24-JUL-09 09:10	
Receive Date: 25-JUL-09	
Collector: Client	

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
<i>Alphaspec Th, Solid "Dry Weight Corrected"</i>												
Thorium-228		0.802	+/-0.247	0.258	0.050	pCi/g		MXA	08/20/09	2036	895332	1
Thorium-230		5.41	+/-0.555	0.161	0.050	pCi/g						
Thorium-232		0.800	+/-0.215	0.111	0.100	pCi/g						
<i>Alphaspec U, Solid "Dry Weight Corrected"</i>												
Uranium-233/234		4.68	+/-0.208	0.0296	0.040	pCi/g		MXA	08/08/09	1554	890375	2
Uranium-235/236		0.262	+/-0.0559	0.0285	0.040	pCi/g						
Uranium-238		4.11	+/-0.195	0.0184	0.040	pCi/g						
Rad Gas Flow Proportional Counting												
<i>Gas Flow Radium 228 "Dry Weight Corrected"</i>												
Radium-228		0.693	+/-0.442	0.689	0.500	pCi/g		JXC5	08/10/09	1136	888747	3
Rad Radium-226												
<i>Lucas Cell, Ra226, solid "Dry Weight Corrected"</i>												
Radium-226		2.40	+/-0.401	0.131	0.500	pCi/g		KSD1	08/21/09	1410	891163	4

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	MXM5	07/27/09	1759	888410

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	DOE EML HASL-300, Th-01-RC Modified	
2	DOE EML HASL-300, U-02-RC Modified	
3	EPA 904.0/SW846 9320 Modified	
4	EPA 903.1 Modified	

Surrogate/Tracer recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Actinium-227 Tracer	Alphaspec Th, Solid "Dry Weight Corrected"			46.9	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			96.6	(15%-125%)
Barium-133 Tracer	Gas Flow Radium 228 "Dry Weight Corrected"			81.5	(25%-125%)

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Certificate of Analysis

Company : Northgate Environmental Management, Inc.
 Address : 1100 Quail St., Suite 102
 Newport Beach, California 92660

Report Date: August 22, 2009

Contact: Mr. Frank Hagar
 Project: **Tronox Henderson**

Client Sample ID:	RSAH3-32B	Project:	KERRHenderson
Sample ID:	233960019	Client ID:	KERR003
Matrix:	SO		
Collect Date:	24-JUL-09 09:43		
Receive Date:	25-JUL-09		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
<i>Alphaspec Th, Solid "Dry Weight Corrected"</i>												
Thorium-228		1.41	+/-0.261	0.173	0.050	pCi/g		MXA	08/20/09	2036	895332	1
Thorium-230		1.37	+/-0.249	0.125	0.050	pCi/g						
Thorium-232		1.21	+/-0.233	0.108	0.100	pCi/g						
<i>Alphaspec U, Solid "Dry Weight Corrected"</i>												
Uranium-233/234		1.24	+/-0.124	0.045	0.040	pCi/g		MXA	08/08/09	1619	890375	2
Uranium-235/236		0.0735	+/-0.0363	0.037	0.040	pCi/g						
Uranium-238		1.38	+/-0.130	0.0419	0.040	pCi/g						
Rad Gas Flow Proportional Counting												
<i>Gas Flow Radium 228 "Dry Weight Corrected"</i>												
Radium-228		0.980	+/-0.259	0.264	0.500	pCi/g		JXC5	08/11/09	2000	888747	3
Rad Radium-226												
<i>Lucas Cell, Ra226, solid "Dry Weight Corrected"</i>												
Radium-226		0.778	+/-0.271	0.273	0.500	pCi/g		KSD1	08/21/09	1410	891163	4

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	MXM5	07/27/09	1759	888410

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	DOE EML HASL-300, Th-01-RC Modified	
2	DOE EML HASL-300, U-02-RC Modified	
3	EPA 904.0/SW846 9320 Modified	
4	EPA 903.1 Modified	

Surrogate/Tracer recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Actinium-227 Tracer	Alphaspec Th, Solid "Dry Weight Corrected"			59.0	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			94.2	(15%-125%)
Barium-133 Tracer	Gas Flow Radium 228 "Dry Weight Corrected"			82.1	(25%-125%)

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Certificate of Analysis

Company : Northgate Environmental Management, Inc.
 Address : 1100 Quail St., Suite 102
 Newport Beach, California 92660

Report Date: August 22, 2009

Contact: Mr. Frank Hagar
 Project: **Tronox Henderson**

Client Sample ID:	RSAI5-0.5B	Project:	KERRHenderson
Sample ID:	233960020	Client ID:	KERR003
Matrix:	SO		
Collect Date:	24-JUL-09 12:38		
Receive Date:	25-JUL-09		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
<i>Alphaspec Th, Solid "Dry Weight Corrected"</i>												
Thorium-228		2.12	+/-0.375	0.250	0.050	pCi/g		MXA	08/20/09	2036	895332	1
Thorium-230		1.31	+/-0.285	0.148	0.050	pCi/g						
Thorium-232		2.25	+/-0.371	0.148	0.100	pCi/g						
<i>Alphaspec U, Solid "Dry Weight Corrected"</i>												
Uranium-233/234		0.914	+/-0.102	0.0358	0.040	pCi/g		MXA	08/08/09	1619	890375	2
Uranium-235/236		0.0576	+/-0.0282	0.0108	0.040	pCi/g						
Uranium-238		0.943	+/-0.105	0.0419	0.040	pCi/g						
Rad Gas Flow Proportional Counting												
<i>Gas Flow Radium 228 "Dry Weight Corrected"</i>												
Radium-228		1.88	+/-0.479	0.497	0.500	pCi/g		JXC5	08/10/09	1142	888747	3
Rad Radium-226												
<i>Lucas Cell, Ra226, solid "Dry Weight Corrected"</i>												
Radium-226		0.998	+/-0.333	0.252	0.500	pCi/g		KSD1	08/21/09	1410	891163	4

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	MXM5	07/27/09	1759	888410

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	DOE EML HASL-300, Th-01-RC Modified	
2	DOE EML HASL-300, U-02-RC Modified	
3	EPA 904.0/SW846 9320 Modified	
4	EPA 903.1 Modified	

Surrogate/Tracer recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Actinium-227 Tracer	Alphaspec Th, Solid "Dry Weight Corrected"			45.4	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			95.1	(15%-125%)
Barium-133 Tracer	Gas Flow Radium 228 "Dry Weight Corrected"			78.1	(25%-125%)

QUALITY CONTROL DATA

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2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Report Date: August 22, 2009
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Northgate Environmental Management, Inc.
1100 Quail St., Suite 102
Newport Beach, California

Contact: Mr. Frank Hagar

Workorder: 233960

Parname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Alpha Spec											
Batch	888842										
QC1201890131	LCS										
Uranium-233/234				2.79	pCi/L				JXD2	07/31/09	19:25
				+/-0.176							
Uranium-235/236				0.218	pCi/L						
				+/-0.0556							
Uranium-238	3.15			2.96	pCi/L		93.9	(75%-125%)			
				+/-0.182							
QC1201890138	LCSD										
Uranium-233/234				3.27	pCi/L	15.8				07/31/09	19:26
				+/-0.194							
Uranium-235/236				0.183	pCi/L	17.2					
				+/-0.0528							
Uranium-238	3.15			3.35	pCi/L	12.6	106	(0%-20%)			
				+/-0.196							
QC1201890124	MB										
Uranium-233/234			U	-0.0183	pCi/L					07/31/09	19:25
				+/-0.0149							
Uranium-235/236			U	0.00	pCi/L						
				+/-0.0106							
Uranium-238			U	0.00	pCi/L						
				+/-0.0149							
Batch	890375										
QC1201893647	233960012	DUP									
Uranium-233/234				1.77	pCi/g	0.713		(0% - 20%)	MXA1	08/08/09	16:19
				+/-0.129							
Uranium-235/236				0.0626	pCi/g	5.29		(0% - 100%)			
				+/-0.028							
Uranium-238				1.37	pCi/g	1.87		(0% - 20%)			
				+/-0.113							
QC1201893649	LCS										
Uranium-233/234				4.78	pCi/g					08/08/09	16:19
				+/-0.241							
Uranium-235/236				0.252	pCi/g						
				+/-0.0631							
Uranium-238	4.94			5.04	pCi/g		102	(75%-125%)			
				+/-0.247							
QC1201893646	MB										
Uranium-233/234			U	-0.014	pCi/g					08/08/09	16:19
				+/-0.0177							
Uranium-235/236				0.017	pCi/g						
				+/-0.0149							
Uranium-238			U	0.011	pCi/g						

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QC Summary

Workorder: 233960

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Alpha Spec											
Batch	890375										
QC1201893648	233960012	MS									
Uranium-233/234		1.77		6.39	pCi/g				MXA1	08/08/09	16:19
		+/-0.129		+/-0.276							
Uranium-235/236		0.0626		0.297	pCi/g						
		+/-0.028		+/-0.0693							
Uranium-238	5.02	1.37		6.47	pCi/g		102	(75%-125%)			
		+/-0.113		+/-0.278							
Batch	891790										
QC1201896964	LCS										
Thorium-228			U	0.0298	pCi/L				JXD2	08/12/09	19:05
				+/-0.0286							
Thorium-230	2.68			2.93	pCi/L		109	(75%-125%)			
				+/-0.180							
Thorium-232			U	0.00	pCi/L			(75%-125%)			
				+/-0.0211							
QC1201896965	LCSD										
Thorium-228			U	0.0272	pCi/L	8.85				08/12/09	19:05
				+/-0.0297							
Thorium-230	2.68			3.21	pCi/L	9.12	120	(0%-20%)			
				+/-0.194							
Thorium-232			U	0.00	pCi/L	0.00					
				+/-0.0118							
QC1201896963	MB										
Thorium-228			U	0.00513	pCi/L					08/12/09	19:05
				+/-0.0246							
Thorium-230			U	0.00511	pCi/L						
				+/-0.0123							
Thorium-232			U	0.00	pCi/L						
				+/-0.00501							
Batch	895332										
QC1201905855	233960012	DUP									
Thorium-228		1.59		1.89	pCi/g	17.3		(0% - 20%)	MXA1	08/20/09	20:36
		+/-0.302		+/-0.408							
Thorium-230		1.21		1.63	pCi/g	29.8*		(0% - 20%)			
		+/-0.246		+/-0.379							
Thorium-232		1.76		1.73	pCi/g	1.90		(0% - 20%)			
		+/-0.294		+/-0.365							
QC1201905857	LCS										
Thorium-228				0.091	pCi/g					08/20/09	20:36
				+/-0.0585							
Thorium-230	8.36			9.53	pCi/g		114	(75%-125%)			
				+/-0.550							
Thorium-232			U	0.00826	pCi/g			(75%-125%)			
				+/-0.0362							

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QC Summary

Workorder: 233960

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Alpha Spec											
Batch	895332										
QC1201905854		MB									
Thorium-228			U	0.0507	pCi/g				MXA1	08/21/09	14:45
				+/-0.0468							
Thorium-230				0.0337	pCi/g						
				+/-0.033							
Thorium-232			U	0.00843	pCi/g						
				+/-0.0369							
QC1201905856	233960012	MS									
Thorium-228				1.59	pCi/g					08/20/09	20:36
				+/-0.302							
Thorium-230	8.39			1.21	pCi/g		99.8	(75%-125%)			
				+/-0.246							
Thorium-232				1.76	pCi/g			(75%-125%)			
				+/-0.294							
Rad Gas Flow											
Batch	888441										
QC1201889164		LCS									
Radium-228	40.7			39.2	pCi/L		96.2	(75%-125%)	JXC5	07/31/09	16:08
				+/-4.45							
QC1201889165		LCSD									
Radium-228	40.7			50.2	pCi/L	24.7*	123	(0%-20%)		07/31/09	16:08
				+/-5.05							
QC1201889163		MB									
Radium-228			U	2.89	pCi/L					07/31/09	16:08
				+/-1.99							
Batch	888747										
QC1201889924	233960012	DUP									
Radium-228				1.44	pCi/g	3.91		(0% - 100%)	JXC5	08/10/09	11:43
				+/-0.672							
QC1201889926		LCS									
Radium-228	8.02			6.86	pCi/g		85.6	(75%-125%)		08/11/09	20:00
				+/-0.788							
QC1201889923		MB									
Radium-228			U	0.221	pCi/g					08/11/09	20:00
				+/-0.192							
QC1201889925	233960012	MS									
Radium-228	75.7			1.44	pCi/g		90.7	(75%-125%)		08/10/09	11:43
				+/-0.672							
Rad Ra-226											
Batch	889473										
QC1201891552		LCS									
Radium-226	24.2			23.3	pCi/L		96.5	(75%-125%)	KSD1	08/14/09	14:15
				+/-1.80							
QC1201891553		LCSD									
Radium-226	24.2			27.6	pCi/L	16.6	114	(0%-20%)		08/14/09	14:50
				+/-2.29							
QC1201891551		MB									

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QC Summary

Workorder: 233960

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Ra-226											
Batch		889473									
Radium-226			U	0.00	pCi/L					08/14/09	14:15
				+/-0.265							
Batch		891163									
QC1201895480	233960012	DUP									
Radium-226				0.754	pCi/g	20.1		(0% - 100%)	KSD1	08/21/09	14:10
				+/-0.236							
QC1201895482	LCS										
Radium-226	11.4			12.7	pCi/g		112	(75%-125%)		08/21/09	14:40
				+/-1.43							
QC1201895479	MB										
Radium-226			U	0.186	pCi/g					08/21/09	14:10
				+/-0.155							
QC1201895481	233960012	MS									
Radium-226	12.0			0.754	pCi/g		88	(75%-125%)		08/21/09	14:40
				+/-0.236							

Notes:

The Qualifiers in this report are defined as follows:

- ** Analyte is a surrogate compound
- < Result is less than value reported
- > Result is greater than value reported
- A The TIC is a suspected aldol-condensation product
- B For General Chemistry and Organic analysis the target analyte was detected in the associated blank.
- BD Results are either below the MDC or tracer recovery is low
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of the sample
- F Estimated Value
- H Analytical holding time was exceeded
- J Value is estimated
- M M if above MDC and less than LLD
- M Matrix Related Failure
- N/A RPD or %Recovery limits do not apply.
- ND Analyte concentration is not detected above the detection limit
- NJ Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- R Sample results are rejected
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
- UI Gamma Spectroscopy--Uncertain identification
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y QC Samples were not spiked with this compound

GEL LABORATORIES LLC

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QC Summary

Workorder: 233960

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<u>Parmname</u>	<u>NOM</u>	<u>Sample</u>	<u>Qual</u>	<u>QC</u>	<u>Units</u>	<u>RPD%</u>	<u>REC%</u>	<u>Range</u>	<u>Anlst</u>	<u>Date</u>	<u>Time</u>
^	RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.										
h	Preparation or preservation holding time was exceeded										

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more.

^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.

* Indicates that a Quality Control parameter was not within specifications.

For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

RAW DATA

THORIUM

Radiochemistry Batch Checklist, Rev 9

Batch# 895332 Product: Th (Ac-227) Date: 8/22/09

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			N/A
Samples have been blank corrected (if required)			N/A
If activity less 10* MDA/ MDC, error is 150% or less of sample activity. If greater 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.		✓	case narrative
If duplicate activities are less 5* MDA/ MDC, then RPD is 100% or less. If greater 5* MDA/ MDC, then RPD 20% or less. If below the MDA/ MDC, the RPD is 0%.	✓		case narrative
Or meets the client's required RER acceptance criteria.			
Tracer yield is 15-125% . Carrier yield 25-125%.		✓	NCR - 725028
Or meets the client's contract acceptance criteria.			
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	✓		case narrative
Sample was run within hold time.	✓		
Sample was correctly preserved if required.			N/A
Smears Taken for Radioactive batches.	✓		NT ⁰⁹ 8/22/09
Method Spike and LCS are within 75-125% or meets the client's contract acceptance criteria.	✓		
No blank spaces on data forms.	✓		
All line outs initialed and dated.	✓		
No transcription errors are apparent.	✓		
Aux data is correct.			N/A
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stasured.	✓		
QC data entered into QC database and batch is in REVW	✓		
Hit notification complete (if necessary)			N/A
Batch entered into Case Narrative.	✓		
Batch non-conformances completed, if applicable.	✓		NCR - 725028
Batch non-conformances second reviewed and disposition verified to be completed.	✓		NCR - 725028
Aliquot Correction completed if required.			N/A
Review sample historical results if available (If REMP, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

GEL Laboratories, LLC

revised 8/1/08

Primary Review Performed By: Denise Green 8/22/09

Secondary Review Performed By: fit call stratos

8/22
KERR

Thorium (Ac-227 Tracer) Que Sheet

20-AUG-09

Batch #: 895332 Analyst: MXA1 First Client Due Date: 22-AUG-09 Internal Due Date: 16-AUG-09
 Tracer Isotope: Ac-227 Tracer Code: 0887-β-152 Expiration Date: 7/23/10 Vol: 0.1ml Ac-227 Separation Date/Time: 8/20/09 AT 1030 AM
 LCS Isotope: Th-230 LCS Code: A2746-5 Expiration Date: 4/15/10 Vol: 0.1ml
 Spike Isotope: Th-230 Spike Code: A2746-5 Expiration Date: 4/15/10 Vol: 0.1ml
 Prep Date: 8/18/09 Initials: JD Pipet ID: 297158 Balance ID: 50410272 Witness: MEB/19/09

Sample ID	Client Description	Type	Hazard Code	Min CRDL	Matrix	Client	Collection Date	Pos.	Label #	Wet/Dry Aliquot (g/l/f)	Th Det #
233960001-2	SA182-10B	SAMPLE		.05 pCi/g	SOIL	KERR003	22-JUL-09	1	1	0.252	173
233960002-2	SA182-25B	SAMPLE		.05 pCi/g	SOIL	KERR003	22-JUL-09	2	2	0.250	174
233960003-2	SA182-38B	SAMPLE		.05 pCi/g	SOIL	KERR003	22-JUL-09	3	3	0.251	175
233960005-2	SA71-10B	SAMPLE		.05 pCi/g	SOIL	KERR003	23-JUL-09	4	4	0.252	176
233960006-2	SA71-25B	SAMPLE		.05 pCi/g	SOIL	KERR003	23-JUL-09	5	5	0.257	177
233960007-2	SA71-36B	SAMPLE		.05 pCi/g	SOIL	KERR003	23-JUL-09	6	6	0.252	178
233960008-2	SA131-0.5B	SAMPLE		.05 pCi/g	SOIL	KERR003	23-JUL-09	7	7	0.252	179
233960009-2	SA131009-0.5B	SAMPLE		.05 pCi/g	SOIL	KERR003	23-JUL-09	8	8	0.255	180
233960010-2	SA131-10B	SAMPLE		.05 pCi/g	SOIL	KERR003	23-JUL-09	9	9	0.253	181
233960011-2	SA131-27B	SAMPLE		.05 pCi/g	SOIL	KERR003	23-JUL-09	10	10	0.255	182
233960012-2	SA145-10B	SAMPLE		.05 pCi/g	SOIL	KERR003	23-JUL-09	11	11	0.253	183
233960013-2	SA145-24B	SAMPLE		.05 pCi/g	SOIL	KERR003	23-JUL-09	12	12	0.256	184
233960015-2	RSAH3-0.5B	SAMPLE		.05 pCi/g	SOIL	KERR003	24-JUL-09	13	13	0.255	185
233960016-2	RSAH3009-0.5B	SAMPLE		.05 pCi/g	SOIL	KERR003	24-JUL-09	14	14	0.254	186
233960017-2	RSAH3-10B	SAMPLE		.05 pCi/g	SOIL	KERR003	24-JUL-09	15	15	0.250	191
233960018-2	RSAH3-20B	SAMPLE		.05 pCi/g	SOIL	KERR003	24-JUL-09	16	16	0.253	192
233960019-2	RSAH3-32B	SAMPLE		.05 pCi/g	SOIL	KERR003	24-JUL-09	17	17	0.254	193
233960020-2	RSA15-0.5B	SAMPLE		.05 pCi/g	SOIL	KERR003	24-JUL-09	18	18	0.256-2/194	198
1201905854-1	MB for batch 895332	MB		UCF pCi/g to 1	SOIL	QC ACCOUNT		19	19	0.256	195
1201905855-2	SA145-10B(233960012DUP)	DUP		.05 pCi/g	SOIL	QC ACCOUNT	23-JUL-09	20	20	0.251	196
1201905856-2	SA145-10B(233960012MS)	MS		.05 pCi/g	SOIL	QC ACCOUNT	23-JUL-09	21	21	0.255	197
1201905857-1	LCS for batch 895332	LCS		UCF pCi/g to 1	SOIL	QC ACCOUNT		22	22	0.256	198

Choose SOP Used: GL-RAD-A-038
GL-RAD-A-045
GL-RAD-A-043
GL-RAD-A-032

Solid Sample Dissolution by: LEACH OF DIGESTION
 Circle Que

Data Reviewed By: Debra Green 8/22/09
Debra Green

GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 895332
SAMPLE DATE : 20-AUG-2009 10:30:00

SAMPLE ID : S0233960001_TH
SAMPLE QTY: 0.252 G

DETECTOR NUMBER :74431
AVERAGE %EFFICIENCY :26.2319
% YIELD : 62.378

COUNT DATE:20-AUG-2009 20:36:06
ELAPSED LIVE TIME(SEC): 60000.00
ANALYST :MXA1

MS/MSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.493E+00

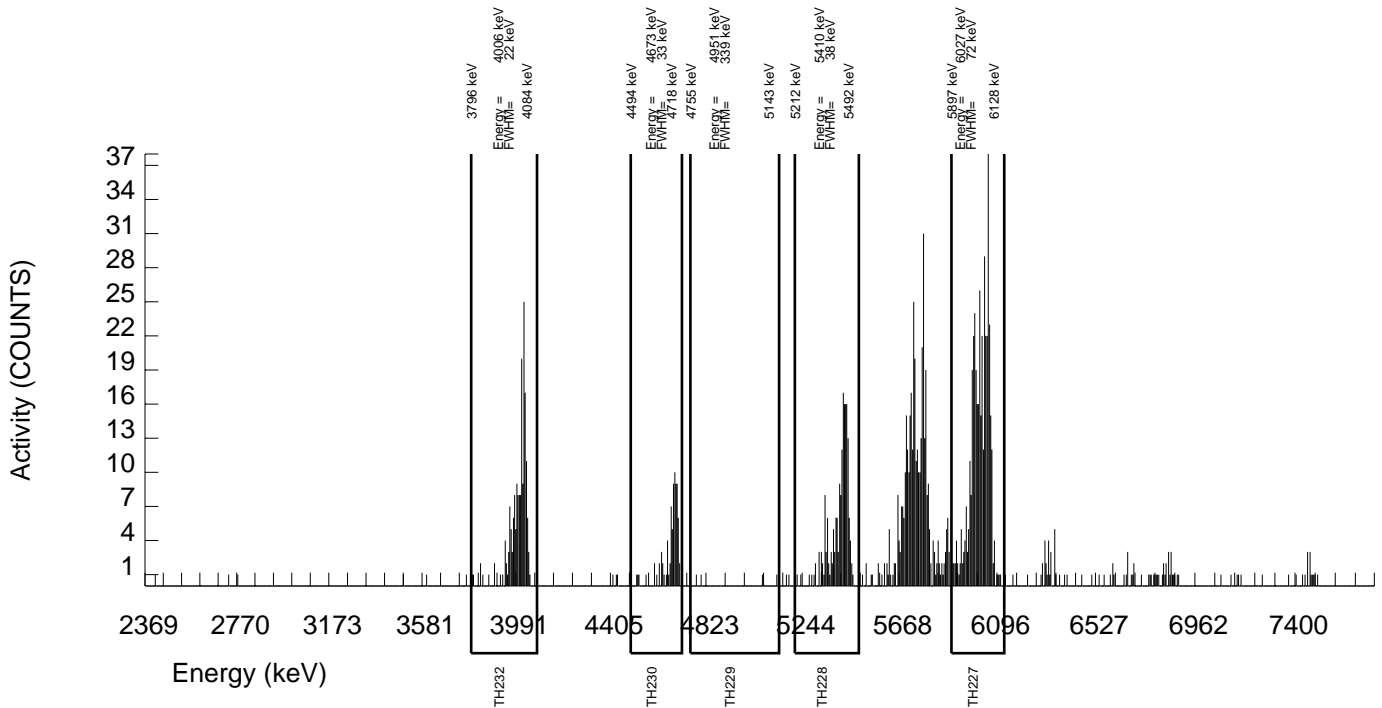
LCS/LCSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.493E+00

TRACER
ID : 0387-B-102
ISOTOPE : AC227
NOMINAL : 3.91473 dpm
RESULTS : 2.44191 dpm

LIB FILE : ENV_ALPHA_TH.N
BKG FILE : B173.CNF;117
BKG DATE : 16-AUG-2009
EFF FILE : W173.CNF;35
CAL DATE : 22-JUL-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
AC-227	6038.010	426.000	424.000	2.000	1.4142	68.10000	7.00E+00	7.88E-01	1.58E-01	5.43E-02	6.69E-01
TH-228	5363.000	184.000	171.000	13.000	3.6056	99.94000	1.87E+00	3.21E-01	2.16E-01	9.18E-02	3.01E-01
TH229	4900.000	4.000	-1.000	5.000	2.2361	99.52000	-1.10E-02	6.45E-02	1.47E-01	5.71E-02	6.45E-02
TH-230	4625.000	80.000	78.000	2.000	1.4142	100.0000	8.52E-01	2.00E-01	1.05E-01	3.59E-02	1.94E-01
TH-232	3972.000	179.000	177.000	2.000	1.4142	100.0000	1.93E+00	3.10E-01	1.05E-01	3.59E-02	2.88E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 895332
SAMPLE DATE : 20-AUG-2009 10:30:00

SAMPLE ID : S0233960002_TH
SAMPLE QTY: 0.250 G

DETECTOR NUMBER :74432
AVERAGE %EFFICIENCY :25.5394
% YIELD : 62.558

COUNT DATE:20-AUG-2009 20:36:08
ELAPSED LIVE TIME(SEC): 60000.00
ANALYST :MXA1

MS/MSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.561E+00

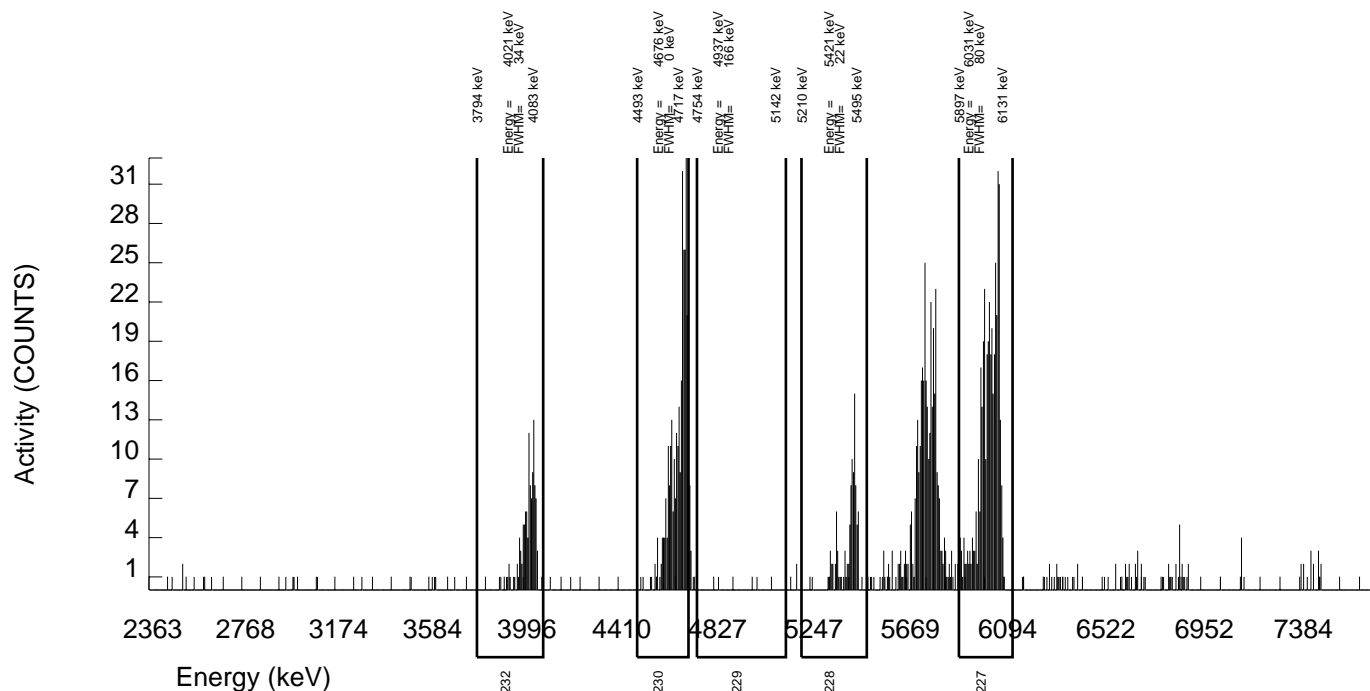
LCS/LCSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.561E+00

TRACER
ID : 0387-B-102
ISOTOPE : AC227
NOMINAL : 3.91473 dpm
RESULTS : 2.44896 dpm

LIB FILE : ENV_ALPHA_TH.N
BKG FILE : B174.CNF;117
BKG DATE : 16-AUG-2009
EFF FILE : W174.CNF;35
CAL DATE : 22-JUL-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
AC-227	6038.010	414.000	414.000	0.000	0.0000	68.10000	7.05E+00	7.99E-01	5.11E-02	0.00E+00	6.79E-01
TH-228	5363.000	100.000	89.000	11.000	3.3166	99.94000	1.01E+00	2.41E-01	2.08E-01	8.71E-02	2.33E-01
TH229	4900.000	2.000	-1.000	3.000	1.7321	99.52000	-1.13E-02	4.97E-02	1.25E-01	4.57E-02	4.97E-02
TH-230	4625.000	303.000	301.000	2.000	1.4142	100.0000	3.39E+00	4.36E-01	1.08E-01	3.71E-02	3.86E-01
TH-232	3972.000	115.000	112.000	3.000	1.7321	100.0000	1.26E+00	2.52E-01	1.25E-01	4.54E-02	2.40E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 895332
SAMPLE DATE : 20-AUG-2009 10:30:00

SAMPLE ID : S0233960003_TH
SAMPLE QTY: 0.251 G

DETECTOR NUMBER :74433
AVERAGE %EFFICIENCY :25.3924
% YIELD : 75.838

COUNT DATE:20-AUG-2009 20:36:11
ELAPSED LIVE TIME(SEC): 60000.00
ANALYST :MXA1

MS/MSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.527E+00

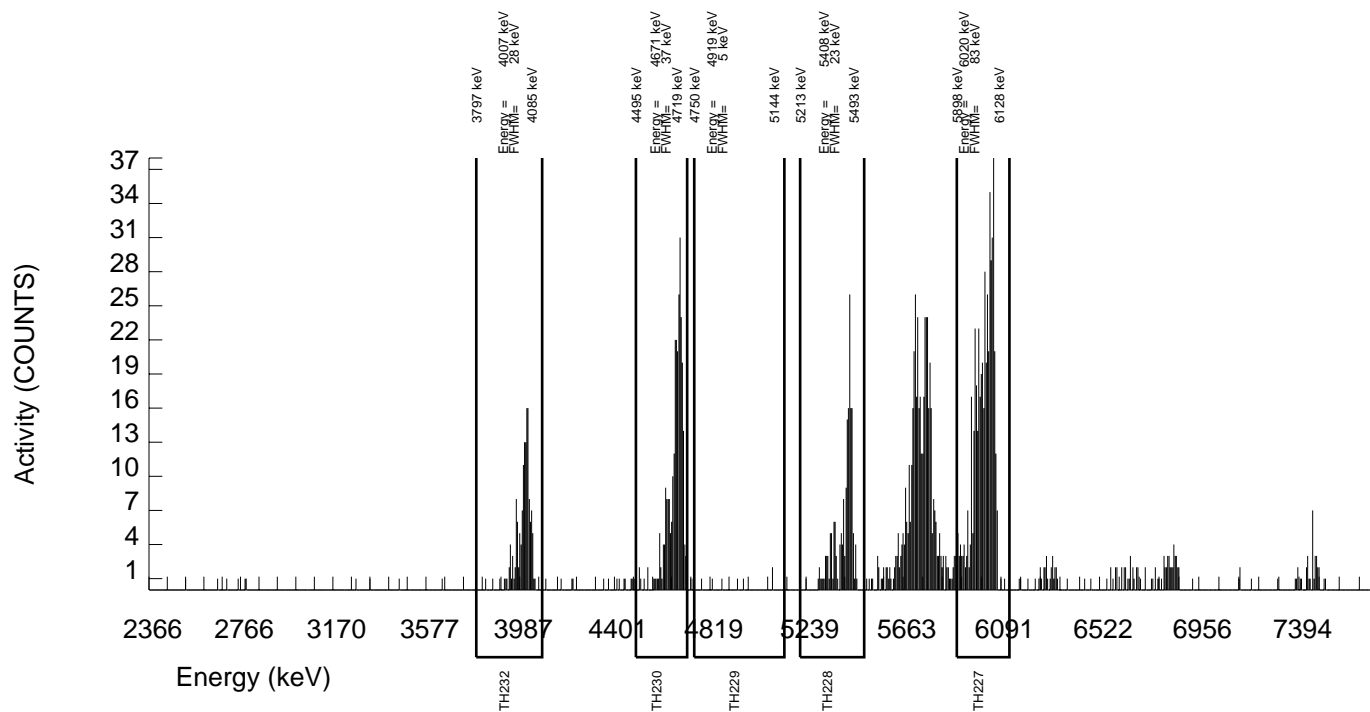
LCS/LCSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.527E+00

TRACER
ID : 0387-B-102
ISOTOPE : AC227
NOMINAL : 3.91473 dpm
RESULTS : 2.96887 dpm

LIB FILE : ENV_ALPHA_TH.N
BKG FILE : B175.CNF;117
BKG DATE : 16-AUG-2009
EFF FILE : W175.CNF;35
CAL DATE : 22-JUL-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
AC-227	6038.010	502.000	499.000	3.000	1.7321	68.10000	7.03E+00	7.48E-01	1.56E-01	5.67E-02	6.20E-01
TH-228	5363.000	179.000	171.000	8.000	2.8284	99.94000	1.60E+00	2.68E-01	1.51E-01	6.14E-02	2.50E-01
TH229	4900.000	8.000	1.000	7.000	2.6458	99.52000	9.36E-03	7.11E-02	1.43E-01	5.76E-02	7.11E-02
TH-230	4625.000	281.000	278.000	3.000	1.7321	100.0000	2.59E+00	3.44E-01	1.03E-01	3.76E-02	3.08E-01
TH-232	3972.000	148.000	147.000	1.000	1.0000	100.0000	1.37E+00	2.37E-01	7.13E-02	2.17E-02	2.23E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 895332
SAMPLE DATE : 20-AUG-2009 10:30:00

SAMPLE ID : S0233960005_TH
SAMPLE QTY: 0.252 G

DETECTOR NUMBER :74434
AVERAGE %EFFICIENCY :25.9651
% YIELD : 46.075

COUNT DATE:20-AUG-2009 20:36:13
ELAPSED LIVE TIME(SEC): 60000.00
ANALYST :MXA1

MS/MSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.493E+00

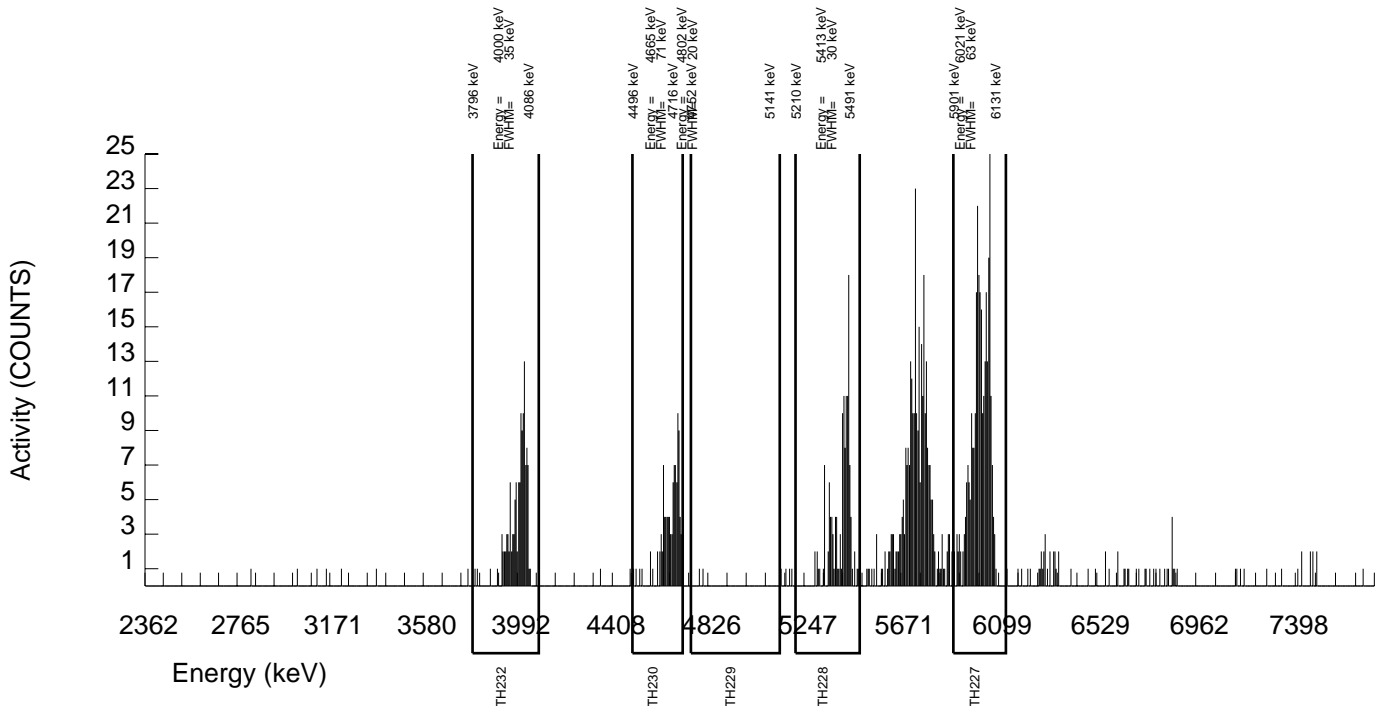
LCS/LCSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.493E+00

TRACER
ID : 0387-B-102
ISOTOPE : AC227
NOMINAL : 3.91473 dpm
RESULTS : 1.80370 dpm

LIB FILE : ENV_ALPHA_TH.N
BKG FILE : B176.CNF;117
BKG DATE : 16-AUG-2009
EFF FILE : W176.CNF;35
CAL DATE : 22-JUL-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
AC-227	6038.010	312.000	310.000	2.000	1.4142	68.10000	7.00E+00	8.88E-01	2.16E-01	7.43E-02	7.84E-01
TH-228	5363.000	134.000	123.000	11.000	3.3166	99.94000	1.84E+00	3.70E-01	2.76E-01	1.15E-01	3.53E-01
TH229	4900.000	2.000	-2.000	4.000	2.0000	99.52000	-3.00E-02	7.21E-02	1.85E-01	6.99E-02	7.21E-02
TH-230	4625.000	101.000	101.000	0.000	0.0000	100.0000	1.51E+00	3.08E-01	4.48E-02	0.00E+00	2.94E-01
TH-232	3972.000	126.000	122.000	4.000	2.0000	100.0000	1.82E+00	3.51E-01	1.84E-01	6.95E-02	3.34E-01

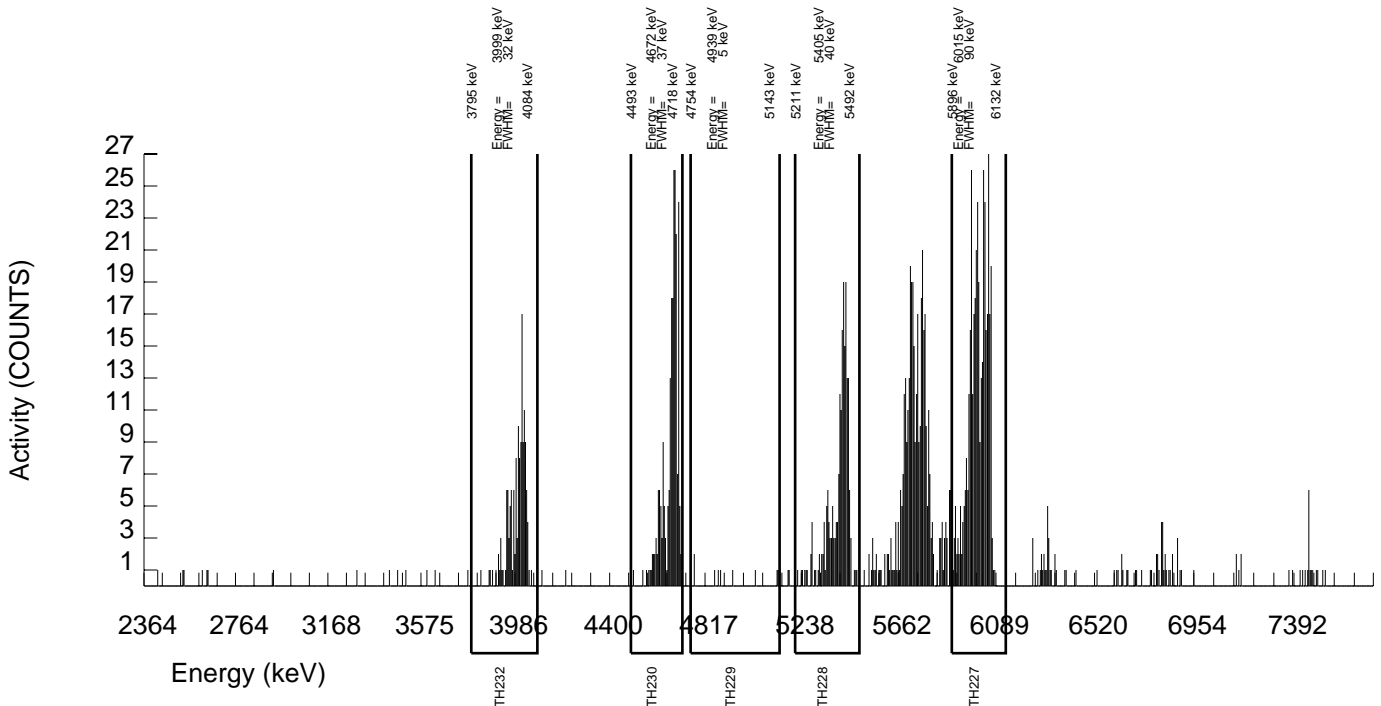


GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 895332 SAMPLE DATE : 20-AUG-2009 10:30:00		SAMPLE ID : S0233960006_TH SAMPLE QTY: 0.251 G	
DETECTOR NUMBER :74435 AVERAGE %EFFICIENCY :26.8586 % YIELD : 58.767		COUNT DATE:20-AUG-2009 20:36:15 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :MXA1	
MS/MSD ID : A2796-J ISOTOPE : TH-230 PCI/G : 8.527E+00	LCS/LCSD ID : A2796-J ISOTOPE : TH-230 PCI/G : 8.527E+00	TRACER ID : 0387-B-102 ISOTOPE : AC227 NOMINAL : 3.91473 dpm RESULTS : 2.30056 dpm	LIB FILE : ENV_ALPHA_TH.N BKG FILE : B177.CNF;117 BKG DATE : 16-AUG-2009 EFF FILE : W177.CNF;35 CAL DATE : 22-JUL-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
AC-227	6038.010	412.000	409.000	3.000	1.7321	68.10000	7.03E+00	8.03E-01	1.90E-01	6.92E-02	6.86E-01
TH-228	5363.000	203.000	191.000	12.000	3.4641	99.94000	2.17E+00	3.52E-01	2.18E-01	9.18E-02	3.27E-01
TH229	4900.000	9.000	6.000	3.000	1.7321	99.52000	6.85E-02	7.77E-02	1.26E-01	4.60E-02	7.76E-02
TH-230	4625.000	227.000	225.000	2.000	1.4142	100.0000	2.56E+00	3.70E-01	1.09E-01	3.74E-02	3.37E-01
TH-232	3972.000	145.000	144.000	1.000	1.0000	100.0000	1.64E+00	2.86E-01	8.70E-02	2.65E-02	2.69E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 895332
SAMPLE DATE : 20-AUG-2009 10:30:00

SAMPLE ID : S0233960007_TH
SAMPLE QTY: 0.252 G

DETECTOR NUMBER :74436
AVERAGE %EFFICIENCY :25.6373
% YIELD : 46.212

COUNT DATE:20-AUG-2009 20:36:19
ELAPSED LIVE TIME(SEC): 60000.00
ANALYST :MXA1

MS/MSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.493E+00

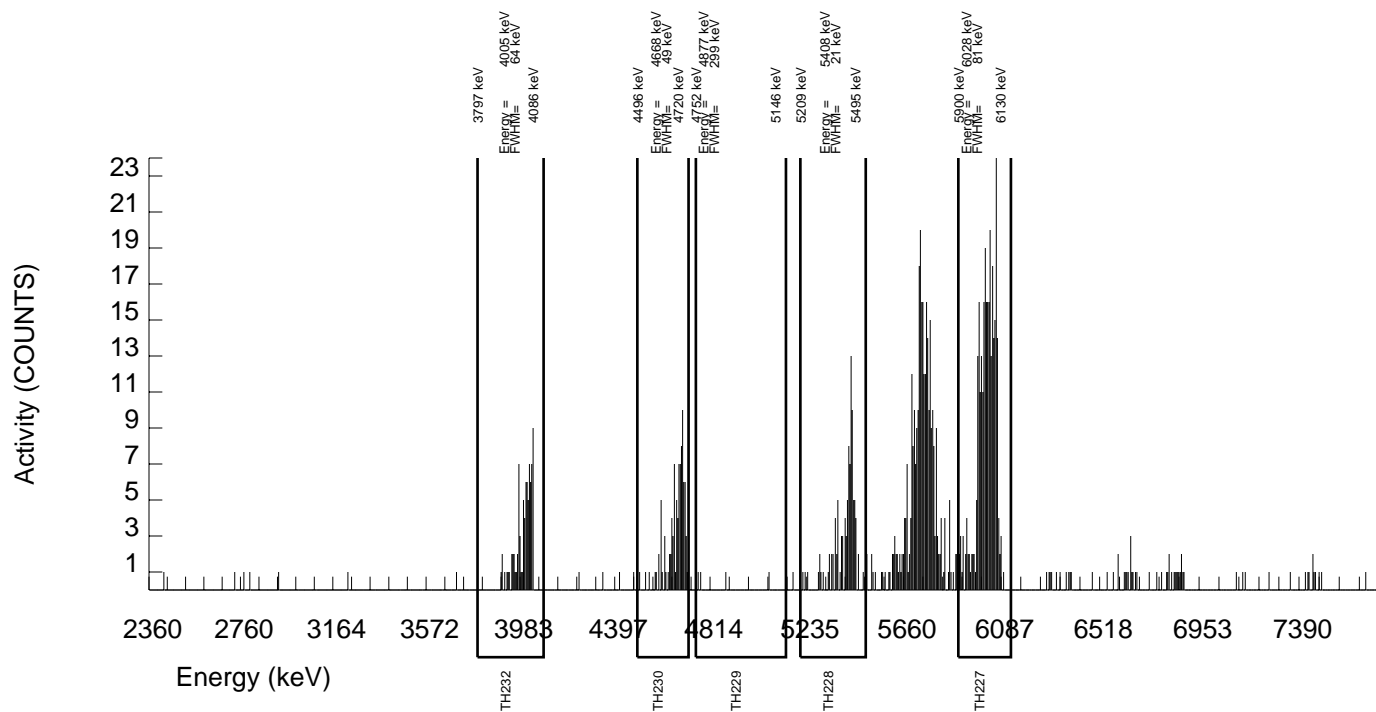
LCS/LCSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.493E+00

TRACER
ID : 0387-B-102
ISOTOPE : AC227
NOMINAL : 3.91473 dpm
RESULTS : 1.80909 dpm

LIB FILE : ENV_ALPHA_TH.N
BKG FILE : B178.CNF;117
BKG DATE : 16-AUG-2009
EFF FILE : W178.CNF;35
CAL DATE : 22-JUL-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
AC-227	6038.010	309.000	307.000	2.000	1.4142	68.10000	7.00E+00	8.91E-01	2.18E-01	7.50E-02	7.88E-01
TH-228	5363.000	100.000	86.000	14.000	3.7417	99.94000	1.30E+00	3.25E-01	3.08E-01	1.32E-01	3.16E-01
TH229	4900.000	4.000	-2.000	6.000	2.4495	99.52000	-3.03E-02	9.40E-02	2.18E-01	8.64E-02	9.40E-02
TH-230	4625.000	94.000	91.000	3.000	1.7321	100.0000	1.37E+00	3.03E-01	1.67E-01	6.08E-02	2.91E-01
TH-232	3972.000	84.000	82.000	2.000	1.4142	100.0000	1.24E+00	2.84E-01	1.45E-01	4.96E-02	2.74E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 895332
SAMPLE DATE : 20-AUG-2009 10:30:00

SAMPLE ID : S0233960008_TH
SAMPLE QTY: 0.252 G

DETECTOR NUMBER :74437
AVERAGE %EFFICIENCY :26.5432
% YIELD : 42.018

COUNT DATE:20-AUG-2009 20:36:21
ELAPSED LIVE TIME(SEC): 60000.00
ANALYST :MXA1

MS/MSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.493E+00

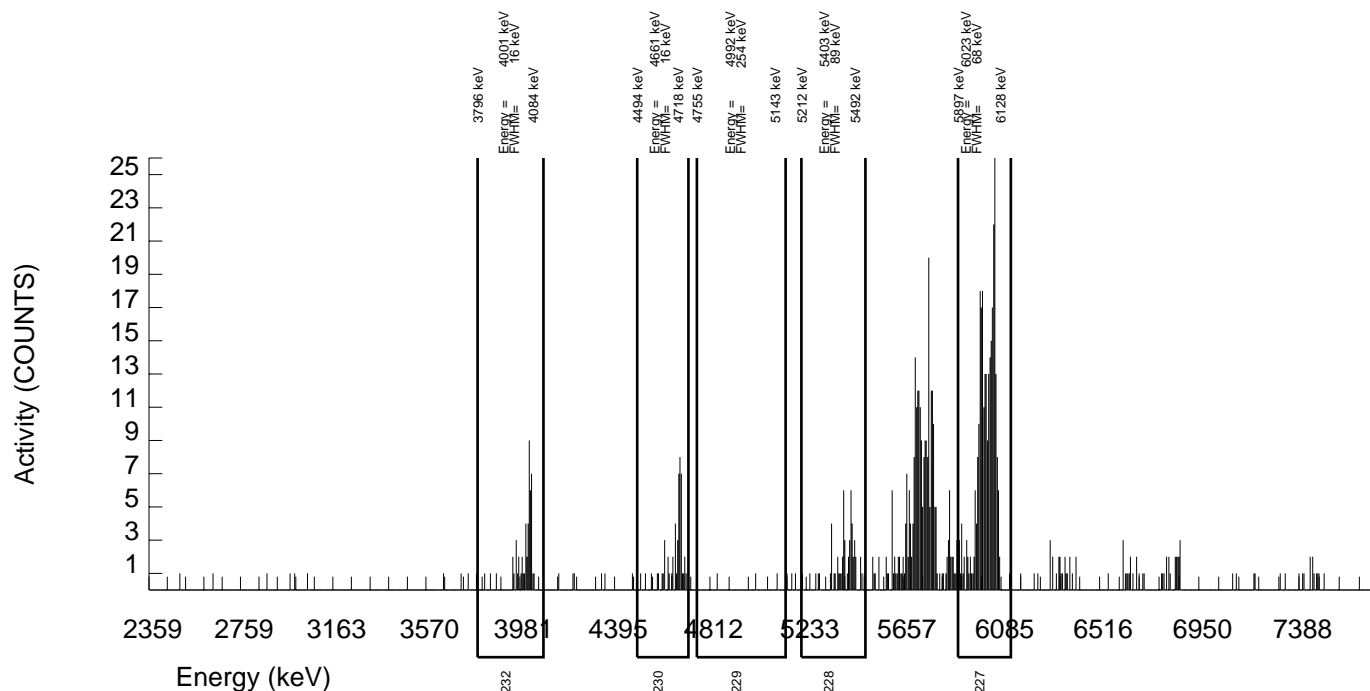
LCS/LCSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.493E+00

TRACER
ID : 0387-B-102
ISOTOPE : AC227
NOMINAL : 3.91473 dpm
RESULTS : 1.64490 dpm

LIB FILE : ENV_ALPHA_TH.N
BKG FILE : B179.CNF;117
BKG DATE : 16-AUG-2009
EFF FILE : W179.CNF;35
CAL DATE : 22-JUL-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
AC-227	6038.010	293.000	289.000	4.000	2.0000	68.10000	7.00E+00	9.18E-01	2.98E-01	1.13E-01	8.18E-01
TH-228	5363.000	55.000	49.000	6.000	2.4495	99.94000	7.86E-01	2.50E-01	2.31E-01	9.15E-02	2.46E-01
TH229	4900.000	3.000	0.000	3.000	1.7321	99.52000	0.00E+00	7.73E-02	1.78E-01	6.49E-02	7.73E-02
TH-230	4625.000	51.000	51.000	0.000	0.0000	100.0000	8.17E-01	2.30E-01	4.81E-02	0.00E+00	2.24E-01
TH-232	3972.000	52.000	52.000	0.000	0.0000	100.0000	8.33E-01	2.32E-01	4.81E-02	0.00E+00	2.27E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 895332
SAMPLE DATE : 20-AUG-2009 10:30:00

SAMPLE ID : S0233960009_TH
SAMPLE QTY: 0.255 G

DETECTOR NUMBER :74438
AVERAGE %EFFICIENCY :25.0525
% YIELD : 36.354

COUNT DATE:20-AUG-2009 20:36:23
ELAPSED LIVE TIME(SEC): 60000.00
ANALYST :MXA1

MS/MSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.393E+00

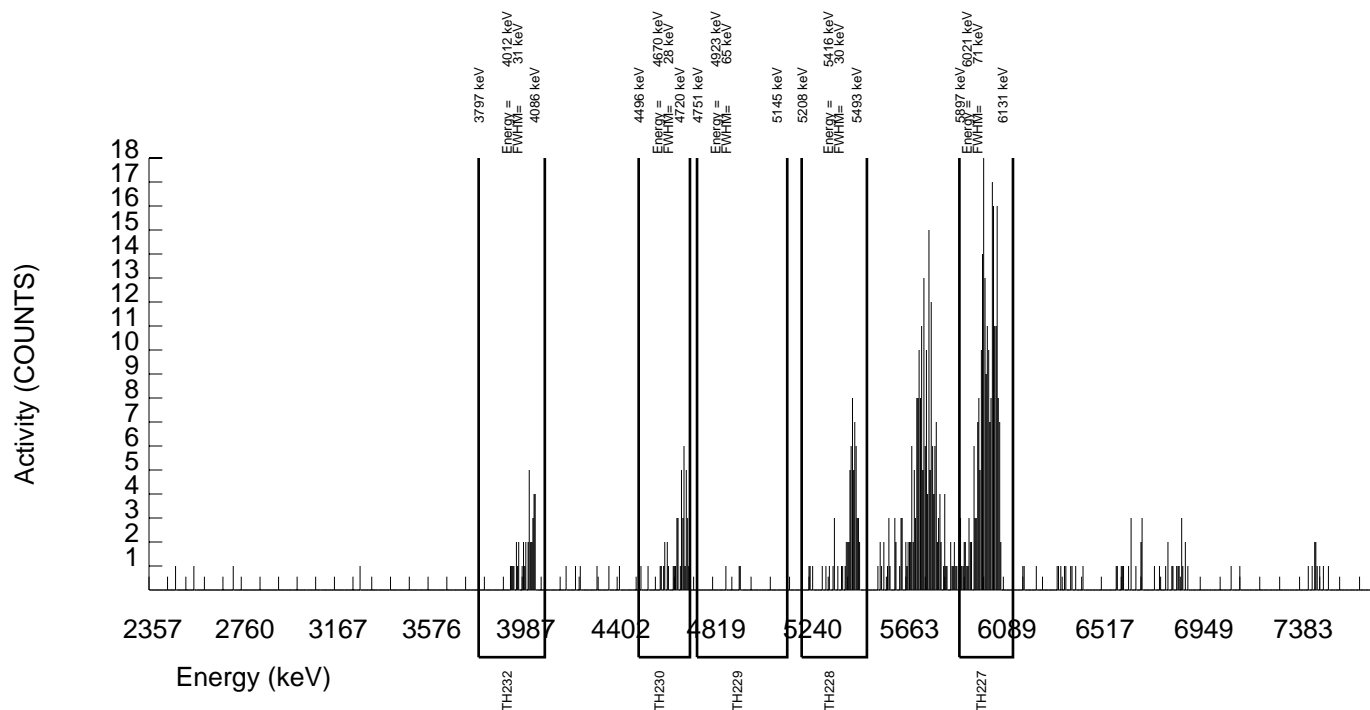
LCS/LCSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.393E+00

TRACER
ID : 0387-B-102
ISOTOPE : AC227
NOMINAL : 3.91473 dpm
RESULTS : 1.42317 dpm

LIB FILE : ENV_ALPHA_TH.N
BKG FILE : B180.CNF;119
BKG DATE : 16-AUG-2009
EFF FILE : W180.CNF;35
CAL DATE : 22-JUL-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
AC-227	6038.010	238.000	236.000	2.000	1.4142	68.10000	6.92E+00	9.80E-01	2.81E-01	9.64E-02	8.90E-01
TH-228	5363.000	65.000	60.000	5.000	2.2361	99.94000	1.17E+00	3.26E-01	2.60E-01	1.01E-01	3.18E-01
TH229	4900.000	3.000	-1.000	4.000	2.0000	99.52000	-1.95E-02	1.01E-01	2.40E-01	9.07E-02	1.01E-01
TH-230	4625.000	44.000	39.000	5.000	2.2361	100.0000	7.56E-01	2.70E-01	2.60E-01	1.01E-01	2.66E-01
TH-232	3972.000	37.000	36.000	1.000	1.0000	100.0000	6.98E-01	2.38E-01	1.48E-01	4.51E-02	2.34E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 895332
SAMPLE DATE : 20-AUG-2009 10:30:00

SAMPLE ID : S0233960010_TH
SAMPLE QTY: 0.253 G

DETECTOR NUMBER :74439
AVERAGE %EFFICIENCY :25.4854
% YIELD : 68.899

COUNT DATE:20-AUG-2009 20:36:25
ELAPSED LIVE TIME(SEC): 60000.00
ANALYST :MXA1

MS/MSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.459E+00

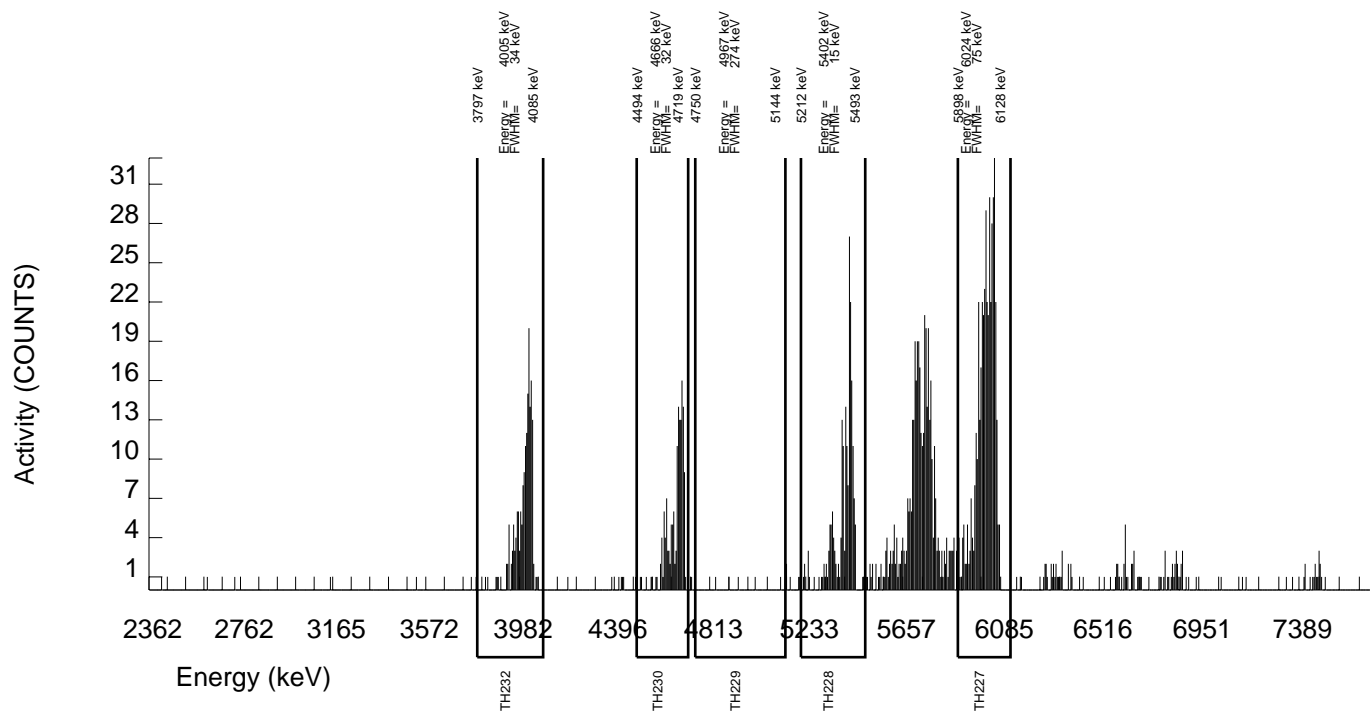
LCS/LCSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.459E+00

TRACER
ID : 0387-B-102
ISOTOPE : AC227
NOMINAL : 3.91473 dpm
RESULTS : 2.69722 dpm

LIB FILE : ENV_ALPHA_TH.N
BKG FILE : B181.CNF;117
BKG DATE : 16-AUG-2009
EFF FILE : W181.CNF;35
CAL DATE : 22-JUL-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
AC-227	6038.010	455.000	455.000	0.000	0.0000	68.10000	6.97E+00	7.63E-01	4.60E-02	0.00E+00	6.40E-01
TH-228	5363.000	204.000	199.000	5.000	2.2361	99.94000	2.02E+00	3.12E-01	1.36E-01	5.28E-02	2.88E-01
TH229	4900.000	5.000	0.000	5.000	2.2361	99.52000	0.00E+00	6.32E-02	1.37E-01	5.30E-02	6.31E-02
TH-230	4625.000	152.000	149.000	3.000	1.7321	100.0000	1.51E+00	2.63E-01	1.12E-01	4.09E-02	2.47E-01
TH-232	3972.000	180.000	179.000	1.000	1.0000	100.0000	1.81E+00	2.88E-01	7.76E-02	2.36E-02	2.67E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 895332
SAMPLE DATE : 20-AUG-2009 10:30:00

SAMPLE ID : S0233960011_TH
SAMPLE QTY: 0.255 G

DETECTOR NUMBER :74440
AVERAGE %EFFICIENCY :25.7871
% YIELD : 61.209

COUNT DATE:20-AUG-2009 20:36:28
ELAPSED LIVE TIME(SEC): 60000.00
ANALYST :MXA1

MS/MSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.393E+00

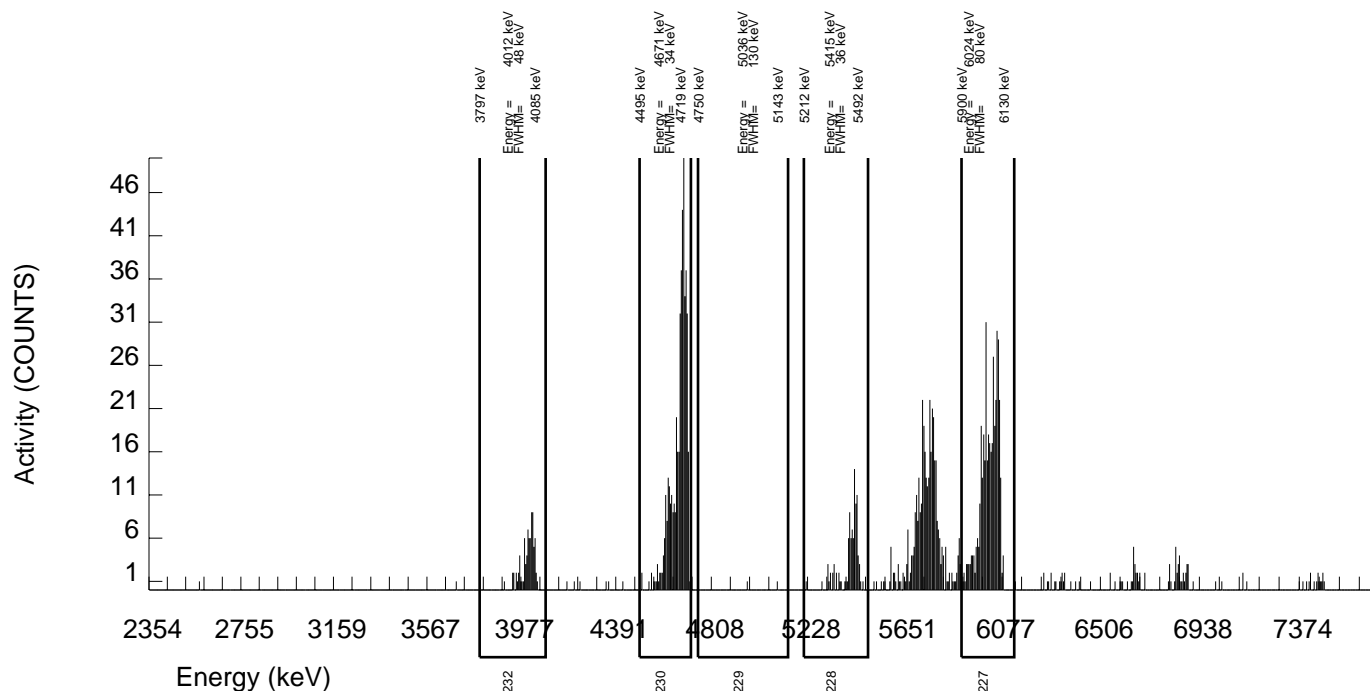
LCS/LCSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.393E+00

TRACER
ID : 0387-B-102
ISOTOPE : AC227
NOMINAL : 3.91473 dpm
RESULTS : 2.39617 dpm

LIB FILE : ENV_ALPHA_TH.N
BKG FILE : B182.CNF;117
BKG DATE : 16-AUG-2009
EFF FILE : W182.CNF;35
CAL DATE : 22-JUL-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
AC-227	6038.010	410.000	409.000	1.000	1.0000	68.10000	6.92E+00	7.87E-01	1.29E-01	3.93E-02	6.72E-01
TH-228	5363.000	101.000	84.000	17.000	4.1231	99.94000	9.41E-01	2.45E-01	2.49E-01	1.07E-01	2.39E-01
TH229	4900.000	2.000	0.000	2.000	1.4142	99.52000	0.00E+00	4.41E-02	1.08E-01	3.70E-02	4.41E-02
TH-230	4625.000	457.000	454.000	3.000	1.7321	100.0000	5.08E+00	5.59E-01	1.24E-01	4.51E-02	4.70E-01
TH-232	3972.000	81.000	80.000	1.000	1.0000	100.0000	8.95E-01	2.06E-01	8.56E-02	2.60E-02	1.99E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 895332
SAMPLE DATE : 20-AUG-2009 10:30:00

SAMPLE ID : S0233960012_TH
SAMPLE QTY: 0.253 G

DETECTOR NUMBER :74441
AVERAGE %EFFICIENCY :26.3659
% YIELD : 53.718

COUNT DATE:20-AUG-2009 20:36:31
ELAPSED LIVE TIME(SEC): 60000.00
ANALYST :MXA1

MS/MSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.459E+00

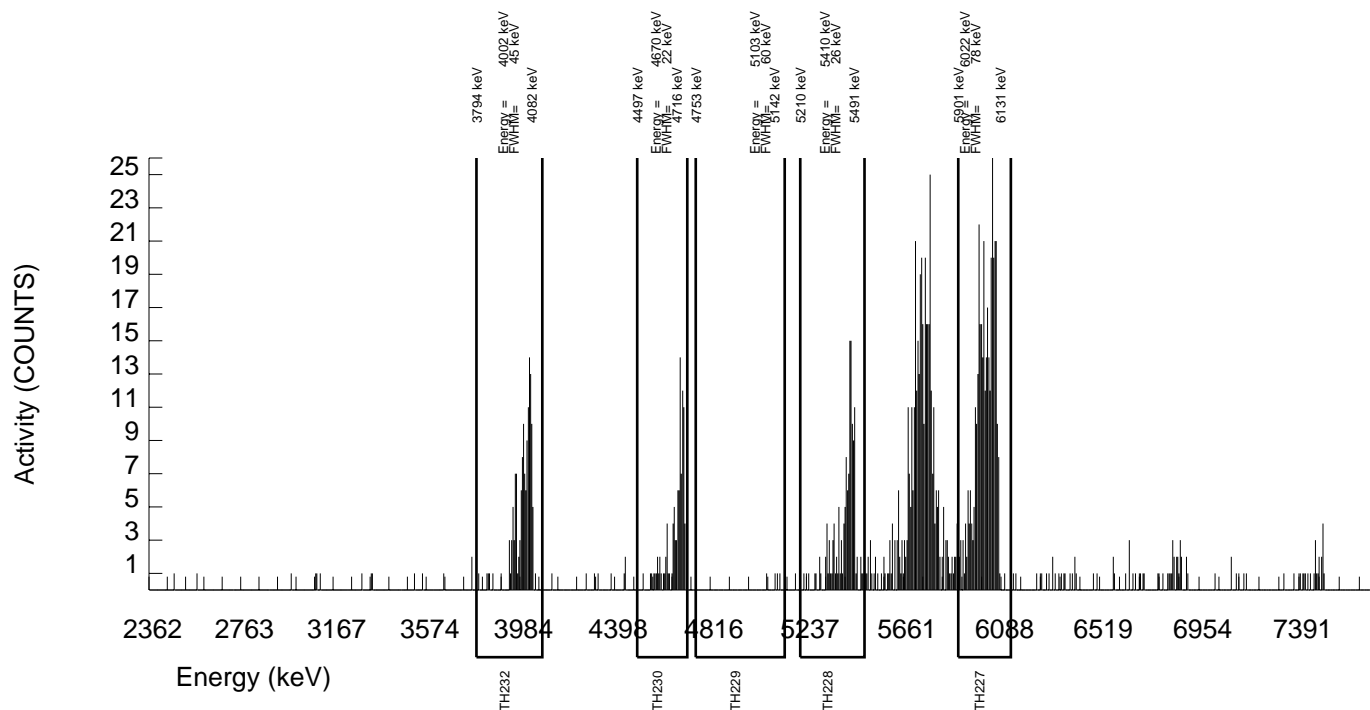
LCS/LCSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.459E+00

TRACER
ID : 0387-B-102
ISOTOPE : AC227
NOMINAL : 3.91473 dpm
RESULTS : 2.10291 dpm

LIB FILE : ENV_ALPHA_TH.N
BKG FILE : B183.CNF;117
BKG DATE : 16-AUG-2009
EFF FILE : W183.CNF;35
CAL DATE : 22-JUL-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
AC-227	6038.010	368.000	367.000	1.000	1.0000	68.10000	6.97E+00	8.27E-01	1.45E-01	4.42E-02	7.15E-01
TH-228	5363.000	138.000	126.000	12.000	3.4641	99.94000	1.59E+00	3.17E-01	2.41E-01	1.01E-01	3.02E-01
TH229	4900.000	4.000	0.000	4.000	2.0000	99.52000	0.00E+00	7.00E-02	1.55E-01	5.88E-02	7.00E-02
TH-230	4625.000	98.000	96.000	2.000	1.4142	100.0000	1.21E+00	2.57E-01	1.20E-01	4.14E-02	2.46E-01
TH-232	3972.000	141.000	140.000	1.000	1.0000	100.0000	1.76E+00	3.12E-01	9.62E-02	2.92E-02	2.94E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 895332
SAMPLE DATE : 20-AUG-2009 10:30:00

SAMPLE ID : S0233960013_TH
SAMPLE QTY: 0.256 G

DETECTOR NUMBER :74442
AVERAGE %EFFICIENCY :25.8992
% YIELD : 52.749

COUNT DATE:20-AUG-2009 20:36:33
ELAPSED LIVE TIME(SEC): 60000.00
ANALYST :MXA1

MS/MSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.360E+00

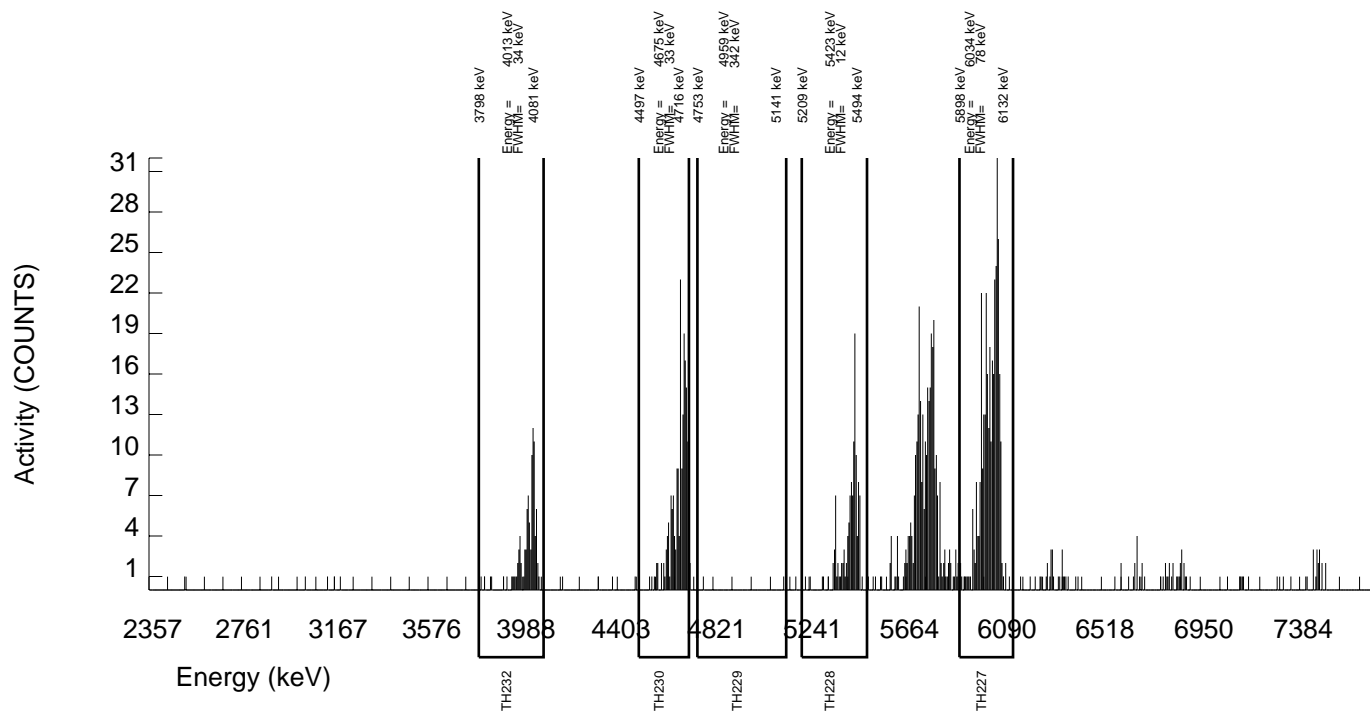
LCS/LCSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.360E+00

TRACER
ID : 0387-B-102
ISOTOPE : AC227
NOMINAL : 3.91473 dpm
RESULTS : 2.06498 dpm

LIB FILE : ENV_ALPHA_TH.N
BKG FILE : B184.CNF;119
BKG DATE : 16-AUG-2009
EFF FILE : W184.CNF;35
CAL DATE : 22-JUL-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
AC-227	6038.010	357.000	354.000	3.000	1.7321	68.10000	6.89E+00	8.31E-01	2.15E-01	7.84E-02	7.24E-01
TH-228	5363.000	123.000	117.000	6.000	2.4495	99.94000	1.51E+00	3.01E-01	1.86E-01	7.35E-02	2.87E-01
TH229	4900.000	2.000	-3.000	5.000	2.2361	99.52000	-3.88E-02	6.71E-02	1.73E-01	6.73E-02	6.71E-02
TH-230	4625.000	182.000	181.000	1.000	1.0000	100.0000	2.33E+00	3.68E-01	9.86E-02	3.00E-02	3.41E-01
TH-232	3972.000	96.000	95.000	1.000	1.0000	100.0000	1.22E+00	2.59E-01	9.86E-02	3.00E-02	2.49E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 895332
SAMPLE DATE : 20-AUG-2009 10:30:00

SAMPLE ID : S0233960015_TH
SAMPLE QTY: 0.255 G

DETECTOR NUMBER :68615
AVERAGE %EFFICIENCY :25.6564
% YIELD : 64.229

COUNT DATE:20-AUG-2009 20:36:36
ELAPSED LIVE TIME(SEC): 60000.00
ANALYST :MXA1

MS/MSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.393E+00

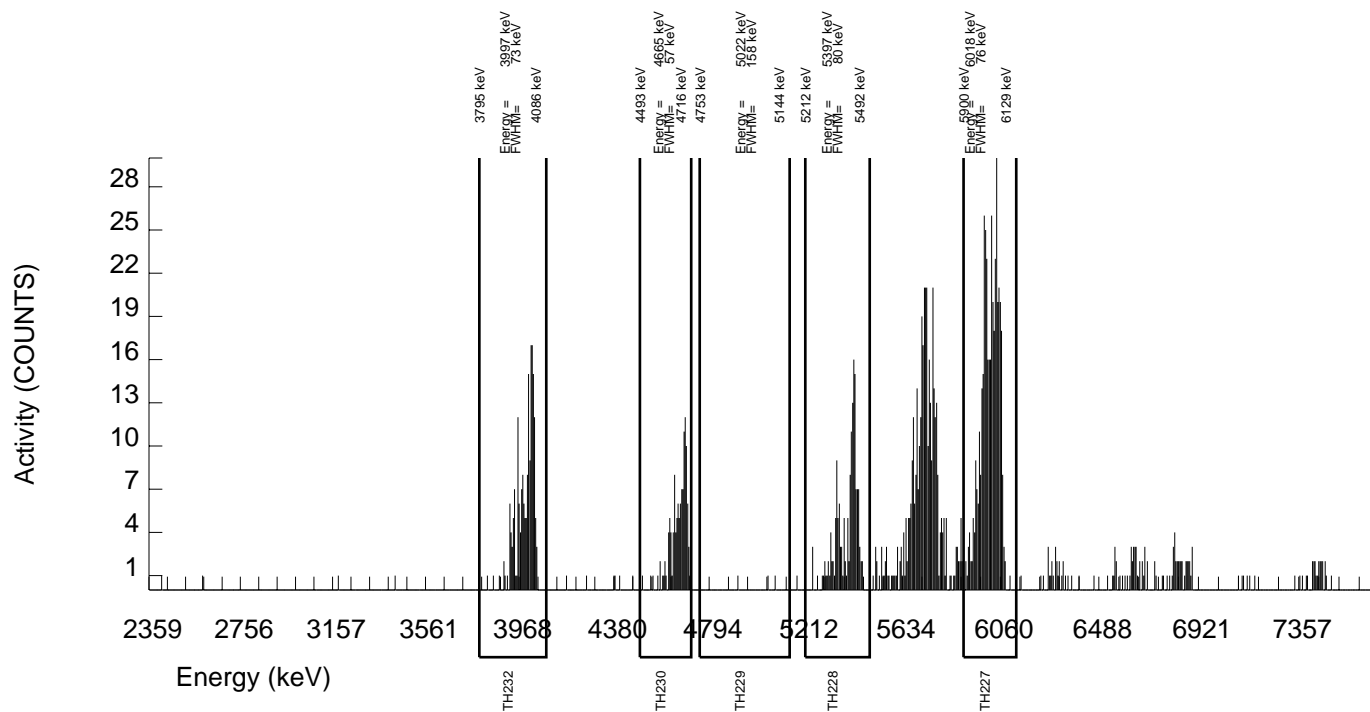
LCS/LCSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.393E+00

TRACER
ID : 0387-B-102
ISOTOPE : AC227
NOMINAL : 3.91473 dpm
RESULTS : 2.51438 dpm

LIB FILE : ENV_ALPHA_TH.N
BKG FILE : B185.CNF;99
BKG DATE : 16-AUG-2009
EFF FILE : W185.CNF;35
CAL DATE : 22-JUL-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
AC-227	6038.010	430.000	427.000	3.000	1.7321	68.10000	6.92E+00	7.78E-01	1.79E-01	6.53E-02	6.61E-01
TH-228	5363.000	160.000	155.000	5.000	2.2361	99.94000	1.66E+00	2.88E-01	1.44E-01	5.58E-02	2.70E-01
TH229	4900.000	3.000	-1.000	4.000	2.0000	99.52000	-1.08E-02	5.59E-02	1.33E-01	5.01E-02	5.59E-02
TH-230	4625.000	120.000	120.000	0.000	0.0000	100.0000	1.29E+00	2.43E-01	3.22E-02	0.00E+00	2.30E-01
TH-232	3972.000	189.000	187.000	2.000	1.4142	100.0000	2.00E+00	3.14E-01	1.03E-01	3.53E-02	2.90E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 895332
SAMPLE DATE : 20-AUG-2009 10:30:00

SAMPLE ID : S0233960016_TH
SAMPLE QTY: 0.256 G

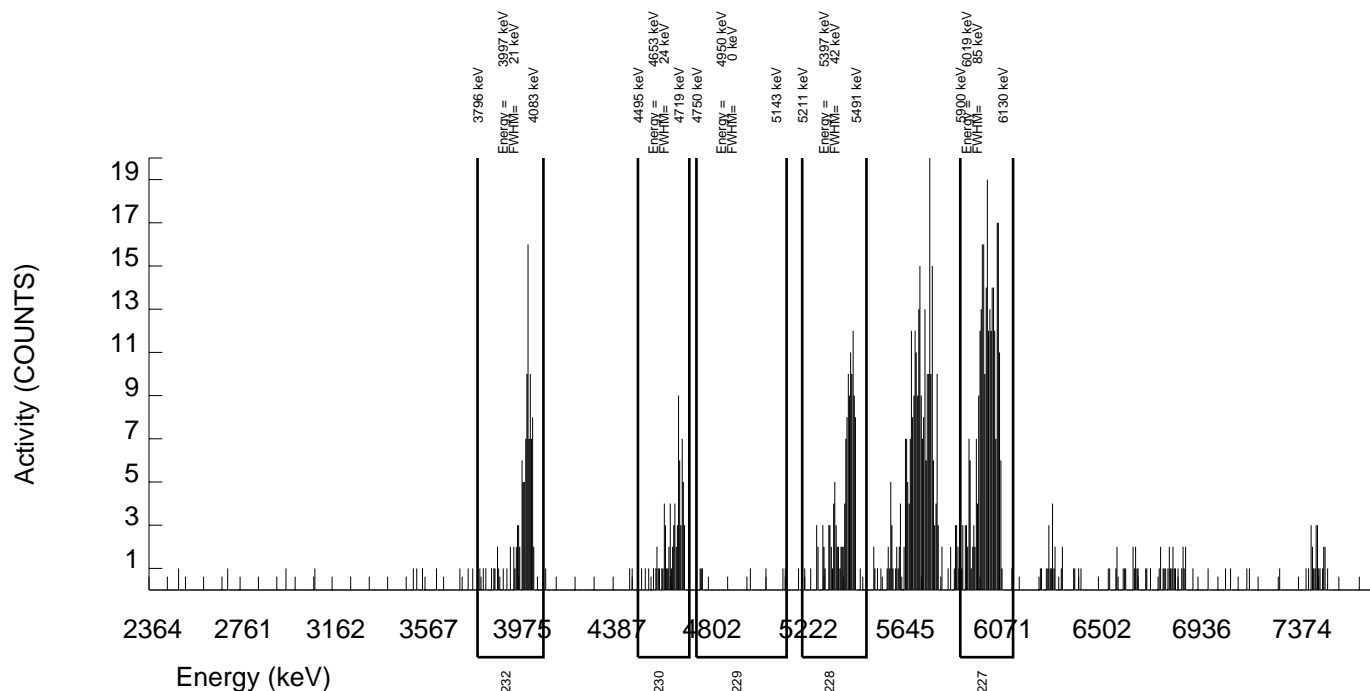
DETECTOR NUMBER :68616
AVERAGE %EFFICIENCY :25.3097
% YIELD : 44.524

COUNT DATE:20-AUG-2009 20:36:38
ELAPSED LIVE TIME(SEC): 60000.00
ANALYST :MXA1

MS/MSD ID : A2796-J ISOTOPE : TH-230 PCI/G : 8.360E+00	LCS/LCSD ID : A2796-J ISOTOPE : TH-230 PCI/G : 8.360E+00	TRACER ID : 0387-B-102 ISOTOPE : AC227 NOMINAL : 3.91473 dpm RESULTS : 1.74299 dpm	LIB FILE : ENV_ALPHA_TH.N BKG FILE : B186.CNF;99 BKG DATE : 16-AUG-2009 EFF FILE : W186.CNF;36 CAL DATE : 22-JUL-2009
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NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
AC-227	6038.010	294.000	292.000	2.000	1.4142	68.10000	6.89E+00	8.95E-01	2.26E-01	7.76E-02	7.95E-01
TH-228	5363.000	135.000	128.000	7.000	2.6458	99.94000	2.00E+00	3.84E-01	2.39E-01	9.62E-02	3.65E-01
TH229	4900.000	7.000	4.000	3.000	1.7321	99.52000	6.28E-02	9.73E-02	1.74E-01	6.32E-02	9.72E-02
TH-230	4625.000	74.000	72.000	2.000	1.4142	100.0000	1.12E+00	2.75E-01	1.50E-01	5.14E-02	2.67E-01
TH-232	3972.000	110.000	109.000	1.000	1.0000	100.0000	1.70E+00	3.38E-01	1.19E-01	3.63E-02	3.22E-01



GEL Laboratories LLC
 ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 895332
 SAMPLE DATE : 20-AUG-2009 10:30:00

SAMPLE ID : S0233960017_TH
 SAMPLE QTY: 0.250 G

DETECTOR NUMBER :68624
 AVERAGE %EFFICIENCY :26.2116
 % YIELD : 48.145

COUNT DATE:20-AUG-2009 20:36:40
 ELAPSED LIVE TIME(SEC): 60000.00
 ANALYST :MXA1

MS/MSD
 ID : A2796-J
 ISOTOPE : TH-230
 PCI/G : 8.561E+00

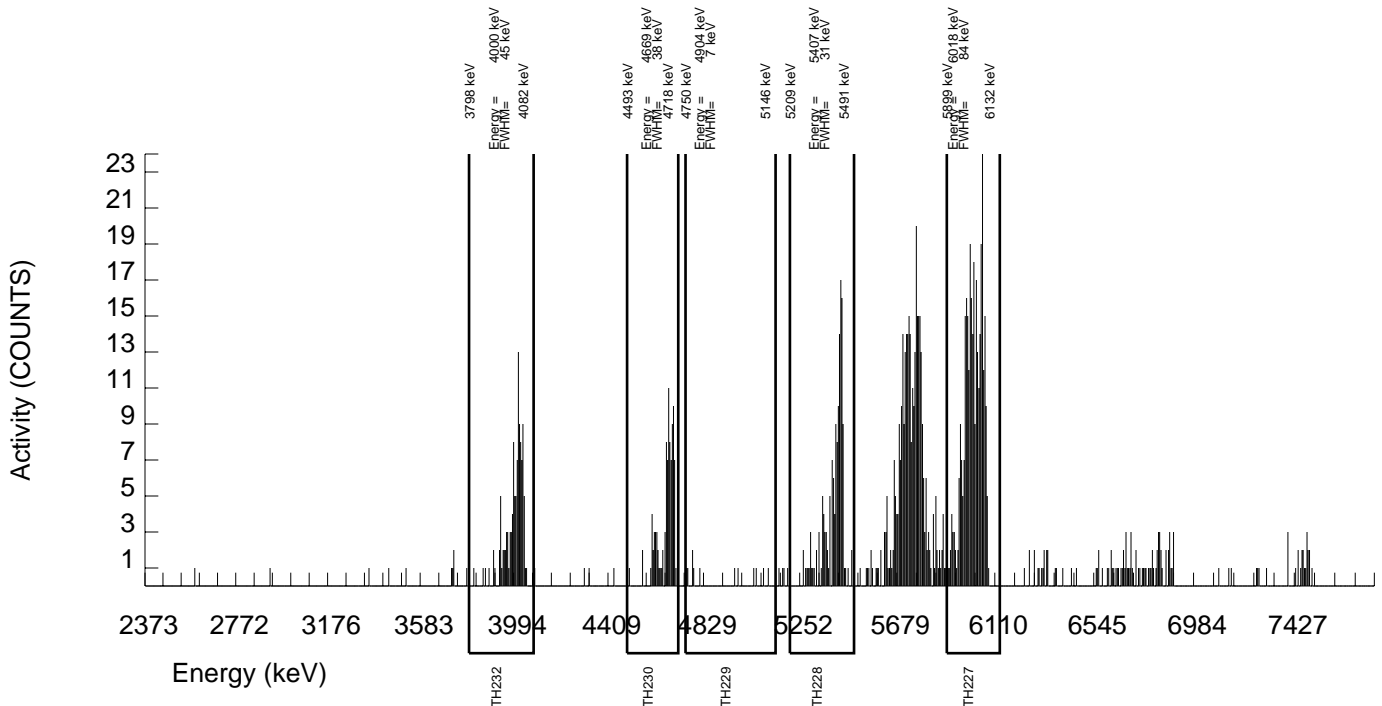
LCS/LCSD
 ID : A2796-J
 ISOTOPE : TH-230
 PCI/G : 8.561E+00

TRACER
 ID : 0387-B-102
 ISOTOPE : AC227
 NOMINAL : 3.91473 dpm
 RESULTS : 1.88475 dpm

LIB FILE : ENV_ALPHA_TH.N
 BKG FILE : B191.CNF;101
 BKG DATE : 16-AUG-2009
 EFF FILE : W191.CNF;35
 CAL DATE : 22-JUL-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
AC-227	6038.010	332.000	327.000	5.000	2.2361	68.10000	7.05E+00	8.94E-01	2.89E-01	1.12E-01	7.76E-01
TH-228	5363.000	146.000	135.000	11.000	3.3166	99.94000	1.93E+00	3.71E-01	2.64E-01	1.10E-01	3.51E-01
TH229	4900.000	13.000	5.000	8.000	2.8284	99.52000	7.17E-02	1.29E-01	2.32E-01	9.44E-02	1.29E-01
TH-230	4625.000	97.000	94.000	3.000	1.7321	100.0000	1.34E+00	2.92E-01	1.58E-01	5.75E-02	2.80E-01
TH-232	3972.000	116.000	115.000	1.000	1.0000	100.0000	1.64E+00	3.20E-01	1.09E-01	3.32E-02	3.03E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 895332
SAMPLE DATE : 20-AUG-2009 10:30:00

SAMPLE ID : S0233960018_TH
SAMPLE QTY: 0.253 G

DETECTOR NUMBER :74430
AVERAGE %EFFICIENCY :26.1047
% YIELD : 46.864

COUNT DATE:20-AUG-2009 20:36:43
ELAPSED LIVE TIME(SEC): 60000.00
ANALYST :MXA1

MS/MSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.459E+00

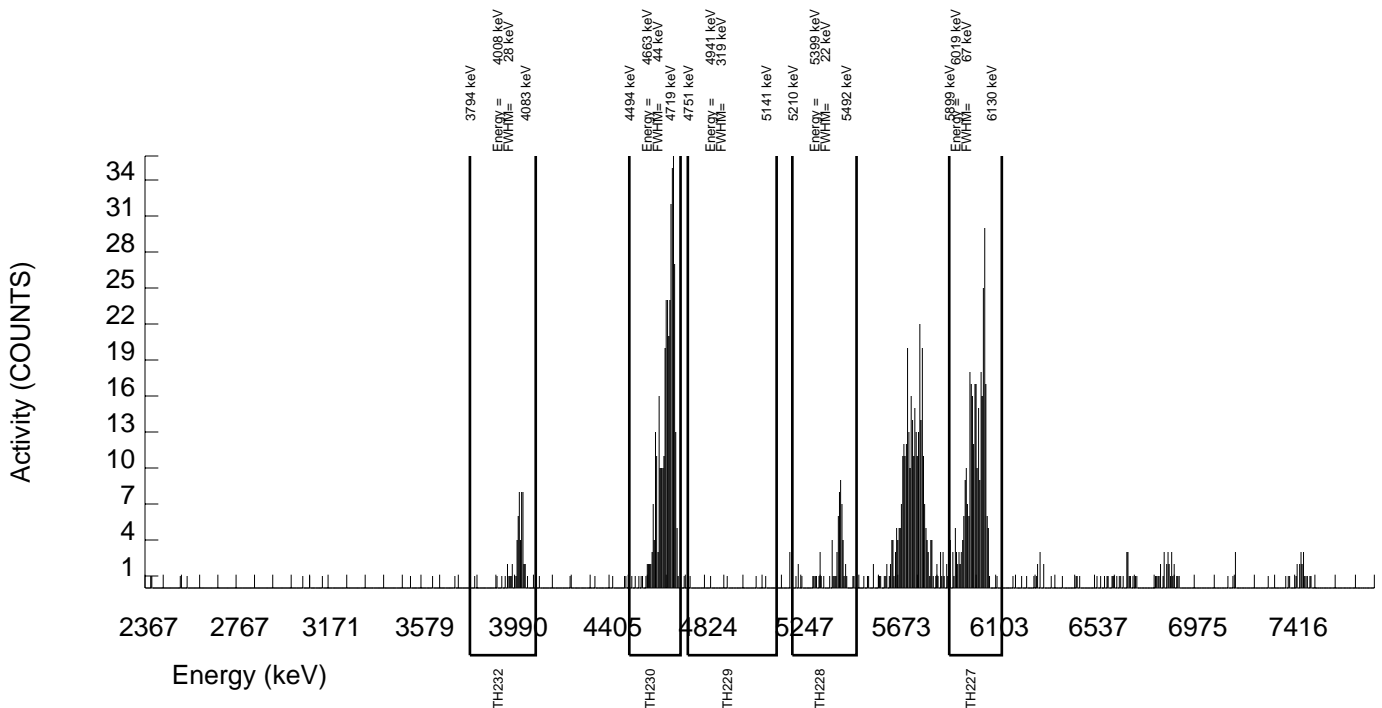
LCS/LCSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.459E+00

TRACER
ID : 0387-B-102
ISOTOPE : AC227
NOMINAL : 3.91473 dpm
RESULTS : 1.83459 dpm

LIB FILE : ENV_ALPHA_TH.N
BKG FILE : B192.CNF;99
BKG DATE : 16-AUG-2009
EFF FILE : W192.CNF;42
CAL DATE : 22-JUL-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
AC-227	6038.010	319.000	317.000	2.000	1.4142	68.10000	6.97E+00	8.77E-01	2.11E-01	7.23E-02	7.72E-01
TH-228	5363.000	65.000	55.000	10.000	3.1623	99.94000	8.02E-01	2.52E-01	2.58E-01	1.07E-01	2.47E-01
TH229	4900.000	5.000	1.000	4.000	2.0000	99.52000	1.46E-02	8.60E-02	1.80E-01	6.80E-02	8.60E-02
TH-230	4625.000	375.000	372.000	3.000	1.7321	100.0000	5.41E+00	6.42E-01	1.61E-01	5.86E-02	5.55E-01
TH-232	3972.000	56.000	55.000	1.000	1.0000	100.0000	8.00E-01	2.21E-01	1.11E-01	3.39E-02	2.15E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 895332
SAMPLE DATE : 20-AUG-2009 10:30:00

SAMPLE ID : S0233960019_TH
SAMPLE QTY: 0.256 G

DETECTOR NUMBER :68627
AVERAGE %EFFICIENCY :26.4072
% YIELD : 59.042

COUNT DATE:20-AUG-2009 20:36:45
ELAPSED LIVE TIME(SEC): 60000.00
ANALYST :MXA1

MS/MSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.360E+00

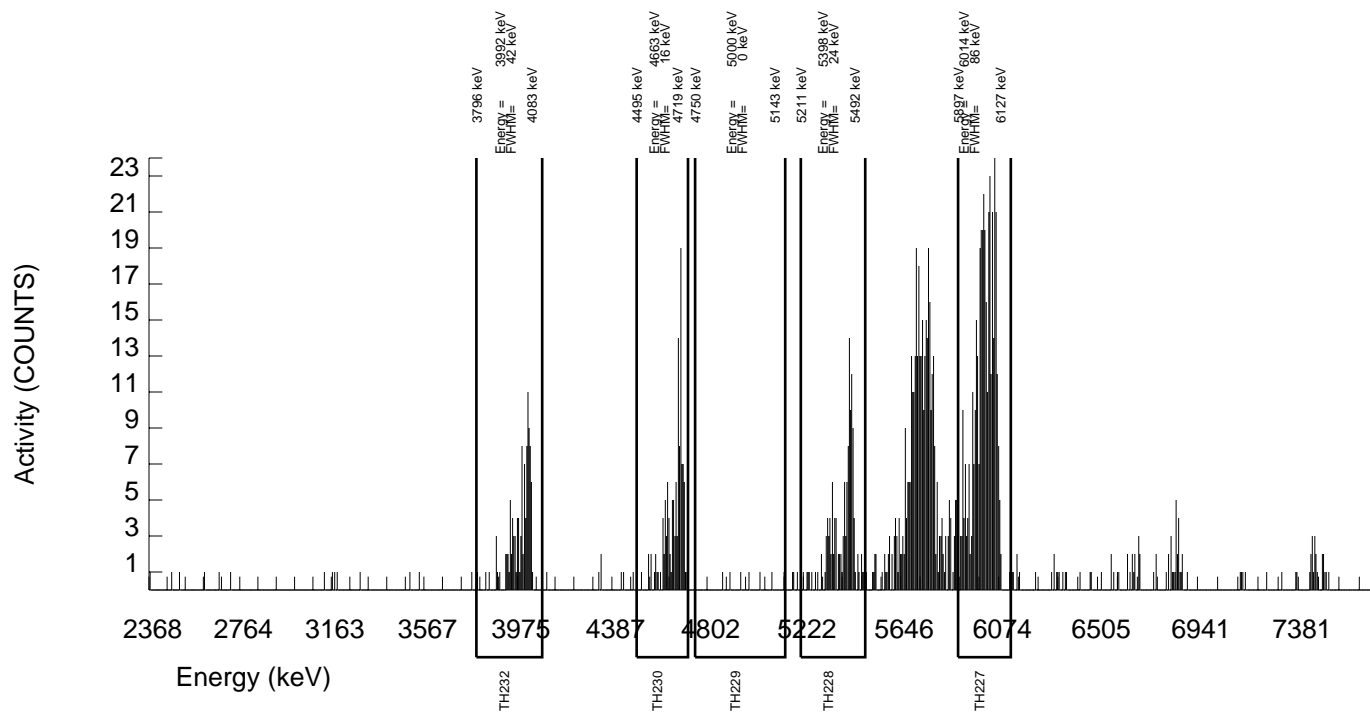
LCS/LCSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.360E+00

TRACER
ID : 0387-B-102
ISOTOPE : AC227
NOMINAL : 3.91473 dpm
RESULTS : 2.31132 dpm

LIB FILE : ENV_ALPHA_TH.N
BKG FILE : B193.CNF;101
BKG DATE : 16-AUG-2009
EFF FILE : W193.CNF;34
CAL DATE : 22-JUL-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
AC-227	6038.010	410.000	404.000	6.000	2.4495	68.10000	6.89E+00	8.06E-01	2.45E-01	9.72E-02	6.82E-01
TH-228	5363.000	132.000	125.000	7.000	2.6458	99.94000	1.41E+00	2.76E-01	1.73E-01	6.96E-02	2.61E-01
TH229	4900.000	7.000	-1.000	8.000	2.8284	99.52000	-1.13E-02	8.61E-02	1.83E-01	7.46E-02	8.61E-02
TH-230	4625.000	124.000	121.000	3.000	1.7321	100.0000	1.37E+00	2.64E-01	1.25E-01	4.55E-02	2.49E-01
TH-232	3972.000	109.000	107.000	2.000	1.4142	100.0000	1.21E+00	2.45E-01	1.08E-01	3.71E-02	2.33E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 895332
SAMPLE DATE : 20-AUG-2009 10:30:00

SAMPLE ID : S0233960020_TH
SAMPLE QTY: 0.252 G

DETECTOR NUMBER :68635
AVERAGE %EFFICIENCY :25.4957
% YIELD : 45.410

COUNT DATE:20-AUG-2009 20:36:48
ELAPSED LIVE TIME(SEC): 60000.00
ANALYST :MXA1

MS/MSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.493E+00

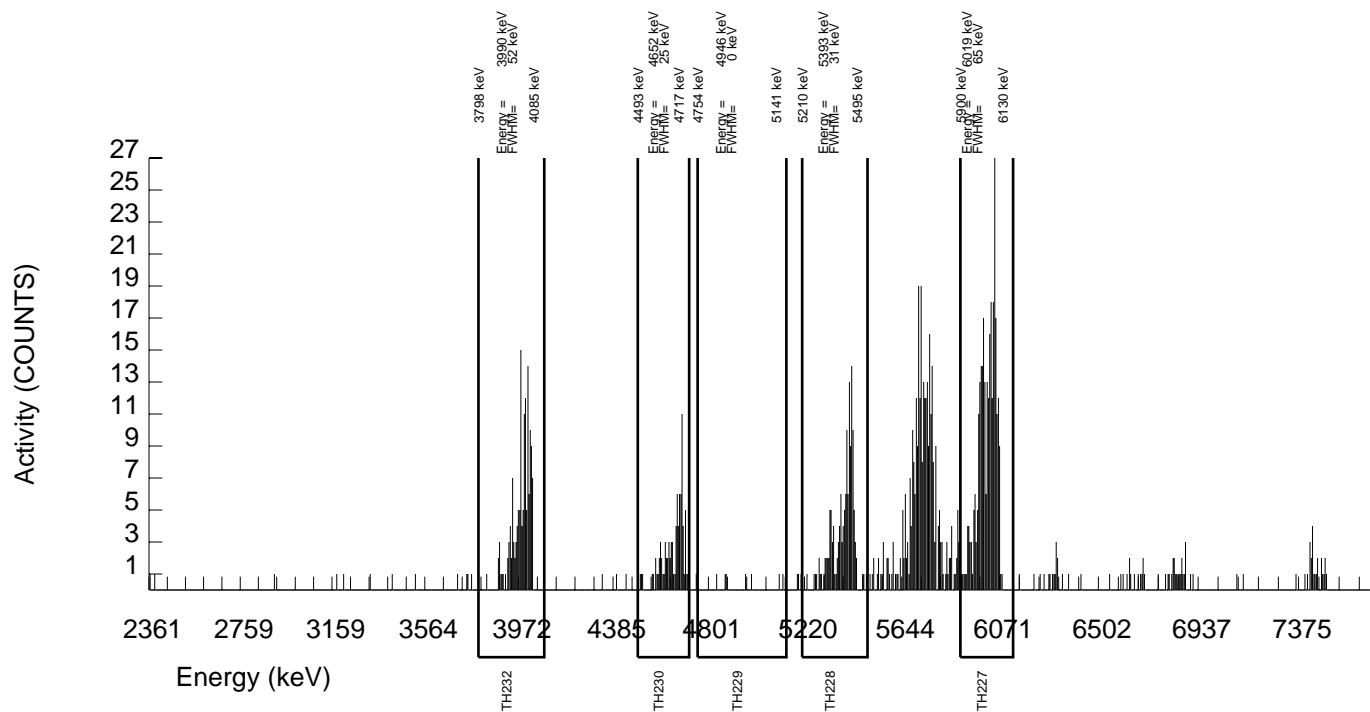
LCS/LCSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.493E+00

TRACER
ID : 0387-B-102
ISOTOPE : AC227
NOMINAL : 3.91473 dpm
RESULTS : 1.77769 dpm

LIB FILE : ENV_ALPHA_TH.N
BKG FILE : B194.CNF;99
BKG DATE : 16-AUG-2009
EFF FILE : W194.CNF;35
CAL DATE : 22-JUL-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
AC-227	6038.010	301.000	300.000	1.000	1.0000	68.10000	7.00E+00	8.97E-01	1.79E-01	5.43E-02	7.94E-01
TH-228	5363.000	145.000	137.000	8.000	2.8284	99.94000	2.12E+00	3.96E-01	2.50E-01	1.02E-01	3.75E-01
TH229	4900.000	8.000	4.000	4.000	2.0000	99.52000	6.21E-02	1.05E-01	1.91E-01	7.22E-02	1.05E-01
TH-230	4625.000	87.000	85.000	2.000	1.4142	100.0000	1.31E+00	2.96E-01	1.48E-01	5.08E-02	2.85E-01
TH-232	3972.000	148.000	146.000	2.000	1.4142	100.0000	2.25E+00	3.94E-01	1.48E-01	5.08E-02	3.71E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 895332
SAMPLE DATE : 20-AUG-2009 10:30:00

SAMPLE ID : S1201905854_TH
SAMPLE QTY: 0.256 G

DETECTOR NUMBER :78895
AVERAGE %EFFICIENCY :25.5422
% YIELD : 81.730

COUNT DATE:21-AUG-2009 14:45:14
ELAPSED LIVE TIME(SEC): 60000.00
ANALYST :MXA1

MS/MSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.360E+00

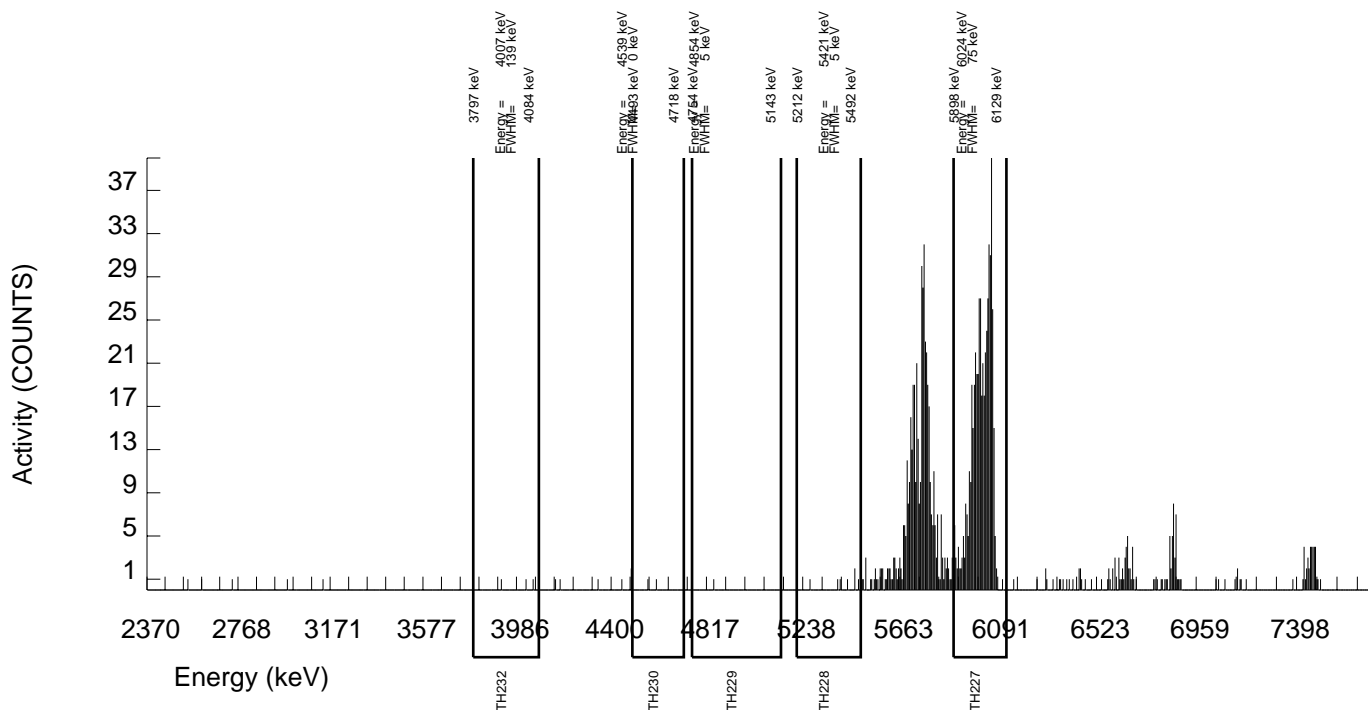
LCS/LCSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.360E+00

TRACER
ID : 0387-B-102
ISOTOPE : AC227
NOMINAL : 3.91473 dpm
RESULTS : 3.19950 dpm

LIB FILE : ENV_ALPHA_TH.N
BKG FILE : B198.CNF;45
BKG DATE : 16-AUG-2009
EFF FILE : W198.CNF;32
CAL DATE : 23-JUL-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
AC-227	6038.010	527.000	526.000	1.000	1.0000	68.10000	6.89E+00	7.18E-01	1.00E-01	3.05E-02	5.90E-01
TH-228	5363.000	7.000	6.000	1.000	1.0000	99.94000	5.07E-02	4.69E-02	6.46E-02	1.97E-02	4.68E-02
TH229	4900.000	1.000	0.000	1.000	1.0000	99.52000	0.00E+00	2.35E-02	6.48E-02	1.97E-02	2.35E-02
TH-230	4625.000	4.000	4.000	0.000	0.0000	100.0000	3.37E-02	3.31E-02	2.53E-02	0.00E+00	3.30E-02
TH-232	3972.000	3.000	1.000	2.000	1.4142	100.0000	8.43E-03	3.69E-02	8.07E-02	2.77E-02	3.69E-02



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 895332
SAMPLE DATE : 20-AUG-2009 10:30:00

SAMPLE ID : S1201905855_TH
SAMPLE QTY: 0.251 G

DETECTOR NUMBER :68637
AVERAGE %EFFICIENCY :25.6679
% YIELD : 35.634

COUNT DATE:20-AUG-2009 20:36:54
ELAPSED LIVE TIME(SEC): 60000.00
ANALYST :MXA1

MS/MSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.527E+00

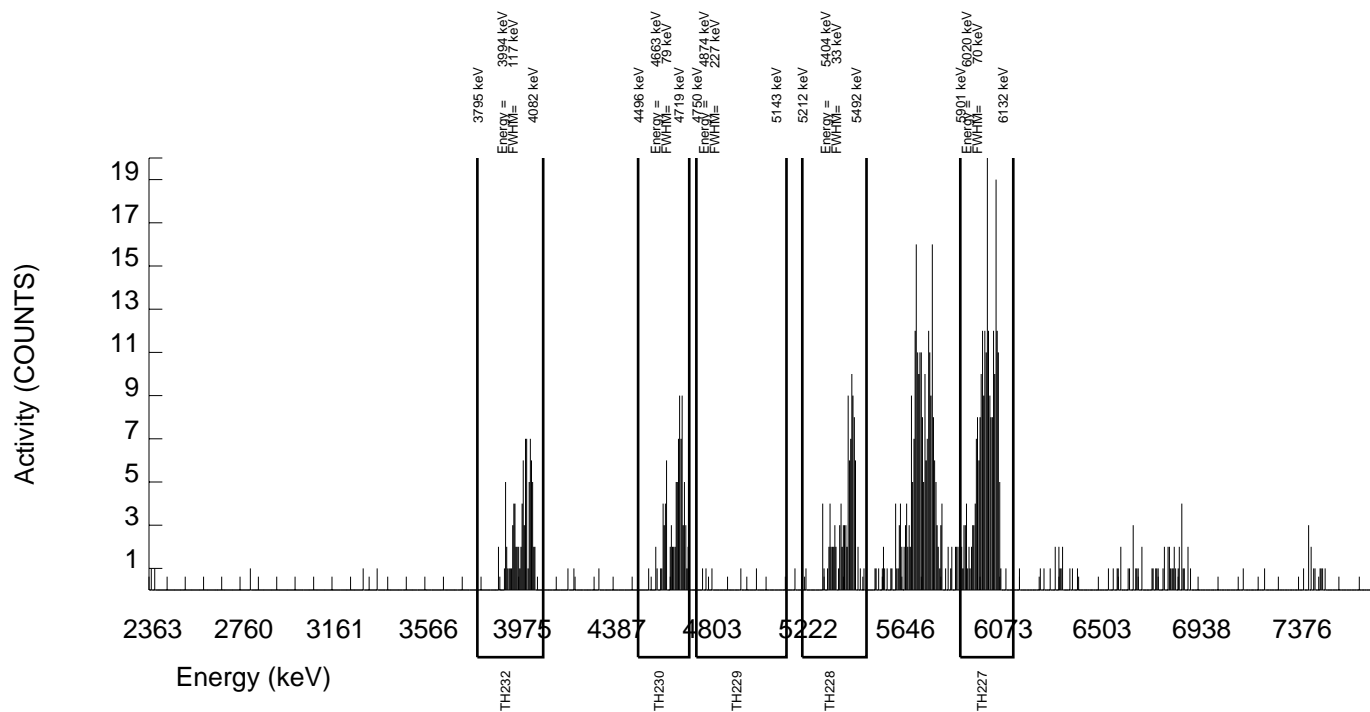
LCS/LCSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.527E+00

TRACER
ID : 0387-B-102
ISOTOPE : AC227
NOMINAL : 3.91473 dpm
RESULTS : 1.39495 dpm

LIB FILE : ENV_ALPHA_TH.N
BKG FILE : B196.CNF;100
BKG DATE : 16-AUG-2009
EFF FILE : W196.CNF;35
CAL DATE : 22-JUL-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
AC-227	6038.010	240.000	237.000	3.000	1.7321	68.10000	7.03E+00	9.98E-01	3.28E-01	1.19E-01	9.06E-01
TH-228	5363.000	104.000	96.000	8.000	2.8284	99.94000	1.89E+00	4.23E-01	3.18E-01	1.29E-01	4.08E-01
TH229	4900.000	5.000	1.000	4.000	2.0000	99.52000	1.97E-02	1.16E-01	2.43E-01	9.17E-02	1.16E-01
TH-230	4625.000	90.000	83.000	7.000	2.6458	100.0000	1.63E+00	3.91E-01	3.00E-01	1.21E-01	3.79E-01
TH-232	3972.000	89.000	88.000	1.000	1.0000	100.0000	1.73E+00	3.79E-01	1.50E-01	4.56E-02	3.65E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 895332
SAMPLE DATE : 20-AUG-2009 10:30:00

SAMPLE ID : S1201905856_TH
SAMPLE QTY: 0.255 G

DETECTOR NUMBER :78894
AVERAGE %EFFICIENCY :25.6823
% YIELD : 75.585

COUNT DATE:20-AUG-2009 20:36:56
ELAPSED LIVE TIME(SEC): 60000.00
ANALYST :MXA1

MS/MSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.393E+00

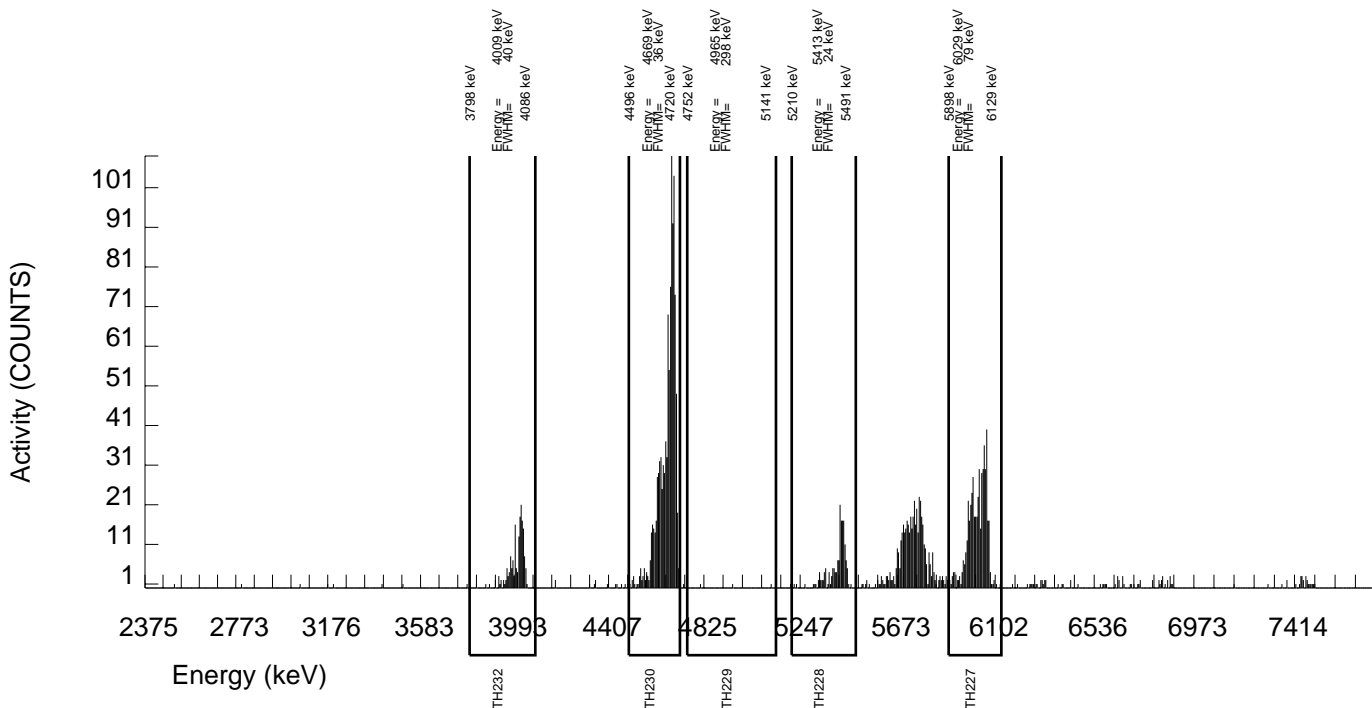
LCS/LCSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.393E+00

TRACER
ID : 0387-B-102
ISOTOPE : AC227
NOMINAL : 3.91473 dpm
RESULTS : 2.95895 dpm

LIB FILE : ENV_ALPHA_TH.N
BKG FILE : B197.CNF;45
BKG DATE : 16-AUG-2009
EFF FILE : W197.CNF;34
CAL DATE : 23-JUL-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
AC-227	6038.010	506.000	503.000	3.000	1.7321	68.10000	6.92E+00	7.34E-01	1.52E-01	5.54E-02	6.08E-01
TH-228	5363.000	166.000	163.000	3.000	1.7321	99.94000	1.49E+00	2.48E-01	1.01E-01	3.67E-02	2.32E-01
TH229	4900.000	3.000	0.000	3.000	1.7321	99.52000	0.00E+00	4.39E-02	1.01E-01	3.68E-02	4.39E-02
TH-230	4625.000	1053.000	1053.000	0.000	0.0000	100.0000	9.58E+00	8.13E-01	2.73E-02	0.00E+00	5.79E-01
TH-232	3972.000	174.000	173.000	1.000	1.0000	100.0000	1.57E+00	2.54E-01	6.96E-02	2.12E-02	2.36E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 895332
SAMPLE DATE : 20-AUG-2009 10:30:00

SAMPLE ID : S1201905857_TH
SAMPLE QTY: 0.256 G

DETECTOR NUMBER :78895
AVERAGE %EFFICIENCY :25.5422
% YIELD : 83.403

COUNT DATE:20-AUG-2009 20:36:59
ELAPSED LIVE TIME(SEC): 60000.00
ANALYST :MXA1

MS/MSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.360E+00

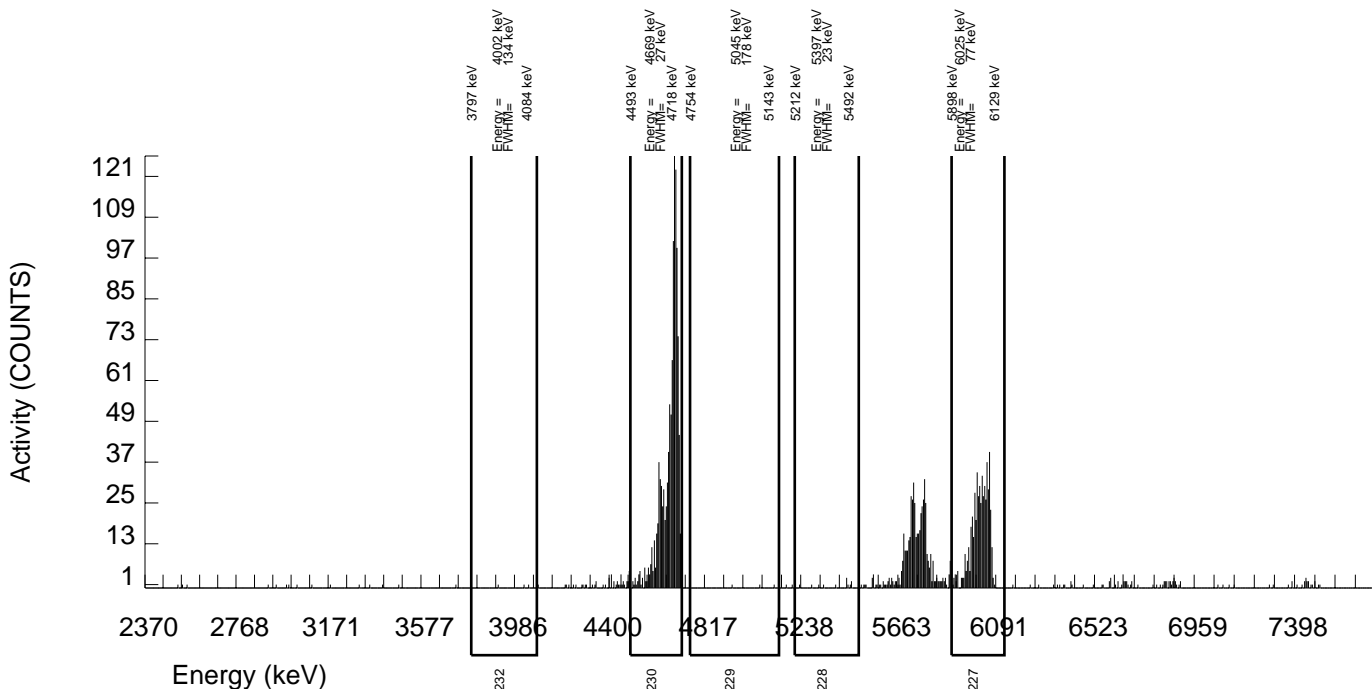
LCS/LCSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.360E+00

TRACER
ID : 0387-B-102
ISOTOPE : AC227
NOMINAL : 3.91473 dpm
RESULTS : 3.26500 dpm

LIB FILE : ENV_ALPHA_TH.N
BKG FILE : B198.CNF;45
BKG DATE : 16-AUG-2009
EFF FILE : W198.CNF;32
CAL DATE : 23-JUL-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
AC-227	6038.010	553.000	552.000	1.000	1.0000	68.10000	6.89E+00	7.07E-01	9.55E-02	2.90E-02	5.76E-01
TH-228	5363.000	12.000	11.000	1.000	1.0000	99.94000	9.10E-02	5.87E-02	6.33E-02	1.92E-02	5.85E-02
TH229	4900.000	3.000	2.000	1.000	1.0000	99.52000	1.66E-02	3.25E-02	6.35E-02	1.93E-02	3.25E-02
TH-230	4625.000	1154.000	1154.000	0.000	0.0000	100.0000	9.53E+00	7.90E-01	2.48E-02	0.00E+00	5.50E-01
TH-232	3972.000	3.000	1.000	2.000	1.4142	100.0000	8.26E-03	3.62E-02	7.91E-02	2.72E-02	3.62E-02



Radiochemistry Batch Checklist, Rev 9

Batch# 891790 Product: Th Date: 8/14/09

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			N/A
Samples have been blank corrected (if required)			N/A
If activity less 10* MDA/ MDC, error is 150% or less of sample activity. If greater 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.			
Method RDL/ LLD has been met.		✓	NCR 721639
If duplicate activities are less 5* MDA/ MDC, then RPD is 100% or less. If greater 5* MDA/ MDC, then RPD 20% or less. If below the MDA/ MDC, the RPD is 0%.	✓		
Or meets the client's required RER acceptance criteria.			
Tracer yield is 15-125% . Carrier yield 25-125%.	✓		
Or meets the client's contract acceptance criteria.			
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.	✓		
Sample was correctly preserved if required.	✓		
Smears Taken for Radioactive batches.			N/A
Method Spike and LCS are within 75-125% or meets the client's contract acceptance criteria.	✓		
No blank spaces on data forms.			
All line outs initialed and dated.	✓		
No transcription errors are apparent.			
Aux data is correct.			N/A
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stasured.	✓		
QC data entered into QC database and batch is in REVW	✓		
Hit notification complete (if necessary)			N/A
Batch entered into Case Narrative.	✓		
Batch non-conformances completed, if applicable.	✓		NCR 721639
Batch non-conformances second reviewed and disposition verified to be completed.	✓		NCR 721639
Aliquot Correction completed if required.			N/A
Review sample historical results if available (If REMF, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

GEL Laboratories, LLC

revised 8/1/08

Primary Review Performed By: Jop LM 1 - 8/14/09

Secondary Review Performed By: Just McNeil 8/15/09

8/12 8/18

VSR

V P

Thorium (Ac-227 Tracer) Que Sheet

07-AUG-09

Batch #: 891790 Analyst: JXD2 First Client Due Date: 18-AUG-09 Internal Due Date: 12-AUG-09
 Tracer Isotope: Ac-227 Tracer Code: 0387-β-102- Expiration Date: 07/22/09 Vol: 0.1 Ac-227 Separation Date/Time: 08/10/09 5:05 PM
 LCS Isotope: Th-230 LCS Code: A2316-J Expiration Date: 04/13/09 Vol: 0.1
 Spike Isotope: Th-230 Spike Code: Expiration Date: Vol:
 Prep Date: 08/07/09 Initials: JXP Pipet ID: 297058 Balance ID: 16750207 Witness: ME 8/11/09

Sample ID	Client Description	Type	Hazard Code	Min CRDL	Matrix	Client	Collection Date	Pos.	Label #	Wet/Dry Aliquot (g) (10f)	Th Det #
233587021-2	EB072009-SO	SAMPLE		.03 pCi/L	WATER	KERR003	22-JUL-09	1	1	0.800	187
233612013-2	EB071709-SO	SAMPLE		.03 pCi/L	WATER	KERR003	17-JUL-09	2	2	0.800	188
233612014-2	FB072109-SO	SAMPLE		.03 pCi/L	WATER	KERR003	21-JUL-09	3	3	0.800	189
233612021-2	EB072109-SO	SAMPLE		.03 pCi/L	WATER	KERR003	21-JUL-09	4	4	0.800	190
233960004-2	EB072209-SO	SAMPLE		.03 pCi/L	WATER	KERR003	22-JUL-09	5	5	0.800	191
233960014-2	EB072309-SO	SAMPLE		.03 pCi/L	WATER	KERR003	23-JUL-09	6	6	0.800	192
234120018-1	EB072709-SO	SAMPLE		.03 pCi/L	WATER	KERR003	27-JUL-09	7	7	0.800	193
1201896963-1	MB for batch 891790	MB		.03 pCi/L	WATER	QC ACCOUNT	22-JUL-09	8	8	0.800	194
1201896964-1	LCS for batch 891790	LCS		.03 pCi/L	WATER	QC ACCOUNT	22-JUL-09	9	9	0.800	195
1201896965-1	LCS for batch 891790	LCS		.03 pCi/L	WATER	QC ACCOUNT	22-JUL-09	10	10	0.800	196

Choose SOP Used: GL-RAD-A-038 ✓
 GL-RAD-A-045 _____
 GL-RAD-A-043 _____
 GL-RAD-A-032 _____
 GEL Laboratories LLC, Radiochemistry Division

Solid Sample Dissolution by: ^{gpd} LEACH ~~OR~~ DIGESTION
 Data Reviewed By: Jupl MLJ - 8/14/09
 Circle One

GEL Laboratories LLC
 ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 891790
 SAMPLE DATE : 10-AUG-2009 17:05:00

SAMPLE ID : S0233960004_TH
 SAMPLE QTY: 0.800 L

DETECTOR NUMBER :68624
 AVERAGE %EFFICIENCY :26.2116
 % YIELD : 73.531

COUNT DATE:12-AUG-2009 19:05:38
 ELAPSED LIVE TIME(SEC): 60000.00
 ANALYST :JXD2

MS/MSD
 ID : A2796-J
 ISOTOPE : TH-230
 PCI/L : 2.675E+00

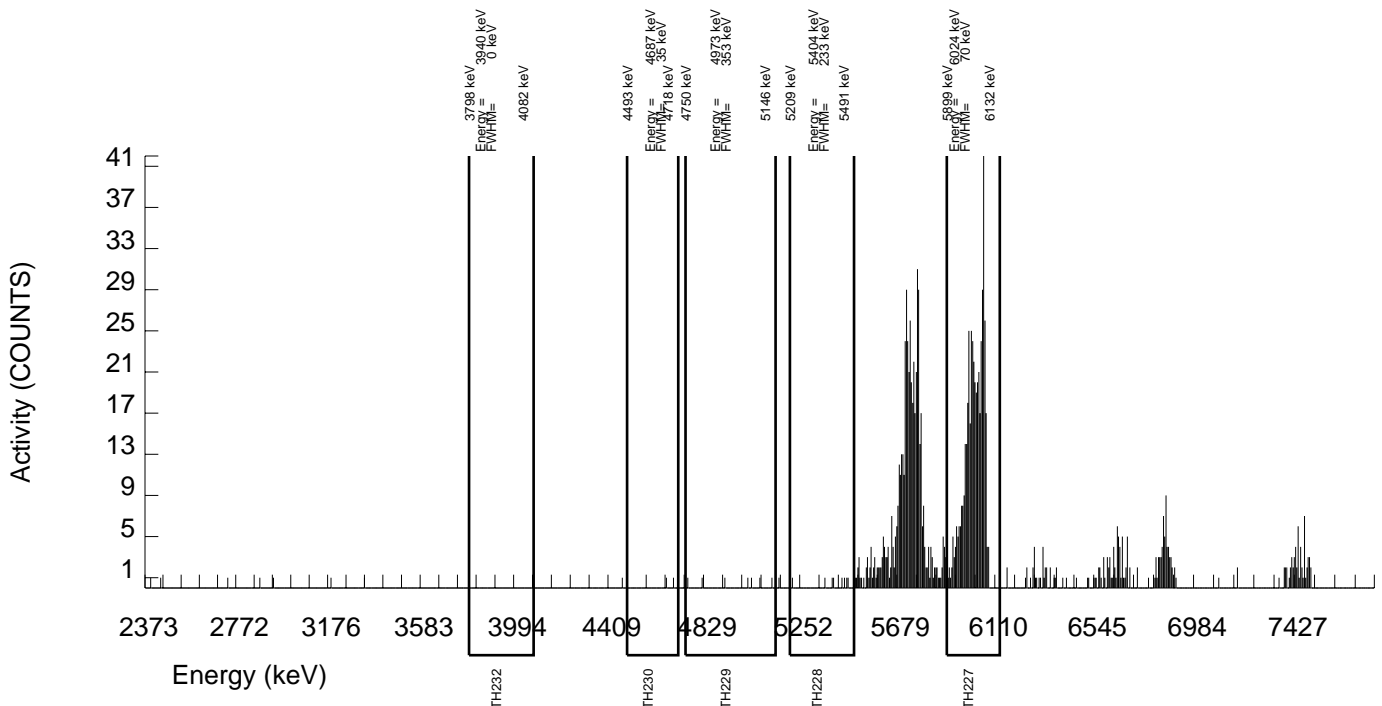
LCS/LCSD
 ID : A2796-J
 ISOTOPE : TH-230
 PCI/L : 2.675E+00

TRACER
 ID : 0387-B-102
 ISOTOPE : AC227
 NOMINAL : 3.91804 dpm
 RESULTS : 2.88096 dpm

LIB FILE : ENV_ALPHA_TH.N
 BKG FILE : B191.CNF;99
 BKG DATE : 9-AUG-2009
 EFF FILE : W191.CNF;35
 CAL DATE : 22-JUL-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/L	TPU 1.96-SIGMA	MDA pCi/L	Lc pCi/L	UNC pCi/L
AC-227	6038.010	473.000	470.000	3.000	1.7321	68.10000	2.21E+00	2.37E-01	5.19E-02	1.89E-02	2.01E-01
TH-228	5363.000	8.000	5.000	3.000	1.7321	99.94000	1.47E-02	1.91E-02	3.24E-02	1.18E-02	1.90E-02
TH229	4900.000	7.000	2.000	5.000	2.2361	99.52000	5.87E-03	1.99E-02	3.93E-02	1.53E-02	1.99E-02
TH-230	4625.000	2.000	1.000	1.000	1.0000	100.0000	2.92E-03	9.92E-03	2.24E-02	6.80E-03	9.92E-03
TH-232	3972.000	0.000	0.000	0.000	0.0000	100.0000	0.00E+00	5.73E-03	8.76E-03	0.00E+00	5.73E-03



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 891790
SAMPLE DATE : 10-AUG-2009 17:05:00

SAMPLE ID : S0233960014_TH
SAMPLE QTY: 0.800 L

DETECTOR NUMBER :74430
AVERAGE %EFFICIENCY :26.1047
% YIELD : 74.931

COUNT DATE:12-AUG-2009 19:05:40
ELAPSED LIVE TIME(SEC): 60000.00
ANALYST :JXD2

MS/MSD
ID : A2796-J
ISOTOPE : TH-230
PCI/L : 2.675E+00

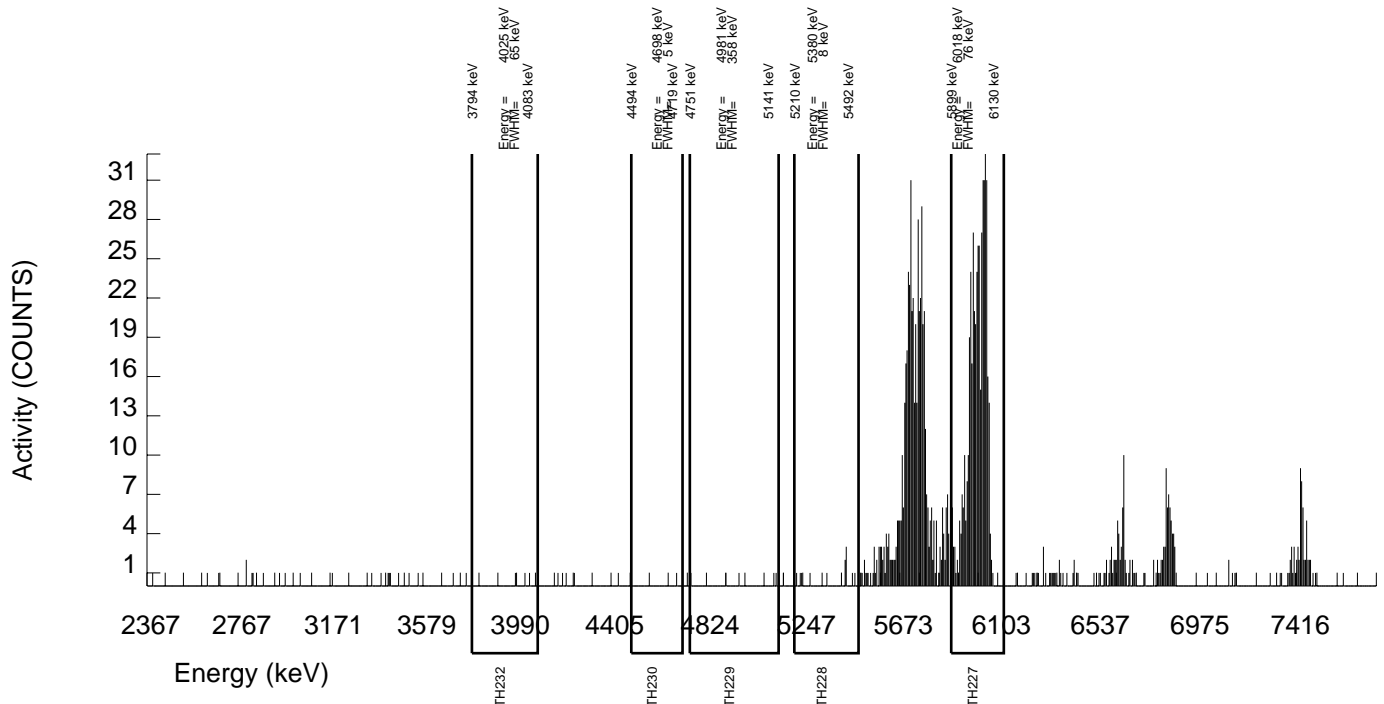
LCS/LCSD
ID : A2796-J
ISOTOPE : TH-230
PCI/L : 2.675E+00

TRACER
ID : 0387-B-102
ISOTOPE : AC227
NOMINAL : 3.91804 dpm
RESULTS : 2.93584 dpm

LIB FILE : ENV_ALPHA_TH.N
BKG FILE : B192.CNF;97
BKG DATE : 9-AUG-2009
EFF FILE : W192.CNF;42
CAL DATE : 22-JUL-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/L	TPU 1.96-SIGMA	MDA pCi/L	Lc pCi/L	UNC pCi/L
AC-227	6038.010	483.000	477.000	6.000	2.4495	68.10000	2.21E+00	2.33E-01	6.66E-02	2.64E-02	2.00E-01
TH-228	5363.000	13.000	6.000	7.000	2.6458	99.94000	1.73E-02	2.53E-02	4.42E-02	1.78E-02	2.53E-02
TH229	4900.000	5.000	-1.000	6.000	2.4495	99.52000	-2.89E-03	1.88E-02	4.16E-02	1.65E-02	1.88E-02
TH-230	4625.000	1.000	1.000	0.000	0.0000	100.0000	2.88E-03	5.64E-03	8.64E-03	0.00E+00	5.64E-03
TH-232	3972.000	3.000	2.000	1.000	1.0000	100.0000	5.76E-03	1.13E-02	2.20E-02	6.70E-03	1.13E-02



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 891790
SAMPLE DATE : 10-AUG-2009 17:05:00

SAMPLE ID : S1201896963_TH
SAMPLE QTY: 0.800 L

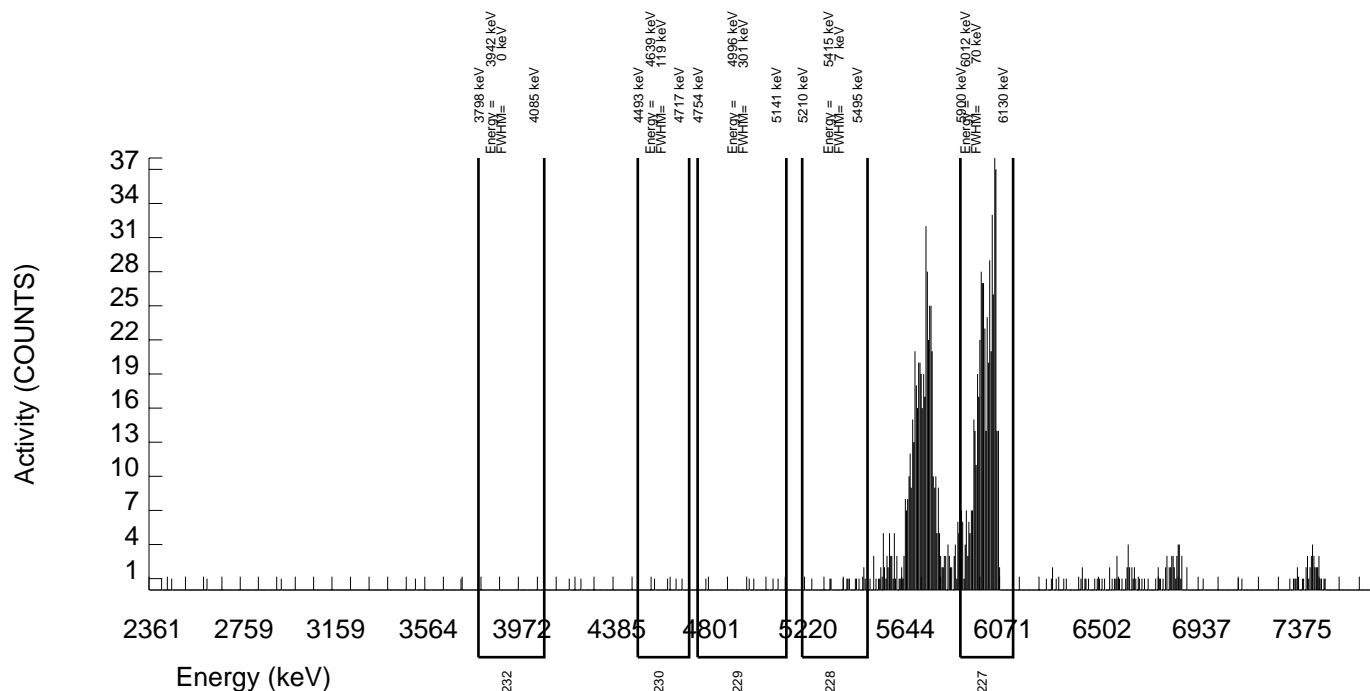
DETECTOR NUMBER :68635
AVERAGE %EFFICIENCY :25.4957
% YIELD : 86.372

COUNT DATE:12-AUG-2009 19:05:45
ELAPSED LIVE TIME(SEC): 60000.00
ANALYST :JXD2

MS/MSD ID : A2796-J ISOTOPE : TH-230 PCI/L : 2.675E+00	LCS/LCSD ID : A2796-J ISOTOPE : TH-230 PCI/L : 2.675E+00	TRACER ID : 0387-B-102 ISOTOPE : AC227 NOMINAL : 3.91804 dpm RESULTS : 3.38410 dpm	LIB FILE : ENV_ALPHA_TH.N BKG FILE : B194.CNF;97 BKG DATE : 9-AUG-2009 EFF FILE : W194.CNF;35 CAL DATE : 22-JUL-2009
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NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/L	TPU 1.96-SIGMA	MDA pCi/L	Lc pCi/L	UNC pCi/L
AC-227	6038.010	538.000	537.000	1.000	1.0000	68.10000	2.21E+00	2.22E-01	3.14E-02	9.56E-03	1.87E-01
TH-228	5363.000	13.000	2.000	11.000	3.3166	99.94000	5.13E-03	2.46E-02	4.73E-02	1.98E-02	2.46E-02
TH229	4900.000	5.000	2.000	3.000	1.7321	99.52000	5.14E-03	1.42E-02	2.84E-02	1.04E-02	1.42E-02
TH-230	4625.000	4.000	2.000	2.000	1.4142	100.0000	5.11E-03	1.23E-02	2.45E-02	8.41E-03	1.23E-02
TH-232	3972.000	0.000	0.000	0.000	0.0000	100.0000	0.00E+00	5.01E-03	7.67E-03	0.00E+00	5.01E-03



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 891790
SAMPLE DATE : 10-AUG-2009 17:05:00

SAMPLE ID : S1201896964_TH
SAMPLE QTY: 0.800 L

DETECTOR NUMBER :68636
AVERAGE %EFFICIENCY :25.7303
% YIELD : 81.122

COUNT DATE:12-AUG-2009 19:05:47
ELAPSED LIVE TIME(SEC): 60000.00
ANALYST :JXD2

MS/MSD
ID : A2796-J
ISOTOPE : TH-230
PCI/L : 2.675E+00

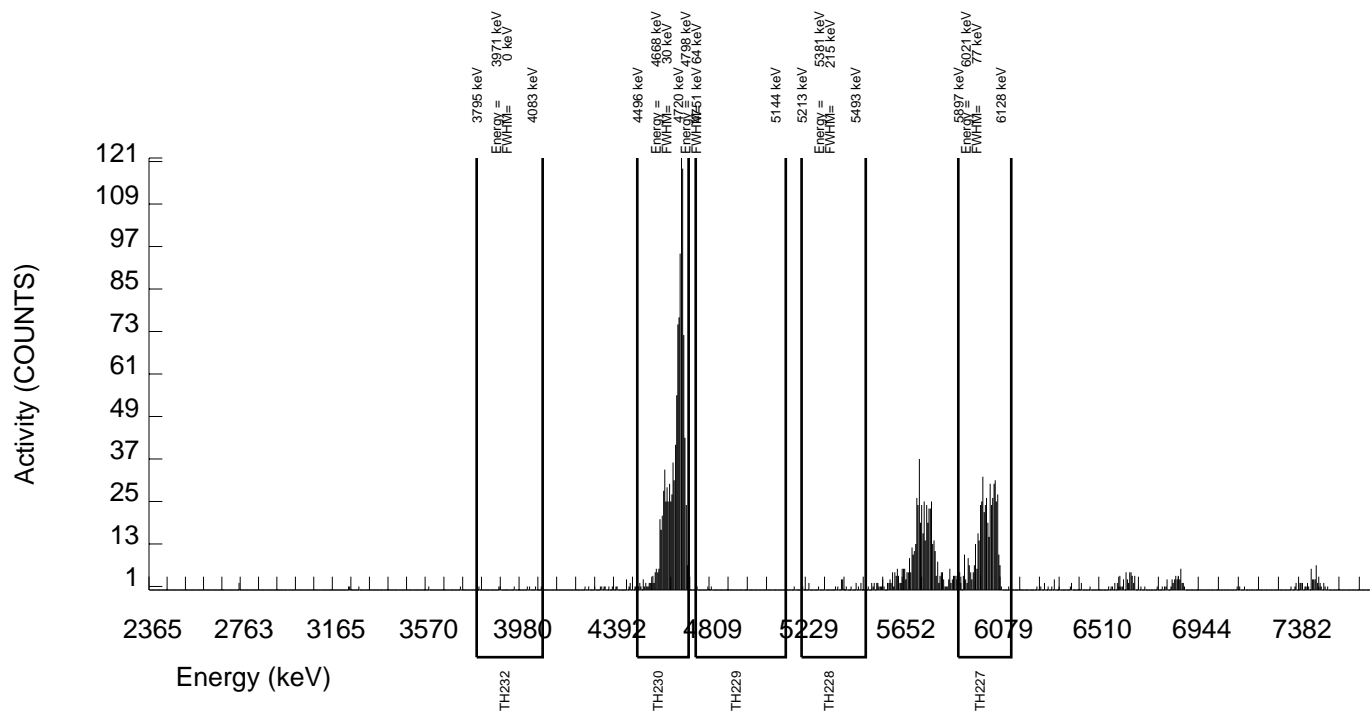
LCS/LCSD
ID : A2796-J
ISOTOPE : TH-230
PCI/L : 2.675E+00

TRACER
ID : 0387-B-102
ISOTOPE : AC227
NOMINAL : 3.91804 dpm
RESULTS : 3.17839 dpm

LIB FILE : ENV_ALPHA_TH.N
BKG FILE : B195.CNF;103
BKG DATE : 9-AUG-2009
EFF FILE : W195.CNF;34
CAL DATE : 22-JUL-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/L	TPU 1.96-SIGMA	MDA pCi/L	Lc pCi/L	UNC pCi/L
AC-227	6038.010	517.000	509.000	8.000	2.8284	68.10000	2.21E+00	2.32E-01	7.00E-02	2.85E-02	1.95E-01
TH-228	5363.000	20.000	11.000	9.000	3.0000	99.94000	2.98E-02	2.86E-02	4.59E-02	1.89E-02	2.86E-02
TH229	4900.000	3.000	-11.000	14.000	3.7417	99.52000	-2.98E-02	2.19E-02	5.53E-02	2.36E-02	2.19E-02
TH-230	4625.000	1125.000	1086.000	39.000	6.2450	100.0000	2.93E+00	2.47E-01	8.65E-02	3.92E-02	1.80E-01
TH-232	3972.000	8.000	0.000	8.000	2.8284	100.0000	0.00E+00	2.11E-02	4.36E-02	1.78E-02	2.11E-02



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 891790
SAMPLE DATE : 10-AUG-2009 17:05:00

SAMPLE ID : S1201896965_TH
SAMPLE QTY: 0.800 L

DETECTOR NUMBER :68637
AVERAGE %EFFICIENCY :25.6679
% YIELD : 72.692

COUNT DATE:12-AUG-2009 19:05:50
ELAPSED LIVE TIME(SEC): 60000.00
ANALYST :JXD2

MS/MSD
ID : A2796-J
ISOTOPE : TH-230
PCI/L : 2.675E+00

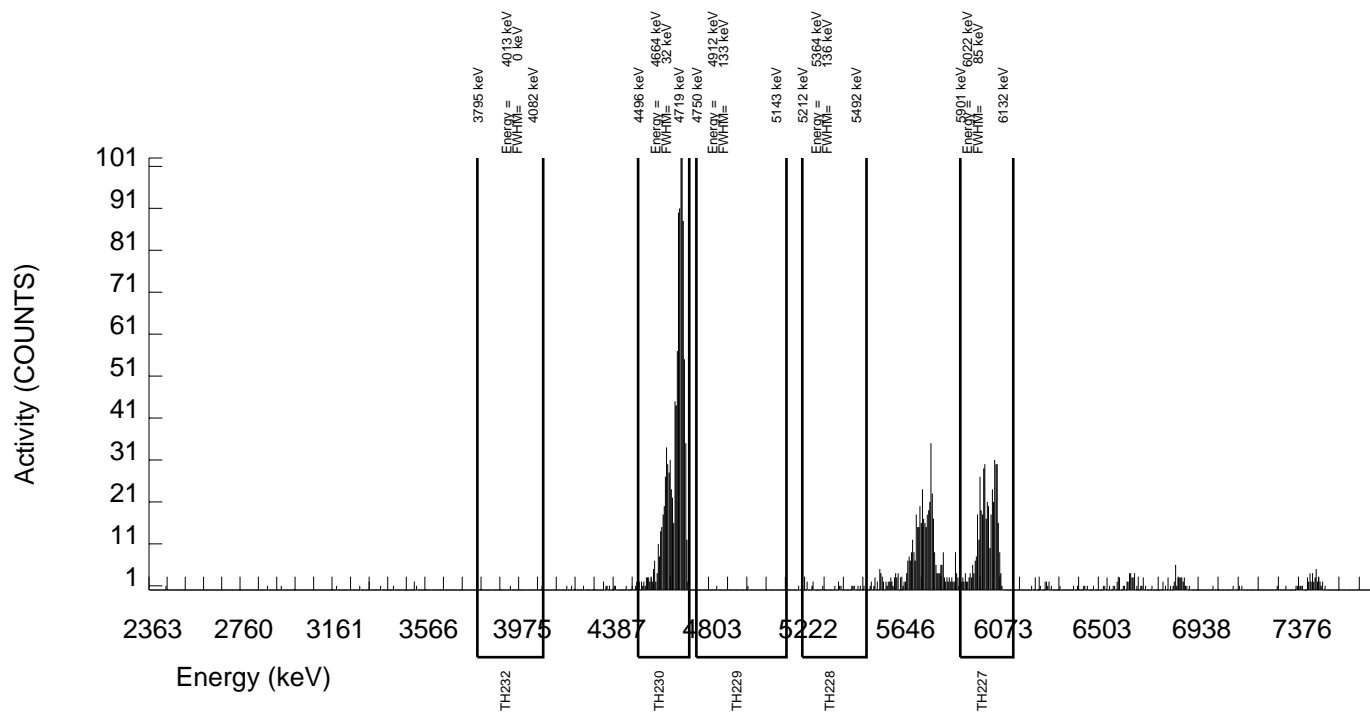
LCS/LCSD
ID : A2796-J
ISOTOPE : TH-230
PCI/L : 2.675E+00

TRACER
ID : 0387-B-102
ISOTOPE : AC227
NOMINAL : 3.91804 dpm
RESULTS : 2.84811 dpm

LIB FILE : ENV_ALPHA_TH.N
BKG FILE : B196.CNF;98
BKG DATE : 9-AUG-2009
EFF FILE : W196.CNF;35
CAL DATE : 22-JUL-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/L	TPU 1.96-SIGMA	MDA pCi/L	Lc pCi/L	UNC pCi/L
AC-227	6038.010	457.000	455.000	2.000	1.4142	68.10000	2.21E+00	2.36E-01	4.64E-02	1.60E-02	2.04E-01
TH-228	5363.000	17.000	9.000	8.000	2.8284	99.94000	2.72E-02	2.97E-02	4.89E-02	1.99E-02	2.97E-02
TH229	4900.000	2.000	0.000	2.000	1.4142	99.52000	0.00E+00	1.19E-02	2.90E-02	9.98E-03	1.19E-02
TH-230	4625.000	1068.000	1063.000	5.000	2.2361	100.0000	3.21E+00	2.60E-01	4.04E-02	1.57E-02	1.94E-01
TH-232	3972.000	2.000	0.000	2.000	1.4142	100.0000	0.00E+00	1.18E-02	2.89E-02	9.93E-03	1.18E-02



URANIUM

Radiochemistry Batch Checklist, Rev 9

Batch# 888842 Product: U Date: 8/12/09

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			N/A
Samples have been blank corrected (if required)			N/A
If activity less 10* MDA/ MDC, error is 150% or less of sample activity. If greater 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.			
Method RDL/ LLD has been met.		✓	NCR 720544
If duplicate activities are less 5* MDA/ MDC, then RPD is 100% or less. If greater 5* MDA/ MDC, then RPD 20% or less. If below the MDA/ MDC, the RPD is 0%.	✓		
Or meets the client's required RER acceptance criteria.			
Tracer yield is 15-125% . Carrier yield 25-125%.			
Or meets the client's contract acceptance criteria.		✓	NCR 720544
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.	✓		
Sample was correctly preserved if required.	✓		
Smears Taken for Radioactive batches.			N/A
Method Spike and LCS are within 75-125% or meets the client's contract acceptance criteria.	✓		
No blank spaces on data forms.			
All line outs initialed and dated.	✓		
No transcription errors are apparent.			
Aux data is correct.			N/A
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stasured.	✓		
QC data entered into QC database and batch is in REVW	✓		
Hit notification complete (if necessary)			N/A
Batch entered into Case Narrative.	✓		
Batch non-conformances completed, if applicable.	✓		NCR 720544
Batch non-conformances second reviewed and disposition verified to be completed.	✓		NCR 720544
Aliquot Correction completed if required.			N/A
Review sample historical results if available (If REMF, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

GEL Laboratories, LLC

revised 8/1/08

Primary Review Performed By: Jap LRL 8/12/09

Secondary Review Performed By: Jen 8/18/09

8/7 8/8

KSR

PV

Uranium Que Sheet

28-JUL-09

Batch #: 888842 Analyst: JXD2 First Client Due Date: 18-AUG-09 Internal Due Date: 17-AUG-09

Tracer Isotope: U-232/U-236 Tracer Code: 1283-C Expiration Date: 01/15/10 Vol: 0.1

LCS Isotope: U-238 LCS Code: 1163-G Expiration Date: 04/15/10 Vol: 0.1

Spike Isotope: U-238 Spike Code: _____ Expiration Date: _____ Vol: _____

Prep Date: 07/21/09 Initials: JXD Pipet ID: 2171058 Balance ID: 16750207

Witness: CHAKA 7/29/09

Sample ID	Client Description	Type	Hazard Code	Min CRDL	Matrix	Client	Collection Date	Pos.	Label #	Wet/Dry Aliquot (g/μl)	U Det #
233587015-1	EB071609-SO	SAMPLE		.03 pCi/L	WATER	KERR003	16-JUL-09	1	1	0.800	131
233587021-1	EB072009-SO	SAMPLE		.03 pCi/L	WATER	KERR003	22-JUL-09	2	2	0.800	133
233612013-1	EB071709-SO	SAMPLE		.03 pCi/L	WATER	KERR003	17-JUL-09	3	3	0.800	134
233612014-1	FB072109-SO	SAMPLE		.03 pCi/L	WATER	KERR003	21-JUL-09	4	4	0.800	135
233612021-1	EB072109-SO	SAMPLE		.03 pCi/L	WATER	KERR003	21-JUL-09	5	5	0.800	136
233960004-1	EB072209-SO	SAMPLE		.03 pCi/L	WATER	KERR003	22-JUL-09	6	6	0.800	137
233960014-1	EB072309-SO	SAMPLE		.03 pCi/L	WATER	KERR003	23-JUL-09	7	7	0.800	138
1201890124-1	MB for batch 888842	MB		.03 pCi/L	WATER	QC ACCOUNT		8	8	0.800	139
1201890131-1	LCS for batch 888842	LCS		.03 pCi/L	WATER	QC ACCOUNT		9	9	0.800	140
1201890138-1	LCS for batch 888842	LCS		.03 pCi/L	WATER	QC ACCOUNT	17-JUL-09	10	10	0.800	144

107

Choose SOP used: GL-RAD-A-011
 GL-RAD-A-038
 GL-RAD-A-045
 GL-RAD-A-043

Solid Sample Dissolution by: LEACH or DIGESTION
 Circle One

Data Reviewed By: J. C. M. / 8/22/09
8/15/09

GEL Laboratories LLC, Radiochemistry Division

Page 1 of 1

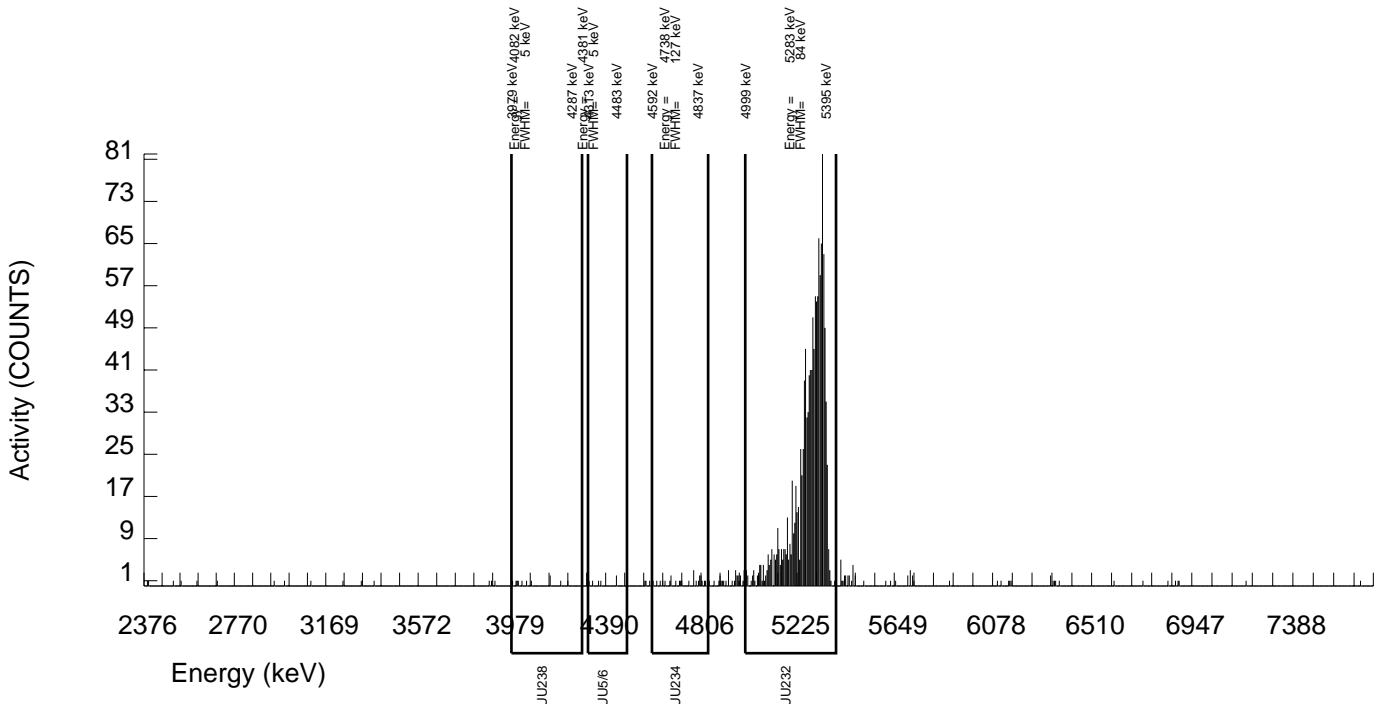
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 888842 SAMPLE DATE : 22-JUL-2009 00:00:00		SAMPLE ID : S0233960004_UU SAMPLE QTY: 0.800 L	
DETECTOR NUMBER :70321 AVERAGE %EFFICIENCY :37.2449 % YIELD : 66.787		COUNT DATE:11-AUG-2009 11:21:38 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :JXD2	
MS/MSD ID : 1163-G ISOTOPE : U-238 PCI/L : 3.149E+00	LCS/LCSD ID : 1163-G ISOTOPE : U-238 PCI/L : 3.149E+00	TRACER ID : 1283-E ISOTOPE : U232 NOMINAL : 5.26525 dpm RESULTS : 3.51650 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B161.CNF;113 BKG DATE : 9-AUG-2009 EFF FILE : W161.CNF;40 CAL DATE : 23-JUL-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/L	TPU 1.96-SIGMA	MDA pCi/L	Lc pCi/L	UNC pCi/L
U-3/4	4763.020	25.000	18.047	3.000	1.7321	100.0000	4.09E-02	2.25E-02	2.50E-02	9.12E-03	2.18E-02
U232	5302.100	1319.000	1309.000	10.000	3.1623	100.0000	2.96E+00	4.33E-01	4.01E-02	1.67E-02	1.62E-01
U-235	4391.000	6.000	5.000	1.000	1.0000	80.90000	1.40E-02	1.46E-02	2.14E-02	6.51E-03	1.45E-02
U-238	4184.730	11.000	10.000	1.000	1.0000	100.0000	2.26E-02	1.57E-02	1.73E-02	5.27E-03	1.54E-02

NOTE: Corrections made to U-3/4 net area due to tracer impurity



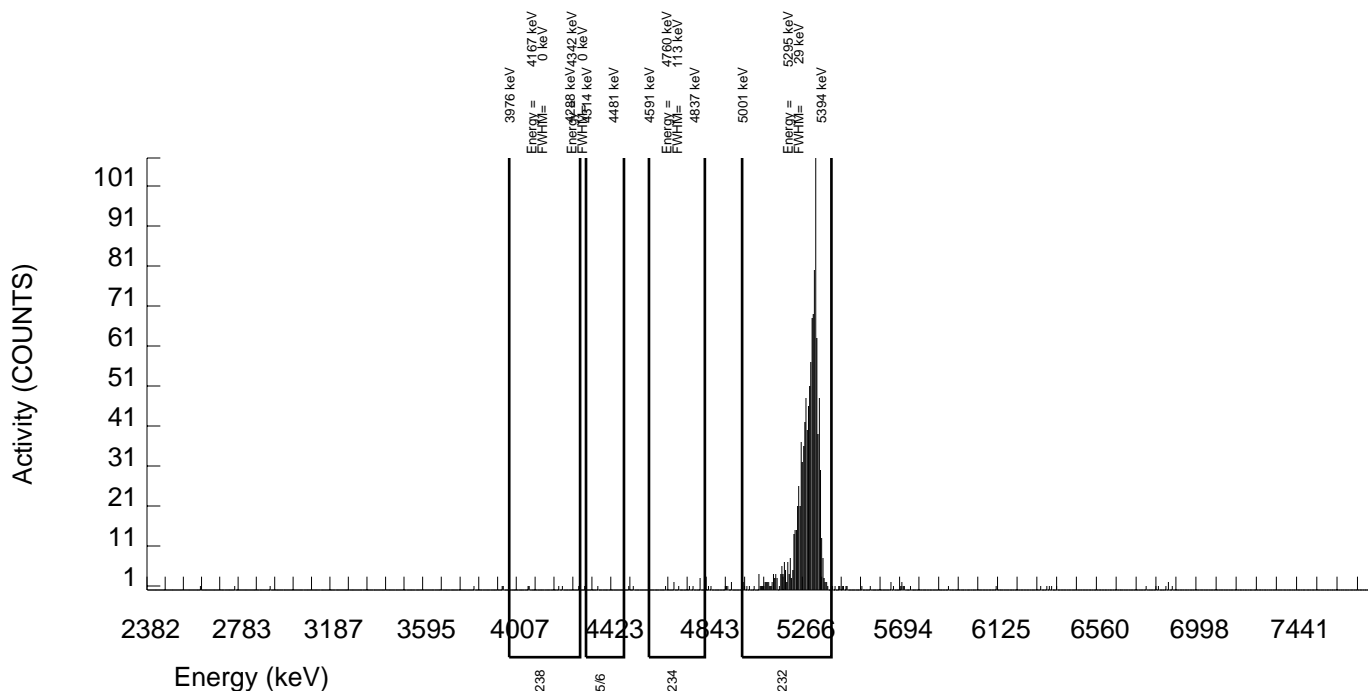
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 888842 SAMPLE DATE : 23-JUL-2009 00:00:00		SAMPLE ID : S0233960014_UU SAMPLE QTY: 0.800 L	
DETECTOR NUMBER :65877 AVERAGE %EFFICIENCY :25.4635 % YIELD : 83.560		COUNT DATE:31-JUL-2009 19:25:45 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :JXD2	
MS/MSD ID : 1163-G ISOTOPE : U-238 PCI/L : 3.149E+00	LCS/LCSD ID : 1163-G ISOTOPE : U-238 PCI/L : 3.149E+00	TRACER ID : 1283-E ISOTOPE : U232 NOMINAL : 5.26510 dpm RESULTS : 4.39951 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B138.CNF;337 BKG DATE : 26-JUL-2009 EFF FILE : W138.CNF;90 CAL DATE : 17-JUL-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/L	TPU 1.96-SIGMA	MDA pCi/L	Lc pCi/L	UNC pCi/L
U-3/4	4763.020	9.000	-5.381	11.000	3.3166	100.0000	-1.42E-02	2.11E-02	4.88E-02	2.04E-02	2.11E-02
U232	5302.100	1131.000	1120.000	11.000	3.3166	100.0000	2.96E+00	4.44E-01	4.88E-02	2.04E-02	1.75E-01
U-235	4391.000	2.000	-1.000	3.000	1.7321	80.90000	-3.27E-03	1.43E-02	3.62E-02	1.32E-02	1.43E-02
U-238	4184.730	5.000	4.000	1.000	1.0000	100.0000	1.06E-02	1.28E-02	2.03E-02	6.16E-03	1.27E-02

NOTE: Corrections made to U-3/4 net area due to tracer impurity



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 888842
SAMPLE DATE : 29-JUL-2009 00:00:00

SAMPLE ID : S1201890124_UU
SAMPLE QTY: 0.800 L

DETECTOR NUMBER :76231
AVERAGE %EFFICIENCY :25.0427
% YIELD : 72.371

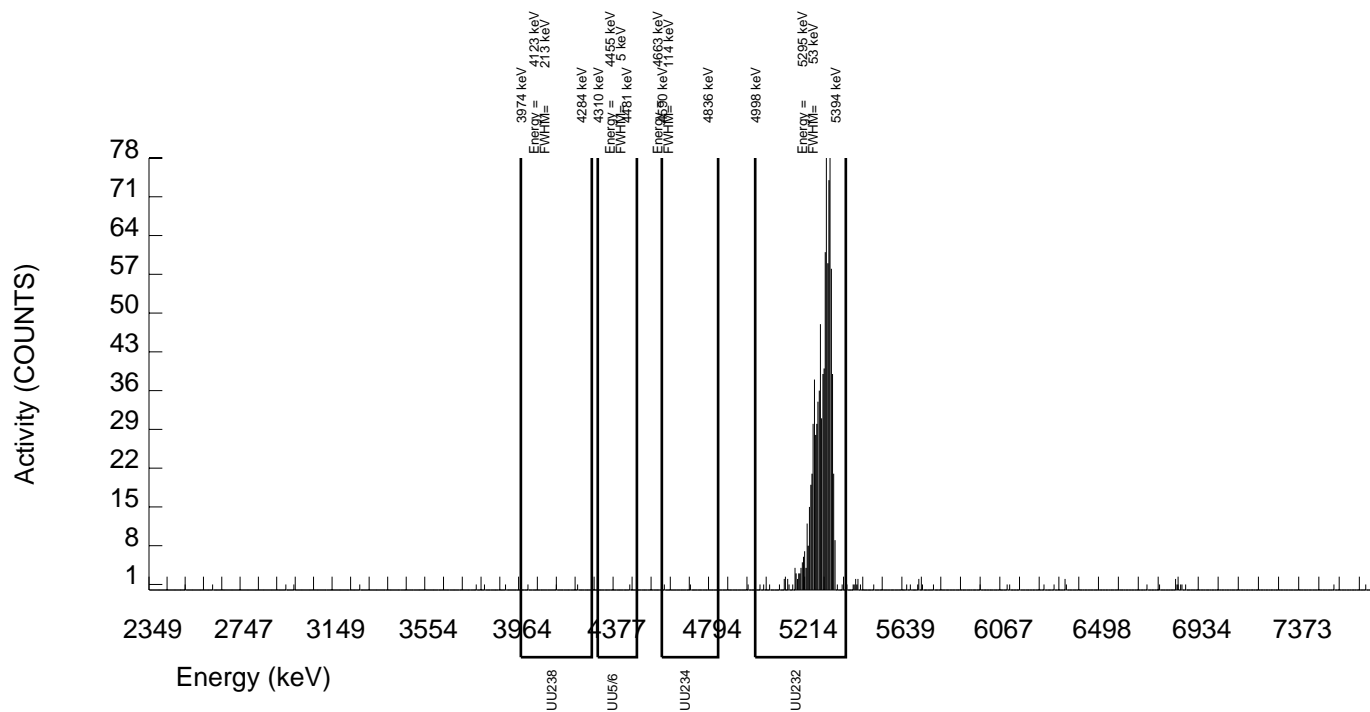
COUNT DATE:31-JUL-2009 19:25:48
ELAPSED LIVE TIME(SEC): 60000.00
ANALYST :JXD2

MS/MSD ID : 1163-G ISOTOPE : U-238 PCI/L : 3.149E+00	LCS/LCSD ID : 1163-G ISOTOPE : U-238 PCI/L : 3.149E+00	TRACER ID : 1283-E ISOTOPE : U232 NOMINAL : 5.26427 dpm RESULTS : 3.80980 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B139.CNF;334 BKG DATE : 26-JUL-2009 EFF FILE : W139.CNF;90 CAL DATE : 17-JUL-2009
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NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/L	TPU 1.96-SIGMA	MDA pCi/L	Lc pCi/L	UNC pCi/L
U-3/4	4763.020	2.000	-5.880	5.000	2.2361	100.0000	-1.83E-02	1.49E-02	4.16E-02	1.62E-02	1.49E-02
U232	5302.100	960.000	954.000	6.000	2.4495	100.0000	2.96E+00	4.63E-01	4.47E-02	1.77E-02	1.89E-01
U-235	4391.000	1.000	0.000	1.000	1.0000	80.90000	0.00E+00	1.07E-02	2.94E-02	8.93E-03	1.06E-02
U-238	4184.730	3.000	0.000	3.000	1.7321	100.0000	0.00E+00	1.49E-02	3.44E-02	1.25E-02	1.49E-02

NOTE: Corrections made to U-3/4 net area due to tracer impurity



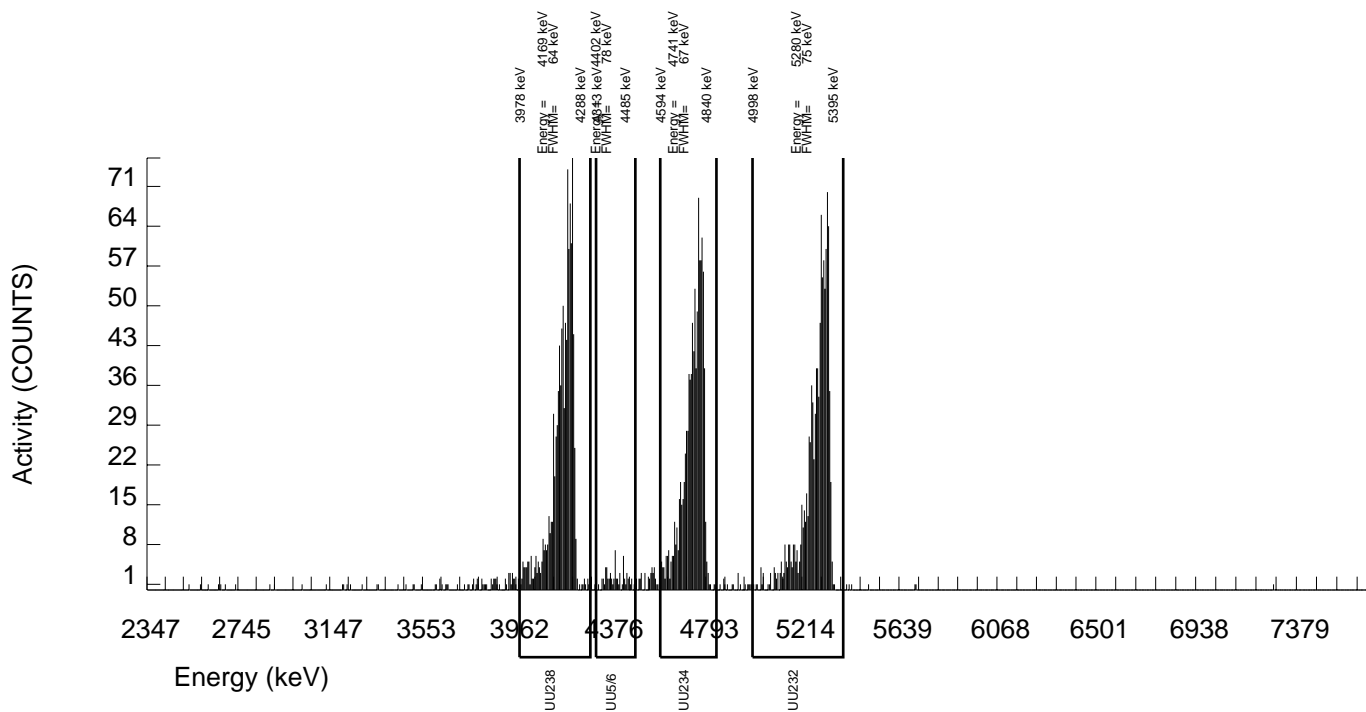
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 888842 SAMPLE DATE : 29-JUL-2009 00:00:00		SAMPLE ID : S1201890131_UU SAMPLE QTY: 0.800 L	
DETECTOR NUMBER :78771 AVERAGE %EFFICIENCY :25.5149 % YIELD : 76.393		COUNT DATE:31-JUL-2009 19:25:51 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :JXD2	
MS/MSD ID : 1163-G ISOTOPE : U-238 PCI/L : 3.149E+00	LCS/LCSD ID : 1163-G ISOTOPE : U-238 PCI/L : 3.149E+00	TRACER ID : 1283-E ISOTOPE : U232 NOMINAL : 5.26427 dpm RESULTS : 4.02151 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B140.CNF;334 BKG DATE : 26-JUL-2009 EFF FILE : W140.CNF;95 CAL DATE : 17-JUL-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/L	TPU 1.96-SIGMA	MDA pCi/L	Lc pCi/L	UNC pCi/L
U-3/4	4763.020	970.000	964.903	2.000	1.4142	100.0000	2.79E+00	4.25E-01	2.77E-02	9.50E-03	1.76E-01
U232	5302.100	1033.000	1026.000	7.000	2.6458	100.0000	2.96E+00	4.50E-01	4.42E-02	1.78E-02	1.83E-01
U-235	4391.000	62.000	61.000	1.000	1.0000	80.90000	2.18E-01	6.32E-02	2.73E-02	8.31E-03	5.56E-02
U-238	4184.730	1030.000	1023.000	7.000	2.6458	100.0000	2.96E+00	4.49E-01	4.42E-02	1.78E-02	1.82E-01

NOTE: Corrections made to U-3/4 net area due to tracer impurity



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 888842
SAMPLE DATE : 29-JUL-2009 00:00:00

SAMPLE ID : S1201890138_UU
SAMPLE QTY: 0.800 L

DETECTOR NUMBER :75551
AVERAGE %EFFICIENCY :24.8919
% YIELD : 76.244

COUNT DATE:31-JUL-2009 19:26:00
ELAPSED LIVE TIME(SEC): 60000.00
ANALYST :JXD2

MS/MSD
ID : 1163-G
ISOTOPE : U-238
PCI/L : 3.149E+00

LCS/LCSD
ID : 1163-G
ISOTOPE : U-238
PCI/L : 3.149E+00

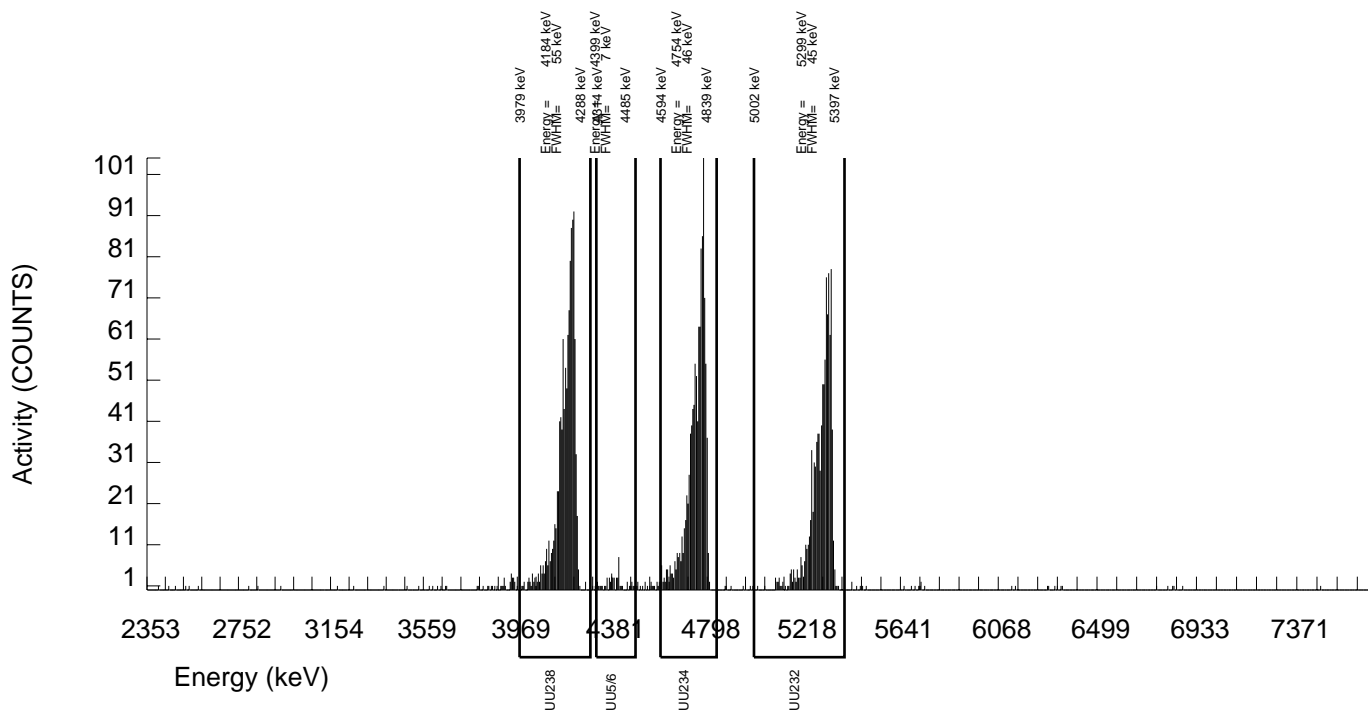
TRACER
ID : 1283-E
ISOTOPE : U232
NOMINAL : 5.26427 dpm
RESULTS : 4.01368 dpm

LIB FILE : ENV_ALPHA_UU.N
BKG FILE : B144.CNF;333
BKG DATE : 26-JUL-2009
EFF FILE : W144.CNF;94
CAL DATE : 17-JUL-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/L	TPU 1.96-SIGMA	MDA pCi/L	Lc pCi/L	UNC pCi/L
U-3/4	4763.020	1110.000	1100.984	6.000	2.4495	100.0000	3.27E+00	4.94E-01	4.27E-02	1.69E-02	1.94E-01
U232	5302.100	1009.000	999.000	10.000	3.1623	100.0000	2.96E+00	4.53E-01	5.26E-02	2.18E-02	1.86E-01
U-235	4391.000	52.000	50.000	2.000	1.4142	80.90000	1.83E-01	5.87E-02	3.51E-02	1.21E-02	5.28E-02
U-238	4184.730	1133.000	1130.000	3.000	1.7321	100.0000	3.35E+00	5.06E-01	3.28E-02	1.20E-02	1.96E-01

NOTE: Corrections made to U-3/4 net area due to tracer impurity



Radiochemistry Batch Checklist, Rev 9

Batch# 890875 Product: u Date: 8/20/09

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			N/A
Samples have been blank corrected (if required)			N/A
If activity less 10* MDA/ MDC, error is 150% or less of sample activity. If greater 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.	✓		
If duplicate activities are less 5* MDA/ MDC, then RPD is 100% or less. If greater 5* MDA/ MDC, then RPD 20% or less. If below the MDA/ MDC, the RPD is 0%.	✓		
Or meets the client's required RER acceptance criteria.	✓		
Tracer yield is 15-125% . Carrier yield 25-125%.	✓		
Or meets the client's contract acceptance criteria.	✓		
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	✓		Case narrative
Sample was run within hold time.	✓		
Sample was correctly preserved if required.	✓		
Smears Taken for Radioactive batches.			N/A
Method Spike and LCS are within 75-125% or meets the client's contract acceptance criteria.	✓		
No blank spaces on data forms.	✓		
All line outs initialed and dated.	✓		
No transcription errors are apparent.			
Aux data is correct.			N/A
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stasured.	✓		
QC data entered into QC database and batch is in REVW	✓		
Hit notification complete (if necessary)			N/A
Batch entered into Case Narrative.	✓		
Batch non-conformances completed, if applicable.	✓		N/A ^{ECS} 8/20/09 NCR# 724536
Batch non-conformances second reviewed and disposition verified to be completed.	✓		N/A NCR# 724536
Aliquot Correction completed if required.			N/A
Review sample historical results if available (If REMP, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

GEL Laboratories, LLC

revised 8/1/08

Primary Review Performed By: [Signature] 8/20/09

Secondary Review Performed By: [Signature] 8/21/09

KELL

8/11 - 8/22

Uranium Que Sheet

03-AUG-09

Batch #: 890375 Analyst: MXA1 First Client Due Date: 22-AUG-09 Internal Due Date: 11-AUG-09
 Tracer Isotope: U-232 U-236 Tracer Code: 1283-E Expiration Date: 1/15/10 Vol: 0.1 uL
 LCS Isotope: U-238 LCS Code: 1163-G Expiration Date: 4/16/10 Vol: 0.1 uL
 Spike Isotope: U-238 Spike Code: 1163-G Expiration Date: 4/16/10 Vol: 0.1 uL
 Prep Date: 8/5/09 Initials: MDA Pipet ID: 2971058 Balance ID: S0410272

Witness: AWO 8/6/09

Sample ID	Client Description	Type	Hazard Code	Min CRDL	Matrix	Client	Collection Date	Pos.	Label #	Wet/Dry Aliquot (g) (1/10)	U Det #
233960001-1	SA182-10B	SAMPLE		.04 pCi/g	SOIL	KERR003	22-JUL-09	1	71	0.504	184
233960002-1	SA182-25B	SAMPLE		.04 pCi/g	SOIL	KERR003	22-JUL-09	2	72	0.500	187
233960003-1	SA182-38B	SAMPLE		.04 pCi/g	SOIL	KERR003	22-JUL-09	3	73	0.508	191
233960005-1	SA71-10B	SAMPLE		.04 pCi/g	SOIL	KERR003	23-JUL-09	4	74	0.503	199
233960006-1	SA71-25B	SAMPLE		.04 pCi/g	SOIL	KERR003	23-JUL-09	5	75	0.503	161 ^{use 8/20/09}
233960007-1	SA71-36B	SAMPLE		.04 pCi/g	SOIL	KERR003	23-JUL-09	6	76	0.501	162
233960008-1	SA131-0.5B	SAMPLE		.04 pCi/g	SOIL	KERR003	23-JUL-09	7	77	0.510	163
233960009-1	SA131009-0.5B	SAMPLE		.04 pCi/g	SOIL	KERR003	23-JUL-09	8	78	0.502	164
233960010-1	SA131-10B	SAMPLE		.04 pCi/g	SOIL	KERR003	23-JUL-09	9	79	0.503	114 ^{use 8/20/09}
233960011-1	SA131-27B	SAMPLE		.04 pCi/g	SOIL	KERR003	23-JUL-09	10	80	0.503	160 ^{use 8/20/09}
233960012-1	SA145-10B	SAMPLE		.04 pCi/g	SOIL	KERR003	23-JUL-09	11	81	0.500	171
233960013-1	SA145-24B	SAMPLE		.04 pCi/g	SOIL	KERR003	23-JUL-09	12	82	0.503	174
233960015-1	RSAH3-0.5B	SAMPLE		.04 pCi/g	SOIL	KERR003	24-JUL-09	13	83	0.503	179
233960016-1	RSAH3009-0.5B	SAMPLE		.04 pCi/g	SOIL	KERR003	24-JUL-09	14	84	0.500	176
233960017-1	RSAH3-10B	SAMPLE		.04 pCi/g	SOIL	KERR003	24-JUL-09	15	85	0.507	171
233960018-1	RSAH3-20B	SAMPLE		.04 pCi/g	SOIL	KERR003	24-JUL-09	16	86	0.507	172
233960019-1	RSAH3-32B	SAMPLE		.04 pCi/g	SOIL	KERR003	24-JUL-09	17	87	0.505	7
233960020-1	RSAL5-0.5B	SAMPLE		.04 pCi/g	SOIL	KERR003	24-JUL-09	18	88	0.505	9
1201893646-1	MB for batch 890375	MB		.04 pCi/g	SOIL	QC ACCOUNT	24-JUL-09	19	89	0.510	9
1201893647-1	SA145-10B(233960012DUP)	DUP		.04 pCi/g	SOIL	QC ACCOUNT	23-JUL-09	20	90	0.503	10
1201893648-1	SA145-10B(233960012MS)	MS		.04 pCi/g	SOIL	QC ACCOUNT	23-JUL-09	21	91	0.502	11
1201893649-1	LCS for batch 890375	LCS		.04 pCi/g	SOIL	QC ACCOUNT	23-JUL-09	22	92	0.510	172

Choose SOP used: GL-RAD-A-011
 GL-RAD-A-038
 GL-RAD-A-045
 GL-RAD-A-043

Solid Sample Dissolution by: LEACH or DIGESTION

Circle One

Data Reviewed By: [Signature] 8/20/09

8/20/09

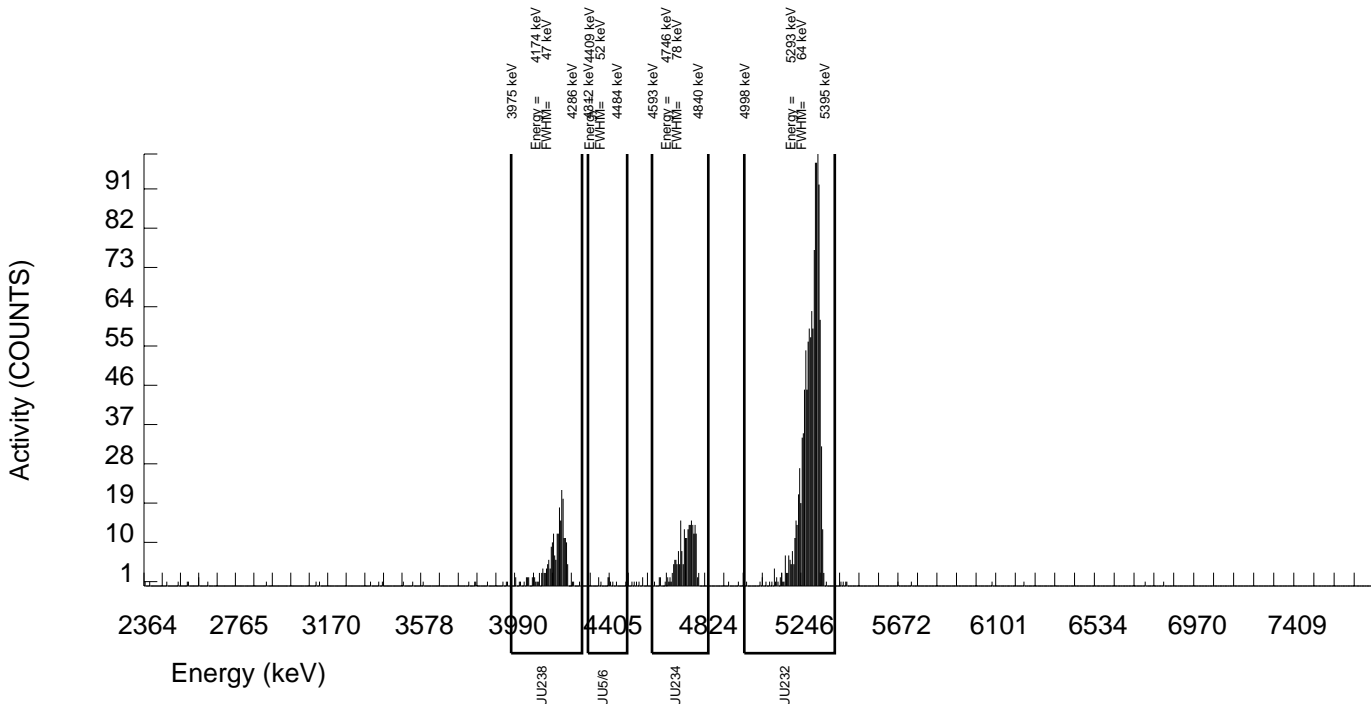
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 890375 SAMPLE DATE : 22-JUL-2009 00:00:00		SAMPLE ID : S0233960001_UU SAMPLE QTY: 0.504 G	
DETECTOR NUMBER :75554 AVERAGE %EFFICIENCY :24.7315 % YIELD : 95.731		COUNT DATE: 8-AUG-2009 15:53:22 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :MXA1	
MS/MSD ID : 1163-G ISOTOPE : U-238 PCI/G : 4.998E+00	LCS/LCSD ID : 1163-G ISOTOPE : U-238 PCI/G : 4.998E+00	TRACER ID : 1283-E ISOTOPE : U232 NOMINAL : 5.26524 dpm RESULTS : 5.04050 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B156.CNF;339 BKG DATE : 2-AUG-2009 EFF FILE : W156.CNF;107 CAL DATE : 17-JUL-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
U-3/4	4763.020	227.000	210.238	13.000	3.6056	100.0000	7.94E-01	1.57E-01	7.47E-02	3.17E-02	1.14E-01
U232	5302.100	1252.000	1246.000	6.000	2.4495	100.0000	4.71E+00	6.96E-01	5.44E-02	2.15E-02	2.63E-01
U-235	4391.000	11.000	11.000	0.000	0.0000	80.90000	5.13E-02	3.11E-02	1.40E-02	0.00E+00	3.03E-02
U-238	4184.730	237.000	233.000	4.000	2.0000	100.0000	8.80E-01	1.66E-01	4.65E-02	1.76E-02	1.15E-01

NOTE: Corrections made to U-3/4 net area due to tracer impurity



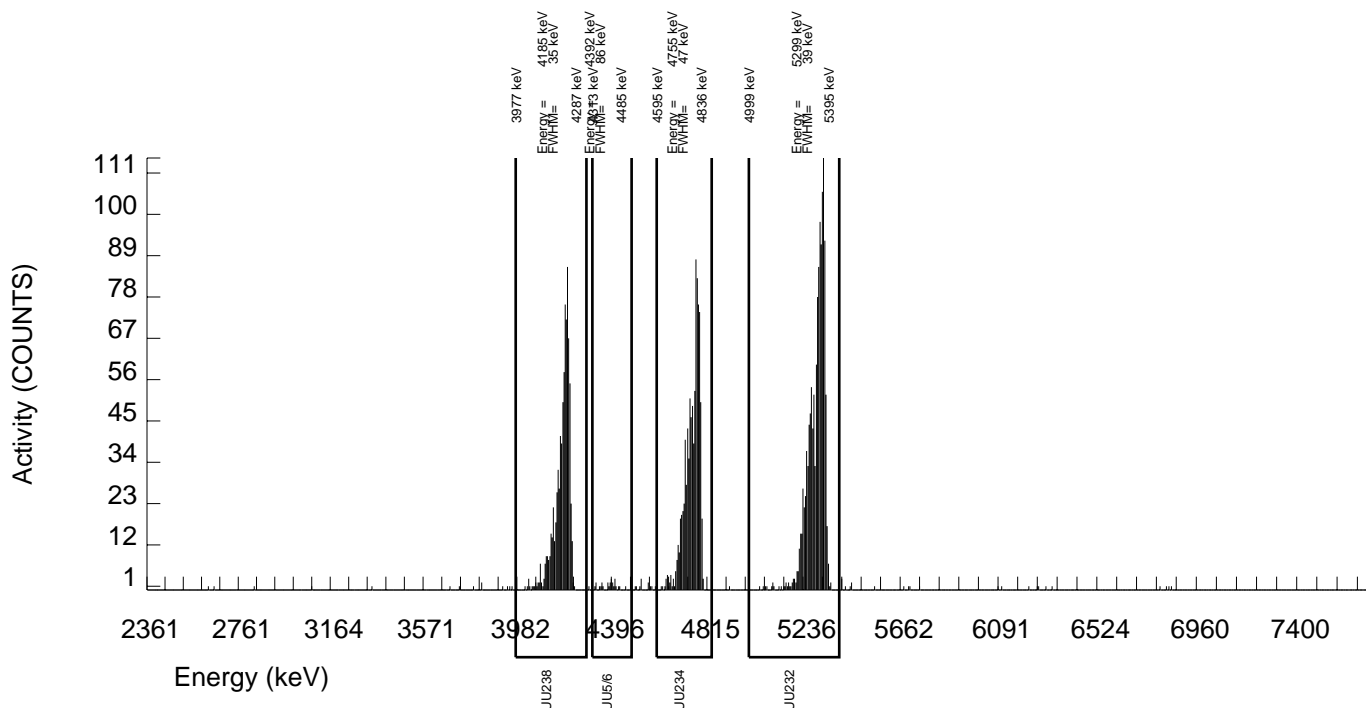
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 890375 SAMPLE DATE : 22-JUL-2009 00:00:00		SAMPLE ID : S0233960002_UU SAMPLE QTY: 0.500 G	
DETECTOR NUMBER :75555 AVERAGE %EFFICIENCY :24.7679 % YIELD : 99.350		COUNT DATE: 8-AUG-2009 15:53:24 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :MXA1	
MS/MSD ID : 1163-G ISOTOPE : U-238 PCI/G : 5.038E+00	LCS/LCSD ID : 1163-G ISOTOPE : U-238 PCI/G : 5.038E+00	TRACER ID : 1283-E ISOTOPE : U232 NOMINAL : 5.26524 dpm RESULTS : 5.23103 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B157.CNF;339 BKG DATE : 2-AUG-2009 EFF FILE : W157.CNF;97 CAL DATE : 17-JUL-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
U-3/4	4763.020	919.000	907.090	8.000	2.8284	100.0000	3.32E+00	5.03E-01	5.92E-02	2.41E-02	2.18E-01
U232	5302.100	1304.000	1295.000	9.000	3.0000	100.0000	4.74E+00	6.98E-01	6.21E-02	2.56E-02	2.60E-01
U-235	4391.000	26.000	22.000	4.000	2.0000	80.90000	9.96E-02	5.04E-02	5.57E-02	2.11E-02	4.86E-02
U-238	4184.730	821.000	818.000	3.000	1.7321	100.0000	2.99E+00	4.58E-01	4.05E-02	1.48E-02	2.06E-01

NOTE: Corrections made to U-3/4 net area due to tracer impurity



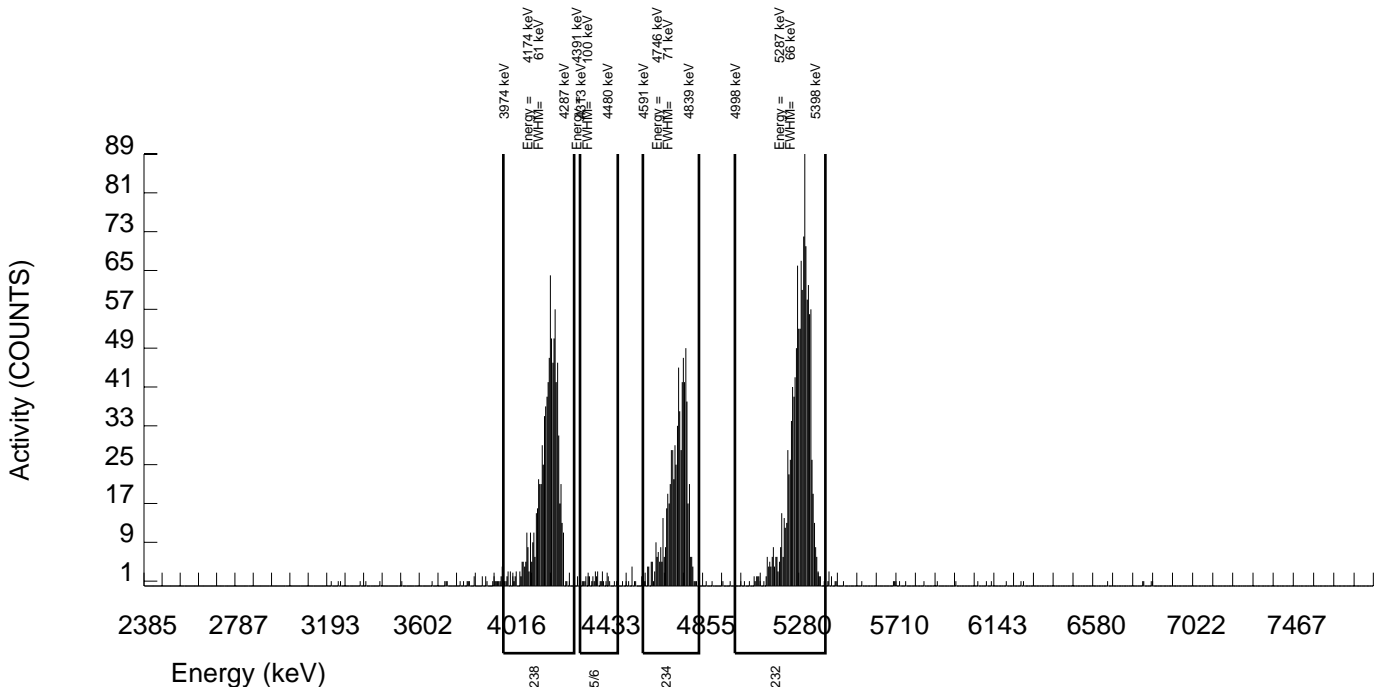
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 890375 SAMPLE DATE : 22-JUL-2009 00:00:00		SAMPLE ID : S0233960003_UU SAMPLE QTY: 0.508 G	
DETECTOR NUMBER :33451 AVERAGE %EFFICIENCY :24.8572 % YIELD : 96.394		COUNT DATE: 8-AUG-2009 15:53:26 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :MXA1	
MS/MSD ID : 1163-G ISOTOPE : U-238 PCI/G : 4.958E+00	LCS/LCSD ID : 1163-G ISOTOPE : U-238 PCI/G : 4.958E+00	TRACER ID : 1283-E ISOTOPE : U232 NOMINAL : 5.26524 dpm RESULTS : 5.07539 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B158.CNF;340 BKG DATE : 2-AUG-2009 EFF FILE : W158.CNF;100 CAL DATE : 17-JUL-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
U-3/4	4763.020	717.000	711.193	2.000	1.4142	100.0000	2.63E+00	4.09E-01	3.55E-02	1.22E-02	1.94E-01
U232	5302.100	1269.000	1261.000	8.000	2.8284	100.0000	4.67E+00	6.89E-01	5.98E-02	2.44E-02	2.59E-01
U-235	4391.000	34.000	31.000	3.000	1.7321	80.90000	1.42E-01	5.79E-02	5.06E-02	1.84E-02	5.45E-02
U-238	4184.730	912.000	911.000	1.000	1.0000	100.0000	3.37E+00	5.11E-01	2.83E-02	8.61E-03	2.19E-01

NOTE: Corrections made to U-3/4 net area due to tracer impurity



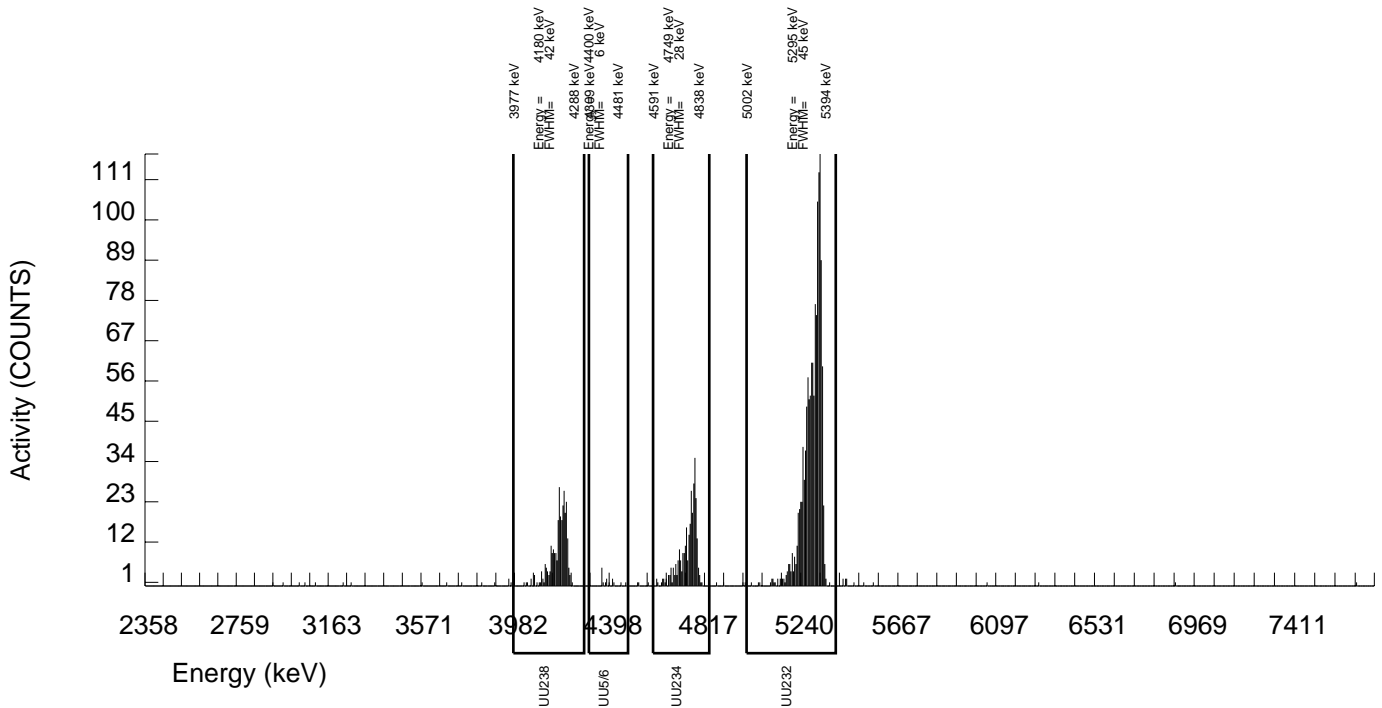
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 890375 SAMPLE DATE : 23-JUL-2009 00:00:00		SAMPLE ID : S0233960005_UU SAMPLE QTY: 0.503 G	
DETECTOR NUMBER :76225 AVERAGE %EFFICIENCY :25.3232 % YIELD : 98.897		COUNT DATE: 8-AUG-2009 15:53:28 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :MXA1	
MS/MSD ID : 1163-G ISOTOPE : U-238 PCI/G : 5.008E+00	LCS/LCSD ID : 1163-G ISOTOPE : U-238 PCI/G : 5.008E+00	TRACER ID : 1283-E ISOTOPE : U232 NOMINAL : 5.26510 dpm RESULTS : 5.20704 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B159.CNF;313 BKG DATE : 2-AUG-2009 EFF FILE : W159.CNF;92 CAL DATE : 17-JUL-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
U-3/4	4763.020	307.000	300.021	3.000	1.7321	100.0000	1.07E+00	1.91E-01	3.95E-02	1.44E-02	1.23E-01
U232	5302.100	1325.000	1318.000	7.000	2.6458	100.0000	4.72E+00	6.92E-01	5.48E-02	2.20E-02	2.56E-01
U-235	4391.000	15.000	15.000	0.000	0.0000	80.90000	6.63E-02	3.47E-02	1.33E-02	0.00E+00	3.36E-02
U-238	4184.730	290.000	289.000	1.000	1.0000	100.0000	1.03E+00	1.85E-01	2.74E-02	8.32E-03	1.20E-01

NOTE: Corrections made to U-3/4 net area due to tracer impurity



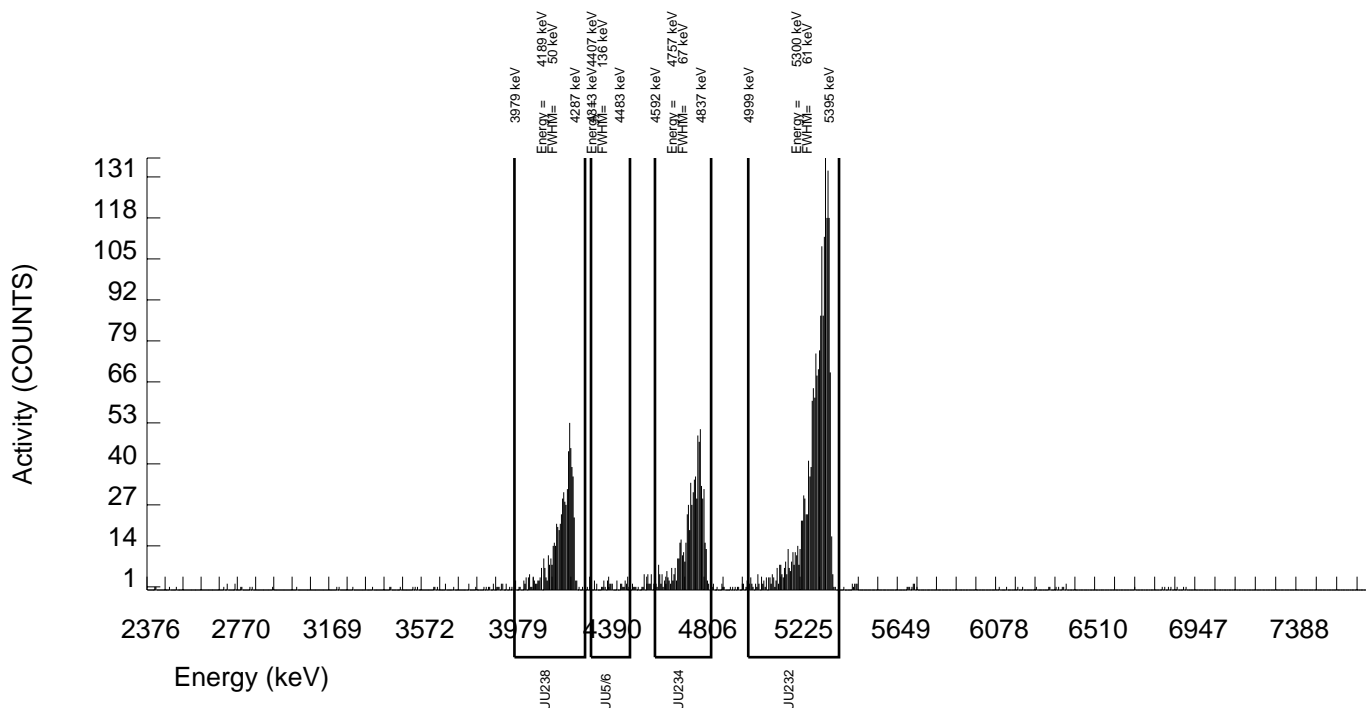
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 890375 SAMPLE DATE : 23-JUL-2009 00:00:00		SAMPLE ID : S0233960006_UU SAMPLE QTY: 0.503 G	
DETECTOR NUMBER :70321 AVERAGE %EFFICIENCY :37.2449 % YIELD : 99.535		COUNT DATE: 8-AUG-2009 15:53:33 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :MXA1	
MS/MSD ID : 1163-G ISOTOPE : U-238 PCI/G : 5.008E+00	LCS/LCSD ID : 1163-G ISOTOPE : U-238 PCI/G : 5.008E+00	TRACER ID : 1283-E ISOTOPE : U232 NOMINAL : 5.26511 dpm RESULTS : 5.24065 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B161.CNF;111 BKG DATE : 2-AUG-2009 EFF FILE : W161.CNF;40 CAL DATE : 23-JUL-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
U-3/4	4763.020	707.000	698.109	3.000	1.7321	100.0000	1.69E+00	2.56E-01	2.67E-02	9.73E-03	1.26E-01
U232	5302.100	1961.000	1951.000	10.000	3.1623	100.0000	4.72E+00	6.59E-01	4.28E-02	1.78E-02	2.10E-01
U-235	4391.000	37.000	36.000	1.000	1.0000	80.90000	1.07E-01	3.88E-02	2.29E-02	6.95E-03	3.61E-02
U-238	4184.730	658.000	656.000	2.000	1.4142	100.0000	1.58E+00	2.43E-01	2.31E-02	7.95E-03	1.22E-01

NOTE: Corrections made to U-3/4 net area due to tracer impurity



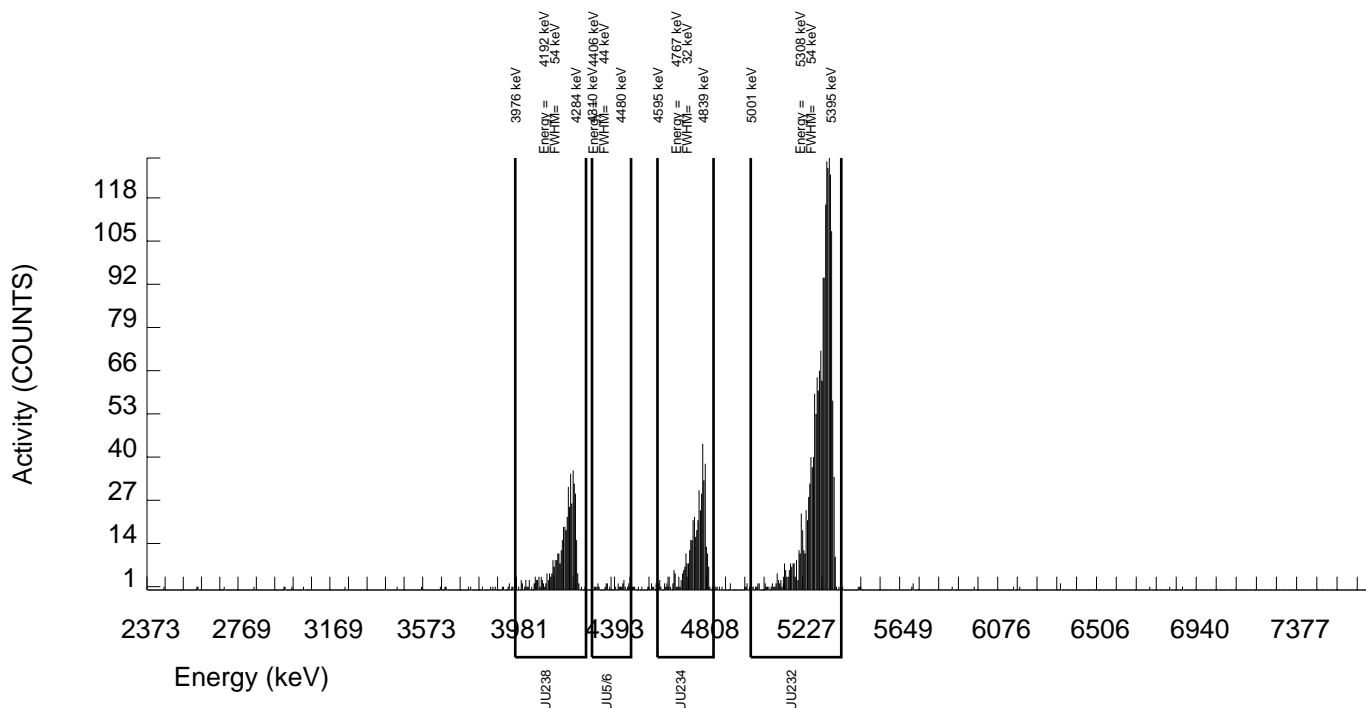
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 890375 SAMPLE DATE : 23-JUL-2009 00:00:00		SAMPLE ID : S0233960007_UU SAMPLE QTY: 0.501 G	
DETECTOR NUMBER :70323 AVERAGE %EFFICIENCY :37.1124 % YIELD : 96.153		COUNT DATE: 8-AUG-2009 15:53:36 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :MXA1	
MS/MSD ID : 1163-G ISOTOPE : U-238 PCI/G : 5.028E+00	LCS/LCSD ID : 1163-G ISOTOPE : U-238 PCI/G : 5.028E+00	TRACER ID : 1283-E ISOTOPE : U232 NOMINAL : 5.26510 dpm RESULTS : 5.06257 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B162.CNF;113 BKG DATE : 2-AUG-2009 EFF FILE : W162.CNF;49 CAL DATE : 4-AUG-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
U-3/4	4763.020	458.000	450.330	2.000	1.4142	100.0000	1.13E+00	1.84E-01	2.41E-02	8.29E-03	1.05E-01
U232	5302.100	1885.000	1878.000	7.000	2.6458	100.0000	4.73E+00	6.64E-01	3.86E-02	1.55E-02	2.15E-01
U-235	4391.000	34.000	33.000	1.000	1.0000	80.90000	1.03E-01	3.86E-02	2.38E-02	7.25E-03	3.61E-02
U-238	4184.730	474.000	472.000	2.000	1.4142	100.0000	1.19E+00	1.91E-01	2.41E-02	8.29E-03	1.08E-01

NOTE: Corrections made to U-3/4 net area due to tracer impurity



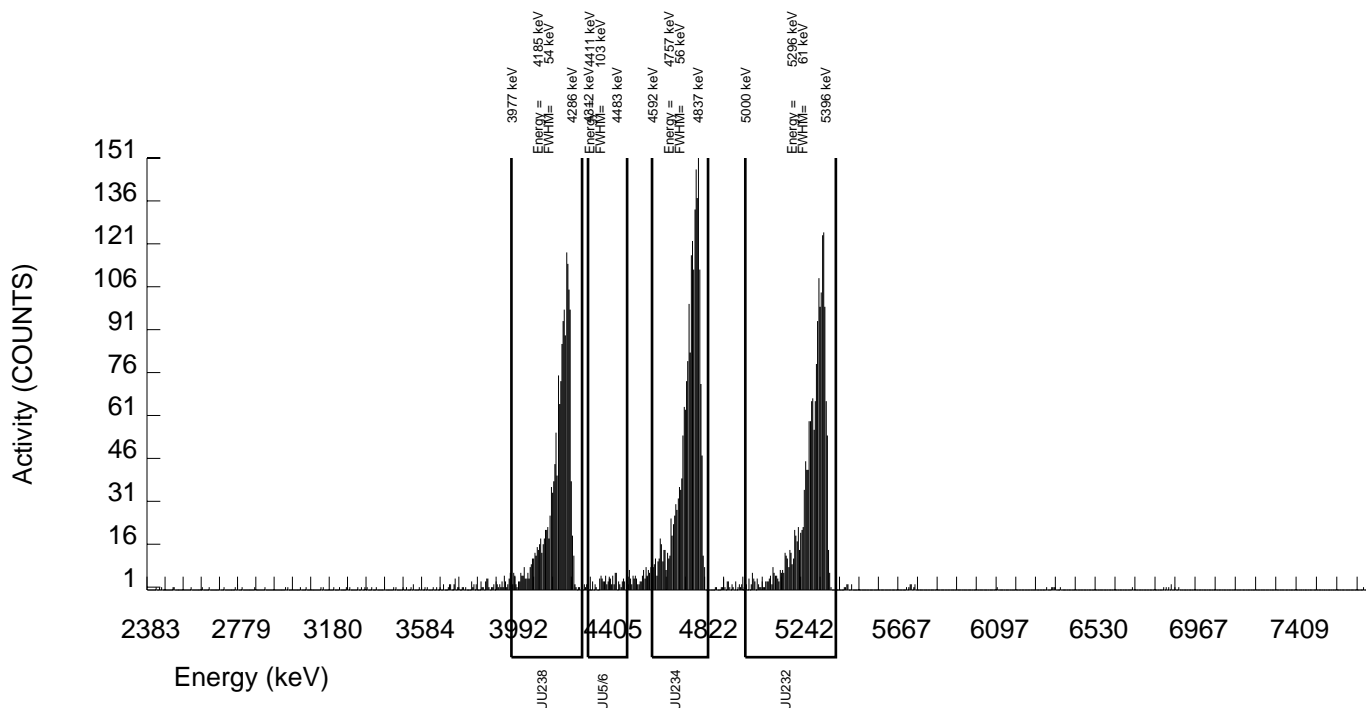
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 890375 SAMPLE DATE : 23-JUL-2009 00:00:00		SAMPLE ID : S0233960008_UU SAMPLE QTY: 0.510 G	
DETECTOR NUMBER :70324 AVERAGE %EFFICIENCY :38.2450 % YIELD : 92.113		COUNT DATE: 8-AUG-2009 15:53:39 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :MXA1	
MS/MSD ID : 1163-G ISOTOPE : U-238 PCI/G : 4.939E+00	LCS/LCSD ID : 1163-G ISOTOPE : U-238 PCI/G : 4.939E+00	TRACER ID : 1283-E ISOTOPE : U232 NOMINAL : 5.26511 dpm RESULTS : 4.84987 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B163.CNF;111 BKG DATE : 2-AUG-2009 EFF FILE : W163.CNF;37 CAL DATE : 23-JUL-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
U-3/4	4763.020	2165.000	2142.402	17.000	4.1231	100.0000	5.37E+00	7.50E-01	5.56E-02	2.40E-02	2.29E-01
U232	5302.100	1871.000	1854.000	17.000	4.1231	100.0000	4.65E+00	6.54E-01	5.56E-02	2.41E-02	2.14E-01
U-235	4391.000	82.000	82.000	0.000	0.0000	80.90000	2.54E-01	6.45E-02	9.30E-03	0.00E+00	5.50E-02
U-238	4184.730	1694.000	1688.000	6.000	2.4495	100.0000	4.23E+00	5.98E-01	3.61E-02	1.43E-02	2.03E-01

NOTE: Corrections made to U-3/4 net area due to tracer impurity



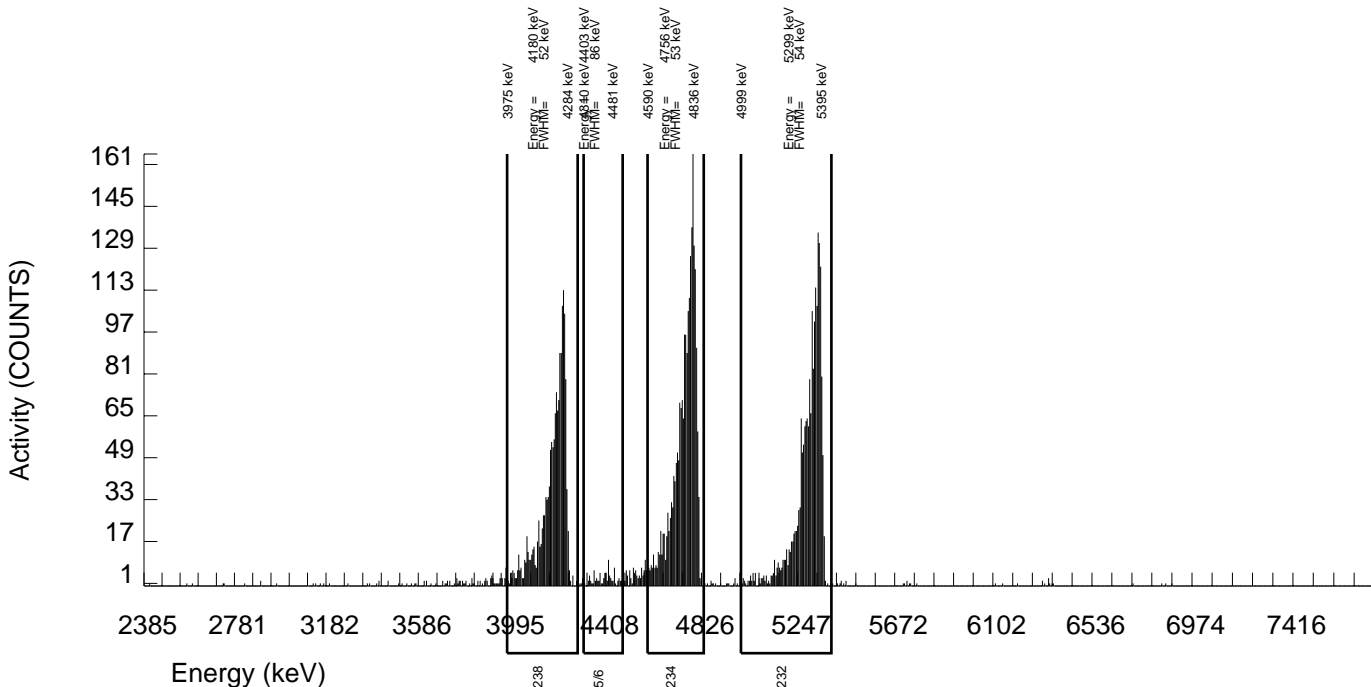
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 890375 SAMPLE DATE : 23-JUL-2009 00:00:00		SAMPLE ID : S0233960009_UU SAMPLE QTY: 0.502 G	
DETECTOR NUMBER :70325 AVERAGE %EFFICIENCY :38.7145 % YIELD : 96.837		COUNT DATE: 8-AUG-2009 15:53:41 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :MXA1	
MS/MSD ID : 1163-G ISOTOPE : U-238 PCI/G : 5.018E+00	LCS/LCSD ID : 1163-G ISOTOPE : U-238 PCI/G : 5.018E+00	TRACER ID : 1283-E ISOTOPE : U232 NOMINAL : 5.26510 dpm RESULTS : 5.09856 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B164.CNF;111 BKG DATE : 2-AUG-2009 EFF FILE : W164.CNF;37 CAL DATE : 23-JUL-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
U-3/4	4763.020	2205.000	2191.043	8.000	2.8284	100.0000	5.24E+00	7.28E-01	3.87E-02	1.57E-02	2.20E-01
U232	5302.100	1986.000	1973.000	13.000	3.6056	100.0000	4.72E+00	6.59E-01	4.74E-02	2.01E-02	2.10E-01
U-235	4391.000	90.000	89.000	1.000	1.0000	80.90000	2.63E-01	6.54E-02	2.26E-02	6.88E-03	5.53E-02
U-238	4184.730	1635.000	1631.000	4.000	2.0000	100.0000	3.90E+00	5.50E-01	2.95E-02	1.11E-02	1.90E-01

NOTE: Corrections made to U-3/4 net area due to tracer impurity



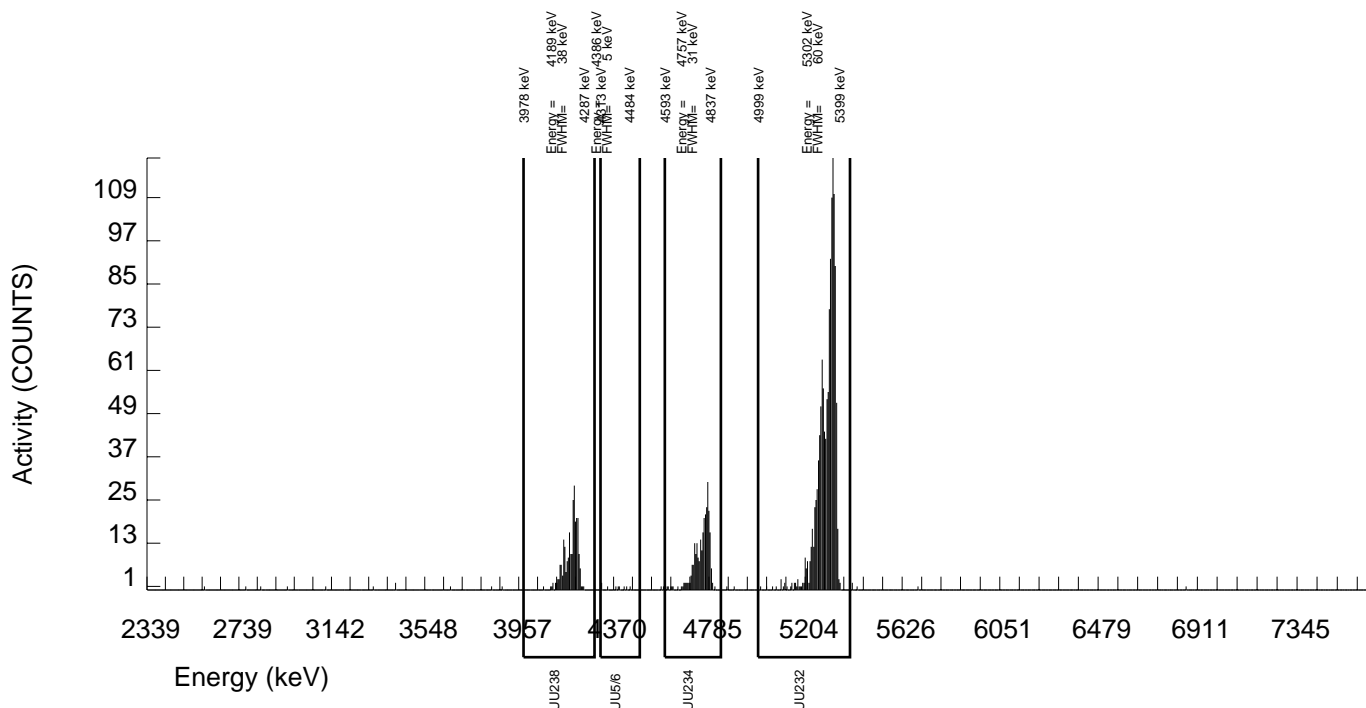
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 890375 SAMPLE DATE : 23-JUL-2009 00:00:00		SAMPLE ID : S0233960010_UU SAMPLE QTY: 0.503 G	
DETECTOR NUMBER :78258 AVERAGE %EFFICIENCY :25.5655 % YIELD : 96.330		COUNT DATE:10-AUG-2009 14:11:25 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :MXA1	
MS/MSD ID : 1163-G ISOTOPE : U-238 PCI/G : 5.008E+00	LCS/LCSD ID : 1163-G ISOTOPE : U-238 PCI/G : 5.008E+00	TRACER ID : 1283-E ISOTOPE : U232 NOMINAL : 5.26510 dpm RESULTS : 5.07186 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B114.CNF;384 BKG DATE : 9-AUG-2009 EFF FILE : W114.CNF;106 CAL DATE : 15-JUL-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
U-3/4	4763.020	275.000	270.087	1.000	1.0000	100.0000	9.82E-01	1.78E-01	2.78E-02	8.46E-03	1.18E-01
U232	5302.100	1296.000	1296.000	0.000	0.0000	100.0000	4.72E+00	6.92E-01	1.09E-02	0.00E+00	2.57E-01
U-235	4391.000	9.000	8.000	1.000	1.0000	80.90000	3.60E-02	2.83E-02	3.44E-02	1.05E-02	2.79E-02
U-238	4184.730	249.000	247.000	2.000	1.4142	100.0000	8.98E-01	1.67E-01	3.48E-02	1.20E-02	1.13E-01

NOTE: Corrections made to U-3/4 net area due to tracer impurity



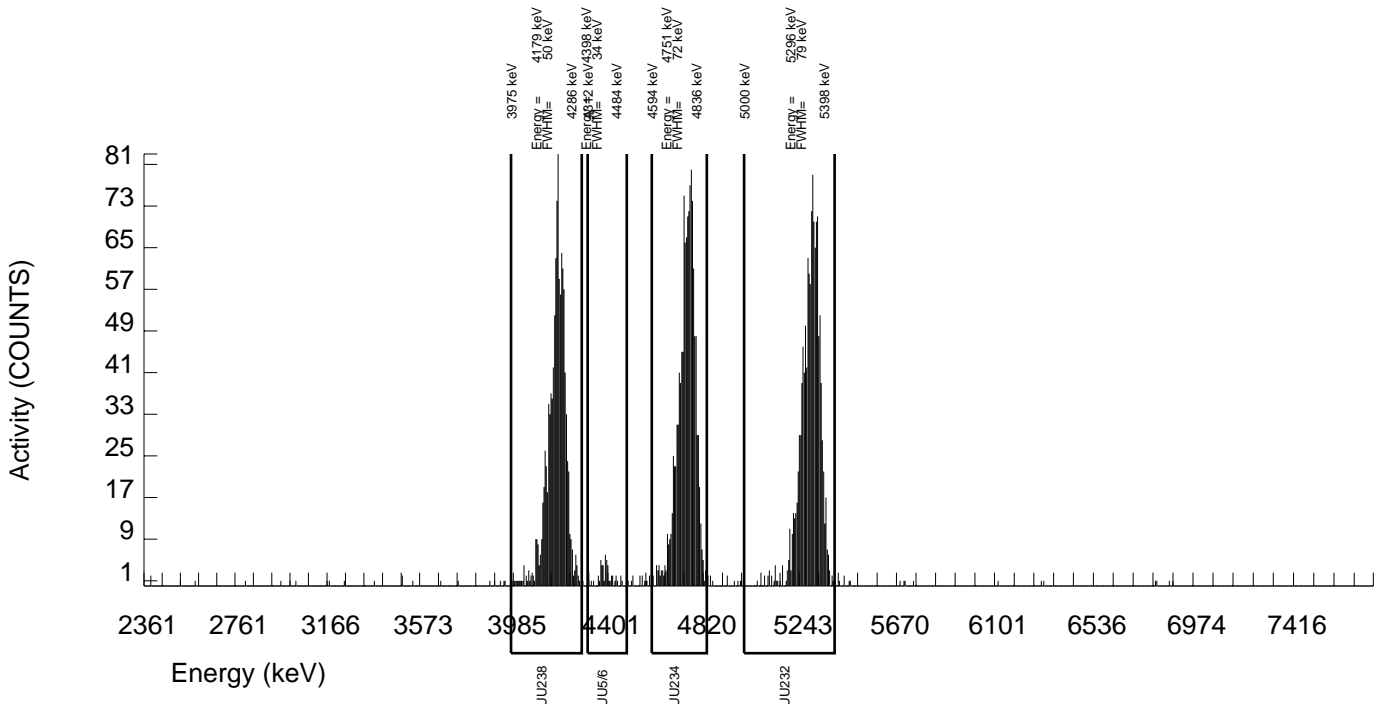
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 890375 SAMPLE DATE : 23-JUL-2009 00:00:00		SAMPLE ID : S0233960011_UU SAMPLE QTY: 0.503 G	
DETECTOR NUMBER :76226 AVERAGE %EFFICIENCY :24.6915 % YIELD : 95.815		COUNT DATE:10-AUG-2009 14:11:27 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :MXA1	
MS/MSD ID : 1163-G ISOTOPE : U-238 PCI/G : 5.008E+00	LCS/LCSD ID : 1163-G ISOTOPE : U-238 PCI/G : 5.008E+00	TRACER ID : 1283-E ISOTOPE : U232 NOMINAL : 5.26511 dpm RESULTS : 5.04474 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B160.CNF;317 BKG DATE : 9-AUG-2009 EFF FILE : W160.CNF;100 CAL DATE : 17-JUL-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
U-3/4	4763.020	1231.000	1216.241	11.000	3.3166	100.0000	4.60E+00	6.83E-01	6.98E-02	2.92E-02	2.61E-01
U232	5302.100	1255.000	1245.000	10.000	3.1623	100.0000	4.72E+00	6.98E-01	6.71E-02	2.79E-02	2.64E-01
U-235	4391.000	48.000	46.000	2.000	1.4142	80.90000	2.15E-01	7.12E-02	4.48E-02	1.54E-02	6.48E-02
U-238	4184.730	1088.000	1084.000	4.000	2.0000	100.0000	4.10E+00	6.13E-01	4.66E-02	1.76E-02	2.45E-01

NOTE: Corrections made to U-3/4 net area due to tracer impurity



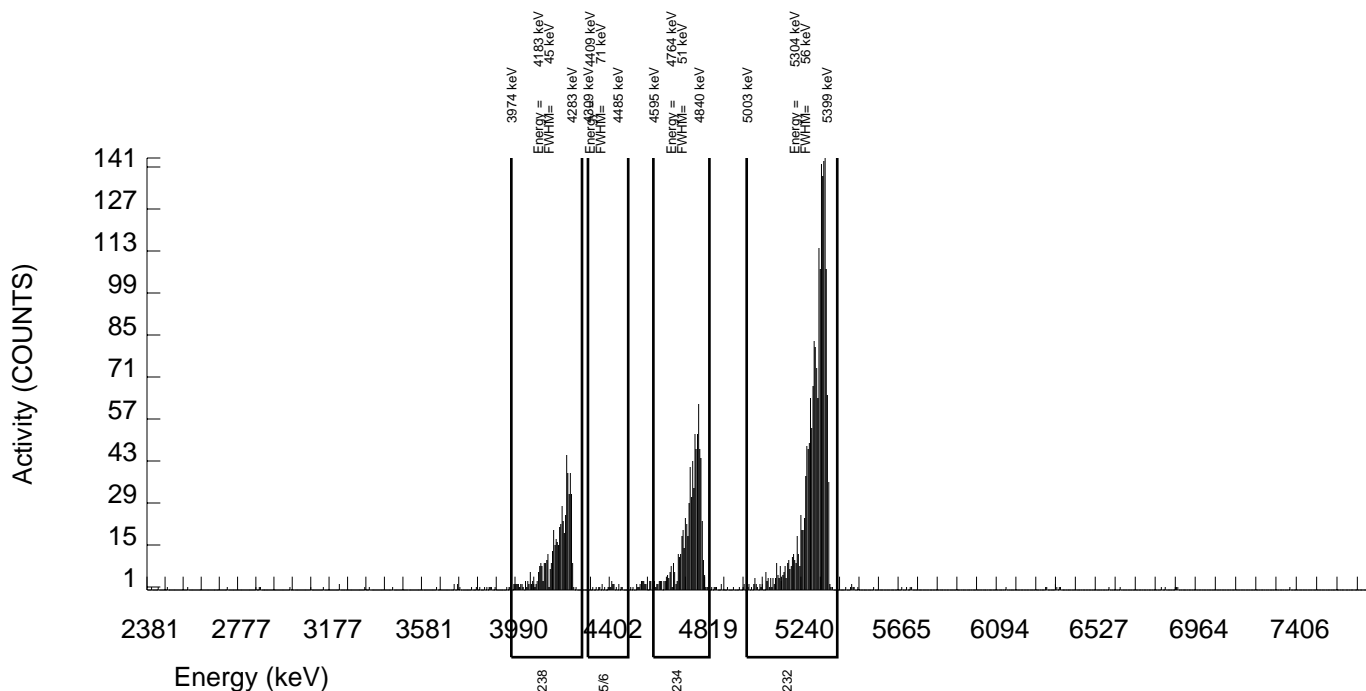
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 890375 SAMPLE DATE : 23-JUL-2009 00:00:00		SAMPLE ID : S0233960012_UU SAMPLE QTY: 0.500 G	
DETECTOR NUMBER :72546 AVERAGE %EFFICIENCY :38.8816 % YIELD : 96.030		COUNT DATE: 8-AUG-2009 15:53:49 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :MXA1	
MS/MSD ID : 1163-G ISOTOPE : U-238 PCI/G : 5.038E+00	LCS/LCSD ID : 1163-G ISOTOPE : U-238 PCI/G : 5.038E+00	TRACER ID : 1283-E ISOTOPE : U232 NOMINAL : 5.26510 dpm RESULTS : 5.05607 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B167.CNF;112 BKG DATE : 2-AUG-2009 EFF FILE : W167.CNF;37 CAL DATE : 23-JUL-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
U-3/4	4763.020	746.000	735.067	5.000	2.2361	100.0000	1.77E+00	2.68E-01	3.23E-02	1.26E-02	1.29E-01
U232	5302.100	1974.000	1965.000	9.000	3.0000	100.0000	4.74E+00	6.62E-01	4.09E-02	1.68E-02	2.11E-01
U-235	4391.000	22.000	21.000	1.000	1.0000	80.90000	6.26E-02	2.92E-02	2.28E-02	6.94E-03	2.80E-02
U-238	4184.730	569.000	567.000	2.000	1.4142	100.0000	1.37E+00	2.13E-01	2.31E-02	7.94E-03	1.13E-01

NOTE: Corrections made to U-3/4 net area due to tracer impurity



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 890375
SAMPLE DATE : 23-JUL-2009 00:00:00

SAMPLE ID : S0233960013_UU
SAMPLE QTY: 0.503 G

DETECTOR NUMBER :72547
AVERAGE %EFFICIENCY :38.9917
% YIELD : 91.957

COUNT DATE: 8-AUG-2009 15:53:52
ELAPSED LIVE TIME(SEC): 60000.00
ANALYST :MXA1

MS/MSD
ID : 1163-G
ISOTOPE : U-238
PCI/G : 5.008E+00

LCS/LCSD
ID : 1163-G
ISOTOPE : U-238
PCI/G : 5.008E+00

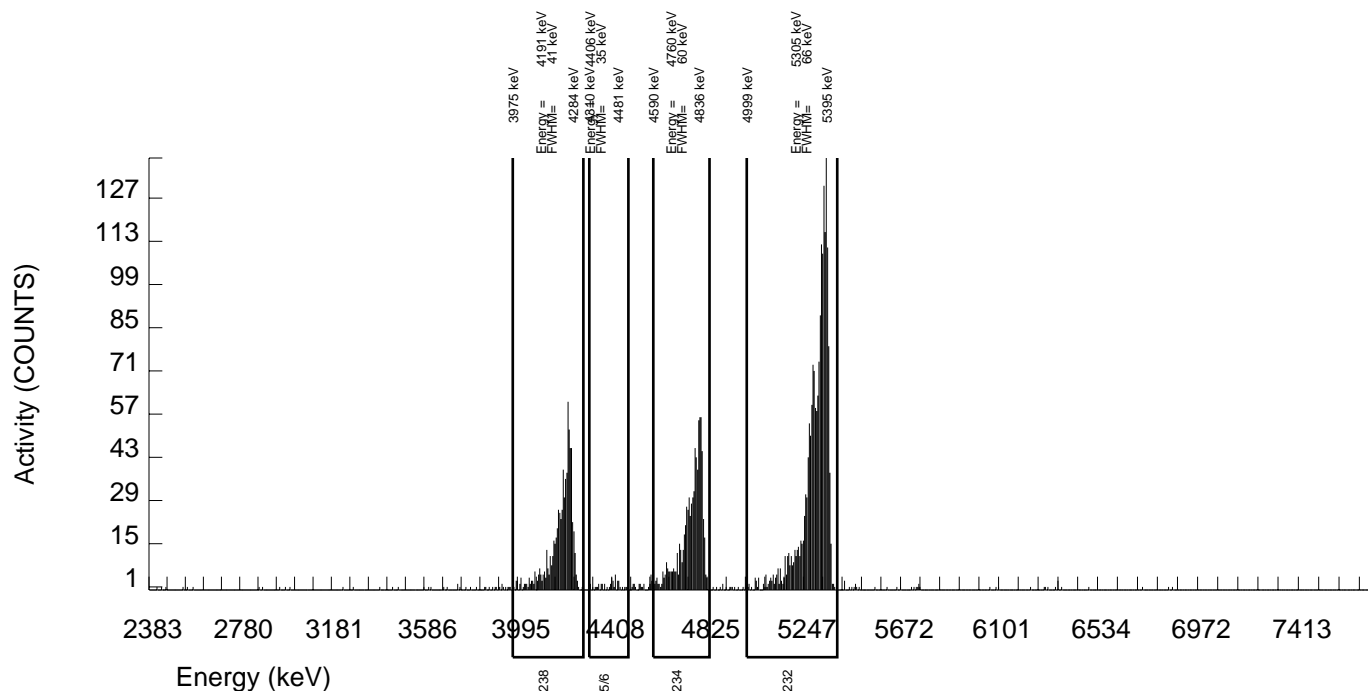
TRACER
ID : 1283-E
ISOTOPE : U232
NOMINAL : 5.26510 dpm
RESULTS : 4.84165 dpm

LIB FILE : ENV_ALPHA_UU.N
BKG FILE : B168.CNF;112
BKG DATE : 2-AUG-2009
EFF FILE : W168.CNF;37
CAL DATE : 23-JUL-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
U-3/4	4763.020	785.000	772.303	7.000	2.6458	100.0000	1.93E+00	2.90E-01	3.82E-02	1.54E-02	1.37E-01
U232	5302.100	1898.000	1887.000	11.000	3.3166	100.0000	4.72E+00	6.61E-01	4.61E-02	1.93E-02	2.14E-01
U-235	4391.000	42.000	40.000	2.000	1.4142	80.90000	1.23E-01	4.34E-02	2.96E-02	1.02E-02	4.01E-02
U-238	4184.730	713.000	710.000	3.000	1.7321	100.0000	1.77E+00	2.69E-01	2.76E-02	1.01E-02	1.31E-01

NOTE: Corrections made to U-3/4 net area due to tracer impurity



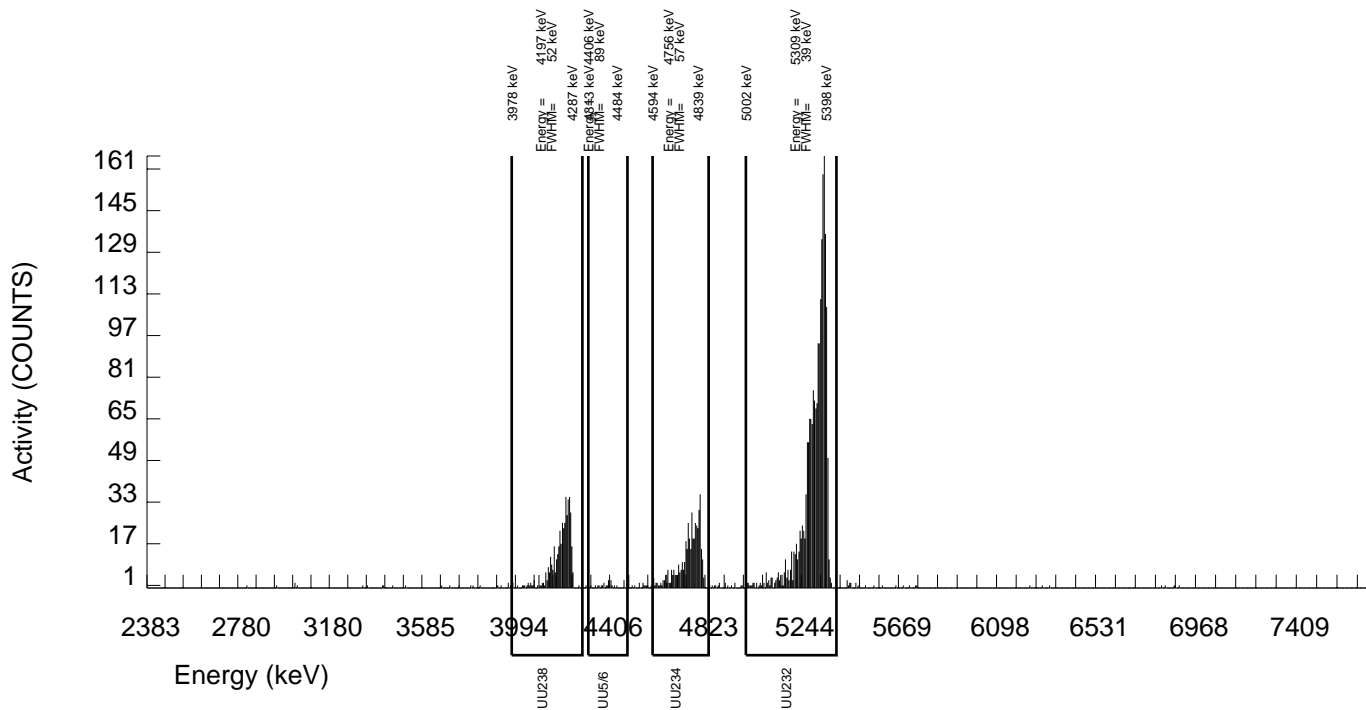
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 890375 SAMPLE DATE : 24-JUL-2009 00:00:00		SAMPLE ID : S0233960015_UU SAMPLE QTY: 0.503 G	
DETECTOR NUMBER :72548 AVERAGE %EFFICIENCY :37.7690 % YIELD : 99.312		COUNT DATE: 8-AUG-2009 15:53:54 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :MXA1	
MS/MSD ID : 1163-G ISOTOPE : U-238 PCI/G : 5.008E+00	LCS/LCSD ID : 1163-G ISOTOPE : U-238 PCI/G : 5.008E+00	TRACER ID : 1283-E ISOTOPE : U232 NOMINAL : 5.26497 dpm RESULTS : 5.22872 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B169.CNF;114 BKG DATE : 2-AUG-2009 EFF FILE : W169.CNF;47 CAL DATE : 4-AUG-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
U-3/4	4763.020	455.000	435.040	14.000	3.7417	100.0000	1.04E+00	1.70E-01	4.87E-02	2.08E-02	1.01E-01
U232	5302.100	1993.000	1974.000	19.000	4.3589	100.0000	4.71E+00	6.59E-01	5.56E-02	2.42E-02	2.10E-01
U-235	4391.000	23.000	18.000	5.000	2.2361	80.90000	5.31E-02	3.14E-02	3.96E-02	1.54E-02	3.06E-02
U-238	4184.730	441.000	434.000	7.000	2.6458	100.0000	1.04E+00	1.69E-01	3.66E-02	1.47E-02	9.90E-02

NOTE: Corrections made to U-3/4 net area due to tracer impurity



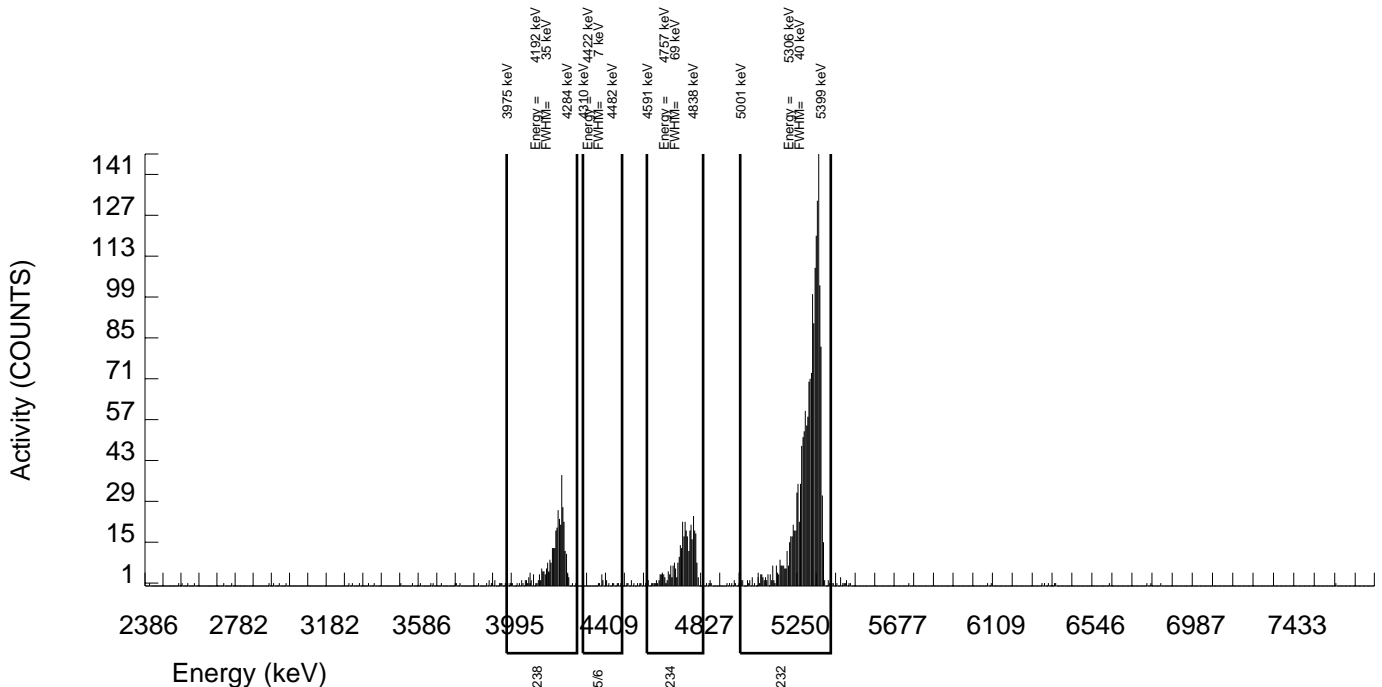
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 890375 SAMPLE DATE : 24-JUL-2009 00:00:00		SAMPLE ID : S0233960016_UU SAMPLE QTY: 0.500 G	
DETECTOR NUMBER :72549 AVERAGE %EFFICIENCY :36.7801 % YIELD : 94.594		COUNT DATE: 8-AUG-2009 15:53:57 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :MXA1	
MS/MSD ID : 1163-G ISOTOPE : U-238 PCI/G : 5.038E+00	LCS/LCSD ID : 1163-G ISOTOPE : U-238 PCI/G : 5.038E+00	TRACER ID : 1283-E ISOTOPE : U232 NOMINAL : 5.26496 dpm RESULTS : 4.98032 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B170.CNF;112 BKG DATE : 2-AUG-2009 EFF FILE : W170.CNF;37 CAL DATE : 23-JUL-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
U-3/4	4763.020	359.000	345.472	8.000	2.8284	100.0000	8.95E-01	1.53E-01	4.18E-02	1.70E-02	9.65E-02
U232	5302.100	1839.000	1831.000	8.000	2.8284	100.0000	4.74E+00	6.67E-01	4.19E-02	1.70E-02	2.18E-01
U-235	4391.000	16.000	15.000	1.000	1.0000	80.90000	4.80E-02	2.66E-02	2.45E-02	7.45E-03	2.59E-02
U-238	4184.730	358.000	357.000	1.000	1.0000	100.0000	9.24E-01	1.56E-01	1.98E-02	6.02E-03	9.62E-02

NOTE: Corrections made to U-3/4 net area due to tracer impurity



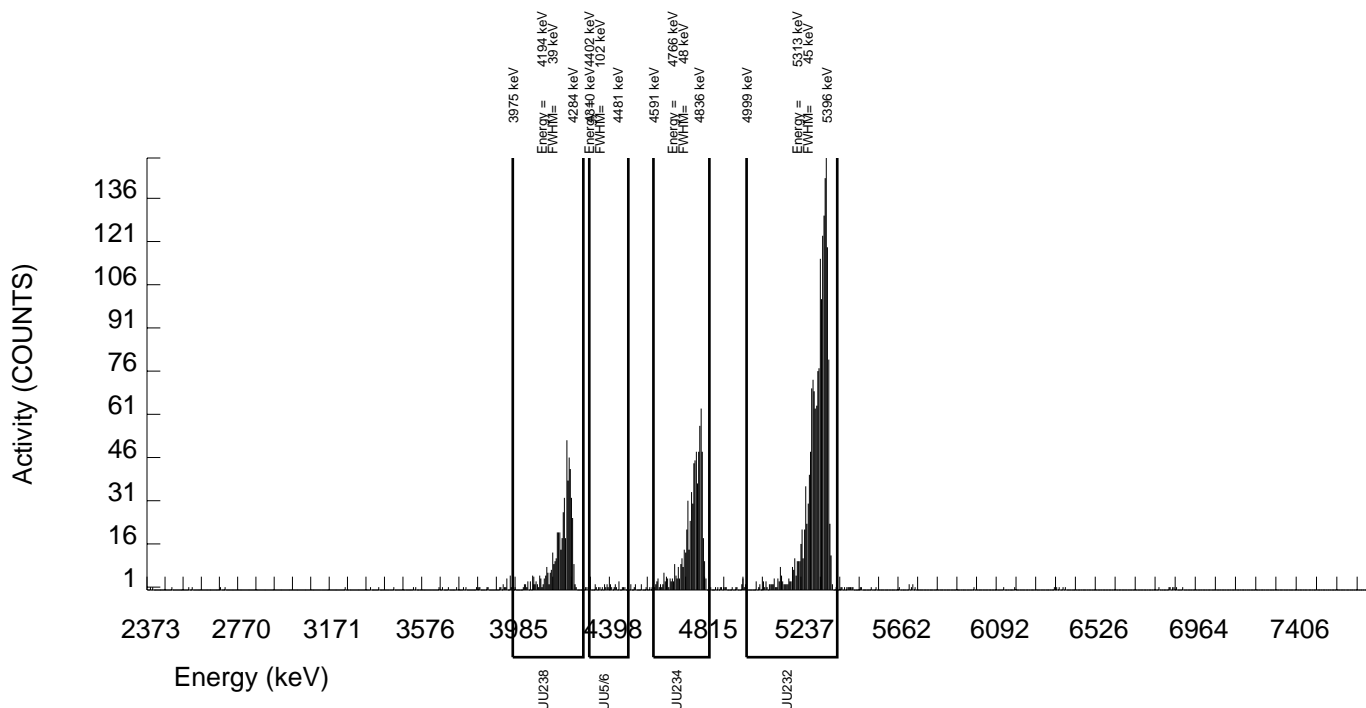
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 890375 SAMPLE DATE : 24-JUL-2009 00:00:00		SAMPLE ID : S0233960017_UU SAMPLE QTY: 0.507 G	
DETECTOR NUMBER :78260 AVERAGE %EFFICIENCY :38.3792 % YIELD : 91.692		COUNT DATE: 8-AUG-2009 15:53:59 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :MXA1	
MS/MSD ID : 1163-G ISOTOPE : U-238 PCI/G : 4.968E+00	LCS/LCSD ID : 1163-G ISOTOPE : U-238 PCI/G : 4.968E+00	TRACER ID : 1283-E ISOTOPE : U232 NOMINAL : 5.26497 dpm RESULTS : 4.82757 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B171.CNF;118 BKG DATE : 2-AUG-2009 EFF FILE : W171.CNF;54 CAL DATE : 23-JUL-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
U-3/4	4763.020	712.000	699.408	7.000	2.6458	100.0000	1.77E+00	2.69E-01	3.87E-02	1.55E-02	1.32E-01
U232	5302.100	1870.000	1852.000	18.000	4.2426	100.0000	4.68E+00	6.58E-01	5.74E-02	2.49E-02	2.15E-01
U-235	4391.000	26.000	25.000	1.000	1.0000	80.90000	7.80E-02	3.34E-02	2.39E-02	7.26E-03	3.18E-02
U-238	4184.730	538.000	520.000	18.000	4.2426	100.0000	1.31E+00	2.10E-01	5.74E-02	2.49E-02	1.17E-01

NOTE: Corrections made to U-3/4 net area due to tracer impurity



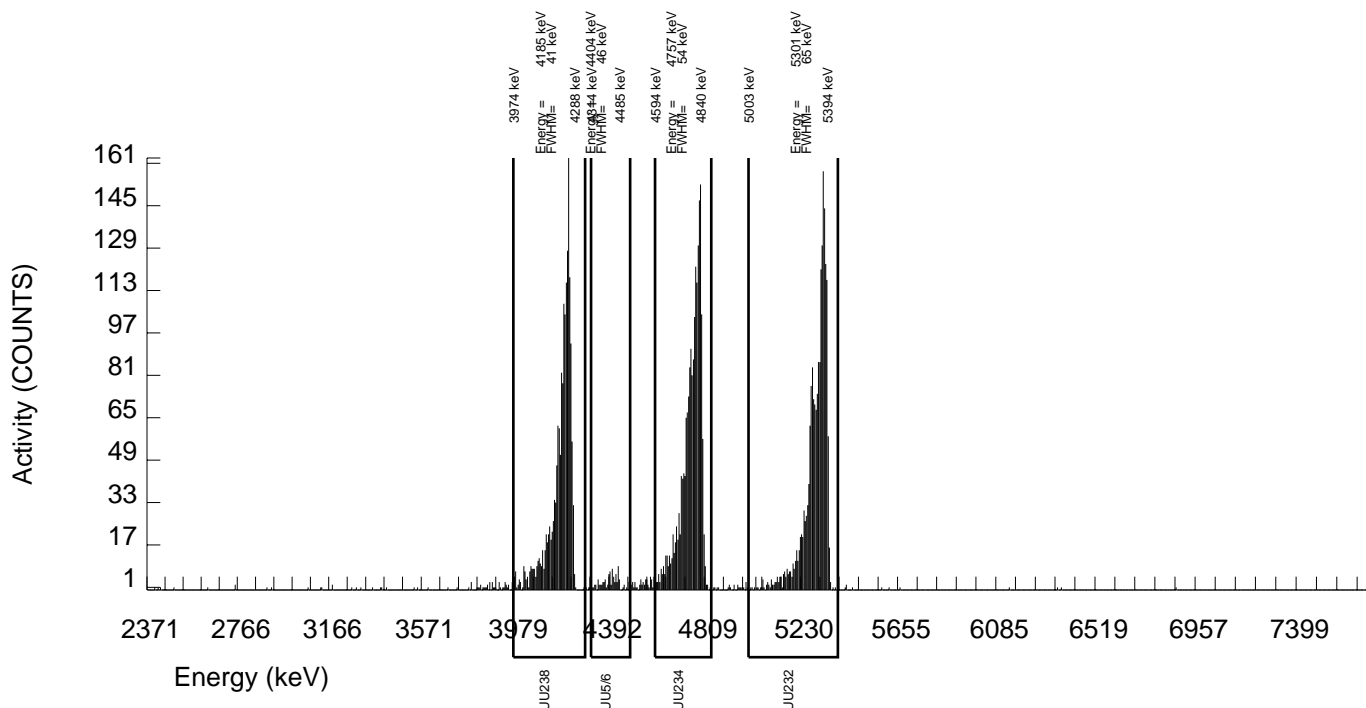
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 890375 SAMPLE DATE : 24-JUL-2009 00:00:00		SAMPLE ID : S0233960018_UU SAMPLE QTY: 0.507 G	
DETECTOR NUMBER :78772 AVERAGE %EFFICIENCY :38.2284 % YIELD : 96.627		COUNT DATE: 8-AUG-2009 15:54:01 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :MXA1	
MS/MSD ID : 1163-G ISOTOPE : U-238 PCI/G : 4.968E+00	LCS/LCSD ID : 1163-G ISOTOPE : U-238 PCI/G : 4.968E+00	TRACER ID : 1283-E ISOTOPE : U232 NOMINAL : 5.26497 dpm RESULTS : 5.08737 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B172.CNF;116 BKG DATE : 2-AUG-2009 EFF FILE : W172.CNF;47 CAL DATE : 23-JUL-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
U-3/4	4763.020	1957.000	1947.130	4.000	2.0000	100.0000	4.68E+00	6.54E-01	2.96E-02	1.12E-02	2.08E-01
U232	5302.100	1948.000	1944.000	4.000	2.0000	100.0000	4.68E+00	6.53E-01	2.96E-02	1.12E-02	2.08E-01
U-235	4391.000	90.000	88.000	2.000	1.4142	80.90000	2.62E-01	6.58E-02	2.85E-02	9.78E-03	5.59E-02
U-238	4184.730	1710.000	1709.000	1.000	1.0000	100.0000	4.11E+00	5.78E-01	1.84E-02	5.60E-03	1.95E-01

NOTE: Corrections made to U-3/4 net area due to tracer impurity



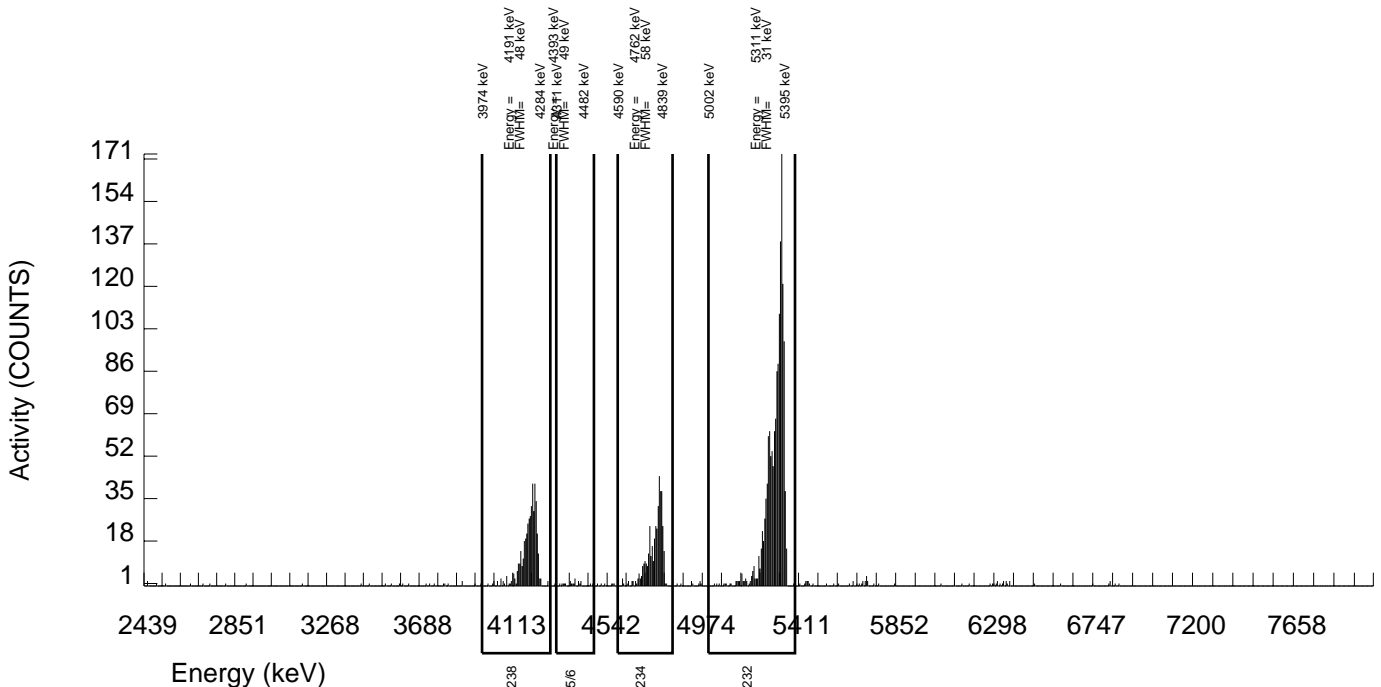
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 890375 SAMPLE DATE : 24-JUL-2009 00:00:00		SAMPLE ID : S0233960019_UU SAMPLE QTY: 0.505 G	
DETECTOR NUMBER :67607 AVERAGE %EFFICIENCY :30.2618 % YIELD : 94.248		COUNT DATE: 8-AUG-2009 16:19:54 ELAPSED LIVE TIME(SEC): 59999.99 ANALYST :MXA1	
MS/MSD ID : 1163-G ISOTOPE : U-238 PCI/G : 4.988E+00	LCS/LCSD ID : 1163-G ISOTOPE : U-238 PCI/G : 4.988E+00	TRACER ID : 1283-E ISOTOPE : U232 NOMINAL : 5.26497 dpm RESULTS : 4.96215 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B007.CNF;1050 BKG DATE : 2-AUG-2009 EFF FILE : W007.CNF;298 CAL DATE : 3-AUG-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
U-3/4	4763.020	408.000	397.468	6.000	2.4495	100.0000	1.24E+00	2.09E-01	4.50E-02	1.78E-02	1.24E-01
U232	5302.100	1510.000	1501.000	9.000	3.0000	100.0000	4.70E+00	6.77E-01	5.31E-02	2.18E-02	2.39E-01
U-235	4391.000	21.000	19.000	2.000	1.4142	80.90000	7.35E-02	3.77E-02	3.70E-02	1.27E-02	3.63E-02
U-238	4184.730	445.000	440.000	5.000	2.2361	100.0000	1.38E+00	2.27E-01	4.19E-02	1.63E-02	1.30E-01

NOTE: Corrections made to U-3/4 net area due to tracer impurity



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 890375
SAMPLE DATE : 24-JUL-2009 00:00:00

SAMPLE ID : S0233960020_UU
SAMPLE QTY: 0.505 G

DETECTOR NUMBER :78788
AVERAGE %EFFICIENCY :32.2415
% YIELD : 95.062

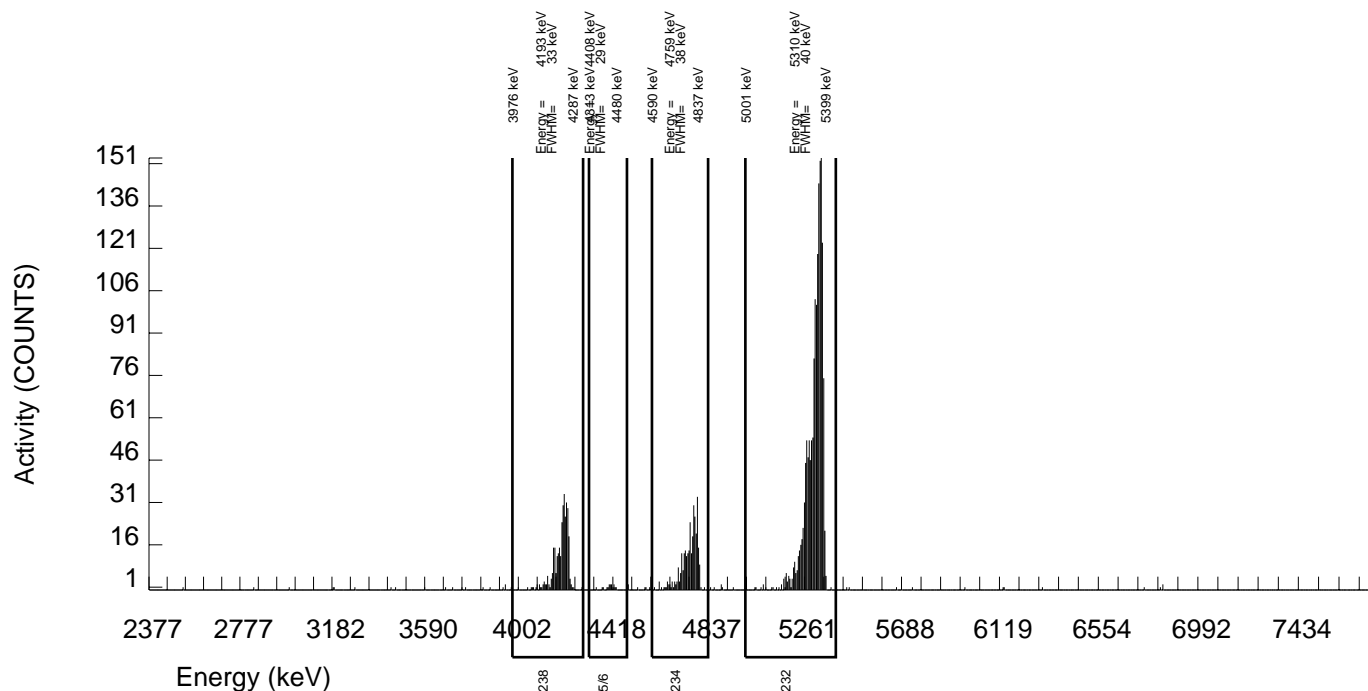
COUNT DATE: 8-AUG-2009 16:19:54
ELAPSED LIVE TIME(SEC): 59999.99
ANALYST :MXA1

MS/MSD ID : 1163-G ISOTOPE : U-238 PCI/G : 4.988E+00	LCS/LCSD ID : 1163-G ISOTOPE : U-238 PCI/G : 4.988E+00	TRACER ID : 1283-E ISOTOPE : U232 NOMINAL : 5.26497 dpm RESULTS : 5.00497 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B008.CNF;1052 BKG DATE : 2-AUG-2009 EFF FILE : W008.CNF;329 CAL DATE : 3-AUG-2009
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NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
U-3/4	4763.020	323.000	314.130	4.000	2.0000	100.0000	9.14E-01	1.60E-01	3.58E-02	1.35E-02	1.02E-01
U232	5302.100	1615.000	1613.000	2.000	1.4142	100.0000	4.70E+00	6.70E-01	2.79E-02	9.58E-03	2.29E-01
U-235	4391.000	16.000	16.000	0.000	0.0000	80.90000	5.76E-02	2.92E-02	1.08E-02	0.00E+00	2.82E-02
U-238	4184.730	330.000	324.000	6.000	2.4495	100.0000	9.43E-01	1.64E-01	4.19E-02	1.66E-02	1.05E-01

NOTE: Corrections made to U-3/4 net area due to tracer impurity



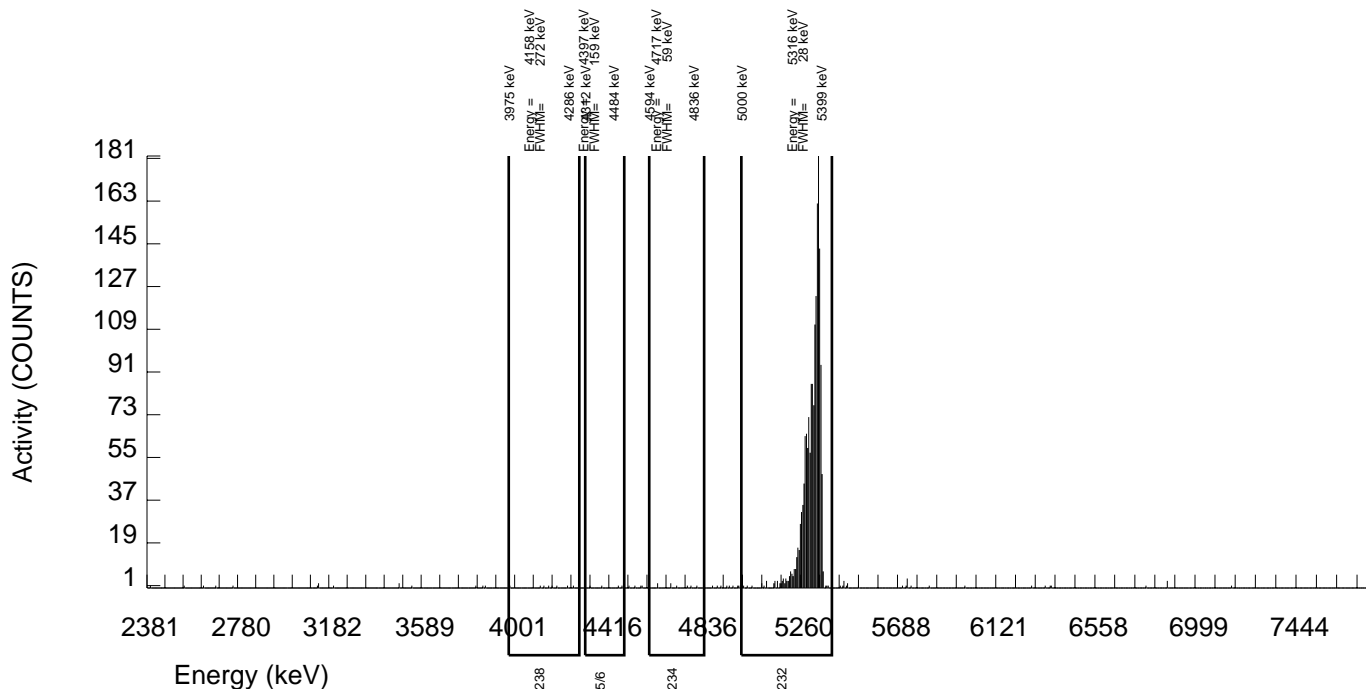
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 890375 SAMPLE DATE : 5-AUG-2009 00:00:00.		SAMPLE ID : S1201893646_UU SAMPLE QTY: 0.510 G	
DETECTOR NUMBER :72528 AVERAGE %EFFICIENCY :34.3164 % YIELD : 93.799		COUNT DATE: 8-AUG-2009 16:19:54 ELAPSED LIVE TIME(SEC): 59999.99 ANALYST :MXA1	
MS/MSD ID : 1163-G ISOTOPE : U-238 PCI/G : 4.939E+00	LCS/LCSD ID : 1163-G ISOTOPE : U-238 PCI/G : 4.939E+00	TRACER ID : 1283-E ISOTOPE : U232 NOMINAL : 5.26330 dpm RESULTS : 4.93694 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B009.CNF;1043 BKG DATE : 2-AUG-2009 EFF FILE : W009.CNF;293 CAL DATE : 3-AUG-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
U-3/4	4763.020	8.000	-5.115	8.000	2.8284	100.0000	-1.40E-02	1.77E-02	4.43E-02	1.81E-02	1.77E-02
U232	5302.100	1703.000	1694.000	9.000	3.0000	100.0000	4.65E+00	6.60E-01	4.65E-02	1.92E-02	2.23E-01
U-235	4391.000	5.000	5.000	0.000	0.0000	80.90000	1.70E-02	1.50E-02	1.02E-02	0.00E+00	1.49E-02
U-238	4184.730	8.000	4.000	4.000	2.0000	100.0000	1.10E-02	1.87E-02	3.38E-02	1.28E-02	1.86E-02

NOTE: Corrections made to U-3/4 net area due to tracer impurity



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 890375
SAMPLE DATE : 23-JUL-2009 00:00:00

SAMPLE ID : S1201893647_UU
SAMPLE QTY: 0.503 G

DETECTOR NUMBER :72529
AVERAGE %EFFICIENCY :31.6338
% YIELD : 94.245

COUNT DATE: 8-AUG-2009 16:19:54
ELAPSED LIVE TIME(SEC): 59999.99
ANALYST :MXA1

MS/MSD
ID : 1163-G
ISOTOPE : U-238
PCI/G : 5.008E+00

LCS/LCSD
ID : 1163-G
ISOTOPE : U-238
PCI/G : 5.008E+00

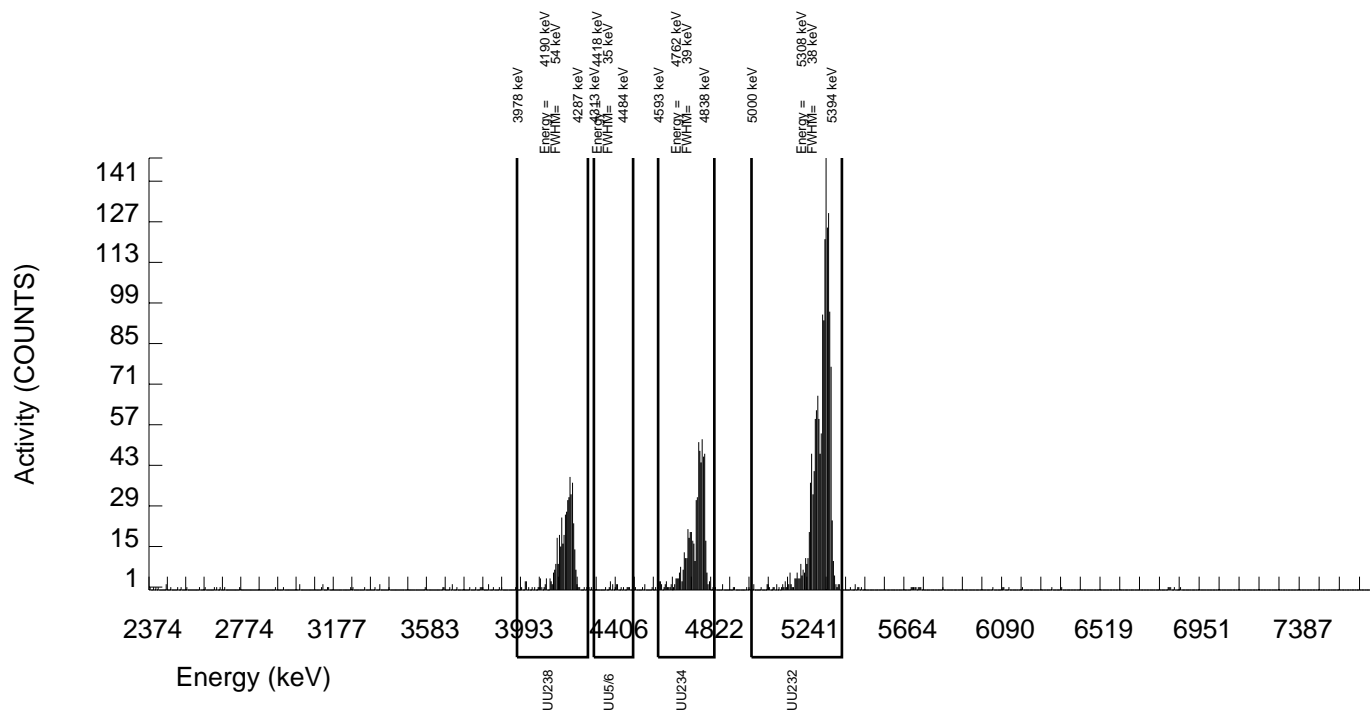
TRACER
ID : 1283-E
ISOTOPE : U232
NOMINAL : 5.26511 dpm
RESULTS : 4.96211 dpm

LIB FILE : ENV_ALPHA_UU.N
BKG FILE : B010.CNF;1061
BKG DATE : 2-AUG-2009
EFF FILE : W010.CNF;321
CAL DATE : 3-AUG-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
U-3/4	4763.020	595.000	586.263	4.000	2.0000	100.0000	1.76E+00	2.77E-01	3.70E-02	1.40E-02	1.44E-01
U232	5302.100	1575.000	1569.000	6.000	2.4495	100.0000	4.72E+00	6.76E-01	4.33E-02	1.71E-02	2.34E-01
U-235	4391.000	17.000	16.000	1.000	1.0000	80.90000	5.94E-02	3.19E-02	2.84E-02	8.64E-03	3.09E-02
U-238	4184.730	453.000	447.000	6.000	2.4495	100.0000	1.34E+00	2.20E-01	4.32E-02	1.71E-02	1.26E-01

NOTE: Corrections made to U-3/4 net area due to tracer impurity



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 890375
SAMPLE DATE : 23-JUL-2009 00:00:00

SAMPLE ID : S1201893648_UU
SAMPLE QTY: 0.502 G

DETECTOR NUMBER :72531
AVERAGE %EFFICIENCY :29.4783
% YIELD : 98.687

COUNT DATE: 8-AUG-2009 16:19:54
ELAPSED LIVE TIME(SEC): 59999.99
ANALYST :MXA1

MS/MSD
ID : 1163-G
ISOTOPE : U-238
PCI/G : 5.018E+00

LCS/LCSD
ID : 1163-G
ISOTOPE : U-238
PCI/G : 5.018E+00

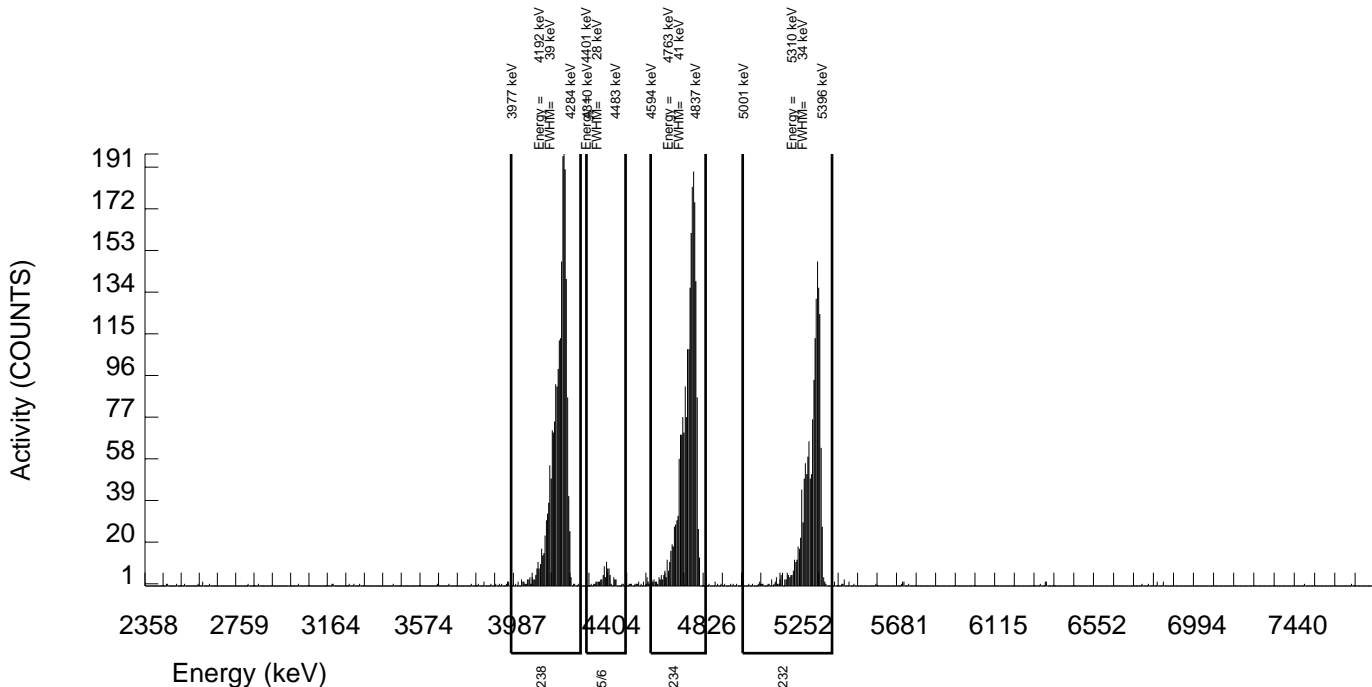
TRACER
ID : 1283-E
ISOTOPE : U232
NOMINAL : 5.26511 dpm
RESULTS : 5.19598 dpm

LIB FILE : ENV_ALPHA_UU.N
BKG FILE : B011.CNF;1053
BKG DATE : 2-AUG-2009
EFF FILE : W011.CNF;299
CAL DATE : 3-AUG-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
U-3/4	4763.020	2081.000	2072.377	4.000	2.0000	100.0000	6.39E+00	9.04E-01	3.80E-02	1.44E-02	2.76E-01
U232	5302.100	1540.000	1531.000	9.000	3.0000	100.0000	4.72E+00	6.79E-01	5.23E-02	2.15E-02	2.38E-01
U-235	4391.000	82.000	78.000	4.000	2.0000	80.90000	2.97E-01	8.00E-02	4.69E-02	1.77E-02	6.93E-02
U-238	4184.730	2103.000	2098.000	5.000	2.2361	100.0000	6.47E+00	9.15E-01	4.13E-02	1.60E-02	2.78E-01

NOTE: Corrections made to U-3/4 net area due to tracer impurity



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 890375
SAMPLE DATE : 5-AUG-2009 00:00:00.

