GEL Laboratories LLC

a member of The GEL Group INC

PO Box 30712 Charleston, SC 29417
2040 Savage Road Charleston, SC 29407

P 843.556.8171 F 843.766.1178

www.gel.com

September 30, 2009

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

Re: Tronox Henderson
Work Order: 236077

Dear Mr. Hagar:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on August 27, 2009, August 28, 2009, September 01, 2009 and September 02, 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 M. Kent

Edith Kent
Project Manager

Chain of Custody: 2027.001.00500, 2027.001.00591, 2027.001.00639, 2027.001.00647, 2027.001.00671, 2027.001.00673, 2027.001.00675 and 2027.001.00689
Enclosures

Tronox LLC
Tronox Henderson
SDG:236077

Table of Contents

Case Narrative

CASE NARRATIVE
for
Tronox LLC
Tronox Henderson
SDG:236077

September 30, 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 August 27, 2009, August 28, 2009, September 01, 2009 and September 02, 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 was a discrepancy between the sample ID on the sample container and on the chain of custody for sample SA68009-25B. The client was notified and verified that the ID on the chain of custody was correct. Please refer to the attached e-mail for further details.

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 September 2, 2009 and the turnaround time would start from then.

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: 236077010, 236077014 and 236077019. For the water Uranium batch, the method blank, the LCS, and the LCS DUP did not meet the Tronox QA program tracer yield requirements of 70-120% with recoveries of 48.3%, 65.5%, and 42.5% respectively. The LCS and LCS DUP met their respective spike recovery requirements and duplicate. The contract uncertainty requirements were met and the samples were counted the maximum count time. The group leader was consulted and results were further evaluated and determined to be of good statistical quality. Please refer to the attached e-mail for further details. 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: 236077008, 236077011, 236077012, 236077016, 236077018 and 236077020. 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: 236077003, 236077007 and 236077014. 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: 236077007 and 236077017. 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: and 236077013. 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: 236077009, 236077014 and 236077015. For the soil Thorium batch, there were following Tronox QA program issues: the lab DUP did not meet the contract tracer yield requirements of 70-120%; sample 236077020 and the lab DUP did not meet the contract %RPD for Th-228 but met the RER requirement; the method blank did not meet the contract detection limit requirements due to keeping the blank volume consistent with the sample aliquots. For the water Thorium batch, the method blank did not meet the Tronox QA program detection limit requirements due to keeping the blank aliquot

consistent with the samples. For the soil Uranium batch, there were following Tronox QA program issues: the matrix spike, 236077001, 236077003, 236077005, 236077007, 236077009, 236077012, 236077015, 236077016, 236077017 did not meet the contract tracer yield requirements of 70-120%; the lab DUP did not meet the contract uncertainty of <30% with activity between 2 and 5 times the MDA.

Sample Identification
The laboratory received the following samples:

Laboratory ID	Client ID
236077001	RSAS3-0.5B
236077002	RSAS3009-0.5B
236077003	RSAS3-10B
236077004	RSAS3-25B
236077005	RSAS3-44B
236077006	RSAT6-10B
236077007	RSAT6-30B
236077008	RSAT6-49B
236077009	SA210-0.5B
236077010	SA210-10B
236077011	SA210-30B
236077012	SA210-49B
236077013	EB082709-SO1
236077014	SA68-0.5B
236077015	SA68-10B
236077016	SA68-25B
236077017	SA68009-25B
236077018	SA68-36B
236077019	EB083109-SO1
236077020	SA133-31B
236077021	EB090109-SO1

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

northgate
environmental management, inc.
1100 Quail Street, Suite 102, Newport Beach, CA 92660
(949) 260-9293

2360777

CHAIN-OF-CUSTODY / Analytical Request Document

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

COC No. 2027.001.00647
Page: 1 of 1
Cooler # 1 of 1
Collection Area: IV

Required Ship to Lab:		Required Project Information:		Required Invoice Information:			
Lab Name:	GEL Laboratories, LLC	Site ID #:	TRONOX LLC. HENDERSON	Send Invoice to:	Susan Crowley Tronox LLC	TAT: Standard 30 day	X Rush ___ Mark One
Address:	2040 Savage Road	Project #	2027.001	Address:	PO Box 55	If Rush, Date due	
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?	X	Non-reimbursement project? ___ Mark one	NJ Reduced Deliverable Package?
Phone/Fax:	(843)556-8171	Site PM Name	Derrick Willis	Send EDD to	Frank Hagar Northgate Environmental Management, Inc frank.hagar@ngem.com	MA MCP Cert? ___	CT RCP Cert? ___ Mark One
Lab PM email	emk@gel.com	Phone/Fax:	949-375-7004	CC Hardcopy report to	PDF Electronic Version Only	Lab Project ID (lab use)	
Applicable Lab Quote #:		Site PM Email:	derrick.willis@ngem.com	CC Hardcopy report to	see additional comments below		

Valid Matrix Codes: MATRIX — DRINKING WATER WP; GROUND WATER WG; WASTE WATER WW; FREE PRODUCT FP; SOIL SO; OIL OL; WIPE WI; AMBIENT AIR AA; SVE AIR SV; SOIL GAS SG; WATER W; SURFACE WATER WS; GC WATER QC WQ; SLUDGE SL; RINSEATE WH; OTHER OT; ANIMAL TISSUE TA

ITEM #	SAMPLE ID (One Character per box. (A-Z, 0-9 / ,-) Samples IDs MUST BE UNIQUE)	MATRIX CODE	SAMPLE TYPE G=GRAB C=COMP	SAMPLE DATE	SAMPLE TIME	#OF CONTAINERS	FIELD FILTERED? (Y/N)	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Requested Analyses: EPA 903.1 Radium-226	EPA 904.0 Radium-226	Radionuclides*	Comments/Lab Sample I.D.
1	RSAS3-0.5B	SO	G	8/26/2009	6:56	1	N	X								X	X	X	250 ml Plastic jar
2	RSAS3009-0.5B	SO	G	8/26/2009	6:56	1	N	X								X	X	X	250 ml Plastic jar
3	RSAS3-10B	SO	G	8/26/2009	8:23	1	N	X								X	X	X	250 ml Plastic jar
4	RSAS3-25B	SO	G	8/26/2009	8:59	1	N	X								X	X	X	250 ml Plastic jar
5	RSAS3-44B	SO	G	8/26/2009	9:45	1	N	X								X	X	X	250 ml Plastic jar
6																			
7																			
8																			
9																			
10																			
11																			
12																			
13																			

DRB 8-26-09

5

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.arnold@ngem.com & frank.hagar@ngem.com

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
Dana Brown, NGEM	26-Aug	14:55	[illegible] GEL	8/26	1455
[illegible] GEL	8/26	1600	Mike Kaufman GEL	8-27-09	0840

SHIPPING METHOD: UPS COURIER (FEDEX) US MAIL

SAMPLER NAME AND SIGNATURE:
PRINT Name of SAMPLER: Dana R. Brown
SIGNATURE of SAMPLER:
DATE Signed: 8/26/2009
Time: 14:55

Sample Receipt Conditions

	Temp in OC	Samples on Ice?	Sample intact?	Trip Blank?
		Y/N	Y/N	Y/N
	23°	Y/(N)	(Y)/N	Y/(N)
		Y/N	Y/N	Y/N
		Y/N	Y/N	Y/N

GEL | Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client: Kerr/Northgate	**SDG/ARCOC/Work Order:** 236077
Received By: MK	**Date Received:** 8-27-09

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?		✓	Maximum Counts Observed*: cpm 30
Classified Radioactive II or III by RSO?		✓	
COC/Samples marked containing PCBs?		✓	
Shipped as a DOT Hazardous?		✓	Hazard Class Shipped: UN#:
Samples identified as Foreign Soil?		✓	

	Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	✓			Circle Applicable: seals broken / damaged container / leaking container / other (describe)
2	Samples requiring cold preservation within 0 ≤ 6 deg. C?		✓		Preservation Method: ice bags / blue ice / dry ice / ~~none~~ / other (describe) 23 C
3	Chain of custody documents included with shipment?	✓			
4	Sample containers intact and sealed?	✓			Circle Applicable: seals broken / damaged container / leaking container / other (describe)
5	Samples requiring chemical preservation at proper pH?		✓		Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6	VOA vials free of headspace (defined as < 6mm bubble)?		✓		Sample ID's and containers affected:
7	Are Encore containers present?			✓	(If yes, immediately deliver to Volatiles laboratory)
8	Samples received within holding time?	✓			Id's and tests affected:
9	Sample ID's on COC match ID's on bottles?	✓			Sample ID's and containers affected:
10	Date & time on COC match date & time on bottles?	✓			Sample ID's affected:
11	Number of containers received match number indicated on COC?	✓			Sample ID's affected:
12	COC form is properly signed in relinquished/received sections?	✓			

Comments:

FX 7978 8266 9481

PM (or PMA) review: Initials EM Date 8/27/09

2360779

200908536837

CHAIN-OF-CUSTODY / Analytical Request Document

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

COC No. 2027.001.00675
Page: 1 of 1
Cooler # 1 of 1
Collection Area: IV

northgate
environmental management, inc.
1100 Quail Street, Suite 102, Newport Beach, CA 92660
(949) 260-9293

Required Ship to Lab:		Required Project Information:		Required Invoice Information:			
Lab Name:	GEL Laboratories, LLC	Site ID #:	TRONOX LLC. HENDERSON	Send Invoice to:	Susan Crowley Tronox LLC	TAT: Standard 30 day	X
Address:	2040 Savage Road	Project #	2027.001	Address:	PO Box 55	If Rush, Date due	
Charleston, SC 29407		Site Address	560 W. Lake Mead Drive	City/State	Henderson, NV 89009	Phone #:	(949) 260-9293
Lab PM:	Edith M. Kent	City	Henderson	State	NV	Reimbursement project?	X
Phone/Fax:	(843) 556-8171	Site PM Name	Derrick Willis	Send EDD to	Frank Hagar Northgate Environmental Management, Inc frank.hagar@ngem.com		
Lab PM email	emk@gel.com	Phone/Fax:	(949) 375-7004	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		

Rush		Mark One
Non-reimbursement project?		Mark one
QC level Required: Standard		Special
NJ Reduced Deliverable Package?		
MA MCP Cert?		CT RCP Cert?

Special	EPA Stage 4	Mark one
		Mark One

Lab Project ID (lab use)

Valid Matrix Codes: MATRIX — DRINKING WATER WP; GROUND WATER WG; WASTE WATER LF; FREE PRODUCT OIL; SOIL SW; OIL AA; WIPE AE; AMBIENT AIR; SVE AIR; SOIL GAS; WATER W; SURFACE WATER WS; SC WATER QC WQ; SLUDGE SL; RINSEATE WH; OTHER OT; GS ANIMAL TISSUE TA

ITEM #	SAMPLE ID (One Character per box. (A-Z, 0-9 / ,-) Samples IDs MUST BE UNIQUE)	MATRIX CODE	SAMPLE TYPE G=GRAB C=COMP	SAMPLE DATE	SAMPLE TIME	#OF CONTAINERS	FIELD FILTERED? (Y/N)	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Requested Analyses: EPA903.1 Radium-226	EPA904.0 Radium-228	Radionuclides*	Comments/Lab Sample I.D.
1	RSAT6-10B	SO	G	8/27/2009	11:26	1	N	X								X	X	X	250 ml Plastic jar
2	RSAT6-30B	SO	G	8/27/2009	14:23	1	N	X								X	X	X	250 ml Plastic jar
3	RSAT6-49B	SO	G	8/27/2009	15:02	1	N	X								X	X	X	250 ml Plastic jar
4																			
5																			
6																			
7	DRB 8-27-09																		
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.arnold@ngem.com & frank.hagar@ngem.com

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
Dana R Brown, NGEM	27-Aug	16:30	GES	8/27	1630
GES	8/27	1700	GEL	8-28-09	0845

Sample Receipt Conditions

	Y/N	Y/N	Y/N
2.4°	Y(N)	(Y)N	(Y)N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N

SHIPPING METHOD (check appropriate) — SAMPLER NAME AND SIGNATURE

UPS COURIER FEDEX
US MAIL

PRINT Name of SAMPLER: Dana R. Brown
SIGNATURE of SAMPLER:
DATE Signed: 8/27/2009
Time: 16:30

Temp in OC	Samples on Ice?	Sample Intact?	Trip Blank?

northgate
environmental management, inc.

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

CHAIN-OF-CUSTODY / Analytical Request Document

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COC No. 2027.001.00671
Page: 1 of 1
Cooler # 1 of 1
Collection Area: II

Required Ship to Lab:		Required Project Information:		Required Invoice Information:			
Lab Name:	GEL Laboratories, LLC	Site ID #:	TRONOX LLC. HENDERSON	Send Invoice to:	Susan Crowley Tronox LLC	TAT: Standard 30 day	X Rush ____ Mark One
Address:	2040 Savage Road	Project #	2027.001	Address:	PO Box 55	If Rush, Date due	
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?	X Non-reimbursement project? ____ Mark one	NJ Reduced Deliverable Package?	
Phone/Fax:	(843) 556-8171	Site PM Name	Derrick Willis	Send EDD to	Frank Hagar Northgate Environmental Management, Inc frank.hagar@ngem.com	MA MCP Cert? ____ CT RCP Cert? ____ Mark One	
Lab PM email	emk@gel.com	Phone/Fax:	(949) 375-7004	CC Hardcopy report to	PDF Electronic Version Only	Lab Project ID (lab use)	
Applicable Lab Quote #:		Site PM Email:	derrick.willis@ngem.com	CC Hardcopy report to	see additional comments below		

Valid Matrix Codes: DRINKING WATER WP; GROUND WATER WG; WASTE WATER LF; FREE PRODUCT OIL; SOIL SW; OIL AA; WIPE AE; AMBIENT AIR; SVE AIR; SOIL GAS; WATER W; SURFACE WATER WS; SC WATER QC WQ; SLUDGE SL; RINSEATE WH; OTHER OT; ANIMAL TISSUE TA

ITEM #	SAMPLE ID (One Character per box. (A-Z, 0-9 / ,-) Samples IDs MUST BE UNIQUE)	MATRIX CODE	SAMPLE TYPE G=GRAB C=COMP	SAMPLE DATE	SAMPLE TIME	#OF CONTAINERS	FIELD FILTERED? (Y/N)	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Requested Analyses: EPA903.1 Radium-226	EPA904.0 Radium 228	Radionuclides*				Comments/Lab Sample I.D.
1	SA210-0.5B	SO	G	8/27/2009	7:50	1	N	X								X	X	X				250 ml Plastic jar
2	SA210-10B	SO	G	8/27/2009	8:00	1	N	X								X	X	X				250 ml Plastic jar
3	SA210-30B	SO	G	8/27/2009	8:29	1	N	X								X	X	X				250 ml Plastic jar
4	SA210-49B	SO	G	8/27/2009	9:34	1	N	X								X	X	X				250 ml Plastic jar
5																						
6																						
7																						
8	DRB 8-27-09																					
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.arnold@ngem.com & frank.hagar@ngem.com

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
Dana R. Brown, NGEM	27-Aug	16:30	[illegible] GEL	8/27	1630
[illegible]	8/27	1700	[illegible] GEL	828/09	0845

Sample Receipt Conditions

	Temp in OC	Samples on Ice?	Sample intact?	Trip Blank?
		Y/N	Y/N	Y/N
	24C	Y/N	Y/N	Y/N
		Y/N	Y/N	Y/N
		Y/N	Y/N	Y/N

SAMPLE SHIPPED VIA: UPS COURIER FEDEX US MAIL

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER: Dana R. Brown
SIGNATURE of SAMPLER: [signature]
DATE Signed: 8/27/2009 Time: 16:30

GEL Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client: Kerr/Northgate	**SDG/ARCOC/Work Order:** 236077
Received By: MK	**Date Received:** 8-28-09

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?		✓	Maximum Counts Observed*: Cpm 20
Classified Radioactive II or III by RSO?		✓	
COC/Samples marked containing PCBs?		✓	
Shipped as a DOT Hazardous?		✓	Hazard Class Shipped: UN#:
Samples identified as Foreign Soil?		✓	

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

Comments:

FX 7978 8688 1575

PM (or PMA) review: Initials EM Date 8/28/09

northgate
environmental management, inc.
1100 Quail Street, Suite 102, Newport Beach, CA 92660
(949) 260-9293

CHAIN-OF-CUSTODY / Analytical Request Document

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COC No. 2027.001.00673
Page: 1 of 1
Cooler # 1 of 1
Collection Area: IV

Required Ship to Lab:		Required Project Information:		Required Invoice Information:					
Lab Name:	GEL Laboratories, LLC	Site ID #:	TRONOX LLC. HENDERSON	Send Invoice to:	Susan Crowley Tronox LLC	TAT: Standard 30 day	X	Rush	Mark One
Address:	2040 Savage Road	Project #	2027.001	Address:	PO Box 55	If Rush, Date due			
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?	X	Non-reimbursement project?	Mark one
Phone/Fax:	(843)556-8171	Site PM Name	Derrick Willis	Send EDD to	Frank Hagar Northgate Environmental Management, Inc frank.hagar@ngem.com	NJ Reduced Deliverable Package?			
Lab PM email	emk@gel.com	Phone/Fax:	949-375-7004	CC Hardcopy report to	PDF Electronic Version Only	MA MCP Cert?		CT RCP Cert?	Mark One
Applicable Lab Quote #:		Site PM Email:	derrick.willis@ngem.com	CC Hardcopy report to	see additional comments below	Lab Project ID (lab use)			

Valid Matrix Codes: MATRIX — DRINKING WATER (WP), GROUND WATER (WG), WASTE WATER (LF), FREE PRODUCT (OL), SOIL (SW), OIL (AA), WIPE (AE), AMBIENT AIR (GS), SVE AIR, SOIL GAS; MATRIX — WATER (W), SURFACE WATER (WS), WATER QC (WQ), SLUDGE (SL), RINSEATE (WH), OTHER (OT), ANIMAL TISSUE (TA)

ITEM #	SAMPLE ID (One Character per box. (A-Z, 0-9 / ,-) Samples IDs MUST BE UNIQUE)	MATRIX CODE	SAMPLE TYPE G=GRAB C=COMP	SAMPLE DATE	SAMPLE TIME	#OF CONTAINERS	FIELD FILTERED? (Y/N)	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Requested Analyses: EPA 903.1/7500-Ra	EML HASL 300	Comments/Lab Sample I.D.
1	EB082709-SO1	W	G	8/27/2009	10:00	1	N			X						X		2 L Poly Clear
2	EB082709-SO1	W	G	8/27/2009	10:00	1	N			X							X	2 L Poly Clear
3																		
4																		
5																		
6	DRS																	
7	8-27-09																	
8																		
9																		
10																		
11																		
12																		

Additional Comments/Special Instructions:

FULL DIGESTION SPECIFICATION
EMSL HASL 300 **- DOE EMSL HASL 300 modified (alpha spectroscopy)**
Thorium (Isotopic) and Uranium (Isotopic)

Equipment Blank is associated with SA210-49B.
All PDF reports and EDDs will be uploaded to:
Northgate Environmental Management, Inc.
FTP site address provided to labs
Notifications provided to:
cindy.arnold@ngem.com & frank.hagar@ngem.com

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
DANA BROWN, NGEM	27-Aug	16:30		8/27	1630
	8/27	1100		8-28-09	0845

SHIPPING METHOD (mark as appropriate): UPS COURIER FEDEX US MAIL

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER: Dana R. Brown
SIGNATURE of SAMPLER:
DATE Signed: 8/27/2009 Time: 16:30

Sample Receipt Conditions	Temp in °C	Samples on Ice?	Sample intact?	Trip Blank?
		Y/N	Y/N	Y/N
	25°	Y/(N)	(Y)/N	Y/(N)
		Y/N	Y/N	Y/N
		Y/N	Y/N	Y/N

10

GEL Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client: Kerr / Workgate	**SDG/ARCOC/Work Order:** 360777.
Received By: MK	**Date Received:** 8-28-09

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?		✓	Maximum Counts Observed*: cpm 20
Classified Radioactive II or III by RSO?		✓	
COC/Samples marked containing PCBs?		✓	
Shipped as a DOT Hazardous?		✓	Hazard Class Shipped: UN#:
Samples identified as Foreign Soil?		✓	

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

Comments:

FX 7968 9939 2918

PM (or PMA) review: Initials EK Date 8/28/09

2360778

20090853637

northgate
environmental management, inc.

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. 2027.001.00639
Page: 1 of 1
Cooler # 1 of 1
Collection Area: III

Required Ship to Lab:		Required Project Information:		Required Invoice Information:	
Lab Name:	GEL Laboratories, LLC	Site ID #:	TRONOX LLC. HENDERSON	Send Invoice to:	Susan Crowley, Tronox LLC
Address:	2040 Savage Road	Project #	2027.001	Address:	PO Box 55
Charleston, SC 29407		Site Address	560 W. Lake Mead Drive	City/State	Henderson, NV 89009; Phone #: (949)260-9293
Lab PM:	Edith M. Kent	City	Henderson; State NV	Reimbursement project?	X; Non-reimbursement project? Mark one
Phone/Fax:	(843)556-8171	Site PM Name	Derrick Willis	Send EDD to	Frank Hagar Northgate Environmental Management, Inc frank.hagar@ngem.com
Lab PM email	emk@gel.com	Phone/Fax:	949-375-7004	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

TAT: Standard 30 day	X	Rush	Mark One
If Rush, Date due			
QC level Required: Standard		Special: EPA Stage 4	Mark one
NJ Reduced Deliverable Package?			
MA MCP Cert?		CT RCP Cert?	Mark One
Lab Project ID (lab use)			

Valid Matrix Codes: MATRIX — DRINKING WATER, GROUND WATER, WASTE WATER, FREE PRODUCT, SOIL, OIL, WIPE, AMBIENT AIR, SVE AIR, SOIL GAS; MATRIX — WATER (W), WW SURFACE WATER (WS), SC WATER QC (WQ), SLUDGE (SL), RINSEATE (WH), OTHER (OT), OS ANIMAL TISSUE (TA)

ITEM #	SAMPLE ID (One Character per box. (A-Z, 0-9 / ,-) Samples IDs MUST BE UNIQUE)	MATRIX CODE	SAMPLE TYPE G=GRAB C=COMP	SAMPLE DATE	SAMPLE TIME	#OF CONTAINERS	FIELD FILTERED? (Y/N)	Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	EPA903.1 Radium-226	EPA904.0 Radium 228	Radionuclides*	Comments/Lab Sample I.D.
1	SA68-0.5B	SO	G	8/31/2009	6:41	1	N	X								X	X	X	250 ml Plastic jar
2	SA68-10B	SO	G	8/31/2009	7:22	1	N	X								X	X	X	250 ml Plastic jar
3	SA68-25B	SO	G	8/31/2009	7:55	1	N	X								X	X	X	250 ml Plastic jar
4	SA68009-25B	SO	G	8/31/2009	7:55	1	N	X								X	X	X	250 ml Plastic jar
5	SA68-36B	SO	G	8/31/2009	8:25	1	N	X								X	X	X	250 ml Plastic jar
6																			
7																			
8																			
9	DRB																		
10	8-31-09																		
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.arnold@ngem.com & frank.hagar@ngem.com

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	Temp in °C	Samples on Ice?	Sample intact?	Trip Blank?
DANA BROWN, NGEM	31-Aug	11:40	[signature] GES	8-31	1140		Y/N	Y/N	Y/N
[signature] GES	8-31	1600	[signature] Gel	9-1-09	0850	2°C	Y/N (N circled)	Y/N (Y circled)	Y/N (N circled)
							Y/N	Y/N	Y/N
							Y/N	Y/N	Y/N

SHIPPING METHOD: UPS COURIER FEDEX (circled) US MAIL

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER: Dana R. Brown
SIGNATURE of SAMPLER: [signature]
DATE Signed: 8/31/2009
Time: 11:40

GEL Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client: Kerr / Northgate	**SDG/ARCOC/Work Order:** 236077 1.
Received By: MK	**Date Received:** 9-1-09

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?		✓	Maximum Counts Observed*: 0 fm 20
Classified Radioactive II or III by RSO?		✓	
COC/Samples marked containing PCBs?		✓	
Shipped as a DOT Hazardous?		✓	Hazard Class Shipped: UN#:
Samples identified as Foreign Soil?		✓	

	Sample Receipt Criteria	**Yes**	**NA**	**No**	**Comments/Qualifiers (Required for Non-Conforming Items)**
1	Shipping containers received intact and sealed?	✓			Circle Applicable: seals broken damaged container leaking container other (describe)
2	Samples requiring cold preservation within 0 ≤ 6 deg. C?		✓		Preservation Method: ice bags blue ice dry ice (none) other (describe) 22c
3	Chain of custody documents included with shipment?	✓			
4	Sample containers intact and sealed?	✓			Circle Applicable: seals broken damaged container leaking container other (describe)
5	Samples requiring chemical preservation at proper pH?		✓		Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6	VOA vials free of headspace (defined as < 6mm bubble)?		✓		Sample ID's and containers affected:
7	Are Encore containers present?			✓	(If yes, immediately deliver to Volatiles laboratory)
8	Samples received within holding time?	✓			Id's and tests affected:
9	Sample ID's on COC match ID's on bottles?			✓	Sample ID's and containers affected: * see Below
10	Date & time on COC match date & time on bottles?	✓			Sample ID's affected:
11	Number of containers received match number indicated on COC?	✓			Sample ID's affected:
12	COC form is properly signed in relinquished/received sections?	✓			

Comments:

* ID ON CHAIN = SA68009-25B
ID ON CONTAINER = SA68-25009B

FX 7969 0718 9918

PM (or PMA) review: Initials EM Date 9/1/09

northgate
environmental management, inc.

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. 2027.001.00689
Page: 1 of 1
Cooler # 1 of 1
Collection Area: III

Required Ship to Lab:		Required Project Information:		Required Invoice Information:					
Lab Name:	GEL Laboratories, LLC	Site ID #:	TRONOX LLC. HENDERSON	Send Invoice to:	Susan Crowley Tronox LLC	TAT: Standard 30 day	X	Rush	Mark One
Address:	2040 Savage Road	Project #	2027.001	Address:	PO Box 55	If Rush, Date due			
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?	X	Non-reimbursement project?	Mark one	NJ Reduced Deliverable Package?	
Phone/Fax:	(843)556-8171	Site PM Name	Derrick Willis	Send EDD to	Frank Hagar Northgate Environmental Management, Inc frank.hagar@ngem.com	MA MCP Cert?		CT RCP Cert?	Mark One
Lab PM email	emk@gel.com	Phone/Fax:	949-375-7004	CC Hardcopy report to	PDF Electronic Version Only	Lab Project ID (lab use)			
Applicable Lab Quote #:		Site PM Email:	derrick.willis@ngem.com	CC Hardcopy report to	see additional comments below				

Valid Matrix Codes: MATRIX — DRINKING WATER WP; GROUND WATER WG; WASTE WATER LF; FREE PRODUCT OL; SOIL SW; OIL AA; WIPE AB; AMBIENT AIR SVE AIR SOIL GAS; WATER WW; SURFACE WATER WS; WATER DC SO; SLUDGE SL; RINSEATE WH; OTHER OT; GS ANIMAL TISSUE TA

ITEM #	SAMPLE ID (One Character per box. (A-Z, 0-9 / ,-) Samples IDs MUST BE UNIQUE)	MATRIX CODE	SAMPLE TYPE G=GRAB C=COMP	SAMPLE DATE	SAMPLE TIME	#OF CONTAINERS	FIELD FILTERED? (Y/N)	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Requested Analyses: EPA 903.1/904.0	EML HASL 300	Comments/Lab Sample I.D.
1	EB083109-SO1	W	G	8/31/2009	10:00	1	N			X						X		2 L Poly Clear
2	EB083109-SO1	W	G	8/31/2009	10:00	1	N			X							X	2 L Poly Clear
3																		
4																		
5																		
6	DRB																	
7	8-31-09																	
8																		
9																		
10																		
11																		
12																		

Additional Comments/Special Instructions:

FULL DIGESTION SPECIFICATION
EMSL HASL 300 **- DOE EMSL HASL 300 modified (alpha spectroscopy)**
Thorium (isotopic) and Uranium (isotopic)

Equipment Blank is associated with SA68-36B.
All PDF reports and EDDs will be uploaded to:
Northgate Environmental Management, Inc.
FTP site address provided to labs
Notifications provided to:
cindy.arnold@ngem.com & frank.hagar@ngem.com

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
DANA BROWN, NGEM	31-Aug	11:40	GES	8-31	1140
GES	8-31	1600	KL	9-1-09	0850

SHIPMENT METHOD: UPS COURIER FEDEX US MAIL

SAMPLE RELEASE AND RECEIPT

PRINT Name of SAMPLER:	Dana R. Brown		
SIGNATURE of SAMPLER:		DATE Signed: 8/31/2009	Time: 11:40

Sample Receipt Conditions	Temp in °C	Samples on Ice?	Sample intact?	Trip Blank?
	Y/N	Y/N	Y/N	
	27°	Y(N)	(Y)N	Y(N)
		Y/N	Y/N	Y/N
		Y/N	Y/N	Y/N

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GEL Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client: Kerr/NorthGate	**SDG/ARCOC/Work Order:** 236077
Received By: MK	**Date Received:** 9-1-09

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?		✓	Maximum Counts Observed*: 6pm 30
Classified Radioactive II or III by RSO?		✓	
COC/Samples marked containing PCBs?		✓	
Shipped as a DOT Hazardous?		✓	Hazard Class Shipped: UN#:
Samples identified as Foreign Soil?		✓	

	Sample Receipt Criteria	**Yes**	**NA**	**No**	**Comments/Qualifiers (Required for Non-Conforming Items)**
1	Shipping containers received intact and sealed?	✓			Circle Applicable: seals broken damaged container leaking container other (describe)
2	Samples requiring cold preservation within 0 ≤ 6 deg. C?		✓		Preservation Method: ice bags blue ice dry ice (none) other (describe) 17C
3	Chain of custody documents included with shipment?	✓			
4	Sample containers intact and sealed?	✓			Circle Applicable: seals broken damaged container leaking container other (describe)
5	Samples requiring chemical preservation at proper pH?	✓			Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6	VOA vials free of headspace (defined as < 6mm bubble)?		✓		Sample ID's and containers affected:
7	Are Encore containers present?			✓	(If yes, immediately deliver to Volatiles laboratory)
8	Samples received within holding time?	✓			Id's and tests affected:
9	Sample ID's on COC match ID's on bottles?	✓			Sample ID's and containers affected:
10	Date & time on COC match date & time on bottles?	✓			Sample ID's affected:
11	Number of containers received match number indicated on COC?	✓			Sample ID's affected:
12	COC form is properly signed in relinquished/received sections?	✓			

Comments:

FX 7969 0718 9870

PM (or PMA) review: Initials EM Date 9/1/09

236077

200908 53637

northgate environmental management, inc.
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. 2027.001.00500
Page: 1 of 1
Cooler # 1 of 2

Required Ship to Lab:

Lab Name:	GEL Laboratories, LLC
Address:	2040 Savage Road
	Charleston, SC 29407
Lab PM:	Edith M. Kent
Phone/Fax:	(843) 556-8171
Lab PM email	emk@gel.com
Applicable Lab Quote #:	

Required Project Information:

Site ID #:	TRONOX LLC. HENDERSON
Project #	2027.001
Site Address	560 W. Lake Mead Drive
City	Henderson; State NV
Site PM Name	Derrick Willis
Phone/Fax:	(949) 375-7004
Site PM Email:	derrick.willis@ngem.com

Required Invoice Information:

Send Invoice to:	Susan Crowley, Tronox LLC
Address:	PO Box 55
City/State	Henderson, NV 89009; Phone #: (949) 260-9293
Reimbursement project?	X
Non-reimbursement project?	(Mark one)
Send EDD to	Frank Hagar Northgate Environmental Management, Inc frank.hagar@ngem.com
CC Hardcopy report to	PDF Electronic Version Only
CC Hardcopy report to	see additional comments below

TAT: Standard 30 day	X
Rush	(Mark One)
If Rush, Date due	
QC level Required: Standard	
Special	EPA Stage 4 (Mark one)
NJ Reduced Deliverable Package?	
MA MCP Cert?	
CT RCP Cert?	(Mark One)
Lab Project ID (lab use)	

Valid Matrix Codes: MATRIX — DRINKING WATER DW, GROUND WATER WG, WASTE WATER WW, FREE PRODUCT LF, SOIL SO, OIL OL, WIPE WP, AMBIENT AIR AA, SVE AIR AE, SOIL GAS GS; MATRIX — WATER W, SURFACE WATER WS, WATER QC WQ, SLUDGE SL, OIL RINSEATE WH, OTHER OT, ANIMAL TISSUE TA

ITEM #	SAMPLE ID (One Character per box. (A-Z, 0-9 / ,-) Samples IDs MUST BE UNIQUE)	MATRIX CODE	SAMPLE TYPE G=GRAB C=COMP	SAMPLE DATE	SAMPLE TIME	#OF CONTAINERS	FIELD FILTERED? (Y/N)	Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	EPA903.1 Radium-226	EPA904.0 Radium 228	Radionuclides*	Comments/Lab Sample I.D.
1	SA133-0.5B	SO	G	9-1-09	09:50	1	N	X								X	X	X	250 ml Plastic jar
2	SA133-10B	SO	G	9-1-09	10:05	1	N	X								X	X	X	250 ml Plastic jar
3	SA133-20B	SO	G	9-1-09	10:25	1	N	X								X	X	X	250 ml Plastic jar
4	SA133-31B	SO	G	9-1-09	10:50	1	N	X								X	X	X	250 ml Plastic jar
5	SA133-31BMS	SO	G	9-1-09	10:50	1	N	X								X	X	X	250 ml Plastic jar
6	SA133-31BMSD	SO	G	9-1-09	10:50	1	N	X								X	X	X	250 ml Plastic jar
7																			
8																			
9	DRB																		
10	9-1-09																		
11																			
12																			
13																			

Additional Comments/Special Instructions:

Samples collected in Area II

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.arnold@ngem.com & frank.hagar@ngem.com

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
DANA BROWN, NGEM	9/1/09	1345	[signature] GES	9/1/09	1345
[signature] GES	9/1/09	1900	[signature] GEL	9/2/09	0835

Temp in 0C	Samples on Ice?	Sample intact?	Trip Blank?
	Y/N	Y/N	Y/N
21°C	Y/(N)	(Y)/N	Y/(N)
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N

Sample Receipt Conditions

SHIPPING METHOD: (mark as appropriate): UPS COURIER (FEDEX) US MAIL

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER: Dana Brown
SIGNATURE of SAMPLER: [signature]
DATE Signed:
Time: 13:45

GEL Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client: Kerr / Northgate	**SDG/ARCOC/Work Order:** 236077
Received By: MC	**Date Received:** 9/2/09

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?		✓	Maximum Counts Observed*: Cpm 20
Classified Radioactive II or III by RSO?		✓	
COC/Samples marked containing PCBs?		✓	
Shipped as a DOT Hazardous?		✓	Hazard Class Shipped: UN#:
Samples identified as Foreign Soil?		✓	

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

Comments:

FX 7978 9883 5948

PM (or PMA) review: Initials GR Date 9/2/09

northgate
environmental management, inc.

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. 2027.001.00591
Page: 1 of 1
Cooler # 1 of 2

Required Ship to Lab:

Lab Name:	GEL Laboratories, LLC
Address:	2040 Savage Road
	Charleston, SC 29407
Lab PM:	Edith M. Kent
Phone/Fax:	(843)556-8171
Lab PM email	emk@gel.com
Applicable Lab Quote #:	

Required Project Information:

Site ID #:	TRONOX LLC. HENDERSON
Project #	2027.001
Site Address	560 W. Lake Mead Drive
City	Henderson
State	NV
Site PM Name	Derrick Willis
Phone/Fax:	949-375-7004
Site PM Email:	derrick.willis@ngem.com

Required Invoice Information:

Send Invoice to:	Susan Crowley Tronox LLC
Address:	PO Box 55
City/State	Henderson, NV 89009
Phone #:	(949)260-9293
Reimbursement project?	X
Non-reimbursement project?	Mark one
Send EDD to	Frank Hagar Northgate Environmental Management, Inc frank.hagar@ngem.com
CC Hardcopy report to	PDF Electronic Version Only
CC Hardcopy report to	see additional comments below

TAT: Standard 30 day	X	Rush		Mark One	
If Rush, Date due					
QC level Required: Standard		Special	EPA Stage 4	Mark one	
NJ Reduced Deliverable Package?					
MA MCP Cert?		CT RCP Cert?		Mark One	
Lab Project ID (lab use)					

Valid Matrix Codes: MATRIX — DRINKING WATER WP; GROUND WATER WG; WASTE WATER WW; FREE PRODUCT LF; SOIL SO; OIL SW; WIPE AA; AMBIENT AIR AE; SVE AIR GS; SOIL GAS — WATER W; SURFACE WATER WS; WATER QC WQ; SLUDGE SL; OIL RINSEATE WH; OTHER OT; ANIMAL TISSUE TA

ITEM #	SAMPLE ID (One Character per box. (A-Z, 0-9 / ,-) Samples IDs MUST BE UNIQUE)	MATRIX CODE	SAMPLE TYPE G=GRAB C=COMP	SAMPLE DATE	SAMPLE TIME	#OF CONTAINERS	FIELD FILTERED? (Y/N)	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Requested Analyses: EPA 903.1/904.0	EML HASL 300*	Comments/Lab Sample I.D.
1	EB090109-SO1	W	G	9/1/2009	12:50	1	N			X						X		2 L Poly Clear
2	EB090109-SO1	W	G	9/1/2009	12:50	1	N			X							X	2 L Poly Clear
3																		
4																		
5																		
6																		
7	DRB																	
8	9-1-09																	
9																		
10																		
11																		
12																		

Additional Comments/Special Instructions:

FULL DIGESTION SPECIFICATION
EMSL HASL 300 **- DOE EMSL HASL 300 modified (alpha spectroscopy) Thorium (isotopic) and Uranium (isotopic)**

Equipment Blank is associated with SA133-31B.
All PDF reports and EDDs will be uploaded to:
Northgate Environmental Management, Inc.
FTP site address provided to labs
Notifications provided to:
cindy.arnold@ngem.com & frank.hagar@ngem.com

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
DANA BROWN, NGEM	9/1/09	13:45	GES	9/1/2009	13:45
GES	9/1/09	17:00		9-2-09	0835

SHIPPING METHOD: (mark as appropriate) UPS COURIER FEDEX US MAIL

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER: Dana Brown
SIGNATURE of SAMPLER:
DATE Signed 9/1/2009 Time: 13:45

Sample Receipt Conditions

	Temp in OC	Samples on Ice?	Sample intact?	Trip Blank?
		Y / N	Y / N	Y / N
	26 C	Y / (N)	(Y) / N	Y / (N)
		Y / N	Y / N	Y / N
		Y / N	Y / N	Y / N

GEL Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client: Kerr / Northgate	**SDG/ARCOC/Work Order:** 236077
Received By: MF	**Date Received:** 9-2-09

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?		✓	Maximum Counts Observed*: cpm 20
Classified Radioactive II or III by RSO?		✓	
COC/Samples marked containing PCBs?		✓	
Shipped as a DOT Hazardous?		✓	Hazard Class Shipped: UN#:
Samples identified as Foreign Soil?		✓	

	Sample Receipt Criteria	**Yes**	**NA**	**No**	**Comments/Qualifiers (Required for Non-Conforming Items)**
1	Shipping containers received intact and sealed?	✓			Circle Applicable: seals broken damaged container leaking container other (describe)
2	Samples requiring cold preservation within 0 ≤ 6 deg. C?		✓		Preservation Method: ice bags blue ice dry ice (none) other (describe) 26 c
3	Chain of custody documents included with shipment?	✓			
4	Sample containers intact and sealed?	✓			Circle Applicable: seals broken damaged container leaking container other (describe)
5	Samples requiring chemical preservation at proper pH?	✓			Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6	VOA vials free of headspace (defined as < 6mm bubble)?		✓		Sample ID's and containers affected:
7	Are Encore containers present?			✓	(If yes, immediately deliver to Volatiles laboratory)
8	Samples received within holding time?	✓			Id's and tests affected:
9	Sample ID's on COC match ID's on bottles?	✓			Sample ID's and containers affected:
10	Date & time on COC match date & time on bottles?	✓			Sample ID's affected:
11	Number of containers received match number indicated on COC?	✓			Sample ID's affected:
12	COC form is properly signed in relinquished/received sections?	✓			

Comments:

FX 7969 1132 3934

PM (or PMA) review: Initials MF Date 9/2/09

Subject: RE: Vivian - RE: COC# 2027.001.00639 Sample ID Discrepancy
From: "Vivian Willis" <vivian.willis@verdant-solutions.com>
Date: Fri, 4 Sep 2009 16:42:47 -0700
To: <emk@gel.com>
CC: <Cindy.Arnold@ngem.com>, <Frank.Hagar@ngem.com>, <Derrick.Willis@ngem.com>, <Team.Kent@gel.com>

The correct sample ID is SA68009-25B.

Vivian Willis
Data Management

Verdant Solutions, Inc.
1000 Bristol Street North, Suite 17-165, Newport Beach, CA 92660
Main: **949.922.9730** | Fax: **949.209.2070** | Email: vivian.willis@**verdant-solutions.com**

From: carnold@ngem.com [mailto:carnold@ngem.com]
Sent: Friday, September 04, 2009 3:47 PM
To: emk@gel.com; vivian.willis@verdant-solutions.com
Cc: Cindy.Arnold@ngem.com; Frank.Hagar@ngem.com; Derrick.Willis@ngem.com; Team.Kent@gel.com
Subject: Vivian - RE: COC# 2027.001.00639 Sample ID Discrepancy

Please include Vivian on all COC discrepancies. Thanks, Cindy

------- Original Message ------- On 9/1/2009 4:34 PM Edie Kent wrote:
There is a discrepancy between the sample ID on the chain and on the sample container for one of the samples. The ID on the chain is SA68009-25B. The ID on the sample container is SA68-25009B. Please verify which is the correct sample ID.

Edie

--
Edith M. Kent
Project Manager
GEL Laboratories, LLC
2040 Savage Road
Charleston, SC (USA) 29407
Direct: 843.769.7385 x4453
Main: 843.556.8171
Fax: 843.766.1178
E-mail: emk@gel.com
Web: www.gel.com

Subject: GEL Closed SDGs 236077
From: Heather Shaffer <Heather.Shaffer@gel.com>
Date: Wed, 02 Sep 2009 17:14:42 -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 today's receipts, we closed soil SDG 2360077. 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 these SDG.

Thank you,
Heather

--
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

236077.xls	**Content-Type:**	application/msexcel
	Content-Encoding:	base64

Subject: SDG 236077 QC Issues - Alpha Spec Th, Alpha Spec U, Ra-226
From: Edie Kent <emk@gel.com>
Date: Wed, 30 Sep 2009 17:34:39 -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:

Soil 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 the maximum possible count time: 236077010, 236077014.

Water Ra 226 Issues:

Sample 236077019 does not meet the Tronox QA program sample result uncertainty limit of <30% with activity between 2 and 5 times the MDA and was counted the maximum possible count time.

Soil Thorium Issues:

The following samples did not meet the Tronox QA program tracer yield requirements of 70-120% but met GEL's standard tracer yield criteria: 236077003, 236077007, 236077014, and the lab DUP. The method blank and the LCS met the contract tracer yield requirements.

Sample 236077020 and the lab DUP did not meet the Tronox QA program %RPD for Th-228 but did meet the relative error ratio requirement with a value of 1.41.

The method blank did not meet the Tronox QA program detection limit requirements for Th-228 and Th-230 due to keeping the blank volume consistent with the other sample aliquots. All other samples met the required detection limits.

Water Thorium Issues:

Sample 236077013 did not meet the Tronox QA program detection limit requirements for Th-228 due to limited sample volume. The sample was counted the maximum possible count time to acheive the best MDA possible. The method blank did not meet the detection limit for Th-228 due to keeping the blank aliquot consistent with the other sample aliquots.

Soil Uranium Issues:

The following samples did not meet the Tronox QA program detection limit requirements for U-235/236 due to aliquot size and the tracer yield: 236077009, 236077014, 236077015. Larger aliquots were not used in order to achieve the best tracer yield results possible.

The following samples do not meet the Tronox QA program sample result uncertainty limit of <30% for U-235/236 with activity greater than 5 times the MDA: 236077007, 236077017.

The following samples do not meet the Tronox QA program sample result uncertainty limit of <30% for U-235/236 with activity between 2 and 5 times the MDA: 236077008, 236077011, 236077012, 236077016, 236077018, 236077020, and the lab DUP.

The following samples did not meet the Tronox QA program tracer yield requirements of 70-120% but did meet GEL's standard tracer yield requirements: 236077001, 236077003, 236077005, 236077007, 236077009, 236077012, 236077015, 236077016, 236077017, and the Matrix Spike. The method blank and the LCS met the contract tracer yield requirements.

All samples were counted the maximum possible count time to achieve the best possible uncertainties and MDAs.

Water Uranium Issues:

The method blank, the LCS, and the LCS DUP did not meet the Tronox QA program tracer yield requirements of 70-120% with recoveries of 48.3%, 65.5%, and 42.5% respectively. The LCS and LCS DUP met their respective spike recovery requirements and duplicate. The contract uncertainty requirements were met and the samples were counted the maximum count time. The group leader was consulted and results were further evaluated and determined to be of good statistical quality.

This will be noted in the case narrative.

Edie

--
Edith M. Kent
Project Manager
GEL Laboratories, LLC
2040 Savage Road
Charleston, SC (USA) 29407
Direct: 843.769.7385 x4453
Main: 843.556.8171
Fax: 843.766.1178
E-mail: emk@gel.com
Web: www.gel.com

Laboratory Certifications

List of current GEL Certifications as of 30 September 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 236077

Method/Analysis Information

Product:	**Alphaspec Th, Liquid**
Analytical Method:	DOE EML HASL-300, Th-01-RC Modified
Analytical Batch Number:	901446

Sample ID	Client ID
236077013	EB082709-SO1
236077019	EB083109-SO1
236077021	EB090109-SO1
1201920746	Method Blank (MB)
1201920747	Laboratory Control Sample (LCS)
1201920748	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 duplicate was not run with the analytical batch since it was designated by the client as a field QC. A laboratory control sample duplicate was analyzed for precision. 1201920747 (LCS) and 1201920748 (LCSD).

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
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 736721 was generated due to RDL less than MDA and Failed Recovery for Surrogate or Tracer. 1. Samples 235860015 and 236077013 did not meet the detection limit for Th-228 and 236534011 did not meet the detection limits for Th-228, Th-230 and Th-232 due to limited sample volume. Blank 1201920746 did not meet the detection limit for Th-228 due to keeping the blank aliquot consistent with the other sample aliquots. 2. Sample 236534011 did not meet the client's tracer yield recovery requirements with an achieved tracer recovery of 67.6%. 1. Sample aliquots were restricted by limited sample volume. Samples were counted 1000 minutes to achieve the best MDA possible. 2. Both the batch blank and LCS met client's tracer yield recovery requirements and the sample meets GEL's standard tracer yield recovery requirements. PM 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 Th, Solid**
Analytical Method:	DOE EML HASL-300, Th-01-RC Modified
Prep Method:	Dry Soil Prep
Analytical Batch Number:	903844
Prep Batch Number:	899845

Sample ID	Client ID
236077001	RSAS3-0.5B
236077002	RSAS3009-0.5B
236077003	RSAS3-10B
236077004	RSAS3-25B
236077005	RSAS3-44B
236077006	RSAT6-10B
236077007	RSAT6-30B
236077008	RSAT6-49B
236077009	SA210-0.5B
236077010	SA210-10B
236077011	SA210-30B
236077012	SA210-49B
236077014	SA68-0.5B
236077015	SA68-10B
236077016	SA68-25B
236077017	SA68009-25B
236077018	SA68-36B
236077020	SA133-31B
1201926675	Method Blank (MB)
1201926676	236077020(SA133-31B) Sample Duplicate (DUP)
1201926677	236077020(SA133-31B) Matrix Spike (MS)
1201926678	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: 236077020 (SA133-31B).

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 recounted due to a suspected blank false positive. Samples 1201926675 (MB), 1201926678 (LCS), 236077014 (SA68-0.5B), 236077017 (SA68009-25B) and 236077018 (SA68-36B) were recounted due to detector error.

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 740164 was generated due to Failed Recovery for Surrogate or Tracer. 1. Samples 236077003, 236077007, 236077014 and 1201926676 do not meet the client's tracer yield requirement of 70 - 120%. 1. With yields of 53.9 - 63.9%, samples do meet the GEL standard tracer yield requirements. The blank and LCS meet the client's tracer yield requirements. PM notified, reporting results.

Manual Integration
No manual integrations were performed on data in this batch.

Additional Comments
The sample and the duplicate, 1201926676 (SA133-31B) and 236077020 (SA133-31B), did not meet the relative percent difference requirement for Th228, however they do meet the relative error ratio requirement with a value of 1.41. The blank, 1201926675 (MB), did not meet the detection limit for Th228 or Th230 due to keeping the blank volume consistent with the other sample aliquots. All other samples met the detection limits.

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:	901448

Sample ID	Client ID
236077013	EB082709-SO1
236077019	EB083109-SO1
236077021	EB090109-SO1
1201920749	Method Blank (MB)
1201920750	Laboratory Control Sample (LCS)
1201920751	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 volumes in this batch.

Designated QC
A laboratory duplicate was not run with the analytical batch since it was designated by the client as a field QC. A laboratory control sample duplicate was analyzed for precision. 1201920750 (LCS) and 1201920751 (LCSD).

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
Sample 1201920749 (MB) was recounted 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 737268 was generated due to Failed Recovery for Surrogate or Tracer and Failed Yield for Surrogates. 1. Samples 235860015 and 236238008, blank 1201920749, laboratory control spike 1201920750 and laboratory control spike duplicate 1201920751 do not meet the client's tracer yield recovery acceptance criteria. 1. Samples were counted the maximum count time and meet the client's uncertainty requirements. The LCS and LCSD both meet their respective spike recovery requirements and meet relative percent difference duplication requirements. Group leader consulted and results were further evaluated and determined to be of good statistical quality. PM notified, reporting results.

Manual Integration
No manual integrations were performed on data in this batch.

Additional Comments
The U-238 blank result is greater than the MDA, but less than the detection limit.

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:	903847
Prep Batch Number:	899845

Sample ID	Client ID
236077001	RSAS3-0.5B
236077002	RSAS3009-0.5B
236077003	RSAS3-10B
236077004	RSAS3-25B
236077005	RSAS3-44B
236077006	RSAT6-10B
236077007	RSAT6-30B
236077008	RSAT6-49B
236077009	SA210-0.5B
236077010	SA210-10B
236077011	SA210-30B
236077012	SA210-49B
236077014	SA68-0.5B
236077015	SA68-10B
236077016	SA68-25B
236077017	SA68009-25B
236077018	SA68-36B
236077020	SA133-31B
1201926679	Method Blank (MB)
1201926680	236077020(SA133-31B) Sample Duplicate (DUP)
1201926681	236077020(SA133-31B) Matrix Spike (MS)
1201926682	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: 236077020 (SA133-31B).

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
Sample 236077001 (RSAS3-0.5B) was recounted due to high MDA. Samples 236077002 (RSAS3009-0.5B), 236077003 (RSAS3-10B), 236077004 (RSAS3-25B), 236077006 (RSAT6-10B), 236077007 (RSAT6-30B), 236077009 (SA210-0.5B), 236077010 (SA210-10B), 236077011 (SA210-30B), 236077012 (SA210-49B), 236077014 (SA68-0.5B), 236077015 (SA68-10B), 236077016 (SA68-25B) and 236077017 (SA68009-25B) were given an additional clean up step and recounted due to poor resolution.

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 740177 was generated due to RDL less than MDA, Failed Recovery for Surrogate or Tracer and Other. 1. Samples 236077001, 236077003, 236077005, 236077007, 236077009, 236077012, 236077015, 236077015, 236077016, 236077017 and the Matrix Spike, 1201926681, do not meet the client's tracer yield requirement of 70 - 120%. 2. Samples 236077009, 236077014 and 236077015 do not meet the required detection limit for U235/236 due to the aliquot size and lower than average tracer yield due to sample matrix. 3. Samples 236077007 and 236077017 have Uranium-235/236 activity greater than five times the MDA and uncertainty greater than 30% of that activity Samples 236077008, 236077011, 236077012, 236077016, 236077018, 236077020 and 1201926680 have Uranium-235/236 activity between two and five times the MDA and uncertainty greater than 30% of that respective activity. 1. With yields of 32.0 - 68.8%, samples do meet the GEL standard tracer yield requirements. The blank and LCS meet the client's tracer yield requirements. PM notified, reporting results. 2. Larger aliquots were not used in order to achieve the best tracer yield results possible. Samples were all counted the maximum count time of 1000 minutes to achieve the best possible MDA. PM notified, reporting results. 3. 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
Additional comments were not required for this sample set.

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:	900849
Prep Batch Number:	899845

Sample ID	Client ID
236077001	RSAS3-0.5B
236077002	RSAS3009-0.5B
236077003	RSAS3-10B
236077004	RSAS3-25B
236077005	RSAS3-44B
236077006	RSAT6-10B
236077007	RSAT6-30B
236077008	RSAT6-49B
236077009	SA210-0.5B
236077010	SA210-10B
236077011	SA210-30B
236077012	SA210-49B
236077014	SA68-0.5B
236077015	SA68-10B
236077016	SA68-25B
236077017	SA68009-25B
236077018	SA68-36B
236077020	SA133-31B
1201919338	Method Blank (MB)
1201919339	236077020(SA133-31B) Sample Duplicate (DUP)
1201919340	236077020(SA133-31B) Matrix Spike (MS)
1201919341	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: 236077020 (SA133-31B).

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 1201919339 (SA133-31B), 236077001 (RSAS3-0.5B), 236077005 (RSAS3-44B), 236077007 (RSAT6-30B), 236077009 (SA210-0.5B), 236077010 (SA210-10B), 236077011 (SA210-30B), 236077012 (SA210-49B), 236077014 (SA68-0.5B) and 236077020 (SA133-31B) were recounted due to client uncertainty requirements.

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:	**GFPC, Ra228, Liquid**
Analytical Method:	EPA 904.0/SW846 9320 Modified
Analytical Batch Number:	902602

Sample ID	Client ID
236077013	EB082709-SO1
236077019	EB083109-SO1
236077021	EB090109-SO1
1201923559	Method Blank (MB)
1201923560	Laboratory Control Sample (LCS)
1201923561	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 duplicate was not run with the analytical batch since it was designated by the client as a field QC. A laboratory control sample duplicate was analyzed for precision. 1201923560 (LCS) and 1201923561 (LCSD).

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 blank result 1201923559 (MB) is greater than the MDC but less than the detection limit.

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:	904060
Prep Batch Number:	899845

Sample ID	Client ID
236077001	RSAS3-0.5B
236077002	RSAS3009-0.5B
236077003	RSAS3-10B
236077004	RSAS3-25B
236077005	RSAS3-44B
236077006	RSAT6-10B
236077007	RSAT6-30B
236077008	RSAT6-49B
236077009	SA210-0.5B
236077010	SA210-10B
236077011	SA210-30B
236077012	SA210-49B
236077014	SA68-0.5B
236077015	SA68-10B
236077016	SA68-25B
236077017	SA68009-25B
236077018	SA68-36B
236077020	SA133-31B
1201927088	Method Blank (MB)
1201927089	236077020(SA133-31B) Sample Duplicate (DUP)
1201927090	236077020(SA133-31B) Matrix Spike (MS)
1201927091	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: 236077020 (SA133-31B).

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 738630 was generated due to Other. 1. Samples 236077010 and 236077014 have Radium-226 activity between two and five times the MDA and uncertainty greater than 30% of that respective activity. Samples were all counted the maximum count time of 30 minutes to achieve the best possible uncertainties. 1. PM notified, reporting results.

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:	904649

Sample ID	Client ID
236077013	EB082709-SO1
236077019	EB083109-SO1
236077021	EB090109-SO1
1201928562	Method Blank (MB)
1201928563	Laboratory Control Sample (LCS)
1201928564	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 duplicate was not run with the analytical batch since it was designated by the client as a field QC. A laboratory control sample duplicate was analyzed for precision. 1201928563 (LCS) and 1201928564 (LCSD).

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 738448 was generated due to Other. 1. Sample, 236077019, has activity between 2 and 5 times the MDA and uncertainty is greater than 30 percent. Samples counted the maximum count time. 1. Reporting results

Additional Comments
The laboratory control sample and the laboratory control sample duplicate, 1201928563 (LCS) and 1201928564 (LCSD), did not meet the relative percent difference requirement, however they do meet the relative error ratio requirement with value of 1.5683.

Qualifier information

Manual qualifiers were not required.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

Review Validation:

GEL requires all analytical data to be verified by a qualified data validator. In addition, all data designated for CLP or CLP-like packaging will receive a third level validation upon completion of the data package.

The following data validator verified the information presented in this case narrative:

Reviewer/Date: Heather A. McCarty 9/30/09

COMPANY - WIDE NONCONFORMANCE REPORT

Mo.Day Yr.	**Division:**	**Quality Criteria:**	**Type:**
22-SEP-09	Radiochemistry	Specifications	Process
Instrument Type:	**Test / Method:**	**Matrix Type:**	**Client Code:**
ALPHA SPECTROMETER	DOE EML HASL-300, Th-01-RC Modified	Liquid	KERR
Batch ID:	**Sample Numbers:**		
901446	See Below		

Potentially affected work order(s)(SDG): 235860,236077,236238,236534

Application Issues:

RDL less than MDA

Failed Recovery for Surrogate or Tracer

Specification and Requirements Nonconformance Description:	**NRG Disposition:**
1. Samples 235860015 and 236077013 did not meet the detection limit for Th-228 and 236534011 did not meet the detection limits for Th-228, Th-230 and Th-232 due to limited sample volume. Blank 1201920746 did not meet the detection limit for Th-228 due to keeping the blank aliquot consistent with the other sample aliquots.	1. Sample aliquots were restricted by limited sample volume. Samples were counted 1000 minutes to achieve the best MDA possible.
2. Sample 236534011 did not meet the client's tracer yield recovery requirements with an achieved tracer recovery of 67.6%.	2. Both the batch blank and LCS met client's tracer yield recovery requirements and the sample meets GEL's standard tracer yield recovery requirements. PM notified, reporting results.

Originator's Name:

Eric Brimstin 22-SEP-09

Data Validator/Group Leader:

Joseph Moulden 23-SEP-09

COMPANY - WIDE NONCONFORMANCE REPORT

Mo.Day Yr.	**Division:**	**Quality Criteria:**	**Type:**
23-SEP-09	Radiochemistry	Specifications	Product
Instrument Type:	**Test / Method:**	**Matrix Type:**	**Client Code:**
ALPHA SPECTROMETER	DOE EML HASL-300, U-02-RC Modified	Liquid	KERR
Batch ID:	**Sample Numbers:**		
901448	See Below.		

Potentially affected work order(s)(SDG): 235860,236077,236238,236534

Application Issues:

Failed Recovery for Surrogate or Tracer

Failed Yield for Surrogates

Specification and Requirements Nonconformance Description:	**NRG Disposition:**
1. Samples 235860015 and 236238008, blank 1201920749, laboratory control spike 1201920750 and laboratory control spike duplicate 1201920751 do not meet the client's tracer yield recovery acceptance criteria.	1. Samples were counted the maximum count time and meet the client's uncertainty requirements. The LCS and LCSD both meet their respective spike recovery requirements and meet relative percent difference duplication requirements. Group leader consulted and results were further evaluated and determined to be of good statistical quality. PM notified, reporting results.

Originator's Name:

Eric Brimstin 23-SEP-09

Data Validator/Group Leader:

Jessica Downey 23-SEP-09

COMPANY - WIDE NONCONFORMANCE REPORT

Mo.Day Yr.	Division:	Quality Criteria:	Type:
25-SEP-09	Radiochemistry	Specifications	Process
Instrument Type:	**Test / Method:**	**Matrix Type:**	**Client Code:**
LUCAS CELL DETECTOR	EPA 903.1 Modified	Liquid	KERR
Batch ID:	**Sample Numbers:**		
904649	See Below		

Potentially affected work order(s)(SDG): 236077,236699,236817,236938,237010,237170,237343

Application Issues:

Other

Specification and Requirements Nonconformance Description:	NRG Disposition:
1. Sample, 236077019, has activity between 2 and 5 times the MDA and uncertainty is greater than 30 percent. Samples counted the maximum count time.	1. Reporting results

Originator's Name:

Takesha Mungo 25-SEP-09

Data Validator/Group Leader:

Layota Yom 25-SEP-09

COMPANY - WIDE NONCONFORMANCE REPORT

Mo.Day Yr.	Division:	Quality Criteria:	Type:
25-SEP-09	Radiochemistry	Specifications	Process
Instrument Type:	**Test / Method:**	**Matrix Type:**	**Client Code:**
LUCAS CELL DETECTOR	EPA 903.1 Modified	Solid	KERR
Batch ID:	**Sample Numbers:**		
904060	SEE BELOW		

Potentially affected work order(s)(SDG): 236077

Application Issues:

Other

Specification and Requirements Nonconformance Description:	NRG Disposition:
1. Samples 236077010 and 236077014 have Radium-226 activity between two and five times the MDA and uncertainty greater than 30% of that respective activity. Samples were all counted the maximum count time of 30 minutes to achieve the best possible uncertainties.	1. PM notified, reporting results.

Originator's Name:

Lyndsey Pace 25-SEP-09

Data Validator/Group Leader:

Layota Yom 28-SEP-09

COMPANY - WIDE NONCONFORMANCE REPORT

Mo.Day Yr.	Division:	Quality Criteria:	Type:
30-SEP-09	Radiochemistry	Specifications	Process
Instrument Type:	**Test / Method:**	**Matrix Type:**	**Client Code:**
ALPHA SPECTROMETER	DOE EML HASL-300, Th-01-RC Modified	Solid	KERR
Batch ID:	**Sample Numbers:**		
903844	See Below		

Potentially affected work order(s)(SDG): 236077

Application Issues:

Failed Recovery for Surrogate or Tracer

Specification and Requirements Nonconformance Description:	NRG Disposition:
1. Samples 236077003, 236077007, 236077014 and 1201926676 do not meet the client's tracer yield requirement of 70 - 120%.	1. With yields of 53.9 - 63.9%, samples do meet the GEL standard tracer yield requirements. The blank and LCS meet the client's tracer yield requirements. PM notified, reporting results.

Originator's Name:

Joseph Moulden 30-SEP-09

Data Validator/Group Leader:

Scott Moreland 30-SEP-09

COMPANY - WIDE NONCONFORMANCE REPORT

Mo.Day Yr.	**Division:**	**Quality Criteria:**	**Type:**
30-SEP-09	Radiochemistry	Specifications	Process
Instrument Type:	**Test / Method:**	**Matrix Type:**	**Client Code:**
ALPHA SPECTROMETER	DOE EML HASL-300, U-02-RC Modified	Solid	KERR
Batch ID:	**Sample Numbers:**		
903847	See Below		

Potentially affected work order(s)(SDG): 236077

Application Issues:

RDL less than MDA

Failed Recovery for Surrogate or Tracer

Other

Specification and Requirements Nonconformance Description:	**NRG Disposition:**
1. Samples 236077001, 236077003, 236077005, 236077007, 236077009, 236077012, 236077015, 236077015, 236077016, 236077017 and the Matrix Spike, 1201926681, do not meet the client's tracer yield requirement of 70 - 120%. 2. Samples 236077009, 236077014 and 236077015 do not meet the required detection limit for U235/236 due to the aliquot size and lower than average tracer yield due to sample matrix. 3. Samples 236077007 and 236077017 have Uranium-235/236 activity greater than five times the MDA and uncertainty greater than 30% of that activity Samples 236077008, 236077011, 236077012, 236077016, 236077018, 236077020 and 1201926680 have Uranium-235/236 activity between two and five times the MDA and uncertainty greater than 30% of that respective activity.	1. With yields of 32.0 - 68.8%, samples do meet the GEL standard tracer yield requirements. The blank and LCS meet the client's tracer yield requirements. PM notified, reporting results. 2. Larger aliquots were not used in order to achieve the best tracer yield results possible. Samples were all counted the maximum count time of 1000 minutes to achieve the best possible MDA. PM notified, reporting results. 3. Samples were all counted the maximum count time of 1000 minutes to achieve the best possible uncertainties. PM notified, reporting results.

Originator's Name:

Joseph Moulden 30-SEP-09

Data Validator/Group Leader:

Scott Moreland 30-SEP-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: 236077 GEL Work Order: 236077

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: September 30, 2009

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

Client Sample ID:	RSAS3-0.5B	Project:	KERRHenderson
Sample ID:	236077001	Client ID:	KERR003
Matrix:	SO		
Collect Date:	26-AUG-09 06:56		
Receive Date:	27-AUG-09		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
Alphaspec Th, Solid "Dry Weight Corrected"												
Thorium-228		1.69	+/-0.226	0.176	0.050	pCi/g		MXE1	09/28/09	1434	903844	1
Thorium-230		0.790	+/-0.141	0.0693	0.050	pCi/g						
Thorium-232		1.39	+/-0.185	0.0693	0.100	pCi/g						
Alphaspec U, Solid "Dry Weight Corrected"												
Uranium-233/234		0.807	+/-0.159	0.0244	0.040	pCi/g		MXE1	09/29/09	1939	903847	2
Uranium-235/236		0.0301	+/-0.0341	0.0301	0.040	pCi/g						
Uranium-238		0.942	+/-0.173	0.0621	0.040	pCi/g						
Rad Gas Flow Proportional Counting												
Gas Flow Radium 228 "Dry Weight Corrected"												
Radium-228		1.23	+/-0.336	0.514	0.500	pCi/g		JXC5	09/21/09	1734	900849	3
Rad Radium-226												
Lucas Cell, Ra226, solid "Dry Weight Corrected"												
Radium-226		0.891	+/-0.247	0.0535	0.500	pCi/g		KSD1	09/25/09	1640	904060	4

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	09/03/09	1047	899845

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"			86.3	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			44.4	(15%-125%)
Barium-133 Tracer	Gas Flow Radium 228 "Dry Weight Corrected"			80.6	(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: September 30, 2009

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

Client Sample ID:	RSAS3009-0.5B	Project:	KERRHenderson
Sample ID:	236077002	Client ID:	KERR003
Matrix:	SO		
Collect Date:	26-AUG-09 06:56		
Receive Date:	27-AUG-09		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
Alphaspec Th, Solid "Dry Weight Corrected"												
Thorium-228		1.59	+/-0.209	0.121	0.050	pCi/g		MXE1	09/28/09	1434	903844	1
Thorium-230		0.856	+/-0.145	0.0485	0.050	pCi/g						
Thorium-232		1.33	+/-0.183	0.078	0.100	pCi/g						
Alphaspec U, Solid "Dry Weight Corrected"												
Uranium-233/234		0.932	+/-0.131	0.0515	0.040	pCi/g		MXE1	09/29/09	1939	903847	2
Uranium-235/236		0.0288	+/-0.0252	0.0173	0.040	pCi/g						
Uranium-238		0.927	+/-0.131	0.0515	0.040	pCi/g						
Rad Gas Flow Proportional Counting												
Gas Flow Radium 228 "Dry Weight Corrected"												
Radium-228		1.65	+/-0.431	0.508	0.500	pCi/g		JXC5	09/21/09	1602	900849	3
Rad Radium-226												
Lucas Cell, Ra226, solid "Dry Weight Corrected"												
Radium-226		0.483	+/-0.214	0.260	0.500	pCi/g		KSD1	09/25/09	1640	904060	4

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	09/03/09	1047	899845

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"			86.4	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			75.8	(15%-125%)
Barium-133 Tracer	Gas Flow Radium 228 "Dry Weight Corrected"			94.1	(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: September 30, 2009

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

Client Sample ID: RSAS3-10B
Sample ID: 236077003
Matrix: SO
Collect Date: 26-AUG-09 08:23
Receive Date: 27-AUG-09
Collector: Client

Project: KERRHenderson
Client ID: KERR003

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
Alphaspec Th, Solid "Dry Weight Corrected"												
Thorium-228		1.58	+/-0.238	0.139	0.050	pCi/g		MXE1	09/28/09	1434	903844	1
Thorium-230		0.995	+/-0.188	0.127	0.050	pCi/g						
Thorium-232		1.36	+/-0.213	0.102	0.100	pCi/g						
Alphaspec U, Solid "Dry Weight Corrected"												
Uranium-233/234		1.62	+/-0.176	0.0376	0.040	pCi/g		MXE1	09/29/09	1939	903847	2
Uranium-235/236		0.0668	+/-0.0461	0.0582	0.040	pCi/g						
Uranium-238		1.31	+/-0.158	0.0471	0.040	pCi/g						
Rad Gas Flow Proportional Counting												
Gas Flow Radium 228 "Dry Weight Corrected"												
Radium-228		0.742	+/-0.348	0.509	0.500	pCi/g		JXC5	09/21/09	1604	900849	3
Rad Radium-226												
Lucas Cell, Ra226, solid "Dry Weight Corrected"												
Radium-226		1.22	+/-0.312	0.0621	0.500	pCi/g		KSD1	09/25/09	1640	904060	4

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	09/03/09	1047	899845

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"			63.9	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			68.3	(15%-125%)
Barium-133 Tracer	Gas Flow Radium 228 "Dry Weight Corrected"			101	(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: September 30, 2009

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

Client Sample ID:	RSAS3-25B	Project:	KERRHenderson
Sample ID:	236077004	Client ID:	KERR003
Matrix:	SO		
Collect Date:	26-AUG-09 08:59		
Receive Date:	27-AUG-09		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
Alphaspec Th, Solid "Dry Weight Corrected"												
Thorium-228		0.768	+/-0.158	0.103	0.050	pCi/g		MXE1	09/28/09	1434	903844	1
Thorium-230		1.51	+/-0.210	0.0821	0.050	pCi/g						
Thorium-232		0.742	+/-0.148	0.0711	0.100	pCi/g						
Alphaspec U, Solid "Dry Weight Corrected"												
Uranium-233/234		1.91	+/-0.179	0.0416	0.040	pCi/g		MXE1	09/29/09	1939	903847	2
Uranium-235/236		0.0698	+/-0.0407	0.0411	0.040	pCi/g						
Uranium-238		1.66	+/-0.169	0.0582	0.040	pCi/g						
Rad Gas Flow Proportional Counting												
Gas Flow Radium 228 "Dry Weight Corrected"												
Radium-228		0.711	+/-0.315	0.444	0.500	pCi/g		JXC5	09/21/09	1604	900849	3
Rad Radium-226												
Lucas Cell, Ra226, solid "Dry Weight Corrected"												
Radium-226		1.65	+/-0.384	0.317	0.500	pCi/g		KSD1	09/25/09	1640	904060	4

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	09/03/09	1047	899845

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"			77.3	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			81.4	(15%-125%)
Barium-133 Tracer	Gas Flow Radium 228 "Dry Weight Corrected"			101	(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: September 30, 2009

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

Client Sample ID:	RSAS3-44B	Project:	KERRHenderson
Sample ID:	236077005	Client ID:	KERR003
Matrix:	SO		
Collect Date:	26-AUG-09 09:45		
Receive Date:	27-AUG-09		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
Alphaspec Th, Solid "Dry Weight Corrected"												
Thorium-228		1.47	+/-0.203	0.162	0.050	pCi/g		MXE1	09/28/09	1434	903844	1
Thorium-230		1.32	+/-0.174	0.0709	0.050	pCi/g						
Thorium-232		1.23	+/-0.166	0.0441	0.100	pCi/g						
Alphaspec U, Solid "Dry Weight Corrected"												
Uranium-233/234		1.56	+/-0.172	0.0763	0.040	pCi/g		MXE1	09/24/09	1520	903847	2
Uranium-235/236		0.0875	+/-0.0549	0.0718	0.040	pCi/g						
Uranium-238		1.50	+/-0.168	0.0723	0.040	pCi/g						
Rad Gas Flow Proportional Counting												
Gas Flow Radium 228 "Dry Weight Corrected"												
Radium-228		1.53	+/-0.292	0.424	0.500	pCi/g		JXC5	09/21/09	1734	900849	3
Rad Radium-226												
Lucas Cell, Ra226, solid "Dry Weight Corrected"												
Radium-226		0.924	+/-0.275	0.188	0.500	pCi/g		KSD1	09/25/09	1640	904060	4

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	09/03/09	1047	899845

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"			97.3	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			63.2	(15%-125%)
Barium-133 Tracer	Gas Flow Radium 228 "Dry Weight Corrected"			94.5	(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: September 30, 2009

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

Client Sample ID: RSAT6-10B
Sample ID: 236077006
Matrix: SO
Collect Date: 27-AUG-09 11:26
Receive Date: 28-AUG-09
Collector: Client

Project: KERRHenderson
Client ID: KERR003

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
Alphaspec Th, Solid "Dry Weight Corrected"												
Thorium-228		1.32	+/-0.189	0.169	0.050	pCi/g		MXE1	09/28/09	1434	903844	1
Thorium-230		0.847	+/-0.132	0.0501	0.050	pCi/g						
Thorium-232		1.02	+/-0.145	0.0501	0.100	pCi/g						
Alphaspec U, Solid "Dry Weight Corrected"												
Uranium-233/234		1.19	+/-0.147	0.0509	0.040	pCi/g		MXE1	09/29/09	1939	903847	2
Uranium-235/236		0.074	+/-0.0432	0.0436	0.040	pCi/g						
Uranium-238		1.02	+/-0.136	0.0509	0.040	pCi/g						
Rad Gas Flow Proportional Counting												
Gas Flow Radium 228 "Dry Weight Corrected"												
Radium-228		1.01	+/-0.393	0.555	0.500	pCi/g		JXC5	09/21/09	1604	900849	3
Rad Radium-226												
Lucas Cell, Ra226, solid "Dry Weight Corrected"												
Radium-226	U	0.0472	+/-0.134	0.254	0.500	pCi/g		KSD1	09/25/09	1640	904060	4

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	09/03/09	1047	899845

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"			106	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			74.0	(15%-125%)
Barium-133 Tracer	Gas Flow Radium 228 "Dry Weight Corrected"			101	(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: September 30, 2009

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

Client Sample ID:	RSAT6-30B	Project:	KERRHenderson
Sample ID:	236077007	Client ID:	KERR003
Matrix:	SO		
Collect Date:	27-AUG-09 14:23		
Receive Date:	28-AUG-09		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
Alphaspec Th, Solid "Dry Weight Corrected"												
Thorium-228		0.974	+/-0.206	0.211	0.050	pCi/g		MXE1	09/28/09	1434	903844	1
Thorium-230		1.58	+/-0.220	0.0746	0.050	pCi/g						
Thorium-232		0.685	+/-0.151	0.104	0.100	pCi/g						
Alphaspec U, Solid "Dry Weight Corrected"												
Uranium-233/234		2.99	+/-0.258	0.044	0.040	pCi/g		MXE1	09/29/09	1939	903847	2
Uranium-235/236		0.199	+/-0.0738	0.0213	0.040	pCi/g						
Uranium-238		2.47	+/-0.236	0.0708	0.040	pCi/g						
Rad Gas Flow Proportional Counting												
Gas Flow Radium 228 "Dry Weight Corrected"												
Radium-228		1.07	+/-0.225	0.322	0.500	pCi/g		JXC5	09/21/09	1734	900849	3
Rad Radium-226												
Lucas Cell, Ra226, solid "Dry Weight Corrected"												
Radium-226		1.88	+/-0.392	0.298	0.500	pCi/g		KSD1	09/25/09	1715	904060	4

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	09/03/09	1047	899845

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"			63.3	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			63.7	(15%-125%)
Barium-133 Tracer	Gas Flow Radium 228 "Dry Weight Corrected"			102	(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: September 30, 2009

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

Client Sample ID:	RSAT6-49B	Project:	KERRHenderson
Sample ID:	236077008	Client ID:	KERR003
Matrix:	SO		
Collect Date:	27-AUG-09 15:02		
Receive Date:	28-AUG-09		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
Alphaspec Th, Solid "Dry Weight Corrected"												
Thorium-228		1.21	+/-0.169	0.119	0.050	pCi/g		MXE1	09/28/09	1434	903844	1
Thorium-230		1.30	+/-0.163	0.0576	0.050	pCi/g						
Thorium-232		0.890	+/-0.136	0.0576	0.100	pCi/g						
Alphaspec U, Solid "Dry Weight Corrected"												
Uranium-233/234		1.72	+/-0.144	0.0516	0.040	pCi/g		MXE1	09/24/09	1520	903847	2
Uranium-235/236		0.0903	+/-0.0404	0.0416	0.040	pCi/g						
Uranium-238		1.47	+/-0.132	0.0375	0.040	pCi/g						
Rad Gas Flow Proportional Counting												
Gas Flow Radium 228 "Dry Weight Corrected"												
Radium-228		0.858	+/-0.332	0.454	0.500	pCi/g		JXC5	09/21/09	1604	900849	3
Rad Radium-226												
Lucas Cell, Ra226, solid "Dry Weight Corrected"												
Radium-226		1.80	+/-0.387	0.300	0.500	pCi/g		KSD1	09/25/09	1715	904060	4

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	09/03/09	1047	899845

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"			102	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			95.0	(15%-125%)
Barium-133 Tracer	Gas Flow Radium 228 "Dry Weight Corrected"			108	(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: September 30, 2009

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

Client Sample ID:	SA210-0.5B	Project:	KERRHenderson
Sample ID:	236077009	Client ID:	KERR003
Matrix:	SO		
Collect Date:	27-AUG-09 07:50		
Receive Date:	28-AUG-09		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
Alphaspec Th, Solid "Dry Weight Corrected"												
Thorium-228		1.71	+/-0.213	0.165	0.050	pCi/g		MXE1	09/28/09	1434	903844	1
Thorium-230		0.815	+/-0.134	0.0609	0.050	pCi/g						
Thorium-232		1.06	+/-0.152	0.0609	0.100	pCi/g						
Alphaspec U, Solid "Dry Weight Corrected"												
Uranium-233/234		0.907	+/-0.158	0.120	0.040	pCi/g		MXE1	09/29/09	1939	903847	2
Uranium-235/236	U	0.0376	+/-0.039	0.0575	0.040	pCi/g						
Uranium-238		0.991	+/-0.154	0.0582	0.040	pCi/g						
Rad Gas Flow Proportional Counting												
Gas Flow Radium 228 "Dry Weight Corrected"												
Radium-228		1.30	+/-0.230	0.314	0.500	pCi/g		JXC5	09/21/09	1734	900849	3
Rad Radium-226												
Lucas Cell, Ra226, solid "Dry Weight Corrected"												
Radium-226		0.503	+/-0.233	0.290	0.500	pCi/g		KSD1	09/25/09	1715	904060	4

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	09/03/09	1047	899845

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"			88.0	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			58.4	(15%-125%)
Barium-133 Tracer	Gas Flow Radium 228 "Dry Weight Corrected"			96.8	(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: September 30, 2009

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

Client Sample ID:	SA210-10B	Project:	KERRHenderson
Sample ID:	236077010	Client ID:	KERR003
Matrix:	SO		
Collect Date:	27-AUG-09 08:00		
Receive Date:	28-AUG-09		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
Alphaspec Th, Solid "Dry Weight Corrected"												
Thorium-228		1.69	+/-0.221	0.114	0.050	pCi/g		MXE1	09/28/09	1434	903844	1
Thorium-230		0.953	+/-0.161	0.0753	0.050	pCi/g						
Thorium-232		1.28	+/-0.183	0.0204	0.100	pCi/g						
Alphaspec U, Solid "Dry Weight Corrected"												
Uranium-233/234		1.33	+/-0.152	0.0136	0.040	pCi/g		MXE1	09/29/09	1939	903847	2
Uranium-235/236		0.0671	+/-0.0438	0.0536	0.040	pCi/g						
Uranium-238		1.16	+/-0.142	0.0136	0.040	pCi/g						
Rad Gas Flow Proportional Counting												
Gas Flow Radium 228 "Dry Weight Corrected"												
Radium-228		1.24	+/-0.335	0.523	0.500	pCi/g		JXC5	09/21/09	1734	900849	3
Rad Radium-226												
Lucas Cell, Ra226, solid "Dry Weight Corrected"												
Radium-226		0.714	+/-0.250	0.268	0.500	pCi/g		KSD1	09/25/09	1715	904060	4

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	09/03/09	1047	899845

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"			80.6	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			75.8	(15%-125%)
Barium-133 Tracer	Gas Flow Radium 228 "Dry Weight Corrected"			93.7	(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: September 30, 2009

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

Client Sample ID:	SA210-30B	Project:	KERRHenderson
Sample ID:	236077011	Client ID:	KERR003
Matrix:	SO		
Collect Date:	27-AUG-09 08:29		
Receive Date:	28-AUG-09		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
Alphaspec Th, Solid "Dry Weight Corrected"												
Thorium-228		1.49	+/-0.210	0.129	0.050	pCi/g		MXE1	09/28/09	1434	903844	1
Thorium-230		1.65	+/-0.211	0.0971	0.050	pCi/g						
Thorium-232		1.12	+/-0.172	0.0646	0.100	pCi/g						
Alphaspec U, Solid "Dry Weight Corrected"												
Uranium-233/234		1.95	+/-0.187	0.0561	0.040	pCi/g		MXE1	09/29/09	1939	903847	2
Uranium-235/236		0.0957	+/-0.0481	0.0431	0.040	pCi/g						
Uranium-238		1.88	+/-0.183	0.0504	0.040	pCi/g						
Rad Gas Flow Proportional Counting												
Gas Flow Radium 228 "Dry Weight Corrected"												
Radium-228		1.11	+/-0.205	0.274	0.500	pCi/g		JXC5	09/21/09	1735	900849	3
Rad Radium-226												
Lucas Cell, Ra226, solid "Dry Weight Corrected"												
Radium-226		1.32	+/-0.358	0.306	0.500	pCi/g		KSD1	09/25/09	1715	904060	4

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	09/03/09	1047	899845

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"			81.0	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			76.2	(15%-125%)
Barium-133 Tracer	Gas Flow Radium 228 "Dry Weight Corrected"			95.2	(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: September 30, 2009

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

Client Sample ID: SA210-49B
Sample ID: 236077012
Matrix: SO
Collect Date: 27-AUG-09 09:34
Receive Date: 28-AUG-09
Collector: Client

Project: KERRHenderson
Client ID: KERR003

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
Alphaspec Th, Solid "Dry Weight Corrected"												
Thorium-228		1.00	+/-0.164	0.106	0.050	pCi/g		MXE1	09/28/09	1434	903844	1
Thorium-230		1.01	+/-0.157	0.0743	0.050	pCi/g						
Thorium-232		0.936	+/-0.150	0.0668	0.100	pCi/g						
Alphaspec U, Solid "Dry Weight Corrected"												
Uranium-233/234		1.07	+/-0.220	0.144	0.040	pCi/g		MXE1	09/29/09	1939	903847	2
Uranium-235/236		0.133	+/-0.0823	0.0398	0.040	pCi/g						
Uranium-238		1.47	+/-0.246	0.0322	0.040	pCi/g						
Rad Gas Flow Proportional Counting												
Gas Flow Radium 228 "Dry Weight Corrected"												
Radium-228		0.896	+/-0.173	0.229	0.500	pCi/g		JXC5	09/21/09	1735	900849	3
Rad Radium-226												
Lucas Cell, Ra226, solid "Dry Weight Corrected"												
Radium-226		0.939	+/-0.257	0.237	0.500	pCi/g		KSD1	09/25/09	1715	904060	4

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	09/03/09	1047	899845

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"			89.4	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			32.0	(15%-125%)
Barium-133 Tracer	Gas Flow Radium 228 "Dry Weight Corrected"			102	(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: September 30, 2009

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

Client Sample ID:	EB082709-SO1	Project:	KERRHenderson
Sample ID:	236077013	Client ID:	KERR003
Matrix:	W		
Collect Date:	27-AUG-09 10:00		
Receive Date:	28-AUG-09		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Rad Alpha Spec Analysis											
Alphaspec Th, Liquid "As Received"											
Thorium-228	U	0.0362	+/-0.0258	0.0383	0.030	pCi/L		CXM2 09/16/09	1756	901446	1
Thorium-230	U	0.00663	+/-0.0144	0.0272	0.030	pCi/L					
Thorium-232	U	-0.00885	+/-0.0106	0.0296	0.030	pCi/L					
Alphaspec U, Liquid "As Received"											
Uranium-233/234	U	0.0241	+/-0.0204	0.0288	0.030	pCi/L		CXM2 09/17/09	1957	901448	2
Uranium-235/236	U	0.00	+/-0.0103	0.0285	0.030	pCi/L					
Uranium-238		0.015	+/-0.0132	0.00902	0.030	pCi/L					
Rad Gas Flow Proportional Counting											
GFPC, Ra228, Liquid "As Received"											
Radium-228	U	0.130	+/-1.38	2.61	3.00	pCi/L		MXS2 09/18/09	1846	902602	3
Rad Radium-226											
Lucas Cell, Ra226, liquid "As Received"											
Radium-226	U	0.166	+/-0.298	0.536	1.00	pCi/L		KSD1 09/25/09	0930	904649	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"			79.4	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Liquid "As Received"			72.5	(15%-125%)
Barium-133 Tracer	GFPC, Ra228, Liquid "As Received"			72.2	(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: September 30, 2009

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

Client Sample ID:	SA68-0.5B	Project:	KERRHenderson
Sample ID:	236077014	Client ID:	KERR003
Matrix:	SO		
Collect Date:	31-AUG-09 06:41		
Receive Date:	01-SEP-09		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
Alphaspec Th, Solid "Dry Weight Corrected"												
Thorium-228		1.63	+/-0.309	0.233	0.050	pCi/g		MXE1	09/29/09	1936	903844	1
Thorium-230		0.663	+/-0.187	0.122	0.050	pCi/g						
Thorium-232		1.22	+/-0.250	0.122	0.100	pCi/g						
Alphaspec U, Solid "Dry Weight Corrected"												
Uranium-233/234		0.829	+/-0.198	0.191	0.040	pCi/g		MXE1	09/29/09	1939	903847	2
Uranium-235/236	U	0.081	+/-0.0752	0.111	0.040	pCi/g						
Uranium-238		0.777	+/-0.179	0.135	0.040	pCi/g						
Rad Gas Flow Proportional Counting												
Gas Flow Radium 228 "Dry Weight Corrected"												
Radium-228		1.11	+/-0.270	0.410	0.500	pCi/g		JXC5	09/21/09	1735	900849	3
Rad Radium-226												
Lucas Cell, Ra226, solid "Dry Weight Corrected"												
Radium-226		0.712	+/-0.257	0.281	0.500	pCi/g		KSD1	09/25/09	1750	904060	4

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	09/03/09	1047	899845

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"			53.9	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			36.9	(15%-125%)
Barium-133 Tracer	Gas Flow Radium 228 "Dry Weight Corrected"			104	(25%-125%)

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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: September 30, 2009

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

Client Sample ID:	SA68-10B	Project:	KERRHenderson
Sample ID:	236077015	Client ID:	KERR003
Matrix:	SO		
Collect Date:	31-AUG-09 07:22		
Receive Date:	01-SEP-09		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
Alphaspec Th, Solid "Dry Weight Corrected"												
Thorium-228		1.65	+/-0.211	0.0535	0.050	pCi/g		MXE1	09/28/09	1434	903844	1
Thorium-230		0.875	+/-0.151	0.0204	0.050	pCi/g						
Thorium-232		1.28	+/-0.182	0.0204	0.100	pCi/g						
Alphaspec U, Solid "Dry Weight Corrected"												
Uranium-233/234		0.947	+/-0.149	0.0461	0.040	pCi/g		MXE1	09/29/09	1939	903847	2
Uranium-235/236	U	0.0447	+/-0.0413	0.057	0.040	pCi/g						
Uranium-238		0.759	+/-0.135	0.0577	0.040	pCi/g						
Rad Gas Flow Proportional Counting												
Gas Flow Radium 228 "Dry Weight Corrected"												
Radium-228		0.989	+/-0.274	0.271	0.500	pCi/g		JXC5	09/21/09	1604	900849	3
Rad Radium-226												
Lucas Cell, Ra226, solid "Dry Weight Corrected"												
Radium-226		0.848	+/-0.248	0.201	0.500	pCi/g		KSD1	09/25/09	1750	904060	4

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	09/03/09	1047	899845

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"			106	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			59.3	(15%-125%)
Barium-133 Tracer	Gas Flow Radium 228 "Dry Weight Corrected"			108	(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: September 30, 2009

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

Client Sample ID:	SA68-25B	Project:	KERRHenderson
Sample ID:	236077016	Client ID:	KERR003
Matrix:	SO		
Collect Date:	31-AUG-09 07:55		
Receive Date:	01-SEP-09		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
Alphaspec Th, Solid "Dry Weight Corrected"												
Thorium-228		1.28	+/-0.203	0.141	0.050	pCi/g		MXE1	09/28/09	1434	903844	1
Thorium-230		3.11	+/-0.296	0.103	0.050	pCi/g						
Thorium-232		1.12	+/-0.176	0.0547	0.100	pCi/g						
Alphaspec U, Solid "Dry Weight Corrected"												
Uranium-233/234		3.81	+/-0.273	0.0809	0.040	pCi/g		MXE1	09/29/09	1939	903847	2
Uranium-235/236		0.124	+/-0.0594	0.0593	0.040	pCi/g						
Uranium-238		3.15	+/-0.249	0.0809	0.040	pCi/g						
Rad Gas Flow Proportional Counting												
Gas Flow Radium 228 "Dry Weight Corrected"												
Radium-228		1.12	+/-0.312	0.302	0.500	pCi/g		JXC5	09/21/09	1604	900849	3
Rad Radium-226												
Lucas Cell, Ra226, solid "Dry Weight Corrected"												
Radium-226		2.86	+/-0.454	0.277	0.500	pCi/g		KSD1	09/25/09	1750	904060	4

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	09/03/09	1047	899845

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"			92.1	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			68.8	(15%-125%)
Barium-133 Tracer	Gas Flow Radium 228 "Dry Weight Corrected"			95.2	(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: September 30, 2009

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

Client Sample ID:	SA68009-25B	Project:	KERRHenderson
Sample ID:	236077017	Client ID:	KERR003
Matrix:	SO		
Collect Date:	31-AUG-09 07:55		
Receive Date:	01-SEP-09		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
Alphaspec Th, Solid "Dry Weight Corrected"												
Thorium-228		1.18	+/-0.230	0.198	0.050	pCi/g		MXE1	09/29/09	1936	903844	1
Thorium-230		2.69	+/-0.310	0.101	0.050	pCi/g						
Thorium-232		1.06	+/-0.198	0.101	0.100	pCi/g						
Alphaspec U, Solid "Dry Weight Corrected"												
Uranium-233/234		3.43	+/-0.322	0.0859	0.040	pCi/g		MXE1	09/29/09	1939	903847	2
Uranium-235/236		0.211	+/-0.0882	0.0288	0.040	pCi/g						
Uranium-238		3.29	+/-0.314	0.0594	0.040	pCi/g						
Rad Gas Flow Proportional Counting												
Gas Flow Radium 228 "Dry Weight Corrected"												
Radium-228		1.46	+/-0.410	0.504	0.500	pCi/g		JXC5	09/21/09	1604	900849	3
Rad Radium-226												
Lucas Cell, Ra226, solid "Dry Weight Corrected"												
Radium-226		2.54	+/-0.435	0.283	0.500	pCi/g		KSD1	09/25/09	1750	904060	4

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	09/03/09	1047	899845

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"			76.1	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			43.3	(15%-125%)
Barium-133 Tracer	Gas Flow Radium 228 "Dry Weight Corrected"			96.0	(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: September 30, 2009

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

Client Sample ID:	SA68-36B	Project:	KERRHenderson
Sample ID:	236077018	Client ID:	KERR003
Matrix:	SO		
Collect Date:	31-AUG-09 08:25		
Receive Date:	01-SEP-09		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
Alphaspec Th, Solid "Dry Weight Corrected"												
Thorium-228		1.42	+/-0.208	0.0937	0.050	pCi/g		MXE1	09/29/09	1936	903844	1
Thorium-230		2.37	+/-0.261	0.0707	0.050	pCi/g						
Thorium-232		1.26	+/-0.190	0.0565	0.100	pCi/g						
Alphaspec U, Solid "Dry Weight Corrected"												
Uranium-233/234		2.60	+/-0.184	0.051	0.040	pCi/g		MXE1	09/24/09	1516	903847	2
Uranium-235/236		0.103	+/-0.0463	0.0506	0.040	pCi/g						
Uranium-238		2.55	+/-0.181	0.041	0.040	pCi/g						
Rad Gas Flow Proportional Counting												
Gas Flow Radium 228 "Dry Weight Corrected"												
Radium-228		1.21	+/-0.345	0.403	0.500	pCi/g		JXC5	09/21/09	1556	900849	3
Rad Radium-226												
Lucas Cell, Ra226, solid "Dry Weight Corrected"												
Radium-226		1.53	+/-0.385	0.228	0.500	pCi/g		KSD1	09/25/09	1750	904060	4

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	09/03/09	1047	899845

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"			90.5	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			104	(15%-125%)
Barium-133 Tracer	Gas Flow Radium 228 "Dry Weight Corrected"			101	(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: September 30, 2009

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

Client Sample ID:	EB083109-SO1	Project:	KERRHenderson
Sample ID:	236077019	Client ID:	KERR003
Matrix:	SO		
Collect Date:	31-AUG-09 10:00		
Receive Date:	01-SEP-09		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Rad Alpha Spec Analysis											
Alphaspec Th, Liquid "As Received"											
Thorium-228		0.0402	+/-0.0216	0.0269	0.030	pCi/L		CXM2 09/16/09	1756	901446	1
Thorium-230	U	0.0079	+/-0.0145	0.0265	0.030	pCi/L					
Thorium-232	U	0.00395	+/-0.00948	0.0189	0.030	pCi/L					
Alphaspec U, Liquid "As Received"											
Uranium-233/234	U	0.0169	+/-0.0158	0.022	0.030	pCi/L		CXM2 09/17/09	1957	901448	2
Uranium-235/236	U	-0.00355	+/-0.00983	0.0271	0.030	pCi/L					
Uranium-238	U	0.0172	+/-0.0159	0.022	0.030	pCi/L					
Rad Gas Flow Proportional Counting											
GFPC, Ra228, Liquid "As Received"											
Radium-228	U	2.64	+/-1.76	2.74	3.00	pCi/L		MXS2 09/18/09	1846	902602	3
Rad Radium-226											
Lucas Cell, Ra226, liquid "As Received"											
Radium-226		1.62	+/-0.551	0.582	1.00	pCi/L		KSD1 09/25/09	0930	904649	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"			86.4	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Liquid "As Received"			76.5	(15%-125%)
Barium-133 Tracer	GFPC, Ra228, Liquid "As Received"			84.8	(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: September 30, 2009

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

Client Sample ID:	SA133-31B	Project:	KERRHenderson
Sample ID:	236077020	Client ID:	KERR003
Matrix:	SO		
Collect Date:	01-SEP-09 10:50		
Receive Date:	02-SEP-09		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
Alphaspec Th, Solid "Dry Weight Corrected"												
Thorium-228		1.02	+/-0.202	0.142	0.050	pCi/g		MXE1	09/28/09	1434	903844	1
Thorium-230		1.88	+/-0.255	0.027	0.050	pCi/g						
Thorium-232		1.00	+/-0.188	0.0689	0.100	pCi/g						
Alphaspec U, Solid "Dry Weight Corrected"												
Uranium-233/234		2.21	+/-0.188	0.0315	0.040	pCi/g		MXE1	09/24/09	1515	903847	2
Uranium-235/236		0.138	+/-0.0556	0.0488	0.040	pCi/g						
Uranium-238		2.18	+/-0.186	0.0124	0.040	pCi/g						
Rad Gas Flow Proportional Counting												
Gas Flow Radium 228 "Dry Weight Corrected"												
Radium-228		1.07	+/-0.163	0.187	0.500	pCi/g		JXC5	09/21/09	1735	900849	3
Rad Radium-226												
Lucas Cell, Ra226, solid "Dry Weight Corrected"												
Radium-226		1.54	+/-0.346	0.277	0.500	pCi/g		KSD1	09/25/09	1750	904060	4

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	09/03/09	1047	899845

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"			74.8	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			85.6	(15%-125%)
Barium-133 Tracer	Gas Flow Radium 228 "Dry Weight Corrected"			105	(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: September 30, 2009

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

Client Sample ID:	EB090109-SO1	Project:	KERRHenderson
Sample ID:	236077021	Client ID:	KERR003
Matrix:	W		
Collect Date:	01-SEP-09 12:50		
Receive Date:	02-SEP-09		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Rad Alpha Spec Analysis											
Alphaspec Th, Liquid "As Received"											
Thorium-228		0.0326	+/-0.0223	0.0326	0.030	pCi/L		CXM2 09/16/09	1756	901446	1
Thorium-230		0.0246	+/-0.0153	0.0181	0.030	pCi/L					
Thorium-232	U	-0.00567	+/-0.00828	0.0232	0.030	pCi/L					
Alphaspec U, Liquid "As Received"											
Uranium-233/234	U	0.0118	+/-0.0129	0.0208	0.030	pCi/L		CXM2 09/17/09	1957	901448	2
Uranium-235/236	U	0.00233	+/-0.0079	0.0178	0.030	pCi/L					
Uranium-238	U	0.0169	+/-0.0143	0.0208	0.030	pCi/L					
Rad Gas Flow Proportional Counting											
GFPC, Ra228, Liquid "As Received"											
Radium-228		3.80	+/-2.15	3.28	3.00	pCi/L		MXS2 09/18/09	1846	902602	3
Rad Radium-226											
Lucas Cell, Ra226, liquid "As Received"											
Radium-226	U	0.506	+/-0.411	0.629	1.00	pCi/L		KSD1 09/25/09	1005	904649	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"			91.4	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Liquid "As Received"			80.1	(15%-125%)
Barium-133 Tracer	GFPC, Ra228, Liquid "As Received"			80.7	(15%-125%)

QUALITY CONTROL DATA

QC Summary

Report Date: September 30, 2009

Northgate Environmental Management, Inc.
1100 Quail St., Suite 102
Newport Beach, California

Contact: **Mr. Frank Hagar**

Workorder: **236077**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Rad Alpha Spec										
Batch 901446										
QC1201920747 LCS										
Thorium-228			U	0.0321 +/-0.0238	pCi/L				CXM2	09/16/09 17:56
Thorium-230	2.68			2.81 +/-0.157	pCi/L		105	(75%-125%)		
Thorium-232			U	0.00 +/-0.00893	pCi/L			(75%-125%)		
QC1201920748 LCSD										
Thorium-228			U	0.0203 +/-0.0303	pCi/L	45.2				09/16/09 17:56
Thorium-230	2.68			2.98 +/-0.160	pCi/L	6.01	111	(0%-20%)		
Thorium-232			U	0.00224 +/-0.00759	pCi/L			(0%-20%)		
QC1201920746 MB										
Thorium-228			U	0.0236 +/-0.0207	pCi/L					09/16/09 17:56
Thorium-230			U	-0.00234 +/-0.0121	pCi/L					
Thorium-232			U	0.00 +/-0.00649	pCi/L					
Batch 901448										
QC1201920750 LCS										
Uranium-233/234				2.76 +/-0.163	pCi/L				CXM2	09/17/09 20:03
Uranium-235/236				0.194 +/-0.0502	pCi/L					
Uranium-238	3.15			3.03 +/-0.170	pCi/L		96.1	(75%-125%)		
QC1201920751 LCSD										
Uranium-233/234				3.20 +/-0.222	pCi/L	14.8				09/17/09 20:03
Uranium-235/236				0.152 +/-0.0586	pCi/L	24.3				
Uranium-238	3.15			3.13 +/-0.220	pCi/L	3.32	99.3	(0%-20%)		
QC1201920749 MB										
Uranium-233/234			U	0.00533 +/-0.0165	pCi/L					09/18/09 19:36
Uranium-235/236			U	0.00 +/-0.0115	pCi/L					
Uranium-238				0.0143	pCi/L					

QC Summary

Workorder: 236077

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Rad Alpha Spec										
Batch 901448										
				+/-0.0162						
Batch 903844										
QC1201926676 236077020 DUP										
Thorium-228		1.02		1.27	pCi/g	21.8*		(0% - 20%)	MXE1	09/28/09 14:34
		+/-0.202		+/-0.266						
Thorium-230		1.88		1.89	pCi/g	0.531		(0% - 20%)		
		+/-0.255		+/-0.315						
Thorium-232		1.00		1.16	pCi/g	14.8		(0% - 20%)		
		+/-0.188		+/-0.243						
QC1201926678 LCS										
Thorium-228			U	0.0859	pCi/g					09/29/09 19:36
				+/-0.0741						
Thorium-230	8.26			7.14	pCi/g		86.4	(75%-125%)		
				+/-0.409						
Thorium-232			U	0.0122	pCi/g			(75%-125%)		
				+/-0.0238						
QC1201926675 MB										
Thorium-228			U	0.110	pCi/g					09/29/09 19:36
				+/-0.0814						
Thorium-230			U	-0.00642	pCi/g					
				+/-0.0281						
Thorium-232			U	0.00642	pCi/g					
				+/-0.0126						
QC1201926677 236077020 MS										
Thorium-228		1.02		1.11	pCi/g					09/28/09 14:34
		+/-0.202		+/-0.190						
Thorium-230	8.46	1.88		8.61	pCi/g		79.6	(75%-125%)		
		+/-0.255		+/-0.507						
Thorium-232		1.00		0.971	pCi/g			(75%-125%)		
		+/-0.188		+/-0.179						
Batch 903847										
QC1201926680 236077020 DUP										
Uranium-233/234		2.21		2.26	pCi/g	2.24		(0% - 20%)	MXE1	09/24/09 15:15
		+/-0.188		+/-0.186						
Uranium-235/236		0.138		0.132	pCi/g	4.44		(0% - 100%)		
		+/-0.0556		+/-0.0517						
Uranium-238		2.18		2.07	pCi/g	5.18		(0% - 20%)		
		+/-0.186		+/-0.178						
QC1201926682 LCS										
Uranium-233/234				4.57	pCi/g					09/24/09 15:16
				+/-0.255						
Uranium-235/236				0.270	pCi/g					
				+/-0.070						
Uranium-238	4.78			4.86	pCi/g		102	(75%-125%)		
				+/-0.264						

QC Summary

Workorder: **236077**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Rad Alpha Spec										
Batch 903847										
QC1201926679 MB										
Uranium-233/234			U	0.0107 +/-0.0246	pCi/g				MXE1	09/24/09 15:15
Uranium-235/236			U	0.00 +/-0.0168	pCi/g					
Uranium-238			U	0.00695 +/-0.0167	pCi/g					
QC1201926681 236077020 MS										
Uranium-233/234		2.21 +/-0.188		7.17 +/-0.464	pCi/g					09/24/09 15:16
Uranium-235/236		0.138 +/-0.0556		0.546 +/-0.142	pCi/g					
Uranium-238	4.78	2.18 +/-0.186		6.81 +/-0.452	pCi/g		96.9	(75%-125%)		
Rad Gas Flow										
Batch 900849										
QC1201919339 236077020 DUP										
Radium-228		1.07 +/-0.163		0.907 +/-0.244	pCi/g	16.3		(0% - 100%)	JXC5	09/21/09 17:34
QC1201919341 LCS										
Radium-228	7.87			8.05 +/-0.770	pCi/g		102	(75%-125%)		09/21/09 15:56
QC1201919338 MB										
Radium-228			U	0.258 +/-0.279	pCi/g					09/21/09 15:56
QC1201919340 236077020 MS										
Radium-228	80.5	1.07 +/-0.163		71.1 +/-7.49	pCi/g		87	(75%-125%)		09/21/09 15:57
Batch 902602										
QC1201923560 LCS										
Radium-228	11.4			11.5 +/-1.19	pCi/L		100	(75%-125%)	MXS2	09/18/09 18:46
QC1201923561 LCSD										
Radium-228	11.4			11.2 +/-1.25	pCi/L	2.33	98.1	(0%-20%)		09/18/09 18:46
QC1201923559 MB										
Radium-228				0.561 +/-0.375	pCi/L					09/18/09 18:46
Rad Ra-226										
Batch 904060										
QC1201927089 236077020 DUP										
Radium-226		1.54 +/-0.346		1.47 +/-0.329	pCi/g	5.01		(0% - 20%)	KSD1	09/25/09 18:25
QC1201927091 LCS										
Radium-226	11.0			11.1 +/-0.875	pCi/g		101	(75%-125%)		09/25/09 18:25
QC1201927088 MB										

QC Summary

Workorder: **236077**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Rad Ra-226										
Batch 904060										
Radium-226			U	0.224 +/-0.182	pCi/g					09/25/09 18:25
QC1201927090 236077020 MS										
Radium-226	12.1	1.54 +/-0.346		13.4 +/-1.02	pCi/g		97.9	(75%-125%)	KSD1	09/25/09 18:25
Batch 904649										
QC1201928563 LCS										
Radium-226	24.2			20.4 +/-1.75	pCi/L		84.3	(75%-125%)	KSD1	09/25/09 10:40
QC1201928564 LCSD										
Radium-226	24.2			30.1 +/-2.30	pCi/L	38.5*	124	(0%-20%)		09/25/09 10:40
QC1201928562 MB										
Radium-226			U	0.419 +/-0.325	pCi/L					09/25/09 10:40

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

QC Summary

Workorder: **236077**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time

^ 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# 901446 Product: Th Date: 9/22/09

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to100 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.		✓	NCR# 736721
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# 736721
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.			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 statused.	✓		
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.	✓		NCR# 736721
Batch non-conformances second reviewed and disposition verified to be completed.	✓		NCR# 736721
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: [signature] 9/22/09

Secondary Review Performed By: [signature] 9/23/09

KERR
9/13- 9/24

P

Thorium (Ac-227 Tracer) Que Sheet

10-SEP-09

Batch #: 901446 **Analyst:** CXM2 **First Client Due Date:**24-SEP-09 **Internal Due Date**13-SEP-09

Tracer Isotope: Ac-227 **Tracer Code:** 0387-B-102 **Expiration Date:** 7/23/10 **Vol:** 0.1mL **Ac-227 Separation Date/Time:** 9/14/09 23:15

LCS Isotope: Th-230 **LCS Code:** A2796-5 **Expiration Date:** 4/13/10 **Vol:** 0.1mL

Spike Isotope: Th-230 **Spike Code:** — **Expiration Date:** — **Vol:** —

Prep Date: 9/11/09 **Initials:** CMM **Pipet ID:** 2971058 **Balance ID:** 1675020 7 **Witness:** ME 9/11/09

Sample ID	Client Description	Type	Hazard Code	Min CRDL	Matrix	Client	Collection Date	Pos.	Label #	Wet/Dry Aliquot (g / L / f)	Th Det #
235860015-1	EB082109-SO1	SAMPLE		.03 pCi/L	WATER	KERR003	21-AUG-09	1	1	0.800	39
236077013-1	EB082709-SO1	SAMPLE		.03 pCi/L	WATER	KERR003	27-AUG-09	2	2	0.800	40
236077019-1	EB083109-SO1	SAMPLE		.03 pCi/L	WATER	KERR003	31-AUG-09	3	3	0.800	41
236077021-1	EB090109-SO1	SAMPLE		.03 pCi/L	WATER	KERR003	01-SEP-09	4	4	0.800	42
236238008-1	FB082809-SO	SAMPLE		.03 pCi/L	WATER	KERR003	28-AUG-09	5	5	0.800	43
236534011-1	EB090209-SO1	SAMPLE		.03 pCi/L	WATER	KERR003	02-SEP-09	6	6	0.800	~~44~~ 193 ESS 9/22/09
1201920746-1	MB for batch 901446	MB		.03 pCi/L	WATER	QC ACCOUNT	~~21-AUG-09~~ DG 9/17/09	7	7	0.800	45
1201920747-1	LCS for batch 901446	LCS		.03 pCi/L	WATER	QC ACCOUNT	21-AUG-09	8	8	0.800	46
1201920748-1	LCSD for batch 901446	LCSD		.03 pCi/L	WATER	QC ACCOUNT	21-AUG-09	9	9	0.800	47

82

Choose SOP Used: GL-RAD-A-038

GL-RAD-A-045 ___
GL-RAD-A-043 ___
GL-RAD-A-032 ___

Solid Sample Dissolution by: N/A ESS 9/17/09 **LEACH or ~~DIGESTION~~** (Circle One)

Data Reviewed By: 9/22/09

GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

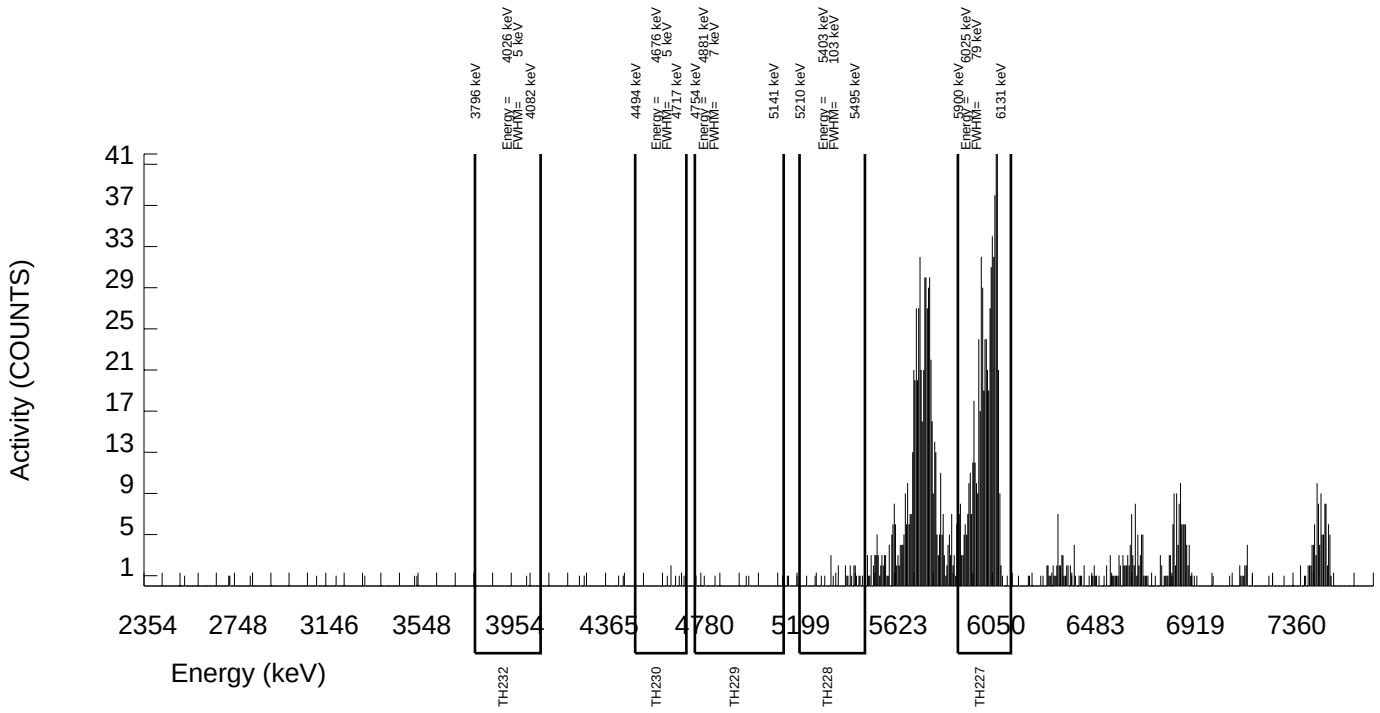
BATCH NUMBER: 901446 SAMPLE DATE : 27-AUG-2009 00:00:00 AC-227 SEPARATION : 14-SEP-2009 23:15:00	SAMPLE ID : S0236077013_TH SAMPLE QTY: 0.800 L
DETECTOR NUMBER :78773 AVERAGE %EFFICIENCY :32.0737 % YIELD : 79.381	COUNT DATE:16-SEP-2009 17:56:23 ELAPSED LIVE TIME(SEC): 59999.99 ANALYST :CXM2

MS/MSD	LCS/LCSD	TRACER	
ID : A2796-J ISOTOPE : TH-230 PCI/L : 2.675E+00	ID : A2796-J ISOTOPE : TH-230 PCI/L : 2.675E+00	ID : 0387-B-102 ISOTOPE : AC227 NOMINAL : 3.90602 dpm RESULTS : 3.10065 dpm	LIB FILE : ENV_ALPHA_TH.N BKG FILE : B040.CNF;1067 BKG DATE : 13-SEP-2009 EFF FILE : W040.CNF;306 CAL DATE : 5-SEP-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	632.000	626.000	6.000	2.4495	68.10000	2.20E+00	2.11E-01	5.06E-02	2.00E-02	1.74E-01
TH-228	5363.000	25.000	16.000	9.000	3.0000	99.94000	3.62E-02	2.59E-02	3.83E-02	1.58E-02	2.58E-02
TH229	4900.000	8.000	4.000	4.000	2.0000	99.52000	8.89E-03	1.51E-02	2.73E-02	1.03E-02	1.51E-02
TH-230	4625.000	7.000	3.000	4.000	2.0000	100.0000	6.63E-03	1.44E-02	2.72E-02	1.03E-02	1.44E-02
TH-232	3972.000	1.000	-4.000	5.000	2.2361	100.0000	-8.85E-03	1.06E-02	2.96E-02	1.15E-02	1.06E-02

NOTE: Ac-227 results decay corrected to separation date/time.



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

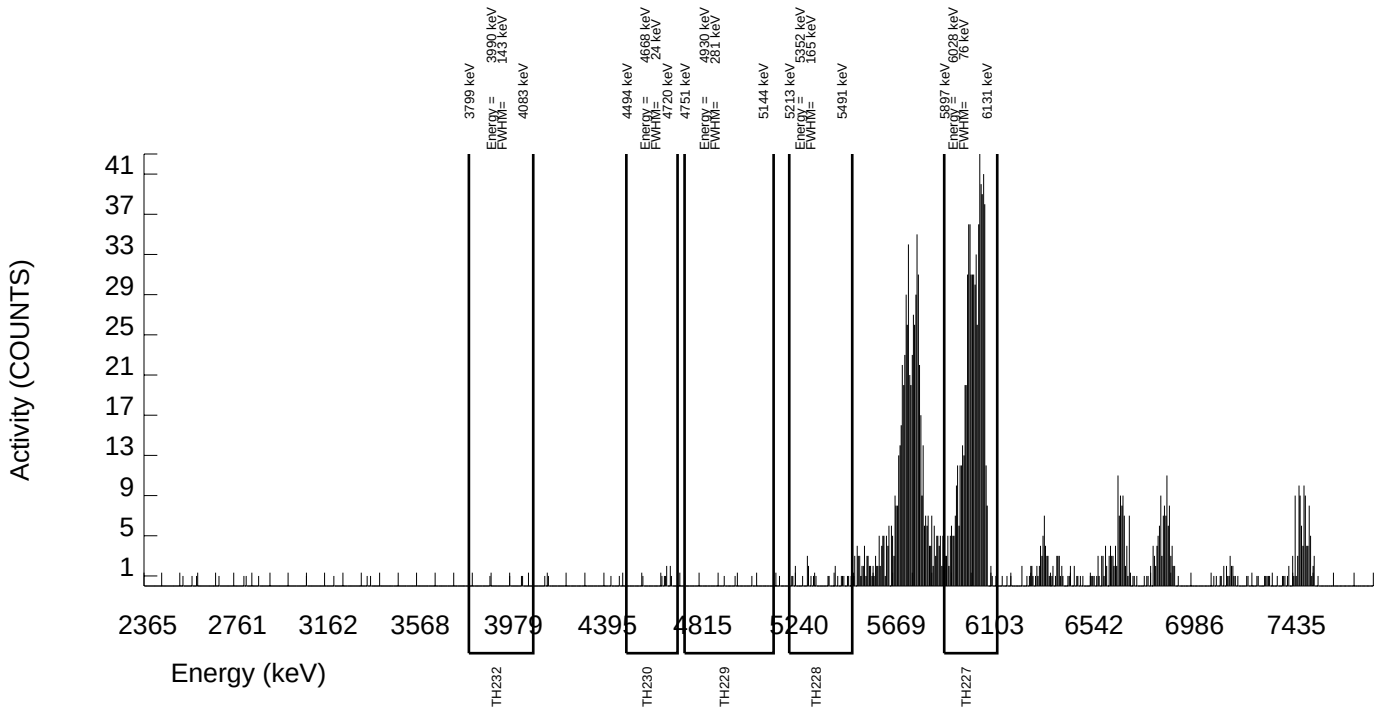
BATCH NUMBER: 901446 SAMPLE DATE : 31-AUG-2009 00:00:00 AC-227 SEPARATION : 14-SEP-2009 23:15:00	SAMPLE ID : S0236077019_TH SAMPLE QTY: 0.800 L
DETECTOR NUMBER :78205 AVERAGE %EFFICIENCY :32.9883 % YIELD : 86.427	COUNT DATE:16-SEP-2009 17:56:23 ELAPSED LIVE TIME(SEC): 59999.99 ANALYST :CXM2

MS/MSD	LCS/LCSD	TRACER	
ID : A2796-J ISOTOPE : TH-230 PCI/L : 2.675E+00	ID : A2796-J ISOTOPE : TH-230 PCI/L : 2.675E+00	ID : 0387-B-102 ISOTOPE : AC227 NOMINAL : 3.90602 dpm RESULTS : 3.37586 dpm	LIB FILE : ENV_ALPHA_TH.N BKG FILE : B041.CNF;1060 BKG DATE : 13-SEP-2009 EFF FILE : W041.CNF;310 CAL DATE : 5-SEP-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	717.000	701.000	16.000	4.0000	68.10000	2.20E+00	2.05E-01	6.78E-02	2.92E-02	1.66E-01
TH-228	5363.000	25.000	20.000	5.000	2.2361	99.94000	4.02E-02	2.17E-02	2.69E-02	1.05E-02	2.16E-02
TH229	4900.000	4.000	0.000	4.000	2.0000	99.52000	0.00E+00	1.10E-02	2.44E-02	9.23E-03	1.10E-02
TH-230	4625.000	9.000	4.000	5.000	2.2361	100.0000	7.90E-03	1.45E-02	2.65E-02	1.03E-02	1.45E-02
TH-232	3972.000	4.000	2.000	2.000	1.4142	100.0000	3.95E-03	9.48E-03	1.89E-02	6.50E-03	9.48E-03

NOTE: Ac-227 results decay corrected to separation date/time.



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

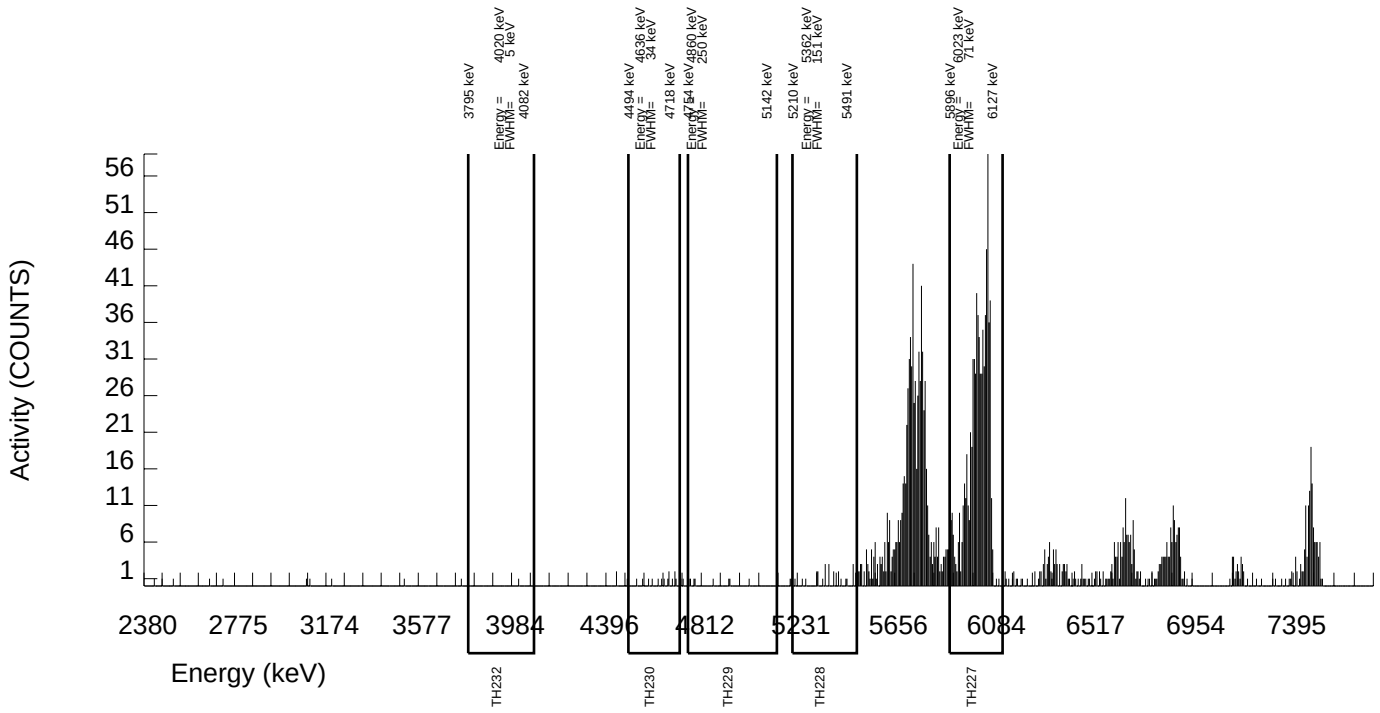
BATCH NUMBER: 901446 SAMPLE DATE : 1-SEP-2009 00:00:00. AC-227 SEPARATION : 14-SEP-2009 23:15:00	SAMPLE ID : S0236077021_TH SAMPLE QTY: 0.800 L
DETECTOR NUMBER :78793 AVERAGE %EFFICIENCY :32.6249 % YIELD : 91.379	COUNT DATE:16-SEP-2009 17:56:23 ELAPSED LIVE TIME(SEC): 59999.99 ANALYST :CXM2

MS/MSD	LCS/LCSD	TRACER	
ID : A2796-J ISOTOPE : TH-230 PCI/L : 2.675E+00	ID : A2796-J ISOTOPE : TH-230 PCI/L : 2.675E+00	ID : 0387-B-102 ISOTOPE : AC227 NOMINAL : 3.90602 dpm RESULTS : 3.56929 dpm	LIB FILE : ENV_ALPHA_TH.N BKG FILE : B042.CNF;1059 BKG DATE : 13-SEP-2009 EFF FILE : W042.CNF;283 CAL DATE : 5-SEP-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	749.000	733.000	16.000	4.0000	68.10000	2.20E+00	2.01E-01	6.48E-02	2.79E-02	1.63E-01
TH-228	5363.000	26.000	17.000	9.000	3.0000	99.94000	3.26E-02	2.23E-02	3.26E-02	1.34E-02	2.23E-02
TH229	4900.000	8.000	-4.000	12.000	3.4641	99.52000	-7.59E-03	1.66E-02	3.63E-02	1.53E-02	1.66E-02
TH-230	4625.000	15.000	13.000	2.000	1.4142	100.0000	2.46E-02	1.53E-02	1.81E-02	6.21E-03	1.53E-02
TH-232	3972.000	1.000	-3.000	4.000	2.0000	100.0000	-5.67E-03	8.28E-03	2.32E-02	8.79E-03	8.28E-03

NOTE: Ac-227 results decay corrected to separation date/time.



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

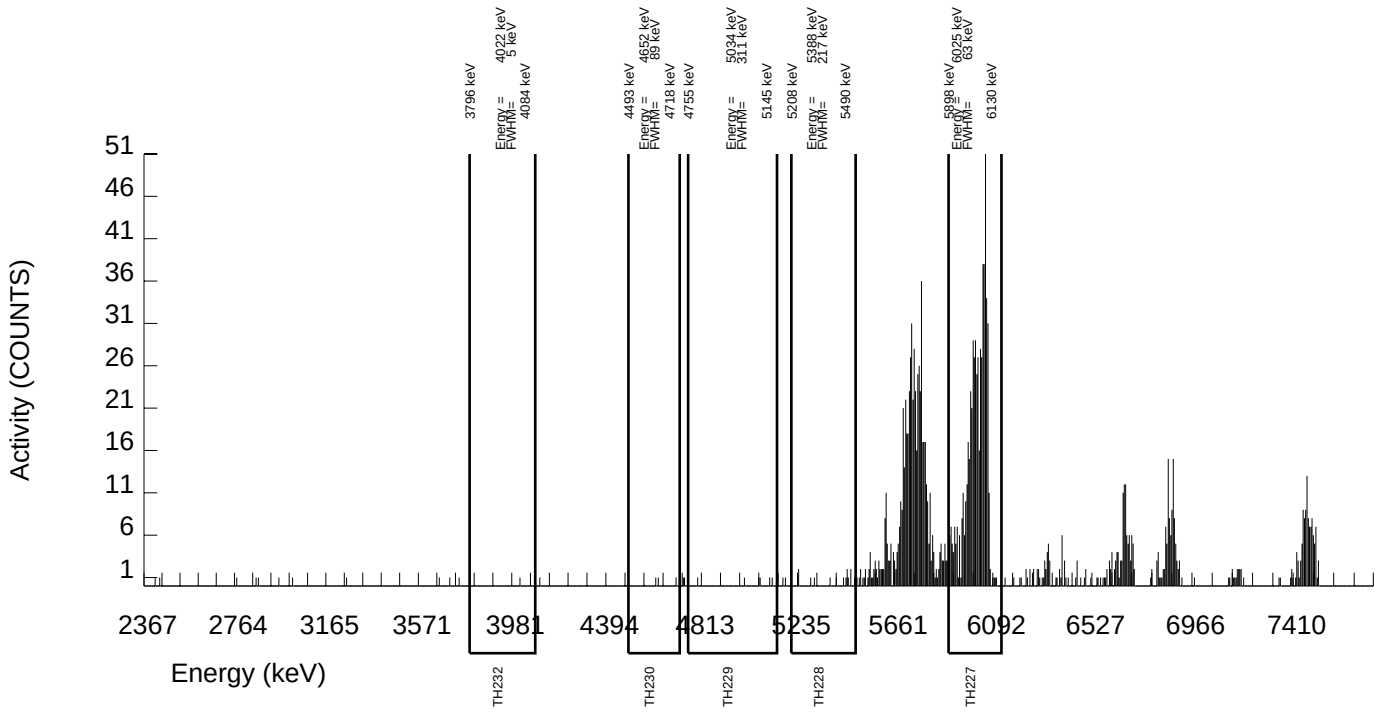
BATCH NUMBER: 901446 SAMPLE DATE : 11-SEP-2009 00:00:00 AC-227 SEPARATION : 14-SEP-2009 23:15:00	SAMPLE ID : S1201920746_TH SAMPLE QTY: 0.800 L
DETECTOR NUMBER :78783 AVERAGE %EFFICIENCY :33.8617 % YIELD : 70.986	COUNT DATE:16-SEP-2009 17:56:24 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :CXM2

MS/MSD	LCS/LCSD	TRACER	
ID : A2796-J ISOTOPE : TH-230 PCI/L : 2.675E+00	ID : A2796-J ISOTOPE : TH-230 PCI/L : 2.675E+00	ID : 0387-B-102 ISOTOPE : AC227 NOMINAL : 3.90602 dpm RESULTS : 2.77272 dpm	LIB FILE : ENV_ALPHA_TH.N BKG FILE : B045.CNF;1054 BKG DATE : 13-SEP-2009 EFF FILE : W045.CNF;287 CAL DATE : 5-SEP-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	593.000	591.000	2.000	1.4142	68.10000	2.20E+00	2.14E-01	3.57E-02	1.22E-02	1.78E-01
TH-228	5363.000	15.000	10.000	5.000	2.2361	99.94000	2.36E-02	2.07E-02	3.16E-02	1.23E-02	2.07E-02
TH229	4900.000	6.000	2.000	4.000	2.0000	99.52000	4.71E-03	1.46E-02	2.90E-02	1.10E-02	1.46E-02
TH-230	4625.000	3.000	-1.000	4.000	2.0000	100.0000	-2.34E-03	1.21E-02	2.88E-02	1.09E-02	1.21E-02
TH-232	3972.000	1.000	0.000	1.000	1.0000	100.0000	0.00E+00	6.49E-03	1.79E-02	5.45E-03	6.49E-03

NOTE: Ac-227 results decay corrected to separation date/time.



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

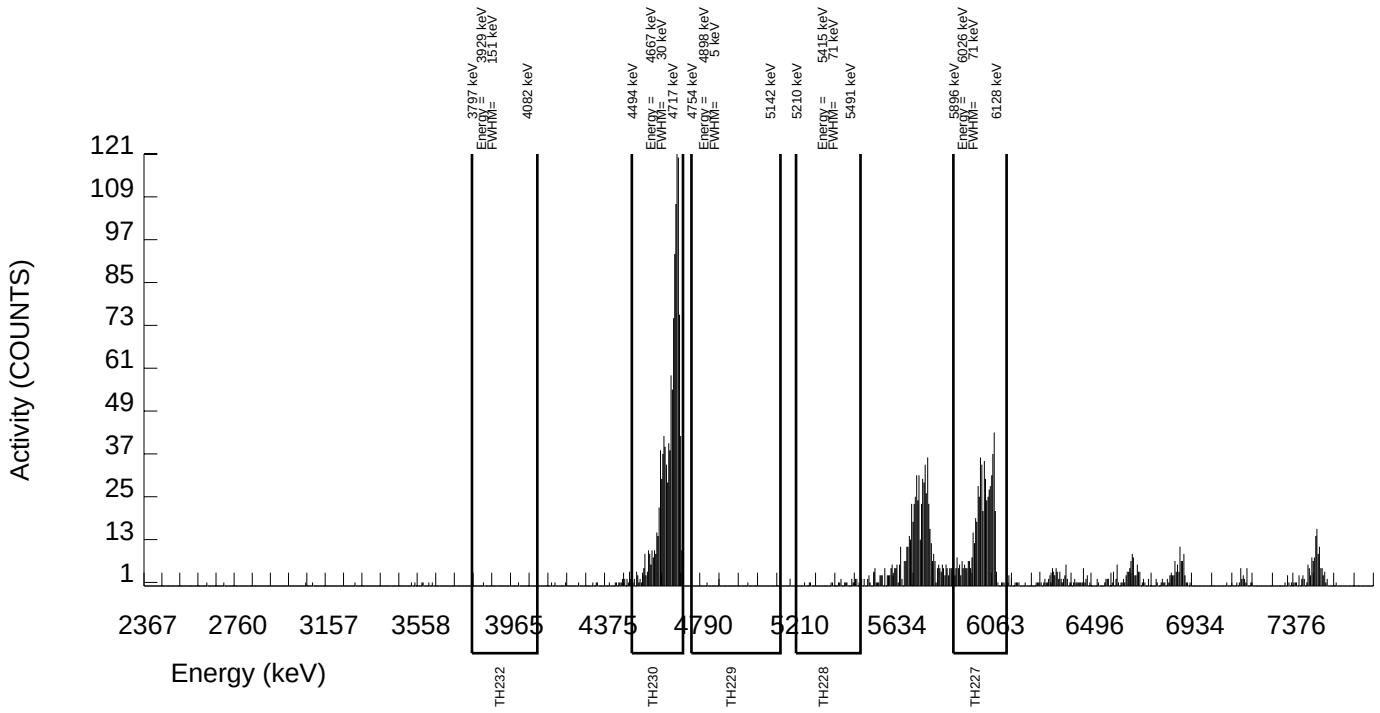
BATCH NUMBER: 901446 SAMPLE DATE : 11-SEP-2009 00:00:00 AC-227 SEPARATION : 14-SEP-2009 23:15:00	SAMPLE ID : S1201920747_TH SAMPLE QTY: 0.800 L
DETECTOR NUMBER :76544 AVERAGE %EFFICIENCY :34.2883 % YIELD : 72.119	COUNT DATE:16-SEP-2009 17:56:24 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :CXM2

MS/MSD	LCS/LCSD	TRACER	
ID : A2796-J ISOTOPE : TH-230 PCI/L : 2.675E+00	ID : A2796-J ISOTOPE : TH-230 PCI/L : 2.675E+00	ID : 0387-B-102 ISOTOPE : AC227 NOMINAL : 3.90602 dpm RESULTS : 2.81699 dpm	LIB FILE : ENV_ALPHA_TH.N BKG FILE : B046.CNF;1065 BKG DATE : 13-SEP-2009 EFF FILE : W046.CNF;278 CAL DATE : 5-SEP-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	613.000	608.000	5.000	2.2361	68.10000	2.20E+00	2.13E-01	4.85E-02	1.88E-02	1.76E-01
TH-228	5363.000	21.000	14.000	7.000	2.6458	99.94000	3.21E-02	2.38E-02	3.51E-02	1.41E-02	2.38E-02
TH229	4900.000	4.000	-2.000	6.000	2.4495	99.52000	-4.58E-03	1.42E-02	3.29E-02	1.30E-02	1.42E-02
TH-230	4625.000	1238.000	1232.000	6.000	2.4495	100.0000	2.81E+00	2.18E-01	3.28E-02	1.30E-02	1.57E-01
TH-232	3972.000	2.000	0.000	2.000	1.4142	100.0000	0.00E+00	8.93E-03	2.18E-02	7.49E-03	8.93E-03

NOTE: Ac-227 results decay corrected to separation date/time.



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

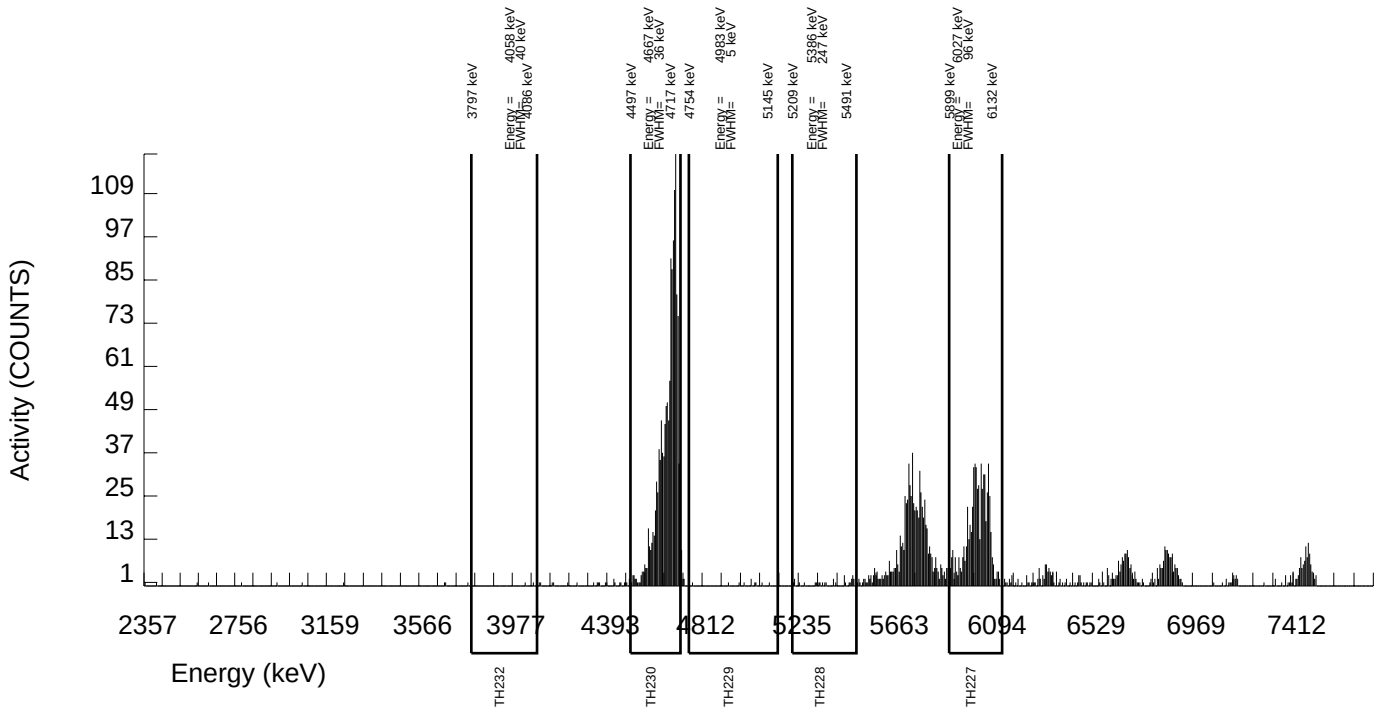
BATCH NUMBER: 901446 SAMPLE DATE : 11-SEP-2009 00:00:00 AC-227 SEPARATION : 14-SEP-2009 23:15:00	SAMPLE ID : S1201920748_TH SAMPLE QTY: 0.800 L
DETECTOR NUMBER :46-089B1 AVERAGE %EFFICIENCY :34.1455 % YIELD : 73.731	COUNT DATE:16-SEP-2009 17:56:24 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :CXM2

MS/MSD	LCS/LCSD	TRACER	
ID : A2796-J ISOTOPE : TH-230 PCI/L : 2.675E+00	ID : A2796-J ISOTOPE : TH-230 PCI/L : 2.675E+00	ID : 0387-B-102 ISOTOPE : AC227 NOMINAL : 3.90602 dpm RESULTS : 2.87995 dpm	LIB FILE : ENV_ALPHA_TH.N BKG FILE : B047.CNF;1060 BKG DATE : 13-SEP-2009 EFF FILE : W047.CNF;292 CAL DATE : 5-SEP-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	628.000	619.000	9.000	3.0000	68.10000	2.20E+00	2.12E-01	6.03E-02	2.48E-02	1.76E-01
TH-228	5363.000	28.000	9.000	19.000	4.3589	99.94000	2.03E-02	3.03E-02	5.24E-02	2.28E-02	3.03E-02
TH229	4900.000	11.000	6.000	5.000	2.2361	99.52000	1.35E-02	1.76E-02	3.01E-02	1.17E-02	1.76E-02
TH-230	4625.000	1335.000	1332.000	3.000	1.7321	100.0000	2.98E+00	2.27E-01	2.47E-02	9.01E-03	1.60E-01
TH-232	3972.000	2.000	1.000	1.000	1.0000	100.0000	2.24E-03	7.59E-03	1.71E-02	5.20E-03	7.59E-03

NOTE: Ac-227 results decay corrected to separation date/time.



Radiochemistry Batch Checklist, Rev 9

Batch# 903844 Product: Th Date: 9/30/09

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to100 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%. Or meets the client's required RER acceptance criteria.	✓		Case narrative
Tracer yield is 15-125%. Carrier yield 25-125%. Or meets the client's contract acceptance criteria.		✓	NCR 740164
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.			N/A
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 statused.	✓		
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 740164
Batch non-conformances second reviewed and disposition verified to be completed.	/		NCR 740164
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] 9/30/09

Secondary Review Performed By: [signature] 9/30/09

9/19 9/30

KERR

Thorium (Ac-227 Tracer) Que Sheet

17-SEP-09

Batch #: 903844 **Analyst:** MXE1 **First Client Due Date:** 30-SEP-09 **Internal Due Date** 19-SEP-09

Tracer Isotope: Ac-227 **Tracer Code:** 0381-B-102 **Expiration Date:** 7/23/10 **Vol:** 0.1 **Ac-227 Separation Date/Time:** 1800 9/23/9

LCS Isotope: Th-230 **LCS Code:** A2196-0 **Expiration Date:** 4/13/10 **Vol:** 0.1

Spike Isotope: Th-230 **Spike Code:** A2196-0 **Expiration Date:** 4/13/10 **Vol:** 0.1

Prep Date: 9/21/09 **Initials:** mae **Pipet ID:** 2971058 **Balance ID:** 50410272 **Witness:** JWD 09/21/09

Sample ID	Client Description	Type	Hazard Code	Min CRDL	Matrix	Client	Collection Date	Pos.	Label #	Wet/Dry Aliquot (g/l/f)	Th Det #
236077001-1	RSAS3-0.5B	SAMPLE		.05 pCi/g	SOIL	KERR003	26-AUG-09	1	1	0.254	~~187~~ 28 25
236077002-1	RSAS3009-0.5B	SAMPLE		.05 pCi/g	SOIL	KERR003	26-AUG-09	2	2	0.256	~~188~~ 29 26
236077003-1	RSAS3-10B	SAMPLE		.05 pCi/g	SOIL	KERR003	26-AUG-09	3	3	0.251	~~193~~ 30 27
236077004-1	RSAS3-25B	SAMPLE		.05 pCi/g	SOIL	KERR003	26-AUG-09	4	4	0.258	179 28
236077005-1	RSAS3-44B	SAMPLE		.05 pCi/g	SOIL	KERR003	26-AUG-09	5	5	0.255	180 29
236077006-1	RSAT6-10B	SAMPLE		.05 pCi/g	SOIL	KERR003	27-AUG-09	6	6	0.254	181 30
236077007-1	RSAT6-30B	SAMPLE		.05 pCi/g	SOIL	KERR003	27-AUG-09	7	7	0.259	182 37
236077008-1	RSAT6-49B	SAMPLE		.05 pCi/g	SOIL	KERR003	27-AUG-09	8	8	~~0.282~~ 0.292 mae 9/21/09	38 (186)
236077009-1	SA210-0.5B	SAMPLE		.05 pCi/g	SOIL	KERR003	27-AUG-09	9	9	0.256	~~191~~ 39
236077010-1	SA210-10B	SAMPLE		.05 pCi/g	SOIL	KERR003	27-AUG-09	10	10	0.256	192 40
236077011-1	SA210-30B	SAMPLE		.05 pCi/g	SOIL	KERR003	27-AUG-09	11	11	0.250	199 41
236077012-1	SA210-49B	SAMPLE		.05 pCi/g	SOIL	KERR003	27-AUG-09	12	12	0.256	200 42
236077014-1	SA68-0.5B	SAMPLE		.05 pCi/g	SOIL	KERR003	31-AUG-09	13	13	0.252	201 ~~197~~ 173 *
236077015-1	SA68-10B	SAMPLE		.05 pCi/g	SOIL	KERR003	31-AUG-09	14	14	0.251	202 199
236077016-1	SA68-25B	SAMPLE		.05 pCi/g	SOIL	KERR003	31-AUG-09	15	15	0.255	203 200
236077017-1	SA68009-25B	SAMPLE		.05 pCi/g	SOIL	KERR003	31-AUG-09	16	16	0.256	205 ~~201~~ 174
236077018-1	SA68-36B	SAMPLE		.05 pCi/g	SOIL	KERR003	31-AUG-09	17	17	0.265	206 ~~202~~ 175 *
236077020-1	SA133-31B	SAMPLE		.05 pCi/g	SOIL	KERR003	01-SEP-09	18	18	0.259	208 203
1201926675-1	MB for batch 903844	MB		.05 pCi/g	SOIL	QC ACCOUNT		19	19	0.259	45 ~~199~~ 176 *
1201926676-1	SA133-31B(236077020DUP)	DUP		.05 pCi/g	SOIL	QC ACCOUNT	01-SEP-09	20	20	0.255	204 204
1201926677-1	SA133-31B(236077020MS)	MS		.05 pCi/g	SOIL	QC ACCOUNT	01-SEP-09	21	21	0.253	207 207
1201926678-1	LCS for batch 903844	LCS		.05 pCi/g	SOIL	QC ACCOUNT		22	22	0.259	~~47~~ ~~208~~ 177 *

9/30/09

Choose SOP Used: GL-RAD-A-038 ✓

GL-RAD-A-045 ___
GL-RAD-A-043 ___
GL-RAD-A-032 ___

Solid Sample Dissolution by: **LEACH or DIGESTION** (DIGESTION circled)
Circle One

Data Reviewed By: 9/30/09
9/30/09

* 9/30/09

GEL Laboratories LLC, Radiochemistry Division

Alpha Spectroscopy Software Version 2.0
effective date: 09-Mar-1997

GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

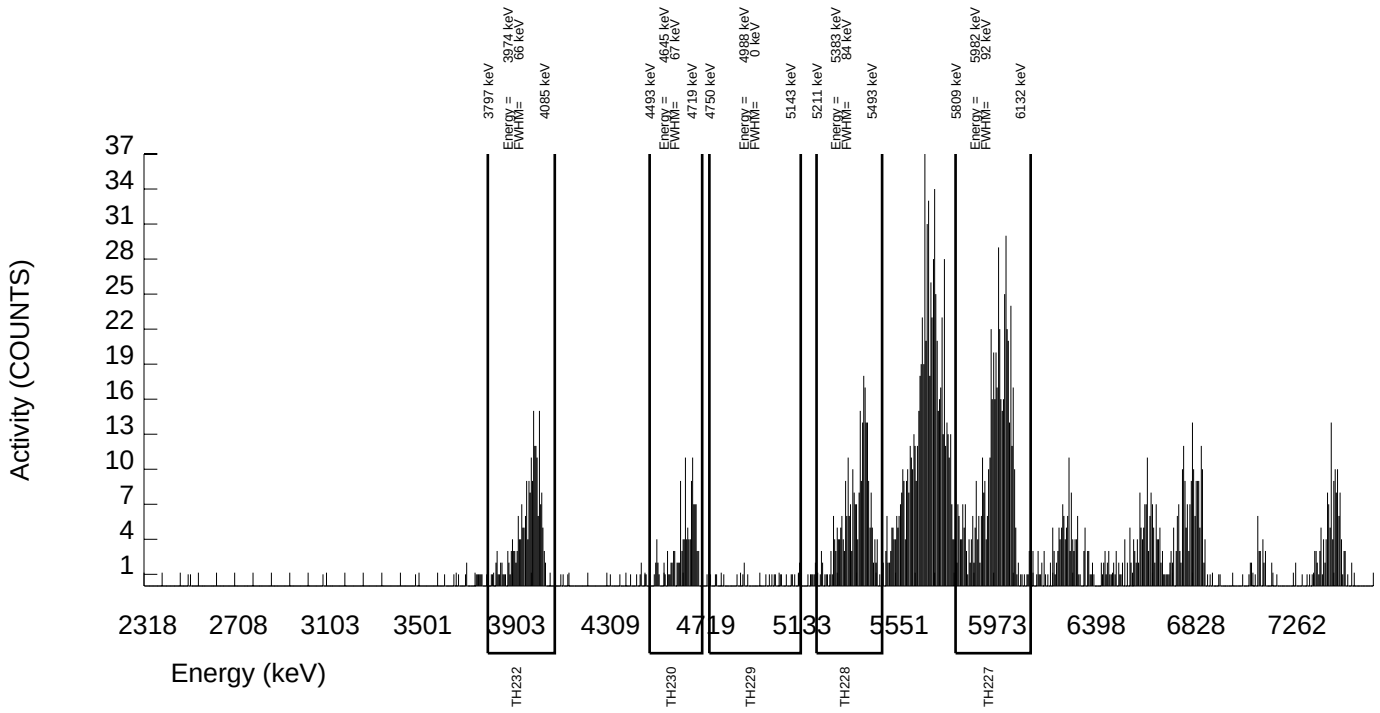
BATCH NUMBER: 903844 SAMPLE DATE : 26-AUG-2009 00:00:00 AC-227 SEPARATION : 23-SEP-2009 18:00:00	SAMPLE ID : S0236077001_TH SAMPLE QTY: 0.254 G
DETECTOR NUMBER :45-149AA5 AVERAGE %EFFICIENCY :32.7650 % YIELD : 86.328	COUNT DATE:28-SEP-2009 14:34:23 ELAPSED LIVE TIME(SEC): 59999.99 ANALYST :MXE1

MS/MSD	LCS/LCSD	TRACER	
ID : A2796-J ISOTOPE : TH-230 PCI/G : 8.426E+00	ID : A2796-J ISOTOPE : TH-230 PCI/G : 8.426E+00	ID : 0387-B-102 ISOTOPE : AC227 NOMINAL : 3.90304 dpm RESULTS : 3.36942 dpm	LIB FILE : ENV_ALPHA_TH.N BKG FILE : B025.CNF;1068 BKG DATE : 27-SEP-2009 EFF FILE : W025.CNF;317 CAL DATE : 5-SEP-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	567.000	523.000	44.000	6.6332	57.44000	6.92E+00	7.62E-01	4.48E-01	2.04E-01	6.41E-01
TH-228	5363.000	288.000	261.000	27.000	5.1962	99.94000	1.69E+00	2.47E-01	1.76E-01	7.84E-02	2.26E-01
TH229	4900.000	23.000	16.000	7.000	2.6458	99.52000	1.01E-01	6.79E-02	9.65E-02	3.88E-02	6.76E-02
TH-230	4625.000	129.000	126.000	3.000	1.7321	100.0000	7.90E-01	1.49E-01	6.93E-02	2.53E-02	1.41E-01
TH-232	3972.000	224.000	221.000	3.000	1.7321	100.0000	1.39E+00	2.03E-01	6.93E-02	2.53E-02	1.85E-01

NOTE: Ac-227 results decay corrected to separation date/time.



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

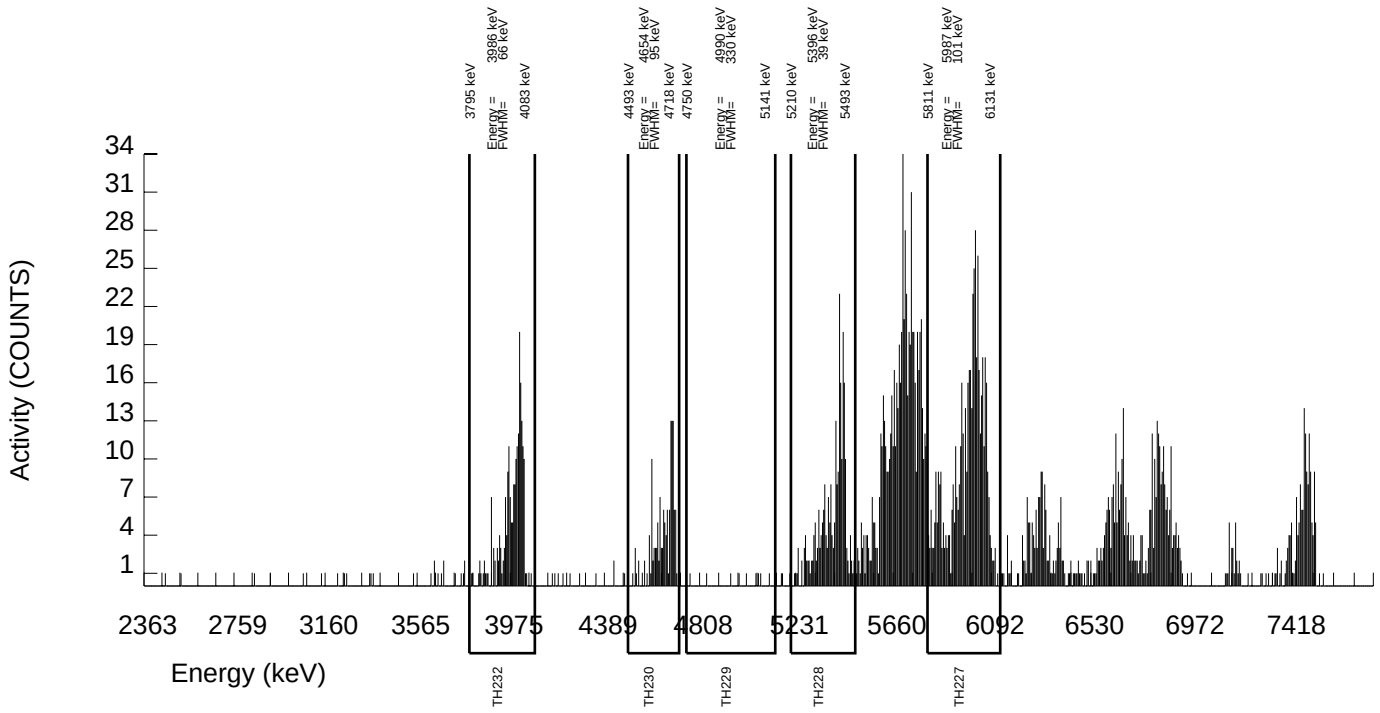
BATCH NUMBER: 903844 SAMPLE DATE : 26-AUG-2009 00:00:00 AC-227 SEPARATION : 23-SEP-2009 18:00:00	SAMPLE ID : S0236077002_TH SAMPLE QTY: 0.256 G
DETECTOR NUMBER :78204 AVERAGE %EFFICIENCY :32.1305 % YIELD : 86.350	COUNT DATE:28-SEP-2009 14:34:23 ELAPSED LIVE TIME(SEC): 59999.99 ANALYST :MXE1

MS/MSD	LCS/LCSD	TRACER	
ID : A2796-J ISOTOPE : TH-230 PCI/G : 8.360E+00	ID : A2796-J ISOTOPE : TH-230 PCI/G : 8.360E+00	ID : 0387-B-102 ISOTOPE : AC227 NOMINAL : 3.90304 dpm RESULTS : 3.37026 dpm	LIB FILE : ENV_ALPHA_TH.N BKG FILE : B026.CNF;1069 BKG DATE : 27-SEP-2009 EFF FILE : W026.CNF;291 CAL DATE : 5-SEP-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	545.000	513.000	32.000	5.6569	57.44000	6.87E+00	7.63E-01	3.93E-01	1.76E-01	6.30E-01
TH-228	5363.000	253.000	242.000	11.000	3.3166	99.94000	1.59E+00	2.31E-01	1.21E-01	5.06E-02	2.09E-01
TH229	4900.000	9.000	3.000	6.000	2.4495	99.52000	1.91E-02	4.84E-02	9.17E-02	3.63E-02	4.84E-02
TH-230	4625.000	136.000	135.000	1.000	1.0000	100.0000	8.56E-01	1.55E-01	4.85E-02	1.48E-02	1.45E-01
TH-232	3972.000	213.000	209.000	4.000	2.0000	100.0000	1.33E+00	2.01E-01	7.80E-02	2.95E-02	1.83E-01

NOTE: Ac-227 results decay corrected to separation date/time.



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

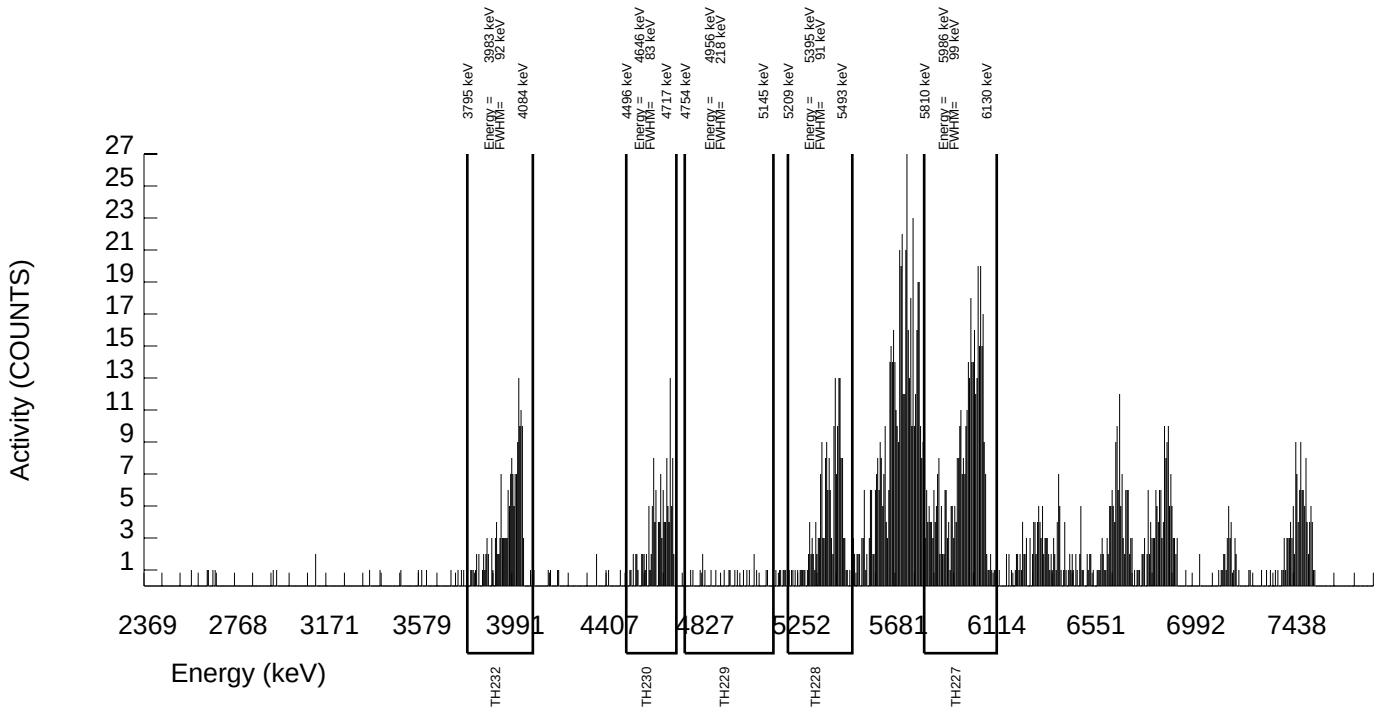
BATCH NUMBER: 903844 SAMPLE DATE : 26-AUG-2009 00:00:00 AC-227 SEPARATION : 23-SEP-2009 18:00:00	SAMPLE ID : S0236077003_TH SAMPLE QTY: 0.251 G
DETECTOR NUMBER :42484 AVERAGE %EFFICIENCY :33.8551 % YIELD : 63.899	COUNT DATE:28-SEP-2009 14:34:23 ELAPSED LIVE TIME(SEC): 59999.99 ANALYST :MXE1

MS/MSD	LCS/LCSD	TRACER	
ID : A2796-J ISOTOPE : TH-230 PCI/G : 8.527E+00	ID : A2796-J ISOTOPE : TH-230 PCI/G : 8.527E+00	ID : 0387-B-102 ISOTOPE : AC227 NOMINAL : 3.90304 dpm RESULTS : 2.49402 dpm	LIB FILE : ENV_ALPHA_TH.N BKG FILE : B027.CNF;1075 BKG DATE : 27-SEP-2009 EFF FILE : W027.CNF;318 CAL DATE : 5-SEP-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	436.000	400.000	36.000	6.0000	57.44000	7.00E+00	8.66E-01	5.41E-01	2.44E-01	7.46E-01
TH-228	5363.000	192.000	184.000	8.000	2.8284	99.94000	1.58E+00	2.58E-01	1.39E-01	5.65E-02	2.38E-01
TH229	4900.000	21.000	13.000	8.000	2.8284	99.52000	1.08E-01	8.82E-02	1.35E-01	5.48E-02	8.80E-02
TH-230	4625.000	127.000	120.000	7.000	2.6458	100.0000	9.95E-01	1.98E-01	1.27E-01	5.11E-02	1.88E-01
TH-232	3972.000	168.000	164.000	4.000	2.0000	100.0000	1.36E+00	2.30E-01	1.02E-01	3.86E-02	2.13E-01

NOTE: Ac-227 results decay corrected to separation date/time.



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

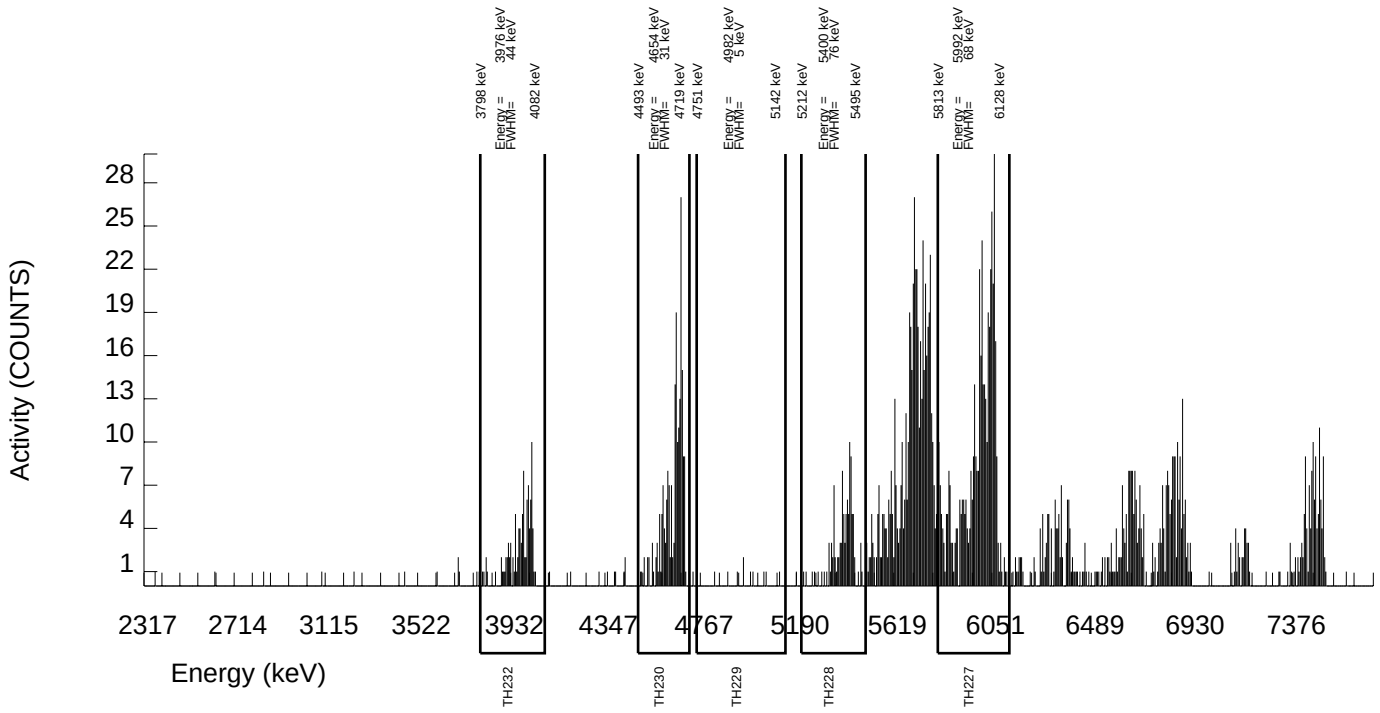
BATCH NUMBER: 903844 SAMPLE DATE : 26-AUG-2009 00:00:00 AC-227 SEPARATION : 23-SEP-2009 18:00:00	SAMPLE ID : S0236077004_TH SAMPLE QTY: 0.258 G
DETECTOR NUMBER :78792 AVERAGE %EFFICIENCY :30.4493 % YIELD : 77.263	COUNT DATE:28-SEP-2009 14:34:23 ELAPSED LIVE TIME(SEC): 59999.99 ANALYST :MXE1

MS/MSD	LCS/LCSD	TRACER	
ID : A2796-J ISOTOPE : TH-230 PCI/G : 8.295E+00	ID : A2796-J ISOTOPE : TH-230 PCI/G : 8.295E+00	ID : 0387-B-102 ISOTOPE : AC227 NOMINAL : 3.90304 dpm RESULTS : 3.01562 dpm	LIB FILE : ENV_ALPHA_TH.N BKG FILE : B028.CNF;1079 BKG DATE : 27-SEP-2009 EFF FILE : W028.CNF;310 CAL DATE : 5-SEP-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	478.000	435.000	43.000	6.5574	57.44000	6.81E+00	8.20E-01	5.25E-01	2.39E-01	7.01E-01
TH-228	5363.000	105.000	100.000	5.000	2.2361	99.94000	7.68E-01	1.65E-01	1.03E-01	4.00E-02	1.58E-01
TH229	4900.000	10.000	2.000	8.000	2.8284	99.52000	1.49E-02	6.20E-02	1.21E-01	4.91E-02	6.20E-02
TH-230	4625.000	206.000	203.000	3.000	1.7321	100.0000	1.51E+00	2.30E-01	8.21E-02	2.99E-02	2.10E-01
TH-232	3972.000	102.000	100.000	2.000	1.4142	100.0000	7.42E-01	1.55E-01	7.11E-02	2.44E-02	1.48E-01

NOTE: Ac-227 results decay corrected to separation date/time.



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

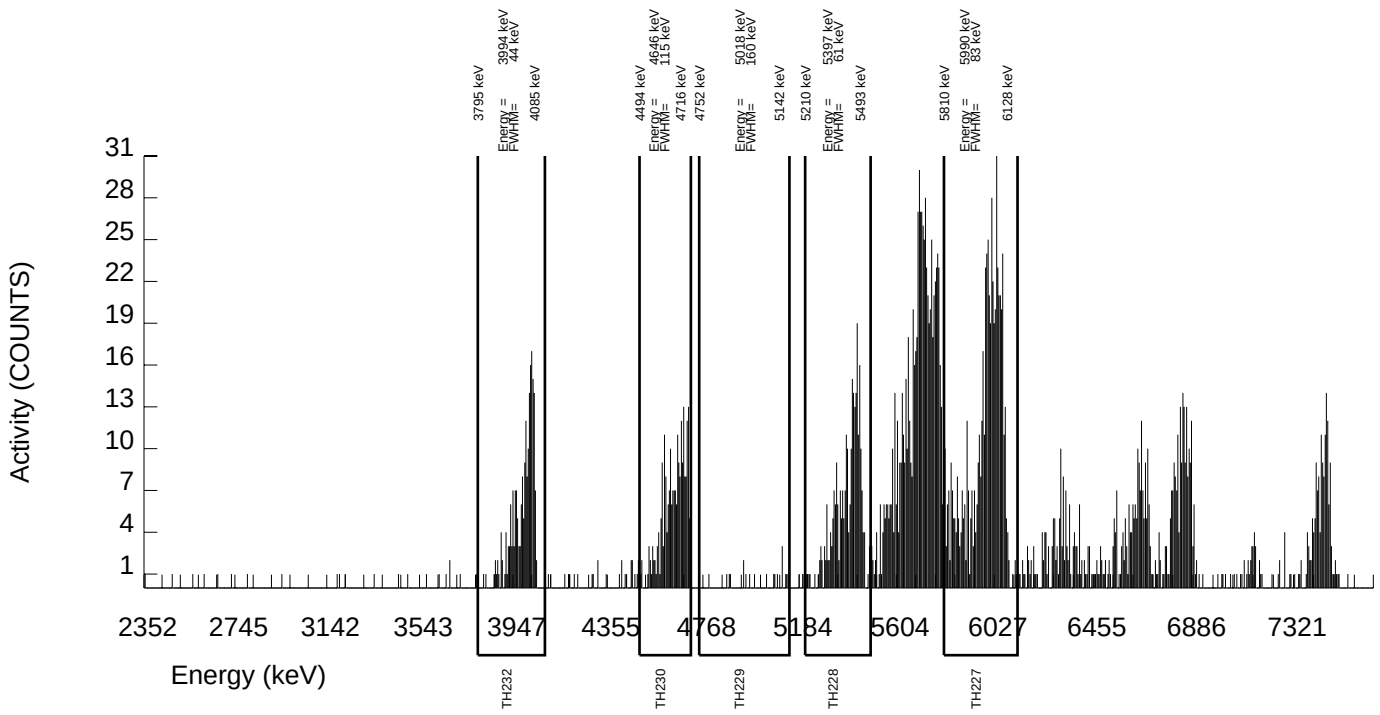
BATCH NUMBER: 903844 SAMPLE DATE : 26-AUG-2009 00:00:00 AC-227 SEPARATION : 23-SEP-2009 18:00:00	SAMPLE ID : S0236077005_TH SAMPLE QTY: 0.255 G
DETECTOR NUMBER :33454 AVERAGE %EFFICIENCY :31.5115 % YIELD : 97.314	COUNT DATE:28-SEP-2009 14:34:23 ELAPSED LIVE TIME(SEC): 59999.99 ANALYST :MXE1

MS/MSD	LCS/LCSD	TRACER	
ID : A2796-J ISOTOPE : TH-230 PCI/G : 8.393E+00	ID : A2796-J ISOTOPE : TH-230 PCI/G : 8.393E+00	ID : 0387-B-102 ISOTOPE : AC227 NOMINAL : 3.90304 dpm RESULTS : 3.79820 dpm	LIB FILE : ENV_ALPHA_TH.N BKG FILE : B029.CNF;1070 BKG DATE : 27-SEP-2009 EFF FILE : W029.CNF;309 CAL DATE : 5-SEP-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	607.000	567.000	40.000	6.3246	57.44000	6.89E+00	7.44E-01	3.94E-01	1.79E-01	6.06E-01
TH-228	5363.000	274.000	247.000	27.000	5.1962	99.94000	1.47E+00	2.23E-01	1.62E-01	7.21E-02	2.03E-01
TH229	4900.000	19.000	8.000	11.000	3.3166	99.52000	4.63E-02	6.22E-02	1.07E-01	4.47E-02	6.21E-02
TH-230	4625.000	233.000	229.000	4.000	2.0000	100.0000	1.32E+00	1.92E-01	7.09E-02	2.68E-02	1.74E-01
TH-232	3972.000	215.000	214.000	1.000	1.0000	100.0000	1.23E+00	1.83E-01	4.41E-02	1.34E-02	1.66E-01

NOTE: Ac-227 results decay corrected to separation date/time.



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

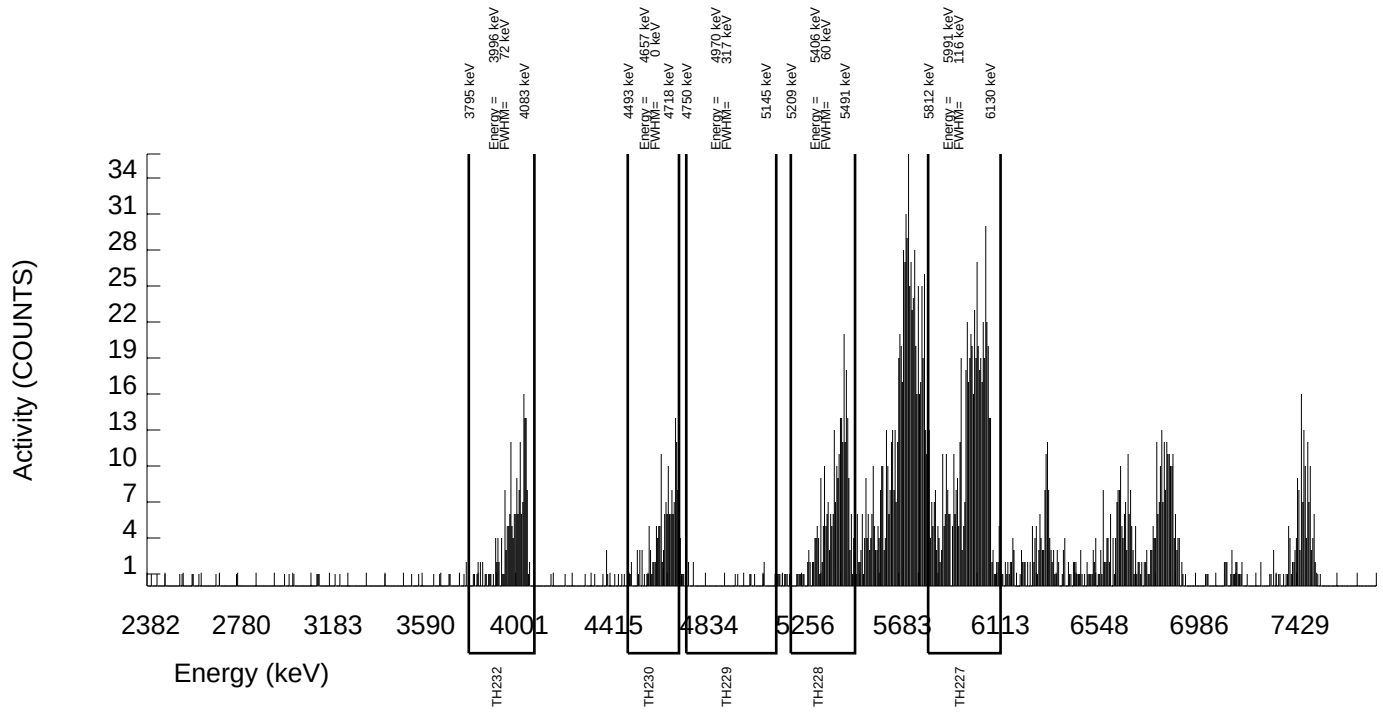
BATCH NUMBER: 903844 SAMPLE DATE : 27-AUG-2009 00:00:00 AC-227 SEPARATION : 23-SEP-2009 18:00:00	SAMPLE ID : S0236077006_TH SAMPLE QTY: 0.254 G
DETECTOR NUMBER :33447 AVERAGE %EFFICIENCY :32.0314 % YIELD : 105.865	COUNT DATE:28-SEP-2009 14:34:23 ELAPSED LIVE TIME(SEC): 59999.99 ANALYST :MXE1

MS/MSD	LCS/LCSD	TRACER	
ID : A2796-J ISOTOPE : TH-230 PCI/G : 8.426E+00	ID : A2796-J ISOTOPE : TH-230 PCI/G : 8.426E+00	ID : 0387-B-102 ISOTOPE : AC227 NOMINAL : 3.90304 dpm RESULTS : 4.13196 dpm	LIB FILE : ENV_ALPHA_TH.N BKG FILE : B030.CNF;1067 BKG DATE : 27-SEP-2009 EFF FILE : W030.CNF;294 CAL DATE : 5-SEP-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	660.000	627.000	33.000	5.7446	57.44000	6.92E+00	7.16E-01	3.28E-01	1.48E-01	5.70E-01
TH-228	5363.000	282.000	245.000	37.000	6.0828	99.94000	1.32E+00	2.07E-01	1.69E-01	7.65E-02	1.89E-01
TH229	4900.000	13.000	-7.000	20.000	4.4721	99.52000	-3.68E-02	5.92E-02	1.25E-01	5.47E-02	5.92E-02
TH-230	4625.000	164.000	162.000	2.000	1.4142	100.0000	8.47E-01	1.42E-01	5.01E-02	1.72E-02	1.32E-01
TH-232	3972.000	197.000	195.000	2.000	1.4142	100.0000	1.02E+00	1.58E-01	5.01E-02	1.72E-02	1.45E-01

NOTE: Ac-227 results decay corrected to separation date/time.



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

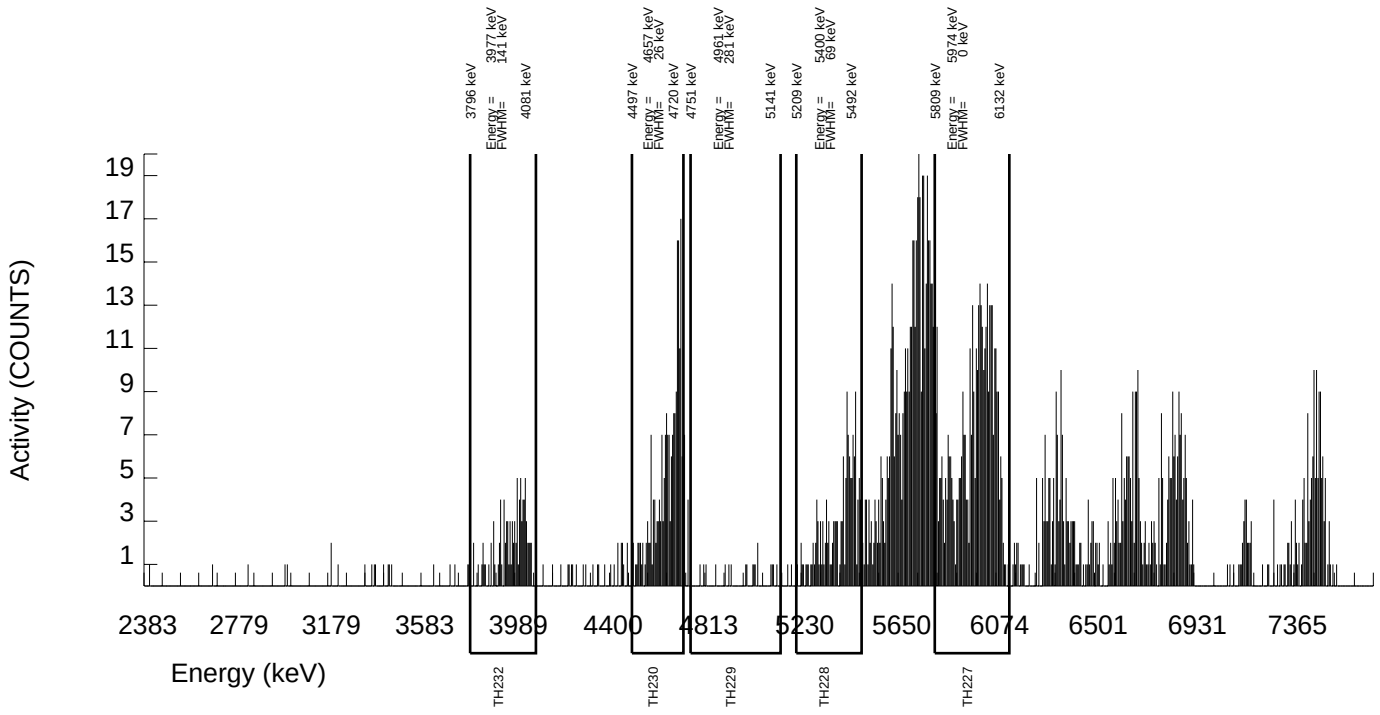
BATCH NUMBER: 903844 SAMPLE DATE : 27-AUG-2009 00:00:00 AC-227 SEPARATION : 23-SEP-2009 18:00:00	SAMPLE ID : S0236077007_TH SAMPLE QTY: 0.259 G
DETECTOR NUMBER :45-149BB5 AVERAGE %EFFICIENCY :35.2731 % YIELD : 63.324	COUNT DATE:28-SEP-2009 14:34:26 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :MXE1

MS/MSD	LCS/LCSD	TRACER	
ID : A2796-J ISOTOPE : TH-230 PCI/G : 8.263E+00	ID : A2796-J ISOTOPE : TH-230 PCI/G : 8.263E+00	ID : 0387-B-102 ISOTOPE : AC227 NOMINAL : 3.90304 dpm RESULTS : 2.47156 dpm	LIB FILE : ENV_ALPHA_TH.N BKG FILE : B037.CNF;1072 BKG DATE : 27-SEP-2009 EFF FILE : W037.CNF;296 CAL DATE : 5-SEP-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	450.000	413.000	37.000	6.0828	57.44000	6.79E+00	8.17E-01	5.14E-01	2.33E-01	7.11E-01
TH-228	5363.000	146.000	121.000	25.000	5.0000	99.94000	9.74E-01	2.14E-01	2.11E-01	9.36E-02	2.06E-01
TH229	4900.000	20.000	5.000	15.000	3.8730	99.52000	3.91E-02	9.08E-02	1.64E-01	7.05E-02	9.07E-02
TH-230	4625.000	205.000	203.000	2.000	1.4142	100.0000	1.58E+00	2.39E-01	7.46E-02	2.56E-02	2.20E-01
TH-232	3972.000	93.000	88.000	5.000	2.2361	100.0000	6.85E-01	1.56E-01	1.04E-01	4.05E-02	1.51E-01

NOTE: Ac-227 results decay corrected to separation date/time.



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

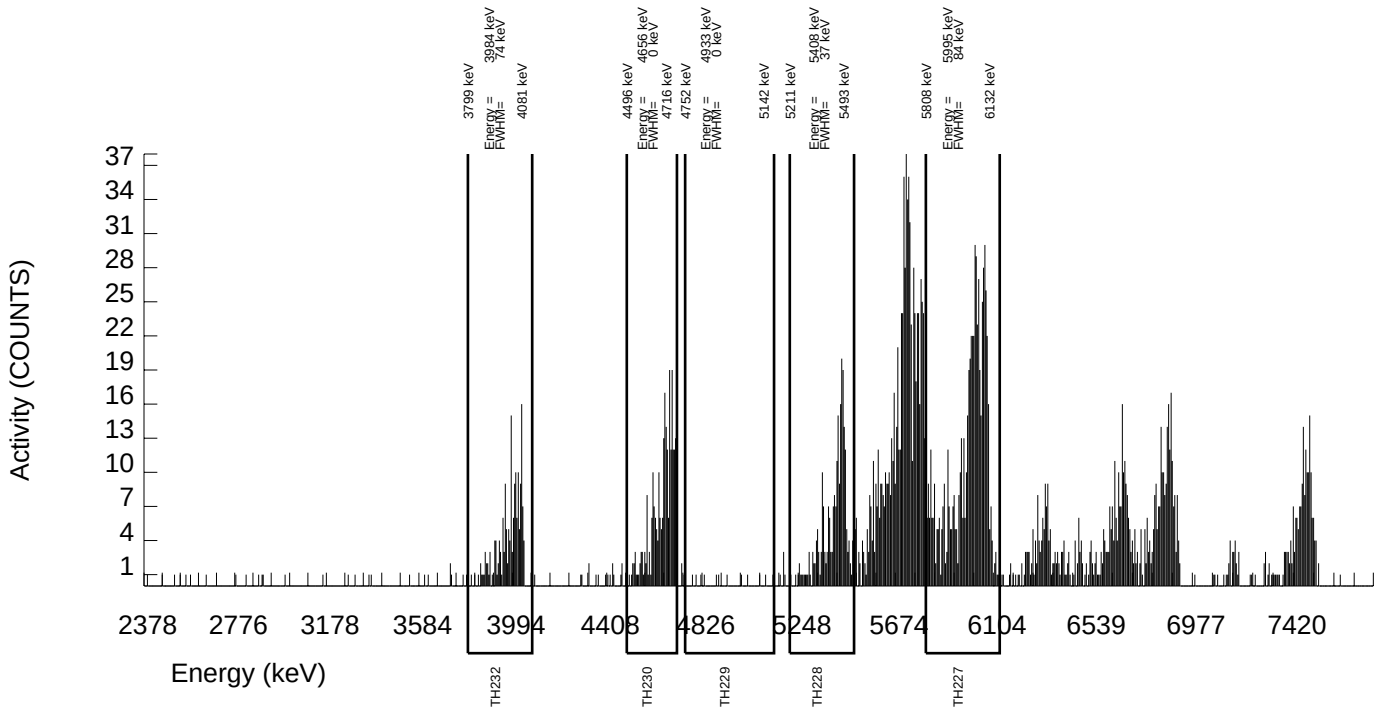
BATCH NUMBER: 903844 SAMPLE DATE : 27-AUG-2009 00:00:00 AC-227 SEPARATION : 23-SEP-2009 18:00:00	SAMPLE ID : S0236077008_TH SAMPLE QTY: 0.252 G
DETECTOR NUMBER :72532 AVERAGE %EFFICIENCY :33.7466 % YIELD : 101.767	COUNT DATE:28-SEP-2009 14:34:26 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :MXE1

MS/MSD	LCS/LCSD	TRACER	
ID : A2796-J ISOTOPE : TH-230 PCI/G : 8.493E+00	ID : A2796-J ISOTOPE : TH-230 PCI/G : 8.493E+00	ID : 0387-B-102 ISOTOPE : AC227 NOMINAL : 3.90304 dpm RESULTS : 3.97199 dpm	LIB FILE : ENV_ALPHA_TH.N BKG FILE : B038.CNF;1069 BKG DATE : 27-SEP-2009 EFF FILE : W038.CNF;310 CAL DATE : 5-SEP-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	675.000	635.000	40.000	6.3246	57.44000	6.98E+00	7.10E-01	3.56E-01	1.62E-01	5.76E-01
TH-228	5363.000	241.000	224.000	17.000	4.1231	99.94000	1.21E+00	1.84E-01	1.19E-01	5.16E-02	1.69E-01
TH229	4900.000	13.000	5.000	8.000	2.8284	99.52000	2.62E-02	4.70E-02	8.45E-02	3.44E-02	4.70E-02
TH-230	4625.000	253.000	250.000	3.000	1.7321	100.0000	1.30E+00	1.81E-01	5.76E-02	2.10E-02	1.63E-01
TH-232	3972.000	174.000	171.000	3.000	1.7321	100.0000	8.90E-01	1.46E-01	5.76E-02	2.10E-02	1.36E-01

NOTE: Ac-227 results decay corrected to separation date/time.



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

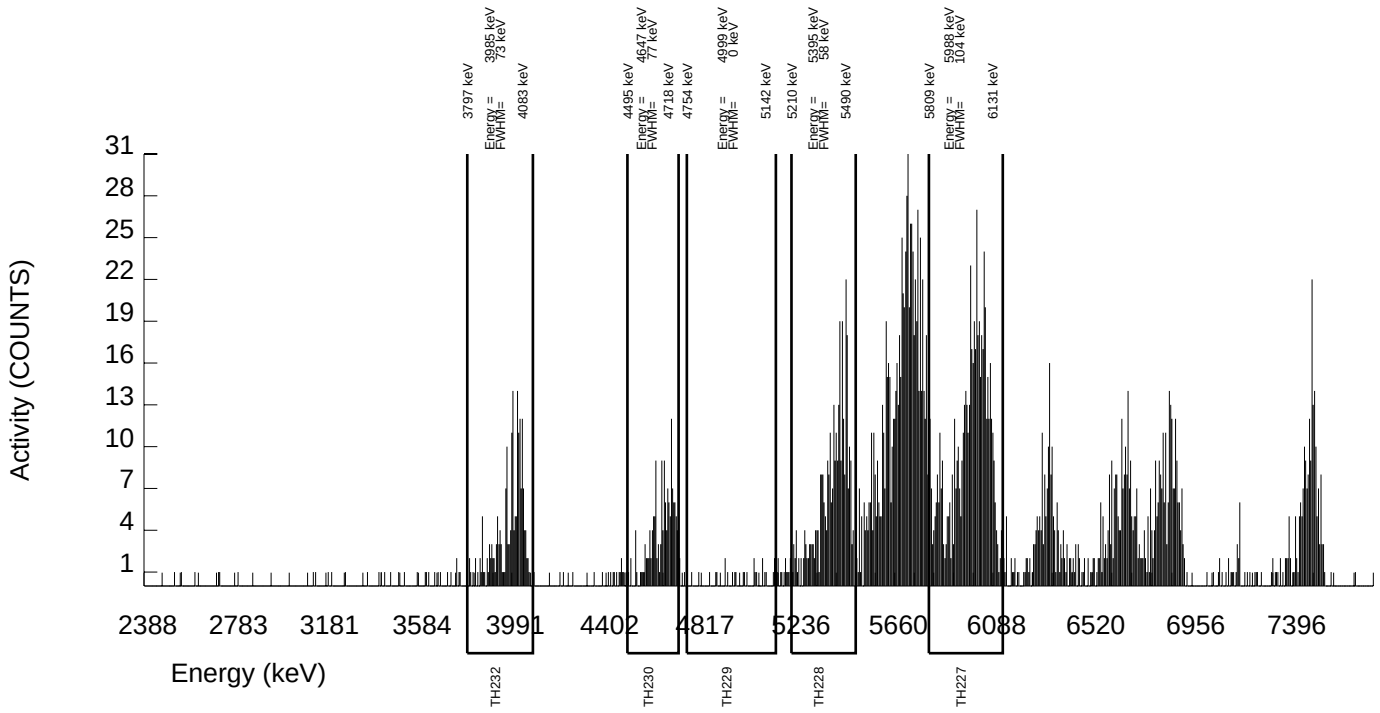
BATCH NUMBER: 903844 SAMPLE DATE : 27-AUG-2009 00:00:00 AC-227 SEPARATION : 23-SEP-2009 18:00:00	SAMPLE ID : S0236077009_TH SAMPLE QTY: 0.256 G
DETECTOR NUMBER :45-149BB2 AVERAGE %EFFICIENCY :36.3031 % YIELD : 88.045	COUNT DATE:28-SEP-2009 14:34:26 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :MXE1

MS/MSD	LCS/LCSD	TRACER	
ID : A2796-J ISOTOPE : TH-230 PCI/G : 8.360E+00	ID : A2796-J ISOTOPE : TH-230 PCI/G : 8.360E+00	ID : 0387-B-102 ISOTOPE : AC227 NOMINAL : 3.90304 dpm RESULTS : 3.43644 dpm	LIB FILE : ENV_ALPHA_TH.N BKG FILE : B039.CNF;1069 BKG DATE : 27-SEP-2009 EFF FILE : W039.CNF;287 CAL DATE : 5-SEP-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	625.000	591.000	34.000	5.8310	57.44000	6.87E+00	7.13E-01	3.50E-01	1.58E-01	5.85E-01
TH-228	5363.000	332.000	301.000	31.000	5.5678	99.94000	1.71E+00	2.36E-01	1.65E-01	7.37E-02	2.13E-01
TH229	4900.000	25.000	13.000	12.000	3.4641	99.52000	7.19E-02	6.61E-02	1.06E-01	4.46E-02	6.59E-02
TH-230	4625.000	151.000	148.000	3.000	1.7321	100.0000	8.15E-01	1.42E-01	6.09E-02	2.22E-02	1.34E-01
TH-232	3972.000	196.000	193.000	3.000	1.7321	100.0000	1.06E+00	1.65E-01	6.09E-02	2.22E-02	1.52E-01

NOTE: Ac-227 results decay corrected to separation date/time.



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

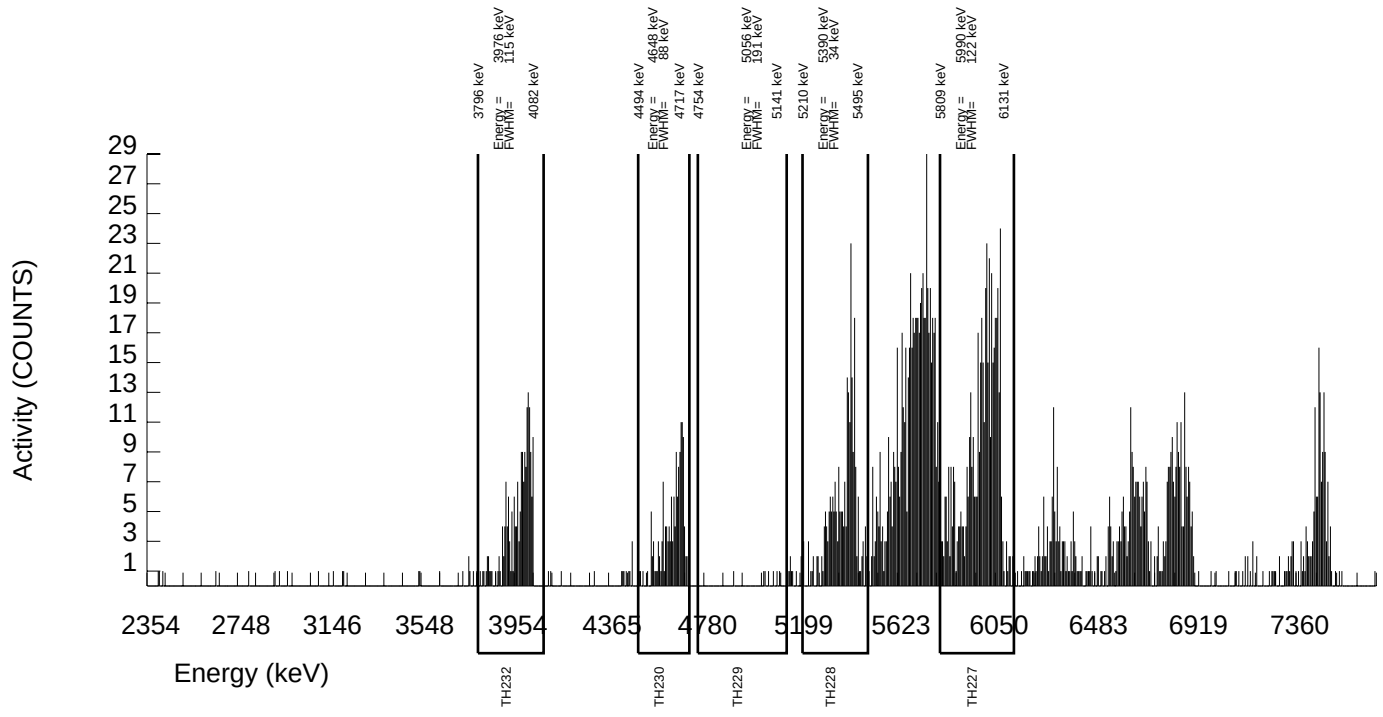
BATCH NUMBER: 903844 SAMPLE DATE : 27-AUG-2009 00:00:00 AC-227 SEPARATION : 23-SEP-2009 18:00:00	SAMPLE ID : S0236077010_TH SAMPLE QTY: 0.256 G
DETECTOR NUMBER :78773 AVERAGE %EFFICIENCY :32.0737 % YIELD : 80.601	COUNT DATE:28-SEP-2009 14:34:26 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :MXE1

MS/MSD	LCS/LCSD	TRACER	
ID : A2796-J ISOTOPE : TH-230 PCI/G : 8.360E+00	ID : A2796-J ISOTOPE : TH-230 PCI/G : 8.360E+00	ID : 0387-B-102 ISOTOPE : AC227 NOMINAL : 3.90304 dpm RESULTS : 3.14589 dpm	LIB FILE : ENV_ALPHA_TH.N BKG FILE : B040.CNF;1072 BKG DATE : 27-SEP-2009 EFF FILE : W040.CNF;306 CAL DATE : 5-SEP-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	516.000	478.000	38.000	6.1644	57.44000	6.87E+00	7.79E-01	4.55E-01	2.06E-01	6.63E-01
TH-228	5363.000	248.000	240.000	8.000	2.8284	99.94000	1.69E+00	2.42E-01	1.14E-01	4.63E-02	2.21E-01
TH229	4900.000	7.000	2.000	5.000	2.2361	99.52000	1.37E-02	4.64E-02	9.17E-02	3.56E-02	4.64E-02
TH-230	4625.000	143.000	140.000	3.000	1.7321	100.0000	9.53E-01	1.71E-01	7.53E-02	2.74E-02	1.61E-01
TH-232	3972.000	188.000	188.000	0.000	0.0000	100.0000	1.28E+00	1.98E-01	2.04E-02	0.00E+00	1.83E-01

NOTE: Ac-227 results decay corrected to separation date/time.



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

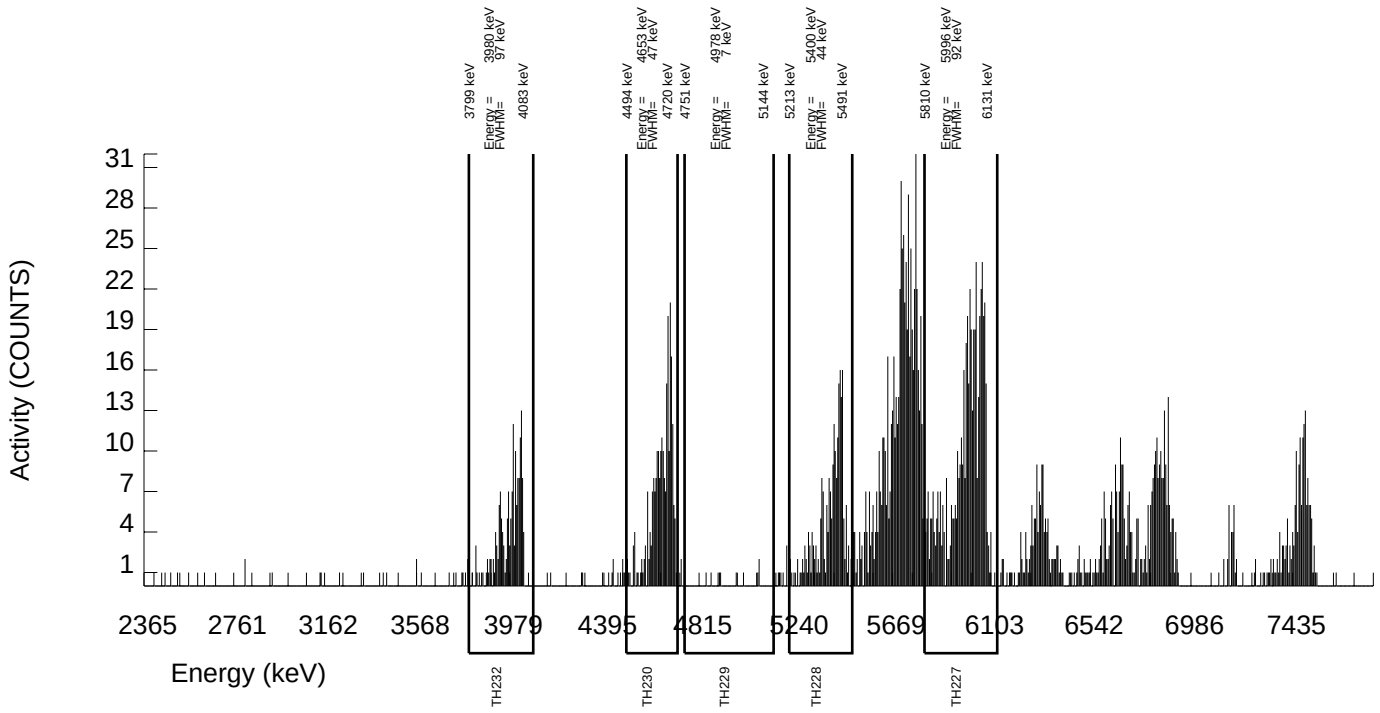
BATCH NUMBER: 903844 SAMPLE DATE : 27-AUG-2009 00:00:00 AC-227 SEPARATION : 23-SEP-2009 18:00:00	SAMPLE ID : S0236077011_TH SAMPLE QTY: 0.250 G
DETECTOR NUMBER :78205 AVERAGE %EFFICIENCY :32.9883 % YIELD : 80.989	COUNT DATE:28-SEP-2009 14:34:26 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :MXE1

MS/MSD	LCS/LCSD	TRACER	
ID : A2796-J ISOTOPE : TH-230 PCI/G : 8.561E+00	ID : A2796-J ISOTOPE : TH-230 PCI/G : 8.561E+00	ID : 0387-B-102 ISOTOPE : AC227 NOMINAL : 3.90304 dpm RESULTS : 3.16105 dpm	LIB FILE : ENV_ALPHA_TH.N BKG FILE : B041.CNF;1065 BKG DATE : 27-SEP-2009 EFF FILE : W041.CNF;310 CAL DATE : 5-SEP-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	528.000	494.000	34.000	5.8310	57.44000	7.03E+00	7.83E-01	4.29E-01	1.93E-01	6.61E-01
TH-228	5363.000	225.000	214.000	11.000	3.3166	99.94000	1.49E+00	2.28E-01	1.29E-01	5.38E-02	2.10E-01
TH229	4900.000	9.000	0.000	9.000	3.0000	99.52000	-6.46E-09	5.64E-02	1.15E-01	4.73E-02	5.64E-02
TH-230	4625.000	250.000	244.000	6.000	2.4495	100.0000	1.65E+00	2.33E-01	9.71E-02	3.84E-02	2.11E-01
TH-232	3972.000	168.000	166.000	2.000	1.4142	100.0000	1.12E+00	1.85E-01	6.46E-02	2.22E-02	1.72E-01

NOTE: Ac-227 results decay corrected to separation date/time.



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

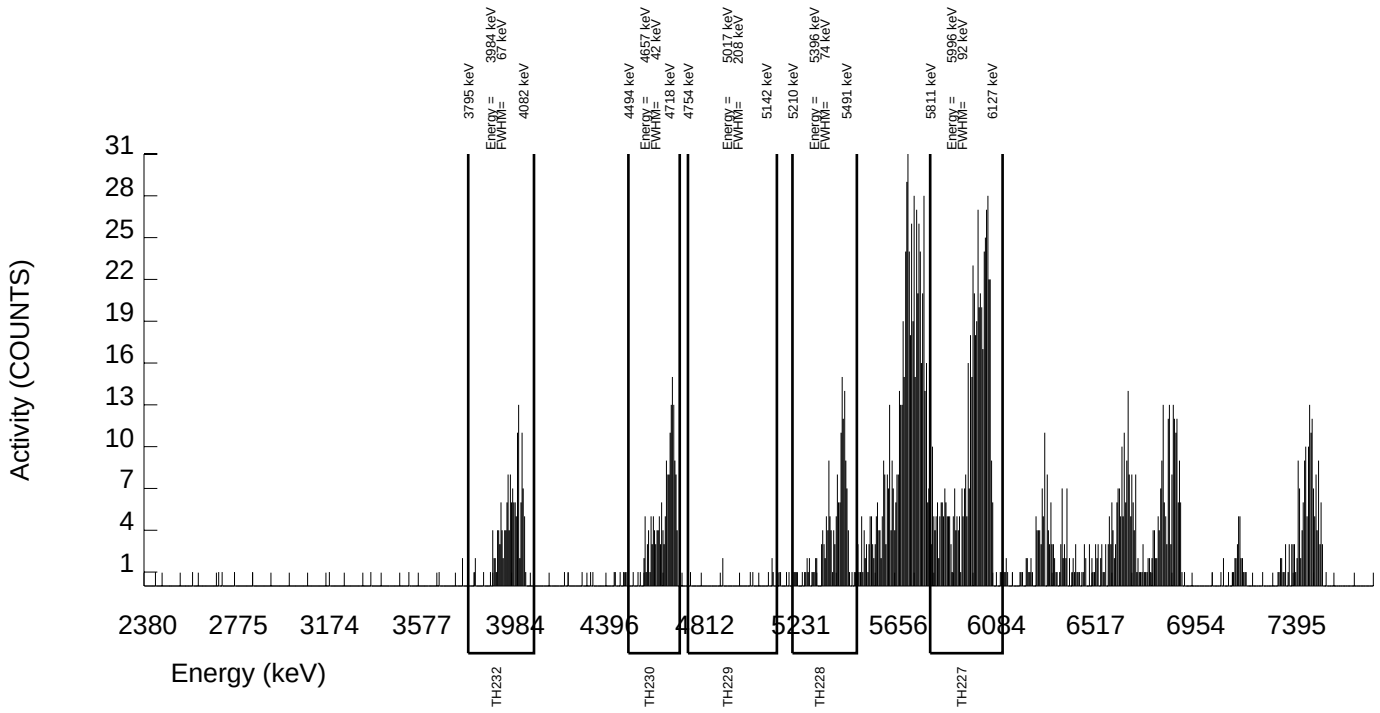
BATCH NUMBER: 903844 SAMPLE DATE : 27-AUG-2009 00:00:00 AC-227 SEPARATION : 23-SEP-2009 18:00:00	SAMPLE ID : S0236077012_TH SAMPLE QTY: 0.256 G
DETECTOR NUMBER :78793 AVERAGE %EFFICIENCY :32.6249 % YIELD : 89.351	COUNT DATE:28-SEP-2009 14:34:26 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :MXE1

MS/MSD	LCS/LCSD	TRACER	
ID : A2796-J ISOTOPE : TH-230 PCI/G : 8.360E+00	ID : A2796-J ISOTOPE : TH-230 PCI/G : 8.360E+00	ID : 0387-B-102 ISOTOPE : AC227 NOMINAL : 3.90304 dpm RESULTS : 3.48742 dpm	LIB FILE : ENV_ALPHA_TH.N BKG FILE : B042.CNF;1064 BKG DATE : 27-SEP-2009 EFF FILE : W042.CNF;283 CAL DATE : 5-SEP-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	571.000	539.000	32.000	5.6569	57.44000	6.87E+00	7.37E-01	3.74E-01	1.68E-01	6.13E-01
TH-228	5363.000	170.000	161.000	9.000	3.0000	99.94000	1.00E+00	1.74E-01	1.06E-01	4.36E-02	1.64E-01
TH229	4900.000	9.000	1.000	8.000	2.8284	99.52000	6.07E-03	4.90E-02	9.80E-02	3.99E-02	4.90E-02
TH-230	4625.000	171.000	167.000	4.000	2.0000	100.0000	1.01E+00	1.68E-01	7.43E-02	2.81E-02	1.57E-01
TH-232	3972.000	158.000	155.000	3.000	1.7321	100.0000	9.36E-01	1.60E-01	6.68E-02	2.43E-02	1.50E-01

NOTE: Ac-227 results decay corrected to separation date/time.



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

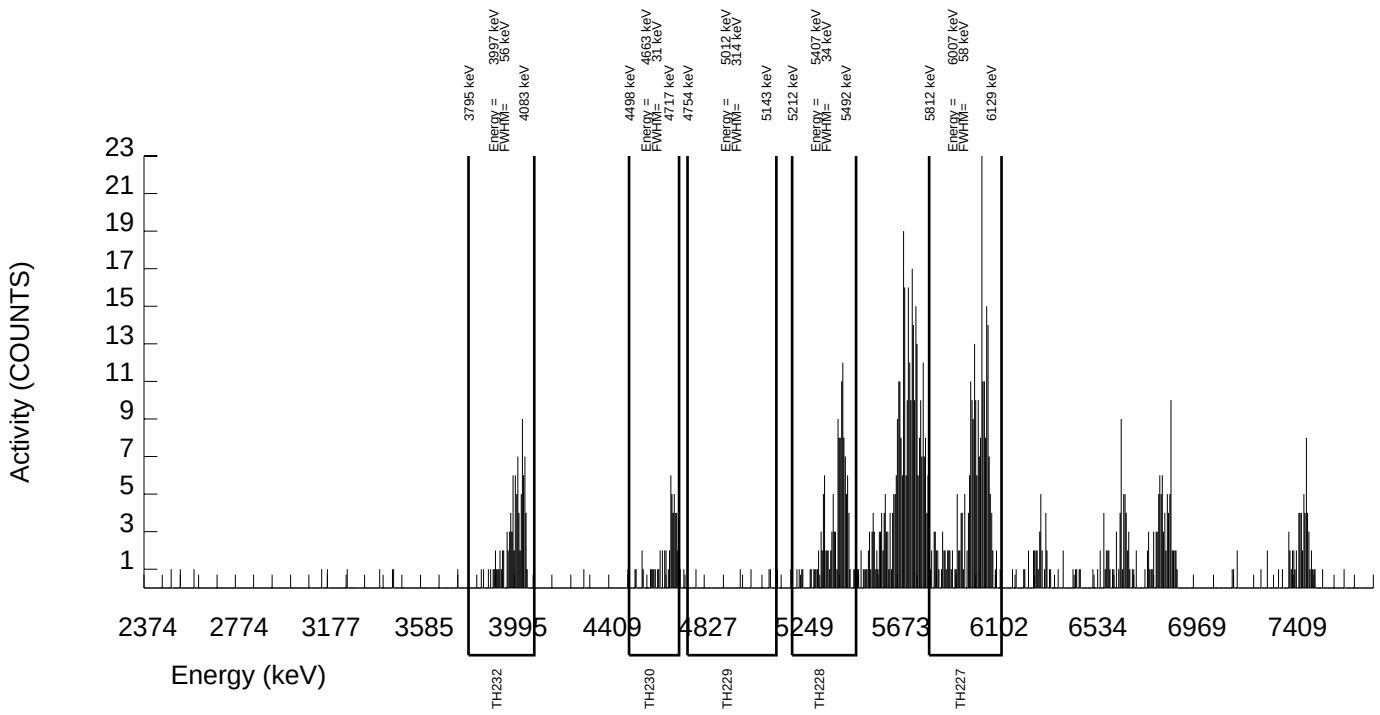
BATCH NUMBER: 903844 SAMPLE DATE : 31-AUG-2009 00:00:00 AC-227 SEPARATION : 23-SEP-2009 18:00:00	SAMPLE ID : S0236077014_TH SAMPLE QTY: 0.252 G
DETECTOR NUMBER :74431 AVERAGE %EFFICIENCY :26.0299 % YIELD : 53.888	COUNT DATE:29-SEP-2009 19:36:17 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :MXE1

MS/MSD	LCS/LCSD	TRACER	
ID : A2796-J ISOTOPE : TH-230 PCI/G : 8.493E+00	ID : A2796-J ISOTOPE : TH-230 PCI/G : 8.493E+00	ID : 0387-B-102 ISOTOPE : AC227 NOMINAL : 3.90303 dpm RESULTS : 2.10327 dpm	LIB FILE : ENV_ALPHA_TH.N BKG FILE : B173.CNF;130 BKG DATE : 28-SEP-2009 EFF FILE : W173.CNF;41 CAL DATE : 21-SEP-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	5994.040	265.000	248.000	17.000	4.1231	57.44000	6.98E+00	1.01E+00	6.24E-01	2.70E-01	9.26E-01
TH-228	5363.000	134.000	124.000	10.000	3.1623	99.94000	1.63E+00	3.24E-01	2.33E-01	9.67E-02	3.09E-01
TH229	4900.000	5.000	0.000	5.000	2.2361	99.52000	0.00E+00	7.94E-02	1.72E-01	6.66E-02	7.94E-02
TH-230	4625.000	54.000	52.000	2.000	1.4142	100.0000	6.63E-01	1.91E-01	1.22E-01	4.19E-02	1.87E-01
TH-232	3972.000	98.000	96.000	2.000	1.4142	100.0000	1.22E+00	2.60E-01	1.22E-01	4.19E-02	2.50E-01

NOTE: Ac-227 results decay corrected to separation date/time.



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

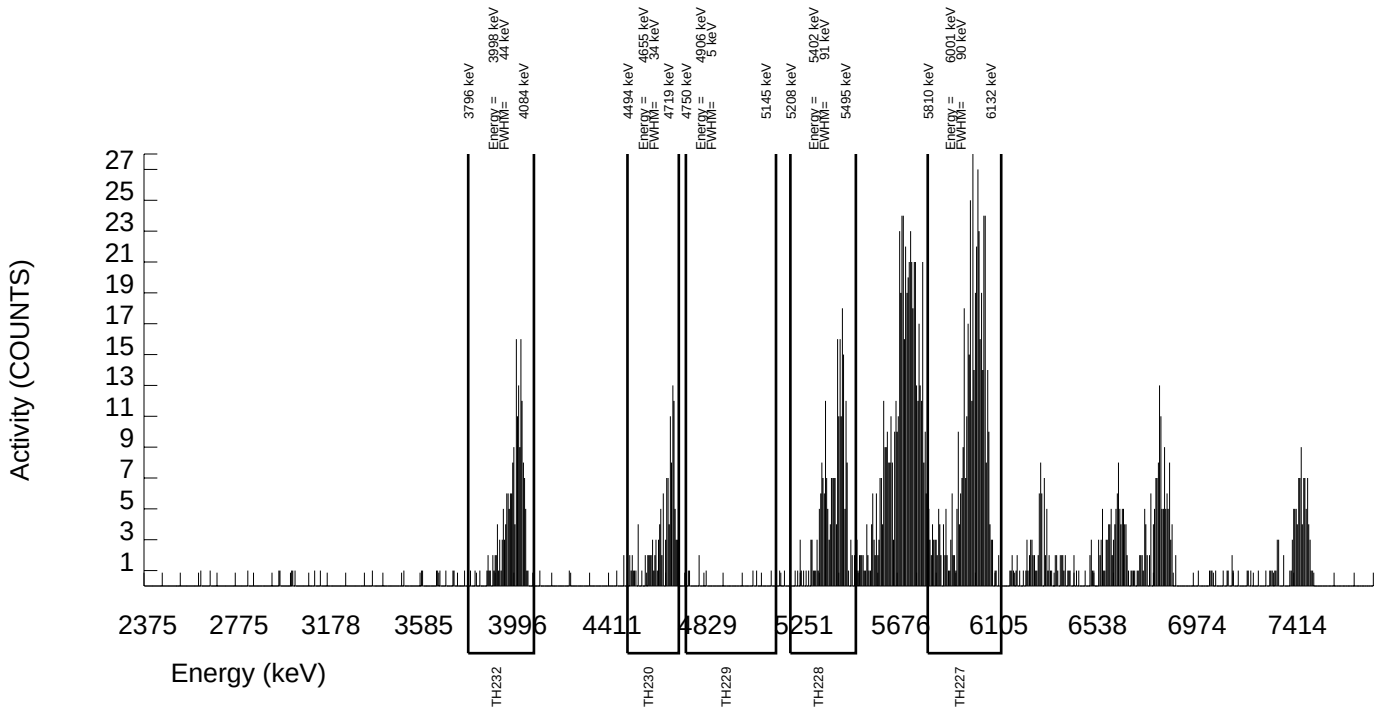
BATCH NUMBER: 903844 SAMPLE DATE : 31-AUG-2009 00:00:00 AC-227 SEPARATION : 23-SEP-2009 18:00:00	SAMPLE ID : S0236077015_TH SAMPLE QTY: 0.251 G
DETECTOR NUMBER :78896 AVERAGE %EFFICIENCY :25.0185 % YIELD : 105.707	COUNT DATE:28-SEP-2009 14:34:05 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :MXE1

MS/MSD	LCS/LCSD	TRACER	
ID : A2796-J ISOTOPE : TH-230 PCI/G : 8.527E+00	ID : A2796-J ISOTOPE : TH-230 PCI/G : 8.527E+00	ID : 0387-B-102 ISOTOPE : AC227 NOMINAL : 3.90303 dpm RESULTS : 4.12580 dpm	LIB FILE : ENV_ALPHA_TH.N BKG FILE : B199.CNF;58 BKG DATE : 27-SEP-2009 EFF FILE : W199.CNF;38 CAL DATE : 21-SEP-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	498.000	489.000	9.000	3.0000	57.44000	7.00E+00	7.58E-01	2.43E-01	1.00E-01	6.32E-01
TH-228	5363.000	237.000	236.000	1.000	1.0000	99.94000	1.65E+00	2.33E-01	5.35E-02	1.63E-02	2.11E-01
TH229	4900.000	8.000	8.000	0.000	0.0000	99.52000	5.45E-02	3.79E-02	2.05E-02	0.00E+00	3.78E-02
TH-230	4625.000	129.000	129.000	0.000	0.0000	100.0000	8.75E-01	1.60E-01	2.04E-02	0.00E+00	1.51E-01
TH-232	3972.000	188.000	188.000	0.000	0.0000	100.0000	1.28E+00	1.98E-01	2.04E-02	0.00E+00	1.82E-01

NOTE: Ac-227 results decay corrected to separation date/time.



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

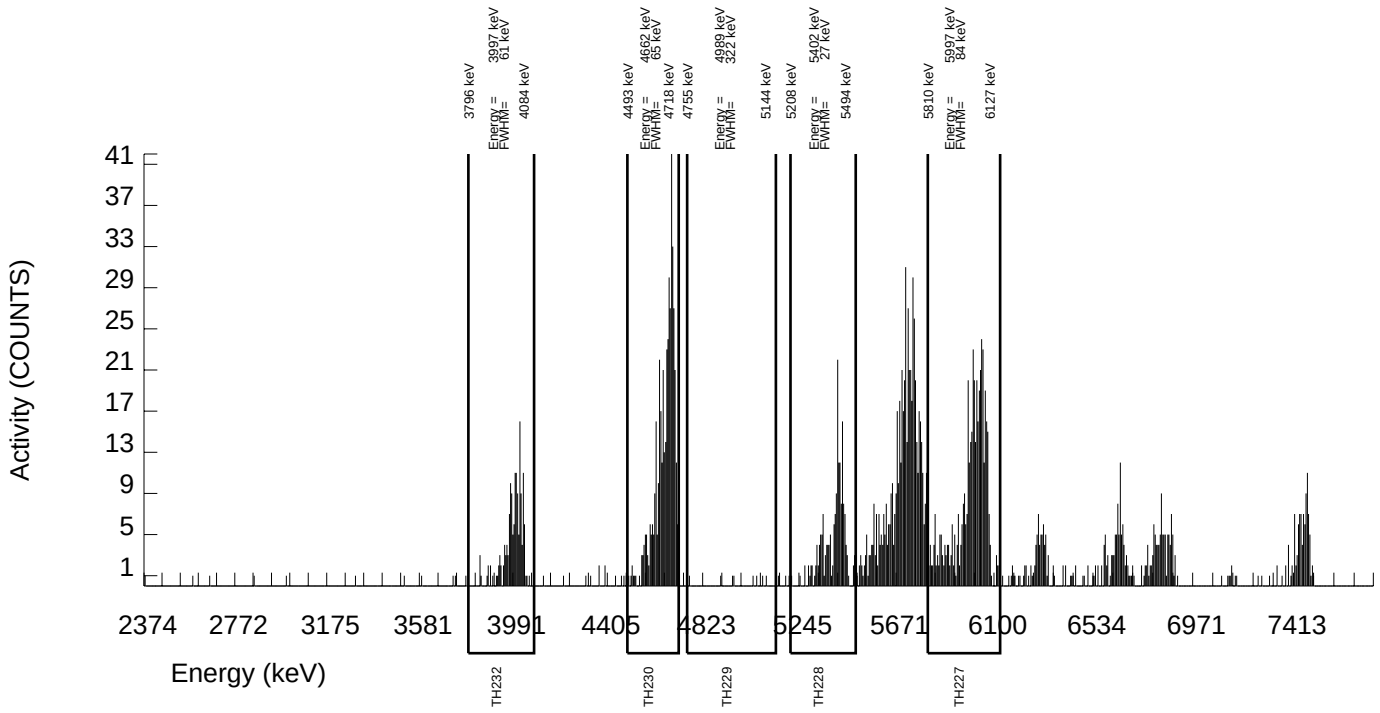
BATCH NUMBER: 903844 SAMPLE DATE : 31-AUG-2009 00:00:00 AC-227 SEPARATION : 23-SEP-2009 18:00:00	SAMPLE ID : S0236077016_TH SAMPLE QTY: 0.255 G
DETECTOR NUMBER :78900 AVERAGE %EFFICIENCY :26.8240 % YIELD : 92.141	COUNT DATE:28-SEP-2009 14:34:07 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :MXE1

MS/MSD	LCS/LCSD	TRACER	
ID : A2796-J ISOTOPE : TH-230 PCI/G : 8.393E+00	ID : A2796-J ISOTOPE : TH-230 PCI/G : 8.393E+00	ID : 0387-B-102 ISOTOPE : AC227 NOMINAL : 3.90304 dpm RESULTS : 3.59628 dpm	LIB FILE : ENV_ALPHA_TH.N BKG FILE : B200.CNF;58 BKG DATE : 27-SEP-2009 EFF FILE : W200.CNF;38 CAL DATE : 21-SEP-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	470.000	457.000	13.000	3.6056	57.44000	6.89E+00	7.69E-01	2.98E-01	1.27E-01	6.50E-01
TH-228	5363.000	186.000	174.000	12.000	3.4641	99.94000	1.28E+00	2.17E-01	1.41E-01	5.93E-02	2.03E-01
TH229	4900.000	8.000	-2.000	10.000	3.1623	99.52000	-1.44E-02	5.97E-02	1.27E-01	5.28E-02	5.97E-02
TH-230	4625.000	441.000	435.000	6.000	2.4495	100.0000	3.11E+00	3.49E-01	1.03E-01	4.07E-02	2.96E-01
TH-232	3972.000	157.000	156.000	1.000	1.0000	100.0000	1.11E+00	1.88E-01	5.47E-02	1.66E-02	1.76E-01

NOTE: Ac-227 results decay corrected to separation date/time.



Alpha Spectroscopy Software Version 2.0
effective date: 09-Mar-1997

GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

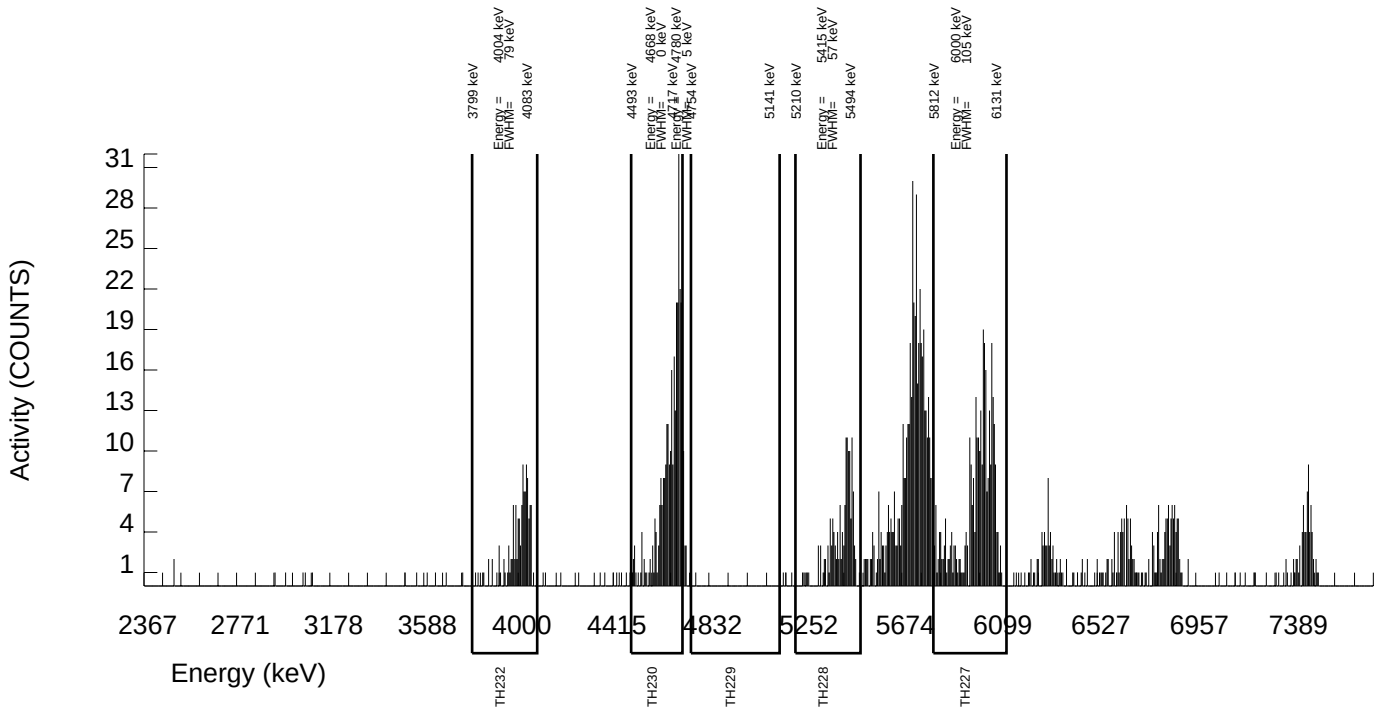
BATCH NUMBER: 903844 SAMPLE DATE : 31-AUG-2009 00:00:00 AC-227 SEPARATION : 23-SEP-2009 18:00:00	SAMPLE ID : S0236077017_TH SAMPLE QTY: 0.256 G
DETECTOR NUMBER :74432 AVERAGE %EFFICIENCY :25.3327 % YIELD : 76.135	COUNT DATE:29-SEP-2009 19:36:19 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :MXE1

MS/MSD	LCS/LCSD	TRACER	
ID : A2796-J ISOTOPE : TH-230 PCI/G : 8.360E+00	ID : A2796-J ISOTOPE : TH-230 PCI/G : 8.360E+00	ID : 0387-B-102 ISOTOPE : AC227 NOMINAL : 3.90304 dpm RESULTS : 2.97159 dpm	LIB FILE : ENV_ALPHA_TH.N BKG FILE : B174.CNF;130 BKG DATE : 28-SEP-2009 EFF FILE : W174.CNF;41 CAL DATE : 21-SEP-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	5994.040	346.000	341.000	5.000	2.2361	57.44000	6.87E+00	8.45E-01	2.70E-01	1.05E-01	7.40E-01
TH-228	5363.000	140.000	125.000	15.000	3.8730	99.94000	1.18E+00	2.40E-01	1.98E-01	8.47E-02	2.30E-01
TH229	4900.000	1.000	-2.000	3.000	1.7321	99.52000	-1.83E-02	3.59E-02	1.01E-01	3.69E-02	3.59E-02
TH-230	4625.000	298.000	295.000	3.000	1.7321	100.0000	2.69E+00	3.49E-01	1.01E-01	3.68E-02	3.10E-01
TH-232	3972.000	119.000	116.000	3.000	1.7321	100.0000	1.06E+00	2.07E-01	1.01E-01	3.68E-02	1.98E-01

NOTE: Ac-227 results decay corrected to separation date/time.



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

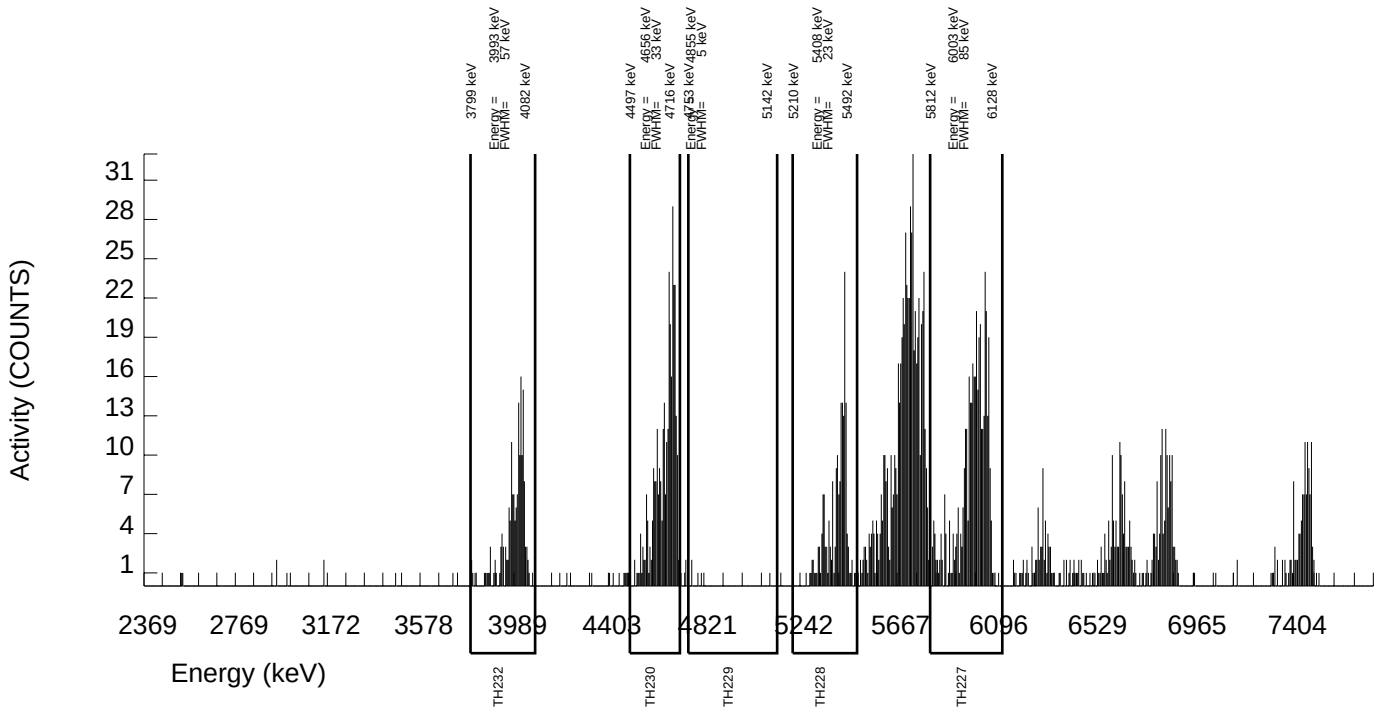
BATCH NUMBER: 903844 SAMPLE DATE : 31-AUG-2009 00:00:00 AC-227 SEPARATION : 23-SEP-2009 18:00:00	SAMPLE ID : S0236077018_TH SAMPLE QTY: 0.265 G
DETECTOR NUMBER :74433 AVERAGE %EFFICIENCY :25.4394 % YIELD : 90.490	COUNT DATE:29-SEP-2009 19:36:21 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :MXE1

MS/MSD	LCS/LCSD	TRACER	
ID : A2796-J ISOTOPE : TH-230 PCI/G : 8.076E+00	ID : A2796-J ISOTOPE : TH-230 PCI/G : 8.076E+00	ID : 0387-B-102 ISOTOPE : AC227 NOMINAL : 3.90303 dpm RESULTS : 3.53186 dpm	LIB FILE : ENV_ALPHA_TH.N BKG FILE : B175.CNF;130 BKG DATE : 28-SEP-2009 EFF FILE : W175.CNF;41 CAL DATE : 21-SEP-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	5994.040	418.000	407.000	11.000	3.3166	57.44000	6.63E+00	7.69E-01	3.00E-01	1.26E-01	6.62E-01
TH-228	5363.000	190.000	186.000	4.000	2.0000	99.94000	1.42E+00	2.24E-01	9.37E-02	3.54E-02	2.08E-01
TH229	4900.000	5.000	1.000	4.000	2.0000	99.52000	7.42E-03	4.36E-02	9.13E-02	3.45E-02	4.36E-02
TH-230	4625.000	323.000	321.000	2.000	1.4142	100.0000	2.37E+00	2.96E-01	7.07E-02	2.43E-02	2.61E-01
TH-232	3972.000	171.000	170.000	1.000	1.0000	100.0000	1.26E+00	2.04E-01	5.65E-02	1.72E-02	1.90E-01

NOTE: Ac-227 results decay corrected to separation date/time.



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

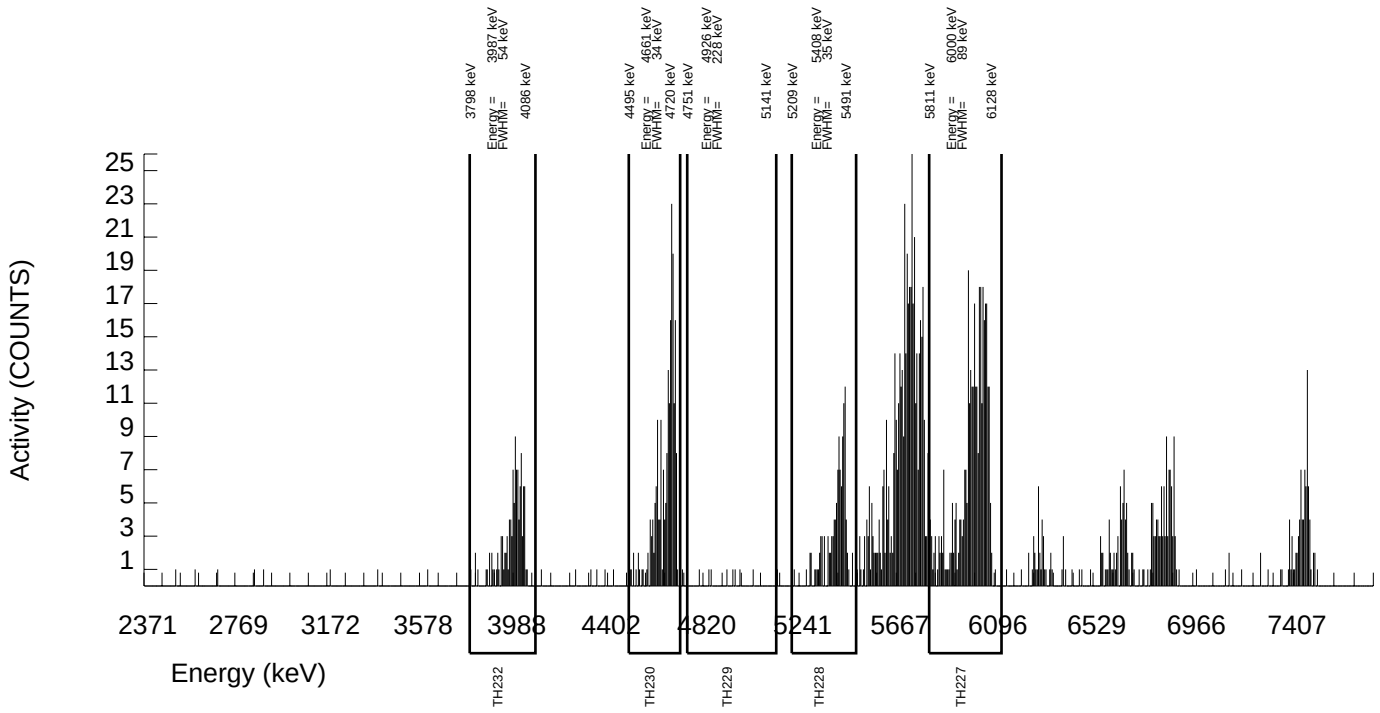
BATCH NUMBER: 903844 SAMPLE DATE : 1-SEP-2009 00:00:00. AC-227 SEPARATION : 23-SEP-2009 18:00:00	SAMPLE ID : S0236077020_TH SAMPLE QTY: 0.259 G
DETECTOR NUMBER :78905 AVERAGE %EFFICIENCY :25.8288 % YIELD : 74.752	COUNT DATE:28-SEP-2009 14:34:14 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :MXE1

MS/MSD	LCS/LCSD	TRACER	
ID : A2796-J ISOTOPE : TH-230 PCI/G : 8.263E+00	ID : A2796-J ISOTOPE : TH-230 PCI/G : 8.263E+00	ID : 0387-B-102 ISOTOPE : AC227 NOMINAL : 3.90304 dpm RESULTS : 2.91760 dpm	LIB FILE : ENV_ALPHA_TH.N BKG FILE : B203.CNF;58 BKG DATE : 27-SEP-2009 EFF FILE : W203.CNF;39 CAL DATE : 21-SEP-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	365.000	357.000	8.000	2.8284	57.44000	6.79E+00	8.25E-01	3.07E-01	1.25E-01	7.20E-01
TH-228	5363.000	117.000	110.000	7.000	2.6458	99.94000	1.02E+00	2.11E-01	1.42E-01	5.70E-02	2.02E-01
TH229	4900.000	8.000	-1.000	9.000	3.0000	99.52000	-9.05E-03	7.31E-02	1.53E-01	6.32E-02	7.31E-02
TH-230	4625.000	209.000	209.000	0.000	0.0000	100.0000	1.88E+00	2.79E-01	2.70E-02	0.00E+00	2.55E-01
TH-232	3972.000	112.000	111.000	1.000	1.0000	100.0000	1.00E+00	1.97E-01	6.89E-02	2.10E-02	1.88E-01

NOTE: Ac-227 results decay corrected to separation date/time.



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

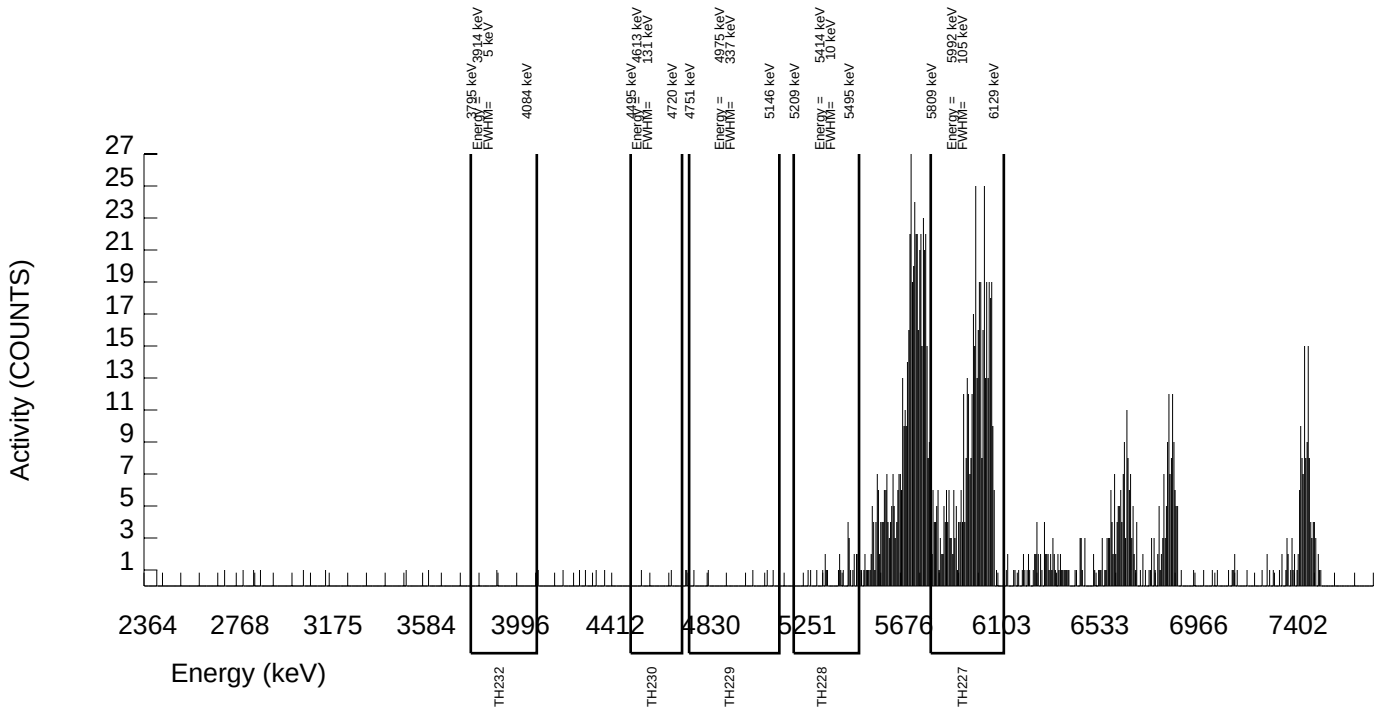
BATCH NUMBER: 903844 SAMPLE DATE : 21-SEP-2009 00:00:00 AC-227 SEPARATION : 23-SEP-2009 18:00:00	SAMPLE ID : S1201926675_TH SAMPLE QTY: 0.259 G
DETECTOR NUMBER :74434 AVERAGE %EFFICIENCY :25.4776 % YIELD : 106.339	COUNT DATE:29-SEP-2009 19:36:24 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :MXE1

MS/MSD	LCS/LCSD	TRACER	
ID : A2796-J ISOTOPE : TH-230 PCI/G : 8.263E+00	ID : A2796-J ISOTOPE : TH-230 PCI/G : 8.263E+00	ID : 0387-B-102 ISOTOPE : AC227 NOMINAL : 3.90303 dpm RESULTS : 4.15043 dpm	LIB FILE : ENV_ALPHA_TH.N BKG FILE : B176.CNF;130 BKG DATE : 28-SEP-2009 EFF FILE : W176.CNF;41 CAL DATE : 21-SEP-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	5994.040	487.000	479.000	8.000	2.8284	57.44000	6.79E+00	7.37E-01	2.29E-01	9.32E-02	6.18E-01
TH-228	5363.000	29.000	17.000	12.000	3.4641	99.94000	1.10E-01	8.16E-02	1.24E-01	5.22E-02	8.13E-02
TH229	4900.000	5.000	0.000	5.000	2.2361	99.52000	0.00E+00	4.00E-02	8.65E-02	3.36E-02	4.00E-02
TH-230	4625.000	2.000	-1.000	3.000	1.7321	100.0000	-6.42E-03	2.81E-02	7.10E-02	2.59E-02	2.81E-02
TH-232	3972.000	1.000	1.000	0.000	0.0000	100.0000	6.42E-03	1.26E-02	1.93E-02	0.00E+00	1.26E-02

NOTE: Ac-227 results decay corrected to separation date/time.



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

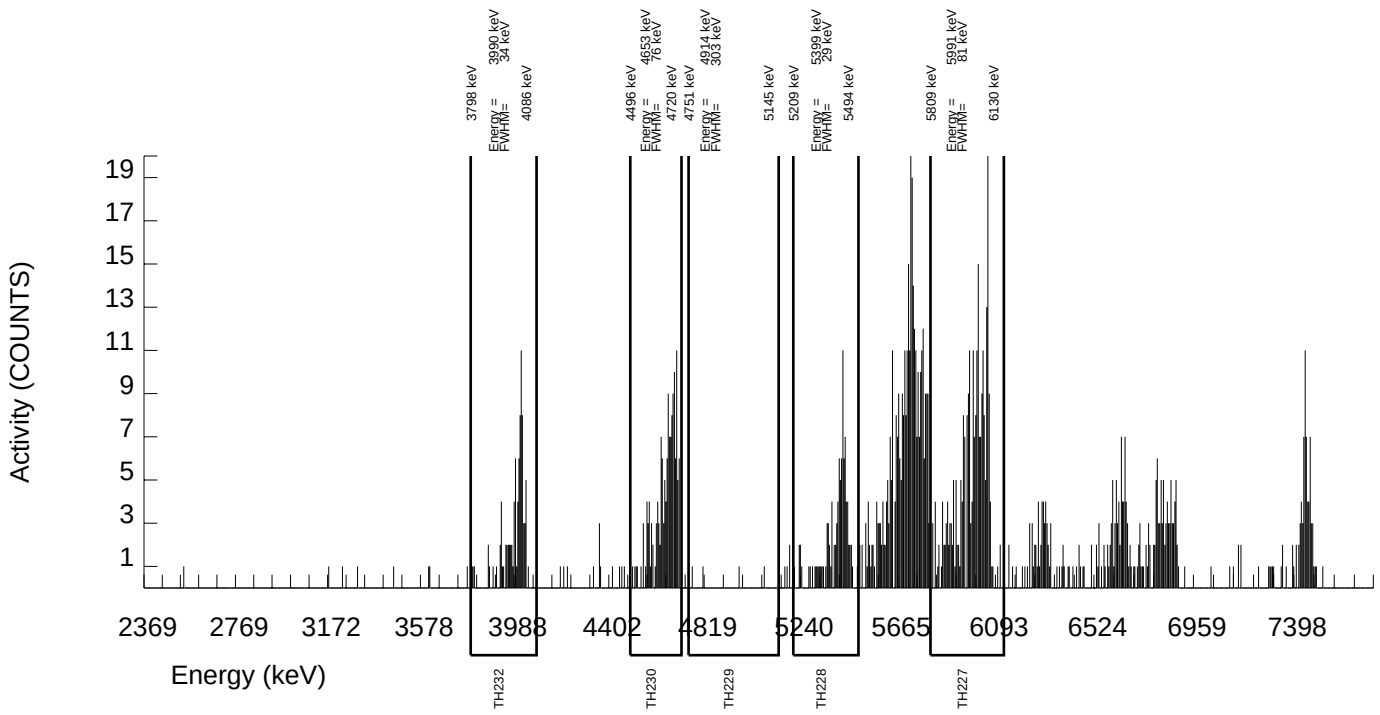
BATCH NUMBER: 903844 SAMPLE DATE : 1-SEP-2009 00:00:00. AC-227 SEPARATION : 23-SEP-2009 18:00:00	SAMPLE ID : S1201926676_TH SAMPLE QTY: 0.255 G
DETECTOR NUMBER :78907 AVERAGE %EFFICIENCY :24.9619 % YIELD : 54.382	COUNT DATE:28-SEP-2009 14:34:17 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :MXE1

MS/MSD	LCS/LCSD	TRACER	
ID : A2796-J ISOTOPE : TH-230 PCI/G : 8.393E+00	ID : A2796-J ISOTOPE : TH-230 PCI/G : 8.393E+00	ID : 0387-B-102 ISOTOPE : AC227 NOMINAL : 3.90304 dpm RESULTS : 2.12256 dpm	LIB FILE : ENV_ALPHA_TH.N BKG FILE : B204.CNF;58 BKG DATE : 27-SEP-2009 EFF FILE : W204.CNF;38 CAL DATE : 21-SEP-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	267.000	251.000	16.000	4.0000	57.44000	6.89E+00	9.94E-01	5.94E-01	2.56E-01	9.06E-01
TH-228	5363.000	99.000	95.000	4.000	2.0000	99.94000	1.27E+00	2.77E-01	1.65E-01	6.23E-02	2.66E-01
TH229	4900.000	4.000	-6.000	10.000	3.1623	99.52000	-7.85E-02	9.59E-02	2.32E-01	9.62E-02	9.59E-02
TH-230	4625.000	149.000	145.000	4.000	2.0000	100.0000	1.89E+00	3.35E-01	1.60E-01	6.05E-02	3.15E-01
TH-232	3972.000	90.000	89.000	1.000	1.0000	100.0000	1.16E+00	2.53E-01	9.96E-02	3.03E-02	2.43E-01

NOTE: Ac-227 results decay corrected to separation date/time.



Alpha Spectroscopy Software Version 2.0
effective date: 09-Mar-1997

GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

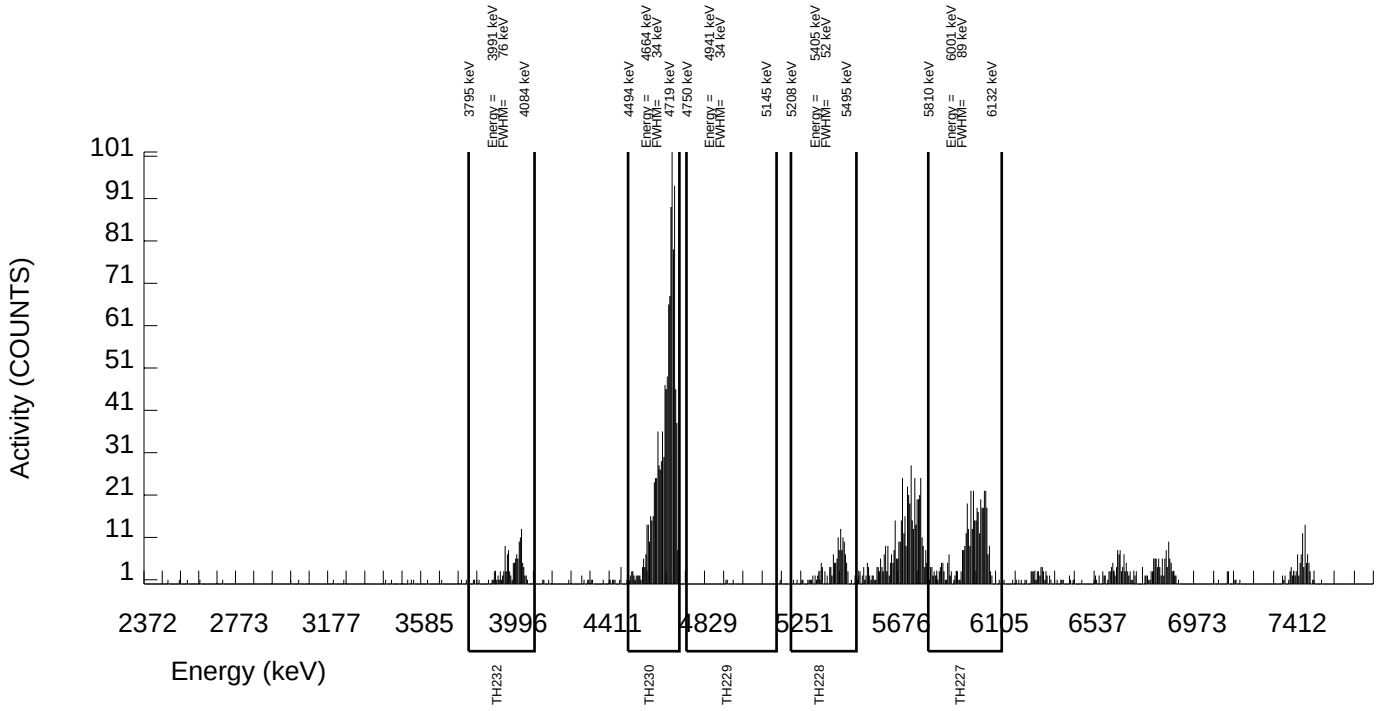
BATCH NUMBER: 903844 SAMPLE DATE : 1-SEP-2009 00:00:00. AC-227 SEPARATION : 23-SEP-2009 18:00:00	SAMPLE ID : S1201926677_TH SAMPLE QTY: 0.253 G
DETECTOR NUMBER :78910 AVERAGE %EFFICIENCY :25.7346 % YIELD : 89.737	COUNT DATE:28-SEP-2009 14:34:25 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :MXE1

MS/MSD	LCS/LCSD	TRACER	
ID : A2796-J ISOTOPE : TH-230 PCI/G : 8.459E+00	ID : A2796-J ISOTOPE : TH-230 PCI/G : 8.459E+00	ID : 0387-B-102 ISOTOPE : AC227 NOMINAL : 3.90303 dpm RESULTS : 3.50247 dpm	LIB FILE : ENV_ALPHA_TH.N BKG FILE : B207.CNF;58 BKG DATE : 27-SEP-2009 EFF FILE : W207.CNF;38 CAL DATE : 21-SEP-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	435.000	427.000	8.000	2.8284	57.44000	6.95E+00	7.89E-01	2.63E-01	1.07E-01	6.71E-01
TH-228	5363.000	145.000	140.000	5.000	2.2361	99.94000	1.11E+00	2.02E-01	1.06E-01	4.13E-02	1.90E-01
TH229	4900.000	3.000	-1.000	4.000	2.0000	99.52000	-7.75E-03	4.02E-02	9.53E-02	3.60E-02	4.02E-02
TH-230	4625.000	1121.000	1117.000	4.000	2.0000	100.0000	8.61E+00	7.22E-01	9.49E-02	3.59E-02	5.07E-01
TH-232	3972.000	133.000	126.000	7.000	2.6458	100.0000	9.71E-01	1.88E-01	1.18E-01	4.75E-02	1.79E-01

NOTE: Ac-227 results decay corrected to separation date/time.



Alpha Spectroscopy Software Version 2.0
effective date: 09-Mar-1997

GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

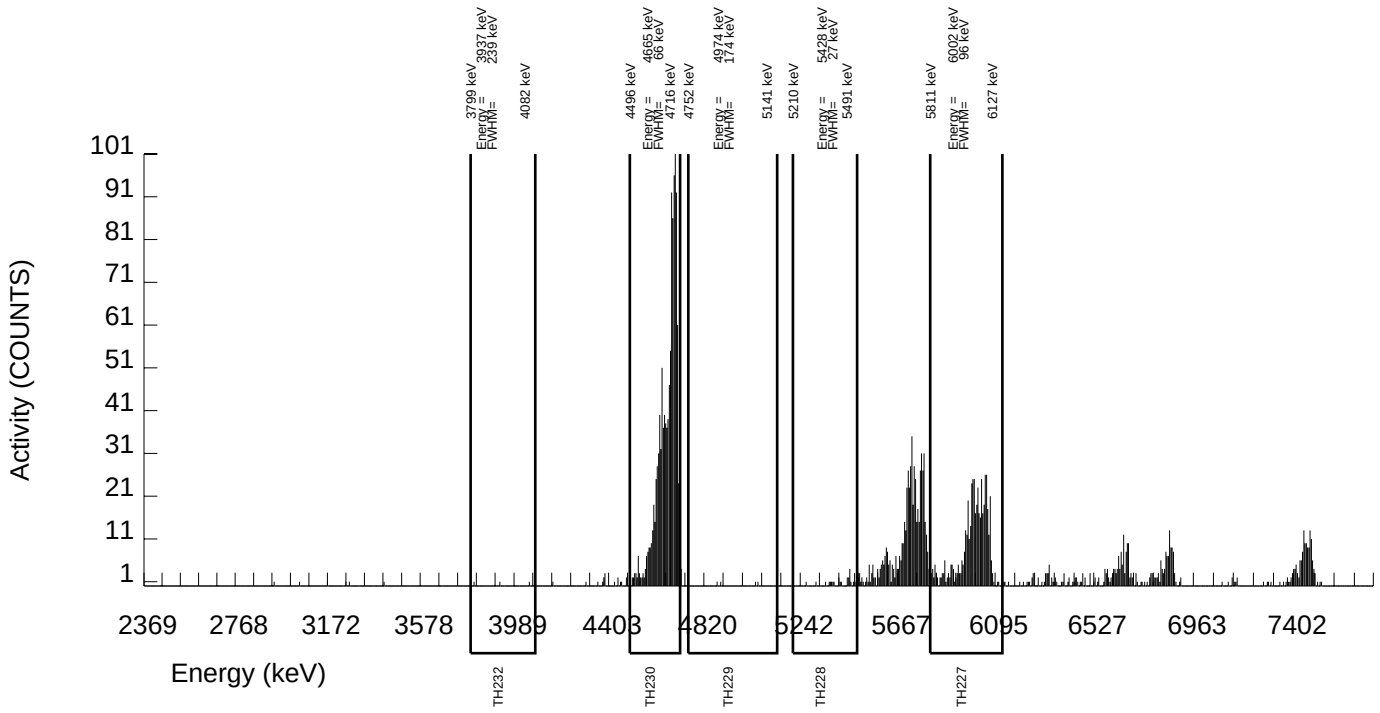
BATCH NUMBER: 903844 SAMPLE DATE : 21-SEP-2009 00:00:00 AC-227 SEPARATION : 23-SEP-2009 18:00:00	SAMPLE ID : S1201926678_TH SAMPLE QTY: 0.259 G
DETECTOR NUMBER :74435 AVERAGE %EFFICIENCY :26.5975 % YIELD : 107.603	COUNT DATE:29-SEP-2009 19:36:26 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :MXE1

MS/MSD	LCS/LCSD	TRACER	
ID : A2796-J ISOTOPE : TH-230 PCI/G : 8.263E+00	ID : A2796-J ISOTOPE : TH-230 PCI/G : 8.263E+00	ID : 0387-B-102 ISOTOPE : AC227 NOMINAL : 3.90304 dpm RESULTS : 4.19979 dpm	LIB FILE : ENV_ALPHA_TH.N BKG FILE : B177.CNF;130 BKG DATE : 28-SEP-2009 EFF FILE : W177.CNF;41 CAL DATE : 21-SEP-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	5994.040	516.000	506.000	10.000	3.1623	57.44000	6.79E+00	7.25E-01	2.38E-01	9.87E-02	6.03E-01
TH-228	5363.000	26.000	14.000	12.000	3.4641	99.94000	8.59E-02	7.43E-02	1.17E-01	4.94E-02	7.41E-02
TH229	4900.000	4.000	-1.000	5.000	2.2361	99.52000	-6.11E-03	3.59E-02	8.18E-02	3.18E-02	3.59E-02
TH-230	4625.000	1177.000	1175.000	2.000	1.4142	100.0000	7.14E+00	5.88E-01	5.82E-02	2.00E-02	4.09E-01
TH-232	3972.000	3.000	2.000	1.000	1.0000	100.0000	1.22E-02	2.38E-02	4.65E-02	1.41E-02	2.38E-02

NOTE: Ac-227 results decay corrected to separation date/time.



URANIUM

Radiochemistry Batch Checklist, Rev 9

Batch# 901448 Product: U Date: 9/23/09

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to100 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.		✓	NCR# 787268
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 statused.	✓		
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# 787268
Batch non-conformances second reviewed and disposition verified to be completed.	✓		NCR# 787268
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] 9/23/09

Secondary Review Performed By: [signature] 9/23/09

KERR

9/13 - 9/24

P

Uranium Que Sheet

10-SEP-09

Batch #: 901448 **Analyst:** CXM2 **First Client Due Date:**24-SEP-09 **Internal Due Date:**13-SEP-09

Tracer Isotope: U-232/U-236 **Tracer Code:** 1283-E **Expiration Date:** 1/15/10 **Vol:** 0.1mL

LCS Isotope: U-238 **LCS Code:** 1163-6 **Expiration Date:** 4/16/10 **Vol:** 0.1mL

Spike Isotope: U-238 **Spike Code:** ~~1163-6~~ 9/11/09 CMM **Expiration Date:** ~~4/16/10~~ 9/4/09 CMM **Vol:** ~~0.1mL~~ 9/11/09 CMM

Prep Date: 9/11/09 **Initials:** CMM **Pipet ID:** 2971058 **Balance ID:** 16750207 **Witness:** ml 9/11/09

Sample ID	Client Description	Type	Hazard Code	Min CRDL	Matrix	Client	Collection Date	Pos.	Label #	Wet/Dry Aliquot (g (l) f)	U Det #
235860015-1	EB082109-SO1	SAMPLE		.03 pCi/L	WATER	KERR003	21-AUG-09	1	1	0.800	14
236077013-1	EB082709-SO1	SAMPLE		.03 pCi/L	WATER	KERR003	27-AUG-09	2	2	0.800	125
236077019-1	EB083109-SO1	SAMPLE		.03 pCi/L	WATER	KERR003	31-AUG-09	3	3	0.800	154
236077021-1	EB090109-SO1	SAMPLE		.03 pCi/L	WATER	KERR003	01-SEP-09	4	4	0.800	161
236238008-1	FB082809-SO	SAMPLE		.03 pCi/L	WATER	KERR003	28-AUG-09	5	5	0.800	162
236534011-1	EB090209-SO1	SAMPLE		.03 pCi/L	WATER	KERR003	02-SEP-09	6	6	0.800	166
1201920749-1	MB for batch 901448	MB		.03 pCi/L	WATER	QC ACCOUNT	~~21-AUG-09~~ DG 9/18/09	7	7	0.800	~~177~~ 121 BS 9/22/09
1201920750-1	LCS for batch 901448	LCS		.03 pCi/L	WATER	QC ACCOUNT	21-AUG-09	8	8	0.800	13
1201920751-1	LCSD for batch 901448	LCSD		.03 pCi/L	WATER	QC ACCOUNT	~~21-AUG-09~~	9	9	0.800	16

115

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~~ N/A EAS 9/17/09
Circle One

Data Reviewed By: 09/23/09 ~~7011198~~ BS 9/23/09

Alpha Spectroscopy Software Version 2.0
effective date: 09-Mar-1997

GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

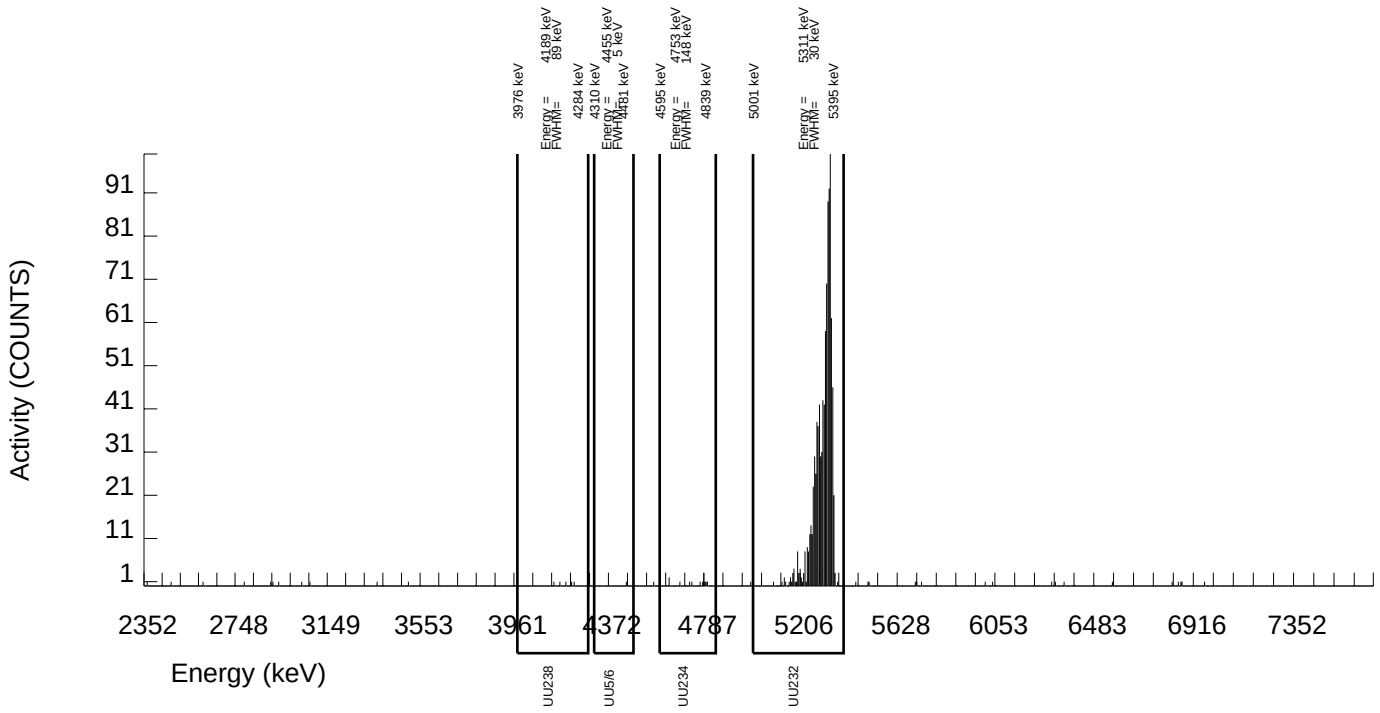
BATCH NUMBER: 901448 SAMPLE DATE : 27-AUG-2009 00:00:00	SAMPLE ID : S0236077013_UU SAMPLE QTY: 0.800 L
DETECTOR NUMBER :75547 AVERAGE %EFFICIENCY :25.8247 % YIELD : 72.478	COUNT DATE:17-SEP-2009 19:57:05 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :CXM2

MS/MSD	LCS/LCSD	TRACER	
ID : 1163-G ISOTOPE : U-238 PCI/L : 3.149E+00	ID : 1163-G ISOTOPE : U-238 PCI/L : 3.149E+00	ID : 1283-E ISOTOPE : U232 NOMINAL : 5.26025 dpm RESULTS : 3.81254 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B125.CNF;400 BKG DATE : 13-SEP-2009 EFF FILE : W125.CNF;121 CAL DATE : 17-SEP-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	13.000	8.026	2.000	1.4142	100.0000	2.41E-02	2.07E-02	2.88E-02	9.90E-03	2.04E-02
U232	5302.100	989.000	984.000	5.000	2.2361	100.0000	2.96E+00	4.52E-01	4.03E-02	1.57E-02	1.86E-01
U-235	4391.000	1.000	0.000	1.000	1.0000	80.90000	0.00E+00	1.03E-02	2.85E-02	8.65E-03	1.03E-02
U-238	4184.730	5.000	5.000	0.000	0.0000	100.0000	1.50E-02	1.33E-02	9.02E-03	0.00E+00	1.32E-02

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



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

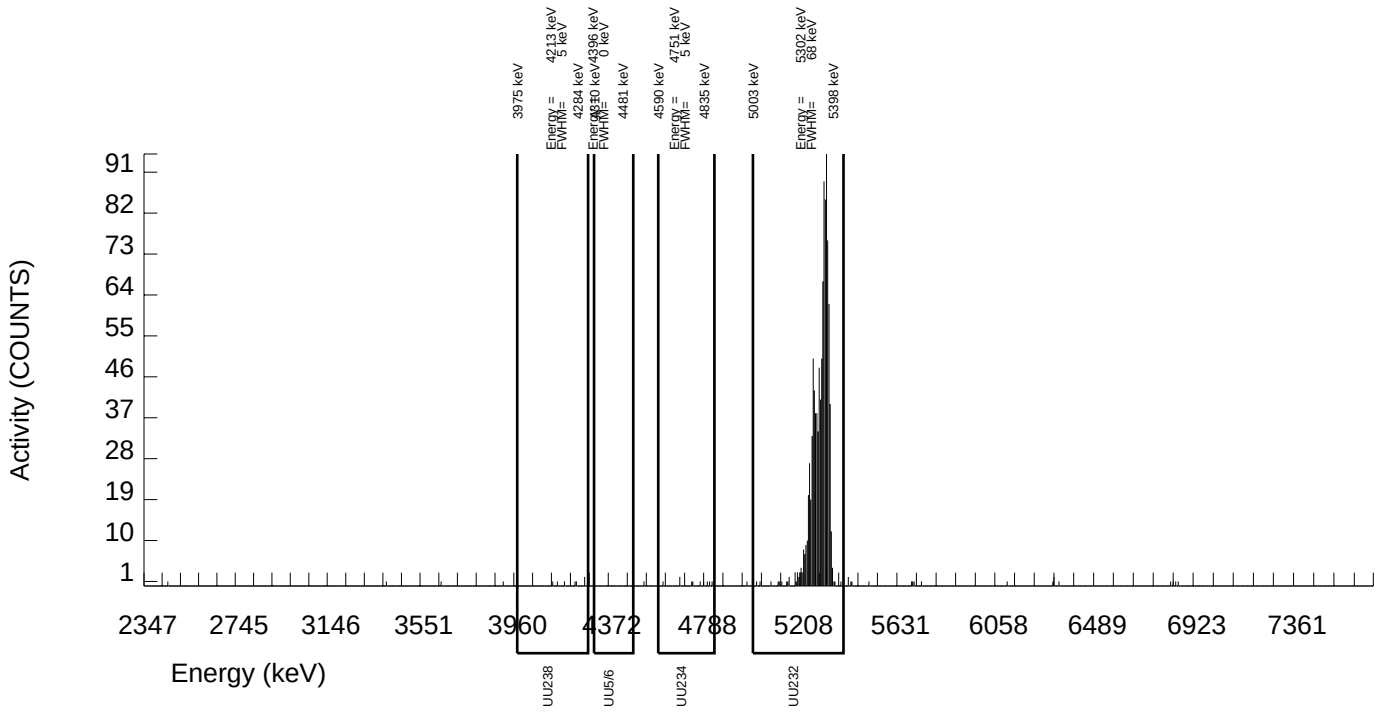
BATCH NUMBER: 901448 SAMPLE DATE : 31-AUG-2009 00:00:00	SAMPLE ID : S0236077019_UU SAMPLE QTY: 0.800 L
DETECTOR NUMBER :76224 AVERAGE %EFFICIENCY :25.6606 % YIELD : 76.500	COUNT DATE:17-SEP-2009 19:57:09 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :CXM2

MS/MSD	LCS/LCSD	TRACER	
ID : 1163-G ISOTOPE : U-238 PCI/L : 3.149E+00	ID : 1163-G ISOTOPE : U-238 PCI/L : 3.149E+00	ID : 1283-E ISOTOPE : U232 NOMINAL : 5.25969 dpm RESULTS : 4.02366 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B154.CNF;344 BKG DATE : 13-SEP-2009 EFF FILE : W154.CNF;98 CAL DATE : 15-SEP-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	10.000	5.881	1.000	1.0000	100.0000	1.69E-02	1.60E-02	2.20E-02	6.67E-03	1.58E-02
U232	5302.100	1037.000	1032.000	5.000	2.2361	100.0000	2.96E+00	4.49E-01	3.85E-02	1.49E-02	1.82E-01
U-235	4391.000	0.000	-1.000	1.000	1.0000	80.90000	-3.55E-03	9.84E-03	2.71E-02	8.25E-03	9.83E-03
U-238	4184.730	7.000	6.000	1.000	1.0000	100.0000	1.72E-02	1.61E-02	2.20E-02	6.67E-03	1.59E-02

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



Alpha Spectroscopy Software Version 2.0
effective date: 09-Mar-1997

GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

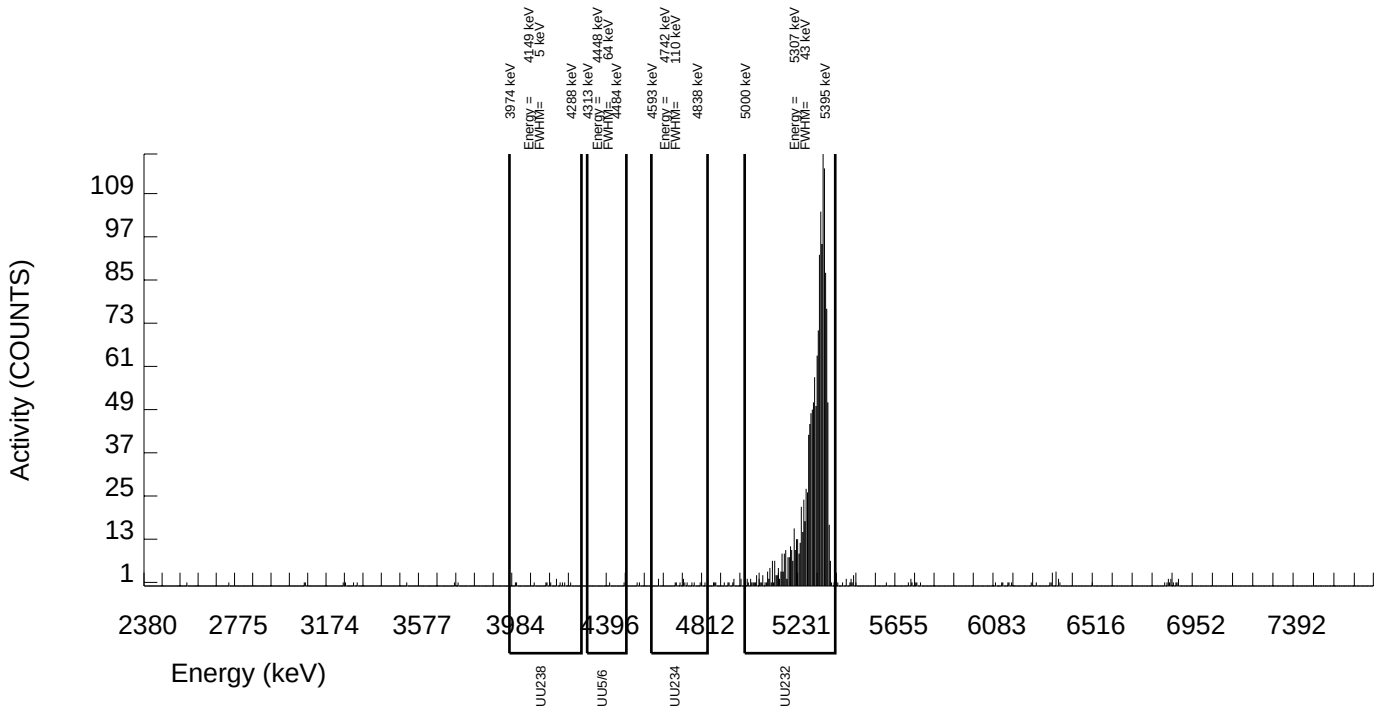
BATCH NUMBER: 901448 SAMPLE DATE : 1-SEP-2009 00:00:00.	SAMPLE ID : S0236077021_UU SAMPLE QTY: 0.800 L
DETECTOR NUMBER :70321 AVERAGE %EFFICIENCY :37.3131 % YIELD : 80.138	COUNT DATE:17-SEP-2009 19:57:11 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :CXM2

MS/MSD	LCS/LCSD	TRACER	
ID : 1163-G ISOTOPE : U-238 PCI/L : 3.149E+00	ID : 1163-G ISOTOPE : U-238 PCI/L : 3.149E+00	ID : 1283-E ISOTOPE : U232 NOMINAL : 5.25955 dpm RESULTS : 4.21491 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B161.CNF;124 BKG DATE : 13-SEP-2009 EFF FILE : W161.CNF;43 CAL DATE : 24-AUG-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	14.000	6.249	3.000	1.7321	100.0000	1.18E-02	1.30E-02	2.08E-02	7.59E-03	1.29E-02
U232	5302.100	1594.000	1572.000	22.000	4.6904	100.0000	2.96E+00	4.23E-01	4.68E-02	2.06E-02	1.48E-01
U-235	4391.000	2.000	1.000	1.000	1.0000	80.90000	2.33E-03	7.91E-03	1.78E-02	5.41E-03	7.90E-03
U-238	4184.730	12.000	9.000	3.000	1.7321	100.0000	1.69E-02	1.45E-02	2.08E-02	7.59E-03	1.43E-02

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



Alpha Spectroscopy Software Version 2.0
effective date: 09-Mar-1997

GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

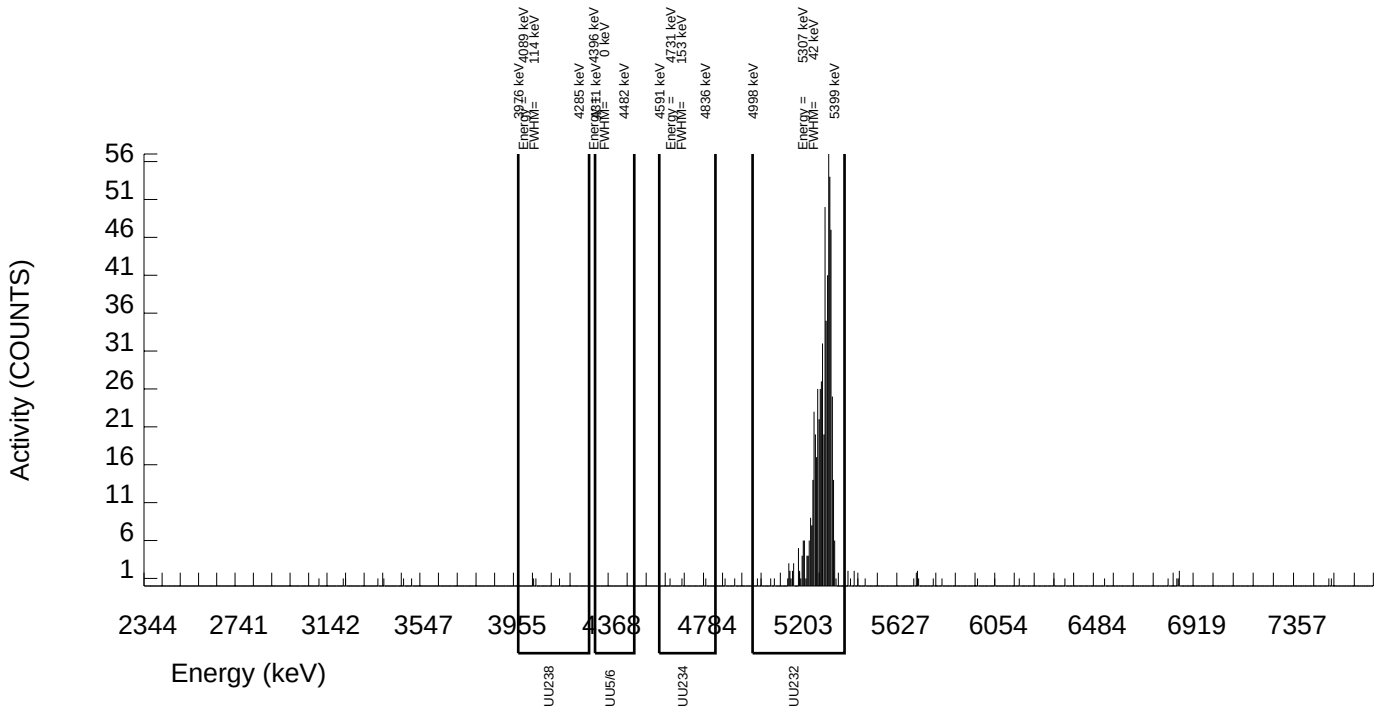
BATCH NUMBER: 901448 SAMPLE DATE : 11-SEP-2009 00:00:00	SAMPLE ID : S1201920749_UU SAMPLE QTY: 0.800 L
DETECTOR NUMBER :75545 AVERAGE %EFFICIENCY :24.5110 % YIELD : 48.271	COUNT DATE:18-SEP-2009 19:36:12 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :CXM2

MS/MSD	LCS/LCSD	TRACER	
ID : 1163-G ISOTOPE : U-238 PCI/L : 3.149E+00	ID : 1163-G ISOTOPE : U-238 PCI/L : 3.149E+00	ID : 1283-E ISOTOPE : U232 NOMINAL : 5.25817 dpm RESULTS : 2.53818 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B121.CNF;394 BKG DATE : 13-SEP-2009 EFF FILE : W121.CNF;108 CAL DATE : 17-SEP-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	4.000	1.120	1.000	1.0000	100.0000	5.33E-03	1.65E-02	3.64E-02	1.11E-02	1.65E-02
U232	5302.100	629.000	622.000	7.000	2.6458	100.0000	2.96E+00	4.96E-01	7.29E-02	2.93E-02	2.35E-01
U-235	4391.000	0.000	0.000	0.000	0.0000	80.90000	0.00E+00	1.16E-02	1.76E-02	0.00E+00	1.15E-02
U-238	4184.730	3.000	3.000	0.000	0.0000	100.0000	1.43E-02	1.63E-02	1.43E-02	0.00E+00	1.62E-02

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



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

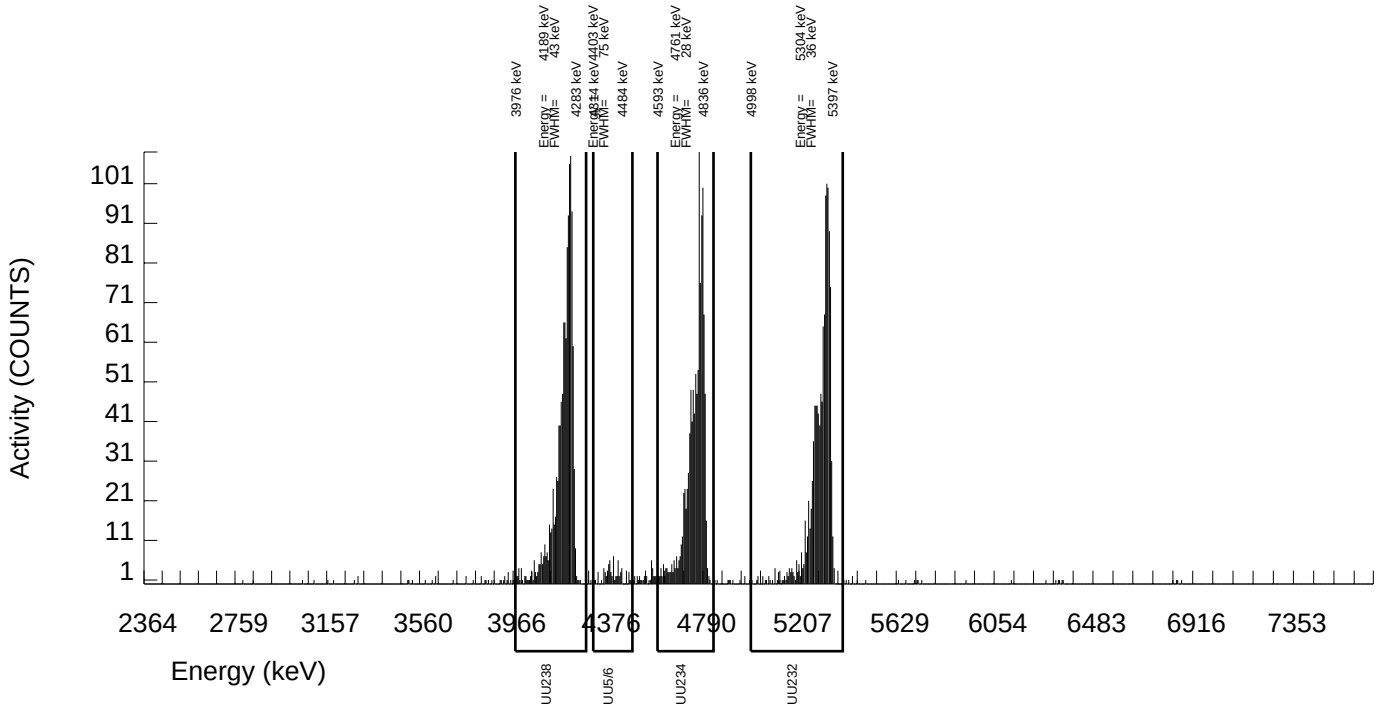
BATCH NUMBER: 901448 SAMPLE DATE : 11-SEP-2009 00:00:00	SAMPLE ID : S1201920750_UU SAMPLE QTY: 0.800 L
DETECTOR NUMBER :78790 AVERAGE %EFFICIENCY :34.4179 % YIELD : 65.546	COUNT DATE:17-SEP-2009 20:03:08 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :CXM2

MS/MSD	LCS/LCSD	TRACER	
ID : 1163-G ISOTOPE : U-238 PCI/L : 3.149E+00	ID : 1163-G ISOTOPE : U-238 PCI/L : 3.149E+00	ID : 1283-E ISOTOPE : U232 NOMINAL : 5.25817 dpm RESULTS : 3.44653 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B013.CNF;1045 BKG DATE : 13-SEP-2009 EFF FILE : W013.CNF;315 CAL DATE : 4-SEP-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	1111.000	1105.415	2.000	1.4142	100.0000	2.76E+00	4.11E-01	2.39E-02	8.21E-03	1.63E-01
U232	5302.100	1191.000	1186.000	5.000	2.2361	100.0000	2.96E+00	4.39E-01	3.35E-02	1.30E-02	1.69E-01
U-235	4391.000	66.000	63.000	3.000	1.7321	80.90000	1.94E-01	5.68E-02	3.41E-02	1.24E-02	5.02E-02
U-238	4184.730	1212.000	1212.000	0.000	0.0000	100.0000	3.03E+00	4.47E-01	7.49E-03	0.00E+00	1.70E-01

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



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

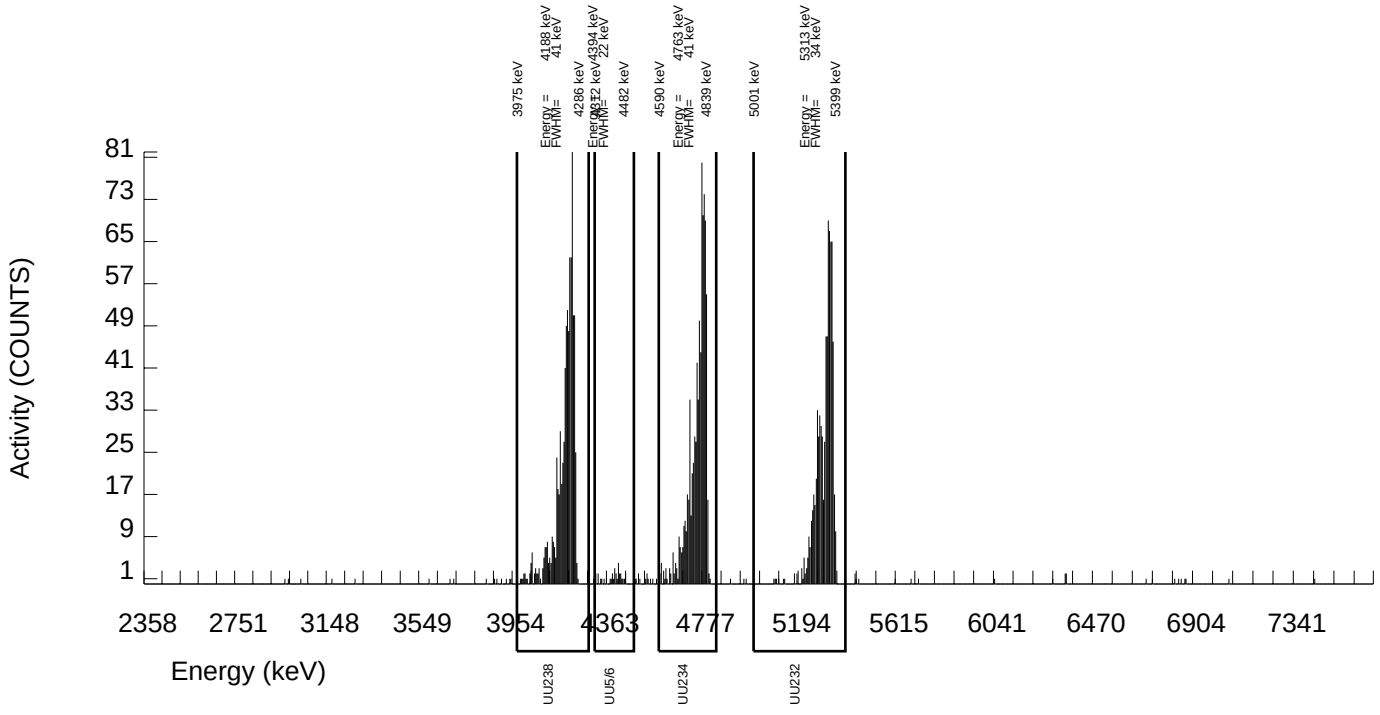
BATCH NUMBER: 901448 SAMPLE DATE : 11-SEP-2009 00:00:00	SAMPLE ID : S1201920751_UU SAMPLE QTY: 0.800 L
DETECTOR NUMBER :78774 AVERAGE %EFFICIENCY :33.3718 % YIELD : 42.464	COUNT DATE:17-SEP-2009 20:03:08 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :CXM2

MS/MSD	LCS/LCSD	TRACER	
ID : 1163-G ISOTOPE : U-238 PCI/L : 3.149E+00	ID : 1163-G ISOTOPE : U-238 PCI/L : 3.149E+00	ID : 1283-E ISOTOPE : U232 NOMINAL : 5.25817 dpm RESULTS : 2.23285 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B016.CNF;1041 BKG DATE : 13-SEP-2009 EFF FILE : W016.CNF;300 CAL DATE : 4-SEP-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	812.000	805.748	4.000	2.0000	100.0000	3.20E+00	5.11E-01	4.89E-02	1.85E-02	2.22E-01
U232	5302.100	750.000	745.000	5.000	2.2361	100.0000	2.96E+00	4.76E-01	5.33E-02	2.07E-02	2.14E-01
U-235	4391.000	34.000	31.000	3.000	1.7321	80.90000	1.52E-01	6.25E-02	5.43E-02	1.98E-02	5.86E-02
U-238	4184.730	791.000	787.000	4.000	2.0000	100.0000	3.13E+00	5.00E-01	4.89E-02	1.85E-02	2.20E-01

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



Radiochemistry Batch Checklist, Rev 9

Batch# 903847 Product: U Date: 9/30/09

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to100 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 740177
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 740177
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.			N/A
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly statused.	✓		
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 740177
Batch non-conformances second reviewed and disposition verified to be completed.	✓		NCR 740177
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] 9/30/09

Secondary Review Performed By: [signature] 9/30/09

9/30

VSOR

Uranium Que Sheet

17-SEP-09

Batch #: 903847 **Analyst:** MXE1 **First Client Due Date:** 30-SEP-09 **Internal Due Date:** 19-SEP-09

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

LCS Isotope: U-238 **LCS Code:** 1163-G **Expiration Date:** 4/16/10 **Vol:** 0.1

Spike Isotope: U-238 **Spike Code:** 1163-G **Expiration Date:** 4/16/10 **Vol:** 0.1

Prep Date: 9/21/09 **Initials:** mae **Pipet ID:** 2971058 **Balance ID:** 50410272 **Witness:** 09/21/09

Sample ID	Client Description	Type	Hazard Code	Min CRDL	Matrix	Client	Collection Date	Pos.	Label #	Wet/Dry Aliquot (g/l/f)	U Det #
236077001-1	RSAS3-0.5B	SAMPLE		.04 pCi/g	SOIL	KERR003	26-AUG-09	1	1	0.501	113
236077002-1	RSAS3009-0.5B	SAMPLE		.04 pCi/g	SOIL	KERR003	26-AUG-09	2	2	0.500	114
236077003-1	RSAS3-10B	SAMPLE		.04 pCi/g	SOIL	KERR003	26-AUG-09	3	3	0.508	116
236077004-1	RSAS3-25B	SAMPLE		.04 pCi/g	SOIL	KERR003	26-AUG-09	4	4	0.502	117
236077005-1	RSAS3-44B	SAMPLE		.04 pCi/g	SOIL	KERR003	26-AUG-09	5	5	0.504	
236077006-1	RSAT6-10B	SAMPLE		.04 pCi/g	SOIL	KERR003	27-AUG-09	6	6	0.516	118
236077007-1	RSAT6-30B	SAMPLE		.04 pCi/g	SOIL	KERR003	27-AUG-09	7	7	0.501	121
236077008-1	RSAT6-49B	SAMPLE		.04 pCi/g	SOIL	KERR003	27-AUG-09	8	8	0.510	
236077009-1	SA210-0.5B	SAMPLE		.04 pCi/g	SOIL	KERR003	27-AUG-09	9	9	0.505	122
236077010-1	SA210-10B	SAMPLE		.04 pCi/g	SOIL	KERR003	27-AUG-09	10	10	0.506	123
236077011-1	SA210-30B	SAMPLE		.04 pCi/g	SOIL	KERR003	27-AUG-09	11	11	0.504	124
236077012-1	SA210-49B	SAMPLE		.04 pCi/g	SOIL	KERR003	27-AUG-09	12	12	0.509	125
236077014-1	SA68-0.5B	SAMPLE		.04 pCi/g	SOIL	KERR003	31-AUG-09	13	13	0.515 (126)	
236077015-1	SA68-10B	SAMPLE		.04 pCi/g	SOIL	KERR003	31-AUG-09	14	14	0.510	127
236077016-1	SA68-25B	SAMPLE		.04 pCi/g	SOIL	KERR003	31-AUG-09	15	15	0.516	128
236077017-1	SA68009-25B	SAMPLE		.04 pCi/g	SOIL	KERR003	31-AUG-09	16	16	0.509	129
236077018-1	SA68-36B	SAMPLE		.04 pCi/g	SOIL	KERR003	31-AUG-09	17	17	0.517	126
236077020-1	SA133-31B	SAMPLE		.04 pCi/g	SOIL	KERR003	01-SEP-09	18	18	0.501	114
1201926679-1	MB for batch 903847	MB		.04 pCi/g	SOIL	QC ACCOUNT		19	19	0.521	116
1201926680-1	SA133-31B(236077020DUP)	DUP		.04 pCi/g	SOIL	QC ACCOUNT	01-SEP-09	20	20	0.503	117
1201926681-1	SA133-31B(236077020MS)	MS		.04 pCi/g	SOIL	QC ACCOUNT	01-SEP-09	21	21	0.521	118
1201926682-1	LCS for batch 903847	LCS		.04 pCi/g	SOIL	QC ACCOUNT		22	22	0.521	121

123

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: 9/30/09

GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

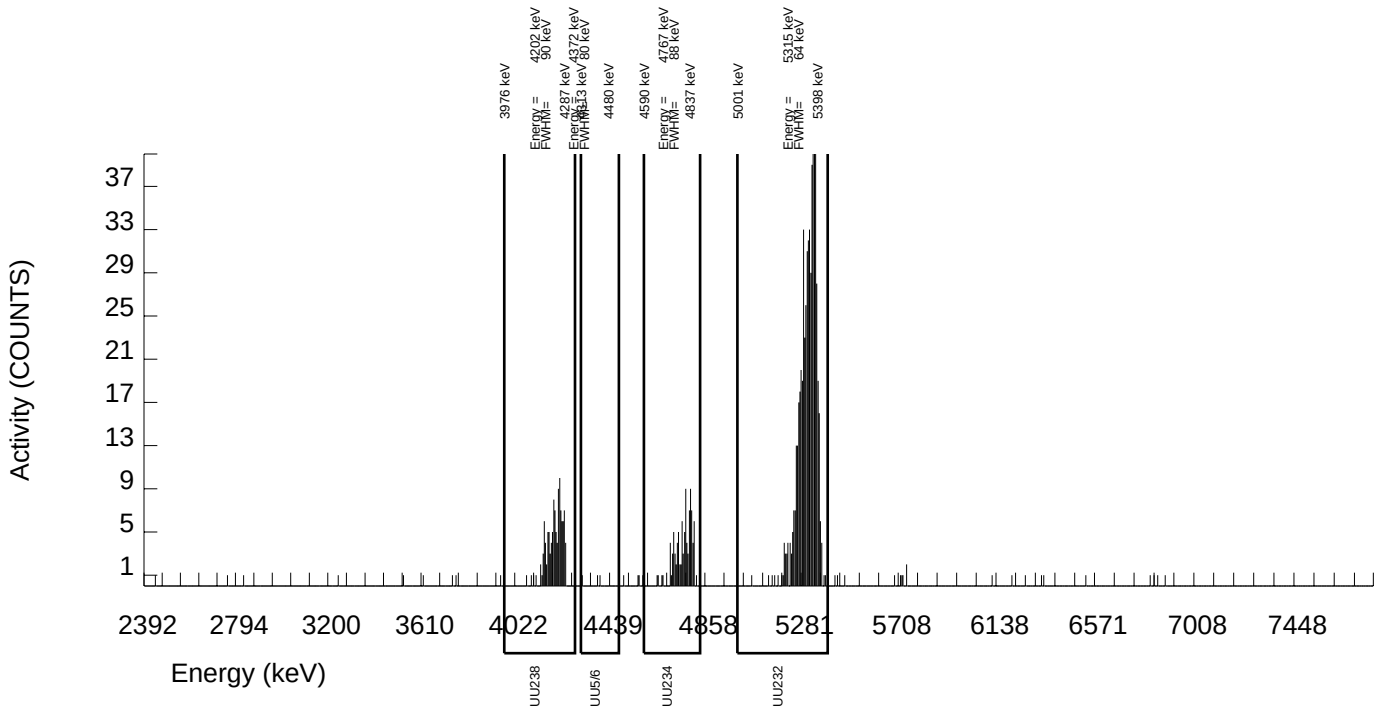
BATCH NUMBER: 903847 SAMPLE DATE : 26-AUG-2009 00:00:00	SAMPLE ID : S0236077001_UU SAMPLE QTY: 0.501 G
DETECTOR NUMBER :45-111B4 AVERAGE %EFFICIENCY :24.9366 % YIELD : 44.409	COUNT DATE:29-SEP-2009 19:39:11 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :MXE1

MS/MSD	LCS/LCSD	TRACER	
ID : 1163-G ISOTOPE : U-238 PCI/G : 5.028E+00	ID : 1163-G ISOTOPE : U-238 PCI/G : 5.028E+00	ID : 1283-E ISOTOPE : U232 NOMINAL : 5.26039 dpm RESULTS : 2.33608 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B113.CNF;398 BKG DATE : 28-SEP-2009 EFF FILE : W113.CNF;114 CAL DATE : 17-SEP-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	100.000	99.413	0.000	0.0000	100.0000	8.07E-01	1.99E-01	2.44E-02	0.00E+00	1.59E-01
U232	5302.100	588.000	582.000	6.000	2.4495	100.0000	4.73E+00	8.07E-01	1.17E-01	4.63E-02	3.88E-01
U-235	4391.000	3.000	3.000	0.000	0.0000	80.90000	3.01E-02	3.44E-02	3.01E-02	0.00E+00	3.41E-02
U-238	4184.730	117.000	116.000	1.000	1.0000	100.0000	9.42E-01	2.23E-01	6.21E-02	1.89E-02	1.73E-01

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



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

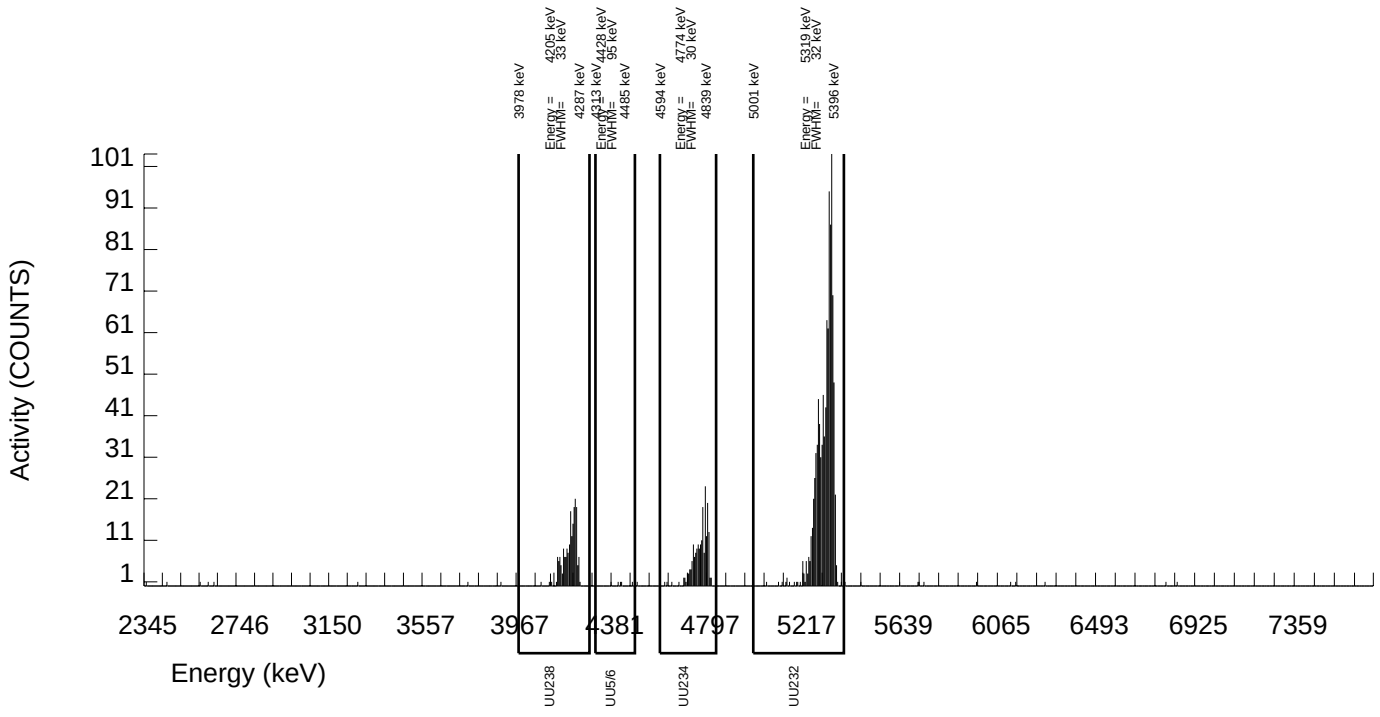
BATCH NUMBER: 903847 SAMPLE DATE : 26-AUG-2009 00:00:00	SAMPLE ID : S0236077002_UU SAMPLE QTY: 0.500 G
DETECTOR NUMBER :78258 AVERAGE %EFFICIENCY :25.4913 % YIELD : 75.838	COUNT DATE:29-SEP-2009 19:39:13 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :MXE1

MS/MSD	LCS/LCSD	TRACER	
ID : 1163-G ISOTOPE : U-238 PCI/G : 5.038E+00	ID : 1163-G ISOTOPE : U-238 PCI/G : 5.038E+00	ID : 1283-E ISOTOPE : U232 NOMINAL : 5.26039 dpm RESULTS : 3.98936 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B114.CNF;399 BKG DATE : 28-SEP-2009 EFF FILE : W114.CNF;110 CAL DATE : 17-SEP-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	204.000	199.976	3.000	1.7321	100.0000	9.32E-01	1.84E-01	5.15E-02	1.88E-02	1.31E-01
U232	5302.100	1016.000	1016.000	0.000	0.0000	100.0000	4.74E+00	7.21E-01	1.40E-02	0.00E+00	2.91E-01
U-235	4391.000	5.000	5.000	0.000	0.0000	80.90000	2.88E-02	2.56E-02	1.73E-02	0.00E+00	2.52E-02
U-238	4184.730	202.000	199.000	3.000	1.7321	100.0000	9.27E-01	1.84E-01	5.15E-02	1.88E-02	1.31E-01

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



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

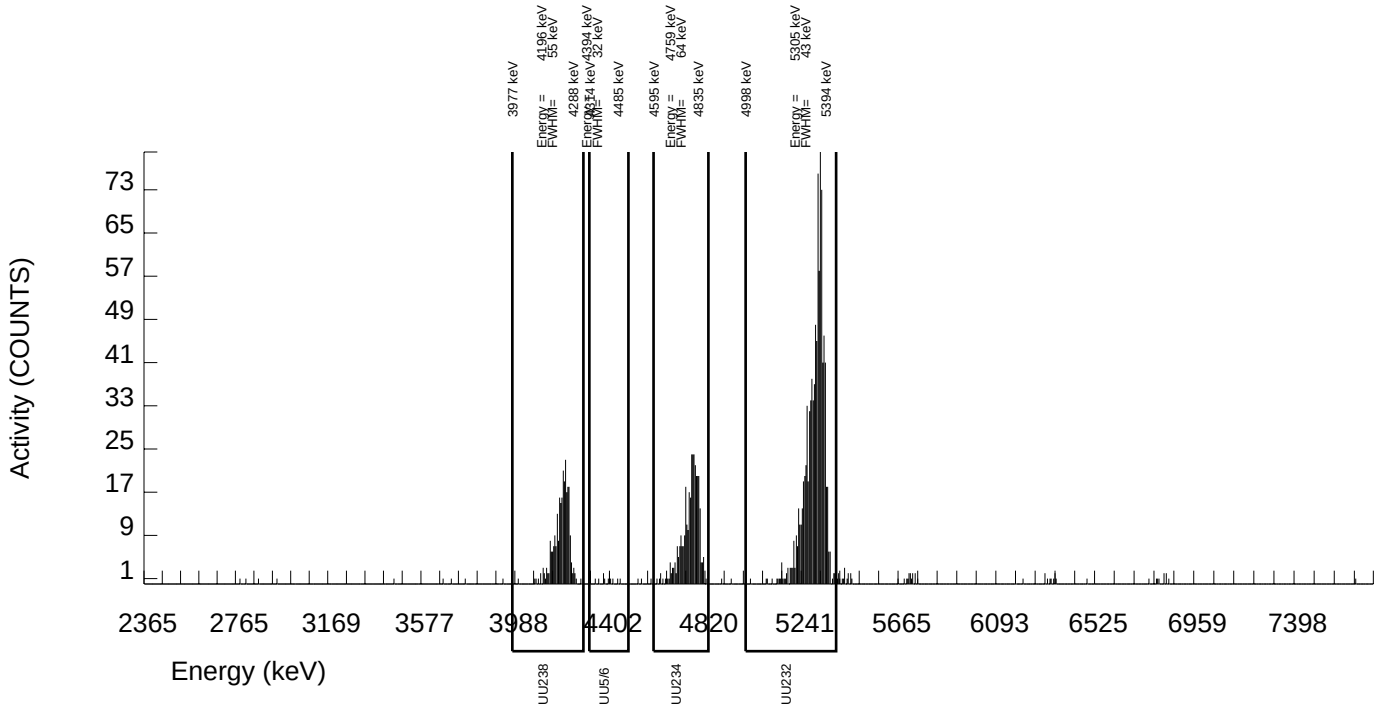
BATCH NUMBER: 903847 SAMPLE DATE : 26-AUG-2009 00:00:00	SAMPLE ID : S0236077003_UU SAMPLE QTY: 0.508 G
DETECTOR NUMBER :45-132FF2 AVERAGE %EFFICIENCY :26.4221 % YIELD : 68.269	COUNT DATE:29-SEP-2009 19:39:16 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :MXE1

MS/MSD	LCS/LCSD	TRACER	
ID : 1163-G ISOTOPE : U-238 PCI/G : 4.958E+00	ID : 1163-G ISOTOPE : U-238 PCI/G : 4.958E+00	ID : 1283-E ISOTOPE : U232 NOMINAL : 5.26039 dpm RESULTS : 3.59123 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B116.CNF;393 BKG DATE : 28-SEP-2009 EFF FILE : W116.CNF;98 CAL DATE : 17-SEP-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	332.000	330.045	1.000	1.0000	100.0000	1.62E+00	2.88E-01	3.76E-02	1.14E-02	1.76E-01
U232	5302.100	956.000	948.000	8.000	2.8284	100.0000	4.66E+00	7.20E-01	7.95E-02	3.24E-02	2.99E-01
U-235	4391.000	13.000	11.000	2.000	1.4142	80.90000	6.68E-02	4.71E-02	5.82E-02	2.00E-02	4.61E-02
U-238	4184.730	268.000	266.000	2.000	1.4142	100.0000	1.31E+00	2.42E-01	4.71E-02	1.62E-02	1.58E-01

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



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

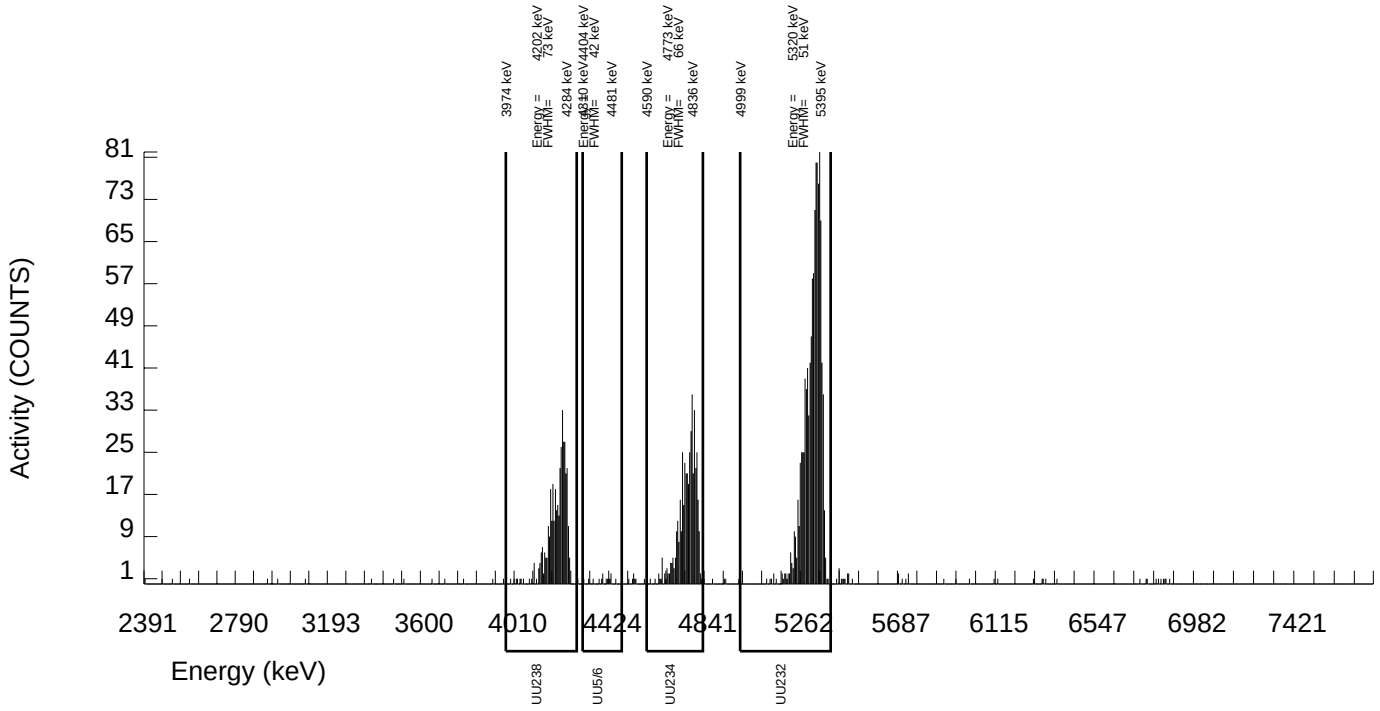
BATCH NUMBER: 903847 SAMPLE DATE : 26-AUG-2009 00:00:00	SAMPLE ID : S0236077004_UU SAMPLE QTY: 0.502 G
DETECTOR NUMBER :33450 AVERAGE %EFFICIENCY :25.3933 % YIELD : 81.376	COUNT DATE:29-SEP-2009 19:39:19 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :MXE1

MS/MSD	LCS/LCSD	TRACER	
ID : 1163-G ISOTOPE : U-238 PCI/G : 5.018E+00	ID : 1163-G ISOTOPE : U-238 PCI/G : 5.018E+00	ID : 1283-E ISOTOPE : U232 NOMINAL : 5.26039 dpm RESULTS : 4.28069 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B117.CNF;403 BKG DATE : 28-SEP-2009 EFF FILE : W117.CNF;110 CAL DATE : 17-SEP-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	442.000	438.906	2.000	1.4142	100.0000	1.91E+00	3.19E-01	4.16E-02	1.43E-02	1.79E-01
U232	5302.100	1093.000	1086.000	7.000	2.6458	100.0000	4.72E+00	7.12E-01	6.65E-02	2.68E-02	2.83E-01
U-235	4391.000	14.000	13.000	1.000	1.0000	80.90000	6.98E-02	4.19E-02	4.11E-02	1.25E-02	4.07E-02
U-238	4184.730	387.000	382.000	5.000	2.2361	100.0000	1.66E+00	2.85E-01	5.82E-02	2.26E-02	1.69E-01

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



Alpha Spectroscopy Software Version 2.0
effective date: 09-Mar-1997

GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

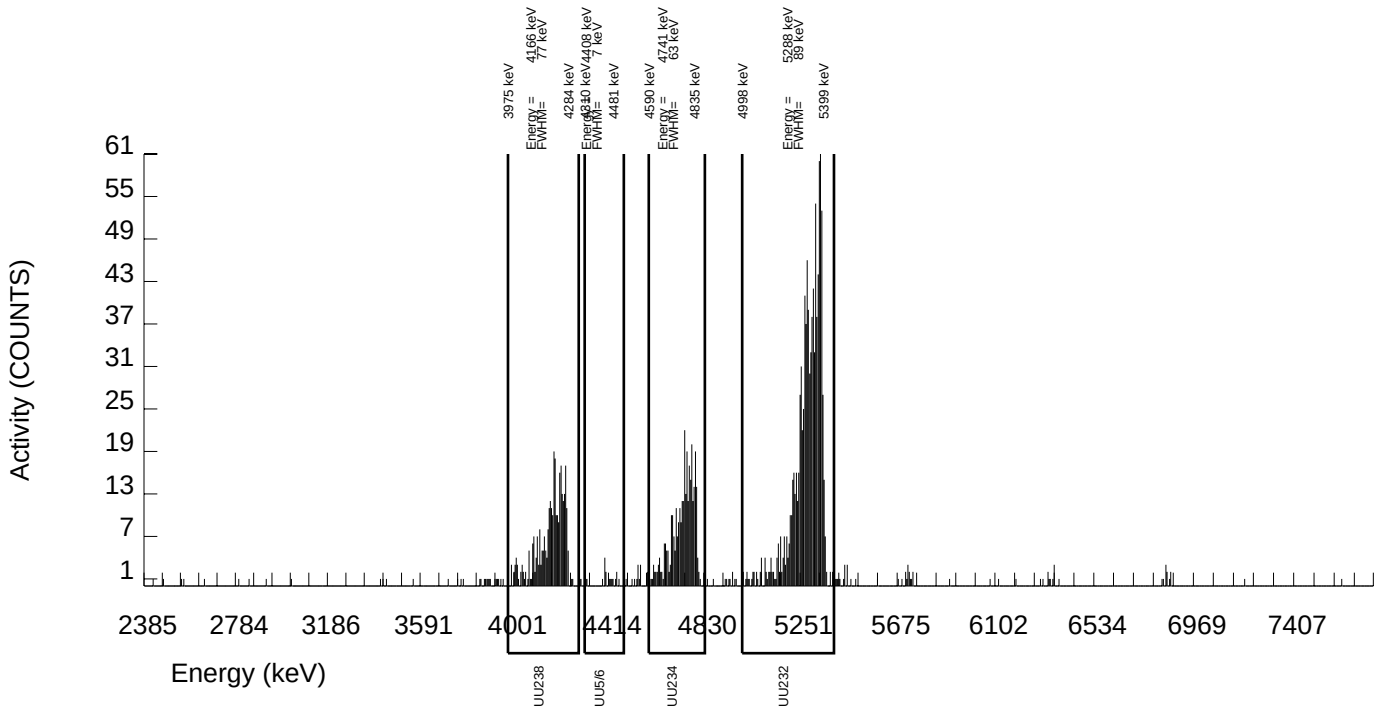
BATCH NUMBER: 903847 SAMPLE DATE : 26-AUG-2009 00:00:00	SAMPLE ID : S0236077005_UU SAMPLE QTY: 0.504 G
DETECTOR NUMBER :67594 AVERAGE %EFFICIENCY :29.9482 % YIELD : 63.209	COUNT DATE:24-SEP-2009 15:20:38 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :MXE1

MS/MSD	LCS/LCSD	TRACER	
ID : 1163-G ISOTOPE : U-238 PCI/G : 4.998E+00	ID : 1163-G ISOTOPE : U-238 PCI/G : 4.998E+00	ID : 1283-E ISOTOPE : U232 NOMINAL : 5.26039 dpm RESULTS : 3.32503 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B012.CNF;1070 BKG DATE : 20-SEP-2009 EFF FILE : W012.CNF;302 CAL DATE : 4-SEP-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	342.000	330.992	8.000	2.8284	100.0000	1.56E+00	2.79E-01	7.63E-02	3.11E-02	1.72E-01
U232	5302.100	1013.000	995.000	18.000	4.2426	100.0000	4.70E+00	7.22E-01	1.07E-01	4.66E-02	2.97E-01
U-235	4391.000	19.000	15.000	4.000	2.0000	80.90000	8.75E-02	5.62E-02	7.18E-02	2.72E-02	5.49E-02
U-238	4184.730	324.000	317.000	7.000	2.6458	100.0000	1.50E+00	2.69E-01	7.23E-02	2.91E-02	1.68E-01

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



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

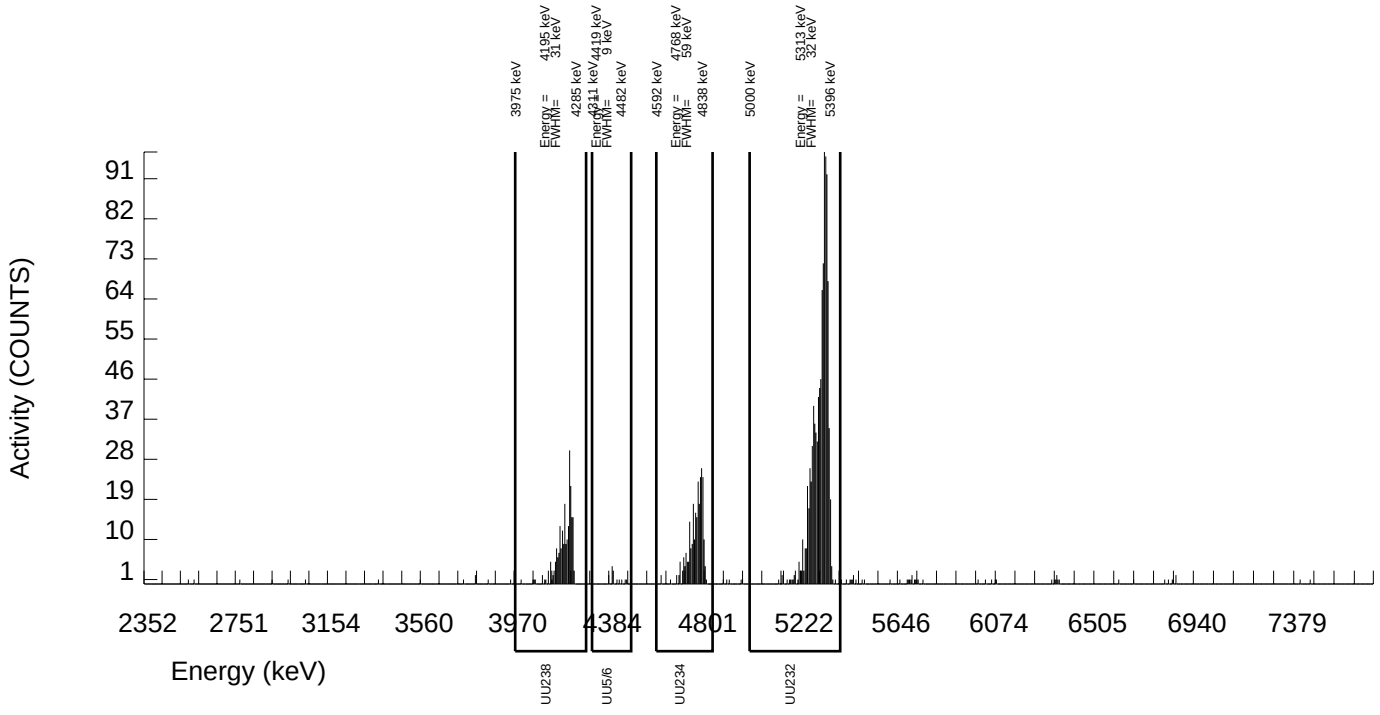
BATCH NUMBER: 903847 SAMPLE DATE : 27-AUG-2009 00:00:00	SAMPLE ID : S0236077006_UU SAMPLE QTY: 0.516 G
DETECTOR NUMBER :75544 AVERAGE %EFFICIENCY :25.6202 % YIELD : 73.971	COUNT DATE:29-SEP-2009 19:39:21 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :MXE1

MS/MSD	LCS/LCSD	TRACER	
ID : 1163-G ISOTOPE : U-238 PCI/G : 4.882E+00	ID : 1163-G ISOTOPE : U-238 PCI/G : 4.882E+00	ID : 1283-E ISOTOPE : U232 NOMINAL : 5.26025 dpm RESULTS : 3.89107 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B118.CNF;402 BKG DATE : 28-SEP-2009 EFF FILE : W118.CNF;107 CAL DATE : 17-SEP-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	263.000	258.996	3.000	1.7321	100.0000	1.19E+00	2.22E-01	5.09E-02	1.86E-02	1.47E-01
U232	5302.100	1001.000	996.000	5.000	2.2361	100.0000	4.59E+00	7.02E-01	6.18E-02	2.40E-02	2.87E-01
U-235	4391.000	14.000	13.000	1.000	1.0000	80.90000	7.40E-02	4.44E-02	4.36E-02	1.32E-02	4.32E-02
U-238	4184.730	225.000	222.000	3.000	1.7321	100.0000	1.02E+00	1.97E-01	5.09E-02	1.86E-02	1.36E-01

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



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

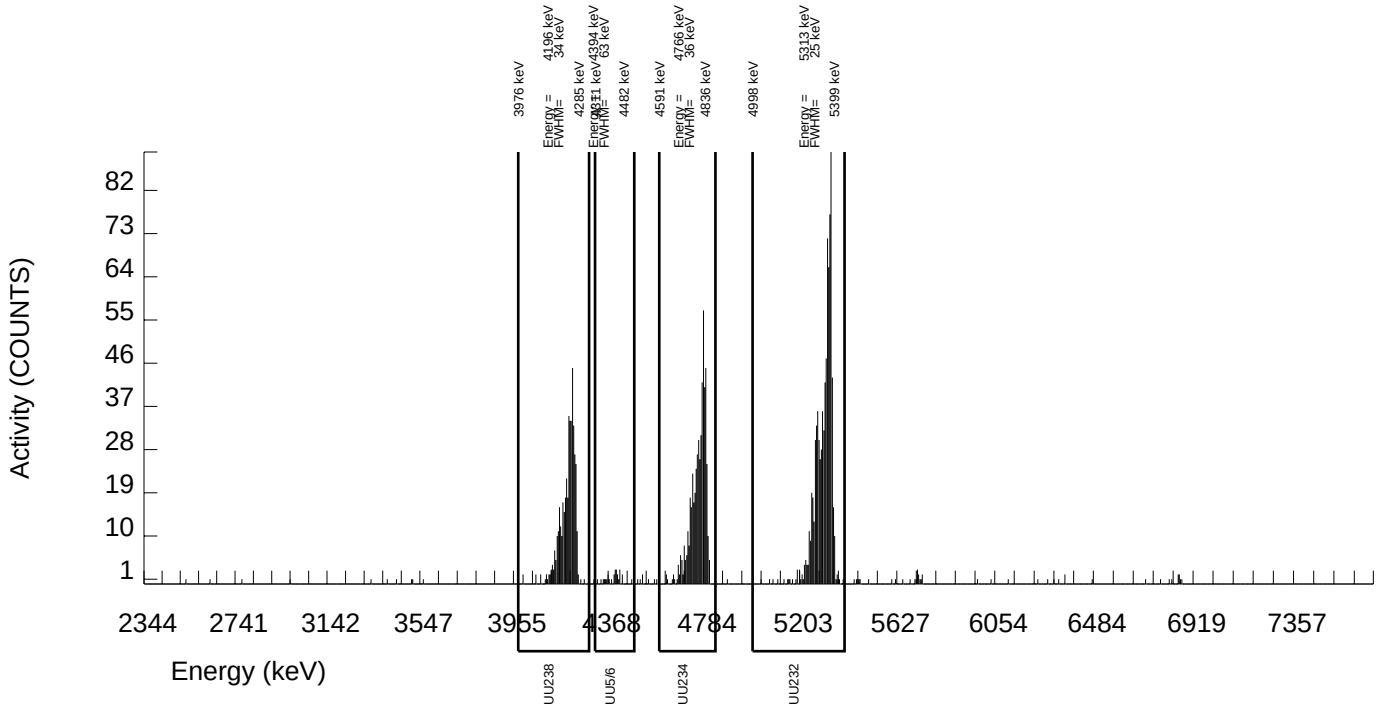
BATCH NUMBER: 903847 SAMPLE DATE : 27-AUG-2009 00:00:00	SAMPLE ID : S0236077007_UU SAMPLE QTY: 0.501 G
DETECTOR NUMBER :75545 AVERAGE %EFFICIENCY :24.5110 % YIELD : 63.733	COUNT DATE:29-SEP-2009 19:39:24 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :MXE1

MS/MSD	LCS/LCSD	TRACER	
ID : 1163-G ISOTOPE : U-238 PCI/G : 5.028E+00	ID : 1163-G ISOTOPE : U-238 PCI/G : 5.028E+00	ID : 1283-E ISOTOPE : U232 NOMINAL : 5.26025 dpm RESULTS : 3.35254 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B121.CNF;398 BKG DATE : 28-SEP-2009 EFF FILE : W121.CNF;108 CAL DATE : 17-SEP-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	522.000	520.173	1.000	1.0000	100.0000	2.99E+00	4.99E-01	4.40E-02	1.34E-02	2.58E-01
U232	5302.100	827.000	821.000	6.000	2.4495	100.0000	4.73E+00	7.49E-01	8.29E-02	3.28E-02	3.26E-01
U-235	4391.000	28.000	28.000	0.000	0.0000	80.90000	1.99E-01	7.91E-02	2.13E-02	0.00E+00	7.38E-02
U-238	4184.730	433.000	429.000	4.000	2.0000	100.0000	2.47E+00	4.24E-01	7.08E-02	2.68E-02	2.36E-01

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



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effective date: 09-Mar-1997

GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

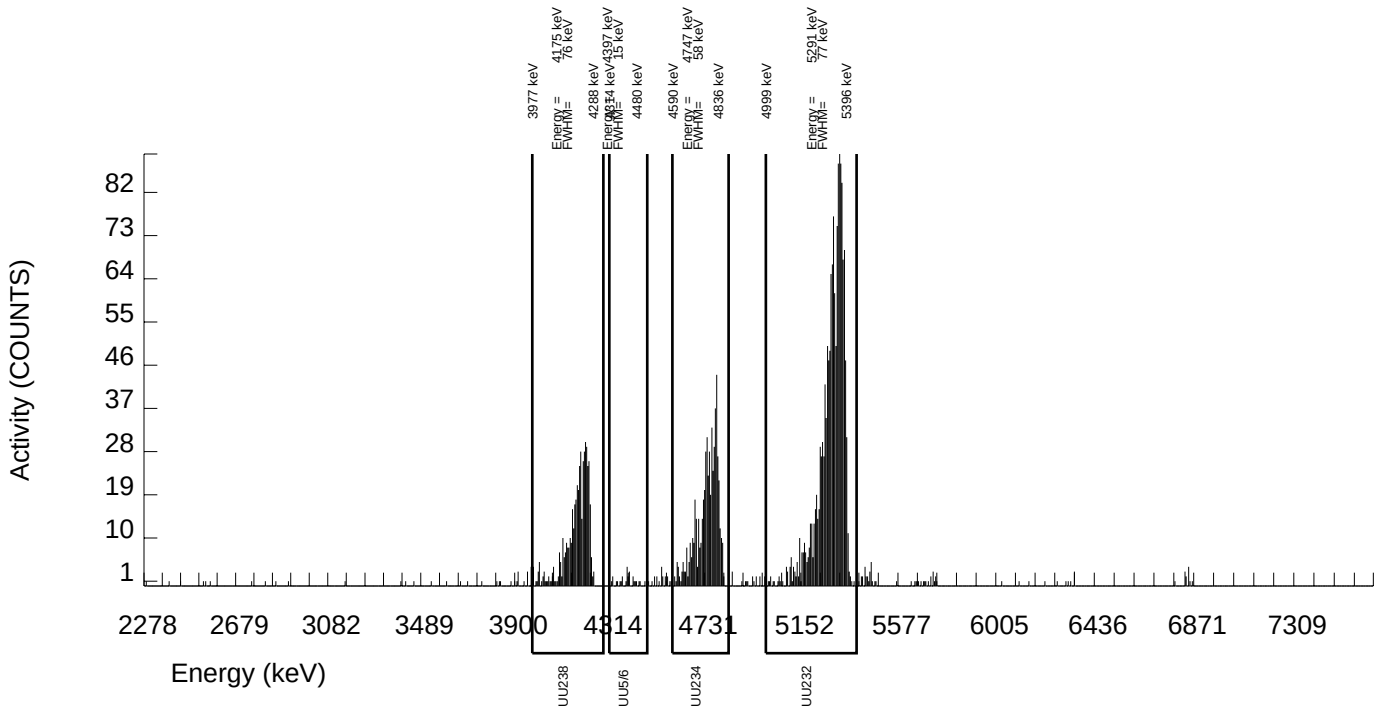
BATCH NUMBER: 903847 SAMPLE DATE : 27-AUG-2009 00:00:00	SAMPLE ID : S0236077008_UU SAMPLE QTY: 0.510 G
DETECTOR NUMBER :67047 AVERAGE %EFFICIENCY :30.5372 % YIELD : 95.009	COUNT DATE:24-SEP-2009 15:20:41 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :MXE1

MS/MSD	LCS/LCSD	TRACER	
ID : 1163-G ISOTOPE : U-238 PCI/G : 4.939E+00	ID : 1163-G ISOTOPE : U-238 PCI/G : 4.939E+00	ID : 1283-E ISOTOPE : U232 NOMINAL : 5.26025 dpm RESULTS : 4.99773 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B021.CNF;1058 BKG DATE : 20-SEP-2009 EFF FILE : W021.CNF;317 CAL DATE : 4-SEP-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	577.000	563.390	9.000	3.0000	100.0000	1.72E+00	2.72E-01	5.16E-02	2.12E-02	1.44E-01
U232	5302.100	1533.000	1525.000	8.000	2.8284	100.0000	4.65E+00	6.68E-01	4.92E-02	2.00E-02	2.34E-01
U-235	4391.000	27.000	24.000	3.000	1.7321	80.90000	9.03E-02	4.22E-02	4.16E-02	1.52E-02	4.04E-02
U-238	4184.730	486.000	482.000	4.000	2.0000	100.0000	1.47E+00	2.38E-01	3.75E-02	1.42E-02	1.32E-01

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



Alpha Spectroscopy Software Version 2.0
effective date: 09-Mar-1997

GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

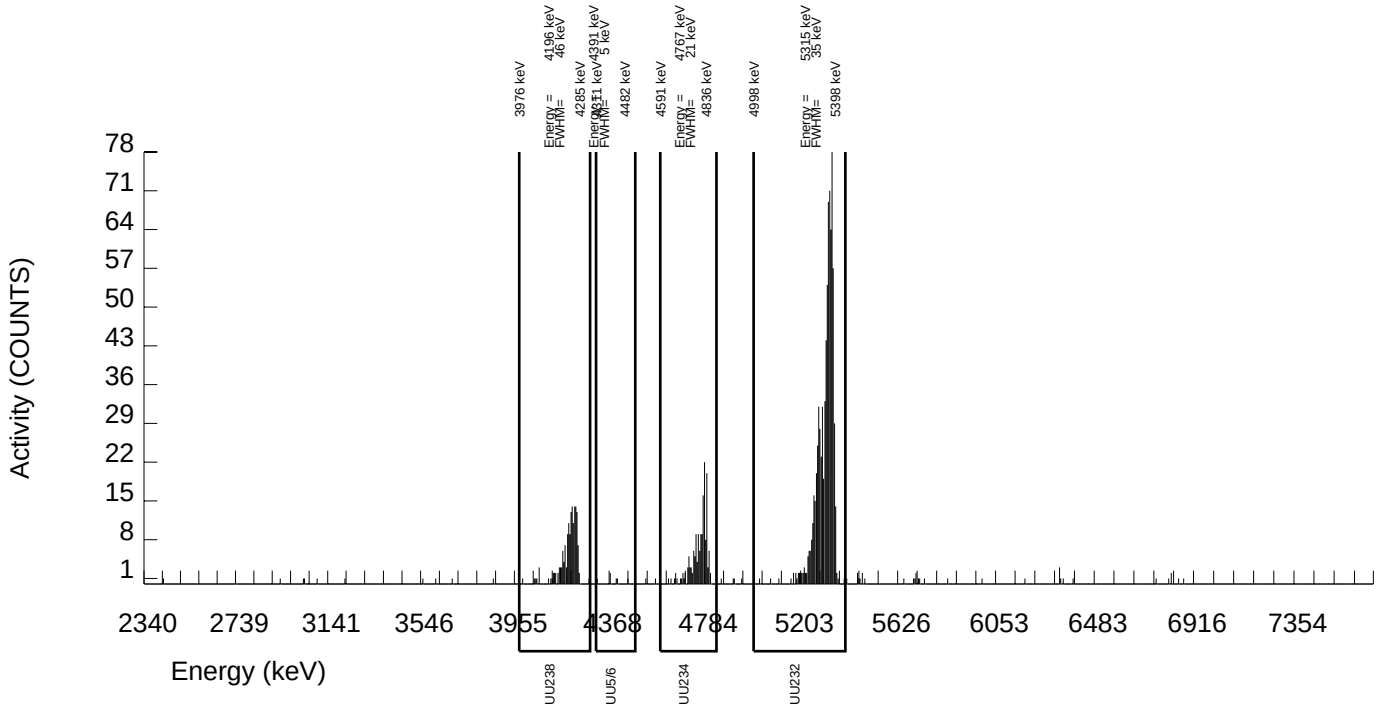
BATCH NUMBER: 903847 SAMPLE DATE : 27-AUG-2009 00:00:00	SAMPLE ID : S0236077009_UU SAMPLE QTY: 0.505 G
DETECTOR NUMBER :75546 AVERAGE %EFFICIENCY :25.1121 % YIELD : 58.419	COUNT DATE:29-SEP-2009 19:39:26 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :MXE1

MS/MSD	LCS/LCSD	TRACER	
ID : 1163-G ISOTOPE : U-238 PCI/G : 4.988E+00	ID : 1163-G ISOTOPE : U-238 PCI/G : 4.988E+00	ID : 1283-E ISOTOPE : U232 NOMINAL : 5.26025 dpm RESULTS : 3.07301 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B122.CNF;400 BKG DATE : 28-SEP-2009 EFF FILE : W122.CNF;111 CAL DATE : 17-SEP-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	163.000	149.223	13.000	3.6056	100.0000	9.07E-01	2.05E-01	1.20E-01	5.10E-02	1.58E-01
U232	5302.100	789.000	771.000	18.000	4.2426	100.0000	4.69E+00	7.57E-01	1.38E-01	6.01E-02	3.39E-01
U-235	4391.000	6.000	5.000	1.000	1.0000	80.90000	3.76E-02	3.93E-02	5.75E-02	1.75E-02	3.90E-02
U-238	4184.730	165.000	163.000	2.000	1.4142	100.0000	9.91E-01	2.10E-01	5.82E-02	2.00E-02	1.54E-01

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



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

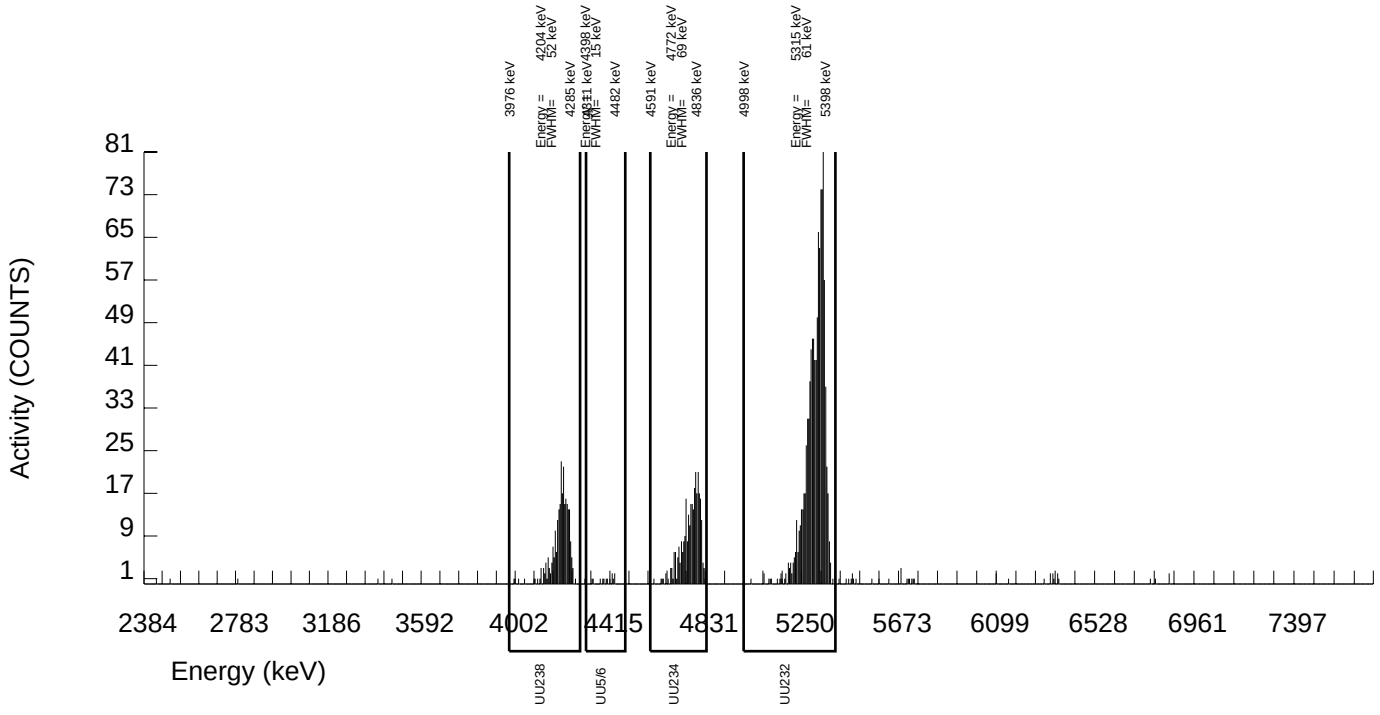
BATCH NUMBER: 903847 SAMPLE DATE : 27-AUG-2009 00:00:00	SAMPLE ID : S0236077010_UU SAMPLE QTY: 0.506 G
DETECTOR NUMBER :45-142V3 AVERAGE %EFFICIENCY :25.9629 % YIELD : 75.780	COUNT DATE:29-SEP-2009 19:39:28 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :MXE1

MS/MSD	LCS/LCSD	TRACER	
ID : 1163-G ISOTOPE : U-238 PCI/G : 4.978E+00	ID : 1163-G ISOTOPE : U-238 PCI/G : 4.978E+00	ID : 1283-E ISOTOPE : U232 NOMINAL : 5.26025 dpm RESULTS : 3.98619 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B123.CNF;398 BKG DATE : 28-SEP-2009 EFF FILE : W123.CNF;107 CAL DATE : 17-SEP-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	296.000	294.958	0.000	0.0000	100.0000	1.33E+00	2.40E-01	1.36E-02	0.00E+00	1.52E-01
U232	5302.100	1043.000	1034.000	9.000	3.0000	100.0000	4.68E+00	7.13E-01	7.68E-02	3.16E-02	2.88E-01
U-235	4391.000	14.000	12.000	2.000	1.4142	80.90000	6.71E-02	4.48E-02	5.36E-02	1.84E-02	4.38E-02
U-238	4184.730	257.000	257.000	0.000	0.0000	100.0000	1.16E+00	2.15E-01	1.36E-02	0.00E+00	1.42E-01

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



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

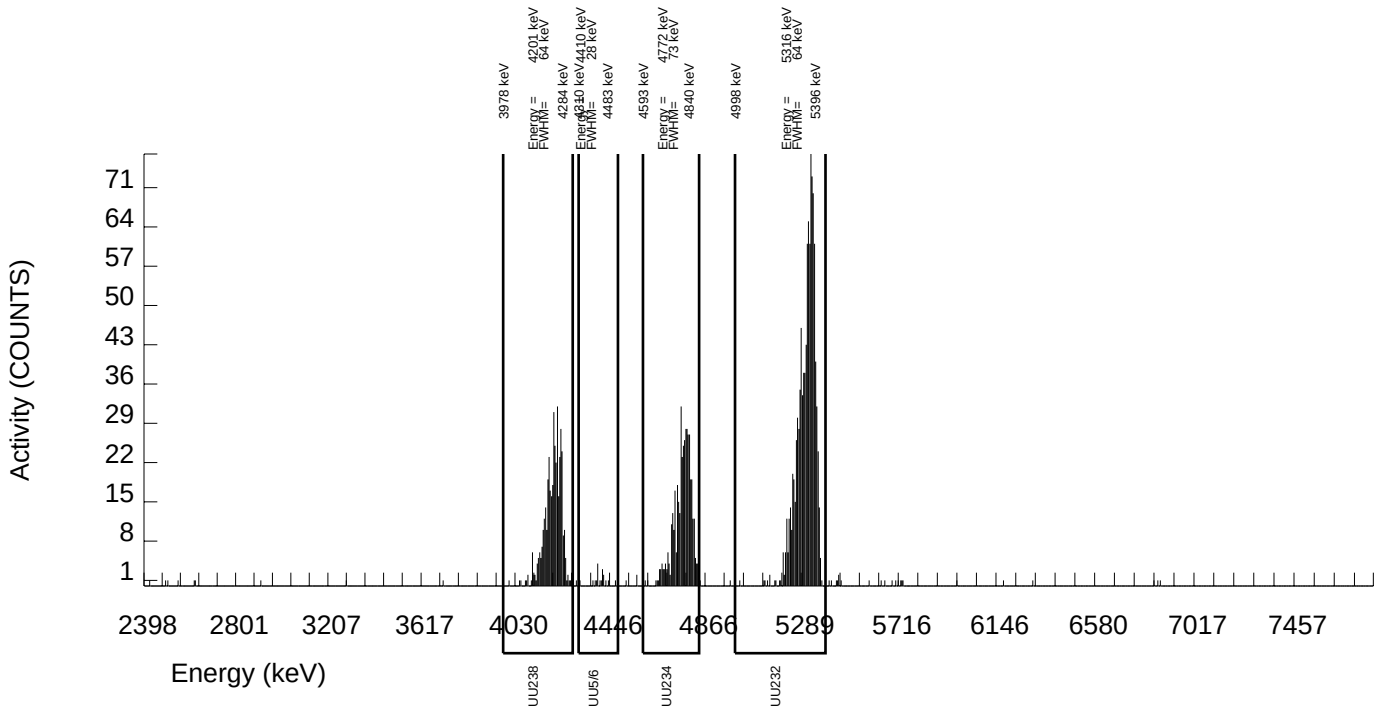
BATCH NUMBER: 903847 SAMPLE DATE : 27-AUG-2009 00:00:00	SAMPLE ID : S0236077011_UU SAMPLE QTY: 0.504 G
DETECTOR NUMBER :45-142V2 AVERAGE %EFFICIENCY :25.7305 % YIELD : 76.242	COUNT DATE:29-SEP-2009 19:39:31 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :MXE1

MS/MSD	LCS/LCSD	TRACER	
ID : 1163-G ISOTOPE : U-238 PCI/G : 4.998E+00	ID : 1163-G ISOTOPE : U-238 PCI/G : 4.998E+00	ID : 1283-E ISOTOPE : U232 NOMINAL : 5.26025 dpm RESULTS : 4.01052 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B124.CNF;394 BKG DATE : 28-SEP-2009 EFF FILE : W124.CNF;103 CAL DATE : 17-SEP-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	434.000	428.961	4.000	2.0000	100.0000	1.95E+00	3.30E-01	5.61E-02	2.12E-02	1.87E-01
U232	5302.100	1034.000	1031.000	3.000	1.7321	100.0000	4.70E+00	7.14E-01	5.04E-02	1.84E-02	2.88E-01
U-235	4391.000	18.000	17.000	1.000	1.0000	80.90000	9.57E-02	4.99E-02	4.31E-02	1.31E-02	4.81E-02
U-238	4184.730	415.000	412.000	3.000	1.7321	100.0000	1.88E+00	3.19E-01	5.04E-02	1.84E-02	1.83E-01

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



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

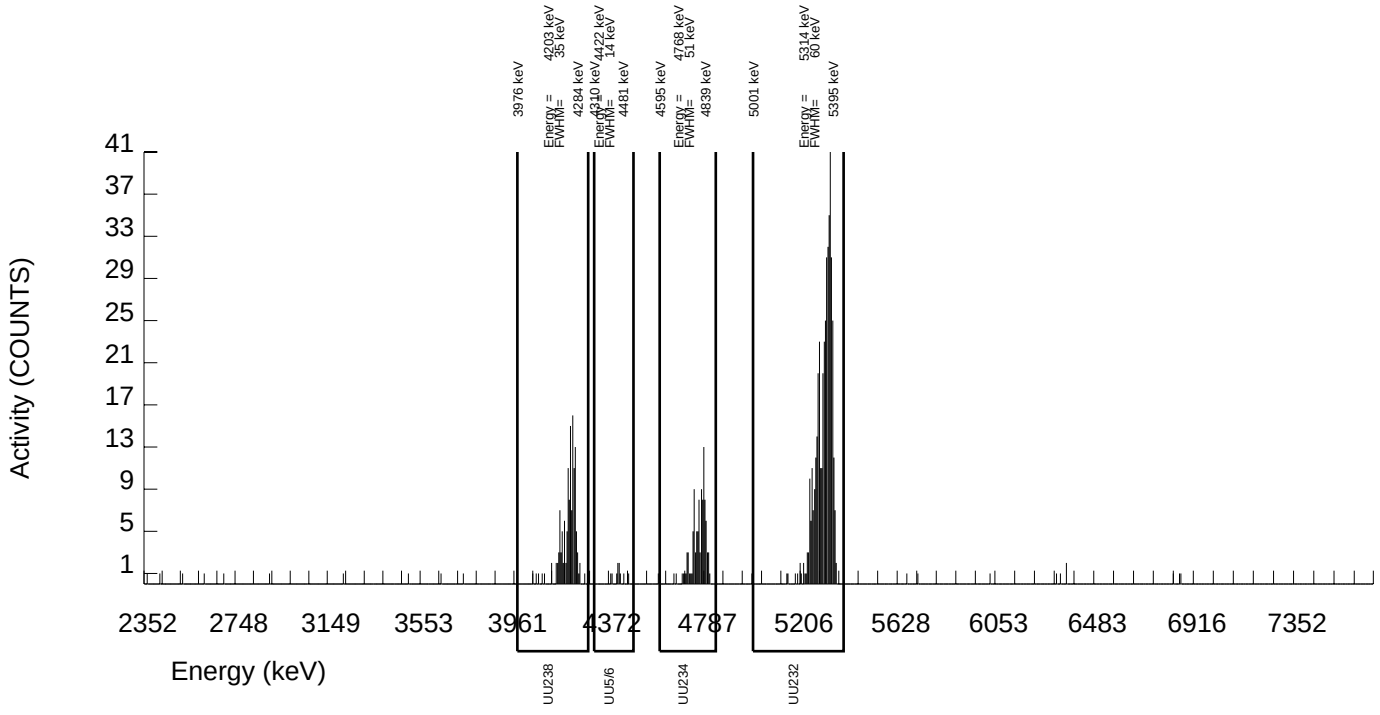
BATCH NUMBER: 903847 SAMPLE DATE : 27-AUG-2009 00:00:00	SAMPLE ID : S0236077012_UU SAMPLE QTY: 0.508 G
DETECTOR NUMBER :75547 AVERAGE %EFFICIENCY :25.8247 % YIELD : 31.977	COUNT DATE:29-SEP-2009 19:39:33 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :MXE1

MS/MSD	LCS/LCSD	TRACER	
ID : 1163-G ISOTOPE : U-238 PCI/G : 4.958E+00	ID : 1163-G ISOTOPE : U-238 PCI/G : 4.958E+00	ID : 1283-E ISOTOPE : U232 NOMINAL : 5.26025 dpm RESULTS : 1.68208 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B125.CNF;404 BKG DATE : 28-SEP-2009 EFF FILE : W125.CNF;121 CAL DATE : 17-SEP-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	105.000	99.563	5.000	2.2361	100.0000	1.07E+00	2.77E-01	1.44E-01	5.59E-02	2.20E-01
U232	5302.100	436.000	434.000	2.000	1.4142	100.0000	4.66E+00	8.53E-01	1.03E-01	3.54E-02	4.41E-01
U-235	4391.000	10.000	10.000	0.000	0.0000	80.90000	1.33E-01	8.49E-02	3.98E-02	0.00E+00	8.23E-02
U-238	4184.730	137.000	137.000	0.000	0.0000	100.0000	1.47E+00	3.37E-01	3.22E-02	0.00E+00	2.46E-01

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



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

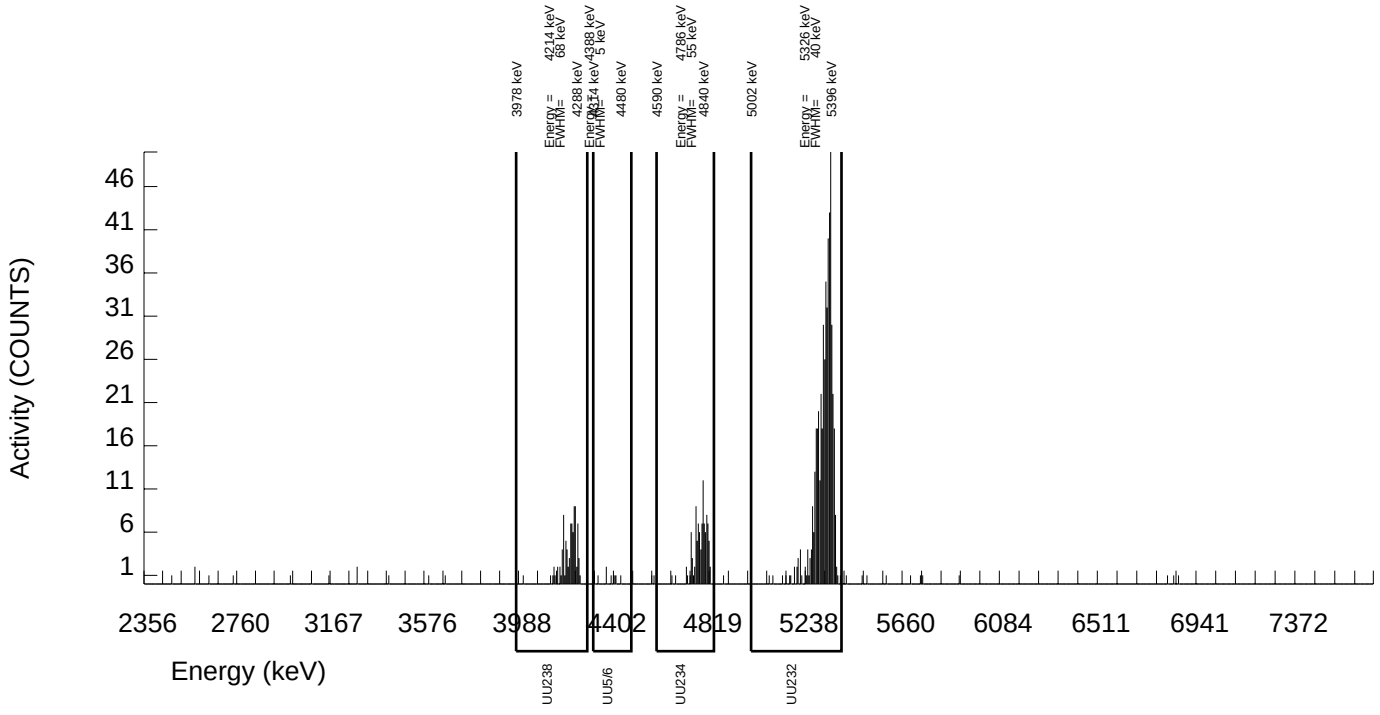
BATCH NUMBER: 903847 SAMPLE DATE : 31-AUG-2009 00:00:00	SAMPLE ID : S0236077014_UU SAMPLE QTY: 0.515 G
DETECTOR NUMBER :75548 AVERAGE %EFFICIENCY :25.2876 % YIELD : 36.945	COUNT DATE:29-SEP-2009 19:39:36 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :MXE1

MS/MSD	LCS/LCSD	TRACER	
ID : 1163-G ISOTOPE : U-238 PCI/G : 4.891E+00	ID : 1163-G ISOTOPE : U-238 PCI/G : 4.891E+00	ID : 1283-E ISOTOPE : U232 NOMINAL : 5.25970 dpm RESULTS : 1.94321 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B126.CNF;403 BKG DATE : 28-SEP-2009 EFF FILE : W126.CNF;123 CAL DATE : 17-SEP-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	103.000	88.505	14.000	3.7417	100.0000	8.29E-01	2.36E-01	1.91E-01	8.15E-02	1.98E-01
U232	5302.100	507.000	491.000	16.000	4.0000	100.0000	4.60E+00	8.26E-01	2.02E-01	8.72E-02	4.20E-01
U-235	4391.000	9.000	7.000	2.000	1.4142	80.90000	8.10E-02	7.63E-02	1.11E-01	3.81E-02	7.52E-02
U-238	4184.730	89.000	83.000	6.000	2.4495	100.0000	7.77E-01	2.15E-01	1.35E-01	5.33E-02	1.79E-01

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



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

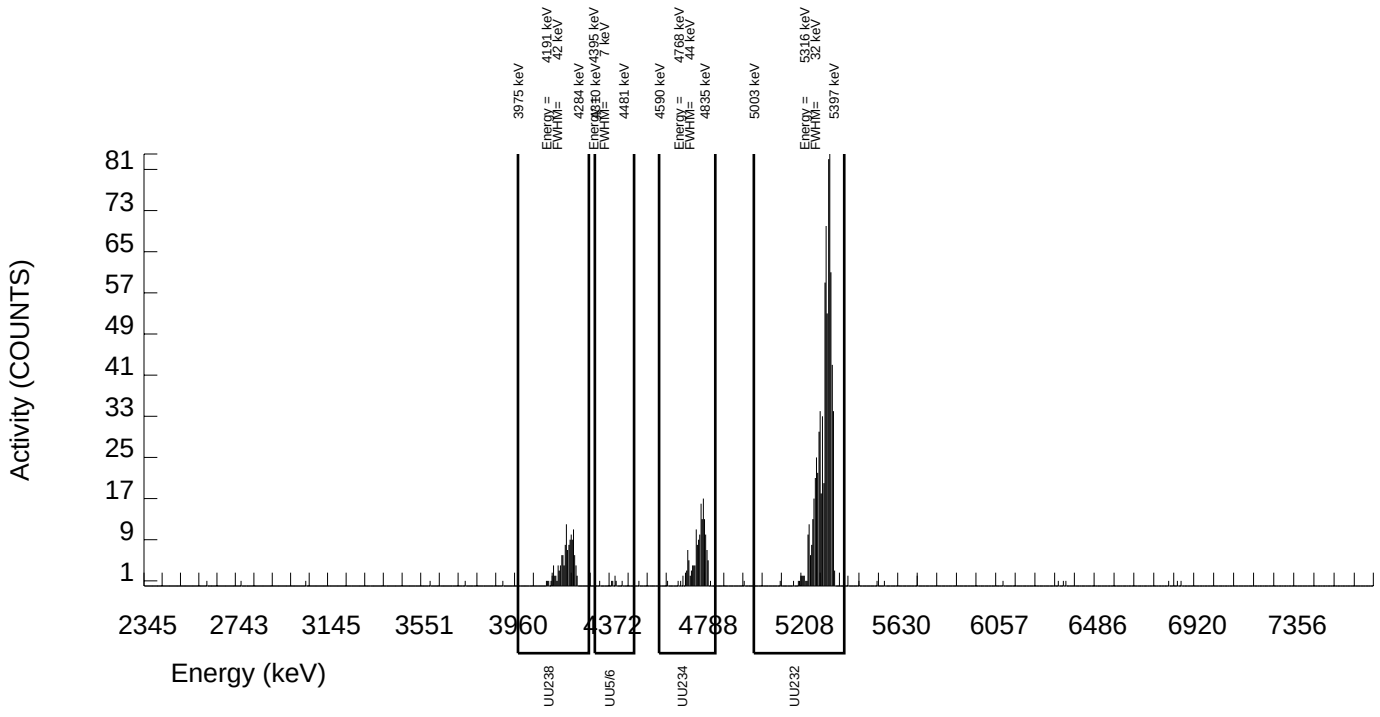
BATCH NUMBER: 903847 SAMPLE DATE : 31-AUG-2009 00:00:00	SAMPLE ID : S0236077015_UU SAMPLE QTY: 0.510 G
DETECTOR NUMBER :78770 AVERAGE %EFFICIENCY :24.7470 % YIELD : 59.281	COUNT DATE:29-SEP-2009 19:39:38 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :MXE1

MS/MSD	LCS/LCSD	TRACER	
ID : 1163-G ISOTOPE : U-238 PCI/G : 4.939E+00	ID : 1163-G ISOTOPE : U-238 PCI/G : 4.939E+00	ID : 1283-E ISOTOPE : U232 NOMINAL : 5.25970 dpm RESULTS : 3.11801 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B127.CNF;407 BKG DATE : 28-SEP-2009 EFF FILE : W127.CNF;114 CAL DATE : 17-SEP-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	159.000	157.223	1.000	1.0000	100.0000	9.47E-01	2.02E-01	4.61E-02	1.40E-02	1.49E-01
U232	5302.100	773.000	771.000	2.000	1.4142	100.0000	4.65E+00	7.43E-01	5.77E-02	1.98E-02	3.29E-01
U-235	4391.000	7.000	6.000	1.000	1.0000	80.90000	4.47E-02	4.18E-02	5.70E-02	1.73E-02	4.13E-02
U-238	4184.730	128.000	126.000	2.000	1.4142	100.0000	7.59E-01	1.73E-01	5.77E-02	1.98E-02	1.35E-01

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



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

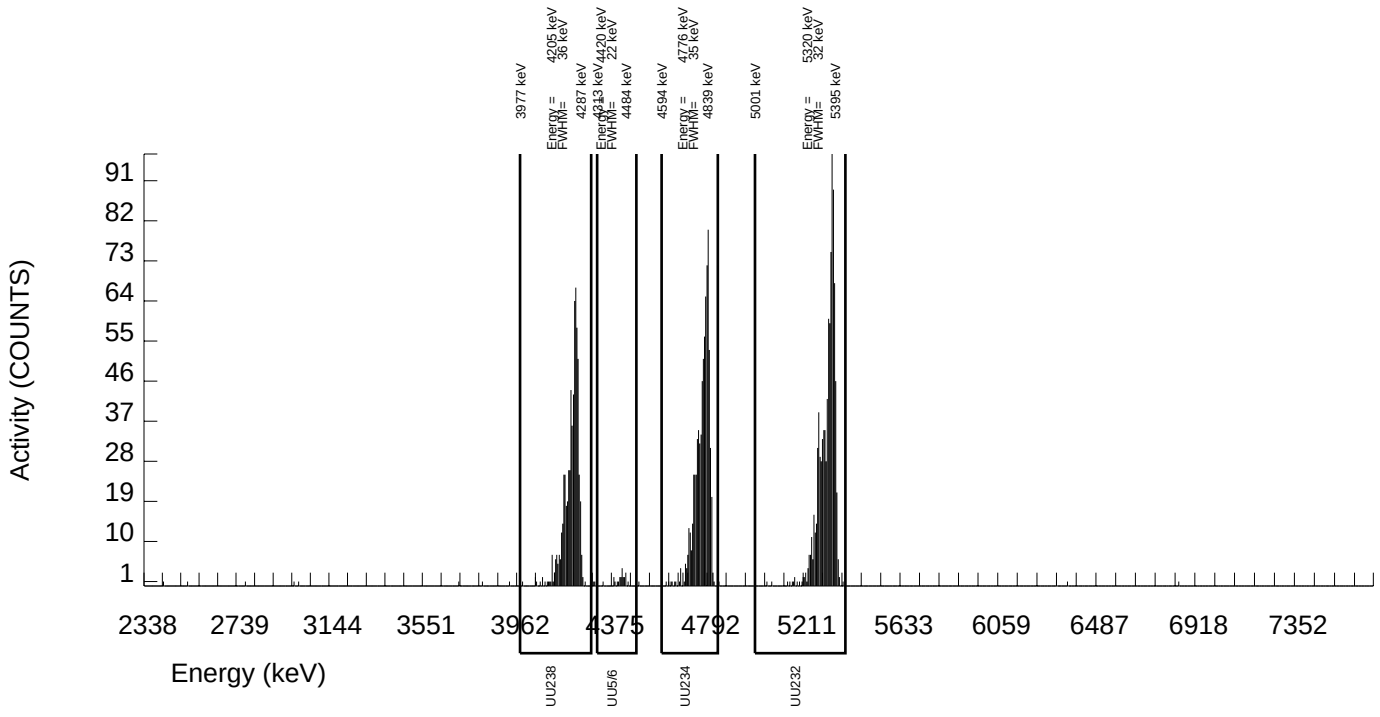
BATCH NUMBER: 903847 SAMPLE DATE : 31-AUG-2009 00:00:00	SAMPLE ID : S0236077016_UU SAMPLE QTY: 0.516 G
DETECTOR NUMBER :75549 AVERAGE %EFFICIENCY :25.3463 % YIELD : 68.765	COUNT DATE:29-SEP-2009 19:39:40 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :MXE1

MS/MSD	LCS/LCSD	TRACER	
ID : 1163-G ISOTOPE : U-238 PCI/G : 4.882E+00	ID : 1163-G ISOTOPE : U-238 PCI/G : 4.882E+00	ID : 1283-E ISOTOPE : U232 NOMINAL : 5.25970 dpm RESULTS : 3.61682 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B128.CNF;413 BKG DATE : 28-SEP-2009 EFF FILE : W128.CNF;124 CAL DATE : 17-SEP-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	769.000	760.077	8.000	2.8284	100.0000	3.81E+00	6.02E-01	8.09E-02	3.30E-02	2.73E-01
U232	5302.100	920.000	916.000	4.000	2.0000	100.0000	4.59E+00	7.12E-01	6.17E-02	2.33E-02	2.99E-01
U-235	4391.000	22.000	20.000	2.000	1.4142	80.90000	1.24E-01	6.20E-02	5.93E-02	2.04E-02	5.94E-02
U-238	4184.730	636.000	628.000	8.000	2.8284	100.0000	3.15E+00	5.08E-01	8.09E-02	3.30E-02	2.49E-01

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



Alpha Spectroscopy Software Version 2.0
effective date: 09-Mar-1997

GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

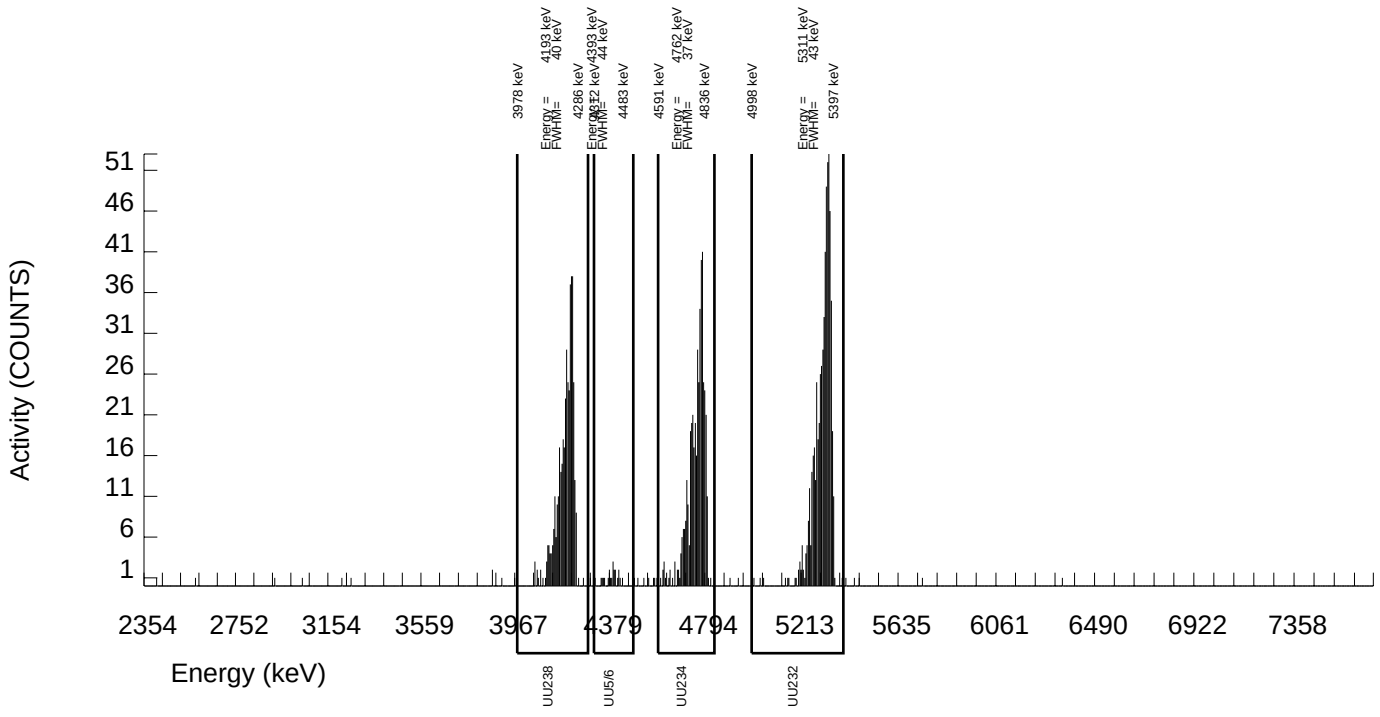
BATCH NUMBER: 903847 SAMPLE DATE : 31-AUG-2009 00:00:00	SAMPLE ID : S0236077017_UU SAMPLE QTY: 0.509 G
DETECTOR NUMBER :76227 AVERAGE %EFFICIENCY :26.3087 % YIELD : 43.322	COUNT DATE:29-SEP-2009 19:39:43 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :MXE1

MS/MSD	LCS/LCSD	TRACER	
ID : 1163-G ISOTOPE : U-238 PCI/G : 4.949E+00	ID : 1163-G ISOTOPE : U-238 PCI/G : 4.949E+00	ID : 1283-E ISOTOPE : U232 NOMINAL : 5.25969 dpm RESULTS : 2.27863 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B129.CNF;402 BKG DATE : 28-SEP-2009 EFF FILE : W129.CNF;119 CAL DATE : 17-SEP-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	445.000	441.396	3.000	1.7321	100.0000	3.43E+00	6.03E-01	8.59E-02	3.13E-02	3.22E-01
U232	5302.100	603.000	599.000	4.000	2.0000	100.0000	4.65E+00	7.87E-01	9.56E-02	3.62E-02	3.75E-01
U-235	4391.000	22.000	22.000	0.000	0.0000	80.90000	2.11E-01	9.36E-02	2.88E-02	0.00E+00	8.82E-02
U-238	4184.730	425.000	424.000	1.000	1.0000	100.0000	3.29E+00	5.81E-01	5.94E-02	1.81E-02	3.14E-01

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



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

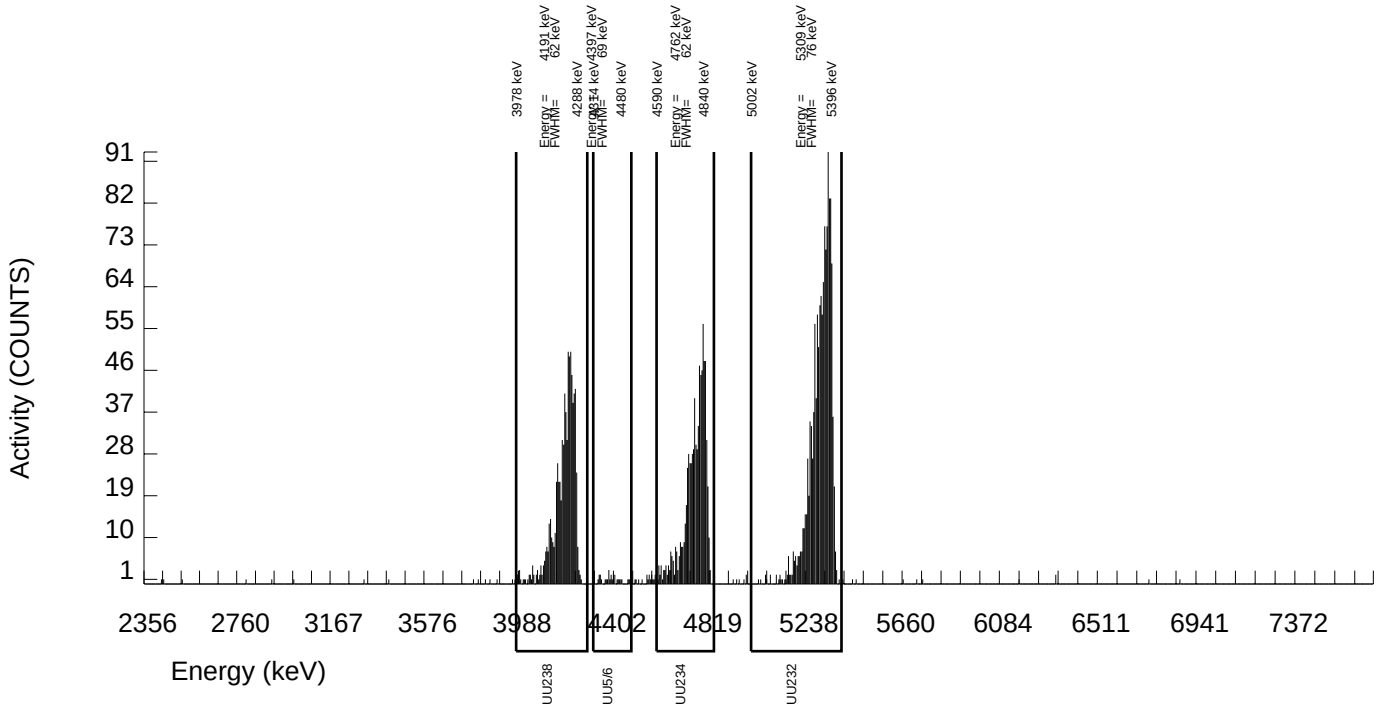
BATCH NUMBER: 903847 SAMPLE DATE : 31-AUG-2009 00:00:00	SAMPLE ID : S0236077018_UU SAMPLE QTY: 0.517 G
DETECTOR NUMBER :75548 AVERAGE %EFFICIENCY :25.2876 % YIELD : 103.523	COUNT DATE:24-SEP-2009 15:16:31 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :MXE1

MS/MSD	LCS/LCSD	TRACER	
ID : 1163-G ISOTOPE : U-238 PCI/G : 4.872E+00	ID : 1163-G ISOTOPE : U-238 PCI/G : 4.872E+00	ID : 1283-E ISOTOPE : U232 NOMINAL : 5.25970 dpm RESULTS : 5.44499 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B126.CNF;401 BKG DATE : 20-SEP-2009 EFF FILE : W126.CNF;123 CAL DATE : 17-SEP-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	792.000	780.840	7.000	2.6458	100.0000	2.60E+00	3.98E-01	5.10E-02	2.05E-02	1.84E-01
U232	5302.100	1384.000	1376.000	8.000	2.8284	100.0000	4.58E+00	6.68E-01	5.38E-02	2.19E-02	2.44E-01
U-235	4391.000	29.000	25.000	4.000	2.0000	80.90000	1.03E-01	4.84E-02	5.06E-02	1.91E-02	4.63E-02
U-238	4184.730	769.000	765.000	4.000	2.0000	100.0000	2.55E+00	3.90E-01	4.10E-02	1.55E-02	1.81E-01

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



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

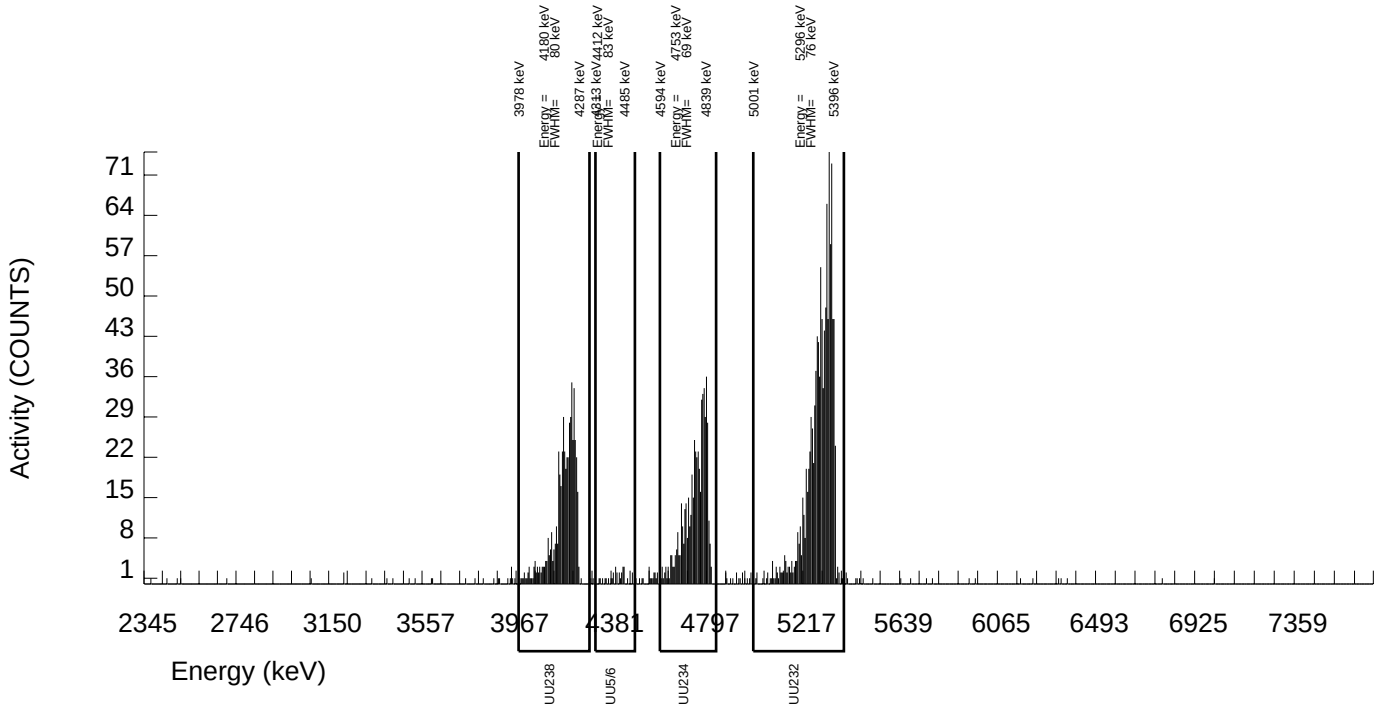
BATCH NUMBER: 903847 SAMPLE DATE : 1-SEP-2009 00:00:00.	SAMPLE ID : S0236077020_UU SAMPLE QTY: 0.501 G
DETECTOR NUMBER :78258 AVERAGE %EFFICIENCY :25.4913 % YIELD : 85.604	COUNT DATE:24-SEP-2009 15:15:49 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :MXE1

MS/MSD	LCS/LCSD	TRACER	
ID : 1163-G ISOTOPE : U-238 PCI/G : 5.028E+00	ID : 1163-G ISOTOPE : U-238 PCI/G : 5.028E+00	ID : 1283-E ISOTOPE : U232 NOMINAL : 5.25956 dpm RESULTS : 4.50241 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B114.CNF;397 BKG DATE : 20-SEP-2009 EFF FILE : W114.CNF;110 CAL DATE : 17-SEP-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	542.000	537.533	1.000	1.0000	100.0000	2.21E+00	3.58E-01	3.15E-02	9.59E-03	1.88E-01
U232	5302.100	1149.000	1147.000	2.000	1.4142	100.0000	4.73E+00	7.06E-01	3.95E-02	1.36E-02	2.74E-01
U-235	4391.000	29.000	27.000	2.000	1.4142	80.90000	1.38E-01	5.87E-02	4.88E-02	1.68E-02	5.56E-02
U-238	4184.730	530.000	530.000	0.000	0.0000	100.0000	2.18E+00	3.54E-01	1.24E-02	0.00E+00	1.86E-01

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



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

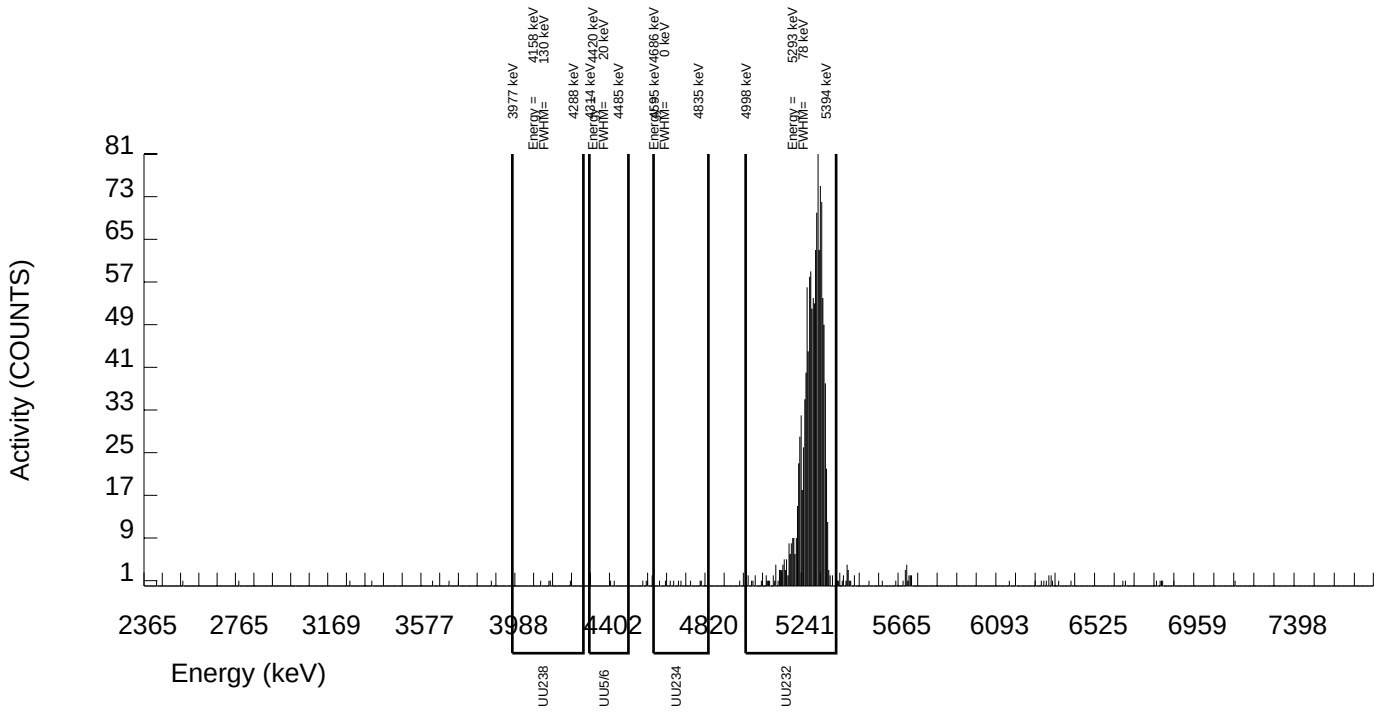
BATCH NUMBER: 903847 SAMPLE DATE : 21-SEP-2009 00:00:00	SAMPLE ID : S1201926679_UU SAMPLE QTY: 0.527 G
DETECTOR NUMBER :45-132FF2 AVERAGE %EFFICIENCY :26.4221 % YIELD : 93.102	COUNT DATE:24-SEP-2009 15:15:56 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :MXE1

MS/MSD	LCS/LCSD	TRACER	
ID : 1163-G ISOTOPE : U-238 PCI/G : 4.780E+00	ID : 1163-G ISOTOPE : U-238 PCI/G : 4.780E+00	ID : 1283-E ISOTOPE : U232 NOMINAL : 5.25679 dpm RESULTS : 4.89415 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B116.CNF;391 BKG DATE : 20-SEP-2009 EFF FILE : W116.CNF;98 CAL DATE : 17-SEP-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	12.000	3.091	5.000	2.2361	100.0000	1.07E-02	2.47E-02	4.66E-02	1.81E-02	2.46E-02
U232	5302.100	1302.000	1293.000	9.000	3.0000	100.0000	4.49E+00	6.60E-01	5.89E-02	2.43E-02	2.47E-01
U-235	4391.000	2.000	0.000	2.000	1.4142	80.90000	0.00E+00	1.68E-02	4.11E-02	1.41E-02	1.68E-02
U-238	4184.730	4.000	2.000	2.000	1.4142	100.0000	6.95E-03	1.67E-02	3.33E-02	1.14E-02	1.67E-02

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



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

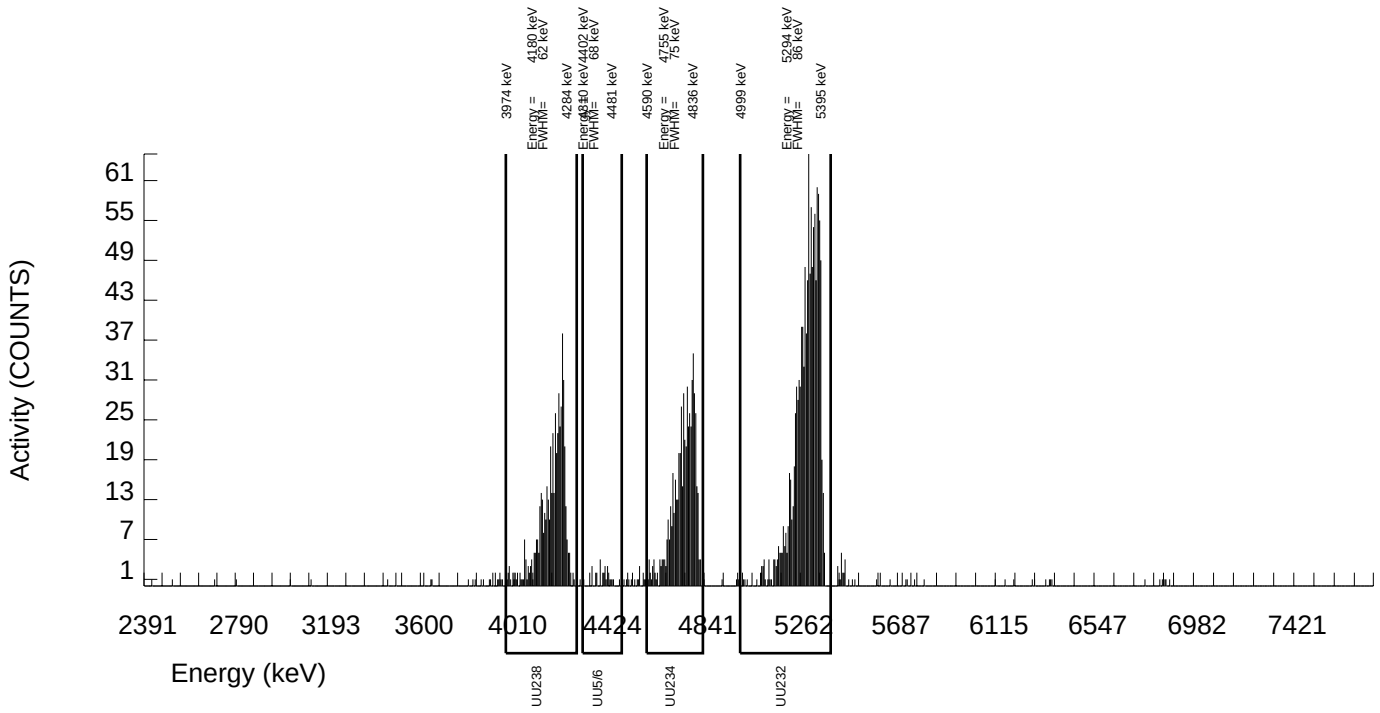
BATCH NUMBER: 903847 SAMPLE DATE : 1-SEP-2009 00:00:00.	SAMPLE ID : S1201926680_UU SAMPLE QTY: 0.503 G
DETECTOR NUMBER :33450 AVERAGE %EFFICIENCY :25.3933 % YIELD : 89.082	COUNT DATE:24-SEP-2009 15:15:58 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :MXE1

MS/MSD	LCS/LCSD	TRACER	
ID : 1163-G ISOTOPE : U-238 PCI/G : 5.008E+00	ID : 1163-G ISOTOPE : U-238 PCI/G : 5.008E+00	ID : 1283-E ISOTOPE : U232 NOMINAL : 5.25955 dpm RESULTS : 4.68529 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B117.CNF;401 BKG DATE : 20-SEP-2009 EFF FILE : W117.CNF;110 CAL DATE : 17-SEP-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	576.000	571.406	1.000	1.0000	100.0000	2.26E+00	3.62E-01	3.03E-02	9.21E-03	1.86E-01
U232	5302.100	1196.000	1189.000	7.000	2.6458	100.0000	4.71E+00	7.01E-01	6.06E-02	2.44E-02	2.69E-01
U-235	4391.000	28.000	27.000	1.000	1.0000	80.90000	1.32E-01	5.47E-02	3.74E-02	1.14E-02	5.17E-02
U-238	4184.730	524.000	523.000	1.000	1.0000	100.0000	2.07E+00	3.35E-01	3.03E-02	9.21E-03	1.78E-01

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



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

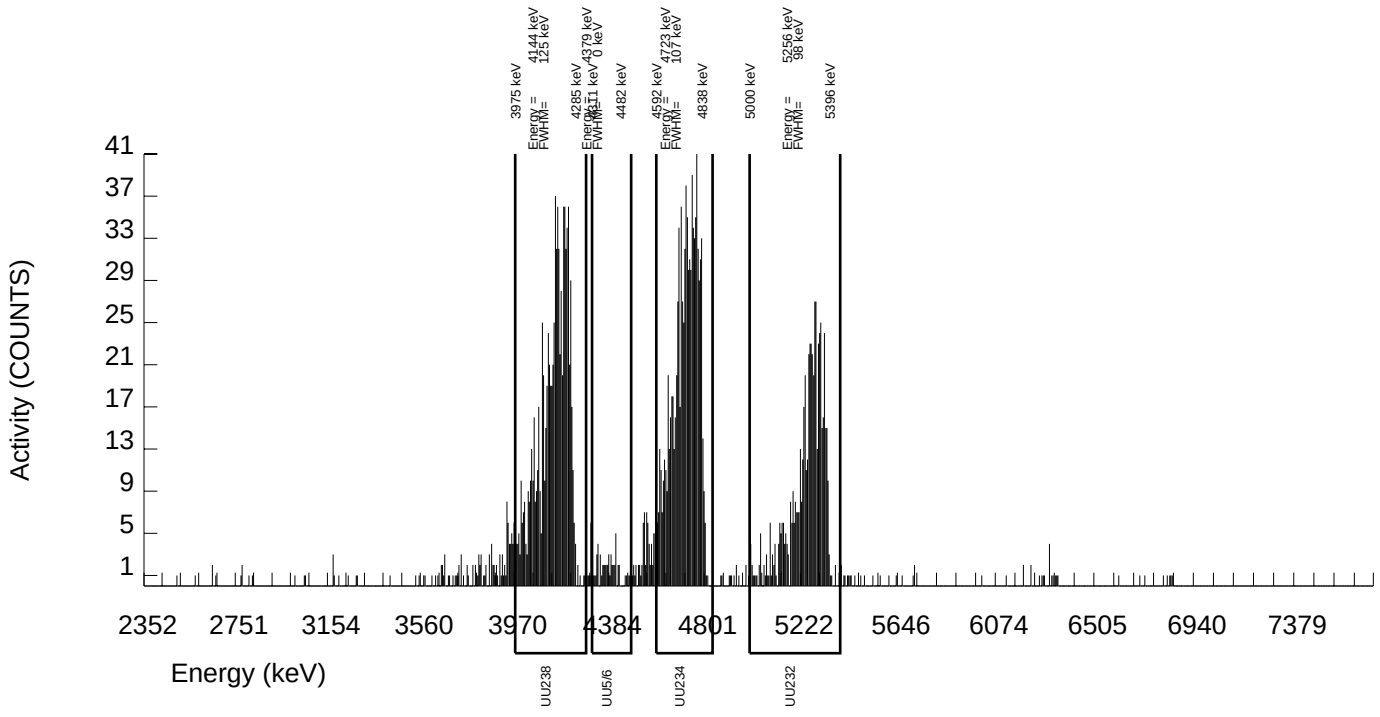
BATCH NUMBER: 903847 SAMPLE DATE : 1-SEP-2009 00:00:00.	SAMPLE ID : S1201926681_UU SAMPLE QTY: 0.527 G
DETECTOR NUMBER :75544 AVERAGE %EFFICIENCY :25.6202 % YIELD : 43.070	COUNT DATE:24-SEP-2009 15:16:02 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :MXE1

MS/MSD	LCS/LCSD	TRACER	
ID : 1163-G ISOTOPE : U-238 PCI/G : 4.780E+00	ID : 1163-G ISOTOPE : U-238 PCI/G : 4.780E+00	ID : 1283-E ISOTOPE : U232 NOMINAL : 5.25955 dpm RESULTS : 2.26527 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B118.CNF;400 BKG DATE : 20-SEP-2009 EFF FILE : W118.CNF;107 CAL DATE : 17-SEP-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	932.000	926.247	4.000	2.0000	100.0000	7.17E+00	1.17E+00	9.53E-02	3.60E-02	4.64E-01
U232	5302.100	588.000	580.000	8.000	2.8284	100.0000	4.50E+00	7.68E-01	1.25E-01	5.10E-02	3.71E-01
U-235	4391.000	57.000	57.000	0.000	0.0000	80.90000	5.46E-01	1.64E-01	2.87E-02	0.00E+00	1.42E-01
U-238	4184.730	882.000	879.000	3.000	1.7321	100.0000	6.81E+00	1.11E+00	8.57E-02	3.12E-02	4.52E-01

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



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

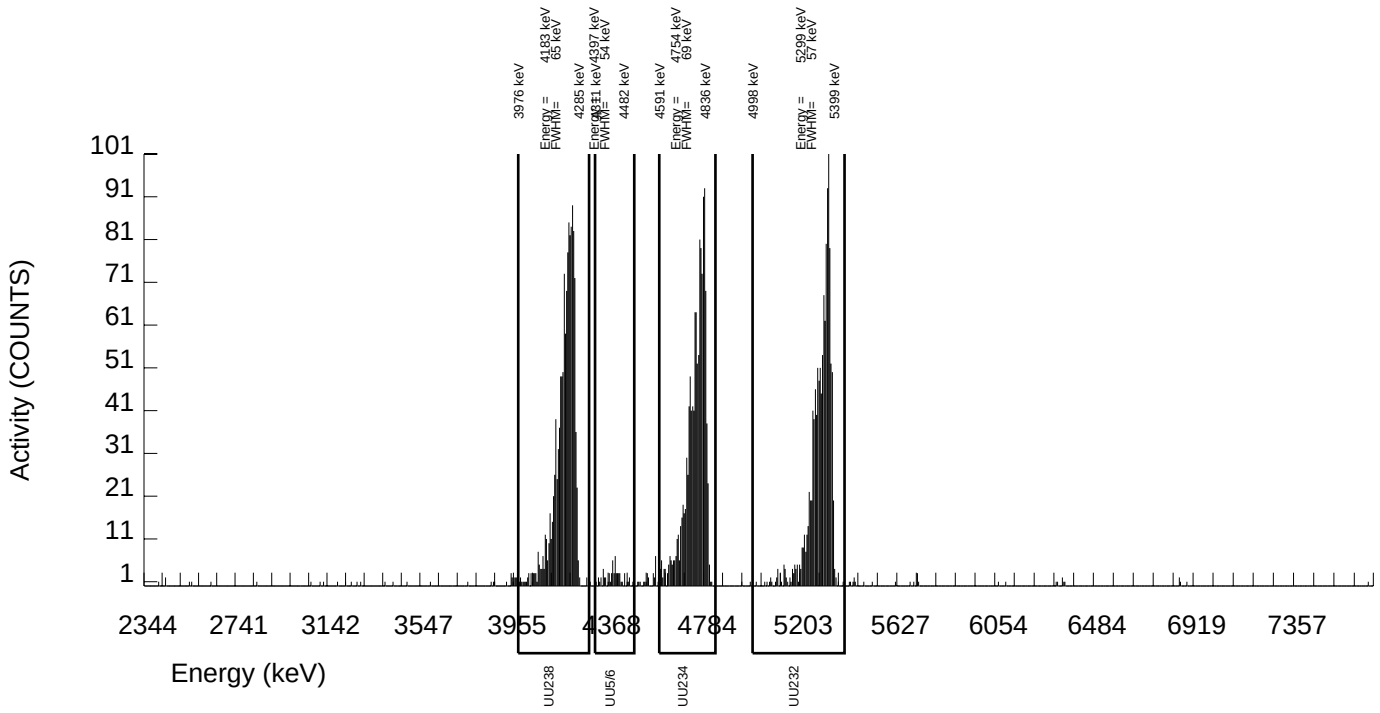
BATCH NUMBER: 903847 SAMPLE DATE : 21-SEP-2009 00:00:00	SAMPLE ID : S1201926682_UU SAMPLE QTY: 0.527 G
DETECTOR NUMBER :75545 AVERAGE %EFFICIENCY :24.5110 % YIELD : 94.229	COUNT DATE:24-SEP-2009 15:16:11 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :MXE1

MS/MSD	LCS/LCSD	TRACER	
ID : 1163-G ISOTOPE : U-238 PCI/G : 4.780E+00	ID : 1163-G ISOTOPE : U-238 PCI/G : 4.780E+00	ID : 1283-E ISOTOPE : U232 NOMINAL : 5.25679 dpm RESULTS : 4.95340 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B121.CNF;396 BKG DATE : 20-SEP-2009 EFF FILE : W121.CNF;108 CAL DATE : 17-SEP-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	1241.000	1234.330	3.000	1.7321	100.0000	4.57E+00	6.76E-01	4.09E-02	1.49E-02	2.55E-01
U232	5302.100	1218.000	1214.000	4.000	2.0000	100.0000	4.49E+00	6.66E-01	4.55E-02	1.72E-02	2.54E-01
U-235	4391.000	60.000	59.000	1.000	1.0000	80.90000	2.70E-01	7.92E-02	3.50E-02	1.06E-02	7.00E-02
U-238	4184.730	1317.000	1314.000	3.000	1.7321	100.0000	4.86E+00	7.17E-01	4.09E-02	1.49E-02	2.64E-01

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



RADIUM 228

Radiochemistry Batch Checklist, Rev 9

Batch# 900849 **Product:** RA 228 **Date:** 9/22/09

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to100 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)	✓		
Sample was run within hold time.	✓		
Sample was correctly preserved if required.			N/A
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 statused.	✓		
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: 9/22/09

Secondary Review Performed By:

REMP 9/30

Radium-228 Que Sheet

General Engineering Laboratories, Radiochemistry Division
09/21/2009

Batch #: 900849 Analyst:JXC5 First Client Due Date:09/30/2009 Internal Due Date:09/19/2009

Spike Isotope: Radium-228 Spike Code: 0503-B Expiration Date: 9-11-10 Vol: 0.1mL Ac-228 Ingrow: 9-18-09 / 1325

LCS Isotope: Radium-228 LCS Code: 0503-B Expiration Date: 9-11-10 Vol: 0.1mL

Tracer Isotope: Barium-133 Tracer Code: 0112-J Expiration Date: 2-17-10 Vol: 0.1mL Ac-228 Separation Date/Time: 9-21-09 / 1345

Prep Date: 9-14-09 Initials: MS Pipet ID: 2766953 Balance ID: 17955160 Witness: MSP 9-14-09 Excepted

Sample ID	Client Description	Type	Hazard Code	Min CRDL	Matrix	Client	Collect Date & Time	Pos. #	Vol 9-14-09 g ~~(mL)~~	Det #	Ba Yield (%)	Gamma Det. #
236077001-1	RSAS3-0.5B	SAMPLE		.5 pCi/g	SOIL	KERR003	26-AUG-09 06:56 AM	1	1.012	3D	80.58	
236077002-1	RSAS3009-0.5B	SAMPLE		.5 pCi/g	SOIL	KERR003	26-AUG-09 06:56 AM	2	1.005	4A	94.05	
236077003-1	RSAS3-10B	SAMPLE		.5 pCi/g	SOIL	KERR003	26-AUG-09 08:23 AM	3	1.013	5B	101.48	
236077004-1	RSAS3-25B	SAMPLE		.5 pCi/g	SOIL	KERR003	26-AUG-09 08:59 AM	4	1.016	5C	101.41	
236077005-1	RSAS3-44B	SAMPLE		.5 pCi/g	SOIL	KERR003	26-AUG-09 09:45 AM	5	1.002	5D	94.47	
236077006-1	RSAT6-10B	SAMPLE		.5 pCi/g	SOIL	KERR003	27-AUG-09 11:26 AM	6	1.014	6A	100.69	
236077007-1	RSAT6-30B	SAMPLE		.5 pCi/g	SOIL	KERR003	27-AUG-09 02:23 PM	7	1.015	6B	101.58	
236077008-1	RSAT6-49B	SAMPLE		.5 pCi/g	SOIL	KERR003	27-AUG-09 03:02 PM	8	1.014	6D	107.59	
236077009-1	SA210-0.5B	SAMPLE		.5 pCi/g	SOIL	KERR003	27-AUG-09 07:50 AM	9	1.015	8A	96.84	
236077010-1	SA210-10B	SAMPLE		.5 pCi/g	SOIL	KERR003	27-AUG-09 08:00 AM	10	1.018	8B	93.71	
236077011-1	SA210-30B	SAMPLE		.5 pCi/g	SOIL	KERR003	27-AUG-09 08:29 AM	11	1.009	8C	95.15	
236077012-1	SA210-49B	SAMPLE		.5 pCi/g	SOIL	KERR003	27-AUG-09 09:34 AM	12	1.015	9A	102.23	
236077014-1	SA68-0.5B	SAMPLE		.5 pCi/g	SOIL	KERR003	31-AUG-09 06:41 AM	13	1.014	9B	103.57	
236077015-1	SA68-10B	SAMPLE		.5 pCi/g	SOIL	KERR003	31-AUG-09 07:22 AM	14	1.013	10A	107.59	
236077016-1	SA68-25B	SAMPLE		.5 pCi/g	SOIL	KERR003	31-AUG-09 07:55 AM	15	1.002	10C	95.19	
236077017-1	SA68009-25B	SAMPLE		.5 pCi/g	SOIL	KERR003	31-AUG-09 07:55 AM	16	1.007	10D	96.01	
236077018-1	SA68-36B	SAMPLE		.5 pCi/g	SOIL	KERR003	31-AUG-09 08:25 AM	17	1.004	11D	100.89	
236077020-1	SA133-31B	SAMPLE		.5 pCi/g	SOIL	KERR003	01-SEP-09 10:50 AM	18	1.007	12B	105.50	10C
1201919338-1	MB for batch 900849	MB		.5 pCi/g	SOIL	QC ACCOUNT		19	1.018	12C	93.54	
1201919339-1	SA133-31B(236077020DUP)	DUP		.5 pCi/g	SOIL	QC ACCOUNT	01-SEP-09 10:50 AM	20	1.012	12D	97.84	10D
1201919340-1	SA133-31B(236077020MS)	MS		.5 pCi/g	SOIL	QC ACCOUNT	01-SEP-09 10:50 AM	21	0.100	13C	91.44	
1201919341-1	LCS for batch 900849	LCS		.5 pCi/g	SOIL	QC ACCOUNT		22	1.018	14B	94.36	

9/22/09

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Comments: _____

Data Reviewed By: _____ 9/22/09

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

1705

Radium-228 Solid

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

Batch : 900849
Analyst : JXC5
Prep Date : 9/14/2009

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

Spike S/N : 0503-B
Spike Exp Date : 9/11/2010
Spike Activity (dpm/ml): 177.96
Spike Volume Added: 0.10

LCS S/N : 0503-B
LCS Exp Date : 9/11/2010
LCS Activity (dpm/ml): 177.96
LCS Volume Added: 0.10

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 :	GFC28RAS	
Parmname :	Radium-228	
Required MDA :	0.5	pCi/G
Halflife of Ra-228 :	5.75	years
Halflife of Ac-228 :	6.13	hours
Batch counted on :	PIC	
BKG Count time :	500	min

Sample Characteristics					Tracer Calculations					
Pos.	Sample ID	Sample Aliquot G	Sample Aliquot StDev. G	Sample Date/Time	Tracer Concentration (cpm) (Ba-133 Ref.)	Tracer Ref. Count Uncertainty (cpm)	Tracer Concentration (cpm) (Ba-133 Samp.)	Tracer Samp. Count Uncertainty (cpm)	Tracer Aliquot (mL)	Tracer Aliquot StDev. (mL)
1	236077001.2	1.0120	3.3246E-03	8/26/2009 6:56	291.0	3.61%	234.5	4.08%	0.1	0.000701
2	236077002.1	1.0050	3.3239E-03	8/26/2009 6:56	291.0	3.61%	273.7	3.73%	0.1	0.000701
3	236077003.1	1.0130	3.3247E-03	8/26/2009 8:23	291.0	3.61%	295.3	3.58%	0.1	0.000701
4	236077004.1	1.0160	3.3250E-03	8/26/2009 8:59	291.0	3.61%	295.1	3.58%	0.1	0.000701
5	236077005.2	1.0020	3.3235E-03	8/26/2009 9:45	291.0	3.61%	274.9	3.72%	0.1	0.000701
6	236077006.1	1.0140	3.3248E-03	8/27/2009 11:26	291.0	3.61%	293.0	3.59%	0.1	0.000701
7	236077007.2	1.0150	3.3249E-03	8/27/2009 14:23	291.0	3.61%	295.6	3.58%	0.1	0.000701
8	236077008.1	1.0140	3.3248E-03	8/27/2009 15:02	291.0	3.61%	313.1	3.46%	0.1	0.000701
9	236077009.2	1.0150	3.3249E-03	8/27/2009 7:50	291.0	3.61%	281.8	3.67%	0.1	0.000701
10	236077010.2	1.0180	3.3252E-03	8/27/2009 8:00	291.0	3.61%	272.7	3.74%	0.1	0.000701
11	236077011.2	1.0090	3.3243E-03	8/27/2009 8:29	291.0	3.61%	276.9	3.71%	0.1	0.000701
12	236077012.2	1.0150	3.3249E-03	8/27/2009 9:34	291.0	3.61%	297.5	3.56%	0.1	0.000701
13	236077014.2	1.0140	3.3248E-03	8/31/2009 6:41	291.0	3.61%	301.4	3.54%	0.1	0.000701
14	236077015.1	1.0130	3.3247E-03	8/31/2009 7:22	291.0	3.61%	313.1	3.46%	0.1	0.000701
15	236077016.1	1.0020	3.3235E-03	8/31/2009 7:55	291.0	3.61%	277.0	3.71%	0.1	0.000701
16	236077017.1	1.0070	3.3241E-03	8/31/2009 7:55	291.0	3.61%	279.4	3.69%	0.1	0.000701
17	236077018.1	1.0040	3.3238E-03	8/31/2009 8:25	291.0	3.61%	293.6	3.59%	0.1	0.000701
18	236077020.2	1.0070	3.3241E-03	9/1/2009 10:50	291.0	3.61%	307.0	3.50%	0.1	0.000701
19	1201919338.1	1.0180	3.3252E-03	9/14/2009 0:00	291.0	3.61%	272.2	3.75%	0.1	0.000701
20	1201919339.2	1.0120	3.3246E-03	9/1/2009 10:50	291.0	3.61%	284.7	3.65%	0.1	0.000701
21	1201919340.1	0.1000	4.3713E-04	9/1/2009 10:50	291.0	3.61%	266.1	3.79%	0.1	0.000701
22	1201919341.1	1.0180	3.3252E-03	9/14/2009 0:00	291.0	3.61%	274.6	3.73%	0.1	0.000701

Count raw Data

Pos.	Detector ID	Counting Time (min.)	Gross Counts Alpha	Gross Counts Beta	Beta cpm	Detector Efficiency (cpm/dpm)	Detector Efficiency Error (cpm/dpm)	Weekly Bkg cpm	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 %
1	3D	390	44	716	1.836	0.5994	0.00464	1.230	500	9/21/2009 13:45	9/21/2009 17:34	0.991	0.649	1.412	80.58%	2.90%
2	4A	60	19	148	2.467	0.6208	0.00744	0.910	500	9/21/2009 13:45	9/21/2009 16:02	0.991	0.771	1.058	94.05%	2.78%
3	5B	60	12	113	1.883	0.6280	0.00816	1.118	500	9/21/2009 13:45	9/21/2009 16:04	0.991	0.768	1.058	101.48%	2.73%
4	5C	60	17	96	1.600	0.6368	0.00816	0.854	500	9/21/2009 13:45	9/21/2009 16:04	0.991	0.768	1.058	101.41%	2.73%
5	5D	390	75	833	2.136	0.6237	0.00816	1.222	500	9/21/2009 13:45	9/21/2009 17:34	0.991	0.649	1.412	94.47%	2.77%
6	6A	60	9	140	2.333	0.6221	0.00816	1.304	500	9/21/2009 13:45	9/21/2009 16:04	0.992	0.768	1.058	100.69%	2.73%
7	6B	390	125	582	1.492	0.6163	0.00816	0.806	500	9/21/2009 13:45	9/21/2009 17:34	0.992	0.649	1.412	101.58%	2.73%
8	6D	60	12	111	1.850	0.6120	0.00816	0.934	500	9/21/2009 13:45	9/21/2009 16:04	0.992	0.768	1.058	107.59%	2.69%
9	8A	390	24	590	1.513	0.6247	0.00816	0.708	500	9/21/2009 13:45	9/21/2009 17:34	0.992	0.648	1.412	96.84%	2.76%
10	8B	390	30	1062	2.723	0.6332	0.00816	1.964	500	9/21/2009 13:45	9/21/2009 17:34	0.992	0.648	1.412	93.71%	2.78%
11	8C	390	31	471	1.208	0.6339	0.00816	0.522	500	9/21/2009 13:45	9/21/2009 17:35	0.992	0.648	1.412	95.15%	2.77%
12	9A	390	37	412	1.056	0.6496	0.00816	0.446	500	9/21/2009 13:45	9/21/2009 17:35	0.992	0.648	1.412	102.23%	2.72%
13	9B	390	28	866	2.221	0.6356	0.00816	1.470	500	9/21/2009 13:45	9/21/2009 17:35	0.993	0.648	1.412	103.57%	2.72%
14	10A	60	2	85	1.417	0.6389	0.00816	0.314	500	9/21/2009 13:45	9/21/2009 16:04	0.993	0.768	1.058	107.59%	2.69%
15	10C	60	8	81	1.350	0.6250	0.00816	0.282	500	9/21/2009 13:45	9/21/2009 16:04	0.993	0.768	1.058	95.19%	2.77%
16	10D	60	42	144	2.400	0.6320	0.00816	0.970	500	9/21/2009 13:45	9/21/2009 16:04	0.993	0.768	1.058	96.01%	2.76%
17	11D	60	12	117	1.950	0.6348	0.00816	0.684	500	9/21/2009 13:45	9/21/2009 15:56	0.993	0.780	1.058	100.89%	2.73%
18	10C	390	27	390	1.000	0.6250	0.00816	0.282	500	9/21/2009 13:45	9/21/2009 17:35	0.993	0.648	1.412	105.50%	2.70%
19	12C	60	5	64	1.067	0.6304	0.00816	0.814	500	9/21/2009 13:45	9/21/2009 15:56	0.997	0.780	1.058	93.54%	2.79%
20	10D	390	181	630	1.615	0.6320	0.00816	1.040	500	9/21/2009 13:45	9/21/2009 17:34	0.993	0.649	1.412	97.84%	2.75%
21	13C	60	10	487	8.117	0.6538	0.00816	1.212	500	9/21/2009 13:45	9/21/2009 15:57	0.993	0.779	1.058	91.44%	2.80%
22	14B	60	15	530	8.833	0.6266	0.00816	0.924	500	9/21/2009 13:45	9/21/2009 15:56	0.997	0.780	1.058	94.36%	2.78%

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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 Nominals are decay corrected to Sample Date/Time

Results

Pos.	Decision Level pCi/G	Critical Level pCi/G	Required MDA pCi/G	MDA pCi/G	Sample Act. Conc. pCi/G	Sample Act. Error pCi/G	Net Count Rate CPM	Net Count Rate Error CPM	**2 SIGMA** Counting Uncertainty pCi/G	**2 SIGMA** Total Prop. Uncertainty pCi/G	Sample QC	Sample Type	RPD	RER	Nominal pCi/G	Recovery
1	0.3532	0.2493	0.5	0.5143	**1.2258**	0.1428	0.6059	0.0847	0.3357	0.3431		SAMPLE				
2	0.3224	0.2276	0.5	0.5083	**1.6526**	0.1362	1.5567	0.2072	0.4311	0.4412		SAMPLE				
3	0.3262	0.2303	0.5	0.5090	**0.7417**	0.2413	0.7653	0.1834	0.3483	0.3508		SAMPLE				
4	0.2805	0.1980	0.5	0.4438	**0.7113**	0.2276	0.7460	0.1684	0.3148	0.3173		SAMPLE				
5	0.2915	0.2058	0.5	0.4245	**1.5309**	0.1016	0.9139	0.0890	0.2922	0.3050		SAMPLE				
6	0.3579	0.2527	0.5	0.5546	**1.0135**	0.2000	1.0293	0.2037	0.3931	0.3972		SAMPLE				
7	0.2199	0.1553	0.5	0.3225	**1.0680**	0.1112	0.6863	0.0737	0.2249	0.2328		SAMPLE				
8	0.2881	0.2034	0.5	0.4536	**0.8578**	0.1994	0.9160	0.1808	0.3319	0.3353		SAMPLE				
9	0.2134	0.1506	0.5	0.3137	**1.2966**	0.0949	0.8048	0.0728	0.2298	0.2413		SAMPLE				
10	0.3613	0.2551	0.5	0.5228	**1.2432**	0.1407	0.7591	0.1045	0.3353	0.3428		SAMPLE				
11	0.1849	0.1305	0.5	0.2736	**1.1149**	0.0982	0.6857	0.0643	0.2051	0.2147		SAMPLE				
12	0.1543	0.1090	0.5	0.2292	**0.8961**	0.1024	0.6104	0.0600	0.1727	0.1798		SAMPLE				
13	0.2826	0.1995	0.5	0.4104	**1.1113**	0.1271	0.7505	0.0929	0.2697	0.2767		SAMPLE				
14	0.1600	0.1129	0.5	0.2707	**0.9889**	0.1440	1.1027	0.1557	0.2737	0.2791		SAMPLE				
15	0.1771	0.1250	0.5	0.3024	**1.1188**	0.1451	1.0680	0.1519	0.3118	0.3183		SAMPLE				
16	0.3204	0.2262	0.5	0.5036	**1.4615**	0.1461	1.4300	0.2048	0.4102	0.4186		SAMPLE				
17	0.2518	0.1778	0.5	0.4034	**1.2110**	0.1482	1.2660	0.1840	0.3450	0.3517		SAMPLE				
18	0.1244	0.0878	0.5	0.1871	**1.0687**	0.0829	0.7180	0.0559	0.1632	0.1737		SAMPLE				
19	0.2930	0.2069	0.5	0.4647	**0.2578**	0.5521	0.2527	0.1393	0.2785	0.2789		MB				
20	0.2531	0.1787	0.5	0.3696	**0.9074**	0.1401	0.5754	0.0789	0.2438	0.2492	236077020.2	DUP	16.3%			
21	3.6079	2.5472	0.5	5.6091	**71.0811**	0.0613	6.9047	0.3711	7.4875	8.5397	236077020.2	MS			80.4941	87.0%
22	0.3113	0.2198	0.5	0.4904	**8.0458**	0.0569	7.9093	0.3861	0.7698	0.8965		LCS			7.8744	102.2%

SampleID	Instr	Time (min.)	Alpha Counts	Beta Counts	Count Start Time	Count End Time	Machine
236077001	3D	390	44	716	9/21/2009 17:34	9/22/2009 0:04	Protean
236077002	4A	60	19	148	9/21/2009 16:02	9/21/2009 17:02	Protean
236077003	5B	60	12	113	9/21/2009 16:04	9/21/2009 17:04	Protean
236077004	5C	60	17	96	9/21/2009 16:04	9/21/2009 17:04	Protean
236077005	5D	390	75	833	9/21/2009 17:34	9/22/2009 0:04	Protean
236077006	6A	60	9	140	9/21/2009 16:04	9/21/2009 17:04	Protean
236077007	6B	390	125	582	9/21/2009 17:34	9/22/2009 0:04	Protean
236077008	6D	60	12	111	9/21/2009 16:04	9/21/2009 17:04	Protean
236077009	8A	390	24	590	9/21/2009 17:34	9/22/2009 0:04	Protean
236077010	8B	390	30	1062	9/21/2009 17:34	9/22/2009 0:04	Protean
236077011	8C	390	31	471	9/21/2009 17:35	9/22/2009 0:05	Protean
236077012	9A	390	37	412	9/21/2009 17:35	9/22/2009 0:05	Protean
236077014	9B	390	28	866	9/21/2009 17:35	9/22/2009 0:05	Protean
236077015	10A	60	2	85	9/21/2009 16:04	9/21/2009 17:04	Protean
236077016	10C	60	8	81	9/21/2009 16:04	9/21/2009 17:04	Protean
236077017	10D	60	42	144	9/21/2009 16:04	9/21/2009 17:04	Protean
236077018	11D	60	12	117	9/21/2009 15:56	9/21/2009 16:56	Protean
236077020	10C	390	27	390	9/21/2009 17:35	9/22/2009 0:05	Protean
1201919338	12C	60	5	64	9/21/2009 15:56	9/21/2009 16:56	Protean
1201919339	10D	390	181	630	9/21/2009 17:34	9/22/2009 0:04	Protean
1201919340	13C	60	10	487	9/21/2009 15:57	9/21/2009 16:57	Protean
1201919341	14B	60	15	530	9/21/2009 15:56	9/21/2009 16:56	Protean

ASSAY 18-Sep-09 12:41:20

Protocol	id	9	228_REC2
Time	limit	180	
Count	limit	50000	
Isotope	Ba-133		
Protocol	date	9-Apr-07	10:02:22
Run	id.	70	

POS	RACK	BATCH	TIME	COUNTS	CPM	ERROR	% RECOVERY	COUNT TIME
1	90	1	180	964	291	3.61		12:41:28
2	90	2	180	795	234.5	4.08	80.58	12:44:39
3	90	3	180	912	273.7	3.73	94.05	12:47:50
4	90	4	180	977	295.3	3.58	101.48	12:51:02
5	90	5	180	977	295.1	3.58	101.41	12:54:13
6	66	6	180	916	274.9	3.72	94.47	12:57:38
7	66	7	180	970	293	3.59	100.69	13:00:49
8	66	8	180	978	295.6	3.58	101.58	13:04:01
9	66	9	180	1030	313.1	3.46	107.59	13:07:12
10	66	10	180	936	281.8	3.67	96.84	13:10:23
11	70	11	180	909	272.7	3.74	93.71	13:13:48
12	70	12	180	922	276.9	3.71	95.15	13:17:00
13	70	13	180	984	297.5	3.56	102.23	13:20:11
14	70	14	180	995	301.4	3.54	103.57	13:23:22
15	70	15	180	1030	313.1	3.46	107.59	13:26:34
16	74	16	180	922	277	3.71	95.19	13:29:58
17	74	17	180	929	279.4	3.69	96.01	13:33:09
18	74	18	180	972	293.6	3.59	100.89	13:36:20
19	74	19	180	1012	307	3.5	105.50	13:39:32
20	74	20	180	908	272.2	3.75	93.54	13:42:43
21	77	21	180	945	284.7	3.65	97.84	13:46:08
22	77	22	180	889	266.1	3.79	91.44	13:49:19
23	77	23	180	915	274.6	3.73	94.36	13:52:30

END OF ASSAY

Radiochemistry Batch Checklist, Rev 9

Batch# 902602 Product: RA-228 Date: 9.23.09

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to100 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.			N/A
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 statused.	✓		
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
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: Rhyen Brantley

Secondary Review Performed By:

KERR 9.30

Radium-228 Que Sheet

General Engineering Laboratories, Radiochemistry Division
09/14/2009

Batch #: 902602 **Analyst:** MXS2 **First Client Due Date:** 09/30/2009 **Internal Due Date:** 09/19/2009

Spike Isotope: Radium-228 **Spike Code:** — **Expiration Date:** — **Vol:** —
LCS Isotope: Radium-228 **LCS Code:** 0503-B **Expiration Date:** 9-11-10 **Vol:** 0.1 mL
Tracer Isotope: Barium-133 **Tracer Code:** 0112-5 **Expiration Date:** 2-17-10 **Vol:** 0.1 mL
Prep Date: 9-15-09 **Initials:** MS **Pipet ID:** 2764953 **Balance ID:** 17955160

Ac-228 Ingrow: 9-16-09 / 1105
Ac-228 Separation Date/Time: 9-18-09 / 16:40
Witness: MCB 9-15-09

Sample ID	Client Description	Type	Hazard Code	Min CRDL	Matrix	Client	Collect Date & Time	Pos. #	Vol (mL)	Det #	Ba Yield (%)	Gamma Det. #
236077013-1	EB082709-SO1	SAMPLE		3 pCi/L	WATER	KERR003	27-AUG-09 10:00 AM	1	200	5A	72.15	
236077019-1	EB083109-SO1	SAMPLE		3 pCi/L	WATER	KERR003	31-AUG-09 10:00 AM	2	200	5C	84.83	
236077021-1	EB090109-SO1	SAMPLE		3 pCi/L	WATER	KERR003	01-SEP-09 12:50 PM	3	200	5D	80.69	
236238008-1	FB082809-SO	SAMPLE		3 pCi/L	WATER	KERR003	28-AUG-09 10:01 AM	4	200	6A	72.28	
236534011-1	EB090209-SO1	SAMPLE		3 pCi/L	WATER	KERR003	02-SEP-09 01:33 PM	5	200	6B	75.59	
236699016-1	EB090309-SO2	SAMPLE		3 pCi/L	WATER	KERR003	03-SEP-09 01:50 PM	6	200	7A	74.49	
236817014-1	EB090809-SO1	SAMPLE		3 pCi/L	WATER	KERR003	08-SEP-09 12:02 PM	7	200	7B	77.03	
236934020-1	Rinsate-1	SAMPLE		1 pCi/L	WATER	BRCM001	09-SEP-09 02:00 PM	8	700	7C	47.96	
1201923559-1	MB for batch 902602	MB		1 pCi/L	WATER	QC ACCOUNT	27-AUG-09 10:00 AM	9	700	7D	84.49	
1201923560-1	LCS for batch 902602	LCS		1 pCi/L	WATER	QC ACCOUNT	27-AUG-09 10:00 AM	10	700	8A	81.55	
1201923561-1	LCSD for batch 902602	LCSD		1 pCi/L	WATER	QC ACCOUNT	27-AUG-09 10:00 AM	11	700	8B	82.84	

DAILY ✓ 9/22/09

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Comments: N/A

Data Reviewed By: 9/22/09

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

Radium-228 Liquid

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

Batch : 902602
Analyst : MXS2
Prep Date : 9/15/2009

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

Calibration Date : 7/2/2009
Calibration Due Date : 7/31/2010
Geometry: CeF on 25mm Filter

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 : 9/11/2010
LCS Activity (dpm/ml): 177.90
LCS Volume Added: 0.10

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 :	GFC28RAL	
Parmname :	Radium-228	
Required MDA :	1	pCi/L
Halflife of Ra-228 :	5.75	years
Halflife of Ac-228 :	6.13	hours
Batch counted on :	PIC	
BKG Count time :	500	min

Sample Characteristics					Tracer Calculations					
Pos.	Sample ID	Sample Aliquot L	Sample Aliquot StDev. L	Sample Date/Time	Tracer Concentration (cpm) (Ba-133 Ref.)	Tracer Ref. Count Uncertainty (cpm)	Tracer Concentration (cpm) (Ba-133 Samp.)	Tracer Samp. Count Uncertainty (cpm)	Tracer Aliquot (mL)	Tracer Aliquot StDev. (mL)
1	236077013.1	0.2000	1.6007E-05	8/27/2009 10:00	311.7	3.47%	224.9	4.17%	0.1	0.000701
2	236077019.1	0.2000	1.6007E-05	8/31/2009 10:00	311.7	3.47%	264.4	3.81%	0.1	0.000701
3	236077021.1	0.2000	1.6007E-05	9/1/2009 12:50	311.7	3.47%	251.5	3.92%	0.1	0.000701
4	236238008.1	0.2000	1.6007E-05	8/28/2009 10:01	311.7	3.47%	225.3	4.17%	0.1	0.000701
5	236534011.1	0.2000	1.6007E-05	9/2/2009 13:33	311.7	3.47%	235.6	4.06%	0.1	0.000701
6	236699016.1	0.2000	1.6007E-05	9/3/2009 13:50	311.7	3.47%	232.2	4.10%	0.1	0.000701
7	236817014.1	0.2000	1.6007E-05	9/8/2009 12:02	311.7	3.47%	240.1	4.02%	0.1	0.000701
8	236934020.1	0.7000	2.0772E-05	9/9/2009 14:00	311.7	3.47%	149.5	5.31%	0.1	0.000701
9	1201923559.1	0.7000	2.0772E-05	9/15/2009 0:00	311.7	3.47%	254.0	3.89%	0.1	0.000701
10	1201923560.1	0.7000	2.0772E-05	9/15/2009 0:00	311.7	3.47%	254.2	3.89%	0.1	0.000701
11	1201923561.1	0.7000	2.0772E-05	9/15/2009 0:00	311.7	3.47%	258.2	3.86%	0.1	0.000701

Count raw Data

Pos.	Detector ID	Counting Time (min.)	Gross Counts Alpha	Gross Counts Beta	Beta cpm	Detector Efficiency (cpm/dpm)	Detector Efficiency Error (cpm/dpm)	Weekly Bkg cpm	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 %
1	5A	60	5	35	0.583	0.6258	0.00816	0.564	500	9/18/2009 16:40	9/18/2009 18:46	0.993	0.789	1.058	72.15%	2.89%
2	5C	60	14	85	1.417	0.6368	0.00816	0.948	500	9/18/2009 16:40	9/18/2009 18:46	0.994	0.789	1.058	84.83%	2.76%
3	5D	60	14	110	1.833	0.6237	0.00816	1.204	500	9/18/2009 16:40	9/18/2009 18:46	0.994	0.789	1.058	80.69%	2.80%
4	6A	60	9	112	1.867	0.6221	0.00816	1.300	500	9/18/2009 16:40	9/18/2009 18:46	0.993	0.789	1.058	72.28%	2.89%
5	6B	60	15	71	1.183	0.6163	0.00816	0.818	500	9/18/2009 16:40	9/18/2009 18:46	0.995	0.789	1.058	75.59%	2.85%
6	7A	60	8	45	0.750	0.6180	0.00816	0.368	500	9/18/2009 16:40	9/18/2009 18:46	0.995	0.788	1.058	74.49%	2.86%
7	7B	60	6	51	0.850	0.6280	0.00816	0.468	500	9/18/2009 16:40	9/18/2009 18:46	0.997	0.788	1.058	77.03%	2.83%
8	7C	60	7	45	0.750	0.6178	0.00816	0.256	500	9/18/2009 16:40	9/18/2009 18:46	0.997	0.788	1.058	47.96%	3.32%
9	7D	60	6	43	0.717	0.6257	0.00816	0.386	500	9/18/2009 16:40	9/18/2009 18:46	0.999	0.788	1.058	81.49%	2.79%
10	8A	60	17	453	7.550	0.6247	0.00816	0.776	500	9/18/2009 16:40	9/18/2009 18:46	0.999	0.788	1.058	81.55%	2.79%
11	8B	60	6	523	8.717	0.6332	0.00816	1.904	500	9/18/2009 16:40	9/18/2009 18:46	0.999	0.788	1.058	82.84%	2.78%

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

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** Counting Uncertainty pCi/L	**2 SIGMA** Total Prop. Uncertainty pCi/L	Sample QC	Sample Type	RPD	RER	Nominal pCi/L	Recovery
1	1.6114	1.1376	3	2.6123	**0.1303**	5.3879	0.0193	0.1042	1.3761	1.3765		SAMPLE				
2	1.7439	1.2312	3	2.7438	**2.6370**	0.3420	0.4687	0.1597	1.7613	1.8851		SAMPLE				
3	2.1087	1.4887	3	3.2793	**3.7991**	0.2900	0.6293	0.1816	2.1482	2.3566		SAMPLE				
4	2.4559	1.7339	3	3.8061	**3.8342**	0.3254	0.5667	0.1836	2.4350	2.6245		SAMPLE				
5	1.8772	1.3253	3	2.9766	**2.3820**	0.4011	0.3653	0.1461	1.8676	1.9641		SAMPLE				
6	1.2738	0.8993	3	2.1284	**2.5197**	0.3026	0.3820	0.1150	1.4874	1.6205		SAMPLE				
7	1.3649	0.9636	3	2.2406	**2.3942**	0.3231	0.3820	0.1229	1.5096	1.6286		SAMPLE				
8	0.4707	0.3323	1	0.8107	**1.4436**	0.2334	0.4940	0.1141	0.6533	0.7516		SAMPLE				
9	0.3353	0.2367	1	0.5582	**0.5605**	0.3423	0.3307	0.1128	0.3747	0.4010		MB				
10	0.4757	0.3359	1	0.7566	**11.4921**	0.0602	6.7740	0.3569	1.1868	3.1613		LCS			11.4479	100.4%
11	0.7239	0.5111	1	1.1045	**11.2269**	0.0636	6.8127	0.3861	1.2471	3.1219		LCSD	2.3%		11.4479	98.1%

SampleID	Instr	Time (min.)	Alpha Counts	Beta Counts	Count Start Time	Count End Time	Machine
236077013	5A	60	5	35	9/18/2009 18:46	9/18/2009 19:46	Protean
236077019	5C	60	14	85	9/18/2009 18:46	9/18/2009 19:46	Protean
236077021	5D	60	14	110	9/18/2009 18:46	9/18/2009 19:46	Protean
236238008	6A	60	9	112	9/18/2009 18:46	9/18/2009 19:46	Protean
236534011	6B	60	15	71	9/18/2009 18:46	9/18/2009 19:46	Protean
236699016	7A	60	8	45	9/18/2009 18:46	9/18/2009 19:46	Protean
236817014	7B	60	6	51	9/18/2009 18:46	9/18/2009 19:46	Protean
236934020	7C	60	7	45	9/18/2009 18:46	9/18/2009 19:46	Protean
1201923559	7D	60	6	43	9/18/2009 18:46	9/18/2009 19:46	Protean
1201923560	8A	60	17	453	9/18/2009 18:46	9/18/2009 19:46	Protean
1201923561	8B	60	6	523	9/18/2009 18:46	9/18/2009 19:46	Protean

ASSAY 16-Sep-09 16:45:49

Protocol	id	9	228_REC2
Time	limit	180	
Count	limit	50000	
Isotope	Ba-133		
Protocol	date	9-Apr-07	10:02:22
Run	id.	61	

POS	RACK	BATCH	TIME	COUNTS	CPM	ERROR	% RECOVERY	COUNT TIME
1	87	1	180	1026	311.7	3.47		16:45:56
2	87	2	180	766	224.9	4.17	72.15	16:49:07
3	87	3	180	884	264.4	3.81	84.83	16:52:19
4	87	4	180	846	251.5	3.92	80.69	16:55:30
5	87	5	180	767	225.3	4.17	72.28	16:58:41
6	68	6	180	798	235.6	4.06	75.59	17:02:06
7	68	7	180	788	232.2	4.1	74.49	17:05:17
8	68	8	180	811	240.1	4.02	77.03	17:08:29
9	68	9	180	540	149.5	5.31	47.96	17:11:40
10	68	10	180	853	254	3.89	81.49	17:14:51
11	70	11	180	854	254.2	3.89	81.55	17:18:16
12	70	12	180	866	258.2	3.86	82.84	17:21:28

END OF ASSAY

RADIUM 226

Radiochemistry Batch Checklist, Rev 9

Batch# 9040160 Product: Ra226 Date: 9/25/09

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to100 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 statused.	✓		
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.	✓		NCR 738630
Batch non-conformances second reviewed and disposition verified to be completed.	✓		GEL 738630
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: Lyndsey Pare KERTZ 9/30/09

Secondary Review Performed By: [illegible] 9/28/09

Radium-226 Que Sheet

17-SEP-09

GEL Laboratories, Radiochemistry Division

Batch #: 904060 Analyst: KSD1 First Client Due Date: 09/30/2009 Internal Due Date: 09/19/2009

Spike Isotope: Radium-226 Spike Code: 0638-14 Expiration Date: 7/17/10 Vol: 0.1 End Initial/Degas Date/Time: 9/22/09 1515

LCS Isotope: Radium-226 LCS Code: 0638-14 Expiration Date: 7/17/10 Vol: 0.1 End LN De-em Date: 9/25/09

Bkg Count Time: 30 (Min) Sample Count Time: 30 (Min) Start Count Date: 9/25/09

Prep Date: 9/21/09 Pipet ID: 1429303 Balance ID: B1350W08 Initials: KD Witness: 9/24/09

Sample I	Client Description	Type	Hazard Code	Matrix	Min CRDL	Client	Position (Label)	Aliquot (mL or g)	End LN De-em Time	Start Count Time	Cell #	Det #	Bkg counts	Total Counts
236077001-1	RSAS3-0.5B	SAMPLE		SOIL	.5 pCi/g	KERR003	1	1.030	1340	1640	111	1	0	50
236077002-1	RSAS3009-0.5B	SAMPLE		SOIL	.5 pCi/g	KERR003	2	1.024	1340	1640	210	2	8	38
236077003-1	RSAS3-10B	SAMPLE		SOIL	.5 pCi/g	KERR003	3	1.027	1340	1640	306	3	0	59
236077004-1	RSAS3-25B	SAMPLE		SOIL	.5 pCi/g	KERR003	4	1.006	1340	1640	410	4	8	92
236077005-1	RSAS3-44B	SAMPLE		SOIL	.5 pCi/g	KERR003	5	1.007	1340	1640	502	5	2	49
236077006-1	RSAT6-10B	SAMPLE		SOIL	.5 pCi/g	KERR003	6	1.024	1340	1640	611	6	8	11
236077007-1	RSAT6-30B	SAMPLE		SOIL	.5 pCi/g	KERR003	7	1.019	1405	1715	104	1	8	110
236077008-1	RSAT6-49B	SAMPLE		SOIL	.5 pCi/g	KERR003	8	1.000	1405	1715	201	2	8	105
236077009-1	SA210-0.5B	SAMPLE		SOIL	.5 pCi/g	KERR003	9	1.061	1405	1715	312	3	8	36
236077010-1	SA210-10B	SAMPLE		SOIL	.5 pCi/g	KERR003	10	1.095	1405	1715	404	4	8	51
236077011-1	SA210-30B	SAMPLE		SOIL	.5 pCi/g	KERR003	11	1.080	1405	1715	504	5	6	68
236077012-1	SA210-49B	SAMPLE		SOIL	.5 pCi/g	KERR003	12	1.031	1405	1715	607	6	8	72
236077014-1	SA68-0.5B	SAMPLE		SOIL	.5 pCi/g	KERR003	13	1.094	1425	1750	108	1	8	49
236077015-1	SA68-10B	SAMPLE		SOIL	.5 pCi/g	KERR003	14	1.006	1425	1750	203	2	4	56
236077016-1	SA68-25B	SAMPLE		SOIL	.5 pCi/g	KERR003	15	1.011	1425	1750	303	3	8	175
236077017-1	SA68009-25B	SAMPLE		SOIL	.5 pCi/g	KERR003	16	1.074	1425	1750	412	4	8	153
236077018-1	SA68-36B	SAMPLE		SOIL	.5 pCi/g	KERR003	17	1.011	1425	1750	508	5	2	66
236077020-1	SA133-31B	SAMPLE		SOIL	.5 pCi/g	KERR003	18	1.005	1425	1750	605	6	8	98
1201927088-1	MB for batch 904060	MB		SOIL	.5 pCi/g	QC ACCOUNT	19	1.094	1450	1825	101	1	8	21
1201927089-1	SA133-31B(236077020DUP)	DUP		SOIL	.5 pCi/g	QC ACCOUNT	20	1.002	1450	1825	206	2	8	98
1201927090-1	SA133-31B(236077020MS)	MS		SOIL	.5 pCi/g	QC ACCOUNT	21	1.001	1450	1825	309	3	8	689
1201927091-1	LCS for batch 904060	LCS		SOIL	.5 pCi/g	QC ACCOUNT	22	1.094	1450	1825	404	4	8	647

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Comments:

Data Reviewed By: Lyndsey Pace 9/25/09

Radium-226 Solid

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

Batch : 904060
Analyst : KSD1
Prep Date : 9/21/2009
Ra-226 Abundance : 1
Ra-226 Method Uncertainty : 0.1153

Spike S/N : 0638-H
Spike Exp Date : 7/17/2010
Spike Activity (dpm/ml): 268.23
Spike Volume Added: 0.10

LCS S/N : 0638-H
LCS Exp Date : 7/17/2010
LCS Activity (dpm/ml): 268.23
LCS 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 : LUC26RAS
Parmname : Radium-226
Required MDA : 0.5 pCi/G
Halflife of Ra-226 : 1600 years
Halflife of Rn-222: 3.823 days
Batch counted on : LUCAS CELL DETECTOR
BKG Count time : 30 min

Sample Characteristics					Count Raw Data				Weekly Background			
Pos.	Sample ID	Sample Aliquot G	Sample Aliquot StDev. G	Sample Date/Time	Cell Number	Counting Time (min.)	Gross Counts	Gross CPM	Counts	CPM	Count Time (min.)	Detector Efficiency (cpm/dpm)
1	236077001.1	1.0300	3.3265E-03	8/26/2009 6:56	111	30	50	1.667	0	0.000	30	2.0240
2	236077002.1	1.0240	3.3258E-03	8/26/2009 6:56	210	30	38	1.267	8	0.267	30	2.2530
3	236077003.1	1.0270	3.3261E-03	8/26/2009 8:23	306	30	59	1.967	0	0.000	30	1.7470
4	236077004.1	1.0060	3.3240E-03	8/26/2009 8:59	410	30	92	3.067	8	0.267	30	1.8860
5	236077005.1	1.0070	3.3241E-03	8/26/2009 9:45	502	30	49	1.633	2	0.067	30	1.8780
6	236077006.1	1.0240	3.3258E-03	8/27/2009 11:26	611	30	11	0.367	8	0.267	30	2.3070
7	236077007.1	1.0190	3.3253E-03	8/27/2009 14:23	104	30	110	3.667	8	0.267	30	1.9720
8	236077008.1	1.0000	3.3233E-03	8/27/2009 15:02	201	30	105	3.500	8	0.267	30	1.9930
9	236077009.1	1.0610	3.3297E-03	8/27/2009 7:50	312	30	36	1.200	8	0.267	30	1.9440
10	236077010.1	1.0950	3.3332E-03	8/27/2009 8:00	409	30	51	1.700	8	0.267	30	2.0360
11	236077011.1	1.0800	3.3317E-03	8/27/2009 8:29	504	30	68	2.267	6	0.200	30	1.6150
12	236077012.1	1.0310	3.3266E-03	8/27/2009 9:34	607	30	72	2.400	8	0.267	30	2.4500
13	236077014.1	1.0940	3.3331E-03	8/31/2009 6:41	108	30	49	1.633	8	0.267	30	1.9460
14	236077015.1	1.0060	3.3240E-03	8/31/2009 7:22	203	30	56	1.867	4	0.133	30	2.2540
15	236077016.1	1.0110	3.3245E-03	8/31/2009 7:55	303	30	175	5.833	8	0.267	30	2.1360
16	236077017.1	1.0740	3.3310E-03	8/31/2009 7:55	412	30	153	5.100	8	0.267	30	1.9670
17	236077018.1	1.0110	3.3245E-03	8/31/2009 8:25	508	30	66	2.200	2	0.067	30	1.5340
18	236077020.1	1.0050	3.3239E-03	9/1/2009 10:50	605	30	98	3.267	8	0.267	30	2.1490
19	1201927088.1	1.0950	3.3332E-03	9/21/2009 0:00	101	30	21	0.700	8	0.267	30	1.9560
20	1201927089.1	1.0020	3.3235E-03	9/1/2009 10:50	206	30	98	3.267	8	0.267	30	2.2590
21	1201927090.1	1.0010	3.3234E-03	9/1/2009 10:50	309	30	689	22.967	8	0.267	30	1.8770
22	1201927091.1	1.0950	3.3332E-03	9/21/2009 0:00	404	30	647	21.567	8	0.267	30	1.9310