SAMPLE ID : S1201893649_UU
SAMPLE QTY: 0.510 G

DETECTOR NUMBER :67594
AVERAGE %EFFICIENCY :29.8567
% YIELD : 94.381

COUNT DATE: 8-AUG-2009 16:19:54
ELAPSED LIVE TIME(SEC): 59999.99
ANALYST :MXA1

MS/MSD
ID : 1163-G
ISOTOPE : U-238
PCI/G : 4.939E+00

LCS/LCSD
ID : 1163-G
ISOTOPE : U-238
PCI/G : 4.939E+00

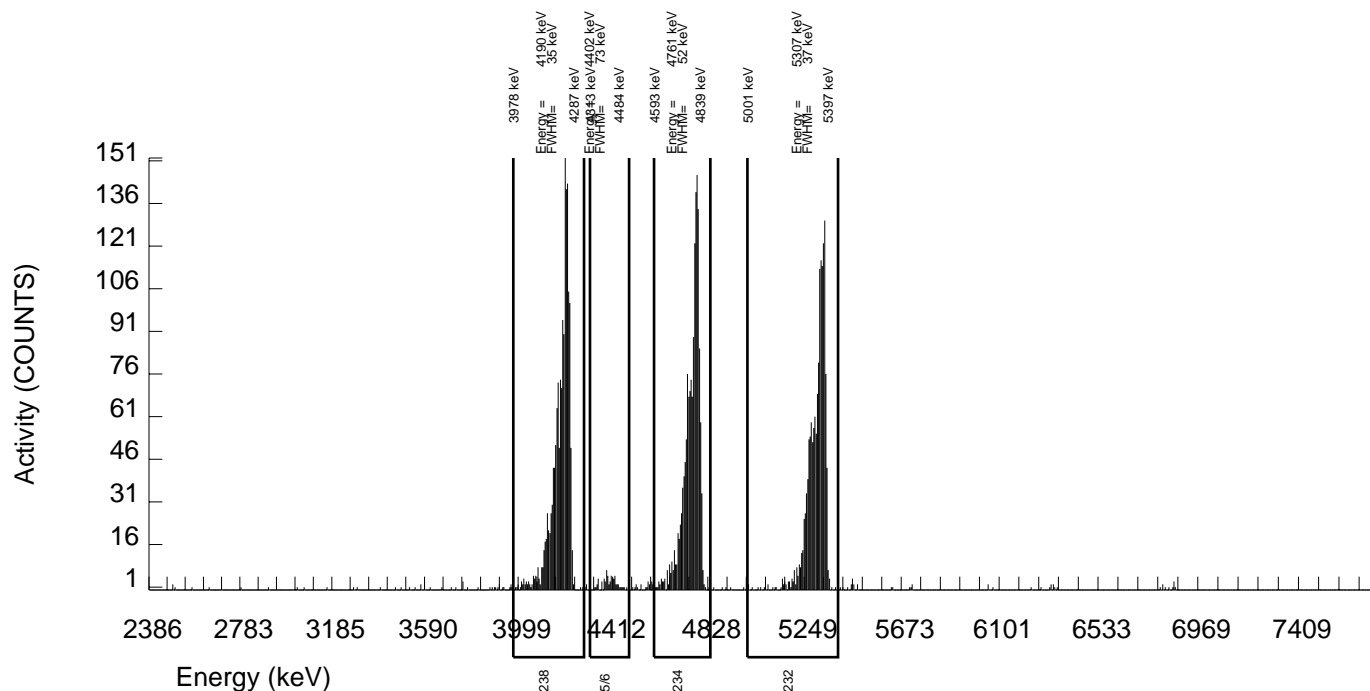
TRACER
ID : 1283-E
ISOTOPE : U232
NOMINAL : 5.26330 dpm
RESULTS : 4.96758 dpm

LIB FILE : ENV_ALPHA_UU.N
BKG FILE : B012.CNF;1055
BKG DATE : 2-AUG-2009
EFF FILE : W012.CNF;300
CAL DATE : 3-AUG-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
U-3/4	4763.020	1539.000	1525.522	9.000	3.0000	100.0000	4.78E+00	6.89E-01	5.32E-02	2.19E-02	2.41E-01
U232	5302.100	1496.000	1483.000	13.000	3.6056	100.0000	4.65E+00	6.72E-01	6.20E-02	2.63E-02	2.39E-01
U-235	4391.000	67.000	65.000	2.000	1.4142	80.90000	2.52E-01	7.17E-02	3.71E-02	1.27E-02	6.31E-02
U-238	4184.730	1616.000	1609.000	7.000	2.6458	100.0000	5.04E+00	7.25E-01	4.80E-02	1.93E-02	2.47E-01

NOTE: Corrections made to U-3/4 net area due to tracer impurity



RADIUM 228

Radiochemistry Batch Checklist, Rev 9

Batch# 888441 Product: Raz28 Date: 7/31/09

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			N/A
Samples have been blank corrected (if required)			N/A
If activity less 10* MDA/ MDC, error is 150% or less of sample activity. If greater 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	/		
Instrument source check is within limits.	/		
Instrument bkg check is within limits.	/		
Method RDL/ LLD has been met.	/		
If duplicate activities are less 5* MDA/ MDC, then RPD is 100% or less. If greater 5* MDA/ MDC, then RPD 20% or less. If below the MDA/ MDC, the RPD is 0%.	/		
Or meets the client's required RER acceptance criteria.			
Tracer yield is 15-125% . Carrier yield 25-125%.			N/A
Or meets the client's contract acceptance criteria.			
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	/		
Sample was run within hold time.	/		
Sample was correctly preserved if required.	/		
Smears Taken for Radioactive batches.			N/A
Method Spike and LCS are within 75-125% or meets the client's contract acceptance criteria.	/		
No blank spaces on data forms.			
All line outs initialed and dated.	/		
No transcription errors are apparent.	/		
Aux data is correct.			N/A
Client Special requirements page has been checked.	/		
Raw Data and/ or spectrum are included and properly stasured.	/		
QC data entered into QC database and batch is in REVW	/		
Hit notification complete (if necessary)	/		
Batch entered into Case Narrative.	/		
Batch non-conformances completed, if applicable.			N/A
Batch non-conformances second reviewed and disposition verified to be completed.			N/A
Aliquot Correction completed if required.		*	N/A
Review sample historical results if available (If REMP, results above MDC have been verified by historical results, recount or re-analysis.)	/		

GEL Laboratories, LLC

revised 8/1/08

Primary Review Performed By:  7/31/09

Secondary Review Performed By: 

Radium-228 Que Sheet

General Engineering Laboratories, Radiochemistry Division
07/27/2009

Batch #: 888441 Analyst: JXC5 First Client Due Date: 08/18/2009 Internal Due Date: 08/08/2009
 Spike Isotope: Radium-228 Spike Code: Expiration Date: Ac-228 Ingrow: 7-29-09 | 1055
 LCS Isotope: Radium-228 LCS Code: 0503-B Expiration Date: 9-13-09
 Tracer Isotope: Barium-133 Tracer Code: 017-J Expiration Date: 2-17-10 Ac-228 Separation Date/Time: 7-31-09 | 1300
 Prep Date: 7-28-09 Initials: MB Pipet ID: 276655 Balance ID: 17955160 Witness: 07-28-09

Sample ID	Client Description	Type	Hazard Code	Min CRDL	Matrix	Client	Collect Date & Time	Pos. #	Vol (mL)	Det #	Ba Yield (%)	Gamma Det. #
233587021-1	EB072009-SO	SAMPLE		3 pCi/L	WATER	KERR003	22-JUL-09 12:30 PM	1	200	4A	74.14	
233612013-1	EB071709-SO	SAMPLE		3 pCi/L	WATER	KERR003	17-JUL-09 07:35 AM	2	200	4C	71.35	
233612014-1	FB072109-SO	SAMPLE		3 pCi/L	WATER	KERR003	21-JUL-09 01:45 PM	3	200	4D	76.42	
233612021-1	EB072109-SO	SAMPLE		3 pCi/L	WATER	KERR003	21-JUL-09 02:05 PM	4	200	5A	80.60	
233960004-1	EB072209-SO	SAMPLE		3 pCi/L	WATER	KERR003	22-JUL-09 11:40 AM	5	200	5B	73.87	
233960014-1	EB072309-SO	SAMPLE		3 pCi/L	WATER	KERR003	23-JUL-09 10:45 AM	6	200	5C	82.55	
1201889163-1	MB for batch 888441	MB		3 pCi/L	WATER	QC ACCOUNT	22-JUL-09 12:30 PM	7	200	5D	71.76	
1201889164-1	LCS for batch 888441	LCS		3 pCi/L	WATER	QC ACCOUNT	22-JUL-09 12:30 PM	8	200	2B	87.74	
1201889165-1	LCSD for batch 888441	LCSD		3 pCi/L	WATER	QC ACCOUNT	22-JUL-09 12:30 PM	9	200	6B	78.11	

OR 7/31/09
✓ DAILIES

Comments: _____
 Data Reviewed By: [Signature] 7/31/09

Instrument Used: (Circle One) PIC S/N: 10751-4

Radium-228 Liquid

Filename : RA228.XLS
 File type : Excel
 Version # : 1.2.3

Spike S/N : N/A
 Spike Exp Date : N/A
 Spike Activity (dpm/ml) : N/A
 Spike Volume Added: N/A

Pipet, 0.1 ml Stdev : +/- 0.000701 ml
 Pipet, 0.5 ml Stdev : +/- 0.002564 ml
 Pipet, 1 ml Stdev : +/- 0.005480 ml

Batch : 888441
 Analyst : JXC5
 Prep Date : 7/28/2009

LCS S/N : 0503-B
 LCS Exp Date : 9/13/2009
 LCS Activity (dpm/ml): 180.80
 LCS Volume Added: 0.10

Ra-228 Abundance : 1
 Ra-228 Method Uncertainty : 0.1268

Procedure Code : GFC28RAL
 Parname : Radium-228

Required MDA : 3 pCi/L
 Half-life of Ra-228 : 5.75 years
 Half-life of Ac-228 : 6.13 hours
 Batch counted on : PIC
 BKG Count time : 500 min

Tracer S/N : 0112-J
 Tracer Exp Date : 2/17/2010
 Tracer Volume Added: 0.10

Calibration Date : 7/2/2009
 Calibration Due Date : 7/31/2010

Pos.	Sample Characteristics		Sample Aliquot L	Sample Aliquot StDev. L	Sample Date/Time	Tracer Calculations			Tracer Samp.		
	Sample Aliquot L	Tracer Concentration (Ba-133 Ref.) (cpm)				Tracer Count	Tracer Concentration (Ba-133 Samp.) (cpm)	Tracer Count	Tracer Aliquot (mL)	Tracer Aliquot StDev. (mL)	
1	233587021.1	0.2000	1.6007E-05	1.6007E-05	7/22/2009 12:30	232.8	4.09%	172.6	4.87%	0.1	0.000701
2	233612013.1	0.2000	1.6007E-05	1.6007E-05	7/17/2009 7:35	232.8	4.09%	166.1	4.99%	0.1	0.000701
3	233612014.1	0.2000	1.6007E-05	1.6007E-05	7/21/2009 13:45	225.2	4.17%	172.1	4.88%	0.1	0.000701
4	233612021.1	0.2000	1.6007E-05	1.6007E-05	7/21/2009 14:05	225.2	4.17%	181.5	4.73%	0.1	0.000701
5	233960004.1	0.2000	1.6007E-05	1.6007E-05	7/22/2009 11:40	225.2	4.17%	166.4	4.98%	0.1	0.000701
6	233960014.1	0.2000	1.6007E-05	1.6007E-05	7/23/2009 10:45	225.2	4.17%	185.9	4.66%	0.1	0.000701
7	1201889163.1	0.2000	1.6007E-05	1.6007E-05	7/28/2009 0:00	225.2	4.17%	161.6	5.07%	0.1	0.000701
8	1201889164.1	0.2000	1.6007E-05	1.6007E-05	7/28/2009 0:00	225.2	4.17%	197.6	4.50%	0.1	0.000701
9	1201889165.1	0.2000	1.6007E-05	1.6007E-05	7/28/2009 0:00	225.2	4.17%	175.9	4.82%	0.1	0.000701

Pos.	Counting		Gross Counts		Beta cpm	Detector Efficiency (cpm/dpm)	Detector Efficiency Error (cpm/dpm)	Weekly Bkg Count Time (min.)	Separation Date/Time	Count Start Date/Time	Ra-228 Decay	Ac-228 Decay	Ac-228 Count Correction	Calculated Sample Recovery %	Sample Recovery Error %
	Detector ID	Time (min.)	Alpha	Beta											
1	4A	80	17	113	1.413	0.6208	0.00744	500	7/31/2009 13:00	7/31/2009 16:08	0.997	0.701	1.077	74.14%	3.33%
2	4C	180	18	299	1.661	0.6052	0.00426	500	7/31/2009 13:00	7/31/2009 16:09	0.995	0.700	1.179	71.35%	3.37%
3	4D	140	25	196	1.400	0.5873	0.00816	500	7/31/2009 13:00	7/31/2009 16:09	0.997	0.700	1.138	76.42%	3.36%
4	5A	60	11	69	1.150	0.6258	0.00816	500	7/31/2009 13:00	7/31/2009 16:09	0.997	0.700	1.058	80.60%	3.31%
5	5B	100	19	153	1.530	0.6280	0.00816	500	7/31/2009 13:00	7/31/2009 16:09	0.997	0.700	1.097	73.89%	3.40%
6	5C	80	14	102	1.275	0.6368	0.00816	500	7/31/2009 13:00	7/31/2009 16:09	0.997	0.699	1.077	82.55%	3.28%
7	5D	120	24	194	1.617	0.6237	0.00816	500	7/31/2009 13:00	7/31/2009 16:08	0.999	0.701	1.117	71.76%	3.43%
8	2B	60	6	460	7.667	0.6167	0.00383	500	7/31/2009 13:00	7/31/2009 16:08	0.999	0.701	1.058	87.74%	3.22%
9	6B	60	35	474	7.900	0.6163	0.00816	500	7/31/2009 13:00	7/31/2009 16:08	0.999	0.701	1.058	78.11%	3.34%

- Notes:
 1 - Results are decay corrected to Sample Date/Time
 2 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date
 3 - Spike Nominals are decay corrected to Sample Date/Time

Pos.	Decision Level pCi/L	Critical Level pCi/L	Required MDA pCi/L	MDA pCi/L	Sample Act. Conc. pCi/L	Sample Act. Error pCi/L	Net Count Rate CPM	Net Count Rate Error CPM	2 SIGMA		Sample QC	Sample Type	RPD	RER	Nominal pCi/L	Recovery
									Counting Uncertainty pCi/L	Total Prop. Uncertainty pCi/L						
1	1.9454	1.3734	3	3.0299	4.2906	0.2470	0.5685	0.1391	2.0574	2.3350		SAMPLE				
2	2.1908	1.5467	3	3.2405	1.4044	0.6959	0.1591	0.1106	1.9133	1.9471		SAMPLE				
3	1.9884	1.4038	3	2.9630	1.7181	0.5310	0.2100	0.1113	1.7843	1.8383		SAMPLE				
4	1.4931	1.0542	3	2.4468	4.5359	0.2145	0.6700	0.1419	1.8825	2.2150		SAMPLE				
5	2.0511	1.4481	3	3.1252	3.2217	0.3156	0.4220	0.1323	1.9803	2.1474		SAMPLE				
6	1.7200	1.2143	3	2.6768	2.7598	0.3204	0.4170	0.1329	1.7235	1.8640		SAMPLE				
7	2.1303	1.5040	3	3.2087	2.8946	0.3523	0.3607	0.1264	1.9887	2.1243		MB			40.7207	96.2%
8	2.3920	1.6888	3	3.6918	39.1889	0.0664	6.2367	0.3614	4.4514	10.9951		LCS		1.2221	40.7207	123.4%
9	1.9991	1.4114	3	3.1760	50.2335	0.0618	7.1100	0.3650	5.0548	13.8872		LCSD	24.7%	1.2221	40.7207	123.4%

888441

SampleID	Instr	Time (min.)	Alpha Counts	Beta Counts	Count Start Time	Count End Time	Machine
233587021	4A	80	17	113	7/31/2009 16:08	7/31/2009 17:28	Protean
233612013	4C	180	18	299	7/31/2009 16:09	7/31/2009 19:09	Protean
233612014	4D	140	25	196	7/31/2009 16:09	7/31/2009 18:29	Protean
233612021	5A	60	11	69	7/31/2009 16:09	7/31/2009 17:09	Protean
233960004	5B	100	19	153	7/31/2009 16:09	7/31/2009 17:49	Protean
233960014	5C	80	14	102	7/31/2009 16:09	7/31/2009 17:29	Protean
1201889163	5D	120	24	194	7/31/2009 16:08	7/31/2009 18:08	Protean
1201889164	2B	60	6	460	7/31/2009 16:08	7/31/2009 17:08	Protean
1201889165	6B	60	35	474	7/31/2009 16:08	7/31/2009 17:08	Protean

ASSAY 29-Jul-09 11:15:34

Protocol id 9 228_REC2
Time limit 180
Count limit 50000
Isotope Ba-133
Protocol date 9-Apr-07 10:02:22
Run id. 27

POS	RACK	BATCH	TIME	COUNTS	CPM	ERROR	% RECOVERY	COUNT TIME
1	87	1	180	767	225.2	4.17		11:15:36
2	87	2	180	532	147	5.86	65.28	11:18:47
3	87	3	180	549	152.6	5.25	67.76	11:21:59
4	87	4	180	607	172.1	4.88	76.42	11:25:10
5	87	5	180	636	181.5	4.73	80.60	11:28:22
6	77	6	180	591	166.4	4.98	73.89	11:31:45
7	77	7	180	649	185.9	4.66	82.55	11:34:57
8	77	8	180	576	161.6	5.07	71.76	11:38:08
9	77	9	180	684	197.6	4.5	87.74	11:41:20
10	77	10	180	619	175.9	4.82	78.11	11:44:31

*8/3/09 **

END OF ASSAY

ASSAY 30-Jul-09 5:41:35

Protocol id 9 228_REC2
Time limit 180
Count limit 50000
Isotope Ba-133
Protocol date 9-Apr-07 10:02:22
Run id. 29

POS	RACK	BATCH	TIME	COUNTS	CPM	ERROR	% RECOVERY	COUNT TIME
1	72	1	180	790	232.8	4.09		05:41:37
2	72	2	180	609	172.6	4.87	74.14	05:44:49
3	72	3	180	589	166.1	4.99	71.35	05:48:00

END OF ASSAY

Radiochemistry Batch Checklist, Rev 9

Batch# 888747 Product: RA 228 Date: 8/13/09

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			NA
Samples have been blank corrected (if required)			NA
If activity less 10* MDA/ MDC, error is 150% or less of sample activity. If greater 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.	✓		
If duplicate activities are less 5* MDA/ MDC, then RPD is 100% or less. If greater 5* MDA/ MDC, then RPD 20% or less. If below the MDA/ MDC, the RPD is 0%. Or meets the client's required RER acceptance criteria.	✓		
Tracer yield is 15-125% . Carrier yield 25-125%. Or meets the client's contract acceptance criteria.	✓		
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.	✓		
Sample was correctly preserved if required.	✓		
Smears Taken for Radioactive batches.	✓		
Method Spike and LCS are within 75-125% or meets the client's contract acceptance criteria.	✓		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	✓		
Aux data is correct.			NA
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stated.	✓		
QC data entered into QC database and batch is in REVW	✓		
Hit notification complete (if necessary)			NA
Batch entered into Case Narrative.	✓		
Batch non-conformances completed, if applicable.			NA
Batch non-conformances second reviewed and disposition verified to be completed.			NA
Aliquot Correction completed if required.			NA
Review sample historical results if available (If REMP, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

GEL Laboratories, LLC

revised 8/1/08

Primary Review Performed By: Mary Muzzie

Secondary Review Performed By: Abraham King II

KERR
8/22

Radium-228 Que Sheet

Batch #: 888747 Analyst: JXC5 First Client Due Date: 08/22/2009 Internal Due Date: 08/11/2009
 Spike Isotope: Radium-228 Spike Code: 0503-B Expiration Date: 9-13-09 Vol: 0.1 mL
 LCS Isotope: Radium-228 LCS Code: 0503-B Expiration Date: 9-13-09 Vol: 0.1 mL
 Tracer Isotope: Barium-133 Tracer Code: 012-J Expiration Date: 2-17-10 Vol: 0.1 mL
 Prep Date: 7-28-09 Initials: MB Pipet ID: 216953 Balance ID: 17955162 Ac-228 Ingrow: 8-3-09 | 0935
 Ac-228 Separation Date/Time: 8-5-09 / 1025 Witness: MCB 7-28-09

Sample ID	Client Description	Type	Hazard Code	Min CRDL	Matrix	Client	Collect Date & Time	Pos. #	Vol (mL)	Ba Yield (%)	Gamma Det. #
233960001-1	SA182-10B	SAMPLE		.5 pCi/g	SOIL	KERR003	22-JUL-09 07:07 AM	1	1.003	87.24	2A
233960002-1	SA182-25B	SAMPLE		.5 pCi/g	SOIL	KERR003	22-JUL-09 07:38 AM	2	1.004	84.55	2B
233960003-1	SA182-38B	SAMPLE		.5 pCi/g	SOIL	KERR003	22-JUL-09 07:56 AM	3	1.012	87.72	2C
233960005-1	SA71-10B	SAMPLE		.5 pCi/g	SOIL	KERR003	23-JUL-09 06:53 AM	4	1.016	87.37	5C
233960006-1	SA71-25B	SAMPLE		.5 pCi/g	SOIL	KERR003	23-JUL-09 07:29 AM	5	1.002	86.53	5D
233960007-1	SA71-36B	SAMPLE		.5 pCi/g	SOIL	KERR003	23-JUL-09 07:46 AM	6	1.000	82.04	7A
233960008-1	SA131-05B	SAMPLE		.5 pCi/g	SOIL	KERR003	23-JUL-09 08:17 AM	7	1.001	91.46	7B
233960009-1	SA131009-0.5B	SAMPLE		.5 pCi/g	SOIL	KERR003	23-JUL-09 08:17 AM	8	1.012	94.0	2D
233960010-1	SA131-10B	SAMPLE		.5 pCi/g	SOIL	KERR003	23-JUL-09 09:05 AM	9	1.016	79.80	7D
233960011-1	SA131-27B	SAMPLE		.5 pCi/g	SOIL	KERR003	23-JUL-09 09:28 AM	10	1.000	98.59	3A
233960012-1	SA145-10B	SAMPLE		.5 pCi/g	SOIL	KERR003	23-JUL-09 11:42 AM	11	1.006	93.35	3C
233960013-1	SA145-24B	SAMPLE		.5 pCi/g	SOIL	KERR003	23-JUL-09 12:28 PM	12	1.011	87.87	9B
233960015-1	RSAH3-0.5B	SAMPLE		.5 pCi/g	SOIL	KERR003	24-JUL-09 08:08 AM	13	1.007	93.84	10A
233960016-1	RSAH3009-0.5B	SAMPLE		.5 pCi/g	SOIL	KERR003	24-JUL-09 08:08 AM	14	1.001	98.59	10B
233960017-1	RSAH3-10B	SAMPLE		.5 pCi/g	SOIL	KERR003	24-JUL-09 08:38 AM	15	1.002	86.86	2B
233960018-1	RSAH3-20B	SAMPLE		.5 pCi/g	SOIL	KERR003	24-JUL-09 09:10 AM	16	1.012	94.94	3D
233960019-1	RSAH3-32B	SAMPLE		.5 pCi/g	SOIL	KERR003	24-JUL-09 09:43 AM	17	1.016	93.99	7C
233960020-1	RSAL5-0.5B	SAMPLE		.5 pCi/g	SOIL	KERR003	24-JUL-09 12:38 PM	18	1.002	99.69	1D
1201889923-1	MB for batch 888747	MB		.5 pCi/g	SOIL	QC ACCOUNT		19	1.016	87.51	9C
1201889924-1	SA145-10B(233960012DUP)	DUP		.5 pCi/g	SOIL	QC ACCOUNT	23-JUL-09 11:42 AM	20	1.011	86.31	2C
1201889925-1	SA145-10B(233960012MS)	MS		.5 pCi/g	SOIL	QC ACCOUNT	23-JUL-09 11:42 AM	21	0.108	92.87	2D
1201889926-1	LCS for batch 888747	LCS		.5 pCi/g	SOIL	QC ACCOUNT		22	1.016	84.11	7D

Comments: Manif Magzell 8/13/09
 * MIM 8/13/09 daily ✓
 Instrument Used: (Circle One) PIC S/N: 107534
 Data Reviewed By: Manif Magzell 8/13/09
 Page 1 of 1

Radium 228 Re-Elute / Reprecipitate

Batch # 888747
 Ra 228 Spike Code 0503-B
 LCS Code 0503-B
 Ba-133 Tracer Code 0112-J

Prep Date 8-6-09
 Spike Vol (mls) 0.1 mL
 LCS Vol (mls) 0.1 mL
 Tracer Vol (mls) 0.1 mL

Initials JLC
 Ingrow Start Time: 8-10-09 / 0905
 Separation Time: 1810 8/11/09

Sample ID	Bkr #	Vol (mls)	Det #	% Yield	Gamma Det #
233960019	17	1.016	9B 7C	82.05	
1201889923	19	1.016	9C	78.61	
1201889926	22	1.016	9D 7D	70.59	
			8-11-09		

Radium 228 Re-Elute / Reprecipitate

Batch # 888747
 Ra 228 Spike Code 0503-B
 LCS Code 0503-B
 Ba-133 Tracer Code 0112-J

Prep Date 8-6-09 Initials MS
 Spike Vol (mls) 0.1 mL
 LCS Vol (mls) 0.1 mL Ingrow Start Time: 1320 8-6-09
 Tracer Vol (mls) 0.1 mL Separation Time: 0905 8-10-09

MS
8-6-09

Sample ID	Bkr #	Vol. (mls)	Det #	% Yield	Gamma Det #
233960001	1	1.003	4L	82.99	
233960002	2	1.004	5A	86.55	
233960003	3	1.012	5B	83.85	
233960004					
233960005	4	1.016	5C	77.15	
233960006	5	1.002	5D	81.66	
233960007	6	1.000	6A 7A	76.72	
233960008	7	1.001	6B 7B	80.46	
233960009	8	1.012	6C 7C	82.60	
233960010	9	1.016	7D	83.42	
233960011	10	1.000	8C	92.27	
233960012	11	1.006	9A	87.50	
233960013	12	1.011	9B	78.48	
233960015	13	1.007	10A	80.07	
233960016	14	1.001	10B	81.79	
233960017	15	1.002	2B	83.89	
233960018	16	1.012	3D	81.53	
233960019	17	1.016	1C	83.25	
233960020	18	1.002	1D	78.09	
1201889923	19	1.016	2A	84.99 84.99	
1201889924	20	1.01	2C	82.35	
1201889925	21	0.108	2D	89.05	
1201889926	22	1.016	3C	70.40	

Radium-228 Solid

Filename : RA228.XLS
 File type : Excel
 Version # : 1.2.4

Spike S/N : 0503-B
 Spike Exp Date : 9/13/2009
 Spike Activity (dpm/ml) : 180.80
 Spike Volume Added : 0.10

Batch : 888747
 Analyst : JXC5
 Prep Date : 8/6/2009

Pipet, 0.1 ml Stdev : +/- 0.000701 ml
 Pipet, 0.5 ml Stdev : +/- 0.002564 ml
 Pipet, 1 ml Stdev : +/- 0.005480 ml

LCS S/N : 0503-B
 LCS Exp Date : 9/13/2009
 LCS Activity (dpm/ml) : 180.80
 LCS Volume Added : 0.10

Procedure Code : GFC28RAS
 Parname : Radium-228

Required MDA : 0.5 pCi/G
 Half-life of Ra-228 : 5.75 years
 Half-life of Ac-228 : 6.13 hours
 BKG counted on : PIC
 BKG Count time : 500 min

Ra-228 Abundance : 1
 Ra-228 Method Uncertainty : 0

Calibration Date : 7/2/2009
 Calibration Due Date : 7/31/2010

Geometry: CeF on 25mm Filter

Sample Characteristics			Tracer Calculations			Tracer Samp.			
Pos.	Sample ID	Sample Aliquot G	Sample Aliquot StDev. G	Tracer Concentration (Ba-133 Ref.) (cpm)	Tracer Ref. Count Uncertainty (%)	Tracer Concentration (Ba-133 Samp.) (cpm)	Tracer Count Uncertainty (%)	Tracer Aliquot (mL)	Tracer Aliquot StDev. (mL)
1	233960001.1	1.0030	3.3237E-03	232.8	4.09%	193.2	4.56%	0.1	0.000701
2	233960002.1	1.0040	3.3238E-03	232.8	4.09%	201.5	4.45%	0.1	0.000701
3	233960003.1	1.0120	3.3246E-03	232.8	4.09%	195.2	4.53%	0.1	0.000701
4	233960005.1	1.0160	3.3250E-03	232.8	4.09%	179.6	4.76%	0.1	0.000701
5	233960006.1	1.0020	3.3235E-03	232.8	4.09%	190.1	4.60%	0.1	0.000701
6	233960007.1	1.0000	3.3233E-03	232.8	4.09%	178.6	4.78%	0.1	0.000701
7	233960008.1	1.0010	3.3234E-03	232.8	4.09%	187.3	4.64%	0.1	0.000701
8	233960009.1	1.0120	3.3246E-03	232.8	4.09%	192.3	4.57%	0.1	0.000701
9	233960010.1	1.0160	3.3250E-03	232.8	4.09%	194.2	4.54%	0.1	0.000701
10	233960011.1	1.0000	3.3233E-03	232.8	4.09%	214.8	4.29%	0.1	0.000701
11	233960012.1	1.0060	3.3240E-03	232.8	4.09%	203.7	4.42%	0.1	0.000701
12	233960013.1	1.0110	3.3245E-03	232.8	4.09%	182.7	4.71%	0.1	0.000701
13	233960015.1	1.0070	3.3241E-03	232.8	4.09%	186.4	4.66%	0.1	0.000701
14	233960016.1	1.0010	3.3234E-03	232.8	4.09%	190.4	4.60%	0.1	0.000701
15	233960017.1	1.0020	3.3235E-03	232.8	4.09%	195.3	4.53%	0.1	0.000701
16	233960018.1	1.0120	3.3246E-03	232.8	4.09%	189.8	4.61%	0.1	0.000701
17	233960019.1	1.0160	3.3250E-03	191.1	4.59%	156.8	5.16%	0.1	0.000701
18	233960020.1	1.0020	3.3235E-03	232.8	4.09%	181.8	4.73%	0.1	0.000701
19	1201889923.1	1.0160	3.3250E-03	182.8	4.71%	143.7	5.44%	0.1	0.000701
20	1201889924.1	1.0110	3.3245E-03	232.8	4.09%	191.7	4.58%	0.1	0.000701
21	1201889925.1	0.1080	3.2303E-03	232.8	4.09%	207.3	4.38%	0.1	0.000701
22	1201889926.1	1.0160	3.3250E-03	191.1	4.59%	134.9	5.65%	0.1	0.000701

- Notes:
 1 - Results are decay corrected to Sample Date/Time
 2 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date
 3 - Spike Nominals are decay corrected to Sample Date/Time

Pos.	Decision Level		Critical Level	Required MDA	MDA	Sample Act. Conc.	Sample Act. Error	Net Count Rate	Net Count Rate Error	2 SIGMA		Sample QC	Sample Type	RPD	RER	Nominal pCi/G	Recovery
	pCi/G	pCi/G								Counting Uncertainty	Total Prop. Uncertainty						
1	0.2880	0.2034	0.2034	0.5	0.4271	1.5512	0.1086	0.5861	0.0607	0.3149	0.3301		SAMPLE				
2	0.4265	0.3011	0.3011	0.5	0.6218	1.5839	0.1360	0.6241	0.0825	0.4103	0.4223		SAMPLE				
3	0.2172	0.1533	0.1533	0.5	0.3273	1.3636	0.1039	0.5078	0.0501	0.2635	0.2777		SAMPLE				
4	0.3496	0.2468	0.2468	0.5	0.5550	1.9282	0.1396	1.5687	0.2026	0.4881	0.5048		SAMPLE				
5	0.4354	0.3074	0.3074	0.5	0.6749	1.9310	0.1445	1.6060	0.2257	0.5318	0.5467		SAMPLE				
6	0.2309	0.1630	0.1630	0.5	0.3908	1.5138	0.1404	1.1693	0.1592	0.4040	0.4165		SAMPLE				
7	0.2344	0.1655	0.1655	0.5	0.3916	1.2526	0.1541	1.0320	0.1551	0.3691	0.3782		SAMPLE				
8	0.2389	0.1687	0.1687	0.5	0.3578	1.4987	0.1015	0.5637	0.0542	0.2822	0.2982		SAMPLE				
9	0.2266	0.1600	0.1600	0.5	0.3778	1.7427	0.1237	1.5053	0.1793	0.4068	0.4224		SAMPLE				
10	0.4051	0.2860	0.2860	0.5	0.5919	1.6380	0.1281	0.6314	0.0782	0.3975	0.4112		SAMPLE				
11	0.6268	0.4425	0.4425	0.5	0.9790	1.4444	0.2396	0.7687	0.1825	0.6722	0.6784		SAMPLE				
12	0.4352	0.3072	0.3072	0.5	0.6754	1.2091	0.2045	0.9920	0.2000	0.4779	0.4846		SAMPLE				
13	0.2115	0.1493	0.1493	0.5	0.3583	1.4795	0.1354	1.2400	0.1626	0.3803	0.3927		SAMPLE				
14	0.4263	0.3009	0.3009	0.5	0.6631	2.7347	0.1143	2.2353	0.2442	0.5855	0.6124		SAMPLE				
15	0.4073	0.2876	0.2876	0.5	0.6351	1.6897	0.1536	1.4100	0.2116	0.4970	0.5085		SAMPLE				
16	0.4420	0.3121	0.3121	0.5	0.6885	0.6930	0.3271	0.5380	0.1751	0.4420	0.4443		SAMPLE				
17	0.1589	0.1122	0.1122	0.5	0.2636	0.9804	0.1398	0.8329	0.1123	0.2591	0.2687		SAMPLE				
18	0.3040	0.2146	0.2146	0.5	0.4974	1.8778	0.1343	1.3767	0.1791	0.4789	0.4944		SAMPLE				
19	0.1903	0.1343	0.1343	0.5	0.3088	0.2210	0.4457	0.1833	0.0814	0.1923	0.1930		MB	3.9%			
20	0.2125	0.1500	0.1500	0.5	0.3650	1.3891	0.1448	1.0693	0.1508	0.3840	0.3944	233960012.1	DUP		75.7458	90.7%	
21	1.9942	1.4079	1.4079	0.5	3.3644	70.1155	0.0683	6.3907	0.3356	7.2158	9.3920	233960012.1	MS		8.0159	85.6%	
22	0.2563	0.1809	0.1809	0.5	0.4273	6.8591	0.0703	5.2387	0.3072	0.7883	0.9448		LCS				

SampleID	Instr	Time (min.)	Alpha Counts	Beta Counts	Count Start Time	Count End Time	Machine
233960001	2A	390	35	415	8/10/2009 15:44	8/10/2009 22:14	Protean
233960002	2B	390	19	688	8/10/2009 15:44	8/10/2009 22:14	Protean
233960003	2C	390	27	301	8/10/2009 15:44	8/10/2009 22:14	Protean
233960005	5C	60	21	142	8/10/2009 11:16	8/10/2009 12:16	Protean
233960006	5D	60	13	174	8/10/2009 11:16	8/10/2009 12:16	Protean
233960007	7A	60	11	89	8/10/2009 11:16	8/10/2009 12:16	Protean
233960008	7B	60	7	84	8/10/2009 11:16	8/10/2009 12:16	Protean
233960009	2D	390	35	347	8/10/2009 15:44	8/10/2009 22:14	Protean
233960010	7D	60	11	113	8/10/2009 11:16	8/10/2009 12:16	Protean
233960011	3A	390	75	630	8/10/2009 15:45	8/10/2009 22:15	Protean
233960012	3C	60	3	112	8/10/2009 15:45	8/10/2009 16:45	Protean
233960013	9B	60	6	135	8/10/2009 11:17	8/10/2009 12:17	Protean
233960015	10A	60	5	93	8/10/2009 11:17	8/10/2009 12:17	Protean
233960016	10B	60	2	206	8/10/2009 11:17	8/10/2009 12:17	Protean
233960017	2B	60	7	153	8/10/2009 11:22	8/10/2009 12:22	Protean
233960018	3D	60	14	102	8/10/2009 11:36	8/10/2009 12:36	Protean
233960019	7C	90	9	98	8/11/2009 20:00	8/11/2009 21:30	Protean
233960020	1D	60	11	112	8/10/2009 11:42	8/10/2009 12:42	Protean
1201889923	9C	90	6	48	8/11/2009 20:00	8/11/2009 21:30	Protean
1201889924	2C	60	9	80	8/10/2009 11:43	8/10/2009 12:43	Protean
1201889925	2D	60	17	403	8/10/2009 11:43	8/10/2009 12:43	Protean
1201889926	7D	60	14	337	8/11/2009 20:00	8/11/2009 21:00	Protean

ASSAY 6-Aug-09 12:43:06

Protocol id 8 228_REC
Time limit 180
Count limit 50000
Isotope Ba-133
Protocol date 9-Apr-07 10:03:07
Run id. 14

POS	RACK	BATCH	TIME	COUNTS	CPM	ERROR	% RECOVERY	COUNT TIME
1	98	1	180	790	232.8	4.09		12:43:13
2	98	2	180	671	193.2	4.56	82.99	12:46:24
3	98	3	180	696	201.5	4.45	86.55	12:49:36
4	98	4	180	677	195.2	4.53	83.85	12:52:47
5	98	5	180	630	179.6	4.76	77.15	12:55:58
6	66	6	180	661	190.1	4.6	81.66	12:59:23
7	66	7	180	627	178.6	4.78	76.72	13:02:35
8	66	8	180	653	187.3	4.64	80.46	13:05:46
9	66	9	180	668	192.3	4.57	82.60	13:08:57
10	66	10	180	674	194.2	4.54	83.42	13:12:09
11	70	11	180	736	214.8	4.29	92.27	13:15:39
12	70	12	180	702	203.7	4.42	87.50	13:18:50
13	70	13	180	639	182.7	4.71	78.48	13:22:01
14	70	14	180	650	186.4	4.66	80.07	13:25:13
15	70	15	180	662	190.4	4.6	81.79	13:28:24
16	68	16	180	677	195.3	4.53	83.89	13:31:43
17	68	17	180	661	189.8	4.61	81.53	13:34:54
18	68	18	180	673	193.8	4.55	83.25	13:38:06
19	68	19	180	637	181.8	4.73	78.09	13:41:17
20	68	20	180	505	137.9	5.58	59.24	13:44:28
21	88	21	180	666	191.7	4.58	82.35	13:47:53
22	88	22	180	713	207.3	4.38	89.05	13:51:04
23	88	23	180	589	163.9	5.02	70.40	13:54:16

END OF ASSAY

ASSAY 11-Aug-09 10:07:28

Protocol id 9 228_REC2
Time limit 180
Count limit 50000
Isotope Ba-133
Protocol date 9-Apr-07 10:02:22
Run id. 66

POS	RACK	BATCH	TIME	COUNTS	CPM	ERROR	% RECOVERY	COUNT TIME
	1	90	1 180	664	191.1	4.59		10:07:35
	2	90	2 180	562	156.8	5.16	82.05	10:10:47
<i>file 8-11-07</i>	3	90	3 180	449	119.2	6.1	62.38	10:13:58
	4	90	4 180	496	134.9	5.65	70.59	10:17:09

END OF ASSAY

ASSAY 11-Aug-09 10:43:11

Protocol id 9 228_REC2
Time limit 180
Count limit 50000
Isotope Ba-133
Protocol date 9-Apr-07 10:02:22
Run id. 68

POS	RACK	BATCH	TIME	COUNTS	CPM	ERROR	% RECOVERY	COUNT TIME
1	90	1	180	640	182.8	4.71		10:43:18
2	90	2	180	522	143.7	5.44	78.61	10:46:30

END OF ASSAY

RADIUM 226

Radiochemistry Batch Checklist, Rev 9

Batch# 889473 Product: Radium 226 Date: 8-14-09

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			NA
Samples have been blank corrected (if required)			NA
If activity less 10* MDA/ MDC, error is 150% or less of sample activity. If greater 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.	✓		
If duplicate activities are less 5* MDA/ MDC, then RPD is 100% or less. If greater 5* MDA/ MDC, then RPD 20% or less. If below the MDA/ MDC, the RPD is 0%. Or meets the client's required RER acceptance criteria.	✓		
Tracer yield is 15-125% . Carrier yield 25-125%. Or meets the client's contract acceptance criteria.			NA
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.	✓		
Sample was correctly preserved if required.			NA
Smears Taken for Radioactive batches.			NA
Method Spike and LCS are within 75-125% or meets the client's contract acceptance criteria.	✓		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	✓		
Aux data is correct.			NA
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stated.	✓		
QC data entered into QC database and batch is in REVW	✓		
Hit notification complete (if necessary)			NA
Batch entered into Case Narrative.	✓		
Batch non-conformances completed, if applicable.			NA
Batch non-conformances second reviewed and disposition verified to be completed.			NA
Aliquot Correction completed if required.			NA
Review sample historical results if available (If REMP. results above MDC have been verified by historical results, recount or re-analysis.)	✓		

GEL Laboratories, LLC

revised 8/1/08

Primary Review Performed By: JM My

KERR 8-18-09

Secondary Review Performed By: Rayste You 8/14/09

Radium-226 Liquid

Filename : RA226.XLS
 File type : Excel
 Version # : 1.2.4

Pipet, 0.1 ml Sdev : +/- 0.000701 ml
 Pipet, 0.5 ml Sdev : +/- 0.002564 ml
 Pipet, 1 ml Sdev : +/- 0.005480 ml

Batch : 889473
 Analyst : KSD1
 Prep Date : 8/11/2009
 Ra-226 Abundance : 1
 Ra-226 Method Uncertainty : 0.0918

Spike S/N : N/A
 Spike Exp Date : N/A
 Spike Activity (dpm/ml): N/A
 Spike Volume Added: N/A

Procedure Code : LUC26RAL

Parname : Radium-226
 Required MDA : 1 pCi/L
 Half-life of Ra-226 : 1600 years
 Half-life of Rn-222 : 3.823 days
 Batch counted on : LUCAS CELL DETECTOR
 BKG Count time : 30 min

LCS S/N : 0638-H
 LCS Exp Date : 7/17/2010
 LCS Activity (dpm/ml): 266.24
 LCS Volume Added: 0.10

Sample Characteristics			Count Raw Data				Weekly Background			Detector		
Pos.	Sample ID	Sample Aliquot L	Sample Aliquot StDev. L	Sample Date/Time	Cell Number	Counting Time (min.)	Gross Counts	Gross CPM	Counts	CPM	Count Time (min.)	Efficiency (cpm/dpm)
1	233587015.1	0.5000	2.0256E-05	7/16/2009 10:40	402	30	22	0.733	8	0.267	30	2.1180
2	233587021.1	0.5000	2.0256E-05	7/22/2009 12:30	506	30	27	0.900	8	0.267	30	2.0040
3	233612013.1	0.5000	2.0256E-05	7/17/2009 7:35	605	30	18	0.600	8	0.267	30	2.1490
4	233612014.1	0.5000	2.0256E-05	7/21/2009 13:45	112	30	15	0.500	4	0.133	30	1.6480
5	233612021.1	0.5000	2.0256E-05	7/21/2009 14:05	206	30	23	0.767	6	0.200	30	2.2590
6	233960004.1	0.5000	2.0256E-05	7/22/2009 11:40	306	30	13	0.433	4	0.133	30	1.7470
7	233960014.1	0.5000	2.0256E-05	7/23/2009 10:45	403	30	5	0.167	5	0.167	30	1.4630
8	1201891551.1	0.5000	2.0256E-05	8/11/2009 0:00	504	30	4	0.133	4	0.133	30	1.6150
9	1201891552.1	0.5000	2.0256E-05	8/11/2009 0:00	601	30	668	22.267	8	0.267	30	2.1810
10	1201891553.1	0.5000	2.0256E-05	8/11/2009 0:00	111	30	569	18.967	4	0.133	30	1.5750

Detector Efficiency Error (cpm/dpm)	Cell Calibration Date	Cell Calibration Due Date	De-Gas Date/Time	Rn-222 Ingrow End Date/Time	Count Start Date/Time	Rn-222 Corrections		Ra-226 Decay	
						De-Gas to Ingrowth	Ingrowth to Count		
0.12371	3/2/2009	3/2/2010	8/11/2009 14:20	8/14/2009 9:45	8/14/2009 13:45	0.399	0.970	1.002	1.000
0.14377	3/25/2009	3/25/2010	8/11/2009 14:20	8/14/2009 9:45	8/14/2009 13:45	0.399	0.970	1.002	1.000
0.06605	8/4/2009	8/4/2010	8/11/2009 14:20	8/14/2009 9:45	8/14/2009 13:45	0.399	0.970	1.002	1.000
0.09580	8/29/2008	8/29/2009	8/11/2009 14:20	8/14/2009 10:10	8/14/2009 14:15	0.401	0.970	1.002	1.000
0.07722	12/19/2008	12/19/2009	8/11/2009 14:20	8/14/2009 10:10	8/14/2009 14:15	0.401	0.970	1.002	1.000
0.06082	2/4/2009	2/4/2010	8/11/2009 14:20	8/14/2009 10:10	8/14/2009 14:15	0.401	0.970	1.002	1.000
0.12371	3/2/2009	3/2/2010	8/11/2009 14:20	8/14/2009 10:10	8/14/2009 14:15	0.401	0.970	1.002	1.000
0.14377	3/25/2009	3/25/2010	8/11/2009 14:20	8/14/2009 10:10	8/14/2009 14:15	0.401	0.970	1.002	1.000
0.06605	8/4/2009	8/4/2010	8/11/2009 14:20	8/14/2009 10:10	8/14/2009 14:15	0.401	0.970	1.002	1.000
0.09580	8/29/2008	8/29/2009	8/11/2009 14:20	8/14/2009 10:35	8/14/2009 14:50	0.403	0.968	1.002	1.000

- Notes:
 1 - Results are decay corrected to Sample Date/Time
 2 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date
 3 - Spike Nominals are decay corrected to Sample Date/Time

Pos.	Decision Level		Critical Level pCi/L	Required MDA pCi/L	MDA pCi/L	Sample Act.		Sample Act. Error pCi/L	Net Count Rate CPM	Net Count Rate Error CPM	2 SIGMA Counting Uncertainty		Sample QC	Sample Type	RPD	RER	Nominal pCi/L	Recovery
	pCi/L	pCi/L				Conc. pCi/L	pCi/L				pCi/L	pCi/L						
1	0.3406	0.2405		1	0.5906	0.5117	0.4103	0.4667	0.1826	0.1826	0.3924	0.4217		SAMPLE				
2	0.3600	0.2542		1	0.6242	0.7339	0.3430	0.6333	0.1972	0.1972	0.4479	0.5107		SAMPLE				
3	0.3357	0.2370		1	0.5821	0.3602	0.5142	0.3333	0.1700	0.1700	0.3600	0.3688		SAMPLE				
4	0.3083	0.2177		1	0.5757	0.5146	0.4077	0.3667	0.1453	0.1453	0.3997	0.4215		SAMPLE				
5	0.2755	0.1945		1	0.4913	0.5802	0.3261	0.5667	0.1795	0.1795	0.3602	0.3852		SAMPLE				
6	0.2908	0.2053		1	0.5430	0.3972	0.4621	0.3000	0.1374	0.1374	0.3566	0.3668		SAMPLE				
7	0.3883	0.2741		1	0.7063	0.000E+00	0.0000	0.0000	0.1054	0.1054	0.3266	0.3270		SAMPLE				
8	0.3146	0.2221		1	0.5874	0.000E+00	0.0000	0.0000	0.0943	0.0943	0.2646	0.2651		MB			24.1657	96.5%
9	0.3294	0.2326		1	0.5712	23.3294	0.0769	22.0000	0.8667	0.8667	1.8013	5.4760		LCS	16.6%		24.1657	114.1%
10	0.3215	0.2270		1	0.6003	27.5611	0.1047	18.8333	0.7979	0.7979	2.2887	7.5239		LCSD			24.1657	114.1%

Radiochemistry Batch Checklist, Rev 9

Batch# 891163 Product: Ra-226 Date: 8/21/09

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			NA
Samples have been blank corrected (if required)			NA
If activity less 10* MDA/ MDC, error is 150% or less of sample activity. If greater 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.	✓		
If duplicate activities are less 5* MDA/ MDC, then RPD is 100% or less. If greater 5* MDA/ MDC, then RPD 20% or less. If below the MDA/ MDC, the RPD is 0%.	✓		
Or meets the client's required REF acceptance criteria.			
Tracer yield is 15-125% . Carrier yield 25-125%.			NA
Or meets the client's contract acceptance criteria.			
Method blank is less than the RDL/ LLD.	✓		
(If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.	✓		
Sample was correctly preserved if required.			NA
Smears Taken for Radioactive batches.			NA
Method Spike and LCS are within 75-125% or meets the client's contract acceptance criteria.	✓		
No blank spaces on data forms.	✓		
All line outs initialed and dated.	✓		
No transcription errors are apparent.			NA
Aux data is correct.			NA
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stated.	✓		
QC data entered into QC database and batch is in REWV	✓		
Hit notification complete (if necessary)			NA
Batch entered into Case Narrative.	✓		2/2/09
Batch non-conformances completed, if applicable.	✓		NA NCR 724844
Batch non-conformances second reviewed and disposition verified to be completed.	✓		NA NCR 724844
Aliquot Correction completed if required.			NA
Review sample historical results if available (If REMF, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

GEL Laboratories, LLC

revised 8/1/08

Primary Review Performed By:

Lynsey Pace

Secondary Review Performed By:

Lind 8/21/09

KERR 8/22/09

Radium-226 Que Sheet

Batch #: 891163 Analyst: KSD1 First Client Due Date: 08/22/2009 Internal Due Date: 08/11/2009
 Spike Isotope: Radium-226 Spike Code: 007614 Expiration Date: 7/17/11 Vol: 0.1 Nom Conc: 12.0110
 LCS Isotope: Radium-226 LCS Code: 0056-H Expiration Date: 7/17/10 Vol: 0.1 Nom Conc: 11.3560
 Prep Date: 8/14/09 Pipet ID: 147202 Initials: LD Witness: [Signature] Sample Count Time: 30 (Min) *count time 15 min
 Bkg Count Time: 30 (Min)

Sample I	Client Description	Type	Hazard Code	Matrix	Min CRDL	Client	Vol (mL)	End Init Degas Date/Tin	End LN De-em Date/Time	Start Count Date/Time	Cell #	Det #	Bkg counts	Total Counts
233960001-1	SA182-10B	SAMPLE		SOIL	.5 pCi/g	KERR003 1	1.037	8/18/09 1530	8/21/09 0920	8/21/09 1950	WV	7	8	36
233960002-1	SA182-25B	SAMPLE		SOIL	.5 pCi/g	KERR003 2	1.013	8/18/09 1530	8/21/09 0920	8/21/09 1950	305	3	7	131
233960003-1	SA182-38B	SAMPLE		SOIL	.5 pCi/g	KERR003 3	1.007	8/18/09 1530	8/21/09 0920	8/21/09 1950	40V	4	8	92
233960005-1	SA71-10B	SAMPLE		SOIL	.5 pCi/g	KERR003 4	1.064	8/18/09 1530	8/21/09 0920	8/21/09 1950	505	5	4	41
233960006-1	SA71-25B	SAMPLE		SOIL	.5 pCi/g	KERR003 5	1.011	8/18/09 1530	8/21/09 0920	8/21/09 1950	605	6	8	111
233960007-1	SA71-36B	SAMPLE		SOIL	.5 pCi/g	KERR003 6	1.011	8/18/09 1530	8/21/09 0920	8/21/09 1950	207	2	8	31
233960008-1	SA131-05B	SAMPLE		SOIL	.5 pCi/g	KERR003 7	1.010	8/18/09 1530	8/21/09 0920	8/21/09 1950	311	3	8	41
233960009-1	SA131009-0.5B	SAMPLE		SOIL	.5 pCi/g	KERR003 8	1.008	8/18/09 1530	8/21/09 0920	8/21/09 1950	410	4	8	37
233960010-1	SA131-10B	SAMPLE		SOIL	.5 pCi/g	KERR003 9	1.017	8/18/09 1530	8/21/09 0920	8/21/09 1950	506	5	8	60
233960011-1	SA131-27B	SAMPLE		SOIL	.5 pCi/g	KERR003 10	1.062	8/18/09 1530	8/21/09 0920	8/21/09 1950	607	6	8	238
233960012-1	SA145-10B	SAMPLE		SOIL	.5 pCi/g	KERR003 11	1.041	8/18/09 1530	8/21/09 0920	8/21/09 1950	711	7	2	45
233960013-1	SA145-24B	SAMPLE		SOIL	.5 pCi/g	KERR003 12	1.042	8/18/09 1530	8/21/09 0920	8/21/09 1950	308	3	4	64
233960015-1	RSAH3-0.5B	SAMPLE		SOIL	.5 pCi/g	KERR003 13	1.026	8/18/09 1530	8/21/09 0920	8/21/09 1950	404	4	8	39
233960016-1	RSAH3009-0.5B	SAMPLE		SOIL	.5 pCi/g	KERR003 14	1.064	8/18/09 1530	8/21/09 0920	8/21/09 1950	508	5	8	47
233960017-1	RSAH3-10B	SAMPLE		SOIL	.5 pCi/g	KERR003 15	1.013	8/18/09 1530	8/21/09 0920	8/21/09 1950	601	6	8	39
233960018-1	RSAH3-20B	SAMPLE		SOIL	.5 pCi/g	KERR003 16	1.003	8/18/09 1530	8/21/09 0920	8/21/09 1950	210	2	1	141
233960019-1	RSAH3-32B	SAMPLE		SOIL	.5 pCi/g	KERR003 17	1.011	8/18/09 1530	8/21/09 0920	8/21/09 1950	301	3	4	47
233960020-1	RSA15-0.5B	SAMPLE		SOIL	.5 pCi/g	KERR003 18	1.010	8/18/09 1530	8/21/09 0920	8/21/09 1950	403	4	2	40
1201895479-1	MB for batch 891163	MB		SOIL	.5 pCi/g	QC ACCOUNT 19	1.014	8/18/09 1530	8/21/09 0920	8/21/09 1950	510	5	4	14
1201895480-1	SA145-10B(233960012DUP)	DUP		SOIL	.5 pCi/g	QC ACCOUNT 20	1.033	8/18/09 1530	8/21/09 0920	8/21/09 1950	604	6	4	41
1201895481-1	SA145-10B(233960012MS)	MS		SOIL	.5 pCi/g	QC ACCOUNT 21	1.026	8/18/09 1530	8/21/09 0920	8/21/09 1950	704	7	8	341
1201895482-1	LCS for batch 891163	LCS		SOIL	.5 pCi/g	QC ACCOUNT 22	1.064	8/18/09 1530	8/21/09 0920	8/21/09 1950	806	8	3	307

Comments: _____
 Instrument ID's: _____
 LUCAS1:90988, LUCAS2:136917, LUCAS3:90989, LUCAS4:102753, LUC5:132286, LUC6:170055
 Data Reviewed By: [Signature] 8/21/09
 Page 1 of 1

Radium-226 Solid

Filename : RA226.XLS
 File type : Excel
 Version # : 1.2.4

Spike SN : 0638-H
 Spike Exp Date : 7/17/2010
 Spike Activity (dpm/ml): 268.24
 Spike Volume Added: 0.10

Pipet, 0.1 ml Stdev : +/- 0.000701 ml
 Pipet, 0.5 ml Stdev : +/- 0.002564 ml
 Pipet, 1 ml Stdev : +/- 0.005480 ml

Batch : 891163

Analyst : KSD1

Prep Date : 8/14/2009

Ra-226 Abundance : 1

Ra-226 Method Uncertainty : 0.1153

Procedure Code : LUC26RAS

Parname : Radium-226

Required MDA : 0.5 pCi/G

Half-life of Ra-226 : 1600 years

Half-life of Rn-222 : 3.823 days

Batch counted on : LUCAS CELL DETECTOR

BKG Count time : 30 min

Sample Characteristics			Counting			Weekly Background			Detector			
Pos.	Sample ID	Sample Aliquot G	Sample Aliquot StDev. G	Sample Date/Time	Cell Number	Time (min.)	Gross Counts	Gross CPM	Counts	CPM	Count Time (min.)	Efficiency (cpm/dpm)
1	233960001.1	1.0370	3.3272E-03	7/22/2009 7:07	202	30	36	1.200	8	0.267	30	2.2610
2	233960002.1	1.0130	3.3247E-03	7/22/2009 7:38	305	30	131	4.367	7	0.233	30	2.0570
3	233960003.1	1.0020	3.3235E-03	7/22/2009 7:56	402	30	92	3.067	8	0.267	30	2.1180
4	233960005.1	1.0640	3.3300E-03	7/23/2009 6:53	501	30	41	1.367	4	0.133	30	2.0870
5	233960006.1	1.0110	3.3245E-03	7/23/2009 7:29	605	30	111	3.700	8	0.267	30	2.1490
6	233960007.1	1.0110	3.3245E-03	7/23/2009 7:46	207	30	31	1.033	8	0.267	30	2.1460
7	233960008.1	1.0100	3.3244E-03	7/23/2009 8:17	311	30	41	1.367	8	0.267	30	2.1140
8	233960009.1	1.0080	3.3242E-03	7/23/2009 8:17	410	30	37	1.233	8	0.267	30	1.8860
9	233960010.1	1.0170	3.3251E-03	7/23/2009 9:05	506	30	60	2.000	8	0.267	30	2.0040
10	233960011.1	1.0620	3.3298E-03	7/23/2009 9:28	607	30	238	7.933	8	0.267	30	2.4500
11	233960012.1	1.0210	3.3255E-03	7/23/2009 11:42	211	30	45	1.500	2	0.067	30	2.1710
12	233960013.1	1.0420	3.3277E-03	7/23/2009 12:28	308	30	64	2.133	6	0.200	30	1.9500
13	233960015.1	1.0260	3.3260E-03	7/24/2009 8:08	404	30	39	1.300	8	0.267	30	1.9310
14	233960016.1	1.0640	3.3300E-03	7/24/2009 8:08	508	30	47	1.567	8	0.267	30	1.5840
15	233960017.1	1.0130	3.3247E-03	7/24/2009 8:38	601	30	39	1.300	8	0.267	30	2.1810
16	233960018.1	1.0030	3.3237E-03	7/24/2009 9:10	210	30	141	4.700	1	0.033	30	2.2530
17	233960019.1	1.0110	3.3245E-03	7/24/2009 9:43	301	30	47	1.567	6	0.200	30	2.0210
18	233960020.1	1.0100	3.3244E-03	7/24/2009 12:38	403	30	40	1.333	2	0.067	30	1.4630
19	1201895479.1	1.0640	3.3300E-03	8/14/2009 0:00	512	30	14	0.467	4	0.133	30	1.9560
20	1201895480.1	1.0330	3.3268E-03	7/23/2009 11:42	604	30	41	1.367	6	0.200	30	2.1330
21	1201895481.1	1.0060	3.3240E-03	7/23/2009 11:42	209	15	341	22.733	8	0.267	30	2.2910
22	1201895482.1	1.0640	3.3300E-03	8/14/2009 0:00	306	15	307	20.467	3	0.100	30	1.7470

Detector Efficiency Error (cpm/dpm)	Cell Calibration Date	Cell Calibration Due Date	Rn-222 Ingrow		De-Gas Date/Time	Count Start Date/Time	Count End Date/Time	De-Gas to Ingrow	Rn-222 Corrections Ingrow to Count	During Count	Ra-226 Decay
			Start Date/Time	End Date/Time							
0.07722	12/19/2008	12/19/2009	8/18/2009 15:30	8/21/2009 9:30	8/18/2009 15:30	8/21/2009 12:30	8/21/2009 12:30	0.393	0.978	1.002	1.000
0.06082	2/4/2009	2/4/2010	8/18/2009 15:30	8/21/2009 9:30	8/18/2009 15:30	8/21/2009 12:30	8/21/2009 12:30	0.393	0.978	1.002	1.000
0.12371	3/2/2009	3/2/2010	8/18/2009 15:30	8/21/2009 9:30	8/18/2009 15:30	8/21/2009 12:30	8/21/2009 12:30	0.393	0.978	1.002	1.000
0.14377	3/25/2009	3/25/2010	8/18/2009 15:30	8/21/2009 9:30	8/18/2009 15:30	8/21/2009 12:30	8/21/2009 12:30	0.393	0.978	1.002	1.000
0.06605	8/4/2009	8/4/2010	8/18/2009 15:30	8/21/2009 9:30	8/18/2009 15:30	8/21/2009 12:30	8/21/2009 12:30	0.393	0.978	1.002	1.000
0.07722	12/19/2008	12/19/2009	8/18/2009 15:30	8/21/2009 9:50	8/18/2009 15:30	8/21/2009 13:05	8/21/2009 13:05	0.394	0.976	1.002	1.000
0.06082	2/4/2009	2/4/2010	8/18/2009 15:30	8/21/2009 9:50	8/18/2009 15:30	8/21/2009 13:05	8/21/2009 13:05	0.394	0.976	1.002	1.000
0.12371	3/2/2009	3/2/2010	8/18/2009 15:30	8/21/2009 9:50	8/18/2009 15:30	8/21/2009 13:05	8/21/2009 13:05	0.394	0.976	1.002	1.000
0.14377	3/25/2009	3/25/2010	8/18/2009 15:30	8/21/2009 9:50	8/18/2009 15:30	8/21/2009 13:05	8/21/2009 13:05	0.394	0.976	1.002	1.000
0.06605	8/4/2009	8/4/2010	8/18/2009 15:30	8/21/2009 9:50	8/18/2009 15:30	8/21/2009 13:05	8/21/2009 13:05	0.394	0.976	1.002	1.000
0.07722	12/19/2008	12/19/2009	8/18/2009 15:30	8/21/2009 10:10	8/18/2009 15:30	8/21/2009 13:35	8/21/2009 13:35	0.396	0.975	1.002	1.000
0.06082	2/4/2009	2/4/2010	8/18/2009 15:30	8/21/2009 10:10	8/18/2009 15:30	8/21/2009 13:35	8/21/2009 13:35	0.396	0.975	1.002	1.000
0.12371	3/2/2009	3/2/2010	8/18/2009 15:30	8/21/2009 10:10	8/18/2009 15:30	8/21/2009 13:35	8/21/2009 13:35	0.396	0.975	1.002	1.000
0.14377	3/25/2009	3/25/2010	8/18/2009 15:30	8/21/2009 10:10	8/18/2009 15:30	8/21/2009 13:35	8/21/2009 13:35	0.396	0.975	1.002	1.000
0.06605	8/4/2009	8/4/2010	8/18/2009 15:30	8/21/2009 10:10	8/18/2009 15:30	8/21/2009 13:35	8/21/2009 13:35	0.396	0.975	1.002	1.000
0.07722	12/19/2008	12/19/2009	8/18/2009 15:30	8/21/2009 10:30	8/18/2009 15:30	8/21/2009 14:10	8/21/2009 14:10	0.397	0.973	1.002	1.000
0.06082	2/4/2009	2/4/2010	8/18/2009 15:30	8/21/2009 10:30	8/18/2009 15:30	8/21/2009 14:10	8/21/2009 14:10	0.397	0.973	1.002	1.000
0.12371	3/2/2009	3/2/2010	8/18/2009 15:30	8/21/2009 10:30	8/18/2009 15:30	8/21/2009 14:10	8/21/2009 14:10	0.397	0.973	1.002	1.000
0.14377	3/25/2009	3/25/2010	8/18/2009 15:30	8/21/2009 10:30	8/18/2009 15:30	8/21/2009 14:10	8/21/2009 14:10	0.397	0.973	1.002	1.000
0.06605	8/4/2009	8/4/2010	8/18/2009 15:30	8/21/2009 10:30	8/18/2009 15:30	8/21/2009 14:10	8/21/2009 14:10	0.397	0.973	1.002	1.000
0.07722	12/19/2008	12/19/2009	8/18/2009 15:30	8/21/2009 10:50	8/18/2009 15:30	8/21/2009 14:40	8/21/2009 14:40	0.399	0.971	1.001	1.000
0.06082	2/4/2009	2/4/2010	8/18/2009 15:30	8/21/2009 10:50	8/18/2009 15:30	8/21/2009 14:40	8/21/2009 14:40	0.399	0.971	1.001	1.000

- Notes:
 1 - Results are decay corrected to Sample Date/Time
 2 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date
 3 - Spike Nominals are decay corrected to Sample Date/Time

Pos.	Decision Level		Critical Level	Required MDA	MDA	Sample Act. Conc.	Sample Act. Error	Net Count Rate	Net Count Rate Error	2 SIGMA		2 SIGMA		Sample QC	Sample Type	RPD	RER	Nominal pCi/G	Recovery
	pCi/G	pCi/G								Counting Uncertainty	Total Prop. Uncertainty	CPM	CPM						
1	0.1552	0.1096	0.1096	0.5	0.2691	0.4663	0.2492	0.9333	0.2211	0.2165	0.2509	SAMPLE							
2	0.1634	0.1153	0.1153	0.5	0.2869	2.3236	0.1126	4.1333	0.3916	0.4315	0.7341	SAMPLE							
3	0.1715	0.1211	0.1211	0.5	0.2973	1.5455	0.1717	2.8000	0.3333	0.3606	0.6265	SAMPLE							
4	0.1159	0.0818	0.0818	0.5	0.2164	0.6506	0.2314	1.2333	0.2236	0.2312	0.3297	SAMPLE							
5	0.1675	0.1183	0.1183	0.5	0.2904	1.8511	0.1249	3.4333	0.3636	0.3843	0.6166	SAMPLE							
6	0.1674	0.1182	0.1182	0.5	0.2903	0.4131	0.2823	0.7667	0.2082	0.2199	0.2469	SAMPLE							
7	0.1701	0.1201	0.1201	0.5	0.2949	0.6023	0.2207	1.1000	0.2333	0.2504	0.2939	SAMPLE							
8	0.1910	0.1349	0.1349	0.5	0.3313	0.5945	0.2623	0.9667	0.2236	0.2695	0.3339	SAMPLE							
9	0.1782	0.1258	0.1258	0.5	0.3090	0.9943	0.2141	1.7333	0.2749	0.3090	0.4738	SAMPLE							
10	0.1396	0.0986	0.0986	0.5	0.2420	3.4448	0.0950	7.6667	0.5228	0.4604	1.0086	SAMPLE							
11	0.0817	0.0577	0.0577	0.5	0.1680	0.7540	0.1772	1.4333	0.2285	0.2356	0.3124	SAMPLE							
12	0.1544	0.1090	0.1090	0.5	0.2754	1.1095	0.1566	1.9333	0.2789	0.3137	0.4229	SAMPLE							
13	0.1828	0.1291	0.1291	0.5	0.3170	0.6082	0.2534	1.0333	0.2285	0.2636	0.3319	SAMPLE							
14	0.2219	0.1567	0.1567	0.5	0.3848	0.9287	0.2384	1.3000	0.2472	0.3461	0.4821	SAMPLE							
15	0.1640	0.1158	0.1158	0.5	0.2843	0.5454	0.2308	1.0333	0.2285	0.2364	0.2758	SAMPLE							
16	0.0566	0.0399	0.0399	0.5	0.1314	2.4033	0.1150	4.6667	0.3972	0.4009	0.7670	SAMPLE							
17	0.1532	0.1082	0.1082	0.5	0.2733	0.7784	0.1877	1.3667	0.2427	0.2709	0.3361	SAMPLE							
18	0.1223	0.0864	0.0864	0.5	0.2515	0.9976	0.2107	1.2667	0.2160	0.3335	0.4697	SAMPLE							
19	0.1228	0.0867	0.0867	0.5	0.2294	0.1864	0.4480	0.3333	0.1414	0.1550	0.1690	SAMPLE							
20	0.1421	0.1003	0.1003	0.5	0.2535	0.6162	0.2067	1.1667	0.2285	0.2366	0.2859	DUP	233960012.1	20.1%	0.6378	12.0110	88.0%		
21	0.1918	0.1354	0.1354	0.5	0.3717	11.3263	0.0948	22.4667	1.2347	1.2200	3.3142	MS	233960012.1			11.3560	112.1%		
22	0.1456	0.1028	0.1028	0.5	0.3307	12.7305	0.0837	20.3667	1.1695	1.4328	3.5551	LCS							

METHOD CALIBRATION DATA

ALPHA SPECTROSCOPY

Alpha Spectroscopy Calibration Sources

The following is a summary of the procedure performed for preparing mixed alpha calibration standards:

A calibration stock solution was prepared by combining the following in a volumetric flask and diluting to 50 ml (51.4561 grams). These individual standards were first verified by direct precipitation of small aliquots of each standard (as described in Attachment I).

Isotope	Serial #	amount used (g)	dpm (note 1)
Gd-148	64445-278	0.2471	212.159287
Np-237	4341	1.8075	204.438594
Cm-244	4320A	7.2704	240.144737

Note 1: Dpm values are decay corrected to 2/7/2003.

Forty one weighted aliquots were then directly precipitated using Neodymium Flouride /HF system. The sources were then mounted on 0.1Poly-propylene filters and taped securely to 1 inch stainless steel planchettes for counting in an Alpha Spectroscopy system. The liquid fraction that passes through the filter is collected, traced with Am-241 and prepared for counting using the identical procedure. These samples are counted to ensure there is no more than 1% loss in the filtering processes. All sources pass this requirement. The DPM information for each source is listed in attachment II.

Certificate files were then created on the Alpha system used for acquisition and processing of data. Each source is assigned a name (AESS-001 through AESS-041). The information for the source activities is entered into the certificate files appropriate for the detector being used.

For example: If source AESS-001 is used for calibrating detector 25, the source data is entered into the certificate file name [env_alpha.cer]U025.cer.

The computer software uses these certificate files to calculate an energy calibration and determine the efficiency of the detector after counting the source.

Ante Hill
4/1/03

2002 Alpha Eff Source Stock Verification

Curium-244

Isotope	Value pCi/g
SSTOCK2002A2_AM	106.000
SSTOCK2002B2_AM	106.000
SSTOCK2002C2_AM	106.000

Mean Value (Counting) = 106.000 98.04%
 Stdev = 0 pCi/g

Target = 108.1230
 Lower Limit = 106
 Upper Limit = 106
 Rule 1 Pass/Fail Pass
 Two sigma = 0
 10 % of Mean = 10.6
 Rule 2 (Pass/Fail) Pass

PASS
 ① Fair 3.5/10

Neptunium-237

Isotope	Value pCi/g
SSTOCK2002A2_AM	90.100
SSTOCK2002B2_AM	87.200
SSTOCK2002C2_AM	93.500

Mean Value (Counting) = 90.267 98.02%
 Stdev = 3.153305144 pCi/g

Target = 92.0900
 Lower Limit = 83.96005638
 Upper Limit = 96.57327696
 Rule 1 Pass/Fail Pass
 Two sigma = 6.306610289
 10 % of Mean = 9.026666667
 Rule 2 (Pass/Fail) Pass

Gadolinium-148

Isotope	Value pCi/g
SSTOCK2002A2_AM	95.080
SSTOCK2002B2_AM	93.750
SSTOCK2002C2_AM	96.560

Mean Value (Counting) = 95.463 99.81%
 Stdev = 1.503074627 pCi/g

Target = 95.6460
 Lower Limit = 92.45718408
 Upper Limit = 98.46948259
 Rule 1 Pass/Fail Pass
 Two sigma = 3.006148253
 10 % of Mean = 9.546333333
 Rule 2 (Pass/Fail) Pass

The analyst prepared three standard verification sources for the mixed alpha stock standard using 0.1030 g for source #1, 0.1035 g for source #2 and 0.1028 g for source #3. Each standard was combined with 1.0 mL of Am-243 standard 0454-A and 0.1 mL of Nd carrier in a disposable centrifuge tube. Four mL of 2 M HCl was added to each standard and then diluted with 4 mL of DI water. 5 mL of ascorbic acid was added to each sample then one mL of 48% HF was added to precipitate Nd (and Curium) fluoride. After 30 minutes, each sample was filtered following routine procedures for alpha spectroscopy source preparation. Each source was counted using routine alpha spec procedures. pCi/L values for the Mixed Alpha Stock were calculated and compared to Am-243 certified values.

① The rule failed because the 3 results from 3 sources were the same. Therefore, the stdev was zero. The intent of this rule is to ensure an appropriate amount of counts are achieved for proper determinations. ~~Since~~ For each standard the # of counts achieved was

Just under 10000 which has a counting error of nearly 1%. Because the standard's bias is < 2% from the known value the standard is acceptable.

Robert J. ... 02103

Attachment II

Mixed alpha Reference date = 2/7/2003		Stock Dpm/g	Reference date	Half-life (years)	amount used for mixed	Dpm/g mixed	Decay corr dpm/g
Isotope	Source						
Gd-148	64445-278 (0502)	44354.59289	9/5/2002	74.60	0.2471	212.9974853	212.159287
Np-237	Srm 4341 (0493)	5820	3/1/1992	2.14E+06	1.8075	204.4393182	204.438594
Cm-244	SRM 4320a (0490)	2223.6	2/1/1996	18.1	7.2704	314.1796879	240.144737
Source	Amount of standard used	dpm Gd-148	dpm Np-237	dpm Cm-244	dps Gd-148	dps Np-237	dps Cm-244
AESS-001	1.0362	219.839	211.839	248.838	3.664	3.531	4.147
AESS-002	1.0344	219.458	211.471	248.406	3.658	3.525	4.140
AESS-003	1.034	219.373	211.390	248.310	3.656	3.523	4.138
AESS-004	1.0331	219.182	211.206	248.094	3.653	3.520	4.135
AESS-005	1.0353	219.649	211.655	248.622	3.661	3.528	4.144
AESS-006	1.0331	219.182	211.206	248.094	3.653	3.520	4.135
AESS-007	1.0348	219.542	211.553	248.502	3.659	3.526	4.142
AESS-008	1.0363	219.861	211.860	248.862	3.664	3.531	4.148
AESS-009	1.0352	219.627	211.635	248.598	3.660	3.527	4.143
AESS-010	1.0346	219.500	211.512	248.454	3.658	3.525	4.141
AESS-011	1.0353	219.649	211.655	248.622	3.661	3.528	4.144
AESS-012	1.0367	219.946	211.941	248.958	3.666	3.532	4.149
AESS-013	1.0396	220.561	212.534	249.654	3.676	3.542	4.161
AESS-014	1.0368	219.967	211.962	248.982	3.666	3.533	4.150
AESS-015	1.0363	219.861	211.860	248.862	3.664	3.531	4.148
AESS-016	1.0353	219.649	211.655	248.622	3.661	3.528	4.144
AESS-017	1.0356	219.712	211.717	248.694	3.662	3.529	4.145
AESS-018	1.0359	219.776	211.778	248.766	3.663	3.530	4.146
AESS-019	1.0349	219.564	211.574	248.526	3.659	3.526	4.142
AESS-020	1.0361	219.818	211.819	248.814	3.664	3.530	4.147
AESS-021	1.0348	219.542	211.553	248.502	3.659	3.526	4.142
AESS-022	1.0353	219.649	211.655	248.622	3.661	3.528	4.144
AESS-023	1.0353	219.649	211.655	248.622	3.661	3.528	4.144
AESS-024	1.0343	219.436	211.451	248.382	3.657	3.524	4.140
AESS-025	1.0364	219.882	211.880	248.886	3.665	3.531	4.148
AESS-026	1.0336	219.288	211.308	248.214	3.655	3.522	4.137
AESS-027	1.0353	219.649	211.655	248.622	3.661	3.528	4.144
AESS-028	1.0366	219.924	211.921	248.934	3.665	3.532	4.149

Attachment II

AESS-029	1.0355	219.691	211.696	248.670	3.662	3.528	4.144
AESS-030	1.0349	219.564	211.574	248.526	3.659	3.526	4.142
AESS-031	1.0343	219.436	211.451	248.382	3.657	3.524	4.140
AESS-032	1.0326	219.076	211.103	247.973	3.651	3.518	4.133
AESS-033	1.0308	218.694	210.735	247.541	3.645	3.512	4.126
AESS-034	1.0314	218.821	210.858	247.685	3.647	3.514	4.128
AESS-035	1.0303	218.588	210.633	247.421	3.643	3.511	4.124
AESS-036	1.0343	219.436	211.451	248.382	3.657	3.524	4.140
AESS-037	1.0353	219.649	211.655	248.622	3.661	3.528	4.144
AESS-038	1.0373	220.073	212.064	249.102	3.668	3.534	4.152
AESS-039	1.0334	219.245	211.267	248.166	3.654	3.521	4.136
AESS-040	1.0346	219.500	211.512	248.454	3.658	3.525	4.141
AESS-041	1.0352	219.627	211.635	248.598	3.660	3.527	4.143



0490
0491

National Institute of Standards & Technology

Certificate

Standard Reference Material 4320A Curium-244 Radioactivity Standard

This Standard Reference Material (SRM) consists of radioactive curium-244 nitrate and nitric acid dissolved in 5 mL of distilled water. The solution is contained in a flame-sealed NIST borosilicate-glass ampoule. The SRM is intended for the calibration of alpha-particle counting instruments and for the monitoring of radiochemical procedures.

Radiological Hazard

The SRM ampoule contains curium-244 with a total activity of approximately 200 Bq. Curium-244 decays by alpha-particle emission to plutonium-240, which also decays by alpha-particle emission. None of the alpha particles escape from the SRM ampoule. During the decay process X-rays and gamma rays with energies from 40 keV to 1100 keV are also emitted. Most of these photons escape from the SRM ampoule but their intensities are so small that they do not represent a radiation hazard. Approximate unshielded dose rates at several distances (as of the reference time) are given in note [a]*. The SRM should be used only by persons qualified to handle radioactive material.

Chemical Hazard

The SRM ampoule contains nitric acid (HNO_3) with a concentration of 1 mole per liter of water. The solution is corrosive and represents a health hazard if it comes in contact with eyes or skin. If the ampoule is to be opened to transfer the solution, the recommended procedure is given on page 2. The ampoule should be opened only by persons qualified to handle both radioactive material and strong acid solution.

Storage and Handling

The SRM should be stored and used at a temperature between 5 and 65 °C. The solution in an unopened ampoule should remain stable and homogeneous until at least February 2006.

The ampoule (or any subsequent container) should always be clearly marked as containing radioactive material. If the ampoule is transported it should be packed, marked, labeled, and shipped in accordance with the applicable national, international, and carrier regulations. The solution in the ampoule is a dangerous good (hazardous material) both because of the radioactivity and because of the strong acid.

Preparation

This Standard Reference Material was prepared in the Physics Laboratory, Ionizing Radiation Division, Radioactivity Group, J.M.R. Hutchinson, Group Leader. The overall technical direction and physical measurements leading to certification were provided by L.L. Lucas of the Radioactivity Group.

The support aspects involved in the preparation, certification, and issuance of this SRM were coordinated through the Standard Reference Materials Program by N.M. Trahey.

Gaithersburg, Maryland 20899
February 1996 (Text only revised November 1997)

Thomas E. Gills, Chief
Standard Reference Materials Program

Recommended Procedure for Opening the SRM Ampoule

- 1) If the SRM solution is to be diluted, it is recommended that the diluting solution have a composition comparable to that of the SRM solution.
- 2) Wear eye protection, gloves, and protective clothing and work over a tray with absorbent paper in it. Work in a fume hood. In addition to the radioactive material, the solution contains strong acid and is corrosive.
- 3) Shake the ampoule to wet all of the inside surface of the ampoule. Return the ampoule to the upright position.
- 4) Check that all of the liquid has drained out of the neck of the ampoule. If necessary, gently tap the neck to speed the process.
- 5) Holding the ampoule upright, score the narrowest part of the neck with a scribe or diamond pencil.
- 6) Lightly wet the scored line. This reduces the crack propagation velocity and makes for a cleaner break.
- 7) Hold the ampoule upright with a paper towel, a wiper, or a support jig. Position the scored line away from you. Using a paper towel or wiper to avoid contamination, snap off the top of the ampoule by pressing the narrowest part of the neck away from you while pulling the tip of the ampoule towards you.
- 8) Transfer the solution from the ampoule using a pycnometer or a pipet with dispenser handle.
NEVER PIPETTE BY MOUTH
- 9) Seal any unused SRM solution in a flame-sealed glass ampoule, if possible, to minimize the evaporation loss.

See also reference [4]*.

PROPERTIES OF SRM 4320A
(Certified values are shown in bold type)

Source identification number	NIST SRM 4320A		
Physical Properties:			
Source description	Liquid in flame-sealed NIST borosilicate-glass ampoule		
Ampoule specifications	Body outside diameter	(16.5 ± 0.5) mm	
	Wall Thickness	(0.60 ± 0.04) mm	
	Barium content	Less than 2.5%	
	Lead-oxide content	Less than 0.02%	
	Other heavy elements	Trace quantities	
Solution density	(1.030 ± 0.002) g·mL ⁻¹ at 22.8 °C [b]*		
Solution mass	Approximately 5.15 g		
Chemical Properties:			
Solution composition	Chemical Formula	Concentration (mol·L ⁻¹)	Mass Fraction (g·g ⁻¹)
	H ₂ O	54	0.94
	HNO ₃	1.0	0.06
	HCl	<0.001	<4 × 10 ⁻⁵
	²⁴⁴ Cm +3	5 × 10 ⁻¹¹	1 × 10 ⁻¹¹
Radiological Properties:			
Radionuclide	Curium-244		
Reference time	1230 EST, 1 February 1996 [c]		
Massic activity of the solution [d]	37.06 Bq·g ⁻¹ 24.12 Bq·g ⁻¹		
Relative expanded uncertainty (k=2)	0.68% [e] [f]		
Alpha-particle-emitting daughters	Plutonium-240: (0.22 ± 0.11) Bq·g ⁻¹ [b] [c]		
Alpha-particle-emitting impurities	Curium-243: (0.005 ± 0.004) Bq·g ⁻¹ [b] [g]		
Photon-emitting impurities	None detected [h]		
Half lives used in the decay corrections	Curium-244: (18.10 ± 0.02) a [i] Plutonium-240: (6563 ± 7) a [i]		
Calibration method	Two 4π liquid-scintillation counting systems		

37.06 x 2 2004
6

- [i] The stated uncertainty is the standard uncertainty. See reference [5].
- [j] Relative standard uncertainty of the input quantity x_i .
- [k] The relative change in the output quantity y divided by the relative change in the input quantity x_i . If $|\partial y/\partial x_i| \cdot (x_i/y) = 1.0$, then a 1% change in x_i results in a 1% change in y . If $|\partial y/\partial x_i| \cdot (x_i/y) = 0.05$, then a 1% change in x_i results in a 0.05% change in y .
- [m] Relative component of combined standard uncertainty of output quantity y , rounded to two significant figures or less. The relative component of combined standard uncertainty of y is given by $u_i(y)/y = |\partial y/\partial x_i| \cdot u(x_i)/y = |\partial y/\partial x_i| \cdot (x_i/y) \cdot u(x_i)/x_i$. The numerical values of $u(x_i)/x_i$, $|\partial y/\partial x_i| \cdot (x_i/y)$, and $u_i(y)/y$, all dimensionless quantities, are listed in columns 3, 4, and 5, respectively. Thus, the value in column 5 is equal to the value in column 4 multiplied by the value in column 3. The input quantities are independent, or very nearly so. Hence the covariances are zero or negligible.
- [n] The relative standard uncertainty of $\lambda \cdot t$ is determined by the relative standard uncertainty of λ (i.e., of the half life). The relative standard uncertainty of t is negligible.
- [p] $|\partial y/\partial x_i| \cdot (x_i/y) = |\lambda \cdot t|$
- [q] The live time is determined by counting the pulses from a gated oscillator.
- [r] The standard uncertainty given is for the detected Cm-243 impurity. $|\partial y/\partial x_i| \cdot (x_i/y) = \{(\text{response per Bq of impurity})/(\text{response per Bq of Cm-244})\} \cdot \{(\text{Bq of impurity})/(\text{Bq of Cm-244})\}$.
- [s] The standard uncertainty for each undetected impurity that might reasonably be expected to be present is estimated to be equal to the estimated limit of detection for that impurity, i.e. $u(x_i)/x_i = 100\%$. $|\partial y/\partial x_i| \cdot (x_i/y) = \{(\text{response per Bq of impurity})/(\text{response per Bq of Cm-244})\} \cdot \{(\text{Bq of impurity})/(\text{Bq of Cm-244})\}$. Thus $u_i(y)/y$ is the relative change in y if the impurity were present with a massic activity equal to the estimated limit of detection.

REFERENCES

- [1] International Organization for Standardization (ISO), *ISO Standards Handbook - Quantities and Units*, 1993. Available from the American National Standards Institute, 11 West 42nd Street, New York, NY 10036, U.S.A. 1-212-642-4900.
- [2] International Organization for Standardization (ISO), *Guide to the Expression of Uncertainty in Measurement*, 1993. Available from the American National Standards Institute, 11 West 42nd Street, New York, NY 10036, U.S.A. 1-212-642-4900. (Listed under ISO miscellaneous publications as "ISO Guide to the Expression 1993".)
- [3] B. N. Taylor and C. E. Kuyatt, *Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results*, NIST Technical Note 1297, 1994. Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20407, U.S.A.
- [4] National Council on Radiation Protection and Measurements Report No. 58, *A Handbook of Radioactivity Measurements Procedures*, Second Edition, 1985. Available from the National Council on Radiation Protection and Measurements, 7910 Woodmont Avenue, Bethesda, MD 20814 U.S.A.
- [5] Evaluated Nuclear Structure Data File (ENSDF), February 1996.

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

64445-278

Gd-148 5 mL Liquid in Flame Sealed Vial

This standard radionuclide source was prepared gravimetrically from a calibrated master liquid radionuclide solution source. The master source was calibrated by liquid scintillation counting.

ANALYTICS maintains traceability to the National Institute of Standards and Technology through Measurements Assurance Programs as described in USNRC Reg. Guide 4.15, Revision 1.

Radionuclide purity and calibration were checked using a germanium gamma spectrometer system. The nuclear decay rate and assay date for this source are given below.

ISOTOPE:	Gd-148
ACTIVITY (dps):	3.759-E3
HALF-LIFE:	74.6 years
CALIBRATION DATE:	September 5, 2002 12:00 EST
TOTAL UNCERTAINTY*:	2.7%
SYSTEMATIC:	1.9%
RANDOM:	0.8%

99% confidence level.

5.08493 grams 0.1M HCl solution.

P O NUMBER 3207RD, Item 1

SOURCE PREPARED BY:

25
31
30
31
31
7:

115

M.D. Currie
M.D. Currie, Radiochemist

Q A APPROVED:

W.M. [Signature] 9-6-02

0493



National Institute of Standards & Technology

Certificate

Standard Reference Material 4341 Radioactivity Standard

Radionuclide	Neptunium-237
Source identification	SRM 4341
Source description	Liquid in flame-sealed NIST borosilicate-glass ampoule ^{(1)*}
Solution mass	Approximately 5 grams
Solution composition	Neptunium-237 in 2 mol·L ⁻¹ nitric acid
Reference time	March 1992
Radioactivity concentration	97.0 Bq·g ⁻¹
Overall uncertainty	1.28 percent ⁽²⁾
Photon-emitting impurities	None detected ⁽³⁾
Alpha-particle-emitting impurities	None detected ⁽⁴⁾
Half life	(2.14 ± 0.11) × 10 ⁶ years ⁽⁵⁾
Measuring instrument	NIST "0.8π" α defined-solid-angle counter with scintillation detector

This standard reference material was prepared in the Physics Laboratory, Ionizing Radiation Division, Radioactivity Group, J.M. Robin Hutchinson, Acting Group Leader.

Gaithersburg, MD
January 1993

William P. Reed, Chief
Standard Reference Materials Program

*Notes on back

NOTES

- (1) Approximately five milliliters of solution. Ampoule specifications:
- | | |
|----------------------|------------------------|
| body diameter | 16.5 ± 0.5 mm |
| wall thickness | 0.60 ± 0.04 mm |
| barium content | less than 2.5 percent |
| lead oxide content | less than 0.02 percent |
| other heavy elements | trace quantities |
- (2) The overall uncertainty was formed by taking three times the quadratic combination of the standard deviations of the mean, or approximations thereof, for the following:
- | | |
|--|--------------|
| a) alpha-particle-emission-rate measurements | 0.34 percent |
| b) background | 0.01 percent |
| c) livetime | 0.10 percent |
| d) detection efficiency | 0.16 percent |
| e) count-rate-vs-energy extrapolation to zero energy | 0.10 percent |
| f) half life | 0.00 percent |
| g) gravimetric measurements | 0.10 percent |
| h) alpha-emitting impurities | 0.10 percent |
- (3) The protactinium-233 daughter of neptunium-237 is approximately in equilibrium.
The limit of detection for photon-emitting impurities is
- $0.19 \text{ } \gamma \cdot \text{s}^{-1} \cdot \text{g}^{-1}$ for energies between 30 and 307 keV and
 $0.01 \text{ } \gamma \cdot \text{s}^{-1} \cdot \text{g}^{-1}$ for energies between 317 and 1750 keV,
provided that the impurity photons are separated in energy by 5 keV or more
from photons emitted in the decay of neptunium-237 and progeny.
- (4) The limit of detection for alpha-particle-emitting impurities is
- $0.10 \text{ } \alpha \cdot \text{s}^{-1} \cdot \text{g}^{-1}$ for energies between 1.0 and 4.3 MeV and
 $0.05 \text{ } \alpha \cdot \text{s}^{-1} \cdot \text{g}^{-1}$ for energies between 4.9 and 10 MeV.
- (5) Evaluated Nuclear Structure Data File (ENSDF), February 1990.

For further information please contact Dr. J.M. Robin Hutchinson at NIST.
Telephone: (301) 975-5532
FAX: (301) 926-7416

Subsection 1: Energy Calibration

The Energy Calibration energy=Cal_Zero+(e1*C)+(e2*C^2)

where : Cal_Zero = Energy Calibration Zero
e1 = Energy Calibration Slope
e2 = Energy Calibration Quadratic
C = Channel

Instrument : CHAMBER 001
Detector : 78788
Calibration Date/Time : 5-AUG-2009 14:45:15
Calibration Source Id : AESS-001

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.768
NP-237	4341	2/28/10	4768.800	4768.589
CM-244	4320A	2/28/10	5795.020	5794.928

Energy/Channel Equation : see above
Energy Calibration Zero : 2541.111
Energy Calibration Slope : 5.103021
Energy Calibration Quadratic : 3.7696620E-04
Energy Calibration Range : 8162.000

Instrument : CHAMBER 002
Detector : 78266
Calibration Date/Time : 5-AUG-2009 14:45:26
Calibration Source Id : AESS-002

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3174.754
NP-237	4341	2/28/10	4768.800	4760.313
CM-244	4320A	2/28/10	5795.020	5783.900

Energy/Channel Equation : see above
Energy Calibration Zero : 2454.309
Energy Calibration Slope : 5.127246
Energy Calibration Quadratic : 2.9634204E-04
Energy Calibration Range : 8015.000

Instrument : CHAMBER 003
Detector : 67617
Calibration Date/Time : 5-AUG-2009 14:45:38
Calibration Source Id : AESS-003

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3181.710
NP-237	4341	2/28/10	4768.800	4767.829
CM-244	4320A	2/28/10	5795.020	5794.321

Energy/Channel Equation : see above
Energy Calibration Zero : 2595.909
Energy Calibration Slope : 5.495871
Energy Calibration Quadratic : 3.8085488E-04
Energy Calibration Range : 8623.000

Instrument : CHAMBER 004
 Detector : 64279
 Calibration Date/Time : 5-AUG-2009 14:45:54
 Calibration Source Id : AESS-004

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.926
NP-237	4341	2/28/10	4768.800	4769.257
CM-244	4320A	2/28/10	5795.020	5795.158

Energy/Channel Equation : see above
 Energy Calibration Zero : 2531.198
 Energy Calibration Slope : 5.085382
 Energy Calibration Quadratic : 3.7076508E-04
 Energy Calibration Range : 8127.000

Instrument : CHAMBER 005
 Detector : 67612
 Calibration Date/Time : 5-AUG-2009 14:46:05
 Calibration Source Id : AESS-005

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.615
NP-237	4341	2/28/10	4768.800	4768.917
CM-244	4320A	2/28/10	5795.020	5795.262

Energy/Channel Equation : see above
 Energy Calibration Zero : 2383.824
 Energy Calibration Slope : 5.018230
 Energy Calibration Quadratic : 2.9044802E-04
 Energy Calibration Range : 7827.000

Instrument : CHAMBER 006
 Detector : 67613
 Calibration Date/Time : 5-AUG-2009 14:46:15
 Calibration Source Id : AESS-006

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.663
NP-237	4341	2/28/10	4768.800	4768.540
CM-244	4320A	2/28/10	5795.020	5794.813

Energy/Channel Equation : see above
 Energy Calibration Zero : 2372.455
 Energy Calibration Slope : 4.968300
 Energy Calibration Quadratic : 3.0602218E-04
 Energy Calibration Range : 7781.000

Instrument : CHAMBER 007
 Detector : 67607
 Calibration Date/Time : 3-AUG-2009 15:08:14
 Calibration Source Id : AESS-007

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.242
NP-237	4341	2/28/10	4768.800	4768.799
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2434.070
 Energy Calibration Slope : 5.126286
 Energy Calibration Quadratic : 3.2231462E-04
 Energy Calibration Range : 8021.000

Instrument : CHAMBER 008
 Detector : 78788
 Calibration Date/Time : 3-AUG-2009 15:08:25
 Calibration Source Id : AESS-008

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.886
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2371.872
 Energy Calibration Slope : 4.982497
 Energy Calibration Quadratic : 2.9716187E-04
 Energy Calibration Range : 7786.000

Instrument : CHAMBER 009
 Detector : 72528
 Calibration Date/Time : 3-AUG-2009 15:08:37
 Calibration Source Id : AESS-009

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2376.048
 Energy Calibration Slope : 4.954385
 Energy Calibration Quadratic : 3.3214918E-04
 Energy Calibration Range : 7798.000

Instrument : CHAMBER 010
 Detector : 72529
 Calibration Date/Time : 3-AUG-2009 15:08:47
 Calibration Source Id : AESS-010

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.799
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2369.197
 Energy Calibration Slope : 4.976785
 Energy Calibration Quadratic : 2.5434556E-04
 Energy Calibration Range : 7732.000

Instrument : CHAMBER 011
 Detector : 72531
 Calibration Date/Time : 3-AUG-2009 15:10:05
 Calibration Source Id : AESS-011

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.798
CM-244	4320A	2/28/10	5795.020	5794.773

Energy/Channel Equation : see above
 Energy Calibration Zero : 2352.745
 Energy Calibration Slope : 4.989676
 Energy Calibration Quadratic : 3.1640983E-04
 Energy Calibration Range : 7794.000

Instrument : CHAMBER 012
 Detector : 67594
 Calibration Date/Time : 3-AUG-2009 15:10:47
 Calibration Source Id : AESS-012

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.999
NP-237	4341	2/28/10	4768.800	4768.892
CM-244	4320A	2/28/10	5795.020	5795.162

Energy/Channel Equation : see above
 Energy Calibration Zero : 2380.763
 Energy Calibration Slope : 4.944053
 Energy Calibration Quadratic : 2.9969949E-04
 Energy Calibration Range : 7758.000

Instrument : CHAMBER 013
 Detector : 78790
 Calibration Date/Time : 3-AUG-2009 15:10:57
 Calibration Source Id : AESS-013
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3182.313
 NP-237 4341 2/28/10 4768.800 4768.407
 CM-244 4320A 2/28/10 5795.020 5794.604

 Energy/Channel Equation : see above
 Energy Calibration Zero : 2363.188
 Energy Calibration Slope : 4.918418
 Energy Calibration Quadratic : 2.9963398E-04
 Energy Calibration Range : 7714.000

Instrument : CHAMBER 014
 Detector : 67616
 Calibration Date/Time : 3-AUG-2009 15:11:09
 Calibration Source Id : AESS-014
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.775
 NP-237 4341 2/28/10 4768.800 4769.221
 CM-244 4320A 2/28/10 5795.020 5795.274

 Energy/Channel Equation : see above
 Energy Calibration Zero : 2348.951
 Energy Calibration Slope : 4.947984
 Energy Calibration Quadratic : 3.1622496E-04
 Energy Calibration Range : 7747.000

Instrument : CHAMBER 015
 Detector : 61581
 Calibration Date/Time : 3-AUG-2009 15:11:19
 Calibration Source Id : AESS-015
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3182.428
 NP-237 4341 2/28/10 4768.800 4768.094
 CM-244 4320A 2/28/10 5795.020 5794.472

 Energy/Channel Equation : see above
 Energy Calibration Zero : 2351.056
 Energy Calibration Slope : 4.893757
 Energy Calibration Quadratic : 3.2378119E-04
 Energy Calibration Range : 7702.000

Instrument : CHAMBER 016
 Detector : 78774
 Calibration Date/Time : 3-AUG-2009 15:11:28
 Calibration Source Id : AESS-016

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.555
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2352.841
 Energy Calibration Slope : 4.901042
 Energy Calibration Quadratic : 2.9683873E-04
 Energy Calibration Range : 7683.000

Instrument : CHAMBER 017
 Detector : 78791
 Calibration Date/Time : 3-AUG-2009 15:12:45
 Calibration Source Id : AESS-017

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.274
NP-237	4341	2/28/10	4768.800	4768.745
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2363.135
 Energy Calibration Slope : 4.992663
 Energy Calibration Quadratic : 2.7446265E-04
 Energy Calibration Range : 7763.000

Instrument : CHAMBER 018
 Detector : 78782
 Calibration Date/Time : 3-AUG-2009 15:12:56
 Calibration Source Id : AESS-018

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.695
NP-237	4341	2/28/10	4768.800	4768.801
CM-244	4320A	2/28/10	5795.020	5795.113

Energy/Channel Equation : see above
 Energy Calibration Zero : 2352.853
 Energy Calibration Slope : 4.963830
 Energy Calibration Quadratic : 3.1513936E-04
 Energy Calibration Range : 7766.000

Instrument : CHAMBER 019
 Detector : 78786
 Calibration Date/Time : 3-AUG-2009 15:13:21
 Calibration Source Id : AESS-019
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.801
 CM-244 4320A 2/28/10 5795.020 5794.625

 Energy/Channel Equation : see above
 Energy Calibration Zero : 2342.911
 Energy Calibration Slope : 5.075375
 Energy Calibration Quadratic : 2.0290195E-04
 Energy Calibration Range : 7753.000

Instrument : CHAMBER 020
 Detector : 78787
 Calibration Date/Time : 3-AUG-2009 15:13:30
 Calibration Source Id : AESS-020
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3182.407
 NP-237 4341 2/28/10 4768.800 4768.798
 CM-244 4320A 2/28/10 5795.020 5794.754

 Energy/Channel Equation : see above
 Energy Calibration Zero : 2341.178
 Energy Calibration Slope : 4.974929
 Energy Calibration Quadratic : 3.0557165E-04
 Energy Calibration Range : 7756.000

Instrument : CHAMBER 021
 Detector : 67047
 Calibration Date/Time : 3-AUG-2009 15:13:40
 Calibration Source Id : AESS-021
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3182.625
 NP-237 4341 2/28/10 4768.800 4768.133
 CM-244 4320A 2/28/10 5795.020 5794.606

 Energy/Channel Equation : see above
 Energy Calibration Zero : 2275.519
 Energy Calibration Slope : 4.971471
 Energy Calibration Quadratic : 2.7405904E-04
 Energy Calibration Range : 7654.000

Instrument : CHAMBER 022
 Detector : 72530
 Calibration Date/Time : 3-AUG-2009 15:13:53
 Calibration Source Id : AESS-022

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.547
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2376.547
 Energy Calibration Slope : 4.977059
 Energy Calibration Quadratic : 2.7739155E-04
 Energy Calibration Range : 7764.000

Instrument : CHAMBER 023
 Detector : 78264
 Calibration Date/Time : 3-AUG-2009 15:14:51
 Calibration Source Id : AESS-023

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.979
NP-237	4341	2/28/10	4768.800	4768.454
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2383.134
 Energy Calibration Slope : 4.999145
 Energy Calibration Quadratic : 2.8956190E-04
 Energy Calibration Range : 7806.000

Instrument : CHAMBER 024
 Detector : 76542
 Calibration Date/Time : 3-AUG-2009 15:15:01
 Calibration Source Id : AESS-024

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.799
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2348.727
 Energy Calibration Slope : 4.965035
 Energy Calibration Quadratic : 2.7366623E-04
 Energy Calibration Range : 7720.000

Instrument : CHAMBER 025
 Detector : 45-149AA5
 Calibration Date/Time : 3-AUG-2009 15:15:13
 Calibration Source Id : AESS-025

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.326
NP-237	4341	2/28/10	4768.800	4769.288
CM-244	4320A	2/28/10	5795.020	5795.321

Energy/Channel Equation : see above
 Energy Calibration Zero : 2318.480
 Energy Calibration Slope : 4.856905
 Energy Calibration Quadratic : 3.0368069E-04
 Energy Calibration Range : 7610.000

Instrument : CHAMBER 026
 Detector : 78204
 Calibration Date/Time : 3-AUG-2009 15:15:23
 Calibration Source Id : AESS-026

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.821
CM-244	4320A	2/28/10	5795.020	5795.028

Energy/Channel Equation : see above
 Energy Calibration Zero : 2356.528
 Energy Calibration Slope : 4.940171
 Energy Calibration Quadratic : 3.3160963E-04
 Energy Calibration Range : 7763.000

Instrument : CHAMBER 027
 Detector : 42484
 Calibration Date/Time : 3-AUG-2009 15:15:36
 Calibration Source Id : AESS-027

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.779
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2362.956
 Energy Calibration Slope : 4.971167
 Energy Calibration Quadratic : 3.1741365E-04
 Energy Calibration Range : 7786.000

Instrument : CHAMBER 028
 Detector : 78792
 Calibration Date/Time : 3-AUG-2009 15:15:45
 Calibration Source Id : AESS-028
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.319
 NP-237 4341 2/28/10 4768.800 4768.977
 CM-244 4320A 2/28/10 5795.020 5795.122

 Energy/Channel Equation : see above
 Energy Calibration Zero : 2311.473
 Energy Calibration Slope : 4.929708
 Energy Calibration Quadratic : 3.5385601E-04
 Energy Calibration Range : 7731.000

Instrument : CHAMBER 029
 Detector : 33454
 Calibration Date/Time : 3-AUG-2009 15:15:55
 Calibration Source Id : AESS-029
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3184.453
 NP-237 4341 2/28/10 4768.800 4773.209
 CM-244 4320A 2/28/10 5795.020 5802.449

 Energy/Channel Equation : see above
 Energy Calibration Zero : 2339.797
 Energy Calibration Slope : 4.857889
 Energy Calibration Quadratic : 3.2029144E-04
 Energy Calibration Range : 7650.000

Instrument : CHAMBER 030
 Detector : 33447
 Calibration Date/Time : 3-AUG-2009 15:16:05
 Calibration Source Id : AESS-030
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3182.504
 NP-237 4341 2/28/10 4768.800 4768.116
 CM-244 4320A 2/28/10 5795.020 5794.519

 Energy/Channel Equation : see above
 Energy Calibration Zero : 2378.547
 Energy Calibration Slope : 4.952705
 Energy Calibration Quadratic : 3.1284252E-04
 Energy Calibration Range : 7778.000

Instrument : CHAMBER 031
 Detector : 67042
 Calibration Date/Time : 3-AUG-2009 15:16:16
 Calibration Source Id : AESS-031
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.466
 NP-237 4341 2/28/10 4768.800 4769.878
 CM-244 4320A 2/28/10 5795.020 5796.077

 Energy/Channel Equation : see above
 Energy Calibration Zero : 2364.033
 Energy Calibration Slope : 4.931703
 Energy Calibration Quadratic : 3.3940026E-04
 Energy Calibration Range : 7770.000

Instrument : CHAMBER 032
 Detector : 67041
 Calibration Date/Time : 3-AUG-2009 15:16:28
 Calibration Source Id : AESS-032
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.801
 CM-244 4320A 2/28/10 5795.020 5795.020

 Energy/Channel Equation : see above
 Energy Calibration Zero : 2370.812
 Energy Calibration Slope : 4.912539
 Energy Calibration Quadratic : 3.7134811E-04
 Energy Calibration Range : 7791.000

Instrument : CHAMBER 033
 Detector : 78785
 Calibration Date/Time : 3-AUG-2009 15:16:44
 Calibration Source Id : AESS-033
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.937
 CM-244 4320A 2/28/10 5795.020 5795.020

 Energy/Channel Equation : see above
 Energy Calibration Zero : 2376.592
 Energy Calibration Slope : 4.933960
 Energy Calibration Quadratic : 3.4911980E-04
 Energy Calibration Range : 7795.000

Instrument : CHAMBER 034
 Detector : 61586
 Calibration Date/Time : 3-AUG-2009 15:16:57
 Calibration Source Id : AESS-034
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3182.237
 NP-237 4341 2/28/10 4768.800 4768.352
 CM-244 4320A 2/28/10 5795.020 5794.135
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2382.364
 Energy Calibration Slope : 5.064843
 Energy Calibration Quadratic : 3.7605409E-04
 Energy Calibration Range : 7963.000

Instrument : CHAMBER 035
 Detector : 78202
 Calibration Date/Time : 3-AUG-2009 15:17:07
 Calibration Source Id : AESS-035
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.976
 CM-244 4320A 2/28/10 5795.020 5795.068
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2332.455
 Energy Calibration Slope : 4.961503
 Energy Calibration Quadratic : 3.2716690E-04
 Energy Calibration Range : 7756.000

Instrument : CHAMBER 036
 Detector : 78203
 Calibration Date/Time : 3-AUG-2009 15:17:19
 Calibration Source Id : AESS-036
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.831
 CM-244 4320A 2/28/10 5795.020 5795.020
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2351.688
 Energy Calibration Slope : 4.934670
 Energy Calibration Quadratic : 3.2679725E-04
 Energy Calibration Range : 7747.000

Instrument : CHAMBER 037
 Detector : 45-149BB5
 Calibration Date/Time : 3-AUG-2009 15:17:30
 Calibration Source Id : AESS-037
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.360
 NP-237 4341 2/28/10 4768.800 4770.173
 CM-244 4320A 2/28/10 5795.020 5795.449
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2380.215
 Energy Calibration Slope : 4.934037
 Energy Calibration Quadratic : 2.6879812E-04
 Energy Calibration Range : 7715.000

Instrument : CHAMBER 038
 Detector : 72532
 Calibration Date/Time : 3-AUG-2009 15:17:42
 Calibration Source Id : AESS-038
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3182.992
 NP-237 4341 2/28/10 4768.800 4768.694
 CM-244 4320A 2/28/10 5795.020 5794.956
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2374.738
 Energy Calibration Slope : 4.941356
 Energy Calibration Quadratic : 3.2555324E-04
 Energy Calibration Range : 7776.000

Instrument : CHAMBER 039
 Detector : 45-149BB2
 Calibration Date/Time : 3-AUG-2009 15:17:50
 Calibration Source Id : AESS-039
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4769.047
 CM-244 4320A 2/28/10 5795.020 5795.021
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2386.341
 Energy Calibration Slope : 4.892657
 Energy Calibration Quadratic : 3.3502636E-04
 Energy Calibration Range : 7748.000

Instrument : CHAMBER 040
 Detector : 78773
 Calibration Date/Time : 3-AUG-2009 15:18:00
 Calibration Source Id : AESS-040

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.801
CM-244	4320A	2/28/10	5795.020	5795.091

Energy/Channel Equation : see above
 Energy Calibration Zero : 2353.680
 Energy Calibration Slope : 4.886324
 Energy Calibration Quadratic : 3.3744561E-04
 Energy Calibration Range : 7711.000

Instrument : CHAMBER 041
 Detector : 78205
 Calibration Date/Time : 3-AUG-2009 15:18:09
 Calibration Source Id : AESS-041

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.801
CM-244	4320A	2/28/10	5795.020	5795.019

Energy/Channel Equation : see above
 Energy Calibration Zero : 2360.991
 Energy Calibration Slope : 4.934965
 Energy Calibration Quadratic : 3.5826201E-04
 Energy Calibration Range : 7790.000

Instrument : CHAMBER 042
 Detector : 78793
 Calibration Date/Time : 3-AUG-2009 15:18:18
 Calibration Source Id : AESS-042

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.799
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2378.631
 Energy Calibration Slope : 4.903480
 Energy Calibration Quadratic : 3.3252311E-04
 Energy Calibration Range : 7748.000

Instrument : CHAMBER 043
 Detector : 76543
 Calibration Date/Time : 3-AUG-2009 15:18:26
 Calibration Source Id : AESS-043

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.829
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2368.789
 Energy Calibration Slope : 4.934124
 Energy Calibration Quadratic : 3.2330386E-04
 Energy Calibration Range : 7760.000

Instrument : CHAMBER 044
 Detector : 79459
 Calibration Date/Time : 3-AUG-2009 15:18:36
 Calibration Source Id : AESS-044

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.302
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2359.457
 Energy Calibration Slope : 4.939529
 Energy Calibration Quadratic : 3.2710869E-04
 Energy Calibration Range : 7761.000

Instrument : CHAMBER 045
 Detector : 78783
 Calibration Date/Time : 3-AUG-2009 15:18:46
 Calibration Source Id : AESS-045

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.992
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2366.479
 Energy Calibration Slope : 4.912705
 Energy Calibration Quadratic : 3.5802016E-04
 Energy Calibration Range : 7773.000

Instrument : CHAMBER 046
 Detector : 76544
 Calibration Date/Time : 3-AUG-2009 15:18:55
 Calibration Source Id : AESS-046

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.801
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2361.703
 Energy Calibration Slope : 4.888400
 Energy Calibration Quadratic : 3.3994557E-04
 Energy Calibration Range : 7724.000

Instrument : CHAMBER 047
 Detector : 46-089B1
 Calibration Date/Time : 3-AUG-2009 15:19:03
 Calibration Source Id : AESS-047

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.340
NP-237	4341	2/28/10	4768.800	4768.922
CM-244	4320A	2/28/10	5795.020	5795.151

Energy/Channel Equation : see above
 Energy Calibration Zero : 2354.429
 Energy Calibration Slope : 4.963282
 Energy Calibration Quadratic : 3.1133511E-04
 Energy Calibration Range : 7763.000

Instrument : CHAMBER 048
 Detector : 42483
 Calibration Date/Time : 3-AUG-2009 15:19:12
 Calibration Source Id : AESS-048

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.266
NP-237	4341	2/28/10	4768.800	4768.972
CM-244	4320A	2/28/10	5795.020	5795.095

Energy/Channel Equation : see above
 Energy Calibration Zero : 2377.788
 Energy Calibration Slope : 4.957360
 Energy Calibration Quadratic : 2.8386535E-04
 Energy Calibration Range : 7752.000

Instrument : CHAMBER 065
 Detector : 68551
 Calibration Date/Time : 11-AUG-2009 11:32:36
 Calibration Source Id : AESS-001

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.849
NP-237	4341	2/28/10	4768.800	4769.466
CM-244	4320A	2/28/10	5795.020	5795.163

Energy/Channel Equation : see above
 Energy Calibration Zero : 2372.264
 Energy Calibration Slope : 4.908353
 Energy Calibration Quadratic : 3.3354512E-04
 Energy Calibration Range : 7748.000

Instrument : CHAMBER 066
 Detector : 46-089C1
 Calibration Date/Time : 11-AUG-2009 11:33:22
 Calibration Source Id : AESS-002

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.390
NP-237	4341	2/28/10	4768.800	4769.085
CM-244	4320A	2/28/10	5795.020	5795.154

Energy/Channel Equation : see above
 Energy Calibration Zero : 2366.405
 Energy Calibration Slope : 4.987269
 Energy Calibration Quadratic : 2.6785664E-04
 Energy Calibration Range : 7754.000

Instrument : CHAMBER 067
 Detector : 46-089B4
 Calibration Date/Time : 11-AUG-2009 11:33:34
 Calibration Source Id : AESS-003

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.001
NP-237	4341	2/28/10	4768.800	4768.295
CM-244	4320A	2/28/10	5795.020	5794.813

Energy/Channel Equation : see above
 Energy Calibration Zero : 2395.106
 Energy Calibration Slope : 4.966452
 Energy Calibration Quadratic : 2.8820083E-04
 Energy Calibration Range : 7783.000

Instrument : CHAMBER 068
 Detector : 78794
 Calibration Date/Time : 11-AUG-2009 11:38:02
 Calibration Source Id : AESS-004

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.980
CM-244	4320A	2/28/10	5795.020	5795.141

Energy/Channel Equation : see above
 Energy Calibration Zero : 2363.999
 Energy Calibration Slope : 4.959627
 Energy Calibration Quadratic : 3.2675461E-04
 Energy Calibration Range : 7785.000

Instrument : CHAMBER 069
 Detector : 78795
 Calibration Date/Time : 11-AUG-2009 11:38:36
 Calibration Source Id : AESS-005

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.715
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2374.161
 Energy Calibration Slope : 4.934980
 Energy Calibration Quadratic : 3.3370449E-04
 Energy Calibration Range : 7777.000

Instrument : CHAMBER 070
 Detector : 46-089B2
 Calibration Date/Time : 11-AUG-2009 11:38:49
 Calibration Source Id : AESS-006

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.376
NP-237	4341	2/28/10	4768.800	4768.799
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2384.967
 Energy Calibration Slope : 4.940035
 Energy Calibration Quadratic : 3.0117441E-04
 Energy Calibration Range : 7759.000

Instrument : CHAMBER 071
 Detector : 64259
 Calibration Date/Time : 11-AUG-2009 11:39:05
 Calibration Source Id : AESS-007

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.799
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2380.222
 Energy Calibration Slope : 4.972534
 Energy Calibration Quadratic : 3.0923611E-04
 Energy Calibration Range : 7796.000

Instrument : CHAMBER 072
 Detector : 45-149AA3
 Calibration Date/Time : 11-AUG-2009 11:41:05
 Calibration Source Id : AESS-008

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.799
CM-244	4320A	2/28/10	5795.020	5794.779

Energy/Channel Equation : see above
 Energy Calibration Zero : 2367.289
 Energy Calibration Slope : 4.936321
 Energy Calibration Quadratic : 3.1663457E-04
 Energy Calibration Range : 7754.000

Instrument : CHAMBER 073
 Detector : 78775
 Calibration Date/Time : 11-AUG-2009 11:41:19
 Calibration Source Id : AESS-009

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2340.294
 Energy Calibration Slope : 4.933617
 Energy Calibration Quadratic : 3.0803526E-04
 Energy Calibration Range : 7715.000

Instrument : CHAMBER 074
 Detector : 78266
 Calibration Date/Time : 11-AUG-2009 11:41:50
 Calibration Source Id : AESS-010

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2357.238
 Energy Calibration Slope : 4.957754
 Energy Calibration Quadratic : 3.2763465E-04
 Energy Calibration Range : 7778.000

Instrument : CHAMBER 075
 Detector : 68550
 Calibration Date/Time : 11-AUG-2009 11:42:08
 Calibration Source Id : AESS-011

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.795
NP-237	4341	2/28/10	4768.800	4769.246
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2357.909
 Energy Calibration Slope : 4.956091
 Energy Calibration Quadratic : 3.1667759E-04
 Energy Calibration Range : 7765.000

Instrument : CHAMBER 076
 Detector : 78779
 Calibration Date/Time : 11-AUG-2009 11:42:40
 Calibration Source Id : AESS-012

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.799
CM-244	4320A	2/28/10	5795.020	5795.193

Energy/Channel Equation : see above
 Energy Calibration Zero : 2353.146
 Energy Calibration Slope : 4.949463
 Energy Calibration Quadratic : 3.2361425E-04
 Energy Calibration Range : 7761.000

Instrument : CHAMBER 077
 Detector : 67576
 Calibration Date/Time : 11-AUG-2009 11:42:53
 Calibration Source Id : AESS-013

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5794.739

Energy/Channel Equation : see above
 Energy Calibration Zero : 2362.830
 Energy Calibration Slope : 4.939044
 Energy Calibration Quadratic : 3.0275399E-04
 Energy Calibration Range : 7738.000

Instrument : CHAMBER 078
 Detector : 67577
 Calibration Date/Time : 11-AUG-2009 11:43:47
 Calibration Source Id : AESS-014

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3181.433
NP-237	4341	2/28/10	4768.800	4767.846
CM-244	4320A	2/28/10	5795.020	5793.522

Energy/Channel Equation : see above
 Energy Calibration Zero : 2407.798
 Energy Calibration Slope : 4.964797
 Energy Calibration Quadratic : 3.3742035E-04
 Energy Calibration Range : 7846.000

Instrument : CHAMBER 079
 Detector : 67598
 Calibration Date/Time : 11-AUG-2009 11:44:09
 Calibration Source Id : AESS-015

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.694
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2369.132
 Energy Calibration Slope : 4.920986
 Energy Calibration Quadratic : 3.1385853E-04
 Energy Calibration Range : 7737.000

Instrument : CHAMBER 080
 Detector : 78197
 Calibration Date/Time : 12-AUG-2009 06:47:19
 Calibration Source Id : AESS-016

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.250
NP-237	4341	2/28/10	4768.800	4769.057
CM-244	4320A	2/28/10	5795.020	5795.270

Energy/Channel Equation : see above
 Energy Calibration Zero : 2352.236
 Energy Calibration Slope : 4.998828
 Energy Calibration Quadratic : 2.8291933E-04
 Energy Calibration Range : 7768.000

Instrument : CHAMBER 081
 Detector : 72533
 Calibration Date/Time : 11-AUG-2009 11:46:32
 Calibration Source Id : AESS-017

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3204.930
NP-237	4341	2/28/10	4768.800	4703.826
CM-244	4320A	2/28/10	5795.020	5726.761

Energy/Channel Equation : see above
 Energy Calibration Zero : 2219.847
 Energy Calibration Slope : 9.458302
 Energy Calibration Quadratic : -5.2725184E-03
 Energy Calibration Range : 6377.000

Instrument : CHAMBER 082
 Detector : 64263
 Calibration Date/Time : 11-AUG-2009 11:47:05
 Calibration Source Id : AESS-018

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.619
NP-237	4341	2/28/10	4768.800	4767.967
CM-244	4320A	2/28/10	5795.020	5794.591

Energy/Channel Equation : see above
 Energy Calibration Zero : 2389.567
 Energy Calibration Slope : 4.987039
 Energy Calibration Quadratic : 3.1898782E-04
 Energy Calibration Range : 7831.000

Instrument : CHAMBER 083
 Detector : 64278
 Calibration Date/Time : 11-AUG-2009 11:47:29
 Calibration Source Id : AESS-019
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.777
 NP-237 4341 2/28/10 4768.800 4768.800
 CM-244 4320A 2/28/10 5795.020 5795.020
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2373.204
 Energy Calibration Slope : 5.041853
 Energy Calibration Quadratic : 2.3808437E-04
 Energy Calibration Range : 7786.000

Instrument : CHAMBER 084
 Detector : 78265
 Calibration Date/Time : 11-AUG-2009 11:47:52
 Calibration Source Id : AESS-020
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.799
 CM-244 4320A 2/28/10 5795.020 5794.867
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2362.363
 Energy Calibration Slope : 5.016379
 Energy Calibration Quadratic : 2.7867779E-04
 Energy Calibration Range : 7791.000

Instrument : CHAMBER 085
 Detector : 78776
 Calibration Date/Time : 11-AUG-2009 11:48:19
 Calibration Source Id : AESS-021
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.802
 CM-244 4320A 2/28/10 5795.020 5795.019
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2368.057
 Energy Calibration Slope : 4.984862
 Energy Calibration Quadratic : 2.9382212E-04
 Energy Calibration Range : 7781.000

Instrument : CHAMBER 086
 Detector : 78198
 Calibration Date/Time : 11-AUG-2009 11:48:41
 Calibration Source Id : AESS-022

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.458
NP-237	4341	2/28/10	4768.800	4768.482
CM-244	4320A	2/28/10	5795.020	5794.558

Energy/Channel Equation : see above
 Energy Calibration Zero : 2358.351
 Energy Calibration Slope : 5.023737
 Energy Calibration Quadratic : 2.3622859E-04
 Energy Calibration Range : 7750.000

Instrument : CHAMBER 087
 Detector : 78199
 Calibration Date/Time : 11-AUG-2009 11:49:08
 Calibration Source Id : AESS-023

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.717
NP-237	4341	2/28/10	4768.800	4768.539
CM-244	4320A	2/28/10	5795.020	5794.745

Energy/Channel Equation : see above
 Energy Calibration Zero : 2342.553
 Energy Calibration Slope : 4.976685
 Energy Calibration Quadratic : 2.4361881E-04
 Energy Calibration Range : 7694.000

Instrument : CHAMBER 088
 Detector : 33452
 Calibration Date/Time : 11-AUG-2009 11:50:14
 Calibration Source Id : AESS-024

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.801
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2348.450
 Energy Calibration Slope : 4.985291
 Energy Calibration Quadratic : 2.0228673E-04
 Energy Calibration Range : 7666.000

Instrument : CHAMBER 089
 Detector : 78262
 Calibration Date/Time : 11-AUG-2009 11:50:54
 Calibration Source Id : AESS-025

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.822
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2360.236
 Energy Calibration Slope : 4.993787
 Energy Calibration Quadratic : 3.1235311E-04
 Energy Calibration Range : 7801.000

Instrument : CHAMBER 090
 Detector : 78263
 Calibration Date/Time : 11-AUG-2009 11:51:07
 Calibration Source Id : AESS-026

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.689
CM-244	4320A	2/28/10	5795.020	5794.864

Energy/Channel Equation : see above
 Energy Calibration Zero : 2367.944
 Energy Calibration Slope : 4.912088
 Energy Calibration Quadratic : 3.3423179E-04
 Energy Calibration Range : 7748.000

Instrument : CHAMBER 091
 Detector : 78259
 Calibration Date/Time : 11-AUG-2009 11:51:19
 Calibration Source Id : AESS-027

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.501
NP-237	4341	2/28/10	4768.800	4768.562
CM-244	4320A	2/28/10	5795.020	5794.908

Energy/Channel Equation : see above
 Energy Calibration Zero : 2373.294
 Energy Calibration Slope : 4.962712
 Energy Calibration Quadratic : 3.3628431E-04
 Energy Calibration Range : 7808.000

Instrument : CHAMBER 092
 Detector : 79457
 Calibration Date/Time : 11-AUG-2009 11:52:08
 Calibration Source Id : AESS-028

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.999
NP-237	4341	2/28/10	4768.800	4769.086
CM-244	4320A	2/28/10	5795.020	5795.236

Energy/Channel Equation : see above
 Energy Calibration Zero : 2353.207
 Energy Calibration Slope : 4.920592
 Energy Calibration Quadratic : 3.2561756E-04
 Energy Calibration Range : 7733.000

Instrument : CHAMBER 093
 Detector : 33206
 Calibration Date/Time : 11-AUG-2009 11:52:22
 Calibration Source Id : AESS-029

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.729
NP-237	4341	2/28/10	4768.800	4768.662
CM-244	4320A	2/28/10	5795.020	5794.973

Energy/Channel Equation : see above
 Energy Calibration Zero : 2374.507
 Energy Calibration Slope : 4.905449
 Energy Calibration Quadratic : 3.4070064E-04
 Energy Calibration Range : 7755.000

Instrument : CHAMBER 094
 Detector : 78267
 Calibration Date/Time : 11-AUG-2009 11:52:36
 Calibration Source Id : AESS-030

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.615
NP-237	4341	2/28/10	4768.800	4768.657
CM-244	4320A	2/28/10	5795.020	5794.828

Energy/Channel Equation : see above
 Energy Calibration Zero : 2364.661
 Energy Calibration Slope : 4.944430
 Energy Calibration Quadratic : 3.0602465E-04
 Energy Calibration Range : 7749.000

Instrument : CHAMBER 095
 Detector : 64279
 Calibration Date/Time : 11-AUG-2009 11:53:20
 Calibration Source Id : AESS-031

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5794.924

Energy/Channel Equation : see above
 Energy Calibration Zero : 2360.997
 Energy Calibration Slope : 4.923662
 Energy Calibration Quadratic : 3.3134571E-04
 Energy Calibration Range : 7750.000

Instrument : CHAMBER 096
 Detector : 67605
 Calibration Date/Time : 11-AUG-2009 11:53:35
 Calibration Source Id : AESS-032

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.861
NP-237	4341	2/28/10	4768.800	4768.801
CM-244	4320A	2/28/10	5795.020	5794.970

Energy/Channel Equation : see above
 Energy Calibration Zero : 2352.669
 Energy Calibration Slope : 4.930194
 Energy Calibration Quadratic : 3.4499675E-04
 Energy Calibration Range : 7763.000

Instrument : CHAMBER 097
 Detector : 67599
 Calibration Date/Time : 11-AUG-2009 11:54:04
 Calibration Source Id : AESS-033

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.385
NP-237	4341	2/28/10	4768.800	4768.497
CM-244	4320A	2/28/10	5795.020	5794.575

Energy/Channel Equation : see above
 Energy Calibration Zero : 2366.630
 Energy Calibration Slope : 4.955770
 Energy Calibration Quadratic : 3.2342706E-04
 Energy Calibration Range : 7780.000

Instrument : CHAMBER 098
 Detector : 68644
 Calibration Date/Time : 11-AUG-2009 11:54:57
 Calibration Source Id : AESS-034

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.677
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2384.988
 Energy Calibration Slope : 4.980790
 Energy Calibration Quadratic : 3.1301824E-04
 Energy Calibration Range : 7814.000

Instrument : CHAMBER 099
 Detector : 70317
 Calibration Date/Time : 11-AUG-2009 11:55:11
 Calibration Source Id : AESS-035

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.657
NP-237	4341	2/28/10	4768.800	4768.798
CM-244	4320A	2/28/10	5795.020	5794.872

Energy/Channel Equation : see above
 Energy Calibration Zero : 2370.271
 Energy Calibration Slope : 4.896307
 Energy Calibration Quadratic : 3.5264078E-04
 Energy Calibration Range : 7754.000

Instrument : CHAMBER 100
 Detector : 79456
 Calibration Date/Time : 11-AUG-2009 11:55:23
 Calibration Source Id : AESS-046

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.007
NP-237	4341	2/28/10	4768.800	4768.931
CM-244	4320A	2/28/10	5795.020	5795.248

Energy/Channel Equation : see above
 Energy Calibration Zero : 2353.091
 Energy Calibration Slope : 4.889555
 Energy Calibration Quadratic : 3.4731548E-04
 Energy Calibration Range : 7724.000

Instrument : CHAMBER 101
 Detector : 64253
 Calibration Date/Time : 11-AUG-2009 11:55:41
 Calibration Source Id : AESS-037

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.482
NP-237	4341	2/28/10	4768.800	4768.628
CM-244	4320A	2/28/10	5795.020	5795.004

Energy/Channel Equation : see above
 Energy Calibration Zero : 2413.378
 Energy Calibration Slope : 4.941072
 Energy Calibration Quadratic : 3.1744229E-04
 Energy Calibration Range : 7806.000

Instrument : CHAMBER 102
 Detector : 72525
 Calibration Date/Time : 11-AUG-2009 11:55:55
 Calibration Source Id : AESS-038

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.620
NP-237	4341	2/28/10	4768.800	4768.759
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2365.023
 Energy Calibration Slope : 4.877947
 Energy Calibration Quadratic : 3.3410732E-04
 Energy Calibration Range : 7710.000

Instrument : CHAMBER 103
 Detector : 79461
 Calibration Date/Time : 11-AUG-2009 11:56:06
 Calibration Source Id : AESS-039

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.724
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2388.602
 Energy Calibration Slope : 4.925415
 Energy Calibration Quadratic : 3.3399722E-04
 Energy Calibration Range : 7782.000

Instrument : CHAMBER 104
 Detector : 72524
 Calibration Date/Time : 11-AUG-2009 11:56:56
 Calibration Source Id : AESS-040

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.731
NP-237	4341	2/28/10	4768.800	4768.746
CM-244	4320A	2/28/10	5795.020	5794.950

Energy/Channel Equation : see above
 Energy Calibration Zero : 2361.164
 Energy Calibration Slope : 4.875978
 Energy Calibration Quadratic : 3.5914616E-04
 Energy Calibration Range : 7731.000

Instrument : CHAMBER 105
 Detector : 78777
 Calibration Date/Time : 11-AUG-2009 11:57:20
 Calibration Source Id : AESS-041

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2374.957
 Energy Calibration Slope : 4.877512
 Energy Calibration Quadratic : 3.5687728E-04
 Energy Calibration Range : 7744.000

Instrument : CHAMBER 106
 Detector : 64274
 Calibration Date/Time : 11-AUG-2009 11:57:33
 Calibration Source Id : AESS-042

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.799
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2386.397
 Energy Calibration Slope : 4.925849
 Energy Calibration Quadratic : 3.5619634E-04
 Energy Calibration Range : 7804.000

Instrument : CHAMBER 107
 Detector : 67578
 Calibration Date/Time : 11-AUG-2009 11:58:23
 Calibration Source Id : AESS-043

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.757
NP-237	4341	2/28/10	4768.800	4768.431
CM-244	4320A	2/28/10	5795.020	5794.760

Energy/Channel Equation : see above
 Energy Calibration Zero : 2365.165
 Energy Calibration Slope : 4.989622
 Energy Calibration Quadratic : 3.0367926E-04
 Energy Calibration Range : 7793.000

Instrument : CHAMBER 108
 Detector : 78778
 Calibration Date/Time : 11-AUG-2009 12:00:02
 Calibration Source Id : AESS-044

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.799
CM-244	4320A	2/28/10	5795.020	5795.085

Energy/Channel Equation : see above
 Energy Calibration Zero : 2361.750
 Energy Calibration Slope : 4.889173
 Energy Calibration Quadratic : 3.3859405E-04
 Energy Calibration Range : 7723.000

Instrument : CHAMBER 109
 Detector : 79463
 Calibration Date/Time : 11-AUG-2009 12:00:23
 Calibration Source Id : AESS-045

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.801
CM-244	4320A	2/28/10	5795.020	5795.011

Energy/Channel Equation : see above
 Energy Calibration Zero : 2361.956
 Energy Calibration Slope : 4.902098
 Energy Calibration Quadratic : 3.6021773E-04
 Energy Calibration Range : 7759.000

Instrument : CHAMBER 110
 Detector : 67602
 Calibration Date/Time : 11-AUG-2009 12:01:03
 Calibration Source Id : AESS-046
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3180.240
 NP-237 4341 2/28/10 4768.800 4767.627
 CM-244 4320A 2/28/10 5795.020 5792.351
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2450.737
 Energy Calibration Slope : 5.078455
 Energy Calibration Quadratic : 3.6329794E-04
 Energy Calibration Range : 8032.000

Instrument : CHAMBER 111
 Detector : 79462
 Calibration Date/Time : 11-AUG-2009 12:01:21
 Calibration Source Id : AESS-047
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3182.689
 NP-237 4341 2/28/10 4768.800 4768.620
 CM-244 4320A 2/28/10 5795.020 5794.913
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2360.863
 Energy Calibration Slope : 4.982990
 Energy Calibration Quadratic : 3.1839884E-04
 Energy Calibration Range : 7797.000

Instrument : CHAMBER 112
 Detector : 78261
 Calibration Date/Time : 11-AUG-2009 12:02:06
 Calibration Source Id : AESS-048
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.798
 CM-244 4320A 2/28/10 5795.020 5795.021
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2372.713
 Energy Calibration Slope : 4.922604
 Energy Calibration Quadratic : 3.2149741E-04
 Energy Calibration Range : 7751.000

Instrument : CHAMBER 113
 Detector : 45-111B4
 Calibration Date/Time : 17-AUG-2009 14:57:05
 Calibration Source Id : AESS-001

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.693
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2388.351
 Energy Calibration Slope : 4.986037
 Energy Calibration Quadratic : 2.9112995E-04
 Energy Calibration Range : 7799.000

Instrument : CHAMBER 114
 Detector : 78258
 Calibration Date/Time : 17-AUG-2009 14:57:42
 Calibration Source Id : AESS-007

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.738
NP-237	4341	2/28/10	4768.800	4768.375
CM-244	4320A	2/28/10	5795.020	5794.878

Energy/Channel Equation : see above
 Energy Calibration Zero : 2341.717
 Energy Calibration Slope : 4.967946
 Energy Calibration Quadratic : 2.6719994E-04
 Energy Calibration Range : 7709.000

Instrument : CHAMBER 115
 Detector : 45-132FF4
 Calibration Date/Time : 17-AUG-2009 14:57:55
 Calibration Source Id : AESS-002

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.996
CM-244	4320A	2/28/10	5795.020	5795.124

Energy/Channel Equation : see above
 Energy Calibration Zero : 2360.484
 Energy Calibration Slope : 5.001271
 Energy Calibration Quadratic : 2.5857674E-04
 Energy Calibration Range : 7753.000

Instrument : CHAMBER 116
 Detector : 45-132FF2
 Calibration Date/Time : 17-AUG-2009 14:58:06
 Calibration Source Id : AESS-008

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.296
NP-237	4341	2/28/10	4768.800	4768.799
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2358.140
 Energy Calibration Slope : 4.998592
 Energy Calibration Quadratic : 2.4986797E-04
 Energy Calibration Range : 7739.000

Instrument : CHAMBER 117
 Detector : 33450
 Calibration Date/Time : 17-AUG-2009 14:58:17
 Calibration Source Id : AESS-003

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.212
NP-237	4341	2/28/10	4768.800	4768.136
CM-244	4320A	2/28/10	5795.020	5794.829

Energy/Channel Equation : see above
 Energy Calibration Zero : 2377.331
 Energy Calibration Slope : 4.984442
 Energy Calibration Quadratic : 2.6023277E-04
 Energy Calibration Range : 7754.000

Instrument : CHAMBER 118
 Detector : 75544
 Calibration Date/Time : 17-AUG-2009 14:58:27
 Calibration Source Id : AESS-009

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.453
NP-237	4341	2/28/10	4768.800	4768.624
CM-244	4320A	2/28/10	5795.020	5794.893

Energy/Channel Equation : see above
 Energy Calibration Zero : 2343.030
 Energy Calibration Slope : 4.970738
 Energy Calibration Quadratic : 2.7650801E-04
 Energy Calibration Range : 7723.000

Instrument : CHAMBER 119
 Detector : 74429
 Calibration Date/Time : 2-FEB-2009 15:15:38
 Calibration Source Id : AESS-004
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3001.688
 NP-237 4341 2/28/10 4768.800 4669.281
 CM-244 4320A 2/28/10 5795.020 5706.875

 Energy/Channel Equation : see above
 Energy Calibration Zero : 2437.949
 Energy Calibration Slope : 5.036866
 Energy Calibration Quadratic :
 Energy Calibration Range : 7596.000

Instrument : CHAMBER 120
 Detector : 74430
 Calibration Date/Time : 18-AUG-2009 13:38:55
 Calibration Source Id : AESS-010
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3182.734
 NP-237 4341 2/28/10 4768.800 4768.799
 CM-244 4320A 2/28/10 5795.020 5794.984

 Energy/Channel Equation : see above
 Energy Calibration Zero : 2316.127
 Energy Calibration Slope : 4.939470
 Energy Calibration Quadratic : 2.8824760E-04
 Energy Calibration Range : 7676.000

Instrument : CHAMBER 121
 Detector : 75545
 Calibration Date/Time : 17-AUG-2009 14:58:37
 Calibration Source Id : AESS-005
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3182.992
 NP-237 4341 2/28/10 4768.800 4768.800
 CM-244 4320A 2/28/10 5795.020 5794.910

 Energy/Channel Equation : see above
 Energy Calibration Zero : 2338.077
 Energy Calibration Slope : 4.950966
 Energy Calibration Quadratic : 2.8139201E-04
 Energy Calibration Range : 7703.000

Instrument : CHAMBER 122
 Detector : 75546
 Calibration Date/Time : 17-AUG-2009 14:58:49
 Calibration Source Id : AESS-011

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.767
NP-237	4341	2/28/10	4768.800	4768.557
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2334.596
 Energy Calibration Slope : 4.961221
 Energy Calibration Quadratic : 2.6947071E-04
 Energy Calibration Range : 7697.000

Instrument : CHAMBER 123
 Detector : 45-142V3
 Calibration Date/Time : 17-AUG-2009 14:58:58
 Calibration Source Id : AESS-006

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.626
NP-237	4341	2/28/10	4768.800	4768.419
CM-244	4320A	2/28/10	5795.020	5794.913

Energy/Channel Equation : see above
 Energy Calibration Zero : 2377.630
 Energy Calibration Slope : 4.988592
 Energy Calibration Quadratic : 2.4062325E-04
 Energy Calibration Range : 7738.000

Instrument : CHAMBER 124
 Detector : 45-142V2
 Calibration Date/Time : 17-AUG-2009 14:59:08
 Calibration Source Id : AESS-012

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.737
NP-237	4341	2/28/10	4768.800	4768.348
CM-244	4320A	2/28/10	5795.020	5794.822

Energy/Channel Equation : see above
 Energy Calibration Zero : 2389.445
 Energy Calibration Slope : 5.014465
 Energy Calibration Quadratic : 2.5700411E-04
 Energy Calibration Range : 7794.000

Instrument : CHAMBER 125
 Detector : 75547
 Calibration Date/Time : 17-AUG-2009 14:59:18
 Calibration Source Id : AESS-013

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.519
NP-237	4341	2/28/10	4768.800	4768.590
CM-244	4320A	2/28/10	5795.020	5794.968

Energy/Channel Equation : see above
 Energy Calibration Zero : 2346.234
 Energy Calibration Slope : 4.935012
 Energy Calibration Quadratic : 2.8653492E-04
 Energy Calibration Range : 7700.000

Instrument : CHAMBER 126
 Detector : 75548
 Calibration Date/Time : 17-AUG-2009 14:59:32
 Calibration Source Id : AESS-019

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.586
NP-237	4341	2/28/10	4768.800	4768.494
CM-244	4320A	2/28/10	5795.020	5794.836

Energy/Channel Equation : see above
 Energy Calibration Zero : 2351.831
 Energy Calibration Slope : 5.025319
 Energy Calibration Quadratic : 2.1107355E-04
 Energy Calibration Range : 7719.000

Instrument : CHAMBER 127
 Detector : 78770
 Calibration Date/Time : 17-AUG-2009 14:59:46
 Calibration Source Id : AESS-014

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.831
NP-237	4341	2/28/10	4768.800	4768.741
CM-244	4320A	2/28/10	5795.020	5794.894

Energy/Channel Equation : see above
 Energy Calibration Zero : 2339.154
 Energy Calibration Slope : 4.970251
 Energy Calibration Quadratic : 2.5652250E-04
 Energy Calibration Range : 7698.000

Instrument : CHAMBER 128
 Detector : 75549
 Calibration Date/Time : 17-AUG-2009 15:00:39
 Calibration Source Id : AESS-020

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.531
NP-237	4341	2/28/10	4768.800	4768.610
CM-244	4320A	2/28/10	5795.020	5794.838

Energy/Channel Equation : see above
 Energy Calibration Zero : 2330.388
 Energy Calibration Slope : 5.000057
 Energy Calibration Quadratic : 2.3812153E-04
 Energy Calibration Range : 7700.000

Instrument : CHAMBER 129
 Detector : 76227
 Calibration Date/Time : 17-AUG-2009 15:00:50
 Calibration Source Id : AESS-015

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.843
NP-237	4341	2/28/10	4768.800	4768.717
CM-244	4320A	2/28/10	5795.020	5794.874

Energy/Channel Equation : see above
 Energy Calibration Zero : 2351.215
 Energy Calibration Slope : 4.930460
 Energy Calibration Quadratic : 2.9455224E-04
 Energy Calibration Range : 7709.000

Instrument : CHAMBER 130
 Detector : 76228
 Calibration Date/Time : 17-AUG-2009 15:01:00
 Calibration Source Id : AESS-021

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.985
NP-237	4341	2/28/10	4768.800	4768.658
CM-244	4320A	2/28/10	5795.020	5794.729

Energy/Channel Equation : see above
 Energy Calibration Zero : 2337.606
 Energy Calibration Slope : 4.982665
 Energy Calibration Quadratic : 2.2944069E-04
 Energy Calibration Range : 7680.000

Instrument : CHAMBER 131
 Detector : 33448
 Calibration Date/Time : 17-AUG-2009 15:01:10
 Calibration Source Id : AESS-016
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3178.948
 NP-237 4341 2/28/10 4768.800 4766.564
 CM-244 4320A 2/28/10 5795.020 5793.610

 Energy/Channel Equation : see above
 Energy Calibration Zero : 2408.823
 Energy Calibration Slope : 4.963500
 Energy Calibration Quadratic : 2.8727154E-04
 Energy Calibration Range : 7793.000

Instrument : CHAMBER 132
 Detector : 67579
 Calibration Date/Time : 17-AUG-2009 15:01:19
 Calibration Source Id : AESS-022
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.495
 CM-244 4320A 2/28/10 5795.020 5794.895

 Energy/Channel Equation : see above
 Energy Calibration Zero : 2326.639
 Energy Calibration Slope : 5.034670
 Energy Calibration Quadratic : 2.1709618E-04
 Energy Calibration Range : 7710.000

Instrument : CHAMBER 133
 Detector : 76229
 Calibration Date/Time : 17-AUG-2009 15:01:29
 Calibration Source Id : AESS-017
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3182.802
 NP-237 4341 2/28/10 4768.800 4768.798
 CM-244 4320A 2/28/10 5795.020 5794.855

 Energy/Channel Equation : see above
 Energy Calibration Zero : 2310.723
 Energy Calibration Slope : 4.901457
 Energy Calibration Quadratic : 2.6648620E-04
 Energy Calibration Range : 7609.000

Instrument : CHAMBER 134
 Detector : 76230
 Calibration Date/Time : 17-AUG-2009 15:01:38
 Calibration Source Id : AESS-023

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.670
NP-237	4341	2/28/10	4768.800	4768.734
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2328.671
 Energy Calibration Slope : 4.971330
 Energy Calibration Quadratic : 2.3919715E-04
 Energy Calibration Range : 7670.000

Instrument : CHAMBER 135
 Detector : 64270
 Calibration Date/Time : 17-AUG-2009 15:01:50
 Calibration Source Id : AESS-018

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.220
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2334.713
 Energy Calibration Slope : 4.950563
 Energy Calibration Quadratic : 2.6665861E-04
 Energy Calibration Range : 7684.000

Instrument : CHAMBER 136
 Detector : 68549
 Calibration Date/Time : 17-AUG-2009 15:02:00
 Calibration Source Id : AESS-024

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.547
NP-237	4341	2/28/10	4768.800	4769.648
CM-244	4320A	2/28/10	5795.020	5795.176

Energy/Channel Equation : see above
 Energy Calibration Zero : 2352.961
 Energy Calibration Slope : 4.996480
 Energy Calibration Quadratic : 2.6544984E-04
 Energy Calibration Range : 7748.000

Instrument : CHAMBER 137
 Detector : 64288
 Calibration Date/Time : 18-AUG-2009 09:58:00
 Calibration Source Id : AESS-025

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.426
CM-244	4320A	2/28/10	5795.020	5794.897

Energy/Channel Equation : see above
 Energy Calibration Zero : 2376.854
 Energy Calibration Slope : 5.032813
 Energy Calibration Quadratic : 2.8756596E-04
 Energy Calibration Range : 7832.000

Instrument : CHAMBER 138
 Detector : 65877
 Calibration Date/Time : 17-AUG-2009 15:10:23
 Calibration Source Id : AESS-031

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.778
CM-244	4320A	2/28/10	5795.020	5794.902

Energy/Channel Equation : see above
 Energy Calibration Zero : 2376.472
 Energy Calibration Slope : 4.997972
 Energy Calibration Quadratic : 2.8433124E-04
 Energy Calibration Range : 7793.000

Instrument : CHAMBER 139
 Detector : 76231
 Calibration Date/Time : 17-AUG-2009 15:10:36
 Calibration Source Id : AESS-026

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.807
NP-237	4341	2/28/10	4768.800	4768.778
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2353.050
 Energy Calibration Slope : 4.923675
 Energy Calibration Quadratic : 3.2614564E-04
 Energy Calibration Range : 7737.000

Instrument : CHAMBER 140
 Detector : 78771
 Calibration Date/Time : 17-AUG-2009 15:10:53
 Calibration Source Id : AESS-032

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5794.950

Energy/Channel Equation : see above
 Energy Calibration Zero : 2343.606
 Energy Calibration Slope : 4.949296
 Energy Calibration Quadratic : 3.0935110E-04
 Energy Calibration Range : 7736.000

Instrument : CHAMBER 141
 Detector : 76232
 Calibration Date/Time : 17-AUG-2009 15:11:05
 Calibration Source Id : AESS-027

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.704
NP-237	4341	2/28/10	4768.800	4768.701
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2354.080
 Energy Calibration Slope : 4.967496
 Energy Calibration Quadratic : 2.7667297E-04
 Energy Calibration Range : 7731.000

Instrument : CHAMBER 142
 Detector : 64261
 Calibration Date/Time : 17-AUG-2009 15:11:22
 Calibration Source Id : AESS-033

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5794.996

Energy/Channel Equation : see above
 Energy Calibration Zero : 2377.858
 Energy Calibration Slope : 4.966272
 Energy Calibration Quadratic : 3.0408424E-04
 Energy Calibration Range : 7782.000

Instrument : CHAMBER 143
 Detector : 65882
 Calibration Date/Time : 17-AUG-2009 15:11:35
 Calibration Source Id : AESS-028
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3182.838
 NP-237 4341 2/28/10 4768.800 4768.801
 CM-244 4320A 2/28/10 5795.020 5795.020
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2353.476
 Energy Calibration Slope : 4.958334
 Energy Calibration Quadratic : 2.9036327E-04
 Energy Calibration Range : 7735.000

Instrument : CHAMBER 144
 Detector : 75551
 Calibration Date/Time : 17-AUG-2009 15:11:48
 Calibration Source Id : AESS-034
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.149
 NP-237 4341 2/28/10 4768.800 4768.801
 CM-244 4320A 2/28/10 5795.020 5795.020
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2348.280
 Energy Calibration Slope : 4.953019
 Energy Calibration Quadratic : 2.9027942E-04
 Energy Calibration Range : 7725.000

Instrument : CHAMBER 145
 Detector : 72526
 Calibration Date/Time : 17-AUG-2009 15:12:06
 Calibration Source Id : AESS-029
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.799
 CM-244 4320A 2/28/10 5795.020 5794.950
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2358.188
 Energy Calibration Slope : 4.950538
 Energy Calibration Quadratic : 3.1101296E-04
 Energy Calibration Range : 7754.000

Instrument : CHAMBER 146
 Detector : 72527
 Calibration Date/Time : 17-AUG-2009 15:12:19
 Calibration Source Id : AESS-035
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3182.841
 NP-237 4341 2/28/10 4768.800 4768.589
 CM-244 4320A 2/28/10 5795.020 5795.021
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2352.896
 Energy Calibration Slope : 4.936564
 Energy Calibration Quadratic : 2.8588294E-04
 Energy Calibration Range : 7708.000

Instrument : CHAMBER 147
 Detector : 75550
 Calibration Date/Time : 17-AUG-2009 15:12:37
 Calibration Source Id : AESS-030
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3182.991
 NP-237 4341 2/28/10 4768.800 4768.681
 CM-244 4320A 2/28/10 5795.020 5794.852
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2344.357
 Energy Calibration Slope : 4.979820
 Energy Calibration Quadratic : 2.4974984E-04
 Energy Calibration Range : 7706.000

Instrument : CHAMBER 148
 Detector : 74429
 Calibration Date/Time : 17-AUG-2009 15:12:57
 Calibration Source Id : AESS-036
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3182.790
 NP-237 4341 2/28/10 4768.800 4768.746
 CM-244 4320A 2/28/10 5795.020 5794.901
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2347.048
 Energy Calibration Slope : 4.952481
 Energy Calibration Quadratic : 2.8881739E-04
 Energy Calibration Range : 7721.000

Instrument : CHAMBER 149
 Detector : 33449
 Calibration Date/Time : 17-AUG-2009 15:02:09
 Calibration Source Id : AESS-037

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.635
NP-237	4341	2/28/10	4768.800	4768.444
CM-244	4320A	2/28/10	5795.020	5794.948

Energy/Channel Equation : see above
 Energy Calibration Zero : 2393.262
 Energy Calibration Slope : 4.951241
 Energy Calibration Quadratic : 3.0021602E-04
 Energy Calibration Range : 7778.000

Instrument : CHAMBER 150
 Detector : 75552
 Calibration Date/Time : 17-AUG-2009 15:02:19
 Calibration Source Id : AESS-043

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.799
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2357.177
 Energy Calibration Slope : 4.964990
 Energy Calibration Quadratic : 2.8429780E-04
 Energy Calibration Range : 7739.000

Instrument : CHAMBER 151
 Detector : 75556
 Calibration Date/Time : 17-AUG-2009 15:02:29
 Calibration Source Id : AESS-038

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.755
CM-244	4320A	2/28/10	5795.020	5794.925

Energy/Channel Equation : see above
 Energy Calibration Zero : 2344.746
 Energy Calibration Slope : 4.932197
 Energy Calibration Quadratic : 2.7974858E-04
 Energy Calibration Range : 7689.000

Instrument : CHAMBER 152
 Detector : 76222
 Calibration Date/Time : 17-AUG-2009 15:02:41
 Calibration Source Id : AESS-044
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3182.811
 NP-237 4341 2/28/10 4768.800 4768.798
 CM-244 4320A 2/28/10 5795.020 5794.877
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2344.480
 Energy Calibration Slope : 4.936235
 Energy Calibration Quadratic : 2.8715734E-04
 Energy Calibration Range : 7700.000

Instrument : CHAMBER 153
 Detector : 76223
 Calibration Date/Time : 17-AUG-2009 15:02:59
 Calibration Source Id : AESS-039
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3182.810
 NP-237 4341 2/28/10 4768.800 4768.800
 CM-244 4320A 2/28/10 5795.020 5794.996
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2337.684
 Energy Calibration Slope : 4.933674
 Energy Calibration Quadratic : 3.0187287E-04
 Energy Calibration Range : 7706.000

Instrument : CHAMBER 154
 Detector : 76224
 Calibration Date/Time : 17-AUG-2009 15:03:12
 Calibration Source Id : AESS-045
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.801
 CM-244 4320A 2/28/10 5795.020 5795.019
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2342.948
 Energy Calibration Slope : 4.948957
 Energy Calibration Quadratic : 2.8683257E-04
 Energy Calibration Range : 7711.000

Instrument : CHAMBER 155
 Detector : 75553
 Calibration Date/Time : 17-AUG-2009 15:03:49
 Calibration Source Id : AESS-040
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3182.770
 NP-237 4341 2/28/10 4768.800 4768.662
 CM-244 4320A 2/28/10 5795.020 5794.902
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2367.728
 Energy Calibration Slope : 4.983710
 Energy Calibration Quadratic : 2.8808211E-04
 Energy Calibration Range : 7773.000

Instrument : CHAMBER 156
 Detector : 75554
 Calibration Date/Time : 17-AUG-2009 15:03:58
 Calibration Source Id : AESS-046
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3182.851
 NP-237 4341 2/28/10 4768.800 4768.705
 CM-244 4320A 2/28/10 5795.020 5794.899
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2362.355
 Energy Calibration Slope : 4.999010
 Energy Calibration Quadratic : 2.6741659E-04
 Energy Calibration Range : 7762.000

Instrument : CHAMBER 157
 Detector : 75555
 Calibration Date/Time : 17-AUG-2009 15:04:07
 Calibration Source Id : AESS-041
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3182.868
 NP-237 4341 2/28/10 4768.800 4768.768
 CM-244 4320A 2/28/10 5795.020 5794.925
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2358.092
 Energy Calibration Slope : 4.979420
 Energy Calibration Quadratic : 2.8018607E-04
 Energy Calibration Range : 7751.000

Instrument : CHAMBER 158
 Detector : 33451
 Calibration Date/Time : 17-AUG-2009 15:04:18
 Calibration Source Id : AESS-047

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.449
NP-237	4341	2/28/10	4768.800	4768.432
CM-244	4320A	2/28/10	5795.020	5794.938

Energy/Channel Equation : see above
 Energy Calibration Zero : 2389.976
 Energy Calibration Slope : 5.006801
 Energy Calibration Quadratic : 3.0287215E-04
 Energy Calibration Range : 7835.000

Instrument : CHAMBER 159
 Detector : 76225
 Calibration Date/Time : 17-AUG-2009 15:04:28
 Calibration Source Id : AESS-042

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2354.720
 Energy Calibration Slope : 4.980748
 Energy Calibration Quadratic : 2.9428111E-04
 Energy Calibration Range : 7764.000

Instrument : CHAMBER 160
 Detector : 76226
 Calibration Date/Time : 17-AUG-2009 15:04:40
 Calibration Source Id : AESS-048

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.799
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2355.649
 Energy Calibration Slope : 4.990073
 Energy Calibration Quadratic : 2.8874222E-04
 Energy Calibration Range : 7768.000

Instrument : CHAMBER 161
 Detector : 70321
 Calibration Date/Time : 23-JUL-2009 13:58:35
 Calibration Source Id : AESS-001
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.800
 CM-244 4320A 2/28/10 5795.020 5795.021
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2371.155
 Energy Calibration Slope : 4.901179
 Energy Calibration Quadratic : 3.3258999E-04
 Energy Calibration Range : 7739.000

Instrument : CHAMBER 162
 Detector : 70323
 Calibration Date/Time : 4-AUG-2009 07:05:59
 Calibration Source Id : AESS-007
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.799
 CM-244 4320A 2/28/10 5795.020 5795.021
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2367.666
 Energy Calibration Slope : 4.932856
 Energy Calibration Quadratic : 2.9126366E-04
 Energy Calibration Range : 7724.000

Instrument : CHAMBER 163
 Detector : 70324
 Calibration Date/Time : 23-JUL-2009 13:58:54
 Calibration Source Id : AESS-002
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.799
 CM-244 4320A 2/28/10 5795.020 5795.021
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2378.440
 Energy Calibration Slope : 4.923447
 Energy Calibration Quadratic : 3.2373652E-04
 Energy Calibration Range : 7760.000

Instrument : CHAMBER 164
 Detector : 70325
 Calibration Date/Time : 23-JUL-2009 13:59:02
 Calibration Source Id : AESS-008
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.800
 CM-244 4320A 2/28/10 5795.020 5795.020
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2380.008
 Energy Calibration Slope : 4.927452
 Energy Calibration Quadratic : 3.2609751E-04
 Energy Calibration Range : 7768.000

Instrument : CHAMBER 165
 Detector : 72544
 Calibration Date/Time : 23-JUL-2009 13:59:11
 Calibration Source Id : AESS-003
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.800
 CM-244 4320A 2/28/10 5795.020 5795.020
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2387.218
 Energy Calibration Slope : 4.942940
 Energy Calibration Quadratic : 3.0943105E-04
 Energy Calibration Range : 7773.000

Instrument : CHAMBER 166
 Detector : 74545
 Calibration Date/Time : 23-JUL-2009 13:59:23
 Calibration Source Id : AESS-009
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.801
 CM-244 4320A 2/28/10 5795.020 5795.020
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2373.718
 Energy Calibration Slope : 4.929422
 Energy Calibration Quadratic : 3.2212323E-04
 Energy Calibration Range : 7759.000

Instrument : CHAMBER 167
 Detector : 72546
 Calibration Date/Time : 23-JUL-2009 13:59:32
 Calibration Source Id : AESS-004

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.799
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2375.899
 Energy Calibration Slope : 4.924172
 Energy Calibration Quadratic : 3.2251154E-04
 Energy Calibration Range : 7756.000

Instrument : CHAMBER 168
 Detector : 72547
 Calibration Date/Time : 23-JUL-2009 13:59:40
 Calibration Source Id : AESS-010

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.799
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2378.301
 Energy Calibration Slope : 4.935927
 Energy Calibration Quadratic : 3.1537362E-04
 Energy Calibration Range : 7763.000

Instrument : CHAMBER 169
 Detector : 72548
 Calibration Date/Time : 4-AUG-2009 07:06:12
 Calibration Source Id : AESS-005

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2378.366
 Energy Calibration Slope : 4.930755
 Energy Calibration Quadratic : 3.1649129E-04
 Energy Calibration Range : 7759.000

Instrument : CHAMBER 170
 Detector : 72549
 Calibration Date/Time : 23-JUL-2009 13:59:58
 Calibration Source Id : AESS-011

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.801
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2381.389
 Energy Calibration Slope : 4.912318
 Energy Calibration Quadratic : 3.5837301E-04
 Energy Calibration Range : 7787.000

Instrument : CHAMBER 171
 Detector : 78260
 Calibration Date/Time : 23-JUL-2009 14:00:07
 Calibration Source Id : AESS-006

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.798
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2368.307
 Energy Calibration Slope : 4.932293
 Energy Calibration Quadratic : 3.2247280E-04
 Energy Calibration Range : 7757.000

Instrument : CHAMBER 172
 Detector : 78772
 Calibration Date/Time : 23-JUL-2009 14:00:15
 Calibration Source Id : AESS-012

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.799
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2365.785
 Energy Calibration Slope : 4.920015
 Energy Calibration Quadratic : 3.3008555E-04
 Energy Calibration Range : 7750.000

Instrument : CHAMBER 173
 Detector : 74431
 Calibration Date/Time : 22-JUL-2009 14:12:56
 Calibration Source Id : AESS-013
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.926
 CM-244 4320A 2/28/10 5795.020 5795.020
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2364.405
 Energy Calibration Slope : 4.981549
 Energy Calibration Quadratic : 2.6860670E-04
 Energy Calibration Range : 7747.000

Instrument : CHAMBER 174
 Detector : 74432
 Calibration Date/Time : 22-JUL-2009 14:13:10
 Calibration Source Id : AESS-019
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.799
 CM-244 4320A 2/28/10 5795.020 5795.021
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2358.379
 Energy Calibration Slope : 5.035265
 Energy Calibration Quadratic : 2.0271989E-04
 Energy Calibration Range : 7727.000

Instrument : CHAMBER 175
 Detector : 74433
 Calibration Date/Time : 22-JUL-2009 14:13:33
 Calibration Source Id : AESS-014
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3182.817
 NP-237 4341 2/28/10 4768.800 4768.732
 CM-244 4320A 2/28/10 5795.020 5794.897
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2361.060
 Energy Calibration Slope : 4.980610
 Energy Calibration Quadratic : 2.6701824E-04
 Energy Calibration Range : 7741.000

Instrument : CHAMBER 176
 Detector : 74434
 Calibration Date/Time : 22-JUL-2009 14:13:51
 Calibration Source Id : AESS-020
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3182.546
 NP-237 4341 2/28/10 4768.800 4768.799
 CM-244 4320A 2/28/10 5795.020 5795.021
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2357.097
 Energy Calibration Slope : 5.018647
 Energy Calibration Quadratic : 2.3654266E-04
 Energy Calibration Range : 7744.000

Instrument : CHAMBER 177
 Detector : 74435
 Calibration Date/Time : 22-JUL-2009 14:14:02
 Calibration Source Id : AESS-015
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.801
 CM-244 4320A 2/28/10 5795.020 5795.020
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2358.948
 Energy Calibration Slope : 4.983318
 Energy Calibration Quadratic : 2.6383059E-04
 Energy Calibration Range : 7739.000

Instrument : CHAMBER 178
 Detector : 74436
 Calibration Date/Time : 22-JUL-2009 14:14:14
 Calibration Source Id : AESS-021
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.799
 CM-244 4320A 2/28/10 5795.020 5795.021
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2354.644
 Energy Calibration Slope : 4.987851
 Energy Calibration Quadratic : 2.6228666E-04
 Energy Calibration Range : 7737.000

Instrument : CHAMBER 179
 Detector : 74437
 Calibration Date/Time : 22-JUL-2009 14:14:24
 Calibration Source Id : AESS-016

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.260
NP-237	4341	2/28/10	4768.800	4768.966
CM-244	4320A	2/28/10	5795.020	5795.056

Energy/Channel Equation : see above
 Energy Calibration Zero : 2353.987
 Energy Calibration Slope : 4.982908
 Energy Calibration Quadratic : 2.6569929E-04
 Energy Calibration Range : 7735.000

Instrument : CHAMBER 180
 Detector : 74438
 Calibration Date/Time : 22-JUL-2009 14:14:36
 Calibration Source Id : AESS-022

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.799
CM-244	4320A	2/28/10	5795.020	5795.167

Energy/Channel Equation : see above
 Energy Calibration Zero : 2352.144
 Energy Calibration Slope : 5.023554
 Energy Calibration Quadratic : 2.2043443E-04
 Energy Calibration Range : 7727.000

Instrument : CHAMBER 181
 Detector : 74439
 Calibration Date/Time : 22-JUL-2009 14:14:47
 Calibration Source Id : AESS-017

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.801
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2357.233
 Energy Calibration Slope : 4.973598
 Energy Calibration Quadratic : 2.7286567E-04
 Energy Calibration Range : 7736.000

Instrument : CHAMBER 182
 Detector : 74440
 Calibration Date/Time : 22-JUL-2009 14:14:57
 Calibration Source Id : AESS-023

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.653
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2348.571
 Energy Calibration Slope : 4.995710
 Energy Calibration Quadratic : 2.4269641E-04
 Energy Calibration Range : 7719.000

Instrument : CHAMBER 183
 Detector : 74441
 Calibration Date/Time : 22-JUL-2009 14:15:07
 Calibration Source Id : AESS-018

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.801
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2357.181
 Energy Calibration Slope : 4.984746
 Energy Calibration Quadratic : 2.6386807E-04
 Energy Calibration Range : 7738.000

Instrument : CHAMBER 184
 Detector : 74442
 Calibration Date/Time : 22-JUL-2009 14:15:18
 Calibration Source Id : AESS-024

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2352.411
 Energy Calibration Slope : 5.026765
 Energy Calibration Quadratic : 2.1738216E-04
 Energy Calibration Range : 7728.000

Instrument : CHAMBER 185
 Detector : 68615
 Calibration Date/Time : 22-JUL-2009 14:15:30
 Calibration Source Id : AESS-025

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.262
NP-237	4341	2/28/10	4768.800	4769.011
CM-244	4320A	2/28/10	5795.020	5795.113

Energy/Channel Equation : see above
 Energy Calibration Zero : 2354.510
 Energy Calibration Slope : 4.938845
 Energy Calibration Quadratic : 2.7730624E-04
 Energy Calibration Range : 7703.000

Instrument : CHAMBER 186
 Detector : 68616
 Calibration Date/Time : 22-JUL-2009 14:15:43
 Calibration Source Id : AESS-031

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.191
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5795.143

Energy/Channel Equation : see above
 Energy Calibration Zero : 2359.547
 Energy Calibration Slope : 4.938616
 Energy Calibration Quadratic : 2.9074642E-04
 Energy Calibration Range : 7722.000

Instrument : CHAMBER 187
 Detector : 68620
 Calibration Date/Time : 22-JUL-2009 14:15:58
 Calibration Source Id : AESS-026

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.775
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2367.921
 Energy Calibration Slope : 4.980083
 Energy Calibration Quadratic : 2.9012386E-04
 Energy Calibration Range : 7772.000

Instrument : CHAMBER 188
 Detector : 68621
 Calibration Date/Time : 22-JUL-2009 14:16:10
 Calibration Source Id : AESS-032

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.008
NP-237	4341	2/28/10	4768.800	4768.799
CM-244	4320A	2/28/10	5795.020	5795.044

Energy/Channel Equation : see above
 Energy Calibration Zero : 2361.934
 Energy Calibration Slope : 4.976158
 Energy Calibration Quadratic : 2.7708741E-04
 Energy Calibration Range : 7748.000

Instrument : CHAMBER 189
 Detector : 68622
 Calibration Date/Time : 22-JUL-2009 14:16:25
 Calibration Source Id : AESS-027

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.799
CM-244	4320A	2/28/10	5795.020	5795.093

Energy/Channel Equation : see above
 Energy Calibration Zero : 2355.697
 Energy Calibration Slope : 4.939315
 Energy Calibration Quadratic : 2.8903113E-04
 Energy Calibration Range : 7717.000

Instrument : CHAMBER 190
 Detector : 68623
 Calibration Date/Time : 22-JUL-2009 14:16:38
 Calibration Source Id : AESS-033

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.298
NP-237	4341	2/28/10	4768.800	4768.799
CM-244	4320A	2/28/10	5795.020	5795.045

Energy/Channel Equation : see above
 Energy Calibration Zero : 2351.739
 Energy Calibration Slope : 4.948914
 Energy Calibration Quadratic : 2.8685224E-04
 Energy Calibration Range : 7720.000

Instrument : CHAMBER 191
 Detector : 68624
 Calibration Date/Time : 22-JUL-2009 14:17:15
 Calibration Source Id : AESS-028
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.925
 CM-244 4320A 2/28/10 5795.020 5795.090
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2367.921
 Energy Calibration Slope : 4.966295
 Energy Calibration Quadratic : 3.1035815E-04
 Energy Calibration Range : 7779.000

Instrument : CHAMBER 192
 Detector : 74430
 Calibration Date/Time : 22-JUL-2009 14:17:47
 Calibration Source Id : AESS-034
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.903
 CM-244 4320A 2/28/10 5795.020 5795.089
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2362.162
 Energy Calibration Slope : 4.978550
 Energy Calibration Quadratic : 2.9185213E-04
 Energy Calibration Range : 7766.000

Instrument : CHAMBER 193
 Detector : 68627
 Calibration Date/Time : 22-JUL-2009 14:18:09
 Calibration Source Id : AESS-029
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3182.786
 NP-237 4341 2/28/10 4768.800 4768.800
 CM-244 4320A 2/28/10 5795.020 5795.042
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2363.145
 Energy Calibration Slope : 4.920224
 Energy Calibration Quadratic : 3.1340783E-04
 Energy Calibration Range : 7730.000

Instrument : CHAMBER 194
 Detector : 68635
 Calibration Date/Time : 22-JUL-2009 14:18:45
 Calibration Source Id : AESS-035

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.799
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2356.478
 Energy Calibration Slope : 4.939730
 Energy Calibration Quadratic : 2.9438961E-04
 Energy Calibration Range : 7723.000

Instrument : CHAMBER 195
 Detector : 68636
 Calibration Date/Time : 22-JUL-2009 14:19:31
 Calibration Source Id : AESS-030

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5795.181

Energy/Channel Equation : see above
 Energy Calibration Zero : 2359.634
 Energy Calibration Slope : 4.956642
 Energy Calibration Quadratic : 2.8082752E-04
 Energy Calibration Range : 7730.000

Instrument : CHAMBER 196
 Detector : 68637
 Calibration Date/Time : 22-JUL-2009 14:19:51
 Calibration Source Id : AESS-036

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.156
NP-237	4341	2/28/10	4768.800	4768.801
CM-244	4320A	2/28/10	5795.020	5795.019

Energy/Channel Equation : see above
 Energy Calibration Zero : 2357.884
 Energy Calibration Slope : 4.943155
 Energy Calibration Quadratic : 2.9007217E-04
 Energy Calibration Range : 7724.000

Instrument : CHAMBER 197
 Detector : 78894
 Calibration Date/Time : 23-JUL-2009 14:00:24
 Calibration Source Id : AESS-037

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.799
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2369.600
 Energy Calibration Slope : 4.961125
 Energy Calibration Quadratic : 2.9980636E-04
 Energy Calibration Range : 7764.000

Instrument : CHAMBER 198
 Detector : 78895
 Calibration Date/Time : 23-JUL-2009 14:00:36
 Calibration Source Id : AESS-043

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.801
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2364.985
 Energy Calibration Slope : 4.958083
 Energy Calibration Quadratic : 2.9077829E-04
 Energy Calibration Range : 7747.000

Instrument : CHAMBER 199
 Detector : 78896
 Calibration Date/Time : 23-JUL-2009 14:00:47
 Calibration Source Id : AESS-038

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.799
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2363.893
 Energy Calibration Slope : 4.975142
 Energy Calibration Quadratic : 2.8265564E-04
 Energy Calibration Range : 7755.000

Instrument : CHAMBER 200
 Detector : 78900
 Calibration Date/Time : 23-JUL-2009 14:00:57
 Calibration Source Id : AESS-044
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.799
 CM-244 4320A 2/28/10 5795.020 5795.021
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2366.560
 Energy Calibration Slope : 4.944607
 Energy Calibration Quadratic : 3.1754555E-04
 Energy Calibration Range : 7763.000

Instrument : CHAMBER 201
 Detector : 78902
 Calibration Date/Time : 23-JUL-2009 14:01:05
 Calibration Source Id : AESS-039
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.799
 CM-244 4320A 2/28/10 5795.020 5795.021
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2365.274
 Energy Calibration Slope : 4.952928
 Energy Calibration Quadratic : 3.1035283E-04
 Energy Calibration Range : 7763.000

Instrument : CHAMBER 202
 Detector : 78903
 Calibration Date/Time : 23-JUL-2009 14:01:14
 Calibration Source Id : AESS-045
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.799
 CM-244 4320A 2/28/10 5795.020 5795.021
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2355.391
 Energy Calibration Slope : 4.951035
 Energy Calibration Quadratic : 2.9712555E-04
 Energy Calibration Range : 7737.000

Instrument : CHAMBER 203
 Detector : 78905
 Calibration Date/Time : 23-JUL-2009 14:01:22
 Calibration Source Id : AESS-040
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.801
 CM-244 4320A 2/28/10 5795.020 5795.020
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2359.621
 Energy Calibration Slope : 4.976038
 Energy Calibration Quadratic : 2.7450506E-04
 Energy Calibration Range : 7743.000

Instrument : CHAMBER 204
 Detector : 78907
 Calibration Date/Time : 23-JUL-2009 14:01:31
 Calibration Source Id : AESS-046
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.800
 CM-244 4320A 2/28/10 5795.020 5795.021
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2360.966
 Energy Calibration Slope : 4.954226
 Energy Calibration Quadratic : 2.9946532E-04
 Energy Calibration Range : 7748.000

Instrument : CHAMBER 205
 Detector : 78908
 Calibration Date/Time : 23-JUL-2009 14:01:40
 Calibration Source Id : AESS-041
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.801
 CM-244 4320A 2/28/10 5795.020 5795.020
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2367.589
 Energy Calibration Slope : 4.954722
 Energy Calibration Quadratic : 3.0296977E-04
 Energy Calibration Range : 7759.000

Instrument : CHAMBER 206
 Detector : 78909
 Calibration Date/Time : 23-JUL-2009 14:01:49
 Calibration Source Id : AESS-047
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.799
 CM-244 4320A 2/28/10 5795.020 5795.021
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2361.905
 Energy Calibration Slope : 4.955875
 Energy Calibration Quadratic : 2.9360279E-04
 Energy Calibration Range : 7745.000

Instrument : CHAMBER 207
 Detector : 78910
 Calibration Date/Time : 23-JUL-2009 14:01:57
 Calibration Source Id : AESS-042
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.800
 CM-244 4320A 2/28/10 5795.020 5795.021
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2368.030
 Energy Calibration Slope : 4.964427
 Energy Calibration Quadratic : 2.9426123E-04
 Energy Calibration Range : 7760.000

Instrument : CHAMBER 208
 Detector : 78911
 Calibration Date/Time : 23-JUL-2009 14:02:06
 Calibration Source Id : AESS-048
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.800
 CM-244 4320A 2/28/10 5795.020 5795.021
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2364.066
 Energy Calibration Slope : 4.968146
 Energy Calibration Quadratic : 2.8974371E-04
 Energy Calibration Range : 7755.000

Instrument : CHAMBER 209
 Detector : 79188
 Calibration Date/Time : 28-JUL-2009 13:59:46
 Calibration Source Id : AESS-001

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2390.309
 Energy Calibration Slope : 4.907889
 Energy Calibration Quadratic : 3.5155186E-04
 Energy Calibration Range : 7785.000

Instrument : CHAMBER 210
 Detector : 79189
 Calibration Date/Time : 28-JUL-2009 13:59:55
 Calibration Source Id : AESS-002

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.801
CM-244	4320A	2/28/10	5795.020	5795.019

Energy/Channel Equation : see above
 Energy Calibration Zero : 2382.719
 Energy Calibration Slope : 4.945560
 Energy Calibration Quadratic : 3.0519743E-04
 Energy Calibration Range : 7767.000

Instrument : CHAMBER 211
 Detector : 79190
 Calibration Date/Time : 28-JUL-2009 14:00:03
 Calibration Source Id : AESS-003

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2388.786
 Energy Calibration Slope : 4.957439
 Energy Calibration Quadratic : 3.0850343E-04
 Energy Calibration Range : 7789.000

Instrument : CHAMBER 212
 Detector : 79191
 Calibration Date/Time : 28-JUL-2009 14:00:11
 Calibration Source Id : AESS-004

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.801
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2386.612
 Energy Calibration Slope : 4.941330
 Energy Calibration Quadratic : 3.1567214E-04
 Energy Calibration Range : 7778.000

Instrument : CHAMBER 213
 Detector : 79192
 Calibration Date/Time : 28-JUL-2009 14:00:20
 Calibration Source Id : AESS-005

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.801
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2392.102
 Energy Calibration Slope : 4.949504
 Energy Calibration Quadratic : 3.0747624E-04
 Energy Calibration Range : 7783.000

Instrument : CHAMBER 214
 Detector : 79193
 Calibration Date/Time : 28-JUL-2009 14:00:29
 Calibration Source Id : AESS-006

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.799
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2383.299
 Energy Calibration Slope : 4.938057
 Energy Calibration Quadratic : 3.2320846E-04
 Energy Calibration Range : 7779.000

Instrument : CHAMBER 215
 Detector : 79194
 Calibration Date/Time : 28-JUL-2009 14:00:38
 Calibration Source Id : AESS-007

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2391.097
 Energy Calibration Slope : 4.946728
 Energy Calibration Quadratic : 3.2361320E-04
 Energy Calibration Range : 7796.000

Instrument : CHAMBER 216
 Detector : 79195
 Calibration Date/Time : 28-JUL-2009 14:00:46
 Calibration Source Id : AESS-008

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.001
NP-237	4341	2/28/10	4768.800	4768.798
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2389.871
 Energy Calibration Slope : 4.924810
 Energy Calibration Quadratic : 3.3861332E-04
 Energy Calibration Range : 7788.000

Instrument : CHAMBER 217
 Detector : 79410
 Calibration Date/Time : 28-JUL-2009 14:00:55
 Calibration Source Id : AESS-009

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.799
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2391.358
 Energy Calibration Slope : 4.934552
 Energy Calibration Quadratic : 3.3054961E-04
 Energy Calibration Range : 7791.000

Instrument : CHAMBER 218
 Detector : 79411
 Calibration Date/Time : 28-JUL-2009 14:01:03
 Calibration Source Id : AESS-010
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.801
 CM-244 4320A 2/28/10 5795.020 5795.020
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2388.335
 Energy Calibration Slope : 4.946022
 Energy Calibration Quadratic : 3.1945287E-04
 Energy Calibration Range : 7788.000

Instrument : CHAMBER 219
 Detector : 79412
 Calibration Date/Time : 28-JUL-2009 14:01:48
 Calibration Source Id : AESS-011
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.801
 CM-244 4320A 2/28/10 5795.020 5795.020
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2390.188
 Energy Calibration Slope : 4.929147
 Energy Calibration Quadratic : 3.3767600E-04
 Energy Calibration Range : 7792.000

Instrument : CHAMBER 220
 Detector : 79413
 Calibration Date/Time : 28-JUL-2009 14:02:00
 Calibration Source Id : AESS-012
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.800
 CM-244 4320A 2/28/10 5795.020 5795.020
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2382.449
 Energy Calibration Slope : 4.943600
 Energy Calibration Quadratic : 3.1373679E-04
 Energy Calibration Range : 7774.000

Instrument : CHAMBER 221
 Detector : 79414
 Calibration Date/Time : 28-JUL-2009 14:02:09
 Calibration Source Id : AESS-013

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2387.174
 Energy Calibration Slope : 4.970656
 Energy Calibration Quadratic : 3.0409341E-04
 Energy Calibration Range : 7796.000

Instrument : CHAMBER 222
 Detector : 79415
 Calibration Date/Time : 28-JUL-2009 14:02:19
 Calibration Source Id : AESS-014

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2382.306
 Energy Calibration Slope : 5.025091
 Energy Calibration Quadratic : 2.4377843E-04
 Energy Calibration Range : 7784.000

Instrument : CHAMBER 223
 Detector : 79416
 Calibration Date/Time : 28-JUL-2009 14:02:29
 Calibration Source Id : AESS-015

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.799
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2389.067
 Energy Calibration Slope : 4.958123
 Energy Calibration Quadratic : 3.2477293E-04
 Energy Calibration Range : 7807.000

Instrument : CHAMBER 224
 Detector : 79417
 Calibration Date/Time : 28-JUL-2009 14:02:37
 Calibration Source Id : AESS-016
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.027
 NP-237 4341 2/28/10 4768.800 4768.799
 CM-244 4320A 2/28/10 5795.020 5795.021

 Energy/Channel Equation : see above
 Energy Calibration Zero : 2386.695
 Energy Calibration Slope : 5.011842
 Energy Calibration Quadratic : 2.6290418E-04
 Energy Calibration Range : 7794.000

Instrument : CHAMBER 225
 Detector : 79418
 Calibration Date/Time : 28-JUL-2009 14:02:46
 Calibration Source Id : AESS-017
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.801
 CM-244 4320A 2/28/10 5795.020 5795.019

 Energy/Channel Equation : see above
 Energy Calibration Zero : 2392.776
 Energy Calibration Slope : 4.933724
 Energy Calibration Quadratic : 3.3852886E-04
 Energy Calibration Range : 7800.000

Instrument : CHAMBER 226
 Detector : 79419
 Calibration Date/Time : 28-JUL-2009 14:02:55
 Calibration Source Id : AESS-018
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.800
 CM-244 4320A 2/28/10 5795.020 5795.020

 Energy/Channel Equation : see above
 Energy Calibration Zero : 2384.150
 Energy Calibration Slope : 4.973210
 Energy Calibration Quadratic : 2.9508519E-04
 Energy Calibration Range : 7786.000

Instrument : CHAMBER 227
 Detector : 79420
 Calibration Date/Time : 28-JUL-2009 14:03:04
 Calibration Source Id : AESS-019
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.799
 CM-244 4320A 2/28/10 5795.020 5795.021
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2391.061
 Energy Calibration Slope : 4.938961
 Energy Calibration Quadratic : 3.3045741E-04
 Energy Calibration Range : 7795.000

Instrument : CHAMBER 228
 Detector : 79421
 Calibration Date/Time : 28-JUL-2009 14:03:13
 Calibration Source Id : AESS-020
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.799
 CM-244 4320A 2/28/10 5795.020 5795.021
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2386.005
 Energy Calibration Slope : 4.959556
 Energy Calibration Quadratic : 3.0744984E-04
 Energy Calibration Range : 7787.000

Instrument : CHAMBER 229
 Detector : 79422
 Calibration Date/Time : 28-JUL-2009 14:03:22
 Calibration Source Id : AESS-021
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.800
 CM-244 4320A 2/28/10 5795.020 5795.020
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2387.995
 Energy Calibration Slope : 4.940877
 Energy Calibration Quadratic : 3.3899915E-04
 Energy Calibration Range : 7803.000

Instrument : CHAMBER 230
 Detector : 79423
 Calibration Date/Time : 28-JUL-2009 14:03:31
 Calibration Source Id : AESS-022

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2384.573
 Energy Calibration Slope : 4.960246
 Energy Calibration Quadratic : 3.1046796E-04
 Energy Calibration Range : 7789.000

Instrument : CHAMBER 231
 Detector : 79424
 Calibration Date/Time : 28-JUL-2009 14:03:40
 Calibration Source Id : AESS-023

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.801
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2387.425
 Energy Calibration Slope : 4.946337
 Energy Calibration Quadratic : 3.1792521E-04
 Energy Calibration Range : 7786.000

Instrument : CHAMBER 232
 Detector : 79425
 Calibration Date/Time : 28-JUL-2009 14:03:48
 Calibration Source Id : AESS-024

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.799
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2384.962
 Energy Calibration Slope : 5.004478
 Energy Calibration Quadratic : 2.5898189E-04
 Energy Calibration Range : 7781.000

Instrument : CHAMBER 233
 Detector : 79426
 Calibration Date/Time : 28-JUL-2009 14:03:57
 Calibration Source Id : AESS-025

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2384.858
 Energy Calibration Slope : 4.908395
 Energy Calibration Quadratic : 3.6085595E-04
 Energy Calibration Range : 7789.000

Instrument : CHAMBER 234
 Detector : 79427
 Calibration Date/Time : 28-JUL-2009 14:04:08
 Calibration Source Id : AESS-026

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.801
CM-244	4320A	2/28/10	5795.020	5795.019

Energy/Channel Equation : see above
 Energy Calibration Zero : 2378.557
 Energy Calibration Slope : 4.936086
 Energy Calibration Quadratic : 3.1737317E-04
 Energy Calibration Range : 7766.000

Instrument : CHAMBER 235
 Detector : 79428
 Calibration Date/Time : 28-JUL-2009 14:04:17
 Calibration Source Id : AESS-027

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2386.048
 Energy Calibration Slope : 4.937345
 Energy Calibration Quadratic : 3.3249237E-04
 Energy Calibration Range : 7791.000

Instrument : CHAMBER 236
 Detector : 79429
 Calibration Date/Time : 28-JUL-2009 14:04:27
 Calibration Source Id : AESS-028

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.801
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2388.810
 Energy Calibration Slope : 4.906125
 Energy Calibration Quadratic : 3.6270331E-04
 Energy Calibration Range : 7793.000

Instrument : CHAMBER 237
 Detector : 79430
 Calibration Date/Time : 28-JUL-2009 14:04:36
 Calibration Source Id : AESS-029

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2387.128
 Energy Calibration Slope : 4.944391
 Energy Calibration Quadratic : 3.2767057E-04
 Energy Calibration Range : 7794.000

Instrument : CHAMBER 238
 Detector : 79431
 Calibration Date/Time : 28-JUL-2009 14:04:46
 Calibration Source Id : AESS-030

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2381.338
 Energy Calibration Slope : 4.929770
 Energy Calibration Quadratic : 3.3144769E-04
 Energy Calibration Range : 7777.000

Instrument : CHAMBER 239
 Detector : 79432
 Calibration Date/Time : 28-JUL-2009 14:04:55
 Calibration Source Id : AESS-031

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.798
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2390.132
 Energy Calibration Slope : 4.920120
 Energy Calibration Quadratic : 3.5708508E-04
 Energy Calibration Range : 7803.000

Instrument : CHAMBER 240
 Detector : 79433
 Calibration Date/Time : 28-JUL-2009 14:05:04
 Calibration Source Id : AESS-032

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.799
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2385.205
 Energy Calibration Slope : 4.918474
 Energy Calibration Quadratic : 3.4866974E-04
 Energy Calibration Range : 7787.000

Instrument : CHAMBER 241
 Detector : 79434
 Calibration Date/Time : 28-JUL-2009 14:05:13
 Calibration Source Id : AESS-033

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2385.825
 Energy Calibration Slope : 4.908836
 Energy Calibration Quadratic : 3.6050563E-04
 Energy Calibration Range : 7790.000

Instrument : CHAMBER 242
 Detector : 79435
 Calibration Date/Time : 28-JUL-2009 14:05:21
 Calibration Source Id : AESS-034

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.801
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2385.009
 Energy Calibration Slope : 4.945025
 Energy Calibration Quadratic : 3.1615721E-04
 Energy Calibration Range : 7780.000

Instrument : CHAMBER 243
 Detector : 79436
 Calibration Date/Time : 28-JUL-2009 14:05:30
 Calibration Source Id : AESS-035

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.801
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2386.770
 Energy Calibration Slope : 4.934989
 Energy Calibration Quadratic : 3.3655608E-04
 Energy Calibration Range : 7793.000

Instrument : CHAMBER 244
 Detector : 79437
 Calibration Date/Time : 28-JUL-2009 14:05:39
 Calibration Source Id : AESS-036

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.801
CM-244	4320A	2/28/10	5795.020	5795.019

Energy/Channel Equation : see above
 Energy Calibration Zero : 2391.069
 Energy Calibration Slope : 4.911016
 Energy Calibration Quadratic : 3.5919523E-04
 Energy Calibration Range : 7797.000

Instrument : CHAMBER 245
 Detector : 79438
 Calibration Date/Time : 28-JUL-2009 14:05:48
 Calibration Source Id : AESS-037
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.800
 CM-244 4320A 2/28/10 5795.020 5795.020
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2392.602
 Energy Calibration Slope : 4.941990
 Energy Calibration Quadratic : 3.3874813E-04
 Energy Calibration Range : 7808.000

Instrument : CHAMBER 246
 Detector : 78912
 Calibration Date/Time : 28-JUL-2009 14:05:57
 Calibration Source Id : AESS-038
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.799
 CM-244 4320A 2/28/10 5795.020 5795.021
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2392.768
 Energy Calibration Slope : 4.935872
 Energy Calibration Quadratic : 3.3401168E-04
 Energy Calibration Range : 7797.000

Instrument : CHAMBER 247
 Detector : 79440
 Calibration Date/Time : 28-JUL-2009 14:06:06
 Calibration Source Id : AESS-039
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.799
 CM-244 4320A 2/28/10 5795.020 5795.021
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2393.687
 Energy Calibration Slope : 4.919972
 Energy Calibration Quadratic : 3.6322643E-04
 Energy Calibration Range : 7813.000

Instrument : CHAMBER 248
 Detector : 79441
 Calibration Date/Time : 28-JUL-2009 14:06:15
 Calibration Source Id : AESS-040
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.799
 CM-244 4320A 2/28/10 5795.020 5795.020
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2386.829
 Energy Calibration Slope : 4.935865
 Energy Calibration Quadratic : 3.3986062E-04
 Energy Calibration Range : 7798.000

Instrument : CHAMBER 249
 Detector : 79442
 Calibration Date/Time : 28-JUL-2009 14:10:21
 Calibration Source Id : AESS-041
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.799
 CM-244 4320A 2/28/10 5795.020 5795.021
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2391.737
 Energy Calibration Slope : 4.913334
 Energy Calibration Quadratic : 3.7958668E-04
 Energy Calibration Range : 7821.000

Instrument : CHAMBER 250
 Detector : 79443
 Calibration Date/Time : 28-JUL-2009 14:07:02
 Calibration Source Id : AESS-042
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.798
 CM-244 4320A 2/28/10 5795.020 5795.021
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2383.582
 Energy Calibration Slope : 4.915850
 Energy Calibration Quadratic : 3.5610356E-04
 Energy Calibration Range : 7791.000

Instrument : CHAMBER 251
 Detector : 79444
 Calibration Date/Time : 28-JUL-2009 14:07:11
 Calibration Source Id : AESS-043

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2390.072
 Energy Calibration Slope : 4.920268
 Energy Calibration Quadratic : 3.7023224E-04
 Energy Calibration Range : 7817.000

Instrument : CHAMBER 252
 Detector : 79445
 Calibration Date/Time : 28-JUL-2009 14:07:24
 Calibration Source Id : AESS-044

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2391.797
 Energy Calibration Slope : 4.906192
 Energy Calibration Quadratic : 3.7361679E-04
 Energy Calibration Range : 7808.000

Instrument : CHAMBER 253
 Detector : 79446
 Calibration Date/Time : 28-JUL-2009 14:07:35
 Calibration Source Id : AESS-045

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.799
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2393.983
 Energy Calibration Slope : 4.947714
 Energy Calibration Quadratic : 3.5550338E-04
 Energy Calibration Range : 7833.000

Instrument : CHAMBER 254
 Detector : 79447
 Calibration Date/Time : 28-JUL-2009 14:07:52
 Calibration Source Id : AESS-046

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.801
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2389.038
 Energy Calibration Slope : 4.937405
 Energy Calibration Quadratic : 3.4224574E-04
 Energy Calibration Range : 7804.000

Instrument : CHAMBER 255
 Detector : 79448
 Calibration Date/Time : 28-JUL-2009 14:08:10
 Calibration Source Id : AESS-047

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2391.216
 Energy Calibration Slope : 4.920984
 Energy Calibration Quadratic : 3.7234218E-04
 Energy Calibration Range : 7821.000

Instrument : CHAMBER 256
 Detector : 79449
 Calibration Date/Time : 28-JUL-2009 14:08:26
 Calibration Source Id : AESS-048

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.801
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2387.279
 Energy Calibration Slope : 4.932406
 Energy Calibration Quadratic : 3.4164111E-04
 Energy Calibration Range : 7796.000

Subsection 2: Background Calibration

Instrument : CHAMBER 001
 Detector : 78788
 Background Analysis Date/Time : 2-AUG-2009 17:38:31
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.927	3299.401	3.000000	0.7200001	57.73503	95.00000
NP-237	4432.428	4902.923	11.000000	2.640001	30.15113	95.00000
CM-244	5533.599	5883.327	10.000000	2.400001	31.62278	95.00000

Instrument : CHAMBER 002
 Detector : 78266
 Background Analysis Date/Time : 2-AUG-2009 17:38:31
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.748	3297.924	4.000000	0.9600002	50.00000	95.00000
NP-237	4434.751	4902.555	3.000000	0.7200001	57.73503	95.00000
CM-244	5533.273	5884.668	1.000000	0.2400001	100.0000	95.00000

Instrument : CHAMBER 003
 Detector : 67617
 Background Analysis Date/Time : 2-AUG-2009 17:38:31
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.035	3300.027	6.000000	1.440000	40.82483	95.00000
NP-237	4433.783	4901.623	9.000000	2.160001	33.33334	95.00000
CM-244	5533.183	5887.889	9.000000	2.160001	33.33334	95.00000

Instrument : CHAMBER 004
 Detector : 64279
 Background Analysis Date/Time : 2-AUG-2009 17:38:31
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.885	3302.347	4.000000	0.9600002	50.00000	95.00000
NP-237	4436.757	4905.540	7.000000	1.680000	37.79645	95.00000
CM-244	5533.807	5887.698	4.000000	0.9600002	50.00000	95.00000

Instrument : CHAMBER 005
 Detector : 67612
 Background Analysis Date/Time : 2-AUG-2009 17:38:31
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.194	3301.639	3.000000	0.7200001	57.73503	95.00000
NP-237	4437.588	4901.889	8.000000	1.920000	35.35534	95.00000
CM-244	5531.535	5887.236	1.000000	0.2400001	100.0000	95.00000

Instrument : CHAMBER 006
 Detector : 67613
 Background Analysis Date/Time : 2-AUG-2009 17:38:31
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.186	3302.064	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4434.812	4901.476	9.000000	2.160001	33.33334	95.00000
CM-244	5533.017	5887.020	8.000000	1.920000	35.35534	95.00000

Instrument : CHAMBER 007
 Detector : 67607
 Background Analysis Date/Time : 2-AUG-2009 17:38:32
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.468	3299.148	8.000000	1.920000	35.35534	95.00000
NP-237	4433.972	4903.766	11.00000	2.640000	30.15113	95.00000
CM-244	5532.246	5885.701	17.00000	4.080001	24.25356	95.00000

Instrument : CHAMBER 008
 Detector : 78788
 Background Analysis Date/Time : 2-AUG-2009 17:38:32
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.215	3298.713	3.000000	0.7200001	57.73503	95.00000
NP-237	4433.303	4905.744	4.000000	0.9600002	50.00000	95.00000
CM-244	5532.461	5886.606	2.000000	0.4800001	70.71068	95.00000

Instrument : CHAMBER 009
 Detector : 72528
 Background Analysis Date/Time : 2-AUG-2009 17:38:32
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.462	3298.900	5.000000	1.200000	44.72136	95.00000
NP-237	4437.055	4904.570	10.000000	2.400000	31.62278	95.00000
CM-244	5532.536	5882.399	13.000000	3.120001	27.73501	95.00000

Instrument : CHAMBER 010
 Detector : 72529
 Background Analysis Date/Time : 2-AUG-2009 17:38:32
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.229	3298.607	8.000000	1.920000	35.35534	95.00000
NP-237	4436.880	4905.484	9.000000	2.160000	33.33334	95.00000
CM-244	5531.409	5886.990	4.000000	0.9600002	50.00000	95.00000

Instrument : CHAMBER 011
 Detector : 72531
 Background Analysis Date/Time : 2-AUG-2009 17:38:32
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.538	3301.988	3.000000	0.7200001	57.73503	95.00000
NP-237	4435.957	4905.467	9.000000	2.160000	33.33334	95.00000
CM-244	5530.314	5886.614	3.000000	0.7200001	57.73503	95.00000

Instrument : CHAMBER 012
 Detector : 67594
 Background Analysis Date/Time : 2-AUG-2009 17:38:32
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.398	3300.615	3.000000	0.7200001	57.73503	95.00000
NP-237	4437.450	4901.503	9.000000	2.160000	33.33334	95.00000
CM-244	5534.709	5886.652	16.000000	3.840001	25.00000	95.00000

Instrument : CHAMBER 013
 Detector : 78790
 Background Analysis Date/Time : 2-AUG-2009 17:38:33
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.666	3298.441	1.000000	0.2400001	100.0000	95.00000
NP-237	4435.272	4902.524	6.000000	1.440000	40.82483	95.00000
CM-244	5533.077	5883.559	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000

Instrument : CHAMBER 014
 Detector : 67616
 Background Analysis Date/Time : 2-AUG-2009 17:38:33
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.504	3300.484	2.000000	0.4800001	70.71068	95.00000
NP-237	4435.990	4902.000	4.000000	0.9600002	50.00000	95.00000
CM-244	5532.918	5886.701	23.00000	5.520001	20.85144	95.00000

Instrument : CHAMBER 015
 Detector : 61581
 Background Analysis Date/Time : 2-AUG-2009 17:38:33
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.739	3297.575	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4432.566	4904.976	10.00000	2.400001	31.62278	95.00000
CM-244	5530.833	5887.242	22.00000	5.280001	21.32007	95.00000

Instrument : CHAMBER 016
 Detector : 78774
 Background Analysis Date/Time : 2-AUG-2009 17:38:33
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.015	3299.769	3.000000	0.7200001	57.73503	95.00000
NP-237	4432.750	4903.568	3.000000	0.7200001	57.73503	95.00000
CM-244	5531.945	5886.508	2.000000	0.4800001	70.71068	95.00000

Instrument : CHAMBER 017
 Detector : 78791
 Background Analysis Date/Time : 2-AUG-2009 17:38:33
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.506	3301.266	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4435.397	4901.753	6.000000	1.440000	40.82483	95.00000
CM-244	5532.102	5885.058	2.000000	0.4800001	70.71068	95.00000

Instrument : CHAMBER 018
 Detector : 78782
 Background Analysis Date/Time : 2-AUG-2009 17:38:33
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.342	3302.274	1.000000	0.2400001	100.0000	95.00000
NP-237	4435.776	4902.996	4.000000	0.9600002	50.00000	95.00000
CM-244	5535.506	5884.764	1.000000	0.2400001	100.0000	95.00000

Instrument : CHAMBER 019
 Detector : 78786
 Background Analysis Date/Time : 2-AUG-2009 17:38:34
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.757	3299.102	1.000000	0.2399998	100.0000	95.00000
NP-237	4436.959	4904.938	5.000000	1.199999	44.72136	95.00000
CM-244	5530.360	5882.637	4.000000	0.9599994	50.00000	95.00000

Instrument : CHAMBER 020
 Detector : 78787
 Background Analysis Date/Time : 2-AUG-2009 17:38:34
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.029	3302.537	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4437.491	4905.035	10.00000	2.399998	31.62278	95.00000
CM-244	5532.389	5886.993	5.000000	1.199999	44.72136	95.00000

Instrument : CHAMBER 021
 Detector : 67047
 Background Analysis Date/Time : 2-AUG-2009 17:38:34
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.044	3301.105	4.000000	0.9599994	50.00000	95.00000
NP-237	4432.692	4903.261	8.000000	1.919999	35.35534	95.00000
CM-244	5532.273	5884.483	16.00000	3.839998	25.00000	95.00000

Instrument : CHAMBER 022
 Detector : 72530
 Background Analysis Date/Time : 2-AUG-2009 17:38:34
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.876	3301.717	5.000000	1.199999	44.72136	95.00000
NP-237	4432.553	4902.907	4.000000	0.9599994	50.00000	95.00000
CM-244	5531.719	5883.858	21.00000	5.039997	21.82179	95.00000

Instrument : CHAMBER 023
 Detector : 78264
 Background Analysis Date/Time : 2-AUG-2009 17:38:34
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.270	3297.465	1.000000	0.2399998	100.0000	95.00000
NP-237	4434.353	4902.238	12.00000	2.879998	28.86751	95.00000
CM-244	5535.006	5884.098	4.000000	0.9599994	50.00000	95.00000

Instrument : CHAMBER 024
 Detector : 76542
 Background Analysis Date/Time : 2-AUG-2009 17:38:34
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.735	3301.963	3.000000	0.7199996	57.73503	95.00000
NP-237	4435.585	4904.900	14.00000	3.359998	26.72612	95.00000
CM-244	5532.247	5883.527	6.000000	1.439999	40.82483	95.00000

Instrument : CHAMBER 025
 Detector : 45-149AA5
 Background Analysis Date/Time : 2-AUG-2009 17:38:35
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.576	3302.009	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4437.518	4905.500	4.000000	0.9600002	50.00000	95.00000
CM-244	5535.553	5882.966	61.00000	14.64000	12.80369	95.00000

Instrument : CHAMBER 026
 Detector : 78204
 Background Analysis Date/Time : 2-AUG-2009 17:38:35
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.278	3302.066	1.000000	0.2400001	100.0000	95.00000
NP-237	4432.530	4904.245	8.000000	1.920000	35.35534	95.00000
CM-244	5530.854	5885.357	35.00000	8.400002	16.90309	95.00000

Instrument : CHAMBER 027
 Detector : 42484
 Background Analysis Date/Time : 2-AUG-2009 17:38:35
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.311	3298.574	1.000000	0.2400001	100.0000	95.00000
NP-237	4433.571	4901.458	4.000000	0.9600002	50.00000	95.00000
CM-244	5534.916	5884.719	37.00000	8.880002	16.43990	95.00000

Instrument : CHAMBER 028
 Detector : 78792
 Background Analysis Date/Time : 2-AUG-2009 17:38:35
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.458	3301.428	1.000000	0.2400001	100.0000	95.00000
NP-237	4433.918	4901.793	10.00000	2.400001	31.62278	95.00000
CM-244	5530.766	5886.861	36.00000	8.640002	16.66667	95.00000

Instrument : CHAMBER 029
 Detector : 33454
 Background Analysis Date/Time : 2-AUG-2009 17:38:35
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.561	3299.264	4.000000	0.9600002	50.00000	95.00000
NP-237	4436.609	4905.813	5.000000	1.200000	44.72136	95.00000
CM-244	5532.652	5886.650	41.00000	9.840002	15.61738	95.00000

Instrument : CHAMBER 030
 Detector : 33447
 Background Analysis Date/Time : 2-AUG-2009 17:38:35
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.462	3300.436	4.000000	0.9600002	50.00000	95.00000
NP-237	4435.706	4901.528	10.00000	2.400001	31.62278	95.00000
CM-244	5532.111	5885.667	49.00000	11.76000	14.28572	95.00000

Instrument : CHAMBER 031
 Detector : 67042
 Background Analysis Date/Time : 2-AUG-2009 17:38:35
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.816	3298.130	4.000000	0.9599994	50.00000	95.00000
NP-237	4432.666	4904.194	11.00000	2.639998	30.15113	95.00000
CM-244	5530.750	5885.317	50.00000	11.99999	14.14214	95.00000

Instrument : CHAMBER 032
 Detector : 67041
 Background Analysis Date/Time : 2-AUG-2009 17:38:35
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.681	3302.442	2.000000	0.4799997	70.71068	95.00000
NP-237	4436.943	4904.070	8.000000	1.919999	35.35534	95.00000
CM-244	5532.476	5883.050	63.00000	15.11999	12.59882	95.00000

Instrument : CHAMBER 033
 Detector : 78785
 Background Analysis Date/Time : 2-AUG-2009 17:38:35
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.750	3301.323	2.000000	0.4799997	70.71068	95.00000
NP-237	4437.327	4904.445	7.000000	1.679999	37.79645	95.00000
CM-244	5532.298	5882.301	47.00000	11.27999	14.58650	95.00000

Instrument : CHAMBER 034
 Detector : 61586
 Background Analysis Date/Time : 2-AUG-2009 17:38:35
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.405	3301.020	3.000000	0.7199996	57.73503	95.00000
NP-237	4436.289	4905.558	6.000000	1.439999	40.82483	95.00000
CM-244	5534.591	5883.408	6.000000	1.439999	40.82483	95.00000

Instrument : CHAMBER 035
 Detector : 78202
 Background Analysis Date/Time : 2-AUG-2009 17:38:35
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.026	3302.211	3.000000	0.7199996	57.73503	95.00000
NP-237	4437.360	4905.577	20.00000	4.799997	22.36068	95.00000
CM-244	5534.350	5884.600	61.00000	14.63999	12.80369	95.00000

Instrument : CHAMBER 036
 Detector : 78203
 Background Analysis Date/Time : 2-AUG-2009 17:38:35
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.680	3301.073	2.000000	0.4799997	70.71068	95.00000
NP-237	4435.041	4905.984	9.000000	2.159999	33.33334	95.00000
CM-244	5531.465	5885.278	47.00000	11.27999	14.58650	95.00000

Instrument : CHAMBER 037
 Detector : 45-149BB5
 Background Analysis Date/Time : 2-AUG-2009 17:38:36
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.168	3302.212	3.000000	0.7199995	57.73503	95.00000
NP-237	4432.895	4904.029	13.00000	3.119998	27.73501	95.00000
CM-244	5532.110	5886.157	66.00000	15.83999	12.30915	95.00000

Instrument : CHAMBER 038
 Detector : 72532
 Background Analysis Date/Time : 2-AUG-2009 17:38:36
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.472	3300.031	4.000000	0.9599993	50.00000	95.00000
NP-237	4434.591	4905.742	16.00000	3.839997	25.00000	95.00000
CM-244	5531.463	5885.396	50.00000	11.99999	14.14214	95.00000

Instrument : CHAMBER 039
 Detector : 45-149BB2
 Background Analysis Date/Time : 2-AUG-2009 17:38:36
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.231	3297.932	6.000000	1.439999	40.82483	95.00000
NP-237	4433.148	4905.972	6.000000	1.439999	40.82483	95.00000
CM-244	5532.651	5884.312	76.00000	18.23999	11.47079	95.00000

Instrument : CHAMBER 040
 Detector : 78773
 Background Analysis Date/Time : 2-AUG-2009 17:38:36
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.631	3299.278	2.000000	0.4799997	70.71068	95.00000
NP-237	4434.455	4902.104	2.000000	0.4799997	70.71068	95.00000
CM-244	5534.140	5885.901	43.00000	10.31999	15.24986	95.00000

Instrument : CHAMBER 041
 Detector : 78205
 Background Analysis Date/Time : 2-AUG-2009 17:38:36
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.485	3301.427	8.000000	1.919999	35.35534	95.00000
NP-237	4434.095	4902.163	8.000000	1.919999	35.35534	95.00000
CM-244	5531.498	5882.427	43.00000	10.31999	15.24986	95.00000

Instrument : CHAMBER 042
 Detector : 78793
 Background Analysis Date/Time : 2-AUG-2009 17:38:36
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.775	3302.182	3.000000	0.7199995	57.73503	95.00000
NP-237	4434.604	4903.031	12.00000	2.879998	28.86751	95.00000
CM-244	5530.666	5882.826	45.00000	10.79999	14.90712	95.00000

Instrument : CHAMBER 043
 Detector : 76543
 Background Analysis Date/Time : 2-AUG-2009 17:38:37
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.605	3297.721	2.000000	0.4799997	70.71068	95.00000
NP-237	4435.729	4906.163	7.000000	1.679999	37.79645	95.00000
CM-244	5530.889	5884.237	59.00000	14.15999	13.01889	95.00000

Instrument : CHAMBER 044
 Detector : 79459
 Background Analysis Date/Time : 2-AUG-2009 17:38:37
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.053	3299.650	4.000000	0.9599994	50.00000	95.00000
NP-237	4434.444	4905.733	8.000000	1.919999	35.35534	95.00000
CM-244	5531.674	5885.749	67.00000	16.07999	12.21694	95.00000

Instrument : CHAMBER 045
 Detector : 78783
 Background Analysis Date/Time : 2-AUG-2009 17:38:37
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.163	3297.674	2.000000	0.4799997	70.71068	95.00000
NP-237	4435.665	4901.796	4.000000	0.9599994	50.00000	95.00000
CM-244	5533.912	5883.468	60.00000	14.39999	12.90994	95.00000

Instrument : CHAMBER 046
 Detector : 76544
 Background Analysis Date/Time : 2-AUG-2009 17:38:37
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.013	3297.754	6.000000	1.439999	40.82483	95.00000
NP-237	4433.428	4906.578	9.000000	2.159999	33.33334	95.00000
CM-244	5533.808	5885.833	47.00000	11.27999	14.58650	95.00000

Instrument : CHAMBER 047
 Detector : 46-089B1
 Background Analysis Date/Time : 2-AUG-2009 17:38:37
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.788	3298.531	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4436.493	4903.356	9.000000	2.159999	33.33334	95.00000
CM-244	5535.296	5884.198	73.00000	17.51999	11.70411	95.00000

Instrument : CHAMBER 048
 Detector : 42483
 Background Analysis Date/Time : 2-AUG-2009 17:38:37
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.838	3299.553	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4437.268	4906.475	10.00000	2.399998	31.62278	95.00000
CM-244	5533.930	5885.396	49.00000	11.75999	14.28572	95.00000

Instrument : CHAMBER 065
 Detector : 68551
 Background Analysis Date/Time : 9-AUG-2009 15:42:44
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.020	3301.790	4.000000	0.9599993	50.00000	95.00000
NP-237	4435.576	4904.585	11.00000	2.639998	30.15113	95.00000
CM-244	5533.015	5885.628	14.00000	3.359998	26.72612	95.00000

Instrument : CHAMBER 066
 Detector : 46-089C1
 Background Analysis Date/Time : 9-AUG-2009 15:42:44
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.945	3298.217	3.000000	0.7199995	57.73503	95.00000
NP-237	4435.388	4905.987	4.000000	0.9599993	50.00000	95.00000
CM-244	5534.885	5886.957	15.00000	3.599998	25.81989	95.00000

Instrument : CHAMBER 067
 Detector : 46-089B4
 Background Analysis Date/Time : 9-AUG-2009 15:42:44
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.195	3298.405	1.000000	0.2399998	100.0000	95.00000
NP-237	4432.996	4903.114	5.000000	1.199999	44.72136	95.00000
CM-244	5531.881	5884.128	12.00000	2.879998	28.86751	95.00000

Instrument : CHAMBER 068
 Detector : 78794
 Background Analysis Date/Time : 9-AUG-2009 15:42:44
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.058	3297.794	2.000000	0.4799997	70.71068	95.00000
NP-237	4436.694	4904.361	3.000000	0.7199995	57.73503	95.00000
CM-244	5532.395	5887.637	15.00000	3.599998	25.81989	95.00000

Instrument : CHAMBER 069
 Detector : 78795
 Background Analysis Date/Time : 9-AUG-2009 15:42:44
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.230	3298.554	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4432.770	4904.008	12.00000	2.879998	28.86751	95.00000
CM-244	5535.390	5884.253	11.00000	2.639998	30.15113	95.00000

Instrument : CHAMBER 070
 Detector : 46-089B2
 Background Analysis Date/Time : 9-AUG-2009 15:42:44
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.134	3299.079	4.000000	0.9599993	50.00000	95.00000
NP-237	4435.081	4904.079	12.00000	2.879998	28.86751	95.00000
CM-244	5531.689	5883.454	10.00000	2.399998	31.62278	95.00000

Instrument : CHAMBER 071
 Detector : 64259
 Background Analysis Date/Time : 9-AUG-2009 15:42:45
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.474	3300.552	4.000000	0.9599993	50.00000	95.00000
NP-237	4434.375	4901.563	12.00000	2.879998	28.86751	95.00000
CM-244	5533.885	5882.968	9.000000	2.159998	33.33334	95.00000

Instrument : CHAMBER 072
 Detector : 45-149AA3
 Background Analysis Date/Time : 9-AUG-2009 15:42:45
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.276	3301.453	1.000000	0.2399998	100.0000	95.00000
NP-237	4434.016	4904.104	11.00000	2.639998	30.15113	95.00000
CM-244	5533.538	5886.502	15.00000	3.599998	25.81989	95.00000

Instrument : CHAMBER 073
 Detector : 78775
 Background Analysis Date/Time : 9-AUG-2009 15:42:45
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.884	3298.904	2.000000	0.4799997	70.71068	95.00000
NP-237	4435.607	4905.083	10.00000	2.399998	31.62278	95.00000
CM-244	5533.495	5885.787	1.000000	0.2399998	100.0000	95.00000

Instrument : CHAMBER 074
 Detector : 78266
 Background Analysis Date/Time : 9-AUG-2009 15:42:45
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.157	3300.875	6.000000	1.439999	40.82483	95.00000
NP-237	4434.541	4902.170	10.00000	2.399998	31.62278	95.00000
CM-244	5535.537	5885.413	5.000000	1.199999	44.72136	95.00000

Instrument : CHAMBER 075
 Detector : 68550
 Background Analysis Date/Time : 9-AUG-2009 15:42:45
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.440	3300.846	3.000000	0.7199995	57.73503	95.00000
NP-237	4432.709	4904.580	14.00000	3.359998	26.72612	95.00000
CM-244	5531.026	5885.258	12.00000	2.879998	28.86751	95.00000

Instrument : CHAMBER 076
 Detector : 78779
 Background Analysis Date/Time : 9-AUG-2009 15:42:45
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.979	3300.154	1.000000	0.2399998	100.0000	95.00000
NP-237	4436.825	4903.508	11.00000	2.639998	30.15113	95.00000
CM-244	5535.510	5884.591	0.000000E+00	0.000000E+00	0.000000E+00	95.00000

Instrument : CHAMBER 077
 Detector : 67576
 Background Analysis Date/Time : 9-AUG-2009 15:42:46
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.957	3302.071	2.000000	0.4800001	70.71068	95.00000
NP-237	4433.544	4902.799	6.000000	1.440000	40.82483	95.00000
CM-244	5530.788	5882.782	17.00000	4.080001	24.25356	95.00000

Instrument : CHAMBER 078
 Detector : 67577
 Background Analysis Date/Time : 9-AUG-2009 15:42:46
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.255	3302.223	3.000000	0.7200001	57.73503	95.00000
NP-237	4437.236	4905.680	5.000000	1.200000	44.72136	95.00000
CM-244	5535.005	5885.680	6.000000	1.440000	40.82483	95.00000

Instrument : CHAMBER 079
 Detector : 67598
 Background Analysis Date/Time : 9-AUG-2009 15:42:46
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.159	3300.331	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4434.317	4902.854	5.000000	1.200000	44.72136	95.00000
CM-244	5535.480	5887.277	7.000000	1.680000	37.79645	95.00000

Instrument : CHAMBER 080
 Detector : 78197
 Background Analysis Date/Time : 9-AUG-2009 15:42:46
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.650	3302.015	2.000000	0.4799997	70.71068	95.00000
NP-237	4433.624	4906.537	7.000000	1.679999	37.79645	95.00000
CM-244	5533.522	5887.645	5.000000	1.199999	44.72136	95.00000

Instrument : CHAMBER 081
 Detector : 72533
 Background Analysis Date/Time : 9-AUG-2009 15:42:46
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2994.266	3303.451	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4435.242	4901.625	6.000000	1.440000	40.82483	95.00000
CM-244	5531.807	5884.164	15.00000	3.600001	25.81989	95.00000

Instrument : CHAMBER 082
 Detector : 64263
 Background Analysis Date/Time : 9-AUG-2009 15:42:46
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.542	3297.569	2.000000	0.4800001	70.71068	95.00000
NP-237	4435.421	4904.506	14.00000	3.360001	26.72612	95.00000
CM-244	5534.230	5884.907	8.000000	1.920000	35.35534	95.00000

Instrument : CHAMBER 083
 Detector : 64278
 Background Analysis Date/Time : 9-AUG-2009 15:42:47
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.854	3298.707	3.000000	0.7199995	57.73503	95.00000
NP-237	4433.271	4906.151	10.00000	2.399998	31.62278	95.00000
CM-244	5531.993	5884.932	8.000000	1.919999	35.35534	95.00000

Instrument : CHAMBER 084
 Detector : 78265
 Background Analysis Date/Time : 9-AUG-2009 15:42:47
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.678	3299.931	1.000000	0.2399998	100.0000	95.00000
NP-237	4434.465	4903.170	11.00000	2.639998	30.15113	95.00000
CM-244	5531.407	5886.178	0.000000E+00	0.000000E+00	0.000000E+00	95.00000

Instrument : CHAMBER 085
 Detector : 78776
 Background Analysis Date/Time : 9-AUG-2009 15:42:47
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.698	3300.313	4.000000	0.9599993	50.00000	95.00000
NP-237	4435.121	4902.282	7.000000	1.679999	37.79645	95.00000
CM-244	5534.187	5882.859	5.000000	1.199999	44.72136	95.00000

Instrument : CHAMBER 086
 Detector : 78198
 Background Analysis Date/Time : 9-AUG-2009 15:42:47
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.009	3300.939	1.000000	0.2399998	100.0000	95.00000
NP-237	4436.927	4902.983	9.000000	2.159998	33.33334	95.00000
CM-244	5531.983	5883.724	1.000000	0.2399998	100.0000	95.00000

Instrument : CHAMBER 087
 Detector : 78199
 Background Analysis Date/Time : 9-AUG-2009 15:42:47
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.599	3301.987	2.000000	0.4799997	70.71068	95.00000
NP-237	4434.300	4902.242	9.000000	2.159998	33.33334	95.00000
CM-244	5532.304	5887.140	2.000000	0.4799997	70.71068	95.00000

Instrument : CHAMBER 088
 Detector : 33452
 Background Analysis Date/Time : 9-AUG-2009 15:42:47
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.881	3297.896	3.000000	0.7199995	57.73503	95.00000
NP-237	4436.727	4902.043	10.00000	2.399998	31.62278	95.00000
CM-244	5532.799	5884.609	11.00000	2.639998	30.15113	95.00000

Instrument : CHAMBER 089
 Detector : 78262
 Background Analysis Date/Time : 9-AUG-2009 15:42:48
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.340	3299.886	3.000000	0.7200001	57.73503	95.00000
NP-237	4433.954	4903.393	6.000000	1.440000	40.82483	95.00000
CM-244	5533.423	5884.190	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000

Instrument : CHAMBER 090
 Detector : 78263
 Background Analysis Date/Time : 9-AUG-2009 15:42:48
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.174	3298.193	2.000000	0.4800001	70.71068	95.00000
NP-237	4432.899	4902.301	9.000000	2.160000	33.33334	95.00000
CM-244	5531.267	5884.186	1.000000	0.2400000	100.0000	95.00000

Instrument : CHAMBER 091
 Detector : 78259
 Background Analysis Date/Time : 9-AUG-2009 15:42:48
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.796	3297.819	3.000000	0.7200001	57.73503	95.00000
NP-237	4433.118	4901.645	4.000000	0.9600002	50.00000	95.00000
CM-244	5531.054	5887.180	2.000000	0.4800001	70.71068	95.00000

Instrument : CHAMBER 092
 Detector : 79457
 Background Analysis Date/Time : 9-AUG-2009 15:42:48
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.378	3299.875	108.0000	25.92000	9.622504	95.00000
NP-237	4435.762	4905.401	82.00000	19.68000	11.04315	95.00000
CM-244	5534.466	5887.335	8.000000	1.920000	35.35534	95.00000

Instrument : CHAMBER 093
 Detector : 33206
 Background Analysis Date/Time : 9-AUG-2009 15:42:48
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.021	3298.707	5.000000	1.200000	44.72136	95.00000
NP-237	4432.645	4901.916	6.000000	1.440000	40.82483	95.00000
CM-244	5530.870	5883.862	2.000000	0.4800001	70.71068	95.00000

Instrument : CHAMBER 094
 Detector : 78267
 Background Analysis Date/Time : 9-AUG-2009 15:42:48
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.496	3299.970	8.000000	1.920000	35.35534	95.00000
NP-237	4432.930	4902.883	1.000000	0.2400000	100.0000	95.00000
CM-244	5531.875	5884.464	4.000000	0.9600002	50.00000	95.00000

Instrument : CHAMBER 095
 Detector : 64279
 Background Analysis Date/Time : 9-AUG-2009 17:08:35
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.646	3298.356	3.000000	0.7199996	57.73503	95.00000
NP-237	4435.397	4905.664	11.00000	2.639998	30.15113	95.00000
CM-244	5530.369	5883.804	23.00000	5.519997	20.85144	95.00000

Instrument : CHAMBER 096
 Detector : 67605
 Background Analysis Date/Time : 9-AUG-2009 17:08:35
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.386	3301.860	1.000000	0.2399998	100.0000	95.00000
NP-237	4437.256	4904.015	24.00000	5.759996	20.41241	95.00000
CM-244	5531.292	5886.331	5.000000	1.199999	44.72136	95.00000

Instrument : CHAMBER 097
 Detector : 67599
 Background Analysis Date/Time : 9-AUG-2009 17:08:35
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.155	3299.592	5.000000	1.199999	44.72136	95.00000
NP-237	4437.204	4904.260	9.000000	2.159999	33.33334	95.00000
CM-244	5531.403	5886.106	16.00000	3.839998	25.00000	95.00000

Instrument : CHAMBER 098
 Detector : 68644
 Background Analysis Date/Time : 9-AUG-2009 17:08:35
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.247	3301.860	4.000000	0.9599994	50.00000	95.00000
NP-237	4432.619	4906.019	9.000000	2.159999	33.33334	95.00000
CM-244	5534.382	5884.237	3.000000	0.7199996	57.73503	95.00000

Instrument : CHAMBER 099
 Detector : 70317
 Background Analysis Date/Time : 9-AUG-2009 17:08:35
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.820	3298.212	1.000000	0.2399998	100.0000	95.00000
NP-237	4437.036	4906.585	8.000000	1.919999	35.35534	95.00000
CM-244	5530.871	5884.331	1.000000	0.2399998	100.0000	95.00000

Instrument : CHAMBER 100
 Detector : 79456
 Background Analysis Date/Time : 9-AUG-2009 17:08:35
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.623	3299.666	6.000000	1.439999	40.82483	95.00000
NP-237	4436.895	4905.650	17.00000	4.079998	24.25356	95.00000
CM-244	5534.086	5886.872	12.00000	2.879998	28.86751	95.00000

Instrument : CHAMBER 101
 Detector : 64253
 Background Analysis Date/Time : 9-AUG-2009 15:42:49
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.814	3297.893	8.000000	1.919999	35.35534	95.00000
NP-237	4435.403	4905.470	5.000000	1.199999	44.72136	95.00000
CM-244	5534.897	5882.499	0.000000E+00	0.000000E+00	0.000000E+00	95.00000

Instrument : CHAMBER 102
 Detector : 72525
 Background Analysis Date/Time : 9-AUG-2009 15:42:49
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.911	3298.890	2.000000	0.4799997	70.71068	95.00000
NP-237	4436.604	4903.163	6.000000	1.439999	40.82483	95.00000
CM-244	5533.661	5884.537	1.000000	0.2399998	100.0000	95.00000

Instrument : CHAMBER 103
 Detector : 79461
 Background Analysis Date/Time : 9-AUG-2009 15:42:49
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.467	3301.138	2.000000	0.4799997	70.71068	95.00000
NP-237	4432.983	4903.264	8.000000	1.919999	35.35534	95.00000
CM-244	5533.387	5886.945	0.000000E+00	0.000000E+00	0.000000E+00	95.00000

Instrument : CHAMBER 104
 Detector : 72524
 Background Analysis Date/Time : 9-AUG-2009 15:42:49
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.174	3300.565	4.000000	0.9599993	50.00000	95.00000
NP-237	4436.202	4904.648	8.000000	1.919999	35.35534	95.00000
CM-244	5532.970	5885.836	3.000000	0.7199995	57.73503	95.00000

Instrument : CHAMBER 105
 Detector : 78777
 Background Analysis Date/Time : 9-AUG-2009 15:42:49
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.222	3299.531	4.000000	0.9599993	50.00000	95.00000
NP-237	4434.728	4902.932	3.000000	0.7199995	57.73503	95.00000
CM-244	5530.878	5883.508	1.000000	0.2399998	100.0000	95.00000

Instrument : CHAMBER 106
 Detector : 64274
 Background Analysis Date/Time : 9-AUG-2009 15:42:49
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.640	3299.757	6.000000	1.439999	40.82483	95.00000
NP-237	4434.577	4901.415	11.00000	2.639998	30.15113	95.00000
CM-244	5534.428	5884.452	4.000000	0.9599993	50.00000	95.00000

Instrument : CHAMBER 107
 Detector : 67578
 Background Analysis Date/Time : 9-AUG-2009 15:42:50
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.547	3298.638	3.000000	0.7199995	57.73503	95.00000
NP-237	4435.772	4904.146	5.000000	1.199999	44.72136	95.00000
CM-244	5532.554	5882.324	8.000000	1.919999	35.35534	95.00000

Instrument : CHAMBER 108
 Detector : 78778
 Background Analysis Date/Time : 9-AUG-2009 15:42:50
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.136	3297.898	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4433.563	4901.441	2.000000	0.4799997	70.71068	95.00000
CM-244	5533.812	5885.772	9.000000	2.159998	33.33334	95.00000

Instrument : CHAMBER 109
 Detector : 79463
 Background Analysis Date/Time : 9-AUG-2009 15:42:50
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.332	3301.320	1.000000	0.2399998	100.0000	95.00000
NP-237	4437.566	4903.059	2.000000	0.4799997	70.71068	95.00000
CM-244	5534.376	5883.521	6.000000	1.439999	40.82483	95.00000

Instrument : CHAMBER 110
 Detector : 67602
 Background Analysis Date/Time : 9-AUG-2009 15:42:50
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.980	3298.573	1.000000	0.2399998	100.0000	95.00000
NP-237	4433.010	4901.606	8.000000	1.919999	35.35534	95.00000
CM-244	5534.957	5883.028	14.00000	3.359998	26.72612	95.00000

Instrument : CHAMBER 111
 Detector : 79462
 Background Analysis Date/Time : 9-AUG-2009 15:42:50
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.711	3298.714	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4436.440	4905.458	8.000000	1.919999	35.35534	95.00000
CM-244	5535.080	5885.693	4.000000	0.9599993	50.00000	95.00000

Instrument : CHAMBER 112
 Detector : 78261
 Background Analysis Date/Time : 9-AUG-2009 15:42:50
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.059	3299.440	3.000000	0.7199995	57.73503	95.00000
NP-237	4434.653	4903.902	1.000000	0.2399998	100.0000	95.00000
CM-244	5532.350	5884.826	7.000000	1.679999	37.79645	95.00000

Instrument : CHAMBER 113
 Detector : 45-111B4
 Background Analysis Date/Time : 16-AUG-2009 16:34:44
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.867	3300.361	1.000000	0.3000000	100.0000	95.00000
NP-237	4434.565	4901.409	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
CM-244	5532.822	5886.571	10.00000	3.000000	31.62278	95.00000

Instrument : CHAMBER 114
 Detector : 78258
 Background Analysis Date/Time : 16-AUG-2009 16:34:50
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.066	3300.343	1.000000	0.3000000	100.0000	95.00000
NP-237	4433.866	4902.961	2.000000	0.6000000	70.71068	95.00000
CM-244	5535.155	5886.142	4.000000	1.200000	50.00000	95.00000

Instrument : CHAMBER 115
 Detector : 45-132FF4
 Background Analysis Date/Time : 16-AUG-2009 16:34:55
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.683	3299.666	2.000000	0.6000000	70.71068	95.00000
NP-237	4433.623	4904.729	6.000000	1.800000	40.82483	95.00000
CM-244	5534.066	5886.268	10.00000	3.000000	31.62278	95.00000

Instrument : CHAMBER 116
 Detector : 45-132FF2
 Background Analysis Date/Time : 16-AUG-2009 16:34:59
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.930	3301.615	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4433.958	4904.160	3.000000	0.9000000	57.73503	95.00000
CM-244	5532.087	5883.400	11.00000	3.300000	30.15113	95.00000

Instrument : CHAMBER 117
 Detector : 33450
 Background Analysis Date/Time : 16-AUG-2009 16:35:03
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.306	3298.199	2.000000	0.6000000	70.71068	95.00000
NP-237	4433.520	4903.152	3.000000	0.9000000	57.73503	95.00000
CM-244	5530.582	5887.083	11.00000	3.300000	30.15113	95.00000

Instrument : CHAMBER 118
 Detector : 75544
 Background Analysis Date/Time : 16-AUG-2009 16:35:08
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.856	3302.528	2.000000	0.6000000	70.71068	95.00000
NP-237	4432.711	4902.773	2.000000	0.6000000	70.71068	95.00000
CM-244	5531.177	5883.080	18.00000	5.400000	23.57022	95.00000

Instrument : CHAMBER 119
 Detector : 74429
 Background Analysis Date/Time : 16-AUG-2009 16:35:12
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.004	3299.253	3.000000	0.9000000	57.73503	95.00000
NP-237	4432.548	4906.013	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
CM-244	5530.584	5883.165	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000

Instrument : CHAMBER 120
 Detector : 74430
 Background Analysis Date/Time : 16-AUG-2009 16:35:17
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.209	3300.389	1.000000	0.3000000	100.0000	95.00000
NP-237	4436.370	4904.997	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
CM-244	5531.794	5882.950	1.000000	0.3000000	100.0000	95.00000

Instrument : CHAMBER 121
 Detector : 75545
 Background Analysis Date/Time : 16-AUG-2009 16:35:22
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.483	3299.036	4.000000	1.200000	50.00000	95.00000
NP-237	4436.007	4904.843	6.000000	1.800000	40.82483	95.00000
CM-244	5531.746	5882.876	5.000000	1.500000	44.72136	95.00000

Instrument : CHAMBER 122
 Detector : 75546
 Background Analysis Date/Time : 16-AUG-2009 16:35:26
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.140	3302.149	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4434.728	4903.501	14.00000	4.200000	26.72612	95.00000
CM-244	5535.323	5886.133	13.00000	3.900000	27.73501	95.00000

Instrument : CHAMBER 123
 Detector : 45-142V3
 Background Analysis Date/Time : 16-AUG-2009 16:35:30
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.820	3298.601	3.000000	0.9000000	57.73503	95.00000
NP-237	4437.478	4905.941	6.000000	1.800000	40.82483	95.00000
CM-244	5531.339	5886.453	8.000000	2.400000	35.35534	95.00000

Instrument : CHAMBER 124
 Detector : 45-142V2
 Background Analysis Date/Time : 16-AUG-2009 16:35:35
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.806	3300.376	2.000000	0.6000000	70.71068	95.00000
NP-237	4436.352	4902.974	9.000000	2.700000	33.33334	95.00000
CM-244	5533.246	5885.946	6.000000	1.800000	40.82483	95.00000

Instrument : CHAMBER 125
 Detector : 75547
 Background Analysis Date/Time : 16-AUG-2009 16:35:39
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.619	3299.275	2.000000	0.6000000	70.71068	95.00000
NP-237	4433.269	4906.266	7.000000	2.100000	37.79645	95.00000
CM-244	5531.959	5882.482	4.000000	1.200000	50.00000	95.00000

Instrument : CHAMBER 126
 Detector : 75548
 Background Analysis Date/Time : 16-AUG-2009 16:35:44
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.372	3298.946	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4437.297	4901.551	16.00000	4.800000	25.00000	95.00000
CM-244	5532.806	5882.587	4.000000	1.200000	50.00000	95.00000

Instrument : CHAMBER 127
 Detector : 78770
 Background Analysis Date/Time : 16-AUG-2009 16:35:48
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.622	3297.830	3.000000	0.9000000	57.73503	95.00000
NP-237	4435.622	4904.092	1.000000	0.3000000	100.0000	95.00000
CM-244	5535.184	5885.434	1.000000	0.3000000	100.0000	95.00000

Instrument : CHAMBER 128
 Detector : 75549
 Background Analysis Date/Time : 16-AUG-2009 16:35:52
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.482	3299.177	135.0000	40.50000	8.606629	95.00000
NP-237	4436.028	4905.664	84.00000	25.20000	10.91089	95.00000
CM-244	5532.549	5883.141	32.00000	9.600000	17.67767	95.00000

Instrument : CHAMBER 129
 Detector : 76227
 Background Analysis Date/Time : 16-AUG-2009 16:35:57
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.146	3298.635	1.000000	0.3000000	100.0000	95.00000
NP-237	4432.563	4905.761	8.000000	2.400000	35.35534	95.00000
CM-244	5531.918	5882.796	2.000000	0.6000000	70.71068	95.00000

Instrument : CHAMBER 130
 Detector : 76228
 Background Analysis Date/Time : 16-AUG-2009 16:36:01
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.230	3297.665	2.000000	0.6000000	70.71068	95.00000
NP-237	4434.582	4901.937	8.000000	2.400000	35.35534	95.00000
CM-244	5530.859	5884.881	4.000000	1.200000	50.00000	95.00000

Instrument : CHAMBER 131
 Detector : 33448
 Background Analysis Date/Time : 16-AUG-2009 16:36:05
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.455	3301.428	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4434.994	4904.668	4.000000	1.200000	50.00000	95.00000
CM-244	5532.826	5884.723	5.000000	1.500000	44.72136	95.00000

Instrument : CHAMBER 132
 Detector : 67579
 Background Analysis Date/Time : 16-AUG-2009 16:36:09
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.906	3301.298	2.000000	0.6000000	70.71068	95.00000
NP-237	4432.560	4903.500	5.000000	1.500000	44.72136	95.00000
CM-244	5531.586	5882.587	2.000000	0.6000000	70.71068	95.00000

Instrument : CHAMBER 133
 Detector : 76229
 Background Analysis Date/Time : 16-AUG-2009 16:36:14
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.199	3301.674	1.000000	0.3000000	100.0000	95.00000
NP-237	4436.849	4905.652	3.000000	0.9000000	57.73503	95.00000
CM-244	5530.602	5882.872	5.000000	1.500000	44.72136	95.00000

Instrument : CHAMBER 134
 Detector : 76230
 Background Analysis Date/Time : 16-AUG-2009 16:36:19
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.055	3302.112	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4432.969	4905.408	21.00000	6.300000	21.82179	95.00000
CM-244	5534.460	5883.375	9.000000	2.700000	33.33334	95.00000

Instrument : CHAMBER 135
 Detector : 64270
 Background Analysis Date/Time : 16-AUG-2009 16:36:23
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.813	3300.105	2.000000	0.6000000	70.71068	95.00000
NP-237	4435.123	4902.752	2.000000	0.6000000	70.71068	95.00000
CM-244	5532.979	5882.877	10.00000	3.000000	31.62278	95.00000

Instrument : CHAMBER 136
 Detector : 68549
 Background Analysis Date/Time : 16-AUG-2009 16:36:27
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.796	3301.682	3.000000	0.9000000	57.73503	95.00000
NP-237	4435.713	4901.780	14.00000	4.200000	26.72612	95.00000
CM-244	5531.520	5884.028	6.000000	1.800000	40.82483	95.00000

Instrument : CHAMBER 137
 Detector : 64288
 Background Analysis Date/Time : 16-AUG-2009 16:36:31
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.035	3302.352	4.000000	1.200000	50.00000	95.00000
NP-237	4435.990	4901.349	6.000000	1.800000	40.82483	95.00000
CM-244	5532.344	5883.346	7.000000	2.100000	37.79645	95.00000

Instrument : CHAMBER 138
 Detector : 65877
 Background Analysis Date/Time : 16-AUG-2009 16:36:35
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.457	3300.623	3.000000	0.9000000	57.73503	95.00000
NP-237	4436.833	4904.301	13.00000	3.900000	27.73501	95.00000
CM-244	5531.035	5885.034	10.00000	3.000000	31.62278	95.00000

Instrument : CHAMBER 139
 Detector : 76231
 Background Analysis Date/Time : 16-AUG-2009 16:36:40
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.624	3300.322	4.000000	1.200000	50.00000	95.00000
NP-237	4436.965	4901.673	8.000000	2.400000	35.35534	95.00000
CM-244	5531.099	5884.173	8.000000	2.400000	35.35534	95.00000

Instrument : CHAMBER 140
 Detector : 78771
 Background Analysis Date/Time : 16-AUG-2009 16:36:43
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.243	3300.208	3.000000	0.9000000	57.73503	95.00000
NP-237	4435.227	4906.111	12.00000	3.600000	28.86751	95.00000
CM-244	5531.085	5884.403	1.000000	0.3000000	100.0000	95.00000

Instrument : CHAMBER 141
 Detector : 76232
 Background Analysis Date/Time : 16-AUG-2009 16:36:48
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.414	3297.748	1.000000	0.3000000	100.0000	95.00000
NP-237	4437.262	4901.753	5.000000	1.500000	44.72136	95.00000
CM-244	5534.971	5886.637	5.000000	1.500000	44.72136	95.00000

Instrument : CHAMBER 142
 Detector : 64261
 Background Analysis Date/Time : 16-AUG-2009 16:36:52
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.269	3301.948	2.000000	0.6000000	70.71068	95.00000
NP-237	4433.864	4905.404	11.00000	3.300000	30.15113	95.00000
CM-244	5531.110	5884.773	12.00000	3.600000	28.86751	95.00000

Instrument : CHAMBER 143
 Detector : 65882
 Background Analysis Date/Time : 16-AUG-2009 16:36:56
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.868	3300.973	10.00000	3.000000	31.62278	95.00000
NP-237	4435.203	4905.234	16.00000	4.800000	25.00000	95.00000
CM-244	5533.941	5886.181	11.00000	3.300000	30.15113	95.00000

Instrument : CHAMBER 144
 Detector : 75551
 Background Analysis Date/Time : 16-AUG-2009 16:37:00
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.050	3299.833	2.000000	0.6000000	70.71068	95.00000
NP-237	4433.005	4902.603	12.00000	3.600000	28.86751	95.00000
CM-244	5530.735	5882.656	9.000000	2.700000	33.33334	95.00000

Instrument : CHAMBER 145
 Detector : 72526
 Background Analysis Date/Time : 16-AUG-2009 16:37:03
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.923	3299.882	3.000000	0.9000000	57.73503	95.00000
NP-237	4434.984	4905.949	4.000000	1.200000	50.00000	95.00000
CM-244	5531.069	5884.490	6.000000	1.800000	40.82483	95.00000

Instrument : CHAMBER 146
 Detector : 72527
 Background Analysis Date/Time : 16-AUG-2009 16:37:08
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.460	3301.164	2.000000	0.6000000	70.71068	95.00000
NP-237	4435.288	4903.095	2.000000	0.6000000	70.71068	95.00000
CM-244	5534.042	5884.573	6.000000	1.800000	40.82483	95.00000

Instrument : CHAMBER 147
 Detector : 75550
 Background Analysis Date/Time : 16-AUG-2009 16:37:11
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.910	3299.539	10.00000	3.000000	31.62278	95.00000
NP-237	4433.251	4901.935	8.000000	2.400000	35.35534	95.00000
CM-244	5533.139	5883.368	12.00000	3.600000	28.86751	95.00000

Instrument : CHAMBER 148
 Detector : 74429
 Background Analysis Date/Time : 16-AUG-2009 16:37:16
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.725	3298.446	6.000000	1.800000	40.82483	95.00000
NP-237	4436.496	4905.977	7.000000	2.100000	37.79645	95.00000
CM-244	5533.919	5885.716	8.000000	2.400000	35.35534	95.00000

Instrument : CHAMBER 149
 Detector : 33449
 Background Analysis Date/Time : 16-AUG-2009 16:37:20
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.734	3299.272	1.000000	0.3000000	100.0000	95.00000
NP-237	4437.371	4901.944	4.000000	1.200000	50.00000	95.00000
CM-244	5530.548	5882.851	6.000000	1.800000	40.82483	95.00000

Instrument : CHAMBER 150
 Detector : 75552
 Background Analysis Date/Time : 16-AUG-2009 16:37:24
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.316	3300.643	2.000000	0.6000000	70.71068	95.00000
NP-237	4435.415	4905.497	7.000000	2.100000	37.79645	95.00000
CM-244	5534.121	5886.240	7.000000	2.100000	37.79645	95.00000

Instrument : CHAMBER 151
 Detector : 75556
 Background Analysis Date/Time : 16-AUG-2009 16:37:28
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.659	3302.040	1.000000	0.3000000	100.0000	95.00000
NP-237	4434.623	4901.634	4.000000	1.200000	50.00000	95.00000
CM-244	5531.364	5886.469	8.000000	2.400000	35.35534	95.00000

Instrument : CHAMBER 152
 Detector : 76222
 Background Analysis Date/Time : 16-AUG-2009 16:37:32
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.044	3297.777	4.000000	1.200000	50.00000	95.00000
NP-237	4437.300	4905.285	5.000000	1.500000	44.72136	95.00000
CM-244	5531.209	5887.199	8.000000	2.400000	35.35534	95.00000

Instrument : CHAMBER 153
 Detector : 76223
 Background Analysis Date/Time : 16-AUG-2009 16:37:35
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.175	3301.127	4.000000	1.200000	50.00000	95.00000
NP-237	4437.148	4906.174	10.00000	3.000000	31.62278	95.00000
CM-244	5533.838	5885.640	4.000000	1.200000	50.00000	95.00000

Instrument : CHAMBER 154
 Detector : 76224
 Background Analysis Date/Time : 16-AUG-2009 16:37:40
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.160	3298.663	3.000000	0.9000000	57.73503	95.00000
NP-237	4435.792	4904.845	6.000000	1.800000	40.82483	95.00000
CM-244	5532.170	5883.602	4.000000	1.200000	50.00000	95.00000

Instrument : CHAMBER 155
 Detector : 75553
 Background Analysis Date/Time : 16-AUG-2009 16:37:44
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.137	3299.574	8.000000	2.400000	35.35534	95.00000
NP-237	4433.383	4905.252	9.000000	2.700000	33.33334	95.00000
CM-244	5530.995	5884.485	8.000000	2.400000	35.35534	95.00000

Instrument : CHAMBER 156
 Detector : 75554
 Background Analysis Date/Time : 16-AUG-2009 16:37:48
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.410	3301.423	6.000000	1.800000	40.82483	95.00000
NP-237	4436.034	4902.390	17.00000	5.100000	24.25356	95.00000
CM-244	5532.563	5885.336	4.000000	1.200000	50.00000	95.00000

Instrument : CHAMBER 157
 Detector : 75555
 Background Analysis Date/Time : 16-AUG-2009 16:37:52
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.948	3299.042	1.000000	0.3000000	100.0000	95.00000
NP-237	4436.337	4902.073	9.000000	2.700000	33.33334	95.00000
CM-244	5531.733	5884.378	7.000000	2.100000	37.79645	95.00000

Instrument : CHAMBER 158
 Detector : 33451
 Background Analysis Date/Time : 16-AUG-2009 16:37:56
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.074	3301.013	2.000000	0.6000000	70.71068	95.00000
NP-237	4435.907	4905.421	11.00000	3.300000	30.15113	95.00000
CM-244	5535.323	5885.904	6.000000	1.800000	40.82483	95.00000

Instrument : CHAMBER 159
 Detector : 76225
 Background Analysis Date/Time : 16-AUG-2009 16:38:00
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.022	3301.502	4.000000	1.200000	50.00000	95.00000
NP-237	4435.853	4902.842	7.000000	2.100000	37.79645	95.00000
CM-244	5534.528	5883.086	12.00000	3.600000	28.86751	95.00000

Instrument : CHAMBER 160
 Detector : 76226
 Background Analysis Date/Time : 16-AUG-2009 16:38:03
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.982	3298.890	6.000000	1.800000	40.82483	95.00000
NP-237	4434.439	4901.761	20.00000	6.000000	22.36068	95.00000
CM-244	5533.753	5882.414	11.00000	3.300000	30.15113	95.00000

Instrument : CHAMBER 161
 Detector : 70321
 Background Analysis Date/Time : 19-JUL-2009 13:08:31
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.000	3299.306	2.000000	0.6000000	70.71068	95.00000
NP-237	4436.547	4904.892	11.00000	3.300000	30.15113	95.00000
CM-244	5532.420	5884.522	7.000000	2.100000	37.79645	95.00000

Instrument : CHAMBER 162
 Detector : 70323
 Background Analysis Date/Time : 2-AUG-2009 17:21:40
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.824	3300.295	1.000000	0.3000000	100.0000	95.00000
NP-237	4433.927	4901.686	3.000000	0.9000000	57.73503	95.00000
CM-244	5532.705	5883.340	7.000000	2.100000	37.79645	95.00000

Instrument : CHAMBER 163
 Detector : 70324
 Background Analysis Date/Time : 19-JUL-2009 13:08:40
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.922	3300.358	1.000000	0.3000000	100.0000	95.00000
NP-237	4435.910	4905.359	19.00000	5.700000	22.94157	95.00000
CM-244	5534.127	5886.809	10.00000	3.000000	31.62278	95.00000

Instrument : CHAMBER 164
 Detector : 70325
 Background Analysis Date/Time : 19-JUL-2009 13:08:44
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.018	3297.699	2.000000	0.6000000	70.71068	95.00000
NP-237	4434.306	4904.250	9.000000	2.700000	33.33334	95.00000
CM-244	5533.729	5886.834	9.000000	2.700000	33.33334	95.00000

Instrument : CHAMBER 165
 Detector : 72544
 Background Analysis Date/Time : 19-JUL-2009 13:08:49
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.844	3302.139	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4434.670	4904.543	11.00000	3.300000	30.15113	95.00000
CM-244	5533.515	5886.135	2.000000	0.6000000	70.71068	95.00000

Instrument : CHAMBER 166
 Detector : 74545
 Background Analysis Date/Time : 19-JUL-2009 13:08:54
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.919	3301.734	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4433.352	4903.208	6.000000	1.800000	40.82483	95.00000
CM-244	5532.473	5885.411	10.00000	3.000000	31.62278	95.00000

Instrument : CHAMBER 167
 Detector : 72546
 Background Analysis Date/Time : 19-JUL-2009 13:08:58
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.456	3297.909	2.000000	0.6000000	70.71068	95.00000
NP-237	4433.461	4902.876	7.000000	2.100000	37.79645	95.00000
CM-244	5531.568	5884.192	8.000000	2.400000	35.35534	95.00000

Instrument : CHAMBER 168
 Detector : 72547
 Background Analysis Date/Time : 19-JUL-2009 13:09:03
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.191	3302.241	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4434.272	4904.107	10.00000	3.000000	31.62278	95.00000
CM-244	5533.178	5885.925	7.000000	2.100000	37.79645	95.00000

Instrument : CHAMBER 169
 Detector : 72548
 Background Analysis Date/Time : 2-AUG-2009 17:22:11
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.637	3301.388	7.000000	2.100000	37.79645	95.00000
NP-237	4432.422	4901.883	25.000000	7.500000	20.00000	95.00000
CM-244	5530.486	5882.987	10.000000	3.000000	31.62278	95.00000

Instrument : CHAMBER 170
 Detector : 72549
 Background Analysis Date/Time : 19-JUL-2009 13:09:11
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.026	3302.433	1.000000	0.3000000	100.0000	95.00000
NP-237	4434.863	4906.064	7.000000	2.100000	37.79645	95.00000
CM-244	5532.657	5887.477	8.000000	2.400000	35.35534	95.00000

Instrument : CHAMBER 171
 Detector : 78260
 Background Analysis Date/Time : 19-JUL-2009 13:09:16
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.883	3301.923	1.000000	0.3000000	100.0000	95.00000
NP-237	4434.363	4904.564	11.000000	3.300000	30.15113	95.00000
CM-244	5534.294	5887.494	6.000000	1.800000	40.82483	95.00000

Instrument : CHAMBER 172
 Detector : 78772
 Background Analysis Date/Time : 19-JUL-2009 13:09:20
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.947	3302.414	1.000000	0.3000000	100.0000	95.00000
NP-237	4433.288	4903.064	6.000000	1.800000	40.82483	95.00000
CM-244	5532.422	5885.508	5.000000	1.500000	44.72136	95.00000

Instrument : CHAMBER 173
 Detector : 74431
 Background Analysis Date/Time : 19-JUL-2009 13:09:25
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.296	3300.266	2.000000	0.6000000	70.71068	95.00000
NP-237	4436.390	4906.583	5.000000	1.500000	44.72136	95.00000
CM-244	5534.964	5886.757	17.00000	5.100000	24.25356	95.00000

Instrument : CHAMBER 174
 Detector : 74432
 Background Analysis Date/Time : 19-JUL-2009 13:09:29
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.955	3301.951	3.000000	0.9000000	57.73503	95.00000
NP-237	4436.112	4905.743	7.000000	2.100000	37.79645	95.00000
CM-244	5531.741	5886.720	21.00000	6.300000	21.82179	95.00000

Instrument : CHAMBER 175
 Detector : 74433
 Background Analysis Date/Time : 19-JUL-2009 13:09:34
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.808	3301.771	2.000000	0.6000000	70.71068	95.00000
NP-237	4437.598	4902.379	3.000000	0.9000000	57.73503	95.00000
CM-244	5530.438	5887.378	15.00000	4.500000	25.81989	95.00000

Instrument : CHAMBER 176
 Detector : 74434
 Background Analysis Date/Time : 19-JUL-2009 13:09:39
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.124	3298.749	3.000000	0.9000000	57.73503	95.00000
NP-237	4433.658	4904.539	5.000000	1.500000	44.72136	95.00000
CM-244	5533.031	5884.495	15.00000	4.500000	25.81989	95.00000

Instrument : CHAMBER 177
 Detector : 74435
 Background Analysis Date/Time : 19-JUL-2009 13:09:43
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.035	3300.055	2.000000	0.6000000	70.71068	95.00000
NP-237	4436.061	4906.072	4.000000	1.200000	50.00000	95.00000
CM-244	5534.094	5885.629	20.00000	6.000000	22.36068	95.00000

Instrument : CHAMBER 178
 Detector : 74436
 Background Analysis Date/Time : 19-JUL-2009 13:09:47
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.331	3301.630	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4433.348	4903.642	11.00000	3.300000	30.15113	95.00000
CM-244	5531.998	5883.700	21.00000	6.300000	21.82179	95.00000

Instrument : CHAMBER 179
 Detector : 74437
 Background Analysis Date/Time : 19-JUL-2009 13:09:52
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.102	3300.165	1.000000	0.3000000	100.0000	95.00000
NP-237	4436.443	4906.617	6.000000	1.800000	40.82483	95.00000
CM-244	5534.901	5886.605	25.00000	7.500000	20.00000	95.00000

Instrument : CHAMBER 180
 Detector : 74438
 Background Analysis Date/Time : 19-JUL-2009 13:09:56
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.611	3299.257	2.000000	0.6000000	70.71068	95.00000
NP-237	4433.245	4903.299	9.000000	2.700000	33.33334	95.00000
CM-244	5535.594	5886.061	21.00000	6.300000	21.82179	95.00000

Instrument : CHAMBER 181
 Detector : 74439
 Background Analysis Date/Time : 19-JUL-2009 13:10:01
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.239	3301.914	2.000000	0.6000000	70.71068	95.00000
NP-237	4437.080	4901.757	3.000000	0.9000000	57.73503	95.00000
CM-244	5535.131	5886.836	26.00000	7.800000	19.61161	95.00000

Instrument : CHAMBER 182
 Detector : 74440
 Background Analysis Date/Time : 19-JUL-2009 13:10:05
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.998	3301.429	2.000000	0.6000000	70.71068	95.00000
NP-237	4432.415	4901.861	6.000000	1.800000	40.82483	95.00000
CM-244	5533.907	5884.511	30.00000	9.000000	18.25742	95.00000

Instrument : CHAMBER 183
 Detector : 74441
 Background Analysis Date/Time : 19-JUL-2009 13:10:09
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.448	3298.556	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4434.882	4905.025	5.000000	1.500000	44.72136	95.00000
CM-244	5533.221	5884.854	26.00000	7.800000	19.61161	95.00000

Instrument : CHAMBER 184
 Detector : 74442
 Background Analysis Date/Time : 19-JUL-2009 13:10:15
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.235	3300.018	3.000000	0.9000000	57.73503	95.00000
NP-237	4434.314	4904.409	4.000000	1.200000	50.00000	95.00000
CM-244	5531.386	5887.098	30.00000	9.000000	18.25742	95.00000

Instrument : CHAMBER 185
 Detector : 68615
 Background Analysis Date/Time : 19-JUL-2009 13:10:19
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.225	3297.857	1.000000	0.3000000	100.0000	95.00000
NP-237	4436.385	4903.692	1.000000	0.3000000	100.0000	95.00000
CM-244	5533.756	5883.696	28.00000	8.400001	18.89822	95.00000

Instrument : CHAMBER 186
 Detector : 68616
 Background Analysis Date/Time : 19-JUL-2009 13:10:23
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.440	3298.282	2.000000	0.6000000	70.71068	95.00000
NP-237	4433.254	4901.541	1.000000	0.3000000	100.0000	95.00000
CM-244	5533.251	5884.261	30.00000	9.000000	18.25742	95.00000

Instrument : CHAMBER 187
 Detector : 68620
 Background Analysis Date/Time : 19-JUL-2009 13:10:27
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.912	3299.166	3.000000	0.9000000	57.73503	95.00000
NP-237	4432.442	4904.149	11.00000	3.300000	30.15113	95.00000
CM-244	5535.067	5883.156	22.00000	6.600000	21.32007	95.00000

Instrument : CHAMBER 188
 Detector : 68621
 Background Analysis Date/Time : 19-JUL-2009 13:10:31
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.283	3302.165	2.000000	0.6000000	70.71068	95.00000
NP-237	4433.129	4903.527	2.000000	0.6000000	70.71068	95.00000
CM-244	5532.390	5884.553	29.00000	8.700001	18.56953	95.00000

Instrument : CHAMBER 189
 Detector : 68622
 Background Analysis Date/Time : 19-JUL-2009 13:10:35
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.652	3299.552	2.000000	0.6000000	70.71068	95.00000
NP-237	4434.579	4902.841	6.000000	1.800000	40.82483	95.00000
CM-244	5534.475	5885.420	43.00000	12.90000	15.24986	95.00000

Instrument : CHAMBER 190
 Detector : 68623
 Background Analysis Date/Time : 19-JUL-2009 13:10:39
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.900	3302.388	5.000000	1.500000	44.72136	95.00000
NP-237	4434.198	4903.145	22.00000	6.600000	21.32007	95.00000
CM-244	5535.637	5887.028	30.00000	9.000000	18.25742	95.00000

Instrument : CHAMBER 191
 Detector : 68624
 Background Analysis Date/Time : 19-JUL-2009 13:10:43
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.514	3302.389	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4435.396	4902.283	1.000000	0.3000000	100.0000	95.00000
CM-244	5534.230	5883.124	16.00000	4.800000	25.00000	95.00000

Instrument : CHAMBER 192
 Detector : 74430
 Background Analysis Date/Time : 19-JUL-2009 13:10:47
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.042	3298.270	2.000000	0.6000000	70.71068	95.00000
NP-237	4436.778	4903.324	5.000000	1.500000	44.72136	95.00000
CM-244	5534.357	5882.529	21.00000	6.300000	21.82179	95.00000

Instrument : CHAMBER 193
 Detector : 68627
 Background Analysis Date/Time : 19-JUL-2009 13:10:51
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.069	3299.225	2.000000	0.6000000	70.71068	95.00000
NP-237	4433.121	4901.609	5.000000	1.500000	44.72136	95.00000
CM-244	5534.158	5885.907	25.00000	7.500000	20.00000	95.00000

Instrument : CHAMBER 194
 Detector : 68635
 Background Analysis Date/Time : 19-JUL-2009 13:10:55
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.572	3300.603	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4436.435	4905.175	1.000000	0.3000000	100.0000	95.00000
CM-244	5532.274	5883.671	22.00000	6.600000	21.32007	95.00000

Instrument : CHAMBER 195
 Detector : 68636
 Background Analysis Date/Time : 19-JUL-2009 13:10:59
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.629	3301.408	5.000000	1.500000	44.72136	95.00000
NP-237	4433.877	4902.925	52.00000	15.60000	13.86751	95.00000
CM-244	5535.397	5886.705	43.00000	12.90000	15.24986	95.00000

Instrument : CHAMBER 196
 Detector : 68637
 Background Analysis Date/Time : 19-JUL-2009 13:11:03
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.343	3302.501	2.000000	0.6000000	70.71068	95.00000
NP-237	4433.338	4901.979	2.000000	0.6000000	70.71068	95.00000
CM-244	5534.144	5885.395	20.00000	6.000000	22.36068	95.00000

Instrument : CHAMBER 197
 Detector : 78894
 Background Analysis Date/Time : 19-JUL-2009 13:11:08
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.389	3297.669	1.000000	0.3000000	100.0000	95.00000
NP-237	4433.236	4904.076	1.000000	0.3000000	100.0000	95.00000
CM-244	5534.086	5887.165	19.00000	5.700000	22.94157	95.00000

Instrument : CHAMBER 198
 Detector : 78895
 Background Analysis Date/Time : 19-JUL-2009 13:11:12
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.288	3302.314	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4436.287	4906.224	1.000000	0.3000000	100.0000	95.00000
CM-244	5534.818	5887.000	15.00000	4.500000	25.81989	95.00000

Instrument : CHAMBER 199
 Detector : 78896
 Background Analysis Date/Time : 19-JUL-2009 13:11:16
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.202	3299.048	2.000000	0.6000000	70.71068	95.00000
NP-237	4435.598	4906.357	2.000000	0.6000000	70.71068	95.00000
CM-244	5530.513	5883.049	21.00000	6.300000	21.82179	95.00000

Instrument : CHAMBER 200
 Detector : 78900
 Background Analysis Date/Time : 19-JUL-2009 13:11:20
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.598	3302.306	3.000000	0.9000000	57.73503	95.00000
NP-237	4436.820	4902.466	15.00000	4.500000	25.81989	95.00000
CM-244	5532.933	5886.480	31.00000	9.300000	17.96053	95.00000

Instrument : CHAMBER 201
 Detector : 78902
 Background Analysis Date/Time : 19-JUL-2009 13:11:24
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.239	3302.324	1.000000	0.3000000	100.0000	95.00000
NP-237	4432.525	4903.539	4.000000	1.200000	50.00000	95.00000
CM-244	5534.042	5887.523	22.00000	6.600000	21.32007	95.00000

Instrument : CHAMBER 202
 Detector : 78903
 Background Analysis Date/Time : 19-JUL-2009 13:11:29
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.965	3301.750	2.000000	0.6000000	70.71068	95.00000
NP-237	4435.262	4905.190	0.000000E+00	0.0000000E+00	0.0000000E+00	95.00000
CM-244	5533.929	5886.269	31.00000	9.300000	17.96053	95.00000

Instrument : CHAMBER 203
 Detector : 78905
 Background Analysis Date/Time : 19-JUL-2009 13:11:32
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.960	3299.739	5.000000	1.500000	44.72136	95.00000
NP-237	4435.540	4905.766	9.000000	2.700000	33.33334	95.00000
CM-244	5534.337	5886.308	25.00000	7.500000	20.00000	95.00000

Instrument : CHAMBER 204
 Detector : 78907
 Background Analysis Date/Time : 19-JUL-2009 13:11:37
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.953	3297.878	13.00000	3.900000	27.73501	95.00000
NP-237	4437.339	4902.439	14.00000	4.200000	26.72612	95.00000
CM-244	5531.727	5884.400	31.00000	9.300000	17.96053	95.00000

Instrument : CHAMBER 205
 Detector : 78908
 Background Analysis Date/Time : 19-JUL-2009 13:11:41
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.664	3299.649	1.000000	0.3000000	100.0000	95.00000
NP-237	4434.348	4904.923	3.000000	0.9000000	57.73503	95.00000
CM-244	5534.662	5887.628	18.00000	5.400000	23.57022	95.00000

Instrument : CHAMBER 206
 Detector : 78909
 Background Analysis Date/Time : 19-JUL-2009 13:11:45
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.007	3298.921	2.000000	0.6000000	70.71068	95.00000
NP-237	4432.777	4902.746	2.000000	0.6000000	70.71068	95.00000
CM-244	5531.452	5883.730	22.00000	6.600000	21.32007	95.00000

Instrument : CHAMBER 207
 Detector : 78910
 Background Analysis Date/Time : 19-JUL-2009 13:11:49
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.143	3301.594	1.000000	0.3000000	100.0000	95.00000
NP-237	4437.296	4902.779	2.000000	0.6000000	70.71068	95.00000
CM-244	5532.449	5885.271	25.00000	7.500000	20.00000	95.00000

Instrument : CHAMBER 208
 Detector : 78911
 Background Analysis Date/Time : 19-JUL-2009 13:11:53
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.612	3298.165	3.000000	0.9000000	57.73503	95.00000
NP-237	4434.097	4904.804	2.000000	0.6000000	70.71068	95.00000
CM-244	5534.389	5887.108	8.000000	2.400000	35.35534	95.00000

Instrument : CHAMBER 209
 Detector : 79188
 Background Analysis Date/Time : 26-JUL-2009 17:06:41
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.310	3300.226	2.000000	0.6000000	70.71068	95.00000
NP-237	4435.667	4905.853	1.000000	0.3000000	100.0000	95.00000
CM-244	5530.947	5884.845	8.000000	2.400000	35.35534	95.00000

Instrument : CHAMBER 210
 Detector : 79189
 Background Analysis Date/Time : 26-JUL-2009 17:06:45
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.620	3297.977	1.000000	0.3000000	100.0000	95.00000
NP-237	4435.731	4905.552	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
CM-244	5534.352	5886.824	9.000000	2.700000	33.33334	95.00000

Instrument : CHAMBER 211
 Detector : 79190
 Background Analysis Date/Time : 26-JUL-2009 17:06:49
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.121	3301.259	3.000000	0.9000000	57.73503	95.00000
NP-237	4436.737	4902.524	1.000000	0.3000000	100.0000	95.00000
CM-244	5532.952	5886.368	15.00000	4.500000	25.81989	95.00000

Instrument : CHAMBER 212
 Detector : 79191
 Background Analysis Date/Time : 26-JUL-2009 17:06:54
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.135	3301.447	1.000000	0.3000000	100.0000	95.00000
NP-237	4434.433	4904.665	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
CM-244	5534.267	5887.313	12.00000	3.600000	28.86751	95.00000

Instrument : CHAMBER 213
 Detector : 79192
 Background Analysis Date/Time : 26-JUL-2009 17:06:58
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.470	3298.036	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4436.689	4901.687	1.000000	0.3000000	100.0000	95.00000
CM-244	5531.037	5883.842	3.000000	0.9000000	57.73503	95.00000

Instrument : CHAMBER 214
 Detector : 79193
 Background Analysis Date/Time : 26-JUL-2009 17:07:02
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.553	3297.788	2.000000	0.6000000	70.71068	95.00000
NP-237	4436.227	4901.574	1.000000	0.3000000	100.0000	95.00000
CM-244	5531.780	5885.252	0.000000E+00	0.000000E+00	0.000000E+00	95.00000

Instrument : CHAMBER 215
 Detector : 79194
 Background Analysis Date/Time : 26-JUL-2009 17:07:06
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.364	3302.121	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4437.186	4903.222	1.000000	0.3000000	100.0000	95.00000
CM-244	5534.359	5882.968	6.000000	1.800000	40.82483	95.00000

Instrument : CHAMBER 216
 Detector : 79195
 Background Analysis Date/Time : 26-JUL-2009 17:07:10
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.730	3302.451	1.000000	0.3000000	100.0000	95.00000
NP-237	4434.761	4905.361	2.000000	0.6000000	70.71068	95.00000
CM-244	5530.680	5884.547	6.000000	1.800000	40.82483	95.00000

Instrument : CHAMBER 217
 Detector : 79410
 Background Analysis Date/Time : 26-JUL-2009 17:07:14
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.264	3300.395	1.000000	0.3000000	100.0000	95.00000
NP-237	4433.666	4904.432	1.000000	0.3000000	100.0000	95.00000
CM-244	5535.108	5883.550	8.000000	2.400000	35.35534	95.00000

Instrument : CHAMBER 218
 Detector : 79411
 Background Analysis Date/Time : 26-JUL-2009 17:07:19
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.480	3299.092	1.000000	0.3000000	100.0000	95.00000
NP-237	4433.463	4904.366	6.000000	1.800000	40.82483	95.00000
CM-244	5534.949	5883.207	1.000000	0.3000000	100.0000	95.00000

Instrument : CHAMBER 219
 Detector : 79412
 Background Analysis Date/Time : 26-JUL-2009 17:07:23
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.558	3298.478	1.000000	0.3000000	100.0000	95.00000
NP-237	4436.677	4902.329	2.000000	0.6000000	70.71068	95.00000
CM-244	5533.300	5887.374	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000

Instrument : CHAMBER 220
 Detector : 79413
 Background Analysis Date/Time : 26-JUL-2009 17:07:26
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.238	3297.635	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4436.067	4906.404	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
CM-244	5530.768	5883.799	4.000000	1.200000	50.00000	95.00000

Instrument : CHAMBER 221
 Detector : 79414
 Background Analysis Date/Time : 26-JUL-2009 17:07:30
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.031	3301.906	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4434.520	4906.347	1.000000	0.3000000	100.0000	95.00000
CM-244	5532.427	5886.301	7.000000	2.100000	37.79645	95.00000

Instrument : CHAMBER 222
 Detector : 79415
 Background Analysis Date/Time : 26-JUL-2009 17:07:34
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.828	3299.834	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4436.567	4903.132	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
CM-244	5532.999	5885.314	5.000000	1.500000	44.72136	95.00000

Instrument : CHAMBER 223
 Detector : 79416
 Background Analysis Date/Time : 26-JUL-2009 17:07:38
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.719	3302.203	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4434.717	4901.802	1.000000	0.3000000	100.0000	95.00000
CM-244	5534.370	5883.775	10.00000	3.000000	31.62278	95.00000

Instrument : CHAMBER 224
 Detector : 79417
 Background Analysis Date/Time : 26-JUL-2009 17:07:43
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.902	3302.451	1.000000	0.3000000	100.0000	95.00000
NP-237	4433.496	4905.621	1.000000	0.3000000	100.0000	95.00000
CM-244	5531.081	5884.107	5.000000	1.500000	44.72136	95.00000

Instrument : CHAMBER 225
 Detector : 79418
 Background Analysis Date/Time : 26-JUL-2009 17:07:47
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.698	3301.928	3.000000	0.9000000	57.73503	95.00000
NP-237	4436.047	4902.115	1.000000	0.3000000	100.0000	95.00000
CM-244	5533.662	5882.674	1.000000	0.3000000	100.0000	95.00000

Instrument : CHAMBER 226
 Detector : 79419
 Background Analysis Date/Time : 26-JUL-2009 17:07:51
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.229	3299.048	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4436.278	4902.399	1.000000	0.3000000	100.0000	95.00000
CM-244	5532.943	5886.259	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000

Instrument : CHAMBER 227
 Detector : 79420
 Background Analysis Date/Time : 26-JUL-2009 17:07:55
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.495	3300.898	1.000000	0.3000000	100.0000	95.00000
NP-237	4435.132	4906.286	3.000000	0.9000000	57.73503	95.00000
CM-244	5532.133	5886.196	1.000000	0.3000000	100.0000	95.00000

Instrument : CHAMBER 228
 Detector : 79421
 Background Analysis Date/Time : 26-JUL-2009 17:07:59
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.613	3298.829	1.000000	0.3000000	100.0000	95.00000
NP-237	4434.639	4905.792	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
CM-244	5531.072	5884.538	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000

Instrument : CHAMBER 229
 Detector : 79422
 Background Analysis Date/Time : 26-JUL-2009 17:08:03
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.805	3298.464	3.000000	0.9000000	57.73503	95.00000
NP-237	4434.226	4906.242	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
CM-244	5533.427	5882.943	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000

Instrument : CHAMBER 230
 Detector : 79423
 Background Analysis Date/Time : 26-JUL-2009 17:08:07
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.308	3297.622	2.000000	0.6000000	70.71068	95.00000
NP-237	4433.975	4905.433	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
CM-244	5531.188	5884.956	1.000000	0.3000000	100.0000	95.00000

Instrument : CHAMBER 231
 Detector : 79424
 Background Analysis Date/Time : 26-JUL-2009 17:08:12
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.586	3298.189	1.000000	0.3000000	100.0000	95.00000
NP-237	4432.432	4903.240	4.000000	1.200000	50.00000	95.00000
CM-244	5533.660	5887.186	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000

Instrument : CHAMBER 232
 Detector : 79425
 Background Analysis Date/Time : 26-JUL-2009 17:08:16
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.229	3299.258	1.000000	0.3000000	100.0000	95.00000
NP-237	4433.403	4904.597	1.000000	0.3000000	100.0000	95.00000
CM-244	5534.062	5886.338	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000

Instrument : CHAMBER 233
 Detector : 79426
 Background Analysis Date/Time : 26-JUL-2009 17:08:20
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.053	3300.219	1.000000	0.3000000	100.0000	95.00000
NP-237	4437.148	4902.933	1.000000	0.3000000	100.0000	95.00000
CM-244	5534.654	5884.028	5.000000	1.500000	44.72136	95.00000

Instrument : CHAMBER 234
 Detector : 79427
 Background Analysis Date/Time : 26-JUL-2009 17:08:25
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.497	3297.542	2.000000	0.6000000	70.71068	95.00000
NP-237	4434.922	4904.935	1.000000	0.3000000	100.0000	95.00000
CM-244	5534.289	5887.217	7.000000	2.100000	37.79645	95.00000

Instrument : CHAMBER 235
 Detector : 79428
 Background Analysis Date/Time : 26-JUL-2009 17:08:29
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.334	3300.717	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4435.003	4906.236	2.000000	0.6000000	70.71068	95.00000
CM-244	5532.236	5886.409	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000

Instrument : CHAMBER 236
 Detector : 79429
 Background Analysis Date/Time : 26-JUL-2009 17:08:33
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.761	3298.777	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4435.283	4906.214	9.000000	2.700000	33.33334	95.00000
CM-244	5532.557	5887.291	3.000000	0.9000000	57.73503	95.00000

Instrument : CHAMBER 237
 Detector : 79430
 Background Analysis Date/Time : 26-JUL-2009 17:08:37
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.197	3297.861	1.000000	0.3000000	100.0000	95.00000
NP-237	4432.935	4904.354	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
CM-244	5530.478	5884.662	11.00000	3.300000	30.15113	95.00000

Instrument : CHAMBER 238
 Detector : 79431
 Background Analysis Date/Time : 26-JUL-2009 17:08:41
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.703	3299.637	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4437.459	4902.787	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
CM-244	5533.171	5886.843	4.000000	1.200000	50.00000	95.00000

Instrument : CHAMBER 239
 Detector : 79432
 Background Analysis Date/Time : 26-JUL-2009 17:08:46
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.694	3302.472	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4436.142	4902.540	8.000000	2.400000	35.35534	95.00000
CM-244	5534.989	5884.715	1.000000	0.3000000	100.0000	95.00000

Instrument : CHAMBER 240
 Detector : 79433
 Background Analysis Date/Time : 26-JUL-2009 17:08:50
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.448	3302.009	1.000000	0.3000000	100.0000	95.00000
NP-237	4434.377	4905.282	1.000000	0.3000000	100.0000	95.00000
CM-244	5531.249	5885.600	1.000000	0.3000000	100.0000	95.00000

Instrument : CHAMBER 241
 Detector : 79434
 Background Analysis Date/Time : 26-JUL-2009 17:08:54
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.069	3301.257	3.000000	0.9000000	57.73503	95.00000
NP-237	4433.036	4904.033	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
CM-244	5530.409	5885.133	1.000000	0.3000000	100.0000	95.00000

Instrument : CHAMBER 242
 Detector : 79435
 Background Analysis Date/Time : 26-JUL-2009 17:08:58
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.986	3300.537	1.000000	0.3000000	100.0000	95.00000
NP-237	4434.402	4905.006	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
CM-244	5535.112	5883.069	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000

Instrument : CHAMBER 243
 Detector : 79436
 Background Analysis Date/Time : 26-JUL-2009 17:09:02
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.831	3301.144	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4435.437	4901.520	3.000000	0.9000000	57.73503	95.00000
CM-244	5533.039	5887.402	2.000000	0.6000000	70.71068	95.00000

Instrument : CHAMBER 244
 Detector : 79437
 Background Analysis Date/Time : 26-JUL-2009 17:09:06
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.561	3301.814	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4433.746	4904.768	1.000000	0.3000000	100.0000	95.00000
CM-244	5531.146	5885.854	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000

Instrument : CHAMBER 245
 Detector : 79438
 Background Analysis Date/Time : 26-JUL-2009 17:09:11
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.519	3298.200	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4434.025	4906.060	1.000000	0.3000000	100.0000	95.00000
CM-244	5533.264	5882.788	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000

Instrument : CHAMBER 246
 Detector : 78912
 Background Analysis Date/Time : 26-JUL-2009 17:09:15
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.883	3302.161	2.000000	0.6000000	70.71068	95.00000
NP-237	4436.171	4902.069	2.000000	0.6000000	70.71068	95.00000
CM-244	5533.279	5887.441	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000

Instrument : CHAMBER 247
 Detector : 79440
 Background Analysis Date/Time : 26-JUL-2009 17:09:20
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.314	3301.154	2.000000	0.6000000	70.71068	95.00000
NP-237	4435.427	4902.237	2.000000	0.6000000	70.71068	95.00000
CM-244	5535.390	5885.574	2.000000	0.6000000	70.71068	95.00000

Instrument : CHAMBER 248
 Detector : 79441
 Background Analysis Date/Time : 26-JUL-2009 17:09:23
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.045	3301.474	2.000000	0.6000000	70.71068	95.00000
NP-237	4436.389	4902.813	1.000000	0.3000000	100.0000	95.00000
CM-244	5534.872	5884.178	5.000000	1.500000	44.72136	95.00000

Instrument : CHAMBER 249
 Detector : 79442
 Background Analysis Date/Time : 26-JUL-2009 17:09:28
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.808	3298.538	3.000000	0.9000000	57.73503	95.00000
NP-237	4433.459	4906.270	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
CM-244	5535.492	5886.613	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000

Instrument : CHAMBER 250
 Detector : 79443
 Background Analysis Date/Time : 26-JUL-2009 17:09:32
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.616	3300.155	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4432.911	4904.182	6.000000	1.800000	40.82483	95.00000
CM-244	5530.811	5885.622	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000

Instrument : CHAMBER 251
 Detector : 79444
 Background Analysis Date/Time : 26-JUL-2009 17:09:36
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.845	3297.824	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4433.069	4905.749	2.000000	0.6000000	70.71068	95.00000
CM-244	5534.571	5885.360	2.000000	0.6000000	70.71068	95.00000

Instrument : CHAMBER 252
 Detector : 79445
 Background Analysis Date/Time : 26-JUL-2009 17:09:40
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.916	3302.142	1.000000	0.3000000	100.0000	95.00000
NP-237	4434.879	4906.631	1.000000	0.3000000	100.0000	95.00000
CM-244	5534.322	5884.528	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000

Instrument : CHAMBER 253
 Detector : 79446
 Background Analysis Date/Time : 26-JUL-2009 17:09:45
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.796	3301.166	2.000000	0.6000000	70.71068	95.00000
NP-237	4435.182	4903.720	9.000000	2.700000	33.33334	95.00000
CM-244	5533.610	5884.813	2.000000	0.6000000	70.71068	95.00000

Instrument : CHAMBER 254
 Detector : 79447
 Background Analysis Date/Time : 26-JUL-2009 17:09:49
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.474	3298.982	1.000000	0.3000000	100.0000	95.00000
NP-237	4434.396	4906.361	4.000000	1.200000	50.00000	95.00000
CM-244	5533.560	5883.122	1.000000	0.3000000	100.0000	95.00000

Instrument : CHAMBER 255
 Detector : 79448
 Background Analysis Date/Time : 26-JUL-2009 17:09:53
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.107	3299.169	3.000000	0.9000000	57.73503	95.00000
NP-237	4434.844	4902.471	4.000000	1.200000	50.00000	95.00000
CM-244	5531.565	5882.529	6.000000	1.800000	40.82483	95.00000

Instrument : CHAMBER 256
 Detector : 79449
 Background Analysis Date/Time : 26-JUL-2009 17:09:57
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.102	3301.350	2.000000	0.6000000	70.71068	95.00000
NP-237	4435.732	4901.991	8.000000	2.400000	35.35534	95.00000
CM-244	5533.871	5883.102	3.000000	0.9000000	57.73503	95.00000

Subsection 3: Efficiency Calibration

Instrument : CHAMBER 001
 Detector : 78788
 Standard ID : AESS-001
 Standard Reference Date : 20-FEB-2008 09:54:53
 Calibration Analysis Date/Time : 5-AUG-2009 09:23:09
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 5-AUG-2009 14:45:15
 Average Efficiency : 0.3129051
 Average Efficiency Error : 8.6269947E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	208.6698	28-FEB-2010	2987.927	3299.401	15169.00	0.3069817	1.3193288E-02	58.42078
NP-237	171.0024	28-FEB-2010	4432.428	4902.923	12984.00	0.3163057	1.6057158E-02	73.48861
CM-244	158.1060	28-FEB-2010	5533.599	5883.327	11428.00	0.3183713	1.6194897E-02	56.66428

Instrument : CHAMBER 002
 Detector : 78266
 Standard ID : AESS-002
 Standard Reference Date : 19-FEB-2008 11:05:22
 Calibration Analysis Date/Time : 5-AUG-2009 09:23:09
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 5-AUG-2009 14:45:26
 Average Efficiency : 0.3058862
 Average Efficiency Error : 8.4242094E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	200.1144	28-FEB-2010	2990.748	3297.924	14398.00	0.3038373	1.3070637E-02	49.74084
NP-237	200.4990	28-FEB-2010	4434.751	4902.555	14828.00	0.3081331	1.5613098E-02	65.75996
CM-244	196.5558	28-FEB-2010	5533.273	5884.668	13676.00	0.3065576	1.5550442E-02	56.66758

Instrument : CHAMBER 003
 Detector : 67617
 Standard ID : AESS-003
 Standard Reference Date : 15-FEB-2008 13:12:27
 Calibration Analysis Date/Time : 5-AUG-2009 09:23:09
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 5-AUG-2009 14:45:38
 Average Efficiency : 0.3501697
 Average Efficiency Error : 9.6245455E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	202.9740	28-FEB-2010	2988.035	3300.027	16505.00	0.3434206	1.4738046E-02	69.44512
NP-237	203.2080	28-FEB-2010	4433.783	4901.623	17421.00	0.3571638	1.8062104E-02	78.56305
CM-244	197.2236	28-FEB-2010	5533.183	5887.889	15808.00	0.3532508	1.7884690E-02	60.67228

Instrument : CHAMBER 004
 Detector : 64279
 Standard ID : AESS-004
 Standard Reference Date : 14-FEB-2008 09:35:18
 Calibration Analysis Date/Time : 5-AUG-2009 09:23:09
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 5-AUG-2009 14:45:54
 Average Efficiency : 0.3004026
 Average Efficiency Error : 8.2737673E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	206.1222	28-FEB-2010	2991.885	3302.347	14848.00	0.3042404	1.3080551E-02	53.10138
NP-237	204.2586	28-FEB-2010	4436.757	4905.540	14917.00	0.3042575	1.5415543E-02	64.73015
CM-244	198.8100	28-FEB-2010	5533.807	5887.698	13166.00	0.2919180	1.4816008E-02	57.85523

Instrument : CHAMBER 005
 Detector : 67612
 Standard ID : AESS-005
 Standard Reference Date : 14-FEB-2008 09:35:18
 Calibration Analysis Date/Time : 5-AUG-2009 09:23:09
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 5-AUG-2009 14:46:05
 Average Efficiency : 0.2843162
 Average Efficiency Error : 7.8336252E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	210.7452	28-FEB-2010	2990.194	3301.639	14157.00	0.2837222	1.2209224E-02	51.06648
NP-237	209.5938	28-FEB-2010	4437.588	4901.889	14375.00	0.2857330	1.4484116E-02	69.27464
CM-244	202.7478	28-FEB-2010	5531.535	5887.236	13050.00	0.2837417	1.4402892E-02	60.22887

Instrument : CHAMBER 006
 Detector : 67613
 Standard ID : AESS-006
 Standard Reference Date : 14-FEB-2008 09:35:18
 Calibration Analysis Date/Time : 5-AUG-2009 09:23:09
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 5-AUG-2009 14:46:15
 Average Efficiency : 0.3150931
 Average Efficiency Error : 8.6723948E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	203.6952	28-FEB-2010	2988.186	3302.064	15061.00	0.3123020	1.3423658E-02	54.65259
NP-237	204.7038	28-FEB-2010	4434.812	4901.476	15598.00	0.3174475	1.6074667E-02	62.21717
CM-244	195.0060	28-FEB-2010	5533.017	5887.020	14013.00	0.3167382	1.6061435E-02	59.32273

Instrument : CHAMBER 007
 Detector : 67607
 Standard ID : AESS-007
 Standard Reference Date : 14-FEB-2008 13:39:25
 Calibration Analysis Date/Time : 3-AUG-2009 10:53:33
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 3-AUG-2009 15:08:14
 Average Efficiency : 0.3026176
 Average Efficiency Error : 8.3323661E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	206.7342	28-FEB-2010	2991.468	3299.148	14693.00	0.3001373	1.2906651E-02	48.67664
NP-237	205.0260	28-FEB-2010	4433.972	4903.766	14977.00	0.3043185	1.5417857E-02	59.64954
CM-244	199.6806	28-FEB-2010	5532.246	5885.701	13798.00	0.3044618	1.5442326E-02	51.23282

Instrument : CHAMBER 008
 Detector : 78788
 Standard ID : AESS-008
 Standard Reference Date : 14-FEB-2008 13:39:25
 Calibration Analysis Date/Time : 3-AUG-2009 10:53:33
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 3-AUG-2009 15:08:25
 Average Efficiency : 0.3224154
 Average Efficiency Error : 8.8692745E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	206.0418	28-FEB-2010	2989.215	3298.713	15734.00	0.3225096	1.3851766E-02	44.71056
NP-237	209.2716	28-FEB-2010	4433.303	4905.744	15863.00	0.3158187	1.5988812E-02	63.33889
CM-244	199.6488	28-FEB-2010	5532.461	5886.606	14925.00	0.3294691	1.6692771E-02	51.66238

Instrument : CHAMBER 009
 Detector : 72528
 Standard ID : AESS-009
 Standard Reference Date : 19-FEB-2008 11:05:22
 Calibration Analysis Date/Time : 3-AUG-2009 10:53:33
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 3-AUG-2009 15:08:37
 Average Efficiency : 0.3431641
 Average Efficiency Error : 9.4328979E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	203.3736	28-FEB-2010	2990.462	3298.900	16457.00	0.3417034	1.4665021E-02	47.76541
NP-237	204.0192	28-FEB-2010	4437.055	4904.570	16959.00	0.3463034	1.7518245E-02	66.91080
CM-244	197.2128	28-FEB-2010	5532.536	5882.399	15320.00	0.3421319	1.7328590E-02	53.20248

Instrument : CHAMBER 010
 Detector : 72529
 Standard ID : AESS-010
 Standard Reference Date : 14-FEB-2008 13:39:25
 Calibration Analysis Date/Time : 3-AUG-2009 10:53:33
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 3-AUG-2009 15:08:47
 Average Efficiency : 0.3163380
 Average Efficiency Error : 8.7065995E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	202.0008	28-FEB-2010	2990.229	3298.607	15141.00	0.3165374	1.3604476E-02	54.57225
NP-237	202.9926	28-FEB-2010	4436.880	4905.484	15237.00	0.3127136	1.5839646E-02	70.41494
CM-244	196.2330	28-FEB-2010	5531.409	5886.990	14242.00	0.3198532	1.6215732E-02	59.36025

Instrument : CHAMBER 011
 Detector : 72531
 Standard ID : AESS-011
 Standard Reference Date : 14-FEB-2008 13:39:25
 Calibration Analysis Date/Time : 3-AUG-2009 10:53:33
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 3-AUG-2009 15:10:05
 Average Efficiency : 0.2947833
 Average Efficiency Error : 8.1152376E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	212.8284	28-FEB-2010	2991.538	3301.988	14786.00	0.2934125	1.2615963E-02	51.15865
NP-237	214.4868	28-FEB-2010	4435.957	4905.467	15318.00	0.2975290	1.5069493E-02	57.97636
CM-244	208.4184	28-FEB-2010	5530.314	5886.614	13904.00	0.2940101	1.4910497E-02	52.04412

Instrument : CHAMBER 012
 Detector : 67594
 Standard ID : AESS-012
 Standard Reference Date : 14-FEB-2008 13:39:25
 Calibration Analysis Date/Time : 3-AUG-2009 10:53:33
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 3-AUG-2009 15:10:47
 Average Efficiency : 0.2985670
 Average Efficiency Error : 8.2218517E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	206.2200	28-FEB-2010	2988.398	3300.615	14557.00	0.2981249	1.2822272E-02	47.31236
NP-237	205.8930	28-FEB-2010	4437.450	4901.503	14889.00	0.3012659	1.5264360E-02	60.85177
CM-244	203.1954	28-FEB-2010	5534.709	5886.652	13676.00	0.2965543	1.5043142E-02	54.26840

Instrument : CHAMBER 013
 Detector : 78790
 Standard ID : AESS-013
 Standard Reference Date : 14-FEB-2008 17:45:04
 Calibration Analysis Date/Time : 3-AUG-2009 10:53:35
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 3-AUG-2009 15:10:57
 Average Efficiency : 0.3409691
 Average Efficiency Error : 9.3713822E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	203.6544	28-FEB-2010	2987.666	3298.441	16523.00	0.3426617	1.4705168E-02	49.16812
NP-237	210.2526	28-FEB-2010	4435.272	4902.524	17040.00	0.3376607	1.7080082E-02	61.60270
CM-244	201.9108	28-FEB-2010	5533.077	5883.559	15669.00	0.3420227	1.7318053E-02	54.98487

Instrument : CHAMBER 014
 Detector : 67616
 Standard ID : AESS-014
 Standard Reference Date : 19-FEB-2008 11:05:22
 Calibration Analysis Date/Time : 3-AUG-2009 10:53:35
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 3-AUG-2009 15:11:09
 Average Efficiency : 0.3130623
 Average Efficiency Error : 8.6121503E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	214.7088	28-FEB-2010	2992.504	3300.484	15590.00	0.3066251	1.3171598E-02	52.69585
NP-237	211.7160	28-FEB-2010	4435.990	4902.000	16202.00	0.3188440	1.6137818E-02	68.36411
CM-244	207.3882	28-FEB-2010	5532.918	5886.701	14925.00	0.3169042	1.6056320E-02	53.58373

Instrument : CHAMBER 015
 Detector : 61581
 Standard ID : AESS-015
 Standard Reference Date : 14-FEB-2008 17:45:04
 Calibration Analysis Date/Time : 3-AUG-2009 10:53:35
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 3-AUG-2009 15:11:19
 Average Efficiency : 0.3249588
 Average Efficiency Error : 8.9409258E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	204.0270	28-FEB-2010	2987.739	3297.575	15440.00	0.3196218	1.3732214E-02	68.63618
NP-237	200.6460	28-FEB-2010	4432.566	4904.976	15842.00	0.3289294	1.6652878E-02	78.34551
CM-244	195.9270	28-FEB-2010	5530.833	5887.242	14624.00	0.3288428	1.6665678E-02	73.03269

Instrument : CHAMBER 016
 Detector : 78774
 Standard ID : AESS-016
 Standard Reference Date : 14-FEB-2008 17:45:04
 Calibration Analysis Date/Time : 3-AUG-2009 10:53:35
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 3-AUG-2009 15:11:28
 Average Efficiency : 0.3372796
 Average Efficiency Error : 9.2755891E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	204.0534	28-FEB-2010	2990.015	3299.769	15968.00	0.3304942	1.4191121E-02	47.63641
NP-237	199.3962	28-FEB-2010	4432.750	4903.568	16594.00	0.3467403	1.7544748E-02	65.62801
CM-244	198.6402	28-FEB-2010	5531.945	5886.508	15241.00	0.3381473	1.7127821E-02	51.73166

Instrument : CHAMBER 017
 Detector : 78791
 Standard ID : AESS-017
 Standard Reference Date : 14-FEB-2008 17:45:04
 Calibration Analysis Date/Time : 3-AUG-2009 10:53:35
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 3-AUG-2009 15:12:45
 Average Efficiency : 0.2920910
 Average Efficiency Error : 8.0447914E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	210.0798	28-FEB-2010	2991.506	3301.266	14360.00	0.2887001	1.2420051E-02	46.05902
NP-237	208.5846	28-FEB-2010	4435.397	4901.753	14828.00	0.2961742	1.5007162E-02	55.70656
CM-244	205.5828	28-FEB-2010	5532.102	5885.058	13665.00	0.2929415	1.4859928E-02	50.18596

Instrument : CHAMBER 018
 Detector : 78782
 Standard ID : AESS-018
 Standard Reference Date : 14-FEB-2008 17:45:04
 Calibration Analysis Date/Time : 3-AUG-2009 10:53:35
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 3-AUG-2009 15:12:56
 Average Efficiency : 0.3172097
 Average Efficiency Error : 8.7289969E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	202.1856	28-FEB-2010	2988.342	3302.274	15345.00	0.3205433	1.3773307E-02	42.03425
NP-237	208.8990	28-FEB-2010	4435.776	4902.996	15628.00	0.3116947	1.5782947E-02	59.98587
CM-244	198.1458	28-FEB-2010	5535.506	5884.764	14315.00	0.3183995	1.6140889E-02	46.41229

Instrument : CHAMBER 019
 Detector : 78786
 Standard ID : AESS-019
 Standard Reference Date : 19-FEB-2008 11:05:22
 Calibration Analysis Date/Time : 3-AUG-2009 10:53:38
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 3-AUG-2009 15:13:21
 Average Efficiency : 0.2910323
 Average Efficiency Error : 8.0228020E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	204.6468	28-FEB-2010	2990.757	3299.102	13644.00	0.2815492	1.2124360E-02	48.88054
NP-237	202.9140	28-FEB-2010	4436.959	4904.938	14592.00	0.2996101	1.5184480E-02	53.45035
CM-244	199.3140	28-FEB-2010	5530.360	5882.637	13450.00	0.2972434	1.5081594E-02	50.55271

Instrument : CHAMBER 020
 Detector : 78787
 Standard ID : AESS-020
 Standard Reference Date : 14-FEB-2008 21:55:55
 Calibration Analysis Date/Time : 3-AUG-2009 10:53:38
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 3-AUG-2009 15:13:30
 Average Efficiency : 0.3471871
 Average Efficiency Error : 9.5441081E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	205.5870	28-FEB-2010	2988.029	3302.537	16453.00	0.3380062	1.4506385E-02	51.08092
NP-237	203.4984	28-FEB-2010	4437.491	4905.035	17379.00	0.3557895	1.7993098E-02	61.84319
CM-244	197.1096	28-FEB-2010	5532.389	5886.993	15772.00	0.3526238	1.7853415E-02	51.51802

Instrument : CHAMBER 021
 Detector : 67047
 Standard ID : AESS-021
 Standard Reference Date : 19-FEB-2008 15:31:52
 Calibration Analysis Date/Time : 3-AUG-2009 10:53:38
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 3-AUG-2009 15:13:40
 Average Efficiency : 0.3035440
 Average Efficiency Error : 8.3565973E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	208.3608	28-FEB-2010	2992.044	3301.105	14782.00	0.2995796	1.2881183E-02	58.16195
NP-237	210.1548	28-FEB-2010	4432.692	4903.261	15300.00	0.3033102	1.5362527E-02	64.83363
CM-244	200.7390	28-FEB-2010	5532.273	5884.483	14116.00	0.3096792	1.5701950E-02	51.57142

Instrument : CHAMBER 022
 Detector : 72530
 Standard ID : AESS-022
 Standard Reference Date : 14-FEB-2008 21:55:55
 Calibration Analysis Date/Time : 3-AUG-2009 10:53:38
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 3-AUG-2009 15:13:53
 Average Efficiency : 0.3171063
 Average Efficiency Error : 8.7253209E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	209.6724	28-FEB-2010	2987.876	3301.717	15368.00	0.3095404	1.3300211E-02	46.46027
NP-237	206.8830	28-FEB-2010	4432.553	4902.907	16121.00	0.3246614	1.6433254E-02	59.61079
CM-244	203.0208	28-FEB-2010	5531.719	5883.858	14793.00	0.3210209	1.6266784E-02	54.93265

Instrument : CHAMBER 023
 Detector : 78264
 Standard ID : AESS-023
 Standard Reference Date : 14-FEB-2008 21:55:55
 Calibration Analysis Date/Time : 3-AUG-2009 10:53:38
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 3-AUG-2009 15:14:51
 Average Efficiency : 0.3475247
 Average Efficiency Error : 9.5510995E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	207.4764	28-FEB-2010	2992.270	3297.465	16655.00	0.3390353	1.4547646E-02	44.65316
NP-237	207.4998	28-FEB-2010	4434.353	4902.238	17621.00	0.3537784	1.7888635E-02	67.17326
CM-244	199.8804	28-FEB-2010	5535.006	5884.098	16062.00	0.3541352	1.7925926E-02	50.59406

Instrument : CHAMBER 024
 Detector : 76542
 Standard ID : AESS-024
 Standard Reference Date : 14-FEB-2008 21:55:55
 Calibration Analysis Date/Time : 3-AUG-2009 10:53:38
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 3-AUG-2009 15:15:01
 Average Efficiency : 0.3329758
 Average Efficiency Error : 9.1575533E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	203.5218	28-FEB-2010	2988.735	3301.963	15751.00	0.3268531	1.4038056E-02	48.09840
NP-237	205.6662	28-FEB-2010	4435.585	4904.900	16552.00	0.3352655	1.6964708E-02	62.82615
CM-244	198.3060	28-FEB-2010	5532.247	5883.527	15292.00	0.3398233	1.7212013E-02	54.96418

Instrument : CHAMBER 025
 Detector : 45-149AA5
 Standard ID : AESS-025
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 3-AUG-2009 10:53:40
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 3-AUG-2009 15:15:13
 Average Efficiency : 0.3273577
 Average Efficiency Error : 9.0229549E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	195.5670	28-FEB-2010	2989.576	3302.009	15260.00	0.3295556	1.4161936E-02	65.60141
NP-237	167.9916	28-FEB-2010	4437.518	4905.500	13240.00	0.3283658	1.6664496E-02	71.67536
CM-244	157.2432	28-FEB-2010	5535.553	5882.966	11554.00	0.3234104	1.6448844E-02	64.13462

Instrument : CHAMBER 026
 Detector : 78204
 Standard ID : AESS-026
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 3-AUG-2009 10:53:40
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 3-AUG-2009 15:15:23
 Average Efficiency : 0.3163501
 Average Efficiency Error : 9.2731481E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	199.5072	28-FEB-2010	2989.278	3302.066	15073.00	0.3190832	1.6165398E-02	47.54145
NP-237	168.0294	28-FEB-2010	4432.530	4904.245	12818.00	0.3178037	1.6136298E-02	64.89447
CM-244	160.5822	28-FEB-2010	5530.854	5885.357	11388.00	0.3123012	1.5887389E-02	53.07367

Instrument : CHAMBER 027
 Detector : 42484
 Standard ID : AESS-027
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 3-AUG-2009 10:53:40
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 3-AUG-2009 15:15:36
 Average Efficiency : 0.3396688
 Average Efficiency Error : 9.9549843E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	193.4238	28-FEB-2010	2989.311	3298.574	15139.00	0.3305598	1.6745884E-02	45.75581
NP-237	161.6154	28-FEB-2010	4433.571	4901.458	13298.00	0.3428161	1.7396733E-02	58.91746
CM-244	148.1754	28-FEB-2010	5534.916	5884.719	11660.00	0.3465259	1.7621491E-02	49.89463

Instrument : CHAMBER 028
 Detector : 78792
 Standard ID : AESS-028
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 3-AUG-2009 10:53:40
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 3-AUG-2009 15:15:45
 Average Efficiency : 0.3070537
 Average Efficiency Error : 9.0059368E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	199.6542	28-FEB-2010	2988.458	3301.428	14649.00	0.3098790	1.5704965E-02	43.03392
NP-237	168.1992	28-FEB-2010	4433.918	4901.793	12445.00	0.3082309	1.5657367E-02	57.16418
CM-244	156.7614	28-FEB-2010	5530.766	5886.861	10793.00	0.3031792	1.5437813E-02	42.94358

Instrument : CHAMBER 029
 Detector : 33454
 Standard ID : AESS-029
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 3-AUG-2009 10:53:40
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 3-AUG-2009 15:15:55
 Average Efficiency : 0.3165512
 Average Efficiency Error : 9.2795976E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	201.5742	28-FEB-2010	2991.561	3299.264	14962.00	0.3134704	1.5882587E-02	59.06260
NP-237	169.7700	28-FEB-2010	4436.609	4905.813	12925.00	0.3171891	1.6103044E-02	65.57512
CM-244	154.8234	28-FEB-2010	5532.652	5886.650	11221.00	0.3191230	1.6238619E-02	58.94875

Instrument : CHAMBER 030
 Detector : 33447
 Standard ID : AESS-030
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 3-AUG-2009 10:53:40
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 3-AUG-2009 15:16:05
 Average Efficiency : 0.3195129
 Average Efficiency Error : 9.3687959E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	198.9792	28-FEB-2010	2992.462	3300.436	14496.00	0.3076674	1.5595090E-02	51.22312
NP-237	166.3758	28-FEB-2010	4435.706	4901.528	13016.00	0.3259090	1.6544048E-02	70.89224
CM-244	157.1856	28-FEB-2010	5532.111	5885.667	11657.00	0.3264974	1.6603231E-02	58.51925

Instrument : CHAMBER 031
 Detector : 67042
 Standard ID : AESS-031
 Standard Reference Date : 18-FEB-2008 11:28:15
 Calibration Analysis Date/Time : 3-AUG-2009 10:53:41
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 3-AUG-2009 15:16:16
 Average Efficiency : 0.3333972
 Average Efficiency Error : 9.1897855E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	193.6650	28-FEB-2010	2990.816	3298.130	15264.00	0.3328327	1.4302717E-02	63.22559
NP-237	162.9186	28-FEB-2010	4432.666	4904.194	13199.00	0.3374993	1.7128870E-02	85.39982
CM-244	153.1968	28-FEB-2010	5530.750	5885.317	11495.00	0.3302312	1.6797049E-02	69.66753

Instrument : CHAMBER 032
 Detector : 67041
 Standard ID : AESS-032
 Standard Reference Date : 18-FEB-2008 11:28:15
 Calibration Analysis Date/Time : 3-AUG-2009 10:53:41
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 3-AUG-2009 15:16:28
 Average Efficiency : 0.3079946
 Average Efficiency Error : 8.4994007E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	195.2364	28-FEB-2010	2990.681	3302.442	14237.00	0.3079492	1.3250315E-02	56.35440
NP-237	165.9822	28-FEB-2010	4436.943	4904.070	12286.00	0.3083688	1.5667509E-02	62.42379
CM-244	153.7938	28-FEB-2010	5532.476	5883.050	10756.00	0.3076837	1.5668528E-02	54.99291

Instrument : CHAMBER 033
 Detector : 78785
 Standard ID : AESS-033
 Standard Reference Date : 18-FEB-2008 11:28:15
 Calibration Analysis Date/Time : 3-AUG-2009 10:53:41
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 3-AUG-2009 15:16:44
 Average Efficiency : 0.3159786
 Average Efficiency Error : 8.7208869E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	192.4158	28-FEB-2010	2988.750	3301.323	14152.00	0.3105978	1.3365801E-02	46.58186
NP-237	161.7816	28-FEB-2010	4437.327	4904.445	12331.00	0.3175407	1.6132571E-02	57.74305
CM-244	147.2670	28-FEB-2010	5532.298	5882.301	10791.00	0.3224820	1.6420925E-02	47.06204

Instrument : CHAMBER 034
 Detector : 61586
 Standard ID : AESS-034
 Standard Reference Date : 18-FEB-2008 11:28:15
 Calibration Analysis Date/Time : 3-AUG-2009 10:53:41
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 3-AUG-2009 15:16:57
 Average Efficiency : 0.3186626
 Average Efficiency Error : 8.7871859E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	200.5488	28-FEB-2010	2990.405	3301.020	14898.00	0.3137061	1.3486663E-02	63.62747
NP-237	167.2962	28-FEB-2010	4436.289	4905.558	12847.00	0.3199310	1.6243735E-02	89.06429
CM-244	154.4388	28-FEB-2010	5534.591	5883.408	11387.00	0.3247890	1.6522311E-02	62.47897

Instrument : CHAMBER 035
 Detector : 78202
 Standard ID : AESS-035
 Standard Reference Date : 18-FEB-2008 11:28:15
 Calibration Analysis Date/Time : 3-AUG-2009 10:53:41
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 3-AUG-2009 15:17:07
 Average Efficiency : 0.3066753
 Average Efficiency Error : 8.4610144E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	198.6666	28-FEB-2010	2988.026	3302.211	14579.00	0.3098971	1.3328200E-02	45.84651
NP-237	168.2934	28-FEB-2010	4437.360	4905.577	12421.00	0.3074051	1.5615990E-02	59.70762
CM-244	158.8128	28-FEB-2010	5534.350	5884.600	10890.00	0.3016905	1.5359893E-02	46.83206

Instrument : CHAMBER 036
 Detector : 78203
 Standard ID : AESS-036
 Standard Reference Date : 18-FEB-2008 11:28:15
 Calibration Analysis Date/Time : 3-AUG-2009 10:53:41
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 3-AUG-2009 15:17:19
 Average Efficiency : 0.3238717
 Average Efficiency Error : 8.9277234E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	201.3204	28-FEB-2010	2988.680	3301.073	15196.00	0.3187600	1.3699047E-02	53.56891
NP-237	167.4312	28-FEB-2010	4435.041	4905.984	13273.00	0.3302565	1.6759887E-02	68.47729
CM-244	156.4188	28-FEB-2010	5531.465	5885.278	11554.00	0.3251042	1.6534815E-02	54.91026

Instrument : CHAMBER 037
 Detector : 45-149BB5
 Standard ID : AESS-037
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 3-AUG-2009 10:53:43
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 3-AUG-2009 15:17:30
 Average Efficiency : 0.3588454
 Average Efficiency Error : 9.8783271E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	197.7372	28-FEB-2010	2991.168	3302.212	16427.00	0.3508205	1.5056745E-02	64.60843
NP-237	167.1294	28-FEB-2010	4432.895	4904.029	14662.00	0.3654579	1.8520588E-02	77.87219
CM-244	154.7664	28-FEB-2010	5532.110	5886.157	12816.00	0.3643632	1.8501068E-02	65.29257

Instrument : CHAMBER 038
 Detector : 72532
 Standard ID : AESS-038
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 3-AUG-2009 10:53:43
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 3-AUG-2009 15:17:42
 Average Efficiency : 0.3401872
 Average Efficiency Error : 9.3690762E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	200.1408	28-FEB-2010	2992.472	3300.031	15896.00	0.3353978	1.4402774E-02	52.10275
NP-237	170.0886	28-FEB-2010	4434.591	4905.742	14074.00	0.3446777	1.7477222E-02	66.10255
CM-244	157.7460	28-FEB-2010	5531.463	5885.396	12284.00	0.3427305	1.7413909E-02	59.13643

Instrument : CHAMBER 039
 Detector : 45-149BB2
 Standard ID : AESS-039
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 3-AUG-2009 10:53:43
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 3-AUG-2009 15:17:50
 Average Efficiency : 0.3635030
 Average Efficiency Error : 1.0010615E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	192.2418	28-FEB-2010	2988.231	3297.932	16136.00	0.3544406	1.5216673E-02	64.96208
NP-237	159.1506	28-FEB-2010	4433.148	4905.972	14381.00	0.3764731	1.9083694E-02	79.22511
CM-244	151.7142	28-FEB-2010	5532.651	5884.312	12578.00	0.3647127	1.8524269E-02	60.58306

Instrument : CHAMBER 040
 Detector : 78773
 Standard ID : AESS-040
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 3-AUG-2009 10:53:43
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 3-AUG-2009 15:18:00
 Average Efficiency : 0.3197618
 Average Efficiency Error : 8.8180574E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	194.4828	28-FEB-2010	2989.631	3299.278	14776.00	0.3208454	1.3795648E-02	47.91216
NP-237	166.8174	28-FEB-2010	4434.455	4902.104	12719.00	0.3176762	1.6131660E-02	62.00956
CM-244	155.0100	28-FEB-2010	5534.140	5885.901	11283.00	0.3203784	1.6300978E-02	46.47287

Instrument : CHAMBER 041
 Detector : 78205
 Standard ID : AESS-041
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 3-AUG-2009 10:53:43
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 3-AUG-2009 15:18:09
 Average Efficiency : 0.3320726
 Average Efficiency Error : 9.1476394E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	203.9034	28-FEB-2010	2988.485	3301.427	15744.00	0.3260407	1.4003299E-02	48.05792
NP-237	171.2268	28-FEB-2010	4434.095	4902.163	13892.00	0.3380044	1.7141877E-02	64.23948
CM-244	159.5796	28-FEB-2010	5531.498	5882.427	12150.00	0.3351395	1.7031105E-02	52.60388

Instrument : CHAMBER 042
 Detector : 78793
 Standard ID : AESS-042
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 3-AUG-2009 10:53:43
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 3-AUG-2009 15:18:18
 Average Efficiency : 0.3355130
 Average Efficiency Error : 9.2503820E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	188.7090	28-FEB-2010	2991.775	3302.182	14895.00	0.3333198	1.4329934E-02	45.19947
NP-237	159.6558	28-FEB-2010	4434.604	4903.031	12973.00	0.3384922	1.7183678E-02	58.44910
CM-244	150.5208	28-FEB-2010	5530.666	5882.826	11480.00	0.3356853	1.7074790E-02	51.00649

Instrument : CHAMBER 043
 Detector : 76543
 Standard ID : AESS-043
 Standard Reference Date : 19-FEB-2008 00:32:27
 Calibration Analysis Date/Time : 3-AUG-2009 10:53:44
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 3-AUG-2009 15:18:26
 Average Efficiency : 0.3394984
 Average Efficiency Error : 9.3512600E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	197.7708	28-FEB-2010	2990.605	3297.721	15848.00	0.3383991	1.4532390E-02	52.98521
NP-237	168.7422	28-FEB-2010	4435.729	4906.163	13860.00	0.3421971	1.7355058E-02	63.69067
CM-244	156.3252	28-FEB-2010	5530.889	5884.237	12022.00	0.3383877	1.7199298E-02	58.34155

Instrument : CHAMBER 044
 Detector : 79459
 Standard ID : AESS-044
 Standard Reference Date : 19-FEB-2008 00:32:27
 Calibration Analysis Date/Time : 3-AUG-2009 10:53:44
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 3-AUG-2009 15:18:36
 Average Efficiency : 0.3472623
 Average Efficiency Error : 9.5641837E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	194.4510	28-FEB-2010	2992.053	3299.650	16240.00	0.3526795	1.5139417E-02	46.60588
NP-237	166.6248	28-FEB-2010	4434.444	4905.733	13868.00	0.3467396	1.7585307E-02	67.40435
CM-244	155.8290	28-FEB-2010	5531.674	5885.749	12067.00	0.3406831	1.7315021E-02	50.52586

Instrument : CHAMBER 045
 Detector : 78783
 Standard ID : AESS-045
 Standard Reference Date : 19-FEB-2008 00:32:27
 Calibration Analysis Date/Time : 3-AUG-2009 10:53:44
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 3-AUG-2009 15:18:46
 Average Efficiency : 0.3473964
 Average Efficiency Error : 9.5752627E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	186.9936	28-FEB-2010	2991.163	3297.674	15321.00	0.3460006	1.4867575E-02	42.89996
NP-237	160.8066	28-FEB-2010	4435.665	4901.796	13169.00	0.3411981	1.7317103E-02	61.13550
CM-244	145.8384	28-FEB-2010	5533.912	5883.468	11808.00	0.3562486	1.8112443E-02	45.70908

Instrument : CHAMBER 046
 Detector : 76544
 Standard ID : AESS-046
 Standard Reference Date : 19-FEB-2008 19:35:48
 Calibration Analysis Date/Time : 3-AUG-2009 10:53:44
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 3-AUG-2009 15:18:55
 Average Efficiency : 0.3396656
 Average Efficiency Error : 9.3595181E-03
 Confidence : 95.00000

Cal. Istds	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	194.7474	28-FEB-2010	2988.013	3297.754	15574.00	0.3376833	1.4506049E-02	53.28547
NP-237	164.6658	28-FEB-2010	4433.428	4906.578	13320.00	0.3369921	1.7100822E-02	64.03419
CM-244	151.3824	28-FEB-2010	5533.808	5885.833	11881.00	0.3453883	1.7558334E-02	49.95901

Instrument : CHAMBER 047
 Detector : 46-089B1
 Standard ID : AESS-047
 Standard Reference Date : 19-FEB-2008 00:32:27
 Calibration Analysis Date/Time : 3-AUG-2009 10:53:44
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 3-AUG-2009 15:19:03
 Average Efficiency : 0.3416091
 Average Efficiency Error : 9.4094146E-03
 Confidence : 95.00000

Cal. Istds	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	197.4804	28-FEB-2010	2989.788	3298.531	15812.00	0.3381371	1.4521689E-02	57.51329
NP-237	168.3948	28-FEB-2010	4436.493	4903.356	13857.00	0.3428169	1.7386565E-02	66.01371
CM-244	154.6032	28-FEB-2010	5535.296	5884.198	12141.00	0.3454518	1.7555740E-02	60.25008

Instrument : CHAMBER 048
 Detector : 42483
 Standard ID : AESS-048
 Standard Reference Date : 19-FEB-2008 00:32:27
 Calibration Analysis Date/Time : 3-AUG-2009 10:53:44
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 3-AUG-2009 15:19:12
 Average Efficiency : 0.3123633
 Average Efficiency Error : 8.6213006E-03
 Confidence : 95.00000

Cal. Istds	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	191.8350	28-FEB-2010	2991.838	3299.553	14065.00	0.3096292	1.3325672E-02	54.65192
NP-237	161.5530	28-FEB-2010	4437.268	4906.475	12285.00	0.3167912	1.6095465E-02	66.40394
CM-244	151.1856	28-FEB-2010	5533.930	5885.396	10717.00	0.3119354	1.5885884E-02	57.74399

Instrument : CHAMBER 065
 Detector : 68551
 Standard ID : AESS-001
 Standard Reference Date : 20-FEB-2008 09:54:53
 Calibration Analysis Date/Time : 11-AUG-2009 07:20:10
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 11-AUG-2009 11:32:36
 Average Efficiency : 0.3083470
 Average Efficiency Error : 8.5085379E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	208.6698	28-FEB-2010	2991.020	3301.790	14596.00	0.2954247	1.2705522E-02	58.52770
NP-237	171.0024	28-FEB-2010	4435.576	4904.585	13191.00	0.3213498	1.6309390E-02	64.23100
CM-244	158.1060	28-FEB-2010	5533.015	5885.628	11352.00	0.3164231	1.6097672E-02	59.22498

Instrument : CHAMBER 066
 Detector : 46-089C1
 Standard ID : AESS-002
 Standard Reference Date : 19-FEB-2008 11:05:22
 Calibration Analysis Date/Time : 11-AUG-2009 07:20:10
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 11-AUG-2009 11:33:22
 Average Efficiency : 0.3112474
 Average Efficiency Error : 8.5695526E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	200.1144	28-FEB-2010	2988.945	3298.217	14657.00	0.3093549	1.3303596E-02	55.37485
NP-237	200.4990	28-FEB-2010	4435.388	4905.987	14981.00	0.3113079	1.5771858E-02	67.81973
CM-244	196.5558	28-FEB-2010	5534.885	5886.957	13998.00	0.3138950	1.5917554E-02	57.19744

Instrument : CHAMBER 067
 Detector : 46-089B4
 Standard ID : AESS-003
 Standard Reference Date : 15-FEB-2008 13:12:27
 Calibration Analysis Date/Time : 11-AUG-2009 07:20:10
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 11-AUG-2009 11:33:34
 Average Efficiency : 0.3251616
 Average Efficiency Error : 8.9453170E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	202.9740	28-FEB-2010	2990.195	3298.405	15523.00	0.3230599	1.3878663E-02	73.01379
NP-237	203.2080	28-FEB-2010	4432.996	4903.114	16006.00	0.3281700	1.6612297E-02	79.50097
CM-244	197.2236	28-FEB-2010	5531.881	5884.128	14543.00	0.3251645	1.6480407E-02	73.28760

Instrument : CHAMBER 068
 Detector : 78794
 Standard ID : AESS-004
 Standard Reference Date : 14-FEB-2008 09:35:18
 Calibration Analysis Date/Time : 11-AUG-2009 07:20:10
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 11-AUG-2009 11:38:02
 Average Efficiency : 0.2988316
 Average Efficiency Error : 8.2298918E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	206.1222	28-FEB-2010	2989.058	3297.794	14610.00	0.2994183	1.2877054E-02	47.51308
NP-237	204.2586	28-FEB-2010	4436.694	4904.361	14617.00	0.2981576	1.5110506E-02	57.11169
CM-244	198.8100	28-FEB-2010	5532.395	5887.637	13466.00	0.2986969	1.5155178E-02	48.38633

Instrument : CHAMBER 069
 Detector : 78795
 Standard ID : AESS-005
 Standard Reference Date : 14-FEB-2008 09:35:18
 Calibration Analysis Date/Time : 11-AUG-2009 07:20:10
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 11-AUG-2009 11:38:36
 Average Efficiency : 0.3175282
 Average Efficiency Error : 8.7343659E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	210.7452	28-FEB-2010	2991.230	3298.554	15670.00	0.3141076	1.3491860E-02	49.70101
NP-237	209.5938	28-FEB-2010	4432.770	4904.008	16141.00	0.3208218	1.6238715E-02	60.15531
CM-244	202.7478	28-FEB-2010	5535.390	5884.253	14673.00	0.3191766	1.6174993E-02	51.27451

Instrument : CHAMBER 070
 Detector : 46-089B2
 Standard ID : AESS-006
 Standard Reference Date : 14-FEB-2008 09:35:18
 Calibration Analysis Date/Time : 11-AUG-2009 07:20:10
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 11-AUG-2009 11:38:49
 Average Efficiency : 0.3529845
 Average Efficiency Error : 9.7008841E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	203.6952	28-FEB-2010	2992.134	3299.079	16742.00	0.3471912	1.4896408E-02	63.07681
NP-237	204.7038	28-FEB-2010	4435.081	4904.079	17300.00	0.3520767	1.7806258E-02	82.77227
CM-244	195.0060	28-FEB-2010	5531.689	5883.454	16039.00	0.3627528	1.8362503E-02	70.00533

Instrument : CHAMBER 071
 Detector : 64259
 Standard ID : AESS-007
 Standard Reference Date : 14-FEB-2008 13:39:25
 Calibration Analysis Date/Time : 11-AUG-2009 07:20:11
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 11-AUG-2009 11:39:05
 Average Efficiency : 0.3208804
 Average Efficiency Error : 8.8285562E-03
 Confidence : 95.00000

Cal. Isteps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	206.7342	28-FEB-2010	2991.474	3300.552	15413.00	0.3149293	1.3531087E-02	62.47171
NP-237	205.0260	28-FEB-2010	4434.375	4901.563	15925.00	0.3235798	1.6380999E-02	71.98354
CM-244	199.6806	28-FEB-2010	5533.885	5882.968	14807.00	0.3270442	1.6571697E-02	60.00851

Instrument : CHAMBER 072
 Detector : 45-149AA3
 Standard ID : AESS-008
 Standard Reference Date : 14-FEB-2008 13:39:25
 Calibration Analysis Date/Time : 11-AUG-2009 07:20:11
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 11-AUG-2009 11:41:05
 Average Efficiency : 0.3267370
 Average Efficiency Error : 8.9871846E-03
 Confidence : 95.00000

Cal. Isteps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	206.0418	28-FEB-2010	2989.276	3301.453	15650.00	0.3208615	1.3782272E-02	51.51645
NP-237	209.2716	28-FEB-2010	4434.016	4904.104	16413.00	0.3267362	1.6534751E-02	70.18485
CM-244	199.6488	28-FEB-2010	5533.538	5886.502	15197.00	0.3356811	1.7003637E-02	59.25634

Instrument : CHAMBER 073
 Detector : 78775
 Standard ID : AESS-009
 Standard Reference Date : 19-FEB-2008 11:05:22
 Calibration Analysis Date/Time : 11-AUG-2009 07:20:11
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 11-AUG-2009 11:41:19
 Average Efficiency : 0.3329331
 Average Efficiency Error : 9.1557140E-03
 Confidence : 95.00000

Cal. Isteps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	203.3736	28-FEB-2010	2991.884	3298.904	15903.00	0.3302805	1.4182931E-02	45.72569
NP-237	204.0192	28-FEB-2010	4435.607	4905.083	16398.00	0.3348464	1.6945357E-02	65.14548
CM-244	197.2128	28-FEB-2010	5533.495	5885.787	14977.00	0.3348103	1.6962610E-02	52.22756

Instrument : CHAMBER 074
 Detector : 78266
 Standard ID : AESS-010
 Standard Reference Date : 14-FEB-2008 13:39:25
 Calibration Analysis Date/Time : 11-AUG-2009 07:20:11
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 11-AUG-2009 11:41:50
 Average Efficiency : 0.3171463
 Average Efficiency Error : 8.7284483E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	202.0008	28-FEB-2010	2992.157	3300.875	15091.00	0.3155650	1.3563500E-02	48.84003
NP-237	202.9926	28-FEB-2010	4434.541	4902.170	15525.00	0.3186204	1.6135018E-02	61.89280
CM-244	196.2330	28-FEB-2010	5535.537	5885.413	14144.00	0.3179084	1.6118674E-02	53.87412

Instrument : CHAMBER 075
 Detector : 68550
 Standard ID : AESS-011
 Standard Reference Date : 14-FEB-2008 13:39:25
 Calibration Analysis Date/Time : 11-AUG-2009 07:20:11
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 11-AUG-2009 11:42:08
 Average Efficiency : 0.2994908
 Average Efficiency Error : 8.2427450E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	212.8284	28-FEB-2010	2992.440	3300.846	15058.00	0.2988699	1.2846401E-02	51.75235
NP-237	214.4868	28-FEB-2010	4432.709	4904.580	15499.00	0.3010221	1.5244178E-02	70.86993
CM-244	208.4184	28-FEB-2010	5531.026	5885.258	14123.00	0.2988416	1.5152307E-02	52.88081

Instrument : CHAMBER 076
 Detector : 78779
 Standard ID : AESS-012
 Standard Reference Date : 14-FEB-2008 13:39:25
 Calibration Analysis Date/Time : 11-AUG-2009 07:20:11
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 11-AUG-2009 11:42:40
 Average Efficiency : 0.3028130
 Average Efficiency Error : 8.3379308E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	206.2200	28-FEB-2010	2991.979	3300.154	14630.00	0.2996896	1.2888389E-02	45.27155
NP-237	205.8930	28-FEB-2010	4436.825	4903.508	15329.00	0.3101608	1.5709149E-02	64.17129
CM-244	203.1954	28-FEB-2010	5535.510	5884.591	13832.00	0.3002685	1.5228972E-02	51.27063

Instrument : CHAMBER 077
 Detector : 67576
 Standard ID : AESS-013
 Standard Reference Date : 14-FEB-2008 17:45:04
 Calibration Analysis Date/Time : 11-AUG-2009 07:20:12
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 11-AUG-2009 11:42:53
 Average Efficiency : 0.3266060
 Average Efficiency Error : 8.9822784E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	203.6544	28-FEB-2010	2989.957	3302.071	15788.00	0.3274788	1.4064389E-02	50.84729
NP-237	210.2526	28-FEB-2010	4433.544	4902.799	16283.00	0.3226589	1.6329939E-02	64.60262
CM-244	201.9108	28-FEB-2010	5530.788	5882.782	15087.00	0.3295008	1.6692154E-02	50.76959

Instrument : CHAMBER 078
 Detector : 67577
 Standard ID : AESS-014
 Standard Reference Date : 19-FEB-2008 11:05:22
 Calibration Analysis Date/Time : 11-AUG-2009 07:20:12
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 11-AUG-2009 11:43:47
 Average Efficiency : 0.3266194
 Average Efficiency Error : 8.9784693E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	214.7088	28-FEB-2010	2988.255	3302.223	16485.00	0.3242883	1.3917238E-02	54.47247
NP-237	211.7160	28-FEB-2010	4437.236	4905.680	16830.00	0.3311986	1.6755598E-02	62.86163
CM-244	207.3882	28-FEB-2010	5535.005	5885.680	15311.00	0.3254575	1.6484126E-02	54.68671

Instrument : CHAMBER 079
 Detector : 67598
 Standard ID : AESS-015
 Standard Reference Date : 14-FEB-2008 17:45:04
 Calibration Analysis Date/Time : 11-AUG-2009 07:20:12
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 11-AUG-2009 11:44:09
 Average Efficiency : 0.3272116
 Average Efficiency Error : 9.0027396E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	204.0270	28-FEB-2010	2989.159	3300.331	15511.00	0.3211554	1.3797027E-02	50.97751
NP-237	200.6460	28-FEB-2010	4434.317	4902.854	16177.00	0.3359110	1.7001966E-02	61.88776
CM-244	195.9270	28-FEB-2010	5535.480	5887.277	14557.00	0.3276861	1.6607955E-02	52.62397

Instrument : CHAMBER 080
 Detector : 78197
 Standard ID : AESS-016
 Standard Reference Date : 14-FEB-2008 17:45:04
 Calibration Analysis Date/Time : 11-AUG-2009 12:17:29
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 12-AUG-2009 06:47:19
 Average Efficiency : 0.3321076
 Average Efficiency Error : 9.1349650E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	204.0534	28-FEB-2010	2991.650	3302.015	15752.00	0.3260951	1.4005513E-02	48.00739
NP-237	199.3962	28-FEB-2010	4433.624	4906.537	16268.00	0.3399083	1.7203139E-02	68.49010
CM-244	198.6402	28-FEB-2010	5533.522	5887.645	15012.00	0.3333320	1.6887236E-02	53.20805

Instrument : CHAMBER 081
 Detector : 72533
 Standard ID : AESS-017
 Standard Reference Date : 14-FEB-2008 17:45:04
 Calibration Analysis Date/Time : 11-AUG-2009 07:20:12
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 11-AUG-2009 11:46:32
 Average Efficiency : 6.1864634E-03
 Average Efficiency Error : 2.9860463E-04
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	210.0798	28-FEB-2010	2994.266	3303.451	1475.000	2.9659975E-02	2.4708204E-03	0.0000000E+00
NP-237	208.5846	28-FEB-2010	4435.242	4901.625	202.0000	4.0063704E-03	3.4766502E-04	575.4393
CM-244	205.5828	28-FEB-2010	5531.807	5884.164	427.0000	9.0843663E-03	3.3504453E-04	562.1900

Instrument : CHAMBER 082
 Detector : 64263
 Standard ID : AESS-018
 Standard Reference Date : 14-FEB-2008 17:45:04
 Calibration Analysis Date/Time : 11-AUG-2009 07:20:12
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 11-AUG-2009 11:47:05
 Average Efficiency : 0.3226976
 Average Efficiency Error : 8.8783512E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	202.1856	28-FEB-2010	2987.542	3297.569	15428.00	0.3223361	1.3849068E-02	64.65321
NP-237	208.8990	28-FEB-2010	4435.421	4904.506	15892.00	0.3169125	1.6043896E-02	93.68992
CM-244	198.1458	28-FEB-2010	5534.230	5884.907	14803.00	0.3294876	1.6695555E-02	84.86885

Instrument : CHAMBER 083
 Detector : 64278
 Standard ID : AESS-019
 Standard Reference Date : 19-FEB-2008 11:05:22
 Calibration Analysis Date/Time : 11-AUG-2009 07:20:14
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 11-AUG-2009 11:47:29
 Average Efficiency : 0.3395500
 Average Efficiency Error : 9.3379803E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	204.6468	28-FEB-2010	2991.854	3298.707	15947.00	0.3291289	1.4132823E-02	53.16394
NP-237	202.9140	28-FEB-2010	4433.271	4906.151	16931.00	0.3476149	1.7584924E-02	67.04104
CM-244	199.3140	28-FEB-2010	5531.993	5884.932	15718.00	0.3476342	1.7601561E-02	59.50858

Instrument : CHAMBER 084
 Detector : 78265
 Standard ID : AESS-020
 Standard Reference Date : 14-FEB-2008 21:55:55
 Calibration Analysis Date/Time : 11-AUG-2009 07:20:14
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 11-AUG-2009 11:47:52
 Average Efficiency : 0.3397457
 Average Efficiency Error : 9.3453201E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	205.5870	28-FEB-2010	2988.678	3299.931	15922.00	0.3271575	1.4048551E-02	47.08979
NP-237	203.4984	28-FEB-2010	4434.465	4903.170	17250.00	0.3531433	1.7860783E-02	67.92932
CM-244	197.1096	28-FEB-2010	5531.407	5886.178	15482.00	0.3464514	1.7544933E-02	50.18247

Instrument : CHAMBER 085
 Detector : 78776
 Standard ID : AESS-021
 Standard Reference Date : 19-FEB-2008 15:31:52
 Calibration Analysis Date/Time : 11-AUG-2009 07:20:14
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 11-AUG-2009 11:48:19
 Average Efficiency : 0.3272626
 Average Efficiency Error : 8.9994660E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	208.3608	28-FEB-2010	2990.698	3300.313	15918.00	0.3226679	1.3855824E-02	49.75027
NP-237	210.1548	28-FEB-2010	4435.121	4902.282	16630.00	0.3296844	1.6681336E-02	59.70044
CM-244	200.7390	28-FEB-2010	5534.187	5882.859	15098.00	0.3315589	1.6796166E-02	51.87433

Instrument : CHAMBER 086
 Detector : 78198
 Standard ID : AESS-022
 Standard Reference Date : 14-FEB-2008 21:55:55
 Calibration Analysis Date/Time : 11-AUG-2009 07:20:14
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 11-AUG-2009 11:48:41
 Average Efficiency : 0.3012526
 Average Efficiency Error : 8.2951793E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	209.6724	28-FEB-2010	2990.009	3300.939	14622.00	0.2945913	1.2669257E-02	46.73733
NP-237	206.8830	28-FEB-2010	4436.927	4902.983	15242.00	0.3069340	1.5546833E-02	58.46733
CM-244	203.0208	28-FEB-2010	5531.983	5883.724	14065.00	0.3055728	1.5494397E-02	51.66624

Instrument : CHAMBER 087
 Detector : 78199
 Standard ID : AESS-023
 Standard Reference Date : 14-FEB-2008 21:55:55
 Calibration Analysis Date/Time : 11-AUG-2009 07:20:14
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 11-AUG-2009 11:49:08
 Average Efficiency : 0.3135695
 Average Efficiency Error : 8.6297104E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	207.4764	28-FEB-2010	2988.599	3301.987	15111.00	0.3076608	1.3223418E-02	48.25697
NP-237	207.4998	28-FEB-2010	4434.300	4902.242	15867.00	0.3185670	1.6127942E-02	61.93990
CM-244	199.8804	28-FEB-2010	5532.304	5887.140	14381.00	0.3173418	1.6086275E-02	50.20942

Instrument : CHAMBER 088
 Detector : 33452
 Standard ID : AESS-024
 Standard Reference Date : 14-FEB-2008 21:55:55
 Calibration Analysis Date/Time : 11-AUG-2009 07:20:14
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 11-AUG-2009 11:50:14
 Average Efficiency : 0.3028336
 Average Efficiency Error : 8.3410190E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	203.5218	28-FEB-2010	2989.881	3297.896	14259.00	0.2959496	1.2733680E-02	60.40763
NP-237	205.6662	28-FEB-2010	4436.727	4902.043	15208.00	0.3080562	1.5604130E-02	68.20498
CM-244	198.3060	28-FEB-2010	5532.799	5884.609	13848.00	0.3079579	1.5618804E-02	57.90837

Instrument : CHAMBER 089
 Detector : 78262
 Standard ID : AESS-025
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 11-AUG-2009 07:20:15
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 11-AUG-2009 11:50:54
 Average Efficiency : 0.2999636
 Average Efficiency Error : 8.2814181E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	195.5670	28-FEB-2010	2989.340	3299.886	14192.00	0.3065364	1.3190371E-02	47.47885
NP-237	167.9916	28-FEB-2010	4433.954	4903.393	12026.00	0.2982433	1.5158199E-02	61.37537
CM-244	157.2432	28-FEB-2010	5533.423	5884.190	10453.00	0.2932044	1.4938097E-02	52.58473

Instrument : CHAMBER 090
 Detector : 78263
 Standard ID : AESS-026
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 11-AUG-2009 07:20:15
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 11-AUG-2009 11:51:07
 Average Efficiency : 0.3280271
 Average Efficiency Error : 9.6107582E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	199.5072	28-FEB-2010	2992.174	3298.193	15340.00	0.3247949	1.6451096E-02	48.79327
NP-237	168.0294	28-FEB-2010	4432.899	4902.301	13513.00	0.3350319	1.6997805E-02	59.73701
CM-244	160.5822	28-FEB-2010	5531.267	5884.186	11821.00	0.3246754	1.6506171E-02	54.24763

Instrument : CHAMBER 091
 Detector : 78259
 Standard ID : AESS-027
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 11-AUG-2009 07:20:15
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 11-AUG-2009 11:51:19
 Average Efficiency : 0.3422945
 Average Efficiency Error : 1.0031743E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	193.4238	28-FEB-2010	2988.796	3297.819	15212.00	0.3322093	1.6828449E-02	48.17033
NP-237	161.6154	28-FEB-2010	4433.118	4901.645	13301.00	0.3428935	1.7400602E-02	71.25236
CM-244	148.1754	28-FEB-2010	5531.054	5887.180	11864.00	0.3531335	1.7951898E-02	54.03432

Instrument : CHAMBER 092
 Detector : 79457
 Standard ID : AESS-028
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 11-AUG-2009 07:20:15
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 11-AUG-2009 11:52:08
 Average Efficiency : 0.3126248
 Average Efficiency Error : 9.1664707E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	199.6542	28-FEB-2010	2988.378	3299.875	14752.00	0.3115867	1.5790872E-02	44.92863
NP-237	168.1992	28-FEB-2010	4435.762	4905.401	12691.00	0.3138909	1.5940819E-02	59.90319
CM-244	156.7614	28-FEB-2010	5534.466	5887.335	11106.00	0.3124176	1.5899830E-02	46.96757

Instrument : CHAMBER 093
 Detector : 33206
 Standard ID : AESS-029
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 11-AUG-2009 07:20:15
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 11-AUG-2009 11:52:22
 Average Efficiency : 0.3223998
 Average Efficiency Error : 9.4486484E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	201.5742	28-FEB-2010	2988.021	3298.707	15183.00	0.3181591	1.6117128E-02	52.68830
NP-237	169.7700	28-FEB-2010	4432.645	4901.916	13165.00	0.3230736	1.6397305E-02	66.05635
CM-244	154.8234	28-FEB-2010	5530.870	5883.862	11451.00	0.3262046	1.6592693E-02	55.78003

Instrument : CHAMBER 094
 Detector : 78267
 Standard ID : AESS-030
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 11-AUG-2009 07:20:15
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 11-AUG-2009 11:52:36
 Average Efficiency : 0.3070784
 Average Efficiency Error : 9.0072202E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	198.9792	28-FEB-2010	2987.496	3299.970	14244.00	0.3023582	1.5329675E-02	44.82082
NP-237	166.3758	28-FEB-2010	4432.930	4902.883	12450.00	0.3117883	1.5837880E-02	57.18416
CM-244	157.1856	28-FEB-2010	5531.875	5884.464	10956.00	0.3073991	1.5648084E-02	55.69304

Instrument : CHAMBER 095
 Detector : 64279
 Standard ID : AESS-031
 Standard Reference Date : 18-FEB-2008 11:28:15
 Calibration Analysis Date/Time : 11-AUG-2009 07:20:16
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 11-AUG-2009 11:53:20
 Average Efficiency : 0.3112848
 Average Efficiency Error : 8.5905641E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	193.6650	28-FEB-2010	2991.646	3298.356	14103.00	0.3075817	1.3236930E-02	52.02211
NP-237	162.9186	28-FEB-2010	4435.397	4905.664	12249.00	0.3132029	1.5913907E-02	59.25825
CM-244	153.1968	28-FEB-2010	5530.369	5883.804	10942.00	0.3147666	1.6023749E-02	56.52655

Instrument : CHAMBER 096
 Detector : 67605
 Standard ID : AESS-032
 Standard Reference Date : 18-FEB-2008 11:28:15
 Calibration Analysis Date/Time : 11-AUG-2009 07:20:16
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 11-AUG-2009 11:53:35
 Average Efficiency : 0.3007939
 Average Efficiency Error : 8.3044088E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	195.2364	28-FEB-2010	2989.386	3301.860	13969.00	0.3022173	1.3008440E-02	46.72513
NP-237	165.9822	28-FEB-2010	4437.256	4904.015	11834.00	0.2969258	1.5095386E-02	61.08714
CM-244	153.7938	28-FEB-2010	5531.292	5886.331	10564.00	0.3028315	1.5425657E-02	47.63036

Instrument : CHAMBER 097
 Detector : 67599
 Standard ID : AESS-033
 Standard Reference Date : 18-FEB-2008 11:28:15
 Calibration Analysis Date/Time : 11-AUG-2009 07:20:16
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 11-AUG-2009 11:54:04
 Average Efficiency : 0.3450123
 Average Efficiency Error : 9.5089795E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	192.4158	28-FEB-2010	2991.155	3299.592	15339.00	0.3367012	1.4467746E-02	59.45457
NP-237	161.7816	28-FEB-2010	4437.204	4904.260	13605.00	0.3503401	1.7772736E-02	79.89651
CM-244	147.2670	28-FEB-2010	5531.403	5886.106	11772.00	0.3523416	1.7914115E-02	60.43928

Instrument : CHAMBER 098
 Detector : 68644
 Standard ID : AESS-034
 Standard Reference Date : 18-FEB-2008 11:28:15
 Calibration Analysis Date/Time : 11-AUG-2009 07:20:16
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 11-AUG-2009 11:54:57
 Average Efficiency : 0.3358550
 Average Efficiency Error : 9.2535829E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	200.5488	28-FEB-2010	2992.247	3301.860	15657.00	0.3297495	1.4163947E-02	50.47488
NP-237	167.2962	28-FEB-2010	4432.619	4906.019	13588.00	0.3383684	1.7165720E-02	63.83917
CM-244	154.4388	28-FEB-2010	5534.382	5884.237	11997.00	0.3424924	1.7407812E-02	51.17926

Instrument : CHAMBER 099
 Detector : 70317
 Standard ID : AESS-035
 Standard Reference Date : 18-FEB-2008 11:28:15
 Calibration Analysis Date/Time : 11-AUG-2009 07:20:16
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 11-AUG-2009 11:55:11
 Average Efficiency : 0.3432277
 Average Efficiency Error : 9.4517590E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	198.6666	28-FEB-2010	2987.820	3298.212	15976.00	0.3396714	1.4585057E-02	54.44847
NP-237	168.2934	28-FEB-2010	4437.036	4906.585	14008.00	0.3467679	1.7584279E-02	71.12630
CM-244	158.8128	28-FEB-2010	5530.871	5884.331	12421.00	0.3448446	1.7517686E-02	52.96134

Instrument : CHAMBER 100
 Detector : 79456
 Standard ID : AESS-046
 Standard Reference Date : 19-FEB-2008 19:35:48
 Calibration Analysis Date/Time : 11-AUG-2009 07:20:16
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 11-AUG-2009 11:55:23
 Average Efficiency : 0.3455574
 Average Efficiency Error : 9.5195137E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	194.7474	28-FEB-2010	2989.623	3299.666	15783.00	0.3422834	1.4700302E-02	52.09954
NP-237	164.6658	28-FEB-2010	4436.895	4905.650	13580.00	0.3435225	1.7427422E-02	69.24625
CM-244	151.3824	28-FEB-2010	5534.086	5886.872	12110.00	0.3525722	1.7917577E-02	56.51697

Instrument : CHAMBER 101
 Detector : 64253
 Standard ID : AESS-037
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 11-AUG-2009 07:20:17
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 11-AUG-2009 11:55:41
 Average Efficiency : 0.3333714
 Average Efficiency Error : 9.1898674E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	197.7372	28-FEB-2010	2990.814	3297.893	15101.00	0.3225393	1.3863103E-02	69.71876
NP-237	167.1294	28-FEB-2010	4435.403	4905.470	13614.00	0.3393782	1.7216442E-02	75.26087
CM-244	154.7664	28-FEB-2010	5534.897	5882.499	12090.00	0.3444314	1.7504154E-02	64.32682

Instrument : CHAMBER 102
 Detector : 72525
 Standard ID : AESS-038
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 11-AUG-2009 07:20:17
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 11-AUG-2009 11:55:55
 Average Efficiency : 0.3351222
 Average Efficiency Error : 9.2311725E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	200.1408	28-FEB-2010	2989.911	3298.890	15784.00	0.3331057	1.4306106E-02	52.96164
NP-237	170.0886	28-FEB-2010	4436.604	4903.163	13774.00	0.3373874	1.7112618E-02	67.26456
CM-244	157.7460	28-FEB-2010	5533.661	5884.537	12012.00	0.3357387	1.7064173E-02	56.82374

Instrument : CHAMBER 103
 Detector : 79461
 Standard ID : AESS-039
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 11-AUG-2009 07:20:17
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 11-AUG-2009 11:56:06
 Average Efficiency : 0.3326890
 Average Efficiency Error : 9.1751814E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	192.2418	28-FEB-2010	2989.467	3301.138	14760.00	0.3242984	1.3944432E-02	47.60223
NP-237	159.1506	28-FEB-2010	4432.983	4903.264	13171.00	0.3447756	1.7498676E-02	57.68694
CM-244	151.7142	28-FEB-2010	5533.387	5886.945	11484.00	0.3337491	1.6975598E-02	51.22444

Instrument : CHAMBER 104
 Detector : 72524
 Standard ID : AESS-040
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 11-AUG-2009 07:20:17
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 11-AUG-2009 11:56:56
 Average Efficiency : 0.3150799
 Average Efficiency Error : 8.6921128E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	194.4828	28-FEB-2010	2991.174	3300.565	14723.00	0.3197476	1.3749403E-02	50.59072
NP-237	166.8174	28-FEB-2010	4436.202	4904.648	12311.00	0.3074494	1.5620295E-02	55.80039
CM-244	155.0100	28-FEB-2010	5532.970	5885.836	11138.00	0.3167908	1.6121507E-02	49.72461

Instrument : CHAMBER 105
 Detector : 78777
 Standard ID : AESS-041
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 11-AUG-2009 07:20:17
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 11-AUG-2009 11:57:20
 Average Efficiency : 0.3276281
 Average Efficiency Error : 9.0270750E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	203.9034	28-FEB-2010	2990.222	3299.531	15562.00	0.3223552	1.3847793E-02	46.50069
NP-237	171.2268	28-FEB-2010	4434.728	4902.932	13744.00	0.3344322	1.6963221E-02	65.77631
CM-244	159.5796	28-FEB-2010	5530.878	5883.508	11897.00	0.3287036	1.6709210E-02	49.01804

Instrument : CHAMBER 106
 Detector : 64274
 Standard ID : AESS-042
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 11-AUG-2009 07:20:17
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 11-AUG-2009 11:57:33
 Average Efficiency : 0.3250493
 Average Efficiency Error : 8.9671388E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	188.7090	28-FEB-2010	2987.640	3299.757	14336.00	0.3208575	1.3803991E-02	53.47353
NP-237	159.6558	28-FEB-2010	4434.577	4901.415	12565.00	0.3278506	1.6651530E-02	72.39591
CM-244	150.5208	28-FEB-2010	5534.428	5884.452	11211.00	0.3283702	1.6708910E-02	56.10339

Instrument : CHAMBER 107
 Detector : 67578
 Standard ID : AESS-043
 Standard Reference Date : 19-FEB-2008 00:32:27
 Calibration Analysis Date/Time : 11-AUG-2009 07:20:19
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 11-AUG-2009 11:58:23
 Average Efficiency : 0.3085136
 Average Efficiency Error : 8.5112611E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	197.7708	28-FEB-2010	2988.547	3298.638	14405.00	0.3076421	1.3234209E-02	50.64014
NP-237	168.7422	28-FEB-2010	4435.772	4904.146	12514.00	0.3089727	1.5693650E-02	62.76998
CM-244	156.3252	28-FEB-2010	5532.554	5882.324	10968.00	0.3092847	1.5743818E-02	52.78785

Instrument : CHAMBER 108
 Detector : 78778
 Standard ID : AESS-044
 Standard Reference Date : 19-FEB-2008 00:32:27
 Calibration Analysis Date/Time : 11-AUG-2009 07:20:19
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 11-AUG-2009 12:00:02
 Average Efficiency : 0.3507076
 Average Efficiency Error : 9.6569844E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	194.4510	28-FEB-2010	2988.136	3297.898	16033.00	0.3482739	1.4953526E-02	49.59322
NP-237	166.6248	28-FEB-2010	4433.563	4901.441	14165.00	0.3542025	1.7958457E-02	66.29896
CM-244	155.8290	28-FEB-2010	5533.812	5885.772	12398.00	0.3507225	1.7816888E-02	52.33121

Instrument : CHAMBER 109
 Detector : 79463
 Standard ID : AESS-045
 Standard Reference Date : 19-FEB-2008 00:32:27
 Calibration Analysis Date/Time : 11-AUG-2009 07:20:19
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 11-AUG-2009 12:00:23
 Average Efficiency : 0.3572300
 Average Efficiency Error : 9.8411189E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	186.9936	28-FEB-2010	2990.332	3301.320	15964.00	0.3605992	1.5483866E-02	43.37672
NP-237	160.8066	28-FEB-2010	4437.566	4903.059	13542.00	0.3508754	1.7801007E-02	56.95218
CM-244	145.8384	28-FEB-2010	5534.376	5883.521	11884.00	0.3592313	1.8261438E-02	45.65917

Instrument : CHAMBER 110
 Detector : 67602
 Standard ID : AESS-046
 Standard Reference Date : 8-JAN-2007 09:29:00
 Calibration Analysis Date/Time : 11-AUG-2009 07:20:19
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 11-AUG-2009 12:01:03
 Average Efficiency : 0.3231843
 Average Efficiency Error : 8.9130215E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	197.6531	28-FEB-2010	2987.980	3298.573	14814.00	0.3198501	1.3754530E-02	53.58074
NP-237	164.3834	28-FEB-2010	4433.010	4901.606	12984.00	0.3290606	1.6704626E-02	68.74621
CM-244	159.4253	28-FEB-2010	5534.957	5883.028	11170.00	0.3222606	1.6399227E-02	53.66474

Instrument : CHAMBER 111
 Detector : 79462
 Standard ID : AESS-047
 Standard Reference Date : 19-FEB-2008 00:32:27
 Calibration Analysis Date/Time : 11-AUG-2009 07:20:19
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 11-AUG-2009 12:01:21
 Average Efficiency : 0.3397023
 Average Efficiency Error : 9.3582701E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	197.4804	28-FEB-2010	2988.711	3298.714	15668.00	0.3351243	1.4394601E-02	47.62338
NP-237	168.3948	28-FEB-2010	4436.440	4905.458	13711.00	0.3392103	1.7206213E-02	64.03130
CM-244	154.6032	28-FEB-2010	5535.080	5885.693	12172.00	0.3470925	1.7637538E-02	47.05465

Instrument : CHAMBER 112
 Detector : 78261
 Standard ID : AESS-048
 Standard Reference Date : 19-FEB-2008 00:32:27
 Calibration Analysis Date/Time : 11-AUG-2009 07:20:19
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 11-AUG-2009 12:02:06
 Average Efficiency : 0.3161603
 Average Efficiency Error : 8.7240264E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	191.8350	28-FEB-2010	2988.059	3299.440	14279.00	0.3143869	1.3526597E-02	45.81523
NP-237	161.5530	28-FEB-2010	4434.653	4903.902	12390.00	0.3195488	1.6233314E-02	58.56979
CM-244	151.1856	28-FEB-2010	5532.350	5884.826	10815.00	0.3153441	1.6056247E-02	49.68813

Instrument : CHAMBER 113
 Detector : 45-111B4
 Standard ID : AESS-001
 Standard Reference Date : 20-FEB-2008 09:54:53
 Calibration Analysis Date/Time : 17-AUG-2009 09:40:49
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 14:57:05
 Average Efficiency : 0.2505672
 Average Efficiency Error : 6.9084223E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	208.6698	28-FEB-2010	2990.867	3300.361	15169.00	0.2456670	1.0558164E-02	69.86203
NP-237	171.0024	28-FEB-2010	4434.565	4901.409	13130.00	0.2559362	1.2990281E-02	75.93420
CM-244	158.1060	28-FEB-2010	5532.822	5886.571	11319.00	0.2525721	1.2849954E-02	69.15296

Instrument : CHAMBER 114
 Detector : 78258
 Standard ID : AESS-007
 Standard Reference Date : 14-FEB-2008 13:39:25
 Calibration Analysis Date/Time : 17-AUG-2009 09:40:56
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 14:57:42
 Average Efficiency : 0.2566939
 Average Efficiency Error : 7.0618941E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	206.7342	28-FEB-2010	2992.066	3300.343	15529.00	0.2538896	1.0907058E-02	46.46336
NP-237	205.0260	28-FEB-2010	4433.866	4902.961	15975.00	0.2597136	1.3147265E-02	59.75802
CM-244	199.6806	28-FEB-2010	5535.155	5886.142	14576.00	0.2577351	1.3062422E-02	48.49145

Instrument : CHAMBER 115
 Detector : 45-132FF4
 Standard ID : AESS-002
 Standard Reference Date : 19-FEB-2008 11:05:22
 Calibration Analysis Date/Time : 17-AUG-2009 09:41:02
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 14:57:55
 Average Efficiency : 0.2653268
 Average Efficiency Error : 7.2980789E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	200.1144	28-FEB-2010	2989.683	3299.666	15797.00	0.2667769	1.1457291E-02	62.01321
NP-237	200.4990	28-FEB-2010	4433.623	4904.729	15897.00	0.2642607	1.3378277E-02	65.74837
CM-244	196.5558	28-FEB-2010	5534.066	5886.268	14729.00	0.2644131	1.3399067E-02	62.30648

Instrument : CHAMBER 116
 Detector : 45-132FF2
 Standard ID : AESS-008
 Standard Reference Date : 14-FEB-2008 13:39:25
 Calibration Analysis Date/Time : 17-AUG-2009 09:41:08
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 14:58:06
 Average Efficiency : 0.2617015
 Average Efficiency Error : 7.1968301E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	206.0418	28-FEB-2010	2991.930	3301.615	15931.00	0.2613424	1.1222276E-02	57.22266
NP-237	209.2716	28-FEB-2010	4433.958	4904.160	16458.00	0.2621330	1.3264989E-02	65.63932
CM-244	199.6488	28-FEB-2010	5532.087	5883.400	14804.00	0.2617715	1.3264321E-02	58.02108

Instrument : CHAMBER 117
 Detector : 33450
 Standard ID : AESS-003
 Standard Reference Date : 15-FEB-2008 13:12:27
 Calibration Analysis Date/Time : 17-AUG-2009 09:41:13
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 14:58:17
 Average Efficiency : 0.2525579
 Average Efficiency Error : 6.9512939E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	202.9740	28-FEB-2010	2989.306	3298.199	15015.00	0.2500224	1.0747343E-02	65.18716
NP-237	203.2080	28-FEB-2010	4433.520	4903.152	15609.00	0.2560285	1.2964435E-02	69.72454
CM-244	197.2236	28-FEB-2010	5530.582	5887.083	14123.00	0.2527719	1.2816428E-02	63.59301

Instrument : CHAMBER 118
 Detector : 75544
 Standard ID : AESS-009
 Standard Reference Date : 19-FEB-2008 11:05:22
 Calibration Analysis Date/Time : 17-AUG-2009 09:41:17
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 14:58:27
 Average Efficiency : 0.2576301
 Average Efficiency Error : 7.0881532E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	203.3736	28-FEB-2010	2988.856	3302.528	15454.00	0.2568017	1.1033086E-02	48.57111
NP-237	204.0192	28-FEB-2010	4432.711	4902.773	15795.00	0.2580543	1.3065088E-02	53.80557
CM-244	197.2128	28-FEB-2010	5531.177	5883.080	14443.00	0.2583711	1.3096387E-02	48.23898

Instrument : CHAMBER 119
 Detector : 74429
 Standard ID : AESS-004
 Standard Reference Date : 14-FEB-2008 09:35:18
 Calibration Analysis Date/Time : 18-AUG-2009 08:34:33
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 2-FEB-2009 15:15:38
 Average Efficiency : 0.2936279
 Average Efficiency Error : 1.2630888E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	206.1222	28-FEB-2010	2992.004	3299.253	1406.000	0.2936279	1.2630888E-02	0.0000000E+00
NP-237	204.2586	28-FEB-2010	4432.548	4906.013	0.0000000E+00	0.0000000E+00	0.0000000E+00	0.0000000E+00
CM-244	198.8100	28-FEB-2010	5530.584	5883.165	0.0000000E+00	0.0000000E+00	0.0000000E+00	0.0000000E+00

Instrument : CHAMBER 120
 Detector : 74430
 Standard ID : AESS-010
 Standard Reference Date : 14-FEB-2008 13:39:25
 Calibration Analysis Date/Time : 18-AUG-2009 08:35:01
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 18-AUG-2009 13:38:55
 Average Efficiency : 0.2589359
 Average Efficiency Error : 7.1242545E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	202.0008	28-FEB-2010	2988.209	3300.389	15391.00	0.2575360	1.1065440E-02	43.23295
NP-237	202.9926	28-FEB-2010	4436.370	4904.997	15823.00	0.2598289	1.3154631E-02	56.74783
CM-244	196.2330	28-FEB-2010	5531.794	5882.950	14449.00	0.2600255	1.3180019E-02	54.60671

Instrument : CHAMBER 121
 Detector : 75545
 Standard ID : AESS-005
 Standard Reference Date : 14-FEB-2008 09:35:18
 Calibration Analysis Date/Time : 17-AUG-2009 09:41:25
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 14:58:37
 Average Efficiency : 0.2477992
 Average Efficiency Error : 6.8184505E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	210.7452	28-FEB-2010	2991.483	3299.036	15409.00	0.2471195	1.0617682E-02	50.47642
NP-237	209.5938	28-FEB-2010	4436.007	4904.843	15591.00	0.2479274	1.2554423E-02	56.89366
CM-244	202.7478	28-FEB-2010	5531.746	5882.876	14277.00	0.2486278	1.2604386E-02	50.04906

Instrument : CHAMBER 122
 Detector : 75546
 Standard ID : AESS-011
 Standard Reference Date : 14-FEB-2008 13:39:25
 Calibration Analysis Date/Time : 17-AUG-2009 09:41:30
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 14:58:49
 Average Efficiency : 0.2511526
 Average Efficiency Error : 6.9076614E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	212.8284	28-FEB-2010	2989.140	3302.149	15817.00	0.2511983	1.0788003E-02	55.71524
NP-237	214.4868	28-FEB-2010	4434.728	4903.501	16008.00	0.2487148	1.2590243E-02	57.96050
CM-244	208.4184	28-FEB-2010	5535.323	5886.133	14974.00	0.2536270	1.2849721E-02	53.77795

Instrument : CHAMBER 123
 Detector : 45-142V3
 Standard ID : AESS-006
 Standard Reference Date : 14-FEB-2008 09:35:18
 Calibration Analysis Date/Time : 17-AUG-2009 09:41:34
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 14:58:58
 Average Efficiency : 0.2594329
 Average Efficiency Error : 7.1380134E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	203.6952	28-FEB-2010	2989.820	3298.601	15515.00	0.2574363	1.1059616E-02	71.81727
NP-237	204.7038	28-FEB-2010	4437.478	4905.941	15738.00	0.2562436	1.2974020E-02	72.62444
CM-244	195.0060	28-FEB-2010	5531.339	5886.453	14683.00	0.2658339	1.3471606E-02	67.85081

Instrument : CHAMBER 124
 Detector : 45-142V2
 Standard ID : AESS-012
 Standard Reference Date : 14-FEB-2008 13:39:25
 Calibration Analysis Date/Time : 17-AUG-2009 09:41:39
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 14:59:08
 Average Efficiency : 0.2622745
 Average Efficiency Error : 7.2123613E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	206.2200	28-FEB-2010	2989.806	3300.376	16169.00	0.2650077	1.1376831E-02	65.10977
NP-237	205.8930	28-FEB-2010	4436.352	4902.974	16128.00	0.2610630	1.3214089E-02	71.08579
CM-244	203.1954	28-FEB-2010	5533.246	5885.946	14953.00	0.2598179	1.3163561E-02	70.97868

Instrument : CHAMBER 125
 Detector : 75547
 Standard ID : AESS-013
 Standard Reference Date : 14-FEB-2008 17:45:04
 Calibration Analysis Date/Time : 17-AUG-2009 09:41:44
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 14:59:18
 Average Efficiency : 0.2577128
 Average Efficiency Error : 7.0888288E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	203.6544	28-FEB-2010	2987.619	3299.275	15570.00	0.2584035	1.1100472E-02	45.32409
NP-237	210.2526	28-FEB-2010	4433.269	4906.266	16194.00	0.2567104	1.2993116E-02	55.37461
CM-244	201.9108	28-FEB-2010	5531.959	5882.482	14741.00	0.2577693	1.3062201E-02	51.62124

Instrument : CHAMBER 126
 Detector : 75548
 Standard ID : AESS-019
 Standard Reference Date : 19-FEB-2008 11:05:22
 Calibration Analysis Date/Time : 17-AUG-2009 09:41:49
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 14:59:32
 Average Efficiency : 0.2528252
 Average Efficiency Error : 6.9586127E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	204.6468	28-FEB-2010	2988.372	3298.946	15025.00	0.2481292	1.0665805E-02	51.29427
NP-237	202.9140	28-FEB-2010	4437.297	4901.551	15728.00	0.2582902	1.3077814E-02	59.55880
CM-244	199.3140	28-FEB-2010	5532.806	5882.587	14367.00	0.2543760	1.2894685E-02	53.51087

Instrument : CHAMBER 127
 Detector : 78770
 Standard ID : AESS-014
 Standard Reference Date : 19-FEB-2008 11:05:22
 Calibration Analysis Date/Time : 17-AUG-2009 09:41:53
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 14:59:46
 Average Efficiency : 0.2467646
 Average Efficiency Error : 6.7887292E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	214.7088	28-FEB-2010	2989.622	3297.830	15608.00	0.2456636	1.0552737E-02	45.17228
NP-237	211.7160	28-FEB-2010	4435.622	4904.092	15815.00	0.2489925	1.2606090E-02	55.68476
CM-244	207.3882	28-FEB-2010	5535.184	5885.434	14463.00	0.2461215	1.2475103E-02	51.99955

Instrument : CHAMBER 128
 Detector : 75549
 Standard ID : AESS-020
 Standard Reference Date : 14-FEB-2008 21:55:55
 Calibration Analysis Date/Time : 17-AUG-2009 09:41:59
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:00:39
 Average Efficiency : 0.2557978
 Average Efficiency Error : 7.0393290E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	205.5870	28-FEB-2010	2989.482	3299.177	15312.00	0.2510756	1.0789989E-02	50.23243
NP-237	203.4984	28-FEB-2010	4436.028	4905.664	15805.00	0.2584755	1.3086889E-02	59.26414
CM-244	197.1096	28-FEB-2010	5532.549	5883.141	14531.00	0.2601309	1.3184624E-02	52.60558

Instrument : CHAMBER 129
 Detector : 76227
 Standard ID : AESS-015
 Standard Reference Date : 14-FEB-2008 17:45:04
 Calibration Analysis Date/Time : 17-AUG-2009 09:42:03
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:00:50
 Average Efficiency : 0.2636167
 Average Efficiency Error : 7.2512124E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	204.0270	28-FEB-2010	2992.146	3298.635	15855.00	0.2626581	1.1279699E-02	51.01081
NP-237	200.6460	28-FEB-2010	4432.563	4905.761	16101.00	0.2674463	1.3537456E-02	55.64974
CM-244	195.9270	28-FEB-2010	5531.918	5882.796	14498.00	0.2612732	1.3242676E-02	51.23387

Instrument : CHAMBER 130
 Detector : 76228
 Standard ID : AESS-021
 Standard Reference Date : 19-FEB-2008 15:31:52
 Calibration Analysis Date/Time : 17-AUG-2009 09:42:09
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:01:00
 Average Efficiency : 0.2500172
 Average Efficiency Error : 6.8798582E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	208.3608	28-FEB-2010	2989.230	3297.665	15254.00	0.2474099	1.0632024E-02	49.47410
NP-237	210.1548	28-FEB-2010	4434.582	4901.937	15716.00	0.2492386	1.2619579E-02	59.00264
CM-244	200.7390	28-FEB-2010	5530.859	5884.881	14487.00	0.2546751	1.2908396E-02	49.18253

Instrument : CHAMBER 131
 Detector : 33448
 Standard ID : AESS-016
 Standard Reference Date : 14-FEB-2008 17:45:04
 Calibration Analysis Date/Time : 17-AUG-2009 09:42:13
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:01:10
 Average Efficiency : 0.2486686
 Average Efficiency Error : 6.8503493E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	204.0534	28-FEB-2010	2988.455	3301.428	14427.00	0.2389750	1.0279993E-02	88.46142
NP-237	199.3962	28-FEB-2010	4434.994	4904.668	15550.00	0.2599315	1.3162703E-02	91.50983
CM-244	198.6402	28-FEB-2010	5532.826	5884.723	14238.00	0.2530668	1.2829903E-02	81.92683

Instrument : CHAMBER 132
 Detector : 67579
 Standard ID : AESS-022
 Standard Reference Date : 14-FEB-2008 21:55:55
 Calibration Analysis Date/Time : 17-AUG-2009 09:42:18
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:01:19
 Average Efficiency : 0.2503150
 Average Efficiency Error : 6.8899435E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	209.6724	28-FEB-2010	2989.906	3301.298	15059.00	0.2427482	1.0434108E-02	48.23922
NP-237	206.8830	28-FEB-2010	4432.560	4903.500	15980.00	0.2574485	1.3032571E-02	59.84295
CM-244	203.0208	28-FEB-2010	5531.586	5882.587	14657.00	0.2549047	1.2918007E-02	51.83584

Instrument : CHAMBER 133
 Detector : 76229
 Standard ID : AESS-017
 Standard Reference Date : 14-FEB-2008 17:45:04
 Calibration Analysis Date/Time : 17-AUG-2009 09:42:22
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:01:29
 Average Efficiency : 0.2444916
 Average Efficiency Error : 6.7288522E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	210.0798	28-FEB-2010	2992.199	3301.674	15088.00	0.2427499	1.0433814E-02	51.73604
NP-237	208.5846	28-FEB-2010	4436.849	4905.652	15341.00	0.2451461	1.2416095E-02	59.86903
CM-244	205.5828	28-FEB-2010	5530.602	5882.872	14343.00	0.2463241	1.2486813E-02	55.80942

Instrument : CHAMBER 134
 Detector : 76230
 Standard ID : AESS-023
 Standard Reference Date : 14-FEB-2008 21:55:55
 Calibration Analysis Date/Time : 17-AUG-2009 09:42:27
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:01:38
 Average Efficiency : 0.2444722
 Average Efficiency Error : 6.7306994E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	207.4764	28-FEB-2010	2989.055	3302.112	14731.00	0.2399838	1.0319396E-02	45.58716
NP-237	207.4998	28-FEB-2010	4432.969	4905.408	15414.00	0.2475136	1.2535379E-02	52.40787
CM-244	199.8804	28-FEB-2010	5534.460	5883.375	14046.00	0.2480791	1.2579419E-02	47.39998

Instrument : CHAMBER 135
 Detector : 64270
 Standard ID : AESS-018
 Standard Reference Date : 14-FEB-2008 17:45:04
 Calibration Analysis Date/Time : 17-AUG-2009 09:42:32
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:01:50
 Average Efficiency : 0.2546879
 Average Efficiency Error : 7.0084208E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	202.1856	28-FEB-2010	2987.813	3300.105	15110.00	0.2525907	1.0856513E-02	49.36219
NP-237	208.8990	28-FEB-2010	4435.123	4902.752	15878.00	0.2533506	1.2826114E-02	62.03614
CM-244	198.1458	28-FEB-2010	5532.979	5882.877	14546.00	0.2591602	1.3135060E-02	51.79539

Instrument : CHAMBER 136
 Detector : 68549
 Standard ID : AESS-024
 Standard Reference Date : 14-FEB-2008 21:55:55
 Calibration Analysis Date/Time : 17-AUG-2009 09:42:37
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:02:00
 Average Efficiency : 0.2475998
 Average Efficiency Error : 6.8165381E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	203.5218	28-FEB-2010	2991.796	3301.682	14741.00	0.2447980	1.0526305E-02	60.65231
NP-237	205.6662	28-FEB-2010	4435.713	4901.780	15573.00	0.2523313	1.2777670E-02	84.66249
CM-244	198.3060	28-FEB-2010	5531.520	5884.028	13875.00	0.2470199	1.2527825E-02	70.83999

Instrument : CHAMBER 137
 Detector : 64288
 Standard ID : AESS-025
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 17-AUG-2009 15:19:29
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 18-AUG-2009 09:58:00
 Average Efficiency : 0.2555233
 Average Efficiency Error : 7.0462842E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	195.5670	28-FEB-2010	2990.035	3302.352	15040.00	0.2599163	1.1172320E-02	62.16771
NP-237	167.9916	28-FEB-2010	4435.990	4901.349	12745.00	0.2528539	1.2839622E-02	74.72440
CM-244	157.2432	28-FEB-2010	5532.344	5883.346	11242.00	0.2523895	1.2842122E-02	61.62554

Instrument : CHAMBER 138
 Detector : 65877
 Standard ID : AESS-031
 Standard Reference Date : 18-FEB-2008 11:28:15
 Calibration Analysis Date/Time : 17-AUG-2009 10:05:25
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:10:23
 Average Efficiency : 0.2550827
 Average Efficiency Error : 7.0365570E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	193.6650	28-FEB-2010	2990.457	3300.623	14458.00	0.2522955	1.0852579E-02	60.07153
NP-237	162.9186	28-FEB-2010	4436.833	4904.301	12578.00	0.2572678	1.3066470E-02	64.63396
CM-244	153.1968	28-FEB-2010	5531.035	5885.034	11155.00	0.2569406	1.3075489E-02	58.61239

Instrument : CHAMBER 139
 Detector : 76231
 Standard ID : AESS-026
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 17-AUG-2009 10:05:40
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:10:36
 Average Efficiency : 0.2493770
 Average Efficiency Error : 7.3113223E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	199.5072	28-FEB-2010	2988.624	3300.322	14789.00	0.2505293	1.2695529E-02	52.23651
NP-237	168.0294	28-FEB-2010	4436.965	4901.673	12535.00	0.2486135	1.2627549E-02	58.33430
CM-244	160.5822	28-FEB-2010	5531.099	5884.173	11327.00	0.2489982	1.2667944E-02	53.91700

Instrument : CHAMBER 140
 Detector : 78771
 Standard ID : AESS-032
 Standard Reference Date : 18-FEB-2008 11:28:15
 Calibration Analysis Date/Time : 17-AUG-2009 10:05:55
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:10:53
 Average Efficiency : 0.2545226
 Average Efficiency Error : 7.0204390E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	195.2364	28-FEB-2010	2992.243	3300.208	14492.00	0.2508534	1.0790074E-02	46.38138
NP-237	165.9822	28-FEB-2010	4435.227	4906.111	12782.00	0.2566222	1.3030458E-02	51.74347
CM-244	153.7938	28-FEB-2010	5531.085	5884.403	11234.00	0.2578183	1.3118429E-02	44.44519

Instrument : CHAMBER 141
 Detector : 76232
 Standard ID : AESS-027
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 17-AUG-2009 10:06:09
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:11:05
 Average Efficiency : 0.2584702
 Average Efficiency Error : 7.5807418E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	193.4238	28-FEB-2010	2989.414	3297.748	14427.00	0.2520987	1.2779256E-02	53.56795
NP-237	161.6154	28-FEB-2010	4437.262	4901.753	12660.00	0.2610831	1.3258832E-02	57.80217
CM-244	148.1754	28-FEB-2010	5534.971	5886.637	11030.00	0.2627913	1.3375781E-02	54.14219

Instrument : CHAMBER 142
 Detector : 64261
 Standard ID : AESS-033
 Standard Reference Date : 18-FEB-2008 11:28:15
 Calibration Analysis Date/Time : 17-AUG-2009 10:06:21
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:11:22
 Average Efficiency : 0.2600435
 Average Efficiency Error : 7.1729934E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	192.4158	28-FEB-2010	2988.269	3301.948	14656.00	0.2574165	1.1070056E-02	54.03382
NP-237	161.7816	28-FEB-2010	4433.864	4905.404	12714.00	0.2618904	1.3299029E-02	57.43495
CM-244	147.2670	28-FEB-2010	5531.110	5884.773	10935.00	0.2619993	1.3337597E-02	54.46835

Instrument : CHAMBER 143
 Detector : 65882
 Standard ID : AESS-028
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 17-AUG-2009 10:06:30
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:11:35
 Average Efficiency : 0.2441945
 Average Efficiency Error : 7.1629179E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	199.6542	28-FEB-2010	2987.868	3300.973	14504.00	0.2454895	1.2443409E-02	48.86588
NP-237	168.1992	28-FEB-2010	4435.203	4905.234	12409.00	0.2458239	1.2487897E-02	54.42411
CM-244	156.7614	28-FEB-2010	5533.941	5886.181	10719.00	0.2413527	1.2290902E-02	48.55591

Instrument : CHAMBER 144
 Detector : 75551
 Standard ID : AESS-034
 Standard Reference Date : 18-FEB-2008 11:28:15
 Calibration Analysis Date/Time : 17-AUG-2009 10:06:42
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:11:48
 Average Efficiency : 0.2468767
 Average Efficiency Error : 6.8111387E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	200.5488	28-FEB-2010	2992.050	3299.833	14487.00	0.2441242	1.0500696E-02	46.56598
NP-237	167.2962	28-FEB-2010	4433.005	4902.603	12463.00	0.2482506	1.2610275E-02	54.14901
CM-244	154.4388	28-FEB-2010	5530.735	5882.656	10920.00	0.2495103	1.2702089E-02	51.83741

Instrument : CHAMBER 145
 Detector : 72526
 Standard ID : AESS-029
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 17-AUG-2009 10:06:50
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:12:06
 Average Efficiency : 0.2516074
 Average Efficiency Error : 7.3767379E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	201.5742	28-FEB-2010	2991.923	3299.882	14896.00	0.2497595	1.2655314E-02	52.44717
NP-237	169.7700	28-FEB-2010	4434.984	4905.949	12721.00	0.2497460	1.2682147E-02	64.14503
CM-244	154.8234	28-FEB-2010	5531.069	5884.490	11206.00	0.2555142	1.3001818E-02	51.97158

Instrument : CHAMBER 146
 Detector : 72527
 Standard ID : AESS-035
 Standard Reference Date : 18-FEB-2008 11:28:15
 Calibration Analysis Date/Time : 17-AUG-2009 10:06:56
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:12:19
 Average Efficiency : 0.2487766
 Average Efficiency Error : 6.8616522E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	198.6666	28-FEB-2010	2989.460	3301.164	14683.00	0.2497765	1.0741138E-02	52.75697
NP-237	168.2934	28-FEB-2010	4435.288	4903.095	12451.00	0.2466013	1.2526580E-02	54.23803
CM-244	158.8128	28-FEB-2010	5534.042	5884.573	11233.00	0.2496148	1.2701104E-02	51.22379

Instrument : CHAMBER 147
 Detector : 75550
 Standard ID : AESS-030
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 17-AUG-2009 10:07:03
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:12:37
 Average Efficiency : 0.2470976
 Average Efficiency Error : 7.2475495E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	198.9792	28-FEB-2010	2990.910	3299.539	14303.00	0.2429080	1.2314880E-02	46.94440
NP-237	166.3758	28-FEB-2010	4433.251	4901.935	12590.00	0.2521924	1.2808450E-02	53.36894
CM-244	157.1856	28-FEB-2010	5533.139	5883.368	10980.00	0.2465573	1.2550585E-02	53.24918

Instrument : CHAMBER 148
 Detector : 74429
 Standard ID : AESS-036
 Standard Reference Date : 18-FEB-2008 11:28:15
 Calibration Analysis Date/Time : 17-AUG-2009 10:07:10
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:12:57
 Average Efficiency : 0.2480969
 Average Efficiency Error : 6.8435837E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	201.3204	28-FEB-2010	2990.725	3298.446	14645.00	0.2458259	1.0571792E-02	53.02917
NP-237	167.4312	28-FEB-2010	4436.496	4905.977	12647.00	0.2517435	1.2784752E-02	56.62496
CM-244	156.4188	28-FEB-2010	5533.919	5885.716	10983.00	0.2477803	1.2612724E-02	51.14078

Instrument : CHAMBER 149
 Detector : 33449
 Standard ID : AESS-037
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 17-AUG-2009 09:46:49
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:02:09
 Average Efficiency : 0.2465136
 Average Efficiency Error : 6.8024271E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	197.7372	28-FEB-2010	2991.734	3299.272	14178.00	0.2423231	1.0427443E-02	68.70028
NP-237	167.1294	28-FEB-2010	4437.371	4901.944	12533.00	0.2499420	1.2695006E-02	68.91545
CM-244	154.7664	28-FEB-2010	5530.548	5882.851	10933.00	0.2492944	1.2690787E-02	65.41205

Instrument : CHAMBER 150
 Detector : 75552
 Standard ID : AESS-043
 Standard Reference Date : 19-FEB-2008 00:32:27
 Calibration Analysis Date/Time : 17-AUG-2009 09:47:06
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:02:19
 Average Efficiency : 0.2486527
 Average Efficiency Error : 6.8590841E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	197.7708	28-FEB-2010	2992.316	3300.643	14670.00	0.2506822	1.0780259E-02	53.31720
NP-237	168.7422	28-FEB-2010	4435.415	4905.497	12565.00	0.2481675	1.2604410E-02	58.05605
CM-244	156.3252	28-FEB-2010	5534.121	5886.240	10915.00	0.2463857	1.2543092E-02	53.10606

Instrument : CHAMBER 151
 Detector : 75556
 Standard ID : AESS-038
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 17-AUG-2009 09:47:22
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:02:29
 Average Efficiency : 0.2450182
 Average Efficiency Error : 6.7593171E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	200.1408	28-FEB-2010	2990.659	3302.040	14473.00	0.2443945	1.0512492E-02	52.21863
NP-237	170.0886	28-FEB-2010	4434.623	4901.634	12448.00	0.2439277	1.2390838E-02	56.98894
CM-244	157.7460	28-FEB-2010	5531.364	5886.469	11043.00	0.2470334	1.2573502E-02	57.42078

Instrument : CHAMBER 152
 Detector : 76222
 Standard ID : AESS-044
 Standard Reference Date : 19-FEB-2008 00:32:27
 Calibration Analysis Date/Time : 17-AUG-2009 09:47:27
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:02:41
 Average Efficiency : 0.2490164
 Average Efficiency Error : 6.8703890E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	194.4510	28-FEB-2010	2991.044	3297.777	14243.00	0.2475301	1.0650607E-02	47.08284
NP-237	166.6248	28-FEB-2010	4437.300	4905.285	12419.00	0.2484124	1.2619114E-02	60.94747
CM-244	155.8290	28-FEB-2010	5531.209	5887.199	11119.00	0.2517907	1.2814093E-02	54.11842

Instrument : CHAMBER 153
 Detector : 76223
 Standard ID : AESS-039
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 17-AUG-2009 09:47:33
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:02:59
 Average Efficiency : 0.2519075
 Average Efficiency Error : 6.9520962E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	192.2418	28-FEB-2010	2989.175	3301.127	14308.00	0.2515197	1.0821341E-02	47.18059
NP-237	159.1506	28-FEB-2010	4437.148	4906.174	12220.00	0.2558792	1.3001786E-02	54.79121
CM-244	151.7142	28-FEB-2010	5533.838	5885.640	10690.00	0.2486704	1.2664073E-02	49.37799

Instrument : CHAMBER 154
 Detector : 76224
 Standard ID : AESS-045
 Standard Reference Date : 19-FEB-2008 00:32:27
 Calibration Analysis Date/Time : 17-AUG-2009 09:47:38
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:03:12
 Average Efficiency : 0.2559401
 Average Efficiency Error : 7.0637148E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	186.9936	28-FEB-2010	2991.160	3298.663	14169.00	0.2560697	1.1019127E-02	49.27927
NP-237	160.8066	28-FEB-2010	4435.792	4904.845	12224.00	0.2533519	1.2873255E-02	55.70718
CM-244	145.8384	28-FEB-2010	5532.170	5883.602	10681.00	0.2584613	1.3162896E-02	52.40295

Instrument : CHAMBER 155
 Detector : 75553
 Standard ID : AESS-040
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 17-AUG-2009 09:47:43
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:03:49
 Average Efficiency : 0.2604031
 Average Efficiency Error : 7.1793078E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	194.4828	28-FEB-2010	2990.137	3299.574	15144.00	0.2631285	1.1309024E-02	51.70325
NP-237	166.8174	28-FEB-2010	4433.383	4905.252	13025.00	0.2602106	1.3208893E-02	58.26657
CM-244	155.0100	28-FEB-2010	5530.995	5884.485	11287.00	0.2569496	1.3073267E-02	54.09868

Instrument : CHAMBER 156
 Detector : 75554
 Standard ID : AESS-046
 Standard Reference Date : 19-FEB-2008 19:35:48
 Calibration Analysis Date/Time : 17-AUG-2009 09:47:48
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:03:58
 Average Efficiency : 0.2478251
 Average Efficiency Error : 6.8396293E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	194.7474	28-FEB-2010	2991.410	3301.423	14146.00	0.2454547	1.0562697E-02	50.29560
NP-237	164.6658	28-FEB-2010	4436.034	4902.390	12227.00	0.2474083	1.2571326E-02	54.83716
CM-244	151.3824	28-FEB-2010	5532.563	5885.336	10800.00	0.2517493	1.2818515E-02	50.76693

Instrument : CHAMBER 157
 Detector : 75555
 Standard ID : AESS-041
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 17-AUG-2009 09:47:53
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:04:07
 Average Efficiency : 0.2459567
 Average Efficiency Error : 6.7838337E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	203.9034	28-FEB-2010	2989.948	3299.042	14635.00	0.2425698	1.0431849E-02	49.95551
NP-237	171.2268	28-FEB-2010	4436.337	4902.073	12880.00	0.2506870	1.2727586E-02	53.18868
CM-244	159.5796	28-FEB-2010	5531.733	5884.378	11136.00	0.2462586	1.2532219E-02	53.03581

Instrument : CHAMBER 158
 Detector : 33451
 Standard ID : AESS-047
 Standard Reference Date : 19-FEB-2008 00:32:27
 Calibration Analysis Date/Time : 17-AUG-2009 09:47:59
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:04:18
 Average Efficiency : 0.2470825
 Average Efficiency Error : 6.8179565E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	197.4804	28-FEB-2010	2990.074	3301.013	14195.00	0.2429217	1.0452971E-02	65.65772
NP-237	168.3948	28-FEB-2010	4435.907	4905.421	12486.00	0.2470921	1.2551059E-02	76.64585
CM-244	154.6032	28-FEB-2010	5535.323	5885.904	11102.00	0.2534059	1.2896620E-02	68.27572

Instrument : CHAMBER 159
 Detector : 76225
 Standard ID : AESS-042
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 17-AUG-2009 09:48:04
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:04:28
 Average Efficiency : 0.2536185
 Average Efficiency Error : 6.9992472E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	188.7090	28-FEB-2010	2992.022	3301.502	14176.00	0.2538644	1.0924136E-02	47.45573
NP-237	159.6558	28-FEB-2010	4435.853	4902.842	12186.00	0.2543722	1.2925758E-02	52.94994
CM-244	150.5208	28-FEB-2010	5534.528	5883.086	10773.00	0.2525320	1.2859062E-02	52.36504

Instrument : CHAMBER 160
 Detector : 76226
 Standard ID : AESS-048
 Standard Reference Date : 19-FEB-2008 00:32:27
 Calibration Analysis Date/Time : 17-AUG-2009 09:48:09
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:04:40
 Average Efficiency : 0.2450936
 Average Efficiency Error : 6.7667966E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	191.8350	28-FEB-2010	2988.982	3298.890	13916.00	0.2451341	1.0552234E-02	50.78497
NP-237	161.5530	28-FEB-2010	4434.439	4901.761	11957.00	0.2465858	1.2534058E-02	58.31113
CM-244	151.1856	28-FEB-2010	5533.753	5882.414	10437.00	0.2435748	1.2410097E-02	52.51821

Instrument : CHAMBER 161
 Detector : 70321
 Standard ID : AESS-001
 Standard Reference Date : 20-FEB-2008 09:54:53
 Calibration Analysis Date/Time : 23-JUL-2009 08:06:57
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 23-JUL-2009 13:58:35
 Average Efficiency : 0.3724494
 Average Efficiency Error : 1.0217360E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	208.6698	28-FEB-2010	2989.000	3299.306	22090.00	0.3575253	1.5279296E-02	62.61223
NP-237	171.0024	28-FEB-2010	4436.547	4904.892	19670.00	0.3833612	1.9362049E-02	79.92251
CM-244	158.1060	28-FEB-2010	5532.420	5884.522	17328.00	0.3856982	1.9506300E-02	61.01914

Instrument : CHAMBER 162
 Detector : 70323
 Standard ID : AESS-007
 Standard Reference Date : 14-FEB-2008 13:39:25
 Calibration Analysis Date/Time : 3-AUG-2009 15:03:36
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 4-AUG-2009 07:05:59
 Average Efficiency : 0.3711236
 Average Efficiency Error : 1.0165478E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	206.7342	28-FEB-2010	2988.824	3300.295	22155.00	0.3620965	1.5474160E-02	57.26881
NP-237	205.0260	28-FEB-2010	4433.927	4901.686	23319.00	0.3791083	1.9117314E-02	71.55396
CM-244	199.6806	28-FEB-2010	5532.705	5883.340	21344.00	0.3768574	1.9018669E-02	56.37528

Instrument : CHAMBER 163
 Detector : 70324
 Standard ID : AESS-002
 Standard Reference Date : 19-FEB-2008 11:05:22
 Calibration Analysis Date/Time : 23-JUL-2009 08:07:06
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 23-JUL-2009 13:58:54
 Average Efficiency : 0.3824499
 Average Efficiency Error : 1.0474509E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	200.1144	28-FEB-2010	2988.922	3300.358	22181.00	0.3743604	1.5997946E-02	60.90985
NP-237	200.4990	28-FEB-2010	4435.910	4905.359	23404.00	0.3890015	1.9615676E-02	79.84089
CM-244	196.5558	28-FEB-2010	5534.127	5886.809	21671.00	0.3880399	1.9580306E-02	54.00466

Instrument : CHAMBER 164
 Detector : 70325
 Standard ID : AESS-008
 Standard Reference Date : 14-FEB-2008 13:39:25
 Calibration Analysis Date/Time : 23-JUL-2009 08:07:11
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 23-JUL-2009 13:59:02
 Average Efficiency : 0.3871453
 Average Efficiency Error : 1.0598736E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	206.0418	28-FEB-2010	2991.018	3297.699	23119.00	0.3790087	1.6188504E-02	60.82843
NP-237	209.2716	28-FEB-2010	4434.306	4904.250	24656.00	0.3926844	1.9792885E-02	74.00230
CM-244	199.6488	28-FEB-2010	5533.729	5886.834	22328.00	0.3938190	1.9866610E-02	56.32586

Instrument : CHAMBER 165
 Detector : 72544
 Standard ID : AESS-003
 Standard Reference Date : 15-FEB-2008 13:12:27
 Calibration Analysis Date/Time : 23-JUL-2009 08:07:15
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 23-JUL-2009 13:59:11
 Average Efficiency : 0.3820039
 Average Efficiency Error : 1.0462373E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	202.9740	28-FEB-2010	2989.844	3302.139	22390.00	0.3726058	1.5921146E-02	65.20252
NP-237	203.2080	28-FEB-2010	4434.670	4904.543	24014.00	0.3938612	1.9856445E-02	91.19821
CM-244	197.2236	28-FEB-2010	5533.515	5886.135	21543.00	0.3846419	1.9409848E-02	65.46077

Instrument : CHAMBER 166
 Detector : 74545
 Standard ID : AESS-009
 Standard Reference Date : 19-FEB-2008 11:05:22
 Calibration Analysis Date/Time : 23-JUL-2009 08:07:19
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 23-JUL-2009 13:59:23
 Average Efficiency : 0.3925092
 Average Efficiency Error : 1.0746423E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	203.3736	28-FEB-2010	2989.919	3301.734	23062.00	0.3829970	1.6359299E-02	52.59587
NP-237	204.0192	28-FEB-2010	4433.352	4903.208	24416.00	0.3988877	2.0107118E-02	75.96468
CM-244	197.2128	28-FEB-2010	5532.473	5885.411	22446.00	0.4005800	2.0206742E-02	58.40631

Instrument : CHAMBER 167
 Detector : 72546
 Standard ID : AESS-004
 Standard Reference Date : 14-FEB-2008 09:35:18
 Calibration Analysis Date/Time : 23-JUL-2009 08:07:23
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 23-JUL-2009 13:59:32
 Average Efficiency : 0.3888160
 Average Efficiency Error : 1.0646137E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	206.1222	28-FEB-2010	2991.456	3297.909	23075.00	0.3781414	1.6151825E-02	58.07474
NP-237	204.2586	28-FEB-2010	4433.461	4902.876	24396.00	0.3980886	2.0066978E-02	77.66827
CM-244	198.8100	28-FEB-2010	5531.568	5884.192	22354.00	0.3959535	1.9974077E-02	59.99561

Instrument : CHAMBER 168
 Detector : 72547
 Standard ID : AESS-010
 Standard Reference Date : 14-FEB-2008 13:39:25
 Calibration Analysis Date/Time : 23-JUL-2009 08:07:28
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 23-JUL-2009 13:59:40
 Average Efficiency : 0.3899174
 Average Efficiency Error : 1.0677175E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	202.0008	28-FEB-2010	2990.191	3302.241	22715.00	0.3798450	1.6227633E-02	58.81176
NP-237	202.9926	28-FEB-2010	4434.272	4904.107	24151.00	0.3965338	1.9990249E-02	77.71660
CM-244	196.2330	28-FEB-2010	5533.178	5885.925	22217.00	0.3986928	2.0113347E-02	60.84048

Instrument : CHAMBER 169
 Detector : 72548
 Standard ID : AESS-005
 Standard Reference Date : 14-FEB-2008 09:35:18
 Calibration Analysis Date/Time : 3-AUG-2009 15:03:40
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 4-AUG-2009 07:06:12
 Average Efficiency : 0.3776897
 Average Efficiency Error : 1.0342728E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	210.7452	28-FEB-2010	2989.637	3301.388	22865.00	0.3665610	1.5658973E-02	55.40712
NP-237	209.5938	28-FEB-2010	4432.422	4901.883	24233.00	0.3852773	1.9422315E-02	82.01970
CM-244	202.7478	28-FEB-2010	5530.486	5882.987	22275.00	0.3873385	1.9540109E-02	60.16400

Instrument : CHAMBER 170
 Detector : 72549
 Standard ID : AESS-011
 Standard Reference Date : 14-FEB-2008 13:39:25
 Calibration Analysis Date/Time : 23-JUL-2009 08:07:36
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 23-JUL-2009 13:59:58
 Average Efficiency : 0.3678014
 Average Efficiency Error : 1.0071305E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	212.8284	28-FEB-2010	2991.026	3302.433	22648.00	0.3594523	1.5356976E-02	58.76050
NP-237	214.4868	28-FEB-2010	4434.863	4906.064	24165.00	0.3755153	1.8930556E-02	77.34428
CM-244	208.4184	28-FEB-2010	5532.657	5887.477	22059.00	0.3727079	1.8803651E-02	57.81808

Instrument : CHAMBER 171
 Detector : 78260
 Standard ID : AESS-006
 Standard Reference Date : 14-FEB-2008 09:35:18
 Calibration Analysis Date/Time : 23-JUL-2009 08:07:41
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 23-JUL-2009 14:00:07
 Average Efficiency : 0.3837917
 Average Efficiency Error : 1.0510301E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	203.6952	28-FEB-2010	2989.883	3301.923	22631.00	0.3752889	1.6033715E-02	57.49370
NP-237	204.7038	28-FEB-2010	4434.363	4904.564	23668.00	0.3853487	1.9429620E-02	72.93391
CM-244	195.0060	28-FEB-2010	5534.294	5887.494	21890.00	0.3953083	1.9945232E-02	55.35253

Instrument : CHAMBER 172
 Detector : 78772
 Standard ID : AESS-012
 Standard Reference Date : 14-FEB-2008 13:39:25
 Calibration Analysis Date/Time : 23-JUL-2009 08:07:46
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 23-JUL-2009 14:00:15
 Average Efficiency : 0.3822835
 Average Efficiency Error : 1.0466998E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	206.2200	28-FEB-2010	2990.947	3302.414	22849.00	0.3742635	1.5988056E-02	52.36660
NP-237	205.8930	28-FEB-2010	4433.288	4903.064	24169.00	0.3912586	1.9724179E-02	72.41768
CM-244	203.1954	28-FEB-2010	5532.422	5885.508	22239.00	0.3854235	1.9443754E-02	56.46907

Instrument : CHAMBER 173
 Detector : 74431
 Standard ID : AESS-013
 Standard Reference Date : 14-FEB-2008 17:45:04
 Calibration Analysis Date/Time : 22-JUL-2009 08:09:49
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 22-JUL-2009 14:12:56
 Average Efficiency : 0.2623188
 Average Efficiency Error : 7.2139227E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	203.6544	28-FEB-2010	2991.296	3300.266	16061.00	0.2663769	1.1436811E-02	50.38961
NP-237	210.2526	28-FEB-2010	4436.390	4906.583	16403.00	0.2600285	1.3159030E-02	60.88579
CM-244	201.9108	28-FEB-2010	5534.964	5886.757	14870.00	0.2592480	1.3135729E-02	54.15428

Instrument : CHAMBER 174
 Detector : 74432
 Standard ID : AESS-019
 Standard Reference Date : 19-FEB-2008 11:05:22
 Calibration Analysis Date/Time : 22-JUL-2009 08:09:54
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 22-JUL-2009 14:13:10
 Average Efficiency : 0.2553943
 Average Efficiency Error : 7.0305546E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	204.6468	28-FEB-2010	2990.955	3301.951	14943.00	0.2465975	1.0600956E-02	50.10695
NP-237	202.9140	28-FEB-2010	4436.112	4905.743	16012.00	0.2629998	1.3313278E-02	60.55487
CM-244	199.3140	28-FEB-2010	5531.741	5886.720	14821.00	0.2616092	1.3255978E-02	55.35811

Instrument : CHAMBER 175
 Detector : 74433
 Standard ID : AESS-014
 Standard Reference Date : 19-FEB-2008 11:05:22
 Calibration Analysis Date/Time : 22-JUL-2009 08:09:59
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 22-JUL-2009 14:13:33
 Average Efficiency : 0.2539235
 Average Efficiency Error : 6.9827326E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	214.7088	28-FEB-2010	2987.808	3301.771	16022.00	0.2520186	1.0820774E-02	50.17014
NP-237	211.7160	28-FEB-2010	4437.598	4902.379	16148.00	0.2542258	1.2867783E-02	58.39753
CM-244	207.3882	28-FEB-2010	5530.438	5887.378	15110.00	0.2563593	1.2986641E-02	52.37697

Instrument : CHAMBER 176
 Detector : 74434
 Standard ID : AESS-020
 Standard Reference Date : 14-FEB-2008 21:55:55
 Calibration Analysis Date/Time : 22-JUL-2009 08:10:03
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 22-JUL-2009 14:13:51
 Average Efficiency : 0.2596514
 Average Efficiency Error : 7.1437038E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	205.5870	28-FEB-2010	2988.124	3298.749	15474.00	0.2542223	1.0921958E-02	48.05445
NP-237	203.4984	28-FEB-2010	4433.658	4904.539	16076.00	0.2633027	1.3327949E-02	56.64418
CM-244	197.1096	28-FEB-2010	5533.031	5884.495	14789.00	0.2641215	1.3383611E-02	51.45706

Instrument : CHAMBER 177
 Detector : 74435
 Standard ID : AESS-015
 Standard Reference Date : 14-FEB-2008 17:45:04
 Calibration Analysis Date/Time : 22-JUL-2009 08:10:07
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 22-JUL-2009 14:14:02
 Average Efficiency : 0.2685861
 Average Efficiency Error : 7.3855612E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	204.0270	28-FEB-2010	2991.035	3300.055	16129.00	0.2670162	1.1463443E-02	46.17820
NP-237	200.6460	28-FEB-2010	4436.061	4906.072	16230.00	0.2696093	1.3645601E-02	58.26474
CM-244	195.9270	28-FEB-2010	5534.094	5885.629	15017.00	0.2697915	1.3668223E-02	52.64664

Instrument : CHAMBER 178
 Detector : 74436
 Standard ID : AESS-021
 Standard Reference Date : 19-FEB-2008 15:31:52
 Calibration Analysis Date/Time : 22-JUL-2009 08:10:12
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 22-JUL-2009 14:14:14
 Average Efficiency : 0.2563734
 Average Efficiency Error : 7.0544411E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	208.3608	28-FEB-2010	2992.331	3301.630	15324.00	0.2483911	1.0673227E-02	46.26046
NP-237	210.1548	28-FEB-2010	4433.348	4903.642	16496.00	0.2615961	1.3237508E-02	57.60064
CM-244	200.7390	28-FEB-2010	5531.998	5883.700	15038.00	0.2635517	1.3351870E-02	53.76401

Instrument : CHAMBER 179
 Detector : 74437
 Standard ID : AESS-016
 Standard Reference Date : 14-FEB-2008 17:45:04
 Calibration Analysis Date/Time : 22-JUL-2009 08:10:16
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 22-JUL-2009 14:14:24
 Average Efficiency : 0.2654315
 Average Efficiency Error : 7.3000593E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	204.0534	28-FEB-2010	2991.102	3300.165	15895.00	0.2631131	1.1298665E-02	48.51485
NP-237	199.3962	28-FEB-2010	4436.443	4906.617	16075.00	0.2687030	1.3601316E-02	57.52364
CM-244	198.6402	28-FEB-2010	5534.901	5886.605	14985.00	0.2655179	1.3452120E-02	51.10583

Instrument : CHAMBER 180
 Detector : 74438
 Standard ID : AESS-022
 Standard Reference Date : 14-FEB-2008 21:55:55
 Calibration Analysis Date/Time : 22-JUL-2009 08:10:21
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 22-JUL-2009 14:14:36
 Average Efficiency : 0.2505249
 Average Efficiency Error : 6.8937857E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	209.6724	28-FEB-2010	2988.611	3299.257	15266.00	0.2459229	1.0567908E-02	47.44321
NP-237	206.8830	28-FEB-2010	4433.245	4903.299	15791.00	0.2543839	1.2879343E-02	51.57590
CM-244	203.0208	28-FEB-2010	5535.594	5886.061	14621.00	0.2534862	1.2846692E-02	51.76523

Instrument : CHAMBER 181
 Detector : 74439
 Standard ID : AESS-017
 Standard Reference Date : 14-FEB-2008 17:45:04
 Calibration Analysis Date/Time : 22-JUL-2009 08:10:26
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 22-JUL-2009 14:14:47
 Average Efficiency : 0.2548543
 Average Efficiency Error : 7.0099598E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	210.0798	28-FEB-2010	2988.239	3301.914	15878.00	0.2552872	1.0962813E-02	48.35796
NP-237	208.5846	28-FEB-2010	4437.080	4901.757	16198.00	0.2588415	1.3100917E-02	57.35833
CM-244	205.5828	28-FEB-2010	5535.131	5886.836	14634.00	0.2505288	1.2696699E-02	51.18034

Instrument : CHAMBER 182
 Detector : 74440
 Standard ID : AESS-023
 Standard Reference Date : 14-FEB-2008 21:55:55
 Calibration Analysis Date/Time : 22-JUL-2009 08:10:30
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 22-JUL-2009 14:14:57
 Average Efficiency : 0.2578707
 Average Efficiency Error : 7.0930445E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	207.4764	28-FEB-2010	2991.998	3301.429	15699.00	0.2555752	1.0977317E-02	46.97070
NP-237	207.4998	28-FEB-2010	4432.415	4901.861	16221.00	0.2605498	1.3187178E-02	56.46945
CM-244	199.8804	28-FEB-2010	5533.907	5884.511	14682.00	0.2584959	1.3099929E-02	47.10158

Instrument : CHAMBER 183
 Detector : 74441
 Standard ID : AESS-018
 Standard Reference Date : 14-FEB-2008 17:45:04
 Calibration Analysis Date/Time : 22-JUL-2009 08:10:35
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 22-JUL-2009 14:15:07
 Average Efficiency : 0.2636590
 Average Efficiency Error : 7.2516296E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	202.1856	28-FEB-2010	2989.448	3298.556	16019.00	0.2676203	1.1490691E-02	47.36681
NP-237	208.8990	28-FEB-2010	4434.882	4905.025	16143.00	0.2575647	1.3036844E-02	61.28753
CM-244	198.1458	28-FEB-2010	5533.221	5884.854	14903.00	0.2647125	1.3412292E-02	54.17869

Instrument : CHAMBER 184
 Detector : 74442
 Standard ID : AESS-024
 Standard Reference Date : 14-FEB-2008 21:55:55
 Calibration Analysis Date/Time : 22-JUL-2009 08:10:39
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 22-JUL-2009 14:15:18
 Average Efficiency : 0.2589915
 Average Efficiency Error : 7.1259094E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	203.5218	28-FEB-2010	2989.235	3300.018	15286.00	0.2536818	1.0901084E-02	45.69374
NP-237	205.6662	28-FEB-2010	4434.314	4904.409	16135.00	0.2614885	1.3235523E-02	58.78146
CM-244	198.3060	28-FEB-2010	5531.386	5887.098	14902.00	0.2644547	1.3399277E-02	53.47013

Instrument : CHAMBER 185
 Detector : 68615
 Standard ID : AESS-025
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 22-JUL-2009 08:10:43
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 22-JUL-2009 14:15:30
 Average Efficiency : 0.2565642
 Average Efficiency Error : 7.0740697E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	195.5670	28-FEB-2010	2991.225	3297.857	15033.00	0.2596380	1.1160337E-02	55.72531
NP-237	167.9916	28-FEB-2010	4436.385	4903.692	12852.00	0.2550071	1.2947261E-02	59.11316
CM-244	157.2432	28-FEB-2010	5533.756	5883.696	11351.00	0.2539946	1.2921941E-02	56.16187

Instrument : CHAMBER 186
 Detector : 68616
 Standard ID : AESS-031
 Standard Reference Date : 18-FEB-2008 11:28:15
 Calibration Analysis Date/Time : 22-JUL-2009 08:10:48
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 22-JUL-2009 14:15:43
 Average Efficiency : 0.2530972
 Average Efficiency Error : 6.9825449E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	193.6650	28-FEB-2010	2991.440	3298.282	14435.00	0.2517332	1.0828621E-02	55.45393
NP-237	162.9186	28-FEB-2010	4433.254	4901.541	12537.00	0.2565026	1.3028130E-02	59.45676
CM-244	153.1968	28-FEB-2010	5533.251	5884.261	10964.00	0.2517129	1.2813604E-02	55.46026

Instrument : CHAMBER 187
 Detector : 68620
 Standard ID : AESS-026
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 22-JUL-2009 08:10:52
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 22-JUL-2009 14:15:58
 Average Efficiency : 0.2501889
 Average Efficiency Error : 7.3357723E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	199.5072	28-FEB-2010	2989.912	3299.166	15000.00	0.2539414	1.2865975E-02	52.23053
NP-237	168.0294	28-FEB-2010	4432.442	4904.149	12738.00	0.2526287	1.2828344E-02	58.21870
CM-244	160.5822	28-FEB-2010	5535.067	5883.156	11152.00	0.2443892	1.2436978E-02	54.57392

Instrument : CHAMBER 188
 Detector : 68621
 Standard ID : AESS-032
 Standard Reference Date : 18-FEB-2008 11:28:15
 Calibration Analysis Date/Time : 22-JUL-2009 08:10:57
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 22-JUL-2009 14:16:10
 Average Efficiency : 0.2601093
 Average Efficiency Error : 7.1711414E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	195.2364	28-FEB-2010	2988.283	3302.165	15025.00	0.2599137	1.1172294E-02	51.37601
NP-237	165.9822	28-FEB-2010	4433.129	4903.527	12962.00	0.2602972	1.3214173E-02	62.37115
CM-244	153.7938	28-FEB-2010	5532.390	5884.553	11377.00	0.2601953	1.3236898E-02	52.05467

Instrument : CHAMBER 189
 Detector : 68622
 Standard ID : AESS-027
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 22-JUL-2009 08:11:01
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 22-JUL-2009 14:16:25
 Average Efficiency : 0.2590416
 Average Efficiency Error : 7.5966278E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	193.4238	28-FEB-2010	2987.652	3299.552	14591.00	0.2547911	1.2913714E-02	51.68600
NP-237	161.6154	28-FEB-2010	4434.579	4902.841	12573.00	0.2592825	1.3168799E-02	58.17202
CM-244	148.1754	28-FEB-2010	5534.475	5885.420	11096.00	0.2633716	1.3404469E-02	50.36570

Instrument : CHAMBER 190
 Detector : 68623
 Standard ID : AESS-033
 Standard Reference Date : 18-FEB-2008 11:28:15
 Calibration Analysis Date/Time : 22-JUL-2009 08:11:06
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 22-JUL-2009 14:16:38
 Average Efficiency : 0.2606415
 Average Efficiency Error : 7.1893386E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	192.4158	28-FEB-2010	2989.900	3302.388	14653.00	0.2571782	1.1059794E-02	51.45757
NP-237	161.7816	28-FEB-2010	4434.198	4903.145	12826.00	0.2641300	1.3411093E-02	58.05247
CM-244	147.2670	28-FEB-2010	5535.637	5887.028	10980.00	0.2622307	1.3348678E-02	51.95362

Instrument : CHAMBER 191
 Detector : 68624
 Standard ID : AESS-028
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 22-JUL-2009 08:11:10
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 22-JUL-2009 14:17:15
 Average Efficiency : 0.2621158
 Average Efficiency Error : 7.6803956E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	199.6542	28-FEB-2010	2988.514	3302.389	15421.00	0.2608921	1.3213424E-02	48.76201
NP-237	168.1992	28-FEB-2010	4435.396	4902.283	13449.00	0.2665235	1.3522904E-02	61.15327
CM-244	156.7614	28-FEB-2010	5534.230	5883.124	11542.00	0.2591464	1.3180151E-02	50.76146

Instrument : CHAMBER 192
 Detector : 74430
 Standard ID : AESS-034
 Standard Reference Date : 18-FEB-2008 11:28:15
 Calibration Analysis Date/Time : 22-JUL-2009 08:11:15
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 22-JUL-2009 14:17:47
 Average Efficiency : 0.2610474
 Average Efficiency Error : 7.1950918E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	200.5488	28-FEB-2010	2989.042	3298.270	15338.00	0.2583001	1.1098851E-02	47.63512
NP-237	167.2962	28-FEB-2010	4436.778	4903.324	13156.00	0.2621002	1.3302793E-02	56.66595
CM-244	154.4388	28-FEB-2010	5534.357	5882.529	11589.00	0.2639953	1.3425920E-02	46.57637

Instrument : CHAMBER 193
 Detector : 68627
 Standard ID : AESS-029
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 22-JUL-2009 08:11:19
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 22-JUL-2009 14:18:09
 Average Efficiency : 0.2640715
 Average Efficiency Error : 7.7369036E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	201.5742	28-FEB-2010	2988.069	3299.225	15508.00	0.2598549	1.3159974E-02	52.58962
NP-237	169.7700	28-FEB-2010	4433.121	4901.609	13394.00	0.2629541	1.3342631E-02	58.77226
CM-244	154.8234	28-FEB-2010	5534.158	5885.907	11872.00	0.2698340	1.3717437E-02	53.66179

Instrument : CHAMBER 194
 Detector : 68635
 Standard ID : AESS-035
 Standard Reference Date : 18-FEB-2008 11:28:15
 Calibration Analysis Date/Time : 22-JUL-2009 08:11:24
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 22-JUL-2009 14:18:45
 Average Efficiency : 0.2549567
 Average Efficiency Error : 7.0293345E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	198.6666	28-FEB-2010	2988.572	3300.603	15135.00	0.2573063	1.1058749E-02	49.25695
NP-237	168.2934	28-FEB-2010	4436.435	4905.175	12918.00	0.2558570	1.2989412E-02	62.01285
CM-244	158.8128	28-FEB-2010	5532.274	5883.671	11329.00	0.2509550	1.2767645E-02	52.44061

Instrument : CHAMBER 195
 Detector : 68636
 Standard ID : AESS-030
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 22-JUL-2009 08:11:29
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 22-JUL-2009 14:19:31
 Average Efficiency : 0.2573034
 Average Efficiency Error : 7.5419121E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	198.9792	28-FEB-2010	2988.629	3301.408	14891.00	0.2527547	1.2807086E-02	48.20201
NP-237	166.3758	28-FEB-2010	4433.877	4902.925	13025.00	0.2606431	1.3231294E-02	57.67042
CM-244	157.1856	28-FEB-2010	5535.397	5886.705	11566.00	0.2588032	1.3162592E-02	51.27964

Instrument : CHAMBER 196
 Detector : 68637
 Standard ID : AESS-036
 Standard Reference Date : 18-FEB-2008 11:28:15
 Calibration Analysis Date/Time : 22-JUL-2009 08:11:34
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 22-JUL-2009 14:19:51
 Average Efficiency : 0.2566788
 Average Efficiency Error : 7.0757568E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	201.3204	28-FEB-2010	2990.343	3302.501	15220.00	0.2553304	1.0972751E-02	52.52193
NP-237	167.4312	28-FEB-2010	4433.338	4901.979	12956.00	0.2579251	1.3093841E-02	56.52662
CM-244	156.4188	28-FEB-2010	5534.144	5885.395	11442.00	0.2573523	1.3090876E-02	54.16713

Instrument : CHAMBER 197
 Detector : 78894
 Standard ID : AESS-037
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 23-JUL-2009 07:57:39
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 23-JUL-2009 14:00:24
 Average Efficiency : 0.2568228
 Average Efficiency Error : 7.0815496E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	197.7372	28-FEB-2010	2989.389	3297.669	14834.00	0.2533745	1.0893730E-02	54.12946
NP-237	167.1294	28-FEB-2010	4433.236	4904.076	13081.00	0.2608898	1.3242440E-02	59.82949
CM-244	154.7664	28-FEB-2010	5534.086	5887.165	11341.00	0.2578318	1.3117233E-02	57.39178

Instrument : CHAMBER 198
 Detector : 78895
 Standard ID : AESS-043
 Standard Reference Date : 19-FEB-2008 00:32:27
 Calibration Analysis Date/Time : 23-JUL-2009 07:57:47
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 23-JUL-2009 14:00:36
 Average Efficiency : 0.2554221
 Average Efficiency Error : 7.0427968E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	197.7708	28-FEB-2010	2989.288	3302.314	14813.00	0.2529756	1.0876846E-02	54.48853
NP-237	168.7422	28-FEB-2010	4436.287	4906.224	13147.00	0.2597000	1.3181067E-02	56.83169
CM-244	156.3252	28-FEB-2010	5534.818	5887.000	11318.00	0.2547599	1.2961345E-02	56.23568

Instrument : CHAMBER 199
 Detector : 78896
 Standard ID : AESS-038
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 23-JUL-2009 07:57:56
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 23-JUL-2009 14:00:47
 Average Efficiency : 0.2512973
 Average Efficiency Error : 6.9297734E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	200.1408	28-FEB-2010	2990.202	3299.048	14855.00	0.2506810	1.0777651E-02	51.46595
NP-237	170.0886	28-FEB-2010	4435.598	4906.357	12647.00	0.2478395	1.2586436E-02	58.09747
CM-244	157.7460	28-FEB-2010	5530.513	5883.049	11473.00	0.2558941	1.3016121E-02	53.79463

Instrument : CHAMBER 200
 Detector : 78900
 Standard ID : AESS-044
 Standard Reference Date : 19-FEB-2008 00:32:27
 Calibration Analysis Date/Time : 23-JUL-2009 07:58:04
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 23-JUL-2009 14:00:57
 Average Efficiency : 0.2672527
 Average Efficiency Error : 7.3646023E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	194.4510	28-FEB-2010	2989.598	3302.306	15546.00	0.2700108	1.1599314E-02	51.74545
NP-237	166.6248	28-FEB-2010	4436.820	4902.466	13287.00	0.2657169	1.3484498E-02	57.34525
CM-244	155.8290	28-FEB-2010	5532.933	5886.480	11743.00	0.2650634	1.3477416E-02	51.61598

Instrument : CHAMBER 201
 Detector : 78902
 Standard ID : AESS-039
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 23-JUL-2009 07:58:10
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 23-JUL-2009 14:01:05
 Average Efficiency : 0.2606938
 Average Efficiency Error : 7.1896687E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	192.2418	28-FEB-2010	2989.239	3302.324	14811.00	0.2602134	1.1188080E-02	47.14003
NP-237	159.1506	28-FEB-2010	4432.525	4903.539	12448.00	0.2606924	1.3242436E-02	55.19216
CM-244	151.7142	28-FEB-2010	5534.042	5887.523	11271.00	0.2613738	1.3298883E-02	50.86152

Instrument : CHAMBER 202
 Detector : 78903
 Standard ID : AESS-045
 Standard Reference Date : 19-FEB-2008 00:32:27
 Calibration Analysis Date/Time : 23-JUL-2009 07:58:17
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 23-JUL-2009 14:01:14
 Average Efficiency : 0.2637661
 Average Efficiency Error : 7.2755860E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	186.9936	28-FEB-2010	2988.965	3301.750	14586.00	0.2634446	1.1330210E-02	45.61659
NP-237	160.8066	28-FEB-2010	4435.262	4905.190	12706.00	0.2633806	1.3374711E-02	55.61831
CM-244	145.8384	28-FEB-2010	5533.929	5886.269	10972.00	0.2646115	1.3470060E-02	49.12627

Instrument : CHAMBER 203
 Detector : 78905
 Standard ID : AESS-040
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 23-JUL-2009 07:58:24
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 23-JUL-2009 14:01:22
 Average Efficiency : 0.2569410
 Average Efficiency Error : 7.0852954E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	194.4828	28-FEB-2010	2990.960	3299.739	14972.00	0.2599902	1.1176325E-02	44.74440
NP-237	166.8174	28-FEB-2010	4435.540	4905.766	12710.00	0.2539164	1.2894144E-02	57.74120
CM-244	155.0100	28-FEB-2010	5534.337	5886.308	11275.00	0.2558869	1.3019669E-02	47.66172

Instrument : CHAMBER 204
 Detector : 78907
 Standard ID : AESS-046
 Standard Reference Date : 19-FEB-2008 19:35:48
 Calibration Analysis Date/Time : 23-JUL-2009 07:58:28
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 23-JUL-2009 14:01:31
 Average Efficiency : 0.2506487
 Average Efficiency Error : 6.9159763E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	194.7474	28-FEB-2010	2989.953	3297.878	14336.00	0.2485577	1.0693511E-02	50.84674
NP-237	164.6658	28-FEB-2010	4437.339	4902.439	12528.00	0.2535195	1.2876903E-02	55.89592
CM-244	151.3824	28-FEB-2010	5531.727	5884.400	10796.00	0.2508073	1.2771029E-02	51.62991

Instrument : CHAMBER 205
 Detector : 78908
 Standard ID : AESS-041
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 23-JUL-2009 07:58:33
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 23-JUL-2009 14:01:40
 Average Efficiency : 0.2503343
 Average Efficiency Error : 6.9021145E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	203.9034	28-FEB-2010	2991.664	3299.649	14924.00	0.2472031	1.0627222E-02	48.93098
NP-237	171.2268	28-FEB-2010	4434.348	4904.923	13015.00	0.2533501	1.2860725E-02	61.87793
CM-244	159.5796	28-FEB-2010	5534.662	5887.628	11424.00	0.2518927	1.2813480E-02	52.59251

Instrument : CHAMBER 206
 Detector : 78909
 Standard ID : AESS-047
 Standard Reference Date : 19-FEB-2008 00:32:27
 Calibration Analysis Date/Time : 23-JUL-2009 07:58:38
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 23-JUL-2009 14:01:49
 Average Efficiency : 0.2562930
 Average Efficiency Error : 7.0664333E-03
 Confidence : 95.00000

Cal. Istds	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	197.4804	28-FEB-2010	2991.007	3298.921	15006.00	0.2566382	1.1031752E-02	49.35140
NP-237	168.3948	28-FEB-2010	4432.777	4902.746	12926.00	0.2558552	1.2989211E-02	55.62066
CM-244	154.6032	28-FEB-2010	5531.452	5883.730	11261.00	0.2562518	1.3038474E-02	55.87610

Instrument : CHAMBER 207
 Detector : 78910
 Standard ID : AESS-042
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 23-JUL-2009 07:58:42
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 23-JUL-2009 14:01:57
 Average Efficiency : 0.2558556
 Average Efficiency Error : 7.0599136E-03
 Confidence : 95.00000

Cal. Istds	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	188.7090	28-FEB-2010	2988.143	3301.594	14367.00	0.2571380	1.1062090E-02	47.38946
NP-237	159.6558	28-FEB-2010	4437.296	4902.779	12320.00	0.2572077	1.3067513E-02	57.42012
CM-244	150.5208	28-FEB-2010	5532.449	5885.271	10817.00	0.2528071	1.2872322E-02	52.11042

Instrument : CHAMBER 208
 Detector : 78911
 Standard ID : AESS-048
 Standard Reference Date : 19-FEB-2008 00:32:27
 Calibration Analysis Date/Time : 23-JUL-2009 07:58:46
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 23-JUL-2009 14:02:06
 Average Efficiency : 0.2527668
 Average Efficiency Error : 6.9748992E-03
 Confidence : 95.00000

Cal. Istds	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	191.8350	28-FEB-2010	2989.612	3298.165	14243.00	0.2507517	1.0789137E-02	50.79447
NP-237	161.5530	28-FEB-2010	4434.097	4904.804	12430.00	0.2564567	1.3027546E-02	58.53157
CM-244	151.1856	28-FEB-2010	5534.389	5887.108	10827.00	0.2520371	1.2832657E-02	54.35335

Instrument : CHAMBER 209
 Detector : 79188
 Standard ID : AESS-001
 Standard Reference Date : 20-FEB-2008 09:54:53
 Calibration Analysis Date/Time : 27-JUL-2009 11:47:13
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-JUL-2009 13:59:46
 Average Efficiency : 0.3720503
 Average Efficiency Error : 1.0203380E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	208.6698	28-FEB-2010	2989.310	3300.226	22310.00	0.3611241	1.5431225E-02	61.07782
NP-237	171.0024	28-FEB-2010	4435.667	4905.853	19559.00	0.3812561	1.9256754E-02	78.47396
CM-244	158.1060	28-FEB-2010	5530.947	5884.845	17057.00	0.3798239	1.9212671E-02	62.16251

Instrument : CHAMBER 210
 Detector : 79189
 Standard ID : AESS-002
 Standard Reference Date : 19-FEB-2008 11:05:22
 Calibration Analysis Date/Time : 27-JUL-2009 11:47:19
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-JUL-2009 13:59:55
 Average Efficiency : 0.3939427
 Average Efficiency Error : 1.0785731E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	200.1144	28-FEB-2010	2990.620	3297.977	22918.00	0.3868399	1.6524704E-02	56.73992
NP-237	200.4990	28-FEB-2010	4435.731	4905.552	24207.00	0.4024462	2.0287881E-02	74.58759
CM-244	196.5558	28-FEB-2010	5534.352	5886.824	22110.00	0.3960794	1.9982373E-02	58.11366

Instrument : CHAMBER 211
 Detector : 79190
 Standard ID : AESS-003
 Standard Reference Date : 15-FEB-2008 13:12:27
 Calibration Analysis Date/Time : 27-JUL-2009 11:47:25
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-JUL-2009 14:00:03
 Average Efficiency : 0.3799735
 Average Efficiency Error : 1.0408110E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	202.9740	28-FEB-2010	2988.121	3301.259	22155.00	0.3687188	1.5757136E-02	56.93997
NP-237	203.2080	28-FEB-2010	4436.737	4902.524	23738.00	0.3893826	1.9632483E-02	71.62598
CM-244	197.2236	28-FEB-2010	5532.952	5886.368	21725.00	0.3879907	1.9577414E-02	62.12684

Instrument : CHAMBER 212
 Detector : 79191
 Standard ID : AESS-004
 Standard Reference Date : 14-FEB-2008 09:35:18
 Calibration Analysis Date/Time : 27-JUL-2009 11:47:32
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-JUL-2009 14:00:11
 Average Efficiency : 0.3809828
 Average Efficiency Error : 1.0432592E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	206.1222	28-FEB-2010	2989.135	3301.447	22739.00	0.3726791	1.5921319E-02	60.42460
NP-237	204.2586	28-FEB-2010	4434.433	4904.665	23808.00	0.3885271	1.9588865E-02	78.17927
CM-244	198.8100	28-FEB-2010	5534.267	5887.313	21781.00	0.3859496	1.9473951E-02	58.94521

Instrument : CHAMBER 213
 Detector : 79192
 Standard ID : AESS-005
 Standard Reference Date : 14-FEB-2008 09:35:18
 Calibration Analysis Date/Time : 27-JUL-2009 11:47:39
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-JUL-2009 14:00:20
 Average Efficiency : 0.3632684
 Average Efficiency Error : 9.9503463E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	210.7452	28-FEB-2010	2990.470	3298.036	22131.00	0.3547624	1.5160903E-02	63.50857
NP-237	209.5938	28-FEB-2010	4436.689	4901.687	23169.00	0.3684698	1.8581852E-02	80.13203
CM-244	202.7478	28-FEB-2010	5531.037	5883.842	21347.00	0.3709584	1.8720919E-02	62.77599

Instrument : CHAMBER 214
 Detector : 79193
 Standard ID : AESS-006
 Standard Reference Date : 14-FEB-2008 09:35:18
 Calibration Analysis Date/Time : 27-JUL-2009 11:47:45
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-JUL-2009 14:00:29
 Average Efficiency : 0.3836091
 Average Efficiency Error : 1.0504629E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	203.6952	28-FEB-2010	2990.553	3297.788	22693.00	0.3763517	1.6078612E-02	56.27348
NP-237	204.7038	28-FEB-2010	4436.227	4901.574	23647.00	0.3850555	1.9414932E-02	74.54285
CM-244	195.0060	28-FEB-2010	5531.780	5885.252	21759.00	0.3931459	1.9837169E-02	56.86452

Instrument : CHAMBER 215
 Detector : 79194
 Standard ID : AESS-007
 Standard Reference Date : 14-FEB-2008 13:39:25
 Calibration Analysis Date/Time : 27-JUL-2009 11:47:51
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-JUL-2009 14:00:38
 Average Efficiency : 0.3803512
 Average Efficiency Error : 1.0415906E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	206.7342	28-FEB-2010	2989.364	3302.121	22674.00	0.3705170	1.5829490E-02	58.59007
NP-237	205.0260	28-FEB-2010	4437.186	4903.222	23893.00	0.3884499	1.9584402E-02	72.67680
CM-244	199.6806	28-FEB-2010	5534.359	5882.968	21950.00	0.3872738	1.9539375E-02	61.41080

Instrument : CHAMBER 216
 Detector : 79195
 Standard ID : AESS-008
 Standard Reference Date : 14-FEB-2008 13:39:25
 Calibration Analysis Date/Time : 27-JUL-2009 11:47:57
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-JUL-2009 14:00:46
 Average Efficiency : 0.3731616
 Average Efficiency Error : 1.0220583E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	206.0418	28-FEB-2010	2990.730	3302.451	22182.00	0.3636904	1.5542008E-02	60.14384
NP-237	209.2716	28-FEB-2010	4434.761	4905.361	23781.00	0.3787806	1.9097654E-02	75.39853
CM-244	199.6488	28-FEB-2010	5530.680	5884.547	21648.00	0.3820059	1.9275997E-02	60.78160

Instrument : CHAMBER 217
 Detector : 79410
 Standard ID : AESS-009
 Standard Reference Date : 19-FEB-2008 11:05:22
 Calibration Analysis Date/Time : 27-JUL-2009 11:48:04
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-JUL-2009 14:00:55
 Average Efficiency : 0.3778184
 Average Efficiency Error : 1.0346431E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	203.3736	28-FEB-2010	2988.264	3300.395	22447.00	0.3728177	1.5929710E-02	59.20551
NP-237	204.0192	28-FEB-2010	4433.666	4904.432	23270.00	0.3801880	1.9172091E-02	76.02460
CM-244	197.2128	28-FEB-2010	5535.108	5883.550	21438.00	0.3827657	1.9316062E-02	61.20031

Instrument : CHAMBER 218
 Detector : 79411
 Standard ID : AESS-010
 Standard Reference Date : 14-FEB-2008 13:39:25
 Calibration Analysis Date/Time : 27-JUL-2009 11:48:10
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-JUL-2009 14:01:03
 Average Efficiency : 0.3940997
 Average Efficiency Error : 1.0791861E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	202.0008	28-FEB-2010	2991.480	3299.092	22843.00	0.3820206	1.6319500E-02	60.57081
NP-237	202.9926	28-FEB-2010	4433.463	4904.366	24456.00	0.4015617	2.0241646E-02	78.79704
CM-244	196.2330	28-FEB-2010	5534.949	5883.207	22582.00	0.4054522	2.0451389E-02	60.53443

Instrument : CHAMBER 219
 Detector : 79412
 Standard ID : AESS-011
 Standard Reference Date : 14-FEB-2008 13:39:25
 Calibration Analysis Date/Time : 27-JUL-2009 11:48:16
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-JUL-2009 14:01:48
 Average Efficiency : 0.3662424
 Average Efficiency Error : 1.0028155E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	212.8284	28-FEB-2010	2991.558	3298.478	22686.00	0.3600933	1.5384067E-02	58.88719
NP-237	214.4868	28-FEB-2010	4436.677	4902.329	24003.00	0.3730206	1.8805804E-02	79.43044
CM-244	208.4184	28-FEB-2010	5533.300	5887.374	21804.00	0.3685999	1.8598294E-02	60.23553

Instrument : CHAMBER 220
 Detector : 79413
 Standard ID : AESS-012
 Standard Reference Date : 14-FEB-2008 13:39:25
 Calibration Analysis Date/Time : 27-JUL-2009 11:48:23
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-JUL-2009 14:02:00
 Average Efficiency : 0.3800345
 Average Efficiency Error : 1.0404716E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	206.2200	28-FEB-2010	2990.238	3297.635	22946.00	0.3758968	1.6057028E-02	61.95944
NP-237	205.8930	28-FEB-2010	4436.067	4906.404	23867.00	0.3863981	1.9481128E-02	76.81815
CM-244	203.1954	28-FEB-2010	5530.768	5883.799	21903.00	0.3797704	1.9161157E-02	61.74461

Instrument : CHAMBER 221
 Detector : 79414
 Standard ID : AESS-013
 Standard Reference Date : 14-FEB-2008 17:45:04
 Calibration Analysis Date/Time : 27-JUL-2009 11:48:29
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-JUL-2009 14:02:09
 Average Efficiency : 0.3757081
 Average Efficiency Error : 1.0287202E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	203.6544	28-FEB-2010	2988.031	3301.906	22489.00	0.3730499	1.5939282E-02	52.97857
NP-237	210.2526	28-FEB-2010	4434.520	4906.347	23758.00	0.3766535	1.8990556E-02	73.94412
CM-244	201.9108	28-FEB-2010	5532.427	5886.301	21697.00	0.3785694	1.9102205E-02	60.49401

Instrument : CHAMBER 222
 Detector : 79415
 Standard ID : AESS-014
 Standard Reference Date : 19-FEB-2008 11:05:22
 Calibration Analysis Date/Time : 27-JUL-2009 11:48:37
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-JUL-2009 14:02:19
 Average Efficiency : 0.3486046
 Average Efficiency Error : 9.5541952E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	214.7088	28-FEB-2010	2988.828	3299.834	21348.00	0.3358505	1.4359185E-02	53.28439
NP-237	211.7160	28-FEB-2010	4436.567	4903.132	22784.00	0.3587198	1.8092748E-02	75.86924
CM-244	207.3882	28-FEB-2010	5532.999	5885.314	21129.00	0.3587538	1.8106727E-02	62.25880

Instrument : CHAMBER 223
 Detector : 79416
 Standard ID : AESS-015
 Standard Reference Date : 14-FEB-2008 17:45:04
 Calibration Analysis Date/Time : 27-JUL-2009 11:48:43
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-JUL-2009 14:02:29
 Average Efficiency : 0.3842350
 Average Efficiency Error : 1.0522764E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	204.0270	28-FEB-2010	2988.719	3302.203	22642.00	0.3749019	1.6017098E-02	52.37010
NP-237	200.6460	28-FEB-2010	4434.717	4901.802	23720.00	0.3940558	1.9868227E-02	70.08206
CM-244	195.9270	28-FEB-2010	5534.370	5883.775	21616.00	0.3886585	1.9611971E-02	55.34917

Instrument : CHAMBER 224
 Detector : 79417
 Standard ID : AESS-016
 Standard Reference Date : 14-FEB-2008 17:45:04
 Calibration Analysis Date/Time : 27-JUL-2009 11:48:51
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-JUL-2009 14:02:37
 Average Efficiency : 0.3844876
 Average Efficiency Error : 1.0532029E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	204.0534	28-FEB-2010	2991.902	3302.451	22483.00	0.3722161	1.5903715E-02	55.77303
NP-237	199.3962	28-FEB-2010	4433.496	4905.621	23986.00	0.4009725	2.0215105E-02	74.29817
CM-244	198.6402	28-FEB-2010	5531.081	5884.107	21855.00	0.3876156	1.9557375E-02	62.08027

Instrument : CHAMBER 225
 Detector : 79418
 Standard ID : AESS-017
 Standard Reference Date : 14-FEB-2008 17:45:04
 Calibration Analysis Date/Time : 27-JUL-2009 11:48:57
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-JUL-2009 14:02:46
 Average Efficiency : 0.3784786
 Average Efficiency Error : 1.0361850E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	210.0798	28-FEB-2010	2989.698	3301.928	23097.00	0.3714026	1.5863828E-02	56.57831
NP-237	208.5846	28-FEB-2010	4436.047	4902.115	24170.00	0.3862496	1.9471634E-02	72.01178
CM-244	205.5828	28-FEB-2010	5533.662	5882.674	22249.00	0.3812986	1.9235564E-02	61.39241

Instrument : CHAMBER 226
 Detector : 79419
 Standard ID : AESS-018
 Standard Reference Date : 14-FEB-2008 17:45:04
 Calibration Analysis Date/Time : 27-JUL-2009 11:49:04
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-JUL-2009 14:02:55
 Average Efficiency : 0.3808596
 Average Efficiency Error : 1.0428368E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	202.1856	28-FEB-2010	2990.229	3299.048	22549.00	0.3767624	1.6097387E-02	54.38462
NP-237	208.8990	28-FEB-2010	4436.278	4902.399	23852.00	0.3805940	1.9188609E-02	81.14477
CM-244	198.1458	28-FEB-2010	5532.943	5886.259	21774.00	0.3871692	1.9535474E-02	57.36676

Instrument : CHAMBER 227
 Detector : 79420
 Standard ID : AESS-019
 Standard Reference Date : 19-FEB-2008 11:05:22
 Calibration Analysis Date/Time : 27-JUL-2009 11:49:10
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-JUL-2009 14:03:04
 Average Efficiency : 0.3843335
 Average Efficiency Error : 1.0524626E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	204.6468	28-FEB-2010	2988.495	3300.898	22690.00	0.3745091	1.5999891E-02	56.91222
NP-237	202.9140	28-FEB-2010	4435.132	4906.286	23781.00	0.3906433	1.9695761E-02	72.78109
CM-244	199.3140	28-FEB-2010	5532.133	5886.196	22245.00	0.3930259	1.9827209E-02	61.27127

Instrument : CHAMBER 228
 Detector : 79421
 Standard ID : AESS-020
 Standard Reference Date : 14-FEB-2008 21:55:55
 Calibration Analysis Date/Time : 27-JUL-2009 11:49:16
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-JUL-2009 14:03:13
 Average Efficiency : 0.3819269
 Average Efficiency Error : 1.0460673E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	205.5870	28-FEB-2010	2990.613	3298.829	22551.00	0.3705553	1.5832171E-02	51.70354
NP-237	203.4984	28-FEB-2010	4434.639	4905.792	23625.00	0.3869812	1.9512173E-02	70.48917
CM-244	197.1096	28-FEB-2010	5531.072	5884.538	22079.00	0.3946491	1.9910410E-02	54.39862

Instrument : CHAMBER 229
 Detector : 79422
 Standard ID : AESS-021
 Standard Reference Date : 19-FEB-2008 15:31:52
 Calibration Analysis Date/Time : 27-JUL-2009 11:49:22
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-JUL-2009 14:03:22
 Average Efficiency : 0.3798401
 Average Efficiency Error : 1.0399979E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	208.3608	28-FEB-2010	2990.805	3298.464	23010.00	0.3730097	1.5933167E-02	54.32673
NP-237	210.1548	28-FEB-2010	4434.226	4906.242	23918.00	0.3793714	1.9126525E-02	69.91097
CM-244	200.7390	28-FEB-2010	5533.427	5882.943	22277.00	0.3907950	1.9714409E-02	60.50524

Instrument : CHAMBER 230
 Detector : 79423
 Standard ID : AESS-022
 Standard Reference Date : 14-FEB-2008 21:55:55
 Calibration Analysis Date/Time : 27-JUL-2009 11:49:29
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-JUL-2009 14:03:31
 Average Efficiency : 0.3762562
 Average Efficiency Error : 1.0304146E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	209.6724	28-FEB-2010	2989.308	3297.622	22698.00	0.3656987	1.5623449E-02	50.65837
NP-237	206.8830	28-FEB-2010	4433.975	4905.433	24027.00	0.3871273	1.9516820E-02	69.68443
CM-244	203.0208	28-FEB-2010	5531.188	5884.956	21996.00	0.3817128	1.9258413E-02	56.82364

Instrument : CHAMBER 231
 Detector : 79424
 Standard ID : AESS-023
 Standard Reference Date : 14-FEB-2008 21:55:55
 Calibration Analysis Date/Time : 27-JUL-2009 11:49:35
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-JUL-2009 14:03:40
 Average Efficiency : 0.3847702
 Average Efficiency Error : 1.0534914E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	207.4764	28-FEB-2010	2990.586	3298.189	23057.00	0.3754197	1.6035730E-02	56.58625
NP-237	207.4998	28-FEB-2010	4432.432	4903.240	24264.00	0.3897645	1.9648222E-02	77.05042
CM-244	199.8804	28-FEB-2010	5533.660	5887.186	22354.00	0.3940257	1.9876782E-02	61.75343

Instrument : CHAMBER 232
 Detector : 79425
 Standard ID : AESS-024
 Standard Reference Date : 14-FEB-2008 21:55:55
 Calibration Analysis Date/Time : 27-JUL-2009 11:49:42
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-JUL-2009 14:03:48
 Average Efficiency : 0.3748871
 Average Efficiency Error : 1.0271599E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	203.5218	28-FEB-2010	2989.229	3299.258	21761.00	0.3612023	1.5439365E-02	56.38522
NP-237	205.6662	28-FEB-2010	4433.403	4904.597	23806.00	0.3858308	1.9452941E-02	74.06577
CM-244	198.3060	28-FEB-2010	5534.062	5886.338	21708.00	0.3856767	1.9460704E-02	58.09093

Instrument : CHAMBER 233
 Detector : 79426
 Standard ID : AESS-025
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 27-JUL-2009 11:49:48
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-JUL-2009 14:03:57
 Average Efficiency : 0.3793921
 Average Efficiency Error : 1.0403312E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	195.5670	28-FEB-2010	2989.053	3300.219	21850.00	0.3774274	1.6132066E-02	56.42078
NP-237	167.9916	28-FEB-2010	4437.148	4902.933	19321.00	0.3833666	1.9365741E-02	74.45728
CM-244	157.2432	28-FEB-2010	5534.654	5884.028	16885.00	0.3782761	1.9136583E-02	61.18657

Instrument : CHAMBER 234
 Detector : 79427
 Standard ID : AESS-026
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 27-JUL-2009 11:49:54
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-JUL-2009 14:04:08
 Average Efficiency : 0.3700874
 Average Efficiency Error : 1.0797138E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	199.5072	28-FEB-2010	2990.497	3297.542	21594.00	0.3656335	1.8451264E-02	61.40455
NP-237	168.0294	28-FEB-2010	4434.922	4904.935	19043.00	0.3777652	1.9085610E-02	76.29016
CM-244	160.5822	28-FEB-2010	5534.289	5887.217	16745.00	0.3673259	1.8584441E-02	59.63282

Instrument : CHAMBER 235
 Detector : 79428
 Standard ID : AESS-027
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 27-JUL-2009 11:50:01
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-JUL-2009 14:04:17
 Average Efficiency : 0.3932829
 Average Efficiency Error : 1.1475780E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	193.4238	28-FEB-2010	2988.334	3300.717	21681.00	0.3786630	1.9108076E-02	53.32552
NP-237	161.6154	28-FEB-2010	4435.003	4906.236	19404.00	0.4001970	2.0215055E-02	77.72460
CM-244	148.1754	28-FEB-2010	5532.236	5886.409	16945.00	0.4028875	2.0380763E-02	59.12006

Instrument : CHAMBER 236
 Detector : 79429
 Standard ID : AESS-028
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 27-JUL-2009 11:50:07
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-JUL-2009 14:04:27
 Average Efficiency : 0.3837650
 Average Efficiency Error : 1.1193846E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	199.6542	28-FEB-2010	2987.761	3298.777	22073.00	0.3734792	1.8843459E-02	56.09225
NP-237	168.1992	28-FEB-2010	4435.283	4906.214	19676.00	0.3898810	1.9691262E-02	74.38795
CM-244	156.7614	28-FEB-2010	5532.557	5887.291	17304.00	0.3888687	1.9666921E-02	61.23972

Instrument : CHAMBER 237
 Detector : 79430
 Standard ID : AESS-029
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 27-JUL-2009 11:50:14
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-JUL-2009 14:04:36
 Average Efficiency : 0.3796787
 Average Efficiency Error : 1.1077547E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	201.5742	28-FEB-2010	2990.197	3297.861	21831.00	0.3658611	1.8460920E-02	57.27552
NP-237	169.7700	28-FEB-2010	4432.935	4904.354	19680.00	0.3864051	1.9515611E-02	75.85569
CM-244	154.8234	28-FEB-2010	5530.478	5884.662	17077.00	0.3885164	1.9652124E-02	63.51448

Instrument : CHAMBER 238
 Detector : 79431
 Standard ID : AESS-030
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 27-JUL-2009 11:50:20
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-JUL-2009 14:04:46
 Average Efficiency : 0.3810317
 Average Efficiency Error : 1.1114767E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	198.9792	28-FEB-2010	2987.703	3299.637	22045.00	0.3742708	1.8883610E-02	56.22876
NP-237	166.3758	28-FEB-2010	4437.459	4902.787	19439.00	0.3894599	1.9672327E-02	69.82738
CM-244	157.1856	28-FEB-2010	5533.171	5886.843	16955.00	0.3799904	1.9222379E-02	58.92646

Instrument : CHAMBER 239
 Detector : 79432
 Standard ID : AESS-031
 Standard Reference Date : 18-FEB-2008 11:28:15
 Calibration Analysis Date/Time : 27-JUL-2009 11:50:26
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-JUL-2009 14:04:55
 Average Efficiency : 0.3927835
 Average Efficiency Error : 1.0770131E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	193.6650	28-FEB-2010	2990.694	3302.472	22065.00	0.3848595	1.6447702E-02	55.29106
NP-237	162.9186	28-FEB-2010	4436.142	4902.540	19439.00	0.3976750	2.0087343E-02	70.90855
CM-244	153.1968	28-FEB-2010	5534.989	5884.715	17391.00	0.3998017	2.0218691E-02	58.92552

Instrument : CHAMBER 240
 Detector : 79433
 Standard ID : AESS-032
 Standard Reference Date : 18-FEB-2008 11:28:15
 Calibration Analysis Date/Time : 27-JUL-2009 11:50:32
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-JUL-2009 14:05:04
 Average Efficiency : 0.3772089
 Average Efficiency Error : 1.0348574E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	195.2364	28-FEB-2010	2990.448	3302.009	21172.00	0.3663063	1.5662992E-02	53.41883
NP-237	165.9822	28-FEB-2010	4434.377	4905.282	19119.00	0.3839507	1.9397326E-02	73.43593
CM-244	153.7938	28-FEB-2010	5531.249	5885.600	16917.00	0.3873951	1.9597435E-02	58.29160

Instrument : CHAMBER 241
 Detector : 79434
 Standard ID : AESS-033
 Standard Reference Date : 18-FEB-2008 11:28:15
 Calibration Analysis Date/Time : 27-JUL-2009 11:50:38
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-JUL-2009 14:05:13
 Average Efficiency : 0.3940109
 Average Efficiency Error : 1.0806140E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	192.4158	28-FEB-2010	2990.069	3301.257	21921.00	0.3848144	1.6447132E-02	59.39081
NP-237	161.7816	28-FEB-2010	4433.036	4904.033	19316.00	0.3979853	2.0104248E-02	71.72956
CM-244	147.2670	28-FEB-2010	5530.409	5885.133	16898.00	0.4041099	2.0443266E-02	59.86270

Instrument : CHAMBER 242
 Detector : 79435
 Standard ID : AESS-034
 Standard Reference Date : 18-FEB-2008 11:28:15
 Calibration Analysis Date/Time : 27-JUL-2009 11:50:45
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-JUL-2009 14:05:21
 Average Efficiency : 0.3872019
 Average Efficiency Error : 1.0618003E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	200.5488	28-FEB-2010	2987.986	3300.537	22304.00	0.3756698	1.6052835E-02	60.14239
NP-237	167.2962	28-FEB-2010	4434.402	4905.006	19728.00	0.3930755	1.9852022E-02	81.49045
CM-244	154.4388	28-FEB-2010	5535.112	5883.069	17513.00	0.3993755	2.0195547E-02	60.38340

Instrument : CHAMBER 243
 Detector : 79436
 Standard ID : AESS-035
 Standard Reference Date : 18-FEB-2008 11:28:15
 Calibration Analysis Date/Time : 27-JUL-2009 11:50:51
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-JUL-2009 14:05:30
 Average Efficiency : 0.3689618
 Average Efficiency Error : 1.0121634E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	198.6666	28-FEB-2010	2988.831	3301.144	21270.00	0.3616530	1.5463094E-02	51.17657
NP-237	168.2934	28-FEB-2010	4435.437	4901.520	19256.00	0.3813798	1.9266052E-02	75.58389
CM-244	158.8128	28-FEB-2010	5533.039	5887.402	16593.00	0.3679604	1.8618485E-02	58.44908

Instrument : CHAMBER 244
 Detector : 79437
 Standard ID : AESS-036
 Standard Reference Date : 18-FEB-2008 11:28:15
 Calibration Analysis Date/Time : 27-JUL-2009 11:50:57
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-JUL-2009 14:05:39
 Average Efficiency : 0.3687662
 Average Efficiency Error : 1.0117218E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	201.3204	28-FEB-2010	2990.561	3301.814	21334.00	0.3579595	1.5304583E-02	62.36397
NP-237	167.4312	28-FEB-2010	4433.746	4904.768	18977.00	0.3778012	1.9088112E-02	75.63606
CM-244	156.4188	28-FEB-2010	5531.146	5885.854	16722.00	0.3765100	1.9049343E-02	61.05648

Instrument : CHAMBER 245
 Detector : 79438
 Standard ID : AESS-037
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 27-JUL-2009 11:51:02
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-JUL-2009 14:05:48
 Average Efficiency : 0.3877061
 Average Efficiency Error : 1.0631136E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	197.7372	28-FEB-2010	2990.519	3298.200	22136.00	0.3781450	1.6160103E-02	62.31918
NP-237	167.1294	28-FEB-2010	4434.025	4906.060	19910.00	0.3970917	2.0053044E-02	78.86944
CM-244	154.7664	28-FEB-2010	5533.264	5882.788	17268.00	0.3929479	1.9873664E-02	61.71907

Instrument : CHAMBER 246
 Detector : 78912
 Standard ID : AESS-038
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 27-JUL-2009 11:51:08
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-JUL-2009 14:05:57
 Average Efficiency : 0.3708842
 Average Efficiency Error : 1.0172031E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	200.1408	28-FEB-2010	2989.883	3302.161	21584.00	0.3642771	1.5572389E-02	64.71516
NP-237	170.0886	28-FEB-2010	4436.171	4902.069	19259.00	0.3774192	1.9065937E-02	76.67652
CM-244	157.7460	28-FEB-2010	5533.279	5887.441	16761.00	0.3742064	1.8932275E-02	58.21912

Instrument : CHAMBER 247
 Detector : 79440
 Standard ID : AESS-039
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 27-JUL-2009 11:51:13
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-JUL-2009 14:06:06
 Average Efficiency : 0.3957888
 Average Efficiency Error : 1.0855773E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	192.2418	28-FEB-2010	2989.314	3301.154	21842.00	0.3837782	1.6403578E-02	54.27637
NP-237	159.1506	28-FEB-2010	4435.427	4902.237	19566.00	0.4097880	2.0697797E-02	74.12901
CM-244	151.7142	28-FEB-2010	5535.390	5885.574	17262.00	0.4007001	2.0265834E-02	60.50509

Instrument : CHAMBER 248
 Detector : 79441
 Standard ID : AESS-040
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 27-JUL-2009 11:51:19
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-JUL-2009 14:06:15
 Average Efficiency : 0.3937030
 Average Efficiency Error : 1.0792862E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	194.4828	28-FEB-2010	2989.045	3301.474	22331.00	0.3878492	1.6573036E-02	60.09726
NP-237	166.8174	28-FEB-2010	4436.389	4902.813	19896.00	0.3975548	2.0076567E-02	79.69174
CM-244	155.0100	28-FEB-2010	5534.872	5884.178	17540.00	0.3984762	2.0149769E-02	58.60526

Instrument : CHAMBER 249
 Detector : 79442
 Standard ID : AESS-041
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 27-JUL-2009 11:51:24
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-JUL-2009 14:10:21
 Average Efficiency : 0.3675877
 Average Efficiency Error : 1.0082438E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	203.9034	28-FEB-2010	2991.808	3298.538	21645.00	0.3585607	1.5327478E-02	53.17529
NP-237	171.2268	28-FEB-2010	4433.459	4906.270	19414.00	0.3779393	1.9090647E-02	76.86456
CM-244	159.5796	28-FEB-2010	5535.492	5886.613	16816.00	0.3711205	1.8775435E-02	56.57472

Instrument : CHAMBER 250
 Detector : 79443
 Standard ID : AESS-042
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 27-JUL-2009 11:51:30
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-JUL-2009 14:07:02
 Average Efficiency : 0.3960947
 Average Efficiency Error : 1.0862177E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	188.7090	28-FEB-2010	2988.616	3300.155	21788.00	0.3900070	1.6670316E-02	52.60693
NP-237	159.6558	28-FEB-2010	4432.911	4904.182	19368.00	0.4043324	2.0424359E-02	73.85986
CM-244	150.5208	28-FEB-2010	5530.811	5885.622	16966.00	0.3969653	2.0080892E-02	59.65899

Instrument : CHAMBER 251
 Detector : 79444
 Standard ID : AESS-043
 Standard Reference Date : 19-FEB-2008 00:32:27
 Calibration Analysis Date/Time : 27-JUL-2009 11:51:36
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-JUL-2009 14:07:11
 Average Efficiency : 0.3862193
 Average Efficiency Error : 1.0589682E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	197.7708	28-FEB-2010	2990.845	3297.824	22101.00	0.3774794	1.6131971E-02	54.21589
NP-237	168.7422	28-FEB-2010	4433.069	4905.749	19931.00	0.3937052	1.9881824E-02	74.21349
CM-244	156.3252	28-FEB-2010	5534.571	5885.360	17400.00	0.3919745	1.9822748E-02	57.06868

Instrument : CHAMBER 252
 Detector : 79445
 Standard ID : AESS-044
 Standard Reference Date : 19-FEB-2008 00:32:27
 Calibration Analysis Date/Time : 27-JUL-2009 11:51:43
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-JUL-2009 14:07:24
 Average Efficiency : 0.3698718
 Average Efficiency Error : 1.0146284E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	194.4510	28-FEB-2010	2990.916	3302.142	21075.00	0.3660958	1.5654918E-02	61.30944
NP-237	166.6248	28-FEB-2010	4434.879	4906.631	18642.00	0.3729277	1.8845377E-02	80.38726
CM-244	155.8290	28-FEB-2010	5534.322	5884.528	16473.00	0.3722862	1.8838966E-02	60.16105

Instrument : CHAMBER 253
 Detector : 79446
 Standard ID : AESS-045
 Standard Reference Date : 19-FEB-2008 00:32:27
 Calibration Analysis Date/Time : 27-JUL-2009 11:51:49
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-JUL-2009 14:07:35
 Average Efficiency : 0.4175173
 Average Efficiency Error : 1.1444525E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	186.9936	28-FEB-2010	2987.796	3301.166	22755.00	0.4110381	1.7559895E-02	55.81194
NP-237	160.8066	28-FEB-2010	4435.182	4903.720	20118.00	0.4169668	2.1054644E-02	75.83978
CM-244	145.8384	28-FEB-2010	5533.610	5884.813	17722.00	0.4279359	2.1636952E-02	56.91713

Instrument : CHAMBER 254
 Detector : 79447
 Standard ID : AESS-046
 Standard Reference Date : 19-FEB-2008 19:35:48
 Calibration Analysis Date/Time : 27-JUL-2009 11:51:54
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-JUL-2009 14:07:52
 Average Efficiency : 0.4058467
 Average Efficiency Error : 1.1127573E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	194.7474	28-FEB-2010	2991.474	3298.982	22591.00	0.3918256	1.6740572E-02	58.61956
NP-237	164.6658	28-FEB-2010	4434.396	4906.361	20593.00	0.4168403	2.1043487E-02	82.24182
CM-244	151.3824	28-FEB-2010	5533.560	5883.122	17929.00	0.4170516	2.1083934E-02	61.14439

Instrument : CHAMBER 255
 Detector : 79448
 Standard ID : AESS-047
 Standard Reference Date : 19-FEB-2008 00:32:27
 Calibration Analysis Date/Time : 27-JUL-2009 11:52:00
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-JUL-2009 14:08:10
 Average Efficiency : 0.3643631
 Average Efficiency Error : 9.9972216E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	197.4804	28-FEB-2010	2992.107	3299.169	20953.00	0.3583827	1.5326263E-02	55.06876
NP-237	168.3948	28-FEB-2010	4434.844	4902.471	18382.00	0.3638436	1.8389078E-02	74.38364
CM-244	154.6032	28-FEB-2010	5531.565	5882.529	16422.00	0.3740352	1.8928226E-02	58.14114

Instrument : CHAMBER 256
 Detector : 79449
 Standard ID : AESS-048
 Standard Reference Date : 19-FEB-2008 00:32:27
 Calibration Analysis Date/Time : 27-JUL-2009 11:52:06
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-JUL-2009 14:08:26
 Average Efficiency : 0.3831320
 Average Efficiency Error : 1.0509511E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	191.8350	28-FEB-2010	2989.102	3301.350	21361.00	0.3761188	1.6080733E-02	55.66320
NP-237	161.5530	28-FEB-2010	4435.732	4901.991	18891.00	0.3897299	1.9691780E-02	78.88689
CM-244	151.1856	28-FEB-2010	5533.871	5883.102	16615.00	0.3870071	1.9581940E-02	56.91294

GAS FLOW PROPORTIONAL COUNTERS

General Engineering Laboratories

2040 Savage Road, Charleston, SC 29414
(843)556-8171

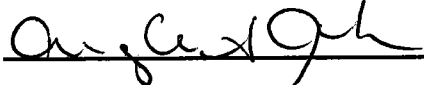
Gas Flow Proportional Counter Calibration Package

Method: Pa-228 (AC)

	YES	NO	Comments
1) Is all calibration standard information enclosed for: primary standard certificate? secondary standard(s) documentation? standard preparation information? standard < 1 Year old or verified?	<input checked="" type="checkbox"/>		
	<input checked="" type="checkbox"/>		
	<input checked="" type="checkbox"/>		
	<input checked="" type="checkbox"/>		
2) Are the detector graphs included? beta absorption curves? beta plateau?			Average Efficiency
	<input checked="" type="checkbox"/>		
3) Is the raw count data included for: the plateau generation? the absorption curve generation? the calibration verification? the crosstalk calculations?	<input checked="" type="checkbox"/>		
	<input checked="" type="checkbox"/>		
	<input checked="" type="checkbox"/>		
	<input checked="" type="checkbox"/>		
4) Are the calibration verification calculations included? are verification recoveries 100% +/- 25%	<input checked="" type="checkbox"/>		
5) Is the method Carrier Standardization included?			N/A

Prepared By: 

Date: 7/2/09

Reviewed By: 

Date: 7/2/09

Effective Date: 7/2/09

10D	3	7/1/09 10:45	7/1/2009 16:53	0.5000	1.5	6363.2	9544.8	10643	3.5	3040.9	6081.577364	0.6372	Average EFF
10D	4	7/1/09 10:45	7/1/2009 16:48	0.5053	1.5	6363.2	9544.8	10064	3.5	2875.4	5690.501596	0.5962	0.6320
11A	1	7/1/09 10:45	7/1/2009 11:56	0.8745	1.5	6363.2	9544.8	14773	3	4924.3	5631.22443	0.5900	
11A	2	7/1/09 10:45	7/1/2009 12:08	0.8547	1.5	6363.2	9544.8	14429	3	4809.7	5627.17636	0.5896	
11A	3	7/1/09 10:45	7/1/2009 12:04	0.8607	1.5	6363.2	9544.8	14454	3	4818.0	5597.851728	0.5865	Average EFF
11A	4	7/1/09 10:45	7/1/2009 12:00	0.8677	1.5	6363.2	9544.8	14013	3	4671.0	5383.193838	0.5640	0.5825
11B	1	7/1/09 10:45	7/1/2009 12:00	0.8681	1.5	6363.2	9544.8	16203	3	5401.0	6221.768068	0.6518	
11B	2	7/1/09 10:45	7/1/2009 11:56	0.8742	1.5	6363.2	9544.8	16106	3	5368.7	6141.073627	0.6434	
11B	3	7/1/09 10:45	7/1/2009 12:08	0.8545	1.5	6363.2	9544.8	15643	3	5214.3	6102.154531	0.6393	Average EFF
11B	4	7/1/09 10:45	7/1/2009 12:04	0.8606	1.5	6363.2	9544.8	15133	3	5044.3	5861.738123	0.6141	0.6372
11C	1	7/1/09 10:45	7/1/2009 12:04	0.8609	1.5	6363.2	9544.8	15637	3	5212.3	6054.305139	0.6343	
11C	2	7/1/09 10:45	7/1/2009 12:00	0.8680	1.5	6363.2	9544.8	15919	3	5308.3	6113.481467	0.6405	
11C	3	7/1/09 10:45	7/1/2009 11:56	0.8740	1.5	6363.2	9544.8	16452	3	5484.0	6274.376359	0.6574	Average EFF
11C	4	7/1/09 10:45	7/1/2009 12:08	0.8544	1.5	6363.2	9544.8	14887	3	4962.3	5808.157492	0.6085	0.6352
11D	1	7/1/09 10:45	7/1/2009 12:08	0.8548	1.5	6363.2	9544.8	15607	3	5202.3	6085.822645	0.6376	
11D	2	7/1/09 10:45	7/1/2009 12:04	0.8608	1.5	6363.2	9544.8	15944	3	5314.7	6174.138045	0.6469	
11D	3	7/1/09 10:45	7/1/2009 12:00	0.8679	1.5	6363.2	9544.8	16098	3	5366.0	6182.989937	0.6478	Average EFF
11D	4	7/1/09 10:45	7/1/2009 11:56	0.8738	1.5	6363.2	9544.8	15191	3	5063.7	5794.733717	0.6071	0.6348
12A	1	7/1/09 10:45	7/1/2009 12:15	0.8437	1.5	6363.2	9544.8	15450	3	5150.0	6104.026984	0.6395	
12A	2	7/1/09 10:45	7/1/2009 12:28	0.8234	1.5	6363.2	9544.8	15016	3	5005.3	6078.958269	0.6369	
12A	3	7/1/09 10:45	7/1/2009 12:24	0.8296	1.5	6363.2	9544.8	14984	3	4994.7	6020.558384	0.6308	Average EFF
12A	4	7/1/09 10:45	7/1/2009 12:20	0.8358	1.5	6363.2	9544.8	14530	3	4843.3	5794.58497	0.6071	0.6286
12B	1	7/1/09 10:45	7/1/2009 12:20	0.8362	1.5	6363.2	9544.8	15404	3	5134.7	6140.835636	0.6433	
12B	2	7/1/09 10:45	7/1/2009 12:15	0.8437	1.5	6363.2	9544.8	15607	3	5202.3	6166.05496	0.6460	
12B	3	7/1/09 10:45	7/1/2009 12:28	0.8232	1.5	6363.2	9544.8	15060	3	5020.0	6097.91718	0.6389	Average EFF
12B	4	7/1/09 10:45	7/1/2009 12:24	0.8295	1.5	6363.2	9544.8	14553	3	4851.0	5848.11587	0.6127	0.6352
12C	1	7/1/09 10:45	7/1/2009 12:24	0.8300	1.5	6363.2	9544.8	15183	3	5061.0	6097.649845	0.6388	
12C	2	7/1/09 10:45	7/1/2009 12:20	0.8361	1.5	6363.2	9544.8	15651	3	5217.0	6239.881493	0.6537	
12C	3	7/1/09 10:45	7/1/2009 12:15	0.8436	1.5	6363.2	9544.8	15216	3	5072.0	6012.519531	0.6299	Average EFF
12C	4	7/1/09 10:45	7/1/2009 12:28	0.8231	1.5	6363.2	9544.8	14117	3	4705.7	5716.805229	0.5989	0.6304
12D	1	7/1/09 10:45	7/1/2009 12:28	0.8235	1.5	6363.2	9544.8	15174	3	5058.0	6141.959419	0.6435	
12D	2	7/1/09 10:45	7/1/2009 12:24	0.8298	1.5	6363.2	9544.8	15137	3	5045.7	6080.699807	0.6371	
12D	3	7/1/09 10:45	7/1/2009 12:20	0.8359	1.5	6363.2	9544.8	15418	3	5139.3	6148.142699	0.6441	Average EFF
12D	4	7/1/09 10:45	7/1/2009 12:15	0.8434	1.5	6363.2	9544.8	14566	3	4855.3	5758.75774	0.6031	0.6320
13A	1	7/1/09 10:45	7/1/2009 12:33	0.8153	1.5	6363.2	9544.8	15230	3	5076.7	6226.552932	0.6524	
13A	2	7/1/09 10:45	7/1/2009 12:50	0.7902	1.5	6363.2	9544.8	14784	3	4928.0	6236.596242	0.6534	
13A	3	7/1/09 10:45	7/1/2009 12:41	0.8031	1.5	6363.2	9544.8	14851	3	4950.3	6164.384216	0.6458	Average EFF
13A	4	7/1/09 10:45	7/1/2009 12:37	0.8090	1.5	6363.2	9544.8	14183	3	4727.7	5843.553624	0.6122	0.6410
13B	1	7/1/09 10:45	7/1/2009 12:37	0.8094	1.5	6363.2	9544.8	15625	3	5208.3	6434.850276	0.6742	
13B	2	7/1/09 10:45	7/1/2009 12:33	0.8153	1.5	6363.2	9544.8	15450	3	5150.0	6316.496573	0.6618	
13B	3	7/1/09 10:45	7/1/2009 12:50	0.7901	1.5	6363.2	9544.8	14689	3	4896.3	6197.297391	0.6493	Average EFF
13B	4	7/1/09 10:45	7/1/2009 12:41	0.8029	1.5	6363.2	9544.8	14377	3	4792.3	5968.757323	0.6253	0.6526
13C	1	7/1/09 10:45	7/1/2009 12:41	0.8033	1.5	6363.2	9544.8	15426	3	5142.0	6401.251014	0.6707	
13C	2	7/1/09 10:45	7/1/2009 12:37	0.8093	1.5	6363.2	9544.8	15315	3	5105.0	6307.973396	0.6609	
13C	3	7/1/09 10:45	7/1/2009 12:33	0.8152	1.5	6363.2	9544.8	15288	3	5096.0	6251.048762	0.6549	Average EFF
13C	4	7/1/09 10:45	7/1/2009 12:50	0.7900	1.5	6363.2	9544.8	14222	3	4740.7	6001.209943	0.6287	0.6538
13D	1	7/1/09 10:45	7/1/2009 12:50	0.7903	1.5	6363.2	9544.8	14492	3	4830.7	6112.65055	0.6404	
13D	2	7/1/09 10:45	7/1/2009 12:46	0.7958	1.5	6363.2	9544.8	14858	3	4952.7	6223.19528	0.6520	
13D	3	7/1/09 10:45	7/1/2009 12:37	0.8082	1.5	6363.2	9544.8	14873	3	4957.7	6126.881339	0.6419	Average EFF
13D	4	7/1/09 10:45	7/1/2009 12:33	0.8151	1.5	6363.2	9544.8	14389	3	4796.3	5884.197712	0.6165	0.6377
14A	1	7/1/09 10:45	7/1/2009 12:54	0.7834	1.5	6363.2	9544.8	14463	3	4821.0	6153.596507	0.6447	
14A	2	7/1/09 10:45	7/1/2009 13:17	0.7507	1.5	6363.2	9544.8	14137	3	4712.3	6277.53373	0.6577	
14A	3	7/1/09 10:45	7/1/2009 13:13	0.7571	1.5	6363.2	9544.8	14022	3	4674.0	6173.627369	0.6468	Average EFF
14A	4	7/1/09 10:45	7/1/2009 13:02	0.7727	1.5	6363.2	9544.8	13451	3	4483.7	5802.830587	0.6080	0.6393
14B	1	7/1/09 10:45	7/1/2009 13:01	0.7730	1.5	6363.2	9544.8	14039	3	4679.7	6054.030301	0.6343	
14B	2	7/1/09 10:45	7/1/2009 12:54	0.7834	1.5	6363.2	9544.8	14398	3	4799.3	6126.324754	0.6418	
14B	3	7/1/09 10:45	7/1/2009 13:17	0.7505	1.5	6363.2	9544.8	13475	3	4491.7	5984.510182	0.6270	Average EFF
14B	4	7/1/09 10:45	7/1/2009 13:13	0.7569	1.5	6363.2	9544.8	13077	3	4359.0	5758.643863	0.6033	0.6266
14C	1	7/1/09 10:45	7/1/2009 13:12	0.7573	1.5	6363.2	9544.8	14116	3	4705.3	6213.281445	0.6510	
14C	2	7/1/09 10:45	7/1/2009 13:02	0.7729	1.5	6363.2	9544.8	14187	3	4729.0	6118.427365	0.6410	
14C	3	7/1/09 10:45	7/1/2009 12:55	0.7832	1.5	6363.2	9544.8	14409	3	4803.0	6132.734423	0.6425	Average EFF
14C	4	7/1/09 10:45	7/1/2009 13:17	0.7505	1.5	6363.2	9544.8	13229	3	4409.7	5875.993199	0.6156	0.6375
14D	1	7/1/09 10:45	7/1/2009 13:17	0.7508	1.5	6363.2	9544.8	13927	3	4642.3	6183.314452	0.6478	
14D	2	7/1/09 10:45	7/1/2009 13:12	0.7572	1.5	6363.2	9544.8	14089	3	4696.3	6202.348821	0.6498	
14D	3	7/1/09 10:45	7/1/2009 13:02	0.7728	1.5	6363.2	9544.8	13912	3	4637.3	6000.768164	0.6287	Average EFF
14D	4	7/1/09 10:45	7/1/2009 12:55	0.7830	1.5	6363.2	9544.8	13545	3	4515.0	5786.084113	0.6041	0.6326

*Background is considered negligible

SampleID	Instr	Time (min.)	Alpha Counts	Beta Counts	Count Start Time	Count End Time
1 1A		3	126	13564	7/1/2009 13:36	7/1/2009 13:39
2 1A		3	136	12775	7/1/2009 13:52	7/1/2009 13:55
3 1A		3	135	12750	7/1/2009 13:48	7/1/2009 13:51
4 1A		3	142	12410	7/1/2009 13:41	7/1/2009 13:44
1 1B		3	115	13292	7/1/2009 13:41	7/1/2009 13:44
2 1B		3	136	13274	7/1/2009 13:36	7/1/2009 13:39
3 1B		3	131	12699	7/1/2009 13:52	7/1/2009 13:55
4 1B		3	129	12072	7/1/2009 13:48	7/1/2009 13:51
1 1C		3	207	12813	7/1/2009 13:48	7/1/2009 13:51
2 1C		3	221	12979	7/1/2009 13:41	7/1/2009 13:44
3 1C		3	189	12755	7/1/2009 13:36	7/1/2009 13:39
4 1C		3	179	11917	7/1/2009 13:52	7/1/2009 13:55
1 1D		3	558	12473	7/1/2009 13:52	7/1/2009 13:55
2 1D		3	582	12484	7/1/2009 13:48	7/1/2009 13:51
3 1D		3	632	12289	7/1/2009 13:41	7/1/2009 13:44
4 1D		3	568	12115	7/1/2009 13:36	7/1/2009 13:39
1 2A		3	424	12499	7/1/2009 13:57	7/1/2009 14:00
2 2A		3	449	12103	7/1/2009 14:15	7/1/2009 14:18
3 2A		3	419	11968	7/1/2009 14:09	7/1/2009 14:12
4 2A		3	417	11855	7/1/2009 14:02	7/1/2009 14:05
1 2B		3	42	12471	7/1/2009 14:02	7/1/2009 14:05
2 2B		3	39	12492	7/1/2009 13:57	7/1/2009 14:00
3 2B		3	54	11892	7/1/2009 14:15	7/1/2009 14:18
4 2B		3	69	11539	7/1/2009 14:09	7/1/2009 14:12
1 2C		3	504	12050	7/1/2009 14:08	7/1/2009 14:11
2 2C		3	527	11914	7/1/2009 14:02	7/1/2009 14:05
3 2C		3	496	11994	7/1/2009 13:58	7/1/2009 14:01
4 2C		3	499	10889	7/1/2009 14:15	7/1/2009 14:18
1 2D		3	543	12010	7/1/2009 14:15	7/1/2009 14:18
2 2D		3	508	12124	7/1/2009 14:08	7/1/2009 14:11
3 2D		3	542	12168	7/1/2009 14:02	7/1/2009 14:05
4 2D		3	544	11692	7/1/2009 13:58	7/1/2009 14:01
1 3A		3	1397	11194	7/1/2009 14:19	7/1/2009 14:22
2 3A		4	1809	14227	7/1/2009 14:35	7/1/2009 14:39
3 3A		4	1757	14180	7/1/2009 14:30	7/1/2009 14:34
4 3A		4	1725	13754	7/1/2009 14:25	7/1/2009 14:29
1 3B		4	914	15370	7/1/2009 14:25	7/1/2009 14:29
2 3B		3	731	11695	7/1/2009 14:20	7/1/2009 14:23
3 3B		4	960	14905	7/1/2009 14:35	7/1/2009 14:39
4 3B		4	922	14220	7/1/2009 14:30	7/1/2009 14:34
1 3C		4	671	15644	7/1/2009 14:29	7/1/2009 14:33
2 3C		4	722	15964	7/1/2009 14:25	7/1/2009 14:29
3 3C		3	558	11701	7/1/2009 14:20	7/1/2009 14:23
4 3C		4	647	14729	7/1/2009 14:35	7/1/2009 14:39
1 3D		4	651	15152	7/1/2009 14:35	7/1/2009 14:39
2 3D		4	722	15168	7/1/2009 14:30	7/1/2009 14:34
3 3D		4	684	15295	7/1/2009 14:25	7/1/2009 14:29
4 3D		3	466	10942	7/1/2009 14:20	7/1/2009 14:23
1 4A		4	412	15298	7/1/2009 14:40	7/1/2009 14:44
2 4A		4	407	14897	7/1/2009 15:00	7/1/2009 15:04
3 4A		4	389	15050	7/1/2009 14:53	7/1/2009 14:57

419
7/2/09

4 4A	4	417	14462	7/1/2009 14:48	7/1/2009 14:52
1 4B	4	58	15335	7/1/2009 14:48	7/1/2009 14:52
2 4B	4	61	15513	7/1/2009 14:41	7/1/2009 14:45
3 4B	4	53	14521	7/1/2009 15:00	7/1/2009 15:04
4 4B	4	72	14328	7/1/2009 14:53	7/1/2009 14:57
1 4C	4	532	14733	7/1/2009 14:53	7/1/2009 14:57
2 4C	4	545	14902	7/1/2009 14:48	7/1/2009 14:52
3 4C	4	486	14856	7/1/2009 14:41	7/1/2009 14:45
4 4C	4	540	13733	7/1/2009 15:00	7/1/2009 15:04
1 4D	4	1158	14167	7/1/2009 15:00	7/1/2009 15:04
2 4D	4	1192	14204	7/1/2009 14:53	7/1/2009 14:57
3 4D	4	1136	14131	7/1/2009 14:48	7/1/2009 14:52
4 4D	4	1149	13978	7/1/2009 14:41	7/1/2009 14:45
1 5A	4	424	14870	7/1/2009 15:06	7/1/2009 15:10
2 5A	4	395	14487	7/1/2009 15:21	7/1/2009 15:25
3 5A	4	403	14259	7/1/2009 15:17	7/1/2009 15:21
4 5A	4	389	13957	7/1/2009 15:12	7/1/2009 15:16
1 5B	4	428	14869	7/1/2009 15:12	7/1/2009 15:16
2 5B	4	440	14821	7/1/2009 15:06	7/1/2009 15:10
3 5B	4	420	14289	7/1/2009 15:21	7/1/2009 15:25
4 5B	4	414	13809	7/1/2009 15:17	7/1/2009 15:21
1 5C	4	436	14676	7/1/2009 15:17	7/1/2009 15:21
2 5C	4	443	15122	7/1/2009 15:12	7/1/2009 15:16
3 5C	4	433	14958	7/1/2009 15:07	7/1/2009 15:11
4 5C	4	416	13831	7/1/2009 15:21	7/1/2009 15:25
1 5D	4	451	14321	7/1/2009 15:21	7/1/2009 15:25
2 5D	4	452	14642	7/1/2009 15:17	7/1/2009 15:21
3 5D	4	444	14443	7/1/2009 15:12	7/1/2009 15:16
4 5D	4	414	13954	7/1/2009 15:07	7/1/2009 15:11
1 6A	4	272	14018	7/1/2009 15:27	7/1/2009 15:31
2 6A	3.5	246	12283	7/1/2009 15:40	7/1/2009 15:44
3 6A	3.5	231	12111	7/1/2009 15:36	7/1/2009 15:40
4 6A	3.5	229	11598	7/1/2009 15:32	7/1/2009 15:35
1 6B	3.5	540	12151	7/1/2009 15:32	7/1/2009 15:36
2 6B	4	592	14371	7/1/2009 15:27	7/1/2009 15:31
3 6B	3.5	498	11705	7/1/2009 15:40	7/1/2009 15:44
4 6B	3.5	498	11388	7/1/2009 15:36	7/1/2009 15:40
1 6C	3.5	462	12161	7/1/2009 15:36	7/1/2009 15:40
2 6C	3.5	468	12083	7/1/2009 15:32	7/1/2009 15:36
3 6C	4	534	13638	7/1/2009 15:27	7/1/2009 15:31
4 6C	3.5	455	11218	7/1/2009 15:40	7/1/2009 15:44
1 6D	3.5	456	11987	7/1/2009 15:40	7/1/2009 15:44
2 6D	3.5	468	12183	7/1/2009 15:36	7/1/2009 15:40
3 6D	3.5	496	11882	7/1/2009 15:32	7/1/2009 15:36
4 6D	4	525	13018	7/1/2009 15:27	7/1/2009 15:31
1 7A	3.5	466	12007	7/1/2009 15:46	7/1/2009 15:50
2 7A	3.5	491	11655	7/1/2009 16:00	7/1/2009 16:04
3 7A	3.5	444	11445	7/1/2009 15:56	7/1/2009 15:59
4 7A	3.5	477	11121	7/1/2009 15:50	7/1/2009 15:54
1 7B	3.5	418	11968	7/1/2009 15:51	7/1/2009 15:54
2 7B	3.5	448	12050	7/1/2009 15:46	7/1/2009 15:50
3 7B	3.5	460	11675	7/1/2009 16:00	7/1/2009 16:04

4 7B	3.5	413	11271	7/1/2009 15:56	7/1/2009 16:00
1 7C	3.5	471	11781	7/1/2009 15:56	7/1/2009 16:00
2 7C	3.5	457	11760	7/1/2009 15:51	7/1/2009 15:54
3 7C	3.5	454	11766	7/1/2009 15:46	7/1/2009 15:50
4 7C	3.5	406	10888	7/1/2009 16:00	7/1/2009 16:04
1 7D	3.5	359	11605	7/1/2009 16:00	7/1/2009 16:04
2 7D	3.5	391	11920	7/1/2009 15:56	7/1/2009 16:00
3 7D	3.5	386	11933	7/1/2009 15:51	7/1/2009 15:55
4 7D	3.5	400	11305	7/1/2009 15:46	7/1/2009 15:50
1 8A	3.5	348	11673	7/1/2009 16:06	7/1/2009 16:09
2 8A	3.5	340	11172	7/1/2009 16:19	7/1/2009 16:22
3 8A	3.5	298	11258	7/1/2009 16:15	7/1/2009 16:18
4 8A	3.5	327	10977	7/1/2009 16:10	7/1/2009 16:13
1 8B	3.5	124	11583	7/1/2009 16:10	7/1/2009 16:13
2 8B	3.5	112	11758	7/1/2009 16:06	7/1/2009 16:09
3 8B	3.5	110	11499	7/1/2009 16:19	7/1/2009 16:23
4 8B	3.5	102	10844	7/1/2009 16:15	7/1/2009 16:18
1 8C	3.5	202	11539	7/1/2009 16:15	7/1/2009 16:18
2 8C	3.5	196	11774	7/1/2009 16:10	7/1/2009 16:14
3 8C	3.5	203	11611	7/1/2009 16:06	7/1/2009 16:09
4 8C	3.5	207	10809	7/1/2009 16:19	7/1/2009 16:23
1 8D	3.5	240	11301	7/1/2009 16:19	7/1/2009 16:23
2 8D	3.5	248	11412	7/1/2009 16:15	7/1/2009 16:18
3 8D	3.5	233	11660	7/1/2009 16:10	7/1/2009 16:14
4 8D	3.5	235	10918	7/1/2009 16:06	7/1/2009 16:10
1 9A	3.5	39	11605	7/1/2009 16:24	7/1/2009 16:28
2 9A	3.5	49	11281	7/1/2009 16:42	7/1/2009 16:46
3 9A	3.5	47	11301	7/1/2009 16:33	7/1/2009 16:36
4 9A	3.5	64	10987	7/1/2009 16:29	7/1/2009 16:32
1 9B	3.5	53	11151	7/1/2009 16:29	7/1/2009 16:32
2 9B	3.5	39	11462	7/1/2009 16:24	7/1/2009 16:28
3 9B	3.5	45	11004	7/1/2009 16:42	7/1/2009 16:46
4 9B	3.5	51	10581	7/1/2009 16:33	7/1/2009 16:36
1 9C	3.5	49	11026	7/1/2009 16:33	7/1/2009 16:36
2 9C	3.5	49	11281	7/1/2009 16:29	7/1/2009 16:32
3 9C	3.5	40	11016	7/1/2009 16:24	7/1/2009 16:28
4 9C	3.5	60	10297	7/1/2009 16:42	7/1/2009 16:46
1 9D	3.5	65	11135	7/1/2009 16:38	7/1/2009 16:41
2 9D	3.5	53	11412	7/1/2009 16:33	7/1/2009 16:37
3 9D	3.5	54	11340	7/1/2009 16:29	7/1/2009 16:32
4 9D	3.5	77	10912	7/1/2009 16:24	7/1/2009 16:28
1 10A	3.5	71	10991	7/1/2009 16:47	7/1/2009 16:51
2 10A	4	106	11959	7/1/2009 17:12	7/1/2009 17:16
3 10A	3.5	70	10553	7/1/2009 16:58	7/1/2009 17:01
4 10A	3.5	95	10338	7/1/2009 16:53	7/1/2009 16:56
1 10B	4	139	11110	7/1/2009 17:03	7/1/2009 17:07
2 10B	3.5	102	10812	7/1/2009 16:47	7/1/2009 16:51
3 10B	4	103	11422	7/1/2009 17:12	7/1/2009 17:16
4 10B	3.5	110	9967	7/1/2009 16:58	7/1/2009 17:01
1 10C	3.5	74	10482	7/1/2009 16:58	7/1/2009 17:01
2 10C	3.5	79	10535	7/1/2009 16:53	7/1/2009 16:57
3 10C	3.5	87	10723	7/1/2009 16:47	7/1/2009 16:51

4 10C	4	95	11066	7/1/2009 17:13	7/1/2009 17:17
1 10D	4	102	12021	7/1/2009 17:13	7/1/2009 17:17
2 10D	3.5	75	10614	7/1/2009 16:58	7/1/2009 17:01
3 10D	3.5	78	10643	7/1/2009 16:53	7/1/2009 16:57
4 10D	3.5	81	10064	7/1/2009 16:48	7/1/2009 16:51
1 11A	3	31	14773	7/1/2009 11:56	7/1/2009 11:59
2 11A	3	23	14429	7/1/2009 12:08	7/1/2009 12:11
3 11A	3	33	14454	7/1/2009 12:04	7/1/2009 12:07
4 11A	3	49	14013	7/1/2009 12:00	7/1/2009 12:03
1 11B	3	43	16203	7/1/2009 12:00	7/1/2009 12:03
2 11B	3	53	16106	7/1/2009 11:56	7/1/2009 11:59
3 11B	3	46	15643	7/1/2009 12:08	7/1/2009 12:11
4 11B	3	42	15133	7/1/2009 12:04	7/1/2009 12:07
1 11C	3	27	15637	7/1/2009 12:04	7/1/2009 12:07
2 11C	3	38	15919	7/1/2009 12:00	7/1/2009 12:03
3 11C	3	33	16452	7/1/2009 11:56	7/1/2009 11:59
4 11C	3	46	14887	7/1/2009 12:08	7/1/2009 12:11
1 11D	3	43	15607	7/1/2009 12:08	7/1/2009 12:11
2 11D	3	42	15944	7/1/2009 12:04	7/1/2009 12:07
3 11D	3	32	16098	7/1/2009 12:00	7/1/2009 12:03
4 11D	3	39	15191	7/1/2009 11:56	7/1/2009 11:59
1 12A	3	29	15450	7/1/2009 12:15	7/1/2009 12:18
2 12A	3	28	15016	7/1/2009 12:28	7/1/2009 12:31
3 12A	3	31	14984	7/1/2009 12:24	7/1/2009 12:27
4 12A	3	46	14530	7/1/2009 12:20	7/1/2009 12:23
1 12B	3	26	15404	7/1/2009 12:20	7/1/2009 12:23
2 12B	3	31	15607	7/1/2009 12:15	7/1/2009 12:18
3 12B	3	34	15060	7/1/2009 12:28	7/1/2009 12:31
4 12B	3	49	14553	7/1/2009 12:24	7/1/2009 12:27
1 12C	3	24	15183	7/1/2009 12:24	7/1/2009 12:27
2 12C	3	44	15651	7/1/2009 12:20	7/1/2009 12:23
3 12C	3	46	15216	7/1/2009 12:15	7/1/2009 12:18
4 12C	3	60	14117	7/1/2009 12:28	7/1/2009 12:31
1 12D	3	48	15174	7/1/2009 12:28	7/1/2009 12:31
2 12D	3	37	15137	7/1/2009 12:24	7/1/2009 12:27
3 12D	3	25	15418	7/1/2009 12:20	7/1/2009 12:23
4 12D	3	59	14566	7/1/2009 12:15	7/1/2009 12:18
1 13A	3	50	15230	7/1/2009 12:33	7/1/2009 12:36
2 13A	3	36	14784	7/1/2009 12:50	7/1/2009 12:53
3 13A	3	41	14851	7/1/2009 12:41	7/1/2009 12:44
4 13A	3	49	14183	7/1/2009 12:37	7/1/2009 12:40
1 13B	3	39	15625	7/1/2009 12:37	7/1/2009 12:40
2 13B	3	41	15450	7/1/2009 12:33	7/1/2009 12:36
3 13B	3	37	14689	7/1/2009 12:50	7/1/2009 12:53
4 13B	3	47	14377	7/1/2009 12:41	7/1/2009 12:44
1 13C	3	54	15426	7/1/2009 12:41	7/1/2009 12:44
2 13C	3	41	15315	7/1/2009 12:37	7/1/2009 12:40
3 13C	3	36	15288	7/1/2009 12:33	7/1/2009 12:36
4 13C	3	34	14222	7/1/2009 12:50	7/1/2009 12:53
1 13D	3	47	14492	7/1/2009 12:50	7/1/2009 12:53
2 13D	3	50	14858	7/1/2009 12:46	7/1/2009 12:49
3 13D	3	43	14873	7/1/2009 12:37	7/1/2009 12:40

4 13D	3	47	14389	7/1/2009 12:33	7/1/2009 12:36
1 14A	3	44	14463	7/1/2009 12:54	7/1/2009 12:57
2 14A	3	41	14137	7/1/2009 13:17	7/1/2009 13:20
3 14A	3	45	14022	7/1/2009 13:13	7/1/2009 13:16
4 14A	3	51	13451	7/1/2009 13:02	7/1/2009 13:05
1 14B	3	42	14039	7/1/2009 13:01	7/1/2009 13:04
2 14B	3	36	14398	7/1/2009 12:54	7/1/2009 12:57
3 14B	3	47	13475	7/1/2009 13:17	7/1/2009 13:20
4 14B	3	47	13077	7/1/2009 13:13	7/1/2009 13:16
1 14C	3	26	14116	7/1/2009 13:12	7/1/2009 13:15
2 14C	3	35	14187	7/1/2009 13:02	7/1/2009 13:05
3 14C	3	37	14409	7/1/2009 12:55	7/1/2009 12:58
4 14C	3	38	13229	7/1/2009 13:17	7/1/2009 13:20
1 14D	3	16	13927	7/1/2009 13:17	7/1/2009 13:20
2 14D	3	32	14089	7/1/2009 13:12	7/1/2009 13:15
3 14D	3	16	13912	7/1/2009 13:02	7/1/2009 13:05
4 14D	3	47	13545	7/1/2009 12:55	7/1/2009 12:58

Radium-228 Liquid

Filename : RA228.XLS
Spike S/N : N/A
Spike Exp Date : N/A
Spike Activity (dpm/ml) : N/A
Spike Volume Added : N/A
LCS S/N : 0503-B
LCS Exp Date : 9/13/2009
LCS Activity (dpm/ml) : 182.42
LCS Volume Added : 2.00
Batch : 595514
Analyst : AFI
Prep Date : 7/1/2009
Re-228 Abundance : 1
Re-228 Method Uncertainty : 0.0784
Calibration Date : 6/2/2008
Calibration Due Date : 6/30/2009
Tracer S/N : 0112-J
Tracer Exp Date : 2/17/2010
Tracer Volume Added : 0.10

Pipet, 0.1 ml Stdev : +/- 0.000701 ml
Pipet, 0.5 ml Stdev : +/- 0.002564 ml
Pipet, 1 ml Stdev : +/- 0.005480 ml
Procedure Code : GFC90SRL
Pararmine : Radium-228
Required MDA : 1 pCi/L
Half-life of Re-228 : 5.75 years
Half-life of Ac-228 : 6.13 hours
Batch counted on : PIC
BKG Count time : 500 min

Table with columns: Pos., Sample Characteristics, Sample Aliquot, Sample Date/Time, Counting Time, Detector ID, Count raw Data, Gross Counts, Beta, Detector Efficiency Error, Weekly Bkg Count, Separation Date/Time, Count Start Date/Time, Ra-228 Decay, Ac-228 Correction, Calculated Sample Recovery %, Sample Recovery Error %, Results Pos.