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			
						De-Gas to Ingrowth	Ingrowth to Count	During Count	Ra-226 Decay
0.05303	8/31/2009	8/31/2010	9/22/2009 15:15	9/25/2009 13:40	9/25/2009 16:40	0.413	0.978	1.002	1.000
0.07722	12/19/2008	12/19/2009	9/22/2009 15:15	9/25/2009 13:40	9/25/2009 16:40	0.413	0.978	1.002	1.000
0.06082	2/4/2009	2/4/2010	9/22/2009 15:15	9/25/2009 13:40	9/25/2009 16:40	0.413	0.978	1.002	1.000
0.12371	3/2/2009	3/2/2010	9/22/2009 15:15	9/25/2009 13:40	9/25/2009 16:40	0.413	0.978	1.002	1.000
0.14377	3/25/2009	3/25/2010	9/22/2009 15:15	9/25/2009 13:40	9/25/2009 16:40	0.413	0.978	1.002	1.000
0.06605	8/4/2009	8/4/2010	9/22/2009 15:15	9/25/2009 13:40	9/25/2009 16:40	0.413	0.978	1.002	1.000
0.05303	8/31/2009	8/31/2010	9/22/2009 15:15	9/25/2009 14:05	9/25/2009 17:15	0.414	0.976	1.002	1.000
0.07722	12/19/2008	12/19/2009	9/22/2009 15:15	9/25/2009 14:05	9/25/2009 17:15	0.414	0.976	1.002	1.000
0.06082	2/4/2009	2/4/2010	9/22/2009 15:15	9/25/2009 14:05	9/25/2009 17:15	0.414	0.976	1.002	1.000
0.12371	3/2/2009	3/2/2010	9/22/2009 15:15	9/25/2009 14:05	9/25/2009 17:15	0.414	0.976	1.002	1.000
0.14377	3/25/2009	3/25/2010	9/22/2009 15:15	9/25/2009 14:05	9/25/2009 17:15	0.414	0.976	1.002	1.000
0.06605	8/4/2009	8/4/2010	9/22/2009 15:15	9/25/2009 14:05	9/25/2009 17:15	0.414	0.976	1.002	1.000
0.05303	8/31/2009	8/31/2010	9/22/2009 15:15	9/25/2009 14:25	9/25/2009 17:50	0.416	0.975	1.002	1.000
0.07722	12/19/2008	12/19/2009	9/22/2009 15:15	9/25/2009 14:25	9/25/2009 17:50	0.416	0.975	1.002	1.000
0.06082	2/4/2009	2/4/2010	9/22/2009 15:15	9/25/2009 14:25	9/25/2009 17:50	0.416	0.975	1.002	1.000
0.12371	3/2/2009	3/2/2010	9/22/2009 15:15	9/25/2009 14:25	9/25/2009 17:50	0.416	0.975	1.002	1.000
0.14377	3/25/2009	3/25/2010	9/22/2009 15:15	9/25/2009 14:25	9/25/2009 17:50	0.416	0.975	1.002	1.000
0.06605	8/4/2009	8/4/2010	9/22/2009 15:15	9/25/2009 14:25	9/25/2009 17:50	0.416	0.975	1.002	1.000
0.05303	8/31/2009	8/31/2010	9/22/2009 15:15	9/25/2009 14:50	9/25/2009 18:25	0.418	0.973	1.002	1.000
0.07722	12/19/2008	12/19/2009	9/22/2009 15:15	9/25/2009 14:50	9/25/2009 18:25	0.418	0.973	1.002	1.000
0.06082	2/4/2009	2/4/2010	9/22/2009 15:15	9/25/2009 14:50	9/25/2009 18:25	0.418	0.973	1.002	1.000
0.12371	3/2/2009	3/2/2010	9/22/2009 15:15	9/25/2009 14:50	9/25/2009 18:25	0.418	0.973	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

Results

Pos.	Decision Level pCi/G	Critical Level pCi/G	Required MDA pCi/G	MDA pCi/G	Sample Act. Conc. pCi/G	Sample Act. Error pCi/G	Net Count Rate CPM	Net Count Rate Error CPM	**2 SIGMA** Counting Uncertainty pCi/G	**2 SIGMA** Total Prop. Uncertainty pCi/G	Sample QC	Sample Type	RPD	RER	Nominal pCi/G	Recovery
1	0.000E+00	0.000E+00	0.5	0.0535	**0.8913**	0.1511	1.6667	0.2357	0.2470	0.3320		SAMPLE				
2	0.1501	0.1060	0.5	0.2603	**0.4832**	0.2389	1.0000	0.2261	0.2141	0.2513		SAMPLE				
3	0.000E+00	0.000E+00	0.5	0.0621	**1.2220**	0.1437	1.9667	0.2560	0.3118	0.4413		SAMPLE				
4	0.1825	0.1289	0.5	0.3165	**1.6452**	0.1717	2.8000	0.3333	0.3839	0.6670		SAMPLE				
5	0.0916	0.0646	0.5	0.1882	**0.9235**	0.2092	1.5667	0.2380	0.2750	0.4324		SAMPLE				
6	0.1466	0.1035	0.5	0.2542	**0.0472**	1.4545	0.1000	0.1453	0.1344	0.1350		SAMPLE				
7	0.1718	0.1213	0.5	0.2979	**1.8802**	0.1190	3.4000	0.3621	0.3925	0.6107		SAMPLE				
8	0.1732	0.1223	0.5	0.3003	**1.8028**	0.1341	3.2333	0.3543	0.3872	0.6249		SAMPLE				
9	0.1674	0.1182	0.5	0.2902	**0.5028**	0.2446	0.9333	0.2211	0.2335	0.2665		SAMPLE				
10	0.1549	0.1093	0.5	0.2685	**0.7144**	0.2173	1.4333	0.2560	0.2501	0.3445		SAMPLE				
11	0.1714	0.1210	0.5	0.3057	**1.3167**	0.1998	2.0667	0.2867	0.3581	0.5954		SAMPLE				
12	0.1367	0.0965	0.5	0.2370	**0.9385**	0.1546	2.1333	0.2981	0.2571	0.3548		SAMPLE				
13	0.1619	0.1143	0.5	0.2807	**0.7122**	0.1916	1.3667	0.2517	0.2570	0.3122		SAMPLE				
14	0.1075	0.0759	0.5	0.2007	**0.8480**	0.1678	1.7333	0.2582	0.2476	0.3384		SAMPLE				
15	0.1596	0.1127	0.5	0.2767	**2.8598**	0.1013	5.5667	0.4509	0.4540	0.8605		SAMPLE				
16	0.1631	0.1152	0.5	0.2829	**2.5382**	0.1516	4.8333	0.4230	0.4353	0.9474		SAMPLE				
17	0.1111	0.0784	0.5	0.2284	**1.5261**	0.1931	2.1333	0.2749	0.3854	0.6727		SAMPLE				
18	0.1596	0.1127	0.5	0.2767	**1.5410**	0.1321	3.0000	0.3432	0.3455	0.5297		SAMPLE				
19	0.1604	0.1132	0.5	0.2781	**0.2237**	0.4176	0.4333	0.1795	0.1817	0.1900		MB				
20	0.1518	0.1072	0.5	0.2632	**1.4658**	0.1381	3.0000	0.3432	0.3286	0.5168	236077020.1	DUP	5.0%			
21	0.1829	0.1291	0.5	0.3171	**13.3613**	0.0722	22.7000	0.8800	1.0153	3.5627	236077020.1	MS			12.0705	97.9%
22	0.1625	0.1147	0.5	0.2817	**11.1403**	0.1301	21.3000	0.8531	0.8745	3.7952		LCS			11.0340	101.0%

Radiochemistry Batch Checklist, Rev 9

Batch# 904649 Product: Radium 226 Date: 9-25-09

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to100 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.		✓	See case narrative
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 statused.	✓		
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.	✓		NCR 738448
Batch non-conformances second reviewed and disposition verified to be completed.	✓		GEL 738448
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: [signature]

Secondary Review Performed By: [signature] 9/25/09 KERR 9-30-09

Radium-226 Que Sheet

21-SEP-09

GEL Laboratories, Radiochemistry Division

Batch #: 904649 Analyst: KSD1 First Client Due Date: 09/30/2009 Internal Due Date: 09/19/2009

Spike Isotope: Radium-226 Spike Code: — Expiration Date: — Vol: — End Initial/Degas Date/Time: 9/22/09 1100

LCS Isotope: Radium-226 LCS Code: 0638-H Expiration Date: 7/17/10 Vol: 0.1 End LN De-em Date: 9/25/09

Bkg Count Time: 30 (Min) Sample Count Time: 30 (Min) Start Count Date: 9/25/09

Prep Date: 9/22/09 Pipet ID: 14253003 Balance ID: 5120486 3 Initials: KD Witness: MS 9-22-09

Sample I	Client Description	Type	Hazard Code	Matrix	Min CRDL	Client	Position (Label)	Aliquot (mL or g)	End LN De-em Time	Start Count Time	Cell #	Det #	Bkg counts	Total Counts
236077013-1	EB082709-SO1	SAMPLE		WATER	1 pCi/L	KERR003	1	500	0605	930	505	5	8	13
236077019-1	EB083109-SO1	SAMPLE		WATER	1 pCi/L	KERR003	2	500	0605	930	605	6	8	53
236077021-1	EB090109-SO1	SAMPLE		WATER	1 pCi/L	KERR003	3	500	0630	1005	107	1	8	21
236699016-1	EB090309-SO2	SAMPLE		WATER	1 pCi/L	KERR003	4	500	0630	1030	207	2	8	17
236817014-1	EB090809-SO1	SAMPLE		WATER	1 pCi/L	KERR003	5	500	0630	1005	305	3	6	20
236938020-1	EB091009-SO1	SAMPLE		WATER	1 pCi/L	KERR003	6	500	0630	~~9/24/09 1005~~ 1240	411	4	8	~~575~~ 21
237010013-1	EB091009-SO2	SAMPLE		WATER	1 pCi/L	KERR003	7	500	0630	1005	506	5	8	23
237170005-1	EB091409-SO1	SAMPLE		WATER	1 pCi/L	KERR003	8	500	0630	1005	601	6	8	17
237170020-1	EB091509-SO1	SAMPLE		WATER	1 pCi/L	KERR003	9	500	0650	1040	112	1	8	27
237343006-1	EB091609-SO1	SAMPLE		WATER	1 pCi/L	KERR003	10	500	0650	~~9/25/09 1040~~ 1110	209	2	8	10
1201928562-1	MB for batch 904649	MB		WATER	1 pCi/L	QC ACCOUNT	11	500	0650	1040	301	3	4	15
1201928563-1	LCS for batch 904649	LCS		WATER	1 pCi/L	QC ACCOUNT	12	500	0650	1040	409	4	8	547
1201928564-1	LCSD for batch 904649	LCSD		WATER	1 pCi/L	QC ACCOUNT	13	500	0650	1040	507	5	4	669

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dailies ✓

Comments: _____

Data Reviewed By: _____ 9-25-09

Radium-226 Liquid

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

Batch : 904649
Analyst : KSD1
Prep Date : 9/22/2009
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

LCS S/N : 0638-H
LCS Exp Date : 7/17/2010
LCS Activity (dpm/ml): 268.23
LCS 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 : LUC26RAL
Parmname : Radium-226
Required MDA : 1 pCi/L
Halflife of Ra-226 : 1600 years
Halflife of Rn-222: 3.823 days
Batch counted on : LUCAS CELL DETECTOR
BKG Count time : 30 min

Sample Characteristics					Count Raw Data				Weekly Background			
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.)	Detector Efficiency (cpm/dpm)
1	236077013.1	0.5000	2.0256E-05	8/27/2009 10:00	505	30	13	0.433	8	0.267	30	2.3310
2	236077019.1	0.5000	2.0256E-05	8/31/2009 10:00	605	30	53	1.767	8	0.267	30	2.1490
3	236077021.1	0.5000	2.0256E-05	9/1/2009 12:50	107	30	21	0.700	8	0.267	30	1.9810
4	236699016.1	0.5000	2.0256E-05	9/3/2009 13:50	207	30	17	0.567	8	0.267	30	2.1460
5	236817014.1	0.5000	2.0256E-05	9/8/2009 12:02	305	30	20	0.667	6	0.200	30	2.0570
6	236938020.1	0.5000	2.0256E-05	9/10/2009 10:37	411	30	21	0.700	8	0.267	30	1.8240
7	237010013.1	0.5000	2.0256E-05	9/10/2009 11:53	506	30	23	0.767	8	0.267	30	2.0040
8	237170005.1	0.5000	2.0256E-05	9/14/2009 9:54	601	30	17	0.567	8	0.267	30	2.1810
9	237170020.1	0.5000	2.0256E-05	9/15/2009 10:16	112	30	27	0.900	8	0.267	30	1.9310
10	237343006.1	0.5000	2.0256E-05	9/16/2009 8:46	209	30	10	0.333	8	0.267	30	2.2910
11	1201928562.1	0.5000	2.0256E-05	9/22/2009 0:00	301	30	15	0.500	4	0.133	30	2.0210
12	1201928563.1	0.5000	2.0256E-05	9/22/2009 0:00	409	30	547	18.233	8	0.267	30	2.0360
13	1201928564.1	0.5000	2.0256E-05	9/22/2009 0:00	507	30	669	22.300	4	0.133	30	1.7010

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			
						De-Gas to Ingrowth	Ingrowth to Count	During Count	Ra-226 Decay
0.14377	3/25/2009	3/25/2010	9/22/2009 11:00	9/25/2009 6:05	9/25/2009 9:30	0.398	0.975	1.002	1.000
0.06605	8/4/2009	8/4/2010	9/22/2009 11:00	9/25/2009 6:05	9/25/2009 9:30	0.398	0.975	1.002	1.000
0.05303	8/31/2009	8/31/2010	9/22/2009 11:00	9/25/2009 6:30	9/25/2009 10:05	0.399	0.973	1.002	1.000
0.07722	12/19/2008	12/19/2009	9/22/2009 11:00	9/25/2009 6:30	9/25/2009 10:30	0.399	0.970	1.002	1.000
0.06082	2/4/2009	2/4/2010	9/22/2009 11:00	9/25/2009 6:30	9/25/2009 10:05	0.399	0.973	1.002	1.000
0.12371	3/2/2009	3/2/2010	9/22/2009 11:00	9/25/2009 6:30	9/25/2009 12:40	0.399	0.954	1.002	1.000
0.14377	3/25/2009	3/25/2010	9/22/2009 11:00	9/25/2009 6:30	9/25/2009 10:05	0.399	0.973	1.002	1.000
0.06605	8/4/2009	8/4/2010	9/22/2009 11:00	9/25/2009 6:30	9/25/2009 10:05	0.399	0.973	1.002	1.000
0.05303	8/31/2009	8/31/2010	9/22/2009 11:00	9/25/2009 6:50	9/25/2009 10:40	0.401	0.971	1.002	1.000
0.07722	12/19/2008	12/19/2009	9/22/2009 11:00	9/25/2009 6:50	9/25/2009 11:10	0.401	0.968	1.002	1.000
0.06082	2/4/2009	2/4/2010	9/22/2009 11:00	9/25/2009 6:50	9/25/2009 10:40	0.401	0.971	1.002	1.000
0.12371	3/2/2009	3/2/2010	9/22/2009 11:00	9/25/2009 6:50	9/25/2009 10:40	0.401	0.971	1.002	1.000
0.14377	3/25/2009	3/25/2010	9/22/2009 11:00	9/25/2009 6:50	9/25/2009 10:40	0.401	0.971	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

Results

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** Counting Uncertainty pCi/L	**2 SIGMA** Total Prop. Uncertainty pCi/L	Sample QC	Sample Type	RPD	RER	Nominal pCi/L	Recovery
1	0.3093	0.2184	1	0.5363	**0.1659**	0.9277	0.1667	0.1528	0.2981	0.3032		SAMPLE				
2	0.3355	0.2369	1	0.5818	**1.6200**	0.1857	1.5000	0.2603	0.5511	0.6578		SAMPLE				
3	0.3627	0.2561	1	0.6289	**0.5059**	0.4176	0.4333	0.1795	0.4108	0.4240		SAMPLE				
4	0.3359	0.2371	1	0.5824	**0.3243**	0.5609	0.3000	0.1667	0.3532	0.3613		SAMPLE				
5	0.3025	0.2136	1	0.5396	**0.5247**	0.3693	0.4667	0.1700	0.3746	0.3913		SAMPLE				
6	0.4017	0.2836	1	0.6965	**0.5603**	0.4323	0.4333	0.1795	0.4549	0.4853		SAMPLE				
7	0.3585	0.2531	1	0.6217	**0.5771**	0.3981	0.5000	0.1856	0.4198	0.4620		SAMPLE				
8	0.3294	0.2326	1	0.5712	**0.3181**	0.5595	0.3000	0.1667	0.3464	0.3535		SAMPLE				
9	0.3714	0.2622	1	0.6440	**0.7571**	0.3159	0.6333	0.1972	0.4621	0.4881		SAMPLE				
10	0.3142	0.2218	1	0.5448	**0.0674**	2.1227	0.0667	0.1414	0.2804	0.2808		SAMPLE				
11	0.2509	0.1771	1	0.4685	**0.4188**	0.4009	0.3667	0.1453	0.3253	0.3376		MB				
12	0.3522	0.2487	1	0.6107	**20.3707**	0.1312	17.9667	0.7853	1.7451	6.3933		LCS			24.1645	84.3%
13	0.2981	0.2105	1	0.5567	**30.0824**	0.1490	22.1667	0.8647	2.3001	10.3172		LCSD	38.5%	1.5683	24.1645	124.5%

METHOD CALIBRATION DATA

GAS FLOW PROPORTIONAL COUNTERS

General Engineering Laboratories
2040 Savage Road, Charleston, SC 29414
(843)556-8171

Gas Flow Proportional Counter Calibration Package

Method: Ra-228 (PIC)

	YES	NO	Comments
1) Is all calibration standard information enclosed for:			
primary standard certificate?	✓		
secondard standard(s) documentation?	✓		
standard preparation information?	✓		
standard < 1 Year old or verified?	✓		
2) Are the detector graphs included?			
beta absorption curves?			Average Efficiency
beta plateau?	✓		
3) Is the raw count data included for:			
the plateau generation?	✓		
the absorption curve generation?	✓		
the calibration verification?	✓		
the crosstalk calculations?	✓		
4) Are the calibration verification calculations included?			
are verification recoveries 100% +/- 25%	✓		
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

Ra-228 Calibration PROTEAN Detectors

Detector #	Source #	Seperation date	Count date	Ac-228 decay (dec)	Spike Vol. Ra-228 (mL)	Seperation time Decay Corrected Std. Act. Ra-228 dpm/mL	Volume corrected Standard Nominal dpm	raw beta counts	ct. time (min)	Beta cpm	corrected* cpm	Ra-228 eff (cpm/dpm)	
1A	1	7/1/09 10:45	7/1/2009 13:36	0.7249	1.5	6363.2	9544.8	13564	3	4521.3	6237.434348	0.6535	
1A	2	7/1/09 10:45	7/1/2009 13:52	0.7032	1.5	6363.2	9544.8	12775	3	4258.3	6055.521583	0.6344	
1A	3	7/1/09 10:45	7/1/2009 13:48	0.7083	1.5	6363.2	9544.8	12750	3	4250.0	6000.085083	0.6286	Average EFF
1A	4	7/1/09 10:45	7/1/2009 13:41	0.7170	1.5	6363.2	9544.8	12410	3	4136.7	5769.693602	0.6045	0.6303
1B	1	7/1/09 10:45	7/1/2009 13:41	0.7174	1.5	6363.2	9544.8	13292	3	4430.7	6176.07771	0.6471	
1B	2	7/1/09 10:45	7/1/2009 13:36	0.7246	1.5	6363.2	9544.8	13274	3	4424.7	6106.181463	0.6397	
1B	3	7/1/09 10:45	7/1/2009 13:52	0.7031	1.5	6363.2	9544.8	12699	3	4233.0	6020.43969	0.6308	Average EFF
1B	4	7/1/09 10:45	7/1/2009 13:48	0.7082	1.5	6363.2	9544.8	12072	3	4024.0	5682.267909	0.5953	0.6282
1C	1	7/1/09 10:45	7/1/2009 13:48	0.7085	1.5	6363.2	9544.8	12813	3	4271.0	6028.410186	0.6316	
1C	2	7/1/09 10:45	7/1/2009 13:41	0.7172	1.5	6363.2	9544.8	12979	3	4326.3	6032.15531	0.6320	
1C	3	7/1/09 10:45	7/1/2009 13:36	0.7245	1.5	6363.2	9544.8	12755	3	4251.7	5868.722998	0.6149	Average EFF
1C	4	7/1/09 10:45	7/1/2009 13:52	0.7030	1.5	6363.2	9544.8	11917	3	3972.3	5650.765354	0.5920	0.6176
1D	1	7/1/09 10:45	7/1/2009 13:52	0.7033	1.5	6363.2	9544.8	12473	3	4157.7	5911.258105	0.6193	
1D	2	7/1/09 10:45	7/1/2009 13:48	0.7084	1.5	6363.2	9544.8	12484	3	4161.3	5874.170562	0.6154	
1D	3	7/1/09 10:45	7/1/2009 13:41	0.7171	1.5	6363.2	9544.8	12289	3	4096.3	5712.363902	0.5985	Average EFF
1D	4	7/1/09 10:45	7/1/2009 13:36	0.7243	1.5	6363.2	9544.8	12115	3	4038.3	5575.47435	0.5841	0.6043
2A	1	7/1/09 10:45	7/1/2009 13:57	0.6960	1.5	6363.2	9544.8	12499	3	4166.3	5986.085459	0.6272	
2A	2	7/1/09 10:45	7/1/2009 14:15	0.6728	1.5	6363.2	9544.8	12103	3	4034.3	5996.6905	0.6283	
2A	3	7/1/09 10:45	7/1/2009 14:09	0.6815	1.5	6363.2	9544.8	11968	3	3989.3	5854.110901	0.6133	Average EFF
2A	4	7/1/09 10:45	7/1/2009 14:02	0.6899	1.5	6363.2	9544.8	11855	3	3951.7	5728.227222	0.6001	0.6172
2B	1	7/1/09 10:45	7/1/2009 14:02	0.6903	1.5	6363.2	9544.8	12471	3	4157.0	6022.286434	0.6309	
2B	2	7/1/09 10:45	7/1/2009 13:57	0.6958	1.5	6363.2	9544.8	12492	3	4164.0	5984.232843	0.6270	
2B	3	7/1/09 10:45	7/1/2009 14:15	0.6727	1.5	6363.2	9544.8	11892	3	3964.0	5892.884561	0.6174	Average EFF
2B	4	7/1/09 10:45	7/1/2009 14:09	0.6814	1.5	6363.2	9544.8	11539	3	3846.3	5644.974311	0.5914	0.6167
2C	1	7/1/09 10:45	7/1/2009 14:08	0.6817	1.5	6363.2	9544.8	12050	3	4016.7	5892.005142	0.6173	
2C	2	7/1/09 10:45	7/1/2009 14:02	0.6901	1.5	6363.2	9544.8	11914	3	3971.3	5754.571355	0.6029	
2C	3	7/1/09 10:45	7/1/2009 13:58	0.6957	1.5	6363.2	9544.8	11994	3	3998.0	5746.92868	0.6021	Average EFF
2C	4	7/1/09 10:45	7/1/2009 14:15	0.6726	1.5	6363.2	9544.8	10889	3	3629.7	5396.37168	0.5654	0.5969
2D	1	7/1/09 10:45	7/1/2009 14:15	0.6729	1.5	6363.2	9544.8	12010	3	4003.3	5949.493049	0.6233	
2D	2	7/1/09 10:45	7/1/2009 14:08	0.6816	1.5	6363.2	9544.8	12124	3	4041.3	5929.303014	0.6212	
2D	3	7/1/09 10:45	7/1/2009 14:02	0.6900	1.5	6363.2	9544.8	12168	3	4056.0	5878.360714	0.6159	Average EFF
2D	4	7/1/09 10:45	7/1/2009 13:58	0.6954	1.5	6363.2	9544.8	11692	3	3897.3	5604.156523	0.5871	0.6119
3A	1	7/1/09 10:45	7/1/2009 14:19	0.6675	1.5	6363.2	9544.8	11194	3	3731.3	5589.748519	0.5856	
3A	2	7/1/09 10:45	7/1/2009 14:35	0.6482	1.5	6363.2	9544.8	14227	4	3556.8	5486.792678	0.5748	
3A	3	7/1/09 10:45	7/1/2009 14:30	0.6548	1.5	6363.2	9544.8	14180	4	3545.0	5414.108112	0.5672	Average EFF
3A	4	7/1/09 10:45	7/1/2009 14:25	0.6608	1.5	6363.2	9544.8	13754	4	3438.5	5203.464549	0.5452	0.5682
3B	1	7/1/09 10:45	7/1/2009 14:25	0.6612	1.5	6363.2	9544.8	15370	4	3842.5	5811.010789	0.6088	
3B	2	7/1/09 10:45	7/1/2009 14:20	0.6673	1.5	6363.2	9544.8	11695	3	3898.3	5842.303251	0.6121	
3B	3	7/1/09 10:45	7/1/2009 14:35	0.6481	1.5	6363.2	9544.8	14905	4	3726.3	5749.171166	0.6023	Average EFF
3B	4	7/1/09 10:45	7/1/2009 14:30	0.6547	1.5	6363.2	9544.8	14220	4	3555.0	5430.231301	0.5689	0.5980
3C	1	7/1/09 10:45	7/1/2009 14:29	0.6552	1.5	6363.2	9544.8	15644	4	3911.0	5969.527404	0.6254	
3C	2	7/1/09 10:45	7/1/2009 14:25	0.6611	1.5	6363.2	9544.8	15964	4	3991.0	6036.911214	0.6325	
3C	3	7/1/09 10:45	7/1/2009 14:20	0.6672	1.5	6363.2	9544.8	11701	3	3900.3	5846.033242	0.6125	Average EFF
3C	4	7/1/09 10:45	7/1/2009 14:35	0.6480	1.5	6363.2	9544.8	14729	4	3682.3	5682.352456	0.5953	0.6164
3D	1	7/1/09 10:45	7/1/2009 14:35	0.6484	1.5	6363.2	9544.8	15152	4	3788.0	5842.430209	0.6121	
3D	2	7/1/09 10:45	7/1/2009 14:30	0.6550	1.5	6363.2	9544.8	15168	4	3792.0	5789.343603	0.6065	
3D	3	7/1/09 10:45	7/1/2009 14:25	0.6610	1.5	6363.2	9544.8	15295	4	3823.8	5785.011122	0.6061	Average EFF
3D	4	7/1/09 10:45	7/1/2009 14:20	0.6670	1.5	6363.2	9544.8	10942	3	3647.3	5468.022172	0.5729	0.5994
4A	1	7/1/09 10:45	7/1/2009 14:40	0.6418	1.5	6363.2	9544.8	15298	4	3824.5	5959.288371	0.6243	
4A	2	7/1/09 10:45	7/1/2009 15:00	0.6187	1.5	6363.2	9544.8	14897	4	3724.3	6019.957238	0.6307	
4A	3	7/1/09 10:45	7/1/2009 14:53	0.6266	1.5	6363.2	9544.8	15050	4	3762.5	6005.095127	0.6291	Average EFF
4A	4	7/1/09 10:45	7/1/2009 14:48	0.6325	1.5	6363.2	9544.8	14462	4	3615.5	5715.951787	0.5989	0.6208
4B	1	7/1/09 10:45	7/1/2009 14:48	0.6329	1.5	6363.2	9544.8	15335	4	3833.8	6057.768128	0.6347	
4B	2	7/1/09 10:45	7/1/2009 14:41	0.6416	1.5	6363.2	9544.8	15513	4	3878.3	6044.745331	0.6333	
4B	3	7/1/09 10:45	7/1/2009 15:00	0.6186	1.5	6363.2	9544.8	14521	4	3630.3	5868.56525	0.6148	Average EFF
4B	4	7/1/09 10:45	7/1/2009 14:53	0.6265	1.5	6363.2	9544.8	14328	4	3582.0	5717.547589	0.5990	0.6205
4C	1	7/1/09 10:45	7/1/2009 14:53	0.6268	1.5	6363.2	9544.8	14733	4	3683.3	5876.583259	0.6157	
4C	2	7/1/09 10:45	7/1/2009 14:48	0.6327	1.5	6363.2	9544.8	14902	4	3725.5	5888.011911	0.6169	
4C	3	7/1/09 10:45	7/1/2009 14:41	0.6414	1.5	6363.2	9544.8	14856	4	3714.0	5790.010642	0.6066	Average EFF
4C	4	7/1/09 10:45	7/1/2009 15:00	0.6185	1.5	6363.2	9544.8	13733	4	3433.3	5550.795964	0.5816	0.6052
4D	1	7/1/09 10:45	7/1/2009 15:00	0.6188	1.5	6363.2	9544.8	14167	4	3541.8	5723.884149	0.5997	
4D	2	7/1/09 10:45	7/1/2009 14:53	0.6267	1.5	6363.2	9544.8	14204	4	3551.0	5666.467573	0.5937	
4D	3	7/1/09 10:45	7/1/2009 14:48	0.6326	1.5	6363.2	9544.8	14131	4	3532.8	5584.07765	0.5850	Average EFF
4D	4	7/1/09 10:45	7/1/2009 14:41	0.6413	1.5	6363.2	9544.8	13978	4	3494.5	5449.182717	0.5709	0.5873
5A	1	7/1/09 10:45	7/1/2009 15:06	0.6112	1.5	6363.2	9544.8	14870	4	3717.5	6082.165089	0.6372	
5A	2	7/1/09 10:45	7/1/2009 15:21	0.5943	1.5	6363.2	9544.8	14487	4	3621.8	6094.223373	0.6385	
5A	3	7/1/09 10:45	7/1/2009 15:17	0.5996	1.5	6363.2	9544.8	14259	4	3564.8	5945.170793	0.6229	Average EFF
5A	4	7/1/09 10:45	7/1/2009 15:12	0.6047	1.5	6363.2	9544.8	13957	4	3489.3	5770.592799	0.6046	0.6258
5B	1	7/1/09 10:45	7/1/2009 15:12	0.6050	1.5	6363.2	9544.8	14869	4	3717.3	6144.005028	0.6437	
5B	2	7/1/09 10:45	7/1/2009 15:06	0.6111	1.5	6363.2	9544.8	14821	4	3705.3	6063.072791	0.6352	
5B	3	7/1/09 10:45	7/1/2009 15:21	0.5942	1.5	6363.2	9544.8	14289	4	3572.3	6011.872812	0.6299	Average EFF
5B	4	7/1/09 10:45	7/1/2009 15:17	0.5995	1.5	6363.2	9544.8	13809	4	3452.3	5758.629577	0.6033	0.6280
5C	1	7/1/09 10:45	7/1/2009 15:17	0.5994	1.5	6363.2	9544.8	14676	4	3669.0	6120.953053	0.6413	
5C	2	7/1/09 10:45	7/1/2009 15:12	0.6049	1.5	6363.2	9544.8	15122	4	3780.5	6249.917577	0.6548	
5C	3	7/1/09 10:45	7/1/2009 15:07	0.6108	1.5	6363.2	9544.8	14958	4	3739.5	6121.8025	0.6414	Average EFF

7/2/09

5C	4	7/1/09 10:45	7/1/2009 15:21	0.5941	1.5	6363.2	9544.8	13831	4	3457.8	5819.905873	0.6097	0.6368
5D	1	7/1/09 10:45	7/1/2009 15:21	0.5943	1.5	6363.2	9544.8	14321	4	3580.3	6024.014899	0.6311	
5D	2	7/1/09 10:45	7/1/2009 15:17	0.5993	1.5	6363.2	9544.8	14642	4	3660.5	6107.538025	0.6399	
5D	3	7/1/09 10:45	7/1/2009 15:12	0.6048	1.5	6363.2	9544.8	14443	4	3610.8	5970.409434	0.6255	Average EFF
5D	4	7/1/09 10:45	7/1/2009 15:07	0.6107	1.5	6363.2	9544.8	13954	4	3488.5	5711.973074	0.5984	0.6237
6A	1	7/1/09 10:45	7/1/2009 15:27	0.5885	1.5	6363.2	9544.8	14018	4	3504.5	5955.42076	0.6239	
6A	2	7/1/09 10:45	7/1/2009 15:40	0.5735	1.5	6363.2	9544.8	12283	3.5	3509.4	6118.819734	0.6411	
6A	3	7/1/09 10:45	7/1/2009 15:36	0.5779	1.5	6363.2	9544.8	12111	3.5	3460.3	5987.187856	0.6273	Average EFF
6A	4	7/1/09 10:45	7/1/2009 15:32	0.5826	1.5	6363.2	9544.8	11598	3.5	3313.7	5687.952648	0.5959	0.6221
6B	1	7/1/09 10:45	7/1/2009 15:32	0.5824	1.5	6363.2	9544.8	12151	3.5	3471.7	5961.398905	0.6246	
6B	2	7/1/09 10:45	7/1/2009 15:27	0.5885	1.5	6363.2	9544.8	14371	4	3592.8	6105.389624	0.6397	
6B	3	7/1/09 10:45	7/1/2009 15:40	0.5734	1.5	6363.2	9544.8	11705	3.5	3344.3	5831.983307	0.6110	Average EFF
6B	4	7/1/09 10:45	7/1/2009 15:36	0.5779	1.5	6363.2	9544.8	11388	3.5	3253.7	5630.295163	0.5899	0.6163
6C	1	7/1/09 10:45	7/1/2009 15:36	0.5778	1.5	6363.2	9544.8	12161	3.5	3474.6	6013.224586	0.6300	
6C	2	7/1/09 10:45	7/1/2009 15:32	0.5821	1.5	6363.2	9544.8	12083	3.5	3452.3	5930.638446	0.6213	
6C	3	7/1/09 10:45	7/1/2009 15:27	0.5883	1.5	6363.2	9544.8	13638	4	3409.5	5795.433731	0.6072	Average EFF
6C	4	7/1/09 10:45	7/1/2009 15:40	0.5733	1.5	6363.2	9544.8	11218	3.5	3205.1	5590.212659	0.5857	0.6111
6D	1	7/1/09 10:45	7/1/2009 15:40	0.5732	1.5	6363.2	9544.8	11987	3.5	3424.9	5974.547886	0.6259	
6D	2	7/1/09 10:45	7/1/2009 15:36	0.5777	1.5	6363.2	9544.8	12183	3.5	3480.9	6025.235519	0.6313	
6D	3	7/1/09 10:45	7/1/2009 15:32	0.5819	1.5	6363.2	9544.8	11882	3.5	3394.9	5833.810262	0.6112	Average EFF
6D	4	7/1/09 10:45	7/1/2009 15:27	0.5881	1.5	6363.2	9544.8	13018	4	3254.5	5533.699914	0.5798	0.6120
7A	1	7/1/09 10:45	7/1/2009 15:46	0.5673	1.5	6363.2	9544.8	12007	3.5	3430.6	6047.285606	0.6336	
7A	2	7/1/09 10:45	7/1/2009 16:00	0.5525	1.5	6363.2	9544.8	11655	3.5	3330.0	6027.30696	0.6315	
7A	3	7/1/09 10:45	7/1/2009 15:56	0.5569	1.5	6363.2	9544.8	11445	3.5	3270.0	5871.972756	0.6152	Average EFF
7A	4	7/1/09 10:45	7/1/2009 15:50	0.5627	1.5	6363.2	9544.8	11121	3.5	3177.4	5646.694018	0.5916	0.6180
7B	1	7/1/09 10:45	7/1/2009 15:51	0.5622	1.5	6363.2	9544.8	11968	3.5	3419.4	6082.664171	0.6373	
7B	2	7/1/09 10:45	7/1/2009 15:46	0.5673	1.5	6363.2	9544.8	12050	3.5	3442.9	6069.322745	0.6359	
7B	3	7/1/09 10:45	7/1/2009 16:00	0.5524	1.5	6363.2	9544.8	11675	3.5	3335.7	6038.785014	0.6327	Average EFF
7B	4	7/1/09 10:45	7/1/2009 15:56	0.5567	1.5	6363.2	9544.8	11271	3.5	3220.3	5784.331251	0.6060	0.6280
7C	1	7/1/09 10:45	7/1/2009 15:56	0.5566	1.5	6363.2	9544.8	11781	3.5	3366.0	6047.202464	0.6336	
7C	2	7/1/09 10:45	7/1/2009 15:51	0.5621	1.5	6363.2	9544.8	11760	3.5	3360.0	5978.073192	0.6263	
7C	3	7/1/09 10:45	7/1/2009 15:46	0.5670	1.5	6363.2	9544.8	11766	3.5	3361.7	5928.878357	0.6212	Average EFF
7C	4	7/1/09 10:45	7/1/2009 16:00	0.5523	1.5	6363.2	9544.8	10888	3.5	3110.9	5632.598965	0.5901	0.6178
7D	1	7/1/09 10:45	7/1/2009 16:00	0.5522	1.5	6363.2	9544.8	11605	3.5	3315.7	6004.271132	0.6291	
7D	2	7/1/09 10:45	7/1/2009 15:56	0.5565	1.5	6363.2	9544.8	11920	3.5	3405.7	6119.509991	0.6411	
7D	3	7/1/09 10:45	7/1/2009 15:51	0.5619	1.5	6363.2	9544.8	11933	3.5	3409.4	6067.346561	0.6357	Average EFF
7D	4	7/1/09 10:45	7/1/2009 15:46	0.5668	1.5	6363.2	9544.8	11305	3.5	3230.0	5698.36602	0.5970	0.6257
8A	1	7/1/09 10:45	7/1/2009 16:06	0.5466	1.5	6363.2	9544.8	11673	3.5	3335.1	6101.651756	0.6393	
8A	2	7/1/09 10:45	7/1/2009 16:19	0.5333	1.5	6363.2	9544.8	11172	3.5	3192.0	5985.379105	0.6271	
8A	3	7/1/09 10:45	7/1/2009 16:15	0.5377	1.5	6363.2	9544.8	11258	3.5	3216.6	5982.329368	0.6268	Average EFF
8A	4	7/1/09 10:45	7/1/2009 16:10	0.5424	1.5	6363.2	9544.8	10977	3.5	3136.3	5782.059146	0.6058	0.6247
8B	1	7/1/09 10:45	7/1/2009 16:10	0.5423	1.5	6363.2	9544.8	11583	3.5	3309.4	6102.412618	0.6393	
8B	2	7/1/09 10:45	7/1/2009 16:06	0.5466	1.5	6363.2	9544.8	11758	3.5	3359.4	6146.082528	0.6439	
8B	3	7/1/09 10:45	7/1/2009 16:19	0.5332	1.5	6363.2	9544.8	11499	3.5	3285.4	6161.727069	0.6456	Average EFF
8B	4	7/1/09 10:45	7/1/2009 16:15	0.5376	1.5	6363.2	9544.8	10844	3.5	3098.3	5763.600098	0.6038	0.6332
8C	1	7/1/09 10:45	7/1/2009 16:15	0.5375	1.5	6363.2	9544.8	11539	3.5	3296.9	6133.762218	0.6426	
8C	2	7/1/09 10:45	7/1/2009 16:10	0.5422	1.5	6363.2	9544.8	11774	3.5	3364.0	6204.011354	0.6500	
8C	3	7/1/09 10:45	7/1/2009 16:06	0.5465	1.5	6363.2	9544.8	11611	3.5	3317.4	6070.574762	0.6360	Average EFF
8C	4	7/1/09 10:45	7/1/2009 16:19	0.5331	1.5	6363.2	9544.8	10809	3.5	3088.3	5793.080291	0.6069	0.6339
8D	1	7/1/09 10:45	7/1/2009 16:19	0.5330	1.5	6363.2	9544.8	11301	3.5	3228.9	6057.336905	0.6346	
8D	2	7/1/09 10:45	7/1/2009 16:15	0.5374	1.5	6363.2	9544.8	11412	3.5	3260.6	6067.58377	0.6357	
8D	3	7/1/09 10:45	7/1/2009 16:10	0.5421	1.5	6363.2	9544.8	11660	3.5	3331.4	6145.674775	0.6439	Average EFF
8D	4	7/1/09 10:45	7/1/2009 16:06	0.5464	1.5	6363.2	9544.8	10918	3.5	3119.4	5709.327085	0.5982	0.6281
9A	1	7/1/09 10:45	7/1/2009 16:24	0.5280	1.5	6363.2	9544.8	11605	3.5	3315.7	6280.207813	0.6580	
9A	2	7/1/09 10:45	7/1/2009 16:42	0.5106	1.5	6363.2	9544.8	11281	3.5	3223.1	6313.016372	0.6614	
9A	3	7/1/09 10:45	7/1/2009 16:33	0.5196	1.5	6363.2	9544.8	11301	3.5	3228.9	6214.402502	0.6511	Average EFF
9A	4	7/1/09 10:45	7/1/2009 16:29	0.5236	1.5	6363.2	9544.8	10987	3.5	3139.1	5995.155865	0.6281	0.6496
9B	1	7/1/09 10:45	7/1/2009 16:29	0.5235	1.5	6363.2	9544.8	11151	3.5	3186.0	6085.406603	0.6376	
9B	2	7/1/09 10:45	7/1/2009 16:24	0.5280	1.5	6363.2	9544.8	11462	3.5	3274.9	6202.821366	0.6499	
9B	3	7/1/09 10:45	7/1/2009 16:42	0.5104	1.5	6363.2	9544.8	11004	3.5	3144.0	6160.125852	0.6454	Average EFF
9B	4	7/1/09 10:45	7/1/2009 16:33	0.5195	1.5	6363.2	9544.8	10581	3.5	3023.1	5819.569586	0.6097	0.6356
9C	1	7/1/09 10:45	7/1/2009 16:33	0.5194	1.5	6363.2	9544.8	11026	3.5	3150.3	6064.890483	0.6354	
9C	2	7/1/09 10:45	7/1/2009 16:29	0.5235	1.5	6363.2	9544.8	11281	3.5	3223.1	6157.122814	0.6451	
9C	3	7/1/09 10:45	7/1/2009 16:24	0.5279	1.5	6363.2	9544.8	11016	3.5	3147.4	5962.583098	0.6247	Average EFF
9C	4	7/1/09 10:45	7/1/2009 16:42	0.5103	1.5	6363.2	9544.8	10297	3.5	2942.0	5765.244836	0.6040	0.6273
9D	1	7/1/09 10:45	7/1/2009 16:38	0.5146	1.5	6363.2	9544.8	11135	3.5	3181.4	6182.4976	0.6477	
9D	2	7/1/09 10:45	7/1/2009 16:33	0.5193	1.5	6363.2	9544.8	11412	3.5	3260.6	6276.391381	0.6578	
9D	3	7/1/09 10:45	7/1/2009 16:29	0.5234	1.5	6363.2	9544.8	11340	3.5	3240.0	6190.682442	0.6486	Average EFF
9D	4	7/1/09 10:45	7/1/2009 16:24	0.5278	1.5	6363.2	9544.8	10912	3.5	3117.7	5907.401951	0.6189	0.6433
10A	1	7/1/09 10:45	7/1/2009 16:47	0.5057	1.5	6363.2	9544.8	10991	3.5	3140.3	6209.984837	0.6506	
10A	2	7/1/09 10:45	7/1/2009 17:12	0.4824	1.5	6363.2	9544.8	11959	4	2989.8	6198.168046	0.6494	
10A	3	7/1/09 10:45	7/1/2009 16:58	0.4958	1.5	6363.2	9544.8	10553	3.5	3015.1	6081.381423	0.6371	Average EFF
10A	4	7/1/09 10:45	7/1/2009 16:53	0.5003	1.5	6363.2	9544.8	10338	3.5	2953.7	5903.409852	0.6185	0.6389
10B	1	7/1/09 10:45	7/1/2009 17:03	0.4910	1.5	6363.2	9544.8	11110	4	2777.5	5656.748417	0.5927	
10B	2	7/1/09 10:45	7/1/2009 16:47	0.5057	1.5	6363.2	9544.8	10812	3.5	3089.1	6109.231533	0.6401	
10B	3	7/1/09 10:45	7/1/2009 17:12	0.4822	1.5	6363.2	9544.8	11422	4	2855.5	5921.333197	0.6204	Average EFF
10B	4	7/1/09 10:45	7/1/2009 16:58	0.4957	1.5	6363.2	9544.8	9967	3.5	2847.7	5744.946895	0.6019	0.6137
10C	1	7/1/09 10:45	7/1/2009 16:58	0.4956	1.5	6363.2	9544.8	10482	3.5	2994.9	6042.548531	0.6331	
10C	2	7/1/09 10:45	7/1/2009 16:53	0.5001	1.5	6363.2	9544.8	10535	3.5	3010.0	6018.73284	0.6306	
10C	3	7/1/09 10:45	7/1/2009 16:47	0.5054	1.5	6363.2	9544.8	10723	3.5	3063.7	6061.601256	0.6351	Average EFF
10C	4	7/1/09 10:45	7/1/2009 17:13	0.4820	1.5	6363.2	9544.8	11066	4	2766.5	5739.114805	0.6013	0.6250
10D	1	7/1/09 10:45	7/1/2009 17:13	0.4819	1.5	6363.2	9544.8	12021	4	3005.3	6236.356344	0.6534	
10D	2	7/1/09 10:45	7/1/2009 16:58	0.4955	1.5	6363.2	9544.8	10614	3.5	3032.6	6119.984615	0.6412	

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	5306.3	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	6174.136045	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	6182.998937	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	6140.635636	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	5756.75774	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	0.8092	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	6213.261445	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	5766.084113	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

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
File type : Excel
Version # : 1.2.3

Batch : 595514
Analyst : AF1
Prep Date : 7/1/2009

Ra-228 Abundance : 1
Ra-228 Method Uncertainty : 0.0784

Calibration Date : 6/2/2008
Calibration Due Date : 6/30/2009

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

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
Parmname : Radium-228
Required MDA : 1 pCi/L
Halflife of Ra-228 : 5.75 years
Halflife of Ac-228 : 6.13 hours
Batch counted on : PIC
BKG Count time : 500 min

Sample Characteristics					Count raw Data																	Results
Pos.	Sample ID	Sample Aliquot L	Sample Aliquot StDev. L	Sample Date/Time	Pos.	Detector ID	Counting Time (min.)	Gross Counts Alpha	Gross Counts Beta	Beta cpm	Detector Efficiency (cpm/dpm)	Detector Efficiency Error (cpm/dpm)	Weekly Bkg cpm	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 %	Pos.
1	1201245712.1	1.0000	2.0399E-05	7/1/2009 0:00	1	1A	15	36	1980	132.000	0.6303	0.00600	0.312	500	7/2/2009 5:40	7/2/2009 8:39	1.000	0.713	1.014	100.83%	1.00%	1 *
2	1201245713.1	1.0000	2.0399E-05	7/1/2009 0:00	2	1B	15	27	1959	130.600	0.6282	0.00409	0.342	500	7/2/2009 5:40	7/2/2009 8:40	1.000	0.712	1.014	108.20%	1.00%	2 *
3	1201245714.1	1.0000	2.0399E-05	7/1/2009 0:00	3	1C	15	44	2108	140.533	0.6176	0.00344	0.716	500	7/2/2009 5:40	7/2/2009 8:40	1.000	0.712	1.014	114.22%	1.00%	3 *
4	1201245715.1	1.0000	2.0399E-05	7/1/2009 0:00	4	1D	15	108	2265	151.000	0.6043	0.00511	0.524	500	7/2/2009 5:40	7/2/2009 8:40	1.000	0.712	1.014	120.58%	1.00%	4 *
5	1201245716.1	1.0000	2.0399E-05	7/1/2009 0:00	5	2A	15	69	1838	122.533	0.6172	0.00349	0.450	500	7/2/2009 5:40	7/2/2009 8:40	1.000	0.712	1.014	105.84%	1.00%	5 *
6	1201245717.1	1.0000	2.0399E-05	7/1/2009 0:00	6	2B	15	8	2053	136.867	0.6167	0.00383	1.428	500	7/2/2009 5:40	7/2/2009 8:40	1.000	0.712	1.014	102.70%	1.00%	6 *
7	1201245718.1	1.0000	2.0399E-05	7/1/2009 0:00	7	2C	15	96	1982	132.133	0.5969	0.00575	0.334	500	7/2/2009 5:40	7/2/2009 8:40	1.000	0.711	1.014	112.82%	1.00%	7 *
8	1201245719.1	1.0000	2.0399E-05	7/1/2009 0:00	8	2D	15	93	1984	132.267	0.6119	0.00479	0.378	500	7/2/2009 5:40	7/2/2009 9:08	1.000	0.676	1.014	111.91%	1.00%	8 *
9	1201245720.1	1.0000	2.0399E-05	7/1/2009 0:00	9	3A	15	233	1645	109.667	0.5682	0.00943	0.762	500	7/2/2009 5:40	7/2/2009 9:08	1.000	0.675	1.014	100.83%	1.00%	9 *
10	1201245721.1	1.0000	2.0399E-05	7/1/2009 0:00	10	3B	15	99	1821	121.400	0.5980	0.00655	1.710	500	7/2/2009 5:40	7/2/2009 9:08	1.000	0.675	1.014	108.20%	1.00%	10 *
11	1201245722.1	1.0000	2.0399E-05	7/1/2009 0:00	11	3C	15	96	1942	129.467	0.6164	0.00535	0.822	500	7/2/2009 5:40	7/2/2009 9:08	1.000	0.675	1.014	114.22%	1.00%	11 *
12	1201245723.1	1.0000	2.0399E-05	7/1/2009 0:00	12	3D	15	90	2076	138.400	0.5994	0.00464	0.630	500	7/2/2009 5:40	7/2/2009 9:08	1.000	0.675	1.014	120.58%	1.00%	12 *
13	1201245724.1	1.0000	2.0399E-05	7/1/2009 0:00	13	4A	15	79	1877	125.133	0.6208	0.00744	0.890	500	7/2/2009 5:40	7/2/2009 9:08	1.000	0.675	1.014	105.84%	1.00%	13 *
14	1201245725.1	1.0000	2.0399E-05	7/1/2009 0:00	14	4B	15	13	1909	127.267	0.6205	0.00196	1.838	500	7/2/2009 5:40	7/2/2009 9:08	1.000	0.675	1.014	102.70%	1.00%	14 *
15	1201245726.1	1.0000	2.0399E-05	7/1/2009 0:00	15	4C	15	97	1974	131.600	0.6052	0.00426	1.260	500	7/2/2009 5:40	7/2/2009 9:09	1.000	0.674	1.014	112.82%	1.00%	15 *
16	1201245727.1	1.0000	2.0399E-05	7/1/2009 0:00	16	4D	15	181	1880	125.333	0.5873	0.00816	1.070	500	7/2/2009 5:40	7/2/2009 9:25	1.000	0.654	1.014	111.91%	1.00%	16 *
17	1201245728.1	1.0000	2.0399E-05	7/1/2009 0:00	17	5A	15	53	1818	121.200	0.6258	0.00816	0.496	500	7/2/2009 5:40	7/2/2009 9:26	1.000	0.653	1.014	100.83%	1.00%	17 *
18	1201245729.1	1.0000	2.0399E-05	7/1/2009 0:00	18	5B	15	59	1785	119.000	0.6280	0.00816	1.050	500	7/2/2009 5:40	7/2/2009 9:26	1.000	0.653	1.014	108.20%	1.00%	18 *
19	1201245730.1	1.0000	2.0399E-05	7/1/2009 0:00	19	5C	15	43	2009	133.933	0.6368	0.00816	0.946	500	7/2/2009 5:40	7/2/2009 9:26	1.000	0.653	1.014	114.22%	1.00%	19 *
20	1201245731.1	1.0000	2.0399E-05	7/1/2009 0:00	20	5D	15	59	2107	140.467	0.6237	0.00816	1.248	500	7/2/2009 5:40	7/2/2009 9:26	1.000	0.652	1.014	120.58%	1.00%	20 *
21	1201245732.1	1.0000	2.0399E-05	7/1/2009 0:00	21	6A	15	35	1800	120.000	0.6221	0.00816	1.004	500	7/2/2009 5:40	7/2/2009 9:27	1.000	0.652	1.014	105.84%	1.00%	21 *
22	1201245733.1	1.0000	2.0399E-05	7/1/2009 0:00	22	6B	15	71	1816	121.067	0.6163	0.00816	0.764	500	7/2/2009 5:40	7/2/2009 9:27	1.000	0.651	1.014	102.70%	1.00%	22 *
23	1201245734.1	1.0000	2.0399E-05	7/1/2009 0:00	23	6C	15	81	1933	128.867	0.6111	0.00816	1.836	500	7/2/2009 5:40	7/2/2009 9:27	1.000	0.651	1.014	112.82%	1.00%	23 *
24	1201245735.1	1.0000	2.0399E-05	7/1/2009 0:00	24	6D	15	81	1826	121.733	0.6120	0.00816	0.362	500	7/2/2009 5:40	7/2/2009 9:47	1.000	0.627	1.014	111.91%	1.00%	24 *
25	1201245736.1	1.0000	2.0399E-05	7/1/2009 0:00	25	7A	15	75	1711	114.067	0.6180	0.00816	0.344	500	7/2/2009 5:40	7/2/2009 9:48	1.000	0.627	1.014	100.83%	1.00%	25 *
26	1201245737.1	1.0000	2.0399E-05	7/1/2009 0:00	26	7B	15	59	1783	118.867	0.6280	0.00816	0.378	500	7/2/2009 5:40	7/2/2009 9:48	1.000	0.627	1.014	108.20%	1.00%	26 *
27	1201245738.1	1.0000	2.0399E-05	7/1/2009 0:00	27	7C	15	74	1934	128.933	0.6178	0.00816	0.302	500	7/2/2009 5:40	7/2/2009 9:48	1.000	0.627	1.014	114.22%	1.00%	27 *
28	1201245739.1	1.0000	2.0399E-05	7/1/2009 0:00	28	7D	15	83	1963	130.867	0.6257	0.00816	0.396	500	7/2/2009 5:40	7/2/2009 9:48	1.000	0.627	1.014	120.58%	1.00%	28 *
29	1201245740.1	1.0000	2.0399E-05	7/1/2009 0:00	29	8A	15	49	1653	110.200	0.6247	0.00816	0.788	500	7/2/2009 5:40	7/2/2009 9:48	1.000	0.626	1.014	105.84%	1.00%	29 *
30	1201245741.1	1.0000	2.0399E-05	7/1/2009 0:00	30	8B	15	20	1788	119.200	0.6332	0.00816	1.946	500	7/2/2009 5:40	7/2/2009 9:48	1.000	0.626	1.014	102.70%	1.00%	30 *
31	1201245742.1	1.0000	2.0399E-05	7/1/2009 0:00	31	8C	15	34	1920	128.000	0.6339	0.00816	0.676	500	7/2/2009 5:40	7/2/2009 9:48	1.000	0.626	1.014	112.82%	1.00%	31 *
32	1201245743.1	1.0000	2.0399E-05	7/1/2009 0:00	32	8D	15	45	1782	118.800	0.6281	0.00816	1.312	500	7/2/2009 5:40	7/2/2009 10:07	1.000	0.604	1.014	111.91%	1.00%	32 *
33	1201490021.1	1.0000	2.0399E-05	7/1/2009 0:00	33	9A	15	17	1689	112.600	0.6496	0.00816	0.380	500	7/2/2009 5:40	7/2/2009 10:06	1.000	0.605	1.014	100.83%	1.00%	33 *
34	1201490022.1	1.0000	2.0399E-05	7/1/2009 0:00	34	9B	15	13	1706	113.733	0.6356	0.00816	1.206	500	7/2/2009 5:40	7/2/2009 10:06	1.000	0.605	1.014	108.20%	1.00%	34 *
35	1201490023.1	1.0000	2.0399E-05	7/1/2009 0:00	35	9C	15	13	1802	120.133	0.6273	0.00816	0.370	500	7/2/2009 5:40	7/2/2009 10:06	1.000	0.605	1.014	114.22%	1.00%	35 *
36	1201490024.1	1.0000	2.0399E-05	7/1/2009 0:00	36	9D	15	15	1945	129.667	0.6433	0.00816	1.292	500	7/2/2009 5:40	7/2/2009 10:06	1.000	0.605	1.014	120.58%	1.00%	36 *
37	1201490025.1	1.0000	2.0399E-05	7/1/2009 0:00	37	10A	15	10	1708	113.867	0.6389	0.00816	0.316	500	7/2/2009 5:40	7/2/2009 10:07	1.000	0.604	1.014	105.84%	1.00%	37 *
38	1201490026.1	1.0000	2.0399E-05	7/1/2009 0:00	38	10B	15	19	1743	116.200	0.6137	0.00816	6.596	500	7/2/2009 5:40	7/2/2009 10:07	1.000	0.604	1.014	102.70%	1.00%	38 *
39	1201490027.1	1.0000	2.0399E-05	7/1/2009 0:00	39	10C	15	15	1826	121.733	0.6250	0.00816	0.324	500	7/2/2009 5:40	7/2/2009 10:07	1.000	0.604	1.014	112.82%	1.00%	39 *
40	1201490028.1	1.0000	2.0399E-05	7/1/2009 0:00	40	10D	15	14	1769	117.933	0.6320	0.00816	0.348	500	7/2/2009 5:40	7/2/2009 10:22	1.000	0.587	1.014	111.91%	1.00%	40 *
41	1201245736.1	1.0000	2.0399E-05	7/1/2009 0:00	41	11A	15	19	2125	141.667	0.5825	0.00816	0.344	500	7/2/2009 5:40	7/2/2009 7:26	1.000	0.819	1.014	100.83%	1.00%	41 *
42	1201245737.1	1.0000	2.0399E-05	7/1/2009 0:00	42	11B	15	22	2260	150.667	0.6372	0.00816	0.378	500	7/2/2009 5:40	7/2/2009 7:26	1.000	0.819	1.014	108.20%	1.00%	42 *
43	1201245738.1	1.0000	2.0399E-05	7/1/2009 0:00	43	11C	15	13	2544	169.600	0.6352	0.00816	0.302	500	7/2/2009 5:40	7/2/2009 7:26	1.000	0.819	1.014	114.22%	1.00%	43 *
44	1201245739.1	1.0000	2.0399E-05	7/1/2009 0:00	44	11D	15	14	2596	173.067	0.6348	0.00816	0.396	500	7/2/2009 5:40	7/2/2009 7:26	1.000	0.819	1.014	120.58%	1.00%	44 *
45	1201245740.1	1.0000	2.0399E-05	7/1/2009 0:00	45	12A	15	17	2235	149.000	0.6286	0.00816	0.788	500	7/2/2009 5:40	7/2/2009 7:26	1.000	0.818	1.014	105.84%	1.00%	45 *
46	1201245741.1	1.0000	2.0399E-05	7/1/2009 0:00	46	12B	15	10	2330	155.333	0.6352	0.00816	1.946	500	7/2/2009 5:40	7/2/2009 7:26	1.000	0.818	1.014	102.70%	1.00%	46 *
47	1201245742.1	1.0000	2.0399E-05	7/1/2009 0:00	47	12C	15	16	2530	168.667	0.6304	0.00816	0.676	500	7/2/2009 5:40	7/2/2009 7:26	1.000	0.818	1.014	112.82%	1.00%	47 *
48	1201245743.1	1.0000	2.0399E-05	7/1/2009 0:00	48	12D	15	10	2463	164.200	0.6320	0.00816	1.312	500	7/2/2009 5:40	7/2/2009 7:26	1.000	0.818	1.014	111.91%	1.00%	48 *
49	1201490021.1	1.0000	2.0399E-05	7/1/2009 0:00	49	13A	15	11	2231	148.733	0.6410	0.00816	0.380	500	7/2/2009 5:40	7/2/2009 7:49	1.000	0.783	1.014	100.83%	1.00%	49 *
50	1201490022.1	1.0000	2.0399E-05	7/1/2009 0:00	50	13B	15	13	2190	146.000	0.6526	0.00816	1.206	500	7/2/2009 5:40	7/2/2009 7:49	1.000	0.783	1.014	108.20%	1.00%	50 *
51	1201490023.1	1.0000	2.0399E-05	7/1/2009 0:00	51	13C	15	11	2458	163.867	0.6538	0.00816	0.370	500	7/2/2009 5:40	7/2/2009 7:49	1.000	0.783	1.014	114.22%	1.00%	51 *
52	1201490024.1	1.0000	2.0399E-05	7/1/2009 0:00	52	13D	15	12	2635	175.667	0.6377	0.00816	1.292	500	7/2/2009 5:40	7/2/2009 7:50	1.000	0.783	1.014	120.58%	1.00%	52 *
53	1201490025.1	1.0000	2.0399E-05	7/1/2009 0:00	53	14A	15	11	2173	144.867	0.6393	0.00816	0.316	500	7/2/2009 5:40	7/2/2009 7:50	1.000	0.783	1.014	105.84%	1.00%	53 *
54	1201490026.1	1.0000	2.0399E-05	7/1/2009 0:00	54	14B	15	11	2281	152.067	0.6266	0.00816	6.596	500	7/2/2009 5:40	7/2/2009 7:50	1.000	0.782	1.014	102.70%	1.00%	54 *
55	1201490027.1	1.0000	2.0399E-05	7/1/2009 0:00	55	14C	15	14	2323	154.867	0.6375	0.00816	0.324	500	7/2/2009 5:40	7/2/2009 7:50	1.000	0.782	1.014	112.82%	1.00%	55 *
56	1201490028.1	1.0000	2.0399E-05	7/1/2009 0:00	56	14D	15	14	2388	159.200	0.6326	0.00816	0.348	500	7/2/2009 5:40	7/2/2009 7:50	1.000	0.782	1.014	111.91%	1.00%	56 *

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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 Nominals are decay corrected to Sample Date/Time

* indicates results calculated at 100% recovery

s 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 Counting Uncertainty pCi/L	2 SIGMA Total Prop. Uncertainty pCi/L	Sample Type	Nominal pCi/L	Recovery
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%
0.5369	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	0.8753	**159.8328**	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	122.0833	2.8583	5.8279	20.5368	LCS	164.3409	77.3%
0.7599	0.5365	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	0.2930	1	0.8072	**145.8192**	0.0251	131.8887	2.9696	6.4352	23.5274	LCS	164.3409	88.7%
0.6347	0.4481	1	1.1343	**129.6854**	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	2.8886	6.1761	21.9739	LCS	164.3409	82.5%
0.9036	0.6379	1	1.4942	**136.9155**	0.0254	125.4287	2.9134	6.2333	22.1127	LCS	164.3409	83.3%
0.7676	0.5419	1	1.3079	**145.9626**	0.0252	130.3400	2.9624	6.5032	23.5621	LCS	164.3409	88.8%
0.7520	0.5309	1	1.3000	**147.9661**	0.0266	124.2633	2.8910	6.7471	24.0105	LCS	164.3409	90.0%
0.4809	0.3395	1	0.9027	**134.9911**	0.0269	120.7040	2.8427	6.2312	21.9265	LCS	164.3409	82.1%
0.6974	0.4924	1	1.2076	**131.4742**	0.0271	117.9500	2.8170	6.1544	21.3797	LCS	164.3409	80.0%
0.6530	0.4610	1	1.1419	**148.2299**	0.0259	132.9873	2.9884	6.4406	23.6659	LCS	164.3409	89.0%
0.7661	0.5409	1	1.3064	**156.3706**	0.0255	139.2187	3.0605	6.7377	25.2668	LCS	164.3409	95.2%
0.6899	0.4871	1	1.1997	**134.1883**	0.0270	118.9960	2.8288	6.2523	21.8127	LCS	164.3409	81.7%
0.6079	0.4292	1	1.0862	**137.0396**	0.0269	120.3027	2.8412	6.3436	22.2643	LCS	164.3409	83.4%
0.9509	0.6713	1	1.5725	**146.0056**	0.0264	127.0307	2.9317	6.6044	23.6775	LCS	164.3409	88.8%
0.4376	0.3090	1	0.8562	**144.5849**	0.0268	121.3713	2.8489	6.6518	23.4785	LCS	164.3409	88.0%
0.4227	0.2984	1	0.8330	**134.2390**	0.0275	113.7227	2.7577	6.3803	21.8573	LCS	164.3409	81.7%
0.4360	0.3079	1	0.8480	**137.6373**	0.0270	118.4887	2.8152	6.4094	22.3723	LCS	164.3409	83.8%
0.3962	0.2797	1	0.7956	**151.8935**	0.0262	128.6313	2.9319	6.7858	24.6088	LCS	164.3409	92.4%
0.4480	0.3163	1	0.8657	**152.1131**	0.0261	130.4707	2.9539	6.7499	24.6318	LCS	164.3409	92.6%
0.6332	0.4470	1	1.1278	**127.8251**	0.0279	109.4120	2.7108	6.2072	20.8518	LCS	164.3409	77.8%
0.9817	0.6931	1	1.6167	**135.1471**	0.0273	117.2540	2.8197	6.3699	21.9896	LCS	164.3409	82.2%
0.5779	0.4080	1	1.0463	**146.5864**	0.0263	127.3240	2.9214	6.5922	23.7610	LCS	164.3409	89.2%
0.8422	0.5946	1	1.4301	**141.4935**	0.0272	117.4880	2.8147	6.6441	23.0149	LCS	164.3409	86.1%
0.4379	0.3091	1	0.8509	**130.5505**	0.0276	112.2200	2.7400	6.2476	21.2692	LCS	164.3409	79.4%
0.7972	0.5629	1	1.3635	**133.7974**	0.0277	112.5273	2.7540	6.4182	21.8026	LCS	164.3409	81.4%
0.4475	0.3159	1	0.8728	**144.2924**	0.0269	119.7633	2.8301	6.6832	23.4437	LCS	164.3409	87.8%
0.8154	0.5757	1	1.3863	**150.8313**	0.0263	128.3747	2.9406	6.7718	24.4459	LCS	164.3409	91.8%
0.4063	0.2868	1	0.8104	**134.4151**	0.0275	113.5507	2.7553	6.3927	21.8871	LCS	164.3409	81.8%
1.9322	1.3641	1	2.9747	**135.0540**	0.0285	109.6040	2.7857	6.7277	22.0820	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	0.3132	1	0.8728	**144.8386**	0.0271	117.5853	2.8041	6.7699	23.5500	LCS	164.3409	88.1%
0.3432	0.2423	1	0.6763	**135.4549**	0.0253	141.3227	3.0733	5.7736	21.8705	LCS	164.3409	82.4%
0.3289	0.2322	1	0.6397	**131.6931**	0.0247	150.2887	3.1694	5.4434	21.2189	LCS	164.3409	80.1%
0.2949	0.2082	1	0.5922	**148.8038**	0.0237	169.2980	3.3626	5.7929	23.8866	LCS	164.3409	90.5%
0.3379	0.2385	1	0.6530	**151.8473**	0.0235	172.6707	3.3968	5.8549	24.3615	LCS	164.3409	92.4%
0.4816	0.3400	1	0.8577	**131.6889**	0.0249	148.2120	3.1520	5.4891	21.2301	LCS	164.3409	80.1%
0.7488	0.5287	1	1.2332	**134.8566**	0.0246	153.3873	3.2186	5.5463	21.7215	LCS	164.3409	82.1%
0.4447	0.3140	1	0.8052	**148.8317**	0.0238	167.9907	3.3535	5.8232	23.8982	LCS	164.3409	90.6%
0.6180	0.4363	1	1.0494	**143.9479**	0.0241	162.8880	3.3090	5.7315	23.1384	LCS	164.3409	87.6%
0.3427	0.2420	1	0.6660	**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	5.4697	20.8960	LCS	164.3409	78.8%
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	21.9070	LCS	164.3409	82.5%
0.3185	0.2249	1	0.6330	**141.6298**	0.0245	154.5427	3.2133	5.7718	22.7990	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%

7/2/09

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

7/21/09

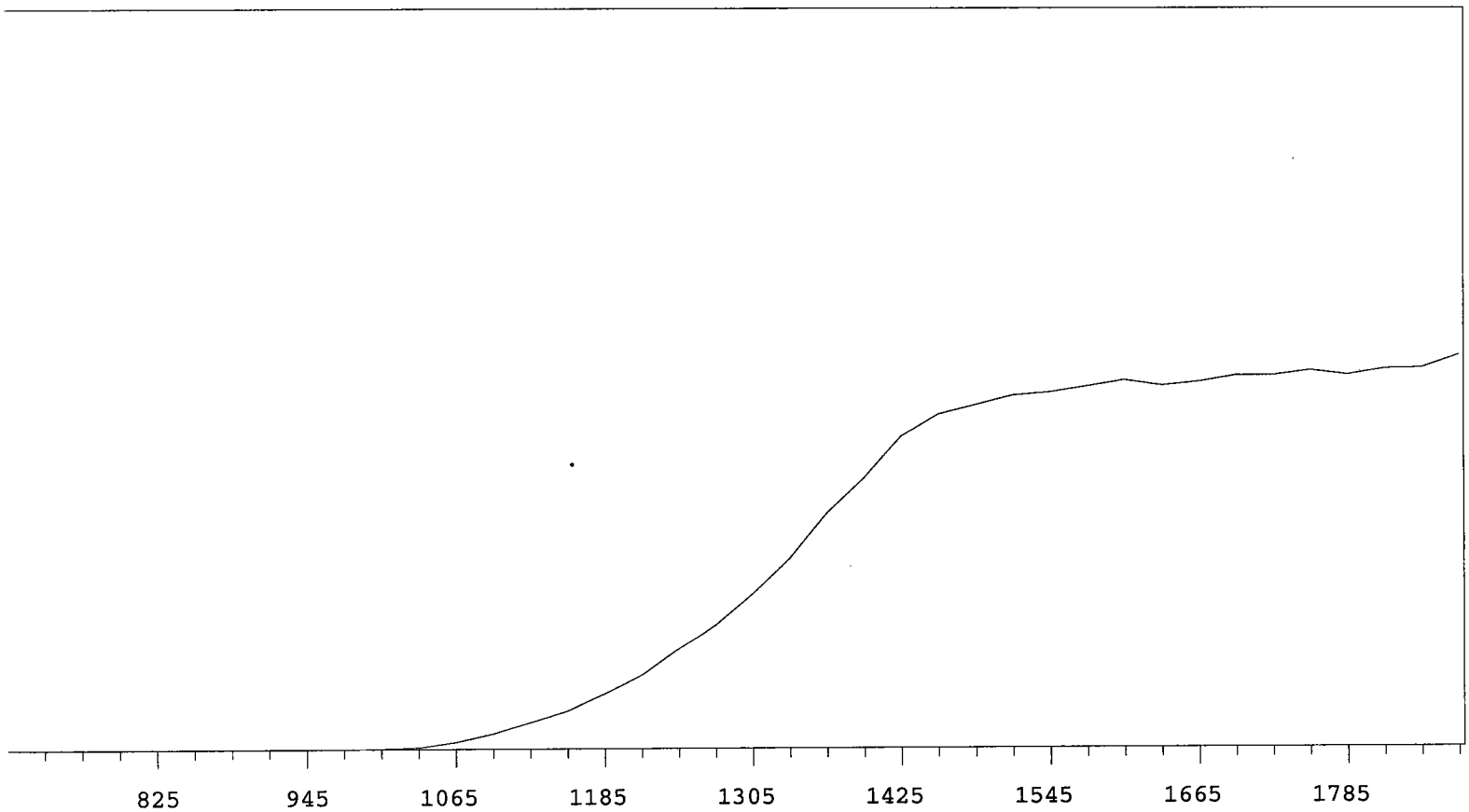
4	13D	15	12	2635	7/2/2009 7:50	7/2/2009 8:05	Protean
5	14A	15	11	2173	7/2/2009 7:50	7/2/2009 8:05	Protean
6	14B	15	11	2281	7/2/2009 7:50	7/2/2009 8:05	Protean
7	14C	15	14	2323	7/2/2009 7:50	7/2/2009 8:05	Protean
8	14D	15	14	2388	7/2/2009 7:50	7/2/2009 8:05	Protean

Ra-228	Cal Date	7/2/2009	Exp Date	7/31/2009	
Protean	A0	A1	A2	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

MPC 9600 Plateau Instrument 1 MPC 9604 Detector A 7/1/2009

Alpha Volts: 1575 Beta Volts: 1575

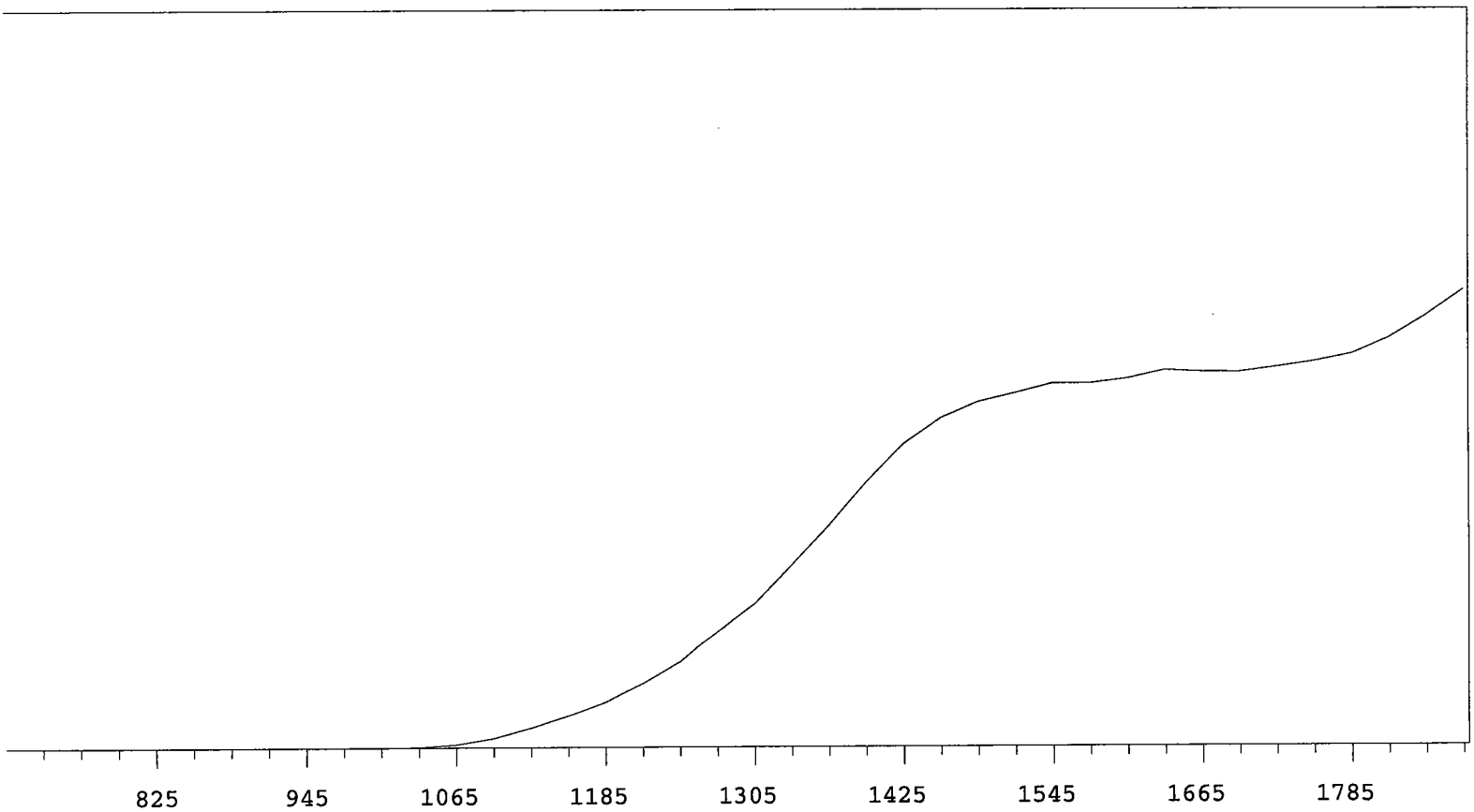


VOLTS	COUNTS	%/100 Volts
705	1	
735	1	
765	0	
795	0	+0.00
825	0	>100
855	1	>100
885	0	+55.56
915	2	+66.67
945	0	>100
975	2	>100
1005	42	>100
1035	145	>100
1065	544	>100
1095	1136	>100
1125	1967	>100
1155	2845	>100
1185	4078	>100
1215	5483	+93.18
1245	7400	+83.35
1275	9328	+75.40

VOLTS	COUNTS	%/100 Volts
1305	11640	+69.78
1335	14241	+62.88
1365	17534	+55.91
1395	20127	+45.04
1425	23254	+31.29
1455	24902	+20.41
1485	25605	+10.49
1515	26310	+6.44
1545	26535	+5.31
1575	26953	+2.79
1605	27399	+1.83
1635	27000	+1.71
1665	27255	+1.62
1695	27723	+3.14
1725	27705	+1.56
1755	28072	+1.15
1785	27729	+1.43
1815	28194	+3.24
1845	28243	
1875	29191	

MPC 9600 Plateau Instrument 1 MPC 9604 Detector B 7/1/2009

Alpha Volts: 1575 Beta Volts: 1575

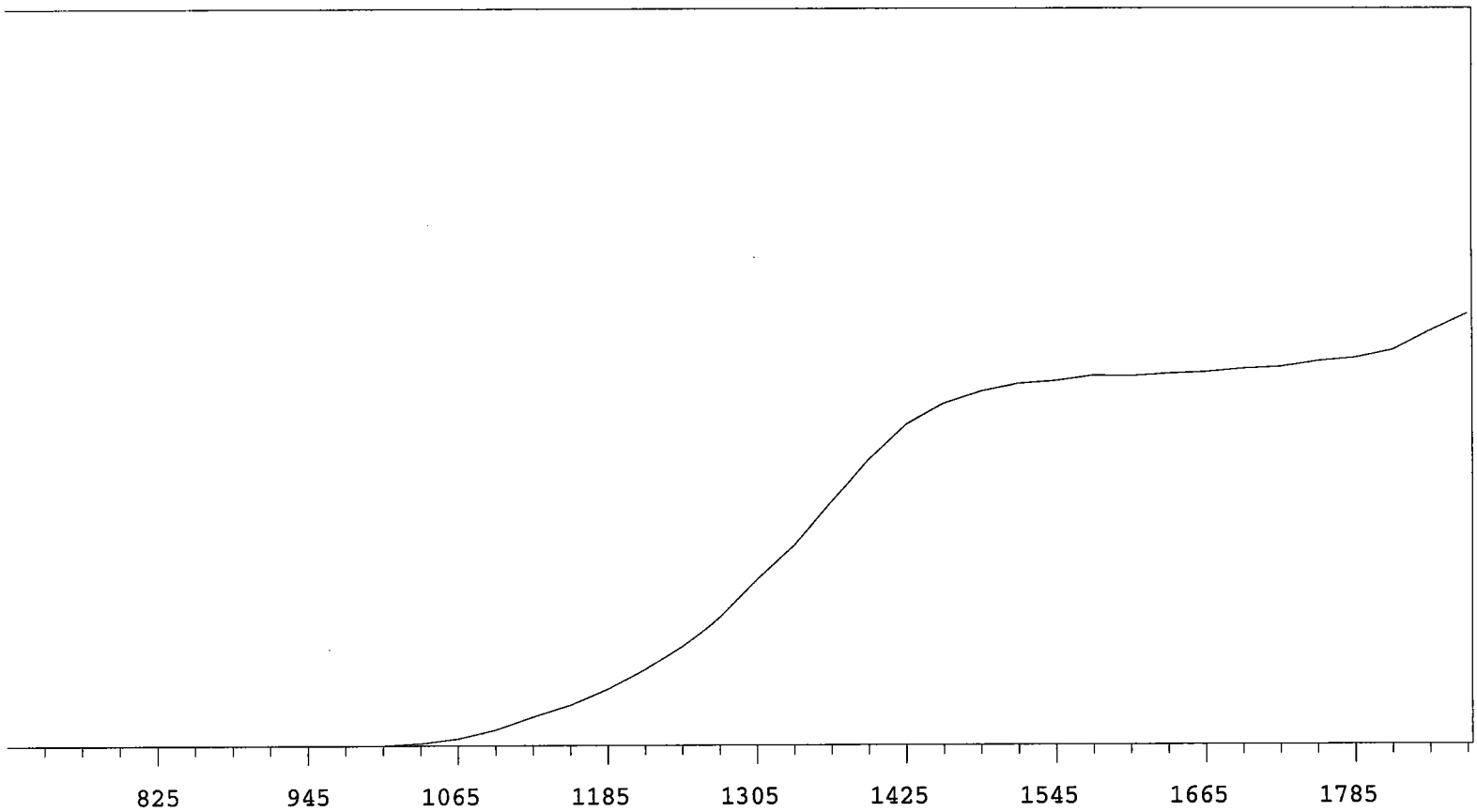


VOLTS	COUNTS	%/100 Volts
705	1	
735	0	
765	0	+55.56
795	1	+83.33
825	1	+55.56
855	0	>100
885	1	+0.00
915	0	+0.00
945	1	>100
975	0	>100
1005	4	>100
1035	56	>100
1065	292	>100
1095	890	>100
1125	1841	>100
1155	2936	>100
1185	4179	>100
1215	5837	>100
1245	7821	+91.28
1275	10638	+83.88

VOLTS	COUNTS	%/100 Volts
1305	13188	+75.92
1335	16818	+67.60
1365	20420	+59.86
1395	24341	+47.85
1425	27854	+35.51
1455	30288	+23.26
1485	31798	+14.54
1515	32622	+8.32
1545	33496	+5.11
1575	33475	+4.43
1605	33903	+3.09
1635	34654	+2.46
1665	34485	+1.74
1695	34445	+1.84
1725	34908	+3.91
1755	35401	+6.80
1785	36062	+10.27
1815	37505	+14.30
1845	39508	
1875	41843	

MPC 9600 Plateau Instrument 1 MPC 9604 Detector C 7/1/2009

Alpha Volts: 1575 Beta Volts: 1575

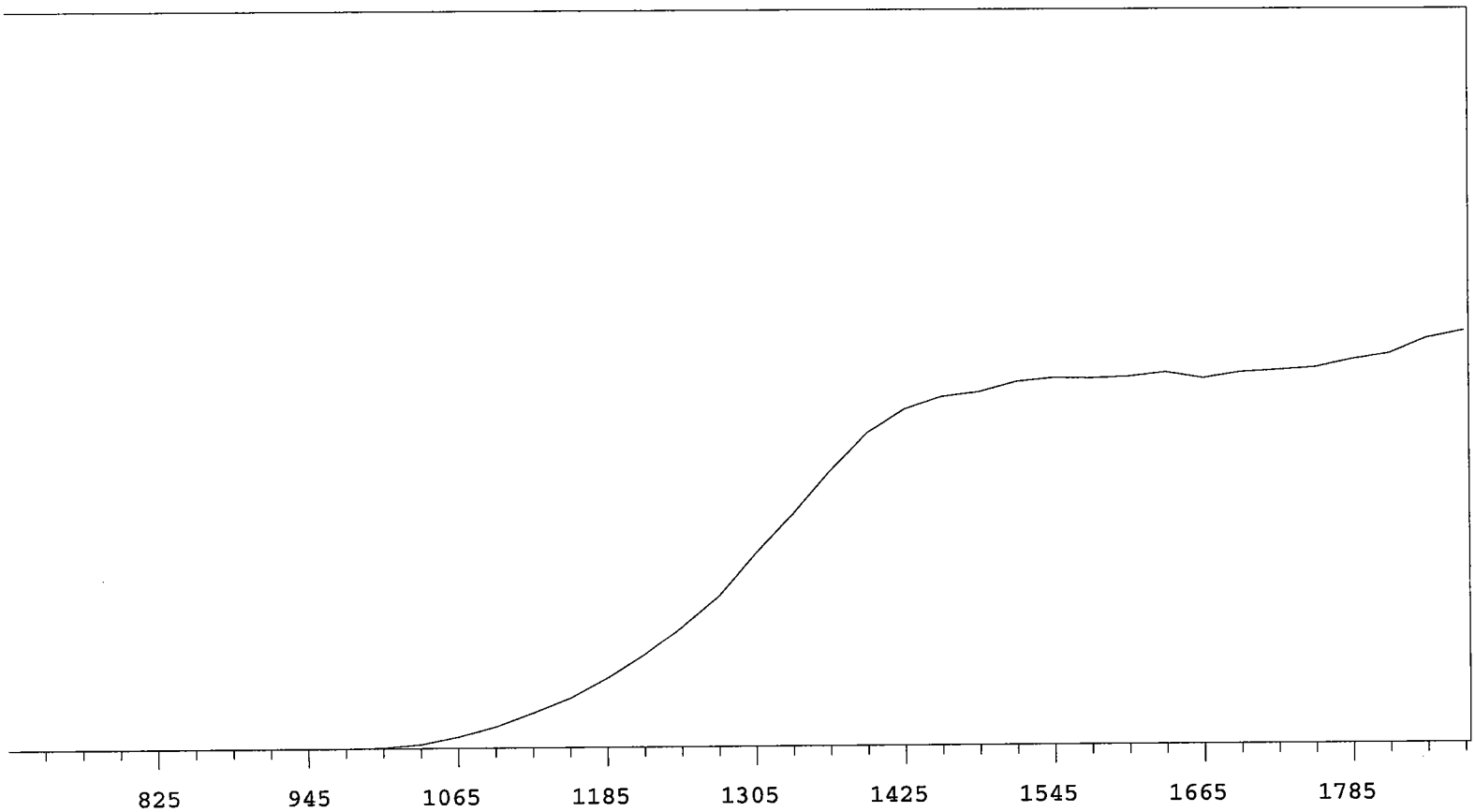


VOLTS	COUNTS	%/100 Volts
705	1	
735	0	
765	1	+0.00
795	0	>100
825	1	-55.56
855	1	+55.56
885	0	>100
915	1	>100
945	0	>100
975	4	>100
1005	32	>100
1035	206	>100
1065	639	>100
1095	1416	>100
1125	2551	>100
1155	3619	>100
1185	5037	+98.68
1215	6875	+91.19
1245	8915	+85.53
1275	11519	+77.28

VOLTS	COUNTS	%/100 Volts
1305	14817	+71.06
1335	17823	+63.34
1365	21704	+53.63
1395	25422	+42.55
1425	28424	+29.21
1455	30244	+18.11
1485	31305	+10.10
1515	31989	+6.07
1545	32223	+3.43
1575	32671	+2.15
1605	32621	+1.68
1635	32837	+1.52
1665	32961	+2.01
1695	33249	+2.64
1725	33409	+3.21
1755	33931	+4.07
1785	34234	+7.20
1815	34909	+10.28
1845	36660	
1875	38205	

MPC 9600 Plateau Instrument 1 MPC 9604 Detector D 7/1/2009

Alpha Volts: 1575 Beta Volts: 1575

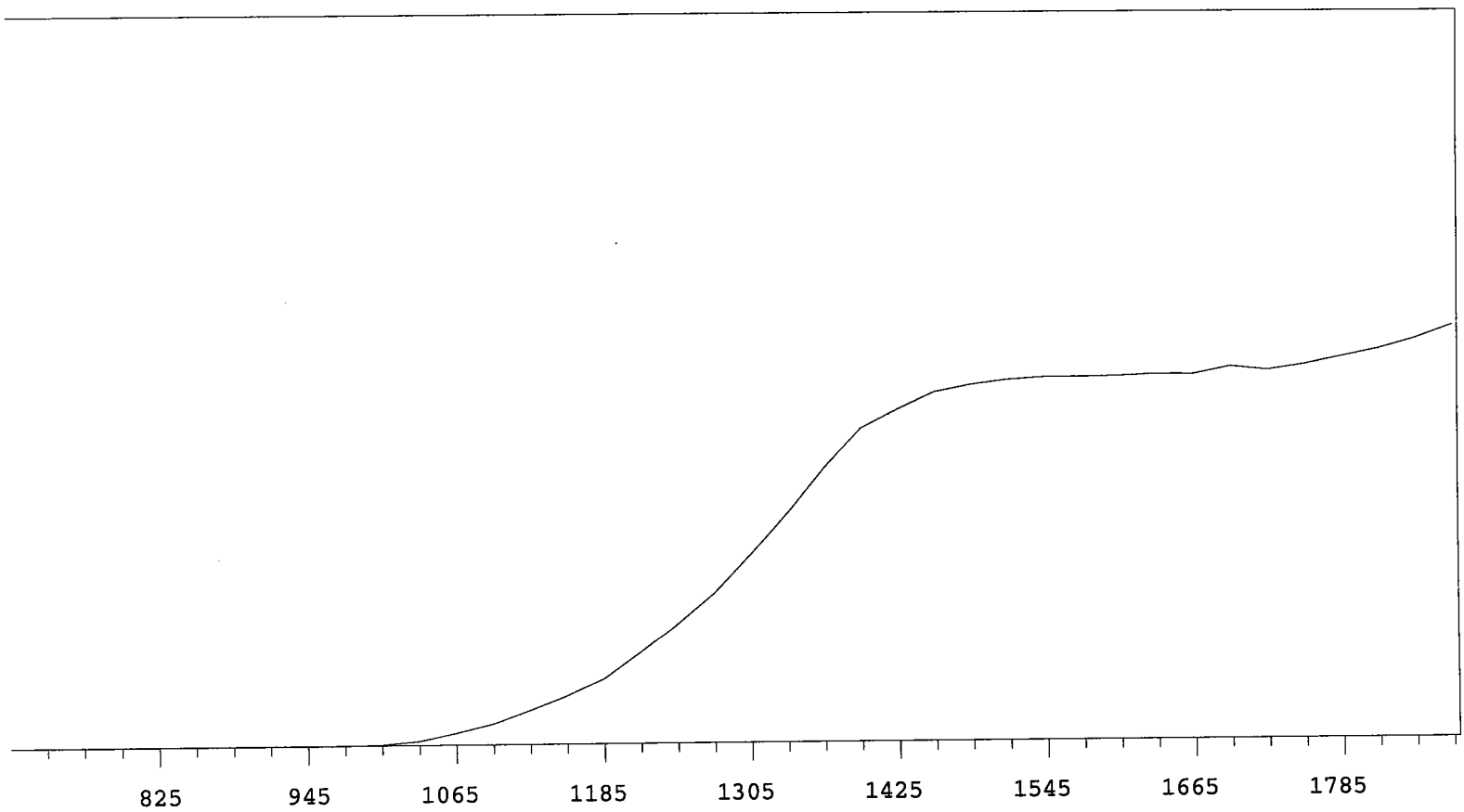


VOLTS	COUNTS	%/100 Volts
705	0	
735	1	
765	0	+0.00
795	1	+0.00
825	0	+0.00
855	1	>100
885	0	>100
915	0	>100
945	0	>100
975	8	>100
1005	75	>100
1035	303	>100
1065	872	>100
1095	1656	>100
1125	2729	>100
1155	3862	>100
1185	5425	+98.19
1215	7256	+88.82
1245	9510	+81.89
1275	11944	+74.07

VOLTS	COUNTS	%/100 Volts
1305	15202	+66.36
1335	18216	+57.86
1365	21597	+45.58
1395	24648	+32.96
1425	26505	+19.92
1455	27475	+11.42
1485	27836	+7.08
1515	28609	+4.51
1545	28896	+2.93
1575	28862	+1.66
1605	28969	+0.36
1635	29292	+0.80
1665	28836	+1.06
1695	29279	+1.48
1725	29439	+3.59
1755	29642	+4.07
1785	30243	+6.51
1815	30699	+7.79
1845	31876	
1875	32444	

MPC 9600 Plateau Instrument 2 MPC 9604 Detector A 7/1/2009

Alpha Volts: 705 Beta Volts: 1575

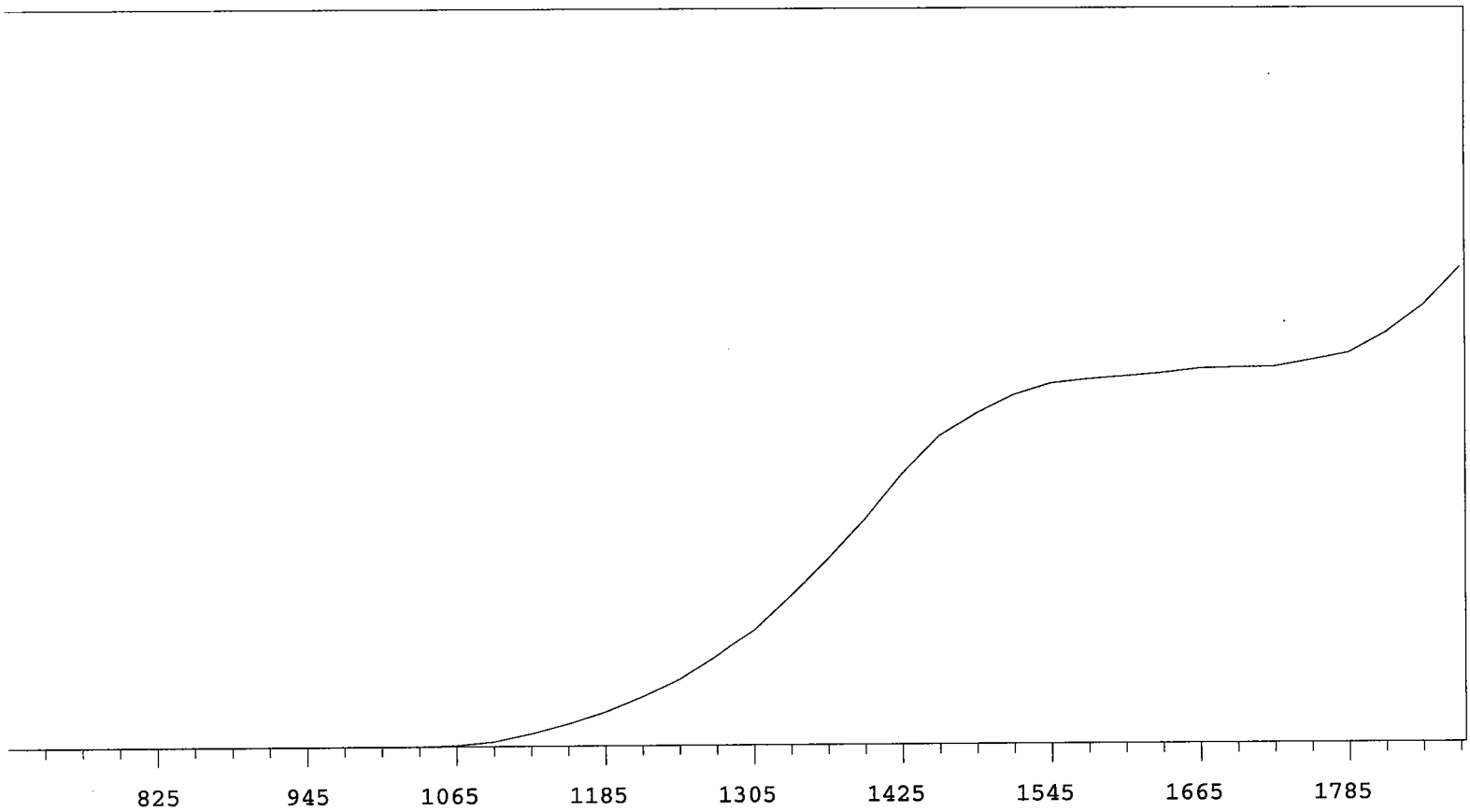


VOLTS	COUNTS	%/100 Volts
705	0	
735	1	
765	0	+83.33
795	0	-83.33
825	1	>100
855	0	>100
885	1	+100.00
915	1	>100
945	2	>100
975	12	>100
1005	91	>100
1035	421	>100
1065	1239	>100
1095	2155	>100
1125	3527	>100
1155	4974	>100
1185	6647	+97.44
1215	9250	+89.00
1245	12041	+82.15
1275	15094	+73.81

VOLTS	COUNTS	%/100 Volts
1305	19017	+67.45
1335	23157	+59.23
1365	27625	+45.78
1395	31465	+32.72
1425	33352	+20.41
1455	35084	+11.74
1485	35819	+7.11
1515	36292	+3.35
1545	36527	+1.63
1575	36540	+0.87
1605	36585	+0.48
1635	36742	+1.76
1665	36691	+1.53
1695	37461	+1.89
1725	37073	+3.07
1755	37603	+4.02
1785	38346	+6.58
1815	39111	+7.95
1845	40115	
1875	41409	

MPC 9600 Plateau Instrument 2 MPC 9604 Detector B 7/1/2009

Alpha Volts: 705 Beta Volts: 1575

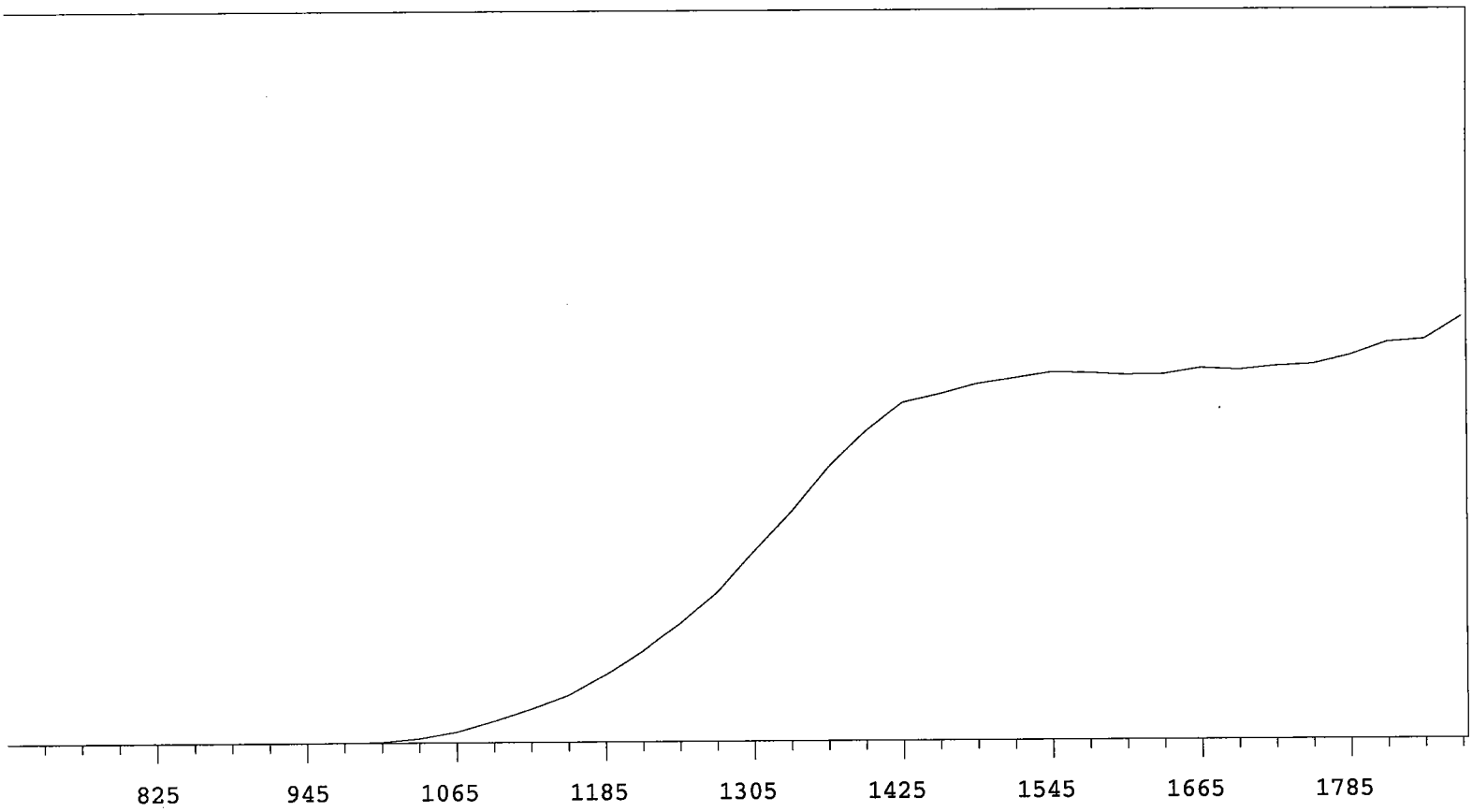


VOLTS	COUNTS	%/100 Volts
705	0	
735	1	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	1	>100
975	2	>100
1005	3	>100
1035	14	>100
1065	127	>100
1095	500	>100
1125	1332	>100
1155	2373	>100
1185	3614	>100
1215	5227	>100
1245	7060	+97.33
1275	9574	+90.30

VOLTS	COUNTS	%/100 Volts
1305	12541	+83.18
1335	16192	+74.48
1365	20083	+67.17
1395	24273	+58.43
1425	29090	+46.86
1455	33223	+34.56
1485	35608	+22.67
1515	37581	+13.63
1545	38762	+8.18
1575	39185	+4.42
1605	39484	+3.06
1635	39806	+2.61
1665	40264	+2.03
1695	40353	+2.32
1725	40431	+3.28
1755	41127	+7.09
1785	41882	+12.40
1815	44049	+18.52
1845	46950	
1875	51097	

MPC 9600 Plateau Instrument 2 MPC 9604 Detector C 7/1/2009

Alpha Volts: 705 Beta Volts: 1575

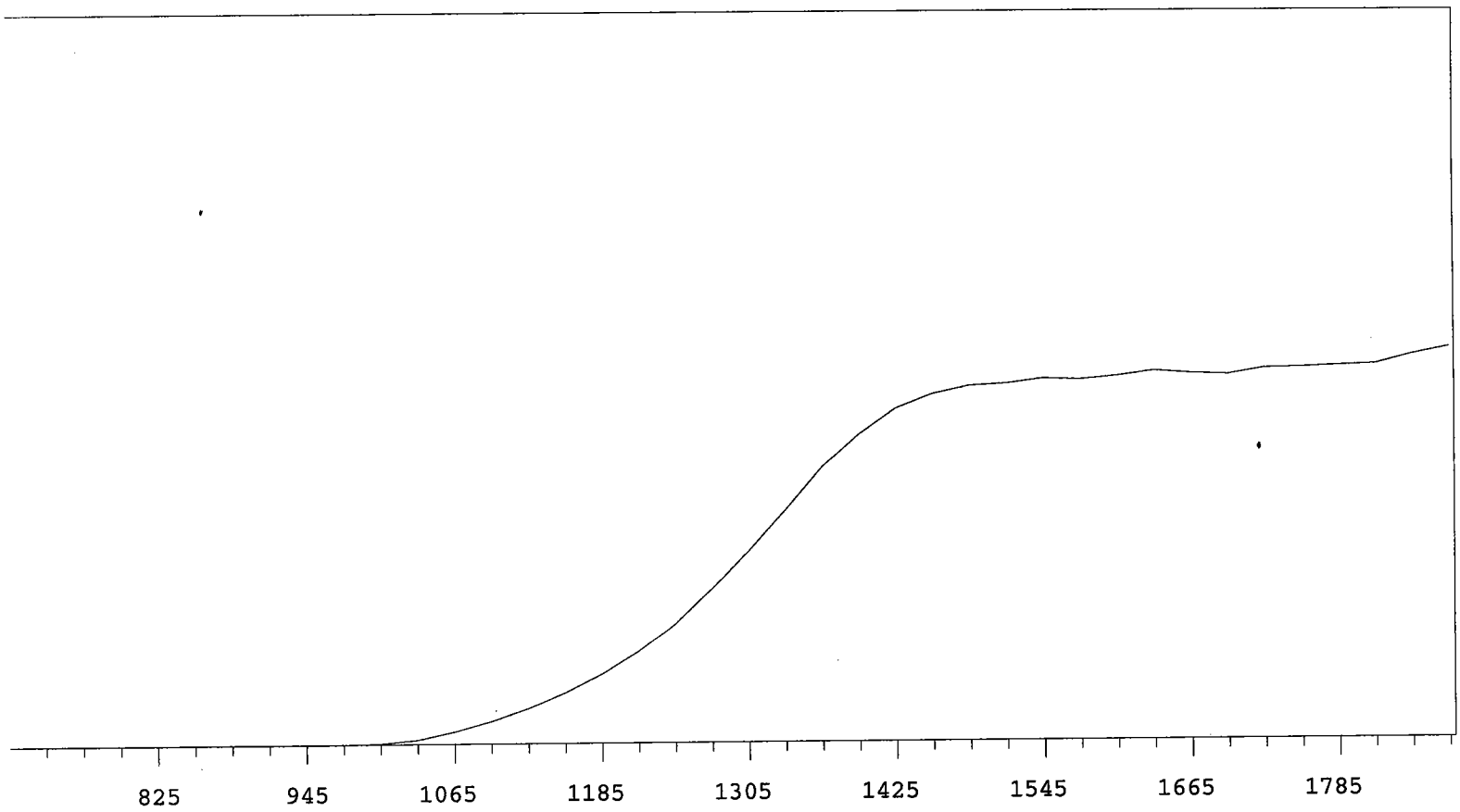


VOLTS	COUNTS	%/100 Volts
705	1	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	1	>100
945	0	>100
975	17	>100
1005	87	>100
1035	438	>100
1065	1055	>100
1095	2114	>100
1125	3282	>100
1155	4625	>100
1185	6554	+97.66
1215	8743	+88.09
1245	11345	+81.31
1275	14261	+74.60

VOLTS	COUNTS	%/100 Volts
1305	18216	+67.74
1335	21995	+58.11
1365	26173	+46.11
1395	29479	+32.75
1425	32186	+20.62
1455	33022	+12.13
1485	33981	+7.22
1515	34520	+4.95
1545	35095	+2.07
1575	35014	+0.38
1605	34812	+0.55
1635	34859	+1.11
1665	35460	+1.94
1695	35273	+1.95
1725	35629	+2.73
1755	35811	+5.77
1785	36656	+6.44
1815	37896	+9.21
1845	38145	
1875	40283	

MPC 9600 Plateau Instrument 2 MPC 9604 Detector D 7/1/2009

Alpha Volts: 705 Beta Volts: 1575

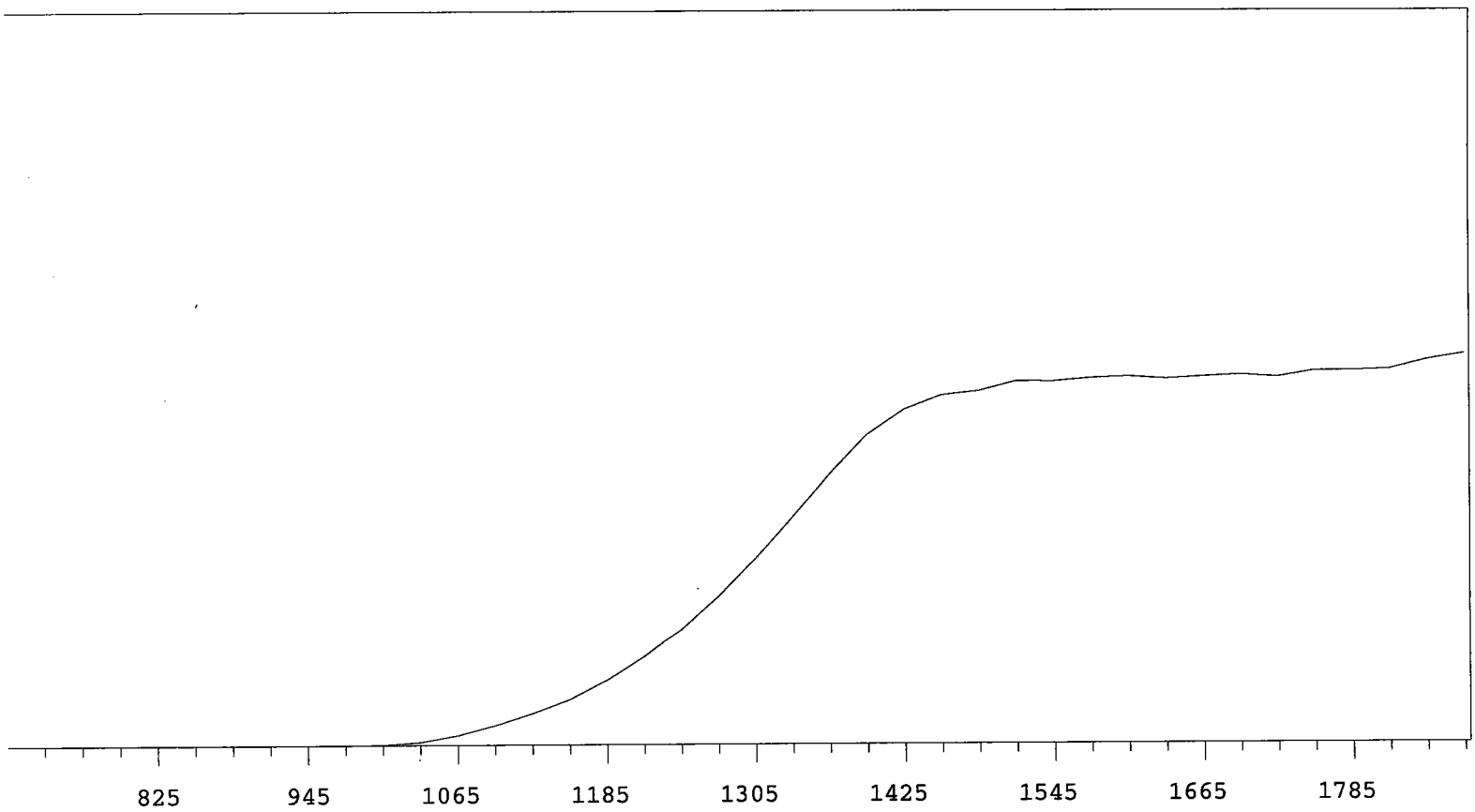


VOLTS	COUNTS	%/100 Volts
705	1	
735	0	
765	0	+83.33
795	2	+55.56
825	1	>100
855	0	>100
885	0	>100
915	0	>100
945	2	>100
975	9	>100
1005	89	>100
1035	439	>100
1065	1198	>100
1095	2164	>100
1125	3436	>100
1155	4917	>100
1185	6762	+96.59
1215	9006	+89.14
1245	11800	+81.34
1275	15132	+73.59

VOLTS	COUNTS	%/100 Volts
1305	18675	+65.94
1335	22620	+55.69
1365	26869	+44.63
1395	29957	+32.08
1425	32494	+20.49
1455	33836	+11.98
1485	34627	+6.45
1515	34849	+3.22
1545	35298	+1.98
1575	35180	+2.37
1605	35503	+1.57
1635	36006	+0.99
1665	35722	+0.89
1695	35597	+0.93
1725	36188	+1.86
1755	36272	+1.90
1785	36389	+2.55
1815	36529	+4.39
1845	37459	
1875	38170	

MPC 9600 Plateau Instrument 3 MPC 9604 Detector A 7/1/2009

Alpha Volts: 705 Beta Volts: 1575

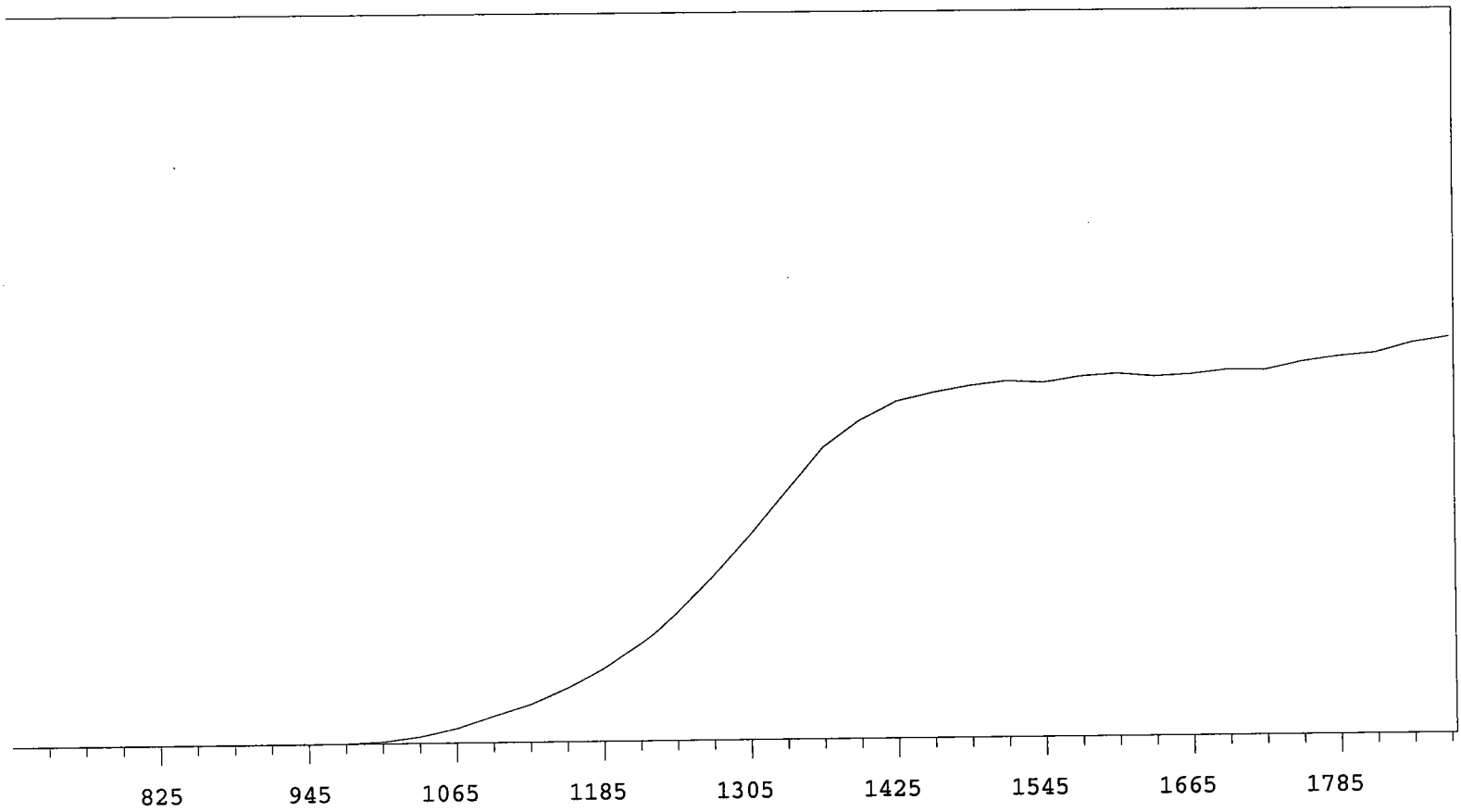


VOLTS	COUNTS	%/100 Volts
705	1	
735	0	
765	0	+55.56
795	1	>100
825	1	+0.00
855	1	>100
885	0	>100
915	0	>100
945	0	>100
975	9	>100
1005	53	>100
1035	302	>100
1065	878	>100
1095	1805	>100
1125	2887	>100
1155	4163	>100
1185	5842	+99.81
1215	7959	+90.90
1245	10323	+83.03
1275	13250	+75.91

VOLTS	COUNTS	%/100 Volts
1305	16654	+68.57
1335	20416	+59.26
1365	24191	+47.28
1395	27643	+34.04
1425	29891	+21.08
1455	31183	+12.30
1485	31558	+6.67
1515	32444	+4.05
1545	32413	+2.90
1575	32704	+0.81
1605	32837	+0.71
1635	32629	+0.49
1665	32797	+0.16
1695	32964	+1.32
1725	32746	+1.40
1755	33308	+1.56
1785	33318	+3.21
1815	33456	+3.92
1845	34283	
1875	34815	

MPC 9600 Plateau Instrument 3 MPC 9604 Detector B 7/1/2009

Alpha Volts: 705 Beta Volts: 1575

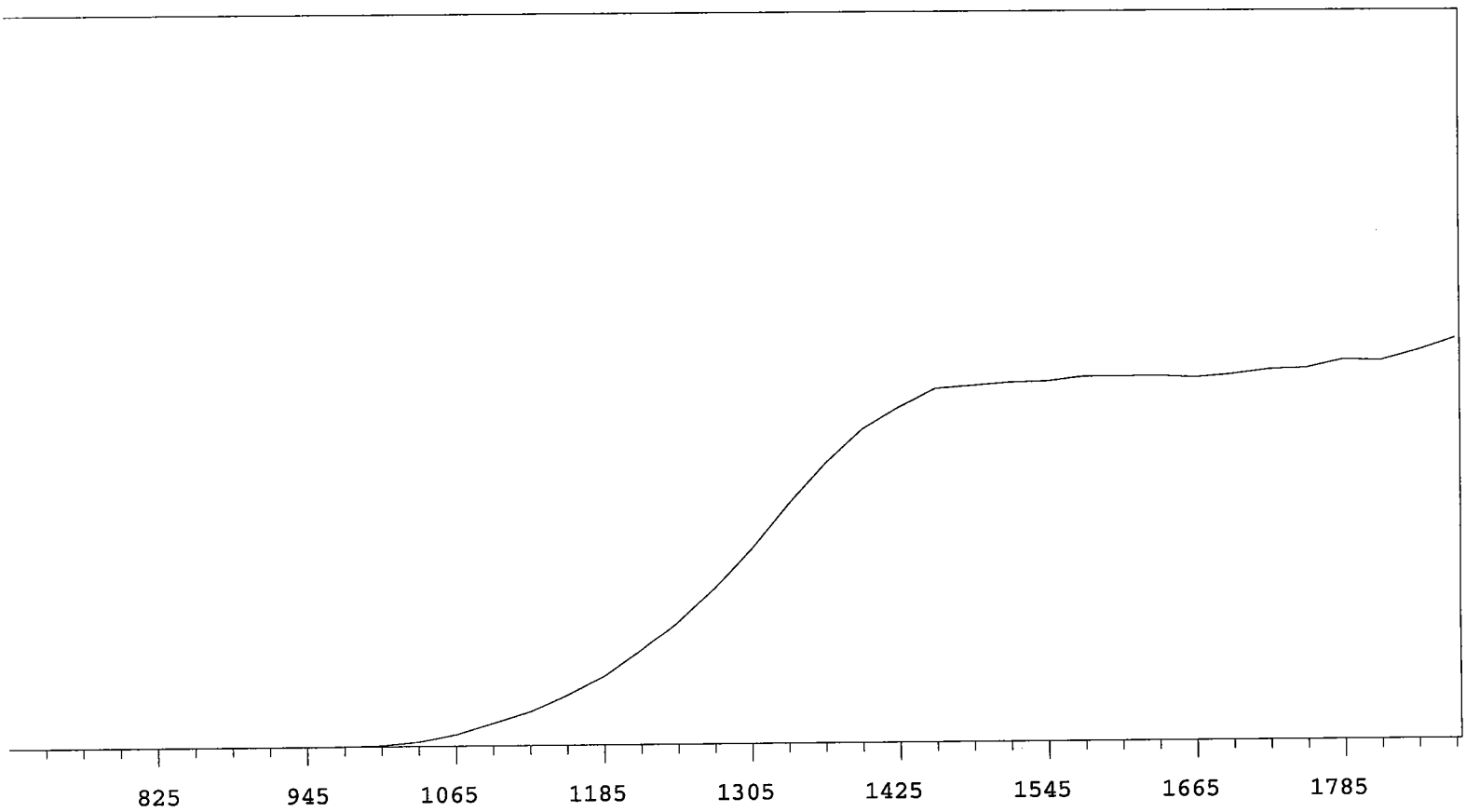


VOLTS	COUNTS	%/100 Volts
705	1	
735	1	
765	0	-55.56
795	0	>100
825	1	>100
855	3	+33.33
885	0	+0.00
915	1	>100
945	2	>100
975	29	>100
1005	165	>100
1035	613	>100
1065	1394	>100
1095	2558	>100
1125	3702	>100
1155	5222	>100
1185	7161	+96.06
1215	9507	+89.18
1245	12552	+81.52
1275	16030	+73.64

VOLTS	COUNTS	%/100 Volts
1305	19810	+64.73
1335	23962	+52.62
1365	28091	+39.27
1395	30594	+25.61
1425	32381	+14.86
1455	33206	+8.91
1485	33832	+4.41
1515	34260	+3.01
1545	34071	+2.33
1575	34623	+1.34
1605	34848	+1.22
1635	34564	+0.89
1665	34733	+1.01
1695	35144	+2.76
1725	35084	+3.66
1755	35839	+3.97
1785	36332	+5.39
1815	36654	+5.35
1845	37609	
1875	38164	

MPC 9600 Plateau Instrument 3 MPC 9604 Detector C 7/1/2009

Alpha Volts: 705 Beta Volts: 1575

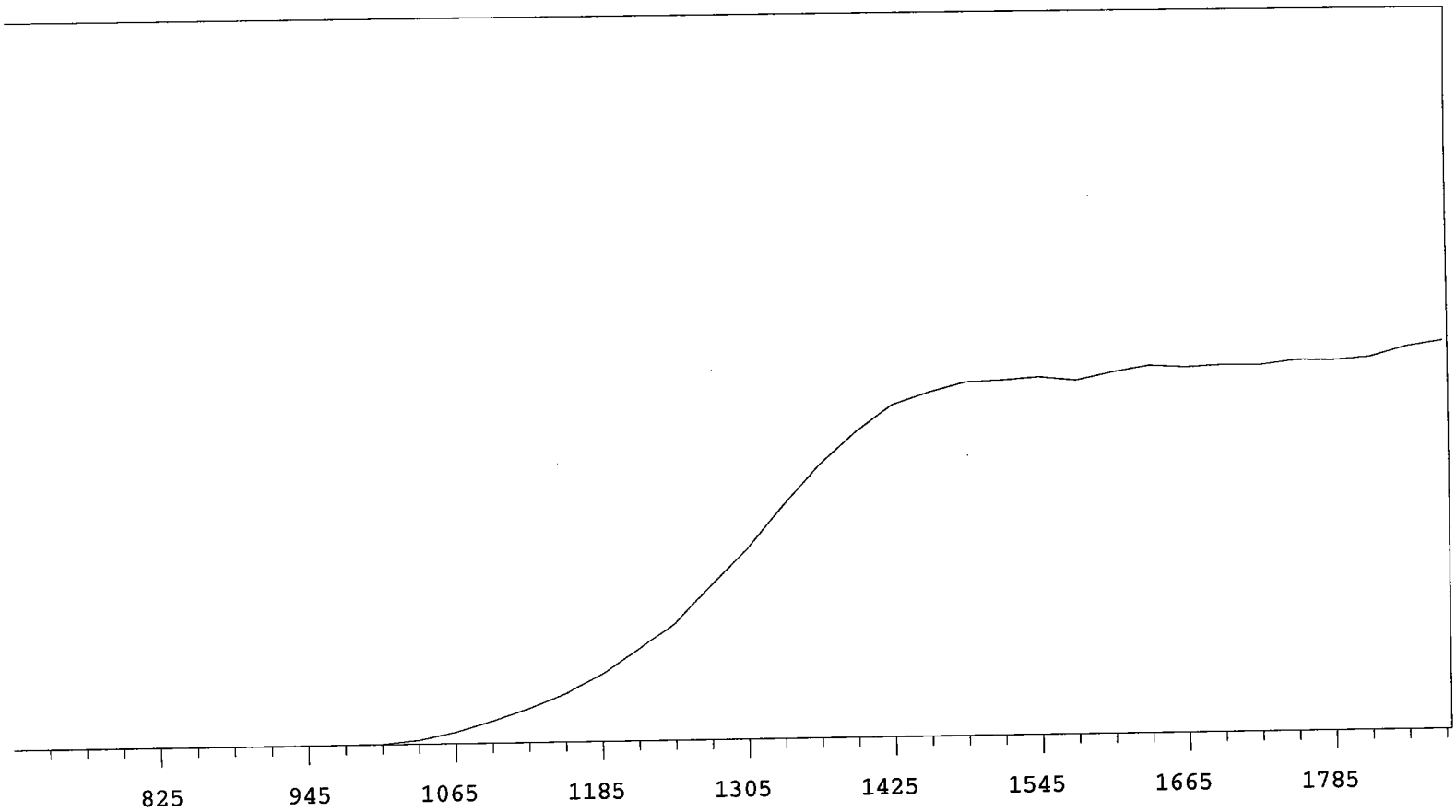


VOLTS	COUNTS	%/100 Volts
705	1	
735	1	
765	1	
795	0	>100
825	0	+0.00
855	0	>100
885	1	>100
915	1	>100
945	1	>100
975	17	>100
1005	122	>100
1035	533	>100
1065	1287	>100
1095	2493	>100
1125	3753	>100
1155	5482	>100
1185	7538	+99.39
1215	10305	+90.31
1245	13415	+82.57
1275	17141	+75.13

VOLTS	COUNTS	%/100 Volts
1305	21412	+66.80
1335	26262	+56.32
1365	30679	+43.71
1395	34466	+31.61
1425	36949	+20.14
1455	38998	+11.16
1485	39313	+5.34
1515	39625	+2.44
1545	39751	+2.04
1575	40227	+1.45
1605	40228	+0.56
1635	40255	+0.13
1665	40075	+1.22
1695	40384	+1.95
1725	40900	+3.50
1755	41028	+3.05
1785	41899	+3.71
1815	41767	+5.64
1845	42852	
1875	44132	

MPC 9600 Plateau Instrument 3 MPC 9604 Detector D 7/1/2009

Alpha Volts: 705 Beta Volts: 1575

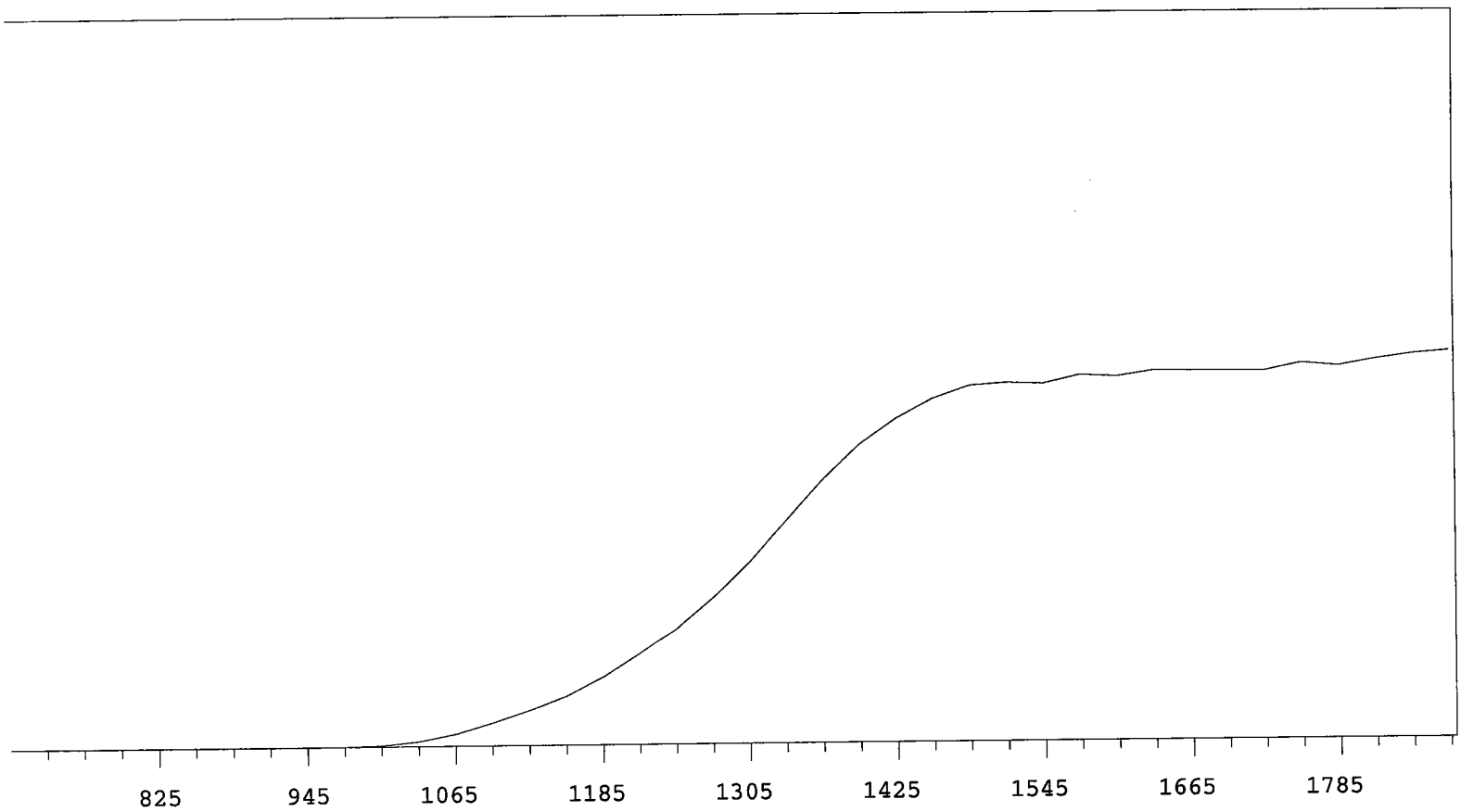


VOLTS	COUNTS	%/100 Volts
705	0	
735	1	
765	0	+0.00
795	1	>100
825	0	+83.33
855	0	-83.33
885	1	>100
915	0	>100
945	1	>100
975	12	>100
1005	51	>100
1035	298	>100
1065	848	>100
1095	1649	>100
1125	2535	>100
1155	3602	>100
1185	5036	+98.31
1215	6880	+91.37
1245	8822	+82.29
1275	11546	+74.61

VOLTS	COUNTS	%/100 Volts
1305	14171	+66.45
1335	17362	+54.90
1365	20310	+43.83
1395	22647	+30.82
1425	24551	+20.19
1455	25440	+11.69
1485	26124	+5.90
1515	26245	+2.21
1545	26428	+1.39
1575	26151	+2.69
1605	26721	+2.72
1635	27168	+2.80
1665	27007	+0.87
1695	27135	+0.70
1725	27089	+1.24
1755	27414	+1.43
1785	27373	+3.21
1815	27581	+4.34
1845	28332	
1875	28750	

MPC 9600 Plateau Instrument 4 MPC 9604 Detector A 7/1/2009

Alpha Volts: 705 Beta Volts: 1575

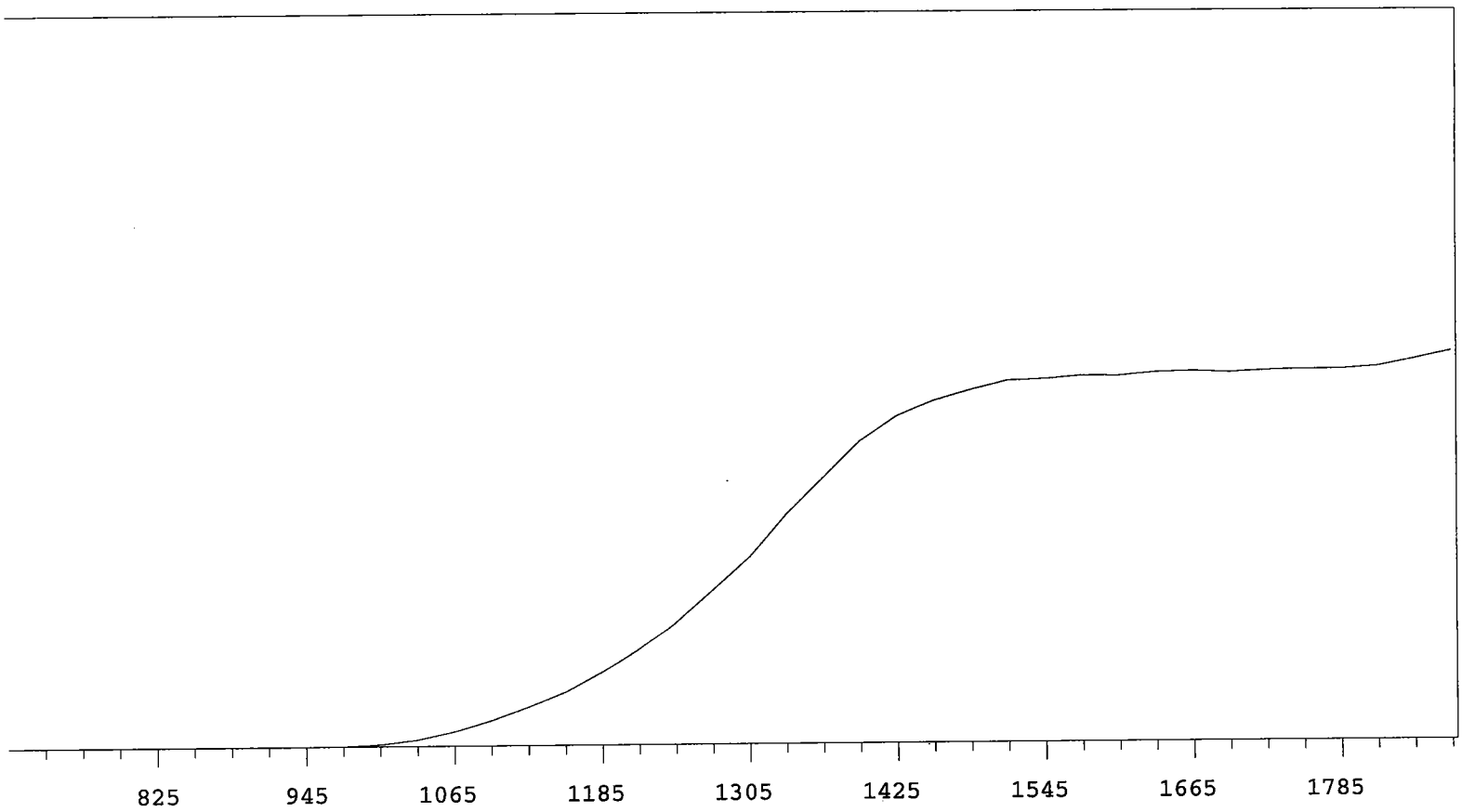


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	2	+55.56
855	1	>100
885	0	-55.56
915	3	>100
945	0	>100
975	16	>100
1005	114	>100
1035	451	>100
1065	1100	>100
1095	2068	>100
1125	3189	>100
1155	4386	>100
1185	6094	+94.81
1215	8184	+87.09
1245	10489	+78.88
1275	13273	+72.66

VOLTS	COUNTS	%/100 Volts
1305	16442	+66.24
1335	20146	+57.40
1365	23769	+46.40
1395	26926	+34.68
1425	29276	+24.40
1455	31037	+15.28
1485	32197	+7.91
1515	32425	+4.33
1545	32314	+2.14
1575	33071	+2.66
1605	32918	+2.52
1635	33435	+1.02
1665	33382	+0.73
1695	33349	+1.07
1725	33324	+1.28
1755	34001	+2.26
1785	33701	+3.08
1815	34304	+2.97
1845	34744	
1875	35012	

MPC 9600 Plateau Instrument 4 MPC 9604 Detector B 7/1/2009

Alpha Volts: 705 Beta Volts: 1575

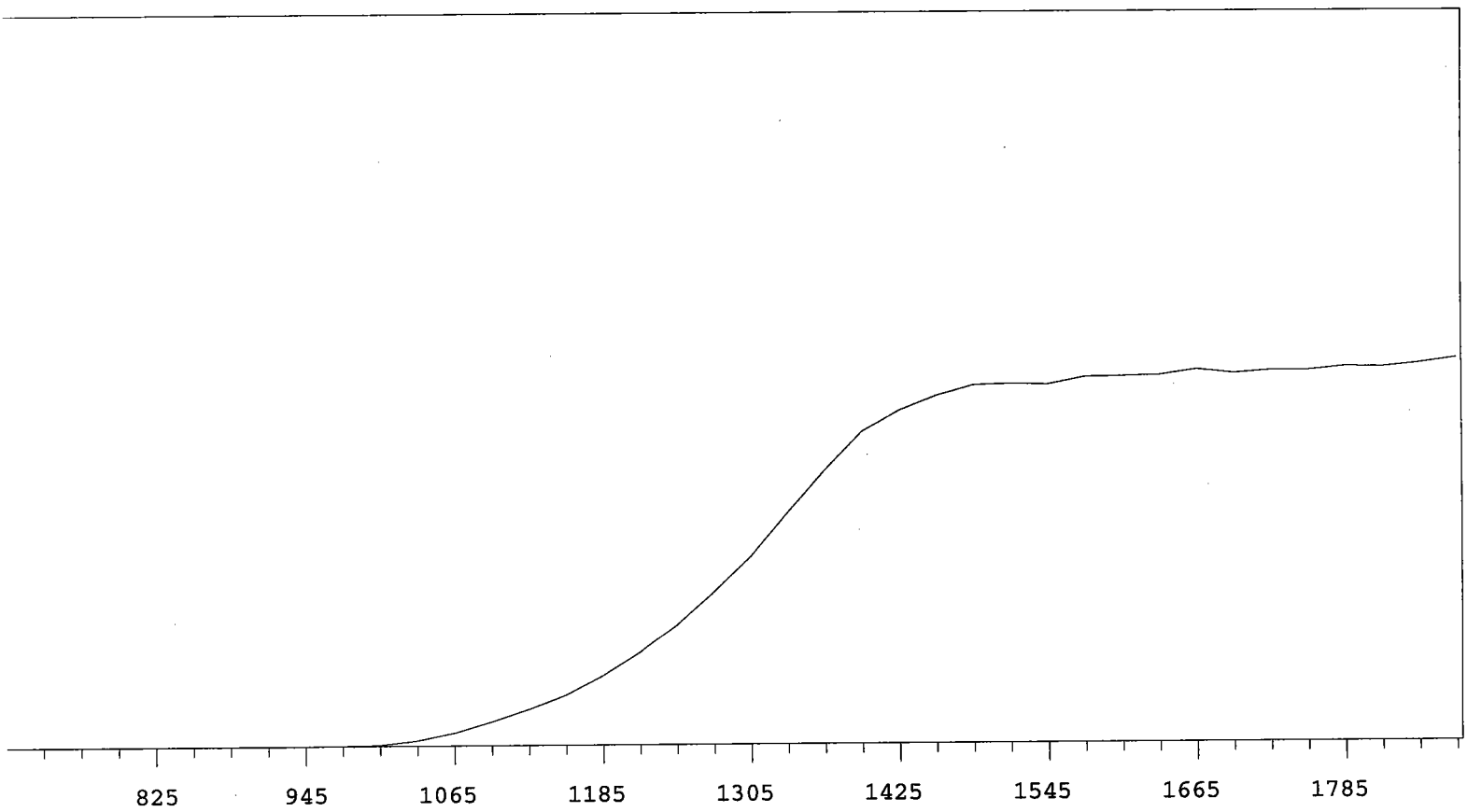


VOLTS	COUNTS	%/100 Volts
705	0	
735	1	
765	0	+0.00
795	1	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	2	>100
975	31	>100
1005	176	>100
1035	550	>100
1065	1218	>100
1095	2114	>100
1125	3212	>100
1155	4416	>100
1185	6066	+92.28
1215	7936	+85.60
1245	10288	+76.79
1275	13020	+70.59

VOLTS	COUNTS	%/100 Volts
1305	15747	+62.38
1335	19230	+54.19
1365	22255	+44.46
1395	25299	+32.45
1425	27370	+22.24
1455	28625	+14.10
1485	29467	+8.56
1515	30213	+5.29
1545	30326	+2.77
1575	30564	+1.57
1605	30548	+1.52
1635	30820	+0.85
1665	30898	+0.79
1695	30779	+0.44
1725	30934	+0.45
1755	31008	+0.96
1785	30991	+2.01
1815	31196	+3.80
1845	31781	
1875	32406	

MPC 9600 Plateau Instrument 4 MPC 9604 Detector C 7/1/2009

Alpha Volts: 705 Beta Volts: 1575

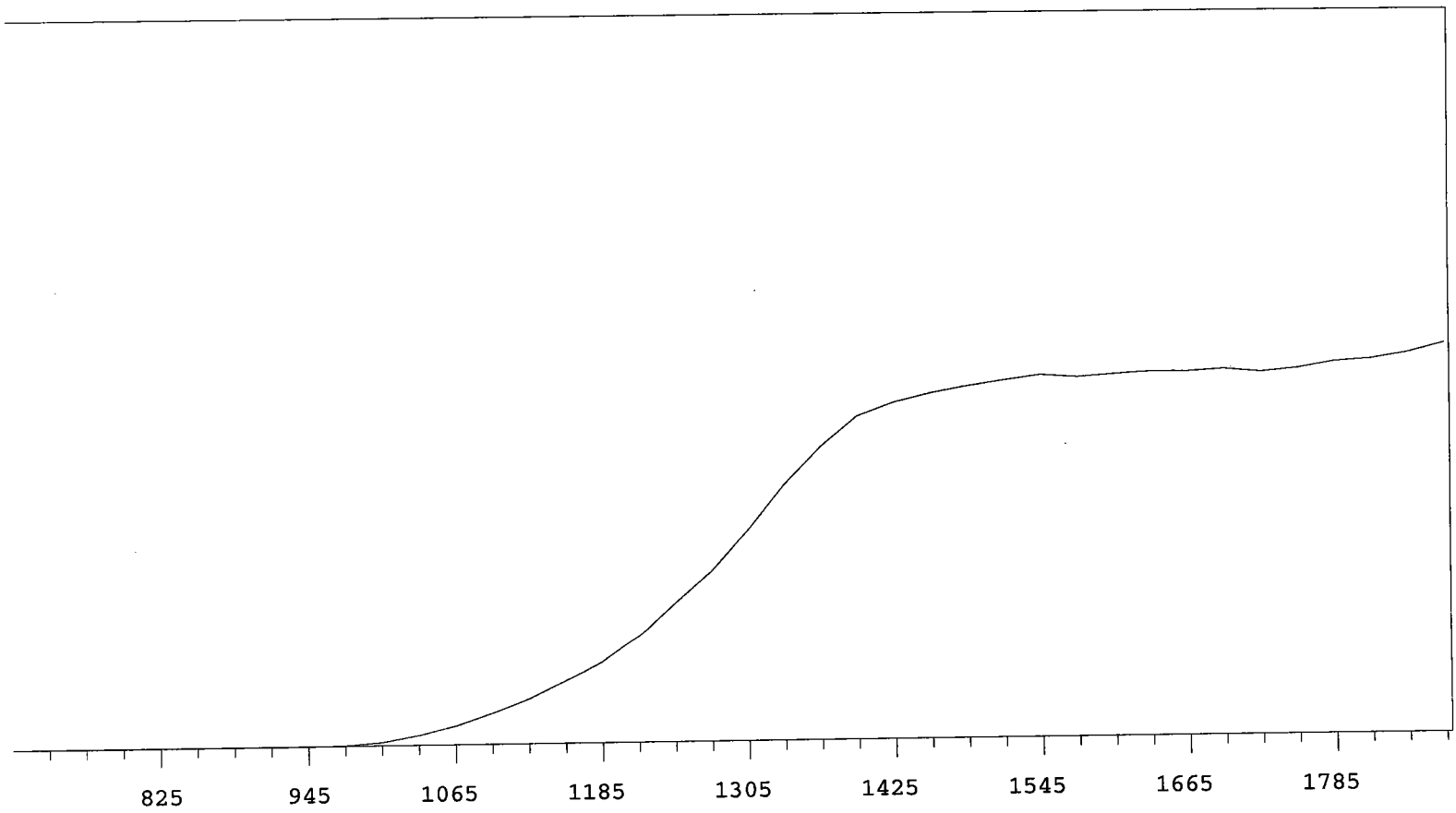


VOLTS	COUNTS	%/100 Volts
705	0	
735	1	
765	0	+55.56
795	2	+0.00
825	0	-55.56
855	1	>100
885	0	>100
915	0	>100
945	2	>100
975	24	>100
1005	134	>100
1035	558	>100
1065	1361	>100
1095	2511	>100
1125	3762	>100
1155	5246	>100
1185	7268	+96.29
1215	9733	+88.98
1245	12701	+79.94
1275	16176	+73.13

VOLTS	COUNTS	%/100 Volts
1305	19796	+65.77
1335	24338	+57.55
1365	28686	+45.86
1395	32750	+32.27
1425	34919	+20.83
1455	36434	+11.45
1485	37487	+5.80
1515	37623	+3.32
1545	37528	+2.07
1575	38277	+2.12
1605	38338	+2.70
1635	38426	+1.12
1665	39007	+1.06
1695	38592	+0.64
1725	38870	+0.63
1755	38868	+1.30
1785	39238	+1.45
1815	39169	+2.34
1845	39570	
1875	40086	

MPC 9600 Plateau Instrument 4 MPC 9604 Detector D 7/1/2009

Alpha Volts: 705 Beta Volts: 1575

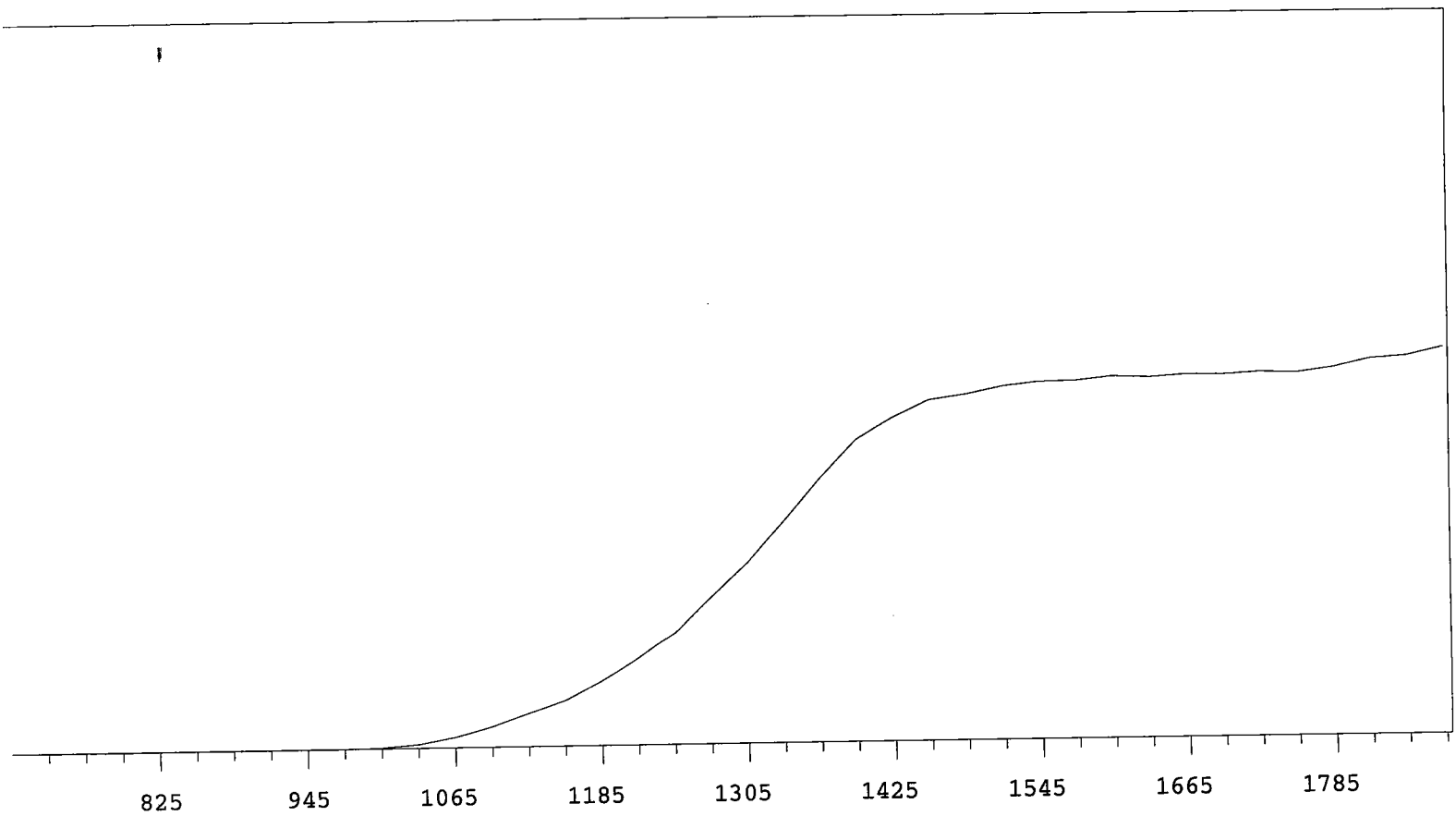


VOLTS	COUNTS	%/100 Volts
705	1	
735	0	
765	0	+0.00
795	0	>100
825	1	+83.33
855	1	+55.56
885	0	+0.00
915	1	>100
945	1	>100
975	60	>100
1005	297	>100
1035	855	>100
1065	1647	>100
1095	2700	>100
1125	3921	>100
1155	5471	+96.54
1185	7042	+90.21
1215	9405	+82.23
1245	12266	+76.33
1275	14989	+69.38

VOLTS	COUNTS	%/100 Volts
1305	18491	+61.09
1335	22444	+51.56
1365	25756	+37.44
1395	28379	+23.82
1425	29517	+14.00
1455	30309	+8.08
1485	30874	+6.03
1515	31345	+3.66
1545	31782	+2.17
1575	31567	+1.31
1605	31789	+0.78
1635	31963	+1.34
1665	31956	+0.29
1695	32123	+0.20
1725	31850	+1.46
1755	32114	+2.39
1785	32665	+3.95
1815	32876	+4.96
1845	33399	
1875	34206	

MPC 9600 Plateau Instrument 5 MPC 9604 Detector A 7/1/2009

Alpha Volts: 705 Beta Volts: 1575

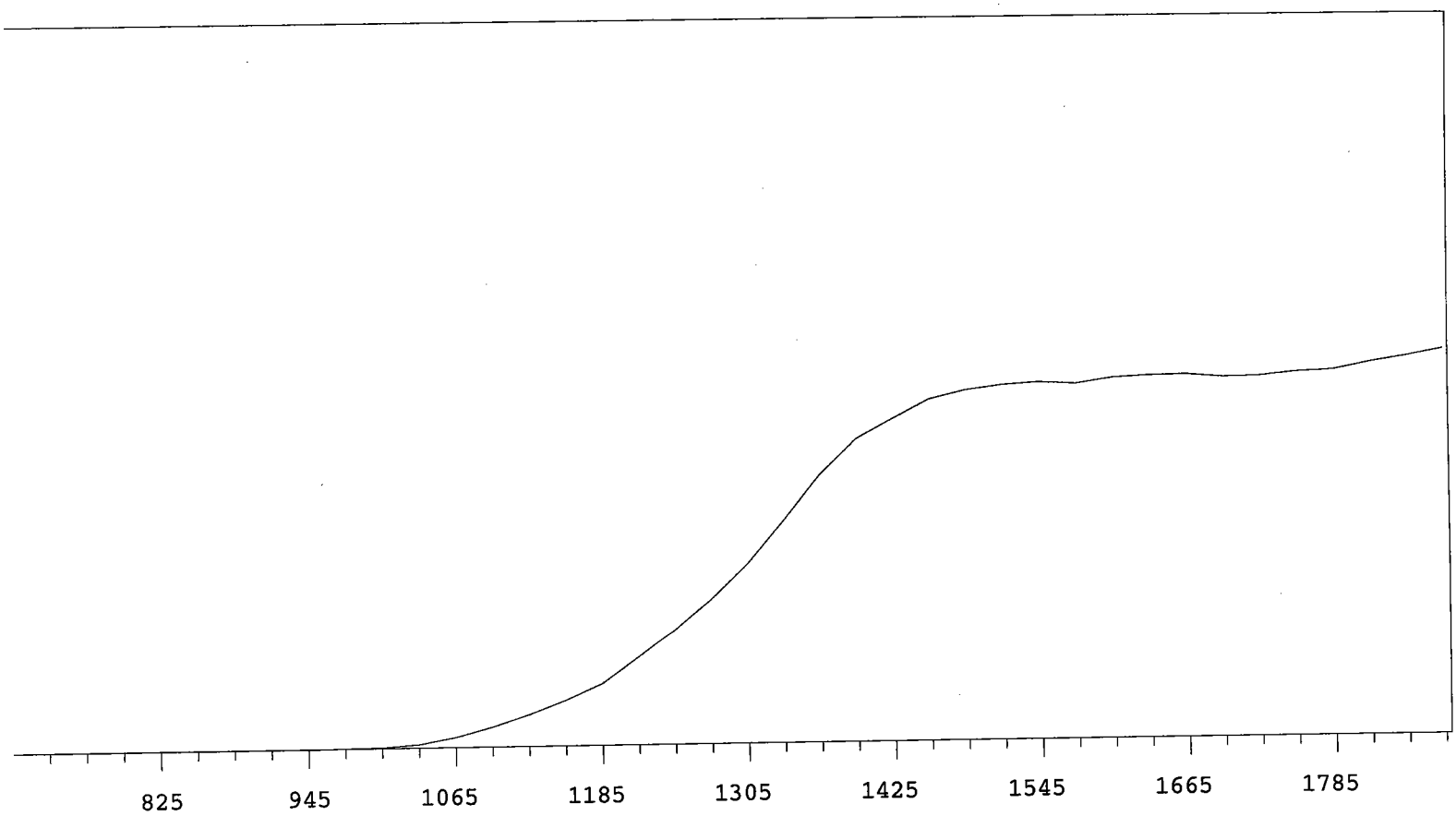


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	1	
795	1	+83.33
825	1	-83.33
855	1	>100
885	0	-55.56
915	0	>100
945	1	>100
975	9	>100
1005	76	>100
1035	308	>100
1065	814	>100
1095	1600	>100
1125	2598	>100
1155	3596	>100
1185	5065	+96.05
1215	6773	+90.23
1245	8717	+81.43
1275	11391	+74.83

VOLTS	COUNTS	%/100 Volts
1305	13974	+68.00
1335	17170	+58.62
1365	20456	+47.04
1395	23332	+33.83
1425	24996	+21.10
1455	26290	+12.40
1485	26683	+7.74
1515	27270	+4.43
1545	27590	+3.48
1575	27635	+1.71
1605	27932	+1.20
1635	27807	+0.88
1665	28006	+0.62
1695	27964	+0.63
1725	28112	+0.98
1755	28020	+2.84
1785	28392	+3.76
1815	29028	+5.17
1845	29220	
1875	29849	

MPC 9600 Plateau Instrument 5 MPC 9604 Detector B 7/1/2009

Alpha Volts: 705 Beta Volts: 1575

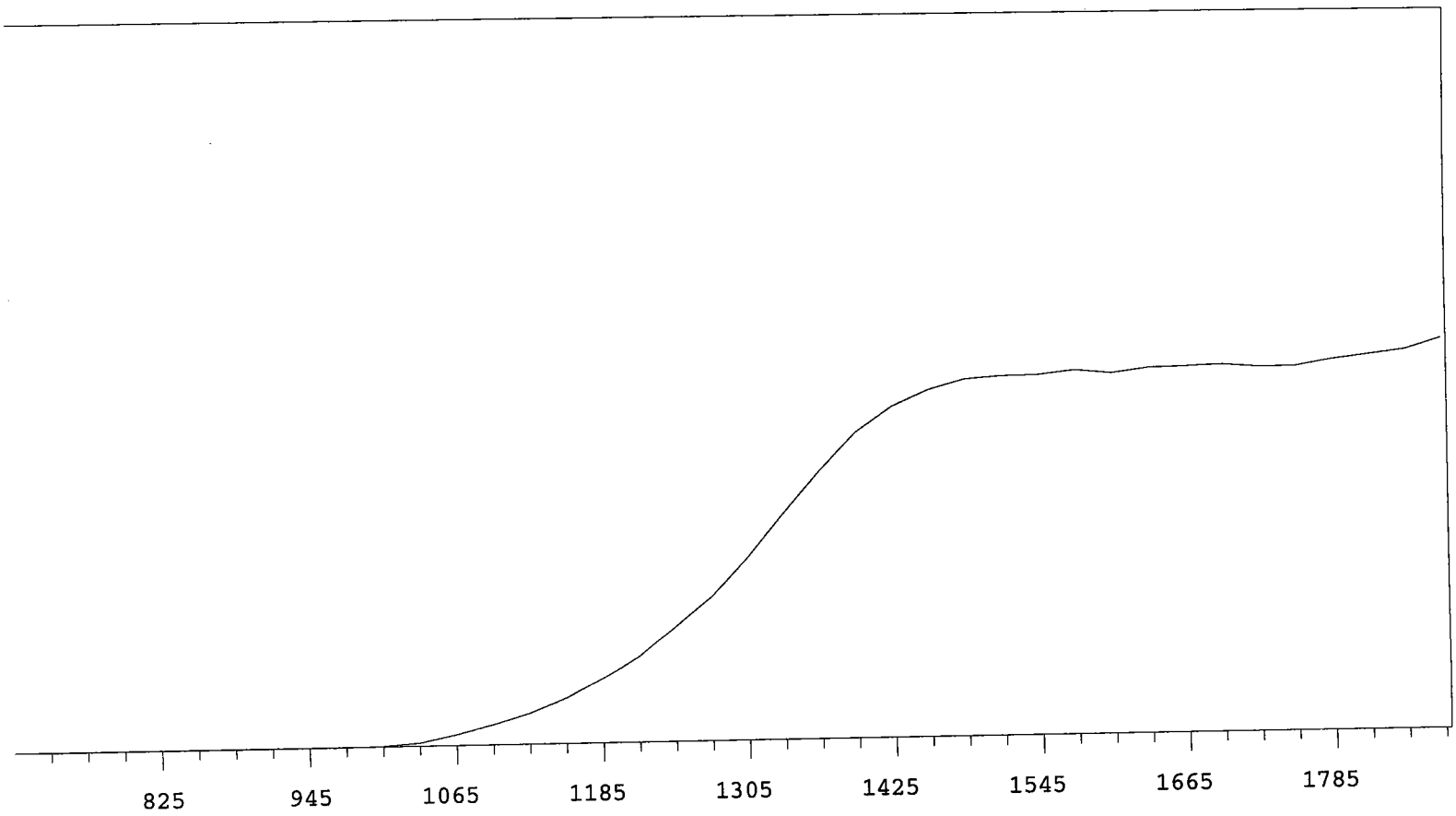


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	1	>100
855	1	+41.67
885	2	-33.33
915	0	>100
945	1	>100
975	17	>100
1005	87	>100
1035	336	>100
1065	1010	>100
1095	1955	>100
1125	3124	>100
1155	4486	>100
1185	6017	>100
1215	8507	+91.20
1245	11148	+82.59
1275	14003	+74.21

VOLTS	COUNTS	%/100 Volts
1305	17414	+68.46
1335	21540	+59.98
1365	25854	+46.75
1395	29222	+33.38
1425	31128	+21.52
1455	32995	+13.26
1485	33846	+8.09
1515	34289	+3.25
1545	34528	+2.00
1575	34311	+1.78
1605	34866	+1.78
1635	35046	+1.14
1665	35087	-0.26
1695	34795	+0.11
1725	34857	+0.93
1755	35220	+2.81
1785	35363	+3.98
1815	36028	+4.79
1845	36577	
1875	37207	

MPC 9600 Plateau Instrument 5 MPC 9604 Detector C 7/1/2009

Alpha Volts: 705 Beta Volts: 1575

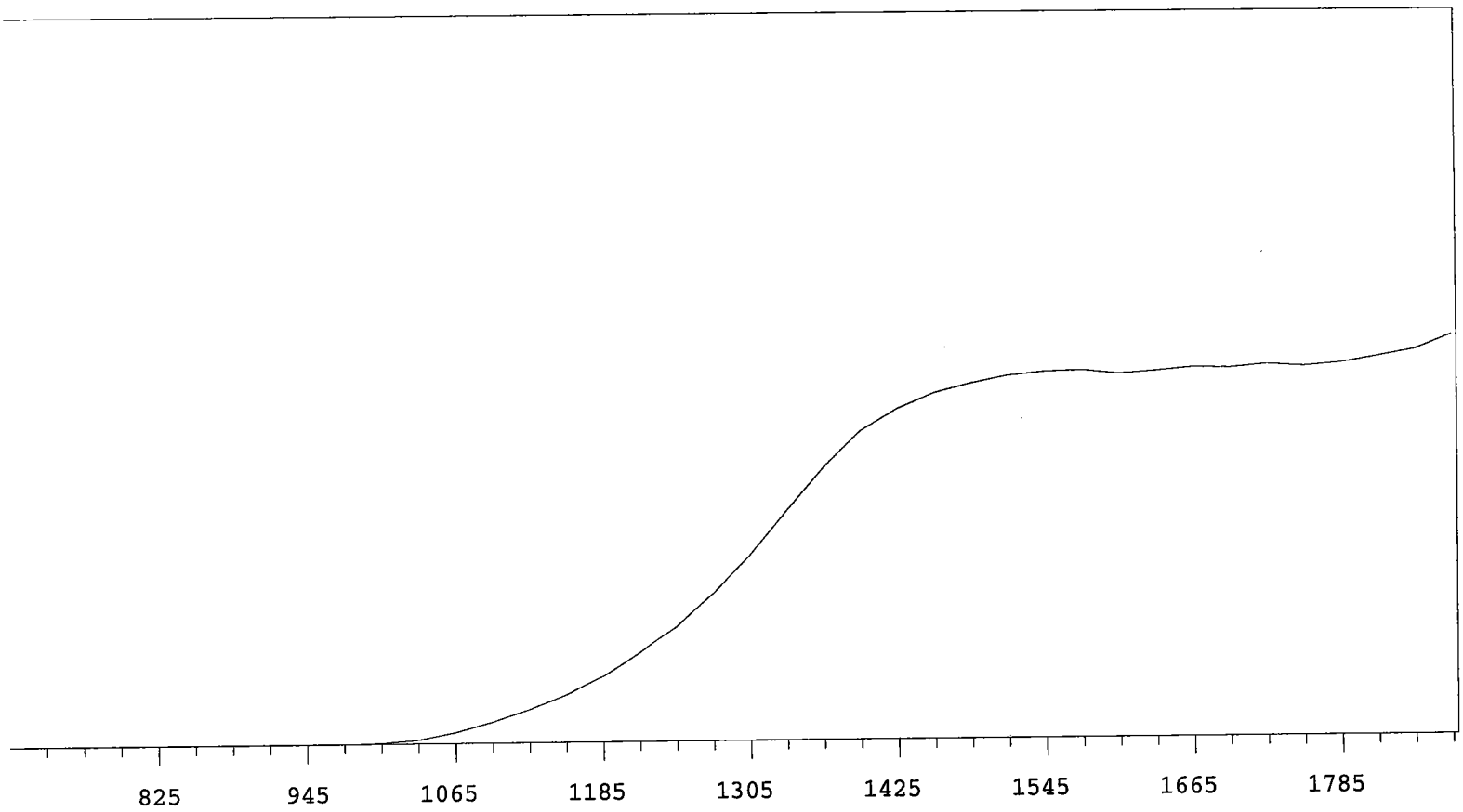


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	1	>100
885	0	>100
915	1	>100
945	2	>100
975	7	>100
1005	56	>100
1035	305	>100
1065	982	>100
1095	1874	>100
1125	2890	>100
1155	4260	>100
1185	6001	>100
1215	8050	+91.54
1245	10895	+82.98
1275	13556	+76.26

VOLTS	COUNTS	%/100 Volts
1305	17085	+68.24
1335	21135	+59.99
1365	25066	+47.39
1395	28530	+33.93
1425	30823	+22.30
1455	32287	+12.93
1485	33217	+6.71
1515	33474	+3.57
1545	33517	+1.17
1575	33921	+1.13
1605	33584	+1.27
1635	34014	+1.12
1665	34116	+0.98
1695	34225	-0.22
1725	33980	+0.58
1755	33971	+1.96
1785	34541	+3.64
1815	34954	+5.38
1845	35375	
1875	36384	

MPC 9600 Plateau Instrument 5 MPC 9604 Detector D 7/1/2009

Alpha Volts: 705 Beta Volts: 1575

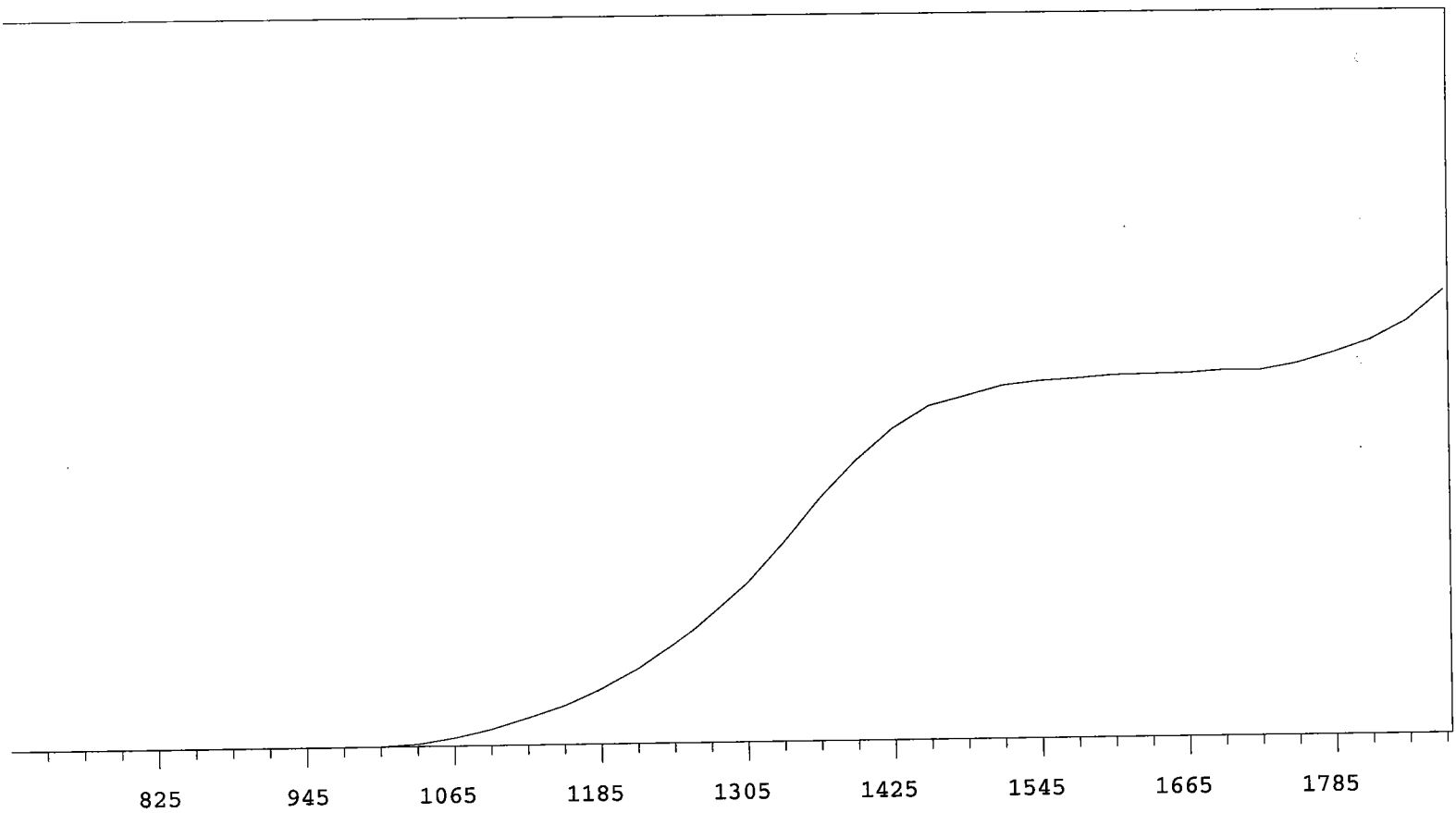


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	0	>100
975	6	>100
1005	81	>100
1035	318	>100
1065	897	>100
1095	1710	>100
1125	2714	>100
1155	3925	>100
1185	5395	+97.31
1215	7282	+88.49
1245	9426	+81.36
1275	12007	+75.65

VOLTS	COUNTS	%/100 Volts
1305	15025	+68.87
1335	18640	+58.97
1365	22048	+45.84
1395	24877	+32.08
1425	26653	+20.83
1455	27899	+13.08
1485	28670	+8.43
1515	29257	+5.13
1545	29568	+2.06
1575	29683	+0.52
1605	29362	+0.57
1635	29589	+0.80
1665	29870	+1.82
1695	29783	+0.90
1725	30077	+0.75
1755	29889	+2.02
1785	30152	+3.33
1815	30656	+6.54
1845	31211	
1875	32389	

MPC 9600 Plateau Instrument 6 MPC 9604 Detector A 7/1/2009

Alpha Volts: 705 Beta Volts: 1575

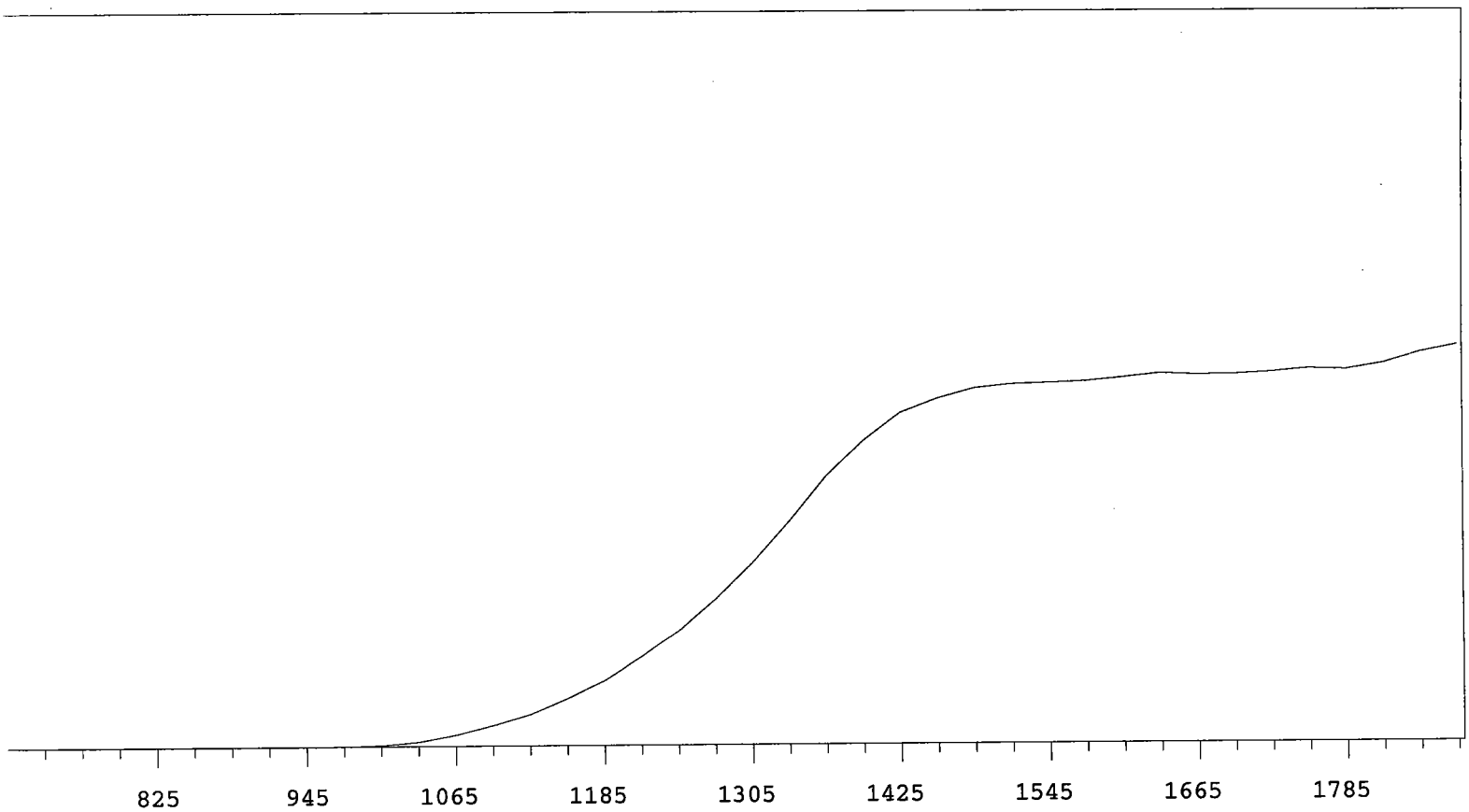


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	0	>100
975	7	>100
1005	31	>100
1035	238	>100
1065	810	>100
1095	1637	>100
1125	2743	>100
1155	3932	>100
1185	5579	>100
1215	7602	+94.41
1245	10078	+84.86
1275	13091	+77.67

VOLTS	COUNTS	%/100 Volts
1305	16217	+71.57
1335	20184	+63.76
1365	24605	+53.98
1395	28528	+41.40
1425	31675	+28.02
1455	33899	+17.93
1485	34826	+10.65
1515	35815	+6.13
1545	36225	+4.15
1575	36456	+2.28
1605	36747	+1.47
1635	36801	+1.26
1665	36859	+0.85
1695	37095	+1.85
1725	37072	+4.01
1755	37724	+6.65
1785	38802	+10.33
1815	40036	+14.71
1845	41975	
1875	45123	

MPC 9600 Plateau Instrument 6 MPC 9604 Detector B 7/1/2009

Alpha Volts: 705 Beta Volts: 1575

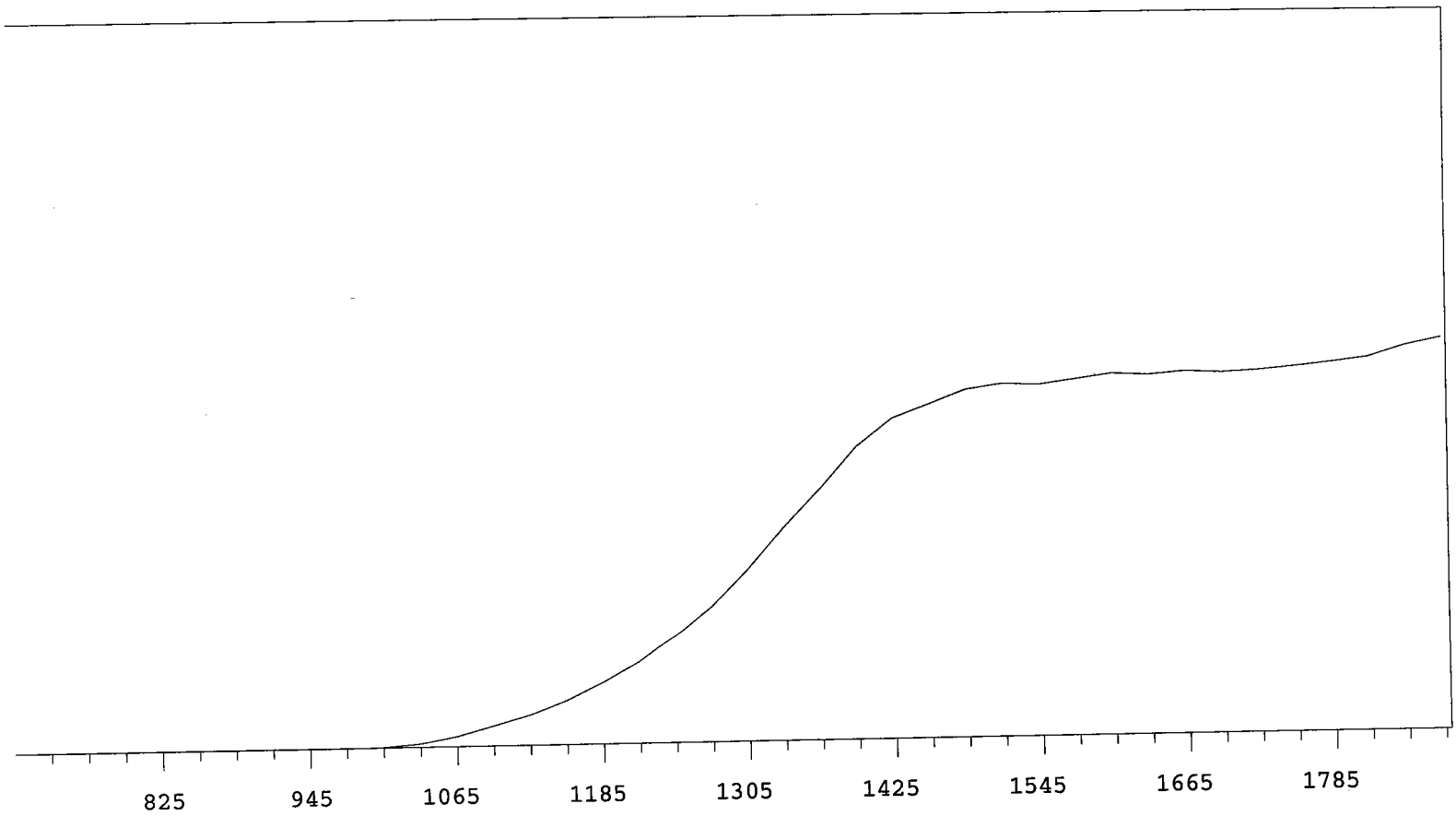


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	1	+83.33
855	1	-83.33
885	0	>100
915	0	>100
945	5	>100
975	18	>100
1005	125	>100
1035	482	>100
1065	1255	>100
1095	2318	>100
1125	3540	>100
1155	5288	>100
1185	7168	+98.51
1215	9760	+88.48
1245	12656	+81.52
1275	16065	+74.58

VOLTS	COUNTS	%/100 Volts
1305	20094	+68.67
1335	24665	+59.40
1365	29591	+47.86
1395	33376	+34.51
1425	36440	+22.50
1455	38024	+13.58
1485	39187	+7.04
1515	39608	+3.63
1545	39722	+2.10
1575	39894	+2.32
1605	40298	+2.09
1635	40711	+1.41
1665	40574	+0.80
1695	40608	+1.02
1725	40839	+1.28
1755	41201	+1.97
1785	41065	+3.74
1815	41711	+5.42
1845	42917	
1875	43699	

MPC 9600 Plateau Instrument 6 MPC 9604 Detector C 7/1/2009

Alpha Volts: 705 Beta Volts: 1575

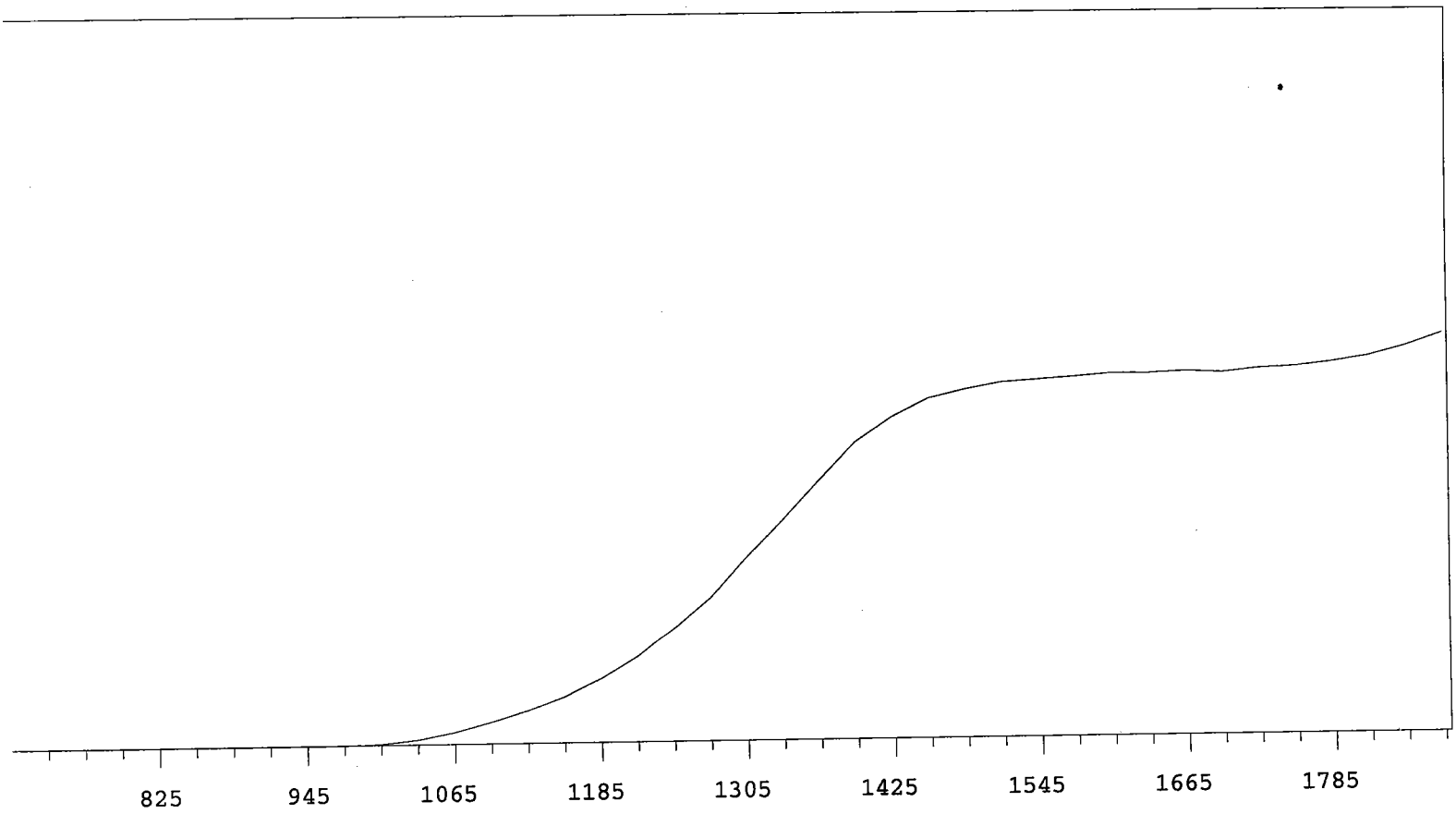


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	1	+0.00
795	0	>100
825	0	+0.00
855	0	>100
885	1	>100
915	1	>100
945	2	>100
975	8	>100
1005	70	>100
1035	353	>100
1065	990	>100
1095	1956	>100
1125	3024	>100
1155	4400	>100
1185	6173	+99.75
1215	8230	+89.85
1245	10904	+82.36
1275	13747	+76.18

VOLTS	COUNTS	%/100 Volts
1305	17350	+67.80
1335	21371	+60.27
1365	25084	+49.32
1395	29177	+36.15
1425	31927	+24.86
1455	33217	+14.70
1485	34545	+7.74
1515	35097	+4.64
1545	34927	+2.96
1575	35439	+2.21
1605	35939	+2.41
1635	35763	+0.94
1665	36053	+0.35
1695	35886	+1.15
1725	36066	+1.77
1755	36379	+3.03
1785	36768	+4.80
1815	37193	+6.14
1845	38320	
1875	39061	

MPC 9600 Plateau Instrument 6 MPC 9604 Detector D 7/1/2009

Alpha Volts: 705 Beta Volts: 1575

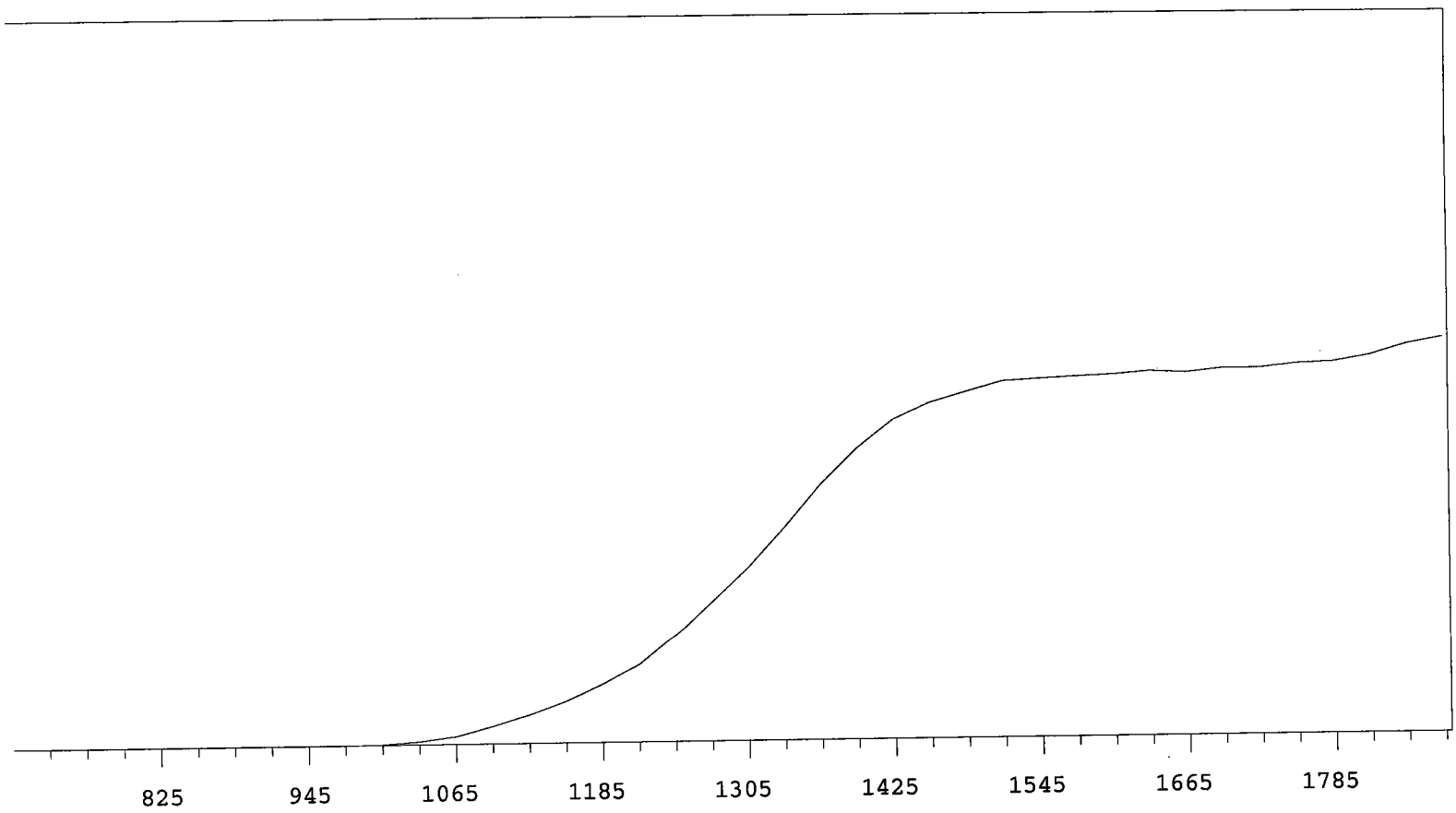


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	1	+0.00
825	0	>100
855	0	+0.00
885	0	>100
915	1	>100
945	0	>100
975	14	>100
1005	109	>100
1035	481	>100
1065	1177	>100
1095	2133	>100
1125	3243	>100
1155	4554	>100
1185	6285	+98.38
1215	8468	+89.75
1245	11266	+83.13
1275	14088	+74.43

VOLTS	COUNTS	%/100 Volts
1305	17954	+65.82
1335	21482	+57.64
1365	25373	+45.78
1395	29042	+34.80
1425	31373	+23.29
1455	33143	+14.25
1485	34006	+8.49
1515	34662	+4.71
1545	34892	+3.14
1575	35129	+1.86
1605	35411	+1.49
1635	35380	+0.62
1665	35554	+0.65
1695	35385	+1.18
1725	35755	+1.89
1755	35907	+3.26
1785	36305	+4.62
1815	36870	+6.98
1845	37807	
1875	39047	

MPC 9600 Plateau Instrument 7 MPC 9604 Detector A 7/1/2009

Alpha Volts: 705 Beta Volts: 1575

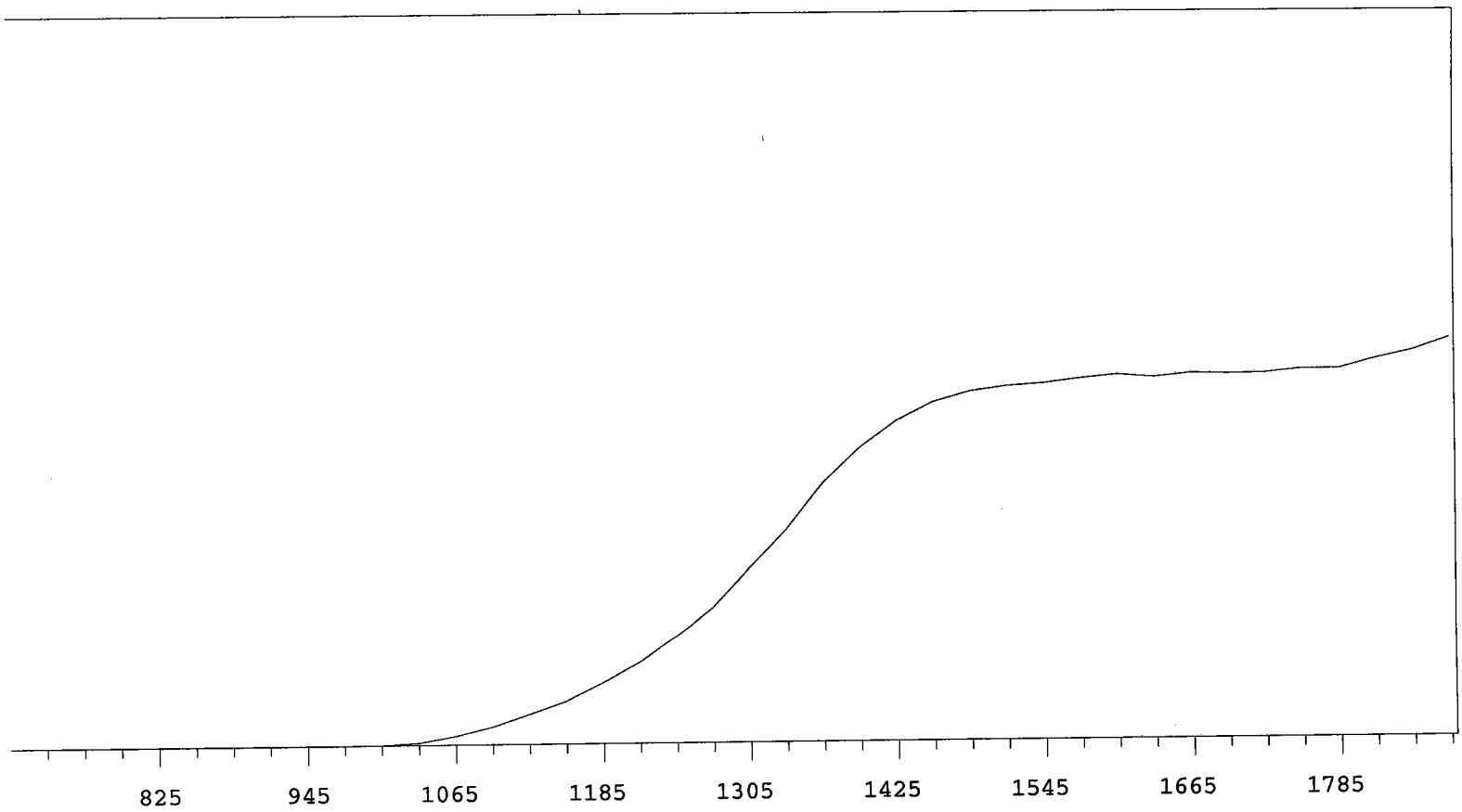


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	1	+83.33
855	1	-83.33
885	0	-55.56
915	0	>100
945	1	>100
975	3	>100
1005	42	>100
1035	242	>100
1065	613	>100
1095	1353	>100
1125	2213	>100
1155	3256	>100
1185	4474	>100
1215	5932	+94.10
1245	8072	+87.32
1275	10579	+79.61

VOLTS	COUNTS	%/100 Volts
1305	13228	+70.36
1335	16271	+60.12
1365	19506	+49.19
1395	22188	+36.46
1425	24373	+24.43
1455	25649	+15.99
1485	26433	+9.58
1515	27195	+5.74
1545	27367	+3.24
1575	27490	+1.86
1605	27608	+1.22
1635	27841	+1.33
1665	27695	+1.11
1695	27999	+1.42
1725	27992	+2.04
1755	28289	+2.52
1785	28408	+4.56
1815	28863	+5.70
1845	29664	
1875	30148	

MPC 9600 Plateau Instrument 7 MPC 9604 Detector B 7/1/2009

Alpha Volts: 705 Beta Volts: 1575

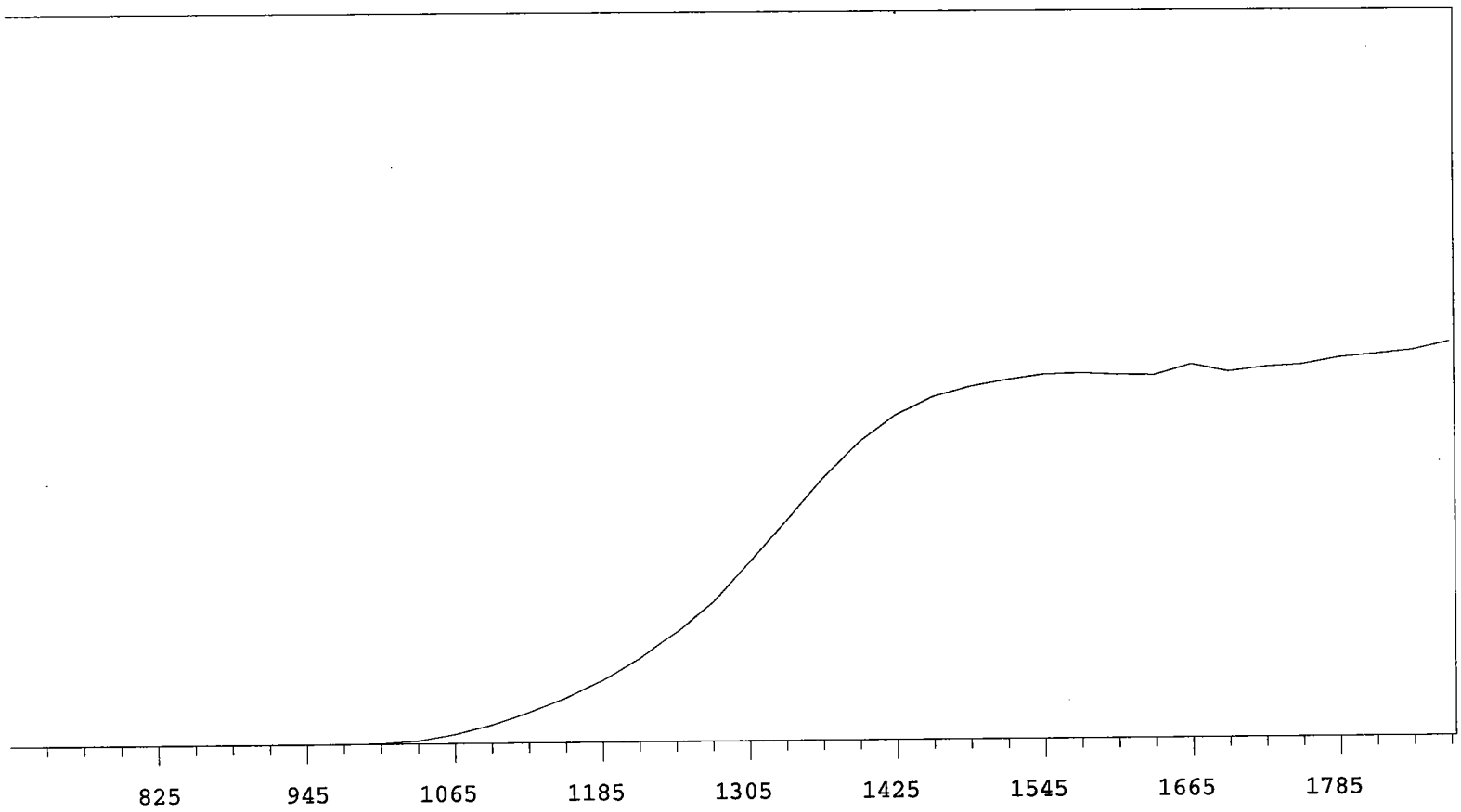


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	1	>100
945	1	>100
975	3	>100
1005	34	>100
1035	221	>100
1065	825	>100
1095	1709	>100
1125	2873	>100
1155	4078	>100
1185	5858	>100
1215	7809	+91.82
1245	10336	+85.02
1275	13215	+77.79

VOLTS	COUNTS	%/100 Volts
1305	16978	+70.97
1335	20569	+61.39
1365	24989	+48.97
1395	28389	+36.69
1425	30977	+24.05
1455	32727	+14.93
1485	33697	+8.42
1515	34195	+4.89
1545	34437	+3.49
1575	34850	+2.11
1605	35174	+1.62
1635	34923	+0.68
1665	35250	+0.35
1695	35171	+1.24
1725	35237	+1.02
1755	35584	+2.79
1785	35587	+4.59
1815	36485	+6.74
1845	37270	
1875	38453	

MPC 9600 Plateau Instrument 7 MPC 9604 Detector C 7/1/2009

Alpha Volts: 705 Beta Volts: 1575

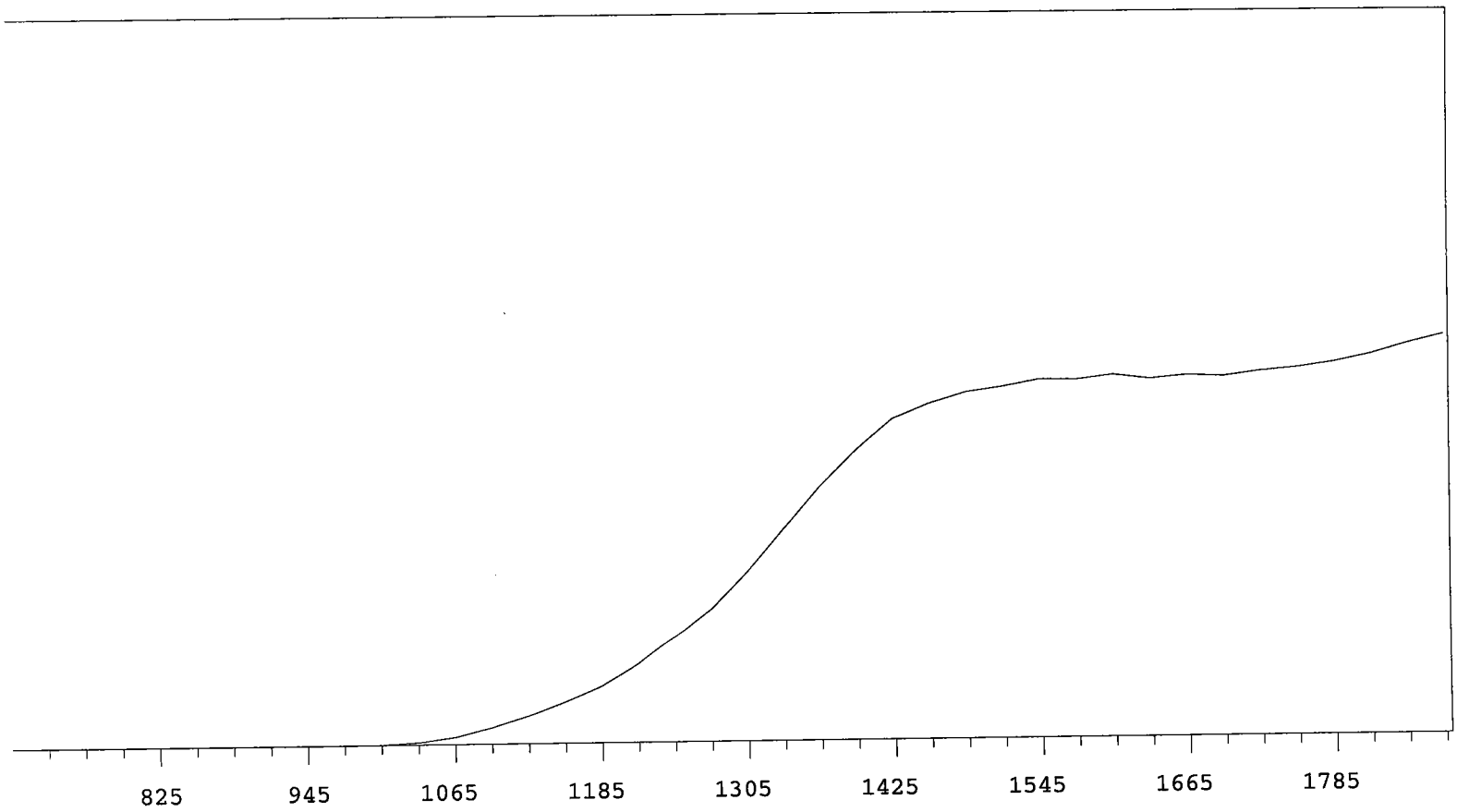


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	0	>100
975	4	>100
1005	57	>100
1035	277	>100
1065	817	>100
1095	1666	>100
1125	2766	>100
1155	4077	>100
1185	5667	>100
1215	7694	+91.50
1245	10209	+84.83
1275	12950	+77.50

VOLTS	COUNTS	%/100 Volts
1305	16543	+70.03
1335	20257	+60.71
1365	24245	+48.17
1395	27602	+35.50
1425	30019	+23.48
1455	31614	+14.53
1485	32522	+8.91
1515	33103	+5.28
1545	33572	+2.60
1575	33695	+0.70
1605	33525	+1.48
1635	33477	+0.99
1665	34432	+1.49
1695	33745	+1.43
1725	34149	+1.60
1755	34350	+3.69
1785	34955	+3.62
1815	35251	+4.44
1845	35592	
1875	36382	

MPC 9600 Plateau Instrument 7 MPC 9604 Detector D 7/1/2009

Alpha Volts: 705 Beta Volts: 1575

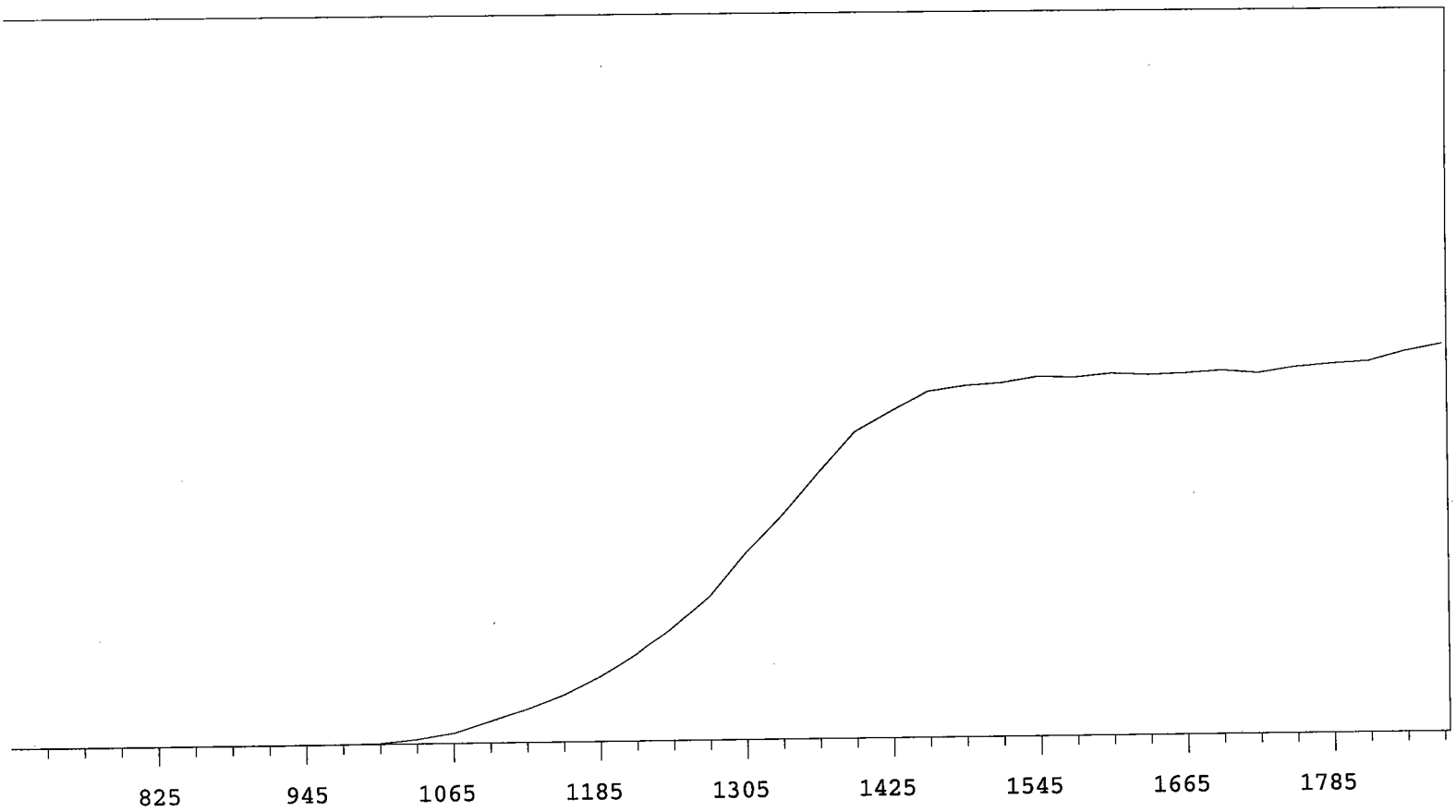


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	0	>100
975	5	>100
1005	29	>100
1035	204	>100
1065	609	>100
1095	1354	>100
1125	2316	>100
1155	3418	>100
1185	4654	>100
1215	6455	+92.99
1245	8669	+86.45
1275	10931	+79.15

VOLTS	COUNTS	%/100 Volts
1305	14016	+71.42
1335	17436	+62.21
1365	20814	+50.32
1395	23760	+36.91
1425	26302	+24.91
1455	27519	+15.17
1485	28410	+8.91
1515	28843	+5.41
1545	29396	+3.58
1575	29357	+1.54
1605	29719	+0.51
1635	29358	+0.23
1665	29623	+0.57
1695	29509	+2.12
1725	29896	+2.84
1755	30165	+4.42
1785	30570	+5.65
1815	31180	+6.95
1845	31995	
1875	32717	

MPC 9600 Plateau Instrument 8 MPC 9604 Detector A 7/1/2009

Alpha Volts: 705 Beta Volts: 1575

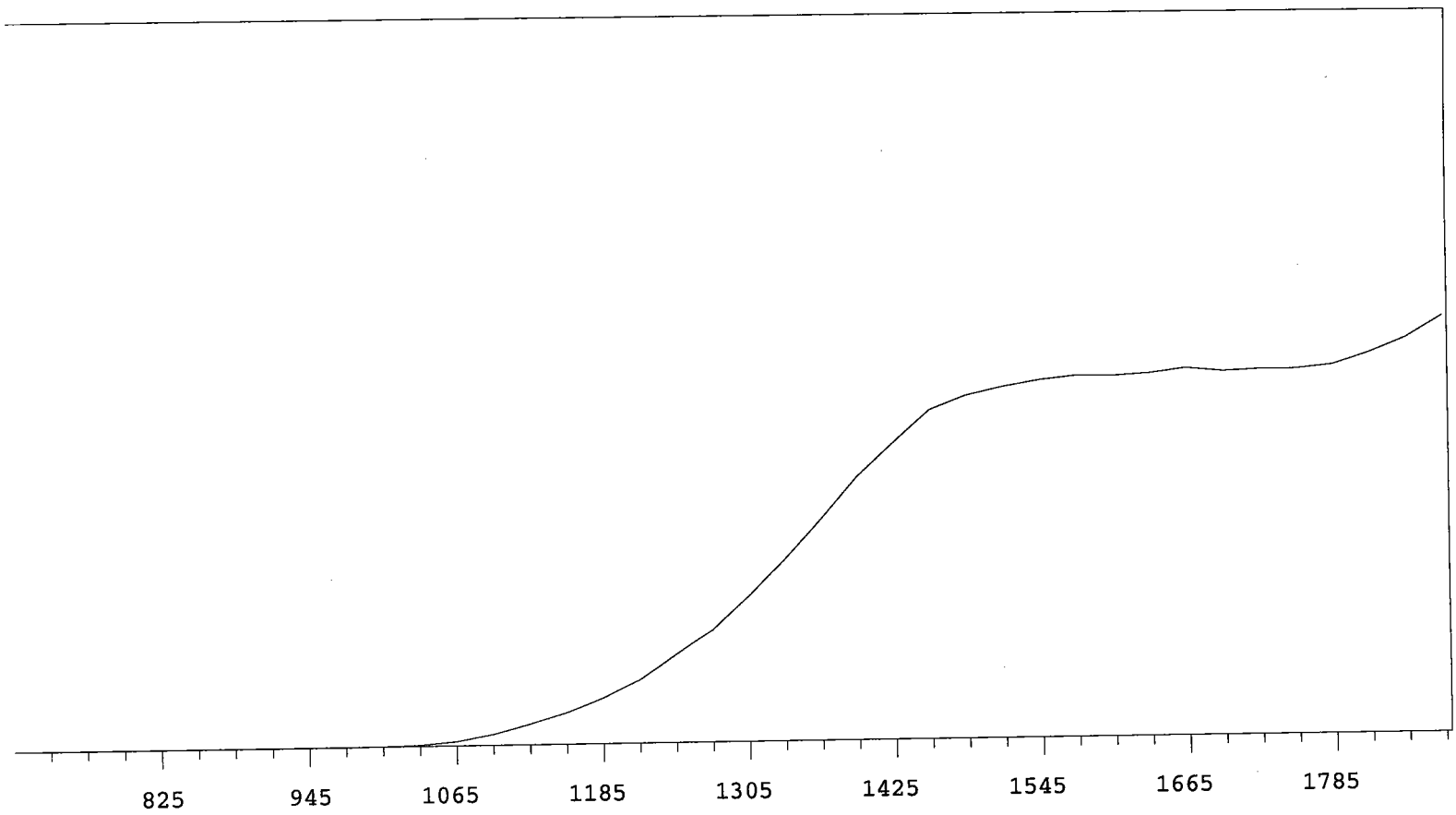


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	1	>100
975	9	>100
1005	96	>100
1035	468	>100
1065	1084	>100
1095	2286	>100
1125	3479	>100
1155	4912	>100
1185	6819	+98.23
1215	9153	+89.05
1245	12105	+83.21
1275	15122	+75.24

VOLTS	COUNTS	%/100 Volts
1305	19482	+67.45
1335	23344	+59.35
1365	27793	+45.86
1395	31916	+34.29
1425	33979	+21.61
1455	35993	+11.71
1485	36530	+7.04
1515	36796	+3.11
1545	37393	+2.44
1575	37279	+1.41
1605	37650	+0.49
1635	37458	+0.91
1665	37579	+0.12
1695	37828	+1.10
1725	37535	+1.72
1755	38104	+2.18
1785	38416	+4.12
1815	38633	+4.92
1845	39649	
1875	40366	

MPC 9600 Plateau Instrument 8 MPC 9604 Detector B 7/1/2009

Alpha Volts: 705 Beta Volts: 1575

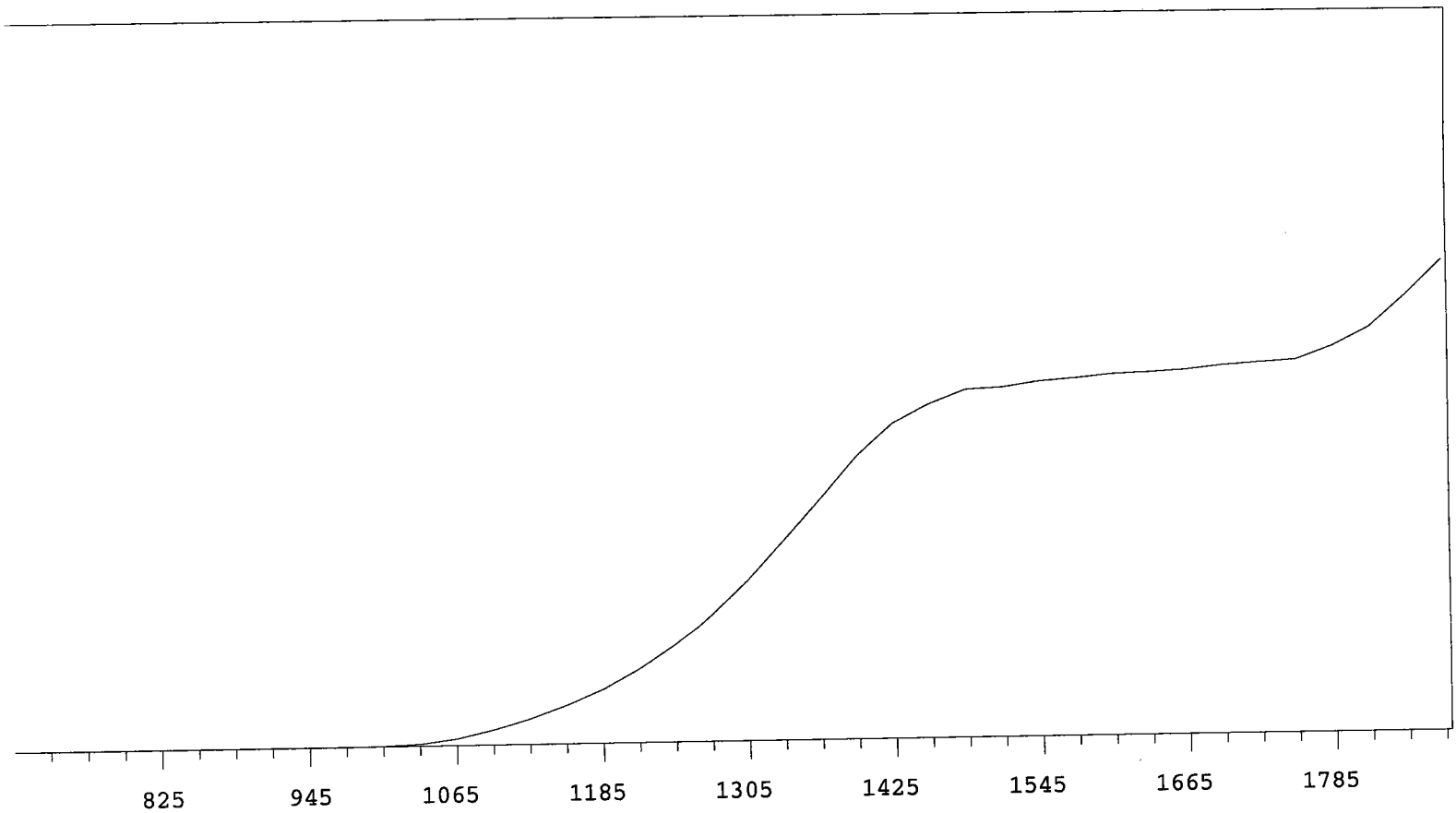


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	0	>100
975	0	>100
1005	20	>100
1035	122	>100
1065	511	>100
1095	1263	>100
1125	2390	>100
1155	3641	>100
1185	5246	>100
1215	7212	+98.32
1245	9897	+89.80
1275	12742	+82.40

VOLTS	COUNTS	%/100 Volts
1305	16337	+74.91
1335	20471	+68.07
1365	25012	+57.86
1395	29694	+47.48
1425	33409	+35.17
1455	37013	+23.27
1485	38629	+14.35
1515	39529	+7.69
1545	40284	+4.34
1575	40711	+2.52
1605	40642	+1.97
1635	40879	+1.11
1665	41405	+0.98
1695	41011	+0.30
1725	41182	+0.41
1755	41178	+3.28
1785	41573	+6.47
1815	42858	+10.82
1845	44440	
1875	46780	

MPC 9600 Plateau Instrument 8 MPC 9604 Detector C 7/1/2009

Alpha Volts: 705 Beta Volts: 1575

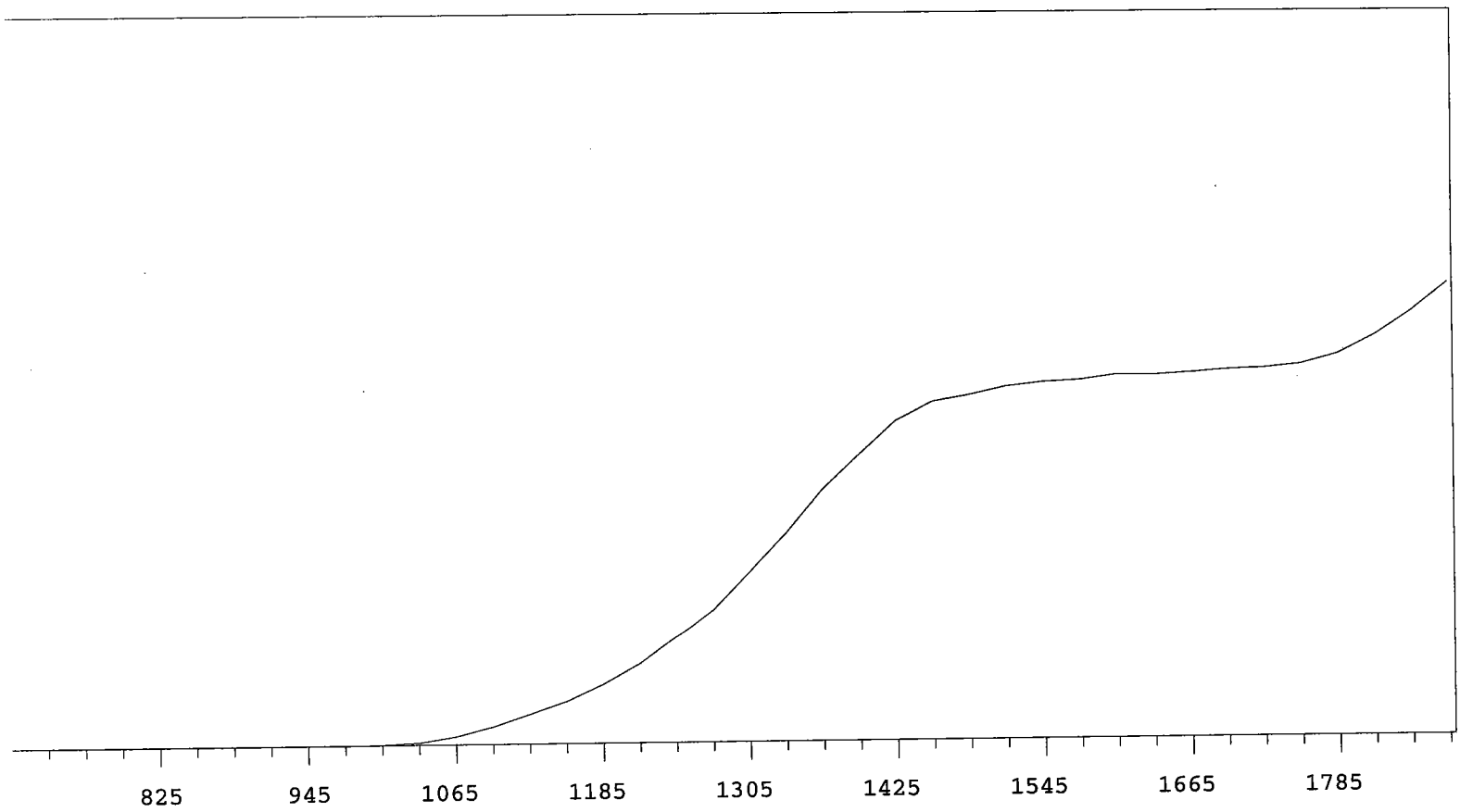


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	0	>100
975	4	>100
1005	46	>100
1035	202	>100
1065	697	>100
1095	1532	>100
1125	2614	>100
1155	3953	>100
1185	5474	>100
1215	7466	+93.09
1245	9842	+86.73
1275	12814	+80.29