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Notes:

- 1 - Results are decay corrected to Sample Date/Time
- 2 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date
- 3 - Spike Normalis are decay corrected to Sample Date/Time

* indicates results calculated at 100% recovery

Decision Level	Critical Level	Required MDA	MDA	Sample Act. Conc.		Sample Error	Net Count Rate	Net Count Rate	Net Count Rate	2 SIGMA Counting		Total Prop. Uncertainty	Sample Type	Nominal pCi/L	Recovery
				pCi/L	Conc.					CPM	CPM				
0.3471	0.2451	1	0.6937	134.0279	0.0254	131.6880	2.9666	5.9178	21.6466	LCS	164.3409	81.6%			
0.3647	0.2575	1	0.7192	133.0399	0.0251	130.2580	2.9508	5.9071	21.4655	LCS	164.3409	81.0%			
0.5889	0.3790	1	0.9659	145.2921	0.0243	139.8173	3.0611	6.2347	23.3752	LCS	164.3409	88.4%			
0.4695	0.3314	1	0.8755	159.8828	0.0239	150.4760	3.1730	6.6057	25.6756	LCS	164.3409	97.3%			
0.4261	0.3008	1	0.8097	127.0000	0.0257	122.0633	2.8583	5.8279	20.5368	LCS	164.3409	77.3%			
0.7599	0.5395	1	1.2813	141.0616	0.0247	135.4387	3.0211	6.1673	22.7300	LCS	164.3409	85.8%			
0.3798	0.2681	1	0.7515	141.8559	0.0253	131.7993	2.9681	6.2613	22.9053	LCS	164.3409	86.3%			
0.4150	0.2830	1	0.8072	145.8182	0.0251	131.8887	2.9696	6.4352	23.5274	LCS	164.3409	88.7%			
0.6347	0.4481	1	1.1943	129.9854	0.0284	108.9047	2.7042	6.3116	21.1935	LCS	164.3409	78.9%			
0.9035	0.6379	1	1.5022	135.4510	0.0266	119.6900	2.8455	6.3115	21.9803	LCS	164.3409	82.4%			
0.6078	0.4291	1	1.0779	141.2594	0.0255	128.6447	2.9382	6.3235	22.8259	LCS	164.3409	86.0%			
0.5473	0.3864	1	0.9987	155.5960	0.0247	137.7700	3.0378	6.7244	25.0636	LCS	164.3409	94.7%			
0.6283	0.4436	1	1.1054	135.5336	0.0264	124.2433	2.8986	6.1761	21.9739	LCS	164.3409	83.3%			
0.9036	0.6378	1	1.4942	136.9155	0.0254	125.4287	2.9134	6.2333	22.1127	LCS	164.3409	88.8%			
0.7676	0.5419	1	1.3079	145.9826	0.0252	130.3400	2.9624	6.5032	23.5621	LCS	164.3409	90.0%			
0.7520	0.5309	1	1.3000	147.9661	0.0269	124.2633	2.8910	6.7471	24.0105	LCS	164.3409	82.1%			
0.4809	0.3395	1	0.9027	134.9611	0.0268	120.7040	2.8427	6.2312	21.9265	LCS	164.3409	80.0%			
0.8974	0.4924	1	1.2076	131.4742	0.0271	117.9500	2.8170	6.1544	21.3797	LCS	164.3409	89.0%			
0.6530	0.4610	1	1.1419	148.2299	0.0259	132.9873	2.9894	6.4406	23.6659	LCS	164.3409	95.2%			
0.7661	0.5409	1	1.3064	156.3706	0.0255	139.2187	3.0605	6.7377	25.2668	LCS	164.3409	81.7%			
0.6899	0.4871	1	1.1997	134.1863	0.0270	118.9960	2.8288	6.2523	21.8127	LCS	164.3409	83.4%			
0.6079	0.4292	1	1.0862	137.0396	0.0269	120.3027	2.8412	6.3436	22.2643	LCS	164.3409	88.8%			
0.9509	0.6713	1	1.5725	146.0056	0.0264	127.0307	2.9317	6.6044	23.6775	LCS	164.3409	88.0%			
0.4376	0.3090	1	0.8562	144.5849	0.0276	113.7227	2.7577	6.3903	21.8573	LCS	164.3409	89.8%			
0.4227	0.2984	1	0.8330	134.2390	0.0275	118.4887	2.8152	6.4094	22.3723	LCS	164.3409	92.4%			
0.4360	0.3079	1	0.8480	137.6373	0.0270	118.4887	2.8152	6.7858	24.6088	LCS	164.3409	92.6%			
0.3962	0.2787	1	0.7956	151.8935	0.0262	128.6313	2.9319	6.6518	23.4785	LCS	164.3409	77.8%			
0.4480	0.3163	1	0.8657	152.1131	0.0261	130.4707	2.9539	6.7489	24.6318	LCS	164.3409	82.2%			
0.6932	0.4470	1	1.1278	127.8251	0.0279	109.4120	2.7108	6.2072	20.8618	LCS	164.3409	89.2%			
0.8917	0.6931	1	1.6167	135.1471	0.0273	117.2540	2.8197	6.3699	21.9896	LCS	164.3409	86.1%			
0.5779	0.4080	1	1.0463	146.5864	0.0263	127.3240	2.9214	6.5922	23.7610	LCS	164.3409	86.1%			
0.8422	0.5946	1	1.4301	141.4935	0.0272	117.4880	2.8147	6.6441	23.0149	LCS	164.3409	79.4%			
0.4379	0.3091	1	0.8509	130.5505	0.0276	112.2200	2.7400	6.2478	21.2682	LCS	164.3409	81.4%			
0.7972	0.5629	1	1.3635	133.7974	0.0277	112.5273	2.7540	6.4182	21.9026	LCS	164.3409	87.8%			
0.4475	0.3159	1	0.8728	144.2924	0.0269	119.7633	2.8301	6.6832	23.4437	LCS	164.3409	91.8%			
0.8154	0.5757	1	1.3863	150.8313	0.0263	128.3747	2.9406	6.7718	24.4459	LCS	164.3409	81.8%			
0.4063	0.2868	1	0.8104	134.4151	0.0285	119.5507	2.7553	6.3927	21.8871	LCS	164.3409	82.2%			
0.4205	0.2969	1	0.8358	146.9063	0.0268	121.4093	2.8489	6.7565	23.8548	LCS	164.3409	89.4%			
0.4437	0.3182	1	0.8728	144.8386	0.0271	117.5853	2.8041	6.7699	23.5500	LCS	164.3409	86.1%			
0.3432	0.2423	1	0.6763	135.4546	0.0253	141.3227	3.0730	5.7736	21.8705	LCS	164.3409	80.1%			
0.3289	0.2322	1	0.6397	131.8931	0.0247	150.2887	3.1684	5.4434	21.2189	LCS	164.3409	80.1%			
0.2949	0.2082	1	0.5922	148.9038	0.0237	169.2980	3.3626	5.7929	23.8966	LCS	164.3409	92.4%			
0.3379	0.2385	1	0.6530	151.8473	0.0235	172.6707	3.3968	5.8549	24.3615	LCS	164.3409	80.1%			
0.4616	0.3400	1	0.8577	131.6889	0.0249	148.2120	3.2186	5.4891	21.2301	LCS	164.3409	82.1%			
0.7498	0.5287	1	1.2332	134.8566	0.0246	153.3873	3.3053	5.6483	21.7215	LCS	164.3409	90.6%			
0.4447	0.3140	1	0.8052	148.8317	0.0238	167.9907	3.3535	5.8232	23.8982	LCS	164.3409	87.8%			
0.6180	0.4363	1	1.0494	143.9479	0.0241	162.8880	3.3080	5.7315	23.1384	LCS	164.3409	90.6%			
0.3427	0.2420	1	0.6680	135.0873	0.0248	148.3533	3.1490	5.6202	21.7752	LCS	164.3409	82.2%			
0.5997	0.4234	1	1.0256	129.5009	0.0251	144.7940	3.1202	5.4687	20.8960	LCS	164.3409	78.9%			
0.3316	0.2341	1	0.6469	146.0021	0.0240	163.4967	3.3053	5.7852	23.4616	LCS	164.3409	88.8%			
0.6355	0.4487	1	1.0805	159.6717	0.0235	174.3747	3.4225	6.1425	25.6134	LCS	164.3409	97.2%			
0.3136	0.2214	1	0.6255	132.0625	0.0251	144.5507	3.1078	5.5650	21.3060	LCS	164.3409	80.4%			
1.4618	1.0321	1	2.2506	135.6135	0.0254	145.4707	3.1861	5.8215	22.7970	LCS	164.3409	86.2%			
0.3185	0.2249	1	0.6330	141.6298	0.0245	154.5427	3.2193	5.7718	21.9090	LCS	164.3409	86.2%			
0.3327	0.2349	1	0.6546	146.7439	0.0242	158.8520	3.2579	5.8988	23.6017	LCS	164.3409	89.3%			

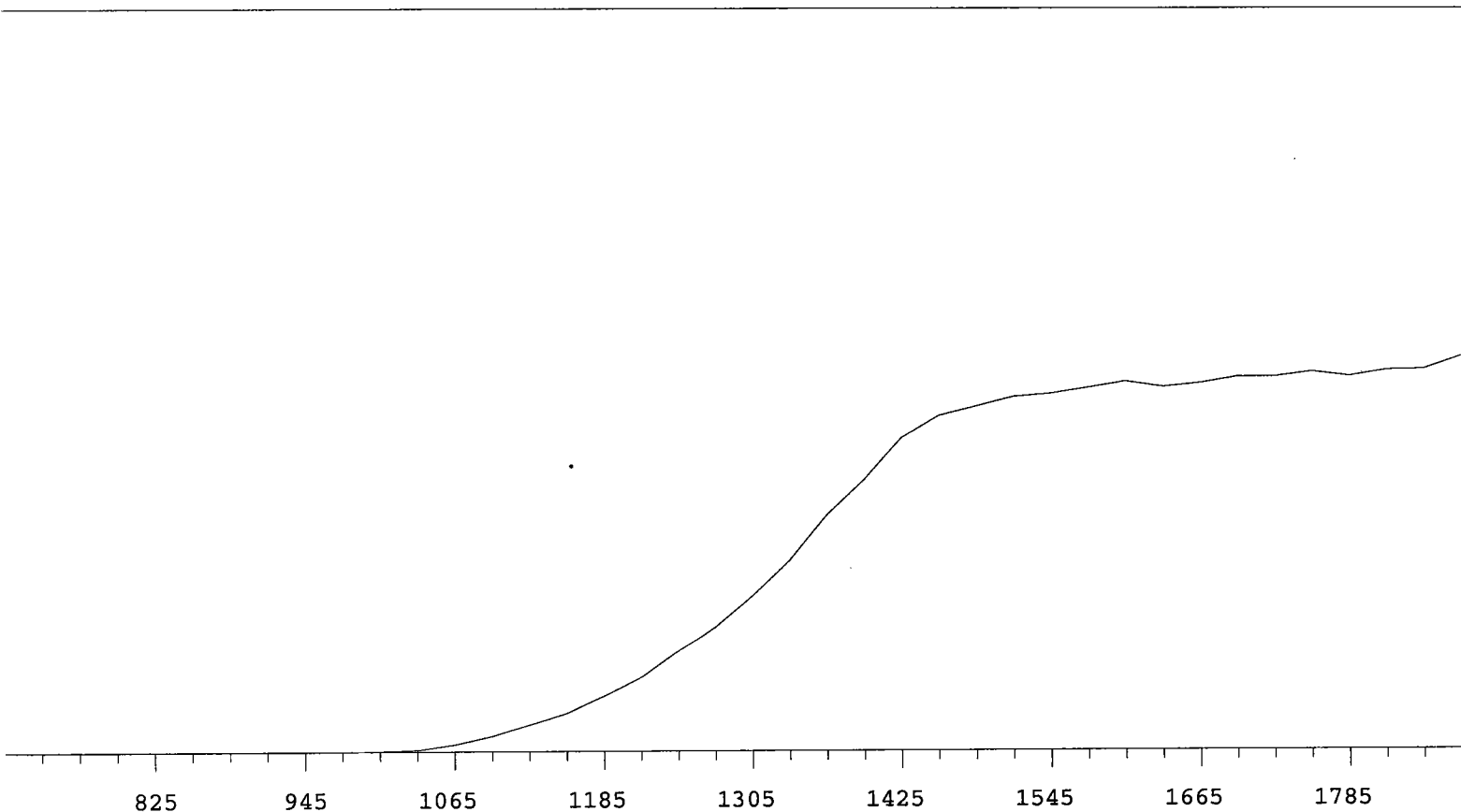
SampleID	Instr	Time (min.)	Alpha Counts	Beta Counts	Count Start Time	Count End Time	Machine
1	1A	15	36	1980	7/2/2009 8:39	7/2/2009 8:54	Protean
2	1B	15	27	1959	7/2/2009 8:40	7/2/2009 8:55	Protean
3	1C	15	44	2108	7/2/2009 8:40	7/2/2009 8:55	Protean
4	1D	15	108	2265	7/2/2009 8:40	7/2/2009 8:55	Protean
5	2A	15	69	1838	7/2/2009 8:40	7/2/2009 8:55	Protean
6	2B	15	8	2053	7/2/2009 8:40	7/2/2009 8:55	Protean
7	2C	15	96	1982	7/2/2009 8:40	7/2/2009 8:55	Protean
8	2D	15	93	1984	7/2/2009 9:08	7/2/2009 9:23	Protean
1	3A	15	233	1645	7/2/2009 9:08	7/2/2009 9:23	Protean
2	3B	15	99	1821	7/2/2009 9:08	7/2/2009 9:23	Protean
3	3C	15	96	1942	7/2/2009 9:08	7/2/2009 9:23	Protean
4	3D	15	90	2076	7/2/2009 9:08	7/2/2009 9:23	Protean
5	4A	15	79	1877	7/2/2009 9:08	7/2/2009 9:23	Protean
6	4B	15	13	1909	7/2/2009 9:08	7/2/2009 9:23	Protean
7	4C	15	97	1974	7/2/2009 9:09	7/2/2009 9:24	Protean
8	4D	15	181	1880	7/2/2009 9:25	7/2/2009 9:40	Protean
1	5A	15	53	1818	7/2/2009 9:26	7/2/2009 9:41	Protean
2	5B	15	59	1785	7/2/2009 9:26	7/2/2009 9:41	Protean
3	5C	15	43	2009	7/2/2009 9:26	7/2/2009 9:41	Protean
4	5D	15	59	2107	7/2/2009 9:26	7/2/2009 9:41	Protean
5	6A	15	35	1800	7/2/2009 9:27	7/2/2009 9:42	Protean
6	6B	15	71	1816	7/2/2009 9:27	7/2/2009 9:42	Protean
7	6C	15	81	1933	7/2/2009 9:27	7/2/2009 9:42	Protean
8	6D	15	81	1826	7/2/2009 9:47	7/2/2009 10:02	Protean
1	7A	15	75	1711	7/2/2009 9:48	7/2/2009 10:03	Protean
2	7B	15	59	1783	7/2/2009 9:48	7/2/2009 10:03	Protean
3	7C	15	74	1934	7/2/2009 9:48	7/2/2009 10:03	Protean
4	7D	15	83	1963	7/2/2009 9:48	7/2/2009 10:03	Protean
5	8A	15	49	1653	7/2/2009 9:48	7/2/2009 10:03	Protean
6	8B	15	20	1788	7/2/2009 9:48	7/2/2009 10:03	Protean
7	8C	15	34	1920	7/2/2009 9:48	7/2/2009 10:03	Protean
8	8D	15	45	1782	7/2/2009 10:07	7/2/2009 10:22	Protean
1	9A	15	17	1689	7/2/2009 10:06	7/2/2009 10:21	Protean
2	9B	15	13	1706	7/2/2009 10:06	7/2/2009 10:21	Protean
3	9C	15	13	1802	7/2/2009 10:06	7/2/2009 10:21	Protean
4	9D	15	15	1945	7/2/2009 10:06	7/2/2009 10:21	Protean
5	10A	15	10	1708	7/2/2009 10:07	7/2/2009 10:22	Protean
6	10B	15	19	1743	7/2/2009 10:07	7/2/2009 10:22	Protean
7	10C	15	15	1826	7/2/2009 10:07	7/2/2009 10:22	Protean
8	10D	15	14	1769	7/2/2009 10:22	7/2/2009 10:37	Protean
1	11A	15	19	2125	7/2/2009 7:26	7/2/2009 7:41	Protean
2	11B	15	22	2260	7/2/2009 7:26	7/2/2009 7:41	Protean
3	11C	15	13	2544	7/2/2009 7:26	7/2/2009 7:41	Protean
4	11D	15	14	2596	7/2/2009 7:26	7/2/2009 7:41	Protean
5	12A	15	17	2235	7/2/2009 7:26	7/2/2009 7:41	Protean
6	12B	15	10	2330	7/2/2009 7:26	7/2/2009 7:41	Protean
7	12C	15	16	2530	7/2/2009 7:26	7/2/2009 7:41	Protean
8	12D	15	10	2463	7/2/2009 7:26	7/2/2009 7:41	Protean
1	13A	15	11	2231	7/2/2009 7:49	7/2/2009 8:04	Protean
2	13B	15	13	2190	7/2/2009 7:49	7/2/2009 8:04	Protean
3	13C	15	11	2458	7/2/2009 7:49	7/2/2009 8:04	Protean

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7/2/09

4	13D	15	12	2635	7/2/2009 7:50	7/2/2009 8:05	Protean
5	14A	15	11	2173	7/2/2009 7:50	7/2/2009 8:05	Protean
6	14B	15	11	2281	7/2/2009 7:50	7/2/2009 8:05	Protean
7	14C	15	14	2323	7/2/2009 7:50	7/2/2009 8:05	Protean
8	14D	15	14	2388	7/2/2009 7:50	7/2/2009 8:05	Protean

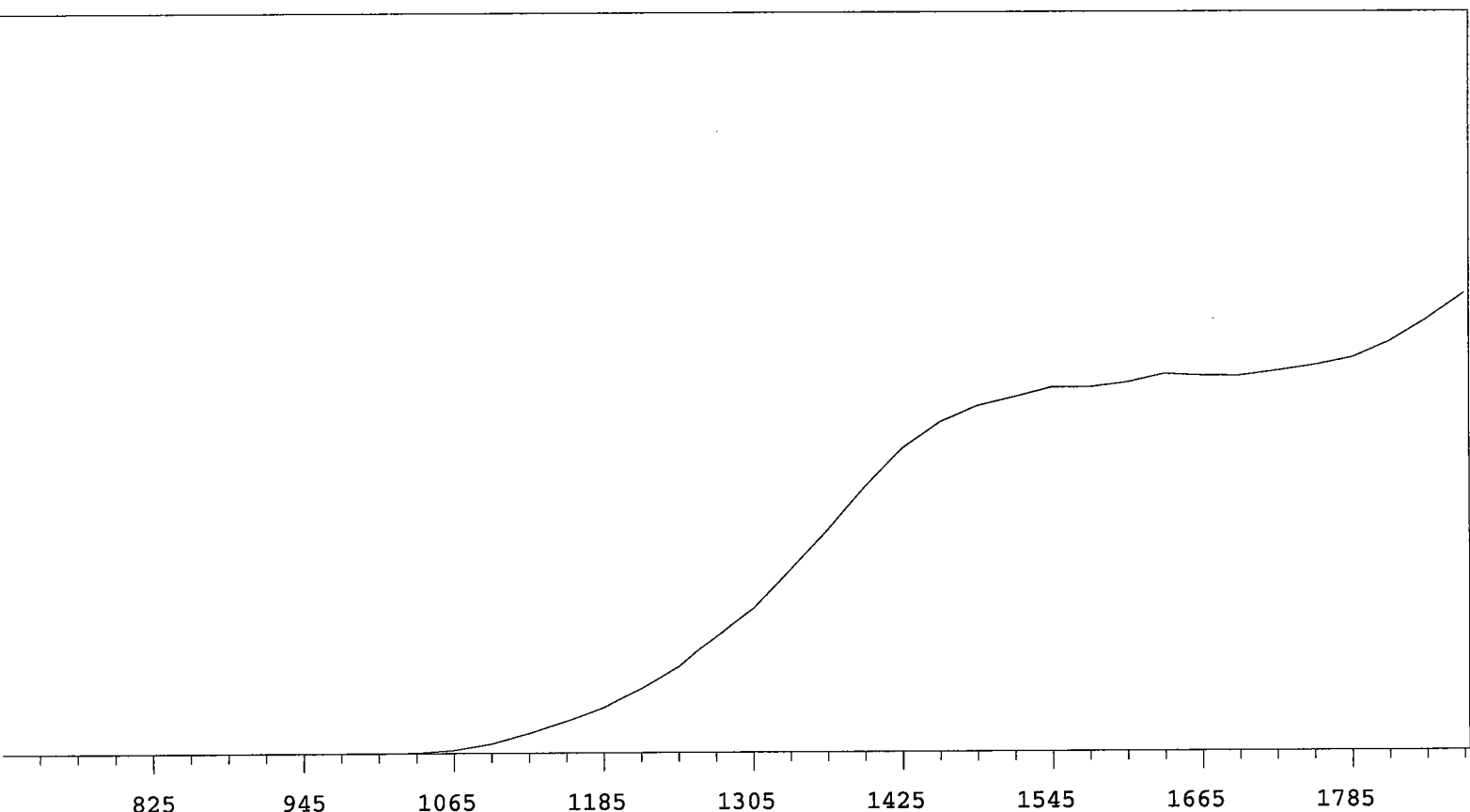
Ra-228 Protean	Cal Date A0	7/2/2009 A1	Exp Date A2	7/31/2009 A3	A4
1A	6.30258E-01				
1B	6.28221E-01				
1C	6.17615E-01				
1D	6.04341E-01				
2A	6.17224E-01				
2B	6.16681E-01				
2C	5.96919E-01				
2D	6.11886E-01				
3A	5.68218E-01				
3B	5.98041E-01				
3C	6.16431E-01				
3D	5.99405E-01				
4A	6.20765E-01				
4B	6.20459E-01				
4C	6.05183E-01				
4D	5.87325E-01				
5A	6.25790E-01				
5B	6.28027E-01				
5C	6.36802E-01				
5D	6.23741E-01				
6A	6.22050E-01				
6B	6.16280E-01				
6C	6.11053E-01				
6D	6.12043E-01				
7A	6.17961E-01				
7B	6.27962E-01				
7C	6.17791E-01				
7D	6.25720E-01				
8A	6.24723E-01				
8B	6.33167E-01				
8C	6.33890E-01				
8D	6.28089E-01				
9A	6.496412E-01				
9B	6.356321E-01				
9C	6.273008E-01				
9D	6.432553E-01				
10A	6.389066E-01				
10B	6.137441E-01				
10C	6.249999E-01				
10D	6.319781E-01				
11A	5.82502E-01				
11B	6.37172E-01				
11C	6.35171E-01				
11D	6.34840E-01				
12A	6.28566E-01				
12B	6.35234E-01				
12C	6.30366E-01				
12D	6.31956E-01				
13A	6.40953E-01				

13B	6.52643E-01
13C	6.53798E-01
13D	6.37701E-01
14A	6.39290E-01
14B	6.26611E-01
14C	6.37531E-01
14D	6.32609E-01



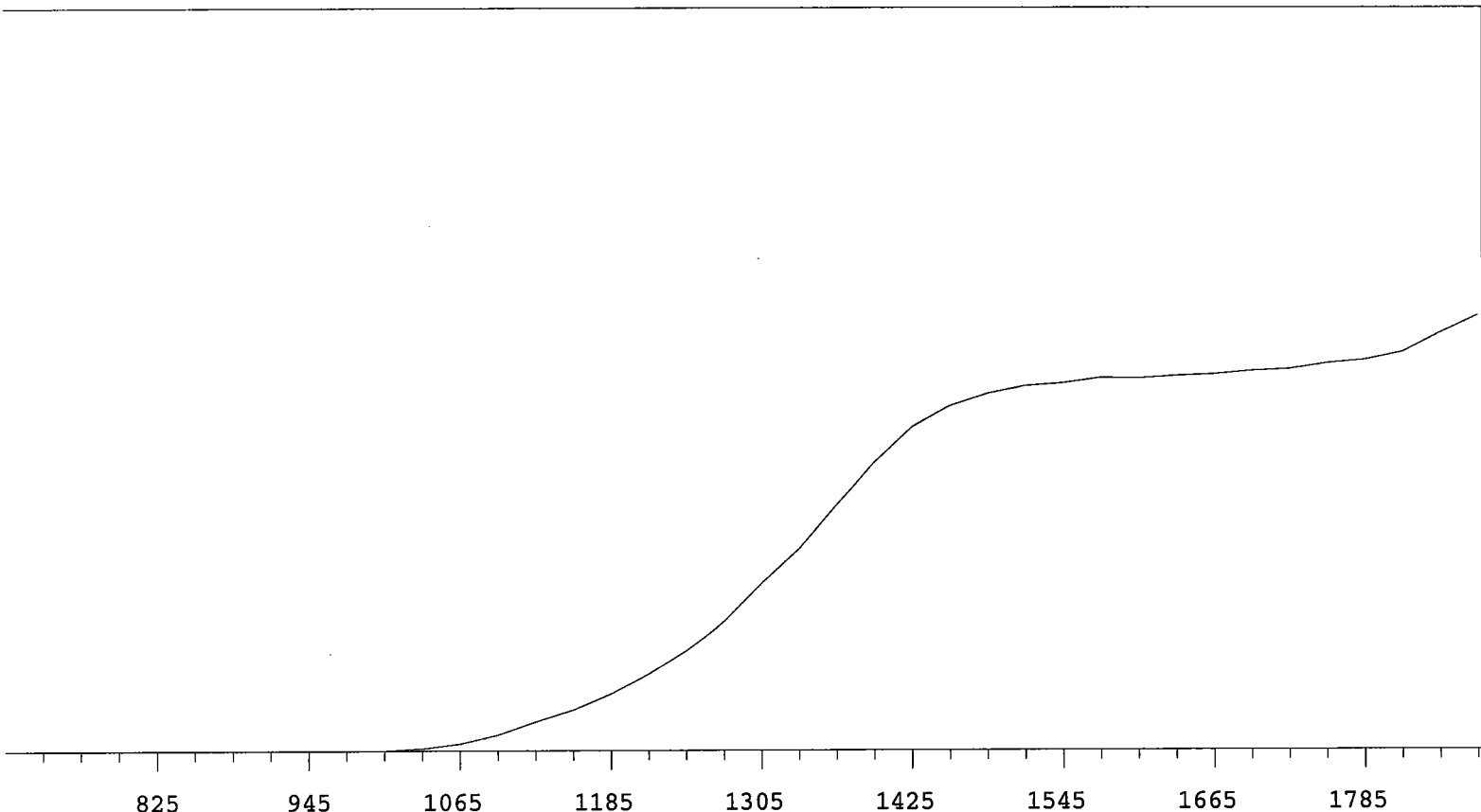
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	1		1305	11640	+69.78
735	1		1335	14241	+62.88
765	0		1365	17534	+55.91
795	0	+0.00	1395	20127	+45.04
825	0	>100	1425	23254	+31.29
855	1	>100	1455	24902	+20.41
885	0	+55.56	1485	25605	+10.49
915	2	+66.67	1515	26310	+6.44
945	0	>100	1545	26535	+5.31
975	2	>100	1575	26953	+2.79
1005	42	>100	1605	27399	+1.83
1035	145	>100	1635	27000	+1.71
1065	544	>100	1665	27255	+1.62
1095	1136	>100	1695	27723	+3.14
1125	1967	>100	1725	27705	+1.56
1155	2845	>100	1755	28072	+1.15
1185	4078	>100	1785	27729	+1.43
1215	5483	+93.18	1815	28194	+3.24
1245	7400	+83.35	1845	28243	
1275	9328	+75.40	1875	29191	

Alpha Volts: 1575 Beta Volts: 1575

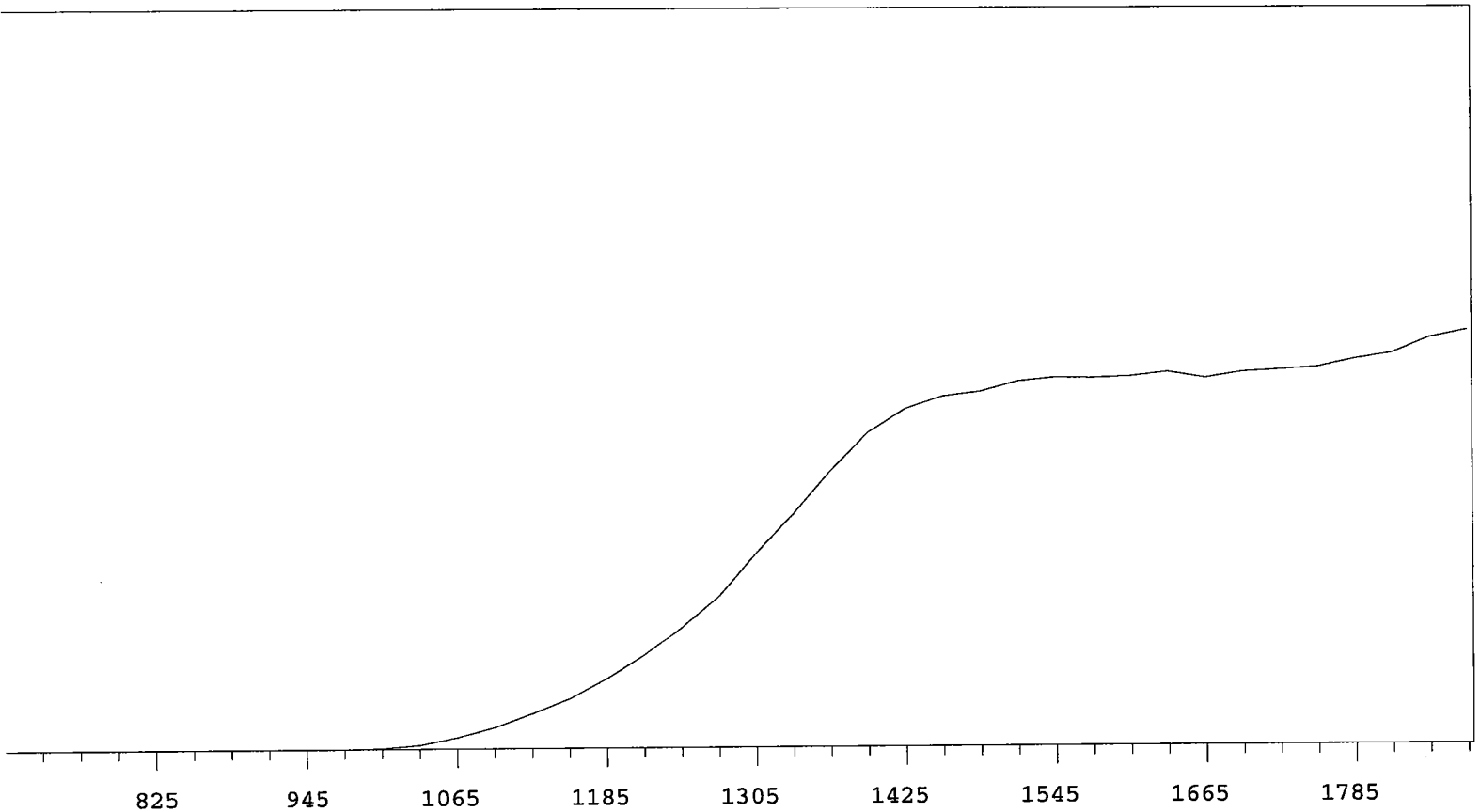


VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	1		1305	13188	+75.92
735	0		1335	16818	+67.60
765	0	+55.56	1365	20420	+59.86
795	1	+83.33	1395	24341	+47.85
825	1	+55.56	1425	27854	+35.51
855	0	>100	1455	30288	+23.26
885	1	+0.00	1485	31798	+14.54
915	0	+0.00	1515	32622	+8.32
945	1	>100	1545	33496	+5.11
975	0	>100	1575	33475	+4.43
1005	4	>100	1605	33903	+3.09
1035	56	>100	1635	34654	+2.46
1065	292	>100	1665	34485	+1.74
1095	890	>100	1695	34445	+1.84
1125	1841	>100	1725	34908	+3.91
1155	2936	>100	1755	35401	+6.80
1185	4179	>100	1785	36062	+10.27
1215	5837	>100	1815	37505	+14.30
1245	7821	+91.28	1845	39508	
1275	10638	+83.88	1875	41843	

Alpha Volts: 1575 Beta Volts: 1575



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	1		1305	14817	+71.06
735	0		1335	17823	+63.34
765	1	+0.00	1365	21704	+53.63
795	0	>100	1395	25422	+42.55
825	1	-55.56	1425	28424	+29.21
855	1	+55.56	1455	30244	+18.11
885	0	>100	1485	31305	+10.10
915	1	>100	1515	31989	+6.07
945	0	>100	1545	32223	+3.43
975	4	>100	1575	32671	+2.15
1005	32	>100	1605	32621	+1.68
1035	206	>100	1635	32837	+1.52
1065	639	>100	1665	32961	+2.01
1095	1416	>100	1695	33249	+2.64
1125	2551	>100	1725	33409	+3.21
1155	3619	>100	1755	33931	+4.07
1185	5037	+98.68	1785	34234	+7.20
1215	6875	+91.19	1815	34909	+10.28
1245	8915	+85.53	1845	36660	
1275	11519	+77.28	1875	38205	

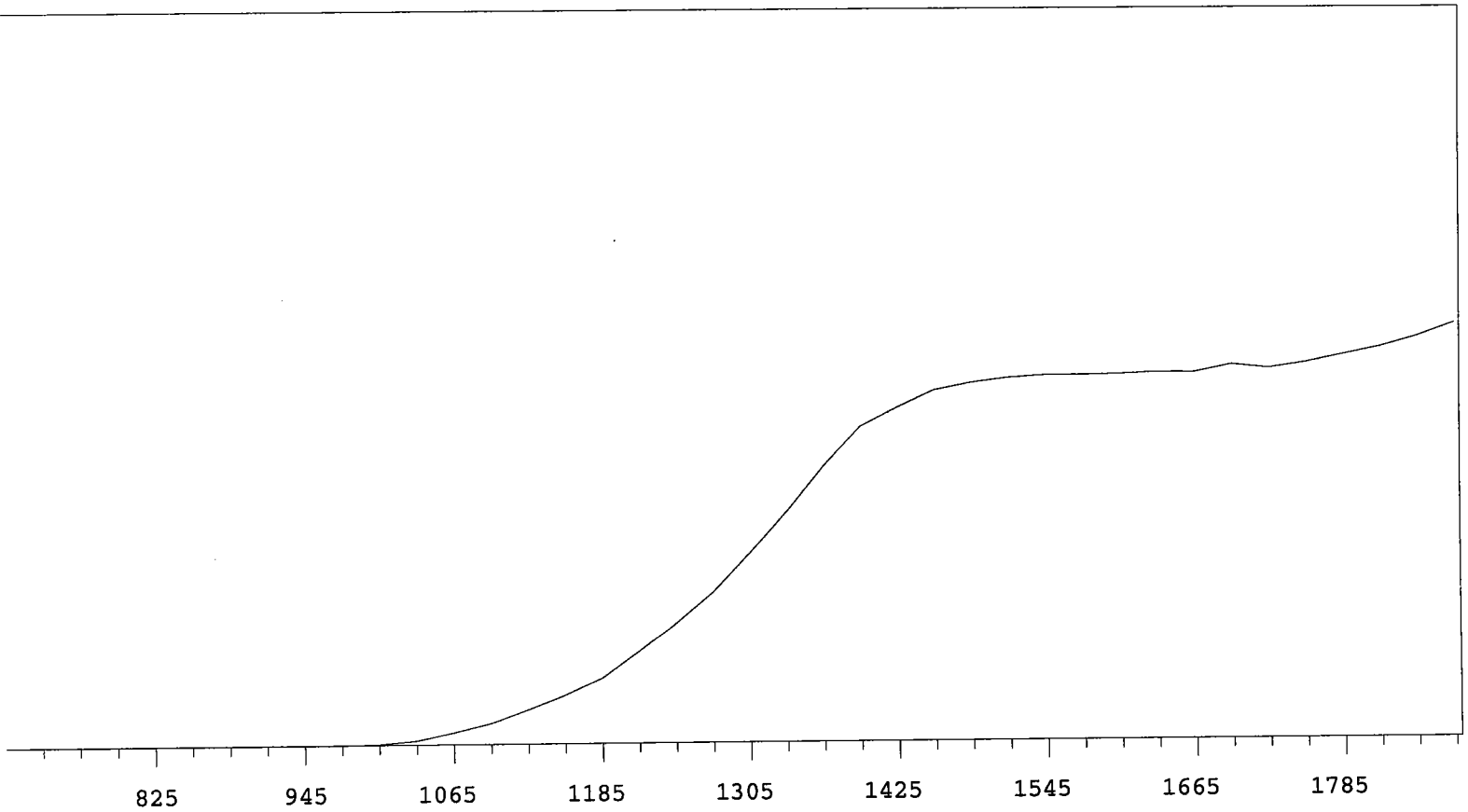


VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	15202	+66.36
735	1		1335	18216	+57.86
765	0	+0.00	1365	21597	+45.58
795	1	+0.00	1395	24648	+32.96
825	0	+0.00	1425	26505	+19.92
855	1	>100	1455	27475	+11.42
885	0	>100	1485	27836	+7.08
915	0	>100	1515	28609	+4.51
945	0	>100	1545	28896	+2.93
975	8	>100	1575	28862	+1.66
1005	75	>100	1605	28969	+0.36
1035	303	>100	1635	29292	+0.80
1065	872	>100	1665	28836	+1.06
1095	1656	>100	1695	29279	+1.48
1125	2729	>100	1725	29439	+3.59
1155	3862	>100	1755	29642	+4.07
1185	5425	+98.19	1785	30243	+6.51
1215	7256	+88.82	1815	30699	+7.79
1245	9510	+81.89	1845	31876	
1275	11944	+74.07	1875	32444	

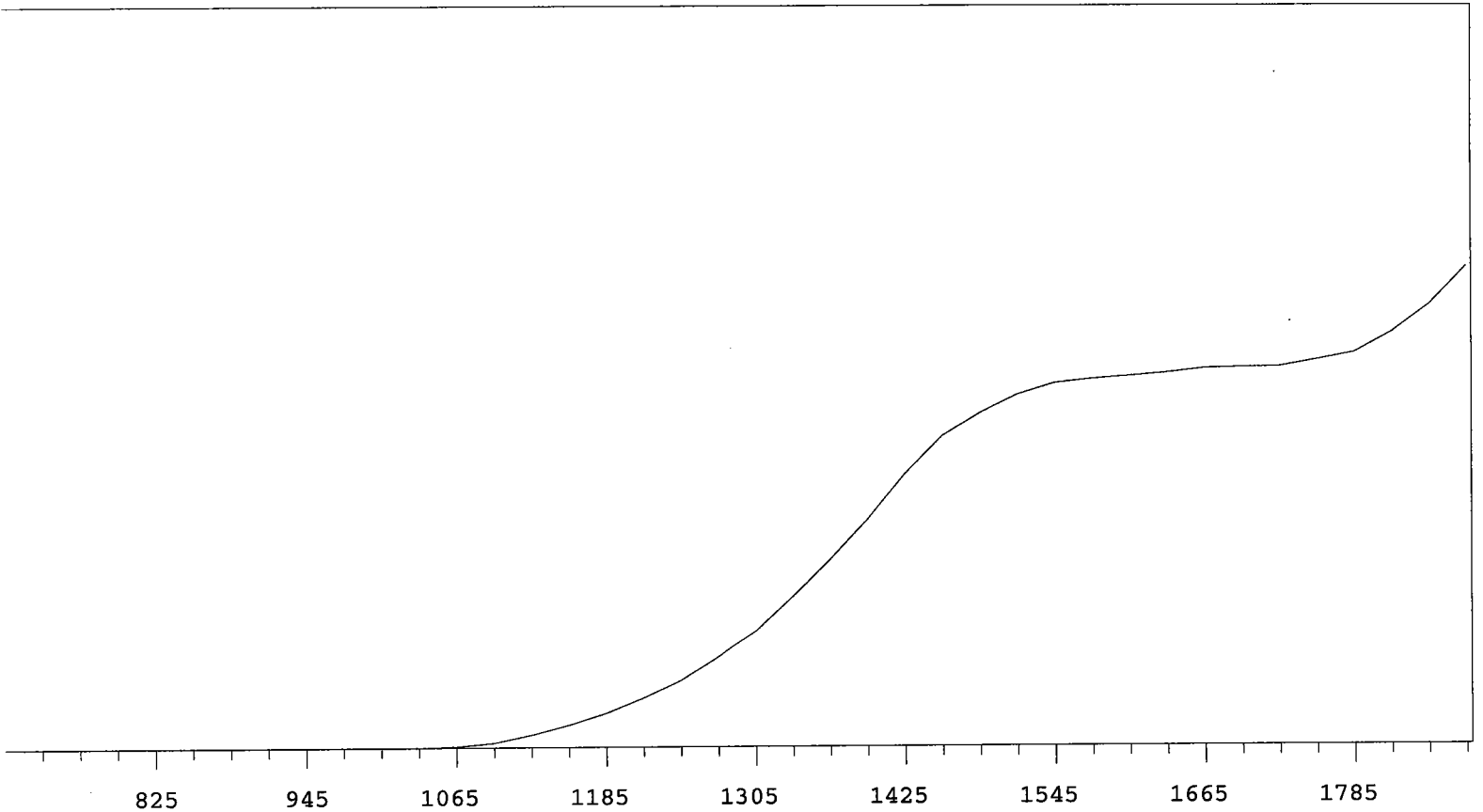
MPC 9600 Plateau
Alpha Volts: 705

Instrument 2 MPC 9604 Detector A
Beta Volts: 1575

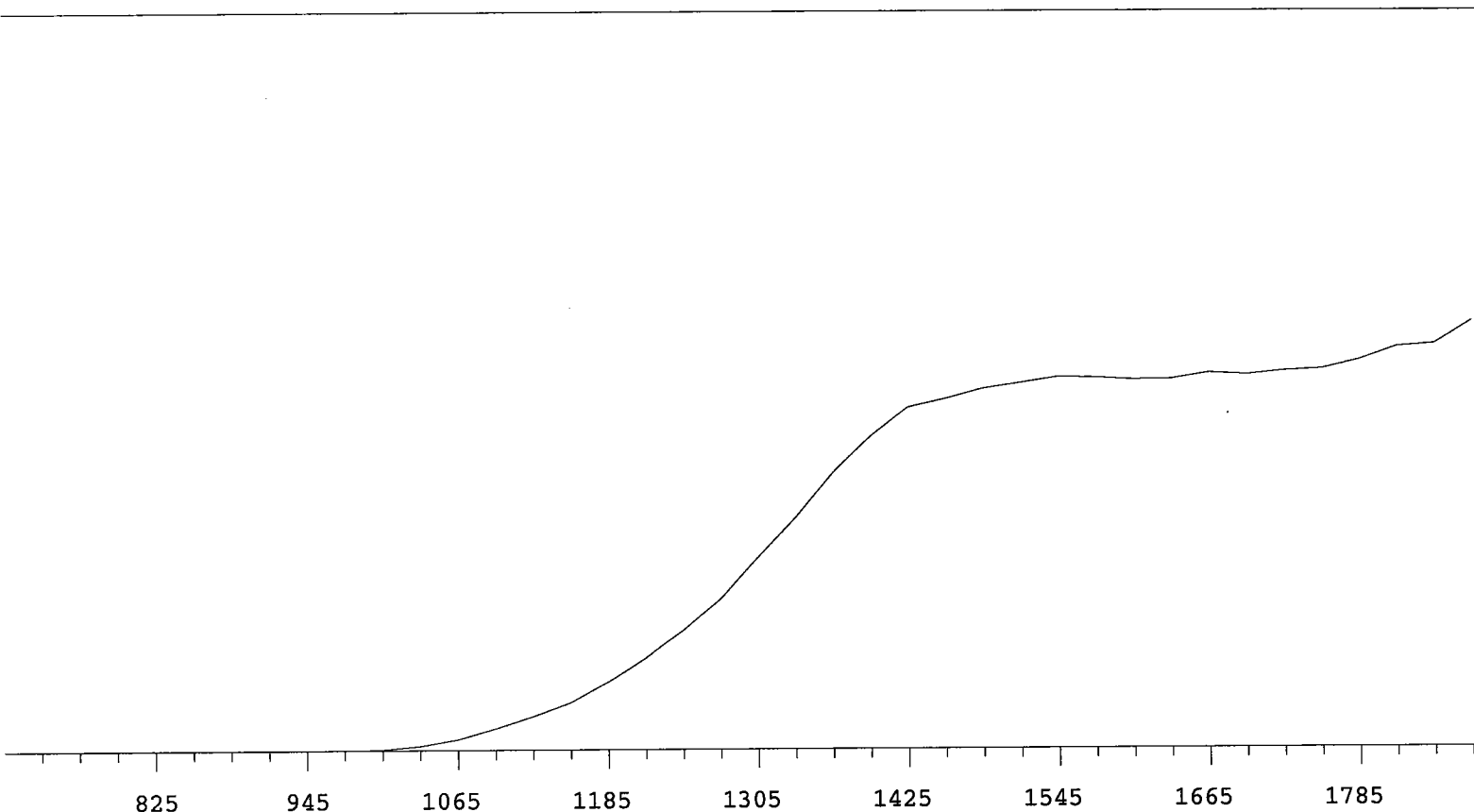
7/1/2009



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	19017	+67.45
735	1		1335	23157	+59.23
765	0	+83.33	1365	27625	+45.78
795	0	-83.33	1395	31465	+32.72
825	1	>100	1425	33352	+20.41
855	0	>100	1455	35084	+11.74
885	1	+100.00	1485	35819	+7.11
915	1	>100	1515	36292	+3.35
945	2	>100	1545	36527	+1.63
975	12	>100	1575	36540	+0.87
1005	91	>100	1605	36585	+0.48
1035	421	>100	1635	36742	+1.76
1065	1239	>100	1665	36691	+1.53
1095	2155	>100	1695	37461	+1.89
1125	3527	>100	1725	37073	+3.07
1155	4974	>100	1755	37603	+4.02
1185	6647	+97.44	1785	38346	+6.58
1215	9250	+89.00	1815	39111	+7.95
1245	12041	+82.15	1845	40115	
1275	15094	+73.81	1875	41409	



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	12541	+83.18
735	1		1335	16192	+74.48
765	0		1365	20083	+67.17
795	0	>100	1395	24273	+58.43
825	0	>100	1425	29090	+46.86
855	0	>100	1455	33223	+34.56
885	0	>100	1485	35608	+22.67
915	0	>100	1515	37581	+13.63
945	1	>100	1545	38762	+8.18
975	2	>100	1575	39185	+4.42
1005	3	>100	1605	39484	+3.06
1035	14	>100	1635	39806	+2.61
1065	127	>100	1665	40264	+2.03
1095	500	>100	1695	40353	+2.32
1125	1332	>100	1725	40431	+3.28
1155	2373	>100	1755	41127	+7.09
1185	3614	>100	1785	41882	+12.40
1215	5227	>100	1815	44049	+18.52
1245	7060	+97.33	1845	46950	
1275	9574	+90.30	1875	51097	

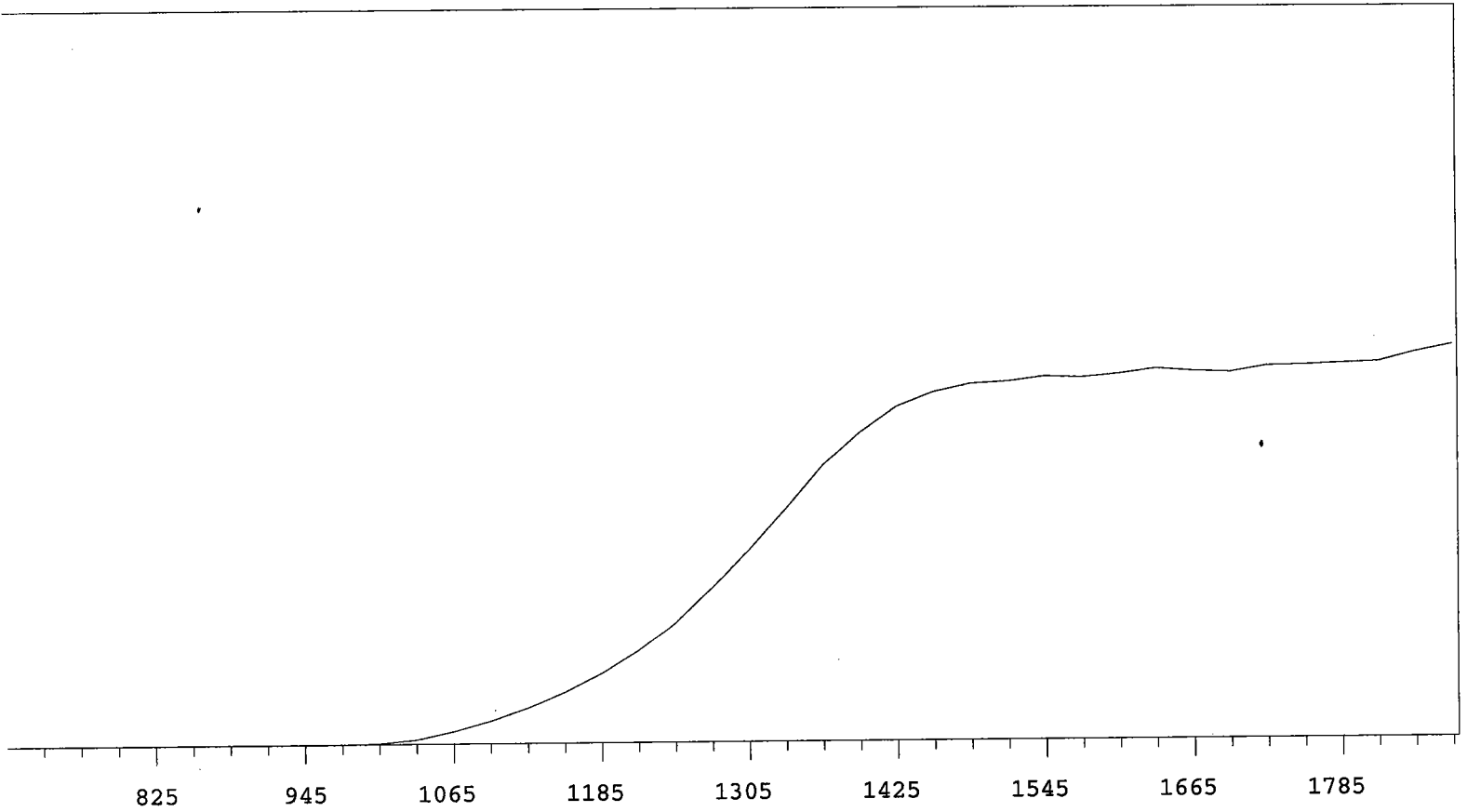


VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	1		1305	18216	+67.74
735	0		1335	21995	+58.11
765	0		1365	26173	+46.11
795	0	>100	1395	29479	+32.75
825	0	>100	1425	32186	+20.62
855	0	>100	1455	33022	+12.13
885	0	>100	1485	33981	+7.22
915	1	>100	1515	34520	+4.95
945	0	>100	1545	35095	+2.07
975	17	>100	1575	35014	+0.38
1005	87	>100	1605	34812	+0.55
1035	438	>100	1635	34859	+1.11
1065	1055	>100	1665	35460	+1.94
1095	2114	>100	1695	35273	+1.95
1125	3282	>100	1725	35629	+2.73
1155	4625	>100	1755	35811	+5.77
1185	6554	+97.66	1785	36656	+6.44
1215	8743	+88.09	1815	37896	+9.21
1245	11345	+81.31	1845	38145	
1275	14261	+74.60	1875	40283	

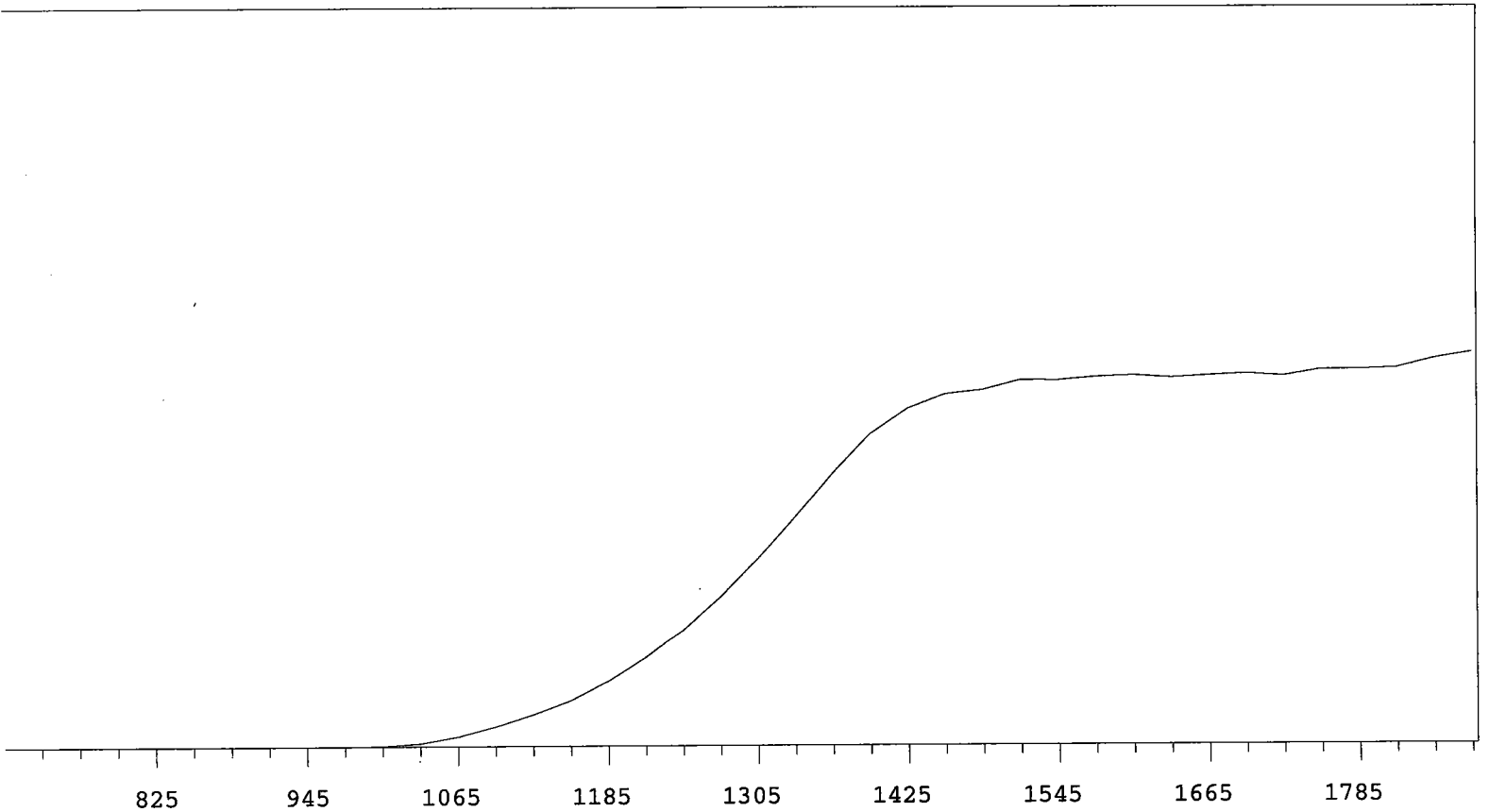
MPC 9600 Plateau
Alpha Volts: 705

Instrument 2 MPC 9604 Detector D
Beta Volts: 1575

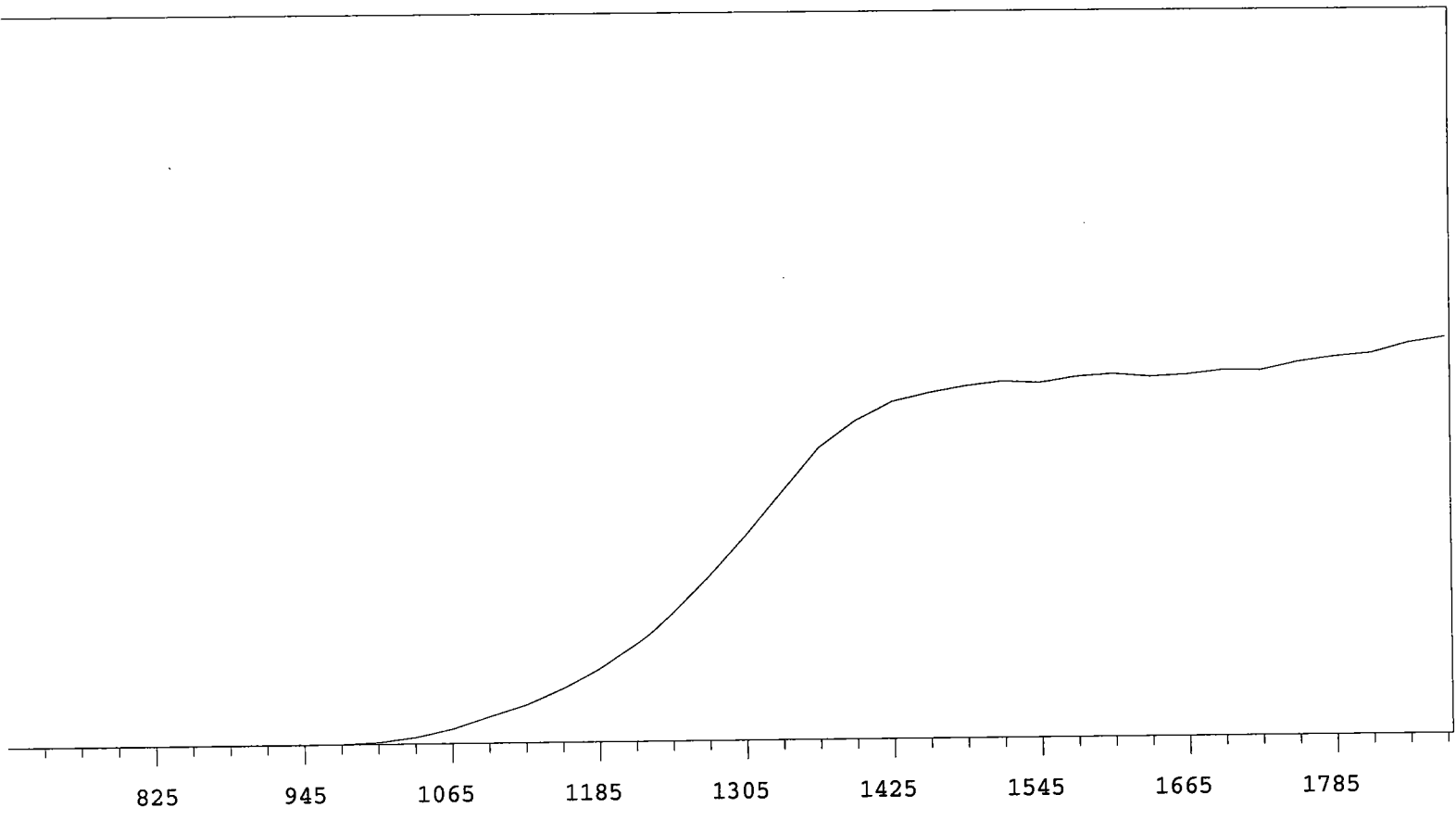
7/1/2009



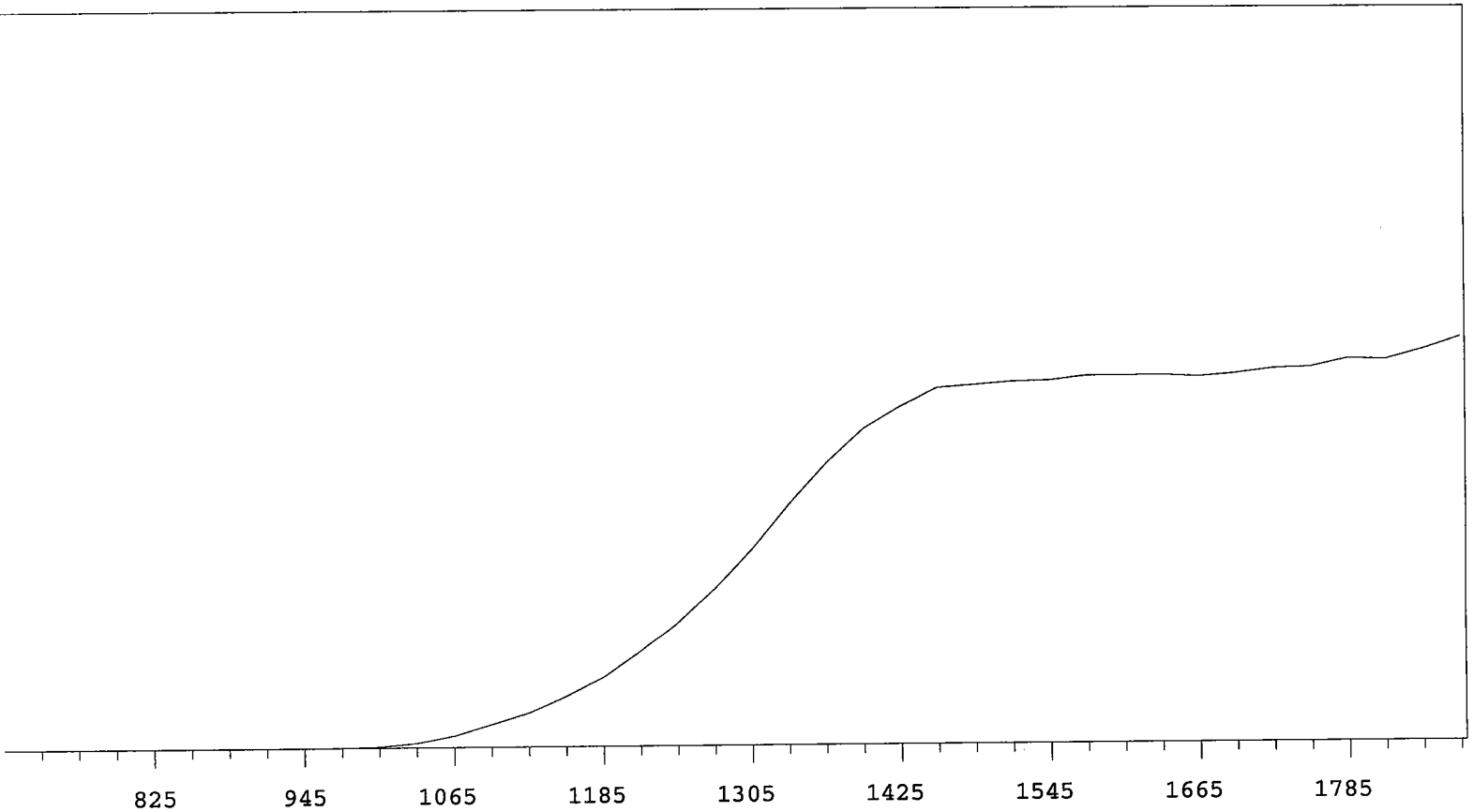
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	1		1305	18675	+65.94
735	0		1335	22620	+55.69
765	0	+83.33	1365	26869	+44.63
795	2	+55.56	1395	29957	+32.08
825	1	>100	1425	32494	+20.49
855	0	>100	1455	33836	+11.98
885	0	>100	1485	34627	+6.45
915	0	>100	1515	34849	+3.22
945	2	>100	1545	35298	+1.98
975	9	>100	1575	35180	+2.37
1005	89	>100	1605	35503	+1.57
1035	439	>100	1635	36006	+0.99
1065	1198	>100	1665	35722	+0.89
1095	2164	>100	1695	35597	+0.93
1125	3436	>100	1725	36188	+1.86
1155	4917	>100	1755	36272	+1.90
1185	6762	+96.59	1785	36389	+2.55
1215	9006	+89.14	1815	36529	+4.39
1245	11800	+81.34	1845	37459	
1275	15132	+73.59	1875	38170	



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	1		1305	16654	+68.57
735	0		1335	20416	+59.26
765	0	+55.56	1365	24191	+47.28
795	1	>100	1395	27643	+34.04
825	1	+0.00	1425	29891	+21.08
855	1	>100	1455	31183	+12.30
885	0	>100	1485	31558	+6.67
915	0	>100	1515	32444	+4.05
945	0	>100	1545	32413	+2.90
975	9	>100	1575	32704	+0.81
1005	53	>100	1605	32837	+0.71
1035	302	>100	1635	32629	+0.49
1065	878	>100	1665	32797	+0.16
1095	1805	>100	1695	32964	+1.32
1125	2887	>100	1725	32746	+1.40
1155	4163	>100	1755	33308	+1.56
1185	5842	+99.81	1785	33318	+3.21
1215	7959	+90.90	1815	33456	+3.92
1245	10323	+83.03	1845	34283	
1275	13250	+75.91	1875	34815	



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	1		1305	19810	+64.73
735	1		1335	23962	+52.62
765	0	-55.56	1365	28091	+39.27
795	0	>100	1395	30594	+25.61
825	1	>100	1425	32381	+14.86
855	3	+33.33	1455	33206	+8.91
885	0	+0.00	1485	33832	+4.41
915	1	>100	1515	34260	+3.01
945	2	>100	1545	34071	+2.33
975	29	>100	1575	34623	+1.34
1005	165	>100	1605	34848	+1.22
1035	613	>100	1635	34564	+0.89
1065	1394	>100	1665	34733	+1.01
1095	2558	>100	1695	35144	+2.76
1125	3702	>100	1725	35084	+3.66
1155	5222	>100	1755	35839	+3.97
1185	7161	+96.06	1785	36332	+5.39
1215	9507	+89.18	1815	36654	+5.35
1245	12552	+81.52	1845	37609	
1275	16030	+73.64	1875	38164	

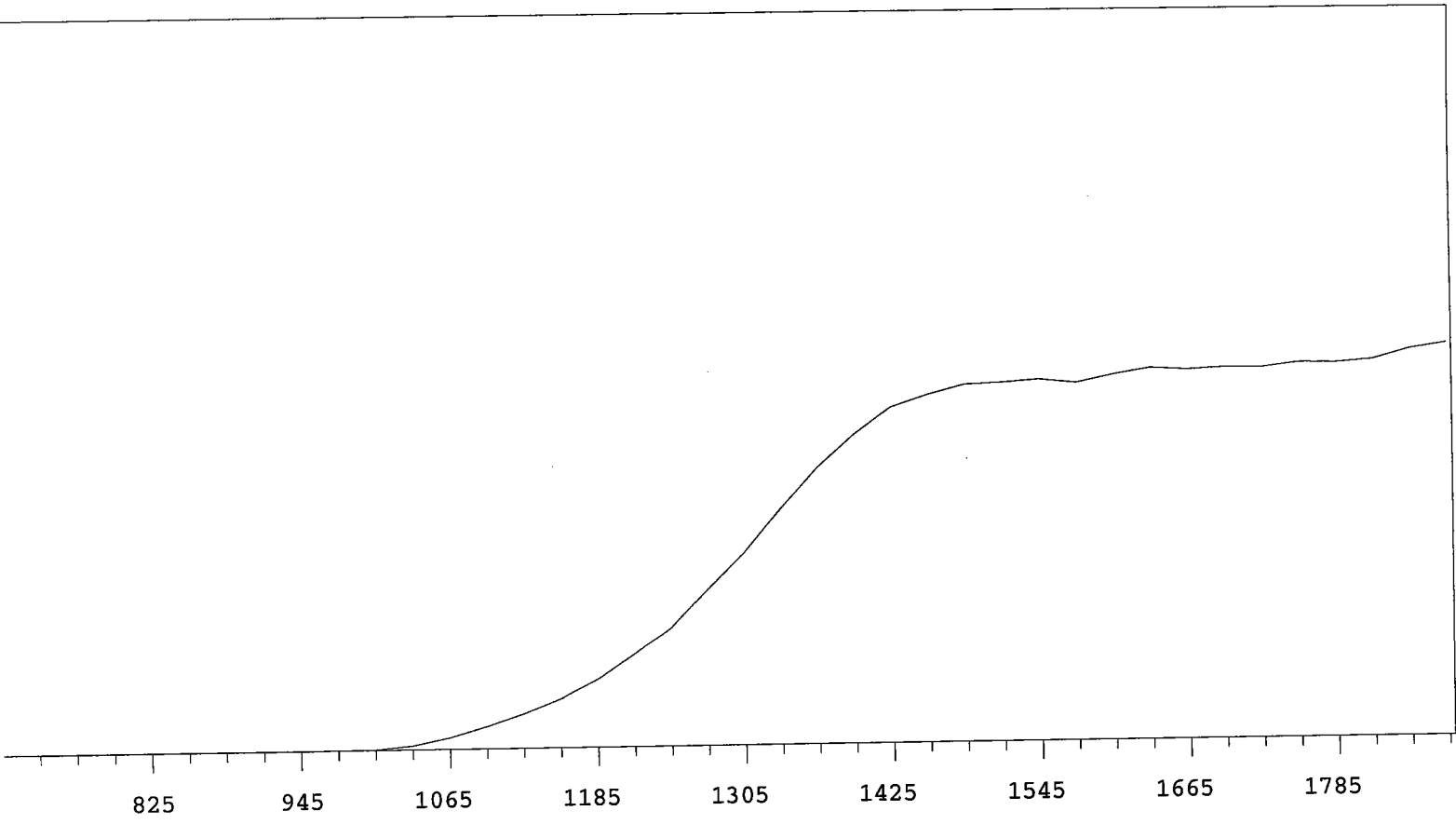


VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	1		1305	21412	+66.80
735	1		1335	26262	+56.32
765	1		1365	30679	+43.71
795	0	>100	1395	34466	+31.61
825	0	+0.00	1425	36949	+20.14
855	0	>100	1455	38998	+11.16
885	1	>100	1485	39313	+5.34
915	1	>100	1515	39625	+2.44
945	1	>100	1545	39751	+2.04
975	17	>100	1575	40227	+1.45
1005	122	>100	1605	40228	+0.56
1035	533	>100	1635	40255	+0.13
1065	1287	>100	1665	40075	+1.22
1095	2493	>100	1695	40384	+1.95
1125	3753	>100	1725	40900	+3.50
1155	5482	>100	1755	41028	+3.05
1185	7538	+99.39	1785	41899	+3.71
1215	10305	+90.31	1815	41767	+5.64
1245	13415	+82.57	1845	42852	
1275	17141	+75.13	1875	44132	

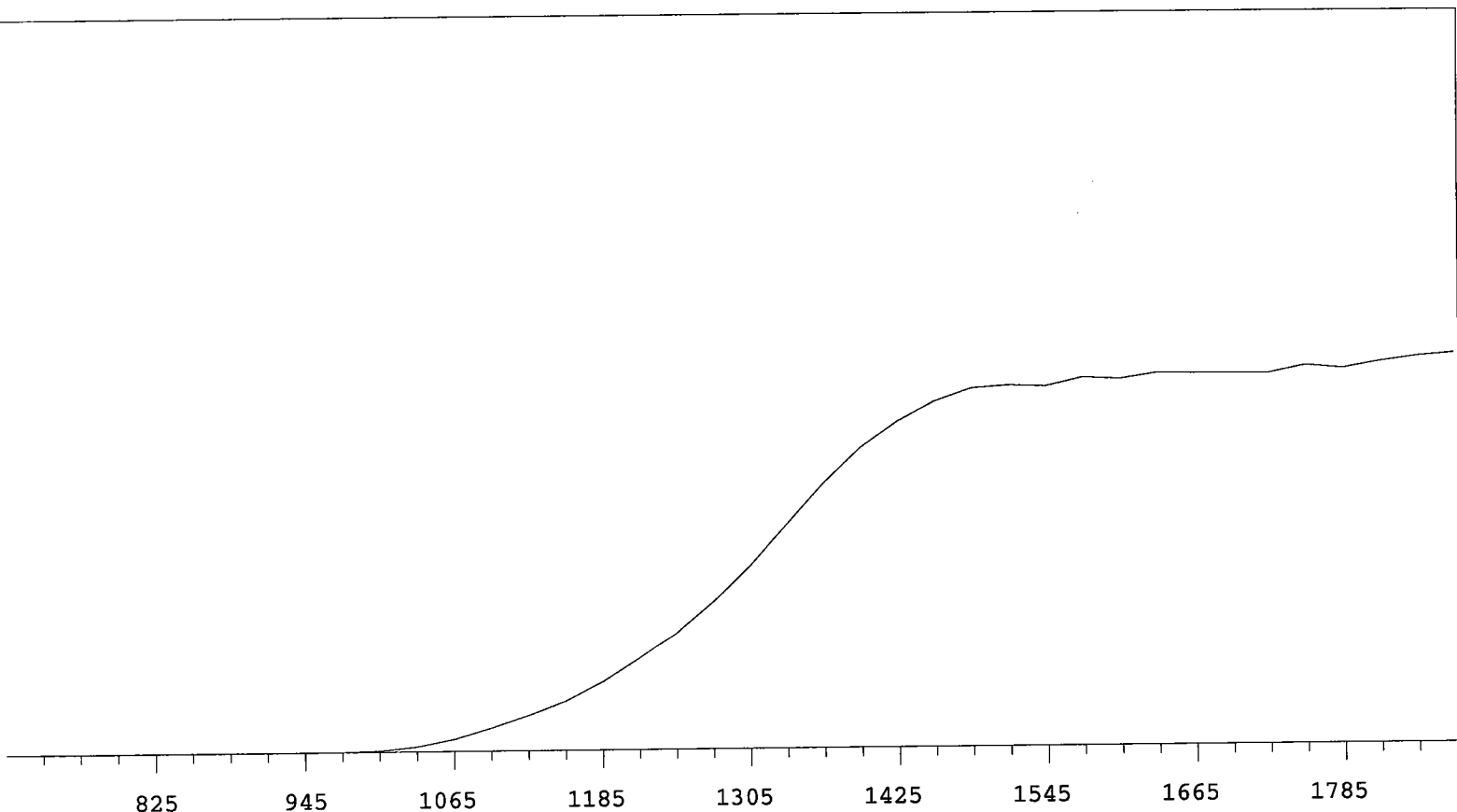
MPC 9600 Plateau
 Alpha Volts: 705

Instrument 3 MPC 9604 Detector D
 Beta Volts: 1575

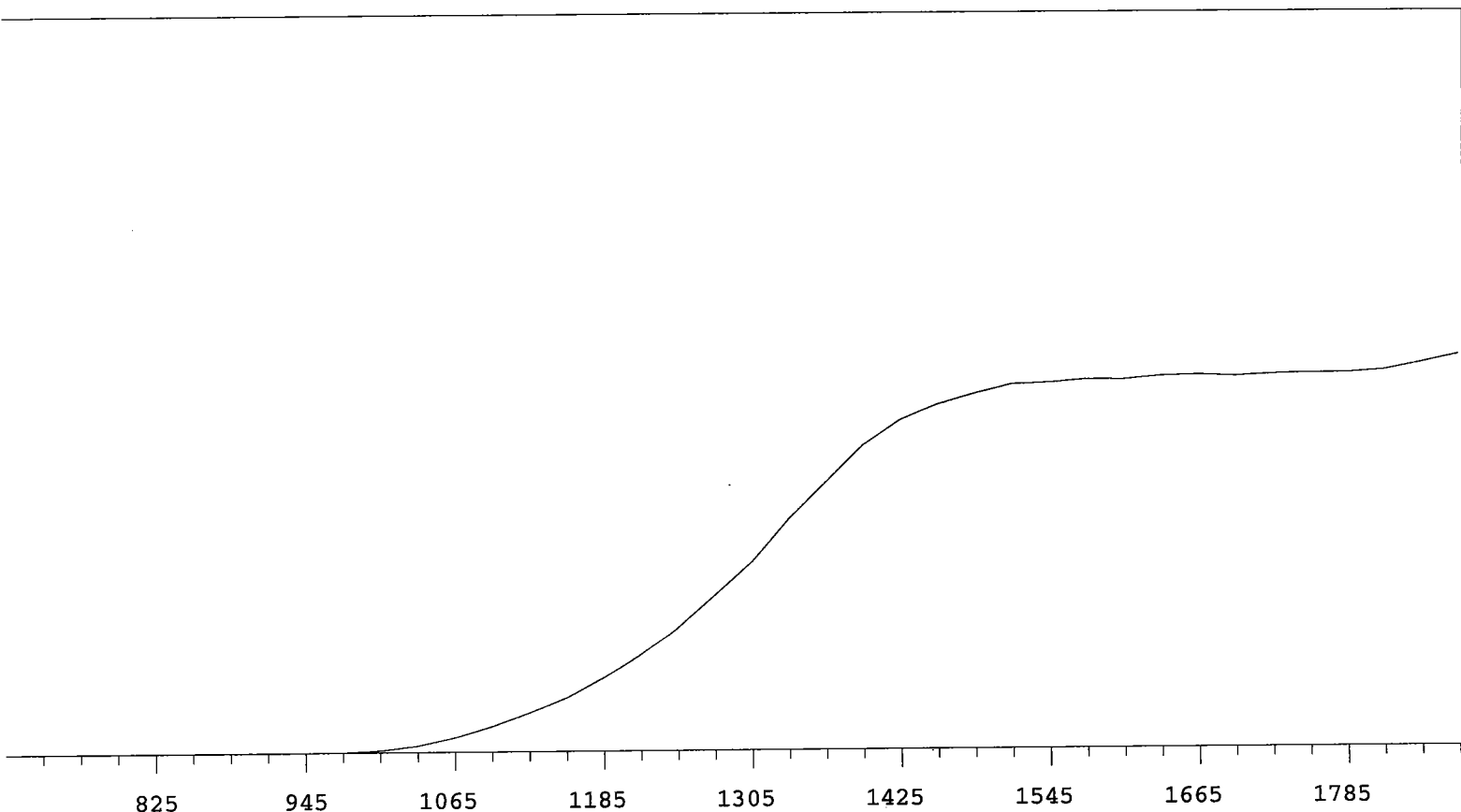
7/1/2009



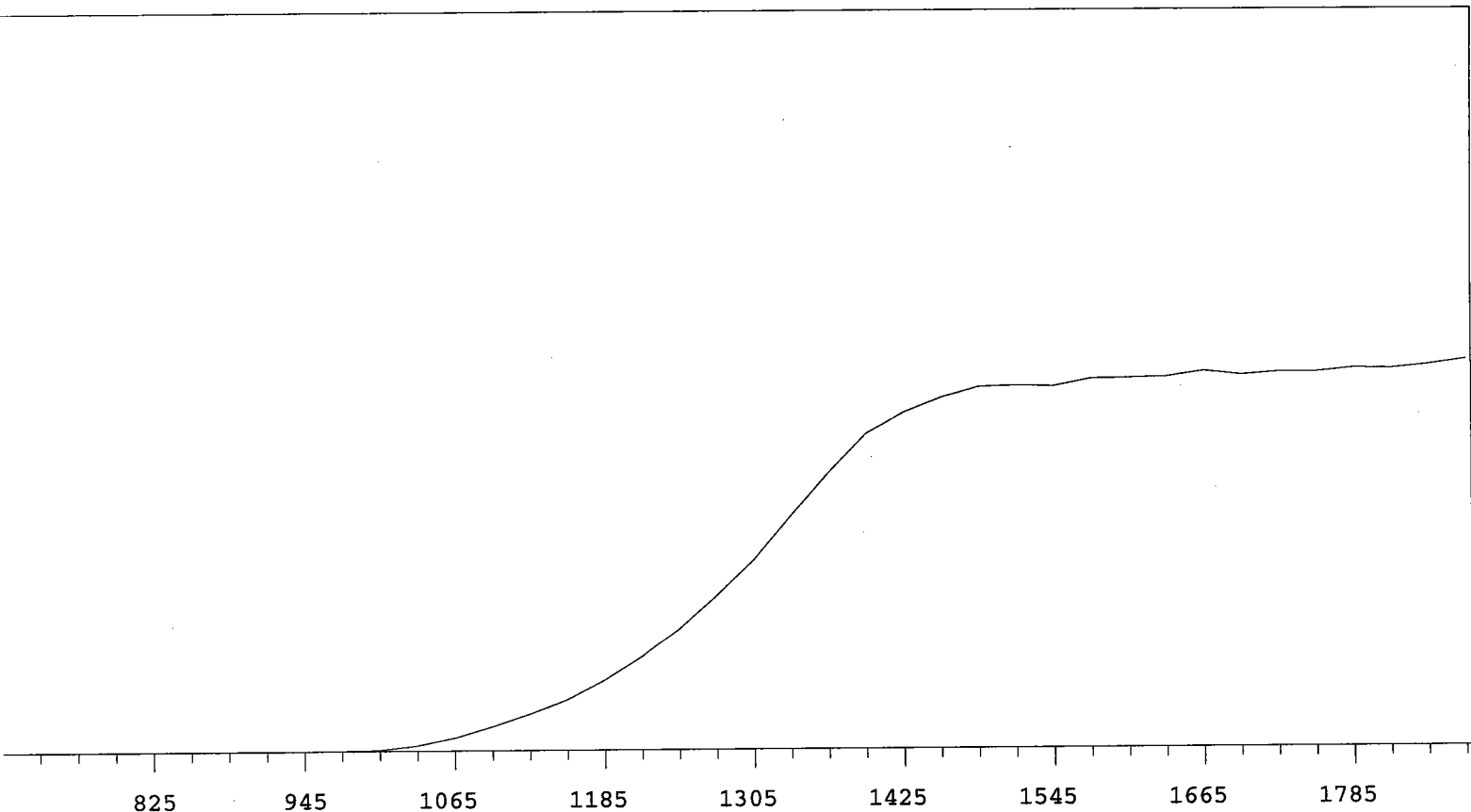
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	14171	+66.45
735	1		1335	17362	+54.90
765	0	+0.00	1365	20310	+43.83
795	1	>100	1395	22647	+30.82
825	0	+83.33	1425	24551	+20.19
855	0	-83.33	1455	25440	+11.69
885	1	>100	1485	26124	+5.90
915	0	>100	1515	26245	+2.21
945	1	>100	1545	26428	+1.39
975	12	>100	1575	26151	+2.69
1005	51	>100	1605	26721	+2.72
1035	298	>100	1635	27168	+2.80
1065	848	>100	1665	27007	+0.87
1095	1649	>100	1695	27135	+0.70
1125	2535	>100	1725	27089	+1.24
1155	3602	>100	1755	27414	+1.43
1185	5036	+98.31	1785	27373	+3.21
1215	6880	+91.37	1815	27581	+4.34
1245	8822	+82.29	1845	28332	
1275	11546	+74.61	1875	28750	



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	16442	+66.24
735	0		1335	20146	+57.40
765	0		1365	23769	+46.40
795	0	>100	1395	26926	+34.68
825	2	+55.56	1425	29276	+24.40
855	1	>100	1455	31037	+15.28
885	0	-55.56	1485	32197	+7.91
915	3	>100	1515	32425	+4.33
945	0	>100	1545	32314	+2.14
975	16	>100	1575	33071	+2.66
1005	114	>100	1605	32918	+2.52
1035	451	>100	1635	33435	+1.02
1065	1100	>100	1665	33382	+0.73
1095	2068	>100	1695	33349	+1.07
1125	3189	>100	1725	33324	+1.28
1155	4386	>100	1755	34001	+2.26
1185	6094	+94.81	1785	33701	+3.08
1215	8184	+87.09	1815	34304	+2.97
1245	10489	+78.88	1845	34744	
1275	13273	+72.66	1875	35012	



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	15747	+62.38
735	1		1335	19230	+54.19
765	0	+0.00	1365	22255	+44.46
795	1	>100	1395	25299	+32.45
825	0	>100	1425	27370	+22.24
855	0	>100	1455	28625	+14.10
885	0	>100	1485	29467	+8.56
915	0	>100	1515	30213	+5.29
945	2	>100	1545	30326	+2.77
975	31	>100	1575	30564	+1.57
1005	176	>100	1605	30548	+1.52
1035	550	>100	1635	30820	+0.85
1065	1218	>100	1665	30898	+0.79
1095	2114	>100	1695	30779	+0.44
1125	3212	>100	1725	30934	+0.45
1155	4416	>100	1755	31008	+0.96
1185	6066	+92.28	1785	30991	+2.01
1215	7936	+85.60	1815	31196	+3.80
1245	10288	+76.79	1845	31781	
1275	13020	+70.59	1875	32406	

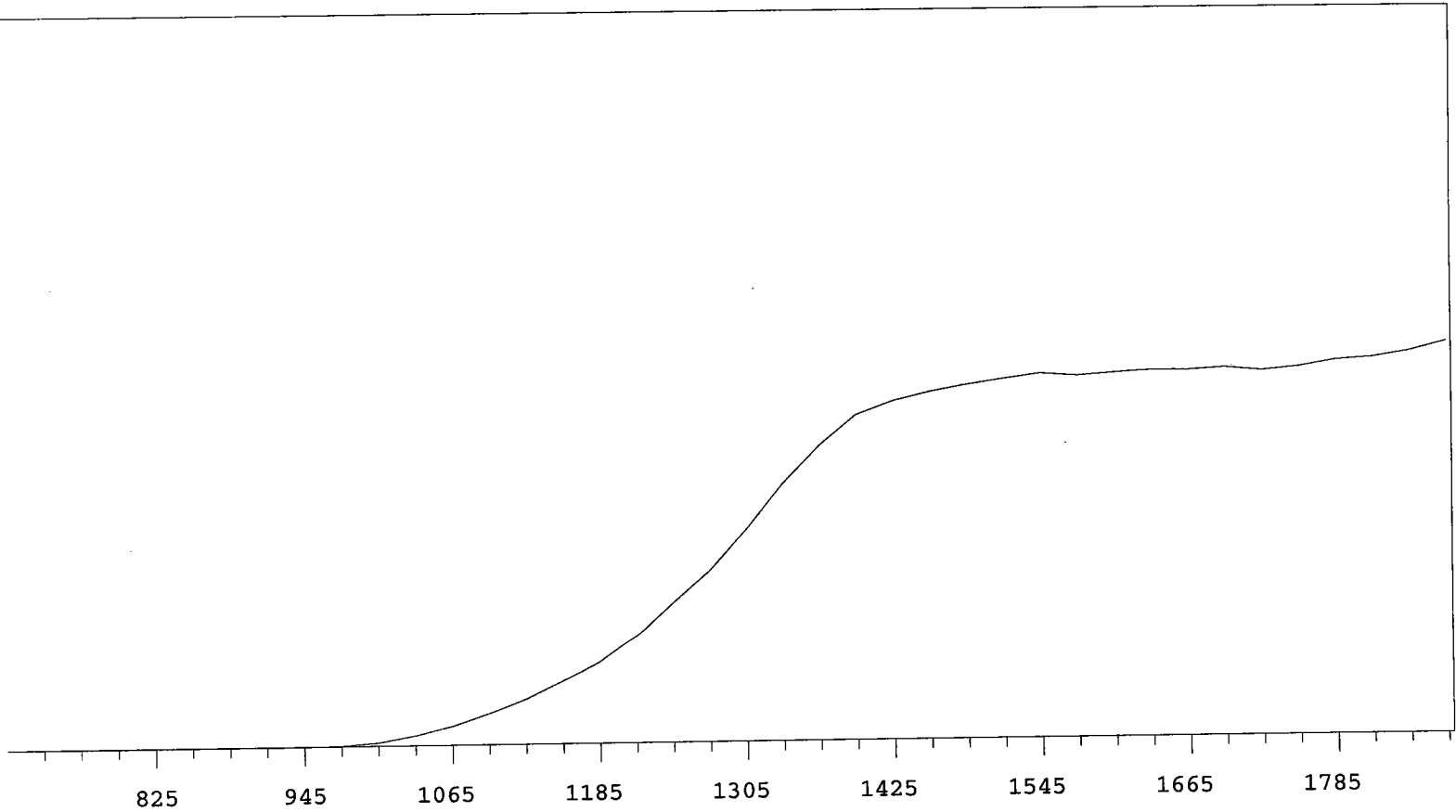


VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	19796	+65.77
735	1		1335	24338	+57.55
765	0	+55.56	1365	28686	+45.86
795	2	+0.00	1395	32750	+32.27
825	0	-55.56	1425	34919	+20.83
855	1	>100	1455	36434	+11.45
885	0	>100	1485	37487	+5.80
915	0	>100	1515	37623	+3.32
945	2	>100	1545	37528	+2.07
975	24	>100	1575	38277	+2.12
1005	134	>100	1605	38338	+2.70
1035	558	>100	1635	38426	+1.12
1065	1361	>100	1665	39007	+1.06
1095	2511	>100	1695	38592	+0.64
1125	3762	>100	1725	38870	+0.63
1155	5246	>100	1755	38868	+1.30
1185	7268	+96.29	1785	39238	+1.45
1215	9733	+88.98	1815	39169	+2.34
1245	12701	+79.94	1845	39570	
1275	16176	+73.13	1875	40086	

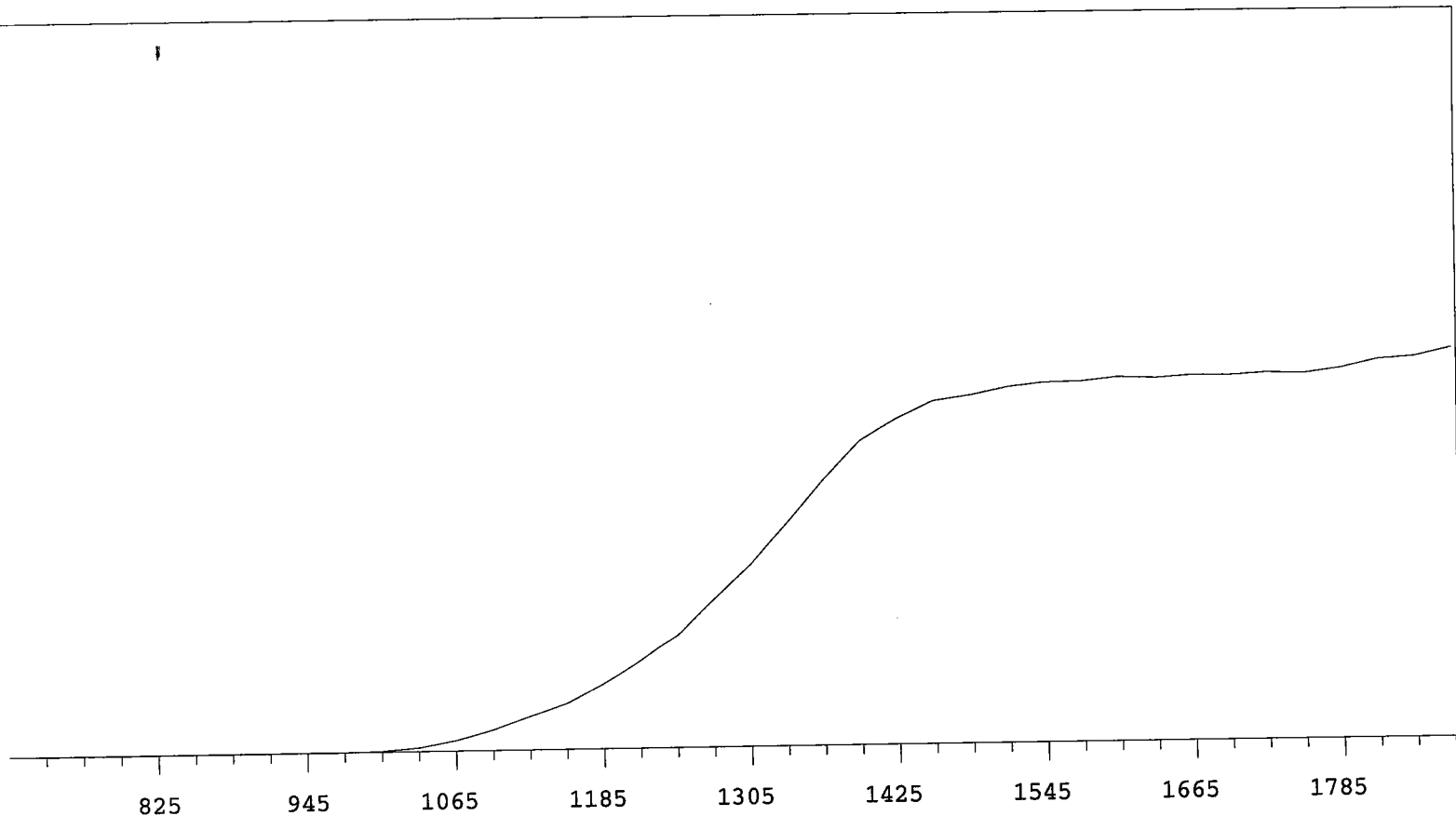
MPC 9600 Plateau
Alpha Volts: 705

Instrument 4 MPC 9604 Detector D
Beta Volts: 1575

7/1/2009



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	1		1305	18491	+61.09
735	0		1335	22444	+51.56
765	0	+0.00	1365	25756	+37.44
795	0	>100	1395	28379	+23.82
825	1	+83.33	1425	29517	+14.00
855	1	+55.56	1455	30309	+8.08
885	0	+0.00	1485	30874	+6.03
915	1	>100	1515	31345	+3.66
945	1	>100	1545	31782	+2.17
975	60	>100	1575	31567	+1.31
1005	297	>100	1605	31789	+0.78
1035	855	>100	1635	31963	+1.34
1065	1647	>100	1665	31956	+0.29
1095	2700	>100	1695	32123	+0.20
1125	3921	>100	1725	31850	+1.46
1155	5471	+96.54	1755	32114	+2.39
1185	7042	+90.21	1785	32665	+3.95
1215	9405	+82.23	1815	32876	+4.96
1245	12266	+76.33	1845	33399	
1275	14989	+69.38	1875	34206	

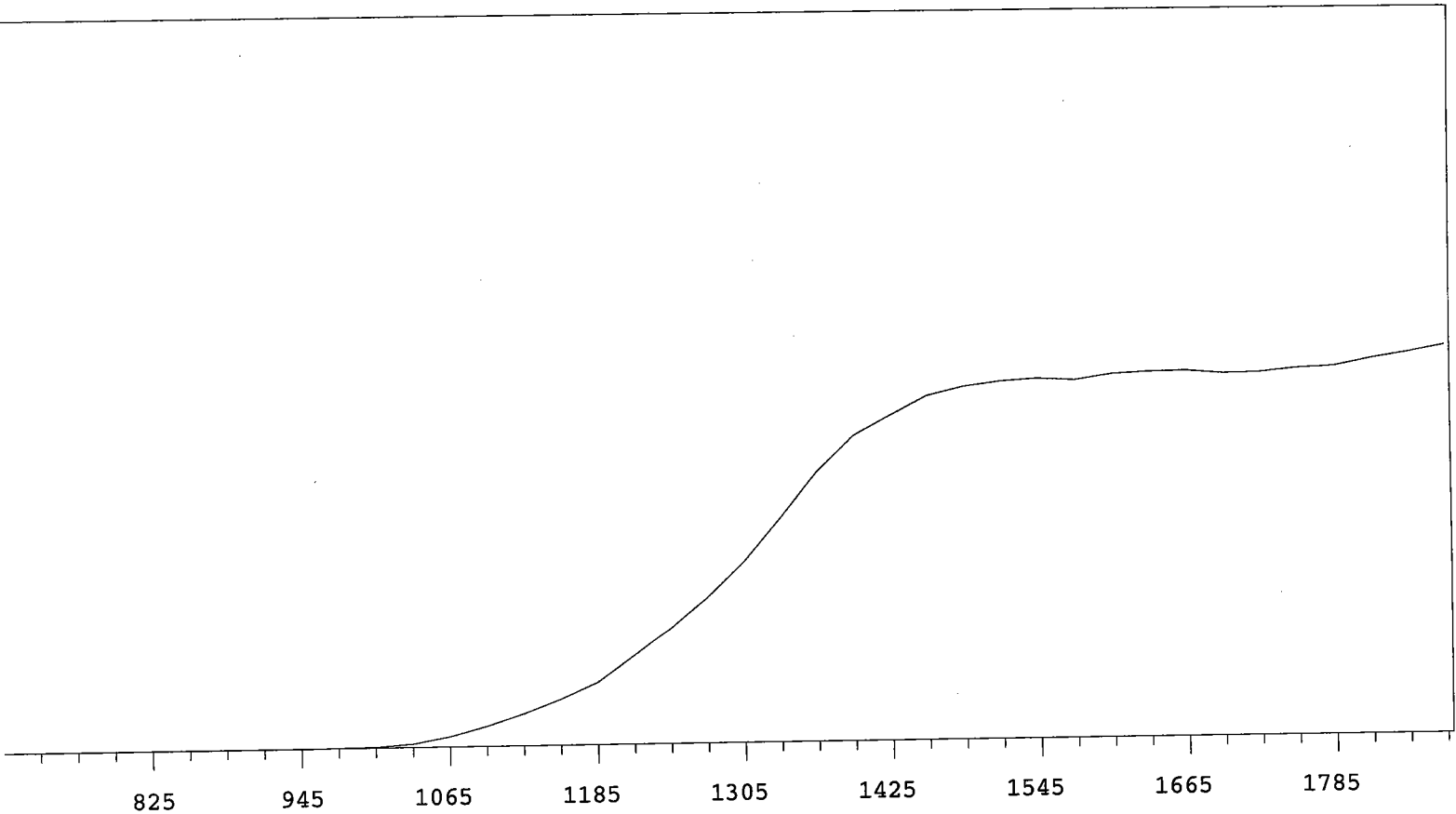


VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	13974	+68.00
735	0		1335	17170	+58.62
765	1		1365	20456	+47.04
795	1	+83.33	1395	23332	+33.83
825	1	-83.33	1425	24996	+21.10
855	1	>100	1455	26290	+12.40
885	0	-55.56	1485	26683	+7.74
915	0	>100	1515	27270	+4.43
945	1	>100	1545	27590	+3.48
975	9	>100	1575	27635	+1.71
1005	76	>100	1605	27932	+1.20
1035	308	>100	1635	27807	+0.88
1065	814	>100	1665	28006	+0.62
1095	1600	>100	1695	27964	+0.63
1125	2598	>100	1725	28112	+0.98
1155	3596	>100	1755	28020	+2.84
1185	5065	+96.05	1785	28392	+3.76
1215	6773	+90.23	1815	29028	+5.17
1245	8717	+81.43	1845	29220	
1275	11391	+74.83	1875	29849	

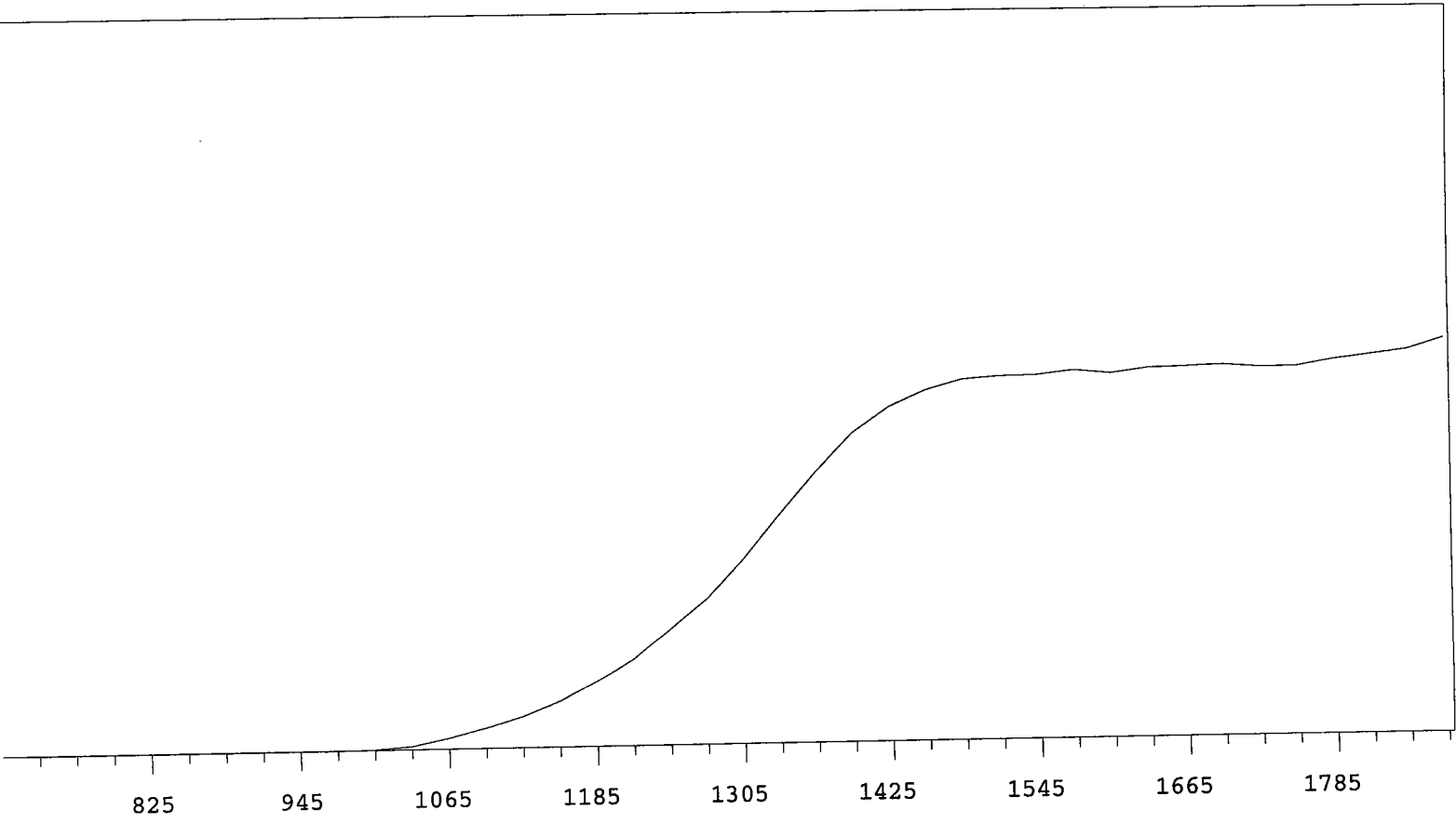
MPC 9600 Plateau
Alpha Volts: 705

Instrument 5 MPC 9604 Detector B
Beta Volts: 1575

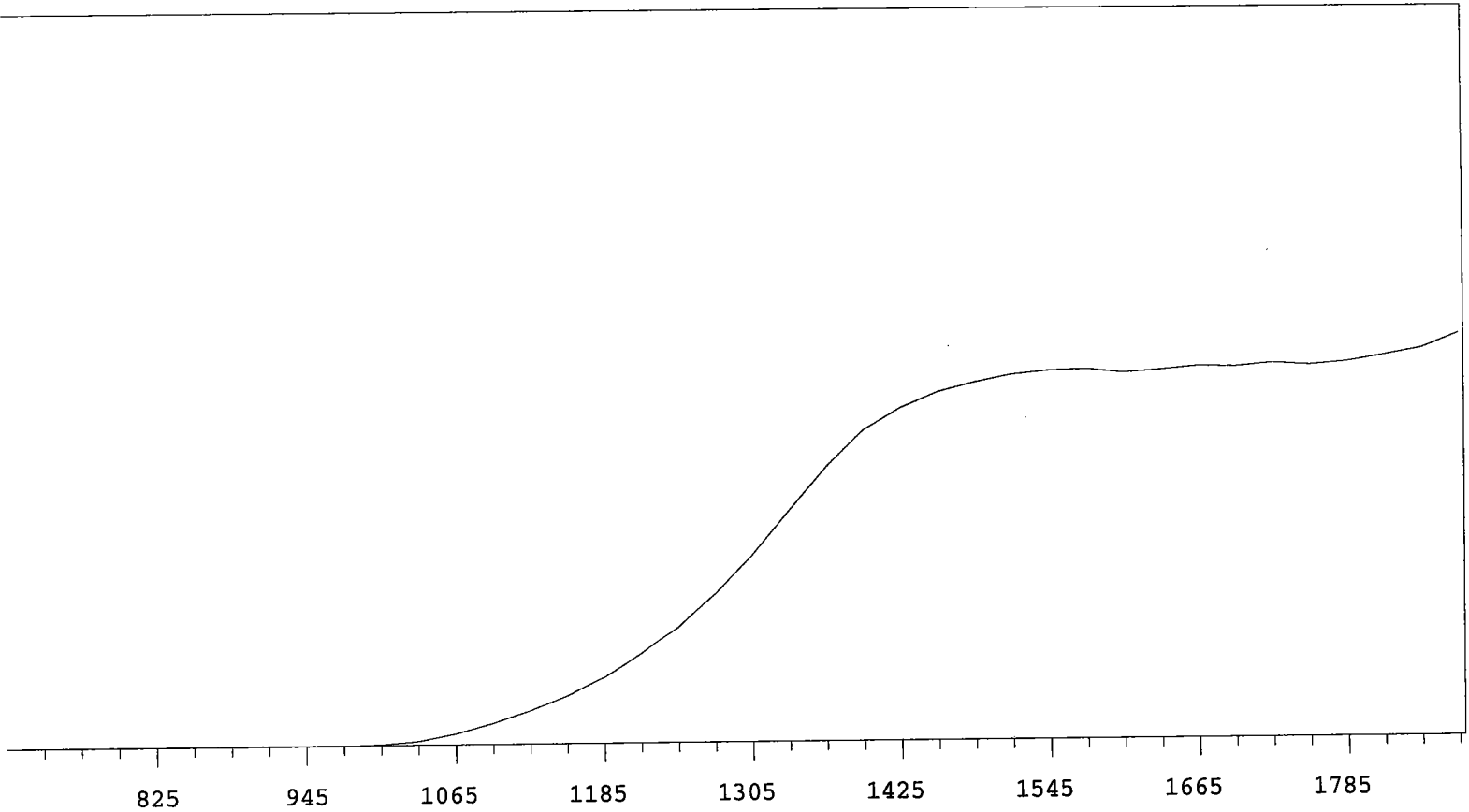
7/1/2009



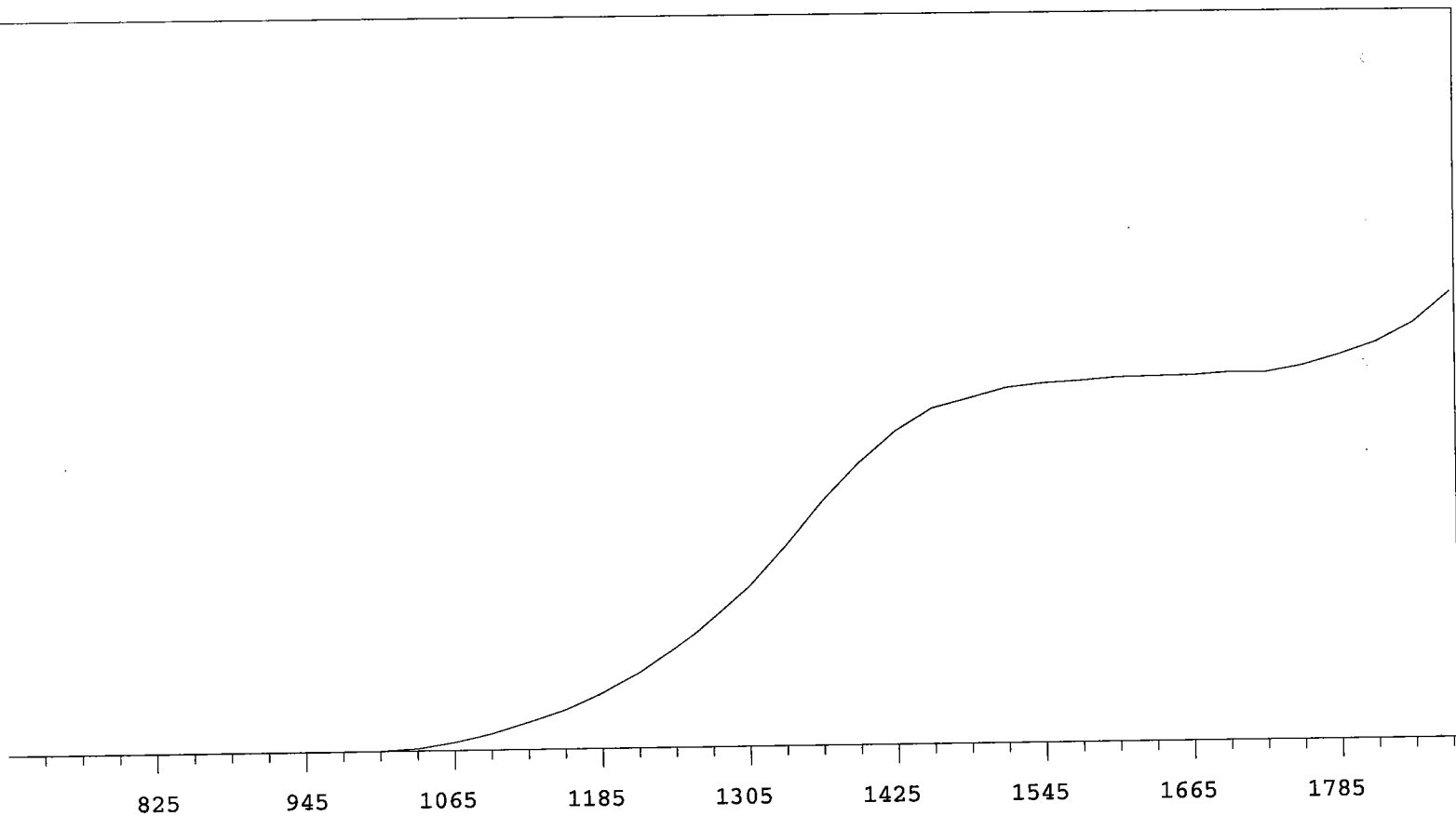
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	17414	+68.46
735	0		1335	21540	+59.98
765	0		1365	25854	+46.75
795	0	>100	1395	29222	+33.38
825	1	>100	1425	31128	+21.52
855	1	+41.67	1455	32995	+13.26
885	2	-33.33	1485	33846	+8.09
915	0	>100	1515	34289	+3.25
945	1	>100	1545	34528	+2.00
975	17	>100	1575	34311	+1.78
1005	87	>100	1605	34866	+1.78
1035	336	>100	1635	35046	+1.14
1065	1010	>100	1665	35087	-0.26
1095	1955	>100	1695	34795	+0.11
1125	3124	>100	1725	34857	+0.93
1155	4486	>100	1755	35220	+2.81
1185	6017	>100	1785	35363	+3.98
1215	8507	+91.20	1815	36028	+4.79
1245	11148	+82.59	1845	36577	
1275	14003	+74.21	1875	37207	



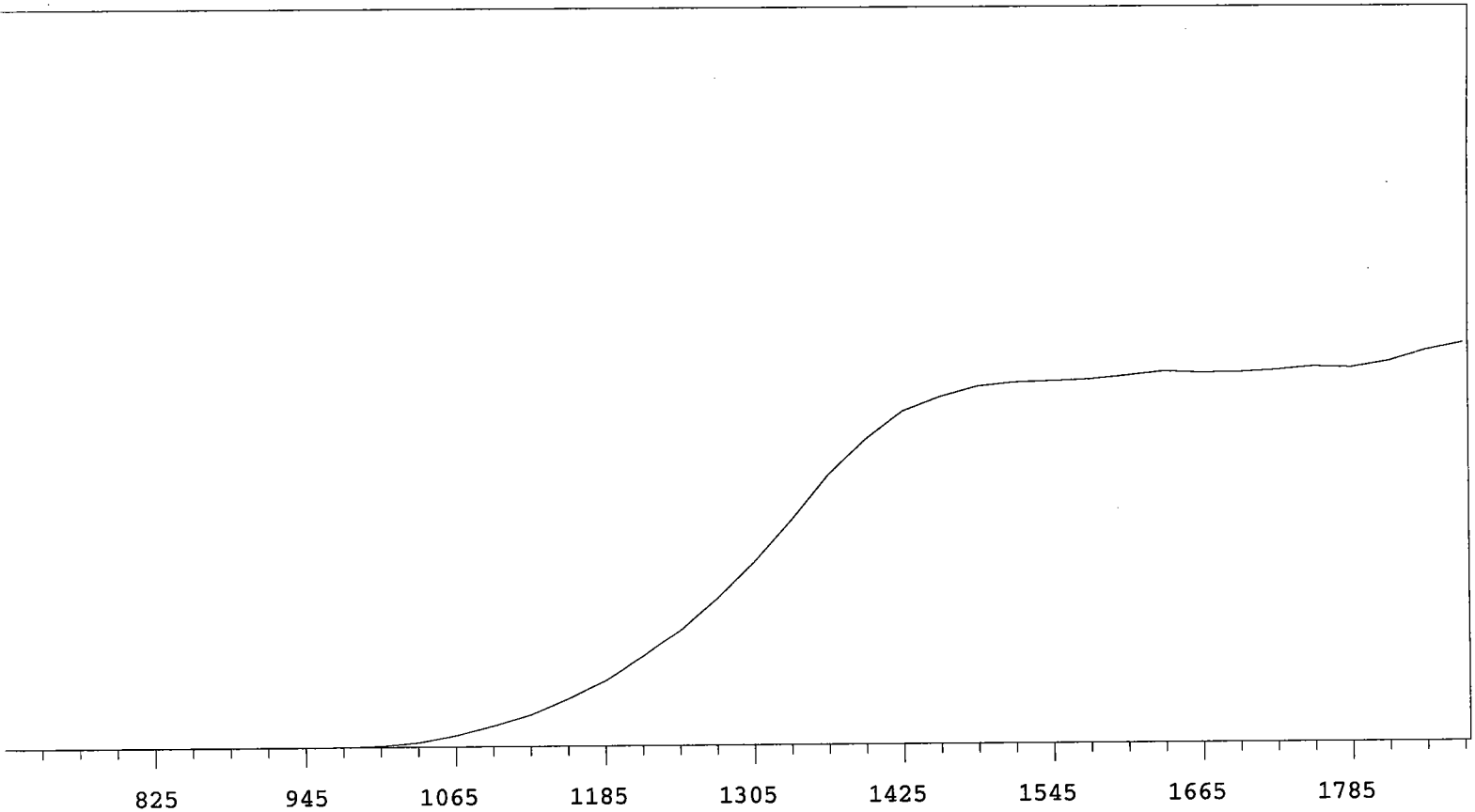
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	17085	+68.24
735	0		1335	21135	+59.99
765	0		1365	25066	+47.39
795	0	>100	1395	28530	+33.93
825	0	>100	1425	30823	+22.30
855	1	>100	1455	32287	+12.93
885	0	>100	1485	33217	+6.71
915	1	>100	1515	33474	+3.57
945	2	>100	1545	33517	+1.17
975	7	>100	1575	33921	+1.13
1005	56	>100	1605	33584	+1.27
1035	305	>100	1635	34014	+1.12
1065	982	>100	1665	34116	+0.98
1095	1874	>100	1695	34225	-0.22
1125	2890	>100	1725	33980	+0.58
1155	4260	>100	1755	33971	+1.96
1185	6001	>100	1785	34541	+3.64
1215	8050	+91.54	1815	34954	+5.38
1245	10895	+82.98	1845	35375	
1275	13556	+76.26	1875	36384	



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	15025	+68.87
735	0		1335	18640	+58.97
765	0		1365	22048	+45.84
795	0	>100	1395	24877	+32.08
825	0	>100	1425	26653	+20.83
855	0	>100	1455	27899	+13.08
885	0	>100	1485	28670	+8.43
915	0	>100	1515	29257	+5.13
945	0	>100	1545	29568	+2.06
975	6	>100	1575	29683	+0.52
1005	81	>100	1605	29362	+0.57
1035	318	>100	1635	29589	+0.80
1065	897	>100	1665	29870	+1.82
1095	1710	>100	1695	29783	+0.90
1125	2714	>100	1725	30077	+0.75
1155	3925	>100	1755	29889	+2.02
1185	5395	+97.31	1785	30152	+3.33
1215	7282	+88.49	1815	30656	+6.54
1245	9426	+81.36	1845	31211	
1275	12007	+75.65	1875	32389	



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	16217	+71.57
735	0		1335	20184	+63.76
765	0		1365	24605	+53.98
795	0	>100	1395	28528	+41.40
825	0	>100	1425	31675	+28.02
855	0	>100	1455	33899	+17.93
885	0	>100	1485	34826	+10.65
915	0	>100	1515	35815	+6.13
945	0	>100	1545	36225	+4.15
975	7	>100	1575	36456	+2.28
1005	31	>100	1605	36747	+1.47
1035	238	>100	1635	36801	+1.26
1065	810	>100	1665	36859	+0.85
1095	1637	>100	1695	37095	+1.85
1125	2743	>100	1725	37072	+4.01
1155	3932	>100	1755	37724	+6.65
1185	5579	>100	1785	38802	+10.33
1215	7602	+94.41	1815	40036	+14.71
1245	10078	+84.86	1845	41975	
1275	13091	+77.67	1875	45123	

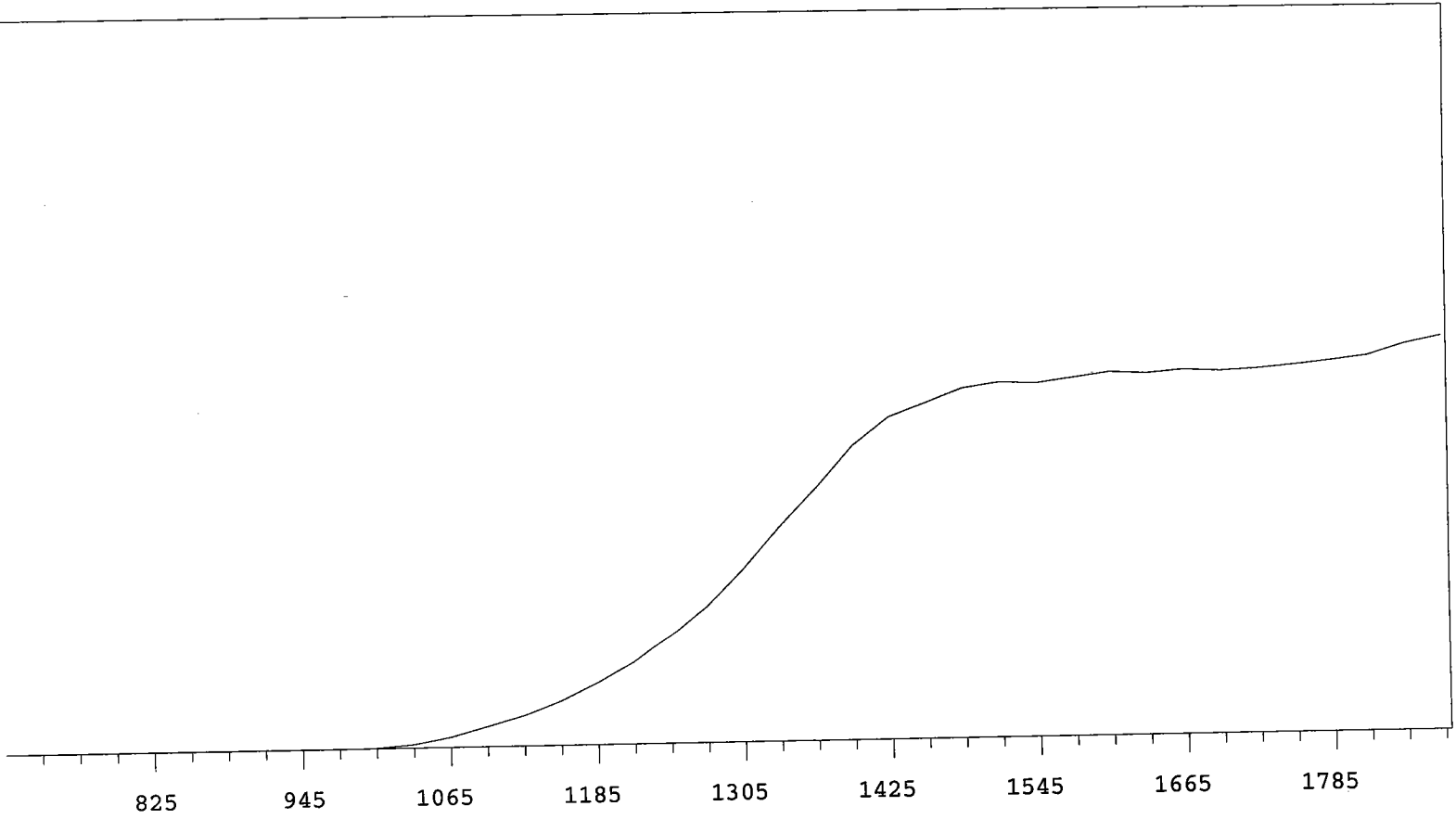


VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	20094	+68.67
735	0		1335	24665	+59.40
765	0		1365	29591	+47.86
795	0	>100	1395	33376	+34.51
825	1	+83.33	1425	36440	+22.50
855	1	-83.33	1455	38024	+13.58
885	0	>100	1485	39187	+7.04
915	0	>100	1515	39608	+3.63
945	5	>100	1545	39722	+2.10
975	18	>100	1575	39894	+2.32
1005	125	>100	1605	40298	+2.09
1035	482	>100	1635	40711	+1.41
1065	1255	>100	1665	40574	+0.80
1095	2318	>100	1695	40608	+1.02
1125	3540	>100	1725	40839	+1.28
1155	5288	>100	1755	41201	+1.97
1185	7168	+98.51	1785	41065	+3.74
1215	9760	+88.48	1815	41711	+5.42
1245	12656	+81.52	1845	42917	
1275	16065	+74.58	1875	43699	

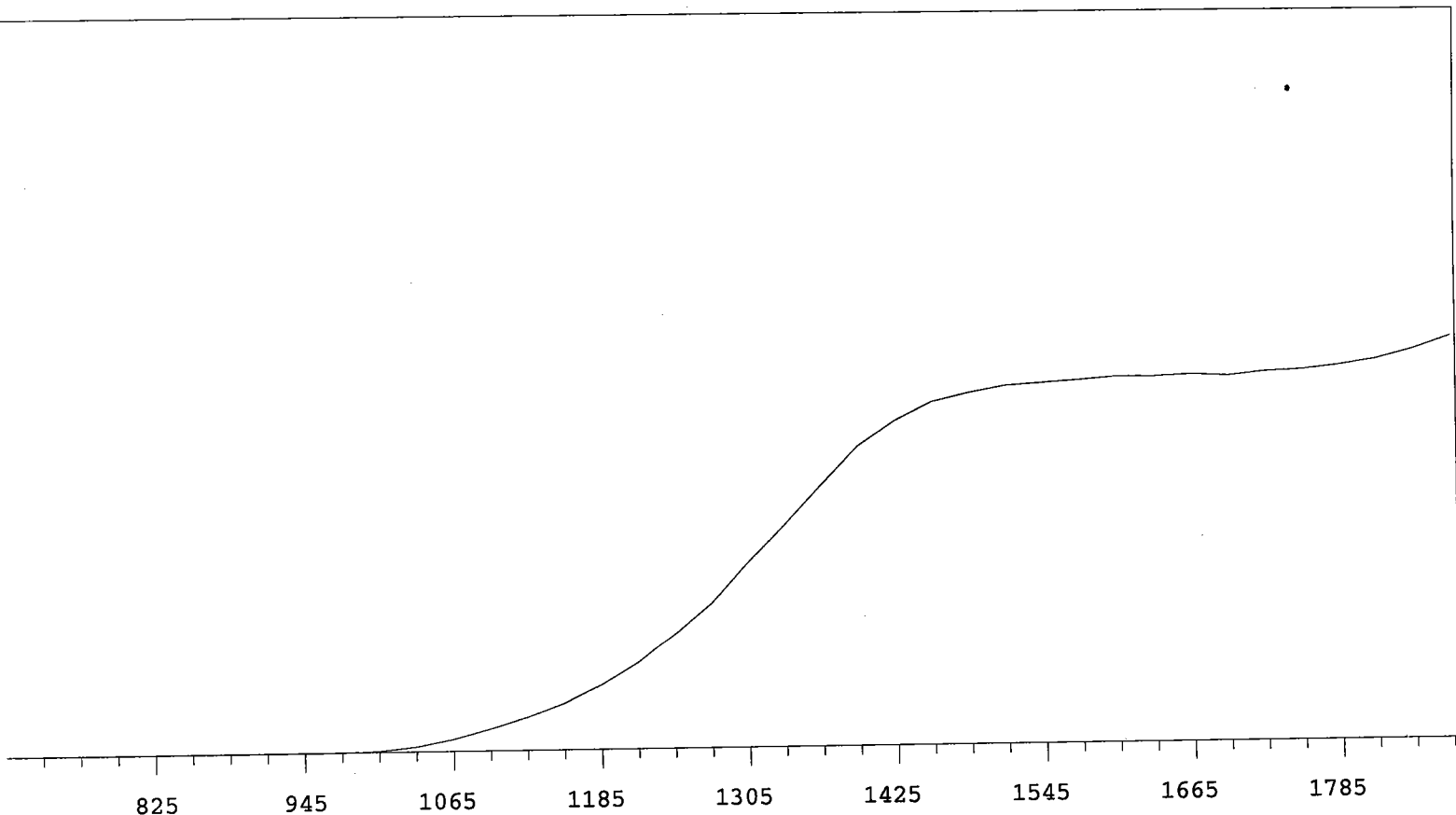
MPC 9600 Plateau
 Alpha Volts: 705

Instrument 6 MPC 9604 Detector C
 Beta Volts: 1575

7/1/2009



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	17350	+67.80
735	0		1335	21371	+60.27
765	1	+0.00	1365	25084	+49.32
795	0	>100	1395	29177	+36.15
825	0	+0.00	1425	31927	+24.86
855	0	>100	1455	33217	+14.70
885	1	>100	1485	34545	+7.74
915	1	>100	1515	35097	+4.64
945	2	>100	1545	34927	+2.96
975	8	>100	1575	35439	+2.21
1005	70	>100	1605	35939	+2.41
1035	353	>100	1635	35763	+0.94
1065	990	>100	1665	36053	+0.35
1095	1956	>100	1695	35886	+1.15
1125	3024	>100	1725	36066	+1.77
1155	4400	>100	1755	36379	+3.03
1185	6173	+99.75	1785	36768	+4.80
1215	8230	+89.85	1815	37193	+6.14
1245	10904	+82.36	1845	38320	
1275	13747	+76.18	1875	39061	

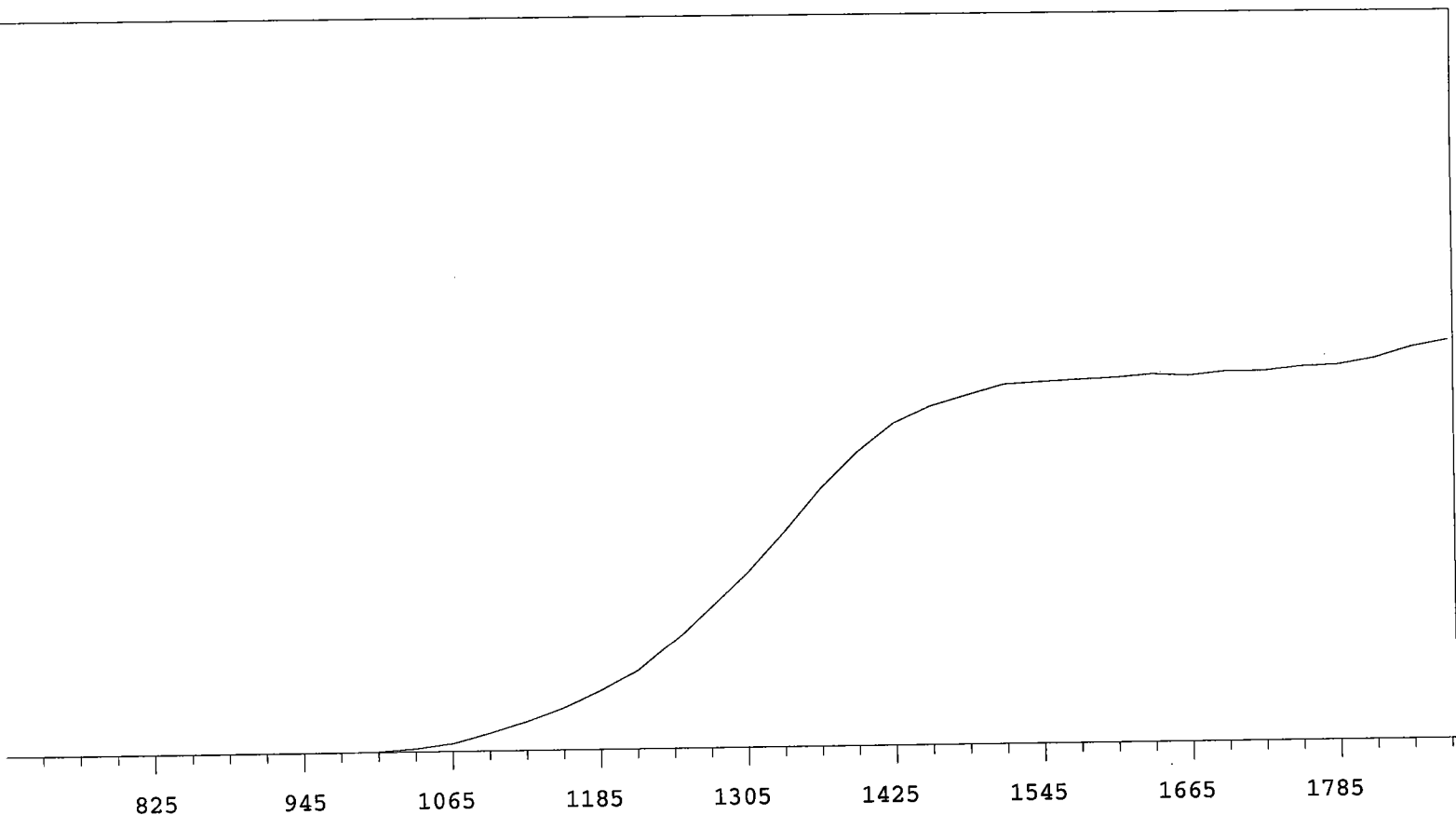


VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	17954	+65.82
735	0		1335	21482	+57.64
765	0		1365	25373	+45.78
795	1	+0.00	1395	29042	+34.80
825	0	>100	1425	31373	+23.29
855	0	+0.00	1455	33143	+14.25
885	0	>100	1485	34006	+8.49
915	1	>100	1515	34662	+4.71
945	0	>100	1545	34892	+3.14
975	14	>100	1575	35129	+1.86
1005	109	>100	1605	35411	+1.49
1035	481	>100	1635	35380	+0.62
1065	1177	>100	1665	35554	+0.65
1095	2133	>100	1695	35385	+1.18
1125	3243	>100	1725	35755	+1.89
1155	4554	>100	1755	35907	+3.26
1185	6285	+98.38	1785	36305	+4.62
1215	8468	+89.75	1815	36870	+6.98
1245	11266	+83.13	1845	37807	
1275	14088	+74.43	1875	39047	

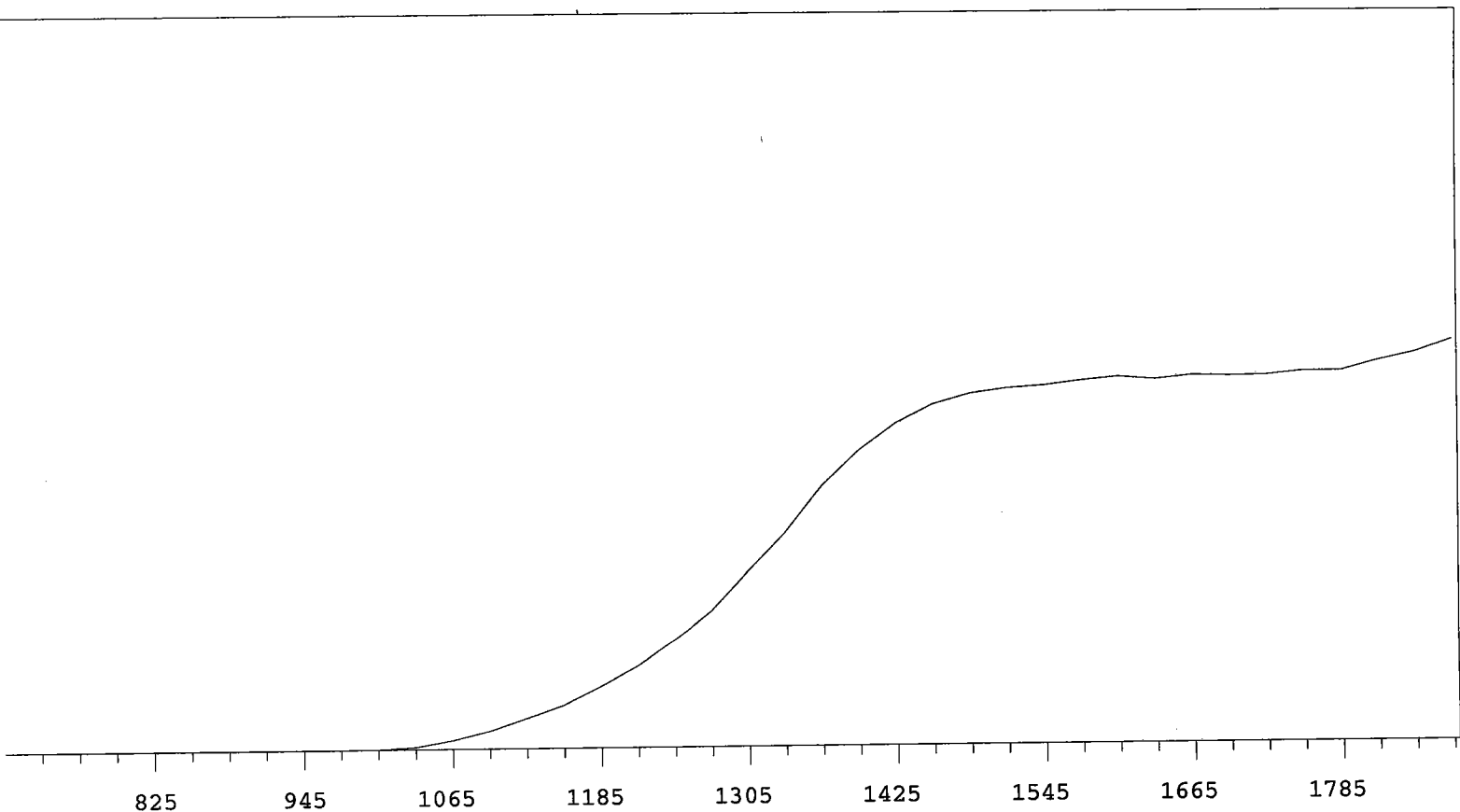
MPC 9600 Plateau
Alpha Volts: 705

Instrument 7 MPC 9604 Detector A
Beta Volts: 1575

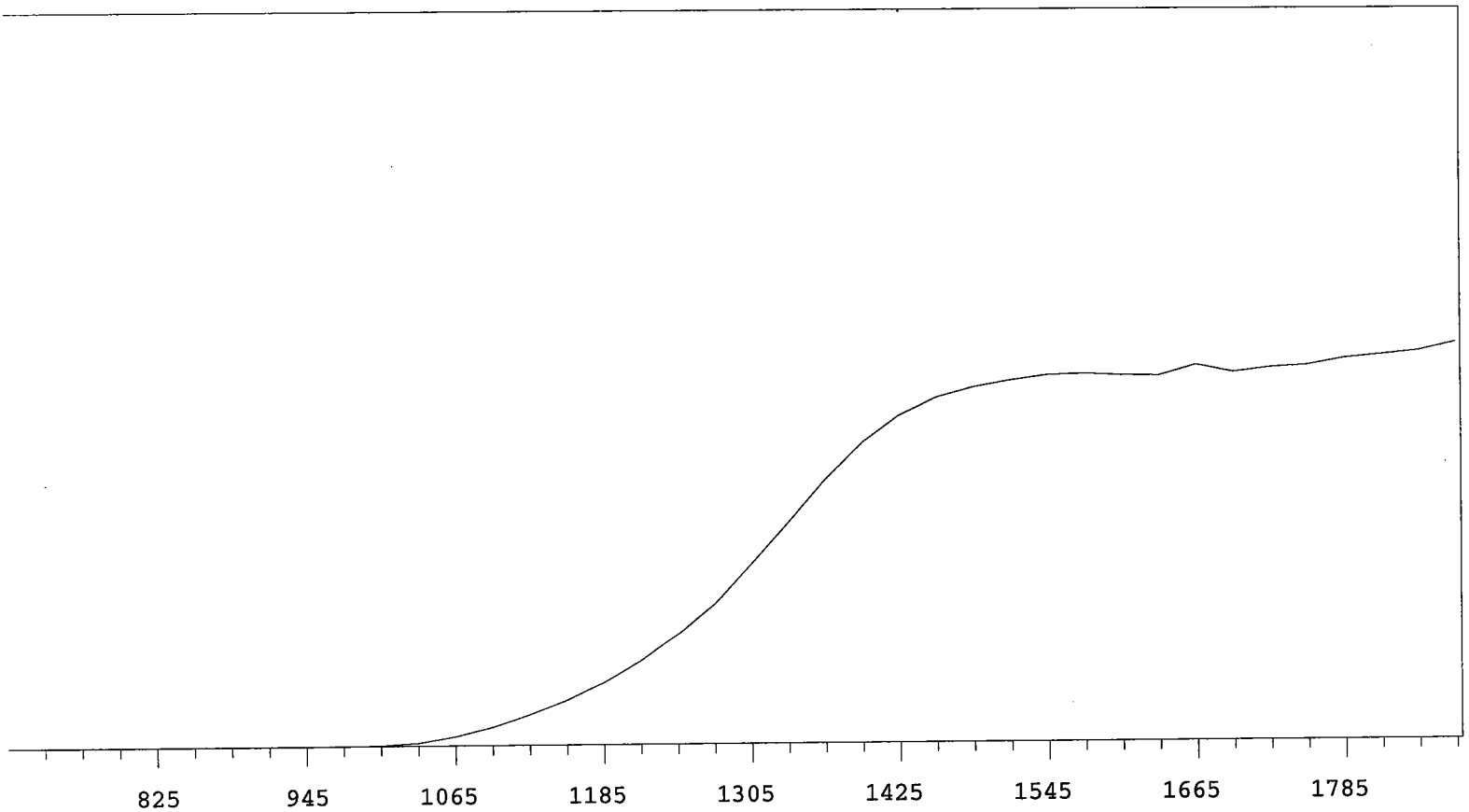
7/1/2009



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	13228	+70.36
735	0		1335	16271	+60.12
765	0		1365	19506	+49.19
795	0	>100	1395	22188	+36.46
825	1	+83.33	1425	24373	+24.43
855	1	-83.33	1455	25649	+15.99
885	0	-55.56	1485	26433	+9.58
915	0	>100	1515	27195	+5.74
945	1	>100	1545	27367	+3.24
975	3	>100	1575	27490	+1.86
1005	42	>100	1605	27608	+1.22
1035	242	>100	1635	27841	+1.33
1065	613	>100	1665	27695	+1.11
1095	1353	>100	1695	27999	+1.42
1125	2213	>100	1725	27992	+2.04
1155	3256	>100	1755	28289	+2.52
1185	4474	>100	1785	28408	+4.56
1215	5932	+94.10	1815	28863	+5.70
1245	8072	+87.32	1845	29664	
1275	10579	+79.61	1875	30148	



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	16978	+70.97
735	0		1335	20569	+61.39
765	0		1365	24989	+48.97
795	0	>100	1395	28389	+36.69
825	0	>100	1425	30977	+24.05
855	0	>100	1455	32727	+14.93
885	0	>100	1485	33697	+8.42
915	1	>100	1515	34195	+4.89
945	1	>100	1545	34437	+3.49
975	3	>100	1575	34850	+2.11
1005	34	>100	1605	35174	+1.62
1035	221	>100	1635	34923	+0.68
1065	825	>100	1665	35250	+0.35
1095	1709	>100	1695	35171	+1.24
1125	2873	>100	1725	35237	+1.02
1155	4078	>100	1755	35584	+2.79
1185	5858	>100	1785	35587	+4.59
1215	7809	+91.82	1815	36485	+6.74
1245	10336	+85.02	1845	37270	
1275	13215	+77.79	1875	38453	

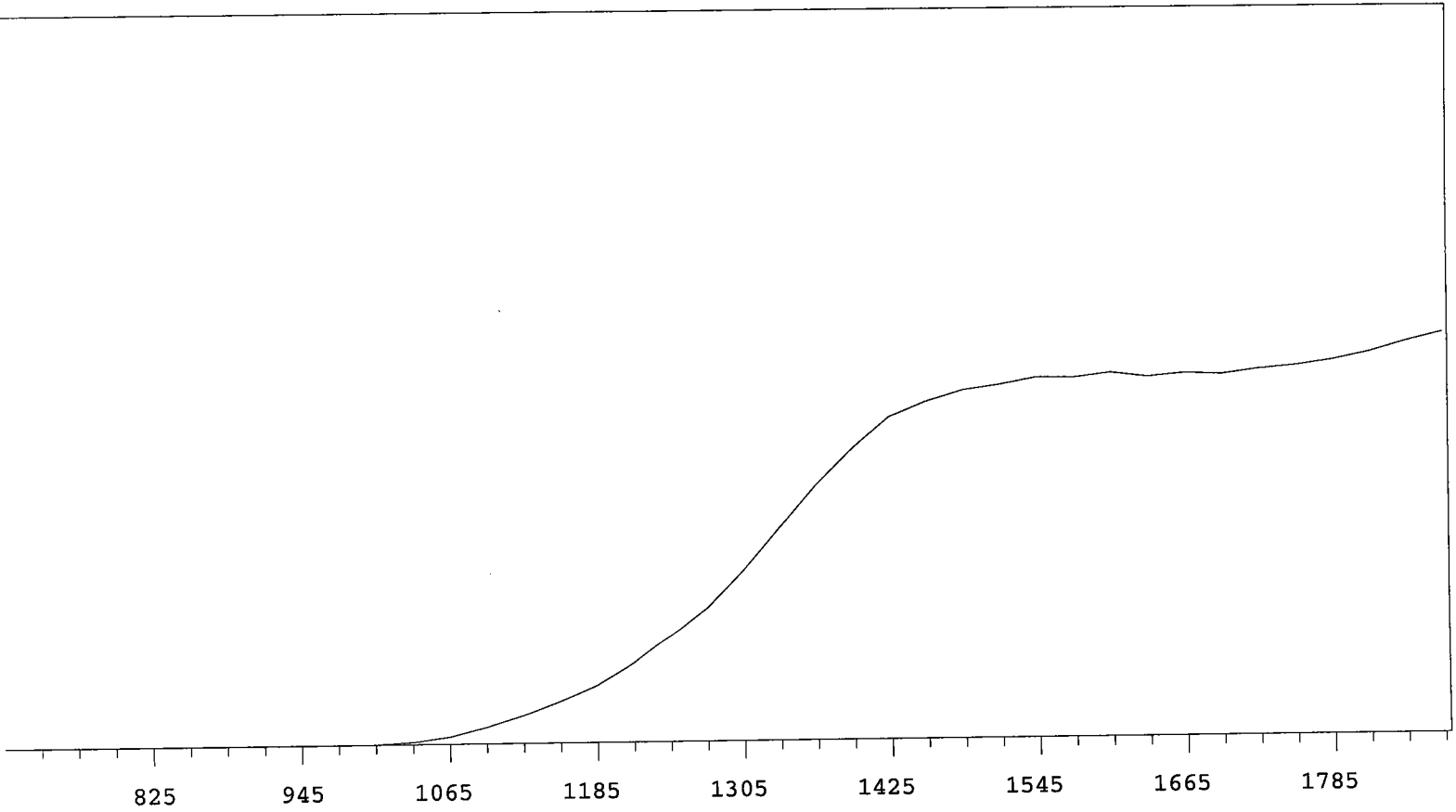


VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	16543	+70.03
735	0		1335	20257	+60.71
765	0		1365	24245	+48.17
795	0	>100	1395	27602	+35.50
825	0	>100	1425	30019	+23.48
855	0	>100	1455	31614	+14.53
885	0	>100	1485	32522	+8.91
915	0	>100	1515	33103	+5.28
945	0	>100	1545	33572	+2.60
975	4	>100	1575	33695	+0.70
1005	57	>100	1605	33525	+1.48
1035	277	>100	1635	33477	+0.99
1065	817	>100	1665	34432	+1.49
1095	1666	>100	1695	33745	+1.43
1125	2766	>100	1725	34149	+1.60
1155	4077	>100	1755	34350	+3.69
1185	5667	>100	1785	34955	+3.62
1215	7694	+91.50	1815	35251	+4.44
1245	10209	+84.83	1845	35592	
1275	12950	+77.50	1875	36382	

MPC 9600 Plateau
Alpha Volts: 705

Instrument 7 MPC 9604 Detector D
Beta Volts: 1575

7/1/2009

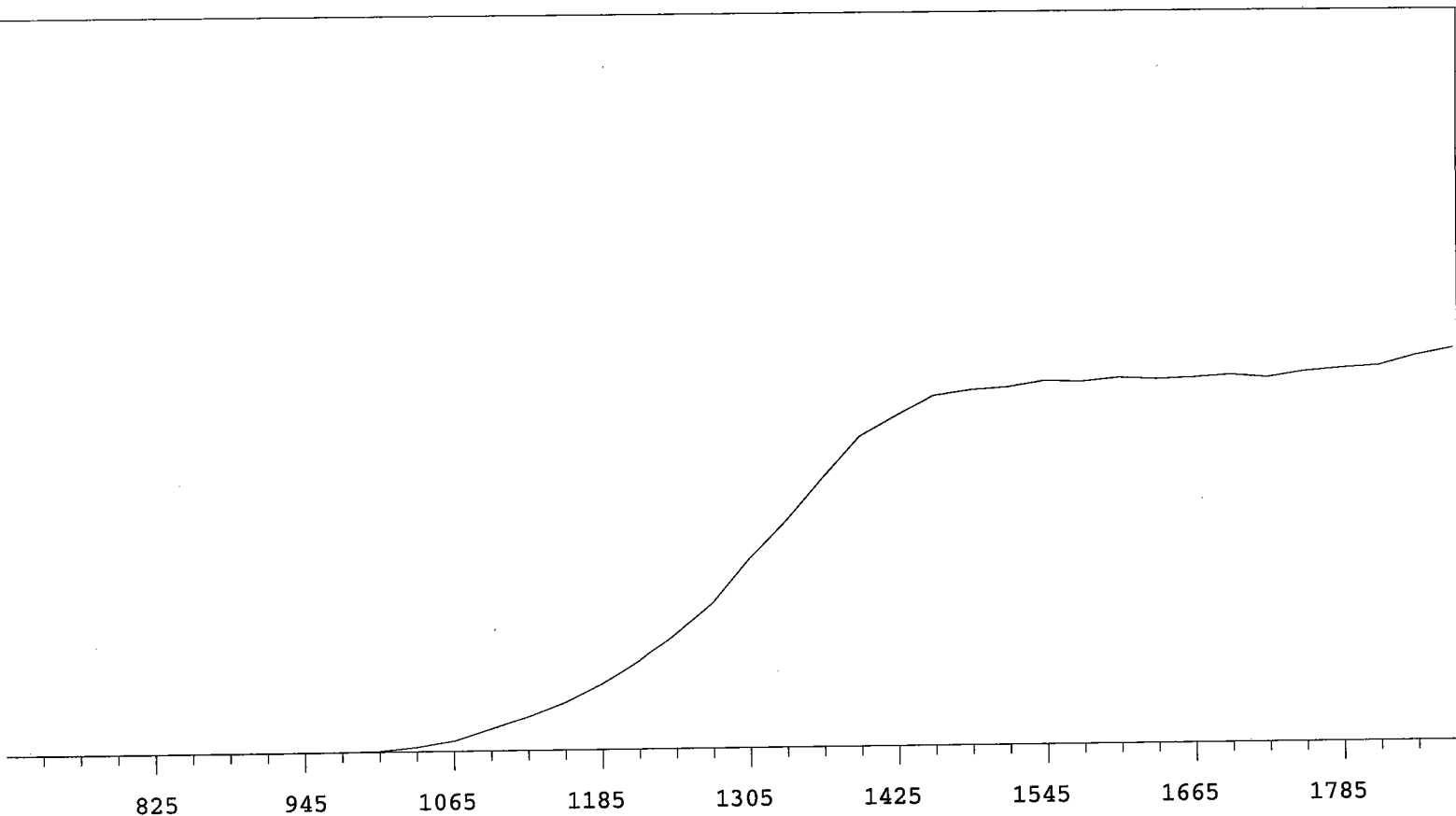


VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	14016	+71.42
735	0		1335	17436	+62.21
765	0		1365	20814	+50.32
795	0	>100	1395	23760	+36.91
825	0	>100	1425	26302	+24.91
855	0	>100	1455	27519	+15.17
885	0	>100	1485	28410	+8.91
915	0	>100	1515	28843	+5.41
945	0	>100	1545	29396	+3.58
975	5	>100	1575	29357	+1.54
1005	29	>100	1605	29719	+0.51
1035	204	>100	1635	29358	+0.23
1065	609	>100	1665	29623	+0.57
1095	1354	>100	1695	29509	+2.12
1125	2316	>100	1725	29896	+2.84
1155	3418	>100	1755	30165	+4.42
1185	4654	>100	1785	30570	+5.65
1215	6455	+92.99	1815	31180	+6.95
1245	8669	+86.45	1845	31995	
1275	10931	+79.15	1875	32717	

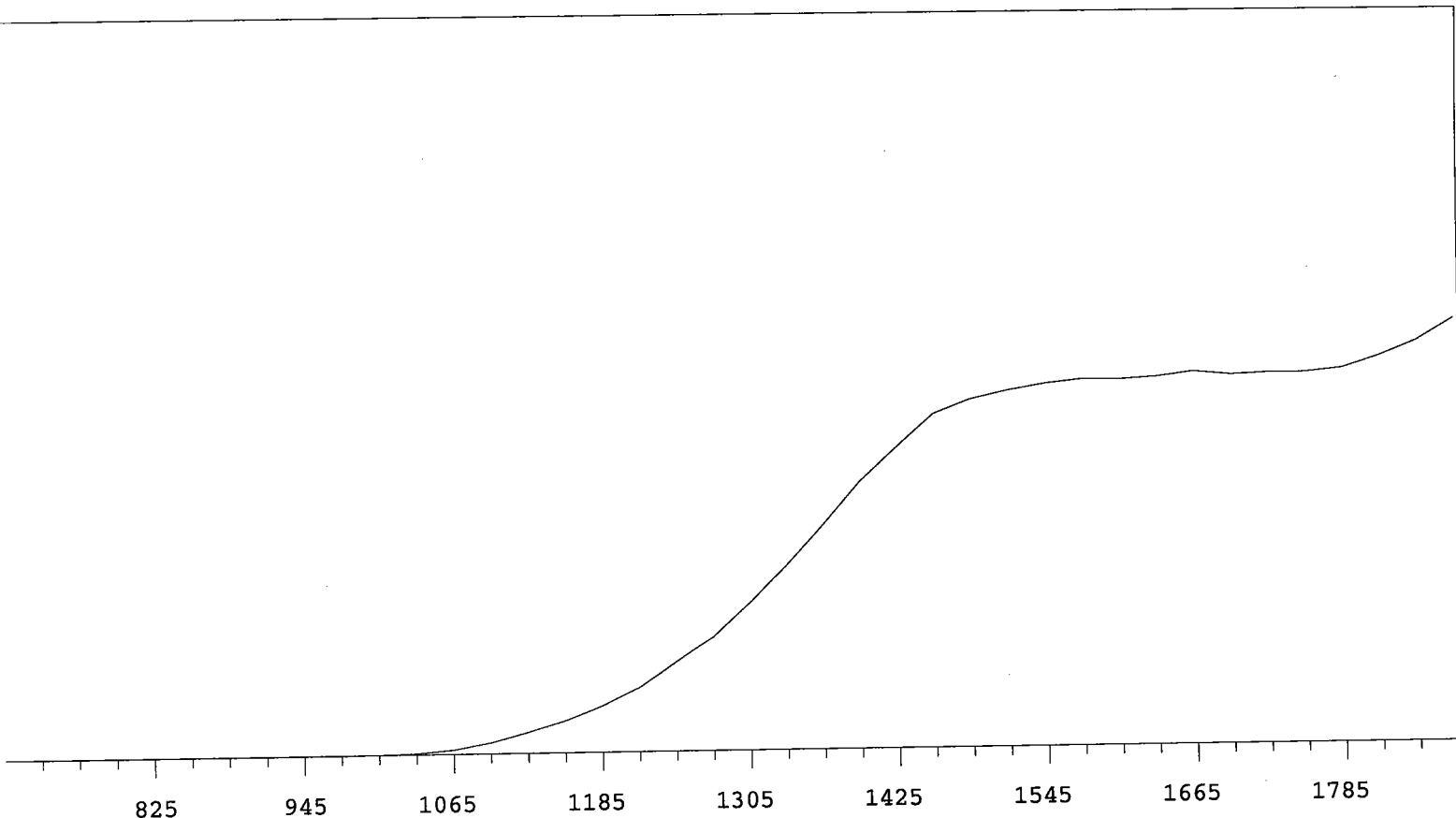
MPC 9600 Plateau
Alpha Volts: 705

Instrument 8 MPC 9604 Detector A
Beta Volts: 1575

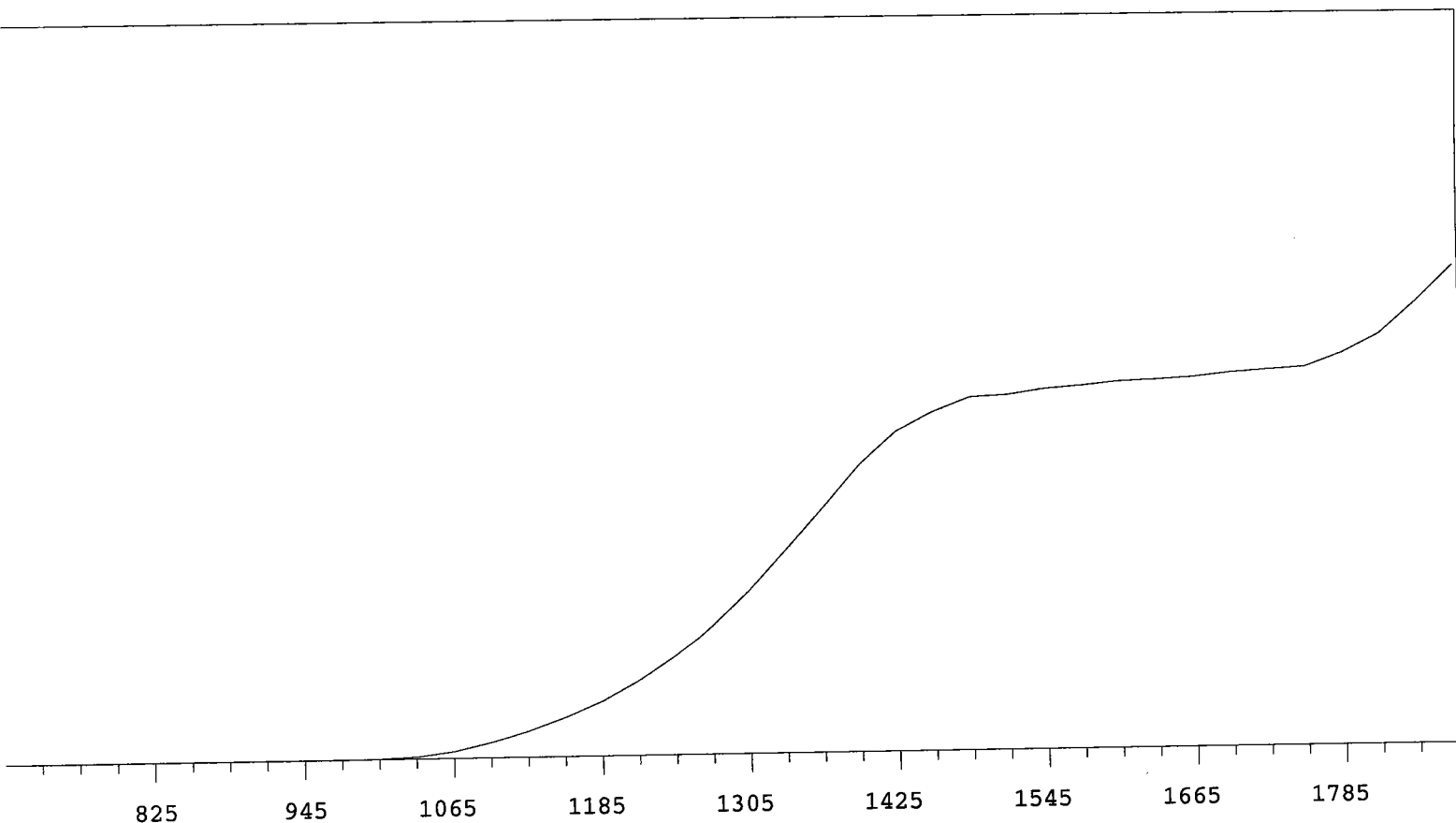
7/1/2009



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	19482	+67.45
735	0		1335	23344	+59.35
765	0		1365	27793	+45.86
795	0	>100	1395	31916	+34.29
825	0	>100	1425	33979	+21.61
855	0	>100	1455	35993	+11.71
885	0	>100	1485	36530	+7.04
915	0	>100	1515	36796	+3.11
945	1	>100	1545	37393	+2.44
975	9	>100	1575	37279	+1.41
1005	96	>100	1605	37650	+0.49
1035	468	>100	1635	37458	+0.91
1065	1084	>100	1665	37579	+0.12
1095	2286	>100	1695	37828	+1.10
1125	3479	>100	1725	37535	+1.72
1155	4912	>100	1755	38104	+2.18
1185	6819	+98.23	1785	38416	+4.12
1215	9153	+89.05	1815	38633	+4.92
1245	12105	+83.21	1845	39649	
1275	15122	+75.24	1875	40366	



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	16337	+74.91
735	0		1335	20471	+68.07
765	0		1365	25012	+57.86
795	0	>100	1395	29694	+47.48
825	0	>100	1425	33409	+35.17
855	0	>100	1455	37013	+23.27
885	0	>100	1485	38629	+14.35
915	0	>100	1515	39529	+7.69
945	0	>100	1545	40284	+4.34
975	0	>100	1575	40711	+2.52
1005	20	>100	1605	40642	+1.97
1035	122	>100	1635	40879	+1.11
1065	511	>100	1665	41405	+0.98
1095	1263	>100	1695	41011	+0.30
1125	2390	>100	1725	41182	+0.41
1155	3641	>100	1755	41178	+3.28
1185	5246	>100	1785	41573	+6.47
1215	7212	+98.32	1815	42858	+10.82
1245	9897	+89.80	1845	44440	
1275	12742	+82.40	1875	46780	

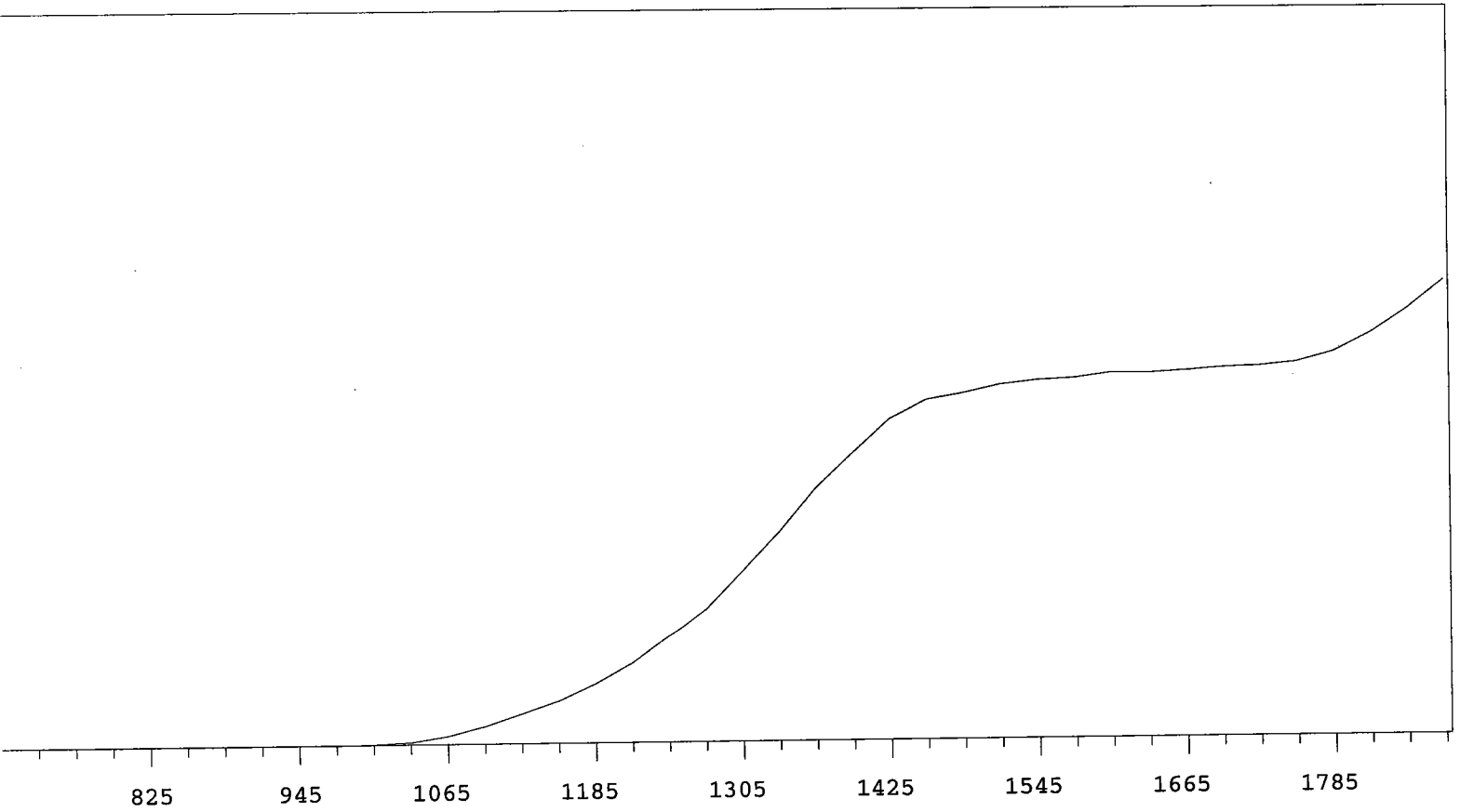


VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	16303	+72.82
735	0		1335	20309	+64.32
765	0		1365	24364	+53.82
795	0	>100	1395	28527	+40.95
825	0	>100	1425	31774	+28.74
855	0	>100	1455	33631	+16.87
885	0	>100	1485	35030	+9.25
915	0	>100	1515	35208	+5.21
945	0	>100	1545	35741	+3.27
975	4	>100	1575	36019	+2.95
1005	46	>100	1605	36373	+2.21
1035	202	>100	1635	36484	+2.27
1065	697	>100	1665	36713	+2.28
1095	1532	>100	1695	37093	+2.46
1125	2614	>100	1725	37325	+4.17
1155	3953	>100	1755	37543	+7.52
1185	5474	>100	1785	38833	+13.43
1215	7466	+93.09	1815	40656	+19.49
1245	9842	+86.73	1845	43753	
1275	12814	+80.29	1875	47246	

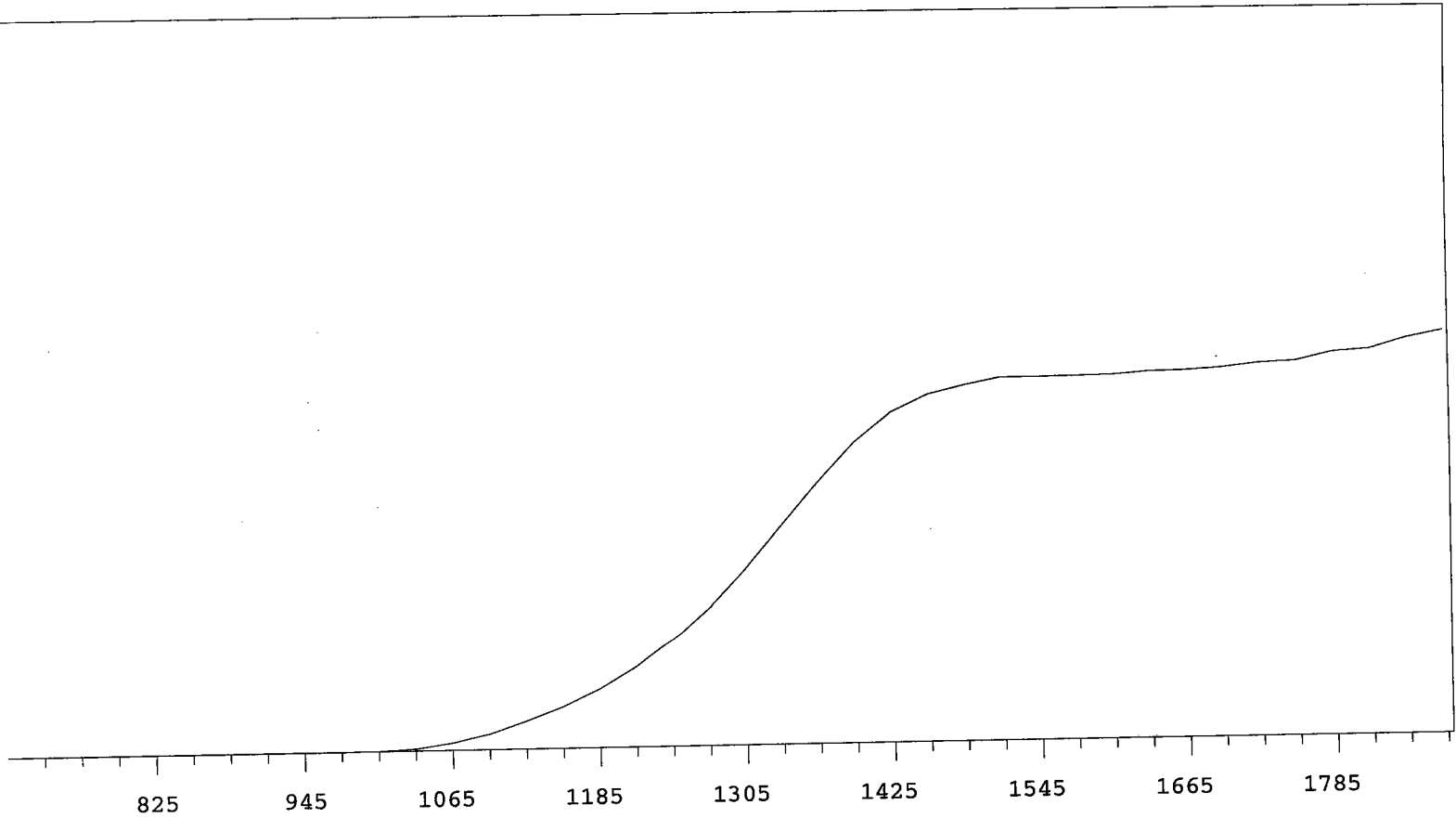
MPC 9600 Plateau
 Alpha Volts: 705

Instrument 8 MPC 9604 Detector D
 Beta Volts: 1575

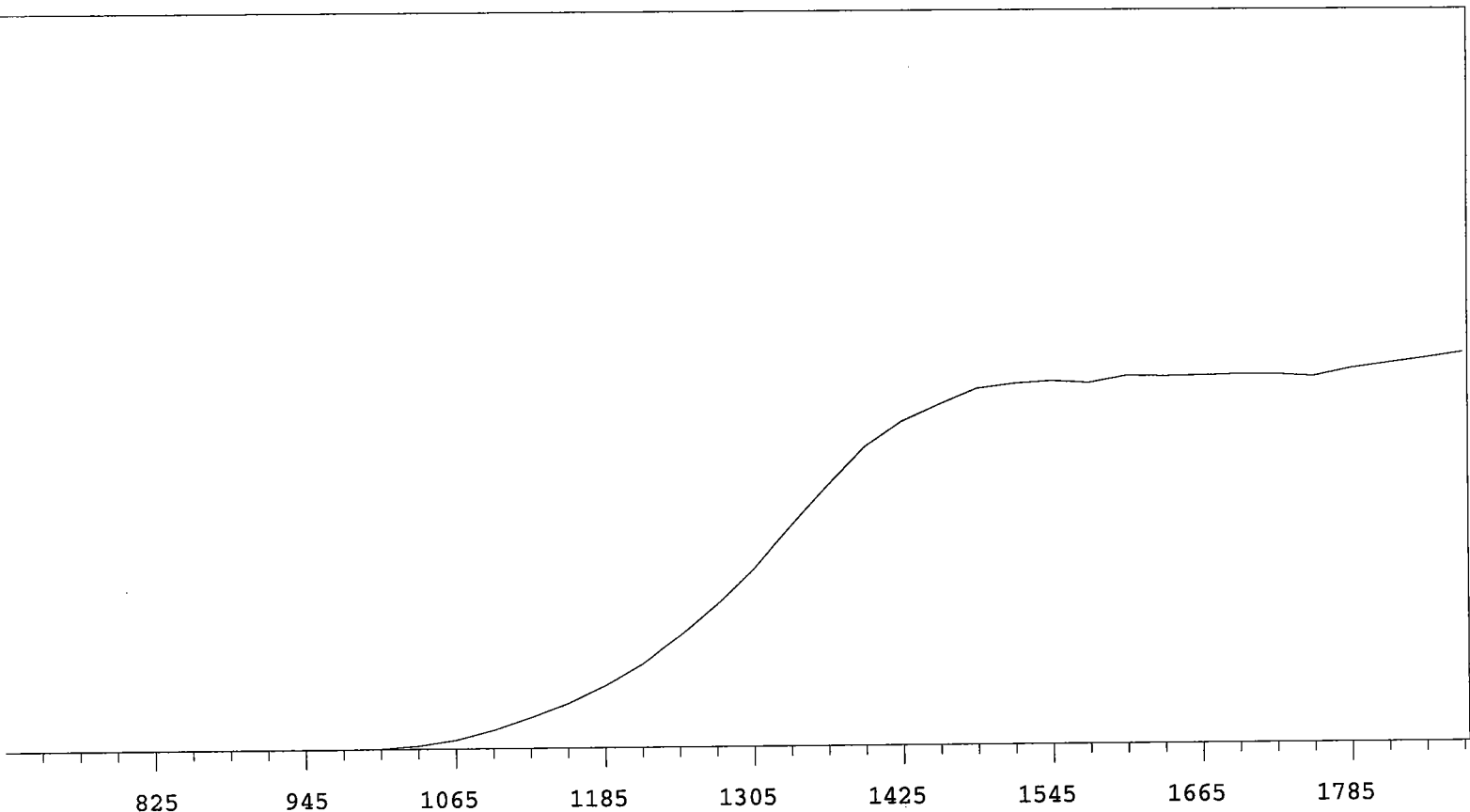
7/1/2009



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	16889	+70.18
735	0		1335	20600	+61.29
765	1	+0.00	1365	24824	+50.40
795	0	>100	1395	28208	+38.85
825	0	>100	1425	31539	+25.79
855	0	>100	1455	33391	+16.06
885	0	>100	1485	33991	+8.60
915	0	>100	1515	34782	+5.01
945	0	>100	1545	35201	+4.10
975	5	>100	1575	35380	+2.50
1005	47	>100	1605	35849	+1.87
1035	243	>100	1635	35784	+1.79
1065	792	>100	1665	36000	+1.43
1095	1744	>100	1695	36269	+2.10
1125	2933	>100	1725	36381	+3.46
1155	4123	>100	1755	36733	+6.86
1185	5780	>100	1785	37669	+11.78
1215	7791	+91.58	1815	39465	+16.64
1245	10478	+84.93	1845	41803	
1275	13118	+77.50	1875	44665	



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	16226	+71.71
735	0		1335	20083	+61.95
765	1	+0.00	1365	23913	+49.99
795	0	>100	1395	27526	+36.97
825	0	>100	1425	30193	+24.54
855	0	>100	1455	31747	+14.71
885	0	>100	1485	32544	+7.71
915	0	>100	1515	33198	+3.66
945	0	>100	1545	33188	+1.51
975	2	>100	1575	33227	+0.73
1005	33	>100	1605	33278	+1.04
1035	203	>100	1635	33518	+1.38
1065	668	>100	1665	33565	+1.95
1095	1403	>100	1695	33774	+1.99
1125	2545	>100	1725	34135	+3.30
1155	3800	>100	1755	34244	+3.67
1185	5363	>100	1785	35022	+4.84
1215	7355	+95.00	1815	35229	+5.93
1245	9807	+87.69	1845	36179	
1275	12700	+80.28	1875	36821	

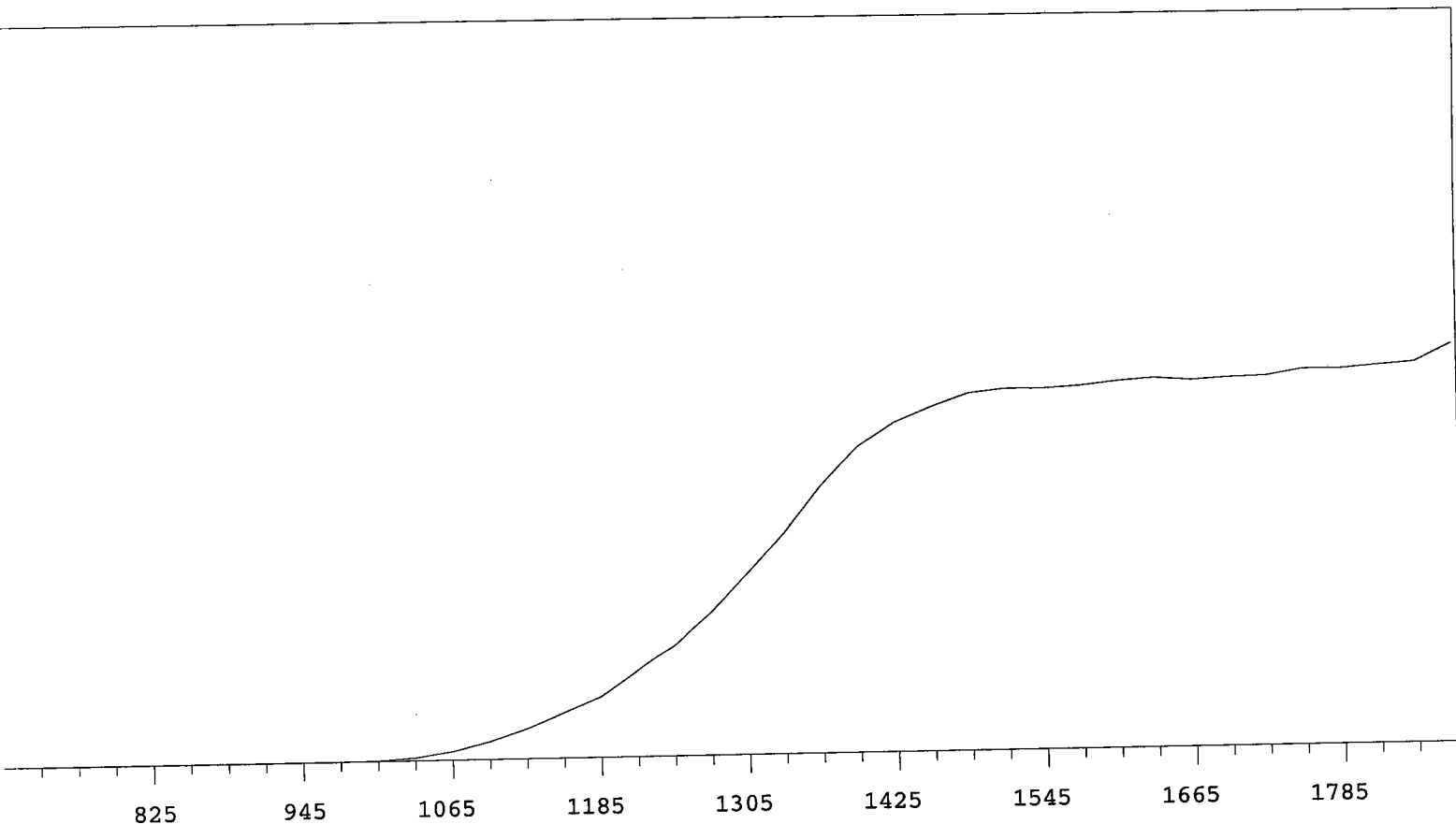


VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	16723	+68.78
735	0		1335	20749	+60.55
765	0		1365	24686	+48.78
795	0	>100	1395	28343	+35.24
825	0	>100	1425	30657	+24.31
855	0	>100	1455	32208	+15.22
885	0	>100	1485	33662	+9.32
915	0	>100	1515	34098	+4.47
945	0	>100	1545	34326	+2.17
975	4	>100	1575	34133	+1.60
1005	45	>100	1605	34758	+1.41
1035	300	>100	1635	34706	+1.35
1065	836	>100	1665	34769	+0.30
1095	1742	>100	1695	34830	-0.10
1125	2896	>100	1725	34850	+0.90
1155	4198	>100	1755	34613	+2.41
1185	5849	>100	1785	35351	+3.87
1215	7887	+92.20	1815	35849	+4.97
1245	10561	+83.55	1845	36285	
1275	13442	+76.62	1875	36814	

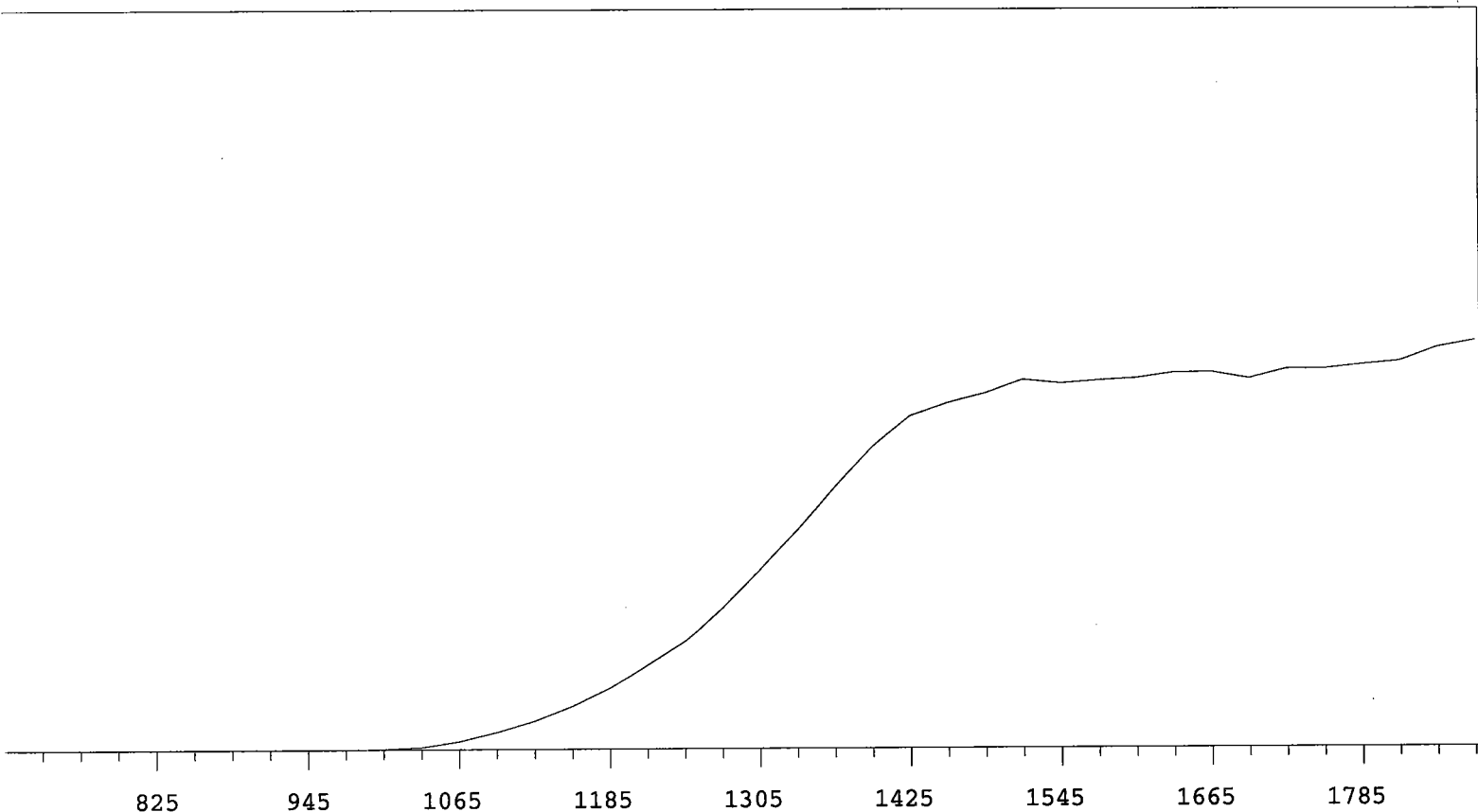
MPC 9600 Plateau
Alpha Volts: 870

Instrument 9 MPC 9604 Detector C
Beta Volts: 1530

7/1/2009



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	20192	+70.39
735	0		1335	24524	+60.97
765	0		1365	29650	+48.44
795	0	>100	1395	33904	+35.09
825	0	>100	1425	36549	+22.73
855	0	>100	1455	38217	+13.58
885	1	>100	1485	39628	+7.51
915	1	>100	1515	40035	+3.73
945	2	>100	1545	40020	+1.92
975	3	>100	1575	40236	+2.06
1005	64	>100	1605	40680	+1.62
1035	349	>100	1635	40953	+1.03
1065	970	>100	1665	40643	+0.43
1095	1982	>100	1695	40882	+1.41
1125	3328	>100	1725	40979	+2.18
1155	5012	>100	1755	41654	+2.20
1185	6669	>100	1785	41602	+2.27
1215	9448	+92.67	1815	41935	+4.50
1245	12293	+86.58	1845	42259	
1275	15917	+76.99	1875	44183	

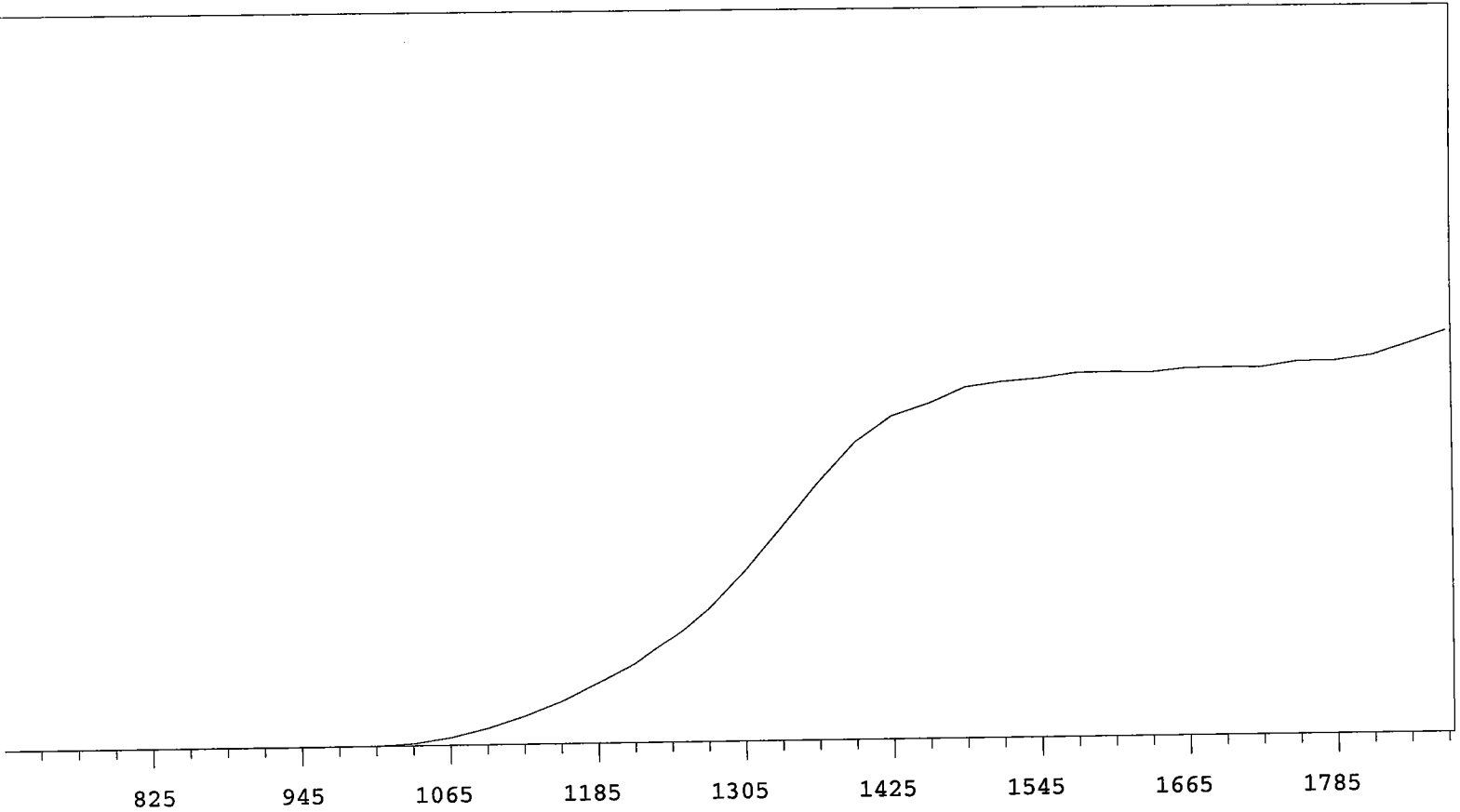


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	1	>100
945	0	>100
975	5	>100
1005	35	>100
1035	186	>100
1065	618	>100
1095	1280	>100
1125	2141	>100
1155	3268	>100
1185	4659	>100
1215	6343	+90.68
1245	8064	+83.46
1275	10497	+77.03
1305	13319	+70.94
1335	16319	+61.35
1365	19577	+50.27
1395	22498	+36.85
1425	24782	+23.90
1455	25761	+15.37
1485	26486	+8.38
1515	27503	+5.11
1545	27223	+2.67
1575	27453	+1.71
1605	27604	+2.70
1635	28021	+0.78
1665	28059	+1.05
1695	27548	+0.90
1725	28280	+2.16
1755	28290	+3.51
1785	28600	+4.46
1815	28879	+6.35
1845	29913	
1875	30417	

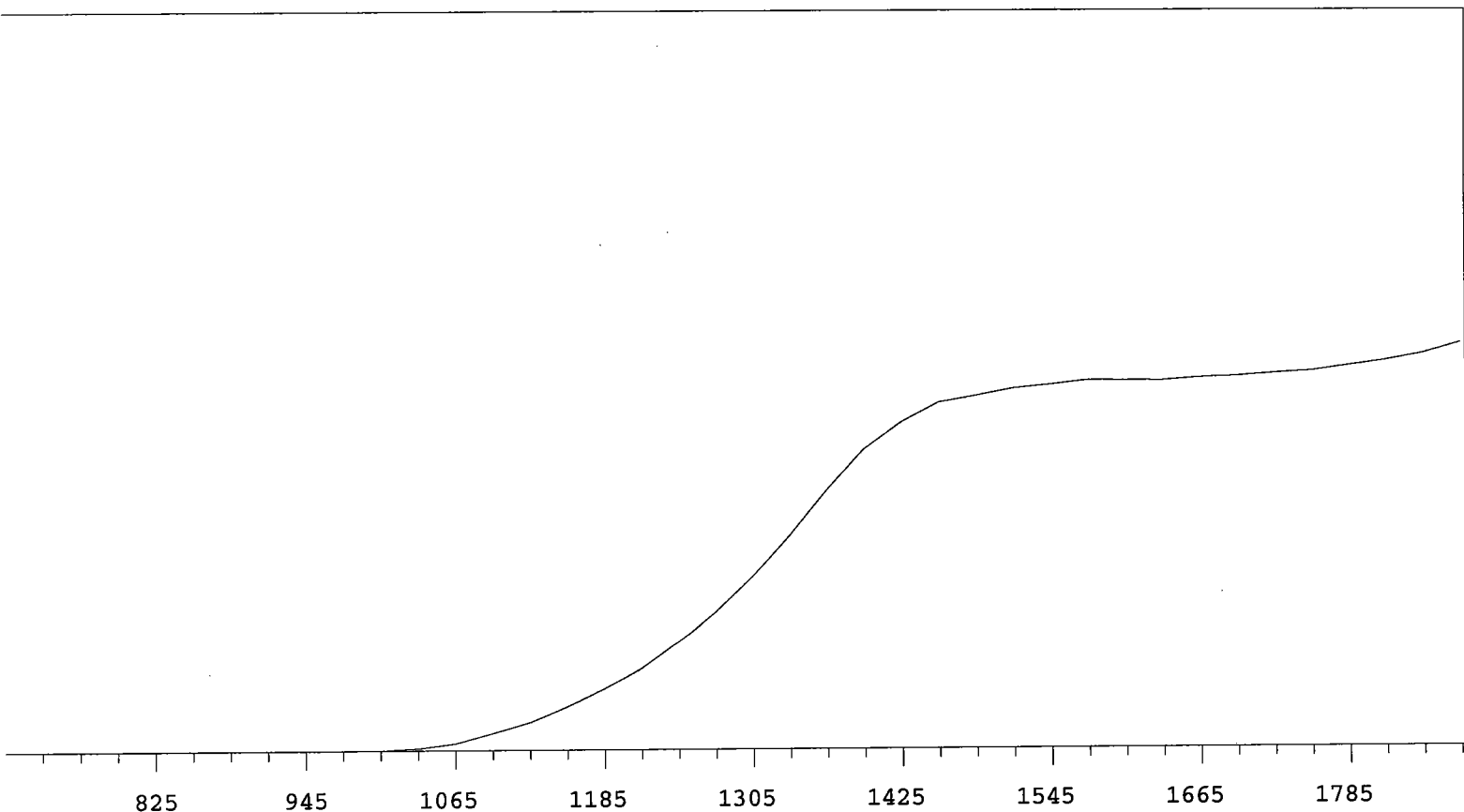
MPC 9600 Plateau
Alpha Volts: 870

Instrument 10 MPC 9604 Detector A
Beta Volts: 1552

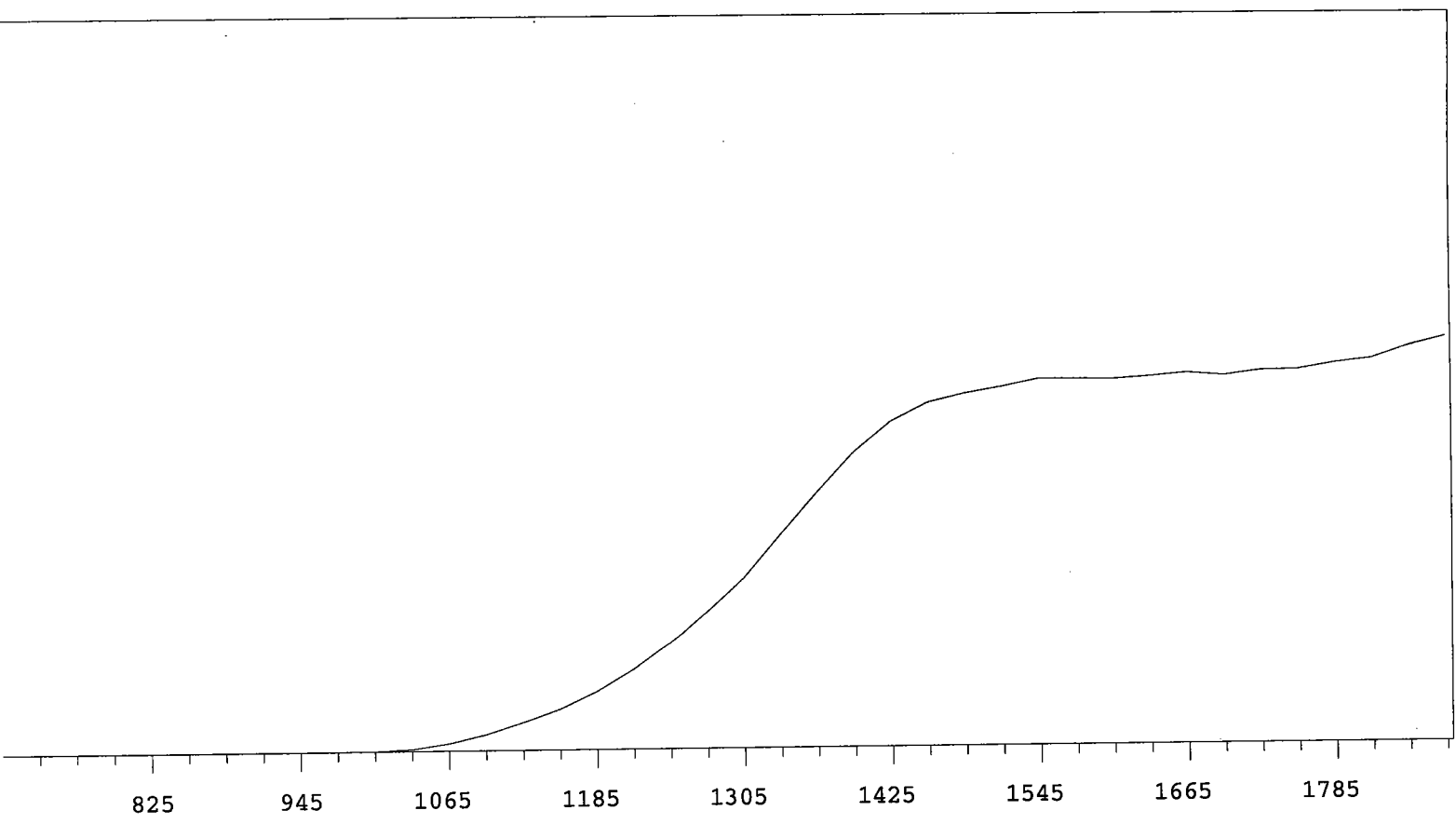
7/1/2009



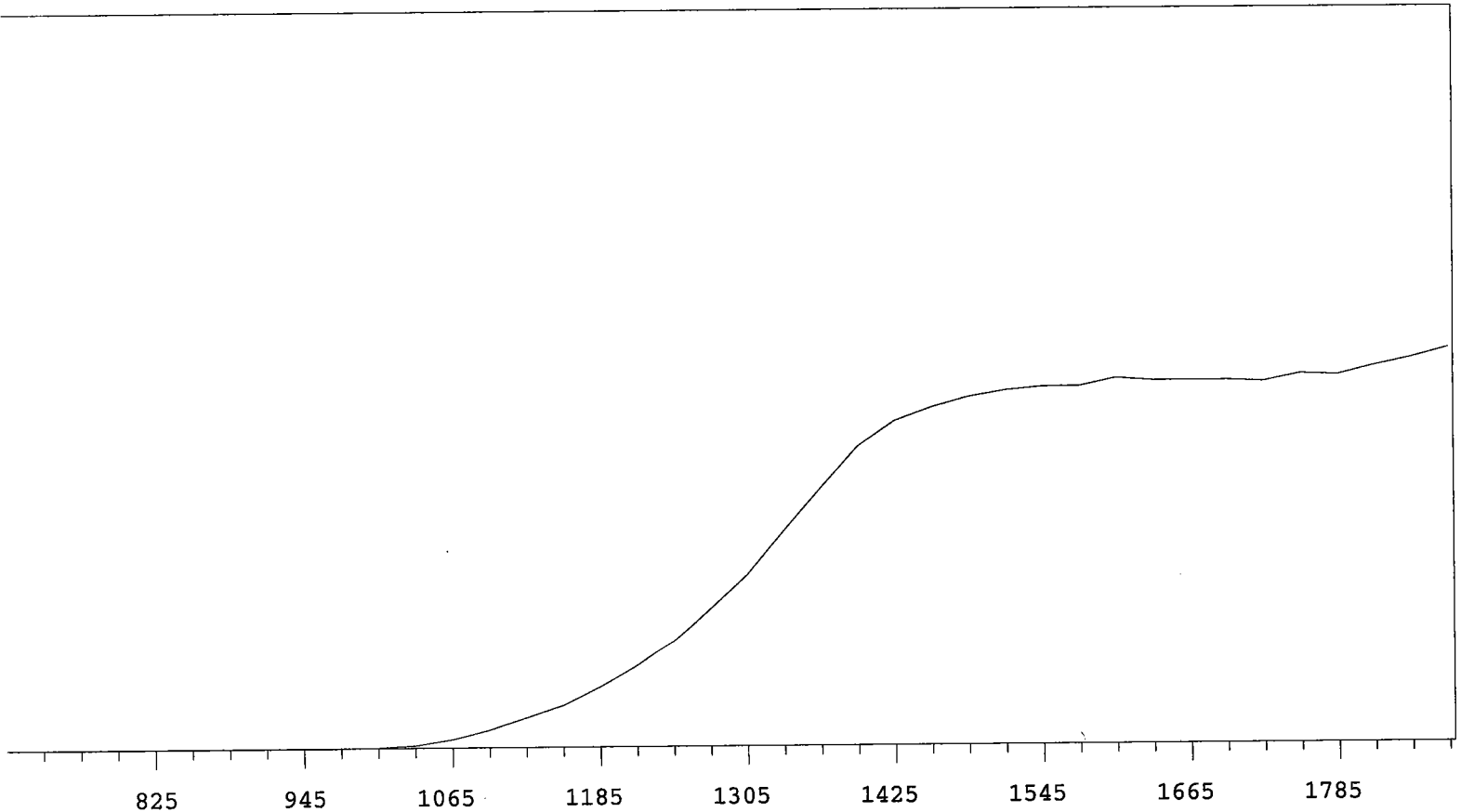
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	16076	+72.76
735	1		1335	19985	+63.85
765	0		1365	24102	+50.95
795	0	>100	1395	27819	+36.01
825	0	>100	1425	30228	+23.86
855	0	>100	1455	31343	+14.40
885	0	>100	1485	32811	+8.77
915	0	>100	1515	33243	+6.10
945	0	>100	1545	33518	+3.25
975	1	>100	1575	34010	+1.98
1005	37	>100	1605	34061	+1.59
1035	198	>100	1635	33973	+0.97
1065	687	>100	1665	34346	+0.93
1095	1491	>100	1695	34366	+1.72
1125	2580	>100	1725	34341	+1.54
1155	3920	>100	1755	34860	+2.47
1185	5588	>100	1785	34897	+4.50
1215	7384	+91.32	1815	35377	+6.60
1245	9794	+84.81	1845	36458	
1275	12572	+79.73	1875	37630	



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	14469	+71.08
735	0		1335	17904	+63.07
765	0		1365	21677	+51.20
795	0	>100	1395	25027	+38.06
825	0	>100	1425	27237	+24.55
855	0	>100	1455	28914	+14.61
885	0	>100	1485	29480	+8.48
915	0	>100	1515	30075	+5.06
945	1	>100	1545	30374	+3.42
975	7	>100	1575	30738	+1.68
1005	28	>100	1605	30703	+1.08
1035	190	>100	1635	30679	+0.77
1065	597	>100	1665	30902	+1.46
1095	1474	>100	1695	30992	+1.89
1125	2383	>100	1725	31224	+2.40
1155	3680	>100	1755	31397	+3.27
1185	5131	>100	1785	31826	+4.13
1215	6808	+89.95	1815	32236	+5.59
1245	8990	+83.03	1845	32782	
1275	11493	+77.30	1875	33632	

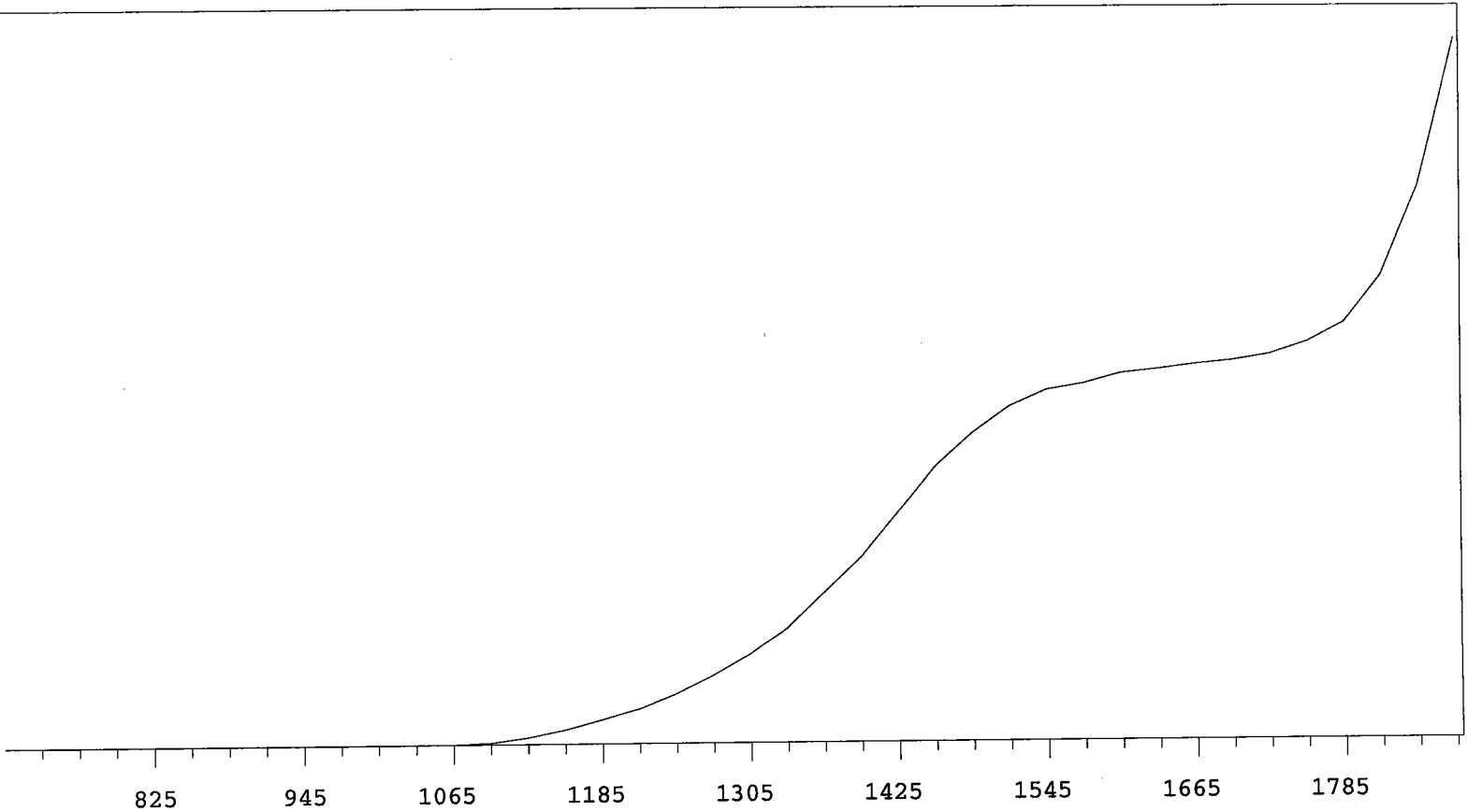


VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	1		1305	18051	+71.16
735	0		1335	22586	+62.34
765	0		1365	26973	+51.47
795	0	>100	1395	31137	+38.24
825	0	>100	1425	34321	+25.70
855	0	>100	1455	36267	+15.37
885	1	>100	1485	37197	+9.21
915	0	>100	1515	37851	+5.38
945	2	>100	1545	38622	+3.00
975	2	>100	1575	38600	+1.55
1005	36	>100	1605	38538	+1.03
1035	220	>100	1635	38786	+0.91
1065	780	>100	1665	39129	+1.38
1095	1712	>100	1695	38832	+1.20
1125	2926	>100	1725	39323	+2.00
1155	4297	>100	1755	39390	+3.35
1185	6097	>100	1785	40031	+4.86
1215	8397	+95.11	1815	40466	+6.64
1245	11155	+85.84	1845	41713	
1275	14430	+78.79	1875	42620	

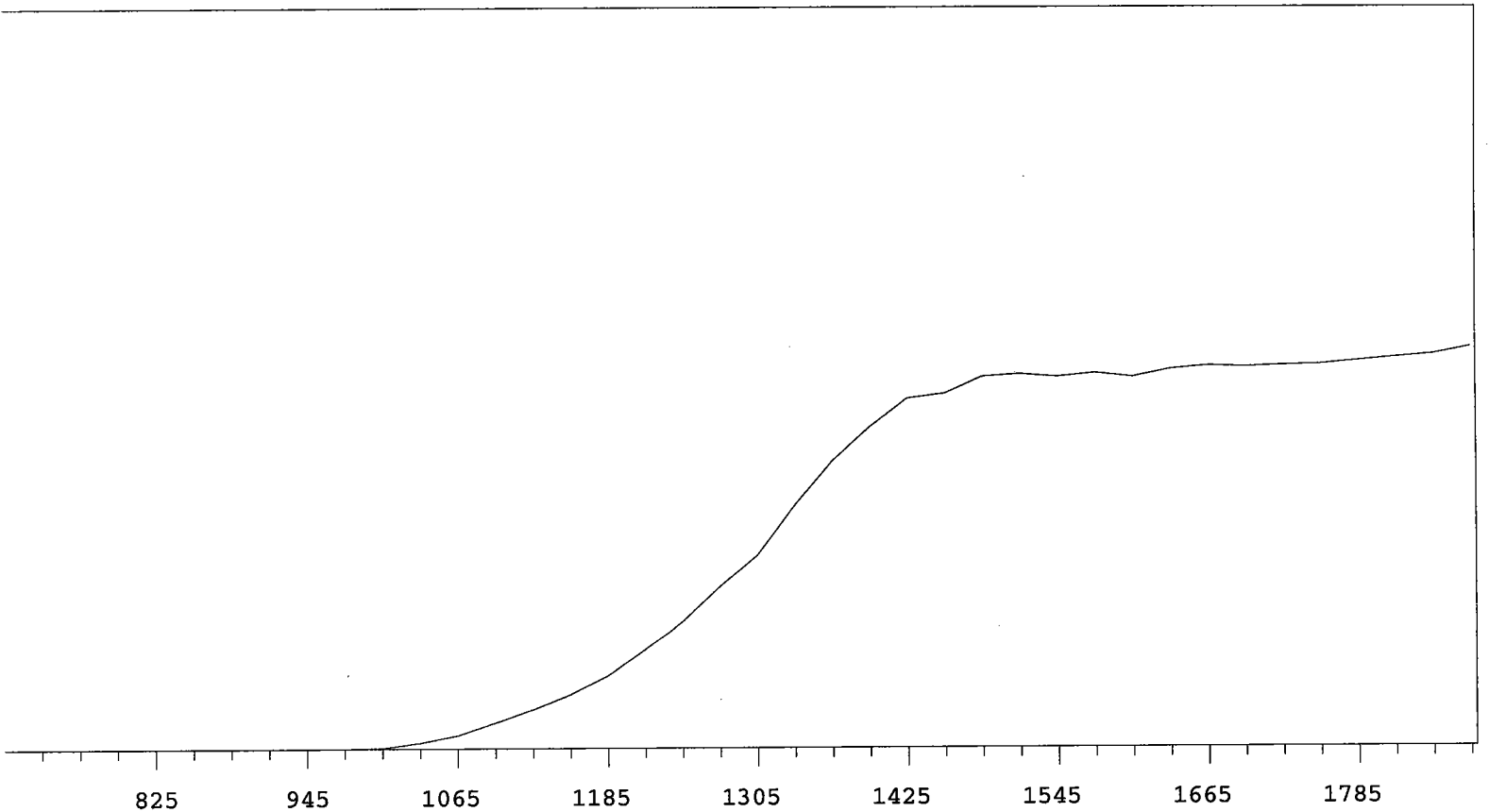


VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	15430	+69.87
735	0		1335	19258	+61.49
765	0		1365	23018	+50.06
795	0	>100	1395	26562	+35.34
825	0	>100	1425	28750	+22.67
855	0	>100	1455	29911	+13.20
885	0	>100	1485	30798	+8.01
915	0	>100	1515	31375	+4.83
945	0	>100	1545	31684	+3.74
975	3	>100	1575	31721	+2.38
1005	49	>100	1605	32398	+1.44
1035	244	>100	1635	32154	+0.64
1065	764	>100	1665	32157	-0.77
1095	1584	>100	1695	32152	+0.99
1125	2677	>100	1725	32029	+1.41
1155	3763	>100	1755	32699	+3.00
1185	5395	>100	1785	32566	+4.71
1215	7350	+93.71	1815	33351	+5.92
1245	9655	+83.52	1845	34031	
1275	12504	+76.82	1875	34941	

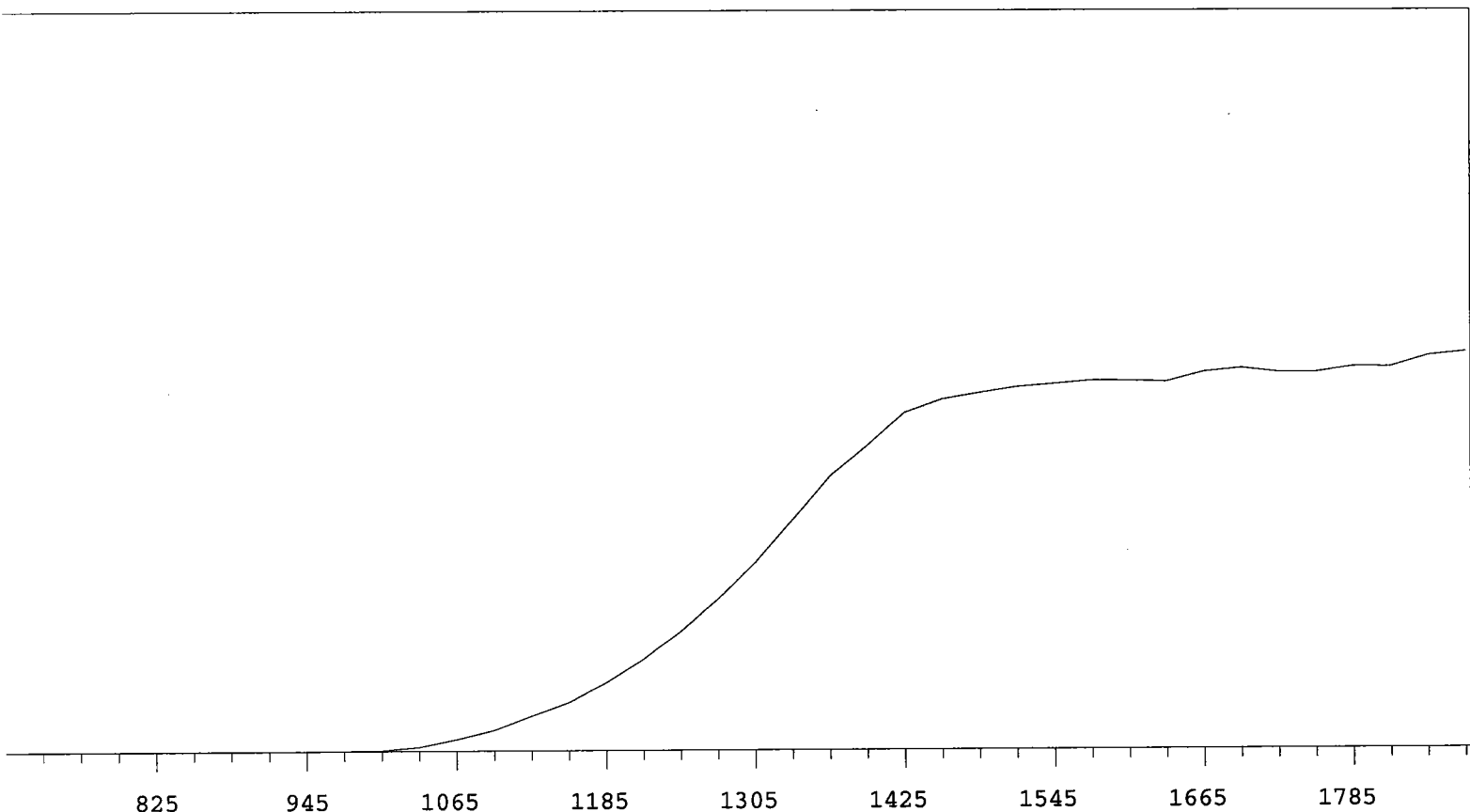
Alpha Volts: 1515 Beta Volts: 1515



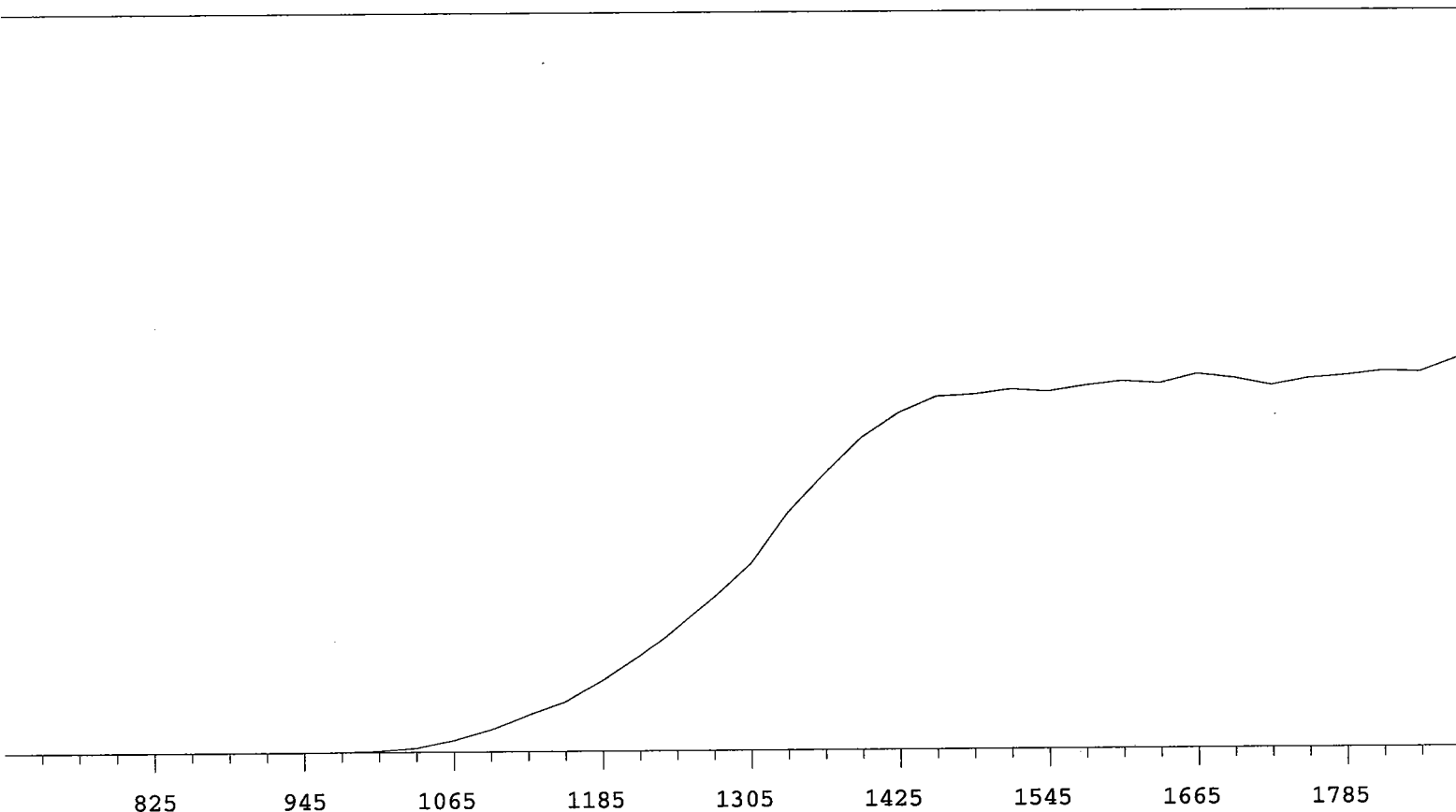
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	3225	+87.64
735	1		1335	4189	+80.15
765	0		1365	5428	+75.12
795	0	>100	1395	6662	+68.60
825	0	>100	1425	8241	+58.14
855	0	>100	1455	9857	+46.65
885	0	>100	1485	11018	+33.24
915	0	>100	1515	11953	+21.01
945	1	+0.00	1545	12538	+13.57
975	0	>100	1575	12760	+8.35
1005	0	>100	1605	13114	+5.84
1035	2	>100	1635	13258	+4.78
1065	9	>100	1665	13430	+3.99
1095	61	>100	1695	13551	+5.46
1125	248	>100	1725	13771	+8.65
1155	528	>100	1755	14204	+16.44
1185	882	>100	1785	14916	+30.03
1215	1270	>100	1815	16579	+48.74
1245	1786	>100	1845	19717	
1275	2478	+93.67	1875	25029	



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	8947	+65.63
735	0		1335	11238	+56.58
765	0		1365	13246	+46.66
795	0	>100	1395	14838	+30.69
825	0	>100	1425	16166	+20.11
855	0	>100	1455	16396	+11.95
885	0	>100	1485	17161	+5.61
915	1	>100	1515	17274	+3.59
945	0	>100	1545	17144	-0.00
975	11	>100	1575	17323	+0.80
1005	47	>100	1605	17136	+2.21
1035	280	>100	1635	17484	+1.94
1065	610	>100	1665	17638	+2.16
1095	1192	>100	1695	17580	+0.85
1125	1789	>100	1725	17655	+1.05
1155	2466	>100	1755	17700	+1.98
1185	3337	+94.91	1785	17857	+2.38
1215	4526	+88.85	1815	18006	+3.36
1245	5885	+78.40	1845	18140	
1275	7518	+72.09	1875	18468	



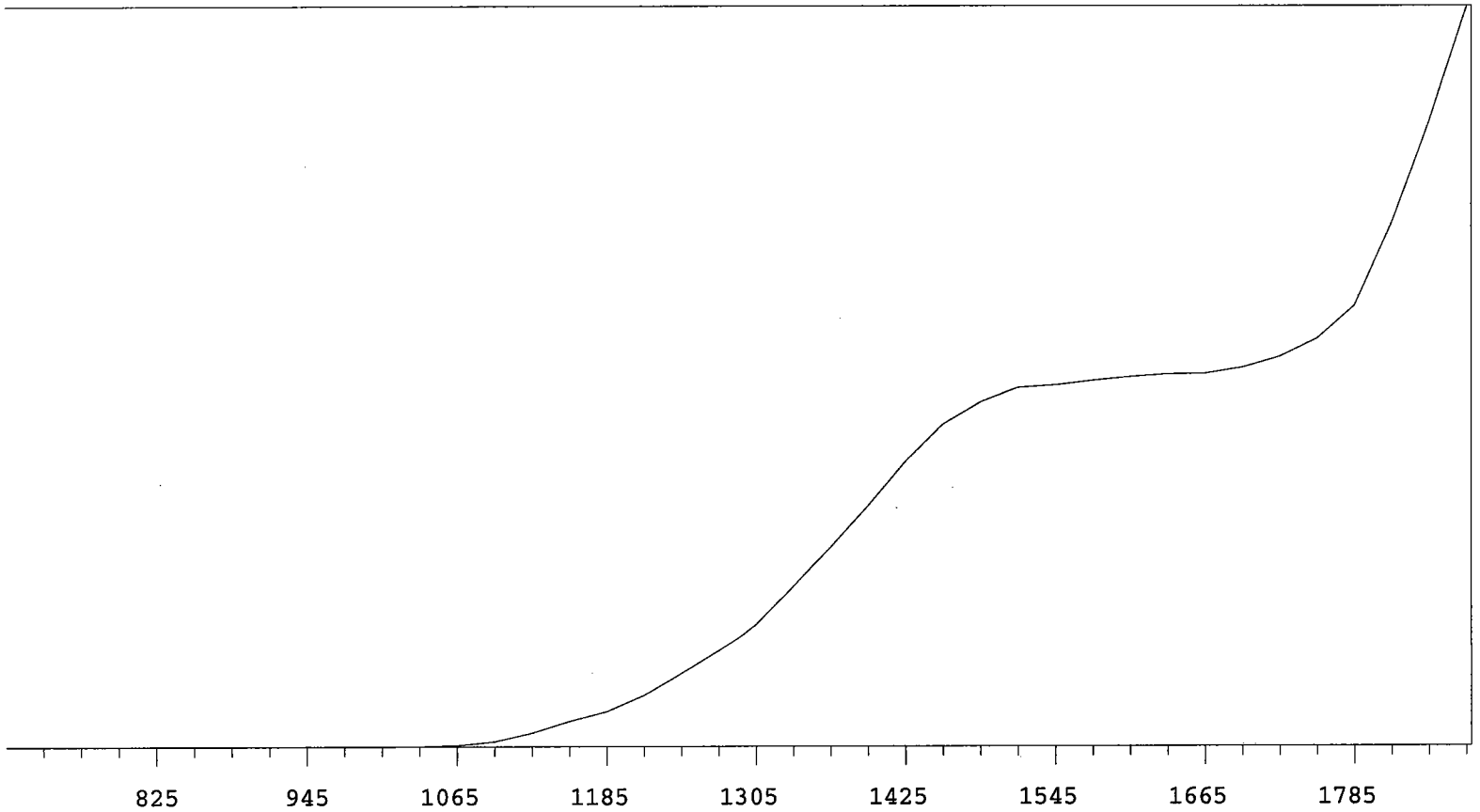
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	1		1305	8636	+66.44
735	0		1335	10593	+56.56
765	0	+0.00	1365	12582	+46.23
795	0	>100	1395	13957	+33.45
825	1	+0.00	1425	15443	+21.49
855	0	>100	1455	16048	+13.14
885	0	+0.00	1485	16331	+6.45
915	0	>100	1515	16603	+4.19
945	1	>100	1545	16736	+2.73
975	7	>100	1575	16884	+1.11
1005	46	>100	1605	16875	+1.91
1035	191	>100	1635	16813	+2.86
1065	540	>100	1665	17257	+2.60
1095	957	>100	1695	17425	+1.58
1125	1597	>100	1725	17238	+0.49
1155	2217	>100	1755	17230	+0.63
1185	3154	+98.74	1785	17482	+3.27
1215	4239	+89.75	1815	17468	+4.46
1245	5550	+79.98	1845	17977	
1275	6980	+73.12	1875	18163	



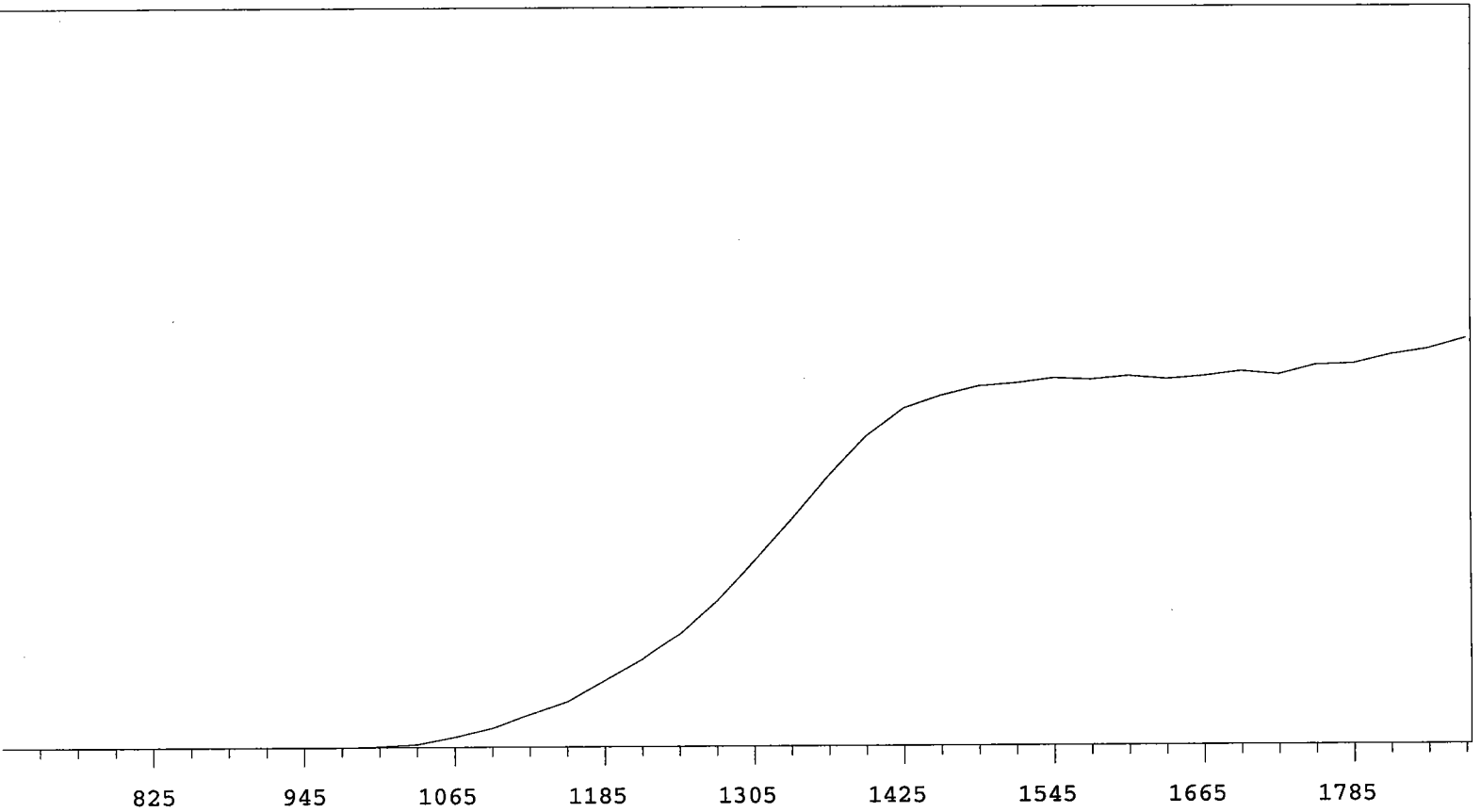
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	7679	+65.97
735	0		1335	9737	+57.57
765	0		1365	11301	+45.87
795	0	>100	1395	12767	+31.71
825	0	>100	1425	13767	+19.90
855	1	+83.33	1455	14399	+10.72
885	1	+55.56	1485	14467	+4.38
915	0	>100	1515	14671	+2.12
945	1	>100	1545	14576	+2.61
975	9	>100	1575	14808	+1.80
1005	60	>100	1605	14974	+3.15
1035	173	>100	1635	14872	+1.76
1065	480	>100	1665	15248	-0.41
1095	911	>100	1695	15067	-0.27
1125	1508	>100	1725	14784	-0.43
1155	2024	>100	1755	15044	+2.01
1185	2872	+97.38	1785	15163	+2.82
1215	3858	+89.30	1815	15333	+3.61
1245	5070	+78.02	1845	15278	
1275	6322	+73.30	1875	15817	

Alpha Volts: 705

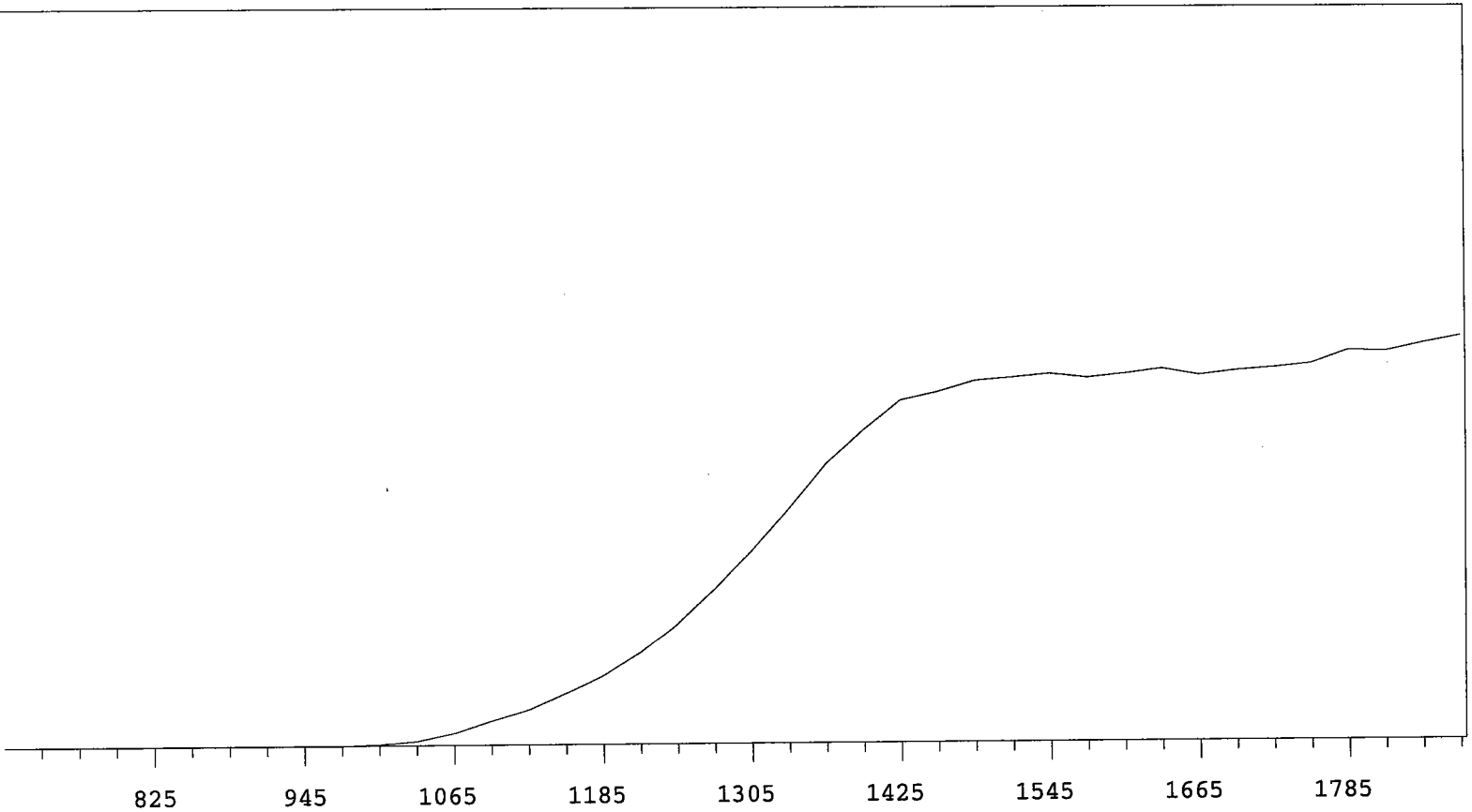
Beta Volts: 1515



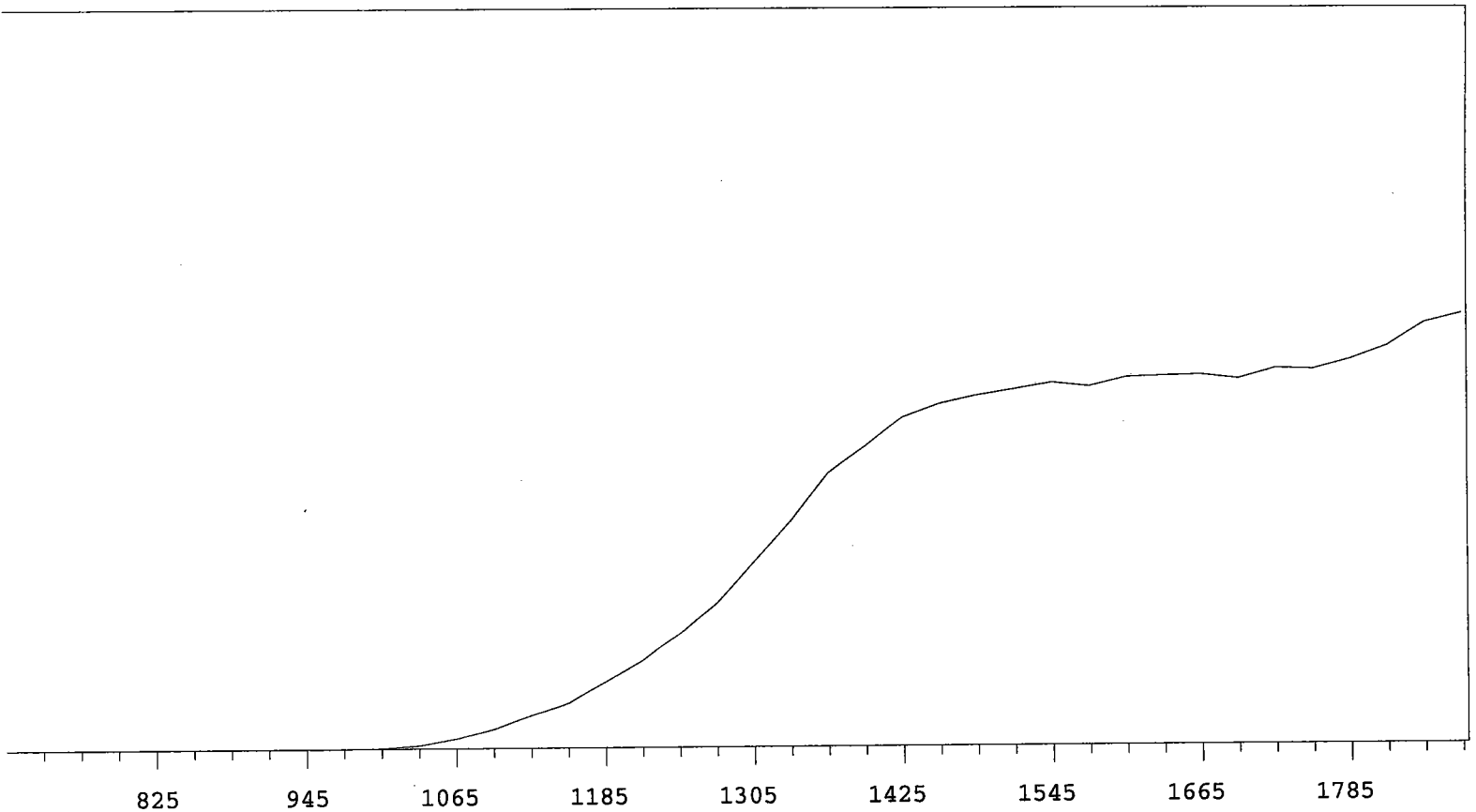
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	6302	+80.03
735	1		1335	8191	+73.78
765	0		1365	10140	+66.18
795	0	>100	1395	12247	+55.83
825	0	>100	1425	14468	+43.92
855	0	>100	1455	16303	+31.28
885	0	>100	1485	17411	+18.64
915	0	>100	1515	18150	+9.87
945	0	>100	1545	18275	+5.30
975	1	>100	1575	18496	+3.16
1005	3	>100	1605	18685	+2.66
1035	17	>100	1635	18820	+2.63
1065	84	>100	1665	18855	+4.16
1095	267	>100	1695	19152	+7.70
1125	709	>100	1725	19706	+13.90
1155	1299	>100	1755	20640	+26.51
1185	1813	>100	1785	22308	+40.92
1215	2638	>100	1815	26460	+51.46
1245	3777	+96.47	1845	31616	
1275	4915	+87.98	1875	37348	



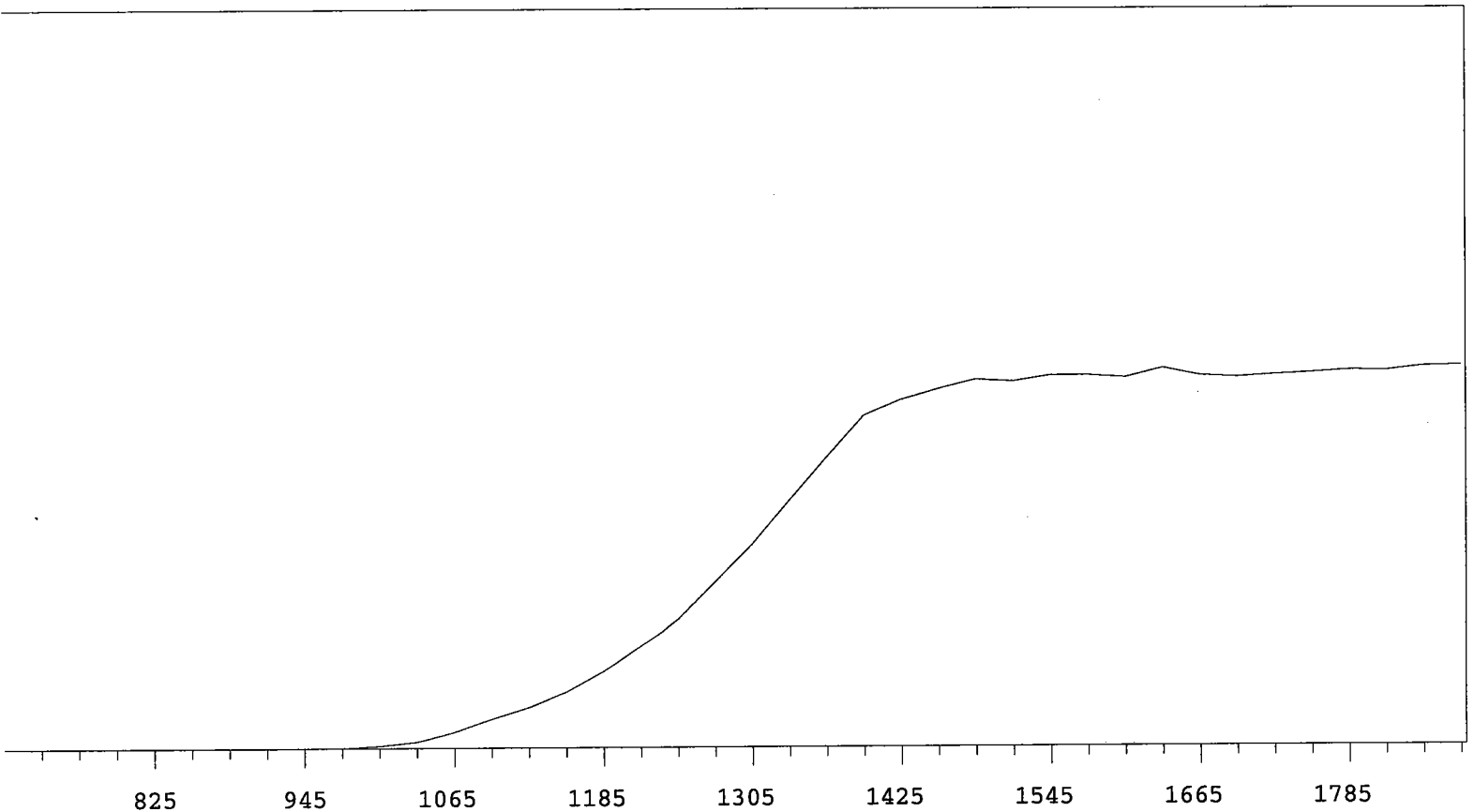
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	10207	+70.42
735	0		1335	12473	+60.75
765	0		1365	14900	+48.87
795	0	>100	1395	17101	+35.36
825	0	>100	1425	18643	+22.53
855	1	+83.33	1455	19350	+12.34
885	1	-83.33	1485	19848	+6.68
915	0	-55.56	1515	20014	+3.51
945	0	>100	1545	20278	+2.03
975	1	>100	1575	20186	+0.80
1005	43	>100	1605	20375	+0.32
1035	165	>100	1635	20209	+1.36
1065	557	>100	1665	20364	+0.83
1095	1055	>100	1695	20607	+2.43
1125	1775	>100	1725	20429	+2.51
1155	2470	>100	1755	20924	+3.64
1185	3617	+98.46	1785	20984	+5.11
1215	4757	+90.95	1815	21470	+5.63
1245	6186	+83.59	1845	21773	
1275	8021	+77.85	1875	22346	



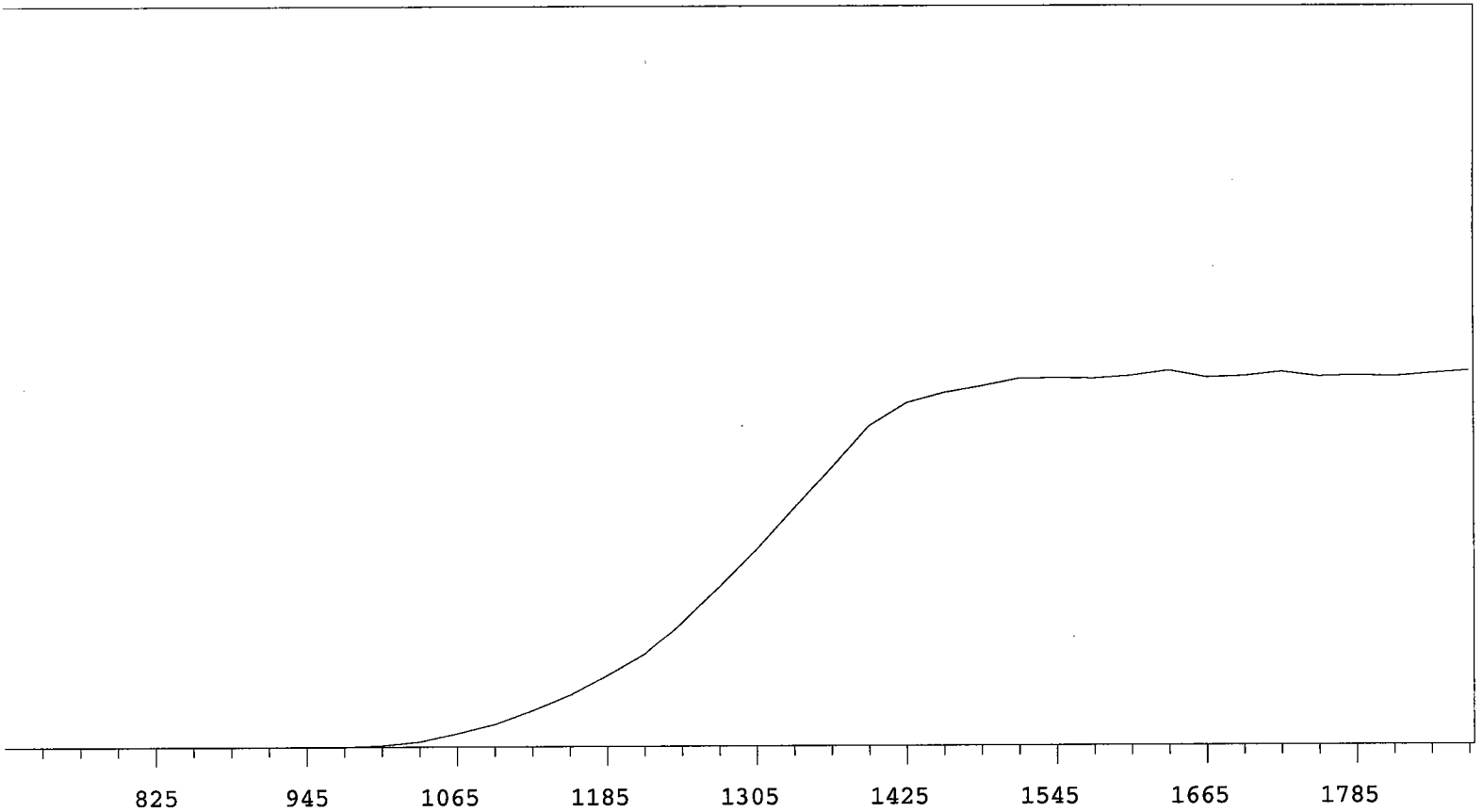
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	1		1305	9543	+67.01
735	0		1335	11617	+56.47
765	0		1365	13791	+45.47
795	0	>100	1395	15387	+31.66
825	0	>100	1425	16819	+20.02
855	0	>100	1455	17210	+11.63
885	1	+0.00	1485	17742	+6.05
915	0	>100	1515	17892	+3.04
945	0	>100	1545	18070	+1.09
975	7	>100	1575	17856	+1.43
1005	52	>100	1605	18054	+0.42
1035	214	>100	1635	18287	+1.06
1065	590	>100	1665	17969	+0.78
1095	1201	>100	1695	18187	+1.48
1125	1759	>100	1725	18317	+4.89
1155	2569	>100	1755	18518	+4.76
1185	3440	+95.13	1785	19156	+5.18
1215	4583	+87.74	1815	19100	+5.18
1245	5985	+81.67	1845	19496	
1275	7682	+74.54	1875	19842	



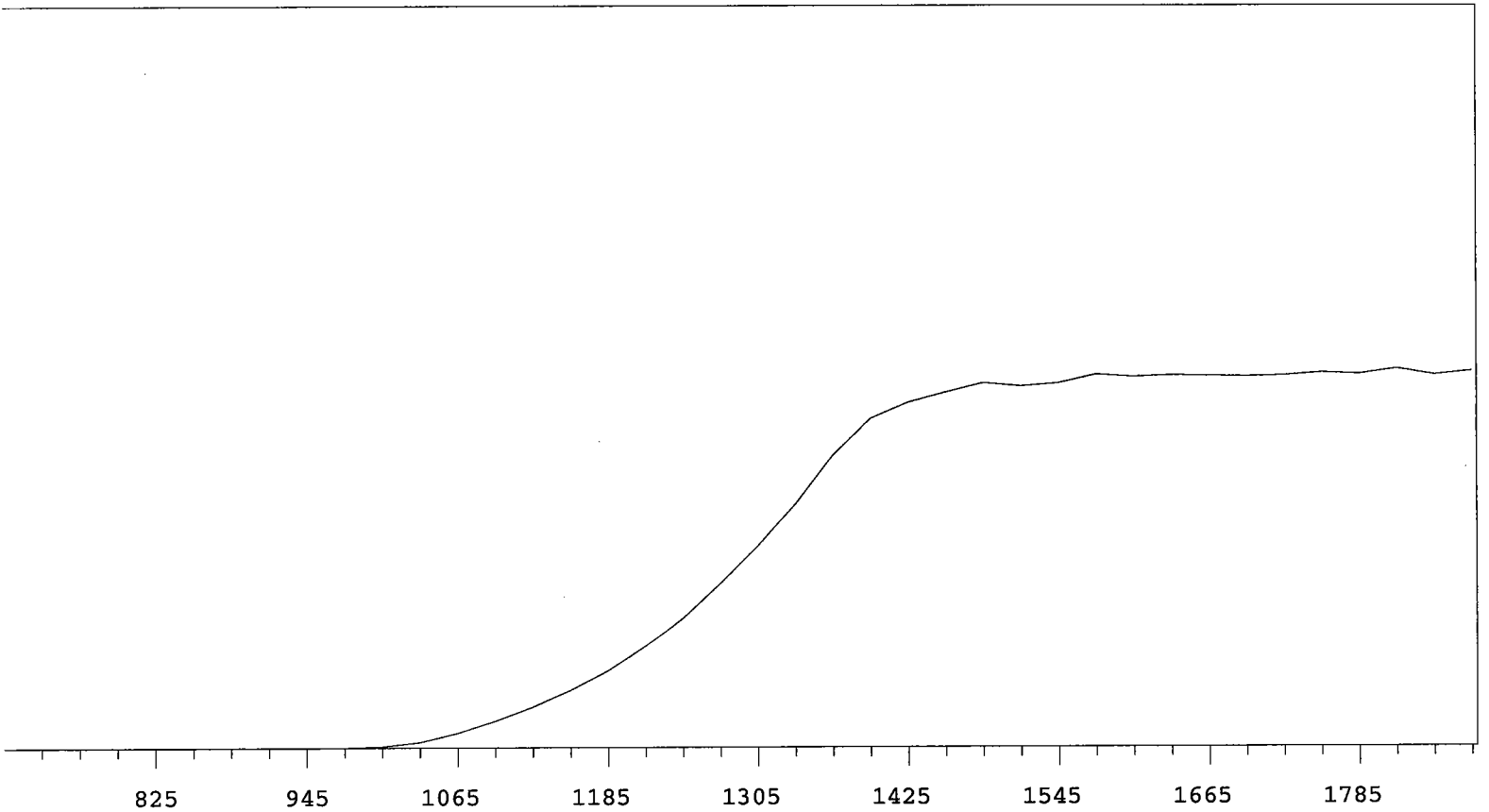
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	9144	+69.92
735	0		1335	11120	+58.43
765	0		1365	13399	+45.40
795	0	>100	1395	14711	+32.57
825	0	>100	1425	16134	+20.69
855	0	>100	1455	16805	+13.46
885	0	>100	1485	17209	+7.90
915	0	>100	1515	17500	+4.31
945	0	>100	1545	17812	+3.48
975	4	>100	1575	17629	+2.80
1005	26	>100	1605	18066	+2.23
1035	169	>100	1635	18122	+1.44
1065	483	>100	1665	18166	+1.20
1095	955	>100	1695	17967	+1.60
1125	1639	>100	1725	18469	+3.41
1155	2233	>100	1755	18409	+6.35
1185	3262	+98.61	1785	18884	+9.47
1215	4306	+89.77	1815	19535	+11.98
1245	5662	+82.36	1845	20630	
1275	7113	+76.36	1875	21076	



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	9209	+64.55
735	1		1335	11200	+55.94
765	0	+55.56	1365	13123	+43.27
795	2	>100	1395	14957	+29.04
825	0	+0.00	1425	15658	+17.41
855	0	>100	1455	16123	+8.01
885	1	>100	1485	16530	+4.92
915	0	>100	1515	16437	+2.71
945	1	>100	1545	16704	+0.83
975	14	>100	1575	16707	+2.14
1005	104	>100	1605	16602	+0.55
1035	281	>100	1635	17024	-0.28
1065	720	>100	1665	16684	-0.42
1095	1302	>100	1695	16597	-0.85
1125	1834	>100	1725	16711	+1.27
1155	2544	>100	1755	16796	+1.51
1185	3485	+92.28	1785	16903	+1.57
1215	4624	+85.50	1815	16880	+1.46
1245	5878	+77.82	1845	17066	
1275	7515	+71.49	1875	17085	



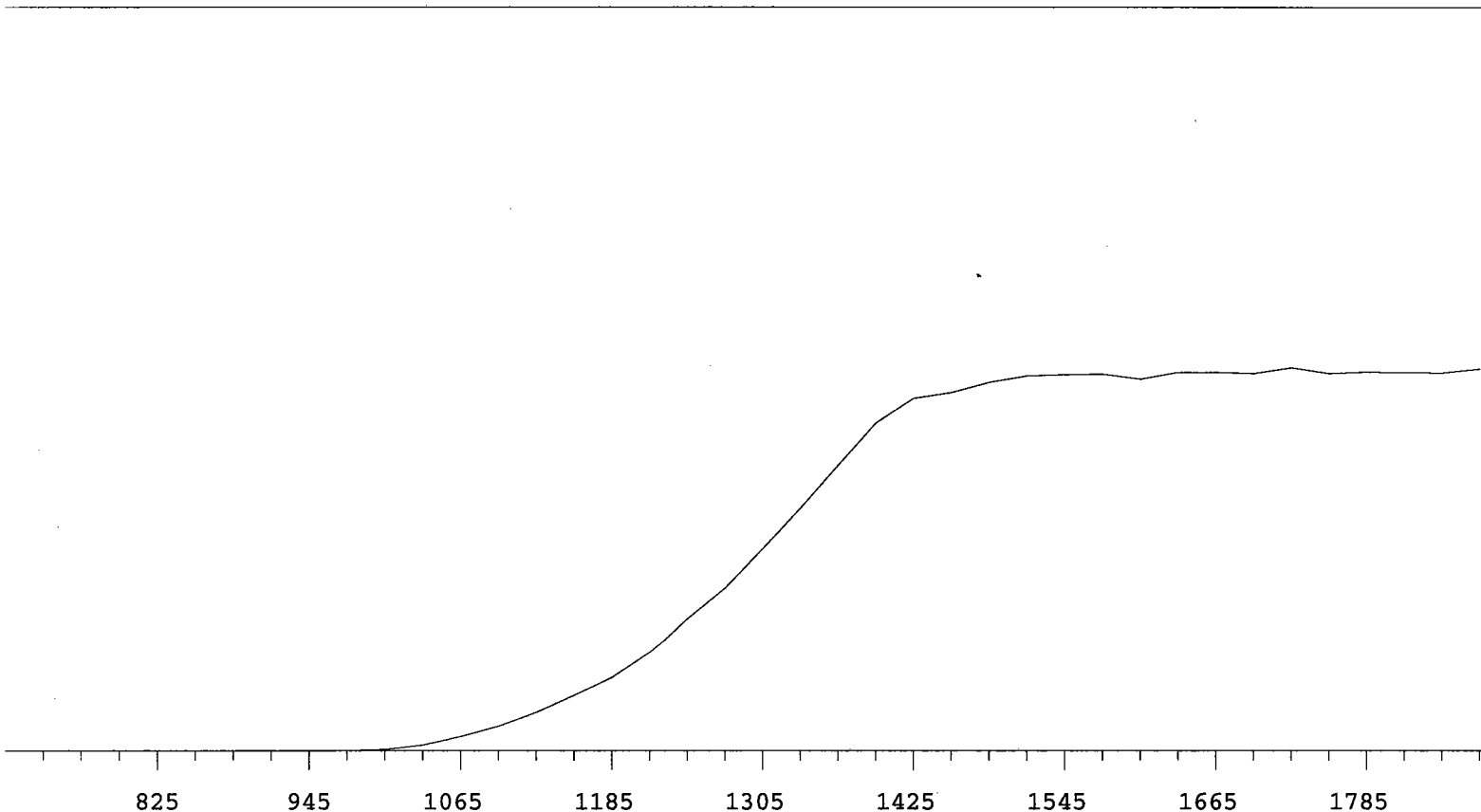
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	9666	+64.39
735	0		1335	11722	+55.91
765	0		1365	13680	+44.91
795	0	>100	1395	15677	+31.56
825	0	>100	1425	16786	+19.46
855	0	>100	1455	17283	+10.57
885	0	>100	1485	17608	+5.95
915	1	>100	1515	17972	+3.32
945	0	>100	1545	18006	+1.84
975	4	>100	1575	17970	+1.58
1005	70	>100	1605	18104	+0.74
1035	257	>100	1635	18351	+0.24
1065	648	>100	1665	18016	+0.16
1095	1116	>100	1695	18080	-0.63
1125	1784	>100	1725	18283	+0.29
1155	2560	>100	1755	18047	-0.47
1185	3531	+96.11	1785	18110	-0.32
1215	4568	+89.22	1815	18040	+1.17
1245	6137	+81.65	1845	18200	
1275	7855	+74.42	1875	18320	



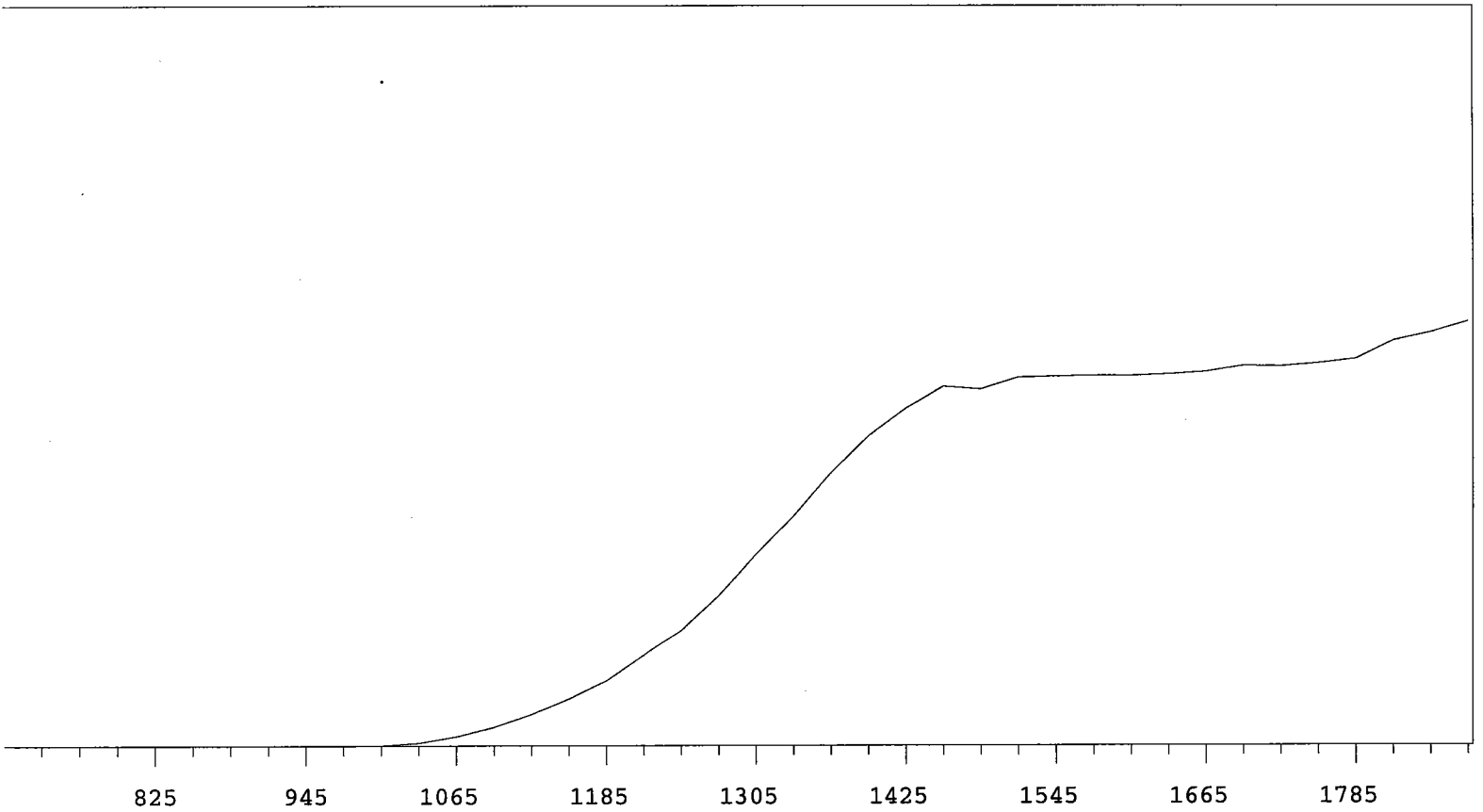
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	11573	+64.95
735	0		1335	13929	+56.47
765	0		1365	16726	+43.82
795	0	>100	1395	18834	+29.38
825	0	>100	1425	19743	+16.84
855	0	>100	1455	20314	+7.95
885	0	>100	1485	20860	+4.16
915	0	>100	1515	20670	+3.23
945	0	>100	1545	20844	+2.09
975	9	>100	1575	21330	+2.48
1005	93	>100	1605	21188	+1.16
1035	325	>100	1635	21280	-0.32
1065	834	>100	1665	21237	+0.08
1095	1525	>100	1695	21202	+0.42
1125	2318	>100	1725	21254	+0.60
1155	3233	>100	1755	21406	+1.41
1185	4357	+92.07	1785	21326	+0.42
1215	5755	+85.64	1815	21619	+0.16
1245	7438	+78.35	1845	21282	
1275	9463	+70.89	1875	21478	

Alpha Volts: 705

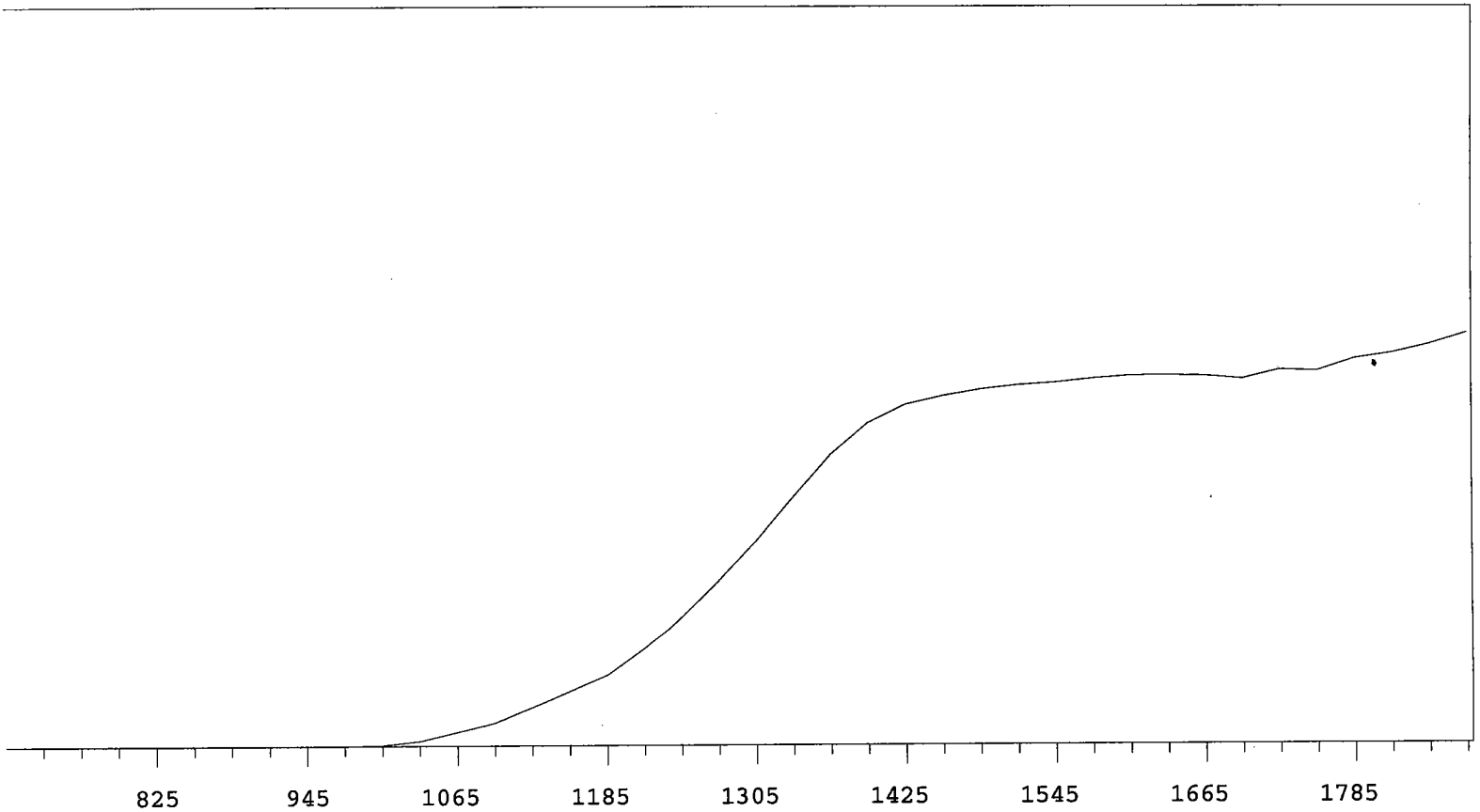
Beta Volts: 1515



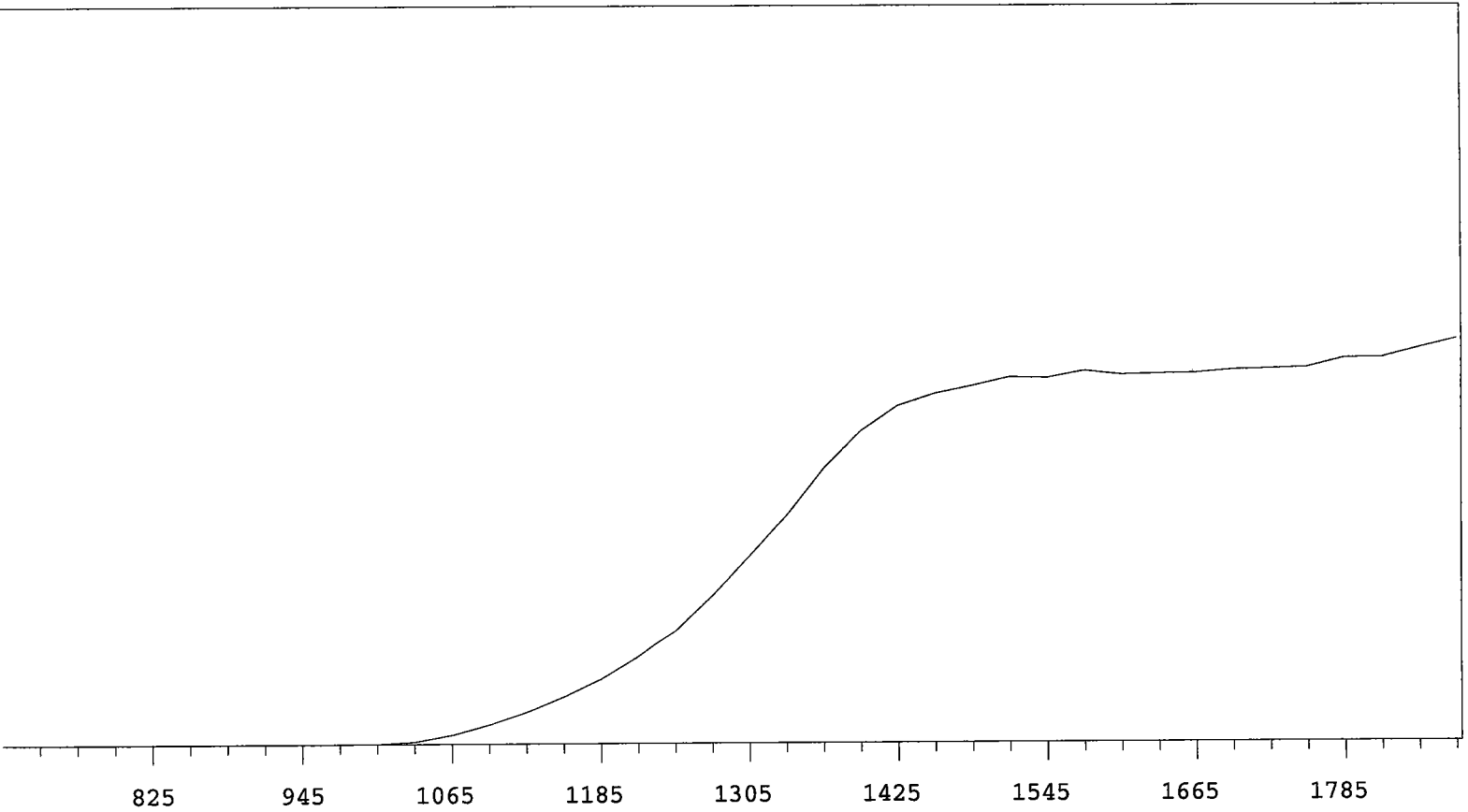
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	1		1305	7524	+61.93
735	0		1335	9002	+55.36
765	0		1365	10542	+44.70
795	0	>100	1395	12064	+31.21
825	0	>100	1425	12981	+19.20
855	0	>100	1455	13192	+10.41
885	0	>100	1485	13570	+5.93
915	0	>100	1515	13820	+4.08
945	0	>100	1545	13866	+0.75
975	9	>100	1575	13880	+0.21
1005	58	>100	1605	13695	+0.59
1035	228	>100	1635	13950	+0.77
1065	544	>100	1665	13954	+1.92
1095	936	>100	1695	13911	+0.19
1125	1468	>100	1725	14116	+0.02
1155	2110	>100	1755	13908	-0.24
1185	2770	+94.71	1785	13960	-0.81
1215	3670	+85.91	1815	13939	+0.71
1245	4937	+79.46	1845	13931	
1275	6066	+70.79	1875	14071	



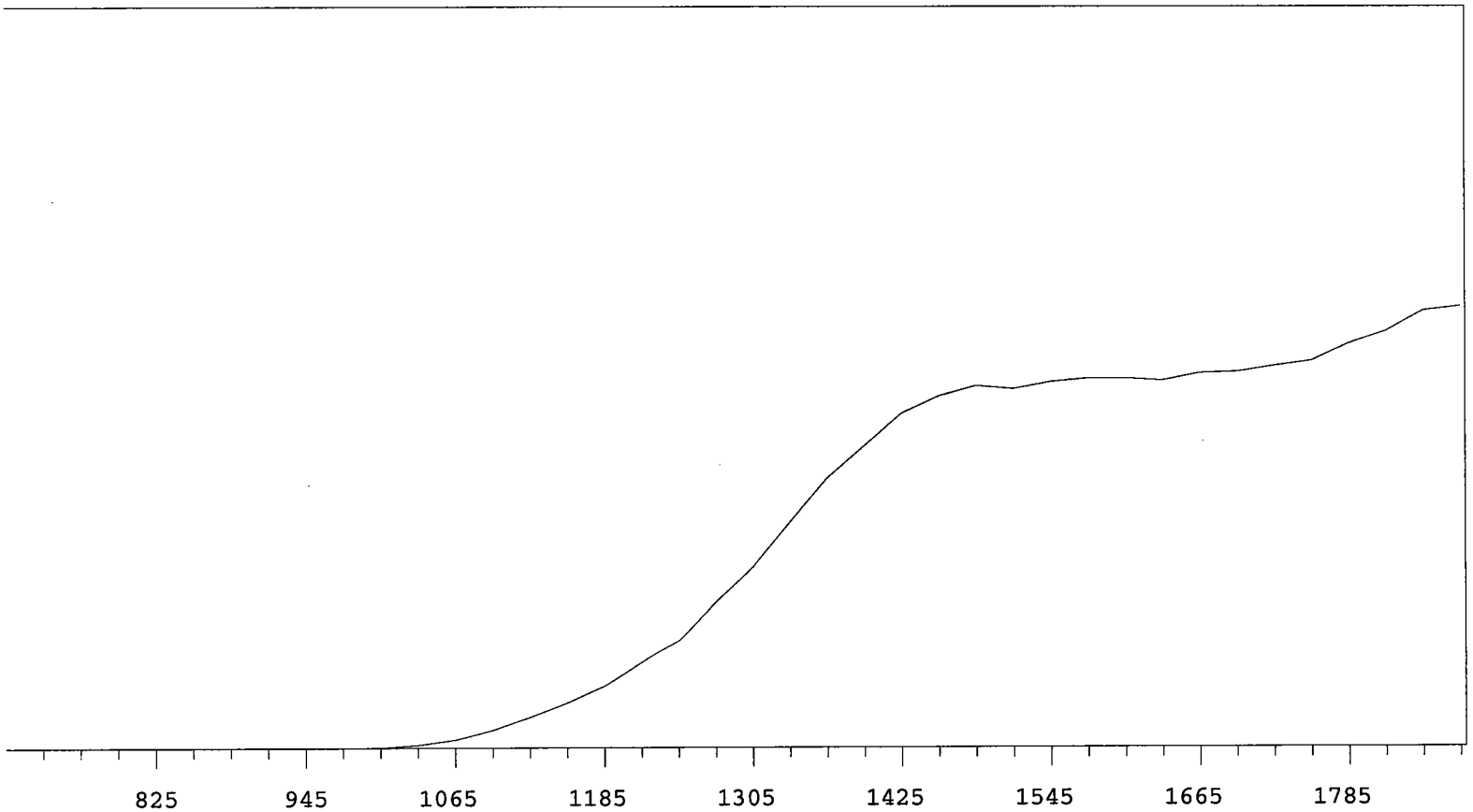
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	8778	+67.49
735	0		1335	10502	+57.68
765	0		1365	12516	+46.36
795	0	>100	1395	14215	+35.88
825	0	>100	1425	15472	+22.01
855	0	>100	1455	16469	+12.99
885	1	+0.00	1485	16342	+6.70
915	0	>100	1515	16874	+3.07
945	0	>100	1545	16918	+2.53
975	0	>100	1575	16950	+0.58
1005	18	>100	1605	16943	+0.95
1035	137	>100	1635	17008	+2.13
1065	430	>100	1665	17130	+2.45
1095	865	>100	1695	17403	+2.43
1125	1444	>100	1725	17377	+2.43
1155	2151	>100	1755	17515	+4.88
1185	2981	>100	1785	17710	+7.54
1215	4168	+92.14	1815	18533	+9.04
1245	5377	+84.73	1845	18905	
1275	6924	+74.92	1875	19415	



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	8797	+65.44
735	0		1335	10726	+54.47
765	0		1365	12570	+41.11
795	0	>100	1395	13917	+26.79
825	0	>100	1425	14687	+15.44
855	1	+0.00	1455	15048	+8.47
885	0	>100	1485	15318	+5.00
915	0	>100	1515	15494	+3.76
945	0	>100	1545	15606	+3.04
975	3	>100	1575	15776	+2.35
1005	40	>100	1605	15889	+1.44
1035	210	>100	1635	15907	-0.16
1065	590	>100	1665	15881	+0.64
1095	983	>100	1695	15741	+1.21
1125	1645	>100	1725	16124	+3.63
1155	2342	>100	1755	16076	+5.41
1185	3045	+96.43	1785	16588	+5.79
1215	4201	+90.42	1815	16830	+7.53
1245	5579	+83.64	1845	17185	
1275	7121	+74.44	1875	17682	



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	10118	+69.76
735	0		1335	12269	+59.65
765	0		1365	14810	+47.35
795	0	>100	1395	16773	+33.46
825	0	>100	1425	18104	+20.13
855	0	>100	1455	18720	+11.98
885	1	+0.00	1485	19122	+6.50
915	0	>100	1515	19580	+4.77
945	0	>100	1545	19527	+2.48
975	2	>100	1575	19902	+0.81
1005	21	>100	1605	19690	+0.53
1035	132	>100	1635	19739	+0.23
1065	491	>100	1665	19765	+1.29
1095	1036	>100	1695	19932	+1.40
1125	1698	>100	1725	19976	+2.72
1155	2517	>100	1755	20051	+2.92
1185	3468	>100	1785	20523	+4.26
1215	4721	+91.83	1815	20542	+5.57
1245	6175	+85.13	1845	21035	
1275	8025	+76.82	1875	21528	



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	8095	+71.16
735	0		1335	10052	+58.38
765	0		1365	11990	+47.92
795	0	>100	1395	13400	+35.01
825	0	>100	1425	14808	+23.58
855	0	>100	1455	15554	+13.45
885	0	>100	1485	15987	+6.39
915	0	>100	1515	15861	+3.45
945	0	>100	1545	16156	+2.18
975	1	>100	1575	16297	+1.72
1005	14	>100	1605	16297	+1.33
1035	130	>100	1635	16208	+1.62
1065	363	>100	1665	16526	+2.92
1095	785	>100	1695	16581	+3.94
1125	1357	>100	1725	16832	+5.91
1155	1996	>100	1755	17039	+8.68
1185	2735	+99.45	1785	17800	+11.53
1215	3785	+94.20	1815	18351	+11.46
1245	4857	+86.43	1845	19265	
1275	6571	+78.80	1875	19468	

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

66002-278

Ra-228 5 mL Liquid in Flame Sealed Vial

This standard radionuclide source was prepared gravimetrically from a calibrated master solution. The master solution was calibrated using a germanium gamma spectrometer system.

Radionuclide purity and calibration were checked using a germanium gamma spectrometer system. The nuclear decay rate and assay date for this source are given below.

ANALYTICS maintains traceability to the National Institute of Standards and Technology through Measurements Assurance Programs as described in USNRC Reg. Guide 4.15, Revision 1.

ISOTOPE:	Ra-228
ACTIVITY (dps):	2.367 E4
HALF-LIFE:	5.75 years
CALIBRATION DATE:	April 23, 2003 12:00 EST
TOTAL UNCERTAINTY*:	2.4%

*95% Confidence Level

Impurities: γ -impurities (other than decay products) <0.1%,
Ra-226 <0.1%

5.31628 grams 4M HCl solution with 100 μ g/g Ba carrier.

P O NUMBER 3219 RD, Item 1

SOURCE PREPARED BY:

M. Taskaeva
M. Taskaeva, Radiochemist

Q A APPROVED:

J.M. Muth 4-23-03



Standard Traceability Log Rad

Source Material Info		A Solution Material Info	
Parent Code:	0553-A	Isotope:	Radium-228 SPIKE
Prepared By:	Lonnie Morris	Prepared By:	Lonnie Morris
Carrier Conc:	0.5M HCl	Prep Date:	04/25/2003
Reference Date:	04/23/2003	Verification Date:	04/27/2005
Ampoule Mass (g):	5.0235 g	Expiration Date:	04/27/2006
Uncertainty:	+/-	Primary Code:	0553-B
LogBook No:	RC-S-035-068	Dilution(mL):	1000 mL
		Mass of Parent(g):	30.535 g
		Density(g/mL):	
		Balance ID:	

Calculations Converting parent activity to dpm/mL|dpm/g

$(\text{Mass of parent(g)}) * (\text{Parm Activity (dpm/mL)}) * (\text{conversion dpm to dpm}) / (\text{Dilution Vol}) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)}) * (\text{Parm Activity (dpm/mL)}) * (\text{conversion dpm to dpm}) / \text{Density (g/mL)} / (\text{Dilution Vol}) = \text{Parent Activity (dpm/g)}$
$(30.535 \text{ g}) * (13419.8626 \text{ dpm/mL}) * (1 \text{ dpm/dpm}) / (1000 \text{ mL}) = 409.7755 \text{ dpm/mL}$
$(30.535 \text{ g}) * (13419.8626 \text{ dpm/mL}) * (1 \text{ dpm/dpm}) / (\text{g/mL}) / (1000 \text{ mL}) = \text{dpm/g}$

Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date

GEL Laboratories LLC
Version 1.0 9/18/2000

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

64673-278

Ra-228 5 mL Liquid in Flame Sealed Vial

This standard radionuclide source was prepared gravimetrically from a calibrated master solution. The master solution was calibrated using a germanium gamma spectrometer system.

Radionuclide purity and calibration were checked using a germanium gamma spectrometer system. The nuclear decay rate and assay date for this source are given below.

ANALYTICS maintains traceability to the National Institute of Standards and Technology through Measurements Assurance Programs as described in USNRC Reg. Guide 4.15, Revision 1.

ISOTOPE:	Ra-228
ACTIVITY (dps):	1.939 E4
HALF-LIFE:	5.75 years
CALIBRATION DATE:	October 1, 2002 12:00 EST
TOTAL UNCERTAINTY*:	3.6%
SYSTEMATIC:	3.4%
RANDOM:	1.1%

*99% Confidence Level

Impurities: γ -impurities <0.1%

5.02617 grams 0.1M HCl solution with 110 $\mu\text{g/g}$ Ba carrier.

P O NUMBER 3208RD, Item 2

SOURCE PREPARED BY:

M. Taskaeva
M. Taskaeva, Radiochemist

Q A APPROVED:

M. M. Ty 10202



Standard Traceability Log Rad

Source Material Info		A Solution Material Info	
Parent Code:	0503	Isotope:	Radium-228
Prepared By:	Angela Johnson	Prepared By:	Angela Johnson
Carrier Conc:	0.1 M HCL	Prep Date:	02/20/2003
Reference Date:	10/01/2002	Verification Date:	04/09/2004
Ampoule Mass (g):	5.02617 g	Expiration Date:	04/09/2005
Uncertainty:	+/- 3.6 %	Primary Code:	0503-A
LogBook No:	RC S 035 018	Dilution(mL):	100 mL
		Mass of Parent(g):	4.4737 g
		Density(g/mL):	0.9992
		Balance ID:	

Calculations Converting parent activity to dpm/mL/dpm/g

$(\text{Mass of parent(g)}) * (\text{Parm Activity (dps)}) * (\text{conversion dpm to dps}) / (\text{Ampoule Mass(g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)}) * (\text{Parm Activity (dps)}) * (\text{conversion dpm to dps}) / \text{Density} / (\text{Ampoule Mass (g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/g)}$
$(4.4737 \text{ g}) * (19390 \text{ dps}) * (60 \text{ dpm/dps}) / (5.02617 \text{ g} * 100 \text{ mL}) = 10355.2060 \text{ dpm/mL}$
$(4.4737 \text{ g}) * (19390 \text{ dps}) * (60 \text{ dpm/dps}) / (0.9992 \text{ g/mL}) / (5.02617 \text{ g} * 100 \text{ mL}) = 10363.0820 \text{ dpm/g}$

Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
04/02/2003	Lonnie Morris	39.71	1000	0503-B	411.518 dpm/mL	09/13/2008	09/13/2009

GEL Laboratories LLC
Version 1.0 9/18/2000

Verification for Ra-228 Standard 0503-B

D. Roy 9/13/2008	Isotope	Detector CPM	BKG CPM	NET CPM	Detector Eff. Mass. Used (mL)	Standard Source DPM/mL
	0503-B	1962.0000	45.6000	1916.4000	9.263763	206.8705773
	0503-B	1983.2000	45.6000	1937.6000	9.263763	209.1590642
	0503-B	1927.0000	45.6000	1881.4000	9.263763	203.092415

Mean Value (Counting) = 206.3740189 dpm/mL
 Stdev = 3.063655617 dpm/mL

102.890426 Rule 3 (Pass/Fail)
 0.01484516 Rule 3 (Pass/Fail)

Certificate Value = 200.596 dpm/mL
 Lower Limit = 200.2467076 dpm/mL
 Upper Limit = 212.5013301 dpm/mL
 Rule 1 Pass/Fail Pass
 Two sigma = 6.127311233
 10 % of Mean = 20.63740189
 Rule 2 (Pass/Fail) Pass

Verification Rules

- Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements
- Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.
- Rule 3 = The determined mean value shall be within 10% of the certificate value.

The analyst prepared three standard verification sources for Ra-228 source 0503-B by transferring portions of the standard into glass liquid scintillation vials. Ten mL of Ready Gel liquid scintillation cocktail was added to each vial and the vials were shaken to mix. A Blank vial was prepared in a similar fashion using 1 mL of DI water and 10 mL of Ready Gel cocktail. The standard verification vials and Background source were dark adapted for two hours and counted on LSC Gold for Ra-228 source standard verification. The Ra-228 efficiency calibration which was used for verification calculations was performed on 9/13/08 using source 0683-A (Ra-228). Calibration data is recorded in this logbook under Ra-228 0683-A. Each verification source calculation was performed as follows:

$$\text{Source dpm/g} = (A - B)/(C)(D)$$

where:

- A = Ver. source cpm,
- B = BKG cpm,
- C = System efficiency, (cpm/dpm), and
- D = mass used for standard verification.

Reference RAD SOP M-001

David D. Perry 9/16/08

Angela Johnson 9/17/08

5/19/16
28

16 SEP 2008 16:24

ID: TOTAL ACTIVITY

USER:11 COMMENT:GOLD

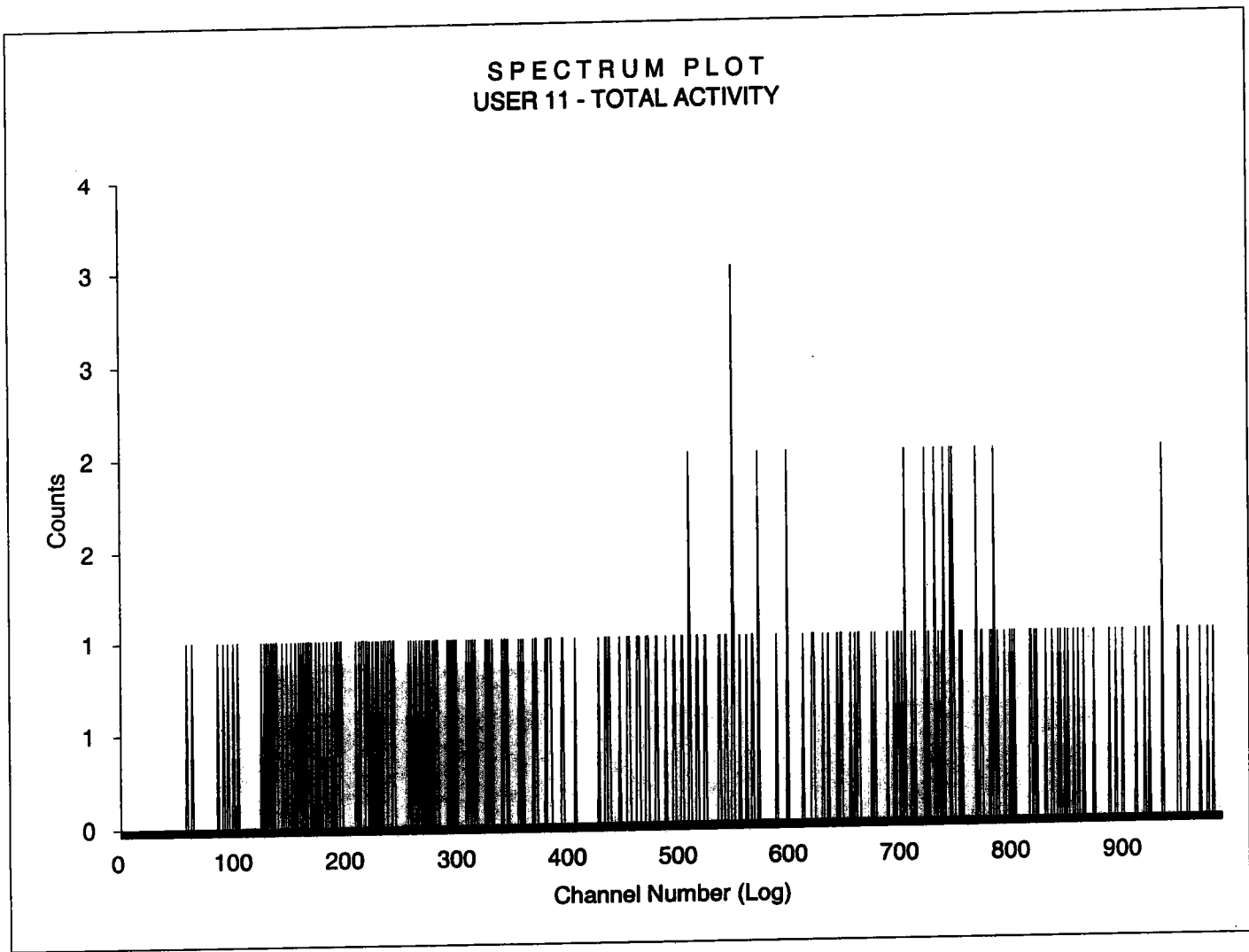
PRESET TIME : 5.00
 DATA CALC : CPM H# :YES SAMPLE REPEATS: 1 PRINTER : STD
 COUNT BLANK : NO IC# : NO REPLICATES : 1 RS232 :EDIT
 TWO PHASE : NO AQC : NO CYCLE REPEATS : 1 DISK : OFF
 SCINTILLATOR: LIQUID LUMEX:YES LOW SAMPLE REJ: 0
 LOW LEVEL : NO HALF LIFE CORRECTION DATE: none

CHAN: 0.0 - 990.0 %ERROR: 2.00 FACTOR: 1.000000 BKG. SUB: 0
 CHAN: 0.0 - 1000.0 %ERROR: 2.00 FACTOR: 1.000000 BKG. SUB: 0

SAM NO	POS	TIME MIN	H#	WIND1		WIND2		LUMEX %	ELAPSED TIME
				CPM	%ERROR	CPM	%ERROR		
1	11-1	5.00	98.2	50.40	12.60	54.00	12.17	0.41	5.55
2	11-2	1.30	99.3	7802.31	1.99	7803.08	1.99	0.00	7.81
3	11-3	1.30	100.4	7782.31	1.99	7786.15	1.99	0.00	10.14
4	11-4	1.35	99.2	7581.48	1.98	7585.19	1.98	0.01	12.51
5	11-5	5.00	97.9	45.60	13.25	47.20	13.02	0.43	18.61
6	11-6	5.00	110.7	1962.00	2.02	1964.80	2.02	0.01	24.65
7	11-7	5.00	110.8	1983.20	2.01	1984.80	2.01	0.01	30.75
8	11-8	5.00	110.7	1927.00	2.04	1927.80	2.04	0.02	36.85

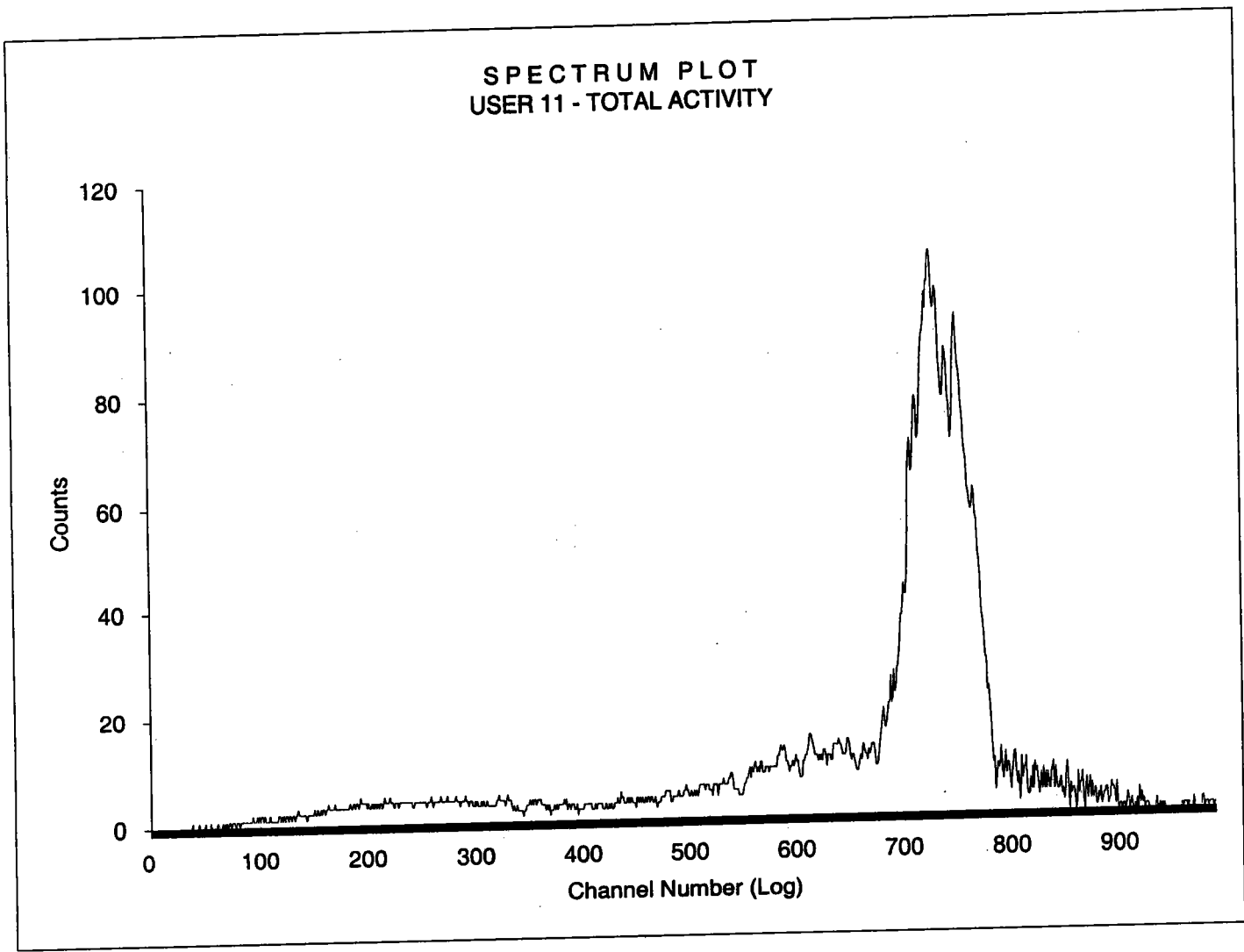
8/16/08
228

Sample Count Start Time: 16 Sep 2008 16:46:59
Data Capture Date: 9/16/2008 16:52:01
User Filename: S11091611-5A.WK1
U11091611-1A.WK1
Spectrum Type: Log Counts
User Number: 11
User Id: TOTAL ACTIVITY
User Comment: GOLD
Isotope Name: 14C
Scintillator: LIQUID
Sample, Rack-Pos, Time: 5 11-5 5.00
H#, Total Counts: 97.9 69
Start, End, X-Axis: 0 990 Channel Number



50/9/16
25

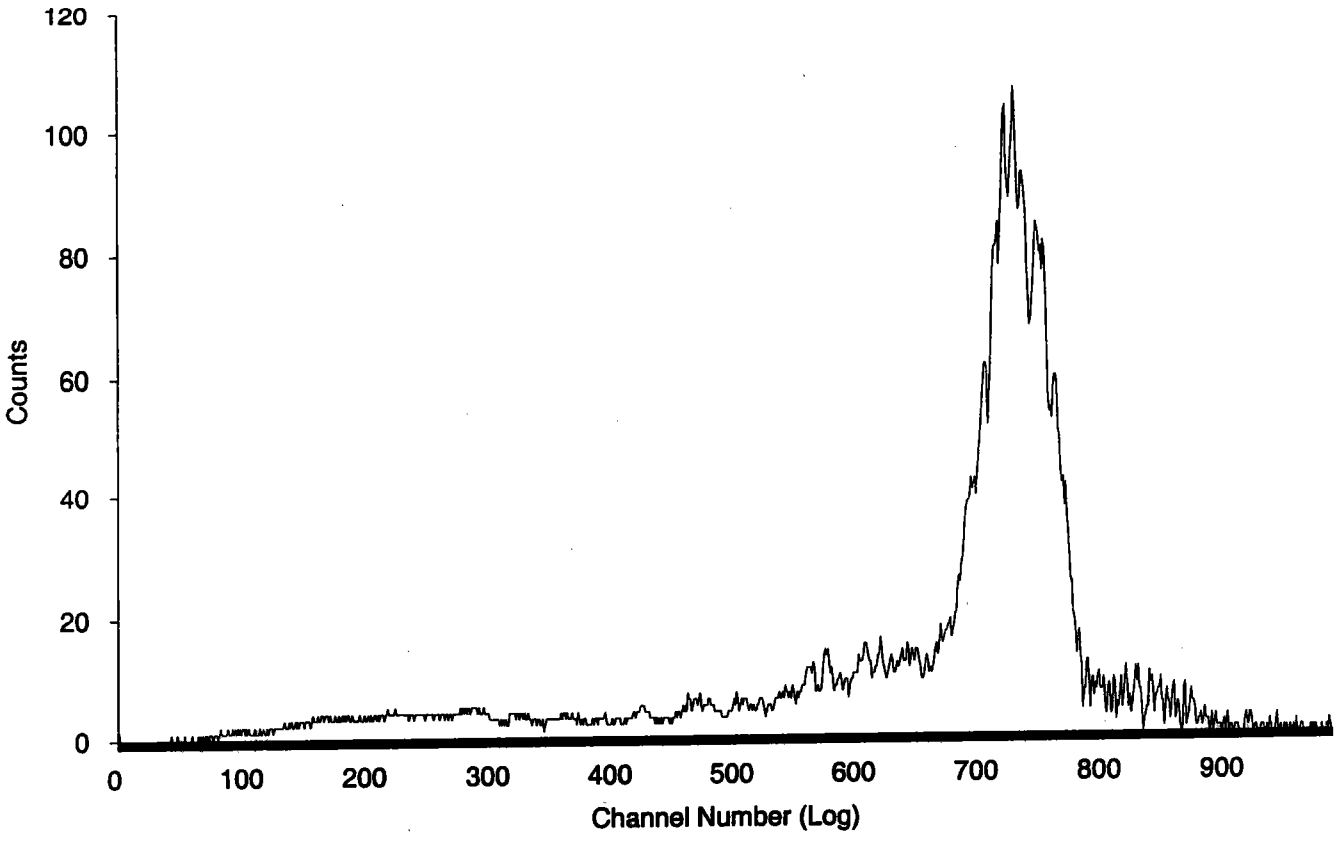
Sample Count Start Time: 16 Sep 2008 16:53:01
Data Capture Date: 9/16/2008 16:58:06
User Filename: S11091611-6A.WK1
U11091611-1A.WK1
Spectrum Type: Log Counts
User Number: 11
User Id: TOTAL ACTIVITY
User Comment: GOLD
Isotope Name: 14C
Scintillator: LIQUID
Sample, Rack-Pos, Time: 6 11-6 5.00
H#, Total Counts: 110.7 7666
Start, End, X-Axis: 0 990 Channel Number



8/16/08
SLS

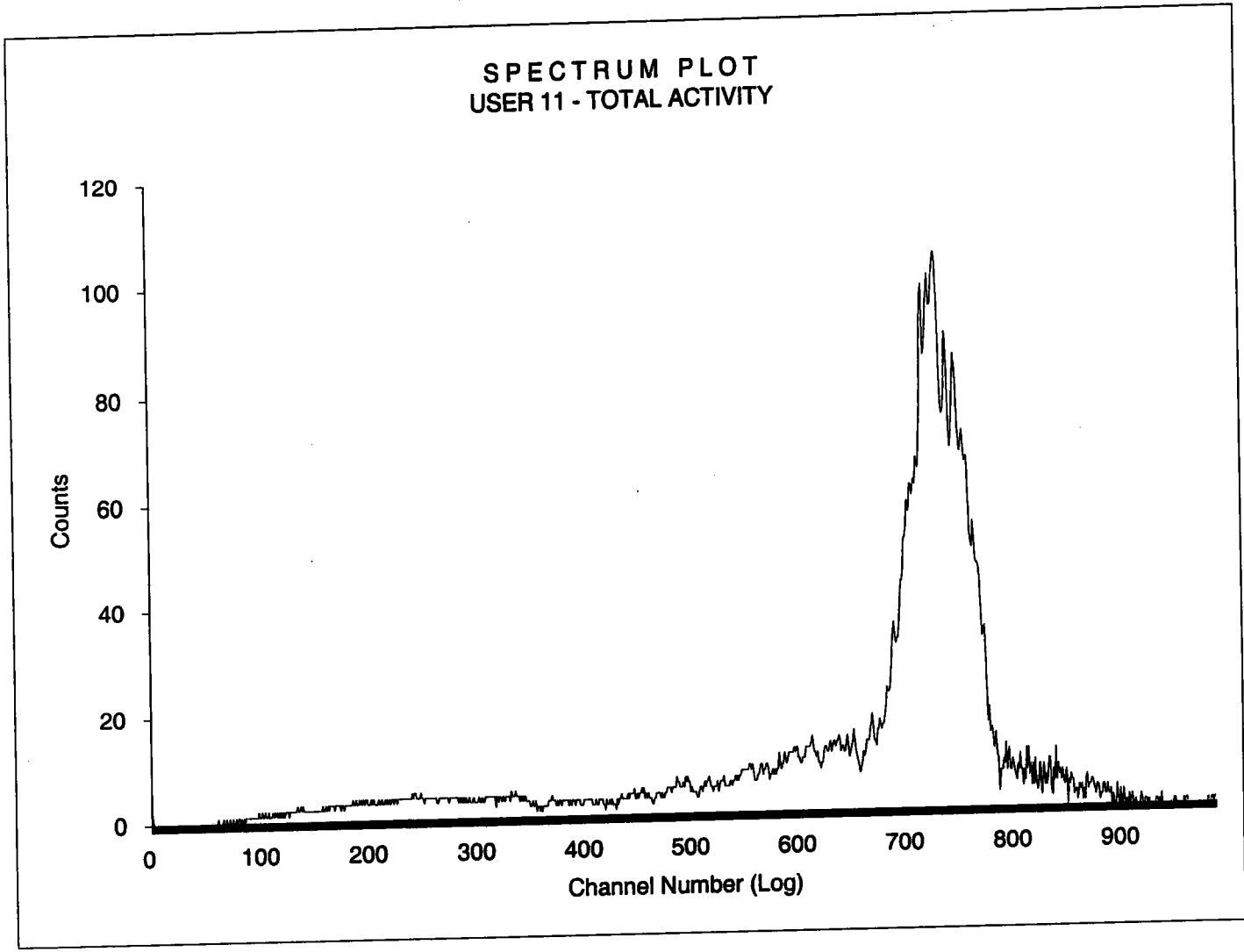
Sample Count Start Time: 16 Sep 2008 16:59:07
Data Capture Date: 9/16/2008 17:04:12
User Filename: S11091611-7A.WK1
U11091611-1A.WK1
Spectrum Type: Log Counts
User Number: 11
User Id: TOTAL ACTIVITY
User Comment: GOLD
Isotope Name: 14C
Scintillator: LIQUID
Sample, Rack-Pos, Time: 7 11-7 5.00
H#, Total Counts: 110.8 7726
Start, End, X-Axis: 0 990 Channel Number

SPECTRUM PLOT
USER 11 - TOTAL ACTIVITY



9/16/08
11-8

Sample Count Start Time: 16 Sep 2008 17:05:13
Data Capture Date: 9/16/2008 17:10:18
User Filename: S11091611-8A.WK1
U11091611-1A.WK1
Spectrum Type: Log Counts
User Number: 11
User Id: TOTAL ACTIVITY
User Comment: GOLD
Isotope Name: 14C
Scintillator: LIQUID
Sample, Rack-Pos, Time: 8 11-8 5.00
H#, Total Counts: 110.7 7557
Start, End, X-Axis: 0 990 Channel Number



Radium-228 Que Sheet

SR 6/30/09

Batch #: 881540
 Spike Isotope: Radium-228
 LCS Isotope: Radium-228
 Tracer Isotope: Barium-133
 Prep Date: 6/30/09
 Analyst: DXM2
 Spike Code: NA
 LCS Code: 0503-B
 Tracer Code: 0112-2
 Initials: JRS
 First Client Due Date: NA
 Expiration Date: 9/13/09
 Expiration Date: 2/17/10
 Pipet ID: 1734212
 Internal Due Date: 07/03/2009
 Ac-228 Ingrow: 2025 6/30/09
 Ac-228 Separation Date/Time: 7-2-09 0540
 Witness: JRS 6/30/09
 Balance ID: NA

Sample ID	Client Description	Type	Hazard Code	Min CRDL	Matrix	Client	Collect Date & Time	Pos. #	Vol (mL)	Det #	Ba Yield (%)	Gamma Det. #
1201872112-1	LCS for batch 881540	LCS		3 pCi/L	GROUND WATI	QC ACCOUNT	16-JUN-09 03:56 PM	1	20		100.83	↑
1201872113-1	LCS for batch 881540	LCS		3 pCi/L	GROUND WATI	QC ACCOUNT	16-JUN-09 03:56 PM	2	20		108.20	
1201872114-1	LCS for batch 881540	LCS		3 pCi/L	GROUND WATI	QC ACCOUNT	16-JUN-09 03:56 PM	3	20		114.22	
1201872115-1	LCS for batch 881540	LCS		3 pCi/L	GROUND WATI	QC ACCOUNT	16-JUN-09 03:56 PM	4	20		120.58	WZAL
1201872116-1	LCS for batch 881540	LCS		3 pCi/L	GROUND WATI	QC ACCOUNT	16-JUN-09 03:56 PM	5	20		105.84	
1201872117-1	LCS for batch 881540	LCS		3 pCi/L	GROUND WATI	QC ACCOUNT	16-JUN-09 03:56 PM	6	20		102.70	
1201872118-1	LCS for batch 881540	LCS		3 pCi/L	GROUND WATI	QC ACCOUNT	16-JUN-09 03:56 PM	7	20		112.82	
1201872119-1	LCS for batch 881540	LCS		3 pCi/L	GROUND WATI	QC ACCOUNT	16-JUN-09 03:56 PM	8	20		111.91	↓

JRS 7/2/09

SLC 7/2/09

Data Reviewed By:

Comments:

ASSAY 30-Jun-09 19:32:06

Protocol id 8 228_REC
Time limit 180
Count limit 50000
Isotope Ba-133
Protocol date 9-Apr-07 10:03:07
Run id. 54

POS	RACK	BATCH	TIME	COUNTS	CPM	ERROR	% RECOVERY	COUNT	TIME
1	97	1	180	779	229.3	4.13			19:32:13
2	97	2	180	785	231.2	4.11	100.83		19:35:24
3	97	3	180	835	248.1	3.95	108.20		19:38:35
4	97	4	180	877	261.9	3.83	114.22		19:41:47
5	97	5	180	921	276.5	3.71	120.58		19:44:58
6	72	6	180	819	242.7	4	105.84		19:48:17
7	72	7	180	798	235.5	4.07	102.70		19:51:28
8	72	8	180	867	258.7	3.85	112.82		19:54:40
9	72	9	180	861	256.6	3.87	111.91		19:57:51

END OF ASSAY

[Handwritten signature]
7/2/09

LUCAS CELL COUNTERS

General Engineering Laboratories

2040 Savage Road, Charleston, SC 29414
(843)556-8171

Lucas Cell Calibration Package

	YES	NO	Comments
1) Is all calibration standard information enclosed for: the primary standard certificate?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
the second standard(s) documentation?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
standard preparation information?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
standard < 1 Year old or verified?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2) Is the efficiency calibration report included ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3) Is the raw count data included for: Cell constant determination?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Plateau generation?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4) Are the calibration verifications included?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
5) Are the instrument settings included: HVPS settings?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
6) Has the CELLEFF.xls file been updated ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
7) Have the calibration dates been updated in ALPHALIMS ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Prepared By: Kelli S. Demee

Date: 8/29/08

Reviewed By: Mark J. Idem

Date: 9/12/08

Effective Date: 9/24/08

Ra-226 Cell Constants

standard ID: 0299-G
 Volume added (mL): 0.1
 Standard Reference Activity (DPM/mL): 2446.35

Lucas cell #	Cell constant	Standard Source	Date/Time of count	Date/time flushed to cell	Date/time end of degas	Bkg Counts	bkg cpm	total counts	count time min	cpm	Known activity dpm	11 (days) end-degas to flush	12 (days) end-flush to count	13 (days) Std Ref Date to count	Decay from Std Ref Date to count
101	1.796	Average 1.751	6/11/2008 22:40	6/11/2008 14:55	6/5/2008 14:10	8	0.267	8239	30	274.63	244.63	6.03125	0.32292	3102	0.9963
101	1.729	Stdev 0.039	8/15/2008 12:50	8/15/2008 9:25	8/12/2008 16:10	8	0.267	4800	30	160.00	244.63	2.71875	0.14236	3167	0.9962
101	1.728		7/31/2008 15:35	7/31/2008 8:55	7/28/2008 10:55	8	0.267	4938	30	164.60	244.63	2.91667	0.27778	3152	0.9963
102	1.677	Average 1.647	6/11/2008 23:15	6/11/2008 15:20	6/5/2008 14:10	8	0.267	7998	30	256.60	244.63	6.04861	0.32986	3102	0.9963
102	1.632	Stdev 0.026	8/4/2008 16:35	8/4/2008 9:45	8/1/2008 13:30	8	0.267	4570	30	152.33	244.63	2.84375	0.28472	3156	0.9963
102	1.632		7/31/2008 16:10	7/31/2008 9:20	7/28/2008 10:55	8	0.267	4680	30	156.00	244.63	2.93403	0.28472	3152	0.9963
103	1.864	Average 1.752	6/11/2008 13:40	6/11/2008 9:40	6/5/2008 14:10	8	0.267	8620	30	287.33	244.63	5.81250	0.16667	3102	0.9963
103	1.667	Stdev 0.098	7/31/2008 16:40	7/31/2008 9:50	7/28/2008 10:55	7	0.233	4862	30	162.07	244.63	2.95486	0.28472	3152	0.9963
103	1.704		8/4/2008 17:10	8/4/2008 10:15	8/1/2008 13:30	7	0.233	4796	30	159.87	244.63	2.86458	0.28819	3156	0.9963
104	1.937	Average 1.973	6/11/2008 14:10	6/11/2008 10:00	6/5/2008 14:10	6	0.200	8955	30	298.50	244.63	5.82639	0.17361	3102	0.9963
104	1.917	Stdev 0.080	6/24/2008 17:20	6/24/2008 14:10	6/20/2008 9:50	8	0.267	7275	30	242.50	244.63	4.18056	0.13194	3115	0.9963
104	2.064		7/31/2008 17:20	7/31/2008 10:15	7/28/2008 10:55	8	0.267	5964	30	198.80	244.63	2.97222	0.29514	3152	0.9963
105	1.916	Average 1.749	8/15/2008 13:55	8/15/2008 9:55	8/12/2008 16:10	8	0.267	5327	30	177.57	244.63	2.73958	0.16667	3167	0.9962
105	1.700	Stdev 0.149	7/31/2008 17:55	7/31/2008 10:45	7/28/2008 10:55	4	0.133	4933	30	164.43	244.63	2.99306	0.29861	3152	0.9963
105	1.631		8/4/2008 18:35	8/4/2008 11:05	8/1/2008 13:30	1	0.033	4805	30	153.50	244.63	2.89931	0.31250	3156	0.9963
106	1.594	Average 1.486	8/15/2008 14:30	8/15/2008 10:15	8/12/2008 16:10	8	0.267	4441	30	148.03	244.63	2.75347	0.17708	3167	0.9962
106	1.441	Stdev 0.094	7/31/2008 18:25	7/31/2008 11:15	7/28/2008 10:55	8	0.267	4208	30	140.27	244.63	3.01389	0.29861	3152	0.9963
106	1.422		8/19/2008 8:00	8/18/2008 16:00	8/15/2008 9:25	8	0.267	4132	30	137.73	244.63	3.27431	0.68667	3170	0.9962
107	1.779	Average 1.773	6/11/2008 15:50	6/11/2008 11:10	6/5/2008 14:10	8	0.267	8232	30	274.40	244.63	5.87500	0.19444	3102	0.9963
107	1.751	Stdev 0.020	7/31/2008 19:05	7/31/2008 11:40	7/28/2008 10:55	7	0.233	5121	30	170.70	244.63	3.03125	0.30903	3152	0.9963
107	1.790		8/4/2008 19:40	8/4/2008 12:00	8/1/2008 13:30	8	0.267	5105	30	170.17	244.63	2.93750	0.31944	3156	0.9963
108	1.755	Average 1.840	6/11/2008 17:00	6/11/2008 11:30	6/5/2008 14:10	7	0.233	8081	30	268.37	244.63	5.88889	0.22917	3102	0.9963
108	1.937	Stdev 0.092	6/25/2008 20:00	6/25/2008 15:40	6/20/2008 9:50	8	0.267	8413	30	280.43	244.63	5.24306	0.18056	3116	0.9963
108	1.827		8/15/2008 16:09	8/15/2008 10:15	8/12/2008 16:10	8	0.267	5071	30	169.03	244.63	2.75347	0.19792	3167	0.9962
109	1.646	Average 1.512	6/11/2008 17:35	6/11/2008 11:45	6/5/2008 14:10	8	0.267	7570	30	252.33	244.63	5.89931	0.24306	3102	0.9963
109	1.441	Stdev 0.117	8/1/2008 8:55	7/31/2008 13:05	7/28/2008 10:55	6	0.200	3694	30	129.80	244.63	3.09028	0.82639	3152	0.9963
109	1.448		8/4/2008 20:40	8/4/2008 13:40	8/1/2008 13:30	8	0.267	4226	30	140.87	244.63	3.00694	0.29167	3156	0.9963
110	1.664	Average 1.544	6/24/2008 21:15	6/24/2008 15:05	6/20/2008 9:50	8	0.267	6214	30	207.13	244.63	4.21875	0.26684	3115	0.9963
110	1.566	Stdev 0.133	8/15/2008 15:35	8/15/2008 10:50	8/12/2008 16:10	8	0.267	4377	30	145.90	244.63	2.77778	0.19792	3167	0.9962
110	1.401		8/4/2008 21:10	8/4/2008 14:05	8/1/2008 13:30	8	0.267	4103	30	136.77	244.63	3.02431	0.29514	3156	0.9963
111	1.632	Average 1.575	6/24/2008 22:30	6/24/2008 15:30	6/20/2008 9:50	7	0.233	6071	30	202.37	244.63	4.23611	0.29167	3115	0.9963
111	1.517	Stdev 0.057	8/1/2008 10:30	7/31/2008 14:00	7/28/2008 10:55	8	0.267	4120	30	137.33	244.63	3.12847	0.65417	3152	0.9963
111	1.576		8/4/2008 21:35	8/4/2008 14:30	8/1/2008 13:30	7	0.233	4636	30	154.53	244.63	3.04167	0.29514	3156	0.9963
112	1.797	Average 1.648	6/11/2008 22:10	6/11/2008 14:30	6/5/2008 14:10	8	0.267	8239	30	274.63	244.63	6.01389	0.31944	3102	0.9963
112	1.588	Stdev 0.130	8/1/2008 11:00	7/31/2008 14:00	7/28/2008 10:55	8	0.267	4294	30	143.13	244.63	3.12847	0.87500	3152	0.9963
112	1.559		8/4/2008 22:00	8/4/2008 14:50	8/1/2008 13:30	8	0.267	4599	30	153.30	244.63	3.05556	0.29861	3156	0.9963

10/8/2010

Ra-226 Verification Sheet

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background CPM	Total Counts
Cal 19	500	6/13/08 1410						
Cal 13	500	6/15/08 1410						
Cal 10	500	6/15/08 1410						
Cal 14	500	6/15/08 1410						
Cal 24	500	6/15/08 1410						
Cal 21	500	6/24/08 0950	6/24/08 1410	6/24/08 1720	104	1	8	7275
Cal 20	500	6/24/08 0950	6/24/08 1430	6/24/08 1820	107	1	8	18
Cal 25	500	6/24/08 0950	6/24/08 1450	6/24/08 1921	108	1	8	7547
Cal 36	500	6/24/08 0950	6/24/08 1505	6/24/08 2115	110	1	8	6214
Cal 37	500	6/24/08 0950	6/24/08 1530	6/24/08 2230	111	1	7	6071
Cal 37	500	6/24/08 0950	6/24/08 1545	6/24/08 2305	112	1	8	5592
Cal 3	500	6/24/08 0950	6/25/08 1405	6/25/08 1705	109	1	8	8275
Cal 32	500	6/24/08 0950	6/25/08 1420	6/25/08 1740	101	1	8	3362
Cal 41	500	6/24/08 0950	6/25/08 1445	6/25/08 1820	103	1	8	8905
Cal 39	500	6/24/08 0950	6/25/08 1510	6/25/08 1851	105	1	8	9300
Cal 43	500	6/24/08 0950	6/25/08 1525	6/25/08 1930	109	1	8	8121
Cal 47	500	6/24/08 0950	6/25/08 1540	6/25/08 2000	100	1	8	8413

Ra-226 Verification Sheet

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background CPM	Total Counts
Ca147	500	6/5/08 1410	6/11/08 0940	6/11/08 1340	103	1	8	8220
Ca13	500	6/5/08 1410	6/11/08 1000	6/11/08 1410	104	1	6	8955
Ca127	500	6/5/08 1410	6/11/08 1015	6/11/08 1440	105	1	4	9424
Ca140	500	6/5/08 1410	6/11/08 1045	6/11/08 1510	106	1	8	3534
Ca125	500	6/5/08 1410	6/11/08 1110	6/11/08 1550	107	1	8	8232
Ca136	500	6/5/08 1410	6/11/08 1130	6/11/08 1700	108	1	7	8081
Ca121	500	6/5/08 1410	6/11/08 1145	6/11/08 1735	109	1	8	7570
Ca132	500	6/5/08 1410	6/11/08 1350	6/11/08 2040	110	1	8	4366
Ca134	500	6/5/08 1410	6/11/08 1415	6/11/08 2115	111	1	6	6792
Ca143	500	6/5/08 1410	6/11/08 1430	6/11/08 2210	110	1	8	5867
Ca117	500	6/5/08 1410	6/11/08 1455	6/11/08 2240	101	1	8	8239
Ca141	500	6/5/08 1410	6/11/08 1520	6/11/08 2315	102	1	8	7690
Ca111	500	6/5/08 1410						
Ca130	500	6/5/08 1410						
Ca17	500	6/5/08 1410						
Ca19	500	6/5/08 1410						
Ca16	500	6/5/08 1410						
Ca18	500	6/5/08 1410						
Ca135	500	6/5/08 1410						

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8/29/08

Ra-226 Verification Sheet

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Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background CPM	Total Counts
Cal 14	500	7/28/08 1055	7/31/08 0855	7/31/08 1535	101	1	8	4938
Cal 144	500	7/28/08 1055	7/31/08 0920	7/31/08 1610	102	1	8	4680
Cal 140	500	7/28/08 1055	7/31/08 0950	7/31/08 1640	103	1	7	4862
Cal 119	500	7/28/08 1055	7/31/08 1015	7/31/08 1720	104	1	8	5964
Cal 130	500	7/28/08 1055	7/31/08 1045	7/31/08 1755	105	1	4	4933
Cal 146	500	7/28/08 1055	7/31/08 1115	7/31/08 1825	106	1	8	4209
Cal 113	500	7/28/08 1055	7/31/08 1140	7/31/08 1905	107	1	7	5721
Cal 113	500	7/28/08 1055	7/31/08 1205	8/1/08 0815	108	1	8	3759
Cal 142	500	7/28/08 1055	7/31/08 1305	8/1/08 0855	109	1	6	3894
Cal 113	500	7/28/08 1055	7/31/08 1330	8/1/08 0930	110	1	6	3185
Cal 143	500	7/28/08 1055	7/31/08 1400	8/1/08 1030	111	1	8	4120
Cal 137	500	7/28/08 1055	7/31/08 1415	8/1/08 1100	112	1	8	4294

100
8/2/08

Ra-226 Verification Sheet

Run 1

VP
8/29/08

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background CPM	Total Counts
41	500	8/11/08 1330	8/4/08 0615	8/4/08 1550	101	1	8	3638
44	500	8/11/08 1330	8/4/08 0645	8.4.08 1635	102	1	8	4570
30	500	8/11/08 1330	8/4/08 1015	8.4.08 1710	103	1	7	4796
19	500	8/11/08 1330	8/4/08 1035	8.4.08 1745	104	1	6	4733
35	500	8/11/08 1330	8/4/08 1105	8.4.08 1835	105	1	1	4605
46	500	8/11/08 1330	8/4/08 1130	8.4.08 1910	106	1	6	3725
13	500	8/11/08 1330	8/4/08 1200	8.4.08 1940	107	1	8	5105
25	500	8/11/08 1330	8/4/08 1310	8.4.08 2010	108	1	8	4575
42	500	8/11/08 1330	8/4/08 1340	8.4.08 2040	109	1	8	4226
15	500	8/11/08 1330	8/4/08 1405	8.4.08 2110	110	1	8	4103
43	500	8/11/08 1330	8/4/08 1430	8.4.08 2135	111	1	7	4636
37	500	8/11/08 1330	8/4/08 1450	8.4.08 2200	112	1	8	4599

VP 8/29/08

Ra-226 Verification Sheet

Ring 1

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background CPM	Total Counts
		8/11/08 1305						
Cal 15		8/12/08 1610	8/15/08 0925	8/15/08 1250	101	1	8	4900
Cal 37		8/12/08 1610	8/15/08 0955	8/15/08 1355	105	1	8	5327
Cal 43		8/12/08 1610	8/15/08 1015	8/15/08 1430	106	1	8	4441
Cal 44		8/12/08 1610	8/15/08 1030	8/15/08 1510	109	1	8	5071
Cal 13		8/12/08 1610	8/15/08 1050	8/15/08 1535	110	1	8	4377
Cal 15	500	8/15/08 0925	8/18/08 1000	8-18-08 1700	104	1	4132	462
CAL-15	500	8/15/08 0925	8/18/08 1600	8/19/08 0800	106	1	8	4132

8/15/08

8/15/08

Verification for Ra-226 Standard 0299-G

4/2/2008	Isotope	Detector CPM	BKG CPM	NET CPM	Detector Eff	Standard Mass. Used (G)	Source DPM/G
D. Roy	0299-G N1	2536.9600	52.4000	2484.5600	1.917186	0.5057	2562.667649
	0299-G N2	2520.2500	52.4000	2467.8500	1.917186	0.5056	2545.935781
	0299-G N3	2532.5000	52.4000	2480.1000	1.917186	0.5042	2565.677715
						Average =	2558.093715

Mean Value (Counting) = 2558.093715
 Stdev = 10.63610098

Certificate Value = 2437.6 dpm/mL
 Lower Limit = 2536.821513 dpm/mL
 Upper Limit = 2579.365917 dpm/mL
 Rule 1 Pass/Fail = **Fail** *exception taken due to full recovery of standard
 Two sigma = 21.27220197 dpm/mL
 10 % of Mean = 255.8093715 dpm/mL
 Rule 2 (Pass/Fail) = **Pass**

Verification Rules

- Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements
- Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.
- Rule 3 = The determined mean value shall be within 10% of the certificate value.

The analyst prepared three standard verification sources for Ra-226 source 0299-G by transferring portions of the standard into tared glass liquid scintillation vials. One mL of DI Water and ten mLs of Ready Gel liquid scintillation cocktail was added to each vial and the vials were shaken to mix. A Blank vial was prepared in a similar fashion using 1 mL of DI water and 10 mL of Ready Gel cocktail. The standard verification vials and Background source were dark adapted for two hours and counted on LSC Gold for Radium source standard verification. The Ra-226 efficiency calibration which was used for verification calculations was performed on 4/02/08 using source 0024-A (Ra-226). Calibration data is recorded in this logbook under Ra-226 0024. Each verification source calculation was performed as follows:

$$\text{Source dpm/g} = (A - B)/(C)(D)$$

where:
 A = Ver. source cpm,
 B = BKG cpm,
 C = System efficiency, (cpm/dpm), and
 D = mass used for standard verification.

RAD.SOP.M-001

W 8/17/08
 Nancy E. Jackson 4/9/08
 David Roy 4/10/08



Standard Traceability Log Rad

Source Material Info		A Solution Material Info	
Parent Code:	0299	Isotope:	Radium-226
Prepared By:	Angela Johnson	Prepared By:	Angela Johnson
Carrier Conc:	0.5 M HCL	Prep Date:	09/15/2000
Reference Date:	12/15/1999	Verification Date:	01/23/2008
Ampoule Mass (g):	5.0368 g	Expiration Date:	01/23/2009
Uncertainty:	+/- 2.5 %	Primary Code:	0299-A
LogBook No:	RC S 027 128	Dilution(mL):	100 mL
		Mass of Parent(g):	4.6634 g
		Density(g/mL):	1.0012
		Balance ID:	

Calculations Converting parent activity to dpm/mL|dpm/g

$(\text{Mass of parent(g)}) * (\text{Parm Activity (kBq/g)}) * (\text{conversion dpm to kBq}) / (\text{Dilution Vol}) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)}) * (\text{Parm Activity (kBq/g)}) * (\text{conversion dpm to kBq}) / \text{Density (g/mL)} / (\text{Dilution Vol}) = \text{Parent Activity (dpm/g)}$
$(4.6634 \text{ g}) * (43.75 \text{ kBq/g}) * (60000 \text{ dpm/kBq}) / (100 \text{ mL}) = 122414.2500 \text{ dpm/mL}$
$(4.6634 \text{ g}) * (43.75 \text{ kBq/g}) * (60000 \text{ dpm/kBq}) / (1.0012 \text{ g/mL}) / (100 \text{ mL}) = 122273.3377 \text{ dpm/g}$

Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
08/26/2003	Angela Johnson	1.9909	100	0299-E	2434.34 dpm/mL	11/04/2004	11/04/2005
08/26/2003	Angela Johnson	1.9872	100	0299-F	2429.82 dpm/mL	08/26/2004	08/26/2005
04/05/2005	Amanda Fehr	5.0018	250	0299-G	2446.3471 dpm/mL	04/02/2008	04/02/2009

GEL Laboratories LLC
Version 1.0 9/18/2000

*140
8/28/08*

General Engineering Laboratories Verification Source Preparation Sheet

Applicable SOP Number GL-KAD-A-008 Isotope Ka-226
 Date Standards Prepared 4/5/05 Cocktail Type Used N/A
 Standard ID 0299-6 Matrix of Vial/Planchett N/A
 Amount Used (g or ml) 0.1 N/A
 Standard Activity (DPM/g or ml) 2446.347 Type of Scintillation Vial N/A
 Reference Date 12/15/99 Pipette ID Used 1429303
 Expiration Date 4/12/09 Balance ID Used 36040216
 Residue/Carrier Agent 0.5M HCl Quenching Agent N/A

	Standard Number	Quenching Vol (uL) Residue Volume (mL)	Initial Wt. (g)	Final Wt. (g)	Net Wt. (mg)
1	CAL 1				
2	CAL 2				
3	CAL 3				
4	CAL 4				
5	CAL 5				
6	CAL 6				
7	CAL 7				
8	CAL 8				
9	CAL 9				
10	CAL 10				
11	CAL 11				
12	CAL 12				
13	CAL 13				
14	CAL 14				
15	CAL 15				

No. of Standards

Prepared By: Kyle B. Dancer Date: 8/23/05
 Reviewed By: John G. Adams Date: 8/28/08

General Engineering Laboratories Verification Source Preparation Sheet

Applicable SOP Number GL-KAD-A-008 Isotope La-226
 Date Standards Prepared 4/5/05 Cocktail Type Used N/A
 Standard ID 02991-6 Matrix of Vial/Planchett N/A
 Amount Used (g or ml) 0.1 N/A
 Standard Activity (DPM/g or ml) 2446.347 Type of Scintillation Vial N/A
 Reference Date 12/15/99 Pipette ID Used 1429303
 Expiration Date 4/12/09 Balance ID Used 36040216
 Residue/Carrier Agent 0.5M HCl Quenching Agent N/A

	Standard Number	Quenching Vol (uL)/ Residue Volume (mL)	Initial Wt. (g)	Final Wt. (g)	Net Wt. (mg)
16	CAL 16				
17	CAL 17				
18	CAL 18				
19	CAL 19				
20	CAL 20				
21	CAL 21				
22	CAL 22				
23	CAL 23				
24	CAL 24				
25	CAL 25				
26	CAL 26				
27	CAL 27				
28	CAL 28				
29	CAL 29				
30	CAL 30				

8/22/08
 8/22/08

Prepared By: Kelli Powell Date: 8/22/08
 Reviewed By: John J. Identi Date: 8/22/08

Rev 1 RLM.9/10/97

General Engineering Laboratories Verification Source Preparation Sheet

Applicable SOP Number GL-KAD-A-008 Isotope Ka-226
 Date Standards Prepared 4/15/05 Cocktail Type Used N/A
 Standard ID 0299-6 Matrix of Vial/Planchet N/A
 Amount Used (g or ml) 0.1 N/A
 Standard Activity (DPM/g or ml) 2446.347 Type of Scintillation Vial N/A
 Reference Date 12/15/99 Pipette ID Used 1429303
 Expiration Date 4/12/09 Balance ID Used 36040216
 Residue/Carrier Agent 0.5M HCl Quenching Agent N/A

	Standard Number	Quenching Vol (uL)/ Residue Volume (mL)	Initial Wt. (g)	Final Wt. (g)	Net Wt. (mg)
31	CAL 31				
32	CAL 32				
33	CAL 33				
34	CAL 34				
35	CAL 35				
36	CAL 36				
37	CAL 37				
38	CAL 38				
39	CAL 39				
40	CAL 40				
41	CAL 41				
42	CAL 42				
43	CAL 43				
44	CAL 44				
45	CAL 45				

Handwritten note: 8/25/08

Prepared By: Kelli Brown Date 8/25/08
 Reviewed By: [Signature] Date 8/29/08

General Engineering Laboratories Verification Source Preparation Sheet

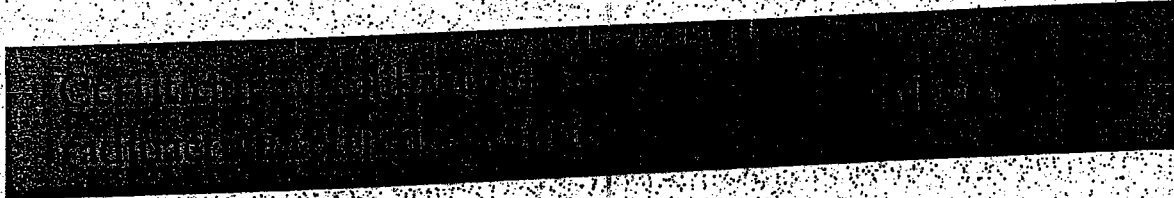
Applicable SOP Number GL-KAD-A-003 Isotope Po-226
 Date Standards Prepared 4/15/05 Cocktail Type Used N/A
 Standard ID 0299-G Matrix of Vial/Planchett N/A
 Amount Used (g or ml) 0.1 Type of Scintillation Vial N/A
 Standard Activity (DPM/g or ml) 2446.347 Pipette ID Used 1429303
 Reference Date 12/15/99 Balance ID Used 36040216
 Expiration Date 4/12/09 Quenching Agent N/A
 Residue/Carrier Agent 0.5M HCl

	Standard Number	Quenching Vol (uL)/ Residue Volume (mL)	Initial Wt. (g)	Final Wt. (g)	Net Wt. (g)
46	CAL 46				
47	CAL 47				
48	CAL 48				

Note: A large diagonal line is drawn across the table from the top-left to the bottom-right. Handwritten notes 'CAL 46-48' and '3/22/05' are present near the line.

Prepared By: Vello's Dione Date: 8/1/05
 Reviewed By: [Signature] Date: 3/28/08

0299



Nycomed Amersham plc
Radiation & Radioactivity
Calibration Laboratory
Amersham Laboratories
White Lion Road
Amersham
Buckinghamshire
HP7 9LL

ISSUED
FOR:

AEA Technology plc
Isotrak
Amersham Laboratories
White Lion Road
Amersham
Buckinghamshire
HP7 9LL

ion Principal radionuclide: Radium-226

Product code: RAY44
Solution number: R4/131/89

ment Reference time: 1200 GMT on 15 December 1999

data Nuclear data quoted on this certificate are taken from the Joint European File, Version 2.2.

ion of The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor $k = 2.00$, which
inties for a t -distribution with $\nu_{\text{eff}} = \infty$ effective degrees of freedom corresponds to a coverage probability of approximately
95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

Unless indicated, all other uncertainties are expressed at the confidence level associated with one standard
uncertainty.

The format used for the uncertainties in the values of radionuclidic purity is illustrated in the following examples;

6.5(21)	-	6.5 ± 2.1
6.54(21)	-	6.54 ± 0.21
6.543(21)	-	6.543 ± 0.021

ved
ory

Date of
issue

17th December 1999

1008/89/100

499

Nycomed
Amersham

Ra-226 WATER

Batch : LCSVER
 Date : 8/20/2008
 Analyst : KSD1

Procedure Code : LUC26RAL
 Parmname : Radium-226

MDA : 1 pCi/L
 Instrument Used : LUCAS CELL DETECTOR

Bkg Count Time: 30 min

Sample ID	Sample Vol L	Count Time min	Gross counts cts	Cell # num	Cell Const. num	BKG cpm	Ra-226 MDA pCi/L	Ra-226 RESULT pCi/L	Ra-226 ERROR pCi/L	COUNT DATE/TIME
Ver 1	0.500	30	738	101	1.751	0.267	0.4737	21.7600	1.5957	8/26/2008 16:10
Ver 2	0.500	30	770	102	1.647	0.267	0.5038	24.1604	1.7334	8/26/2008 17:05
Ver 3	0.500	30	716	103	1.752	0.267	0.4735	21.0967	1.5715	8/26/2008 17:45
Ver 4	0.500	30	820	104	1.973	0.200	0.3728	21.4823	1.4866	8/26/2008 18:15
Ver 5	0.500	30	656	106	1.486	0.267	0.5576	22.7382	1.7722	8/26/2008 19:00
Ver 6	0.500	30	860	107	1.773	0.267	0.4674	25.0613	1.6986	8/26/2008 19:35
Ver 7	0.500	30	867	108	1.940	0.267	0.4505	24.3515	1.6436	8/26/2008 20:10
Ver 8	0.500	30	756	110	1.544	0.267	0.5372	25.2853	1.8313	8/26/2008 20:40
Ver 9	0.500	30	827	111	1.575	0.133	0.3989	27.2897	1.8735	8/26/2008 21:10
VER 10	0.500	30	851	112	1.648	0.267	0.5042	26.7480	1.8227	8/26/2008 21:45

WJ
 8/25/08

Sample ID	Sample Dup	Det #	Run Date	Sample Type	Standard ID	NC	NC units	Recovery/RPD
Ver 1		1	8/26/2008 13:00	LCS	0638-F	24.10	pCi/L	90%
Ver 2		1	8/26/2008 13:30	LCS	0638-F	24.10	pCi/L	100%
Ver 3		1	8/26/2008 13:55	LCS	0638-F	24.10	pCi/L	88%
Ver 4		1	8/26/2008 14:25	LCS	0638-F	24.10	pCi/L	89%
Ver 5		1	8/26/2008 14:45	LCS	0638-F	24.10	pCi/L	94%
Ver 6		1	8/26/2008 15:05	LCS	0638-F	24.10	pCi/L	104%
Ver 7		1	8/26/2008 15:25	LCS	0638-F	24.10	pCi/L	101%
Ver 8		1	8/26/2008 15:40	LCS	0638-F	24.10	pCi/L	105%
Ver 9		1	8/26/2008 15:55	LCS	0638-F	24.10	pCi/L	113%
Ver 10		1	8/26/2008 16:10	LCS	0638-F	24.10	pCi/L	111%

DEGASSING DATE/TIME	DE-EMAN. DATE/TIME	DEGASS-DE-EM	dE-EM-COUNT	constant	constant	constant	Net CPM	Ingrowth constant
8/21/2008 15:30	8/26/2008 13:00	117.50	3.17	0.5882	0.9764	1.0019	24.3333	0.5754
8/21/2008 15:30	8/26/2008 13:30	118.00	3.58	0.5897	0.9733	1.0019	25.4000	0.5751
8/21/2008 15:30	8/26/2008 13:55	118.42	3.83	0.5910	0.9715	1.0019	23.6000	0.5752
8/21/2008 15:30	8/26/2008 14:25	118.92	3.83	0.5925	0.9715	1.0019	27.1333	0.5767
8/21/2008 15:30	8/26/2008 14:45	119.25	4.25	0.5936	0.9684	1.0019	21.6000	0.5759
8/21/2008 15:30	8/26/2008 15:05	119.58	4.50	0.5946	0.9666	1.0019	28.4000	0.5758
8/21/2008 15:30	8/26/2008 15:25	119.92	4.75	0.5956	0.9648	1.0019	28.6333	0.5757
8/21/2008 15:30	8/26/2008 15:40	120.17	5.00	0.5964	0.9630	1.0019	24.9333	0.5754
8/21/2008 15:30	8/26/2008 15:55	120.42	5.25	0.5971	0.9611	1.0019	27.4333	0.5750
8/21/2008 15:30	8/26/2008 16:10	120.67	5.58	0.5979	0.9587	1.0019	28.1000	0.5743

Handwritten signature

Verification for Ra-226 Standard 0638-F

D Roy
12/27/2007

Isotope	Detector CPM	BKG CPM	NET CPM	Detector Eff Mass. Used (mL)	Source DPM/mL
0638-F N1	1239.9000	31.5000	1208.4000	1.0000	261.3311626
0638-F N2	1222.8000	31.5000	1191.3000	1.0000	257.6330801
0638-F N3	1219.4000	31.5000	1187.9000	1.0000	256.8977889
				Average =	258.6206772

Mean Value (Counting) = 258.6206772
 Stdev = 2.375965421

Certificate Value = 267.1
 Lower Limit = 253.8687464
 Upper Limit = 263.3726081
 Rule 1 Pass/Fail **Fail**
 Two sigma = 4.751930843
 10 % of Mean = 25.86206772
 Rule 2 (Pass/Fail) **Pass**

*exception taken due to full recovery of standard

Verification Rules

- Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements
- Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.
- Rule 3 = The determined mean value shall be within 5% of the certificate value.

The analyst prepared three standard verification sources for Ra-226 source 0638-F by transferring portions of the standard into tared glass liquid scintillation vials. One mL of DI Water and 10 mL Ready Gel liquid scintillation cocktail was added to each vial and the vials were shaken to mix. A Blank vial was prepared in a similar fashion using 1 mL of DI water and 10 mL of Ready Gel cocktail. The standard verification vials and Background source were dark adapted for two hours and counted on LSC YELLOW using source standard verification. The Ra-226 efficiency calibration which was used for verification calculations was performed on 12/27/07 using source 0024-A (Ra-226). Calibration data is recorded in this logbook under Ra-226 (0024-A). Each verification source calculation was performed as follows:

$$\text{Source dpm/g} = (A - B)/(C)(D)$$

where:

- A = Ver. source cpm,
- B = BKG cpm,
- C = System efficiency, (cpm/dpm), and
- D = mass used for standard verification.

Reference RAD SOP M-001

VAD
 8/27/08
 Amanda L. Fehr 1/4/07
 Amanda L. Fehr 1/4/07

**General Engineering Laboratories
Verification Source Preparation Sheet**

Applicable SOP Number GL-RAD-A-008

Isotope Ra-226

Date Standards Prepared 12/18/07

Cocktail Type Used N/A

Standard ID 0638-F

Matrix of Vial/Planchett N/A

Amount Used (g or ml) 0.1

N/A
N/A

Standard Activity (DPM/g or mL) 267.519

Type of Scintillation Vial N/A

Reference Date 1/23/04

Pipette ID Used 1429303

Expiration Date 12/20/08

Balance ID Used 3604046

Residue/Carrier Agent 0.1M HCl

Quenching Agent N/A

	Standard Number	Quenching Vol (uL)/ Residue Volume(mL)	Initial Wt. (g)	Final Wt. (g)	Net Wt. (mg)
1	ver 1				
2	ver 2				
3	ver 3				
4	ver 4				
5	ver 5				
6	ver 6				
7	ver 7				
8	ver 8				
9	ver 9				
10	ver 10				
11	ver 11				
12	ver 12				
13	ver 13				
14	ver 14				
15	ver 15				

Prepared By: Kelli Perce Date 8/29/08

Reviewed By: Man G. Jaur Date 8/29/08

Rev 1 RLM 9/10/97

**General Engineering Laboratories
Verification Source Preparation Sheet**

Applicable SOP Number GL-MAD-A-008

Isotope Ka-226

Date Standards Prepared 12/18/07

Cocktail Type Used N/A

Standard ID 0638-P

Matrix of Vial/Planchett N/A

Amount Used (g or ml) 12.1

N/A

N/A

Standard Activity (DPM/g or mL) 267-519

Type of Scintillation Vial N/A

Reference Date 1/23/04

Pipette ID Used 1429303

Expiration Date 12/20/08

Balance ID Used 3604046

Residue/Carrier Agent 0.1M HCl

Quenching Agent N/A

	Standard Number	Quenching Vol (uL)/ Residue Volume(mL)	Initial Wt. (g)	Final Wt. (g)	Net Wt. (mg)
16	VER 16				
17	VER 17				
18	VER 18				
19	VER 19				
20	VER 20				
21	VER 21				
22	VER 22				
23	VER 23				
24	VER 24				

N/A 12/20/08

Prepared By: Kelly Daniel Date 8/29/08

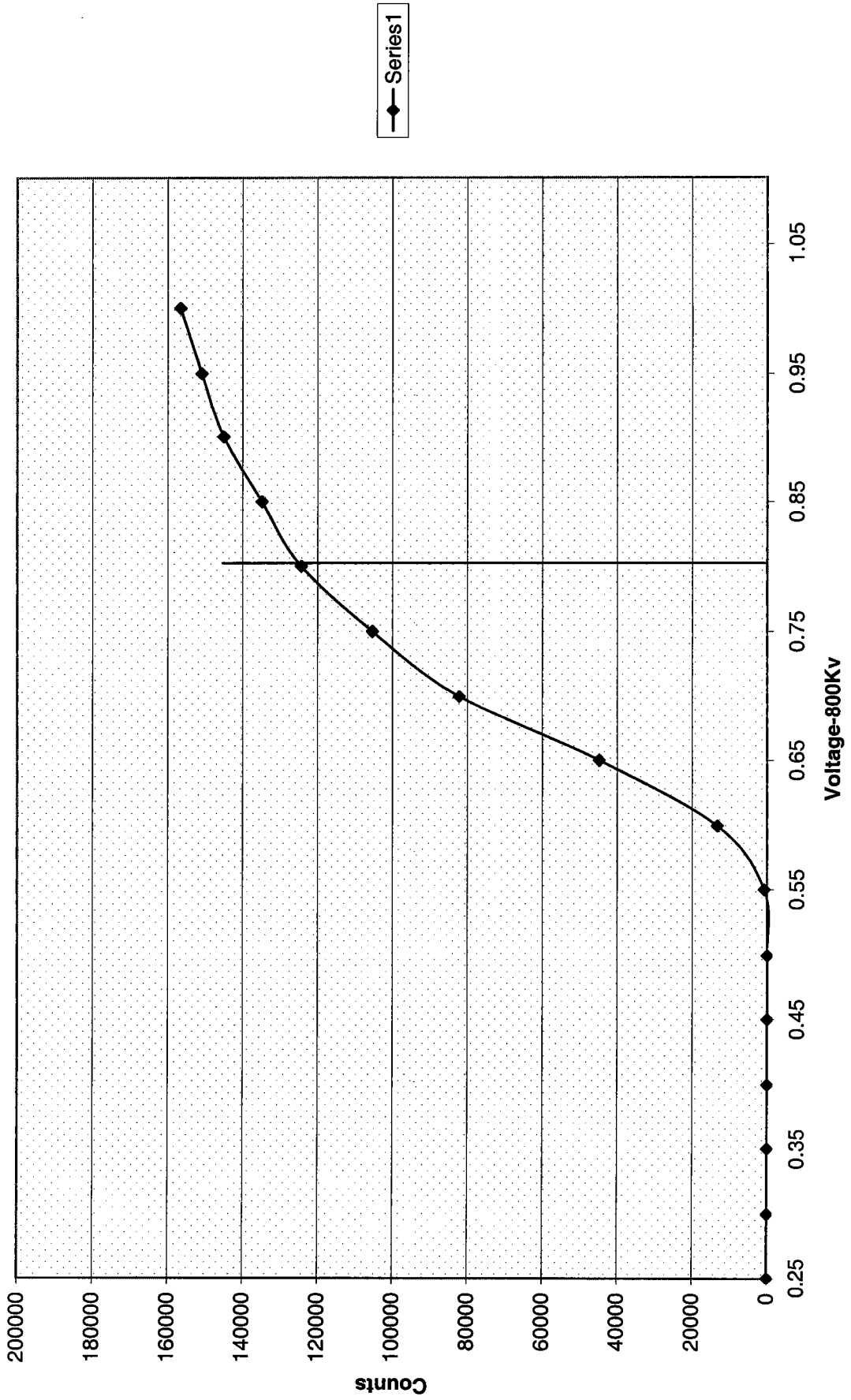
Reviewed By: John J. Adams Date 8/28/08

VOLTAGE CURVE 08

Voltage Curve Ludlum # 1				
Volts	Counts	Date	Time	Detector
0.00	0	8/19/2008	11:00	1
0.05	0	8/19/2008	11:00	1
0.10	0	8/19/2008	11:00	1
0.15	0	8/19/2008	11:00	1
0.20	0	8/19/2008	11:00	1
0.25	0	8/19/2008	11:00	1
0.30	0	8/19/2008	11:00	1
0.35	0	8/19/2008	11:00	1
0.40	0	8/19/2008	11:00	1
0.45	0	8/19/2008	11:00	1
0.50	0	8/19/2008	11:00	1
0.55	813	8/19/2008	11:00	1
0.60	13369	8/19/2008	11:00	1
0.65	44807	8/19/2008	11:00	1
0.70	82131	8/19/2008	11:00	1
0.75	105365	8/19/2008	11:00	1
0.80	124405	8/19/2008	11:00	1
0.85	134938	8/19/2008	11:00	1
0.90	145048	8/19/2008	11:00	1
0.95	150949	8/19/2008	11:00	1
1.00	156594	8/19/2008	11:00	1

*MD
Shaner*

Ludlum 1 Voltage Curve



PO 8/29/08

101	1.751	8/29/2008
102	1.647	8/29/2008
103	1.752	8/29/2008
104	1.973	8/29/2008
105	1.749	8/29/2008
106	1.486	8/29/2008
107	1.773	8/29/2008
108	1.840	8/29/2008
109	1.512	8/29/2008
110	1.544	8/29/2008
111	1.575	8/29/2008
112	1.648	8/29/2008

General Engineering Laboratories

2040 Savage Road, Charleston, SC 29414
(843)556-8171

Lucas Cell Calibration Package

	YES	NO	Comments
1) Is all calibration standard information enclosed for: the primary standard certificate?	✓	✓	
the secondary standard(s) documentation?	✓	✓	
standard preparation information?	✓	✓	
standard < 1 Year old or verified?	✓	✓	
2) Is the efficiency calibration report included?	✓	✓	
3) Is the raw count data included for: Cell constant determination?	✓	✓	
Plateau generation?	✓	✓	
4) Are the calibration verifications included?	✓	✓	
5) Are the instrument settings included: HVPS settings?	✓	✓	
6) Has the CELLEFF.xls file been updated?	✓	✓	
7) Have the calibration dates been updated in ALPHALIMS?	✓	✓	

Prepared By: Kelli Donnell

Date: 12/19/08

Reviewed By: Mark G. Adams

Date: 12/19/08

Effective Date: 12/19/08

NU 12/19/08

Ra-226 Cell Constants

Standard Reference date: 12/15/1999
 standard ID: 0299-G
 Volume added (mL): 0.1
 Standard Reference Activity (DPM/mL): 2446.35

Lucas cell #	Cell constant	Standard Source	Date/Time of count	Date/Time flushed to cell	Date/Time end of degas	bkg cpm	total counts	count time min	cpm	Known activity dpm	11 (days) end-degas to flush	12 (days) end-flush to count	13 (days) Std Ref Date to count	Decay from Std Ref Date to count
201	2.021	Average	9/15/2008 15:45	9/15/2008 9:05	9/12/2008 13:20	0.267	5596	30	186.53	243.02	2.82292	0.27778	3198	0.9962
201	2.043	Stdv	9/18/2008 13:00	9/18/2008 8:10	9/15/2008 9:05	0.267	5949	30	198.30	243.02	2.96181	0.20139	3201	0.9962
201	1.915		9/25/2008 19:35	9/25/2008 9:15	9/22/2008 10:00	0.267	5361	30	178.70	243.02	2.96875	0.49056	3208	0.9962
202	2.436	Average	9/15/2008 16:20	9/15/2008 9:35	9/12/2008 13:20	0.267	6779	30	225.97	243.02	2.84375	0.28125	3198	0.9962
202	2.209	Stdv	9/18/2008 13:50	9/18/2008 8:45	9/15/2008 9:35	0.267	6425	30	214.17	243.02	2.96528	0.21181	3201	0.9962
202	2.137		10/21/2008 13:50	10/20/2008 13:45	10/13/2008 16:00	0.267	9248	30	308.27	243.02	6.90625	1.00347	3234	0.9962
203	2.255	Average	9/15/2008 16:50	9/15/2008 10:00	9/12/2008 13:20	0.267	6300	30	210.00	243.02	2.86111	0.28472	3198	0.9962
203	2.273	Stdv	9/18/2008 14:25	9/18/2008 9:15	9/15/2008 10:00	0.267	6613	30	220.43	243.02	2.96875	0.21528	3201	0.9962
203	2.234		9/25/2008 21:00	9/25/2008 10:15	9/22/2008 10:00	0.267	6298	30	209.93	243.02	3.01042	0.44782	3208	0.9962
204	2.184	Average	9/15/2008 17:25	9/15/2008 10:30	9/12/2008 13:20	0.267	6132	30	204.40	243.02	2.88194	0.28819	3198	0.9962
204	2.300	Stdv	9/18/2008 14:55	9/18/2008 9:35	9/15/2008 10:30	0.267	6671	30	222.37	243.02	2.96181	0.22222	3201	0.9962
204	2.096		9/30/2008 14:05	9/30/2008 9:10	9/28/2008 9:45	0.133	7535	30	251.17	243.02	3.97569	0.20486	3213	0.9962
205	1.677	Average	10/21/2008 8:30	10/20/2008 14:05	10/13/2008 16:00	0.267	7584	30	252.80	243.02	6.32014	0.76736	3233	0.9962
205	1.730	Stdv	9/18/2008 16:00	9/18/2008 10:05	9/15/2008 10:55	0.167	4989	30	166.63	243.02	2.96528	0.24653	3201	0.9962
205	1.990		9/30/2008 14:45	9/30/2008 9:40	9/28/2008 9:45	0.167	7170	30	239.00	243.02	3.89653	0.21181	3213	0.9962
206	2.240	Average	9/15/2008 21:10	9/15/2008 11:25	9/12/2008 13:20	0.233	6216	30	207.20	243.02	2.32014	0.40825	3198	0.9962
206	2.293	Stdv	9/18/2008 16:35	9/18/2008 10:25	9/15/2008 11:25	0.267	6604	30	220.13	243.02	2.95833	0.25694	3201	0.9962
206	2.245		9/30/2008 15:20	9/30/2008 10:15	9/28/2008 9:45	0.267	8125	30	270.83	243.02	4.02083	0.21181	3213	0.9962
207	2.187	Average	9/15/2008 21:40	9/15/2008 11:50	9/12/2008 13:20	0.267	6084	30	203.13	243.02	2.33750	0.40972	3198	0.9962
207	2.141	Stdv	9/18/2008 17:55	9/18/2008 10:40	9/15/2008 11:50	0.267	6105	30	203.50	243.02	2.95139	0.30208	3201	0.9962
207	2.110		9/30/2008 16:00	9/30/2008 10:45	9/28/2008 9:45	0.233	7856	30	255.20	243.02	4.04167	0.21875	3213	0.9962
208	2.239	Average	9/15/2008 22:15	9/15/2008 12:15	9/12/2008 13:20	0.267	6288	30	208.60	243.02	2.85486	0.41667	3198	0.9962
208	2.243	Stdv	9/18/2008 19:30	9/18/2008 11:00	9/15/2008 12:15	0.133	6374	30	212.47	243.02	2.94786	0.41290	3201	0.9962
208	2.148		9/30/2008 16:55	9/30/2008 11:10	9/28/2008 9:45	0.167	7691	30	236.03	243.02	4.04989	0.21875	3213	0.9962
209	2.471	Average	9/15/2008 22:45	9/15/2008 13:50	9/12/2008 13:20	0.033	7073	30	235.77	243.02	3.02083	0.37153	3198	0.9962
209	2.212	Stdv	9/18/2008 19:15	9/18/2008 11:15	9/15/2008 13:50	0.067	6170	30	205.67	243.02	2.89236	0.33333	3201	0.9962
209	2.420		9/30/2008 17:25	9/30/2008 11:40	9/28/2008 9:45	0.100	8795	30	293.17	243.02	4.07986	0.23958	3213	0.9962
210	2.320	Average	9/15/2008 23:15	9/15/2008 14:15	9/12/2008 13:20	0.033	6665	30	222.17	243.02	3.03819	0.37500	3198	0.9962
210	2.210	Stdv	9/18/2008 19:45	9/18/2008 11:30	9/15/2008 14:15	0.100	6142	30	204.73	243.02	2.88542	0.34375	3201	0.9962
210	2.230		9/30/2008 18:00	9/30/2008 12:05	9/28/2008 9:45	0.033	8116	30	270.53	243.02	4.09722	0.24653	3213	0.9962
211	2.140	Average	9/15/2008 23:50	9/15/2008 14:30	9/12/2008 13:20	0.033	6150	30	205.00	243.02	3.04661	0.36889	3198	0.9962
211	2.238	Stdv	9/18/2008 22:20	9/18/2008 12:35	9/15/2008 14:30	0.133	6207	30	206.90	243.02	2.92014	0.40625	3201	0.9962
211	2.136		9/30/2008 18:30	9/30/2008 13:35	9/28/2008 9:45	0.100	7917	30	263.90	243.02	4.15972	0.20486	3213	0.9962
212	2.405	Average	9/16/2008 0:20	9/15/2008 14:50	9/12/2008 13:20	0.033	6926	30	230.87	243.02	3.06250	0.39583	3198	0.9962
212	2.315	Stdv	9/18/2008 22:55	9/18/2008 12:50	9/15/2008 14:50	0.267	6405	30	213.50	243.02	2.91667	0.42014	3201	0.9962
212	2.244		9/30/2008 19:50	9/30/2008 14:00	9/28/2008 9:45	0.267	8287	30	276.23	243.02	4.17708	0.24306	3213	0.9962

NU 12/19/08

NU 12/19/08

NU 12/19/08

Ra-226 Verification Sheet

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background CPM	Total Counts
Cal 14	500	9/12/08 1320	9/15/08 1405	9/15/08 1545	201	2	8	5596
Cal 13	500	9/12/08 1320	9/15/08 0935	9/15/08 1620	202	2	8	6779
Cal 43	500	9/12/08 1320	9/15/08 1000	9/15/08 1650	203	2	8	6300
Cal 15	500	9/12/08 1320	9/15/08 1030	9/15/08 1725	204	2	8	6132
Cal 44	500	9/12/08 1320	9/15/08 1055	9/15/08 1805	205	2	5	6132
Cal 46	500	9/12/08 1320	9/15/08 1115	9/15/08 2110	206	2	7	6216
Cal 36	500	9/12/08 1320	9/15/08 1150	9/15/08 2140	207	2	8	6094
Cal 38	500	9/12/08 1320	9/15/08 1215	9/15/08 2215	208	2	8	6258
Cal 19	500	9/12/08 1320	9/15/08 1350	9/15/08 2245	209	2	1	7073
Cal 47	500	9/12/08 1320	9/15/08 1415	9/15/08 2315	210	2	1	6665
Cal 37	500	9/12/08 1320	9/15/08 1430	9/15/08 2350	211	2	1	6150
Cal 42	500	9/12/08 1320	9/15/08 1450	9/16/08 0020	212	2	1	6426

12/18/08

12/19/08

12/19/08
12/19/08
12/19/08

12/19/08

Ra-226 Verification Sheet

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background CPM	Total Counts
15	500	9/20/08 0945	9/20/08 0910	9/20/08 1405	204	2	4	1535
44	500	9/20/08 0945	9/20/08 0940	9/30/08 1445	205	2	5	7170
46	500	9/20/08 0945	9/30/08 1015	9/30/08 1520	206	2	8	8125
36	500	9/20/08 0945	9/30/08 1015	9/30/08 1410	207	2	7	1456
30	500	9/20/08 0945	9/30/08 1110	9/30/08 1635	208	2	1	7681
19	500	9/20/08 0945	9/30/08 1140	9.30.08 1725	209	2	3	8795
47	500	9/20/08 0945	9/30/08 1205	9.30.08 1800	210	2	1	8116
37	500	9/20/08 0945	9/30/08 1335	9.30.08 1830	211	2	3	7917
42	500	9/20/08 0945	9/30/08 1400	9.30.08 1950	212	2	8	8287

100 12/19/08

100 12/19/08
14696
12/19/08

12/18/08
40

Verification for Ra-226 Standard 0299-G

Standard	Source DPM/G
Mass. Used (G)	2562.667649
0.5057	2545.935781
0.5056	2565.677715
0.5042	2558.093715
Average =	

Detector Eff	NET CPM	BKG CPM	Pass
1.917186	2484.5600	104.944421	Rule 3 (Pass/Fail)
1.917186	2467.8500	0.00415782	
1.917186	2480.1000		

Isotope	Detector CPM	BKG CPM	NET CPM
0299-G N1	2536.9600	52.4000	2484.5600
0299-G N2	2520.2500	52.4000	2467.8500
0299-G N3	2532.5000	52.4000	2480.1000

Mean Value (Counting) = 2558.093715
 Stdev = 10.63610098

Certificate Value = 2437.6 dpm/mL
 Lower Limit = 2536.821513 dpm/mL
 Upper Limit = 2579.365917 dpm/mL
 Rule 1 Pass/Fail = Fail *exception taken due to full recovery of standard
 Two sigma = 21.27220197 dpm/mL
 10 % of Mean = 255.8093715 dpm/mL
 Rule 2 (Pass/Fail) = Pass

Verification Rules

- Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements
- Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.
- Rule 3 = The determined mean value shall be within 10% of the certificate value.

The analyst prepared three standard verification sources for Ra-226 source 0299-G by transferring portions of the standard into tared glass liquid scintillation vials. One mL of DI Water and ten mLs of Ready Gel liquid scintillation cocktail was added to each vial and the vials were shaken to mix. A Blank vial was prepared in a similar fashion using 1 mL of DI water and 10 mL of Ready Gel cocktail. The standard verification vials and Background source were dark adapted for two hours and counted on LSC Gold for Radium source standard verification. The Ra-226 efficiency calibration which was used for verification calculations was performed on 4/02/08 using source 0024-A (Ra-226). Calibration data is recorded in this logbook under Ra-226 0024. Each verification source calculation was performed as follows:

Source dpm/g = (A - B)/(C)(D)
 where:
 A = Ver. source cpm,
 B = BKG cpm,
 C = System efficiency, (cpm/dpm), and
 D = mass used for standard verification.

BAD.SOP.M-001

Mut 12/19/08
W 17/19/08
Mary E. Johnson 4/19/08
Daniel Dwyer 4/10/08



Standard Traceability Log Rad

Source Material Info		A Solution Material Info	
Parent Code:	0299	Isotope:	Radium-226
Prepared By:	Angela Johnson	Prepared By:	Angela Johnson
Carrier Conc:	0.5 M HCL	Prep Date:	09/15/2000
Reference Date:	12/15/1999	Verification Date:	01/23/2008
Ampoule Mass (g):	5.0368 g	Expiration Date:	01/23/2009
Uncertainty:	+/- 2.5 %	Primary Code:	0299-A
LogBook No:	RC S 027 128	Dilution(mL):	100 mL
		Mass of Parent(g):	4.6634 g
		Density(g/mL):	1.0012
		Balance ID:	

Calculations Converting parent activity to dpm/mL|dpm/g

$$(\text{Mass of parent(g)}) * (\text{Parm Activity (kBq/g)}) * (\text{conversion dpm to kBq}) / (\text{Dilution Vol}) = \text{Parent Activity (dpm/mL)}$$

$$(\text{Mass of parent(g)}) * (\text{Parm Activity (kBq/g)}) * (\text{conversion dpm to kBq}) / \text{Density (g/mL)} / (\text{Dilution Vol}) = \text{Parent Activity (dpm/g)}$$

$$(4.6634 \text{ g}) * (43.75 \text{ kBq/g}) * (60000 \text{ dpm/kBq}) / (100 \text{ mL}) = 122414.2500 \text{ dpm/mL}$$

$$(4.6634 \text{ g}) * (43.75 \text{ kBq/g}) * (60000 \text{ dpm/kBq}) / (1.0012 \text{ g/mL}) / (100 \text{ mL}) = 122273.3377 \text{ dpm/g}$$

Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
08/26/2003	Angela Johnson	1.9909	100	0299-E	2434.34 dpm/mL	11/04/2004	11/04/2005
08/26/2003	Angela Johnson	1.9872	100	0299-F	2429.82 dpm/mL	08/26/2004	08/26/2005
04/05/2005	Amanda Fehr	5.0018	250	0299-G	2446.3471 dpm/mL	04/02/2008	04/02/2009

GEL Laboratories LLC
Version 1.0 9/18/2000

all the 12/19/08
len 12/19/08

General Engineering Laboratories Verification Source Preparation Sheet

Applicable SOP Number <u>GLRAD A-008</u>	Isotope <u>Ra-226</u>
Date Standards Prepared <u>4/5/08</u>	Cocktail Type Used <u>NA</u>
Standard ID <u>0299-G</u>	Matrix of Vial/Planchett <u>NA</u> <u>NA</u> <u>NA</u>
Amount Used (g or ml) <u>0.1</u>	Type of Scintillation Vial <u>NA</u>
Standard Activity (DPM/g or ml) <u>2446.347</u>	Pipette ID Used <u>1429303</u>
Reference Date <u>12/15/99</u>	Balance ID Used <u>36040216</u>
Expiration Date <u>4/2/09</u>	Quenching Agent <u>NA</u>
Residue/Carrier Agent <u>0.5 M HCl</u>	

	Standard Number	Quenching Vol (uL) Residue Volume (mL)	Initial Wt. (g)	Final Wt. (g)	Net Wt. (mg)
14	Cal 14				
13	Cal 13				
43	Cal 43				
15	Cal 15				
44	Cal 44				
46	Cal 46				
36	Cal 36				
19	Cal 19				
47	Cal 47				
37	Cal 37				
42	Cal 42				

See
table

Prepared By: <u>Kelli S. Deroso</u>	Date: <u>12/19/08</u>
Reviewed By: <u>M. G. Johnson</u>	Date: <u>12/19/08</u>

Rev 1 RLM 9/10/97

0299

UKAS ACCREDITED CALIBRATION LABORATORY No. 0146

Reference time for solution number R4/131/89:	1200 GMT on 15 December 1999
Radioactive concentration of radium-226:	43.75 kilobecquerels per gram of solution
which is equivalent to:	1.183 microcuries per gram of solution
Mass of solution:	5.0368 grams
Total activity of radium-226:	220.4 kilobecquerels
which is equivalent to:	5.956 microcuries
Recommended half life:	1600 years
Method of measurement:	
The activity of the solution was measured using a high pressure re-entrant ionisation chamber calibrated with a large number of absolutely standardised solutions.	

Calibration date: 15 December 1999
The calibration date is provided for added information only, and must not be confused with the reference date on pages 1 and 2 of the certificate. It is the reference date that must be used in all calculations relating to the values of activity.

Expanded uncertainty in the radioactive concentration quoted above: $\pm 2.5\%$
Combined Type A uncertainty: $\pm 0.2\%$
Combined Type B uncertainty: $\pm 1.3\%$

Radiochemical The estimated activities of any radioactive impurities found by high-resolution gamma ray spectrometry, or in any other examination of the solution, are listed below expressed as percentages of the activity of the principal radionuclide at the reference time.

Carrier free in 0.5M HCl

This product meets the quality assurance requirements for achieving traceability to NIST as defined in ANSI N42.22-1995.

1 year = 365.25 days

At the reference date radium-226 was shown to be in radioactive equilibrium with its daughter nuclides down the decay chain to polonium-214 and thallium-210, the precursors of lead-210. The ionisation chamber was calibrated using a standard supplied by the National Institute of Standards and Technology, Washington DC, USA.

Handwritten: 12/19/99
12/19/98

Ra-226 WATER

Batch : LCSVER
Date : 10/31/2008
Analyst : KSD1

Procedure Code : LUC26RAL

Parname : Radium-226

MDA : 1 pCi/L

Instrument Used : LUCAS CELL DETECTOR

Bkg Count Time: 30 min

Sample ID	Sample Vol L	Count Time min	Gross counts cts	Cell # num	Cell Const. num	BKG cpm	Ra-226 MDA pCi/L	Ra-226 RESULT pCi/L	Ra-226 ERROR pCi/L	COUNT DATE/TIME
VER 1	0.500	30	1014	201	1.993	0.267	0.3504	22.1841	1.3817	11/17/2008 15:10
VER 2	0.500	30	1056	202	2.261	0.267	0.3089	20.3702	1.2427	11/17/2008 15:45
VER 3	0.500	30	726	203	2.254	0.267	0.5419	24.4866	1.8110	10/30/2008 16:05
VER 4	0.500	30	737	204	2.193	0.267	0.5519	25.3188	1.8580	10/30/2008 18:20
VER 5	0.500	30	937	205	1.799	0.267	0.3882	22.6936	1.4718	11/17/2008 16:20
VER 6	0.500	30	780	206	2.259	0.267	0.5373	26.1045	1.8604	10/30/2008 20:20
VER 7	0.500	30	711	207	2.146	0.267	0.5705	25.2245	1.8858	10/30/2008 22:00
VER 3	0.500	30	593	208	2.283	0.267	0.5132	16.9552	1.4723	11/20/2008 16:40
VER 9	0.500	30	630	209	2.291	0.133	0.4042	21.0513	1.6596	10/30/2008 23:40
VER 10	0.500	30	691	210	2.253	0.033	0.2527	23.7356	1.7736	10/31/2008 1:15
VER 11	0.500	30	1067	211	2.171	0.267	0.3314	22.0840	1.3401	11/17/2008 21:55
VER 12	0.500	30	648	212	2.322	0.133	0.4223	22.6294	1.7586	10/31/2008 9:15

12/19/08
KSD

Sample ID	Sample Dup	Det #	Run Date	Sample Type	Standard ID	NC	NC units	Recovery/RPD
201		2	11/17/2008 10:20	LCS	0638-F	24.10	pCi/L	92%
202		2	11/17/2008 10:45	LCS	0638-F	24.10	pCi/L	85%
203		2	10/30/2008 11:05	LCS	0638-F	24.10	pCi/L	102%
204		2	10/30/2008 12:30	LCS	0638-F	24.10	pCi/L	105%
205		2	11/17/2008 11:10	LCS	0638-F	24.10	pCi/L	94%
206		2	10/30/2008 13:10	LCS	0638-F	24.10	pCi/L	108%
207		2	10/30/2008 13:25	LCS	0638-F	24.10	pCi/L	105%
208		2	11/20/2008 11:45	LCS	0638-F	24.10	pCi/L	70% <i>W</i>
209		2	10/30/2008 14:05	LCS	0638-F	24.10	pCi/L	87% <i>W</i>
210		2	10/30/2008 14:25	LCS	0638-F	24.10	pCi/L	98% <i>W</i>
211		2	11/17/2008 12:20	LCS	0638-F	24.10	pCi/L	92%
212		2	10/30/2008 14:55	LCS	0638-F	24.10	pCi/L	94%

W
12/18/08

DEGASSING DATE/TIME	DE-EMAN. DATE/TIME	DEGASS-DE-EM	dE-EM-COUNT	constant	constant	constant	Net CPM	Ingrowth constant
11/10/2008 15:35	11/17/2008 10:20	162.75	4.83	0.7073	0.9642	1.0019	33.5333	0.6833
11/10/2008 15:35	11/17/2008 10:45	163.17	5.00	0.7083	0.9630	1.0019	34.9333	0.6833
10/27/2008 14:20	10/30/2008 11:05	68.75	5.00	0.4049	0.9630	1.0019	23.9333	0.3907
10/27/2008 14:20	10/30/2008 12:30	70.17	5.83	0.4113	0.9569	1.0019	24.3000	0.3943
11/10/2008 15:35	11/17/2008 11:10	163.58	5.17	0.7092	0.9617	1.0019	30.9667	0.6833
10/27/2008 14:20	10/30/2008 13:10	70.83	7.17	0.4142	0.9473	1.0019	25.7333	0.3931
10/27/2008 14:20	10/30/2008 13:25	71.08	8.58	0.4153	0.9373	1.0019	23.4330	0.3900
11/17/2008 11:10	11/20/2008 11:45	72.58	4.92	0.4219	0.9696	1.0019	17.5900	0.4073
10/27/2008 14:20	10/30/2008 14:05	71.75	9.58	0.4182	0.9302	1.0019	20.8670	0.3898
10/27/2008 14:20	10/30/2008 14:25	72.08	10.83	0.4197	0.9215	1.0019	23.0003	0.3875
11/10/2008 15:35	11/17/2008 12:20	164.75	9.58	0.7117	0.9302	1.0019	35.3000	0.6633
10/27/2008 14:20	10/30/2008 14:55	72.58	18.33	0.4219	0.8707	1.0019	21.4670	0.3681

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12/18/08

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12/18/08

Ra-226 Verification Sheet

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background CPM	Total Counts
VCV 1	500	1110108 1535	1111108 1020	1111108 1510	201	2	8	1014
2	500	11110108 1535	1111108 1045	1111108 1545	202	2	8	1054
3	500	11110108 1535	1111108 1110	1111108 1020	205	2	8	937
4	500	11110108 1535	1111108 1145	1111108 2050	208	2	8	786
5	500	11110108 1535	1111108 1150	1111108 2120	209	2	8	1200
6	500	11110108 1535	1111108 1200	1111108 2155	211	2	8	1067
7	500	11110108 1535	1111108 1845	1111108 1330	701	1	8	982
8	500	11110108 1535	1111108 0900	1111108 1405	708	7	8	1191
9	500	11110108 1535	1111108 0900	1111108 1435	705	7	8	1121
10								
11								
12								
VCV 3	500	1111108 1110	11110108 1145	11110108 1040	208	2	8	533

12/18/08

522

12/18/08

12/18/08

12/19/08

12/19/08

Verification for Ra-226 Standard 0638-F

D Roy
12/27/2007

Isotope	Detector CPM	BKG CPM	NET CPM	Detector Eff Mass. Used (mL)	Source DPM/mL
0638-F N1	1239.9000	31.5000	1208.4000	4.624018	261.3311626
0638-F N2	1222.8000	31.5000	1191.3000	4.624018	257.6330801
0638-F N3	1219.4000	31.5000	1187.9000	4.624018	256.8977889
					Average = 258.6206772

Mean Value (Counting) = 258.6206772
 Stdev = 2.375965421

Certificate Value = 267.1
 Lower Limit = 253.8687464
 Upper Limit = 263.3726081
 Rule 1 Pass/Fail **Fail**
 Two sigma = 4.751930843
 10 % of Mean = 25.86206772
 Rule 2 (Pass/Fail) **Pass**

*exception taken due to full recovery of standard

96.8384646 **Pass**
 0.00918707 **Rule 3 (Pass/Fail)**

Verification Rules

- Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements
- Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.
- Rule 3 = The determined mean value shall be within 5% of the certificate value.

The analyst prepared three standard verification sources for Ra-226 source 0638-F by transferring portions of the standard into tared glass liquid scintillation vials. One mL of DI Water and 10 mL Ready Gel liquid scintillation cocktail was added to each vial and the vials were shaken to mix. A Blank vial was prepared in a similar fashion using 1 mL of DI water and 10 mL of Ready Gel cocktail. The standard verification vials and Background source were dark adapted for two hours and counted on LSC YELLOW using source standard verification. The Ra-226 efficiency calibration which was used for verification calculations was performed on 12/27/07 using source 0024-A (Ra-226). Calibration data is recorded in this logbook under Ra-226 (0024-A). Each verification source calculation was performed as follows:

$$\text{Source dpm/g} = (A - B)/(C)(D)$$

where:

- A = Ver. source cpm,
- B = BKG cpm,
- C = System efficiency, (cpm/dpm), and
- D = mass used for standard verification.

Reference RAD SOP M-001

12/19/08

Handwritten signature and date:
 1/4/07
 Amanda L. Feher 1/4/07

General Engineering Laboratories Verification Source Preparation Sheet

Applicable SOP Number GE-RAD-A-008 Isotope RA-226
 Date Standards Prepared 12/18/07 Cocktail Type Used NA
 Standard ID 0638-F Matrix of Vial/Planchett NA
NA
NA
 Amount Used (g or ml) 0.1 Type of Scintillation Vial NA
 Standard Activity (DPM/g or mL) 1127.519 Pipette ID Used 1429303
 Reference Date 1/23/04 Balance ID Used 3604046
 Expiration Date 12/20/08 Quenching Agent NA
 Residue/Carrier Agent 0.1M HCl

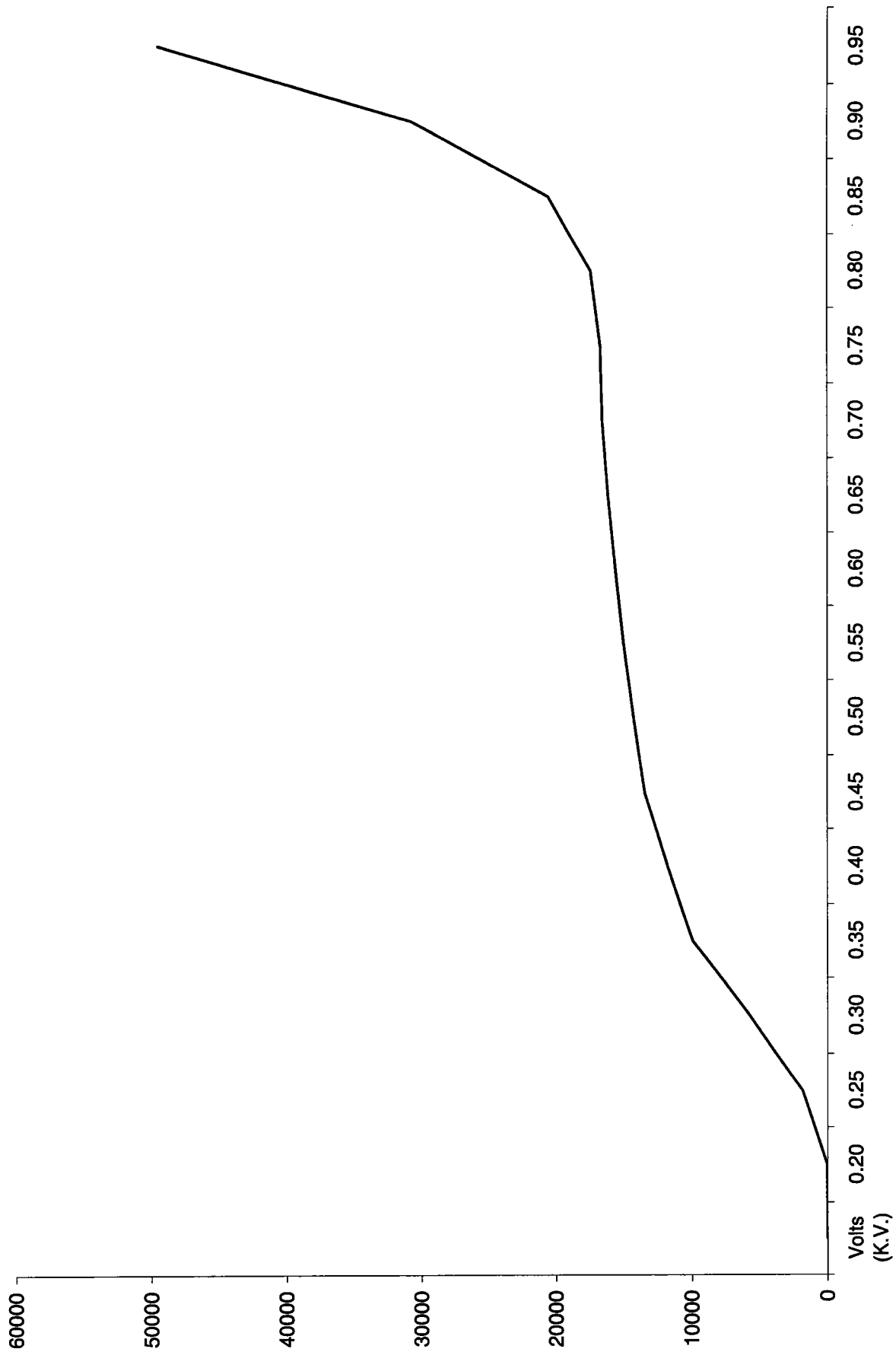
	Standard Number	Quenching Vol (uL) Residue Volume (mL)	Initial Wt. (g)	Final Wt. (g)	Net Wt. (mg)
1	Ver 1				
2	Ver 2				
3	Ver 3				
4	Ver 4				
5	Ver 5				
6	Ver 6				
7	Ver 7				
8	Ver 8				
9	Ver 9				
10	Ver 10				
11	Ver 11				
12	Ver 12				

12/19/08

Prepared By: Kelli Dieriel Date: 12/19/08
 Reviewed By: Mary Jo Adams Date: 12/19/08

Voltage Curve Ludlum # 2				
Volts (K.V.)	Counts	Date	Time	Detector
0.20	0	9/19/2008	10:00	2
0.25	0	9/19/2008	10:00	2
0.30	0	9/19/2008	10:00	2
0.35	0	9/19/2008	10:00	2
0.40	0	9/19/2008	10:00	2
0.45	36	9/19/2008	10:00	2
0.50	1860	9/19/2008	10:00	2
0.55	5751	9/19/2008	10:00	2
0.60	9916	9/19/2008	10:00	2
0.65	11761	9/19/2008	10:00	2
0.70	13431	9/19/2008	10:00	2
0.75	14254	9/19/2008	10:00	2
0.80	14984	9/19/2008	10:00	2
0.85	15598	9/19/2008	10:00	2
0.90	16129	9/19/2008	10:00	2
0.95	16562	9/19/2008	10:00	2
1.00	16711	9/19/2008	10:00	2
1.05	17428	9/19/2008	10:00	2
1.10	20558	9/19/2008	10:00	2
1.15	30722	9/19/2008	10:00	2
1.20	49527	9/19/2008	10:00	2
1.25	71509	9/19/2008	10:00	2
1.30	115018	9/19/2008	10:00	2

W 12/19/08
L 12/19/08



mut 12/19/08
60 12/19/08

201	1.993	12/19/2008
202	2.261	12/19/2008
203	2.254	12/19/2008
204	2.193	12/19/2008
205	1.799	12/19/2008
206	2.259	12/19/2008
207	2.146	12/19/2008
209	2.291	12/19/2008
210	2.253	12/19/2008
211	2.171	12/19/2008
212	2.322	12/19/2008

*Next
12/19/08*

General Engineering Laboratories

2040 Savage Road, Charleston, SC 29414

(843)556-8171

Lucas Cell Calibration Package

	YES	NO	Comments
1) Is all calibration standard information enclosed for: the primary standard certificate? the secondary standard(s) documentation? standard preparation information? standard < 1 Year old or verified?	✓		
	✓		
	✓		
	✓		
2) Is the efficiency calibration report included ?	✓		
3) Is the raw count data included for: Cell constant determination? Plateau generation?	✓		
	✓		
4) Are the calibration verifications included?	✓		
5) Are the instrument settings included: HVPS settings?	✓		
6) Has the CELLEFF.xls file been updated ?	✓		
7) Have the calibration dates been updated in ALPHALIMS ?	✓		

Prepared By: Kellipanel

Date: 2/3/09

Reviewed By: W. G. Hens

Date: 2/4/09

Effective Date: 2/4/09

Ra-226 Cell Constants

Standard Reference date: 12/15/1999
standard ID: 0299-G
Volume added (mL): 0.1
Standard Reference Activity (DPM/mL): 2446.35

Lucas cell #	Cell constant	Standard Source	Date/Time of count	Date/Time flushed to cell	Date/Time end of degas	bkg cpm	total counts	count time min	cpm	Known activity dpm	t1 (days) end-degas to flush	t2 (days) end-flush to count	t3 (days) Std Ref Date to count	Decay from Std Ref Date to count
301	1.867	Average	1/20/2009 11:05	1/19/2009 10:10	1/19/2009 15:45	0.267	9355	30	311.83	243.67	9.76736	1.03819	3324	0.9961
301	2.184	Stdev	1/29/2009 11:50	1/29/2009 8:50	1/28/2009 13:00	0.267	6239	30	207.97	243.67	2.82639	0.12500	3333	0.9961
301	2.011		1/26/2009 14:35	1/26/2009 9:25	1/22/2009 9:10	0.267	7282	30	242.73	243.67	4.01042	0.21528	3331	0.9961
302	2.082	Average	1/30/2009 11:30	1/30/2009 8:30	1/28/2009 13:00	0.267	7401	30	246.70	243.67	3.81250	0.12500	3334	0.9961
302	2.225	Stdev	1/29/2009 13:30	1/29/2009 9:20	1/28/2009 13:00	0.233	6335	30	211.17	243.67	2.84722	0.17361	3334	0.9961
302	2.086		1/26/2009 15:30	1/26/2009 9:55	1/22/2009 9:10	0.267	7555	30	251.83	243.67	4.03125	0.23264	3331	0.9961
303	1.958	Average	1/20/2009 13:40	1/19/2009 11:00	1/19/2009 15:45	0.267	9695	30	323.17	243.67	9.80208	1.11111	3325	0.9961
303	2.218	Stdev	1/22/2009 20:35	1/22/2009 10:05	1/19/2009 15:00	0.267	5938	30	197.93	243.67	2.79514	0.43750	3327	0.9961
303	2.231		1/26/2009 17:20	1/26/2009 10:25	1/22/2009 9:10	0.267	8028	30	267.60	243.67	4.05208	0.28819	3331	0.9961

305	1.897	Average	1/20/2009 14:50	1/19/2009 11:35	1/19/2009 15:45	0.200	9357	30	311.90	243.67	9.82639	1.13542	3325	0.9961
305	2.191	Stdev	1/22/2009 21:50	1/22/2009 11:05	1/19/2009 15:00	0.267	5921	30	197.37	243.67	2.83681	0.44792	3327	0.9961
305	2.083		1/26/2009 23:00	1/26/2009 11:20	1/22/2009 9:10	0.267	7280	30	242.67	243.67	4.09028	0.48611	3331	0.9961
306	1.730	Average	1/20/2009 15:20	1/19/2009 11:50	1/19/2009 15:45	0.167	8521	30	284.03	243.67	9.83681	1.14593	3325	0.9961
306	1.891	Stdev	1/29/2009 14:30	1/29/2009 10:20	1/28/2009 13:00	0.233	4869	30	162.30	243.67	2.88889	0.17361	3334	0.9961
306	1.821		1/26/2009 23:30	1/26/2009 11:50	1/22/2009 9:10	0.267	6387	30	212.90	243.67	4.11111	0.48611	3331	0.9961
307	1.818	Average	1/20/2009 15:50	1/19/2009 12:05	1/19/2009 15:45	0.267	8944	30	298.13	243.67	9.84722	1.15625	3325	0.9961
307	2.095	Stdev	1/30/2009 12:55	1/30/2009 9:10	1/28/2009 13:00	0.267	7442	30	248.07	243.67	3.84028	0.15625	3335	0.9961
307	1.881		1/27/2009 0:05	1/26/2009 12:10	1/22/2009 9:10	0.267	6598	30	219.93	243.67	4.12500	0.49653	3331	0.9961
308	2.129	Average	1/29/2009 15:50	1/29/2009 11:05	1/28/2009 13:00	0.133	6149	30	204.97	243.67	2.92014	0.19792	3334	0.9961
308	1.858	Stdev	1/23/2009 9:35	1/22/2009 13:45	1/19/2009 15:00	0.267	4829	30	160.97	243.67	2.94792	0.82639	3327	0.9961
308	1.862		1/27/2009 8:30	1/26/2009 13:15	1/22/2009 9:10	0.267	6226	30	207.53	243.67	4.17014	0.80208	3331	0.9961
309	1.857	Average	1/20/2009 17:20	1/19/2009 13:35	1/19/2009 15:45	0.033	9149	30	304.97	243.67	9.90972	1.15625	3325	0.9961
309	1.964	Stdev	1/23/2009 10:30	1/22/2009 14:05	1/19/2009 15:00	0.267	5100	30	170.00	243.67	2.96181	0.85069	3327	0.9961
309	1.810		1/27/2009 9:05	1/26/2009 13:30	1/22/2009 9:10	0.267	6046	30	201.53	243.67	4.18056	0.81597	3331	0.9961

311	2.140	Average	1/29/2009 16:40	1/29/2009 11:20	1/28/2009 13:00	0.267	6176	30	205.87	243.67	2.93056	0.22222	3334	0.9961
311	2.212	Stdev	1/23/2009 12:20	1/22/2009 14:25	1/19/2009 15:00	0.267	5698	30	189.93	243.67	2.97569	0.91319	3328	0.9961
311	1.988		1/27/2009 10:15	1/26/2009 13:45	1/22/2009 9:10	0.267	6607	30	220.23	243.67	4.19097	0.85417	3331	0.9961
312	1.871	Average	1/20/2009 19:16	1/19/2009 14:10	1/19/2009 15:45	0.100	9135	30	304.50	243.67	9.93403	1.21250	3325	0.9961
312	2.014	Stdev	1/29/2009 17:10	1/29/2009 11:35	1/28/2009 13:00	0.167	5814	30	193.80	243.67	2.94097	0.23264	3334	0.9961
312	1.946		1/27/2009 11:10	1/26/2009 14:00	1/22/2009 9:10	0.267	6446	30	214.87	243.67	4.20139	0.88194	3331	0.9961

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#3

Ra-226 Verification Sheet

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background CPM	Total Counts
Cal 13	500	1126109 1300	1126109 0820	1126109 1130	302	3	8	7401
Cal 28	500	1126109 1300	1126109 0855	1126109 1200	304	3	8	7101
Cal 34	500	1126109 1300	1126109 0910	1126109 1255	307	3	8	7442
Remaining rows are crossed out with a diagonal line.								

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12/16

#3

Ra-226 Verification Sheet

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background CPM	Total Counts
Cal 13	500	11/26/09 1300	11/26/09 0850	11/26/09 1150	301	3	8	6239
Cal 17	500	11/26/09 1300	11/26/09 0920	11/26/09 1330	302	3	7	6335
Cal 19	500	11/26/09 1300	11/26/09 0450	11/26/09 1450	304	3	2	6472
Cal 30	500	11/26/09 1300	11/26/09 1020	11/26/09 1430	306	3	7	4809
Cal 42	500	11/26/09 1300	11/26/09 1045	11/26/09 1515	307	3	3	6688
Cal 44	500	11/26/09 1300	11/26/09 1105	11/26/09 1550	308	3	4	6149
Cal 15	500	11/26/09 1300	11/26/09 1120	11/29/09 1640	311	3	8	6176
Cal 14	500	11/26/09 1300	11/26/09 1135	11/29/09 1710	312	3	5	5814
Cal 13	500	11/26/09 1300						
Cal 28	500	11/26/09 1300						
Cal 36	500	11/26/09 1300						
Cal 37	500	11/26/09 1300						

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Ra-226 Verification Sheet

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background CPM	Total Counts
Cal 43	500	11/9/09 1545	11/9/09 1010	11/20/09 1105	301	3	8	9355
Cal 44	500	11/9/09 1545	11/9/09 1040	11/20/09 1150	302	3	8	8433
Cal 19	500	11/9/09 1545	11/9/09 1100	11/20/09 1340	303	3	8	9095
Cal 20	500	11/9/09 1545	11/9/09 1100	11/20/09 1440	304	3	8	1050
Cal 42	500	11/9/09 1545	11/9/09 1135	11/20/09 1450	305	3	5	9357
Cal 44	500	11/9/09 1545	11/9/09 1150	11/20/09 1520 11/20/09 1440	306	3	7	8521
Cal 15	500	11/9/09 1545	11/9/09 1205	11/20/09 1550	307	3	8	8944
Cal 14	500	11/9/09 1545	11/9/09 1315	11/20/09 1645	308	3	3	6938
Cal 13	500	11/9/09 1545	11/9/09 1325	11/20/09 1720	309	3	1	9149
Cal 28	500	11/9/09 1545	11/9/09 1355	11/20/09 1840	311	3	8	8648
Cal 36	500	11/9/09 1545	11/9/09 1410	11/20/09 1916	312	3	1	9135
Cal 37	500	11/9/09 1545						

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Verification for Ra-226 Standard 0299-G

4/2/2008	Isotope	Detector CPM	BKG CPM	NET CPM	Detector Eff	Standard Mass. Used (G)	Source DPM/G
D. Roy	0299-G N1	2536.9600	52.4000	2484.5600	1.917186	0.5057	2562.667649
	0299-G N2	2520.2500	52.4000	2467.8500	1.917186	0.5056	2545.935781
	0299-G N3	2532.5000	52.4000	2480.1000	1.917186	0.5042	2565.677715
						Average =	2558.093715

Mean Value (Counting) = 2558.093715
 Stdev = 10.63610098

104.944421 Pass
 0.00415782 Rule 3 (Pass/Fail)

Certificate Value = 2437.6 dpm/mL
 Lower Limit = 2536.821513 dpm/mL
 Upper Limit = 2579.365917 dpm/mL
 Rule 1 Pass/Fail Fail *exception taken due to full recovery of standard
 Two sigma = 21.27220197 dpm/mL
 10 % of Mean = 255.8093715 dpm/mL
 Rule 2 (Pass/Fail) Pass

Verification Rules

- Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements
- Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.
- Rule 3 = The determined mean value shall be within 10% of the certificate value.

The analyst prepared three standard verification sources for Ra-226 source 0299-G by transferring portions of the standard into tared glass liquid scintillation vials. One mL of DI Water and ten mLs of Ready Gel liquid scintillation cocktail was added to each vial and the vials were shaken to mix. A Blank vial was prepared in a similar fashion using 1 mL of DI water and 10 mL of Ready Gel cocktail. The standard verification vials and Background source were dark adapted for two hours and counted on LSC Gold for Radium source standard verification. The Ra-226 efficiency calibration which was used for verification calculations was performed on 4/02/08 using source 0024-A (Ra-226). Calibration data is recorded in this logbook under Ra-226 0024. Each verification source calculation was performed as follows:

$$\text{Source dpm/g} = (A - B)/(C)(D)$$

where:

- A = Ver. source cpm,
- B = BKG cpm,
- C = System efficiency, (cpm/dpm), and
- D = mass used for standard verification.

IRAD-SOP-M-001

Handwritten notes:
 5/10/08
 M. N. 2310
 1.5 ml water for 30 sec



Standard Traceability Log Rad

Source Material Info		A Solution Material Info	
Parent Code:	0299	Isotope:	Radium-226
Prepared By:	Angela Johnson	Prepared By:	Angela Johnson
Carrier Conc:	0.5 M HCL	Prep Date:	09/15/2000
Reference Date:	12/15/1999	Verification Date:	01/23/2008
Ampoule Mass (g):	5.0368 g	Expiration Date:	01/23/2009
Uncertainty:	+/- 2.5 %	Primary Code:	0299-A
LogBook No:	RC S 027 128	Dilution(mL):	100 mL
		Mass of Parent(g):	4.6634 g
		Density(g/mL):	1.0012
		Balance ID:	

Calculations Converting parent activity to dpm/mL|dpm/g

$$(\text{Mass of parent(g)}) * (\text{Parm Activity (kBq/g)}) * (\text{conversion dpm to kBq}) / (\text{Dilution Vol}) = \text{Parent Activity (dpm/mL)}$$

$$(\text{Mass of parent(g)}) * (\text{Parm Activity (kBq/g)}) * (\text{conversion dpm to kBq}) / \text{Density (g/mL)} / (\text{Dilution Vol}) = \text{Parent Activity (dpm/g)}$$

$$(4.6634 \text{ g}) * (43.75 \text{ kBq/g}) * (60000 \text{ dpm/kBq}) / (100 \text{ mL}) = 122414.2500 \text{ dpm/mL}$$

$$(4.6634 \text{ g}) * (43.75 \text{ kBq/g}) * (60000 \text{ dpm/kBq}) / (1.0012 \text{ g/mL}) / (100 \text{ mL}) = 122273.3377 \text{ dpm/g}$$

Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
08/26/2003	Angela Johnson	1.9909	100	0299-E	2434.34 dpm/mL	11/04/2004	11/04/2005
08/26/2003	Angela Johnson	1.9872	100	0299-F	2429.82 dpm/mL	08/26/2004	08/26/2005
04/05/2005	Amanda Fehr	5.0018	250	0299-G	2446.3471 dpm/mL	04/02/2008	04/02/2009

GEL Laboratories LLC
Version 1.0 9/18/2000

LD 2/3/09
ALLA 2/4/09

General Engineering Laboratories Verification Source Preparation Sheet

Applicable SOP Number GL RAD A 008 Isotope RA 226

Date Standards Prepared 4/5/09 Cocktail Type Used NA

Standard ID 02896 Matrix of Vial/Planchett NA
NA
NA

Amount Used (g or ml) 0.1 Type of Scintillation Vial NA

Standard Activity (DPM/g or mL) 2446.347 Pipette ID Used 1429303

Reference Date 12/15/99 Balance ID Used 30040216

Expiration Date 4/2/09 Quenching Agent NA

Residue/Carrier Agent 0.5 M HCl

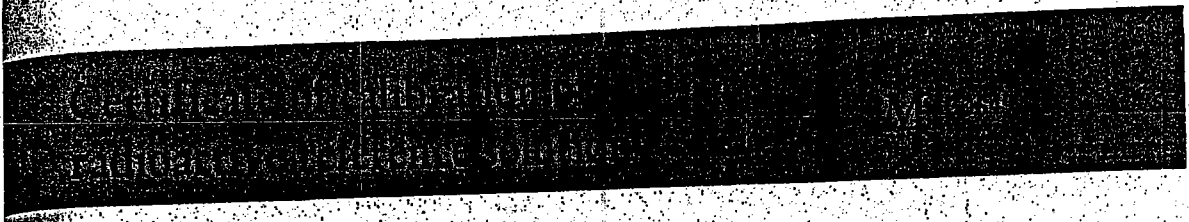
	Standard Number	Quenching Vol (uL) Residue Volume (mL)	Initial Wt. (g)	Final Wt. (g)	Net Wt. (mg)
43	Cal 43				
47	Cal 47				
19	Cal 19				
30	Cal 30				
42	Cal 42				
44	Cal 44				
15	Cal 15				
14	Cal 14				
13	Cal 13				
28	Cal 28				
36	Cal 36				

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2/3/09

Prepared By: Kelli Brown Date: 2/3/09

Reviewed By: Raymond Jones Date: 2/4/09

0299



UKAS ACCREDITED CALIBRATION LABORATORY No. 0146

Reference time for solution number R4/131/89:	1200 GMT on 15 December 1999
Radioactive concentration of radium-226:	43.75 kilobecquerels per gram of solution
which is equivalent to:	1.183 microcuries per gram of solution
Mass of solution:	5.0368 grams
Total activity of radium-226:	220.4 kilobecquerels
which is equivalent to:	5.956 microcuries
Recommended half life:	1600 years

Method of measurement:
The activity of the solution was measured using a high pressure re-entrant ionisation chamber calibrated with a large number of absolutely standardised solutions.

Calibration date: 15 December 1999

The calibration date is provided for added information only, and must not be confused with the reference date on pages 1 and 2 of the certificate. It is the reference date that must be used in all calculations relating to the values of activity.

Expanded uncertainty in the radioactive concentration quoted above: $\pm 2.5\%$

Combined Type A uncertainty: $\pm 0.2\%$

Combined Type B uncertainty: $\pm 1.3\%$

Radiochemical purity: The estimated activities of any radioactive impurities found by high-resolution gamma ray spectrometry, or in any other examination of the solution, are listed below expressed as percentages of the activity of the principal radionuclide at the reference time.

Chemical form: Carrier free in 0.5M HCL

Conformance: This product meets the quality assurance requirements for achieving traceability to NIST as defined in ANSI N42.22-1995.

1 year = 365.25 days

At the reference date radium-226 was shown to be in radioactive equilibrium with its daughter nuclides down the decay chain to polonium-214 and thallium-210, the precursors of lead-210. The ionisation chamber was calibrated using a standard supplied by the National Institute of Standards and Technology, Washington DC, USA.

KB 21/3/09
UKAS 21/11/09

Ra-226 WATER

Batch : LCSVER
 Date : 1/2/2009
 Analyst : KSD1

Procedure Code : LUC26RAL
 Parmname : Radium-226

MDA : 1 pCi/L

Instrument Used : LUCAS CELL DETECTOR

Bkg Count Time: 30 min

Sample ID	Sample Vol L	Count Time min	Gross counts cts	Cell # num	Cell Const. num	BKG cpm	Ra-226 MDA pCi/L	Ra-226 RESULT pCi/L	Ra-226 ERROR pCi/L	COUNT DATE/TIME
1	0.500	30	656	301	2.021	0.267	0.4919	20.0589	1.5634	1/30/2009 15:05
1	0.500	30	655	302	2.131	0.267	0.5554	22.6149	1.7640	2/2/2009 13:40
2	0.500	30	914	303	2.136	0.267	0.4647	26.4838	1.7397	1/30/2009 15:40
3	0.500	30	791	305	2.057	0.267	0.4845	23.8718	1.6891	1/30/2009 17:05
4	0.500	30	768	306	1.747	0.267	0.5709	27.2885	1.9605	1/30/2009 17:37
2	0.500	30	720	307	1.931	0.267	0.6113	27.3779	2.0335	2/2/2009 14:15
5	0.500	30	730	308	1.950	0.267	0.5149	23.3957	1.7254	1/30/2009 19:05
6	0.500	30	764	309	1.877	0.267	0.5908	28.0944	2.0238	1/31/2009 10:20
7	0.500	30	594	311	2.114	0.267	0.5510	20.3087	1.6667	1/31/2009 17:20
8	0.500	30	542	312	1.944	0.267	0.8009	26.8983	2.3154	2/2/2009 8:25

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Sample ID	Cell #	Det #	Run Date	Sample Type	Standard ID	NC	NC units	Recovery/RPD
1	301	3	1/30/2009 10:40	LCS	0638-F	24.10	pCi/L	83%
2	302	3	2/2/2009 9:15	LCS	0638-F	24.10	pCi/L	94%
2	303	3	1/30/2009 11:05	LCS	0638-F	24.10	pCi/L	110%
3	305	3	1/30/2009 11:30	LCS	0638-F	24.10	pCi/L	99%
4	306	3	1/30/2009 11:45	LCS	0638-F	24.10	pCi/L	113%
2	307	3	2/2/2009 9:40	LCS	0638-F	24.10	pCi/L	114%
5	308	3	1/30/2009 12:00	LCS	0638-F	24.10	pCi/L	97%
3	309	3	1/30/2009 13:05	LCS	0638-F	24.10	pCi/L	117%
7	311	3	1/30/2009 13:20	LCS	0638-F	24.10	pCi/L	84%
8	312	3	1/30/2009 13:40	LCS	0638-F	24.10	pCi/L	112%

DEGASSING DATE/TIME	DE-EMAN. DATE/TIME	DEGASS-DE-EM	dE-EM-COUNT	constant	constant	Net CPM	Ingrowth constant
1/26/2009 16:05	1/30/2009 10:40	90.58	4.42	0.9672	1.0019	21.6000	0.4800
1/30/2009 10:00	2/2/2009 9:15	71.25	4.42	0.9672	1.0019	21.5667	0.4032
1/26/2009 16:05	1/30/2009 11:05	91.00	4.58	0.9660	1.0019	30.1997	0.4809
1/26/2009 16:05	1/30/2009 11:30	91.42	5.58	0.9587	1.0019	26.1000	0.4788
1/26/2009 16:05	1/30/2009 11:45	91.67	5.87	0.9567	1.0019	25.3330	0.4787
1/30/2009 10:00	2/2/2009 9:40	71.67	4.58	0.9660	1.0019	23.7330	0.4044
1/26/2009 16:05	1/30/2009 12:00	91.92	7.08	0.9479	1.0019	24.0667	0.4753
1/26/2009 16:05	1/30/2009 13:05	93.00	21.25	0.8518	1.0019	25.1997	0.4305
1/26/2009 16:05	1/30/2009 13:20	93.25	28.00	0.8095	1.0019	19.5330	0.4099
1/26/2009 16:05	1/30/2009 13:40	93.58	66.75	0.6041	1.0019	17.7997	0.3067

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 LEWA 2141.04

Ra-226 Verification Sheet

#3

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background CPM	Total Counts
VER 1	500	11/20/09 1605	11/20/09 1040	11/20/09 1505	301	3	8	656
VER 2	500	11/20/09 1605	11/20/09 1105	11/20/09 1540	303	3	8	914
VER 3	500	11/20/09 1605	11/20/09 1130	11/30/09 1705	305	3	8	791
VER 4	500	11/20/09 1605	11/20/09 1145	11/20/09 1737 1.31.09 1020	306	3	8	768
VER 5	500	11/20/09 1605	11/30/09 1200	11/30/09 1905 1.31.09 1020	308	3	8	730
VER 6	500	11/20/09 1605	11/30/09 1305	1.31.09 1020	309	3	8	764
VER 7	500	11/20/09 1605	11/20/09 1320	13/09 1720	311	3	8	594
VER 8	500	11/20/09 1605	11/20/09 1340	11/09 0805	312	3	8	542
VER 9	500	11/20/09 1605						
VER 10	500	11/20/09 1605						
VER 11	500	11/20/09 1605						
VER 12	500	11/20/09 1605						

VER 10
VER 11

1.31.09

Verification for Ra-226 Standard 0638-F

D. Roy 2/2/2009	Isotope	Value	Uncertainty
	0638-F #1	24.629	1.7426
	0638-F #2	24.438	1.7557
	0638-F #3	22.791	1.6808
Mean Value (Counting) =	23.953	99.60	Pass
Stdev =	1.010781096		Rule 3 (Pass/Fail)
Target =	24.05		
Lower Limit =	21.93100448		
Upper Limit =	25.97412886		
Rule 1 Pass/Fail	Pass		
Two sigma =	2.021562191		
10 % of Mean =	2.395256667		
Rule 2 (Pass/Fail)	Pass		

- Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements**
- Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.**
- Rule 3 = The determined mean value shall be within 5% of the certificate value.**

The analyst prepared three standard verification sources for standard 0638-F using 0.1 mL for each source. Each source was counted using routine Lucas cell procedures. Calibration for 0299-G was used in this verification.

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[Signature] 2/2/09
 Amanda L. Lehn
 2/2/09

General Engineering Laboratories Verification Source Preparation Sheet

Applicable SOP Number GL-RAD-008 Isotope Pb-226
 Date Standards Prepared ^{2/11/09} 2/13/2007 Cocktail Type Used N/A
 Standard ID 0630-F Matrix of Vial/Planchett N/A
 Amount Used (g or ml) 0.1 ml Type of Scintillation Vial N/A
 Standard Activity (DPM/g or mL) 267.519 dpm/ml Pipette ID Used 1429303
 Reference Date 1/23/2004 Balance ID Used N/A
 Expiration Date 2/14/09 Quenching Agent N/A
 Residue/Carrier Agent 0.1 ml H₂O

	Standard Number	Quenching Vol (uL)/ Residue Volume (mL)	Initial Wt. (g)	Final Wt. (g)	Net Wt. (mg)
1	Ver 1				
2	Ver 2				
3	Ver 3				
4	Ver 4				
5	Ver 5				
6	Ver 6				
7	Ver 7				
8	Ver 8				
9	Ver 9				
10	Ver 10				
11	Ver 11				
12	Ver 12				

LO 2/13/09

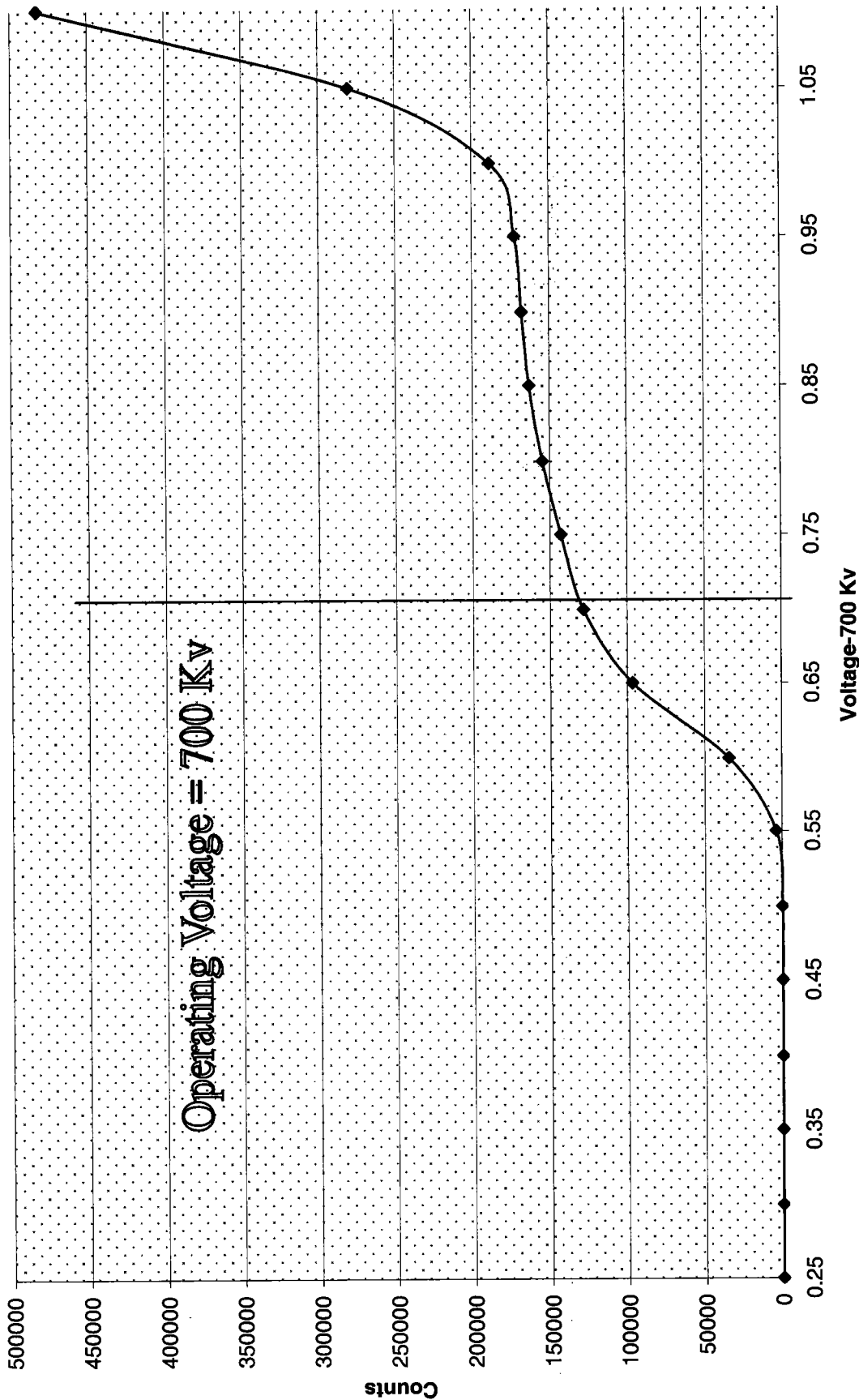
Prepared By: Kelli B. Nevel Date 2/13/09
 Reviewed By: [Signature] Date 2/14/09

Voltage Curve 1-09

Voltage Curve Ludlum # 3				
Volts	Counts	Date	Time	Detector
0.00	0	1/20/2009	13:45	3
0.05	0	1/20/2009	13:46	3
0.10	0	1/20/2009	13:47	3
0.15	0	1/20/2009	13:48	3
0.20	0	1/20/2009	13:49	3
0.25	0	1/20/2009	14:00	3
0.30	0	1/20/2009	14:01	3
0.35	0	1/20/2009	14:02	3
0.40	0	1/20/2009	14:03	3
0.45	0	1/20/2009	14:04	3
0.50	0	1/20/2009	14:05	3
0.55	3914	1/20/2009	14:06	3
0.60	34392	1/20/2009	14:07	3
0.65	96643	1/20/2009	14:08	3
0.70	128361	1/20/2009	14:09	3
0.75	142888	1/20/2009	14:10	3
0.80	154583	1/20/2009	14:11	3
0.85	163087	1/20/2009	14:12	3
0.90	167801	1/20/2009	14:13	3
0.95	172317	1/20/2009	14:14	3
1.00	188508	1/20/2009	14:15	3

LLA 2/4/09
LW
2/3/09

Ludlum 3 Voltage Curve



LCM
2/11/09

KO 213109

301	2.021	2/4/2009
302	2.131	2/4/2009
303	2.136	2/4/2009
305	2.057	2/4/2009
306	1.747	2/4/2009
307	1.931	2/4/2009
308	1.950	2/4/2009
309	1.877	2/4/2009
311	2.114	2/4/2009
312	1.944	2/4/2009

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2/4/09

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RE UT
2/4/09

General Engineering Laboratories

2040 Savage Road, Charleston, SC 29414

(843)556-8171

Lucas Cell Calibration Package

	YES	NO	Comments
1) Is all calibration standard information enclosed for: the primary standard certificate? the secondary standard(s) documentation? standard preparation information? standard < 1 Year old or verified?	✓		
	✓		
	✓		
	✓		
2) Is the efficiency calibration report included?	✓		
3) Is the raw count data included for: Cell constant determination? Plateau generation?	✓		
	✓		
4) Are the calibration verifications included?	✓		
5) Are the instrument settings included: HVPS settings?	✓		
6) Has the CELLEFF.xls file been updated?	✓		
7) Have the calibration dates been updated in ALPHALIMS?	✓		

Prepared By: Kelli Dorrel

Date: 2/28/09

Reviewed By: Angela Johnson

Date: 3/2/09

Effective Date: 3/2/09

Ra-226 Cell Constants

Standard Reference date : 12/15/1999
 standard ID : 0.299-G
 Volume added (mL) : 0.1
 Standard Reference Activity (DPM/mL) : 2446.35

Lucas cell #	Call constant	Standard Source	Date/Time of count	Date/Time flushed to cell	Date/Time end of degas	bkg cpm	total counts	count time min	cpm	Known activity dpm	11 (days) end-degas to flush	12 (days) end-flush to count	13 (days) Std Ref Date to count	Decay from Std Ref Date to count
401	1.689	Average	2/23/2009 16:15	2/23/2009 10:30	2/20/2009 17:25	0.267	4580	30	152.67	243.66	2.71181	0.23958	3359	0.9960
401	1.585	Stdev	2/27/2009 13:15	2/27/2009 9:00	2/23/2009 16:05	0.267	5474	30	182.47	243.66	3.70486	0.17708	3363	0.9960
401	1.448		2/25/2009 14:40	2/25/2009 7:55	2/20/2009 17:25	0.267	5677	30	189.23	243.66	4.60417	0.28125	3361	0.9960
402	2.133	Average	2/23/2009 16:55	2/23/2009 11:05	2/20/2009 17:25	0.267	5817	30	193.90	243.66	2.73611	0.24306	3359	0.9960
402	2.173	Stdev	2/27/2009 14:10	2/27/2009 9:30	2/23/2009 16:05	0.267	7507	30	250.23	243.66	3.72569	0.19444	3363	0.9960
402	2.048		2/25/2009 15:25	2/25/2009 8:15	2/20/2009 17:25	0.267	8017	30	267.23	243.66	4.61806	0.29861	3361	0.9960
403	1.475	Average	2/23/2009 18:30	2/23/2009 11:30	2/20/2009 17:25	0.267	4011	30	133.70	243.66	2.75347	0.29167	3359	0.9960
403	1.495	Stdev	2/27/2009 14:50	2/27/2009 10:00	2/23/2009 16:05	0.267	5182	30	172.73	243.66	3.74853	0.20139	3363	0.9960
403	1.419		2/25/2009 15:55	2/25/2009 8:35	2/20/2009 17:25	0.267	5582	30	185.40	243.66	4.63194	0.30556	3361	0.9960
404	1.792	Average	2/23/2009 19:05	2/23/2009 13:10	2/20/2009 17:25	0.267	5005	30	166.83	243.66	2.82292	0.24653	3359	0.9960
404	2.142	Stdev	2/27/2009 15:25	2/27/2009 10:30	2/23/2009 16:05	0.267	7443	30	248.10	243.66	3.76736	0.20486	3363	0.9960
404	1.859		2/25/2009 20:20	2/25/2009 8:55	2/20/2009 17:25	0.267	7075	30	235.83	243.66	4.64583	0.47569	3361	0.9960
405	2.066	Average	3/2/2009 13:40	3/2/2009 10:30	2/25/2009 14:00	0.267	8602	30	286.73	243.66	4.85417	0.13194	3366	0.9960
405	1.899	Stdev	2/27/2009 16:00	2/27/2009 10:55	2/23/2009 16:05	0.267	6612	30	220.40	243.66	3.78472	0.21181	3363	0.9960
405	1.745		2/25/2009 20:55	2/25/2009 10:10	2/20/2009 17:25	0.267	6721	30	224.03	243.66	4.69792	0.44792	3361	0.9960
409	1.805	Average	2/24/2009 0:30	2/23/2009 15:20	2/20/2009 17:25	0.267	5039	30	167.97	243.66	2.91319	0.38194	3359	0.9960
409	2.153	Stdev	2/3/2009 21:10	2/3/2009 15:00	1/30/2009 10:50	0.267	7949	30	264.97	243.67	4.17361	0.25694	3339	0.9960
409	2.149		2/27/2009 16:35	2/27/2009 11:30	2/23/2009 16:05	0.267	7516	30	250.53	243.66	3.80903	0.21181	3363	0.9960
410	1.869	Average	2/26/2009 8:50	2/25/2009 13:05	2/20/2009 17:25	0.267	6838	30	227.93	243.66	4.31944	0.82292	3361	0.9960
410	1.965	Stdev	2/4/2009 8:30	2/3/2009 15:30	1/30/2009 10:50	0.267	6708	30	223.60	243.67	4.19444	0.70853	3339	0.9960
410	1.824		2/24/2009 8:00	2/23/2009 15:40	2/20/2009 17:25	0.267	4840	30	161.33	243.66	2.92708	0.68056	3359	0.9960
411	1.824	Average	2/24/2009 8:40	2/23/2009 15:55	2/20/2009 17:25	0.267	4839	30	161.30	243.66	2.93750	0.69792	3359	0.9960
411	1.911	Stdev	2/27/2009 17:45	2/27/2009 12:20	2/23/2009 16:05	0.267	6357	30	211.90	243.66	3.84375	0.22569	3363	0.9960
411	1.836		2/26/2009 9:30	2/25/2009 13:40	2/20/2009 17:25	0.267	6734	30	224.47	243.66	4.84375	0.82639	3361	0.9960
412	1.947	Average	2/26/2009 10:15	2/25/2009 14:05	2/20/2009 17:25	0.267	7137	30	237.90	243.66	4.86111	0.84028	3361	0.9960
412	2.131	Stdev	2/27/2009 18:20	2/27/2009 12:45	2/23/2009 16:05	0.267	7495	30	249.83	243.66	3.86111	0.23264	3363	0.9960
412	1.822		2/24/2009 9:40	2/23/2009 16:10	2/20/2009 17:25	0.267	4818	30	160.60	243.66	2.94792	0.72917	3359	0.9960

EffErr 0.123705 <- Put in Machines.xls (Lucas Cell Tab)

Angela J. ... 3/2/09
Miki Davel 3/2/09

401	1.574	3/2/2009
402	2.118	3/2/2009
403	1.463	3/2/2009
404	1.931	3/2/2009
405	1.903	3/2/2009
409	2.036	3/2/2009
410	1.886	3/2/2009
411	1.824	3/2/2009
412	1.967	3/2/2009

General Engineering Laboratories Verification Source Preparation Sheet

Applicable SOP Number GLRAD-A-008 Isotope Pu-239
 Date Standards Prepared 4/15/09 Cocktail Type Used NA
 Standard ID 02996 Matrix of Vial/Planchett NA
 Amount Used (g or ml) 0.1 NA
 Standard Activity (DPM/g or mL) 2446.347 Type of Scintillation Vial NA
 Reference Date 4/15/09 Pipette ID Used 1429303
 Expiration Date 4/15/09 Balance ID Used 3604026
 Residue/Carrier Agent 0.5M HCl Quenching Agent NA

	Standard Number	Quenching Vol (uL) Residue Volume(mL)	Initial Wt. (g)	Final Wt. (g)	Net Wt. (mg)
3	CA13				
43	CA143				
7	CA17				
42	CA142				
13	CA143				
44	CA144				
30	CA130				
48	CA148				
36	CA136				
35	CA135				
38	CA138				
15	CA115				
14	CA114				
46	CA146				
47	CA147				

W 3/2/09

Prepared By: Kell Deneo Date: 3/2/09
 Reviewed By: Angie J. Ghera Date: 3/2/09

Rev 1 RLM 9/10/97

Standard Traceability Log Rad

Source Material Info		A Solution Material Info	
Parent Code:	0299	Isotope:	Radium-226
Prepared By:	Angela Johnson	Prepared By:	Angela Johnson
Carrier Conc:	0.5 M HCL	Prep Date:	09/15/2000
Reference Date:	12/15/1999	Verification Date:	01/23/2008
Ampoule Mass (g):	5.0368 g	Expiration Date:	01/23/2009
Uncertainty:	+/- 2.5 %	Primary Code:	0299-A
LogBook No:	RC S 027 128	Dilution(mL):	100 mL
		Mass of Parent(g):	4.6634 g
		Density(g/mL):	1.0012
		Balance ID:	

554

Calculations Converting parent activity to dpm/mL|dpm/g

$(\text{Mass of parent(g)}) * (\text{Parent Activity (kBq/g)}) * (\text{conversion dpm to kBq}) / (\text{Dilution Vol}) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)}) * (\text{Parent Activity (kBq/g)}) * (\text{conversion dpm to kBq}) / \text{Density (g/mL)} / (\text{Dilution Vol}) = \text{Parent Activity (dpm/g)}$
$(4.6634 \text{ g}) * (43.75 \text{ kBq/g}) * (60000 \text{ dpm/kBq}) / (100 \text{ mL}) = 122414.2500 \text{ dpm/mL}$
$(4.6634 \text{ g}) * (43.75 \text{ kBq/g}) * (60000 \text{ dpm/kBq}) / (1.0012 \text{ g/mL}) / (100 \text{ mL}) = 122273.3377 \text{ dpm/g}$

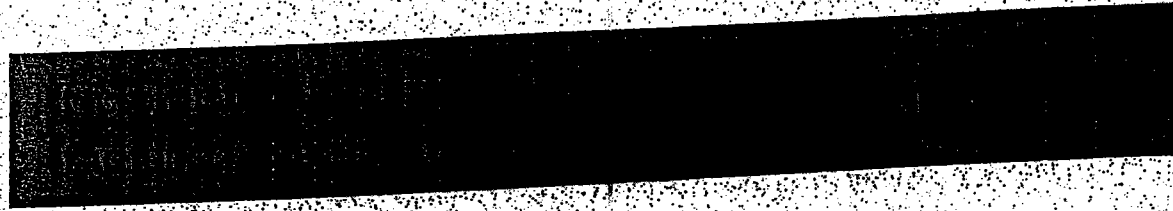
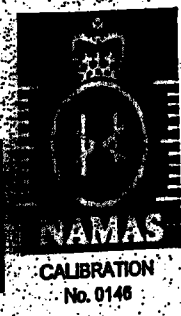
Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
08/26/2003	Angela Johnson	1.9909	100	0299-E	2434.34 dpm/mL	11/04/2004	11/04/2005
08/26/2003	Angela Johnson	1.9872	100	0299-F	2429.82 dpm/mL	08/26/2004	08/26/2005
04/05/2005	Amanda Fehr	5.0018	250	0299-G	2446.3471 dpm/mL	04/02/2008	04/02/2009

CEL Laboratories LLC
Version 1.0 9/18/2000

8-21-00
Nycomed Amersham plc
Amersham Laboratories

0299



Nycomed Amersham plc
Radiation & Radioactivity
Calibration Laboratory
Amersham Laboratories
White Lion Road
Amersham
Buckinghamshire
HP7 9LL

ISSUED
FOR:

AEA Technology plc
Isotrak
Amersham Laboratories
White Lion Road
Amersham
Buckinghamshire
HP7 9LL

ion Principal radionuclide: Radium-226

Product code: RAY44
Solution number: R4/131/89

ment Reference time: 1200 GMT on 15 December 1999

data Nuclear data quoted on this certificate are taken from the Joint European File, Version 2.2.

ion of The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor $k = 2.00$, which
inties for a t -distribution with $\nu_{eff} = \infty$ effective degrees of freedom corresponds to a coverage probability of approximately
95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

Unless indicated, all other uncertainties are expressed at the confidence level associated with one standard
uncertainty.

The format used for the uncertainties in the values of radionuclidic purity is illustrated in the following examples;

6.5(21)	-	6.5 ± 2.1
6.54(21)	-	6.54 ± 0.21
6.543(21)	-	6.543 ± 0.021

ved
ory

Date of
issue 17th December 1999

Nycomed
Amersham

Verification for Ra-226 Standard 0299-G

4/2/2008	Isotope	Detector CPM	BKG CPM	NET CPM	Detector Eff	Standard Mass. Used (G)	Source DPM/G
D. Roy	0299-G N1	2536.9600	52.4000	2484.5600	1.917186	0.5057	2562.667649
	0299-G N2	2520.2500	52.4000	2467.8500	1.917186	0.5056	2545.935781
	0299-G N3	2532.5000	52.4000	2480.1000	1.917186	0.5042	2565.677715
						Average =	2558.093715

Mean Value (Counting) = 2558.093715 **Pass**
 Stdev = 10.63610098 0.00415782 **Rule 3 (Pass/Fail)**

Certificate Value = 2437.6 dpm/mL
 Lower Limit = 2536.821513 dpm/mL
 Upper Limit = 2579.365917 dpm/mL
Rule 1 Pass/Fail *exception taken due to full recovery of standard
 Two sigma = 21.27220197 dpm/mL
 10 % of Mean = 255.8093715 dpm/mL
Rule 2 (Pass/Fail) **Pass**

Verification Rules

- Rule 1 =** The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements
- Rule 2 =** The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.
- Rule 3 =** The determined mean value shall be within 10% of the certificate value.

The analyst prepared three standard verification sources for Ra-226 source 0299-G by transferring portions of the standard into tared glass liquid scintillation vials. One mL of DI Water and ten mLs of Ready Gel liquid scintillation cocktail was added to each vial and the vials were shaken to mix. A Blank vial was prepared in a similar fashion using 1 mL of DI water and 10 mL of Ready Gel cocktail. The standard verification vials and Background source were dark adapted for two hours and counted on LSC Gold for Radium source standard verification. The Ra-226 efficiency calibration which was used for verification calculations was performed on 4/02/08 using source 0024-A (Ra-226). Calibration data is recorded in this logbook under Ra-226 0024. Each verification source calculation was performed as follows:

$$\text{Source dpm/g} = (A - B)/(C)(D)$$

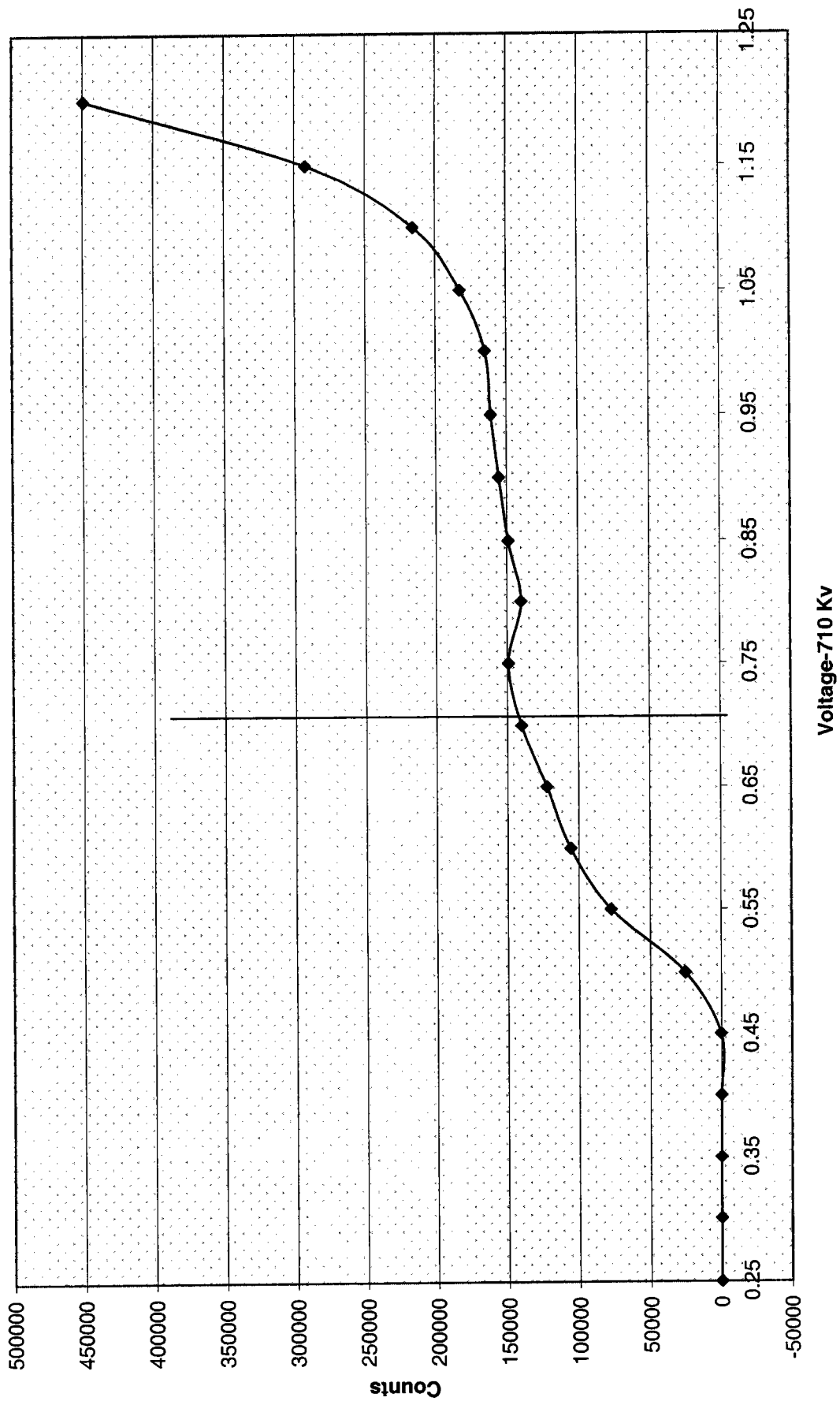
where:

- A = Ver. source cpm,
- B = BKG cpm,
- C = System efficiency, (cpm/dpm), and
- D = mass used for standard verification.

RAD.SOP.M-001

Henry St. Johnson 4/19/08
David Dwyer 4/10/08
WMS

Ludlum 4 Voltage Curve



10/3/04

General Engineering Laboratories

2040 Savage Road, Charleston, SC 29414
(843)556-8171

Lucas Cell Calibration Package (501-512)

	YES	NO	Comments
1) Is all calibration standard information enclosed for: the primary standard certificate? the secondary standard(s) documentation? standard preparation information? standard < 1 Year old or verified?	<input checked="" type="checkbox"/>		
	<input checked="" type="checkbox"/>		
	<input checked="" type="checkbox"/>		
	<input checked="" type="checkbox"/>		
2) Is the efficiency calibration report included?	<input checked="" type="checkbox"/>		
3) Is the raw count data included for: Cell constant determination? Plateau generation?	<input checked="" type="checkbox"/>		
	<input checked="" type="checkbox"/>		
4) Are the calibration verifications included?	<input checked="" type="checkbox"/>		
5) Are the instrument settings included: HVPS settings?	<input checked="" type="checkbox"/>		
	<input checked="" type="checkbox"/>		
6) Has the CELLEFF.xls file been updated?	<input checked="" type="checkbox"/>		
7) Have the calibration dates been updated in ALPHALIMS?	<input checked="" type="checkbox"/>		

Prepared By: Kelli S. Dancer

Date: 3/24/09

Reviewed By: Angela J. Johnson

Date: 3/25/09

Effective Date: 3/25/09

Ra-226 Cell Constants

standard ID: 0299-E
Volume added (mL): 0.1
Standard Reference Activity (DPM/mL): 2434.34

Lucas cell #	Cell constant	Standard Source	Date/Time of count	Date/time flushed to cell	Date/time end of degas	total counts	count time min	Known activity dpm	t1 (days) end-degas to flush	t2 (days) end-flush to count	t3 (days) Std Ref Date to count	Decay from Std Ref Date to count	
501	1.927	15	3/6/2009 7:50	3/3/2009 8:15	2/25/2009 14:00	5281	30	176.03	243.03	5.76042	2.98264	3369	0.9960
501	2.086	9	3/11/2009 10:40	3/10/2009 12:50	3/5/2009 14:00	7611	30	253.70	243.03	4.95139	0.90972	3374	0.9960
501	2.247	42	3/12/2009 13:30	3/12/2009 9:10	3/6/2009 15:25	10210	30	340.33	243.03	5.73958	0.18056	3376	0.9960
502	1.772	16	3/18/2009 8:25	3/17/2009 12:50	3/10/2009 14:00	7951	30	265.03	243.03	6.95739	0.81597	3381	0.9960
502	2.045	14	3/11/2009 11:15	3/10/2009 13:20	3/5/2009 14:00	7474	30	249.13	243.03	4.97222	0.91319	3374	0.9960
502	1.816	19	3/12/2009 14:20	3/12/2009 9:35	3/6/2009 15:25	8243	30	274.77	243.03	5.75694	0.19792	3376	0.9960
503	1.581	46	3/6/2009 9:20	3/5/2009 9:20	2/25/2009 14:00	7250	30	241.67	243.03	7.80556	1.00000	3369	0.9960
503	1.633	42	3/19/2009 20:15	3/19/2009 15:15	3/12/2009 12:10	8282	30	276.07	243.03	7.12847	0.20833	3383	0.9960
503	1.588	44	3/12/2009 14:50	3/12/2009 10:00	3/6/2009 15:25	7214	30	240.47	243.03	5.77431	0.20139	3378	0.9960
504	1.592	47	3/6/2009 10:30	3/5/2009 9:40	2/25/2009 14:00	7262	30	242.07	243.03	7.81944	1.03472	3369	0.9960
504	1.611	34	3/11/2009 12:30	3/10/2009 14:05	3/5/2009 14:00	5889	30	196.30	243.03	5.00347	0.93403	3375	0.9960
504	1.641	19	3/19/2009 20:50	3/19/2009 15:30	3/12/2009 12:10	8310	30	277.00	243.03	7.13889	0.22222	3383	0.9960
505	2.364	16	3/6/2009 12:40	3/5/2009 10:05	2/25/2009 14:00	10654	30	355.13	243.03	7.83681	1.10764	3370	0.9960
505	2.438	23	3/11/2009 13:00	3/10/2009 14:30	3/5/2009 14:00	8924	30	297.47	243.03	5.02083	0.93750	3375	0.9960
505	2.190	7	3/12/2009 17:01	3/12/2009 10:50	3/6/2009 15:25	9884	30	329.47	243.03	5.80903	0.25764	3376	0.9960
506	1.902	25	3/6/2009 13:10	3/5/2009 10:30	2/25/2009 14:00	8576	30	285.87	243.03	7.85417	1.11111	3370	0.9960
506	2.124	47	3/11/2009 13:30	3/10/2009 15:05	3/5/2009 14:00	7804	30	260.13	243.03	5.04514	0.93403	3375	0.9960
506	1.965	13	3/12/2009 17:40	3/12/2009 11:15	3/6/2009 15:25	8954	30	298.47	243.03	5.82639	0.26736	3376	0.9960
507	1.708	23	3/6/2009 13:45	3/5/2009 10:55	2/25/2009 14:00	7695	30	256.50	243.03	7.87153	1.11806	3370	0.9960
507	1.722	25	3/11/2009 14:20	3/10/2009 15:27	3/5/2009 14:00	6315	30	210.50	243.03	5.06042	0.95347	3375	0.9960
507	1.674	43	3/12/2009 18:30	3/12/2009 11:35	3/6/2009 15:25	7535	30	251.17	243.03	5.84028	0.28819	3376	0.9960
508	1.605	39	3/6/2009 14:20	3/5/2009 11:25	2/25/2009 14:00	7236	30	241.20	243.03	7.89236	1.12153	3370	0.9960
508	1.497	44	3/19/2009 21:30	3/19/2009 15:45	3/12/2009 12:10	7581	30	252.03	243.03	7.14931	0.23958	3383	0.9960
508	1.499	3	3/12/2009 20:45	3/12/2009 12:10	3/6/2009 15:25	6680	30	222.67	243.03	5.86458	0.35764	3376	0.9960
509	1.730	28	3/6/2009 14:50	3/5/2009 11:45	2/25/2009 14:00	7795	30	259.83	243.03	7.90625	1.12847	3370	0.9960
509	1.857	39	3/11/2009 15:25	3/10/2009 16:05	3/5/2009 14:00	6810	30	227.00	243.03	5.08681	0.97222	3375	0.9960
509	1.806	36	3/12/2009 21:20	3/12/2009 12:35	3/6/2009 15:25	8049	30	268.30	243.03	5.88194	0.36458	3376	0.9960
510	1.460	9	3/6/2009 15:25	3/5/2009 12:10	2/25/2009 14:00	6578	30	219.27	243.03	7.92361	1.13542	3370	0.9960
510	1.433	28	3/11/2009 16:05	3/10/2009 16:20	3/5/2009 14:00	5246	30	174.87	243.03	5.09722	0.98958	3375	0.9960
510	1.481	35	3/12/2009 21:55	3/12/2009 12:50	3/6/2009 15:25	6589	30	219.63	243.03	5.89236	0.37847	3376	0.9960
511	1.839	34	3/6/2009 16:30	3/5/2009 13:20	2/25/2009 14:00	8316	30	277.20	243.03	7.97222	1.13194	3370	0.9960
511	1.995	46	3/12/2009 16:50	3/10/2009 16:35	3/5/2009 14:00	7283	30	242.77	243.03	5.10764	1.01042	3375	0.9960
511	2.041	37	3/12/2009 22:40	3/12/2009 13:10	3/6/2009 15:25	9088	30	302.27	243.03	5.90625	0.39583	3376	0.9960
512	1.796	48	3/11/2009 17:35	3/10/2009 16:50	3/5/2009 14:00	6542	30	218.07	243.03	5.11806	1.03125	3375	0.9960
512	2.100	38	3/12/2009 23:15	3/12/2009 13:30	3/6/2009 15:25	9322	30	310.73	243.03	5.92014	0.40625	3376	0.9960
512	1.972	48	3/18/2009 13:00	3/17/2009 14:00	3/10/2009 14:00	8653	30	288.43	243.03	7.00000	0.95833	3382	0.9960

*Backgrounds are not significant enough to be considered in calculations. ANSI N42.25-1997 (B.2).

ERR 0.143768 <- Put in Machines.xls (Lucas Cell Tab)

Calibration
Ra-226 Verification-Sheet
3/14/09

Cal # 5

no 3124109
3119109

3/19/09

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background CPM	Total Counts
Cal 15	500	2/25/09 1400	3/3/09 0815	3/6/09 0750	501	5	8	5281
Cal 14	500	2/25/09 1400	2/27/09 0845	3/6/09 0840	502	5	1	4208
		2/25/09 1400	3/3/09		503	5	100 313109	6800
Cal 46	500	2/25/09 1400	3/5/09 0920	3/6/09 0900	503	5	3	7250
Cal 47	500	2/25/09 1400	3/5/09 0940	3/6/09 1030	504	5	1	7262
Cal 48	500	2/25/09 1400	3/5/09 1005	3/6/09 1040	505	5	3	10654
Cal 45	500	2/25/09 1400	3/5/09 1030	3/6/09 1016	506	5	8	8576
Cal 23	500	2/25/09 1400	3/5/09 1055	3/6/09 1345	507	5	4	7695
Cal 39	500	2/25/09 1400	3/5/09 1125	3/6/09 1420	508	5	1	7236
Cal 28	500	2/25/09 1400	3/5/09 1145	3/6/09 1450	509	5	8	7795
Cal 9	500	2/25/09 1400	3/5/09 1210	3/6/09 1525	510	5	2	6578
Cal 34	500	2/25/09 1400	3/5/09 1220	3/6/09 1630	511	5	6	8316

Calibration

Ra-226 Verification Sheet

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Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background CPM	Total Counts
Cal 9	500	3/5/09 1400	3/10/09 1250	3/11/09 1040	501	5	8	7611
Cal 14	500	3/5/09 1400	3/10/09 1370	3/11/09 1115	502	5	5	7474
Cal 15	500	3/5/09 1400	3/10/09 1345	3/11/09 1155	503	5	8	7352
Cal 16	500	3/5/09 1400	3/10/09 1405	3/11/09 1230	504	5	4	5889
Cal 17	500	3/5/09 1400	3/10/09 1430	3/11/09 1280	505	5	2	8924
Cal 17	500	3/5/09 1400	3/10/09 1505	3/11/09 1530	506	5	8	7804
Cal 18	500	3/5/09 1400	3/10/09 1527	3/11/09 1410	507	5	4	6315
Cal 19	500	3/5/09 1400	3/10/09 1550	3/11/09 1455	508	5	4	6443
Cal 29	500	3/5/09 1400	3/10/09 1605	3/11/09 1525	509	5	8	6810
Cal 28	500	3/5/09 1400	3/10/09 1620	3/11/09 1610	510	5	3	5246
Cal 44	500	3/5/09 1400	3/10/09 1635	3/11/09 1650	511	5	8	7283
Cal 48	500	3/5/09 1400	3/10/09 1650	3/11/09 1735	512	5	8	6542

219 3124109

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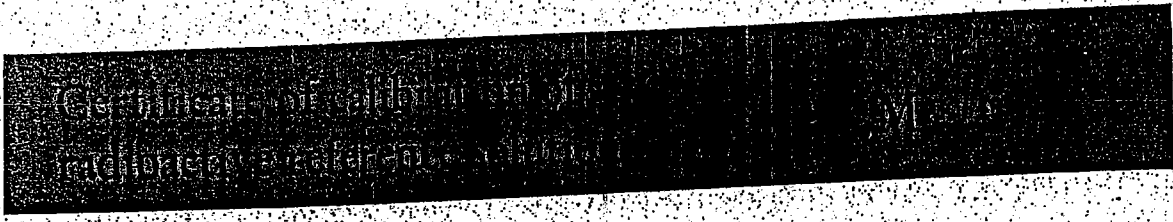
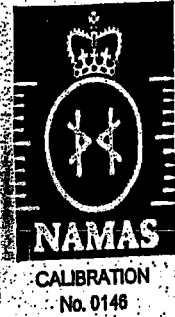
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219 3116109

8-21-00

Nycomed Amersham plc
Amersham Laboratories

0299



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Radiation & Radioactivity
Calibration Laboratory
Amersham Laboratories
White Lion Road
Amersham
Buckinghamshire
HP7 9LL

ISSUED
FOR:

AEA Technology plc
Isotrak
Amersham Laboratories
White Lion Road
Amersham
Buckinghamshire
HP7 9LL

ion Principal radionuclide: Radium-226

Product code: RAY44
Solution number: R4/131/89

ment Reference time: 1200 GMT on 15 December 1999

data Nuclear data quoted on this certificate are taken from the Joint European File, Version 2.2.

ion of The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor $k = 2.00$, which
inties for a t -distribution with $v_{eff} = \infty$ effective degrees of freedom corresponds to a coverage probability of approximately
95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

Unless indicated, all other uncertainties are expressed at the confidence level associated with one standard
uncertainty.

The format used for the uncertainties in the values of radionuclidic purity is illustrated in the following examples;

6.5(21)	-	6.5 ± 2.1
6.54(21)	-	6.54 ± 0.21
6.543(21)	-	6.543 ± 0.021

ved

Date of 571 17th December 1999



Standard Traceability Log Rad

Source Material Info	
Parent Code:	0299
Prepared By:	Angela Johnson
Carrier Conc:	0.5 M HCL
Reference Date:	12/15/1999
Ampoule Mass (g):	5.0368 g
Uncertainty:	+/- 2.5 %
LogBook No:	RC S 027 128

A Solution Material Info	
Isotope:	Radium-226
Prepared By:	Angela Johnson
Prep Date:	09/15/2000
Verification Date:	01/23/2008
Expiration Date:	01/23/2009
Primary Code:	0299-A
Dilution(mL):	100 mL
Mass of Parent(g):	4.6634 g
Density(g/mL):	1.0012
Balance ID:	

Calculations Converting parent activity to dpm/mL|dpm/g

$$(\text{Mass of parent(g)}) * (\text{Parm Activity (kBq/g)}) * (\text{conversion dpm to kBq}) / (\text{Dilution Vol}) = \text{Parent Activity (dpm/mL)}$$

$$(\text{Mass of parent(g)}) * (\text{Parm Activity (kBq/g)}) * (\text{conversion dpm to kBq}) / \text{Density (g/mL)} / (\text{Dilution Vol}) = \text{Parent Activity (dpm/g)}$$

$$(4.6634 \text{ g}) * (43.75 \text{ kBq/g}) * (60000 \text{ dpm/kBq}) / (100 \text{ mL}) = 122414.2500 \text{ dpm/mL}$$

$$(4.6634 \text{ g}) * (43.75 \text{ kBq/g}) * (60000 \text{ dpm/kBq}) / (1.0012 \text{ g/mL}) / (100 \text{ mL}) = 122273.3377 \text{ dpm/g}$$

Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
08/26/2003	Angela Johnson	1.9909	100	0299-E	2434.34 dpm/mL	11/04/2004	11/04/2005
08/26/2003	Angela Johnson	1.9872	100	0299-F	2429.82 dpm/mL	08/26/2004	08/26/2005
04/05/2005	Amanda Fehr	5.0018	250	0299-G	2446.3471 dpm/mL	04/02/2008	04/02/2009

GEL Laboratories LLC
Version 1.0 9/18/2000

Kelli Sporell

Verification for Ra-226 Standard 0299-G

4/2/2008	Isotope	Detector CPM	BKG CPM	NET CPM	Detector Eff	Standard Mass. Used (G)	Source DPM/G
D. Roy	0299-G N1	2536.9600	52.4000	2484.5600	1.917186	0.5057	2562.667649
	0299-G N2	2520.2500	52.4000	2467.8500	1.917186	0.5056	2545.935781
	0299-G N3	2532.5000	52.4000	2480.1000	1.917186	0.5042	2565.677715
						Average =	2558.093715

Mean Value (Counting) = 2558.093715
 Stdev = 10.63610098

Certificate Value = 2437.6 dpm/mL
 Lower Limit = 2536.821513 dpm/mL
 Upper Limit = 2579.365917 dpm/mL
 Rule 1 Pass/Fail **Fail** *exception taken due to full recovery of standard
 Two sigma = 21.27220197 dpm/mL
 10 % of Mean = 255.8093715 dpm/mL
 Rule 2 (Pass/Fail) **Pass**

Verification Rules

- Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements
- Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.
- Rule 3 = The determined mean value shall be within 10% of the certificate value.

The analyst prepared three standard verification sources for Ra-226 source 0299-G by transferring portions of the standard into tared glass liquid scintillation vials. One mL of DI Water and ten mLs of Ready Gel liquid scintillation cocktail was added to each vial and the vials were shaken to mix. A Blank vial was prepared in a similar fashion using 1 mL of DI water and 10 mL of Ready Gel cocktail. The standard verification vials and Background source were dark adapted for two hours and counted on LSC Gold for Radium source standard verification. The Ra-226 efficiency calibration which was used for verification calculations was performed on 4/02/08 using source 0024-A (Ra-226). Calibration data is recorded in this logbook under Ra-226 0024. Each verification source calculation was performed as follows:

$$\text{Source dpm/g} = (A - B)/(C)(D)$$

where:

- A = Ver. source cpm,
- B = BKG cpm,
- C = System efficiency, (cpm/dpm), and
- D = mass used for standard verification.

BAD.SOP.M-001

Handwritten notes:
 New Source 3/24/09
 4/19/08
 David Dwyer 4/10/08

General Engineering Laboratories
Verification Source Preparation Sheet
Calibration

Applicable SOP Number GL RAD-A-008 Isotope RA-226
 Date Standards Prepared 4/15/09 Cocktail Type Used NA
 Standard ID 0249-G Matrix of Vial/Planchett NA
 Amount Used (g or ml) 0.1 NA
 Standard Activity (DPM/g or ml) 2446.347 Type of Scintillation Vial NA
 Reference Date 12/15/99 Pipette ID Used 1429303
 Expiration Date 4/2/09 Balance ID Used 36240216
 Residue/Carrier Agent D.5M HCl Quenching Agent NA

	Standard Number	Quenching Vol (uL) Residue Volume (mL)	Initial Wt. (g)	Final Wt. (g)	Net Wt. (mg)
15	Ca115				
46	Ca146				
47	Ca147				
16	Ca116				
25	Ca125				
23	Ca123				
39	Ca139				
28	Ca128				
9	Ca19				
34	Ca134				
42	Ca142				
19	Ca119				
44	Ca144				
7	Ca17				
13	Ca113				

VLD 3/24/09

Prepared By: Kelli D'Amore Date 3/24/09
 Reviewed By: _____ Date _____

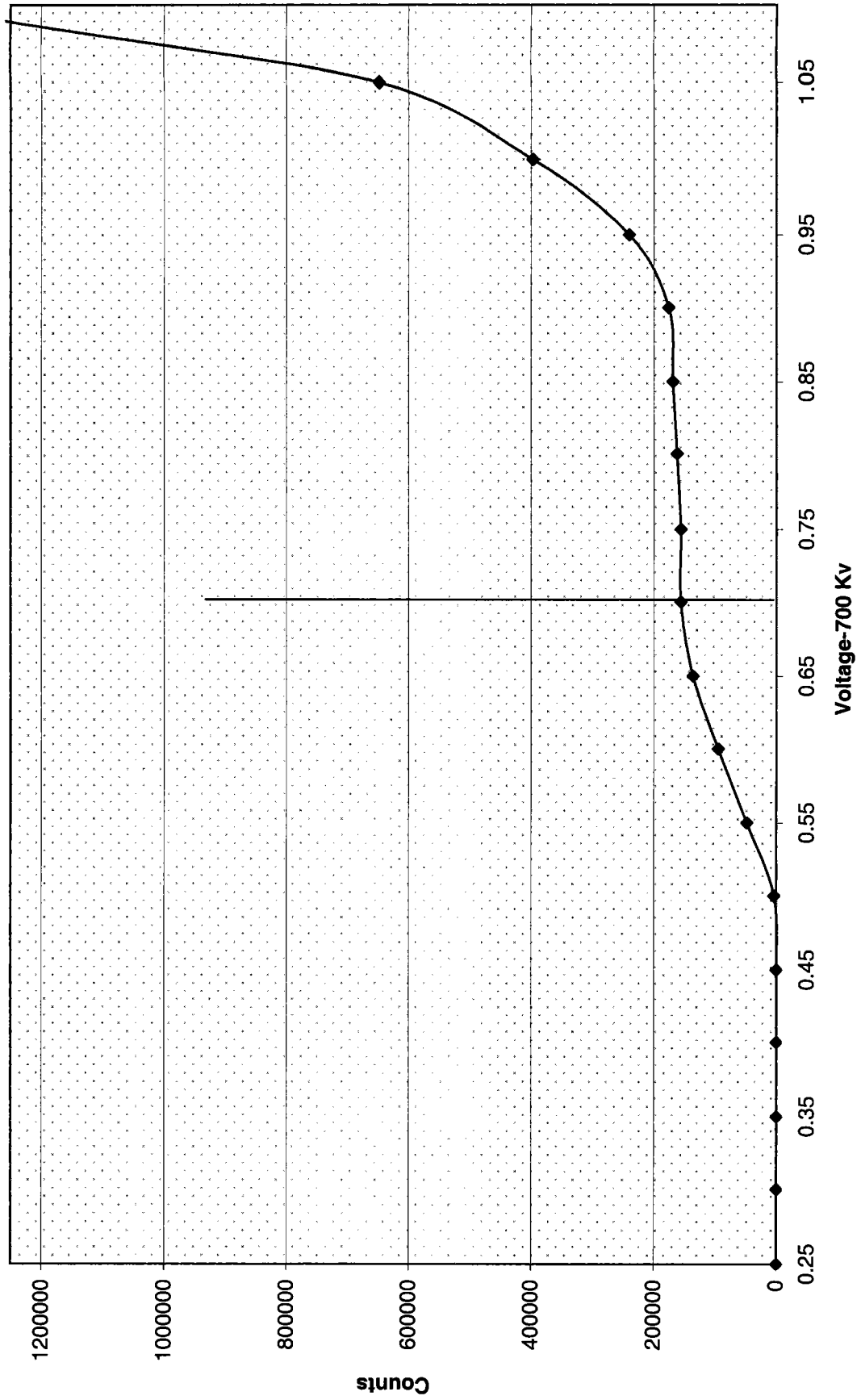
Rev 1 RLM 9/10/97

Voltage

Voltage Curve Ludlum # 5				
Volts	Counts	Date	Time	Detector
0.00	0	2/25/2009	9:20	5
0.05	0	2/25/2009	9:20	5
0.10	0	2/25/2009	9:20	5
0.15	0	2/25/2009	9:20	5
0.20	0	2/25/2009	9:20	5
0.25	0	2/25/2009	9:20	5
0.30	0	2/25/2009	9:20	5
0.35	0	2/25/2009	9:20	5
0.40	0	2/25/2009	9:20	5
0.45	0	2/25/2009	9:20	5
0.50	3611	2/25/2009	9:20	5
0.55	47984	2/25/2009	9:20	5
0.60	94752	2/25/2009	9:20	5
0.65	135854	2/25/2009	9:20	5
0.70	155952	2/25/2009	9:20	5
0.75	155696	2/25/2009	9:20	5
0.80	161972	2/25/2009	9:20	5
0.85	168840	2/25/2009	9:20	5
0.90	175598	2/25/2009	9:20	5
0.95	239969	2/25/2009	9:20	5
1.00	397249	2/25/2009	9:20	5

UD 3/25/09

Ludlum 5 Voltage Curve



KAP 3/24/09

Ra-226 WATER

Batch : LCSVER
 Date : 2/20/2008
 Analyst : DXM2

Procedure Code : LUC26RAL

Parname : Radium-226

MDA : 1 pCi/L

Instrument Used : LUCAS CELL DETECTOR

Bkg Count Time: 30 min

Sample ID	Sample Vol L	Count Time min	Gross counts cts	Cell # num	Cell Const. num	BKG cpm	Ra-226 MDA pCi/L	Ra-226 RESULT pCi/L	Ra-226 ERROR pCi/L	COUNT DATE/TIME
Ver 1	0.500	30	766	501	2.087	0.267	0.6041	28.8142	2.0728	3/16/2009 15:10
Ver 2	0.500	30	537	502	1.878	0.167	0.5682	23.0223	1.9747	3/16/2009 19:25
Ver 3	0.500	30	518	503	1.601	0.267	0.8071	25.9035	2.2832	3/16/2009 20:20
Ver 4	0.500	30	701	504	1.615	0.267	0.6021	26.2570	1.9774	3/20/2009 19:00
Ver 5	0.500	30	680	505	2.331	0.033	0.2559	23.5744	1.7758	3/16/2009 22:00
Ver 6	0.500	30	893	506	2.004	0.267	0.4859	27.0593	1.7988	3/20/2009 19:40
Ver 7	0.500	30	488	507	1.701	0.267	0.7287	22.0004	2.0008	3/16/2009 23:00
Ver 8	0.500	30	544	508	1.534	0.033	0.3760	27.7023	2.3344	3/16/2009 23:30
Ver 9	0.500	30	768	509	1.798	0.267	0.5430	25.9694	1.8657	3/20/2009 20:50
Ver 10	0.500	30	432	510	1.458	0.033	0.3700	21.6379	2.0476	3/17/2009 5:00
Ver 11	0.500	30	577	511	1.959	0.267	0.5934	21.2369	1.7694	3/17/2009 5:35
Ver 12	0.500	30	723	512	1.956	0.267	0.5945	26.7349	1.9815	3/17/2009 6:10

Sample ID	Sample Dup	Det #	Run Date	Sample Type	Standard ID	NC	NC units	Recovery/RPD
501		5	3/16/2009 15:10	LCS	0638-F	24.05	pCi/L	120%
502		5	3/16/2009 19:25	LCS	0638-F	24.05	pCi/L	96%
503		5	3/16/2009 20:20	LCS	0638-F	24.05	pCi/L	108%
504		5	3/20/2009 19:00	LCS	0638-F	24.05	pCi/L	109%
505		5	3/16/2009 22:00	LCS	0638-F	24.05	pCi/L	98%
506		5	3/20/2009 19:40	LCS	0638-F	24.05	pCi/L	113%
507		5	3/16/2009 23:00	LCS	0638-F	24.05	pCi/L	91%
508		5	3/16/2009 23:30	LCS	0638-F	24.05	pCi/L	115%
509		5	3/20/2009 20:50	LCS	0638-F	24.05	pCi/L	108%
510		5	3/17/2009 5:00	LCS	0638-F	24.05	pCi/L	90%
511		5	3/17/2009 5:35	LCS	0638-F	24.05	pCi/L	88%
512		5	3/17/2009 6:10	LCS	0638-F	24.05	pCi/L	111%

DEGASSING DATE/TIME	DE-EMAN. DATE/TIME	DEGASS-DE-EM	dE-EM-COUNT	constant	constant	constant	Net CPM	Ingrowth constant
3/13/2009 15:30	3/16/2009 9:45	66.25	5.42	0.3936	0.9599	1.0019	25.2667	0.3785
3/13/2009 15:30	3/16/2009 10:10	66.67	9.25	0.3955	0.9325	1.0019	17.7333	0.3695
3/13/2009 15:30	3/16/2009 10:30	67.00	9.83	0.3970	0.9284	1.0019	17.0000	0.3693
3/16/2009 14:00	3/20/2009 13:05	95.08	5.92	0.5122	0.9563	1.0019	23.1000	0.4908
3/13/2009 15:30	3/16/2009 11:25	67.92	10.58	0.4012	0.9232	1.0019	22.6333	0.3711
3/16/2009 14:00	3/20/2009 13:20	95.33	6.33	0.5131	0.9533	1.0019	29.5000	0.4901
3/13/2009 15:30	3/16/2009 13:50	70.33	9.17	0.4120	0.9331	1.0019	15.9997	0.3852
3/13/2009 15:30	3/16/2009 13:50	70.33	9.67	0.4120	0.9296	1.0019	18.1000	0.3837
3/16/2009 14:00	3/20/2009 13:45	95.75	7.08	0.5147	0.9479	1.0019	25.3333	0.4888
3/13/2009 5:30	3/16/2009 14:25	80.92	14.58	0.4571	0.8957	1.0019	14.3667	0.4103
3/13/2009 5:30	3/16/2009 14:45	81.25	14.83	0.4585	0.8941	1.0019	18.9663	0.4107
3/13/2009 5:30	3/16/2009 15:00	81.50	15.17	0.4595	0.8918	1.0019	23.8330	0.4106

Ra-226 Verification Sheet

Standard ID: 0638F

Volume Added (mL): 0.1

Expiration Date: 12/10

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background Counts	Total Counts
VEN 1	500	3/16/09 1400	3/20/09 1245	3/20/09 1820	501	5	8	70
VEN 2	500	3/16/09 1400	3/20/09 1305	3/20/09 1900	504	5	8	701
VEN 3	500	3/16/09 1400	3/20/09 1320	3/20/09 1940	506	5	8	893
VEN 4	500	3/16/09 1400	3/20/09 1345	3/20/09 2050	509	5	8	768

VEN 3/24/09

VEN 3/24/09

VEN 3/24/09

GEL Standard Traceability Log Rad

Source Material Info		A Solution Material Info	
Parent Code:	0638	Isotope:	Radium-226
Prepared By:	Amanda Fehr	Prepared By:	Amanda Fehr
Carrier Conc:	0.1M HCl	Prep Date:	01/16/2006
Reference Date:	01/23/2004	Verification Date:	03/04/2007
Ampoule Mass (g):	5.01065 g	Expiration Date:	03/04/2008
Uncertainty:	+/- 3.3 %	Primary Code:	0638-A
LogBook No:	RC-S-037-037	Dilution(mL):	100 mL
		Mass of Parent(g):	4.8398 g
		Density(g/mL):	1.0266
		Balance ID:	38080204

Calculations Converting parent activity to dpm/mL|dpm/g

$(\text{Mass of parent(g)}) * (\text{Parm Activity (dps)}) * (\text{conversion dpm to dps}) / (\text{Ampoule Mass(g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)}) * (\text{Parm Activity (dps)}) * (\text{conversion dpm to dps}) / \text{Density} / (\text{Ampoule Mass (g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/g)}$
$(4.8398 \text{ g}) * (23530 \text{ dps}) * (60 \text{ dpm/dps}) / (5.01065 \text{ g} * 100 \text{ mL}) = 13636.6133 \text{ dpm/mL}$
$(4.8398 \text{ g}) * (23530 \text{ dps}) * (60 \text{ dpm/dps}) / (1.0266 \text{ g/mL}) / (5.01065 \text{ g} * 100 \text{ mL}) = 13282.9676 \text{ dpm/g}$

Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
01/17/2006	Amanda Fehr	2.1041	100	0638-B	279.0211 dpm/mL	01/17/2007	01/17/2008
07/17/2006	Mary Aders	2.1313	100	0638-C	282.6281 dpm/mL	07/26/2006	07/26/2007
03/28/2007	Daniel Roy	2.1025	100	0638-D	279.2744 dpm/ml	04/08/2007	04/08/2008
03/28/2007	Daniel Roy	45.468	250	0638-E	2415.7999 dpm/ml	04/09/2008	04/08/2009
12/18/2007	Daniel Roy	2.014	100	0638-F	267.519 dpm/ml	02/02/2009	02/02/2010
02/12/2008	Daniel Roy	.5004	100	0638-G	66.468 dpm/ml	03/04/2008	03/04/2009
07/23/2008	Daniel Roy	5.0607	250	0638-H	268.8845 dpm/ml	07/23/2008	07/23/2009

Verification for Ra-226 Standard 0638-F

D. Roy	Isotope	Value	Uncertainty
2/2/2009	0638-F #1	24.629	1.7426
	0638-F #2	24.438	1.7557
	0638-F #3	22.791	1.6808
Mean Value (Counting) =	23.953	99.60	Pass
Stdev =	1.010781096		Rule 3 (Pass/Fail)
Target =	24.05		
Lower Limit =	21.93100448		
Upper Limit =	25.97412886		
Rule 1 Pass/Fail	Pass		
Two sigma =	2.021562191		
10 % of Mean =	2.395256667		
Rule 2 (Pass/Fail)	Pass		

Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements

Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.

Rule 3 = The determined mean value shall be within 5% of the certificate value.

The analyst prepared three standard verification sources for standard 0638-F using 0.1 mL for each source. Each source was counted using routine Lucas cell procedures. Calibration for 0299-G was used in this verification.

140 3124109

General Engineering Laboratories

2040 Savage Road, Charleston, SC 29414
(843)556-8171

Lucas Cell Calibration Package

	YES	NO	Comments
1) Is all calibration standard information enclosed for: the primary standard certificate? the second standard standard(s) documentation? standard preparation information? standard < 1 Year old or verified?	✓		
	✓		
	✓		
	✓		
2) Is the efficiency calibration report included ?	✓		
3) Is the raw count data included for: Cell constant determination? Plateau generation?	✓		
	✓		
4) Are the calibration verifications included?	✓		
5) Are the instrument settings included: HVPS settings?	✓		
	✓		
6) Has the CELLEFF.xls file been updated ?	✓		
7) Have the calibration dates been updated in ALPHALIMS ?	✓		

Prepared By: KDD [Signature]

Date: 8/4/09

Reviewed By: [Signature]

Date: 8/6/09

Effective Date: 8/4/09

KD 8/6/09

Ra-226 Cell Constants

Standard Reference date: 12/15/1999
 Standard ID: 0299-G
 Volume added (mL): 0.1
 Standard Reference Activity (DPM/mL): 2446.3471

Lucas cell #	Cell constant	Standard Source	Date/Time of count	Date/time flushed to cell	Date/time end of degas	total counts	count time min	Known activity dpm	t1 (days) end-degas to flush	t2 (days) end-flush to count	t3 (days) Std Ref Date to count	Decay from Std Ref Date to count
601	2.164	Average	5/26/2009 13:30	5/26/2009 9:30	5/19/2009 14:00	10883	30	362.77	6.81250	0.16667	3451	0.9959
601	2.253	Stdev	5/22/2009 12:55	5/22/2009 9:15	5/19/2009 14:00	6378	30	212.60	2.80208	0.15278	3447	0.9959
601	2.126		5/29/2009 14:45	5/29/2009 9:50	5/22/2009 10:45	10735	30	357.83	6.96181	0.20486	3454	0.9959
602	2.007	Average	5/29/2009 15:20	5/29/2009 10:15	5/22/2009 10:45	10133	30	337.77	6.97917	0.21181	3454	0.9959
602	2.194	Stdev	5/26/2009 14:05	5/26/2009 9:55	5/19/2009 14:00	11033	30	367.77	6.82986	0.17361	3451	0.9959
602	2.304		6/2/2009 14:45	6/2/2009 11:30	5/29/2009 9:50	8575	30	285.83	4.06944	0.13542	3458	0.9959
604	2.244	Average	6/2/2009 15:50	6/2/2009 11:50	5/29/2009 9:50	8321	30	277.37	4.08333	0.16667	3458	0.9959
604	2.076	Stdev	5/29/2009 15:55	5/29/2009 10:45	5/22/2009 12:00	10451	30	348.37	6.94792	0.21528	3454	0.9959
604	2.079		5/26/2009 15:45	5/26/2009 10:20	5/19/2009 14:00	10372	30	345.73	6.84722	0.22569	3451	0.9959
605	2.096	Average	5/26/2009 16:15	5/26/2009 10:50	5/19/2009 14:00	10474	30	349.13	6.86806	0.22569	3451	0.9959
605	2.228	Stdev	5/22/2009 16:25	5/22/2009 10:45	5/19/2009 14:00	6318	30	210.60	2.86458	0.23611	3447	0.9959
605	2.122		5/29/2009 17:15	5/29/2009 11:05	5/22/2009 12:50	10587	30	352.90	6.92708	0.25694	3454	0.9959
606	2.543	Average	5/29/2009 17:45	5/29/2009 13:10	5/26/2009 9:30	7816	30	260.53	3.15278	0.19097	3454	0.9959
606	2.202	Stdev	5/26/2009 16:45	5/26/2009 12:25	5/22/2009 12:00	8057	30	268.57	4.01736	0.18056	3451	0.9959
606	2.298		6/2/2009 18:20	6/2/2009 12:55	5/29/2009 9:50	8495	30	283.17	4.12847	0.22569	3458	0.9959
607	2.454	Average	6/2/2009 19:00	6/2/2009 13:10	5/29/2009 9:50	9057	30	301.90	4.13889	0.24306	3458	0.9959
607	2.572	Stdev	5/29/2009 19:00	5/29/2009 13:25	5/26/2009 9:55	7832	30	261.07	3.14583	0.23264	3454	0.9959
607	2.325		5/26/2009 17:15	5/26/2009 12:50	5/22/2009 12:00	8527	30	284.23	4.03472	0.18403	3451	0.9959
609	2.277	Average	5/26/2009 19:20	5/26/2009 13:10	5/22/2009 12:00	8261	30	275.37	4.04861	0.25694	3451	0.9959
609	2.280	Stdev	5/22/2009 19:20	5/22/2009 12:00	5/19/2009 14:00	6473	30	215.77	2.91667	0.30556	3447	0.9959
609	2.392		5/29/2009 19:40	5/29/2009 13:45	5/26/2009 10:20	7261	30	242.03	3.14236	0.24653	3454	0.9959
611	2.488	Average	5/29/2009 20:20	5/29/2009 14:00	5/26/2009 10:50	7510	30	250.33	3.13194	0.26389	3454	0.9959
611	2.245	Stdev	5/26/2009 22:00	5/26/2009 13:25	5/22/2009 12:00	8010	30	267.00	4.05903	0.35764	3451	0.9959
611	2.187		6/2/2009 19:50	6/2/2009 13:25	5/29/2009 9:50	8052	30	268.40	4.14931	0.26736	3458	0.9959

EffEr 0.066051 ← Put in Machines.xls (Lucas Cell Tab)

Backgrounds are not significant enough to be included in calculations ANSI N42.25-1997 (B.2).

Original of 9/16/09
WJ 8/16/09

601	2.181	8/4/2009
602	2.168	8/4/2009
604	2.133	8/4/2009
605	2.149	8/4/2009
606	2.348	8/4/2009
607	2.45	8/4/2009
609	2.316	8/4/2009
611	2.307	8/4/2009

Lucas	Ra-226	
Oldest Cal	01/23/2008	
Detector	Eff Error	Cal Date
1	0.0958	8/29/2008
2	0.0772	12/19/2008
3	0.0608	1/23/2008
4	0.1237	3/2/2009
5	0.1438	3/25/2009
6	0.0661	8/4/2009
7	0.0855	11/21/2008

**General Engineering Laboratories
Calibration Source Preparation Sheet**

Applicable SOP Number GL-RAD-A-008

Isotope Ra226

Date Standards Prepared 4/5/05

Cocktail Type Used NA

Standard ID 0299-G

Matrix of Vial/Planchett NA

Amount Used (g or ml) 0.1

NA
NA

Standard Activity (DPM/g or mL) 2446.3471

Type of Scintillation Vial NA

Reference Date 12/15/99

Pipette ID Used 1429303

Expiration Date 1/26/10

Balance ID Used 38080204

Residue/Carrier Agent 0.1M HCl

Quenching Agent NA

	Standard Number	Quenching Vol (uL)/ Residue Volume(mL)	Initial Wt. (g)	Final Wt. (g)	Net Wt. (mg)
1	cal 1				
2	cal 2				
3	cal 3				
4	cal 4				
5	cal 5				
6	cal 6				
7	cal 7				
8	cal 8				
9	cal 9				
10	cal 10				
11	cal 11				
12	cal 12				

JBG
8/4/09

JBG
8/4/09

Prepared By: Kelli Rowell Date 8/4/09

Reviewed By: Angel J Gh Date 8/4/09

Rev 1 RLM 9/10/97

Ra-226 Calibration Sheet

Standard ID: ~~0299-6~~ 0299-6
 Volume Added (mL): 0.1 ~~1126110~~ 1126110
 Expiration Date: ~~1126110~~ 1126110

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Total Counts
Cal 1	500	5/19/09 1400	5/22/09 0915	5/20/09 1255	601	6	6318
Cal 2	500	5/19/09 1400	5/22/09 0945	5/22/09 1325	602	6	6358
Cal 3	500	5/19/09 1400	5/22/09 1010	5/22/09 1420	604	6	4600
Cal 4	500	5/19/09 1400	5/22/09 1045	5/22/09 1625	605	6	6318
Cal 5	500	5/19/09 1400	5/22/09 1115	5/22/09 1700	606	6	6494
Cal 6	500	5/19/09 1400	5/22/09 1140	5/22/09 1735	607	6	6428
Cal 7	500	5/19/09 1400	5/22/09 1200	5/22/09 1920	609	6	6473
Cal 8	500	5/19/09 1400	5/22/09 1250	5/22/09 2035	611	6	6455
Cal 9							
Cal 10							
Cal 11							
Cal 12							

100 814109
 100 814109
 100 814109
 100 814109
 100 814109
 6162-100 814109

11/11/09

249
 814109
 100 816109

Ra-226 Calibration Sheet

Standard ID: ~~10386~~ 0299-G
 Volume Added (mL): 0.1 ~~1.1~~ 419 814101
 Expiration Date: ~~11/26/10~~ 419 514109

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Total Counts
Cal 9	500	5/19/09 1400	5/26/09 1430	5/26/09 1330	601	6	10883
Cal 10	500	5/19/09 1400	5/26/09 1455	5/26/09 1405	602	6	11033
Cal 11	500	5/19/09 1400	5/26/09 1020	5/26/09 1545	604	6	10372
Cal 12	500	5/19/09 1400	5/26/09 1050	5/26/09 1615	605	6	10474
Cal 1	500	5/22/09 1200	5/26/09 1725	5/26/09 1645	606	6	8857
Cal 2	500	5/22/09 1200	5/26/09 1750	5/26/09 1715	607	6	8527
Cal 3	500	5/22/09 1200	5/26/09 1310	5/26/09 1920	609	6	8261
Cal 4	500	5/22/09 1200	5/26/09 1325	5/26/09 2200	611	6	8010
				100 814109			

419 814109
 419 814109

EEC

8-21-00

Nycomed Amersham plc
Amersham Laboratories

0299

CALIBRATION
No. 0146

ISSUED BY: Nycomed Amersham plc
Radiation & Radioactivity
Calibration Laboratory
Amersham Laboratories
White Lion Road
Amersham
Buckinghamshire
HP7 9LL

ISSUED FOR: AEA Technology plc
Isotrak
Amersham Laboratories
White Lion Road
Amersham
Buckinghamshire
HP7 9LL

Description Principal radionuclide: Radium-226

Product code: RAY44
Solution number: R4/131/89

Measurement Reference time: 1200 GMT on 15 December 1999

Nuclear data Nuclear data quoted on this certificate are taken from the Joint European File, Version 2.2.

Expression of uncertainties The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor $k = 2.00$, which for a t -distribution with $\nu_{eff} = \infty$ effective degrees of freedom corresponds to a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

Unless indicated, all other uncertainties are expressed at the confidence level associated with one standard uncertainty.

The format used for the uncertainties in the values of radionuclidic purity is illustrated in the following examples;

6.5(21)	-	6.5 ± 2.1
6.54(21)	-	6.54 ± 0.21
6.543(21)	-	6.543 ± 0.021

Approved
Signature

Date of issue

17th December 1999

Verification for Ra-226 Standard 0299-G

M. Aders 1/26/2009	Isotope	Value DPM	Uncertainty
	0299-A #1	220.970	0.2670
	0299-A #2	241.730	0.2670
	0299-A #3	257.470	0.2670
Mean Value (Counting) =	240.057	98.52	Pass
Stdev =	18.30744475		Rule 3 (Pass/Fail)
Target =	243.67		
Lower Limit =	203.4417772		
Upper Limit =	276.6715562		
Rule 1 Pass/Fail	Pass		
Two sigma =	36.6148895		
10 % of Mean =	24.00566667		
Rule 2 (Pass/Fail)	Fail	*exception taken due to full recovery of standard	

- Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements**
- Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.**
- Rule 3 = The determined mean value shall be within 5% of the certificate value.**

The analyst prepared three standard verification sources for standard 0299-A using 0.1 mL for each source. Each standard was degassed and transferred according to SOP GL-RAD-A-008. Each source was counted using Ra-226 procedures.

M. Aders 241.730
August 9th 8/4/09

Ra-226 Cell Constants

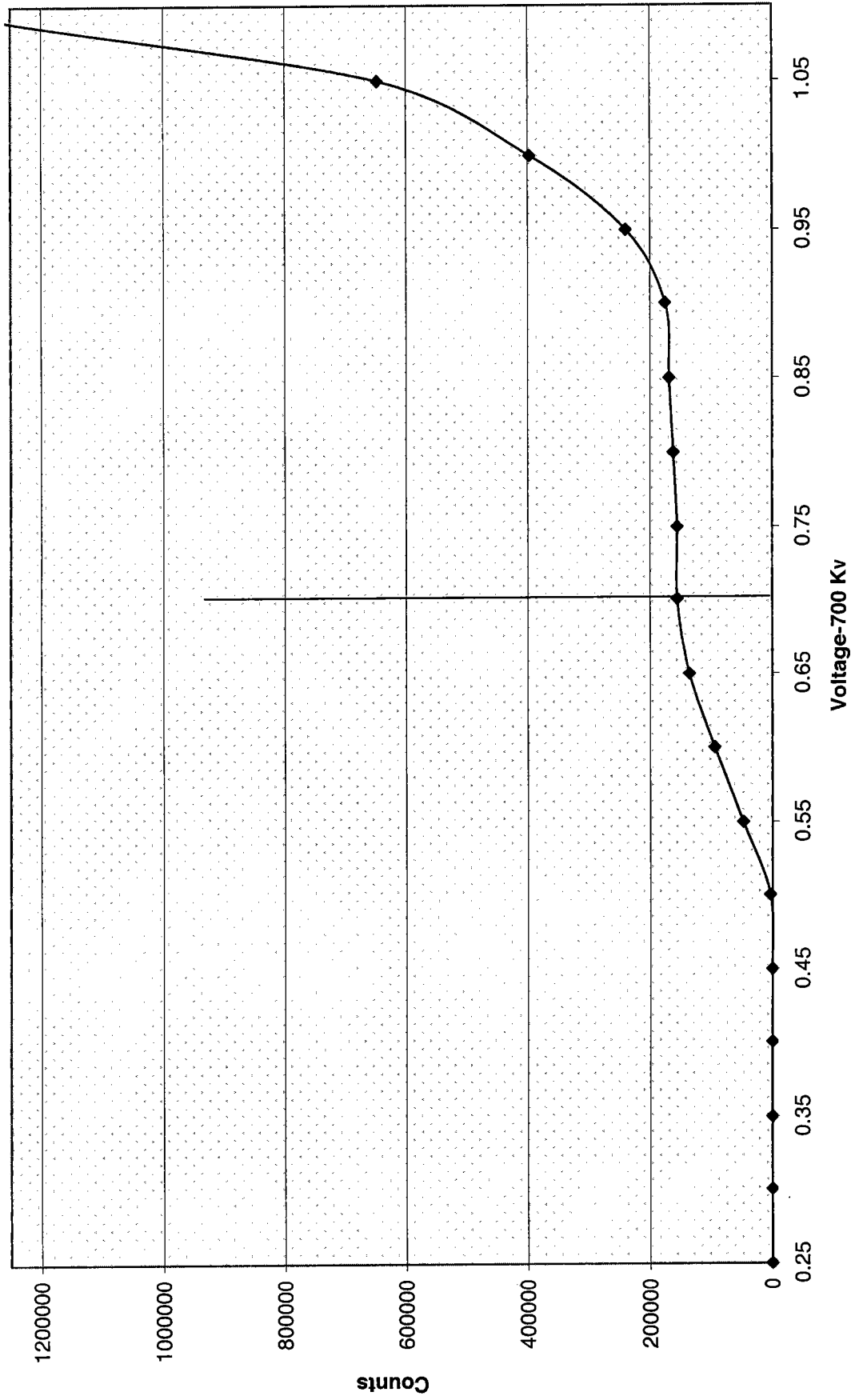
Standard Reference date: 12/15/1999
standard ID: 0299-G
Volume added (mL): 0.1
Standard Reference Activity (DPM/mL): 2446.35

Lucas cell #	Cell constant	Standard Source	Date/Time of count	Date/Time flushed to cell	Date/time end of degas	bkg cpm	total counts	count time min	cpm	Known activity dpm	t1 (days) end-degas to flush	t2 (days) end-flush to count	t3 (days) Std Ref Date to count	Decay from Std Ref Date to count
301	2.021	43	39839.60764	39839.39236	39835.38194	0.267	7282	30	242.73	243.6698	4.01041667	0.2152778	3330.607639	0.996055555
302	2.131	47	39839.64583	39839.41319	39835.38194	0.267	7555	30	251.83	243.6698	4.03125	0.2326389	3330.645833	0.996055551
303	2.136	19	39839.72222	39839.43403	39835.38194	0.267	8028	30	267.60	243.6697	4.05208333	0.2881944	3330.722222	0.996055419

Voltage Curve Ludlum # 6				
Volts	Counts	Date	Time	Detector
0.00	0	5/20/2009	9:00	6
0.05	0	5/20/2009	9:01	6
0.10	0	5/20/2009	9:02	6
0.15	0	5/20/2009	9:03	6
0.20	0	5/20/2009	9:04	6
0.25	0	5/20/2009	9:05	6
0.30	0	5/20/2009	9:06	6
0.35	0	5/20/2009	9:07	6
0.40	0	5/20/2009	9:08	6
0.45	512	5/20/2009	9:09	6
0.50	3625	5/20/2009	9:10	6
0.55	47990	5/20/2009	9:11	6
0.60	94752	5/20/2009	9:12	6
0.65	135854	5/20/2009	9:13	6
0.70	155952	5/20/2009	9:14	6
0.75	155700	5/20/2009	9:15	6
0.80	161972	5/20/2009	9:16	6
0.85	168860	5/20/2009	9:17	6
0.90	175598	5/20/2009	9:18	6
0.95	239969	5/20/2009	9:19	6
1.00	397270	5/20/2009	9:20	6

W 8/4/09

Ludlum 6 Voltage Curve



WGS

Ra-226 WATER

Batch : LCSVER
 Date : 6/2/2009
 Analyst : KSD1

Procedure Code : LUC26RAL
 Parmname : Radium-226

MDA : 1 pCi/L

Instrument Used : LUCAS CELL DETECTOR

Bkg Count Time: 30 min

Sample ID	Sample Vol L	Count Time min	Gross counts cts	Cell # num	Cell Const. num	BKG cpm	Ra-226 MDA pCi/L	Ra-226 RESULT pCi/L	Ra-226 ERROR pCi/L	COUNT DATE/TIME
ver 1	0.800	30	1018	601	2.181	0.267	0.2115	13.4431	0.8356	6/8/2009 15:35
ver 2	0.800	30	994	602	2.168	0.100	0.1442	13.2563	0.8279	6/8/2009 16:05
ver 3	0.800	30	955	604	2.133	0.167	0.1786	12.9119	0.8254	6/8/2009 16:40
ver 4	0.800	30	1144	605	2.149	0.267	0.2143	15.3201	0.8971	6/8/2009 17:15
ver 5	0.800	30	1046	606	2.348	0.233	0.1867	12.8971	0.7895	6/8/2009 18:30
ver 6	0.800	30	1001	607	2.450	0.267	0.1893	11.8239	0.7413	6/8/2009 19:15
ver 7	0.800	30	1060	609	2.316	0.267	0.2007	13.2848	0.8089	6/8/2009 20:05
ver 8	0.800	30	943	611	2.307	0.267	0.2053	12.0754	0.7806	6/8/2009 23:10

Handwritten notes:
 8/6/09
 8/16/05

Sample ID	Cell #	Det #	Run Date	Sample Type	Standard ID	NC	NC units	Recovery/RPD
ver 1	601	6	6/8/2009 15:35	LCS	0638-F	15.03	pCi/L	89%
ver 2	602	6	6/8/2009 16:05	LCS	0638-F	15.03	pCi/L	88%
ver 3	604	6	6/8/2009 16:40	LCS	0638-F	15.03	pCi/L	86%
ver 4	605	6	6/8/2009 17:15	LCS	0638-F	15.03	pCi/L	102%
ver 5	606	6	6/8/2009 18:30	LCS	0638-F	15.03	pCi/L	86%
ver 6	607	6	6/8/2009 19:15	LCS	0638-F	15.03	pCi/L	79%
ver 7	609	6	6/8/2009 20:05	LCS	0638-F	15.03	pCi/L	88%
ver 8	611	6	6/8/2009 23:10	LCS	0638-F	15.03	pCi/L	80%

DEGASSING DATE/TIME	DE-EMAN. DATE/TIME	DEGASS-DE-EM	dE-EM-COUNT	constant	constant	constant	Net CPM	Ingrowth constant
6/2/2009 12:40	6/8/2009 12:15	143.58	3.33	0.6618	0.9751	1.0019	33.6667	0.6466
6/2/2009 12:40	6/8/2009 12:40	144.00	3.42	0.6628	0.9745	1.0019	33.0333	0.6472
6/2/2009 12:40	6/8/2009 13:05	144.42	3.58	0.6639	0.9733	1.0019	31.6663	0.6474
6/2/2009 12:40	6/8/2009 13:30	144.83	3.75	0.6650	0.9721	1.0019	37.8667	0.6476
6/2/2009 12:40	6/8/2009 13:50	145.17	4.67	0.6658	0.9654	1.0019	34.6333	0.6440
6/2/2009 12:40	6/8/2009 14:15	145.58	5.00	0.6668	0.9630	1.0019	33.0997	0.6434
6/2/2009 12:40	6/8/2009 14:35	145.92	5.50	0.6677	0.9593	1.0019	35.0667	0.6417
6/2/2009 12:40	6/8/2009 15:00	146.33	8.17	0.6687	0.9402	1.0019	31.1663	0.6299

Handwritten notes:
 8/16/09
 11/18/10

General Engineering Laboratories Verification Source Preparation Sheet

A W 8/4/09

Applicable SOP Number <u><i>GL 2007-008</i></u>	Isotope <u><i>Yb-226</i></u>
Date Standards Prepared <u><i>11/16/09</i></u>	Cocktail Type Used <u><i>NA</i></u>
Standard ID <u><i>6035-F</i></u>	Matrix of Vial/Planchett <u><i>NA</i></u>
Amount Used (g or ml) <u><i>0.1</i></u>	<u><i>NA</i></u>
Standard Activity (DPM/g or ml) <u><i>267.519</i></u>	Type of Scintillation Vial <u><i>NA</i></u>
Reference Date <u><i>1/23/04</i></u>	Pipette ID Used <u><i>1125203</i></u>
Expiration Date <u><i>2/1/10</i></u>	Balance ID Used <u><i>38080104</i></u>
Residue/Carrier Agent <u><i>NA</i></u>	Quenching Agent <u><i>NA</i></u>

	Standard Number	Quenching Vol (uL) Residue Volume (mL)	Initial Wt. (g)	Final Wt. (g)	Net Wt. (mg)
1	<i>Ver 1</i>				
2	<i>Ver 2</i>				
3	<i>Ver 3</i>				
4	<i>Ver 4</i>				
5	<i>Ver 5</i>				
6	<i>Ver 6</i>				
7	<i>Ver 7</i>				
8	<i>Ver 8</i>				
<i>W 8/4/09</i>					

Prepared By: *Willi + Doree* Date: *8/4/09*

Reviewed By: *Angela J. G...* Date: *8/4/09*

Rev 1 RLM.9/10/97

W 8/4/09

0638

CERTIFICATE OF CALIBRATION
Standard Radionuclide Source

67519-278

Ra-226 5 mL Liquid in Flame Sealed Vial

This standard radionuclide source was prepared gravimetrically from a calibrated master solution. The master solution was calibrated using a germanium gamma spectrometer system.

Radionuclide purity and calibration were checked using a germanium gamma spectrometer system. The nuclear decay rate and assay date for this source are given below.

Analytics maintains traceability to the National Institute of Standards and Technology through participation in a Measurements Assurance Program as described in USNRC Reg. Guide 4.15, Revision 1, February 1979.

ISOTOPE:	Ra-226
ACTIVITY (dps):	2.353 E4
HALF-LIFE:	1.600 E3 years
CALIBRATION DATE:	January 23, 2004 12:00 EST
RELATIVE EXPANDED UNCERTAINTY (k=2):	3.3%

Impurities: γ -impurities (other than decay products) <0.1%

5.01065 grams 0.1M HCl solution with 50 μ g/g Ba carrier.

P O NUMBER 3231RD, Item 5

SOURCE PREPARED BY:

M. D. Currie
M. D. Currie, Radiochemist

Q A APPROVED:

RCUW 1/26/04

Standard Traceability Log Rad

Source Material Info	
Parent Code:	0638
Prepared By:	Amanda Fehr
Carrier Conc:	0.1M HCl
Reference Date:	01/23/2004
Ampoule Mass (g):	5.01065 g
Uncertainty:	+/- 3.3 %
LogBook No:	RC-S-037-037

A Solution Material Info	
Isotope:	Radium-226
Prepared By:	Amanda Fehr
Prep Date:	01/16/2006
Verification Date:	04/09/2009
Expiration Date:	04/09/2010
Primary Code:	0638-A
Dilution(mL):	100 mL
Mass of Parent(g):	4.8398 g
Density(g/mL):	1.0266
Balance ID:	38080204

Calculations Converting parent activity to dpm/mL|dpm/g

$$(\text{Mass of parent(g)}) * (\text{Parm Activity (dps)}) * (\text{conversion dpm to dps}) / (\text{Ampoule Mass(g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/mL)}$$

$$(\text{Mass of parent(g)}) * (\text{Parm Activity (dps)}) * (\text{conversion dpm to dps}) / \text{Density} / (\text{Ampoule Mass (g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/g)}$$

$$(4.8398 \text{ g}) * (23530 \text{ dps}) * (60 \text{ dpm/dps}) / (5.01065 \text{ g} * 100 \text{ mL}) = 13636.6133 \text{ dpm/mL}$$

$$(4.8398 \text{ g}) * (23530 \text{ dps}) * (60 \text{ dpm/dps}) / (1.0266 \text{ g/mL}) / (5.01065 \text{ g} * 100 \text{ mL}) = 13282.9676 \text{ dpm/g}$$

WMO 8/14/09

Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
01/17/2006	Amanda Fehr	2.1041	100	0638-B	279.0211 dpm/mL	01/17/2007	01/17/2008
07/17/2006	Mary Aders	2.1313	100	0638-C	282.6281 dpm/mL	07/26/2006	07/26/2007
03/28/2007	Daniel Roy	2.1025	100	0638-D	279.2744 dpm/ml	04/08/2007	04/08/2008
03/28/2007	Daniel Roy	45.468	250	0638-E	2415.7999 dpm/ml	04/09/2009	04/09/2010
12/18/2007	Daniel Roy	2.014	100	0638-F	267.519 dpm/ml	02/02/2009	02/02/2010
02/12/2008	Daniel Roy	.5004	100	0638-G	66.468 dpm/ml	03/02/2009	03/02/2010
07/23/2008	Daniel Roy	5.0607	250	0638-H	268.8845 dpm/ml	07/17/2009	07/17/2010

GEL Laboratories LLC
Version 1.0 9/18/2000

W084116

Verification for Ra-226 Standard 0638-F

D. Roy 2/2/2009	Isotope	Value	Uncertainty
	0638-F #1	24.629	1.7426
	0638-F #2	24.438	1.7557
	0638-F #3	22.791	1.6808
Mean Value (Counting) =	23.953	99.60	Pass
Stdev =	1.010781096		Rule 3 (Pass/Fail)
Target =	24.05		
Lower Limit =	21.93100448		
Upper Limit =	25.97412886		
Rule 1 Pass/Fail	Pass		
Two sigma =	2.021562191		
10 % of Mean =	2.395256667		
Rule 2 (Pass/Fail)	Pass		

Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements

Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.

Rule 3 = The determined mean value shall be within 5% of the certificate value.

The analyst prepared three standard verification sources for standard 0638-F using 0.1 mL for each source. Each source was counted using routine Lucas cell procedures. Calibration for 0299-G was used in this verification.

Handwritten notes:
 0638-F #1
 2/2/2009
 Amanda [Signature]

Radium-226 Que Sheet

General Engineering Laboratories, Radiochemistry Division

02/03/2009

Analyst: KSDI

First Client Due Date:

Internal Due Date: 02/07/2009

Batch #: 838839

Spike Isotope: Radium-226 Spike Code: 0003-P

Expiration Date: 12/27/08

Nom Conc:

LCS Isotope: Radium-226 LCS Code: 003000

Expiration Date: 12/27/08

Nom Conc:

Prep Date: 12/27/08 Pipet ID: _____

Initials: VSD Witness: _____

Sample Count Time: 30 (Min)

Bkg Count Time: 30 (Min)

Sample I	Client Description	Type	Hazard Code	Matrix	Min CRDL	Client	Vol (mL)	End Init Degas Date/Tin	End LN Date/Time	De-em Date/Time	Start Count Date/Time	Cell #	Det #	Bkg counts	Total Counts
1201770521-1	LCS for batch 838839	LCS	GROUND	WAJ 1	1 pCi/L	QC ACCOUNT	500	1/26/09 10:05	1/26/09 11:30	1/26/09 13:10	1/26/09 17:05	305	3	9	741
1201770522-1	LCS for batch 838839	LCS	GROUND	WAJ 1	1 pCi/L	QC ACCOUNT	500	1/26/09 10:05	1/26/09 11:45	1/26/09 13:10	1/26/09 17:57	304	3	9	748
1201770523-1	LCS for batch 838839	LCS	GROUND	WAJ 1	1 pCi/L	QC ACCOUNT	500	1/26/09 10:05	1/26/09 12:00	1/26/09 13:10	1/26/09 19:05	305	3	9	743

VO 81615

Comments: _____ Data Reviewed By: _____

Instrument ID: _____

LUCAS-5028, LUCAS-13617, LUCAS-90899, LUCAS-162753, LUCAS-132286, LUC-6-17055

Radium-226 Liquid

Filename : RA226.XLS
 File type : Excel
 Version # : 1.2.3

Pipet, 0.1 ml Stdev : +/- 0.000701 ml
 Pipet, 0.5 ml Stdev : +/- 0.002564 ml
 Pipet, 1 ml Stdev : +/- 0.005480 ml

Spike S/N : N/A
 Spike Exp Date : N/A
 Spike Activity (dpm/ml): N/A
 Spike Volume Added: N/A

Batch : 838839

Analyst : KSD1

Prep Date : 1/26/2009

Ra-226 Abundance : 1

Ra-226 Method Uncertainty : 0.0918

Procedure Code : LUC26RAL

Parname : Radium-226

Required MDA : 1 pCi/L

Half-life of Ra-226 : 1600 years

Half-life of Rn-222: 3.823 days

Batch counted on : LUCAS CELL DETECTOR

BKG Count time : 30 min

Sample ID	Sample Aliquot L	Sample Aliquot StDev. L	Sample Date/Time	Count Raw Data			Weekly Background			Detector Efficiency (cpm/dpm)
				Cell Number	Counting Time (min.)	Gross Counts	Gross CPM	Counts	CPM	
1201770521.1	0.5000	2.0256E-05	1/26/2009 0:00	305	30	791	26.367	8	0.267	1.9930
1201770522.1	0.5000	2.0256E-05	1/26/2009 0:00	306	30	768	25.600	8	0.267	1.9500
1201770523.1	0.5000	2.0256E-05	1/26/2009 0:00	308	30	730	24.333	8	0.267	2.0010

Handwritten notes:
 UNSM105
 1/26/09

Detector Efficiency Error (cpm/dpm)	Cell Calibration Date	Cell Calibration Due Date	De-Gas Date/Time	Rn-222 Ingrow End Date/Time	Count Start Date/Time	De-Gas to Ingrowth	Rn-222 Corrections Ingrowth to Count	During Count	Ra-226 Decay
0.06082	1/23/2008	1/22/2009	1/26/2009 16:05	1/30/2009 11:30	1/30/2009 17:05	0.499	0.959	1.002	1.000
0.06082	1/23/2008	1/22/2009	1/26/2009 16:05	1/30/2009 11:45	1/30/2009 17:37	0.500	0.957	1.002	1.000
0.06082	1/23/2008	1/22/2009	1/26/2009 16:05	1/30/2009 12:00	1/30/2009 19:05	0.501	0.948	1.002	1.000

K0816104
04/21/09

- Notes.
 1 - Results are decay corrected to Sample Date/Time
 2 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date
 3 - Spike Nominals are decay corrected to Sample Date/Time

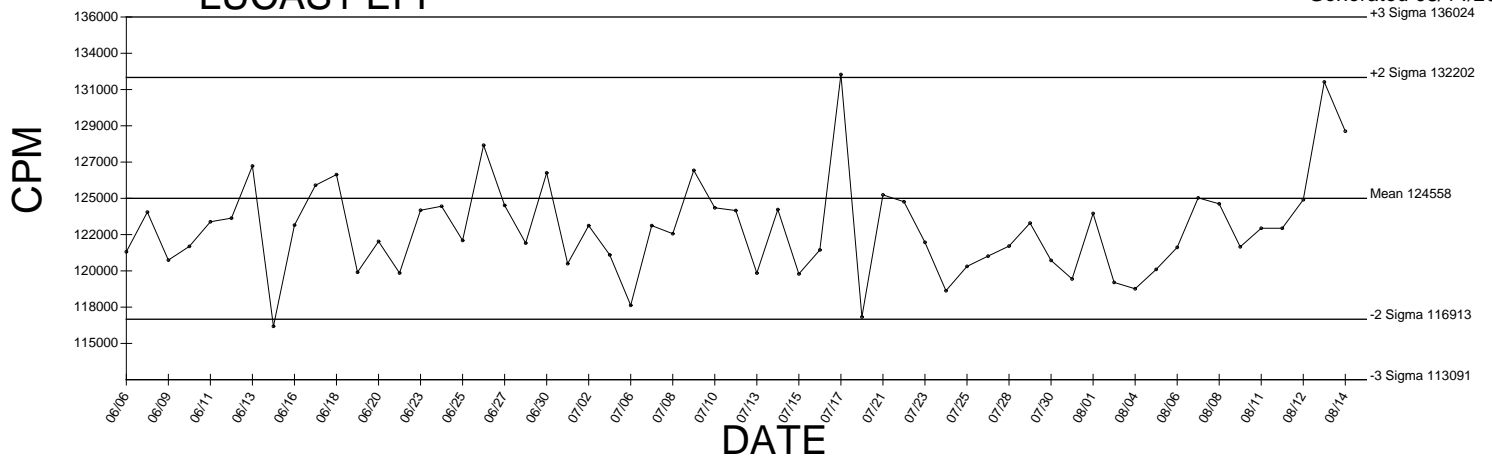
Results Decision Level pCi/L	Critical Level pCi/L	MDA pCi/L	Sample Act. Conc. pCi/L	Sample Act. Error pCi/L	Net Count Rate CPM	Net Count Rate Error CPM	2 SIGMA		Sample QC	Sample Type	RPD	RER	Nominal pCi/L	Recovery
							Counting Uncertainty pCi/L	Total Prop. Uncertainty pCi/L						
0.2932	0.2070	0.5083	24.6287	0.0707	26.1000	0.9422	1.7426	5.5940		LCS			24.0486	102.4%
0.2997	0.2116	0.5196	24.4384	0.0710	25.3333	0.9286	1.7557	5.5591		LCS			24.0486	101.6%
0.2942	0.2077	0.5101	22.7906	0.0715	24.0667	0.9055	1.6808	5.1982		LCS			24.0486	94.8%

11/28/10
(15)

BACKGROUND AND EFFICIENCY DATA

LUCAS1 EFF

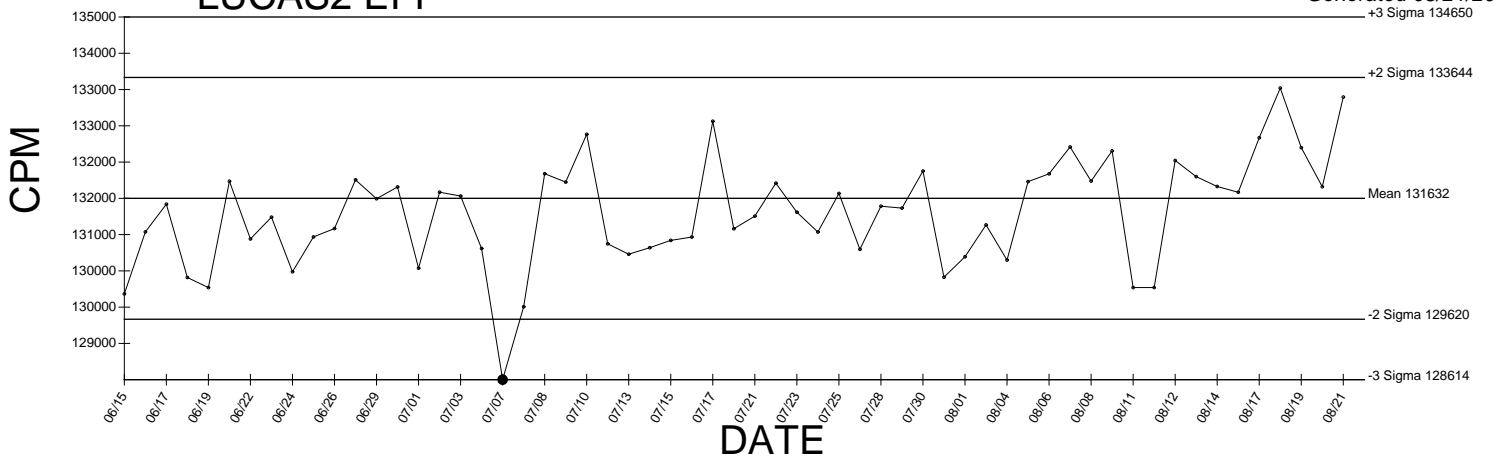
Generated 08/14/2009



● Denotes Outlier

LUCAS2 EFF

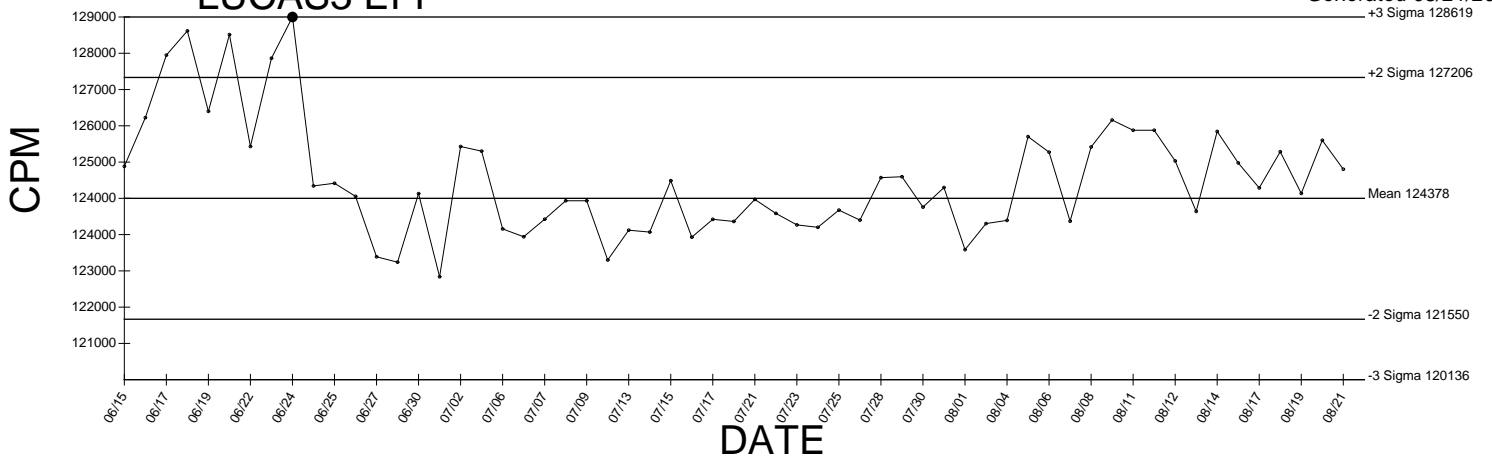
Generated 08/21/2009



● Denotes Outlier

LUCAS3 EFF

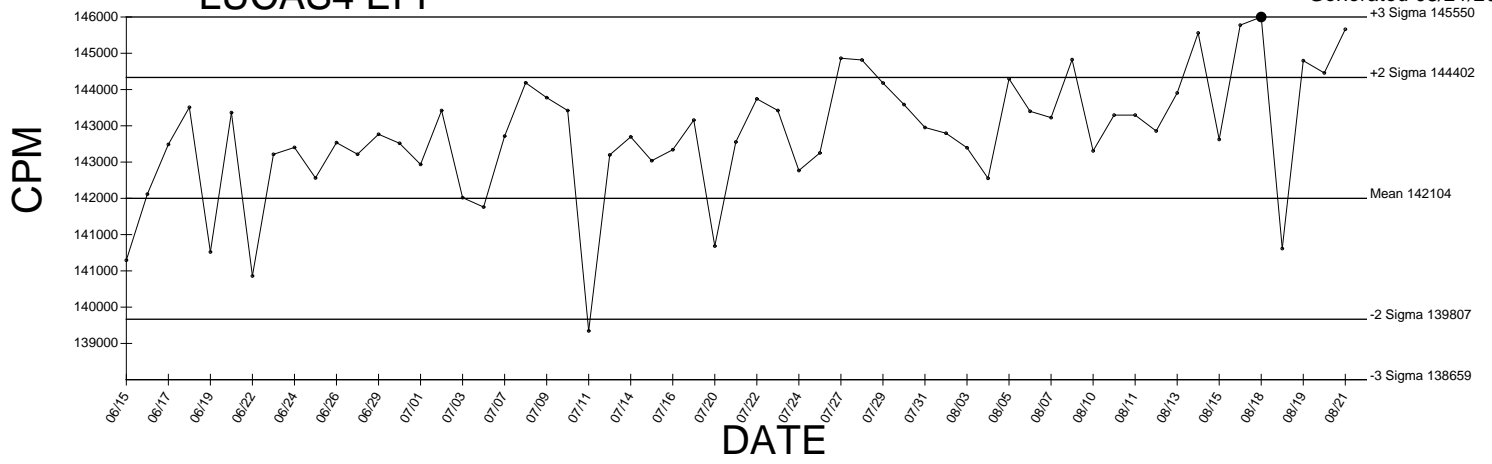
Generated 08/21/2009



● Denotes Outlier

LUCAS4 EFF

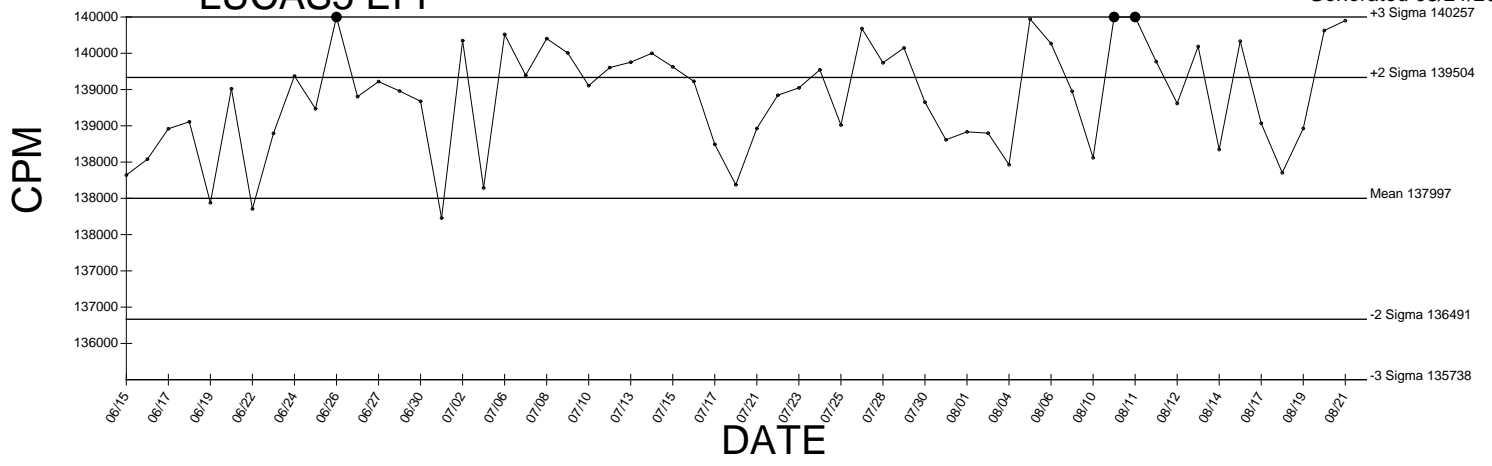
Generated 08/21/2009



● Denotes Outlier

LUCAS5 EFF

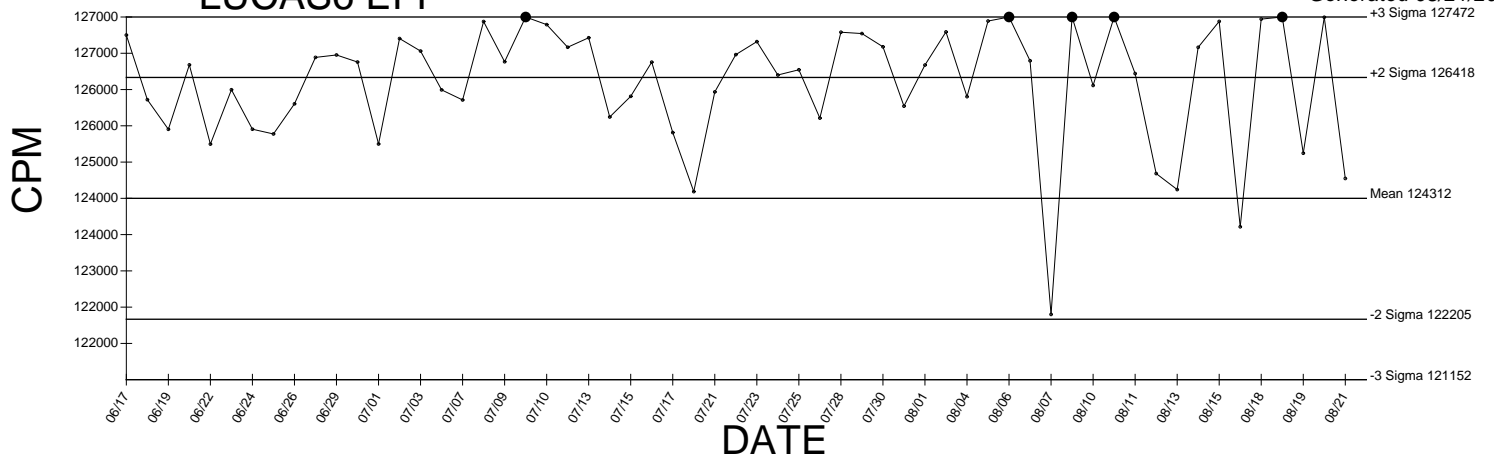
Generated 08/21/2009



● Denotes Outlier

LUCAS6 EFF

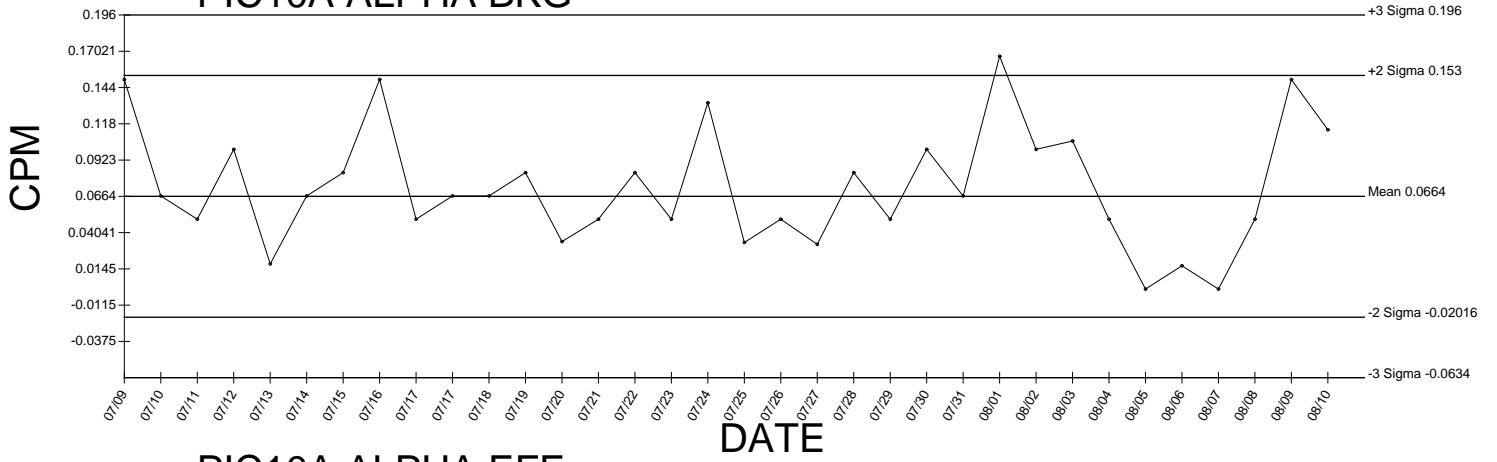
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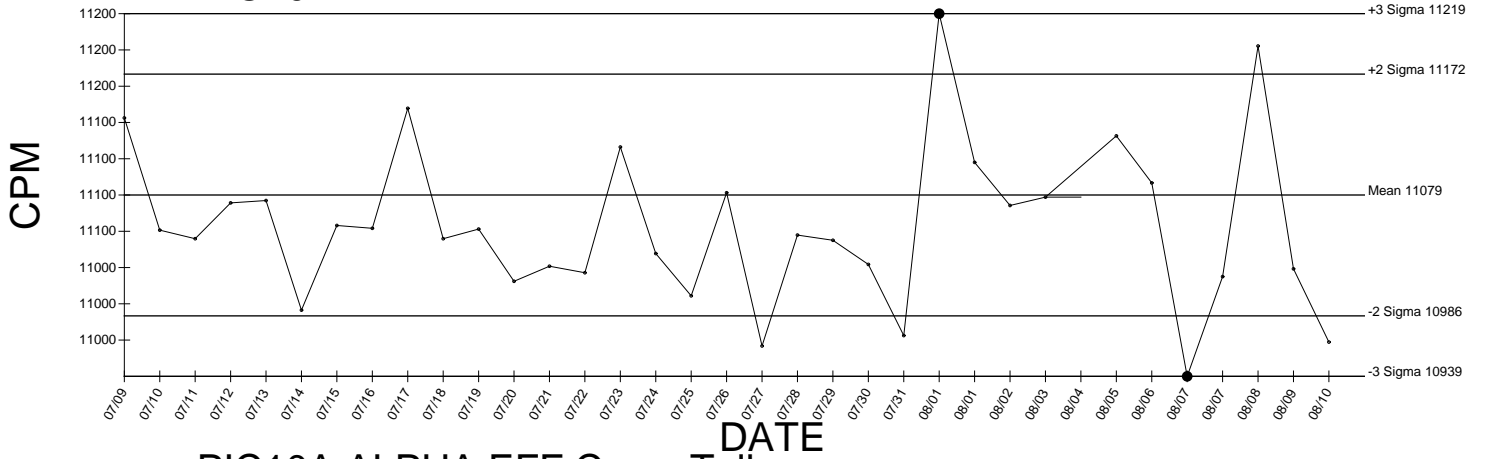
● Denotes Outlier

PIC10A ALPHA BKG

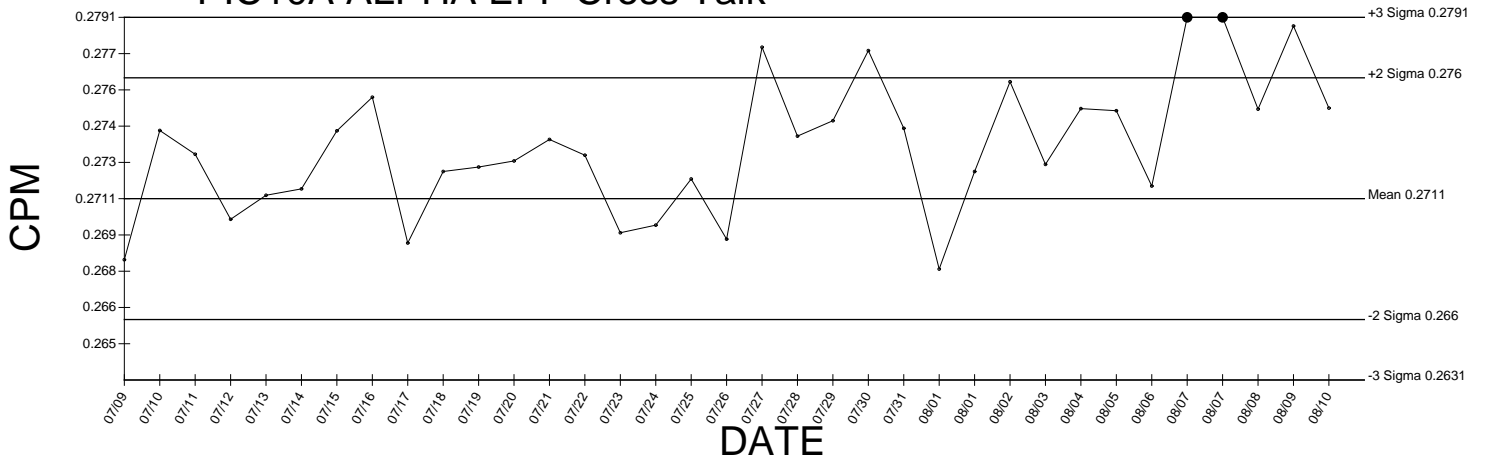
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PIC10A ALPHA EFF



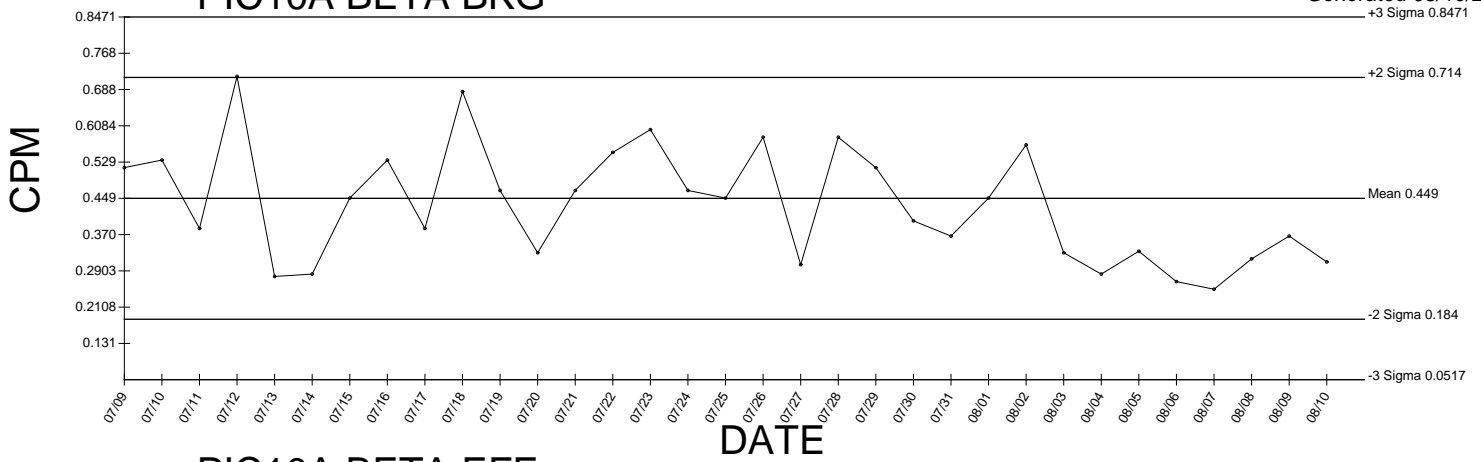
PIC10A ALPHA EFF Cross Talk



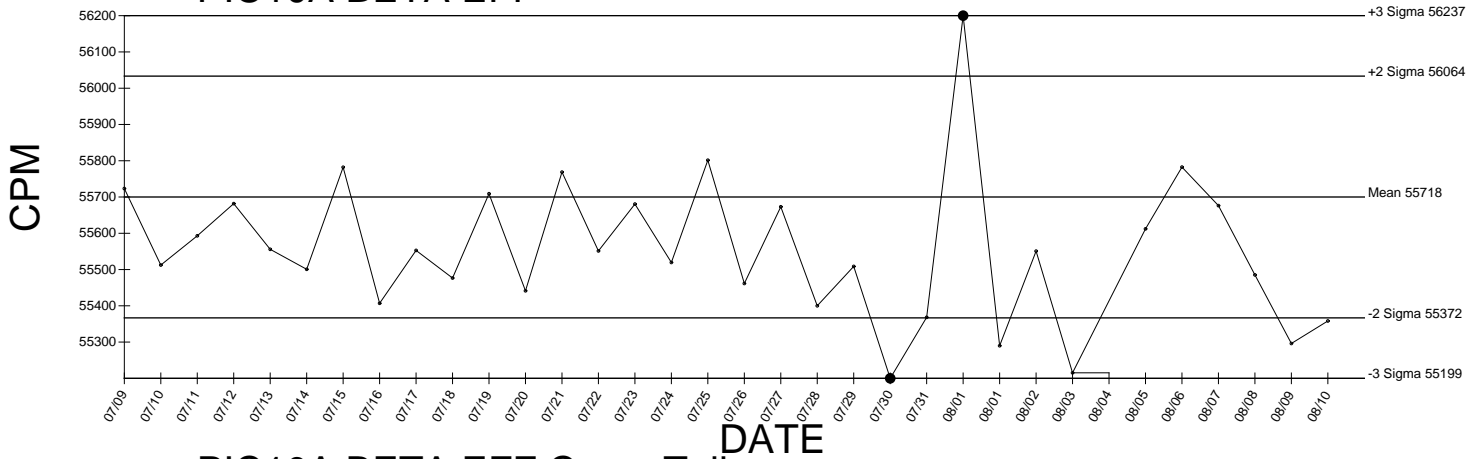
● Denotes Outlier

PIC10A BETA BKG

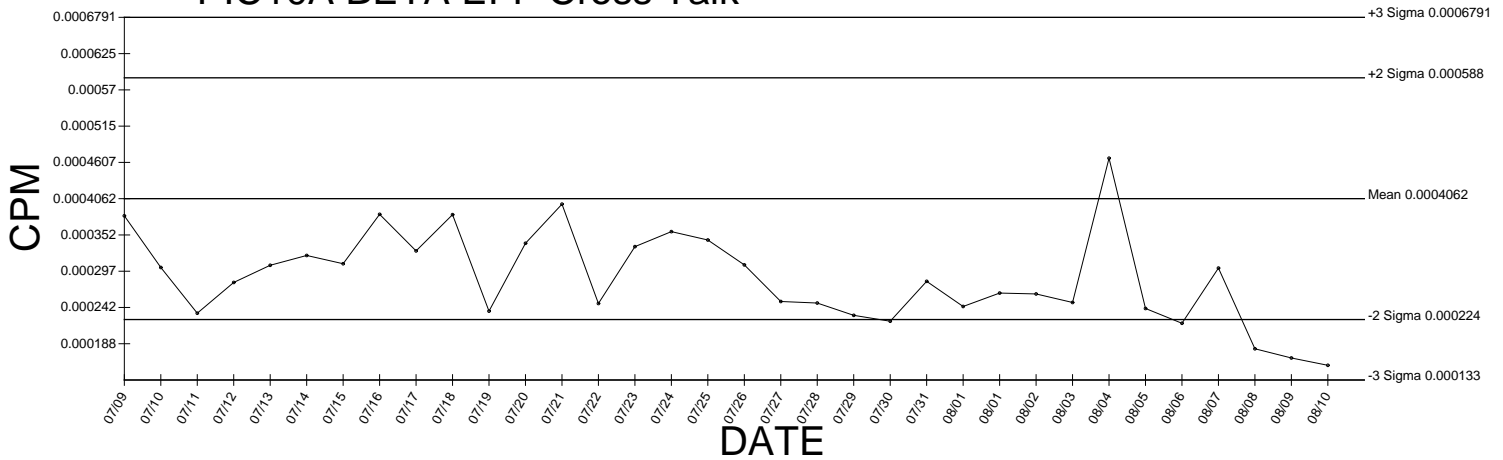
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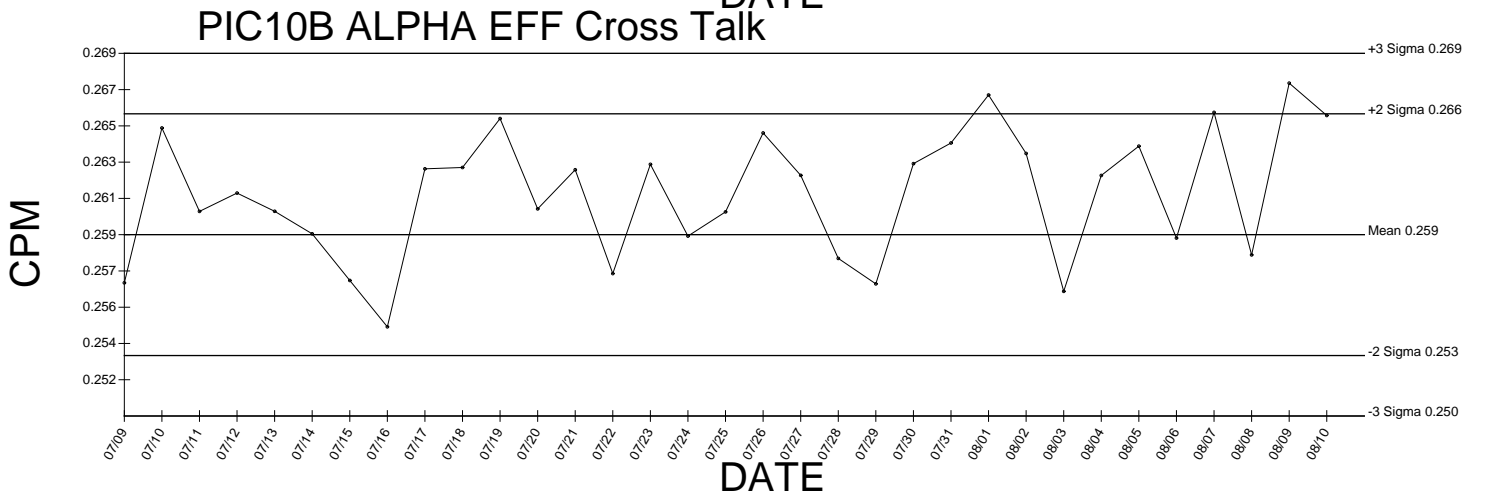
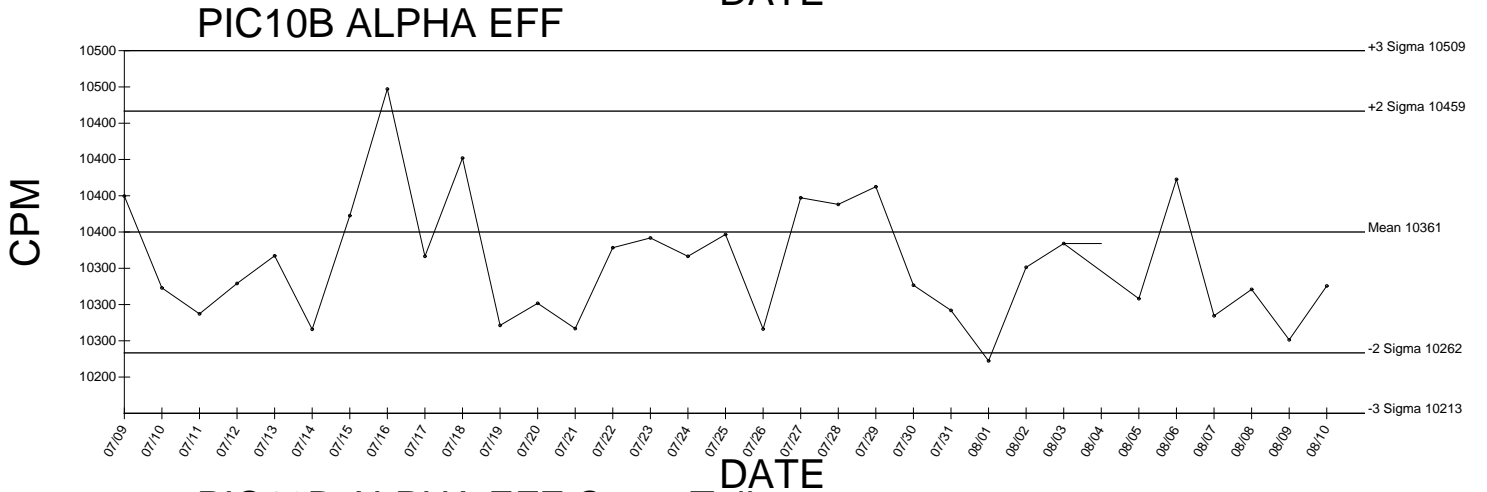
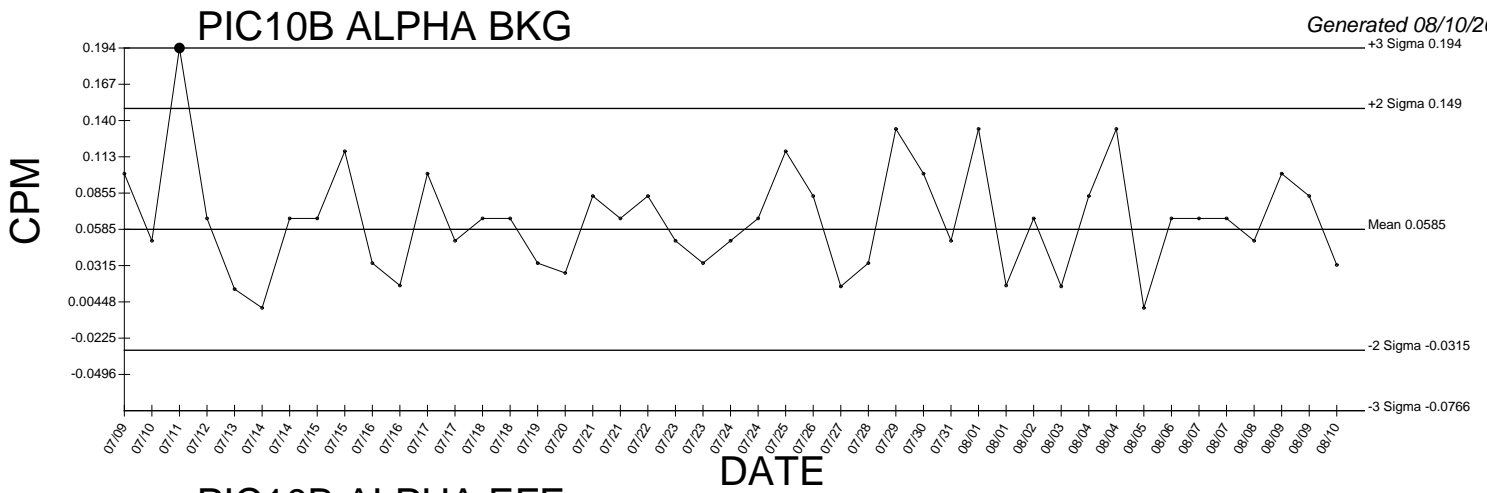
PIC10A BETA EFF



PIC10A BETA EFF Cross Talk



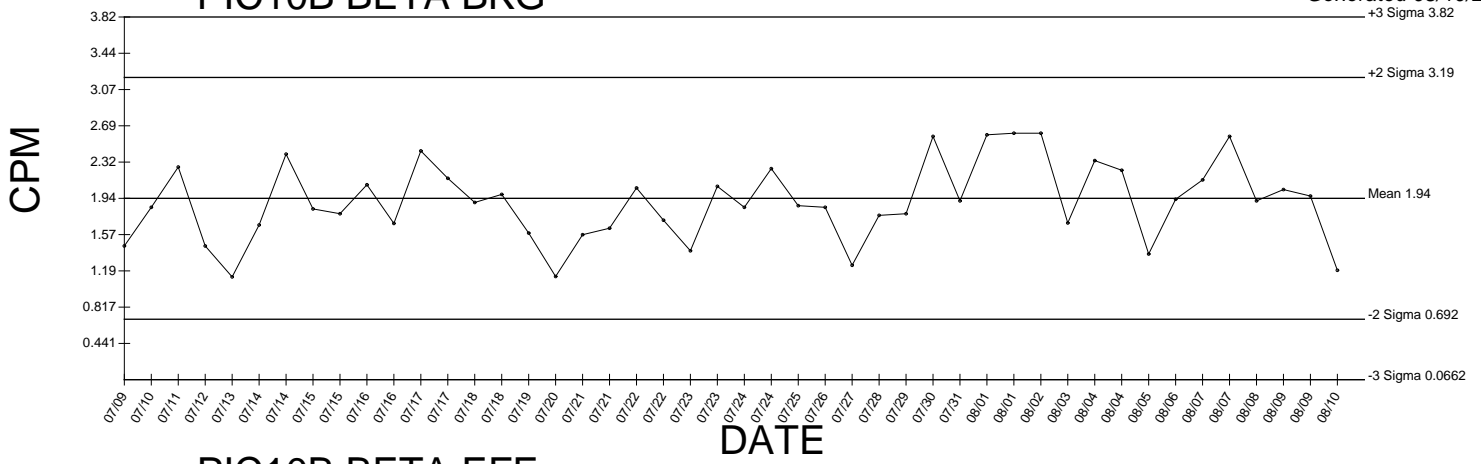
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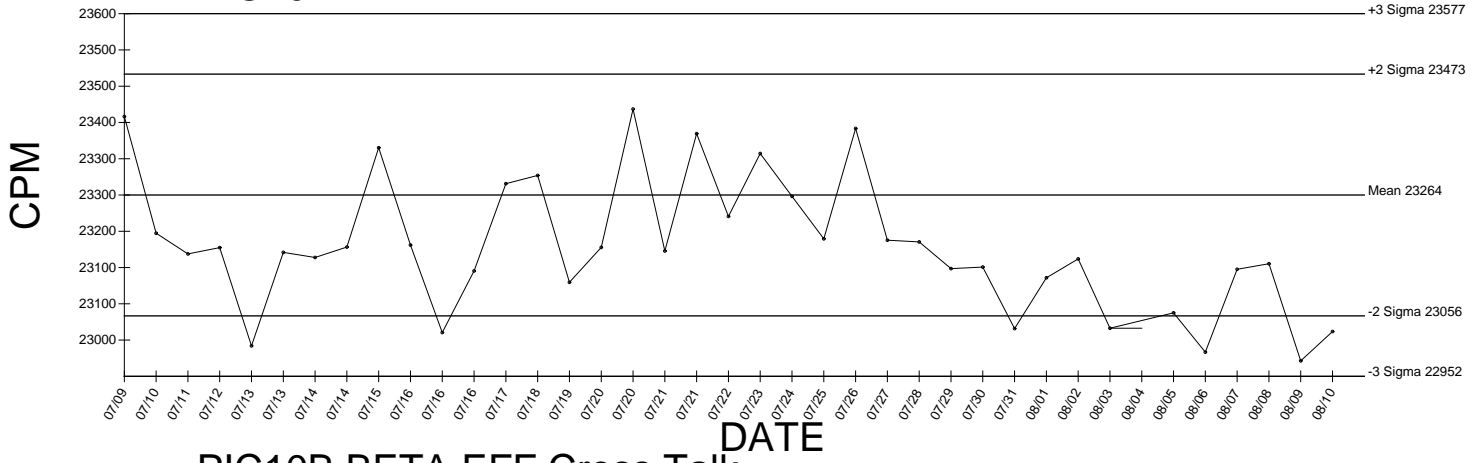
● Denotes Outlier

PIC10B BETA BKG

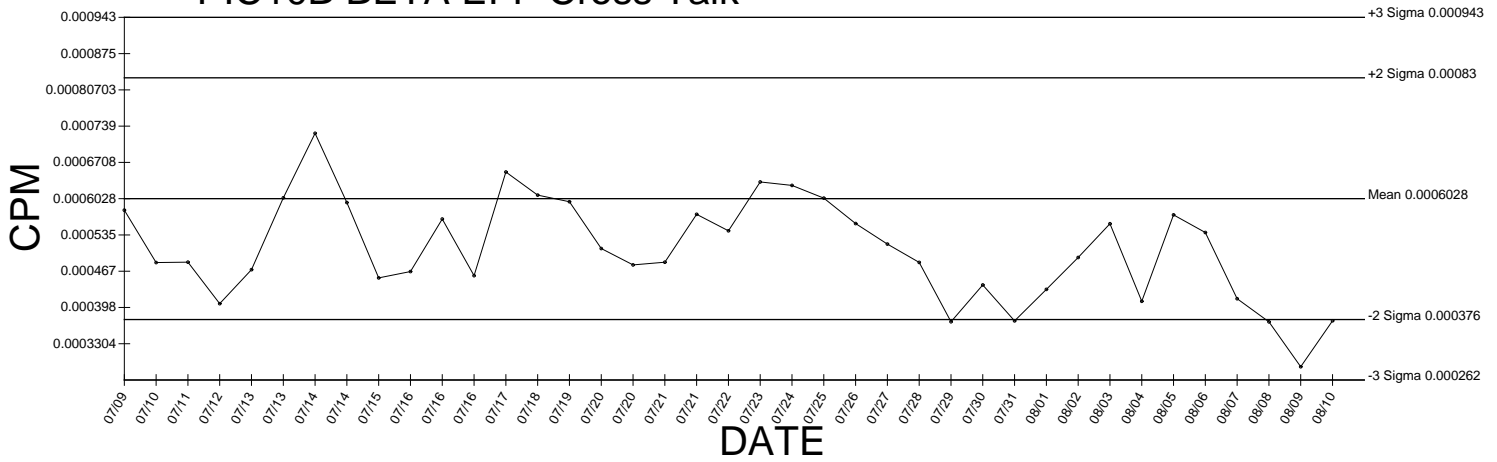
Generated 08/10/2009



PIC10B BETA EFF

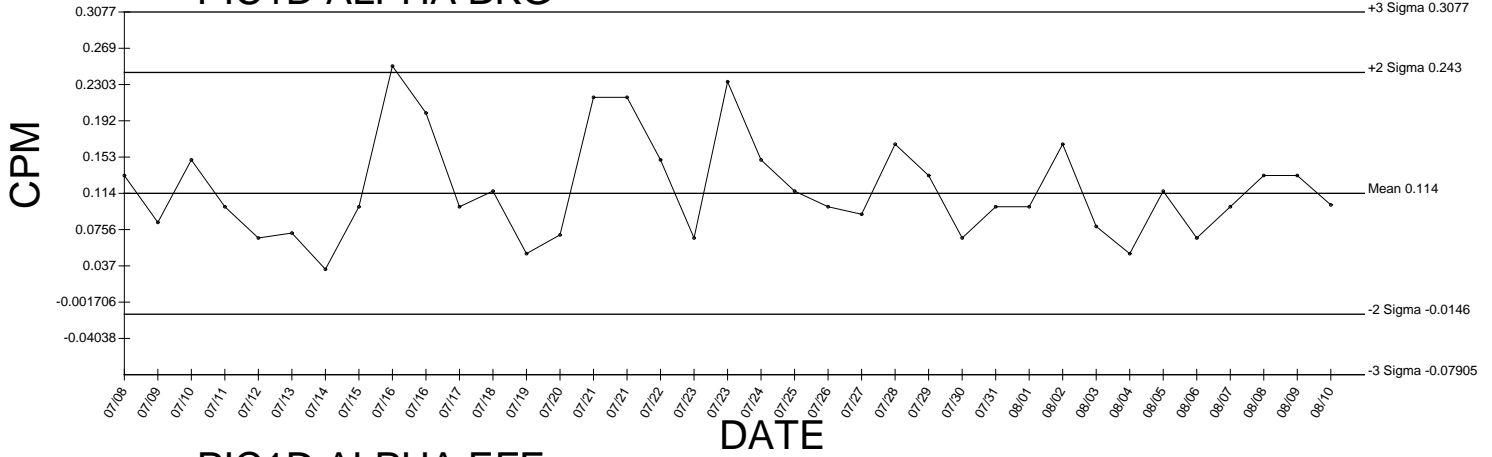


PIC10B BETA EFF Cross Talk

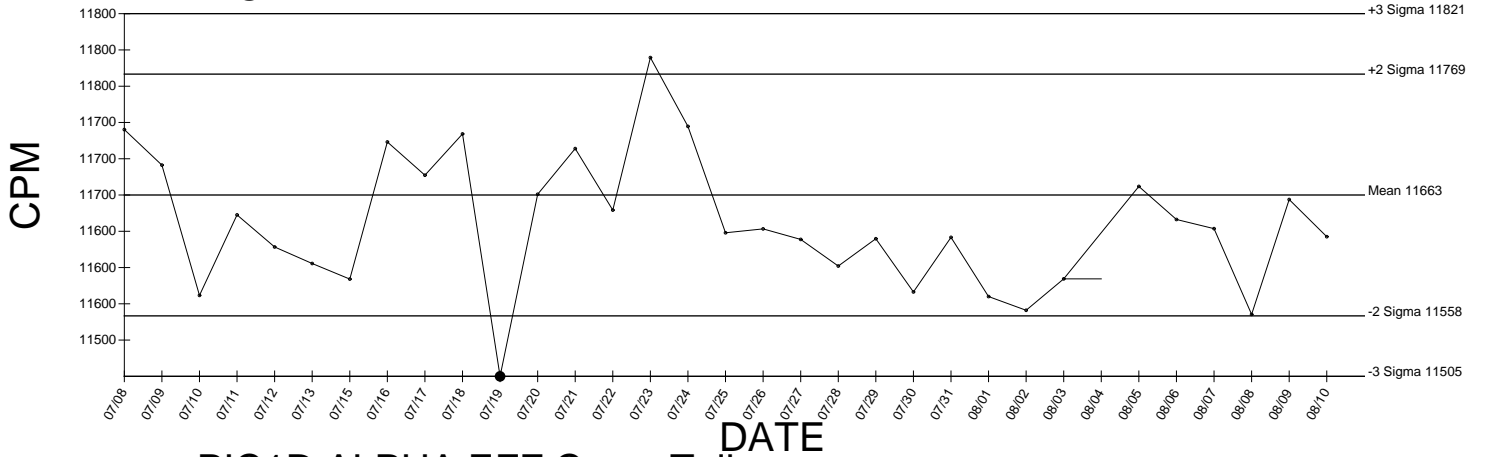


● Denotes Outlier

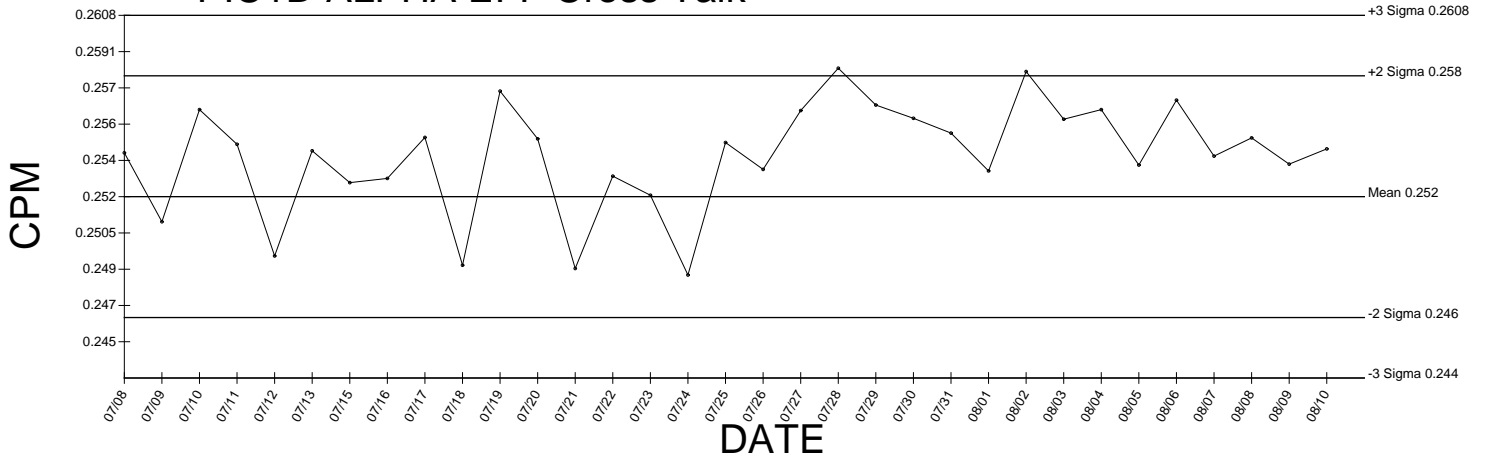
PIC1D ALPHA BKG



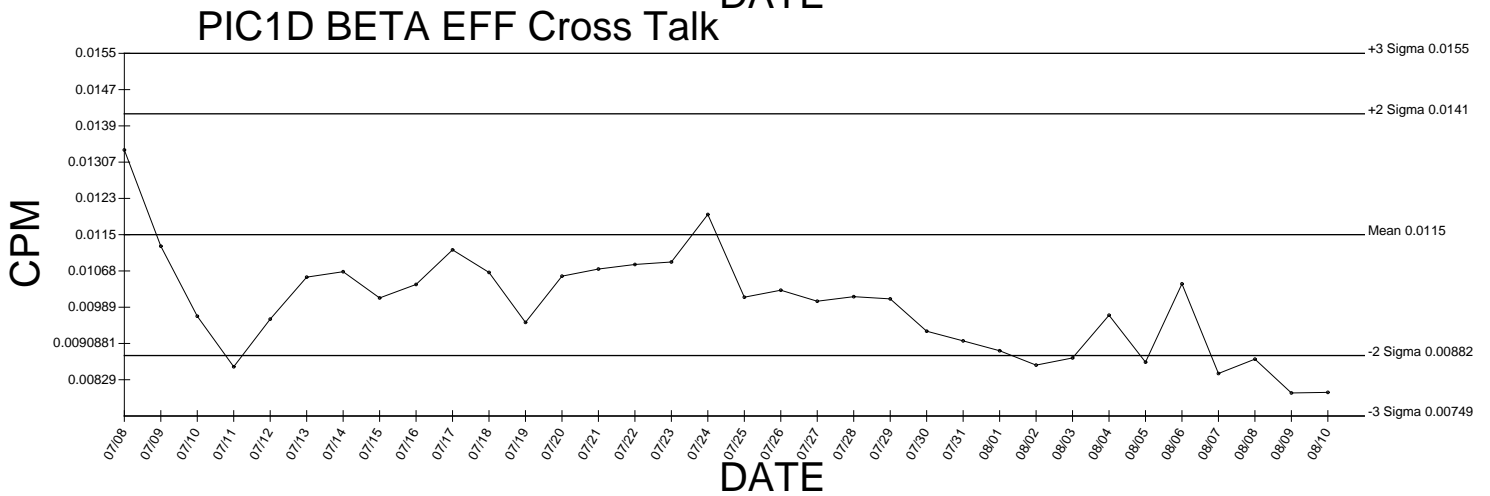
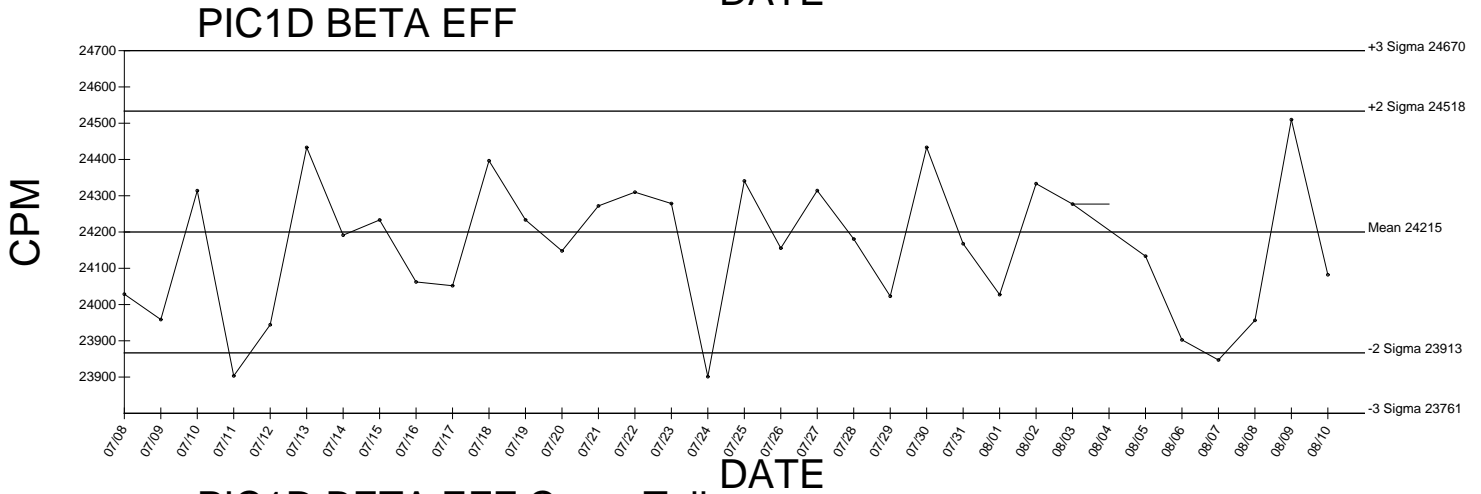
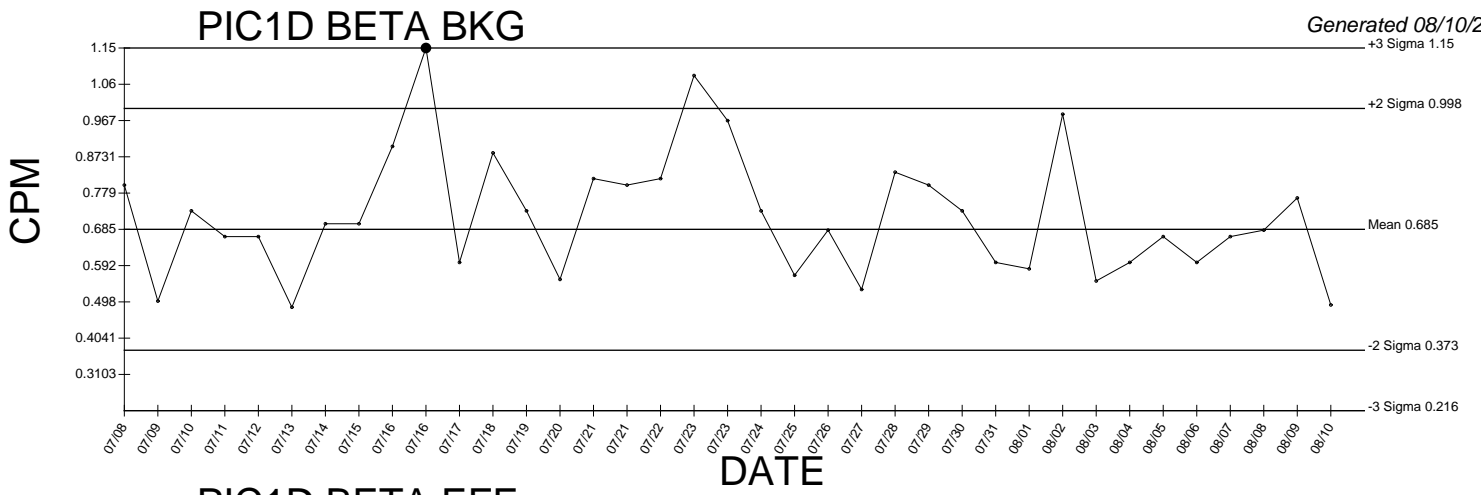
PIC1D ALPHA EFF



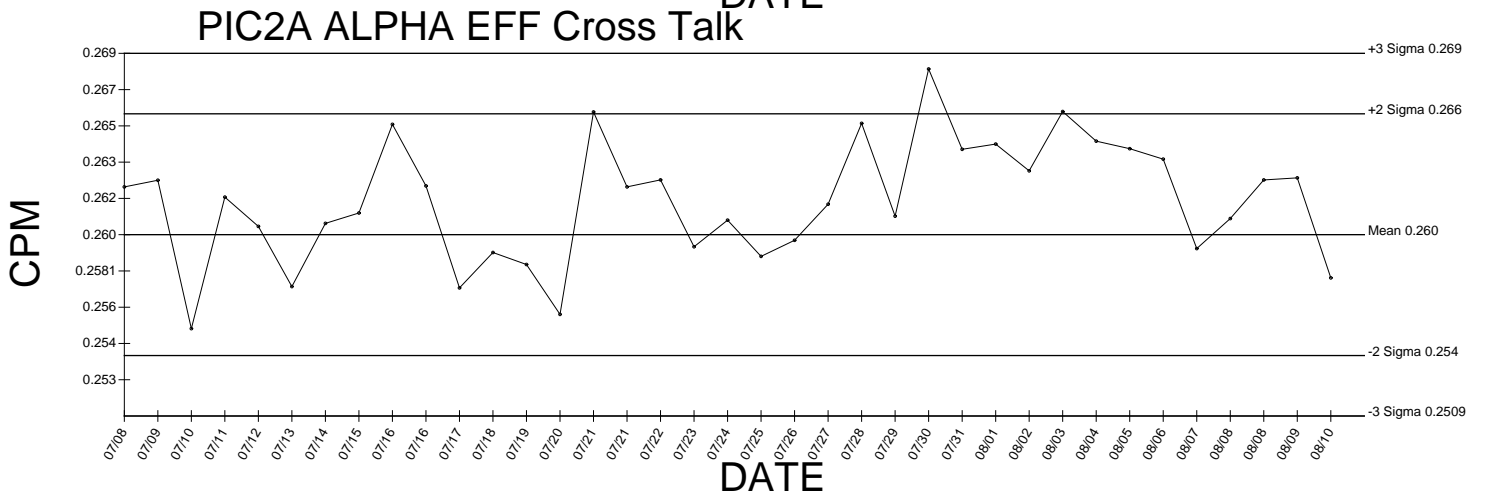
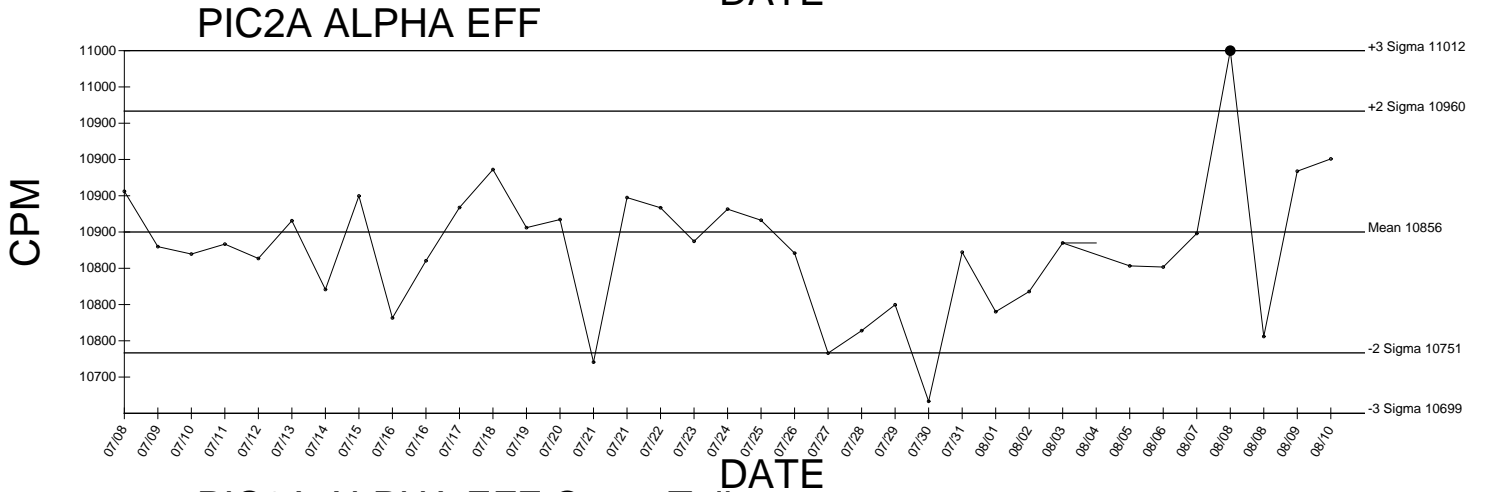
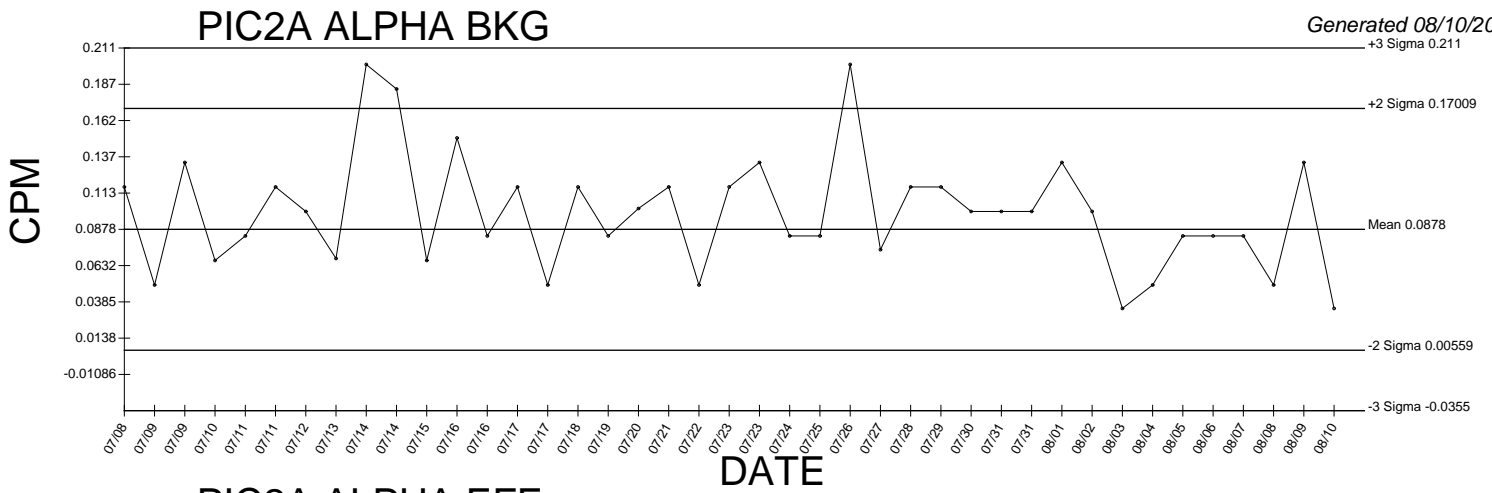
PIC1D ALPHA EFF Cross Talk



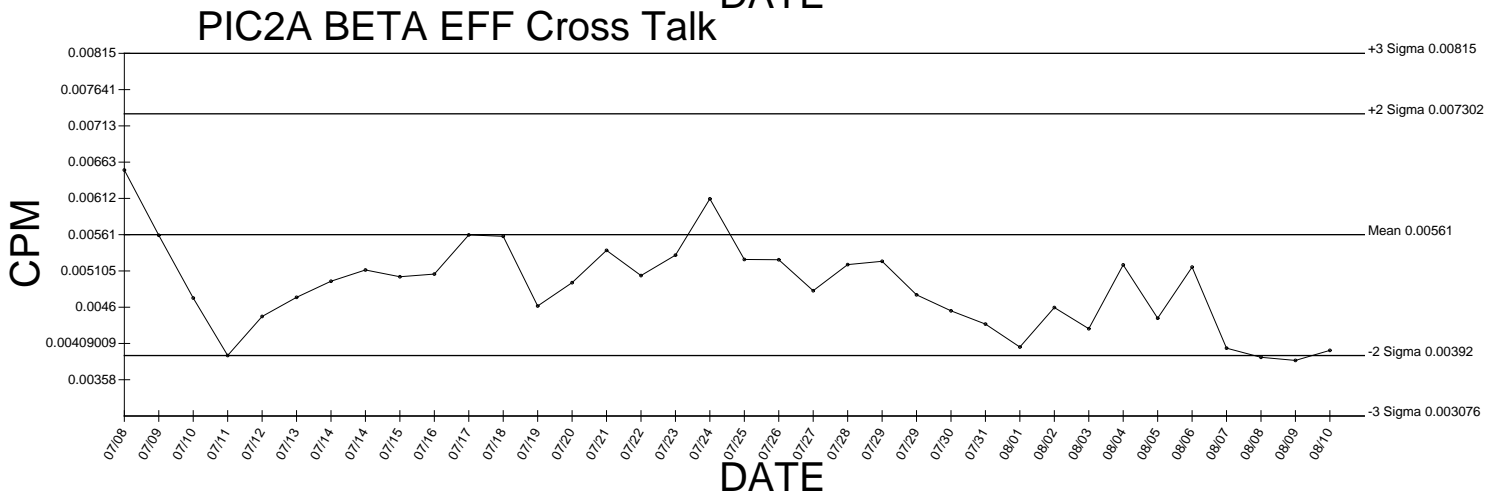
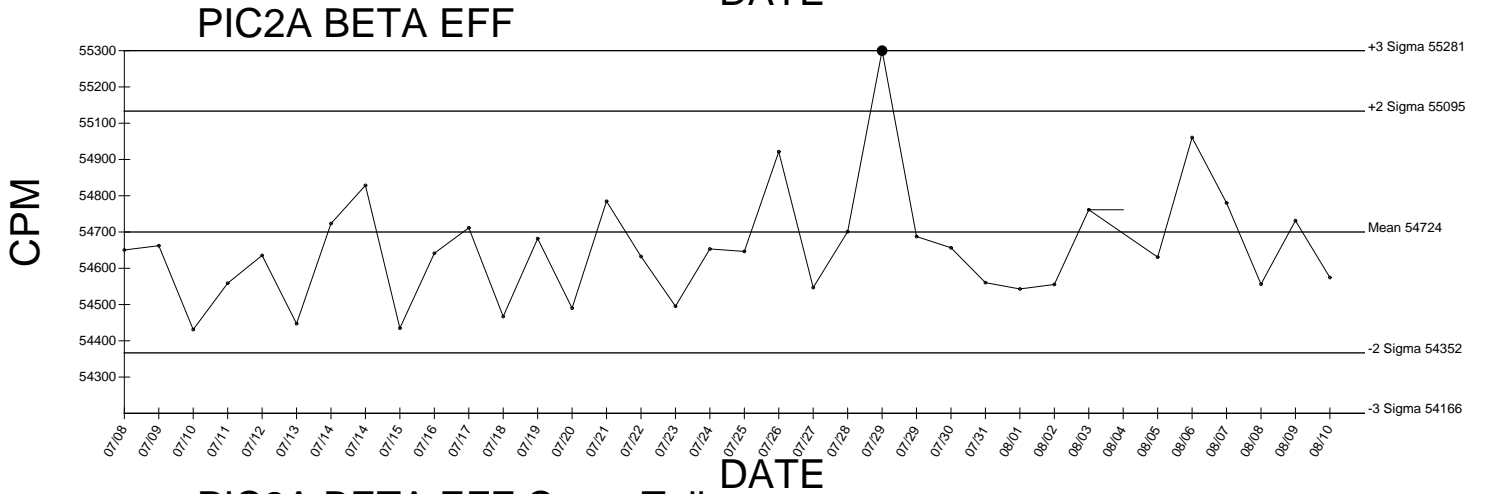
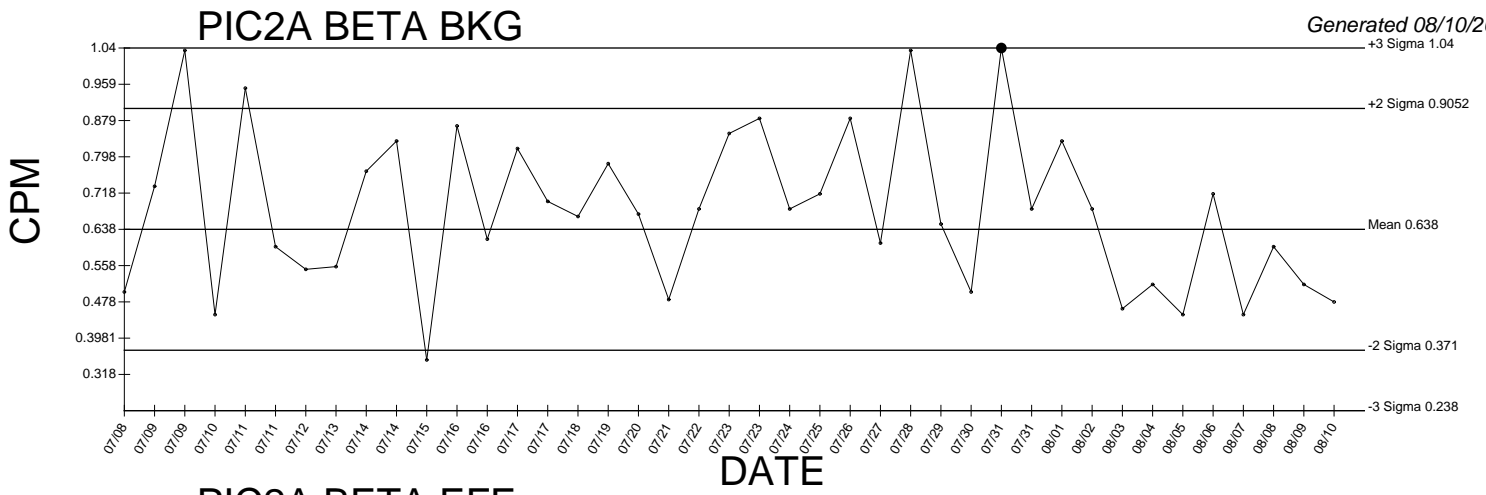
● Denotes Outlier