VOLTS	COUNTS	%/100 Volts
1305	16303	+72.82
1335	20309	+64.32
1365	24364	+53.82
1395	28527	+40.95
1425	31774	+28.74
1455	33631	+16.87
1485	35030	+9.25
1515	35208	+5.21
1545	35741	+3.27
1575	36019	+2.95
1605	36373	+2.21
1635	36484	+2.27
1665	36713	+2.28
1695	37093	+2.46
1725	37325	+4.17
1755	37543	+7.52
1785	38833	+13.43
1815	40656	+19.49
1845	43753	
1875	47246	

MPC 9600 Plateau Instrument 8 MPC 9604 Detector D 7/1/2009

Alpha Volts: 705 Beta Volts: 1575

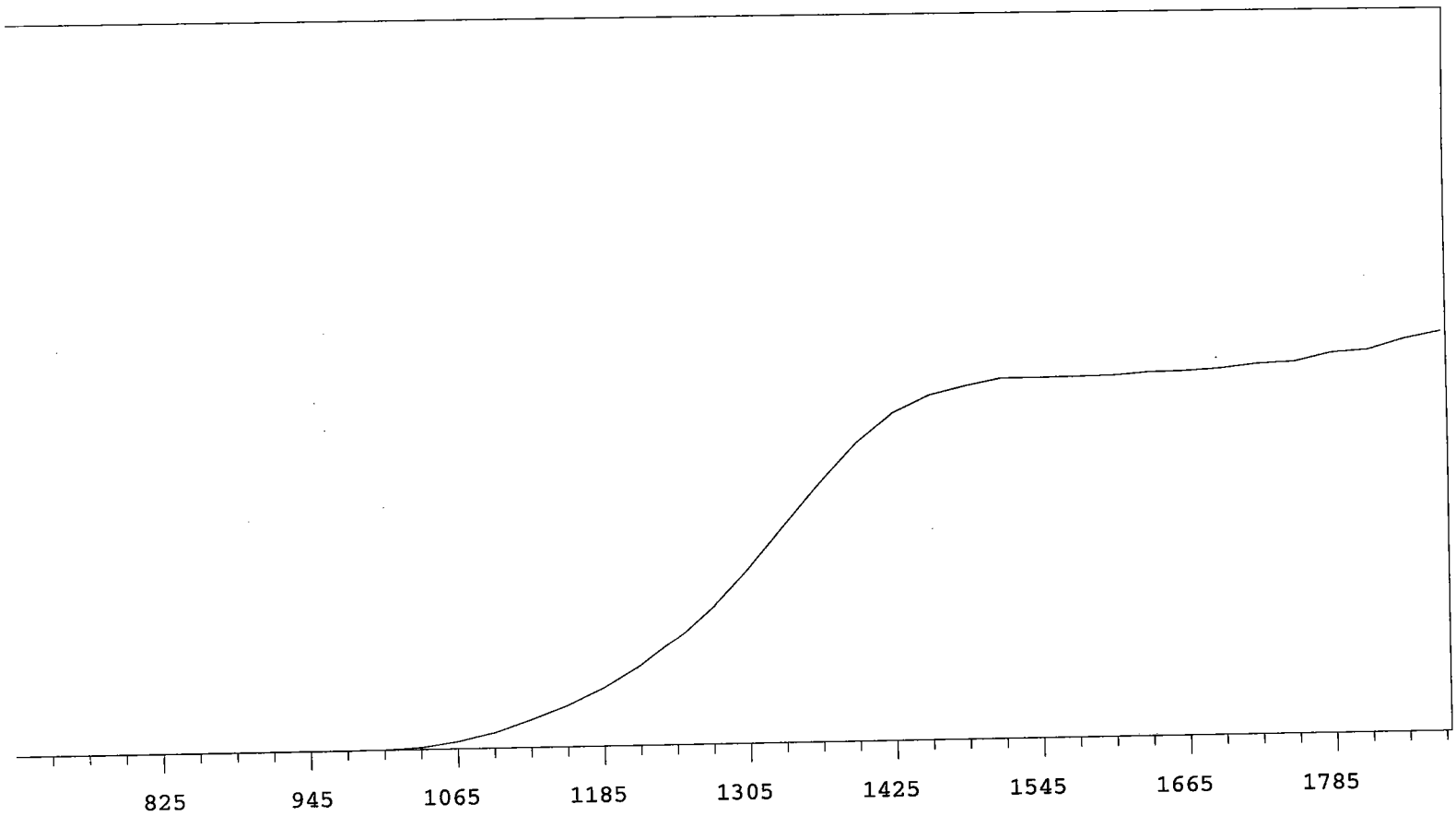


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	1	+0.00
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	0	>100
975	5	>100
1005	47	>100
1035	243	>100
1065	792	>100
1095	1744	>100
1125	2933	>100
1155	4123	>100
1185	5780	>100
1215	7791	+91.58
1245	10478	+84.93
1275	13118	+77.50

VOLTS	COUNTS	%/100 Volts
1305	16889	+70.18
1335	20600	+61.29
1365	24824	+50.40
1395	28208	+38.85
1425	31539	+25.79
1455	33391	+16.06
1485	33991	+8.60
1515	34782	+5.01
1545	35201	+4.10
1575	35380	+2.50
1605	35849	+1.87
1635	35784	+1.79
1665	36000	+1.43
1695	36269	+2.10
1725	36381	+3.46
1755	36733	+6.86
1785	37669	+11.78
1815	39465	+16.64
1845	41803	
1875	44665	

MPC 9600 Plateau Instrument 9 MPC 9604 Detector A 7/1/2009

Alpha Volts: 870 Beta Volts: 1530

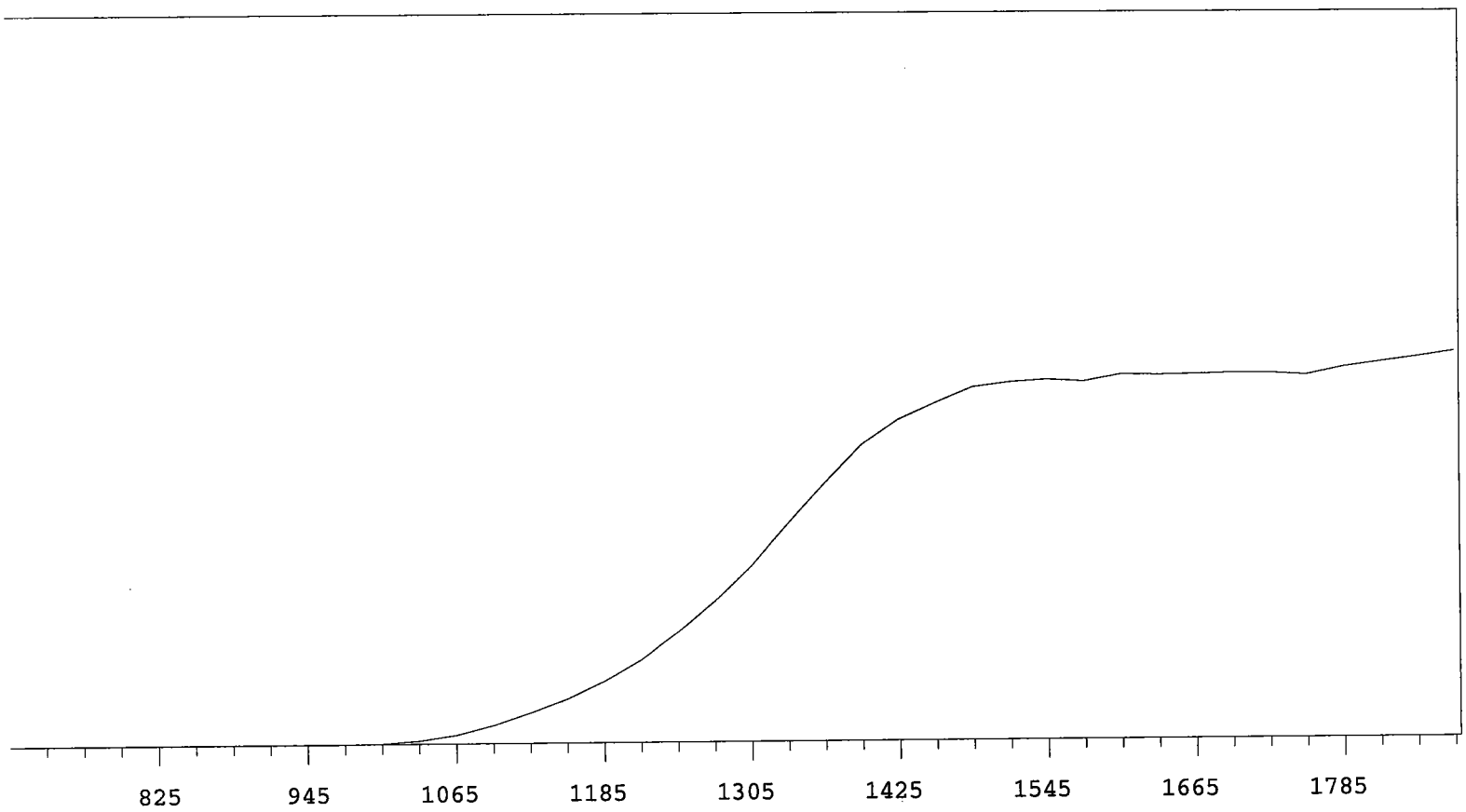


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	1	+0.00
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	0	>100
975	2	>100
1005	33	>100
1035	203	>100
1065	668	>100
1095	1403	>100
1125	2545	>100
1155	3800	>100
1185	5363	>100
1215	7355	+95.00
1245	9807	+87.69
1275	12700	+80.28

VOLTS	COUNTS	%/100 Volts
1305	16226	+71.71
1335	20083	+61.95
1365	23913	+49.99
1395	27526	+36.97
1425	30193	+24.54
1455	31747	+14.71
1485	32544	+7.71
1515	33198	+3.66
1545	33188	+1.51
1575	33227	+0.73
1605	33278	+1.04
1635	33518	+1.38
1665	33565	+1.95
1695	33774	+1.99
1725	34135	+3.30
1755	34244	+3.67
1785	35022	+4.84
1815	35229	+5.93
1845	36179	
1875	36821	

MPC 9600 Plateau Instrument 9 MPC 9604 Detector B 7/1/2009

Alpha Volts: 870 Beta Volts: 1530

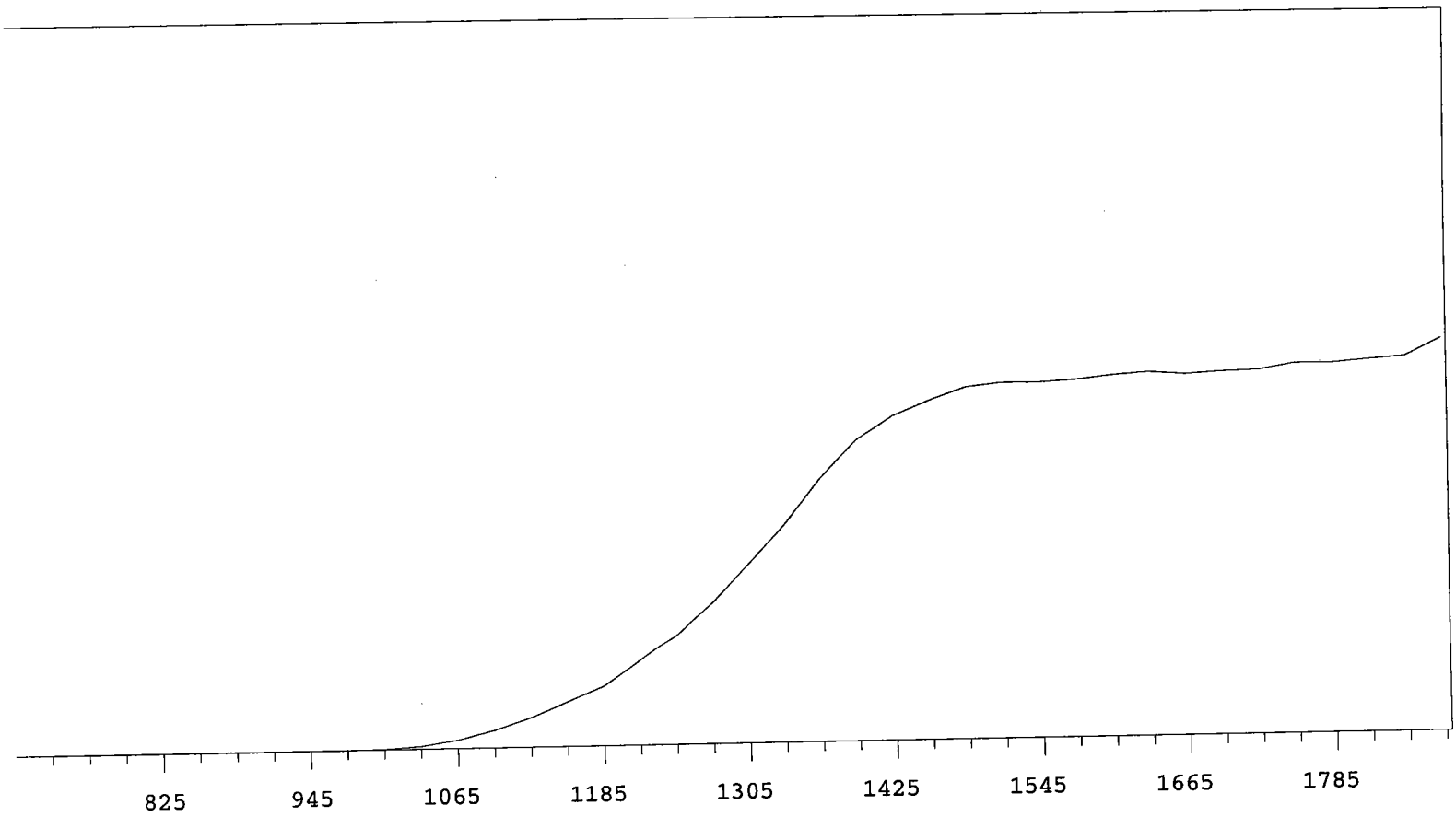


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	0	>100
975	4	>100
1005	45	>100
1035	300	>100
1065	836	>100
1095	1742	>100
1125	2896	>100
1155	4198	>100
1185	5849	>100
1215	7887	+92.20
1245	10561	+83.55
1275	13442	+76.62

VOLTS	COUNTS	%/100 Volts
1305	16723	+68.78
1335	20749	+60.55
1365	24686	+48.78
1395	28343	+35.24
1425	30657	+24.31
1455	32208	+15.22
1485	33662	+9.32
1515	34098	+4.47
1545	34326	+2.17
1575	34133	+1.60
1605	34758	+1.41
1635	34706	+1.35
1665	34769	+0.30
1695	34830	-0.10
1725	34850	+0.90
1755	34613	+2.41
1785	35351	+3.87
1815	35849	+4.97
1845	36285	
1875	36814	

MPC 9600 Plateau Instrument 9 MPC 9604 Detector C 7/1/2009

Alpha Volts: 870 Beta Volts: 1530

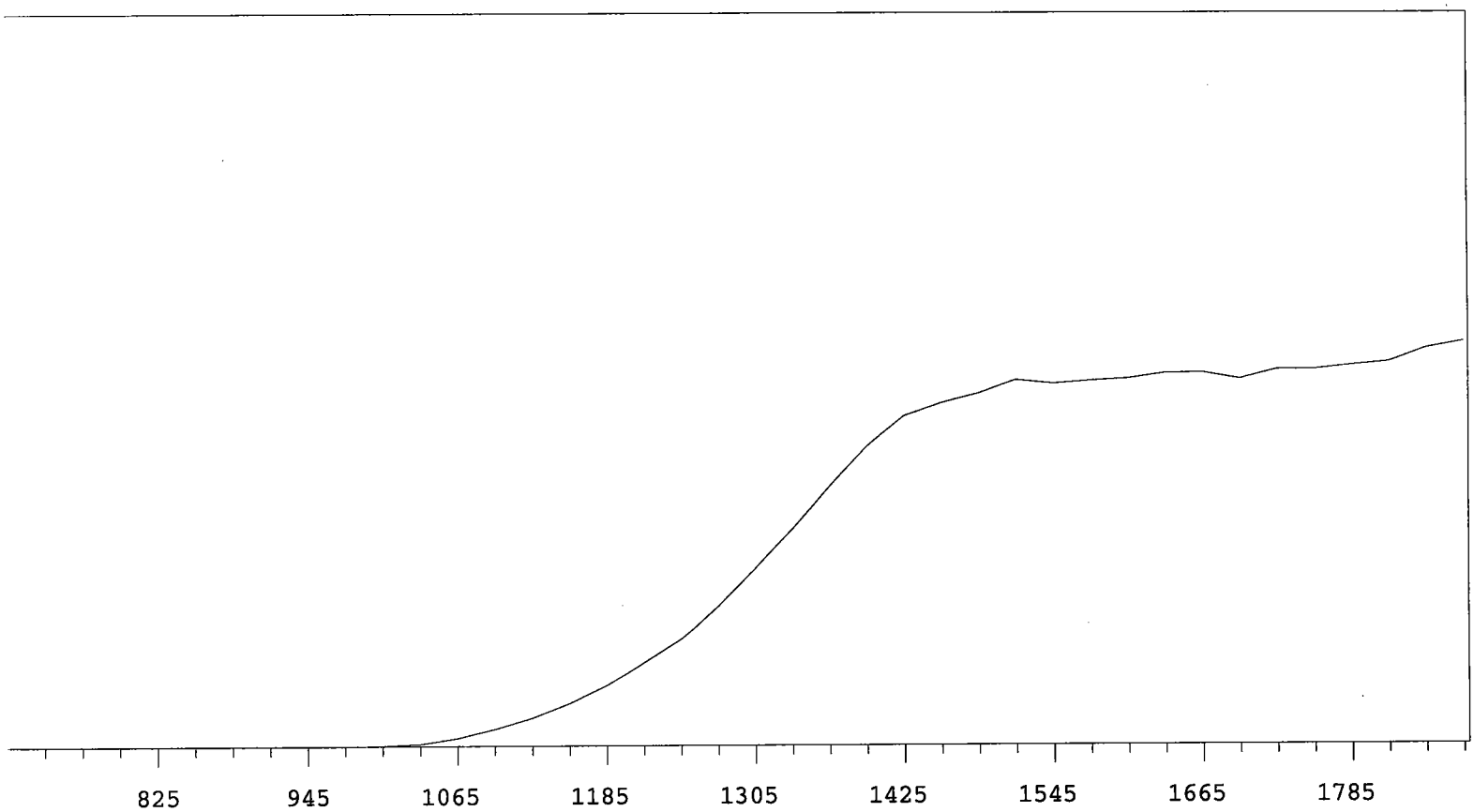


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	1	>100
915	1	>100
945	2	>100
975	3	>100
1005	64	>100
1035	349	>100
1065	970	>100
1095	1982	>100
1125	3328	>100
1155	5012	>100
1185	6669	>100
1215	9448	+92.67
1245	12293	+86.58
1275	15917	+76.99

VOLTS	COUNTS	%/100 Volts
1305	20192	+70.39
1335	24524	+60.97
1365	29650	+48.44
1395	33904	+35.09
1425	36549	+22.73
1455	38217	+13.58
1485	39628	+7.51
1515	40035	+3.73
1545	40020	+1.92
1575	40236	+2.06
1605	40680	+1.62
1635	40953	+1.03
1665	40643	+0.43
1695	40882	+1.41
1725	40979	+2.18
1755	41654	+2.20
1785	41602	+2.27
1815	41935	+4.50
1845	42259	
1875	44183	

MPC 9600 Plateau Instrument 9 MPC 9604 Detector D 7/1/2009

Alpha Volts: 870 Beta Volts: 1530

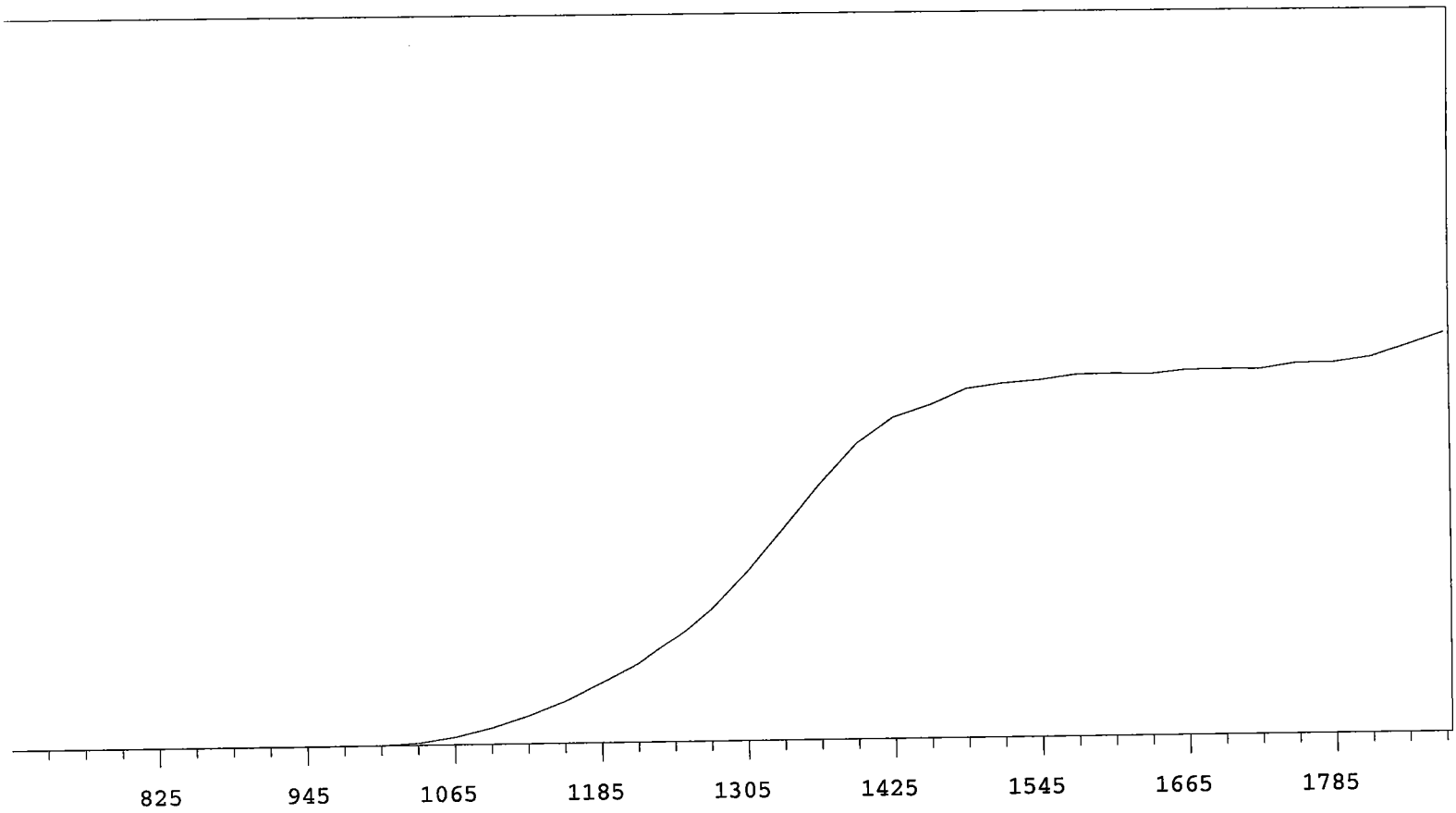


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	1	>100
945	0	>100
975	5	>100
1005	35	>100
1035	186	>100
1065	618	>100
1095	1280	>100
1125	2141	>100
1155	3268	>100
1185	4659	>100
1215	6343	+90.68
1245	8064	+83.46
1275	10497	+77.03

VOLTS	COUNTS	%/100 Volts
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 Instrument 10 MPC 9604 Detector A 7/1/2009

Alpha Volts: 870 Beta Volts: 1552

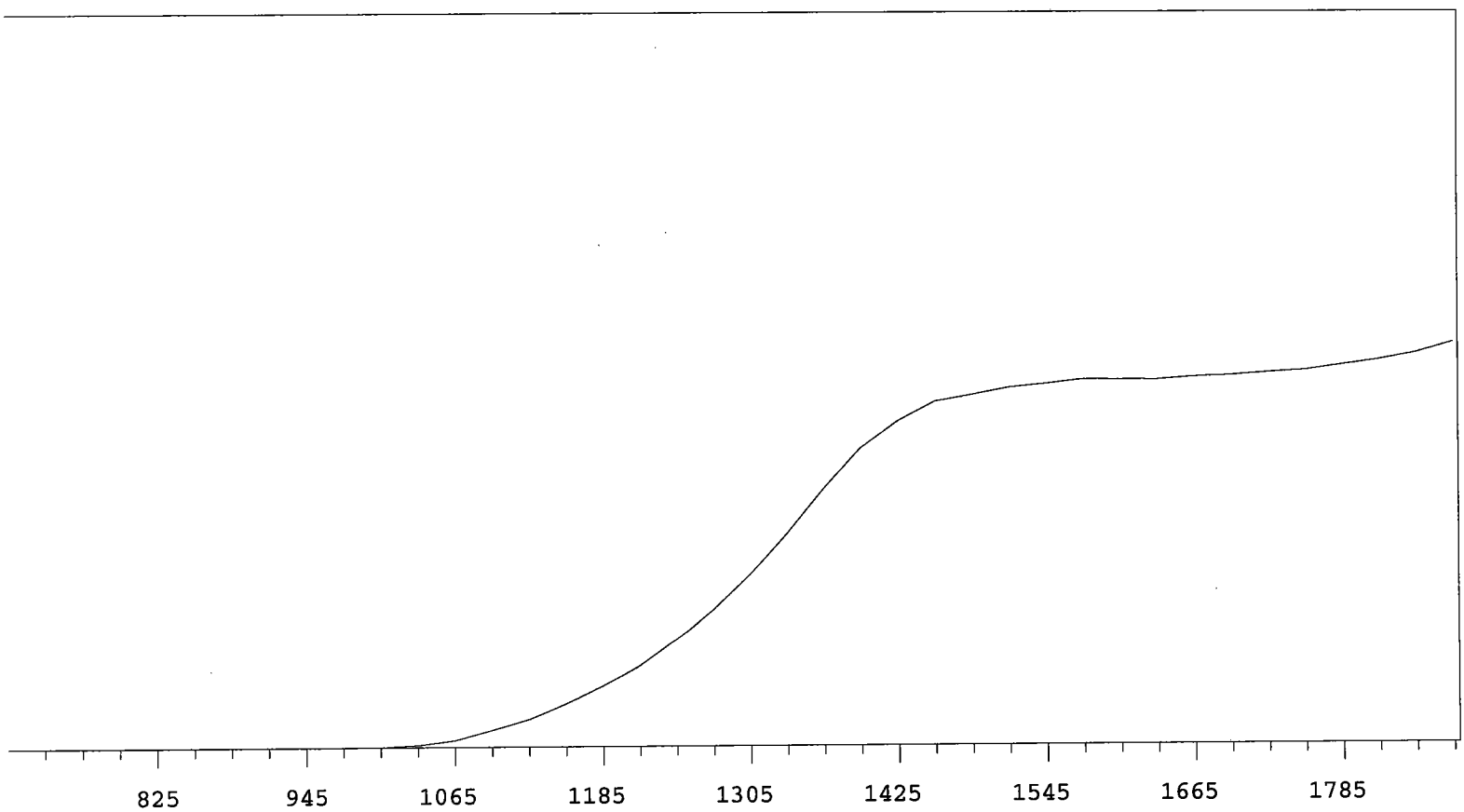


VOLTS	COUNTS	%/100 Volts
705	0	
735	1	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	0	>100
975	1	>100
1005	37	>100
1035	198	>100
1065	687	>100
1095	1491	>100
1125	2580	>100
1155	3920	>100
1185	5588	>100
1215	7384	+91.32
1245	9794	+84.81
1275	12572	+79.73

VOLTS	COUNTS	%/100 Volts
1305	16076	+72.76
1335	19985	+63.85
1365	24102	+50.95
1395	27819	+36.01
1425	30228	+23.86
1455	31343	+14.40
1485	32811	+8.77
1515	33243	+6.10
1545	33518	+3.25
1575	34010	+1.98
1605	34061	+1.59
1635	33973	+0.97
1665	34346	+0.93
1695	34366	+1.72
1725	34341	+1.54
1755	34860	+2.47
1785	34897	+4.50
1815	35377	+6.60
1845	36458	
1875	37630	

MPC 9600 Plateau Instrument 10 MPC 9604 Detector B 7/1/2009

Alpha Volts: 870 Beta Volts: 1552

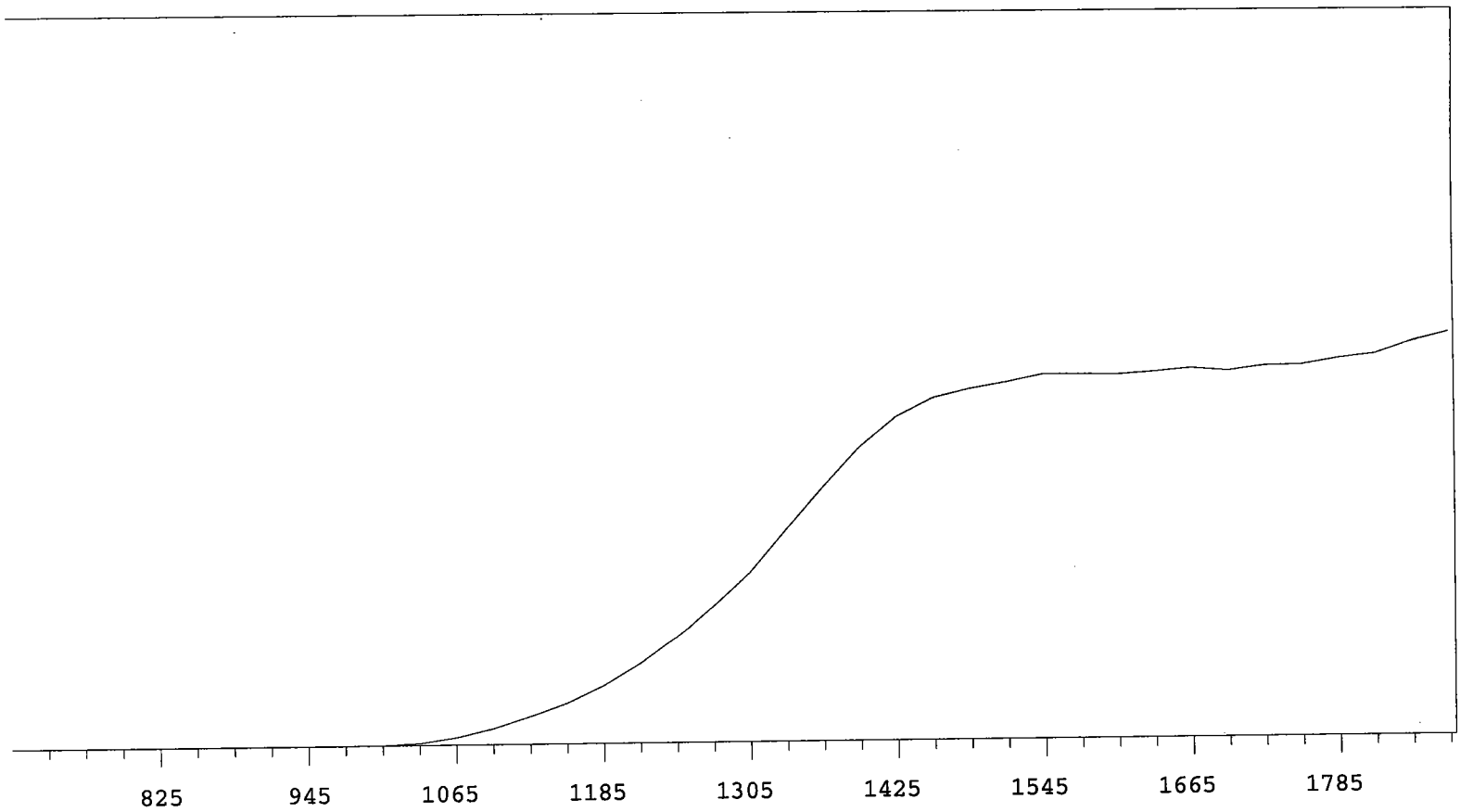


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	1	>100
975	7	>100
1005	28	>100
1035	190	>100
1065	597	>100
1095	1474	>100
1125	2383	>100
1155	3680	>100
1185	5131	>100
1215	6808	+89.95
1245	8990	+83.03
1275	11493	+77.30

VOLTS	COUNTS	%/100 Volts
1305	14469	+71.08
1335	17904	+63.07
1365	21677	+51.20
1395	25027	+38.06
1425	27237	+24.55
1455	28914	+14.61
1485	29480	+8.48
1515	30075	+5.06
1545	30374	+3.42
1575	30738	+1.68
1605	30703	+1.08
1635	30679	+0.77
1665	30902	+1.46
1695	30992	+1.89
1725	31224	+2.40
1755	31397	+3.27
1785	31826	+4.13
1815	32236	+5.59
1845	32782	
1875	33632	

MPC 9600 Plateau Instrument 10 MPC 9604 Detector C 7/1/2009

Alpha Volts: 870 Beta Volts: 1552

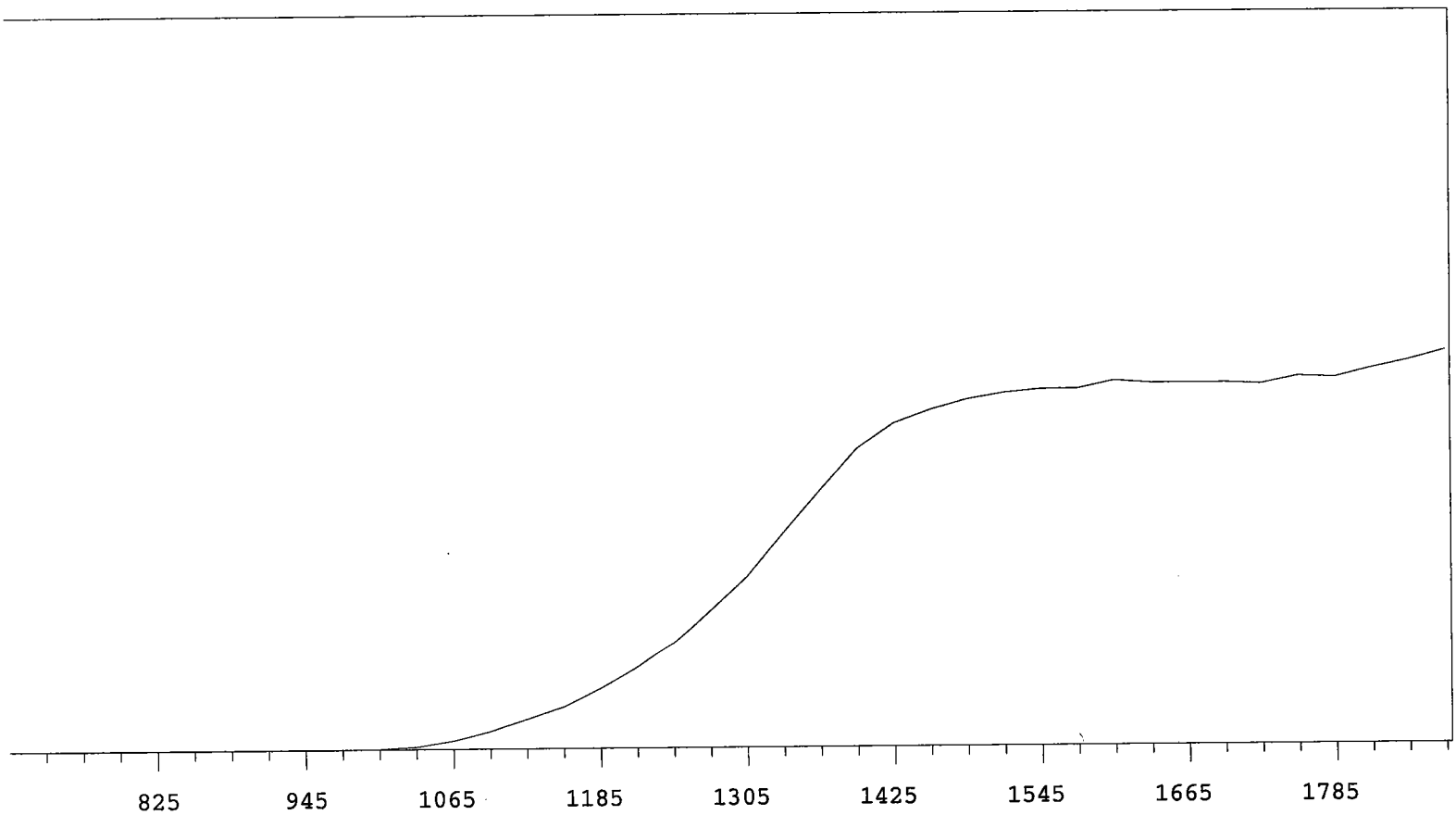


VOLTS	COUNTS	%/100 Volts
705	1	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	1	>100
915	0	>100
945	2	>100
975	2	>100
1005	36	>100
1035	220	>100
1065	780	>100
1095	1712	>100
1125	2926	>100
1155	4297	>100
1185	6097	>100
1215	8397	+95.11
1245	11155	+85.84
1275	14430	+78.79

VOLTS	COUNTS	%/100 Volts
1305	18051	+71.16
1335	22586	+62.34
1365	26973	+51.47
1395	31137	+38.24
1425	34321	+25.70
1455	36267	+15.37
1485	37197	+9.21
1515	37851	+5.38
1545	38622	+3.00
1575	38600	+1.55
1605	38538	+1.03
1635	38786	+0.91
1665	39129	+1.38
1695	38832	+1.20
1725	39323	+2.00
1755	39390	+3.35
1785	40031	+4.86
1815	40466	+6.64
1845	41713	
1875	42620	

MPC 9600 Plateau Instrument 10 MPC 9604 Detector D 7/1/2009

Alpha Volts: 870 Beta Volts: 1552

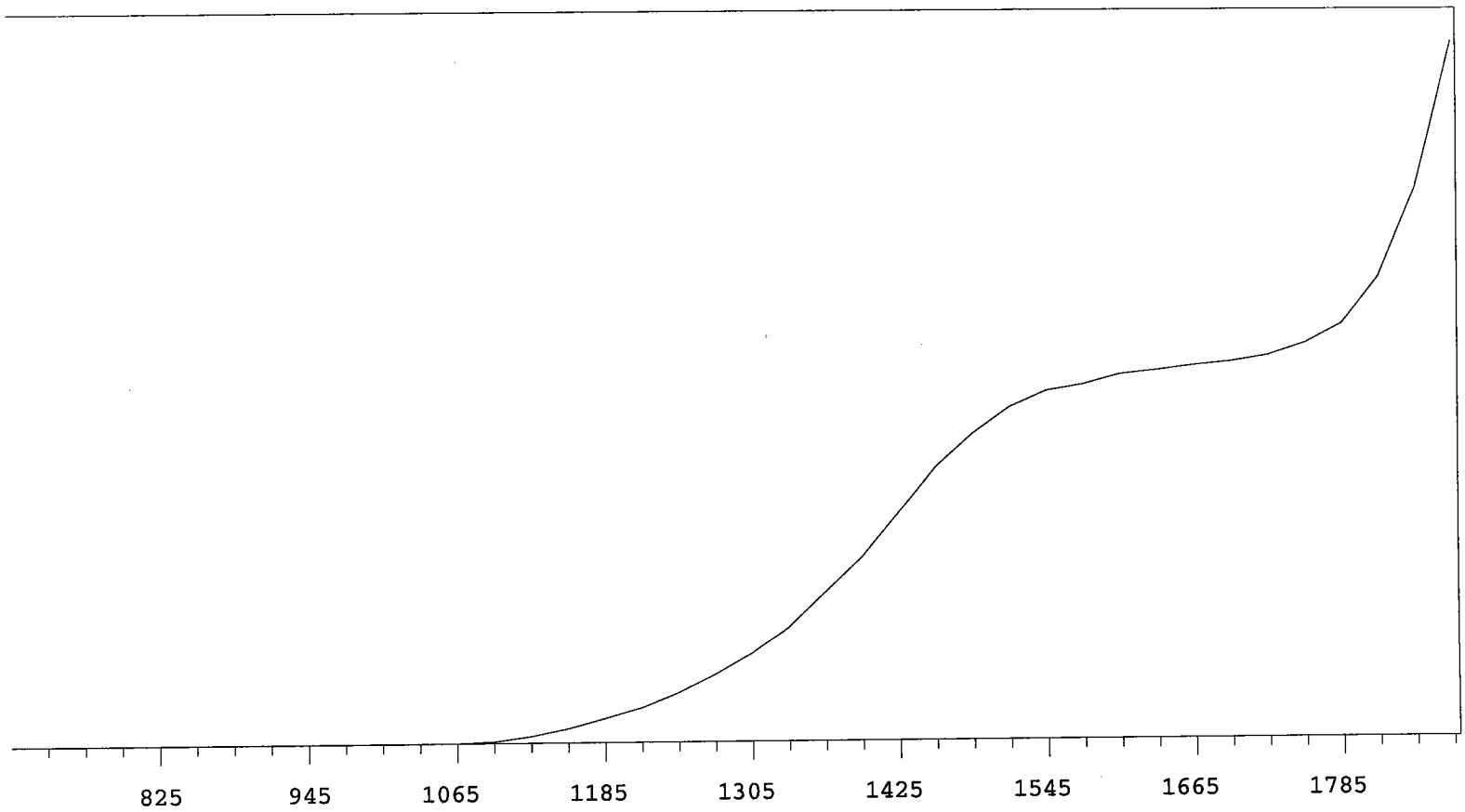


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	0	>100
975	3	>100
1005	49	>100
1035	244	>100
1065	764	>100
1095	1584	>100
1125	2677	>100
1155	3763	>100
1185	5395	>100
1215	7350	+93.71
1245	9655	+83.52
1275	12504	+76.82

VOLTS	COUNTS	%/100 Volts
1305	15430	+69.87
1335	19258	+61.49
1365	23018	+50.06
1395	26562	+35.34
1425	28750	+22.67
1455	29911	+13.20
1485	30798	+8.01
1515	31375	+4.83
1545	31684	+3.74
1575	31721	+2.38
1605	32398	+1.44
1635	32154	+0.64
1665	32157	-0.77
1695	32152	+0.99
1725	32029	+1.41
1755	32699	+3.00
1785	32566	+4.71
1815	33351	+5.92
1845	34031	
1875	34941	

Plateau 7/1/09 Instrument 11 MPC 9604 Detector A 7/1/2009

Alpha Volts: 1515 Beta Volts: 1515

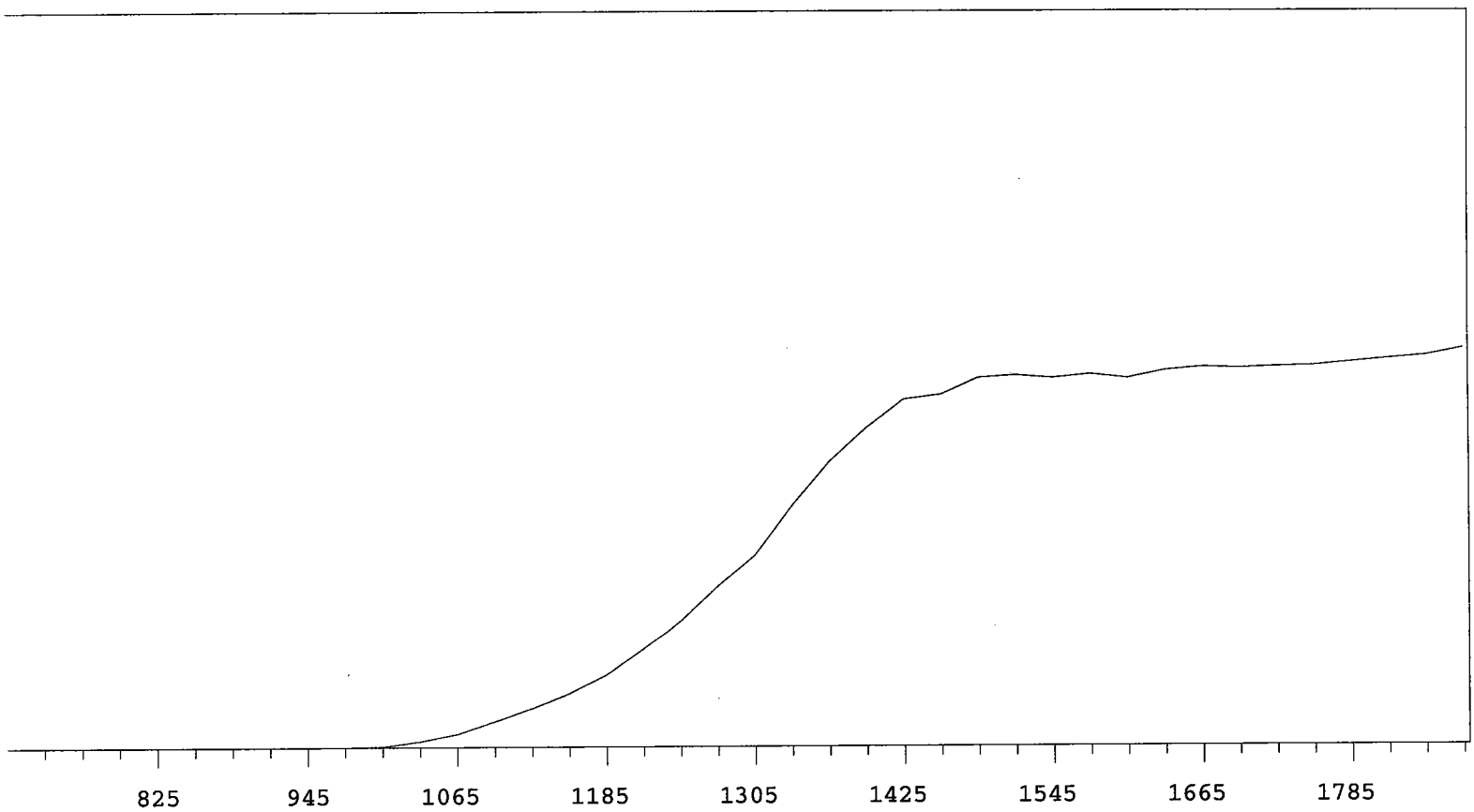


VOLTS	COUNTS	%/100 Volts
705	0	
735	1	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	1	+0.00
975	0	>100
1005	0	>100
1035	2	>100
1065	9	>100
1095	61	>100
1125	248	>100
1155	528	>100
1185	882	>100
1215	1270	>100
1245	1786	>100
1275	2478	+93.67

VOLTS	COUNTS	%/100 Volts
1305	3225	+87.64
1335	4189	+80.15
1365	5428	+75.12
1395	6662	+68.60
1425	8241	+58.14
1455	9857	+46.65
1485	11018	+33.24
1515	11953	+21.01
1545	12538	+13.57
1575	12760	+8.35
1605	13114	+5.84
1635	13258	+4.78
1665	13430	+3.99
1695	13551	+5.46
1725	13771	+8.65
1755	14204	+16.44
1785	14916	+30.03
1815	16579	+48.74
1845	19717	
1875	25029	

Plateau 7/1/09 Instrument 11 MPC 9604 Detector B 7/1/2009

Alpha Volts: 1515 Beta Volts: 1515

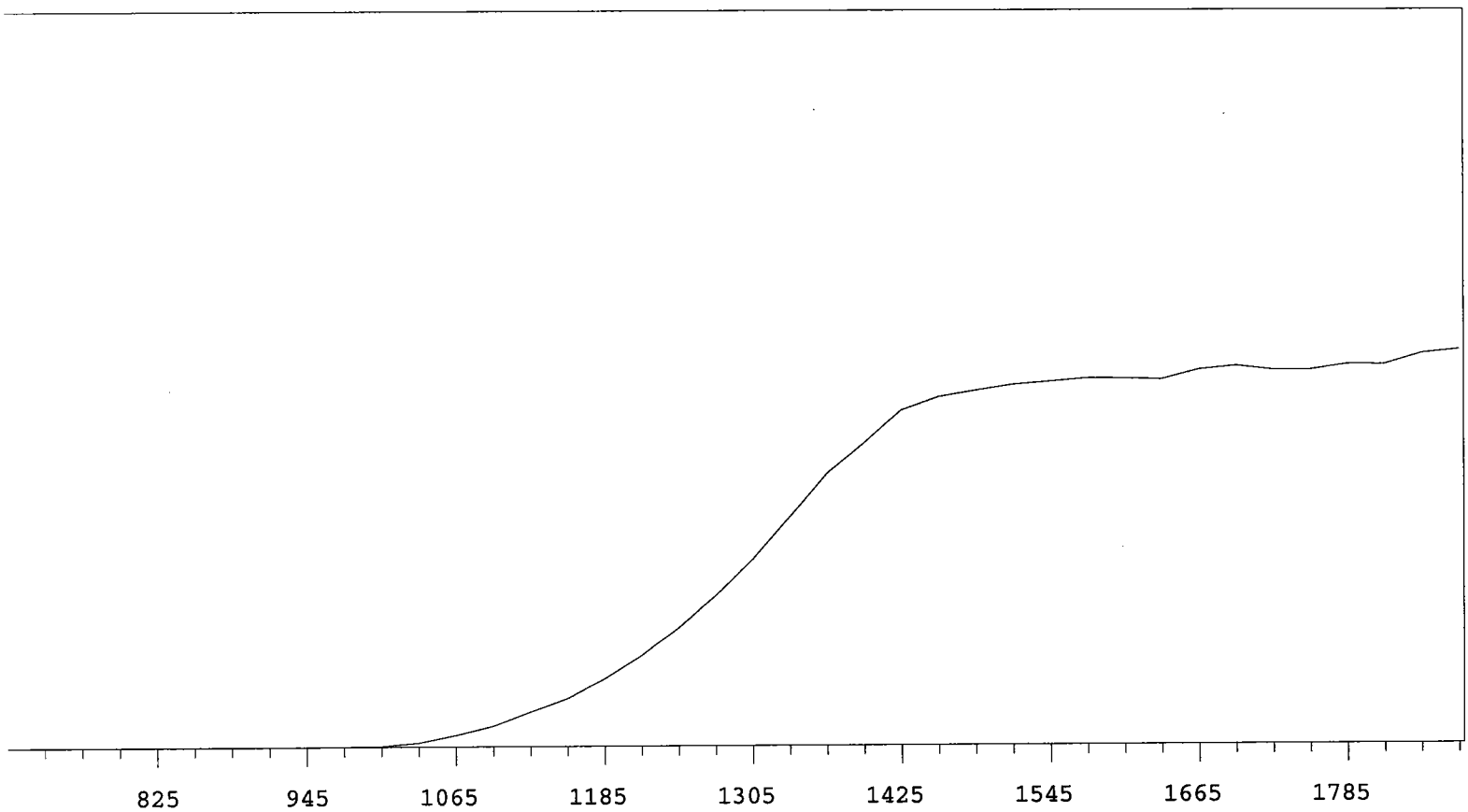


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	1	>100
945	0	>100
975	11	>100
1005	47	>100
1035	280	>100
1065	610	>100
1095	1192	>100
1125	1789	>100
1155	2466	>100
1185	3337	+94.91
1215	4526	+88.85
1245	5885	+78.40
1275	7518	+72.09

VOLTS	COUNTS	%/100 Volts
1305	8947	+65.63
1335	11238	+56.58
1365	13246	+46.66
1395	14838	+30.69
1425	16166	+20.11
1455	16396	+11.95
1485	17161	+5.61
1515	17274	+3.59
1545	17144	-0.00
1575	17323	+0.80
1605	17136	+2.21
1635	17484	+1.94
1665	17638	+2.16
1695	17580	+0.85
1725	17655	+1.05
1755	17700	+1.98
1785	17857	+2.38
1815	18006	+3.36
1845	18140	
1875	18468	

Plateau 7/1/09 Instrument 11 MPC 9604 Detector C 7/1/2009

Alpha Volts: 1515 Beta Volts: 1515

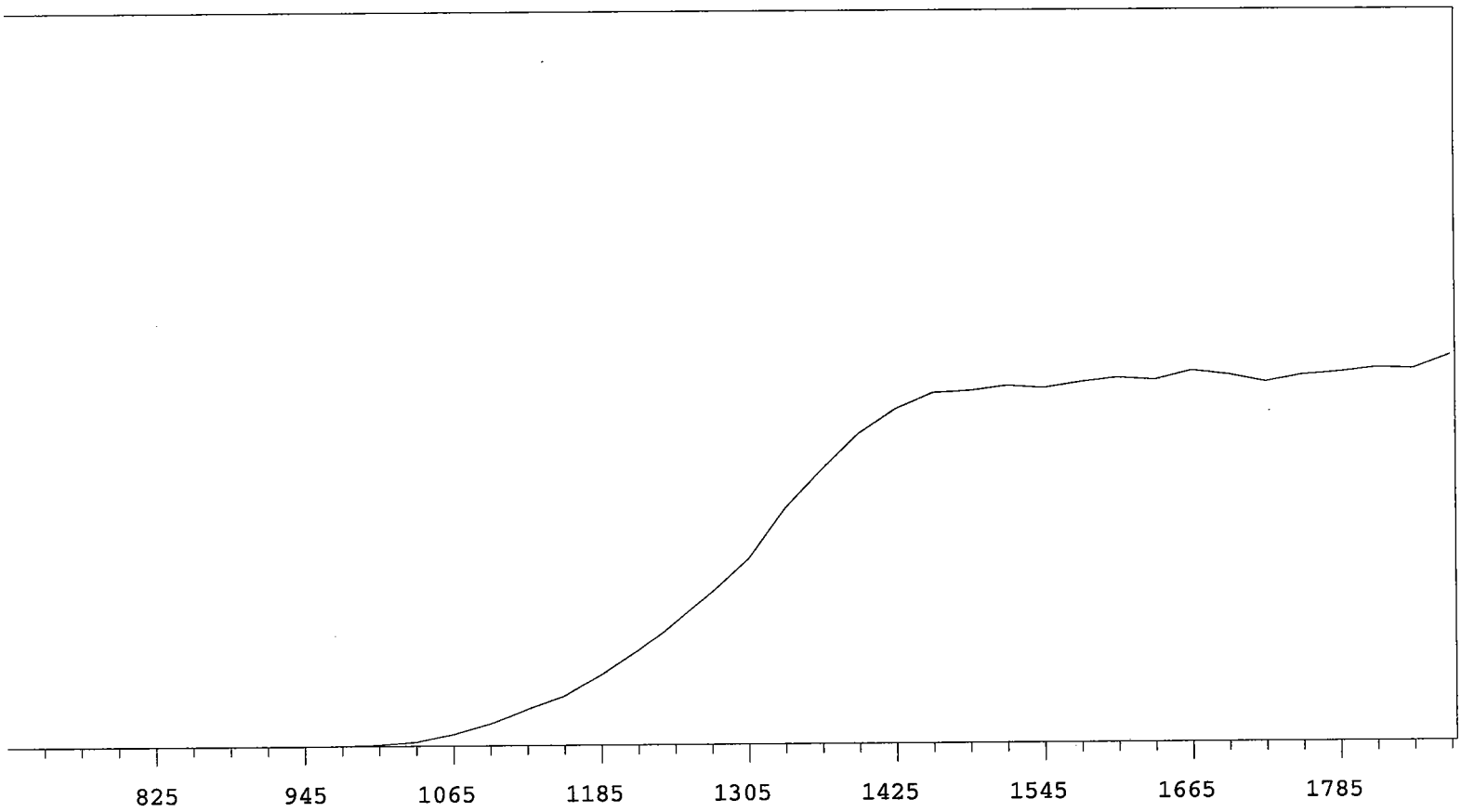


VOLTS	COUNTS	%/100 Volts
705	1	
735	0	
765	0	+0.00
795	0	>100
825	1	+0.00
855	0	>100
885	0	+0.00
915	0	>100
945	1	>100
975	7	>100
1005	46	>100
1035	191	>100
1065	540	>100
1095	957	>100
1125	1597	>100
1155	2217	>100
1185	3154	+98.74
1215	4239	+89.75
1245	5550	+79.98
1275	6980	+73.12

VOLTS	COUNTS	%/100 Volts
1305	8636	+66.44
1335	10593	+56.56
1365	12582	+46.23
1395	13957	+33.45
1425	15443	+21.49
1455	16048	+13.14
1485	16331	+6.45
1515	16603	+4.19
1545	16736	+2.73
1575	16884	+1.11
1605	16875	+1.91
1635	16813	+2.86
1665	17257	+2.60
1695	17425	+1.58
1725	17238	+0.49
1755	17230	+0.63
1785	17482	+3.27
1815	17468	+4.46
1845	17977	
1875	18163	

Plateau 7/1/09 Instrument 11 MPC 9604 Detector D 7/1/2009

Alpha Volts: 1515 Beta Volts: 1515

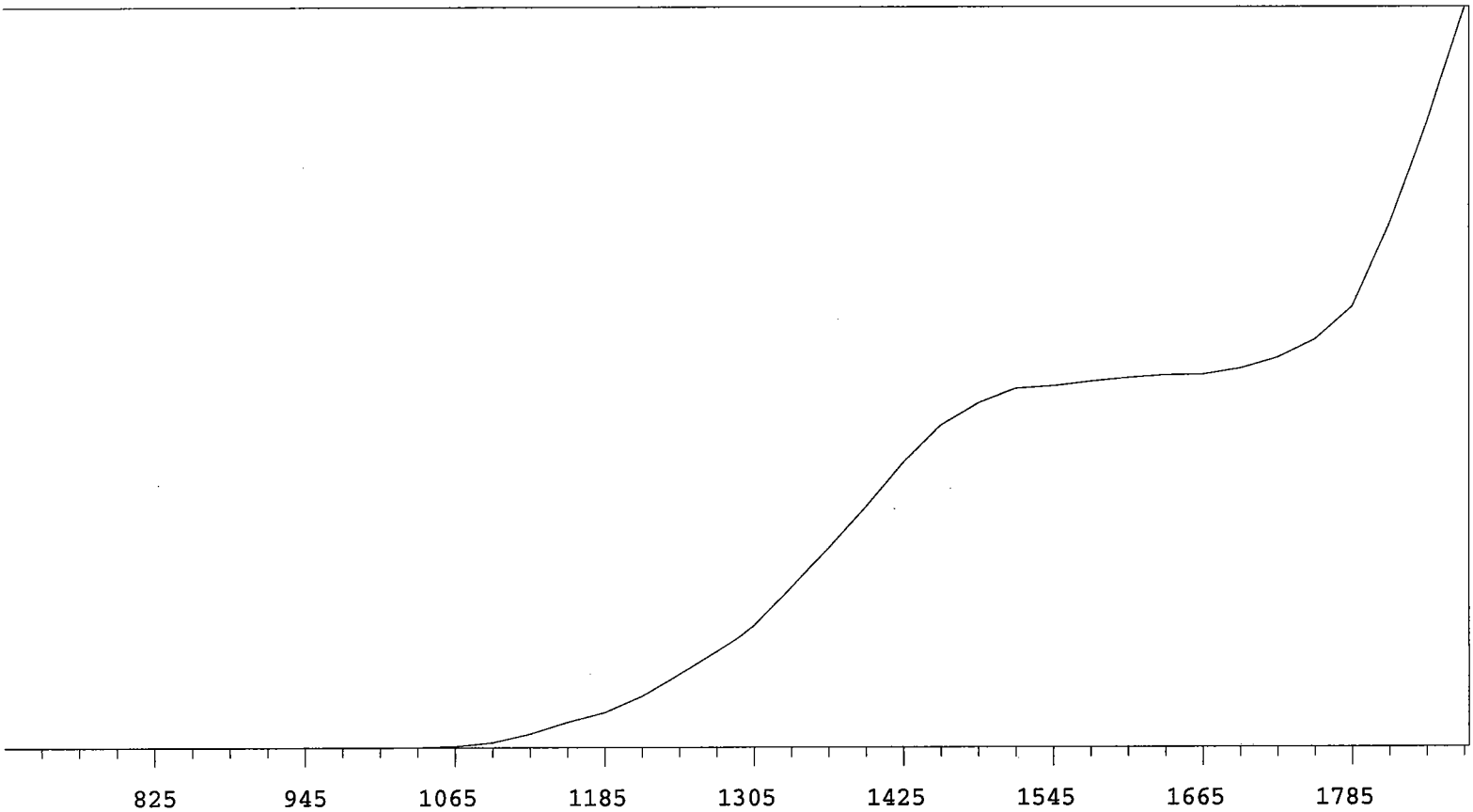


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	1	+83.33
885	1	+55.56
915	0	>100
945	1	>100
975	9	>100
1005	60	>100
1035	173	>100
1065	480	>100
1095	911	>100
1125	1508	>100
1155	2024	>100
1185	2872	+97.38
1215	3858	+89.30
1245	5070	+78.02
1275	6322	+73.30

VOLTS	COUNTS	%/100 Volts
1305	7679	+65.97
1335	9737	+57.57
1365	11301	+45.87
1395	12767	+31.71
1425	13767	+19.90
1455	14399	+10.72
1485	14467	+4.38
1515	14671	+2.12
1545	14576	+2.61
1575	14808	+1.80
1605	14974	+3.15
1635	14872	+1.76
1665	15248	-0.41
1695	15067	-0.27
1725	14784	-0.43
1755	15044	+2.01
1785	15163	+2.82
1815	15333	+3.61
1845	15278	
1875	15817	

Plateau 7/1/09 Instrument 12 MPC 9604 Detector A 7/1/2009

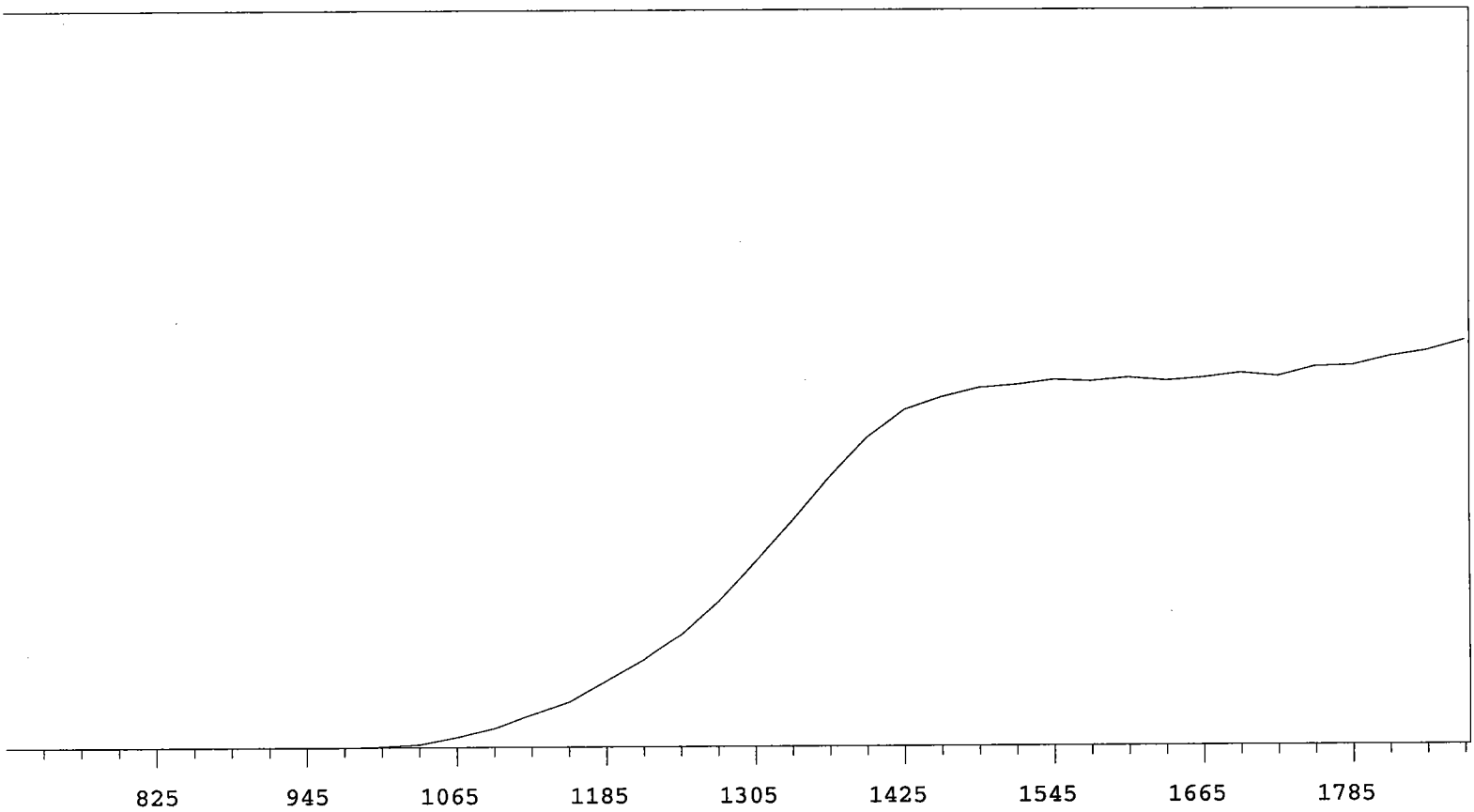
Alpha Volts: 705 Beta Volts: 1515



VOLTS	COUNTS	%/100 Volts
705	0	
735	1	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	0	>100
975	1	>100
1005	3	>100
1035	17	>100
1065	84	>100
1095	267	>100
1125	709	>100
1155	1299	>100
1185	1813	>100
1215	2638	>100
1245	3777	+96.47
1275	4915	+87.98
1305	6302	+80.03
1335	8191	+73.78
1365	10140	+66.18
1395	12247	+55.83
1425	14468	+43.92
1455	16303	+31.28
1485	17411	+18.64
1515	18150	+9.87
1545	18275	+5.30
1575	18496	+3.16
1605	18685	+2.66
1635	18820	+2.63
1665	18855	+4.16
1695	19152	+7.70
1725	19706	+13.90
1755	20640	+26.51
1785	22308	+40.92
1815	26460	+51.46
1845	31616	
1875	37348	

Plateau 7/1/09 Instrument 12 MPC 9604 Detector B 7/1/2009

Alpha Volts: 705 Beta Volts: 1515

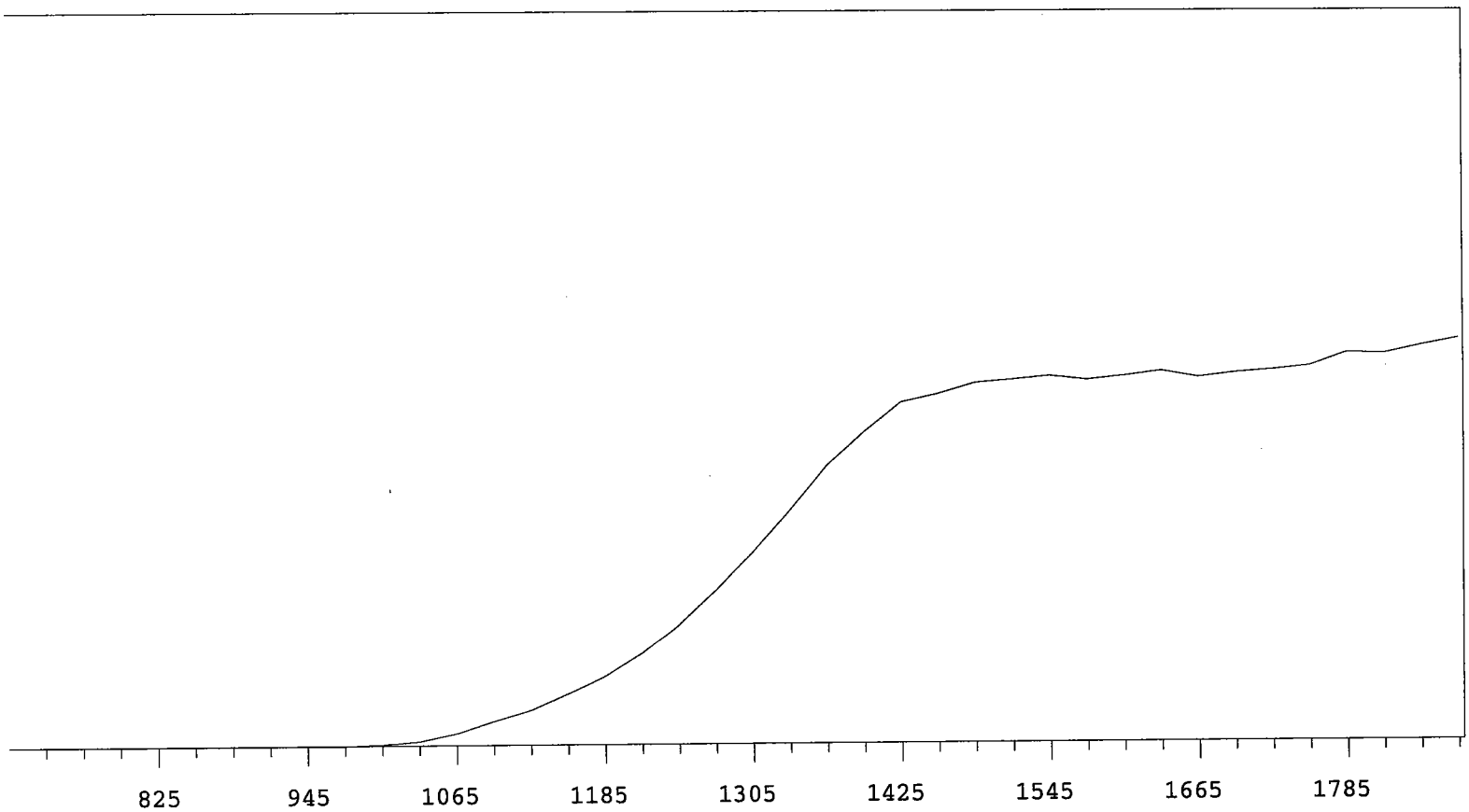


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	1	+83.33
885	1	-83.33
915	0	-55.56
945	0	>100
975	1	>100
1005	43	>100
1035	165	>100
1065	557	>100
1095	1055	>100
1125	1775	>100
1155	2470	>100
1185	3617	+98.46
1215	4757	+90.95
1245	6186	+83.59
1275	8021	+77.85

VOLTS	COUNTS	%/100 Volts
1305	10207	+70.42
1335	12473	+60.75
1365	14900	+48.87
1395	17101	+35.36
1425	18643	+22.53
1455	19350	+12.34
1485	19848	+6.68
1515	20014	+3.51
1545	20278	+2.03
1575	20186	+0.80
1605	20375	+0.32
1635	20209	+1.36
1665	20364	+0.83
1695	20607	+2.43
1725	20429	+2.51
1755	20924	+3.64
1785	20984	+5.11
1815	21470	+5.63
1845	21773	
1875	22346	

Plateau 7/1/09 Instrument 12 MPC 9604 Detector C 7/1/2009

Alpha Volts: 705 Beta Volts: 1515

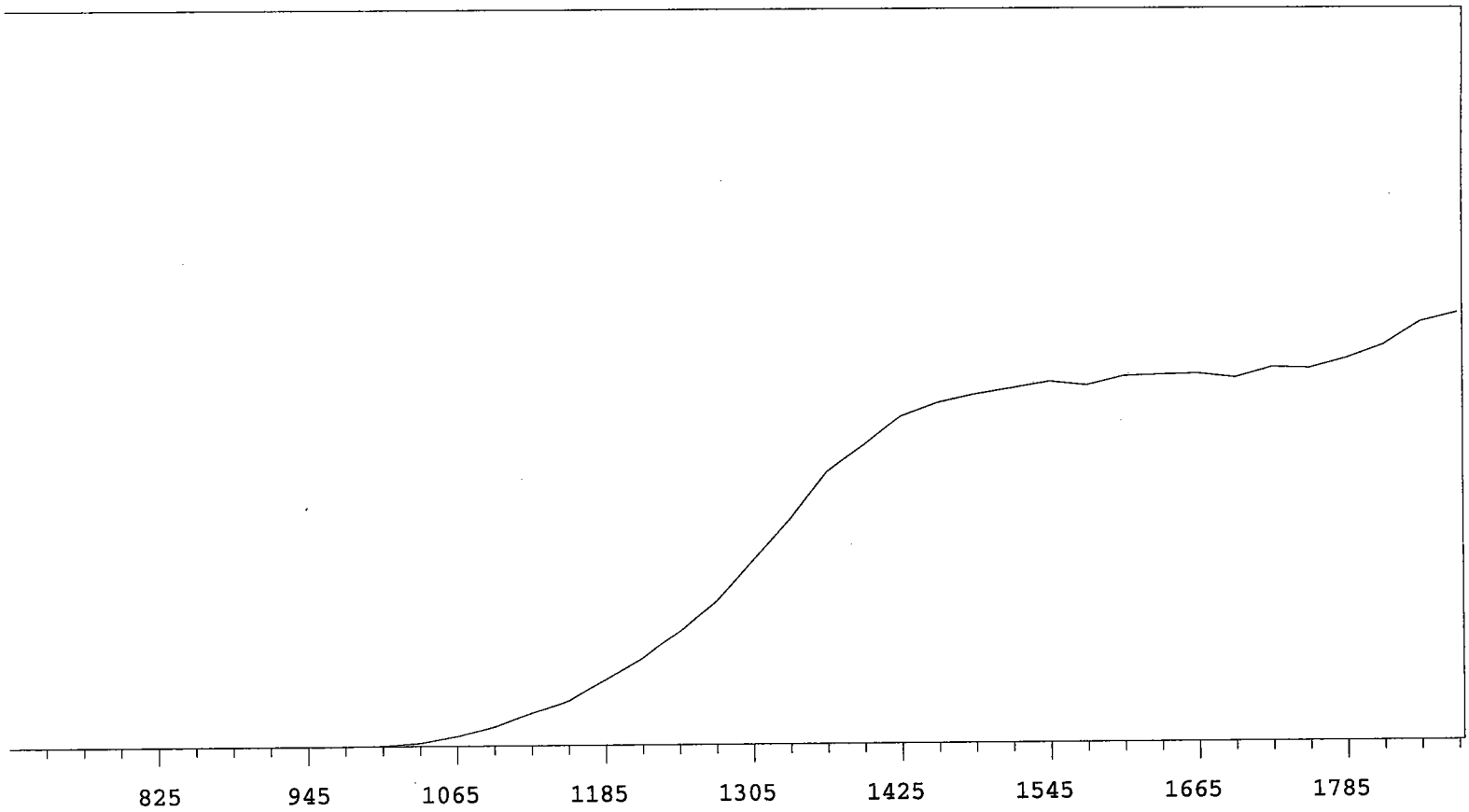


VOLTS	COUNTS	%/100 Volts
705	1	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	1	+0.00
915	0	>100
945	0	>100
975	7	>100
1005	52	>100
1035	214	>100
1065	590	>100
1095	1201	>100
1125	1759	>100
1155	2569	>100
1185	3440	+95.13
1215	4583	+87.74
1245	5985	+81.67
1275	7682	+74.54

VOLTS	COUNTS	%/100 Volts
1305	9543	+67.01
1335	11617	+56.47
1365	13791	+45.47
1395	15387	+31.66
1425	16819	+20.02
1455	17210	+11.63
1485	17742	+6.05
1515	17892	+3.04
1545	18070	+1.09
1575	17856	+1.43
1605	18054	+0.42
1635	18287	+1.06
1665	17969	+0.78
1695	18187	+1.48
1725	18317	+4.89
1755	18518	+4.76
1785	19156	+5.18
1815	19100	+5.18
1845	19496	
1875	19842	

Plateau 7/1/09 Instrument 12 MPC 9604 Detector D 7/1/2009

Alpha Volts: 705 Beta Volts: 1515

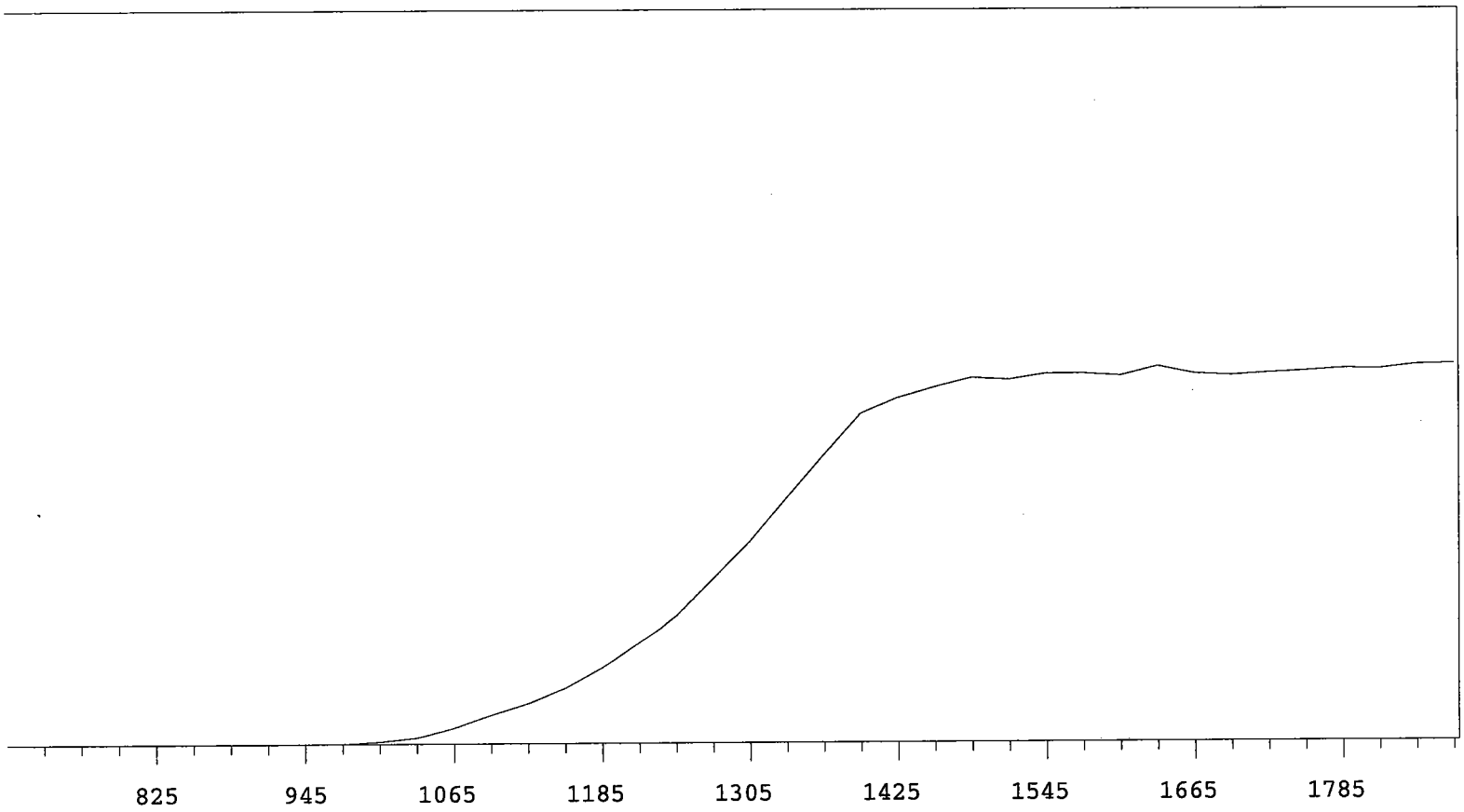


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	0	>100
975	4	>100
1005	26	>100
1035	169	>100
1065	483	>100
1095	955	>100
1125	1639	>100
1155	2233	>100
1185	3262	+98.61
1215	4306	+89.77
1245	5662	+82.36
1275	7113	+76.36

VOLTS	COUNTS	%/100 Volts
1305	9144	+69.92
1335	11120	+58.43
1365	13399	+45.40
1395	14711	+32.57
1425	16134	+20.69
1455	16805	+13.46
1485	17209	+7.90
1515	17500	+4.31
1545	17812	+3.48
1575	17629	+2.80
1605	18066	+2.23
1635	18122	+1.44
1665	18166	+1.20
1695	17967	+1.60
1725	18469	+3.41
1755	18409	+6.35
1785	18884	+9.47
1815	19535	+11.98
1845	20630	
1875	21076	

Plateau 7/1/09 Instrument 13 MPC 9604 Detector A 7/1/2009

Alpha Volts: 705 Beta Volts: 1515

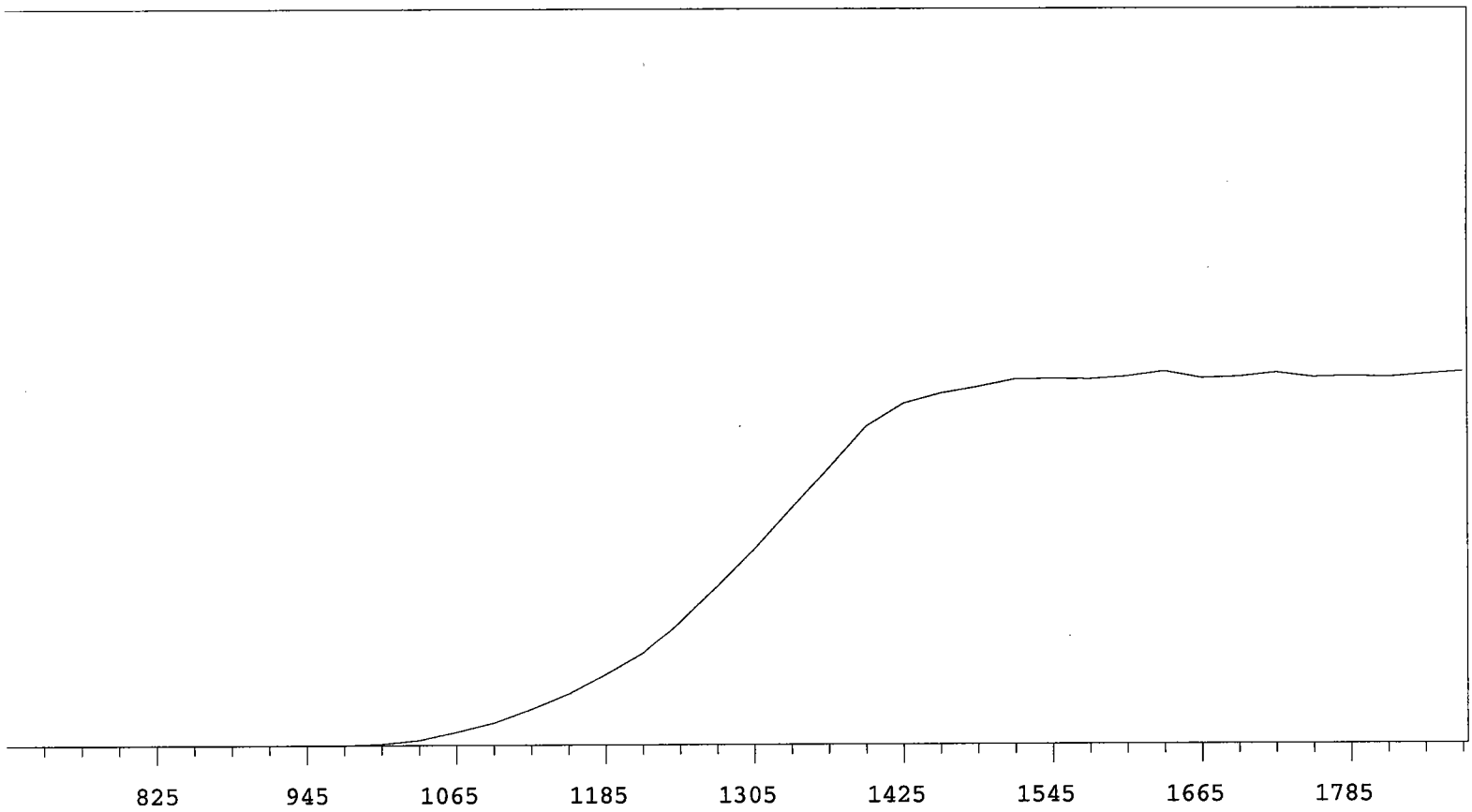


VOLTS	COUNTS	%/100 Volts
705	0	
735	1	
765	0	+55.56
795	2	>100
825	0	+0.00
855	0	>100
885	1	>100
915	0	>100
945	1	>100
975	14	>100
1005	104	>100
1035	281	>100
1065	720	>100
1095	1302	>100
1125	1834	>100
1155	2544	>100
1185	3485	+92.28
1215	4624	+85.50
1245	5878	+77.82
1275	7515	+71.49

VOLTS	COUNTS	%/100 Volts
1305	9209	+64.55
1335	11200	+55.94
1365	13123	+43.27
1395	14957	+29.04
1425	15658	+17.41
1455	16123	+8.01
1485	16530	+4.92
1515	16437	+2.71
1545	16704	+0.83
1575	16707	+2.14
1605	16602	+0.55
1635	17024	-0.28
1665	16684	-0.42
1695	16597	-0.85
1725	16711	+1.27
1755	16796	+1.51
1785	16903	+1.57
1815	16880	+1.46
1845	17066	
1875	17085	

Plateau 7/1/09 Instrument 13 MPC 9604 Detector B 7/1/2009

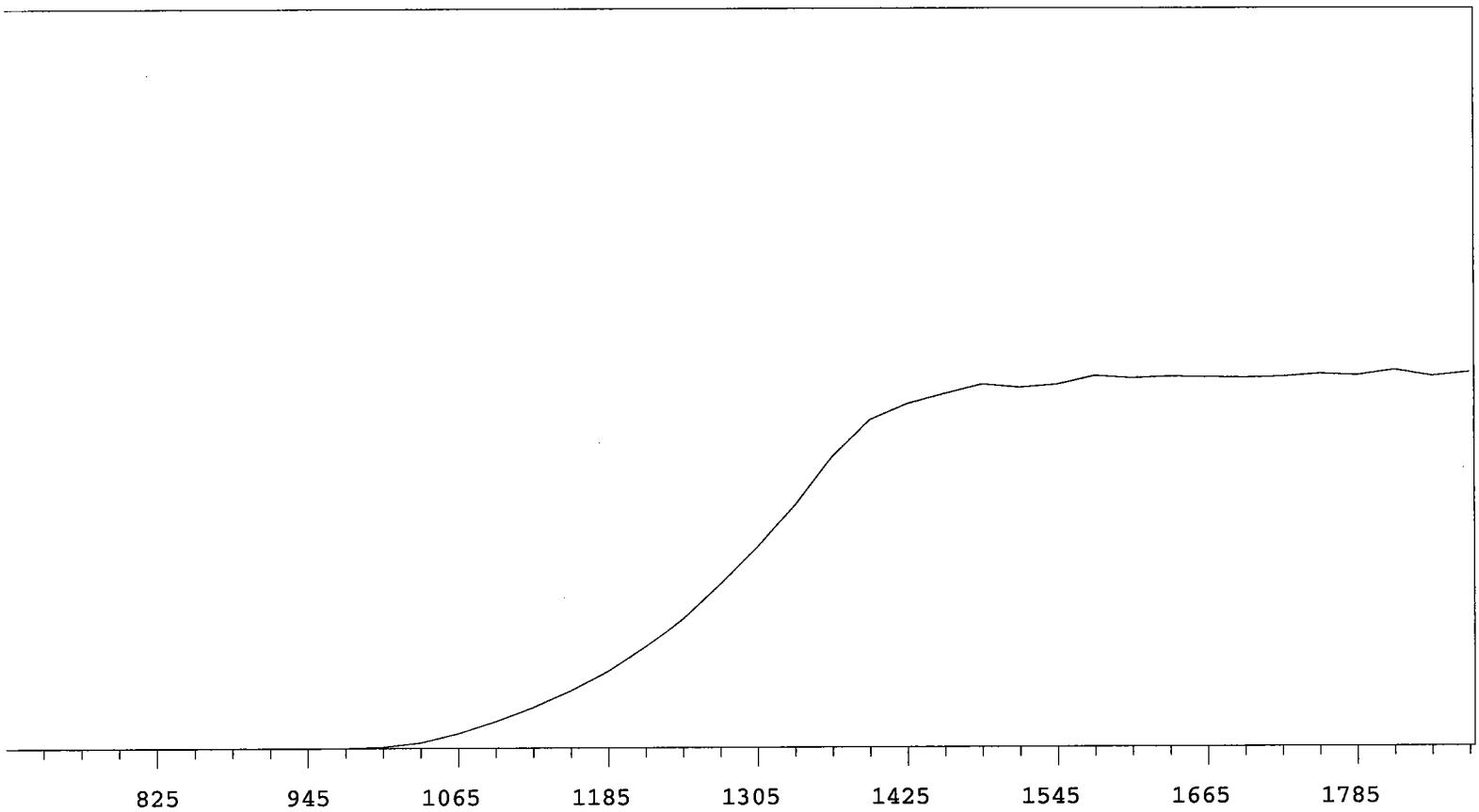
Alpha Volts: 705 Beta Volts: 1515



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	4	>100
1005	70	>100
1035	257	>100
1065	648	>100
1095	1116	>100
1125	1784	>100
1155	2560	>100
1185	3531	+96.11
1215	4568	+89.22
1245	6137	+81.65
1275	7855	+74.42

VOLTS	COUNTS	%/100 Volts
1305	9666	+64.39
1335	11722	+55.91
1365	13680	+44.91
1395	15677	+31.56
1425	16786	+19.46
1455	17283	+10.57
1485	17608	+5.95
1515	17972	+3.32
1545	18006	+1.84
1575	17970	+1.58
1605	18104	+0.74
1635	18351	+0.24
1665	18016	+0.16
1695	18080	-0.63
1725	18283	+0.29
1755	18047	-0.47
1785	18110	-0.32
1815	18040	+1.17
1845	18200	
1875	18320	

Plateau 7/1/09 Instrument 13 MPC 9604 Detector C 7/1/2009
Alpha Volts: 705 Beta Volts: 1515

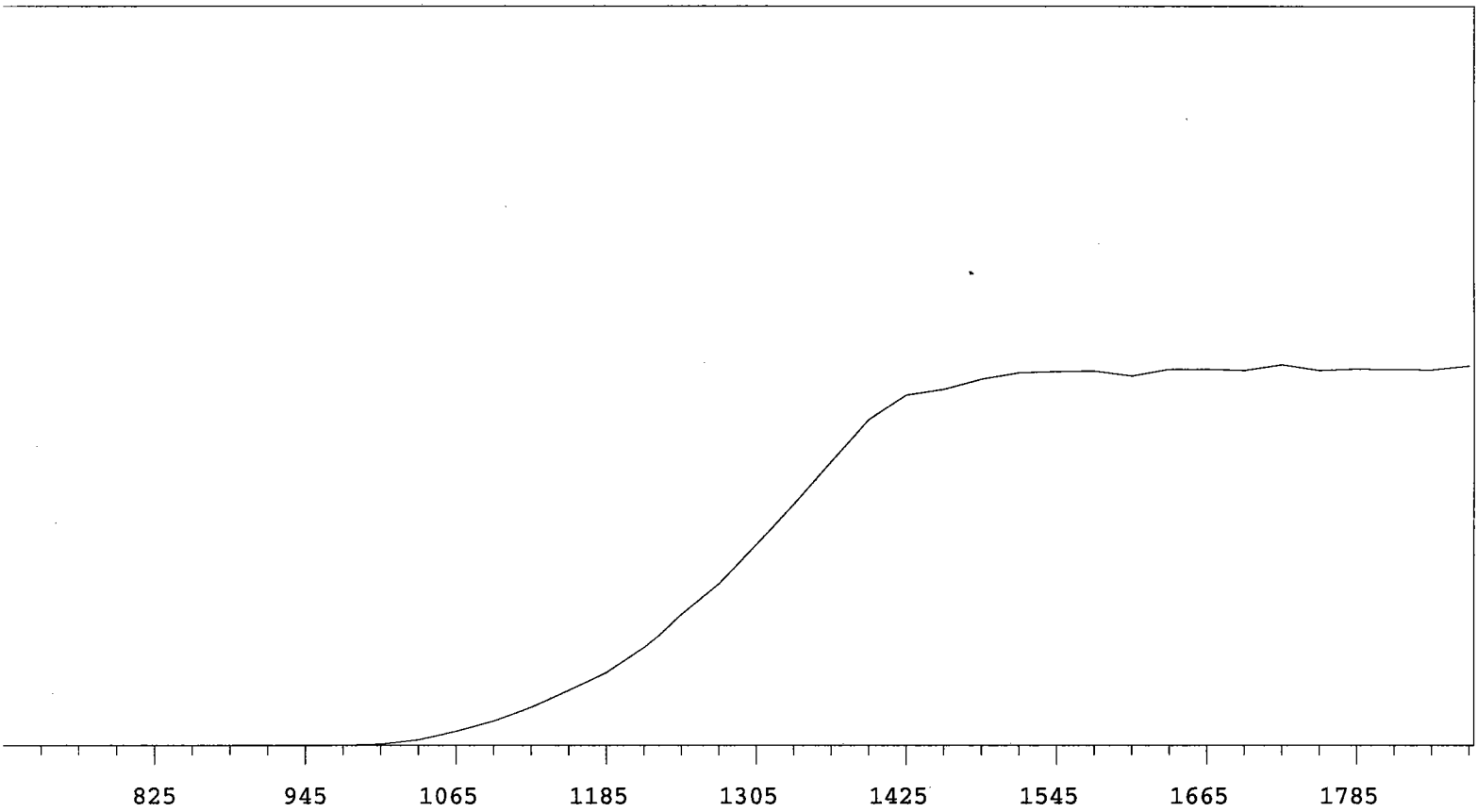


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	0	>100
975	9	>100
1005	93	>100
1035	325	>100
1065	834	>100
1095	1525	>100
1125	2318	>100
1155	3233	>100
1185	4357	+92.07
1215	5755	+85.64
1245	7438	+78.35
1275	9463	+70.89

VOLTS	COUNTS	%/100 Volts
1305	11573	+64.95
1335	13929	+56.47
1365	16726	+43.82
1395	18834	+29.38
1425	19743	+16.84
1455	20314	+7.95
1485	20860	+4.16
1515	20670	+3.23
1545	20844	+2.09
1575	21330	+2.48
1605	21188	+1.16
1635	21280	-0.32
1665	21237	+0.08
1695	21202	+0.42
1725	21254	+0.60
1755	21406	+1.41
1785	21326	+0.42
1815	21619	+0.16
1845	21282	
1875	21478	

Plateau 7/1/09 Instrument 13 MPC 9604 Detector D 7/1/2009

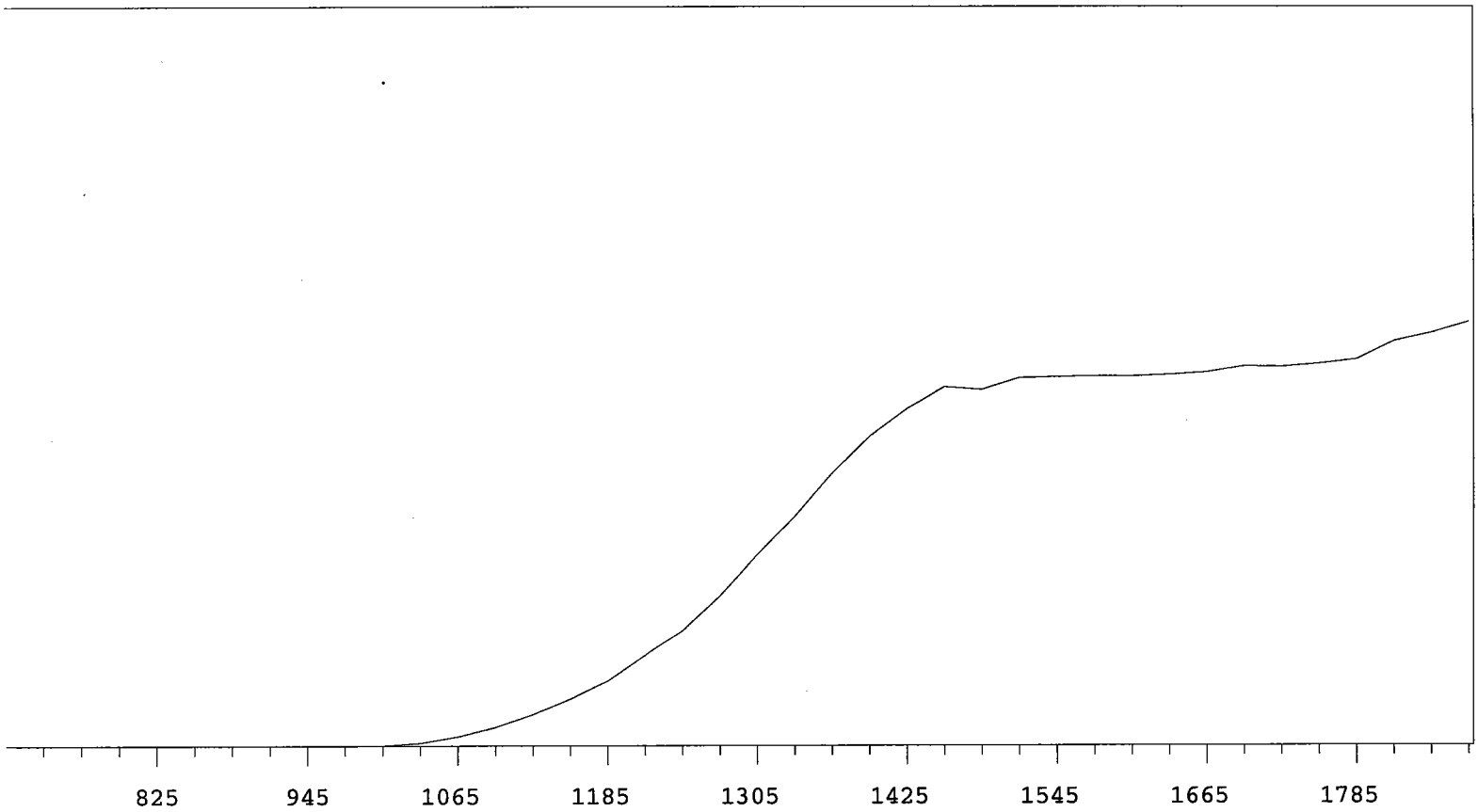
Alpha Volts: 705 Beta Volts: 1515



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	

Plateau 7/1/09 Instrument 14 MPC 9604 Detector A 7/1/2009

Alpha Volts: 705 Beta Volts: 1515

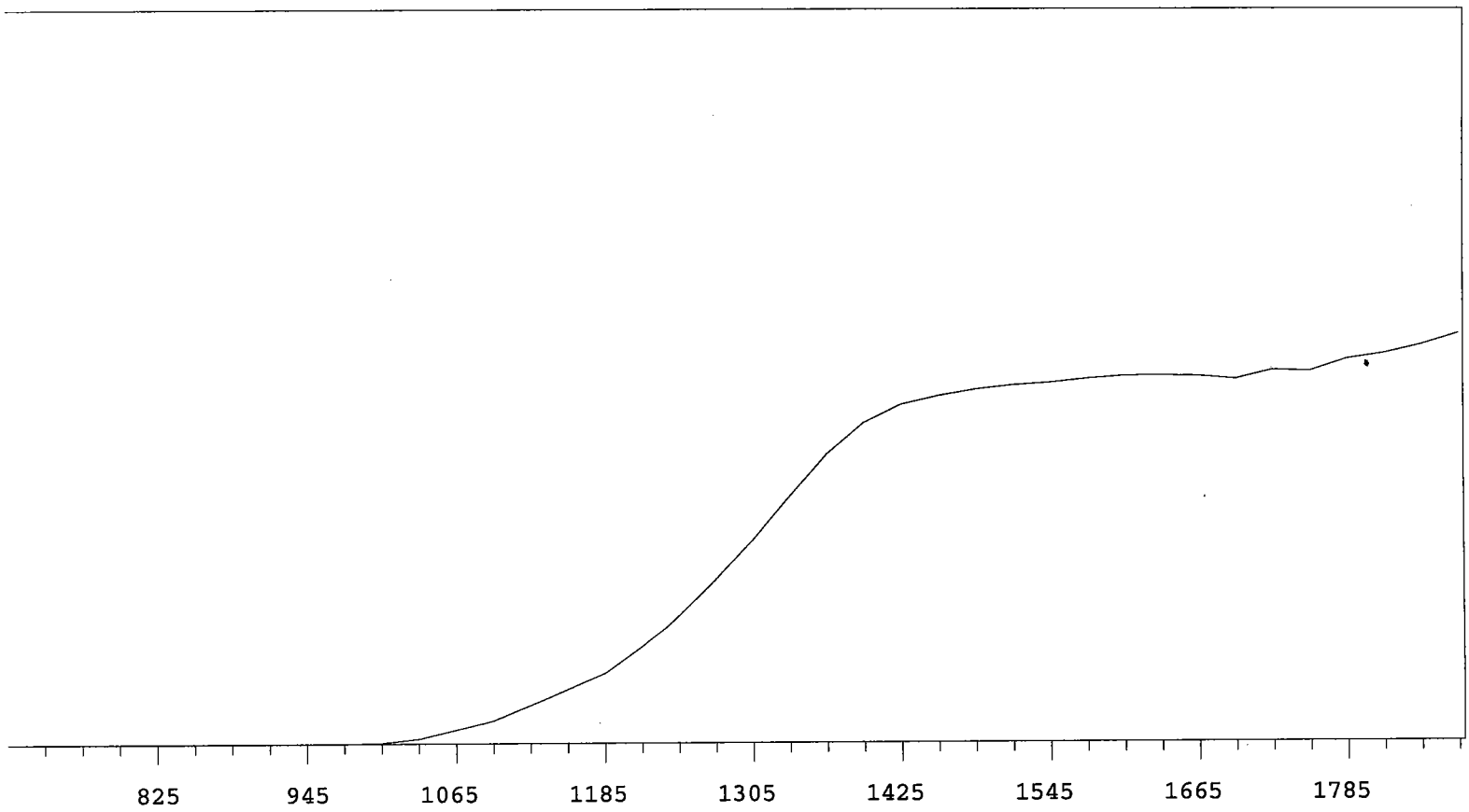


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	1	+0.00
915	0	>100
945	0	>100
975	0	>100
1005	18	>100
1035	137	>100
1065	430	>100
1095	865	>100
1125	1444	>100
1155	2151	>100
1185	2981	>100
1215	4168	+92.14
1245	5377	+84.73
1275	6924	+74.92

VOLTS	COUNTS	%/100 Volts
1305	8778	+67.49
1335	10502	+57.68
1365	12516	+46.36
1395	14215	+35.88
1425	15472	+22.01
1455	16469	+12.99
1485	16342	+6.70
1515	16874	+3.07
1545	16918	+2.53
1575	16950	+0.58
1605	16943	+0.95
1635	17008	+2.13
1665	17130	+2.45
1695	17403	+2.43
1725	17377	+2.43
1755	17515	+4.88
1785	17710	+7.54
1815	18533	+9.04
1845	18905	
1875	19415	

Plateau 7/1/09 Instrument 14 MPC 9604 Detector B 7/1/2009

Alpha Volts: 705 Beta Volts: 1515

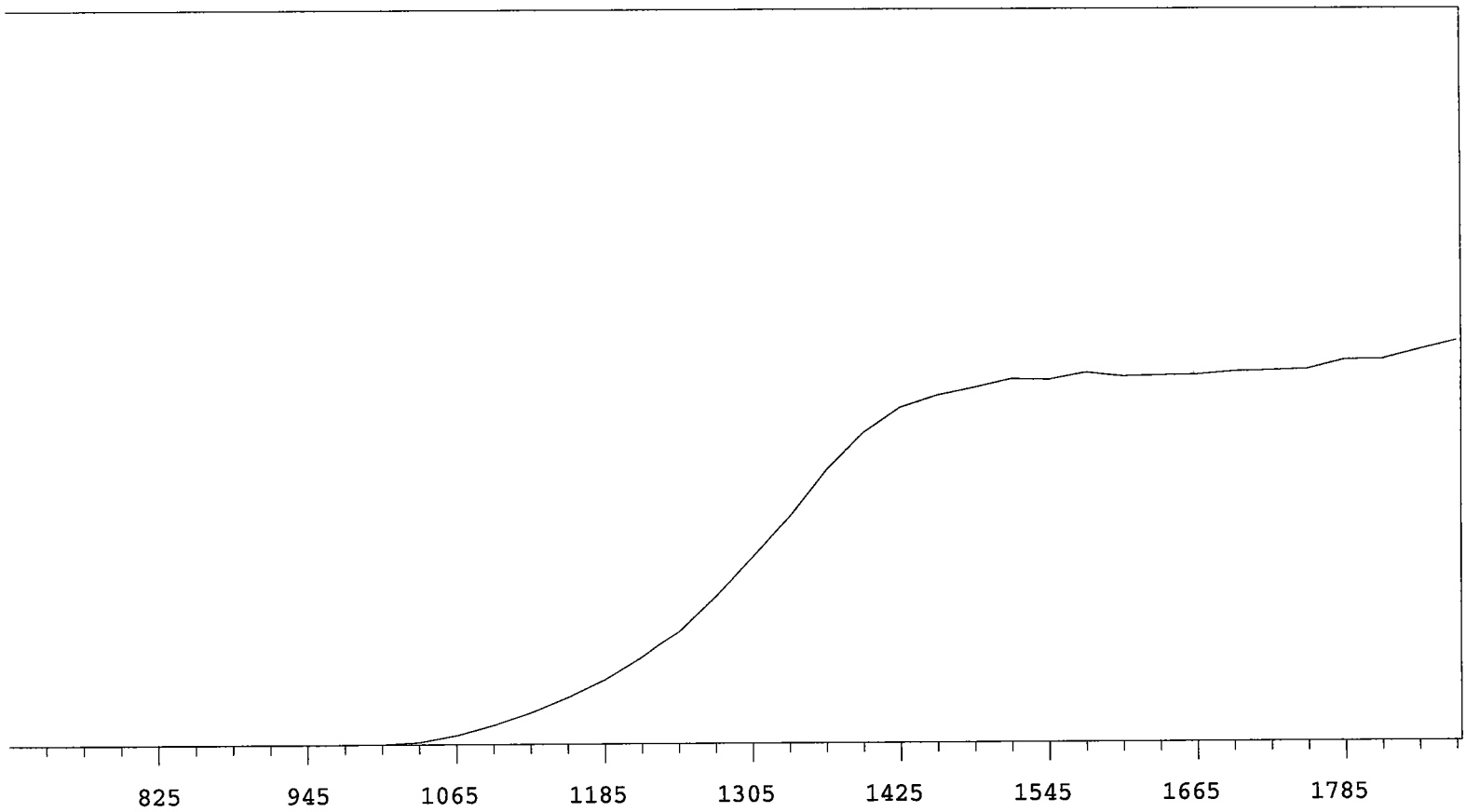


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	1	+0.00
885	0	>100
915	0	>100
945	0	>100
975	3	>100
1005	40	>100
1035	210	>100
1065	590	>100
1095	983	>100
1125	1645	>100
1155	2342	>100
1185	3045	+96.43
1215	4201	+90.42
1245	5579	+83.64
1275	7121	+74.44

VOLTS	COUNTS	%/100 Volts
1305	8797	+65.44
1335	10726	+54.47
1365	12570	+41.11
1395	13917	+26.79
1425	14687	+15.44
1455	15048	+8.47
1485	15318	+5.00
1515	15494	+3.76
1545	15606	+3.04
1575	15776	+2.35
1605	15889	+1.44
1635	15907	-0.16
1665	15881	+0.64
1695	15741	+1.21
1725	16124	+3.63
1755	16076	+5.41
1785	16588	+5.79
1815	16830	+7.53
1845	17185	
1875	17682	

Plateau 7/1/09 Instrument 14 MPC 9604 Detector C 7/1/2009

Alpha Volts: 705 Beta Volts: 1515

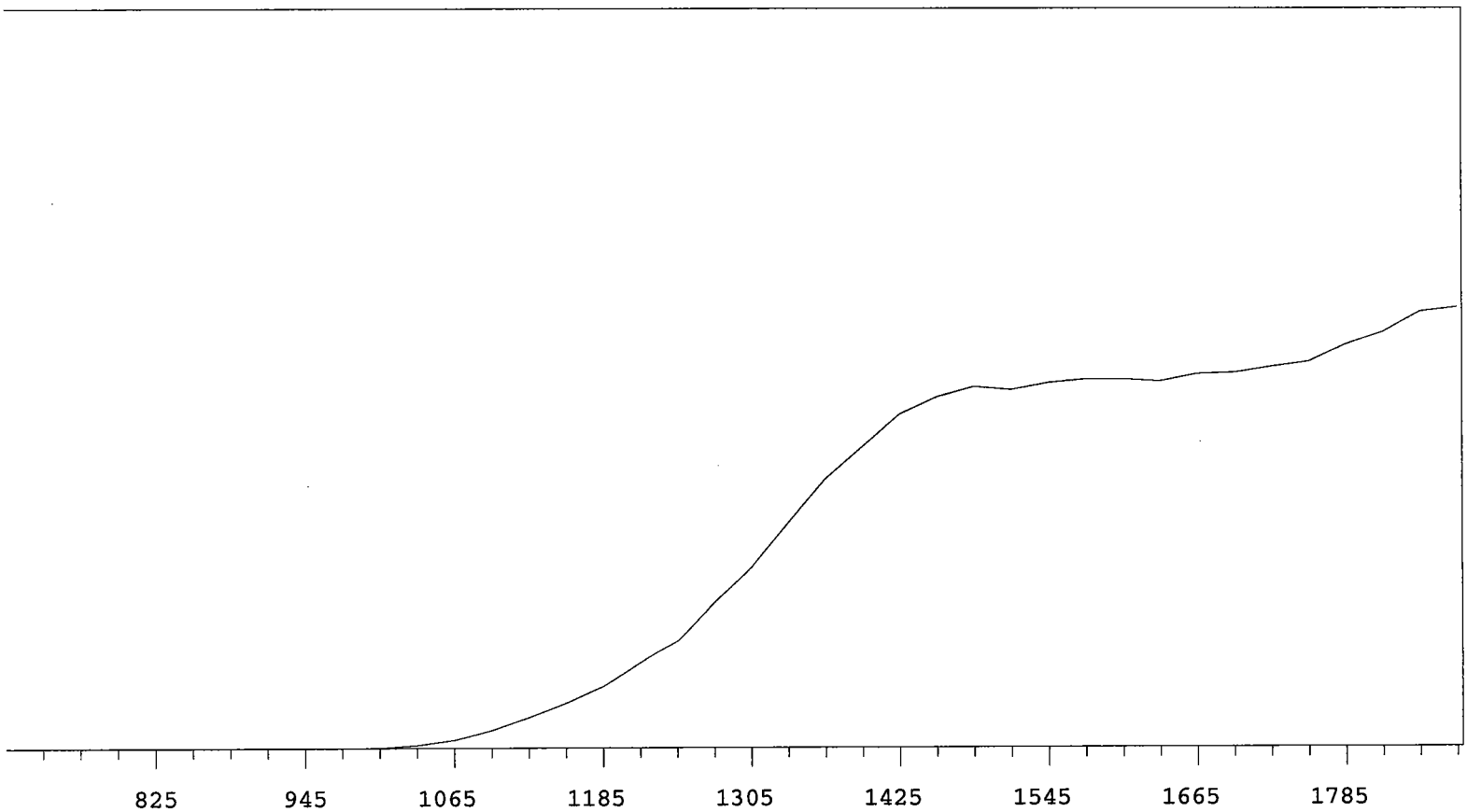


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	1	+0.00
915	0	>100
945	0	>100
975	2	>100
1005	21	>100
1035	132	>100
1065	491	>100
1095	1036	>100
1125	1698	>100
1155	2517	>100
1185	3468	>100
1215	4721	+91.83
1245	6175	+85.13
1275	8025	+76.82

VOLTS	COUNTS	%/100 Volts
1305	10118	+69.76
1335	12269	+59.65
1365	14810	+47.35
1395	16773	+33.46
1425	18104	+20.13
1455	18720	+11.98
1485	19122	+6.50
1515	19580	+4.77
1545	19527	+2.48
1575	19902	+0.81
1605	19690	+0.53
1635	19739	+0.23
1665	19765	+1.29
1695	19932	+1.40
1725	19976	+2.72
1755	20051	+2.92
1785	20523	+4.26
1815	20542	+5.57
1845	21035	
1875	21528	

Plateau 7/1/09 Instrument 14 MPC 9604 Detector D 7/1/2009

Alpha Volts: 705 Beta Volts: 1515



VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	0	>100
975	1	>100
1005	14	>100
1035	130	>100
1065	363	>100
1095	785	>100
1125	1357	>100
1155	1996	>100
1185	2735	+99.45
1215	3785	+94.20
1245	4857	+86.43
1275	6571	+78.80

VOLTS	COUNTS	%/100 Volts
1305	8095	+71.16
1335	10052	+58.38
1365	11990	+47.92
1395	13400	+35.01
1425	14808	+23.58
1455	15554	+13.45
1485	15987	+6.39
1515	15861	+3.45
1545	16156	+2.18
1575	16297	+1.72
1605	16297	+1.33
1635	16208	+1.62
1665	16526	+2.92
1695	16581	+3.94
1725	16832	+5.91
1755	17039	+8.68
1785	17800	+11.53
1815	18351	+11.46
1845	19265	
1875	19468	

0553

ANALYTICS

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318 · U.S.A.

Phone (404) 352-8677
Fax (404) 352-2837

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 µg/g Ba carrier.

P O NUMBER 3219 RD, Item 1

SOURCE PREPARED BY: M Taskaeva
M. Taskaeva, Radiochemist

Q A APPROVED: M. Monty 4-23-03

Standard Traceability Log Rad

Source Material Info	
Parent Code:	0553-A
Prepared By:	Lonnie Morris
Carrier Conc:	0.5M HCl
Reference Date:	04/23/2003
Ampoule Mass (g):	5.0235 g
Uncertainty:	+/-
LogBook No:	RC-S-035-068

A Solution Material Info	
Isotope:	Radium-228 SPIKE
Prepared By:	Lonnie Morris
Prep Date:	04/25/2003
Verification Date:	04/27/2005
Expiration Date:	04/27/2006
Primary Code:	0553-B
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

(Mass of parent(g)) * (Parm Activity (dpm/mL)) * (conversion dpm to dpm) / (Dilution Vol) = Parent Activity (dpm/mL)
(Mass of parent(g)) * (Parm Activity (dpm/mL)) * (conversion dpm to dpm) / Density (g/mL)/ (Dilution Vol) = Parent Activity (dpm/g)
(30.535 g) * (13419.8626 dpm/mL) * (1 dpm/dpm) / (1000 mL) = 409.7755 dpm/mL
(30.535 g) * (13419.8626 dpm/mL) * (1 dpm/dpm) / (g/mL) / (1000 mL) = 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

0503

ANALYTICS

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318 · U.S.A.

Phone (404) 352-8677
Fax (404) 352-2837

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 µg/g Ba carrier.

P O NUMBER 3208RD, Item 2

SOURCE PREPARED BY: M Taskaeva
M. Taskaeva, Radiochemist

Q A APPROVED: M. Mtg 10-2-02

RC-S-035-018a

Standard Traceability Log Rad

Source Material Info	
Parent Code:	0503
Prepared By:	Angela Johnson
Carrier Conc:	0.1 M HCL
Reference Date:	10/01/2002
Ampoule Mass (g):	5.02617 g
Uncertainty:	+/- 3.6 %
LogBook No:	RC S 035 018

A Solution Material Info	
Isotope:	Radium-228
Prepared By:	Angela Johnson
Prep Date:	02/20/2003
Verification Date:	04/09/2004
Expiration Date:	04/09/2005
Primary Code:	0503-A
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

(Mass of parent(g)) * (Parm Activity (dps)) * (conversion dpm to dps) / (Ampoule Mass(g) *(Dilution Vol)) = Parent Activity (dpm/mL)
(Mass of parent(g)) * (Parm Activity (dps)) * (conversion dpm to dps) / Density / (Ampoule Mass (g) * (Dilution Vol)) = Parent Activity (dpm/g)
(4.4737 g) * (19390 dps) * (60 dpm/dps) / (5.02617 g * 100 mL) = 10355.2060 dpm/mL
(4.4737 g) * (19390 dps) * (60 dpm/dps) / (0.9992 g/mL)/ (5.02617 g * 100 mL) = 10363.0820 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	Standard Mass. Used (mL)	Source DPM/mL
	0503-B	1962.0000	45.6000	1916.4000	9.263763	1.0000	206.8705773
	0503-B	1983.2000	45.6000	1937.6000	9.263763	1.0000	209.1590642
	0503-B	1927.0000	45.6000	1881.4000	9.263763	1.0000	203.092415
							206.3740189

Mean Value (Counting) =	206.3740189	dpm/mL	**102.880426**	**Pass**
Stdev =	3.063655617	dpm/mL	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:

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 Roy 9/16/08

Angela A Johnson 9/17/08

ID:TOTAL ACTIVITY 16 SEP 2008 16:24

USER:11 COMMENT:GOLD

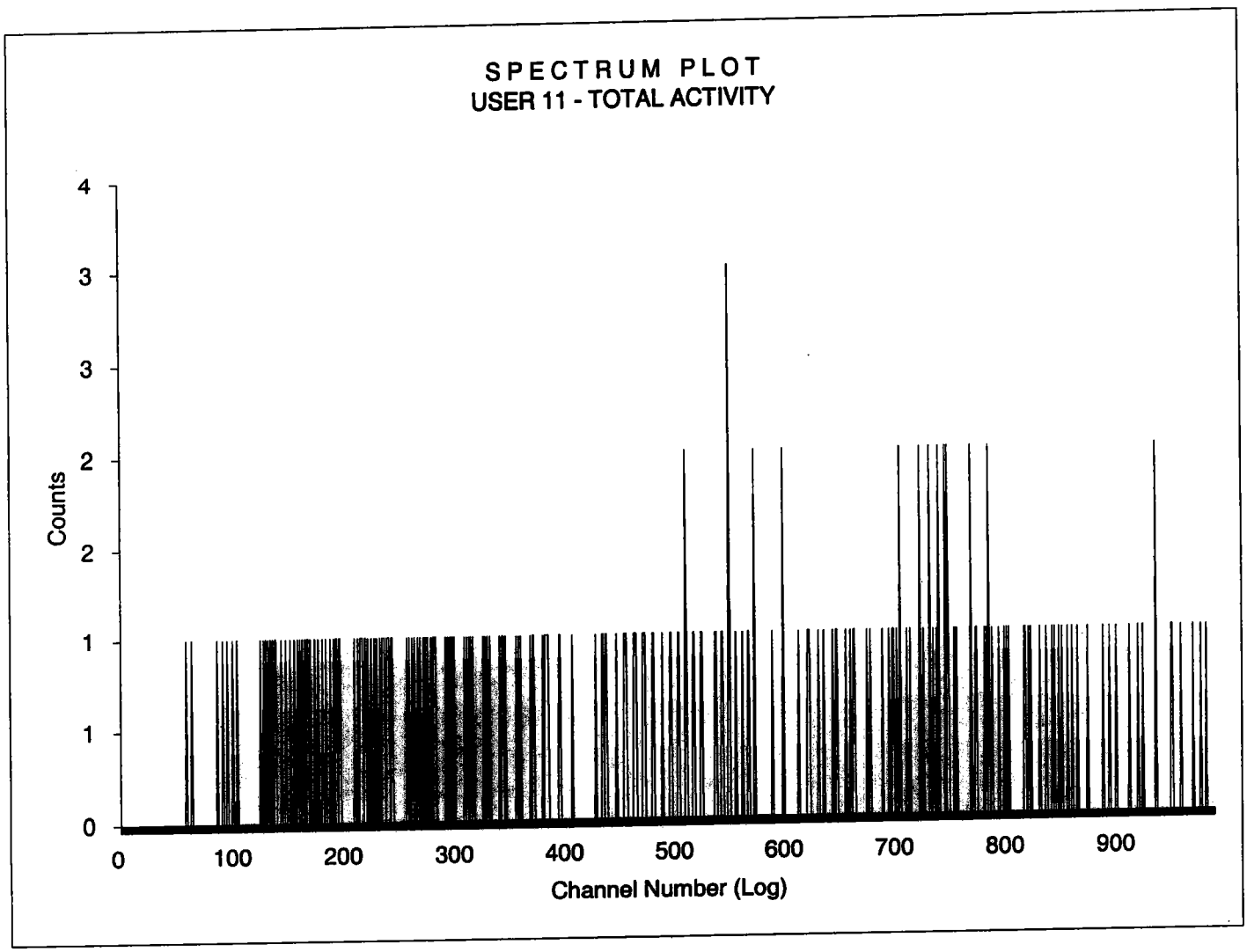
PRESET TIME :	5.00						
DATA CALC :	CPM	H#	:YES	SAMPLE REPEATS:	1	PRINTER	: STD
COUNT BLANK :	NO	IC#	: NO	REPLICATES :	1	RS232	:EDIT
TWO PHASE :	NO	AQC	: NO	CYCLE REPEATS :	1	DISK	: OFF
SCINTILLATOR:	LIQUID	LUMEX	:YES	LOW SAMPLE REJ:	0		
LOW LEVEL :	NO	HALF LIFE CORRECTION DATE:				none	

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

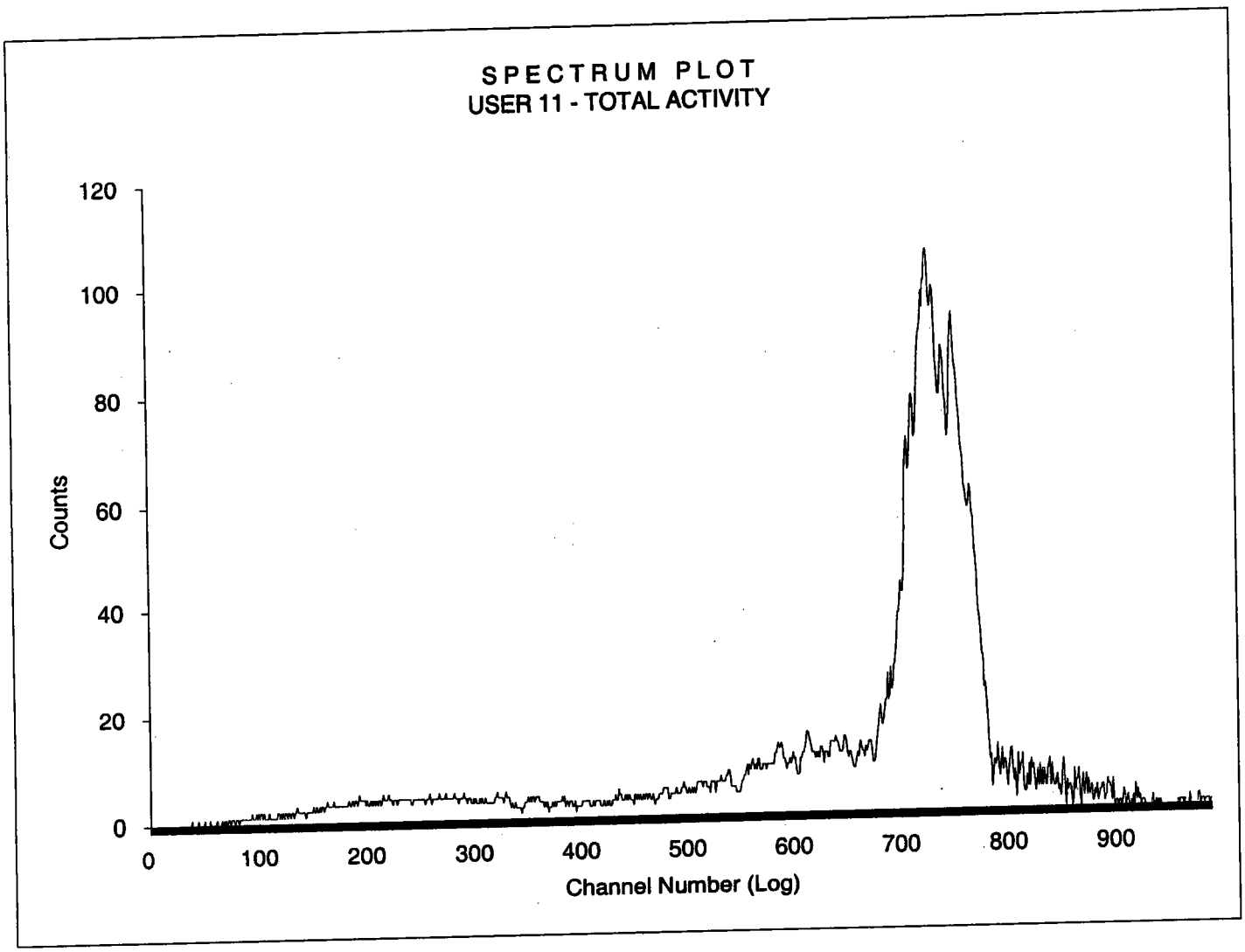
SAM NO	POS	TIME MIN	H#	WIND1 CPM	WIND1 %ERROR	WIND2 CPM	WIND2 %ERROR	LUMEX %	ELAPSED TIME
1	11-1	5.00	98.2	50.40	12.60	54.00	12.17	0.41	5.55
2	11-2	1.30	99.3	7802.31	1.99	7803.08	1.99	0.00	7.81
3	11-3	1.30	100.4	7782.31	1.99	7786.15	1.99	0.00	10.14
4	11-4	1.35	99.2	7581.48	1.98	7585.19	1.98	0.01	12.51
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

9/19/08

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

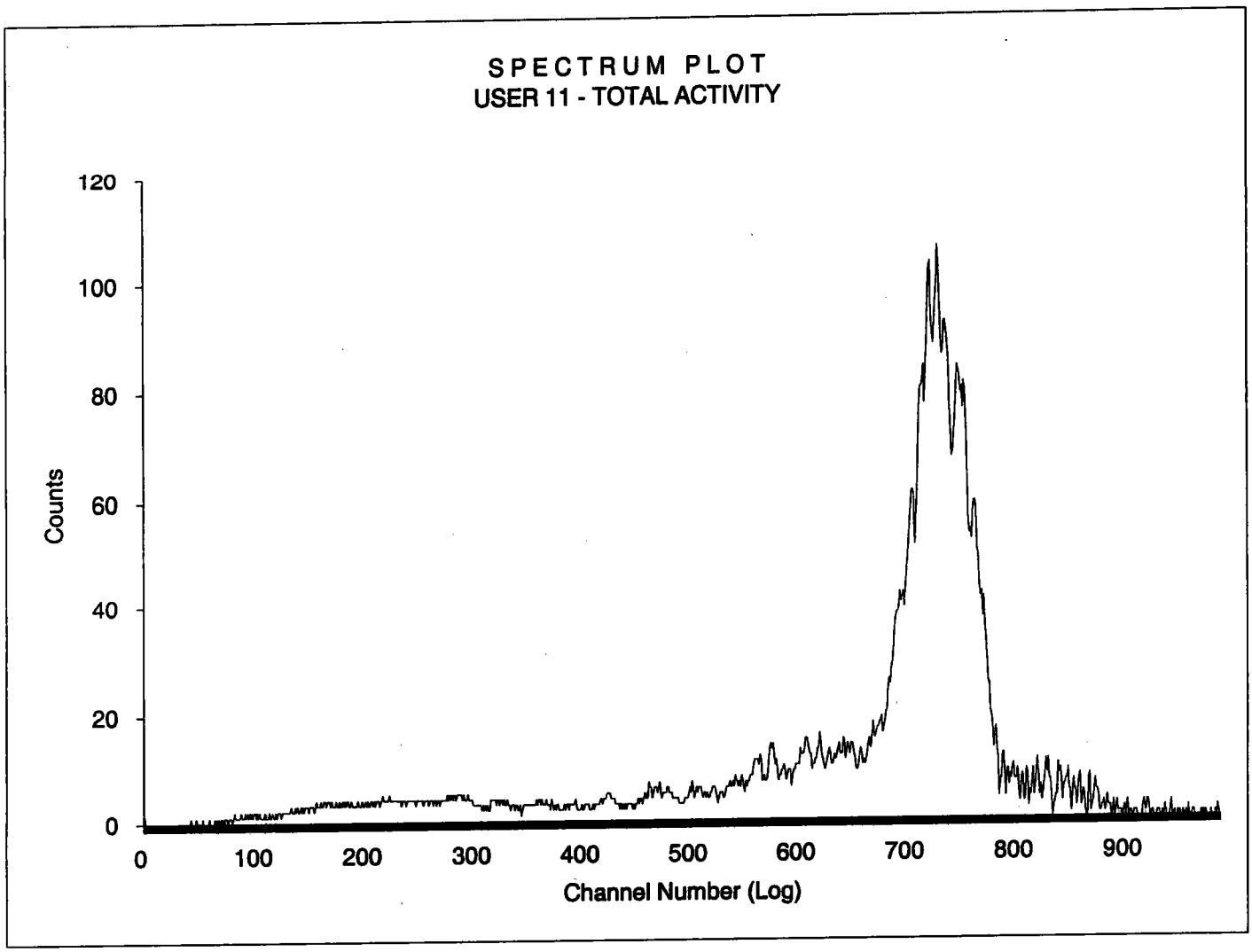


Sample Count Start Time:	16 Sep 2008 16:53:01		
Data Capture Date:	9/16/2008 16:58:06		
User Filename:	S11091611-6A.WK1		
	U11091611-1A.WK1		
Spectrum Type	Log Counts		
User Number:	11		
User Id:	TOTAL ACTIVITY		
User Comment:	GOLD		
Isotope Name:	14C		
Scintillator:	LIQUID		
Sample, Rack-Pos, Time:	6	11-6	5.00
H#, Total Counts:	110.7	7666	
Start, End, X-Axis:	0	990	Channel Number



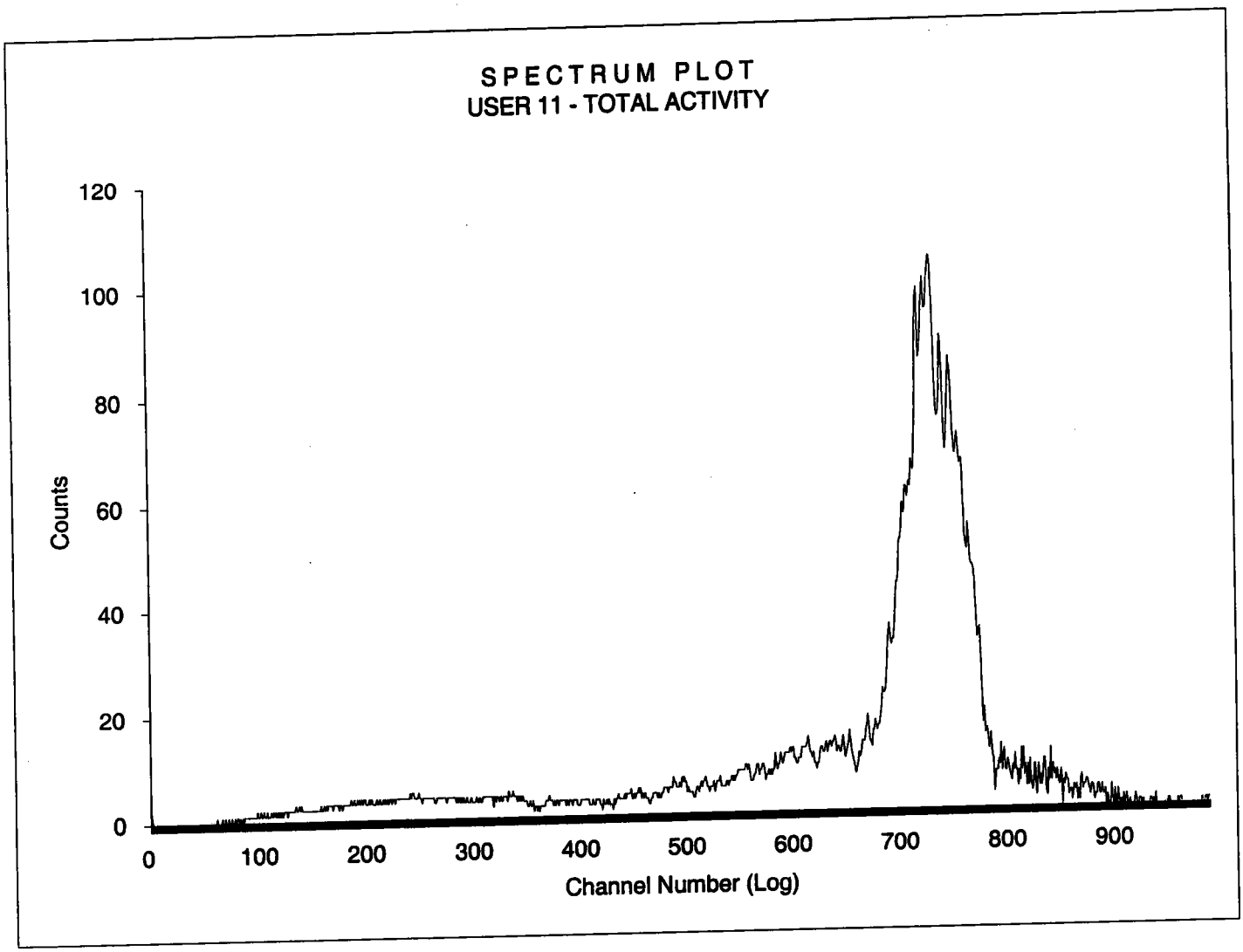
8/9/16

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



8/9/16

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

JRS 6/30/09

Batch #: 881540 **Analyst:DXM2** **First Client Due Date:** **Internal Due Date** 07/03/2009 **Ac-228 Ingrow:** 2025 6/30/09

Spike Isotope: Radium-228 **Spike Code:** 0 NA **Expiration Date:** NA **Vol:** NA

LCS Isotope: Radium-228 **LCS Code:** 0503-B **Expiration Date:** 9/13/09 **Vol:** 2 **Ac-228 Separation Date/Time:** 7-2-09 0540

Tracer Isotope: Barium-133 **Tracer Code:** 0112-J **Expiration Date:** 2/17/10 **Vol:** 0.1

Prep Date: 6/30/09 **Initials:** JRS **Pipet ID:** 1734218 **Balance ID:** NA **Witness:** JH 6/30/09

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	W2ALL
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	↓

JR 7/2/09

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Comments: _____

Data Reviewed By: 7/2/09

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

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

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?	✓		
the secondard 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: [signature] Date: 8/31/09

Reviewed By: [signature] Date: 8/31/09

Effective Date: 8/31/09

KD 8/31/09

Ra-226 Cell Constants

standard ID :	0299-H
Volume added (mL) :	0.1
Standard Reference Activity (DPM/mL) :	2483.21

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	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
101	1.846	Average	1.956	cal 7	8/27/2009 16:35	8/27/2009 13:30	8/21/2009 11:30			4479	15	298.60	248.32	6.08333	0.12847	3544	0.9958
101	1.960	Stdev	0.107	cal 9	8/24/2009 14:20	8/24/2009 9:30	8/18/2009 13:40			4581	15	305.40	248.32	5.82639	0.20139	3541	0.9958
101	2.060			cal 1	8/21/2009 15:00	8/21/2009 9:30	8/18/2009 13:40			2945	15	196.33	248.32	2.82639	0.22917	3538	0.9958
102	1.862	Average	1.855	cal 5	8/27/2009 15:50	8/27/2009 12:40	8/21/2009 10:50			4510	15	300.67	248.32	6.07639	0.13194	3544	0.9958
102	1.850	Stdev	0.006	cal 10	8/24/2009 14:45	8/24/2009 9:55	8/18/2009 13:40			4330	15	288.67	248.32	5.84375	0.20139	3541	0.9958
102	1.853			cal 2	8/21/2009 15:20	8/21/2009 9:50	8/18/2009 13:40			2659	15	177.27	248.32	2.84028	0.22917	3538	0.9958
104	2.073	Average	1.972	cal 1	8/27/2009 14:25	8/27/2009 9:35	8/24/2009 11:00			3070	15	204.67	248.32	2.94097	0.20139	3544	0.9958
104	1.855	Stdev	0.110	cal 11	8/24/2009 15:15	8/24/2009 10:15	8/18/2009 13:40			4343	15	289.53	248.32	5.85764	0.20833	3541	0.9958
104	1.987			cal 3	8/21/2009 15:50	8/21/2009 10:10	8/18/2009 13:40			2858	15	190.53	248.32	2.85417	0.23611	3538	0.9958
106	1.985	Average	1.836	cal 2	8/27/2009 14:55	8/27/2009 10:00	8/24/2009 11:20			2940	15	196.00	248.32	2.94444	0.20486	3544	0.9958
106	1.738	Stdev	0.131	cal 12	8/24/2009 15:35	8/24/2009 10:40	8/18/2009 13:40			4078	15	271.87	248.32	5.87500	0.20486	3541	0.9958
106	1.786			cal 4	8/21/2009 16:30	8/21/2009 10:30	8/18/2009 13:40			2572	15	171.47	248.32	2.86806	0.25000	3538	0.9958
107	2.025	Average	1.981	cal 8	8/27/2009 16:55	8/27/2009 13:50	8/21/2009 11:55			4910	15	327.33	248.32	6.07986	0.12847	3544	0.9958
107	2.054	Stdev	0.102	cal 1	8/24/2009 15:55	8/24/2009 11:00	8/21/2009 10:50			3090	15	206.00	248.32	3.00694	0.20486	3541	0.9958
107	1.864			cal 5	8/21/2009 16:45	8/21/2009 10:50	8/18/2009 13:40			2696	15	179.73	248.32	2.88194	0.24653	3538	0.9958
108	1.906	Average	1.946	cal 6	8/27/2009 16:05	8/27/2009 13:05	8/21/2009 11:15			4623	15	308.20	248.32	6.07639	0.12500	3544	0.9958
108	1.975	Stdev	0.036	cal 2	8/24/2009 16:25	8/24/2009 11:20	8/21/2009 10:50			2978	15	198.53	248.32	3.02083	0.21181	3541	0.9958
108	1.957			cla 6	8/21/2009 17:00	8/21/2009 11:15	8/18/2009 13:40			2846	15	189.73	248.32	2.89931	0.23958	3538	0.9958
111	2.162	Average	2.024	cal 3	8/27/2009 15:12	8/27/2009 10:20	8/24/2009 12:25			3177	15	211.80	248.32	2.91319	0.20278	3544	0.9958
111	2.051	Stdev	0.153	cal 3	8/24/2009 17:00	8/24/2009 12:25	8/21/2009 10:50			3139	15	209.27	248.32	3.06597	0.19097	3541	0.9958
111	1.859			cal 7	8/21/2009 17:15	8/21/2009 11:30	8/18/2009 13:40			2712	15	180.80	248.32	2.90972	0.23958	3538	0.9958
112	1.962	Average	1.931	cal 4	8/27/2009 15:30	8/27/2009 10:50	8/24/2009 12:40			2895	15	193.00	248.32	2.92361	0.19444	3544	0.9958
112	1.967	Stdev	0.059	cal 4	8/24/2009 17:15	8/24/2009 12:40	8/21/2009 10:50			3019	15	201.27	248.32	3.07639	0.19097	3541	0.9958
112	1.863			cal 8	8/21/2009 17:35	8/21/2009 11:55	8/18/2009 13:40			2731	15	182.07	248.32	2.92708	0.23611	3538	0.9958

EffErr 0.053028 <- Put in Machines.xls (Lucas Cell Tab)

8/31/09

8/31/09

Voltage ~~1.10~~ = .900

Ra-226 Calibration Sheet

Standard ID: 0199-H
Volume Added (mL): 0.1
Expiration Date: 8/1/10

* count time 15 min

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Total Counts	
Cal 1	500	8/18/09 1340	8/21/09 0930	8/21/09 ~~1230~~ 1410 1500	101	1	~~6052~~ 3142	2945
Cal 2	500	8/18/09 1340	8/21/09 0950	8/21/09 ~~1305~~ 1425 1520	102	1	~~2778~~	2659
Cal 3	500	8/18/09 1340	8/21/09 1010	8/21/09 1445 1550	104	1	~~2182~~	2858
Cal 4	500	8/18/09 1340	8/21/09 1030	8/21/09 1630	106	1	2572	
Cal 5	500	8/18/09 1340	8/21/09 1050	8/21/09 1645	107	1	2096	
Cal 6	500	8/18/09 1340	8/21/09 1115	8/21/09 1700	108	1	2846	
Cal 7	500	8/18/09 1340	8/21/09 1130	8/21/09 1715	111	1	2712	
Cal 8	500	8/18/09 1340	8/21/09 1155	8/21/09 1735	112	1	2731	
Cal 9								
Cal 10								
Cal 11								
Cal 12								

KD 8/31/09

KD 8/31/09

8/31/09

Voltage - 0.9

Ra-226 Calibration Sheet

Standard ID: 0799-H
Volume Added (mL): 0.1
Expiration Date: 9/7/10

count time = 15 mins

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Total Counts
Cal 9	500	8/18/09 1340	8/24/09 0930	8/24/09 ~~1735~~ 1420	101	1	~~4439~~ 4581
Cal 10	500	8/18/09 1340	8/24/09 0955	8/24/09 ~~1305~~ 1445	102	1	~~4477~~ 4330
Cal 11	500	8/18/09 1340	8/24/09 1015	8/24/09 ~~1405~~ 1515	104	1	4343
Cal 12	500	8/18/09 1340	8/24/09 1040	8/24/09 1535	106	1	4078
Cal 1	500	8/21/09 1050	8/24/09 1100	8/24/09 1555	107	1	3090
Cal 2	500	8/21/09 1050	8/24/09 1120	8/24/09 1625	108	1	2978
Cal 3	500	8/21/09 1050	8/24/09 1215	8/24/09 1700	111	1	3139
Cal 4	500	8/21/09 1050	8/24/09 1240	8/24/09 1715	112	1	3019
KP 8/28/09							

KP 8/31/09

KP 8/31/09

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Voltage - 0.9

Ra-226 Calibration Sheet

Standard ID: D199-H
Volume Added (mL): 1.1
Expiration Date: 8/7/10

* 15 min counts

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Total Counts
Cal 1	500	8/24/09 1100	8/27/09 0935	8/27/09 1425	104	1	3070
Cal 2	500	8/24/09 1120	8/27/09 1000	8/27/09 1455	106	1	2940
Cal 3	500	8/24/09 1225	8/27/09 1020	8/27/09 1512	111	1	3177
Cal 4	500	8/24/09 1240	8/27/09 1050	8/27/09 1530	112	1	2895
Cal 5	500	8/24/09 1050	8/27/09 1240	8/27/09 1550	102	1	4510
Cal 6	500	8/24/09 1115	8/27/09 1305	8/27/09 1605	108	1	4623
Cal 7	500	8/24/09 1130	8/27/09 1330	8/27/09 1635	101	1	4479
Cal 8	500	8/24/09 1155	8/27/09 1350	8/27/09 1655	107	1	4910

KD 8/27/09

KD 8/31/09

KD 8/31/09

General Engineering Laboratories
Verification Source Preparation Sheet

Applicable SOP Number: GL-RAD-A-008

Date Standards Prepared: 4/5/05

Standard ID: 0299-H

Amount Used (g or ml): 0.1

Standard Activity (DPM/g or mL): 2483.2133

Reference Date: 12/15/99

Expiration Date: 8/1/10

Residue/Carrier Agent: 0.1M HCl

Isotope: RA226

Cocktail Type Used: NA

Matrix of Vial/Planchett: NA

NA

NA

Type of Scintillation Vial: NA

Pipette ID Used: 1429303

Balance ID Used: 38080204

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				
	KD 8/31/09				

KD 8/31/09

Prepared By: Kelli Dillon Date: 8/31/09

Reviewed By: [signature] Date: 8/31/09

Rev 1 RLM 9/10/97

EEC 8-21-00

Nycomed Amersham plc
Amersham Laboratories

0299

[redacted]

CALIBRATION
No. 0146

[redacted]

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 Signatory

Date of issue: 17th December 1999

VO 8/30/105

Nycomed

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

(Mass of parent(g)) * (Parm Activity (kBq/g)) * (conversion dpm to kBq) / (Dilution Vol) = Parent Activity (dpm/mL)
(Mass of parent(g)) * (Parm Activity (kBq/g)) * (conversion dpm to kBq) / Density (g/mL)/ (Dilution Vol) = Parent Activity (dpm/g)
(4.6634 g) * (43.75 kBq/g) * (60000 dpm/kBq) / (100 mL) = 122414.2500 dpm/mL
(4.6634 g) * (43.75 kBq/g) * (60000 dpm/kBq) / (1.0012 g/mL) / (100 mL) = 122273.3377 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	01/26/2009	01/26/2010
08/07/2009	Mary Aders	5.0767	250	0299-H	2483.2133 dpm/mL	08/07/2009	08/07/2010

GEL Laboratories LLC
Version 1.0 9/18/2000

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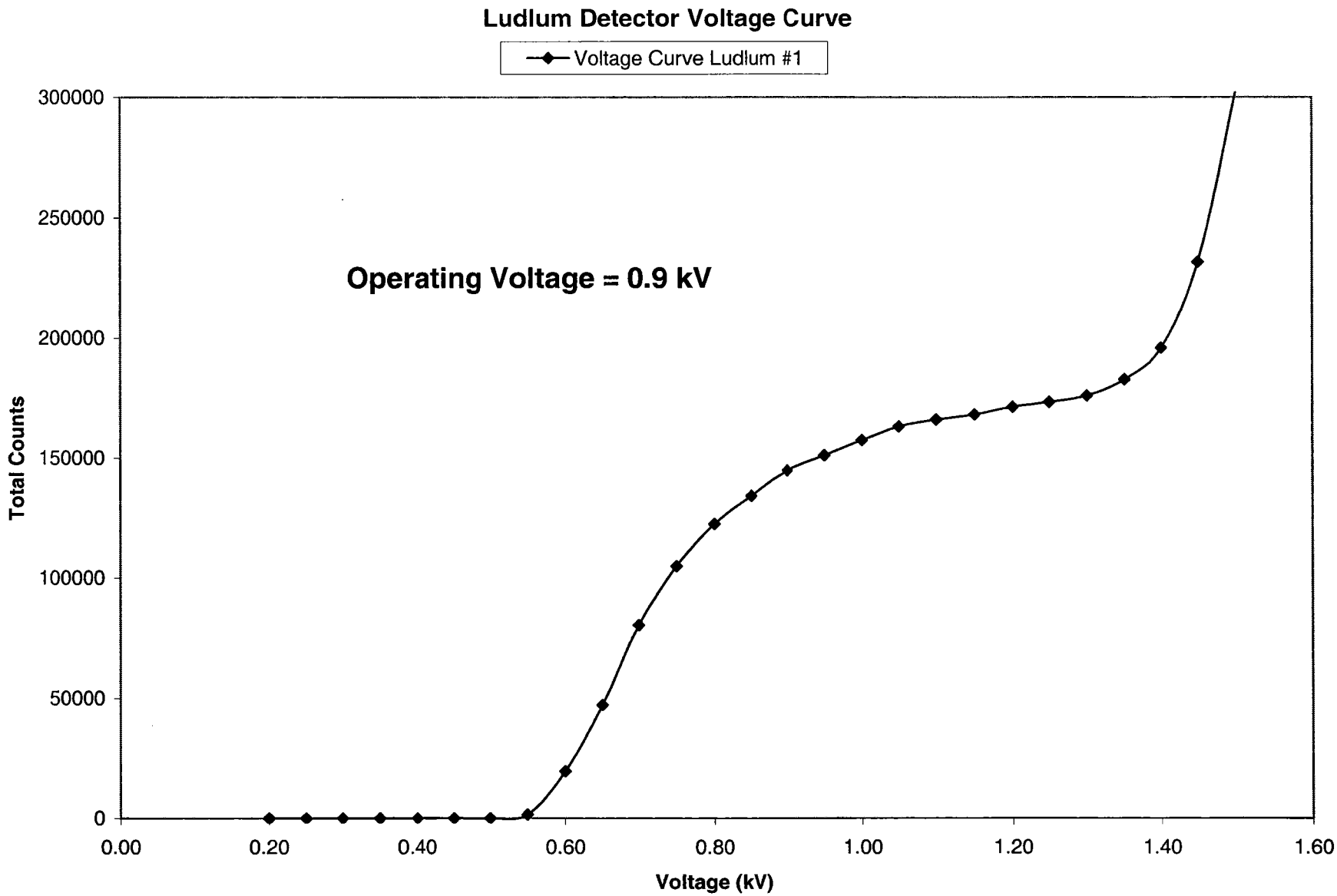
VO 8/31/09

Voltage Curve Ludlum #1

Voltage (kV)	Count Time (min)	Counts	Date/Time
0.20	1.00	0	8/21/09 13:20
0.25	1.00	0	8/21/09 13:21
0.30	1.00	0	8/21/09 13:22
0.35	1.00	0	8/21/09 13:23
0.40	1.00	0	8/21/09 13:24
0.45	1.00	0	8/21/09 13:25
0.50	1.00	0	8/21/09 13:26
0.55	1.00	1534	8/21/09 13:27
0.60	1.00	19637	8/21/09 13:28
0.65	1.00	47206	8/21/09 13:29
0.70	1.00	80410	8/21/09 13:30
0.75	1.00	104945	8/21/09 13:31
0.80	1.00	122514	8/21/09 13:32
0.85	1.00	134160	8/21/09 13:33
0.90	1.00	144753	8/21/09 13:34
0.95	1.00	151057	8/21/09 13:35
1.00	1.00	157429	8/21/09 13:36
1.05	1.00	163110	8/21/09 13:37
1.10	1.00	166034	8/21/09 13:38
1.15	1.00	168121	8/21/09 13:39
1.20	1.00	171347	8/21/09 13:40
1.25	1.00	173388	8/21/09 13:41
1.30	1.00	175958	8/21/09 13:42
1.35	1.00	182719	8/21/09 13:43
1.40	1.00	195871	8/21/09 13:44
1.45	1.00	231584	8/21/09 13:45
1.50	1.00	303021	8/21/09 13:46
1.55	1.00	387838	8/21/09 13:47

Detector set to operate at 0.90 kV

8/31/09


Ludlum Detector Voltage Curve
Voltage Curve Ludlum #1
Operating Voltage = 0.9 kV
Total Counts
300000
250000
200000
150000
100000
50000
0
0.00
0.20
0.40
0.60
0.80
1.00
1.20
1.40
1.60
Voltage (kV)

8/31/09

Control Limits for Lucas Cell Counter #1

Analyst: **KSD1**

Date: **8/31/2009**

Count #	**Detector #1**
1	138383
2	138269
3	141307
4	140521
5	132825
6	135924
7	139231
8	138298
9	135342
10	138056
11	138123
12	139159
13	138410
14	138251
15	138438
16	138080
17	137814
18	137961
19	137248
20	137477
Average =	137955.9
Std. Dev. =	1775.5
+3 S. D. =	143282.4266
+2 S. D. =	141506.901
Mean =	137955.9
-2 S. D. =	134404.799
-3 S. D. =	132629.2734

Control Limits	**8/31/2009**
	Detector #1
Upper Limit	**143282**
Lower Limit	**132629**

* Operating Voltage changed to 0.9 kV

8/31/09

	Eff	Cal Date
101	1.956	8/31/2009
102	1.855	8/31/2009
104	1.972	8/31/2009
106	1.836	8/31/2009
107	1.981	8/31/2009
108	1.946	8/31/2009
111	2.024	8/31/2009
112	1.931	8/31/2009

Lucas	Ra-226	
Oldest Cal	01/23/2008	
Detector	**Eff Error**	**Cal Date**
1	0.0530	8/31/2009
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

Ra-226 WATER

Batch : LCSVER
Date : 8/20/2008
Analyst : KSD1
Bkg Count Time: 30 min

Procedure Code : LUC26RAL
Parmname : Radium-226
MDA : 1 pCi/L
Instrument Used : LUCAS CELL DETECTOR

Sample ID	Sample Vol L	Count Time min	Gross counts cts	Cell # num	Cell Const. num	BKG	BKG cpm	Ra-226 MDA pCi/L	**Ra-226 RESULT pCi/L**	Ra-226 ERROR pCi/L	COUNT DATE/TIME
Ver 2	0.500	30	689	**101**	1.956	8	0.267	0.5907	**25.3156**	1.9236	8/31/2009 14:35
Ver 6	0.500	30	697	**102**	1.855	4	0.133	0.4721	**27.1986**	2.0367	8/31/2009 15:05
Ver 2	0.500	30	656	**104**	1.972	8	0.267	0.6303	**25.7021**	2.0032	8/28/2009 14:00
Ver 4	0.500	30	638	**106**	1.836	8	0.267	0.6304	**24.9919**	1.9762	8/31/2009 15:40
Ver 7	0.500	30	629	**107**	1.981	8	0.267	0.6257	**24.4533**	1.9479	8/28/2009 17:50
Ver 5	0.500	30	693	**108**	1.946	8	0.267	0.5959	**25.6861**	1.9459	8/31/2009 16:15
Ver 3	0.500	30	672	**111**	2.024	8	0.267	0.6129	**25.6096**	1.9713	8/28/2009 14:35
Ver 4	0.500	30	631	**112**	1.931	8	0.267	0.6411	**25.1365**	1.9990	8/28/2009 15:10

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8/31/09

Sample ID	Sample Dup	Det #	Run Date	Sample Type	Standard ID	NC	NC units	Recovery/RPD
Ver 2		1	8/31/2009 14:35	LCS	0638-H	24.17	pCi/L	**105%**
Ver 3		1	8/31/2009 15:05	LCS	0638-H	24.17	pCi/L	**113%**
Ver 2		1	8/28/2009 14:00	LCS	0638-H	24.17	pCi/L	**106%**
Ver 4		1	8/31/2009 15:40	LCS	0638-H	24.17	pCi/L	**103%**
Ver 7		1	8/28/2009 17:50	LCS	0638-H	24.17	pCi/L	**101%**
Ver 8		1	8/31/2009 16:15	LCS	0638-H	24.17	pCi/L	**106%**
Ver 3		1	8/28/2009 14:35	LCS	0638-H	24.17	pCi/L	**106%**
Ver 4		1	8/28/2009 15:10	LCS	0638-H	24.17	pCi/L	**104%**

DEGASSING DATE/TIME	DE-EMAN. DATE/TIME	DEGASS-DE-EM	dE-EM-COUNT	constant	constant	constant	Net CPM cpm	Ingrowth constant
8/28/2009 10:20	8/31/2009 11:10	72.83	3.42	0.4230	0.9745	1.0019	22.7000	0.4130
8/28/2009 10:40	8/31/2009 11:30	72.83	3.58	0.4230	0.9733	1.0019	23.1000	0.4125
8/25/2009 16:00	8/28/2009 10:20	66.33	3.67	0.3940	0.9727	1.0019	21.6000	0.3839
8/28/2009 11:00	8/31/2009 11:55	72.92	3.75	0.4234	0.9721	1.0019	21.0000	0.4123
8/25/2009 16:00	8/28/2009 12:00	68.00	5.83	0.4015	0.9569	1.0019	20.7000	0.3850
8/28/2009 11:20	8/31/2009 12:15	72.92	4.00	0.4234	0.9703	1.0019	22.8333	0.4115
8/25/2009 16:00	8/28/2009 10:40	66.67	3.92	0.3955	0.9709	1.0019	22.1333	0.3847
8/25/2009 16:00	8/28/2009 11:00	67.00	4.17	0.3970	0.9690	1.0019	20.7667	0.3854

8/31/09

0623674 cap: 1/11/10

Ra-226 Verification Sheet

#1 .9 voltage

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background CPM	Total Counts
~~Ver1~~	500	~~8/25/09 1600~~	~~8/28/09 0955~~	~~8/28/09 1340~~	101	1	8	525
Ver2	500	8/25/09 1600	8/28/09 1020	8/28/09 1400	104	1	8	656
Ver3	500	8/25/09 1600	8/28/09 1040	8/28/09 1435	111	1	8	672
Ver4	500	8/25/09 1600	8/28/09 1100	8/28/09 1510	112	1	8	631
~~Ver5~~	~~500~~	~~8/25/09 1600~~	~~8/28/09 1120~~	~~8/28/09 1540~~	106	1	~~8~~	~~678~~
~~Ver6~~	~~500~~	~~8/25/09 1600~~	~~8/28/09 1140~~	~~8/28/09 1610~~	102	1	~~4~~	~~654~~
Ver7	500	8/25/09 1600	8/28/09 1200	8/28/09 ~~1650~~ 1750	107	1	8	629
~~Ver8~~	~~500~~	~~8/25/09 1600~~	~~8/28/09~~ 1305	8/28/09 1820	108	1	~~8~~	~~736~~
Ver2	500	8/28/09 1020	8/31/09 1110	8/31/09 1435	101	1	8	689
Ver3	500	8/28/09 1040	8/31/09 1130	8/31/09 1505	102	1	4	697
Ver4	500	8/28/09 1100	8/31/09 1155	8/31/09 1540	106	1	8	638
Ver5	500	8/28/09 1120	8/31/09 1215	8/31/09 1615	108	1	8	693

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General Engineering Laboratories
Verification Source Preparation Sheet

Applicable SOP Number: GL-RAD-A 008

Isotope: Ra-226

Date Standards Prepared: 7/23/08

Cocktail Type Used: NA

Standard ID: 06638-H

Matrix of Vial/Planchett: NA

NA

NA

Amount Used (g or (ml)): 0.1

Standard Activity (DPM/g or (mL)): ~~66.4108~~ 168.8845 KO 8/31/09

Type of Scintillation Vial: NA

Reference Date: 1/23/04

Pipette ID Used: 1429303

Expiration Date: 7/17/10

Balance ID Used: 38080204

Residue/Carrier Agent: NA

Quenching Agent: NA

	Standard Number	Quenching Vol (uL)/ Residue Volume(mL)	Initial Wt. (g)	Final Wt. (g)	Net Wt. (mg)
1	Ver1				
2	Ver2				
3	Ver3				
4	Ver4				
5	Ver5				
6	Ver6				
7	Ver7				
8	Ver8				

KO 8/31/09

Prepared By: Kellie S Dawson Date: 8/31/09

Reviewed By: Angela [signature] Date: 8/31/09

Rev 1 RLM 9/10/97

ANALYTICS

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318 • U.S.A.

Phone (404) 352-8677
Fax (404) 352-2837

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 µg/g Ba carrier.

P O NUMBER 3231RD, Item 5

SOURCE PREPARED BY: M. D. Currie
M. D. Currie, Radiochemist

Q A APPROVED: 1/26/04

WO 873105

Standard Traceability Log Rad

WARNING! Training must be completed!!
Alphalims will be locked out if training is not completed within 1 week of assignment Contact Quality if additional time is needed to complete training

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

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Calculations Converting parent activity to dpm/mL|dpm/g

(Mass of parent(g)) * (Parm Activity (dps)) * (conversion dpm to dps) / (Ampoule Mass(g) *(Dilution Vol)) = Parent Activity (dpm/mL)
(Mass of parent(g)) * (Parm Activity (dps)) * (conversion dpm to dps) / Density / (Ampoule Mass (g) * (Dilution Vol)) = Parent Activity (dpm/g)
(4.8398 g) * (23530 dps) * (60 dpm/dps) / (5.01065 g * 100 mL) = 13636.6133 dpm/mL
(4.8398 g) * (23530 dps) * (60 dpm/dps) / (1.0266 g/mL)/ (5.01065 g * 100 mL) = 13282.9676 dpm/g

8/31/09

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

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KW 8/31/09

Verification for Ra-226 Standard 0638-H

D. Roy	Isotope	Value	Uncertainty
7/23/2008	0638-H	11.852	1.1079
	0638-H	12.092	1.1141
	0638-H	12.372	1.1216
Mean Value (Counting) =	12.106	100.13	**Pass**
Stdev =	0.260353631		**Rule 3 (Pass/Fail)**
Target =	12.09		
Lower Limit =	11.5848594		
Upper Limit =	12.62627393		
Rule 1 Pass/Fail	**Pass**		
Two sigma =	0.520707263		
10 % of Mean =	1.210556667		
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 Ra-226 source 0638-H by transferring portions of the degassed standard into tared glass liquid scintillation vials. 10 mL of DI Water and 10 mL of mineral oil were added to each vial and the vials were shaken. A Blank vial was prepared in a similar fashion using 10 mL of DI Water and 10 mL of mineral oil. The standard verification vials and Background source were dark adapted for two hours and counted on LSC RED using source standard verification. 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.

Reference RAD SOP M-001

8/14/08

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 secondard 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 Dowell Date: 12/19/08

Reviewed By: [signature] Date: 12/19/08

Effective Date: 12/19/08

Ra-226 Cell Constants

NLD 12/19/08

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
201	2.021	Average	1.993	Cal 14	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	Stdev	0.068	Cal 14	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			Cal 14	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	0.43056	3208	0.9962
202	2.436	Average	2.261	Cal 13	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	Stdev	0.156	Cal 13	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			Cal 14	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	2.254	Cal 43	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	Stdev	0.019	Cal 43	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			Cal 43	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	0.44792	3208	0.9962
204	2.184	Average	2.193	Cal 15	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	Stdev	0.102	Cal 15	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			Cal 15	9/30/2008 14:05	9/30/2008 9:10	9/26/2008 9:45	0.133	7535	30	251.17	243.02	3.97569	0.20486	3213	0.9962
205	1.677	Average	1.799	Cal 13	10/21/2008 8:30	10/20/2008 14:05	10/13/2008 16:00	0.267	7584	30	252.80	243.02	6.92014	0.76736	3233	0.9962
205	1.730	Stdev	0.167	Cal 44	9/18/2008 16:00	9/18/2008 10:05	9/15/2008 10:55	0.167	4999	30	166.63	243.02	2.96528	0.24653	3201	0.9962
205	1.990			Cal 44	9/30/2008 14:45	9/30/2008 9:40	9/26/2008 9:45	0.167	7170	30	239.00	243.02	3.99653	0.21181	3213	0.9962
206	2.240	Average	2.259	Cal 46	9/15/2008 21:10	9/15/2008 11:25	9/12/2008 13:20	0.233	6216	30	207.20	243.02	2.92014	0.40625	3198	0.9962
206	2.293	Stdev	0.030	Cal 46	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			Cal 46	9/30/2008 15:20	9/30/2008 10:15	9/26/2008 9:45	0.267	8125	30	270.83	243.02	4.02083	0.21181	3213	0.9962
207	2.187	Average	2.146	Cal 36	9/15/2008 21:40	9/15/2008 11:50	9/12/2008 13:20	0.267	6094	30	203.13	243.02	2.93750	0.40972	3198	0.9962
207	2.141	Stdev	0.038	Cal 36	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			Cal 36	9/30/2008 16:00	9/30/2008 10:45	9/26/2008 9:45	0.233	7656	30	255.20	243.02	4.04167	0.21875	3213	0.9962
~~208~~	~~2.239~~	~~Average~~	~~2.283~~	~~Cal 30~~	~~9/15/2008 22:15~~	~~9/15/2008 12:15~~	~~9/12/2008 13:20~~	~~0.267~~	~~6258~~	~~30~~	~~208.60~~	~~243.02~~	~~3.95486~~	~~0.41667~~	~~3198~~	~~0.9962~~
~~208~~	~~2.243~~	~~Stdev~~	~~0.135~~	~~Cal 30~~	~~9/18/2008 18:30~~	~~9/18/2008 11:00~~	~~9/15/2008 10:15~~	~~0.133~~	~~6374~~	~~30~~	~~212.47~~	~~243.02~~	~~2.94792~~	~~0.81250~~	~~3201~~	~~0.9962~~
~~208~~	~~2.116~~			~~Cal 30~~	~~9/30/2008 18:35~~	~~9/30/2008 11:10~~	~~9/26/2008 9:45~~	~~0.333~~	~~7681~~	~~30~~	~~256.03~~	~~243.02~~	~~4.05990~~	~~0.99560~~	~~3213~~	~~0.9962~~
209	2.471	Average	2.291	Cal 19	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	Stdev	0.137	Cal 19	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			Cal 19	9/30/2008 17:25	9/30/2008 11:40	9/26/2008 9:45	0.100	8795	30	293.17	243.02	4.07986	0.23958	3213	0.9962
210	2.320	Average	2.253	Cal 47	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	Stdev	0.059	Cal 47	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			Cal 47	9/30/2008 18:00	9/30/2008 12:05	9/26/2008 9:45	0.033	8116	30	270.53	243.02	4.09722	0.24653	3213	0.9962
211	2.140	Average	2.171	Cal 37	9/15/2008 23:50	9/15/2008 14:30	9/12/2008 13:20	0.033	6150	30	205.00	243.02	3.04861	0.38889	3198	0.9962
211	2.238	Stdev	0.057	Cal 37	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			Cal 37	9/30/2008 18:30	9/30/2008 13:35	9/26/2008 9:45	0.100	7917	30	263.90	243.02	4.15972	0.20486	3213	0.9962
212	2.405	Average	2.322	Cal 42	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	Stdev	0.081	Cal 42	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			Cal 42	9/30/2008 19:50	9/30/2008 14:00	9/26/2008 9:45	0.267	8287	30	276.23	243.02	4.17708	0.24306	3213	0.9962

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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 14	500	9/22/08 1000	9/25/08 0815	9/25/08 1935	201	2	0	5361
~~Cal 13~~	500	~~9/22/08 1000~~	~~9/25/08 0850~~	~~9/25/08 2010~~	202	2	0	5845
Cal 43	500	9/22/08 1000	9/25/08 1015	9/25/08 2100	203	2	0	6298
Cal 15	500	9/22/08 1000						
Cal 44	500	9/22/08 1000						
Cal 46	500	9/22/08 1000						
Cal 36	500	9/22/08 1000						
Cal 30	500	9/22/08 1000						
Cal 19	500	9/22/08 1000						
Cal 47	500	9/22/08 1000						
Cal 37	500	9/22/08 1000						
Cal 42	500	9/22/08 1000						

KW 12/18/08

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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 14	500	9/12/08 1320	9/15/08 0905	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 1125	9.15.09 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 30~~	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	6926

KM 12/18/08

KM 12/18/08

KM 12/19/08

KM 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	9/26/08 0945	9/30/08 0910	9/30/08 1405	204	2	4	7535
44	500	9/26/08 0945	9/30/08 0940	9/30/08 1445	205	2	5	7170
46	500	9/26/08 0945	9/30/08 1015	9/30/08 1520	206	2	8	8125
36	500	9/26/08 0945	9/30/08 1015	9/30/08 1600	207	2	7	7656
~~30~~	~~500~~	~~9/26/08 0945~~	~~9/30/08 1110~~	~~9/30/08 1635~~	~~208~~	~~2~~	~~1~~	~~7681~~
19	500	9/26/08 0945	9/30/08 1140	9.30.08 1725	209	2	3	8795
47	500	9/26/08 0945	9/30/08 1205	9.30.08 1800	210	2	1	8116
37	500	9/26/08 0945	9/30/08 1335	9.30.08 1830	211	2	3	7917
42	500	9/26/08 0945	9/30/08 1400	9.30.08 1950	212	2	8	8287

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KD 12/19/08

KD 12/18/08

KD 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	9/15/08 0905	9/18/08 0810	9/18/08 1300	201	2	8	5949
cal 13	500	9/15/08 0935	9/18/08 0845	9/18/08 1350	202	2	8	6425
Cal 43	500	9/15/08 1000	9/18/08 0915	9/18/08 1425	203	2	8	6413
cal 15	500	9/15/08 1030	9/18/08 0935	9/18/08 1455	204	2	8	6671
cal 44	500	9/15/08 1055	9/18/08 1005	9/18/08 1600	205	2	5	4999
Cal 46	500	9/15/08 1125	9/18/08 1025	9/18/08 1635	206	2	8	6604
Ca136	500	9/15/08 1150	9/18/08 1040	9/18/08 1755	207	2	8	6105
~~Cal30~~	~~500~~	9/15/08 1215	9/18/08 1100	9/18/08 1830	208	2	4	6374
Cal 19	500	9/15/08 1350	9/18/08 1115	9/18/08 1915	209	2	2	6170
Cal 47	500	9/15/08 1415	9/18/08 1130	9/18/08 1945	210	2	3	6142
Cal 37	500	9/15/08 1430	9/18/08 1235	9/18/08 2220	211	2	4	6207
Ca142	500	9/15/08 1450	9/18/08 1250	9/18/08 2255	212	2	8	6405

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KW 12/19/08

KW 12/18/08

KW 12/19/08

KW 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	10/13/08 1600	10/20/08 1345	~~10/20/08~~ 10.21.08 13:50	202	2	8	9248
13	500	10/13/08 1600	10/20/08 1405	10/21/08 0830	205	2	8	1584
43								
44								
15								
36								
46								
30								
19								
47								
37				160 12/18/08				
42								

160 12/19/08

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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		**104.944421**	**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	**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.

RAD SOP M-001

4/10/08
4/9/08
4/10/08

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

(Mass of parent(g)) * (Parm Activity (kBq/g)) * (conversion dpm to kBq) / (Dilution Vol) = Parent Activity (dpm/mL)
(Mass of parent(g)) * (Parm Activity (kBq/g)) * (conversion dpm to kBq) / Density (g/mL)/ (Dilution Vol) = Parent Activity (dpm/g)
(4.6634 g) * (43.75 kBq/g) * (60000 dpm/kBq) / (100 mL) = 122414.2500 dpm/mL
(4.6634 g) * (43.75 kBq/g) * (60000 dpm/kBq) / (1.0012 g/mL) / (100 mL) = 122273.3377 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

General Engineering Laboratories
Verification Source Preparation Sheet

Applicable SOP Number: GL-RAD A-008

Isotope: Ra-226

Date Standards Prepared: 4/5/05

Cocktail Type Used: NA

Standard ID: 0299-G

Matrix of Vial/Planchett: NA / NA / NA

Amount Used (g or (ml)): 0.1

Standard Activity (DPM/g or (mL)): 1446.347

Type of Scintillation Vial: NA

Reference Date: 4/15/99

Pipette ID Used: 1429303

Expiration Date: 4/2/09

Balance ID Used: 36040216

Residue/Carrier Agent: 0.5 M HCl

Quenching Agent: NA

	Standard Number	Quenching Vol (uL)/ Residue Volume(mL)	Initial Wt. (g)	Final Wt. (g)	Net Wt. (mg)
14	Cal14				
13	Cal13				
43	Cal43				
15	Cal15				
44	Cal44				
46	Cal46				
36	Cal36				
19	Cal19				
47	Cal47				
37	Cal37				
42	Cal42				

Prepared By: Kelli S Dermody Date: 12/19/08

Reviewed By: [signature] Date: 12/19/08

Rev 1 RLM 9/10/97

0299

[redacted]

UKAS ACCREDITED CALIBRATION LABORATORY No. 0146

ement	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.

acy Expanded uncertainty in the radioactive concentration quoted above: ± 2.5 %

Combined Type A uncertainty: ± 0.2 %
Combined Type B uncertainty: ± 1.3 %

onuclidic 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.

tical Carrier free in 0.5M HCl
position

arks 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.

MCR 12/19/98
LD 12/19/98

ver 11-08

Ra-226 WATER

Batch : LCSVER
Date : 10/31/2008
Analyst : KSD1

Bkg Count Time: 30 min

Procedure Code : LUC26RAL
Parmname : Radium-226
MDA : 1 pCi/L
Instrument Used : LUCAS CELL DETECTOR

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~~	~~533~~	~~**208**~~	~~**2.283**~~	~~0.267~~	~~0.5132~~	~~**16.9552**~~	~~1.4723~~	~~11/20/2008 16:40~~ KD
VER 9	0.500	30	630	**209**	**2.291**	0.133	0.4042	**21.0513**	1.6596	10/30/2008 23:40 12/19/08
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

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LL LA 12/19/08
KD 12/19/08

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%~~
209		2	10/30/2008 14:05	LCS	0638-F	24.10	pCi/L	87%
210		2	10/30/2008 14:25	LCS	0638-F	24.10	pCi/L	98%
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%

KD 12/18/08

DEGASSING DATE/TIME	DE-EMAN. DATE/TIME	DEGASS-DE-EM	dE-EM-COUNT	constant	constant	constant	Net CPM 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~~	~~0.9636~~	~~1.0019~~	~~17.5000~~	~~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

KD 12/18/08

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NCA 12/19/08
KD 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
VER 1	500	~~11/10/08 1535~~ ~~10/30/08 1430~~ 11/10/08	11/17/08 1020	11/17/08 1510	201	2	8	1014
2	500	11/10/08 1535	11/17/08 1045	11/17/08 1545	202	2	8	1056
3	500	11/10/08 1535	11/17/08 1110	11/17/08 1620	205	2	8	937
4	500	11/10/08 1535	11/17/08 1135	~~11.17.08 2050~~	~~208~~	~~2~~	~~8~~	~~786~~
5	500	11/10/08 1535	11/17/08 1150	11.17.08 2120	209	2	8	1200
6	500	11/10/08 1535	11/17/08 1220	11.17.08 2155	211	2	8	1067
7	~~500~~	~~11/10/08 1535~~	~~11/17/08 0845~~	~~11/17/08 1330~~	~~702~~	~~1~~	~~8~~	~~982~~
8	500	11/10/08 1535	11/17/08 0900	~~11/17/08 1405~~	~~708~~	~~7~~	~~8~~	~~1164~~
9	500	~~11/10/08 1535~~	11/17/08 0930	11/17/08 1435	705	7	8	1122
10								
11								
12								
~~VER 3~~	500	~~11/17/08 1110~~	~~11/20/08 1145~~	~~11/20/08 1640~~	~~208~~	~~2~~	~~8~~	~~533~~

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KW 12/18/08

KW 12/18/08

KW 12/18/08

KW 12/18/08

KW 11/21/08

KW 12/18/08

KW 12/18/08

KW 12/19/08

KW 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
~~VW 1~~	~~500~~	~~10/27/08 1420~~	~~10/30/08 0945~~	10/30/08 1500	201	~~2~~	~~4~~	~~152~~
~~VW 2~~	~~500~~	~~10/27/08 1420~~	10/30/08 1005	10/30/08 1535	202	2	~~6~~	~~189~~
VW 3	500	10/27/08 1420	10/30/08 1105	10/30/08 1605	~~203~~ 204	2	8	726
VW 4	500	10/27/08 1420	10/30/08 1230	10/30/08 1820	~~204~~ 205	2	8	737
~~VW 5~~	~~500~~	~~10/27/08 1420~~	~~10/30/08 1250~~	10/30/08 1900	205	2	6	663
VW 6	500	10/27/08 1420	10/30/08 1310	10/30/08 2020	206	2	8	780
VW 7	500	10/27/08 1420	10/30/08 1325	10/30/08 2200	207	2	8	711
~~VW 8~~	~~500~~	10/27/08 1420	10/30/08 1345	10/30/08 2300	208	2	4	497
VW 9	500	10/27/08 1420	10/30/08 1405	10/30/08 2340	209	2	4	630
VW 10	500	10/27/08 1420	10/30/08 1425	10/31/08 0115	210	2	1	691
~~VW 11~~	~~500~~	10/27/08 1420	10/30/08 1440	10/31/08 0835	211	2	3	~~123~~
VW 12	500	10/27/08 1420	10/30/08 1455	10/31/08 0915	212	2	4	648

KO 12/18/08

KO 12/18/08

KO 12/18/08

KO 12/18/08

KO 12/18/08

KO 12/19/08

KO 12/19/08

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Verification for Ra-226 Standard 0638-F

D Roy
12/27/2007

	Isotope	Detector CPM	BKG CPM	NET CPM	Detector Eff	Standard Mass. Used (mL)	Source DPM/mL
	0638-F N1	1239.9000	31.5000	1208.4000	4.624018	1.0000	261.3311626
	0638-F N2	1222.8000	31.5000	1191.3000	4.624018	1.0000	257.6330801
	0638-F N3	1219.4000	31.5000	1187.9000	4.624018	1.0000	256.8977889
						Average =	258.6206772
Mean Value (Counting) =	258.6206772		**96.8384646**	**Pass**			
Stdev =	2.375965421		0.00918707	**Rule 3 (Pass/Fail)**			
Certificate Value =	267.1						
Lower Limit =	253.8687464						
Upper Limit =	263.3726081						
Rule 1 Pass/Fail	**Fail**	'exception taken due to full recovery of standard					
Two sigma =	4.751930843						
10 % of Mean =	25.86206772						
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 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:

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

LW 12/19/08

1/4/07

Amanda L. Tech 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: NA

Standard ID: 0638-F

Matrix of Vial/Planchett: NA / NA / NA

Amount Used (g or ml): 0.1

Standard Activity (DPM/g or mL): 167.519

Type of Scintillation Vial: NA

Reference Date: 1/23/04

Pipette ID Used: 1425303

Expiration Date: 12/2010 8

Balance ID Used: 3604046

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	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

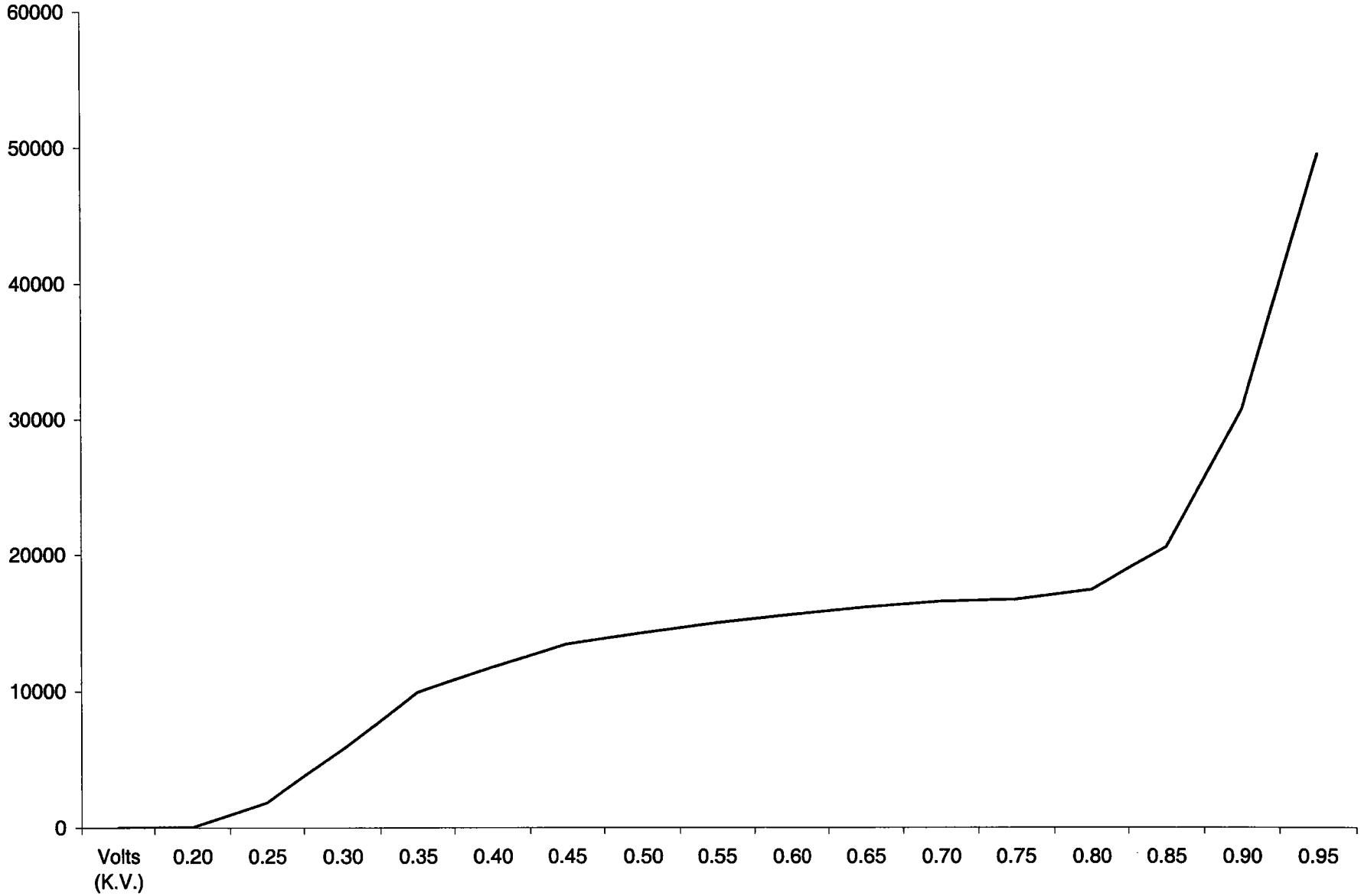
Prepared By: Kelli Dienel Date: 12/19/08

Reviewed By: [signature] Date: 12/19/08

Rev 1 RLM 9/10/97

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

12/19/08
12/19/08



12/19/08
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

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 secondard 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 Daniel Date: 2/3/09

Reviewed By: [signature] 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	2.021	43	1/20/2009 11:05	1/19/2009 10:10	1/9/2009 15:45	0.267	9355	30	311.83	243.67	9.76736	1.03819	3324	0.9961
301	2.184	Stdev	0.159	43	1/29/2009 11:50	1/29/2009 8:50	1/26/2009 13:00	0.267	6239	30	207.97	243.67	2.82639	0.12500	3333	0.9961
301	2.011			43	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	2.131	13	1/30/2009 11:30	1/30/2009 8:30	1/26/2009 13:00	0.267	7401	30	246.70	243.67	3.81250	0.12500	3334	0.9961
302	2.225	Stdev	0.082	47	1/29/2009 13:30	1/29/2009 9:20	1/26/2009 13:00	0.233	6335	30	211.17	243.67	2.84722	0.17361	3334	0.9961
302	2.086			47	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	2.136	19	1/20/2009 13:40	1/19/2009 11:00	1/9/2009 15:45	0.267	9695	30	323.17	243.67	9.80208	1.11111	3325	0.9961
303	2.218	Stdev	0.154	19	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			19	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	2.057	42	1/20/2009 14:50	1/19/2009 11:35	1/9/2009 15:45	0.200	9357	30	311.90	243.67	9.82639	1.13542	3325	0.9961
305	2.191	Stdev	0.149	42	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			42	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	1.747	44	1/20/2009 15:20	1/19/2009 11:50	1/9/2009 15:45	0.167	8521	30	284.03	243.67	9.83681	1.14583	3325	0.9961
306	1.691	Stdev	0.067	30	1/29/2009 14:30	1/29/2009 10:20	1/26/2009 13:00	0.233	4869	30	162.30	243.67	2.88889	0.17361	3334	0.9961
306	1.821			44	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	1.931	15	1/20/2009 15:50	1/19/2009 12:05	1/9/2009 15:45	0.267	8944	30	298.13	243.67	9.84722	1.15625	3325	0.9961
307	2.095	Stdev	0.145	36	1/30/2009 12:55	1/30/2009 9:10	1/26/2009 13:00	0.267	7442	30	248.07	243.67	3.84028	0.15625	3335	0.9961
307	1.881			15	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	1.950	44	1/29/2009 15:50	1/29/2009 11:05	1/26/2009 13:00	0.133	6149	30	204.97	243.67	2.92014	0.19792	3334	0.9961
308	1.858	Stdev	0.155	14	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			14	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	1.877	13	1/20/2009 17:20	1/19/2009 13:35	1/9/2009 15:45	0.033	9149	30	304.97	243.67	9.90972	1.15625	3325	0.9961
309	1.964	Stdev	0.079	13	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			13	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	2.114	15	1/29/2009 16:40	1/29/2009 11:20	1/26/2009 13:00	0.267	6176	30	205.87	243.67	2.93056	0.22222	3334	0.9961
311	2.212	Stdev	0.114	28	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			28	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	1.944	36	1/20/2009 19:16	1/19/2009 14:10	1/9/2009 15:45	0.100	9135	30	304.50	243.67	9.93403	1.21250	3325	0.9961
312	2.014	Stdev	0.071	14	1/29/2009 17:10	1/29/2009 11:35	1/26/2009 13:00	0.167	5814	30	193.80	243.67	2.94097	0.23264	3334	0.9961
312	1.946			36	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

300

KD 2/3/09

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
Cal 13	500	11/26/09 1300	11/30/09 0830	11/30/09 1130	302	3	8	7401
~~Cal 28~~	~~500~~	~~11/26/09 1300~~	~~11/30/09 0855~~	~~11/30/09 1200~~	~~304~~	~~3~~	~~8~~	~~7101~~
Cal 36	500	11/26/09 1300	11/30/09 0910	11/30/09 1255	307	3	8	7442

KD 2/3/09

1/3/09

301

KD 2/3/09

MCA 2/4/09

KD 2/3/09

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
Cal 43	500	1/26/09 1300	1/29/09 0850	1/29/09 1150	301	3	8	6239
Cal 47	500	1/26/09 1300	1/29/09 0920	1/29/09 1330	302	3	7	6335
~~Cal 49~~	~~500~~	~~1/26/09 1300~~	~~1/29/09 0950~~	~~1/29/09 1400~~	~~304~~	~~3~~	~~2~~	~~6472~~
Cal 130	500	1/26/09 1300	1/29/09 1020	1/29/09 1430	306	3	7	4869
~~Cal 142~~	~~500~~	~~1/26/09 1300~~	~~1/29/09 1045~~	~~1/29/09 1515~~	~~307~~	~~3~~	~~3~~	~~6668~~
Cal 144	500	1/26/09 1300	1/29/09 1105	1/29/09 1550	308	3	4	6149
Cal 15	500	1/26/09 1300	1/29/09 1120	1/29/09 1640	311	3	8	6176
Cal 14	500	1/26/09 1300	1/29/09 1135	1/29/09 1710	312	3	5	5814
392 Cal 13	500	1/26/09 1300						
Cal 28	500	1/26/09 1300						
Cal 36	500	1/26/09 1300						
Cal 37	500	1/26/09 1300						
				KW 2/3/09				

~~Cal 49~~ ~~500~~ ~~1/26/09 1300~~ ~~1/29/09 0950~~ ~~1/29/09 1400~~ ~~304~~ ~~3~~ ~~2~~ ~~6472~~ LW 2/3/09

~~Cal 142~~ ~~500~~ ~~1/26/09 1300~~ ~~1/29/09 1045~~ ~~1/29/09 1515~~ ~~307~~ ~~3~~ ~~3~~ ~~6668~~ LW 2/3/09

KD 2/3/09

M.A 2/4/09

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	1/9/09 1545	1/19/09 1010	1/20/09 1105	301	3	8	9355	
~~Cal 47~~	~~500~~	~~1/9/09 1545~~	~~1/19/09 1040~~	~~1/20/09 1150~~	~~302~~	~~3~~	~~8~~	~~8933~~	KD 2/3/09
Cal 19	500	1/9/09 1545	1/19/09 1100	1/20/09 1340	303	3	8	9695	
~~Cal 30~~	~~500~~	~~1/9/09 1545~~	~~1/19/09 1120~~	~~1/20/09 1410~~	~~304~~	~~3~~	~~8~~	~~9630~~	KD 2/3/09
Cal 42	500	1/9/09 1545	1/19/09 1135	1/20/09 1450	305	3	5	9357	
Cal 44	500	1/9/09 1545	1/19/09 1150	1/20/09 ~~1510~~ 1520 KD 1/20/09	306	3	7	8521	
Cal 15	500	1/9/09 1545	1/19/09 1205	1/20/09 1550	307	3	8	8944	
~~Cal 14~~	~~500~~	~~1/9/09 1545~~	~~1/19/09 1315~~	~~1/20/09 1645~~	~~308~~	~~3~~	~~3~~	~~6938~~	KD 2/3/09
Cal 13	500	1/9/09 1545	1/19/09 1335	1/20/09 1720	309	3	1	9149	
~~Cal 28~~	~~500~~	~~1/9/09 1545~~	~~1/19/09 1355~~	~~1/20/09 1840~~	~~311~~	~~3~~	~~8~~	~~8648~~	KD 2/3/09
Cal 36	500	1/9/09 1545	1/19/09 1410	1/20/09 1916	312	3	1	9135	
~~Cal 37~~	500	1/9/09 1545							
								KD 2/3/09	KD 2/3/09 MLA 2/4/09

303

Ra-226 Verification Sheet

Cal for #3

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~~	~~11/19/09 1500~~	~~11/22/09 0910~~	~~11/23/09 1525~~	~~301~~	~~3~~	~~8~~	~~6408~~	KD 2/3/09
~~Cal 44~~	~~500~~	~~11/19/09 1500~~	~~11/22/09 0935~~	11/22/09 1605	302	3	~~8~~	6498	KD 2/3/09
Cal 29	500	11/19/09 1500	11/22/09 1005	1.22.09 2035	303	3	8	5938	
Cal 30	500	11/19/09 1500	11/22/09 1035	1.22.09 2120	~~304~~	~~3~~	~~8~~	~~5240~~	KD 2/3/09
Cal 42	500	11/19/09 1500	11/22/09 1105	11/22/09 2150	305	3	8	5921	
~~Cal 44~~	500	11/19/09 1500	~~11/22/09 1135~~	~~11/23/09 0830~~	~~306~~	~~3~~	~~8~~	~~5393~~	KD 2/3/09
Cal 15	500	11/19/09 1500	~~11/22/09~~ 1320	11/23/09 0950	~~307~~	~~3~~	~~8~~	~~5870~~	KD 2/3/09
Cal 14	500	11/19/09 1500	11/22/09 1345	11/23/09 0935	308	3	8	4826	
Cal 13	500	11/19/09 1500	11/22/09 1405	11/23/09 1030	309	3	8	5100	
Cal 28	500	11/19/09 1500	11/22/09 1425	11/23/09 1220	311	3	8	5698	
~~Cal 36~~	500	11/19/09 1500	11/22/09 1440	~~11/23/09 1315~~	~~312~~	~~3~~	~~8~~	~~5881~~	KD 2/3/09
Cal 27	500	11/19/09 1500	11/22/09						
					KD 2/3/09				KD 2/3/09 MLA 2/4/09

304

Ra-226 Verification Sheet

Cal for #3

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	11/22/09 0910	11/26/09 0925	11/26/09 1455	301	3	8	7282
Cal 47	500	11/22/09 0910	11/26/09 0955	11/26/09 1530	302	3	8	1555
Cal 19	500	11/22/09 0910	11/26/09 1025	11/26/09 1610 1720	303	3	8	8028
~~Cal 30~~	~~500~~	~~11/22/09 0910~~	11/26/09 1050	~~1.26.09 1645~~	~~304~~	~~3~~		~~5162~~
Cal 42	500	11/22/09 0910	11/26/09 1120	1.26.09 2300	305	3	8	7280
Cal 44	500	11/22/09 0910	11/26/09 1150	1.26.09 2330	306	3	8	6387
Cal 15	500	11/22/09 0910	11/26/09 1210	1.27.09 0005	307	3	8	6598
Cal 14	500	11/22/09 0910	11/26/09 1315	11/27/09 0830	308	3	8	6726
Cal 13	500	11/22/09 0910	11/26/09 1330	11/27/09 0905	309	3	8	6046
Cal 28	500	11/22/09 0910	11/26/09 1345	11/27/09 1015	311	3	8	6607
Cal 36	500	11/22/09 1910	11/26/09 1400	11/27/09 1110	312	3	8	6446
Cal 37								

KD 2/3/09

KD 2/3/09

ALM 2/4/09

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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		**104.944421**	**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	**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.

RAD SOP M-001

2/3/09

2/4/09

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

(Mass of parent(g)) * (Parm Activity (kBq/g)) * (conversion dpm to kBq) / (Dilution Vol) = Parent Activity (dpm/mL)
(Mass of parent(g)) * (Parm Activity (kBq/g)) * (conversion dpm to kBq) / Density (g/mL)/ (Dilution Vol) = Parent Activity (dpm/g)
(4.6634 g) * (43.75 kBq/g) * (60000 dpm/kBq) / (100 mL) = 122414.2500 dpm/mL
(4.6634 g) * (43.75 kBq/g) * (60000 dpm/kBq) / (1.0012 g/mL) / (100 mL) = 122273.3377 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

KD 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: 02996

Matrix of Vial/Planchett: NA / NA / NA

Amount Used (g or ml): 0.1

Standard Activity (DPM/g or mL): 246.347

Type of Scintillation Vial: NA

Reference Date: 12/15/99

Pipette ID Used: 1429303

Expiration Date: 4/2/09

Balance ID Used: 36040216

Residue/Carrier Agent: 0.5 M HCl

Quenching Agent: NA

	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				

LVD 2/31/09

Prepared By: Kelli S Power Date: 2/31/09

Reviewed By: [signature] Date: 2/4/09

Rev 1 RLM 9/10/97

0299

Certificate of Calibration for Radium-226 Solution

UKAS ACCREDITED CALIBRATION LABORATORY No. 0146

ement	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.

acy Expanded uncertainty in the radioactive concentration quoted above: ± 2.5 %

Combined Type A uncertainty: ± 0.2 %
Combined Type B uncertainty: ± 1.3 %

onuclidic 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.

nical Carrier free in 0.5M HCl
position

arks 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.

KD 2/3/09
NLA 2/11/09

Ra-226 WATER

Batch : LCSVER
Date : 1/2/2009
Analyst : KSD1
Bkg Count Time: 30 min

Procedure Code : LUC26RAL
Parmname : Radium-226
MDA : 1 pCi/L
Instrument Used : LUCAS CELL DETECTOR

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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2/4/09 dm

2/4/09

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%**
						24.10		
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%**
						24.10		
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	constant	Net CPM cpm	Ingrowth constant
1/26/2009 16:05	1/30/2009 10:40	90.58	4.42	0.4954	0.9672	1.0019	21.6000	0.4800
1/30/2009 10:00	2/2/2009 9:15	71.25	4.42	0.4160	0.9672	1.0019	21.5667	0.4032
1/26/2009 16:05	1/30/2009 11:05	91.00	4.58	0.4969	0.9660	1.0019	30.1997	0.4809
1/26/2009 16:05	1/30/2009 11:30	91.42	5.58	0.4985	0.9587	1.0019	26.1000	0.4788
1/26/2009 16:05	1/30/2009 11:45	91.67	5.87	0.4995	0.9567	1.0019	25.3330	0.4787
1/30/2009 10:00	2/2/2009 9:40	71.67	4.58	0.4179	0.9660	1.0019	23.7330	0.4044
1/26/2009 16:05	1/30/2009 12:00	91.92	7.08	0.5004	0.9479	1.0019	24.0667	0.4753
1/26/2009 16:05	1/30/2009 13:05	93.00	21.25	0.5045	0.8518	1.0019	25.1997	0.4305
1/26/2009 16:05	1/30/2009 13:20	93.25	28.00	0.5054	0.8095	1.0019	19.5330	0.4099
1/26/2009 16:05	1/30/2009 13:40	93.58	66.75	0.5067	0.6041	1.0019	17.7997	0.3067

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LCWA 2141.9

#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
Ver 1	500	11/26/09 1605	11/30/09 1040	11/30/09 1505	301	3	8	656
Ver 2	500	11/26/09 1605	11/30/09 1105	11/30/09 1510	303	3	8	914
Ver 3	500	11/26/09 1605	11/30/09 1130	11/30/09 1705	305	3	8	791
Ver 4	500	11/26/09 1605	11/30/09 1145	~~11/30/09~~ 1.30.09 1737	306	3	8	768
Ver 5	500	11/26/09 1605	11/30/09 1200	~~11/30/09~~ 1.30.09 1905	308	3	8	730
Ver 6	500	11/26/09 1605	11/30/09 1305	1.31.09 1020	309	3	8	764
Ver 7	500	11/26/09 1605	11/30/09 1320	1.31.09 1720	311	3	8	594
Ver 8	500	11/26/09 1605	11/30/09 1340	12/1/09 0825	312	3	8	542
~~Ver 9~~ 312	500	11/26/09 1605						
Ver 10	500	11/26/09 1605						
Ver 11	500	11/26/09 1605						
Ver 12	500	11/26/09 1605						

KD 2/3/09

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
VW 1	500	11/30/09 1000	12/1/09 0915	12/1/09 1340	307	3	8	655
VW 2	500	11/30/09 1000	12/1/09 0940	12/1/09 1415	307	3	8	720
~~VW 3~~	~~500~~	~~11/30/09 1000~~	~~12/1/09 1115~~	12/1/09 1450	~~309~~	3	8	~~754~~

KD 2/3/09

KD 2/3/09

KD 2/3/09

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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.

General Engineering Laboratories
Verification Source Preparation Sheet

Applicable SOP Number: GL-RAD-008

Date Standards Prepared: ~~12/18/2007~~ (KO 2/4/09)

Standard ID: 0633-F

Amount Used (g or ml): 0.1ml

Standard Activity (DPM/g or mL): 267.519 dpm/ml

Reference Date: 1/23/2004

Expiration Date: 2/4/09 (2 KO 2/4/09)

Residue/Carrier Agent: 0.1M HCl

Isotope: Ra-226

Cocktail Type Used: N/A

Matrix of Vial/Planchett: N/A

N/A

N/A

Type of Scintillation Vial: N/A

Pipette ID Used: 1429303

Balance ID Used: N/A

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	KO 2/3/09			
12	Ver 12				

Prepared By: Kelli Brewer Date: 2/3/09

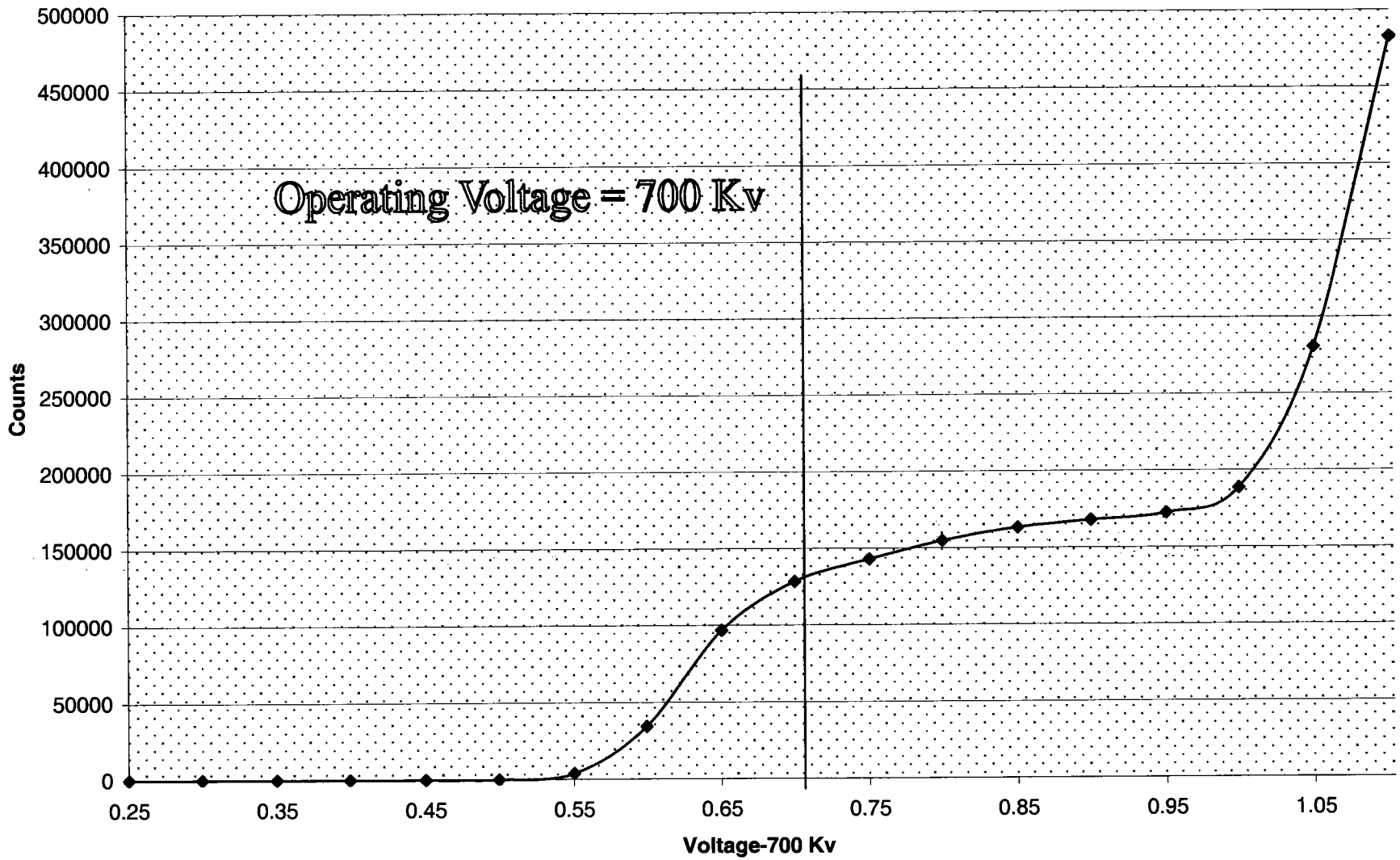
Reviewed By: [signature] Date: 2/4/09

Rev 1 RLM 9/10/97

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

ALA 2/4/09
KM 2/3/09

Ludlum 3 Voltage Curve



KO 2/3/09

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

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 secondard 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 Worrell Date: 2/28/09

Reviewed By: [signature] 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 #	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
401	1.689	Average	1.574	3	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	0.121	3	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			38	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	2.118	43	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	0.064	43	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			15	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	1.463	7	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	0.039	7	2/27/2009 14:50	2/27/2009 10:00	2/23/2009 16:05	0.267	5182	30	172.73	243.66	3.74653	0.20139	3363	0.9960
403	1.419			14	2/25/2009 15:55	2/25/2009 8:35	2/20/2009 17:25	0.267	5562	30	185.40	243.66	4.63194	0.30556	3361	0.9960
404	1.792	Average	1.931	42	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	0.186	42	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			46	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	1.903	38	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	0.161	13	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			47	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	2.036	30	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	0.200	44	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			44	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	1.886	28	2/26/2009 8:50	2/25/2009 13:05	2/20/2009 17:25	0.267	6838	30	227.93	243.66	4.81944	0.82292	3361	0.9960
410	1.965	Stdev	0.072	15	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	0.70833	3339	0.9960
410	1.824			48	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	1.824	36	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	1.811	Stdev	0.013	30	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			9	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	1.967	34	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	0.156	48	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			35	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)

3/2/09

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: GL-RAD-A-008

Isotope: Ra-226

Date Standards Prepared: 4/15/05

Cocktail Type Used: NA

Standard ID: D2996

Matrix of Vial/Planchett: NA / NA / NA

Amount Used (g or (ml)): 0.1

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: 3604021C

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	Cal 3				
43	Cal 43				
7	Cal 7				
42	Cal 42				
13	Cal 43				
44	Cal 44				
30	Cal 30				
48	Cal 48				
36	Cal 36				
35	Cal 35				
38	Cal 38				
15	Cal 15				
14	Cal 14				
46	Cal 46				
47	Cal 47				

3/2/09

Prepared By: Kelli Dowdle Date: 3/2/09

Reviewed By: Angela Johnson Date: 3/2/09

Rev 1 RLM 9/10/97

General Engineering Laboratories
Verification Source Preparation Sheet

Applicable SOP Number: GL-RAD-A-008

Date Standards Prepared: 4/5/05

Standard ID: 02996

Amount Used (g or ml): ~~0.2~~ KD 3/2/09 0.1

Standard Activity (DPM/g or mL): 2,446,347

Reference Date: 12/15/99

Expiration Date: 4/2/09

Residue/Carrier Agent: 0.5M HCl

Isotope: RA-226

Cocktail Type Used: NA

Matrix of Vial/Planchett: NA

NA

NA

Type of Scintillation Vial: NA

Pipette ID Used: 1429303

Balance ID Used: 36040216

Quenching Agent: NA

	Standard Number	Quenching Vol (uL)/ Residue Volume(mL)	Initial Wt. (g)	Final Wt. (g)	Net Wt. (mg)
16	CA116				
25	CA125				
23	CA123				
28	CA128				
9	CA19				
34	CA134				
		KD 3/2/09			

Prepared By: Kellie Dennee Date: 3/2/09

Reviewed By: Angela [signature] Date: 3/2/09

Rev 1 RLM 9/10/97

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

(Mass of parent(g)) * (Parm Activity (kBq/g)) * (conversion dpm to kBq) / (Dilution Vol) = Parent Activity (dpm/mL)
(Mass of parent(g)) * (Parm Activity (kBq/g)) * (conversion dpm to kBq) / Density (g/mL)/ (Dilution Vol) = Parent Activity (dpm/g)
(4.6634 g) * (43.75 kBq/g) * (60000 dpm/kBq) / (100 mL) = 122414.2500 dpm/mL
(4.6634 g) * (43.75 kBq/g) * (60000 dpm/kBq) / (1.0012 g/mL) / (100 mL) = 122273.3377 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

! 8-21-00

Nycomed Amersham plc
Amersham Laboratories

0299

[redacted]

NAMAS
CALIBRATION
No. 0146

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

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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

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Nycomed Amersham

Verification for Ra-226 Standard 0299-G

	Isotope	Detector CPM	BKG CPM	NET CPM	Detector Eff	Standard Mass. Used (G)	Source DPM/G
4/2/2008							
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		**104.944421**	**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	**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.

RAD SOP M-001

4/10/08

Ra-226 Verification Sheet

Cal #4

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~~		~~11/30/09 1050~~	~~2/3/09 1335~~	~~2.3.09 1710~~	~~401~~	~~4~~	~~8~~	~~6763~~	
47		11/30/09 1050	2/3/09 1310	2.3.09 1800	402	4	8	9067	
~~19~~		~~11/30/09 1050~~	2/3/09 1335	2.3.09 1840	403	4	8	~~7092~~	
~~30~~		11/30/09 1050	2/3/09 1400	2.3.09 1915	~~404~~	4	8	7877	
42		11/30/09 ~~1050~~	~~2/3/09 1435~~	2.3.09 2035	405	4	8	8700	
44		11/30/09 1050	2/3/09 1500	2.3.09 2110	409	4	8	7949	
15		11/30/09 1050	2/3/09 1530	~~2/4/09~~ 2/4/09 0830	410	4	8	4108	
~~14~~		~~11/30/09 1050~~	~~2/3/09 1545~~	~~2/4/10 1015~~	~~411~~	4	8	~~7562~~	
~~13~~		11/30/09 1050	2/3/09 1600	2/4/09 1100	412	4	8	~~9523~~	
~~38~~									
36									
				KD 2/18/09					

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KD 3/2/09

KD 3/2/09

KD 3/2/09

KD 3/2/09

KD 3/2/09

KD 3/2/09

KD 3/2/09

KD 3/2/09

KD 3/2/09

Ra-226 Verification Sheet

Cal #4

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background CPM	Total Counts	
Cal 3	500	2/20/09 1725	2/23/09 1030	2/23/09 1415	401	4	8	4580	
43	500	2/20/09 1725	2/23/09 1105	2/23/09 1655	402	4	8	~~4817~~ 5017	KD 2/23/09
7	500	2/20/09 1725	2/23/09 1130	2.23.09 1930	403	4	8	4011	
42	500	2/20/09 1725	2/23/09 1310	2.23.09 1905	404	4	8	5005	
~~13~~	~~500~~	2/20/09 1725	2/23/09 1340	2.23.09 1955	405	4	8	~~4224~~	KD 2/28/09
~~34~~	~~500~~	2/20/09 1725	~~2/23/09~~ 1405	2.23.09 2250	406	4		~~2355~~	KD 2/28/09
44	500	~~2/20/09 1725~~	~~2/23/09 1435~~	2.23.09 2330	407	4		2359	2/28/09 KD
~~14~~	500	2/20/09 1725	2/23/09 1455	2.24.09 00:00	408	4		~~2598~~	KD 2/28/09
30	500	2/20/09 1725	2/23/09 1520	2.24.09 00:30	409	4	8	~~5035~~ 5029	KD 2/24/09
48	500	2/20/09 1725	2/23/09 1540	~~2/24/09 0850~~ 2/24/09 0800	40	4	8	4840	
36	500	2/20/09 1725	2/23/09 1555	2/24/09 0840	411	4	8	4839	
35	500	2/20/09 1725	2/23/09 1610	2/24/09 0940	412	4	8	4818	
				KD 2/28/09					

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KD 3/2/09

KD 3/2/09

Ra-226 Verification Sheet

#4

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background CPM	Total Counts
Cal 38	500	2/20/09 1725	2/25/09 0755	2/25/09 1440	401	4	8	5677
15	500	2/20/09 1725	2/25/09 0815	2/25/09 1525	402	4	8	8017
14	500	2/20/09 1725	2/25/09 0835	2/25/09 1555	403	4	8	5562
46	500	2/20/09 1725	2/25/09 0855	2.25.09 20:20	404	4	8	7075
47	500	2/20/09 1725	2/25/09 1010	2.25.09 20:55	405	4	8	6721
16	500	2/20/09 1725	2/25/09 1040	2.26.09 20:22 ~~2.25.09 2135~~	406	4	8	2094
25	500	2/20/09 1725	2/25/09 1110	2.25.09 2205	407	4	8	2827
23	500	2/20/09 1725	2/25/09 1145	2.25.09 ~~2240~~ 2253	408	4	8	3137
39	500	2/20/09 1725	2/25/09 1210	2/26/09 0810	409	4	8	5169
28	500	2/20/09 1725	2/25/09 1305	2/26/09 0850	410	4	8	6838
9	500	2/20/09 1725	2/25/09 1340	2/26/09 0930	411	4	8	6734
34	500	2/20/09 1725	2/25/09 1405	2/26/09 1015	412	4	8	7137
				KO 2/26/09				

#9 3/2/09

#9 3/2/09

#9 3/2/09

KO 3/2/09

#9 3/2/09

KO 3/2/09

Ra-226 Verification Sheet

Cal #4

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background CPM	Total Counts
~~Cal 5~~ Cal 3	500	2/23/09 1605	2/27/09 0900	2/27/09 0915	401	4	8	5474
Cal 43	500	2/23/09 1605	2/27/09 0930	2/27/09 1416	402	4	8	7507
Cal 7	500	2/23/09 1605	2/27/09 1000	2/27/09 1450	403	4	8	5182
Cal 42	500	2/23/09 1605	2/27/09 1030	2/27/09 1525	404	4	8	7443
Cal 13	500	2/23/09 1605	2/27/09 1055	2/27/09 1600	405	4	8	6612
Cal 44	500	2/23/09 1605	2/27/09 1130	2/27/09 16:35	409	4	8	7516
~~Cal 9~~	~~500~~	~~2/23/09 1605~~	~~2/27/09 1150~~	~~2/27/09 17:15~~	~~410~~	~~4~~	~~8~~	~~7850~~
Cal 30	500	2/23/09 1605	2/27/09 1220	2/27/09 17:45	411	4	8	~~2357~~ 6357
Cal 48	500	2/23/09 1605	2/27/09 1245	2/27/09 18:20	412	4	8	7495

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ICV 3/2/09

ICV 2/28/09

ICV 2/28/09

ICV 3/2/09

Ra-226 Verification Sheet Cal #4

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background CPM	Total Counts
Cal 38	500	2/25/09 1400	3/2/09 1030	3/2/09 1340	405	4	8	8602

KO 3/2/09

AQ 3/2/09

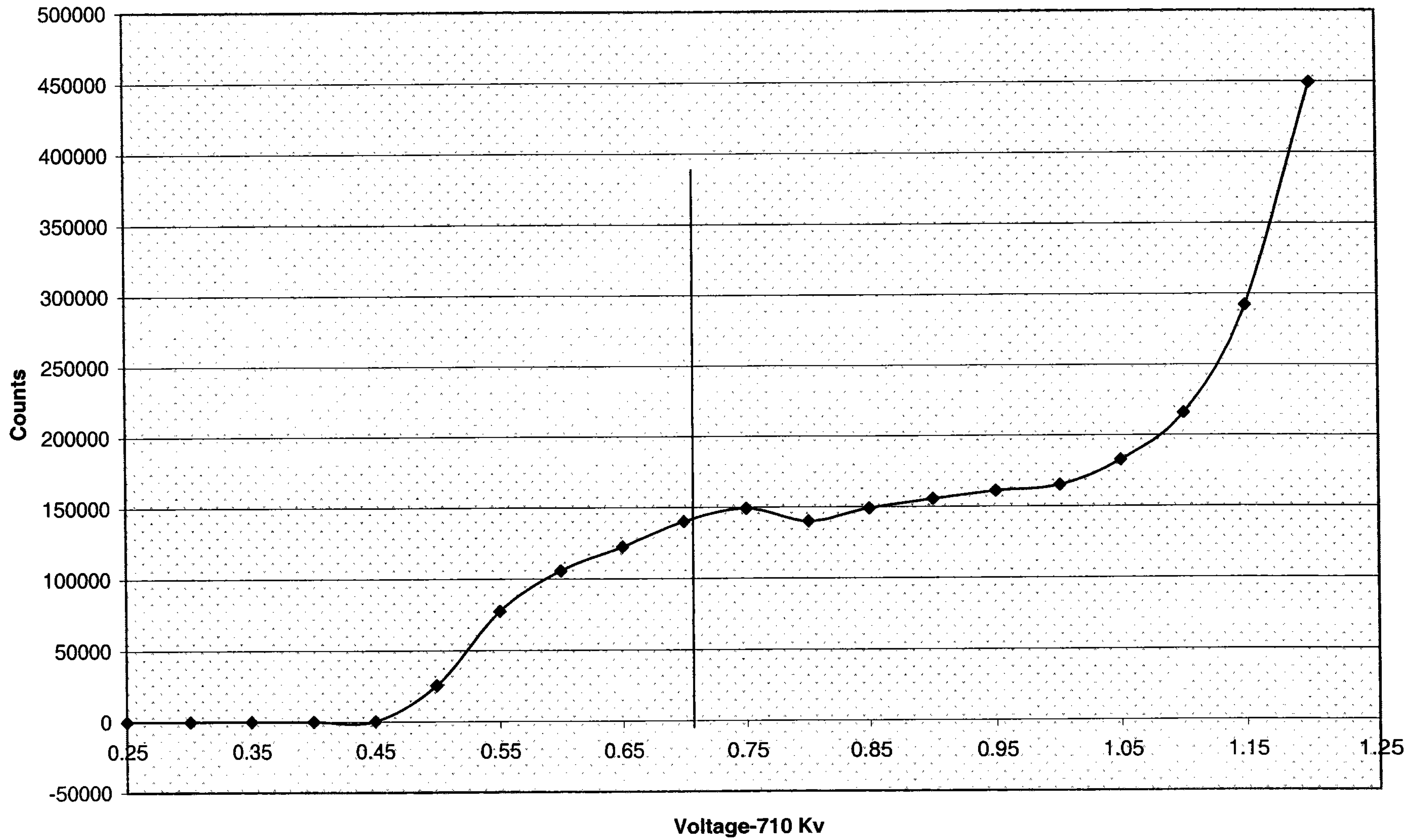
KO 3/2/09

Voltage Curve Ludlum # 4				
Volts (K.V.)	Counts	Date	Time	Detector
0.20	0	2/2/2009	9:00	4
0.25	0	2/2/2009	9:00	4
0.30	0	2/2/2009	9:00	4
0.35	0	2/2/2009	9:00	4
0.40	0	2/2/2009	9:00	4
0.45	473	2/2/2009	9:00	4
0.50	25577	2/2/2009	9:00	4
0.55	77365	2/2/2009	9:00	4
0.60	105618	2/2/2009	9:00	4
0.65	122379	2/2/2009	9:00	4
0.70	140073	2/2/2009	9:00	4
0.75	149183	2/2/2009	9:00	4
0.80	140046	2/2/2009	9:00	4
0.85	149183	2/2/2009	9:00	4
0.90	155553	2/2/2009	9:00	4
0.95	161020	2/2/2009	9:00	4
1.00	165182	2/2/2009	9:00	4
1.05	182720	2/2/2009	9:00	4
1.10	215932	2/2/2009	9:00	4
1.15	292211	2/2/2009	9:00	4
1.20	449383	2/2/2009	9:00	4

3/2/09

lm 3/2/09

Ludlum 4 Voltage Curve



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 secondard 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 Sparrow Date: 3/24/09

Reviewed By: Angela Quinn 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	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
501	1.927	Average	2.087	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	Stdev	0.160	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	Average	1.878	16	3/18/2009 8:25	3/17/2009 12:50	3/10/2009 14:00	7951	30	265.03	243.03	6.95139	0.81597	3381	0.9960
502	2.045	Stdev	0.146	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	Average	1.601	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	Stdev	0.028	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	3376	0.9960
504	1.592	Average	1.615	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	Stdev	0.025	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	Average	2.331	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	Stdev	0.127	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	Average	2.004	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	Stdev	0.112	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	1.985			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	Average	1.701	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	Stdev	0.024	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	Average	1.534	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	Stdev	0.062	44	3/19/2009 21:30	3/19/2009 15:45	3/12/2009 12:10	7561	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	Average	1.798	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	Stdev	0.064	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	Average	1.458	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	Stdev	0.024	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	Average	1.959	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	Stdev	0.106	46	3/11/2009 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	9068	30	302.27	243.03	5.90625	0.39583	3376	0.9960
512	1.796	Average	1.956	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	Stdev	0.152	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

EffErr 0.143768 <- Put in Machines.xls (Lucas Cell Tab)

*Backgrounds are not significant enough to be considered in calculations. ANSI N42.25-1997 (B.2).

Cal #5

Calibration

Ra-226 ~~Verification~~ Sheet JH 3/16/09

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~~	~~3/3/09 0845~~	~~3/6/09 0840~~	502	5	1	~~4308~~
		~~2/25/09 1400~~	3/3/09		~~503~~	5	~~No~~ 3/3/09	~~6860~~
Cal 46	500	2/25/09 1400	3/5/09 0920	3/6/09 0920	503	5	3	7250
Cal 47	500	2/25/09 1400	3/5/09 0940	3/6/09 1030	504	5	1	7262
Cal 16	500	2/25/09 1400	3/5/09 1005	3/6/09 1240	505	5	3	10654
Cal 25	500	2/25/09 1400	3/5/09 1030	3/6/09 1310	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	502	2/25/09 1400	3/5/09 1320	3/6/09 1630	511	5	6	8316

~~No~~ 3/24/09 JH 3/19/09

JH 3/16/09

Calibration

Ra-226 ~~Verification~~ Sheet

JAS 3/16/09

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background CPM	Total Counts	
Cal 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 1320	3/11/09 1115	502	5	5	7414	
~~Cal 15~~	~~500~~	~~3/5/09 1400~~	~~3/10/09 1345~~	~~3/11/09 1155~~	503	5	8	7352	KD 3/24/09
Cal 34	500	3/5/09 1400	3/10/09 1405	3/11/09 1230	504	5	4	5889	
Cal 23	500	3/5/09 1400	3/10/09 1430	3/11/09 1300	505	5	2	8924	
Cal 47	500	3/5/09 1400	3/10/09 1505	3/11/09 1330	506	5	8	7804	
~~Cal 45~~	~~500~~	~~3/5/09 1400~~	3/10/09 1527	3/11/09 1420	~~507~~	~~5~~	~~4~~	~~6315~~	KD 3/24/09
~~Cal 16~~	~~500~~	~~3/5/09 1400~~	3/10/09 1550	3/11/09 1455	~~508~~	~~5~~	~~4~~	~~6443~~	KD 3/24/09
Cal 39	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	7246	
Cal 46	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	

JAS 3/16/09

Calibration

Ra-226 ~~Verification~~ Sheet

JH 3/11/09

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background CPM	Total Counts
Cal 42	500	3/6/09 1525	3/12/09 0910	3/12/09 1330	501	5	8	10210
Cal 19	500	3/6/09 1525	3/12/09 ~~0940~~ 0935 ~~to 3/11/09~~	3/12/09 1420	502	5	8	8243
Cal 44	500	3/6/09 1525	3/12/09 1000	3/12/09 1450	503	5	2	7214
~~Cal 40~~	500	3/6/09 1525	3/12/09 1025	3/11/09 1525	~~504~~	~~5~~	~~0~~	~~420~~
Cal 7	500	3/6/09 1525	3/12/09 1050	3/12/09 1701	505	5	5	9884
Cal 15	500	3/6/09 1525	3/12/09 1115	3/12/09 17:40	506	5	8	8954
Cal 43	500	3/6/09 1525	3/12/09 1135	3/12/09 18:30	507	5	6	7535
Cal 3	500	~~3/10~~ 3/6/09 1525 ~~to 3/12/09~~	3/12/09 1210	3/12/09 20:45	508	5	0	6640
Cal 36	500	3/6/09 1525	3/12/09 1235	3/12/09 21:20	509	5	8	8049
Cal 35	500	3/6/09 1525	3/12/09 1250	3/12/09 21:55	510	5	1	6589
Cal 37	500	3/6/09 1525	3/12/09 1310	3/12/09 22:40	511	5	8	9068
Cal 38	500	3/6/09 1525	3/12/09 1330	3/12/09 23:15	512	5	5	9322

LCD 3/24/09

JH 3/11/09

Calibration

Ra-226 ~~Verification~~ Sheet Cal #5's

KD 3/25/09

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background CPM	Total Counts
Cal 16	500	3/10/09 1400	3/17/09 1250	3/18/09 0825	502	5	5	7951
~~Cal 39~~	~~500~~	~~3/10/09 1400~~	~~3/17/09 1325~~	~~3/18/09 0855~~	~~503~~	5		6855
~~Cal 28~~	~~500~~	~~3/10/09 1400~~	~~3/17/09 1345~~	~~3/18/09 1025~~	~~504~~	5		6804
Cal 40	500	3/10/09 1400	3/17/09 1400	3/18/09 1300	512	5	8	8653
Cal 25	500	3/5/09 1400	3/10/09 1527	3/11/09 1420	507	5	4	6315

KD 3/24/09

KD 3/24/09

KD 3/24/09

KD 3/25/09

Ra-226 Calibration Sheet

Standard ID: 0299-0
Volume Added (mL): 0.1
Expiration Date: 4/1/09

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Total Counts
Cal 42	500	3/12/09 1210	3/19/09 1515	3/19/09 2015	503	~~8~~5	8282
Cal 19	500	3/12/09 1210	3/19/09 1530	3/19/09 2050	504	5	8310
Cal 44	500	3/12/09 1210	3/19/09 1545	3/19/09 2130	508	5	7561
~~Cal 30~~	~~500~~	~~3/12/09 1210~~	~~3/19/09 1600~~	3/19/09 2200	509	5	~~9942~~

WD 3/24/09

WD 3/24/09

WD 3/24/09

3/25/09

8-21-00

Nycomed Amersham plc
Amersham Laboratories

0299

Certificate of calibration of radionuclide activity

NAMAS
CALIBRATION
No. 0146

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

Date of 341 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

(Mass of parent(g)) * (Parm Activity (kBq/g)) * (conversion dpm to kBq) / (Dilution Vol) = Parent Activity (dpm/mL)
(Mass of parent(g)) * (Parm Activity (kBq/g)) * (conversion dpm to kBq) / Density (g/mL)/ (Dilution Vol) = Parent Activity (dpm/g)
(4.6634 g) * (43.75 kBq/g) * (60000 dpm/kBq) / (100 mL) = 122414.2500 dpm/mL
(4.6634 g) * (43.75 kBq/g) * (60000 dpm/kBq) / (1.0012 g/mL) / (100 mL) = 122273.3377 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 Darnell

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		**104.944421**	**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	**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.

RAD SOP M-001

3/24/08 4/9/08

4/10/08

General Engineering Laboratories

~~Verification~~ Source Preparation Sheet

3/25/09 Calibration

Applicable SOP Number: GL-RAD-A-008

Date Standards Prepared: 4/15/05

Standard ID: 0249-G

Amount Used (g or ml): 0.1

Standard Activity (DPM/g or mL): 12446.347

Reference Date: 12/15/99

Expiration Date: 4/2/09

Residue/Carrier Agent: 0.5M HCl

Isotope: RA-226

Cocktail Type Used: NA

Matrix of Vial/Planchett: NA

NA

NA

Type of Scintillation Vial: NA

Pipette ID Used: 1425303

Balance ID Used: 3600402216

Quenching Agent: NA

	Standard Number	Quenching Vol (uL)/ Residue Volume(mL)	Initial Wt. (g)	Final Wt. (g)	Net Wt. (mg)
15	Cal 15				
46	Cal 46				
47	Cal 47				
16	Cal 16				
25	Cal 25				
23	Cal 23				
39	Cal 39				
28	Cal 28				
9	Cal 9				
34	Cal 34				
42	Cal 42				
19	Cal 19				
44	Cal 44				
7	Cal 7				
13	Cal 13				

KLD 3/24/09

Prepared By: Kelli Dossie Date: 3/24/09

Reviewed By: _____ Date: _____

Rev 1 RLM 9/10/97

General Engineering Laboratories
~~Verification~~ Source Preparation Sheet
3/25/09 Calibration

Applicable SOP Number: GL-RAD-A-008
Isotope: RA226
Date Standards Prepared: 4/5/09
Cocktail Type Used: NA
Standard ID: 12996
Matrix of Vial/Planchett: NA / NA / NA
Amount Used (g or ml): 0.1
Standard Activity (DPM/g or mL): 2246.347
Type of Scintillation Vial: NA
Reference Date: 12/15/99
Pipette ID Used: 1429303
Expiration Date: 4/2/09
Balance ID Used: 36040216
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)
43	Cal143				
3	Cal3				
36	Cal136				
35	Cal135				
37	Cal137				
38	Cal138				

KD 3/24/09

Prepared By: Kelli Deere Date: 3/24/09

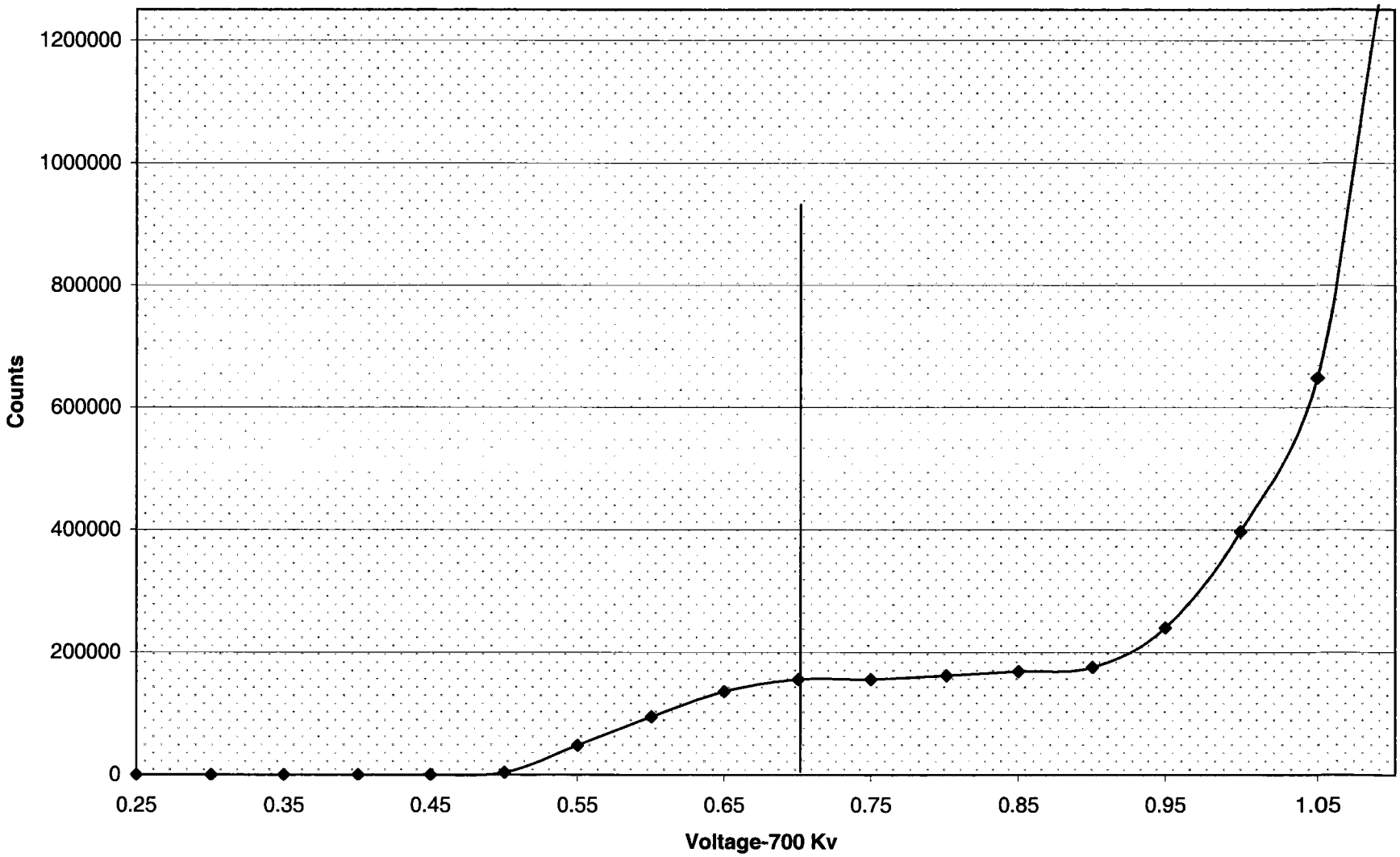
Reviewed By: Date:

Rev 1 RLM 9/10/97

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

VD 3/24/09

Ludlum 5 Voltage Curve



KAP 3/24/09

Ra-226 WATER

Batch : LCSVER
Date : 2/20/2008
Analyst : DXM2
Bkg Count Time: 30 min

Procedure Code : LUC26RAL
Parmname : Radium-226
MDA : 1 pCi/L
Instrument Used : LUCAS CELL DETECTOR

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 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

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	3/13/09 1530	3/16/09 0945	~~3/16/09 1510~~ 3.16.09 1510 ->SEA 3.17.09	501	5	8	766
VER 2	500	3/13/09 1530	3/16/09 1010	3.16.09 1925	502	5	~~8~~ 5 KD 3/25/09	537
VER 3	500	3/13/09 1530	3/16/09 1030	3/16/09 2020	503	5	8	518
~~VER 4~~	~~500~~	~~3/13/09 1530~~	~~3/16/09~~ 1100	~~3.16.09 2115~~	504	5	8	~~577~~ KD 3/24/09
VER 5	500	3/13/09 1530	3/16/09 1125	3.16.09 2200	505	5	~~8~~ 1 KD 3/25/09	680
~~VER 6~~	~~500~~	3/13/09 1530	3/16/09 1155	3.16.09 2230	506	5	8	~~707~~ KD 3/24/09
VER 7	500	3/13/09 1530	3/16/09 1320	3.16.09 2300	507	5	8	488
VER 8	500	3/13/09 1530	3/16/09 1350	3.16.09 2330	508	5	~~8~~ 1 KD 3/25/09	544
350 ~~VER 9~~	~~500~~	~~3/13/09 1530~~	~~3/16/09 1410~~	~~3/17/09 0315~~ 0415 SB 3/17/09	509	5	8	640 KD 3/24/09
VER 10	500	3/13/09 1530	3/16/09 1425	3/17/09 0500	510	5	~~8~~ 1 KD 3/25/09	432
VER 11	500	3/13/09 1530	3/16/09 1445	3/17/09 0535	511	5	8	577
VER 12	500	3/13/09 1530	3/16/09 1500	3/17/09 0610	512	5	8	723
				KD 3/24/09				

KD 3/25/09

Ra-226 Verification Sheet

Standard ID: 0638F
Volume Added (mL): D.I
Expiration Date: 2/2/10

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background Counts	Total Counts
~~VER 1~~	~~500~~	~~3/16/09 1400~~	3/20/09 1245	3/20/09 1820	501	5	~~8~~	~~10~~
VER 2	500	3/16/09 1400	3/20/09 1305	3/20/09 1900	504	5	8	701
VER 3	500	3/16/09 1400	3/20/09 1320	3/~~30~~20/09 1940	506	5	8	893
VER 4	500	3/16/09 1400	3/20/09 1345	3/~~30~~20/09 2050	509	5	8	768

KW 3/24/09

KW 3/24/09

KW 3/24/09

General Engineering Laboratories
Verification Source Preparation Sheet

Applicable SOP Number: GL-RAD-A-008

Date Standards Prepared: 11/16/09

Standard ID: 0638-F

Amount Used (g or ml): 0.1

Standard Activity (DPM/g or mL): 267.519

Reference Date: 1123104

Expiration Date: 2/2/10

Residue/Carrier Agent: NA

Isotope: RA-226

Cocktail Type Used: NA

Matrix of Vial/Planchett: NA / NA / NA

Type of Scintillation Vial: NA

Pipette ID Used: 1429303

Balance ID Used: 3808 0004

Quenching Agent: NA

	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		LD 3/25/09		
10	Ver 10				
11	Ver 11				
12	Ver 12				

Prepared By: Kelli Diesel Date: 3/24/09

Reviewed By: Angela A Quinn Date: 3/25/09

Rev 1 RLM 9/10/97

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:	03/04/2007
Expiration Date:	03/04/2008
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

(Mass of parent(g)) * (Parm Activity (dps)) * (conversion dpm to dps) / (Ampoule Mass(g) *(Dilution Vol)) = Parent Activity (dpm/mL)
(Mass of parent(g)) * (Parm Activity (dps)) * (conversion dpm to dps) / Density / (Ampoule Mass (g) * (Dilution Vol)) = Parent Activity (dpm/g)
(4.8398 g) * (23530 dps) * (60 dpm/dps) / (5.01065 g * 100 mL) = 13636.6133 dpm/mL
(4.8398 g) * (23530 dps) * (60 dpm/dps) / (1.0266 g/mL)/ (5.01065 g * 100 mL) = 13282.9676 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.

LW 3/24/09

2/2/09

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 secondard 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: [signature] Date: 8/4/09

Reviewed By: [signature] Date: 8/6/09

Effective Date: 8/4/09

KP 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*	*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*
601	**2.164**	Average	**2.181**	9	5/26/2009 13:30	5/26/2009 9:30	5/19/2009 14:00	10883	30	*362.77*	*244.63*	*6.81250*	*0.16667*	*3451*	*0.9959*
601	**2.253**	Stdev	**0.065**	1	5/22/2009 12:55	5/22/2009 9:15	5/19/2009 14:00	6378	30	*212.60*	*244.63*	*2.80208*	*0.15278*	*3447*	*0.9959*
601	**2.126**			5	5/29/2009 14:45	5/29/2009 9:50	5/22/2009 10:45	10735	30	*357.83*	*244.63*	*6.96181*	*0.20486*	*3454*	*0.9959*
602	**2.007**	Average	**2.168**	6	5/29/2009 15:20	5/29/2009 10:15	5/22/2009 10:45	10133	30	*337.77*	*244.63*	*6.97917*	*0.21181*	*3454*	*0.9959*
602	**2.194**	Stdev	**0.150**	10	5/26/2009 14:05	5/26/2009 9:55	5/19/2009 14:00	11033	30	*367.77*	*244.63*	*6.82986*	*0.17361*	*3451*	*0.9959*
602	**2.304**			5	6/2/2009 14:45	6/2/2009 11:30	5/29/2009 9:50	8575	30	*285.83*	*244.63*	*4.06944*	*0.13542*	*3458*	*0.9959*
604	**2.244**	Average	**2.133**	6	6/2/2009 15:50	6/2/2009 11:50	5/29/2009 9:50	8321	30	*277.37*	*244.63*	*4.08333*	*0.16667*	*3458*	*0.9959*
604	**2.076**	Stdev	**0.096**	7	5/29/2009 15:55	5/29/2009 10:45	5/22/2009 12:00	10451	30	*348.37*	*244.63*	*6.94792*	*0.21528*	*3454*	*0.9959*
604	**2.079**			11	5/26/2009 15:45	5/26/2009 10:20	5/19/2009 14:00	10372	30	*345.73*	*244.63*	*6.84722*	*0.22569*	*3451*	*0.9959*
605	**2.096**	Average	**2.149**	12	5/26/2009 16:15	5/26/2009 10:50	5/19/2009 14:00	10474	30	*349.13*	*244.63*	*6.86806*	*0.22569*	*3451*	*0.9959*
605	**2.228**	Stdev	**0.070**	4	5/22/2009 16:25	5/22/2009 10:45	5/19/2009 14:00	6318	30	*210.60*	*244.63*	*2.86458*	*0.23611*	*3447*	*0.9959*
605	**2.122**			8	5/29/2009 17:15	5/29/2009 11:05	5/22/2009 12:50	10587	30	*352.90*	*244.63*	*6.92708*	*0.25694*	*3454*	*0.9959*
606	**2.543**	Average	**2.348**	9	5/29/2009 17:45	5/29/2009 13:10	5/26/2009 9:30	7816	30	*260.53*	*244.63*	*3.15278*	*0.19097*	*3454*	*0.9959*
606	**2.202**	Stdev	**0.176**	1	5/26/2009 16:45	5/26/2009 12:25	5/22/2009 12:00	8057	30	*268.57*	*244.63*	*4.01736*	*0.18056*	*3451*	*0.9959*
606	**2.298**			7	6/2/2009 18:20	6/2/2009 12:55	5/29/2009 9:50	8495	30	*283.17*	*244.63*	*4.12847*	*0.22569*	*3458*	*0.9959*
607	**2.454**	Average	**2.450**	8	6/2/2009 19:00	6/2/2009 13:10	5/29/2009 9:50	9057	30	*301.90*	*244.63*	*4.13889*	*0.24306*	*3458*	*0.9959*
607	**2.572**	Stdev	**0.123**	10	5/29/2009 19:00	5/29/2009 13:25	5/26/2009 9:55	7832	30	*261.07*	*244.63*	*3.14583*	*0.23264*	*3454*	*0.9959*
607	**2.325**			2	5/26/2009 17:15	5/26/2009 12:50	5/22/2009 12:00	8527	30	*284.23*	*244.63*	*4.03472*	*0.18403*	*3451*	*0.9959*
609	**2.277**	Average	**2.316**	3	5/26/2009 19:20	5/26/2009 13:10	5/22/2009 12:00	8261	30	*275.37*	*244.63*	*4.04861*	*0.25694*	*3451*	*0.9959*
609	**2.280**	Stdev	**0.066**	7	5/22/2009 19:20	5/22/2009 12:00	5/19/2009 14:00	6473	30	*215.77*	*244.63*	*2.91667*	*0.30556*	*3447*	*0.9959*
609	**2.392**			11	5/29/2009 19:40	5/29/2009 13:45	5/26/2009 10:20	7261	30	*242.03*	*244.63*	*3.14236*	*0.24653*	*3454*	*0.9959*
611	**2.488**	Average	**2.307**	12	5/29/2009 20:20	5/29/2009 14:00	5/26/2009 10:50	7510	30	*250.33*	*244.63*	*3.13194*	*0.26389*	*3454*	*0.9959*
611	**2.245**	Stdev	**0.160**	4	5/26/2009 22:00	5/26/2009 13:25	5/22/2009 12:00	8010	30	*267.00*	*244.63*	*4.05903*	*0.35764*	*3451*	*0.9959*
611	**2.187**			9	6/2/2009 19:50	6/2/2009 13:25	5/29/2009 9:50	8052	30	*268.40*	*244.63*	*4.14931*	*0.26736*	*3458*	*0.9959*

EffErr 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).

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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 / NA / NA

Amount Used (g or (ml)): 0.1

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: 0.1 M 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				

8/4/09

8/4/09

Prepared By: [signature] Date: 8/4/09

Reviewed By: [signature] Date: 8/4/09

Rev 1 RLM 9/10/97

10/8/6/05

Ra-226 Calibration Sheet

Standard ID: ~~0630-G~~ 0299-G JH 8/4/09
Volume Added (mL): 0.1
Expiration Date: ~~4/9/10~~ JH 8/4/09

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Total Counts
Cal 5	500	5/22/09 1045	5/26/09 0950	5/29/09 14:45	601	6	10735
Cal 6	500	5/22/09 1045	5/26/09 1015	5/29/09 15:20	602	6	10133
Cal 7	500	5/22/09 1200	5/29/09 1045	5/29/09 1555	604	6	10451
Cal 8	500	5/22/09 1250	5/26/09 1105	5/29/09 17:15	605	6	10587
Cal 9	500	5/26/09 0930	5/29/09 1310	5/29/09 17:45	606	6	7816
Cal 10	500	5/26/09 0955	5/29/09 1325	5/29/09 19:00	607	6	7832
Cal 11	500	5/26/09 1010	5/29/09 1345	5/29/09 19:40	609	6	7261
Cal 12	500	5/26/09 1050	5/29/09 1400	5/29/09 20:20	611	6	7510
					WO 8/4/09		

WO 8/4/09
JH 8/4/09

Ra-226 Calibration Sheet #9

Standard ID: ~~0036-G~~ 0299-G

Volume Added (mL): 0.1 #9 8/4/09

Expiration Date: ~~#1 4/10~~ 11/26/10 #9 8/4/09

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	5/22/09 1255	601	6	6378
~~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 1410~~	~~5/22/09 1200~~	~~5/22/09 2035~~	~~611~~	~~6~~	~~6355~~ 6162
Cal 9							
Cal 10							
Cal 11							
Cal 12							

~~KD~~ 8/4/09

~~Cal 2~~ KD 8/4/09

~~Cal 3~~ KD 8/4/09

~~Cal 5~~ KD 8/4/09

~~Cal 6~~ KD 8/4/09

~~Cal 8~~ 8/4/09

#9 8/4/09

KD 8/6/09

Ra-226 Calibration Sheet

Standard ID: ~~0039E~~ 0299-G MH 8/14/09
Volume Added (mL): 0.1
Expiration Date: ~~4/9/10~~ 1/22/10 MH 8/14/09

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Total Counts
Cal 5	500	5/29/09 0950	6/2/09 1130	6/2/09 1445	602	6	8575
Cal 6	500	5/29/09 0950	6/2/09 1150	6/2/09 1650	604	6	8321
Cal 7	500	5/29/09 0950	6/2/09 1255	6.2.09 1820	606	6	8495
Cal 8	500	5/29/09 0950	6/2/09 1310	6.2.09 1900	607	6	9057
Cal 9	500	5/29/09 0950	6/2/09 1325	6.2.09 1950	611	6	8052
				MH 8/14/09			

MH 8/14/09

KD 8/16/09

Ra-226 Calibration Sheet

Standard ID: ~~[illegible]~~ 0299-G
Volume Added (mL): 0.1 JH 8/14/09
Expiration Date: ~~11/9/10~~ 11/26/10 JH 8/14/09

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 0930	5/26/09 1330	601	6	10883
Cal 10	500	5/19/09 1400	5/26/09 0955	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	8057
Cal 2	500	5/22/09 1200	5/26/09 1250	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
				KO 8/14/09			

JH 8/14/09

KO 8/16/09

eec 8-21-00

Nycomed Amersham plc
Amersham Laboratories

0299

[redacted]

CALIBRATION
No. 0146

[redacted]

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 Signatory [signature]

Date of issue 17th December 1999

Nycomed Amersham

Verification for Ra-226 Standard 0299-G

M. Aders	Isotope	Value DPM	Uncertainty
1/26/2009	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.

8/4/09

8/4/09

Ra-226 Cell Constants

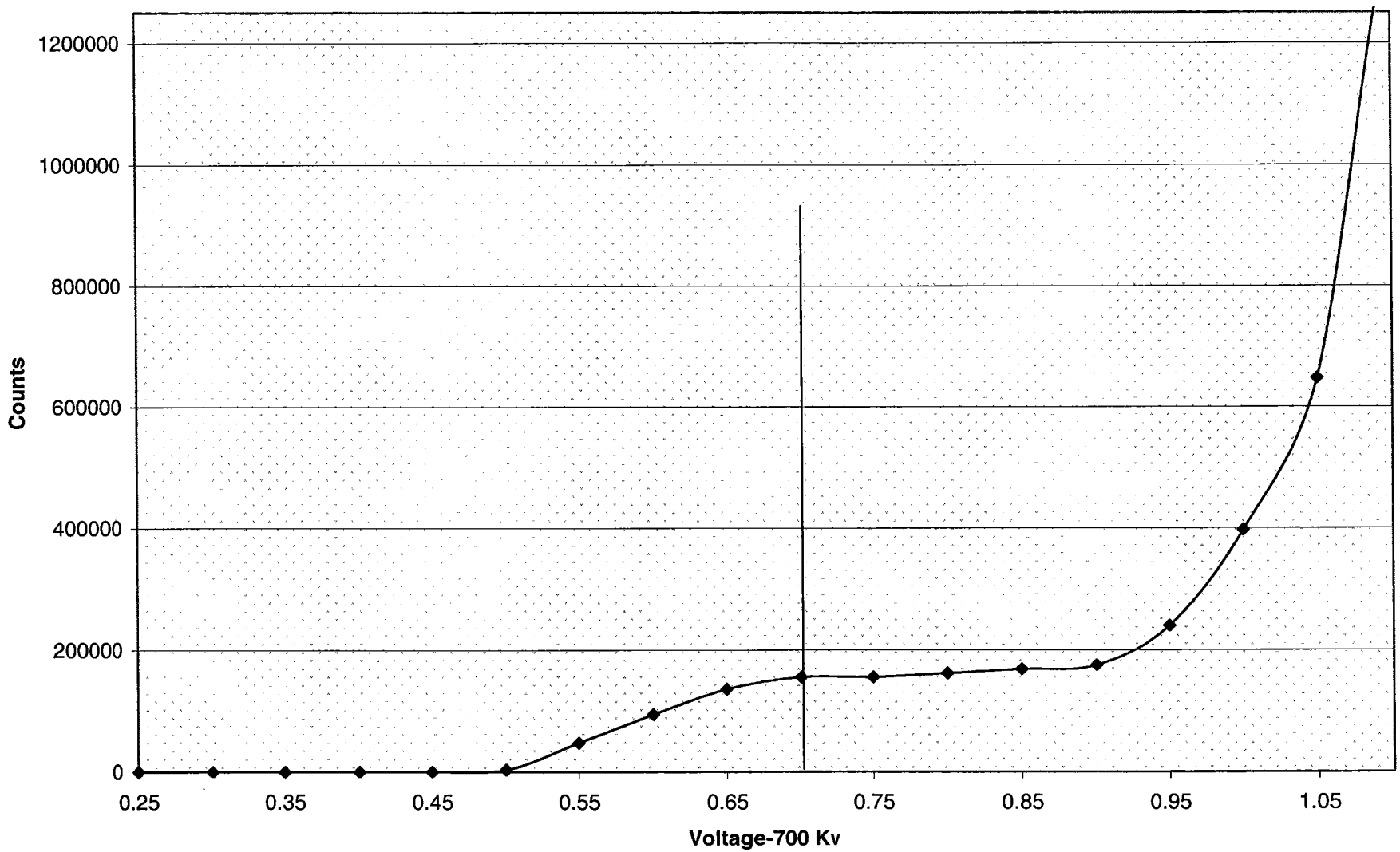
Standard Reference date :	*12/15/1999*
standard ID :	*0299-G*
Volume added (mL) :	*0.1*
Standard Reference Activity (DPM/mL) :	*2446.35*

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	0.99605551
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

8/4/09

Ludlum 6 Voltage Curve



ver 6_09

Ra-226 WATER

Batch : LCSVER
Date : 6/2/2009
Analyst : KSD1

Bkg Count Time: 30 min

Procedure Code : LUC26RAL
Parmname : Radium-226
MDA : 1 pCi/L
Instrument Used : LUCAS CELL DETECTOR

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

8/16/09
8/16/09

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 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

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8/6/09

Ra-226 Verification Sheet

Ver #6

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	6/2/09 1240	6/8/09 1215	6.8.09 1535	601	6	8	1018
Ver 2	500	6/2/09 1240	6/8/09 1240	6.8.09 1605	602	6	3	994
Ver 3	500	6/2/09 1240	6/8/09 1305	6.8.09 1640	604	6	5	955
Ver 4	500	6/2/09 1240	6/8/09 1330	6.8.09 1715	605	6	8	1144
Ver 5	500	6/2/09 1240	6/8/09 1350	6.8.09 1830	606	6	7	1046
Ver 6	500	6/2/09 1240	6/8/09 1413	6.8.09 1915	607	6	8	1001
Ver 7	500	6/2/09 1240	6/8/09 1435	6.8.09 2005	609	6	8	1060
Ver 8	500	6/2/09 1240	6/8/09 1500	6.8.09 2310	611	6	8	943
Ver 9	500							
Ver 10	500							
Ver 11	500							
Ver 12	500							

VO 8/4/09

VO 8/4/09

[initials] 8/4/09

[initials] 8/4/09

General Engineering Laboratories
Verification Source Preparation Sheet

A VP 8/4/09

Applicable SOP Number GL-RAD-D08

Date Standards Prepared 11/16/09

Standard ID 0638-F

Amount Used (g or (ml)) 0.1

Standard Activity (DPM/g or (mL)) 267.519

Reference Date 1/23/04

Expiration Date 2/2/10

Residue/Carrier Agent NA

Isotope Ra 226

Cocktail Type Used NA

Matrix of Vial/Planchett NA

NA

NA

Type of Scintillation Vial NA

Pipette ID Used 1172303

Balance ID Used 38080204

Quenching Agent NA

	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				

VP 8/4/09

Prepared By: Vicki A Davis Date 8/4/09

Reviewed By: Angela A Quinn Date 8/4/09

Rev 1 RLM 9/10/97

VP 8/4/09

ANALYTICS

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318 - U.S.A.

Phone (404) 352-8677
Fax (404) 352-2837

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 µg/g Ba carrier.

P O NUMBER 3231RD, Item 5

SOURCE PREPARED BY: M. D. Currie
M. D. Currie, Radiochemist

Q A APPROVED: 1/26/04

WD 8/4/09

RC-S-037-037a

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

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Calculations Converting parent activity to dpm/mL|dpm/g

(Mass of parent(g)) * (Parm Activity (dps)) * (conversion dpm to dps) / (Ampoule Mass(g) *(Dilution Vol)) = Parent Activity (dpm/mL)
(Mass of parent(g)) * (Parm Activity (dps)) * (conversion dpm to dps) / Density / (Ampoule Mass (g) * (Dilution Vol)) = Parent Activity (dpm/g)
(4.8398 g) * (23530 dps) * (60 dpm/dps) / (5.01065 g * 100 mL) = 13636.6133 dpm/mL
(4.8398 g) * (23530 dps) * (60 dpm/dps) / (1.0266 g/mL)/ (5.01065 g * 100 mL) = 13282.9676 dpm/g

8/4/09

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

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VD 8/4/15

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.

Radium-226 Que Sheet

02/03/2009 *General Engineering Laboratories, Radiochemistry Division*

Batch #: 838839 **Analyst:**KSD1 **First Client Due Date:** **Internal Due Date:**02/07/2009

Spike Isotope: Radium-226 **Spike Code:** [illegible] **Expiration Date:** 12/27/[illegible] **Vol:** [illegible] **Nom Conc:**

LCS Isotope: Radium-226 **LCS Code:** [illegible] **Expiration Date:** [illegible] **Vol:** [illegible] **Nom Conc:**

Prep Date: 1/26/09 **Pipet ID:** **Initials:** KSD **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 De-em Date/Time	Start Count Date/Time	Cell #	Det #	Bkg counts	Total Counts
1201770521-1	LCS for batch 838839	LCS		GROUND WA1	1 pCi/L	QC ACCOUNT	500	1/26/09 1005	1/3/09 1130	1/30/09 1705	305	3	9	7911
1201770522-1	LCS for batch 838839	LCS		GROUND WA1	1 pCi/L	QC ACCOUNT	500	1/26/09 1005	1/3/09 1145	1/3/09 1737	304	3	8	768
1201770523-1	LCS for batch 838839	LCS		GROUND WA1	1 pCi/L	QC ACCOUNT	500	1/26/09 1005	1/3/09 1200	1/30/09 1905	303	3	8	730

Comments:

Instrument ID's:
LUCAS1:50238, LUCAS2:136917, LUCAS3:90989, LUCAS4:182753, LUC5:132286, LUC6:170055

Data Reviewed By: 608[illegible]

Radium-226 Liquid

Filename : RA226.XLS
File type : Excel
Version # : 1.2.3

Batch : 838839
Analyst : KSD1
Prep Date : 1/26/2009
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

LCS S/N : 0638-F
LCS Exp Date : 12/20/2008
LCS Activity (dpm/ml): 266.94
LCS 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 : LUC26RAL
Parmname : Radium-226
Required MDA : 1 pCi/L
Halflife of Ra-226 : 1600 years
Halflife of Rn-222: 3.823 days
Batch counted on : LUCAS CELL DETECTOR
BKG Count time : 30 min

Sample Characteristics				Count Raw Data				Weekly Background			
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.)	Detector Efficiency (cpm/dpm)
1201770521.1	0.5000	2.0256E-05	1/26/2009 0:00	305	30	791	26.367	8	0.267	30	1.9930
1201770522.1	0.5000	2.0256E-05	1/26/2009 0:00	306	30	768	25.600	8	0.267	30	1.9500
1201770523.1	0.5000	2.0256E-05	1/26/2009 0:00	308	30	730	24.333	8	0.267	30	2.0010

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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			
						De-Gas to Ingrowth	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

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K0816109

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** Counting Uncertainty pCi/L	**2 SIGMA** Total Prop. Uncertainty pCi/L	Sample QC	Sample Type	RPD	RER	Nominal pCi/L	Recovery
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%

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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-proplyene 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.

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

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

Gadolinium-148

Isotope	Value pCi/g		
SSTOCK2002A2_AM	96.080		
SSTOCK2002B2_AM	93.750		
SSTOCK2002C2_AM	96.560		
Mean Value (Counting) =	95.463	99.81%	
Stdev =	1.503074627		
Target =	95.6460	pCi/g	
Lower Limit =	92.45718408		
Upper Limit =	98.46948259		
Rule 1 Pass/Fail	Pass	Pass	Pass
Two sigma =	3.006149253		
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 std dev was zero. The intent of this rule is to ensure an appropriate amount of counts are achieved for proper determinations. 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.

[signature] 021203

Attachment II

Mixed alpha	Reference date =	2/7/2003					
Isotope	Source	Stock Dpm/g	Reference date	Half-life (years)	amount used for mixed	Dpm/g mixed	Decay corr dpm/g
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

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

*Notes and references are on pages 5 and 6

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]*.

*Notes and references are on pages 5 and 6.

RC-5-035-005

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 Wall Thickness Barium content Lead-oxide content Other heavy elements	(16.5 ± 0.5) mm (0.60 ± 0.04) mm Less than 2.5% Less than 0.02% 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_2O HNO_3 HCl $^{244}Cm^{+3}$	54 1.0 <0.001 5×10^{-11}	0.94 0.06 $<4 \times 10^{-5}$ 1×10^{-11}
Radiological Properties:			
Radionuclide	**Curium-244**		
Reference time	**1200 EST, 1 February 1996** [c]		
Massic activity of the solution [d]	**37.06 Bq·g^{-1}** 74.12 Bq·g^{-1}		
Relative expanded uncertainty (k=2)	**0.68%** [e] [f]		
Alpha-particle-emitting daughters Alpha-particle-emitting impurities	Plutonium-240: (0.22 ± 0.11) Bq·g^{-1} [b] [c] 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 4πα liquid-scintillation counting systems		

37.06 x 2 2004

6

*Notes and references are on pages 5 and 6.

RC-S-035-005c

[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 $u_i(y)/y \equiv |\partial y/\partial x_i| \cdot u(x_i)/y = |\partial y/\partial x_i| \cdot (x_i/y) \cdot u(x_i)/x_i$. 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. $|\partial y/\partial x_i| \cdot (x_i/y)$ = {(response per Bq of impurity)/(response per Bq of Cm-244)}·{(Bq of impurity)/(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%. $|\partial y/\partial x_i| \cdot (x_i/y)$ = {(response per Bq of impurity)/(response per Bq of Cm-244)}·{(Bq of impurity)/(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.

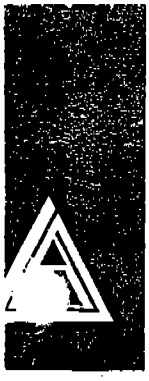
[2] International Organization for Standardization (ISO), *Guide to the Expression of Uncertainty in Measurement*, 1993. Available from the American National Standards Institute, 11 West 42nd Street, New York, NY 10036, U.S.A. 1-212-642-4900. (Listed under ISO miscellaneous publications as "ISO Guide 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.

RC-5-035-005



ANALYTICS

0502

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318 · U.S.A.

Phone (404) 352-8677
Fax (404) 352-2837

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: M.D. Currie

M.D. Currie, Radiochemist

Q A APPROVED: 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 $mol \cdot L^{-1}$ nitric acid
Reference time	March 1992
Radioactivity concentration	97.0 $Bq \cdot g^{-1}$
Overall uncertainty	1.28 percent (2)
Photon-emitting impurities	None detected (3)
Alpha-particle-emitting impurities	None detected (4)
Half life	$(2.14 \pm 0.11) \times 10^6$ years (5)
Measuring instrument	NIST "$0.8\pi\alpha$ 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 $\gamma \cdot s^{-1} \cdot g^{-1}$ for energies between 30 and 307 keV and
0.01 $\gamma \cdot s^{-1} \cdot g^{-1}$ 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 $\alpha \cdot s^{-1} \cdot g^{-1}$ for energies between 1.0 and 4.3 MeV and
0.05 $\alpha \cdot s^{-1} \cdot g^{-1}$ 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 : 4-SEP-2009 12:35:32
Calibration Source Id : AESS-001

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.226
NP-237	4341	2/28/10	4768.800	4768.853
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
Energy Calibration Zero : 2535.497
Energy Calibration Slope : 5.123575
Energy Calibration Quadratic : 3.5177087E-04
Energy Calibration Range : 8151.000

Instrument : CHAMBER 002
Detector : 78266
Calibration Date/Time : 4-SEP-2009 12:35:41
Calibration Source Id : AESS-002

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3181.913
NP-237	4341	2/28/10	4768.800	4768.018
CM-244	4320A	2/28/10	5795.020	5794.179

Energy/Channel Equation : see above
Energy Calibration Zero : 2471.037
Energy Calibration Slope : 5.125078
Energy Calibration Quadratic : 3.3477767E-04
Energy Calibration Range : 8070.000

Instrument : CHAMBER 003
Detector : 67617
Calibration Date/Time : 4-SEP-2009 12:35:49
Calibration Source Id : AESS-003

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.431
NP-237	4341	2/28/10	4768.800	4767.487
CM-244	4320A	2/28/10	5795.020	5793.671

Energy/Channel Equation : see above
Energy Calibration Zero : 2603.599
Energy Calibration Slope : 5.520661
Energy Calibration Quadratic : 3.8628373E-04
Energy Calibration Range : 8662.000

Instrument : CHAMBER 004
Detector : 64279
Calibration Date/Time : 4-SEP-2009 12:35:56
Calibration Source Id : AESS-004

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.248
NP-237	4341	2/28/10	4768.800	4768.163
CM-244	4320A	2/28/10	5795.020	5794.666

Energy/Channel Equation : see above
Energy Calibration Zero : 2539.883
Energy Calibration Slope : 5.106114
Energy Calibration Quadratic : 3.6220285E-04
Energy Calibration Range : 8148.000

Instrument : CHAMBER 005
Detector : 67612
Calibration Date/Time : 4-SEP-2009 12:36:04
Calibration Source Id : AESS-005

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.596
NP-237	4341	2/28/10	4768.800	4768.626
CM-244	4320A	2/28/10	5795.020	5794.885

Energy/Channel Equation : see above
Energy Calibration Zero : 2389.695
Energy Calibration Slope : 5.003819
Energy Calibration Quadratic : 3.1809139E-04
Energy Calibration Range : 7847.000

Instrument : CHAMBER 006
Detector : 67613
Calibration Date/Time : 4-SEP-2009 12:36:12
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	4768.970
CM-244	4320A	2/28/10	5795.020	5795.230

Energy/Channel Equation : see above
Energy Calibration Zero : 2372.089
Energy Calibration Slope : 4.968963
Energy Calibration Quadratic : 2.9746475E-04
Energy Calibration Range : 7772.000

Instrument : CHAMBER 007
Detector : 67607
Calibration Date/Time : 4-SEP-2009 12:36:20
Calibration Source Id : AESS-007

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3194.223
NP-237	4341	2/28/10	4768.800	4774.131
CM-244	4320A	2/28/10	5795.020	5795.286

Energy/Channel Equation : see above
Energy Calibration Zero : 2411.533
Energy Calibration Slope : 5.136289
Energy Calibration Quadratic : 3.6015504E-04
Energy Calibration Range : 8049.000

Instrument : CHAMBER 008
Detector : 78788
Calibration Date/Time : 4-SEP-2009 12:36:40
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	4768.947
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2374.892
Energy Calibration Slope : 4.958869
Energy Calibration Quadratic : 3.2790817E-04
Energy Calibration Range : 7797.000

Instrument : CHAMBER 009
Detector : 72528
Calibration Date/Time : 4-SEP-2009 12:36:51
Calibration Source Id : AESS-009

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.331
NP-237	4341	2/28/10	4768.800	4768.908
CM-244	4320A	2/28/10	5795.020	5795.229

Energy/Channel Equation : see above
Energy Calibration Zero : 2369.859
Energy Calibration Slope : 4.969983
Energy Calibration Quadratic : 3.0930861E-04
Energy Calibration Range : 7783.000

Instrument : CHAMBER 010
Detector : 72529
Calibration Date/Time : 4-SEP-2009 12:37:00
Calibration Source Id : AESS-010

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.738
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 : 2375.295
Energy Calibration Slope : 4.946028
Energy Calibration Quadratic : 2.9286626E-04
Energy Calibration Range : 7747.000

Instrument : CHAMBER 011
Detector : 72531
Calibration Date/Time : 4-SEP-2009 12:37:27
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	4768.800
CM-244	4320A	2/28/10	5795.020	5795.151

Energy/Channel Equation : see above
Energy Calibration Zero : 2351.281
Energy Calibration Slope : 4.995483
Energy Calibration Quadratic : 3.1063837E-04
Energy Calibration Range : 7792.000

Instrument : CHAMBER 012
Detector : 67594
Calibration Date/Time : 4-SEP-2009 12:37:37
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	4768.665
CM-244	4320A	2/28/10	5795.020	5794.701

Energy/Channel Equation : see above
Energy Calibration Zero : 2380.536
Energy Calibration Slope : 4.954679
Energy Calibration Quadratic : 2.8732172E-04
Energy Calibration Range : 7755.000

Instrument : CHAMBER 013
Detector : 78790
Calibration Date/Time : 4-SEP-2009 12:37:47
Calibration Source Id : AESS-013

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.702
NP-237	4341	2/28/10	4768.800	4769.527
CM-244	4320A	2/28/10	5795.020	5795.398

Energy/Channel Equation : see above
Energy Calibration Zero : 2358.963
Energy Calibration Slope : 4.909760
Energy Calibration Quadratic : 2.9884593E-04
Energy Calibration Range : 7700.000

Instrument : CHAMBER 014
Detector : 67616
Calibration Date/Time : 4-SEP-2009 12:37:57
Calibration Source Id : AESS-014

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.690
NP-237	4341	2/28/10	4768.800	4768.619
CM-244	4320A	2/28/10	5795.020	5794.719

Energy/Channel Equation : see above
Energy Calibration Zero : 2351.225
Energy Calibration Slope : 4.953602
Energy Calibration Quadratic : 3.2283107E-04
Energy Calibration Range : 7762.000

Instrument : CHAMBER 015
Detector : 61581
Calibration Date/Time : 4-SEP-2009 12:38:32
Calibration Source Id : AESS-015

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.566
NP-237	4341	2/28/10	4768.800	4769.887
CM-244	4320A	2/28/10	5795.020	5795.771

Energy/Channel Equation : see above
Energy Calibration Zero : 2340.391
Energy Calibration Slope : 4.902360
Energy Calibration Quadratic : 2.9459049E-04
Energy Calibration Range : 7669.000

Instrument : CHAMBER 016
Detector : 78774
Calibration Date/Time : 4-SEP-2009 12:39:14
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	4768.862
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
Energy Calibration Zero : 2352.881
Energy Calibration Slope : 4.887459
Energy Calibration Quadratic : 3.1538753E-04
Energy Calibration Range : 7688.000

Instrument : CHAMBER 017
Detector : 78791
Calibration Date/Time : 4-SEP-2009 12:39:56
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	4768.864
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
Energy Calibration Zero : 2360.881
Energy Calibration Slope : 4.992493
Energy Calibration Quadratic : 2.7980251E-04
Energy Calibration Range : 7767.000

Instrument : CHAMBER 018
Detector : 78782
Calibration Date/Time : 4-SEP-2009 12:40:11
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	5794.892

Energy/Channel Equation : see above
Energy Calibration Zero : 2354.269
Energy Calibration Slope : 4.957198
Energy Calibration Quadratic : 3.2317592E-04
Energy Calibration Range : 7769.000

Instrument : CHAMBER 019
Detector : 78786
Calibration Date/Time : 4-SEP-2009 12:40:24
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	4768.321
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
Energy Calibration Zero : 2346.765
Energy Calibration Slope : 5.052913
Energy Calibration Quadratic : 2.4091676E-04
Energy Calibration Range : 7774.000

Instrument : CHAMBER 020
Detector : 78787
Calibration Date/Time : 4-SEP-2009 12:40:33
Calibration Source Id : AESS-020

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.527
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 : 2338.013
Energy Calibration Slope : 4.982131
Energy Calibration Quadratic : 2.9908412E-04
Energy Calibration Range : 7753.000

Instrument : CHAMBER 021
Detector : 67047
Calibration Date/Time : 4-SEP-2009 12:40:41
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	4768.801
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2273.506
Energy Calibration Slope : 4.978734
Energy Calibration Quadratic : 2.7200553E-04
Energy Calibration Range : 7657.000

Instrument : CHAMBER 022
Detector : 72530
Calibration Date/Time : 4-SEP-2009 12:40:50
Calibration Source Id : AESS-022

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.361
NP-237	4341	2/28/10	4768.800	4769.133
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
Energy Calibration Zero : 2375.240
Energy Calibration Slope : 4.980961
Energy Calibration Quadratic : 2.7447013E-04
Energy Calibration Range : 7764.000

Instrument : CHAMBER 023
Detector : 78264
Calibration Date/Time : 4-SEP-2009 12:40:59
Calibration Source Id : AESS-023

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.015
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5794.708

Energy/Channel Equation : see above
Energy Calibration Zero : 2381.774
Energy Calibration Slope : 5.002218
Energy Calibration Quadratic : 2.9209474E-04
Energy Calibration Range : 7810.000

Instrument : CHAMBER 024
Detector : 76542
Calibration Date/Time : 4-SEP-2009 12:41:10
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 : 2348.764
Energy Calibration Slope : 4.960187
Energy Calibration Quadratic : 2.8149344E-04
Energy Calibration Range : 7723.000

Instrument : CHAMBER 025
Detector : 45-149AA5
Calibration Date/Time : 5-SEP-2009 13:36:12
Calibration Source Id : AESS-025

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.301
NP-237	4341	2/28/10	4768.800	4769.169
CM-244	4320A	2/28/10	5795.020	5795.134

Energy/Channel Equation : see above
Energy Calibration Zero : 2313.345
Energy Calibration Slope : 4.853284
Energy Calibration Quadratic : 3.0770546E-04
Energy Calibration Range : 7606.000

Instrument : CHAMBER 026
Detector : 78204
Calibration Date/Time : 5-SEP-2009 13:36:22
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	4768.929
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2358.057
Energy Calibration Slope : 4.920322
Energy Calibration Quadratic : 3.5937896E-04
Energy Calibration Range : 7773.000

Instrument : CHAMBER 027
Detector : 42484
Calibration Date/Time : 5-SEP-2009 13:36:31
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	4768.819
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
Energy Calibration Zero : 2363.651
Energy Calibration Slope : 4.963936
Energy Calibration Quadratic : 3.2873321E-04
Energy Calibration Range : 7791.000

Instrument : CHAMBER 028
Detector : 78792
Calibration Date/Time : 5-SEP-2009 13:36:41
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	5795.019

Energy/Channel Equation : see above
Energy Calibration Zero : 2311.599
Energy Calibration Slope : 4.936965
Energy Calibration Quadratic : 3.4681335E-04
Energy Calibration Range : 7731.000

Instrument : CHAMBER 029
Detector : 33454
Calibration Date/Time : 5-SEP-2009 13:36:49
Calibration Source Id : AESS-029

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.046
NP-237	4341	2/28/10	4768.800	4768.273
CM-244	4320A	2/28/10	5795.020	5794.838

Energy/Channel Equation : see above
Energy Calibration Zero : 2346.906
Energy Calibration Slope : 4.889407
Energy Calibration Quadratic : 2.9813289E-04
Energy Calibration Range : 7666.000

Instrument : CHAMBER 030
Detector : 33447
Calibration Date/Time : 5-SEP-2009 13:36:58
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	4768.799
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
Energy Calibration Zero : 2376.621
Energy Calibration Slope : 4.959564
Energy Calibration Quadratic : 3.0966211E-04
Energy Calibration Range : 7780.000

Instrument : CHAMBER 031
Detector : 67042
Calibration Date/Time : 5-SEP-2009 13:37:09
Calibration Source Id : AESS-031

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.344
NP-237	4341	2/28/10	4768.800	4769.750
CM-244	4320A	2/28/10	5795.020	5795.848

Energy/Channel Equation : see above
Energy Calibration Zero : 2358.347
Energy Calibration Slope : 4.922678
Energy Calibration Quadratic : 3.3807335E-04
Energy Calibration Range : 7754.000

Instrument : CHAMBER 032
Detector : 67041
Calibration Date/Time : 5-SEP-2009 13:37:21
Calibration Source Id : AESS-032

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3082.708
NP-237	4341	2/28/10	4768.800	4596.952
CM-244	4320A	2/28/10	5795.020	5590.557

Energy/Channel Equation : see above
Energy Calibration Zero : 2480.957
Energy Calibration Slope : 5.431309
Energy Calibration Quadratic :
Energy Calibration Range : 8043.000

Instrument : CHAMBER 033
Detector : 78785
Calibration Date/Time : 5-SEP-2009 13:37:30
Calibration Source Id : AESS-033

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.293
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 : 2371.628
Energy Calibration Slope : 4.957000
Energy Calibration Quadratic : 3.2105893E-04
Energy Calibration Range : 7784.000

Instrument : CHAMBER 034
Detector : 61586
Calibration Date/Time : 5-SEP-2009 13:37:40
Calibration Source Id : AESS-034

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3048.128
NP-237	4341	2/28/10	4768.800	4505.317
CM-244	4320A	2/28/10	5795.020	5654.358

Energy/Channel Equation : see above
Energy Calibration Zero : 2505.085
Energy Calibration Slope : 5.306273
Energy Calibration Quadratic :
Energy Calibration Range : 7939.000

Instrument : CHAMBER 035
Detector : 78202
Calibration Date/Time : 5-SEP-2009 13:37:51
Calibration Source Id : AESS-035

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.195
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 : 2331.502
Energy Calibration Slope : 4.956956
Energy Calibration Quadratic : 3.3284936E-04
Energy Calibration Range : 7756.000

Instrument : CHAMBER 036
Detector : 78203
Calibration Date/Time : 5-SEP-2009 13:38:00
Calibration Source Id : AESS-036

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.261
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5795.112

Energy/Channel Equation : see above
Energy Calibration Zero : 2349.949
Energy Calibration Slope : 4.931112
Energy Calibration Quadratic : 3.3396695E-04
Energy Calibration Range : 7750.000

Instrument : CHAMBER 037
Detector : 45-149BB5
Calibration Date/Time : 5-SEP-2009 13:38:11
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	4769.328
CM-244	4320A	2/28/10	5795.020	5795.274

Energy/Channel Equation : see above
Energy Calibration Zero : 2377.698
Energy Calibration Slope : 4.936130
Energy Calibration Quadratic : 2.6397177E-04
Energy Calibration Range : 7709.000

Instrument : CHAMBER 038
Detector : 72532
Calibration Date/Time : 5-SEP-2009 13:38:20
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	4768.800
CM-244	4320A	2/28/10	5795.020	5795.173

Energy/Channel Equation : see above
Energy Calibration Zero : 2373.418
Energy Calibration Slope : 4.945736
Energy Calibration Quadratic : 3.1779311E-04
Energy Calibration Range : 7771.000

Instrument : CHAMBER 039
Detector : 45-149BB2
Calibration Date/Time : 5-SEP-2009 13:38:28
Calibration Source Id : AESS-039

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.413
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 : 2383.597
Energy Calibration Slope : 4.901721
Energy Calibration Quadratic : 3.2673960E-04
Energy Calibration Range : 7746.000

Instrument : CHAMBER 040
Detector : 78773
Calibration Date/Time : 5-SEP-2009 13:38:36
Calibration Source Id : AESS-040

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.203
NP-237	4341	2/28/10	4768.800	4768.877
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
Energy Calibration Zero : 2349.601
Energy Calibration Slope : 4.890684
Energy Calibration Quadratic : 3.3607692E-04
Energy Calibration Range : 7710.000

Instrument : CHAMBER 041
Detector : 78205
Calibration Date/Time : 5-SEP-2009 13:38:44
Calibration Source Id : AESS-041

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.316
NP-237	4341	2/28/10	4768.800	4768.914
CM-244	4320A	2/28/10	5795.020	5795.124

Energy/Channel Equation : see above
Energy Calibration Zero : 2359.603
Energy Calibration Slope : 4.927306
Energy Calibration Quadratic : 3.6796945E-04
Energy Calibration Range : 7791.000

Instrument : CHAMBER 042
Detector : 78793
Calibration Date/Time : 5-SEP-2009 13:38:52
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	4768.945
CM-244	4320A	2/28/10	5795.020	5795.068

Energy/Channel Equation : see above
Energy Calibration Zero : 2375.562
Energy Calibration Slope : 4.905127
Energy Calibration Quadratic : 3.3096116E-04
Energy Calibration Range : 7745.000

Instrument : CHAMBER 043
Detector : 76543
Calibration Date/Time : 5-SEP-2009 13:38:59
Calibration Source Id : AESS-043

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.008
NP-237	4341	2/28/10	4768.800	4768.799
CM-244	4320A	2/28/10	5795.020	5795.285

Energy/Channel Equation : see above
Energy Calibration Zero : 2370.828
Energy Calibration Slope : 4.912446
Energy Calibration Quadratic : 3.4794814E-04
Energy Calibration Range : 7766.000

Instrument : CHAMBER 044
Detector : 79459
Calibration Date/Time : 5-SEP-2009 13:39:07
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	4768.899
CM-244	4320A	2/28/10	5795.020	5795.019

Energy/Channel Equation : see above
Energy Calibration Zero : 2357.678
Energy Calibration Slope : 4.935909
Energy Calibration Quadratic : 3.3428424E-04
Energy Calibration Range : 7763.000

Instrument : CHAMBER 045
Detector : 78783
Calibration Date/Time : 5-SEP-2009 13:39:15
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	4768.800
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2362.021
Energy Calibration Slope : 4.936533
Energy Calibration Quadratic : 3.2874785E-04
Energy Calibration Range : 7762.000

Instrument : CHAMBER 046
Detector : 76544
Calibration Date/Time : 5-SEP-2009 13:39:23
Calibration Source Id : AESS-046

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.265
NP-237	4341	2/28/10	4768.800	4768.973
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2361.969
Energy Calibration Slope : 4.880176
Energy Calibration Quadratic : 3.5064379E-04
Energy Calibration Range : 7727.000

Instrument : CHAMBER 047
Detector : 46-089B1
Calibration Date/Time : 5-SEP-2009 13:39:31
Calibration Source Id : AESS-047

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.348
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 : 2352.118
Energy Calibration Slope : 4.961685
Energy Calibration Quadratic : 3.1629670E-04
Energy Calibration Range : 7765.000

Instrument : CHAMBER 048
Detector : 42483
Calibration Date/Time : 5-SEP-2009 13:39:40
Calibration Source Id : AESS-048

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.138
NP-237	4341	2/28/10	4768.800	4768.944
CM-244	4320A	2/28/10	5795.020	5795.069

Energy/Channel Equation : see above
Energy Calibration Zero : 2374.542
Energy Calibration Slope : 4.945658
Energy Calibration Quadratic : 2.9861915E-04
Energy Calibration Range : 7752.000

Instrument : CHAMBER 065
Detector : 68551
Calibration Date/Time : 10-SEP-2009 15:04:30
Calibration Source Id : AESS-001

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.073
NP-237	4341	2/28/10	4768.800	4768.577
CM-244	4320A	2/28/10	5795.020	5794.580

Energy/Channel Equation : see above
Energy Calibration Zero : 2383.800
Energy Calibration Slope : 4.899660
Energy Calibration Quadratic : 3.5114386E-04
Energy Calibration Range : 7769.000

Instrument : CHAMBER 066
Detector : 46-089C1
Calibration Date/Time : 10-SEP-2009 15:10:17
Calibration Source Id : AESS-002

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.283
NP-237	4341	2/28/10	4768.800	4768.430
CM-244	4320A	2/28/10	5795.020	5794.649

Energy/Channel Equation : see above
Energy Calibration Zero : 2375.698
Energy Calibration Slope : 4.989659
Energy Calibration Quadratic : 2.8016025E-04
Energy Calibration Range : 7779.000

Instrument : CHAMBER 067
Detector : 46-089B4
Calibration Date/Time : 10-SEP-2009 15:10:36
Calibration Source Id : AESS-003

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.598
NP-237	4341	2/28/10	4768.800	4768.347
CM-244	4320A	2/28/10	5795.020	5794.829

Energy/Channel Equation : see above
Energy Calibration Zero : 2400.727
Energy Calibration Slope : 4.962031
Energy Calibration Quadratic : 2.9563357E-04
Energy Calibration Range : 7792.000

Instrument : CHAMBER 068
Detector : 78794
Calibration Date/Time : 10-SEP-2009 15:10:50
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	4768.527
CM-244	4320A	2/28/10	5795.020	5794.924

Energy/Channel Equation : see above
Energy Calibration Zero : 2364.846
Energy Calibration Slope : 4.977042
Energy Calibration Quadratic : 3.0877045E-04
Energy Calibration Range : 7785.000

Instrument : CHAMBER 069
Detector : 78795
Calibration Date/Time : 10-SEP-2009 15:11:01
Calibration Source Id : AESS-005

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.644
NP-237	4341	2/28/10	4768.800	4768.741
CM-244	4320A	2/28/10	5795.020	5794.891

Energy/Channel Equation : see above
Energy Calibration Zero : 2374.492
Energy Calibration Slope : 4.948631
Energy Calibration Quadratic : 3.2262344E-04
Energy Calibration Range : 7780.000

Instrument : CHAMBER 070
Detector : 46-089B2
Calibration Date/Time : 10-SEP-2009 15:11:09
Calibration Source Id : AESS-006

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.486
NP-237	4341	2/28/10	4768.800	4768.275
CM-244	4320A	2/28/10	5795.020	5794.764

Energy/Channel Equation : see above
Energy Calibration Zero : 2390.844
Energy Calibration Slope : 4.930166
Energy Calibration Quadratic : 3.1462612E-04
Energy Calibration Range : 7769.000

Instrument : CHAMBER 071
Detector : 64259
Calibration Date/Time : 10-SEP-2009 11:52:27
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	4768.801
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2376.047
Energy Calibration Slope : 4.992121
Energy Calibration Quadratic : 2.8609094E-04
Energy Calibration Range : 7788.000

Instrument : CHAMBER 072
Detector : 45-149AA3
Calibration Date/Time : 10-SEP-2009 11:52:37
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	4768.801
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2365.249
Energy Calibration Slope : 4.946693
Energy Calibration Quadratic : 3.0473375E-04
Energy Calibration Range : 7750.000

Instrument : CHAMBER 073
Detector : 78775
Calibration Date/Time : 10-SEP-2009 11:52:45
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	4768.994
CM-244	4320A	2/28/10	5795.020	5795.212

Energy/Channel Equation : see above
Energy Calibration Zero : 2337.191
Energy Calibration Slope : 4.930847
Energy Calibration Quadratic : 3.1032809E-04
Energy Calibration Range : 7712.000

Instrument : CHAMBER 074
Detector : 78266
Calibration Date/Time : 10-SEP-2009 11:52:53
Calibration Source Id : AESS-010

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.297
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 : 2347.677
Energy Calibration Slope : 4.994187
Energy Calibration Quadratic : 2.9070242E-04
Energy Calibration Range : 7767.000

Instrument : CHAMBER 075
Detector : 68550
Calibration Date/Time : 10-SEP-2009 11:53:01
Calibration Source Id : AESS-011

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.614
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 : 2361.927
Energy Calibration Slope : 4.947097
Energy Calibration Quadratic : 3.2553895E-04
Energy Calibration Range : 7769.000

Instrument : CHAMBER 076
Detector : 78779
Calibration Date/Time : 10-SEP-2009 11:54:17
Calibration Source Id : AESS-012

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.273
NP-237	4341	2/28/10	4768.800	4769.246
CM-244	4320A	2/28/10	5795.020	5795.156

Energy/Channel Equation : see above
Energy Calibration Zero : 2348.219
Energy Calibration Slope : 4.941242
Energy Calibration Quadratic : 3.2608485E-04
Energy Calibration Range : 7750.000

Instrument : CHAMBER 077
Detector : 67576
Calibration Date/Time : 9-SEP-2009 14:24:36
Calibration Source Id : AESS-013

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.586
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 : 2365.540
Energy Calibration Slope : 4.940758
Energy Calibration Quadratic : 2.9910897E-04
Energy Calibration Range : 7739.000

Instrument : CHAMBER 078
Detector : 67577
Calibration Date/Time : 9-SEP-2009 14:24:46
Calibration Source Id : AESS-014

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.776
NP-237	4341	2/28/10	4768.800	4770.902
CM-244	4320A	2/28/10	5795.020	5796.737

Energy/Channel Equation : see above
Energy Calibration Zero : 2400.171
Energy Calibration Slope : 4.950543
Energy Calibration Quadratic : 3.2390543E-04
Energy Calibration Range : 7809.000

Instrument : CHAMBER 079
Detector : 67598
Calibration Date/Time : 9-SEP-2009 14:25:09
Calibration Source Id : AESS-015

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3180.320
NP-237	4341	2/28/10	4768.800	4761.978
CM-244	4320A	2/28/10	5795.020	5776.398

Energy/Channel Equation : see above
Energy Calibration Zero : 2390.911
Energy Calibration Slope : 5.011374
Energy Calibration Quadratic : 2.7555224E-04
Energy Calibration Range : 7811.000

Instrument : CHAMBER 080
Detector : 78197
Calibration Date/Time : 9-SEP-2009 14:25:19
Calibration Source Id : AESS-016

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.420
NP-237	4341	2/28/10	4768.800	4768.374
CM-244	4320A	2/28/10	5795.020	5794.640

Energy/Channel Equation : see above
Energy Calibration Zero : 2357.814
Energy Calibration Slope : 5.017712
Energy Calibration Quadratic : 2.8129964E-04
Energy Calibration Range : 7791.000

Instrument : CHAMBER 081
Detector : 72533
Calibration Date/Time : 9-SEP-2009 14:25:34
Calibration Source Id : AESS-017

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3181.871
NP-237	4341	2/28/10	4768.800	4695.089
CM-244	4320A	2/28/10	5795.020	5736.250

Energy/Channel Equation : see above
Energy Calibration Zero : 2241.359
Energy Calibration Slope : 9.062563
Energy Calibration Quadratic : -3.5732647E-03
Energy Calibration Range : 7775.000

Instrument : CHAMBER 082
Detector : 64263
Calibration Date/Time : 9-SEP-2009 14:25:44
Calibration Source Id : AESS-018

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.636
NP-237	4341	2/28/10	4768.800	4767.951
CM-244	4320A	2/28/10	5795.020	5793.988

Energy/Channel Equation : see above
Energy Calibration Zero : 2395.243
Energy Calibration Slope : 4.989262
Energy Calibration Quadratic : 3.2476569E-04
Energy Calibration Range : 7845.000

Instrument : CHAMBER 083
Detector : 64278
Calibration Date/Time : 9-SEP-2009 14:25:54
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	4768.177
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2373.941
Energy Calibration Slope : 5.037010
Energy Calibration Quadratic : 2.4928377E-04
Energy Calibration Range : 7793.000

Instrument : CHAMBER 084
Detector : 78265
Calibration Date/Time : 9-SEP-2009 14:26:03
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	4768.800
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
Energy Calibration Zero : 2362.060
Energy Calibration Slope : 5.027309
Energy Calibration Quadratic : 2.6733367E-04
Energy Calibration Range : 7790.000

Instrument : CHAMBER 085
Detector : 78776
Calibration Date/Time : 9-SEP-2009 14:26:12
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 : 2364.723
Energy Calibration Slope : 5.005558
Energy Calibration Quadratic : 2.7239005E-04
Energy Calibration Range : 7776.000

Instrument : CHAMBER 086
Detector : 78198
Calibration Date/Time : 9-SEP-2009 14:26:20
Calibration Source Id : AESS-022

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.488
NP-237	4341	2/28/10	4768.800	4769.725
CM-244	4320A	2/28/10	5795.020	5795.349

Energy/Channel Equation : see above
Energy Calibration Zero : 2355.530
Energy Calibration Slope : 5.002363
Energy Calibration Quadratic : 2.4857160E-04
Energy Calibration Range : 7739.000

Instrument : CHAMBER 087
Detector : 78199
Calibration Date/Time : 9-SEP-2009 14:26:29
Calibration Source Id : AESS-023

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.441
NP-237	4341	2/28/10	4768.800	4769.107
CM-244	4320A	2/28/10	5795.020	5795.313

Energy/Channel Equation : see above
Energy Calibration Zero : 2342.304
Energy Calibration Slope : 4.966381
Energy Calibration Quadratic : 2.5458023E-04
Energy Calibration Range : 7695.000

Instrument : CHAMBER 088
Detector : 33452
Calibration Date/Time : 9-SEP-2009 14:26:37
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 : 2351.972
Energy Calibration Slope : 4.962395
Energy Calibration Quadratic : 2.3138702E-04
Energy Calibration Range : 7676.000

Instrument : CHAMBER 089
Detector : 78262
Calibration Date/Time : 9-SEP-2009 14:26:46
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	4768.799
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2361.780
Energy Calibration Slope : 4.988051
Energy Calibration Quadratic : 3.2016891E-04
Energy Calibration Range : 7805.000

Instrument : CHAMBER 090
Detector : 78263
Calibration Date/Time : 9-SEP-2009 14:26:55
Calibration Source Id : AESS-026

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.786
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 : 2369.189
Energy Calibration Slope : 4.910583
Energy Calibration Quadratic : 3.3626173E-04
Energy Calibration Range : 7750.000

Instrument : CHAMBER 091
Detector : 78259
Calibration Date/Time : 9-SEP-2009 14:27:04
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 : 2372.086
Energy Calibration Slope : 4.976717
Energy Calibration Quadratic : 3.2079496E-04
Energy Calibration Range : 7805.000

Instrument : CHAMBER 092
Detector : 79457
Calibration Date/Time : 9-SEP-2009 14:27:12
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	4768.777
CM-244	4320A	2/28/10	5795.020	5794.923

Energy/Channel Equation : see above
Energy Calibration Zero : 2353.868
Energy Calibration Slope : 4.924122
Energy Calibration Quadratic : 3.2251322E-04
Energy Calibration Range : 7734.000

Instrument : CHAMBER 093
Detector : 33206
Calibration Date/Time : 9-SEP-2009 14:27:22
Calibration Source Id : AESS-029

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.249
NP-237	4341	2/28/10	4768.800	4768.968
CM-244	4320A	2/28/10	5795.020	5795.159

Energy/Channel Equation : see above
Energy Calibration Zero : 2372.322
Energy Calibration Slope : 4.913898
Energy Calibration Quadratic : 3.2920585E-04
Energy Calibration Range : 7749.000

Instrument : CHAMBER 094
Detector : 78267
Calibration Date/Time : 9-SEP-2009 14:27:30
Calibration Source Id : AESS-030

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.321
NP-237	4341	2/28/10	4768.800	4768.963
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2364.784
Energy Calibration Slope : 4.940577
Energy Calibration Quadratic : 3.1028298E-04
Energy Calibration Range : 7749.000

Instrument : CHAMBER 095
Detector : 64279
Calibration Date/Time : 9-SEP-2009 14:27:38
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	4768.571
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
Energy Calibration Zero : 2357.875
Energy Calibration Slope : 4.949866
Energy Calibration Quadratic : 3.0133256E-04
Energy Calibration Range : 7743.000

Instrument : CHAMBER 096
Detector : 67605
Calibration Date/Time : 9-SEP-2009 14:27:47
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	4768.717
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
Energy Calibration Zero : 2354.901
Energy Calibration Slope : 4.924323
Energy Calibration Quadratic : 3.5411670E-04
Energy Calibration Range : 7769.000

Instrument : CHAMBER 097
Detector : 67599
Calibration Date/Time : 9-SEP-2009 14:27:55
Calibration Source Id : AESS-033

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.643
NP-237	4341	2/28/10	4768.800	4768.475
CM-244	4320A	2/28/10	5795.020	5795.003

Energy/Channel Equation : see above
Energy Calibration Zero : 2369.802
Energy Calibration Slope : 4.943386
Energy Calibration Quadratic : 3.3847254E-04
Energy Calibration Range : 7787.000

Instrument : CHAMBER 098
Detector : 68644
Calibration Date/Time : 9-SEP-2009 14:28:04
Calibration Source Id : AESS-034

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.815
NP-237	4341	2/28/10	4768.800	4768.749
CM-244	4320A	2/28/10	5795.020	5794.866

Energy/Channel Equation : see above
Energy Calibration Zero : 2387.741
Energy Calibration Slope : 4.973858
Energy Calibration Quadratic : 3.2656032E-04
Energy Calibration Range : 7823.000

Instrument : CHAMBER 099
Detector : 70317
Calibration Date/Time : 9-SEP-2009 14:28:14
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	4768.694
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
Energy Calibration Zero : 2371.501
Energy Calibration Slope : 4.902037
Energy Calibration Quadratic : 3.4626262E-04
Energy Calibration Range : 7754.000

Instrument : CHAMBER 100
Detector : 79456
Calibration Date/Time : 9-SEP-2009 14:28:23
Calibration Source Id : AESS-046

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.712
NP-237	4341	2/28/10	4768.800	4768.612
CM-244	4320A	2/28/10	5795.020	5794.822

Energy/Channel Equation : see above
Energy Calibration Zero : 2353.407
Energy Calibration Slope : 4.911796
Energy Calibration Quadratic : 3.3084911E-04
Energy Calibration Range : 7730.000

Instrument : CHAMBER 101
Detector : 64253
Calibration Date/Time : 9-SEP-2009 14:28:33
Calibration Source Id : AESS-037

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.576
NP-237	4341	2/28/10	4768.800	4768.407
CM-244	4320A	2/28/10	5795.020	5794.465

Energy/Channel Equation : see above
Energy Calibration Zero : 2416.719
Energy Calibration Slope : 4.931056
Energy Calibration Quadratic : 3.4281739E-04
Energy Calibration Range : 7826.000

Instrument : CHAMBER 102
Detector : 72525
Calibration Date/Time : 9-SEP-2009 14:28:41
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	4768.861
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
Energy Calibration Zero : 2364.512
Energy Calibration Slope : 4.874489
Energy Calibration Quadratic : 3.3478835E-04
Energy Calibration Range : 7707.000

Instrument : CHAMBER 103
Detector : 79461
Calibration Date/Time : 9-SEP-2009 14:28:50
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	4768.799
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
Energy Calibration Zero : 2389.015
Energy Calibration Slope : 4.922173
Energy Calibration Quadratic : 3.3696479E-04
Energy Calibration Range : 7783.000

Instrument : CHAMBER 104
Detector : 72524
Calibration Date/Time : 9-SEP-2009 14:28:59
Calibration Source Id : AESS-040

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.839
NP-237	4341	2/28/10	4768.800	4768.720
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
Energy Calibration Zero : 2361.914
Energy Calibration Slope : 4.883392
Energy Calibration Quadratic : 3.4849218E-04
Energy Calibration Range : 7728.000

Instrument : CHAMBER 105
Detector : 78777
Calibration Date/Time : 10-SEP-2009 13:05:54
Calibration Source Id : AESS-041

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.290
NP-237	4341	2/28/10	4768.800	4769.099
CM-244	4320A	2/28/10	5795.020	5795.203

Energy/Channel Equation : see above
Energy Calibration Zero : 2371.469
Energy Calibration Slope : 4.894183
Energy Calibration Quadratic : 3.2872061E-04
Energy Calibration Range : 7728.000

Instrument : CHAMBER 106
Detector : 64274
Calibration Date/Time : 9-SEP-2009 14:29:53
Calibration Source Id : AESS-042

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.543
NP-237	4341	2/28/10	4768.800	4769.107
CM-244	4320A	2/28/10	5795.020	5795.161

Energy/Channel Equation : see above
Energy Calibration Zero : 2386.643
Energy Calibration Slope : 4.909638
Energy Calibration Quadratic : 3.7089069E-04
Energy Calibration Range : 7803.000

Instrument : CHAMBER 107
Detector : 67578
Calibration Date/Time : 9-SEP-2009 14:30:02
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	5795.094

Energy/Channel Equation : see above
Energy Calibration Zero : 2367.437
Energy Calibration Slope : 4.969880
Energy Calibration Quadratic : 3.2337336E-04
Energy Calibration Range : 7796.000

Instrument : CHAMBER 108
Detector : 78778
Calibration Date/Time : 9-SEP-2009 14:30:11
Calibration Source Id : AESS-044

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.197
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 : 2361.148
Energy Calibration Slope : 4.886508
Energy Calibration Quadratic : 3.4449942E-04
Energy Calibration Range : 7726.000

Instrument : CHAMBER 109
Detector : 79463
Calibration Date/Time : 9-SEP-2009 14:30:20
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	4768.819
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
Energy Calibration Zero : 2363.478
Energy Calibration Slope : 4.886961
Energy Calibration Quadratic : 3.7578429E-04
Energy Calibration Range : 7762.000

Instrument : CHAMBER 110
Detector : 67602
Calibration Date/Time : 9-SEP-2009 14:30:29
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	4768.799
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
Energy Calibration Zero : 2455.144
Energy Calibration Slope : 5.068584
Energy Calibration Quadratic : 3.6489649E-04
Energy Calibration Range : 8028.000

Instrument : CHAMBER 111
Detector : 79462
Calibration Date/Time : 9-SEP-2009 14:30:39
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	4768.801
CM-244	4320A	2/28/10	5795.020	5795.019

Energy/Channel Equation : see above
Energy Calibration Zero : 2364.093
Energy Calibration Slope : 4.964253
Energy Calibration Quadratic : 3.3889871E-04
Energy Calibration Range : 7803.000

Instrument : CHAMBER 112
Detector : 78261
Calibration Date/Time : 9-SEP-2009 14:30:47
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 : 2374.713
Energy Calibration Slope : 4.915321
Energy Calibration Quadratic : 3.3604659E-04
Energy Calibration Range : 7760.000

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 : 24-AUG-2009 14:06:47
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 : 2374.961
Energy Calibration Slope : 4.910189
Energy Calibration Quadratic : 3.2356248E-04
Energy Calibration Range : 7742.000

Instrument : CHAMBER 162
Detector : 70323
Calibration Date/Time : 24-AUG-2009 14:06:56
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 : 2369.767
Energy Calibration Slope : 4.933752
Energy Calibration Quadratic : 2.9582490E-04
Energy Calibration Range : 7732.000

Instrument : CHAMBER 163
Detector : 70324
Calibration Date/Time : 24-AUG-2009 14:07:06
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	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2380.833
Energy Calibration Slope : 4.951450
Energy Calibration Quadratic : 2.9602056E-04
Energy Calibration Range : 7762.000

Instrument : CHAMBER 164
Detector : 70325
Calibration Date/Time : 24-AUG-2009 14:07:20
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	4768.801
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2382.319
Energy Calibration Slope : 4.937610
Energy Calibration Quadratic : 3.1754762E-04
Energy Calibration Range : 7771.000

Instrument : CHAMBER 165
Detector : 72544
Calibration Date/Time : 24-AUG-2009 14:07:34
Calibration Source Id : AESS-003

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
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 : 2383.801
Energy Calibration Slope : 4.978922
Energy Calibration Quadratic : 2.7212233E-04
Energy Calibration Range : 7768.000

Instrument : CHAMBER 166
Detector : 74545
Calibration Date/Time : 24-AUG-2009 14:07:42
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	5795.021

Energy/Channel Equation : see above
Energy Calibration Zero : 2376.102
Energy Calibration Slope : 4.917744
Energy Calibration Quadratic : 3.4292034E-04
Energy Calibration Range : 7771.000

Instrument : CHAMBER 167
Detector : 72546
Calibration Date/Time : 24-AUG-2009 14:07:51
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	4768.800
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2378.657
Energy Calibration Slope : 4.932514
Energy Calibration Quadratic : 3.1670861E-04
Energy Calibration Range : 7762.000

Instrument : CHAMBER 168
Detector : 72547
Calibration Date/Time : 24-AUG-2009 14:07:59
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 : 2383.249
Energy Calibration Slope : 4.927288
Energy Calibration Quadratic : 3.2642024E-04
Energy Calibration Range : 7771.000

Instrument : CHAMBER 169
Detector : 72548
Calibration Date/Time : 24-AUG-2009 14:08:11
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	4768.799
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
Energy Calibration Zero : 2381.642
Energy Calibration Slope : 4.923596
Energy Calibration Quadratic : 3.2521432E-04
Energy Calibration Range : 7764.000

Instrument : CHAMBER 170
Detector : 72549
Calibration Date/Time : 24-AUG-2009 14:08:20
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	4768.492
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
Energy Calibration Zero : 2382.004
Energy Calibration Slope : 4.926051
Energy Calibration Quadratic : 3.3877406E-04
Energy Calibration Range : 7782.000

Instrument : CHAMBER 171
Detector : 78260
Calibration Date/Time : 24-AUG-2009 14:08:29
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	4769.426
CM-244	4320A	2/28/10	5795.020	5795.289

Energy/Channel Equation : see above
Energy Calibration Zero : 2366.691
Energy Calibration Slope : 4.935659
Energy Calibration Quadratic : 3.0618926E-04
Energy Calibration Range : 7742.000

Instrument : CHAMBER 172
Detector : 78772
Calibration Date/Time : 24-AUG-2009 14:08:40
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	4768.798
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
Energy Calibration Zero : 2367.995
Energy Calibration Slope : 4.907234
Energy Calibration Quadratic : 3.5045875E-04
Energy Calibration Range : 7760.000

Instrument : CHAMBER 173
Detector : 74431
Calibration Date/Time : 24-AUG-2009 14:08:49
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	4768.801
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2364.808
Energy Calibration Slope : 4.998088
Energy Calibration Quadratic : 2.5220143E-04
Energy Calibration Range : 7747.000

Instrument : CHAMBER 174
Detector : 74432
Calibration Date/Time : 24-AUG-2009 14:08:58
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	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2359.695
Energy Calibration Slope : 5.048626
Energy Calibration Quadratic : 1.8959134E-04
Energy Calibration Range : 7728.000

Instrument : CHAMBER 175
Detector : 74433
Calibration Date/Time : 24-AUG-2009 14:09:06
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	4768.801
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2365.396
Energy Calibration Slope : 4.978646
Energy Calibration Quadratic : 2.7462494E-04
Energy Calibration Range : 7751.000

Instrument : CHAMBER 176
Detector : 74434
Calibration Date/Time : 24-AUG-2009 14:09:15
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	4768.800
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2362.332
Energy Calibration Slope : 5.014320
Energy Calibration Quadratic : 2.4356594E-04
Energy Calibration Range : 7752.000

Instrument : CHAMBER 177
Detector : 74435
Calibration Date/Time : 24-AUG-2009 14:09:24
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	4768.800
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2364.740
Energy Calibration Slope : 4.964604
Energy Calibration Quadratic : 2.9061688E-04
Energy Calibration Range : 7753.000

Instrument : CHAMBER 178
Detector : 74436
Calibration Date/Time : 24-AUG-2009 14:09:35
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	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2358.420
Energy Calibration Slope : 4.990875
Energy Calibration Quadratic : 2.6006214E-04
Energy Calibration Range : 7742.000

Instrument : CHAMBER 179
Detector : 74437
Calibration Date/Time : 24-AUG-2009 14:09:44
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	4768.800
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2360.365
Energy Calibration Slope : 4.967896
Energy Calibration Quadratic : 2.8685154E-04
Energy Calibration Range : 7748.000

Instrument : CHAMBER 180
Detector : 74438
Calibration Date/Time : 24-AUG-2009 14:09:54
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 : 2358.338
Energy Calibration Slope : 5.025792
Energy Calibration Quadratic : 2.1654682E-04
Energy Calibration Range : 7732.000

Instrument : CHAMBER 181
Detector : 74439
Calibration Date/Time : 24-AUG-2009 14:10:03
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	4768.697
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2362.787
Energy Calibration Slope : 4.972206
Energy Calibration Quadratic : 2.7814286E-04
Energy Calibration Range : 7746.000

Instrument : CHAMBER 182
Detector : 74440
Calibration Date/Time : 24-AUG-2009 14:10:14
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	4768.799
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
Energy Calibration Zero : 2353.051
Energy Calibration Slope : 4.986979
Energy Calibration Quadratic : 2.5764259E-04
Energy Calibration Range : 7730.000

Instrument : CHAMBER 183
Detector : 74441
Calibration Date/Time : 24-AUG-2009 14:10:29
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	4768.799
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
Energy Calibration Zero : 2362.208
Energy Calibration Slope : 4.980685
Energy Calibration Quadratic : 2.7016739E-04
Energy Calibration Range : 7746.000

Instrument : CHAMBER 184
Detector : 74442
Calibration Date/Time : 24-AUG-2009 14:10:41
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 : 2359.055
Energy Calibration Slope : 5.010284
Energy Calibration Quadratic : 2.3703104E-04
Energy Calibration Range : 7738.000

Instrument : CHAMBER 185
Detector : 68615
Calibration Date/Time : 24-AUG-2009 14:10:54
Calibration Source Id : AESS-025

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.699
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2361.733
Energy Calibration Slope : 4.933492
Energy Calibration Quadratic : 2.8617174E-04
Energy Calibration Range : 7714.000

Instrument : CHAMBER 186
Detector : 68616
Calibration Date/Time : 24-AUG-2009 14:11:06
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	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2365.753
Energy Calibration Slope : 4.935731
Energy Calibration Quadratic : 2.9755512E-04
Energy Calibration Range : 7732.000

Instrument : CHAMBER 187
Detector : 68620
Calibration Date/Time : 24-AUG-2009 14:11:16
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	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2376.047
Energy Calibration Slope : 4.966012
Energy Calibration Quadratic : 3.0612116E-04
Energy Calibration Range : 7782.000

Instrument : CHAMBER 188
Detector : 68621
Calibration Date/Time : 24-AUG-2009 14:11:25
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 : 2368.519
Energy Calibration Slope : 4.967674
Energy Calibration Quadratic : 2.9094989E-04
Energy Calibration Range : 7761.000

Instrument : CHAMBER 189
Detector : 68622
Calibration Date/Time : 24-AUG-2009 14:11:34
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 : 2363.805
Energy Calibration Slope : 4.932057
Energy Calibration Quadratic : 3.0281782E-04
Energy Calibration Range : 7732.000

Instrument : CHAMBER 190
Detector : 68623
Calibration Date/Time : 24-AUG-2009 14:11:43
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	4768.799
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
Energy Calibration Zero : 2358.846
Energy Calibration Slope : 4.945598
Energy Calibration Quadratic : 2.9230170E-04
Energy Calibration Range : 7730.000

Instrument : CHAMBER 191
Detector : 68624
Calibration Date/Time : 24-AUG-2009 14:11:54
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	4768.800
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2370.757
Energy Calibration Slope : 4.964250
Energy Calibration Quadratic : 3.1056980E-04
Energy Calibration Range : 7780.000

Instrument : CHAMBER 192
Detector : 74430
Calibration Date/Time : 24-AUG-2009 14:12:04
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	4768.800
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
Energy Calibration Zero : 2365.552
Energy Calibration Slope : 4.984001
Energy Calibration Quadratic : 2.9122332E-04
Energy Calibration Range : 7775.000

Instrument : CHAMBER 193
Detector : 68627
Calibration Date/Time : 24-AUG-2009 14:12:15
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	5795.021

Energy/Channel Equation : see above
Energy Calibration Zero : 2364.432
Energy Calibration Slope : 4.926356
Energy Calibration Quadratic : 3.1079396E-04
Energy Calibration Range : 7735.000

Instrument : CHAMBER 194
Detector : 68635
Calibration Date/Time : 24-AUG-2009 14:12:24
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 : 2361.972
Energy Calibration Slope : 4.949121
Energy Calibration Quadratic : 2.8917161E-04
Energy Calibration Range : 7733.000

Instrument : CHAMBER 195
Detector : 68636
Calibration Date/Time : 24-AUG-2009 14:12:38
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	4768.802
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2361.575
Energy Calibration Slope : 4.972611
Energy Calibration Quadratic : 2.6226370E-04
Energy Calibration Range : 7729.000

Instrument : CHAMBER 196
Detector : 68637
Calibration Date/Time : 24-AUG-2009 14:12:49
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	4768.799
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
Energy Calibration Zero : 2364.691
Energy Calibration Slope : 4.926461
Energy Calibration Quadratic : 3.1398068E-04
Energy Calibration Range : 7739.000

Instrument : CHAMBER 197
Detector : 78894
Calibration Date/Time : 24-AUG-2009 14:12:58
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	4768.801
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2371.940
Energy Calibration Slope : 4.962372
Energy Calibration Quadratic : 3.0214558E-04
Energy Calibration Range : 7770.000

Instrument : CHAMBER 198
Detector : 78895
Calibration Date/Time : 24-AUG-2009 14:13:11
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	4768.801
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2366.058
Energy Calibration Slope : 4.966545
Energy Calibration Quadratic : 2.8346200E-04
Energy Calibration Range : 7749.000

Instrument : CHAMBER 199
Detector : 78896
Calibration Date/Time : 24-AUG-2009 14:13:20
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	4768.800
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2368.399
Energy Calibration Slope : 4.967513
Energy Calibration Quadratic : 2.9532972E-04
Energy Calibration Range : 7765.000

Instrument : CHAMBER 200
Detector : 78900
Calibration Date/Time : 24-AUG-2009 14:13:29
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	4768.801
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2366.221
Energy Calibration Slope : 4.968300
Energy Calibration Quadratic : 2.9352392E-04
Energy Calibration Range : 7762.000

Instrument : CHAMBER 201
Detector : 78902
Calibration Date/Time : 24-AUG-2009 14:13:38
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	4768.801
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2362.156
Energy Calibration Slope : 4.974658
Energy Calibration Quadratic : 2.9066936E-04
Energy Calibration Range : 7761.000

Instrument : CHAMBER 202
Detector : 78903
Calibration Date/Time : 24-AUG-2009 14:13:47
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	4768.800
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2356.033
Energy Calibration Slope : 4.956886
Energy Calibration Quadratic : 2.9409473E-04
Energy Calibration Range : 7740.000

Instrument : CHAMBER 203
Detector : 78905
Calibration Date/Time : 24-AUG-2009 14:16:33
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	4768.800
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2364.159
Energy Calibration Slope : 4.957525
Energy Calibration Quadratic : 3.0185276E-04
Energy Calibration Range : 7757.000

Instrument : CHAMBER 204
Detector : 78907
Calibration Date/Time : 24-AUG-2009 14:14:37
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	4768.799
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
Energy Calibration Zero : 2361.336
Energy Calibration Slope : 4.953297
Energy Calibration Quadratic : 3.0559121E-04
Energy Calibration Range : 7754.000

Instrument : CHAMBER 205
Detector : 78908
Calibration Date/Time : 24-AUG-2009 14:14:46
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	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2366.916
Energy Calibration Slope : 4.956555
Energy Calibration Quadratic : 3.0603251E-04
Energy Calibration Range : 7763.000

Instrument : CHAMBER 206
Detector : 78909
Calibration Date/Time : 24-AUG-2009 14:14:55
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 : 2362.312
Energy Calibration Slope : 4.958225
Energy Calibration Quadratic : 2.9557038E-04
Energy Calibration Range : 7749.000

Instrument : CHAMBER 207
Detector : 78910
Calibration Date/Time : 24-AUG-2009 14:15:04
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	4768.801
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2365.581
Energy Calibration Slope : 4.980759
Energy Calibration Quadratic : 2.8388310E-04
Energy Calibration Range : 7764.000

Instrument : CHAMBER 208
Detector : 78911
Calibration Date/Time : 24-AUG-2009 14:15:14
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	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2364.472
Energy Calibration Slope : 4.972521
Energy Calibration Quadratic : 2.9282621E-04
Energy Calibration Range : 7763.000

Instrument : CHAMBER 209
Detector : 79188
Calibration Date/Time : 28-AUG-2009 13:24:07
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	4768.335
CM-244	4320A	2/28/10	5795.020	5794.881

Energy/Channel Equation : see above
Energy Calibration Zero : 2390.838
Energy Calibration Slope : 4.927811
Energy Calibration Quadratic : 3.3034658E-04
Energy Calibration Range : 7783.000

Instrument : CHAMBER 210
Detector : 79189
Calibration Date/Time : 28-AUG-2009 13:25:35
Calibration Source Id : AESS-002

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.411
NP-237	4341	2/28/10	4768.800	4768.113
CM-244	4320A	2/28/10	5795.020	5794.645

Energy/Channel Equation : see above
Energy Calibration Zero : 2383.667
Energy Calibration Slope : 4.959684
Energy Calibration Quadratic : 2.9263049E-04
Energy Calibration Range : 7769.000

Instrument : CHAMBER 211
Detector : 79190
Calibration Date/Time : 28-AUG-2009 13:25:47
Calibration Source Id : AESS-003

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.995
NP-237	4341	2/28/10	4768.800	4768.326
CM-244	4320A	2/28/10	5795.020	5794.748

Energy/Channel Equation : see above
Energy Calibration Zero : 2392.783
Energy Calibration Slope : 4.948876
Energy Calibration Quadratic : 3.2176418E-04
Energy Calibration Range : 7798.000

Instrument : CHAMBER 212
Detector : 79191
Calibration Date/Time : 28-AUG-2009 13:26:50
Calibration Source Id : AESS-004

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.995
NP-237	4341	2/28/10	4768.800	4768.536
CM-244	4320A	2/28/10	5795.020	5794.696

Energy/Channel Equation : see above
Energy Calibration Zero : 2390.425
Energy Calibration Slope : 4.930474
Energy Calibration Quadratic : 3.3508314E-04
Energy Calibration Range : 7791.000

Instrument : CHAMBER 213
Detector : 79192
Calibration Date/Time : 28-AUG-2009 13:27:02
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	4768.585
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2391.388
Energy Calibration Slope : 4.965888
Energy Calibration Quadratic : 2.9186261E-04
Energy Calibration Range : 7782.000

Instrument : CHAMBER 214
Detector : 79193
Calibration Date/Time : 28-AUG-2009 13:27:13
Calibration Source Id : AESS-006

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.617
NP-237	4341	2/28/10	4768.800	4768.269
CM-244	4320A	2/28/10	5795.020	5794.897

Energy/Channel Equation : see above
Energy Calibration Zero : 2388.729
Energy Calibration Slope : 4.939622
Energy Calibration Quadratic : 3.2170661E-04
Energy Calibration Range : 7784.000

Instrument : CHAMBER 215
Detector : 79194
Calibration Date/Time : 28-AUG-2009 13:27:24
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	4768.687
CM-244	4320A	2/28/10	5795.020	5794.826

Energy/Channel Equation : see above
Energy Calibration Zero : 2394.311
Energy Calibration Slope : 4.937372
Energy Calibration Quadratic : 3.3629968E-04
Energy Calibration Range : 7803.000

Instrument : CHAMBER 216
Detector : 79195
Calibration Date/Time : 28-AUG-2009 13:27:35
Calibration Source Id : AESS-008

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.995
NP-237	4341	2/28/10	4768.800	4768.219
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
Energy Calibration Zero : 2390.139
Energy Calibration Slope : 4.935822
Energy Calibration Quadratic : 3.2837162E-04
Energy Calibration Range : 7789.000

Instrument : CHAMBER 217
Detector : 79410
Calibration Date/Time : 28-AUG-2009 13:27:45
Calibration Source Id : AESS-009

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.999
NP-237	4341	2/28/10	4768.800	4768.801
CM-244	4320A	2/28/10	5795.020	5794.882

Energy/Channel Equation : see above
Energy Calibration Zero : 2392.370
Energy Calibration Slope : 4.932100
Energy Calibration Quadratic : 3.3393077E-04
Energy Calibration Range : 7793.000

Instrument : CHAMBER 218
Detector : 79411
Calibration Date/Time : 28-AUG-2009 13:27:55
Calibration Source Id : AESS-010

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.358
NP-237	4341	2/28/10	4768.800	4768.423
CM-244	4320A	2/28/10	5795.020	5794.546

Energy/Channel Equation : see above
Energy Calibration Zero : 2390.502
Energy Calibration Slope : 4.945263
Energy Calibration Quadratic : 3.2289582E-04
Energy Calibration Range : 7793.000

Instrument : CHAMBER 219
Detector : 79412
Calibration Date/Time : 28-AUG-2009 13:28:06
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	4768.507
CM-244	4320A	2/28/10	5795.020	5794.730

Energy/Channel Equation : see above
Energy Calibration Zero : 2388.417
Energy Calibration Slope : 4.951864
Energy Calibration Quadratic : 3.1518008E-04
Energy Calibration Range : 7790.000

Instrument : CHAMBER 220
Detector : 79413
Calibration Date/Time : 28-AUG-2009 13:28:15
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	4768.604
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2384.931
Energy Calibration Slope : 4.925590
Energy Calibration Quadratic : 3.4113281E-04
Energy Calibration Range : 7786.000

Instrument : CHAMBER 221
Detector : 79414
Calibration Date/Time : 28-AUG-2009 13:28:26
Calibration Source Id : AESS-013

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.994
NP-237	4341	2/28/10	4768.800	4768.508
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
Energy Calibration Zero : 2389.873
Energy Calibration Slope : 4.963081
Energy Calibration Quadratic : 3.1328213E-04
Energy Calibration Range : 7801.000

Instrument : CHAMBER 222
Detector : 79415
Calibration Date/Time : 28-AUG-2009 13:28:40
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	4768.242
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2383.161
Energy Calibration Slope : 5.032124
Energy Calibration Quadratic : 2.3446424E-04
Energy Calibration Range : 7782.000

Instrument : CHAMBER 223
Detector : 79416
Calibration Date/Time : 28-AUG-2009 13:28:50
Calibration Source Id : AESS-015

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.591
CM-244	4320A	2/28/10	5795.020	5794.816

Energy/Channel Equation : see above
Energy Calibration Zero : 2389.471
Energy Calibration Slope : 4.966544
Energy Calibration Quadratic : 3.1951332E-04
Energy Calibration Range : 7810.000

Instrument : CHAMBER 224
Detector : 79417
Calibration Date/Time : 28-AUG-2009 13:29:01
Calibration Source Id : AESS-016

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.496
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 : 2391.014
Energy Calibration Slope : 4.986970
Energy Calibration Quadratic : 2.9468181E-04
Energy Calibration Range : 7807.000

Instrument : CHAMBER 225
Detector : 79418
Calibration Date/Time : 28-AUG-2009 13:29:13
Calibration Source Id : AESS-017

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.995
NP-237	4341	2/28/10	4768.800	4768.482
CM-244	4320A	2/28/10	5795.020	5794.771

Energy/Channel Equation : see above
Energy Calibration Zero : 2392.520
Energy Calibration Slope : 4.953336
Energy Calibration Quadratic : 3.1543931E-04
Energy Calibration Range : 7795.000

Instrument : CHAMBER 226
Detector : 79419
Calibration Date/Time : 28-AUG-2009 13:29:24
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	4768.533
CM-244	4320A	2/28/10	5795.020	5794.638

Energy/Channel Equation : see above
Energy Calibration Zero : 2385.990
Energy Calibration Slope : 4.969761
Energy Calibration Quadratic : 3.0473244E-04
Energy Calibration Range : 7795.000

Instrument : CHAMBER 227
Detector : 79420
Calibration Date/Time : 28-AUG-2009 13:29:35
Calibration Source Id : AESS-019

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.989
NP-237	4341	2/28/10	4768.800	4768.396
CM-244	4320A	2/28/10	5795.020	5795.019

Energy/Channel Equation : see above
Energy Calibration Zero : 2390.018
Energy Calibration Slope : 4.958102
Energy Calibration Quadratic : 3.1095589E-04
Energy Calibration Range : 7793.000

Instrument : CHAMBER 228
Detector : 79421
Calibration Date/Time : 28-AUG-2009 13:30:03
Calibration Source Id : AESS-020

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.001
NP-237	4341	2/28/10	4768.800	4768.080
CM-244	4320A	2/28/10	5795.020	5794.730

Energy/Channel Equation : see above
Energy Calibration Zero : 2384.553
Energy Calibration Slope : 4.991631
Energy Calibration Quadratic : 2.7237524E-04
Energy Calibration Range : 7782.000

Instrument : CHAMBER 229
Detector : 79422
Calibration Date/Time : 28-AUG-2009 13:30:14
Calibration Source Id : AESS-021

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.535
NP-237	4341	2/28/10	4768.800	4768.314
CM-244	4320A	2/28/10	5795.020	5794.771

Energy/Channel Equation : see above
Energy Calibration Zero : 2391.623
Energy Calibration Slope : 4.946116
Energy Calibration Quadratic : 3.3402635E-04
Energy Calibration Range : 7807.000

Instrument : CHAMBER 230
Detector : 79423
Calibration Date/Time : 28-AUG-2009 13:31:10
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	4768.295
CM-244	4320A	2/28/10	5795.020	5794.755

Energy/Channel Equation : see above
Energy Calibration Zero : 2386.924
Energy Calibration Slope : 4.965939
Energy Calibration Quadratic : 3.0765639E-04
Energy Calibration Range : 7795.000

Instrument : CHAMBER 231
Detector : 79424
Calibration Date/Time : 28-AUG-2009 13:31:59
Calibration Source Id : AESS-023

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.555
NP-237	4341	2/28/10	4768.800	4768.511
CM-244	4320A	2/28/10	5795.020	5794.833

Energy/Channel Equation : see above
Energy Calibration Zero : 2389.970
Energy Calibration Slope : 4.957988
Energy Calibration Quadratic : 3.0450191E-04
Energy Calibration Range : 7786.000

Instrument : CHAMBER 232
Detector : 79425
Calibration Date/Time : 28-AUG-2009 13:32:18
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	4768.305
CM-244	4320A	2/28/10	5795.020	5794.704

Energy/Channel Equation : see above
Energy Calibration Zero : 2386.107
Energy Calibration Slope : 5.009925
Energy Calibration Quadratic : 2.5456178E-04
Energy Calibration Range : 7783.000

Instrument : CHAMBER 233
Detector : 79426
Calibration Date/Time : 28-AUG-2009 13:32:35
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	4768.576
CM-244	4320A	2/28/10	5795.020	5794.737

Energy/Channel Equation : see above
Energy Calibration Zero : 2384.864
Energy Calibration Slope : 4.921108
Energy Calibration Quadratic : 3.4491287E-04
Energy Calibration Range : 7786.000

Instrument : CHAMBER 234
Detector : 79427
Calibration Date/Time : 28-AUG-2009 13:32:51
Calibration Source Id : AESS-026

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.551
NP-237	4341	2/28/10	4768.800	4768.513
CM-244	4320A	2/28/10	5795.020	5794.778

Energy/Channel Equation : see above
Energy Calibration Zero : 2381.948
Energy Calibration Slope : 4.930495
Energy Calibration Quadratic : 3.2252993E-04
Energy Calibration Range : 7769.000

Instrument : CHAMBER 235
Detector : 79428
Calibration Date/Time : 28-AUG-2009 13:33:07
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	5795.021

Energy/Channel Equation : see above
Energy Calibration Zero : 2389.848
Energy Calibration Slope : 4.916008
Energy Calibration Quadratic : 3.6057594E-04
Energy Calibration Range : 7802.000

Instrument : CHAMBER 236
Detector : 79429
Calibration Date/Time : 28-AUG-2009 13:33:24
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	4768.403
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
Energy Calibration Zero : 2389.679
Energy Calibration Slope : 4.915041
Energy Calibration Quadratic : 3.5203501E-04
Energy Calibration Range : 7792.000

Instrument : CHAMBER 237
Detector : 79430
Calibration Date/Time : 28-AUG-2009 13:33:41
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	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2386.371
Energy Calibration Slope : 4.953910
Energy Calibration Quadratic : 3.1539882E-04
Energy Calibration Range : 7790.000

Instrument : CHAMBER 238
Detector : 79431
Calibration Date/Time : 28-AUG-2009 13:33:59
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	4768.662
CM-244	4320A	2/28/10	5795.020	5795.015

Energy/Channel Equation : see above
Energy Calibration Zero : 2382.061
Energy Calibration Slope : 4.932787
Energy Calibration Quadratic : 3.2764973E-04
Energy Calibration Range : 7777.000

Instrument : CHAMBER 239
Detector : 79432
Calibration Date/Time : 28-AUG-2009 13:34:23
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	4768.800
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2390.464
Energy Calibration Slope : 4.922751
Energy Calibration Quadratic : 3.5207078E-04
Energy Calibration Range : 7801.000

Instrument : CHAMBER 240
Detector : 79433
Calibration Date/Time : 28-AUG-2009 13:34:40
Calibration Source Id : AESS-032

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.994
NP-237	4341	2/28/10	4768.800	4768.676
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2384.323
Energy Calibration Slope : 4.929180
Energy Calibration Quadratic : 3.3816224E-04
Energy Calibration Range : 7786.000

Instrument : CHAMBER 241
Detector : 79434
Calibration Date/Time : 28-AUG-2009 13:34:57
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	4768.801
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2388.207
Energy Calibration Slope : 4.903821
Energy Calibration Quadratic : 3.6748822E-04
Energy Calibration Range : 7795.000

Instrument : CHAMBER 242
Detector : 79435
Calibration Date/Time : 28-AUG-2009 13:35:16
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	4768.542
CM-244	4320A	2/28/10	5795.020	5794.775

Energy/Channel Equation : see above
Energy Calibration Zero : 2390.032
Energy Calibration Slope : 4.921538
Energy Calibration Quadratic : 3.5085063E-04
Energy Calibration Range : 7798.000

Instrument : CHAMBER 243
Detector : 79436
Calibration Date/Time : 28-AUG-2009 13:35:39
Calibration Source Id : AESS-035

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.988
NP-237	4341	2/28/10	4768.800	4768.486
CM-244	4320A	2/28/10	5795.020	5794.752

Energy/Channel Equation : see above
Energy Calibration Zero : 2386.548
Energy Calibration Slope : 4.951634
Energy Calibration Quadratic : 3.2005890E-04
Energy Calibration Range : 7793.000

Instrument : CHAMBER 244
Detector : 79437
Calibration Date/Time : 28-AUG-2009 13:36:07
Calibration Source Id : AESS-036

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.497
NP-237	4341	2/28/10	4768.800	4768.339
CM-244	4320A	2/28/10	5795.020	5794.813

Energy/Channel Equation : see above
Energy Calibration Zero : 2390.547
Energy Calibration Slope : 4.935142
Energy Calibration Quadratic : 3.3349055E-04
Energy Calibration Range : 7794.000

Instrument : CHAMBER 245
Detector : 79438
Calibration Date/Time : 28-AUG-2009 13:36:53
Calibration Source Id : AESS-037

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.392
NP-237	4341	2/28/10	4768.800	4768.244
CM-244	4320A	2/28/10	5795.020	5794.789

Energy/Channel Equation : see above
Energy Calibration Zero : 2393.397
Energy Calibration Slope : 4.967153
Energy Calibration Quadratic : 3.0749093E-04
Energy Calibration Range : 7802.000

Instrument : CHAMBER 246
Detector : 78912
Calibration Date/Time : 28-AUG-2009 13:37:05
Calibration Source Id : AESS-038

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.994
NP-237	4341	2/28/10	4768.800	4768.559
CM-244	4320A	2/28/10	5795.020	5794.661

Energy/Channel Equation : see above
Energy Calibration Zero : 2393.972
Energy Calibration Slope : 4.938848
Energy Calibration Quadratic : 3.3234741E-04
Energy Calibration Range : 7800.000

Instrument : CHAMBER 247
Detector : 79440
Calibration Date/Time : 28-AUG-2009 13:37:16
Calibration Source Id : AESS-039

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.001
NP-237	4341	2/28/10	4768.800	4768.340
CM-244	4320A	2/28/10	5795.020	5794.822

Energy/Channel Equation : see above
Energy Calibration Zero : 2392.511
Energy Calibration Slope : 4.947969
Energy Calibration Quadratic : 3.3144341E-04
Energy Calibration Range : 7807.000

Instrument : CHAMBER 248
Detector : 79441
Calibration Date/Time : 28-AUG-2009 13:37:28
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	5794.763

Energy/Channel Equation : see above
Energy Calibration Zero : 2387.425
Energy Calibration Slope : 4.938920
Energy Calibration Quadratic : 3.3573247E-04
Energy Calibration Range : 7797.000

Instrument : CHAMBER 249
Detector : 79442
Calibration Date/Time : 28-AUG-2009 13:37:39
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	4768.655
CM-244	4320A	2/28/10	5795.020	5794.817

Energy/Channel Equation : see above
Energy Calibration Zero : 2387.492
Energy Calibration Slope : 4.950956
Energy Calibration Quadratic : 3.3470633E-04
Energy Calibration Range : 7808.000

Instrument : CHAMBER 250
Detector : 79443
Calibration Date/Time : 28-AUG-2009 13:37:51
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	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2382.437
Energy Calibration Slope : 4.924478
Energy Calibration Quadratic : 3.4610991E-04
Energy Calibration Range : 7788.000

Instrument : CHAMBER 251
Detector : 79444
Calibration Date/Time : 28-AUG-2009 13:38:01
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	4768.630
CM-244	4320A	2/28/10	5795.020	5794.883

Energy/Channel Equation : see above
Energy Calibration Zero : 2390.000
Energy Calibration Slope : 4.933837
Energy Calibration Quadratic : 3.5430092E-04
Energy Calibration Range : 7814.000

Instrument : CHAMBER 252
Detector : 79445
Calibration Date/Time : 28-AUG-2009 13:38:11
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	4768.618
CM-244	4320A	2/28/10	5795.020	5794.764

Energy/Channel Equation : see above
Energy Calibration Zero : 2389.483
Energy Calibration Slope : 4.925191
Energy Calibration Quadratic : 3.5263240E-04
Energy Calibration Range : 7803.000

Instrument : CHAMBER 253
Detector : 79446
Calibration Date/Time : 28-AUG-2009 13:38:20
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	5794.899

Energy/Channel Equation : see above
Energy Calibration Zero : 2397.089
Energy Calibration Slope : 4.939593
Energy Calibration Quadratic : 3.6825475E-04
Energy Calibration Range : 7841.000

Instrument : CHAMBER 254
Detector : 79447
Calibration Date/Time : 28-AUG-2009 13:38:31
Calibration Source Id : AESS-046

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.420
NP-237	4341	2/28/10	4768.800	4768.432
CM-244	4320A	2/28/10	5795.020	5794.736

Energy/Channel Equation : see above
Energy Calibration Zero : 2392.513
Energy Calibration Slope : 4.939602
Energy Calibration Quadratic : 3.3955529E-04
Energy Calibration Range : 7807.000

Instrument : CHAMBER 255
Detector : 79448
Calibration Date/Time : 28-AUG-2009 13:38:42
Calibration Source Id : AESS-047

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.573
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 : 2389.962
Energy Calibration Slope : 4.937794
Energy Calibration Quadratic : 3.5419688E-04
Energy Calibration Range : 7818.000

Instrument : CHAMBER 256
Detector : 79449
Calibration Date/Time : 28-AUG-2009 13:38:54
Calibration Source Id : AESS-048

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.994
NP-237	4341	2/28/10	4768.800	4768.603
CM-244	4320A	2/28/10	5795.020	5794.763

Energy/Channel Equation : see above
Energy Calibration Zero : 2390.038
Energy Calibration Slope : 4.925209
Energy Calibration Quadratic : 3.5748276E-04
Energy Calibration Range : 7808.000

Subsection 2: Background Calibration

Instrument : CHAMBER 001
Detector : 78788
Background Analysis Date/Time : 30-AUG-2009 16:15:10
Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.095	3301.491	2.000000	0.4800001	70.71068	95.00000
NP-237	4436.328	4901.460	12.00000	2.880001	28.86751	95.00000
CM-244	5531.570	5886.270	6.000000	1.440000	40.82483	95.00000

Instrument : CHAMBER 002
Detector : 78266
Background Analysis Date/Time : 30-AUG-2009 16:15:10
Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.085	3299.620	1.000000	0.2400001	100.0000	95.00000
NP-237	4434.644	4904.846	7.000000	1.680000	37.79645	95.00000
CM-244	5534.154	5882.659	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000

Instrument : CHAMBER 003
Detector : 67617
Background Analysis Date/Time : 30-AUG-2009 16:15:10
Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.938	3299.717	3.000000	0.7200001	57.73503	95.00000
NP-237	4432.844	4902.827	10.00000	2.400001	31.62278	95.00000
CM-244	5531.440	5887.803	4.000000	0.9600002	50.00000	95.00000

Instrument : CHAMBER 004
Detector : 64279
Background Analysis Date/Time : 30-AUG-2009 16:15:10
Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.026	3298.308	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4435.760	4905.548	7.000000	1.680000	37.79645	95.00000
CM-244	5534.947	5883.809	2.000000	0.4800001	70.71068	95.00000

Instrument : CHAMBER 005
Detector : 67612
Background Analysis Date/Time : 30-AUG-2009 16:15:10
Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.654	3300.689	4.000000	0.9600002	50.00000	95.00000
NP-237	4436.859	4901.997	5.000000	1.200000	44.72136	95.00000
CM-244	5533.435	5885.045	2.000000	0.4800001	70.71068	95.00000

Instrument : CHAMBER 006
Detector : 67613
Background Analysis Date/Time : 30-AUG-2009 16:15:10
Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.771	3301.528	3.000000	0.7200001	57.73503	95.00000
NP-237	4433.310	4904.612	10.00000	2.400001	31.62278	95.00000
CM-244	5535.175	5883.158	9.000000	2.160001	33.33334	95.00000

Instrument : CHAMBER 007
Detector : 67607
Background Analysis Date/Time : 30-AUG-2009 16:15:11
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.315	3300.370	2.000000	0.4799997	70.71068	95.00000
NP-237	4436.975	4905.147	7.000000	1.679999	37.79645	95.00000
CM-244	5533.959	5885.477	23.00000	5.519996	20.85144	95.00000

Instrument : CHAMBER 008
Detector : 78788
Background Analysis Date/Time : 30-AUG-2009 16:15:11
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.794	3298.426	2.000000	0.4799997	70.71068	95.00000
NP-237	4437.020	4904.595	6.000000	1.439999	40.82483	95.00000
CM-244	5532.536	5882.336	4.000000	0.9599993	50.00000	95.00000

Instrument : CHAMBER 009
Detector : 72528
Background Analysis Date/Time : 30-AUG-2009 16:15:11
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.892	3299.892	4.000000	0.9599993	50.00000	95.00000
NP-237	4433.436	4905.789	11.00000	2.639998	30.15113	95.00000
CM-244	5532.687	5887.081	9.000000	2.159998	33.33334	95.00000

Instrument : CHAMBER 010
Detector : 72529
Background Analysis Date/Time : 30-AUG-2009 16:15:11
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.087	3300.334	3.000000	0.7199995	57.73503	95.00000
NP-237	4436.842	4905.812	6.000000	1.439999	40.82483	95.00000
CM-244	5533.178	5884.706	6.000000	1.439999	40.82483	95.00000

Instrument : CHAMBER 011
Detector : 72531
Background Analysis Date/Time : 30-AUG-2009 16:15:11
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.718	3301.411	3.000000	0.7199995	57.73503	95.00000
NP-237	4435.900	4905.463	15.00000	3.599998	25.81989	95.00000
CM-244	5535.617	5886.431	10.00000	2.399998	31.62278	95.00000

Instrument : CHAMBER 012
Detector : 67594
Background Analysis Date/Time : 30-AUG-2009 16:15:11
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.283	3301.924	2.000000	0.4799997	70.71068	95.00000
NP-237	4434.309	4903.502	10.00000	2.399998	31.62278	95.00000
CM-244	5531.028	5882.575	10.00000	2.399998	31.62278	95.00000

Instrument : CHAMBER 013
Detector : 78790
Background Analysis Date/Time : 30-AUG-2009 16:15:12
Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.309	3297.583	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4432.512	4904.184	11.00000	2.640001	30.15113	95.00000
CM-244	5533.734	5883.657	4.000000	0.9600002	50.00000	95.00000

Instrument : CHAMBER 014
Detector : 67616
Background Analysis Date/Time : 30-AUG-2009 16:15:12
Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.575	3298.988	3.000000	0.7200001	57.73503	95.00000
NP-237	4436.470	4903.458	8.000000	1.920000	35.35534	95.00000
CM-244	5530.496	5885.133	26.00000	6.240001	19.61161	95.00000

Instrument : CHAMBER 015
Detector : 61581
Background Analysis Date/Time : 30-AUG-2009 16:15:12
Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.656	3297.520	3.000000	0.7200001	57.73503	95.00000
NP-237	4435.901	4901.612	9.000000	2.160001	33.33334	95.00000
CM-244	5535.255	5884.514	26.00000	6.240001	19.61161	95.00000

Instrument : CHAMBER 016
Detector : 78774
Background Analysis Date/Time : 30-AUG-2009 16:15:12
Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.611	3297.891	1.000000	0.2400001	100.0000	95.00000
NP-237	4435.494	4901.479	2.000000	0.4800001	70.71068	95.00000
CM-244	5530.741	5886.030	3.000000	0.7200001	57.73503	95.00000

Instrument : CHAMBER 017
Detector : 78791
Background Analysis Date/Time : 30-AUG-2009 16:15:12
Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.315	3299.165	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4433.955	4905.994	7.000000	1.680000	37.79645	95.00000
CM-244	5531.756	5885.157	1.000000	0.2400001	100.0000	95.00000

Instrument : CHAMBER 018
Detector : 78782
Background Analysis Date/Time : 30-AUG-2009 16:15:12
Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.045	3297.645	5.000000	1.200000	44.72136	95.00000
NP-237	4435.824	4903.103	6.000000	1.440000	40.82483	95.00000
CM-244	5530.534	5885.395	5.000000	1.200000	44.72136	95.00000

Instrument : CHAMBER 019
Detector : 78786
Background Analysis Date/Time : 30-AUG-2009 16:15:13
Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.371	3300.084	2.000000	0.4800001	70.71068	95.00000
NP-237	4432.711	4901.697	6.000000	1.440000	40.82483	95.00000
CM-244	5534.730	5883.386	3.000000	0.7200001	57.73503	95.00000

Instrument : CHAMBER 020
Detector : 78787
Background Analysis Date/Time : 30-AUG-2009 16:15:13
Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.745	3300.511	3.000000	0.7200001	57.73503	95.00000
NP-237	4436.191	4903.850	11.00000	2.640001	30.15113	95.00000
CM-244	5531.198	5885.719	4.000000	0.9600002	50.00000	95.00000

Instrument : CHAMBER 021
Detector : 67047
Background Analysis Date/Time : 30-AUG-2009 16:15:13
Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.027	3300.488	2.000000	0.4800001	70.71068	95.00000
NP-237	4433.390	4904.438	6.000000	1.440000	40.82483	95.00000
CM-244	5534.035	5886.544	16.00000	3.840001	25.00000	95.00000

Instrument : CHAMBER 022
Detector : 72530
Background Analysis Date/Time : 30-AUG-2009 16:15:13
Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.050	3301.029	39.00000	9.360003	16.01282	95.00000
NP-237	4437.549	4902.815	18.00000	4.320001	23.57022	95.00000
CM-244	5531.706	5883.854	12.00000	2.880001	28.86751	95.00000

Instrument : CHAMBER 023
Detector : 78264
Background Analysis Date/Time : 30-AUG-2009 16:15:13
Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.319	3301.853	1.000000	0.2400001	100.0000	95.00000
NP-237	4434.632	4902.993	6.000000	1.440000	40.82483	95.00000
CM-244	5531.100	5885.960	8.000000	1.920000	35.35534	95.00000

Instrument : CHAMBER 024
Detector : 76542
Background Analysis Date/Time : 30-AUG-2009 16:15:13
Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.280	3301.361	1.000000	0.2400001	100.0000	95.00000
NP-237	4434.951	4904.473	14.00000	3.360001	26.72612	95.00000
CM-244	5532.286	5883.922	5.000000	1.200000	44.72136	95.00000

Instrument : CHAMBER 025
Detector : 45-149AA5
Background Analysis Date/Time : 30-AUG-2009 16:15:14
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.958	3301.287	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4436.686	4904.740	7.000000	1.680000	37.79645	95.00000
CM-244	5534.991	5882.562	76.00000	18.24000	11.47079	95.00000

Instrument : CHAMBER 026
Detector : 78204
Background Analysis Date/Time : 30-AUG-2009 16:15:14
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.735	3300.836	2.000000	0.4800001	70.71068	95.00000
NP-237	4435.801	4902.784	4.000000	0.9600002	50.00000	95.00000
CM-244	5530.708	5886.284	60.00000	14.40000	12.90994	95.00000

Instrument : CHAMBER 027
Detector : 42484
Background Analysis Date/Time : 30-AUG-2009 16:15:14
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.280	3298.316	9.000000	2.160000	33.33334	95.00000
NP-237	4433.196	4906.637	9.000000	2.160000	33.33334	95.00000
CM-244	5535.439	5885.723	61.00000	14.64000	12.80369	95.00000

Instrument : CHAMBER 028
Detector : 78792
Background Analysis Date/Time : 30-AUG-2009 16:15:14
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.441	3297.640	2.000000	0.4800001	70.71068	95.00000
NP-237	4435.847	4903.788	13.00000	3.120001	27.73501	95.00000
CM-244	5532.676	5883.223	65.00000	15.60000	12.40347	95.00000

Instrument : CHAMBER 029
Detector : 33454
Background Analysis Date/Time : 30-AUG-2009 16:15:14
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.567	3301.667	2.000000	0.4800001	70.71068	95.00000
NP-237	4432.493	4902.470	13.00000	3.120001	27.73501	95.00000
CM-244	5535.032	5883.746	87.00000	20.88000	10.72113	95.00000

Instrument : CHAMBER 030
Detector : 33447
Background Analysis Date/Time : 30-AUG-2009 16:15:14
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.332	3299.665	1.000000	0.2400000	100.0000	95.00000
NP-237	4436.037	4902.215	13.00000	3.120001	27.73501	95.00000
CM-244	5533.195	5886.933	97.00000	23.28000	10.15346	95.00000

Instrument : CHAMBER 031
Detector : 67042
Background Analysis Date/Time : 30-AUG-2009 16:15:14
Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.980	3300.809	8.000000	1.919999	35.35534	95.00000
NP-237	4433.475	4904.204	10.00000	2.399998	31.62278	95.00000
CM-244	5535.021	5883.627	87.00000	20.87999	10.72113	95.00000

Instrument : CHAMBER 032
Detector : 67041
Background Analysis Date/Time : 30-AUG-2009 16:15:14
Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.500	3301.085	2.000000	0.4799997	70.71068	95.00000
NP-237	4436.228	4903.321	14.00000	3.359998	26.72612	95.00000
CM-244	5533.353	5886.388	25.00000	5.999996	20.00000	95.00000

Instrument : CHAMBER 033
Detector : 78785
Background Analysis Date/Time : 30-AUG-2009 16:15:14
Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.232	3299.661	3.000000	0.7199996	57.73503	95.00000
NP-237	4437.092	4904.010	7.000000	1.679999	37.79645	95.00000
CM-244	5530.913	5885.453	49.00000	11.75999	14.28572	95.00000

Instrument : CHAMBER 034
Detector : 61586
Background Analysis Date/Time : 30-AUG-2009 16:15:14
Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.956	3301.026	2.000000	0.4799997	70.71068	95.00000
NP-237	4436.568	4903.521	30.00000	7.199996	18.25742	95.00000
CM-244	5534.967	5885.181	31.00000	7.439995	17.96053	95.00000

Instrument : CHAMBER 035
Detector : 78202
Background Analysis Date/Time : 30-AUG-2009 16:15:14
Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.620	3300.593	2.000000	0.4799997	70.71068	95.00000
NP-237	4435.499	4903.774	16.00000	3.839998	25.00000	95.00000
CM-244	5532.763	5883.199	70.00000	16.79999	11.95229	95.00000

Instrument : CHAMBER 036
Detector : 78203
Background Analysis Date/Time : 30-AUG-2009 16:15:14
Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.620	3298.917	2.000000	0.4799997	70.71068	95.00000
NP-237	4433.050	4904.263	7.000000	1.679999	37.79645	95.00000
CM-244	5535.616	5884.466	51.00000	12.23999	14.00280	95.00000

Instrument : CHAMBER 037
Detector : 45-149BB5
Background Analysis Date/Time : 30-AUG-2009 16:15:15
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.836	3299.917	5.000000	1.199999	44.72136	95.00000
NP-237	4435.582	4906.557	19.00000	4.559997	22.94157	95.00000
CM-244	5534.307	5882.810	72.00000	17.27999	11.78511	95.00000

Instrument : CHAMBER 038
Detector : 72532
Background Analysis Date/Time : 30-AUG-2009 16:15:15
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.576	3299.256	2.000000	0.4799997	70.71068	95.00000
NP-237	4433.771	4904.686	10.00000	2.399998	31.62278	95.00000
CM-244	5535.244	5883.467	79.00000	18.95999	11.25088	95.00000

Instrument : CHAMBER 039
Detector : 45-149BB2
Background Analysis Date/Time : 30-AUG-2009 16:15:15
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.453	3301.599	1.000000	0.2399998	100.0000	95.00000
NP-237	4432.722	4905.688	12.00000	2.879998	28.86751	95.00000
CM-244	5532.346	5883.894	84.00000	20.15999	10.91089	95.00000

Instrument : CHAMBER 040
Detector : 78773
Background Analysis Date/Time : 30-AUG-2009 16:15:15
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.070	3301.002	6.000000	1.439999	40.82483	95.00000
NP-237	4437.116	4905.104	4.000000	0.9599993	50.00000	95.00000
CM-244	5532.249	5884.180	66.00000	15.83999	12.30915	95.00000

Instrument : CHAMBER 041
Detector : 78205
Background Analysis Date/Time : 30-AUG-2009 16:15:15
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.305	3298.942	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4436.425	4904.659	10.00000	2.399998	31.62278	95.00000
CM-244	5534.452	5885.748	82.00000	19.67999	11.04315	95.00000

Instrument : CHAMBER 042
Detector : 78793
Background Analysis Date/Time : 30-AUG-2009 16:15:15
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.887	3299.366	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4437.123	4905.630	11.00000	2.639998	30.15113	95.00000
CM-244	5533.333	5885.512	81.00000	19.43999	11.11111	95.00000

Instrument : CHAMBER 043
Detector : 76543
Background Analysis Date/Time : 30-AUG-2009 16:15:16
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.321	3301.623	1.000000	0.2400000	100.0000	95.00000
NP-237	4433.027	4903.519	5.000000	1.200000	44.72136	95.00000
CM-244	5534.268	5882.956	61.00000	14.64000	12.80369	95.00000

Instrument : CHAMBER 044
Detector : 79459
Background Analysis Date/Time : 30-AUG-2009 16:15:16
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.930	3302.506	5.000000	1.200000	44.72136	95.00000
NP-237	4437.594	4903.934	14.00000	3.360001	26.72612	95.00000
CM-244	5530.392	5884.844	80.00000	19.20000	11.18034	95.00000

Instrument : CHAMBER 045
Detector : 78783
Background Analysis Date/Time : 30-AUG-2009 16:15:16
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.243	3301.709	2.000000	0.4800001	70.71068	95.00000
NP-237	4436.057	4901.945	5.000000	1.200000	44.72136	95.00000
CM-244	5533.013	5887.031	74.00000	17.76000	11.62476	95.00000

Instrument : CHAMBER 046
Detector : 76544
Background Analysis Date/Time : 30-AUG-2009 16:15:16
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.377	3301.861	2.000000	0.4800001	70.71068	95.00000
NP-237	4437.291	4905.414	7.000000	1.680000	37.79645	95.00000
CM-244	5533.098	5885.505	74.00000	17.76000	11.62476	95.00000

Instrument : CHAMBER 047
Detector : 46-089B1
Background Analysis Date/Time : 30-AUG-2009 16:15:16
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.396	3301.175	5.000000	1.200000	44.72136	95.00000
NP-237	4434.358	4901.480	17.00000	4.080001	24.25356	95.00000
CM-244	5533.889	5883.104	83.00000	19.92000	10.97643	95.00000

Instrument : CHAMBER 048
Detector : 42483
Background Analysis Date/Time : 30-AUG-2009 16:15:16
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.395	3299.708	1.000000	0.2400000	100.0000	95.00000
NP-237	4436.890	4906.295	16.00000	3.840001	25.00000	95.00000
CM-244	5534.380	5886.375	85.00000	20.40000	10.84652	95.00000

Instrument : CHAMBER 065
Detector : 68551
Background Analysis Date/Time : 6-SEP-2009 14:27:07
Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.771	3302.255	4.000000	0.9600002	50.00000	95.00000
NP-237	4436.128	4905.667	13.00000	3.120001	27.73501	95.00000
CM-244	5535.235	5883.315	19.00000	4.560001	22.94157	95.00000

Instrument : CHAMBER 066
Detector : 46-089C1
Background Analysis Date/Time : 6-SEP-2009 14:27:07
Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.607	3298.188	3.000000	0.7200001	57.73503	95.00000
NP-237	4437.248	4903.693	10.00000	2.400001	31.62278	95.00000
CM-244	5534.302	5887.473	10.00000	2.400001	31.62278	95.00000

Instrument : CHAMBER 067
Detector : 46-089B4
Background Analysis Date/Time : 6-SEP-2009 14:27:07
Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.364	3298.403	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4432.841	4903.104	10.00000	2.400001	31.62278	95.00000
CM-244	5532.249	5884.796	13.00000	3.120001	27.73501	95.00000

Instrument : CHAMBER 068
Detector : 78794
Background Analysis Date/Time : 6-SEP-2009 14:27:07
Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.800	3301.258	3.000000	0.7200001	57.73503	95.00000
NP-237	4436.421	4904.138	1.000000	0.2400001	100.0000	95.00000
CM-244	5531.799	5886.613	11.00000	2.640001	30.15113	95.00000

Instrument : CHAMBER 069
Detector : 78795
Background Analysis Date/Time : 6-SEP-2009 14:27:07
Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.054	3301.031	4.000000	0.9600002	50.00000	95.00000
NP-237	4436.816	4903.115	3.000000	0.7200001	57.73503	95.00000
CM-244	5534.580	5883.355	10.00000	2.400001	31.62278	95.00000

Instrument : CHAMBER 070
Detector : 46-089B2
Background Analysis Date/Time : 6-SEP-2009 14:27:07
Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.000	3298.556	1.000000	0.2400001	100.0000	95.00000
NP-237	4433.983	4903.126	6.000000	1.440000	40.82483	95.00000
CM-244	5531.262	5883.482	8.000000	1.920000	35.35534	95.00000

Instrument : CHAMBER 071
Detector : 64259
Background Analysis Date/Time : 6-SEP-2009 14:27:07
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.344	3299.186	3.000000	0.7199995	57.73503	95.00000
NP-237	4434.336	4901.423	9.000000	2.159998	33.33334	95.00000
CM-244	5533.037	5886.837	10.00000	2.399998	31.62278	95.00000

Instrument : CHAMBER 072
Detector : 45-149AA3
Background Analysis Date/Time : 6-SEP-2009 14:27:07
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.347	3300.937	4.000000	0.9599993	50.00000	95.00000
NP-237	4434.227	4904.277	7.000000	1.679999	37.79645	95.00000
CM-244	5533.368	5885.995	19.00000	4.559997	22.94157	95.00000

Instrument : CHAMBER 073
Detector : 78775
Background Analysis Date/Time : 6-SEP-2009 14:27:07
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.457	3300.404	1.000000	0.2399998	100.0000	95.00000
NP-237	4436.939	4906.411	7.000000	1.679999	37.79645	95.00000
CM-244	5534.874	5887.223	1.000000	0.2399998	100.0000	95.00000

Instrument : CHAMBER 074
Detector : 78266
Background Analysis Date/Time : 6-SEP-2009 14:27:07
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.696	3301.963	2.000000	0.4799997	70.71068	95.00000
NP-237	4433.697	4901.594	11.00000	2.639998	30.15113	95.00000
CM-244	5534.405	5883.535	6.000000	1.439999	40.82483	95.00000

Instrument : CHAMBER 075
Detector : 68550
Background Analysis Date/Time : 6-SEP-2009 14:27:07
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.430	3298.418	5.000000	1.199999	44.72136	95.00000
NP-237	4434.533	4906.317	16.00000	3.839997	25.00000	95.00000
CM-244	5532.867	5887.264	9.000000	2.159998	33.33334	95.00000

Instrument : CHAMBER 076
Detector : 78779
Background Analysis Date/Time : 6-SEP-2009 14:27:07
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.065	3298.826	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4434.152	4905.629	7.000000	1.679999	37.79645	95.00000
CM-244	5531.791	5885.977	3.000000	0.7199995	57.73503	95.00000

Instrument : CHAMBER 077
Detector : 67576
Background Analysis Date/Time : 6-SEP-2009 14:27:08
Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.808	3299.921	1.000000	0.2399998	100.0000	95.00000
NP-237	4436.345	4905.457	2.000000	0.4799997	70.71068	95.00000
CM-244	5533.165	5884.958	10.00000	2.399998	31.62278	95.00000

Instrument : CHAMBER 078
Detector : 67577
Background Analysis Date/Time : 6-SEP-2009 14:27:08
Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.845	3301.764	3.000000	0.7199996	57.73503	95.00000
NP-237	4437.423	4903.707	6.000000	1.439999	40.82483	95.00000
CM-244	5535.183	5883.980	9.000000	2.159999	33.33334	95.00000

Instrument : CHAMBER 079
Detector : 67598
Background Analysis Date/Time : 6-SEP-2009 14:27:08
Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.167	3301.886	2.000000	0.4799997	70.71068	95.00000
NP-237	4434.317	4902.083	5.000000	1.199999	44.72136	95.00000
CM-244	5534.342	5882.989	7.000000	1.679999	37.79645	95.00000

Instrument : CHAMBER 080
Detector : 78197
Background Analysis Date/Time : 6-SEP-2009 14:27:08
Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.423	3300.841	4.000000	0.9599994	50.00000	95.00000
NP-237	4436.127	4905.211	7.000000	1.679999	37.79645	95.00000
CM-244	5534.013	5883.733	4.000000	0.9599994	50.00000	95.00000

Instrument : CHAMBER 081
Detector : 72533
Background Analysis Date/Time : 6-SEP-2009 14:27:08
Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2985.860	3301.995	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4434.890	4902.925	1.000000	0.2399998	100.0000	95.00000
CM-244	5531.182	5884.811	5.000000	1.199999	44.72136	95.00000

Instrument : CHAMBER 082
Detector : 64263
Background Analysis Date/Time : 6-SEP-2009 14:27:08
Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.498	3298.727	4.000000	0.9599994	50.00000	95.00000
NP-237	4432.414	4902.039	7.000000	1.679999	37.79645	95.00000
CM-244	5532.619	5883.836	11.00000	2.639998	30.15113	95.00000

Instrument : CHAMBER 083
Detector : 64278
Background Analysis Date/Time : 6-SEP-2009 14:27:09
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.167	3298.934	1.000000	0.2400000	100.0000	95.00000
NP-237	4433.867	4901.929	7.000000	1.680000	37.79645	95.00000
CM-244	5533.935	5887.502	5.000000	1.200000	44.72136	95.00000

Instrument : CHAMBER 084
Detector : 78265
Background Analysis Date/Time : 6-SEP-2009 14:27:09
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.557	3301.261	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4436.726	4905.499	6.000000	1.440000	40.82483	95.00000
CM-244	5533.547	5882.686	2.000000	0.4800001	70.71068	95.00000

Instrument : CHAMBER 085
Detector : 78776
Background Analysis Date/Time : 6-SEP-2009 14:27:09
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.601	3300.074	1.000000	0.2400000	100.0000	95.00000
NP-237	4436.653	4903.942	6.000000	1.440000	40.82483	95.00000
CM-244	5535.486	5883.705	1.000000	0.2400000	100.0000	95.00000

Instrument : CHAMBER 086
Detector : 78198
Background Analysis Date/Time : 6-SEP-2009 14:27:09
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.774	3299.664	2.000000	0.4800001	70.71068	95.00000
NP-237	4432.667	4903.104	10.00000	2.400000	31.62278	95.00000
CM-244	5531.307	5882.758	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000

Instrument : CHAMBER 087
Detector : 78199
Background Analysis Date/Time : 6-SEP-2009 14:27:09
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.236	3300.170	4.000000	0.9600002	50.00000	95.00000
NP-237	4436.843	4904.805	7.000000	1.680000	37.79645	95.00000
CM-244	5535.169	5884.995	2.000000	0.4800001	70.71068	95.00000

Instrument : CHAMBER 088
Detector : 33452
Background Analysis Date/Time : 6-SEP-2009 14:27:09
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.949	3298.130	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4435.755	4901.405	6.000000	1.440000	40.82483	95.00000
CM-244	5533.353	5886.188	11.00000	2.640000	30.15113	95.00000

Instrument : CHAMBER 089
Detector : 78262
Background Analysis Date/Time : 6-SEP-2009 14:27:10
Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.289	3300.634	2.000000	0.4800001	70.71068	95.00000
NP-237	4434.456	4904.010	10.00000	2.400001	31.62278	95.00000
CM-244	5534.385	5885.433	2.000000	0.4800001	70.71068	95.00000

Instrument : CHAMBER 090
Detector : 78263
Background Analysis Date/Time : 6-SEP-2009 14:27:10
Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.266	3299.227	2.000000	0.4800001	70.71068	95.00000
NP-237	4433.868	4903.300	9.000000	2.160001	33.33334	95.00000
CM-244	5532.356	5885.351	1.000000	0.2400001	100.0000	95.00000

Instrument : CHAMBER 091
Detector : 78259
Background Analysis Date/Time : 6-SEP-2009 14:27:10
Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.076	3298.663	1.000000	0.2400001	100.0000	95.00000
NP-237	4435.039	4903.577	5.000000	1.200000	44.72136	95.00000
CM-244	5532.620	5882.943	1.000000	0.2400001	100.0000	95.00000

Instrument : CHAMBER 092
Detector : 79457
Background Analysis Date/Time : 6-SEP-2009 14:27:10
Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.440	3301.094	98.00000	23.52001	10.10153	95.00000
NP-237	4437.352	4901.805	9.000000	2.160001	33.33334	95.00000
CM-244	5530.798	5883.590	9.000000	2.160001	33.33334	95.00000

Instrument : CHAMBER 093
Detector : 33206
Background Analysis Date/Time : 6-SEP-2009 14:27:10
Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.703	3297.696	5.000000	1.200000	44.72136	95.00000
NP-237	4437.176	4906.330	9.000000	2.160001	33.33334	95.00000
CM-244	5534.842	5887.449	1.000000	0.2400001	100.0000	95.00000

Instrument : CHAMBER 094
Detector : 78267
Background Analysis Date/Time : 6-SEP-2009 14:27:10
Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.223	3299.522	2.000000	0.4800001	70.71068	95.00000
NP-237	4437.384	4902.143	9.000000	2.160001	33.33334	95.00000
CM-244	5531.241	5883.942	1.000000	0.2400001	100.0000	95.00000

Instrument : CHAMBER 095
Detector : 64279
Background Analysis Date/Time : 6-SEP-2009 14:27:11
Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.368	3299.100	4.000000	0.9599994	50.00000	95.00000
NP-237	4432.777	4902.890	11.00000	2.639998	30.15113	95.00000
CM-244	5531.978	5884.563	25.00000	5.999996	20.00000	95.00000

Instrument : CHAMBER 096
Detector : 67605
Background Analysis Date/Time : 6-SEP-2009 14:27:11
Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.016	3298.247	3.000000	0.7199996	57.73503	95.00000
NP-237	4433.400	4905.592	17.00000	4.079998	24.25356	95.00000
CM-244	5533.378	5883.405	6.000000	1.439999	40.82483	95.00000

Instrument : CHAMBER 097
Detector : 67599
Background Analysis Date/Time : 6-SEP-2009 14:27:11
Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.986	3300.981	1.000000	0.2399998	100.0000	95.00000
NP-237	4432.608	4904.990	4.000000	0.9599994	50.00000	95.00000
CM-244	5532.644	5882.410	5.000000	1.199999	44.72136	95.00000

Instrument : CHAMBER 098
Detector : 68644
Background Analysis Date/Time : 6-SEP-2009 14:27:11
Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.306	3298.708	7.000000	1.679999	37.79645	95.00000
NP-237	4434.769	4903.339	9.000000	2.159999	33.33334	95.00000
CM-244	5532.564	5883.056	3.000000	0.7199996	57.73503	95.00000

Instrument : CHAMBER 099
Detector : 70317
Background Analysis Date/Time : 6-SEP-2009 14:27:11
Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.666	3300.290	2.000000	0.4799997	70.71068	95.00000
NP-237	4434.357	4903.837	11.00000	2.639998	30.15113	95.00000
CM-244	5533.206	5886.495	5.000000	1.199999	44.72136	95.00000

Instrument : CHAMBER 100
Detector : 79456
Background Analysis Date/Time : 6-SEP-2009 14:27:11
Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.537	3298.592	4.000000	0.9599994	50.00000	95.00000
NP-237	4433.227	4902.504	17.00000	4.079998	24.25356	95.00000
CM-244	5531.221	5883.961	12.00000	2.879998	28.86751	95.00000

Instrument : CHAMBER 101
Detector : 64253
Background Analysis Date/Time : 6-SEP-2009 14:27:11
Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.324	3300.256	3.000000	0.7199996	57.73503	95.00000
NP-237	4433.583	4904.714	11.00000	2.639998	30.15113	95.00000
CM-244	5530.834	5885.200	1.000000	0.2399998	100.0000	95.00000

Instrument : CHAMBER 102
Detector : 72525
Background Analysis Date/Time : 6-SEP-2009 14:27:11
Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.972	3297.750	2.000000	0.4799997	70.71068	95.00000
NP-237	4434.781	4906.296	6.000000	1.439999	40.82483	95.00000
CM-244	5531.260	5887.302	2.000000	0.4799997	70.71068	95.00000

Instrument : CHAMBER 103
Detector : 79461
Background Analysis Date/Time : 6-SEP-2009 14:27:11
Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.531	3301.057	1.000000	0.2399998	100.0000	95.00000
NP-237	4432.571	4902.800	2.000000	0.4799997	70.71068	95.00000
CM-244	5532.928	5886.525	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000

Instrument : CHAMBER 104
Detector : 72524
Background Analysis Date/Time : 6-SEP-2009 14:27:11
Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.726	3302.339	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4433.026	4906.432	9.000000	2.159999	33.33334	95.00000
CM-244	5534.210	5886.645	1.000000	0.2399998	100.0000	95.00000

Instrument : CHAMBER 105
Detector : 78777
Background Analysis Date/Time : 6-SEP-2009 14:27:11
Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.378	3298.176	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4433.342	4905.964	4.000000	0.9599994	50.00000	95.00000
CM-244	5532.223	5883.573	1.000000	0.2399998	100.0000	95.00000

Instrument : CHAMBER 106
Detector : 64274
Background Analysis Date/Time : 6-SEP-2009 14:27:11
Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.139	3297.527	1.000000	0.2399998	100.0000	95.00000
NP-237	4435.882	4902.515	11.00000	2.639998	30.15113	95.00000
CM-244	5535.620	5885.870	5.000000	1.199999	44.72136	95.00000

Instrument : CHAMBER 107
Detector : 67578
Background Analysis Date/Time : 6-SEP-2009 14:27:12
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.674	3297.932	4.000000	0.9600002	50.00000	95.00000
NP-237	4433.280	4901.472	7.000000	1.680000	37.79645	95.00000
CM-244	5535.487	5885.665	1.000000	0.2400000	100.0000	95.00000

Instrument : CHAMBER 108
Detector : 78778
Background Analysis Date/Time : 6-SEP-2009 14:27:12
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.265	3302.021	2.000000	0.4800001	70.71068	95.00000
NP-237	4432.866	4906.223	4.000000	0.9600002	50.00000	95.00000
CM-244	5533.837	5886.132	2.000000	0.4800001	70.71068	95.00000

Instrument : CHAMBER 109
Detector : 79463
Background Analysis Date/Time : 6-SEP-2009 14:27:12
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.183	3300.537	2.000000	0.4800001	70.71068	95.00000
NP-237	4435.497	4906.168	6.000000	1.440000	40.82483	95.00000
CM-244	5532.493	5887.375	2.000000	0.4800001	70.71068	95.00000

Instrument : CHAMBER 110
Detector : 67602
Background Analysis Date/Time : 6-SEP-2009 14:27:12
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.369	3301.395	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4433.897	4901.753	5.000000	1.200000	44.72136	95.00000
CM-244	5534.153	5887.267	15.00000	3.600001	25.81989	95.00000

Instrument : CHAMBER 111
Detector : 79462
Background Analysis Date/Time : 6-SEP-2009 14:27:12
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.920	3299.168	3.000000	0.7200001	57.73503	95.00000
NP-237	4435.442	4904.437	8.000000	1.920000	35.35534	95.00000
CM-244	5534.527	5885.642	2.000000	0.4800001	70.71068	95.00000

Instrument : CHAMBER 112
Detector : 78261
Background Analysis Date/Time : 6-SEP-2009 14:27:12
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.379	3300.588	1.000000	0.2400000	100.0000	95.00000
NP-237	4436.103	4905.883	5.000000	1.200000	44.72136	95.00000
CM-244	5535.395	5883.265	3.000000	0.7200001	57.73503	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	0.0000000E+00	0.0000000E+00	0.0000000E+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	6.000000	1.800000	40.82483	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	15.00000	4.500000	25.81989	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	6.000000	1.800000	40.82483	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	5.000000	1.500000	44.72136	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	0.0000000E+00	0.0000000E+00	0.0000000E+00	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	7.000000	2.100000	37.79645	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	10.00000	3.000000	31.62278	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 : 23-AUG-2009 11:54:11
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.799	3299.450	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4437.354	4905.712	6.000000	1.800000	40.82483	95.00000
CM-244	5533.034	5884.911	14.00000	4.200000	26.72612	95.00000

Instrument : CHAMBER 162
Detector : 70323
Background Analysis Date/Time : 23-AUG-2009 11:54:16
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.108	3297.679	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4437.157	4905.370	5.000000	1.500000	44.72136	95.00000
CM-244	5531.808	5882.856	5.000000	1.500000	44.72136	95.00000

Instrument : CHAMBER 163
Detector : 70324
Background Analysis Date/Time : 23-AUG-2009 11:54:21
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.316	3301.922	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4434.725	4904.333	12.00000	3.600000	28.86751	95.00000
CM-244	5532.622	5884.699	13.00000	3.900000	27.73501	95.00000

Instrument : CHAMBER 164
Detector : 70325
Background Analysis Date/Time : 23-AUG-2009 11:54:26
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.433	3301.590	2.000000	0.6000000	70.71068	95.00000
NP-237	4434.137	4904.243	9.000000	2.700000	33.33334	95.00000
CM-244	5533.726	5886.727	6.000000	1.800000	40.82483	95.00000

Instrument : CHAMBER 165
Detector : 72544
Background Analysis Date/Time : 23-AUG-2009 11:54:31
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.235	3298.979	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4434.502	4904.549	7.000000	2.100000	37.79645	95.00000
CM-244	5532.823	5884.601	7.000000	2.100000	37.79645	95.00000

Instrument : CHAMBER 166
Detector : 74545
Background Analysis Date/Time : 23-AUG-2009 11:54:35
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.175	3297.621	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4434.428	4904.926	5.000000	1.500000	44.72136	95.00000
CM-244	5535.556	5884.119	12.00000	3.600000	28.86751	95.00000

Instrument : CHAMBER 167
Detector : 72546
Background Analysis Date/Time : 23-AUG-2009 11:54:40
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.148	3302.011	2.000000	0.6000000	70.71068	95.00000
NP-237	4433.463	4903.100	12.00000	3.600000	28.86751	95.00000
CM-244	5531.940	5884.576	10.00000	3.000000	31.62278	95.00000

Instrument : CHAMBER 168
Detector : 72547
Background Analysis Date/Time : 23-AUG-2009 11:54:44
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.237	3300.921	1.000000	0.3000000	100.0000	95.00000
NP-237	4437.534	4902.237	16.00000	4.800000	25.00000	95.00000
CM-244	5531.663	5884.741	9.000000	2.700000	33.33334	95.00000

Instrument : CHAMBER 169
Detector : 72548
Background Analysis Date/Time : 23-AUG-2009 11:54:49
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.165	3298.594	1.000000	0.3000000	100.0000	95.00000
NP-237	4434.229	4903.754	13.00000	3.900000	27.73501	95.00000
CM-244	5532.658	5885.433	3.000000	0.9000000	57.73503	95.00000

Instrument : CHAMBER 170
Detector : 72549
Background Analysis Date/Time : 23-AUG-2009 11:54:54
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.025	3299.867	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4432.622	4903.408	16.00000	4.800000	25.00000	95.00000
CM-244	5534.316	5882.981	5.000000	1.500000	44.72136	95.00000

Instrument : CHAMBER 171
Detector : 78260
Background Analysis Date/Time : 23-AUG-2009 11:54:58
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.433	3300.366	1.000000	0.3000000	100.0000	95.00000
NP-237	4436.595	4905.826	9.000000	2.700000	33.33334	95.00000
CM-244	5533.870	5885.935	10.00000	3.000000	31.62278	95.00000

Instrument : CHAMBER 172
Detector : 78772
Background Analysis Date/Time : 23-AUG-2009 11:55:03
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.870	3297.903	3.000000	0.9000000	57.73503	95.00000
NP-237	4433.678	4903.969	9.000000	2.700000	33.33334	95.00000
CM-244	5534.514	5883.121	7.000000	2.100000	37.79645	95.00000

Instrument : CHAMBER 173
Detector : 74431
Background Analysis Date/Time : 23-AUG-2009 11:55:07
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.449	3298.086	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4435.604	4905.905	2.000000	0.6000000	70.71068	95.00000
CM-244	5534.021	5885.467	33.00000	9.900001	17.40777	95.00000

Instrument : CHAMBER 174
Detector : 74432
Background Analysis Date/Time : 23-AUG-2009 11:55:12
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.639	3300.179	2.000000	0.6000000	70.71068	95.00000
NP-237	4435.486	4905.219	9.000000	2.700000	33.33334	95.00000
CM-244	5531.026	5885.734	20.00000	6.000000	22.36068	95.00000

Instrument : CHAMBER 175
Detector : 74433
Background Analysis Date/Time : 23-AUG-2009 11:55:16
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.018	3300.926	1.000000	0.3000000	100.0000	95.00000
NP-237	4437.197	4902.367	8.000000	2.400000	35.35534	95.00000
CM-244	5531.134	5883.215	22.00000	6.600000	21.32007	95.00000

Instrument : CHAMBER 176
Detector : 74434
Background Analysis Date/Time : 23-AUG-2009 11:55:21
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.853	3298.318	1.000000	0.3000000	100.0000	95.00000
NP-237	4433.083	4904.101	7.000000	2.100000	37.79645	95.00000
CM-244	5532.948	5884.695	23.00000	6.900000	20.85144	95.00000

Instrument : CHAMBER 177
Detector : 74435
Background Analysis Date/Time : 23-AUG-2009 11:55:26
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.857	3298.211	3.000000	0.9000000	57.73503	95.00000
NP-237	4433.475	4903.934	1.000000	0.3000000	100.0000	95.00000
CM-244	5533.213	5885.773	29.00000	8.700001	18.56953	95.00000

Instrument : CHAMBER 178
Detector : 74436
Background Analysis Date/Time : 23-AUG-2009 11:55:31
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.399	3300.807	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4432.785	4903.123	10.00000	3.000000	31.62278	95.00000
CM-244	5531.481	5883.158	22.00000	6.600000	21.32007	95.00000

Instrument : CHAMBER 179
Detector : 74437
Background Analysis Date/Time : 23-AUG-2009 11:55:36
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.874	3299.393	2.000000	0.6000000	70.71068	95.00000
NP-237	4435.018	4905.518	5.000000	1.500000	44.72136	95.00000
CM-244	5534.758	5887.251	32.00000	9.600000	17.67767	95.00000

Instrument : CHAMBER 180
Detector : 74438
Background Analysis Date/Time : 23-AUG-2009 11:55:40
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.946	3300.627	2.000000	0.6000000	70.71068	95.00000
NP-237	4434.505	4904.405	9.000000	2.700000	33.33334	95.00000
CM-244	5531.104	5886.649	24.00000	7.200000	20.41241	95.00000

Instrument : CHAMBER 181
Detector : 74439
Background Analysis Date/Time : 23-AUG-2009 11:55:45
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.658	3302.315	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4432.549	4902.677	7.000000	2.100000	37.79645	95.00000
CM-244	5531.208	5883.203	33.00000	9.900001	17.40777	95.00000

Instrument : CHAMBER 182
Detector : 74440
Background Analysis Date/Time : 23-AUG-2009 11:55:49
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.553	3299.709	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4435.824	4905.707	3.000000	0.9000000	57.73503	95.00000
CM-244	5533.404	5884.684	13.00000	3.900000	27.73501	95.00000

Instrument : CHAMBER 183
Detector : 74441
Background Analysis Date/Time : 23-AUG-2009 11:55:54
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.015	3297.962	3.000000	0.9000000	57.73503	95.00000
NP-237	4434.099	4904.342	5.000000	1.500000	44.72136	95.00000
CM-244	5532.826	5884.696	34.00000	10.20000	17.14986	95.00000

Instrument : CHAMBER 184
Detector : 74442
Background Analysis Date/Time : 23-AUG-2009 11:55:58
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.045	3299.169	1.000000	0.3000000	100.0000	95.00000
NP-237	4437.505	4902.470	5.000000	1.500000	44.72136	95.00000
CM-244	5535.333	5886.318	24.00000	7.200000	20.41241	95.00000

Instrument : CHAMBER 185
Detector : 68615
Background Analysis Date/Time : 23-AUG-2009 11:56:04
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.897	3299.344	1.000000	0.3000000	100.0000	95.00000
NP-237	4432.571	4905.243	2.000000	0.6000000	70.71068	95.00000
CM-244	5530.503	5886.106	27.00000	8.100000	19.24501	95.00000

Instrument : CHAMBER 186
Detector : 68616
Background Analysis Date/Time : 23-AUG-2009 11:56:08
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.379	3299.140	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4434.242	4902.774	1.000000	0.3000000	100.0000	95.00000
CM-244	5534.982	5886.349	24.00000	7.200000	20.41241	95.00000

Instrument : CHAMBER 187
Detector : 68620
Background Analysis Date/Time : 23-AUG-2009 11:56:12
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.498	3300.157	4.000000	1.200000	50.00000	95.00000
NP-237	4437.493	4903.961	8.000000	2.400000	35.35534	95.00000
CM-244	5535.243	5883.722	19.00000	5.700000	22.94157	95.00000

Instrument : CHAMBER 188
Detector : 68621
Background Analysis Date/Time : 23-AUG-2009 11:56:16
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.985	3297.497	1.000000	0.3000000	100.0000	95.00000
NP-237	4433.354	4904.064	5.000000	1.500000	44.72136	95.00000
CM-244	5533.683	5886.437	31.00000	9.300000	17.96053	95.00000

Instrument : CHAMBER 189
Detector : 68622
Background Analysis Date/Time : 23-AUG-2009 11:56:21
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.052	3301.735	1.000000	0.3000000	100.0000	95.00000
NP-237	4436.853	4905.539	3.000000	0.9000000	57.73503	95.00000
CM-244	5532.776	5884.354	29.00000	8.700001	18.56953	95.00000

Instrument : CHAMBER 190
Detector : 68623
Background Analysis Date/Time : 23-AUG-2009 11:56:25
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.652	3298.950	4.000000	1.200000	50.00000	95.00000
NP-237	4435.677	4904.720	24.00000	7.200000	20.41241	95.00000
CM-244	5532.170	5883.736	36.00000	10.80000	16.66667	95.00000

Instrument : CHAMBER 191
Detector : 68624
Background Analysis Date/Time : 23-AUG-2009 11:56:29
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.100	3299.772	1.000000	0.3000000	100.0000	95.00000
NP-237	4437.436	4904.158	1.000000	0.3000000	100.0000	95.00000
CM-244	5530.545	5884.668	27.00000	8.100000	19.24501	95.00000

Instrument : CHAMBER 192
Detector : 74430
Background Analysis Date/Time : 23-AUG-2009 11:56:33
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.046	3297.560	1.000000	0.3000000	100.0000	95.00000
NP-237	4437.061	4903.990	4.000000	1.200000	50.00000	95.00000
CM-244	5535.519	5883.955	25.00000	7.500000	20.00000	95.00000

Instrument : CHAMBER 193
Detector : 68627
Background Analysis Date/Time : 23-AUG-2009 11:56:37
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.087	3301.572	2.000000	0.6000000	70.71068	95.00000
NP-237	4436.483	4905.309	7.000000	2.100000	37.79645	95.00000
CM-244	5532.931	5884.819	32.00000	9.600000	17.67767	95.00000

Instrument : CHAMBER 194
Detector : 68635
Background Analysis Date/Time : 23-AUG-2009 11:56:41
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.152	3297.570	1.000000	0.3000000	100.0000	95.00000
NP-237	4434.536	4903.587	4.000000	1.200000	50.00000	95.00000
CM-244	5530.970	5882.461	12.00000	3.600000	28.86751	95.00000

Instrument : CHAMBER 195
Detector : 68636
Background Analysis Date/Time : 23-AUG-2009 11:56:45
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.288	3300.624	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4434.057	4902.978	3.000000	0.9000000	57.73503	95.00000
CM-244	5534.813	5885.542	15.00000	4.500000	25.81989	95.00000

Instrument : CHAMBER 196
Detector : 68637
Background Analysis Date/Time : 23-AUG-2009 11:56:50
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.410	3301.963	3.000000	0.9000000	57.73503	95.00000
NP-237	4437.321	4906.417	5.000000	1.500000	44.72136	95.00000
CM-244	5534.476	5886.645	21.00000	6.300000	21.82179	95.00000

Instrument : CHAMBER 197
Detector : 78894
Background Analysis Date/Time : 23-AUG-2009 11:56:54
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.920	3300.320	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4436.468	4902.348	1.000000	0.3000000	100.0000	95.00000
CM-244	5532.745	5886.065	12.00000	3.600000	28.86751	95.00000

Instrument : CHAMBER 198
Detector : 78895
Background Analysis Date/Time : 23-AUG-2009 11:56:58
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.305	3299.642	1.000000	0.3000000	100.0000	95.00000
NP-237	4434.397	4904.448	1.000000	0.3000000	100.0000	95.00000
CM-244	5533.011	5885.087	30.00000	9.000000	18.25742	95.00000

Instrument : CHAMBER 199
Detector : 78896
Background Analysis Date/Time : 23-AUG-2009 11:57:02
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.912	3297.497	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4433.891	4904.941	5.000000	1.500000	44.72136	95.00000
CM-244	5535.121	5882.869	7.000000	2.100000	37.79645	95.00000

Instrument : CHAMBER 200
Detector : 78900
Background Analysis Date/Time : 23-AUG-2009 11:57:06
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.845	3300.480	2.000000	0.6000000	70.71068	95.00000
NP-237	4436.941	4902.709	10.00000	3.000000	31.62278	95.00000
CM-244	5532.744	5885.759	30.00000	9.000000	18.25742	95.00000

Instrument : CHAMBER 201
Detector : 78902
Background Analysis Date/Time : 23-AUG-2009 11:57:10
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.531	3297.499	1.000000	0.3000000	100.0000	95.00000
NP-237	4434.991	4906.359	5.000000	1.500000	44.72136	95.00000
CM-244	5531.510	5884.700	15.00000	4.500000	25.81989	95.00000

Instrument : CHAMBER 202
Detector : 78903
Background Analysis Date/Time : 23-AUG-2009 11:57:14
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.301	3298.322	1.000000	0.3000000	100.0000	95.00000
NP-237	4432.596	4902.750	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
CM-244	5531.710	5884.137	14.00000	4.200000	26.72612	95.00000

Instrument : CHAMBER 203
Detector : 78905
Background Analysis Date/Time : 23-AUG-2009 11:57:19
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.566	3301.771	4.000000	1.200000	50.00000	95.00000
NP-237	4437.077	4902.609	6.000000	1.800000	40.82483	95.00000
CM-244	5532.534	5885.590	12.00000	3.600000	28.86751	95.00000

Instrument : CHAMBER 204
Detector : 78907
Background Analysis Date/Time : 23-AUG-2009 11:57:23
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.303	3298.289	13.00000	3.900000	27.73501	95.00000
NP-237	4433.152	4903.866	12.00000	3.600000	28.86751	95.00000
CM-244	5533.856	5886.993	34.00000	10.20000	17.14986	95.00000

Instrument : CHAMBER 205
Detector : 78908
Background Analysis Date/Time : 23-AUG-2009 11:57:27
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.267	3299.423	1.000000	0.3000000	100.0000	95.00000
NP-237	4434.928	4905.917	1.000000	0.3000000	100.0000	95.00000
CM-244	5530.946	5884.256	15.00000	4.500000	25.81989	95.00000

Instrument : CHAMBER 206
Detector : 78909
Background Analysis Date/Time : 23-AUG-2009 11:57:31
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.740	3299.836	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4434.469	4904.811	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
CM-244	5534.058	5886.660	13.00000	3.900000	27.73501	95.00000

Instrument : CHAMBER 207
Detector : 78910
Background Analysis Date/Time : 23-AUG-2009 11:57:35
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.560	3301.824	2.000000	0.6000000	70.71068	95.00000
NP-237	4434.563	4905.877	4.000000	1.200000	50.00000	95.00000
CM-244	5530.790	5883.765	14.00000	4.200000	26.72612	95.00000

Instrument : CHAMBER 208
Detector : 78911
Background Analysis Date/Time : 23-AUG-2009 11:57:40
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.613	3299.492	2.000000	0.6000000	70.71068	95.00000
NP-237	4436.795	4902.883	6.000000	1.800000	40.82483	95.00000
CM-244	5533.327	5886.561	13.00000	3.900000	27.73501	95.00000

Instrument : CHAMBER 209
Detector : 79188
Background Analysis Date/Time : 23-AUG-2009 11:57:44
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.940	3298.642	2.000000	0.6000000	70.71068	95.00000
NP-237	4435.592	4905.793	3.000000	0.9000000	57.73503	95.00000
CM-244	5530.388	5883.749	4.000000	1.200000	50.00000	95.00000

Instrument : CHAMBER 210
Detector : 79189
Background Analysis Date/Time : 23-AUG-2009 11:57:48
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.073	3301.089	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4435.142	4905.164	1.000000	0.3000000	100.0000	95.00000
CM-244	5533.916	5886.208	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000

Instrument : CHAMBER 211
Detector : 79190
Background Analysis Date/Time : 23-AUG-2009 11:57:52
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.282	3299.071	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4434.230	4900.253	2.000000	0.6000000	70.71068	95.00000
CM-244	5531.327	5885.262	2.000000	0.6000000	70.71068	95.00000

Instrument : CHAMBER 212
Detector : 79191
Background Analysis Date/Time : 23-AUG-2009 11:57:56
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.918	3298.870	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4437.027	4902.590	1.000000	0.3000000	100.0000	95.00000
CM-244	5533.378	5887.318	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000

Instrument : CHAMBER 213
Detector : 79192
Background Analysis Date/Time : 23-AUG-2009 11:58:01
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.497	3299.775	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4434.841	4905.254	1.000000	0.3000000	100.0000	95.00000
CM-244	5534.504	5887.063	3.000000	0.9000000	57.73503	95.00000

Instrument : CHAMBER 214
Detector : 79193
Background Analysis Date/Time : 23-AUG-2009 11:58:05
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.133	3298.396	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4436.844	4902.153	4.000000	1.200000	50.00000	95.00000
CM-244	5532.271	5885.676	3.000000	0.9000000	57.73503	95.00000

Instrument : CHAMBER 215
Detector : 79194
Background Analysis Date/Time : 23-AUG-2009 11:58:09
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.638	3298.993	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4433.482	4904.904	1.000000	0.3000000	100.0000	95.00000
CM-244	5531.246	5885.655	3.000000	0.9000000	57.73503	95.00000

Instrument : CHAMBER 216
Detector : 79195
Background Analysis Date/Time : 23-AUG-2009 11:58:13
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.181	3299.336	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4432.606	4903.311	1.000000	0.3000000	100.0000	95.00000
CM-244	5533.853	5887.574	3.000000	0.9000000	57.73503	95.00000

Instrument : CHAMBER 217
Detector : 79410
Background Analysis Date/Time : 23-AUG-2009 11:58:18
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.031	3301.074	1.000000	0.3000000	100.0000	95.00000
NP-237	4434.240	4905.058	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
CM-244	5530.547	5884.453	2.000000	0.6000000	70.71068	95.00000

Instrument : CHAMBER 218
Detector : 79411
Background Analysis Date/Time : 23-AUG-2009 11:58:23
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.583	3301.235	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4435.884	4901.733	9.000000	2.700000	33.33334	95.00000
CM-244	5532.602	5886.438	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000

Instrument : CHAMBER 219
Detector : 79412
Background Analysis Date/Time : 23-AUG-2009 11:58:27
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.207	3300.096	1.000000	0.3000000	100.0000	95.00000
NP-237	4435.206	4906.290	4.000000	1.200000	50.00000	95.00000
CM-244	5531.669	5885.285	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000

Instrument : CHAMBER 220
Detector : 79413
Background Analysis Date/Time : 23-AUG-2009 11:58:31
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.930	3297.738	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4435.749	4901.420	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
CM-244	5532.504	5886.683	1.000000	0.3000000	100.0000	95.00000

Instrument : CHAMBER 221
Detector : 79414
Background Analysis Date/Time : 23-AUG-2009 11:58:35
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.954	3298.454	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4435.659	4902.272	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
CM-244	5533.925	5882.692	2.000000	0.6000000	70.71068	95.00000

Instrument : CHAMBER 222
Detector : 79415
Background Analysis Date/Time : 23-AUG-2009 11:58:40
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.392	3301.657	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4433.525	4905.197	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
CM-244	5534.683	5886.672	2.000000	0.6000000	70.71068	95.00000

Instrument : CHAMBER 223
Detector : 79416
Background Analysis Date/Time : 23-AUG-2009 11:58:47
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.058	3298.884	2.000000	0.6000000	70.71068	95.00000
NP-237	4432.434	4905.074	2.000000	0.6000000	70.71068	95.00000
CM-244	5532.599	5887.467	3.000000	0.9000000	57.73503	95.00000

Instrument : CHAMBER 224
Detector : 79417
Background Analysis Date/Time : 23-AUG-2009 11:58:53
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.636	3298.216	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4432.951	4905.382	3.000000	0.9000000	57.73503	95.00000
CM-244	5532.025	5886.099	4.000000	1.200000	50.00000	95.00000

Instrument : CHAMBER 225
Detector : 79418
Background Analysis Date/Time : 23-AUG-2009 11:58:59
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.462	3299.408	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4434.737	4905.917	1.000000	0.3000000	100.0000	95.00000
CM-244	5531.430	5885.124	1.000000	0.3000000	100.0000	95.00000

Instrument : CHAMBER 226
Detector : 79419
Background Analysis Date/Time : 23-AUG-2009 11:59:05
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.793	3300.581	1.000000	0.3000000	100.0000	95.00000
NP-237	4433.080	4904.877	2.000000	0.6000000	70.71068	95.00000
CM-244	5530.936	5884.804	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000

Instrument : CHAMBER 227
Detector : 79420
Background Analysis Date/Time : 23-AUG-2009 11:59:10
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.468	3297.622	1.000000	0.3000000	100.0000	95.00000
NP-237	4433.427	4904.675	1.000000	0.3000000	100.0000	95.00000
CM-244	5535.505	5883.794	1.000000	0.3000000	100.0000	95.00000

Instrument : CHAMBER 228
Detector : 79421
Background Analysis Date/Time : 23-AUG-2009 11:59:16
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.529	3302.052	1.000000	0.3000000	100.0000	95.00000
NP-237	4435.206	4906.368	1.000000	0.3000000	100.0000	95.00000
CM-244	5530.800	5883.365	1.000000	0.3000000	100.0000	95.00000

Instrument : CHAMBER 229
Detector : 79422
Background Analysis Date/Time : 23-AUG-2009 11:59:21
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.967	3297.813	1.000000	0.3000000	100.0000	95.00000
NP-237	4433.942	4905.968	2.000000	0.6000000	70.71068	95.00000
CM-244	5533.045	5882.442	1.000000	0.3000000	100.0000	95.00000

Instrument : CHAMBER 230
Detector : 79423
Background Analysis Date/Time : 23-AUG-2009 11:59:28
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.307	3300.916	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4432.950	4904.639	2.000000	0.6000000	70.71068	95.00000
CM-244	5530.626	5884.491	1.000000	0.3000000	100.0000	95.00000

Instrument : CHAMBER 231
Detector : 79424
Background Analysis Date/Time : 23-AUG-2009 11:59:34
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.314	3302.411	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4437.493	4903.010	4.000000	1.200000	50.00000	95.00000
CM-244	5532.978	5886.091	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000

Instrument : CHAMBER 232
Detector : 79425
Background Analysis Date/Time : 23-AUG-2009 11:59:39
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.963	3301.243	2.000000	0.6000000	70.71068	95.00000
NP-237	4436.020	4902.090	4.000000	1.200000	50.00000	95.00000
CM-244	5531.563	5883.791	2.000000	0.6000000	70.71068	95.00000

Instrument : CHAMBER 233
Detector : 79426
Background Analysis Date/Time : 23-AUG-2009 11:59:46
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.373	3302.025	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4434.487	4905.324	2.000000	0.6000000	70.71068	95.00000
CM-244	5531.110	5885.315	3.000000	0.9000000	57.73503	95.00000

Instrument : CHAMBER 234
Detector : 79427
Background Analysis Date/Time : 23-AUG-2009 11:59:51
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.269	3300.079	1.000000	0.3000000	100.0000	95.00000
NP-237	4436.893	4901.571	1.000000	0.3000000	100.0000	95.00000
CM-244	5530.864	5883.822	6.000000	1.800000	40.82483	95.00000

Instrument : CHAMBER 235
Detector : 79428
Background Analysis Date/Time : 23-AUG-2009 11:59:57
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.964	3301.553	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4434.767	4906.350	1.000000	0.3000000	100.0000	95.00000
CM-244	5533.497	5883.248	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000

Instrument : CHAMBER 236
Detector : 79429
Background Analysis Date/Time : 23-AUG-2009 12:00:03
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.553	3300.921	3.000000	0.9000000	57.73503	95.00000
NP-237	4432.813	4903.618	11.00000	3.300000	30.15113	95.00000
CM-244	5534.883	5883.901	1.000000	0.3000000	100.0000	95.00000

Instrument : CHAMBER 237
Detector : 79430
Background Analysis Date/Time : 23-AUG-2009 12:00:08
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.412	3298.430	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4434.021	4905.306	1.000000	0.3000000	100.0000	95.00000
CM-244	5530.956	5884.725	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000

Instrument : CHAMBER 238
Detector : 79431
Background Analysis Date/Time : 23-AUG-2009 12:00:14
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.738	3300.787	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4433.583	4904.073	4.000000	1.200000	50.00000	95.00000
CM-244	5534.315	5882.484	1.000000	0.3000000	100.0000	95.00000

Instrument : CHAMBER 239
Detector : 79432
Background Analysis Date/Time : 23-AUG-2009 12:00:20
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.271	3298.066	2.000000	0.6000000	70.71068	95.00000
NP-237	4436.718	4902.950	8.000000	2.400000	35.35534	95.00000
CM-244	5535.054	5884.530	1.000000	0.3000000	100.0000	95.00000

Instrument : CHAMBER 240
Detector : 79433
Background Analysis Date/Time : 23-AUG-2009 12:00:26
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.716	3297.687	2.000000	0.6000000	70.71068	95.00000
NP-237	4436.108	4901.861	3.000000	0.9000000	57.73503	95.00000
CM-244	5532.981	5887.143	1.000000	0.3000000	100.0000	95.00000

Instrument : CHAMBER 241
Detector : 79434
Background Analysis Date/Time : 23-AUG-2009 12:00:31
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.942	3297.913	4.000000	1.200000	50.00000	95.00000
NP-237	4434.531	4905.642	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
CM-244	5532.339	5887.328	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000

Instrument : CHAMBER 242
Detector : 79435
Background Analysis Date/Time : 23-AUG-2009 12:00:38
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.675	3302.424	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4435.599	4901.625	2.000000	0.6000000	70.71068	95.00000
CM-244	5533.423	5882.719	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000

Instrument : CHAMBER 243
Detector : 79436
Background Analysis Date/Time : 23-AUG-2009 12:00:44
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.382	3298.347	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4434.037	4905.494	2.000000	0.6000000	70.71068	95.00000
CM-244	5531.482	5885.497	1.000000	0.3000000	100.0000	95.00000

Instrument : CHAMBER 244
Detector : 79437
Background Analysis Date/Time : 23-AUG-2009 12:00:50
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.566	3299.789	5.000000	1.500000	44.72136	95.00000
NP-237	4433.571	4904.626	2.000000	0.6000000	70.71068	95.00000
CM-244	5530.417	5884.486	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000

Instrument : CHAMBER 245
Detector : 79438
Background Analysis Date/Time : 23-AUG-2009 12:00:56
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.843	3302.525	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4434.670	4906.399	2.000000	0.6000000	70.71068	95.00000
CM-244	5532.436	5886.326	1.000000	0.3000000	100.0000	95.00000

Instrument : CHAMBER 246
Detector : 78912
Background Analysis Date/Time : 23-AUG-2009 12:01:02
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.420	3298.792	1.000000	0.3000000	100.0000	95.00000
NP-237	4433.098	4904.335	4.000000	1.200000	50.00000	95.00000
CM-244	5530.336	5884.508	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000

Instrument : CHAMBER 247
Detector : 79440
Background Analysis Date/Time : 23-AUG-2009 12:01:07
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.040	3298.952	5.000000	1.500000	44.72136	95.00000
NP-237	4435.157	4901.869	5.000000	1.500000	44.72136	95.00000
CM-244	5534.103	5883.404	6.000000	1.800000	40.82483	95.00000

Instrument : CHAMBER 248
Detector : 79441
Background Analysis Date/Time : 23-AUG-2009 12:01:13
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.950	3302.491	1.000000	0.3000000	100.0000	95.00000
NP-237	4437.546	4903.912	6.000000	1.800000	40.82483	95.00000
CM-244	5530.441	5884.950	3.000000	0.9000000	57.73503	95.00000

Instrument : CHAMBER 249
Detector : 79442
Background Analysis Date/Time : 23-AUG-2009 12:01:19
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.458	3299.653	2.000000	0.6000000	70.71068	95.00000
NP-237	4437.087	4904.383	6.000000	1.800000	40.82483	95.00000
CM-244	5532.120	5887.291	2.000000	0.6000000	70.71068	95.00000

Instrument : CHAMBER 250
Detector : 79443
Background Analysis Date/Time : 23-AUG-2009 12:01:25
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.375	3300.259	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4433.621	4904.859	3.000000	0.9000000	57.73503	95.00000
CM-244	5531.200	5885.729	1.000000	0.3000000	100.0000	95.00000

Instrument : CHAMBER 251
Detector : 79444
Background Analysis Date/Time : 23-AUG-2009 12:01:31
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.181	3299.694	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4435.877	4903.211	9.000000	2.700000	33.33334	95.00000
CM-244	5531.476	5887.181	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000

Instrument : CHAMBER 252
Detector : 79445
Background Analysis Date/Time : 23-AUG-2009 12:01:36
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.594	3297.549	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4436.816	4903.310	2.000000	0.6000000	70.71068	95.00000
CM-244	5530.420	5885.459	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000

Instrument : CHAMBER 253
Detector : 79446
Background Analysis Date/Time : 23-AUG-2009 12:01:42
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.116	3298.147	1.000000	0.3000000	100.0000	95.00000
NP-237	4437.082	4905.908	11.00000	3.300000	30.15113	95.00000
CM-244	5531.106	5882.794	1.000000	0.3000000	100.0000	95.00000

Instrument : CHAMBER 254
Detector : 79447
Background Analysis Date/Time : 23-AUG-2009 12:01:48
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.155	3297.706	1.000000	0.3000000	100.0000	95.00000
NP-237	4433.107	4904.992	6.000000	1.800000	40.82483	95.00000
CM-244	5532.020	5886.853	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000

Instrument : CHAMBER 255
Detector : 79448
Background Analysis Date/Time : 23-AUG-2009 12:02:23
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.598	3300.373	1.000000	0.3000000	100.0000	95.00000
NP-237	4437.418	4905.095	9.000000	2.700000	33.33334	95.00000
CM-244	5533.813	5884.354	1.000000	0.3000000	100.0000	95.00000

Instrument : CHAMBER 256
Detector : 79449
Background Analysis Date/Time : 23-AUG-2009 12:02:28
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.222	3298.267	1.000000	0.3000000	100.0000	95.00000
NP-237	4432.956	4905.052	3.000000	0.9000000	57.73503	95.00000
CM-244	5532.797	5882.840	2.000000	0.6000000	70.71068	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 : 4-SEP-2009 07:36:39
Calibration Count Time : 240.0000
Efficiency Calibration Date/Time : 4-SEP-2009 12:35:32
Average Efficiency : 0.3122659
Average Efficiency Error : 8.6114258E-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	2989.095	3301.491	15006.00	0.3039177	1.3064248E-02	58.79536
NP-237	171.0024	28-FEB-2010	4436.328	4901.460	12916.00	0.3146430	1.5974019E-02	71.14886
CM-244	158.1060	28-FEB-2010	5531.570	5886.270	11555.00	0.3229480	1.6424600E-02	57.32594

Instrument : CHAMBER 002
Detector : 78266
Standard ID : AESS-002
Standard Reference Date : 19-FEB-2008 11:05:22
Calibration Analysis Date/Time : 4-SEP-2009 07:36:39
Calibration Count Time : 240.0000
Efficiency Calibration Date/Time : 4-SEP-2009 12:35:41
Average Efficiency : 0.3090980
Average Efficiency Error : 8.5114390E-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	2992.085	3299.620	14650.00	0.3094049	1.3305944E-02	45.54427
NP-237	200.4990	28-FEB-2010	4434.644	4904.846	15015.00	0.3119993	1.5806440E-02	68.48380
CM-244	196.5558	28-FEB-2010	5534.154	5882.659	13603.00	0.3058844	1.5517467E-02	51.44160

Instrument : CHAMBER 003
Detector : 67617
Standard ID : AESS-003
Standard Reference Date : 15-FEB-2008 13:12:27
Calibration Analysis Date/Time : 4-SEP-2009 07:36:39
Calibration Count Time : 240.0000
Efficiency Calibration Date/Time : 4-SEP-2009 12:35:49
Average Efficiency : 0.3361934
Average Efficiency Error : 9.2456024E-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	2991.938	3299.717	15919.00	0.3314925	1.4234867E-02	68.71011
NP-237	203.2080	28-FEB-2010	4432.844	4902.827	16799.00	0.3444051	1.7424129E-02	74.30300
CM-244	197.2236	28-FEB-2010	5531.440	5887.803	14947.00	0.3350840	1.6976947E-02	62.51212

Instrument : CHAMBER 004
Detector : 64279
Standard ID : AESS-004
Standard Reference Date : 14-FEB-2008 09:35:18
Calibration Analysis Date/Time : 4-SEP-2009 07:36:39
Calibration Count Time : 240.0000
Efficiency Calibration Date/Time : 4-SEP-2009 12:35:56
Average Efficiency : 0.3331009
Average Efficiency Error : 9.1593768E-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	2992.026	3298.308	16101.00	0.3301861	1.4176016E-02	53.22534
NP-237	204.2586	28-FEB-2010	4435.760	4905.548	16353.00	0.3335505	1.6880305E-02	62.94835
CM-244	198.8100	28-FEB-2010	5534.947	5883.809	15145.00	0.3368652	1.7064264E-02	54.23564

Instrument : CHAMBER 005
Detector : 67612
Standard ID : AESS-005
Standard Reference Date : 14-FEB-2008 09:35:18
Calibration Analysis Date/Time : 4-SEP-2009 07:36:39
Calibration Count Time : 240.0000
Efficiency Calibration Date/Time : 4-SEP-2009 12:36:04
Average Efficiency : 0.2950116
Average Efficiency Error : 8.1236903E-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	2989.654	3300.689	14685.00	0.2945226	1.2665418E-02	52.17361
NP-237	209.5938	28-FEB-2010	4436.859	4901.997	14804.00	0.2942757	1.4911278E-02	59.02256
CM-244	202.7478	28-FEB-2010	5533.435	5885.045	13592.00	0.2964495	1.5039029E-02	52.51872

Instrument : CHAMBER 006
Detector : 67613
Standard ID : AESS-006
Standard Reference Date : 14-FEB-2008 09:35:18
Calibration Analysis Date/Time : 4-SEP-2009 07:36:39
Calibration Count Time : 240.0000
Efficiency Calibration Date/Time : 4-SEP-2009 12:36:12
Average Efficiency : 0.3072436
Average Efficiency Error : 8.4615378E-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	2987.771	3301.528	14462.00	0.3000935	1.2908642E-02	53.74769
NP-237	204.7038	28-FEB-2010	4433.310	4904.612	15292.00	0.3112141	1.5762975E-02	64.28081
CM-244	195.0060	28-FEB-2010	5535.175	5883.158	13852.00	0.3140766	1.5929047E-02	53.04362

Instrument	:	CHAMBER 007
Detector	:	67607
Standard ID	:	AESS-007
Standard Reference Date	:	14-FEB-2008 13:39:25
Calibration Analysis Date/Time	:	4-SEP-2009 07:36:40
Calibration Count Time	:	239.9998
Efficiency Calibration Date/Time	:	4-SEP-2009 12:36:20
Average Efficiency	:	0.2367712
Average Efficiency Error	:	6.6109751E-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	2991.315	3300.370	13798.00	0.2821096	1.2145956E-02	48.72938
NP-237	205.0260	28-FEB-2010	4436.975	4905.147	11957.00	0.2429639	1.2349783E-02	65.83331
CM-244	199.6806	28-FEB-2010	5533.959	5885.477	9051.000	0.2003213	1.0235304E-02	52.23785

Instrument	:	CHAMBER 008
Detector	:	78788
Standard ID	:	AESS-008
Standard Reference Date	:	14-FEB-2008 13:39:25
Calibration Analysis Date/Time	:	4-SEP-2009 07:36:40
Calibration Count Time	:	239.9998
Efficiency Calibration Date/Time	:	4-SEP-2009 12:36:40
Average Efficiency	:	0.3205987
Average Efficiency Error	:	8.8198772E-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	2989.794	3298.426	15461.00	0.3171742	1.3626882E-02	47.98743
NP-237	209.2716	28-FEB-2010	4437.020	4904.595	16084.00	0.3202048	1.6208146E-02	61.69046
CM-244	199.6488	28-FEB-2010	5532.536	5882.336	14721.00	0.3260421	1.6522150E-02	43.41613

Instrument	:	CHAMBER 009
Detector	:	72528
Standard ID	:	AESS-009
Standard Reference Date	:	19-FEB-2008 11:05:22
Calibration Analysis Date/Time	:	4-SEP-2009 07:36:40
Calibration Count Time	:	239.9998
Efficiency Calibration Date/Time	:	4-SEP-2009 12:36:51
Average Efficiency	:	0.3402912
Average Efficiency Error	:	9.3554687E-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	2990.892	3299.892	16250.00	0.3376825	1.4495632E-02	49.34795
NP-237	204.0192	28-FEB-2010	4433.436	4905.789	16617.00	0.3393191	1.7169004E-02	62.72510
CM-244	197.2128	28-FEB-2010	5532.687	5887.081	15400.00	0.3450909	1.7477276E-02	53.13368

Instrument : CHAMBER 010
Detector : 72529
Standard ID : AESS-010
Standard Reference Date : 14-FEB-2008 13:39:25
Calibration Analysis Date/Time : 4-SEP-2009 07:36:40
Calibration Count Time : 239.9998
Efficiency Calibration Date/Time : 4-SEP-2009 12:37:00
Average Efficiency : 0.3139585
Average Efficiency Error : 8.6422609E-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	2988.087	3300.334	14912.00	0.3120262	1.3414358E-02	49.22013
NP-237	202.9926	28-FEB-2010	4436.842	4905.812	15310.00	0.3142270	1.5915314E-02	60.15851
CM-244	196.2330	28-FEB-2010	5533.178	5884.706	14044.00	0.3164504	1.6046330E-02	53.33372

Instrument : CHAMBER 011
Detector : 72531
Standard ID : AESS-011
Standard Reference Date : 14-FEB-2008 13:39:25
Calibration Analysis Date/Time : 4-SEP-2009 07:36:40
Calibration Count Time : 239.9998
Efficiency Calibration Date/Time : 4-SEP-2009 12:37:27
Average Efficiency : 0.2979373
Average Efficiency Error : 8.2009137E-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	2990.718	3301.411	14912.00	0.2961519	1.2731905E-02	50.71152
NP-237	214.4868	28-FEB-2010	4435.900	4905.463	15442.00	0.2999101	1.5188582E-02	60.36610
CM-244	208.4184	28-FEB-2010	5535.617	5886.431	14071.00	0.2985013	1.5135813E-02	50.96436

Instrument : CHAMBER 012
Detector : 67594
Standard ID : AESS-012
Standard Reference Date : 14-FEB-2008 13:39:25
Calibration Analysis Date/Time : 4-SEP-2009 07:36:40
Calibration Count Time : 239.9998
Efficiency Calibration Date/Time : 4-SEP-2009 12:37:37
Average Efficiency : 0.2994823
Average Efficiency Error : 8.2469489E-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	2989.283	3301.924	14660.00	0.3004818	1.2922071E-02	52.00318
NP-237	205.8930	28-FEB-2010	4434.309	4903.502	14933.00	0.3021517	1.5308659E-02	64.10130
CM-244	203.1954	28-FEB-2010	5531.028	5882.575	13584.00	0.2955756	1.4994888E-02	57.14846

Instrument : CHAMBER 013
Detector : 78790
Standard ID : AESS-013
Standard Reference Date : 14-FEB-2008 17:45:04
Calibration Analysis Date/Time : 4-SEP-2009 07:36:41
Calibration Count Time : 240.0000
Efficiency Calibration Date/Time : 4-SEP-2009 12:37:47
Average Efficiency : 0.3441789
Average Efficiency Error : 9.4585977E-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	2992.309	3297.583	16707.00	0.3467621	1.4878578E-02	47.93691
NP-237	210.2526	28-FEB-2010	4432.512	4904.184	17205.00	0.3409068	1.7242415E-02	63.48001
CM-244	201.9108	28-FEB-2010	5533.734	5883.657	15707.00	0.3439779	1.7416557E-02	53.05471

Instrument : CHAMBER 014
Detector : 67616
Standard ID : AESS-014
Standard Reference Date : 19-FEB-2008 11:05:22
Calibration Analysis Date/Time : 4-SEP-2009 07:36:41
Calibration Count Time : 240.0000
Efficiency Calibration Date/Time : 4-SEP-2009 12:37:57
Average Efficiency : 0.3126531
Average Efficiency Error : 8.6011579E-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	2990.575	3298.988	15569.00	0.3064544	1.3164708E-02	48.59332
NP-237	211.7160	28-FEB-2010	4436.470	4903.458	16179.00	0.3183725	1.6114254E-02	68.41453
CM-244	207.3882	28-FEB-2010	5530.496	5885.133	14842.00	0.3161798	1.6020818E-02	54.78078

Instrument : CHAMBER 015
Detector : 61581
Standard ID : AESS-015
Standard Reference Date : 14-FEB-2008 17:45:04
Calibration Analysis Date/Time : 4-SEP-2009 07:36:41
Calibration Count Time : 240.0000
Efficiency Calibration Date/Time : 4-SEP-2009 12:38:32
Average Efficiency : 0.3250474
Average Efficiency Error : 8.9431657E-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	2987.656	3297.520	15498.00	0.3210663	1.3793531E-02	58.50532
NP-237	200.6460	28-FEB-2010	4435.901	4901.612	15878.00	0.3296820	1.6690506E-02	70.32646
CM-244	195.9270	28-FEB-2010	5535.255	5884.514	14460.00	0.3262195	1.6535265E-02	60.28641

Instrument : CHAMBER 016
Detector : 78774
Standard ID : AESS-016
Standard Reference Date : 14-FEB-2008 17:45:04
Calibration Analysis Date/Time : 4-SEP-2009 07:36:41
Calibration Count Time : 240.0000
Efficiency Calibration Date/Time : 4-SEP-2009 12:39:14
Average Efficiency : 0.3337179
Average Efficiency Error : 9.1785332E-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	2988.611	3297.891	15952.00	0.3304393	1.4189126E-02	48.70612
NP-237	199.3962	28-FEB-2010	4435.494	4901.479	16393.00	0.3425452	1.7334972E-02	61.52191
CM-244	198.6402	28-FEB-2010	5530.741	5886.030	14827.00	0.3300566	1.6723992E-02	56.19504

Instrument : CHAMBER 017
Detector : 78791
Standard ID : AESS-017
Standard Reference Date : 14-FEB-2008 17:45:04
Calibration Analysis Date/Time : 4-SEP-2009 07:36:41
Calibration Count Time : 240.0000
Efficiency Calibration Date/Time : 4-SEP-2009 12:39:56
Average Efficiency : 0.2932511
Average Efficiency Error : 8.0763726E-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	2989.315	3299.165	14535.00	0.2924541	1.2578820E-02	44.96824
NP-237	208.5846	28-FEB-2010	4433.955	4905.994	14930.00	0.2982117	1.5109048E-02	56.65096
CM-244	205.5828	28-FEB-2010	5531.756	5885.157	13466.00	0.2896459	1.4695838E-02	49.42458

Instrument : CHAMBER 018
Detector : 78782
Standard ID : AESS-018
Standard Reference Date : 14-FEB-2008 17:45:04
Calibration Analysis Date/Time : 4-SEP-2009 07:36:41
Calibration Count Time : 240.0000
Efficiency Calibration Date/Time : 4-SEP-2009 12:40:11
Average Efficiency : 0.3229291
Average Efficiency Error : 8.8838805E-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	2989.045	3297.645	15448.00	0.3229351	1.3874616E-02	44.39913
NP-237	208.8990	28-FEB-2010	4435.824	4903.103	16130.00	0.3216979	1.6283154E-02	64.50001
CM-244	198.1458	28-FEB-2010	5530.534	5885.395	14527.00	0.3241743	1.6430404E-02	51.39432

Instrument : CHAMBER 019
Detector : 78786
Standard ID : AESS-019
Standard Reference Date : 19-FEB-2008 11:05:22
Calibration Analysis Date/Time : 4-SEP-2009 07:36:42
Calibration Count Time : 240.0000
Efficiency Calibration Date/Time : 4-SEP-2009 12:40:24
Average Efficiency : 0.2905655
Average Efficiency Error : 8.0145085E-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	2992.371	3300.084	13452.00	0.2778059	1.1966659E-02	44.41962
NP-237	202.9140	28-FEB-2010	4432.711	4901.697	14988.00	0.3077365	1.5590836E-02	62.76942
CM-244	199.3140	28-FEB-2010	5534.730	5883.386	13290.00	0.2946945	1.4954864E-02	50.33946

Instrument : CHAMBER 020
Detector : 78787
Standard ID : AESS-020
Standard Reference Date : 14-FEB-2008 21:55:55
Calibration Analysis Date/Time : 4-SEP-2009 07:36:42
Calibration Count Time : 240.0000
Efficiency Calibration Date/Time : 4-SEP-2009 12:40:33
Average Efficiency : 0.3434685
Average Efficiency Error : 9.4453506E-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	2990.745	3300.511	16134.00	0.3317050	1.4240759E-02	49.47922
NP-237	203.4984	28-FEB-2010	4436.191	4903.850	17194.00	0.3519965	1.7803436E-02	60.99994
CM-244	197.1096	28-FEB-2010	5531.198	5885.719	15755.00	0.3534269	1.7894309E-02	50.27258

Instrument : CHAMBER 021
Detector : 67047
Standard ID : AESS-021
Standard Reference Date : 19-FEB-2008 15:31:52
Calibration Analysis Date/Time : 4-SEP-2009 07:36:42
Calibration Count Time : 240.0000
Efficiency Calibration Date/Time : 4-SEP-2009 12:40:41
Average Efficiency : 0.3053718
Average Efficiency Error : 8.4061036E-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	2991.027	3300.488	14910.00	0.3024271	1.3001683E-02	54.25101
NP-237	210.1548	28-FEB-2010	4433.390	4904.438	15336.00	0.3040332	1.5398674E-02	66.84158
CM-244	200.7390	28-FEB-2010	5534.035	5886.544	14134.00	0.3111110	1.5774274E-02	53.45971

Instrument : CHAMBER 022
Detector : 72530
Standard ID : AESS-022
Standard Reference Date : 14-FEB-2008 21:55:55
Calibration Analysis Date/Time : 4-SEP-2009 07:36:42
Calibration Count Time : 240.0000
Efficiency Calibration Date/Time : 4-SEP-2009 12:40:50
Average Efficiency : 0.3167550
Average Efficiency Error : 8.7174345E-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	2992.050	3301.029	15236.00	0.3069546	1.3191545E-02	48.80446
NP-237	206.8830	28-FEB-2010	4437.549	4902.815	16171.00	0.3256005	1.6480263E-02	64.55595
CM-244	203.0208	28-FEB-2010	5531.706	5883.854	14838.00	0.3231215	1.6372502E-02	53.46963

Instrument : CHAMBER 023
Detector : 78264
Standard ID : AESS-023
Standard Reference Date : 14-FEB-2008 21:55:55
Calibration Analysis Date/Time : 4-SEP-2009 07:36:42
Calibration Count Time : 240.0000
Efficiency Calibration Date/Time : 4-SEP-2009 12:40:59
Average Efficiency : 0.3319828
Average Efficiency Error : 9.1288136E-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	2991.319	3301.853	16017.00	0.3263104	1.4010864E-02	47.06707
NP-237	207.4998	28-FEB-2010	4434.632	4902.993	16663.00	0.3345701	1.6928136E-02	62.52299
CM-244	199.8804	28-FEB-2010	5531.100	5885.960	15271.00	0.3377988	1.7109787E-02	47.13729

Instrument : CHAMBER 024
Detector : 76542
Standard ID : AESS-024
Standard Reference Date : 14-FEB-2008 21:55:55
Calibration Analysis Date/Time : 4-SEP-2009 07:36:42
Calibration Count Time : 240.0000
Efficiency Calibration Date/Time : 4-SEP-2009 12:41:10
Average Efficiency : 0.3282878
Average Efficiency Error : 9.0300748E-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	2988.280	3301.361	15578.00	0.3235334	1.3898253E-02	49.01440
NP-237	205.6662	28-FEB-2010	4434.951	4904.473	16364.00	0.3314564	1.6774241E-02	73.72572
CM-244	198.3060	28-FEB-2010	5532.286	5883.922	14893.00	0.3320678	1.6824935E-02	56.15541

Instrument : CHAMBER 025
Detector : 45-149AA5
Standard ID : AESS-025
Standard Reference Date : 15-FEB-2008 09:06:52
Calibration Analysis Date/Time : 5-SEP-2009 09:03:08
Calibration Count Time : 240.0000
Efficiency Calibration Date/Time : 5-SEP-2009 13:36:12
Average Efficiency : 0.3276502
Average Efficiency Error : 9.0310313E-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	2988.958	3301.287	15226.00	0.3290954	1.4142862E-02	57.79382
NP-237	167.9916	28-FEB-2010	4436.686	4904.740	13253.00	0.3286704	1.6679743E-02	71.75627
CM-244	157.2432	28-FEB-2010	5534.991	5882.562	11563.00	0.3246800	1.6513394E-02	67.10056

Instrument : CHAMBER 026
Detector : 78204
Standard ID : AESS-026
Standard Reference Date : 15-FEB-2008 09:06:52
Calibration Analysis Date/Time : 5-SEP-2009 09:03:08
Calibration Count Time : 240.0000
Efficiency Calibration Date/Time : 5-SEP-2009 13:36:22
Average Efficiency : 0.3213052
Average Efficiency Error : 9.4170934E-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	2988.735	3300.836	15089.00	0.3196830	1.6195688E-02	50.04417
NP-237	168.0294	28-FEB-2010	4435.801	4902.784	13239.00	0.3282672	1.6659509E-02	56.07543
CM-244	160.5822	28-FEB-2010	5530.708	5886.284	11504.00	0.3164098	1.6093958E-02	50.89248

Instrument : CHAMBER 027
Detector : 42484
Standard ID : AESS-027
Standard Reference Date : 15-FEB-2008 09:06:52
Calibration Analysis Date/Time : 5-SEP-2009 09:03:08
Calibration Count Time : 240.0000
Efficiency Calibration Date/Time : 5-SEP-2009 13:36:31
Average Efficiency : 0.3385510
Average Efficiency Error : 9.9218553E-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	2989.280	3298.316	15261.00	0.3334595	1.6891224E-02	44.29322
NP-237	161.6154	28-FEB-2010	4433.196	4906.637	13292.00	0.3426305	1.7387481E-02	57.33553
CM-244	148.1754	28-FEB-2010	5535.439	5885.723	11402.00	0.3398517	1.7288936E-02	52.16496

Instrument : CHAMBER 028
Detector : 78792
Standard ID : AESS-028
Standard Reference Date : 15-FEB-2008 09:06:52
Calibration Analysis Date/Time : 5-SEP-2009 09:03:08
Calibration Count Time : 240.0000
Efficiency Calibration Date/Time : 5-SEP-2009 13:36:41
Average Efficiency : 0.3044925
Average Efficiency Error : 8.9324238E-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	2989.441	3297.640	14137.00	0.2992923	1.5175839E-02	43.30858
NP-237	168.1992	28-FEB-2010	4435.847	4903.788	12490.00	0.3093279	1.5712239E-02	58.21876
CM-244	156.7614	28-FEB-2010	5532.676	5883.223	10835.00	0.3052154	1.5540821E-02	45.24567

Instrument : CHAMBER 029
Detector : 33454
Standard ID : AESS-029
Standard Reference Date : 15-FEB-2008 09:06:52
Calibration Analysis Date/Time : 5-SEP-2009 09:03:08
Calibration Count Time : 240.0000
Efficiency Calibration Date/Time : 5-SEP-2009 13:36:49
Average Efficiency : 0.3151154
Average Efficiency Error : 9.2400359E-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	2987.567	3301.667	14598.00	0.3061087	1.5514722E-02	59.98596
NP-237	169.7700	28-FEB-2010	4432.493	4902.470	13008.00	0.3191791	1.6202597E-02	64.76778
CM-244	154.8234	28-FEB-2010	5535.032	5883.746	11258.00	0.3209674	1.6332163E-02	52.83419

Instrument : CHAMBER 030
Detector : 33447
Standard ID : AESS-030
Standard Reference Date : 15-FEB-2008 09:06:52
Calibration Analysis Date/Time : 5-SEP-2009 09:03:08
Calibration Count Time : 240.0000
Efficiency Calibration Date/Time : 5-SEP-2009 13:36:58
Average Efficiency : 0.3203139
Average Efficiency Error : 9.3901874E-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	2991.332	3299.665	14751.00	0.3133562	1.5879847E-02	54.85928
NP-237	166.3758	28-FEB-2010	4436.037	4902.215	13026.00	0.3261414	1.6555686E-02	71.82014
CM-244	157.1856	28-FEB-2010	5533.195	5886.933	11469.00	0.3220125	1.6380262E-02	58.73045

Instrument : CHAMBER 031
Detector : 67042
Standard ID : AESS-031
Standard Reference Date : 18-FEB-2008 11:28:15
Calibration Analysis Date/Time : 5-SEP-2009 09:03:09
Calibration Count Time : 239.9998
Efficiency Calibration Date/Time : 5-SEP-2009 13:37:09
Average Efficiency : 0.3353133
Average Efficiency Error : 9.2432722E-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	2988.980	3300.809	15051.00	0.3284457	1.4117910E-02	62.13078
NP-237	162.9186	28-FEB-2010	4433.475	4904.204	13378.00	0.3420834	1.7358093E-02	78.83074
CM-244	153.1968	28-FEB-2010	5535.021	5883.627	11764.00	0.3388719	1.7230390E-02	60.52183

Instrument : CHAMBER 032
Detector : 67041
Standard ID : AESS-032
Standard Reference Date : 18-FEB-2008 11:28:15
Calibration Analysis Date/Time : 5-SEP-2009 09:03:09
Calibration Count Time : 239.9998
Efficiency Calibration Date/Time : 5-SEP-2009 13:37:21
Average Efficiency : 0.2159665
Average Efficiency Error : 6.2416224E-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	2991.500	3301.085	12930.00	0.2799107	1.2067080E-02	108.5704
NP-237	165.9822	28-FEB-2010	4436.228	4903.321	11857.00	0.2975635	1.5127208E-02	150.4912
CM-244	153.7938	28-FEB-2010	5533.353	5886.388	5601.000	0.1608285	8.3242906E-03	0.0000000E+00

Instrument : CHAMBER 033
Detector : 78785
Standard ID : AESS-033
Standard Reference Date : 18-FEB-2008 11:28:15
Calibration Analysis Date/Time : 5-SEP-2009 09:03:09
Calibration Count Time : 239.9998
Efficiency Calibration Date/Time : 5-SEP-2009 13:37:30
Average Efficiency : 0.3134830
Average Efficiency Error : 8.6526405E-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	2991.232	3299.661	14169.00	0.3112248	1.3392622E-02	46.76679
NP-237	161.7816	28-FEB-2010	4437.092	4904.010	12161.00	0.3131624	1.5913626E-02	60.14054
CM-244	147.2670	28-FEB-2010	5530.913	5885.453	10575.00	0.3170980	1.6152723E-02	52.75375

Instrument : CHAMBER 034
Detector : 61586
Standard ID : AESS-034
Standard Reference Date : 18-FEB-2008 11:28:15
Calibration Analysis Date/Time : 5-SEP-2009 09:03:09
Calibration Count Time : 239.9998
Efficiency Calibration Date/Time : 5-SEP-2009 13:37:40
Average Efficiency : 5.4748973E-05
Average Efficiency Error : 8.9538866E-05
Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	200.5488	28-FEB-2010	2987.956	3301.026	9319.000	0.1963924	8.5345702E-03	80.18852
NP-237	167.2962	28-FEB-2010	4436.568	4903.521	7134.000	0.1774998	9.1209533E-03	0.0000000E+00
CM-244	154.4388	28-FEB-2010	5534.967	5885.181	8.000000	1.6030130E-05	9.9548113E-05	5.306273

Instrument : CHAMBER 035
Detector : 78202
Standard ID : AESS-035
Standard Reference Date : 18-FEB-2008 11:28:15
Calibration Analysis Date/Time : 5-SEP-2009 09:03:09
Calibration Count Time : 239.9998
Efficiency Calibration Date/Time : 5-SEP-2009 13:37:51
Average Efficiency : 0.3050995
Average Efficiency Error : 8.4187118E-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	2991.620	3300.593	14168.00	0.3014163	1.2970550E-02	45.14441
NP-237	168.2934	28-FEB-2010	4435.499	4903.774	12515.00	0.3097561	1.5733534E-02	52.82528
CM-244	158.8128	28-FEB-2010	5532.763	5883.199	11004.00	0.3058464	1.5568729E-02	51.98632

Instrument : CHAMBER 036
Detector : 78203
Standard ID : AESS-036
Standard Reference Date : 18-FEB-2008 11:28:15
Calibration Analysis Date/Time : 5-SEP-2009 09:03:09
Calibration Count Time : 239.9998
Efficiency Calibration Date/Time : 5-SEP-2009 13:38:00
Average Efficiency : 0.3236991
Average Efficiency Error : 8.9239618E-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	2991.620	3298.917	15082.00	0.3166323	1.3609574E-02	51.84582
NP-237	167.4312	28-FEB-2010	4433.050	4904.263	13282.00	0.3304925	1.6771674E-02	66.46858
CM-244	156.4188	28-FEB-2010	5535.616	5884.466	11603.00	0.3275855	1.6659884E-02	53.86180

Instrument : CHAMBER 037
Detector : 45-149BB5
Standard ID : AESS-037
Standard Reference Date : 18-FEB-2008 15:31:47
Calibration Analysis Date/Time : 5-SEP-2009 09:03:11
Calibration Count Time : 239.9998
Efficiency Calibration Date/Time : 5-SEP-2009 13:38:11
Average Efficiency : 0.3527313
Average Efficiency Error : 9.7141266E-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	2988.836	3299.917	16029.00	0.3425954	1.4709930E-02	69.97938
NP-237	167.1294	28-FEB-2010	4435.582	4906.557	14502.00	0.3614331	1.8319361E-02	87.55756
CM-244	154.7664	28-FEB-2010	5534.307	5882.810	12611.00	0.3597120	1.8269511E-02	71.60854

Instrument : CHAMBER 038
Detector : 72532
Standard ID : AESS-038
Standard Reference Date : 18-FEB-2008 15:31:47
Calibration Analysis Date/Time : 5-SEP-2009 09:03:11
Calibration Count Time : 239.9998
Efficiency Calibration Date/Time : 5-SEP-2009 13:38:20
Average Efficiency : 0.3374661
Average Efficiency Error : 9.2953844E-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	2991.576	3299.256	15782.00	0.3332799	1.4313720E-02	52.53116
NP-237	170.0886	28-FEB-2010	4433.771	4904.686	13898.00	0.3404015	1.7263360E-02	67.00319
CM-244	157.7460	28-FEB-2010	5535.244	5883.467	12174.00	0.3406372	1.7310385E-02	53.71938

Instrument : CHAMBER 039
Detector : 45-149BB2
Standard ID : AESS-039
Standard Reference Date : 18-FEB-2008 15:31:47
Calibration Analysis Date/Time : 5-SEP-2009 09:03:11
Calibration Count Time : 239.9998
Efficiency Calibration Date/Time : 5-SEP-2009 13:38:28
Average Efficiency : 0.3630306
Average Efficiency Error : 9.9983541E-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	2991.453	3301.599	16042.00	0.3526957	1.5143363E-02	60.09052
NP-237	159.1506	28-FEB-2010	4432.722	4905.688	14315.00	0.3747012	1.8995127E-02	78.06614
CM-244	151.7142	28-FEB-2010	5532.346	5883.894	12631.00	0.3674615	1.8662771E-02	63.39179

Instrument : CHAMBER 040
Detector : 78773
Standard ID : AESS-040
Standard Reference Date : 18-FEB-2008 15:31:47
Calibration Analysis Date/Time : 5-SEP-2009 09:03:11
Calibration Count Time : 239.9998
Efficiency Calibration Date/Time : 5-SEP-2009 13:38:36
Average Efficiency : 0.3207370
Average Efficiency Error : 8.8450955E-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	2991.070	3301.002	14629.00	0.3178972	1.3671570E-02	46.05933
NP-237	166.8174	28-FEB-2010	4437.116	4905.104	12857.00	0.3211111	1.6303439E-02	59.80341
CM-244	155.0100	28-FEB-2010	5532.249	5884.180	11394.00	0.3244938	1.6507916E-02	47.50864

Instrument : CHAMBER 041
Detector : 78205
Standard ID : AESS-041
Standard Reference Date : 18-FEB-2008 15:31:47
Calibration Analysis Date/Time : 5-SEP-2009 09:03:11
Calibration Count Time : 239.9998
Efficiency Calibration Date/Time : 5-SEP-2009 13:38:44
Average Efficiency : 0.3298833
Average Efficiency Error : 9.0887686E-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	2991.305	3298.942	15596.00	0.3232844	1.3887258E-02	46.32725
NP-237	171.2268	28-FEB-2010	4436.425	4904.659	13704.00	0.3334179	1.6912539E-02	62.94285
CM-244	159.5796	28-FEB-2010	5534.452	5885.748	12158.00	0.3362667	1.7088668E-02	51.06727

Instrument : CHAMBER 042
Detector : 78793
Standard ID : AESS-042
Standard Reference Date : 18-FEB-2008 15:31:47
Calibration Analysis Date/Time : 5-SEP-2009 09:03:11
Calibration Count Time : 239.9998
Efficiency Calibration Date/Time : 5-SEP-2009 13:38:52
Average Efficiency : 0.3262490
Average Efficiency Error : 8.9996839E-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	2988.887	3299.366	14425.00	0.3230868	1.3898331E-02	45.61874
NP-237	159.6558	28-FEB-2010	4437.123	4905.630	12564.00	0.3278245	1.6650224E-02	58.62441
CM-244	150.5208	28-FEB-2010	5533.333	5885.512	11230.00	0.3292493	1.6754221E-02	49.02582

Instrument : CHAMBER 043
Detector : 76543
Standard ID : AESS-043
Standard Reference Date : 19-FEB-2008 00:32:27
Calibration Analysis Date/Time : 5-SEP-2009 09:03:12
Calibration Count Time : 240.0000
Efficiency Calibration Date/Time : 5-SEP-2009 13:38:59
Average Efficiency : 0.3388386
Average Efficiency Error : 9.3338015E-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	2990.321	3301.623	15716.00	0.3358650	1.4425773E-02	53.08127
NP-237	168.7422	28-FEB-2010	4433.027	4903.519	13744.00	0.3393443	1.7212395E-02	71.29913
CM-244	156.3252	28-FEB-2010	5534.268	5882.956	12132.00	0.3426539	1.7413609E-02	49.48456

Instrument : CHAMBER 044
Detector : 79459
Standard ID : AESS-044
Standard Reference Date : 19-FEB-2008 00:32:27
Calibration Analysis Date/Time : 5-SEP-2009 09:03:12
Calibration Count Time : 240.0000
Efficiency Calibration Date/Time : 5-SEP-2009 13:39:07
Average Efficiency : 0.3461110
Average Efficiency Error : 9.5328372E-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	2989.930	3302.506	16084.00	0.3495771	1.5008831E-02	49.84488
NP-237	166.6248	28-FEB-2010	4437.594	4903.934	13869.00	0.3467283	1.7584775E-02	67.30765
CM-244	155.8290	28-FEB-2010	5530.392	5884.844	12036.00	0.3408923	1.7326539E-02	50.42044

Instrument : CHAMBER 045
Detector : 78783
Standard ID : AESS-045
Standard Reference Date : 19-FEB-2008 00:32:27
Calibration Analysis Date/Time : 5-SEP-2009 09:03:12
Calibration Count Time : 240.0000
Efficiency Calibration Date/Time : 5-SEP-2009 13:39:15
Average Efficiency : 0.3386171
Average Efficiency Error : 9.3369978E-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	2989.243	3301.709	15126.00	0.3418811	1.4694056E-02	41.09813
NP-237	160.8066	28-FEB-2010	4436.057	4901.945	12808.00	0.3318377	1.6849035E-02	59.62828
CM-244	145.8384	28-FEB-2010	5533.013	5887.031	11276.00	0.3412594	1.7364025E-02	48.59882

Instrument : CHAMBER 046
Detector : 76544
Standard ID : AESS-046
Standard Reference Date : 19-FEB-2008 19:35:48
Calibration Analysis Date/Time : 5-SEP-2009 09:03:12
Calibration Count Time : 240.0000
Efficiency Calibration Date/Time : 5-SEP-2009 13:39:23
Average Efficiency : 0.3428833
Average Efficiency Error : 9.4477413E-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	2992.377	3301.861	15517.00	0.3367483	1.4466916E-02	50.54656
NP-237	164.6658	28-FEB-2010	4437.291	4905.414	13709.00	0.3468411	1.7593319E-02	60.02387
CM-244	151.3824	28-FEB-2010	5533.098	5885.505	11938.00	0.3480568	1.7692965E-02	49.85977

Instrument : CHAMBER 047
Detector : 46-089B1
Standard ID : AESS-047
Standard Reference Date : 19-FEB-2008 00:32:27
Calibration Analysis Date/Time : 5-SEP-2009 09:03:12
Calibration Count Time : 240.0000
Efficiency Calibration Date/Time : 5-SEP-2009 13:39:31
Average Efficiency : 0.3414553
Average Efficiency Error : 9.4057210E-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	2992.396	3301.175	15755.00	0.3371730	1.4481370E-02	53.45372
NP-237	168.3948	28-FEB-2010	4434.358	4901.480	13876.00	0.3432392	1.7407728E-02	75.59270
CM-244	154.6032	28-FEB-2010	5533.889	5883.104	12119.00	0.3459478	1.7581582E-02	61.01867

Instrument : CHAMBER 048
Detector : 42483
Standard ID : AESS-048
Standard Reference Date : 19-FEB-2008 00:32:27
Calibration Analysis Date/Time : 5-SEP-2009 09:03:12
Calibration Count Time : 240.0000
Efficiency Calibration Date/Time : 5-SEP-2009 13:39:40
Average Efficiency : 0.3165880
Average Efficiency Error : 8.7361159E-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	2992.395	3299.708	14224.00	0.3133849	1.3484558E-02	54.26610
NP-237	161.5530	28-FEB-2010	4436.890	4906.295	12281.00	0.3166445	1.6088169E-02	68.16459
CM-244	151.1856	28-FEB-2010	5534.380	5886.375	11007.00	0.3212399	1.6352450E-02	58.44775

Instrument : CHAMBER 065
Detector : 68551
Standard ID : AESS-001
Standard Reference Date : 20-FEB-2008 09:54:53
Calibration Analysis Date/Time : 9-SEP-2009 09:27:46
Calibration Count Time : 240.0000
Efficiency Calibration Date/Time : 10-SEP-2009 15:04:30
Average Efficiency : 0.3100883
Average Efficiency Error : 8.5527664E-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	2991.771	3302.255	14851.00	0.3008073	1.2933016E-02	62.88732
NP-237	171.0024	28-FEB-2010	4436.128	4905.667	13073.00	0.3184626	1.6165027E-02	69.15641
CM-244	158.1060	28-FEB-2010	5535.235	5883.315	11309.00	0.3161527	1.6085027E-02	63.10107

Instrument : CHAMBER 066
Detector : 46-089C1
Standard ID : AESS-002
Standard Reference Date : 19-FEB-2008 11:05:22
Calibration Analysis Date/Time : 9-SEP-2009 09:27:46
Calibration Count Time : 240.0000
Efficiency Calibration Date/Time : 10-SEP-2009 15:10:17
Average Efficiency : 0.3110259
Average Efficiency Error : 8.5637672E-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	2988.607	3298.188	14654.00	0.3095190	1.3310824E-02	54.84346
NP-237	200.4990	28-FEB-2010	4437.248	4903.693	15121.00	0.3141871	1.5915856E-02	66.53844
CM-244	196.5558	28-FEB-2010	5534.302	5887.473	13783.00	0.3100429	1.5725579E-02	63.56669

Instrument : CHAMBER 067
Detector : 46-089B4
Standard ID : AESS-003
Standard Reference Date : 15-FEB-2008 13:12:27
Calibration Analysis Date/Time : 9-SEP-2009 09:27:46
Calibration Count Time : 240.0000
Efficiency Calibration Date/Time : 10-SEP-2009 15:10:36
Average Efficiency : 0.3240344
Average Efficiency Error : 8.9155603E-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	2990.364	3298.403	15350.00	0.3196994	1.3737111E-02	79.47321
NP-237	203.2080	28-FEB-2010	4432.841	4903.104	15841.00	0.3247619	1.6441898E-02	80.45038
CM-244	197.2236	28-FEB-2010	5532.249	5884.796	14701.00	0.3296957	1.6707668E-02	73.81536