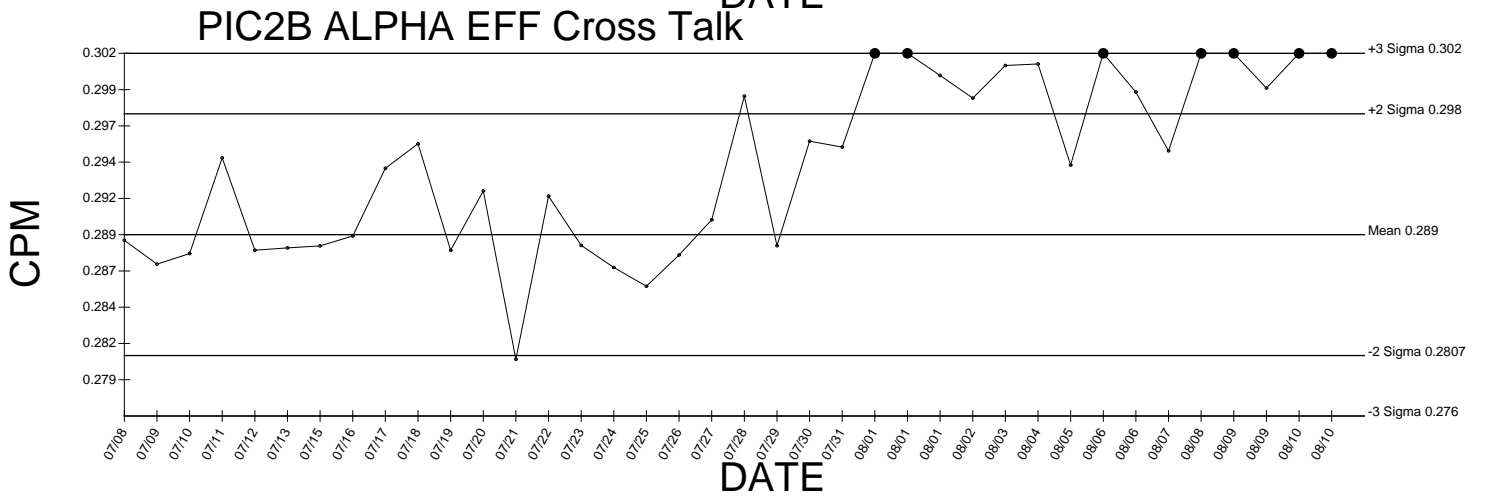
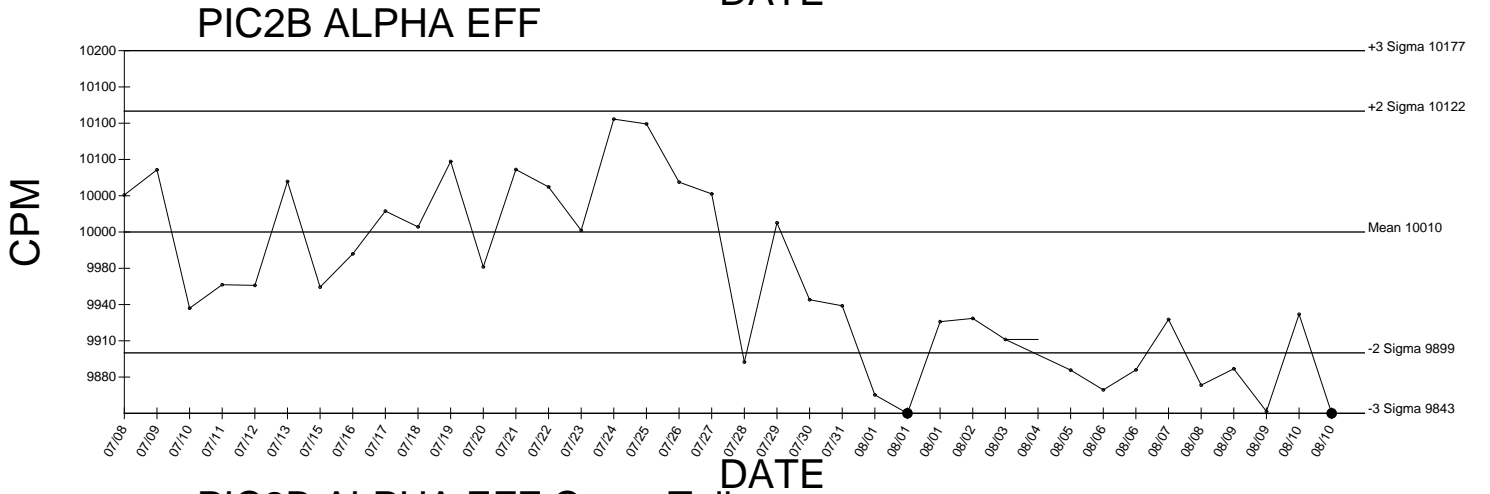
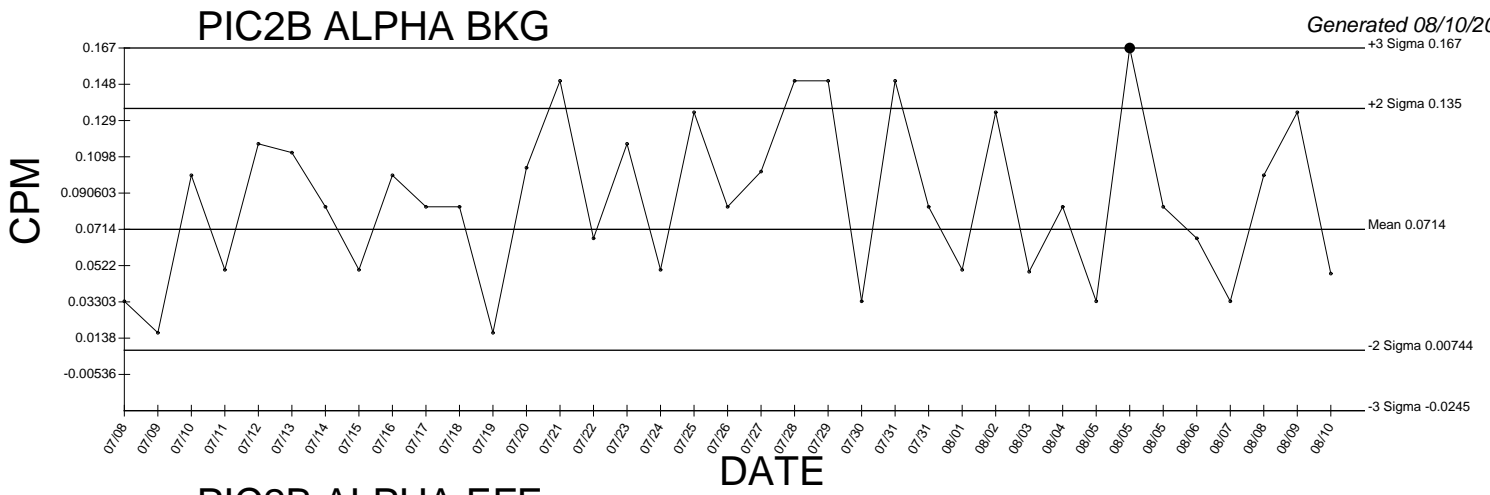
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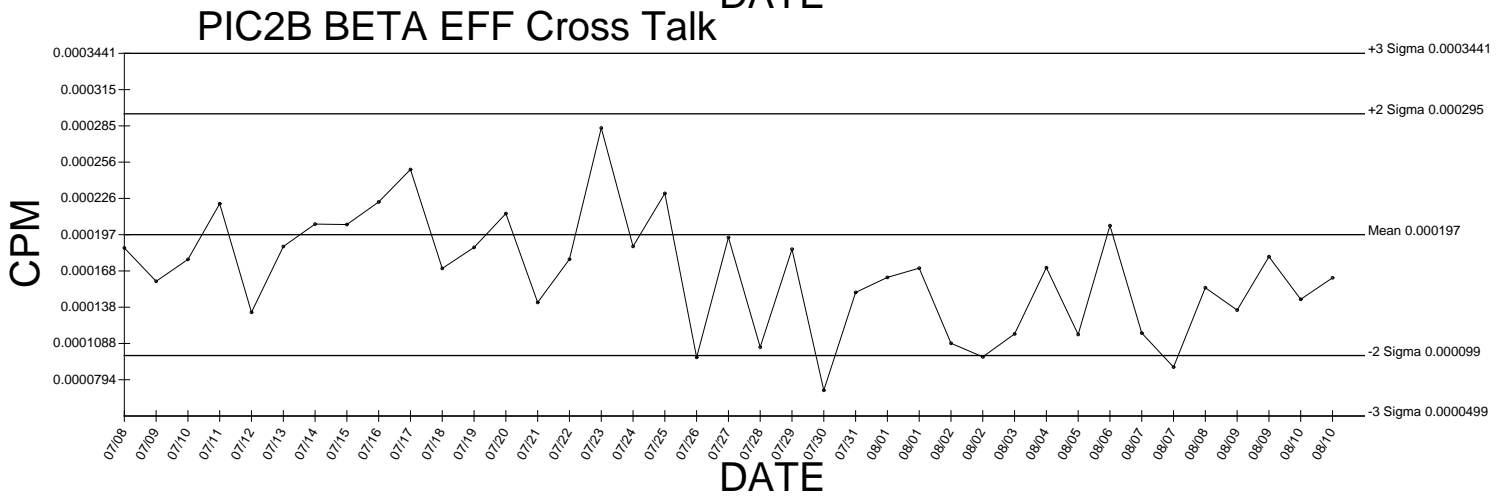
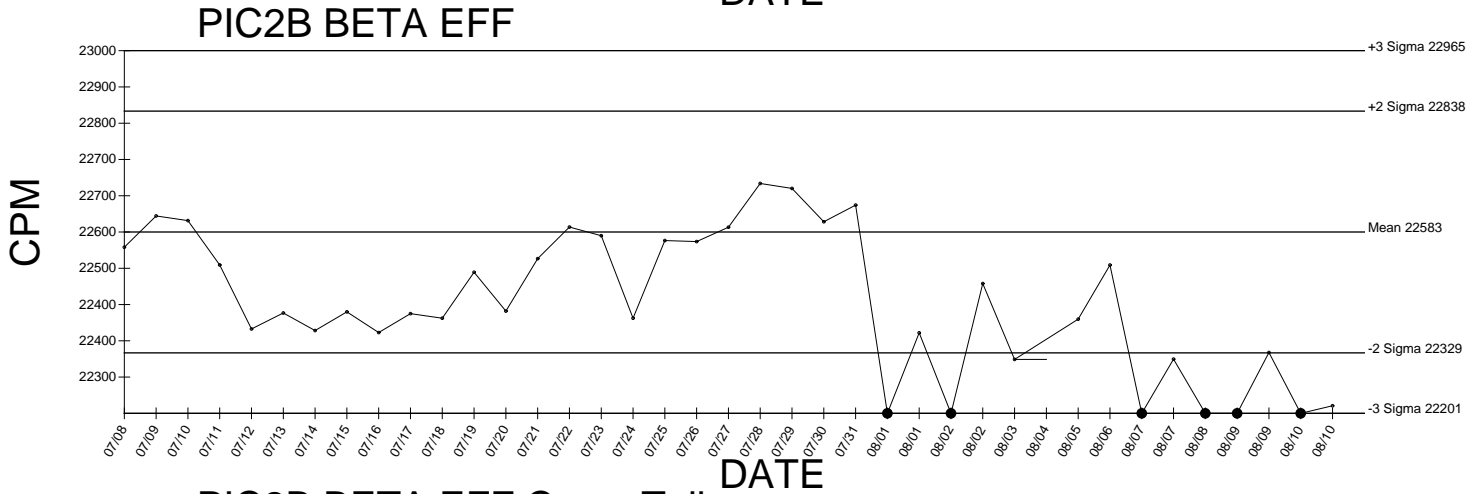
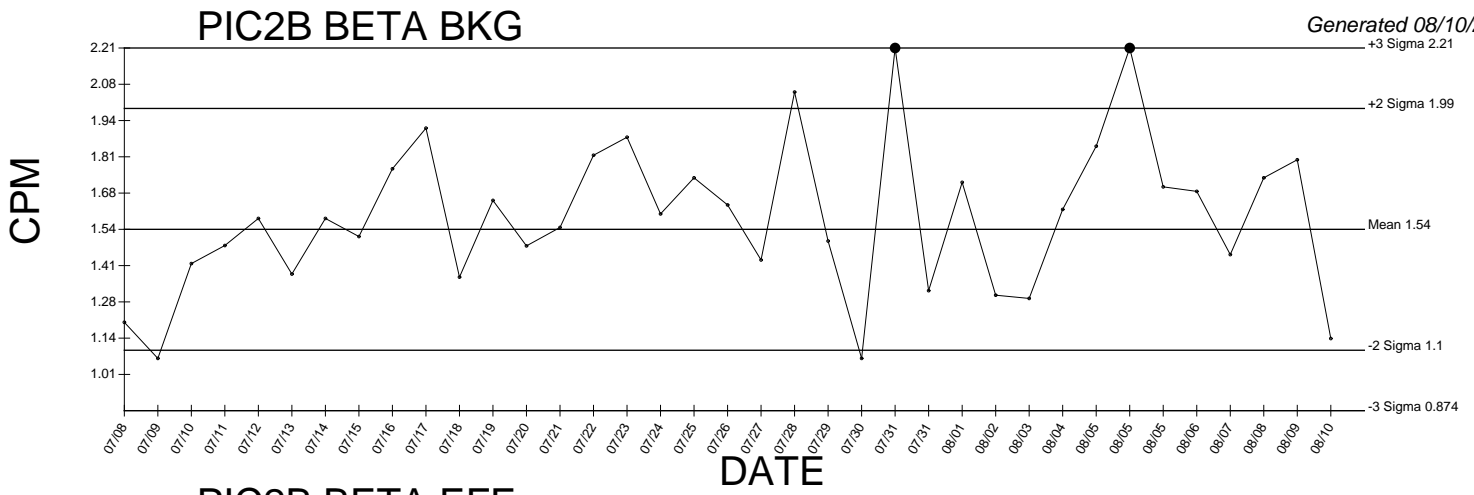
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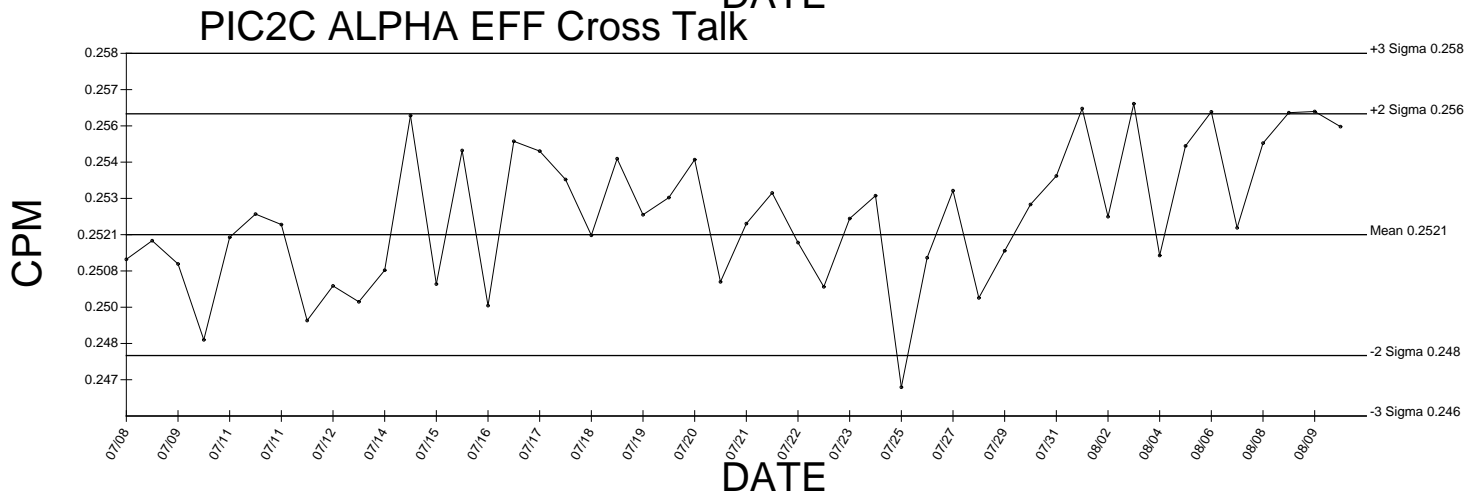
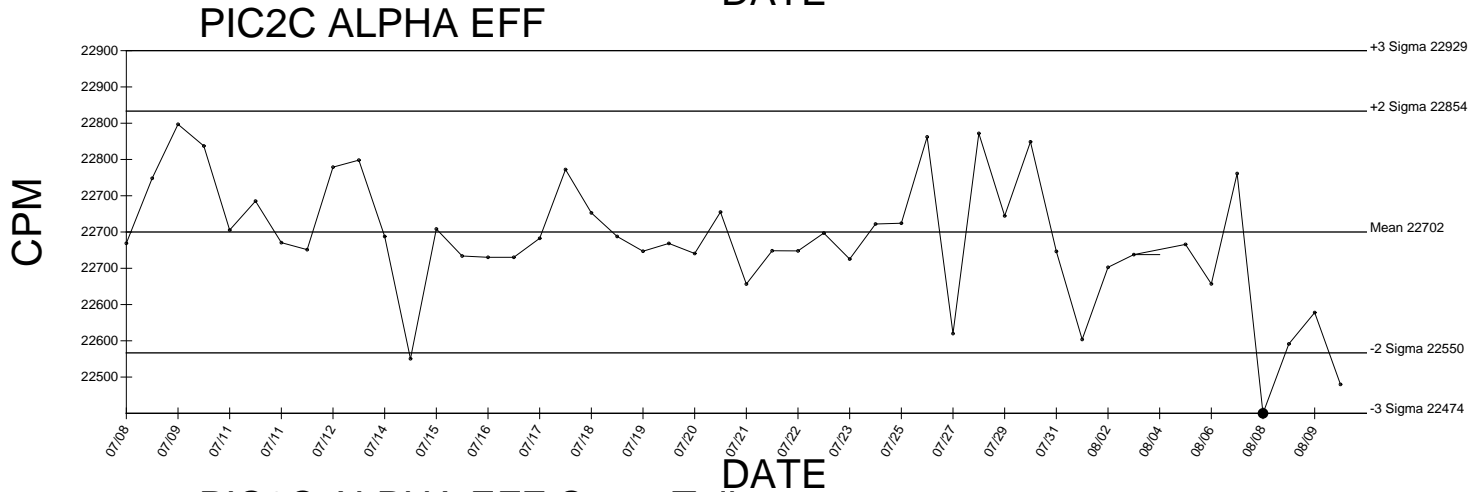
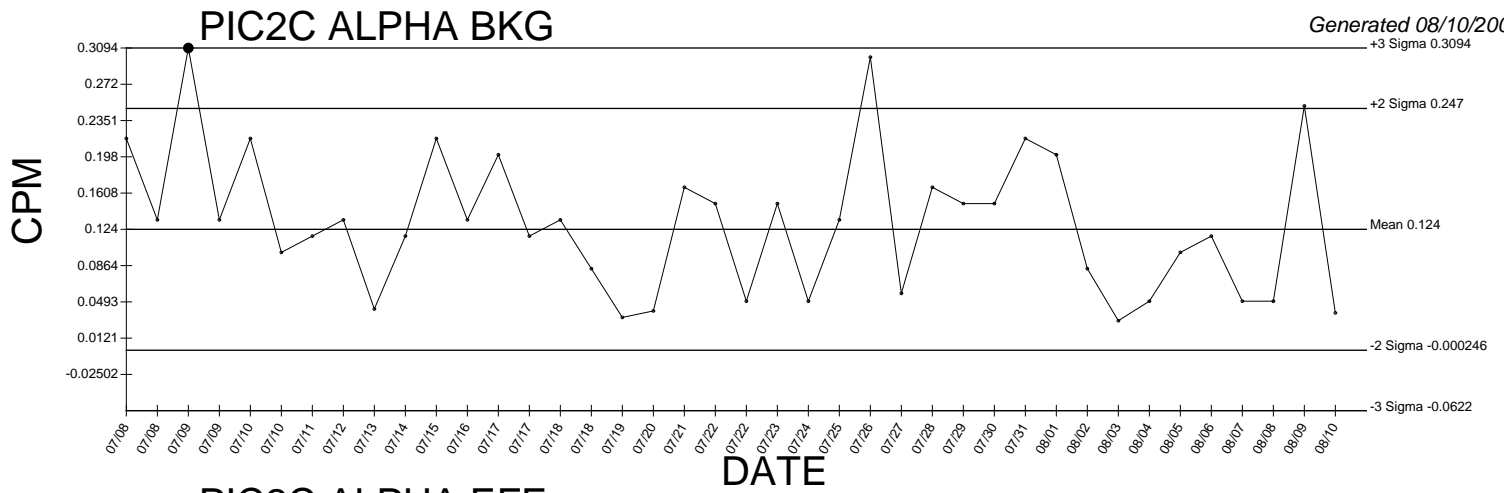
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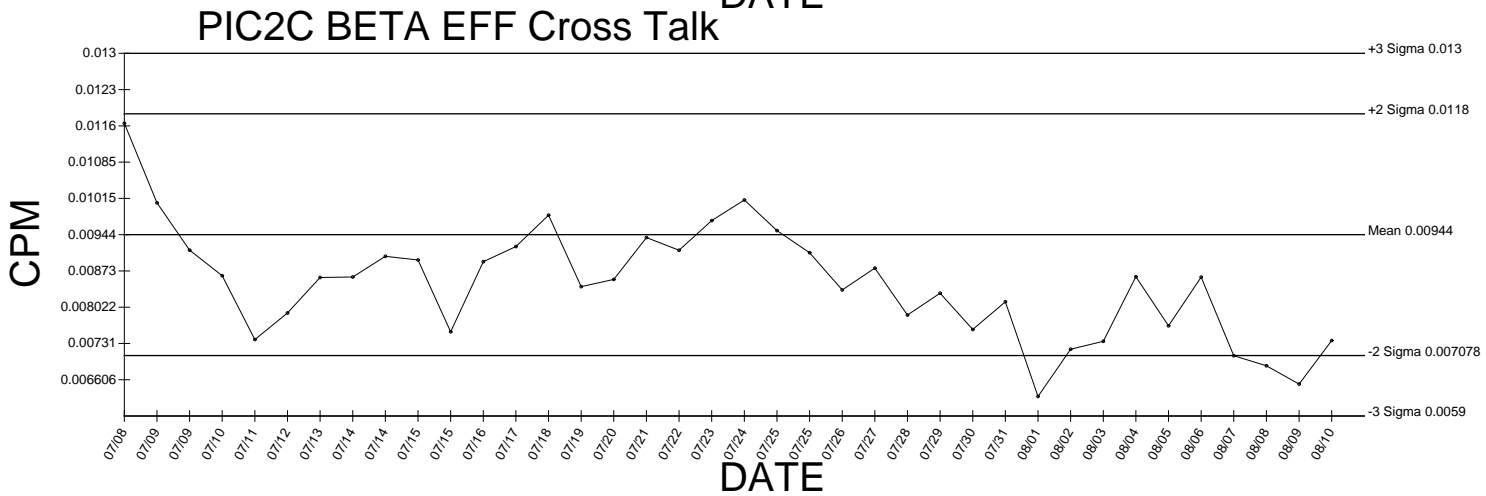
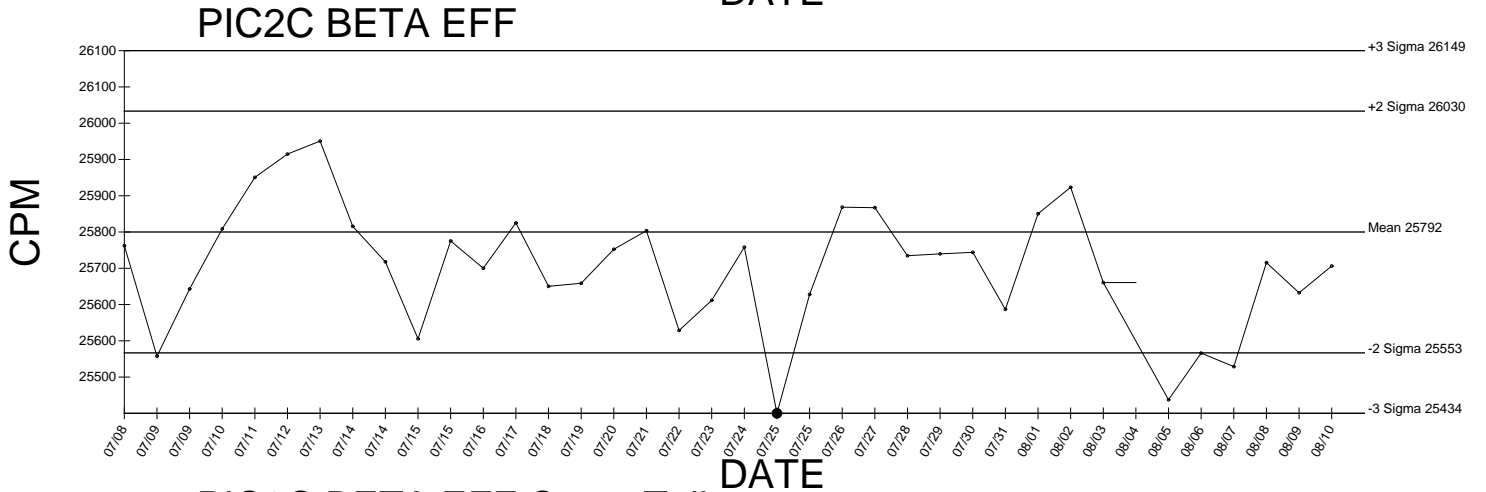
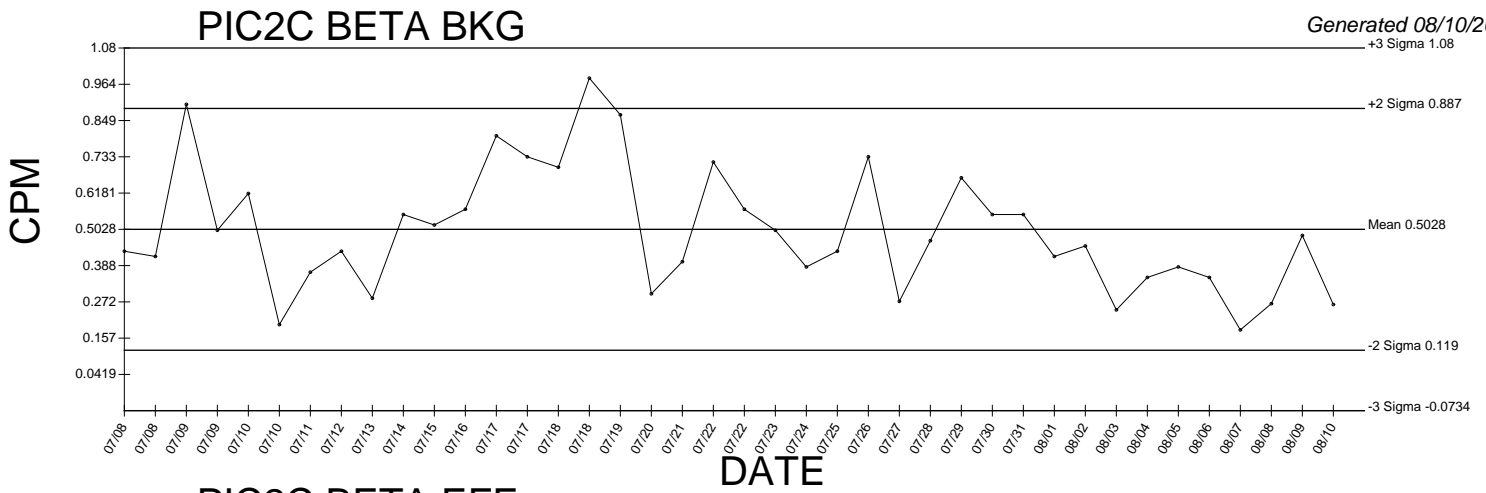
● Denotes Outlier



● Denotes Outlier

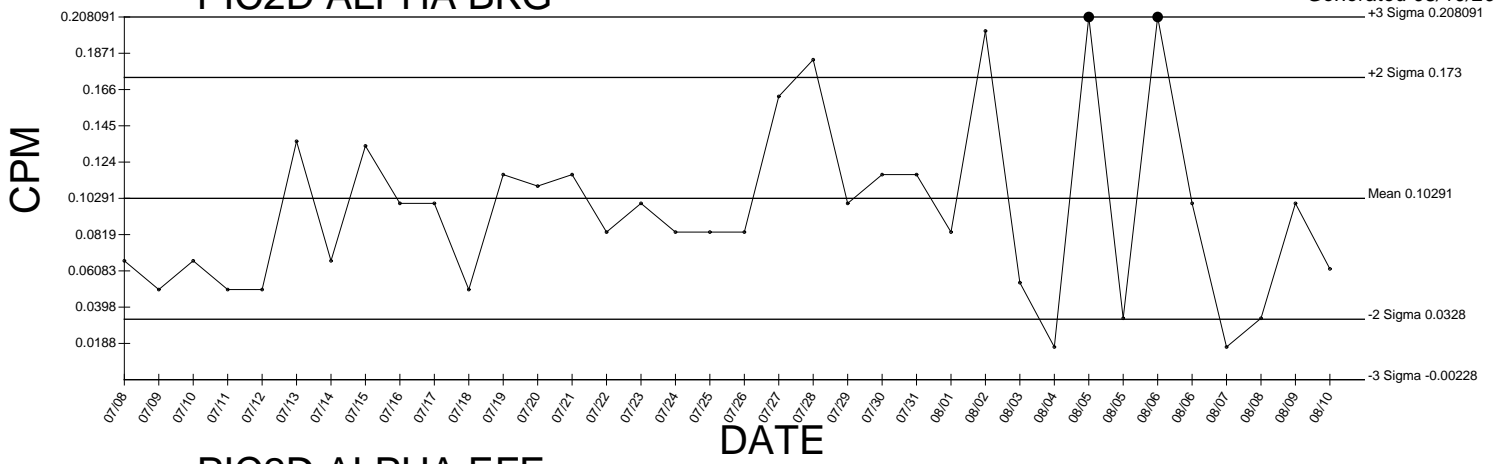


● Denotes Outlier

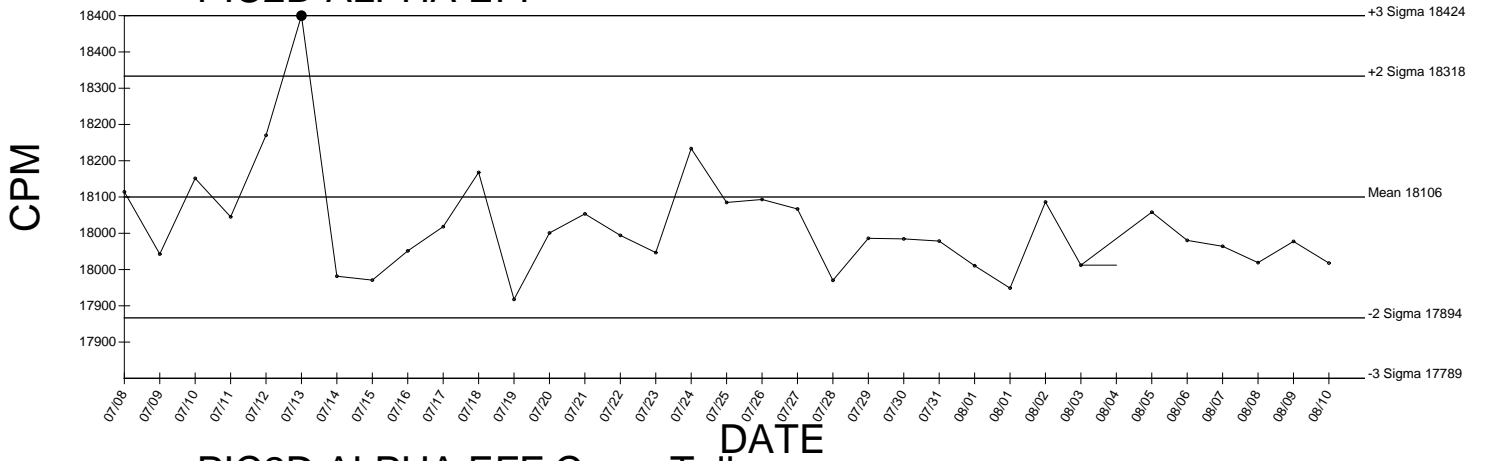


● Denotes Outlier

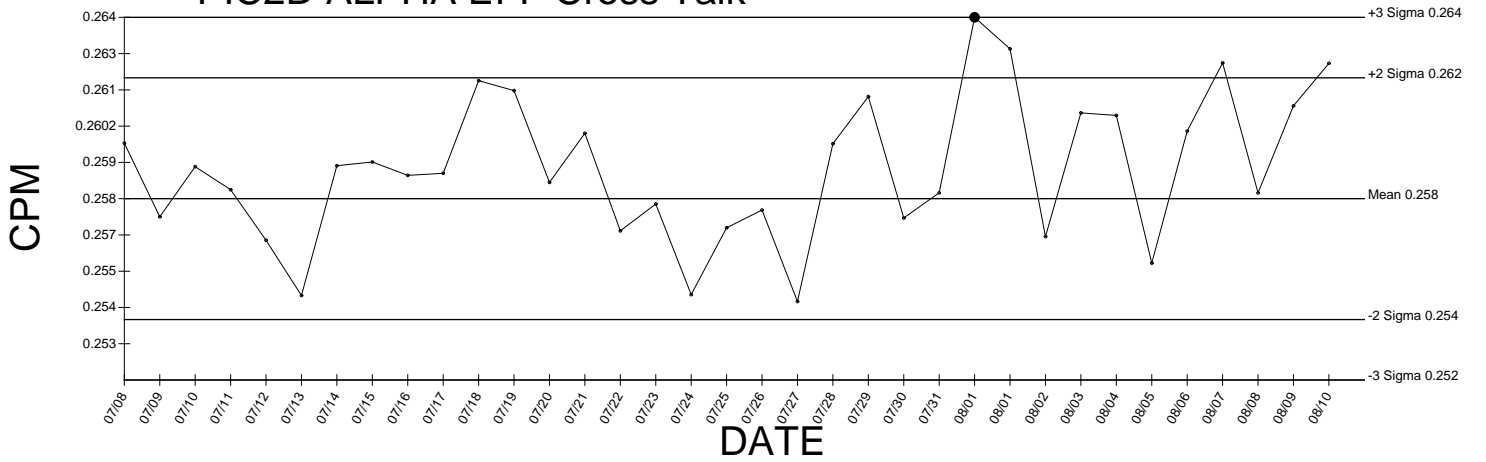
PIC2D ALPHA BKG



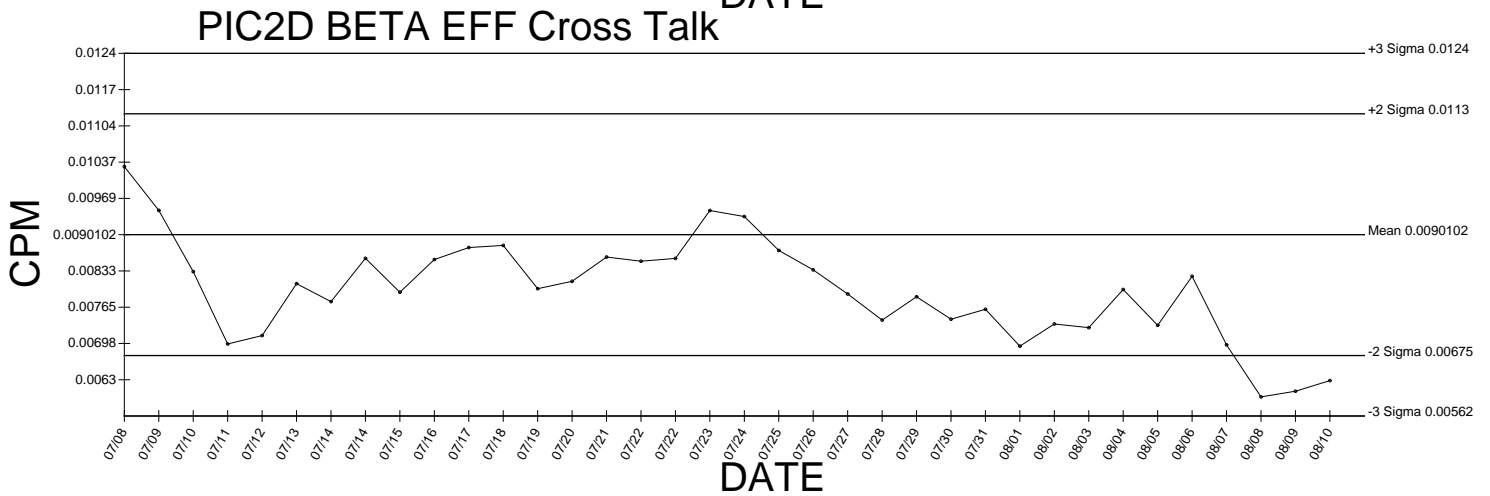
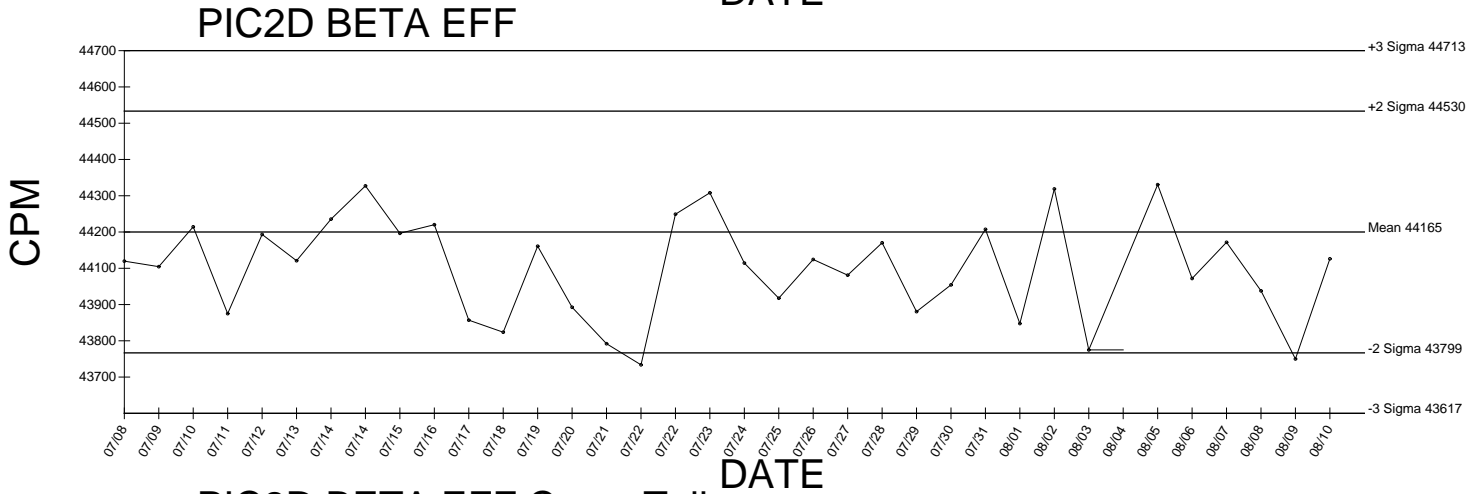
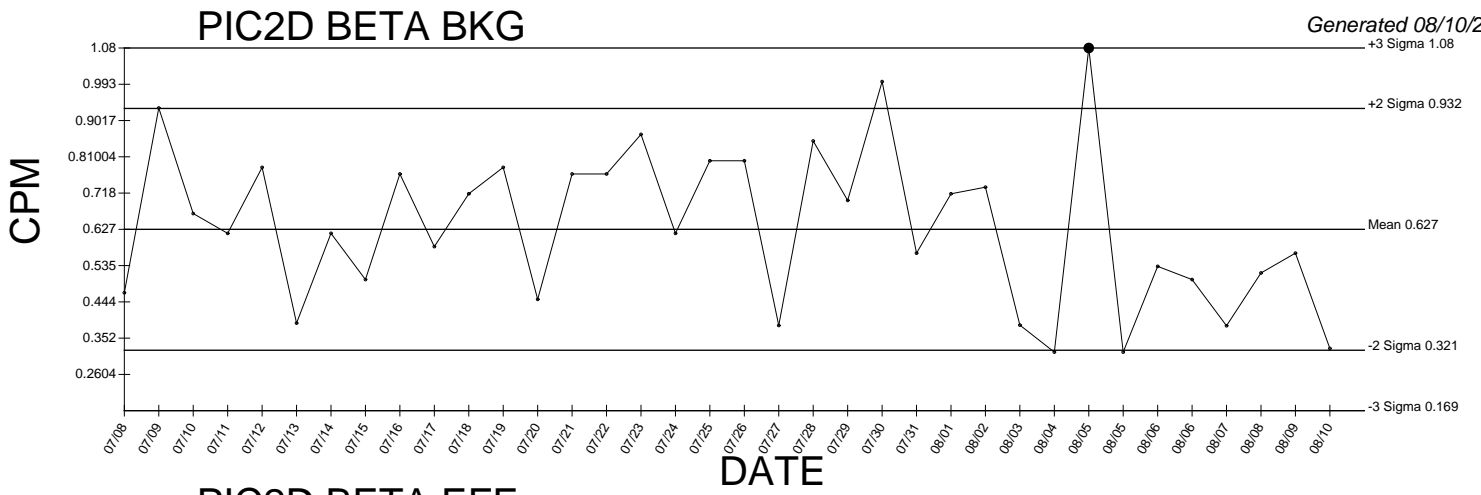
PIC2D ALPHA EFF



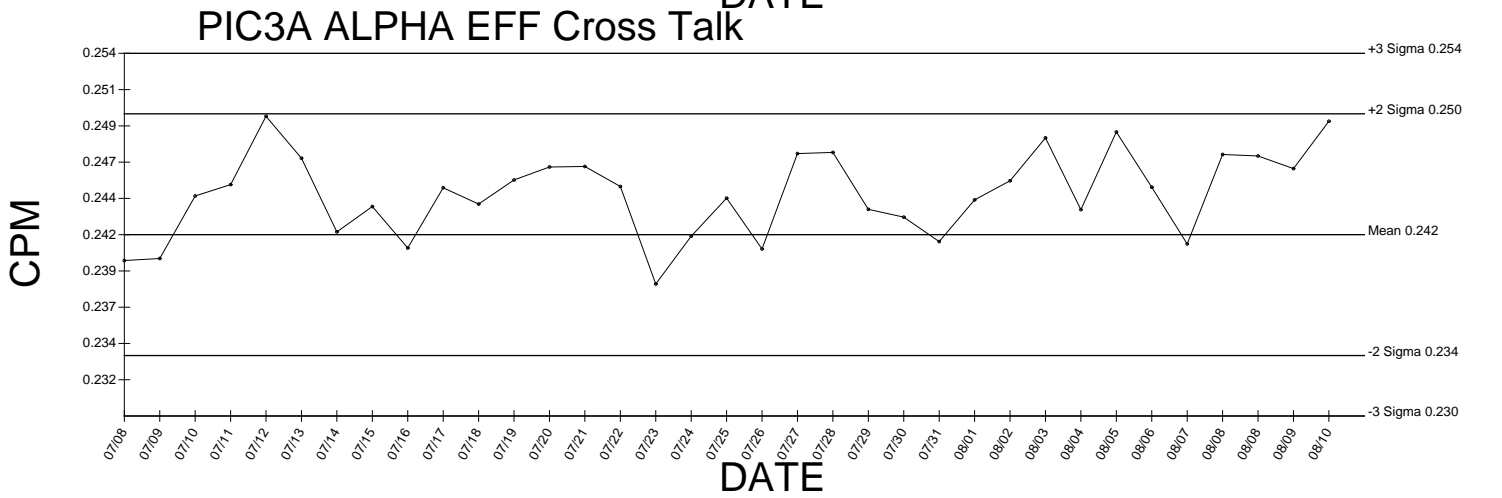
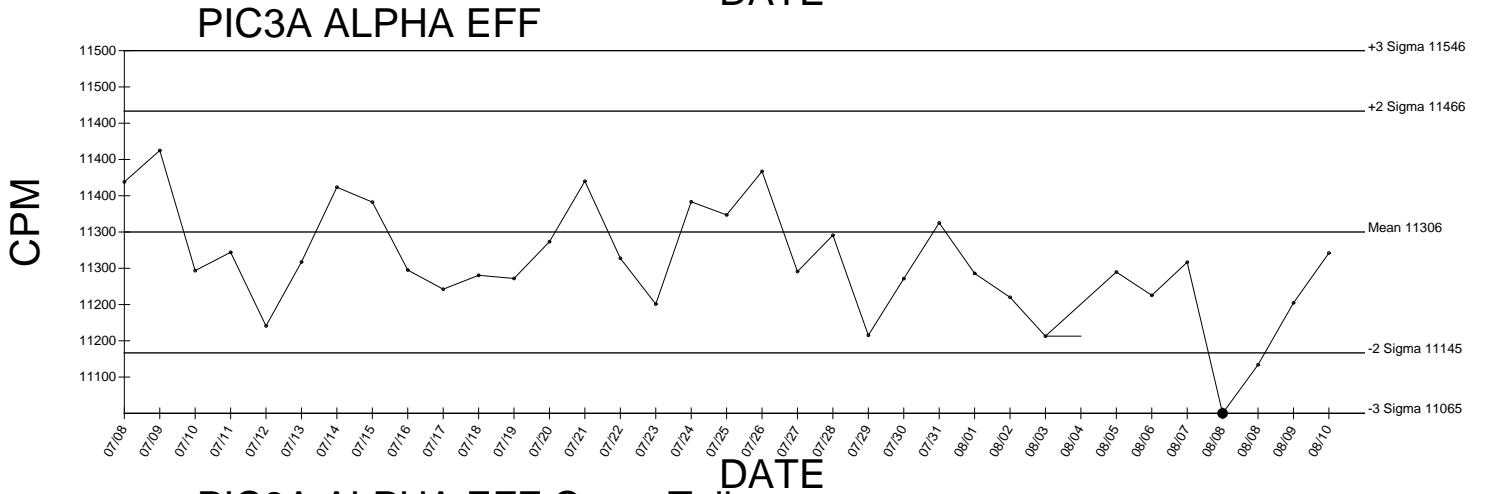
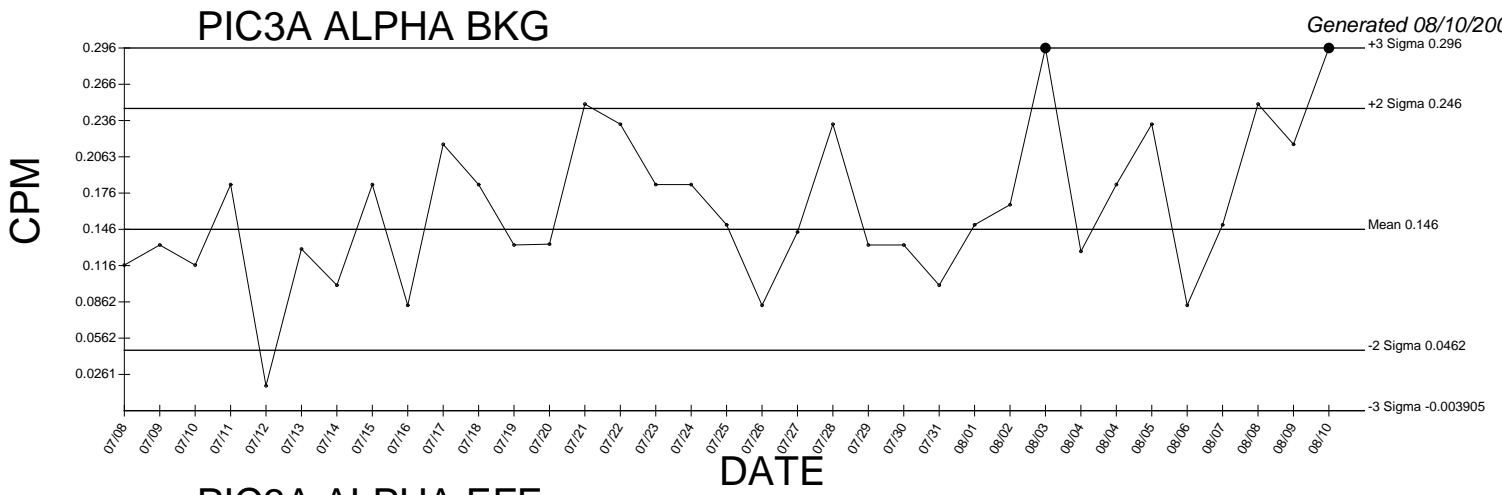
PIC2D ALPHA EFF Cross Talk



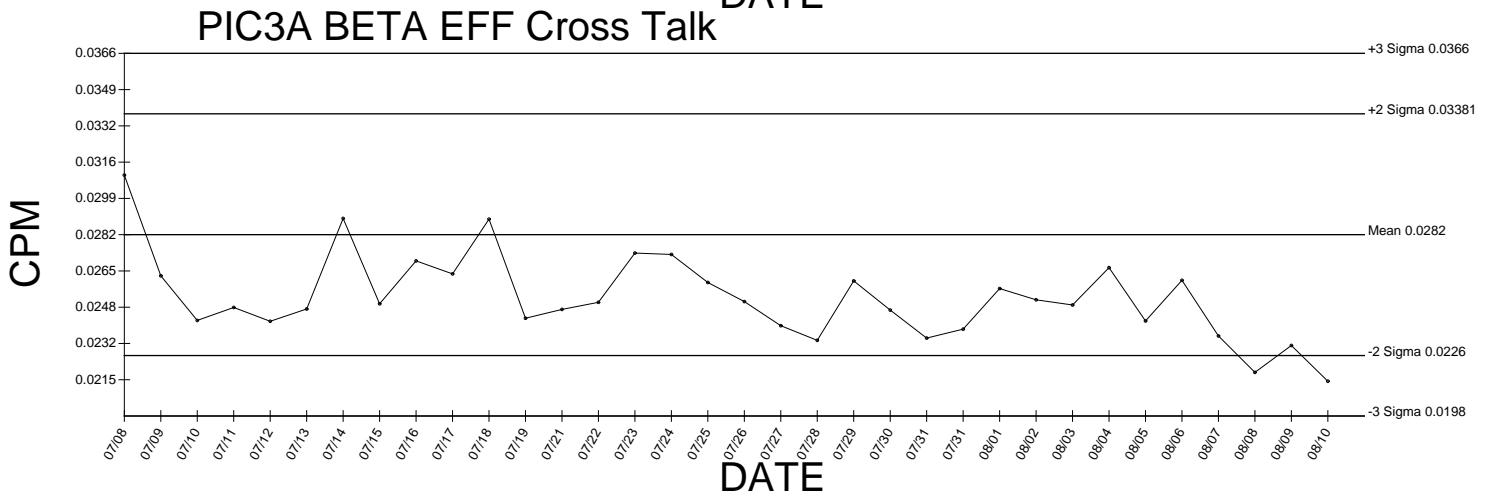
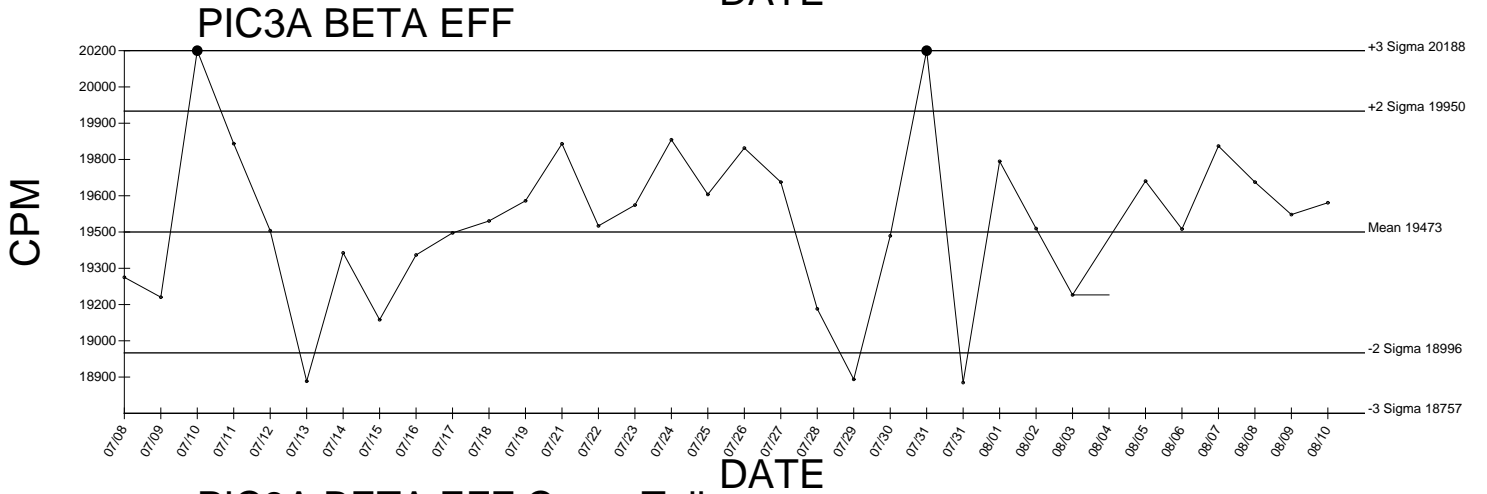
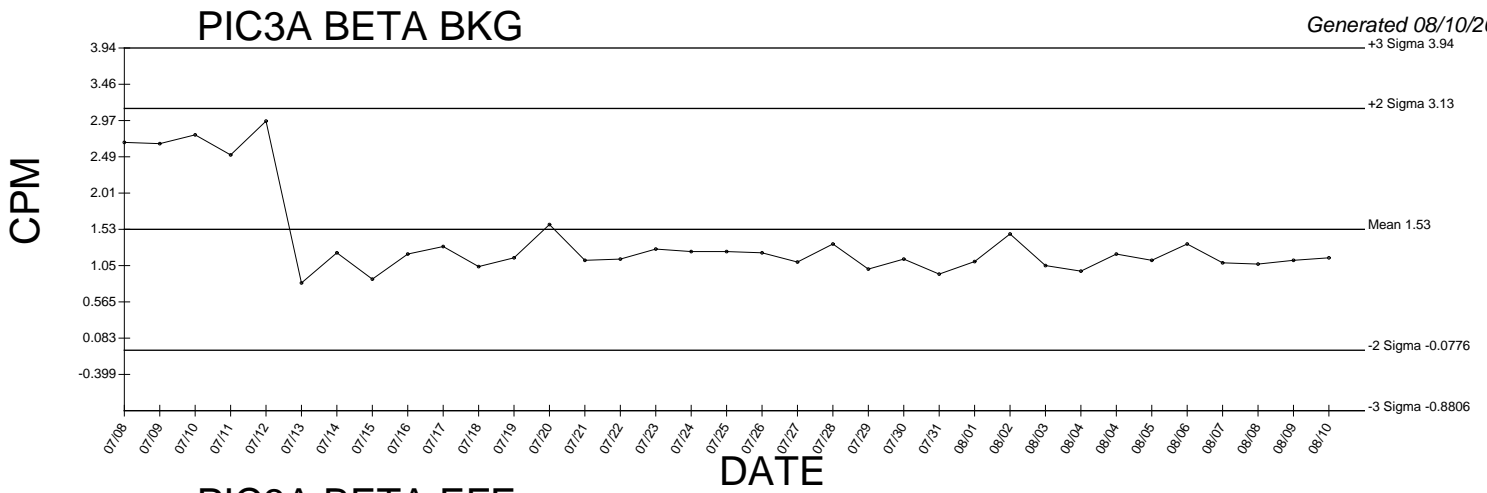
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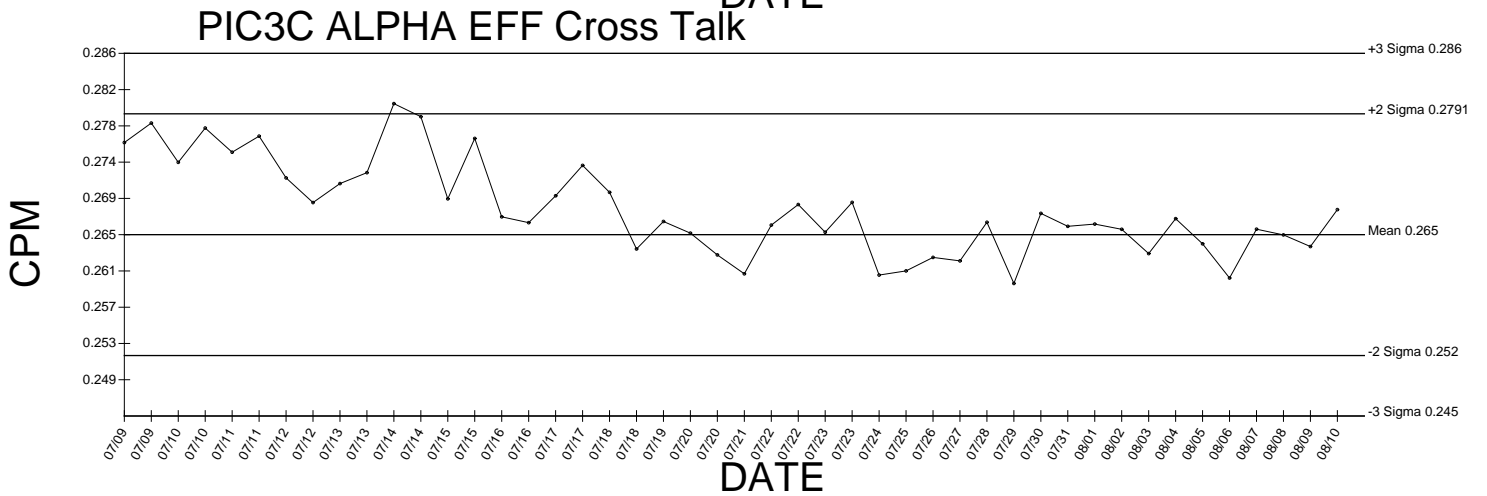
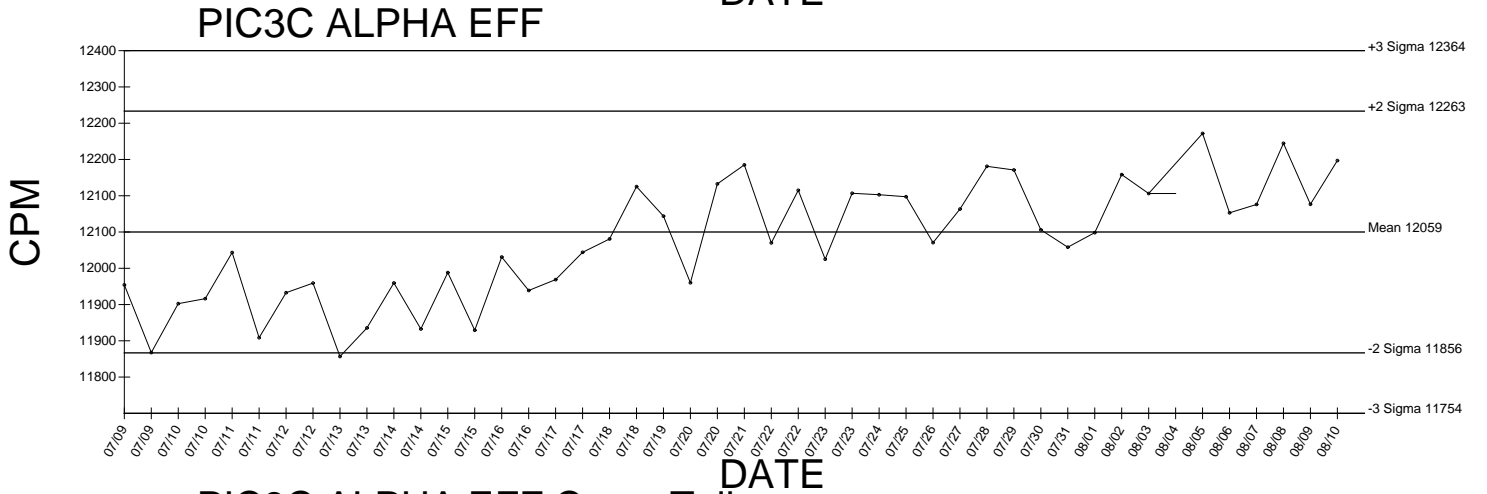
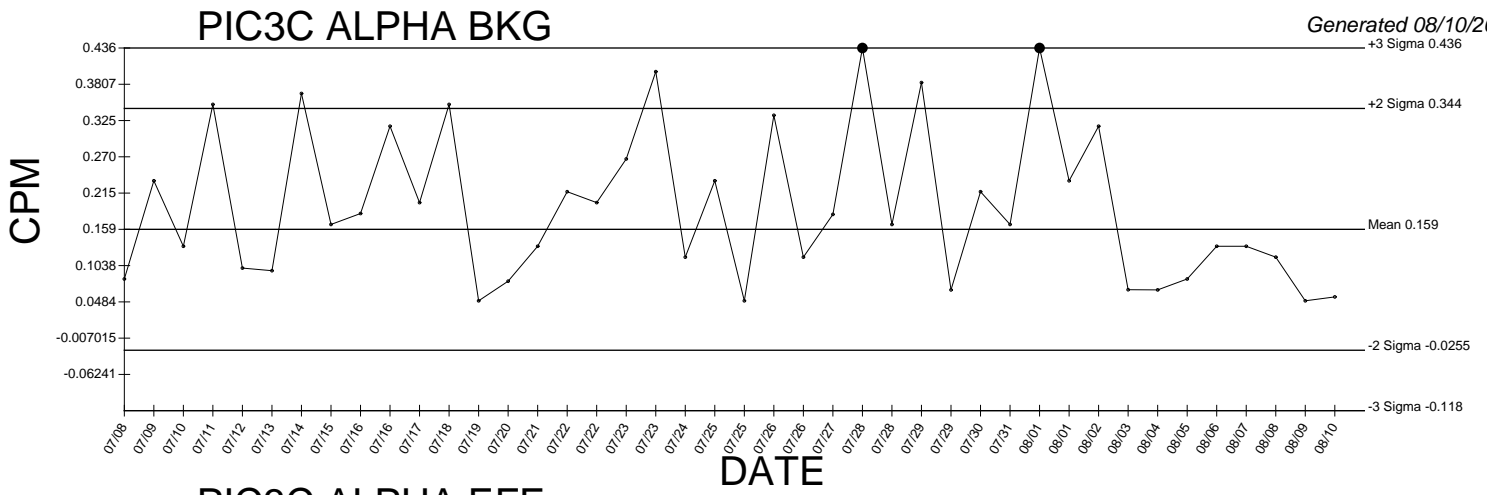
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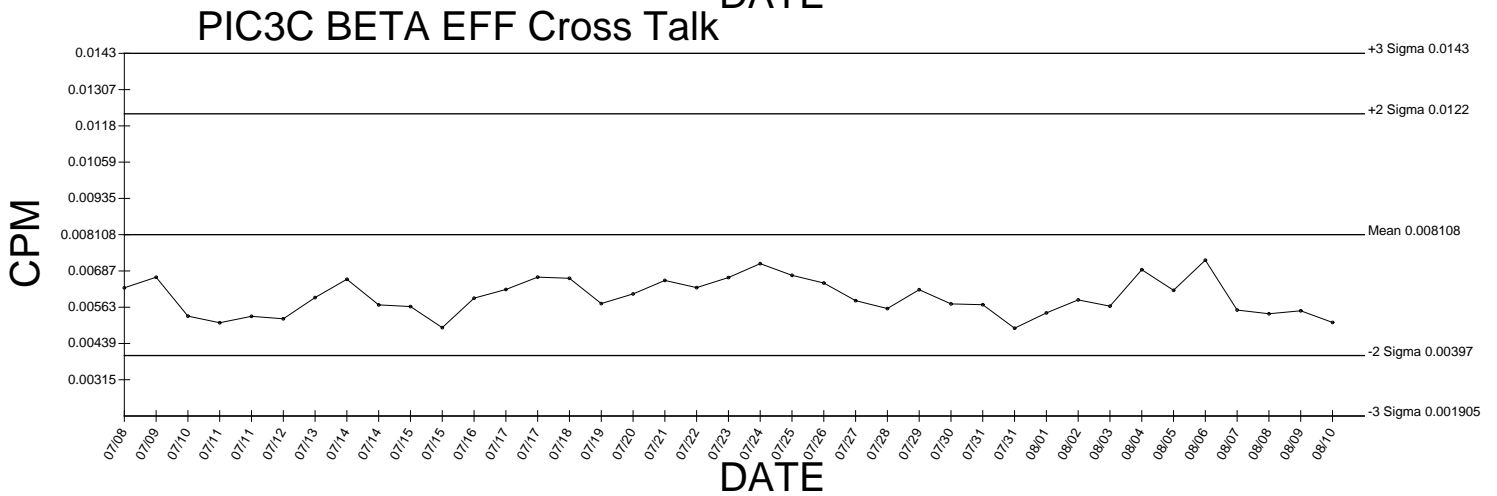
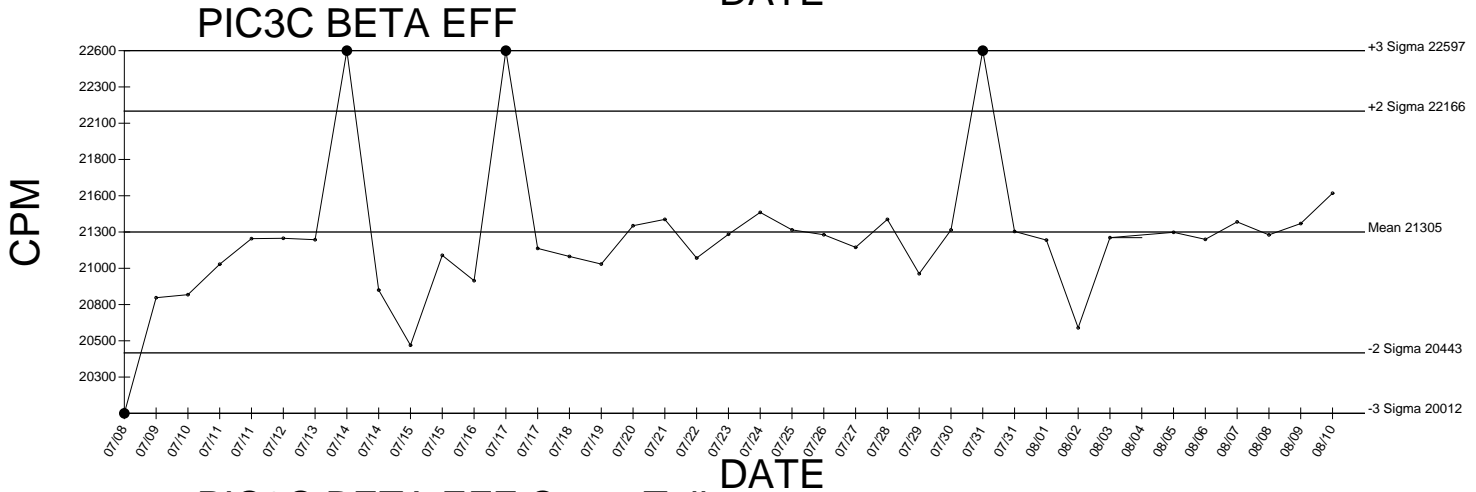
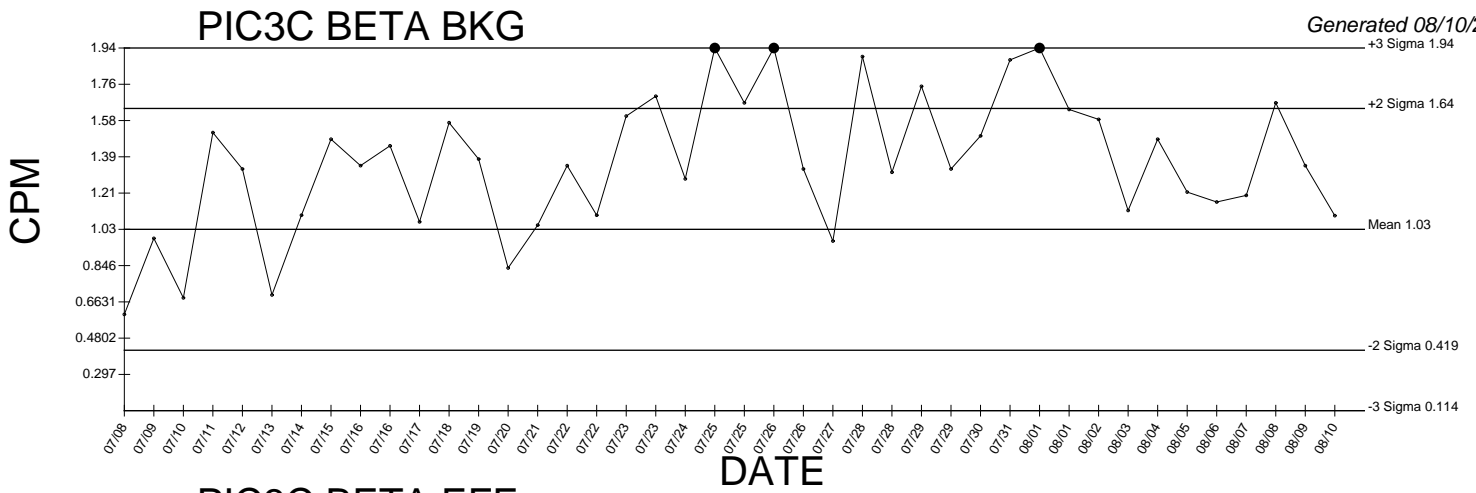
● Denotes Outlier



● Denotes Outlier

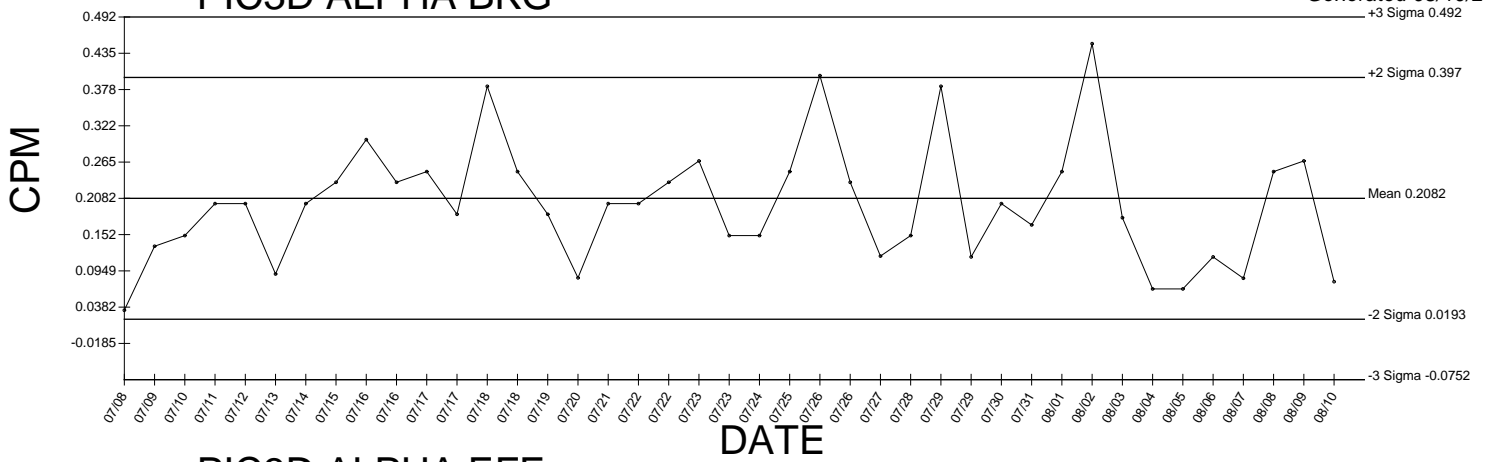


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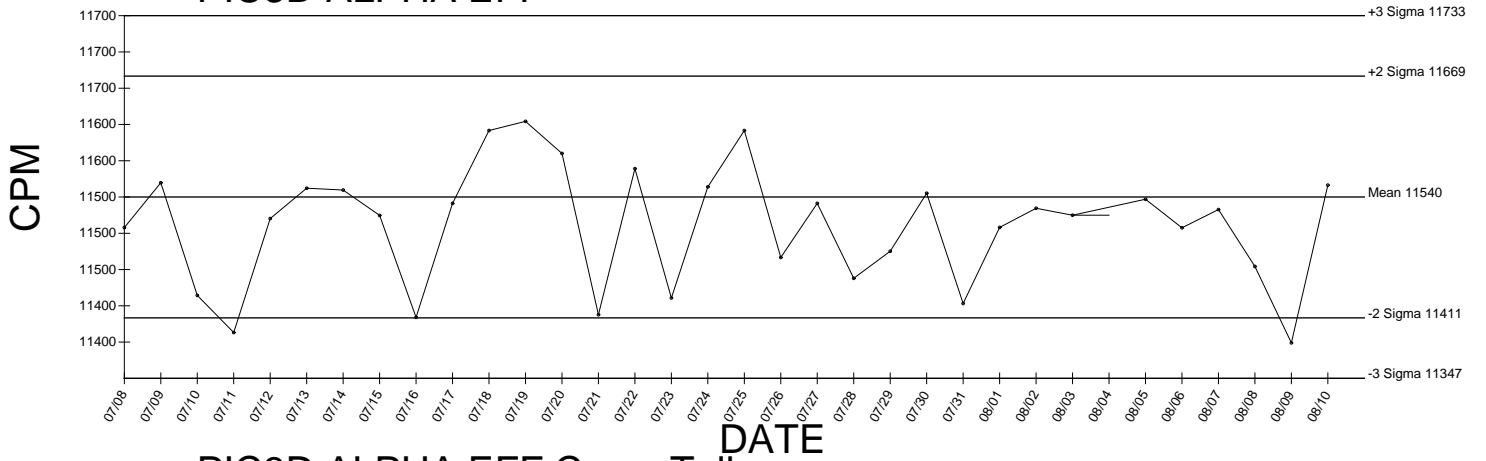


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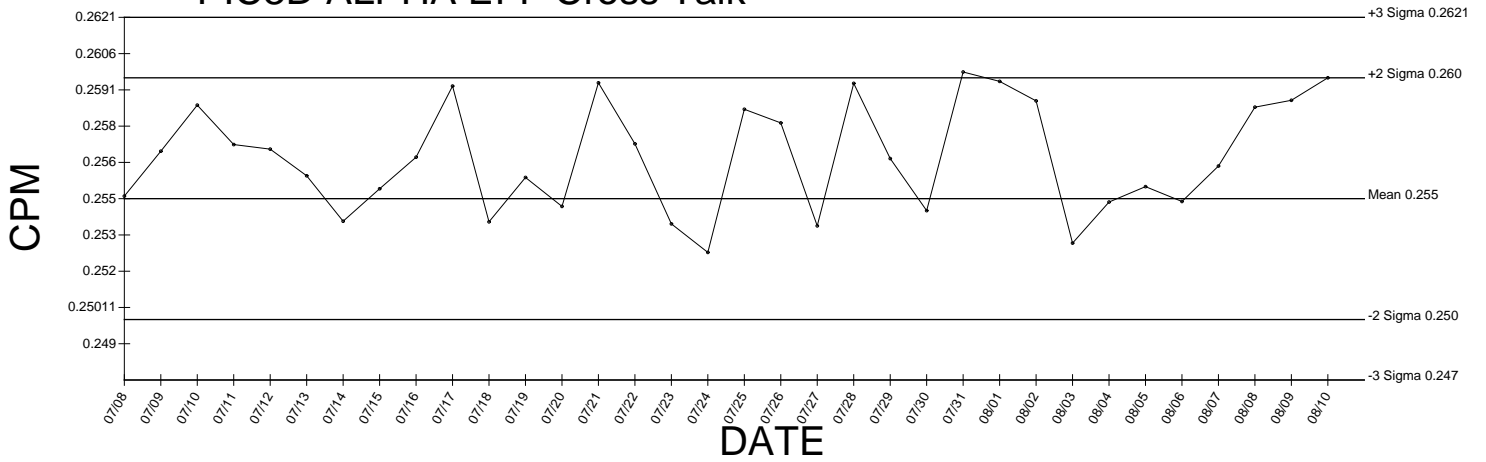
PIC3D ALPHA BKG



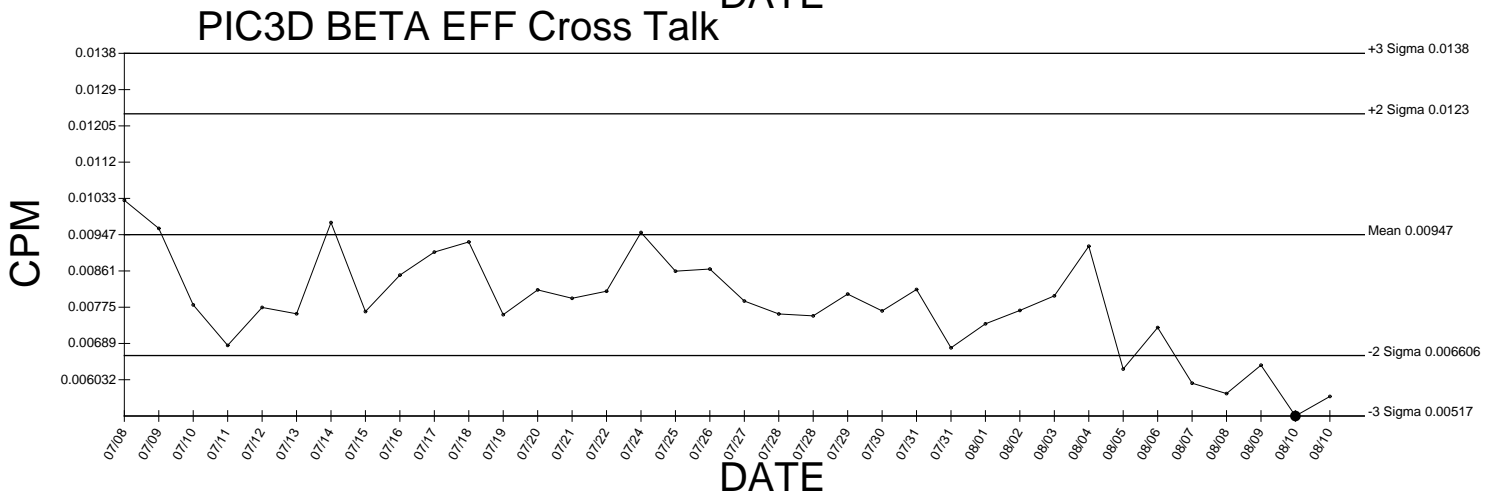
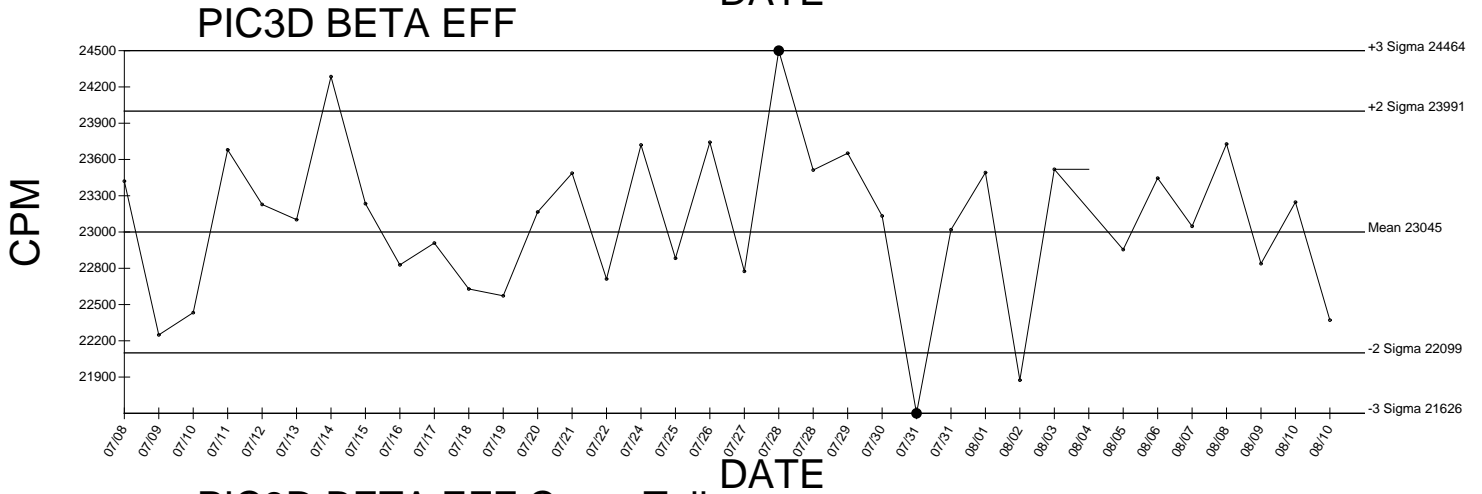
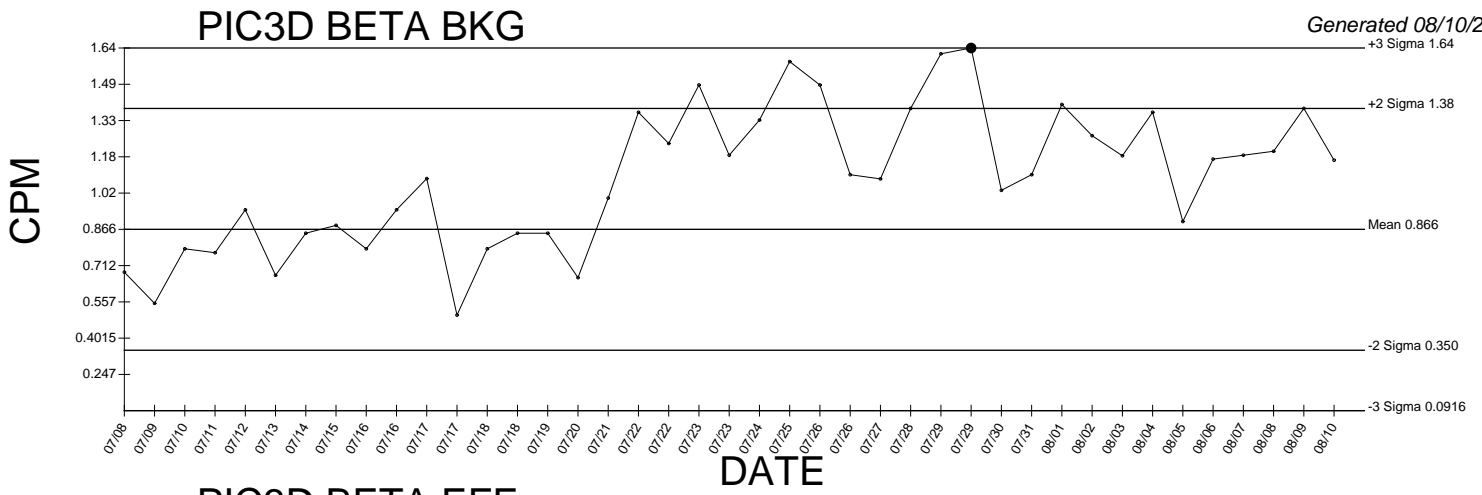
PIC3D ALPHA EFF



PIC3D ALPHA EFF Cross Talk



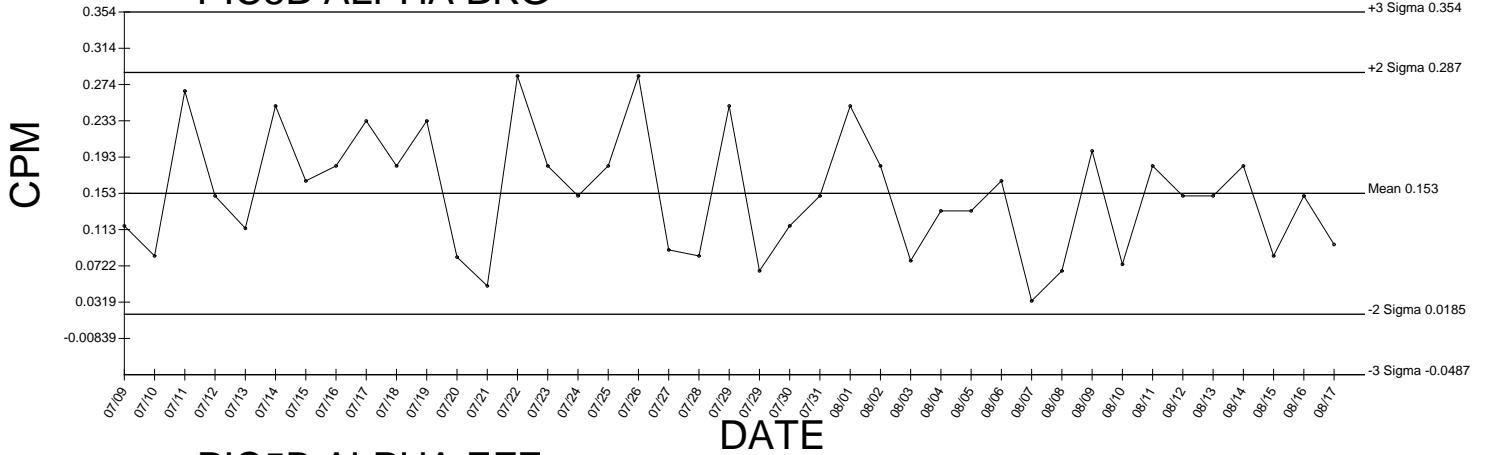
● Denotes Outlier



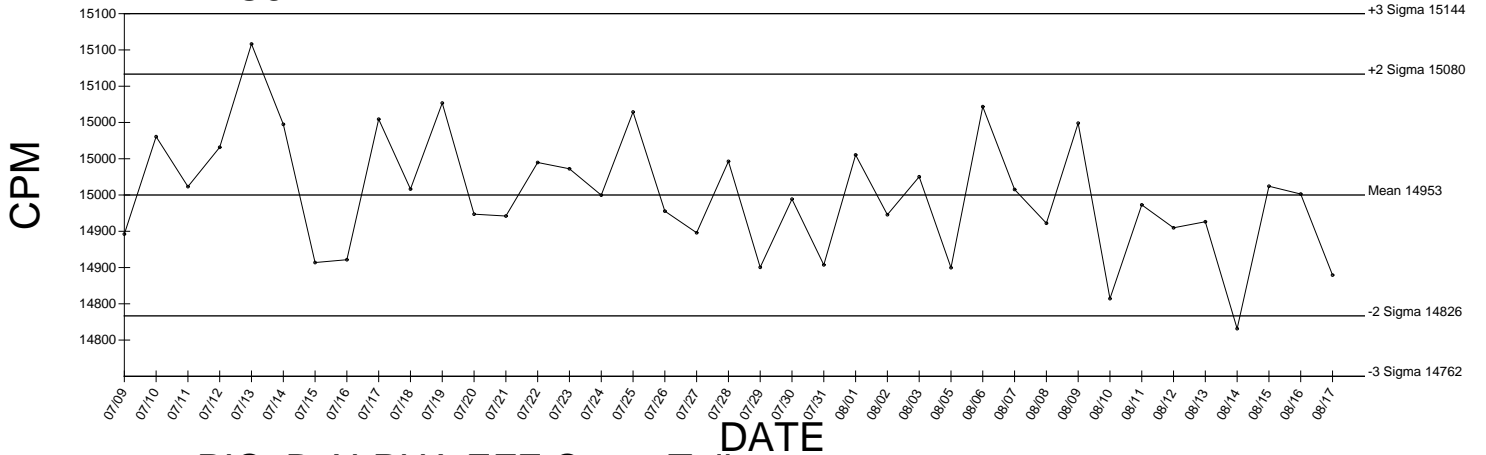
● Denotes Outlier

PIC5B ALPHA BKG

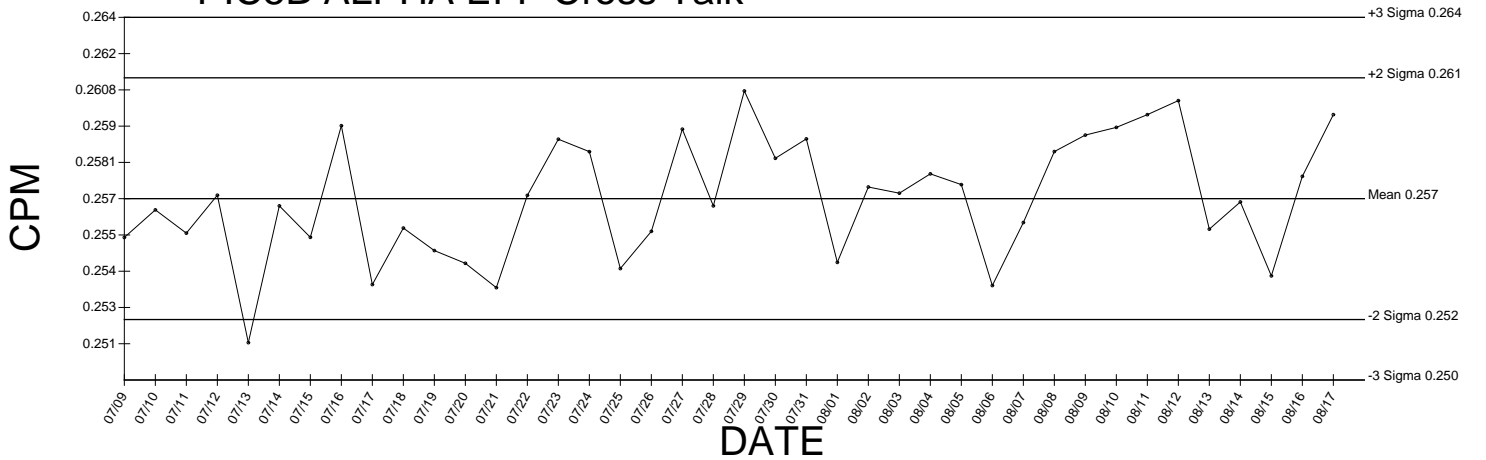
Generated 08/17/2009



PIC5B ALPHA EFF

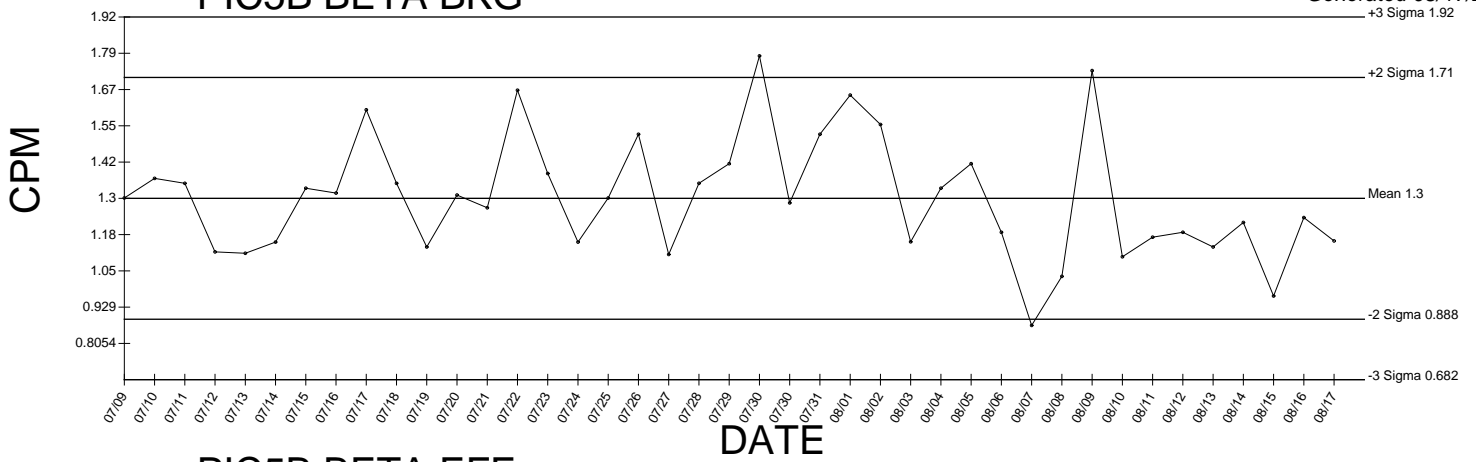


PIC5B ALPHA EFF Cross Talk

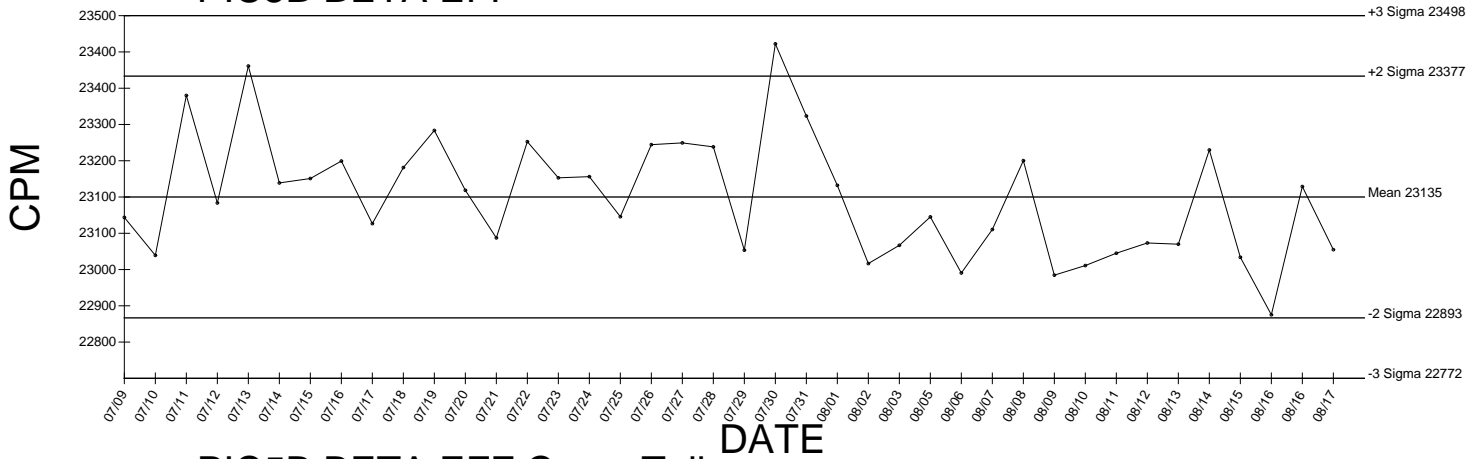


● Denotes Outlier

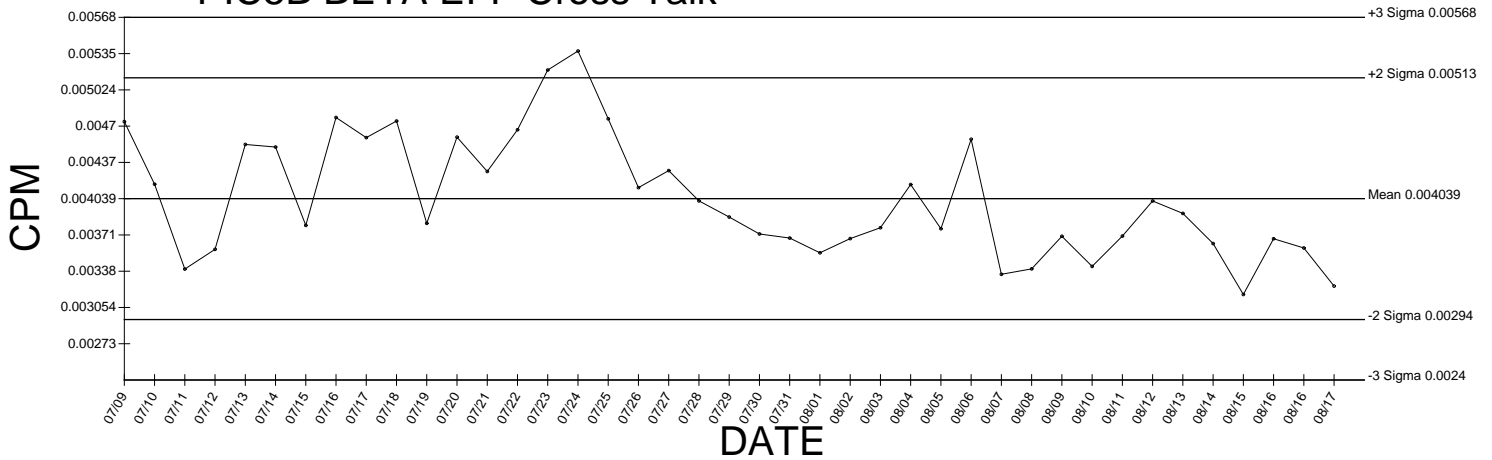
PIC5B BETA BKG



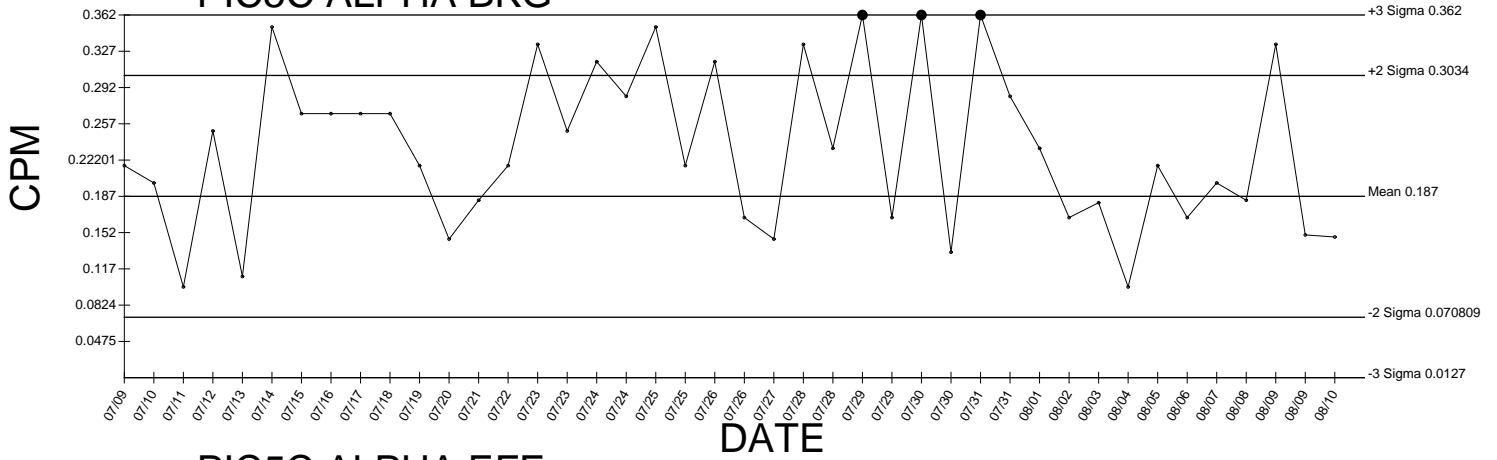
PIC5B BETA EFF



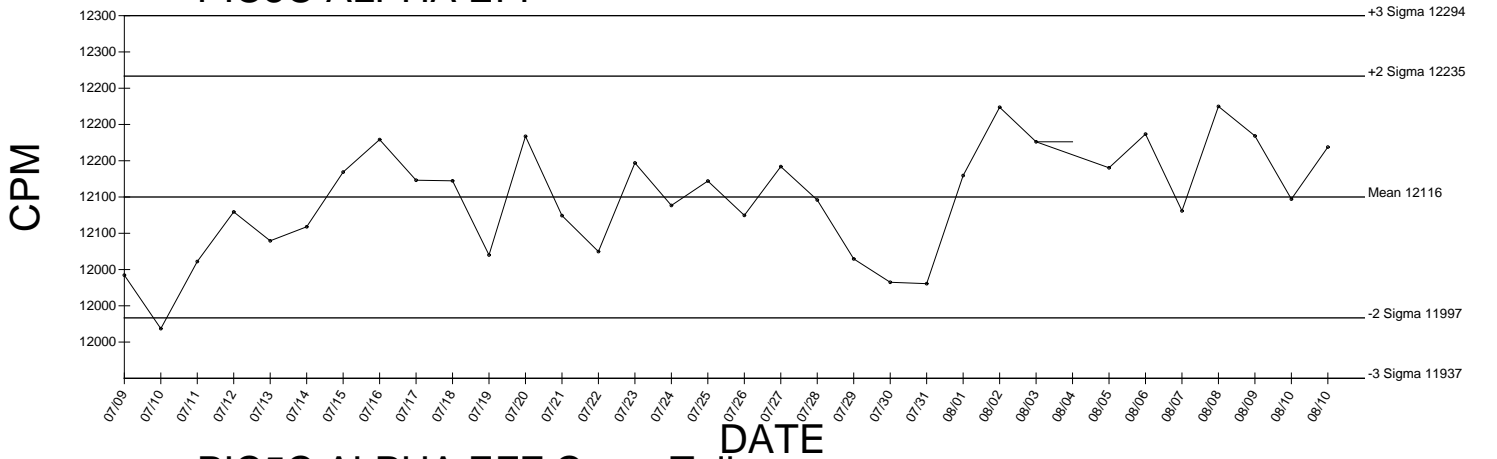
PIC5B BETA EFF Cross Talk



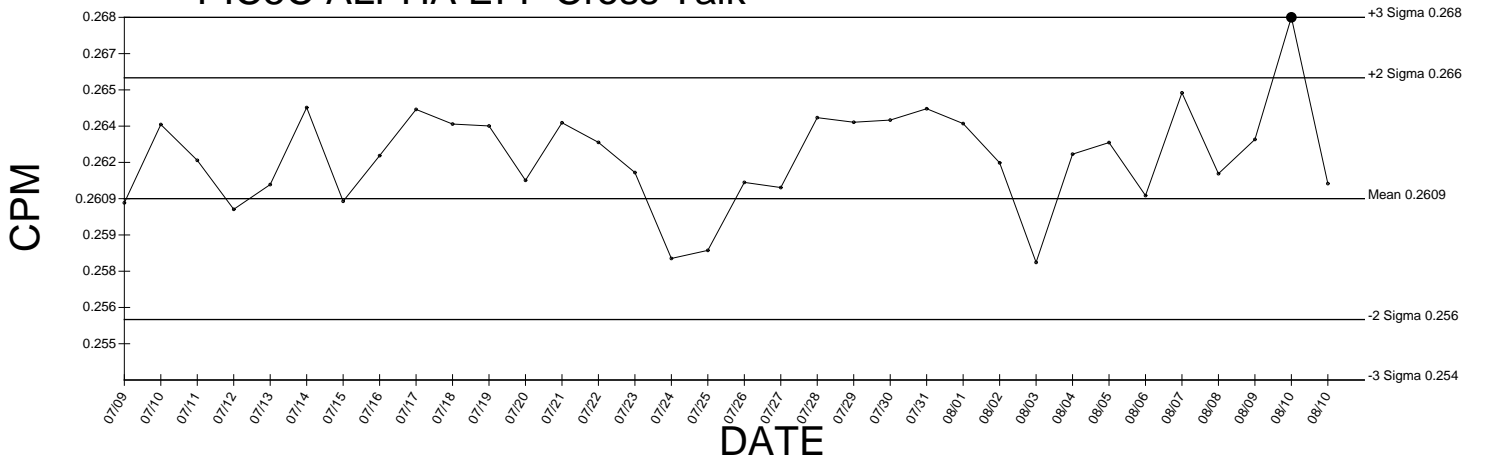
PIC5C ALPHA BKG



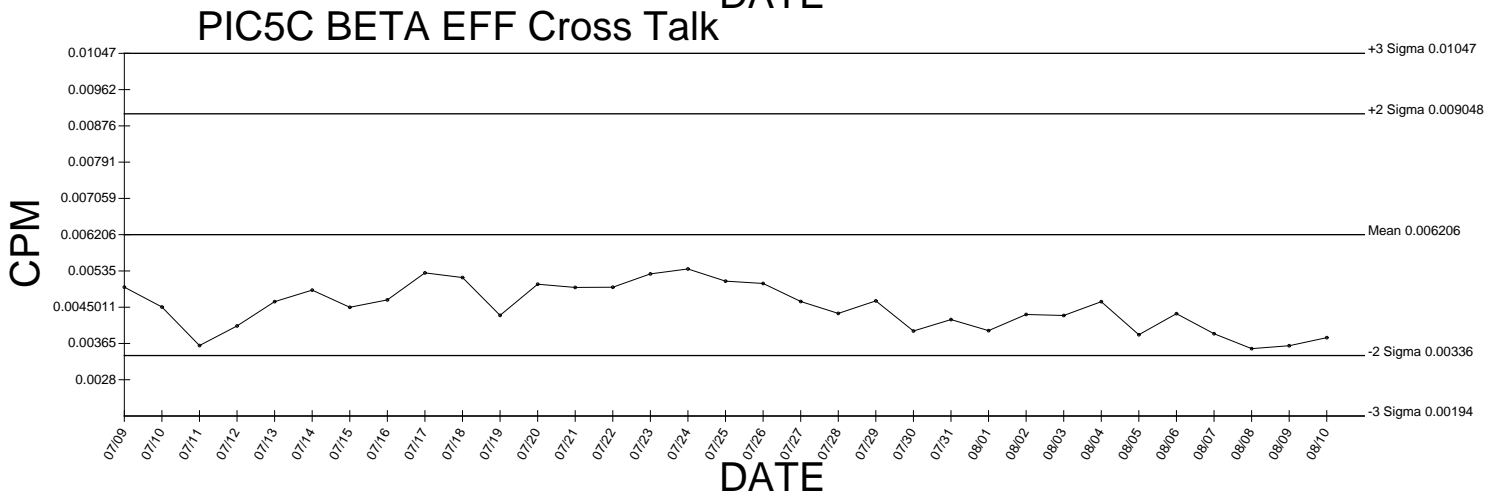
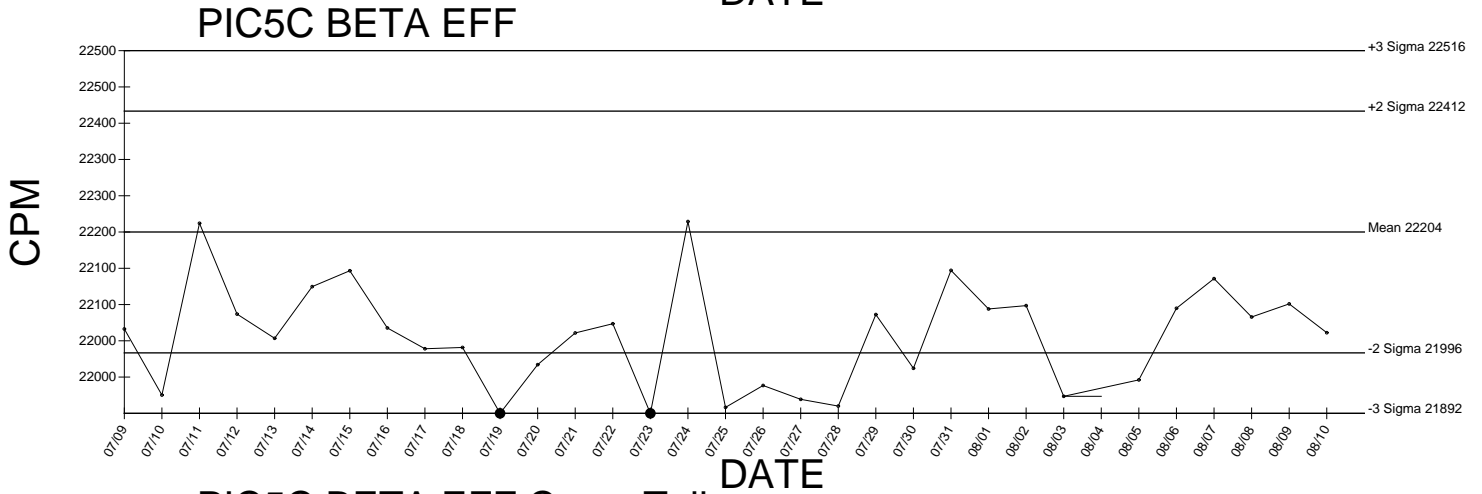
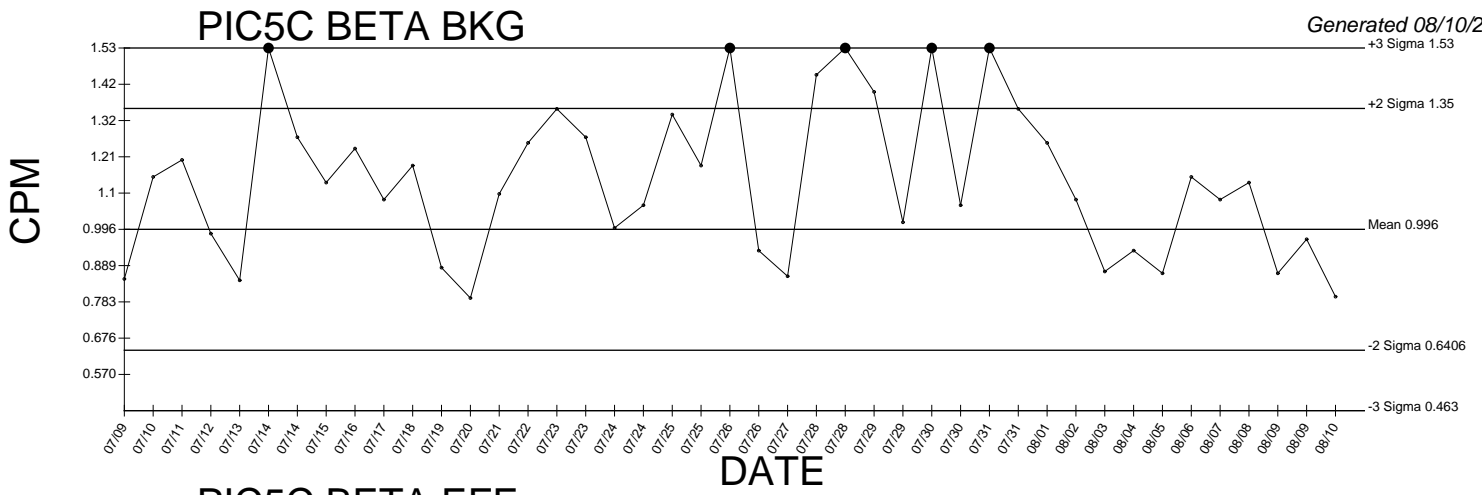
PIC5C ALPHA EFF



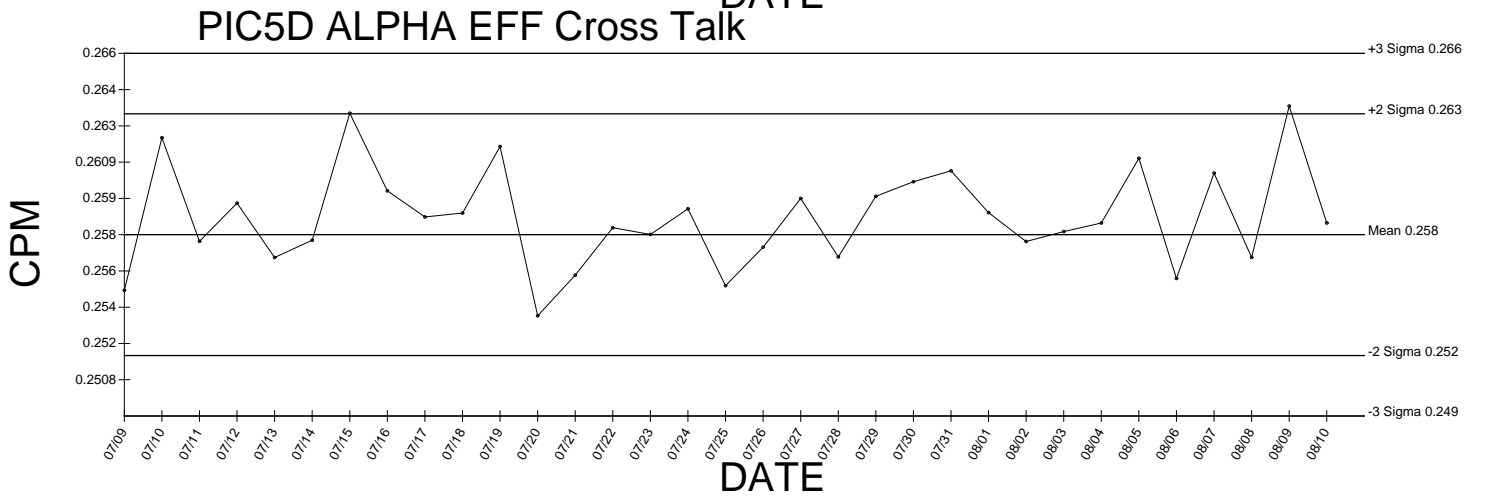
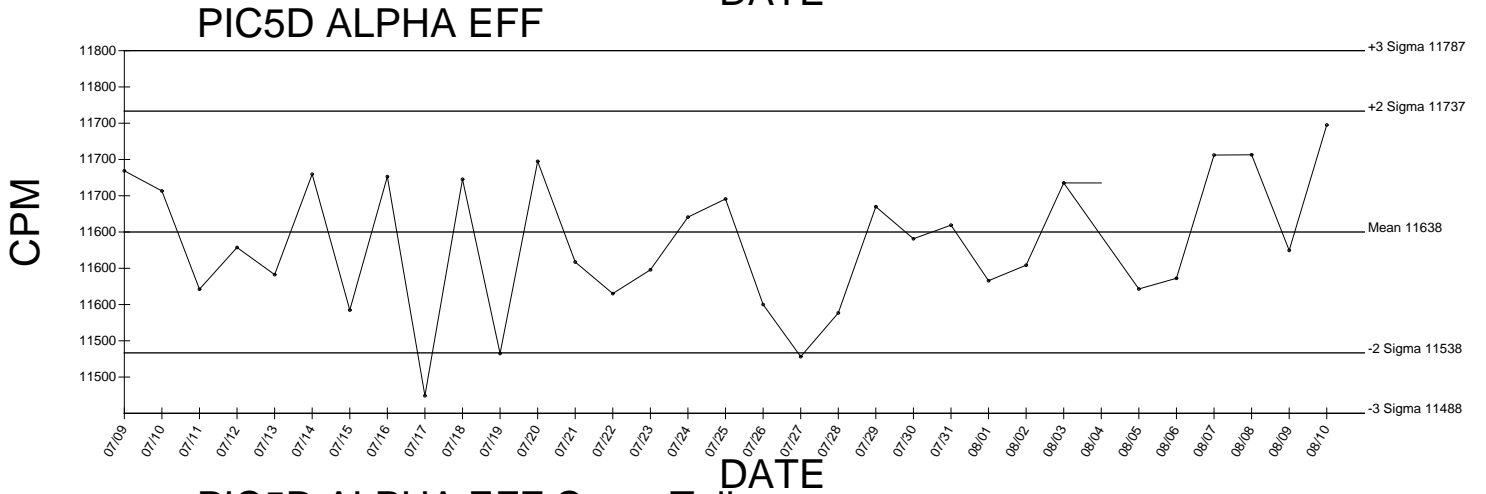
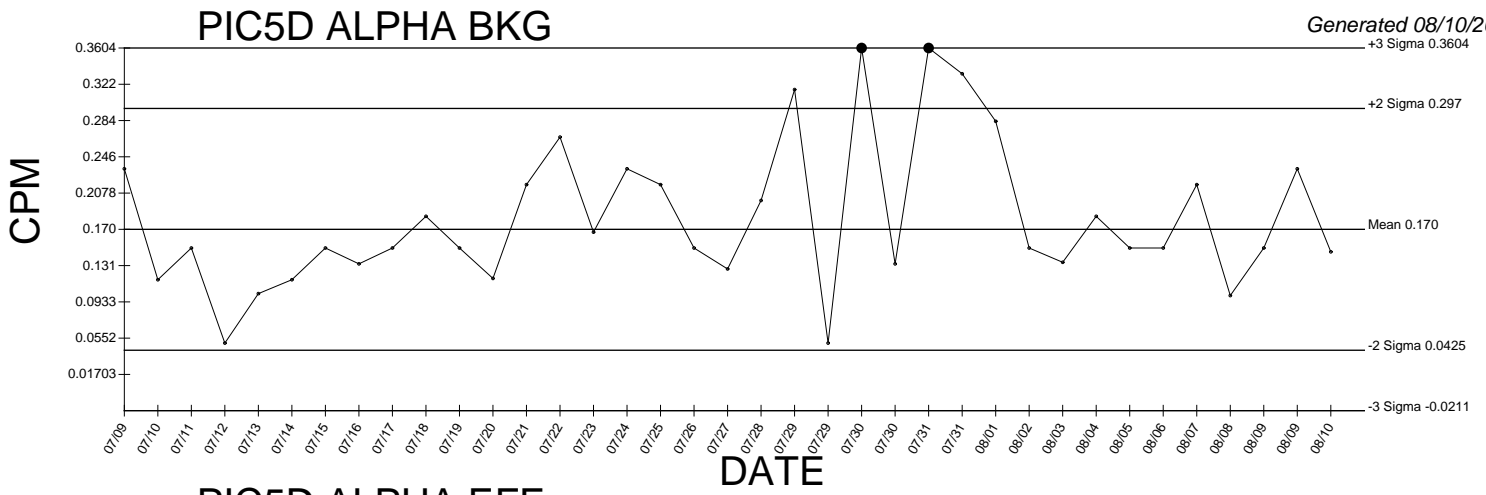
PIC5C ALPHA EFF Cross Talk



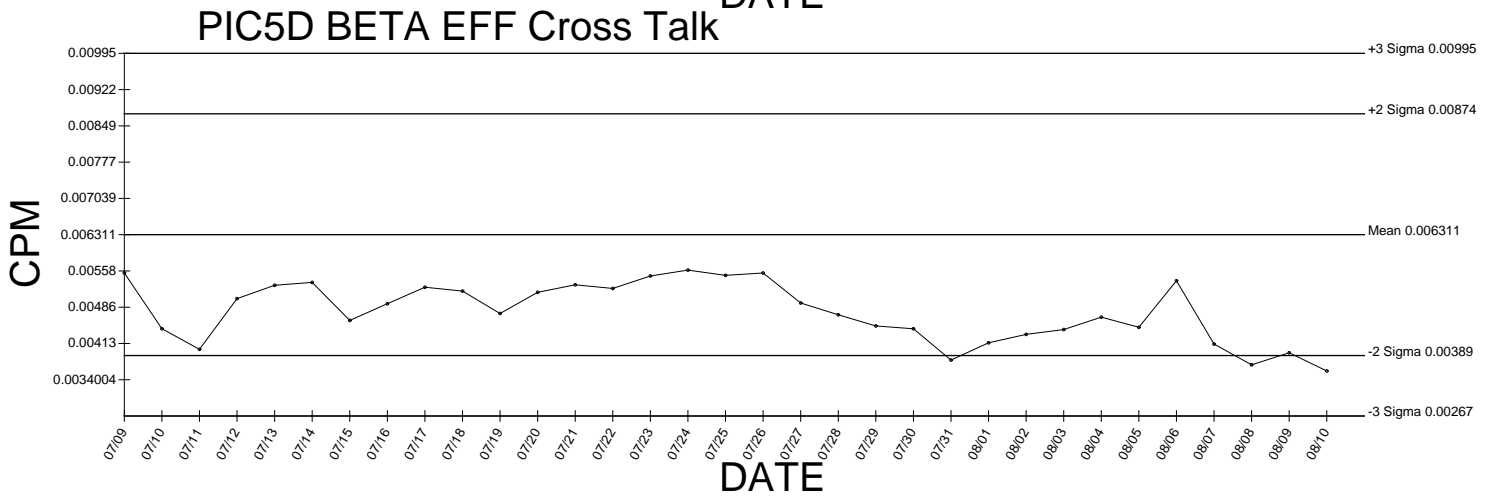
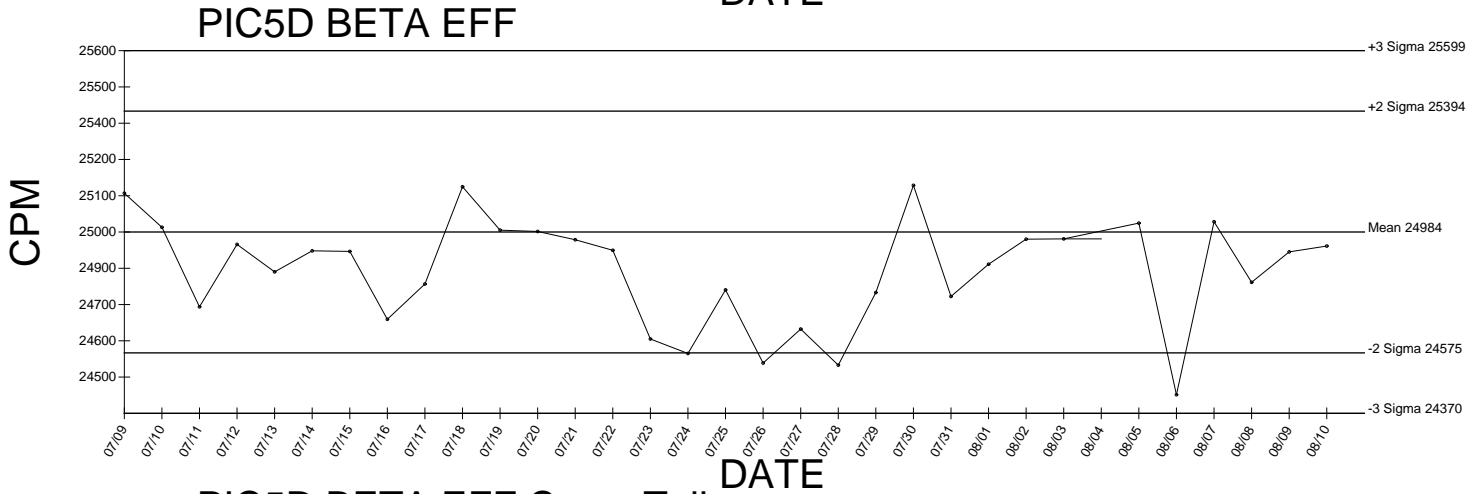
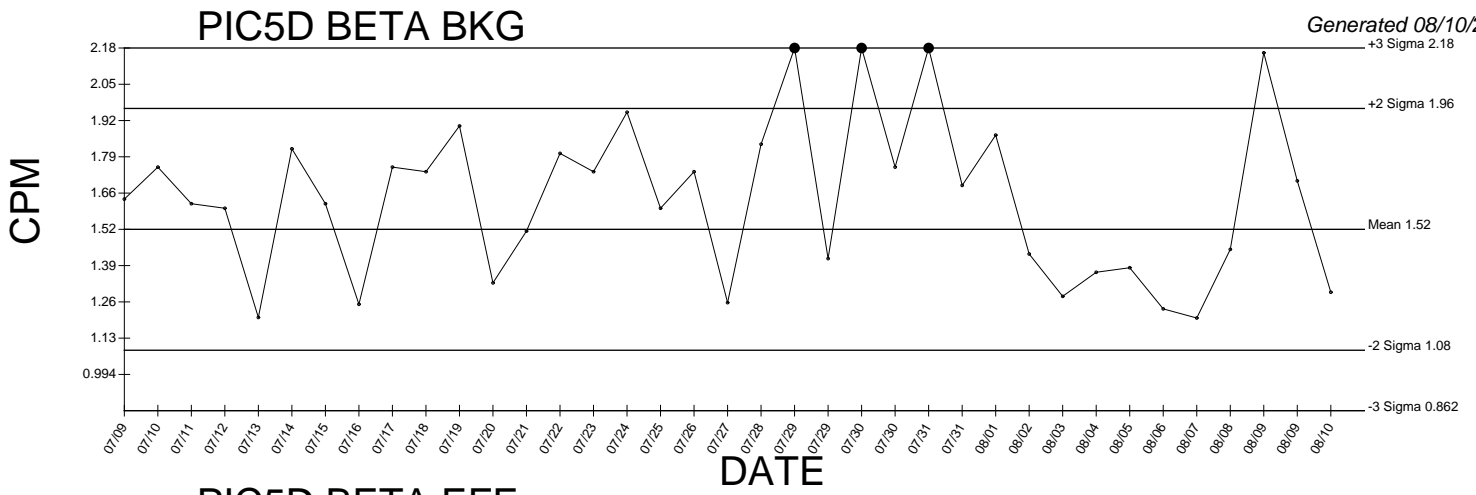
● Denotes Outlier



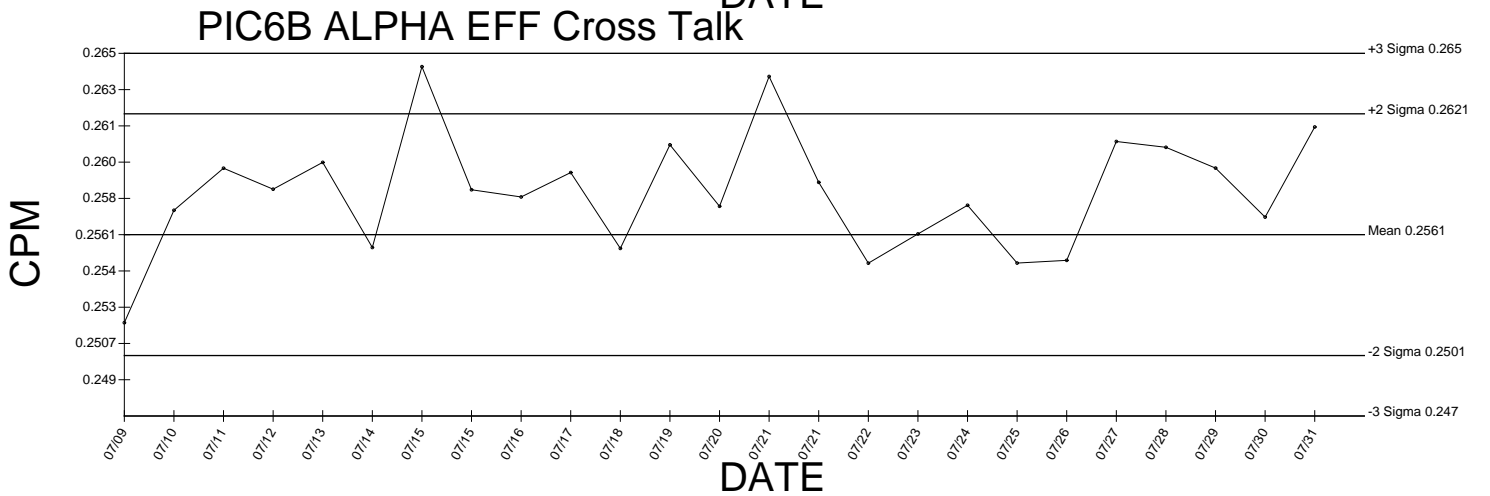
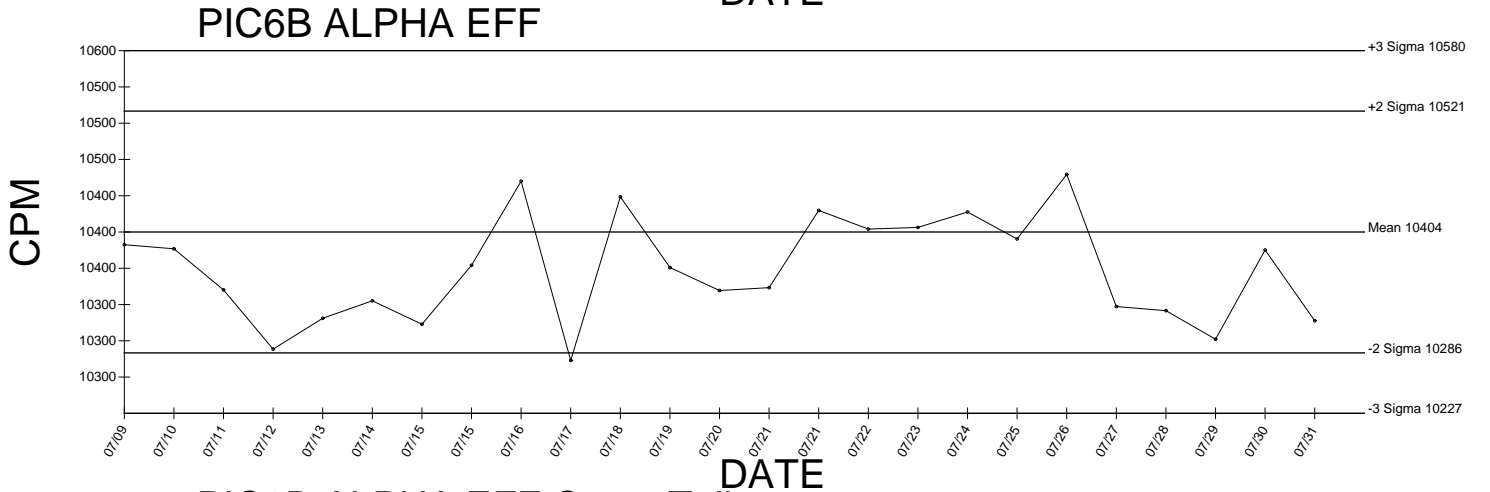
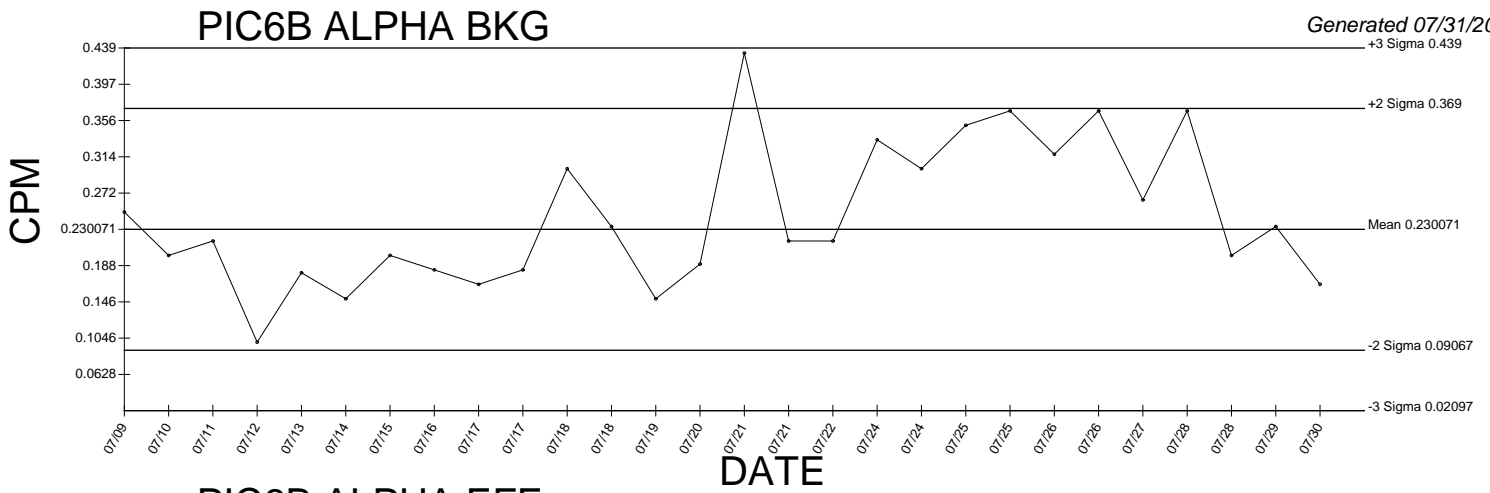
● Denotes Outlier



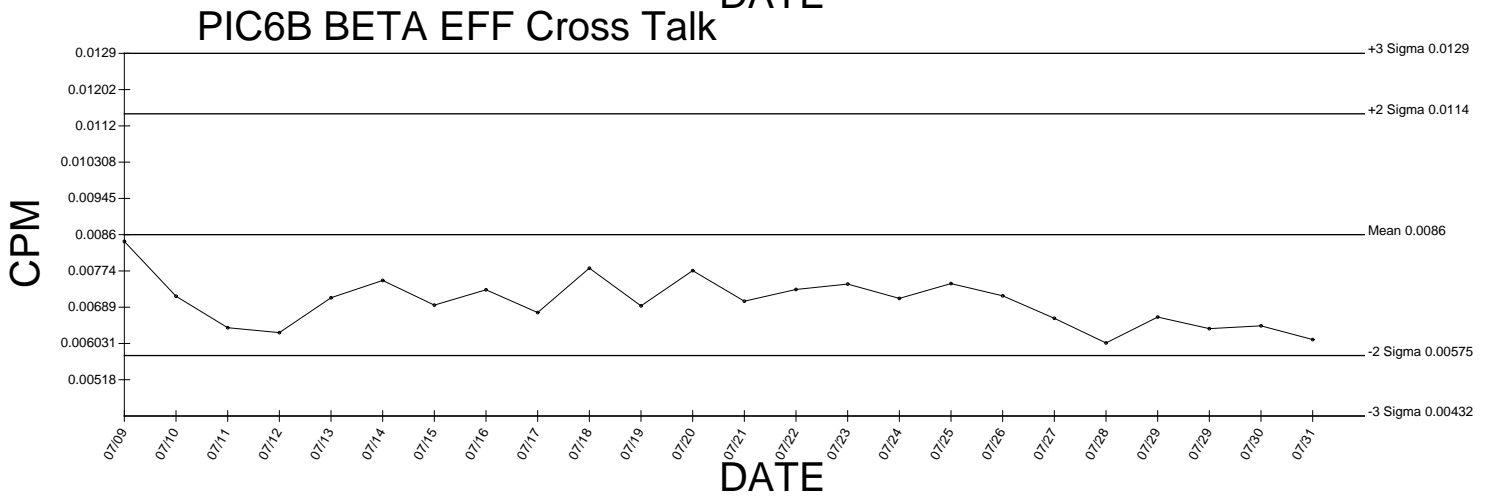
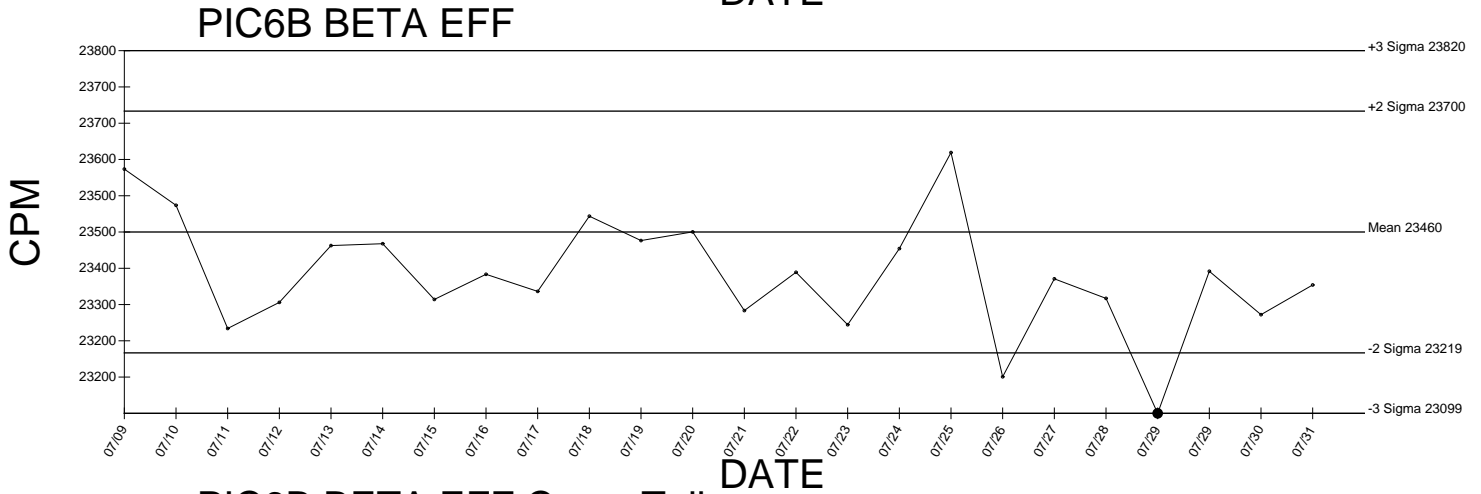
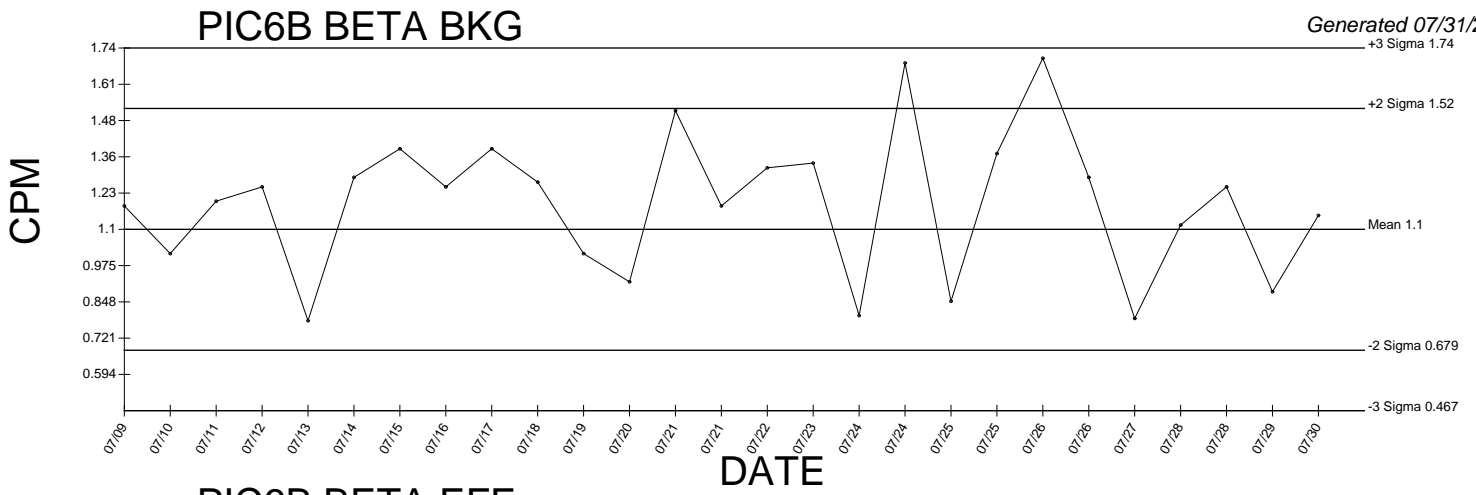
● Denotes Outlier



● Denotes Outlier

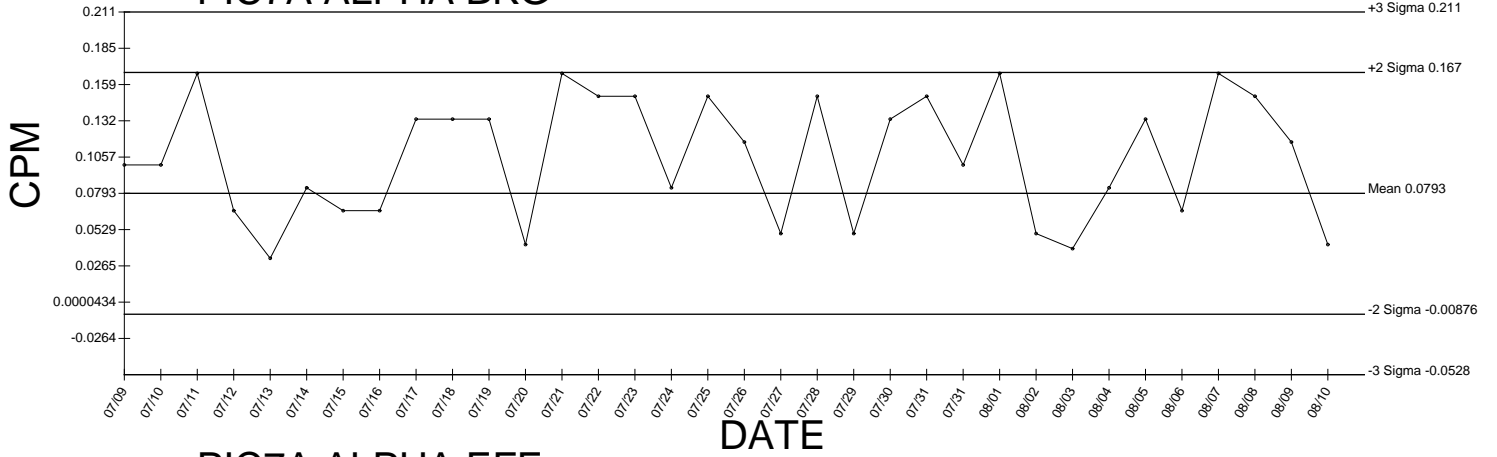


● Denotes Outlier

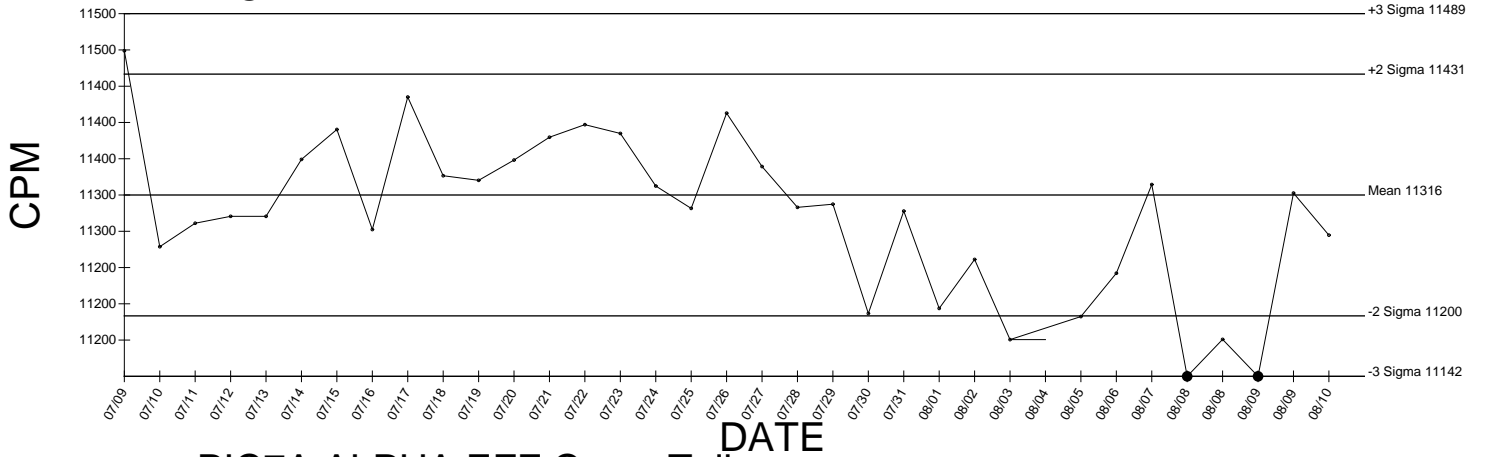


● Denotes Outlier

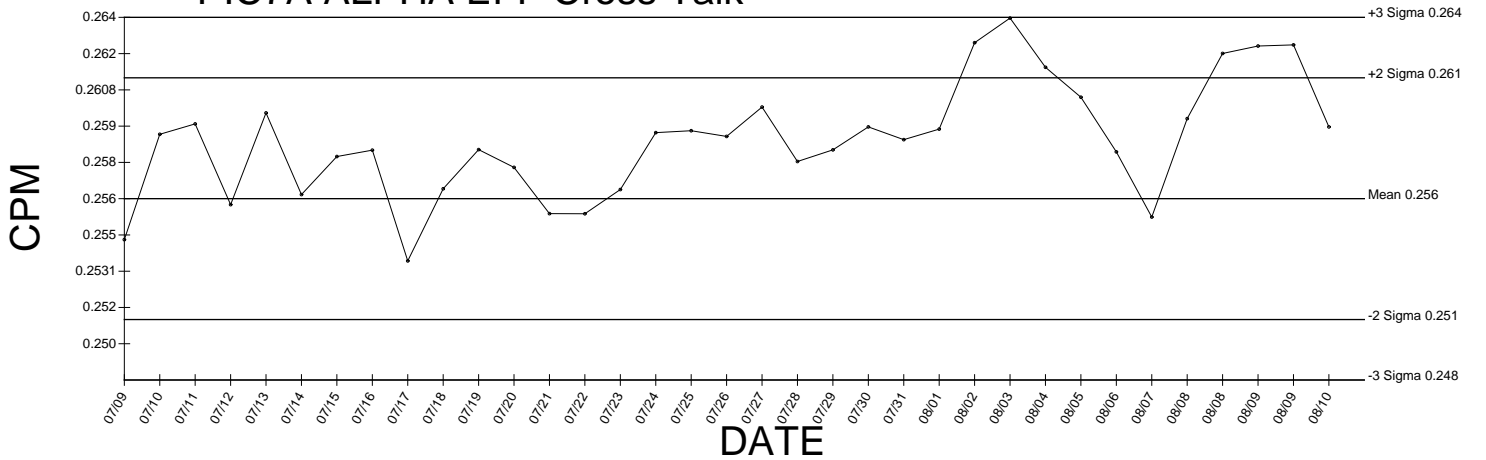
PIC7A ALPHA BKG



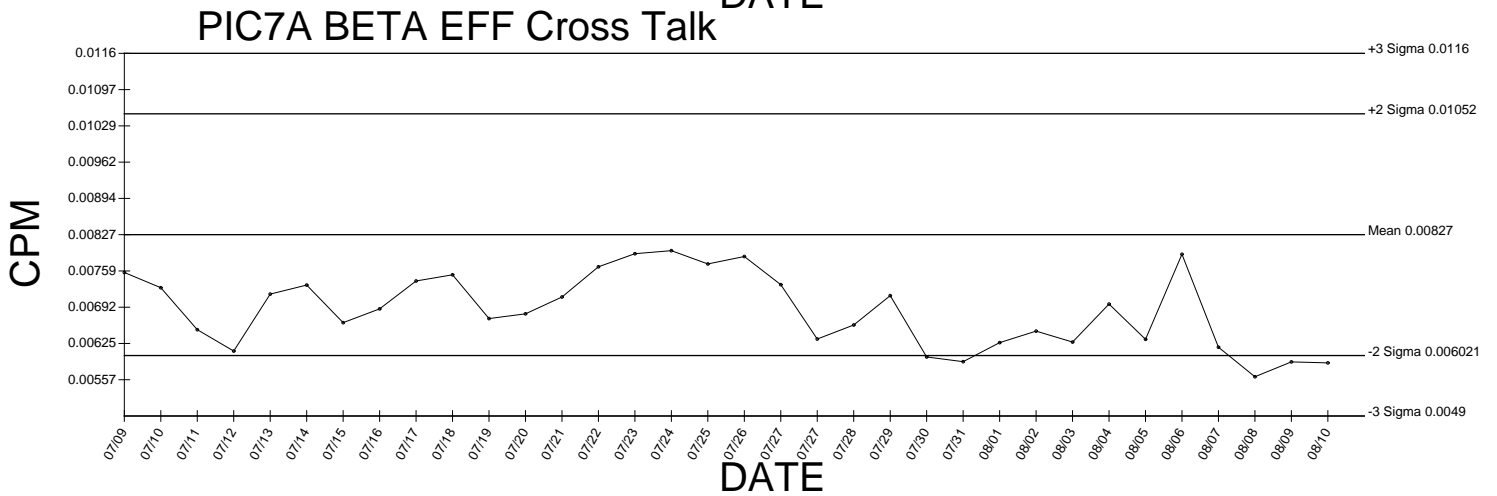
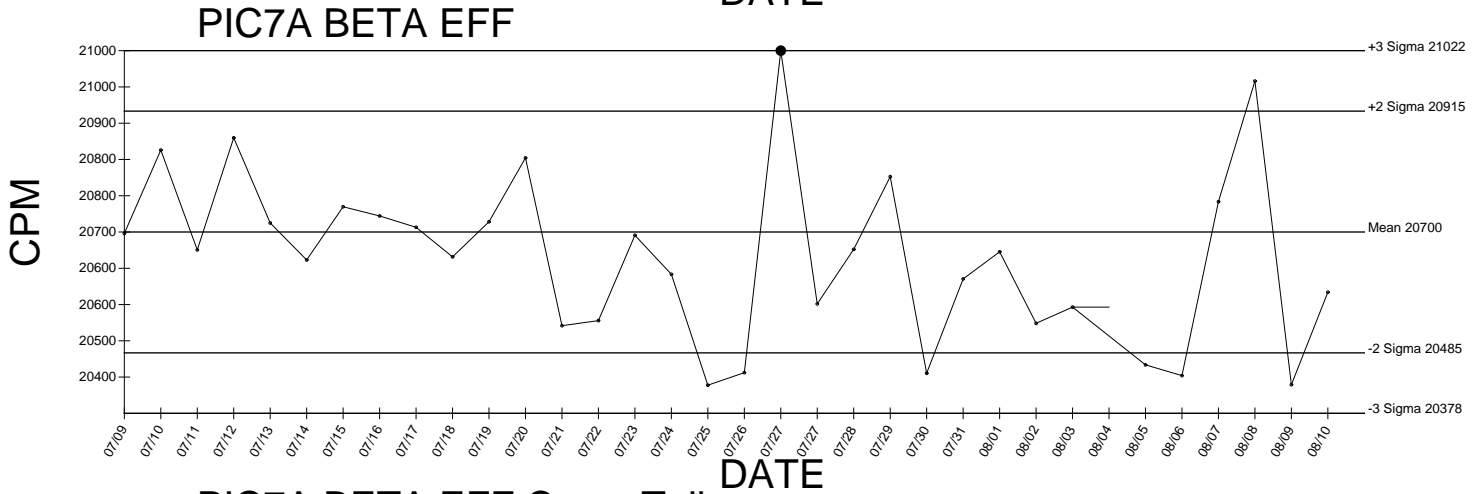
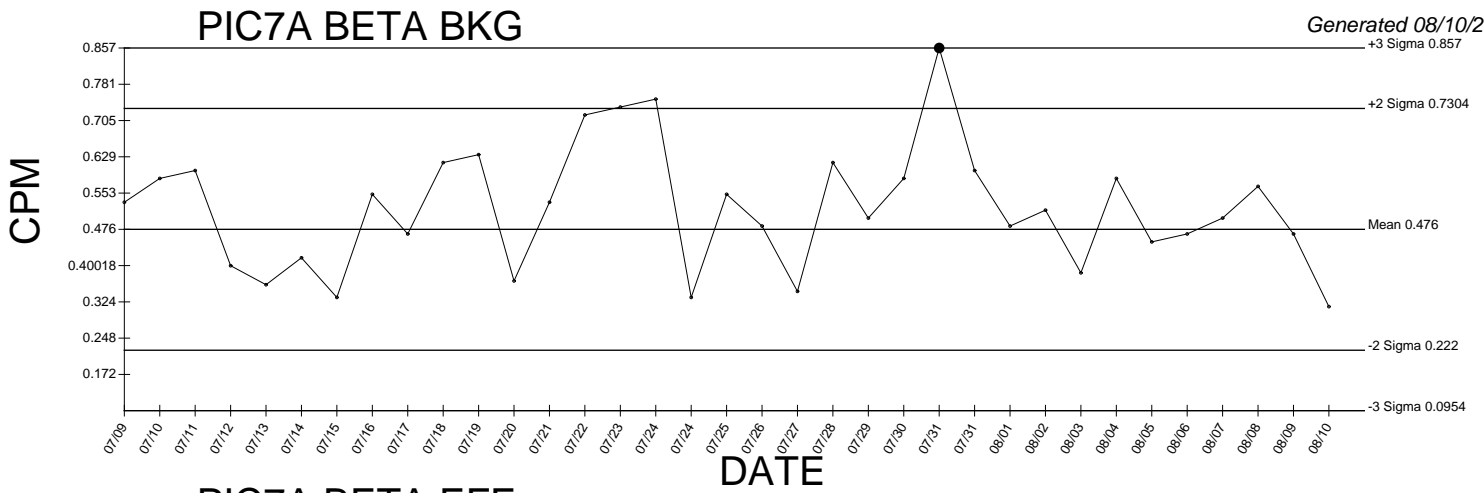
PIC7A ALPHA EFF



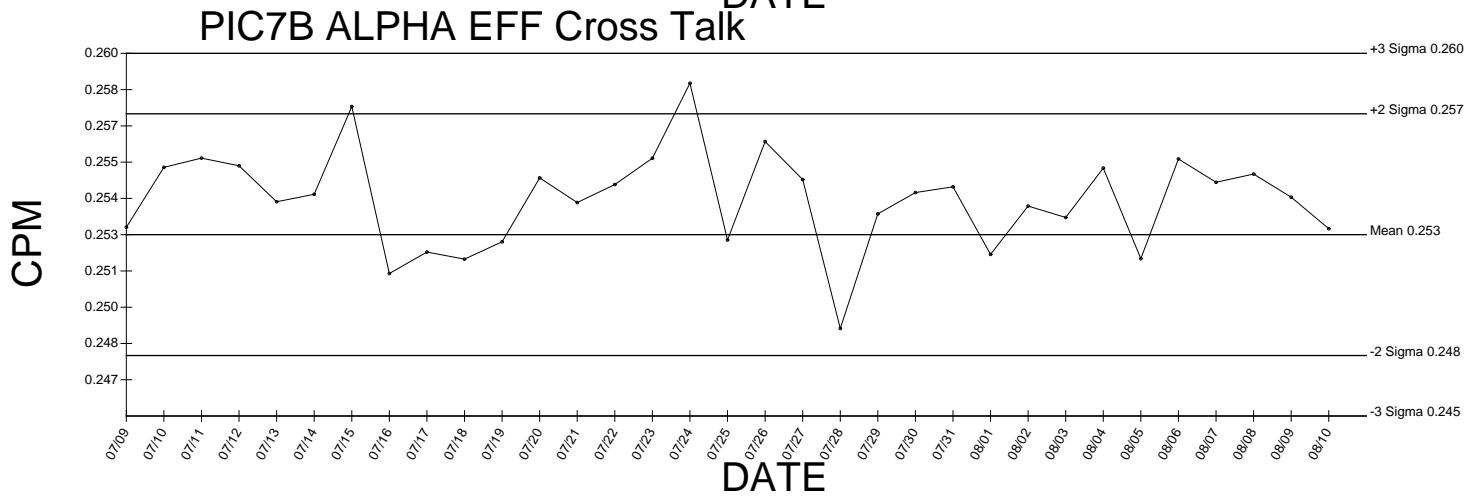
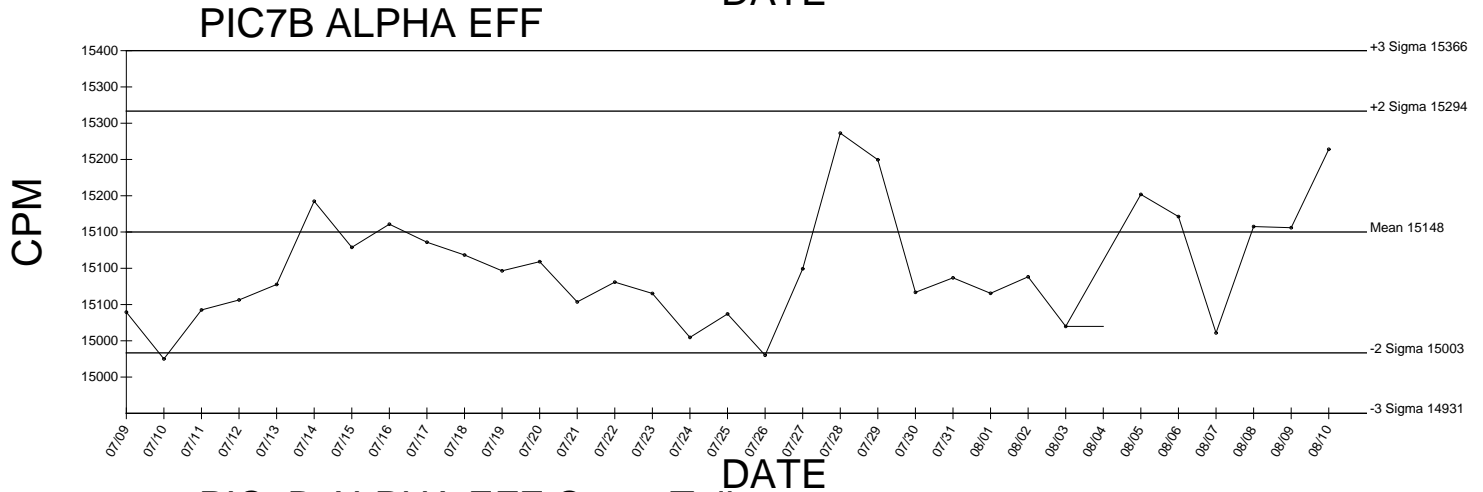
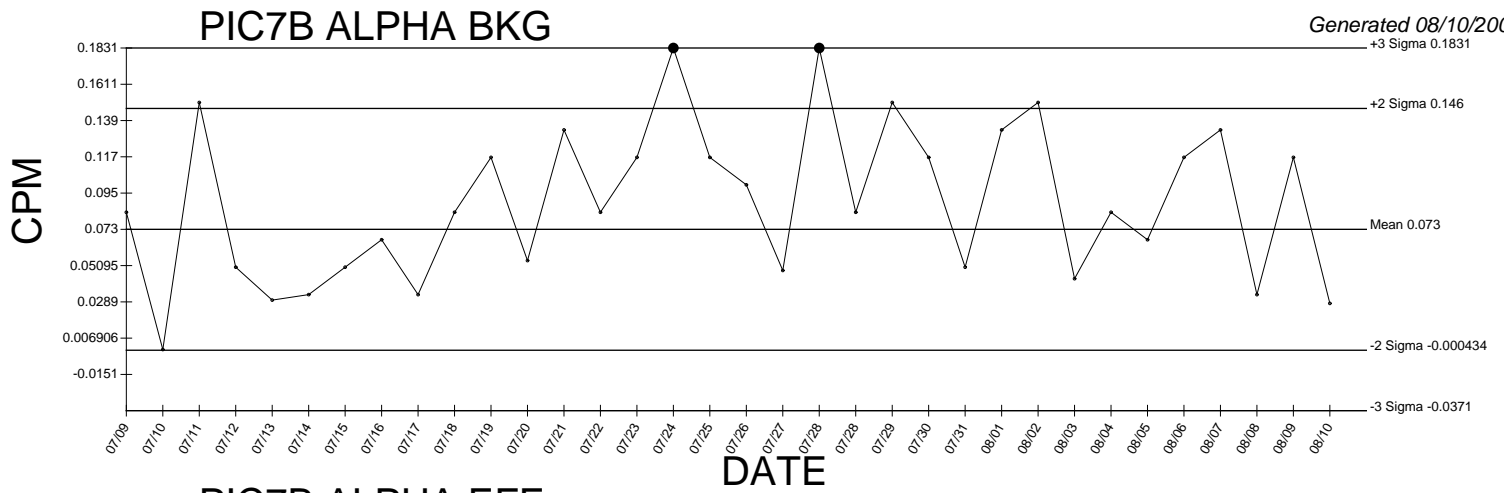
PIC7A ALPHA EFF Cross Talk



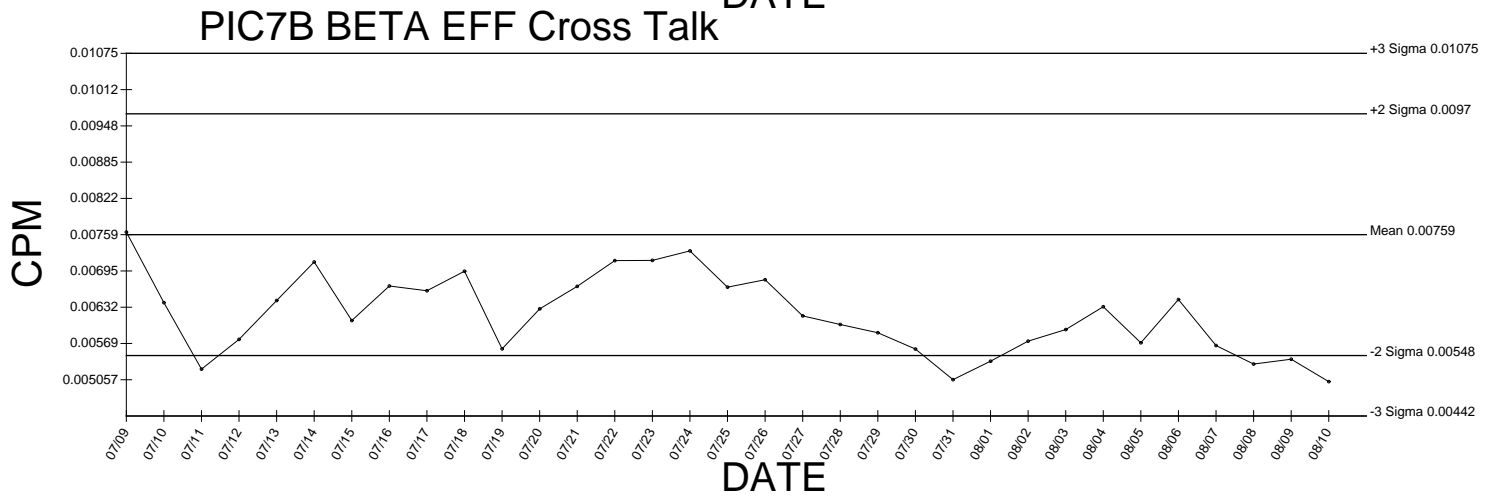
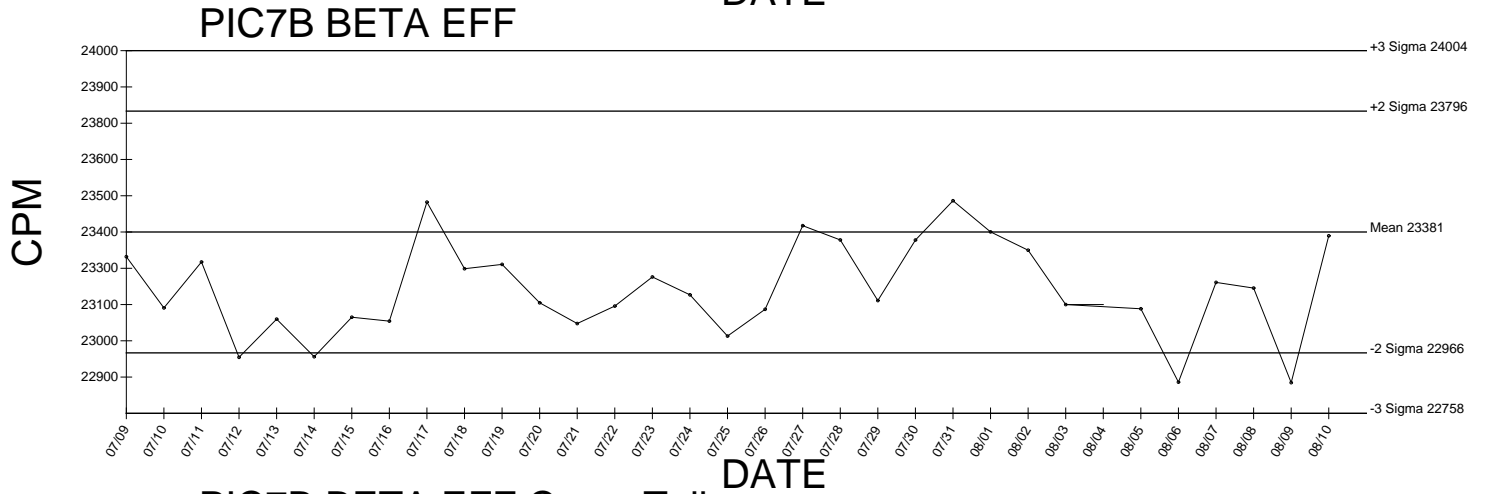
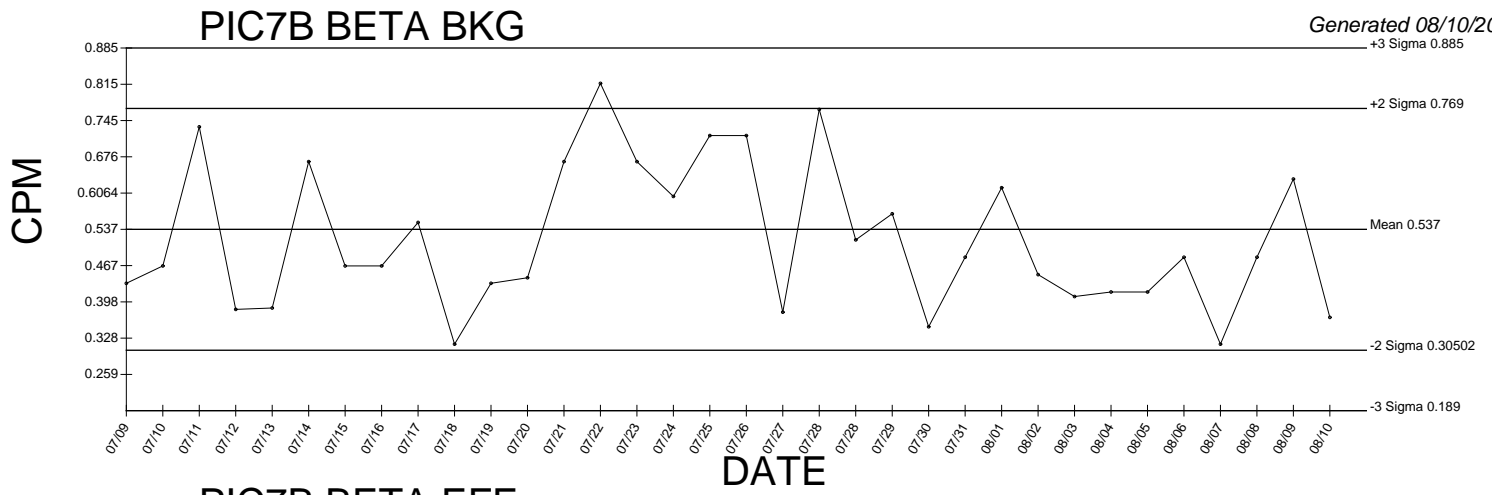
● Denotes Outlier



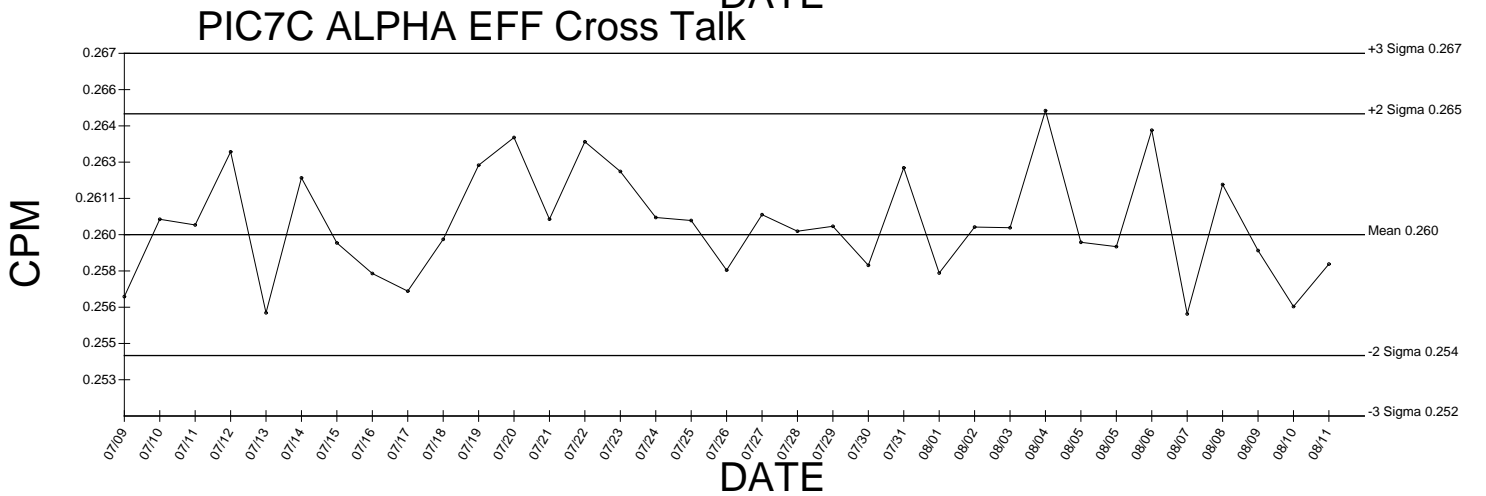
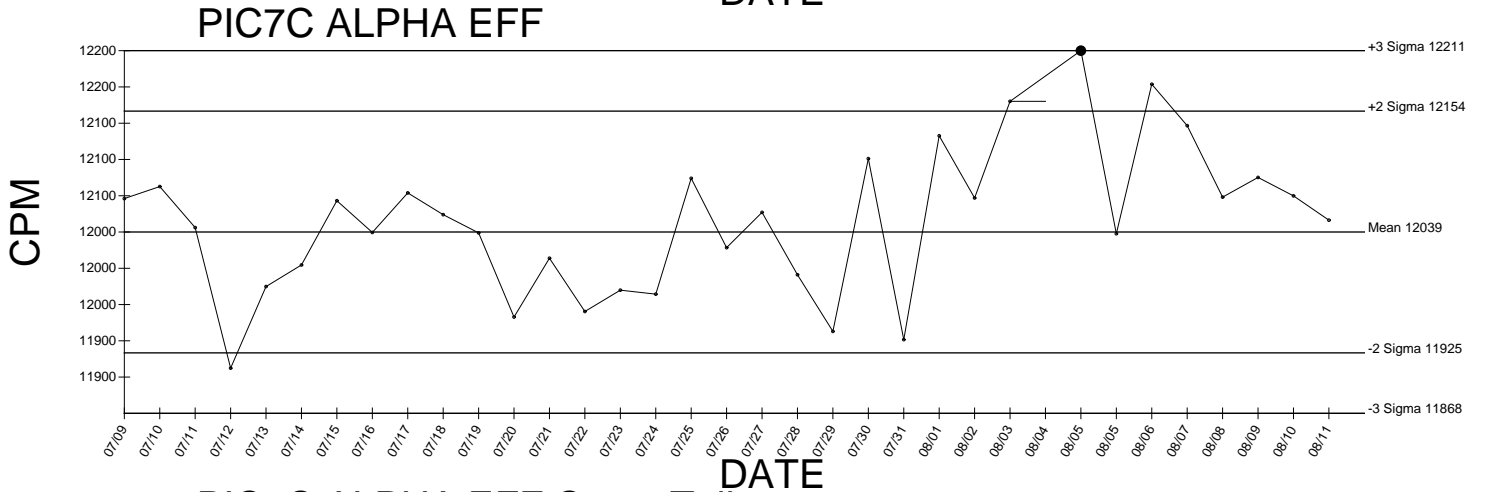
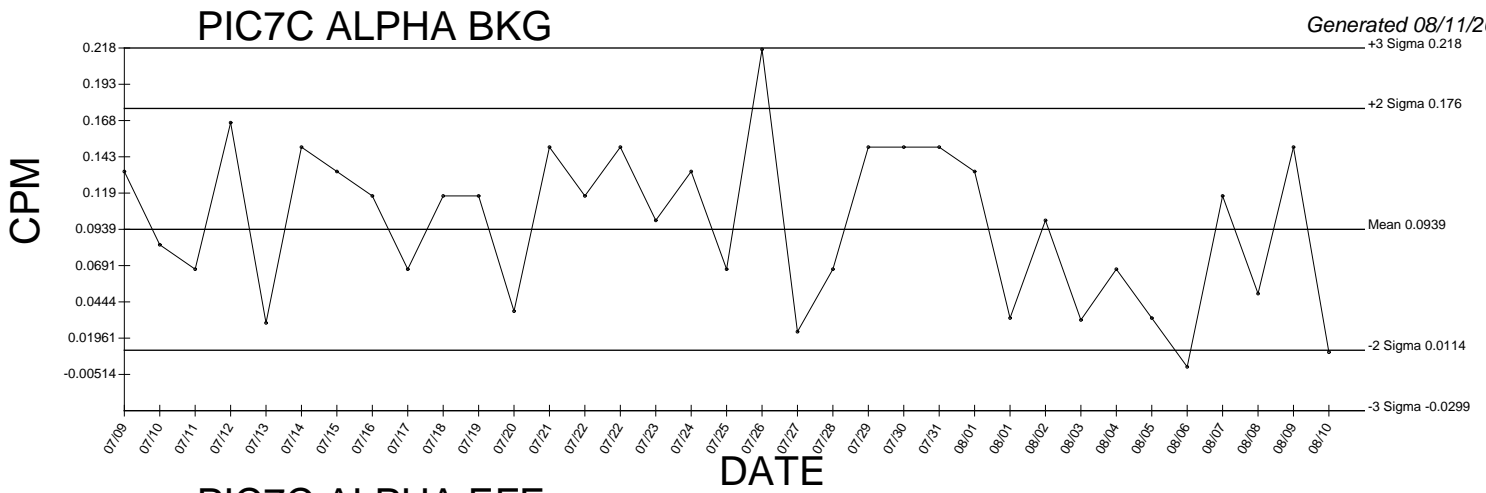
● Denotes Outlier



● Denotes Outlier

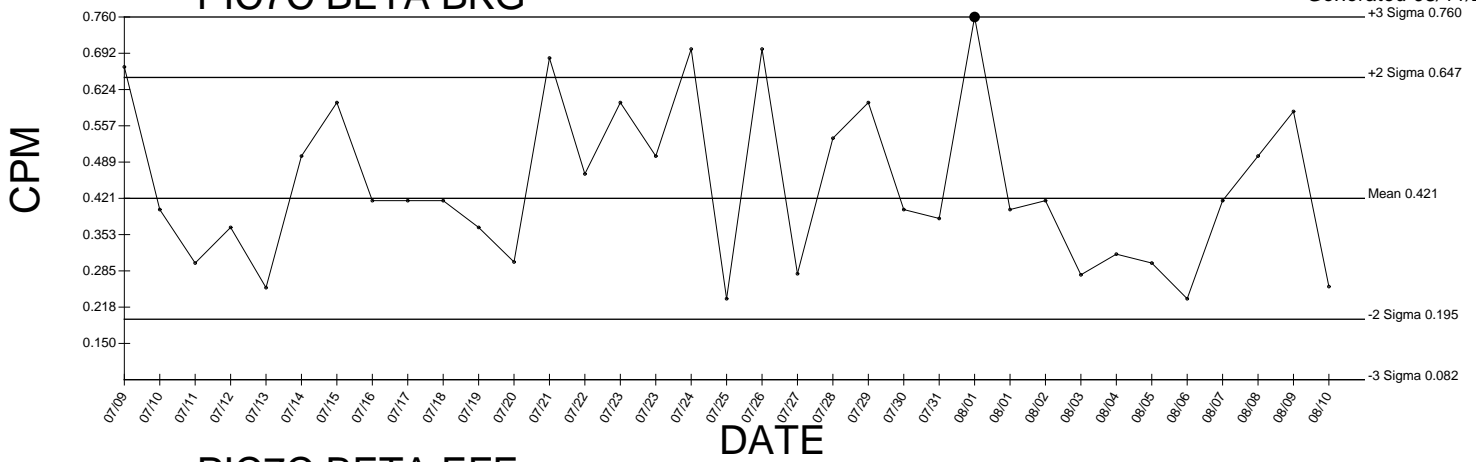


● Denotes Outlier

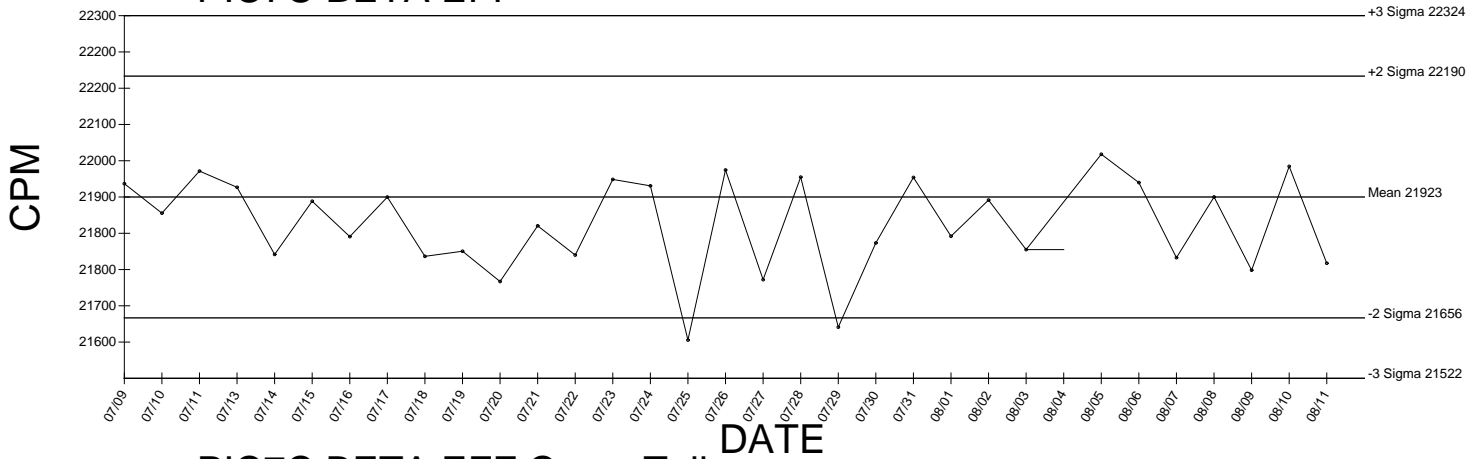


● Denotes Outlier

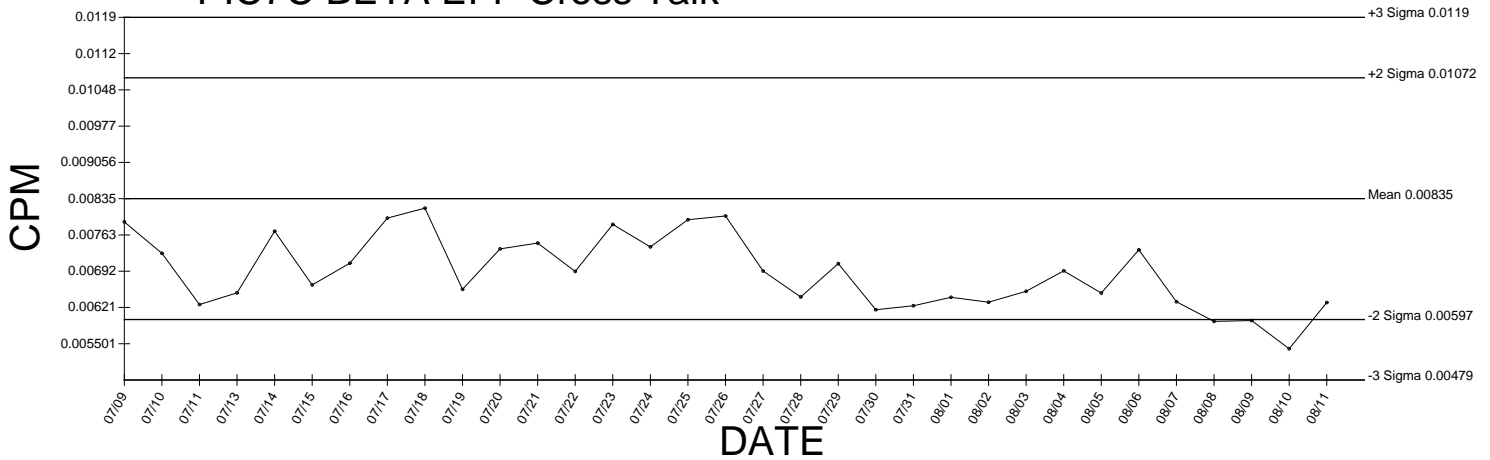
PIC7C BETA BKG



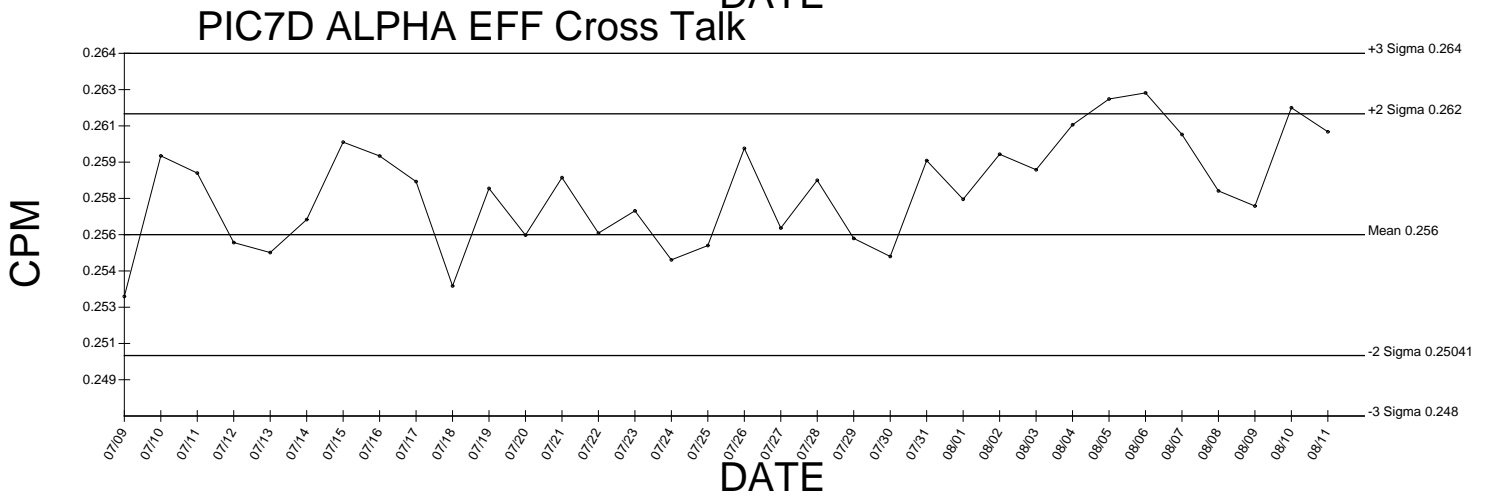
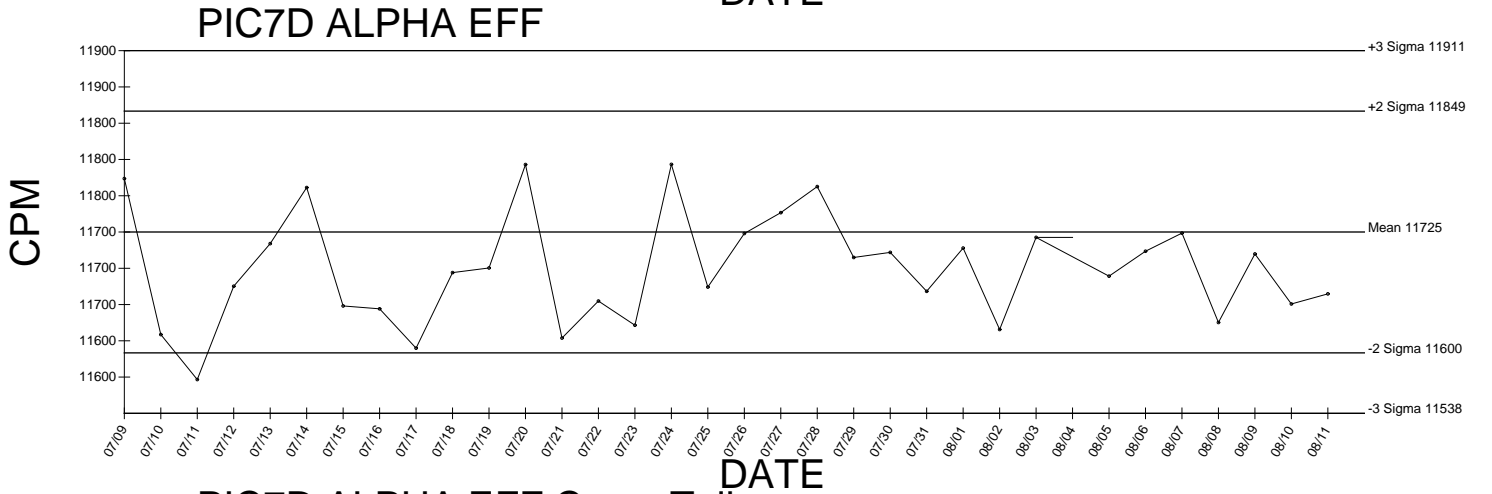
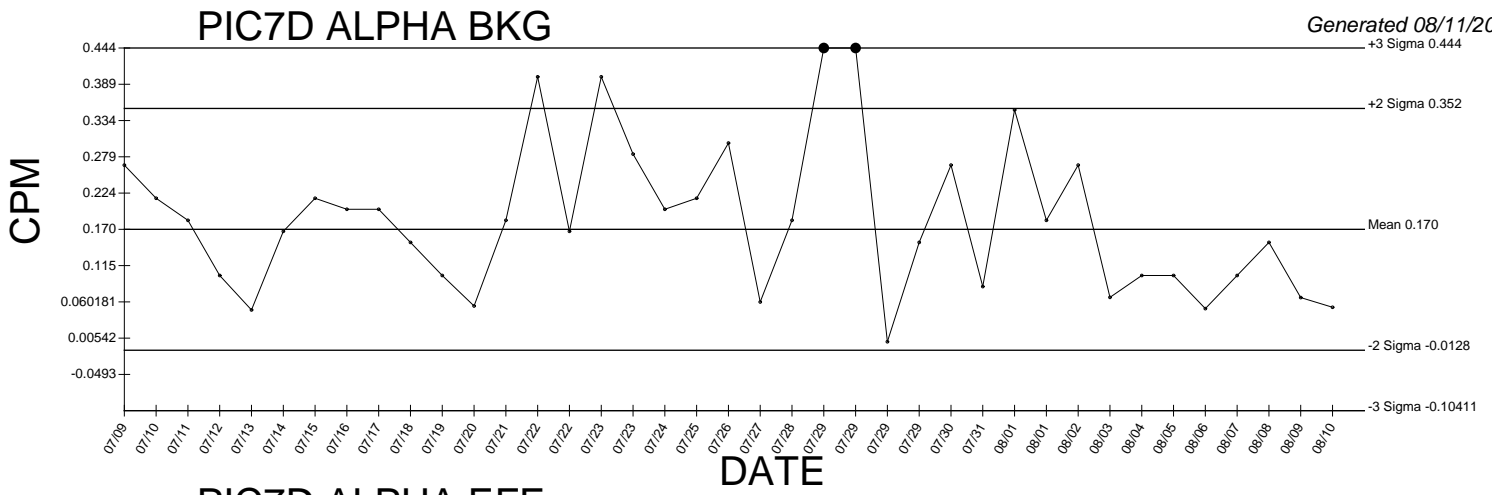
PIC7C BETA EFF



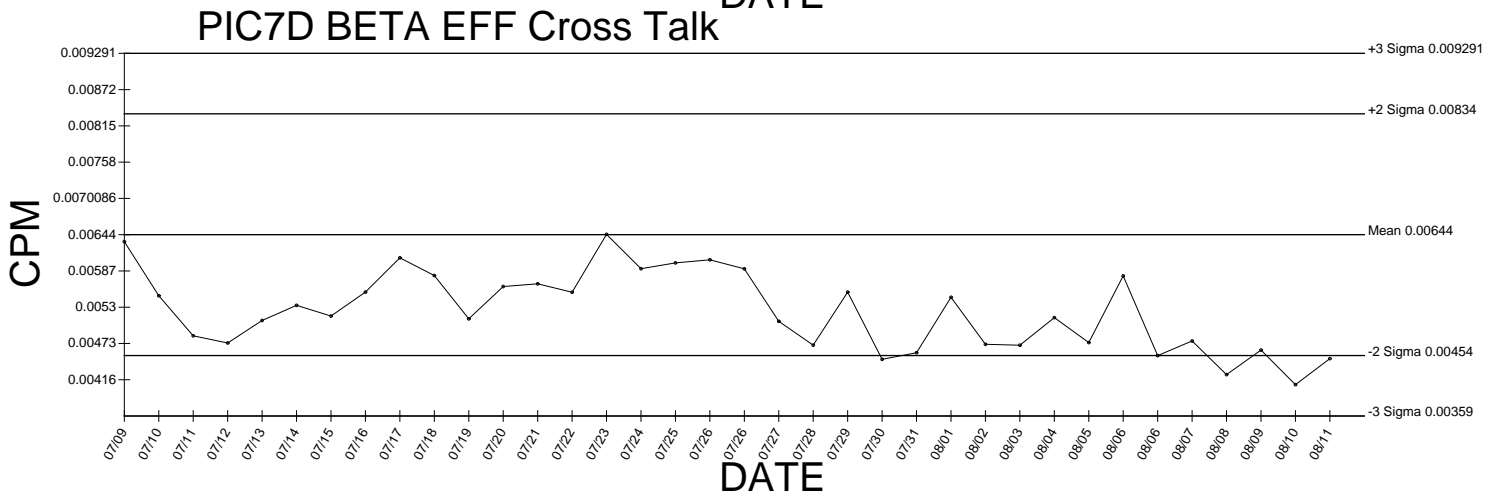
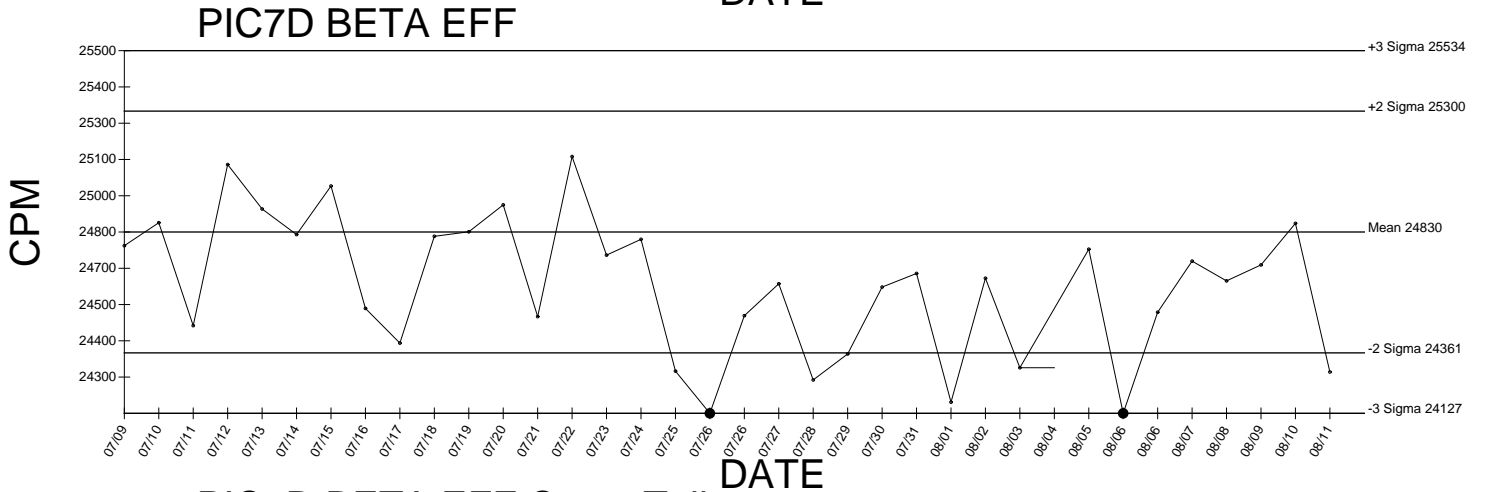
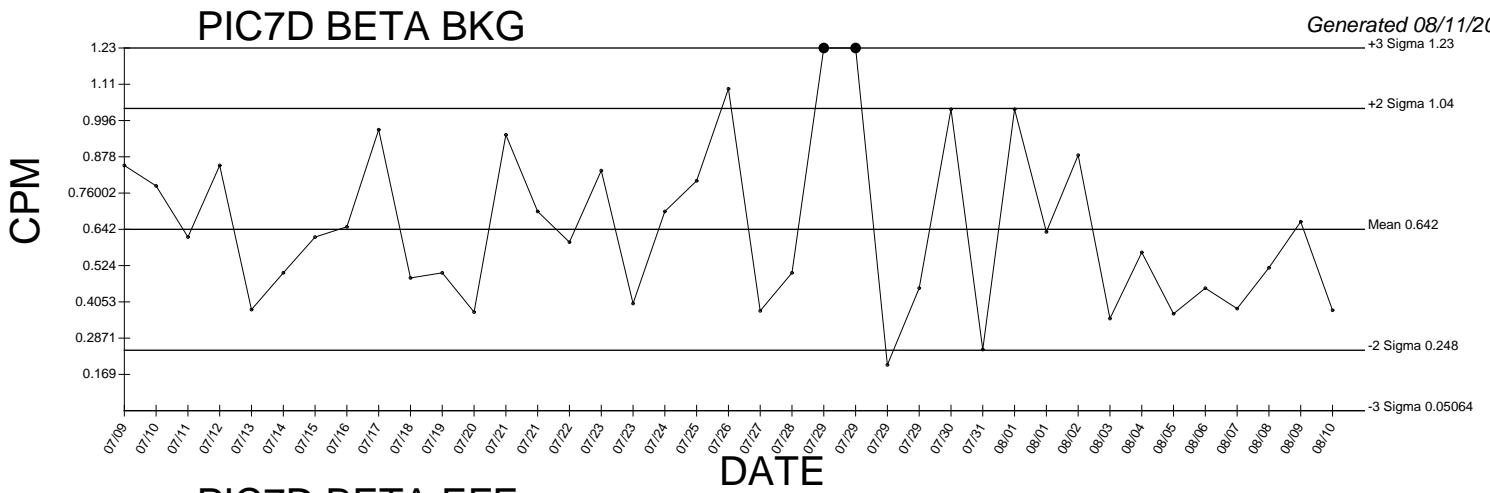
PIC7C BETA EFF Cross Talk



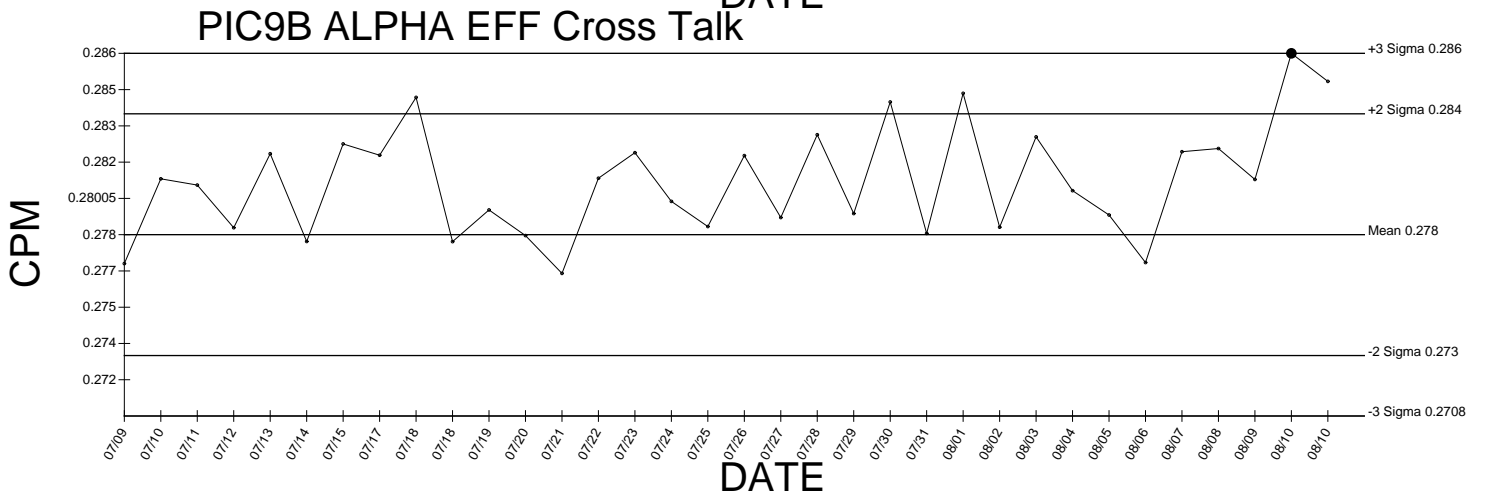
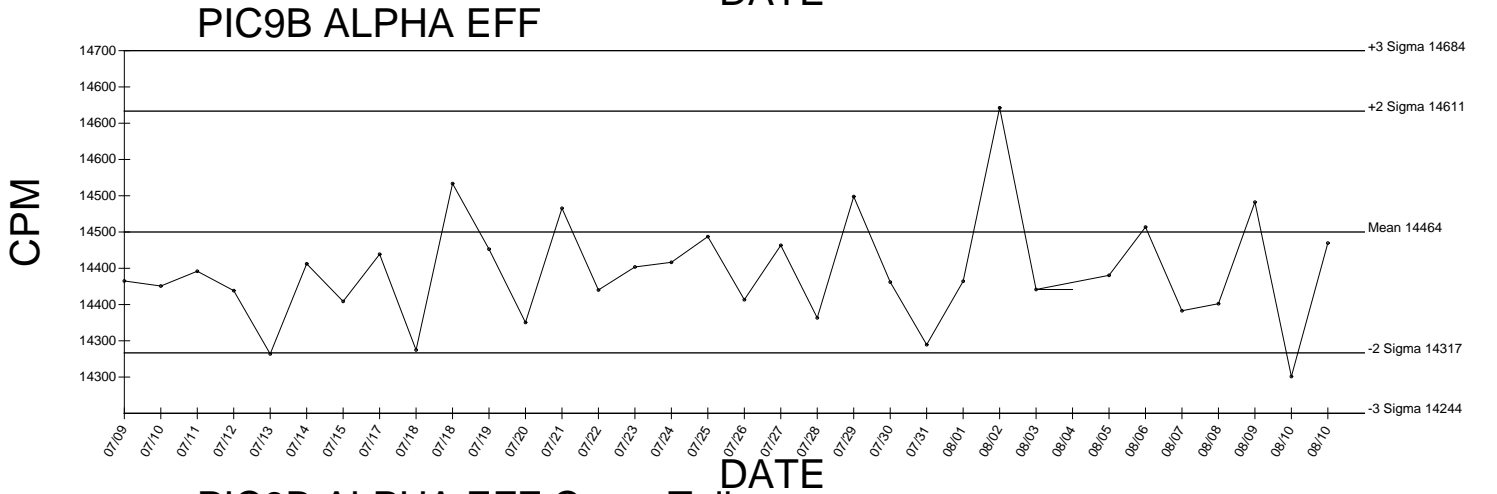
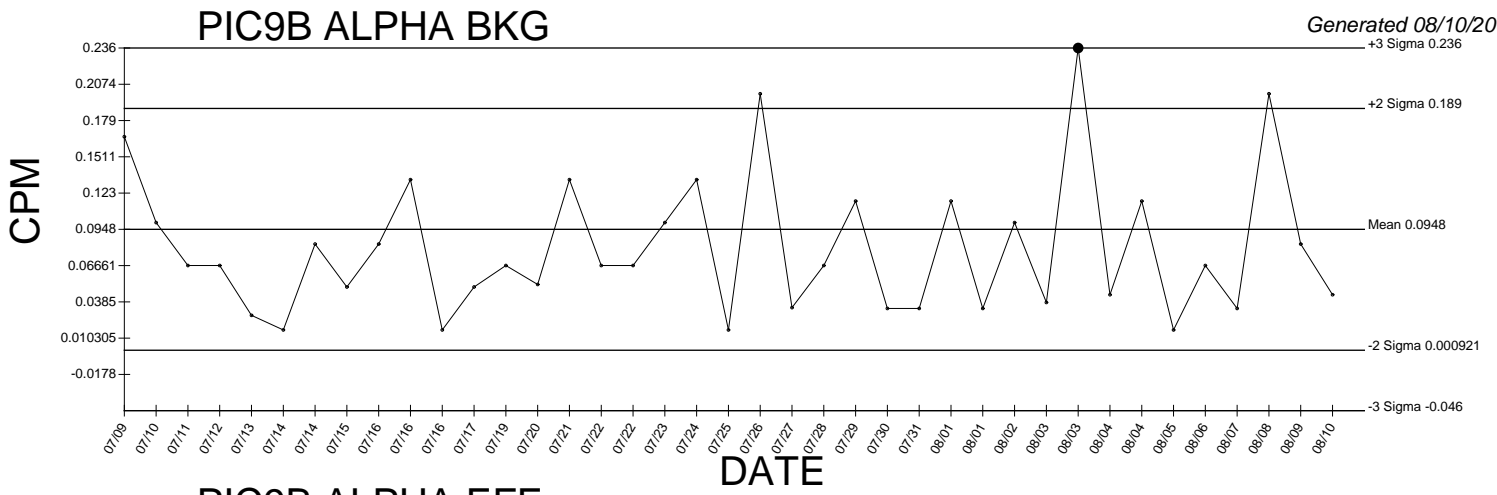
● Denotes Outlier



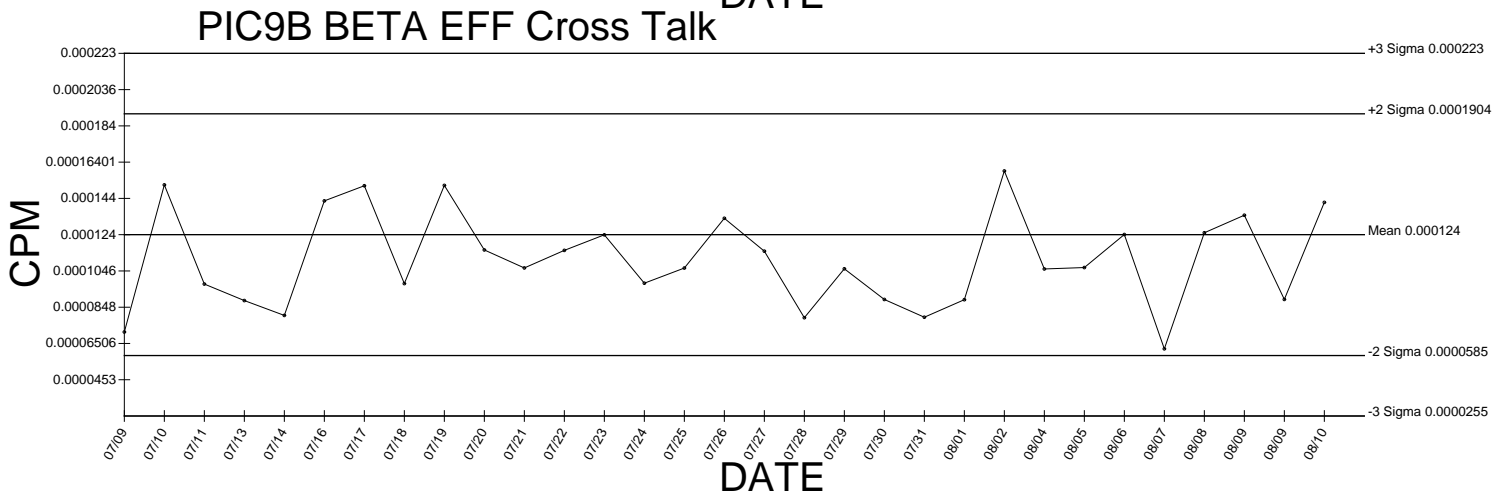
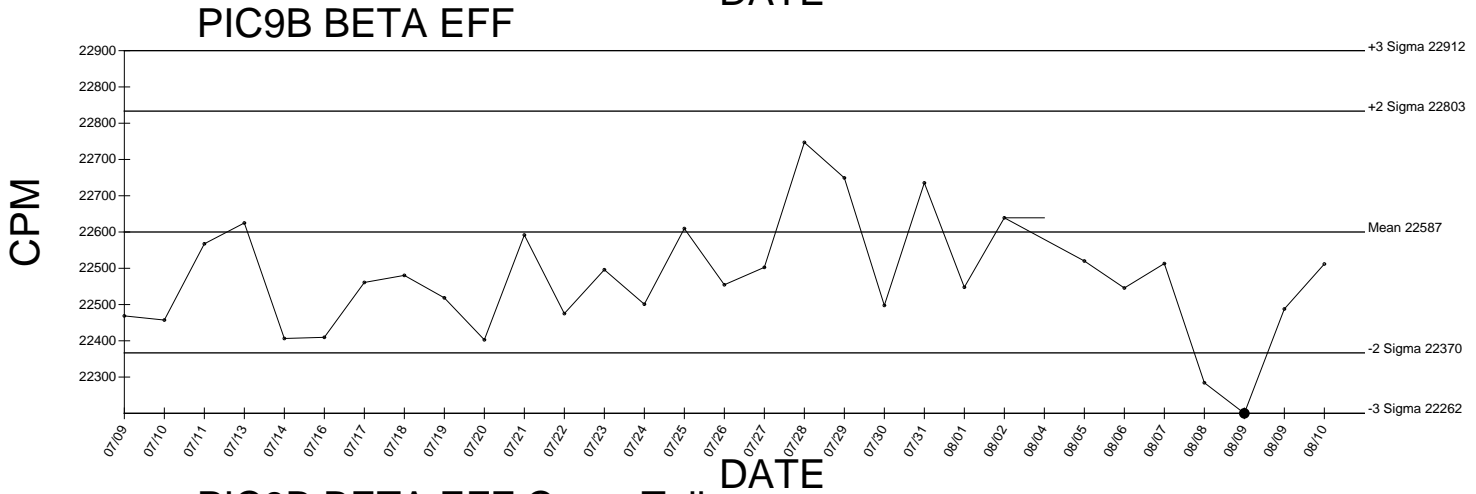
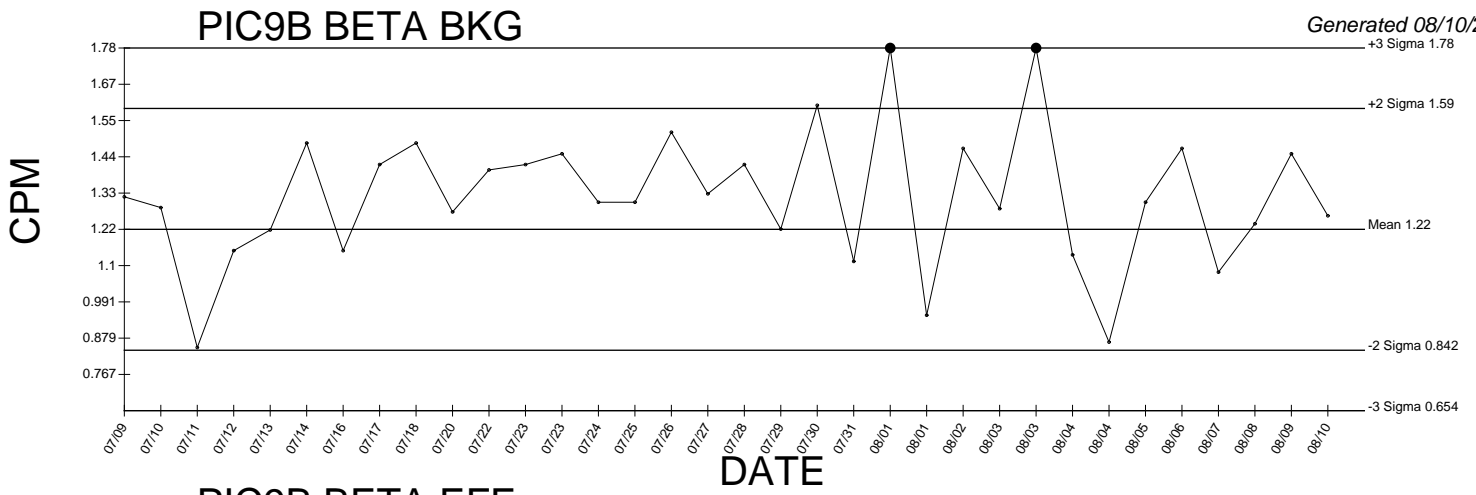
● Denotes Outlier



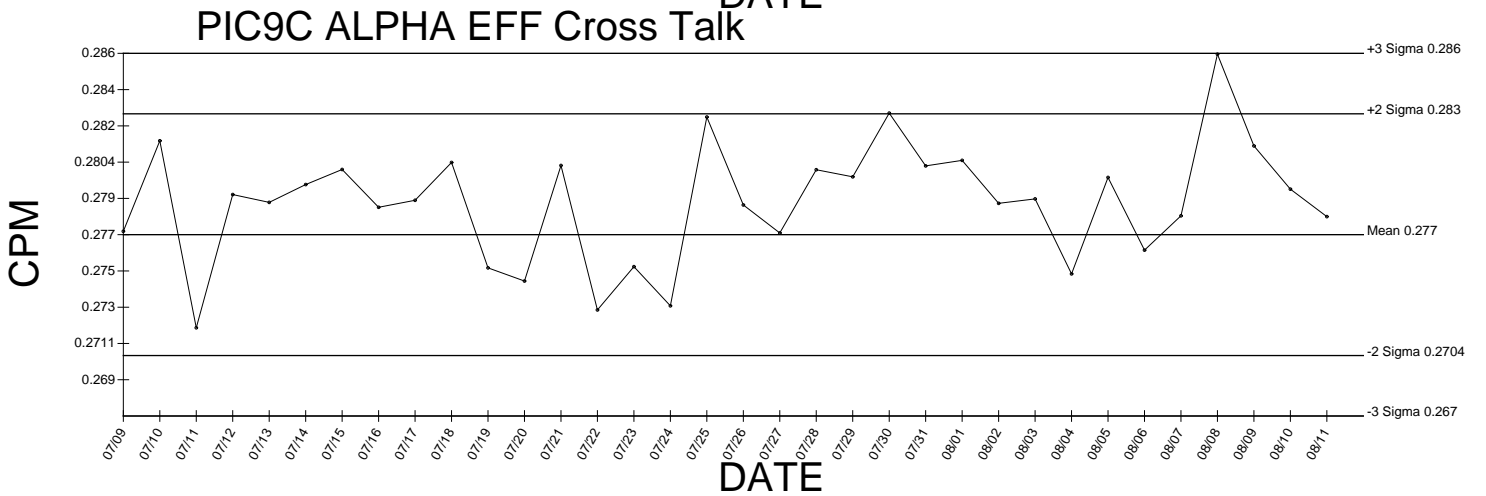
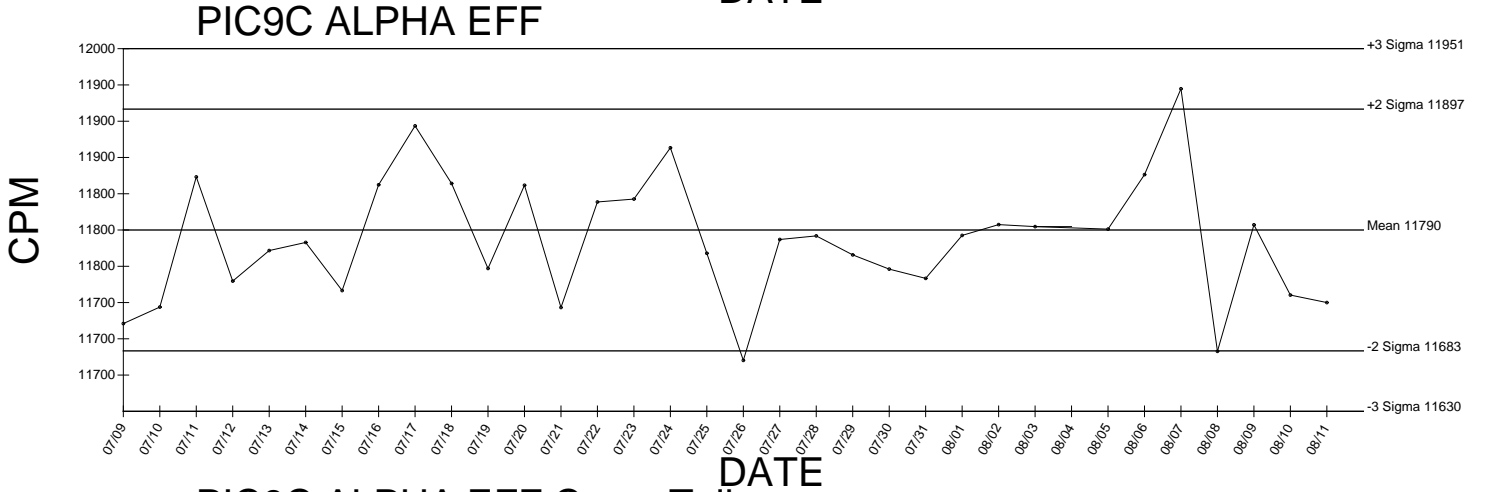
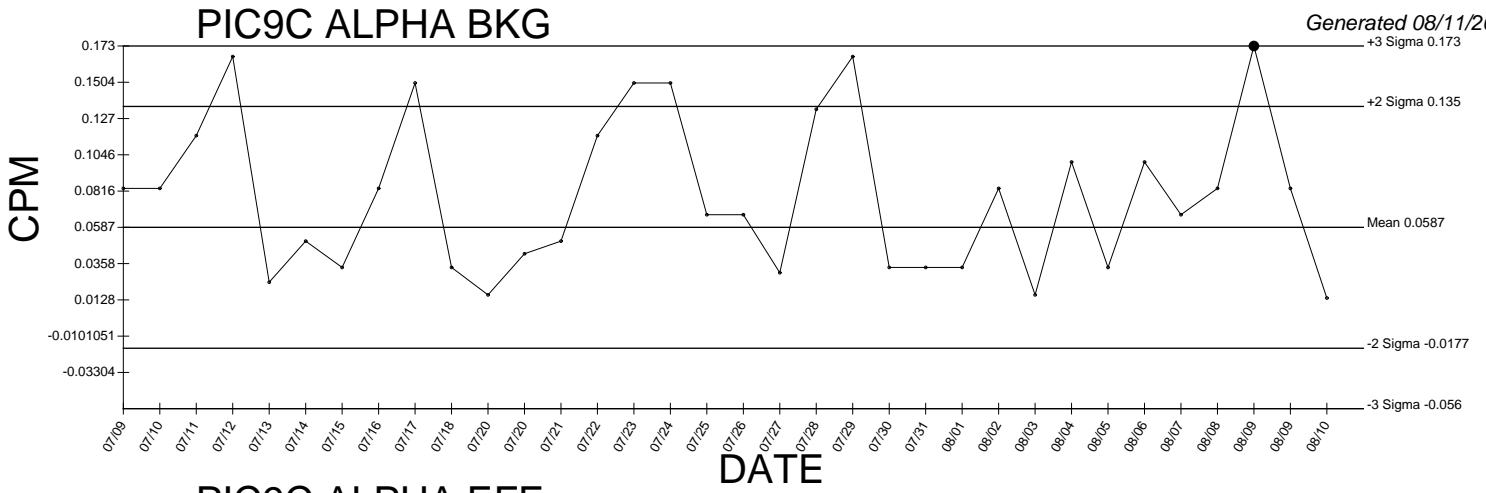
● Denotes Outlier



● Denotes Outlier



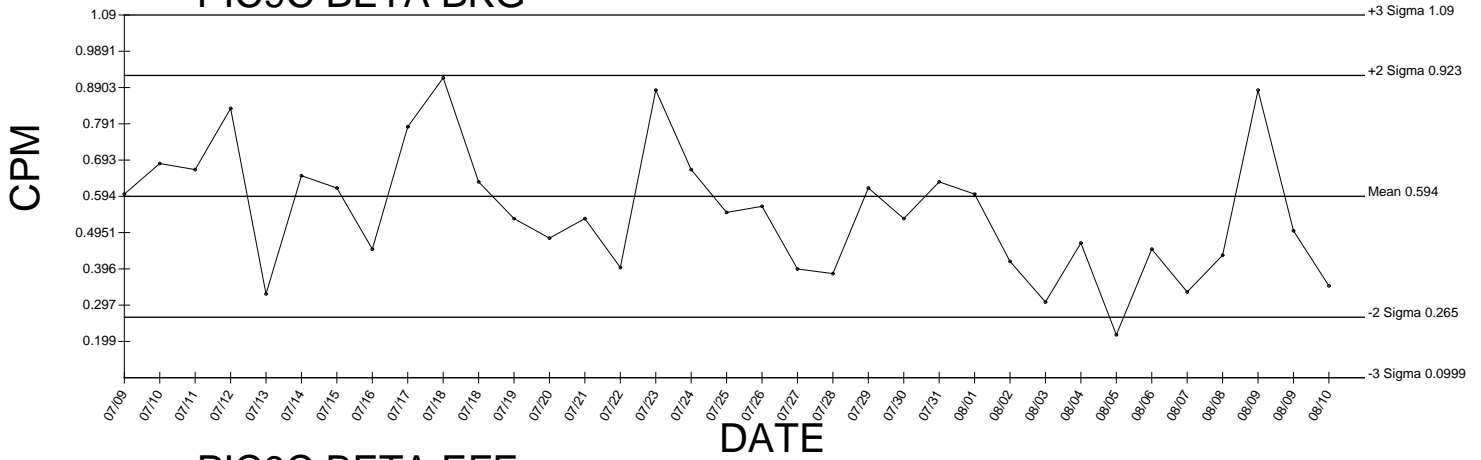
● Denotes Outlier



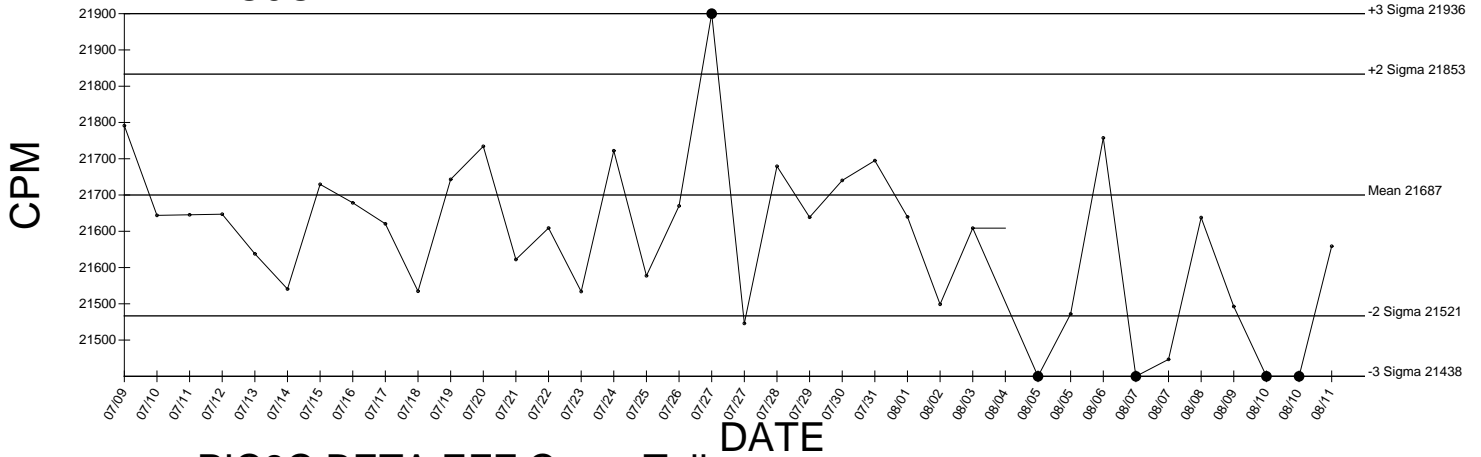
● Denotes Outlier

PIC9C BETA BKG

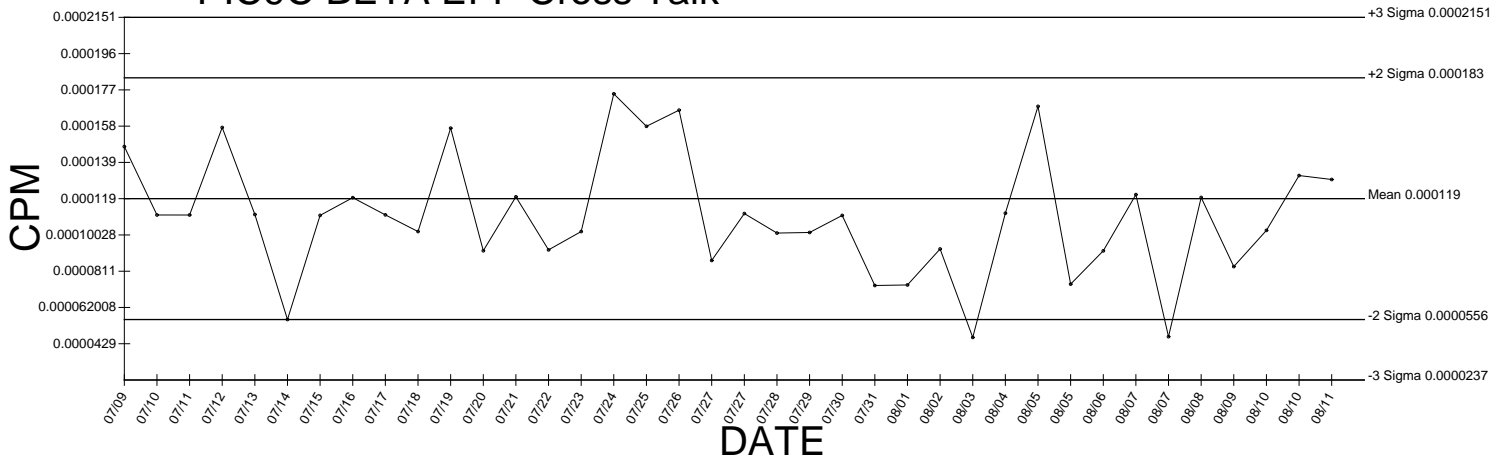
Generated 08/11/2009



PIC9C BETA EFF

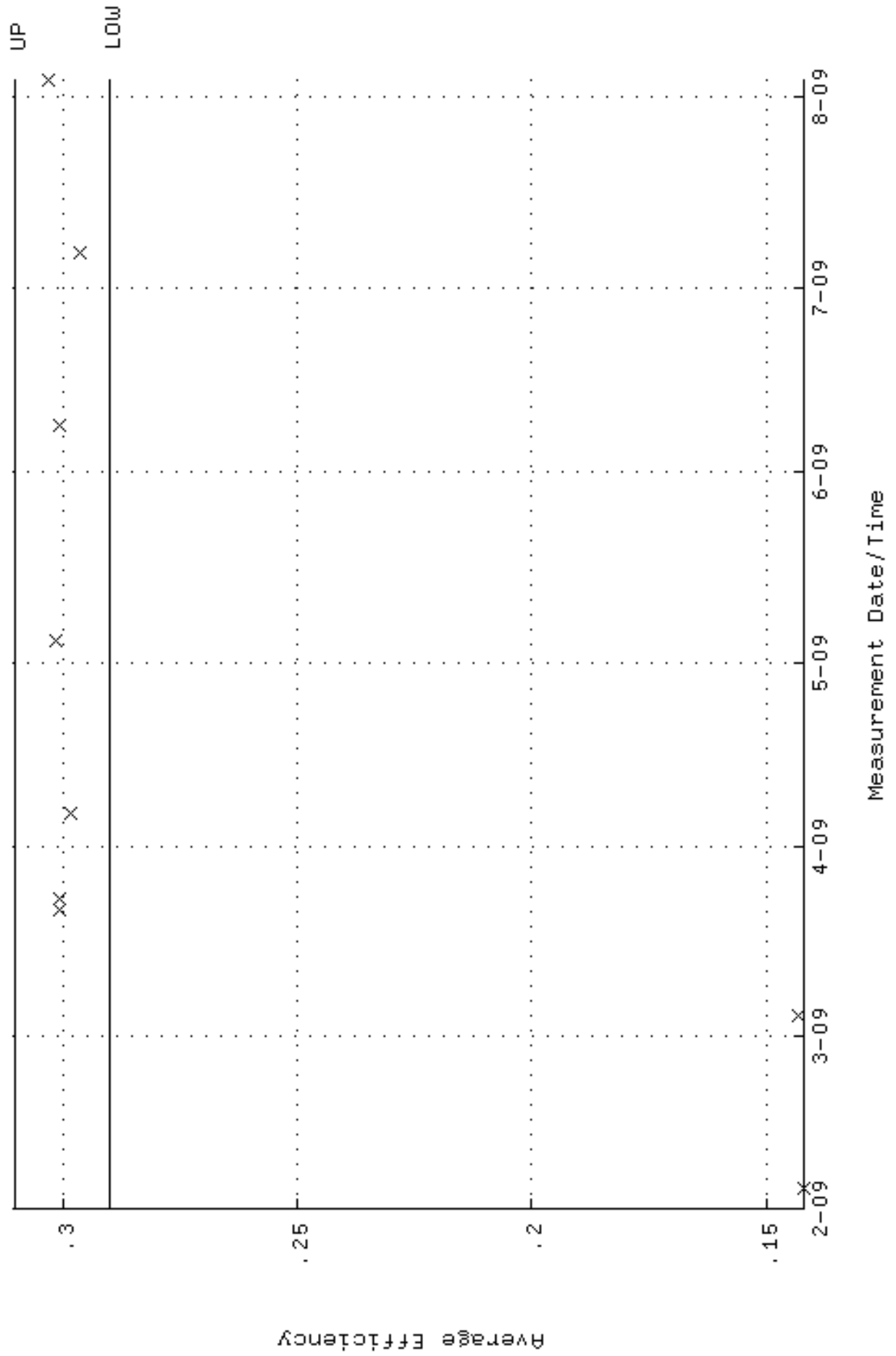


PIC9C BETA EFF Cross Talk

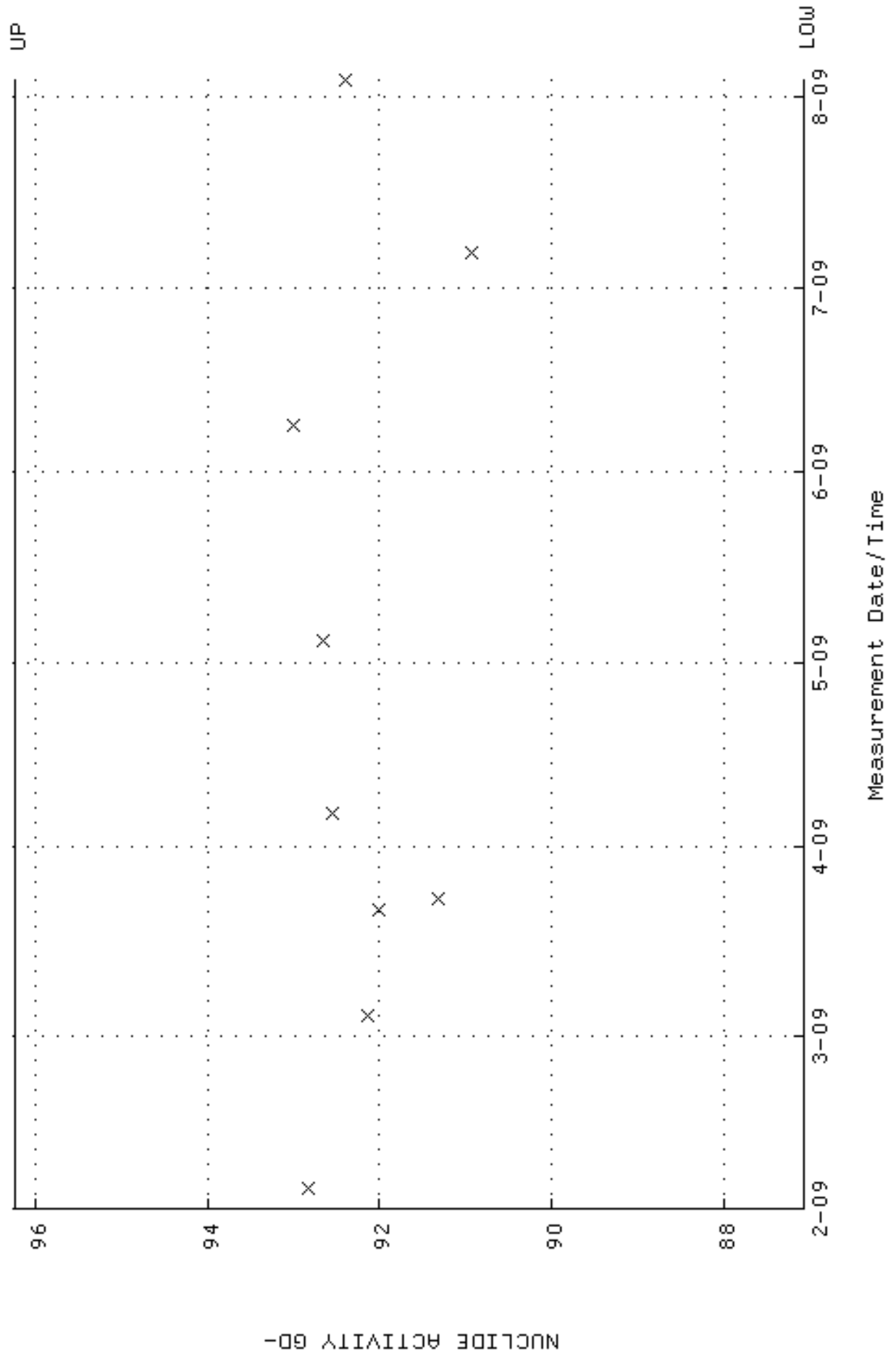


● Denotes Outlier

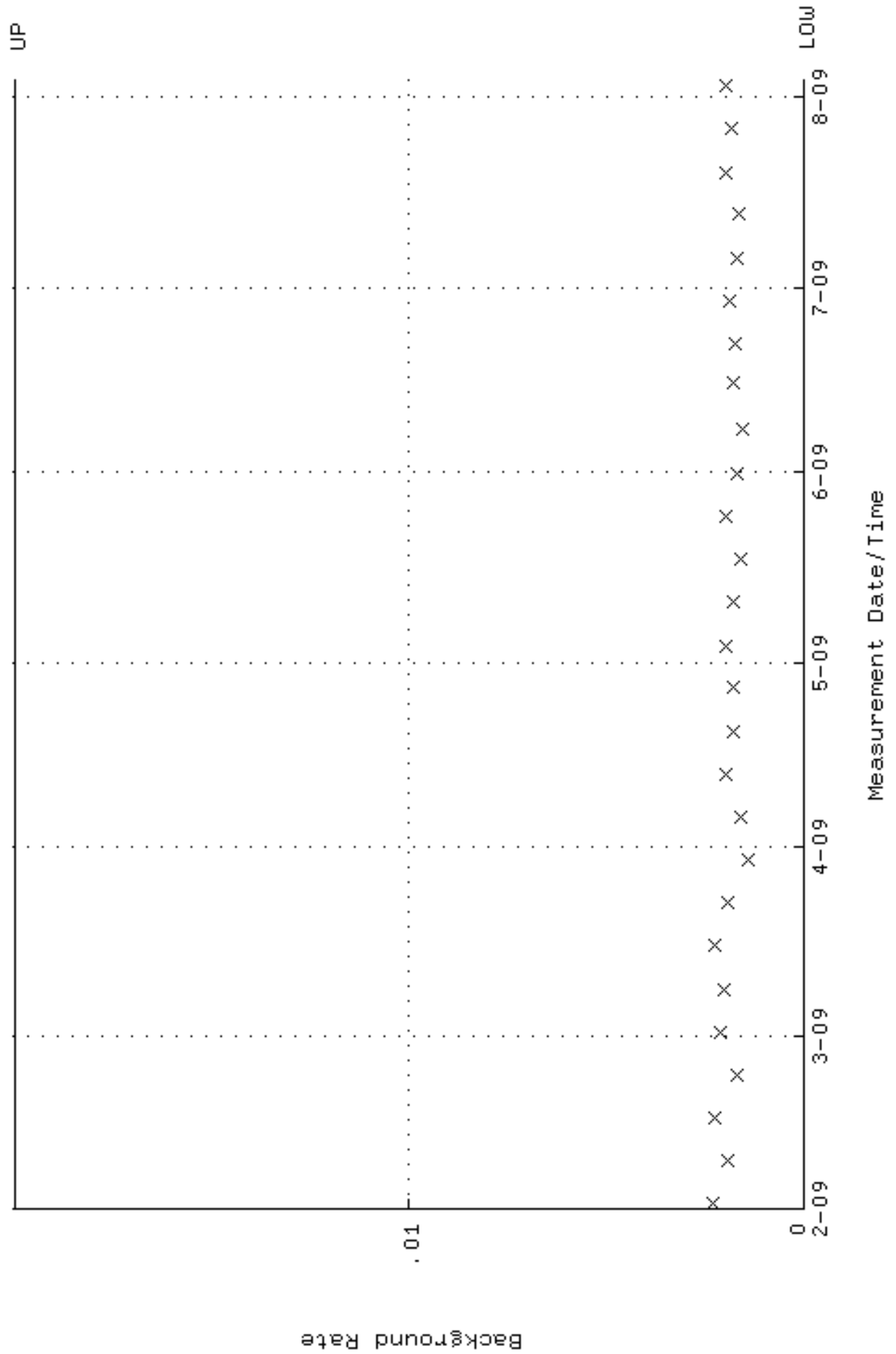
QA filename : DKA100:[ENV_ALPHA.QA.W]W007.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 4-FEB-2009 07:05:54 through 3-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.290108 through 0.310108



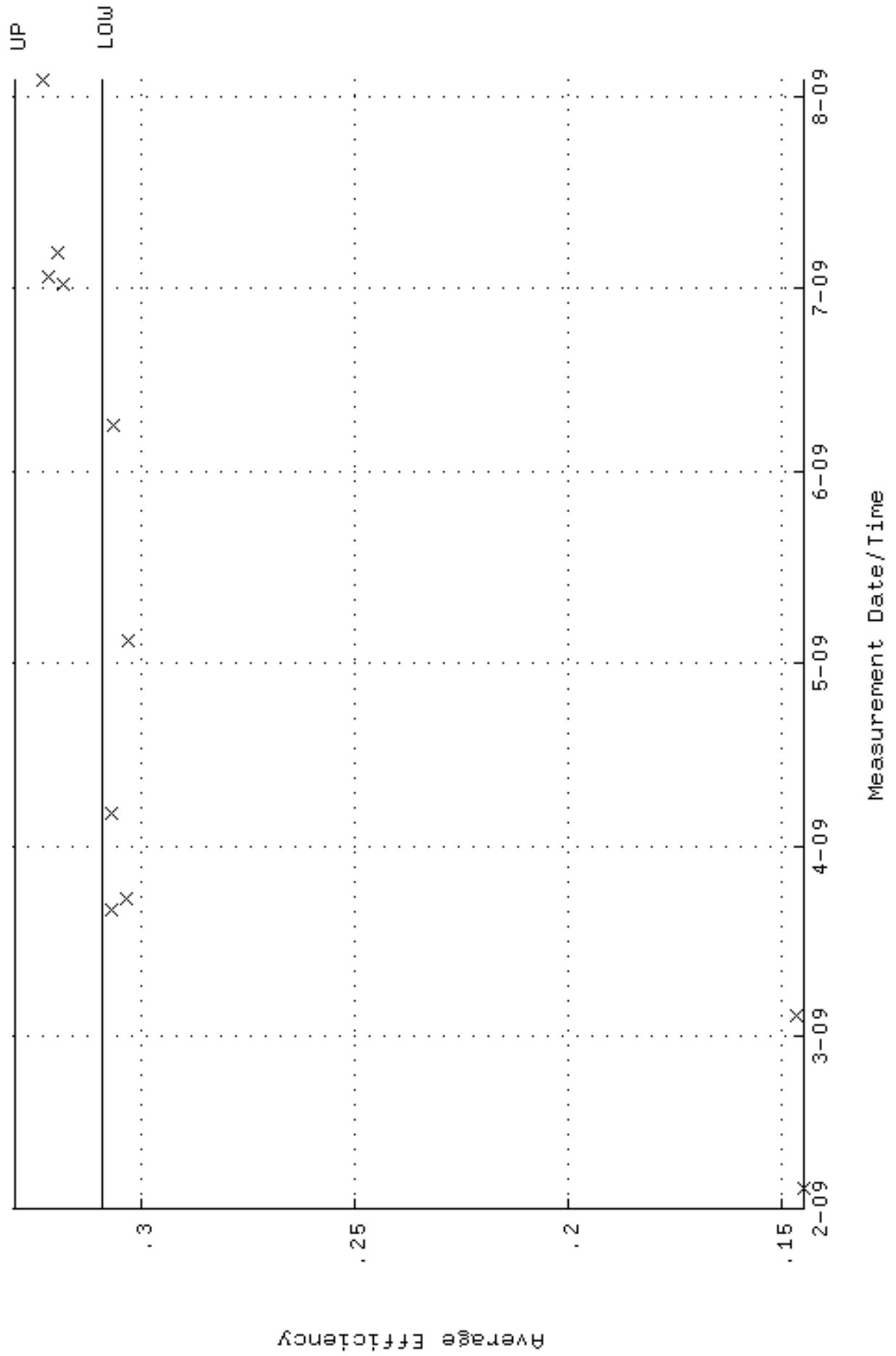
QA filename : DKA100:[ENV_ALPHA.QA.W]W007.QAF;3
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 4-FEB-2009 07:05:54 through 3-AUG-2009 12:00:00
 Lower/Upper Lmts: 87.0687 through 96.2339



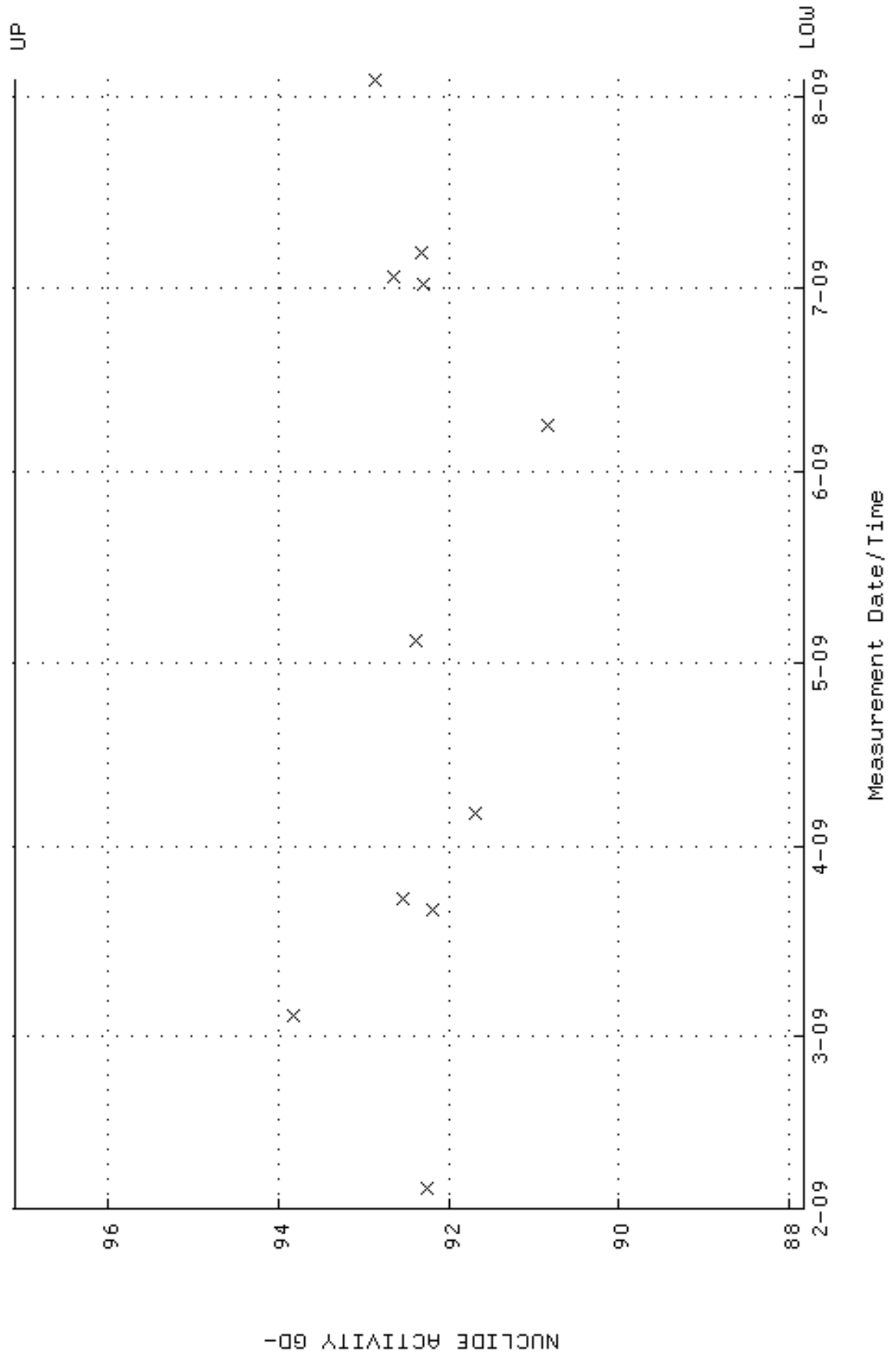
QA filename : DKA100:[ENV_ALPHA.QA.B]B007.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 1-FEB-2009 20:04:46 through 3-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



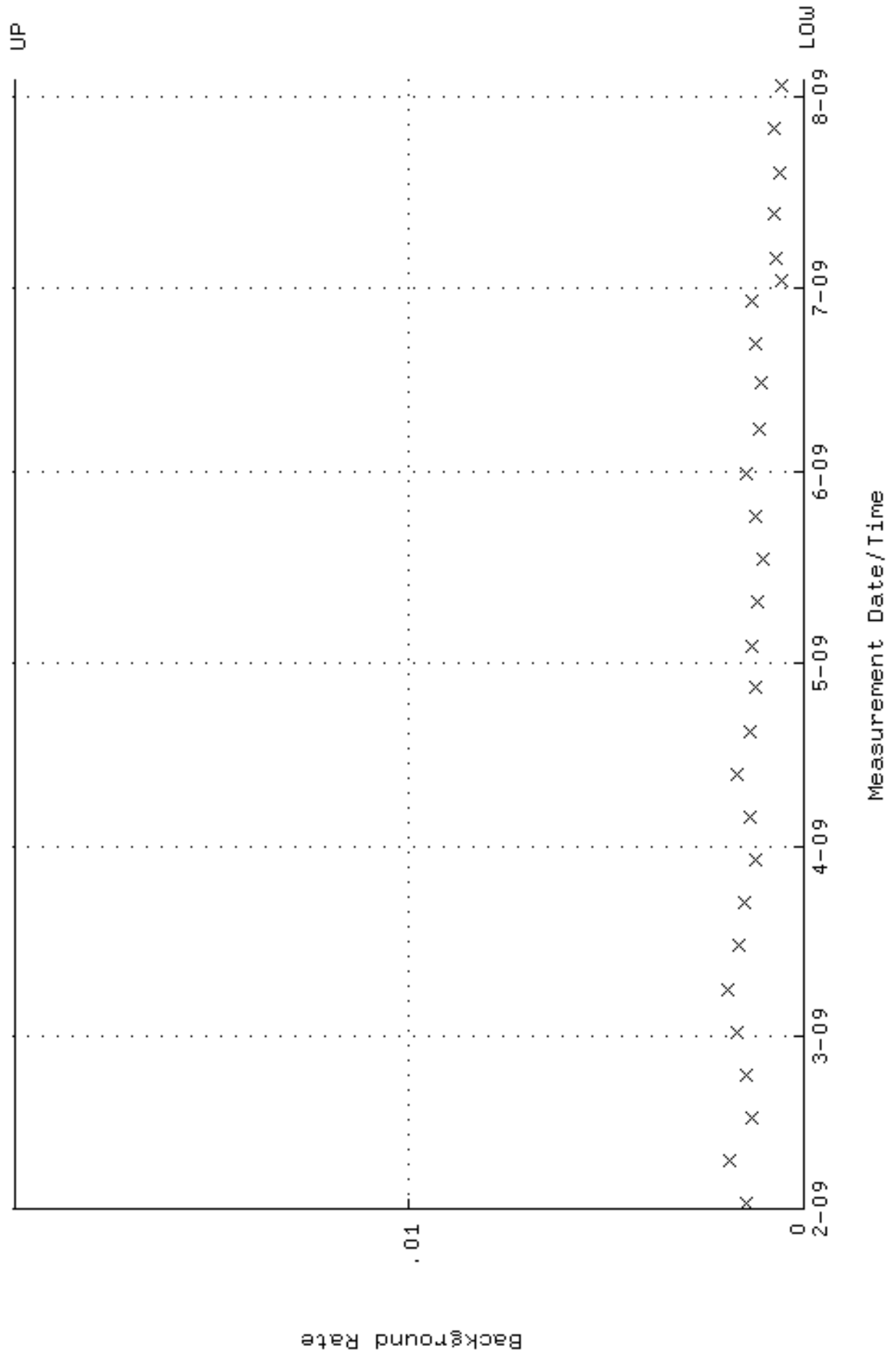
QA filename : DKA100:[ENV_ALPHA.QA.W]W008.QAF;4
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 4-FEB-2009 07:05:54 through 3-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.309318 through 0.329318



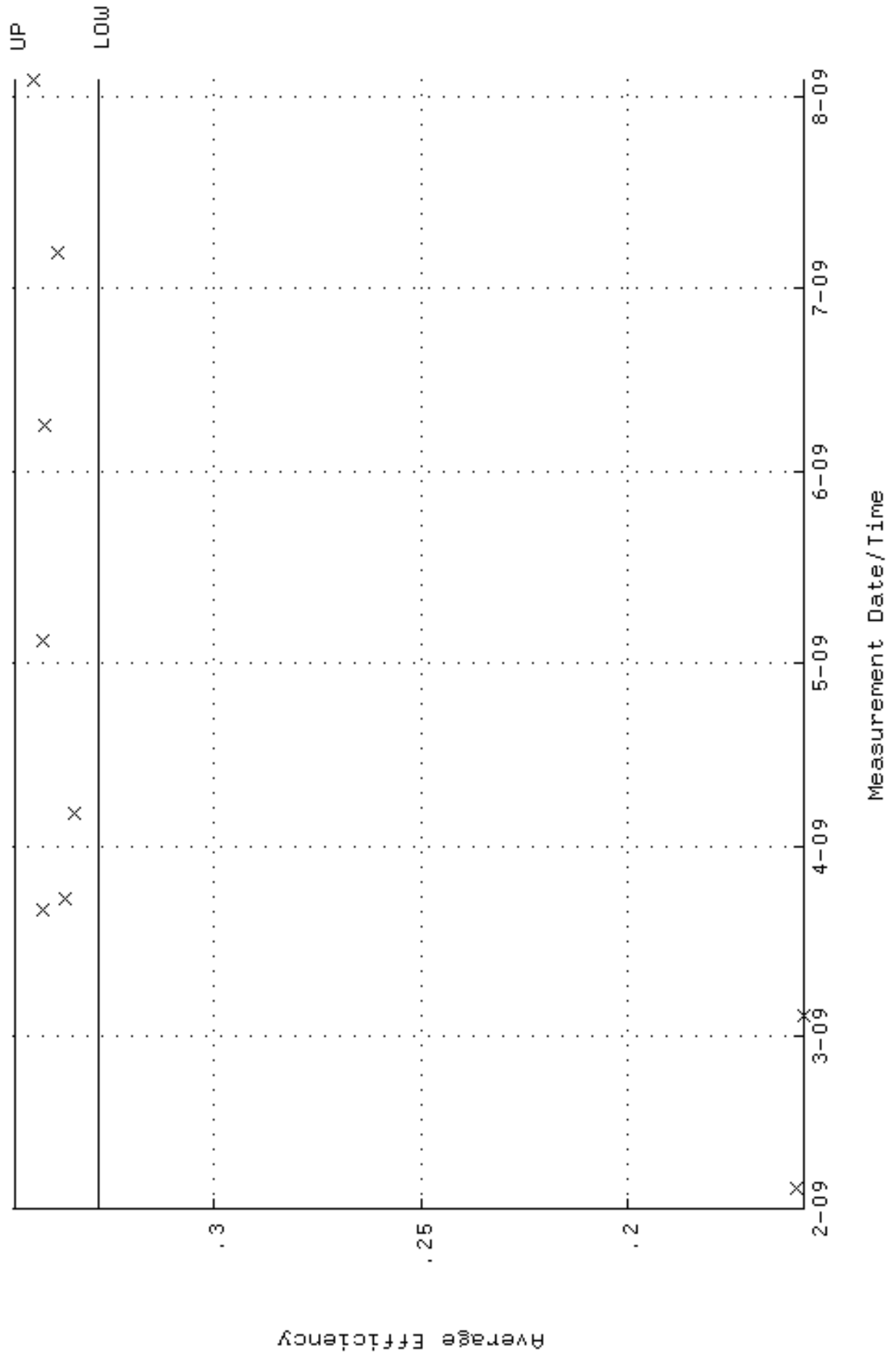
QA filename : DKA100:[ENV_ALPHA.QA.W]W008.QAF;4
Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 4-FEB-2009 07:05:54 through 3-AUG-2009 12:00:00
Lower/Upper Lmts: 87.8346 through 97.0804



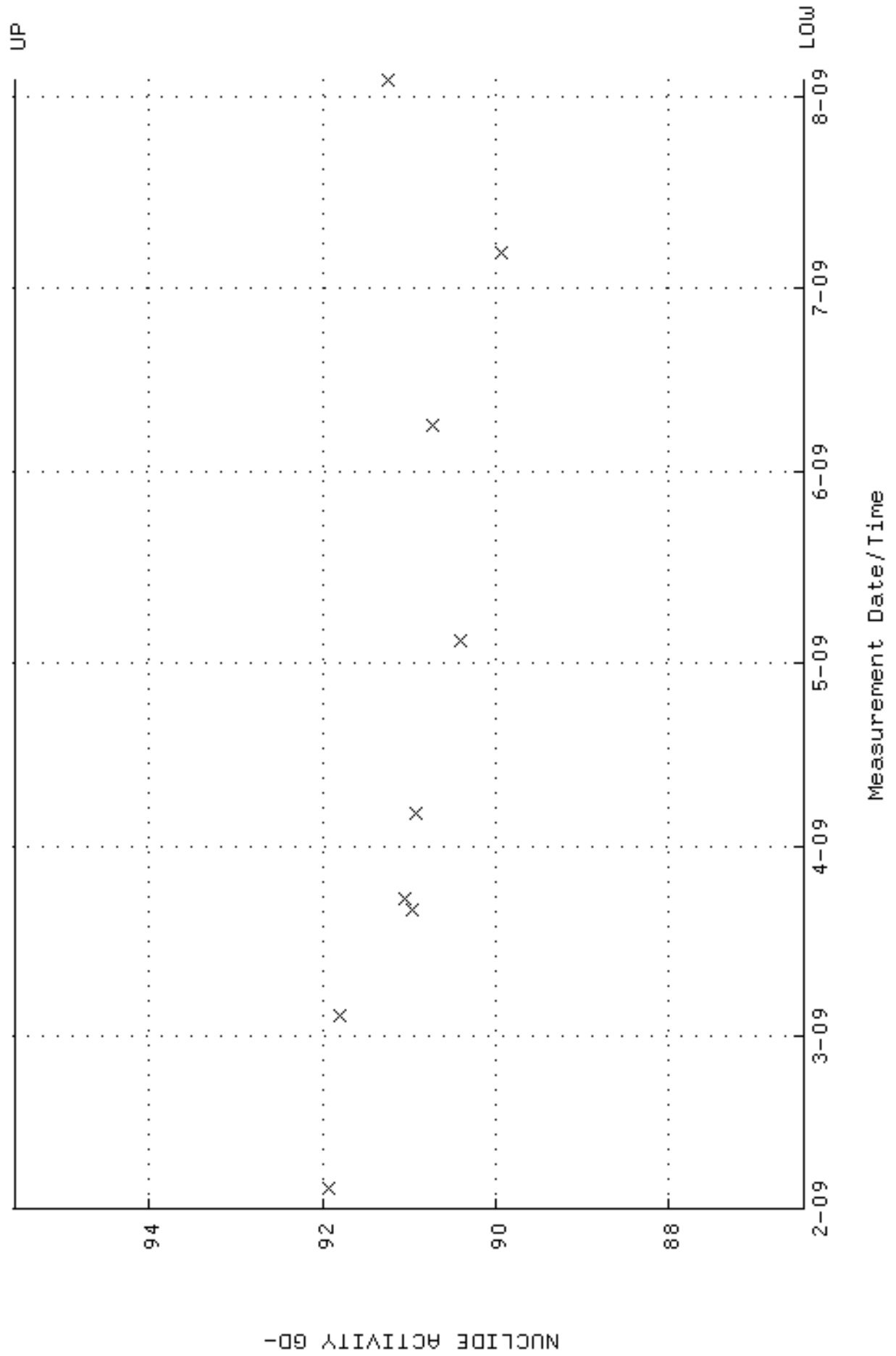
QA filename : DKA100:[ENV_ALPHA.QA.B]B008.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 1-FEB-2009 20:04:46 through 3-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



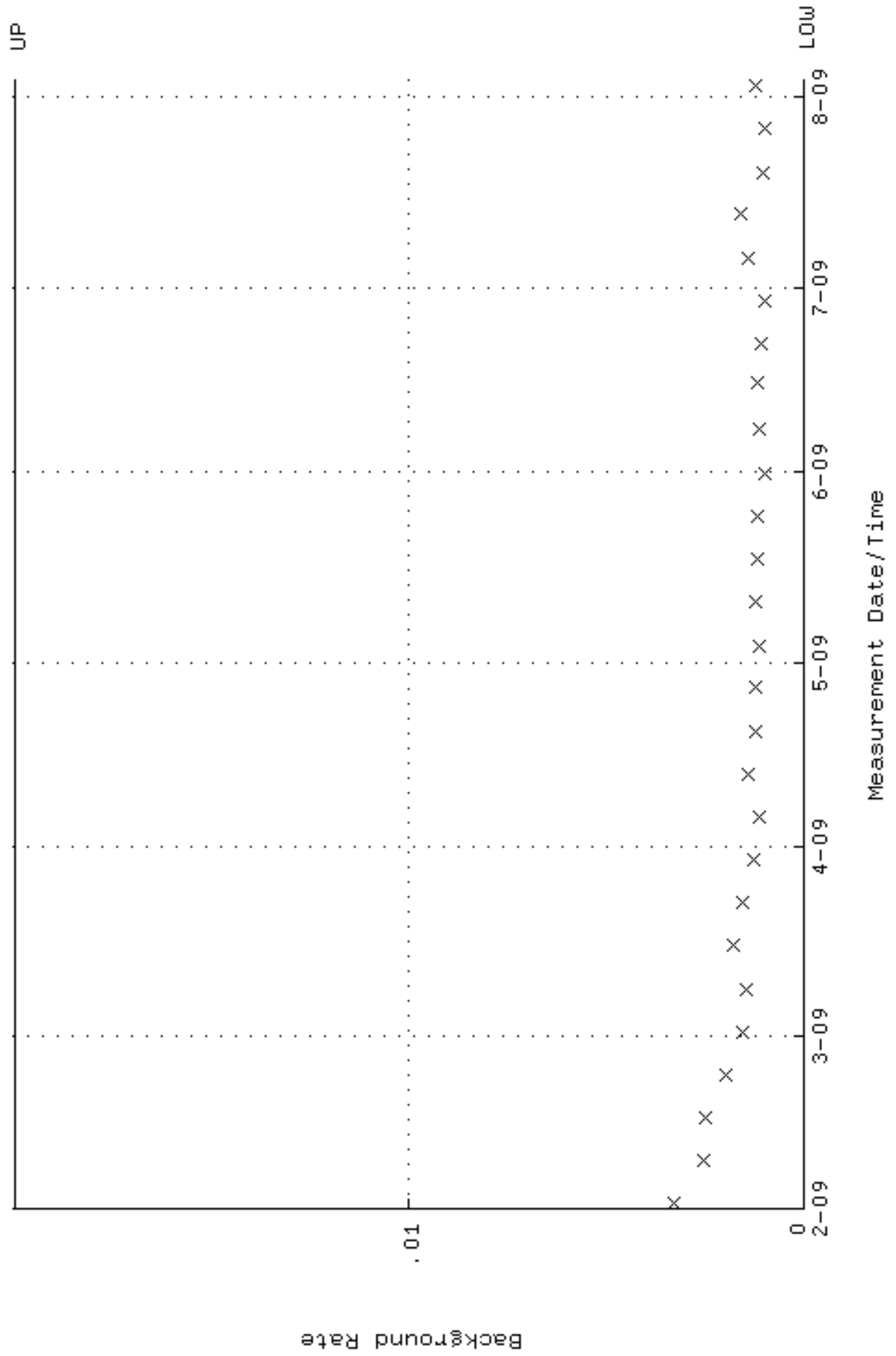
QA filename : DKA100:[ENV_ALPHA.QA.W]W009.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 4-FEB-2009 07:05:54 through 3-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.328261 through 0.348261



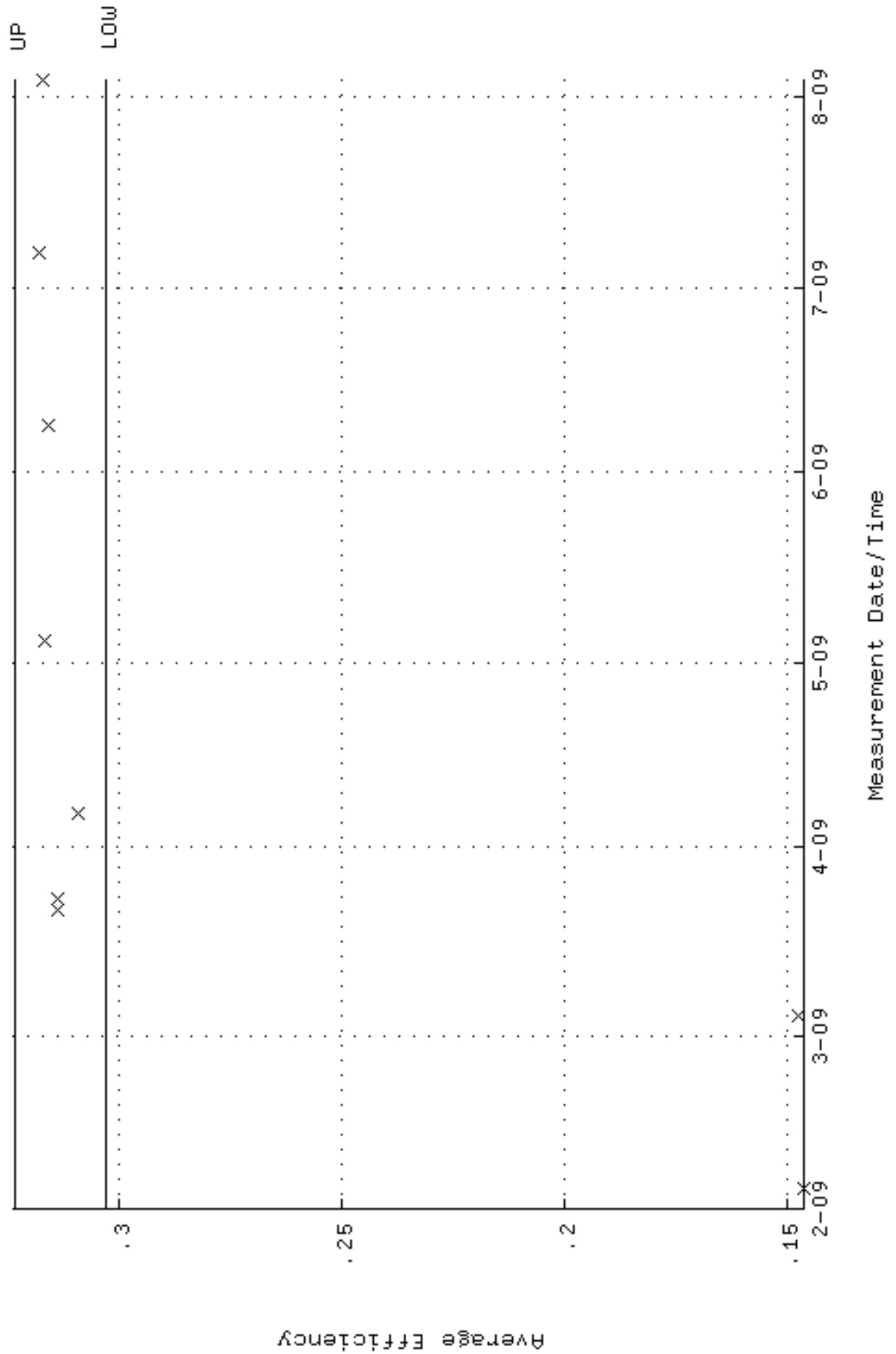
QA filename : DKA100:[ENV_ALPHA.QA.W]W009.QAF;3
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 4-FEB-2009 07:05:54 through 3-AUG-2009 12:00:00
 Lower/Upper Lmts: 86.4475 through 95.5473



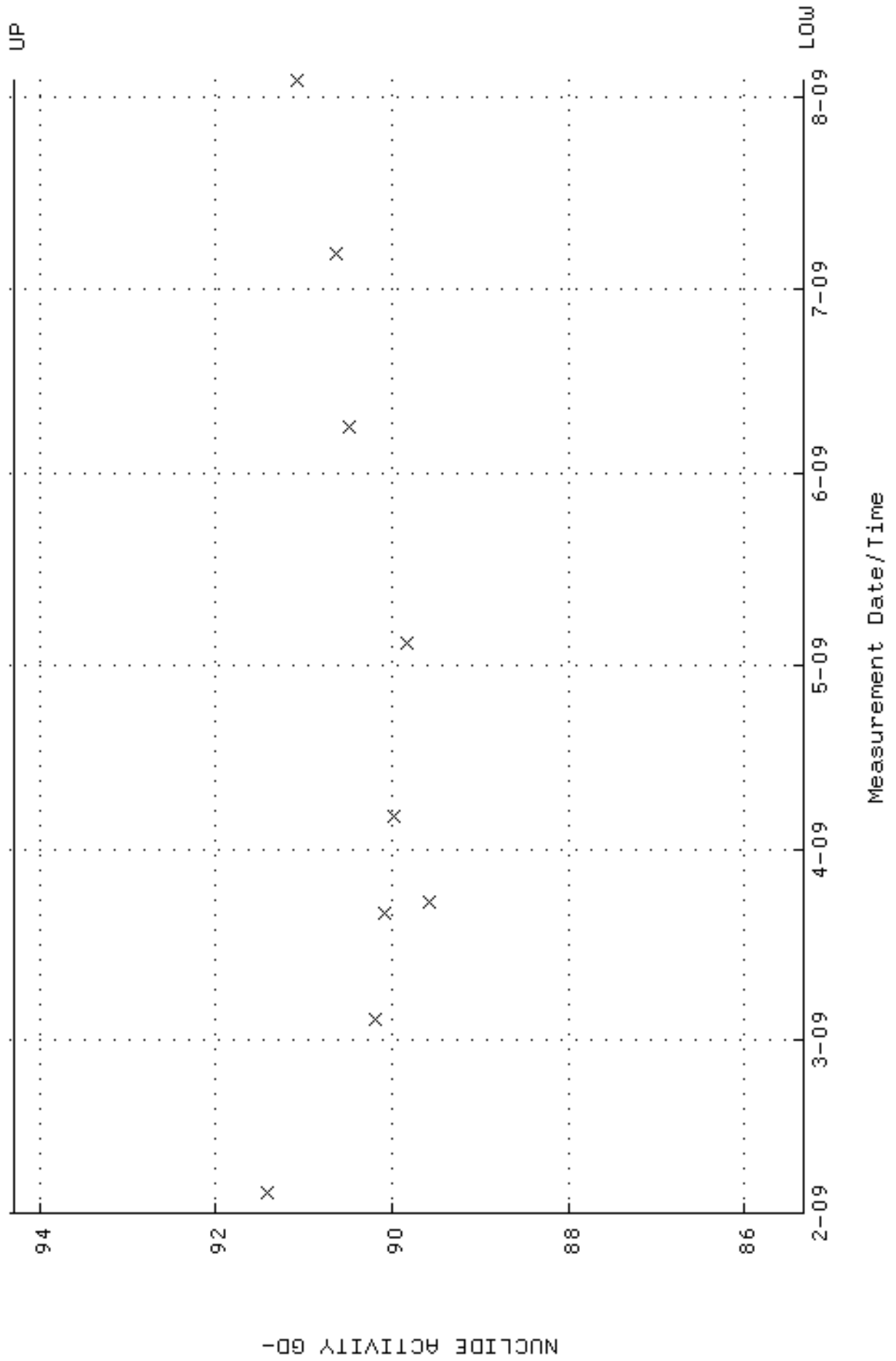
QA filename : DKA100:[ENV_ALPHA.QA.B]B009.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 1-FEB-2009 20:04:46 through 3-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



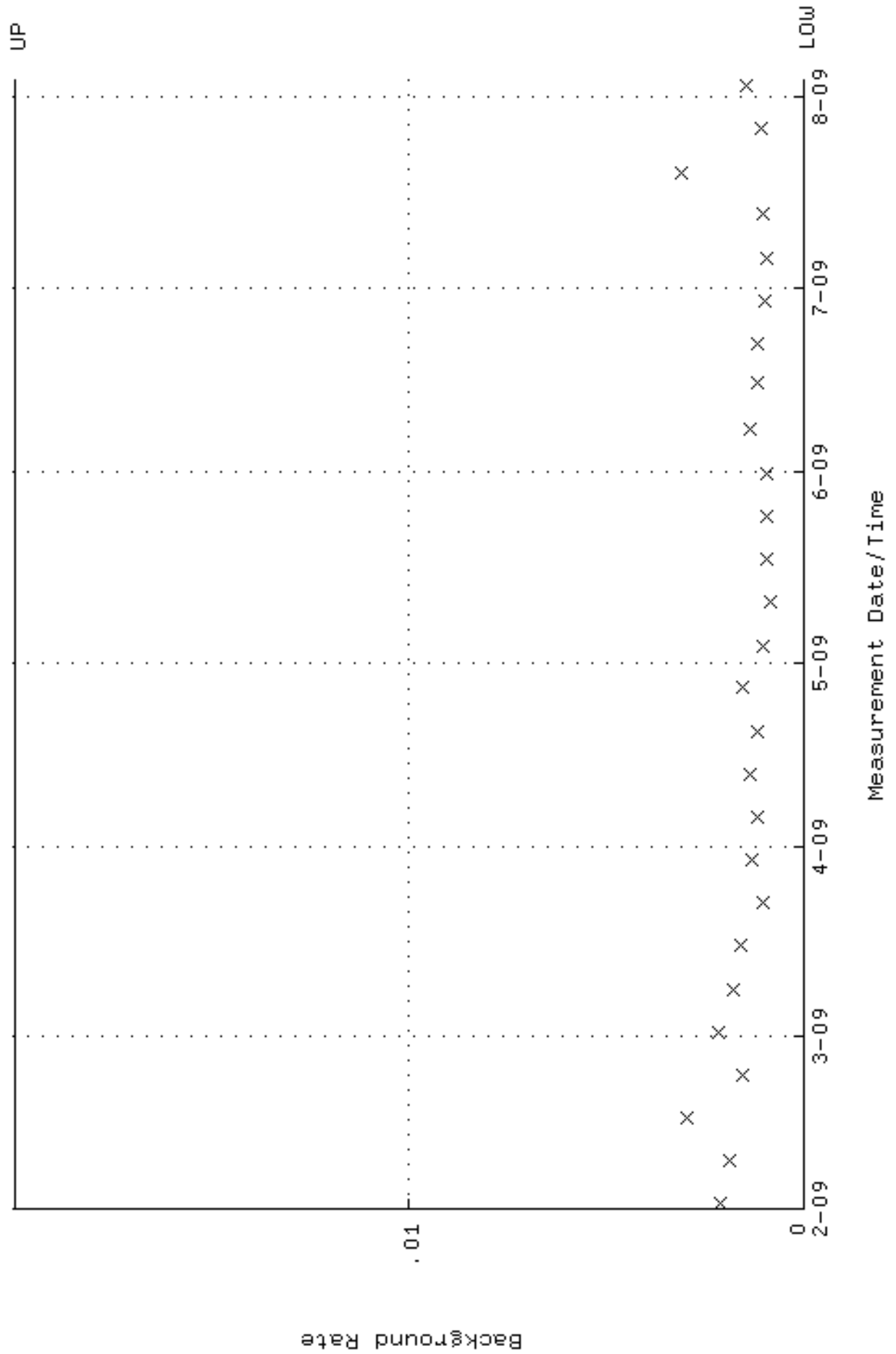
QA filename : DKA100:[ENV_ALPHA.QA.W]W010.QAF;5
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 4-FEB-2009 07:05:54 through 3-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.303169 through 0.323169



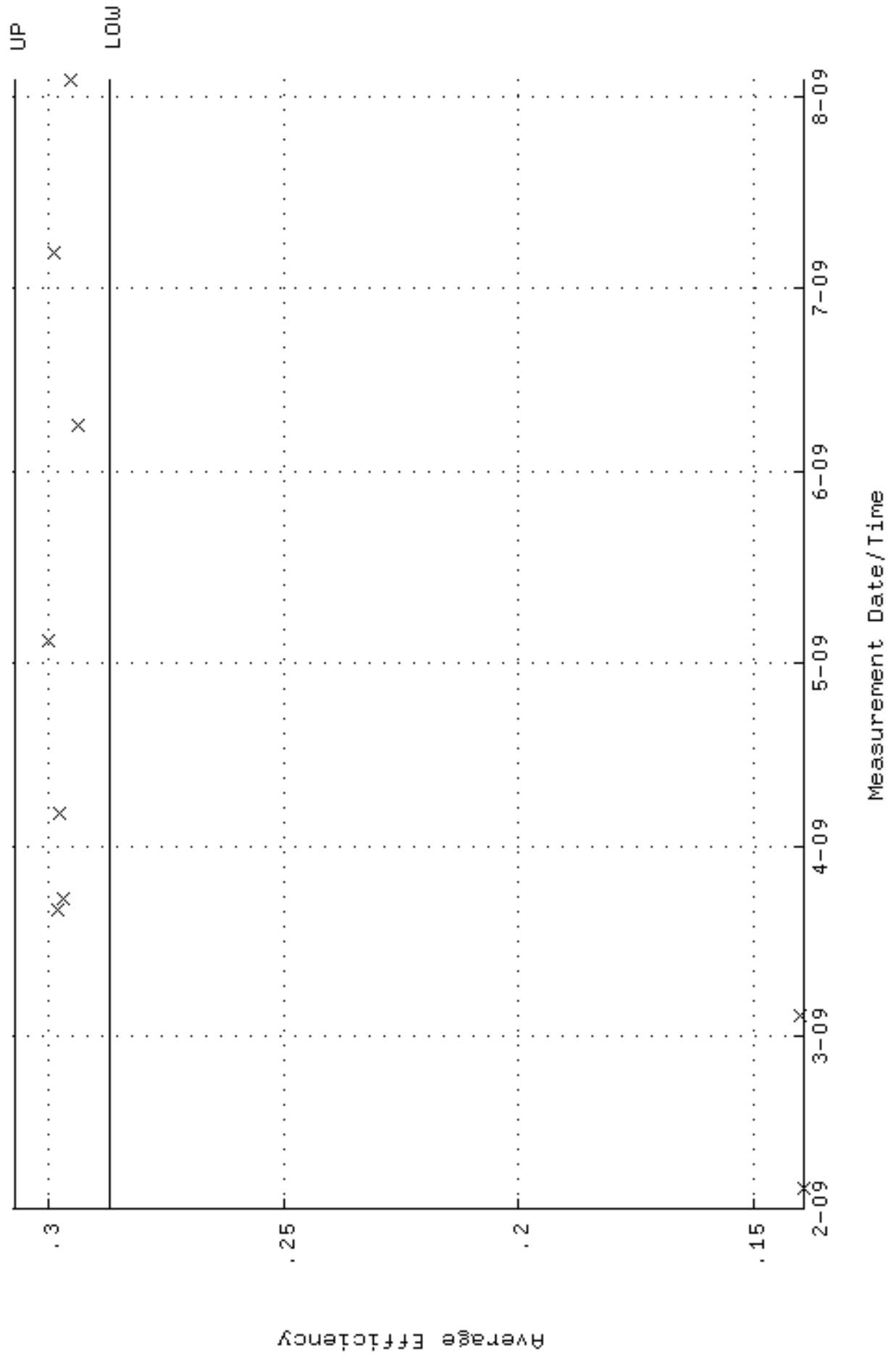
QA filename : DKA100:[ENV_ALPHA.QA.W]W010.QAF;5
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 4-FEB-2009 07:05:54 through 3-AUG-2009 12:00:00
 Lower/Upper Lmts: 85.3273 through 94.3091



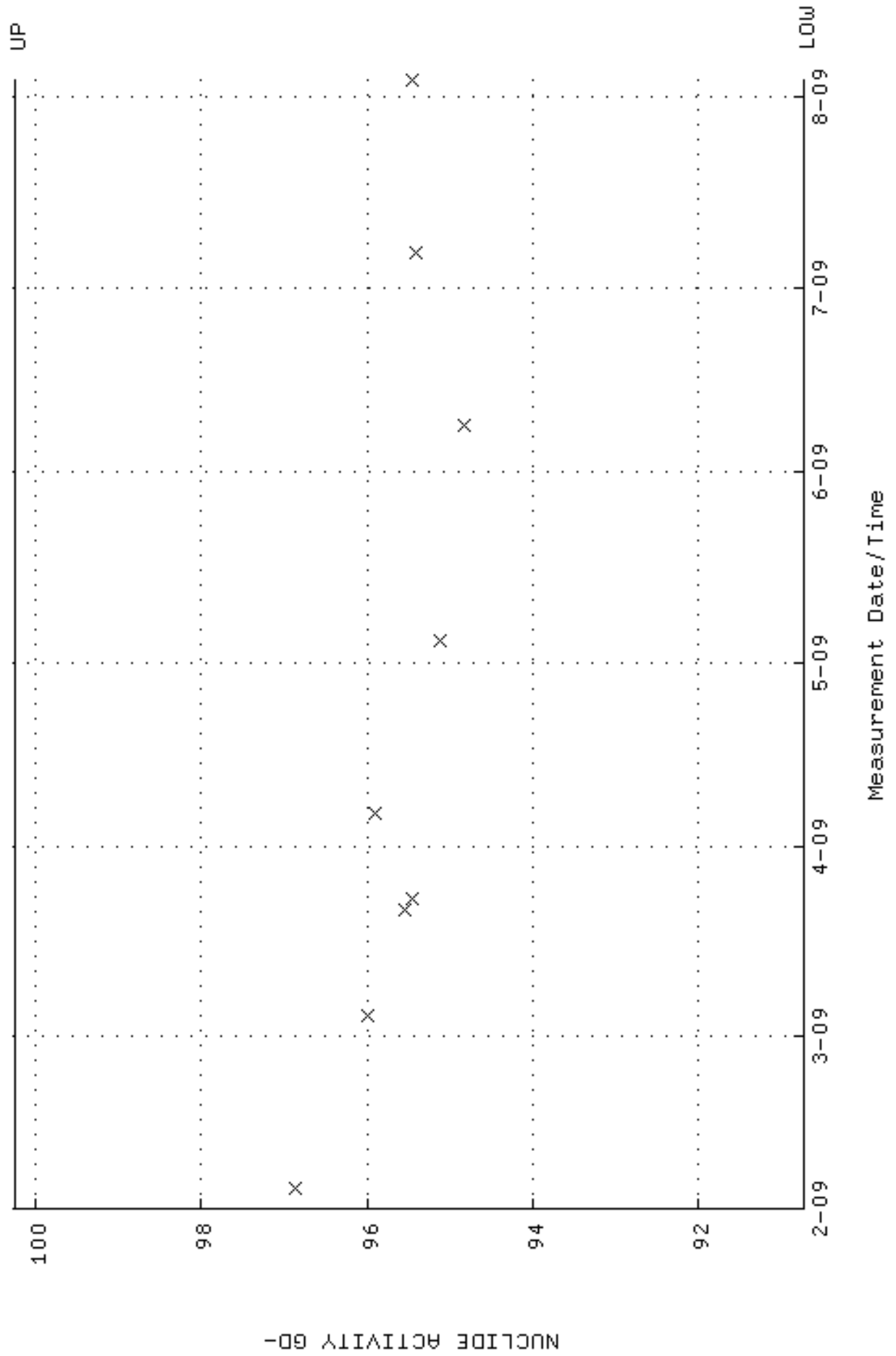
QA filename : DKA100:[ENV_ALPHA.QA.B]B010.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 1-FEB-2009 20:04:46 through 3-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



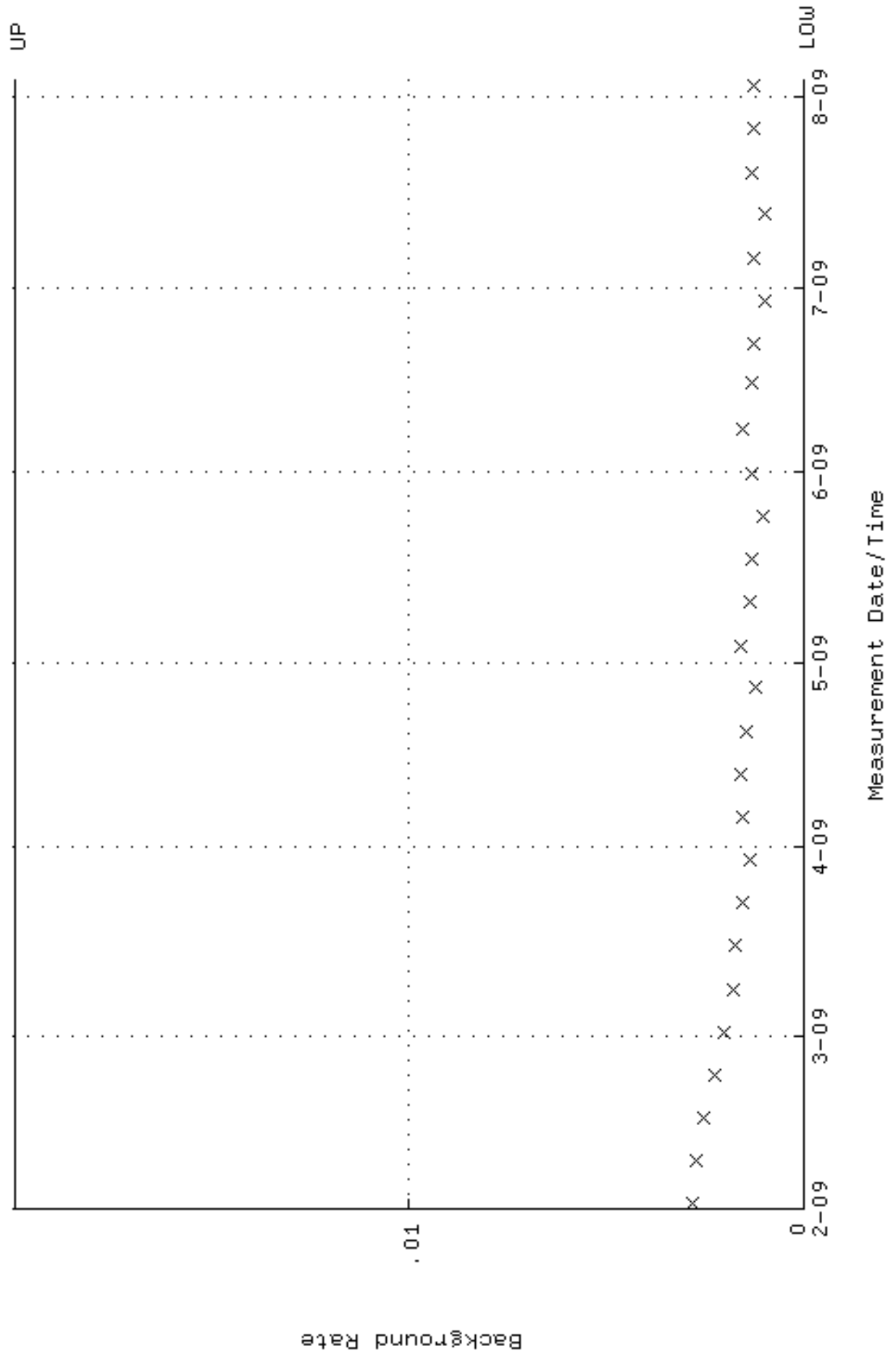
QA filename : DKA100:[ENV_ALPHA.QA.W]W011.QAF;4
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 4-FEB-2009 07:05:54 through 3-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.287129 through 0.307129



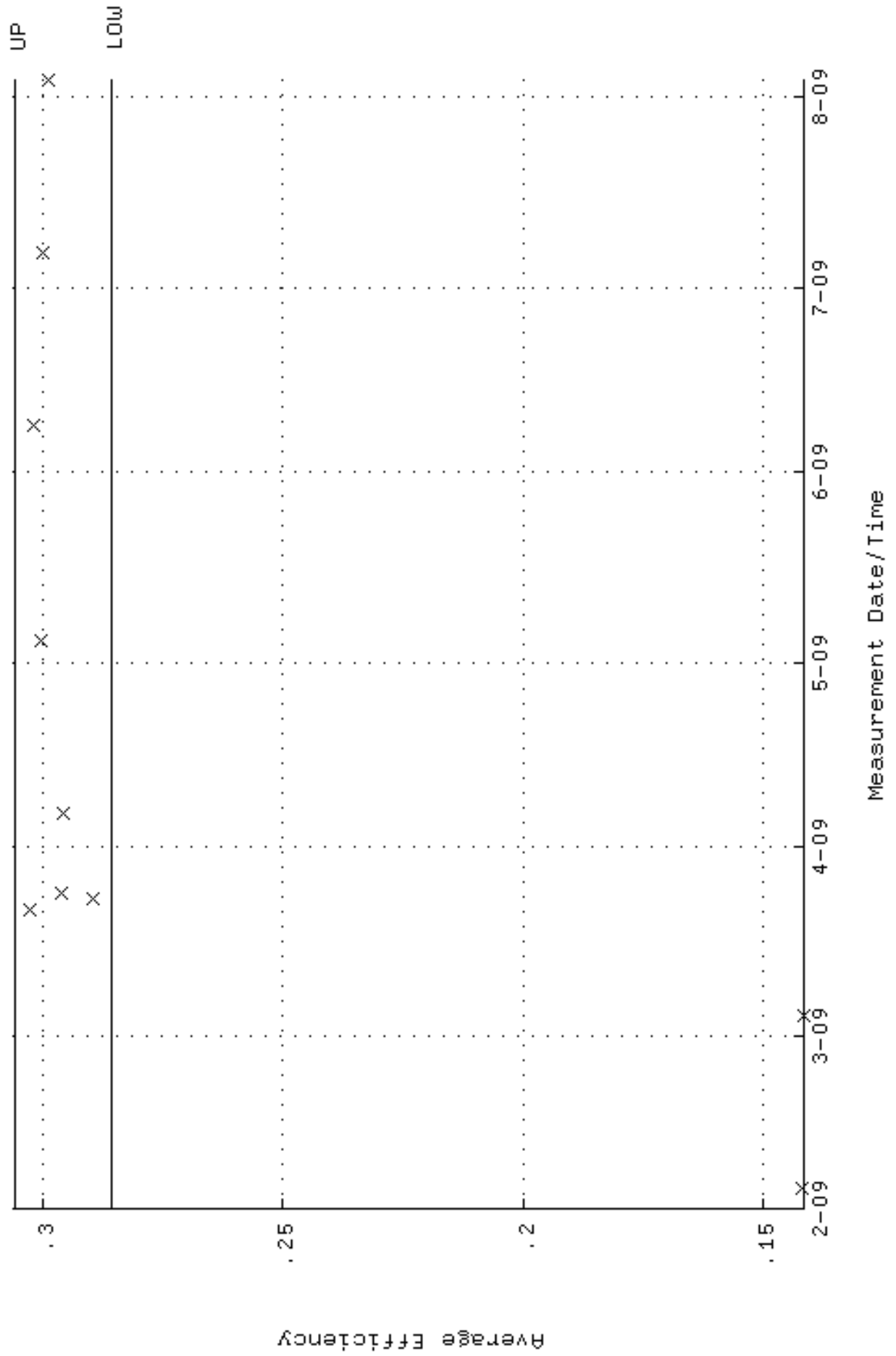
QA filename : DKA100:[ENV_ALPHA.QA.W]W011.QAF;4
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 4-FEB-2009 07:05:54 through 3-AUG-2009 12:00:00
 Lower/Upper Lmts: 90.7092 through 100.258



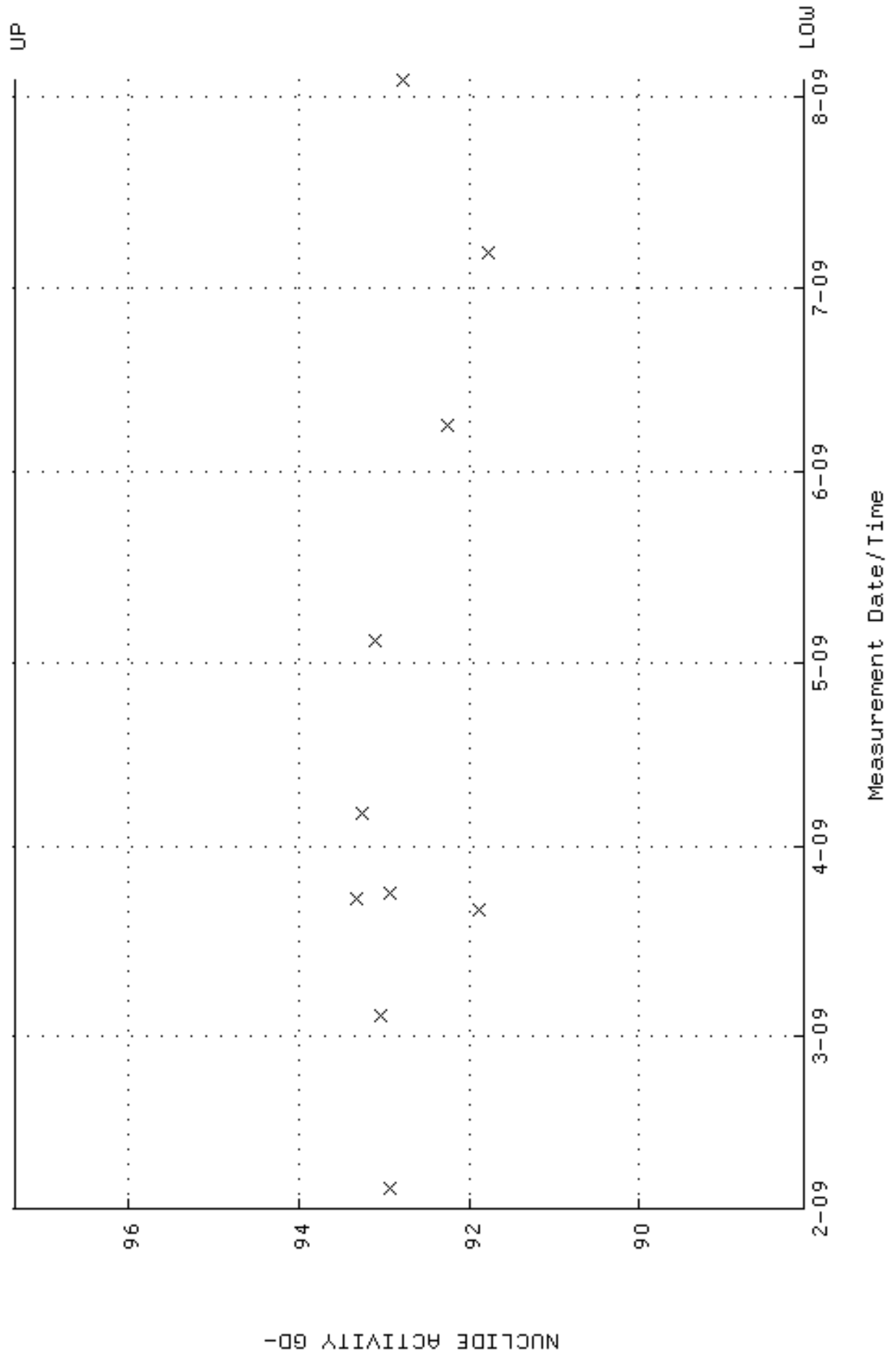
QA filename : DKA100:[ENV_ALPHA.QA.B]B011.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 1-FEB-2009 20:04:46 through 3-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



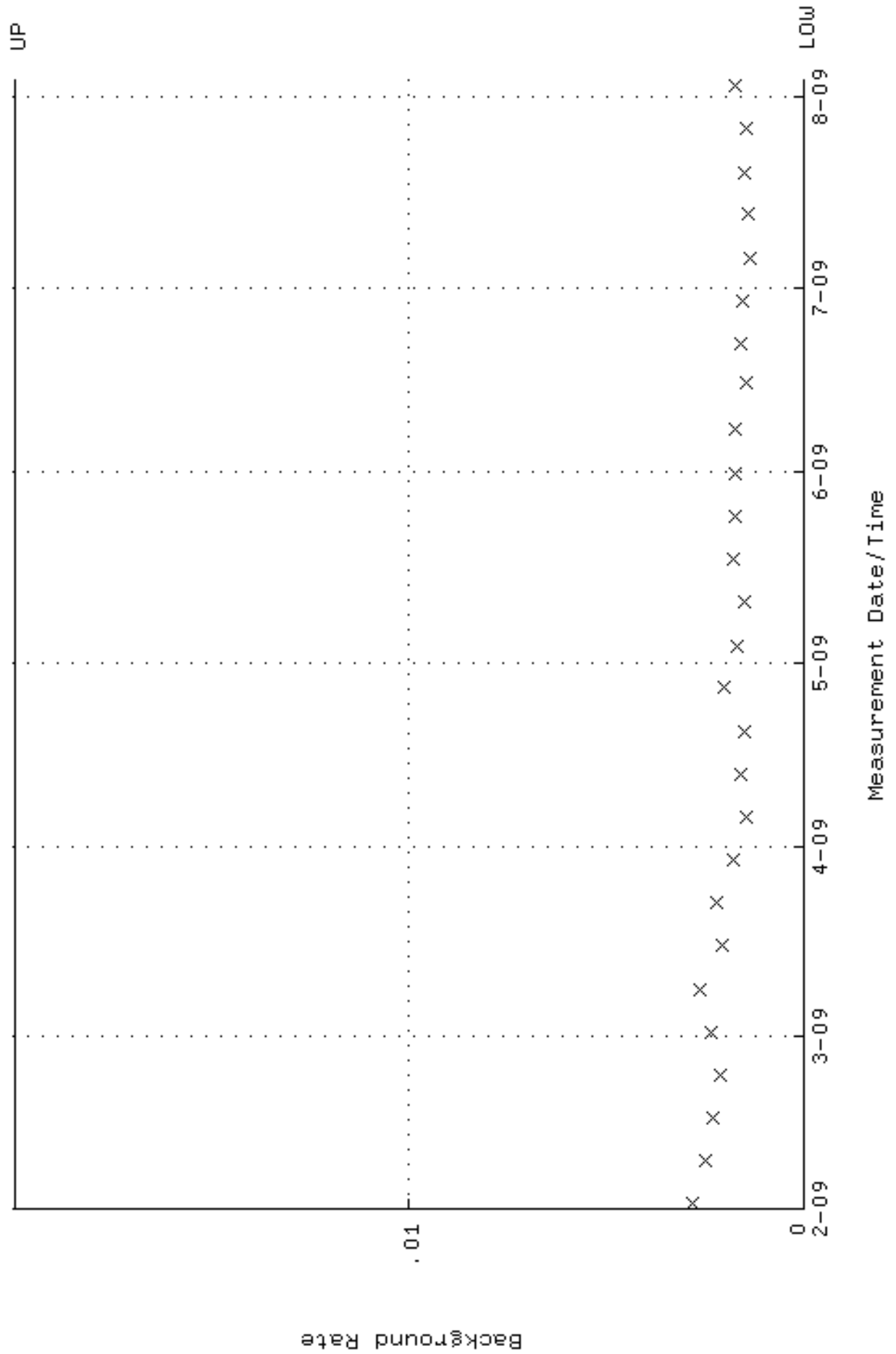
QA filename : DKA100:[ENV_ALPHA.QA.W]W012.QAF;4
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 4-FEB-2009 07:05:54 through 3-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.285730 through 0.305730



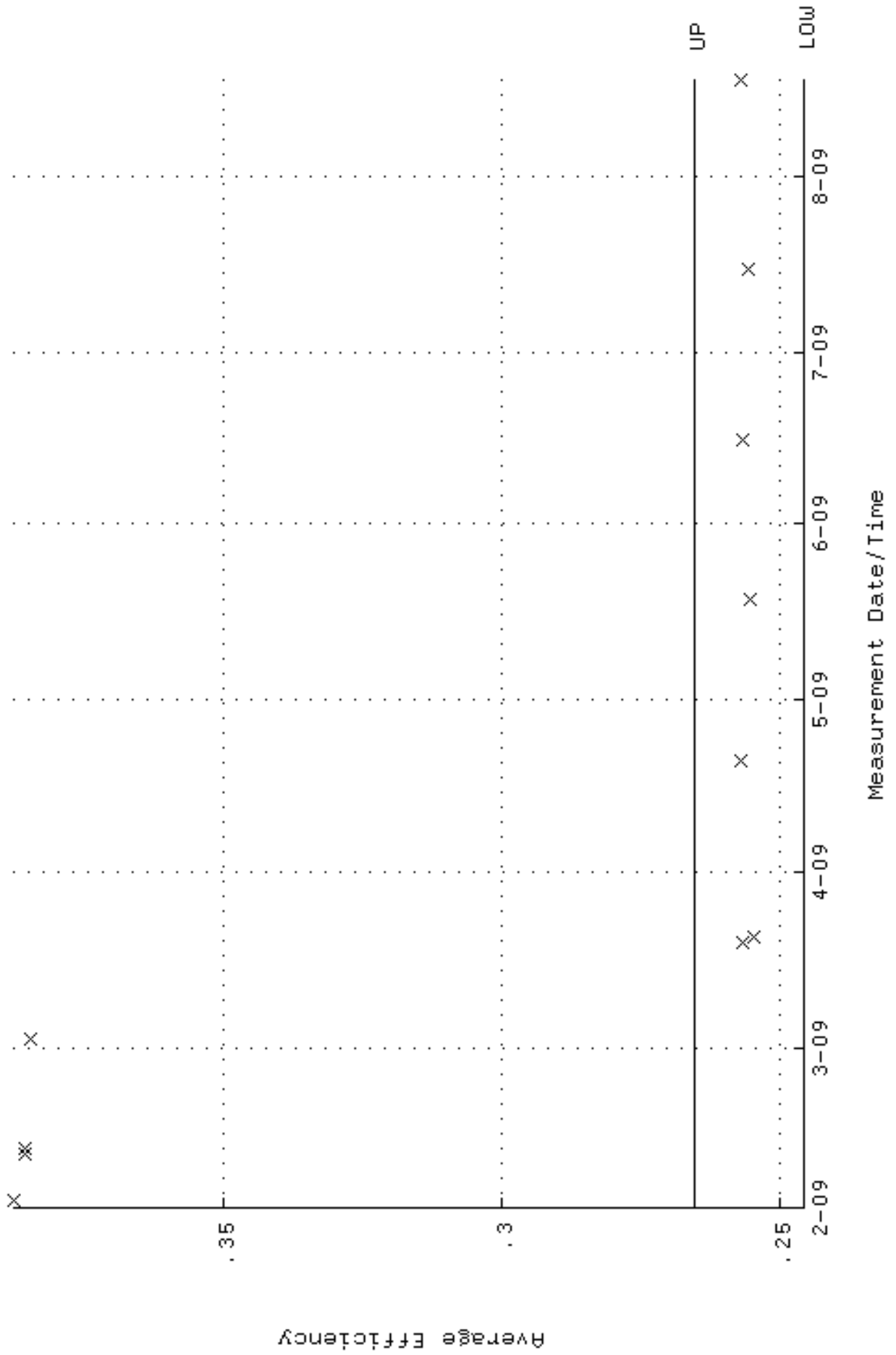
QA filename : DKA100:[ENV_ALPHA.QA.W]w012.QAF;4
Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 4-FEB-2009 07:05:54 through 3-AUG-2009 12:00:00
Lower/Upper Lmts: 88.0678 through 97.3382



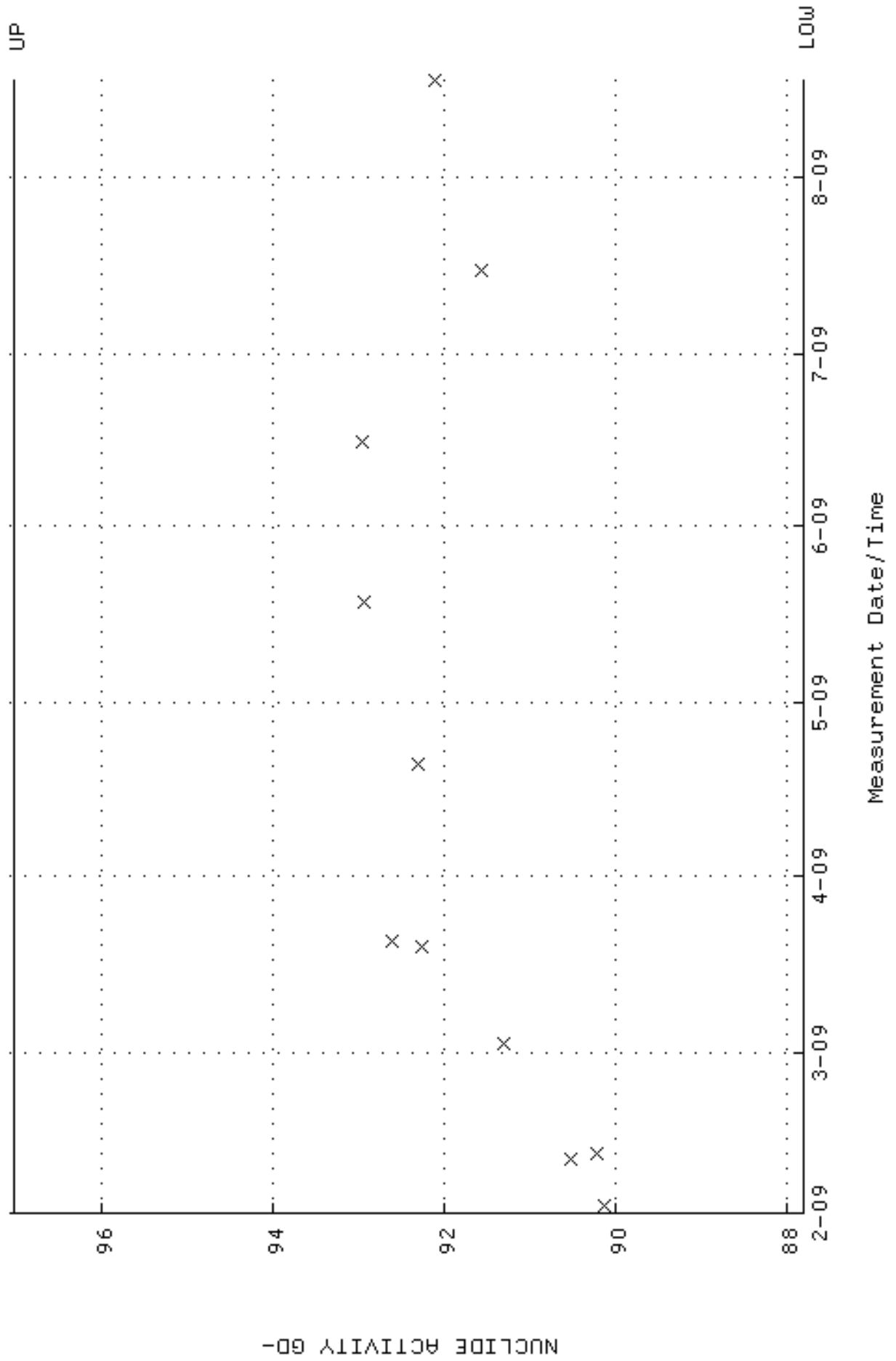
QA filename : DKA100:[ENV_ALPHA.QA.B]B012.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 1-FEB-2009 20:04:46 through 3-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



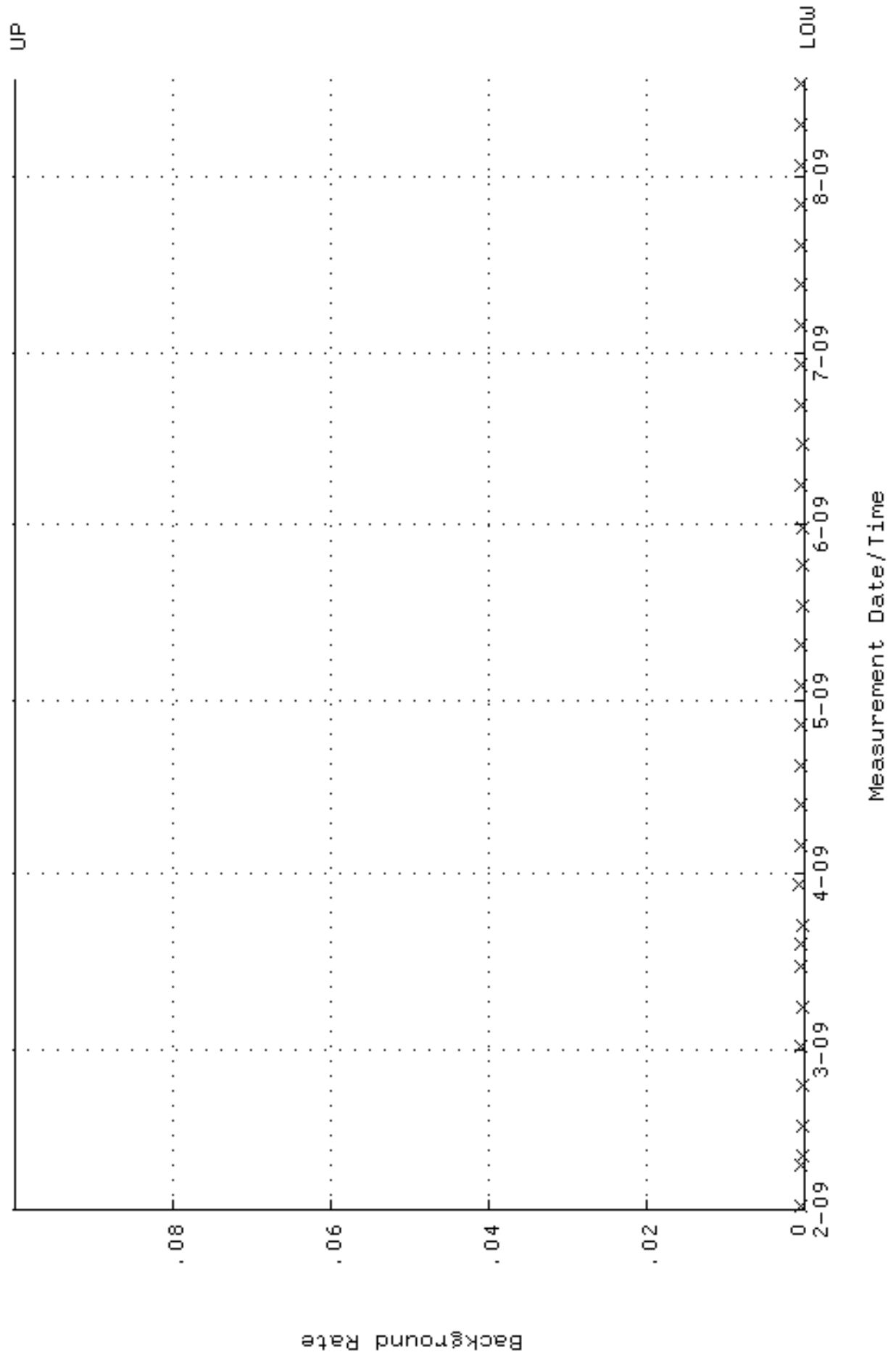
QA filename : DKA100:[ENV_ALPHA.QA.W]W114.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 2-FEB-2009 10:31:11 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.245499 through 0.265499



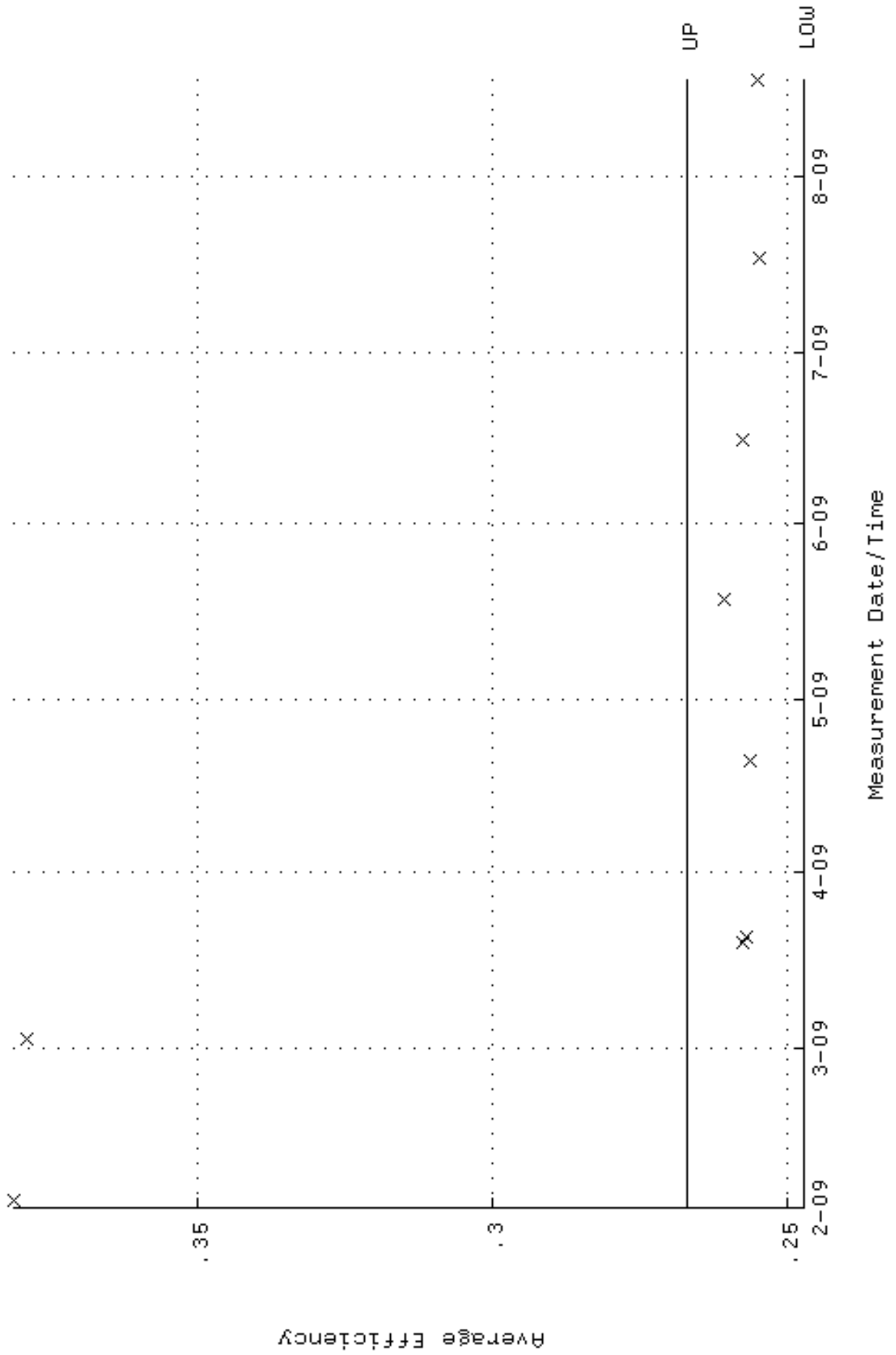
QA filename : DKA100:[ENV_ALPHA.QA.W]w114.QAF;1
Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 2-FEB-2009 10:31:11 through 17-AUG-2009 12:00:00
Lower/Upper Lmts: 87.8108 through 97.0540



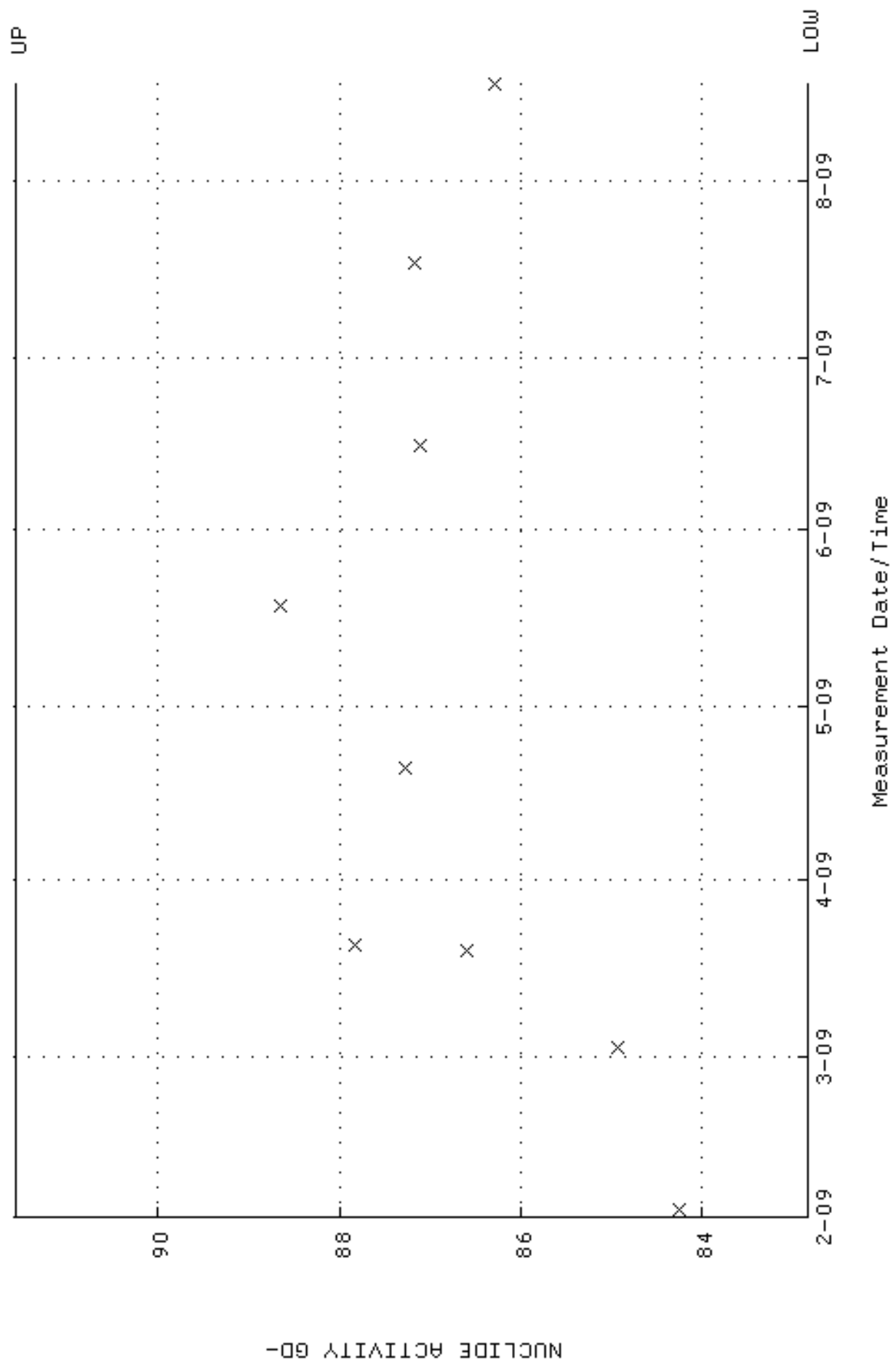
QA filename : DKA100:[ENV_ALPHA.QA.B]B114.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 1-FEB-2009 17:00:32 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



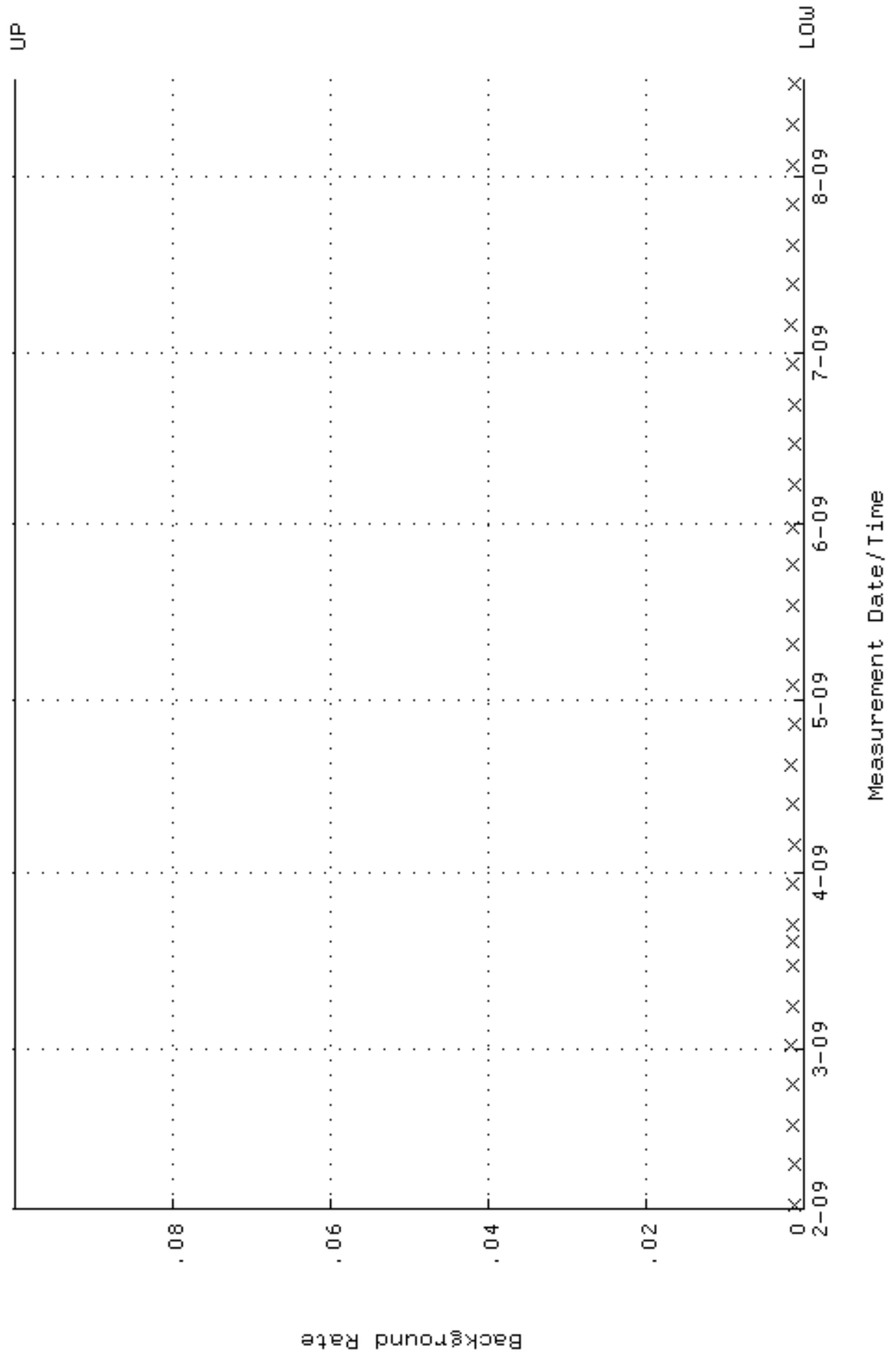
QA filename : DKA100:[ENV_ALPHA.QA.W]W138.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 2-FEB-2009 10:34:01 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.247085 through 0.267085



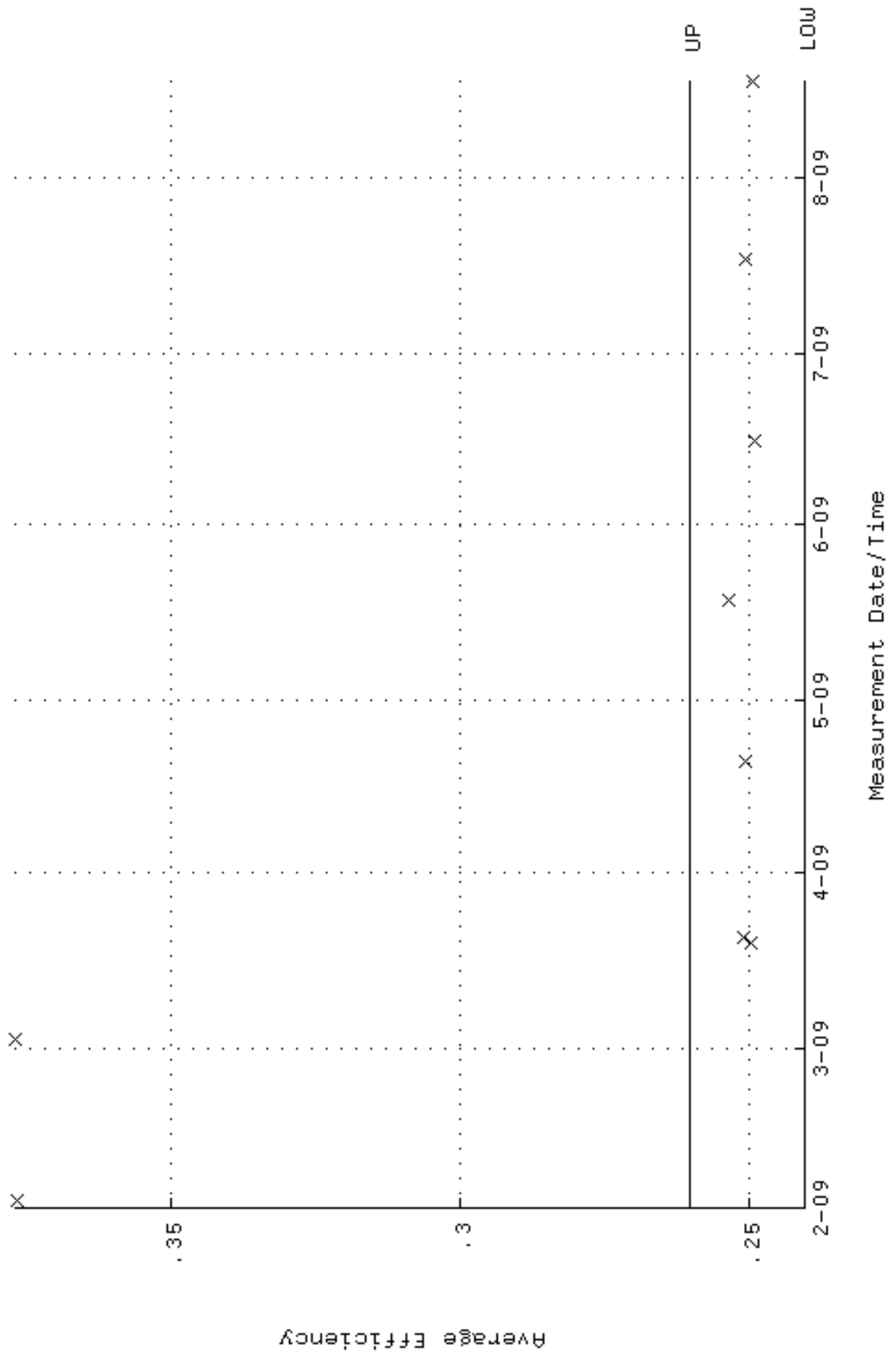
QA filename : DKA100:[ENV_ALPHA.QA.W]W138.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 2-FEB-2009 10:34:01 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 82.8399 through 91.5599



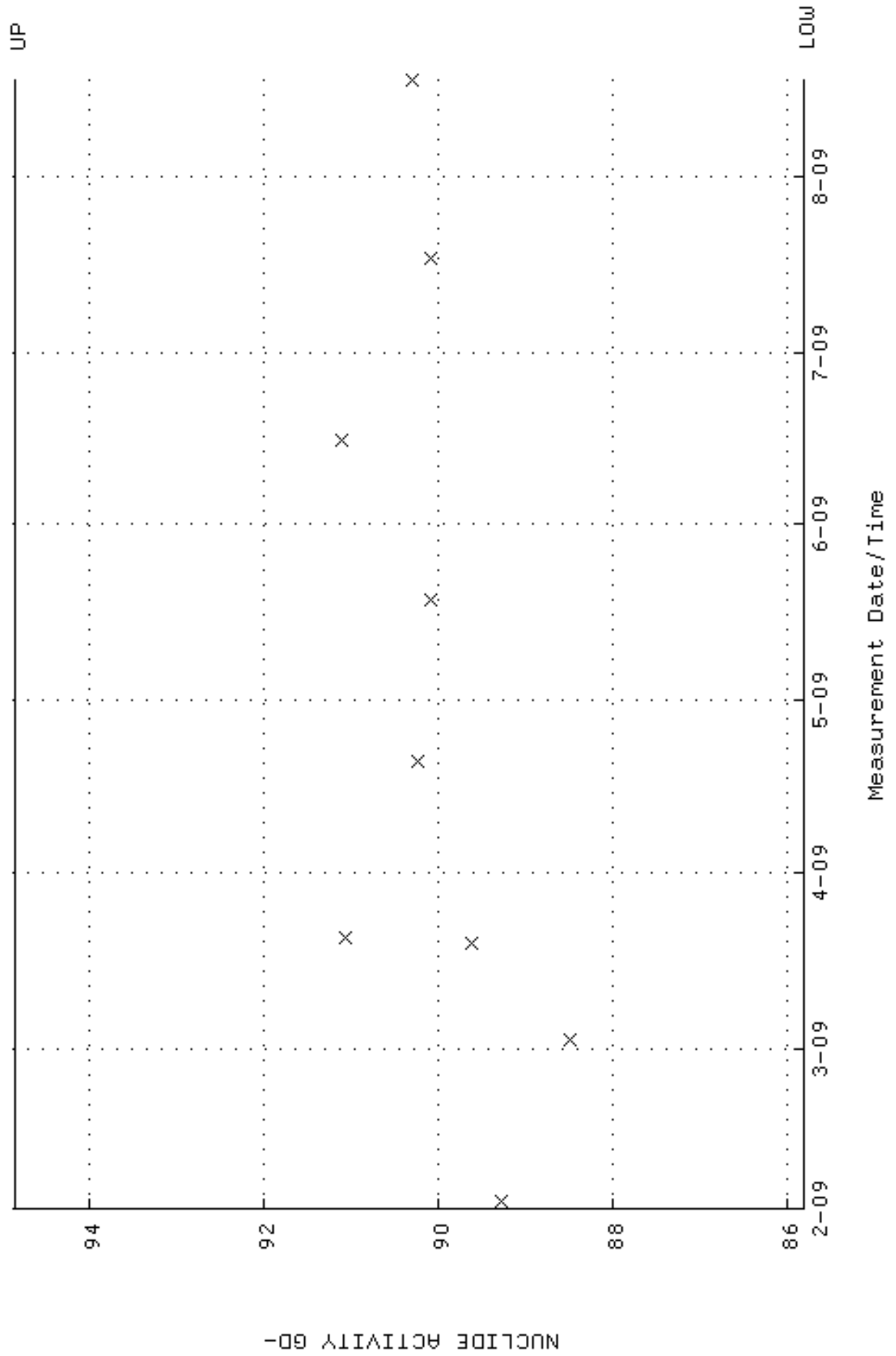
QA filename : DKA100:[ENV_ALPHA.QA.B]B138.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 1-FEB-2009 17:06:20 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



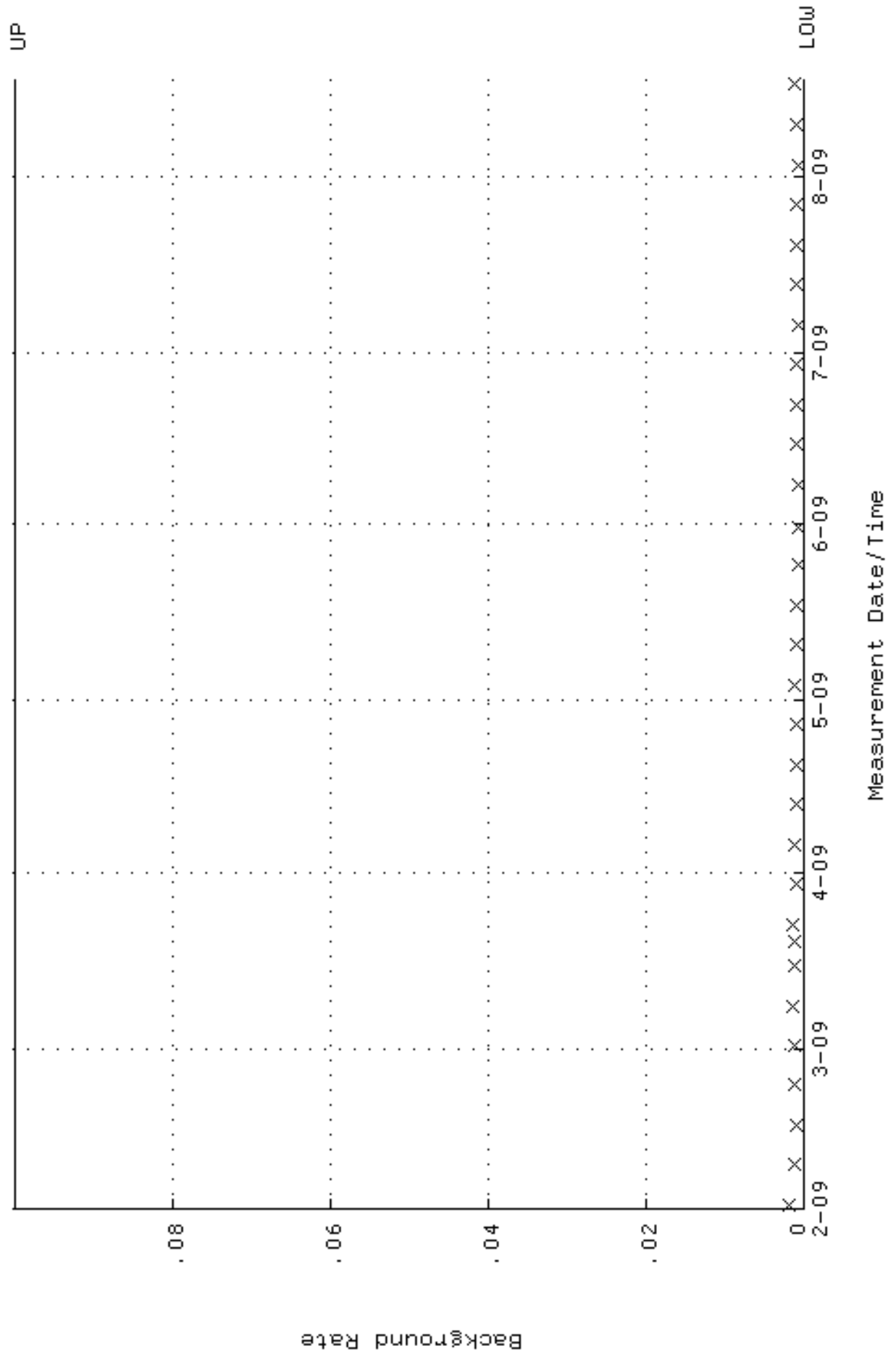
QA filename : DKA100:[ENV_ALPHA.QA.W]W139.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 2-FEB-2009 10:34:08 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.240299 through 0.260299



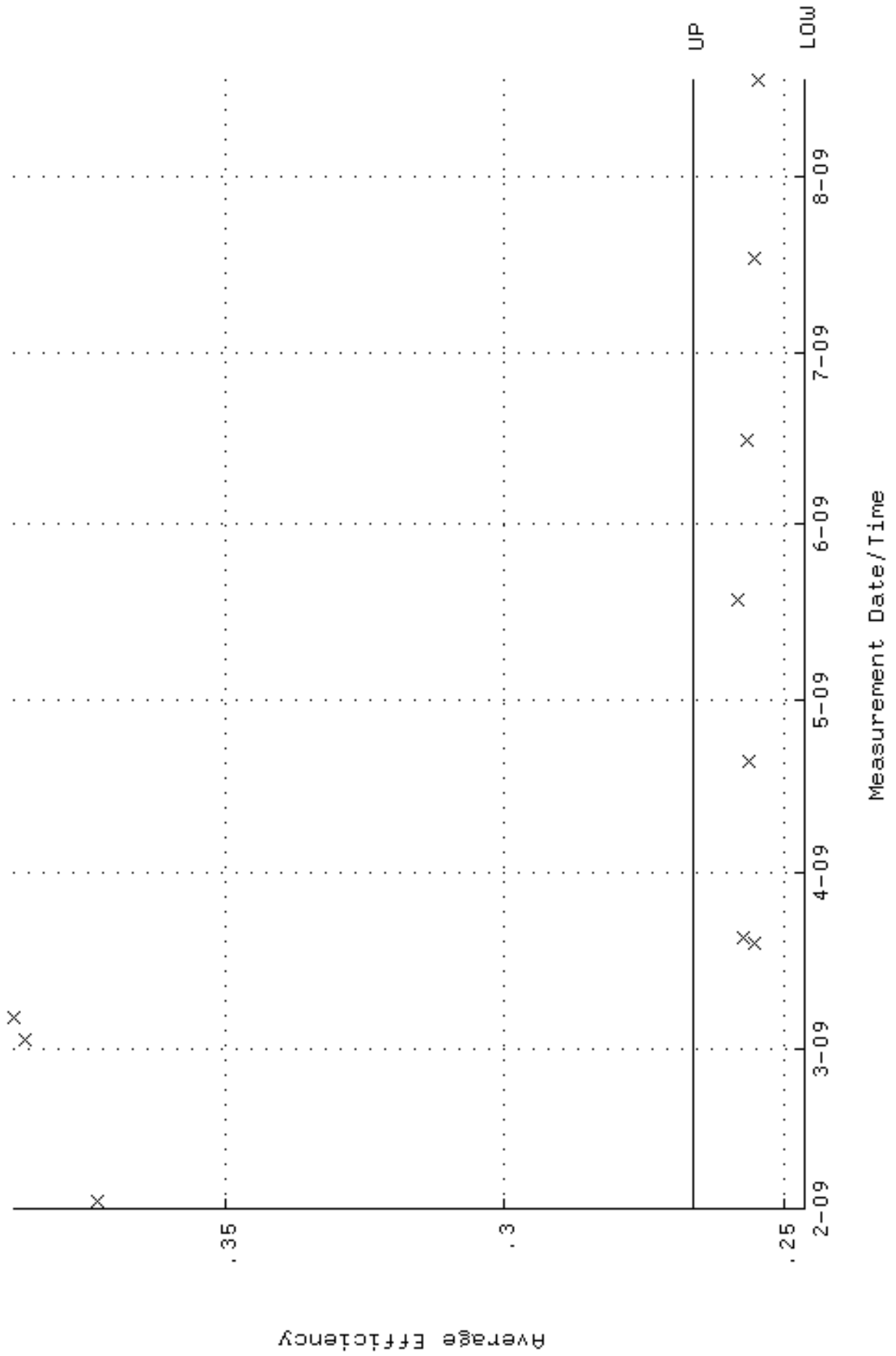
QA filename : DKA100:[ENV_ALPHA.QA.W]W139.QAF;1
Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 2-FEB-2009 10:34:08 through 17-AUG-2009 12:00:00
Lower/Upper Lmts: 85.8145 through 94.8477



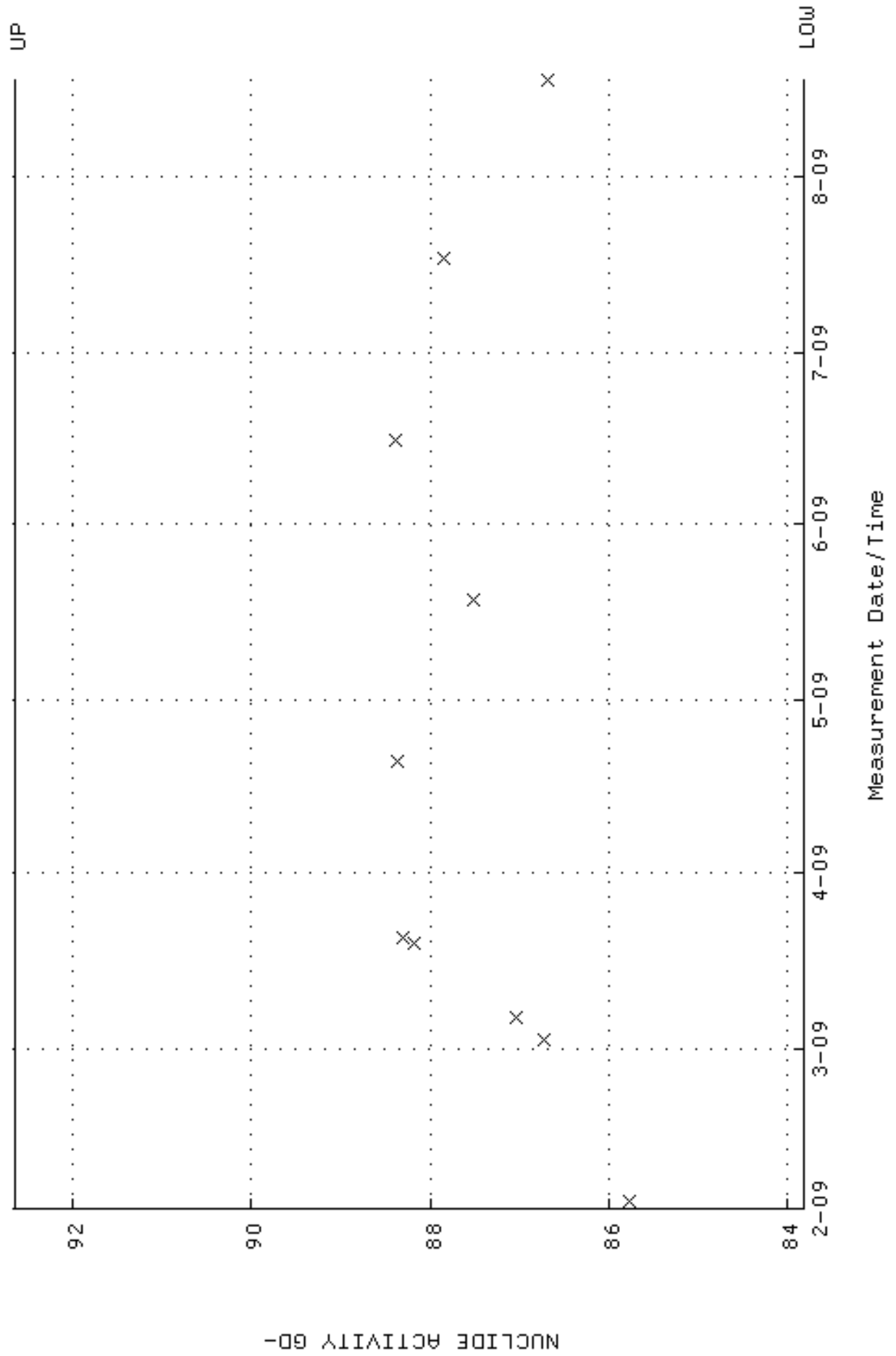
QA filename : DKA100:[ENV_ALPHA.QA.B]B139.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 1-FEB-2009 17:06:33 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



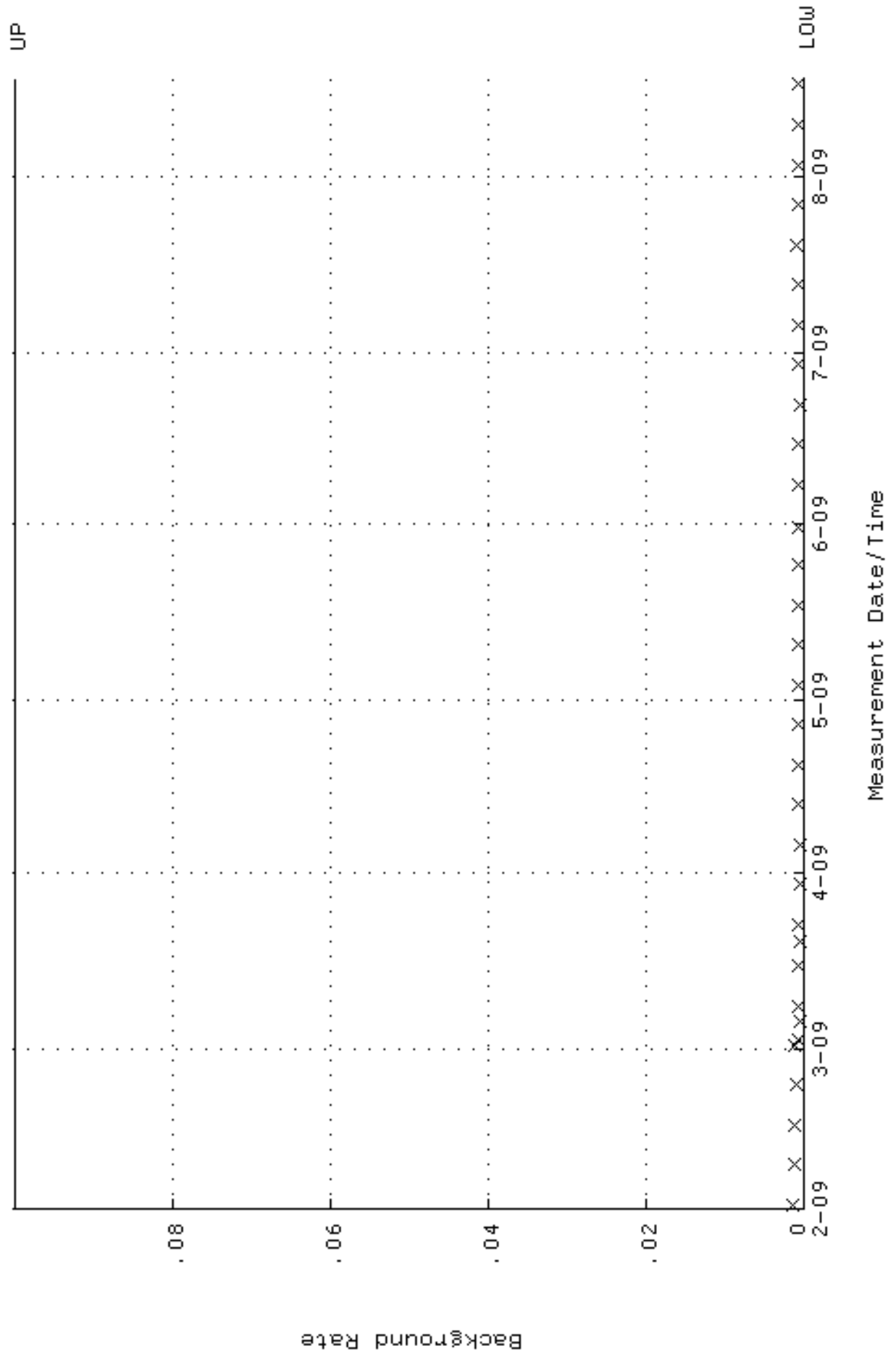
QA filename : DKA100:[ENV_ALPHA.QA.W]W140.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 2-FEB-2009 10:34:15 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.246178 through 0.266178



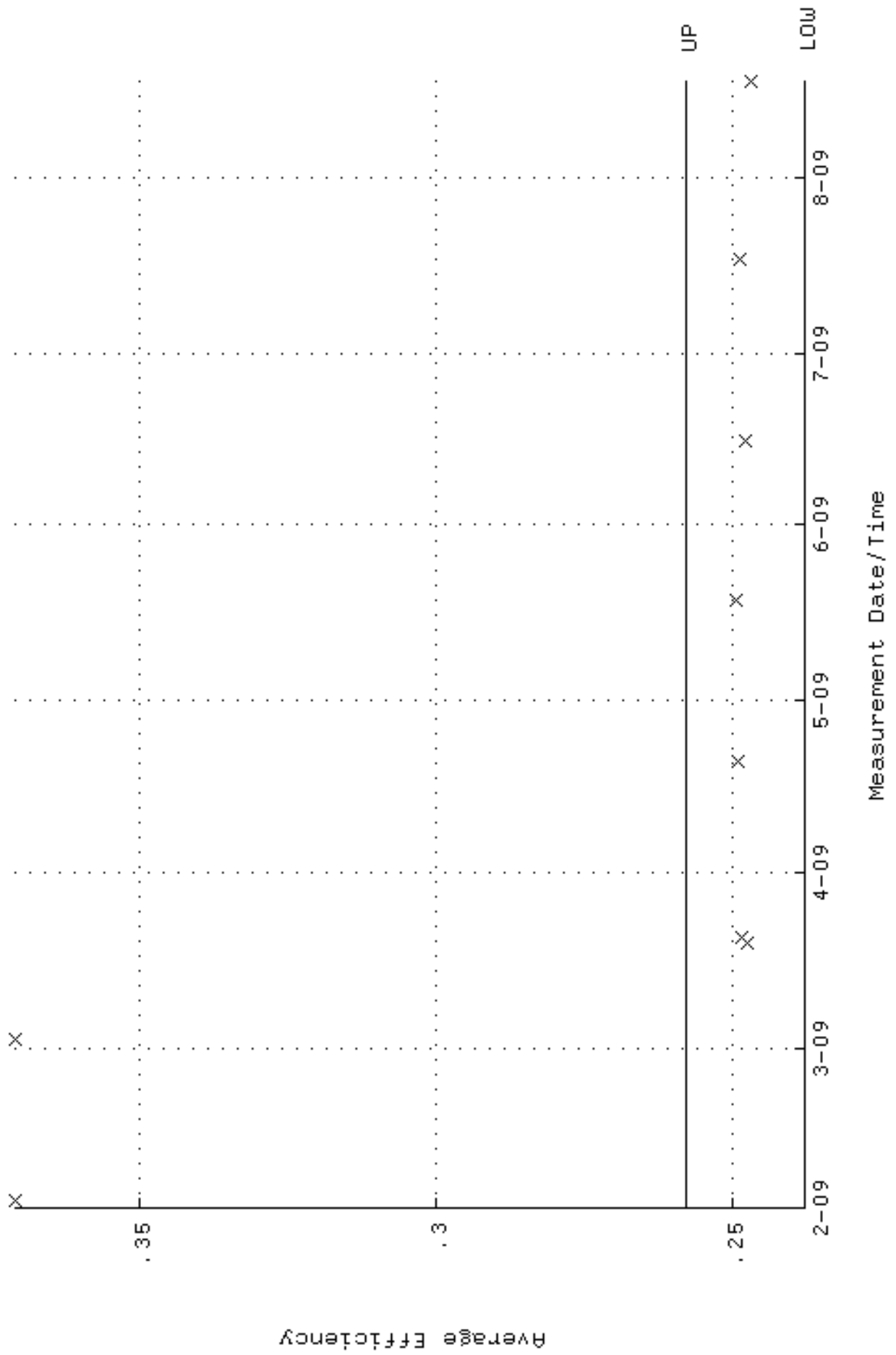
QA filename : DKA100:[ENV_ALPHA.QA.W]W140.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 2-FEB-2009 10:34:15 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 83.8171 through 92.6399



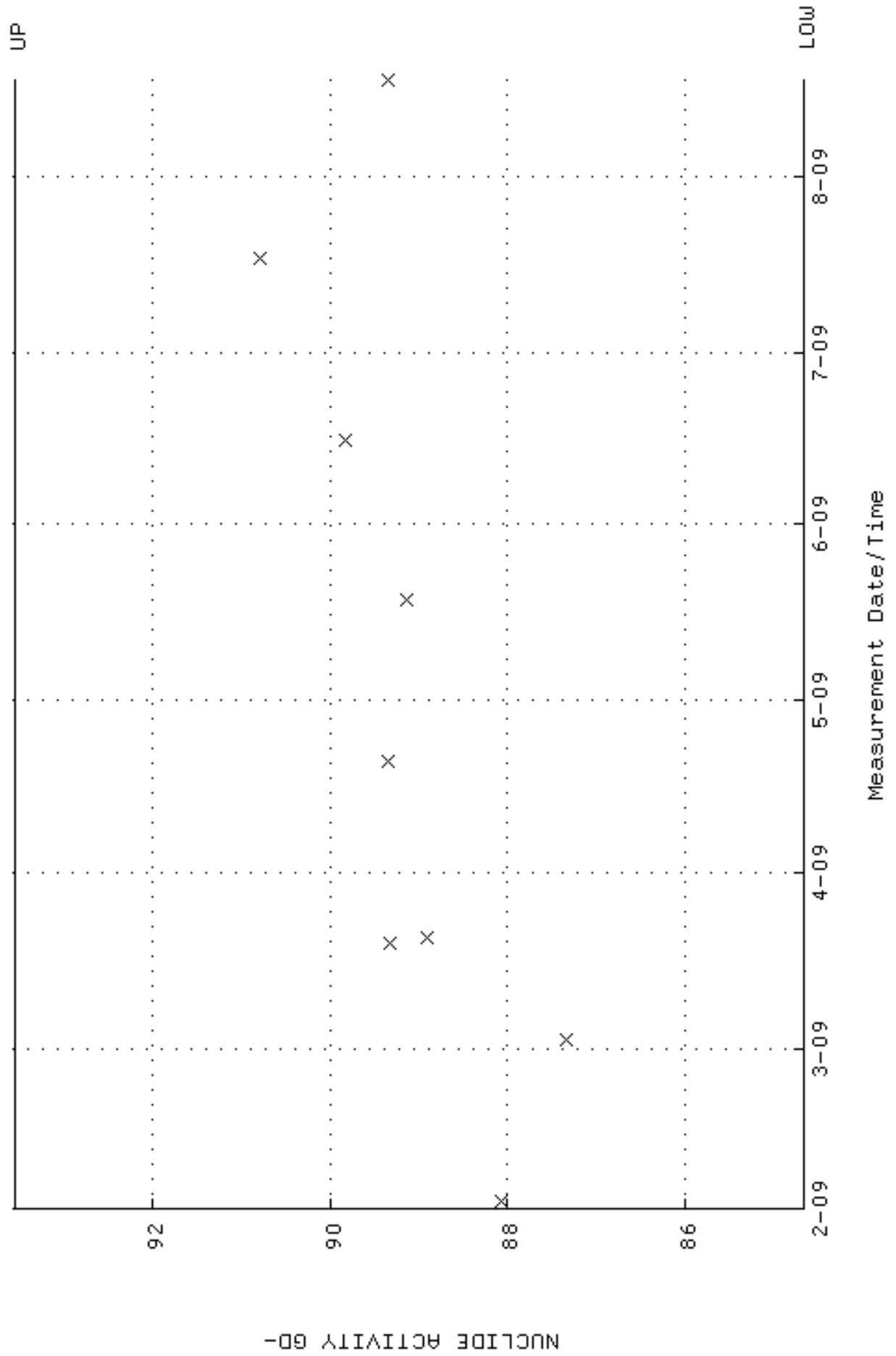
QA filename : DKA100:[ENV_ALPHA.QA.B]B140.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 1-FEB-2009 17:06:49 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



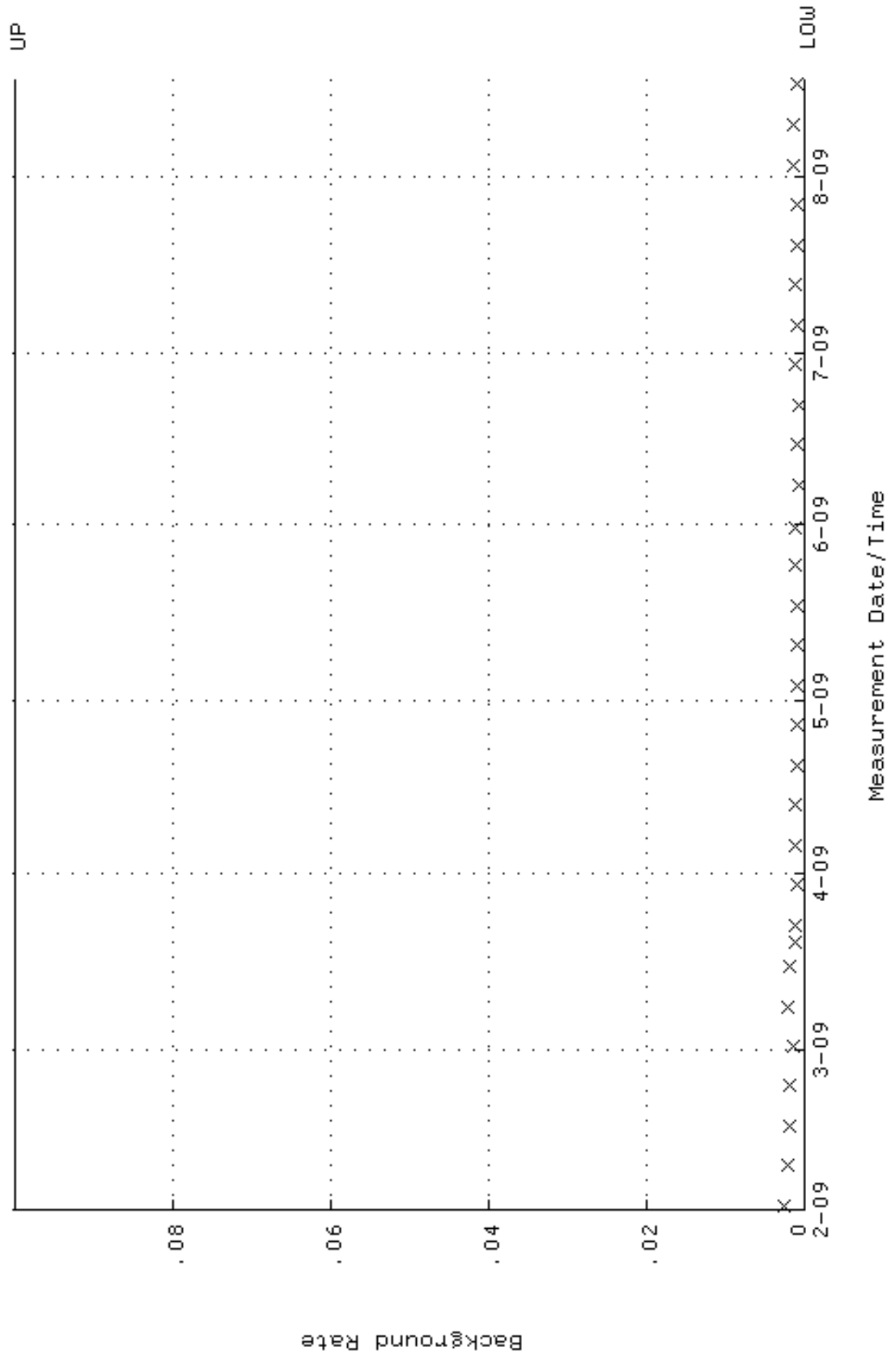
QA filename : DKA100:[ENV_ALPHA.QA.W]W144.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 2-FEB-2009 10:34:43 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.237963 through 0.257963



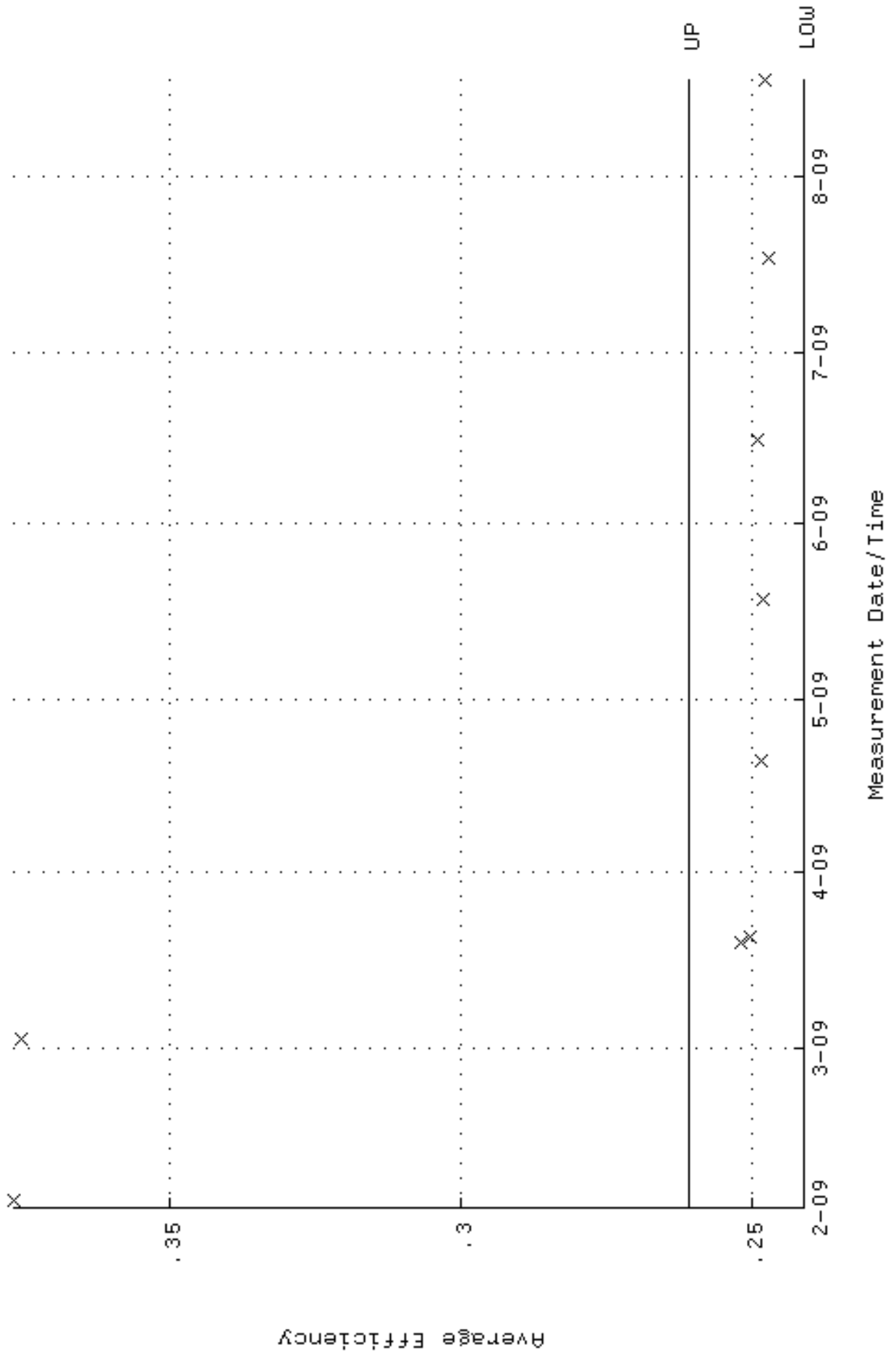
QA filename : DKA100:[ENV_ALPHA.QA.W]W144.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 2-FEB-2009 10:34:43 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 84.6507 through 93.5613



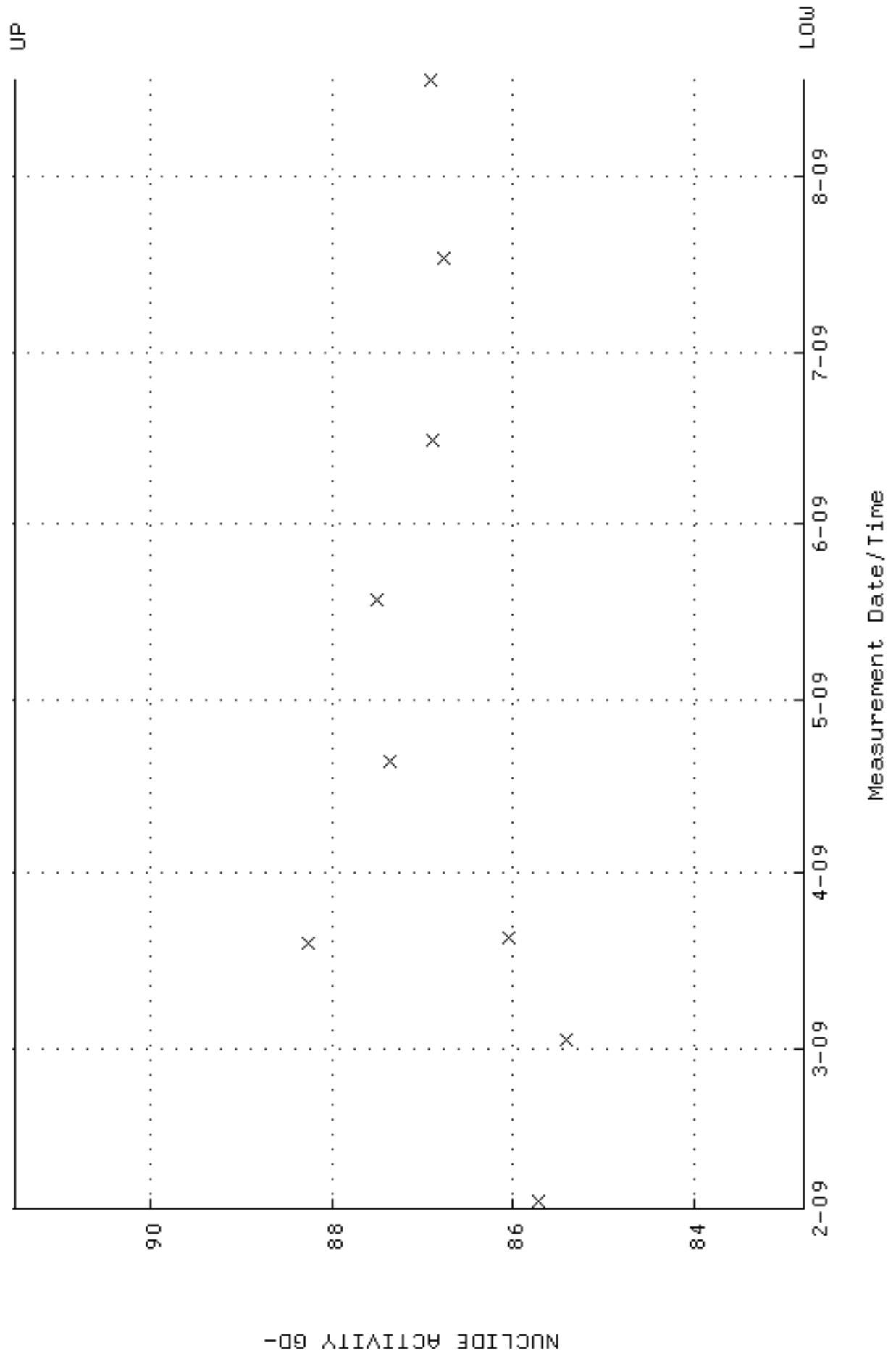
QA filename : DKA100:[ENV_ALPHA.QA.B]B144.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 1-FEB-2009 17:07:46 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



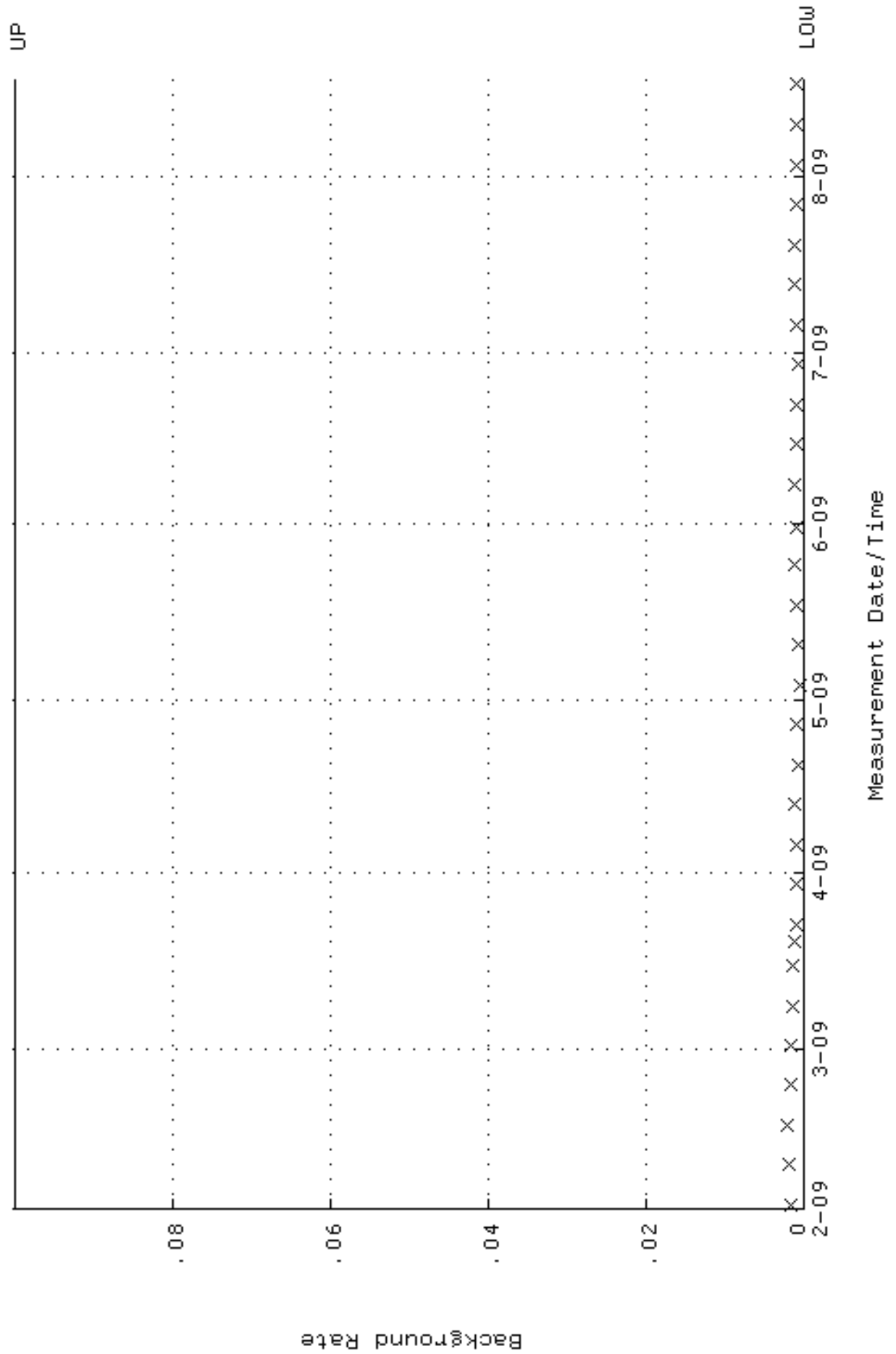
QA filename : DKA100:[ENV_ALPHA.QA.W]W156.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 2-FEB-2009 10:36:02 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.241250 through 0.261250



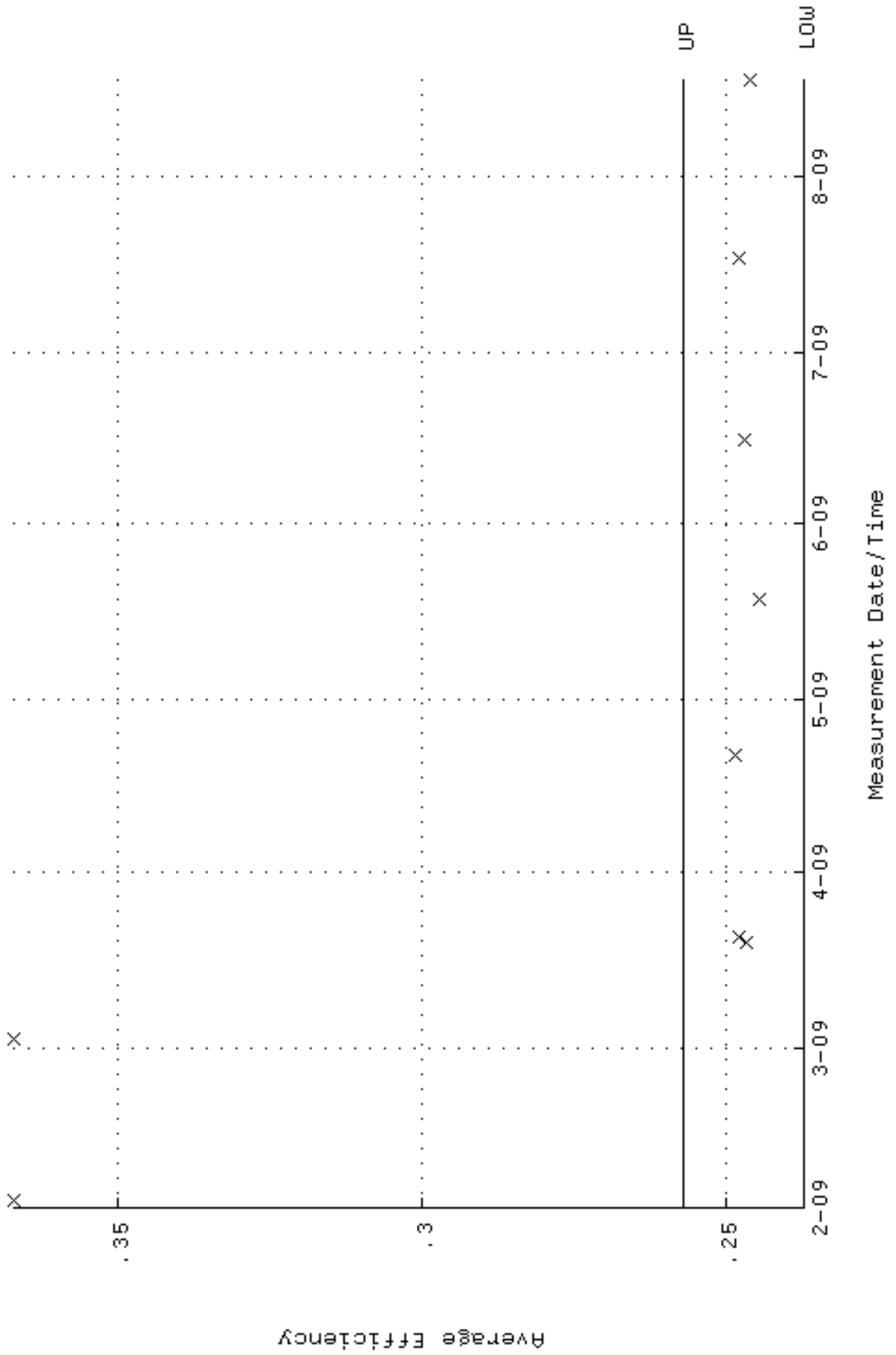
QA filename : DKA100:[ENV_ALPHA.QA.W]w156.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 2-FEB-2009 10:36:02 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 82.7847 through 91.4989



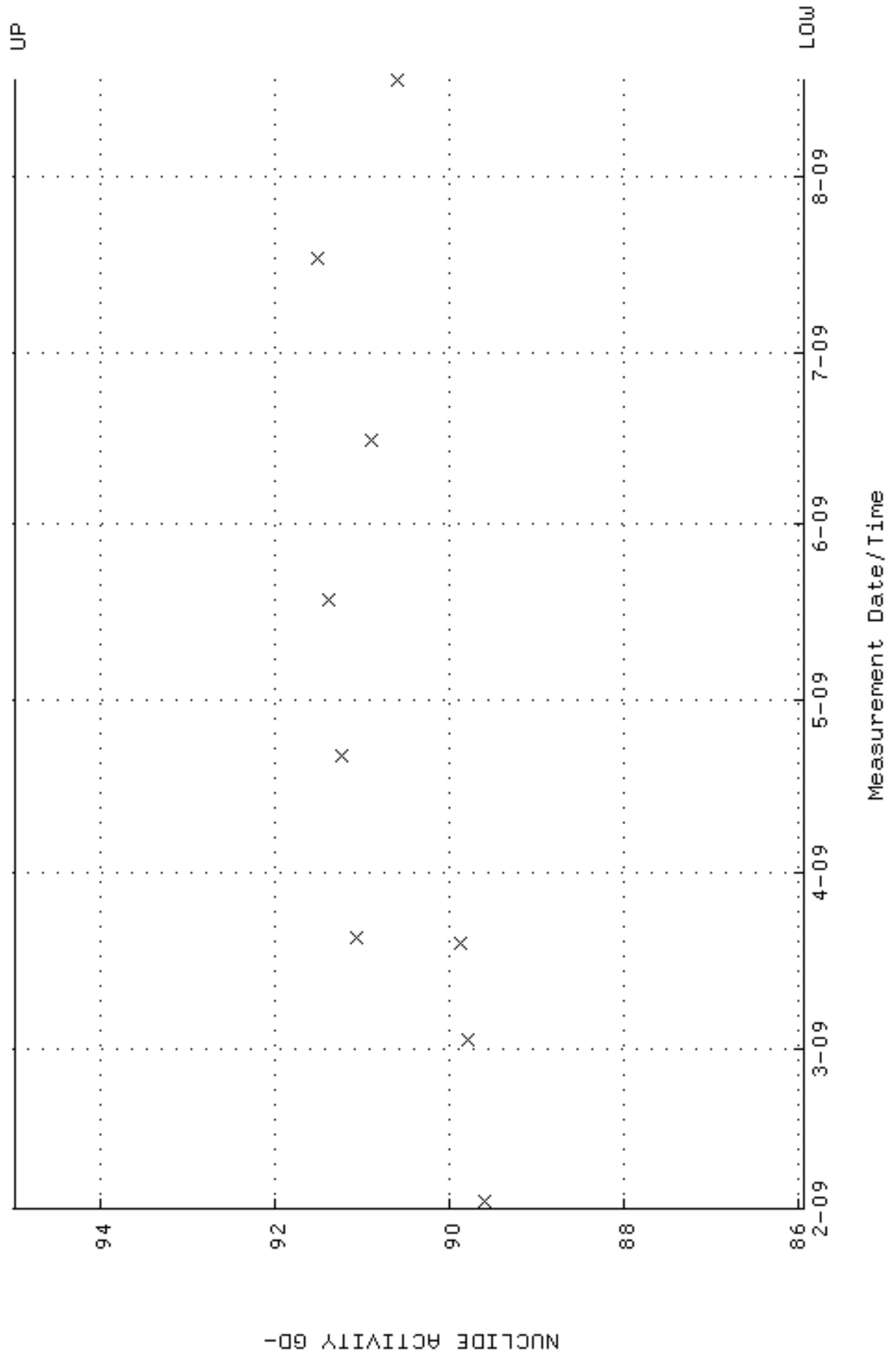
QA filename : DKA100:[ENV_ALPHA.QA.B]B156.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 1-FEB-2009 17:10:49 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



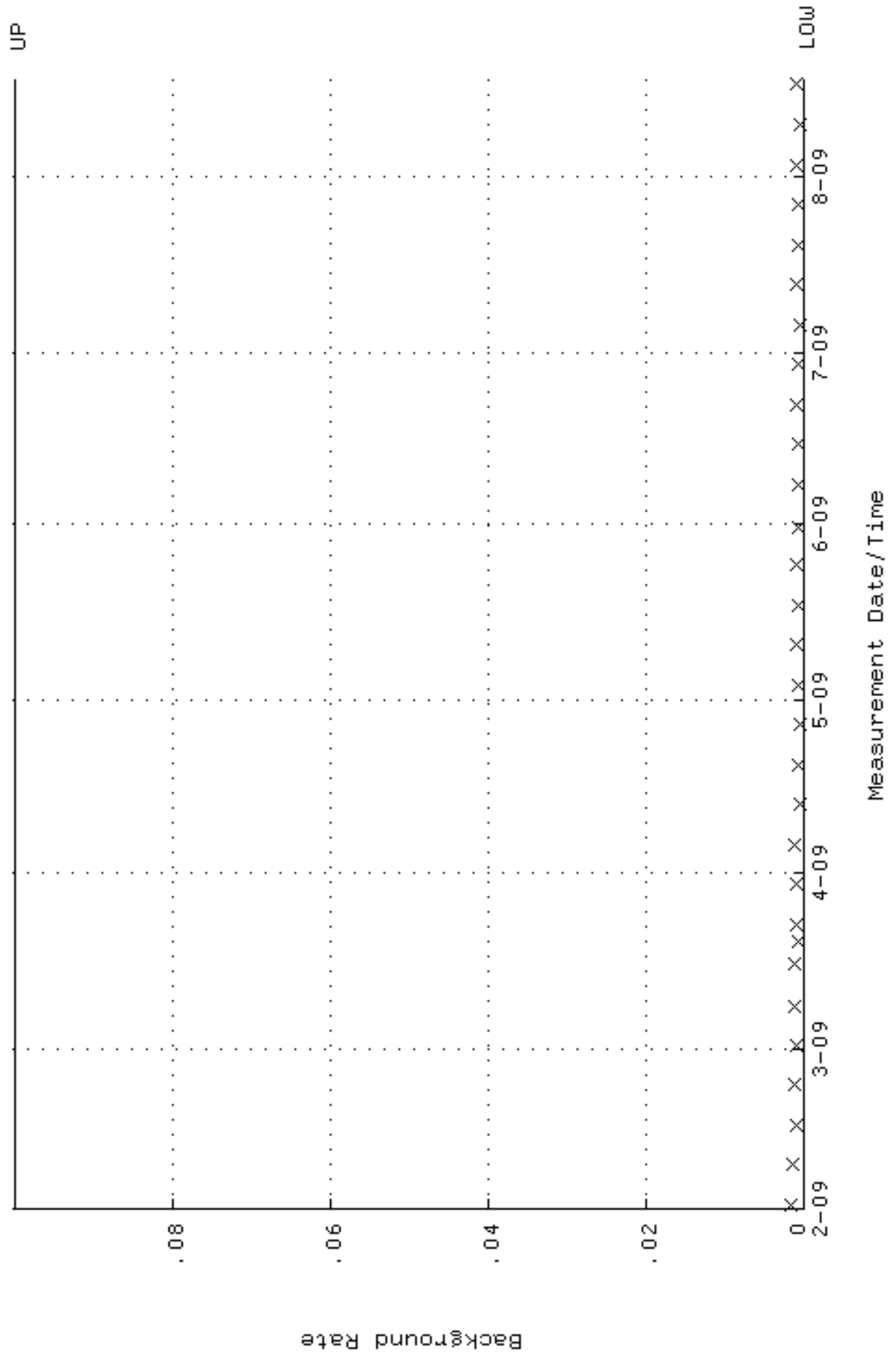
QA filename : DKA100:[ENV_ALPHA.QA.W]W157.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 2-FEB-2009 10:36:08 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.237137 through 0.257137



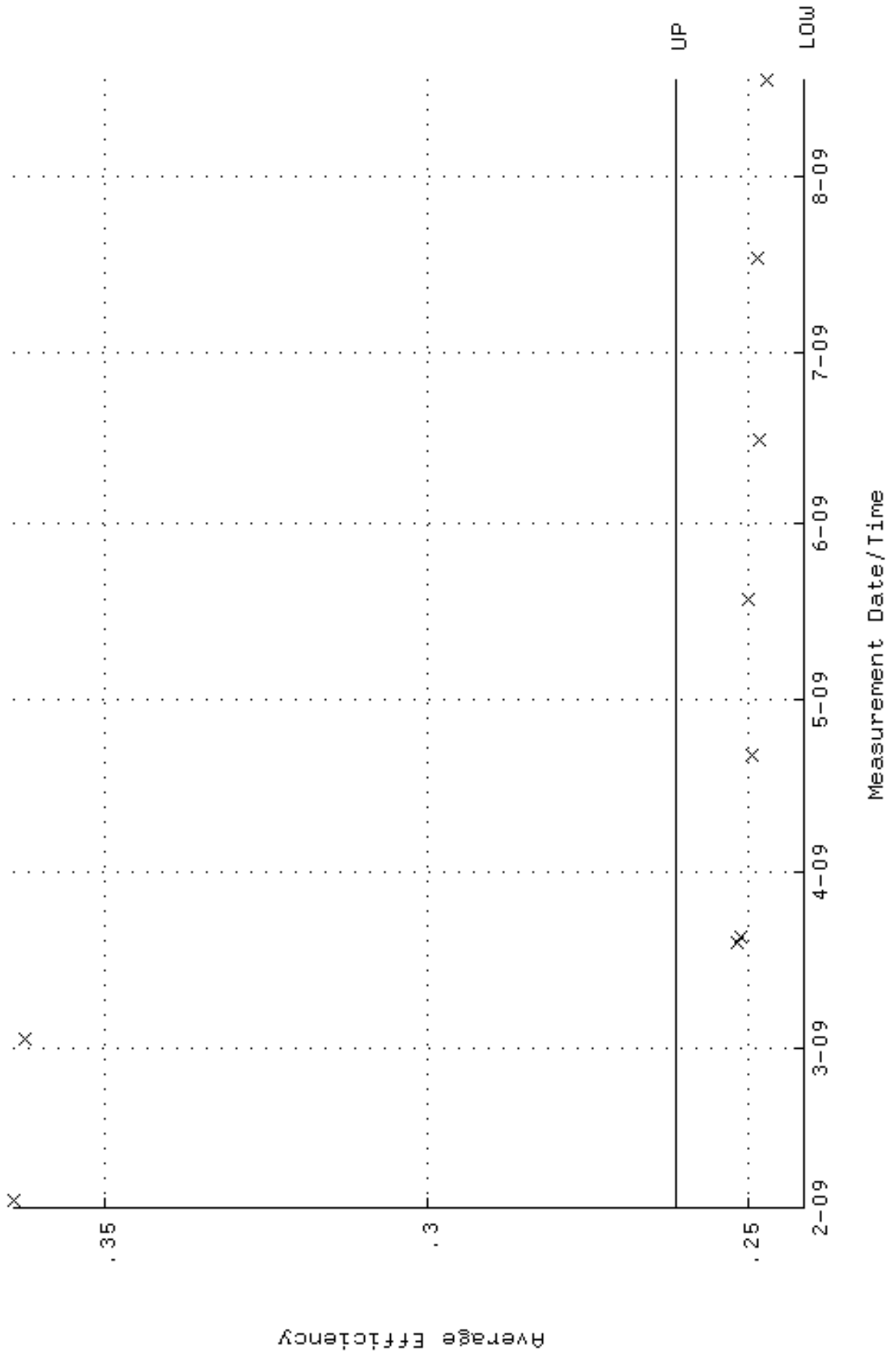
QA filename : DKA100:[ENV_ALPHA.QA.W]w157.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 2-FEB-2009 10:36:08 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 85.9292 through 94.9744



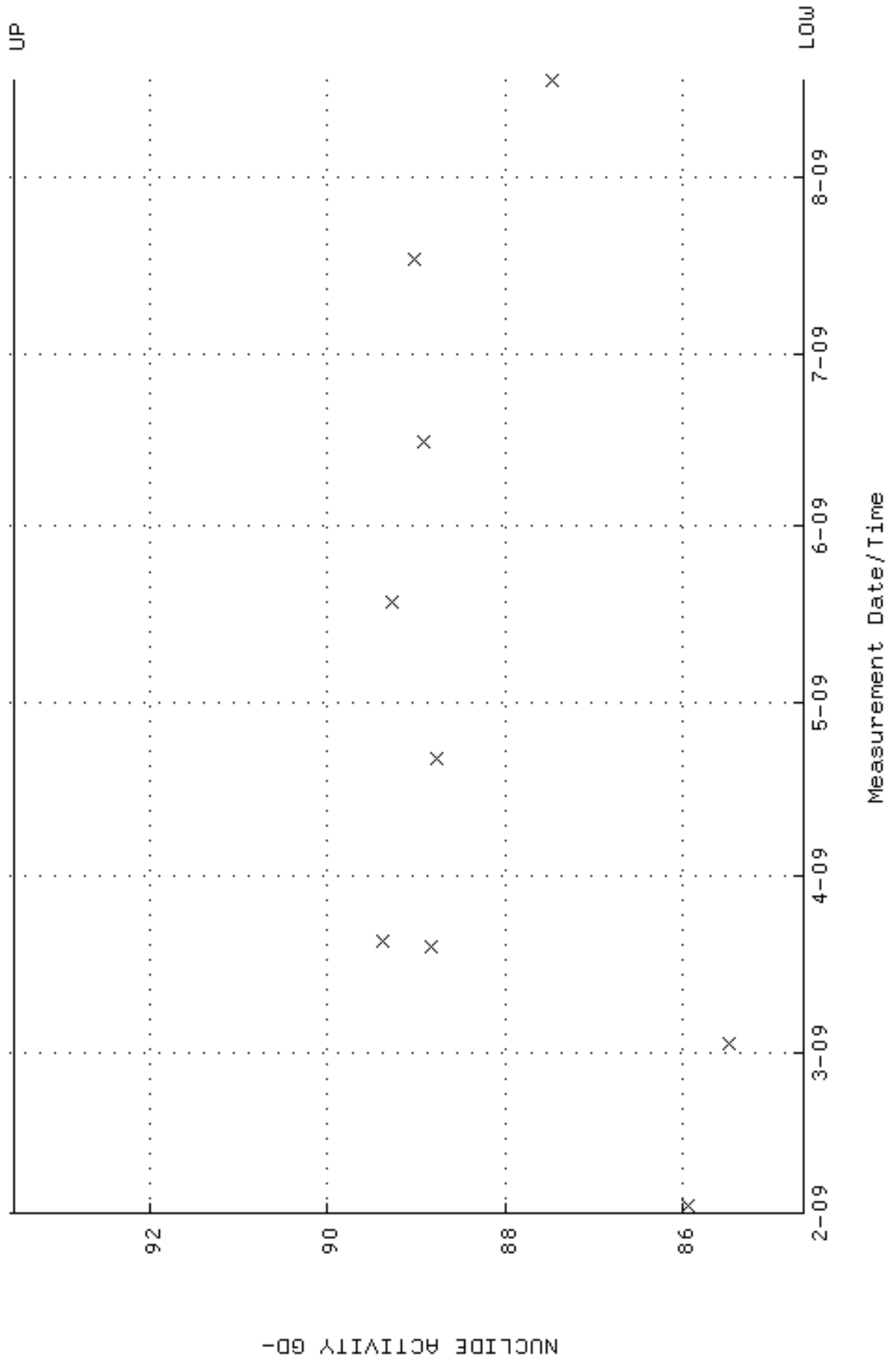
QA filename : DKA100:[ENV_ALPHA.QA.B]B157.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 1-FEB-2009 17:11:05 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



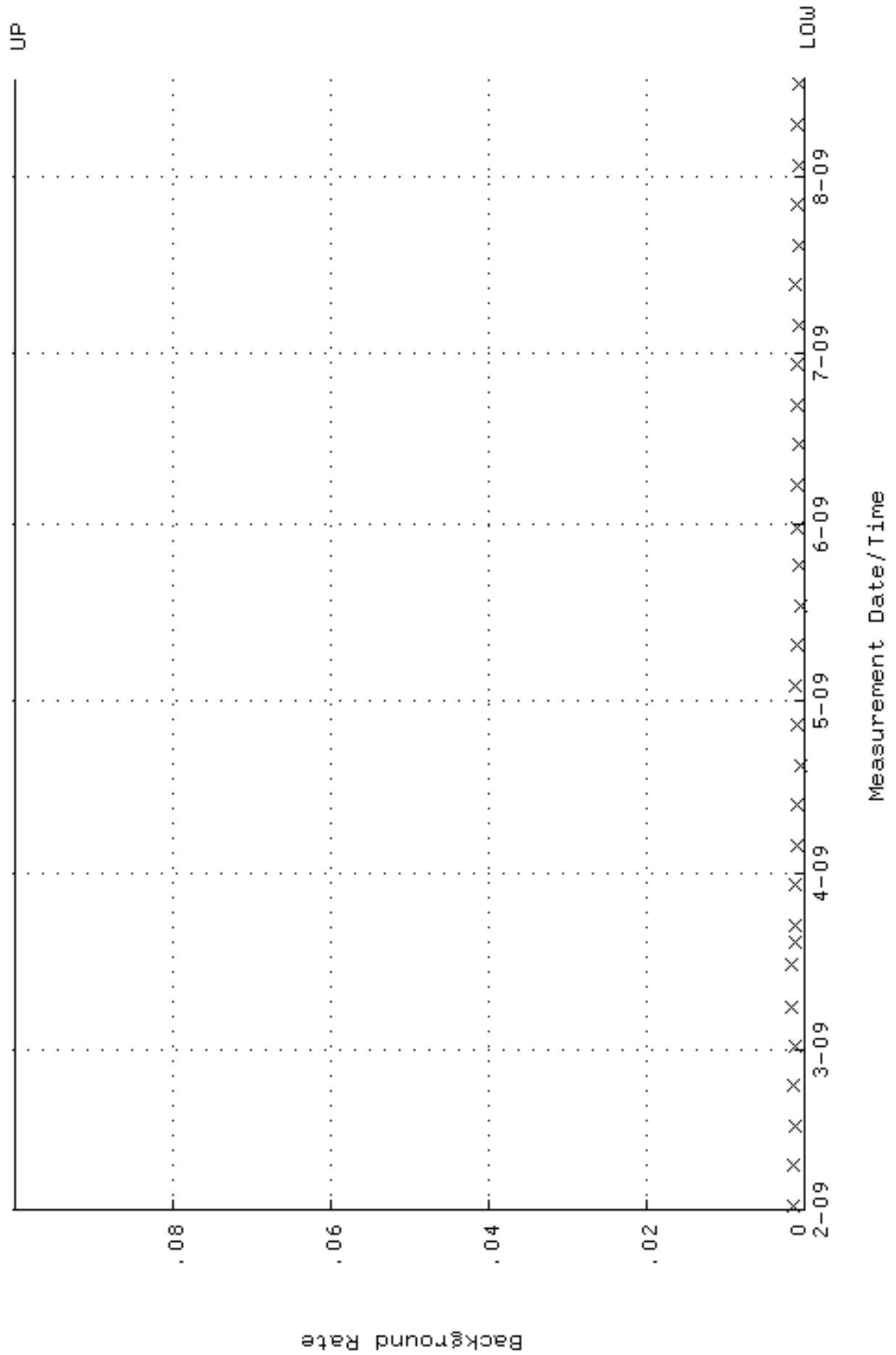
QA filename : DKA100:[ENV_ALPHA.QA.W]W158.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 2-FEB-2009 10:36:14 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.241466 through 0.261466



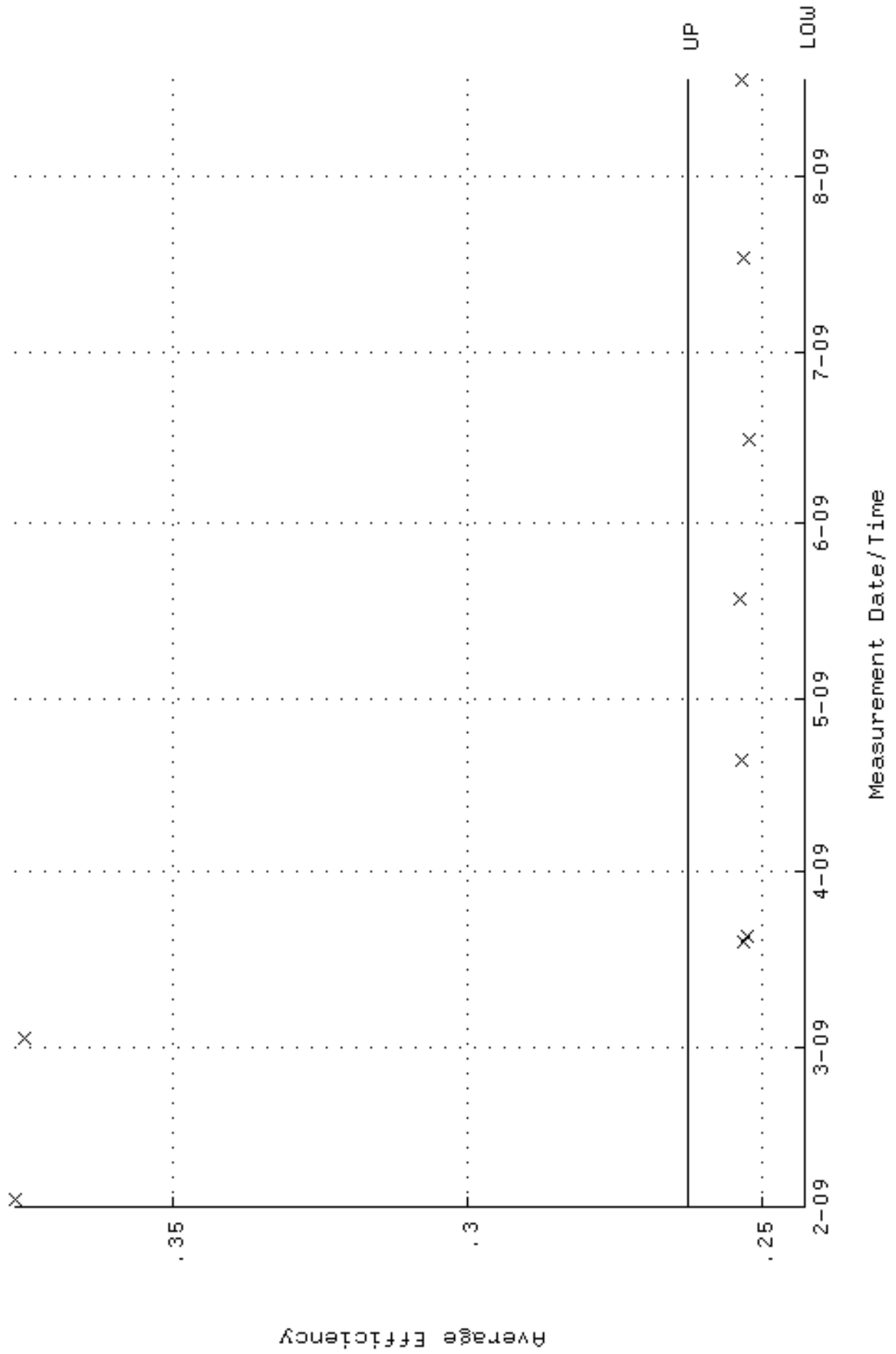
QA filename : DKA100:[ENV_ALPHA.QA.W]w158.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 2-FEB-2009 10:36:14 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 84.6414 through 93.5510



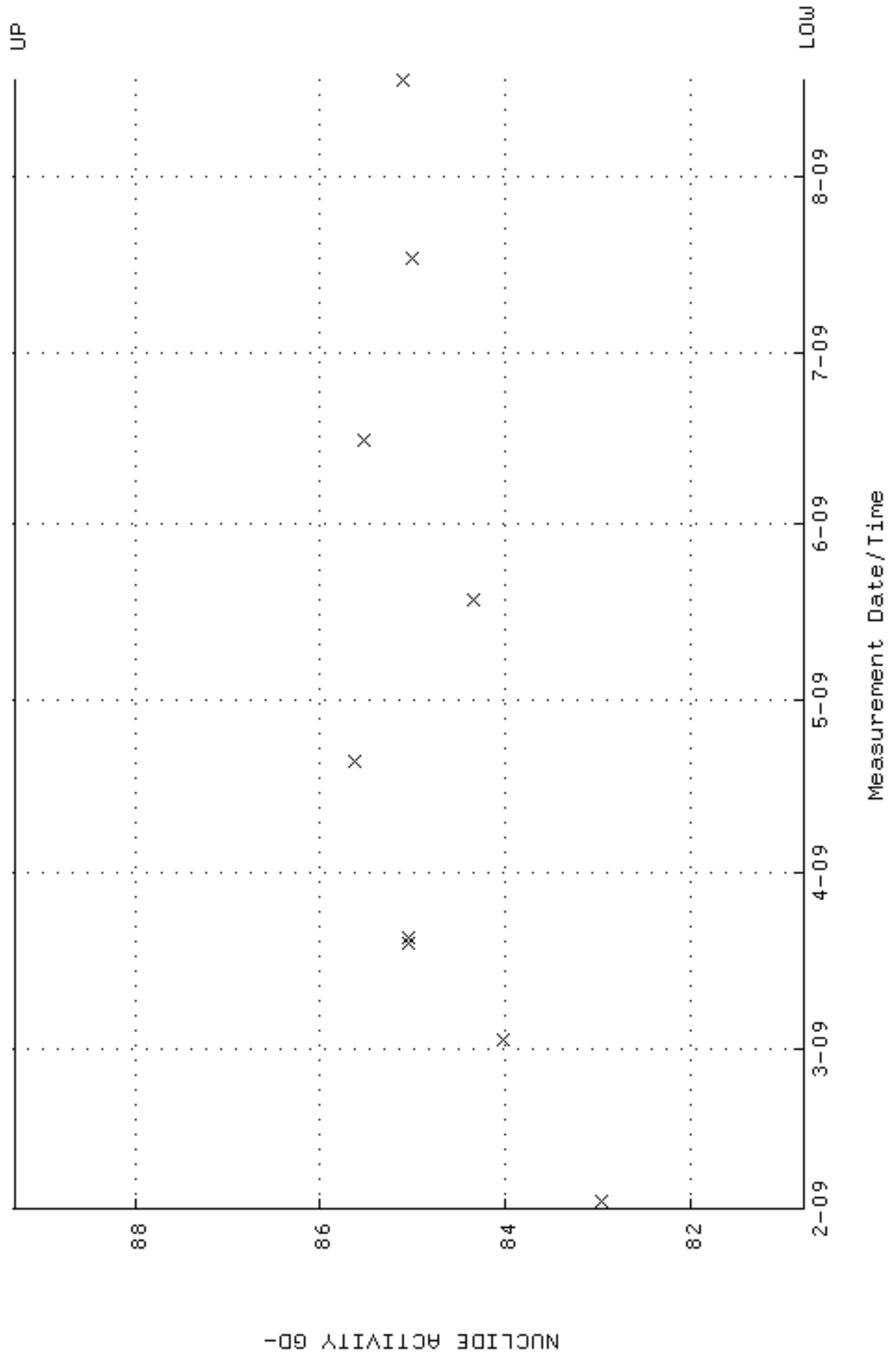
QA filename : DKA100:[ENV_ALPHA.QA.B]B158.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 1-FEB-2009 17:11:24 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



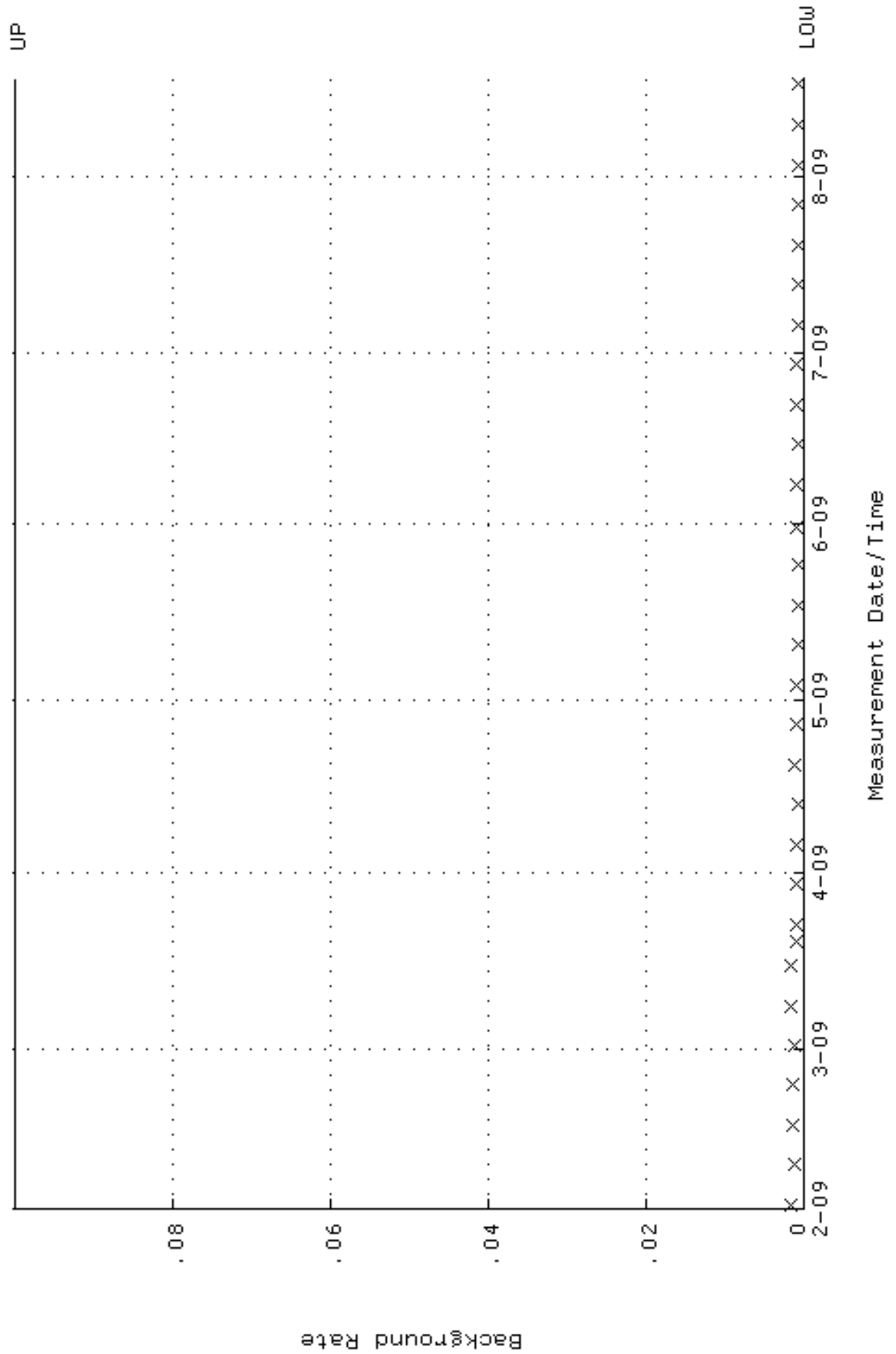
QA filename : DKA100:[ENV_ALPHA.QA.W]W159.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 2-FEB-2009 10:36:22 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.242851 through 0.262851



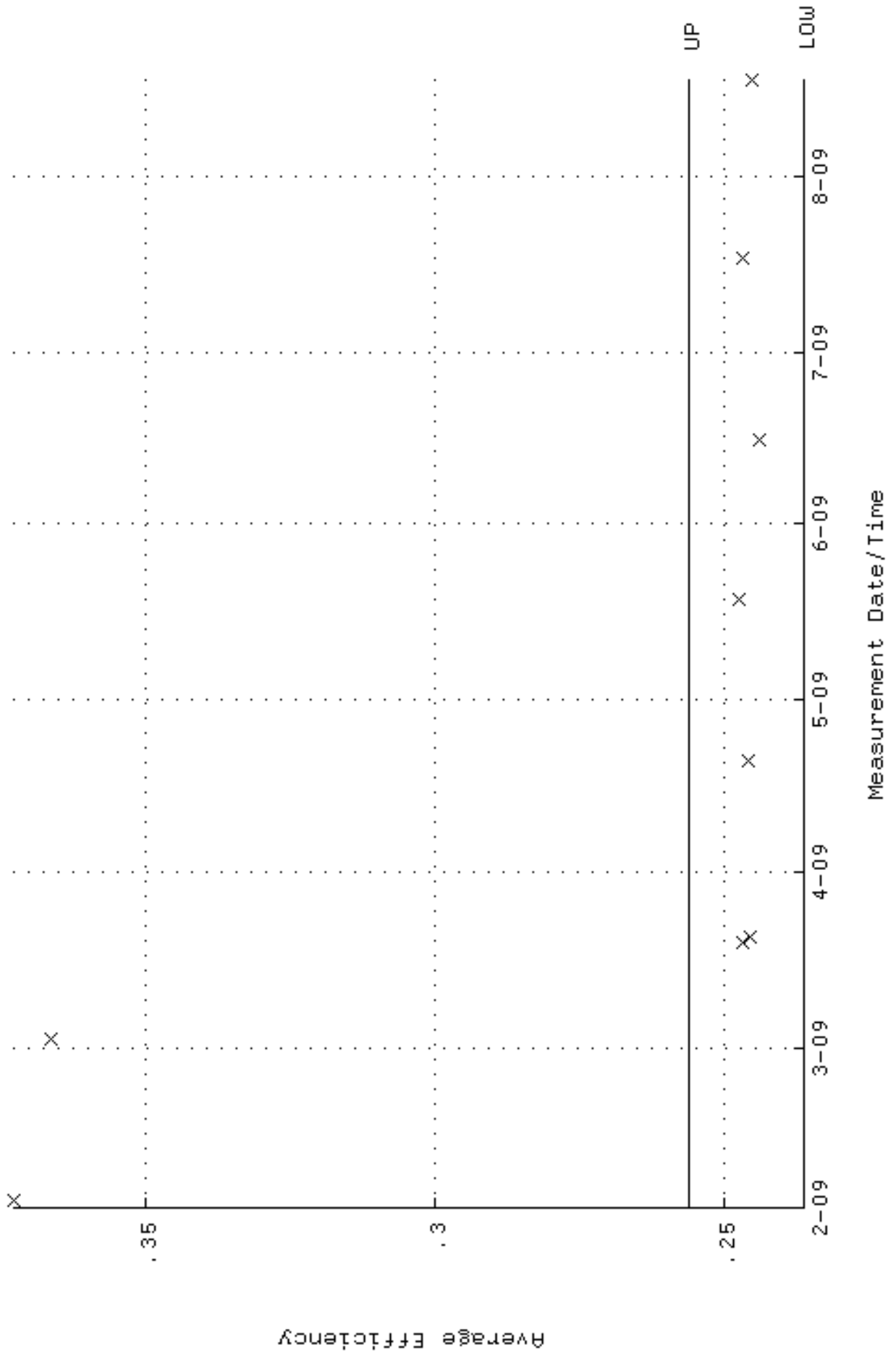
QA filename : DKA100:[ENV_ALPHA.QA.W]w159.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 2-FEB-2009 10:36:22 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 80.7870 through 89.2909



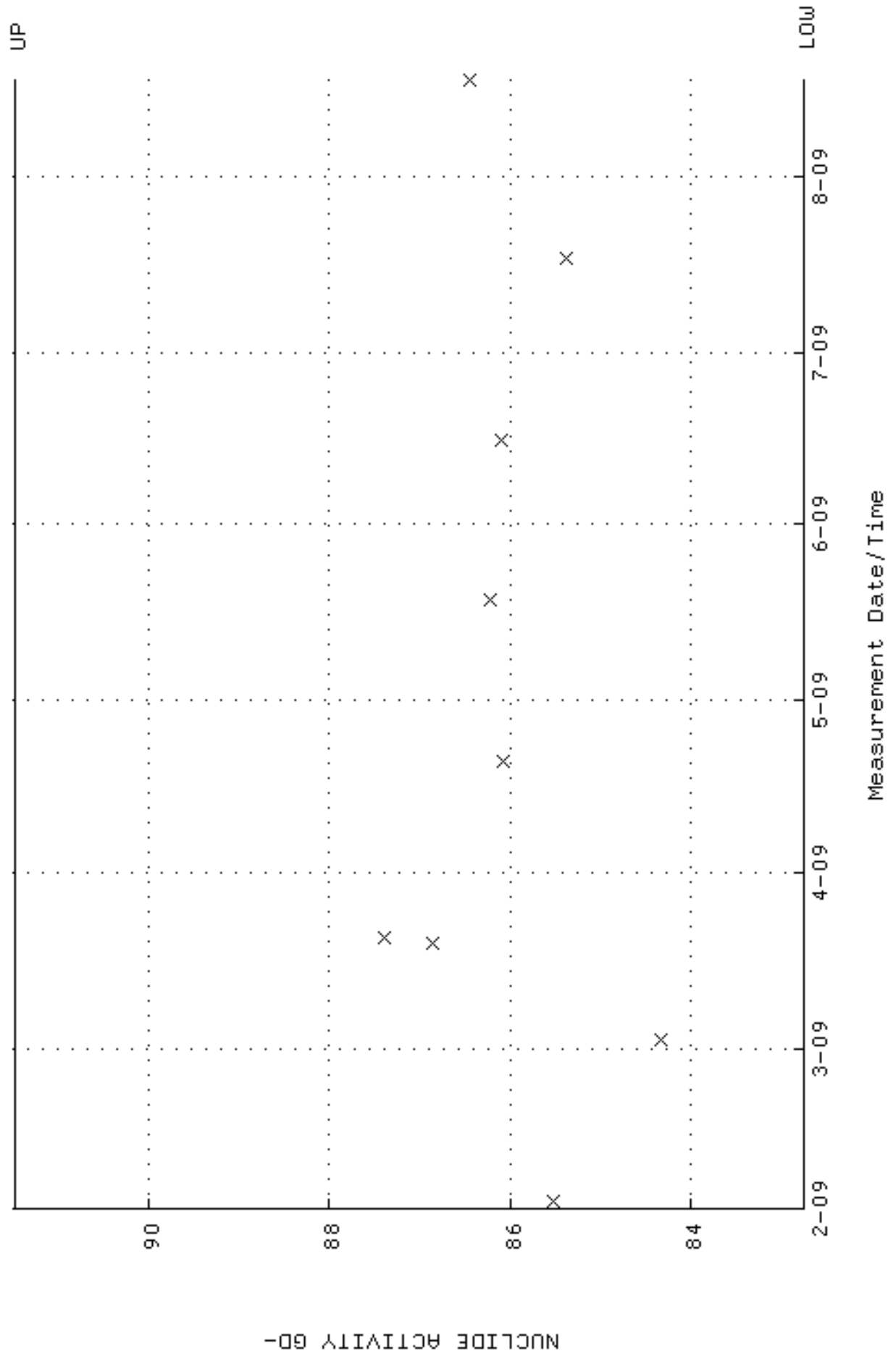
QA filename : DKA100:[ENV_ALPHA.QA.B]B159.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 1-FEB-2009 17:11:35 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



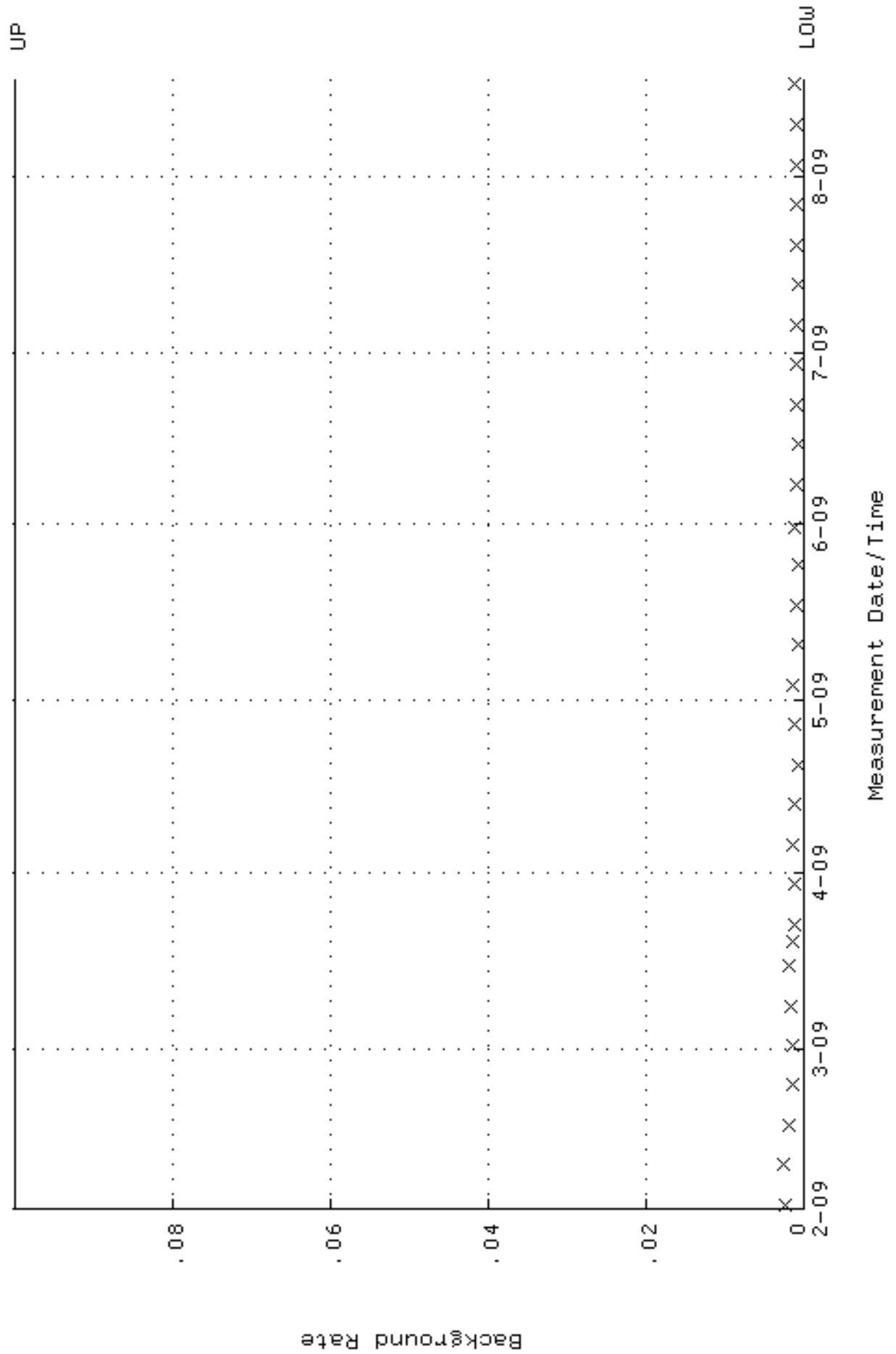
QA filename : DKA100:[ENV_ALPHA.QA.W]W160.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 2-FEB-2009 10:36:28 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.236284 through 0.256284



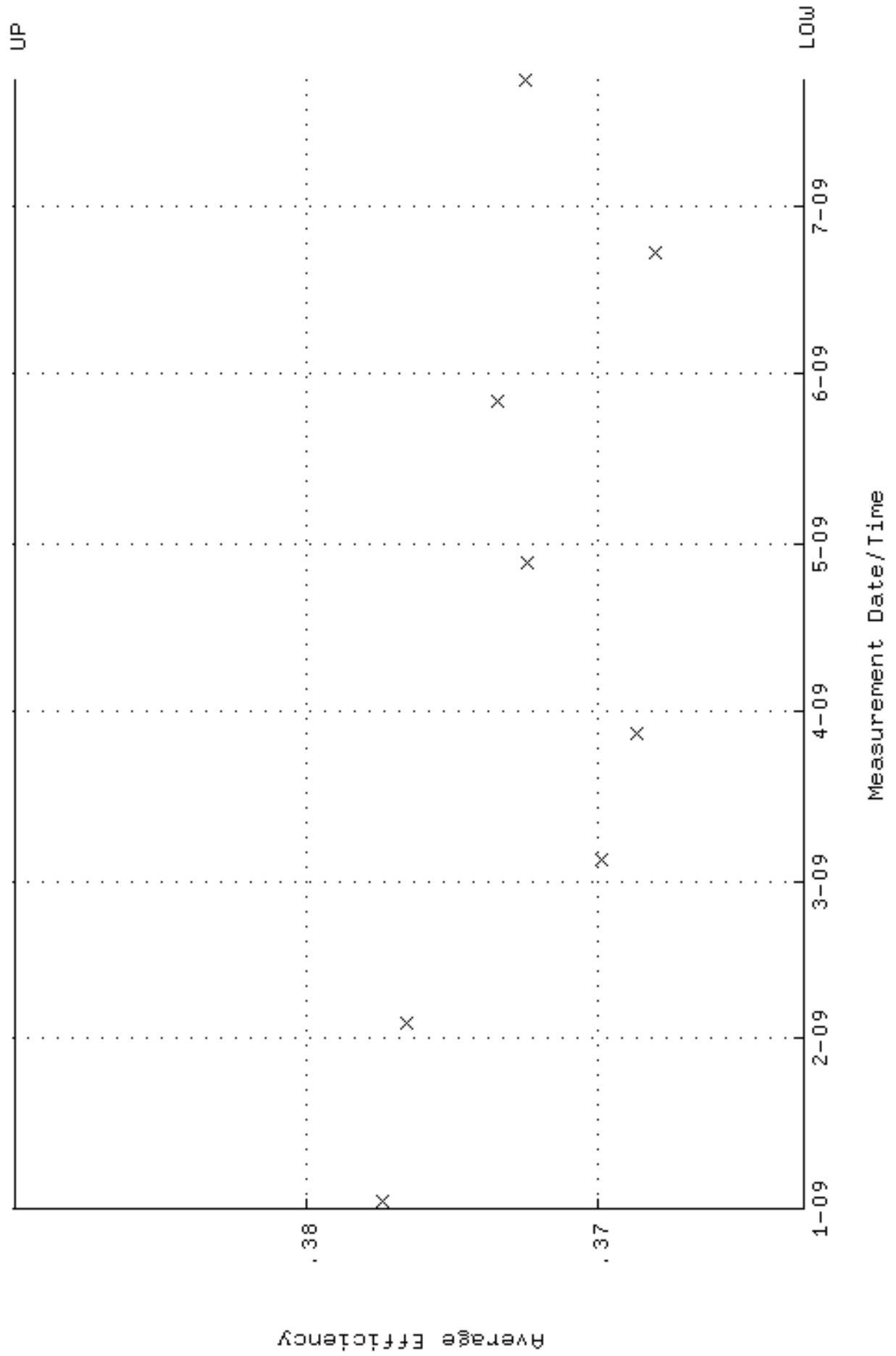
QA filename : DKA100:[ENV_ALPHA.QA.W]w160.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 2-FEB-2009 10:36:28 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 82.7554 through 91.4664



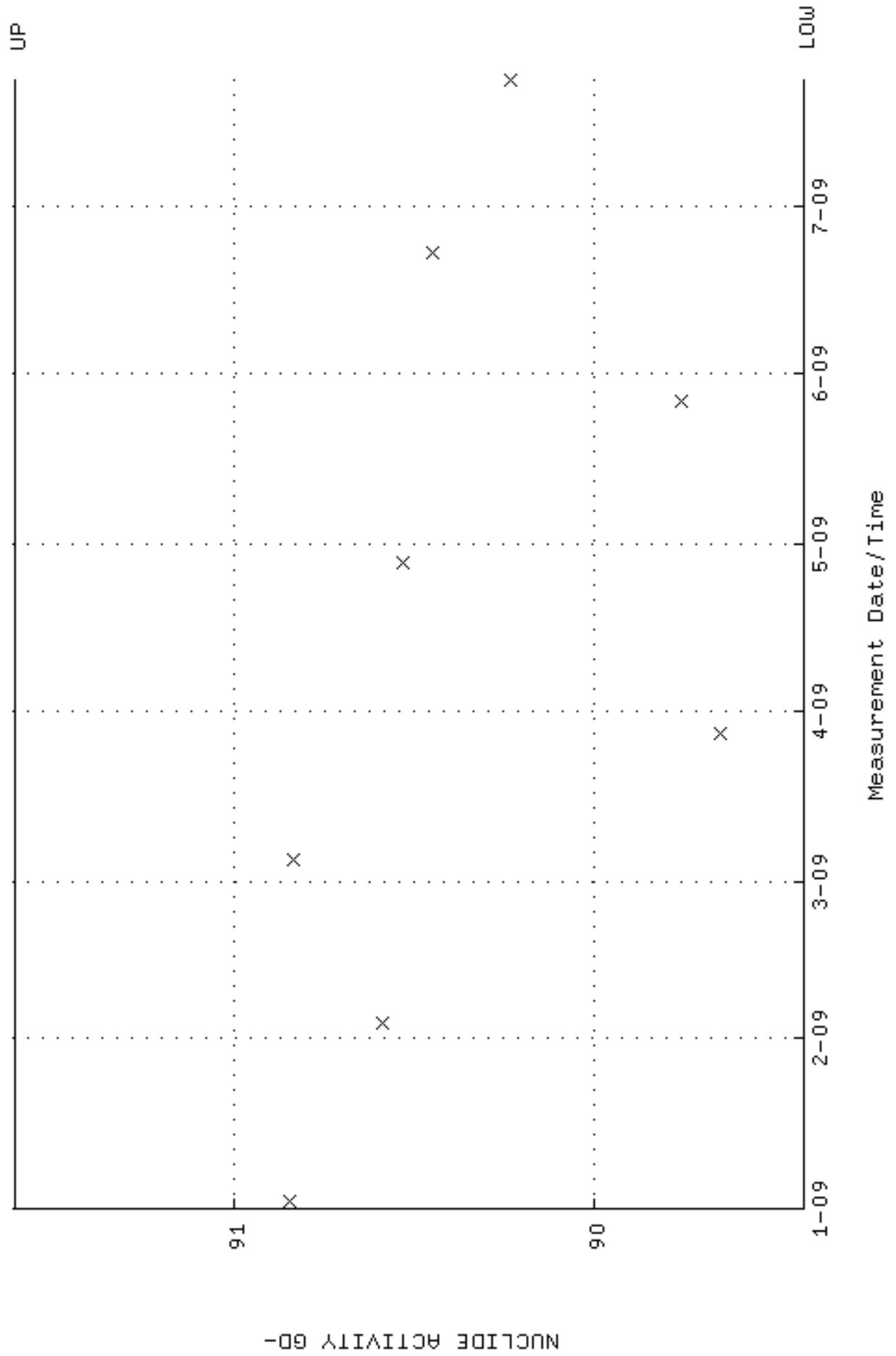
QA filename : DKA100:[ENV_ALPHA.QA.B]B160.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 1-FEB-2009 17:11:51 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



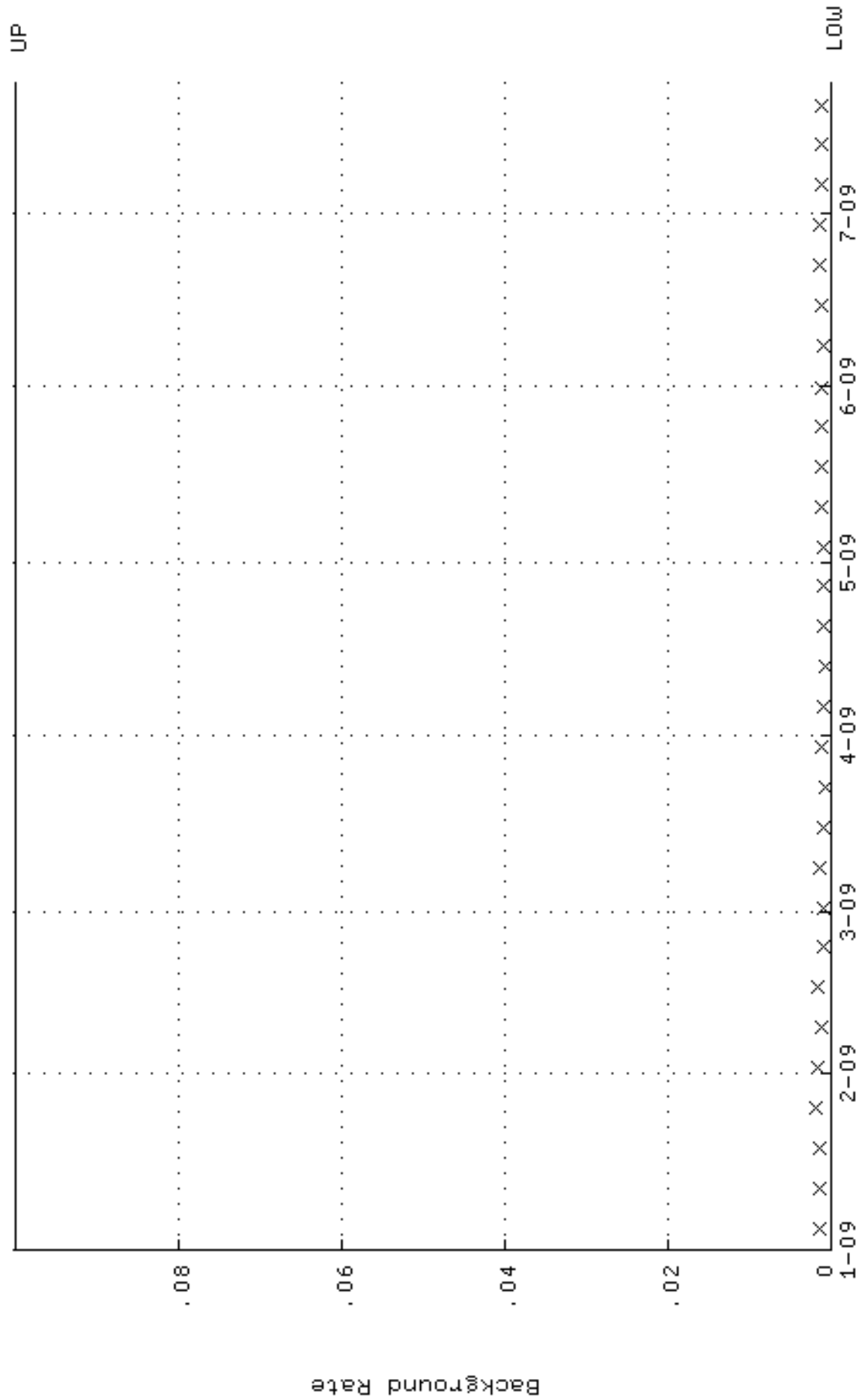
QA filename : DKA100:[ENV_ALPHA.QA.W]W161.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 2-JAN-2009 12:08:44 through 23-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.362982 through 0.389932



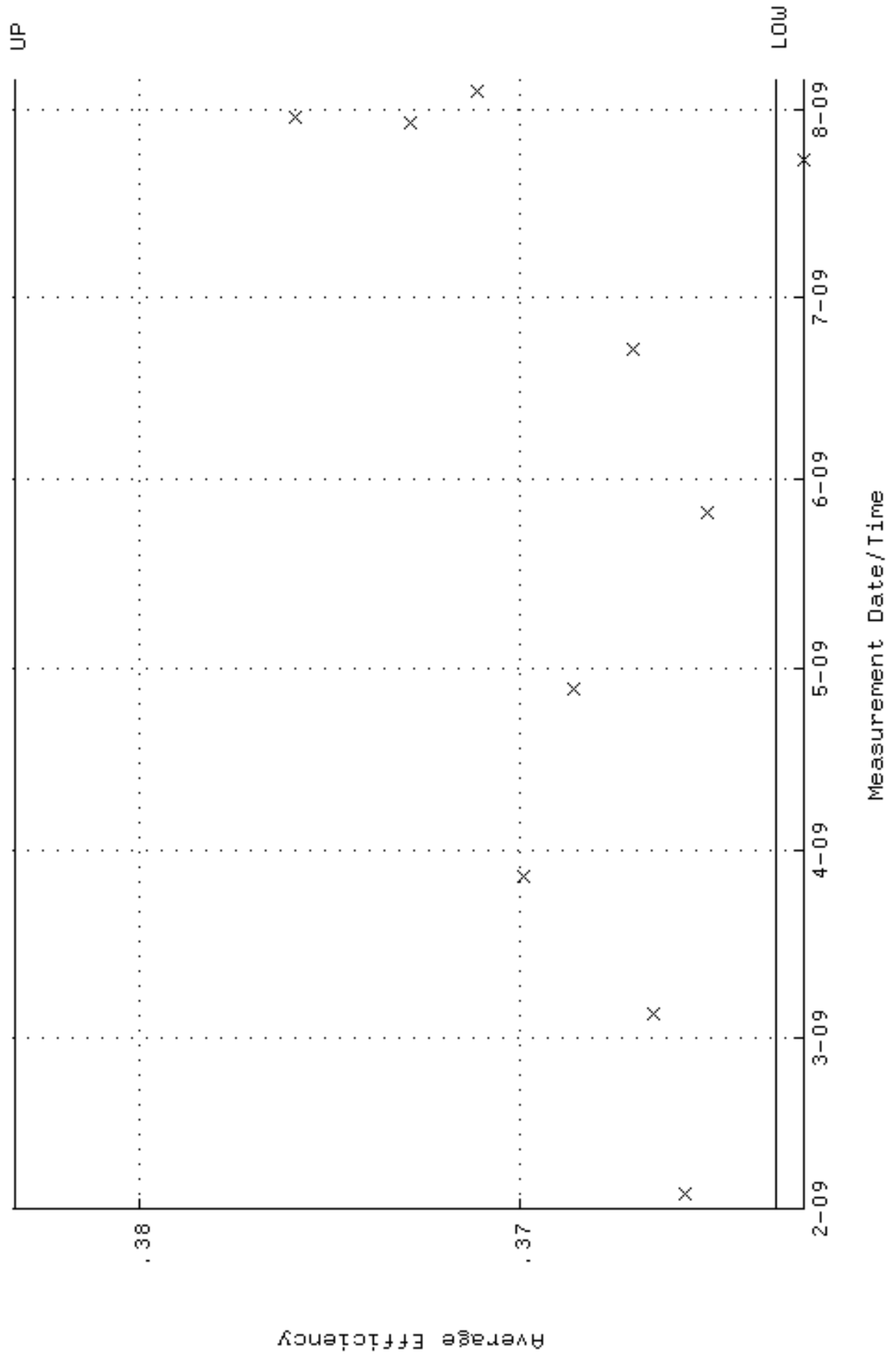
QA filename : DKA100:[ENV_ALPHA.QA.W]w161.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 2-JAN-2009 12:08:44 through 23-JUL-2009 12:00:00
 Lower/Upper Lmts: 89.4216 through 91.6054



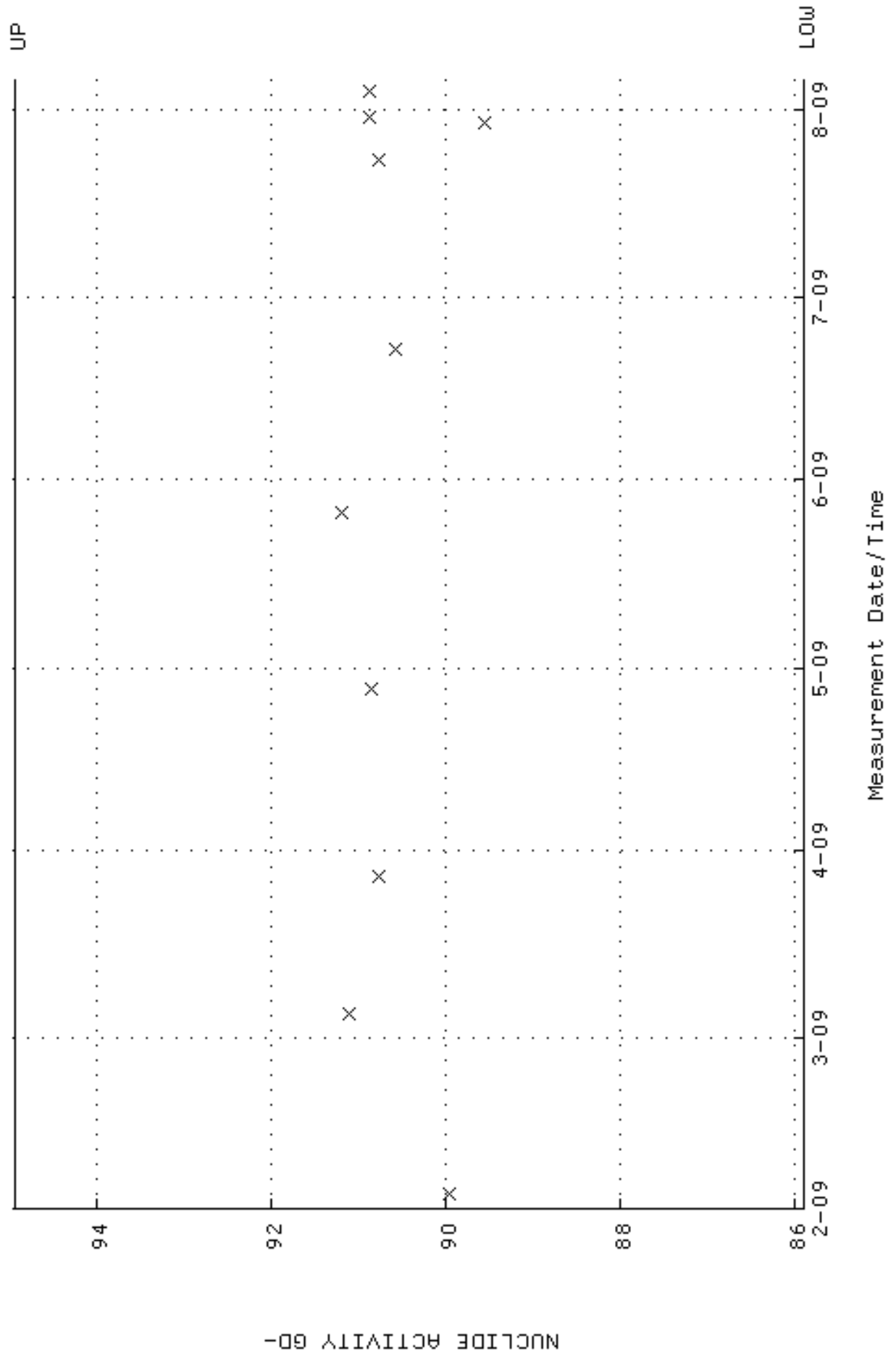
QA filename : DKA100:[ENV_ALPHA.QA.B]B161.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-JAN-2009 17:25:06 through 23-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



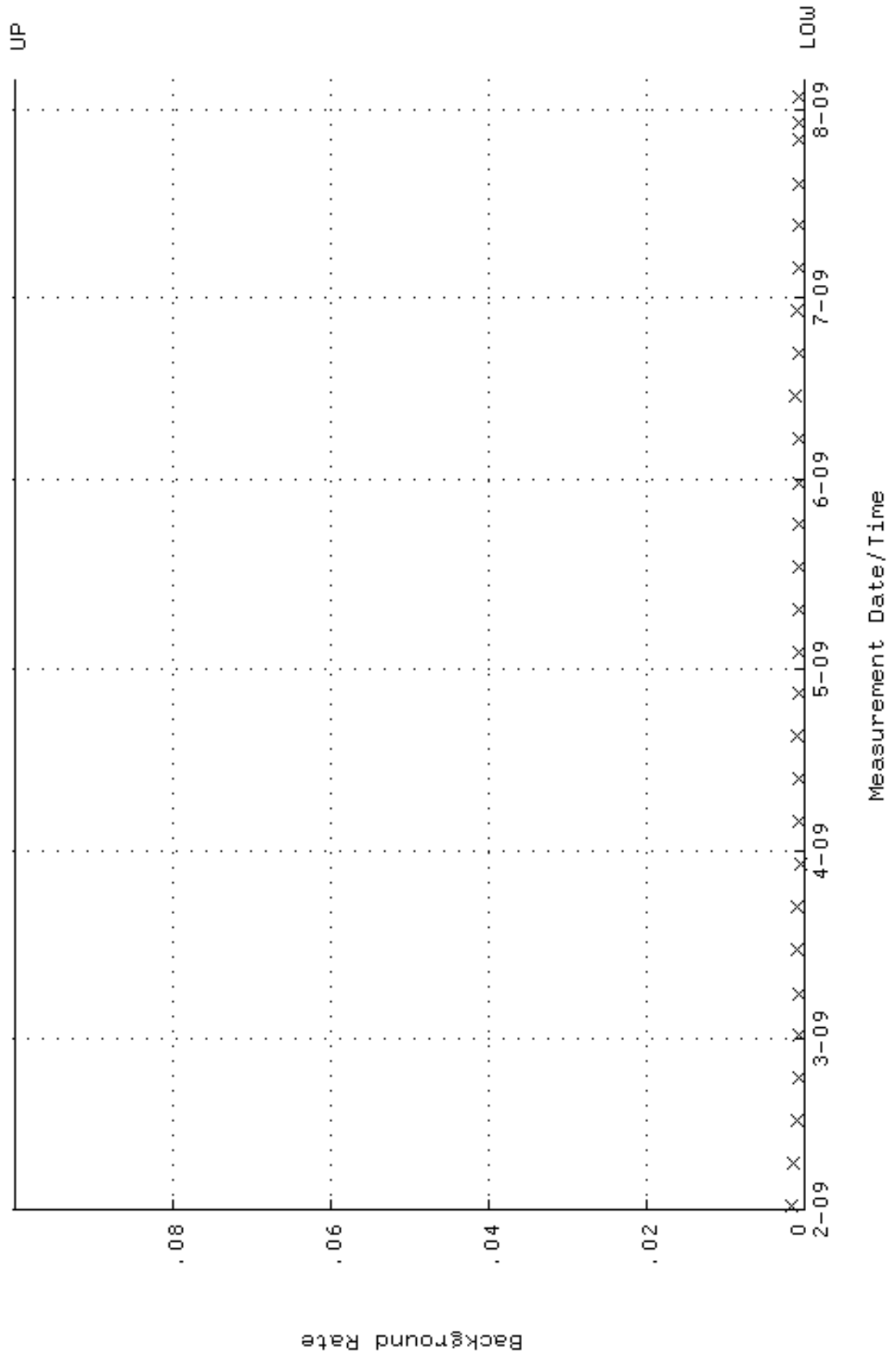
QA filename : DKA100:[ENV_ALPHA.QA.W]W162.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 3-FEB-2009 07:29:45 through 5-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.363287 through 0.383287



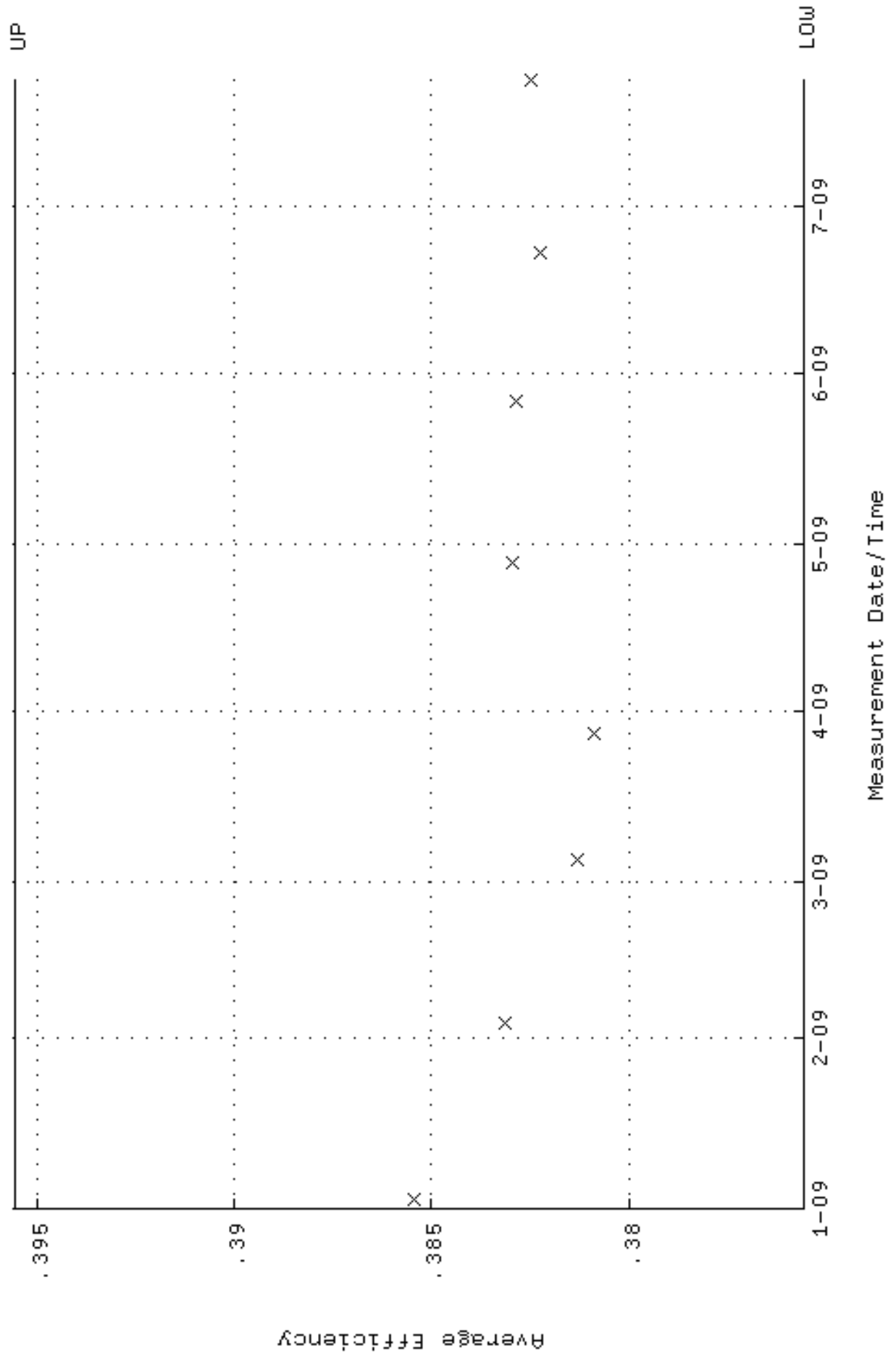
QA filename : DKA100:[ENV_ALPHA.QA.W]w162.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 3-FEB-2009 07:29:45 through 5-AUG-2009 12:00:00
 Lower/Upper Lmts: 85.8969 through 94.9387



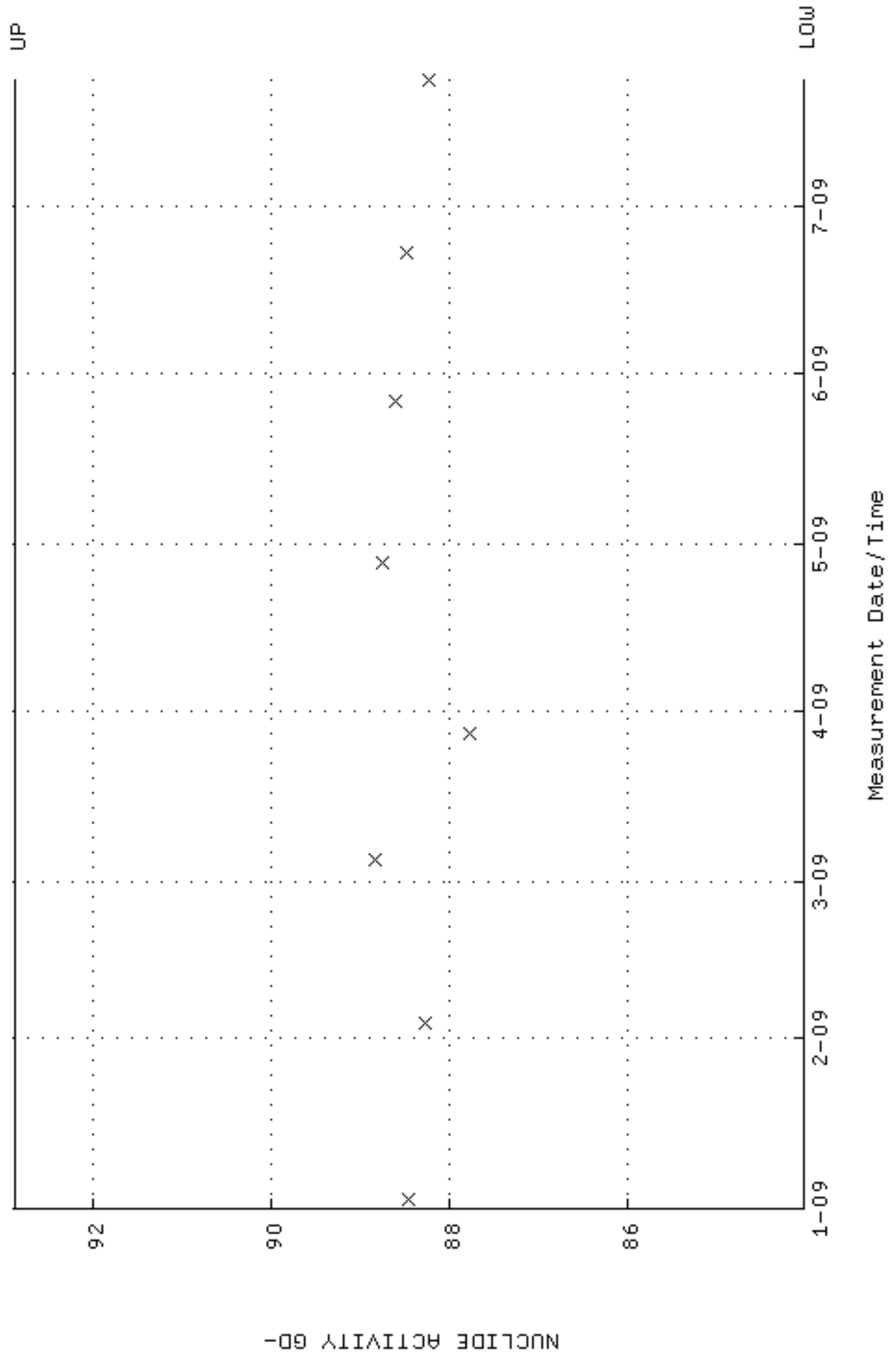
QA filename : DKA100:[ENV_ALPHA.QA.B]B162.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 1-FEB-2009 17:12:19 through 5-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



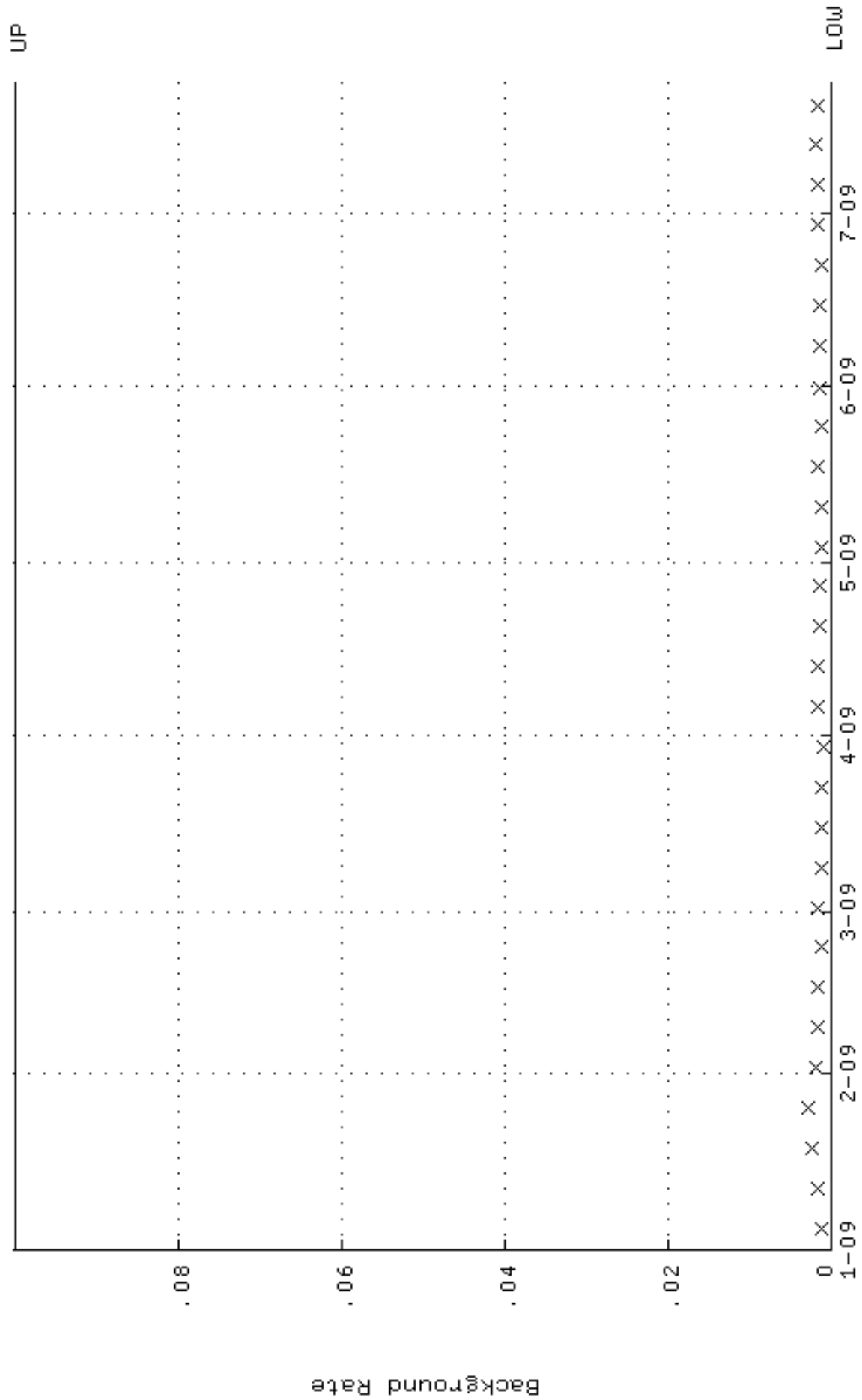
QA filename : DKA100:[ENV_ALPHA.QA.W]W163.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 2-JAN-2009 12:08:55 through 23-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.375557 through 0.395557



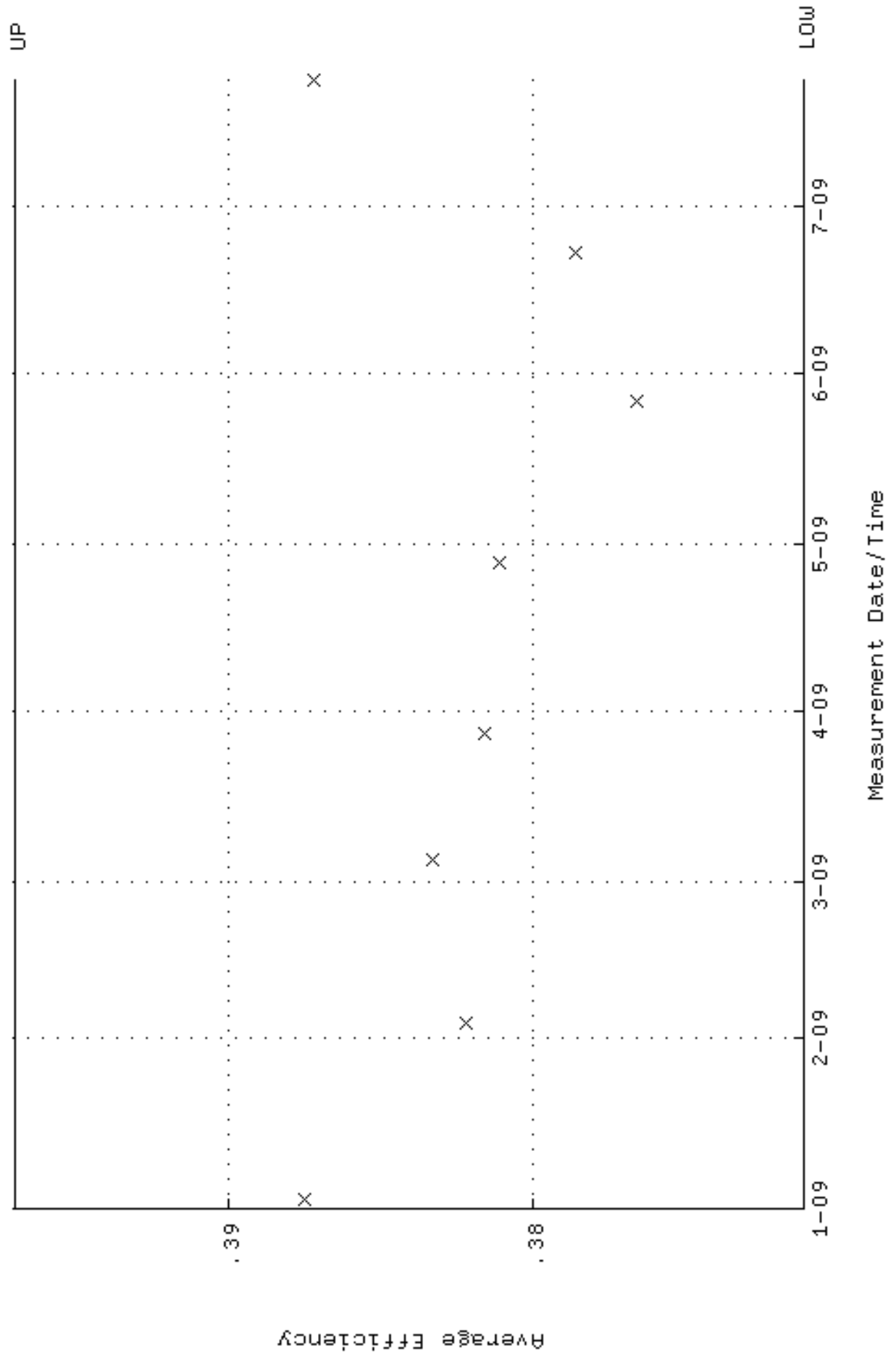
QA filename : DKA100:[ENV_ALPHA.QA.W]w163.QAF;1
Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 2-JAN-2009 12:08:55 through 23-JUL-2009 12:00:00
Lower/Upper Lmts: 84.0322 through 92.8777



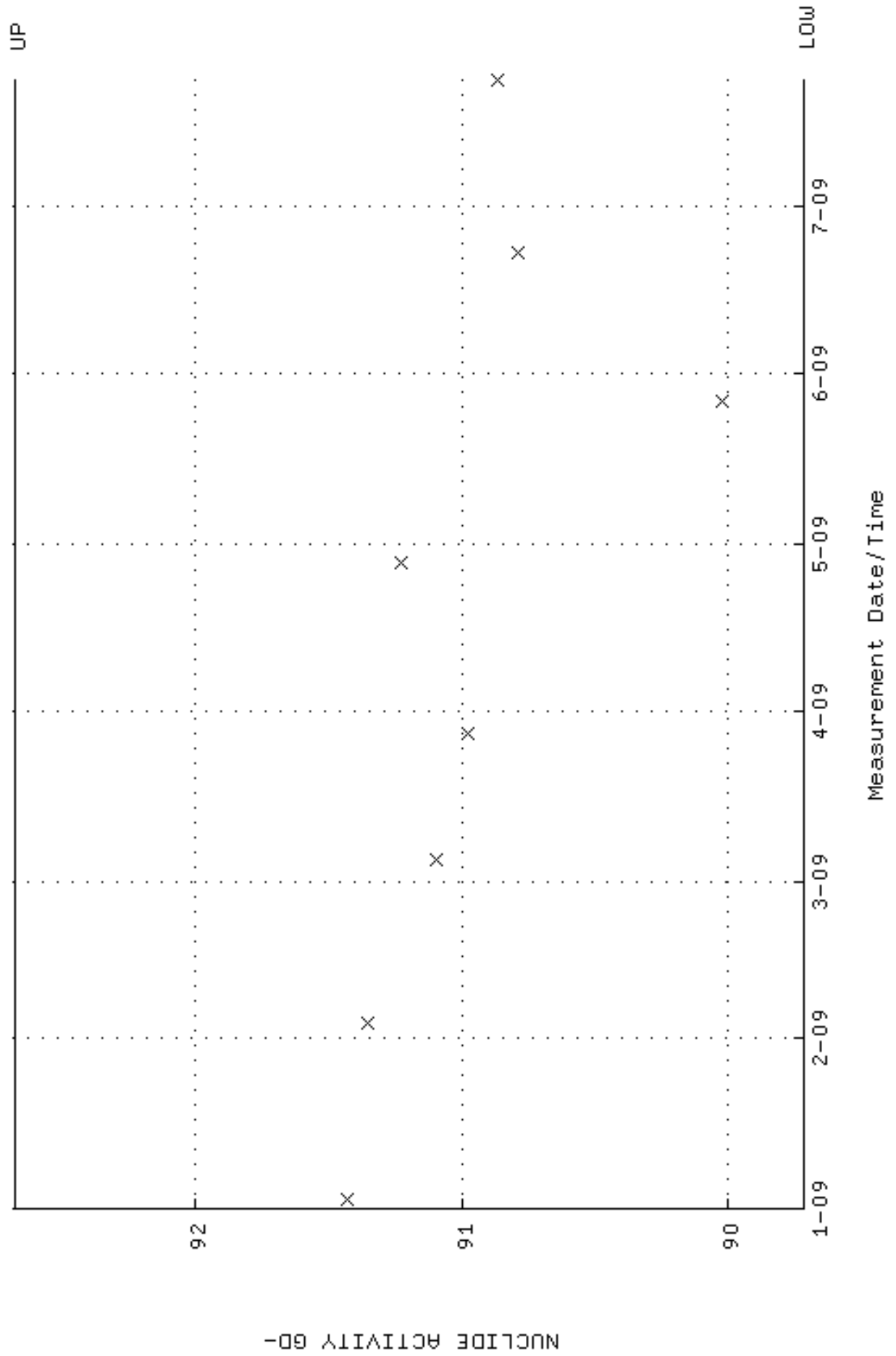
QA filename : DKA100:[ENV_ALPHA.QA.B]B163.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-JAN-2009 17:25:13 through 23-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



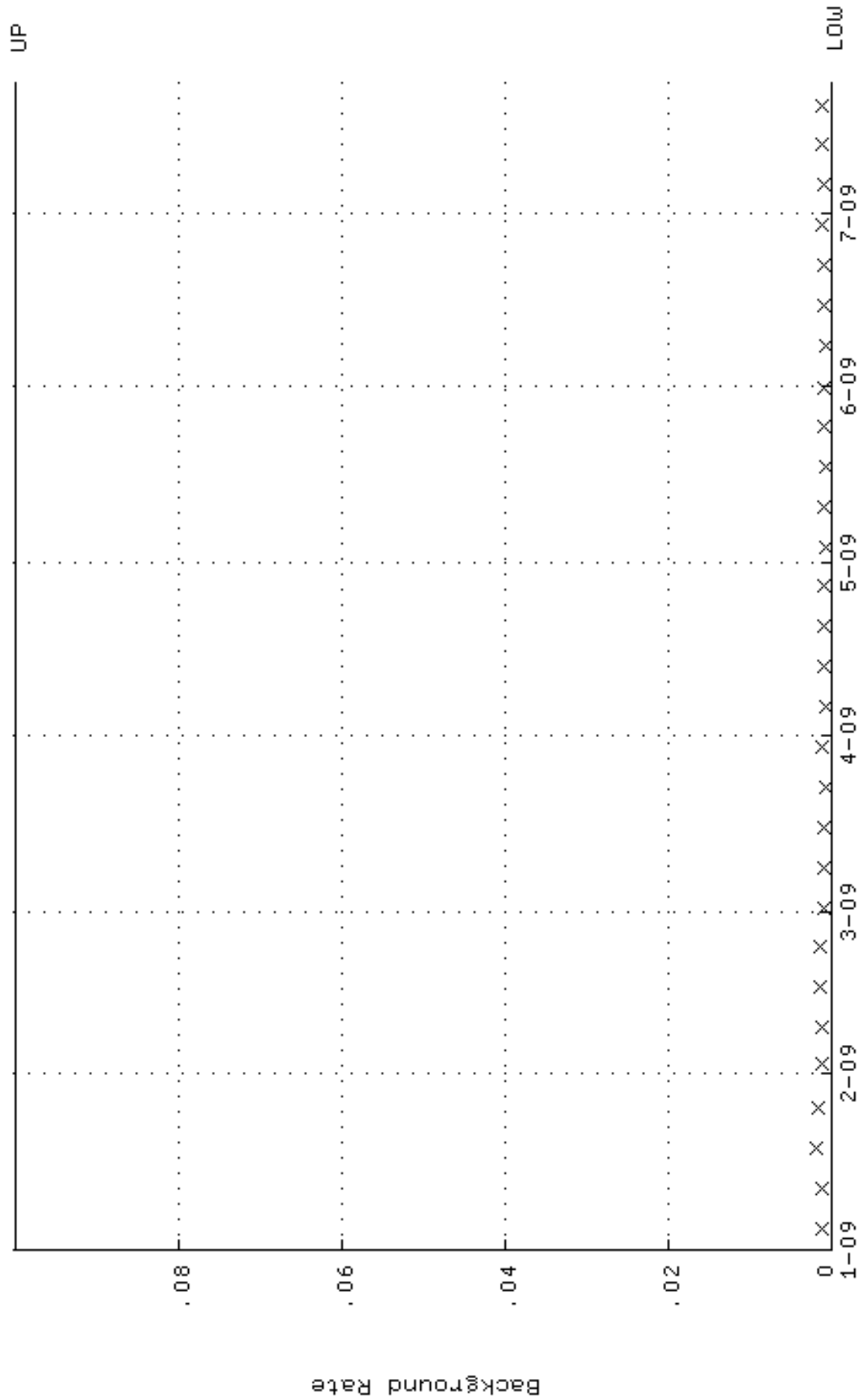
QA filename : DKA100:[ENV_ALPHA.QA.W]W164.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 2-JAN-2009 12:09:00 through 23-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.371107 through 0.397001



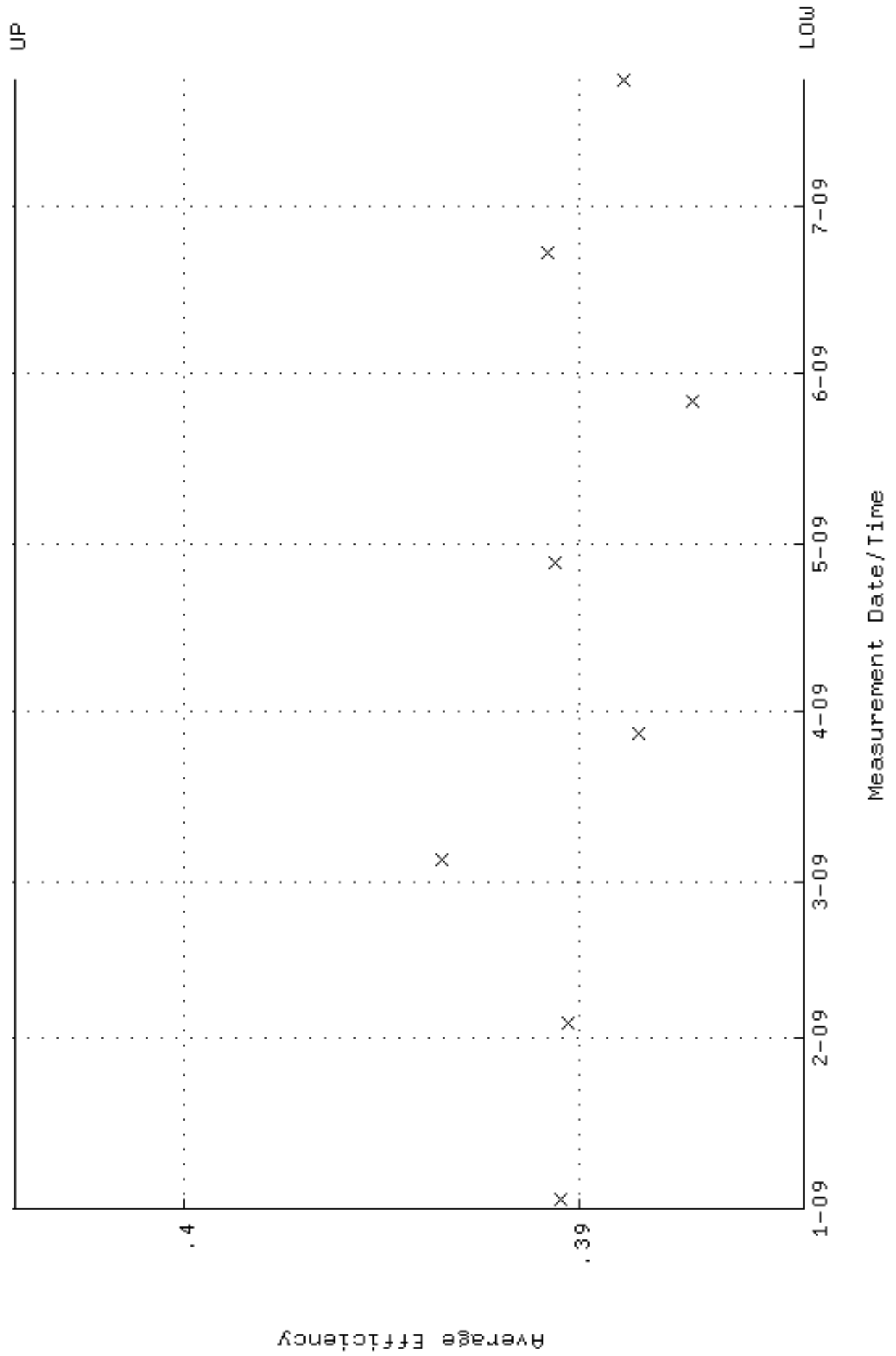
QA filename : DKA100:[ENV_ALPHA.QA.W]w164.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 2-JAN-2009 12:09:00 through 23-JUL-2009 12:00:00
 Lower/Upper Lmts: 89.7107 through 92.6809



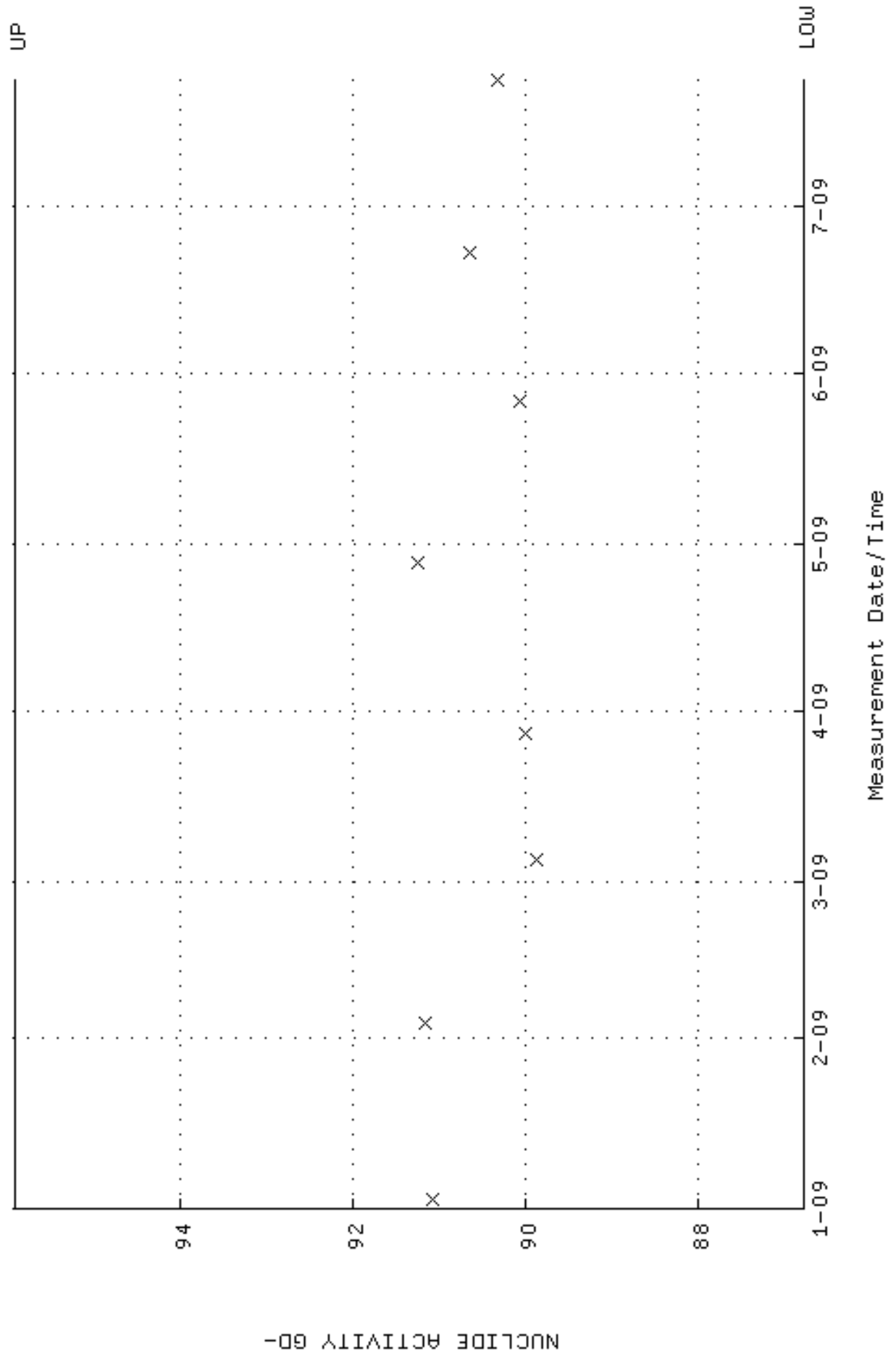
QA filename : DKA100:[ENV_ALPHA.QA.B]B164.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-JAN-2009 17:25:17 through 23-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



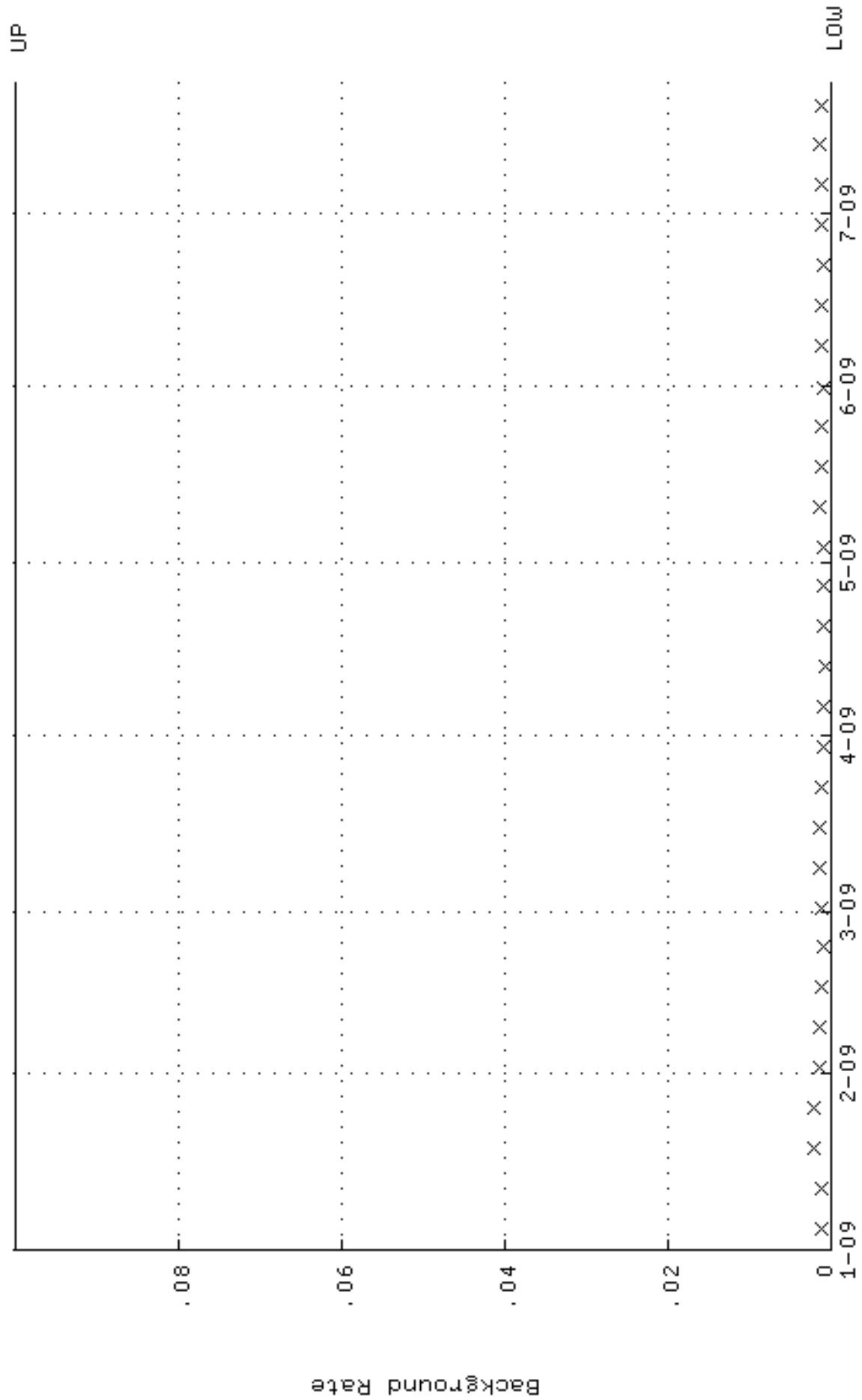
QA filename : DKA100:[ENV_ALPHA.QA.W]W167.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 2-JAN-2009 12:09:17 through 23-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.384285 through 0.404285



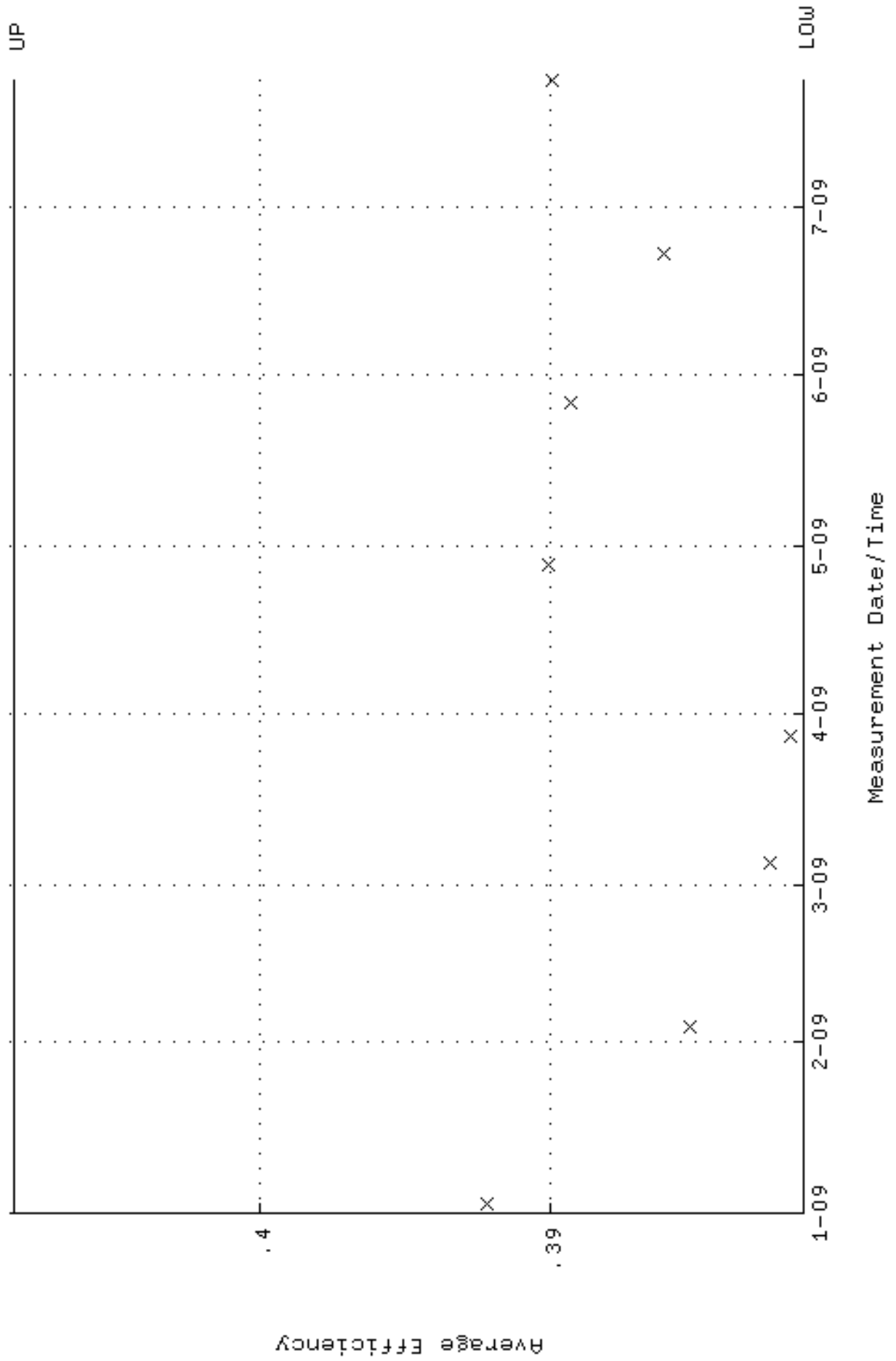
QA filename : DKA100:[ENV_ALPHA.QA.W]w167.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 2-JAN-2009 12:09:17 through 23-JUL-2009 12:00:00
 Lower/Upper Lmts: 86.7740 through 95.9082



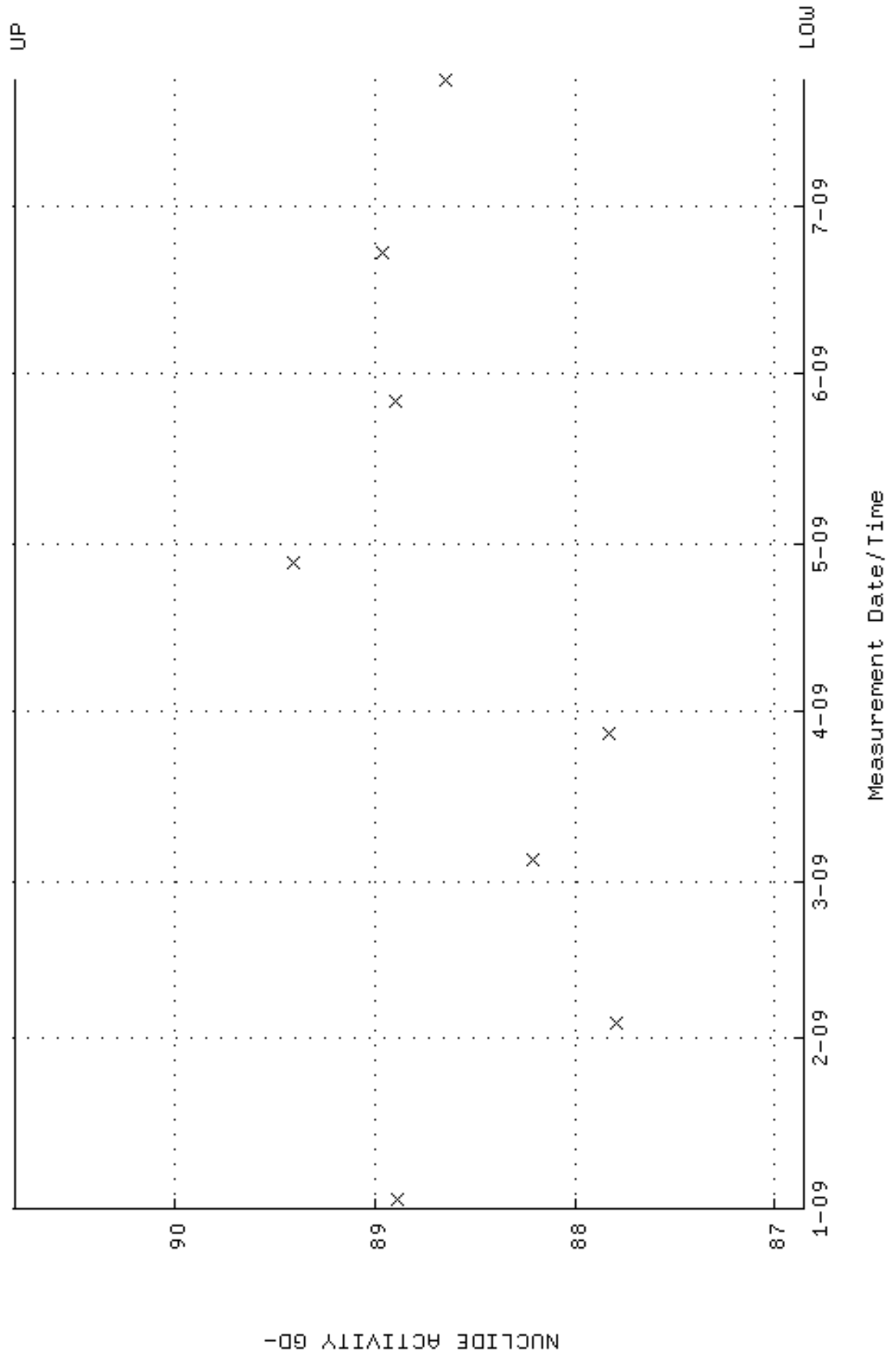
QA filename : DKA100:[ENV_ALPHA.QA.B]B167.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-JAN-2009 17:25:28 through 23-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



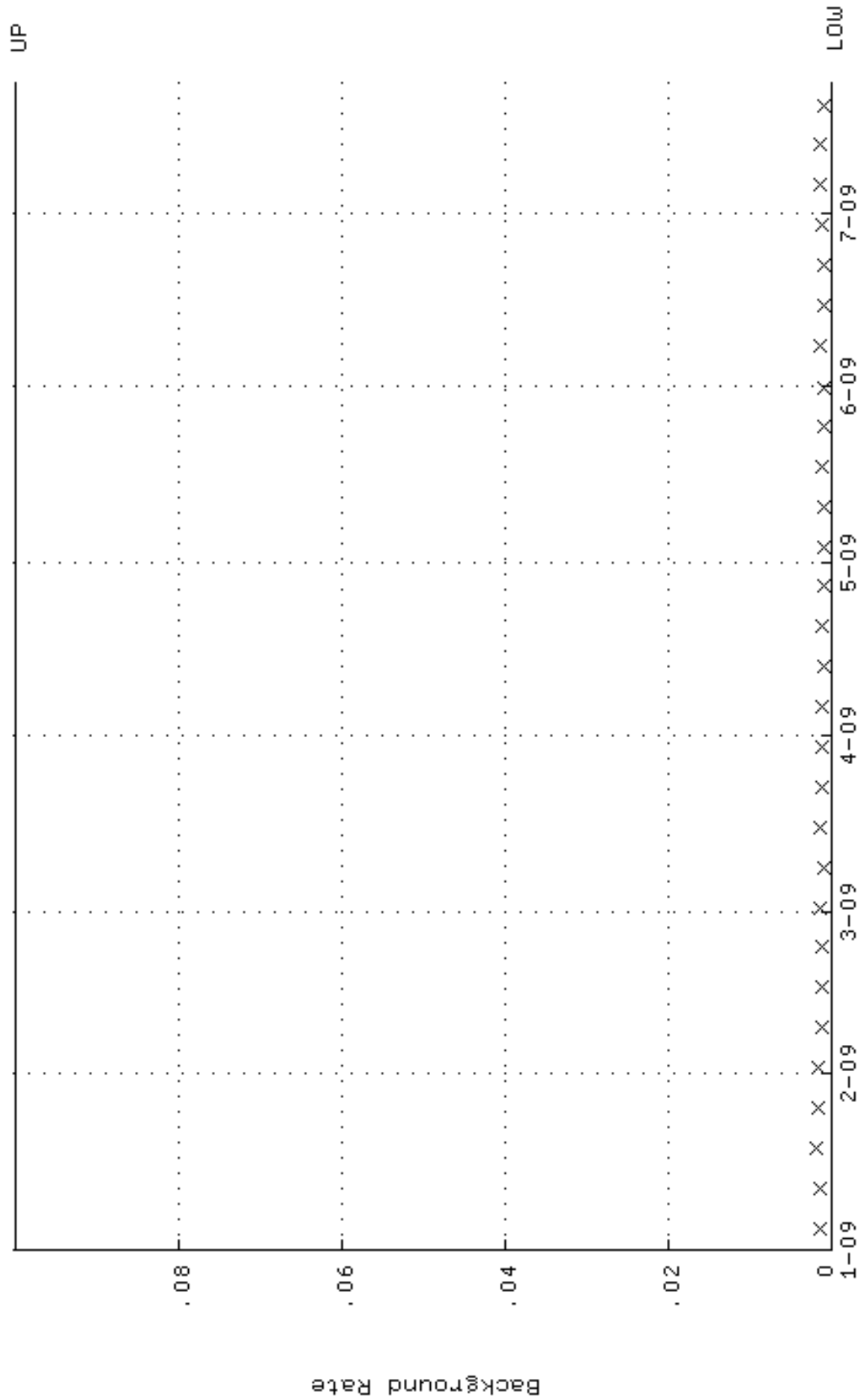
QA filename : DKA100:[ENV_ALPHA.QA.W]W168.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 2-JAN-2009 12:09:22 through 23-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.381339 through 0.408495



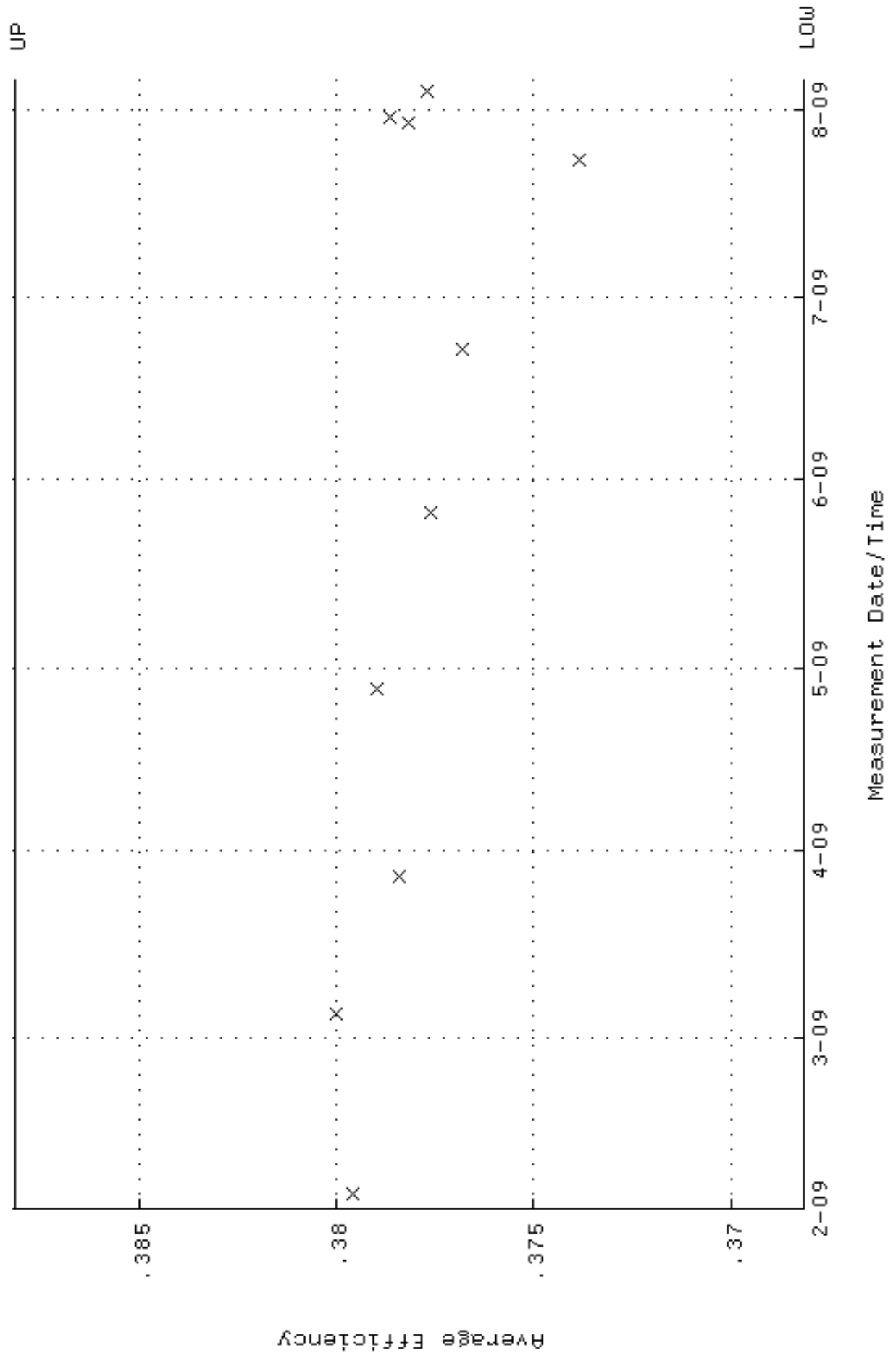
QA filename : DKA100:[ENV_ALPHA.QA.W]W168.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 2-JAN-2009 12:09:22 through 23-JUL-2009 12:00:00
 Lower/Upper Lmts: 86.8544 through 90.7976



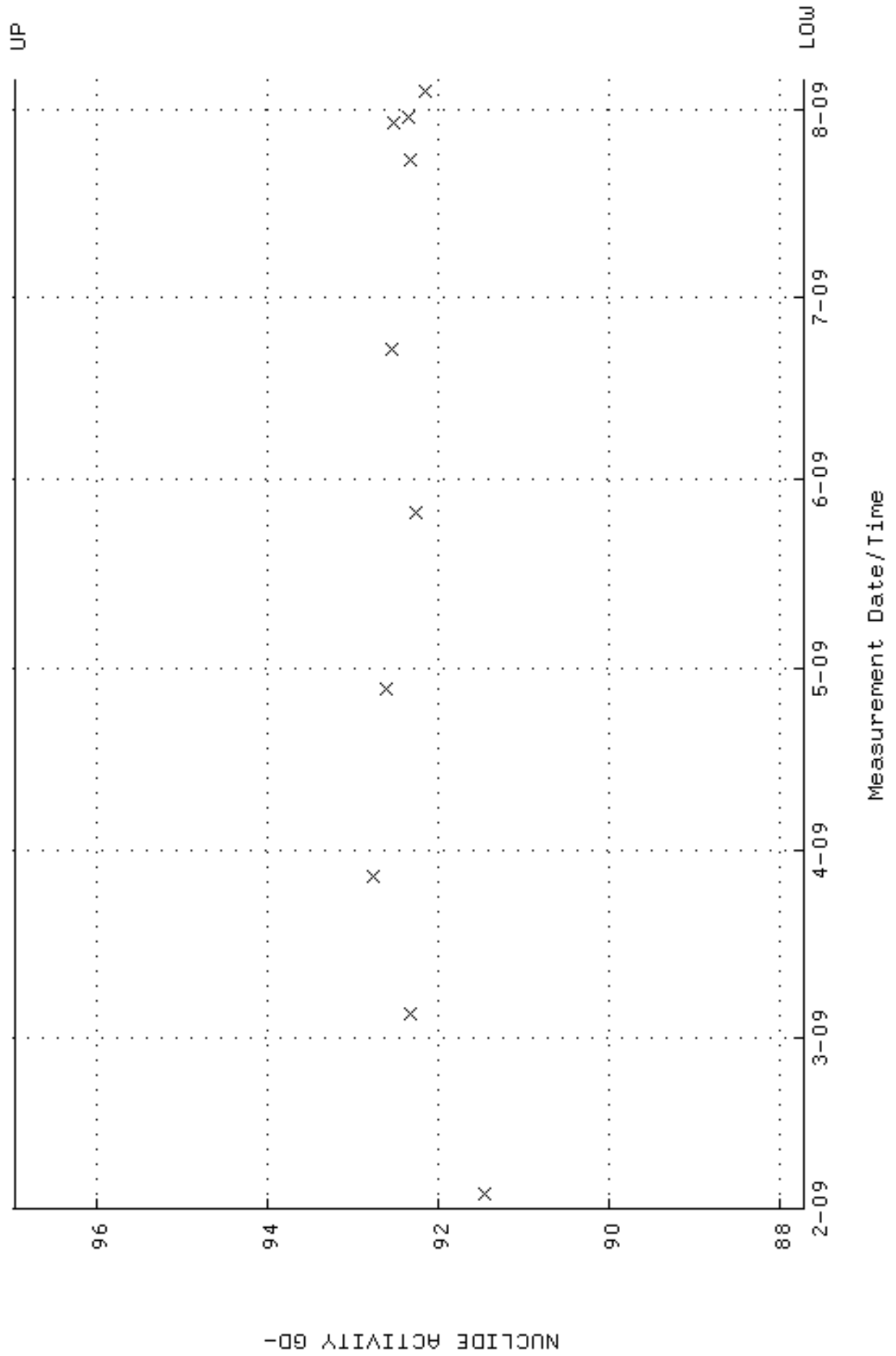
QA filename : DKA100:[ENV_ALPHA.QA.B]B168.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-JAN-2009 17:25:31 through 23-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



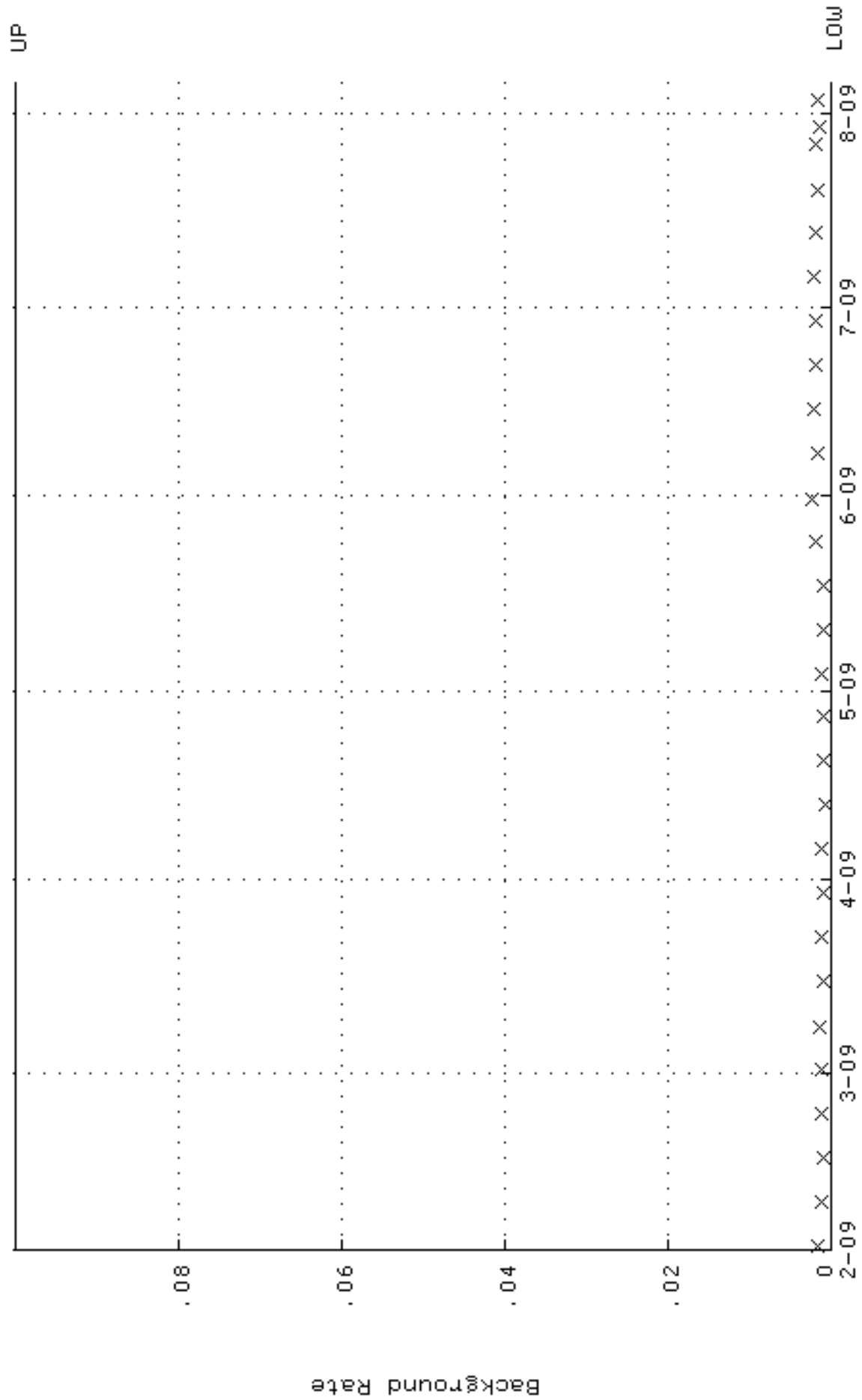
QA filename : DKA100:[ENV_ALPHA.QA.W]W169.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 3-FEB-2009 07:30:32 through 5-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.368144 through 0.388144



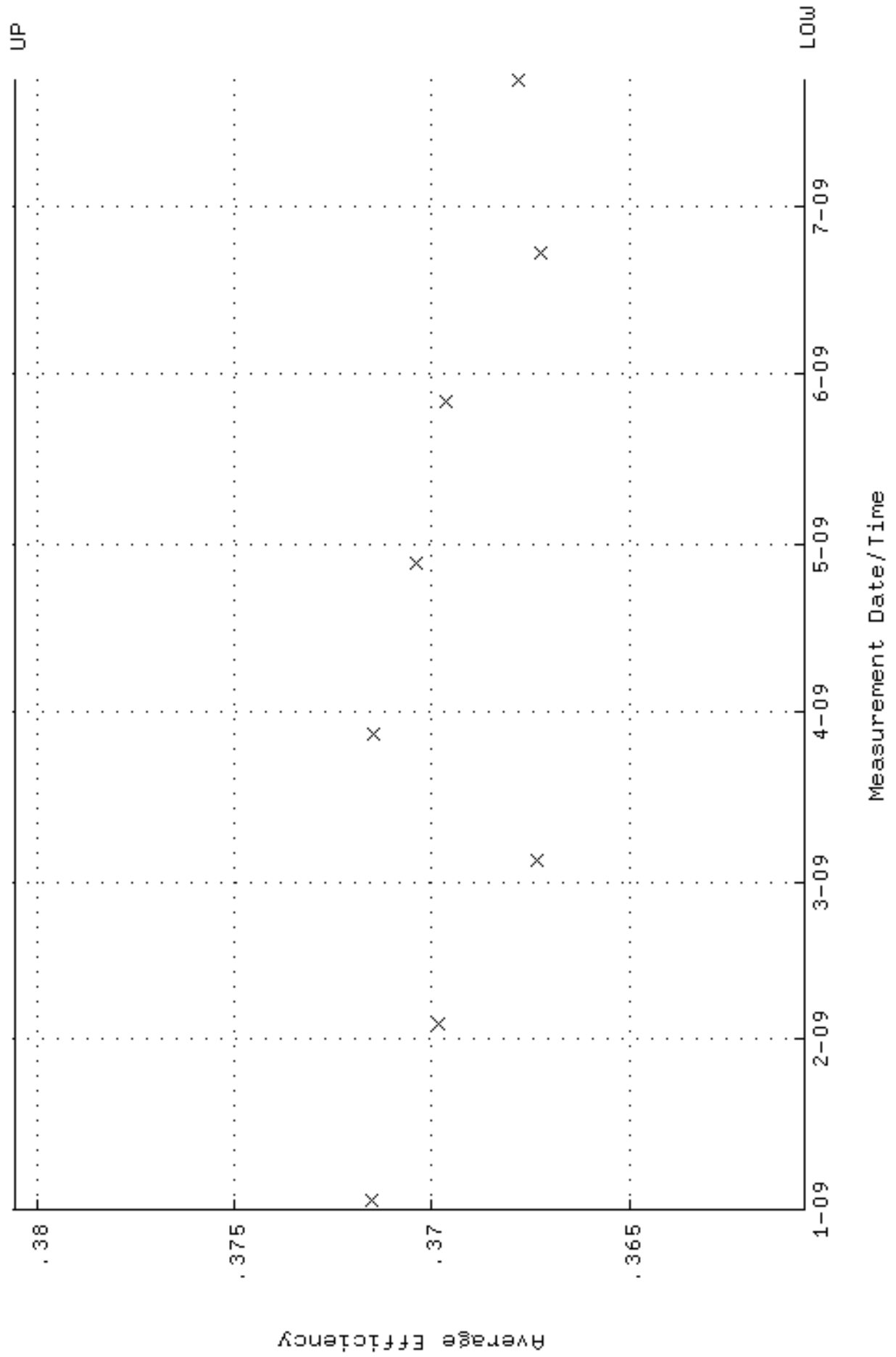
QA filename : DKA100:[ENV_ALPHA.QA.W]W169.QAF;1
Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 3-FEB-2009 07:30:32 through 5-AUG-2009 12:00:00
Lower/Upper Lmts: 87.7141 through 96.9471



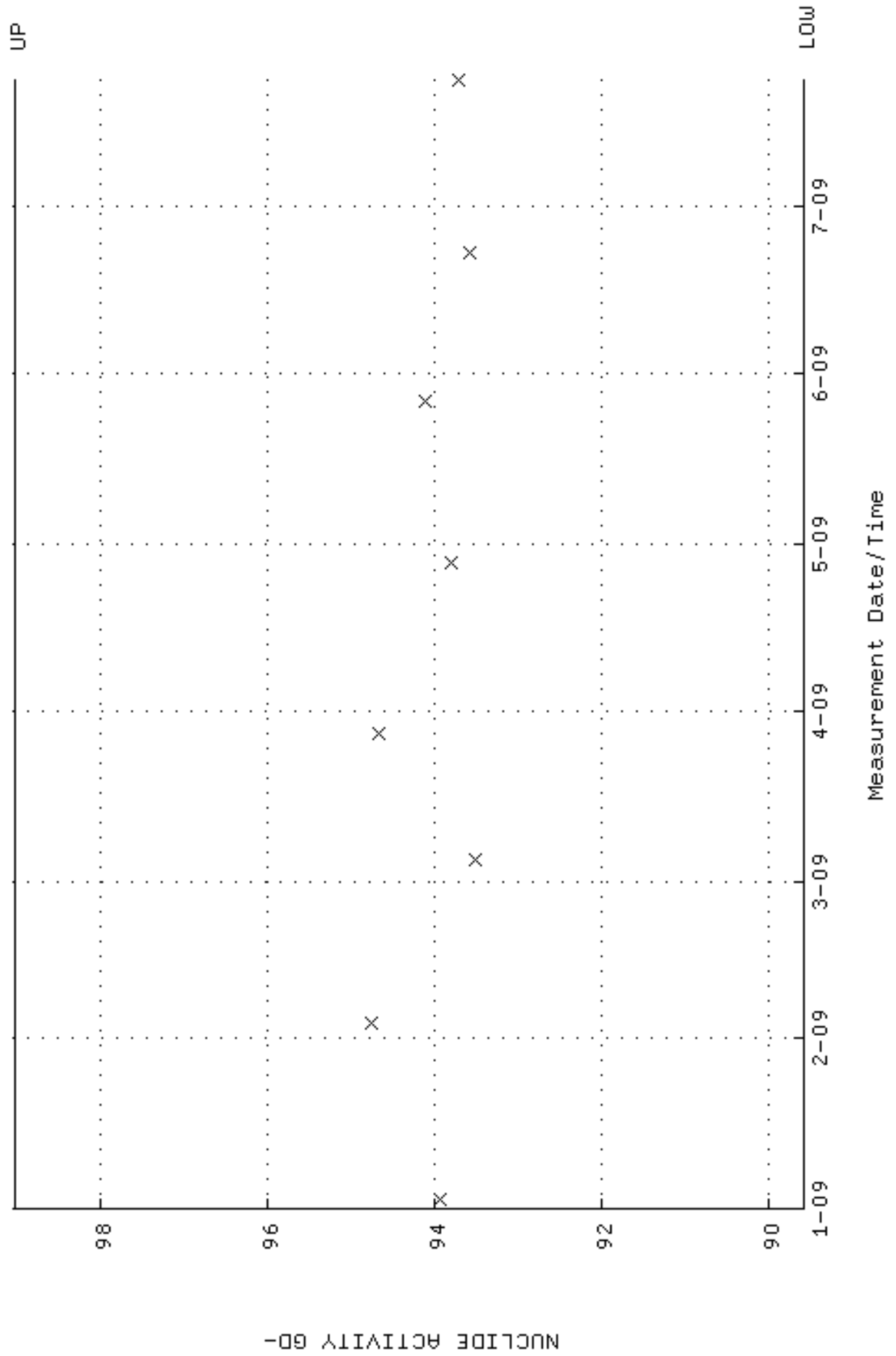
QA filename : DKA100:[ENV_ALPHA.QA.B]B169.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 1-FEB-2009 17:13:46 through 5-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



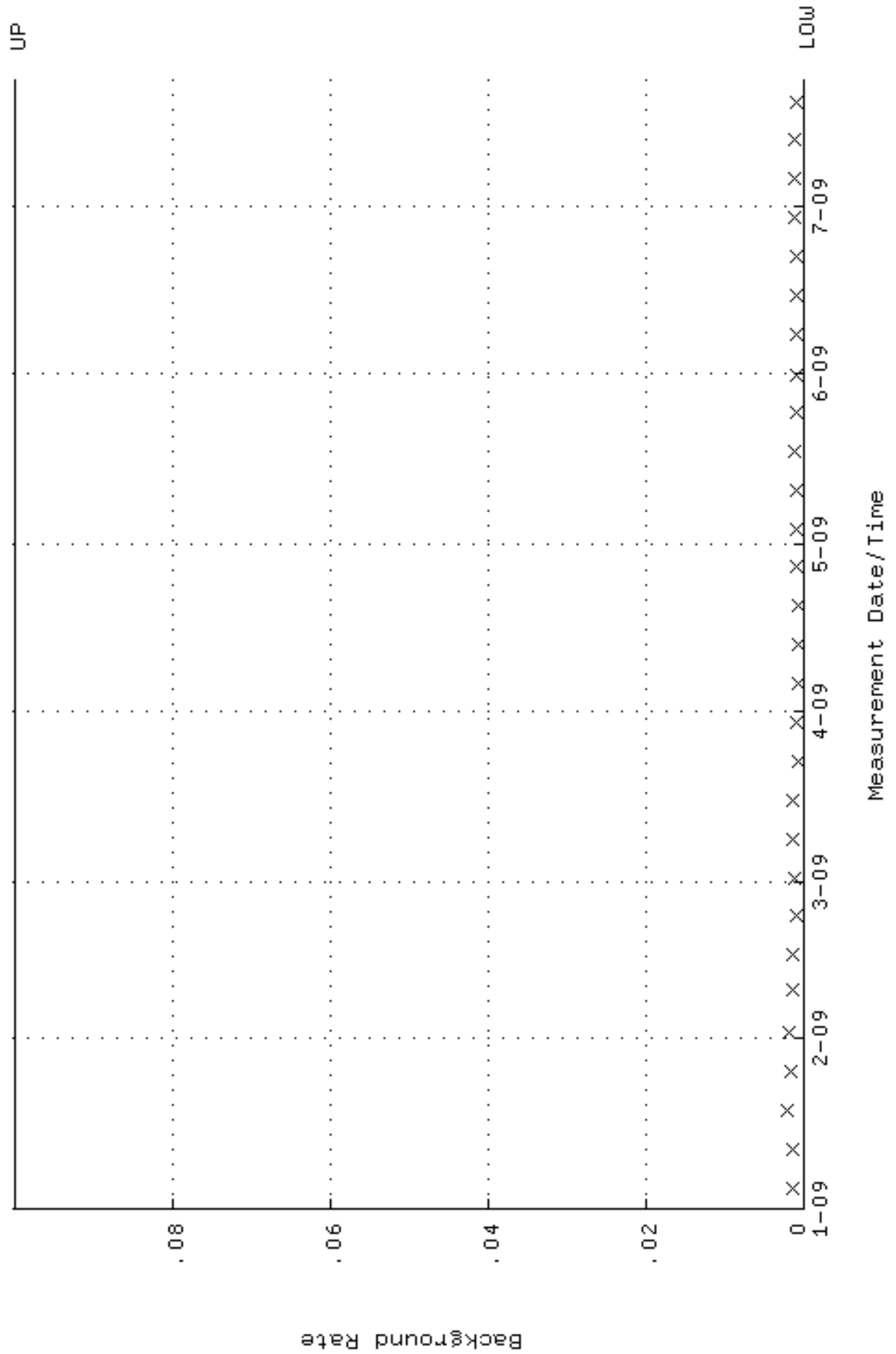
QA filename : DKA100:[ENV_ALPHA.QA.W]W170.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 2-JAN-2009 12:09:33 through 23-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.360563 through 0.380563



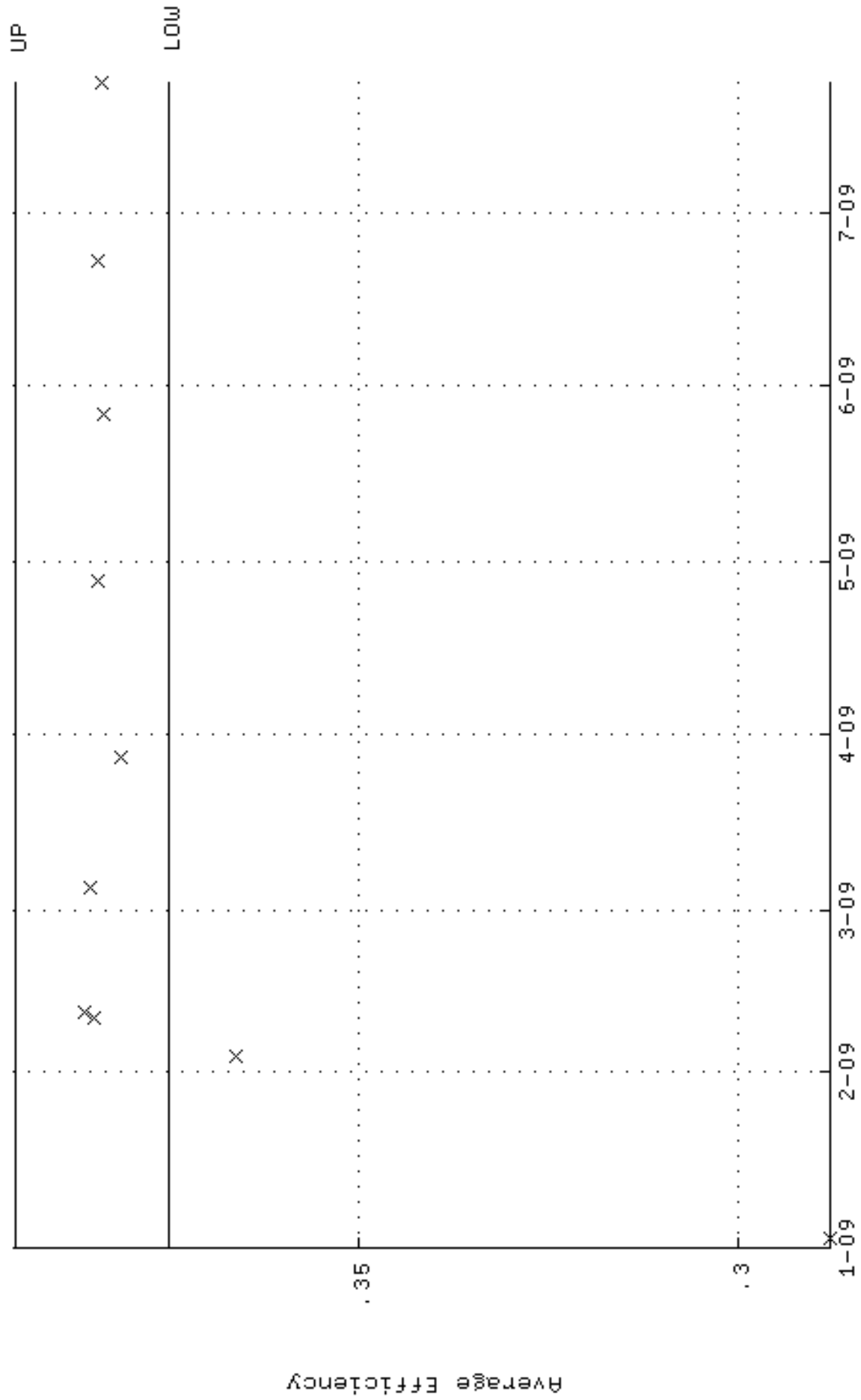
QA filename : DKA100:[ENV_ALPHA.QA.W]w170.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 2-JAN-2009 12:09:33 through 23-JUL-2009 12:00:00
 Lower/Upper Lmts: 89.5841 through 99.0139



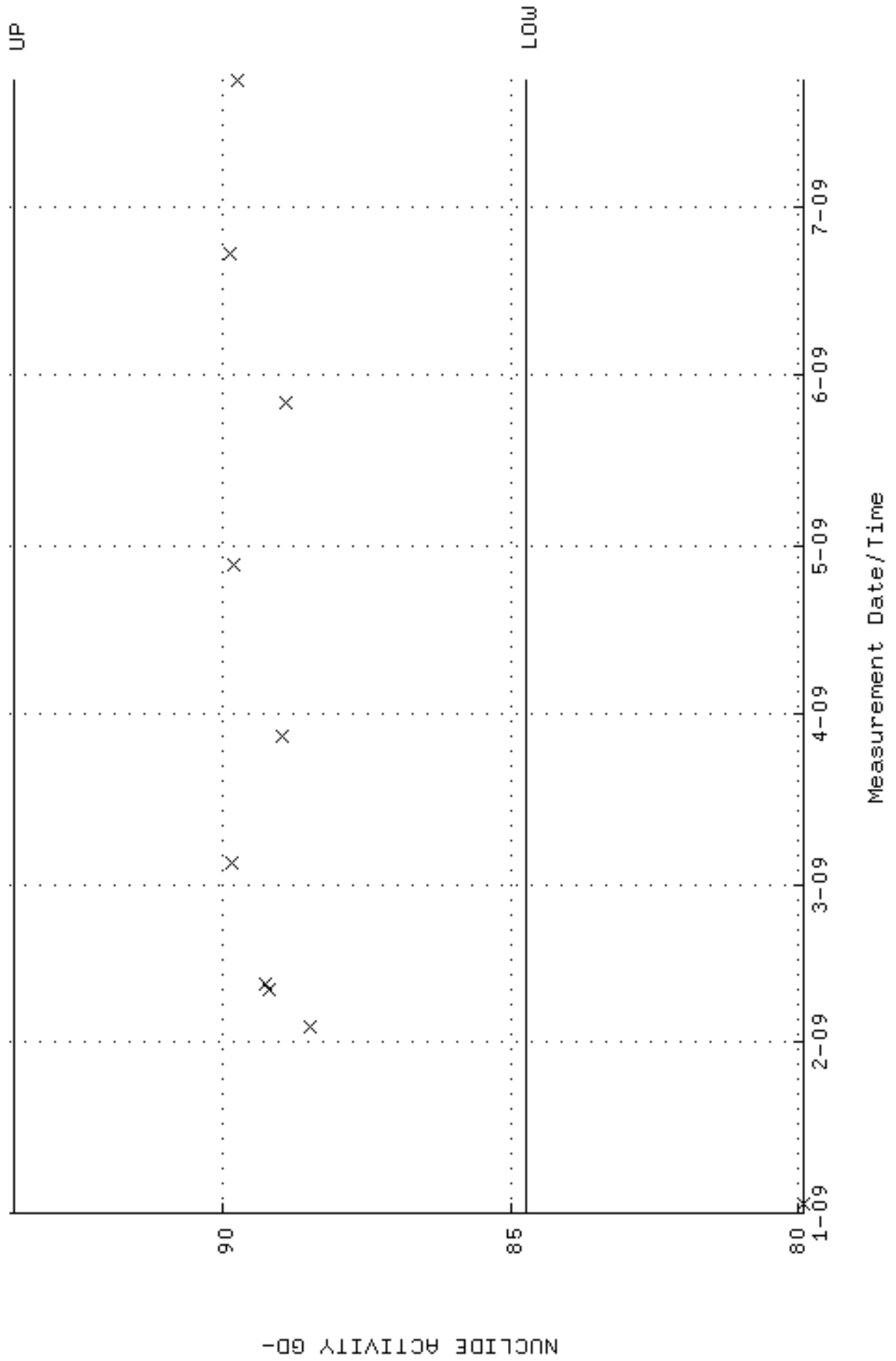
QA filename : DKA100:[ENV_ALPHA.QA.B]B170.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-JAN-2009 17:25:39 through 23-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



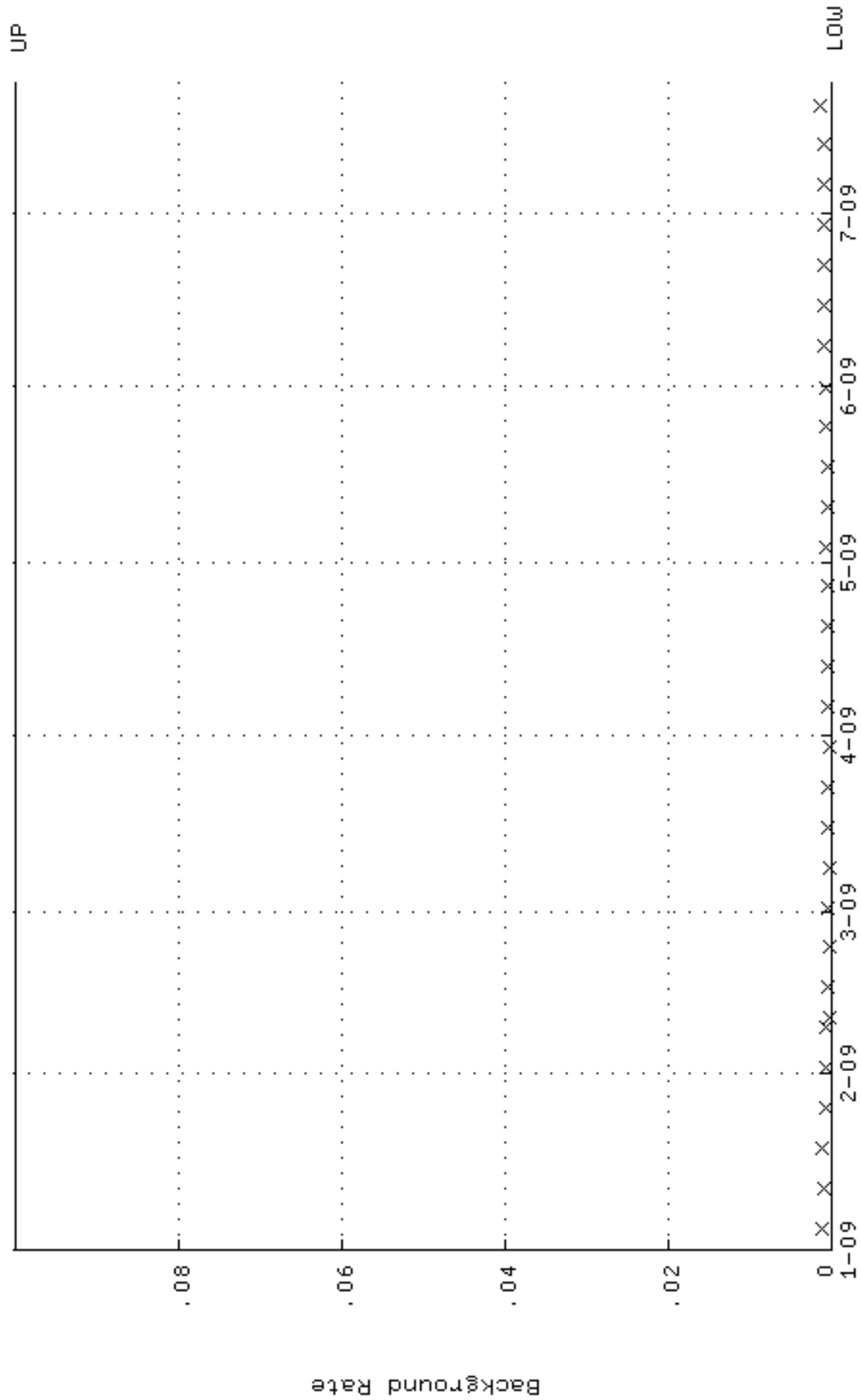
QA filename : DKA100:[ENV_ALPHA.QA.W]W171.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 2-JAN-2009 12:09:38 through 23-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.375364 through 0.395364



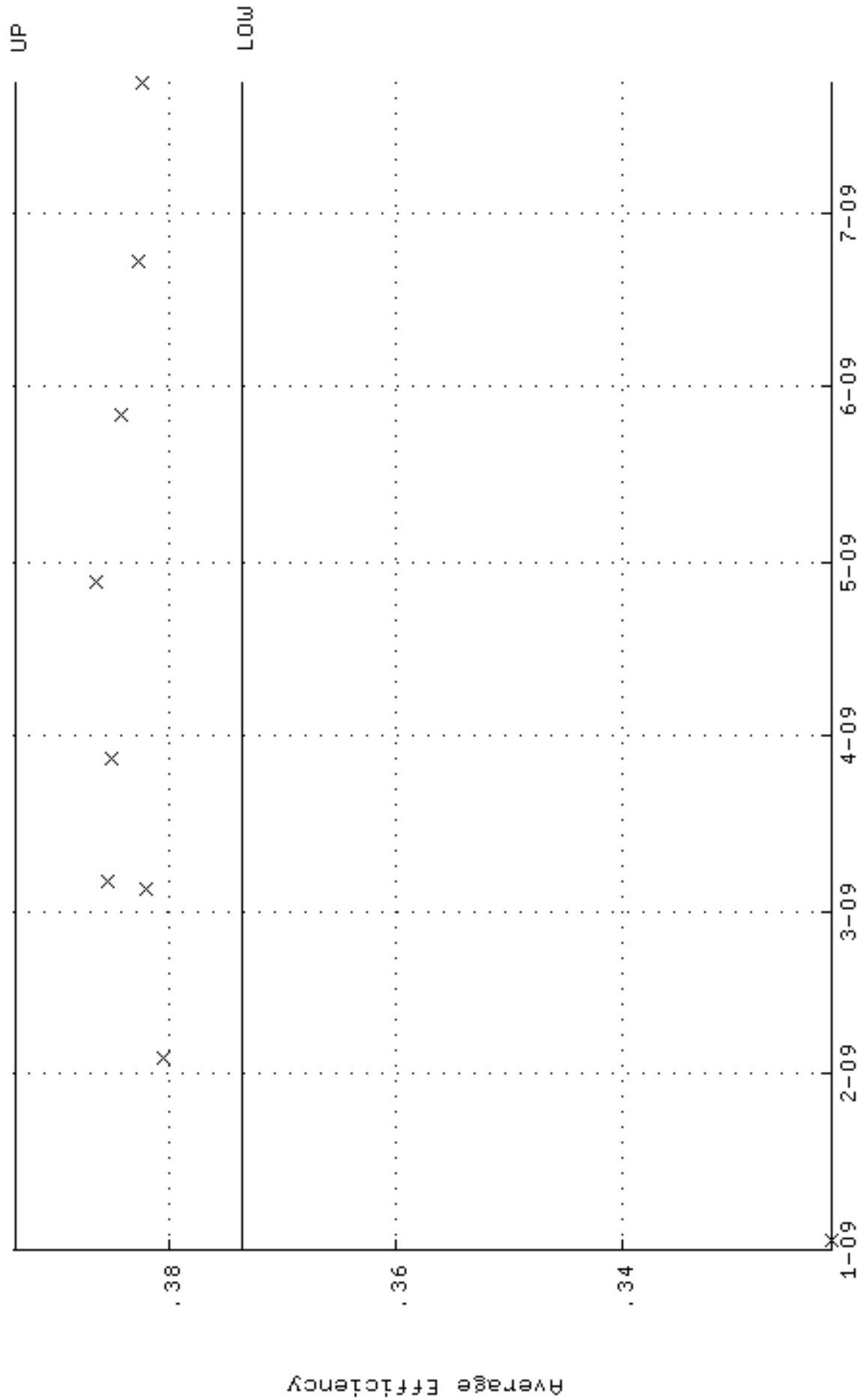
QA filename : DKA100:[ENV_ALPHA.QA.W]w171.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 2-JAN-2009 12:09:38 through 23-JUL-2009 12:00:00
 Lower/Upper Lmts: 84.7539 through 93.6753



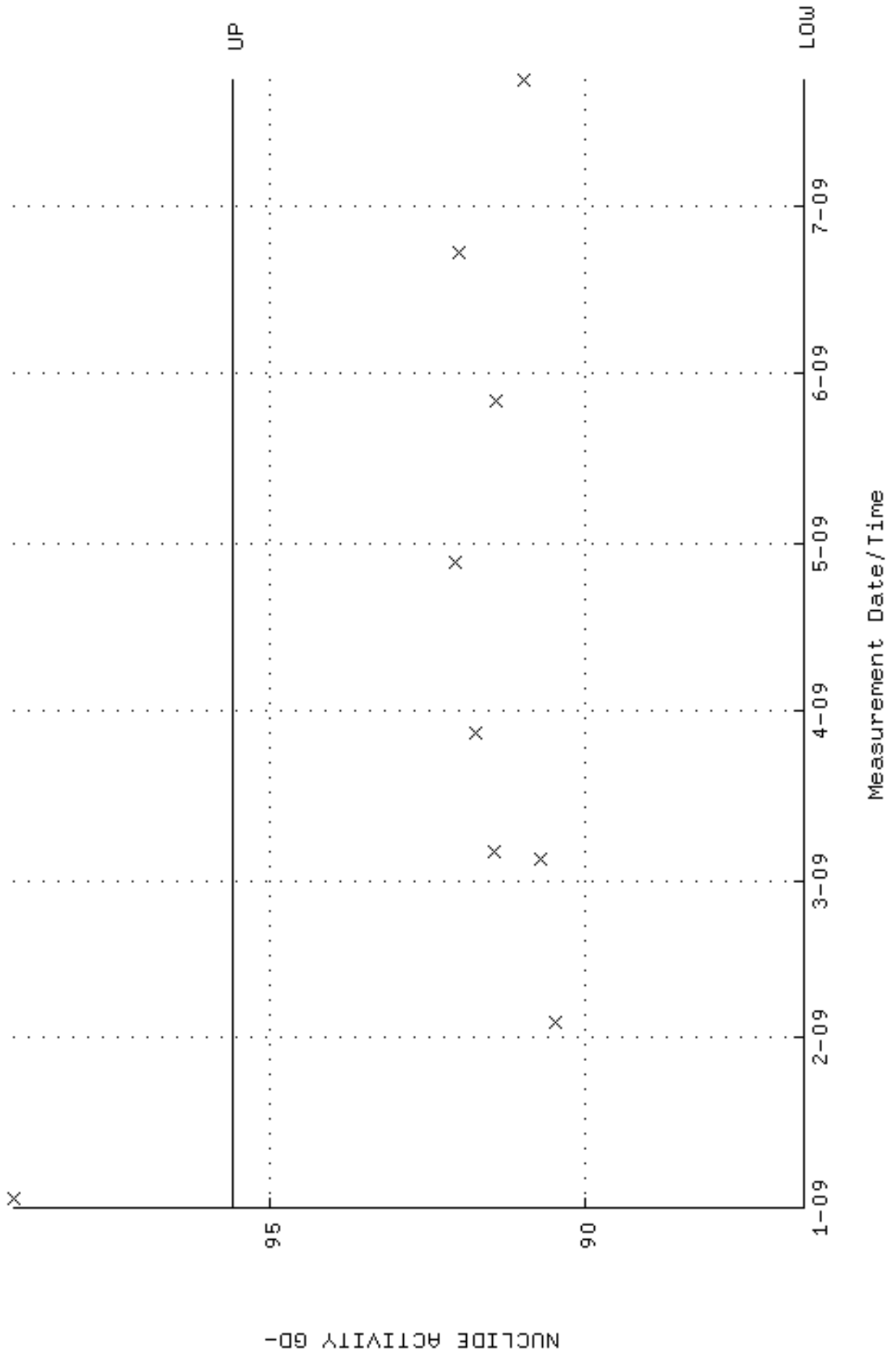
QA filename : DKA100:[ENV_ALPHA.QA.B]B171.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-JAN-2009 17:25:42 through 23-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



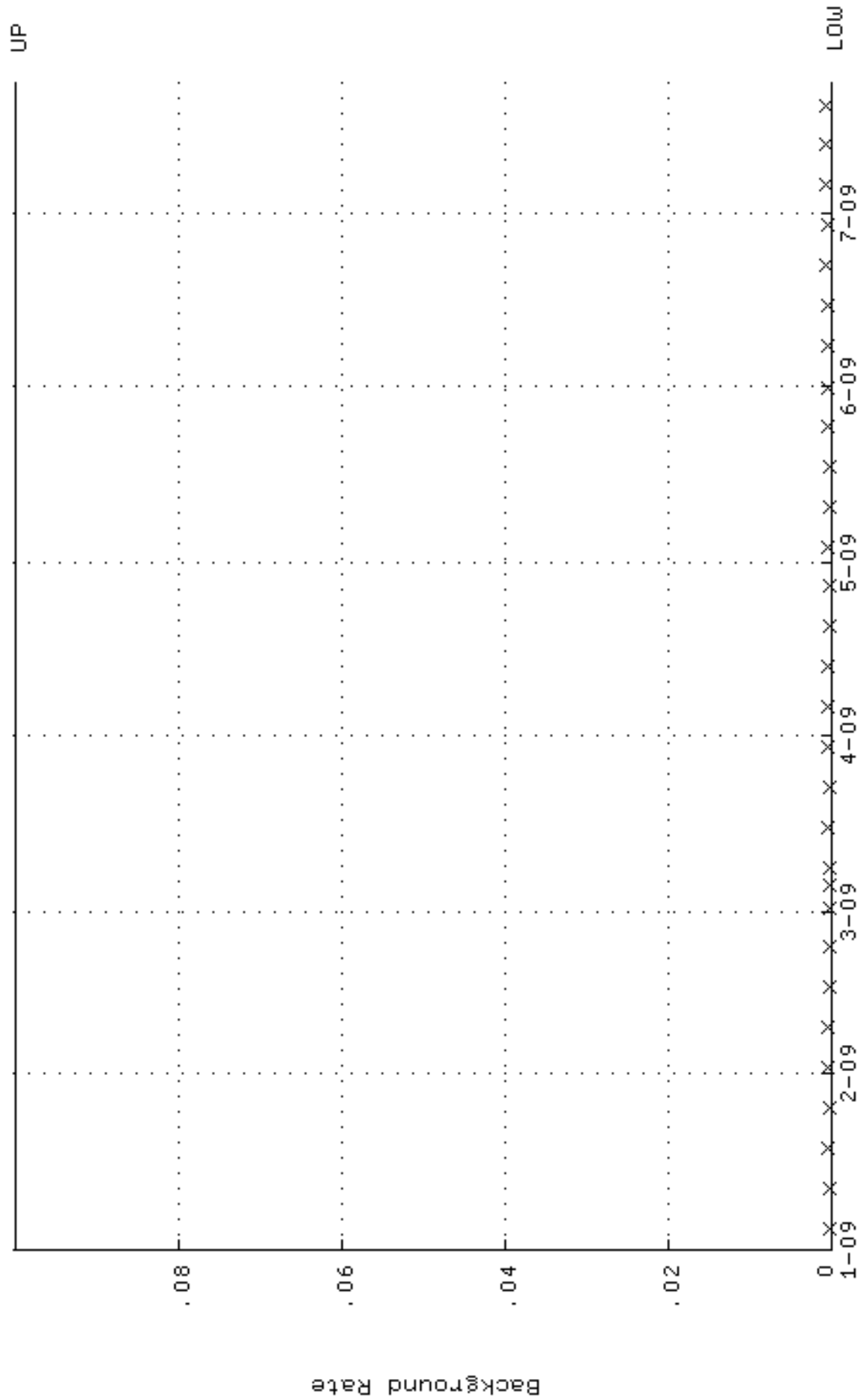
QA filename : DKA100:[ENV_ALPHA.QA.W]W172.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 2-JAN-2009 12:09:49 through 23-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.373575 through 0.393575



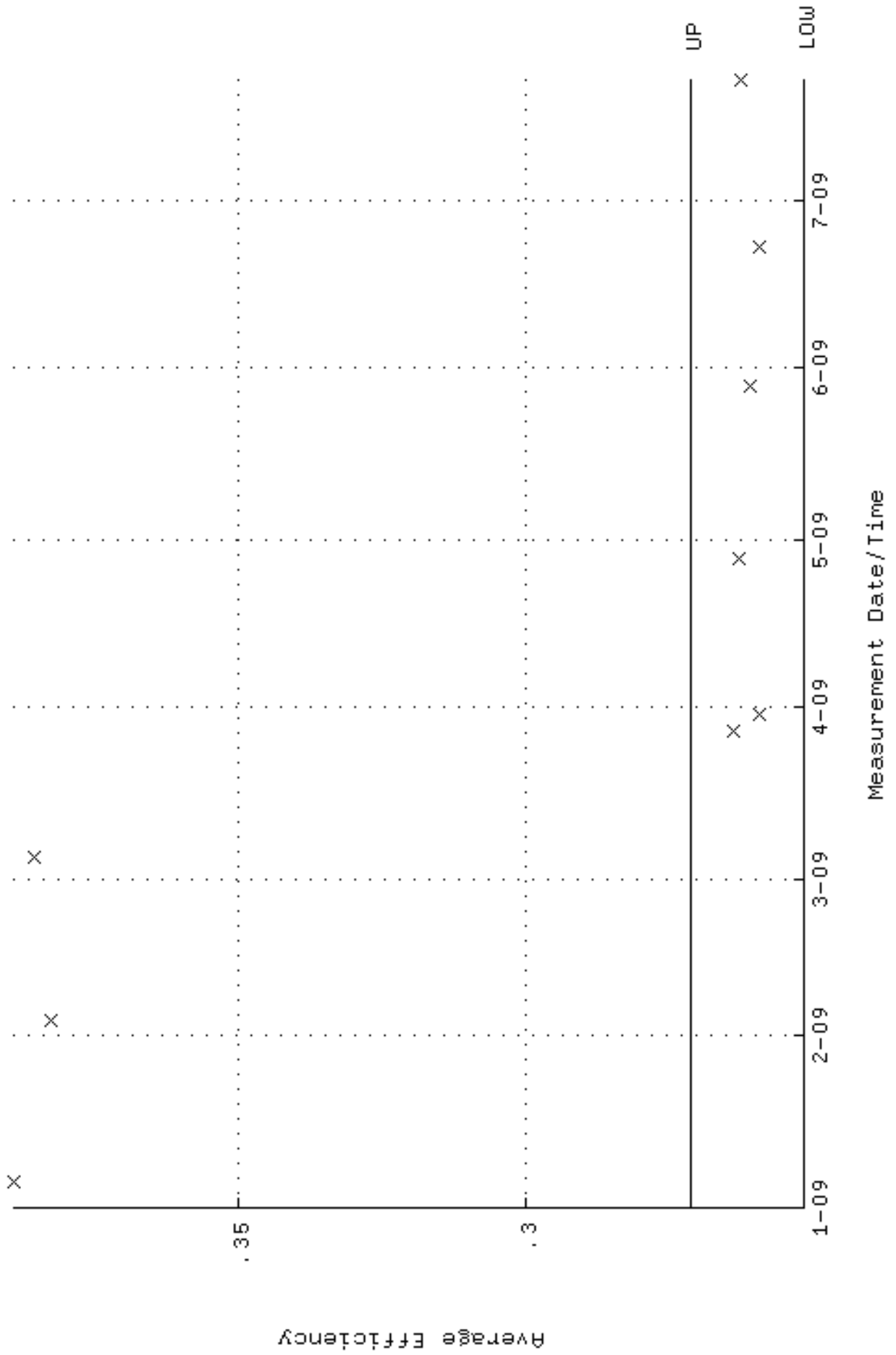
QA filename : DKA100:[ENV_ALPHA.QA.W]w172.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 2-JAN-2009 12:09:49 through 23-JUL-2009 12:00:00
 Lower/Upper Lmts: 86.5089 through 95.6151



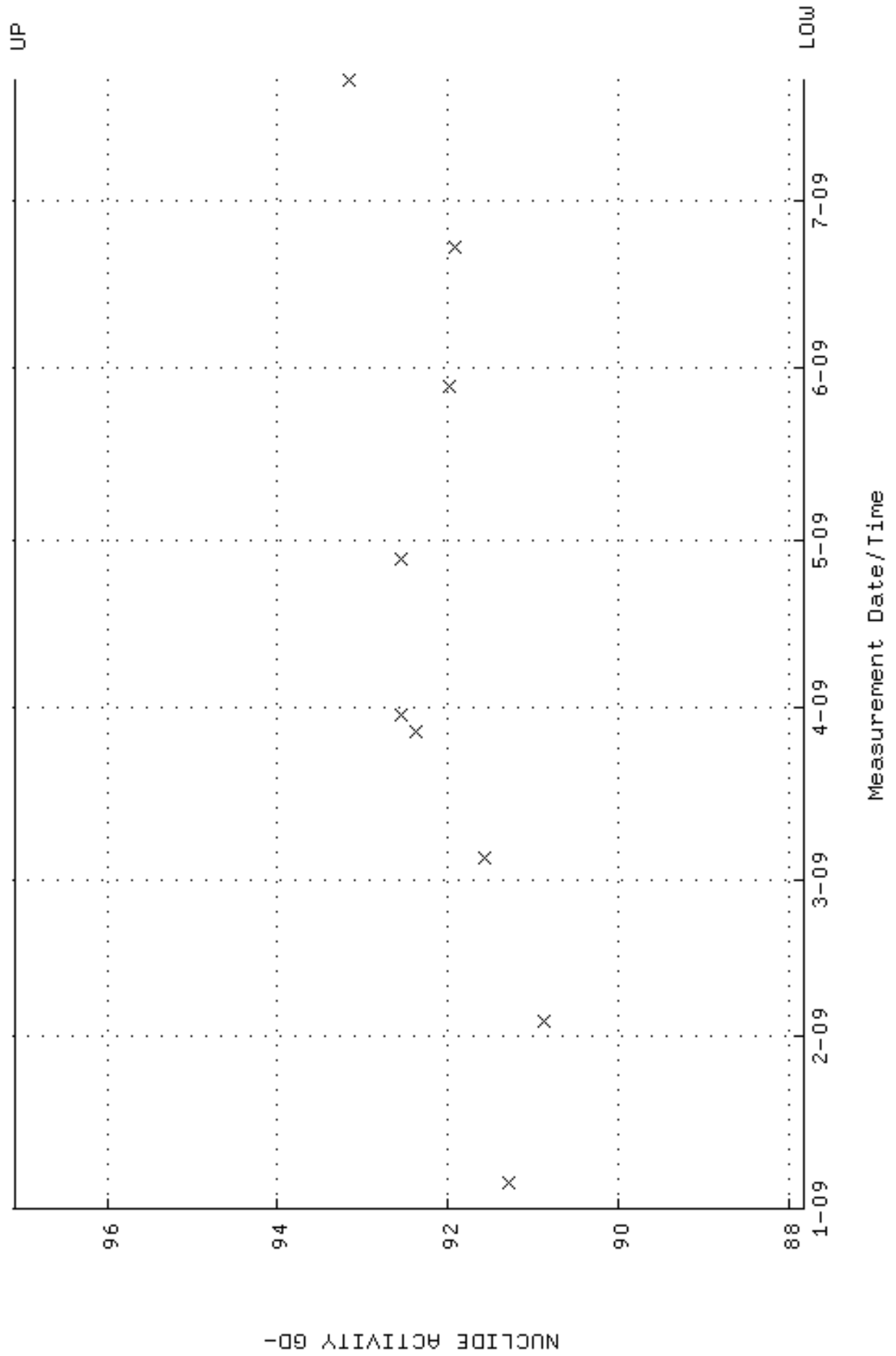
QA filename : DKA100:[ENV_ALPHA.QA.B]B172.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-JAN-2009 17:25:46 through 23-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



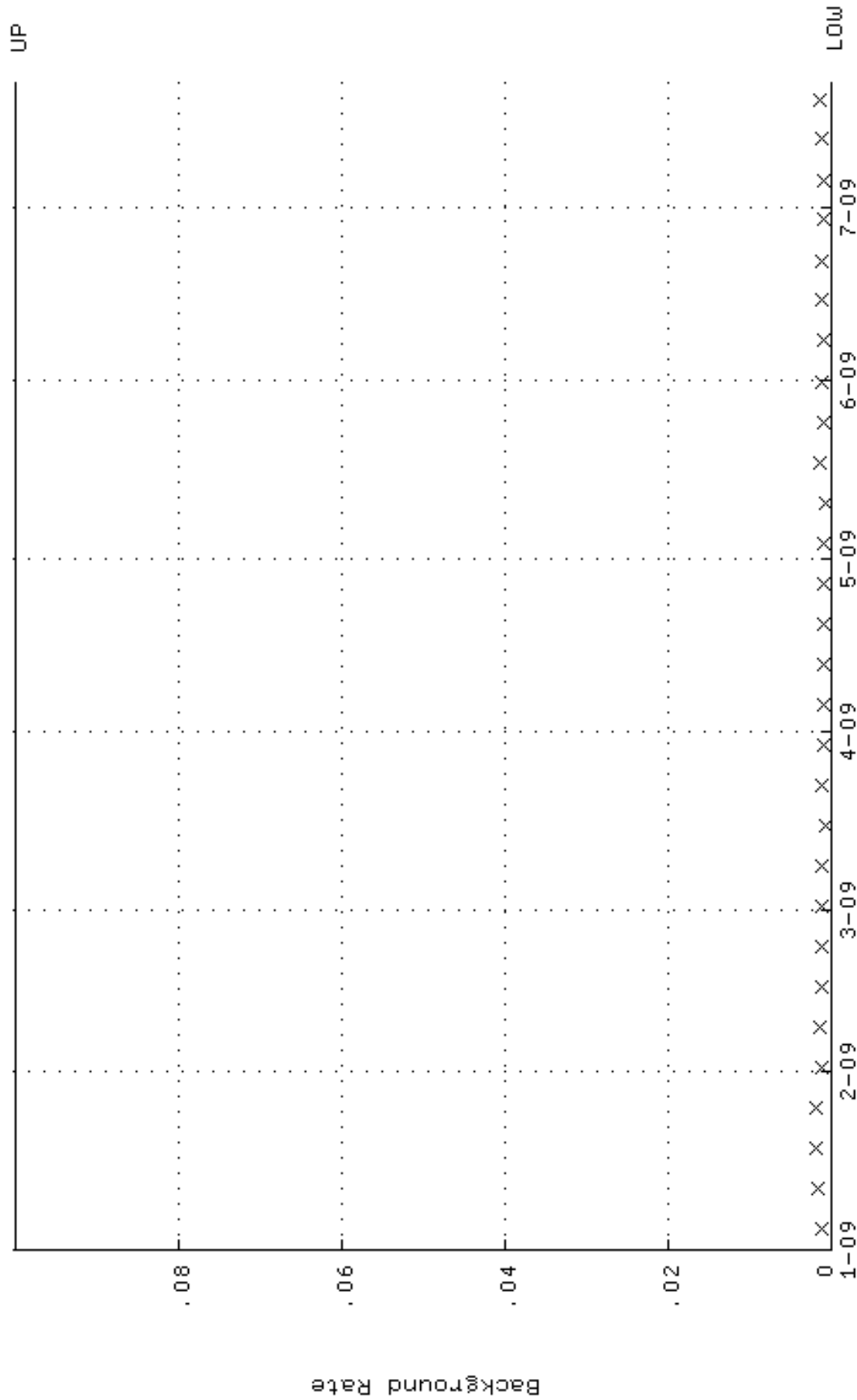
QA filename : DKA100:[ENV_ALPHA.QA.W]W173.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 5-JAN-2009 12:56:51 through 22-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.251498 through 0.271498