Instrument : CHAMBER 068
Detector : 78794
Standard ID : AESS-004
Standard Reference Date : 14-FEB-2008 09:35:18
Calibration Analysis Date/Time : 9-SEP-2009 09:27:46
Calibration Count Time : 240.0000
Efficiency Calibration Date/Time : 10-SEP-2009 15:10:50
Average Efficiency : 0.3020239
Average Efficiency Error : 8.3167572E-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	2991.800	3301.258	14672.00	0.3009101	1.2940318E-02	47.94542
NP-237	204.2586	28-FEB-2010	4436.421	4904.138	14895.00	0.3038381	1.5394546E-02	58.67663
CM-244	198.8100	28-FEB-2010	5531.799	5886.613	13563.00	0.3017887	1.5310434E-02	51.79538

Instrument : CHAMBER 069
Detector : 78795
Standard ID : AESS-005
Standard Reference Date : 14-FEB-2008 09:35:18
Calibration Analysis Date/Time : 9-SEP-2009 09:27:46
Calibration Count Time : 240.0000
Efficiency Calibration Date/Time : 10-SEP-2009 15:11:01
Average Efficiency : 0.3129162
Average Efficiency Error : 8.6101322E-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	2988.054	3301.031	15378.00	0.3084619	1.3253862E-02	54.03180
NP-237	209.5938	28-FEB-2010	4436.816	4903.115	16074.00	0.3195325	1.6174214E-02	58.24020
CM-244	202.7478	28-FEB-2010	5534.580	5883.355	14342.00	0.3129326	1.5863417E-02	53.89188

Instrument : CHAMBER 070
Detector : 46-089B2
Standard ID : AESS-006
Standard Reference Date : 14-FEB-2008 09:35:18
Calibration Analysis Date/Time : 9-SEP-2009 09:27:46
Calibration Count Time : 240.0000
Efficiency Calibration Date/Time : 10-SEP-2009 15:11:09
Average Efficiency : 0.3482738
Average Efficiency Error : 9.5760990E-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	2992.000	3298.556	16246.00	0.3371675	1.4473605E-02	67.12303
NP-237	204.7038	28-FEB-2010	4433.983	4903.126	17357.00	0.3532659	1.7865704E-02	81.09286
CM-244	195.0060	28-FEB-2010	5531.262	5883.482	15901.00	0.3607397	1.8262517E-02	66.82144

Instrument : CHAMBER 071
Detector : 64259
Standard ID : AESS-007
Standard Reference Date : 14-FEB-2008 13:39:25
Calibration Analysis Date/Time : 10-SEP-2009 07:45:11
Calibration Count Time : 239.9998
Efficiency Calibration Date/Time : 10-SEP-2009 11:52:27
Average Efficiency : 0.3214687
Average Efficiency Error : 8.8457242E-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	2989.344	3299.186	15325.00	0.3133740	1.3465736E-02	56.09136
NP-237	205.0260	28-FEB-2010	4434.336	4901.423	16144.00	0.3280451	1.6604269E-02	69.48186
CM-244	199.6806	28-FEB-2010	5533.037	5886.837	14767.00	0.3271829	1.6579321E-02	59.20222

Instrument : CHAMBER 072
Detector : 45-149AA3
Standard ID : AESS-008
Standard Reference Date : 14-FEB-2008 13:39:25
Calibration Analysis Date/Time : 10-SEP-2009 07:45:11
Calibration Count Time : 239.9998
Efficiency Calibration Date/Time : 10-SEP-2009 11:52:37
Average Efficiency : 0.3227442
Average Efficiency Error : 8.8778548E-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	2988.347	3300.937	15575.00	0.3195517	1.3727306E-02	55.34483
NP-237	209.2716	28-FEB-2010	4434.227	4904.277	16283.00	0.3241670	1.6406268E-02	64.89168
CM-244	199.6488	28-FEB-2010	5533.368	5885.995	14710.00	0.3259238	1.6516438E-02	59.94393

Instrument : CHAMBER 073
Detector : 78775
Standard ID : AESS-009
Standard Reference Date : 19-FEB-2008 11:05:22
Calibration Analysis Date/Time : 10-SEP-2009 07:45:11
Calibration Count Time : 239.9998
Efficiency Calibration Date/Time : 10-SEP-2009 11:52:45
Average Efficiency : 0.3359991
Average Efficiency Error : 9.2396224E-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	2988.457	3300.404	15946.00	0.3314302	1.4231771E-02	46.86103
NP-237	204.0192	28-FEB-2010	4436.939	4906.411	16500.00	0.3369443	1.7050246E-02	59.05204
CM-244	197.2128	28-FEB-2010	5534.874	5887.223	15241.00	0.3417855	1.7312098E-02	52.30267

Instrument : CHAMBER 074
Detector : 78266
Standard ID : AESS-010
Standard Reference Date : 14-FEB-2008 13:39:25
Calibration Analysis Date/Time : 10-SEP-2009 07:45:11
Calibration Count Time : 239.9998
Efficiency Calibration Date/Time : 10-SEP-2009 11:52:53
Average Efficiency : 0.3169551
Average Efficiency Error : 8.7234061E-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	2991.696	3301.963	15290.00	0.3199897	1.3750562E-02	44.39154
NP-237	202.9926	28-FEB-2010	4433.697	4901.594	15300.00	0.3139971	1.5903838E-02	61.02532
CM-244	196.2330	28-FEB-2010	5534.405	5883.535	14008.00	0.3158379	1.6015843E-02	51.54432

Instrument : CHAMBER 075
Detector : 68550
Standard ID : AESS-011
Standard Reference Date : 14-FEB-2008 13:39:25
Calibration Analysis Date/Time : 10-SEP-2009 07:45:11
Calibration Count Time : 239.9998
Efficiency Calibration Date/Time : 10-SEP-2009 11:53:01
Average Efficiency : 0.2971224
Average Efficiency Error : 8.1791338E-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	2990.430	3298.418	14809.00	0.2941414	1.2647107E-02	52.11724
NP-237	214.4868	28-FEB-2010	4434.533	4906.317	15462.00	0.3002940	1.5207780E-02	67.55200
CM-244	208.4184	28-FEB-2010	5532.867	5887.264	14050.00	0.2982485	1.5123297E-02	57.31767

Instrument : CHAMBER 076
Detector : 78779
Standard ID : AESS-012
Standard Reference Date : 14-FEB-2008 13:39:25
Calibration Analysis Date/Time : 10-SEP-2009 07:45:11
Calibration Count Time : 239.9998
Efficiency Calibration Date/Time : 10-SEP-2009 11:54:17
Average Efficiency : 0.3059885
Average Efficiency Error : 8.4235072E-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	2991.065	3298.826	14877.00	0.3049859	1.3112247E-02	45.11341
NP-237	205.8930	28-FEB-2010	4434.152	4905.629	15344.00	0.3104837	1.5725281E-02	58.70590
CM-244	203.1954	28-FEB-2010	5531.791	5885.977	13918.00	0.3030716	1.5369832E-02	46.80729

Instrument : CHAMBER 077
Detector : 67576
Standard ID : AESS-013
Standard Reference Date : 14-FEB-2008 17:45:04
Calibration Analysis Date/Time : 9-SEP-2009 09:27:47
Calibration Count Time : 239.9998
Efficiency Calibration Date/Time : 9-SEP-2009 14:24:36
Average Efficiency : 0.3291396
Average Efficiency Error : 9.0509364E-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	2987.808	3299.921	15927.00	0.3306105	1.4196881E-02	53.64344
NP-237	210.2526	28-FEB-2010	4436.345	4905.457	16476.00	0.3265030	1.6522143E-02	62.05485
CM-244	201.9108	28-FEB-2010	5533.165	5884.958	15053.00	0.3297988	1.6707685E-02	51.22417

Instrument : CHAMBER 078
Detector : 67577
Standard ID : AESS-014
Standard Reference Date : 19-FEB-2008 11:05:22
Calibration Analysis Date/Time : 9-SEP-2009 09:27:47
Calibration Count Time : 239.9998
Efficiency Calibration Date/Time : 9-SEP-2009 14:24:46
Average Efficiency : 0.3299014
Average Efficiency Error : 9.0704178E-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	2988.845	3301.764	16285.00	0.3205900	1.3761424E-02	56.74648
NP-237	211.7160	28-FEB-2010	4437.423	4903.707	17250.00	0.3394600	1.7168697E-02	79.97527
CM-244	207.3882	28-FEB-2010	5535.183	5883.980	15699.00	0.3347095	1.6947417E-02	74.62044

Instrument : CHAMBER 079
Detector : 67598
Standard ID : AESS-015
Standard Reference Date : 14-FEB-2008 17:45:04
Calibration Analysis Date/Time : 9-SEP-2009 09:27:47
Calibration Count Time : 239.9998
Efficiency Calibration Date/Time : 9-SEP-2009 14:25:09
Average Efficiency : 0.3093783
Average Efficiency Error : 8.5256686E-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	2991.167	3301.886	15186.00	0.3146481	1.3522660E-02	117.2651
NP-237	200.6460	28-FEB-2010	4434.317	4902.083	15627.00	0.3244899	1.6430864E-02	180.5293
CM-244	195.9270	28-FEB-2010	5534.342	5882.989	12883.00	0.2908847	1.4768375E-02	168.4019

Instrument : CHAMBER 080
Detector : 78197
Standard ID : AESS-016
Standard Reference Date : 14-FEB-2008 17:45:04
Calibration Analysis Date/Time : 9-SEP-2009 09:27:47
Calibration Count Time : 239.9998
Efficiency Calibration Date/Time : 9-SEP-2009 14:25:19
Average Efficiency : 0.3317912
Average Efficiency Error : 9.1261221E-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	2989.423	3300.841	15869.00	0.3287475	1.4117784E-02	46.69153
NP-237	199.3962	28-FEB-2010	4436.127	4905.211	16261.00	0.3397571	1.7195579E-02	62.40028
CM-244	198.6402	28-FEB-2010	5534.013	5883.733	14752.00	0.3285567	1.6649110E-02	54.90419

Instrument : CHAMBER 081
Detector : 72533
Standard ID : AESS-017
Standard Reference Date : 14-FEB-2008 17:45:04
Calibration Analysis Date/Time : 9-SEP-2009 09:27:47
Calibration Count Time : 239.9998
Efficiency Calibration Date/Time : 9-SEP-2009 14:25:34
Average Efficiency : 3.2520483E-03
Average Efficiency Error : 2.2165517E-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	2985.860	3301.995	519.0000	1.0443983E-02	3596549E-04	0.0000000E+00
NP-237	208.5846	28-FEB-2010	4434.890	4902.925	110.0000	2.1925590E-02	3650678E-04	324.5057
CM-244	205.5828	28-FEB-2010	5531.182	5884.811	15476.00	0.3330374	1.6865745E-02	123.0501

Instrument : CHAMBER 082
Detector : 64263
Standard ID : AESS-018
Standard Reference Date : 14-FEB-2008 17:45:04
Calibration Analysis Date/Time : 9-SEP-2009 09:27:47
Calibration Count Time : 239.9998
Efficiency Calibration Date/Time : 9-SEP-2009 14:25:44
Average Efficiency : 0.3270527
Average Efficiency Error : 8.9960992E-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	2988.498	3298.727	15879.00	0.3319936	1.4257031E-02	68.06654
NP-237	208.8990	28-FEB-2010	4432.414	4902.039	16167.00	0.3224314	1.6319836E-02	99.17132
CM-244	198.1458	28-FEB-2010	5532.619	5883.836	14565.00	0.3251634	1.6480012E-02	89.06033

Instrument : CHAMBER 083
Detector : 64278
Standard ID : AESS-019
Standard Reference Date : 19-FEB-2008 11:05:22
Calibration Analysis Date/Time : 9-SEP-2009 09:27:48
Calibration Count Time : 240.0000
Efficiency Calibration Date/Time : 9-SEP-2009 14:25:54
Average Efficiency : 0.3391902
Average Efficiency Error : 9.3321698E-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	2992.167	3298.934	15733.00	0.3249606	1.3957175E-02	58.00032
NP-237	202.9140	28-FEB-2010	4433.867	4901.929	17290.00	0.3550012	1.7954253E-02	70.26266
CM-244	199.3140	28-FEB-2010	5533.935	5887.502	15622.00	0.3465812	1.7549563E-02	56.38813

Instrument : CHAMBER 084
Detector : 78265
Standard ID : AESS-020
Standard Reference Date : 14-FEB-2008 21:55:55
Calibration Analysis Date/Time : 9-SEP-2009 09:27:48
Calibration Count Time : 240.0000
Efficiency Calibration Date/Time : 9-SEP-2009 14:26:03
Average Efficiency : 0.3350314
Average Efficiency Error : 9.2154304E-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	2989.557	3301.261	15819.00	0.3252851	1.3969814E-02	48.98574
NP-237	203.4984	28-FEB-2010	4436.726	4905.499	16848.00	0.3449366	1.7450403E-02	70.44247
CM-244	197.1096	28-FEB-2010	5533.547	5882.686	15157.00	0.3402030	1.7233172E-02	54.07273

Instrument : CHAMBER 085
Detector : 78776
Standard ID : AESS-021
Standard Reference Date : 19-FEB-2008 15:31:52
Calibration Analysis Date/Time : 9-SEP-2009 09:27:48
Calibration Count Time : 240.0000
Efficiency Calibration Date/Time : 9-SEP-2009 14:26:12
Average Efficiency : 0.3292786
Average Efficiency Error : 9.0559786E-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	2989.601	3300.074	15821.00	0.3209520	1.3783680E-02	42.12930
NP-237	210.1548	28-FEB-2010	4436.653	4903.942	16896.00	0.3349628	1.6945269E-02	61.19312
CM-244	200.7390	28-FEB-2010	5535.486	5883.705	15264.00	0.3362489	1.7031331E-02	49.49862

Instrument : CHAMBER 086
Detector : 78198
Standard ID : AESS-022
Standard Reference Date : 14-FEB-2008 21:55:55
Calibration Analysis Date/Time : 9-SEP-2009 09:27:48
Calibration Count Time : 240.0000
Efficiency Calibration Date/Time : 9-SEP-2009 14:26:20
Average Efficiency : 0.3029490
Average Efficiency Error : 8.3418479E-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	2989.774	3299.664	14654.00	0.2954483	1.2705724E-02	44.56695
NP-237	206.8830	28-FEB-2010	4432.667	4903.104	15406.00	0.3102368	1.5711984E-02	60.31703
CM-244	203.0208	28-FEB-2010	5531.307	5882.758	14090.00	0.3070555	1.5569190E-02	52.15140

Instrument : CHAMBER 087
Detector : 78199
Standard ID : AESS-023
Standard Reference Date : 14-FEB-2008 21:55:55
Calibration Analysis Date/Time : 9-SEP-2009 09:27:48
Calibration Count Time : 240.0000
Efficiency Calibration Date/Time : 9-SEP-2009 14:26:29
Average Efficiency : 0.3163625
Average Efficiency Error : 8.7070642E-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	2992.236	3300.170	15108.00	0.3078162	1.3230279E-02	45.44902
NP-237	207.4998	28-FEB-2010	4436.843	4904.805	16167.00	0.3246053	1.6429869E-02	59.32936
CM-244	199.8804	28-FEB-2010	5535.169	5884.995	14512.00	0.3212101	1.6280370E-02	49.57772

Instrument : CHAMBER 088
Detector : 33452
Standard ID : AESS-024
Standard Reference Date : 14-FEB-2008 21:55:55
Calibration Analysis Date/Time : 9-SEP-2009 09:27:48
Calibration Count Time : 240.0000
Efficiency Calibration Date/Time : 9-SEP-2009 14:26:37
Average Efficiency : 0.2999967
Average Efficiency Error : 8.2643600E-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	2990.949	3298.130	14110.00	0.2930872	1.2613131E-02	56.18594
NP-237	205.6662	28-FEB-2010	4435.755	4901.405	15108.00	0.3060495	1.5503770E-02	71.69653
CM-244	198.3060	28-FEB-2010	5533.353	5886.188	13644.00	0.3043465	1.5438884E-02	59.83284

Instrument : CHAMBER 089
Detector : 78262
Standard ID : AESS-025
Standard Reference Date : 15-FEB-2008 09:06:52
Calibration Analysis Date/Time : 9-SEP-2009 09:27:49
Calibration Count Time : 240.0000
Efficiency Calibration Date/Time : 9-SEP-2009 14:26:46
Average Efficiency : 0.2972493
Average Efficiency Error : 8.2093449E-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	2990.289	3300.634	14083.00	0.3044111	1.3100956E-02	47.72214
NP-237	167.9916	28-FEB-2010	4434.456	4904.010	12075.00	0.2994348	1.5217808E-02	61.09237
CM-244	157.2432	28-FEB-2010	5534.385	5885.433	10178.00	0.2863488	1.4596111E-02	52.33496

Instrument : CHAMBER 090
Detector : 78263
Standard ID : AESS-026
Standard Reference Date : 15-FEB-2008 09:06:52
Calibration Analysis Date/Time : 9-SEP-2009 09:27:49
Calibration Count Time : 240.0000
Efficiency Calibration Date/Time : 9-SEP-2009 14:26:55
Average Efficiency : 0.3275550
Average Efficiency Error : 9.5983204E-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	2988.266	3299.227	15467.00	0.3277251	1.6597889E-02	53.31313
NP-237	168.0294	28-FEB-2010	4433.868	4903.300	13545.00	0.3358254	1.7037485E-02	69.24764
CM-244	160.5822	28-FEB-2010	5532.356	5885.351	11610.00	0.3198535	1.6265867E-02	52.99377

Instrument : CHAMBER 091
Detector : 78259
Standard ID : AESS-027
Standard Reference Date : 15-FEB-2008 09:06:52
Calibration Analysis Date/Time : 9-SEP-2009 09:27:49
Calibration Count Time : 240.0000
Efficiency Calibration Date/Time : 9-SEP-2009 14:27:04
Average Efficiency : 0.3392405
Average Efficiency Error : 9.9426452E-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	2989.076	3298.663	15172.00	0.3315902	1.6797749E-02	49.95338
NP-237	161.6154	28-FEB-2010	4435.039	4903.577	13164.00	0.3393553	1.7223677E-02	65.17027
CM-244	148.1754	28-FEB-2010	5532.620	5882.943	11642.00	0.3475904	1.7675593E-02	49.76140

Instrument : CHAMBER 092
Detector : 79457
Standard ID : AESS-028
Standard Reference Date : 15-FEB-2008 09:06:52
Calibration Analysis Date/Time : 9-SEP-2009 09:27:49
Calibration Count Time : 240.0000
Efficiency Calibration Date/Time : 9-SEP-2009 14:27:12
Average Efficiency : 0.3136944
Average Efficiency Error : 9.1980351E-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	2989.440	3301.094	14617.00	0.3089983	1.5661661E-02	48.63953
NP-237	168.1992	28-FEB-2010	4437.352	4901.805	12860.00	0.3185114	1.6171454E-02	63.42407
CM-244	156.7614	28-FEB-2010	5530.798	5883.590	11124.00	0.3138794	1.5973775E-02	49.57573

Instrument : CHAMBER 093
Detector : 33206
Standard ID : AESS-029
Standard Reference Date : 15-FEB-2008 09:06:52
Calibration Analysis Date/Time : 9-SEP-2009 09:27:49
Calibration Count Time : 240.0000
Efficiency Calibration Date/Time : 9-SEP-2009 14:27:22
Average Efficiency : 0.3231539
Average Efficiency Error : 9.4716763E-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	2991.703	3297.696	15042.00	0.3154363	1.5981223E-02	52.74934
NP-237	169.7700	28-FEB-2010	4437.176	4906.330	13219.00	0.3243812	1.6462712E-02	61.46286
CM-244	154.8234	28-FEB-2010	5534.842	5887.449	11563.00	0.3304077	1.6803728E-02	55.29604

Instrument : CHAMBER 094
Detector : 78267
Standard ID : AESS-030
Standard Reference Date : 15-FEB-2008 09:06:52
Calibration Analysis Date/Time : 9-SEP-2009 09:27:49
Calibration Count Time : 240.0000
Efficiency Calibration Date/Time : 9-SEP-2009 14:27:30
Average Efficiency : 0.3055932
Average Efficiency Error : 8.9650415E-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	2992.223	3299.522	14071.00	0.2989359	1.5158761E-02	44.30522
NP-237	166.3758	28-FEB-2010	4437.384	4902.143	12435.00	0.3113646	1.5816737E-02	61.41903
CM-244	157.1856	28-FEB-2010	5531.241	5883.942	10909.00	0.3070350	1.5630694E-02	52.35673

Instrument : CHAMBER 095
Detector : 64279
Standard ID : AESS-031
Standard Reference Date : 18-FEB-2008 11:28:15
Calibration Analysis Date/Time : 9-SEP-2009 09:27:50
Calibration Count Time : 239.9998
Efficiency Calibration Date/Time : 9-SEP-2009 14:27:38
Average Efficiency : 0.3137313
Average Efficiency Error : 8.6583951E-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	2991.368	3299.100	14061.00	0.3068862	1.3207882E-02	52.62669
NP-237	162.9186	28-FEB-2010	4432.777	4902.890	12558.00	0.3211056	1.6309092E-02	65.45838
CM-244	153.1968	28-FEB-2010	5531.978	5884.563	10977.00	0.3167241	1.6122520E-02	52.41710

Instrument : CHAMBER 096
Detector : 67605
Standard ID : AESS-032
Standard Reference Date : 18-FEB-2008 11:28:15
Calibration Analysis Date/Time : 9-SEP-2009 09:27:50
Calibration Count Time : 239.9998
Efficiency Calibration Date/Time : 9-SEP-2009 14:27:47
Average Efficiency : 0.3106423
Average Efficiency Error : 8.5713780E-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	2991.016	3298.247	14392.00	0.3115879	1.3404301E-02	50.48295
NP-237	165.9822	28-FEB-2010	4433.400	4905.592	12339.00	0.3096451	1.5731385E-02	66.39977
CM-244	153.7938	28-FEB-2010	5533.378	5883.405	10793.00	0.3103344	1.5801737E-02	51.91969

Instrument : CHAMBER 097
Detector : 67599
Standard ID : AESS-033
Standard Reference Date : 18-FEB-2008 11:28:15
Calibration Analysis Date/Time : 9-SEP-2009 09:27:50
Calibration Count Time : 239.9998
Efficiency Calibration Date/Time : 9-SEP-2009 14:27:55
Average Efficiency : 0.3432320
Average Efficiency Error : 9.4599053E-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	2987.986	3300.981	15354.00	0.3372997	1.4493308E-02	58.69976
NP-237	161.7816	28-FEB-2010	4432.608	4904.990	13427.00	0.3457866	1.7545013E-02	70.32799
CM-244	147.2670	28-FEB-2010	5532.644	5882.410	11640.00	0.3495324	1.7774450E-02	61.10017

Instrument : CHAMBER 098
Detector : 68644
Standard ID : AESS-034
Standard Reference Date : 18-FEB-2008 11:28:15
Calibration Analysis Date/Time : 9-SEP-2009 09:27:50
Calibration Count Time : 239.9998
Efficiency Calibration Date/Time : 9-SEP-2009 14:28:04
Average Efficiency : 0.3363666
Average Efficiency Error : 9.2672715E-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	2989.306	3298.708	15807.00	0.3331439	1.4307539E-02	48.93986
NP-237	167.2962	28-FEB-2010	4434.769	4903.339	13402.00	0.3337240	1.6933486E-02	63.20418
CM-244	154.4388	28-FEB-2010	5532.564	5883.056	12013.00	0.3439962	1.7483871E-02	53.44681

Instrument : CHAMBER 099
Detector : 70317
Standard ID : AESS-035
Standard Reference Date : 18-FEB-2008 11:28:15
Calibration Analysis Date/Time : 9-SEP-2009 09:27:50
Calibration Count Time : 239.9998
Efficiency Calibration Date/Time : 9-SEP-2009 14:28:14
Average Efficiency : 0.3415650
Average Efficiency Error : 9.4073527E-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	2989.666	3300.290	15818.00	0.3365546	1.4453813E-02	52.12797
NP-237	168.2934	28-FEB-2010	4434.357	4903.837	14011.00	0.3468184	1.7586825E-02	67.03065
CM-244	158.8128	28-FEB-2010	5533.206	5886.495	12343.00	0.3436985	1.7461235E-02	57.20668

Instrument : CHAMBER 100
Detector : 79456
Standard ID : AESS-046
Standard Reference Date : 19-FEB-2008 19:35:48
Calibration Analysis Date/Time : 9-SEP-2009 09:27:50
Calibration Count Time : 239.9998
Efficiency Calibration Date/Time : 9-SEP-2009 14:28:23
Average Efficiency : 0.3417855
Average Efficiency Error : 9.4188042E-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	2987.537	3298.592	15379.00	0.3337772	1.4341556E-02	48.29451
NP-237	164.6658	28-FEB-2010	4433.227	4902.504	13725.00	0.3471916	1.7610893E-02	69.52662
CM-244	151.3824	28-FEB-2010	5531.221	5883.961	11934.00	0.3485355	1.7716564E-02	58.65465

Instrument : CHAMBER 101
Detector : 64253
Standard ID : AESS-037
Standard Reference Date : 18-FEB-2008 15:31:47
Calibration Analysis Date/Time : 9-SEP-2009 09:27:51
Calibration Count Time : 239.9998
Efficiency Calibration Date/Time : 9-SEP-2009 14:28:33
Average Efficiency : 0.3331621
Average Efficiency Error : 9.1828480E-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	2988.324	3300.256	15185.00	0.3245981	1.3950290E-02	62.51688
NP-237	167.1294	28-FEB-2010	4433.583	4904.714	13661.00	0.3405141	1.7273273E-02	74.91586
CM-244	154.7664	28-FEB-2010	5530.834	5885.200	11860.00	0.3389104	1.7228924E-02	62.58625

Instrument : CHAMBER 102
Detector : 72525
Standard ID : AESS-038
Standard Reference Date : 18-FEB-2008 15:31:47
Calibration Analysis Date/Time : 9-SEP-2009 09:27:51
Calibration Count Time : 239.9998
Efficiency Calibration Date/Time : 9-SEP-2009 14:28:41
Average Efficiency : 0.3306259
Average Efficiency Error : 9.1093592E-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	2988.972	3297.750	15673.00	0.3310117	1.4218019E-02	58.00007
NP-237	170.0886	28-FEB-2010	4434.781	4906.296	13528.00	0.3313670	1.6811563E-02	65.49485
CM-244	157.7460	28-FEB-2010	5531.260	5887.302	11748.00	0.3293554	1.6745811E-02	54.09600

Instrument : CHAMBER 103
Detector : 79461
Standard ID : AESS-039
Standard Reference Date : 18-FEB-2008 15:31:47
Calibration Analysis Date/Time : 9-SEP-2009 09:27:51
Calibration Count Time : 239.9998
Efficiency Calibration Date/Time : 9-SEP-2009 14:28:50
Average Efficiency : 0.3374034
Average Efficiency Error : 9.3009584E-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	2989.531	3301.057	15204.00	0.3343053	1.4367142E-02	48.16033
NP-237	159.1506	28-FEB-2010	4432.571	4902.800	13150.00	0.3442635	1.7473033E-02	61.80596
CM-244	151.7142	28-FEB-2010	5532.928	5886.525	11500.00	0.3352344	1.7050749E-02	51.58518

Instrument : CHAMBER 104
Detector : 72524
Standard ID : AESS-040
Standard Reference Date : 18-FEB-2008 15:31:47
Calibration Analysis Date/Time : 9-SEP-2009 09:27:51
Calibration Count Time : 239.9998
Efficiency Calibration Date/Time : 9-SEP-2009 14:28:59
Average Efficiency : 0.3164843
Average Efficiency Error : 8.7294979E-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	2987.726	3302.339	14550.00	0.3162437	1.3601788E-02	50.21744
NP-237	166.8174	28-FEB-2010	4433.026	4906.432	12735.00	0.3180338	1.6149586E-02	61.05716
CM-244	155.0100	28-FEB-2010	5534.210	5886.645	11051.00	0.3152894	1.6047265E-02	49.53526

Instrument : CHAMBER 105
Detector : 78777
Standard ID : AESS-041
Standard Reference Date : 18-FEB-2008 15:31:47
Calibration Analysis Date/Time : 10-SEP-2009 08:05:49
Calibration Count Time : 239.9998
Efficiency Calibration Date/Time : 10-SEP-2009 13:05:54
Average Efficiency : 0.3204335
Average Efficiency Error : 8.8321911E-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	2988.378	3298.176	15185.00	0.3147994	1.3529159E-02	44.06408
NP-237	171.2268	28-FEB-2010	4433.342	4905.964	13331.00	0.3243763	1.6460380E-02	67.44377
CM-244	159.5796	28-FEB-2010	5532.223	5883.573	11721.00	0.3248615	1.6517937E-02	52.09479

Instrument : CHAMBER 106
Detector : 64274
Standard ID : AESS-042
Standard Reference Date : 18-FEB-2008 15:31:47
Calibration Analysis Date/Time : 9-SEP-2009 09:27:51
Calibration Count Time : 239.9998
Efficiency Calibration Date/Time : 9-SEP-2009 14:29:53
Average Efficiency : 0.3297303
Average Efficiency Error : 9.0942848E-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	2991.139	3297.527	14535.00	0.3255782	1.4003548E-02	57.74923
NP-237	159.6558	28-FEB-2010	4435.882	4902.515	12678.00	0.3307996	1.6798999E-02	64.42507
CM-244	150.5208	28-FEB-2010	5535.620	5885.870	11395.00	0.3347719	1.7029930E-02	57.47010

Instrument : CHAMBER 107
Detector : 67578
Standard ID : AESS-043
Standard Reference Date : 19-FEB-2008 00:32:27
Calibration Analysis Date/Time : 9-SEP-2009 09:27:52
Calibration Count Time : 240.0000
Efficiency Calibration Date/Time : 9-SEP-2009 14:30:02
Average Efficiency : 0.3095734
Average Efficiency Error : 8.5404720E-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	2988.674	3297.932	14378.00	0.3072861	1.3219491E-02	51.71804
NP-237	168.7422	28-FEB-2010	4433.280	4901.472	12674.00	0.3129115	1.5890619E-02	56.28183
CM-244	156.3252	28-FEB-2010	5535.487	5885.665	10942.00	0.3095406	1.5757412E-02	53.71681

Instrument : CHAMBER 108
Detector : 78778
Standard ID : AESS-044
Standard Reference Date : 19-FEB-2008 00:32:27
Calibration Analysis Date/Time : 9-SEP-2009 09:27:52
Calibration Count Time : 240.0000
Efficiency Calibration Date/Time : 9-SEP-2009 14:30:11
Average Efficiency : 0.3469062
Average Efficiency Error : 9.5538897E-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	2992.265	3302.021	15929.00	0.3462588	1.4868798E-02	47.67246
NP-237	166.6248	28-FEB-2010	4432.866	4906.223	13845.00	0.3461942	1.7558007E-02	66.16933
CM-244	155.8290	28-FEB-2010	5533.837	5886.132	12282.00	0.3485486	1.7708981E-02	53.14913

Instrument : CHAMBER 109
Detector : 79463
Standard ID : AESS-045
Standard Reference Date : 19-FEB-2008 00:32:27
Calibration Analysis Date/Time : 9-SEP-2009 09:27:52
Calibration Count Time : 240.0000
Efficiency Calibration Date/Time : 9-SEP-2009 14:30:20
Average Efficiency : 0.3601399
Average Efficiency Error : 9.9204248E-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	2990.183	3300.537	15991.00	0.3614694	1.5520932E-02	45.39969
NP-237	160.8066	28-FEB-2010	4435.497	4906.168	13637.00	0.3533118	1.7922862E-02	63.49113
CM-244	145.8384	28-FEB-2010	5532.493	5887.375	12056.00	0.3655725	1.8579422E-02	47.36362

Instrument : CHAMBER 110
Detector : 67602
Standard ID : AESS-046
Standard Reference Date : 8-JAN-2007 09:29:00
Calibration Analysis Date/Time : 9-SEP-2009 09:27:52
Calibration Count Time : 240.0000
Efficiency Calibration Date/Time : 9-SEP-2009 14:30:29
Average Efficiency : 0.3276164
Average Efficiency Error : 9.0335608E-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	2991.369	3301.395	14962.00	0.3232884	1.3900084E-02	49.50702
NP-237	164.3834	28-FEB-2010	4433.897	4901.753	13166.00	0.3336918	1.6936194E-02	65.58610
CM-244	159.4253	28-FEB-2010	5534.153	5887.267	11333.00	0.3279556	1.6684897E-02	50.52806

Instrument : CHAMBER 111
Detector : 79462
Standard ID : AESS-047
Standard Reference Date : 19-FEB-2008 00:32:27
Calibration Analysis Date/Time : 9-SEP-2009 09:27:52
Calibration Count Time : 240.0000
Efficiency Calibration Date/Time : 9-SEP-2009 14:30:39
Average Efficiency : 0.3412021
Average Efficiency Error : 9.3983272E-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	2989.920	3299.168	15887.00	0.3400430	1.4602548E-02	48.42237
NP-237	168.3948	28-FEB-2010	4435.442	4904.437	13721.00	0.3394575	1.7218571E-02	66.98242
CM-244	154.6032	28-FEB-2010	5534.527	5885.642	12050.00	0.3446757	1.7517529E-02	50.93661

Instrument : CHAMBER 112
Detector : 78261
Standard ID : AESS-048
Standard Reference Date : 19-FEB-2008 00:32:27
Calibration Analysis Date/Time : 9-SEP-2009 09:27:52
Calibration Count Time : 240.0000
Efficiency Calibration Date/Time : 9-SEP-2009 14:30:47
Average Efficiency : 0.3196034
Average Efficiency Error : 8.8177547E-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	2989.379	3300.588	14393.00	0.3171406	1.3643136E-02	45.61455
NP-237	161.5530	28-FEB-2010	4436.103	4905.883	12568.00	0.3241147	1.6461657E-02	58.16378
CM-244	151.1856	28-FEB-2010	5535.395	5883.265	10896.00	0.3187040	1.6225114E-02	46.20684

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 : 24-AUG-2009 08:39:50
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 24-AUG-2009 14:06:47
Average Efficiency : 0.3731306
Average Efficiency Error : 1.0235887E-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	2988.799	3299.450	22121.00	0.3583271	1.5313427E-02	65.76945
NP-237	171.0024	28-FEB-2010	4437.354	4905.712	19775.00	0.3854371	1.9465830E-02	75.53835
CM-244	158.1060	28-FEB-2010	5533.034	5884.911	17229.00	0.3847365	1.9458989E-02	65.65879

Instrument : CHAMBER 162
Detector : 70323
Standard ID : AESS-007
Standard Reference Date : 14-FEB-2008 13:39:25
Calibration Analysis Date/Time : 24-AUG-2009 08:39:56
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 24-AUG-2009 14:06:56
Average Efficiency : 0.3723955
Average Efficiency Error : 1.0201765E-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	2991.108	3297.679	22068.00	0.3608688	1.5422536E-02	59.05890
NP-237	205.0260	28-FEB-2010	4437.157	4905.370	23621.00	0.3840082	1.9362321E-02	75.93850
CM-244	199.6806	28-FEB-2010	5531.808	5882.856	21406.00	0.3787849	1.9115422E-02	59.17039

Instrument : CHAMBER 163
Detector : 70324
Standard ID : AESS-002
Standard Reference Date : 19-FEB-2008 11:05:22
Calibration Analysis Date/Time : 24-AUG-2009 08:40:01
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 24-AUG-2009 14:07:06
Average Efficiency : 0.3784964
Average Efficiency Error : 1.0368022E-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	2989.316	3301.922	21875.00	0.3695002	1.5793122E-02	75.87975
NP-237	200.4990	28-FEB-2010	4434.725	4904.333	23130.00	0.3844810	1.9389626E-02	89.93044
CM-244	196.5558	28-FEB-2010	5532.622	5884.699	21494.00	0.3861476	1.9486297E-02	68.44479

Instrument : CHAMBER 164
Detector : 70325
Standard ID : AESS-008
Standard Reference Date : 14-FEB-2008 13:39:25
Calibration Analysis Date/Time : 24-AUG-2009 08:40:07
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 24-AUG-2009 14:07:20
Average Efficiency : 0.3795241
Average Efficiency Error : 1.0392675E-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	2989.433	3301.590	22711.00	0.3726217	1.5919240E-02	60.22451
NP-237	209.2716	28-FEB-2010	4434.137	4904.243	23751.00	0.3782692	1.9072101E-02	72.85822
CM-244	199.6488	28-FEB-2010	5533.726	5886.727	22121.00	0.3914949	1.9750981E-02	58.50513

Instrument : CHAMBER 165
Detector : 72544
Standard ID : AESS-003
Standard Reference Date : 15-FEB-2008 13:12:27
Calibration Analysis Date/Time : 24-AUG-2009 08:40:14
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 24-AUG-2009 14:07:34
Average Efficiency : 0.3818519
Average Efficiency Error : 1.0458693E-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	2990.235	3298.979	22293.00	0.3712923	1.5866017E-02	64.67880
NP-237	203.2080	28-FEB-2010	4434.502	4904.549	23821.00	0.3907148	1.9699110E-02	89.80749
CM-244	197.2236	28-FEB-2010	5532.823	5884.601	21728.00	0.3892223	1.9639486E-02	65.21038

Instrument : CHAMBER 166
Detector : 74545
Standard ID : AESS-009
Standard Reference Date : 19-FEB-2008 11:05:22
Calibration Analysis Date/Time : 24-AUG-2009 08:40:20
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 24-AUG-2009 14:07:42
Average Efficiency : 0.3930937
Average Efficiency Error : 1.0762543E-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	2991.175	3297.621	23070.00	0.3834404	1.6378330E-02	51.93287
NP-237	204.0192	28-FEB-2010	4434.428	4904.926	24581.00	0.4015882	2.0242147E-02	75.61842
CM-244	197.2128	28-FEB-2010	5535.556	5884.119	22299.00	0.3992831	2.0142501E-02	56.82180

Instrument : CHAMBER 167
Detector : 72546
Standard ID : AESS-004
Standard Reference Date : 14-FEB-2008 09:35:18
Calibration Analysis Date/Time : 24-AUG-2009 08:40:25
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 24-AUG-2009 14:07:51
Average Efficiency : 0.3896100
Average Efficiency Error : 1.0666691E-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	2990.148	3302.011	23242.00	0.3811870	1.6280681E-02	60.73105
NP-237	204.2586	28-FEB-2010	4433.463	4903.100	24426.00	0.3985536	2.0090239E-02	78.42995
CM-244	198.8100	28-FEB-2010	5531.940	5884.576	22136.00	0.3933990	1.9846944E-02	60.41788

Instrument : CHAMBER 168
Detector : 72547
Standard ID : AESS-010
Standard Reference Date : 14-FEB-2008 13:39:25
Calibration Analysis Date/Time : 24-AUG-2009 08:40:32
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 24-AUG-2009 14:07:59
Average Efficiency : 0.3891803
Average Efficiency Error : 1.0657012E-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	2989.237	3300.921	22691.00	0.3797462	1.6223785E-02	60.45912
NP-237	202.9926	28-FEB-2010	4437.534	4902.237	24096.00	0.3956006	1.9943606E-02	81.13048
CM-244	196.2330	28-FEB-2010	5531.663	5884.741	22054.00	0.3970870	2.0033659E-02	60.17071

Instrument : CHAMBER 169
Detector : 72548
Standard ID : AESS-005
Standard Reference Date : 14-FEB-2008 09:35:18
Calibration Analysis Date/Time : 24-AUG-2009 08:40:37
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 24-AUG-2009 14:08:11
Average Efficiency : 0.3755721
Average Efficiency Error : 1.0284009E-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	2992.165	3298.594	22868.00	0.3668304	1.5670519E-02	63.17508
NP-237	209.5938	28-FEB-2010	4434.229	4903.754	23971.00	0.3811674	1.9216783E-02	80.00423
CM-244	202.7478	28-FEB-2010	5532.658	5885.433	21988.00	0.3832155	1.9334303E-02	60.82853

Instrument : CHAMBER 170
Detector : 72549
Standard ID : AESS-011
Standard Reference Date : 14-FEB-2008 13:39:25
Calibration Analysis Date/Time : 24-AUG-2009 08:40:43
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 24-AUG-2009 14:08:20
Average Efficiency : 0.3679080
Average Efficiency Error : 1.0074493E-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	2988.025	3299.867	22620.00	0.3593037	1.5351000E-02	55.68573
NP-237	214.4868	28-FEB-2010	4432.622	4903.408	24183.00	0.3757574	1.8942678E-02	83.32780
CM-244	208.4184	28-FEB-2010	5534.316	5882.981	22007.00	0.3730944	1.8823531E-02	57.78218

Instrument : CHAMBER 171
Detector : 78260
Standard ID : AESS-006
Standard Reference Date : 14-FEB-2008 09:35:18
Calibration Analysis Date/Time : 24-AUG-2009 08:40:49
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 24-AUG-2009 14:08:29
Average Efficiency : 0.3855957
Average Efficiency Error : 1.0559761E-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	2988.433	3300.366	22641.00	0.3757591	1.6053872E-02	54.75708
NP-237	204.7038	28-FEB-2010	4436.595	4905.826	23976.00	0.3903738	1.9680876E-02	77.89750
CM-244	195.0060	28-FEB-2010	5533.870	5885.935	21851.00	0.3959031	1.9975597E-02	57.65449

Instrument : CHAMBER 172
Detector : 78772
Standard ID : AESS-012
Standard Reference Date : 14-FEB-2008 13:39:25
Calibration Analysis Date/Time : 24-AUG-2009 08:40:55
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 24-AUG-2009 14:08:40
Average Efficiency : 0.3797724
Average Efficiency Error : 1.0397769E-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	2991.870	3297.903	22889.00	0.3752128	1.6028440E-02	52.39552
NP-237	205.8930	28-FEB-2010	4433.678	4903.969	23812.00	0.3854640	1.9434443E-02	82.21458
CM-244	203.1954	28-FEB-2010	5534.514	5883.121	21897.00	0.3807611	1.9211210E-02	56.07287

Instrument : CHAMBER 173
Detector : 74431
Standard ID : AESS-013
Standard Reference Date : 14-FEB-2008 17:45:04
Calibration Analysis Date/Time : 24-AUG-2009 08:41:01
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 24-AUG-2009 14:08:49
Average Efficiency : 0.2601730
Average Efficiency Error : 7.1557011E-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	2988.449	3298.086	15819.00	0.2625923	1.1277330E-02	48.84491
NP-237	210.2526	28-FEB-2010	4435.604	4905.905	16223.00	0.2571892	1.3017043E-02	57.42966
CM-244	201.9108	28-FEB-2010	5534.021	5885.467	14862.00	0.2599279	1.3170394E-02	53.55892

Instrument : CHAMBER 174
Detector : 74432
Standard ID : AESS-019
Standard Reference Date : 19-FEB-2008 11:05:22
Calibration Analysis Date/Time : 24-AUG-2009 08:41:06
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 24-AUG-2009 14:08:58
Average Efficiency : 0.2560052
Average Efficiency Error : 7.0460425E-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	2988.639	3300.179	15066.00	0.2488402	1.0695883E-02	51.37117
NP-237	202.9140	28-FEB-2010	4435.486	4905.219	15899.00	0.2611338	1.3219978E-02	60.89258
CM-244	199.3140	28-FEB-2010	5531.026	5885.734	14784.00	0.2618657	1.3269406E-02	47.62206

Instrument : CHAMBER 175
Detector : 74433
Standard ID : AESS-014
Standard Reference Date : 19-FEB-2008 11:05:22
Calibration Analysis Date/Time : 24-AUG-2009 08:41:12
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 24-AUG-2009 14:09:06
Average Efficiency : 0.2541471
Average Efficiency Error : 6.9896011E-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	2992.018	3300.926	15876.00	0.2499355	1.0733101E-02	50.54956
NP-237	211.7160	28-FEB-2010	4437.197	4902.367	16318.00	0.2568789	1.3000464E-02	57.64658
CM-244	207.3882	28-FEB-2010	5531.134	5883.215	15134.00	0.2576209	1.3050339E-02	53.56906

Instrument : CHAMBER 176
Detector : 74434
Standard ID : AESS-020
Standard Reference Date : 14-FEB-2008 21:55:55
Calibration Analysis Date/Time : 24-AUG-2009 08:41:18
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 24-AUG-2009 14:09:15
Average Efficiency : 0.2565841
Average Efficiency Error : 7.0622312E-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	2987.853	3298.318	15148.00	0.2490841	1.0705328E-02	47.98410
NP-237	203.4984	28-FEB-2010	4433.083	4904.101	15833.00	0.2593126	1.3128439E-02	58.20272
CM-244	197.1096	28-FEB-2010	5532.948	5884.695	14821.00	0.2655677	1.3456577E-02	49.33431

Instrument : CHAMBER 177
Detector : 74435
Standard ID : AESS-015
Standard Reference Date : 14-FEB-2008 17:45:04
Calibration Analysis Date/Time : 24-AUG-2009 08:41:25
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 24-AUG-2009 14:09:24
Average Efficiency : 0.2668152
Average Efficiency Error : 7.3382389E-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	2989.857	3298.211	15920.00	0.2637714	1.1326759E-02	49.45098
NP-237	200.6460	28-FEB-2010	4433.475	4903.934	16338.00	0.2714185	1.3736055E-02	53.30935
CM-244	195.9270	28-FEB-2010	5533.213	5885.773	14796.00	0.2666922	1.3513907E-02	53.74039

Instrument : CHAMBER 178
Detector : 74436
Standard ID : AESS-021
Standard Reference Date : 19-FEB-2008 15:31:52
Calibration Analysis Date/Time : 24-AUG-2009 08:41:30
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 24-AUG-2009 14:09:35
Average Efficiency : 0.2595187
Average Efficiency Error : 7.1381964E-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	2991.399	3300.807	15690.00	0.2545363	1.0932880E-02	44.11681
NP-237	210.1548	28-FEB-2010	4432.785	4903.123	16730.00	0.2653126	1.3423340E-02	55.16845
CM-244	200.7390	28-FEB-2010	5531.481	5883.158	14852.00	0.2611876	1.3234260E-02	50.76077

Instrument : CHAMBER 179
Detector : 74437
Standard ID : AESS-016
Standard Reference Date : 14-FEB-2008 17:45:04
Calibration Analysis Date/Time : 24-AUG-2009 08:41:36
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 24-AUG-2009 14:09:44
Average Efficiency : 0.2718232
Average Efficiency Error : 7.4735158E-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	2990.874	3299.393	16266.00	0.2694745	1.1567459E-02	45.58660
NP-237	199.3962	28-FEB-2010	4435.018	4905.518	16480.00	0.2754735	1.3939864E-02	58.76590
CM-244	198.6402	28-FEB-2010	5534.758	5887.251	15277.00	0.2715900	1.3756392E-02	54.51526

Instrument : CHAMBER 180
Detector : 74438
Standard ID : AESS-022
Standard Reference Date : 14-FEB-2008 21:55:55
Calibration Analysis Date/Time : 24-AUG-2009 08:41:41
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 24-AUG-2009 14:09:54
Average Efficiency : 0.2528372
Average Efficiency Error : 6.9568004E-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	2989.946	3300.627	15376.00	0.2479020	1.0651710E-02	47.69878
NP-237	206.8830	28-FEB-2010	4434.505	4904.405	15995.00	0.2576708	1.3043700E-02	52.34612
CM-244	203.0208	28-FEB-2010	5531.104	5886.649	14679.00	0.2553639	1.2941188E-02	49.43889

Instrument : CHAMBER 181
Detector : 74439
Standard ID : AESS-017
Standard Reference Date : 14-FEB-2008 17:45:04
Calibration Analysis Date/Time : 24-AUG-2009 08:41:46
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 24-AUG-2009 14:10:03
Average Efficiency : 0.2567677
Average Efficiency Error : 7.0618824E-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	2988.658	3302.315	15809.00	0.2543999	1.0925616E-02	48.94121
NP-237	208.5846	28-FEB-2010	4432.549	4902.677	16291.00	0.2603085	1.3174290E-02	56.85185
CM-244	205.5828	28-FEB-2010	5531.208	5883.203	14943.00	0.2566723	1.3004515E-02	53.00024

Instrument : CHAMBER 182
Detector : 74440
Standard ID : AESS-023
Standard Reference Date : 14-FEB-2008 21:55:55
Calibration Analysis Date/Time : 24-AUG-2009 08:41:51
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 24-AUG-2009 14:10:14
Average Efficiency : 0.2534730
Average Efficiency Error : 6.9745579E-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	2990.553	3299.709	15297.00	0.2492435	1.0710318E-02	46.65529
NP-237	207.4998	28-FEB-2010	4435.824	4905.707	15977.00	0.2566445	1.2991886E-02	50.94455
CM-244	199.8804	28-FEB-2010	5533.404	5884.684	14515.00	0.2565299	1.3002145E-02	46.18616

Instrument : CHAMBER 183
Detector : 74441
Standard ID : AESS-018
Standard Reference Date : 14-FEB-2008 17:45:04
Calibration Analysis Date/Time : 24-AUG-2009 08:41:56
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 24-AUG-2009 14:10:29
Average Efficiency : 0.2637588
Average Efficiency Error : 7.2541810E-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	2989.015	3297.962	16012.00	0.2677119	1.1494849E-02	47.11412
NP-237	208.8990	28-FEB-2010	4434.099	4904.342	16303.00	0.2601227	1.3164749E-02	52.97176
CM-244	198.1458	28-FEB-2010	5532.826	5884.696	14712.00	0.2621811	1.3286361E-02	53.53780

Instrument : CHAMBER 184
Detector : 74442
Standard ID : AESS-024
Standard Reference Date : 14-FEB-2008 21:55:55
Calibration Analysis Date/Time : 24-AUG-2009 08:42:02
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 24-AUG-2009 14:10:41
Average Efficiency : 0.2604004
Average Efficiency Error : 7.1640476E-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	2989.045	3299.169	15378.00	0.2554370	1.0975426E-02	49.39055
NP-237	205.6662	28-FEB-2010	4437.505	4902.470	16322.00	0.2645144	1.3386835E-02	57.05146
CM-244	198.3060	28-FEB-2010	5535.333	5886.318	14804.00	0.2636573	1.3359983E-02	50.92117

Instrument : CHAMBER 185
Detector : 68615
Standard ID : AESS-025
Standard Reference Date : 15-FEB-2008 09:06:52
Calibration Analysis Date/Time : 24-AUG-2009 08:42:07
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 24-AUG-2009 14:10:54
Average Efficiency : 0.2583998
Average Efficiency Error : 7.1241027E-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	2987.897	3299.344	14977.00	0.2588871	1.1128917E-02	59.70583
NP-237	167.9916	28-FEB-2010	4432.571	4905.243	13169.00	0.2612911	1.3261506E-02	62.76381
CM-244	157.2432	28-FEB-2010	5530.503	5886.106	11355.00	0.2549717	1.2971560E-02	55.40694

Instrument : CHAMBER 186
Detector : 68616
Standard ID : AESS-031
Standard Reference Date : 18-FEB-2008 11:28:15
Calibration Analysis Date/Time : 24-AUG-2009 08:42:13
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 24-AUG-2009 14:11:06
Average Efficiency : 0.2578412
Average Efficiency Error : 7.1111098E-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	2992.379	3299.140	14692.00	0.2564398	1.1027561E-02	55.81911
NP-237	162.9186	28-FEB-2010	4434.242	4902.774	12639.00	0.2585895	1.3132489E-02	57.78773
CM-244	153.1968	28-FEB-2010	5534.982	5886.349	11244.00	0.2590897	1.3183227E-02	55.94541

Instrument : CHAMBER 187
Detector : 68620
Standard ID : AESS-026
Standard Reference Date : 15-FEB-2008 09:06:52
Calibration Analysis Date/Time : 24-AUG-2009 08:42:19
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 24-AUG-2009 14:11:16
Average Efficiency : 0.2520546
Average Efficiency Error : 7.3888451E-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	2991.498	3300.157	14978.00	0.2537758	1.2857930E-02	50.69514
NP-237	168.0294	28-FEB-2010	4437.493	4903.961	12739.00	0.2526664	1.2830210E-02	58.36928
CM-244	160.5822	28-FEB-2010	5535.243	5883.722	11357.00	0.2497735	1.2706947E-02	53.40160

Instrument	:	CHAMBER 188
Detector	:	68621
Standard ID	:	AESS-032
Standard Reference Date	:	18-FEB-2008 11:28:15
Calibration Analysis Date/Time	:	24-AUG-2009 08:42:24
Calibration Count Time	:	300.0000
Efficiency Calibration Date/Time	:	24-AUG-2009 14:11:25
Average Efficiency	:	0.2590206
Average Efficiency Error	:	7.1418569E-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	2988.985	3297.497	14940.00	0.2586645	1.1119837E-02	50.77880
NP-237	165.9822	28-FEB-2010	4433.354	4904.064	12857.00	0.2581703	1.3107833E-02	59.69577
CM-244	153.7938	28-FEB-2010	5533.683	5886.437	11347.00	0.2603945	1.3247656E-02	50.83346

Instrument	:	CHAMBER 189
Detector	:	68622
Standard ID	:	AESS-027
Standard Reference Date	:	15-FEB-2008 09:06:52
Calibration Analysis Date/Time	:	24-AUG-2009 08:42:30
Calibration Count Time	:	300.0000
Efficiency Calibration Date/Time	:	24-AUG-2009 14:11:34
Average Efficiency	:	0.2605012
Average Efficiency Error	:	7.6393606E-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	2990.052	3301.735	14579.00	0.2547995	1.2914370E-02	54.11663
NP-237	161.6154	28-FEB-2010	4436.853	4905.539	12669.00	0.2612749	1.3268417E-02	57.74998
CM-244	148.1754	28-FEB-2010	5532.776	5884.354	11162.00	0.2659585	1.3534531E-02	55.68552

Instrument	:	CHAMBER 190
Detector	:	68623
Standard ID	:	AESS-033
Standard Reference Date	:	18-FEB-2008 11:28:15
Calibration Analysis Date/Time	:	24-AUG-2009 08:42:35
Calibration Count Time	:	300.0000
Efficiency Calibration Date/Time	:	24-AUG-2009 14:11:43
Average Efficiency	:	0.2627709
Average Efficiency Error	:	7.2474247E-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	2991.652	3298.950	14837.00	0.2606309	1.1205810E-02	49.34105
NP-237	161.7816	28-FEB-2010	4435.677	4904.720	12625.00	0.2599701	1.3203092E-02	52.76612
CM-244	147.2670	28-FEB-2010	5532.170	5883.736	11225.00	0.2689729	1.3686700E-02	52.48962

Instrument : CHAMBER 191
Detector : 68624
Standard ID : AESS-028
Standard Reference Date : 15-FEB-2008 09:06:52
Calibration Analysis Date/Time : 24-AUG-2009 08:42:40
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 24-AUG-2009 14:11:54
Average Efficiency : 0.2621362
Average Efficiency Error : 7.6808794E-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	2991.100	3299.772	15569.00	0.2636111	1.3349629E-02	49.40056
NP-237	168.1992	28-FEB-2010	4437.436	4904.158	13280.00	0.2631744	1.3355431E-02	53.16087
CM-244	156.7614	28-FEB-2010	5530.545	5884.668	11529.00	0.2596773	1.3207550E-02	53.47022

Instrument : CHAMBER 192
Detector : 74430
Standard ID : AESS-034
Standard Reference Date : 18-FEB-2008 11:28:15
Calibration Analysis Date/Time : 24-AUG-2009 08:42:45
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 24-AUG-2009 14:12:04
Average Efficiency : 0.2555450
Average Efficiency Error : 7.0466422E-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	2988.046	3297.560	14899.00	0.2511216	1.0796109E-02	50.91946
NP-237	167.2962	28-FEB-2010	4437.061	4903.990	12977.00	0.2585397	1.3124744E-02	59.22014
CM-244	154.4388	28-FEB-2010	5535.519	5883.955	11337.00	0.2591194	1.3182904E-02	51.43979

Instrument : CHAMBER 193
Detector : 68627
Standard ID : AESS-029
Standard Reference Date : 15-FEB-2008 09:06:52
Calibration Analysis Date/Time : 24-AUG-2009 08:42:50
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 24-AUG-2009 14:12:15
Average Efficiency : 0.2629034
Average Efficiency Error : 7.7030240E-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	2990.087	3301.572	15539.00	0.2605920	1.3197066E-02	51.03585
NP-237	169.7700	28-FEB-2010	4436.483	4905.309	13298.00	0.2610572	1.3247789E-02	60.49369
CM-244	154.8234	28-FEB-2010	5532.931	5884.819	11722.00	0.2672982	1.3591460E-02	49.40217

Instrument : CHAMBER 194
Detector : 68635
Standard ID : AESS-035
Standard Reference Date : 18-FEB-2008 11:28:15
Calibration Analysis Date/Time : 24-AUG-2009 08:42:56
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 24-AUG-2009 14:12:24
Average Efficiency : 0.2559154
Average Efficiency Error : 7.0551960E-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	2990.152	3297.570	15094.00	0.2568187	1.1038445E-02	52.22760
NP-237	168.2934	28-FEB-2010	4434.536	4903.587	12941.00	0.2562945	1.3011310E-02	57.01247
CM-244	158.8128	28-FEB-2010	5530.970	5882.461	11437.00	0.2543004	1.2935611E-02	52.26905

Instrument : CHAMBER 195
Detector : 68636
Standard ID : AESS-030
Standard Reference Date : 15-FEB-2008 09:06:52
Calibration Analysis Date/Time : 24-AUG-2009 08:43:02
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 24-AUG-2009 14:12:38
Average Efficiency : 0.2667065
Average Efficiency Error : 7.8130718E-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	2992.288	3300.624	15672.00	0.2662604	1.3482675E-02	51.81870
NP-237	166.3758	28-FEB-2010	4434.057	4902.978	13400.00	0.2684508	1.3621432E-02	55.01876
CM-244	157.1856	28-FEB-2010	5534.813	5885.542	11813.00	0.2654414	1.3495106E-02	48.18431

Instrument : CHAMBER 196
Detector : 68637
Standard ID : AESS-036
Standard Reference Date : 18-FEB-2008 11:28:15
Calibration Analysis Date/Time : 24-AUG-2009 08:43:07
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 24-AUG-2009 14:12:49
Average Efficiency : 0.2563491
Average Efficiency Error : 7.0671304E-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	2990.410	3301.963	15144.00	0.2542627	1.0927959E-02	54.37652
NP-237	167.4312	28-FEB-2010	4437.321	4906.417	12971.00	0.2582058	1.3107896E-02	61.84642
CM-244	156.4188	28-FEB-2010	5534.476	5886.645	11409.00	0.2574924	1.3098660E-02	57.13540

Instrument : CHAMBER 197
Detector : 78894
Standard ID : AESS-037
Standard Reference Date : 18-FEB-2008 15:31:47
Calibration Analysis Date/Time : 24-AUG-2009 08:43:12
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 24-AUG-2009 14:12:58
Average Efficiency : 0.2565553
Average Efficiency Error : 7.0746746E-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	2991.920	3300.320	14773.00	0.2525423	1.0858861E-02	53.38351
NP-237	167.1294	28-FEB-2010	4436.468	4902.348	13097.00	0.2612088	1.3258392E-02	59.72187
CM-244	154.7664	28-FEB-2010	5532.745	5886.065	11302.00	0.2578566	1.3119171E-02	59.33312

Instrument : CHAMBER 198
Detector : 78895
Standard ID : AESS-043
Standard Reference Date : 19-FEB-2008 00:32:27
Calibration Analysis Date/Time : 24-AUG-2009 08:43:18
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 24-AUG-2009 14:13:11
Average Efficiency : 0.2541020
Average Efficiency Error : 7.0067579E-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	2991.305	3299.642	14821.00	0.2533123	1.0891330E-02	54.52969
NP-237	168.7422	28-FEB-2010	4434.397	4904.448	12902.00	0.2548661	1.2939337E-02	62.13729
CM-244	156.3252	28-FEB-2010	5533.011	5885.087	11271.00	0.2544529	1.2946853E-02	57.18044

Instrument : CHAMBER 199
Detector : 78896
Standard ID : AESS-038
Standard Reference Date : 18-FEB-2008 15:31:47
Calibration Analysis Date/Time : 24-AUG-2009 08:43:24
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 24-AUG-2009 14:13:20
Average Efficiency : 0.2501573
Average Efficiency Error : 6.8986462E-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	2988.912	3297.497	14841.00	0.2506579	1.0776930E-02	55.76347
NP-237	170.0886	28-FEB-2010	4433.891	4904.941	12813.00	0.2510752	1.2748260E-02	59.43263
CM-244	157.7460	28-FEB-2010	5535.121	5882.869	11103.00	0.2485638	1.2650183E-02	55.23568

Instrument : CHAMBER 200
Detector : 78900
Standard ID : AESS-044
Standard Reference Date : 19-FEB-2008 00:32:27
Calibration Analysis Date/Time : 24-AUG-2009 08:43:29
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 24-AUG-2009 14:13:29
Average Efficiency : 0.2684568
Average Efficiency Error : 7.3974063E-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	2991.845	3300.480	15537.00	0.2700785	1.1602442E-02	51.63891
NP-237	166.6248	28-FEB-2010	4436.941	4902.709	13461.00	0.2692276	1.3660024E-02	60.85046
CM-244	155.8290	28-FEB-2010	5532.744	5885.759	11723.00	0.2655081	1.3500395E-02	52.11015

Instrument : CHAMBER 201
Detector : 78902
Standard ID : AESS-039
Standard Reference Date : 18-FEB-2008 15:31:47
Calibration Analysis Date/Time : 24-AUG-2009 08:43:34
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 24-AUG-2009 14:13:38
Average Efficiency : 0.2592217
Average Efficiency Error : 7.1504964E-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	2988.531	3297.499	14697.00	0.2584198	1.1112645E-02	48.26062
NP-237	159.1506	28-FEB-2010	4434.991	4906.359	12598.00	0.2638277	1.3399226E-02	56.82220
CM-244	151.7142	28-FEB-2010	5531.510	5884.700	10999.00	0.2559689	1.3029314E-02	45.31117

Instrument : CHAMBER 202
Detector : 78903
Standard ID : AESS-045
Standard Reference Date : 19-FEB-2008 00:32:27
Calibration Analysis Date/Time : 24-AUG-2009 08:43:39
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 24-AUG-2009 14:13:47
Average Efficiency : 0.2636107
Average Efficiency Error : 7.2720256E-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	2990.301	3298.322	14668.00	0.2651460	1.1402297E-02	43.51926
NP-237	160.8066	28-FEB-2010	4432.596	4902.750	12471.00	0.2585094	1.3131124E-02	55.44957
CM-244	145.8384	28-FEB-2010	5531.710	5884.137	11024.00	0.2668914	1.3584715E-02	46.64507

Instrument : CHAMBER 203
Detector : 78905
Standard ID : AESS-040
Standard Reference Date : 18-FEB-2008 15:31:47
Calibration Analysis Date/Time : 24-AUG-2009 08:43:44
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 24-AUG-2009 14:16:33
Average Efficiency : 0.2640079
Average Efficiency Error : 7.2768405E-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	2988.566	3301.771	15299.00	0.2658898	1.1425615E-02	49.79924
NP-237	166.8174	28-FEB-2010	4437.077	4902.609	13111.00	0.2619471	1.3295709E-02	56.73104
CM-244	155.0100	28-FEB-2010	5532.534	5885.590	11568.00	0.2635126	1.3401660E-02	53.98056

Instrument : CHAMBER 204
Detector : 78907
Standard ID : AESS-046
Standard Reference Date : 19-FEB-2008 19:35:48
Calibration Analysis Date/Time : 24-AUG-2009 08:43:49
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 24-AUG-2009 14:14:37
Average Efficiency : 0.2523464
Average Efficiency Error : 6.9619059E-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	2990.303	3298.289	14571.00	0.2528380	1.0874456E-02	50.39679
NP-237	164.6658	28-FEB-2010	4433.152	4903.866	12403.00	0.2510013	1.2750966E-02	53.81767
CM-244	151.3824	28-FEB-2010	5533.856	5886.993	10856.00	0.2530294	1.2882944E-02	47.99111

Instrument : CHAMBER 205
Detector : 78908
Standard ID : AESS-041
Standard Reference Date : 18-FEB-2008 15:31:47
Calibration Analysis Date/Time : 24-AUG-2009 08:43:54
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 24-AUG-2009 14:14:46
Average Efficiency : 0.2560018
Average Efficiency Error : 7.0556081E-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	2991.267	3299.423	15358.00	0.2545983	1.0939639E-02	47.30880
NP-237	171.2268	28-FEB-2010	4434.928	4905.917	13265.00	0.2582288	1.3104673E-02	60.39516
CM-244	159.5796	28-FEB-2010	5530.946	5884.256	11561.00	0.2557920	1.3009178E-02	54.31215

Instrument : CHAMBER 206
Detector : 78909
Standard ID : AESS-047
Standard Reference Date : 19-FEB-2008 00:32:27
Calibration Analysis Date/Time : 24-AUG-2009 08:44:00
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 24-AUG-2009 14:14:55
Average Efficiency : 0.2539860
Average Efficiency Error : 7.0044687E-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	2991.740	3299.836	14668.00	0.2510710	1.0797012E-02	49.54147
NP-237	168.3948	28-FEB-2010	4434.469	4904.811	12921.00	0.2557680	1.2984839E-02	58.90450
CM-244	154.6032	28-FEB-2010	5534.058	5886.660	11229.00	0.2564440	1.3048770E-02	52.29348

Instrument : CHAMBER 207
Detector : 78910
Standard ID : AESS-042
Standard Reference Date : 18-FEB-2008 15:31:47
Calibration Analysis Date/Time : 24-AUG-2009 08:44:06
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 24-AUG-2009 14:15:04
Average Efficiency : 0.2567169
Average Efficiency Error : 7.0834220E-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	2987.560	3301.824	14325.00	0.2565888	1.1039187E-02	52.32441
NP-237	159.6558	28-FEB-2010	4434.563	4905.877	12409.00	0.2590533	1.3159815E-02	57.42267
CM-244	150.5208	28-FEB-2010	5530.790	5883.765	10855.00	0.2546263	1.2963978E-02	55.85357

Instrument : CHAMBER 208
Detector : 78911
Standard ID : AESS-048
Standard Reference Date : 19-FEB-2008 00:32:27
Calibration Analysis Date/Time : 24-AUG-2009 08:44:11
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 24-AUG-2009 14:15:14
Average Efficiency : 0.2558721
Average Efficiency Error : 7.0590605E-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	2990.613	3299.492	14536.00	0.2561232	1.1016136E-02	49.47414
NP-237	161.5530	28-FEB-2010	4436.795	4902.883	12269.00	0.2531039	1.2859914E-02	57.37383
CM-244	151.1856	28-FEB-2010	5533.327	5886.561	11065.00	0.2584097	1.3152145E-02	53.34291

Instrument : CHAMBER 209
Detector : 79188
Standard ID : AESS-001
Standard Reference Date : 20-FEB-2008 09:54:53
Calibration Analysis Date/Time : 28-AUG-2009 07:06:29
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 28-AUG-2009 13:24:07
Average Efficiency : 0.3688648
Average Efficiency Error : 1.0119580E-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	2991.940	3298.642	21909.00	0.3549186	1.5169610E-02	67.58371
NP-237	171.0024	28-FEB-2010	4435.592	4905.793	19508.00	0.3802500	1.9206451E-02	83.29742
CM-244	158.1060	28-FEB-2010	5530.388	5883.749	17000.00	0.3798451	1.9214446E-02	66.10979

Instrument : CHAMBER 210
Detector : 79189
Standard ID : AESS-002
Standard Reference Date : 19-FEB-2008 11:05:22
Calibration Analysis Date/Time : 28-AUG-2009 07:06:35
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 28-AUG-2009 13:25:35
Average Efficiency : 0.3925964
Average Efficiency Error : 1.0751541E-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	2988.073	3301.089	22564.00	0.3811763	1.6285976E-02	59.50077
NP-237	200.4990	28-FEB-2010	4435.142	4905.164	24168.00	0.4017925	2.0255197E-02	72.98598
CM-244	196.5558	28-FEB-2010	5533.916	5886.208	22310.00	0.4010454	2.0231251E-02	59.60097

Instrument : CHAMBER 211
Detector : 79190
Standard ID : AESS-003
Standard Reference Date : 15-FEB-2008 13:12:27
Calibration Analysis Date/Time : 28-AUG-2009 07:06:39
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 28-AUG-2009 13:25:47
Average Efficiency : 0.3783190
Average Efficiency Error : 1.0361547E-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	2991.282	3299.071	22252.00	0.3706464	1.5838793E-02	59.43069
NP-237	203.2080	28-FEB-2010	4434.230	4900.253	23526.00	0.3867531	1.9501008E-02	83.71527
CM-244	197.2236	28-FEB-2010	5531.327	5885.262	21283.00	0.3814342	1.9250123E-02	60.34041

Instrument : CHAMBER 212
Detector : 79191
Standard ID : AESS-004
Standard Reference Date : 14-FEB-2008 09:35:18
Calibration Analysis Date/Time : 28-AUG-2009 07:06:45
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 28-AUG-2009 13:26:50
Average Efficiency : 0.3842054
Average Efficiency Error : 1.0521159E-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	2991.918	3298.870	22817.00	0.3742636	1.5988497E-02	61.37182
NP-237	204.2586	28-FEB-2010	4437.027	4902.590	24211.00	0.3950988	1.9917466E-02	76.39180
CM-244	198.8100	28-FEB-2010	5533.378	5887.318	21854.00	0.3886002	1.9607035E-02	60.73505

Instrument : CHAMBER 213
Detector : 79192
Standard ID : AESS-005
Standard Reference Date : 14-FEB-2008 09:35:18
Calibration Analysis Date/Time : 28-AUG-2009 07:06:50
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 28-AUG-2009 13:27:02
Average Efficiency : 0.3626718
Average Efficiency Error : 9.9363821E-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	2991.497	3299.775	21877.00	0.3509731	1.5001265E-02	65.21502
NP-237	209.5938	28-FEB-2010	4434.841	4905.254	23395.00	0.3720641	1.8761570E-02	80.31606
CM-244	202.7478	28-FEB-2010	5534.504	5887.063	21311.00	0.3715691	1.8752033E-02	64.10100

Instrument : CHAMBER 214
Detector : 79193
Standard ID : AESS-006
Standard Reference Date : 14-FEB-2008 09:35:18
Calibration Analysis Date/Time : 28-AUG-2009 07:06:55
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 28-AUG-2009 13:27:13
Average Efficiency : 0.3838671
Average Efficiency Error : 1.0511074E-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	2991.133	3298.396	22762.00	0.3778099	1.6140467E-02	58.86099
NP-237	204.7038	28-FEB-2010	4436.844	4902.153	23748.00	0.3866856	1.9496445E-02	74.56451
CM-244	195.0060	28-FEB-2010	5532.271	5885.676	21514.00	0.3900006	1.9680507E-02	59.70840

Instrument : CHAMBER 215
Detector : 79194
Standard ID : AESS-007
Standard Reference Date : 14-FEB-2008 13:39:25
Calibration Analysis Date/Time : 28-AUG-2009 07:06:59
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 28-AUG-2009 13:27:24
Average Efficiency : 0.3806459
Average Efficiency Error : 1.0423170E-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	2991.638	3298.993	22783.00	0.3725980	1.5917629E-02	61.31356
NP-237	205.0260	28-FEB-2010	4433.482	4904.904	23893.00	0.3884499	1.9584404E-02	80.36595
CM-244	199.6806	28-FEB-2010	5531.246	5885.655	21745.00	0.3849533	1.9423924E-02	60.77392

Instrument : CHAMBER 216
Detector : 79195
Standard ID : AESS-008
Standard Reference Date : 14-FEB-2008 13:39:25
Calibration Analysis Date/Time : 28-AUG-2009 07:07:04
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 28-AUG-2009 13:27:35
Average Efficiency : 0.3745080
Average Efficiency Error : 1.0257245E-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	2992.181	3299.336	22346.00	0.3666793	1.5668461E-02	61.23994
NP-237	209.2716	28-FEB-2010	4432.606	4903.311	23466.00	0.3737679	1.8847005E-02	82.70575
CM-244	199.6488	28-FEB-2010	5533.853	5887.574	21885.00	0.3874936	1.9550970E-02	61.73182

Instrument : CHAMBER 217
Detector : 79410
Standard ID : AESS-009
Standard Reference Date : 19-FEB-2008 11:05:22
Calibration Analysis Date/Time : 28-AUG-2009 07:07:09
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 28-AUG-2009 13:27:45
Average Efficiency : 0.3777330
Average Efficiency Error : 1.0345438E-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	2989.031	3301.074	22245.00	0.3697601	1.5800970E-02	58.22815
NP-237	204.0192	28-FEB-2010	4434.240	4905.058	23534.00	0.3845063	1.9388009E-02	79.31593
CM-244	197.2128	28-FEB-2010	5530.547	5884.453	21374.00	0.3829291	1.9324809E-02	62.42009

Instrument : CHAMBER 218
Detector : 79411
Standard ID : AESS-010
Standard Reference Date : 14-FEB-2008 13:39:25
Calibration Analysis Date/Time : 28-AUG-2009 07:07:14
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 28-AUG-2009 13:27:55
Average Efficiency : 0.3930598
Average Efficiency Error : 1.0761084E-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	2988.583	3301.235	23052.00	0.3858313	1.6480651E-02	58.44905
NP-237	202.9926	28-FEB-2010	4435.884	4901.733	24227.00	0.3977866	2.0052891E-02	78.90448
CM-244	196.2330	28-FEB-2010	5532.602	5886.438	22153.00	0.3990829	2.0133503E-02	64.39376

Instrument : CHAMBER 219
Detector : 79412
Standard ID : AESS-011
Standard Reference Date : 14-FEB-2008 13:39:25
Calibration Analysis Date/Time : 28-AUG-2009 07:07:18
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 28-AUG-2009 13:28:06
Average Efficiency : 0.3681216
Average Efficiency Error : 1.0080670E-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	2992.207	3300.096	22591.00	0.3588740	1.5332905E-02	58.48974
NP-237	214.4868	28-FEB-2010	4435.206	4906.290	24021.00	0.3732913	1.8819345E-02	78.80820
CM-244	208.4184	28-FEB-2010	5531.669	5885.285	22231.00	0.3770731	1.9022530E-02	63.56152

Instrument : CHAMBER 220
Detector : 79413
Standard ID : AESS-012
Standard Reference Date : 14-FEB-2008 13:39:25
Calibration Analysis Date/Time : 28-AUG-2009 07:07:23
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 28-AUG-2009 13:28:15
Average Efficiency : 0.3790617
Average Efficiency Error : 1.0378873E-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	2990.930	3297.738	22806.00	0.3739041	1.5973235E-02	57.23833
NP-237	205.8930	28-FEB-2010	4435.749	4901.420	23881.00	0.3866248	1.9492462E-02	76.47005
CM-244	203.1954	28-FEB-2010	5532.504	5886.683	21795.00	0.3791749	1.9131947E-02	59.12632

Instrument : CHAMBER 221
Detector : 79414
Standard ID : AESS-013
Standard Reference Date : 14-FEB-2008 17:45:04
Calibration Analysis Date/Time : 28-AUG-2009 07:07:27
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 28-AUG-2009 13:28:26
Average Efficiency : 0.3760977
Average Efficiency Error : 1.0297902E-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	2989.954	3298.454	22543.00	0.3742467	1.5990108E-02	51.83245
NP-237	210.2526	28-FEB-2010	4435.659	4902.272	23655.00	0.3750251	1.8909130E-02	73.29375
CM-244	201.9108	28-FEB-2010	5533.925	5882.692	21697.00	0.3798594	1.9167274E-02	59.34735

Instrument : CHAMBER 222
Detector : 79415
Standard ID : AESS-014
Standard Reference Date : 19-FEB-2008 11:05:22
Calibration Analysis Date/Time : 28-AUG-2009 07:07:32
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 28-AUG-2009 13:28:40
Average Efficiency : 0.3479734
Average Efficiency Error : 9.5388982E-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	2990.392	3301.657	21181.00	0.3334915	1.4259904E-02	57.45364
NP-237	211.7160	28-FEB-2010	4433.525	4905.197	22862.00	0.3599479	1.8154154E-02	71.83906
CM-244	207.3882	28-FEB-2010	5534.683	5886.672	21099.00	0.3594557	1.8142378E-02	61.07040

Instrument : CHAMBER 223
Detector : 79416
Standard ID : AESS-015
Standard Reference Date : 14-FEB-2008 17:45:04
Calibration Analysis Date/Time : 28-AUG-2009 07:07:38
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 28-AUG-2009 13:28:50
Average Efficiency : 0.3915000
Average Efficiency Error : 1.0720647E-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	2990.058	3298.884	22991.00	0.3809772	1.6273832E-02	50.91898
NP-237	200.6460	28-FEB-2010	4432.434	4905.074	24293.00	0.4035698	2.0343946E-02	76.26361
CM-244	195.9270	28-FEB-2010	5532.599	5887.467	21933.00	0.3957134	1.9965306E-02	59.83861

Instrument : CHAMBER 224
Detector : 79417
Standard ID : AESS-016
Standard Reference Date : 14-FEB-2008 17:45:04
Calibration Analysis Date/Time : 28-AUG-2009 07:07:44
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 28-AUG-2009 13:29:01
Average Efficiency : 0.3813685
Average Efficiency Error : 1.0448295E-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	2988.636	3298.216	22249.00	0.3686436	1.5753238E-02	55.61435
NP-237	199.3962	28-FEB-2010	4432.951	4905.382	23877.00	0.3991403	2.0123499E-02	76.52156
CM-244	198.6402	28-FEB-2010	5532.025	5886.099	21587.00	0.3841456	1.9384453E-02	60.82283

Instrument : CHAMBER 225
Detector : 79418
Standard ID : AESS-017
Standard Reference Date : 14-FEB-2008 17:45:04
Calibration Analysis Date/Time : 28-AUG-2009 07:07:50
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 28-AUG-2009 13:29:13
Average Efficiency : 0.3798896
Average Efficiency Error : 1.0400972E-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	2991.462	3299.408	23067.00	0.3712333	1.5856978E-02	56.54003
NP-237	208.5846	28-FEB-2010	4434.737	4905.917	24322.00	0.3886784	1.9593079E-02	73.79168
CM-244	205.5828	28-FEB-2010	5531.430	5885.124	22345.00	0.3842223	1.9382324E-02	56.97727

Instrument : CHAMBER 226
Detector : 79419
Standard ID : AESS-018
Standard Reference Date : 14-FEB-2008 17:45:04
Calibration Analysis Date/Time : 28-AUG-2009 07:07:57
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 28-AUG-2009 13:29:24
Average Efficiency : 0.3827937
Average Efficiency Error : 1.0482643E-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	2991.793	3300.581	22481.00	0.3759236	1.6062303E-02	52.26083
NP-237	208.8990	28-FEB-2010	4433.080	4904.877	23880.00	0.3810358	1.9210700E-02	71.56741
CM-244	198.1458	28-FEB-2010	5530.936	5884.804	22156.00	0.3952768	1.9941466E-02	57.91118

Instrument : CHAMBER 227
Detector : 79420
Standard ID : AESS-019
Standard Reference Date : 19-FEB-2008 11:05:22
Calibration Analysis Date/Time : 28-AUG-2009 07:08:03
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 28-AUG-2009 13:29:35
Average Efficiency : 0.3801799
Average Efficiency Error : 1.0412521E-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	2989.468	3297.622	22414.00	0.3702514	1.5820496E-02	54.09752
NP-237	202.9140	28-FEB-2010	4433.427	4904.675	23804.00	0.3910310	1.9715140E-02	71.53796
CM-244	199.3140	28-FEB-2010	5535.505	5883.794	21696.00	0.3846057	1.9406769E-02	56.80846

Instrument : CHAMBER 228
Detector : 79421
Standard ID : AESS-020
Standard Reference Date : 14-FEB-2008 21:55:55
Calibration Analysis Date/Time : 28-AUG-2009 07:08:10
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 28-AUG-2009 13:30:03
Average Efficiency : 0.3820991
Average Efficiency Error : 1.0465804E-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	2992.529	3302.052	22496.00	0.3699491	1.5806897E-02	57.79967
NP-237	203.4984	28-FEB-2010	4435.206	4906.368	23880.00	0.3911529	1.9720770E-02	74.62083
CM-244	197.1096	28-FEB-2010	5530.800	5883.365	21859.00	0.3920157	1.9779330E-02	58.42591

Instrument : CHAMBER 229
Detector : 79422
Standard ID : AESS-021
Standard Reference Date : 19-FEB-2008 15:31:52
Calibration Analysis Date/Time : 28-AUG-2009 07:08:15
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 28-AUG-2009 13:30:14
Average Efficiency : 0.3792264
Average Efficiency Error : 1.0383990E-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	2989.967	3297.813	22847.00	0.3706752	1.5834933E-02	56.62864
NP-237	210.1548	28-FEB-2010	4433.942	4905.968	24067.00	0.3817250	1.9244215E-02	74.03220
CM-244	200.7390	28-FEB-2010	5533.045	5882.442	22147.00	0.3898062	1.9665552E-02	61.11129

Instrument : CHAMBER 230
Detector : 79423
Standard ID : AESS-022
Standard Reference Date : 14-FEB-2008 21:55:55
Calibration Analysis Date/Time : 28-AUG-2009 07:08:19
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 28-AUG-2009 13:31:10
Average Efficiency : 0.3733873
Average Efficiency Error : 1.0229134E-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	2992.307	3300.916	22287.00	0.3593755	1.5356863E-02	52.42038
NP-237	206.8830	28-FEB-2010	4432.950	4904.639	23944.00	0.3857800	1.9449461E-02	68.40366
CM-244	203.0208	28-FEB-2010	5530.626	5884.491	22017.00	0.3833580	1.9341249E-02	56.79975

Instrument : CHAMBER 231
Detector : 79424
Standard ID : AESS-023
Standard Reference Date : 14-FEB-2008 21:55:55
Calibration Analysis Date/Time : 28-AUG-2009 07:08:24
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 28-AUG-2009 13:31:59
Average Efficiency : 0.3850142
Average Efficiency Error : 1.0541392E-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	2989.314	3302.411	23101.00	0.3764438	1.6079262E-02	62.44617
NP-237	207.4998	28-FEB-2010	4437.493	4903.010	24175.00	0.3883348	1.9576734E-02	78.49866
CM-244	199.8804	28-FEB-2010	5532.978	5886.091	22319.00	0.3947221	1.9912189E-02	60.41550

Instrument : CHAMBER 232
Detector : 79425
Standard ID : AESS-024
Standard Reference Date : 14-FEB-2008 21:55:55
Calibration Analysis Date/Time : 28-AUG-2009 07:08:30
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 28-AUG-2009 13:32:18
Average Efficiency : 0.3742643
Average Efficiency Error : 1.0255569E-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	2990.963	3301.243	21662.00	0.3598436	1.5382325E-02	53.98000
NP-237	205.6662	28-FEB-2010	4436.020	4902.090	23797.00	0.3856703	1.9444924E-02	72.96513
CM-244	198.3060	28-FEB-2010	5531.563	5883.791	21651.00	0.3859375	1.9474341E-02	56.32160

Instrument	:	CHAMBER 233
Detector	:	79426
Standard ID	:	AESS-025
Standard Reference Date	:	15-FEB-2008 09:06:52
Calibration Analysis Date/Time	:	28-AUG-2009 07:08:35
Calibration Count Time	:	300.0000
Efficiency Calibration Date/Time	:	28-AUG-2009 13:32:35
Average Efficiency	:	0.3806617
Average Efficiency Error	:	1.0437921E-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	2990.373	3302.025	21917.00	0.3788947	1.6194314E-02	59.57938
NP-237	167.9916	28-FEB-2010	4434.487	4905.324	19388.00	0.3846898	1.9431910E-02	80.68842
CM-244	157.2432	28-FEB-2010	5531.110	5885.315	16870.00	0.3792152	1.9184273E-02	59.70237

Instrument	:	CHAMBER 234
Detector	:	79427
Standard ID	:	AESS-026
Standard Reference Date	:	15-FEB-2008 09:06:52
Calibration Analysis Date/Time	:	28-AUG-2009 07:08:41
Calibration Count Time	:	300.0000
Efficiency Calibration Date/Time	:	28-AUG-2009 13:32:51
Average Efficiency	:	0.3701842
Average Efficiency Error	:	1.0801505E-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	2988.269	3300.079	21287.00	0.3607304	1.8206345E-02	60.36027
NP-237	168.0294	28-FEB-2010	4436.893	4901.571	19195.00	0.3807805	1.9236386E-02	87.24484
CM-244	160.5822	28-FEB-2010	5530.864	5883.822	16817.00	0.3701437	1.8726060E-02	61.15481

Instrument	:	CHAMBER 235
Detector	:	79428
Standard ID	:	AESS-027
Standard Reference Date	:	15-FEB-2008 09:06:52
Calibration Analysis Date/Time	:	28-AUG-2009 07:08:45
Calibration Count Time	:	300.0000
Efficiency Calibration Date/Time	:	28-AUG-2009 13:33:07
Average Efficiency	:	0.3924418
Average Efficiency Error	:	1.1451972E-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	2989.964	3301.553	21591.00	0.3773947	1.9044928E-02	59.06186
NP-237	161.6154	28-FEB-2010	4434.767	4906.350	19376.00	0.3996259	2.0186499E-02	69.60875
CM-244	148.1754	28-FEB-2010	5533.497	5883.248	16865.00	0.4023240	2.0353375E-02	59.46798

Instrument : CHAMBER 236
Detector : 79429
Standard ID : AESS-028
Standard Reference Date : 15-FEB-2008 09:06:52
Calibration Analysis Date/Time : 28-AUG-2009 07:08:51
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 28-AUG-2009 13:33:24
Average Efficiency : 0.3822154
Average Efficiency Error : 1.1149851E-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	2989.553	3300.921	21911.00	0.3710214	1.8720830E-02	59.63935
NP-237	168.1992	28-FEB-2010	4432.813	4903.618	19461.00	0.3856082	1.9477623E-02	76.00614
CM-244	156.7614	28-FEB-2010	5534.883	5883.901	17350.00	0.3912177	1.9785114E-02	63.22596

Instrument : CHAMBER 237
Detector : 79430
Standard ID : AESS-029
Standard Reference Date : 15-FEB-2008 09:06:52
Calibration Analysis Date/Time : 28-AUG-2009 07:08:55
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 28-AUG-2009 13:33:41
Average Efficiency : 0.3836243
Average Efficiency Error : 1.1190724E-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	2990.412	3298.430	22171.00	0.3718633	1.8761324E-02	57.93632
NP-237	169.7700	28-FEB-2010	4434.021	4905.306	19694.00	0.3866741	1.9529065E-02	74.67754
CM-244	154.8234	28-FEB-2010	5530.956	5884.725	17244.00	0.3937016	1.9912098E-02	63.18201

Instrument : CHAMBER 238
Detector : 79431
Standard ID : AESS-030
Standard Reference Date : 15-FEB-2008 09:06:52
Calibration Analysis Date/Time : 28-AUG-2009 07:09:00
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 28-AUG-2009 13:33:59
Average Efficiency : 0.3827302
Average Efficiency Error : 1.1164652E-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	2988.738	3300.787	21962.00	0.3731618	1.8828424E-02	57.84193
NP-237	166.3758	28-FEB-2010	4433.583	4904.073	19552.00	0.3916996	1.9784329E-02	69.05827
CM-244	157.1856	28-FEB-2010	5534.315	5882.484	17088.00	0.3842701	1.9437104E-02	55.46104

Instrument : CHAMBER 239
Detector : 79432
Standard ID : AESS-031
Standard Reference Date : 18-FEB-2008 11:28:15
Calibration Analysis Date/Time : 28-AUG-2009 07:09:05
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 28-AUG-2009 13:34:23
Average Efficiency : 0.3877645
Average Efficiency Error : 1.0634423E-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	2991.271	3298.066	21814.00	0.3807774	1.6275739E-02	53.01001
NP-237	162.9186	28-FEB-2010	4436.718	4902.950	19446.00	0.3978185	2.0094519E-02	75.58379
CM-244	153.1968	28-FEB-2010	5535.054	5884.530	16836.00	0.3883347	1.9646063E-02	61.05005

Instrument : CHAMBER 240
Detector : 79433
Standard ID : AESS-032
Standard Reference Date : 18-FEB-2008 11:28:15
Calibration Analysis Date/Time : 28-AUG-2009 07:09:09
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 28-AUG-2009 13:34:40
Average Efficiency : 0.3763680
Average Efficiency Error : 1.0324174E-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	2990.716	3297.687	21305.00	0.3688990	1.5772741E-02	54.18781
NP-237	165.9822	28-FEB-2010	4436.108	4901.861	19099.00	0.3835373	1.9376662E-02	70.26006
CM-244	153.7938	28-FEB-2010	5532.981	5887.143	16557.00	0.3804168	1.9249255E-02	59.34691

Instrument : CHAMBER 241
Detector : 79434
Standard ID : AESS-033
Standard Reference Date : 18-FEB-2008 11:28:15
Calibration Analysis Date/Time : 28-AUG-2009 07:09:15
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 28-AUG-2009 13:34:57
Average Efficiency : 0.3975072
Average Efficiency Error : 1.0901848E-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	2991.942	3297.913	22027.00	0.3869813	1.6538920E-02	56.90702
NP-237	161.7816	28-FEB-2010	4434.531	4905.642	19524.00	0.4022706	2.0318527E-02	70.70508
CM-244	147.2670	28-FEB-2010	5532.339	5887.328	17047.00	0.4090414	2.0690644E-02	61.22742

Instrument : CHAMBER 242
Detector : 79435
Standard ID : AESS-034
Standard Reference Date : 18-FEB-2008 11:28:15
Calibration Analysis Date/Time : 28-AUG-2009 07:09:21
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 28-AUG-2009 13:35:16
Average Efficiency : 0.3864579
Average Efficiency Error : 1.0596083E-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	2990.675	3302.424	22431.00	0.3781182	1.6156483E-02	57.80299
NP-237	167.2962	28-FEB-2010	4435.599	4901.625	19682.00	0.3921467	1.9805590E-02	79.14774
CM-244	154.4388	28-FEB-2010	5533.423	5882.719	17192.00	0.3933641	1.9895712E-02	58.04135

Instrument : CHAMBER 243
Detector : 79436
Standard ID : AESS-035
Standard Reference Date : 18-FEB-2008 11:28:15
Calibration Analysis Date/Time : 28-AUG-2009 07:09:26
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 28-AUG-2009 13:35:39
Average Efficiency : 0.3714339
Average Efficiency Error : 1.0188053E-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	2990.382	3298.347	21390.00	0.3639862	1.5561880E-02	52.11441
NP-237	168.2934	28-FEB-2010	4434.037	4905.494	19170.00	0.3796824	1.9181171E-02	79.79841
CM-244	158.8128	28-FEB-2010	5531.482	5885.497	16828.00	0.3744243	1.8942432E-02	60.93315

Instrument : CHAMBER 244
Detector : 79437
Standard ID : AESS-036
Standard Reference Date : 18-FEB-2008 11:28:15
Calibration Analysis Date/Time : 28-AUG-2009 07:09:32
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 28-AUG-2009 13:36:07
Average Efficiency : 0.3715149
Average Efficiency Error : 1.0192083E-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	2987.566	3299.789	21504.00	0.3610823	1.5436707E-02	66.23463
NP-237	167.4312	28-FEB-2010	4433.571	4904.626	19293.00	0.3840864	1.9402392E-02	76.43731
CM-244	156.4188	28-FEB-2010	5530.417	5884.486	16611.00	0.3752594	1.8987549E-02	63.78664

Instrument : CHAMBER 245
Detector : 79438
Standard ID : AESS-037
Standard Reference Date : 18-FEB-2008 15:31:47
Calibration Analysis Date/Time : 28-AUG-2009 07:09:37
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 28-AUG-2009 13:36:53
Average Efficiency : 0.3848314
Average Efficiency Error : 1.0552316E-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	2988.843	3302.525	22076.00	0.3774236	1.6129972E-02	66.05534
NP-237	167.1294	28-FEB-2010	4434.670	4906.399	19600.00	0.3909029	1.9743593E-02	75.47243
CM-244	154.7664	28-FEB-2010	5532.436	5886.326	17075.00	0.3898463	1.9719332E-02	65.09534

Instrument : CHAMBER 246
Detector : 78912
Standard ID : AESS-038
Standard Reference Date : 18-FEB-2008 15:31:47
Calibration Analysis Date/Time : 28-AUG-2009 07:09:44
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 28-AUG-2009 13:37:05
Average Efficiency : 0.3738058
Average Efficiency Error : 1.0253170E-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	2991.420	3298.792	21522.00	0.3635281	1.5541083E-02	66.60865
NP-237	170.0886	28-FEB-2010	4433.098	4904.335	19515.00	0.3824243	1.9316213E-02	81.32760
CM-244	157.7460	28-FEB-2010	5530.336	5884.508	17010.00	0.3810334	1.9274388E-02	64.73948

Instrument : CHAMBER 247
Detector : 79440
Standard ID : AESS-039
Standard Reference Date : 18-FEB-2008 15:31:47
Calibration Analysis Date/Time : 28-AUG-2009 07:09:50
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 28-AUG-2009 13:37:16
Average Efficiency : 0.3955781
Average Efficiency Error : 1.0848942E-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	2991.040	3298.952	21948.00	0.3859353	1.6494961E-02	55.97421
NP-237	159.1506	28-FEB-2010	4435.157	4901.869	19486.00	0.4080938	2.0613093E-02	75.98156
CM-244	151.7142	28-FEB-2010	5534.103	5883.404	17090.00	0.3980037	2.0131798E-02	63.42304

Instrument	:	CHAMBER 248
Detector	:	79441
Standard ID	:	AESS-040
Standard Reference Date	:	18-FEB-2008 15:31:47
Calibration Analysis Date/Time	:	28-AUG-2009 07:09:55
Calibration Count Time	:	300.0000
Efficiency Calibration Date/Time	:	28-AUG-2009 13:37:28
Average Efficiency	:	0.3941916
Average Efficiency Error	:	1.0806664E-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	2989.950	3302.491	22290.00	0.3874540	1.6556673E-02	56.03559
NP-237	166.8174	28-FEB-2010	4437.546	4903.912	19884.00	0.3972850	2.0063095E-02	79.90582
CM-244	155.0100	28-FEB-2010	5530.441	5884.950	17598.00	0.4011423	2.0283826E-02	58.96740

Instrument	:	CHAMBER 249
Detector	:	79442
Standard ID	:	AESS-041
Standard Reference Date	:	18-FEB-2008 15:31:47
Calibration Analysis Date/Time	:	28-AUG-2009 07:10:01
Calibration Count Time	:	300.0000
Efficiency Calibration Date/Time	:	28-AUG-2009 13:37:39
Average Efficiency	:	0.3691496
Average Efficiency Error	:	1.0125251E-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	2991.458	3299.653	21709.00	0.3599154	1.5384958E-02	54.07297
NP-237	171.2268	28-FEB-2010	4437.087	4904.383	19560.00	0.3807467	1.9231046E-02	72.35228
CM-244	159.5796	28-FEB-2010	5532.120	5887.291	16794.00	0.3718590	1.8813105E-02	57.81293

Instrument	:	CHAMBER 250
Detector	:	79443
Standard ID	:	AESS-042
Standard Reference Date	:	18-FEB-2008 15:31:47
Calibration Analysis Date/Time	:	28-AUG-2009 07:10:06
Calibration Count Time	:	300.0000
Efficiency Calibration Date/Time	:	28-AUG-2009 13:37:51
Average Efficiency	:	0.3921595
Average Efficiency Error	:	1.0755106E-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	2988.375	3300.259	21703.00	0.3887982	1.6619630E-02	48.88448
NP-237	159.6558	28-FEB-2010	4433.621	4904.859	19099.00	0.3987351	2.0144468E-02	67.77724
CM-244	150.5208	28-FEB-2010	5531.200	5885.729	16638.00	0.3905834	1.9762557E-02	55.02527

Instrument : CHAMBER 251
Detector : 79444
Standard ID : AESS-043
Standard Reference Date : 19-FEB-2008 00:32:27
Calibration Analysis Date/Time : 28-AUG-2009 07:10:12
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 28-AUG-2009 13:38:01
Average Efficiency : 0.3860320
Average Efficiency Error : 1.0584467E-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	2992.181	3299.694	22112.00	0.3779713	1.6153051E-02	53.81643
NP-237	168.7422	28-FEB-2010	4435.877	4903.211	19812.00	0.3913130	1.9762235E-02	75.40137
CM-244	156.3252	28-FEB-2010	5531.476	5887.181	17382.00	0.3928898	1.9869251E-02	59.21478

Instrument : CHAMBER 252
Detector : 79445
Standard ID : AESS-044
Standard Reference Date : 19-FEB-2008 00:32:27
Calibration Analysis Date/Time : 28-AUG-2009 07:10:17
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 28-AUG-2009 13:38:11
Average Efficiency : 0.3746736
Average Efficiency Error : 1.0277720E-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	2990.594	3297.549	21166.00	0.3679778	1.5734663E-02	58.89096
NP-237	166.6248	28-FEB-2010	4436.816	4903.310	19132.00	0.3827184	1.9334946E-02	82.92307
CM-244	155.8290	28-FEB-2010	5530.420	5885.459	16612.00	0.3766809	1.9059464E-02	58.52933

Instrument : CHAMBER 253
Detector : 79446
Standard ID : AESS-045
Standard Reference Date : 19-FEB-2008 00:32:27
Calibration Analysis Date/Time : 28-AUG-2009 07:10:22
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 28-AUG-2009 13:38:20
Average Efficiency : 0.4166903
Average Efficiency Error : 1.1423565E-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	2990.116	3298.147	22479.00	0.4063848	1.7363828E-02	54.86803
NP-237	160.8066	28-FEB-2010	4437.082	4905.908	20384.00	0.4224682	2.1329734E-02	78.85169
CM-244	145.8384	28-FEB-2010	5531.106	5882.794	17611.00	0.4266897	2.1575425E-02	60.09909

Instrument : CHAMBER 254
Detector : 79447
Standard ID : AESS-046
Standard Reference Date : 19-FEB-2008 19:35:48
Calibration Analysis Date/Time : 28-AUG-2009 07:10:27
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 28-AUG-2009 13:38:31
Average Efficiency : 0.3994595
Average Efficiency Error : 1.0953108E-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	2990.155	3297.706	22342.00	0.3878187	1.6571781E-02	57.29897
NP-237	164.6658	28-FEB-2010	4433.107	4904.992	20059.00	0.4060186	2.0502383E-02	81.53826
CM-244	151.3824	28-FEB-2010	5532.020	5886.853	17611.00	0.4110290	2.0783551E-02	57.98274

Instrument : CHAMBER 255
Detector : 79448
Standard ID : AESS-047
Standard Reference Date : 19-FEB-2008 00:32:27
Calibration Analysis Date/Time : 28-AUG-2009 07:10:32
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 28-AUG-2009 13:38:42
Average Efficiency : 0.3673038
Average Efficiency Error : 1.0076646E-02
Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	197.4804	28-FEB-2010	2987.598	3300.373	21106.00	0.3613006	1.5449724E-02	54.03281
NP-237	168.3948	28-FEB-2010	4437.418	4905.095	18737.00	0.3708411	1.8738993E-02	71.81757
CM-244	154.6032	28-FEB-2010	5533.813	5884.354	16306.00	0.3726670	1.8860538E-02	60.74806

Instrument : CHAMBER 256
Detector : 79449
Standard ID : AESS-048
Standard Reference Date : 19-FEB-2008 00:32:27
Calibration Analysis Date/Time : 28-AUG-2009 07:10:37
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 28-AUG-2009 13:38:54
Average Efficiency : 0.3796731
Average Efficiency Error : 1.0416142E-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	2991.222	3298.267	21126.00	0.3722856	1.5919263E-02	56.71911
NP-237	161.5530	28-FEB-2010	4432.956	4905.052	18745.00	0.3867485	1.9542677E-02	77.89369
CM-244	151.1856	28-FEB-2010	5532.797	5882.840	16417.00	0.3836786	1.9416265E-02	61.63605

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 113
Detector : 45-111B4
Calibration Date/Time : 17-SEP-2009 15:08:33
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	4768.774
CM-244	4320A	2/28/10	5795.020	5794.950

Energy/Channel Equation : see above
Energy Calibration Zero : 2386.732
Energy Calibration Slope : 5.009326
Energy Calibration Quadratic : 2.6770448E-04
Energy Calibration Range : 7797.000

Instrument : CHAMBER 114
Detector : 78258
Calibration Date/Time : 17-SEP-2009 15:08:44
Calibration Source Id : AESS-007

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.722
NP-237	4341	2/28/10	4768.800	4768.568
CM-244	4320A	2/28/10	5795.020	5794.894

Energy/Channel Equation : see above
Energy Calibration Zero : 2339.893
Energy Calibration Slope : 4.993507
Energy Calibration Quadratic : 2.3911390E-04
Energy Calibration Range : 7704.000

Instrument : CHAMBER 115
Detector : 45-132FF4
Calibration Date/Time : 17-SEP-2009 15:08:54
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	4768.800
CM-244	4320A	2/28/10	5795.020	5794.872

Energy/Channel Equation : see above
Energy Calibration Zero : 2361.262
Energy Calibration Slope : 5.000648
Energy Calibration Quadratic : 2.6309560E-04
Energy Calibration Range : 7758.000

Instrument : CHAMBER 116
Detector : 45-132FF2
Calibration Date/Time : 17-SEP-2009 15:09:06
Calibration Source Id : AESS-008

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
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 : 2359.730
Energy Calibration Slope : 4.985509
Energy Calibration Quadratic : 2.6726534E-04
Energy Calibration Range : 7745.000

Instrument : CHAMBER 117
Detector : 33450
Calibration Date/Time : 17-SEP-2009 15:09:16
Calibration Source Id : AESS-003

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.491
NP-237	4341	2/28/10	4768.800	4768.339
CM-244	4320A	2/28/10	5795.020	5794.819

Energy/Channel Equation : see above
Energy Calibration Zero : 2385.651
Energy Calibration Slope : 4.970261
Energy Calibration Quadratic : 2.8056922E-04
Energy Calibration Range : 7769.000

Instrument : CHAMBER 118
Detector : 75544
Calibration Date/Time : 17-SEP-2009 15:09:28
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 : 2346.819
Energy Calibration Slope : 4.967181
Energy Calibration Quadratic : 2.8012006E-04
Energy Calibration Range : 7727.000

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	3112.902
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 : 17-SEP-2009 15:09:40
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	4768.710
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2314.428
Energy Calibration Slope : 4.966161
Energy Calibration Quadratic : 2.5640638E-04
Energy Calibration Range : 7669.000

Instrument : CHAMBER 121
Detector : 75545
Calibration Date/Time : 17-SEP-2009 15:09:49
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 : 2338.861
Energy Calibration Slope : 4.942947
Energy Calibration Quadratic : 2.9029930E-04
Energy Calibration Range : 7705.000

Instrument : CHAMBER 122
Detector : 75546
Calibration Date/Time : 17-SEP-2009 15:09:59
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	4768.800
CM-244	4320A	2/28/10	5795.020	5794.807

Energy/Channel Equation : see above
Energy Calibration Zero : 2335.373
Energy Calibration Slope : 4.957498
Energy Calibration Quadratic : 2.7508504E-04
Energy Calibration Range : 7700.000

Instrument : CHAMBER 123
Detector : 45-142V3
Calibration Date/Time : 17-SEP-2009 15:10:08
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	4768.800
CM-244	4320A	2/28/10	5795.020	5795.112

Energy/Channel Equation : see above
Energy Calibration Zero : 2378.713
Energy Calibration Slope : 4.974333
Energy Calibration Quadratic : 2.5756090E-04
Energy Calibration Range : 7743.000

Instrument : CHAMBER 124
Detector : 45-142V2
Calibration Date/Time : 17-SEP-2009 15:10:17
Calibration Source Id : AESS-012

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.748
NP-237	4341	2/28/10	4768.800	4768.555
CM-244	4320A	2/28/10	5795.020	5794.792

Energy/Channel Equation : see above
Energy Calibration Zero : 2392.695
Energy Calibration Slope : 5.013852
Energy Calibration Quadratic : 2.6642549E-04
Energy Calibration Range : 7806.000

Instrument : CHAMBER 125
Detector : 75547
Calibration Date/Time : 17-SEP-2009 15:10:26
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	4768.724
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2346.597
Energy Calibration Slope : 4.937986
Energy Calibration Quadratic : 2.8199228E-04
Energy Calibration Range : 7699.000

Instrument : CHAMBER 126
Detector : 75548
Calibration Date/Time : 17-SEP-2009 15:10:43
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	4768.630
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2351.075
Energy Calibration Slope : 5.037023
Energy Calibration Quadratic : 1.9564512E-04
Energy Calibration Range : 7714.000

Instrument : CHAMBER 127
Detector : 78770
Calibration Date/Time : 17-SEP-2009 15:10:52
Calibration Source Id : AESS-014

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.015
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 : 2339.960
Energy Calibration Slope : 4.959275
Energy Calibration Quadratic : 2.7139953E-04
Energy Calibration Range : 7703.000

Instrument : CHAMBER 128
Detector : 75549
Calibration Date/Time : 17-SEP-2009 15:11:01
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	4768.687
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2332.893
Energy Calibration Slope : 5.000373
Energy Calibration Quadratic : 2.3169331E-04
Energy Calibration Range : 7696.000

Instrument : CHAMBER 129
Detector : 76227
Calibration Date/Time : 17-SEP-2009 15:11:11
Calibration Source Id : AESS-015

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.775
NP-237	4341	2/28/10	4768.800	4768.764
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
Energy Calibration Zero : 2349.422
Energy Calibration Slope : 4.954164
Energy Calibration Quadratic : 2.6775626E-04
Energy Calibration Range : 7703.000

Instrument : CHAMBER 130
Detector : 76228
Calibration Date/Time : 17-SEP-2009 15:11:20
Calibration Source Id : AESS-021

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.546
NP-237	4341	2/28/10	4768.800	4768.433
CM-244	4320A	2/28/10	5795.020	5794.777

Energy/Channel Equation : see above
Energy Calibration Zero : 2341.580
Energy Calibration Slope : 4.993090
Energy Calibration Quadratic : 2.1626826E-04
Energy Calibration Range : 7681.000

Instrument : CHAMBER 131
Detector : 33448
Calibration Date/Time : 17-SEP-2009 15:11:29
Calibration Source Id : AESS-016

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.958
NP-237	4341	2/28/10	4768.800	4768.209
CM-244	4320A	2/28/10	5795.020	5794.532

Energy/Channel Equation : see above
Energy Calibration Zero : 2411.500
Energy Calibration Slope : 4.968785
Energy Calibration Quadratic : 2.8956254E-04
Energy Calibration Range : 7803.000

Instrument : CHAMBER 132
Detector : 67579
Calibration Date/Time : 17-SEP-2009 15:11:39
Calibration Source Id : AESS-022

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.807
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 : 2330.434
Energy Calibration Slope : 5.033886
Energy Calibration Quadratic : 2.1528341E-04
Energy Calibration Range : 7711.000

Instrument : CHAMBER 133
Detector : 76229
Calibration Date/Time : 17-SEP-2009 15:11:48
Calibration Source Id : AESS-017

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.772
NP-237	4341	2/28/10	4768.800	4768.493
CM-244	4320A	2/28/10	5795.020	5795.019

Energy/Channel Equation : see above
Energy Calibration Zero : 2312.054
Energy Calibration Slope : 4.909425
Energy Calibration Quadratic : 2.5591909E-04
Energy Calibration Range : 7608.000

Instrument : CHAMBER 134
Detector : 76230
Calibration Date/Time : 17-SEP-2009 15:11:57
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	4768.690
CM-244	4320A	2/28/10	5795.020	5794.888

Energy/Channel Equation : see above
Energy Calibration Zero : 2332.446
Energy Calibration Slope : 4.965801
Energy Calibration Quadratic : 2.4601555E-04
Energy Calibration Range : 7675.000

Instrument : CHAMBER 135
Detector : 64270
Calibration Date/Time : 17-SEP-2009 15:12:06
Calibration Source Id : AESS-018

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.697
NP-237	4341	2/28/10	4768.800	4768.428
CM-244	4320A	2/28/10	5795.020	5794.686

Energy/Channel Equation : see above
Energy Calibration Zero : 2343.759
Energy Calibration Slope : 4.952811
Energy Calibration Quadratic : 2.7405450E-04
Energy Calibration Range : 7703.000

Instrument : CHAMBER 136
Detector : 68549
Calibration Date/Time : 17-SEP-2009 15:12:16
Calibration Source Id : AESS-024

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.402
NP-237	4341	2/28/10	4768.800	4769.943
CM-244	4320A	2/28/10	5795.020	5797.448

Energy/Channel Equation : see above
Energy Calibration Zero : 2342.322
Energy Calibration Slope : 5.020517
Energy Calibration Quadratic : 2.2833873E-04
Energy Calibration Range : 7723.000

Instrument : CHAMBER 137
Detector : 64288
Calibration Date/Time : 16-SEP-2009 12:25:39
Calibration Source Id : AESS-025

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.831
NP-237	4341	2/28/10	4768.800	4768.466
CM-244	4320A	2/28/10	5795.020	5794.813

Energy/Channel Equation : see above
Energy Calibration Zero : 2384.608
Energy Calibration Slope : 5.017363
Energy Calibration Quadratic : 3.1012692E-04
Energy Calibration Range : 7848.000

Instrument : CHAMBER 138
Detector : 65877
Calibration Date/Time : 16-SEP-2009 12:25:51
Calibration Source Id : AESS-031

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.721
NP-237	4341	2/28/10	4768.800	4768.624
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2381.507
Energy Calibration Slope : 4.981775
Energy Calibration Quadratic : 3.0701407E-04
Energy Calibration Range : 7805.000

Instrument : CHAMBER 139
Detector : 76231
Calibration Date/Time : 16-SEP-2009 12:26:02
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	4768.667
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
Energy Calibration Zero : 2352.536
Energy Calibration Slope : 4.942561
Energy Calibration Quadratic : 2.9986945E-04
Energy Calibration Range : 7728.000

Instrument : CHAMBER 140
Detector : 78771
Calibration Date/Time : 16-SEP-2009 12:26:12
Calibration Source Id : AESS-032

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.880
NP-237	4341	2/28/10	4768.800	4768.746
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
Energy Calibration Zero : 2344.410
Energy Calibration Slope : 4.964199
Energy Calibration Quadratic : 2.9030148E-04
Energy Calibration Range : 7732.000

Instrument : CHAMBER 141
Detector : 76232
Calibration Date/Time : 16-SEP-2009 12:26:23
Calibration Source Id : AESS-027

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.756
NP-237	4341	2/28/10	4768.800	4768.664
CM-244	4320A	2/28/10	5795.020	5794.921

Energy/Channel Equation : see above
Energy Calibration Zero : 2359.530
Energy Calibration Slope : 4.949186
Energy Calibration Quadratic : 2.9451301E-04
Energy Calibration Range : 7736.000

Instrument : CHAMBER 142
Detector : 64261
Calibration Date/Time : 16-SEP-2009 12:26:33
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	4768.702
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2380.580
Energy Calibration Slope : 4.968856
Energy Calibration Quadratic : 3.0223309E-04
Energy Calibration Range : 7786.000

Instrument : CHAMBER 143
Detector : 65882
Calibration Date/Time : 16-SEP-2009 12:26:43
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 : 2353.411
Energy Calibration Slope : 4.964171
Energy Calibration Quadratic : 2.8231755E-04
Energy Calibration Range : 7733.000

Instrument : CHAMBER 144
Detector : 75551
Calibration Date/Time : 16-SEP-2009 12:26:53
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	4768.799
CM-244	4320A	2/28/10	5795.020	5795.045

Energy/Channel Equation : see above
Energy Calibration Zero : 2347.296
Energy Calibration Slope : 4.959377
Energy Calibration Quadratic : 2.8099009E-04
Energy Calibration Range : 7720.000

Instrument : CHAMBER 145
Detector : 72526
Calibration Date/Time : 16-SEP-2009 12:27:03
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	5795.021

Energy/Channel Equation : see above
Energy Calibration Zero : 2354.857
Energy Calibration Slope : 4.970427
Energy Calibration Quadratic : 2.8643355E-04
Energy Calibration Range : 7745.000

Instrument : CHAMBER 146
Detector : 72527
Calibration Date/Time : 16-SEP-2009 12:27:13
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	5795.019

Energy/Channel Equation : see above
Energy Calibration Zero : 2349.628
Energy Calibration Slope : 4.953955
Energy Calibration Quadratic : 2.6576858E-04
Energy Calibration Range : 7701.000

Instrument : CHAMBER 147
Detector : 75550
Calibration Date/Time : 16-SEP-2009 12:27:23
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 : 2346.748
Energy Calibration Slope : 4.969914
Energy Calibration Quadratic : 2.5925279E-04
Energy Calibration Range : 7708.000

Instrument : CHAMBER 148
Detector : 74429
Calibration Date/Time : 16-SEP-2009 12:27:33
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	4768.800
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2346.190
Energy Calibration Slope : 4.957554
Energy Calibration Quadratic : 2.8058770E-04
Energy Calibration Range : 7717.000

Instrument : CHAMBER 149
Detector : 33449
Calibration Date/Time : 15-SEP-2009 13:29:50
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	4768.962
CM-244	4320A	2/28/10	5795.020	5795.120

Energy/Channel Equation : see above
Energy Calibration Zero : 2390.249
Energy Calibration Slope : 4.945051
Energy Calibration Quadratic : 3.1025134E-04
Energy Calibration Range : 7779.000

Instrument : CHAMBER 150
Detector : 75552
Calibration Date/Time : 15-SEP-2009 13:30:04
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	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2355.846
Energy Calibration Slope : 4.963627
Energy Calibration Quadratic : 2.8320536E-04
Energy Calibration Range : 7736.000

Instrument : CHAMBER 151
Detector : 75556
Calibration Date/Time : 15-SEP-2009 13:30:37
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	4768.876
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2346.769
Energy Calibration Slope : 4.917734
Energy Calibration Quadratic : 2.9527576E-04
Energy Calibration Range : 7692.000

Instrument : CHAMBER 152
Detector : 76222
Calibration Date/Time : 15-SEP-2009 13:30:48
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	4768.772
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
Energy Calibration Zero : 2342.471
Energy Calibration Slope : 4.955277
Energy Calibration Quadratic : 2.6035175E-04
Energy Calibration Range : 7690.000

Instrument : CHAMBER 153
Detector : 76223
Calibration Date/Time : 15-SEP-2009 13:31:00
Calibration Source Id : AESS-039

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.192
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 : 2333.990
Energy Calibration Slope : 4.951685
Energy Calibration Quadratic : 2.7959119E-04
Energy Calibration Range : 7698.000

Instrument : CHAMBER 154
Detector : 76224
Calibration Date/Time : 15-SEP-2009 13:31:26
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	4768.800
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2342.016
Energy Calibration Slope : 4.948280
Energy Calibration Quadratic : 2.8570730E-04
Energy Calibration Range : 7709.000

Instrument : CHAMBER 155
Detector : 75553
Calibration Date/Time : 15-SEP-2009 13:31:39
Calibration Source Id : AESS-040

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.184
NP-237	4341	2/28/10	4768.800	4768.936
CM-244	4320A	2/28/10	5795.020	5795.140

Energy/Channel Equation : see above
Energy Calibration Zero : 2366.281
Energy Calibration Slope : 4.966718
Energy Calibration Quadratic : 2.9833001E-04
Energy Calibration Range : 7765.000

Instrument : CHAMBER 156
Detector : 75554
Calibration Date/Time : 15-SEP-2009 13:31:49
Calibration Source Id : AESS-046

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3189.446
NP-237	4341	2/28/10	4768.800	5162.066
CM-244	4320A	2/28/10	5795.020	5800.248

Energy/Channel Equation : see above
Energy Calibration Zero : 2363.858
Energy Calibration Slope : 4.985206
Energy Calibration Quadratic : 2.8685082E-04
Energy Calibration Range : 7769.000

Instrument : CHAMBER 157
Detector : 75555
Calibration Date/Time : 15-SEP-2009 13:32:00
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	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2360.555
Energy Calibration Slope : 4.963046
Energy Calibration Quadratic : 2.9731516E-04
Energy Calibration Range : 7754.000

Instrument : CHAMBER 158
Detector : 33451
Calibration Date/Time : 15-SEP-2009 13:32:11
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	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2391.673
Energy Calibration Slope : 4.990663
Energy Calibration Quadratic : 3.2096857E-04
Energy Calibration Range : 7839.000

Instrument : CHAMBER 159
Detector : 76225
Calibration Date/Time : 15-SEP-2009 13:32:21
Calibration Source Id : AESS-042

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.819
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 : 2354.535
Energy Calibration Slope : 4.988183
Energy Calibration Quadratic : 2.8453415E-04
Energy Calibration Range : 7761.000

Instrument : CHAMBER 160
Detector : 76226
Calibration Date/Time : 15-SEP-2009 13:32:31
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	4768.745
CM-244	4320A	2/28/10	5795.020	5794.943

Energy/Channel Equation : see above
Energy Calibration Zero : 2354.507
Energy Calibration Slope : 5.015394
Energy Calibration Quadratic : 2.5826940E-04
Energy Calibration Range : 7761.000

Subsection 2: Background Calibration

Instrument : CHAMBER 113
Detector : 45-111B4
Background Analysis Date/Time : 13-SEP-2009 12:07:37
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.706	3302.190	1.000000	0.3000000	100.0000	95.00000
NP-237	4433.295	4905.578	9.000000	2.700000	33.33334	95.00000
CM-244	5531.363	5884.629	11.00000	3.300000	30.15113	95.00000

Instrument : CHAMBER 114
Detector : 78258
Background Analysis Date/Time : 13-SEP-2009 12:07:42
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.034	3302.376	1.000000	0.3000000	100.0000	95.00000
NP-237	4432.616	4901.658	1.000000	0.3000000	100.0000	95.00000
CM-244	5533.073	5883.287	3.000000	0.9000000	57.73503	95.00000

Instrument : CHAMBER 115
Detector : 45-132FF4
Background Analysis Date/Time : 13-SEP-2009 12:07:47
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.454	3300.485	1.000000	0.3000000	100.0000	95.00000
NP-237	4434.893	4906.309	7.000000	2.100000	37.79645	95.00000
CM-244	5530.846	5883.358	10.00000	3.000000	31.62278	95.00000

Instrument : CHAMBER 116
Detector : 45-132FF2
Background Analysis Date/Time : 13-SEP-2009 12:07:52
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.147	3301.366	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4433.104	4903.545	7.000000	2.100000	37.79645	95.00000
CM-244	5532.219	5884.159	18.00000	5.400000	23.57022	95.00000

Instrument : CHAMBER 117
Detector : 33450
Background Analysis Date/Time : 13-SEP-2009 12:07:56
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.160	3299.532	1.000000	0.3000000	100.0000	95.00000
NP-237	4434.233	4904.181	9.000000	2.700000	33.33334	95.00000
CM-244	5532.536	5884.461	14.00000	4.200000	26.72612	95.00000

Instrument : CHAMBER 118
Detector : 75544
Background Analysis Date/Time : 13-SEP-2009 12:08:02
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.246	3300.695	1.000000	0.3000000	100.0000	95.00000
NP-237	4435.648	4905.687	4.000000	1.200000	50.00000	95.00000
CM-244	5534.149	5886.128	10.00000	3.000000	31.62278	95.00000

Instrument : CHAMBER 119
Detector : 74429
Background Analysis Date/Time : 13-SEP-2009 12:08:06
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	0.0000000E+00	0.0000000E+00	0.0000000E+00	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 : 13-SEP-2009 12:08:12
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.533	3297.646	2.000000	0.6000000	70.71068	95.00000
NP-237	4435.084	4903.407	2.000000	0.6000000	70.71068	95.00000
CM-244	5534.300	5884.438	2.000000	0.6000000	70.71068	95.00000

Instrument : CHAMBER 121
Detector : 75545
Background Analysis Date/Time : 13-SEP-2009 12:08:17
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.369	3298.608	1.000000	0.3000000	100.0000	95.00000
NP-237	4434.997	4903.847	3.000000	0.9000000	57.73503	95.00000
CM-244	5530.990	5882.362	6.000000	1.800000	40.82483	95.00000

Instrument : CHAMBER 122
Detector : 75546
Background Analysis Date/Time : 13-SEP-2009 12:08:22
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.526	3302.417	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4434.926	4903.828	13.00000	3.900000	27.73501	95.00000
CM-244	5530.663	5887.014	17.00000	5.100000	24.25356	95.00000

Instrument : CHAMBER 123
Detector : 45-142V3
Background Analysis Date/Time : 13-SEP-2009 12:08:27
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.415	3297.641	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4435.564	4904.117	4.000000	1.200000	50.00000	95.00000
CM-244	5535.344	5885.681	8.000000	2.400000	35.35534	95.00000

Instrument : CHAMBER 124
Detector : 45-142V2
Background Analysis Date/Time : 13-SEP-2009 12:08:33
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.039	3298.711	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4435.637	4902.902	5.000000	1.500000	44.72136	95.00000
CM-244	5534.267	5882.317	5.000000	1.500000	44.72136	95.00000

Instrument : CHAMBER 125
Detector : 75547
Background Analysis Date/Time : 13-SEP-2009 12:08:38
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.290	3300.040	2.000000	0.6000000	70.71068	95.00000
NP-237	4434.085	4901.751	2.000000	0.6000000	70.71068	95.00000
CM-244	5532.412	5882.738	6.000000	1.800000	40.82483	95.00000

Instrument : CHAMBER 126
Detector : 75548
Background Analysis Date/Time : 13-SEP-2009 12:08:44
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.846	3299.840	2.000000	0.6000000	70.71068	95.00000
NP-237	4433.552	4902.802	10.00000	3.000000	31.62278	95.00000
CM-244	5533.398	5882.628	5.000000	1.500000	44.72136	95.00000

Instrument : CHAMBER 127
Detector : 78770
Background Analysis Date/Time : 13-SEP-2009 12:08:49
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.252	3302.146	1.000000	0.3000000	100.0000	95.00000
NP-237	4434.433	4903.142	2.000000	0.6000000	70.71068	95.00000
CM-244	5534.926	5885.739	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000

Instrument : CHAMBER 128
Detector : 75549
Background Analysis Date/Time : 13-SEP-2009 12:08:54
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.918	3301.506	2.000000	0.6000000	70.71068	95.00000
NP-237	4437.567	4901.469	5.000000	1.500000	44.72136	95.00000
CM-244	5532.764	5882.821	1.000000	0.3000000	100.0000	95.00000

Instrument : CHAMBER 129
Detector : 76227
Background Analysis Date/Time : 13-SEP-2009 12:08:58
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.942	3300.379	1.000000	0.3000000	100.0000	95.00000
NP-237	4435.988	4903.888	7.000000	2.100000	37.79645	95.00000
CM-244	5534.503	5884.627	4.000000	1.200000	50.00000	95.00000

Instrument : CHAMBER 130
Detector : 76228
Background Analysis Date/Time : 13-SEP-2009 12:09:04
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.288	3298.075	3.000000	0.9000000	57.73503	95.00000
NP-237	4435.444	4902.612	12.00000	3.600000	28.86751	95.00000
CM-244	5530.953	5884.486	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000

Instrument : CHAMBER 131
Detector : 33448
Background Analysis Date/Time : 13-SEP-2009 12:09:09
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.775	3300.047	1.000000	0.3000000	100.0000	95.00000
NP-237	4434.944	4905.225	5.000000	1.500000	44.72136	95.00000
CM-244	5534.242	5886.644	5.000000	1.500000	44.72136	95.00000

Instrument : CHAMBER 132
Detector : 67579
Background Analysis Date/Time : 13-SEP-2009 12:09:14
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.478	3299.760	1.000000	0.3000000	100.0000	95.00000
NP-237	4435.728	4906.447	7.000000	2.100000	37.79645	95.00000
CM-244	5534.199	5884.992	3.000000	0.9000000	57.73503	95.00000

Instrument : CHAMBER 133
Detector : 76229
Background Analysis Date/Time : 13-SEP-2009 12:09:19
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.448	3299.164	1.000000	0.3000000	100.0000	95.00000
NP-237	4434.532	4903.111	3.000000	0.9000000	57.73503	95.00000
CM-244	5532.731	5884.588	5.000000	1.500000	44.72136	95.00000

Instrument : CHAMBER 134
Detector : 76230
Background Analysis Date/Time : 13-SEP-2009 12:09:24
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.219	3300.010	1.000000	0.3000000	100.0000	95.00000
NP-237	4435.624	4902.916	35.00000	10.50000	16.90309	95.00000
CM-244	5532.171	5886.589	7.000000	2.100000	37.79645	95.00000

Instrument : CHAMBER 135
Detector : 64270
Background Analysis Date/Time : 13-SEP-2009 12:09:28
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.256	3299.743	1.000000	0.3000000	100.0000	95.00000
NP-237	4436.015	4904.361	7.000000	2.100000	37.79645	95.00000
CM-244	5530.434	5886.345	10.00000	3.000000	31.62278	95.00000

Instrument : CHAMBER 136
Detector : 68549
Background Analysis Date/Time : 13-SEP-2009 12:09:33
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.690	3299.356	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4433.911	4904.417	19.00000	5.700000	22.94157	95.00000
CM-244	5532.210	5883.186	6.000000	1.800000	40.82483	95.00000

Instrument : CHAMBER 137
Detector : 64288
Background Analysis Date/Time : 13-SEP-2009 12:09:37
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.157	3297.781	3.000000	0.9000000	57.73503	95.00000
NP-237	4435.908	4901.616	4.000000	1.200000	50.00000	95.00000
CM-244	5533.626	5885.457	9.000000	2.700000	33.33334	95.00000

Instrument : CHAMBER 138
Detector : 65877
Background Analysis Date/Time : 13-SEP-2009 12:09:42
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.797	3298.359	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4433.795	4901.574	16.00000	4.800000	25.00000	95.00000
CM-244	5534.629	5884.088	9.000000	2.700000	33.33334	95.00000

Instrument : CHAMBER 139
Detector : 76231
Background Analysis Date/Time : 13-SEP-2009 12:09:46
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.097	3302.448	7.000000	2.100000	37.79645	95.00000
NP-237	4434.583	4904.027	9.000000	2.700000	33.33334	95.00000
CM-244	5532.194	5884.250	7.000000	2.100000	37.79645	95.00000

Instrument : CHAMBER 140
Detector : 78771
Background Analysis Date/Time : 13-SEP-2009 12:09:51
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.623	3298.088	3.000000	0.9000000	57.73503	95.00000
NP-237	4433.734	4904.340	8.000000	2.400000	35.35534	95.00000
CM-244	5533.806	5886.466	1.000000	0.3000000	100.0000	95.00000

Instrument : CHAMBER 141
Detector : 76232
Background Analysis Date/Time : 13-SEP-2009 12:09:56
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.803	3300.386	27.00000	8.100000	19.24501	95.00000
NP-237	4433.014	4902.508	26.00000	7.800000	19.61161	95.00000
CM-244	5530.609	5882.563	14.00000	4.200000	26.72612	95.00000

Instrument : CHAMBER 142
Detector : 64261
Background Analysis Date/Time : 13-SEP-2009 12:10:00
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.279	3300.003	3.000000	0.9000000	57.73503	95.00000
NP-237	4437.328	4903.684	13.00000	3.900000	27.73501	95.00000
CM-244	5534.720	5883.018	16.00000	4.800000	25.00000	95.00000

Instrument : CHAMBER 143
Detector : 65882
Background Analysis Date/Time : 13-SEP-2009 12:10:05
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.414	3301.724	9.000000	2.700000	33.33334	95.00000
NP-237	4436.178	4906.076	12.00000	3.600000	28.86751	95.00000
CM-244	5534.405	5886.338	8.000000	2.400000	35.35534	95.00000

Instrument : CHAMBER 144
Detector : 75551
Background Analysis Date/Time : 13-SEP-2009 12:10:09
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.731	3299.721	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4433.065	4902.473	11.00000	3.300000	30.15113	95.00000
CM-244	5535.430	5887.007	9.000000	2.700000	33.33334	95.00000

Instrument : CHAMBER 145
Detector : 72526
Background Analysis Date/Time : 13-SEP-2009 12:10:13
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.721	3299.421	1.000000	0.3000000	100.0000	95.00000
NP-237	4435.677	4906.422	5.000000	1.500000	44.72136	95.00000
CM-244	5530.652	5883.277	6.000000	1.800000	40.82483	95.00000

Instrument : CHAMBER 146
Detector : 72527
Background Analysis Date/Time : 13-SEP-2009 12:10:17
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.088	3300.474	1.000000	0.3000000	100.0000	95.00000
NP-237	4435.771	4903.488	6.000000	1.800000	40.82483	95.00000
CM-244	5533.810	5883.749	15.00000	4.500000	25.81989	95.00000

Instrument : CHAMBER 147
Detector : 75550
Background Analysis Date/Time : 13-SEP-2009 12:10:22
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.181	3300.391	5.000000	1.500000	44.72136	95.00000
NP-237	4433.176	4901.748	17.00000	5.100000	24.25356	95.00000
CM-244	5533.043	5883.438	7.000000	2.100000	37.79645	95.00000

Instrument : CHAMBER 148
Detector : 74429
Background Analysis Date/Time : 13-SEP-2009 12:10:27
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.384	3298.254	7.000000	2.100000	37.79645	95.00000
NP-237	4436.330	4905.591	5.000000	1.500000	44.72136	95.00000
CM-244	5533.038	5884.458	5.000000	1.500000	44.72136	95.00000

Instrument : CHAMBER 149
Detector : 33449
Background Analysis Date/Time : 13-SEP-2009 12:10:31
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.123	3300.525	5.000000	1.500000	44.72136	95.00000
NP-237	4433.492	4903.565	7.000000	2.100000	37.79645	95.00000
CM-244	5532.823	5885.611	8.000000	2.400000	35.35534	95.00000

Instrument : CHAMBER 150
Detector : 75552
Background Analysis Date/Time : 13-SEP-2009 12:10:36
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.795	3299.018	4.000000	1.200000	50.00000	95.00000
NP-237	4433.345	4903.215	6.000000	1.800000	40.82483	95.00000
CM-244	5531.531	5883.467	8.000000	2.400000	35.35534	95.00000

Instrument : CHAMBER 151
Detector : 75556
Background Analysis Date/Time : 13-SEP-2009 12:10:41
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.065	3301.859	4.000000	1.200000	50.00000	95.00000
NP-237	4433.320	4905.527	3.000000	0.9000000	57.73503	95.00000
CM-244	5530.408	5885.912	9.000000	2.700000	33.33334	95.00000

Instrument : CHAMBER 152
Detector : 76222
Background Analysis Date/Time : 13-SEP-2009 12:10:46
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.057	3298.427	2.000000	0.6000000	70.71068	95.00000
NP-237	4433.408	4906.063	4.000000	1.200000	50.00000	95.00000
CM-244	5530.659	5885.565	7.000000	2.100000	37.79645	95.00000

Instrument : CHAMBER 153
Detector : 76223
Background Analysis Date/Time : 13-SEP-2009 12:10:51
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.484	3300.080	6.000000	1.800000	40.82483	95.00000
NP-237	4437.092	4905.894	12.00000	3.600000	28.86751	95.00000
CM-244	5532.708	5883.766	6.000000	1.800000	40.82483	95.00000

Instrument : CHAMBER 154
Detector : 76224
Background Analysis Date/Time : 13-SEP-2009 12:10:55
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.121	3297.561	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4434.389	4903.288	1.000000	0.3000000	100.0000	95.00000
CM-244	5530.382	5887.013	6.000000	1.800000	40.82483	95.00000

Instrument : CHAMBER 155
Detector : 75553
Background Analysis Date/Time : 13-SEP-2009 12:11:00
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.782	3300.412	1.000000	0.3000000	100.0000	95.00000
NP-237	4437.153	4903.167	6.000000	1.800000	40.82483	95.00000
CM-244	5533.649	5886.970	10.00000	3.000000	31.62278	95.00000

Instrument : CHAMBER 156
Detector : 75554
Background Analysis Date/Time : 13-SEP-2009 12:11:05
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.491	3301.031	8.000000	2.400000	35.35534	95.00000
NP-237	4435.135	4901.821	15.00000	4.500000	25.81989	95.00000
CM-244	5532.917	5886.438	4.000000	1.200000	50.00000	95.00000

Instrument : CHAMBER 157
Detector : 75555
Background Analysis Date/Time : 13-SEP-2009 12:11:09
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.619	3299.042	2.000000	0.6000000	70.71068	95.00000
NP-237	4434.971	4905.888	4.000000	1.200000	50.00000	95.00000
CM-244	5530.610	5883.642	4.000000	1.200000	50.00000	95.00000

Instrument : CHAMBER 158
Detector : 33451
Background Analysis Date/Time : 13-SEP-2009 12:11:14
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.107	3300.392	6.000000	1.800000	40.82483	95.00000
NP-237	4434.046	4903.553	8.000000	2.400000	35.35534	95.00000
CM-244	5533.886	5884.921	6.000000	1.800000	40.82483	95.00000

Instrument : CHAMBER 159
Detector : 76225
Background Analysis Date/Time : 13-SEP-2009 12:11:19
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.563	3302.370	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4437.078	4903.944	7.000000	2.100000	37.79645	95.00000
CM-244	5535.224	5883.443	3.000000	0.9000000	57.73503	95.00000

Instrument : CHAMBER 160
Detector : 76226
Background Analysis Date/Time : 13-SEP-2009 12:11:23
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.547	3301.417	2.000000	0.6000000	70.71068	95.00000
NP-237	4433.329	4905.681	15.00000	4.500000	25.81989	95.00000
CM-244	5531.326	5884.399	7.000000	2.100000	37.79645	95.00000

Subsection 3: Efficiency Calibration

Instrument : CHAMBER 113
Detector : 45-111B4
Standard ID : AESS-001
Standard Reference Date : 20-FEB-2008 09:54:53
Calibration Analysis Date/Time : 17-SEP-2009 07:22:34
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 17-SEP-2009 15:08:33
Average Efficiency : 0.2493664
Average Efficiency Error : 6.8753385E-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	2991.706	3302.190	15200.00	0.2463616	1.0587734E-02	67.05293
NP-237	171.0024	28-FEB-2010	4433.295	4905.578	12844.00	0.2503200	1.2709484E-02	68.82748
CM-244	158.1060	28-FEB-2010	5531.363	5884.629	11294.00	0.2528249	1.2863314E-02	69.69121

Instrument : CHAMBER 114
Detector : 78258
Standard ID : AESS-007
Standard Reference Date : 14-FEB-2008 13:39:25
Calibration Analysis Date/Time : 17-SEP-2009 07:22:42
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 17-SEP-2009 15:08:44
Average Efficiency : 0.2549134
Average Efficiency Error : 7.0137801E-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	2988.034	3302.376	15415.00	0.2522229	1.0836960E-02	47.39108
NP-237	205.0260	28-FEB-2010	4432.616	4901.658	15874.00	0.2580762	1.3065383E-02	60.20995
CM-244	199.6806	28-FEB-2010	5533.073	5883.287	14411.00	0.2556491	1.2958678E-02	47.07045

Instrument : CHAMBER 115
Detector : 45-132FF4
Standard ID : AESS-002
Standard Reference Date : 19-FEB-2008 11:05:22
Calibration Analysis Date/Time : 17-SEP-2009 07:22:48
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 17-SEP-2009 15:08:54
Average Efficiency : 0.2607451
Average Efficiency Error : 7.1741594E-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	2990.454	3300.485	15582.00	0.2633568	1.1313187E-02	59.06649
NP-237	200.4990	28-FEB-2010	4434.893	4906.309	15600.00	0.2593181	1.3131134E-02	67.99342
CM-244	196.5558	28-FEB-2010	5530.846	5883.358	14362.00	0.2586598	1.3111949E-02	66.45667

Instrument : CHAMBER 116
Detector : 45-132FF2
Standard ID : AESS-008
Standard Reference Date : 14-FEB-2008 13:39:25
Calibration Analysis Date/Time : 17-SEP-2009 07:22:54
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 17-SEP-2009 15:09:06
Average Efficiency : 0.2642209
Average Efficiency Error : 7.2657783E-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	2992.147	3301.366	15928.00	0.2614976	1.1229084E-02	58.63169
NP-237	209.2716	28-FEB-2010	4433.104	4903.545	16584.00	0.2641209	1.3364404E-02	67.71608
CM-244	199.6488	28-FEB-2010	5532.219	5884.159	15127.00	0.2683146	1.3592103E-02	63.73655

Instrument : CHAMBER 117
Detector : 33450
Standard ID : AESS-003
Standard Reference Date : 15-FEB-2008 13:12:27
Calibration Analysis Date/Time : 17-SEP-2009 07:22:59
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 17-SEP-2009 15:09:16
Average Efficiency : 0.2539330
Average Efficiency Error : 6.9886767E-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	2991.160	3299.532	15096.00	0.2515729	1.0813041E-02	72.94815
NP-237	203.2080	28-FEB-2010	4434.233	4904.181	15475.00	0.2538008	1.2853066E-02	68.32410
CM-244	197.2236	28-FEB-2010	5532.536	5884.461	14342.00	0.2575089	1.3053890E-02	66.10744

Instrument : CHAMBER 118
Detector : 75544
Standard ID : AESS-009
Standard Reference Date : 19-FEB-2008 11:05:22
Calibration Analysis Date/Time : 17-SEP-2009 07:23:06
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 17-SEP-2009 15:09:28
Average Efficiency : 0.2562016
Average Efficiency Error : 7.0496872E-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	2992.246	3300.695	15488.00	0.2575730	1.1065898E-02	48.08698
NP-237	204.0192	28-FEB-2010	4435.648	4905.687	15474.00	0.2527997	1.2802343E-02	51.47660
CM-244	197.2128	28-FEB-2010	5534.149	5886.128	14364.00	0.2578340	1.3070064E-02	51.26923

Instrument : CHAMBER 119
Detector : 74429
Standard ID : AESS-004
Standard Reference Date : 14-FEB-2008 09:35:18
Calibration Analysis Date/Time : 17-SEP-2009 07:23:12
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	14305.00	0.2936279	1.2630888E-02	65.91196
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 : 17-SEP-2009 07:23:19
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 17-SEP-2009 15:09:40
Average Efficiency : 0.2607642
Average Efficiency Error : 7.1738800E-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	2989.533	3297.646	15530.00	0.2600539	1.1171980E-02	51.65312
NP-237	202.9926	28-FEB-2010	4435.084	4903.407	15890.00	0.2609192	1.3209156E-02	58.42772
CM-244	196.2330	28-FEB-2010	5534.300	5884.438	14492.00	0.2616084	1.3259737E-02	53.52900

Instrument : CHAMBER 121
Detector : 75545
Standard ID : AESS-005
Standard Reference Date : 14-FEB-2008 09:35:18
Calibration Analysis Date/Time : 17-SEP-2009 07:23:26
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 17-SEP-2009 15:09:49
Average Efficiency : 0.2451099
Average Efficiency Error : 6.7468924E-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	2991.369	3298.608	14990.00	0.2406018	1.0342800E-02	48.96049
NP-237	209.5938	28-FEB-2010	4434.997	4903.847	15464.00	0.2459217	1.2454119E-02	62.72179
CM-244	202.7478	28-FEB-2010	5530.990	5882.362	14372.00	0.2510890	1.2728020E-02	56.59771

Instrument : CHAMBER 122
Detector : 75546
Standard ID : AESS-011
Standard Reference Date : 14-FEB-2008 13:39:25
Calibration Analysis Date/Time : 17-SEP-2009 07:23:33
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 17-SEP-2009 15:09:59
Average Efficiency : 0.2511206
Average Efficiency Error : 6.9071823E-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	2989.526	3302.417	15637.00	0.2485339	1.0675786E-02	50.53908
NP-237	214.4868	28-FEB-2010	4434.926	4903.828	16238.00	0.2522937	1.2769196E-02	58.55772
CM-244	208.4184	28-FEB-2010	5530.663	5887.014	14930.00	0.2536814	1.2853005E-02	49.92265

Instrument : CHAMBER 123
Detector : 45-142V3
Standard ID : AESS-006
Standard Reference Date : 14-FEB-2008 09:35:18
Calibration Analysis Date/Time : 17-SEP-2009 07:23:40
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 17-SEP-2009 15:10:08
Average Efficiency : 0.2596290
Average Efficiency Error : 7.1429913E-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	2989.415	3297.641	15549.00	0.2582173	1.1092825E-02	65.43886
NP-237	204.7038	28-FEB-2010	4435.564	4904.117	15822.00	0.2576210	1.3042886E-02	67.03554
CM-244	195.0060	28-FEB-2010	5535.344	5885.681	14523.00	0.2637896	1.3369960E-02	69.14881

Instrument : CHAMBER 124
Detector : 45-142V2
Standard ID : AESS-012
Standard Reference Date : 14-FEB-2008 13:39:25
Calibration Analysis Date/Time : 17-SEP-2009 07:23:47
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 17-SEP-2009 15:10:17
Average Efficiency : 0.2573053
Average Efficiency Error : 7.0782932E-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	2988.039	3298.711	15522.00	0.2546119	1.0938271E-02	67.72288
NP-237	205.8930	28-FEB-2010	4435.637	4902.902	16168.00	0.2617298	1.3247415E-02	71.34655
CM-244	203.1954	28-FEB-2010	5534.267	5882.317	14734.00	0.2568478	1.3015599E-02	72.65984

Instrument	:	CHAMBER 125
Detector	:	75547
Standard ID	:	AESS-013
Standard Reference Date	:	14-FEB-2008 17:45:04
Calibration Analysis Date/Time	:	17-SEP-2009 07:23:54
Calibration Count Time	:	300.0000
Efficiency Calibration Date/Time	:	17-SEP-2009 15:10:26
Average Efficiency	:	0.2582467
Average Efficiency Error	:	7.1037016E-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	2988.290	3300.040	15695.00	0.2606819	1.1196902E-02	49.19345
NP-237	210.2526	28-FEB-2010	4434.085	4901.751	16039.00	0.2542721	1.2871174E-02	57.62983
CM-244	201.9108	28-FEB-2010	5532.412	5882.738	14766.00	0.2590335	1.3125989E-02	51.15325

Instrument	:	CHAMBER 126
Detector	:	75548
Standard ID	:	AESS-019
Standard Reference Date	:	19-FEB-2008 11:05:22
Calibration Analysis Date/Time	:	17-SEP-2009 07:24:03
Calibration Count Time	:	300.0000
Efficiency Calibration Date/Time	:	17-SEP-2009 15:10:43
Average Efficiency	:	0.2528757
Average Efficiency Error	:	6.9609745E-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	2988.846	3299.840	14908.00	0.2463797	1.0592219E-02	51.21568
NP-237	202.9140	28-FEB-2010	4433.552	4902.802	15759.00	0.2588291	1.3104737E-02	56.16846
CM-244	199.3140	28-FEB-2010	5533.398	5882.628	14458.00	0.2568124	1.3017087E-02	52.26496

Instrument	:	CHAMBER 127
Detector	:	78770
Standard ID	:	AESS-014
Standard Reference Date	:	19-FEB-2008 11:05:22
Calibration Analysis Date/Time	:	17-SEP-2009 07:24:09
Calibration Count Time	:	300.0000
Efficiency Calibration Date/Time	:	17-SEP-2009 15:10:52
Average Efficiency	:	0.2474696
Average Efficiency Error	:	6.8085734E-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	2989.252	3302.146	15471.00	0.2437071	1.0470388E-02	48.16148
NP-237	211.7160	28-FEB-2010	4434.433	4903.142	15929.00	0.2507826	1.2695607E-02	58.40179
CM-244	207.3882	28-FEB-2010	5534.926	5885.739	14624.00	0.2496737	1.2653272E-02	52.79491

Instrument : CHAMBER 128
Detector : 75549
Standard ID : AESS-020
Standard Reference Date : 14-FEB-2008 21:55:55
Calibration Analysis Date/Time : 17-SEP-2009 07:24:16
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 17-SEP-2009 15:11:01
Average Efficiency : 0.2534627
Average Efficiency Error : 6.9763800E-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	2991.918	3301.506	15064.00	0.2478480	1.0653354E-02	48.72564
NP-237	203.4984	28-FEB-2010	4437.567	4901.469	15680.00	0.2568161	1.3003596E-02	61.32889
CM-244	197.1096	28-FEB-2010	5532.764	5882.821	14387.00	0.2585539	1.3106194E-02	50.94863

Instrument : CHAMBER 129
Detector : 76227
Standard ID : AESS-015
Standard Reference Date : 14-FEB-2008 17:45:04
Calibration Analysis Date/Time : 17-SEP-2009 07:24:21
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 17-SEP-2009 15:11:11
Average Efficiency : 0.2630869
Average Efficiency Error : 7.2373999E-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	2987.942	3300.379	15637.00	0.2592492	1.1136069E-02	51.14825
NP-237	200.6460	28-FEB-2010	4435.988	4903.888	16067.00	0.2668864	1.3509459E-02	61.16219
CM-244	195.9270	28-FEB-2010	5534.503	5884.627	14653.00	0.2649124	1.3425237E-02	55.22726

Instrument : CHAMBER 130
Detector : 76228
Standard ID : AESS-021
Standard Reference Date : 19-FEB-2008 15:31:52
Calibration Analysis Date/Time : 17-SEP-2009 07:24:25
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 17-SEP-2009 15:11:20
Average Efficiency : 0.2483380
Average Efficiency Error : 6.8345908E-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	2989.288	3298.075	15085.00	0.2448552	1.0524444E-02	49.62173
NP-237	210.1548	28-FEB-2010	4435.444	4902.612	15873.00	0.2517098	1.2743165E-02	56.97301
CM-244	200.7390	28-FEB-2010	5530.953	5884.486	14177.00	0.2500546	1.2677893E-02	51.59090

Instrument : CHAMBER 131
Detector : 33448
Standard ID : AESS-016
Standard Reference Date : 14-FEB-2008 17:45:04
Calibration Analysis Date/Time : 17-SEP-2009 07:24:30
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 17-SEP-2009 15:11:29
Average Efficiency : 0.2501664
Average Efficiency Error : 6.8896543E-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	2991.775	3300.047	14580.00	0.2416933	1.0394993E-02	94.70427
NP-237	199.3962	28-FEB-2010	4434.944	4905.225	15408.00	0.2575527	1.3043756E-02	97.00230
CM-244	198.6402	28-FEB-2010	5534.242	5886.644	14360.00	0.2560634	1.2980316E-02	84.26888

Instrument : CHAMBER 132
Detector : 67579
Standard ID : AESS-022
Standard Reference Date : 14-FEB-2008 21:55:55
Calibration Analysis Date/Time : 17-SEP-2009 07:24:36
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 17-SEP-2009 15:11:39
Average Efficiency : 0.2502582
Average Efficiency Error : 6.8874490E-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	2988.478	3299.760	15157.00	0.2445240	1.0509308E-02	47.44493
NP-237	206.8830	28-FEB-2010	4435.728	4906.447	15902.00	0.2561820	1.2969248E-02	59.39411
CM-244	203.0208	28-FEB-2010	5534.199	5884.992	14501.00	0.2530044	1.2823543E-02	54.36437

Instrument : CHAMBER 133
Detector : 76229
Standard ID : AESS-017
Standard Reference Date : 14-FEB-2008 17:45:04
Calibration Analysis Date/Time : 17-SEP-2009 07:24:41
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 17-SEP-2009 15:11:48
Average Efficiency : 0.2438080
Average Efficiency Error : 6.7106839E-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	2989.448	3299.164	15021.00	0.2418610	1.0396539E-02	54.98614
NP-237	208.5846	28-FEB-2010	4434.532	4903.111	15484.00	0.2474312	1.2530360E-02	61.05153
CM-244	205.5828	28-FEB-2010	5532.731	5884.588	14106.00	0.2430393	1.2323108E-02	54.34287

Instrument : CHAMBER 134
Detector : 76230
Standard ID : AESS-023
Standard Reference Date : 14-FEB-2008 21:55:55
Calibration Analysis Date/Time : 17-SEP-2009 07:24:46
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 17-SEP-2009 15:11:57
Average Efficiency : 0.2444534
Average Efficiency Error : 6.7299884E-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	2992.219	3300.010	14779.00	0.2409492	1.0360401E-02	46.56962
NP-237	207.4998	28-FEB-2010	4435.624	4902.916	15337.00	0.2462044	1.2469973E-02	55.22544
CM-244	199.8804	28-FEB-2010	5532.171	5886.589	13986.00	0.2478311	1.2567575E-02	48.04740

Instrument : CHAMBER 135
Detector : 64270
Standard ID : AESS-018
Standard Reference Date : 14-FEB-2008 17:45:04
Calibration Analysis Date/Time : 17-SEP-2009 07:24:53
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 17-SEP-2009 15:12:06
Average Efficiency : 0.2526507
Average Efficiency Error : 6.9530043E-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	2992.256	3299.743	15152.00	0.2534960	1.0894979E-02	56.63107
NP-237	208.8990	28-FEB-2010	4436.015	4904.361	15645.00	0.2496088	1.2639027E-02	67.14091
CM-244	198.1458	28-FEB-2010	5530.434	5886.345	14246.00	0.2546374	1.2909472E-02	60.82066

Instrument : CHAMBER 136
Detector : 68549
Standard ID : AESS-024
Standard Reference Date : 14-FEB-2008 21:55:55
Calibration Analysis Date/Time : 17-SEP-2009 07:24:58
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 17-SEP-2009 15:12:16
Average Efficiency : 0.2485794
Average Efficiency Error : 6.8427753E-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	2988.690	3299.356	14903.00	0.2476970	1.0648914E-02	56.69555
NP-237	205.6662	28-FEB-2010	4433.911	4904.417	15511.00	0.2513022	1.2726229E-02	83.91869
CM-244	198.3060	28-FEB-2010	5532.210	5883.186	13838.00	0.2471603	1.2535414E-02	66.08641

Instrument : CHAMBER 137
Detector : 64288
Standard ID : AESS-025
Standard Reference Date : 15-FEB-2008 09:06:52
Calibration Analysis Date/Time : 16-SEP-2009 07:03:27
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 16-SEP-2009 12:25:39
Average Efficiency : 0.2528386
Average Efficiency Error : 6.9739525E-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	2991.157	3297.781	14785.00	0.2557061	1.0994853E-02	66.23147
NP-237	167.9916	28-FEB-2010	4435.908	4901.616	12861.00	0.2551677	1.2955310E-02	79.15361
CM-244	157.2432	28-FEB-2010	5533.626	5885.457	10964.00	0.2468996	1.2568292E-02	71.74486

Instrument : CHAMBER 138
Detector : 65877
Standard ID : AESS-031
Standard Reference Date : 18-FEB-2008 11:28:15
Calibration Analysis Date/Time : 16-SEP-2009 07:03:32
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 16-SEP-2009 12:25:51
Average Efficiency : 0.2560047
Average Efficiency Error : 7.0619099E-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	2988.797	3298.359	14674.00	0.2562743	1.1020770E-02	57.98399
NP-237	162.9186	28-FEB-2010	4433.795	4901.574	12708.00	0.2599091	1.3198568E-02	62.78986
CM-244	153.1968	28-FEB-2010	5534.629	5884.088	10904.00	0.2519520	1.2826724E-02	60.43048

Instrument : CHAMBER 139
Detector : 76231
Standard ID : AESS-026
Standard Reference Date : 15-FEB-2008 09:06:52
Calibration Analysis Date/Time : 16-SEP-2009 07:03:37
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 16-SEP-2009 12:26:02
Average Efficiency : 0.2492872
Average Efficiency Error : 7.3094456E-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	2990.097	3302.448	14822.00	0.2512630	1.2732445E-02	51.16375
NP-237	168.0294	28-FEB-2010	4434.583	4904.027	12686.00	0.2516089	1.2777339E-02	56.09538
CM-244	160.5822	28-FEB-2010	5532.194	5884.250	11118.00	0.2451757	1.2477465E-02	51.18374

Instrument : CHAMBER 140
Detector : 78771
Standard ID : AESS-032
Standard Reference Date : 18-FEB-2008 11:28:15
Calibration Analysis Date/Time : 16-SEP-2009 07:03:42
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 16-SEP-2009 12:26:12
Average Efficiency : 0.2526492
Average Efficiency Error : 6.9693825E-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	2989.623	3298.088	14531.00	0.2517187	1.0826853E-02	46.10829
NP-237	165.9822	28-FEB-2010	4433.734	4904.340	12513.00	0.2512438	1.2761484E-02	54.69451
CM-244	153.7938	28-FEB-2010	5533.806	5886.466	11096.00	0.2554495	1.3000681E-02	47.20534

Instrument : CHAMBER 141
Detector : 76232
Standard ID : AESS-027
Standard Reference Date : 15-FEB-2008 09:06:52
Calibration Analysis Date/Time : 16-SEP-2009 07:03:47
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 16-SEP-2009 12:26:23
Average Efficiency : 0.2547455
Average Efficiency Error : 7.4726613E-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	2987.803	3300.386	14389.00	0.2514884	1.2749074E-02	55.20152
NP-237	161.6154	28-FEB-2010	4433.014	4902.508	12459.00	0.2568074	1.3045154E-02	58.63324
CM-244	148.1754	28-FEB-2010	5530.609	5882.563	10718.00	0.2560930	1.3041621E-02	54.14653

Instrument : CHAMBER 142
Detector : 64261
Standard ID : AESS-033
Standard Reference Date : 18-FEB-2008 11:28:15
Calibration Analysis Date/Time : 16-SEP-2009 07:03:52
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 16-SEP-2009 12:26:33
Average Efficiency : 0.2603842
Average Efficiency Error : 7.1830968E-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	2991.279	3300.003	14554.00	0.2558129	1.1002630E-02	53.68588
NP-237	161.7816	28-FEB-2010	4437.328	4903.684	12703.00	0.2616512	1.3287083E-02	68.08553
CM-244	147.2670	28-FEB-2010	5534.720	5883.018	11068.00	0.2659896	1.3537915E-02	58.50507

Instrument : CHAMBER 143
Detector : 65882
Standard ID : AESS-028
Standard Reference Date : 15-FEB-2008 09:06:52
Calibration Analysis Date/Time : 16-SEP-2009 07:03:57
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 16-SEP-2009 12:26:43
Average Efficiency : 0.2438162
Average Efficiency Error : 7.1521485E-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	2988.414	3301.724	14343.00	0.2429526	1.2316748E-02	45.85791
NP-237	168.1992	28-FEB-2010	4436.178	4906.076	12465.00	0.2469572	1.2544546E-02	55.41743
CM-244	156.7614	28-FEB-2010	5534.405	5886.338	10698.00	0.2416553	1.2306704E-02	49.25873

Instrument : CHAMBER 144
Detector : 75551
Standard ID : AESS-034
Standard Reference Date : 18-FEB-2008 11:28:15
Calibration Analysis Date/Time : 16-SEP-2009 07:04:02
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 16-SEP-2009 12:26:53
Average Efficiency : 0.2432079
Average Efficiency Error : 6.7124735E-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	2991.731	3299.721	14149.00	0.2386236	1.0268736E-02	49.42162
NP-237	167.2962	28-FEB-2010	4433.065	4902.473	12333.00	0.2456661	1.2481030E-02	52.43185
CM-244	154.4388	28-FEB-2010	5535.430	5887.007	10803.00	0.2476103	1.2607776E-02	51.75169

Instrument : CHAMBER 145
Detector : 72526
Standard ID : AESS-029
Standard Reference Date : 15-FEB-2008 09:06:52
Calibration Analysis Date/Time : 16-SEP-2009 07:04:08
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 16-SEP-2009 12:27:03
Average Efficiency : 0.2494907
Average Efficiency Error : 7.3155323E-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	2990.721	3299.421	14837.00	0.2489683	1.2615955E-02	50.61446
NP-237	169.7700	28-FEB-2010	4435.677	4906.422	12664.00	0.2486207	1.2625882E-02	55.75652
CM-244	154.8234	28-FEB-2010	5530.652	5883.277	10970.00	0.2509164	1.2772597E-02	53.06380

Instrument : CHAMBER 146
Detector : 72527
Standard ID : AESS-035
Standard Reference Date : 18-FEB-2008 11:28:15
Calibration Analysis Date/Time : 16-SEP-2009 07:04:13
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 16-SEP-2009 12:27:13
Average Efficiency : 0.2521794
Average Efficiency Error : 6.9540716E-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	2988.088	3300.474	14792.00	0.2518262	1.0827903E-02	50.57500
NP-237	168.2934	28-FEB-2010	4435.771	4903.488	12795.00	0.2533910	1.2866129E-02	58.62805
CM-244	158.8128	28-FEB-2010	5533.810	5883.749	11284.00	0.2514743	1.2794847E-02	52.59344

Instrument : CHAMBER 147
Detector : 75550
Standard ID : AESS-030
Standard Reference Date : 15-FEB-2008 09:06:52
Calibration Analysis Date/Time : 16-SEP-2009 07:04:19
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 16-SEP-2009 12:27:23
Average Efficiency : 0.2462009
Average Efficiency Error : 7.2221002E-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	2992.181	3300.391	14151.00	0.2405333	1.2196311E-02	44.26603
NP-237	166.3758	28-FEB-2010	4433.176	4901.748	12552.00	0.2513769	1.2767726E-02	56.17089
CM-244	157.1856	28-FEB-2010	5533.043	5883.438	10973.00	0.2472064	1.2583700E-02	52.54537

Instrument : CHAMBER 148
Detector : 74429
Standard ID : AESS-036
Standard Reference Date : 18-FEB-2008 11:28:15
Calibration Analysis Date/Time : 16-SEP-2009 07:04:24
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 16-SEP-2009 12:27:33
Average Efficiency : 0.2474463
Average Efficiency Error : 6.8263425E-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	2990.384	3298.254	14523.00	0.2439571	1.0493157E-02	54.37553
NP-237	167.4312	28-FEB-2010	4436.330	4905.591	12624.00	0.2512974	1.2762434E-02	58.03280
CM-244	156.4188	28-FEB-2010	5533.038	5884.458	10990.00	0.2487361	1.2661190E-02	52.85587

Instrument : CHAMBER 149
Detector : 33449
Standard ID : AESS-037
Standard Reference Date : 18-FEB-2008 15:31:47
Calibration Analysis Date/Time : 15-SEP-2009 07:17:20
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 15-SEP-2009 13:29:50
Average Efficiency : 0.2442746
Average Efficiency Error : 6.7418939E-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	2988.123	3300.525	14041.00	0.2401365	1.0335403E-02	63.60672
NP-237	167.1294	28-FEB-2010	4433.492	4903.565	12391.00	0.2470920	1.2552506E-02	63.37567
CM-244	154.7664	28-FEB-2010	5532.823	5885.611	10826.00	0.2475891	1.2606204E-02	58.70196

Instrument : CHAMBER 150
Detector : 75552
Standard ID : AESS-043
Standard Reference Date : 19-FEB-2008 00:32:27
Calibration Analysis Date/Time : 15-SEP-2009 07:17:25
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 15-SEP-2009 13:30:04
Average Efficiency : 0.2497773
Average Efficiency Error : 6.8896711E-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	2990.795	3299.018	14579.00	0.2492991	1.0722128E-02	50.95595
NP-237	168.7422	28-FEB-2010	4433.345	4903.215	12583.00	0.2485292	1.2622490E-02	60.02569
CM-244	156.3252	28-FEB-2010	5531.531	5883.467	11119.00	0.2517459	1.2811826E-02	53.55379

Instrument : CHAMBER 151
Detector : 75556
Standard ID : AESS-038
Standard Reference Date : 18-FEB-2008 15:31:47
Calibration Analysis Date/Time : 15-SEP-2009 07:17:30
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 15-SEP-2009 13:30:37
Average Efficiency : 0.2445973
Average Efficiency Error : 6.7483815E-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	2991.065	3301.859	14594.00	0.2466028	1.0605961E-02	51.54713
NP-237	170.0886	28-FEB-2010	4433.320	4905.527	12551.00	0.2459524	1.2492075E-02	61.04260
CM-244	157.7460	28-FEB-2010	5530.408	5885.912	10724.00	0.2406166	1.2253285E-02	55.41215

Instrument : CHAMBER 152
Detector : 76222
Standard ID : AESS-044
Standard Reference Date : 19-FEB-2008 00:32:27
Calibration Analysis Date/Time : 15-SEP-2009 07:17:36
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 15-SEP-2009 13:30:48
Average Efficiency : 0.2467650
Average Efficiency Error : 6.8100104E-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	2991.057	3298.427	14281.00	0.2483825	1.0686823E-02	51.43459
NP-237	166.6248	28-FEB-2010	4433.408	4906.063	12493.00	0.2498989	1.2693445E-02	55.87722
CM-244	155.8290	28-FEB-2010	5530.659	5885.565	10640.00	0.2416724	1.2308771E-02	51.92970

Instrument : CHAMBER 153
Detector : 76223
Standard ID : AESS-039
Standard Reference Date : 18-FEB-2008 15:31:47
Calibration Analysis Date/Time : 15-SEP-2009 07:17:41
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 15-SEP-2009 13:31:00
Average Efficiency : 0.2530614
Average Efficiency Error : 6.9837277E-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	2992.484	3300.080	14284.00	0.2512709	1.0811096E-02	45.25198
NP-237	159.1506	28-FEB-2010	4437.092	4905.894	12330.00	0.2581708	1.3116390E-02	53.88176
CM-244	151.7142	28-FEB-2010	5532.708	5883.766	10746.00	0.2507173	1.2767147E-02	50.96059

Instrument : CHAMBER 154
Detector : 76224
Standard ID : AESS-045
Standard Reference Date : 19-FEB-2008 00:32:27
Calibration Analysis Date/Time : 15-SEP-2009 07:17:46
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 15-SEP-2009 13:31:26
Average Efficiency : 0.2566059
Average Efficiency Error : 7.0827994E-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	2990.121	3297.561	14209.00	0.2569968	1.1058494E-02	47.64388
NP-237	160.8066	28-FEB-2010	4434.389	4903.288	12086.00	0.2505226	1.2731740E-02	51.56582
CM-244	145.8384	28-FEB-2010	5530.382	5887.013	10826.00	0.2627504	1.3378122E-02	46.75677

Instrument : CHAMBER 155
Detector : 75553
Standard ID : AESS-040
Standard Reference Date : 18-FEB-2008 15:31:47
Calibration Analysis Date/Time : 15-SEP-2009 07:17:52
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 15-SEP-2009 13:31:39
Average Efficiency : 0.2586447
Average Efficiency Error : 7.1315672E-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	2991.782	3300.412	14971.00	0.2603490	1.1191908E-02	52.31090
NP-237	166.8174	28-FEB-2010	4437.153	4903.167	12889.00	0.2575112	1.3073887E-02	61.10300
CM-244	155.0100	28-FEB-2010	5533.649	5886.970	11275.00	0.2574479	1.3098875E-02	53.76326

Instrument : CHAMBER 156
Detector : 75554
Standard ID : AESS-046
Standard Reference Date : 19-FEB-2008 19:35:48
Calibration Analysis Date/Time : 15-SEP-2009 07:17:57
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 15-SEP-2009 13:31:49
Average Efficiency : 0.2458351
Average Efficiency Error : 6.7870235E-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	2991.491	3301.031	12844.31	0.2400144	1.0333307E-02	49.77089
NP-237	164.6658	28-FEB-2010	4435.135	4901.821	97.08801	0.2506796	1.2734897E-02	61.19961
CM-244	151.3824	28-FEB-2010	5532.917	5886.438	10151.71	0.0000000E+00	0.0000000E+00	52.61485

Instrument : CHAMBER 157
Detector : 75555
Standard ID : AESS-041
Standard Reference Date : 18-FEB-2008 15:31:47
Calibration Analysis Date/Time : 15-SEP-2009 07:18:03
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 15-SEP-2009 13:32:00
Average Efficiency : 0.2474201
Average Efficiency Error : 6.8232059E-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	2990.619	3299.042	14777.00	0.2450977	1.0538791E-02	51.15771
NP-237	171.2268	28-FEB-2010	4434.971	4905.888	12804.00	0.2492367	1.2655036E-02	55.90152
CM-244	159.5796	28-FEB-2010	5530.610	5883.642	11223.00	0.2489554	1.2667720E-02	51.75545

Instrument : CHAMBER 158
Detector : 33451
Standard ID : AESS-047
Standard Reference Date : 19-FEB-2008 00:32:27
Calibration Analysis Date/Time : 15-SEP-2009 07:18:08
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 15-SEP-2009 13:32:11
Average Efficiency : 0.2493795
Average Efficiency Error : 6.8797250E-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	2990.107	3300.392	14422.00	0.2469665	1.0623971E-02	68.44221
NP-237	168.3948	28-FEB-2010	4434.046	4903.553	12588.00	0.2491289	1.2652891E-02	70.67268
CM-244	154.6032	28-FEB-2010	5533.886	5884.921	11059.00	0.2531897	1.2886493E-02	68.82631

Instrument : CHAMBER 159
Detector : 76225
Standard ID : AESS-042
Standard Reference Date : 18-FEB-2008 15:31:47
Calibration Analysis Date/Time : 15-SEP-2009 07:18:13
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 15-SEP-2009 13:32:21
Average Efficiency : 0.2508302
Average Efficiency Error : 6.9238753E-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	2987.563	3302.370	14009.00	0.2510785	1.0806765E-02	45.91304
NP-237	159.6558	28-FEB-2010	4437.078	4903.944	12079.00	0.2521446	1.2814357E-02	56.71059
CM-244	150.5208	28-FEB-2010	5535.224	5883.443	10596.00	0.2491983	1.2692972E-02	51.46926

Instrument : CHAMBER 160
Detector : 76226
Standard ID : AESS-048
Standard Reference Date : 19-FEB-2008 00:32:27
Calibration Analysis Date/Time : 15-SEP-2009 07:18:19
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 15-SEP-2009 13:32:31
Average Efficiency : 0.2441046
Average Efficiency Error : 6.7402101E-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	2990.547	3301.417	13828.00	0.2437831	1.0495425E-02	76.67180
NP-237	161.5530	28-FEB-2010	4433.329	4905.681	11940.00	0.2462660	1.2518029E-02	87.79373
CM-244	151.1856	28-FEB-2010	5531.326	5884.399	10356.00	0.2424449	1.2354254E-02	77.67188

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 161
Detector : 70321
Calibration Date/Time : 21-SEP-2009 14:45:33
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	4768.798
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
Energy Calibration Zero : 2376.675
Energy Calibration Slope : 4.903314
Energy Calibration Quadratic : 3.3071014E-04
Energy Calibration Range : 7744.000

Instrument : CHAMBER 162
Detector : 70323
Calibration Date/Time : 21-SEP-2009 14:45:43
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	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2372.249
Energy Calibration Slope : 4.921350
Energy Calibration Quadratic : 3.0858925E-04
Energy Calibration Range : 7735.000

Instrument : CHAMBER 163
Detector : 70324
Calibration Date/Time : 21-SEP-2009 14:46:06
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	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2383.315
Energy Calibration Slope : 4.921310
Energy Calibration Quadratic : 3.3110939E-04
Energy Calibration Range : 7770.000

Instrument : CHAMBER 164
Detector : 70325
Calibration Date/Time : 21-SEP-2009 14:46:16
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	5795.021

Energy/Channel Equation : see above
Energy Calibration Zero : 2381.492
Energy Calibration Slope : 4.935361
Energy Calibration Quadratic : 3.1875577E-04
Energy Calibration Range : 7770.000

Instrument : CHAMBER 165
Detector : 72544
Calibration Date/Time : 21-SEP-2009 14:46:29
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 : 2386.890
Energy Calibration Slope : 4.958474
Energy Calibration Quadratic : 2.9448030E-04
Energy Calibration Range : 7773.000

Instrument : CHAMBER 166
Detector : 74545
Calibration Date/Time : 21-SEP-2009 14:47:27
Calibration Source Id : AESS-009

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	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 : 2376.522
Energy Calibration Slope : 4.921530
Energy Calibration Quadratic : 3.3686910E-04
Energy Calibration Range : 7769.000

Instrument : CHAMBER 167
Detector : 72546
Calibration Date/Time : 21-SEP-2009 14:48:04
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	4768.800
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
Energy Calibration Zero : 2378.613
Energy Calibration Slope : 4.924971
Energy Calibration Quadratic : 3.2533024E-04
Energy Calibration Range : 7763.000

Instrument : CHAMBER 168
Detector : 72547
Calibration Date/Time : 21-SEP-2009 14:48:25
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 : 2381.283
Energy Calibration Slope : 4.946027
Energy Calibration Quadratic : 3.0436489E-04
Energy Calibration Range : 7765.000

Instrument : CHAMBER 169
Detector : 72548
Calibration Date/Time : 21-SEP-2009 14:48:47
Calibration Source Id : AESS-005

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.001
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 : 2384.302
Energy Calibration Slope : 4.926007
Energy Calibration Quadratic : 3.2111545E-04
Energy Calibration Range : 7765.000

Instrument : CHAMBER 170
Detector : 72549
Calibration Date/Time : 21-SEP-2009 14:49:16
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	4768.800
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2384.736
Energy Calibration Slope : 4.931669
Energy Calibration Quadratic : 3.3333997E-04
Energy Calibration Range : 7784.000

Instrument : CHAMBER 171
Detector : 78260
Calibration Date/Time : 21-SEP-2009 14:49:40
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	4768.120
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
Energy Calibration Zero : 2375.901
Energy Calibration Slope : 4.923372
Energy Calibration Quadratic : 3.1892414E-04
Energy Calibration Range : 7752.000

Instrument : CHAMBER 172
Detector : 78772
Calibration Date/Time : 21-SEP-2009 14:49:54
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	4768.801
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2374.003
Energy Calibration Slope : 4.928030
Energy Calibration Quadratic : 3.2592146E-04
Energy Calibration Range : 7762.000

Instrument : CHAMBER 173
Detector : 74431
Calibration Date/Time : 21-SEP-2009 14:50:04
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	4768.801
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2368.870
Energy Calibration Slope : 4.977422
Energy Calibration Quadratic : 2.7764533E-04
Energy Calibration Range : 7757.000

Instrument : CHAMBER 174
Detector : 74432
Calibration Date/Time : 21-SEP-2009 14:50:13
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	4768.800
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2361.911
Energy Calibration Slope : 5.039232
Energy Calibration Quadratic : 2.0001861E-04
Energy Calibration Range : 7732.000

Instrument : CHAMBER 175
Detector : 74433
Calibration Date/Time : 21-SEP-2009 14:50:24
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	4768.801
CM-244	4320A	2/28/10	5795.020	5795.019

Energy/Channel Equation : see above
Energy Calibration Zero : 2364.263
Energy Calibration Slope : 4.969145
Energy Calibration Quadratic : 2.8674255E-04
Energy Calibration Range : 7753.000

Instrument : CHAMBER 176
Detector : 74434
Calibration Date/Time : 21-SEP-2009 14:50:36
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	4768.800
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2359.390
Energy Calibration Slope : 5.025916
Energy Calibration Quadratic : 2.3010977E-04
Energy Calibration Range : 7747.000

Instrument : CHAMBER 177
Detector : 74435
Calibration Date/Time : 21-SEP-2009 14:50:46
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	4768.800
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
Energy Calibration Zero : 2363.896
Energy Calibration Slope : 4.971116
Energy Calibration Quadratic : 2.8296176E-04
Energy Calibration Range : 7751.000

Instrument : CHAMBER 178
Detector : 74436
Calibration Date/Time : 21-SEP-2009 14:50:57
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 : 2357.960
Energy Calibration Slope : 4.995038
Energy Calibration Quadratic : 2.5281982E-04
Energy Calibration Range : 7738.000

Instrument : CHAMBER 179
Detector : 74437
Calibration Date/Time : 21-SEP-2009 14:51:07
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	4768.800
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2362.475
Energy Calibration Slope : 4.962544
Energy Calibration Quadratic : 2.9229760E-04
Energy Calibration Range : 7751.000

Instrument : CHAMBER 180
Detector : 74438
Calibration Date/Time : 21-SEP-2009 14:51:16
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 : 2357.168
Energy Calibration Slope : 5.024229
Energy Calibration Quadratic : 2.2182068E-04
Energy Calibration Range : 7735.000

Instrument : CHAMBER 181
Detector : 74439
Calibration Date/Time : 21-SEP-2009 14:51:26
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	4768.800
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2361.833
Energy Calibration Slope : 4.977290
Energy Calibration Quadratic : 2.7170058E-04
Energy Calibration Range : 7743.000

Instrument : CHAMBER 182
Detector : 74440
Calibration Date/Time : 21-SEP-2009 14:51:42
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	4768.675
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
Energy Calibration Zero : 2351.365
Energy Calibration Slope : 5.006705
Energy Calibration Quadratic : 2.3110739E-04
Energy Calibration Range : 7721.000

Instrument : CHAMBER 183
Detector : 74441
Calibration Date/Time : 21-SEP-2009 14:51:54
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 : 2365.306
Energy Calibration Slope : 4.968304
Energy Calibration Quadratic : 2.8504903E-04
Energy Calibration Range : 7752.000

Instrument : CHAMBER 184
Detector : 74442
Calibration Date/Time : 21-SEP-2009 14:52:17
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 : 2357.045
Energy Calibration Slope : 5.026213
Energy Calibration Quadratic : 2.2053947E-04
Energy Calibration Range : 7735.000

Instrument : CHAMBER 185
Detector : 68615
Calibration Date/Time : 21-SEP-2009 14:52:26
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	4768.801
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2363.439
Energy Calibration Slope : 4.921171
Energy Calibration Quadratic : 2.9912216E-04
Energy Calibration Range : 7716.000

Instrument : CHAMBER 186
Detector : 68616
Calibration Date/Time : 21-SEP-2009 14:52:35
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	4768.799
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
Energy Calibration Zero : 2362.841
Energy Calibration Slope : 4.954493
Energy Calibration Quadratic : 2.7342763E-04
Energy Calibration Range : 7723.000

Instrument : CHAMBER 187
Detector : 68620
Calibration Date/Time : 21-SEP-2009 14:52:45
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	4768.799
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
Energy Calibration Zero : 2375.999
Energy Calibration Slope : 4.962572
Energy Calibration Quadratic : 3.0889659E-04
Energy Calibration Range : 7782.000

Instrument : CHAMBER 188
Detector : 68621
Calibration Date/Time : 21-SEP-2009 14:57:16
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	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2372.483
Energy Calibration Slope : 4.952415
Energy Calibration Quadratic : 3.0726261E-04
Energy Calibration Range : 7766.000

Instrument : CHAMBER 189
Detector : 68622
Calibration Date/Time : 21-SEP-2009 14:53:03
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	5795.021

Energy/Channel Equation : see above
Energy Calibration Zero : 2360.450
Energy Calibration Slope : 4.959707
Energy Calibration Quadratic : 2.6419348E-04
Energy Calibration Range : 7716.000

Instrument : CHAMBER 190
Detector : 68623
Calibration Date/Time : 21-SEP-2009 14:53:12
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	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2356.994
Energy Calibration Slope : 4.952447
Energy Calibration Quadratic : 2.7996209E-04
Energy Calibration Range : 7722.000

Instrument : CHAMBER 191
Detector : 68624
Calibration Date/Time : 21-SEP-2009 14:53:21
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 : 2375.194
Energy Calibration Slope : 4.970817
Energy Calibration Quadratic : 3.1015038E-04
Energy Calibration Range : 7791.000

Instrument : CHAMBER 192
Detector : 74430
Calibration Date/Time : 21-SEP-2009 14:53:32
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 : 2368.673
Energy Calibration Slope : 4.975485
Energy Calibration Quadratic : 3.0052042E-04
Energy Calibration Range : 7779.000

Instrument : CHAMBER 193
Detector : 68627
Calibration Date/Time : 21-SEP-2009 14:53:41
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	5795.021

Energy/Channel Equation : see above
Energy Calibration Zero : 2366.307
Energy Calibration Slope : 4.926867
Energy Calibration Quadratic : 3.0849138E-04
Energy Calibration Range : 7735.000

Instrument : CHAMBER 194
Detector : 68635
Calibration Date/Time : 21-SEP-2009 14:53:50
Calibration Source Id : AESS-035

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.001
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 : 2363.136
Energy Calibration Slope : 4.944215
Energy Calibration Quadratic : 2.9438949E-04
Energy Calibration Range : 7735.000

Instrument : CHAMBER 195
Detector : 68636
Calibration Date/Time : 21-SEP-2009 14:53:59
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	4768.799
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
Energy Calibration Zero : 2364.925
Energy Calibration Slope : 4.962630
Energy Calibration Quadratic : 2.7555652E-04
Energy Calibration Range : 7736.000

Instrument : CHAMBER 196
Detector : 68637
Calibration Date/Time : 21-SEP-2009 14:54:08
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	4768.798
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
Energy Calibration Zero : 2367.455
Energy Calibration Slope : 4.936808
Energy Calibration Quadratic : 2.9704699E-04
Energy Calibration Range : 7734.000

Instrument : CHAMBER 197
Detector : 78894
Calibration Date/Time : 21-SEP-2009 14:42:21
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 : 2367.634
Energy Calibration Slope : 4.977818
Energy Calibration Quadratic : 2.8380580E-04
Energy Calibration Range : 7763.000

Instrument : CHAMBER 198
Detector : 78895
Calibration Date/Time : 21-SEP-2009 14:54:28
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 : 2368.665
Energy Calibration Slope : 4.961154
Energy Calibration Quadratic : 2.8666743E-04
Energy Calibration Range : 7749.000

Instrument : CHAMBER 199
Detector : 78896
Calibration Date/Time : 21-SEP-2009 14:54:37
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	4768.801
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2369.988
Energy Calibration Slope : 4.975040
Energy Calibration Quadratic : 2.8448759E-04
Energy Calibration Range : 7763.000

Instrument : CHAMBER 200
Detector : 78900
Calibration Date/Time : 21-SEP-2009 14:54:46
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 : 2368.958
Energy Calibration Slope : 4.954888
Energy Calibration Quadratic : 3.0549458E-04
Energy Calibration Range : 7763.000

Instrument : CHAMBER 201
Detector : 78902
Calibration Date/Time : 21-SEP-2009 14:54:55
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 : 2361.867
Energy Calibration Slope : 4.974102
Energy Calibration Quadratic : 2.9147897E-04
Energy Calibration Range : 7761.000

Instrument : CHAMBER 202
Detector : 78903
Calibration Date/Time : 21-SEP-2009 14:55:05
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	4768.800
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2354.252
Energy Calibration Slope : 4.963346
Energy Calibration Quadratic : 2.8640320E-04
Energy Calibration Range : 7737.000

Instrument : CHAMBER 203
Detector : 78905
Calibration Date/Time : 21-SEP-2009 14:55:14
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	5795.021

Energy/Channel Equation : see above
Energy Calibration Zero : 2365.971
Energy Calibration Slope : 4.956215
Energy Calibration Quadratic : 3.0086067E-04
Energy Calibration Range : 7757.000

Instrument : CHAMBER 204
Detector : 78907
Calibration Date/Time : 21-SEP-2009 14:55:23
Calibration Source Id : AESS-046

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
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 : 2364.131
Energy Calibration Slope : 4.970463
Energy Calibration Quadratic : 2.7864033E-04
Energy Calibration Range : 7746.000

Instrument : CHAMBER 205
Detector : 78908
Calibration Date/Time : 21-SEP-2009 14:55:32
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 : 2369.855
Energy Calibration Slope : 4.963379
Energy Calibration Quadratic : 2.9518205E-04
Energy Calibration Range : 7762.000

Instrument : CHAMBER 206
Detector : 78909
Calibration Date/Time : 21-SEP-2009 14:55:41
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 : 2367.801
Energy Calibration Slope : 4.940775
Energy Calibration Quadratic : 3.1145863E-04
Energy Calibration Range : 7754.000

Instrument : CHAMBER 207
Detector : 78910
Calibration Date/Time : 21-SEP-2009 14:55:50
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	5795.020

Energy/Channel Equation : see above
Energy Calibration Zero : 2367.063
Energy Calibration Slope : 4.985894
Energy Calibration Quadratic : 2.7485727E-04
Energy Calibration Range : 7761.000

Instrument : CHAMBER 208
Detector : 78911
Calibration Date/Time : 21-SEP-2009 14:56:00
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 : 2366.635
Energy Calibration Slope : 4.964264
Energy Calibration Quadratic : 3.0284186E-04
Energy Calibration Range : 7768.000

Subsection 2: Background Calibration

Instrument : CHAMBER 161
Detector : 70321
Background Analysis Date/Time : 20-SEP-2009 15:51:51
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.771	3300.133	1.000000	0.3000000	100.0000	95.00000
NP-237	4437.452	4905.776	11.00000	3.300000	30.15113	95.00000
CM-244	5533.229	5885.267	9.000000	2.700000	33.33334	95.00000

Instrument : CHAMBER 162
Detector : 70323
Background Analysis Date/Time : 20-SEP-2009 15:51:55
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.239	3298.296	1.000000	0.3000000	100.0000	95.00000
NP-237	4436.702	4904.841	3.000000	0.9000000	57.73503	95.00000
CM-244	5531.500	5882.828	10.00000	3.000000	31.62278	95.00000

Instrument : CHAMBER 163
Detector : 70324
Background Analysis Date/Time : 20-SEP-2009 15:52:00
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.643	3300.046	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4435.946	4905.743	20.00000	6.000000	22.36068	95.00000
CM-244	5535.155	5882.911	12.00000	3.600000	28.86751	95.00000

Instrument : CHAMBER 164
Detector : 70325
Background Analysis Date/Time : 20-SEP-2009 15:52:04
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.351	3300.390	2.000000	0.6000000	70.71068	95.00000
NP-237	4432.597	4902.599	13.00000	3.900000	27.73501	95.00000
CM-244	5531.973	5884.930	9.000000	2.700000	33.33334	95.00000

Instrument : CHAMBER 165
Detector : 72544
Background Analysis Date/Time : 20-SEP-2009 15:52:09
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.177	3299.087	2.000000	0.6000000	70.71068	95.00000
NP-237	4432.981	4902.991	5.000000	1.500000	44.72136	95.00000
CM-244	5531.772	5884.104	7.000000	2.100000	37.79645	95.00000

Instrument : CHAMBER 166
Detector : 74545
Background Analysis Date/Time : 20-SEP-2009 15:52:13
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.972	3298.535	1.000000	0.3000000	100.0000	95.00000
NP-237	4435.387	4905.732	7.000000	2.100000	37.79645	95.00000
CM-244	5530.676	5884.311	9.000000	2.700000	33.33334	95.00000

Instrument : CHAMBER 167
Detector : 72546
Background Analysis Date/Time : 20-SEP-2009 15:52:18
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.306	3300.867	1.000000	0.3000000	100.0000	95.00000
NP-237	4436.966	4901.435	16.00000	4.800000	25.00000	95.00000
CM-244	5530.518	5883.394	9.000000	2.700000	33.33334	95.00000

Instrument : CHAMBER 168
Detector : 72547
Background Analysis Date/Time : 20-SEP-2009 15:52:22
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.229	3301.657	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4434.347	4904.144	14.00000	4.200000	26.72612	95.00000
CM-244	5532.888	5885.320	10.00000	3.000000	31.62278	95.00000

Instrument : CHAMBER 169
Detector : 72548
Background Analysis Date/Time : 20-SEP-2009 15:52:26
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.054	3301.559	7.000000	2.100000	37.79645	95.00000
NP-237	4437.192	4906.601	22.00000	6.600000	21.32007	95.00000
CM-244	5535.250	5882.471	13.00000	3.900000	27.73501	95.00000

Instrument : CHAMBER 170
Detector : 72549
Background Analysis Date/Time : 20-SEP-2009 15:52:31
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.361	3298.395	1.000000	0.3000000	100.0000	95.00000
NP-237	4436.739	4902.328	14.00000	4.200000	26.72612	95.00000
CM-244	5533.108	5887.023	12.00000	3.600000	28.86751	95.00000

Instrument : CHAMBER 171
Detector : 78260
Background Analysis Date/Time : 20-SEP-2009 15:52:36
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.303	3297.640	3.000000	0.9000000	57.73503	95.00000
NP-237	4432.543	4901.594	10.00000	3.000000	31.62278	95.00000
CM-244	5535.033	5887.339	8.000000	2.400000	35.35534	95.00000

Instrument : CHAMBER 172
Detector : 78772
Background Analysis Date/Time : 20-SEP-2009 15:52:40
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.091	3301.893	2.000000	0.6000000	70.71068	95.00000
NP-237	4433.700	4903.740	15.00000	4.500000	25.81989	95.00000
CM-244	5533.343	5886.514	6.000000	1.800000	40.82483	95.00000

Instrument : CHAMBER 173
Detector : 74431
Background Analysis Date/Time : 20-SEP-2009 15:52:45
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.339	3299.195	1.000000	0.3000000	100.0000	95.00000
NP-237	4435.469	4905.977	7.000000	2.100000	37.79645	95.00000
CM-244	5534.997	5887.255	28.00000	8.400001	18.89822	95.00000

Instrument : CHAMBER 174
Detector : 74432
Background Analysis Date/Time : 20-SEP-2009 15:52:49
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.852	3301.015	5.000000	1.500000	44.72136	95.00000
NP-237	4435.608	4905.341	7.000000	2.100000	37.79645	95.00000
CM-244	5531.406	5886.389	21.00000	6.300000	21.82179	95.00000

Instrument : CHAMBER 175
Detector : 74433
Background Analysis Date/Time : 20-SEP-2009 15:52:53
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.886	3298.444	3.000000	0.9000000	57.73503	95.00000
NP-237	4434.203	4904.756	10.00000	3.000000	31.62278	95.00000
CM-244	5534.062	5886.590	23.00000	6.900000	20.85144	95.00000

Instrument : CHAMBER 176
Detector : 74434
Background Analysis Date/Time : 20-SEP-2009 15:52:58
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.225	3302.172	2.000000	0.6000000	70.71068	95.00000
NP-237	4432.630	4903.602	3.000000	0.9000000	57.73503	95.00000
CM-244	5532.053	5883.416	19.00000	5.700000	22.94157	95.00000

Instrument : CHAMBER 177
Detector : 74435
Background Analysis Date/Time : 20-SEP-2009 15:53:02
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.707	3298.313	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4434.012	4904.435	5.000000	1.500000	44.72136	95.00000
CM-244	5533.475	5885.809	18.00000	5.400000	23.57022	95.00000

Instrument : CHAMBER 178
Detector : 74436
Background Analysis Date/Time : 20-SEP-2009 15:53:06
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.348	3300.873	3.000000	0.9000000	57.73503	95.00000
NP-237	4432.820	4902.942	9.000000	2.700000	33.33334	95.00000
CM-244	5530.837	5887.508	19.00000	5.700000	22.94157	95.00000

Instrument : CHAMBER 179
Detector : 74437
Background Analysis Date/Time : 20-SEP-2009 15:53:11
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.396	3300.692	2.000000	0.6000000	70.71068	95.00000
NP-237	4435.850	4906.313	3.000000	0.9000000	57.73503	95.00000
CM-244	5535.639	5882.885	32.00000	9.600000	17.67767	95.00000

Instrument : CHAMBER 180
Detector : 74438
Background Analysis Date/Time : 20-SEP-2009 15:53:16
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.663	3299.349	1.000000	0.3000000	100.0000	95.00000
NP-237	4433.569	4903.757	13.00000	3.900000	27.73501	95.00000
CM-244	5530.967	5886.867	29.00000	8.700001	18.56953	95.00000

Instrument : CHAMBER 181
Detector : 74439
Background Analysis Date/Time : 20-SEP-2009 15:53:20
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.239	3302.087	2.000000	0.6000000	70.71068	95.00000
NP-237	4432.597	4902.658	3.000000	0.9000000	57.73503	95.00000
CM-244	5530.942	5882.719	27.00000	8.100000	19.24501	95.00000

Instrument : CHAMBER 182
Detector : 74440
Background Analysis Date/Time : 20-SEP-2009 15:53:24
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.945	3300.794	1.000000	0.3000000	100.0000	95.00000
NP-237	4432.572	4902.020	5.000000	1.500000	44.72136	95.00000
CM-244	5533.775	5884.077	33.00000	9.900001	17.40777	95.00000

Instrument : CHAMBER 183
Detector : 74441
Background Analysis Date/Time : 20-SEP-2009 15:53:29
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.798	3299.272	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4434.624	4904.963	5.000000	1.500000	44.72136	95.00000
CM-244	5533.945	5886.272	42.00000	12.60000	15.43033	95.00000

Instrument : CHAMBER 184
Detector : 74442
Background Analysis Date/Time : 20-SEP-2009 15:53:33
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.768	3299.551	1.000000	0.3000000	100.0000	95.00000
NP-237	4434.041	4904.303	1.000000	0.3000000	100.0000	95.00000
CM-244	5531.580	5887.500	28.00000	8.400001	18.89822	95.00000

Instrument : CHAMBER 185
Detector : 68615
Background Analysis Date/Time : 20-SEP-2009 15:53:38
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.255	3299.191	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4436.568	4904.026	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
CM-244	5534.840	5885.460	35.00000	10.50000	16.90309	95.00000

Instrument : CHAMBER 186
Detector : 68616
Background Analysis Date/Time : 20-SEP-2009 15:53:42
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.448	3298.893	1.000000	0.3000000	100.0000	95.00000
NP-237	4434.968	4903.217	3.000000	0.9000000	57.73503	95.00000
CM-244	5534.439	5884.968	30.00000	9.000000	18.25742	95.00000

Instrument : CHAMBER 187
Detector : 68620
Background Analysis Date/Time : 20-SEP-2009 15:53:46
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.069	3299.571	4.000000	1.200000	50.00000	95.00000
NP-237	4436.508	4902.892	10.00000	3.000000	31.62278	95.00000
CM-244	5534.129	5882.618	35.00000	10.50000	16.90309	95.00000

Instrument : CHAMBER 188
Detector : 68621
Background Analysis Date/Time : 20-SEP-2009 15:53:50
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.307	3299.196	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4433.812	4904.473	3.000000	0.9000000	57.73503	95.00000
CM-244	5534.433	5887.575	21.00000	6.300000	21.82179	95.00000

Instrument : CHAMBER 189
Detector : 68622
Background Analysis Date/Time : 20-SEP-2009 15:53:55
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.567	3302.212	2.000000	0.6000000	70.71068	95.00000
NP-237	4433.165	4906.352	5.000000	1.500000	44.72136	95.00000
CM-244	5531.737	5887.138	29.00000	8.700001	18.56953	95.00000

Instrument : CHAMBER 190
Detector : 68623
Background Analysis Date/Time : 20-SEP-2009 15:53:59
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.470	3297.949	3.000000	0.9000000	57.73503	95.00000
NP-237	4434.559	4903.208	45.00000	13.50000	14.90712	95.00000
CM-244	5535.128	5886.122	75.00000	22.50000	11.54701	95.00000

Instrument : CHAMBER 191
Detector : 68624
Background Analysis Date/Time : 20-SEP-2009 15:54:03
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.297	3300.325	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4434.026	4906.466	4.000000	1.200000	50.00000	95.00000
CM-244	5533.499	5882.588	39.00000	11.70000	16.01282	95.00000

Instrument : CHAMBER 192
Detector : 74430
Background Analysis Date/Time : 20-SEP-2009 15:54:07
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.254	3299.423	1.000000	0.3000000	100.0000	95.00000
NP-237	4433.037	4905.173	6.000000	1.800000	40.82483	95.00000
CM-244	5531.571	5885.579	27.00000	8.100000	19.24501	95.00000

Instrument : CHAMBER 193
Detector : 68627
Background Analysis Date/Time : 20-SEP-2009 15:54:11
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.990	3298.419	3.000000	0.9000000	57.73503	95.00000
NP-237	4433.001	4901.628	20.00000	6.000000	22.36068	95.00000
CM-244	5534.240	5885.963	35.00000	10.50000	16.90309	95.00000

Instrument : CHAMBER 194
Detector : 68635
Background Analysis Date/Time : 20-SEP-2009 15:54:15
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.781	3297.998	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4434.565	4903.602	2.000000	0.6000000	70.71068	95.00000
CM-244	5531.095	5882.711	16.00000	4.800000	25.00000	95.00000

Instrument : CHAMBER 195
Detector : 68636
Background Analysis Date/Time : 20-SEP-2009 15:54:19
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.560	3297.508	1.000000	0.3000000	100.0000	95.00000
NP-237	4435.548	4904.654	6.000000	1.800000	40.82483	95.00000
CM-244	5531.770	5882.945	25.00000	7.500000	20.00000	95.00000

Instrument : CHAMBER 196
Detector : 68637
Background Analysis Date/Time : 20-SEP-2009 15:54:23
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.197	3301.025	2.000000	0.6000000	70.71068	95.00000
NP-237	4436.299	4904.887	12.00000	3.600000	28.86751	95.00000
CM-244	5531.851	5883.206	21.00000	6.300000	21.82179	95.00000

Instrument : CHAMBER 197
Detector : 78894
Background Analysis Date/Time : 20-SEP-2009 15:54:27
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.248	3298.244	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4435.410	4906.453	2.000000	0.6000000	70.71068	95.00000
CM-244	5531.008	5883.783	22.00000	6.600000	21.32007	95.00000

Instrument : CHAMBER 198
Detector : 78895
Background Analysis Date/Time : 20-SEP-2009 15:54:30
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.256	3301.357	1.000000	0.3000000	100.0000	95.00000
NP-237	4435.341	4905.168	3.000000	0.9000000	57.73503	95.00000
CM-244	5533.514	5885.508	20.00000	6.000000	22.36068	95.00000

Instrument : CHAMBER 199
Detector : 78896
Background Analysis Date/Time : 20-SEP-2009 15:54:35
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.267	3300.107	3.000000	0.9000000	57.73503	95.00000
NP-237	4436.748	4902.339	6.000000	1.800000	40.82483	95.00000
CM-244	5531.913	5884.562	27.00000	8.100000	19.24501	95.00000

Instrument : CHAMBER 200
Detector : 78900
Background Analysis Date/Time : 20-SEP-2009 15:54:38
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.062	3301.136	2.000000	0.6000000	70.71068	95.00000
NP-237	4436.203	4901.740	14.00000	4.200000	26.72612	95.00000
CM-244	5531.761	5884.914	26.00000	7.800000	19.61161	95.00000

Instrument : CHAMBER 201
Detector : 78902
Background Analysis Date/Time : 20-SEP-2009 15:54:42
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.184	3302.217	1.000000	0.3000000	100.0000	95.00000
NP-237	4434.609	4905.994	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
CM-244	5531.184	5884.407	20.00000	6.000000	22.36068	95.00000

Instrument : CHAMBER 202
Detector : 78903
Background Analysis Date/Time : 20-SEP-2009 15:54:47
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.216	3297.484	1.000000	0.3000000	100.0000	95.00000
NP-237	4437.369	4902.276	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
CM-244	5530.984	5883.177	24.00000	7.200000	20.41241	95.00000

Instrument : CHAMBER 203
Detector : 78905
Background Analysis Date/Time : 20-SEP-2009 15:54:51
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.199	3298.236	9.000000	2.700000	33.33334	95.00000
NP-237	4432.988	4903.526	7.000000	2.100000	37.79645	95.00000
CM-244	5533.164	5886.048	26.00000	7.800000	19.61161	95.00000

Instrument : CHAMBER 204
Detector : 78907
Background Analysis Date/Time : 20-SEP-2009 15:54:55
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.792	3298.277	15.00000	4.500000	25.81989	95.00000
NP-237	4433.265	4903.277	16.00000	4.800000	25.00000	95.00000
CM-244	5531.668	5883.589	51.00000	15.30000	14.00280	95.00000

Instrument : CHAMBER 205
Detector : 78908
Background Analysis Date/Time : 20-SEP-2009 15:54:58
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.853	3298.183	1.000000	0.3000000	100.0000	95.00000
NP-237	4433.644	4904.311	4.000000	1.200000	50.00000	95.00000
CM-244	5533.979	5886.811	26.00000	7.800000	19.61161	95.00000

Instrument : CHAMBER 206
Detector : 78909
Background Analysis Date/Time : 20-SEP-2009 15:55:02
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.264	3297.560	2.000000	0.6000000	70.71068	95.00000
NP-237	4435.483	4905.550	2.000000	0.6000000	70.71068	95.00000
CM-244	5534.828	5887.642	15.00000	4.500000	25.81989	95.00000

Instrument : CHAMBER 207
Detector : 78910
Background Analysis Date/Time : 20-SEP-2009 15:55:07
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.540	3298.860	2.000000	0.6000000	70.71068	95.00000
NP-237	4436.642	4902.427	8.000000	2.400000	35.35534	95.00000
CM-244	5532.022	5884.565	36.00000	10.80000	16.66667	95.00000

Instrument : CHAMBER 208
Detector : 78911
Background Analysis Date/Time : 20-SEP-2009 15:55:11
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.900	3300.465	2.000000	0.6000000	70.71068	95.00000
NP-237	4437.256	4903.414	3.000000	0.9000000	57.73503	95.00000
CM-244	5534.200	5882.369	22.00000	6.600000	21.32007	95.00000

Subsection 3: Efficiency Calibration

Instrument : CHAMBER 161
Detector : 70321
Standard ID : AESS-001
Standard Reference Date : 20-FEB-2008 09:54:53
Calibration Analysis Date/Time : 21-SEP-2009 09:28:18
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 21-SEP-2009 14:45:33
Average Efficiency : 0.3689128
Average Efficiency Error : 1.0123267E-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	2989.771	3300.133	21764.00	0.3527895	1.5079973E-02	62.09401
NP-237	171.0024	28-FEB-2010	4437.452	4905.776	19466.00	0.3793849	1.9163225E-02	75.59914
CM-244	158.1060	28-FEB-2010	5533.229	5885.267	17188.00	0.3849835	1.9471968E-02	61.24743

Instrument : CHAMBER 162
Detector : 70323
Standard ID : AESS-007
Standard Reference Date : 14-FEB-2008 13:39:25
Calibration Analysis Date/Time : 21-SEP-2009 09:28:25
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 21-SEP-2009 14:45:43
Average Efficiency : 0.3711489
Average Efficiency Error : 1.0169771E-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	2992.239	3298.296	21845.00	0.3574707	1.5279390E-02	61.21131
NP-237	205.0260	28-FEB-2010	4436.702	4904.841	23392.00	0.3802952	1.9176660E-02	80.07285
CM-244	199.6806	28-FEB-2010	5531.500	5882.828	21627.00	0.3837951	1.9366477E-02	60.40187

Instrument : CHAMBER 163
Detector : 70324
Standard ID : AESS-002
Standard Reference Date : 19-FEB-2008 11:05:22
Calibration Analysis Date/Time : 21-SEP-2009 09:28:32
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 21-SEP-2009 14:46:06
Average Efficiency : 0.3784813
Average Efficiency Error : 1.0368052E-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	2988.643	3300.046	21830.00	0.3690017	1.5772363E-02	62.20918
NP-237	200.4990	28-FEB-2010	4435.946	4905.743	23254.00	0.3865025	1.9490723E-02	75.42545
CM-244	196.5558	28-FEB-2010	5535.155	5882.911	21361.00	0.3848922	1.9424047E-02	59.52460

Instrument : CHAMBER 164
Detector : 70325
Standard ID : AESS-008
Standard Reference Date : 14-FEB-2008 13:39:25
Calibration Analysis Date/Time : 21-SEP-2009 09:28:39
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 21-SEP-2009 14:46:16
Average Efficiency : 0.3791597
Average Efficiency Error : 1.0381414E-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	2988.351	3300.390	22809.00	0.3744951	1.5998594E-02	58.40551
NP-237	209.2716	28-FEB-2010	4432.597	4902.599	23895.00	0.3805439	1.9185850E-02	71.09055
CM-244	199.6488	28-FEB-2010	5531.973	5884.930	21669.00	0.3846071	1.9407105E-02	56.87473

Instrument : CHAMBER 165
Detector : 72544
Standard ID : AESS-003
Standard Reference Date : 15-FEB-2008 13:12:27
Calibration Analysis Date/Time : 21-SEP-2009 09:28:46
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 21-SEP-2009 14:46:29
Average Efficiency : 0.3786044
Average Efficiency Error : 1.0371909E-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	2991.177	3299.087	21994.00	0.3665624	1.5666667E-02	68.94492
NP-237	203.2080	28-FEB-2010	4432.981	4902.991	23569.00	0.3865909	1.9492906E-02	76.46336
CM-244	197.2236	28-FEB-2010	5531.772	5884.104	21676.00	0.3894331	1.9650551E-02	69.10842

Instrument : CHAMBER 166
Detector : 74545
Standard ID : AESS-009
Standard Reference Date : 19-FEB-2008 11:05:22
Calibration Analysis Date/Time : 21-SEP-2009 09:28:52
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 21-SEP-2009 14:47:27
Average Efficiency : 0.3925645
Average Efficiency Error : 1.0746635E-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	2991.972	3298.535	23250.00	0.3867014	1.6516251E-02	56.08769
NP-237	204.0192	28-FEB-2010	4435.387	4905.732	24303.00	0.3970365	2.0014562E-02	79.13438
CM-244	197.2128	28-FEB-2010	5530.676	5884.311	22089.00	0.3967021	2.0013960E-02	55.09056

Instrument : CHAMBER 167
Detector : 72546
Standard ID : AESS-004
Standard Reference Date : 14-FEB-2008 09:35:18
Calibration Analysis Date/Time : 21-SEP-2009 09:28:59
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 21-SEP-2009 14:48:04
Average Efficiency : 0.3871779
Average Efficiency Error : 1.0602054E-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	2989.306	3300.867	22941.00	0.3765221	1.6084069E-02	55.09563
NP-237	204.2586	28-FEB-2010	4436.966	4901.435	24233.00	0.3953844	1.9931784E-02	76.26476
CM-244	198.8100	28-FEB-2010	5530.518	5883.394	22180.00	0.3953461	1.9944822E-02	56.09549

Instrument : CHAMBER 168
Detector : 72547
Standard ID : AESS-010
Standard Reference Date : 14-FEB-2008 13:39:25
Calibration Analysis Date/Time : 21-SEP-2009 09:29:07
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 21-SEP-2009 14:48:25
Average Efficiency : 0.3895916
Average Efficiency Error : 1.0669101E-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	2989.229	3301.657	22631.00	0.3790159	1.6193239E-02	61.00068
NP-237	202.9926	28-FEB-2010	4434.347	4904.144	24065.00	0.3951014	1.9918641E-02	83.09320
CM-244	196.2330	28-FEB-2010	5532.888	5885.320	22172.00	0.4003809	2.0198891E-02	61.18747

Instrument : CHAMBER 169
Detector : 72548
Standard ID : AESS-005
Standard Reference Date : 14-FEB-2008 09:35:18
Calibration Analysis Date/Time : 21-SEP-2009 09:29:13
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 21-SEP-2009 14:48:47
Average Efficiency : 0.3742271
Average Efficiency Error : 1.0248713E-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	2990.054	3301.559	22666.00	0.3638192	1.5543718E-02	59.25828
NP-237	209.5938	28-FEB-2010	4437.192	4906.601	23965.00	0.3810294	1.9209908E-02	71.80399
CM-244	202.7478	28-FEB-2010	5535.250	5882.471	21940.00	0.3834514	1.9346640E-02	60.12471

Instrument : CHAMBER 170
Detector : 72549
Standard ID : AESS-011
Standard Reference Date : 14-FEB-2008 13:39:25
Calibration Analysis Date/Time : 21-SEP-2009 09:29:20
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 21-SEP-2009 14:49:16
Average Efficiency : 0.3642089
Average Efficiency Error : 9.9735176E-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	2991.361	3298.395	22497.00	0.3575987	1.5279310E-02	63.36363
NP-237	214.4868	28-FEB-2010	4436.739	4902.328	23611.00	0.3668730	1.8498441E-02	80.98635
CM-244	208.4184	28-FEB-2010	5533.108	5887.023	21846.00	0.3714186	1.8740255E-02	58.50939

Instrument : CHAMBER 171
Detector : 78260
Standard ID : AESS-006
Standard Reference Date : 14-FEB-2008 09:35:18
Calibration Analysis Date/Time : 21-SEP-2009 09:29:26
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 21-SEP-2009 14:49:40
Average Efficiency : 0.3810605
Average Efficiency Error : 1.0438851E-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	2991.303	3297.640	22193.00	0.3685752	1.5750948E-02	59.60153
NP-237	204.7038	28-FEB-2010	4432.543	4901.594	23828.00	0.3879591	1.9560140E-02	73.97815
CM-244	195.0060	28-FEB-2010	5535.033	5887.339	21671.00	0.3938129	1.9871602E-02	62.27898

Instrument : CHAMBER 172
Detector : 78772
Standard ID : AESS-012
Standard Reference Date : 14-FEB-2008 13:39:25
Calibration Analysis Date/Time : 21-SEP-2009 09:29:32
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 21-SEP-2009 14:49:54
Average Efficiency : 0.3822589
Average Efficiency Error : 1.0466043E-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	2990.091	3301.893	22979.00	0.3769604	1.6102478E-02	57.80247
NP-237	205.8930	28-FEB-2010	4433.700	4903.740	24203.00	0.3917651	1.9749530E-02	76.25694
CM-244	203.1954	28-FEB-2010	5533.343	5886.514	21835.00	0.3808052	1.9213919E-02	58.76520

Instrument : CHAMBER 173
Detector : 74431
Standard ID : AESS-013
Standard Reference Date : 14-FEB-2008 17:45:04
Calibration Analysis Date/Time : 21-SEP-2009 09:29:38
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 21-SEP-2009 14:50:04
Average Efficiency : 0.2602993
Average Efficiency Error : 7.1600322E-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	2990.339	3299.195	15911.00	0.2643020	1.1349737E-02	50.51283
NP-237	210.2526	28-FEB-2010	4435.469	4905.977	15987.00	0.2534239	1.2828780E-02	57.29033
CM-244	201.9108	28-FEB-2010	5534.997	5887.255	14946.00	0.2621880	1.3283902E-02	53.12511

Instrument : CHAMBER 174
Detector : 74432
Standard ID : AESS-019
Standard Reference Date : 19-FEB-2008 11:05:22
Calibration Analysis Date/Time : 21-SEP-2009 09:29:43
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 21-SEP-2009 14:50:13
Average Efficiency : 0.2533270
Average Efficiency Error : 6.9733807E-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	2989.852	3301.015	14930.00	0.2467540	1.0608066E-02	48.02879
NP-237	202.9140	28-FEB-2010	4435.608	4905.341	15850.00	0.2603388	1.3180215E-02	57.62176
CM-244	199.3140	28-FEB-2010	5531.406	5886.389	14432.00	0.2563750	1.2995369E-02	54.02073

Instrument : CHAMBER 175
Detector : 74433
Standard ID : AESS-014
Standard Reference Date : 19-FEB-2008 11:05:22
Calibration Analysis Date/Time : 21-SEP-2009 09:29:50
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 21-SEP-2009 14:50:24
Average Efficiency : 0.2543943
Average Efficiency Error : 6.9960668E-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	2989.886	3298.444	16030.00	0.2525296	1.0842831E-02	50.61414
NP-237	211.7160	28-FEB-2010	4434.203	4904.756	16439.00	0.2587745	1.3095257E-02	57.23130
CM-244	207.3882	28-FEB-2010	5534.062	5886.590	14808.00	0.2528055	1.2810053E-02	51.72563

Instrument : CHAMBER 176
Detector : 74434
Standard ID : AESS-020
Standard Reference Date : 14-FEB-2008 21:55:55
Calibration Analysis Date/Time : 21-SEP-2009 09:29:58
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 21-SEP-2009 14:50:36
Average Efficiency : 0.2547762
Average Efficiency Error : 7.0115663E-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	2991.225	3302.172	15206.00	0.2502103	1.0753103E-02	46.19209
NP-237	203.4984	28-FEB-2010	4432.630	4903.602	15838.00	0.2594141	1.3133497E-02	58.51922
CM-244	197.1096	28-FEB-2010	5532.053	5883.416	14295.00	0.2569134	1.3024328E-02	51.87393

Instrument : CHAMBER 177
Detector : 74435
Standard ID : AESS-015
Standard Reference Date : 14-FEB-2008 17:45:04
Calibration Analysis Date/Time : 21-SEP-2009 09:30:03
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 21-SEP-2009 14:50:46
Average Efficiency : 0.2659749
Average Efficiency Error : 7.3150843E-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	2989.707	3298.313	15952.00	0.2645041	1.1357911E-02	48.05111
NP-237	200.6460	28-FEB-2010	4434.012	4904.435	16053.00	0.2666638	1.3498317E-02	54.07773
CM-244	195.9270	28-FEB-2010	5533.475	5885.809	14787.00	0.2673737	1.3548458E-02	55.83525

Instrument : CHAMBER 178
Detector : 74436
Standard ID : AESS-021
Standard Reference Date : 19-FEB-2008 15:31:52
Calibration Analysis Date/Time : 21-SEP-2009 09:30:10
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 21-SEP-2009 14:50:57
Average Efficiency : 0.2584701
Average Efficiency Error : 7.1088150E-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	2991.348	3300.873	15813.00	0.2566991	1.1024418E-02	46.60859
NP-237	210.1548	28-FEB-2010	4432.820	4902.942	16293.00	0.2583858	1.3076977E-02	58.74612
CM-244	200.7390	28-FEB-2010	5530.837	5887.508	14803.00	0.2611073	1.3230741E-02	51.69608

Instrument : CHAMBER 179
Detector : 74437
Standard ID : AESS-016
Standard Reference Date : 14-FEB-2008 17:45:04
Calibration Analysis Date/Time : 21-SEP-2009 09:30:16
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 21-SEP-2009 14:51:07
Average Efficiency : 0.2656665
Average Efficiency Error : 7.3066968E-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	2992.396	3300.692	16018.00	0.2655541	1.1402219E-02	48.47999
NP-237	199.3962	28-FEB-2010	4435.850	4906.313	16096.00	0.2690641	1.3619361E-02	58.18980
CM-244	198.6402	28-FEB-2010	5535.639	5882.885	14727.00	0.2625763	1.3306193E-02	54.75912

Instrument : CHAMBER 180
Detector : 74438
Standard ID : AESS-022
Standard Reference Date : 14-FEB-2008 21:55:55
Calibration Analysis Date/Time : 21-SEP-2009 09:30:22
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 21-SEP-2009 14:51:16
Average Efficiency : 0.2482043
Average Efficiency Error : 6.8309689E-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	2988.663	3299.349	15136.00	0.2442104	1.0496107E-02	47.14516
NP-237	206.8830	28-FEB-2010	4433.569	4903.757	15632.00	0.2518027	1.2750288E-02	52.81374
CM-244	203.0208	28-FEB-2010	5530.967	5886.867	14358.00	0.2504804	1.2697529E-02	50.18464

Instrument : CHAMBER 181
Detector : 74439
Standard ID : AESS-017
Standard Reference Date : 14-FEB-2008 17:45:04
Calibration Analysis Date/Time : 21-SEP-2009 09:30:28
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 21-SEP-2009 14:51:26
Average Efficiency : 0.2568994
Average Efficiency Error : 7.0653898E-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	3302.087	16106.00	0.2593535	1.1134949E-02	50.88416
NP-237	208.5846	28-FEB-2010	4432.597	4902.658	16106.00	0.2573713	1.3027404E-02	57.22441
CM-244	205.5828	28-FEB-2010	5530.942	5882.719	14695.00	0.2531832	1.2830525E-02	53.69027

Instrument : CHAMBER 182
Detector : 74440
Standard ID : AESS-023
Standard Reference Date : 14-FEB-2008 21:55:55
Calibration Analysis Date/Time : 21-SEP-2009 09:30:34
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 21-SEP-2009 14:51:42
Average Efficiency : 0.2555217
Average Efficiency Error : 7.0314407E-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	2990.945	3300.794	15263.00	0.2488660	1.0694612E-02	45.64035
NP-237	207.4998	28-FEB-2010	4432.572	4902.020	16228.00	0.2606671	1.3193036E-02	52.09262
CM-244	199.8804	28-FEB-2010	5533.775	5884.077	14703.00	0.2605115	1.3201850E-02	48.97062

Instrument : CHAMBER 183
Detector : 74441
Standard ID : AESS-018
Standard Reference Date : 14-FEB-2008 17:45:04
Calibration Analysis Date/Time : 21-SEP-2009 09:30:39
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 21-SEP-2009 14:51:54
Average Efficiency : 0.2611987
Average Efficiency Error : 7.1849022E-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	2990.798	3299.272	15703.00	0.2627467	1.1285488E-02	47.53299
NP-237	208.8990	28-FEB-2010	4434.624	4904.963	16100.00	0.2568786	1.3002539E-02	53.88460
CM-244	198.1458	28-FEB-2010	5533.945	5886.272	14750.00	0.2635892	1.3357328E-02	53.93570

Instrument : CHAMBER 184
Detector : 74442
Standard ID : AESS-024
Standard Reference Date : 14-FEB-2008 21:55:55
Calibration Analysis Date/Time : 21-SEP-2009 09:30:45
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 21-SEP-2009 14:52:17
Average Efficiency : 0.2584583
Average Efficiency Error : 7.1114316E-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	2988.768	3299.551	15277.00	0.2539344	1.0912240E-02	50.31911
NP-237	205.6662	28-FEB-2010	4434.041	4904.303	16050.00	0.2601255	1.3167357E-02	58.63404
CM-244	198.3060	28-FEB-2010	5531.580	5887.500	14754.00	0.2635180	1.3353555E-02	51.04471

Instrument : CHAMBER 185
Detector : 68615
Standard ID : AESS-025
Standard Reference Date : 15-FEB-2008 09:06:52
Calibration Analysis Date/Time : 21-SEP-2009 09:30:51
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 21-SEP-2009 14:52:26
Average Efficiency : 0.2578048
Average Efficiency Error : 7.1078530E-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	2988.255	3299.191	14889.00	0.2575537	1.1072870E-02	57.86859
NP-237	167.9916	28-FEB-2010	4436.568	4904.026	13054.00	0.2590211	1.3147981E-02	60.38557
CM-244	157.2432	28-FEB-2010	5534.840	5885.460	11412.00	0.2569523	1.3071318E-02	57.79462

Instrument : CHAMBER 186
Detector : 68616
Standard ID : AESS-031
Standard Reference Date : 18-FEB-2008 11:28:15
Calibration Analysis Date/Time : 21-SEP-2009 09:30:57
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 21-SEP-2009 14:52:35
Average Efficiency : 0.2488432
Average Efficiency Error : 6.8683540E-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	2991.448	3298.893	14023.00	0.2449313	1.0542010E-02	55.63848
NP-237	162.9186	28-FEB-2010	4434.968	4903.217	12465.00	0.2550169	1.2953850E-02	61.88278
CM-244	153.1968	28-FEB-2010	5534.439	5884.968	10759.00	0.2485880	1.2658793E-02	53.78214

Instrument : CHAMBER 187
Detector : 68620
Standard ID : AESS-026
Standard Reference Date : 15-FEB-2008 09:06:52
Calibration Analysis Date/Time : 21-SEP-2009 09:31:03
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 21-SEP-2009 14:52:45
Average Efficiency : 0.2500139
Average Efficiency Error : 7.3307389E-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	2991.069	3299.571	14686.00	0.2490046	1.2619531E-02	51.85893
NP-237	168.0294	28-FEB-2010	4436.508	4902.892	12870.00	0.2552532	1.2959577E-02	54.96236
CM-244	160.5822	28-FEB-2010	5534.129	5882.618	11163.00	0.2461146	1.2524742E-02	53.45123

Instrument : CHAMBER 188
Detector : 68621
Standard ID : AESS-032
Standard Reference Date : 18-FEB-2008 11:28:15
Calibration Analysis Date/Time : 21-SEP-2009 09:31:08
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 21-SEP-2009 14:57:16
Average Efficiency : 0.2573678
Average Efficiency Error : 7.0972578E-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	2991.307	3299.196	14948.00	0.2589918	1.1133890E-02	51.99499
NP-237	165.9822	28-FEB-2010	4433.812	4904.473	12790.00	0.2568368	1.3041135E-02	63.01558
CM-244	153.7938	28-FEB-2010	5534.433	5887.575	11106.00	0.2556783	1.3012402E-02	52.96853

Instrument : CHAMBER 189
Detector : 68622
Standard ID : AESS-027
Standard Reference Date : 15-FEB-2008 09:06:52
Calibration Analysis Date/Time : 21-SEP-2009 09:31:15
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 21-SEP-2009 14:53:03
Average Efficiency : 0.2613129
Average Efficiency Error : 7.6623494E-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	2989.567	3302.212	14738.00	0.2577560	1.3062426E-02	55.08699
NP-237	161.6154	28-FEB-2010	4433.165	4906.352	12695.00	0.2618049	1.3294927E-02	59.92243
CM-244	148.1754	28-FEB-2010	5531.737	5887.138	11072.00	0.2645886	1.3466716E-02	57.86366