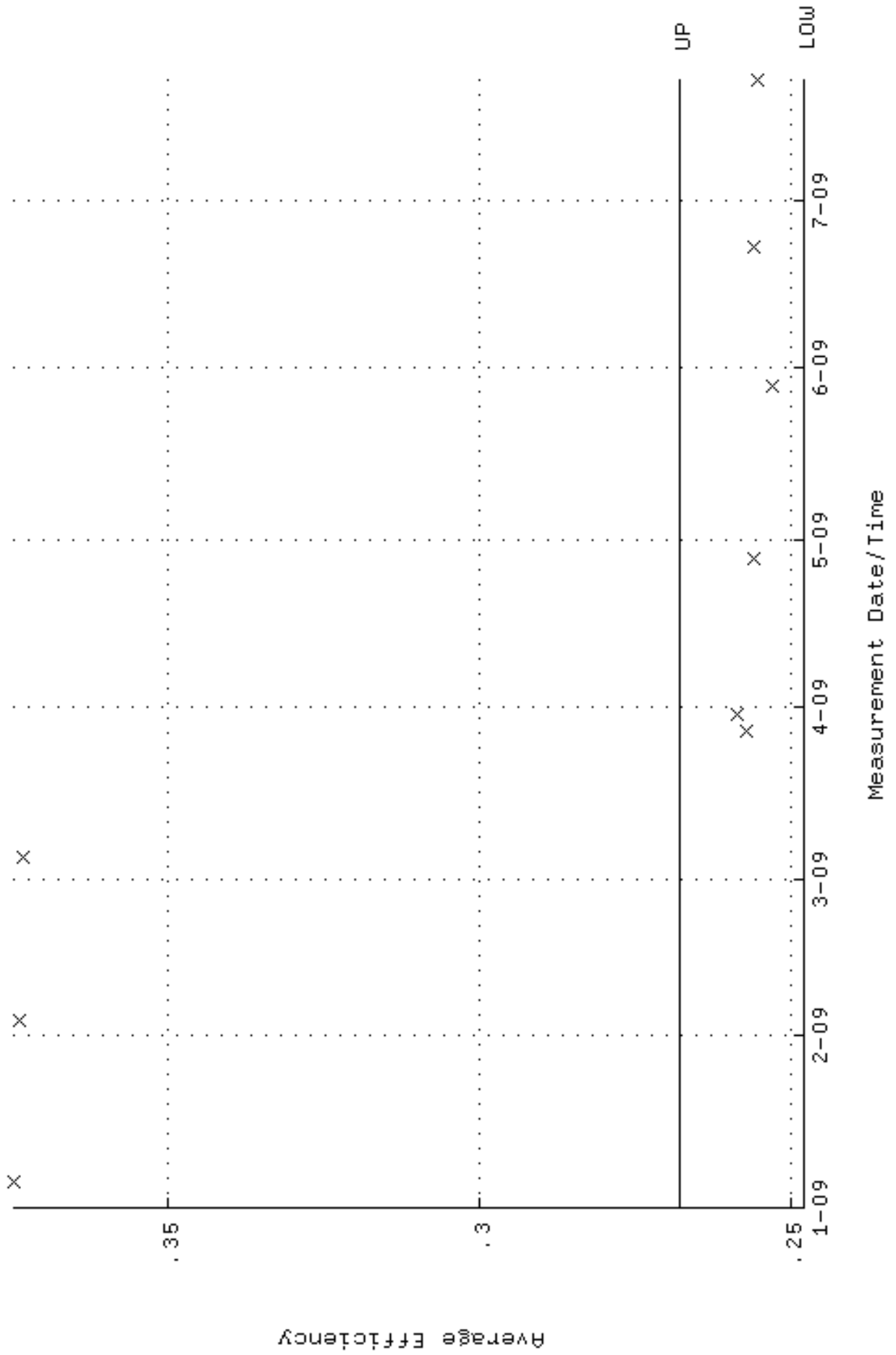
QA filename : DKA100:[ENV_ALPHA.QA.W]w173.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 5-JAN-2009 12:56:51 through 22-JUL-2009 12:00:00
 Lower/Upper Lmts: 87.8322 through 97.0776



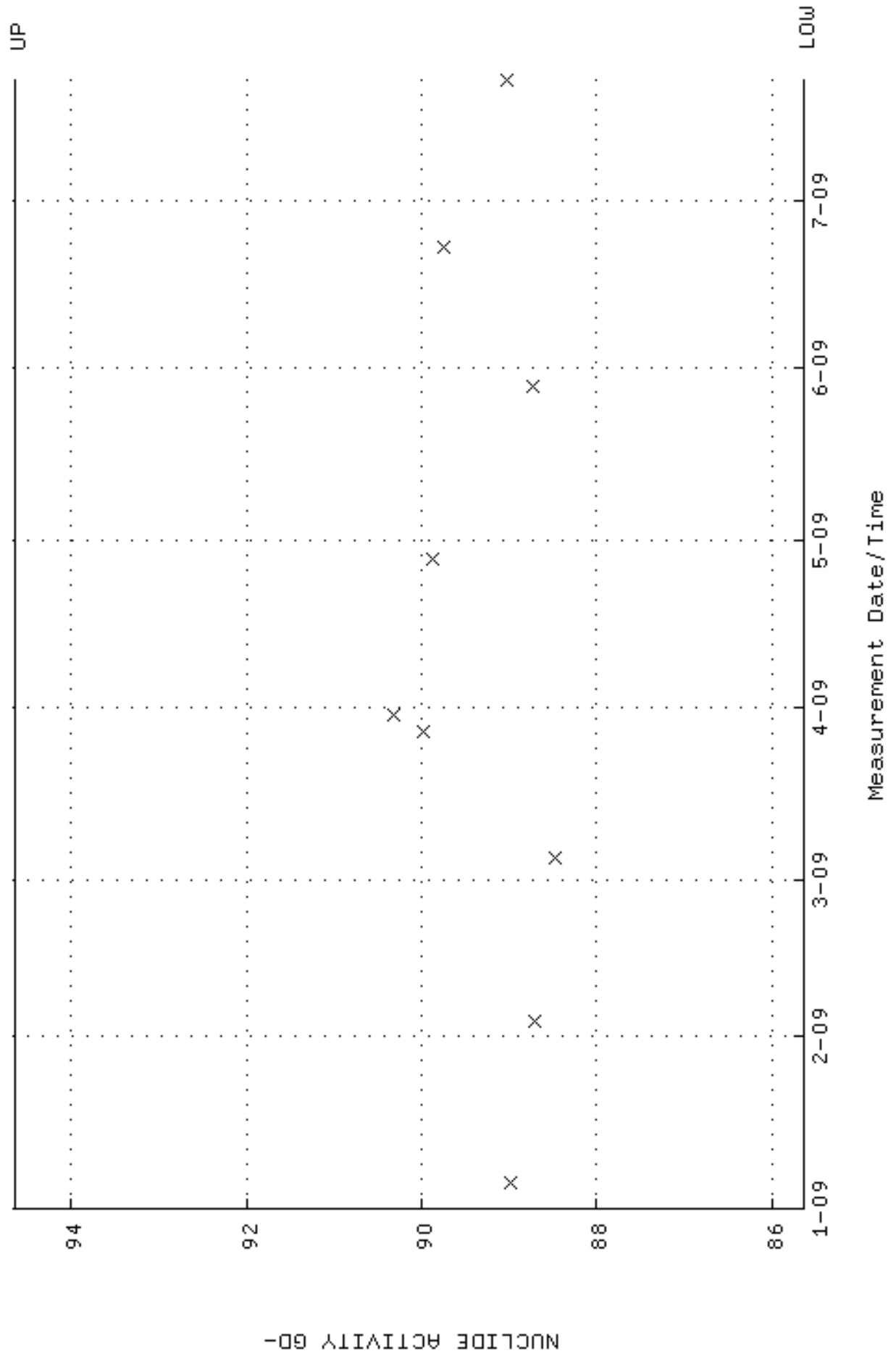
QA filename : DKA100:[ENV_ALPHA.QA.B]B173.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-JAN-2009 17:25:49 through 22-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



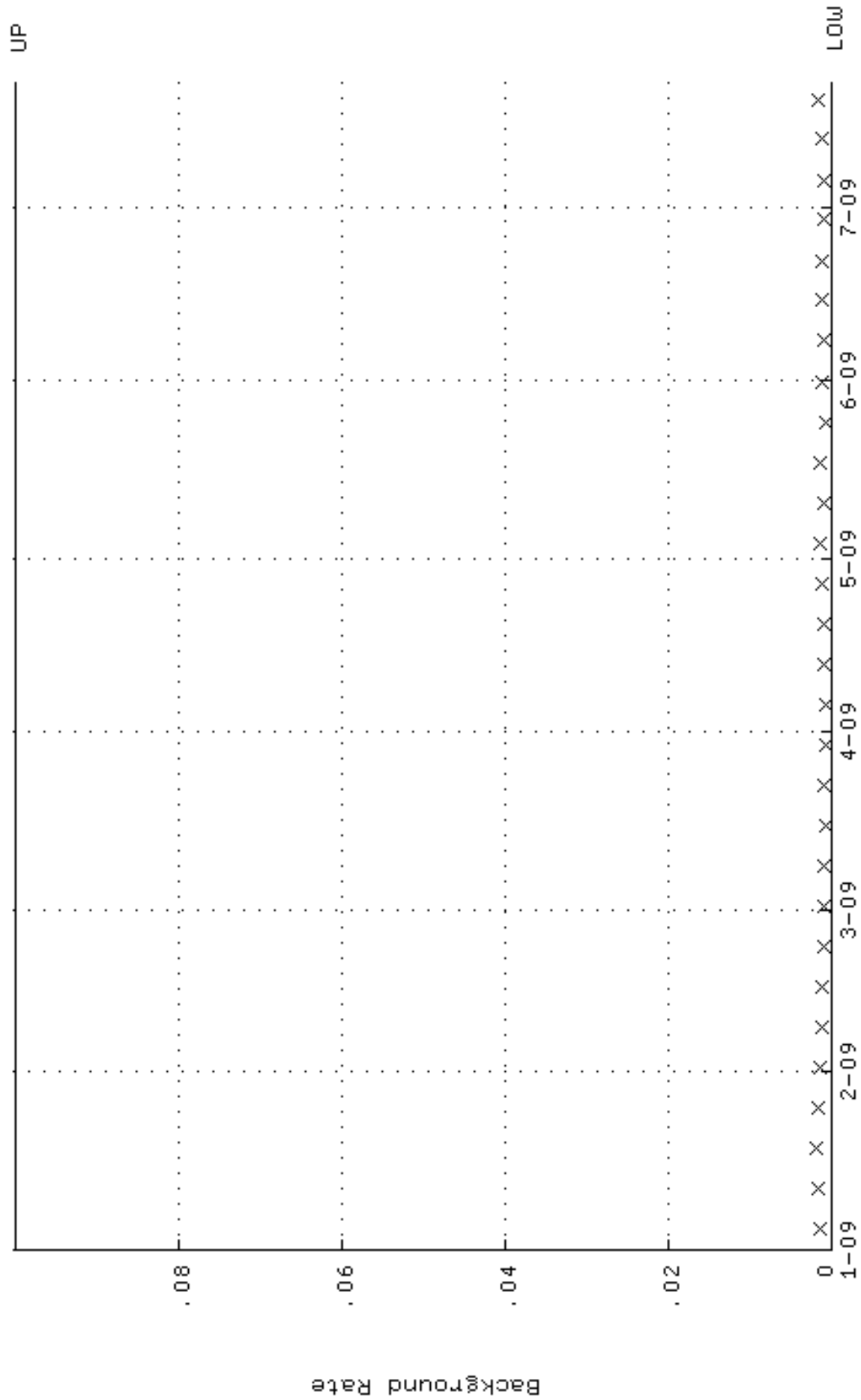
QA filename : DKA100:[ENV_ALPHA.QA.W]W174.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 5-JAN-2009 12:56:57 through 22-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.248038 through 0.268038



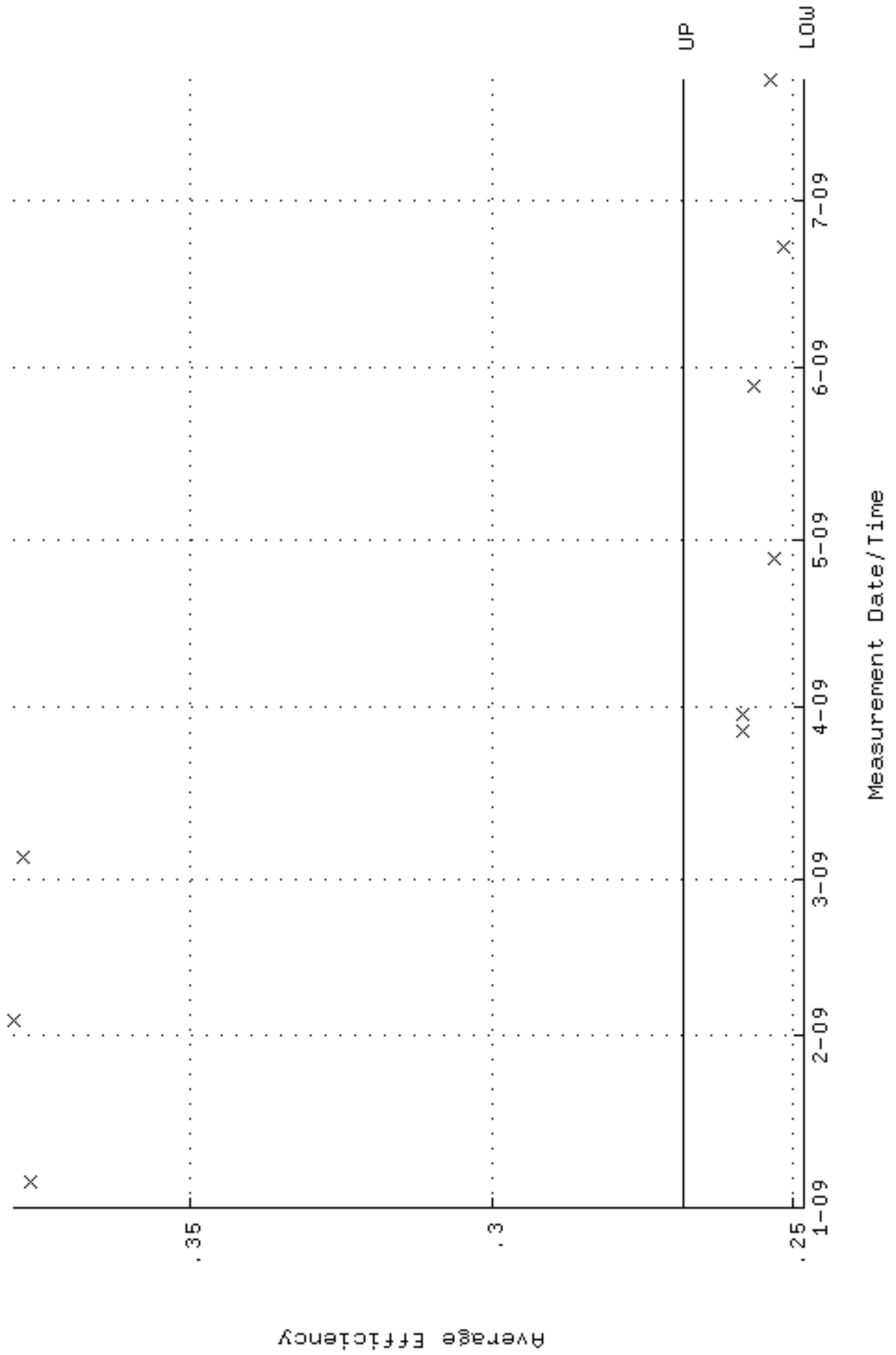
QA filename : DKA100:[ENV_ALPHA.QA.W]w174.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 5-JAN-2009 12:56:57 through 22-JUL-2009 12:00:00
 Lower/Upper Lmts: 85.6304 through 94.6442



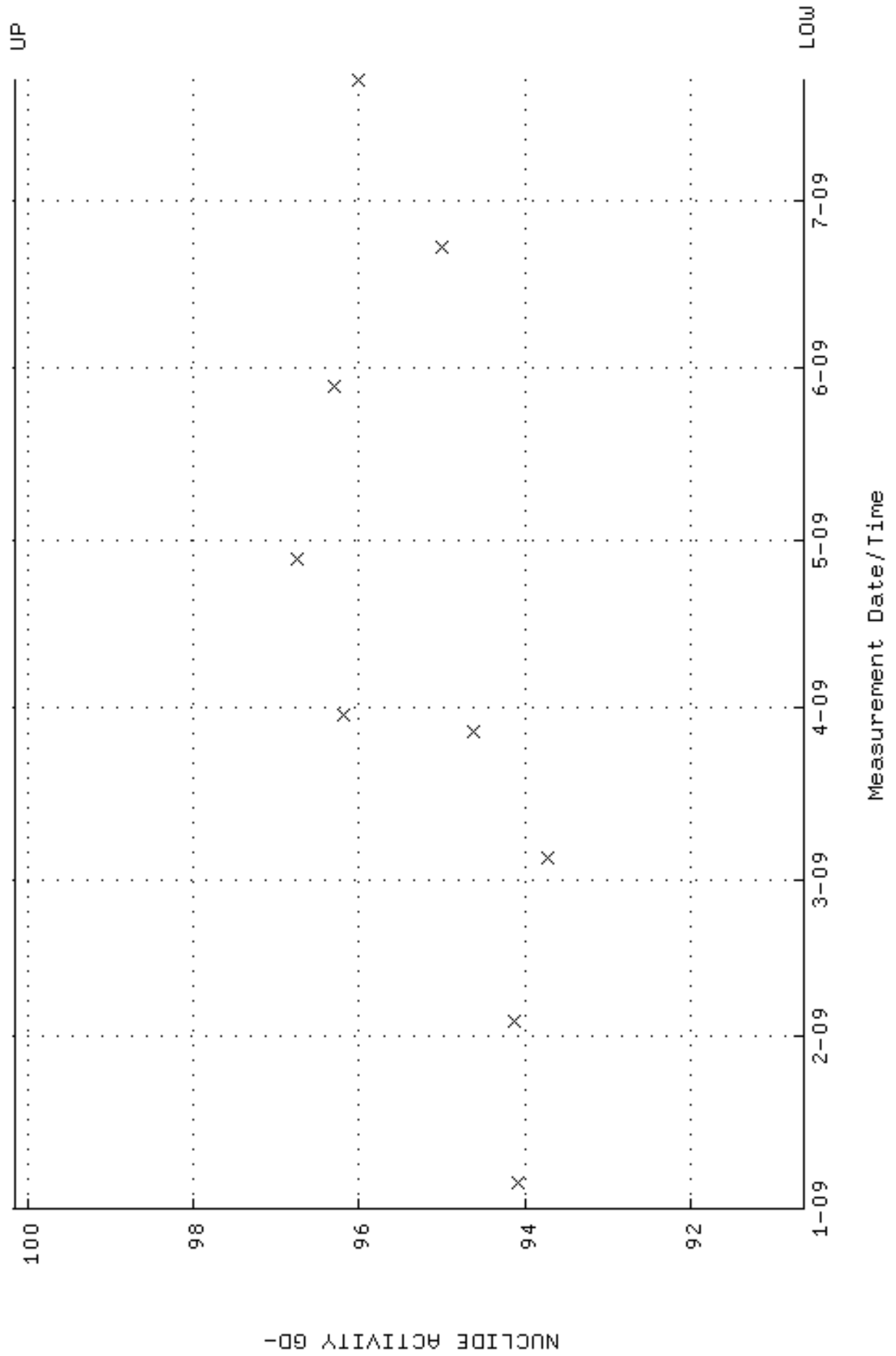
QA filename : DKA100:[ENV_ALPHA.QA.B]B174.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-JAN-2009 17:25:54 through 22-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



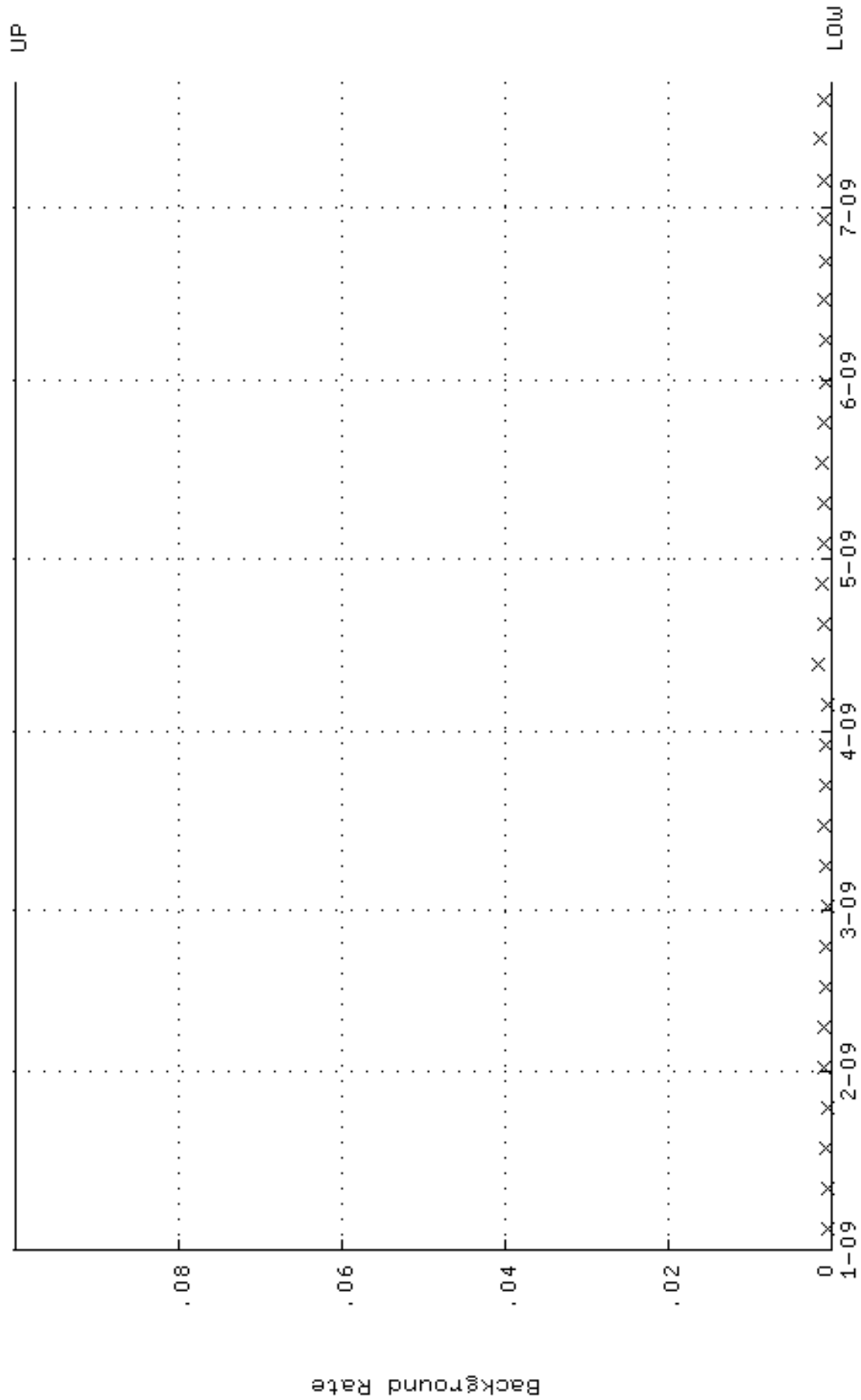
QA filename : DKA100:[ENV_ALPHA.QA.W]W175.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 5-JAN-2009 12:57:05 through 22-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.248296 through 0.268296



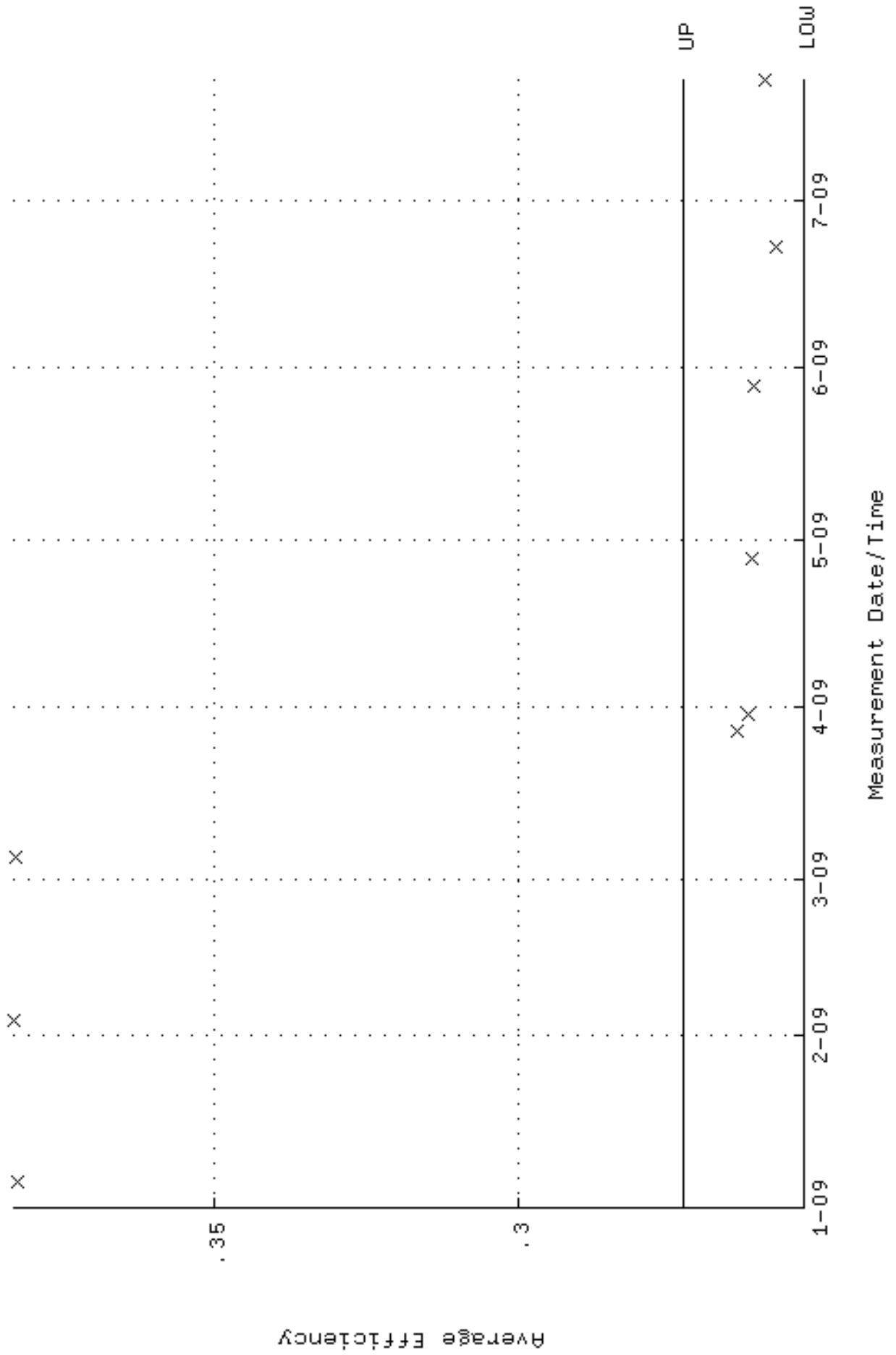
QA filename : DKA100:[ENV_ALPHA.QA.W]w175.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 5-JAN-2009 12:57:05 through 22-JUL-2009 12:00:00
 Lower/Upper Lmts: 90.6224 through 100.162



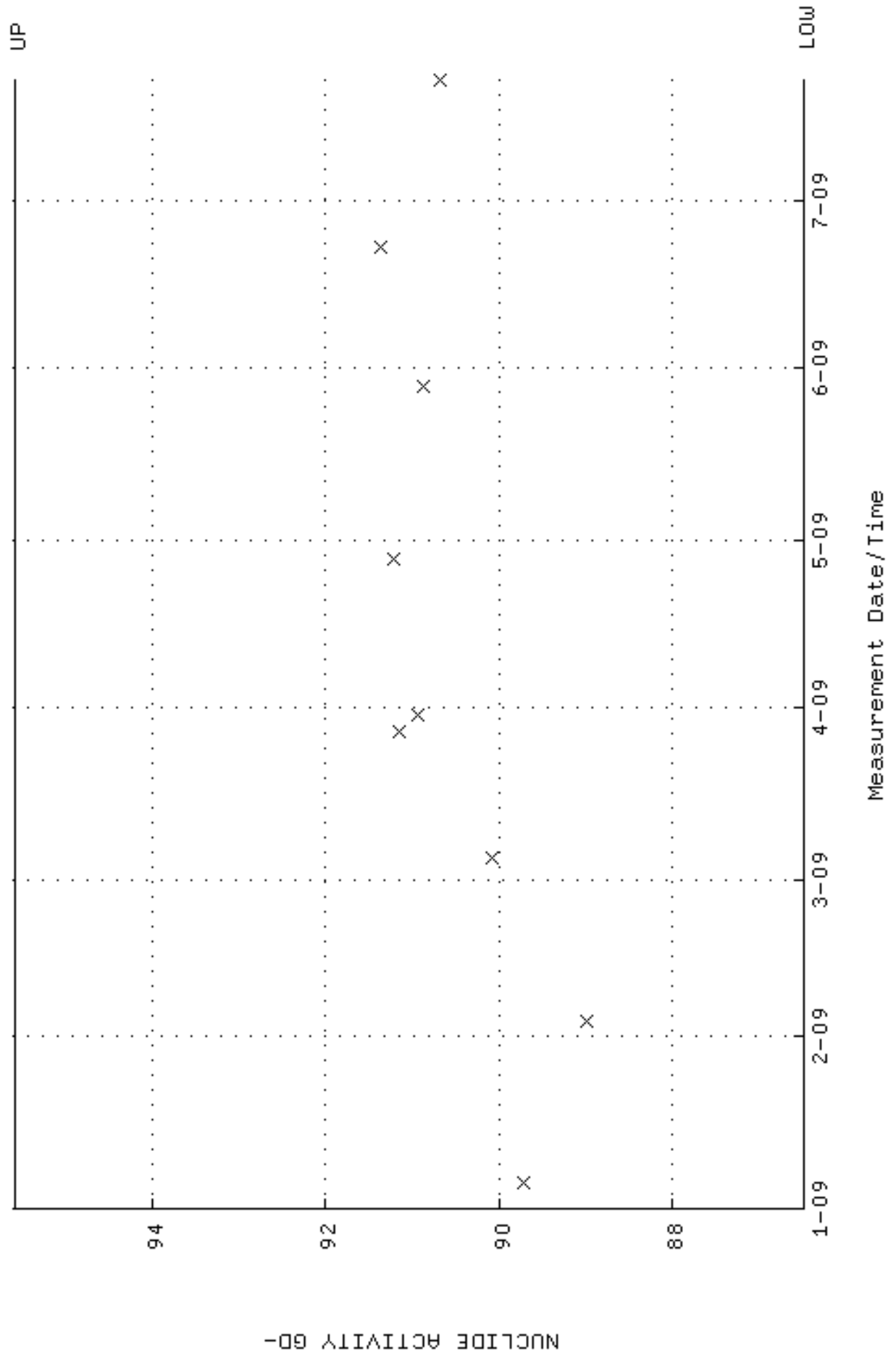
QA filename : DKA100:[ENV_ALPHA.QA.B]B175.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-JAN-2009 17:25:58 through 22-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



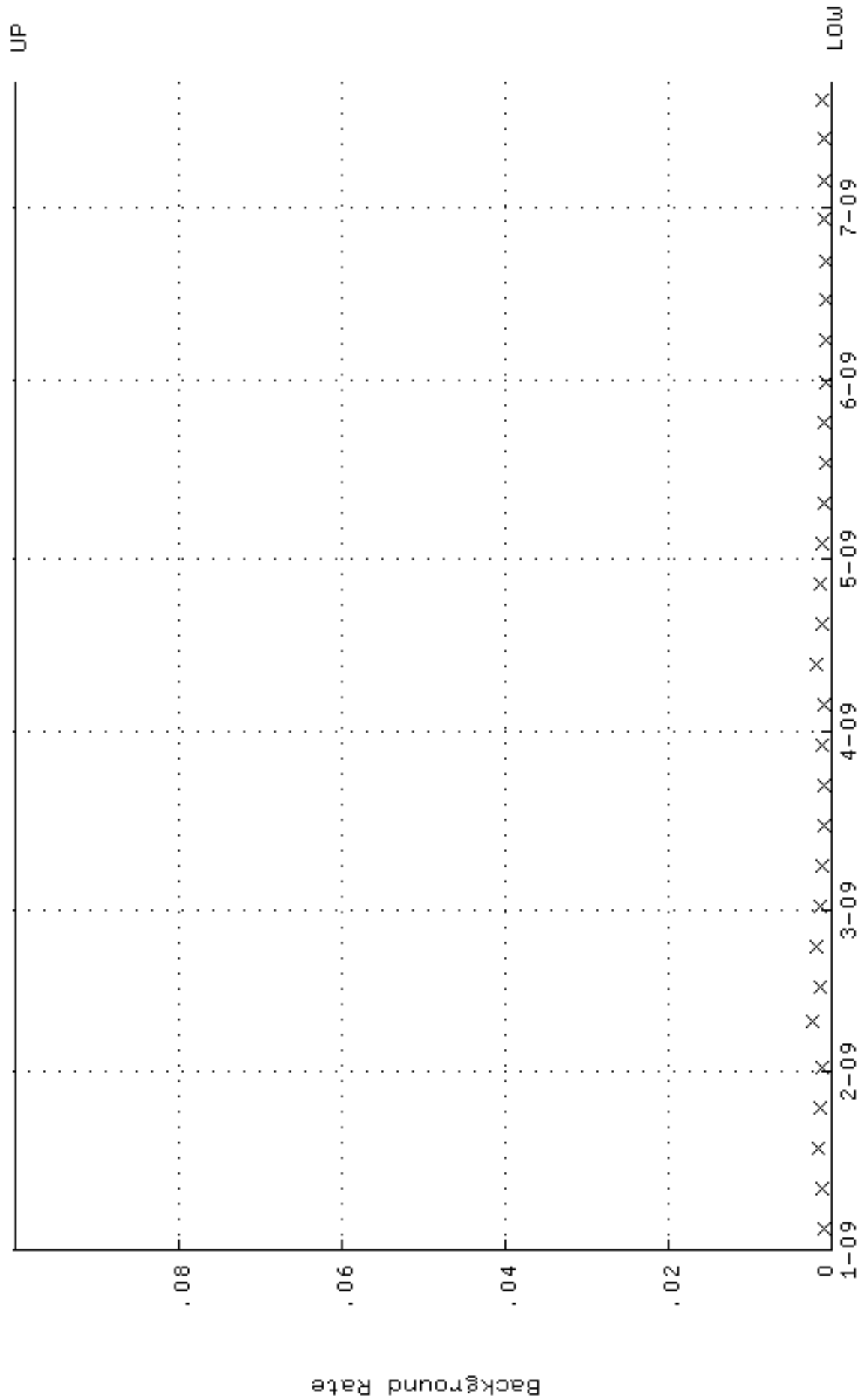
QA filename : DKA100:[ENV_ALPHA.QA.W]W176.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 5-JAN-2009 12:57:11 through 22-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.253285 through 0.273285



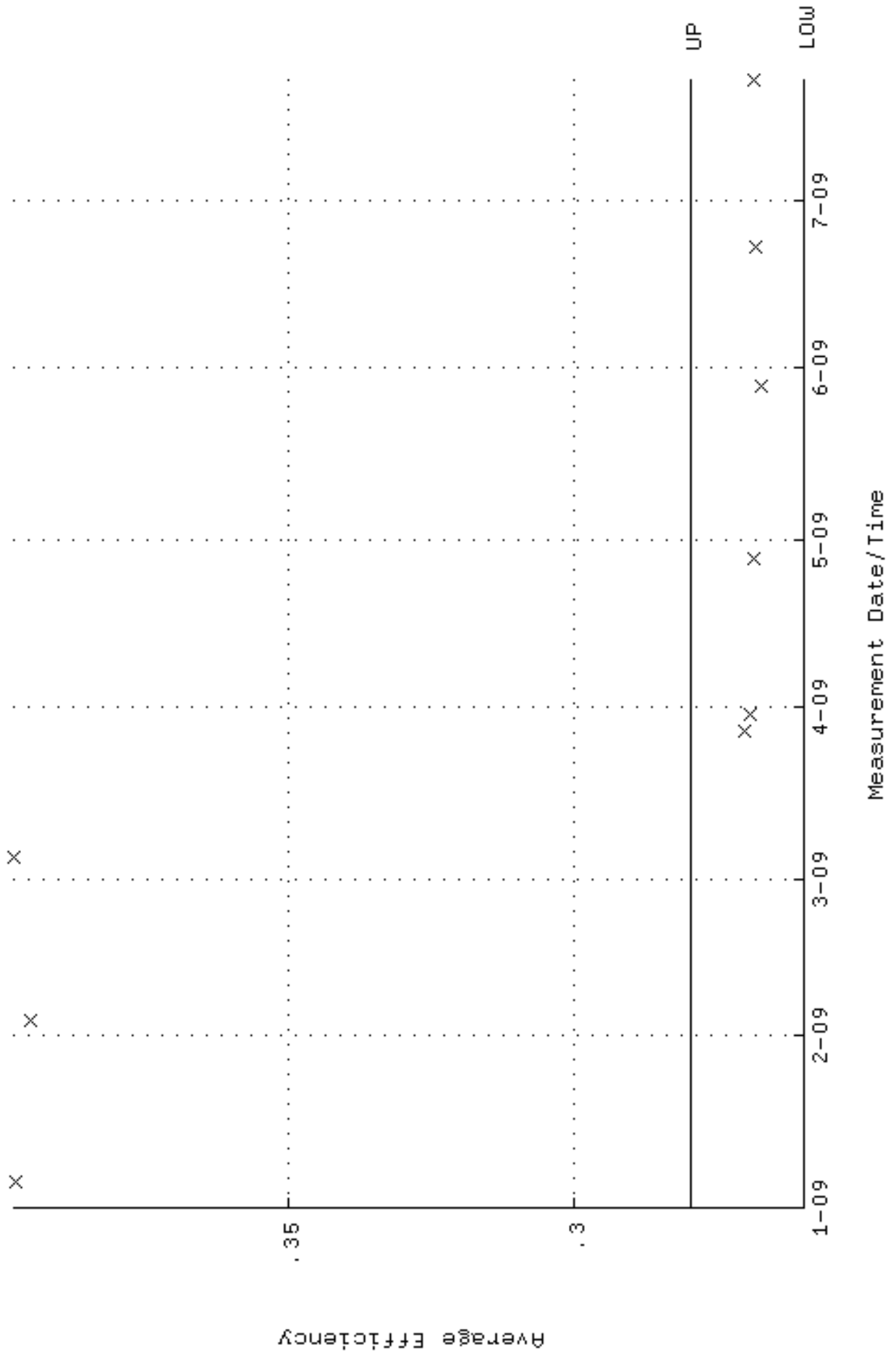
QA filename : DKA100:[ENV_ALPHA.QA.W]w176.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 5-JAN-2009 12:57:11 through 22-JUL-2009 12:00:00
 Lower/Upper Lmts: 86.4817 through 95.5851



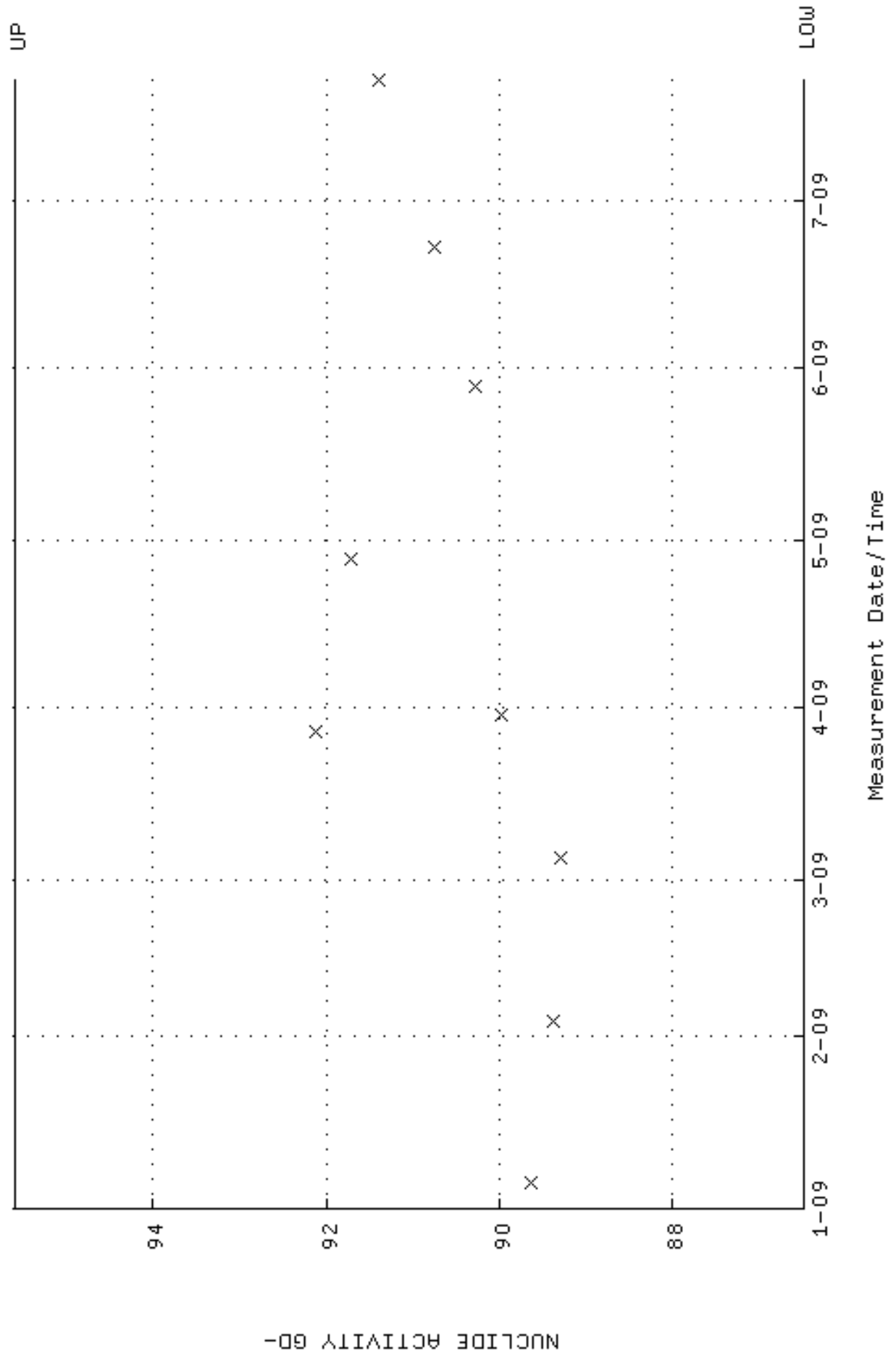
QA filename : DKA100:[ENV_ALPHA.QA.B]B176.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-JAN-2009 17:26:01 through 22-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



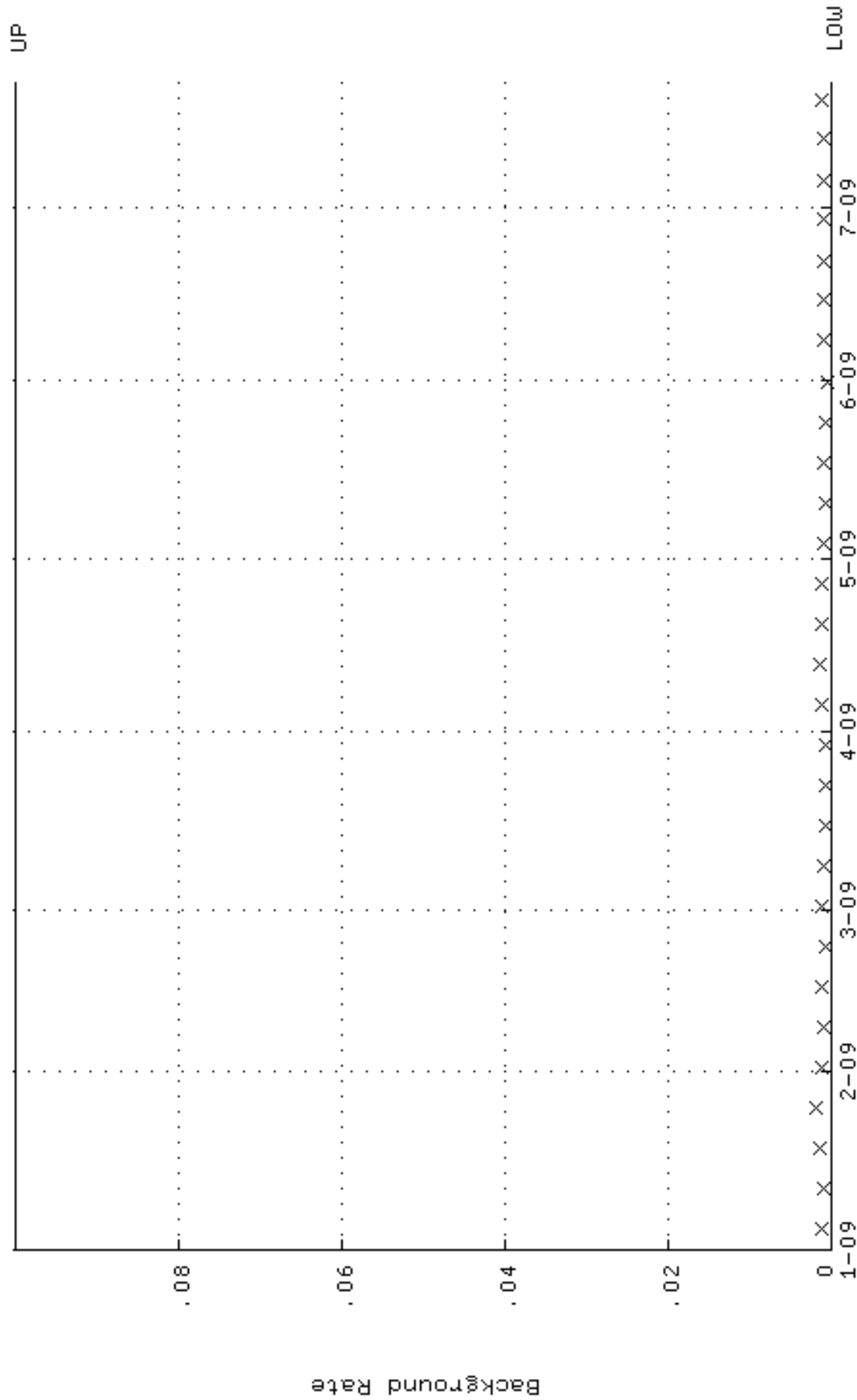
QA filename : DKA100:[ENV_ALPHA.QA.W]W177.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 5-JAN-2009 12:57:19 through 22-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.259935 through 0.279935



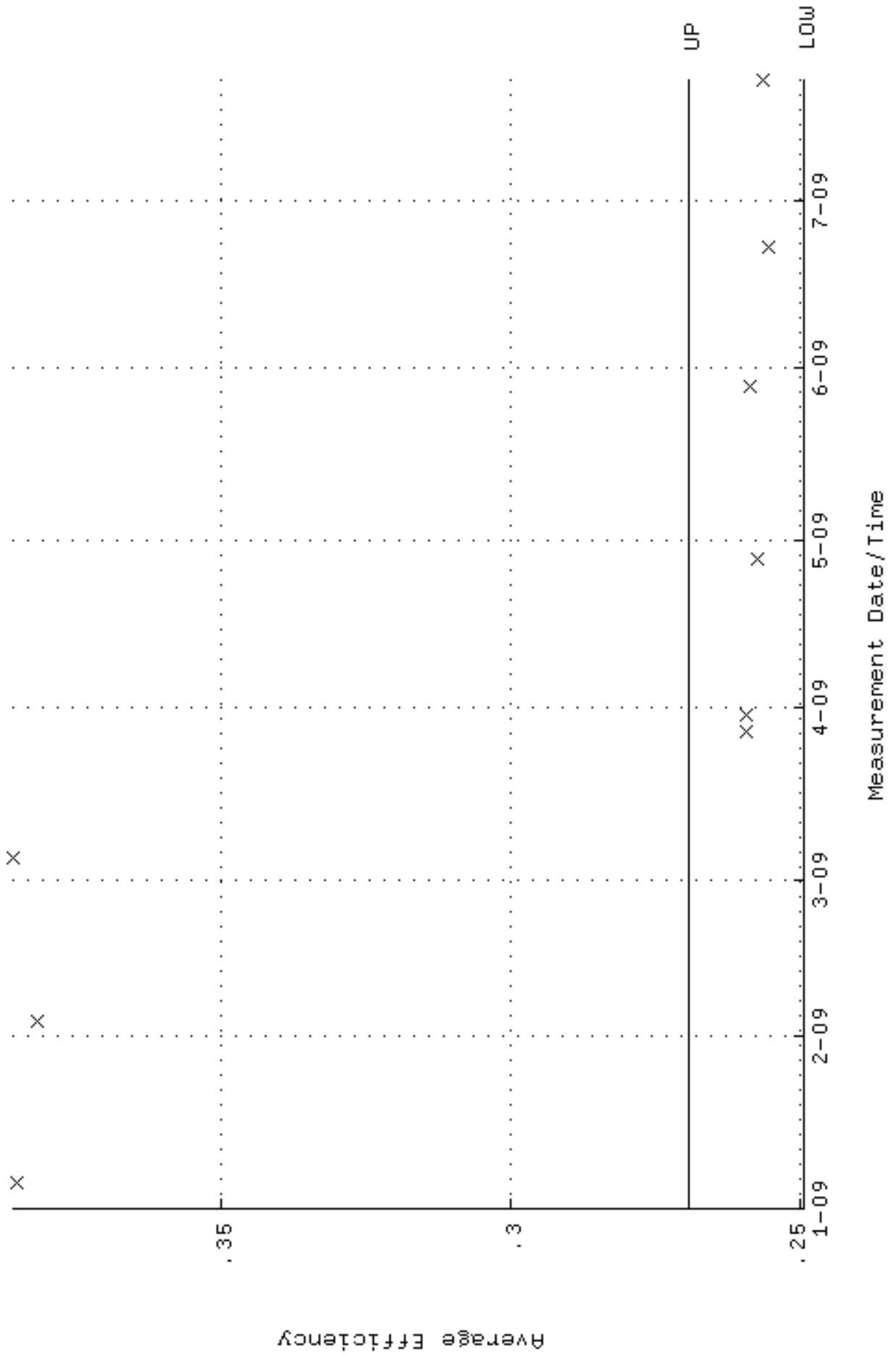
QA filename : DKA100:[ENV_ALPHA.QA.W]w177.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 5-JAN-2009 12:57:19 through 22-JUL-2009 12:00:00
 Lower/Upper Lmts: 86.4857 through 95.5895



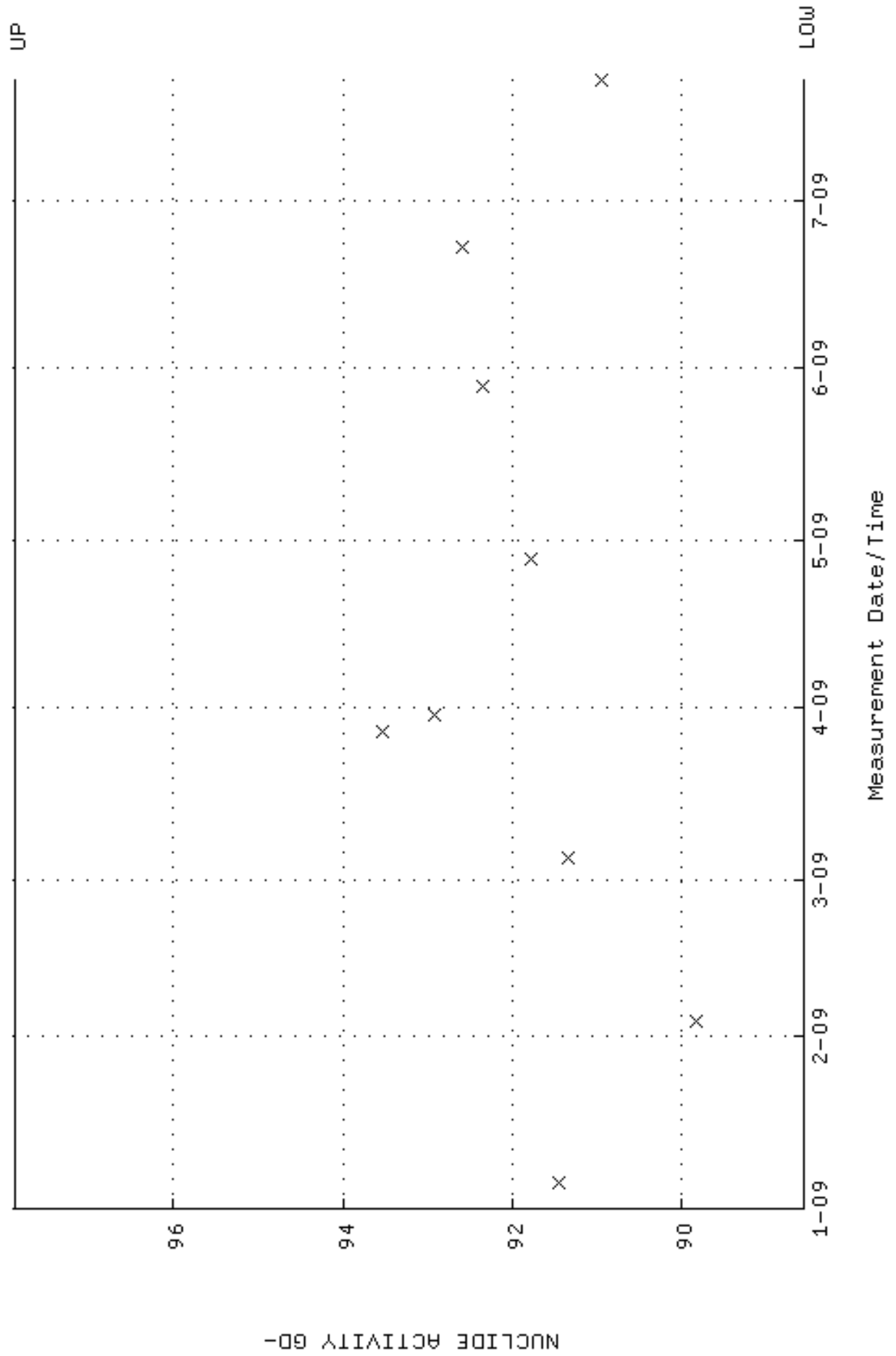
QA filename : DKA100:[ENV_ALPHA.QA.B]B177.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-JAN-2009 17:26:05 through 22-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



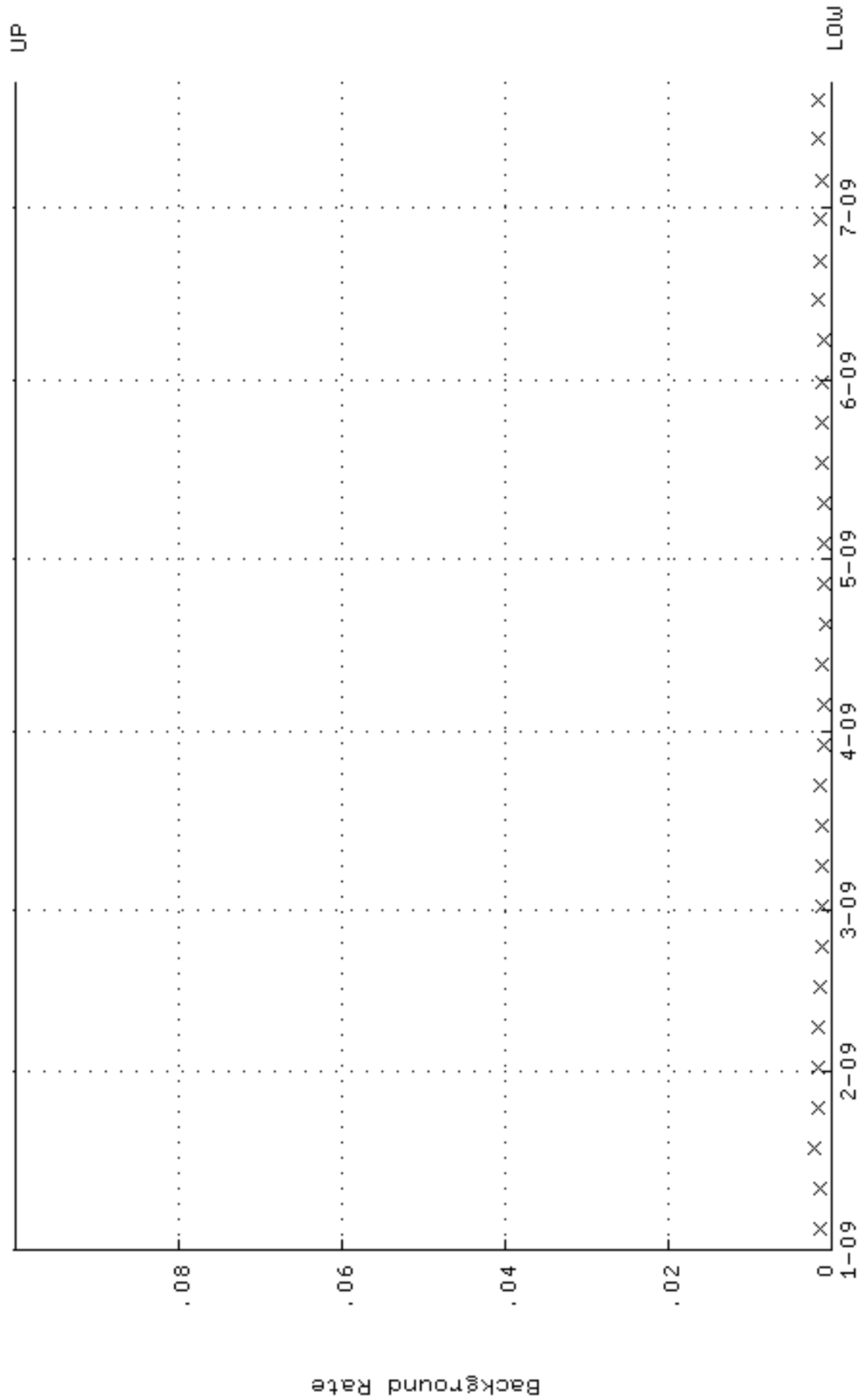
QA filename : DKA100:[ENV_ALPHA.QA.W]W178.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 5-JAN-2009 12:57:25 through 22-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.249490 through 0.269490



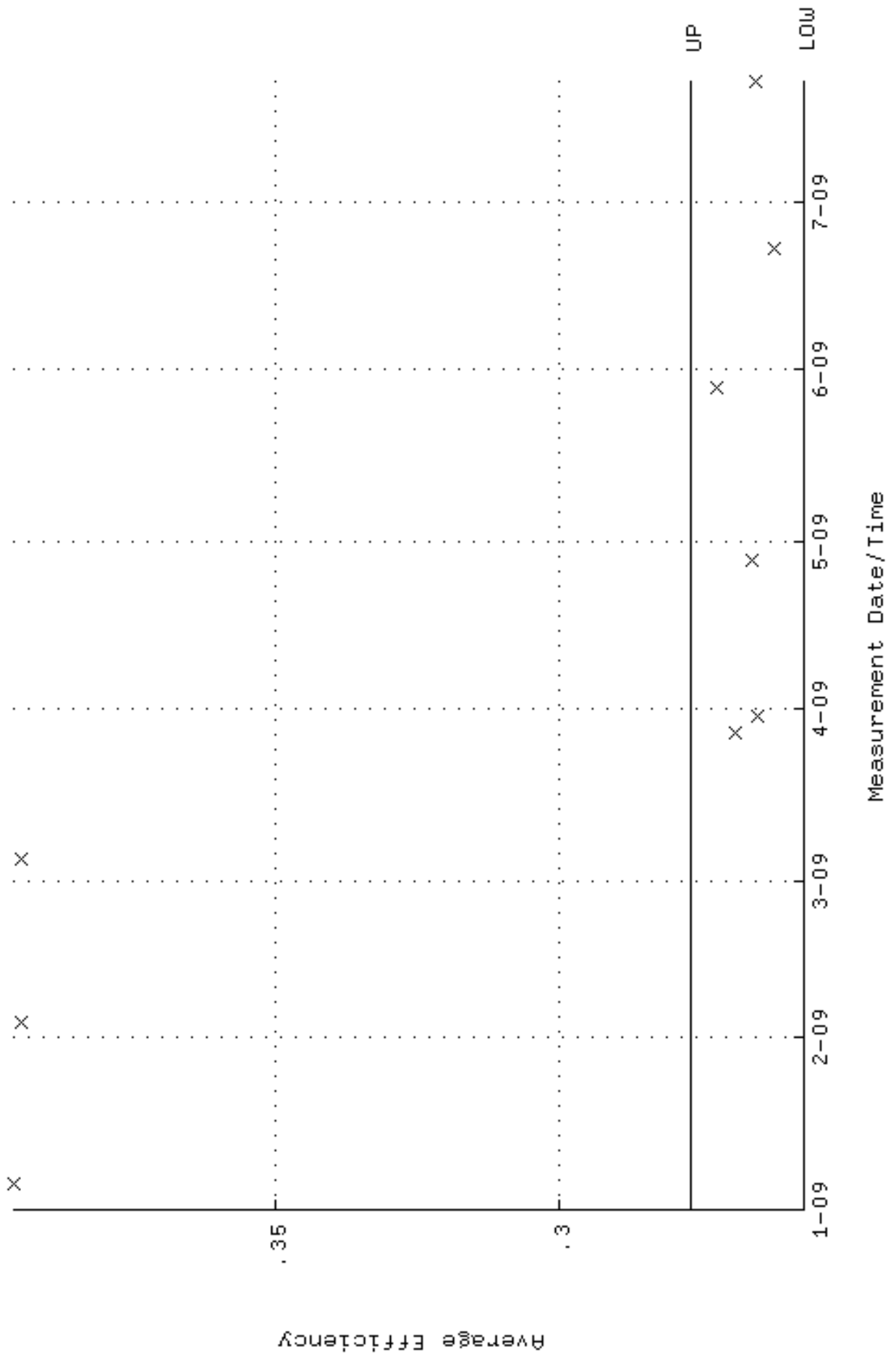
QA filename : DKA100:[ENV_ALPHA.QA.W]w178.QAF;1
Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 5-JAN-2009 12:57:25 through 22-JUL-2009 12:00:00
Lower/Upper Lmts: 88.5525 through 97.8739



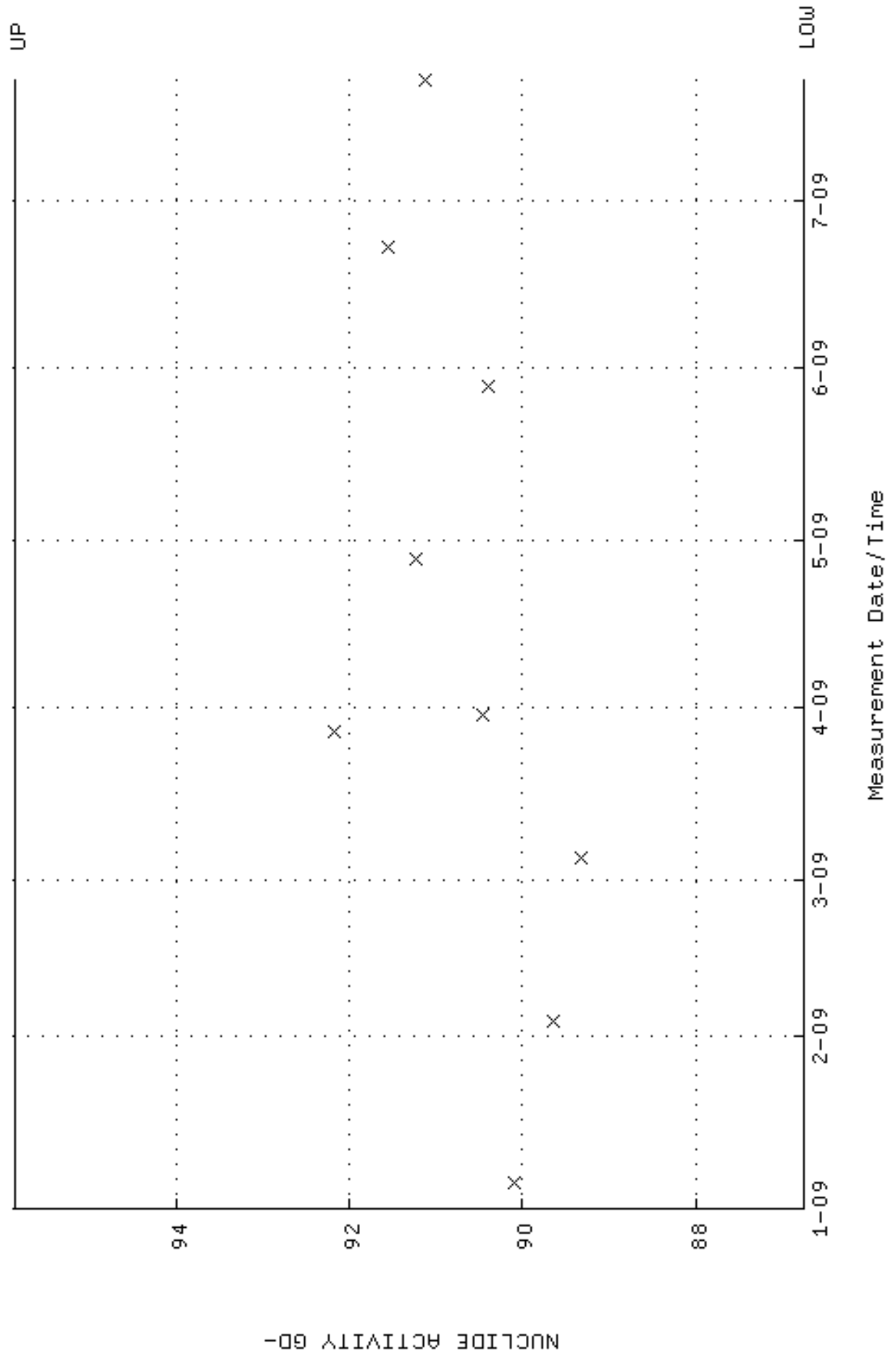
QA filename : DKA100:[ENV_ALPHA.QA.B]B178.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-JAN-2009 17:26:09 through 22-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



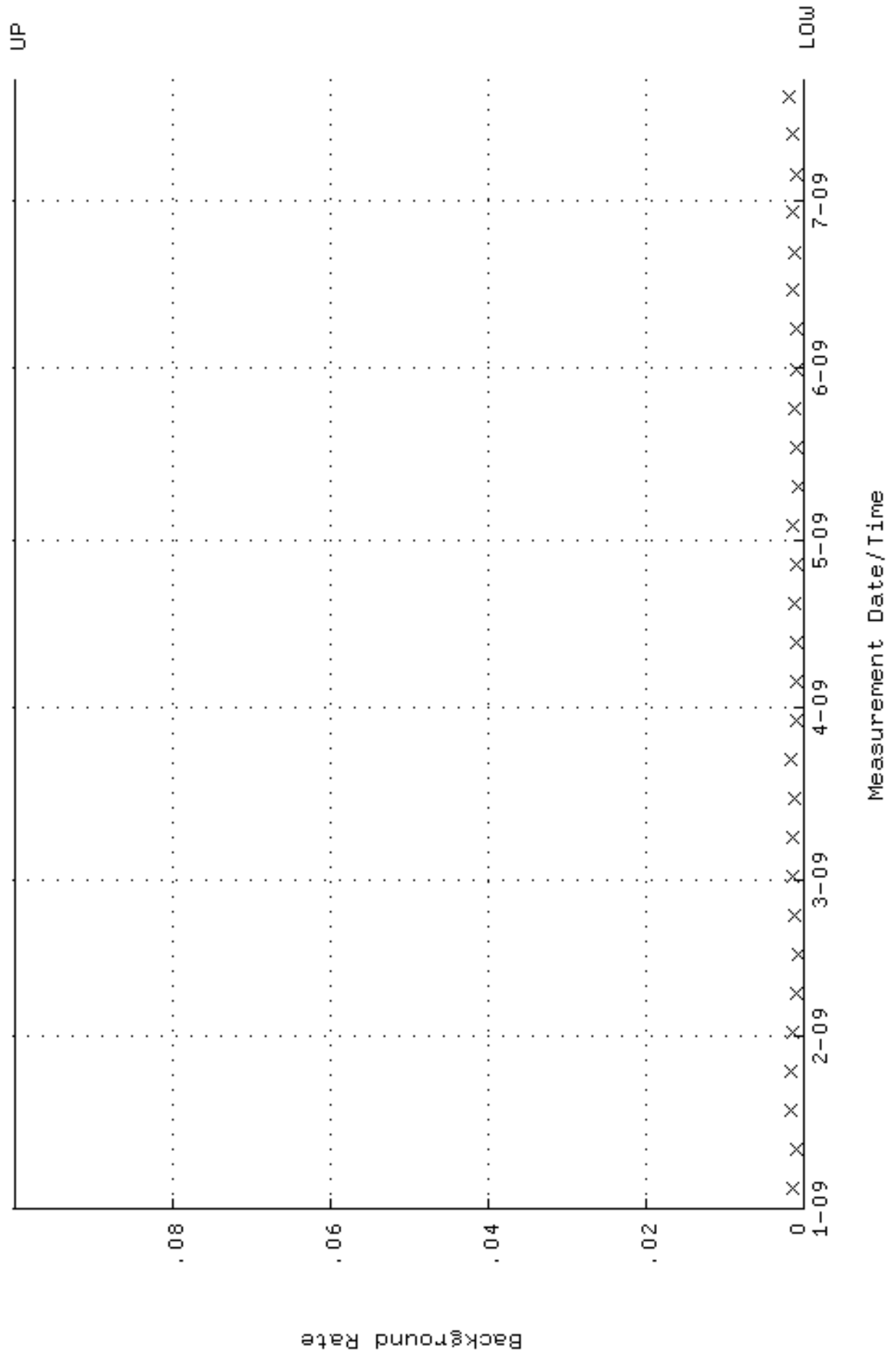
QA filename : DKA100:[ENV_ALPHA.QA.W]W179.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 5-JAN-2009 12:57:29 through 22-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.256911 through 0.276911



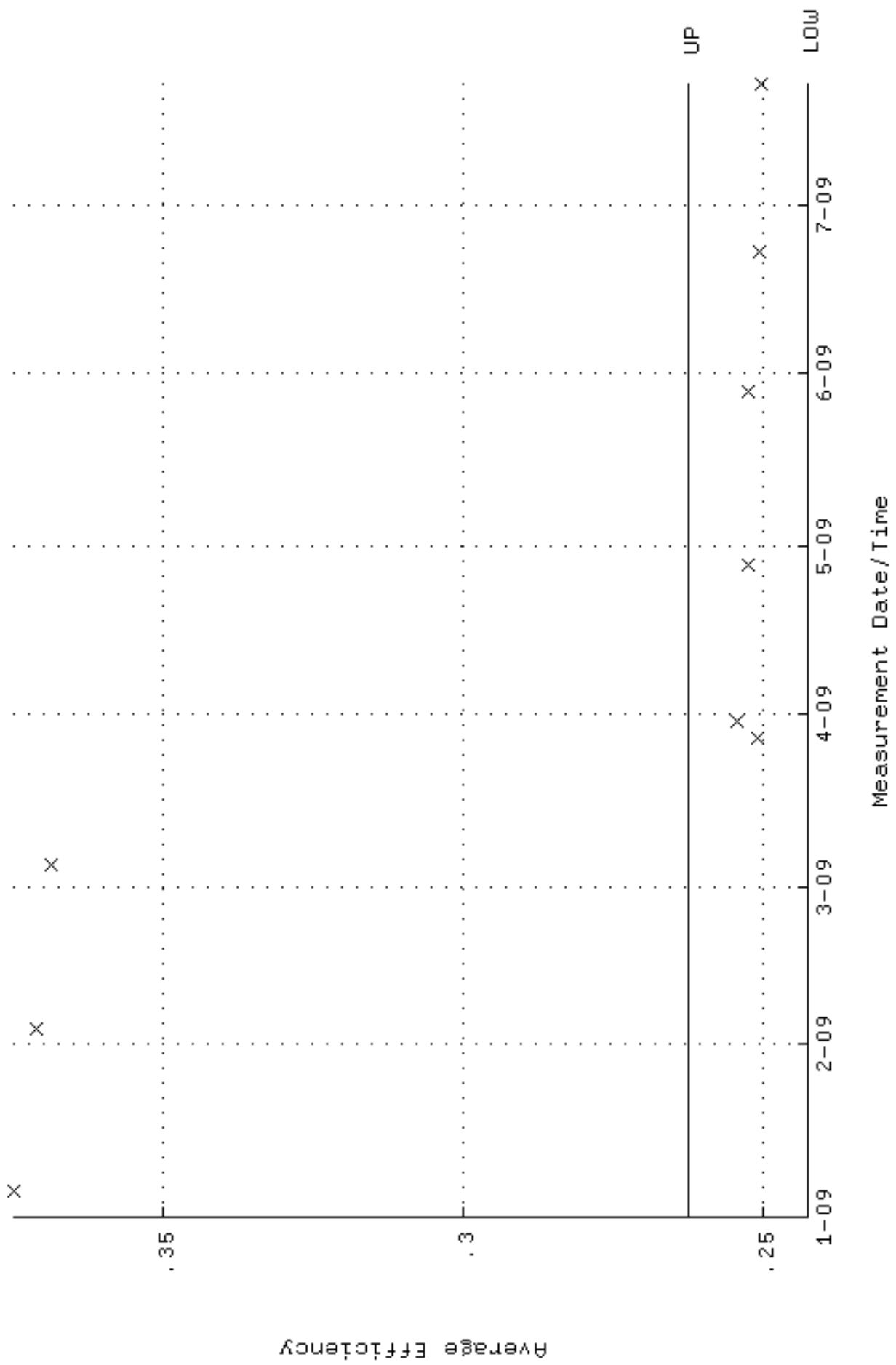
QA filename : DKA100:[ENV_ALPHA.QA.W]w179.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 5-JAN-2009 12:57:29 through 22-JUL-2009 12:00:00
 Lower/Upper Lmts: 86.7434 through 95.8742



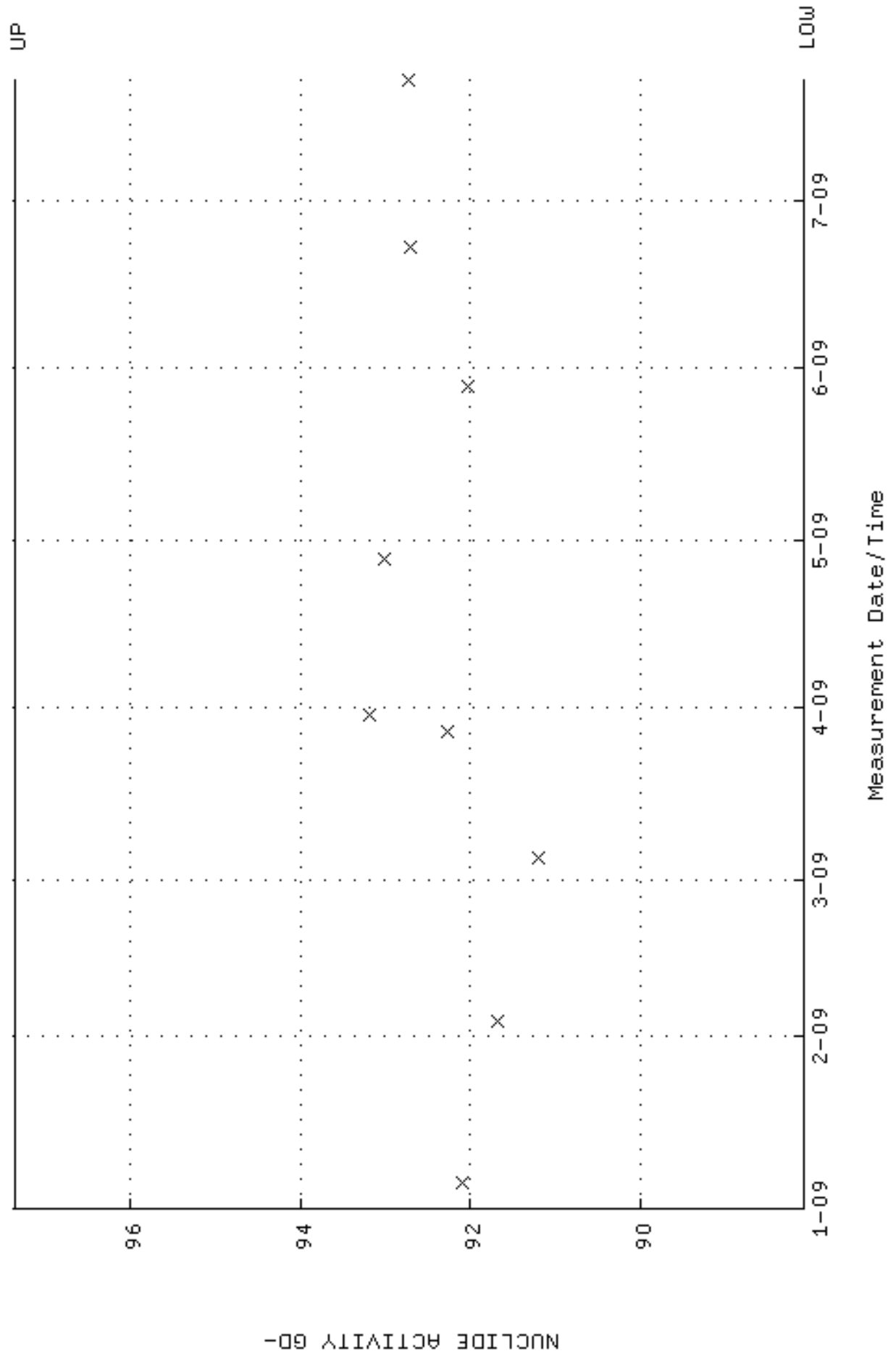
QA filename : DKA100:[ENV_ALPHA.QA.B]B179.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-JAN-2009 17:26:13 through 22-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



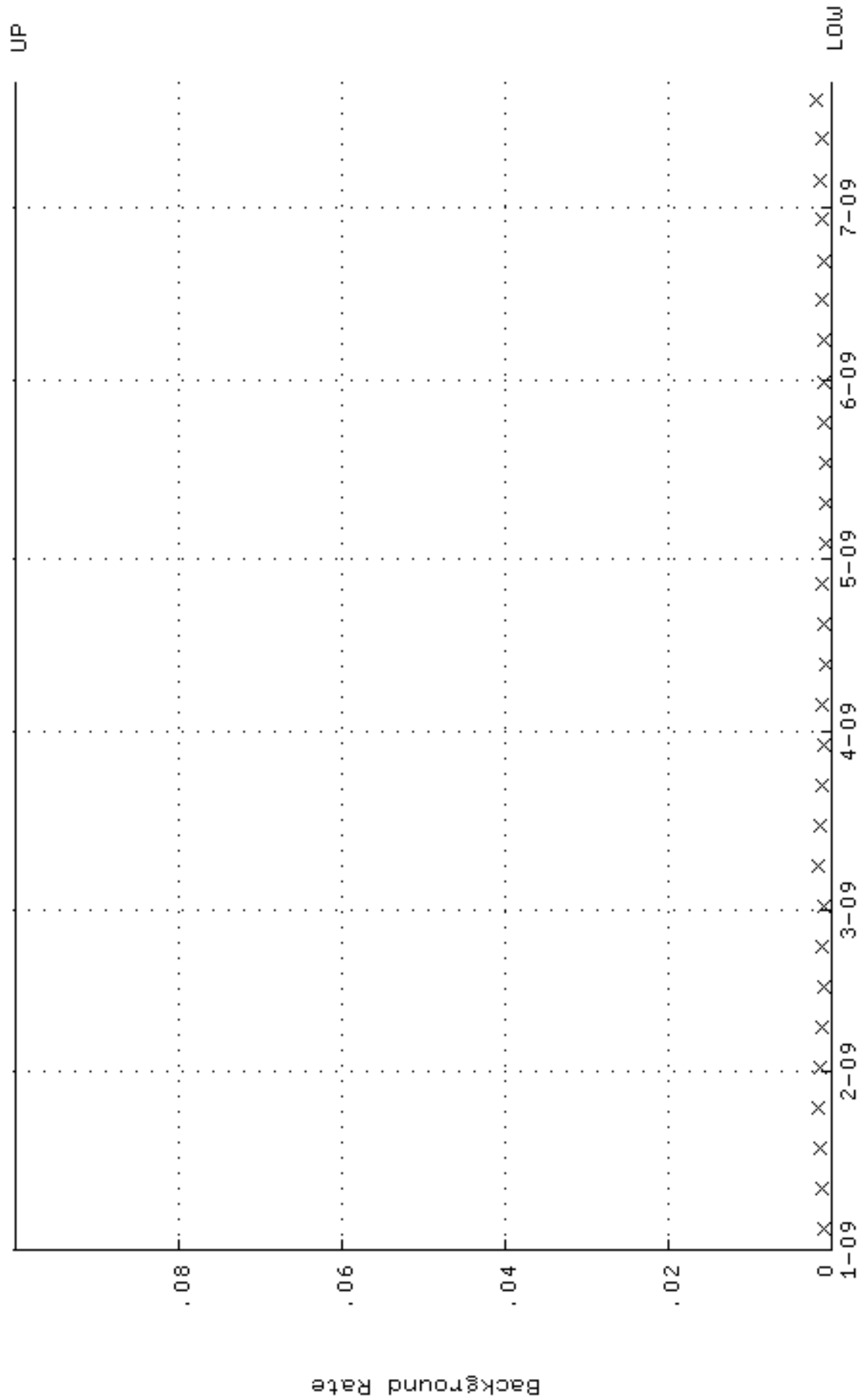
QA filename : DKA100:[ENV_ALPHA.QA.W]W180.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 5-JAN-2009 12:57:34 through 22-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.242633 through 0.262633



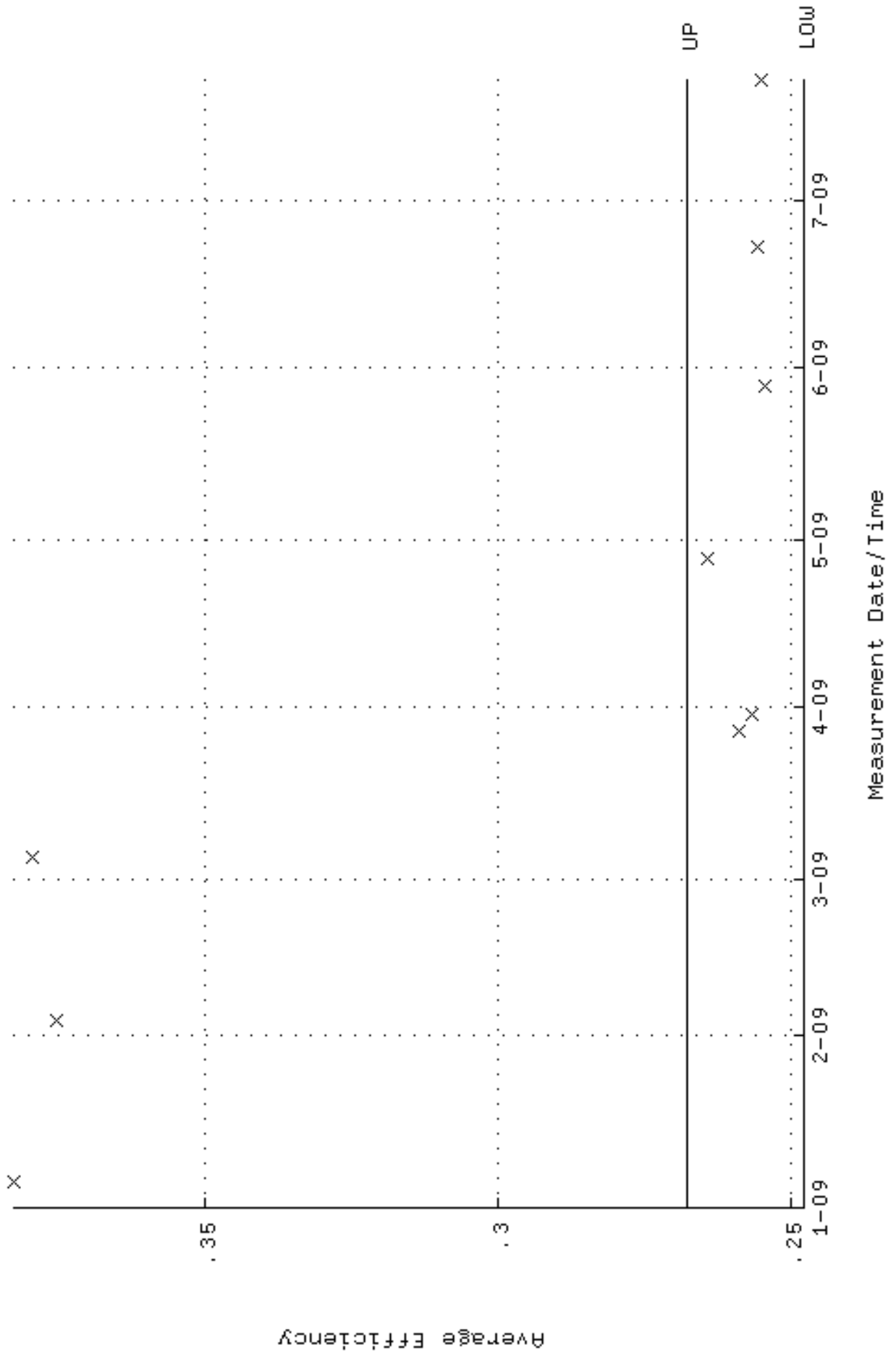
QA filename : DKA100:[ENV_ALPHA.QA.W]w180.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 5-JAN-2009 12:57:34 through 22-JUL-2009 12:00:00
 Lower/Upper Lmts: 88.0803 through 97.3519



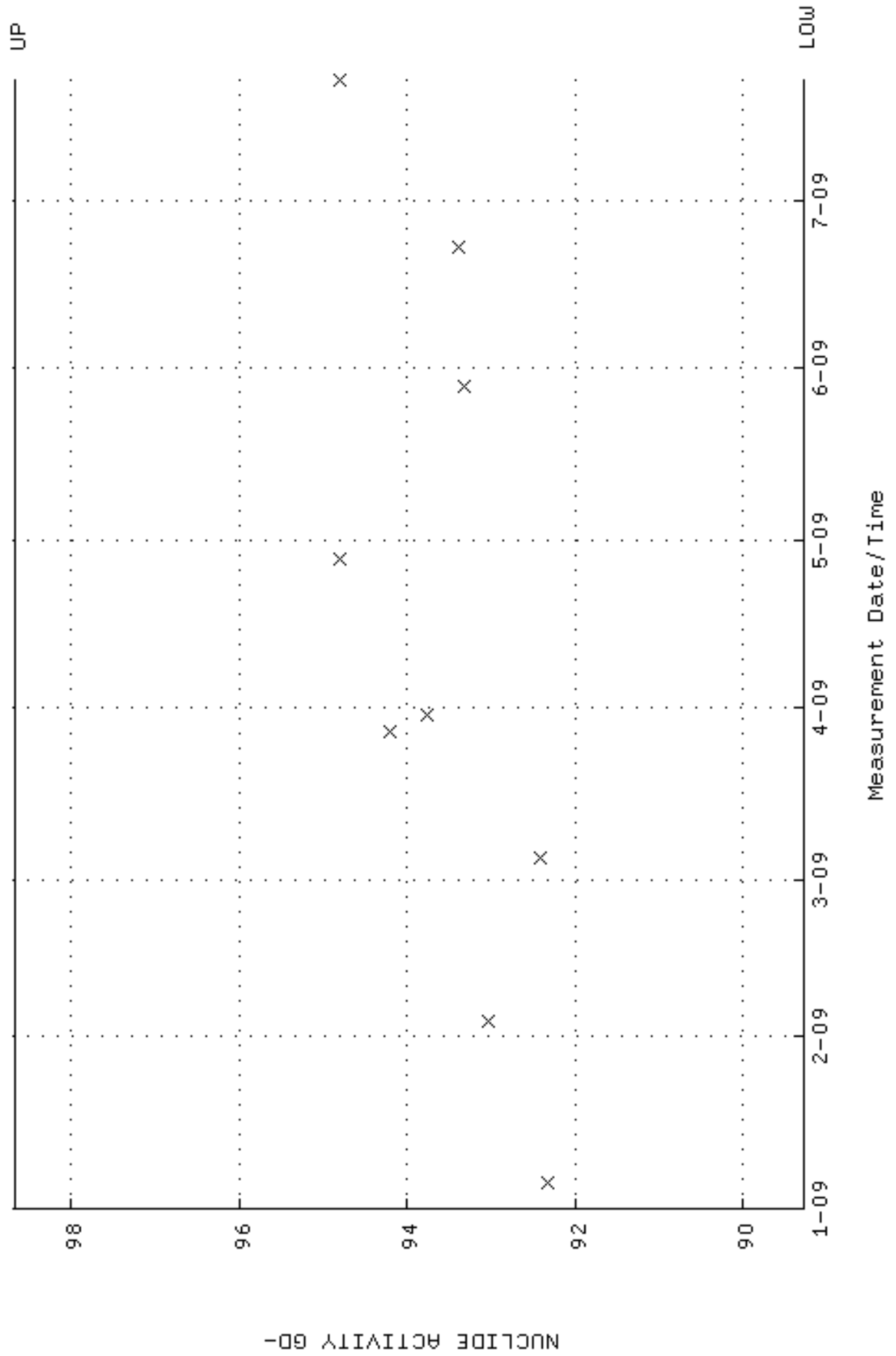
QA filename : DKA100:[ENV_ALPHA.QA.B]B180.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-JAN-2009 17:26:17 through 22-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



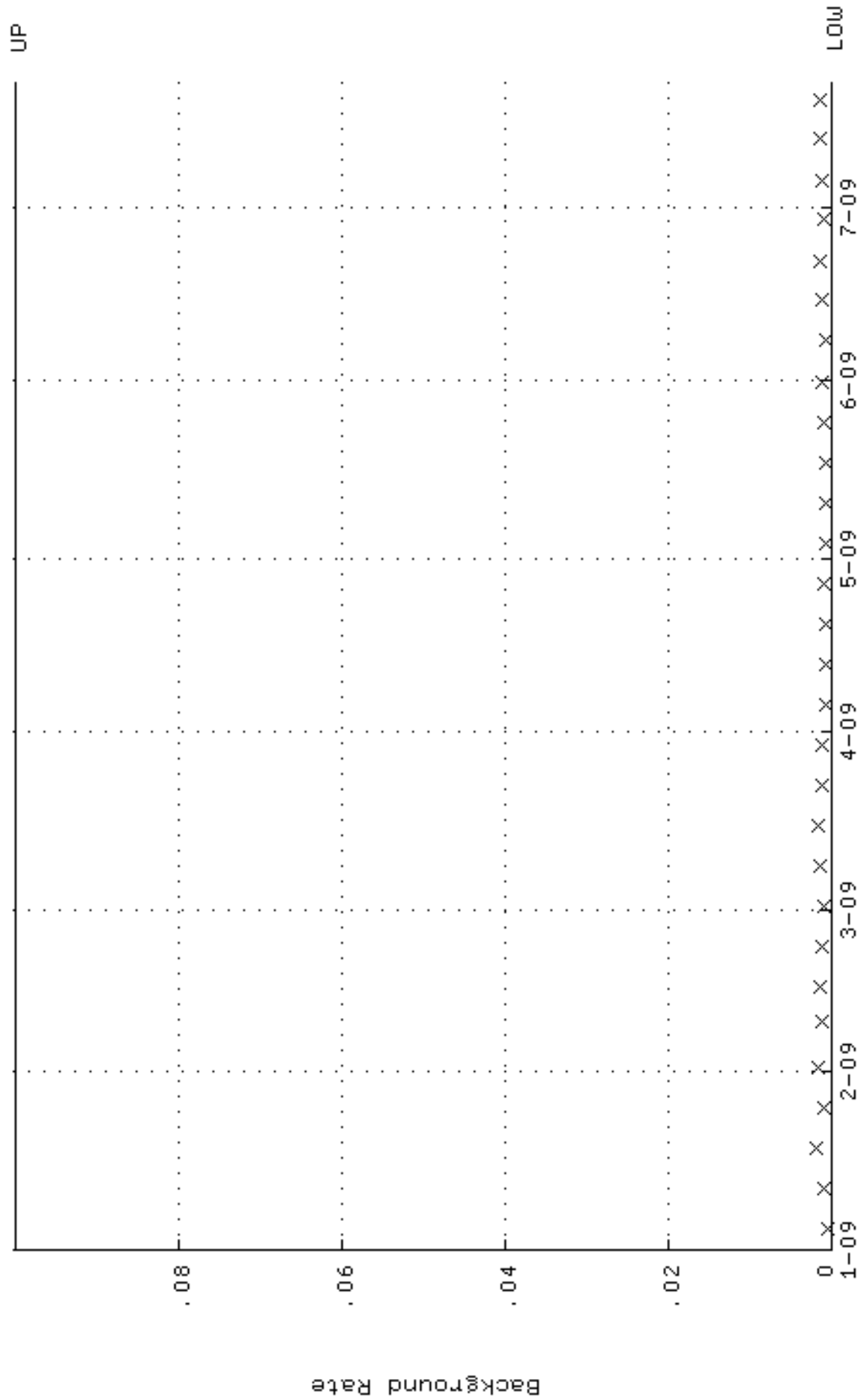
QA filename : DKA100:[ENV_ALPHA.QA.W]W181.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 5-JAN-2009 12:57:38 through 22-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.247722 through 0.267722



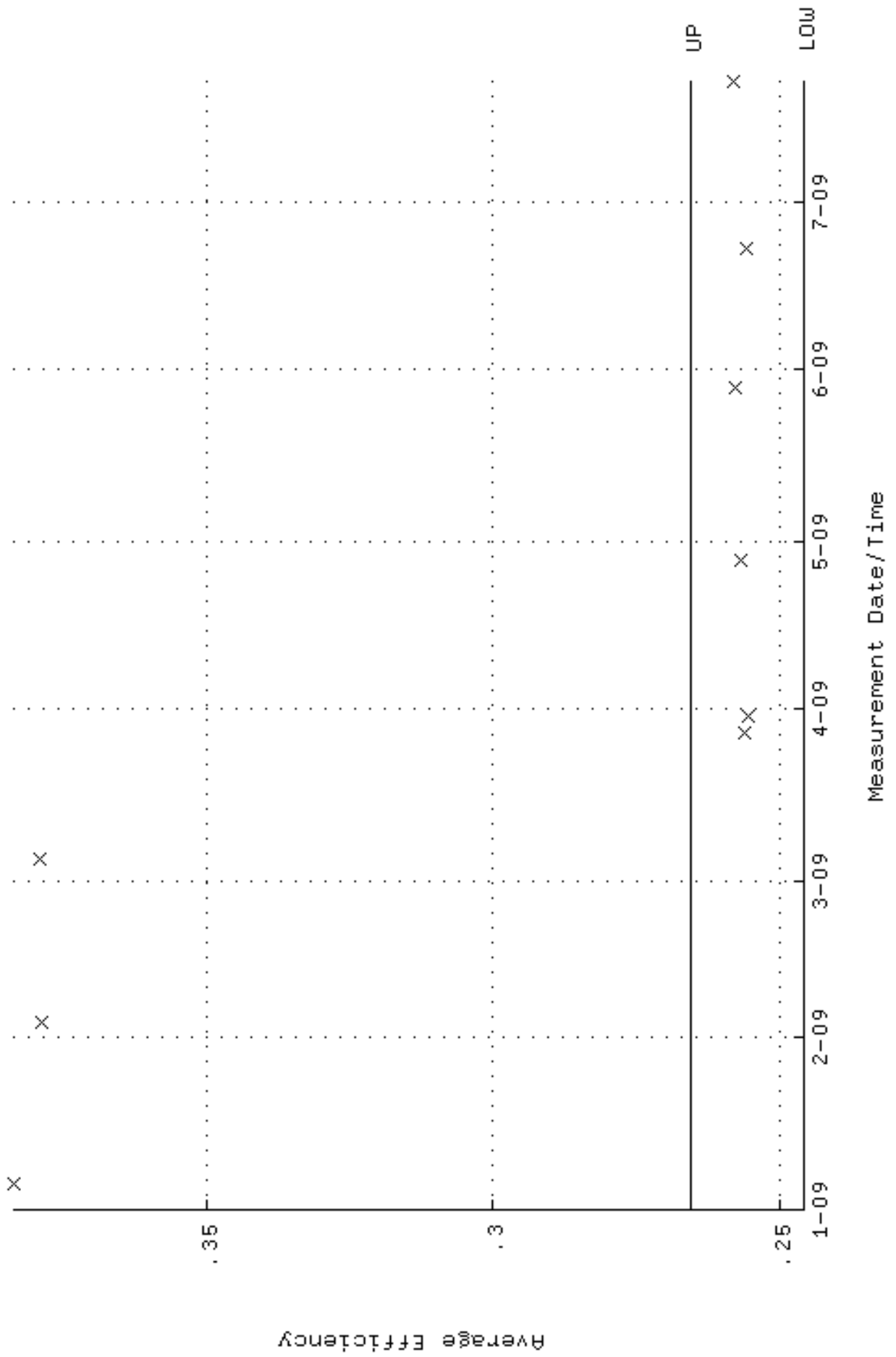
QA filename : DKA100:[ENV_ALPHA.QA.W]w181.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 5-JAN-2009 12:57:38 through 22-JUL-2009 12:00:00
 Lower/Upper Lmts: 89.2737 through 98.6709



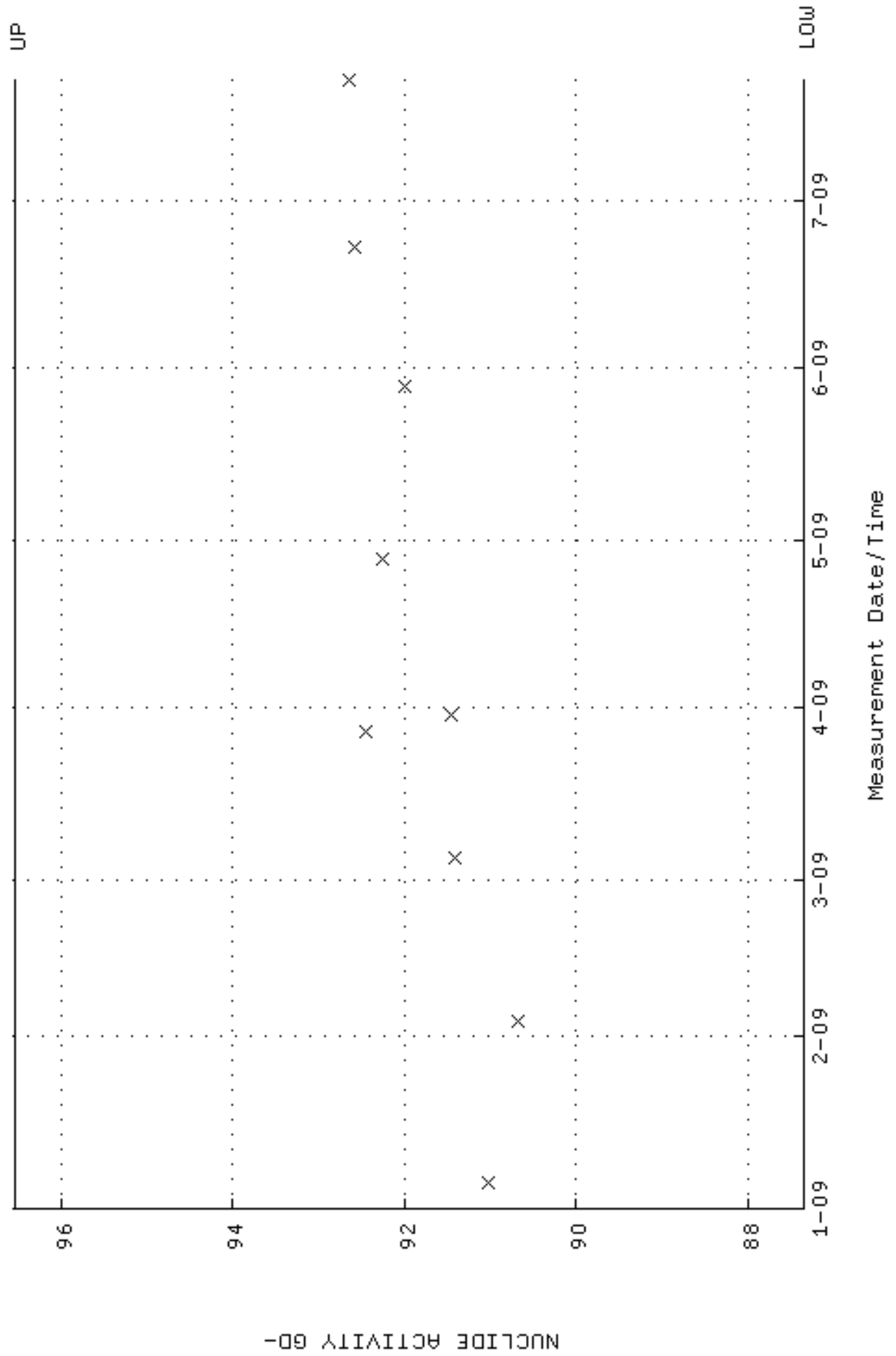
QA filename : DKA100:[ENV_ALPHA.QA.B]B181.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-JAN-2009 17:26:21 through 22-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



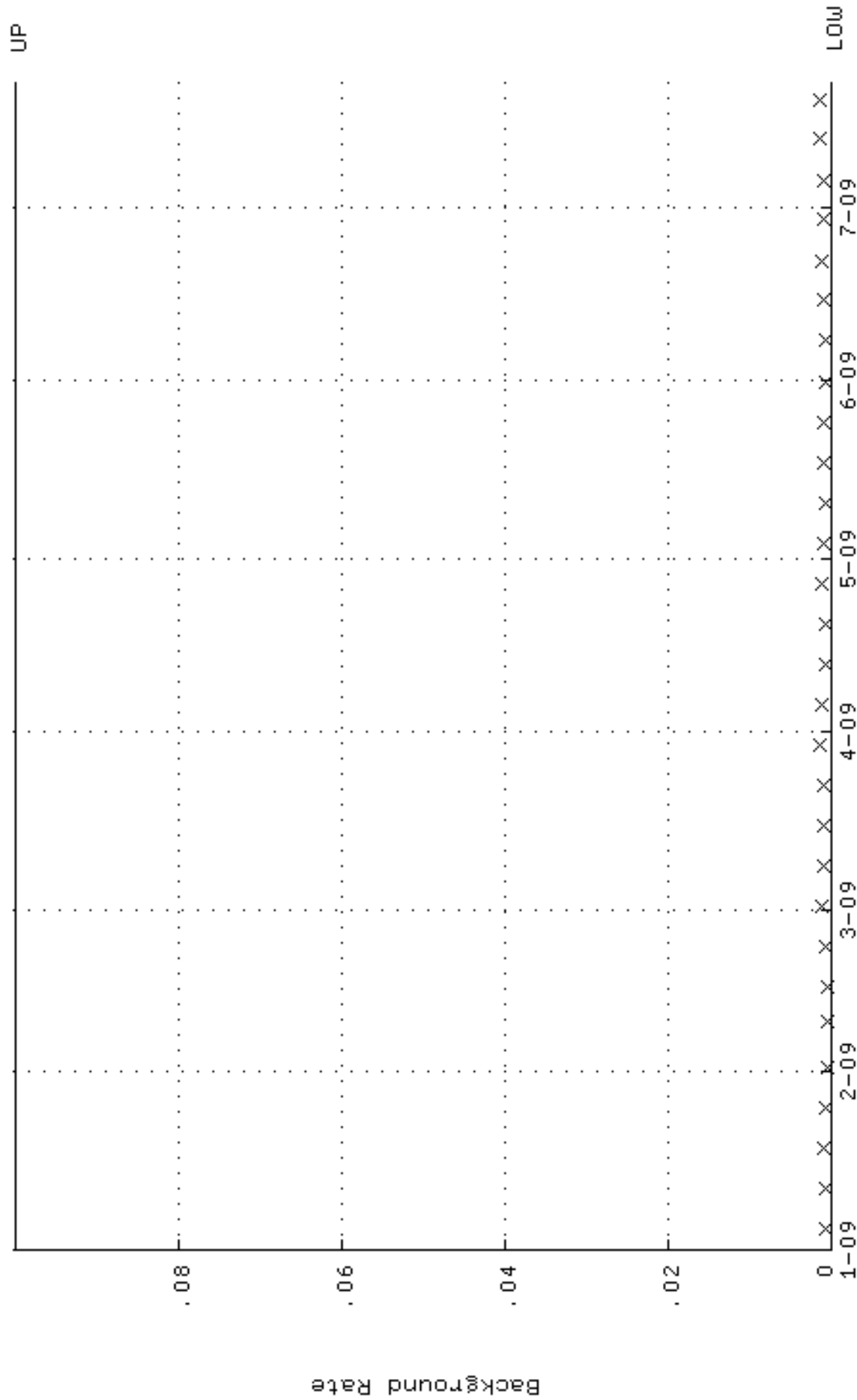
QA filename : DKA100:[ENV_ALPHA.QA.W]W182.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 5-JAN-2009 12:57:42 through 22-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.245707 through 0.265707



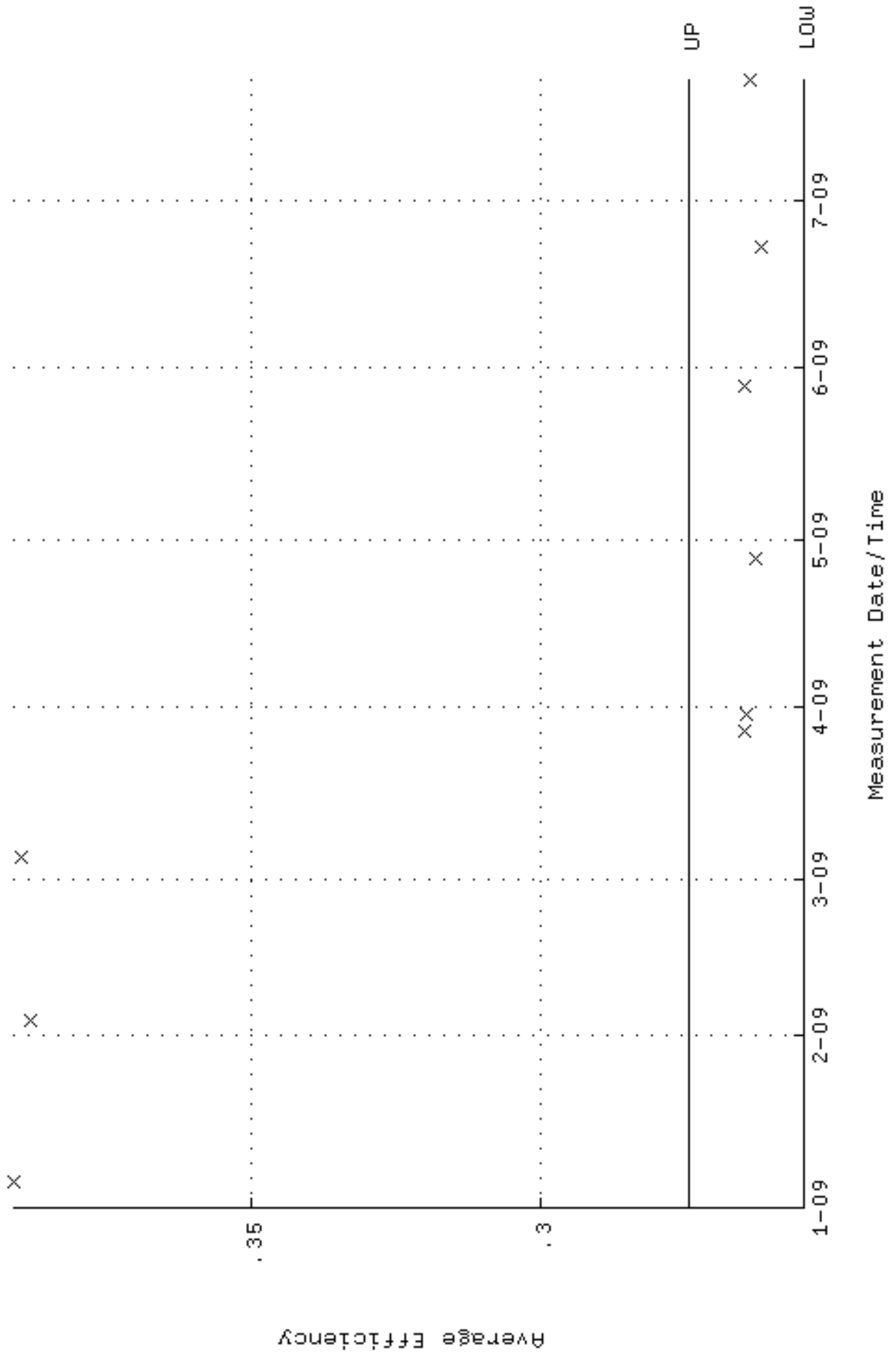
QA filename : DKA100:[ENV_ALPHA.QA.W]w182.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 5-JAN-2009 12:57:42 through 22-JUL-2009 12:00:00
 Lower/Upper Lmts: 87.3454 through 96.5396



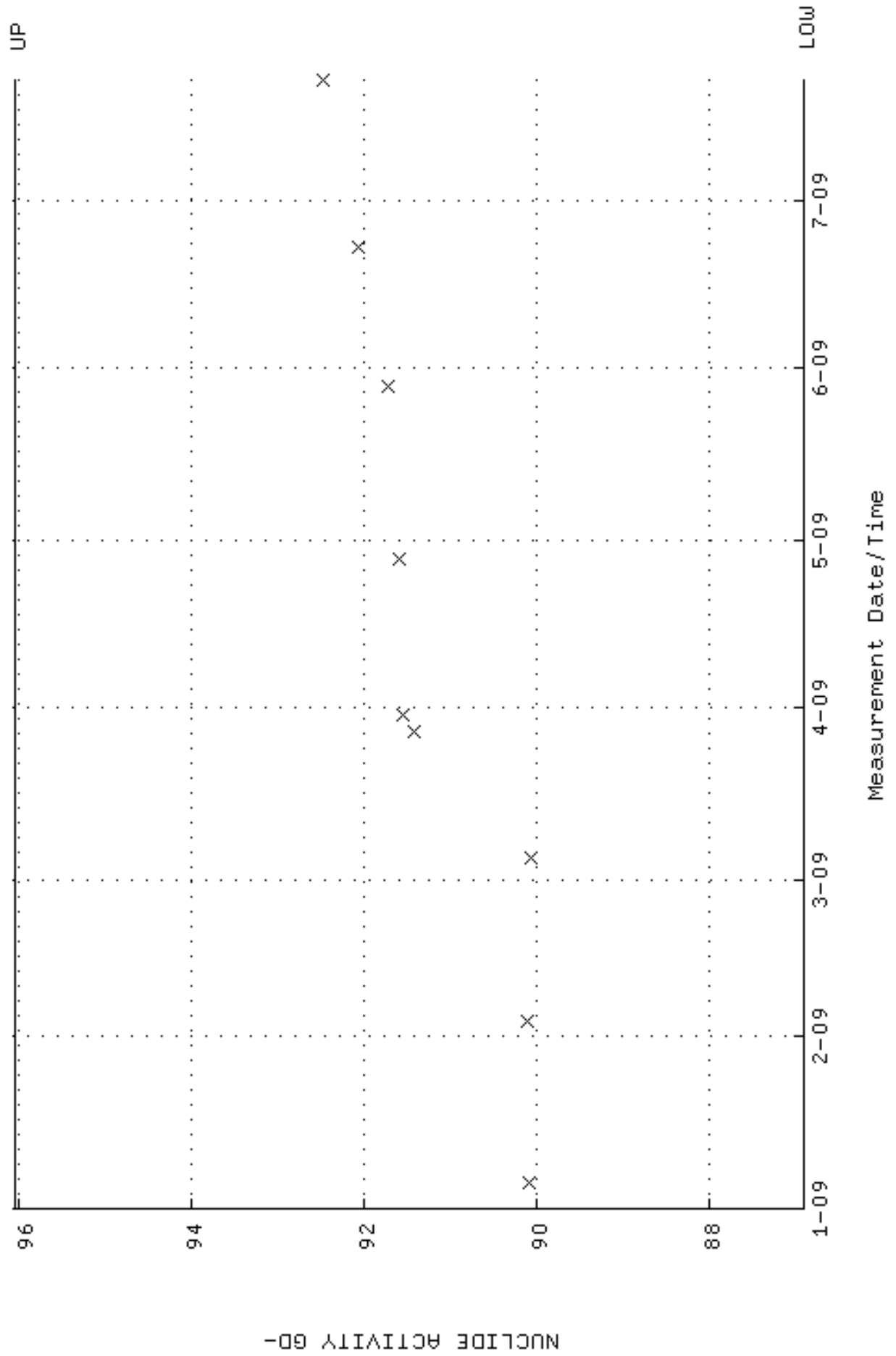
QA filename : DKA100:[ENV_ALPHA.QA.B]B182.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-JAN-2009 17:26:24 through 22-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



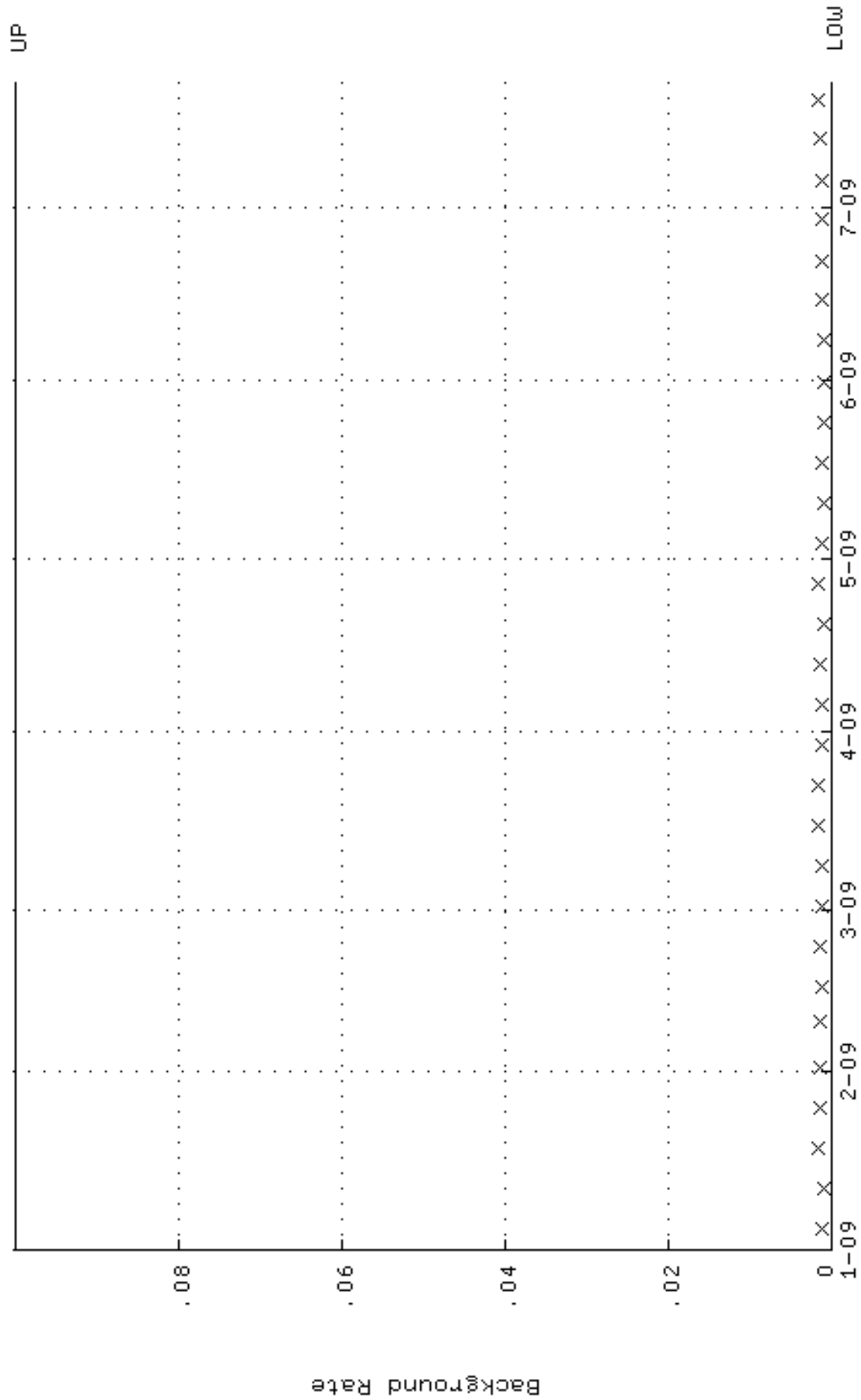
QA filename : DKA100:[ENV_ALPHA.QA.W]W183.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 5-JAN-2009 12:57:46 through 22-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.254364 through 0.274364



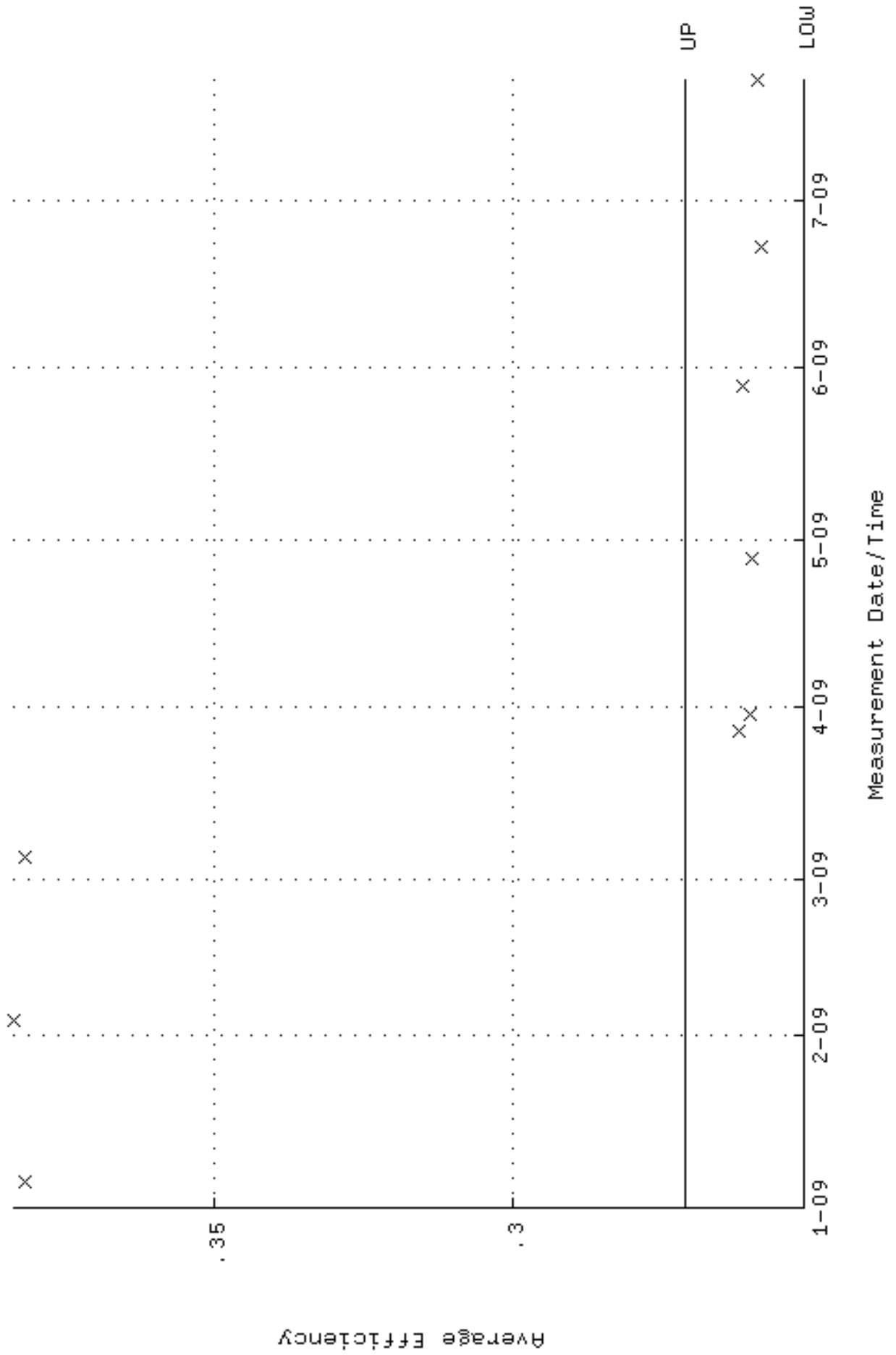
QA filename : DKA100:[ENV_ALPHA.QA.W]w183.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 5-JAN-2009 12:57:46 through 22-JUL-2009 12:00:00
 Lower/Upper Lmts: 86.8927 through 96.0393



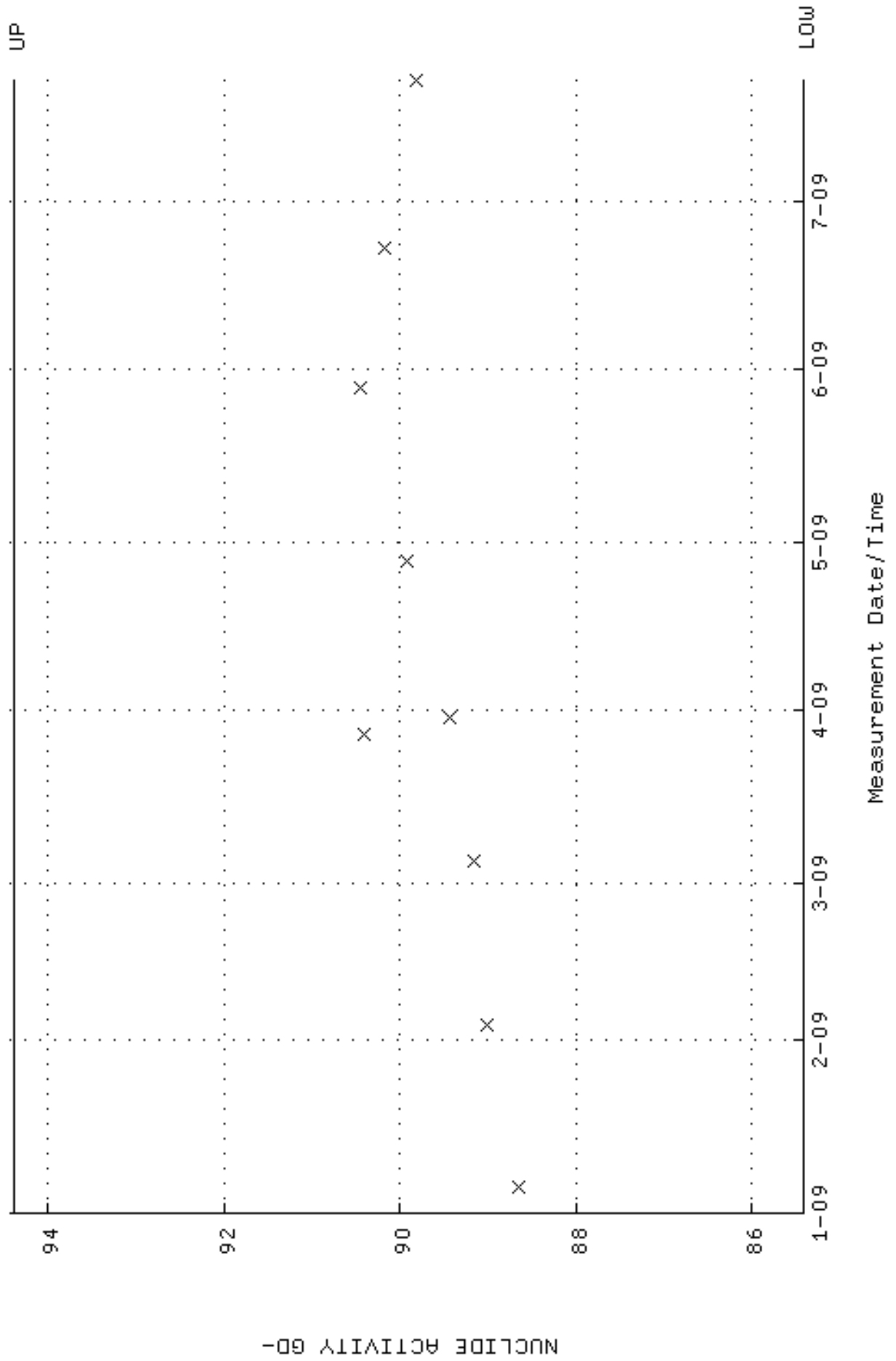
QA filename : DKA100:[ENV_ALPHA.QA.B]B183.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-JAN-2009 17:26:28 through 22-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



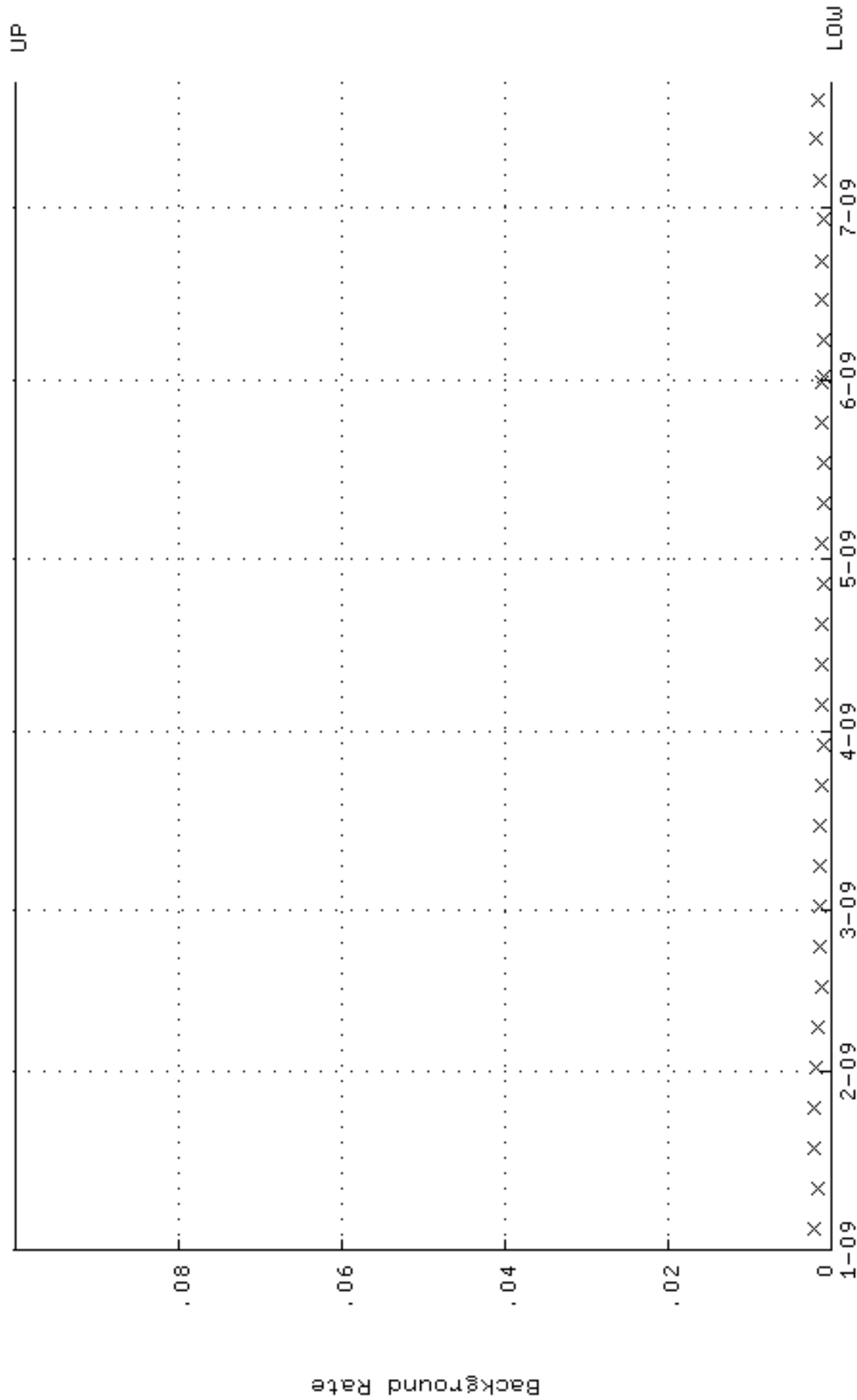
QA filename : DKA100:[ENV_ALPHA.QA.W]W184.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 5-JAN-2009 12:57:51 through 22-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.251367 through 0.271367



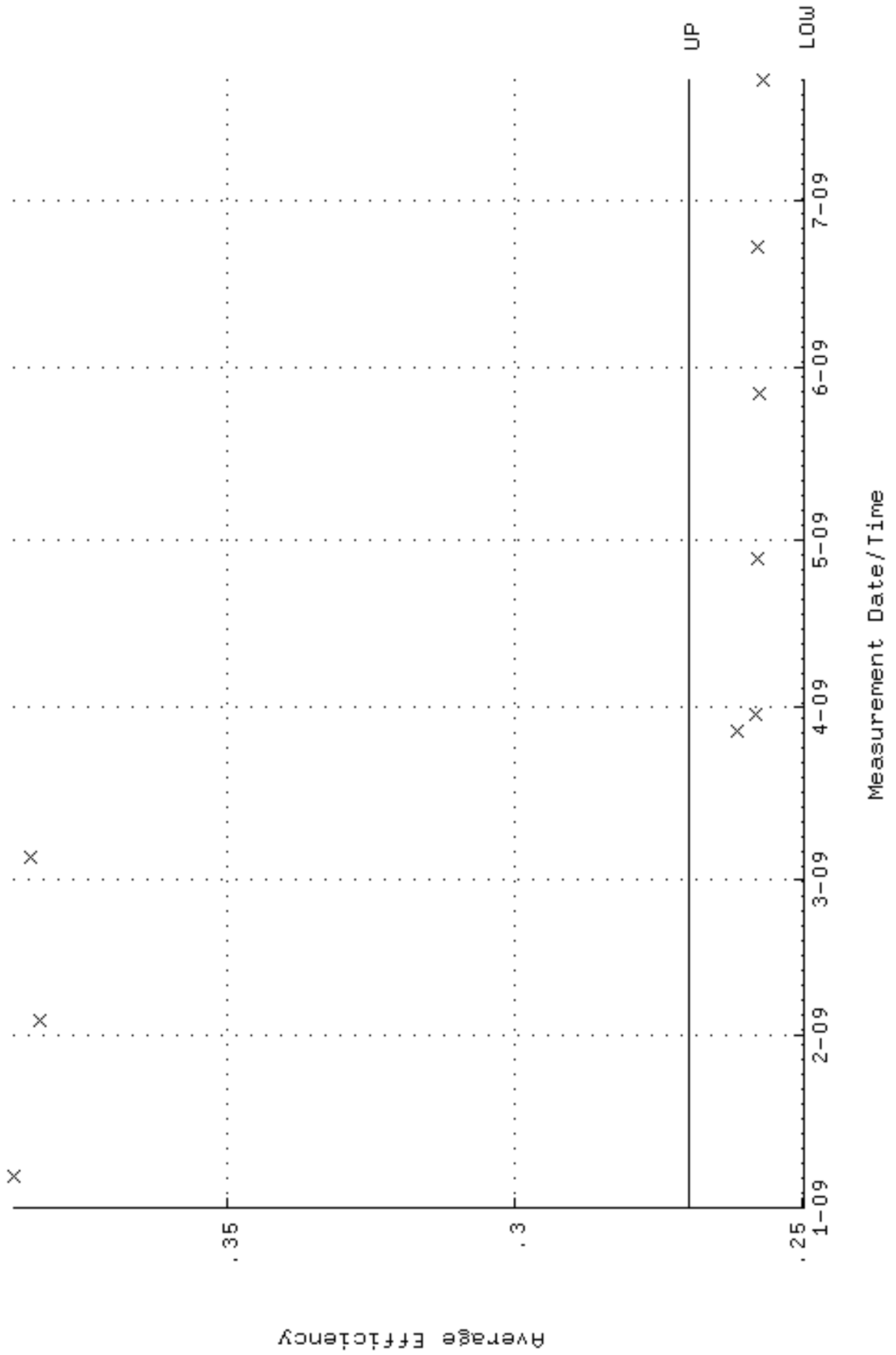
QA filename : DKA100:[ENV_ALPHA.QA.W]w184.QAF;1
Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 5-JAN-2009 12:57:51 through 22-JUL-2009 12:00:00
Lower/Upper Lmts: 85.4139 through 94.4049



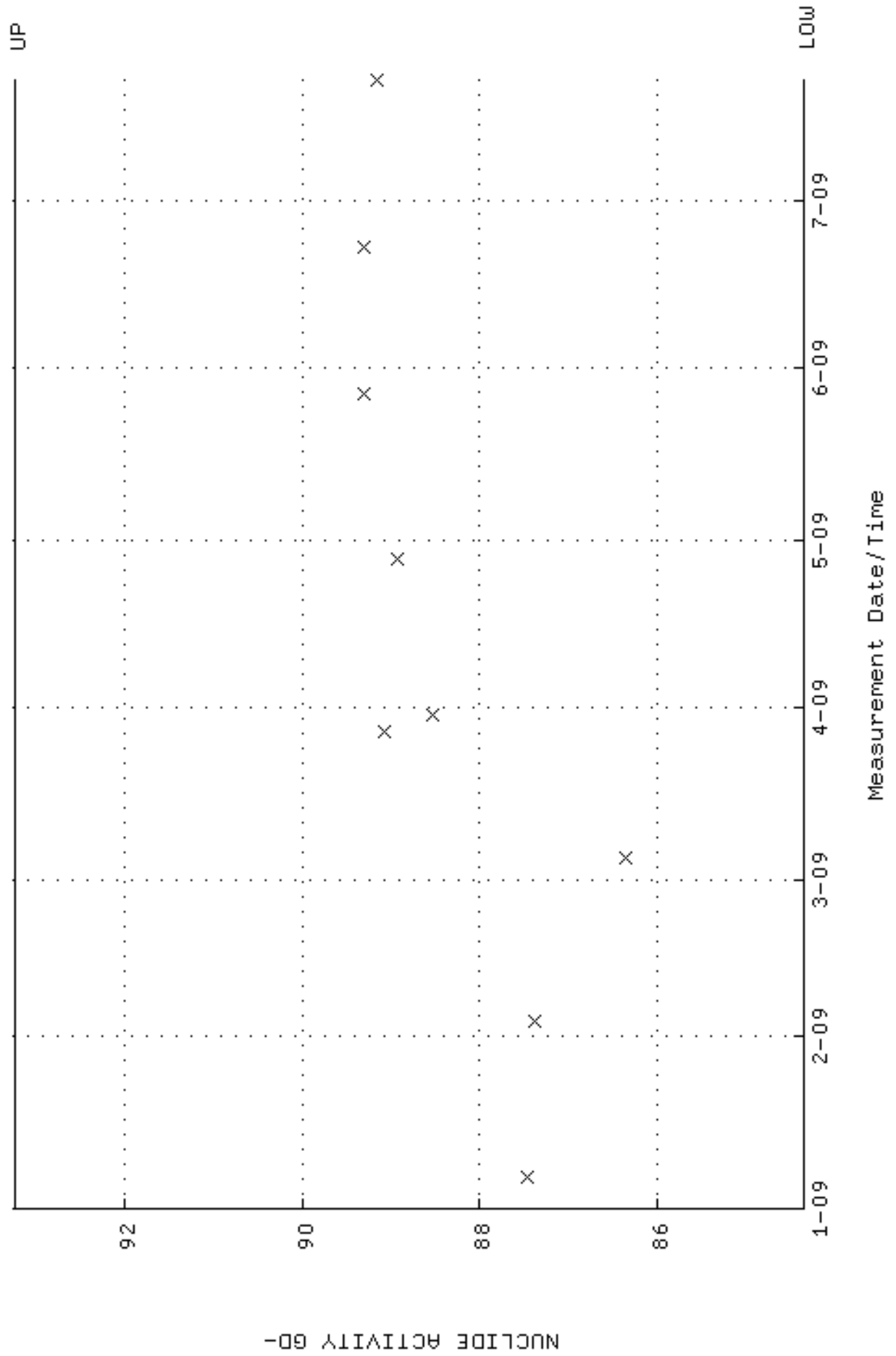
QA filename : DKA100:[ENV_ALPHA.QA.B]B184.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-JAN-2009 17:26:32 through 22-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



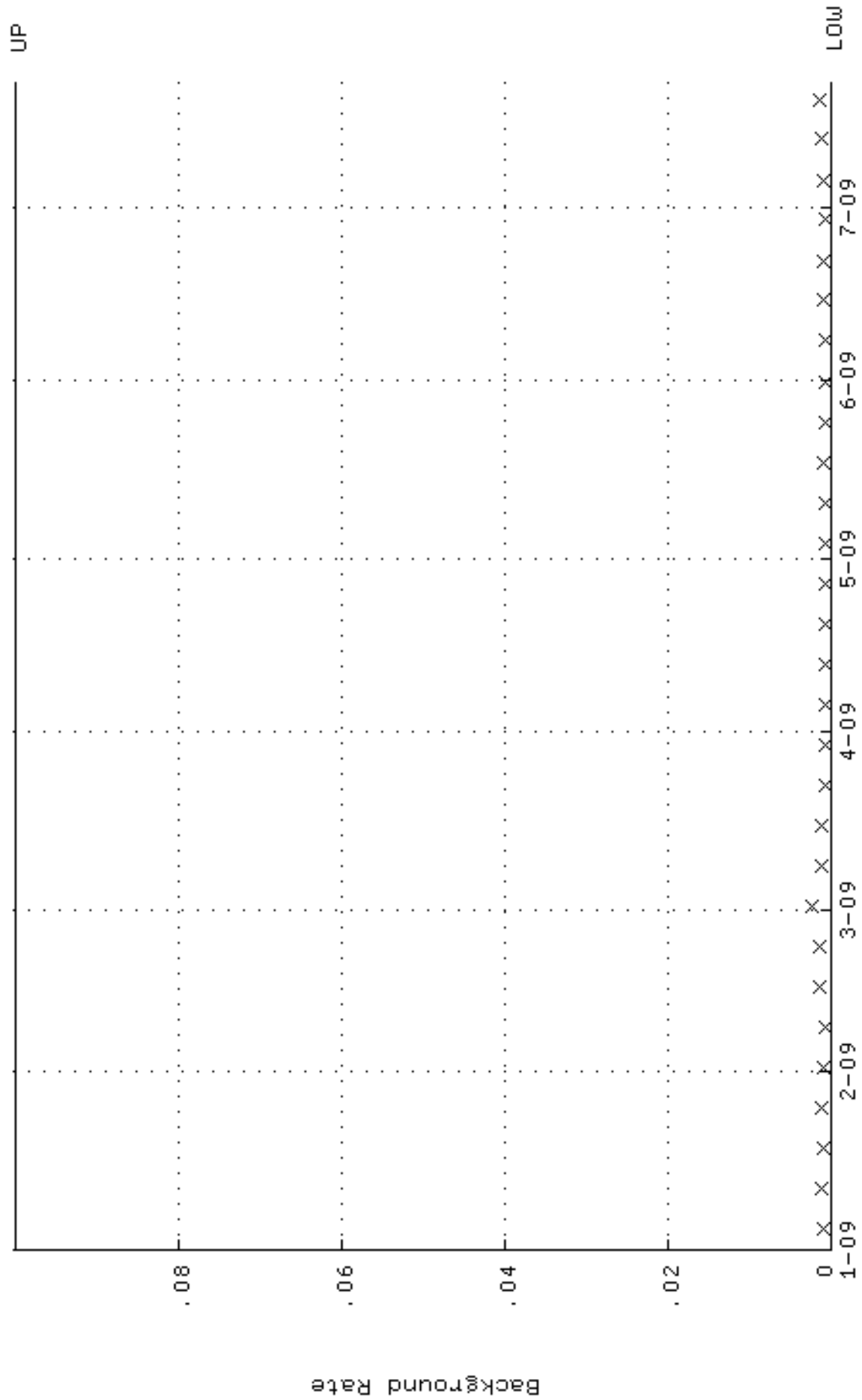
QA filename : DKA100:[ENV_ALPHA.QA.W]W185.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 6-JAN-2009 19:31:29 through 22-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.249628 through 0.269628



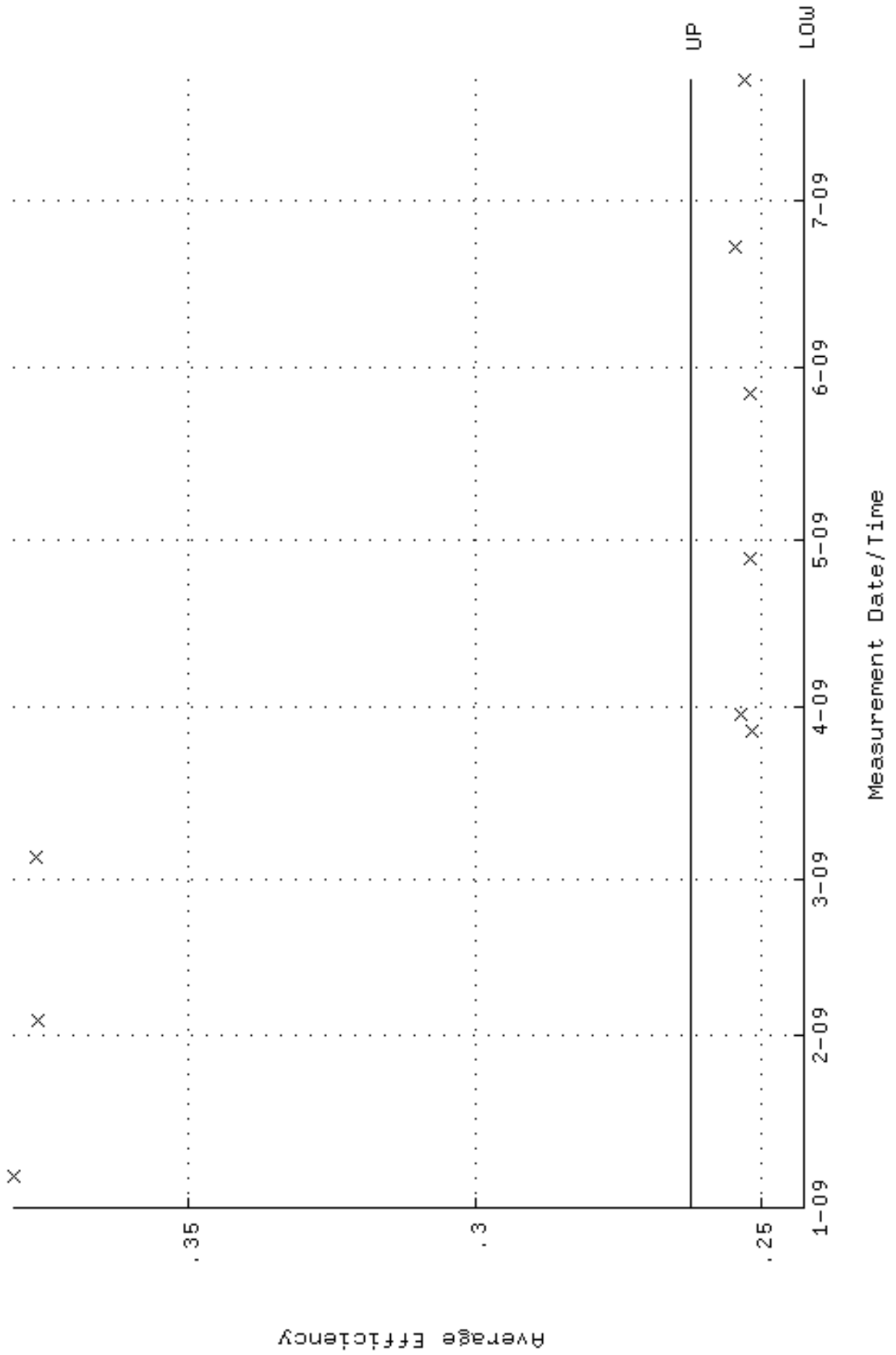
QA filename : DKA100:[ENV_ALPHA.QA.W]W185.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 6-JAN-2009 19:31:29 through 22-JUL-2009 12:00:00
 Lower/Upper Lmts: 84.3502 through 93.2292



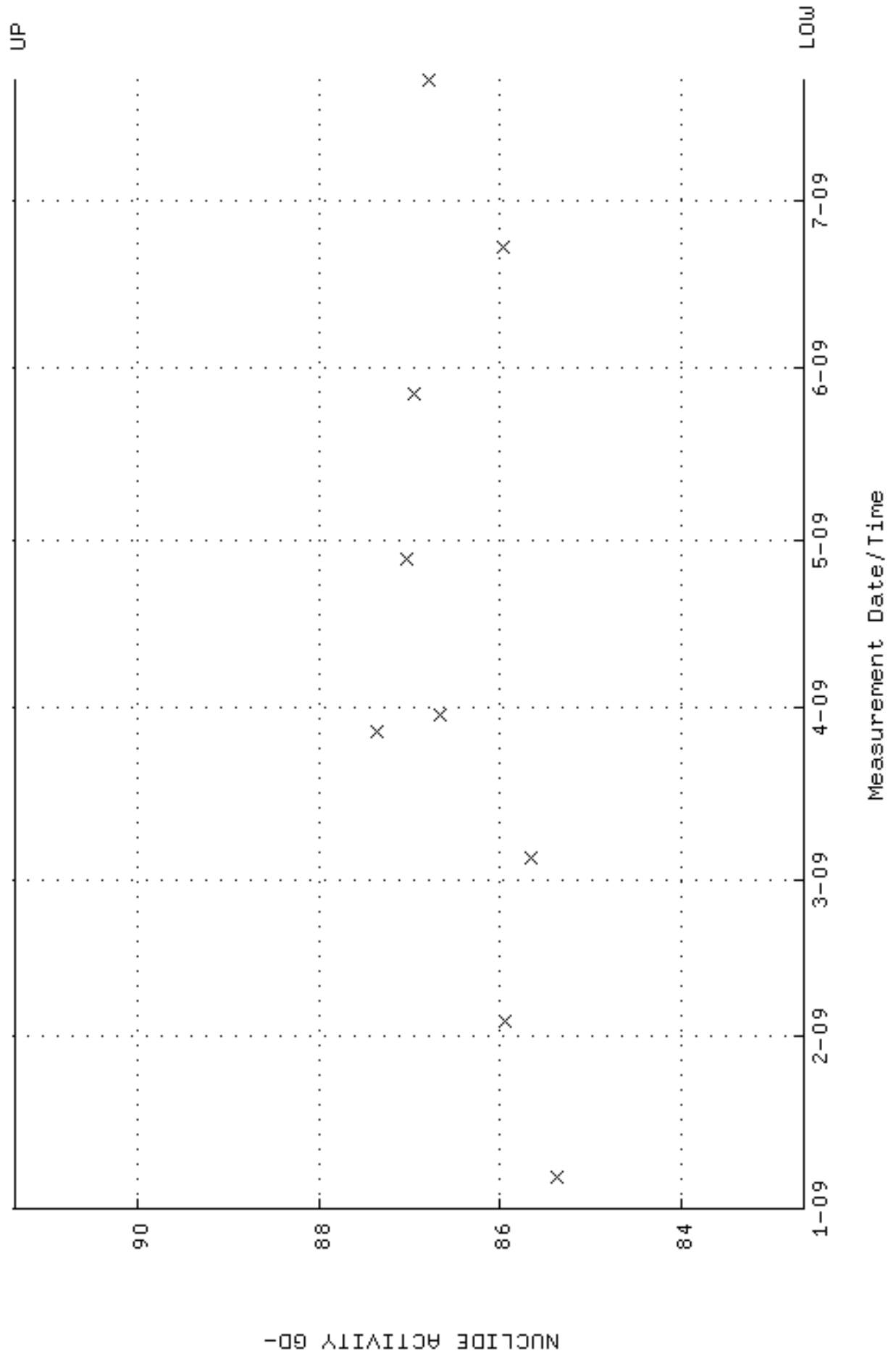
QA filename : DKA100:[ENV_ALPHA.QA.B]B185.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-JAN-2009 17:26:36 through 22-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



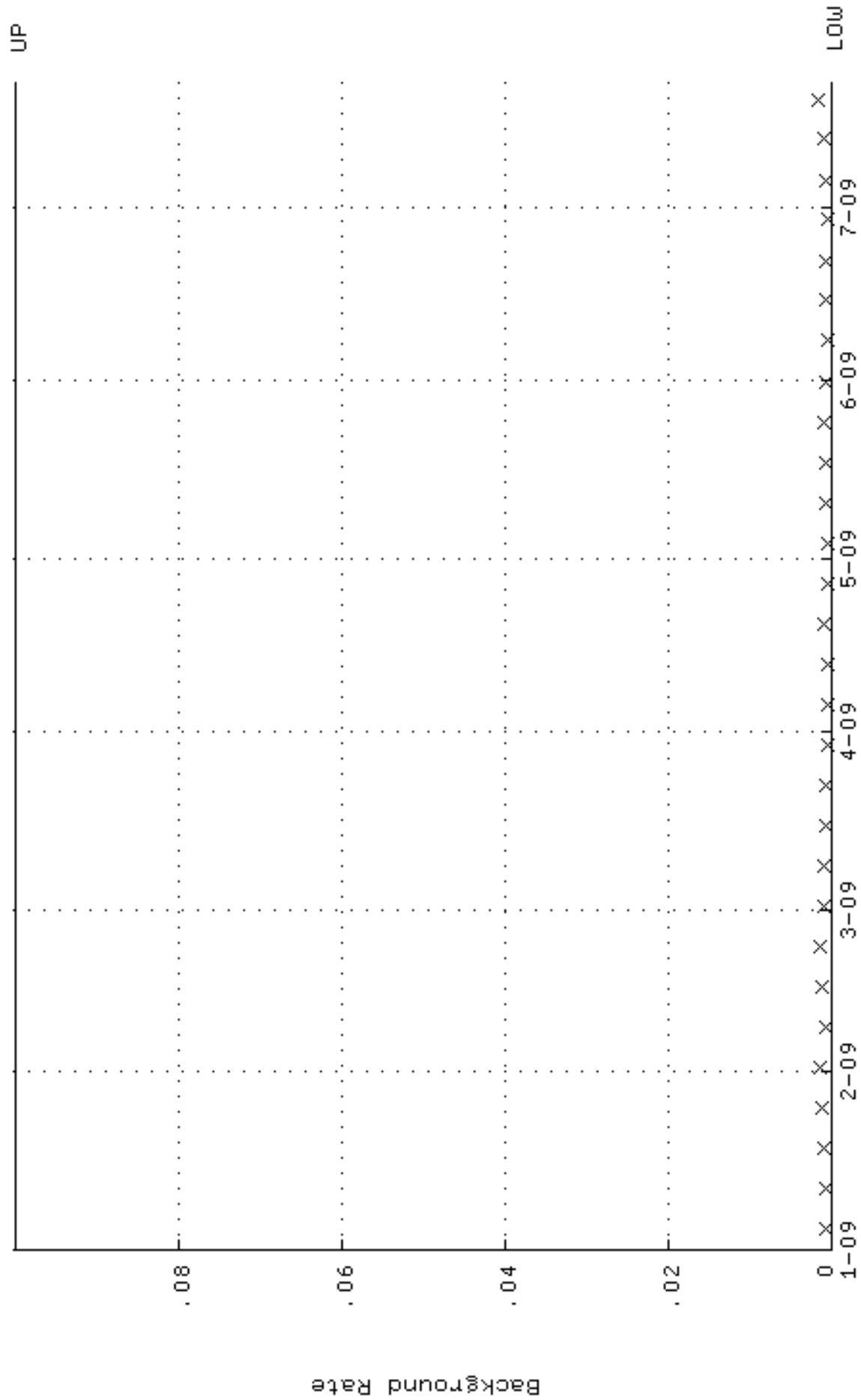
QA filename : DKA100:[ENV_ALPHA.QA.W]W186.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 6-JAN-2009 19:31:33 through 22-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.242649 through 0.262649



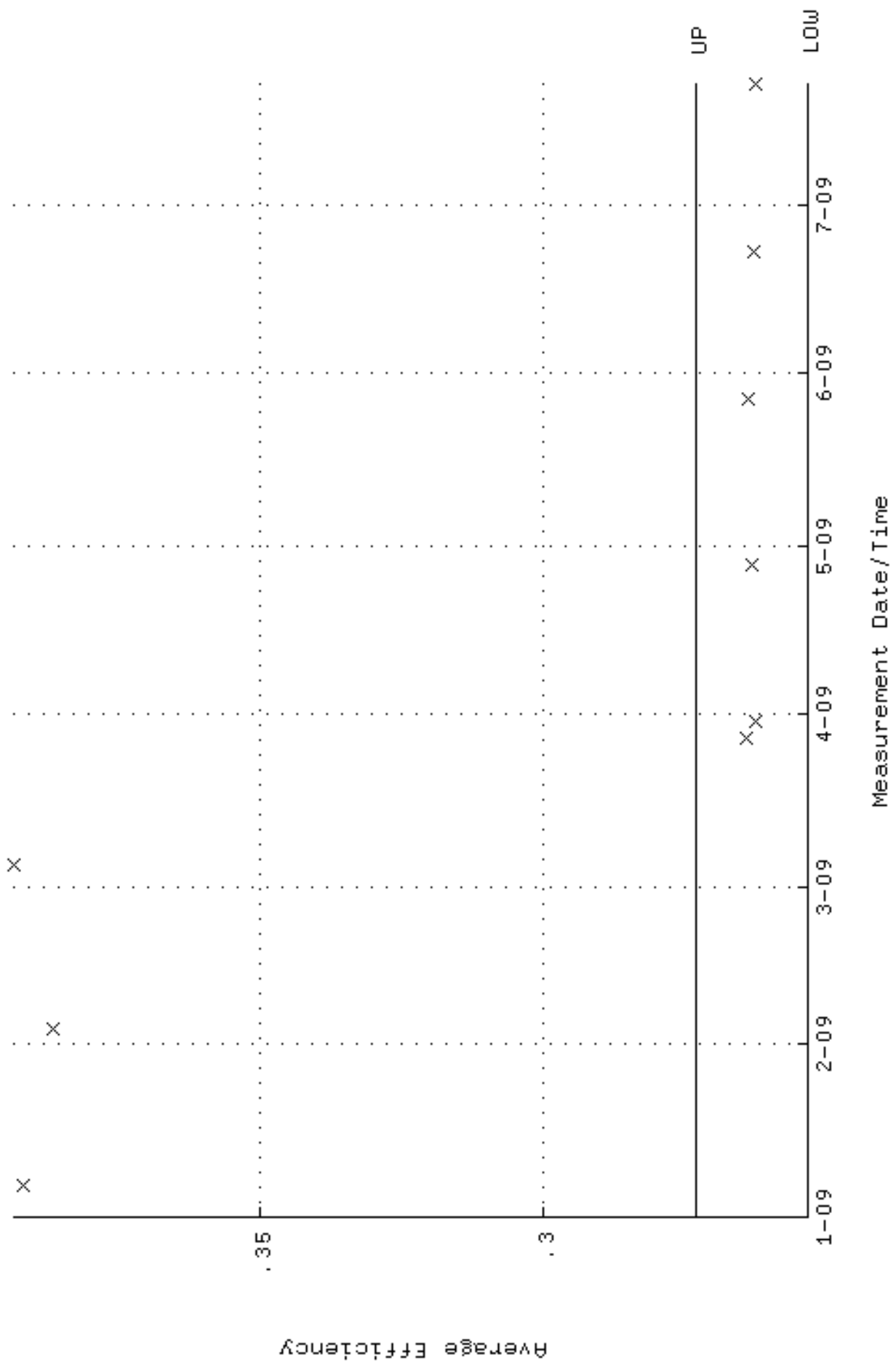
QA filename : DKA100:[ENV_ALPHA.QA.W]w186.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 6-JAN-2009 19:31:33 through 22-JUL-2009 12:00:00
 Lower/Upper Lmts: 82.6495 through 91.3495



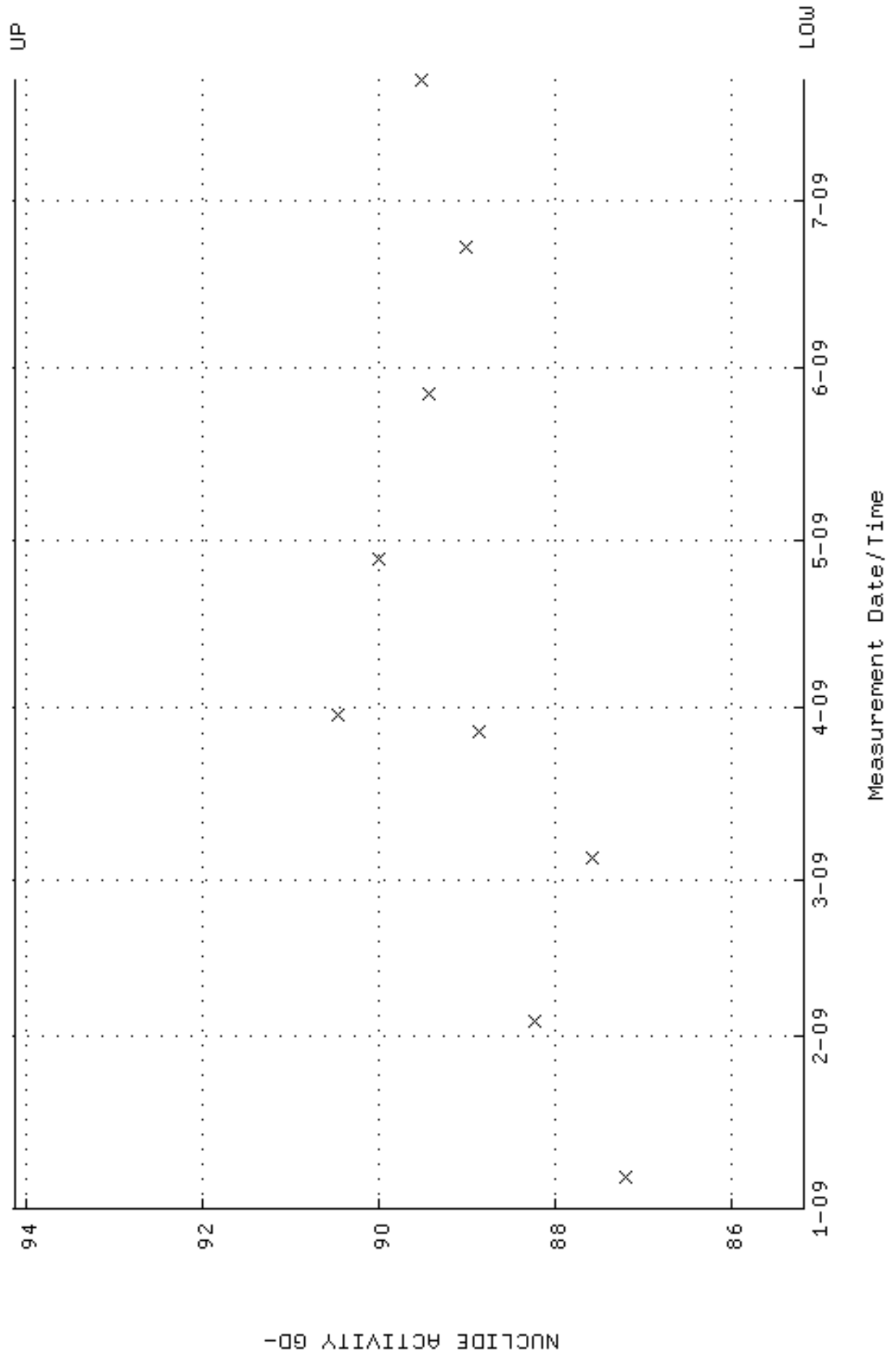
QA filename : DKA100:[ENV_ALPHA.QA.B]B186.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-JAN-2009 17:26:40 through 22-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



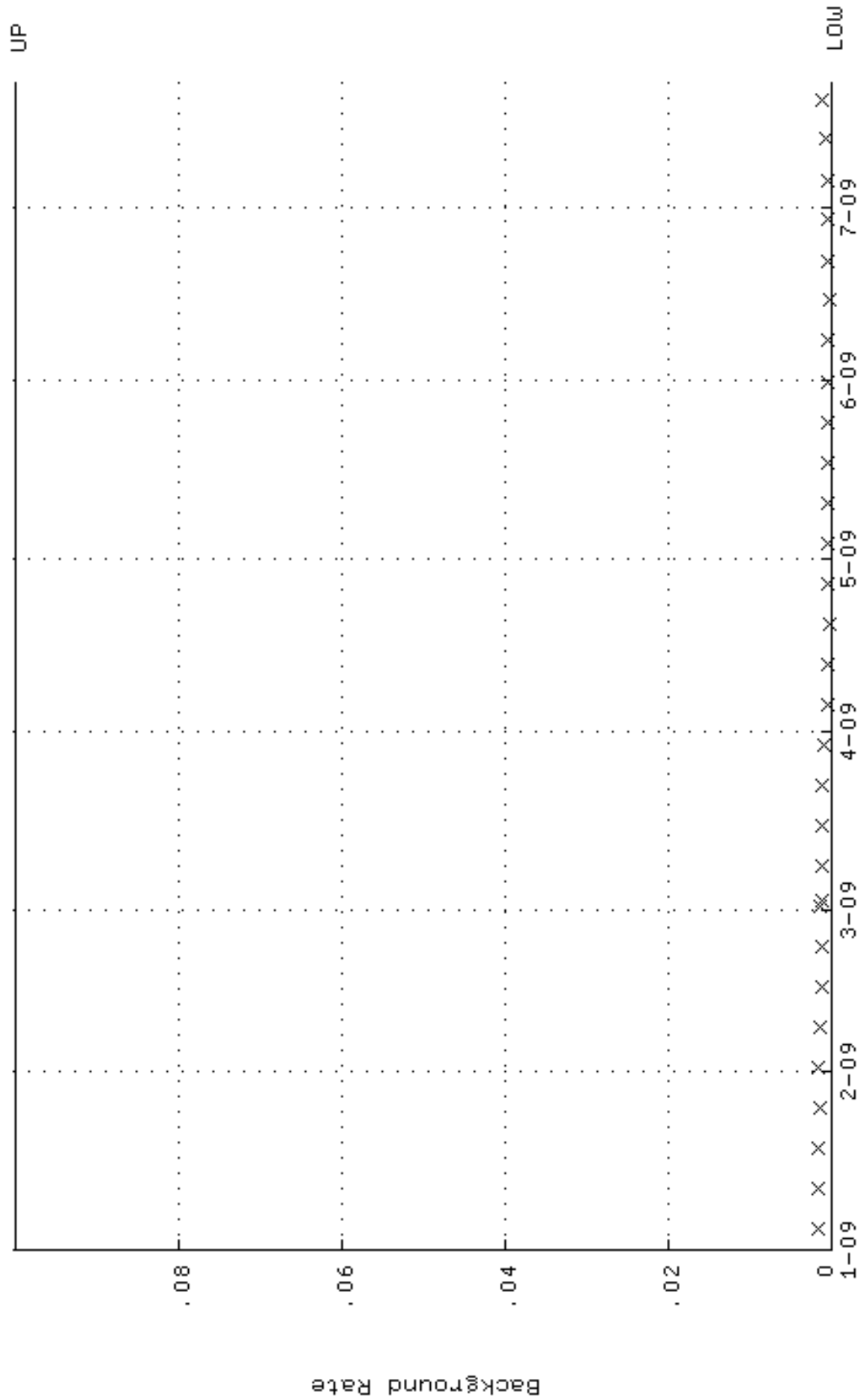
QA filename : DKA100:[ENV_ALPHA.QA.W]W191.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 6-JAN-2009 19:31:54 through 22-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.252993 through 0.272993



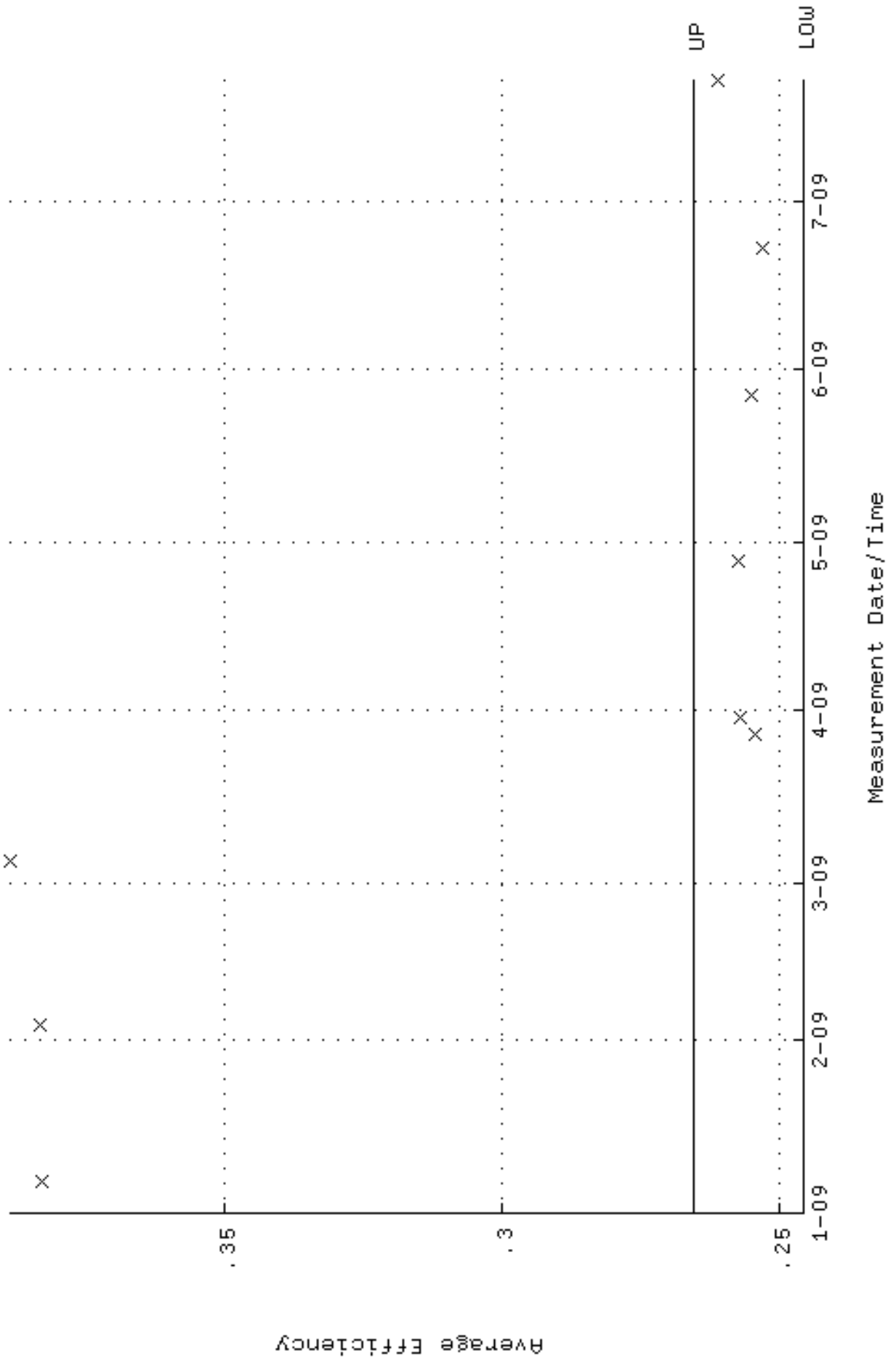
QA filename : DKA100:[ENV_ALPHA.QA.W]w191.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 6-JAN-2009 19:31:54 through 22-JUL-2009 12:00:00
 Lower/Upper Lmts: 85.1712 through 94.1366



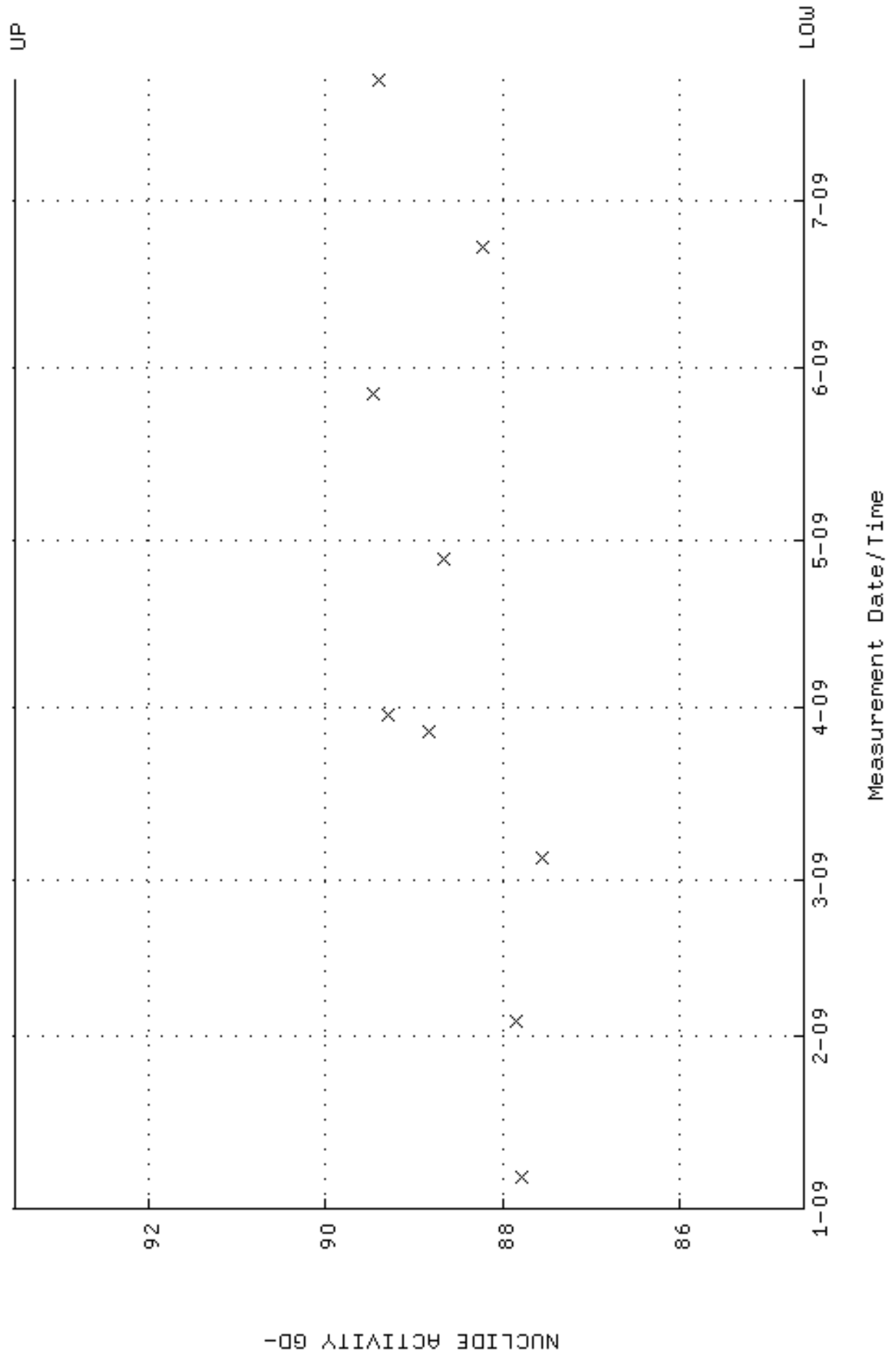
QA filename : DKA100:[ENV_ALPHA.QA.B]B191.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-JAN-2009 17:26:58 through 22-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



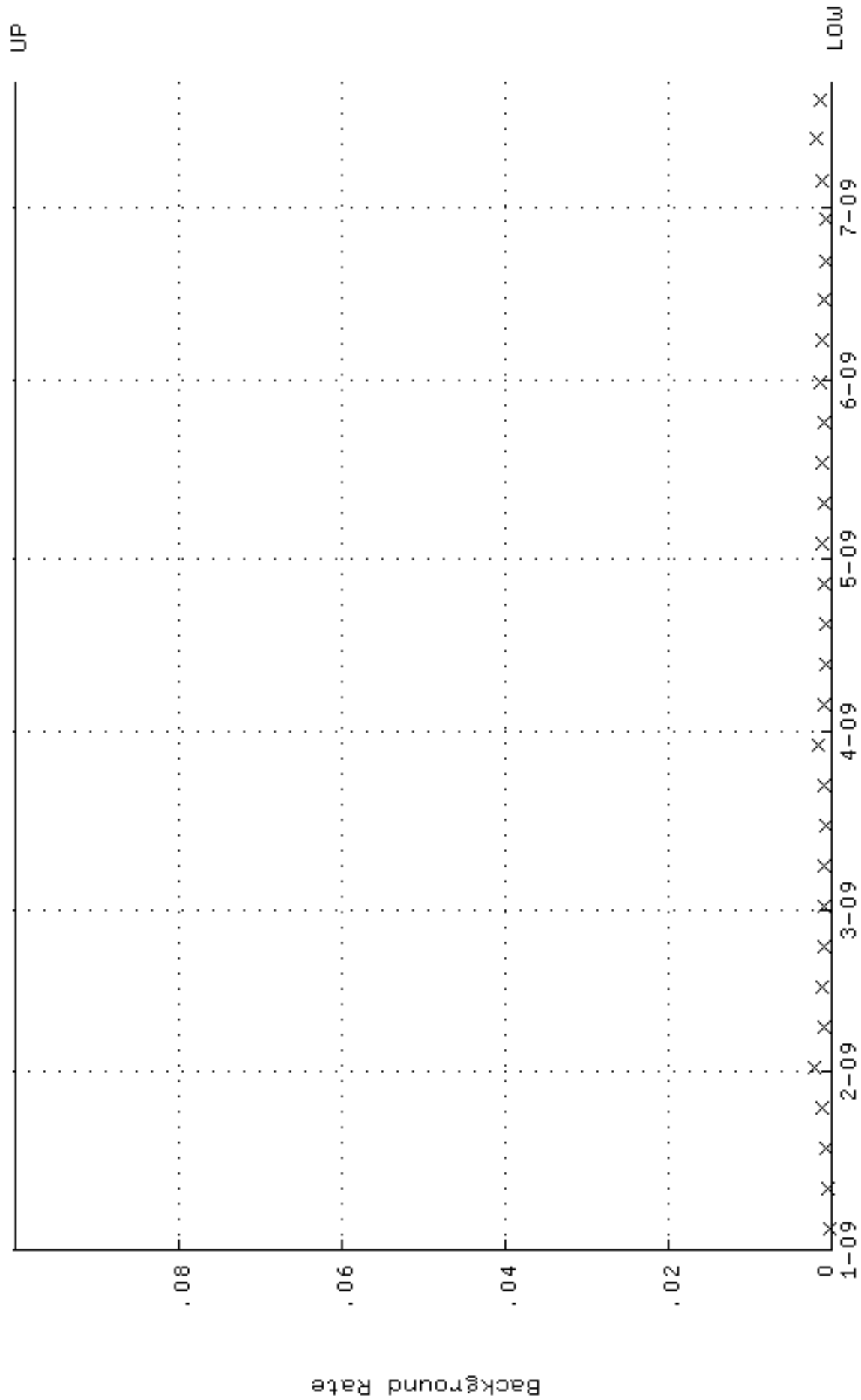
QA filename : DKA100:[ENV_ALPHA.QA.W]W192.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 6-JAN-2009 19:31:58 through 22-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.245663 through 0.265663



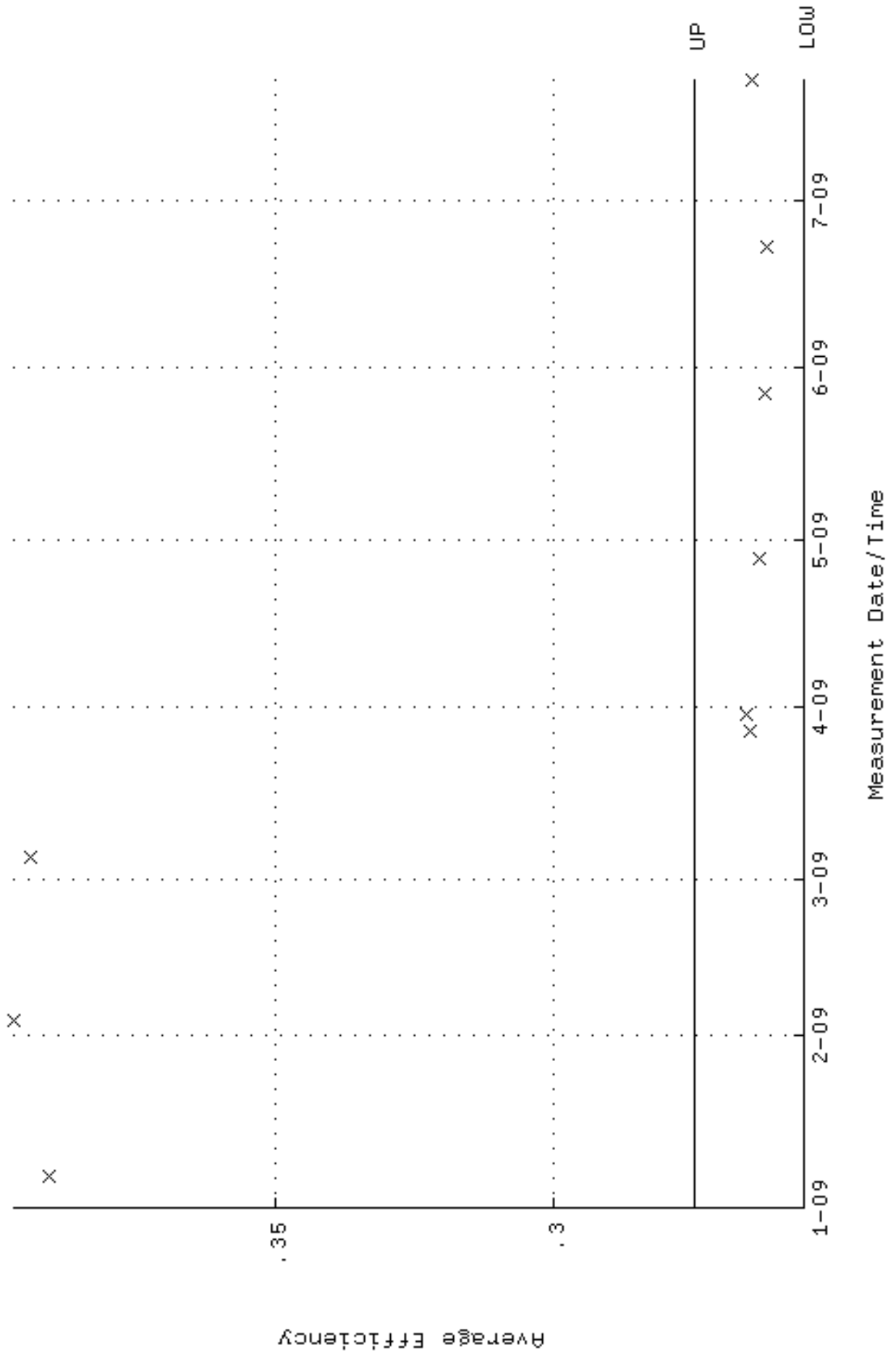
QA filename : DKA100:[ENV_ALPHA.QA.W]W192.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 6-JAN-2009 19:31:58 through 22-JUL-2009 12:00:00
 Lower/Upper Lmts: 84.6037 through 93.5093



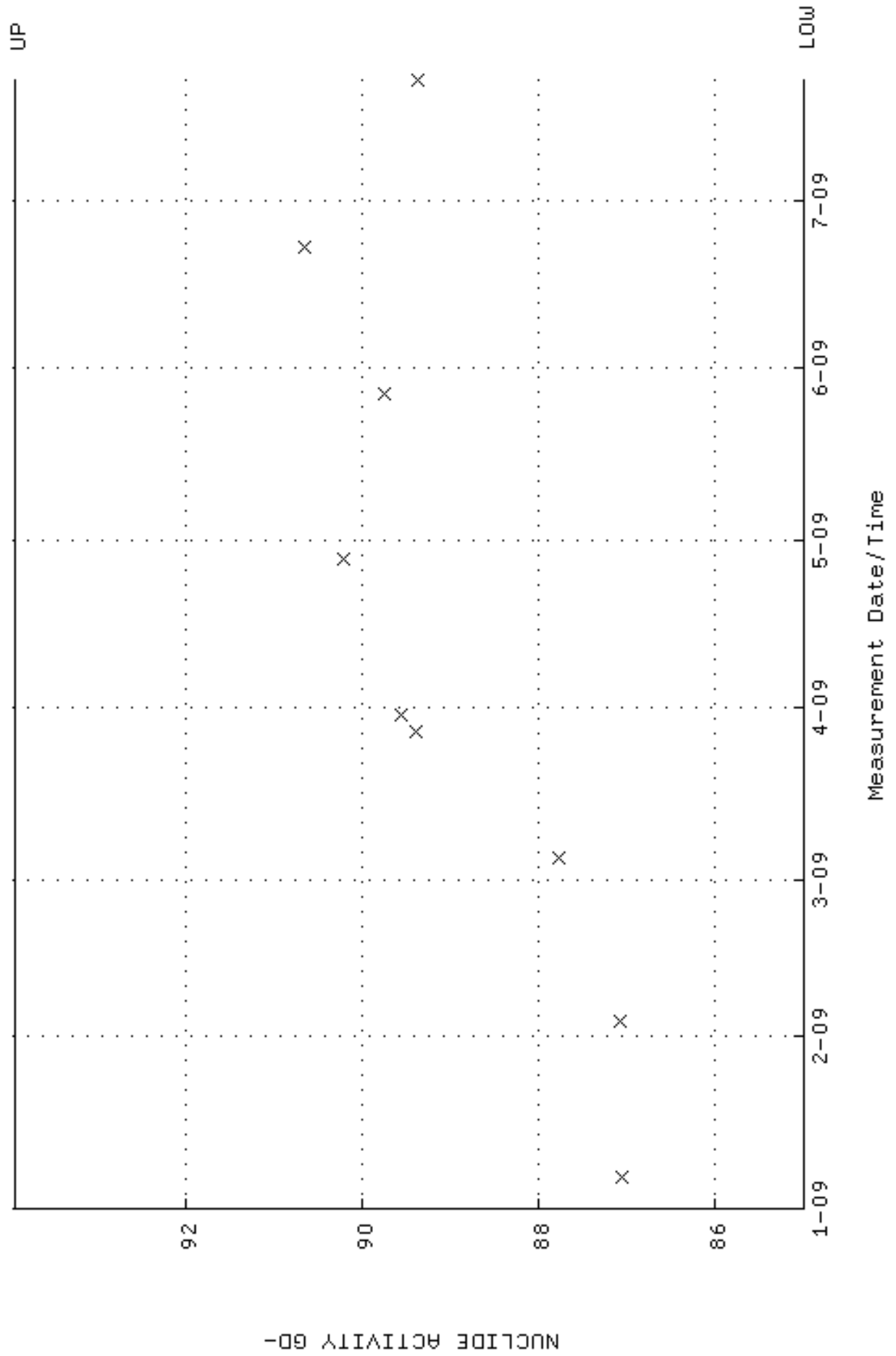
QA filename : DKA100:[ENV_ALPHA.QA.B]B192.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-JAN-2009 17:27:03 through 22-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



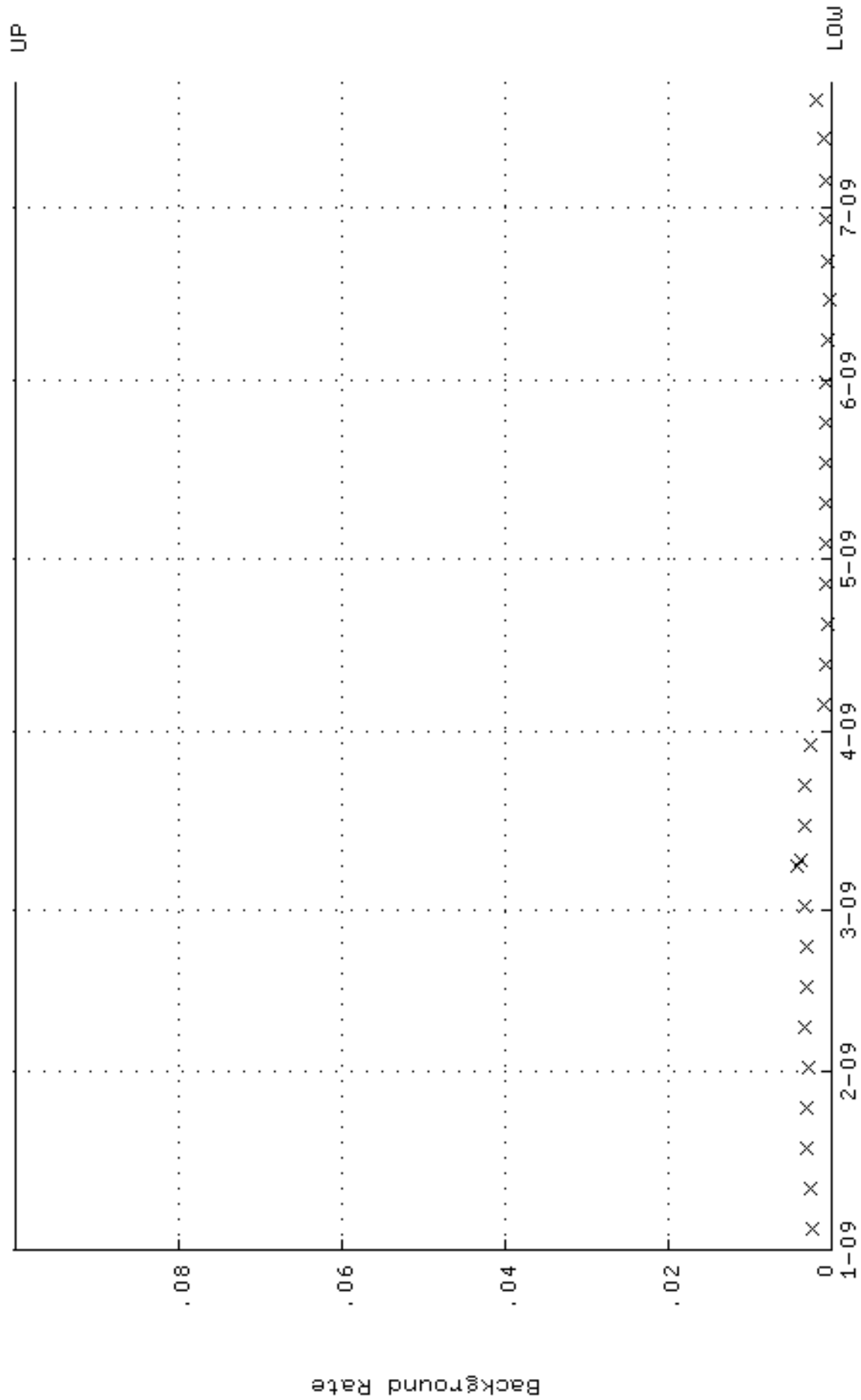
QA filename : DKA100:[ENV_ALPHA.QA.W]W193.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 6-JAN-2009 19:32:01 through 22-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.254861 through 0.274861



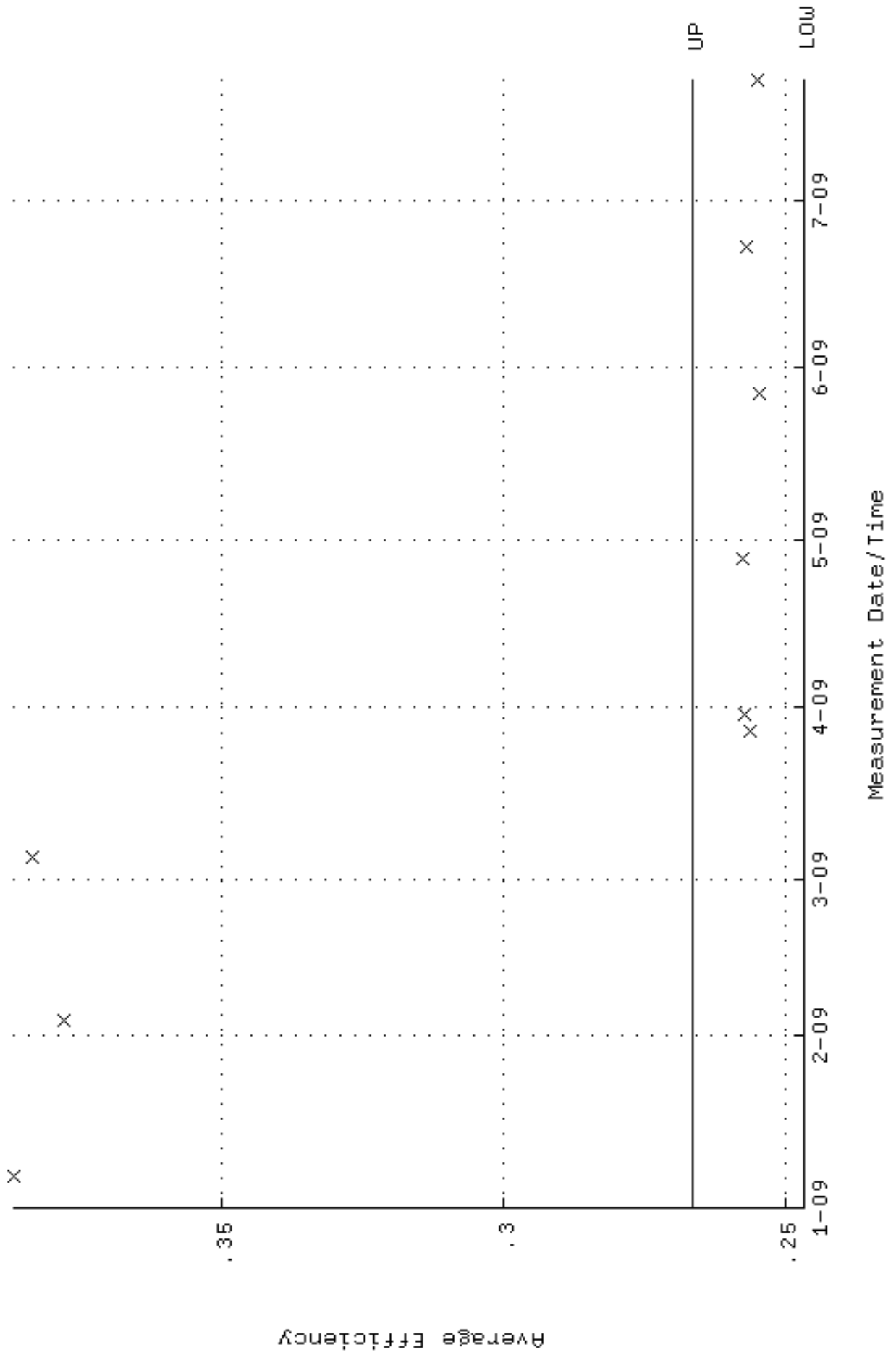
QA filename : DKA100:[ENV_ALPHA.QA.W]w193.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 6-JAN-2009 19:32:01 through 22-JUL-2009 12:00:00
 Lower/Upper Lmts: 84.9815 through 93.9269



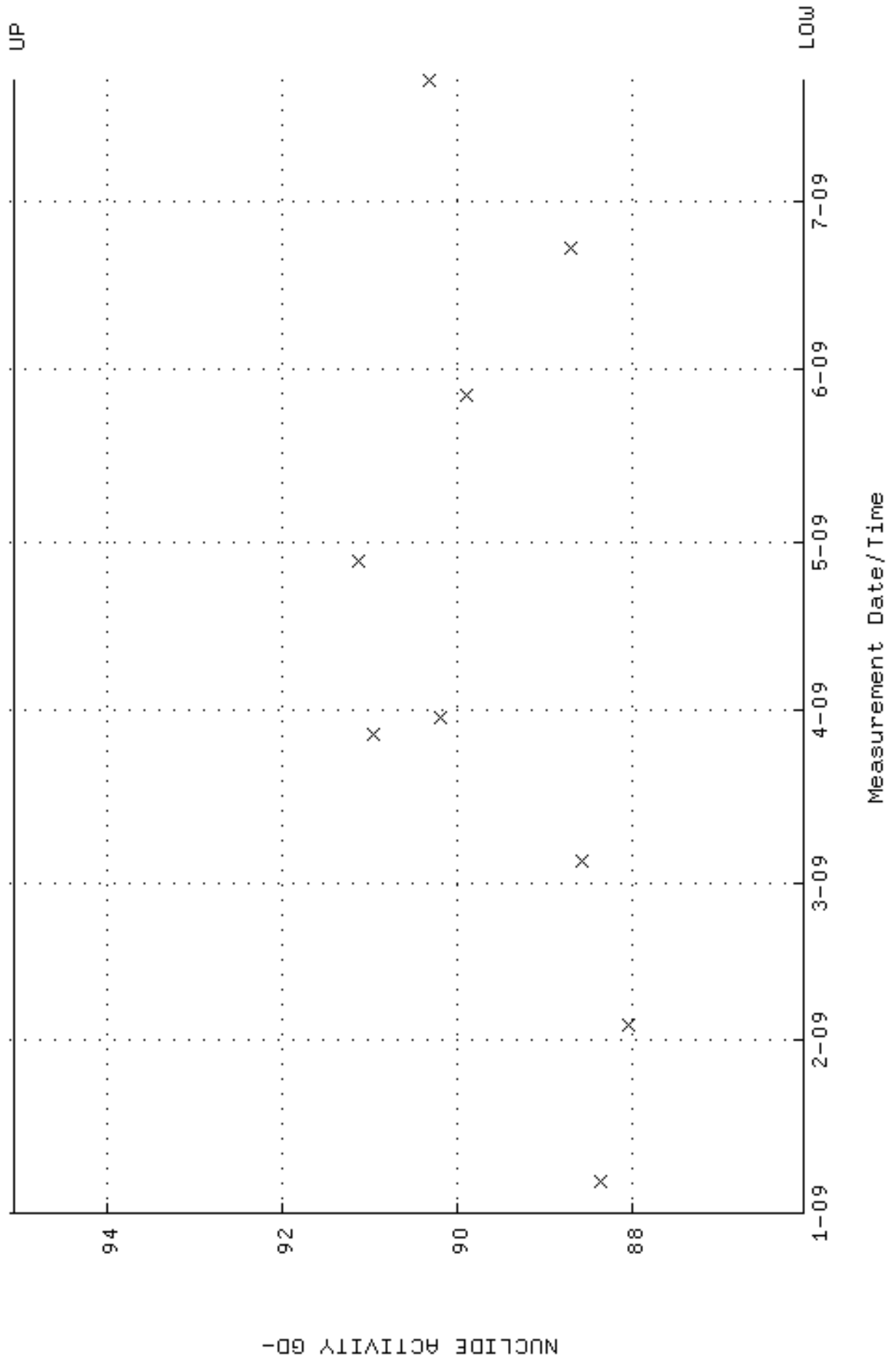
QA filename : DKA100:[ENV_ALPHA.QA.B]B193.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-JAN-2009 17:27:07 through 22-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



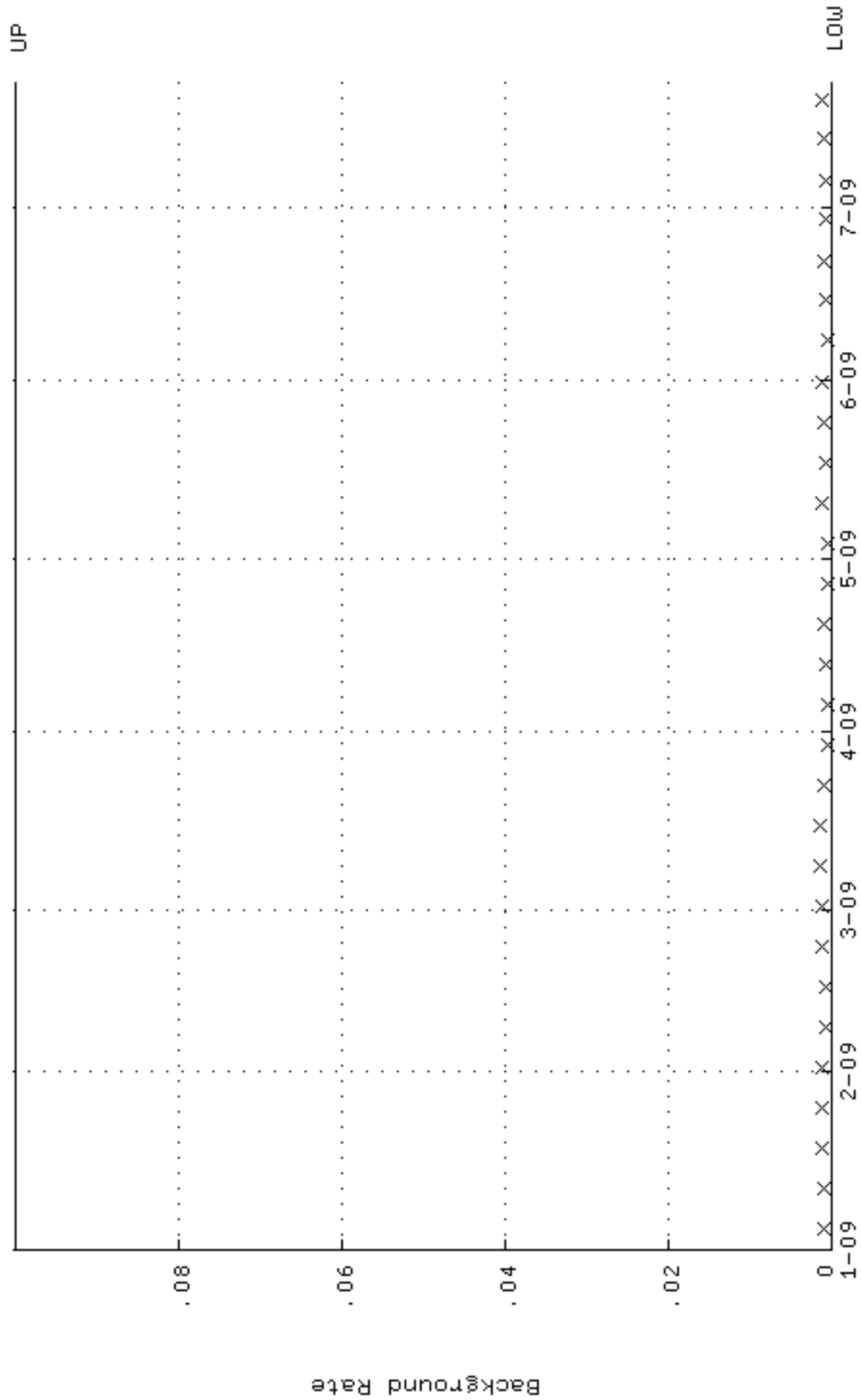
QA filename : DKA100:[ENV_ALPHA.QA.W]W194.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 6-JAN-2009 19:32:05 through 22-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.246760 through 0.266760



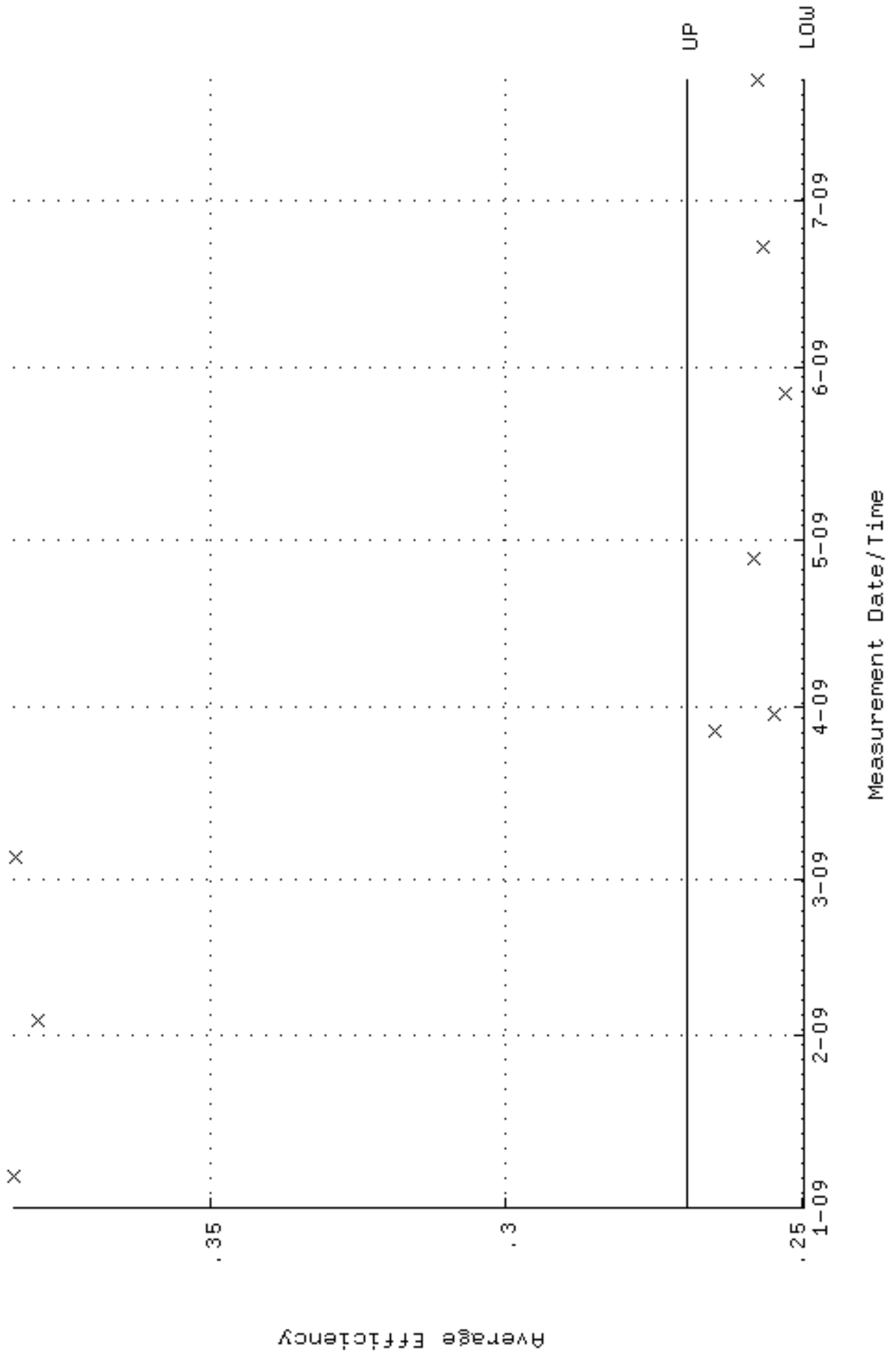
QA filename : DKA100:[ENV_ALPHA.QA.W]w194.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 6-JAN-2009 19:32:05 through 22-JUL-2009 12:00:00
 Lower/Upper Lmts: 86.0376 through 95.0942



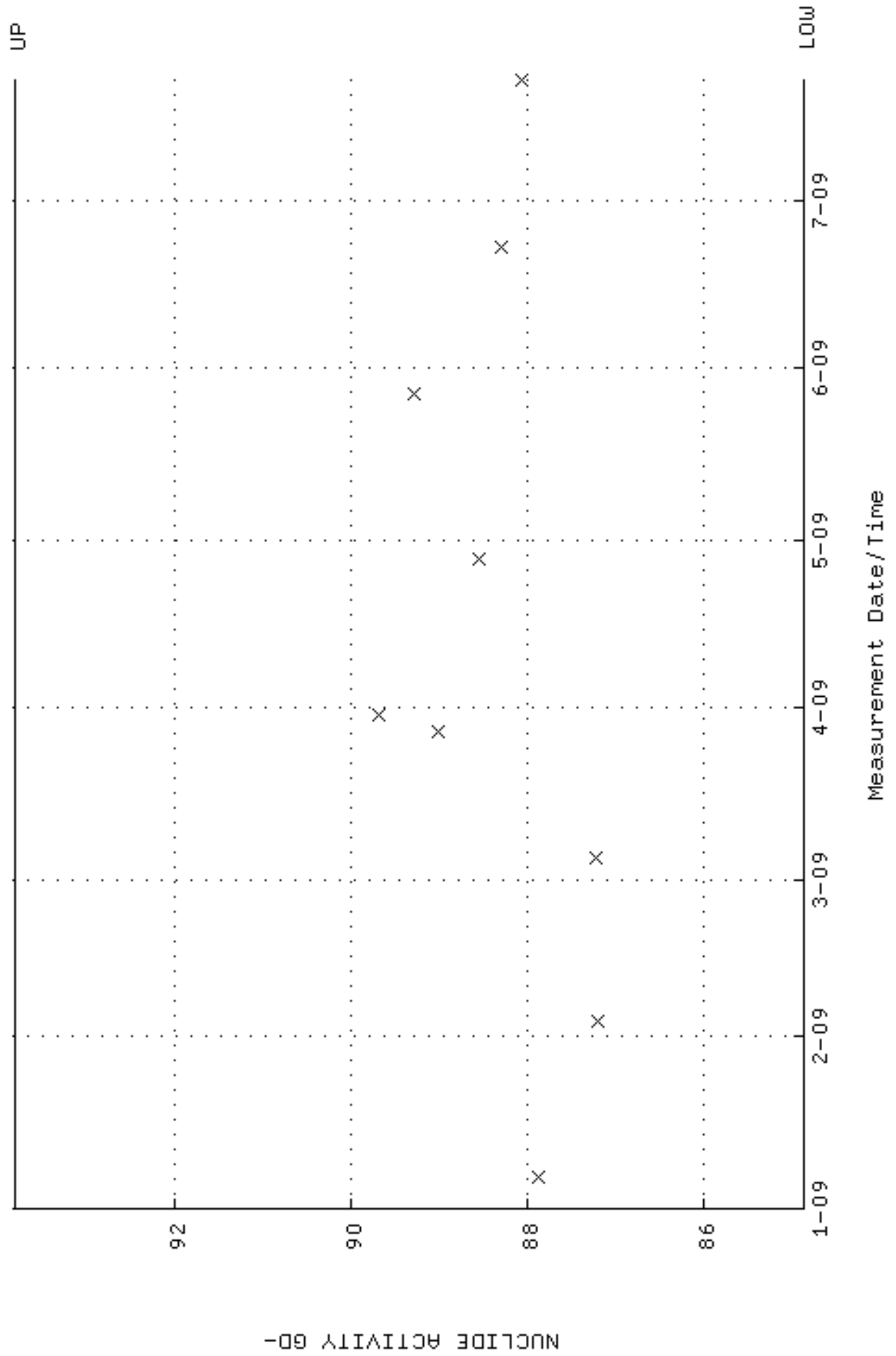
QA filename : DKA100:[ENV_ALPHA.QA.B]B194.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-JAN-2009 17:27:10 through 22-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



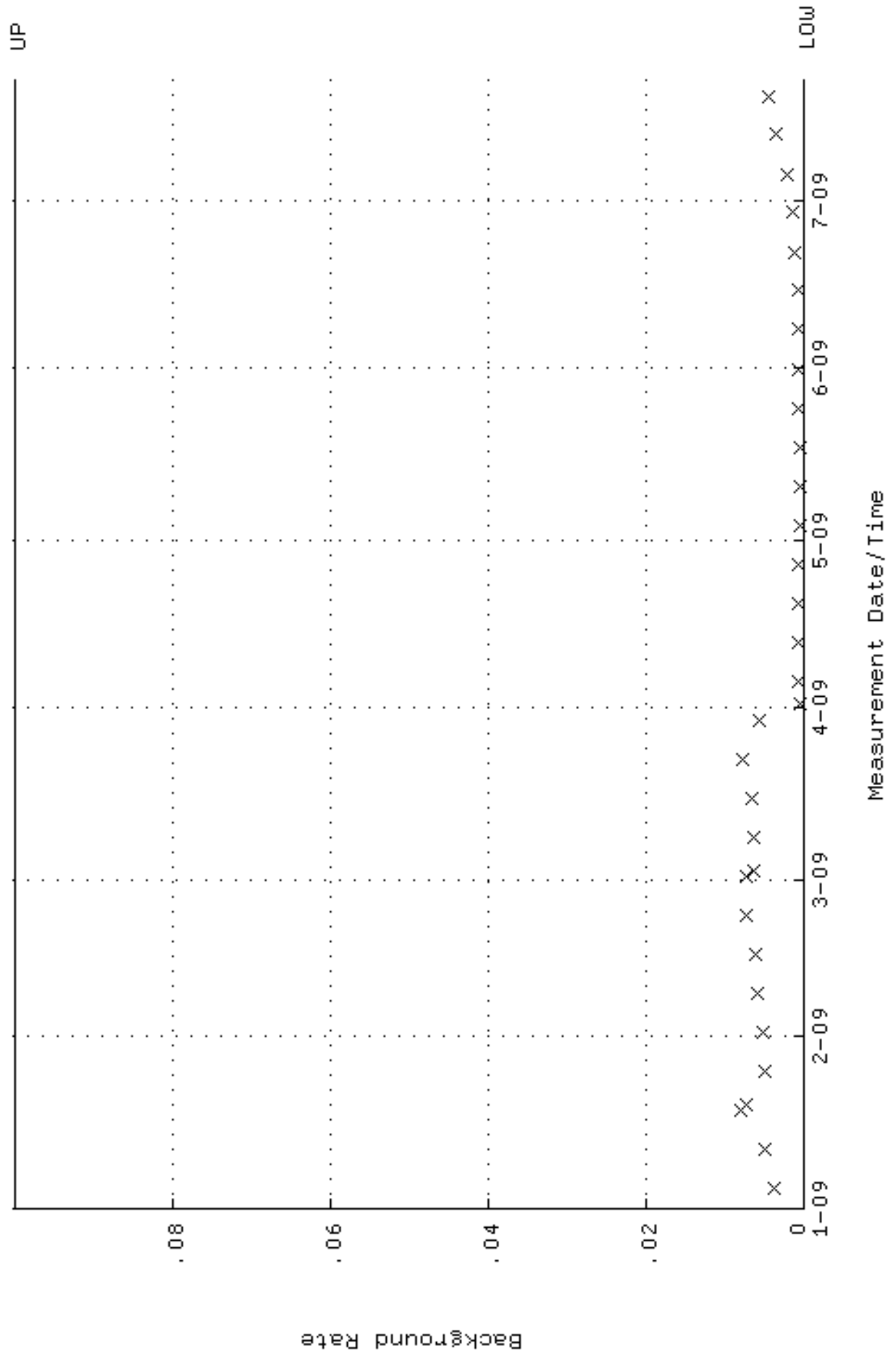
QA filename : DKA100:[ENV_ALPHA.QA.W]W195.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 6-JAN-2009 19:32:09 through 22-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.249622 through 0.269622



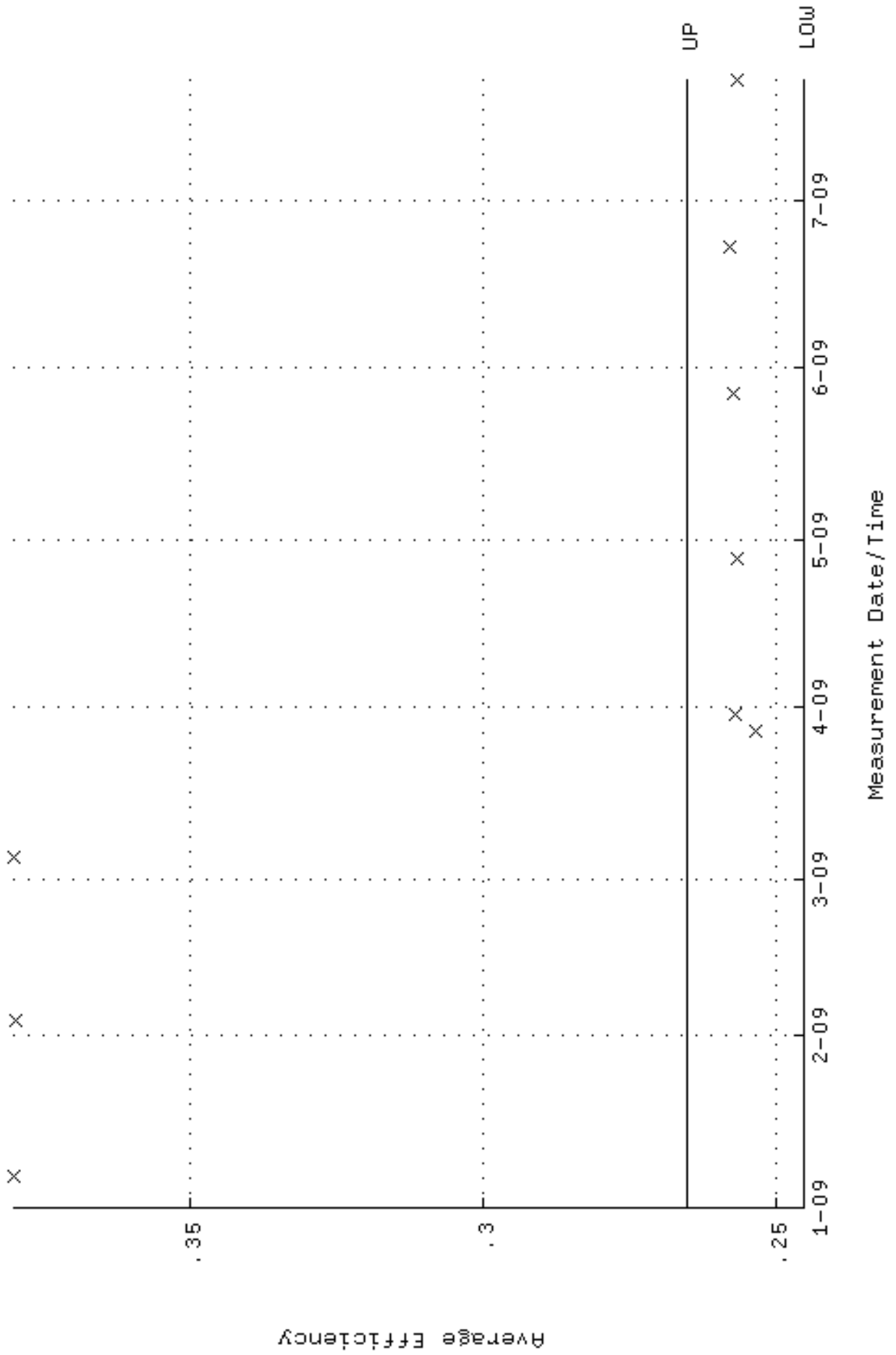
QA filename : DKA100:[ENV_ALPHA.QA.W]W195.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 6-JAN-2009 19:32:09 through 22-JUL-2009 12:00:00
 Lower/Upper Lmts: 84.8653 through 93.7985



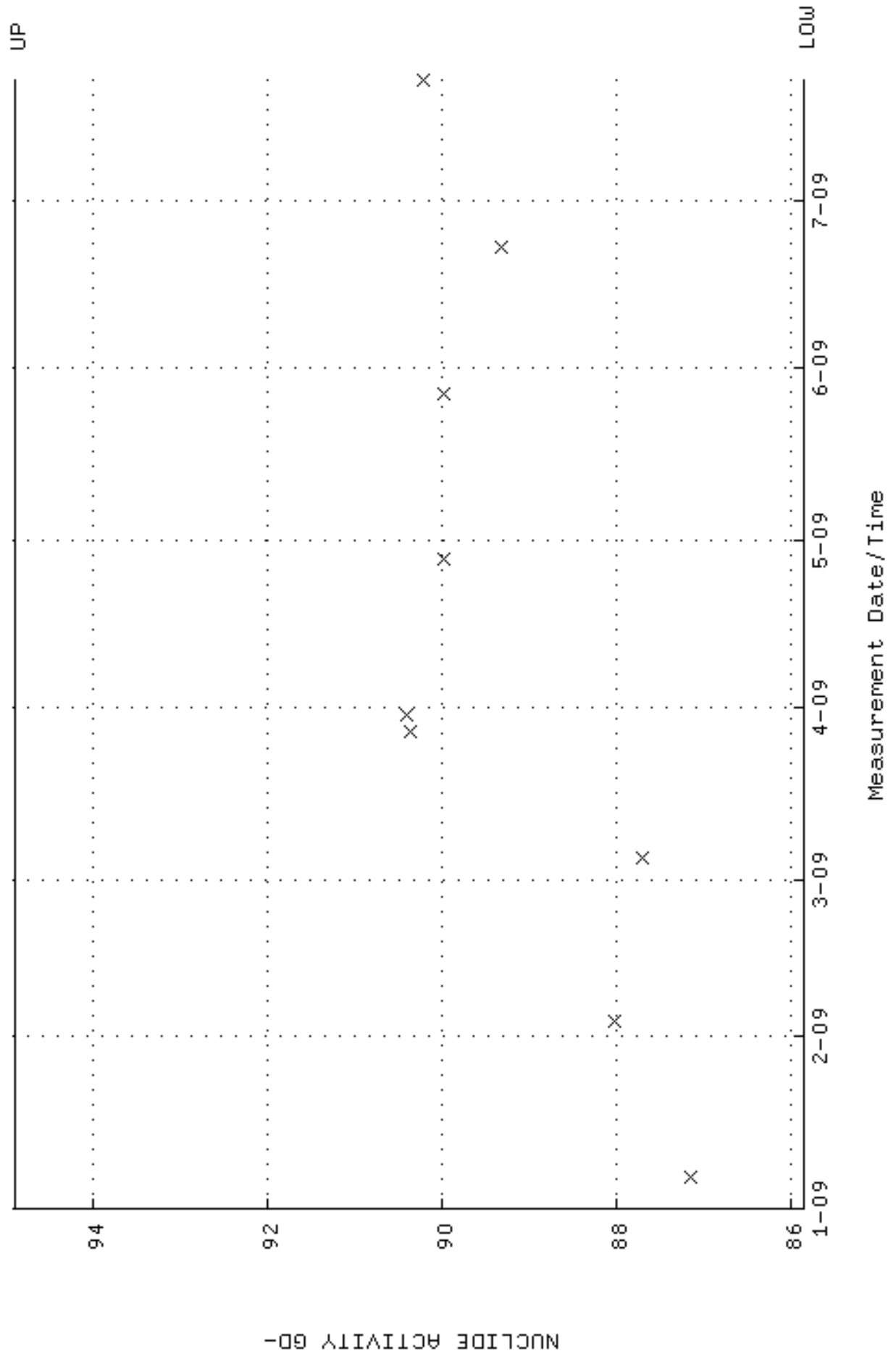
QA filename : DKA100:[ENV_ALPHA.QA.B]B195.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-JAN-2009 17:27:14 through 22-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



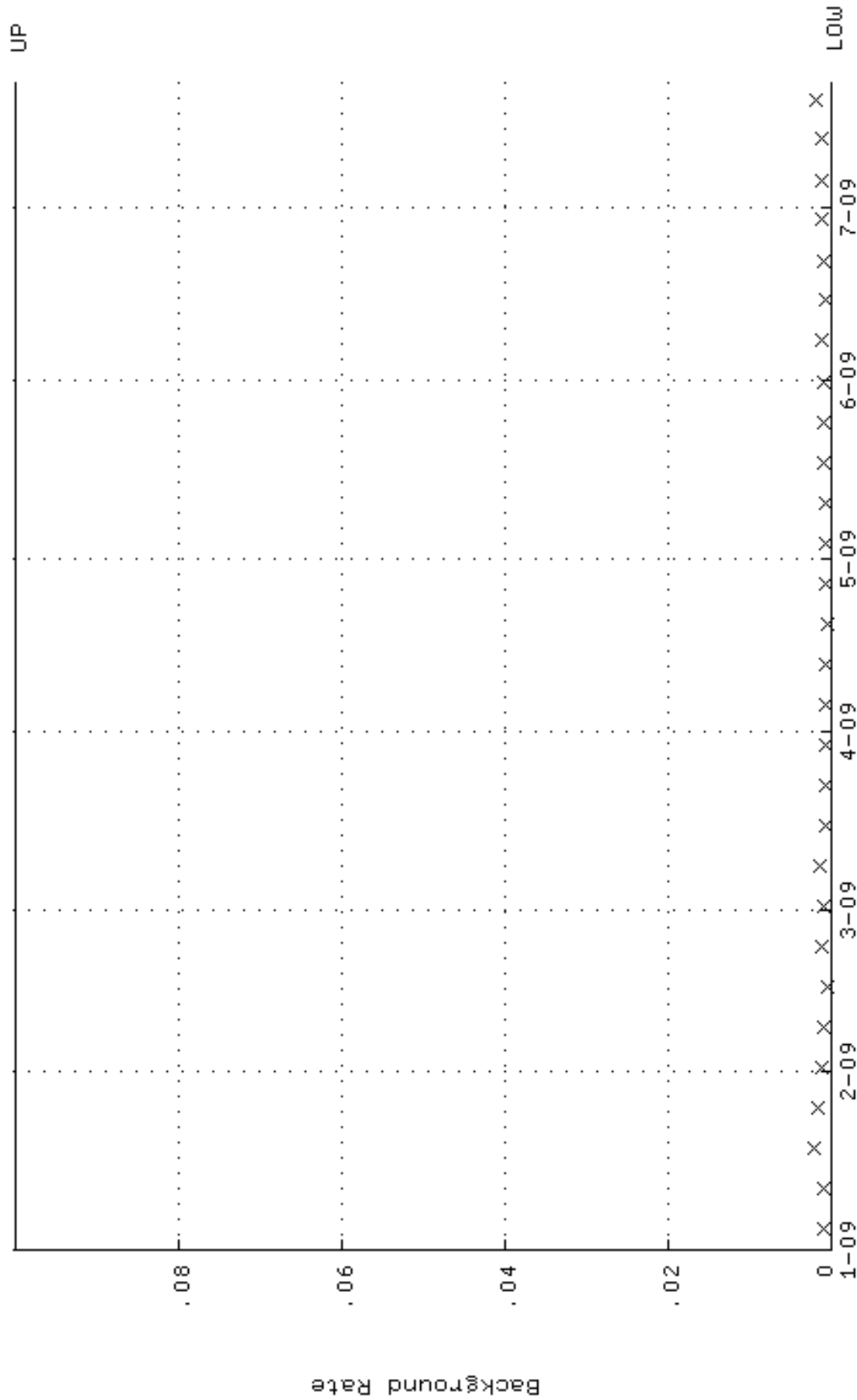
QA filename : DKA100:[ENV_ALPHA.QA.W]W196.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 6-JAN-2009 19:32:14 through 22-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.245168 through 0.265168



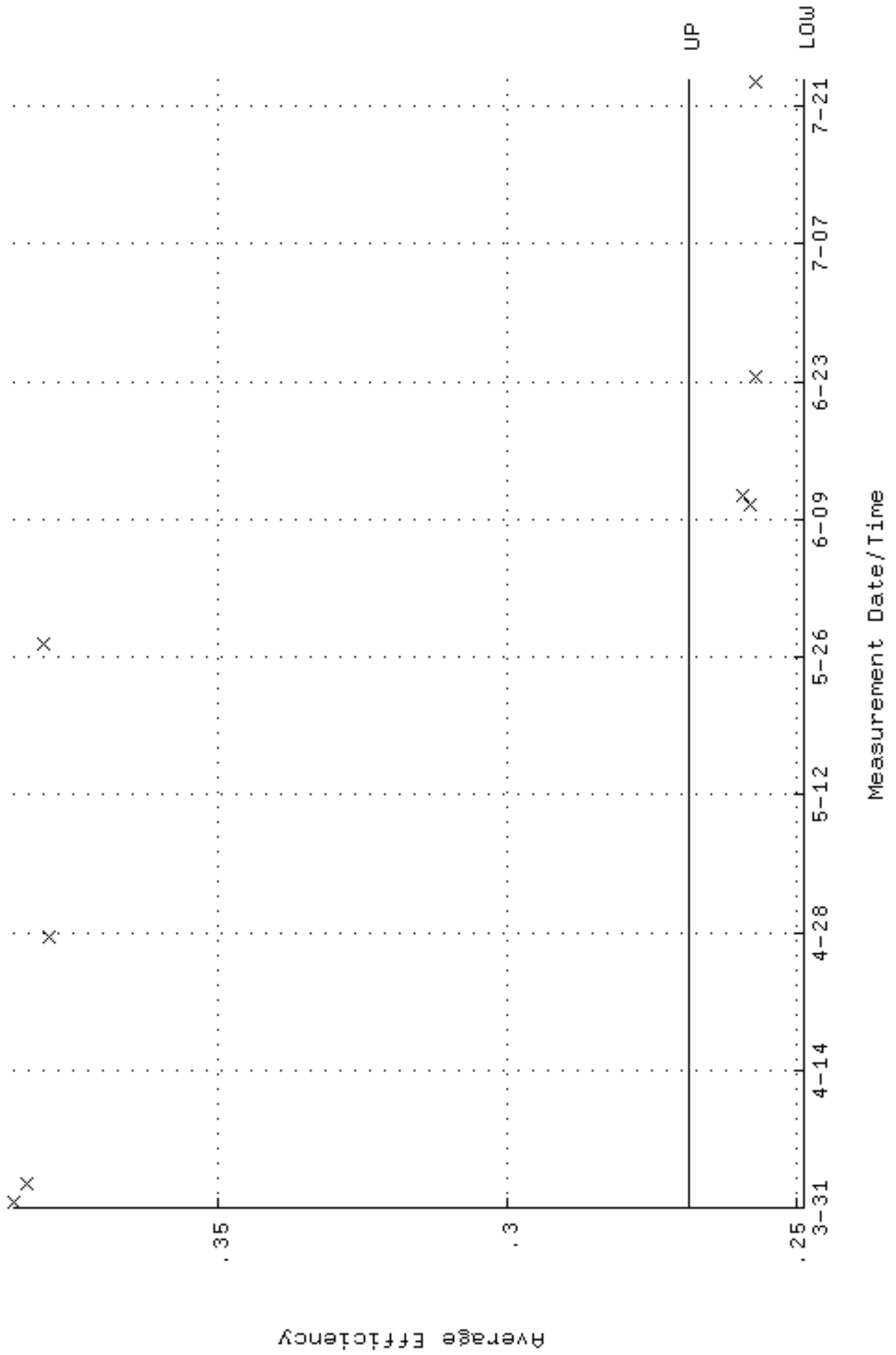
QA filename : DKA100:[ENV_ALPHA.QA.W]w196.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 6-JAN-2009 19:32:14 through 22-JUL-2009 12:00:00
 Lower/Upper Lmts: 85.8592 through 94.8970



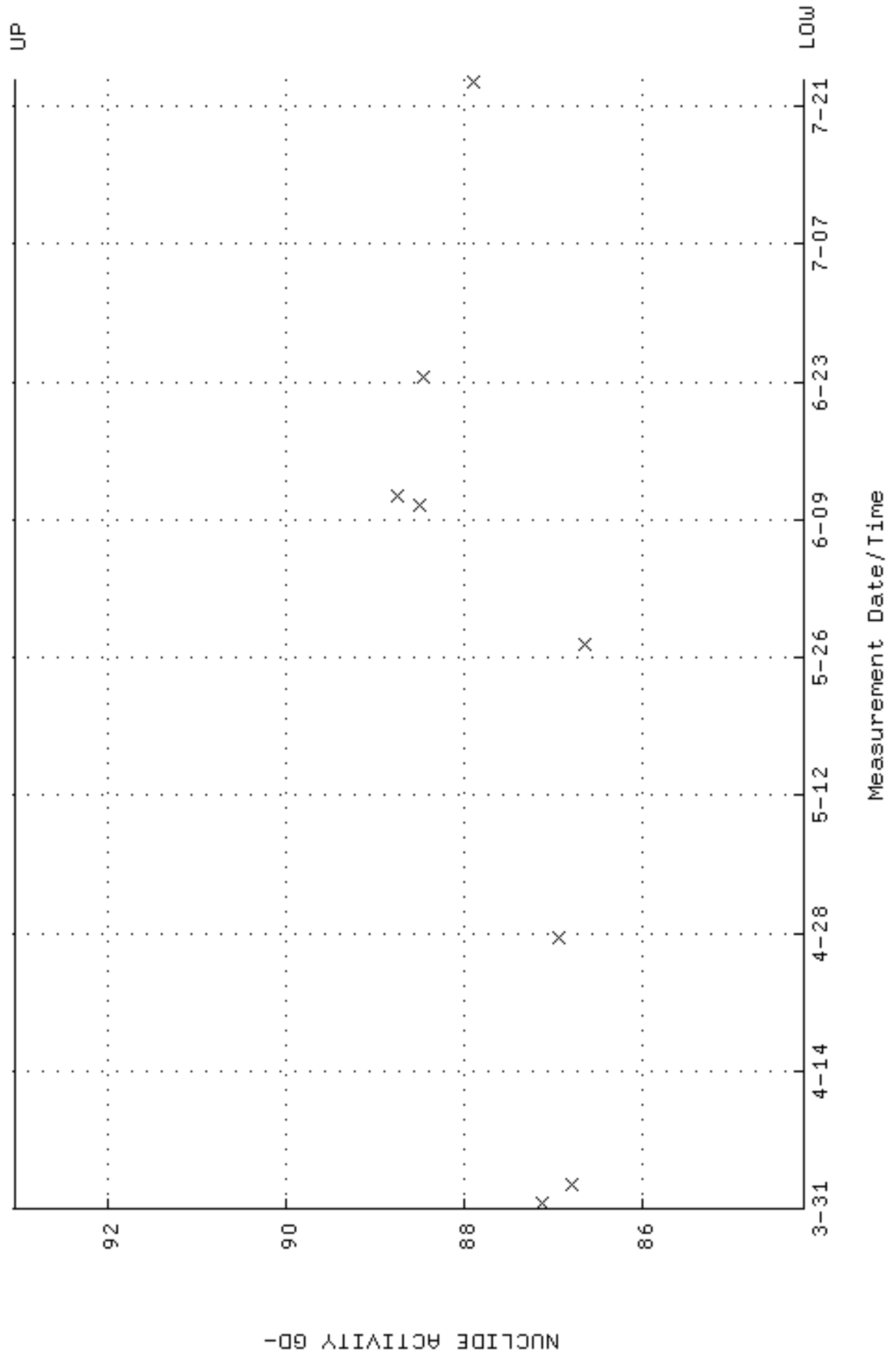
QA filename : DKA100:[ENV_ALPHA.QA.B]B196.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-JAN-2009 17:27:18 through 22-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



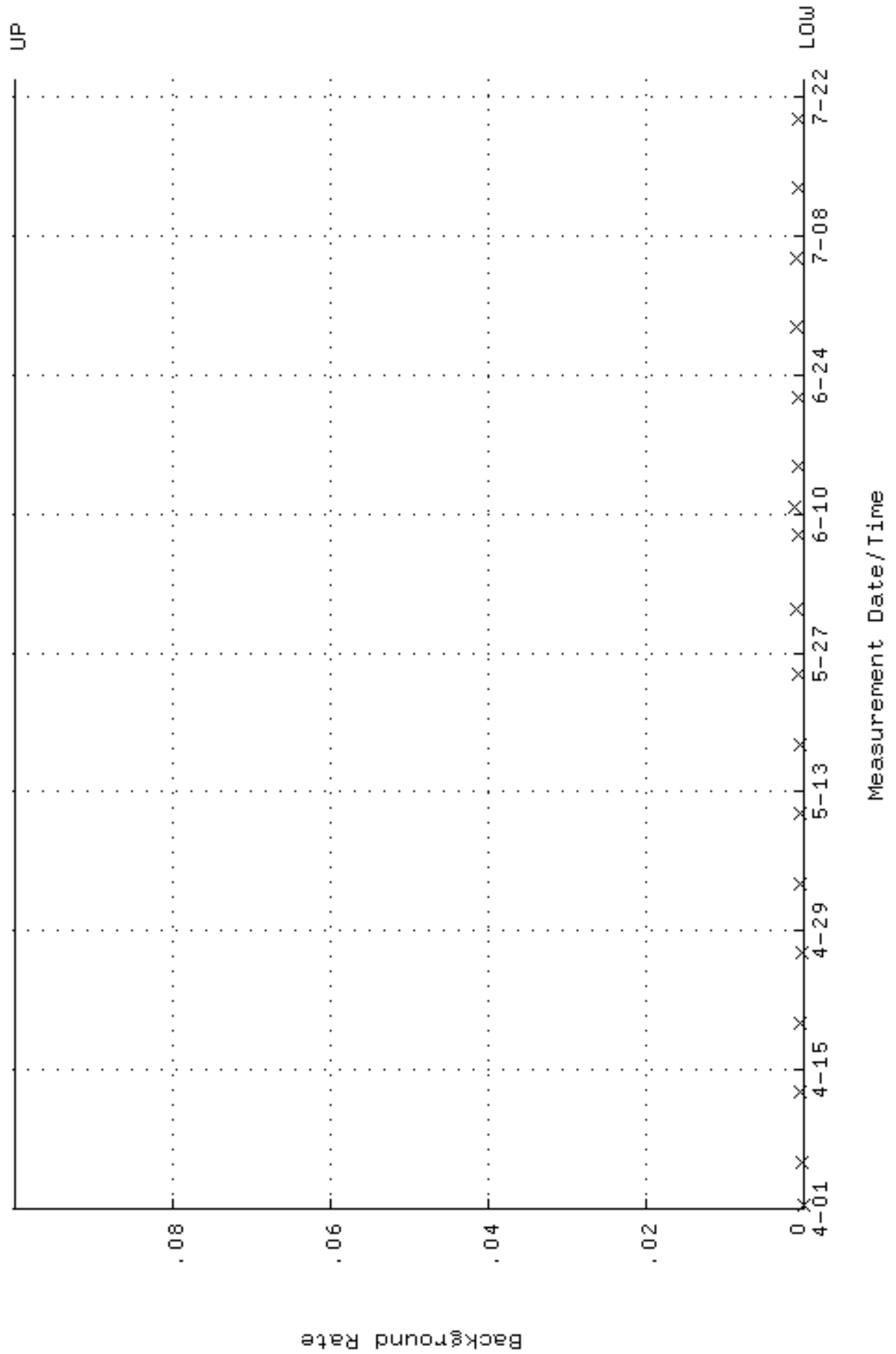
QA filename : DKA100:[ENV_ALPHA.QA.W]W197.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 31-MAR-2009 15:03:56 through 23-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.248572 through 0.268572



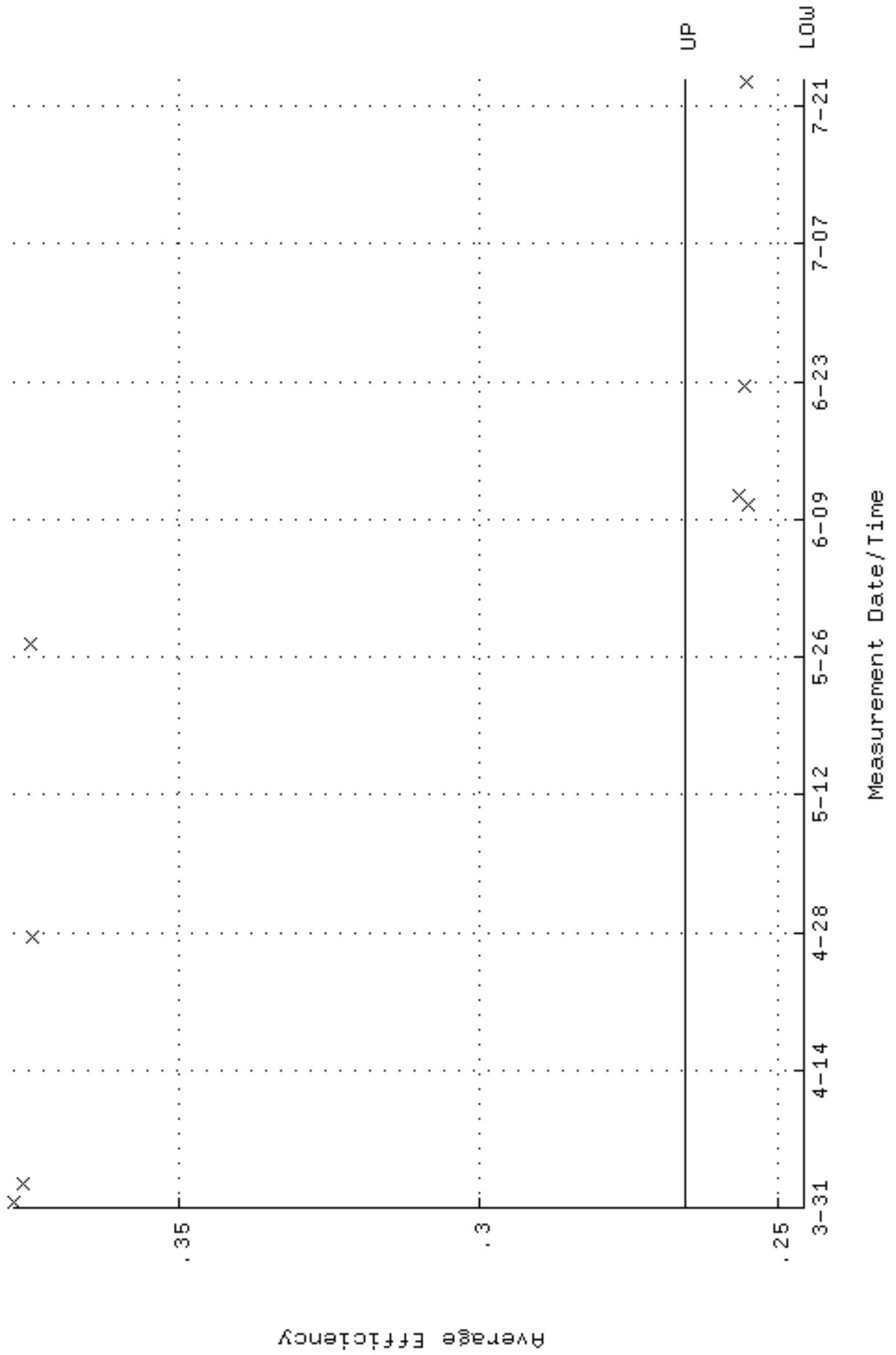
QA filename : DKA100:[ENV_ALPHA.QA.W]W197.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 31-MAR-2009 15:03:56 through 23-JUL-2009 12:00:00
 Lower/Upper Lmts: 84.1772 through 93.0380



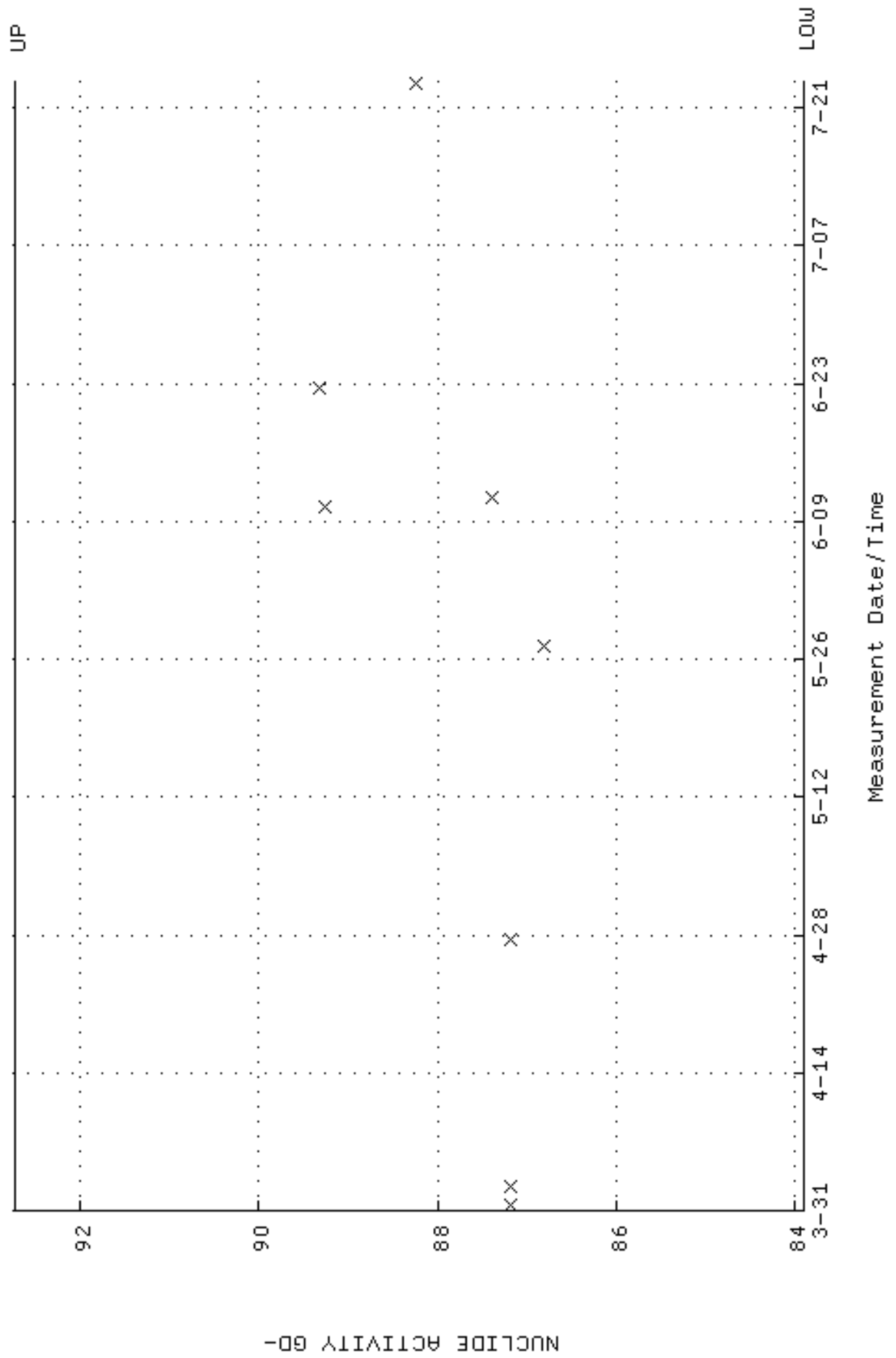
QA filename : DKA100:[ENV_ALPHA.QA.B]B197.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 1-APR-2009 08:02:18 through 23-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



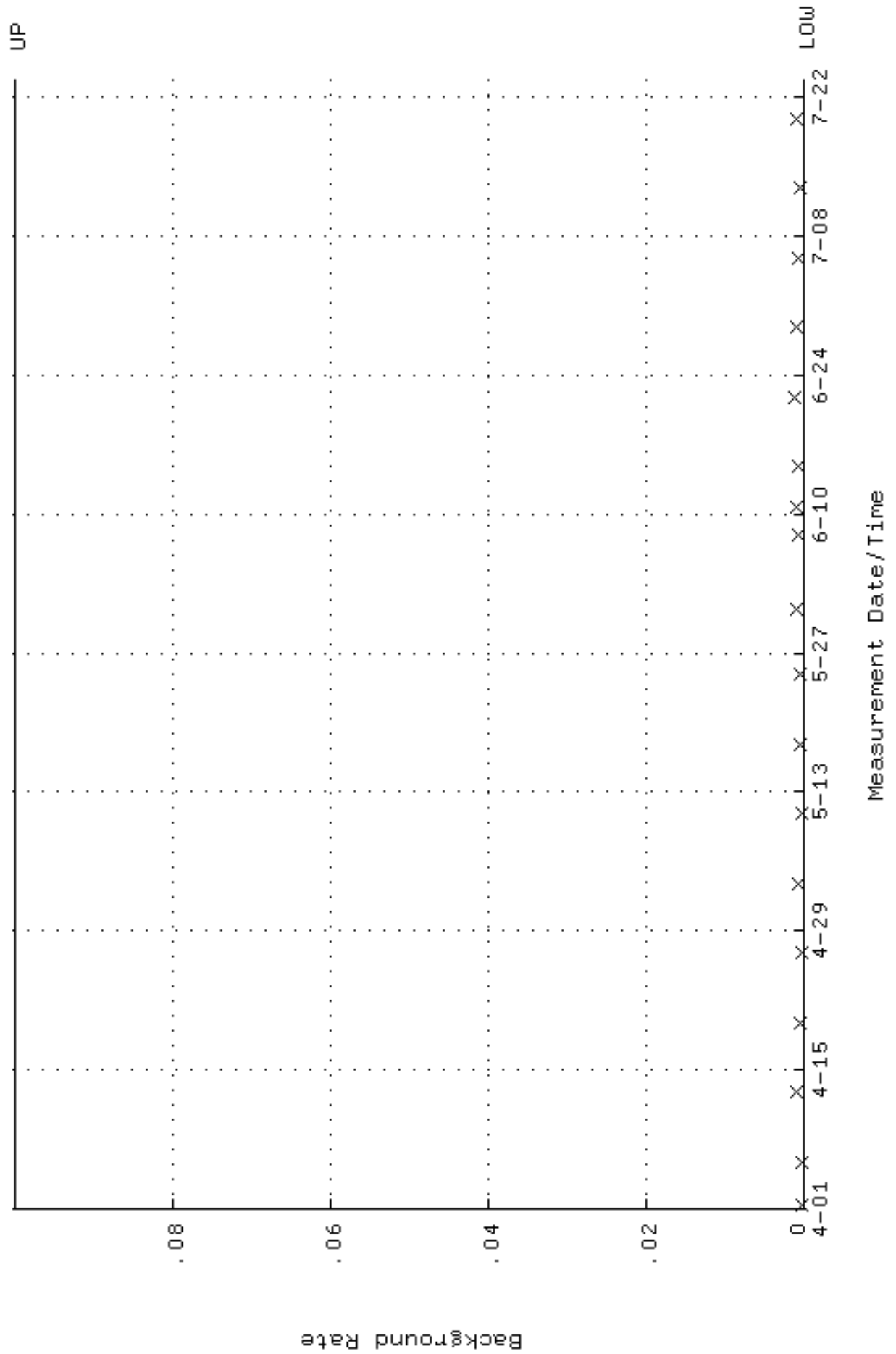
QA filename : DKA100:[ENV_ALPHA.QA.W]W198.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 31-MAR-2009 15:06:01 through 23-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.245817 through 0.265817



QA filename : DKA100:[ENV_ALPHA.QA.W]W198.QAF;1
 Parameter Name : NACTIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 31-MAR-2009 15:06:01 through 23-JUL-2009 12:00:00
 Lower/Upper Lmts: 83.8978 through 92.7292



QA filename : DKA100:[ENV_ALPHA.QA.B]B198.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 1-APR-2009 08:02:23 through 23-JUL-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



RUNLOGS

Instrument Run Log

Instrument Type: GFPC

Batch ID: 888441

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
1201889164	LCS	JXC5	PIC2B	31-JUL-09 16:08	DONE	CeF on 25mm Filter	02-JUL-09 00:00
1201889163	MB	JXC5	PIC5D	31-JUL-09 16:08	DONE	CeF on 25mm Filter	02-JUL-09 00:00
1201889165	LCSD	JXC5	PIC6B	31-JUL-09 16:08	DONE	CeF on 25mm Filter	02-JUL-09 00:00
233587021	SAMPLE	JXC5	PIC4A	31-JUL-09 16:08	DONE	CeF on 25mm Filter	02-JUL-09 00:00
233612013	SAMPLE	JXC5	PIC4C	31-JUL-09 16:09	DONE	CeF on 25mm Filter	02-JUL-09 00:00
233612014	SAMPLE	JXC5	PIC4D	31-JUL-09 16:09	DONE	CeF on 25mm Filter	02-JUL-09 00:00
233612021	SAMPLE	JXC5	PIC5A	31-JUL-09 16:09	DONE	CeF on 25mm Filter	02-JUL-09 00:00
233960004	SAMPLE	JXC5	PIC5B	31-JUL-09 16:09	DONE	CeF on 25mm Filter	02-JUL-09 00:00
233960014	SAMPLE	JXC5	PIC5C	31-JUL-09 16:09	DONE	CeF on 25mm Filter	02-JUL-09 00:00

Instrument Run Log

Instrument Type: GFPC

Batch ID: 888747

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
233960005	SAMPLE	JXC5	PIC5C	10-AUG-09 11:16	DONE	CeF on 25mm Filter	02-JUL-09 00:00
233960006	SAMPLE	JXC5	PIC5D	10-AUG-09 11:16	DONE	CeF on 25mm Filter	02-JUL-09 00:00
233960007	SAMPLE	JXC5	PIC7A	10-AUG-09 11:16	DONE	CeF on 25mm Filter	02-JUL-09 00:00
233960008	SAMPLE	JXC5	PIC7B	10-AUG-09 11:16	DONE	CeF on 25mm Filter	02-JUL-09 00:00
233960010	SAMPLE	JXC5	PIC7D	10-AUG-09 11:16	DONE	CeF on 25mm Filter	02-JUL-09 00:00
233960013	SAMPLE	JXC5	PIC9B	10-AUG-09 11:17	DONE	CeF on 25mm Filter	02-JUL-09 00:00
233960015	SAMPLE	JXC5	PIC10A	10-AUG-09 11:17	DONE	CeF on 25mm Filter	02-JUL-09 00:00
233960016	SAMPLE	JXC5	PIC10B	10-AUG-09 11:17	DONE	CeF on 25mm Filter	02-JUL-09 00:00
233960017	SAMPLE	JXC5	PIC2B	10-AUG-09 11:22	DONE	CeF on 25mm Filter	02-JUL-09 00:00
233960018	SAMPLE	JXC5	PIC3D	10-AUG-09 11:36	DONE	CeF on 25mm Filter	02-JUL-09 00:00
233960020	SAMPLE	JXC5	PIC1D	10-AUG-09 11:42	DONE	CeF on 25mm Filter	02-JUL-09 00:00
1201889924	DUP	JXC5	PIC2C	10-AUG-09 11:43	DONE	CeF on 25mm Filter	02-JUL-09 00:00
1201889925	MS	JXC5	PIC2D	10-AUG-09 11:43	DONE	CeF on 25mm Filter	02-JUL-09 00:00
233960001	SAMPLE	JXC5	PIC2A	10-AUG-09 15:44	DONE	CeF on 25mm Filter	02-JUL-09 00:00
233960002	SAMPLE	JXC5	PIC2B	10-AUG-09 15:44	DONE	CeF on 25mm Filter	02-JUL-09 00:00
233960003	SAMPLE	JXC5	PIC2C	10-AUG-09 15:44	DONE	CeF on 25mm Filter	02-JUL-09 00:00
233960009	SAMPLE	JXC5	PIC2D	10-AUG-09 15:44	DONE	CeF on 25mm Filter	02-JUL-09 00:00
233960011	SAMPLE	JXC5	PIC3A	10-AUG-09 15:45	DONE	CeF on 25mm Filter	02-JUL-09 00:00
233960012	SAMPLE	JXC5	PIC3C	10-AUG-09 15:45	DONE	CeF on 25mm Filter	02-JUL-09 00:00
233960019	SAMPLE	JXC5	PIC7C	11-AUG-09 20:00	DONE	CeF on 25mm Filter	02-JUL-09 00:00
1201889923	MB	JXC5	PIC9C	11-AUG-09 20:00	DONE	CeF on 25mm Filter	02-JUL-09 00:00
1201889926	LCS	JXC5	PIC7D	11-AUG-09 20:00	DONE	CeF on 25mm Filter	02-JUL-09 00:00

Instrument Run Log

Instrument Type: ALPHA SPECTROMETER

Batch ID: 888842

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
233587015	SAMPLE	JXD2	1131	31-JUL-09 19:25	DONE		
233587021	SAMPLE	JXD2	1133	31-JUL-09 19:25	DONE		
233612013	SAMPLE	JXD2	1134	31-JUL-09 19:25	DONE		
233612014	SAMPLE	JXD2	1135	31-JUL-09 19:25	DUSE		
233612021	SAMPLE	JXD2	1136	31-JUL-09 19:25	DONE		
233960004	SAMPLE	JXD2	1137	31-JUL-09 19:25	DUSE		
233960014	SAMPLE	JXD2	1138	31-JUL-09 19:25	DONE		
1201890124	MB	JXD2	1139	31-JUL-09 19:25	DONE		
1201890131	LCS	JXD2	1140	31-JUL-09 19:25	DONE		
1201890138	LCSD	JXD2	1144	31-JUL-09 19:26	DONE		
233960004	SAMPLE	JXD2	1161	11-AUG-09 11:21	DONE		
233612014	SAMPLE	JXD2	1162	11-AUG-09 11:21	DONE		

Instrument Run Log

Instrument Type: LUCAS CELL DETECTOR

Batch ID: 889473

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
233587015	SAMPLE	KSD1	LUCAS4	14-AUG-09 13:45	DONE	Lucas Cell	02-MAR-09 00:00
233587021	SAMPLE	KSD1	LUCAS5	14-AUG-09 13:45	DONE	Lucas Cell	25-MAR-09 00:00
233612013	SAMPLE	KSD1	LUCAS6	14-AUG-09 13:45	DONE	Lucas Cell	04-AUG-09 00:00
233612014	SAMPLE	KSD1	LUCAS1	14-AUG-09 14:15	DONE	Lucas Cell	29-AUG-08 00:00
233612021	SAMPLE	KSD1	LUCAS2	14-AUG-09 14:15	DONE	Lucas Cell	19-DEC-08 00:00
233960004	SAMPLE	KSD1	LUCAS3	14-AUG-09 14:15	DONE	Lucas Cell	04-FEB-09 00:00
233960014	SAMPLE	KSD1	LUCAS4	14-AUG-09 14:15	DONE	Lucas Cell	02-MAR-09 00:00
1201891551	MB	KSD1	LUCAS5	14-AUG-09 14:15	DONE	Lucas Cell	25-MAR-09 00:00
1201891552	LCS	KSD1	LUCAS6	14-AUG-09 14:15	DONE	Lucas Cell	04-AUG-09 00:00
1201891553	LCSD	KSD1	LUCAS1	14-AUG-09 14:50	DONE	Lucas Cell	29-AUG-08 00:00

Instrument Run Log

Instrument Type: ALPHA SPECTROMETER

Batch ID: 890375

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
233960001	SAMPLE	MXA1	1156	08-AUG-09 15:53	DONE		
233960002	SAMPLE	MXA1	1157	08-AUG-09 15:53	DONE		
233960003	SAMPLE	MXA1	1158	08-AUG-09 15:53	DONE		
233960005	SAMPLE	MXA1	1159	08-AUG-09 15:53	DONE		
233960006	SAMPLE	MXA1	1161	08-AUG-09 15:53	DONE		
233960007	SAMPLE	MXA1	1162	08-AUG-09 15:53	DONE		
233960008	SAMPLE	MXA1	1163	08-AUG-09 15:53	DONE		
233960009	SAMPLE	MXA1	1164	08-AUG-09 15:53	DONE		
233960012	SAMPLE	MXA1	1167	08-AUG-09 15:53	DONE		
233960013	SAMPLE	MXA1	1168	08-AUG-09 15:53	DONE		
233960015	SAMPLE	MXA1	1169	08-AUG-09 15:53	DONE		
233960016	SAMPLE	MXA1	1170	08-AUG-09 15:53	DONE		
233960017	SAMPLE	MXA1	1171	08-AUG-09 15:53	DONE		
233960018	SAMPLE	MXA1	1172	08-AUG-09 15:54	DONE		
233960019	SAMPLE	MXA1	1007	08-AUG-09 16:19	DONE		
233960020	SAMPLE	MXA1	1008	08-AUG-09 16:19	DONE		
1201893646	MB	MXA1	1009	08-AUG-09 16:19	DONE		
1201893647	DUP	MXA1	1010	08-AUG-09 16:19	DONE		
1201893648	MS	MXA1	1011	08-AUG-09 16:19	DONE		
1201893649	LCS	MXA1	1012	08-AUG-09 16:19	DONE		
233960010	SAMPLE	MXA1	1114	10-AUG-09 14:11	DONE		
233960011	SAMPLE	MXA1	1160	10-AUG-09 14:11	DONE		

Instrument Run Log

Instrument Type: LUCAS CELL DETECTOR

Batch ID: 891163

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
233960001	SAMPLE	KSD1	LUCAS2	21-AUG-09 12:30	DONE	Lucas Cell	19-DEC-08 00:00
233960002	SAMPLE	KSD1	LUCAS3	21-AUG-09 12:30	DONE	Lucas Cell	04-FEB-09 00:00
233960003	SAMPLE	KSD1	LUCAS4	21-AUG-09 12:30	DONE	Lucas Cell	02-MAR-09 00:00
233960005	SAMPLE	KSD1	LUCAS5	21-AUG-09 12:30	DONE	Lucas Cell	25-MAR-09 00:00
233960006	SAMPLE	KSD1	LUCAS6	21-AUG-09 12:30	DONE	Lucas Cell	04-AUG-09 00:00
233960007	SAMPLE	KSD1	LUCAS2	21-AUG-09 13:05	DONE	Lucas Cell	19-DEC-08 00:00
233960008	SAMPLE	KSD1	LUCAS3	21-AUG-09 13:05	DONE	Lucas Cell	04-FEB-09 00:00
233960009	SAMPLE	KSD1	LUCAS4	21-AUG-09 13:05	DONE	Lucas Cell	02-MAR-09 00:00
233960010	SAMPLE	KSD1	LUCAS5	21-AUG-09 13:05	DONE	Lucas Cell	25-MAR-09 00:00
233960011	SAMPLE	KSD1	LUCAS6	21-AUG-09 13:05	DONE	Lucas Cell	04-AUG-09 00:00
233960012	SAMPLE	KSD1	LUCAS2	21-AUG-09 13:35	DONE	Lucas Cell	19-DEC-08 00:00
233960013	SAMPLE	KSD1	LUCAS3	21-AUG-09 13:35	DONE	Lucas Cell	04-FEB-09 00:00
233960015	SAMPLE	KSD1	LUCAS4	21-AUG-09 13:35	DONE	Lucas Cell	02-MAR-09 00:00
233960016	SAMPLE	KSD1	LUCAS5	21-AUG-09 13:35	DONE	Lucas Cell	25-MAR-09 00:00
233960017	SAMPLE	KSD1	LUCAS6	21-AUG-09 13:35	DONE	Lucas Cell	04-AUG-09 00:00
233960018	SAMPLE	KSD1	LUCAS2	21-AUG-09 14:10	DONE	Lucas Cell	19-DEC-08 00:00
233960019	SAMPLE	KSD1	LUCAS3	21-AUG-09 14:10	DONE	Lucas Cell	04-FEB-09 00:00
233960020	SAMPLE	KSD1	LUCAS4	21-AUG-09 14:10	DONE	Lucas Cell	02-MAR-09 00:00
1201895479	MB	KSD1	LUCAS5	21-AUG-09 14:10	DONE	Lucas Cell	25-MAR-09 00:00
1201895480	DUP	KSD1	LUCAS6	21-AUG-09 14:10	DONE	Lucas Cell	04-AUG-09 00:00
1201895481	MS	KSD1	LUCAS2	21-AUG-09 14:40	DONE	Lucas Cell	19-DEC-08 00:00
1201895482	LCS	KSD1	LUCAS3	21-AUG-09 14:40	DONE	Lucas Cell	04-FEB-09 00:00

Instrument Run Log

Instrument Type: ALPHA SPECTROMETER

Batch ID: 891790

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
233587021	SAMPLE	JXD2	1187	12-AUG-09 19:05	DONE		
233612013	SAMPLE	JXD2	1188	12-AUG-09 19:05	DONE		
233612014	SAMPLE	JXD2	1189	12-AUG-09 19:05	DONE		
233612021	SAMPLE	JXD2	1190	12-AUG-09 19:05	DONE		
233960004	SAMPLE	JXD2	1191	12-AUG-09 19:05	DONE		
233960014	SAMPLE	JXD2	1192	12-AUG-09 19:05	DONE		
234120018	SAMPLE	JXD2	1193	12-AUG-09 19:05	DONE		
1201896963	MB	JXD2	1194	12-AUG-09 19:05	DONE		
1201896964	LCS	JXD2	1195	12-AUG-09 19:05	DONE		
1201896965	LCSD	JXD2	1196	12-AUG-09 19:05	DONE		

Instrument Run Log

Instrument Type: ALPHA SPECTROMETER

Batch ID: 895332

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
233960001	SAMPLE	MXA1	1173	20-AUG-09 20:36	DONE		
233960002	SAMPLE	MXA1	1174	20-AUG-09 20:36	DONE		
233960003	SAMPLE	MXA1	1175	20-AUG-09 20:36	DONE		
233960005	SAMPLE	MXA1	1176	20-AUG-09 20:36	DONE		
233960006	SAMPLE	MXA1	1177	20-AUG-09 20:36	DONE		
233960007	SAMPLE	MXA1	1178	20-AUG-09 20:36	DONE		
233960008	SAMPLE	MXA1	1179	20-AUG-09 20:36	DONE		
233960009	SAMPLE	MXA1	1180	20-AUG-09 20:36	DONE		
233960010	SAMPLE	MXA1	1181	20-AUG-09 20:36	DONE		
233960011	SAMPLE	MXA1	1182	20-AUG-09 20:36	DONE		
233960012	SAMPLE	MXA1	1183	20-AUG-09 20:36	DONE		
233960013	SAMPLE	MXA1	1184	20-AUG-09 20:36	DONE		
233960015	SAMPLE	MXA1	1185	20-AUG-09 20:36	DONE		
233960016	SAMPLE	MXA1	1186	20-AUG-09 20:36	DONE		
233960017	SAMPLE	MXA1	1191	20-AUG-09 20:36	DONE		
233960018	SAMPLE	MXA1	1192	20-AUG-09 20:36	DONE		
233960019	SAMPLE	MXA1	1193	20-AUG-09 20:36	DONE		
233960020	SAMPLE	MXA1	1194	20-AUG-09 20:36	DONE		
1201905854	MB	MXA1	1195	20-AUG-09 20:36	DUSE		
1201905855	DUP	MXA1	1196	20-AUG-09 20:36	DONE		
1201905856	MS	MXA1	1197	20-AUG-09 20:36	DONE		
1201905857	LCS	MXA1	1198	20-AUG-09 20:36	DONE		
1201905854	MB	MXA1	1198	21-AUG-09 14:45	DONE		