Instrument : CHAMBER 190
Detector : 68623
Standard ID : AESS-033
Standard Reference Date : 18-FEB-2008 11:28:15
Calibration Analysis Date/Time : 21-SEP-2009 09:31:22
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 21-SEP-2009 14:53:12
Average Efficiency : 0.2619864
Average Efficiency Error : 7.2268778E-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	2990.470	3297.949	14602.00	0.2566898	1.1039688E-02	51.16143
NP-237	161.7816	28-FEB-2010	4434.559	4903.208	12864.00	0.2647705	1.3443264E-02	59.23622
CM-244	147.2670	28-FEB-2010	5535.128	5886.122	11129.00	0.2671734	1.3597734E-02	49.90292

Instrument : CHAMBER 191
Detector : 68624
Standard ID : AESS-028
Standard Reference Date : 15-FEB-2008 09:06:52
Calibration Analysis Date/Time : 21-SEP-2009 09:31:28
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 21-SEP-2009 14:53:21
Average Efficiency : 0.2625601
Average Efficiency Error : 7.6934313E-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	2991.297	3300.325	15252.00	0.2584319	1.3090833E-02	50.79485
NP-237	168.1992	28-FEB-2010	4434.026	4906.466	13308.00	0.2637113	1.3382300E-02	58.03377
CM-244	156.7614	28-FEB-2010	5533.499	5882.588	11769.00	0.2657853	1.3513734E-02	53.41747

Instrument : CHAMBER 192
Detector : 74430
Standard ID : AESS-034
Standard Reference Date : 18-FEB-2008 11:28:15
Calibration Analysis Date/Time : 21-SEP-2009 09:31:34
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 21-SEP-2009 14:53:32
Average Efficiency : 0.2544576
Average Efficiency Error : 7.0170104E-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	2990.254	3299.423	14893.00	0.2511986	1.0799594E-02	50.05982
NP-237	167.2962	28-FEB-2010	4433.037	4905.173	12941.00	0.2578104	1.3088287E-02	62.20525
CM-244	154.4388	28-FEB-2010	5531.571	5885.579	11163.00	0.2558767	1.3021424E-02	54.21256

Instrument : CHAMBER 193
Detector : 68627
Standard ID : AESS-029
Standard Reference Date : 15-FEB-2008 09:06:52
Calibration Analysis Date/Time : 21-SEP-2009 09:31:40
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 21-SEP-2009 14:53:41
Average Efficiency : 0.2615199
Average Efficiency Error : 7.6632542E-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	2991.990	3298.419	15396.00	0.2583720	1.3086254E-02	50.38469
NP-237	169.7700	28-FEB-2010	4433.001	4901.628	13286.00	0.2607451	1.3232258E-02	58.19065
CM-244	154.8234	28-FEB-2010	5534.240	5885.963	11618.00	0.2656835	1.3511403E-02	53.47323

Instrument : CHAMBER 194
Detector : 68635
Standard ID : AESS-035
Standard Reference Date : 18-FEB-2008 11:28:15
Calibration Analysis Date/Time : 21-SEP-2009 09:31:45
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 21-SEP-2009 14:53:50
Average Efficiency : 0.2542233
Average Efficiency Error : 7.0097935E-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	2990.781	3297.998	14819.00	0.2523236	1.0848935E-02	51.65903
NP-237	168.2934	28-FEB-2010	4434.565	4903.602	13013.00	0.2577325	1.3083202E-02	59.92809
CM-244	158.8128	28-FEB-2010	5531.095	5882.711	11369.00	0.2534982	1.2896180E-02	53.05344

Instrument : CHAMBER 195
Detector : 68636
Standard ID : AESS-030
Standard Reference Date : 15-FEB-2008 09:06:52
Calibration Analysis Date/Time : 21-SEP-2009 09:31:51
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 21-SEP-2009 14:53:59
Average Efficiency : 0.2554399
Average Efficiency Error : 7.4881674E-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	2989.560	3297.508	14812.00	0.2518228	1.2760897E-02	51.28571
NP-237	166.3758	28-FEB-2010	4435.548	4904.654	12878.00	0.2579744	1.3097576E-02	59.53444
CM-244	157.1856	28-FEB-2010	5531.770	5882.945	11394.00	0.2567084	1.3059122E-02	52.18182

Instrument : CHAMBER 196
Detector : 68637
Standard ID : AESS-036
Standard Reference Date : 18-FEB-2008 11:28:15
Calibration Analysis Date/Time : 21-SEP-2009 09:31:58
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 21-SEP-2009 14:54:08
Average Efficiency : 0.2560611
Average Efficiency Error : 7.0601865E-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	2989.197	3301.025	14971.00	0.2515414	1.0813317E-02	54.46194
NP-237	167.4312	28-FEB-2010	4436.299	4904.887	13068.00	0.2600951	1.3202412E-02	58.47227
CM-244	156.4188	28-FEB-2010	5531.851	5883.206	11431.00	0.2587482	1.3162114E-02	55.12206

Instrument : CHAMBER 197
Detector : 78894
Standard ID : AESS-037
Standard Reference Date : 18-FEB-2008 15:31:47
Calibration Analysis Date/Time : 21-SEP-2009 09:32:04
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 21-SEP-2009 14:42:21
Average Efficiency : 0.2524827
Average Efficiency Error : 6.9639706E-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	2989.248	3298.244	14631.00	0.2502923	1.0764122E-02	53.79660
NP-237	167.1294	28-FEB-2010	4435.410	4906.453	12637.00	0.2520285	1.2799331E-02	65.84109
CM-244	154.7664	28-FEB-2010	5531.008	5883.783	11198.00	0.2561660	1.3035372E-02	58.58810

Instrument : CHAMBER 198
Detector : 78895
Standard ID : AESS-043
Standard Reference Date : 19-FEB-2008 00:32:27
Calibration Analysis Date/Time : 21-SEP-2009 09:32:10
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 21-SEP-2009 14:54:28
Average Efficiency : 0.2546443
Average Efficiency Error : 7.0217522E-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	2988.256	3301.357	14781.00	0.2528079	1.0870277E-02	53.58070
NP-237	168.7422	28-FEB-2010	4435.341	4905.168	12907.00	0.2549473	1.2943417E-02	60.79170
CM-244	156.3252	28-FEB-2010	5533.514	5885.508	11347.00	0.2569917	1.3074390E-02	55.00752

Instrument : CHAMBER 199
Detector : 78896
Standard ID : AESS-038
Standard Reference Date : 18-FEB-2008 15:31:47
Calibration Analysis Date/Time : 21-SEP-2009 09:32:15
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 21-SEP-2009 14:54:37
Average Efficiency : 0.2501853
Average Efficiency Error : 6.8995738E-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	2991.267	3300.107	14889.00	0.2516318	1.0818291E-02	52.50020
NP-237	170.0886	28-FEB-2010	4436.748	4902.339	12711.00	0.2490705	1.2648016E-02	63.29102
CM-244	157.7460	28-FEB-2010	5531.913	5884.562	11110.00	0.2493175	1.2688680E-02	53.66205

Instrument	:	CHAMBER 200
Detector	:	78900
Standard ID	:	AESS-044
Standard Reference Date	:	19-FEB-2008 00:32:27
Calibration Analysis Date/Time	:	21-SEP-2009 09:32:21
Calibration Count Time	:	300.0000
Efficiency Calibration Date/Time	:	21-SEP-2009 14:54:46
Average Efficiency	:	0.2682398
Average Efficiency Error	:	7.3923203E-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	2988.062	3301.136	15568.00	0.2708094	1.1633540E-02	50.91508
NP-237	166.6248	28-FEB-2010	4436.203	4901.740	13553.00	0.2710442	1.3750886E-02	57.22134
CM-244	155.8290	28-FEB-2010	5531.761	5884.914	11543.00	0.2622247	1.3336830E-02	45.01981

Instrument	:	CHAMBER 201
Detector	:	78902
Standard ID	:	AESS-039
Standard Reference Date	:	18-FEB-2008 15:31:47
Calibration Analysis Date/Time	:	21-SEP-2009 09:32:27
Calibration Count Time	:	300.0000
Efficiency Calibration Date/Time	:	21-SEP-2009 14:54:55
Average Efficiency	:	0.2589892
Average Efficiency Error	:	7.1445713E-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	2988.184	3302.217	14648.00	0.2577410	1.1084234E-02	45.65341
NP-237	159.1506	28-FEB-2010	4434.609	4905.994	12631.00	0.2645504	1.3435334E-02	55.65960
CM-244	151.7142	28-FEB-2010	5531.184	5884.407	10948.00	0.2554961	1.3006385E-02	45.41114

Instrument	:	CHAMBER 202
Detector	:	78903
Standard ID	:	AESS-045
Standard Reference Date	:	19-FEB-2008 00:32:27
Calibration Analysis Date/Time	:	21-SEP-2009 09:32:32
Calibration Count Time	:	300.0000
Efficiency Calibration Date/Time	:	21-SEP-2009 14:55:05
Average Efficiency	:	0.2665268
Average Efficiency Error	:	7.3516225E-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	2989.216	3297.484	14828.00	0.2682285	1.1532663E-02	43.97738
NP-237	160.8066	28-FEB-2010	4437.369	4902.276	12547.00	0.2600848	1.3209904E-02	52.01093
CM-244	145.8384	28-FEB-2010	5530.984	5883.177	11169.00	0.2711185	1.3796896E-02	50.67951

Instrument : CHAMBER 203
Detector : 78905
Standard ID : AESS-040
Standard Reference Date : 18-FEB-2008 15:31:47
Calibration Analysis Date/Time : 21-SEP-2009 09:32:39
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 21-SEP-2009 14:55:14
Average Efficiency : 0.2582881
Average Efficiency Error : 7.1221651E-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	2990.199	3298.236	14936.00	0.2597386	1.1166240E-02	50.45560
NP-237	166.8174	28-FEB-2010	4432.988	4903.526	12999.00	0.2597034	1.3183516E-02	56.72982
CM-244	155.0100	28-FEB-2010	5533.164	5886.048	11164.00	0.2549590	1.2974691E-02	53.05425

Instrument : CHAMBER 204
Detector : 78907
Standard ID : AESS-046
Standard Reference Date : 19-FEB-2008 19:35:48
Calibration Analysis Date/Time : 21-SEP-2009 09:32:45
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 21-SEP-2009 14:55:23
Average Efficiency : 0.2496188
Average Efficiency Error : 6.8885502E-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	2989.792	3298.277	14212.00	0.2467715	1.0618629E-02	52.28694
NP-237	164.6658	28-FEB-2010	4433.265	4903.277	12386.00	0.2506330	1.2732573E-02	55.30292
CM-244	151.3824	28-FEB-2010	5531.668	5883.589	10818.00	0.2527654	1.2870559E-02	51.63226

Instrument : CHAMBER 205
Detector : 78908
Standard ID : AESS-041
Standard Reference Date : 18-FEB-2008 15:31:47
Calibration Analysis Date/Time : 21-SEP-2009 09:32:51
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 21-SEP-2009 14:55:32
Average Efficiency : 0.2549397
Average Efficiency Error : 7.0272260E-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	2989.853	3298.183	15200.00	0.2521578	1.0836856E-02	49.40310
NP-237	171.2268	28-FEB-2010	4433.644	4904.311	13124.00	0.2554664	1.2966554E-02	56.83091
CM-244	159.5796	28-FEB-2010	5533.979	5886.811	11652.00	0.2584914	1.3144889E-02	54.55809

Instrument : CHAMBER 206
Detector : 78909
Standard ID : AESS-047
Standard Reference Date : 19-FEB-2008 00:32:27
Calibration Analysis Date/Time : 21-SEP-2009 09:32:57
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 21-SEP-2009 14:55:41
Average Efficiency : 0.2541434
Average Efficiency Error : 7.0085586E-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	2990.264	3297.560	14794.00	0.2533972	1.0895449E-02	48.44042
NP-237	168.3948	28-FEB-2010	4435.483	4905.550	12839.00	0.2541331	1.2903095E-02	60.11407
CM-244	154.6032	28-FEB-2010	5534.828	5887.642	11143.00	0.2552143	1.2987950E-02	53.79968

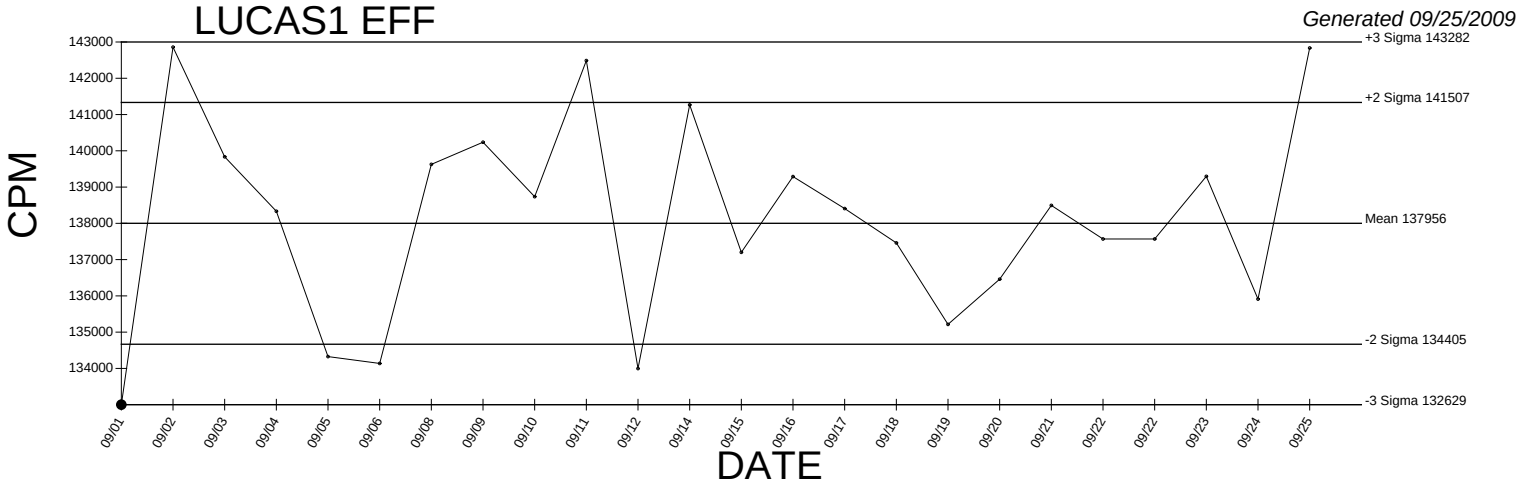
Instrument : CHAMBER 207
Detector : 78910
Standard ID : AESS-042
Standard Reference Date : 18-FEB-2008 15:31:47
Calibration Analysis Date/Time : 21-SEP-2009 09:33:03
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 21-SEP-2009 14:55:50
Average Efficiency : 0.2573462
Average Efficiency Error : 7.1005006E-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	2989.540	3298.860	14353.00	0.2572728	1.1068305E-02	52.62569
NP-237	159.6558	28-FEB-2010	4436.642	4902.427	12327.00	0.2573162	1.3072978E-02	61.37923
CM-244	150.5208	28-FEB-2010	5532.022	5884.565	10951.00	0.2574795	1.3107520E-02	49.75304

Instrument : CHAMBER 208
Detector : 78911
Standard ID : AESS-048
Standard Reference Date : 19-FEB-2008 00:32:27
Calibration Analysis Date/Time : 21-SEP-2009 09:33:08
Calibration Count Time : 300.0000
Efficiency Calibration Date/Time : 21-SEP-2009 14:56:00
Average Efficiency : 0.2510063
Average Efficiency Error : 6.9273296E-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	2991.900	3300.465	14140.00	0.2493222	1.0729297E-02	51.69543
NP-237	161.5530	28-FEB-2010	4437.256	4903.414	12240.00	0.2525304	1.2831211E-02	60.66938
CM-244	151.1856	28-FEB-2010	5534.200	5882.369	10757.00	0.2518900	1.2826865E-02	52.12144

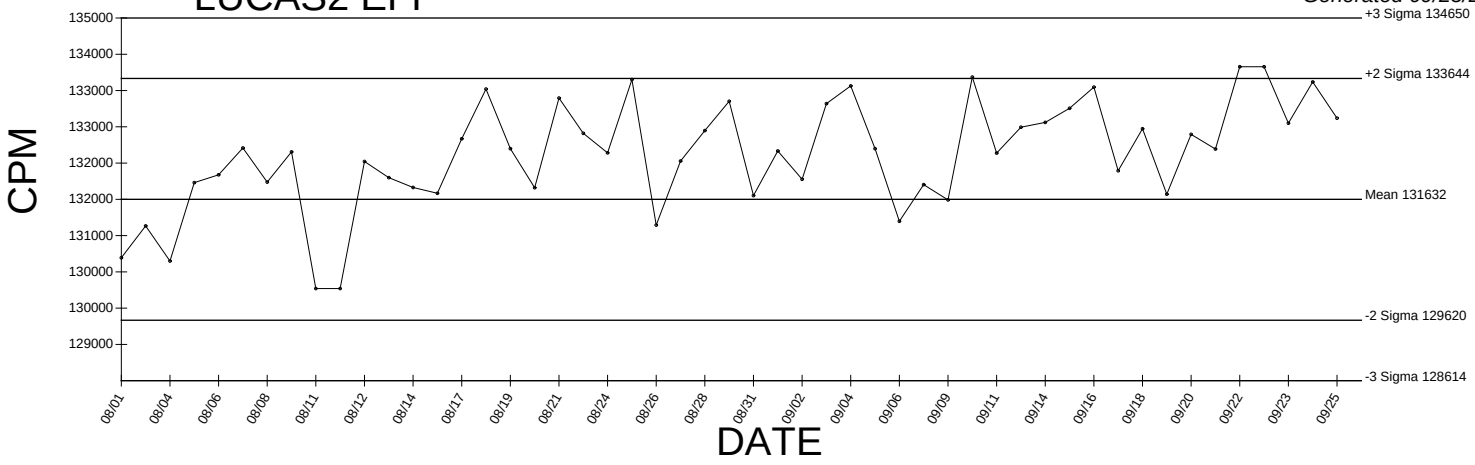
BACKGROUND AND EFFICIENCY DATA



● Denotes Outlier

LUCAS2 EFF

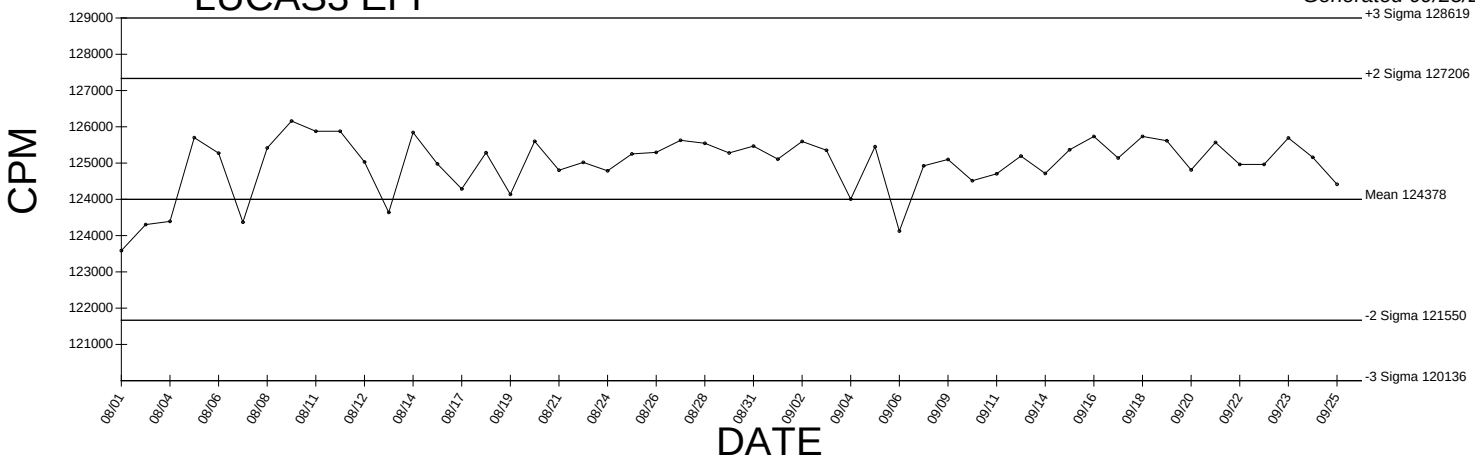
Generated 09/25/2009



● Denotes Outlier

LUCAS3 EFF

Generated 09/25/2009



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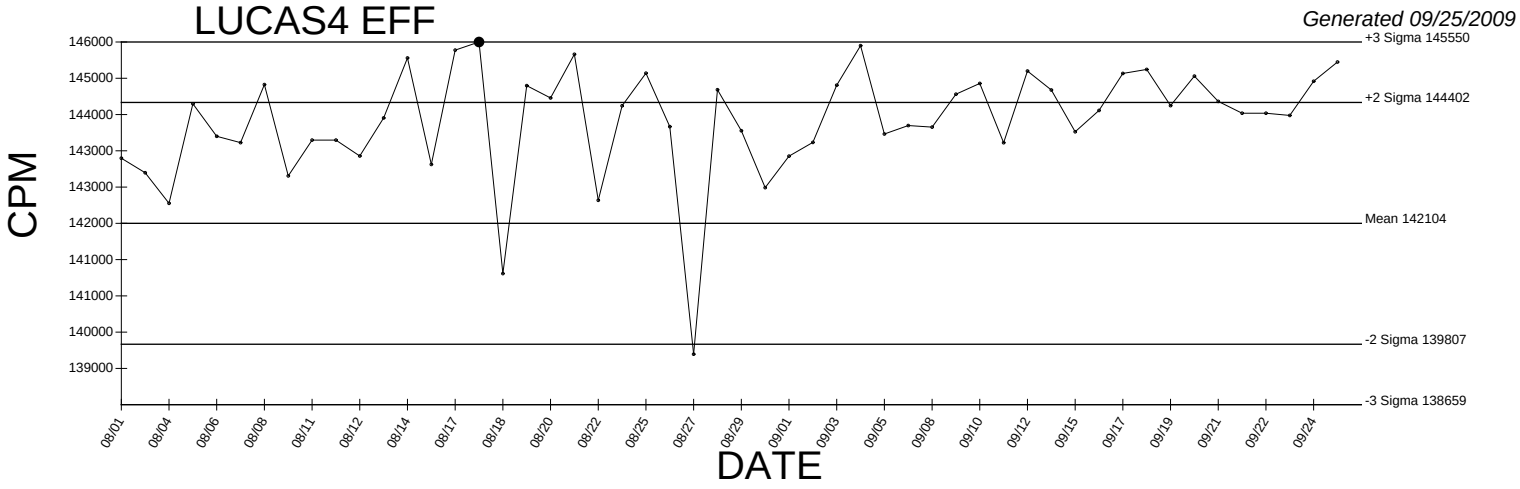

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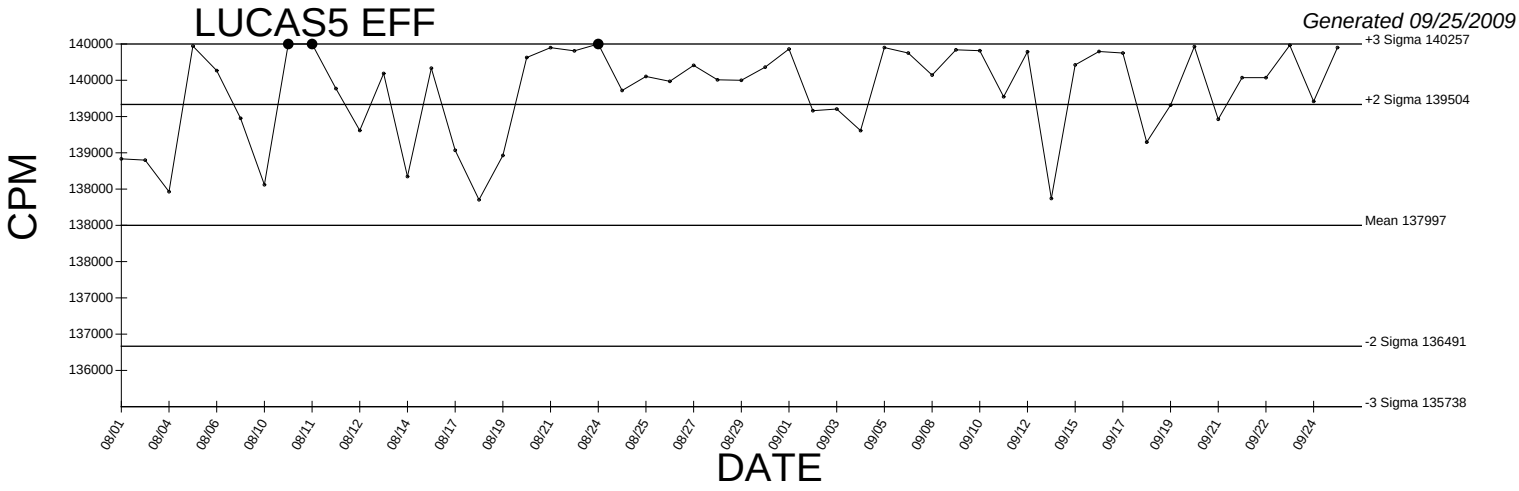

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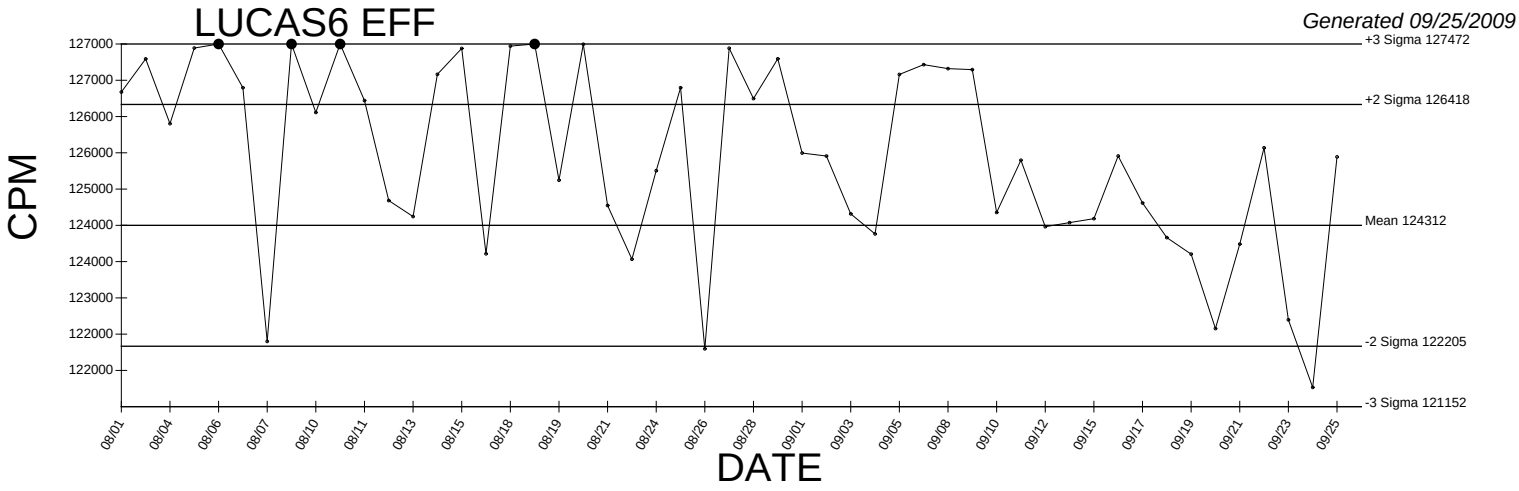

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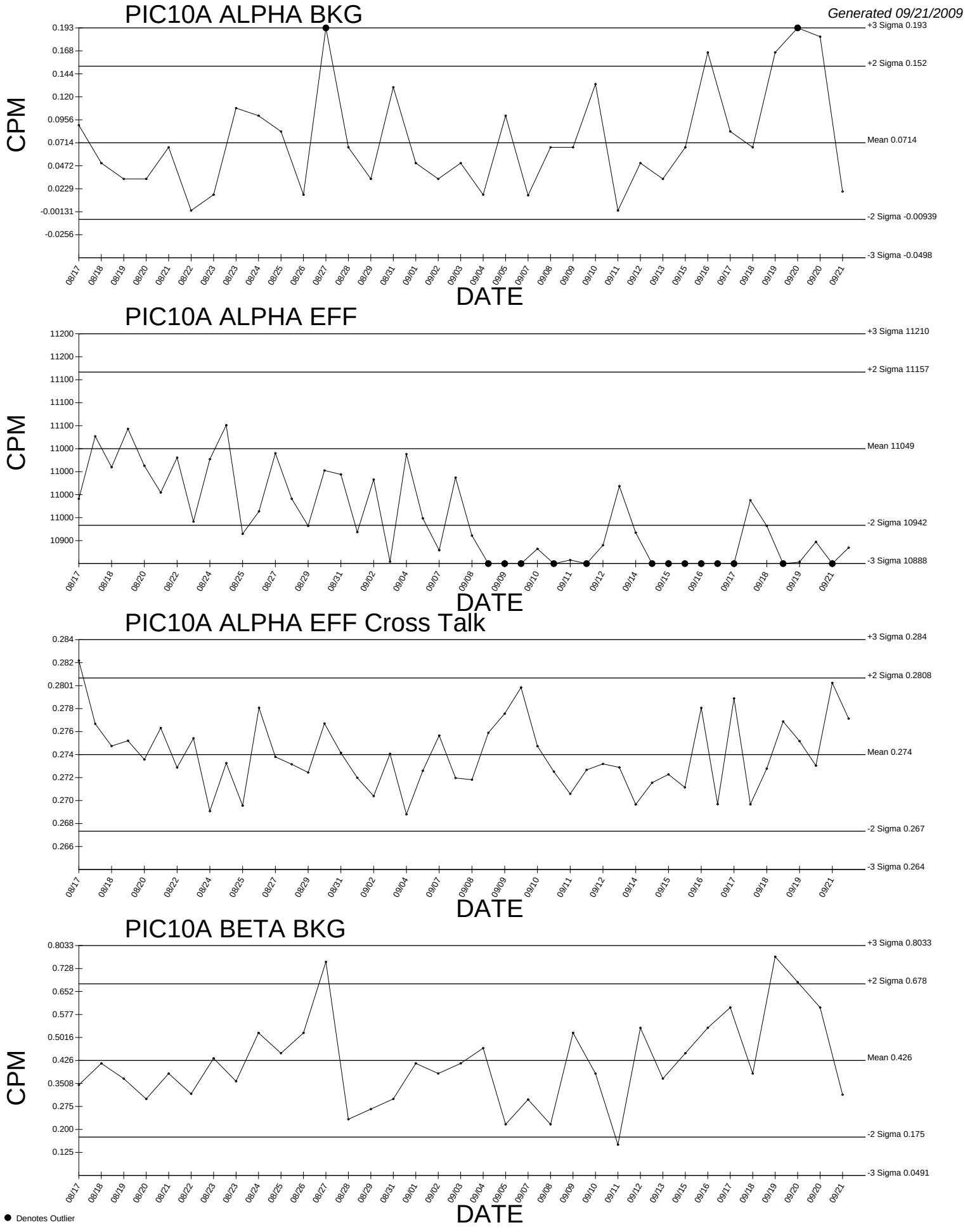
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Generated 09/21/2009
CPM
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PIC10A ALPHA EFF
+3 Sigma 11210
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Mean 11049
-2 Sigma 10942
-3 Sigma 10888
PIC10A ALPHA EFF Cross Talk
+3 Sigma 0.284
+2 Sigma 0.2808
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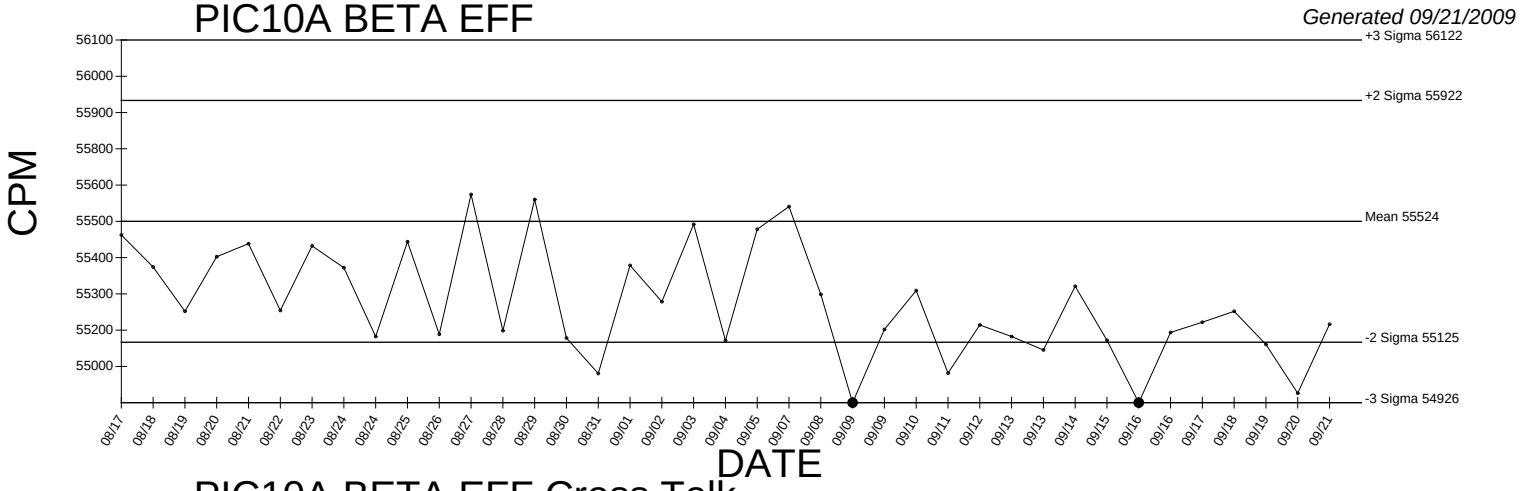
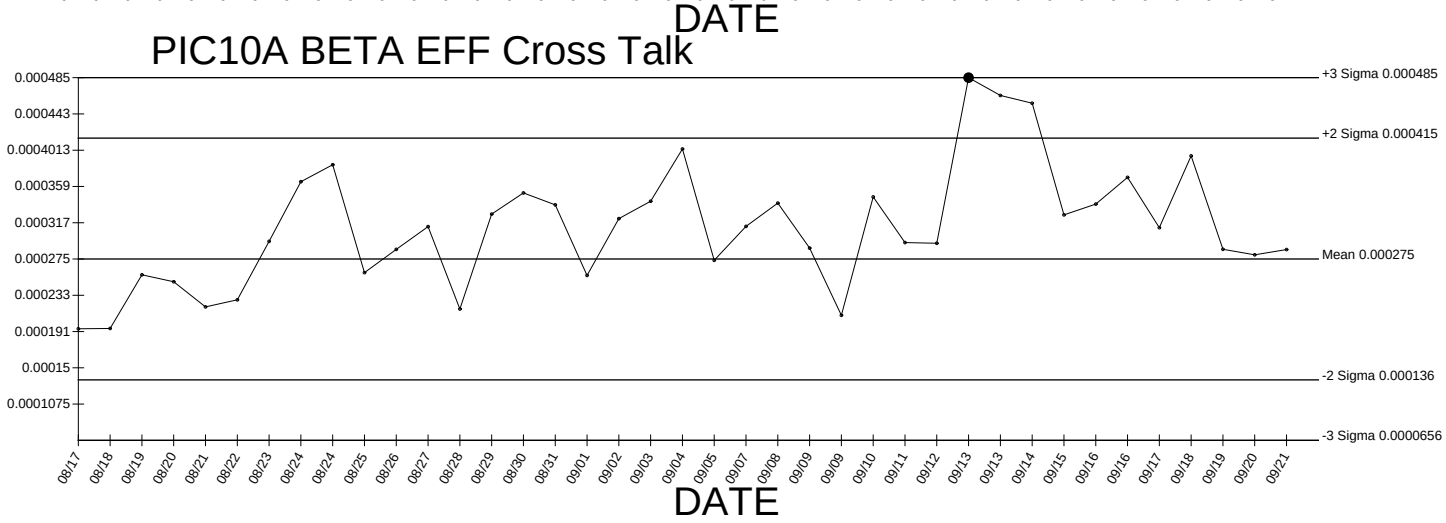
● Denotes Outlier





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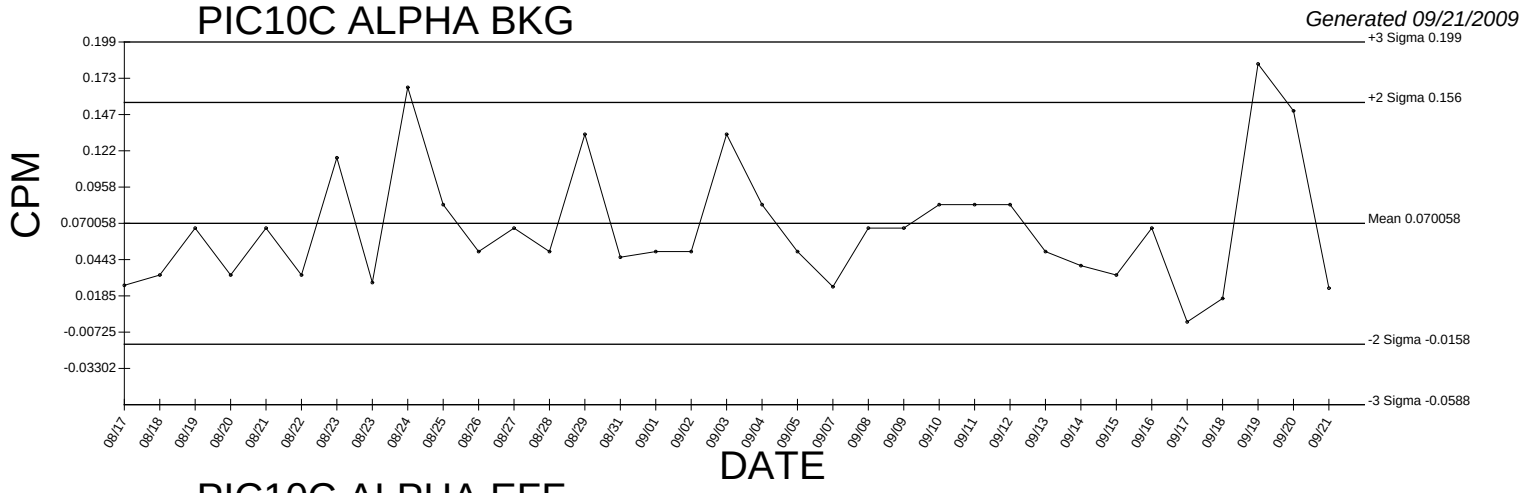

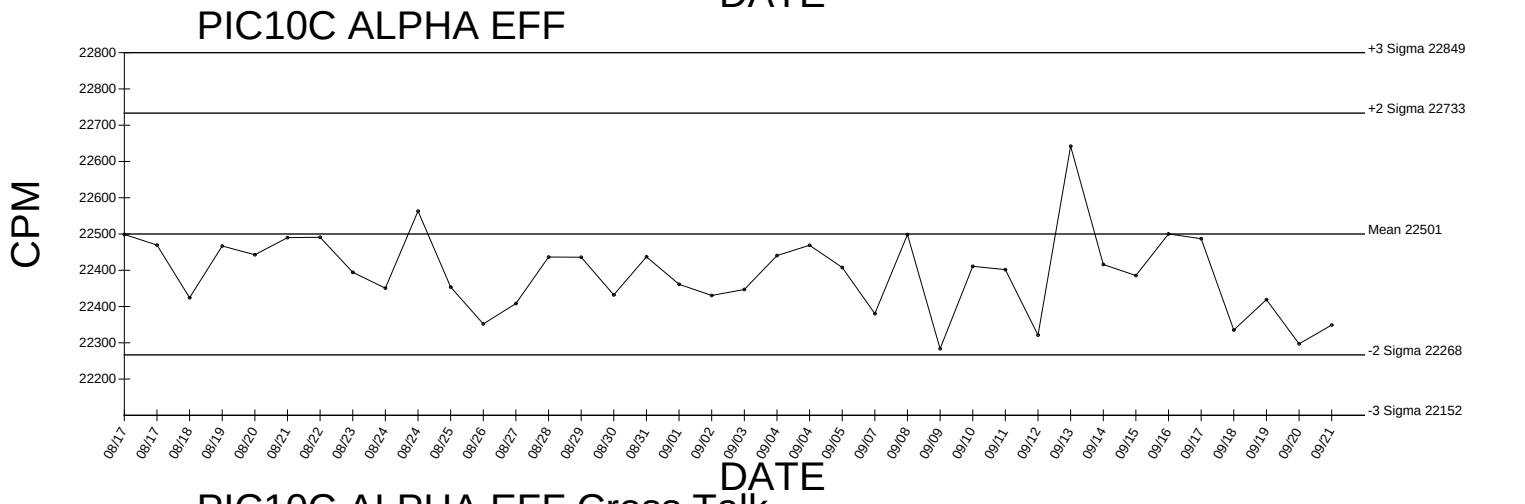

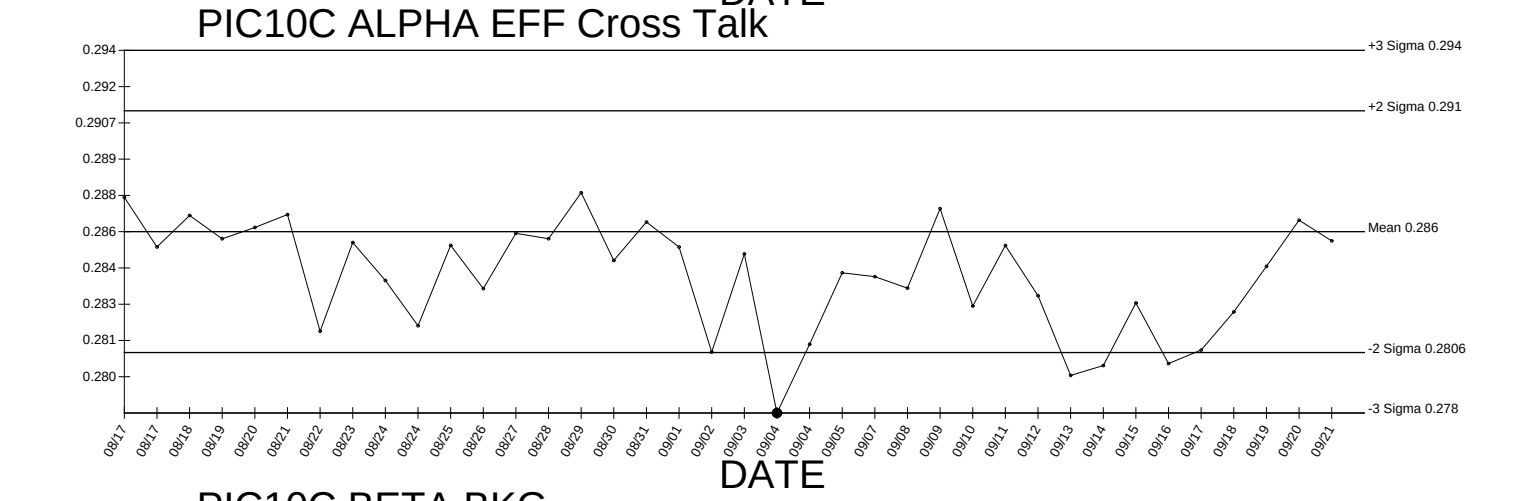

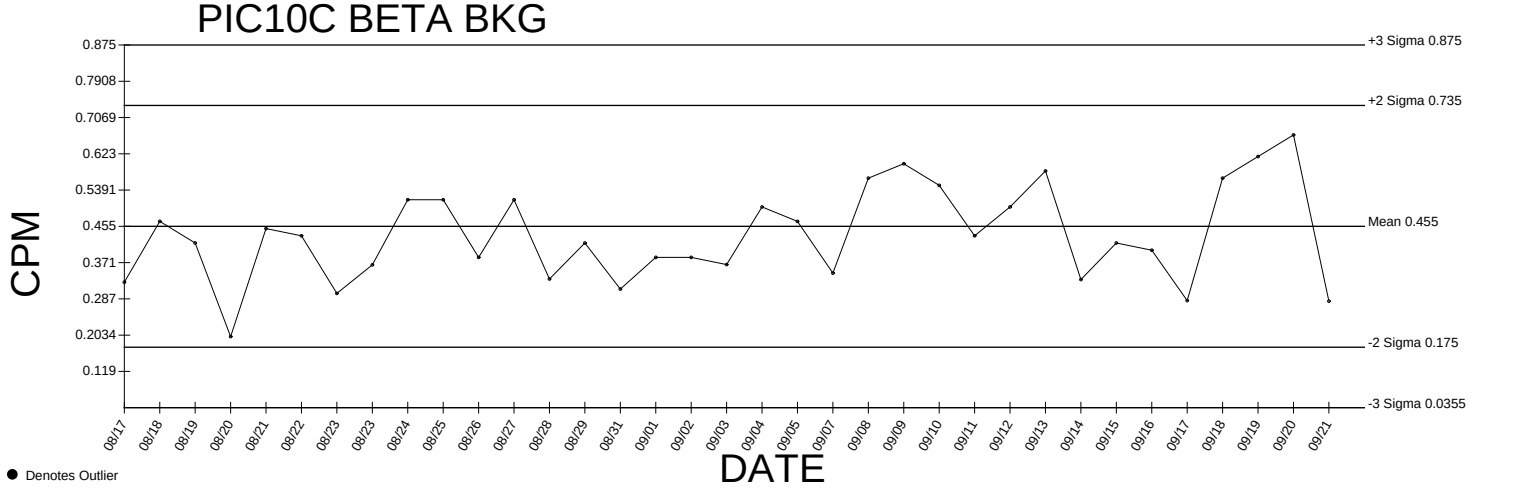

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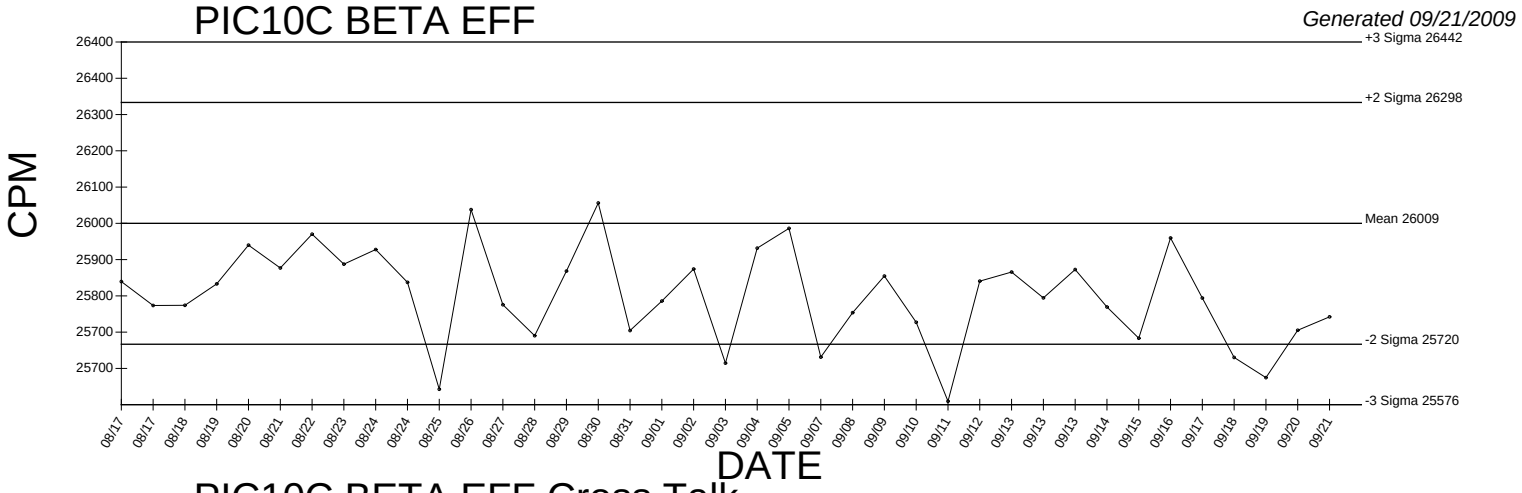

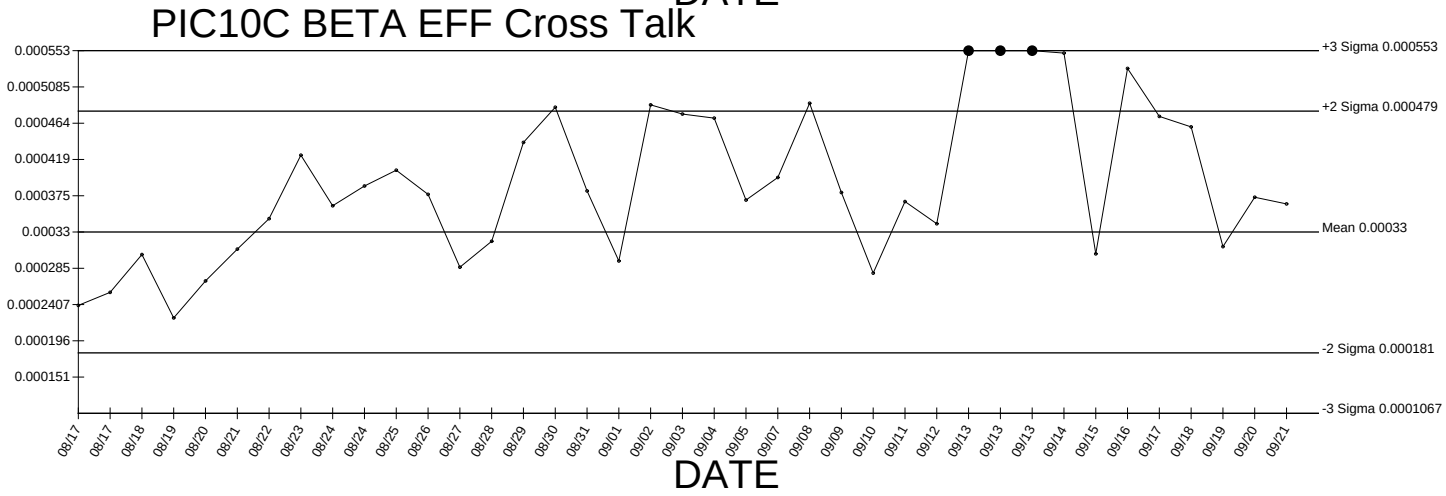

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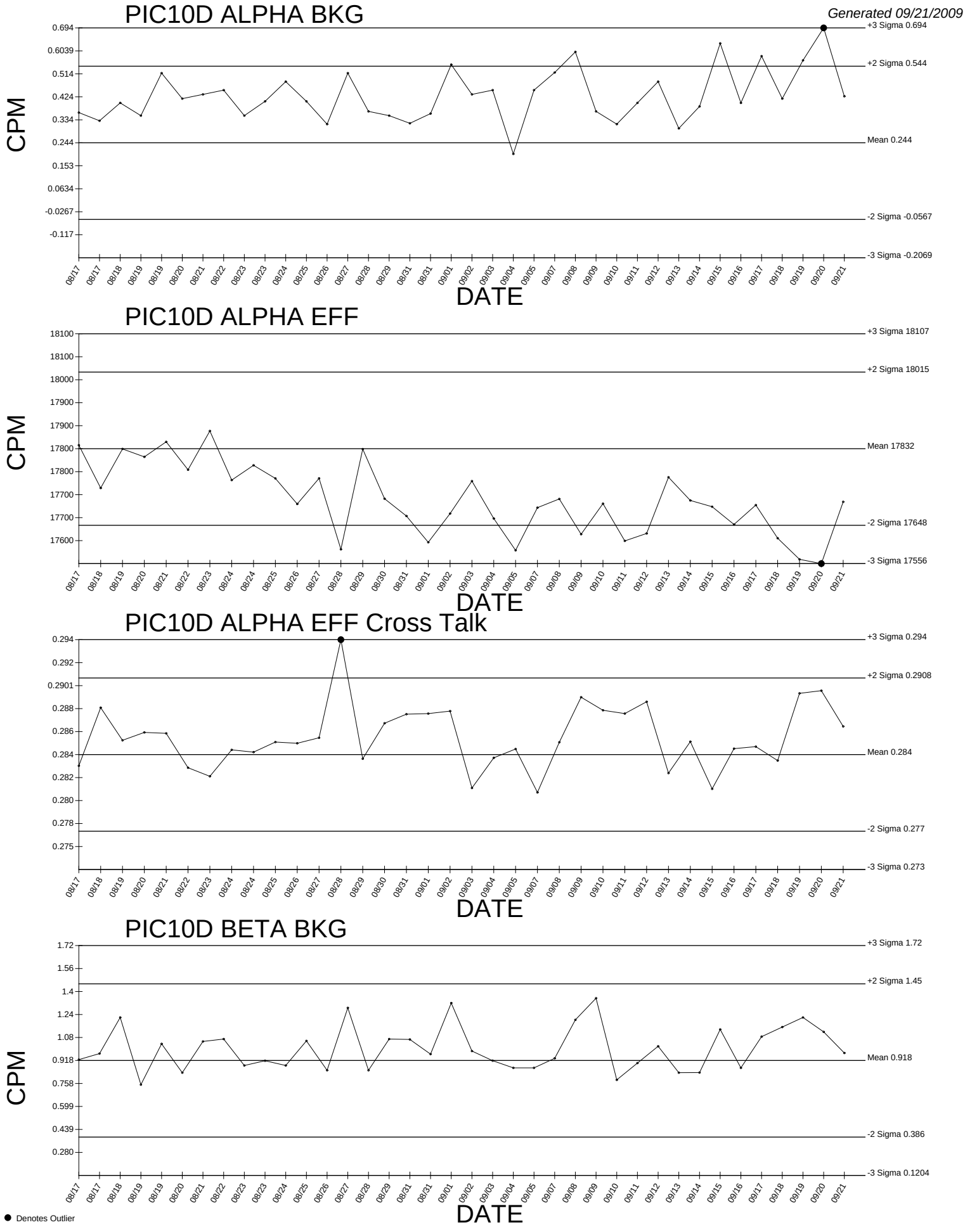
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Generated 09/21/2009
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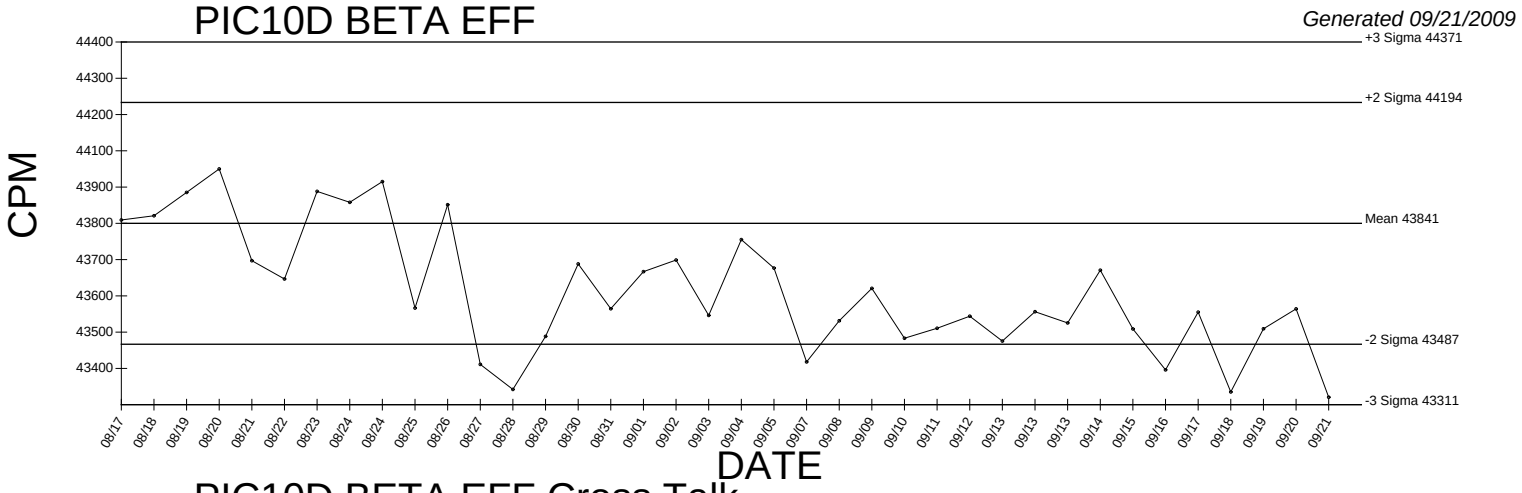
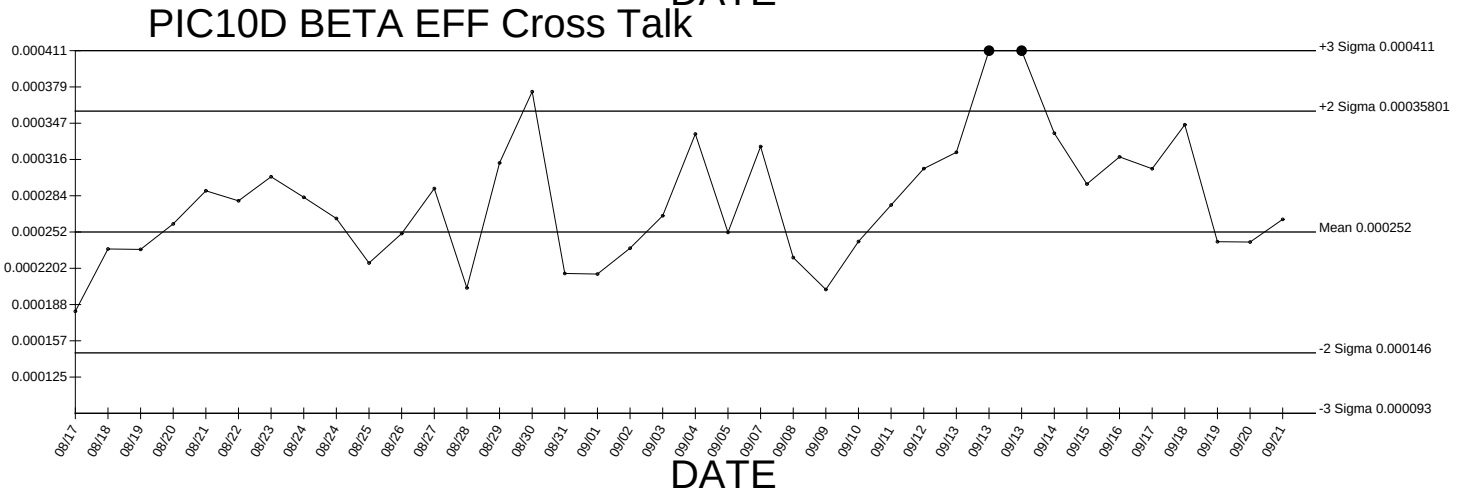
-2 Sigma -0.0567
-3 Sigma -0.2069
PIC10D ALPHA EFF
+3 Sigma 18107
+2 Sigma 18015
Mean 17832
-2 Sigma 17648
-3 Sigma 17556
PIC10D ALPHA EFF Cross Talk
+3 Sigma 0.294
+2 Sigma 0.2908
Mean 0.284
-2 Sigma 0.277
-3 Sigma 0.273
PIC10D BETA BKG
+3 Sigma 1.72
+2 Sigma 1.45
Mean 0.918
-2 Sigma 0.386
-3 Sigma 0.1204
● Denotes Outlier





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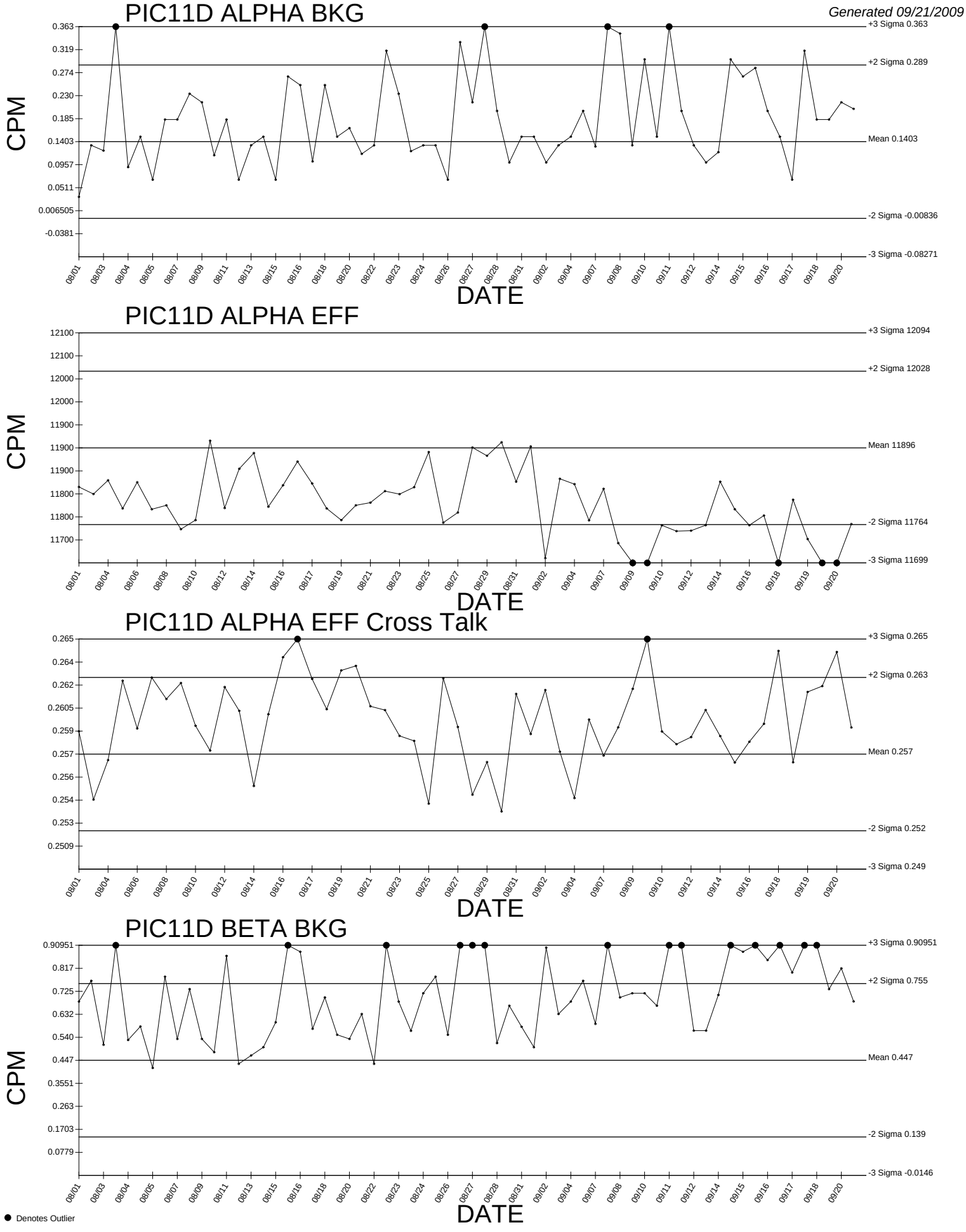
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Generated 09/21/2009
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0.274
0.230
0.185
0.1403
0.0957
0.0511
0.006505
-0.0381
+3 Sigma 0.363
+2 Sigma 0.289
Mean 0.1403
-2 Sigma -0.00836
-3 Sigma -0.08271
08/01 08/03 08/04 08/05 08/07 08/09 08/11 08/13 08/15 08/16 08/18 08/20 08/22 08/23 08/24 08/26 08/27 08/28 08/31 09/02 09/04 09/07 09/08 09/10 09/11 09/12 09/14 09/15 09/16 09/17 09/18 09/20
DATE
PIC11D ALPHA EFF
CPM
12100
12100
12000
12000
11900
11900
11800
11800
11700
+3 Sigma 12094
+2 Sigma 12028
Mean 11896
-2 Sigma 11764
-3 Sigma 11699
08/01 08/04 08/06 08/08 08/10 08/12 08/14 08/16 08/17 08/19 08/21 08/23 08/25 08/27 08/29 08/31 09/02 09/04 09/07 09/09 09/10 09/12 09/14 09/16 09/18 09/19 09/20
DATE
PIC11D ALPHA EFF Cross Talk
0.265
0.264
0.262
0.2605
0.259
0.257
0.256
0.254
0.253
0.2509
+3 Sigma 0.265
+2 Sigma 0.263
Mean 0.257
-2 Sigma 0.252
-3 Sigma 0.249
08/01 08/04 08/06 08/08 08/10 08/12 08/14 08/16 08/17 08/19 08/21 08/23 08/25 08/27 08/29 08/31 09/02 09/04 09/07 09/09 09/10 09/12 09/14 09/16 09/18 09/19 09/20
DATE
PIC11D BETA BKG
CPM
0.90951
0.817
0.725
0.632
0.540
0.447
0.3551
0.263
0.1703
0.0779
+3 Sigma 0.90951
+2 Sigma 0.755
Mean 0.447
-2 Sigma 0.139
-3 Sigma -0.0146
08/01 08/03 08/04 08/05 08/07 08/09 08/11 08/13 08/15 08/16 08/18 08/20 08/22 08/23 08/24 08/26 08/27 08/28 08/31 09/02 09/04 09/07 09/08 09/10 09/11 09/12 09/14 09/15 09/16 09/17 09/18 09/20
DATE
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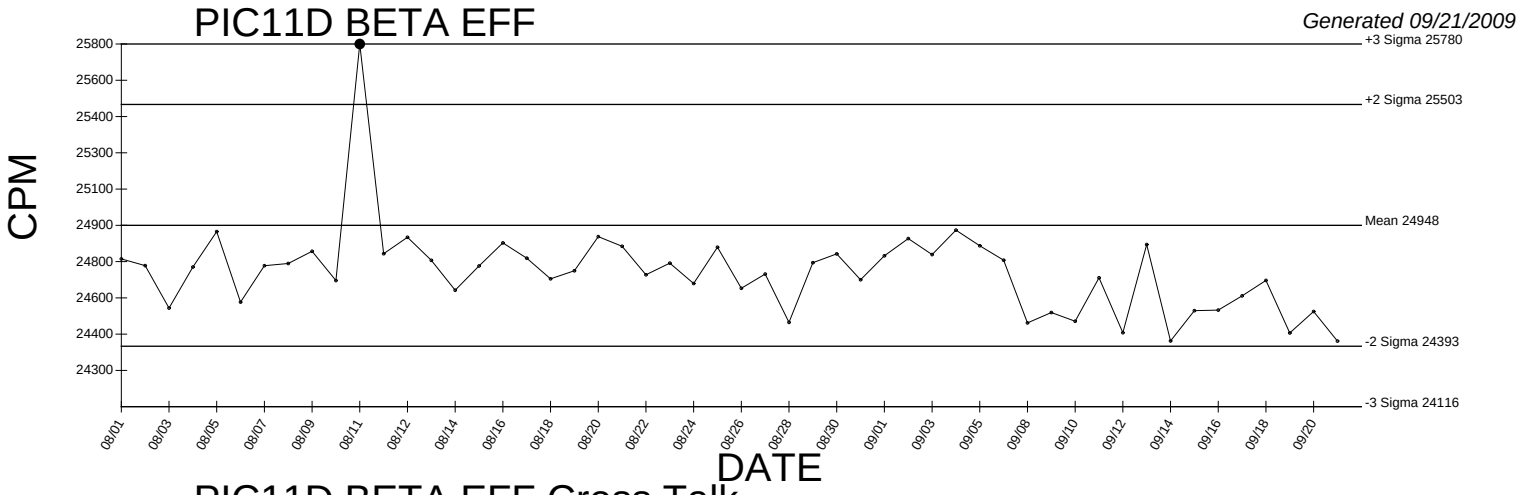

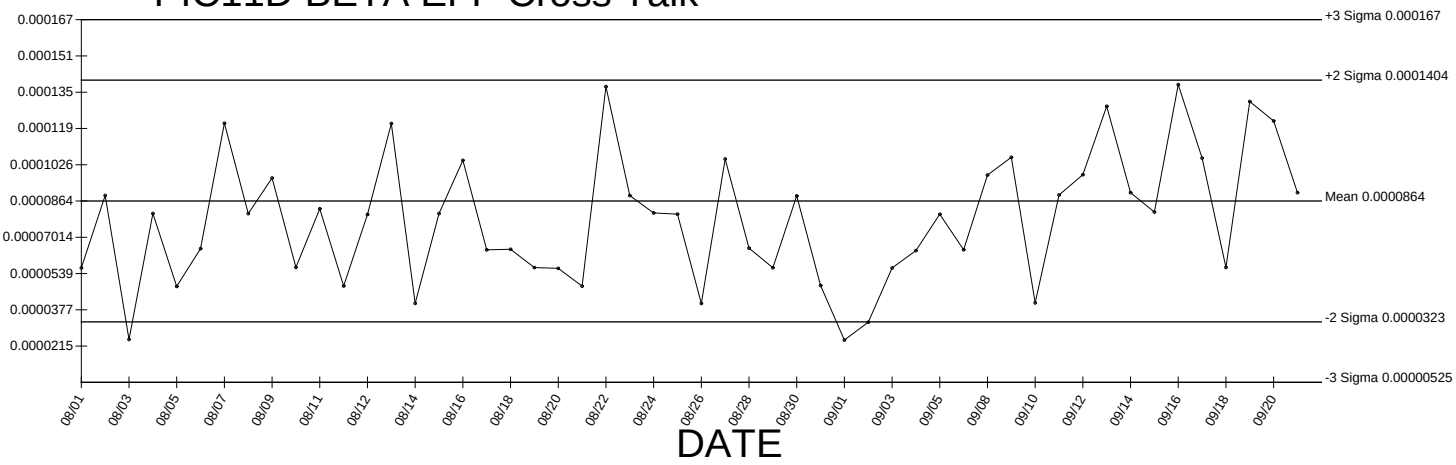

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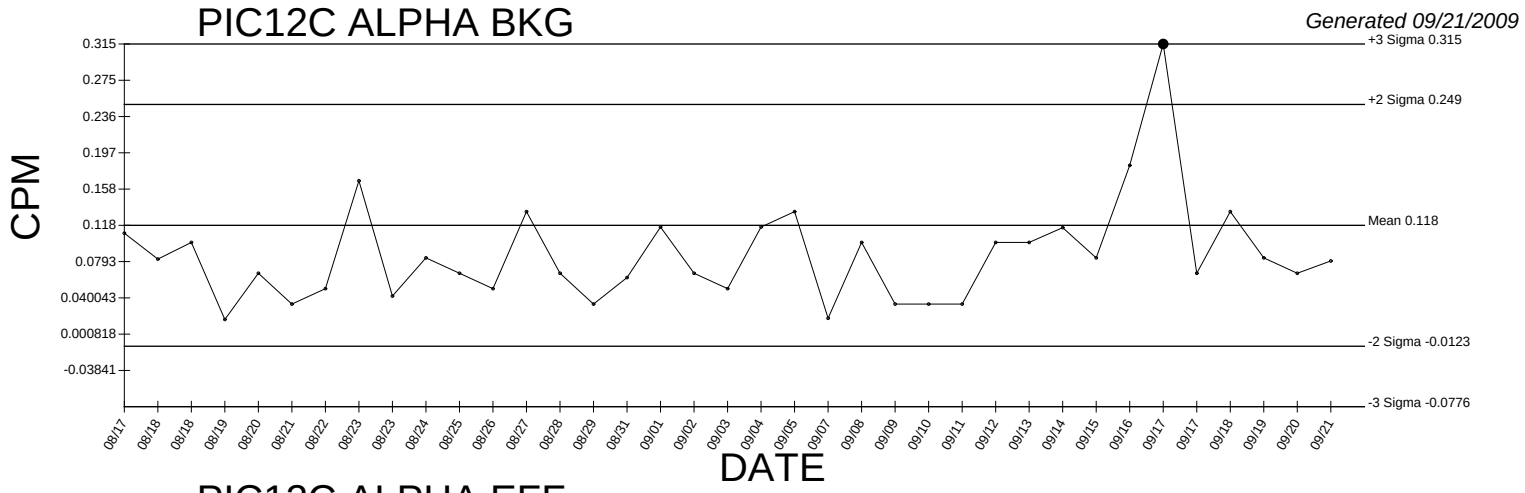

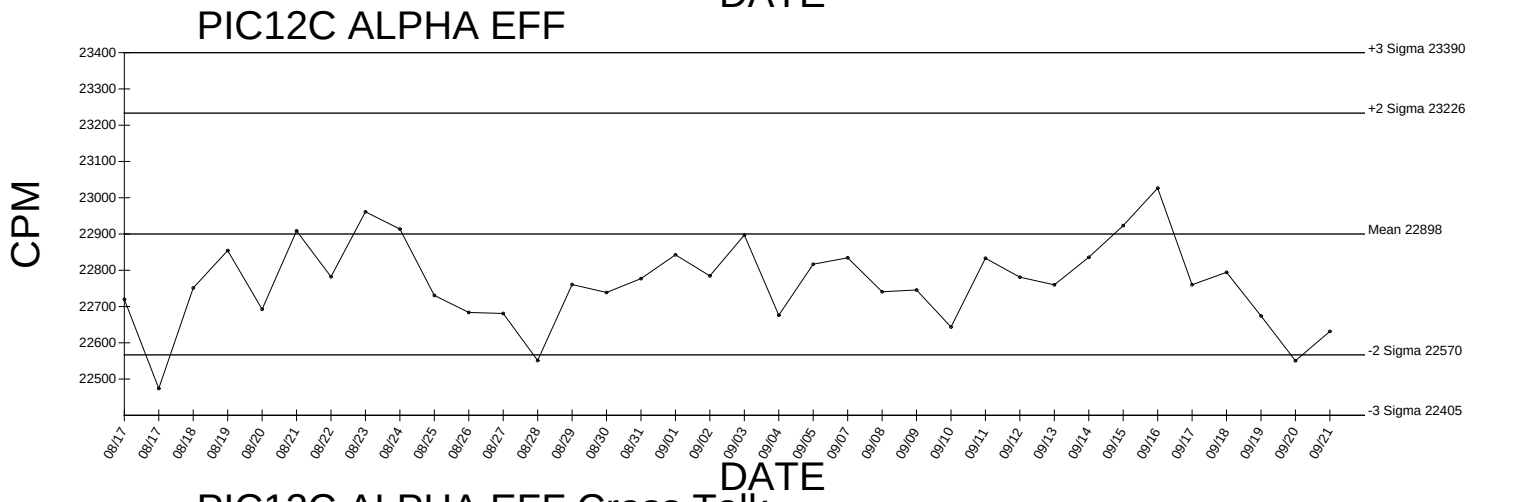

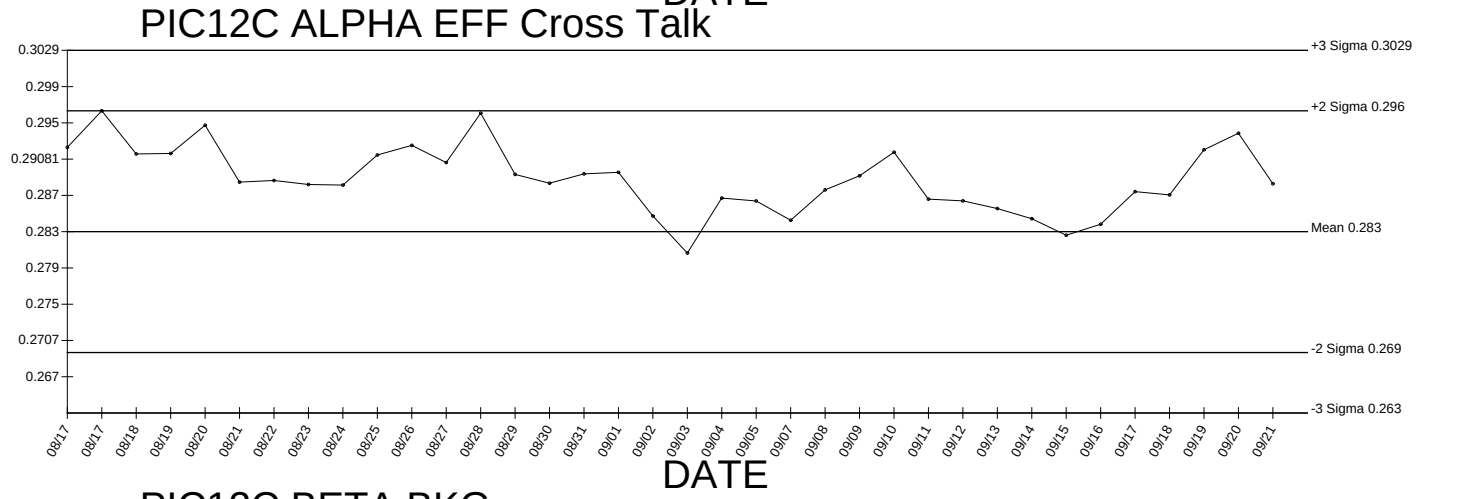

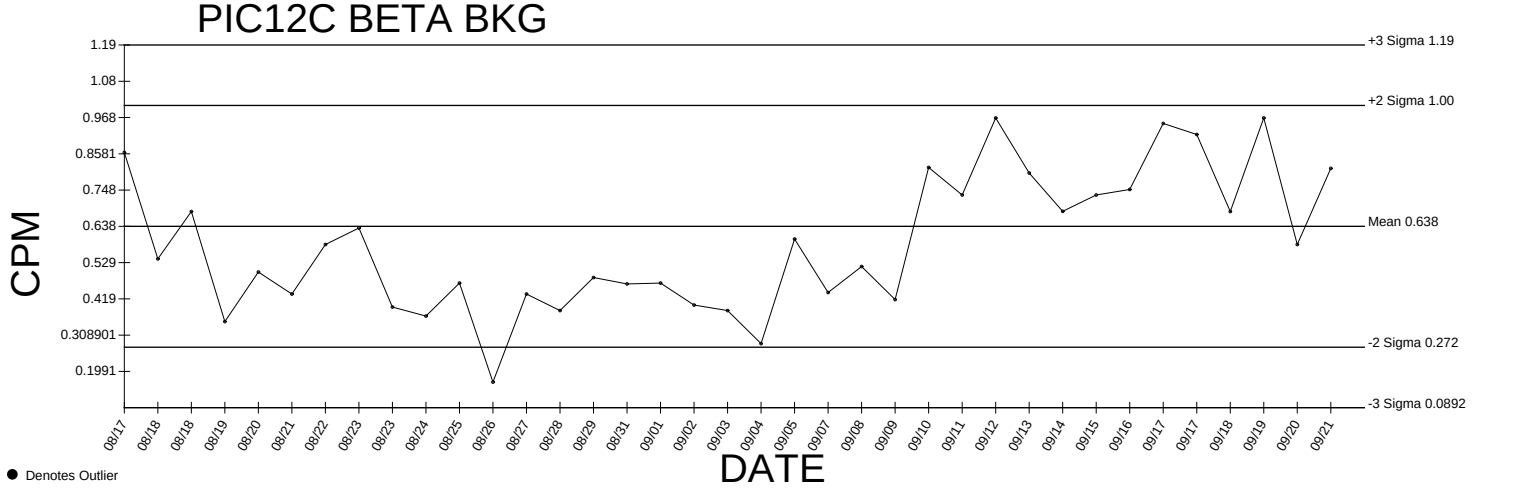

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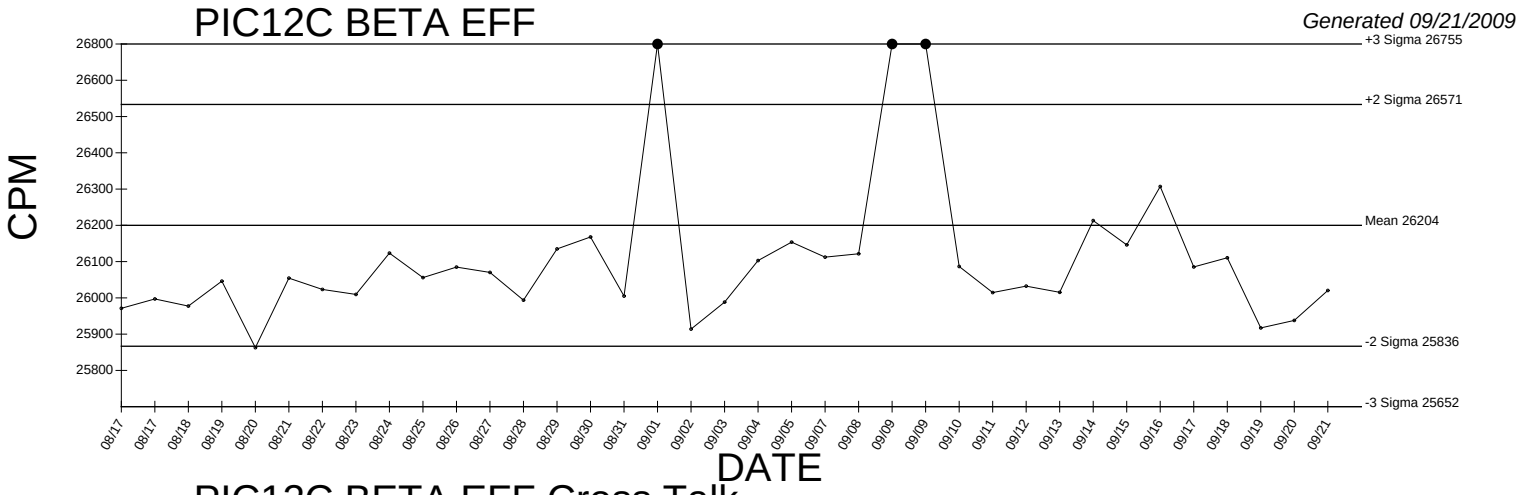

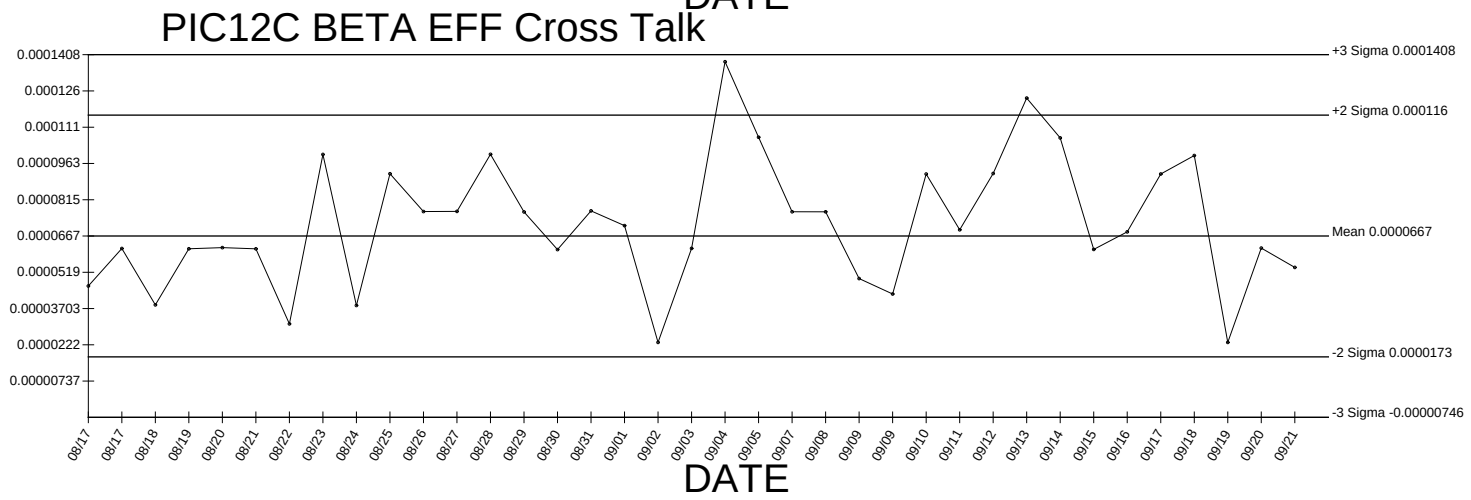

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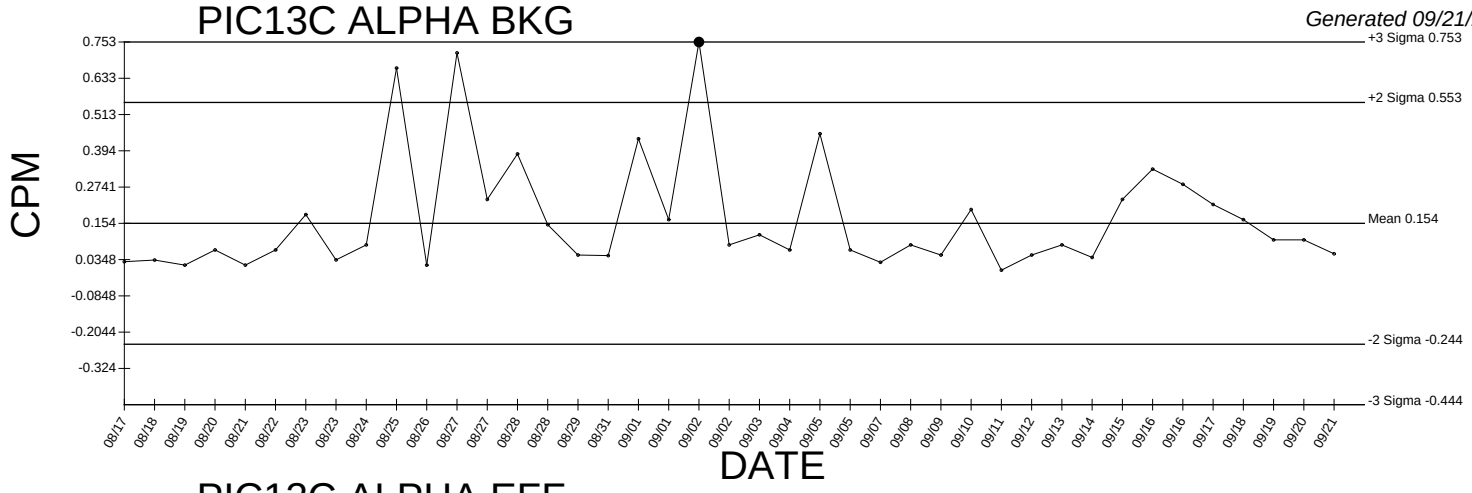

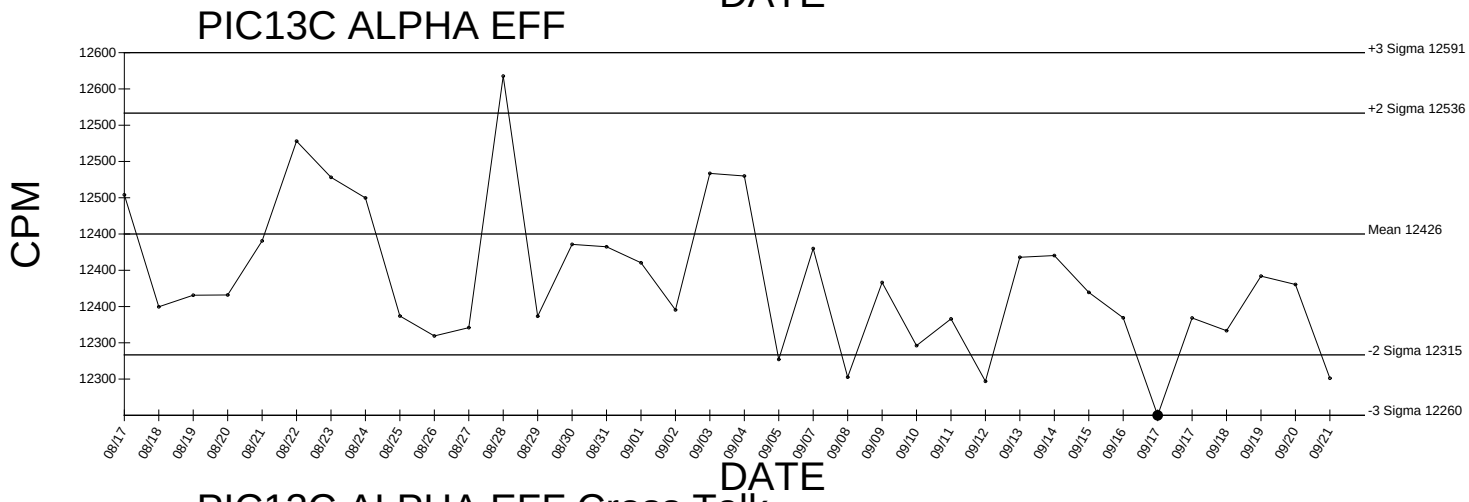

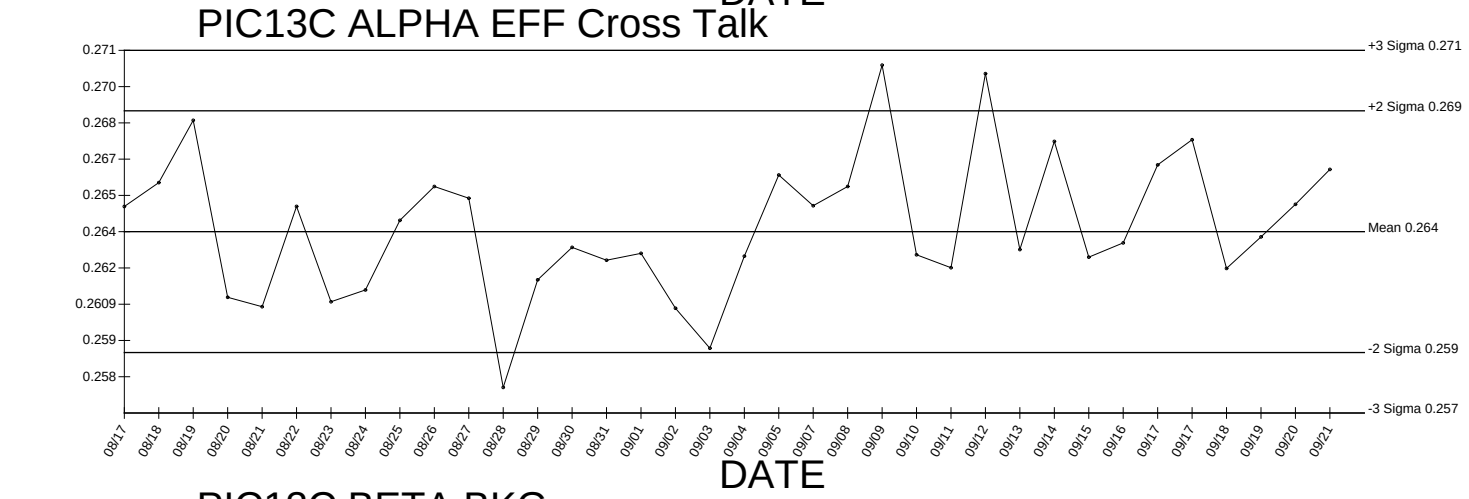

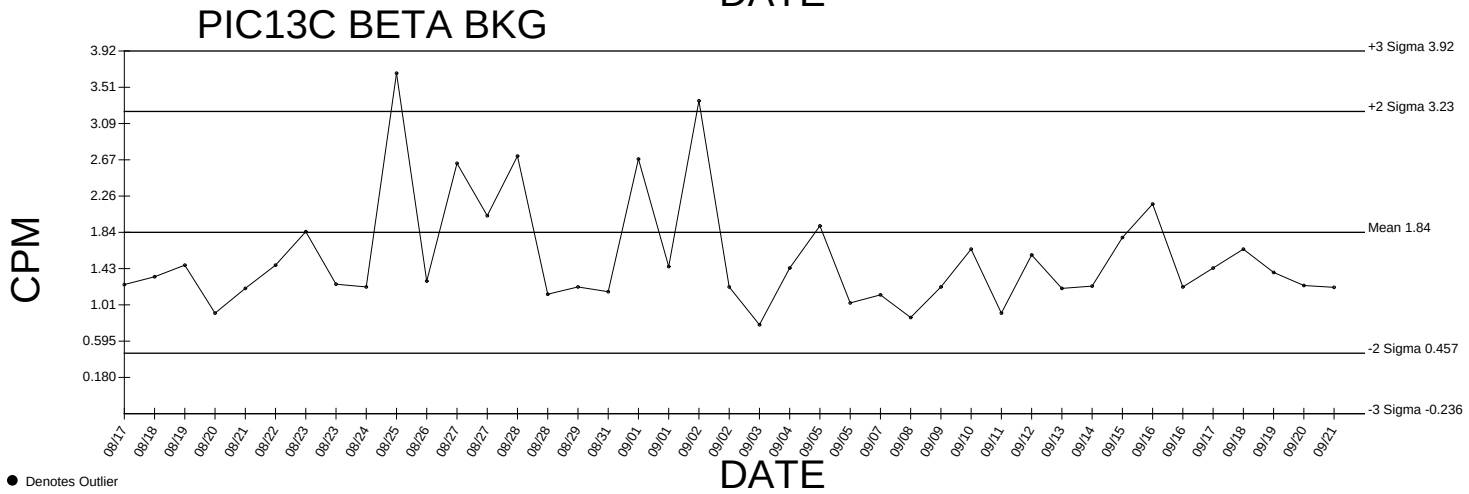

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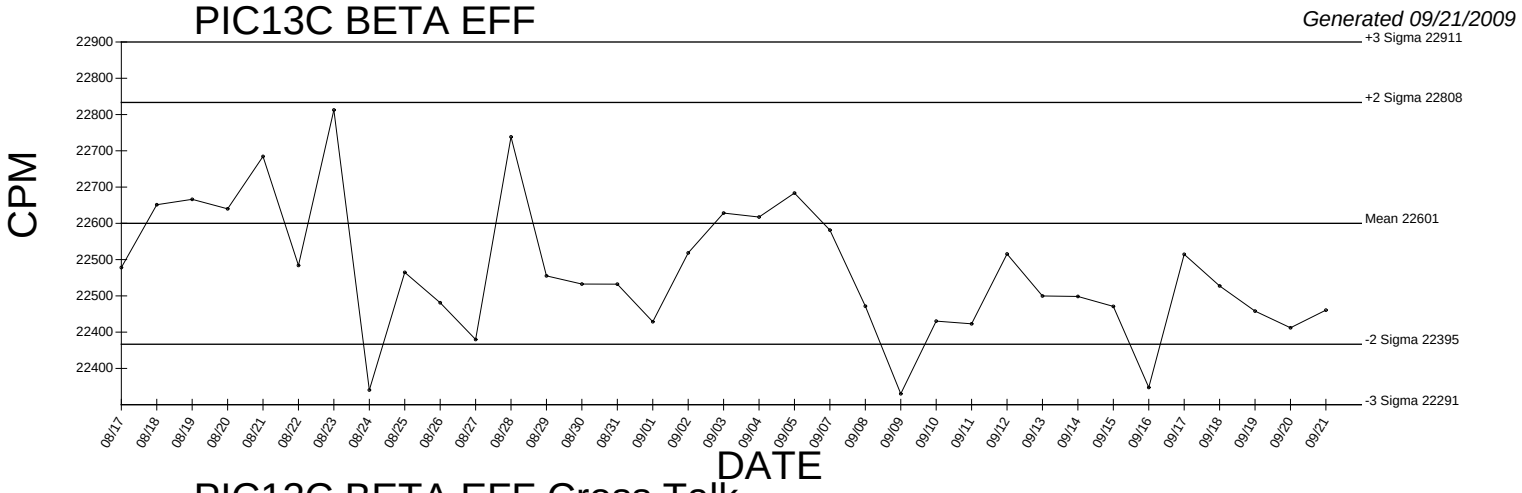

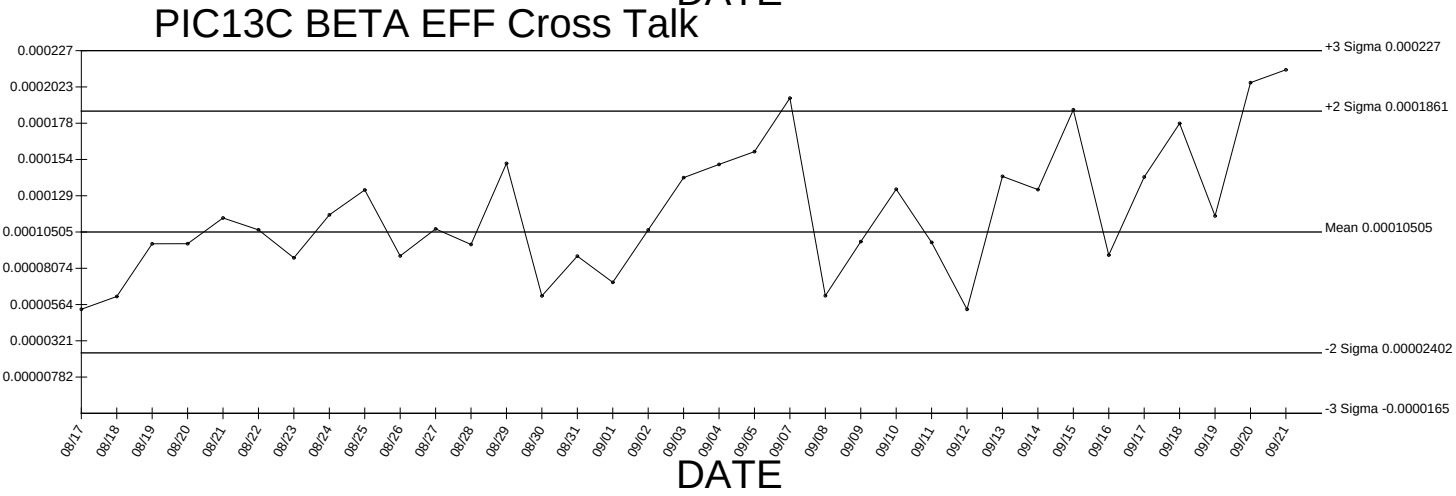

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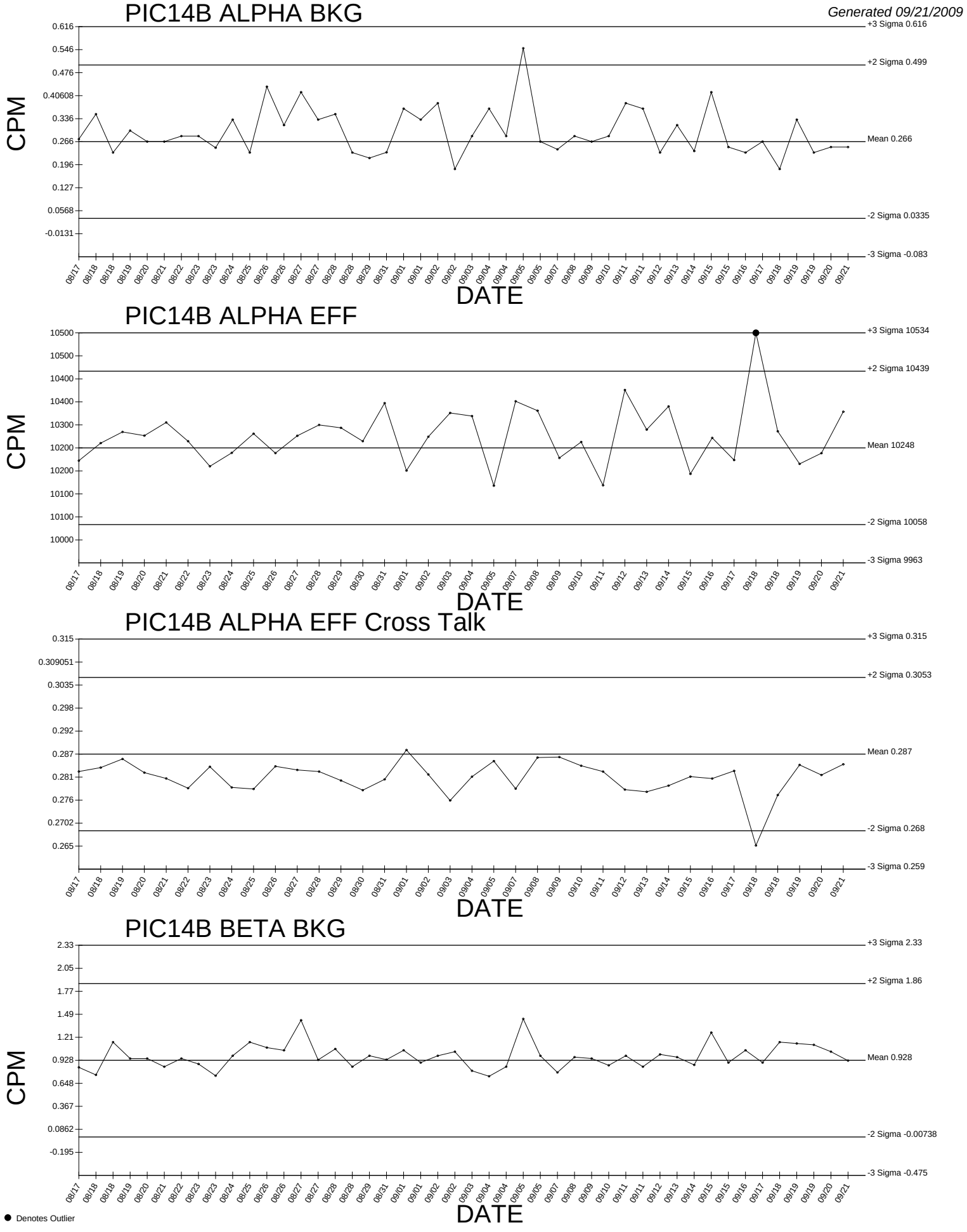
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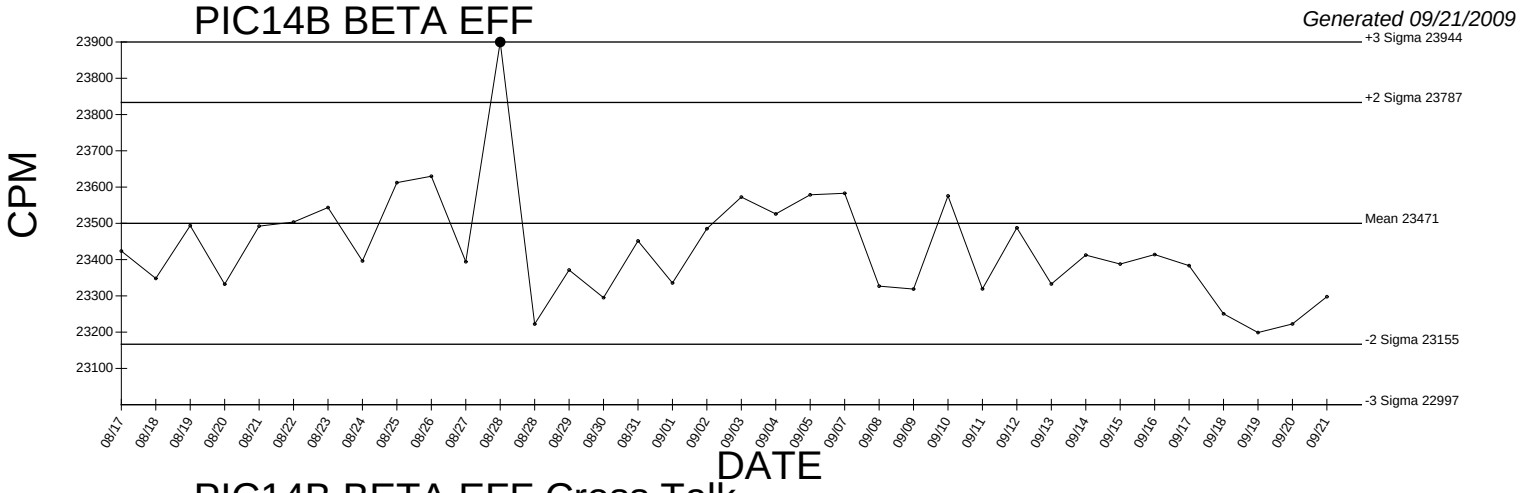
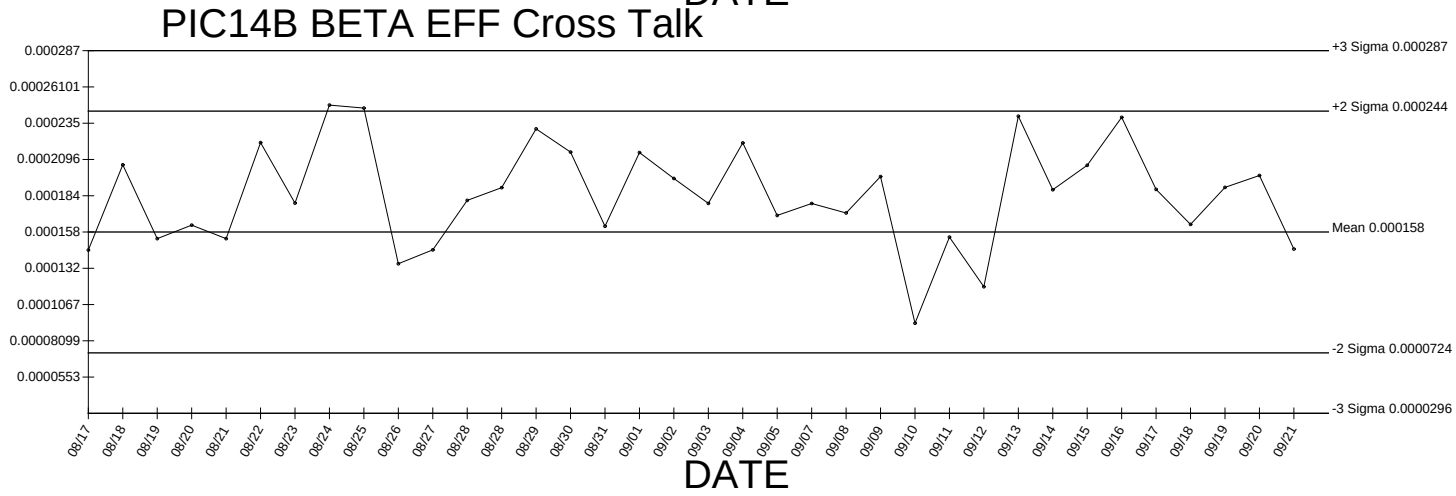
Generated 09/21/2009
CPM
DATE
+3 Sigma 0.616
+2 Sigma 0.499
Mean 0.266
-2 Sigma 0.0335
-3 Sigma -0.083
PIC14B ALPHA EFF
+3 Sigma 10534
+2 Sigma 10439
Mean 10248
-2 Sigma 10058
-3 Sigma 9963
PIC14B ALPHA EFF Cross Talk
+3 Sigma 0.315
+2 Sigma 0.3053
Mean 0.287
-2 Sigma 0.268
-3 Sigma 0.259
PIC14B BETA BKG
+3 Sigma 2.33
+2 Sigma 1.86
Mean 0.928
-2 Sigma -0.00738
-3 Sigma -0.475
● Denotes Outlier





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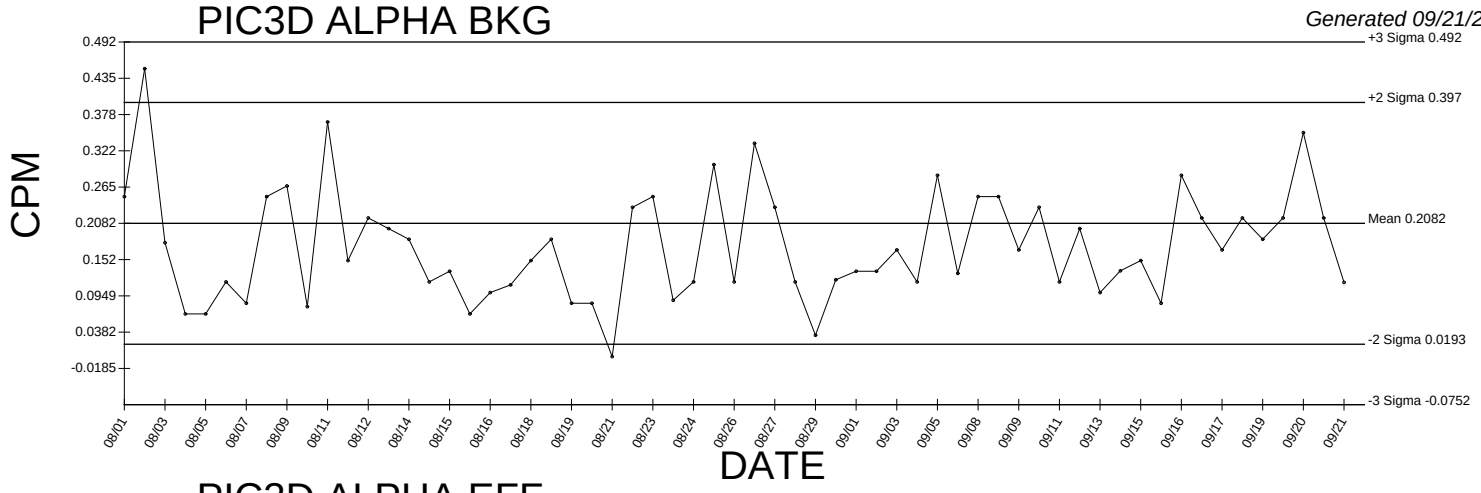

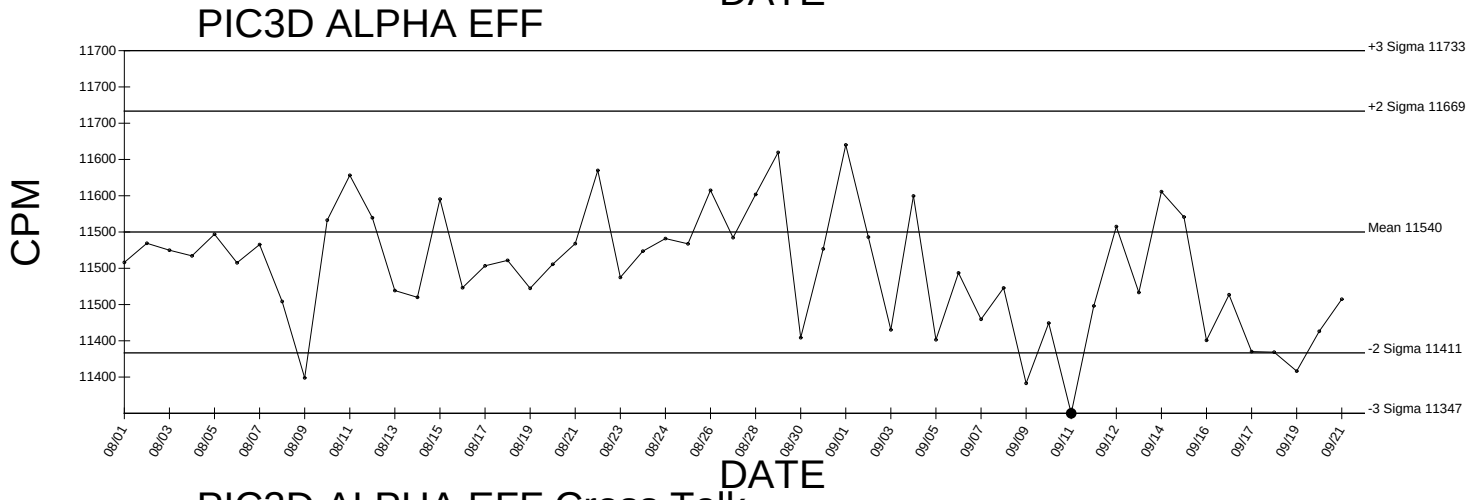

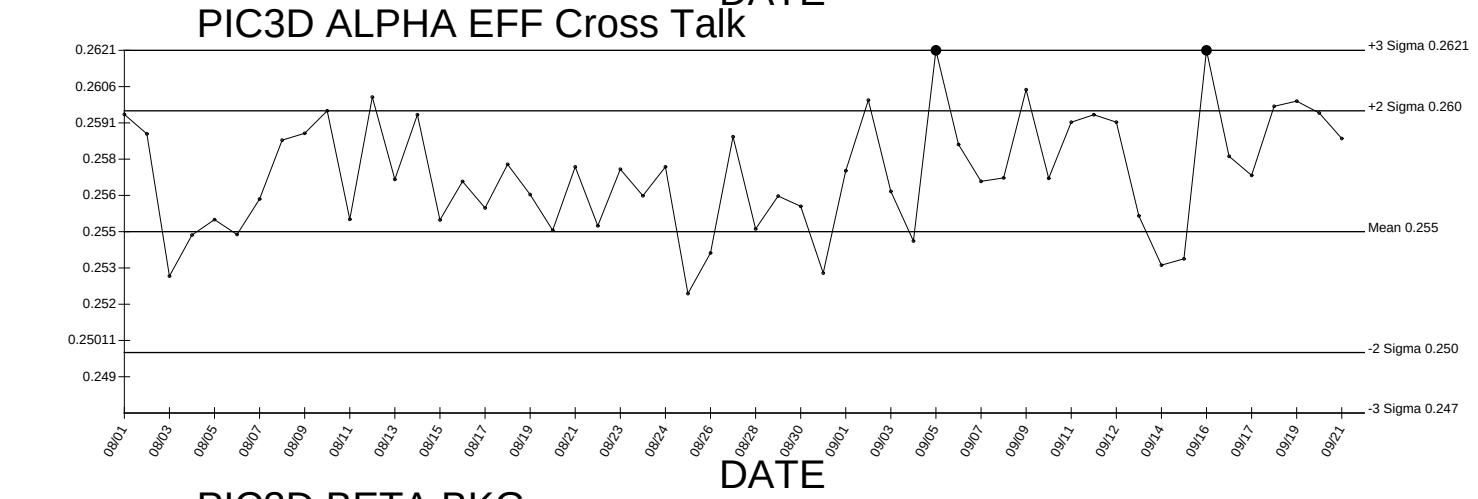

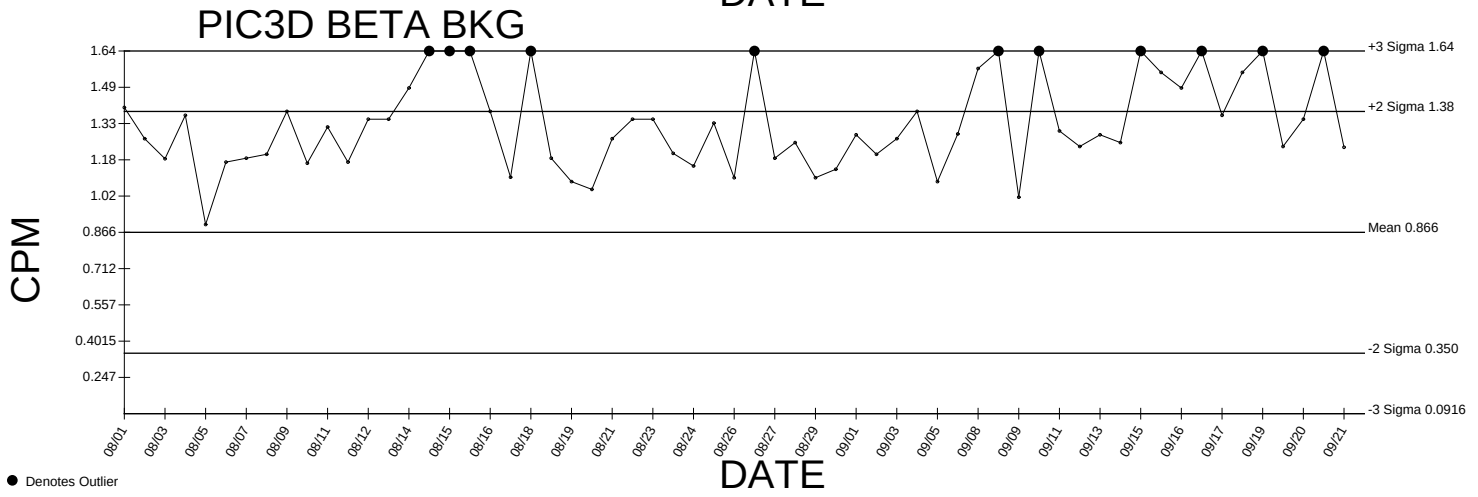

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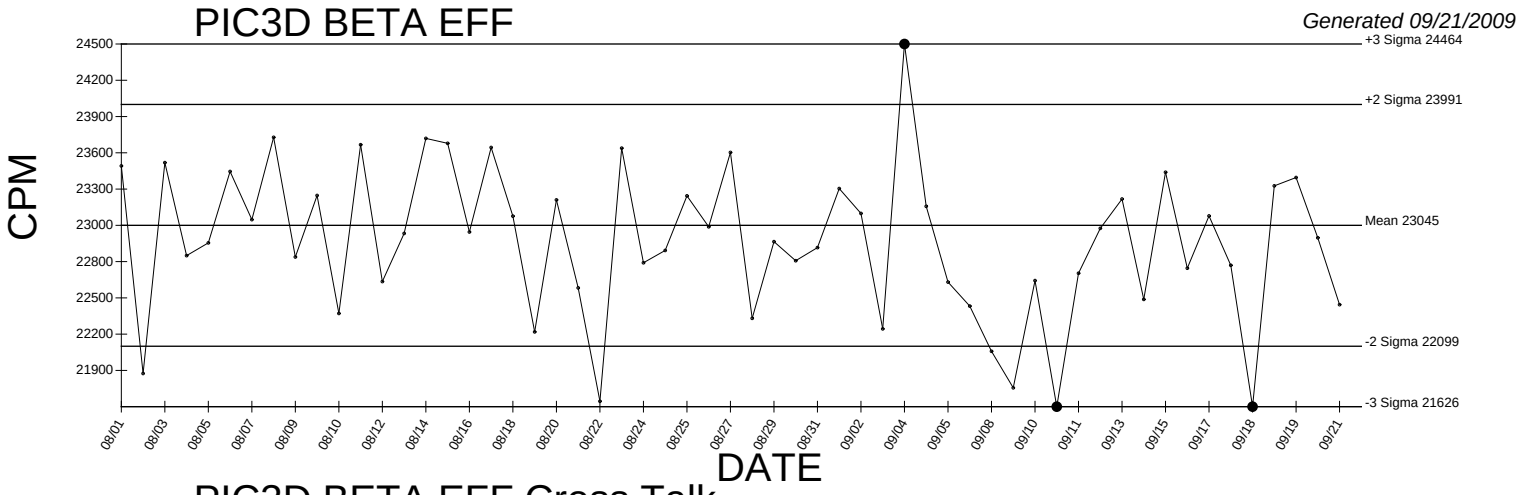

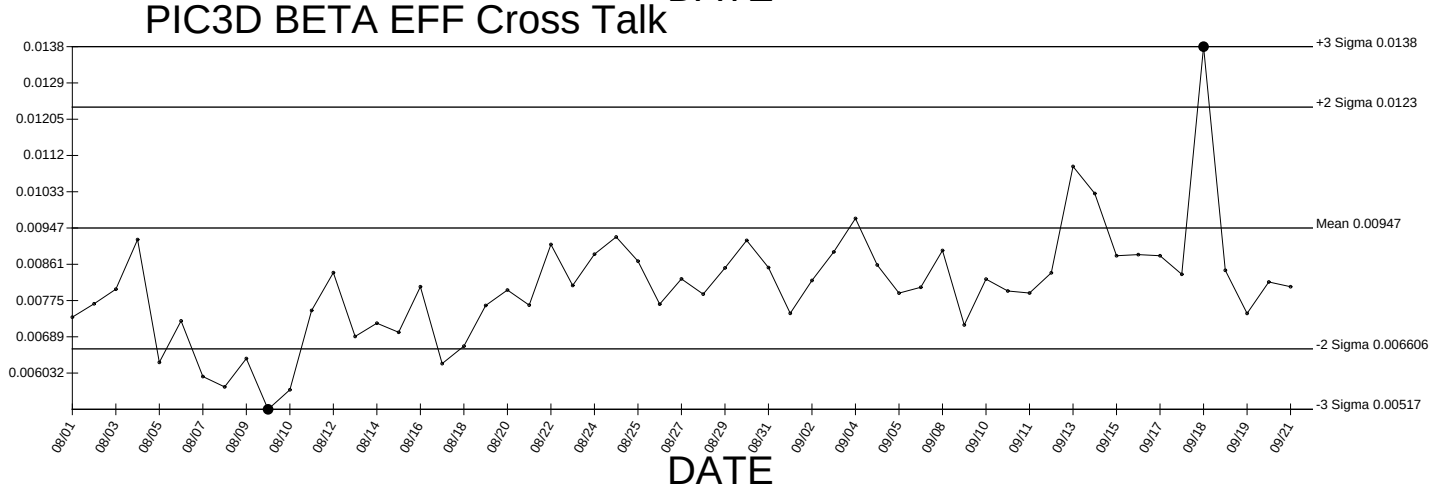

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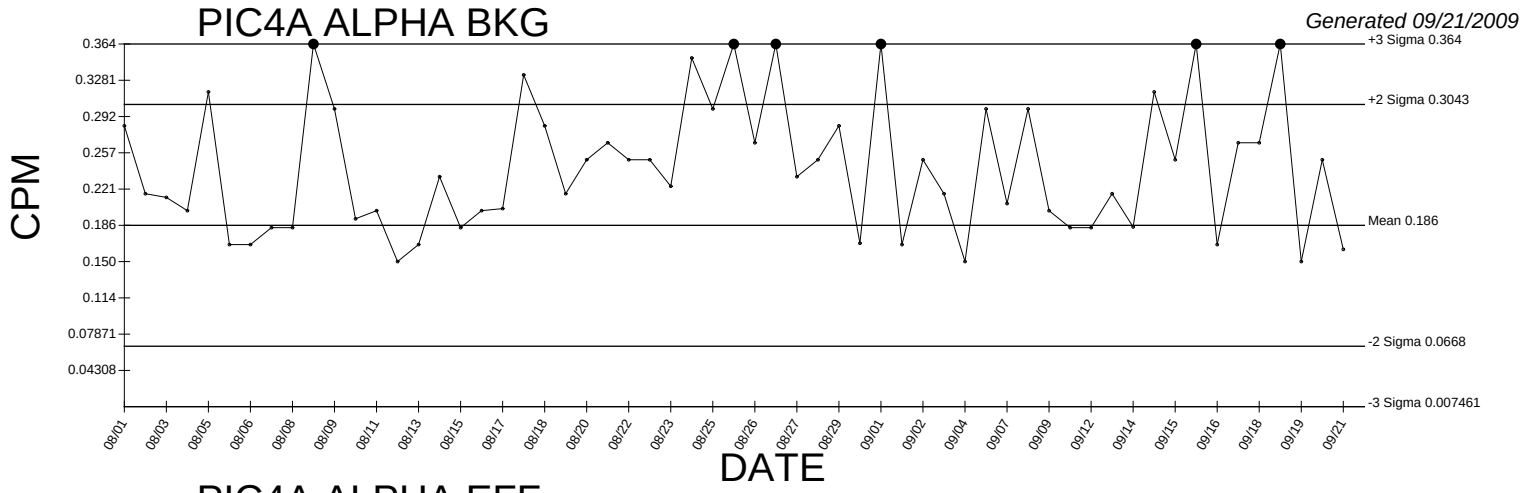

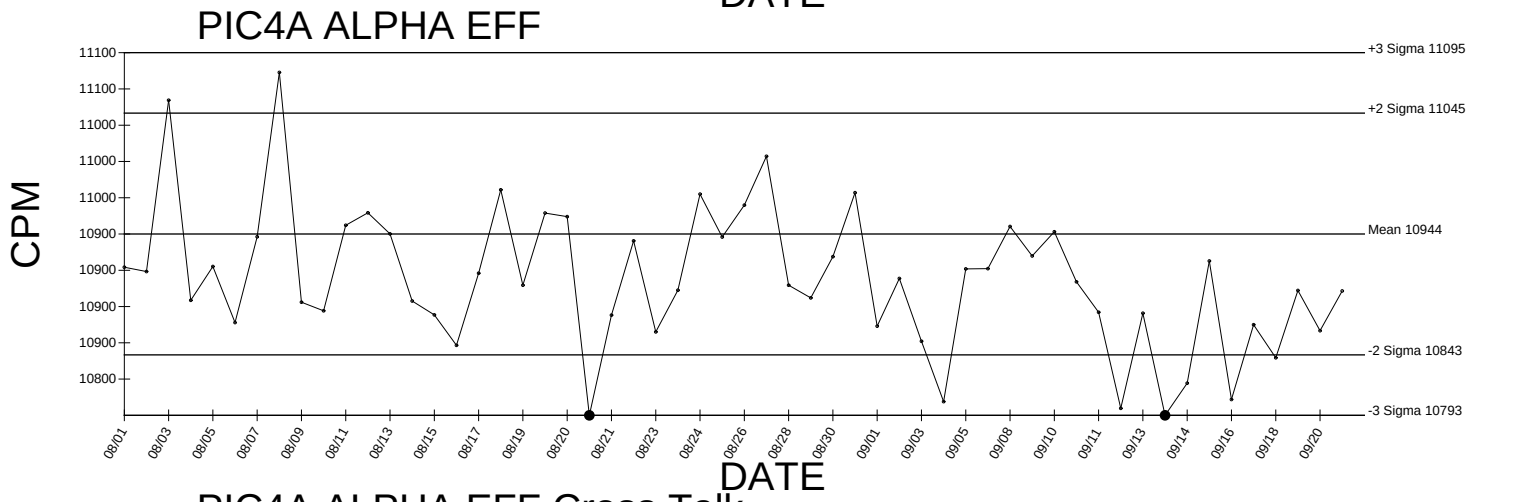

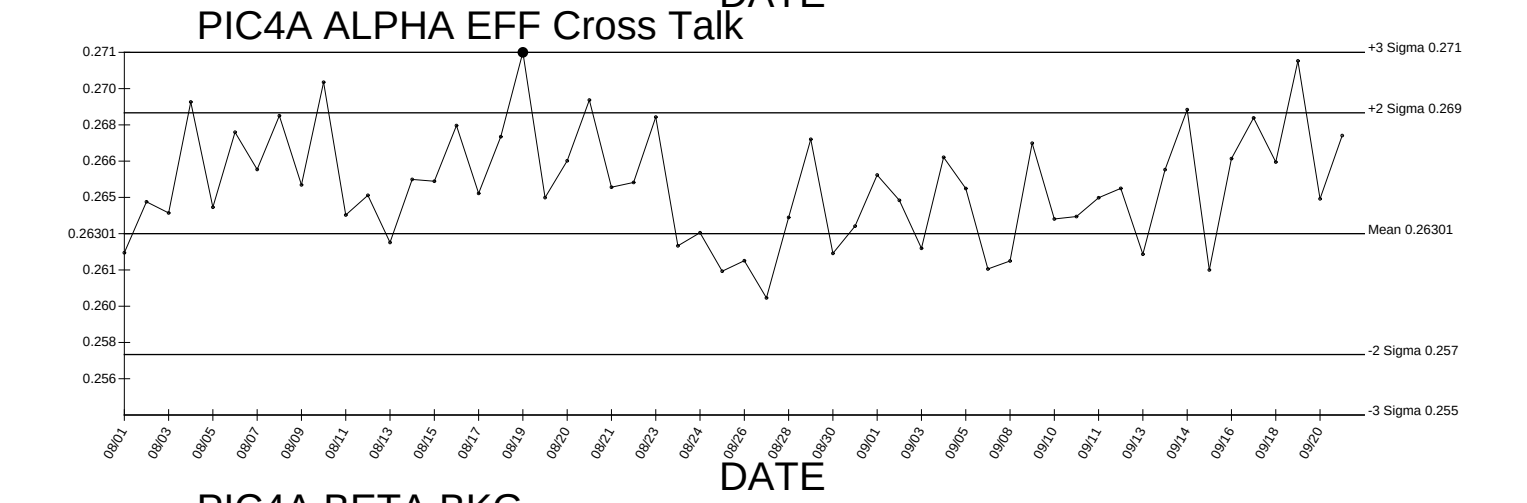

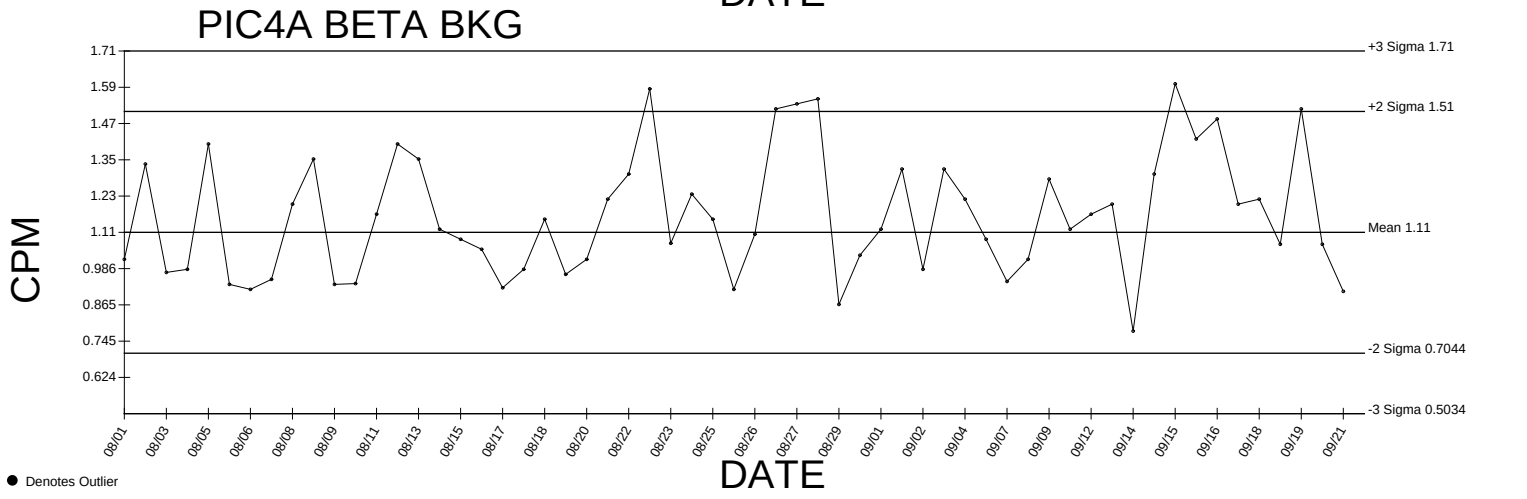

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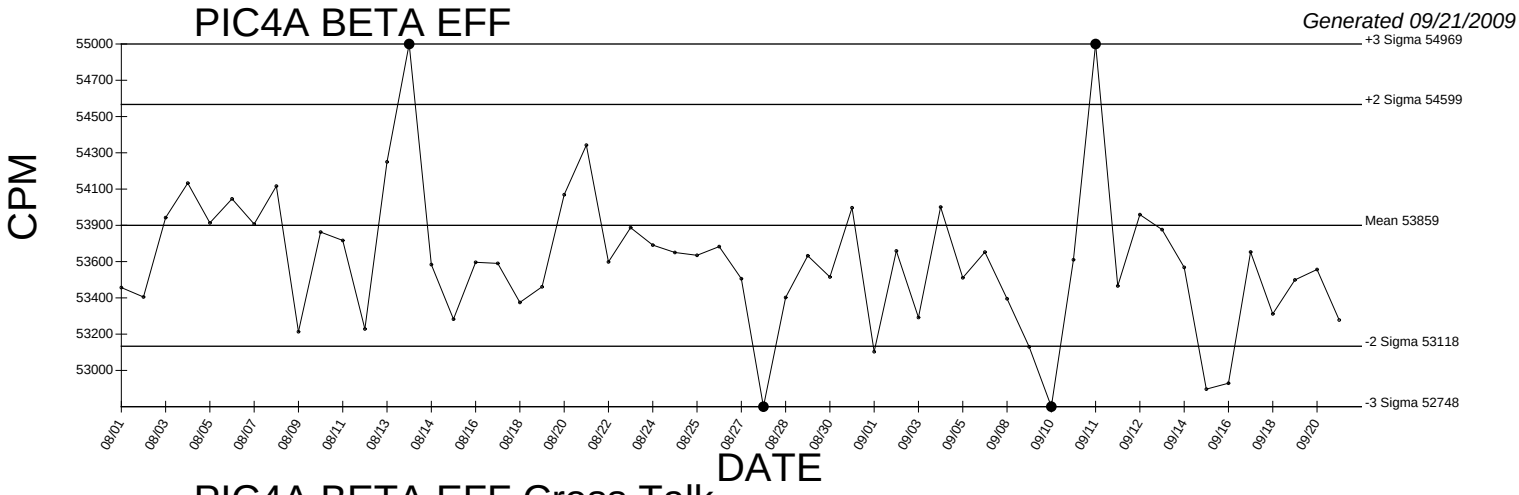

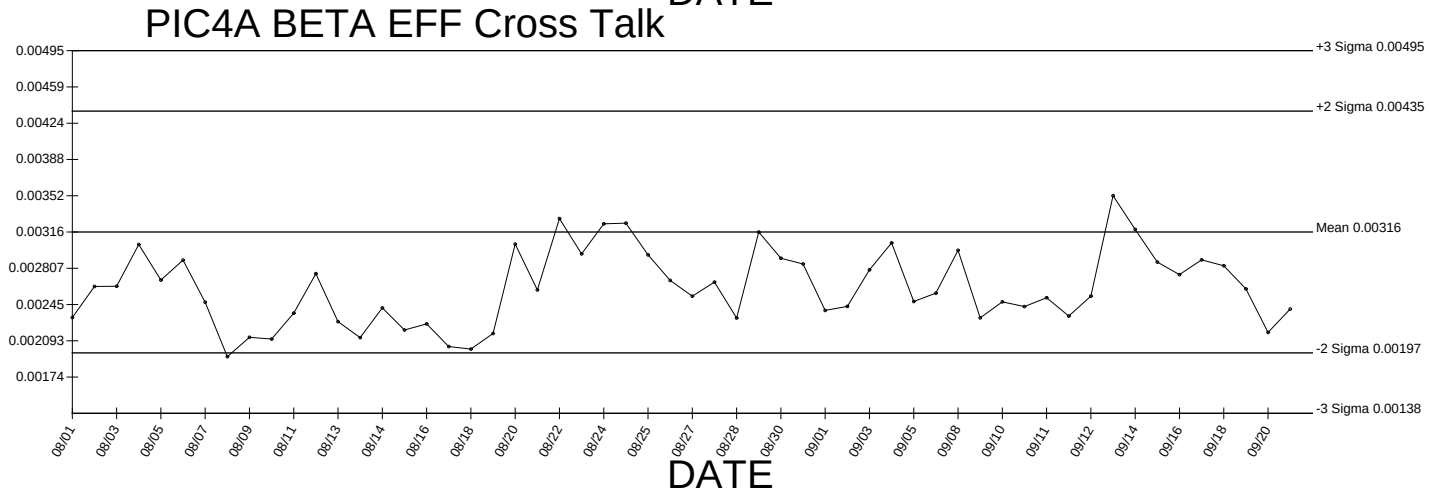

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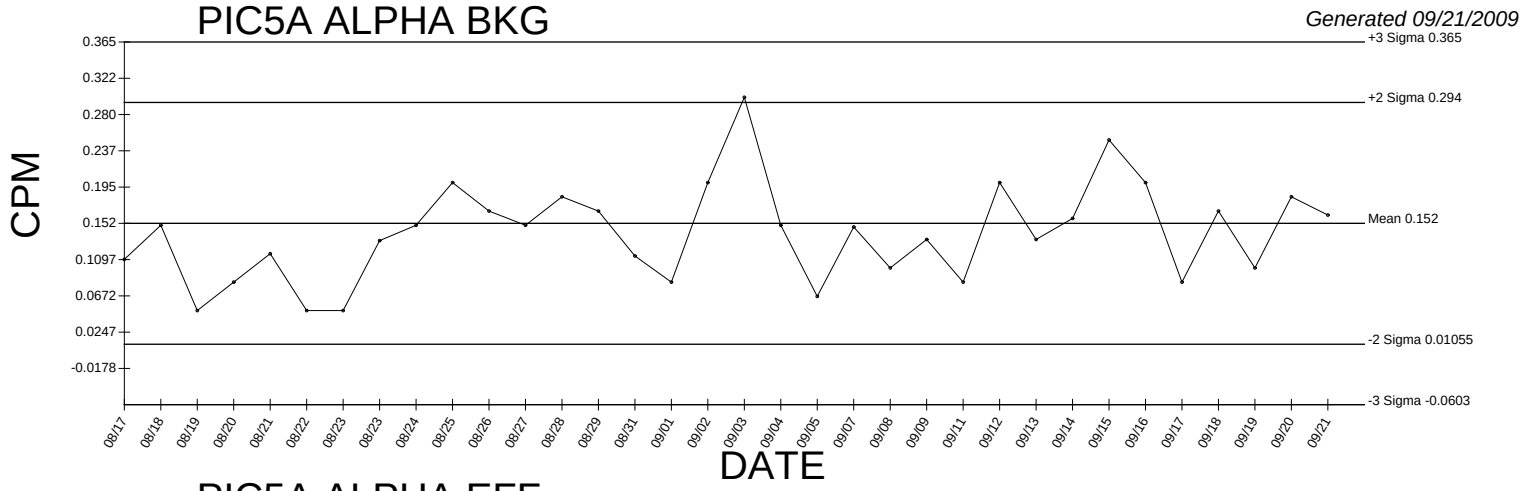

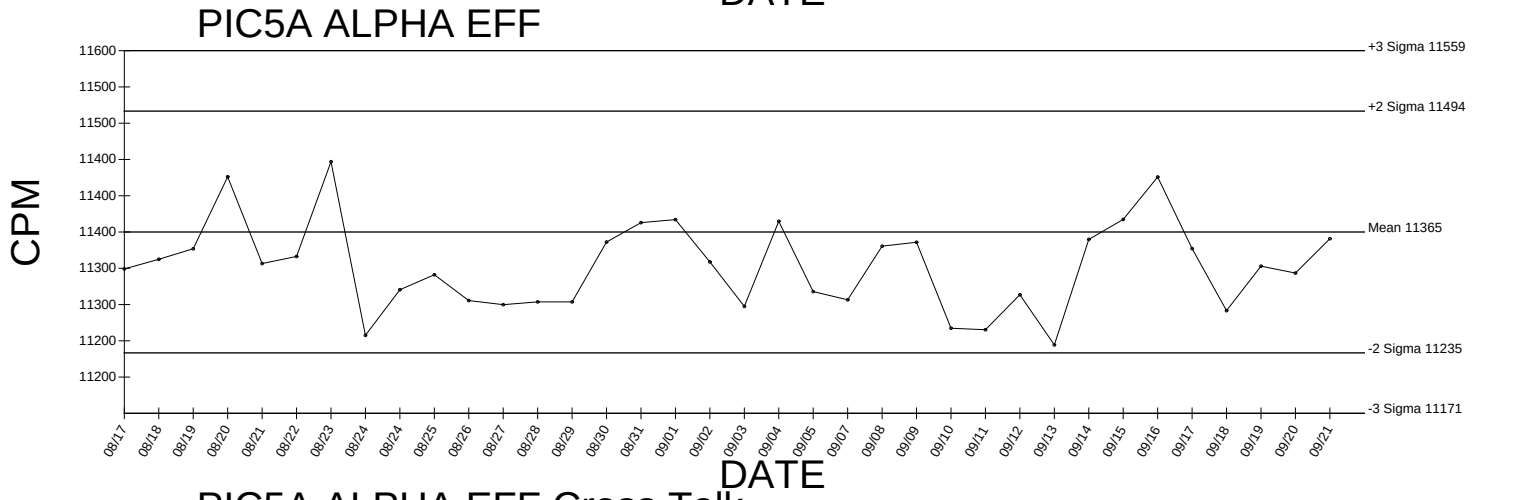

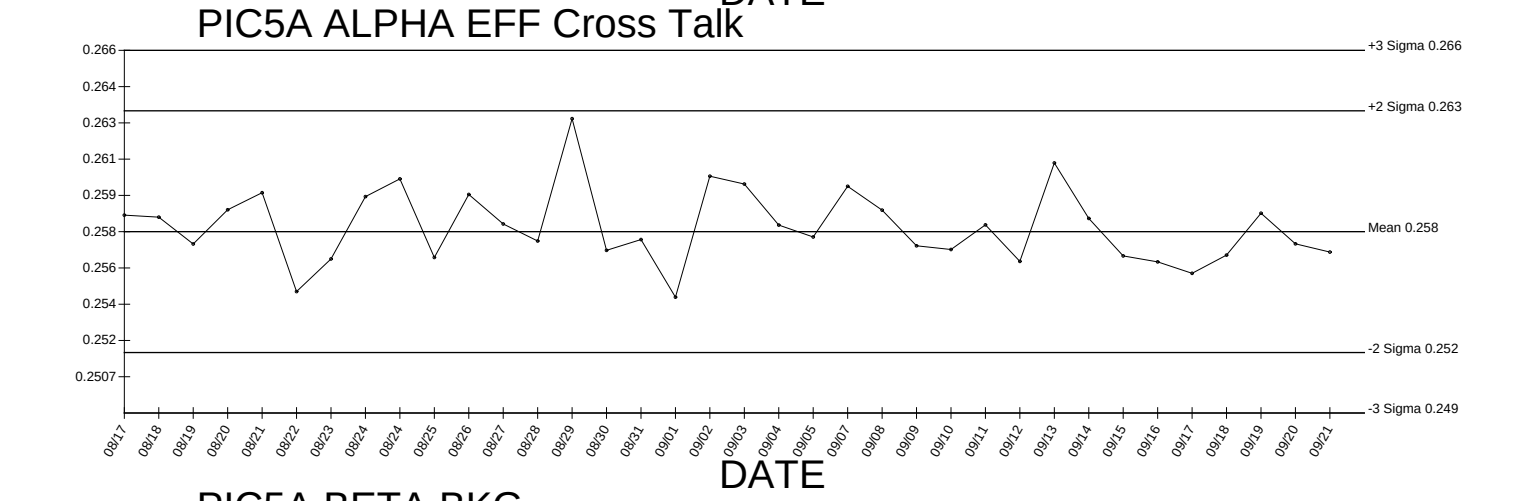

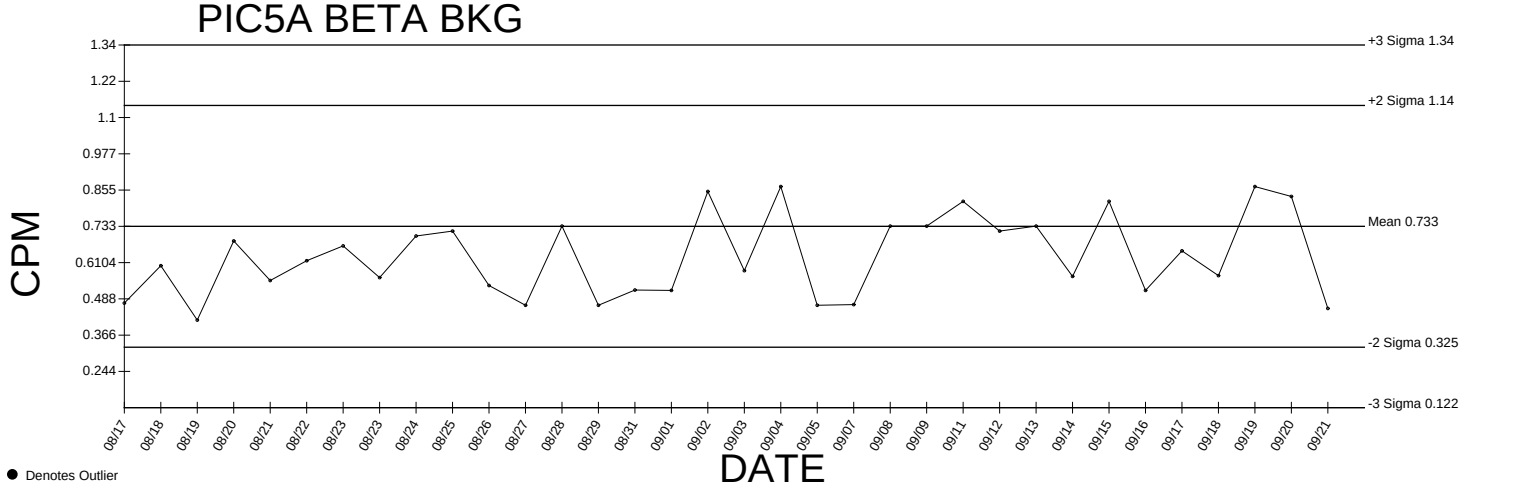

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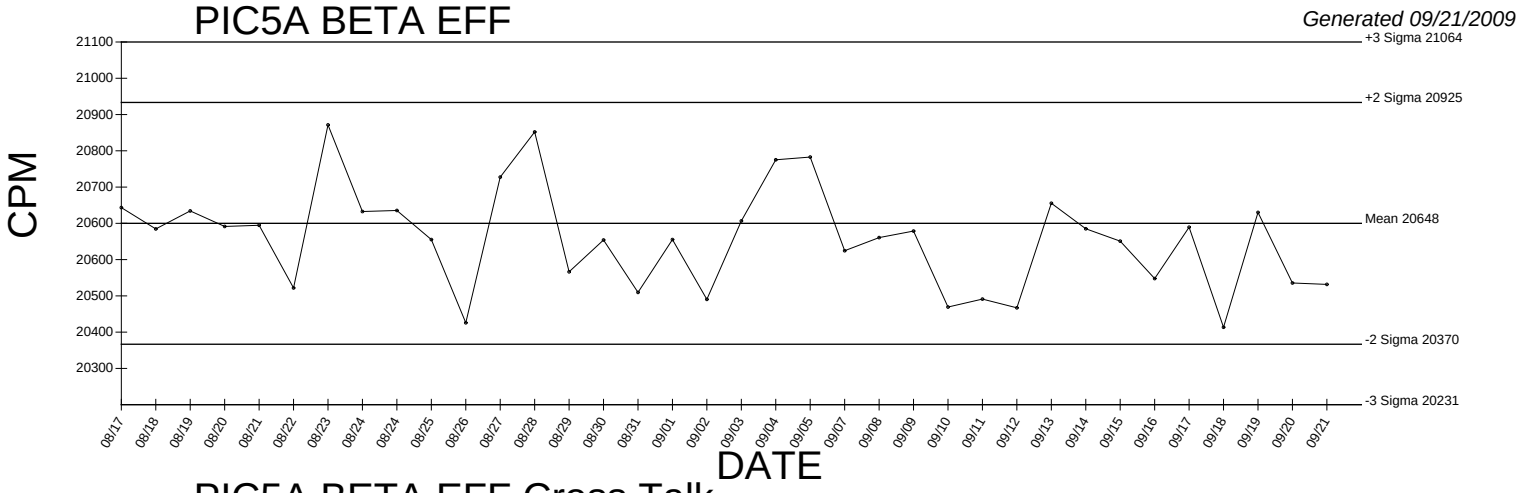

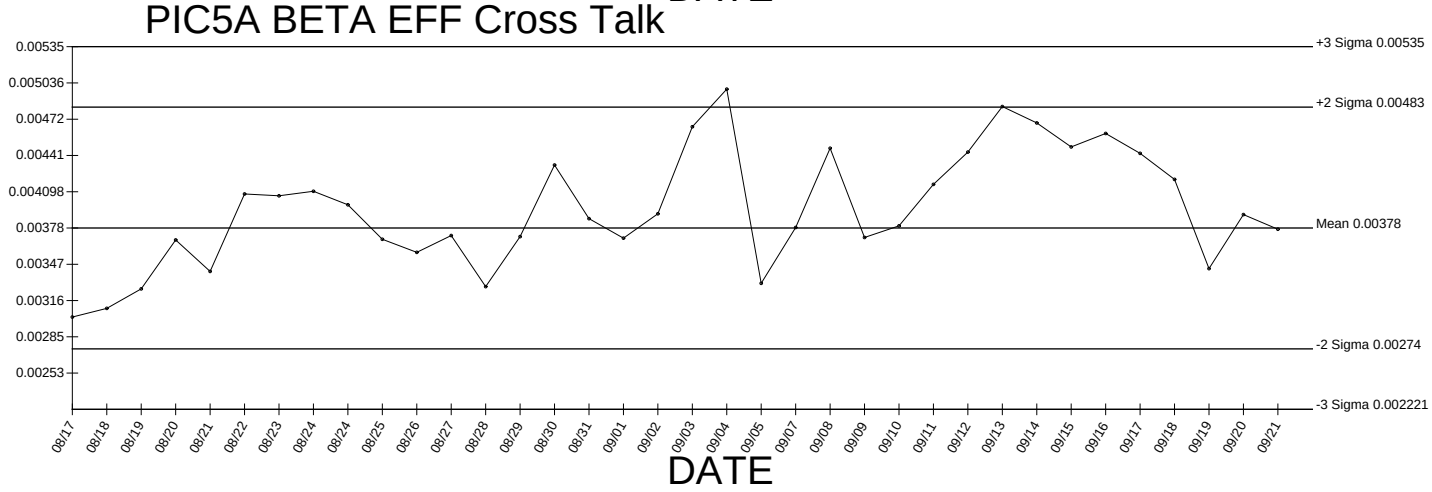

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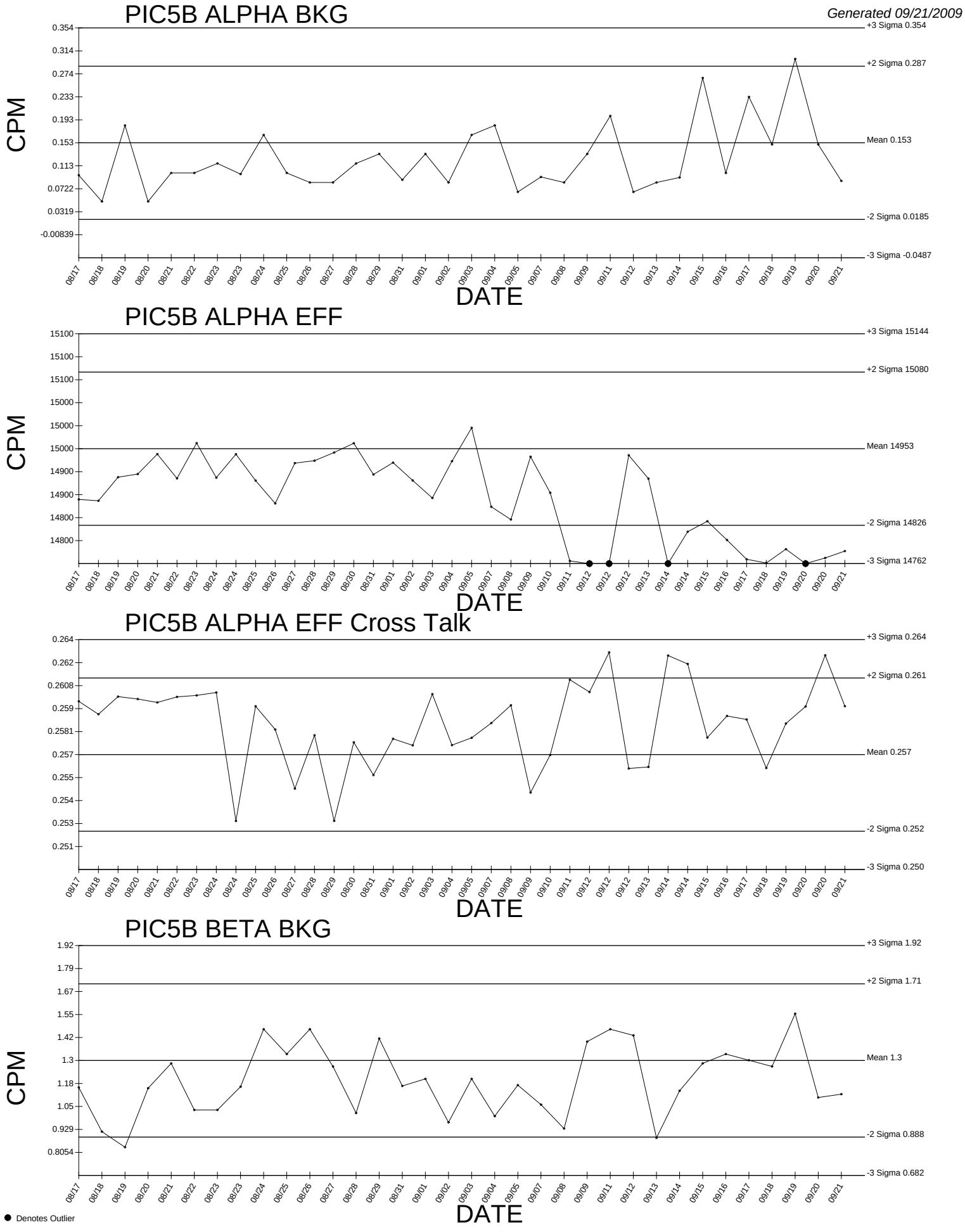
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Generated 09/21/2009
CPM
DATE
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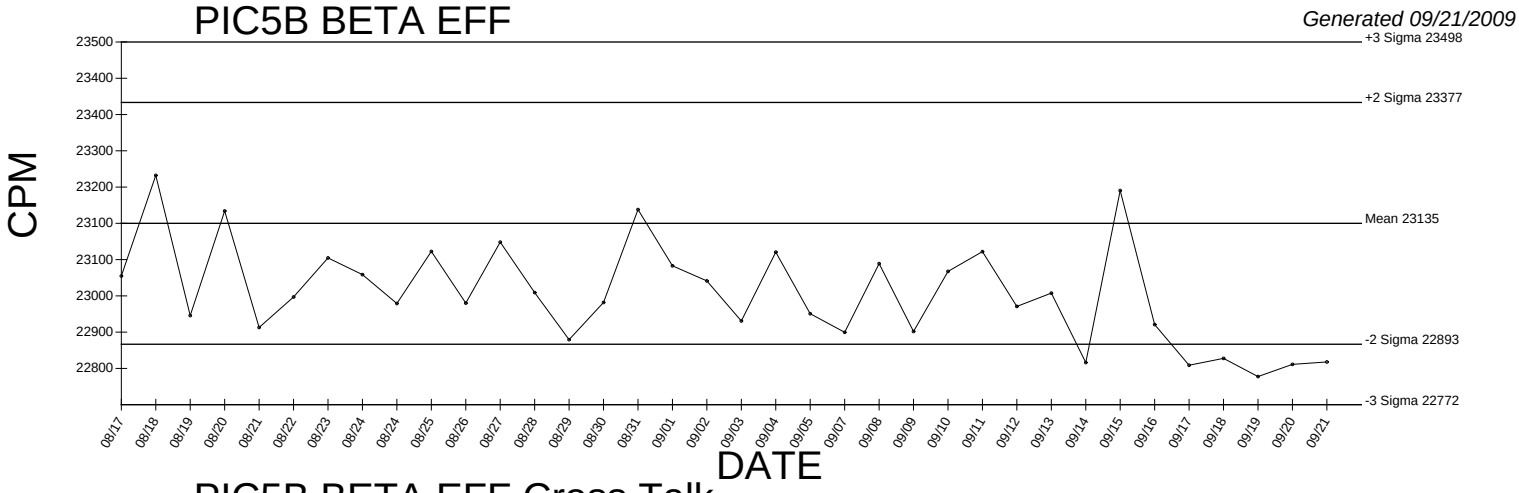
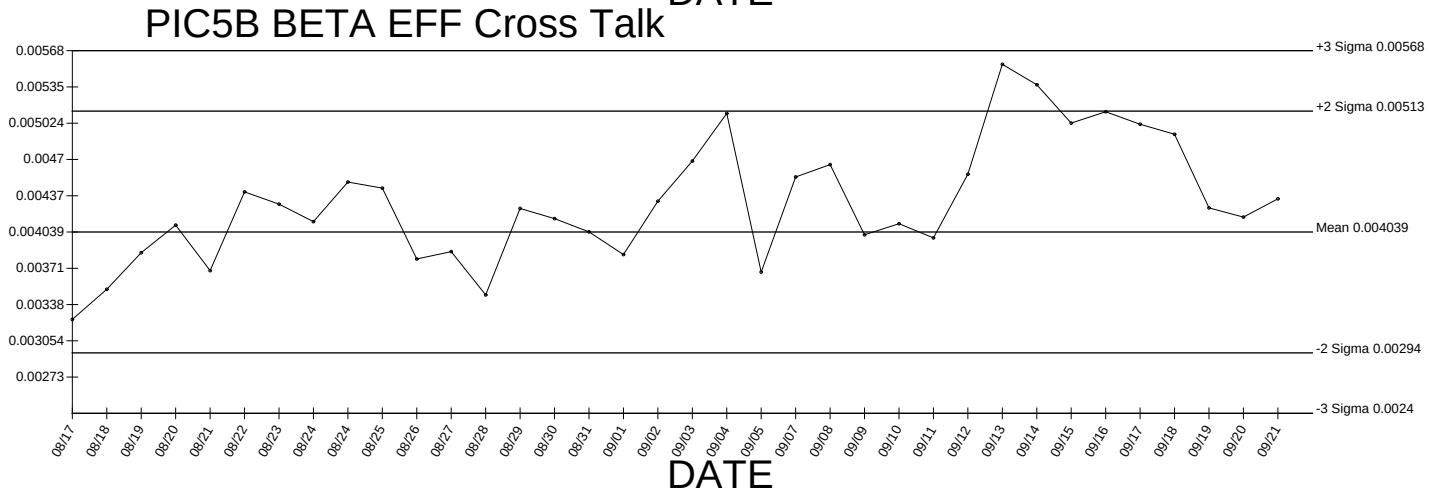
+2 Sigma 0.287
Mean 0.153
-2 Sigma 0.0185
-3 Sigma -0.0487
PIC5B ALPHA EFF
+3 Sigma 15144
+2 Sigma 15080
Mean 14953
-2 Sigma 14826
-3 Sigma 14762
PIC5B ALPHA EFF Cross Talk
+3 Sigma 0.264
+2 Sigma 0.261
Mean 0.257
-2 Sigma 0.252
-3 Sigma 0.250
PIC5B BETA BKG
+3 Sigma 1.92
+2 Sigma 1.71
Mean 1.3
-2 Sigma 0.888
-3 Sigma 0.682
● Denotes Outlier





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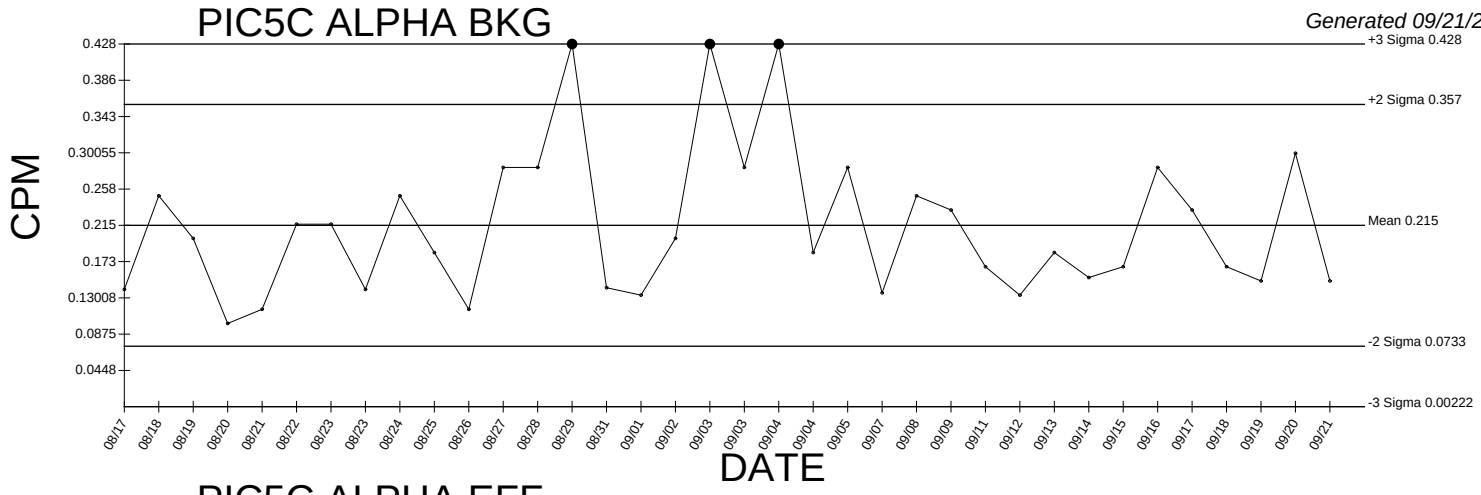

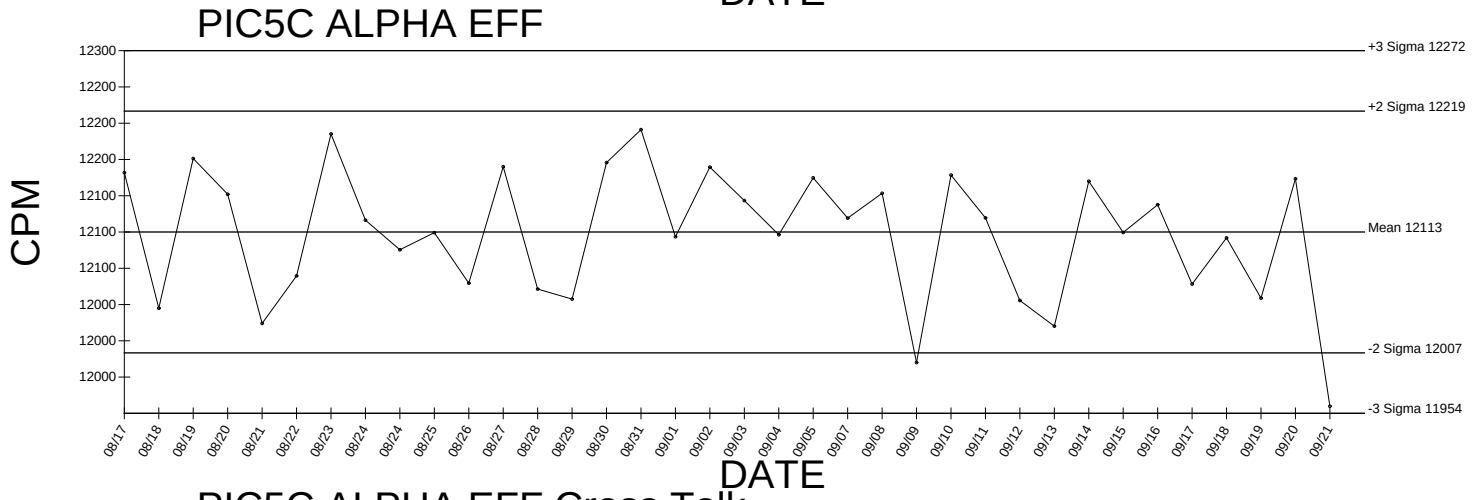

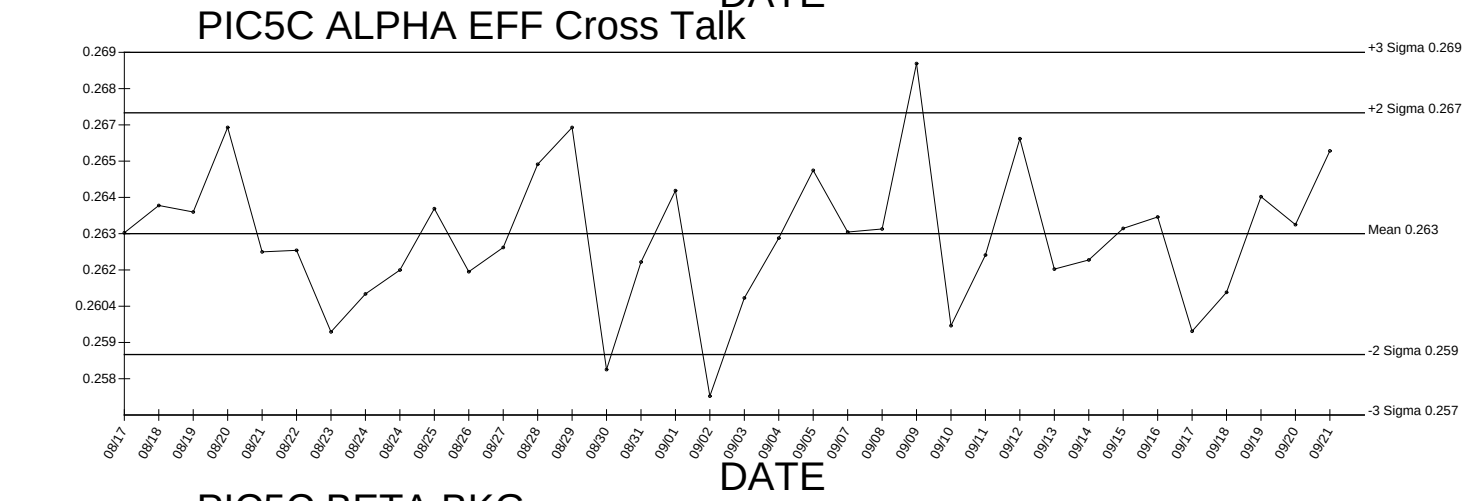

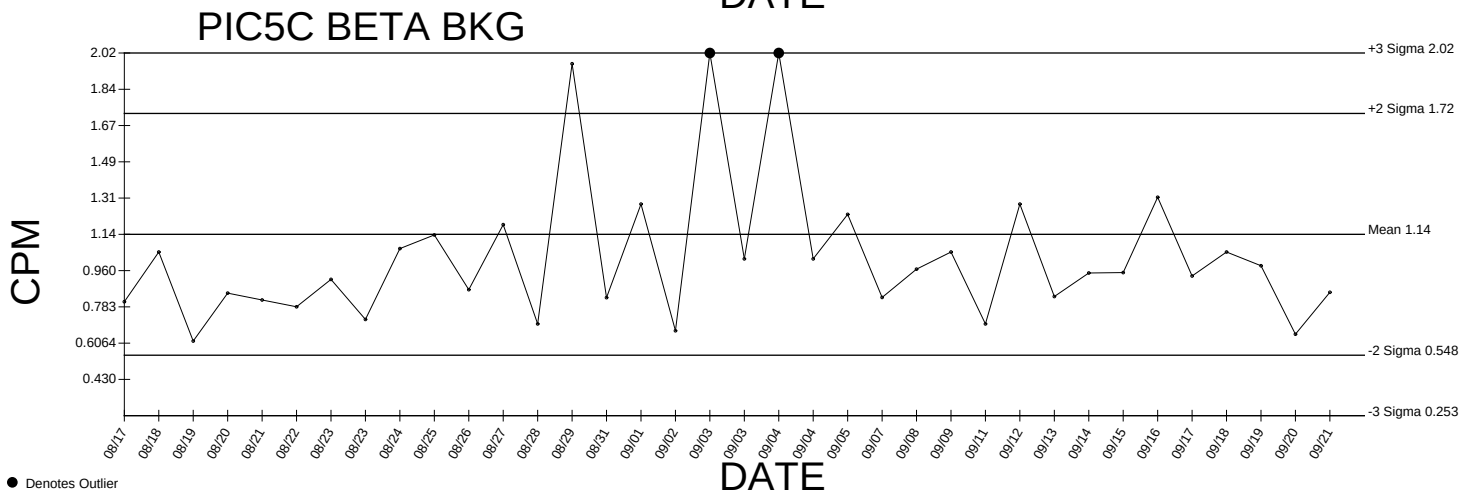

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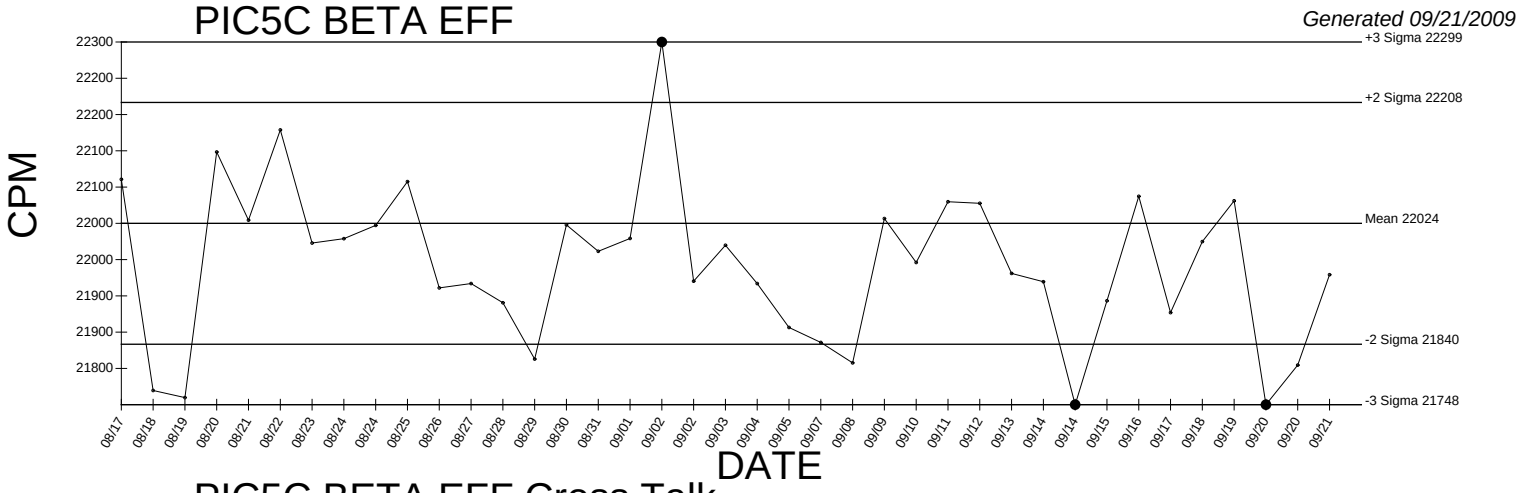
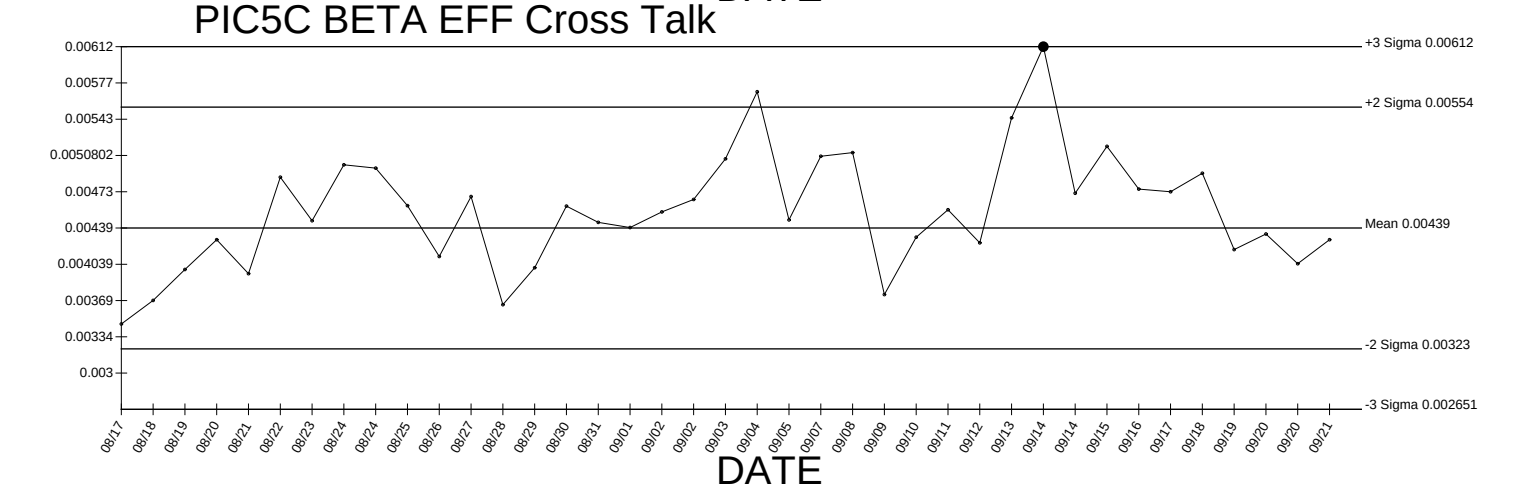
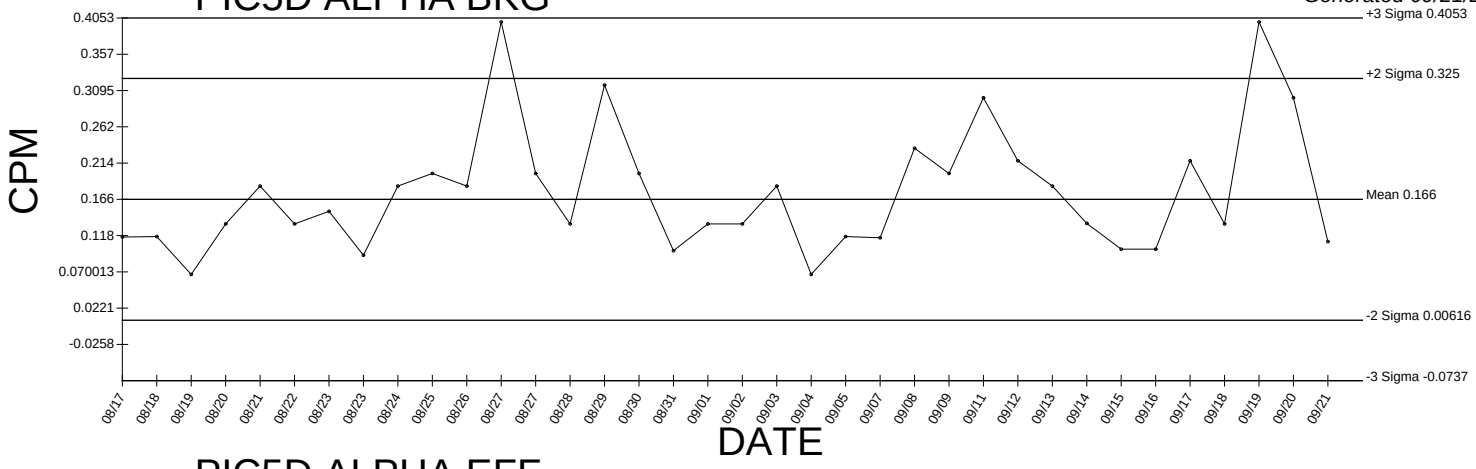


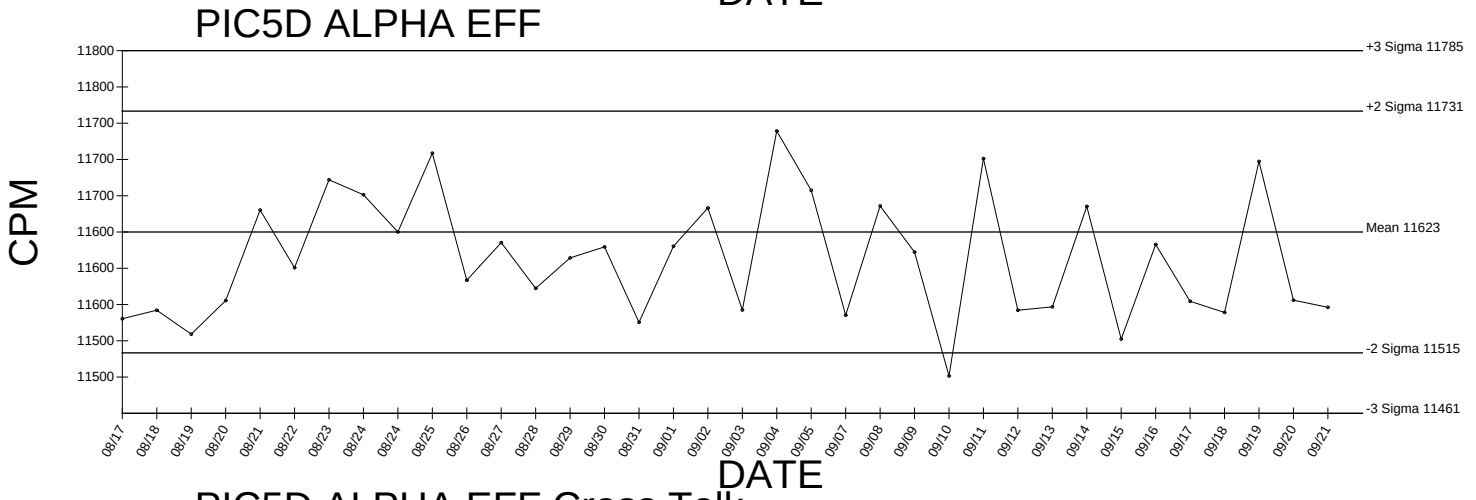


● Denotes Outlier

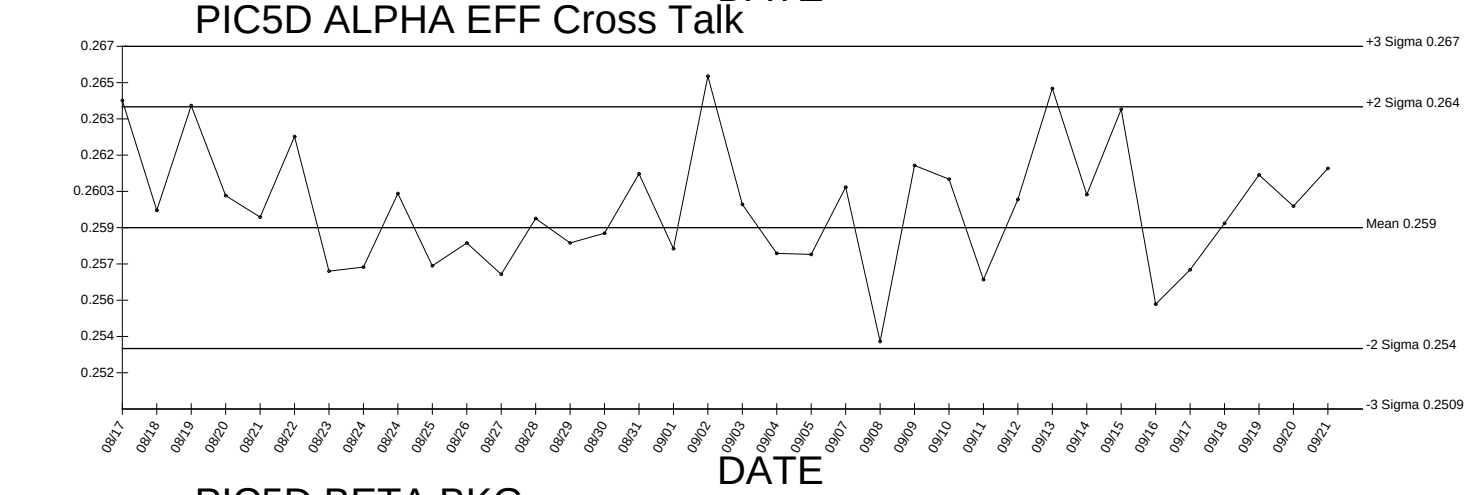
PIC5D ALPHA BKG



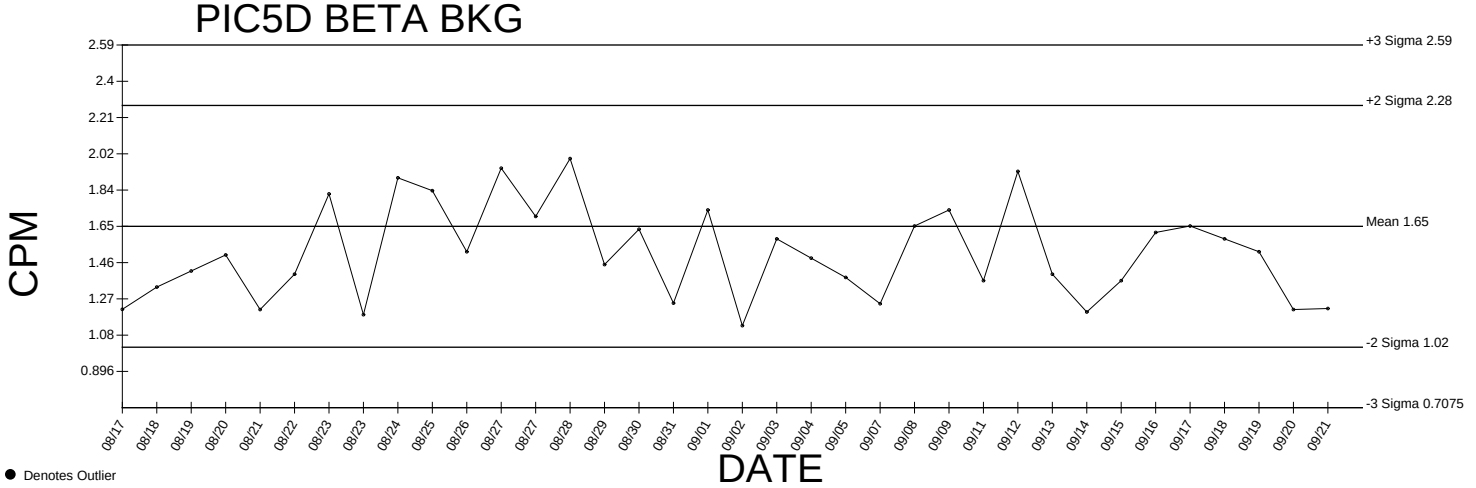
PIC5D ALPHA EFF



PIC5D ALPHA EFF Cross Talk



PIC5D BETA BKG



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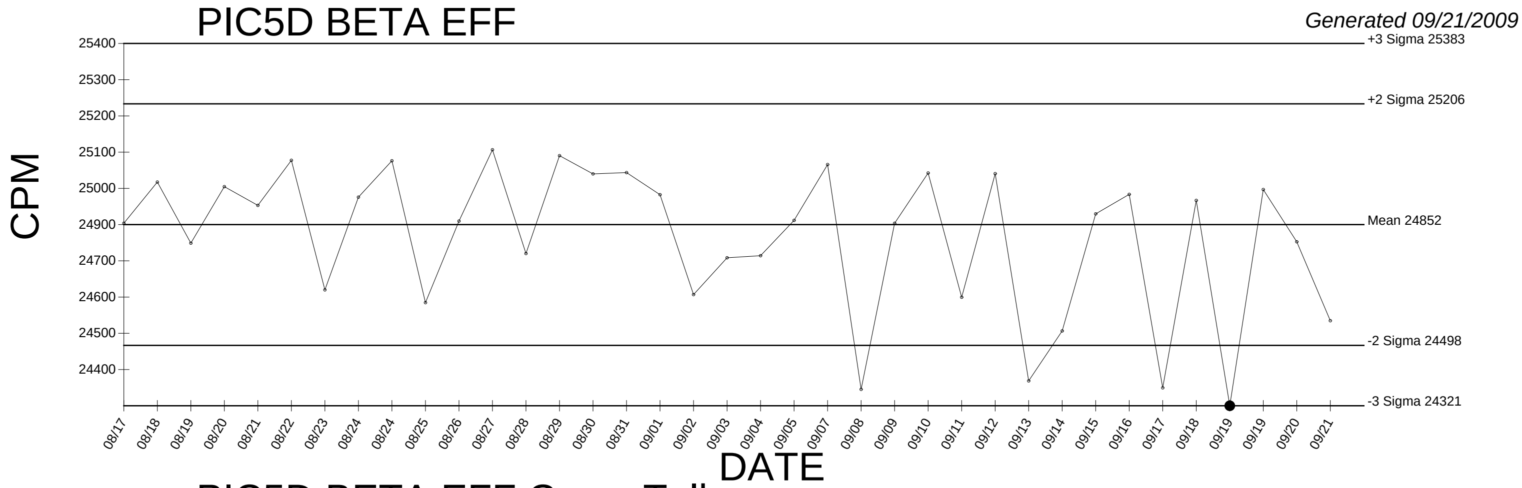

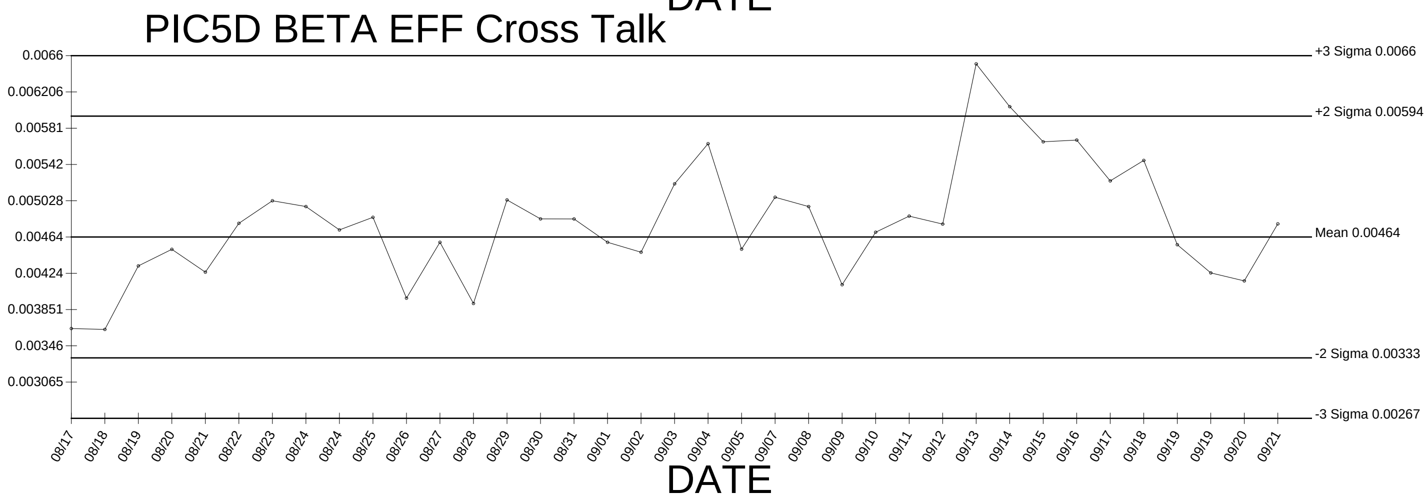

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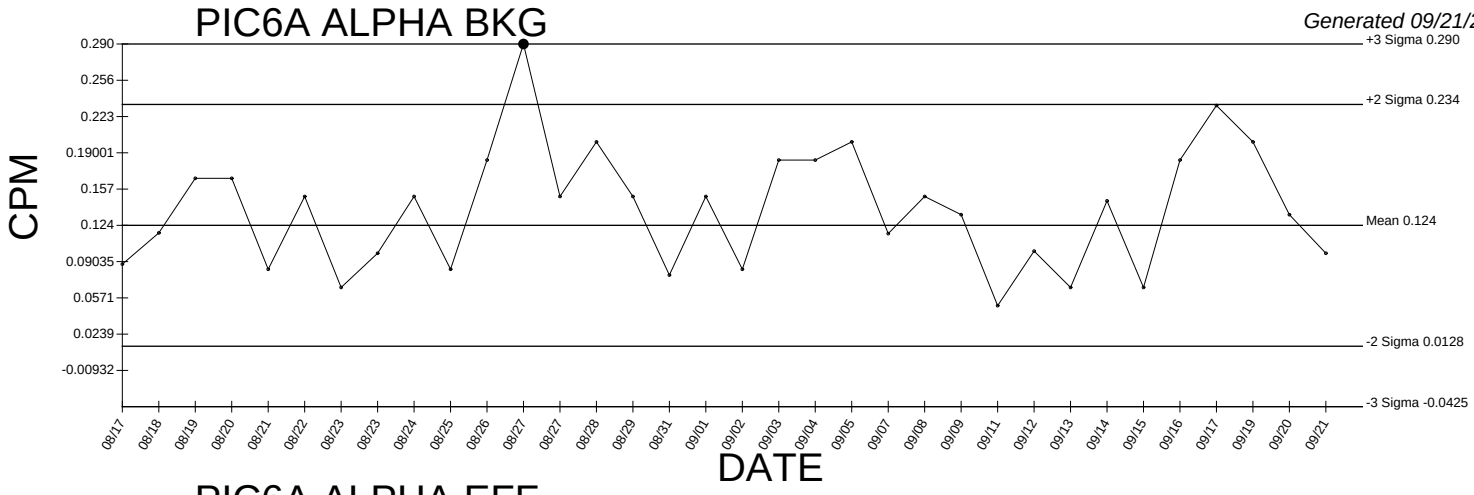

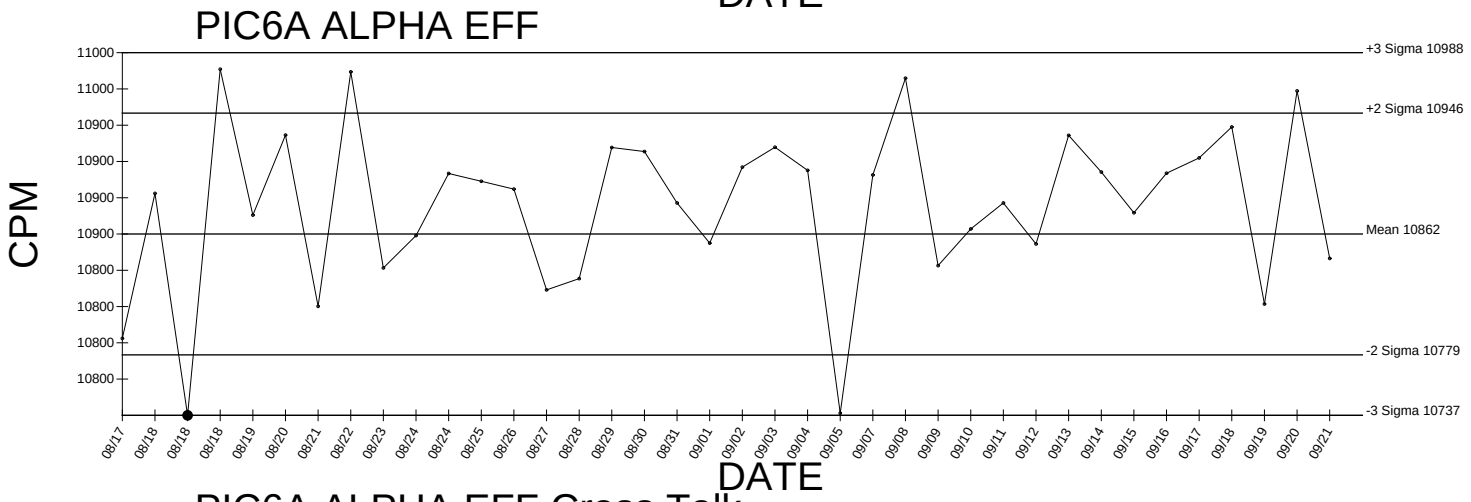

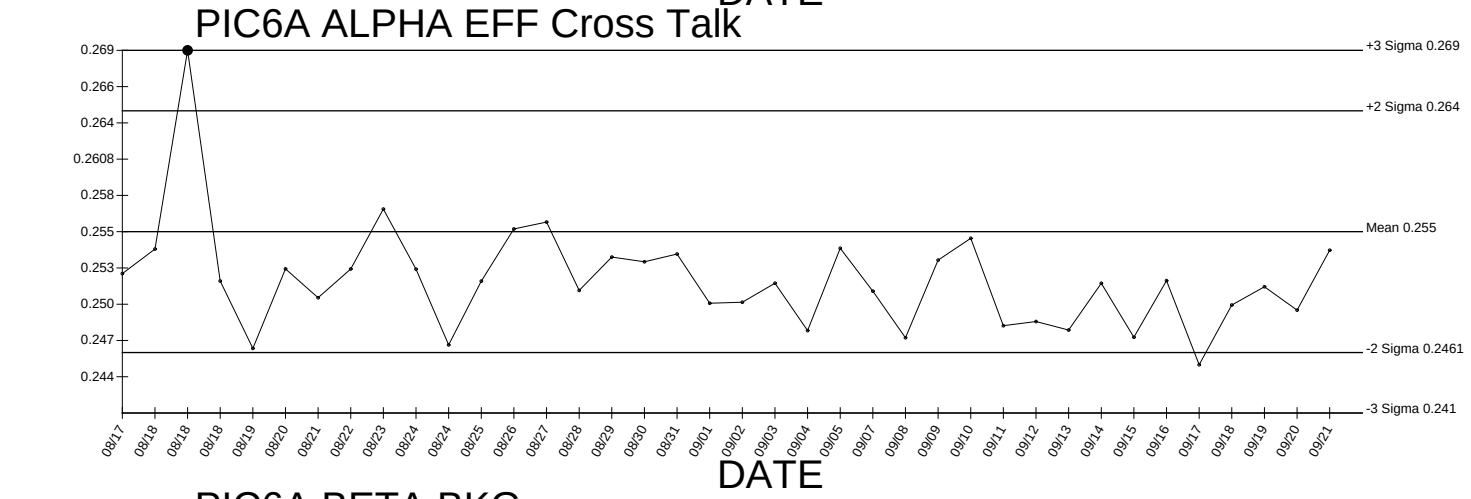

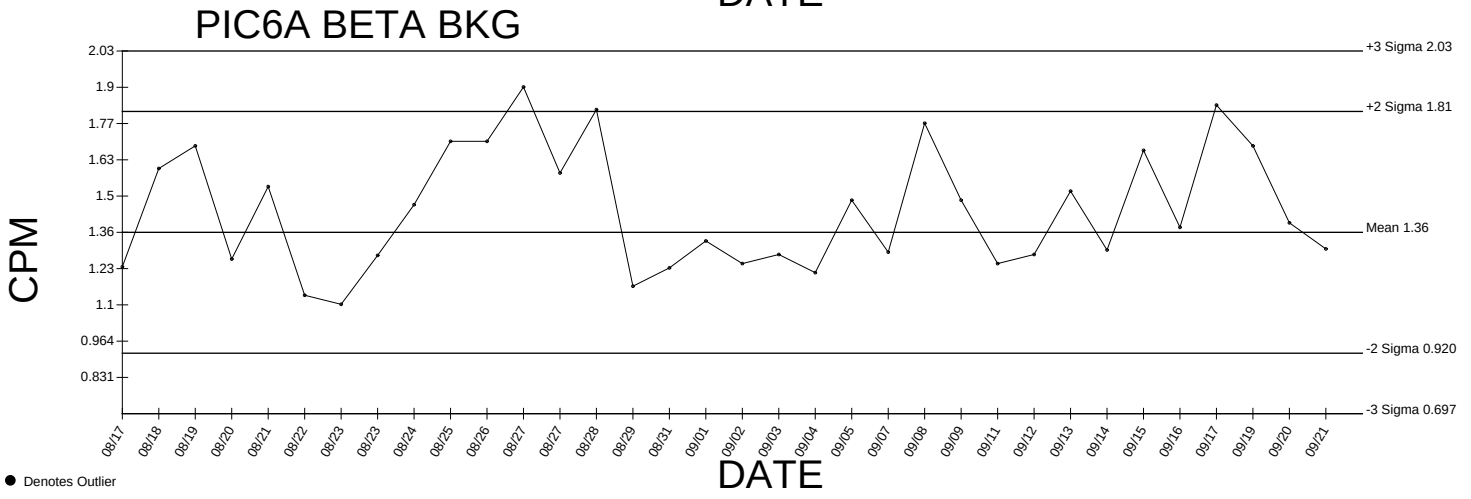

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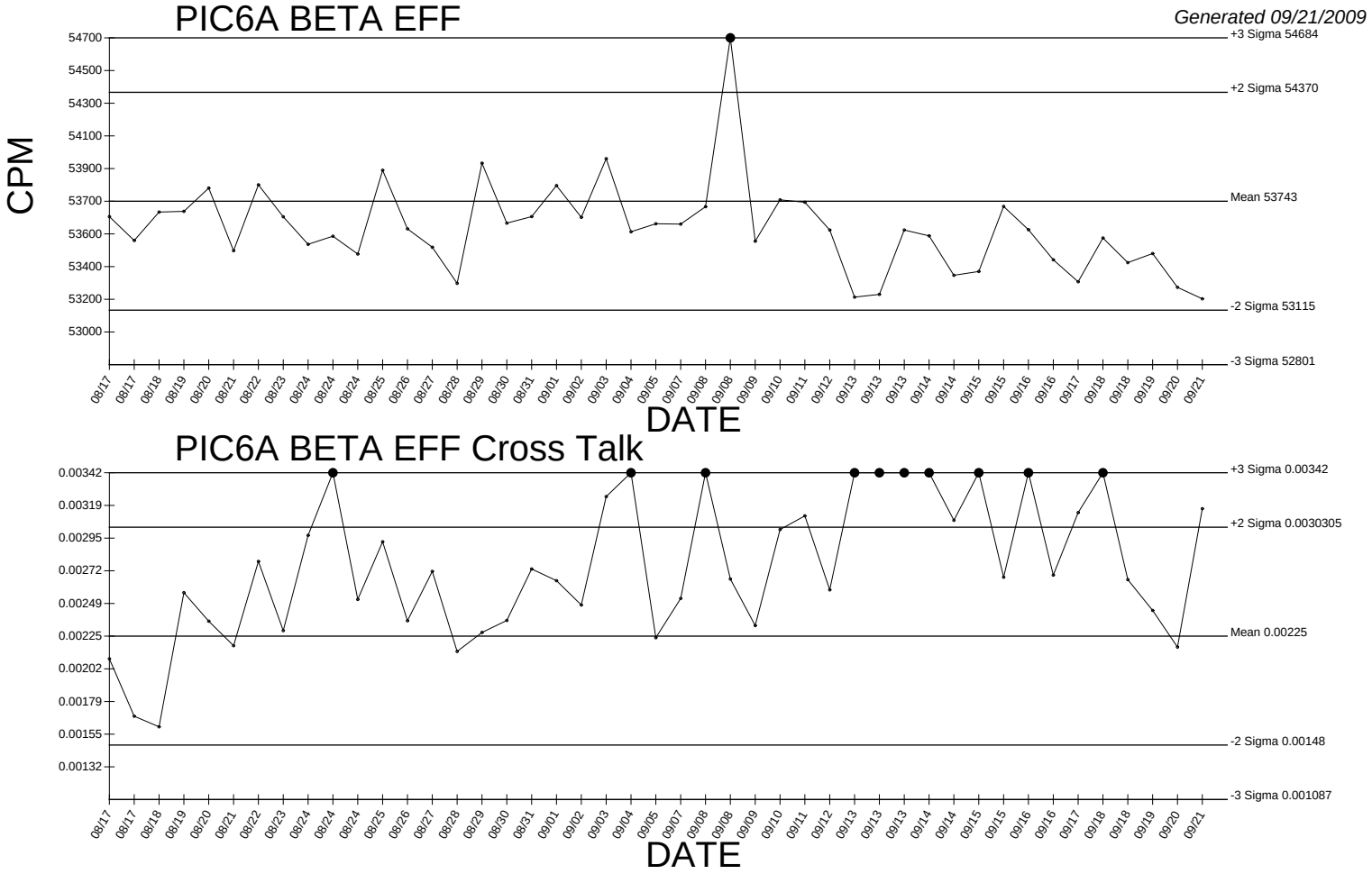

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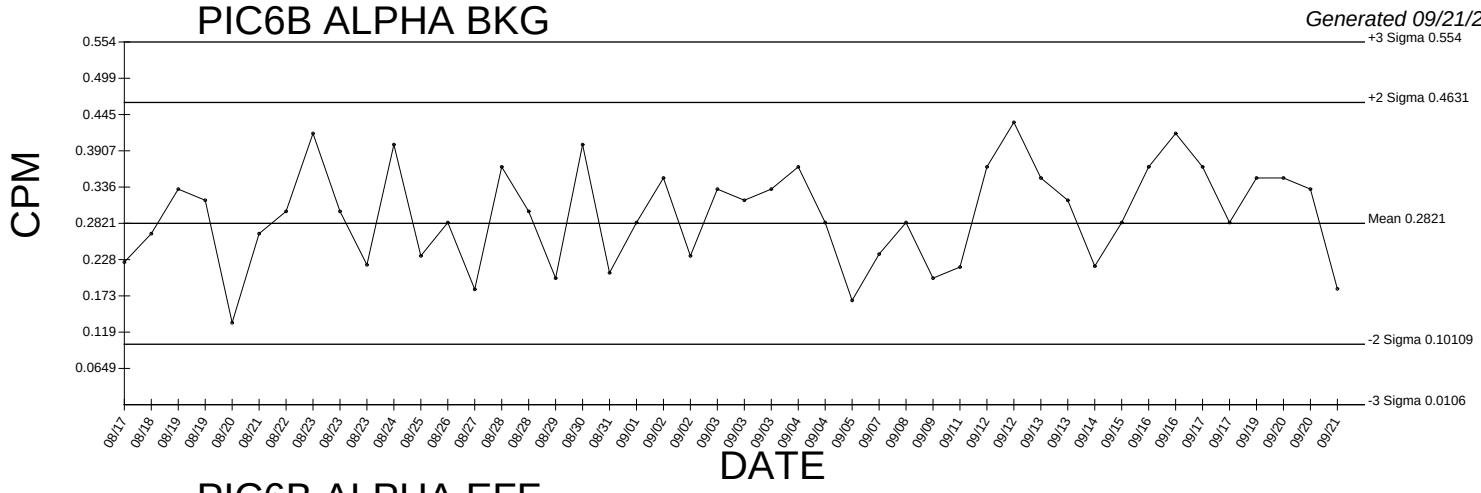

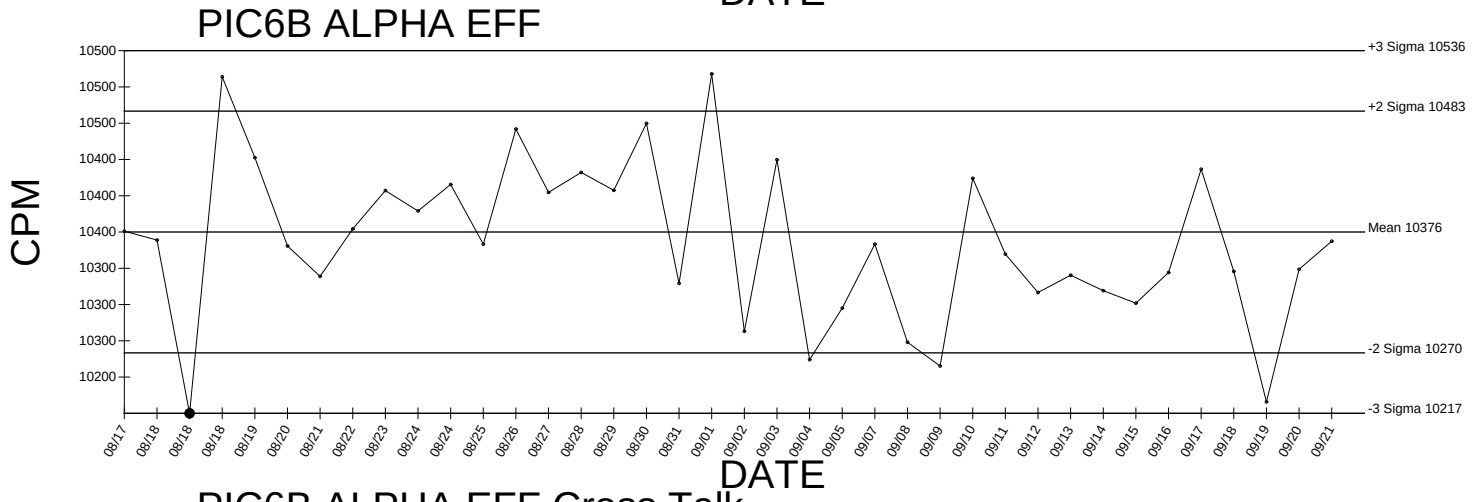

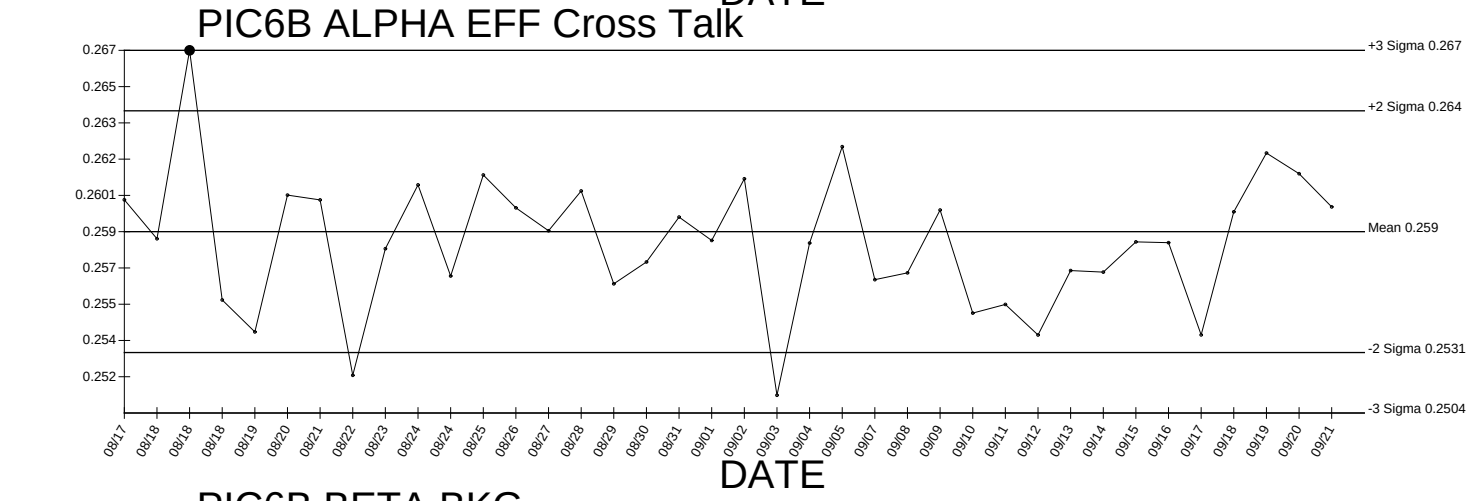

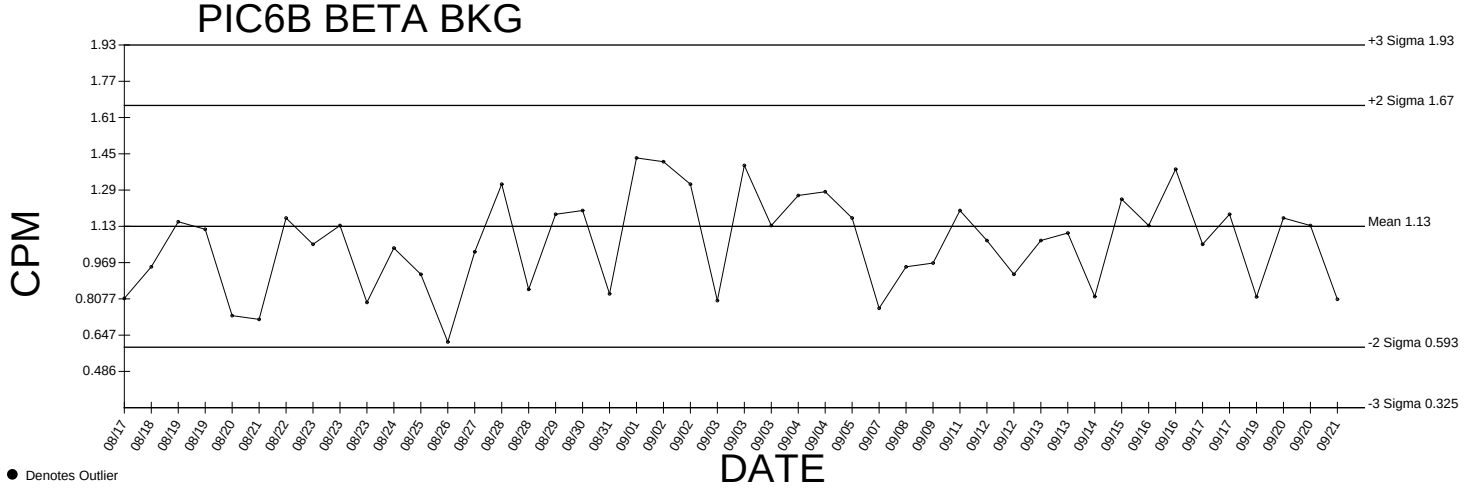

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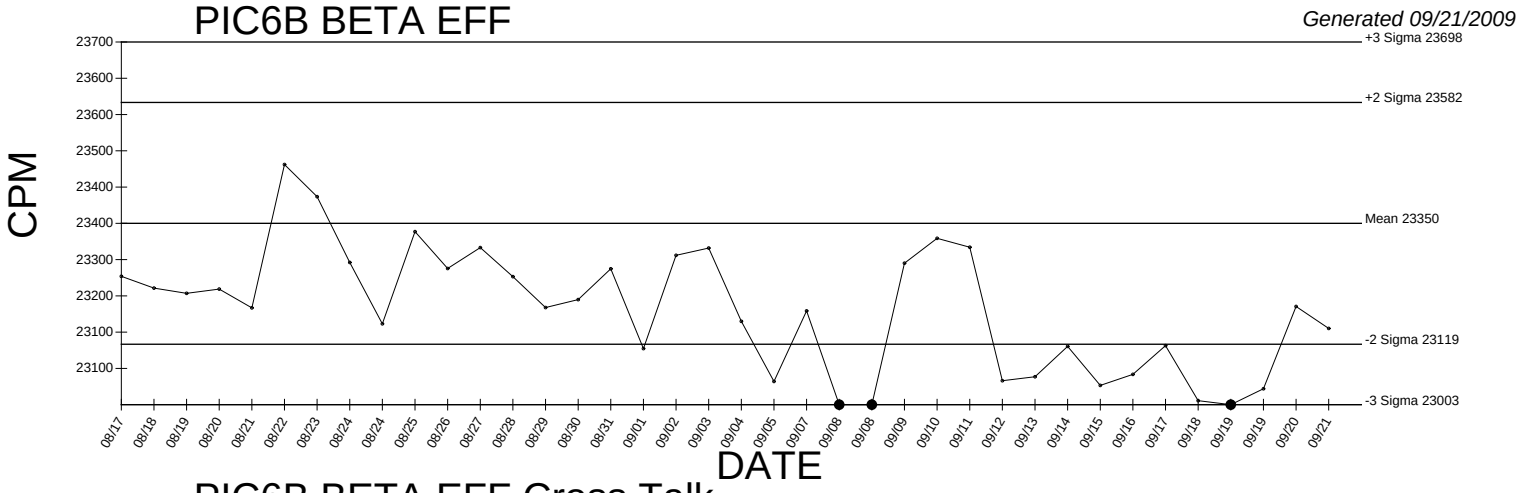

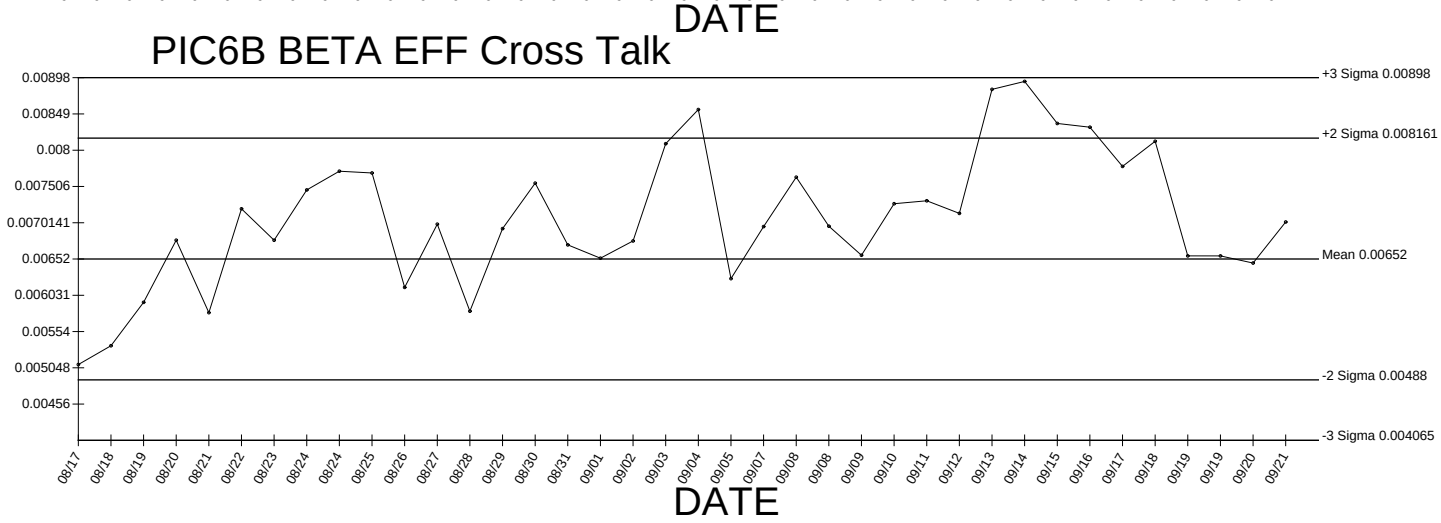

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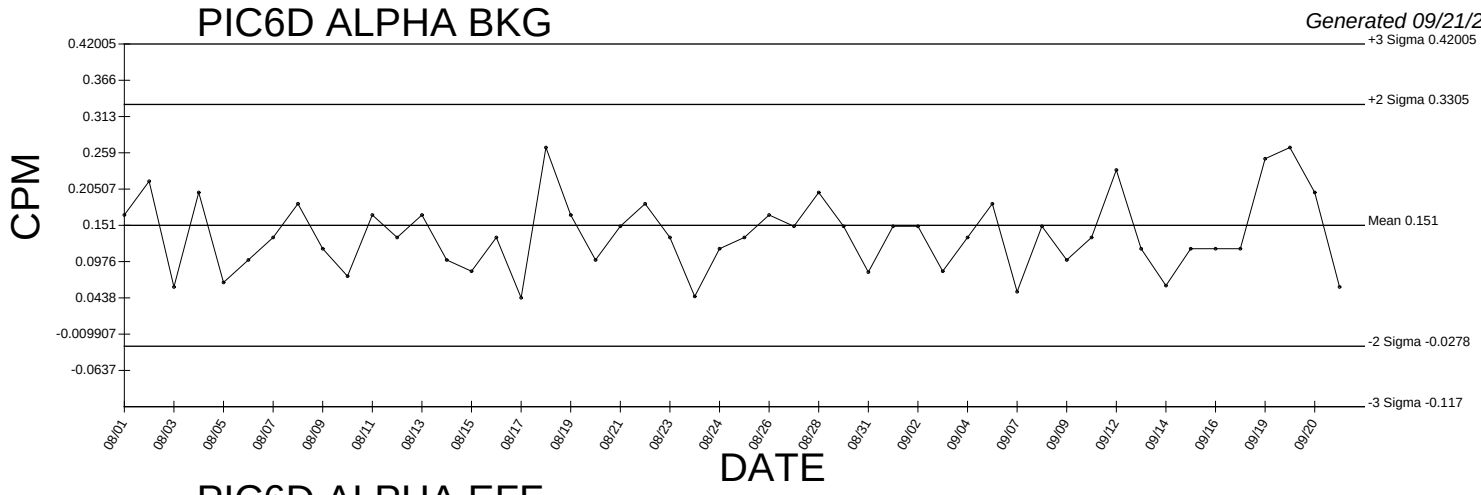

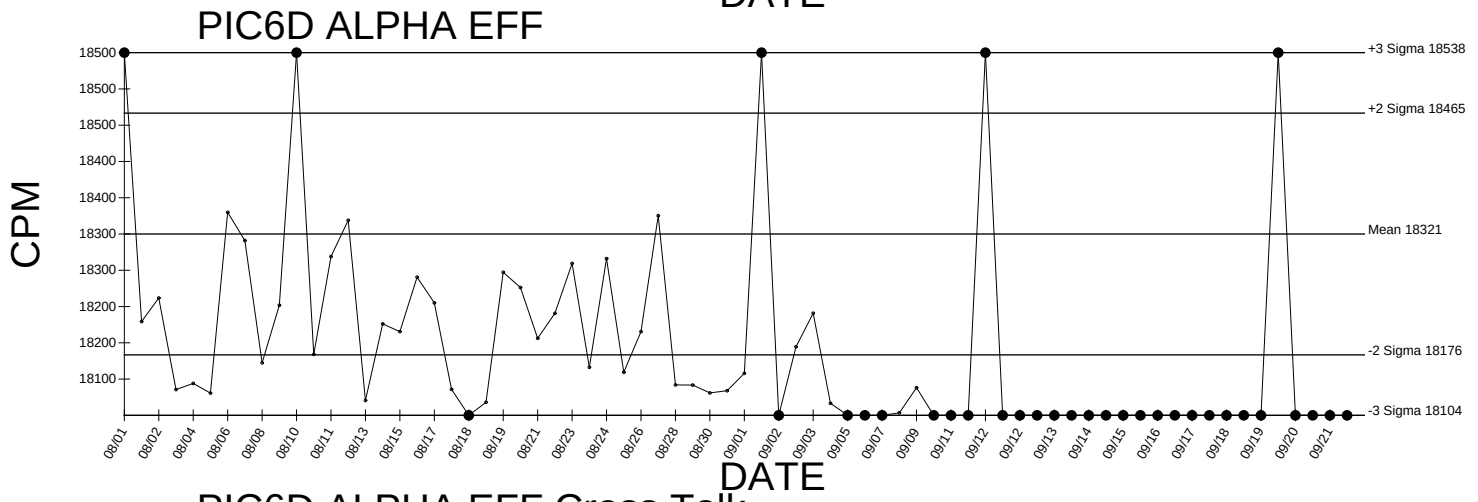

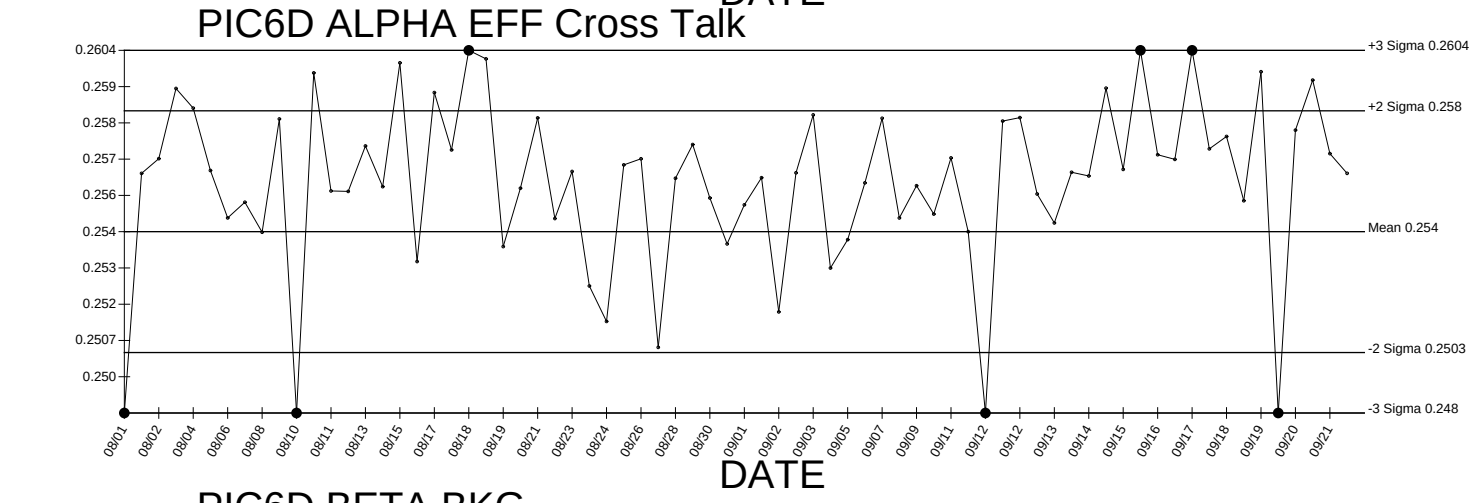

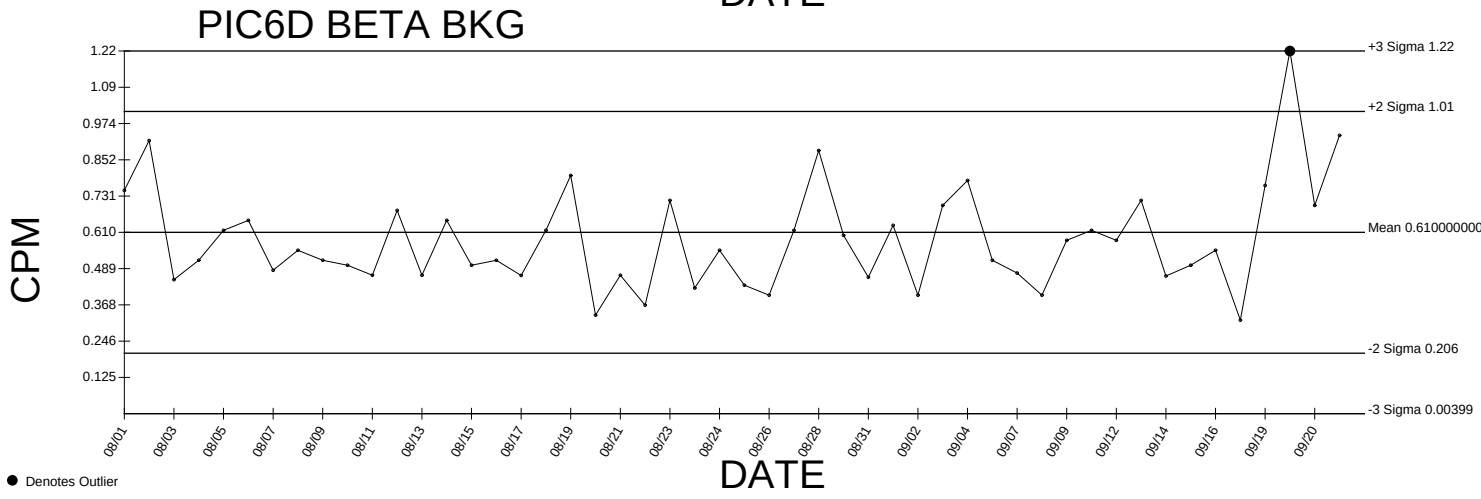

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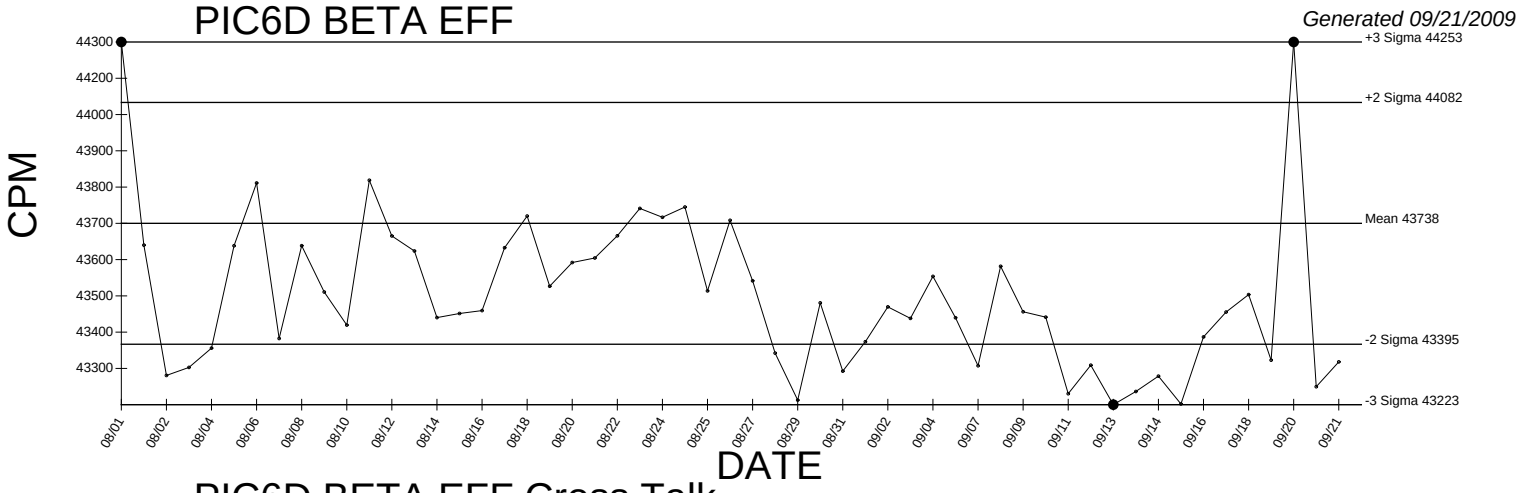
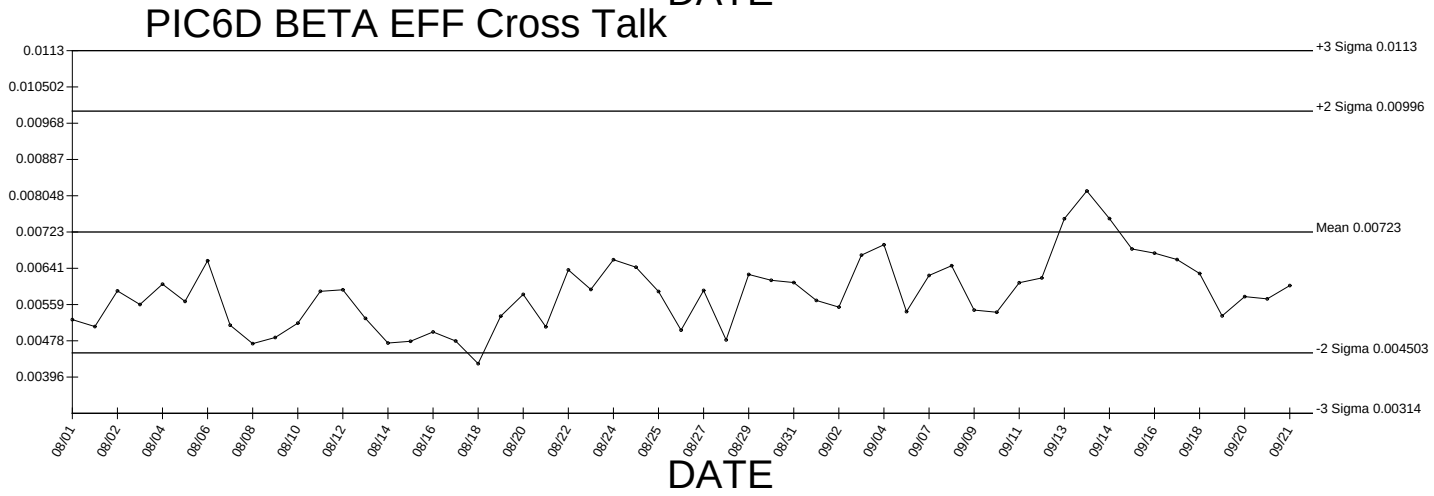
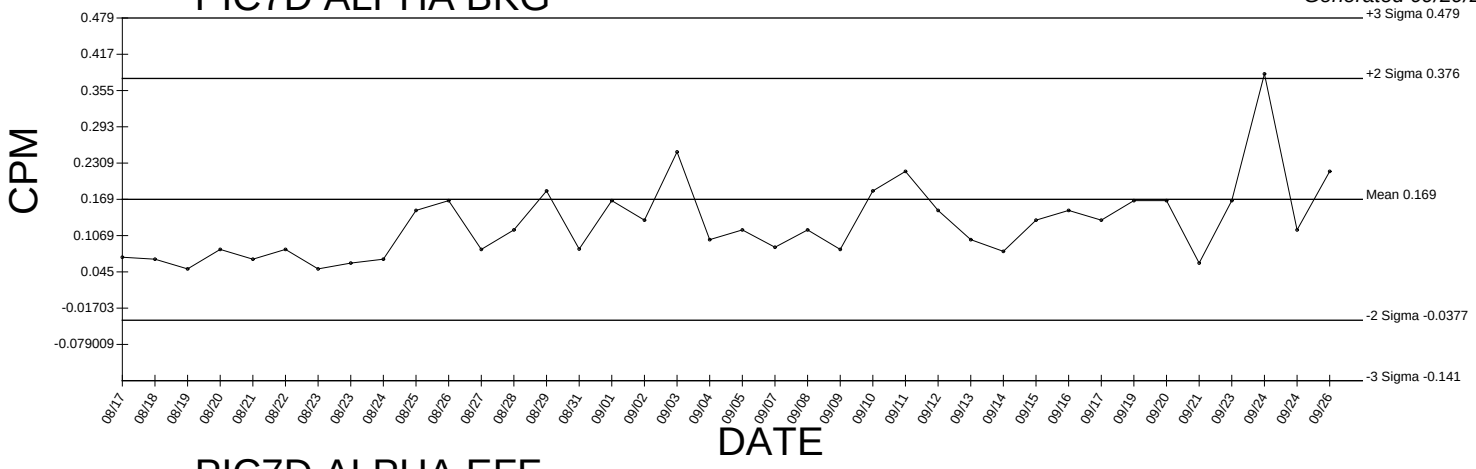


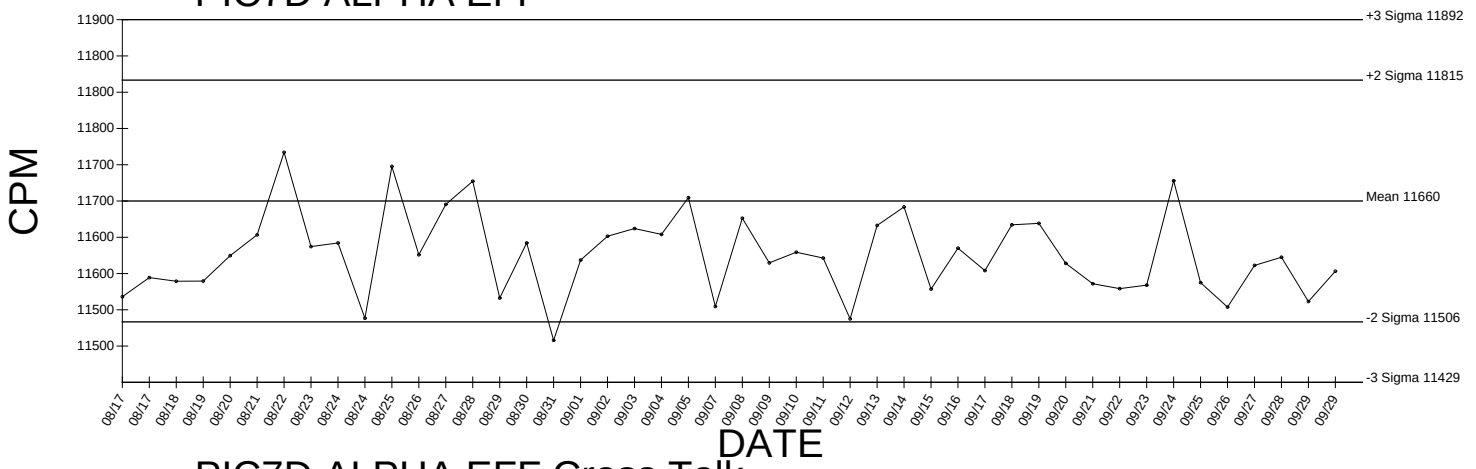


● Denotes Outlier

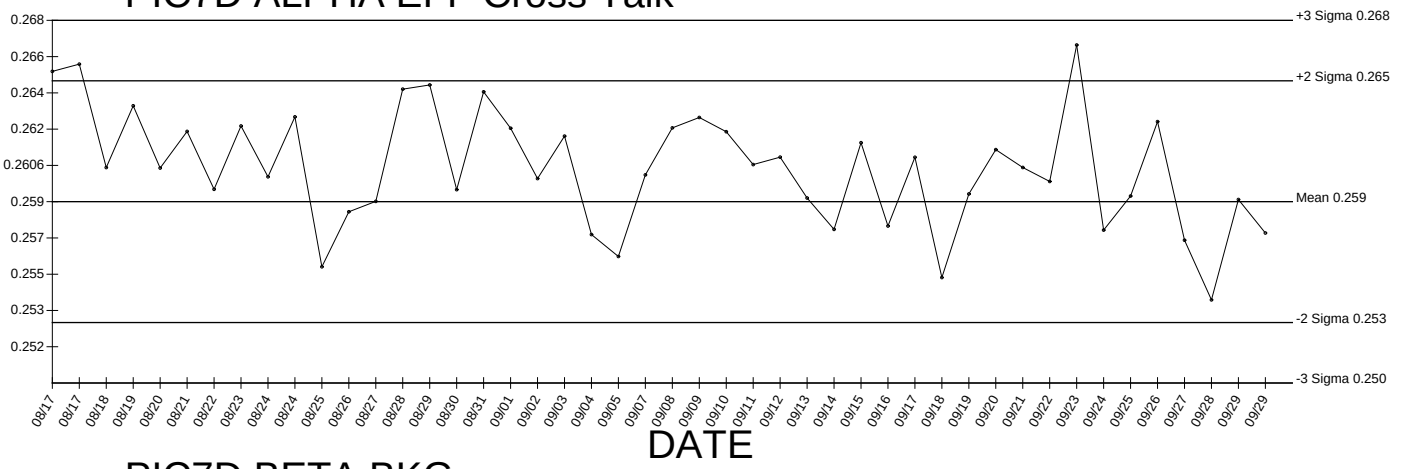
PIC7D ALPHA BKG



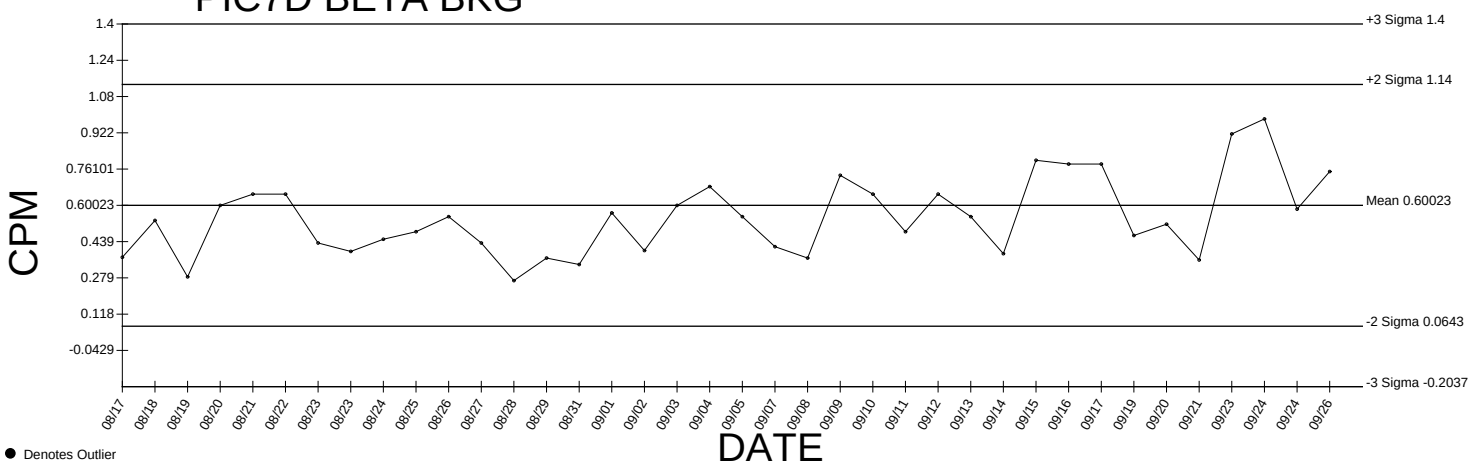
PIC7D ALPHA EFF



PIC7D ALPHA EFF Cross Talk

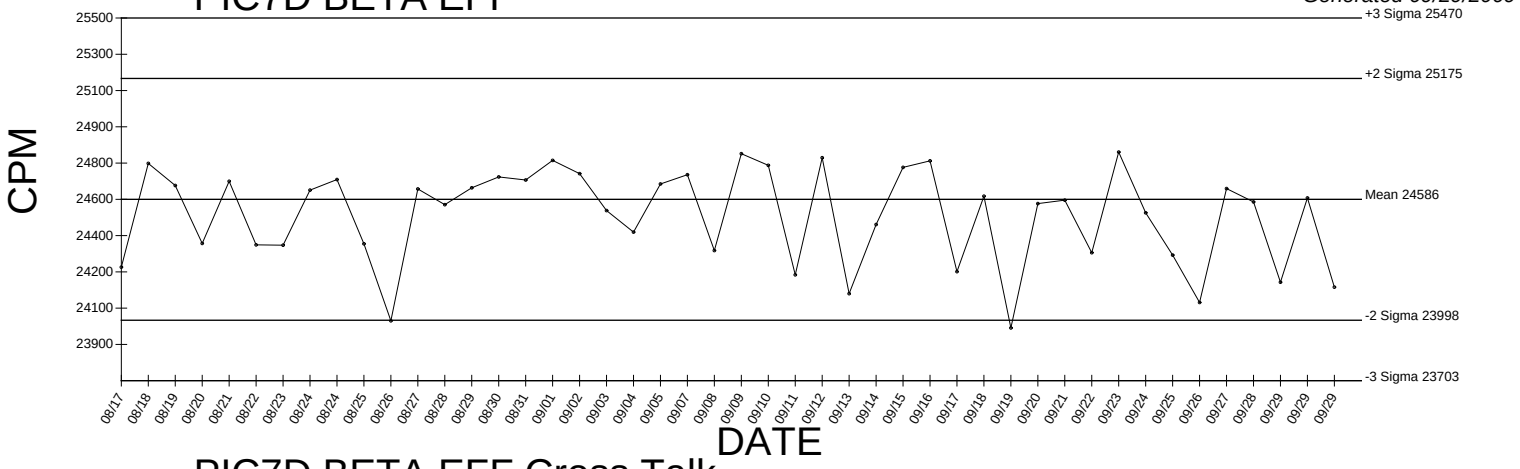


PIC7D BETA BKG

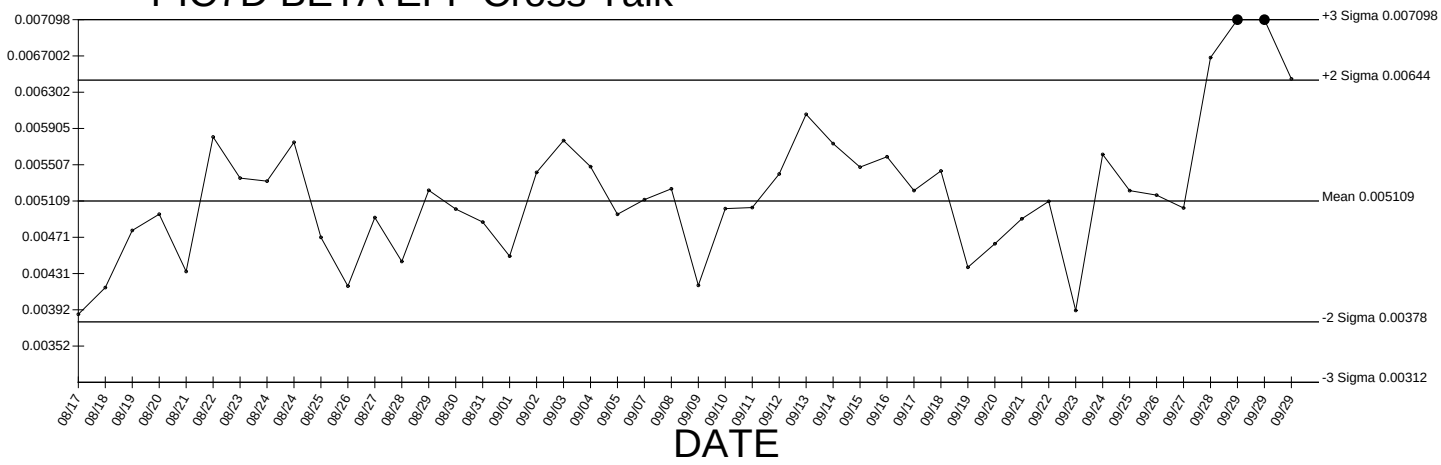


● Denotes Outlier

PIC7D BETA EFF



PIC7D BETA EFF Cross Talk



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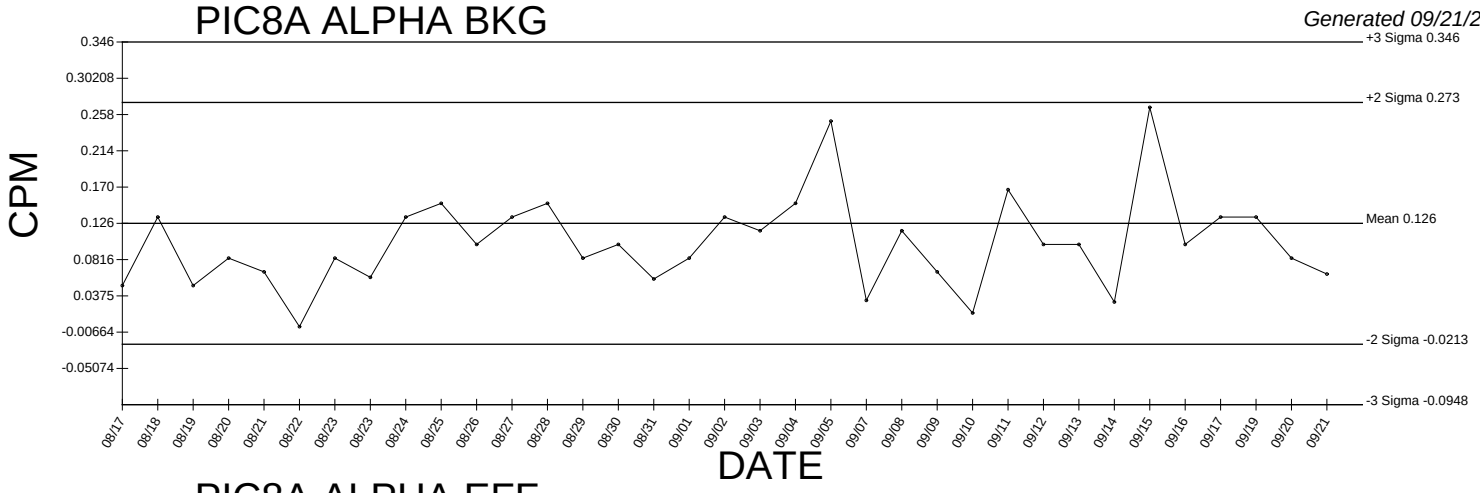

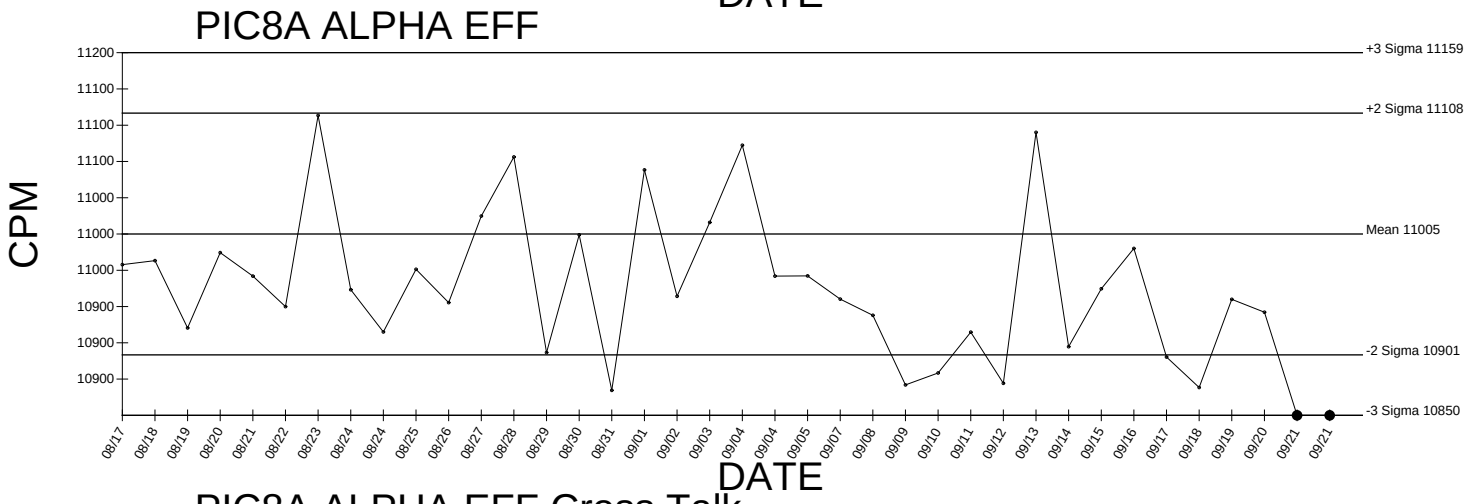

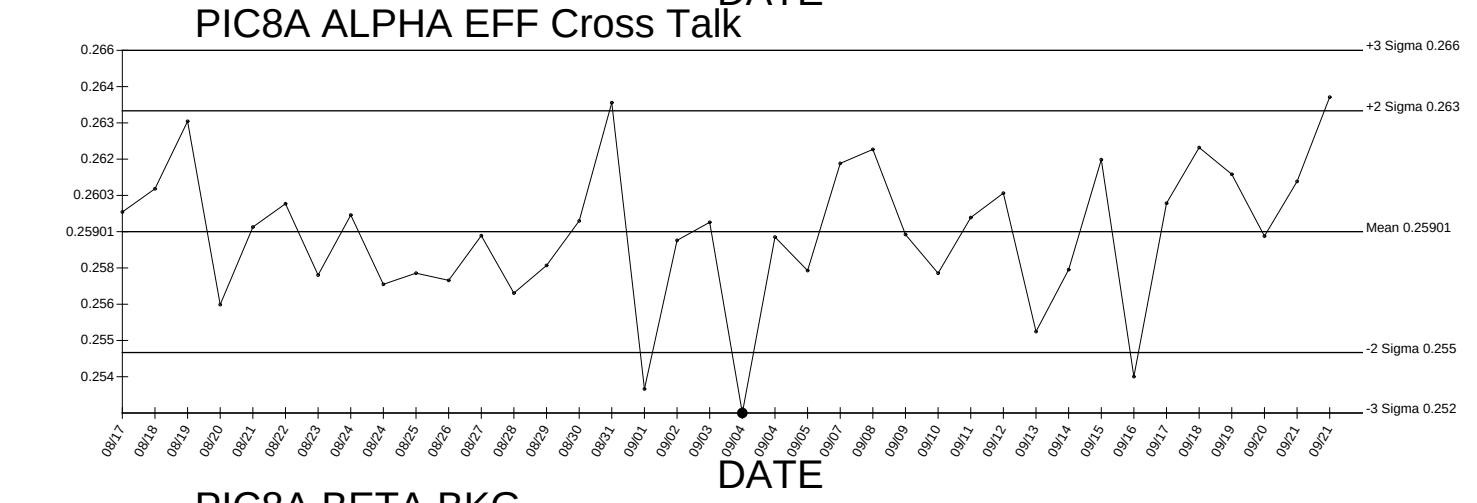

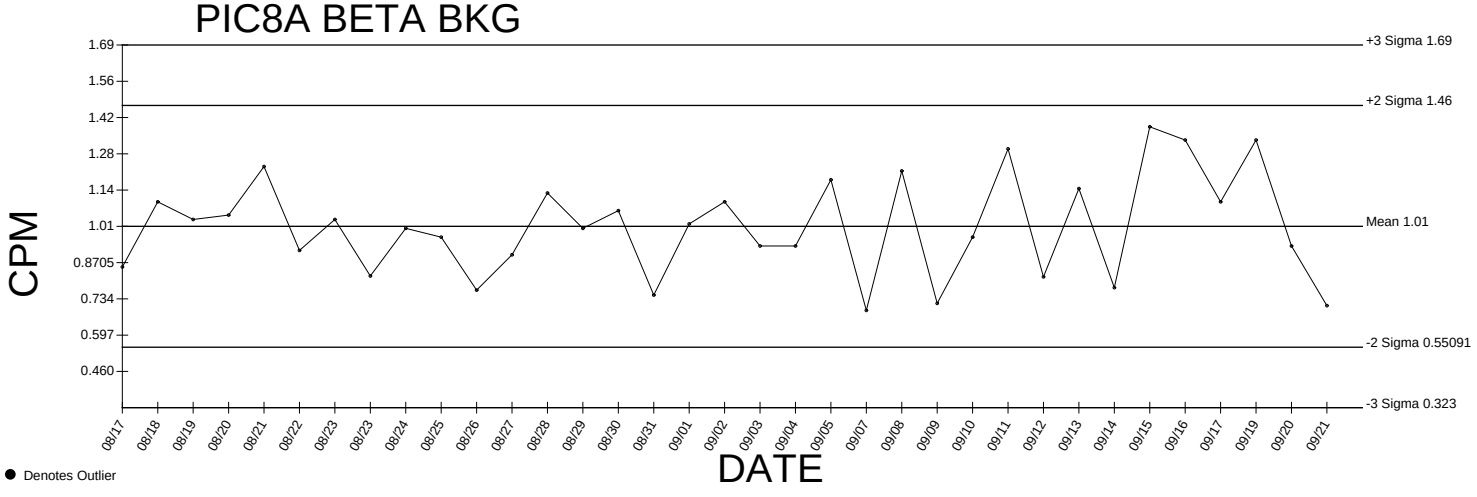

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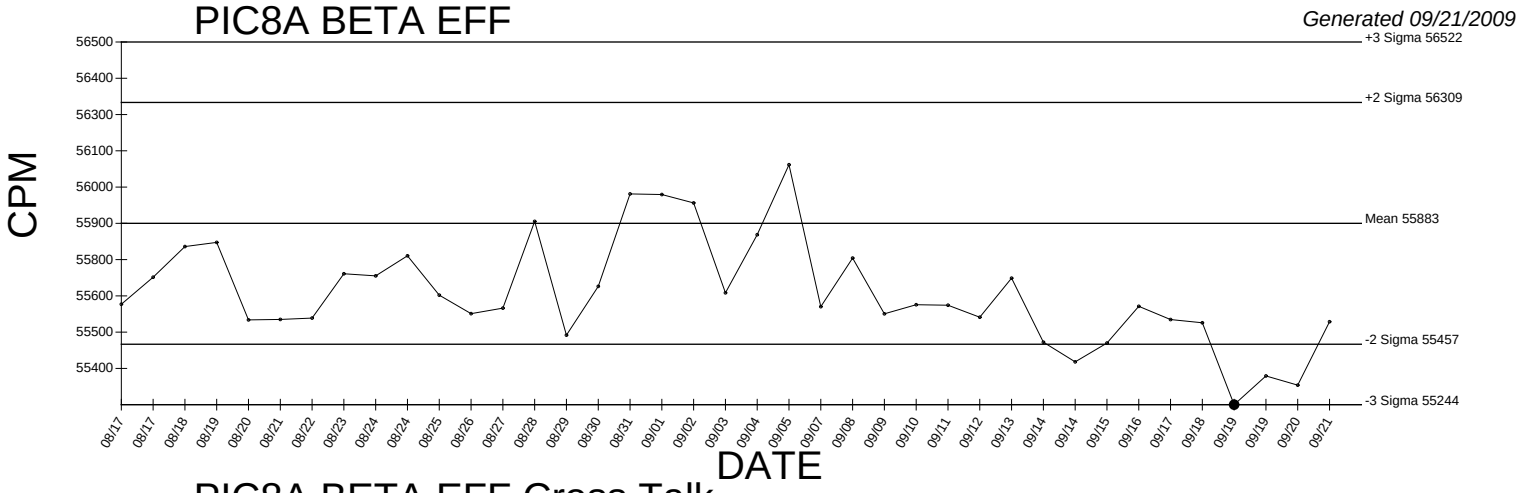

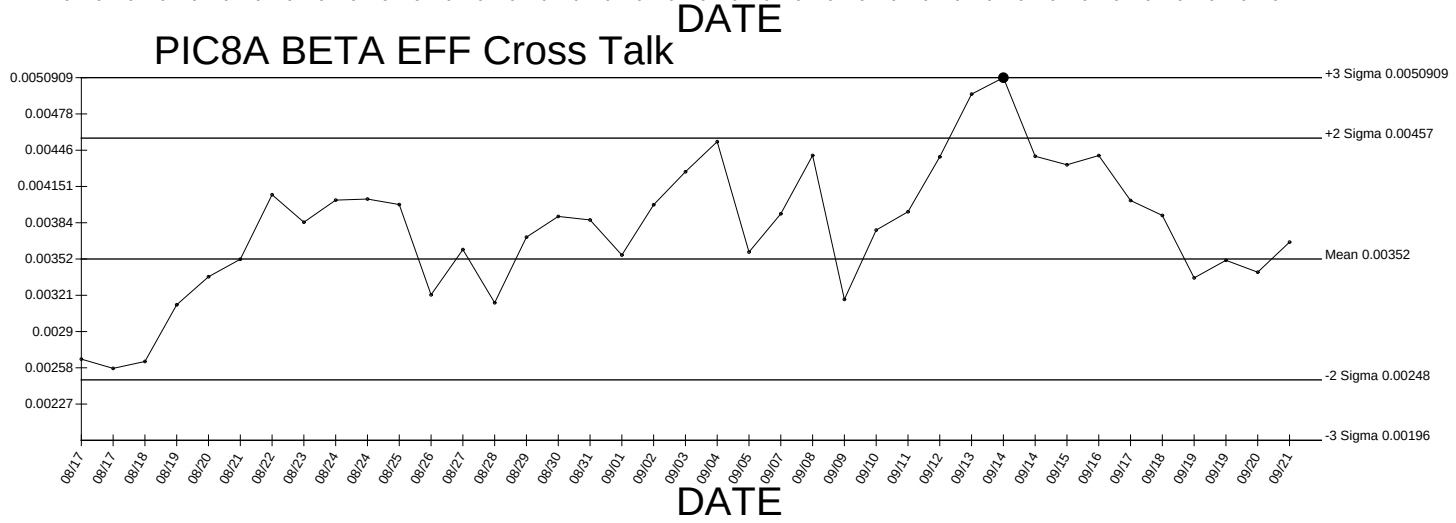

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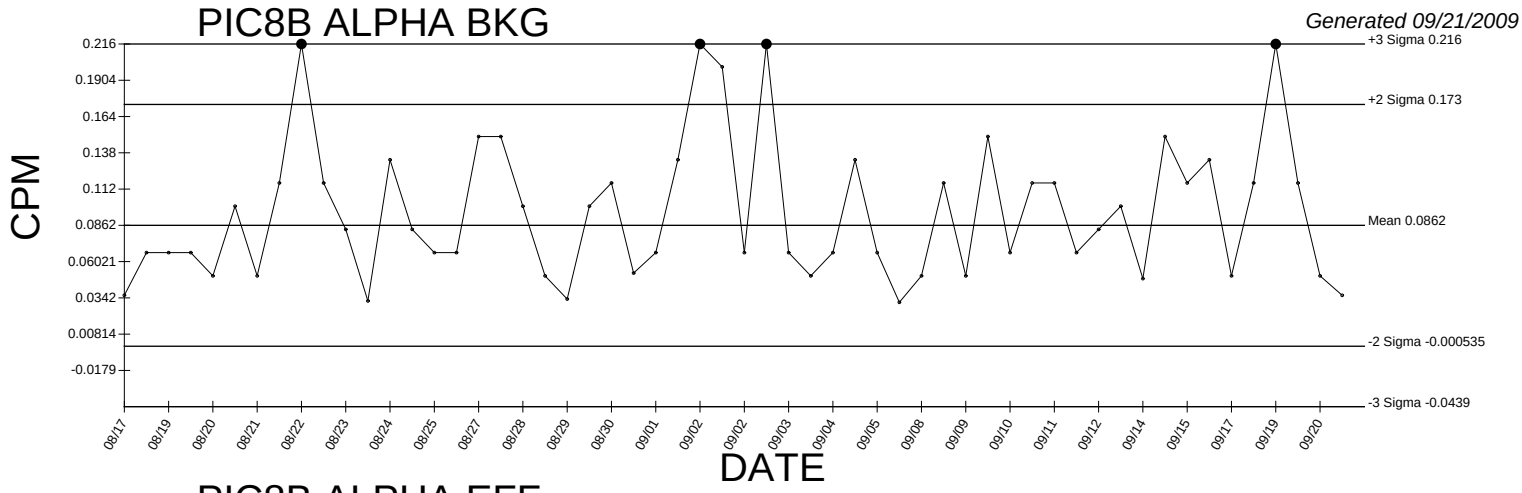

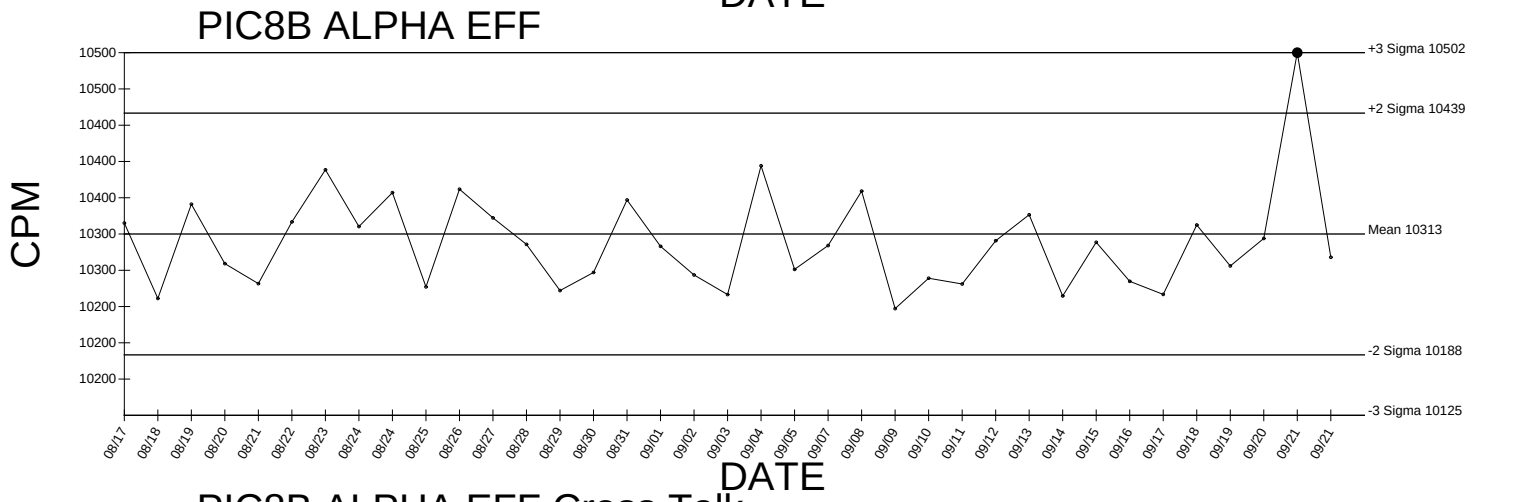

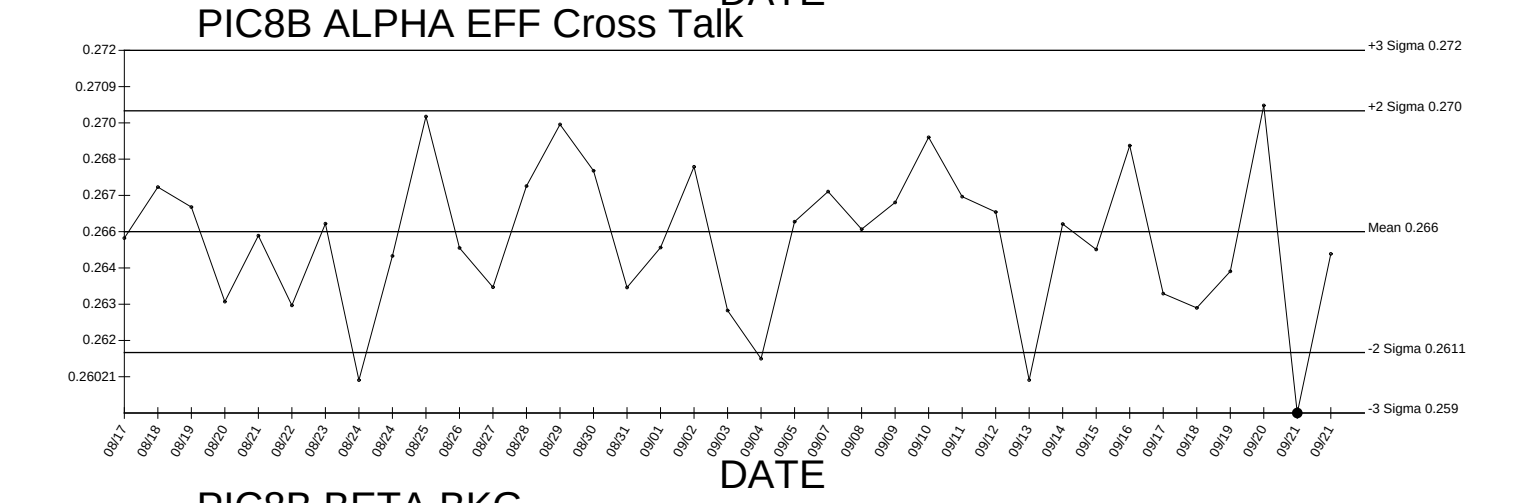

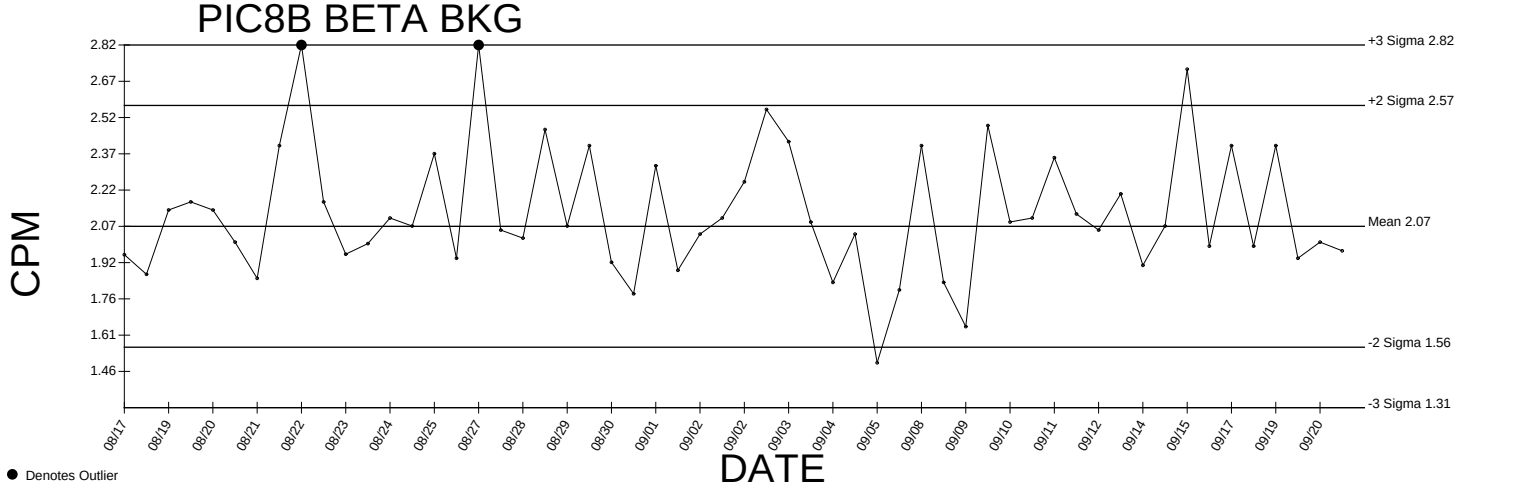

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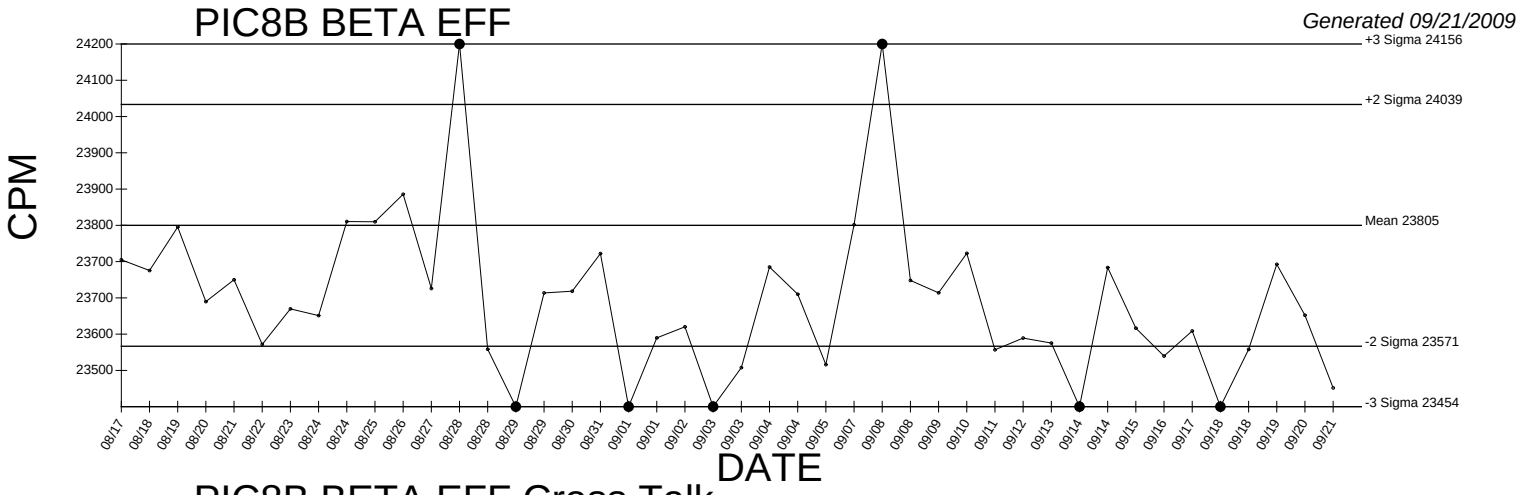

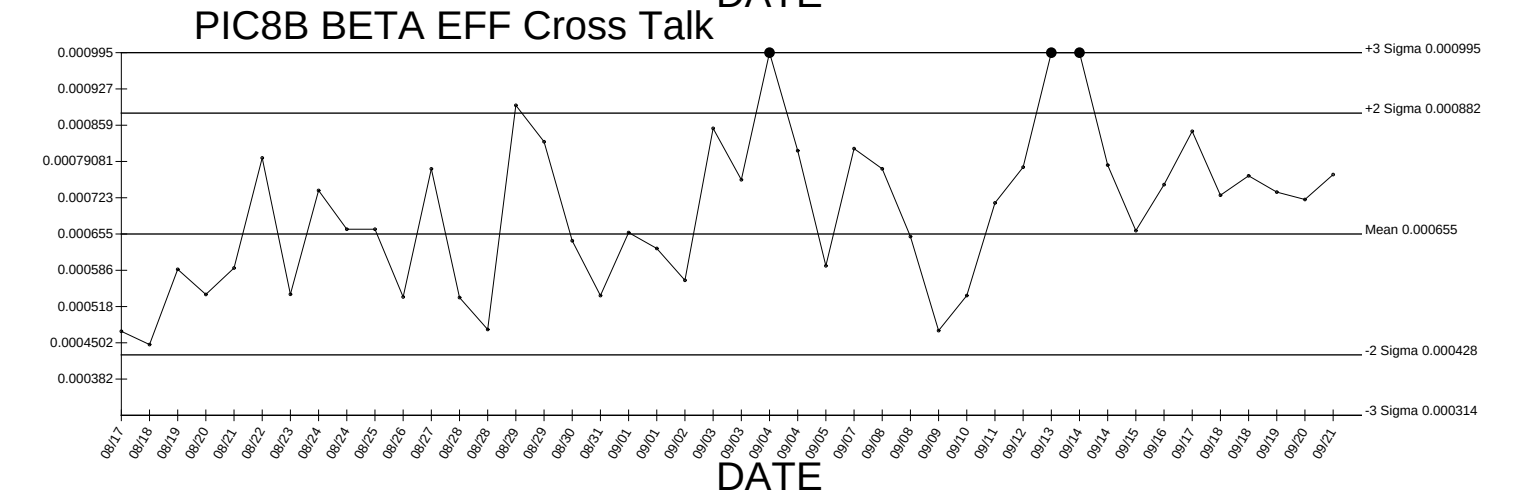

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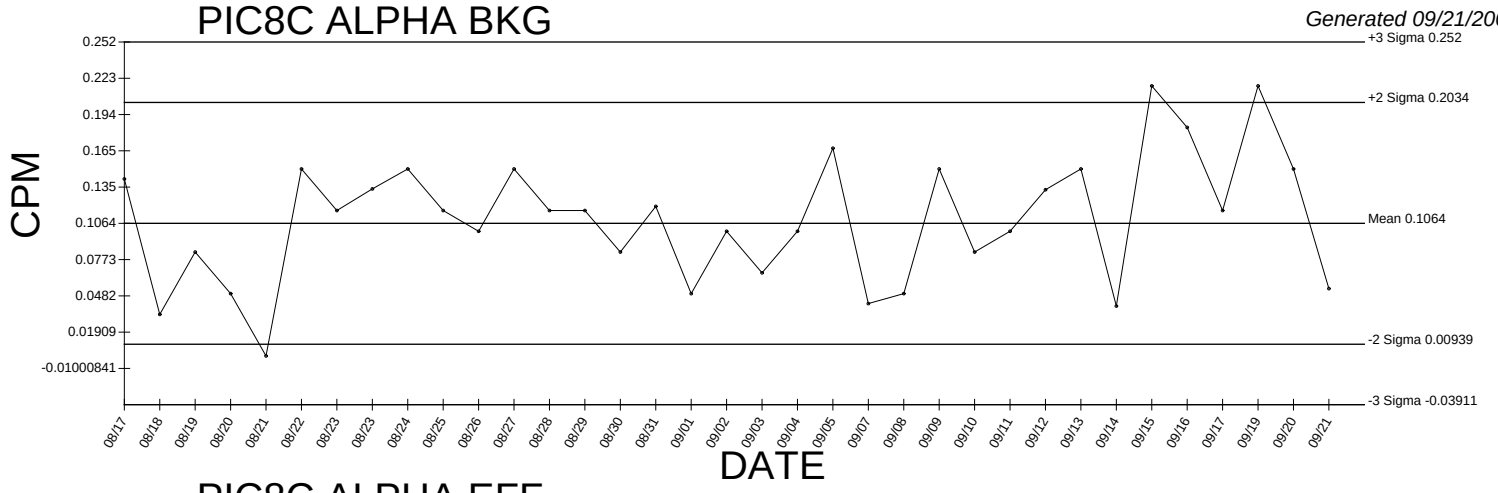

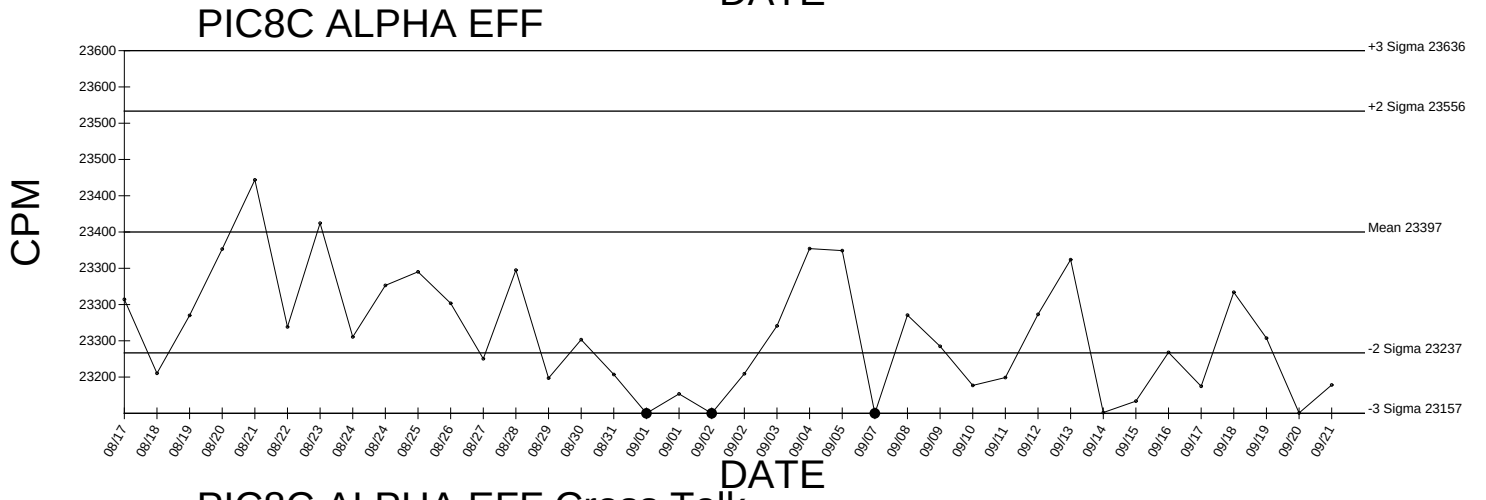

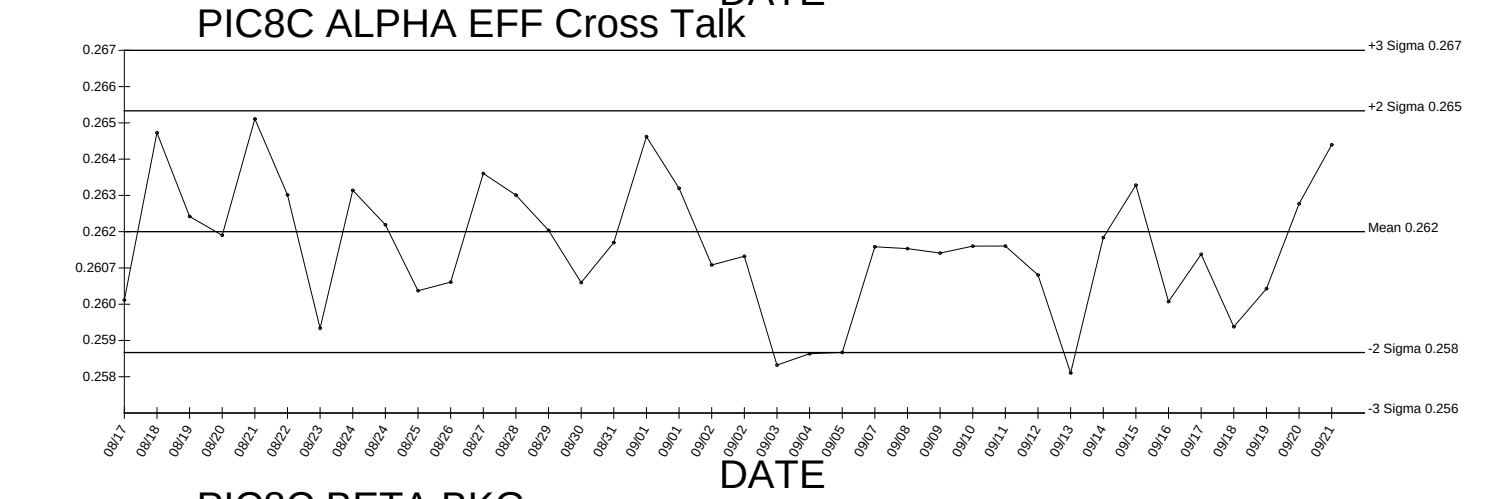

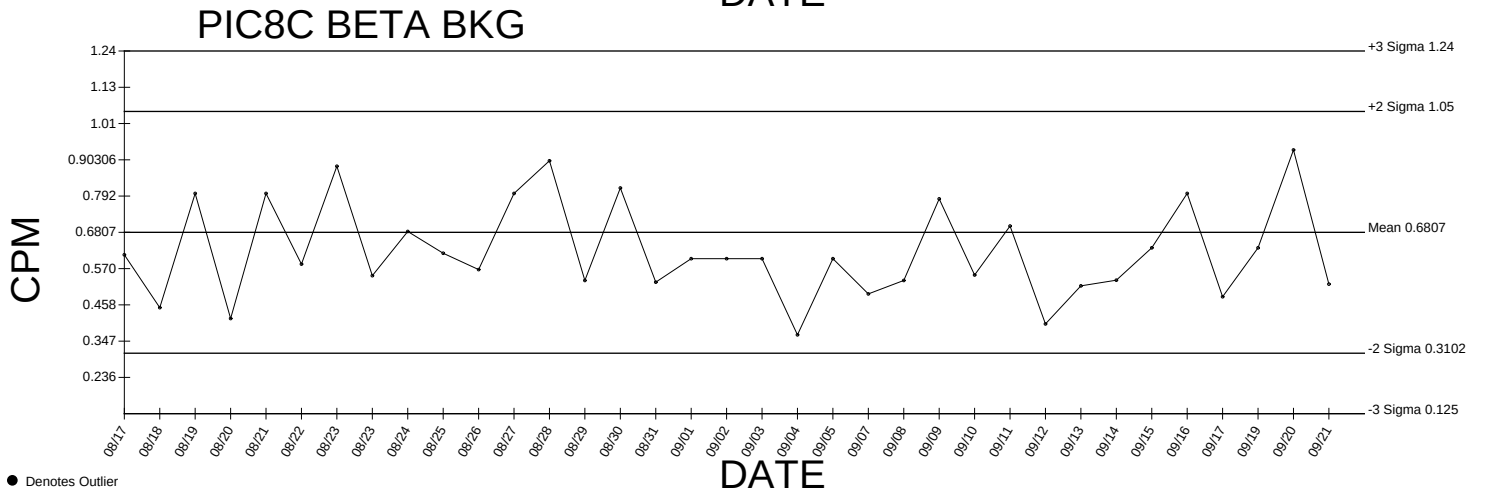

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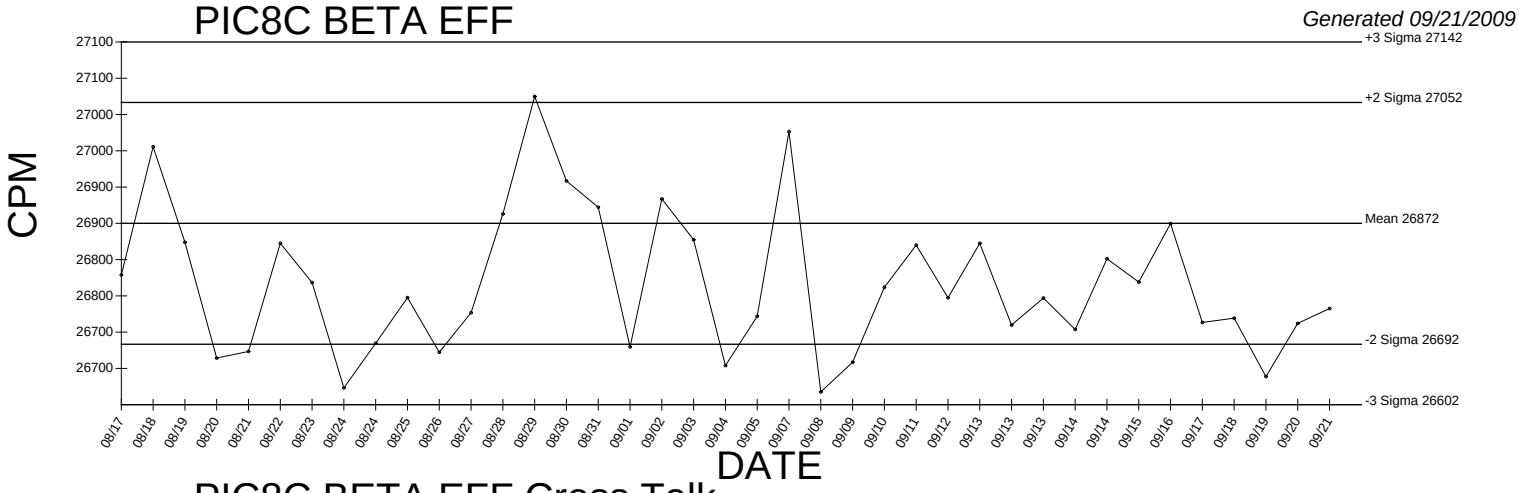

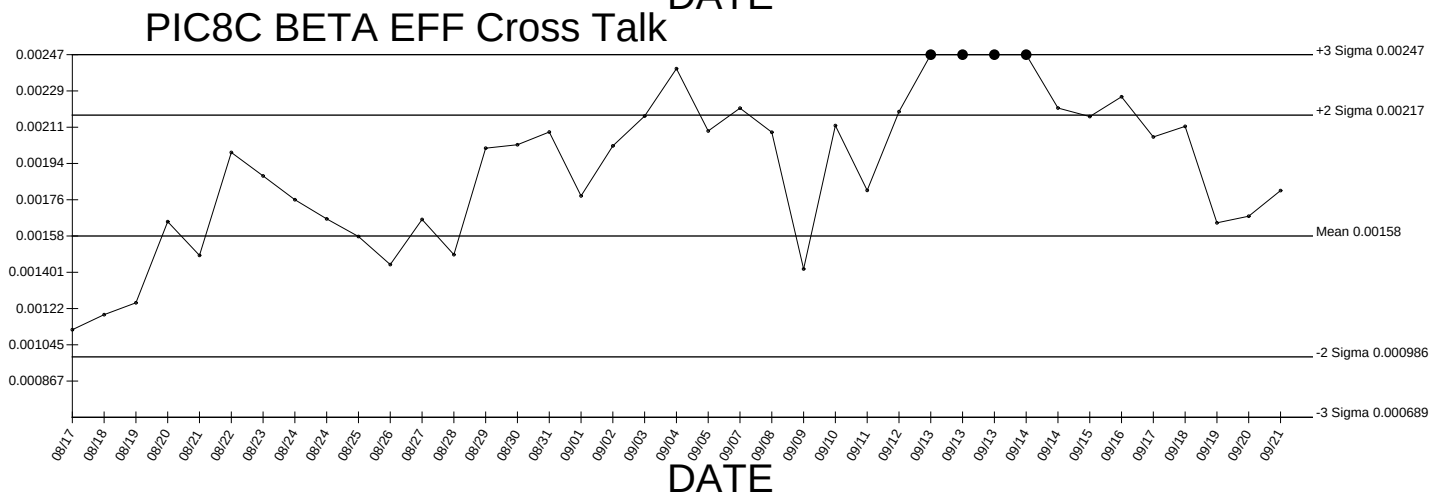

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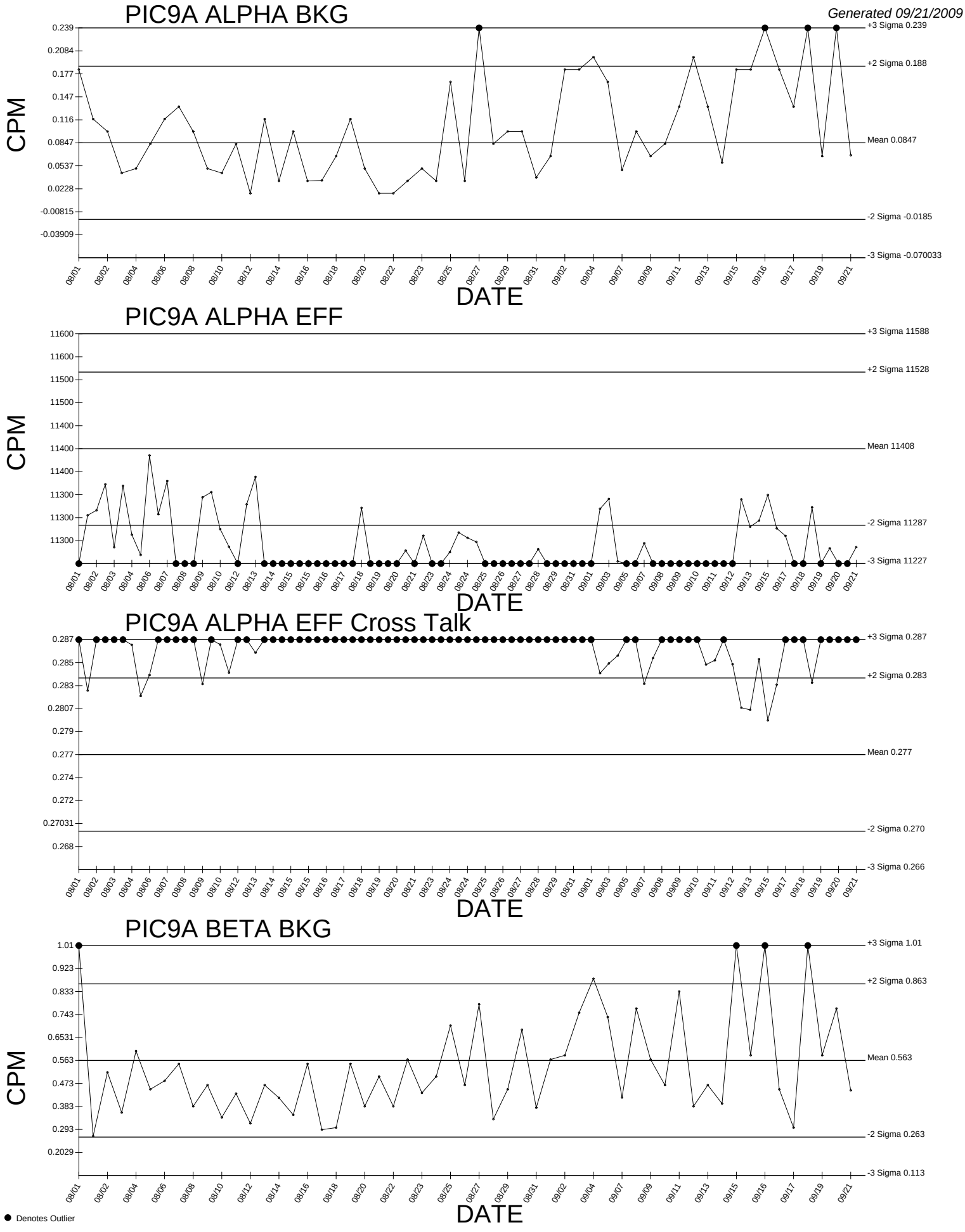
PIC9A ALPHA BKG
Generated 09/21/2009
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0.177
0.147
0.116
0.0847
0.0537
0.0228
-0.00815
-0.03909
+3 Sigma 0.239
+2 Sigma 0.188
Mean 0.0847
-2 Sigma -0.0185
-3 Sigma -0.070033
DATE
PIC9A ALPHA EFF
CPM
11600
11600
11500
11500
11400
11400
11300
11300
+3 Sigma 11588
+2 Sigma 11528
Mean 11408
-2 Sigma 11287
-3 Sigma 11227
DATE
PIC9A ALPHA EFF Cross Talk
0.287
0.285
0.283
0.2807
0.279
0.277
0.274
0.272
0.27031
0.268
+3 Sigma 0.287
+2 Sigma 0.283
Mean 0.277
-2 Sigma 0.270
-3 Sigma 0.266
DATE
PIC9A BETA BKG
CPM
1.01
0.923
0.833
0.743
0.6531
0.563
0.473
0.383
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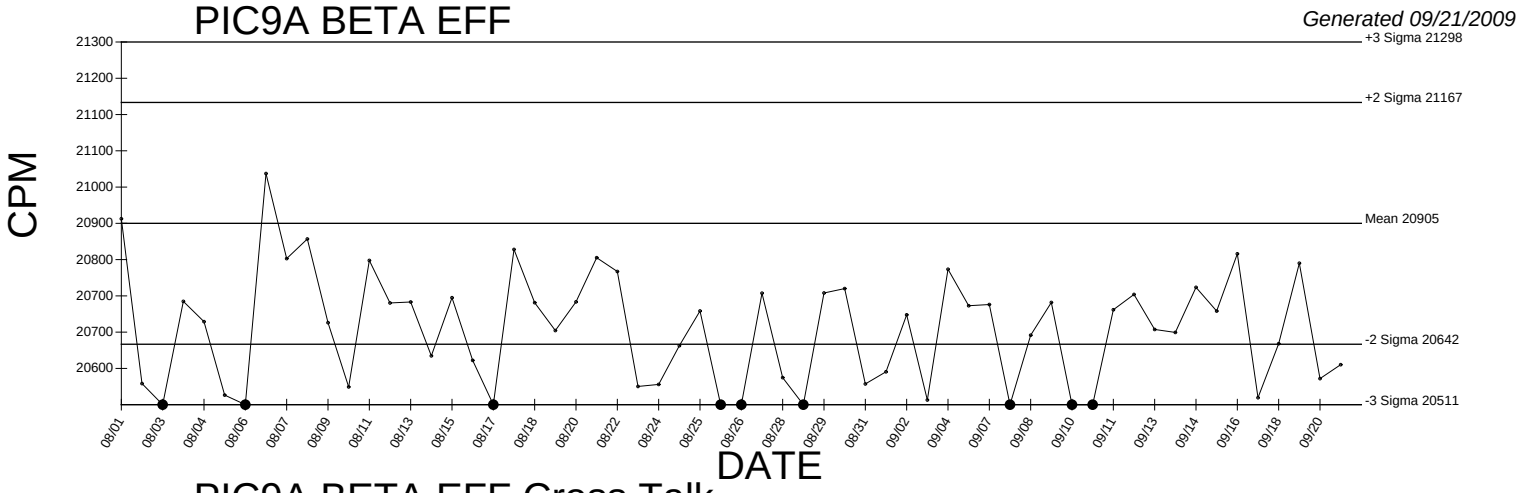
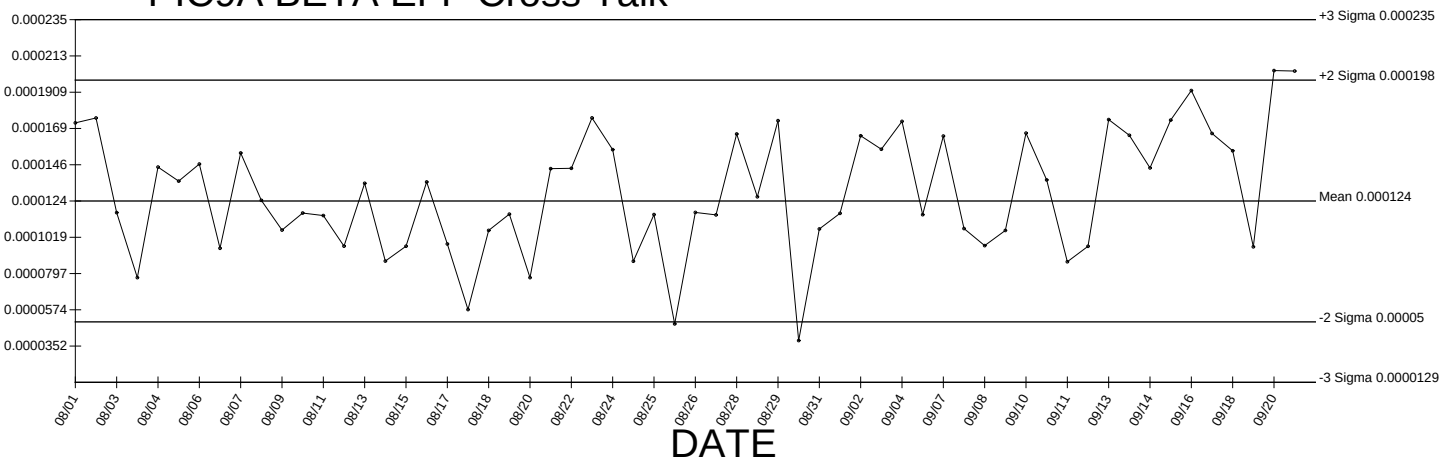
+2 Sigma 0.863
Mean 0.563
-2 Sigma 0.263
-3 Sigma 0.113
DATE
● Denotes Outlier





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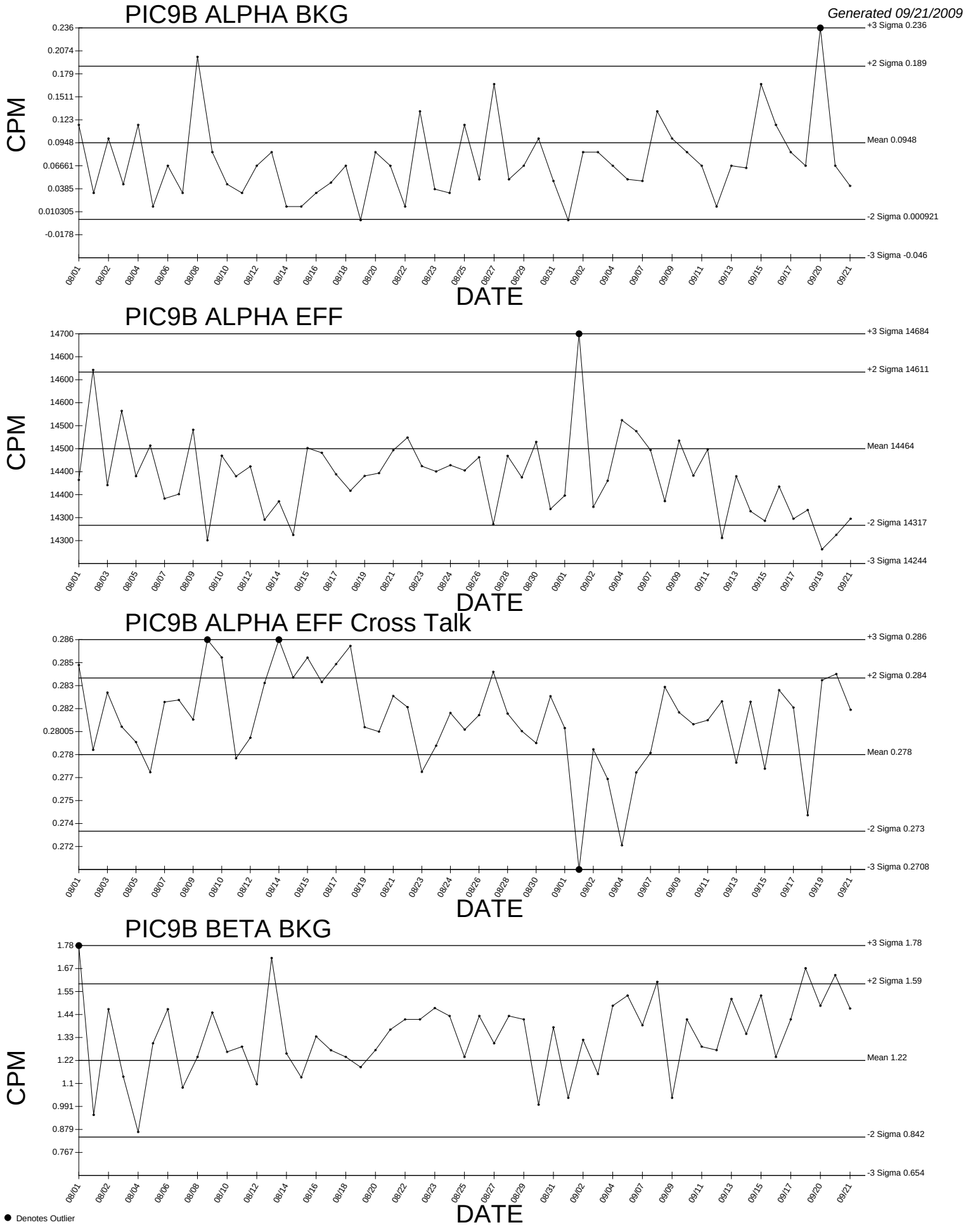
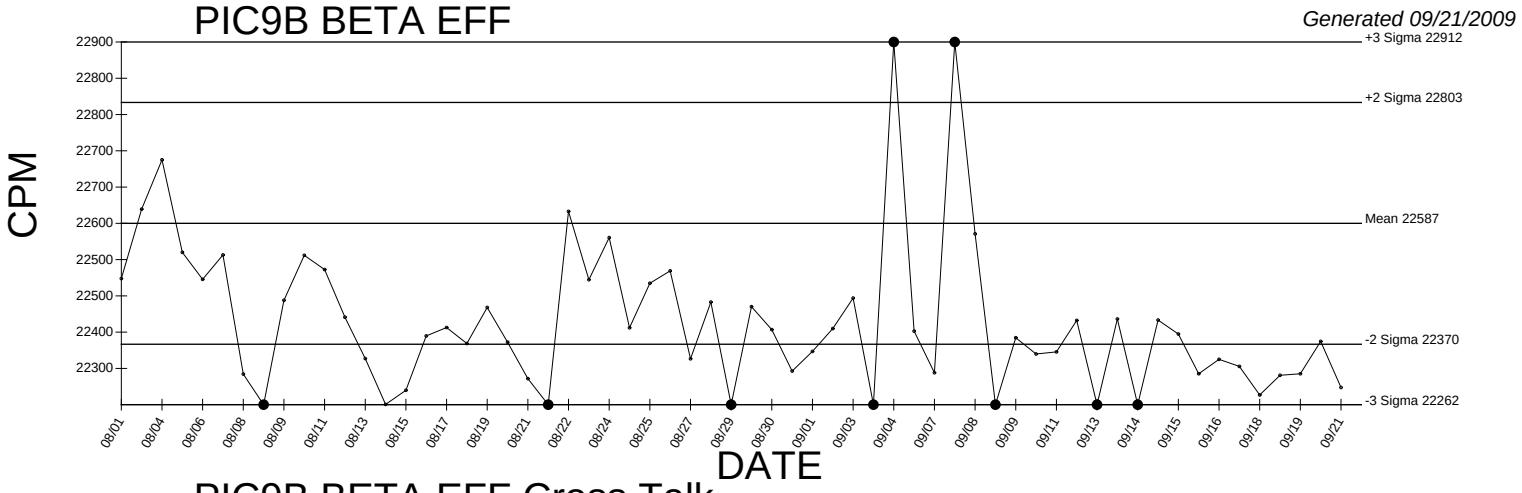
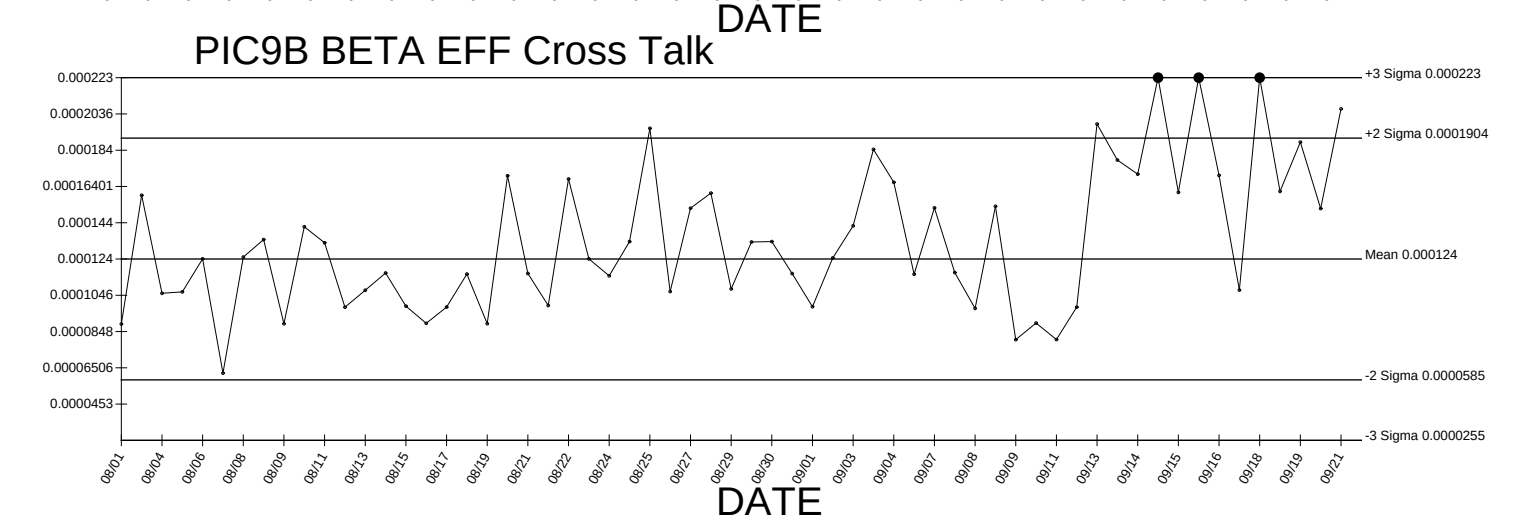
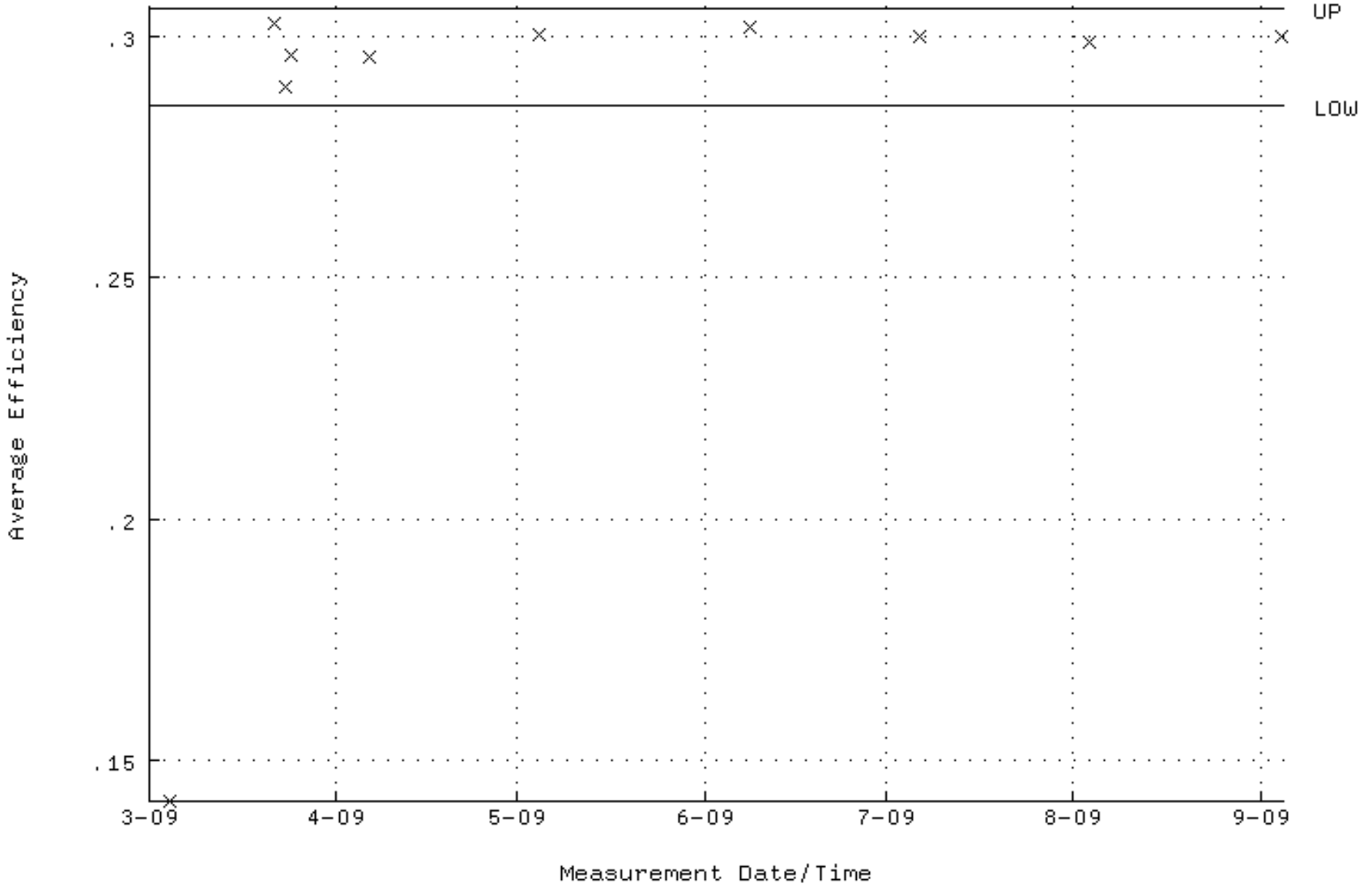

PIC9B ALPHA BKG
Generated 09/21/2009
CPM
DATE
+3 Sigma 0.236
+2 Sigma 0.189
Mean 0.0948
-2 Sigma 0.000921
-3 Sigma -0.046
PIC9B ALPHA EFF
+3 Sigma 14684
+2 Sigma 14611
Mean 14464
-2 Sigma 14317
-3 Sigma 14244
PIC9B ALPHA EFF Cross Talk
+3 Sigma 0.286
+2 Sigma 0.284
Mean 0.278
-2 Sigma 0.273
-3 Sigma 0.2708
PIC9B BETA BKG
+3 Sigma 1.78
+2 Sigma 1.59
Mean 1.22
-2 Sigma 0.842
-3 Sigma 0.654
● Denotes Outlier



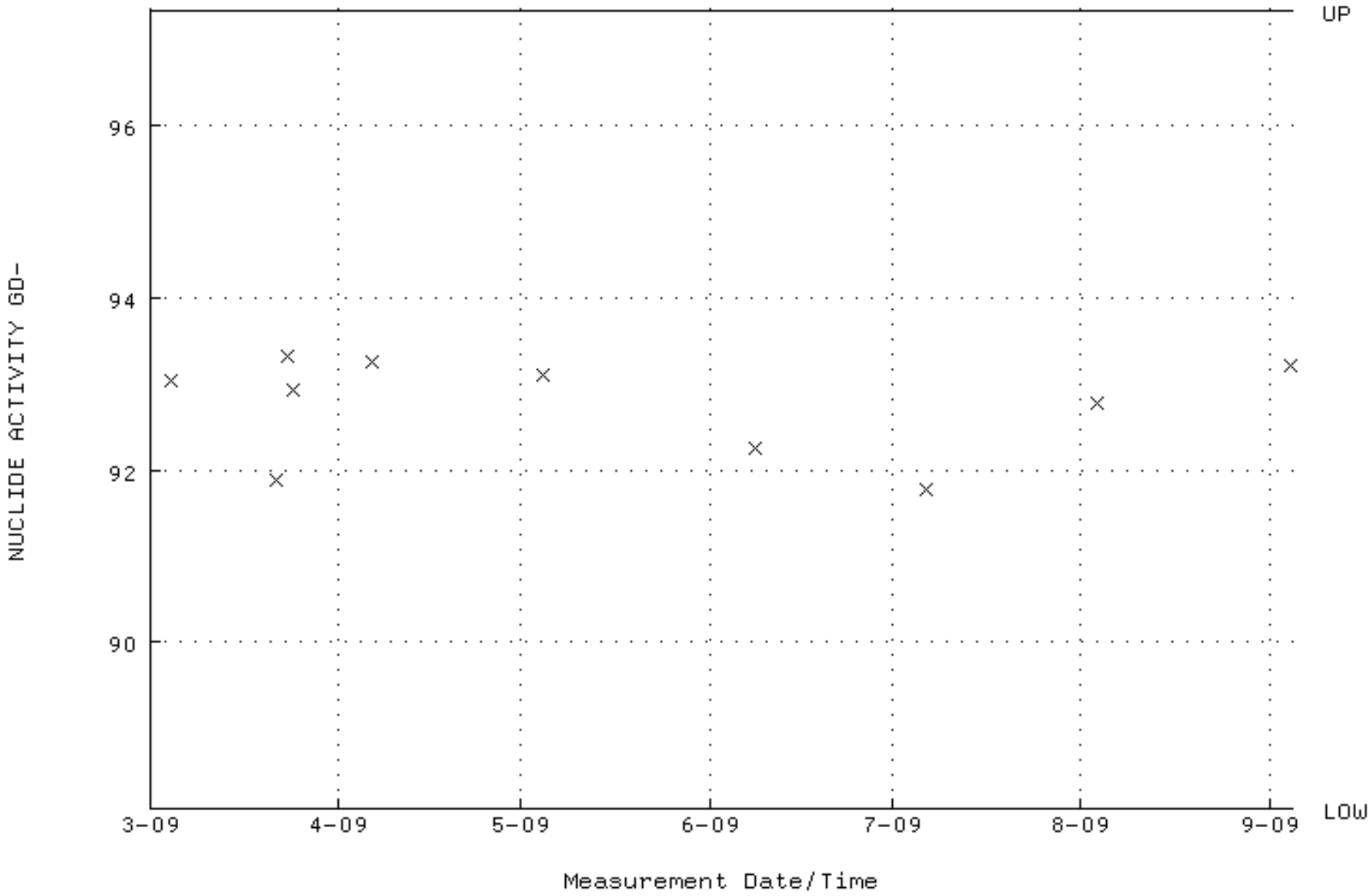


● Denotes Outlier

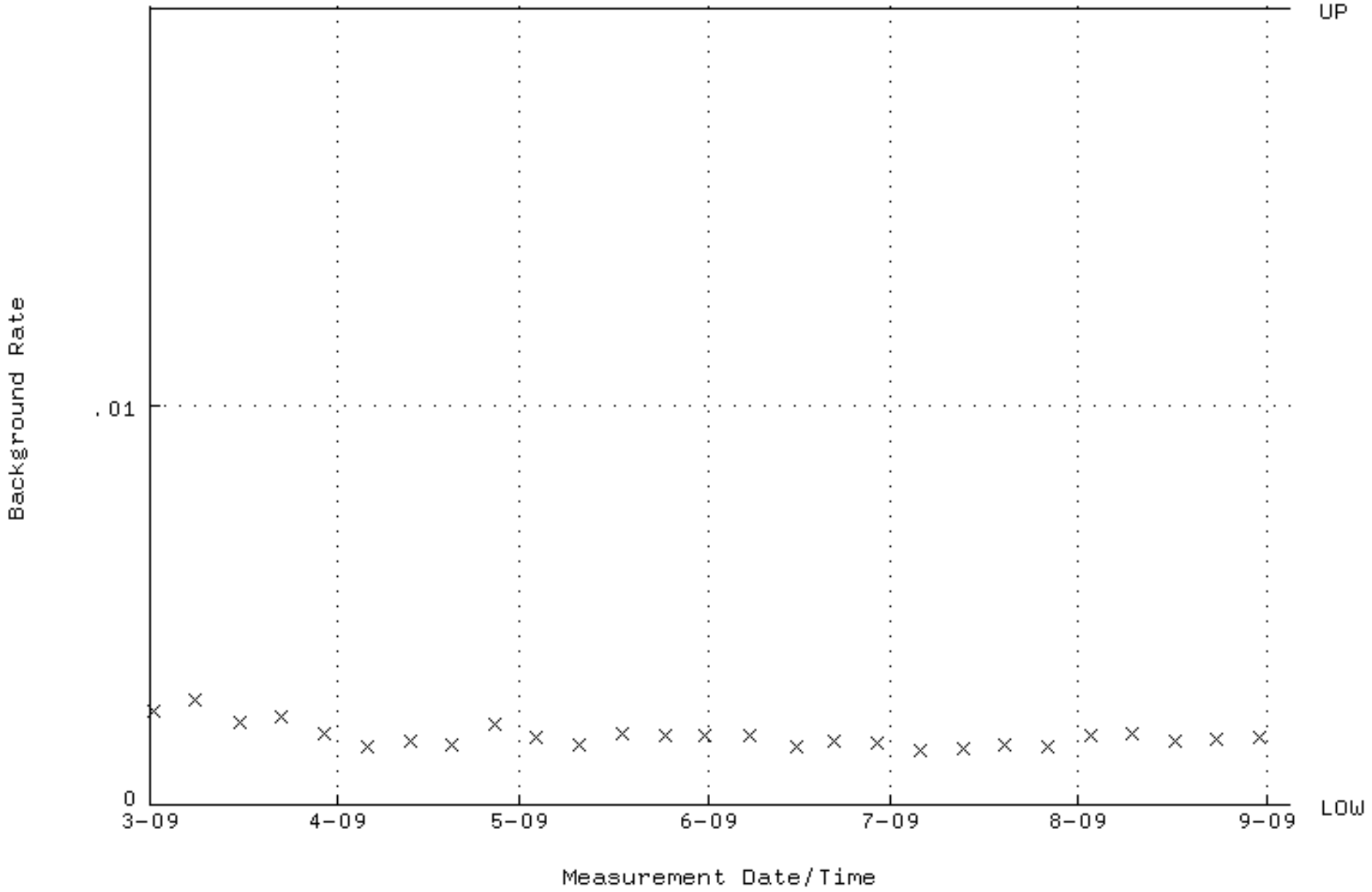
QA filename : DKA100:[ENV_ALPHA.QA.W]W012.QAF;4
Parameter Name : AVRGEFF (Average Efficiency)
Start/End Dates : 4-MAR-2009 12:51:49 through 4-SEP-2009 12:00:00
Lower/Upper Lmts: 0.285730 through 0.305730



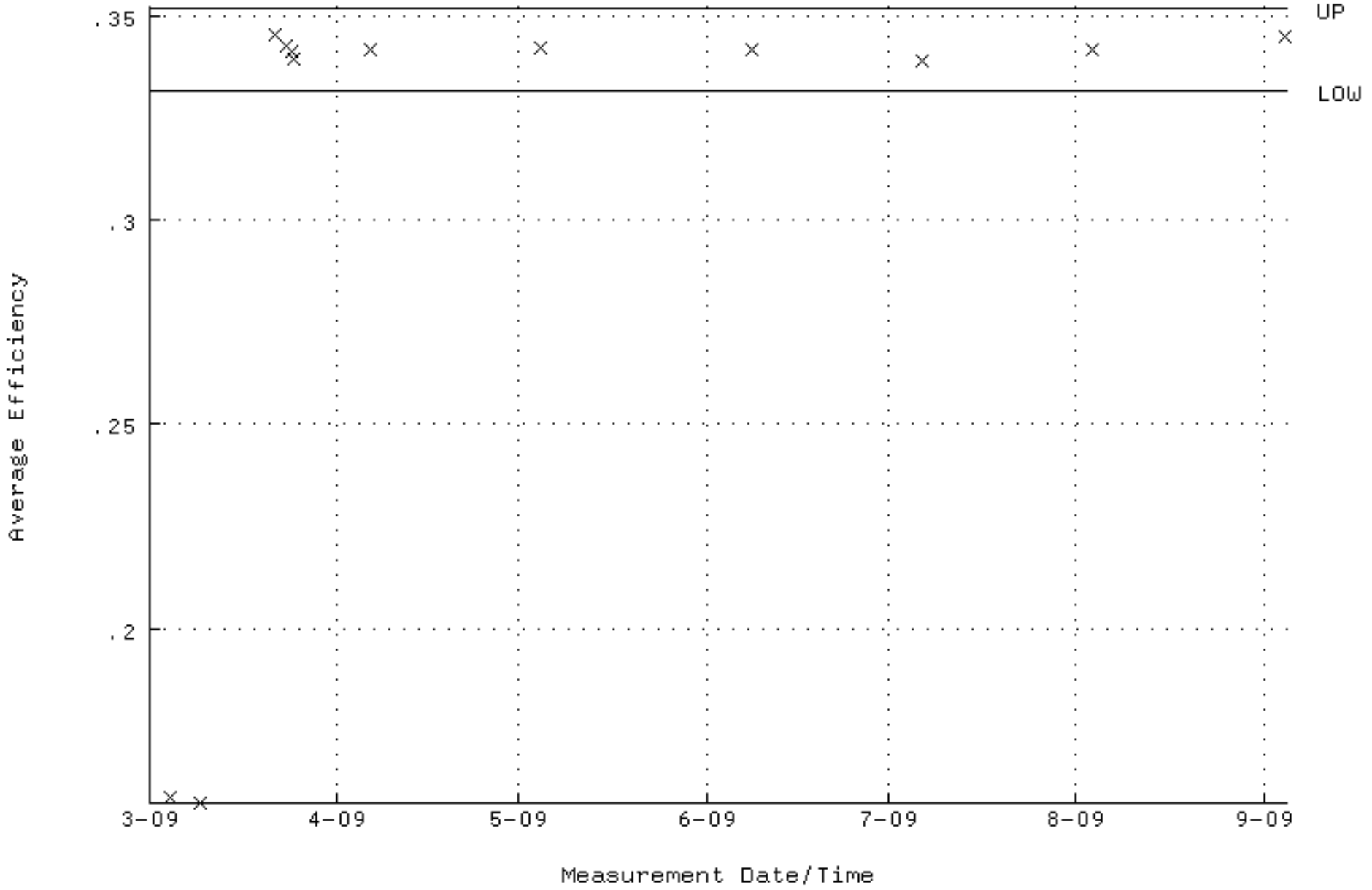
QA filename : DKA100:[ENV_ALPHA.QA.W]W012.QAF;4
Parameter Name : NLACTVTY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 4-MAR-2009 12:51:49 through 4-SEP-2009 12:00:00
Lower/Upper Lmts: 88.0678 through 97.3382



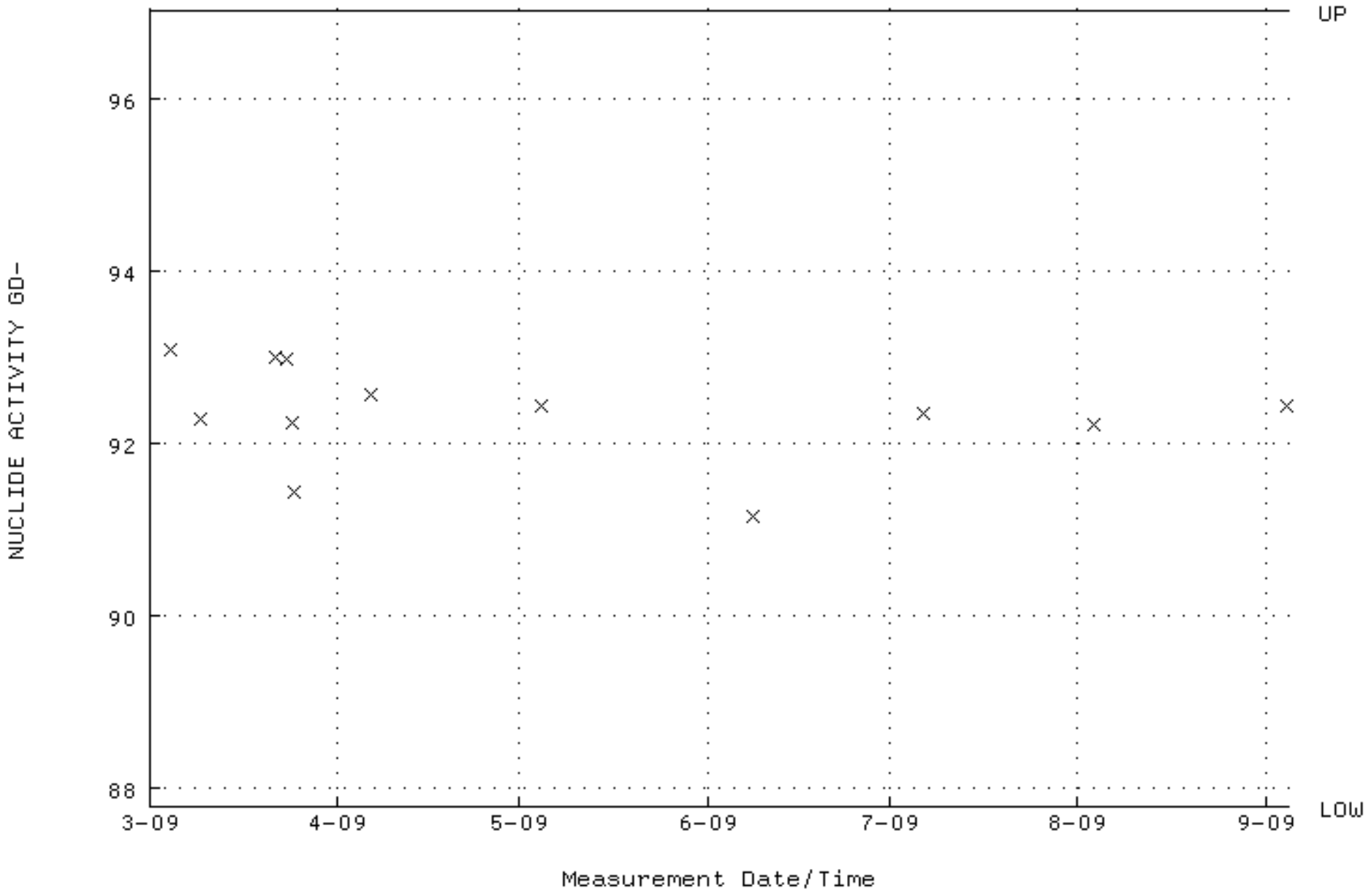
QA filename : DKA100:[ENV_ALPHA.QA.B]B012.QAF;2
Parameter Name : BACKRATE (Background Rate)
Start/End Dates : 1-MAR-2009 17:17:21 through 4-SEP-2009 12:00:00
Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



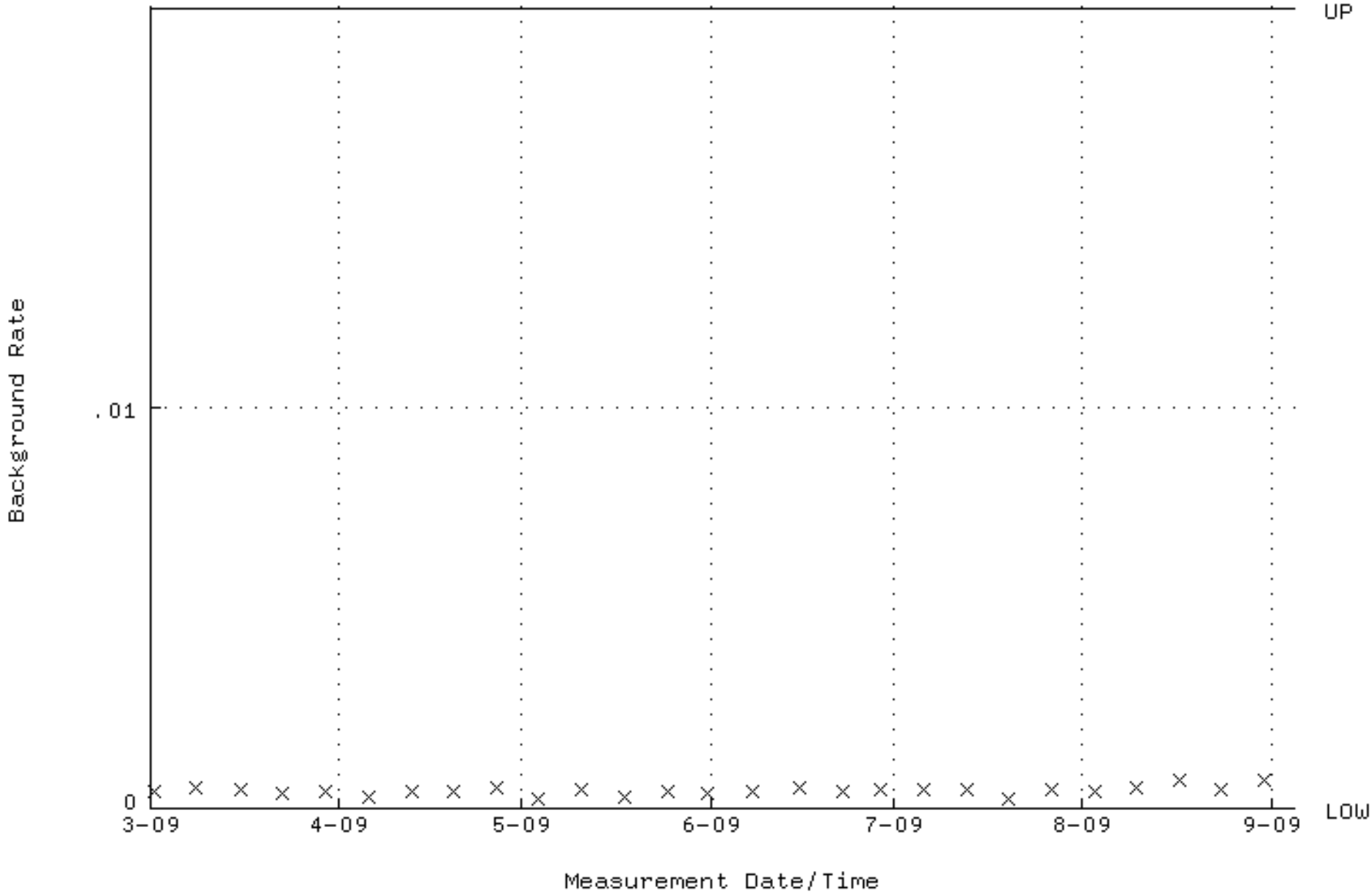
QA filename : DKA100:[ENV_ALPHA.QA.W]W013.QAF;2
Parameter Name : AVRGEFF (Average Efficiency)
Start/End Dates : 4-MAR-2009 06:58:08 through 4-SEP-2009 12:00:00
Lower/Upper Lmts: 0.331676 through 0.351676



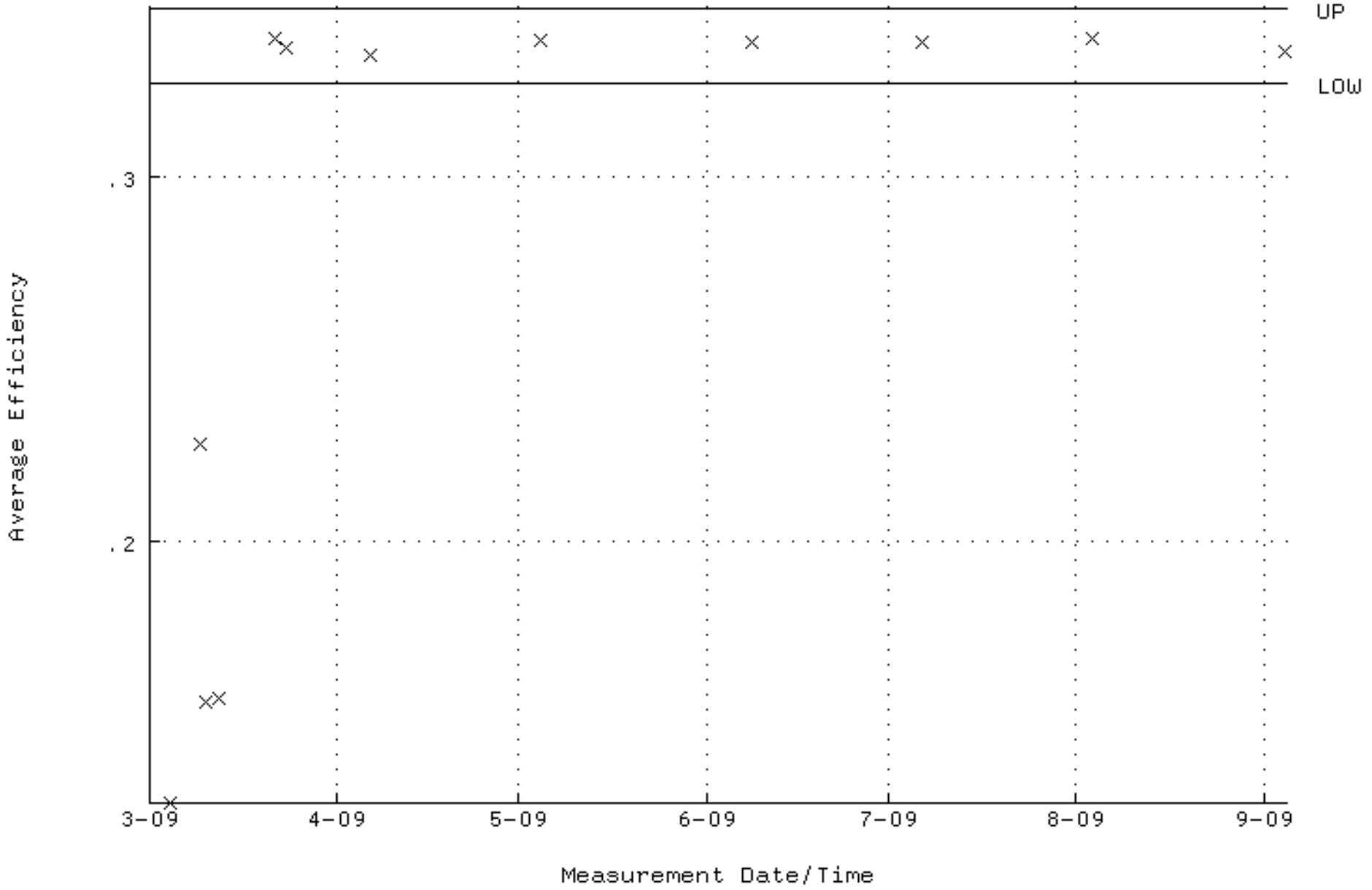
QA filename : DKA100:[ENV_ALPHA.QA.W]W013.QAF;2
Parameter Name : NLACTVTY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 4-MAR-2009 06:58:08 through 4-SEP-2009 12:00:00
Lower/Upper Lmts: 87.7736 through 97.0130



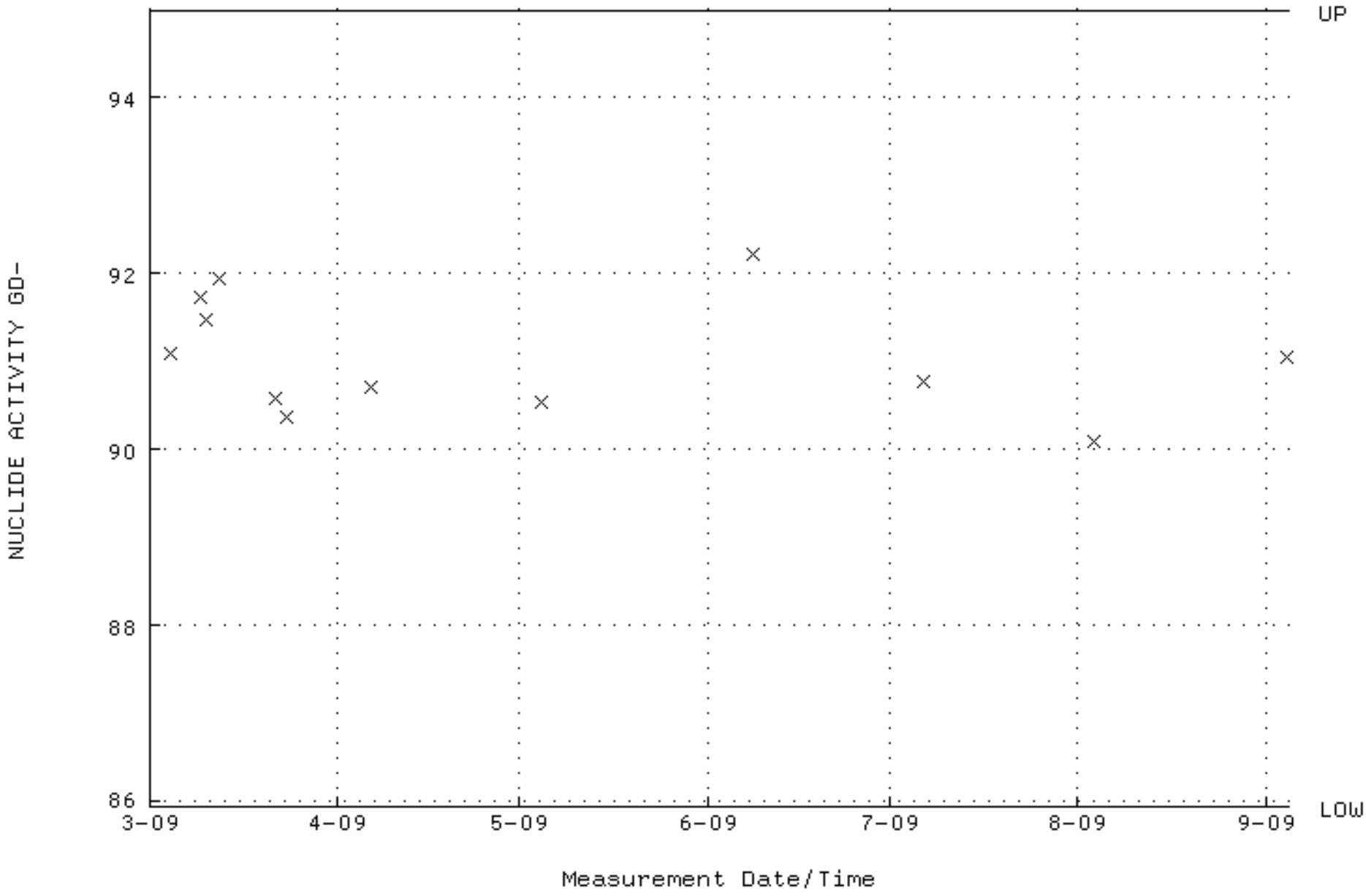
QA filename : DKA100:[ENV_ALPHA.QA.B]B013.QAF;1
Parameter Name : BACKRATE (Background Rate)
Start/End Dates : 1-MAR-2009 17:17:22 through 4-SEP-2009 12:00:00
Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



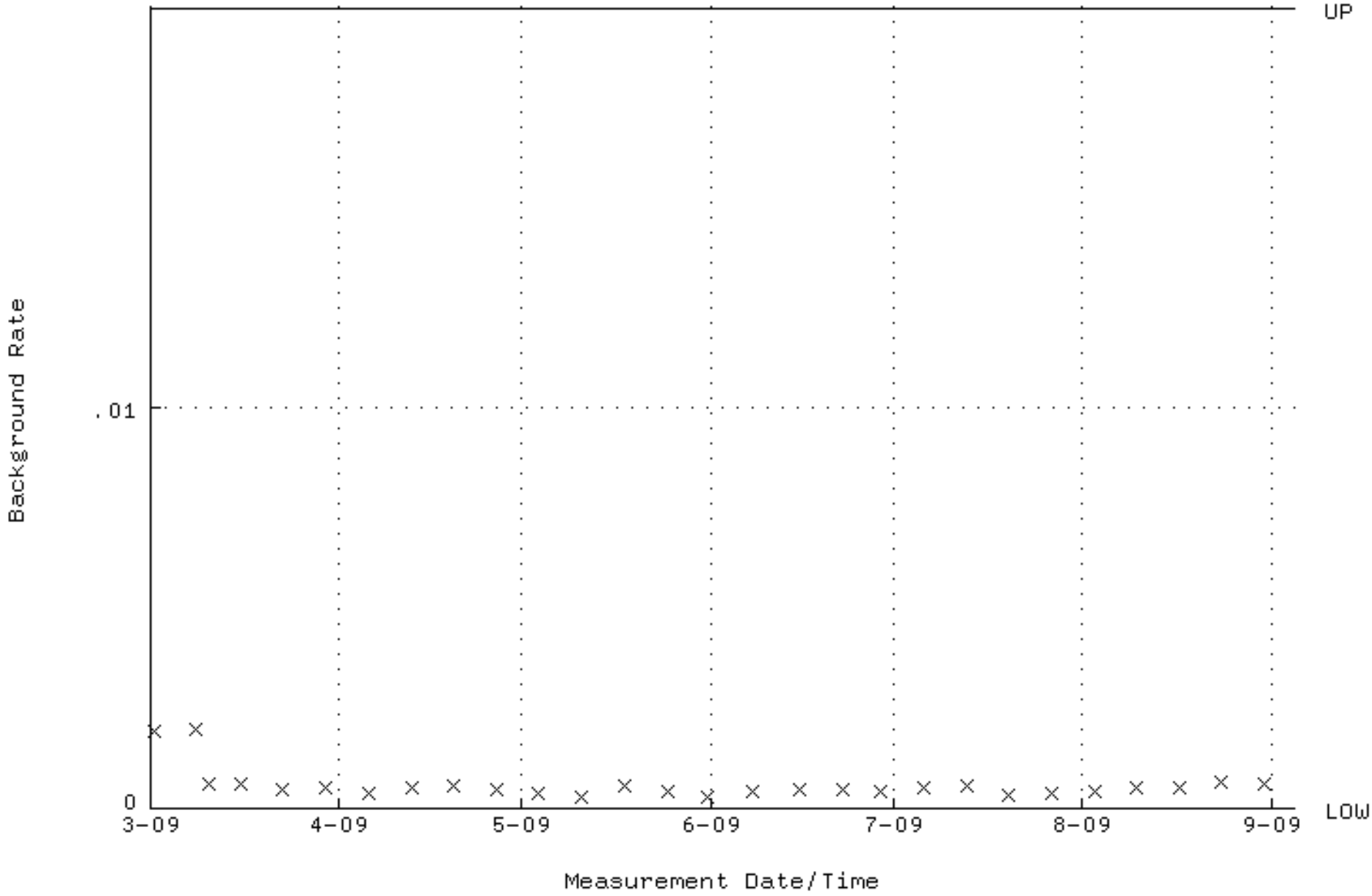
QA filename : DKA100:[ENV_ALPHA.QA.W]W016.QAF;3
Parameter Name : AVRGEFF (Average Efficiency)
Start/End Dates : 4-MAR-2009 06:58:08 through 4-SEP-2009 12:00:00
Lower/Upper Lmts: 0.326058 through 0.346058



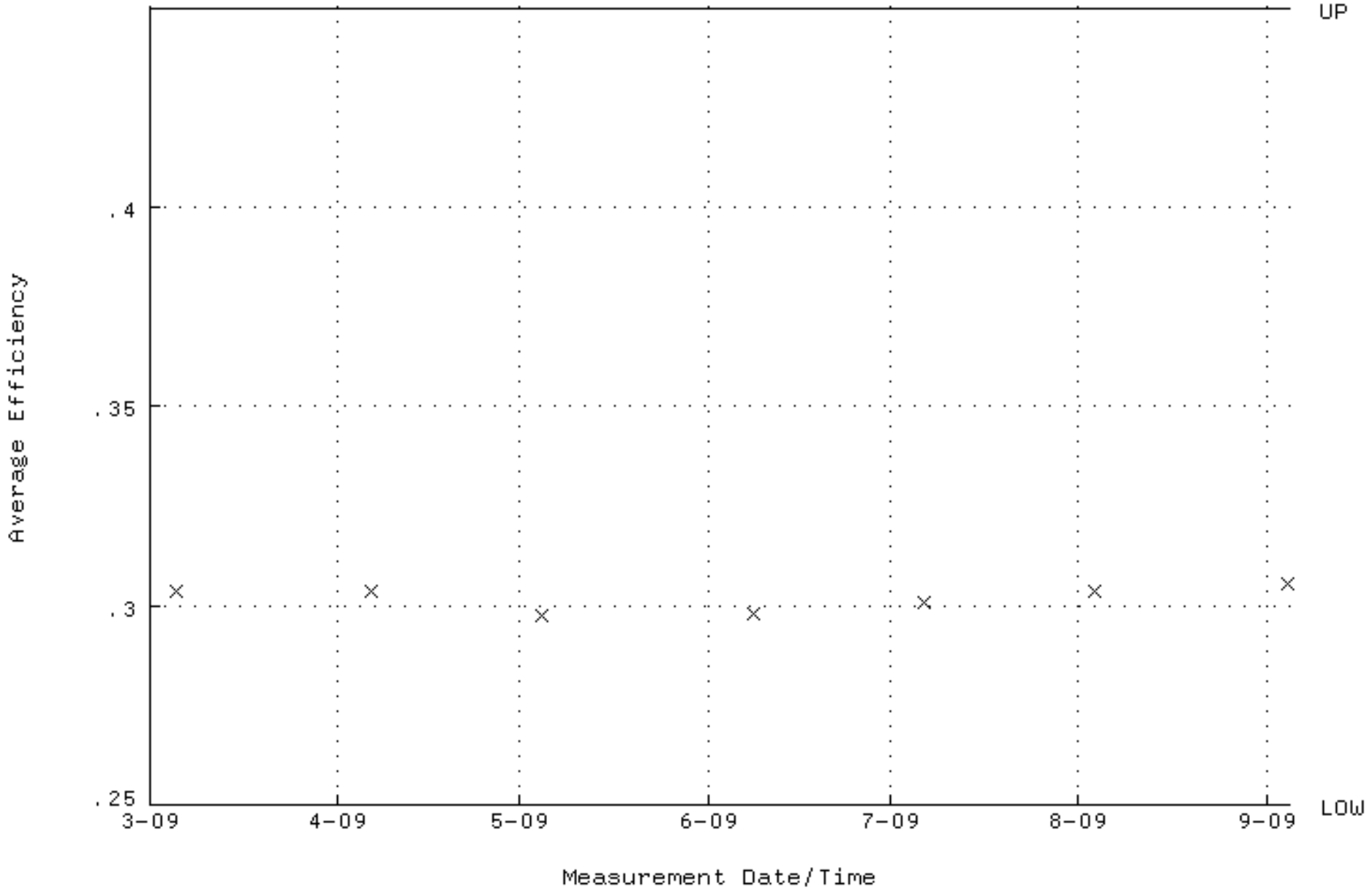
QA filename : DKA100:[ENV_ALPHA.QA.W]W016.QAF;3
Parameter Name : NLACTVTY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 4-MAR-2009 06:58:08 through 4-SEP-2009 12:00:00
Lower/Upper Lmts: 85.9280 through 94.9730



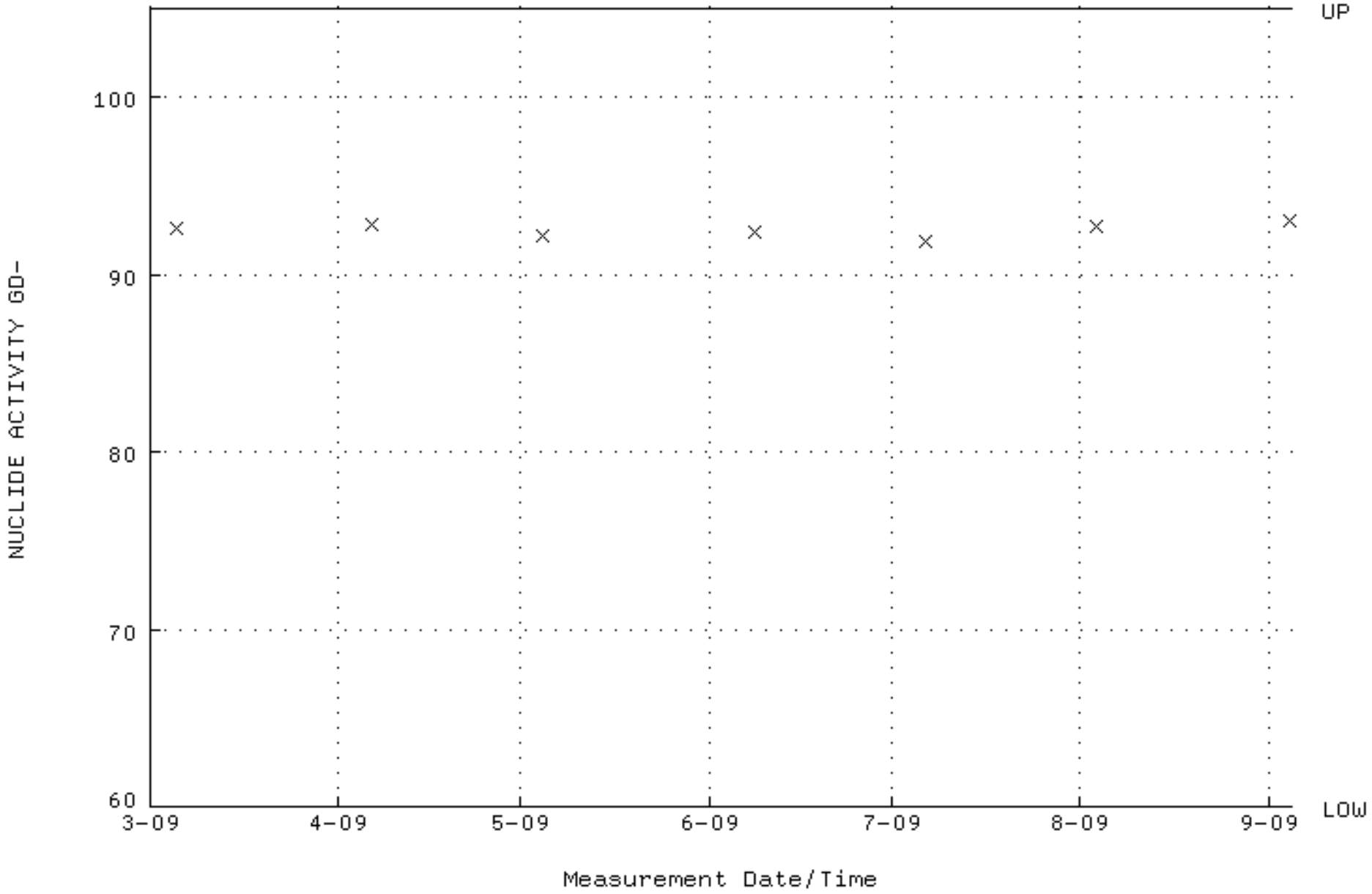
QA filename : DKA100:[ENV_ALPHA.QA.B]B016.QAF;2
Parameter Name : BACKRATE (Background Rate)
Start/End Dates : 1-MAR-2009 17:17:22 through 4-SEP-2009 12:00:00
Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



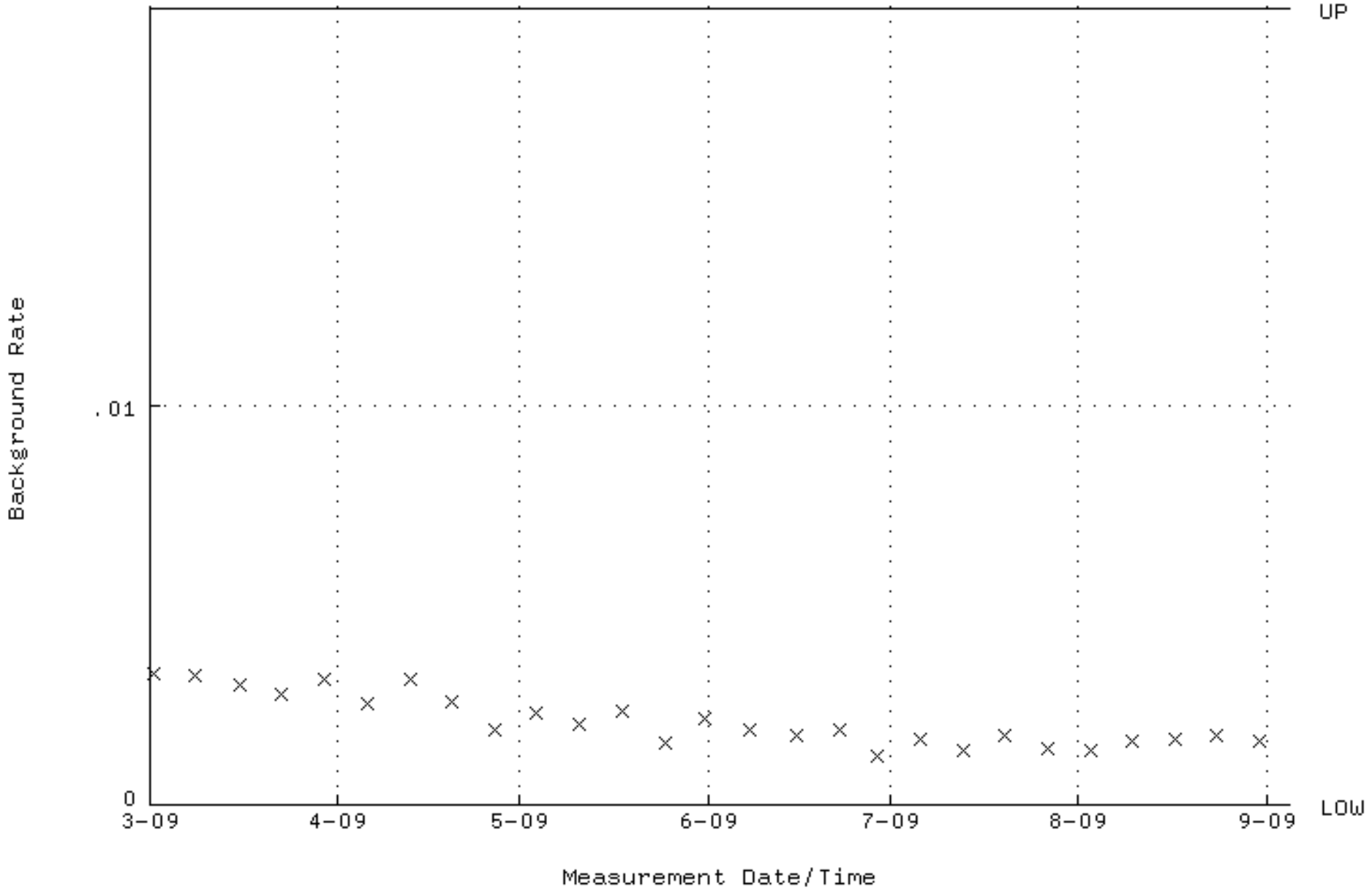
QA filename : DKA100:[ENV_ALPHA.QA.W]W021.QAF;4
Parameter Name : AVRGEFF (Average Efficiency)
Start/End Dates : 5-MAR-2009 07:45:19 through 4-SEP-2009 12:00:00
Lower/Upper Lmts: 0.250000 through 0.450000



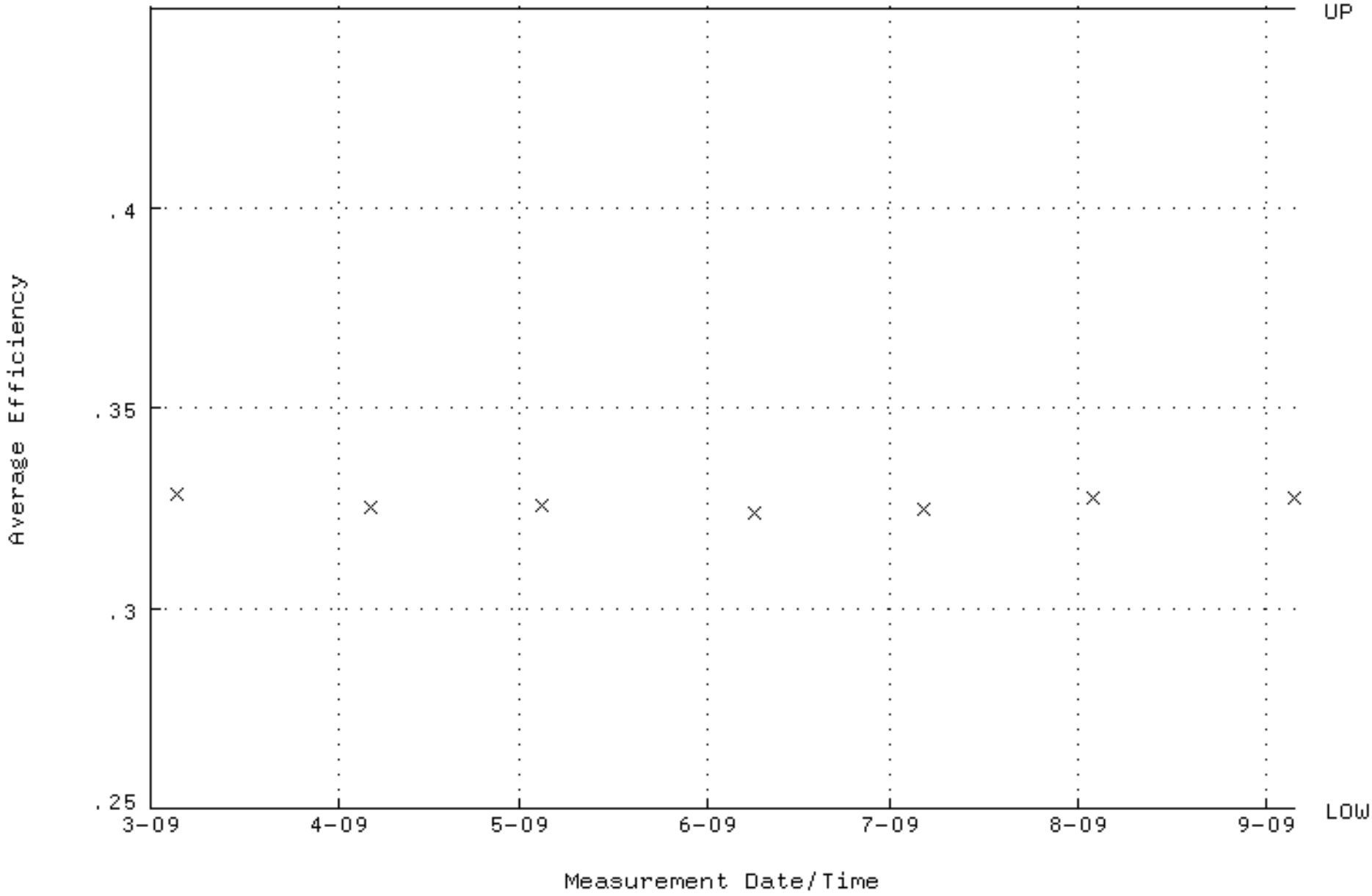
QA filename : DKA100:[ENV_ALPHA.QA.W]W021.QAF;4
Parameter Name : NLACTVTY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 5-MAR-2009 07:45:19 through 4-SEP-2009 12:00:00
Lower/Upper Lmts: 60.0000 through 105.000



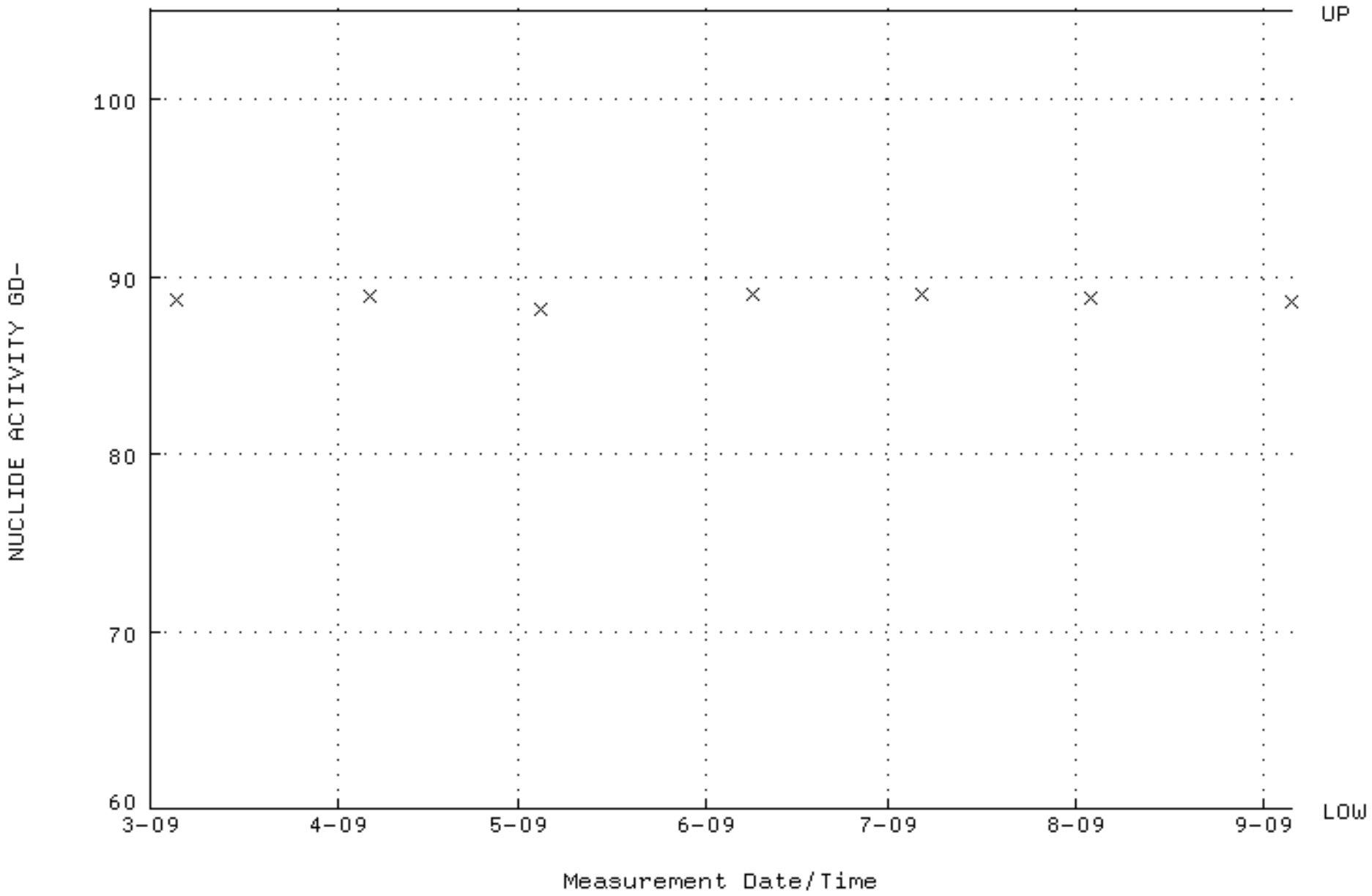
QA filename : DKA100:[ENV_ALPHA.QA.B]B021.QAF;1
Parameter Name : BACKRATE (Background Rate)
Start/End Dates : 1-MAR-2009 17:17:24 through 4-SEP-2009 12:00:00
Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



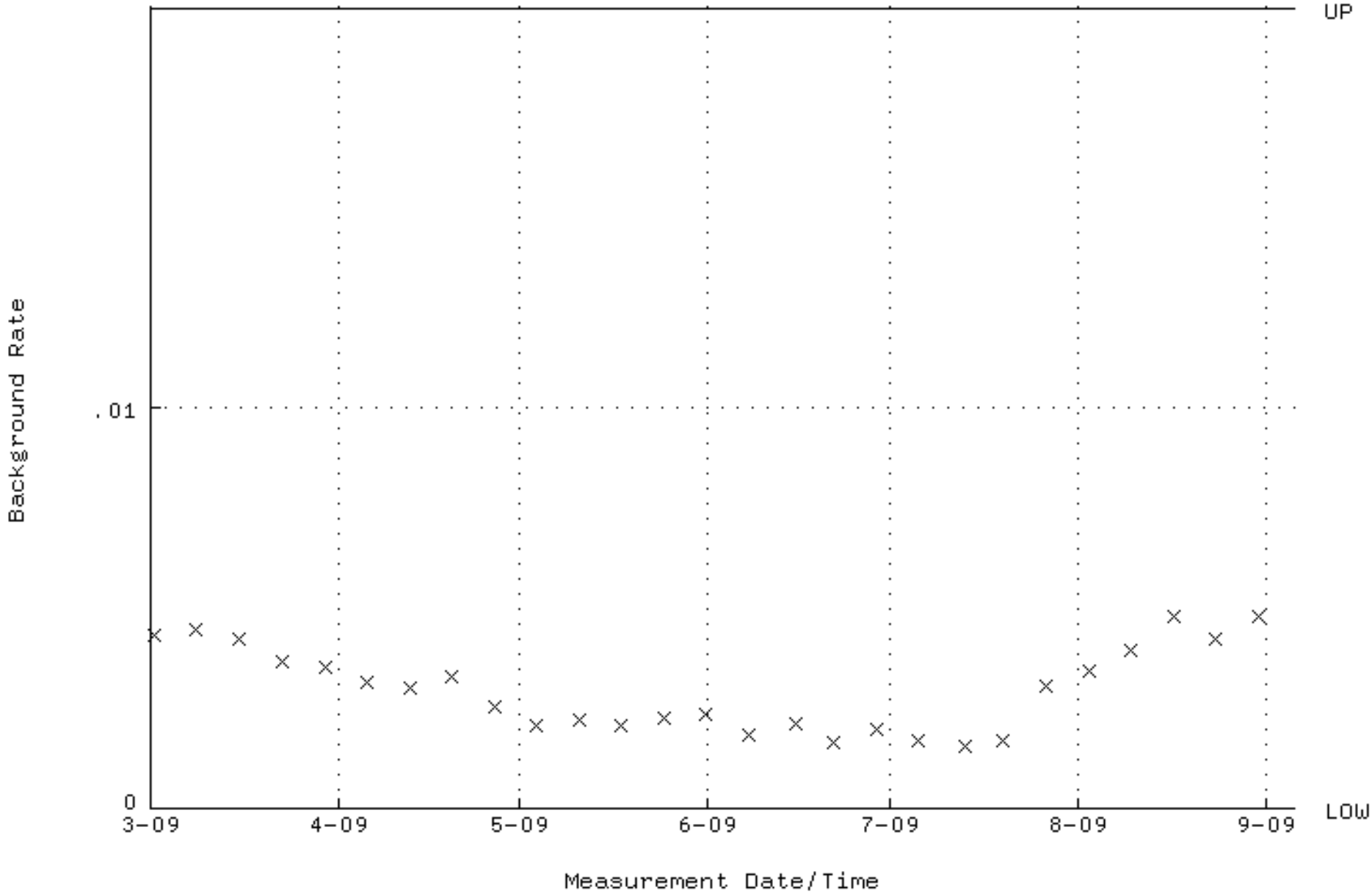
QA filename : DKA100:[ENV_ALPHA.QA.W]W025.QAF;4
Parameter Name : AVRGEFF (Average Efficiency)
Start/End Dates : 5-MAR-2009 07:45:20 through 5-SEP-2009 12:00:00
Lower/Upper Lmts: 0.250000 through 0.450000



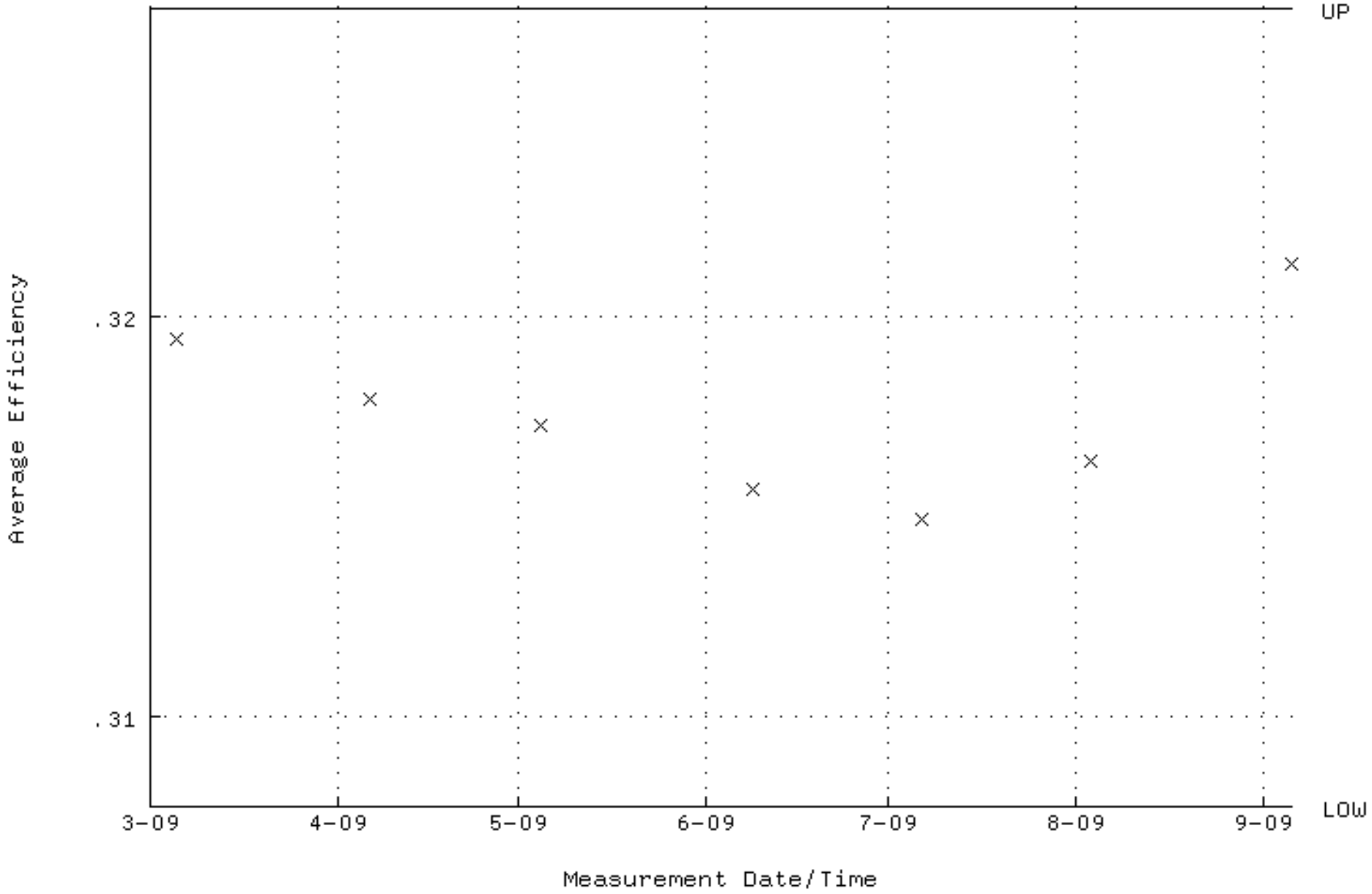
QA filename : DKA100:[ENV_ALPHA.QA.W]W025.QAF;4
Parameter Name : NLACTVTY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 5-MAR-2009 07:45:20 through 5-SEP-2009 12:00:00
Lower/Upper Lmts: 60.0000 through 105.000



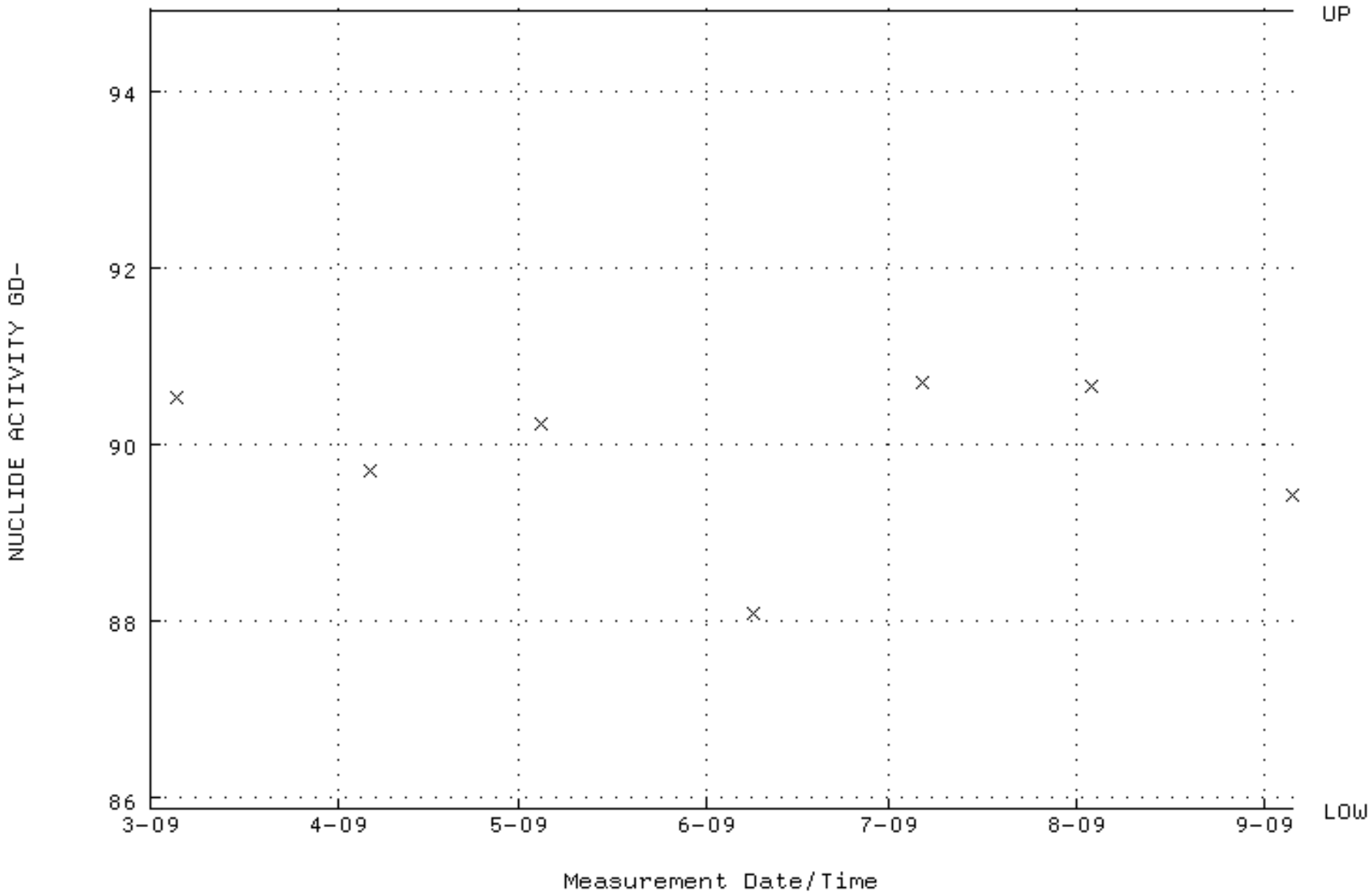
QA filename : DKA100:[ENV_ALPHA.QA.B]B025.QAF;2
Parameter Name : BACKRATE (Background Rate)
Start/End Dates : 1-MAR-2009 17:17:25 through 5-SEP-2009 12:00:00
Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



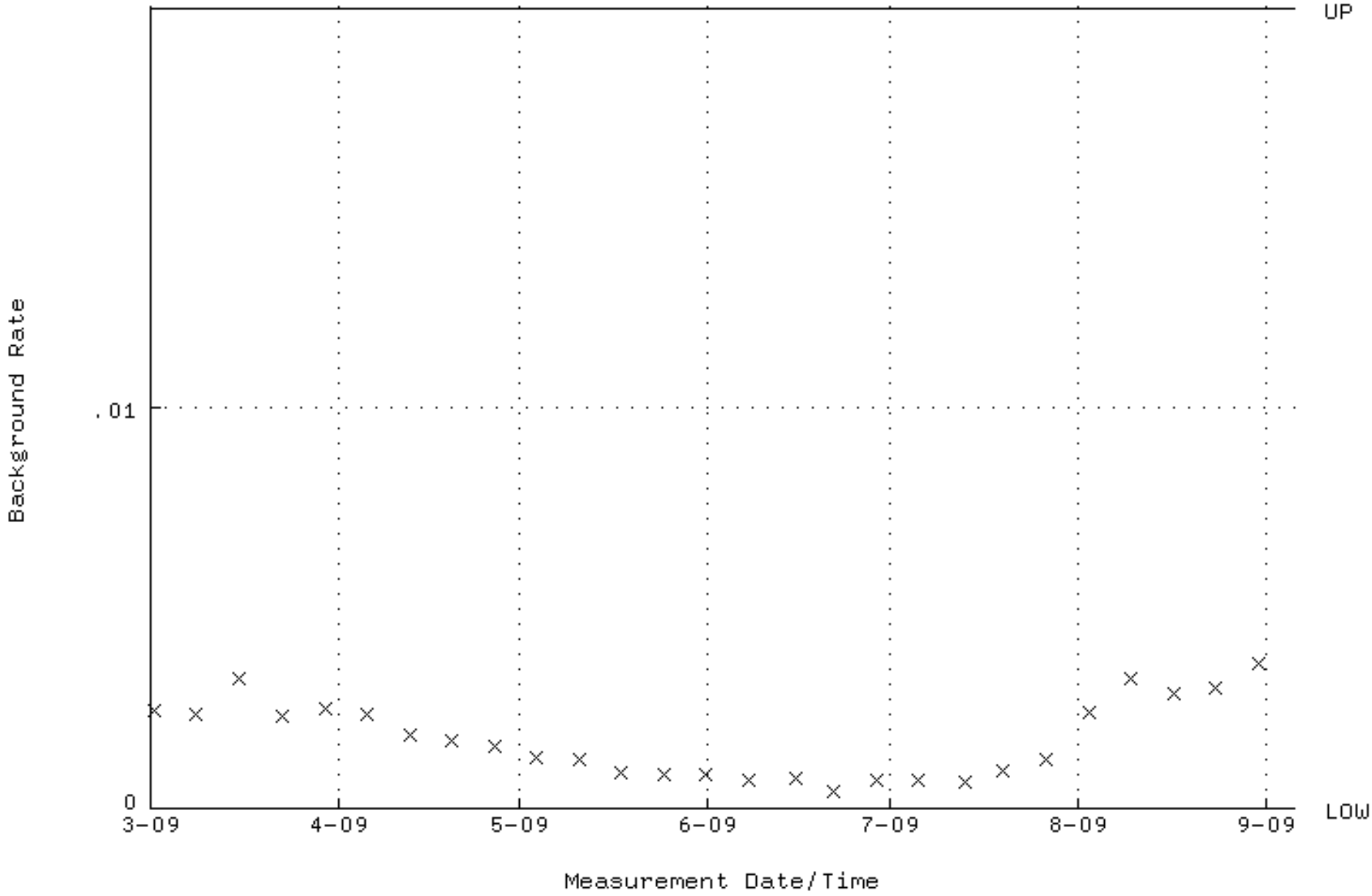
QA filename : DKA100:[ENV_ALPHA.QA.W]W026.QAF;3
Parameter Name : AVRGEFF (Average Efficiency)
Start/End Dates : 5-MAR-2009 07:45:20 through 5-SEP-2009 12:00:00
Lower/Upper Lmts: 0.307728 through 0.327728



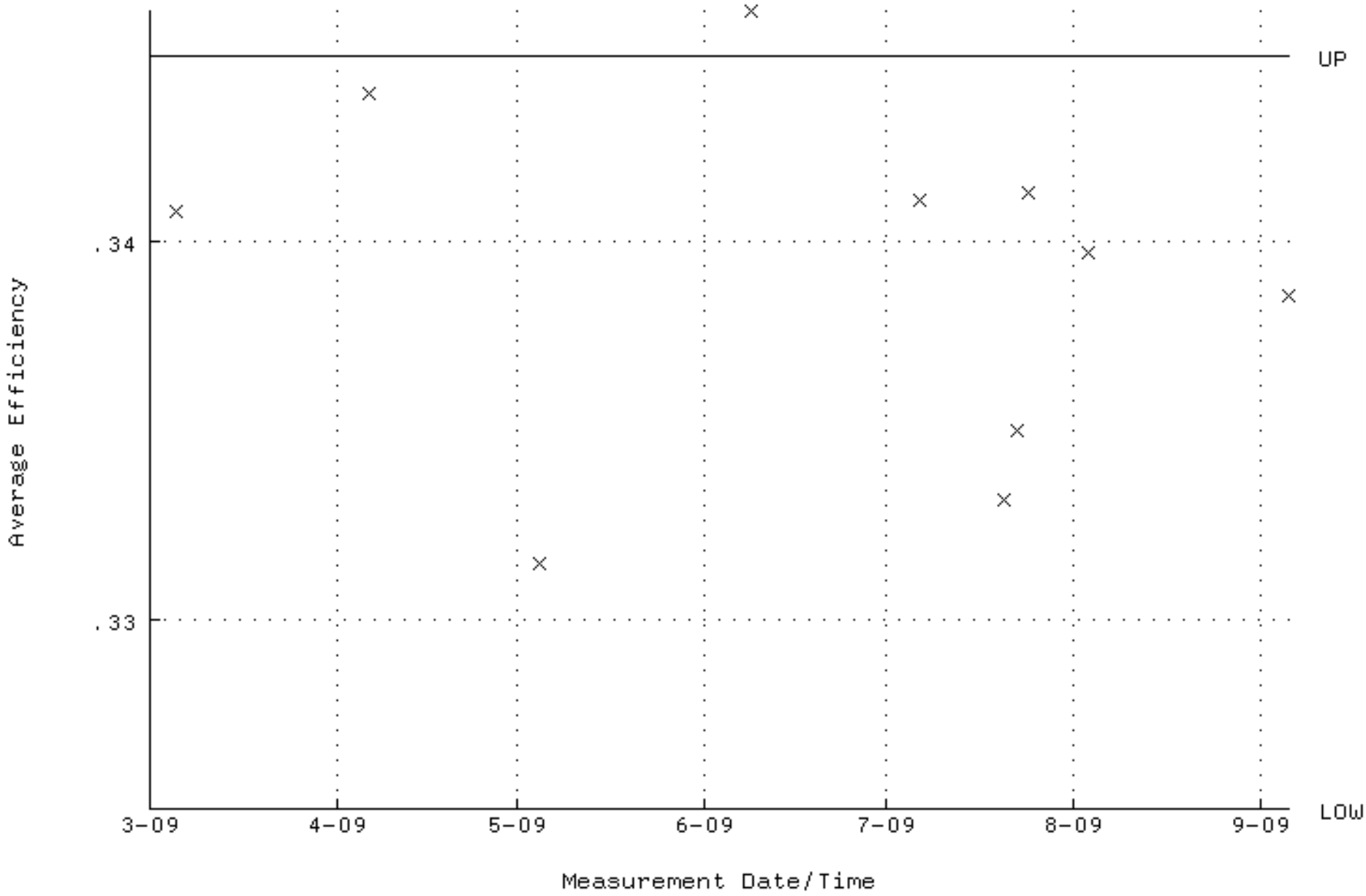
QA filename : DKA100:[ENV_ALPHA.QA.W]W026.QAF;3
Parameter Name : NLACTVTY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 5-MAR-2009 07:45:20 through 5-SEP-2009 12:00:00
Lower/Upper Lmts: 85.8763 through 94.9159



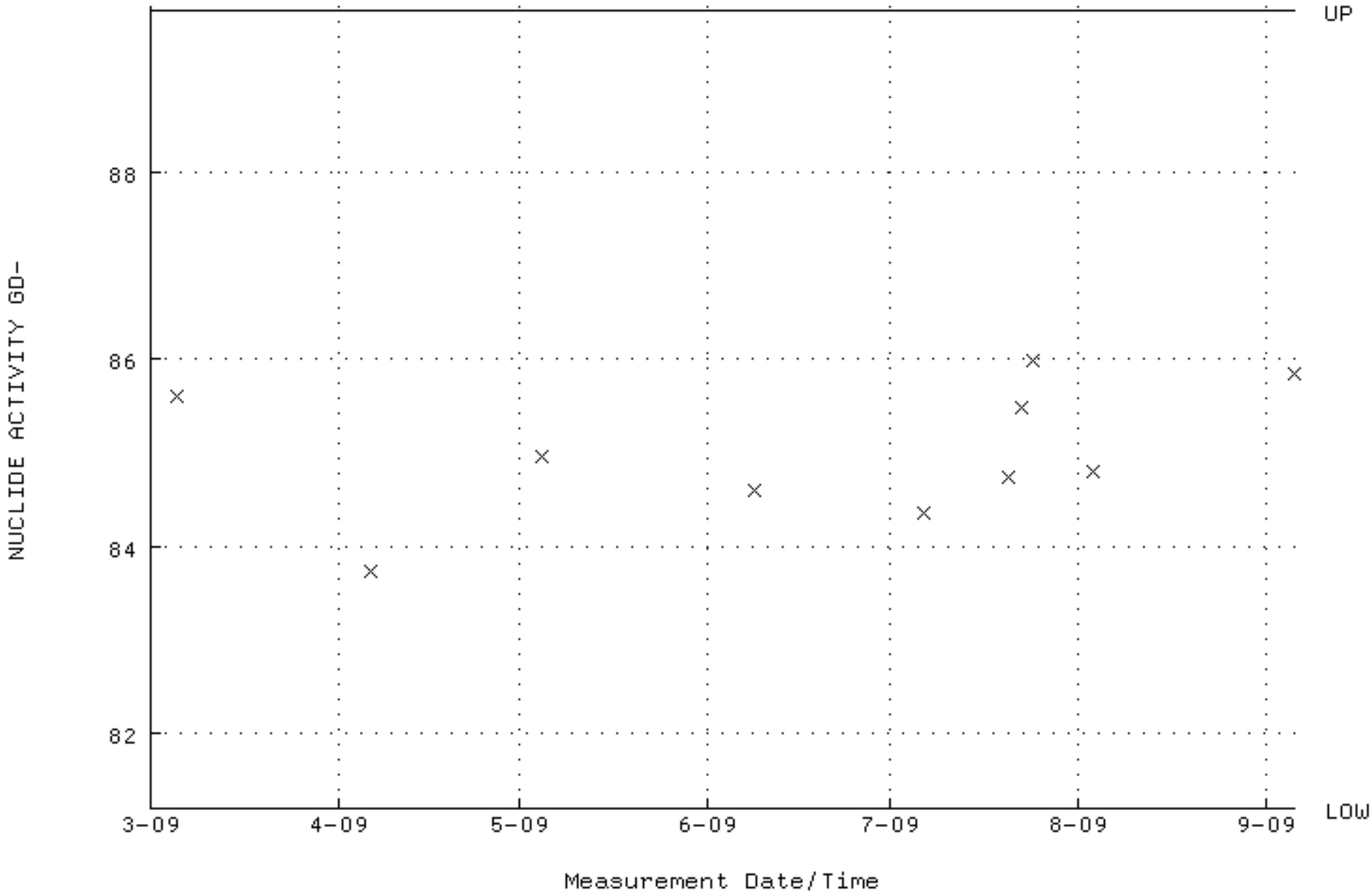
QA filename : DKA100:[ENV_ALPHA.QA.B]B026.QAF;1
Parameter Name : BACKRATE (Background Rate)
Start/End Dates : 1-MAR-2009 17:17:25 through 5-SEP-2009 12:00:00
Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



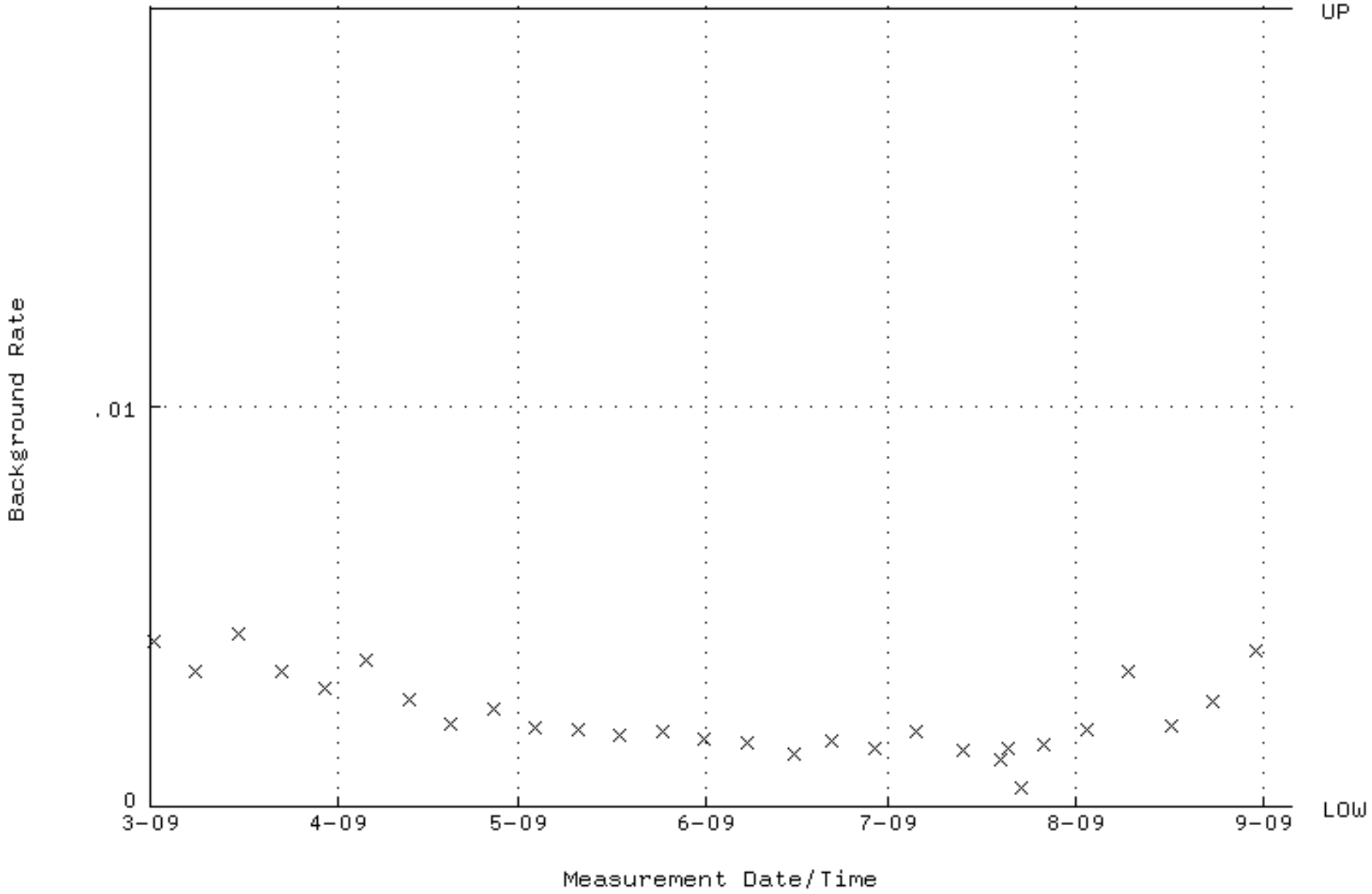
QA filename : DKA100:[ENV_ALPHA.QA.W]W027.QAF;4
Parameter Name : AVRGEFF (Average Efficiency)
Start/End Dates : 5-MAR-2009 07:45:20 through 5-SEP-2009 12:00:00
Lower/Upper Lmts: 0.324980 through 0.344980



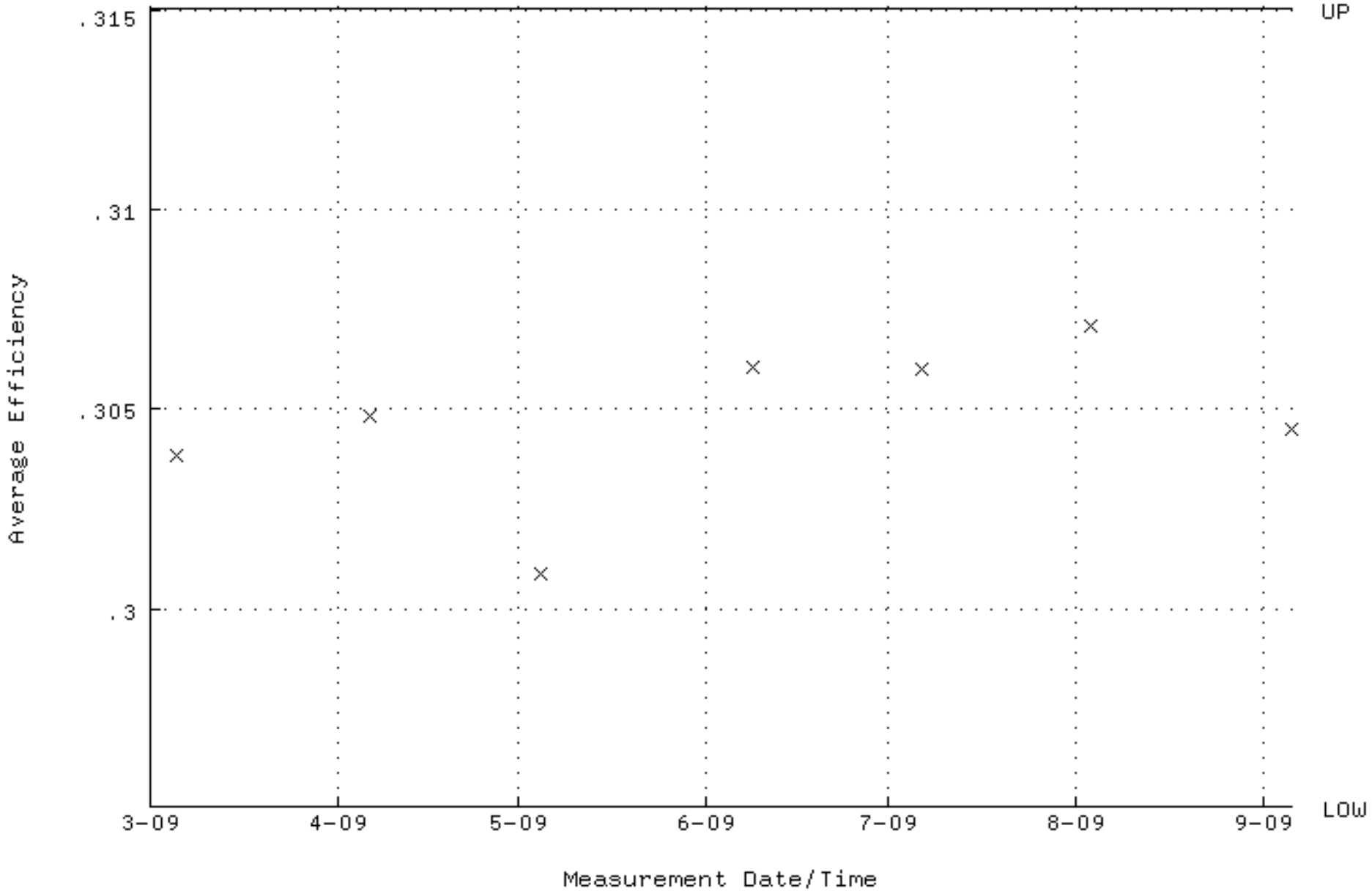
QA filename : DKA100:[ENV_ALPHA.QA.W]W027.QAF;4
Parameter Name : NLACTVTY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 5-MAR-2009 07:45:20 through 5-SEP-2009 12:00:00
Lower/Upper Lmts: 81.2030 through 89.7506



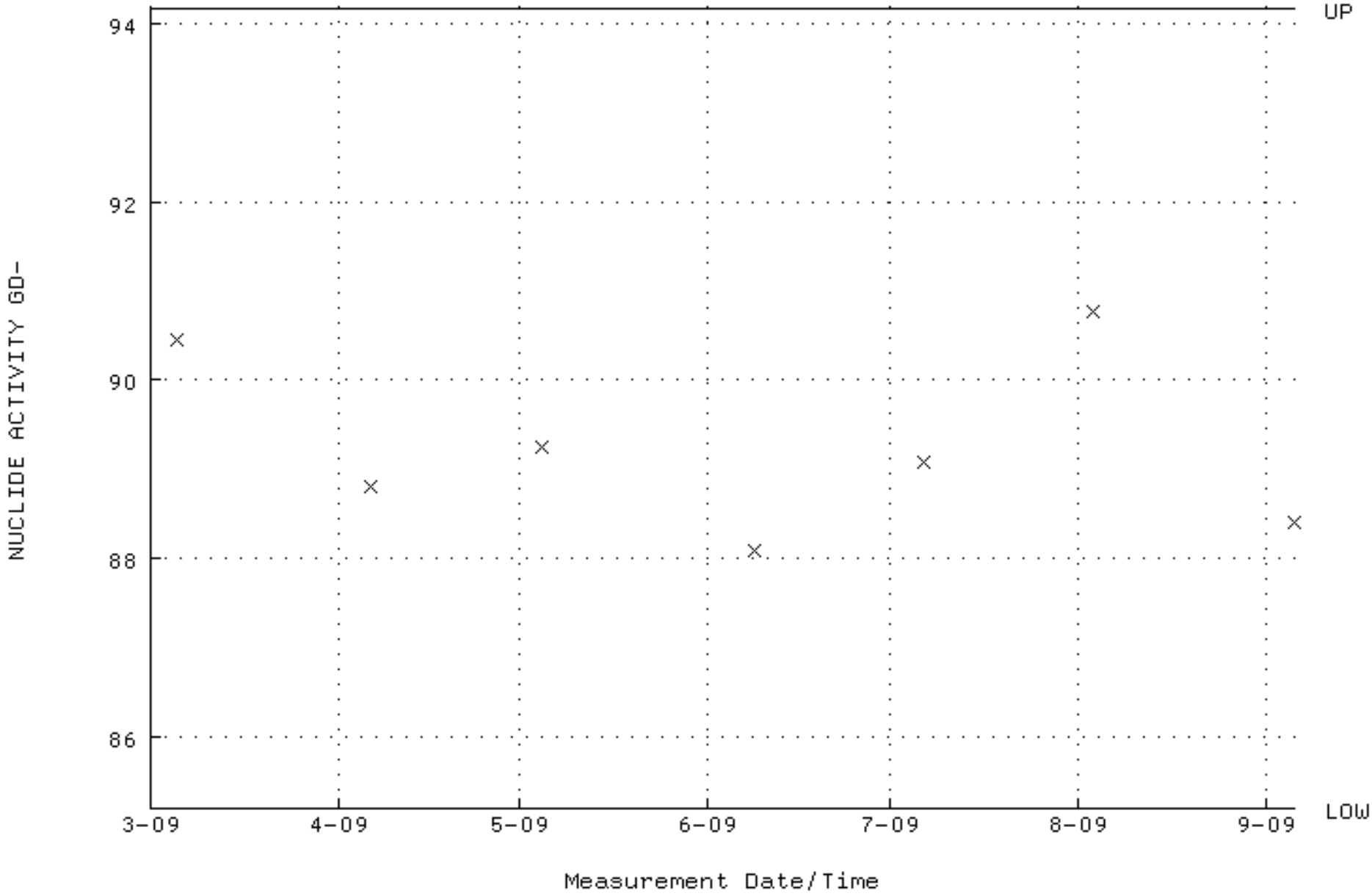
QA filename : DKA100:[ENV_ALPHA.QA.B]B027.QAF;1
Parameter Name : BACKRATE (Background Rate)
Start/End Dates : 1-MAR-2009 17:17:25 through 5-SEP-2009 12:00:00
Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



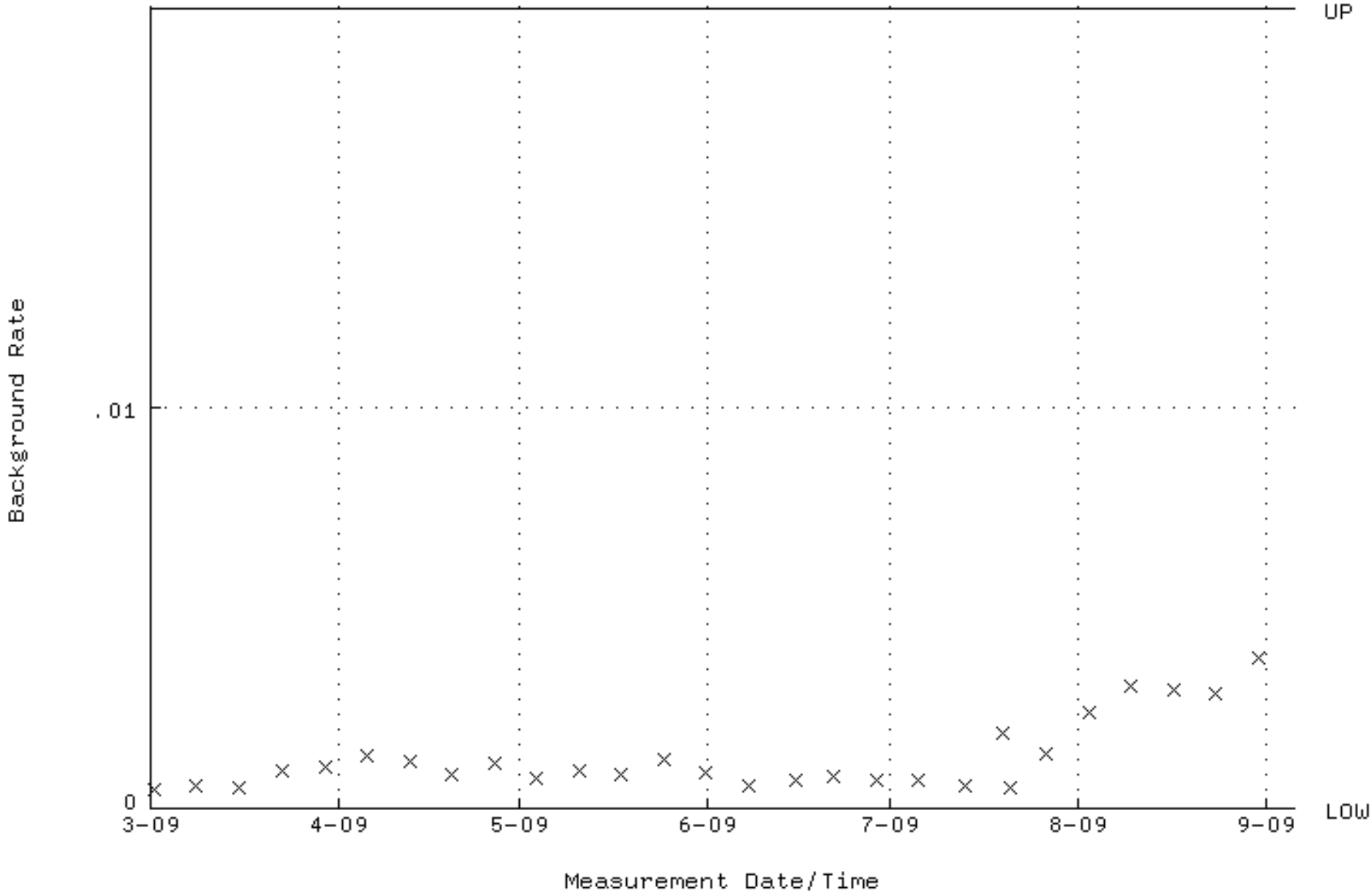
QA filename : DKA100:[ENV_ALPHA.QA.W]W028.QAF;4
Parameter Name : AVRGEFF (Average Efficiency)
Start/End Dates : 5-MAR-2009 07:45:20 through 5-SEP-2009 12:00:00
Lower/Upper Lmts: 0.295040 through 0.315040



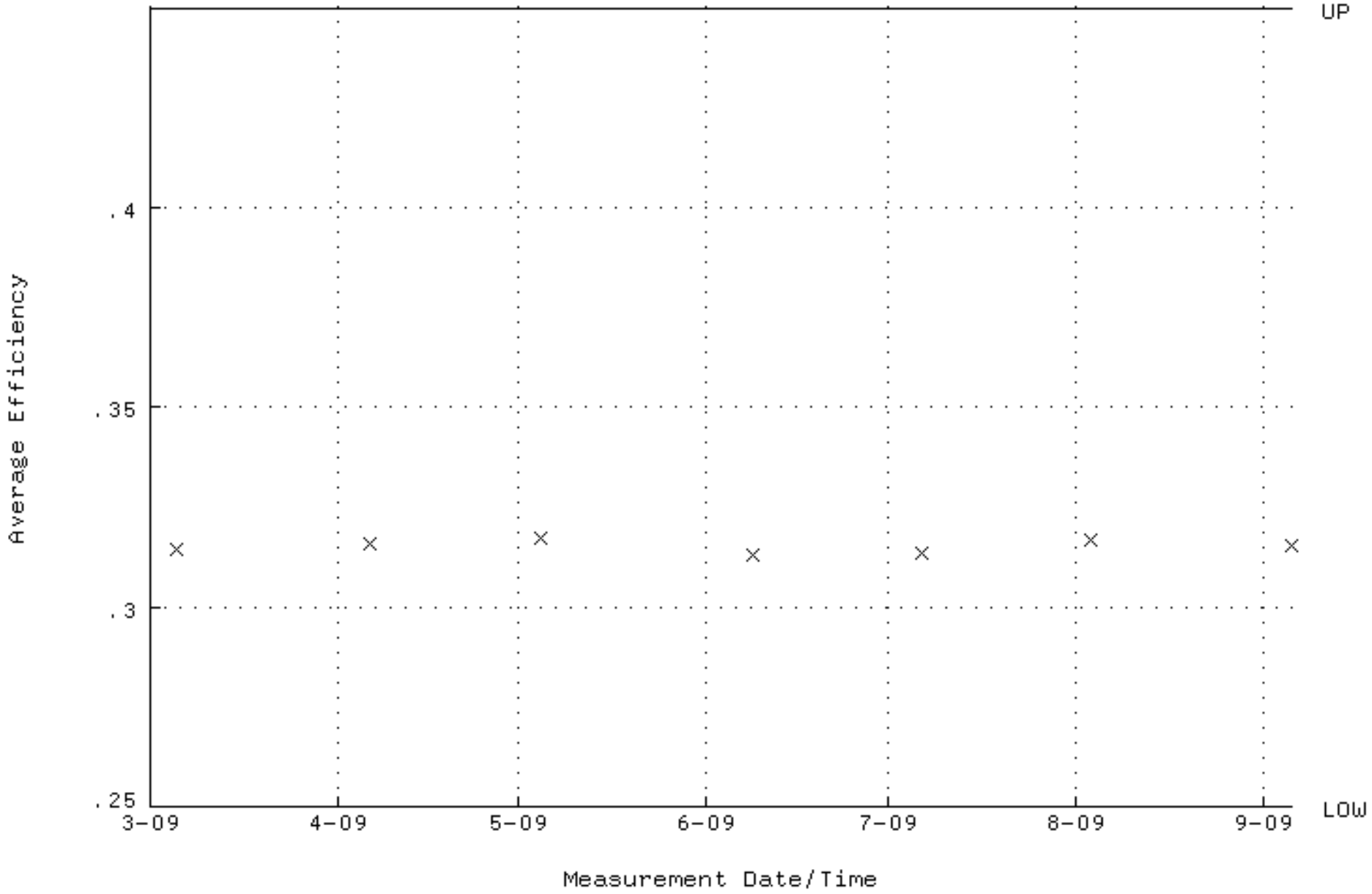
QA filename : DKA100:[ENV_ALPHA.QA.W]W028.QAF;4
Parameter Name : NLACTVTY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 5-MAR-2009 07:45:20 through 5-SEP-2009 12:00:00
Lower/Upper Lmts: 85.1965 through 94.1645



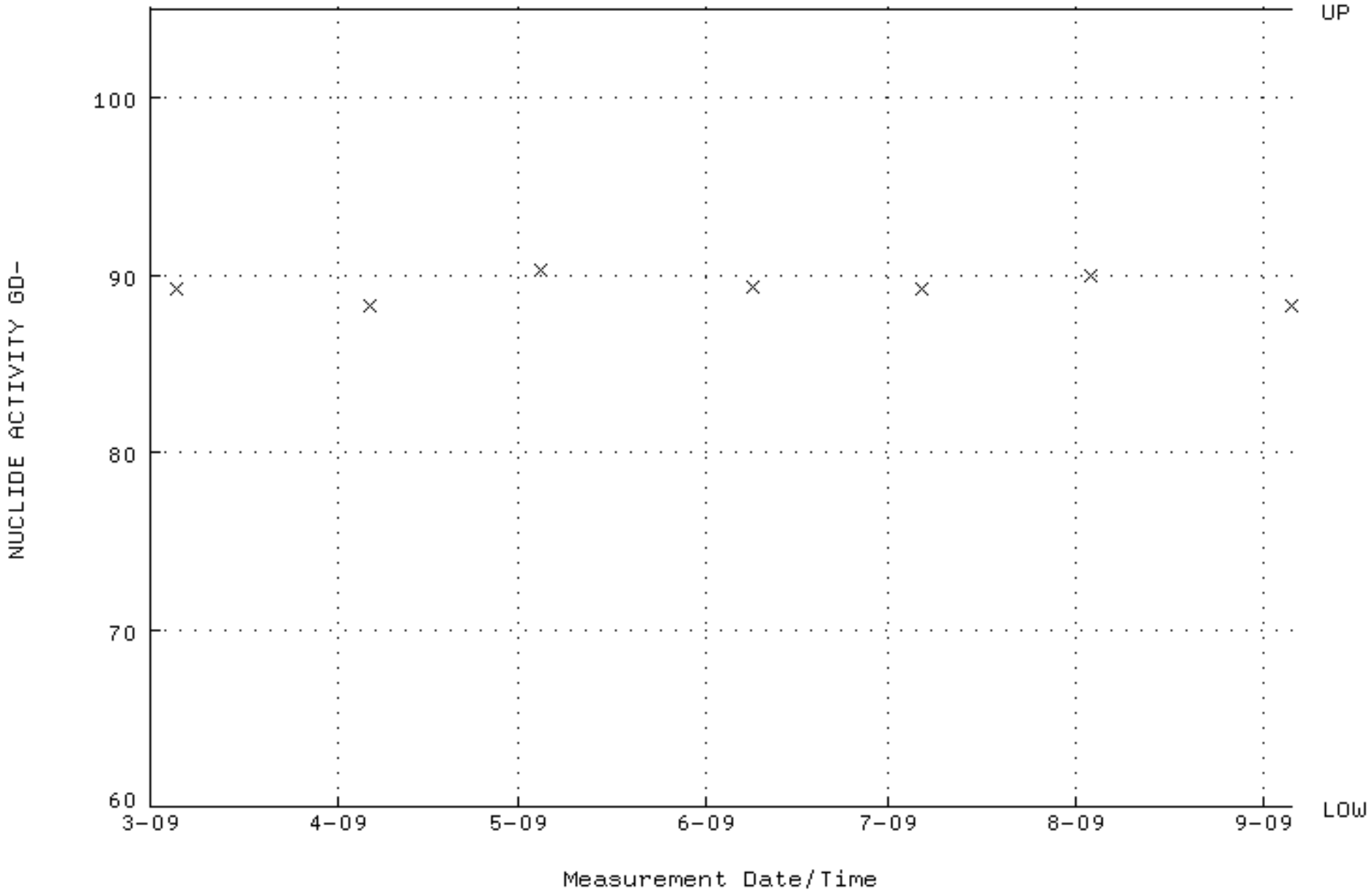
QA filename : DKA100:[ENV_ALPHA.QA.B]B028.QAF;1
Parameter Name : BACKRATE (Background Rate)
Start/End Dates : 1-MAR-2009 17:17:25 through 5-SEP-2009 12:00:00
Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



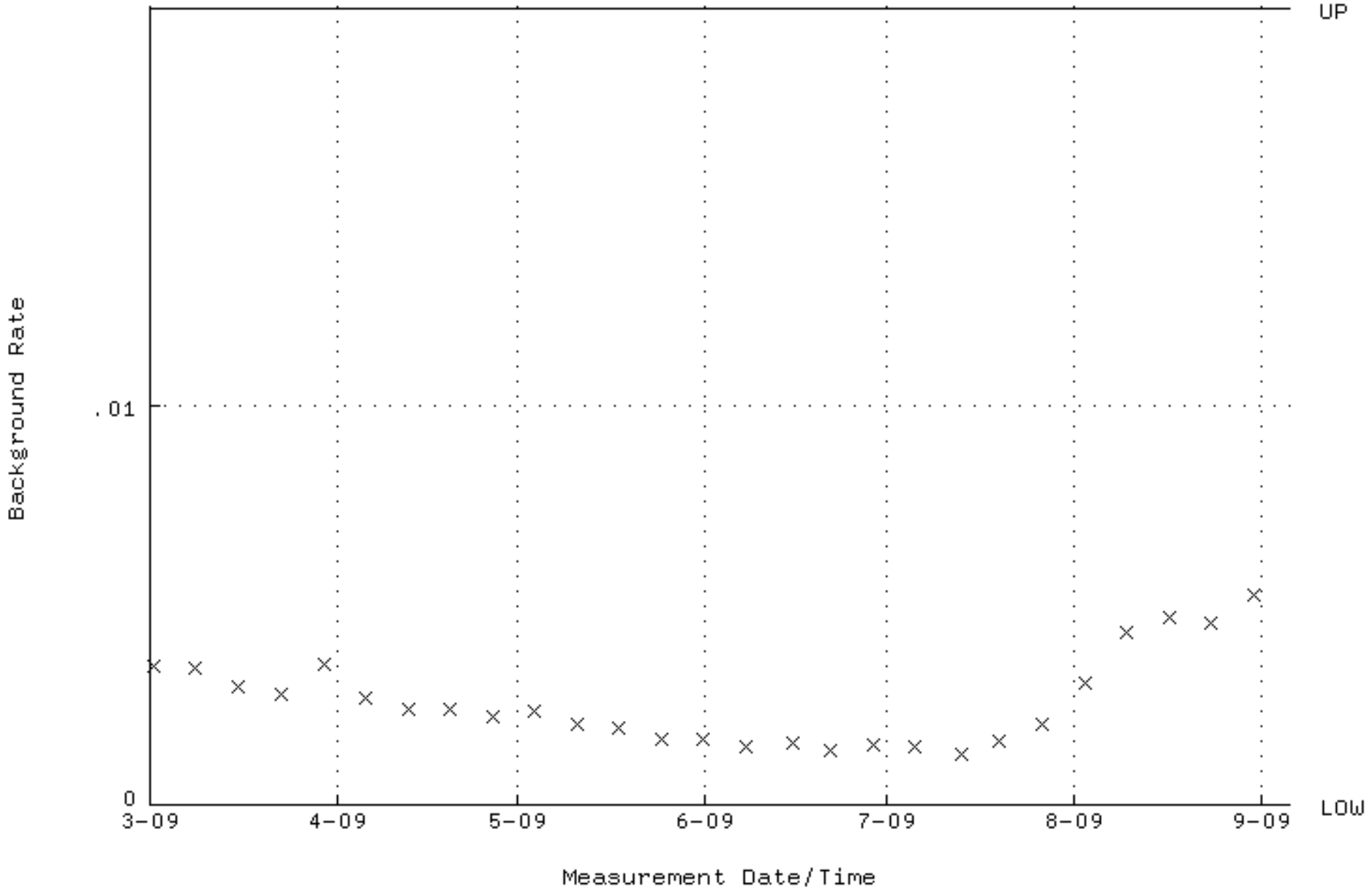
QA filename : DKA100:[ENV_ALPHA.QA.W]W029.QAF;6
Parameter Name : AVRGEFF (Average Efficiency)
Start/End Dates : 5-MAR-2009 07:45:20 through 5-SEP-2009 12:00:00
Lower/Upper Lmts: 0.250000 through 0.450000



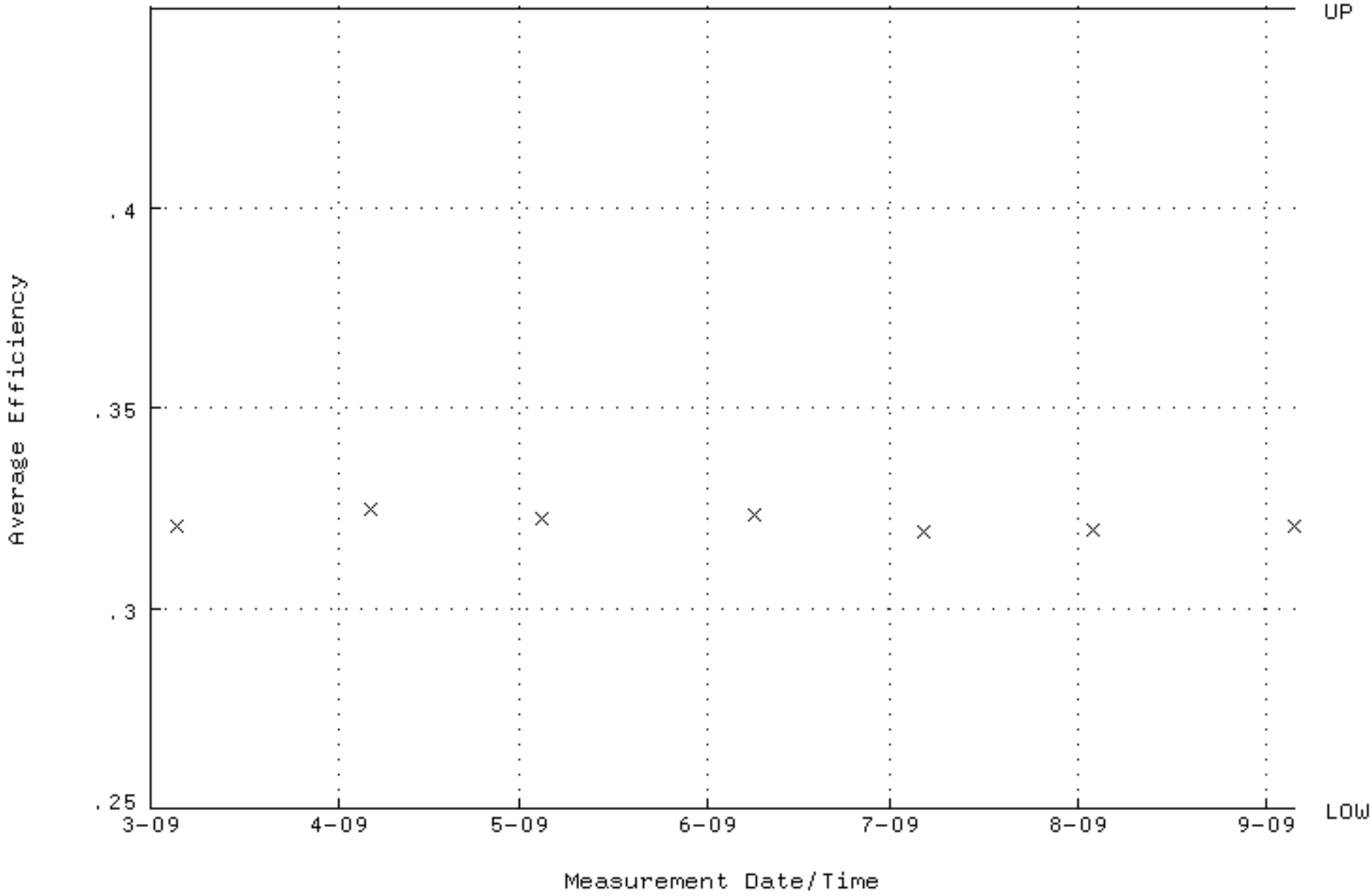
QA filename : DKA100:[ENV_ALPHA.QA.W]W029.QAF;6
Parameter Name : NLACTVTY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 5-MAR-2009 07:45:20 through 5-SEP-2009 12:00:00
Lower/Upper Lmts: 60.0000 through 105.000



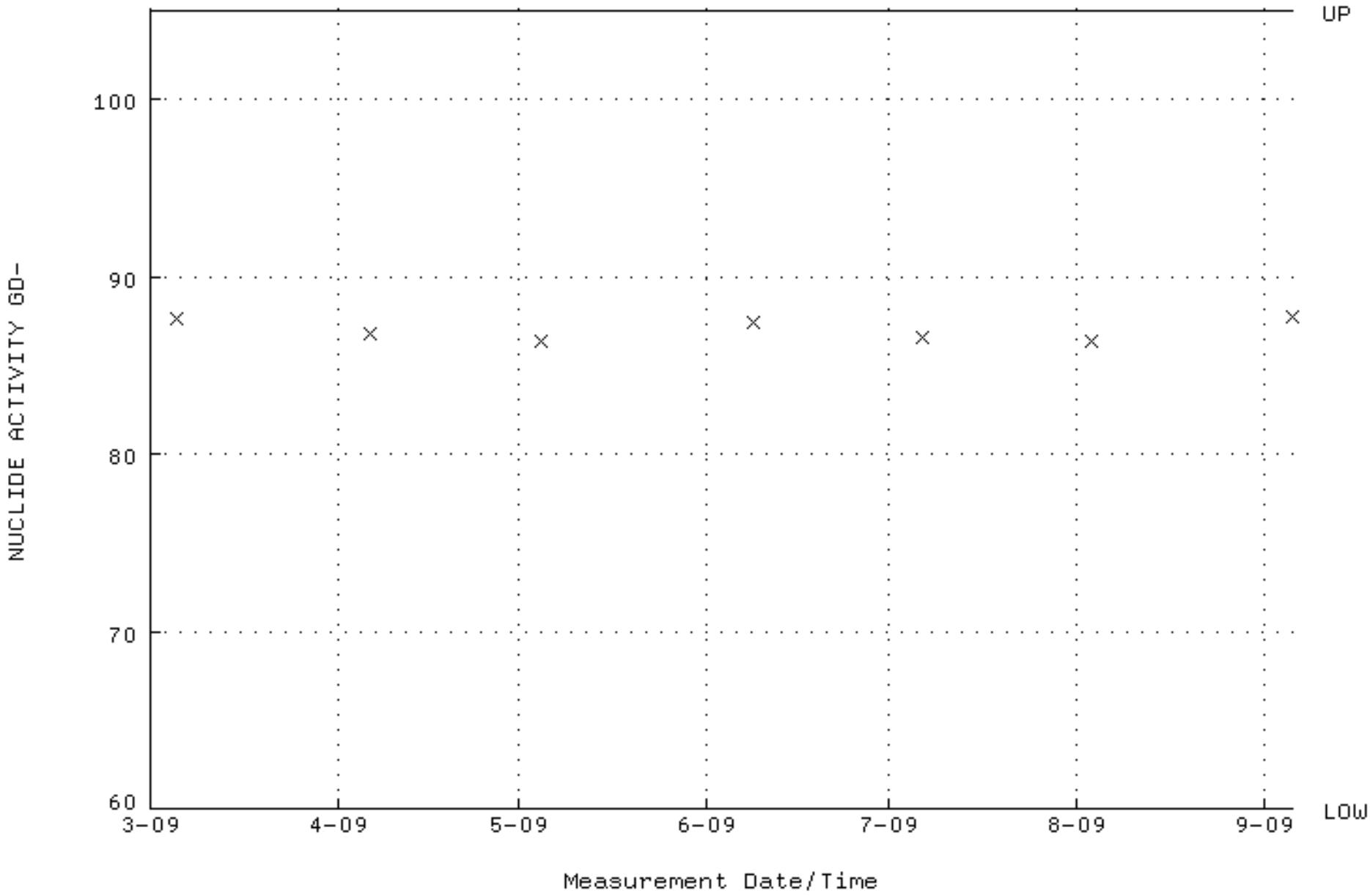
QA filename : DKA100:[ENV_ALPHA.QA.B]B029.QAF;1
Parameter Name : BACKRATE (Background Rate)
Start/End Dates : 1-MAR-2009 17:17:25 through 5-SEP-2009 12:00:00
Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



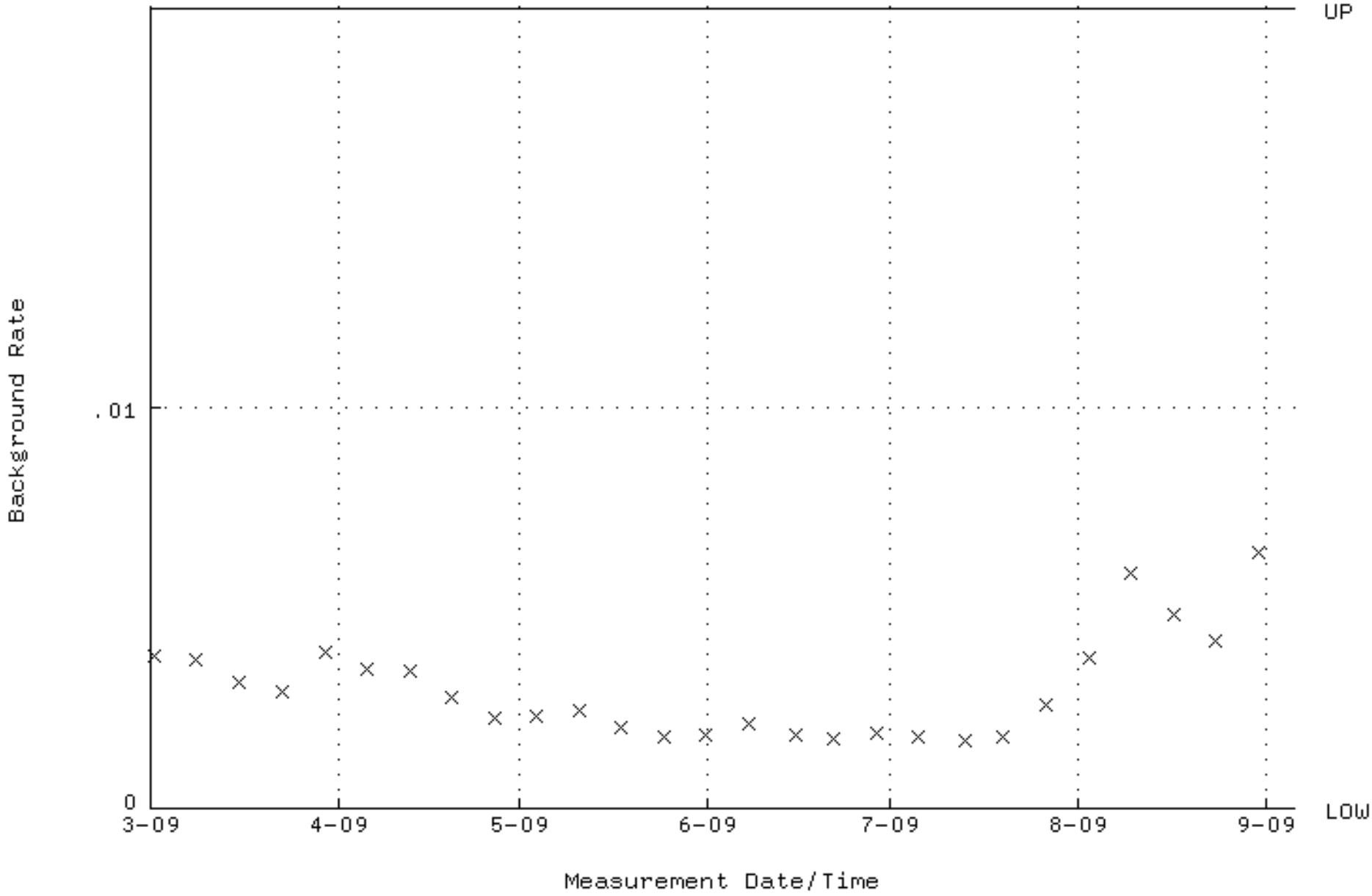
QA filename : DKA100:[ENV_ALPHA.QA.W]W030.QAF;3
Parameter Name : AVRGEFF (Average Efficiency)
Start/End Dates : 5-MAR-2009 07:45:20 through 5-SEP-2009 12:00:00
Lower/Upper Lmts: 0.250000 through 0.450000



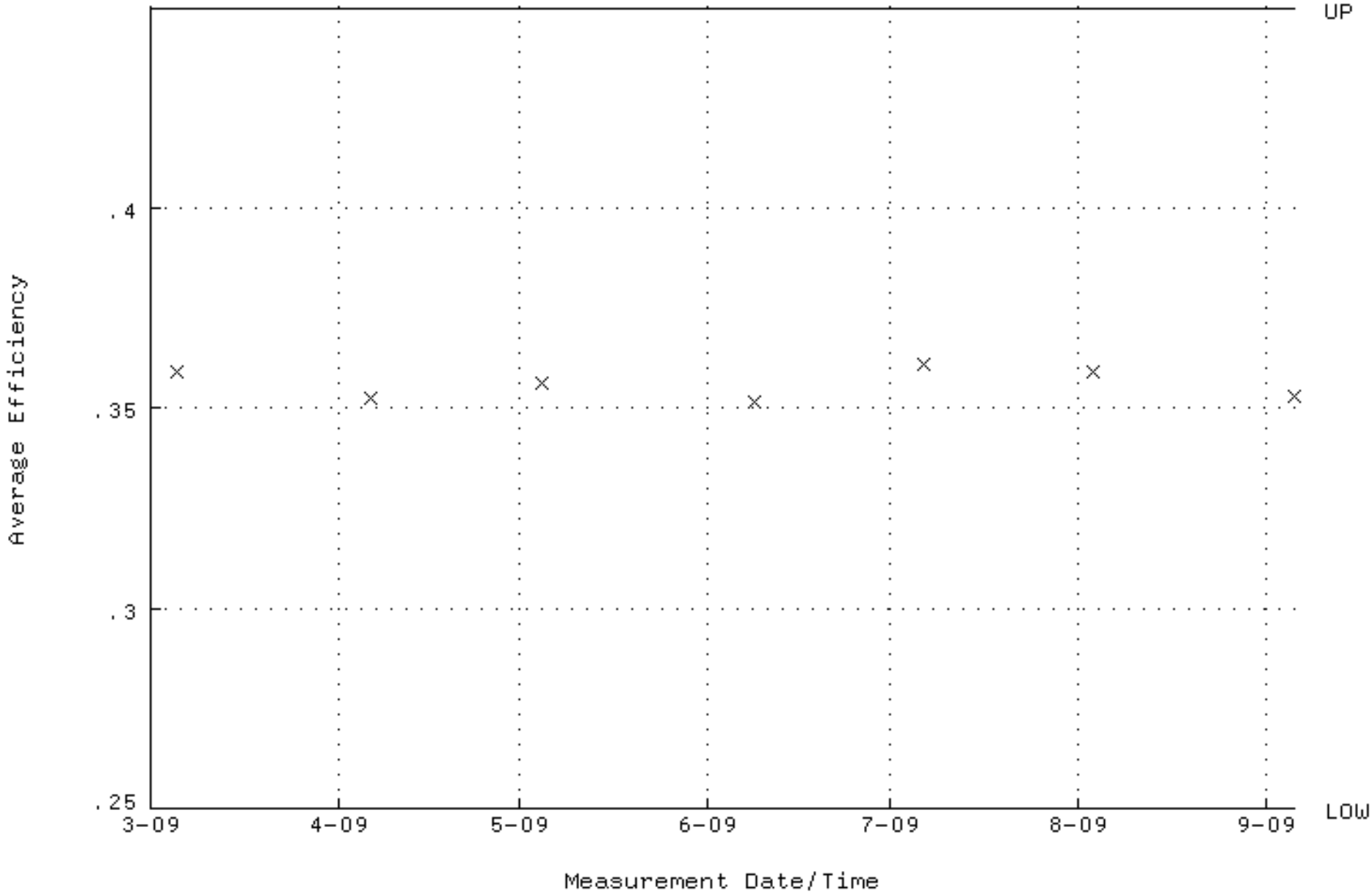
QA filename : DKA100:[ENV_ALPHA.QA.W]W030.QAF;3
Parameter Name : NLACTVTY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 5-MAR-2009 07:45:20 through 5-SEP-2009 12:00:00
Lower/Upper Lmts: 60.0000 through 105.000



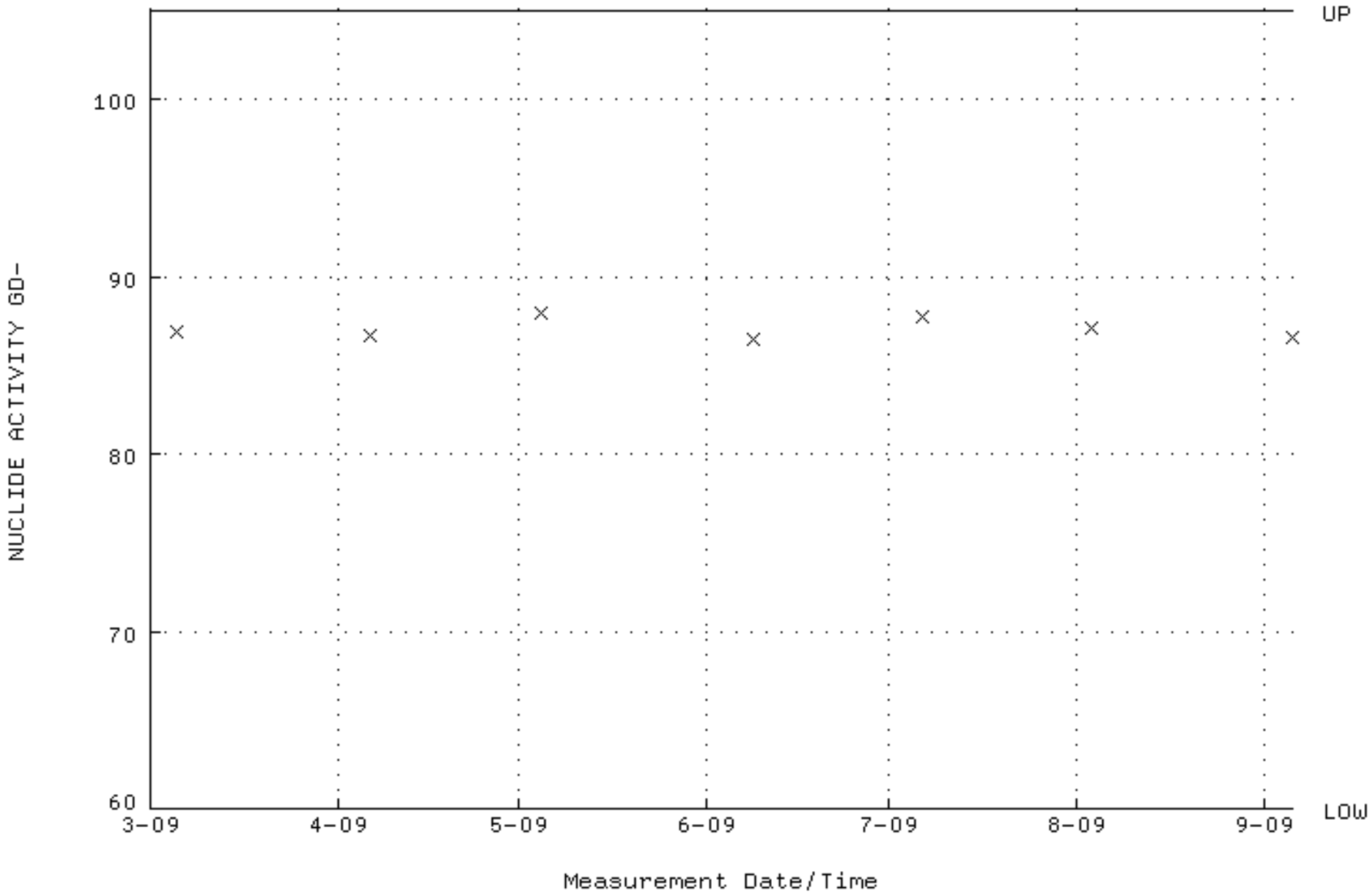
QA filename : DKA100:[ENV_ALPHA.QA.B]B030.QAF;1
Parameter Name : BACKRATE (Background Rate)
Start/End Dates : 1-MAR-2009 17:17:25 through 5-SEP-2009 12:00:00
Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



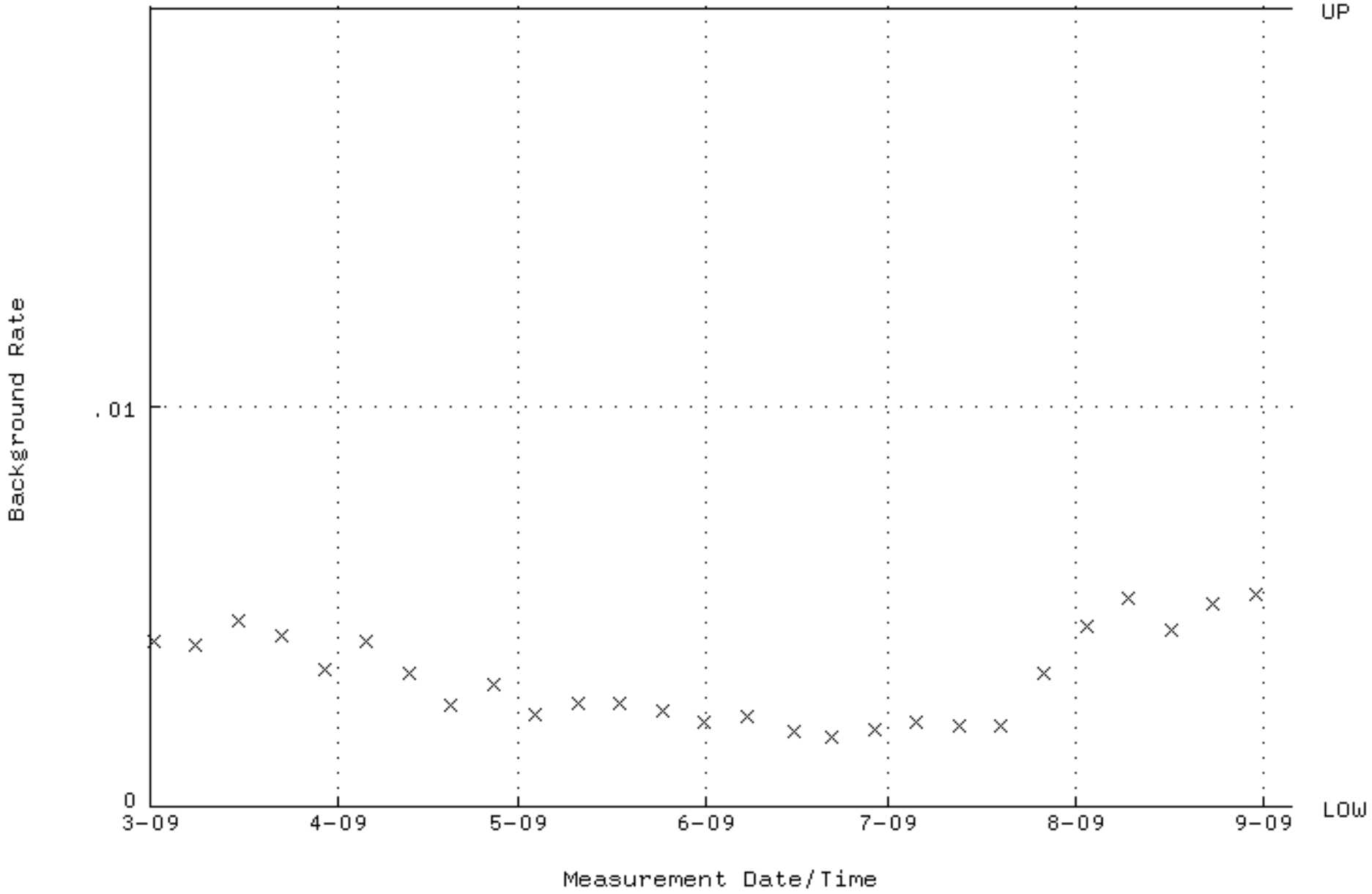
QA filename : DKA100:[ENV_ALPHA.QA.W]W037.QAF;4
Parameter Name : AVRGEFF (Average Efficiency)
Start/End Dates : 5-MAR-2009 07:45:22 through 5-SEP-2009 12:00:00
Lower/Upper Lmts: 0.250000 through 0.450000



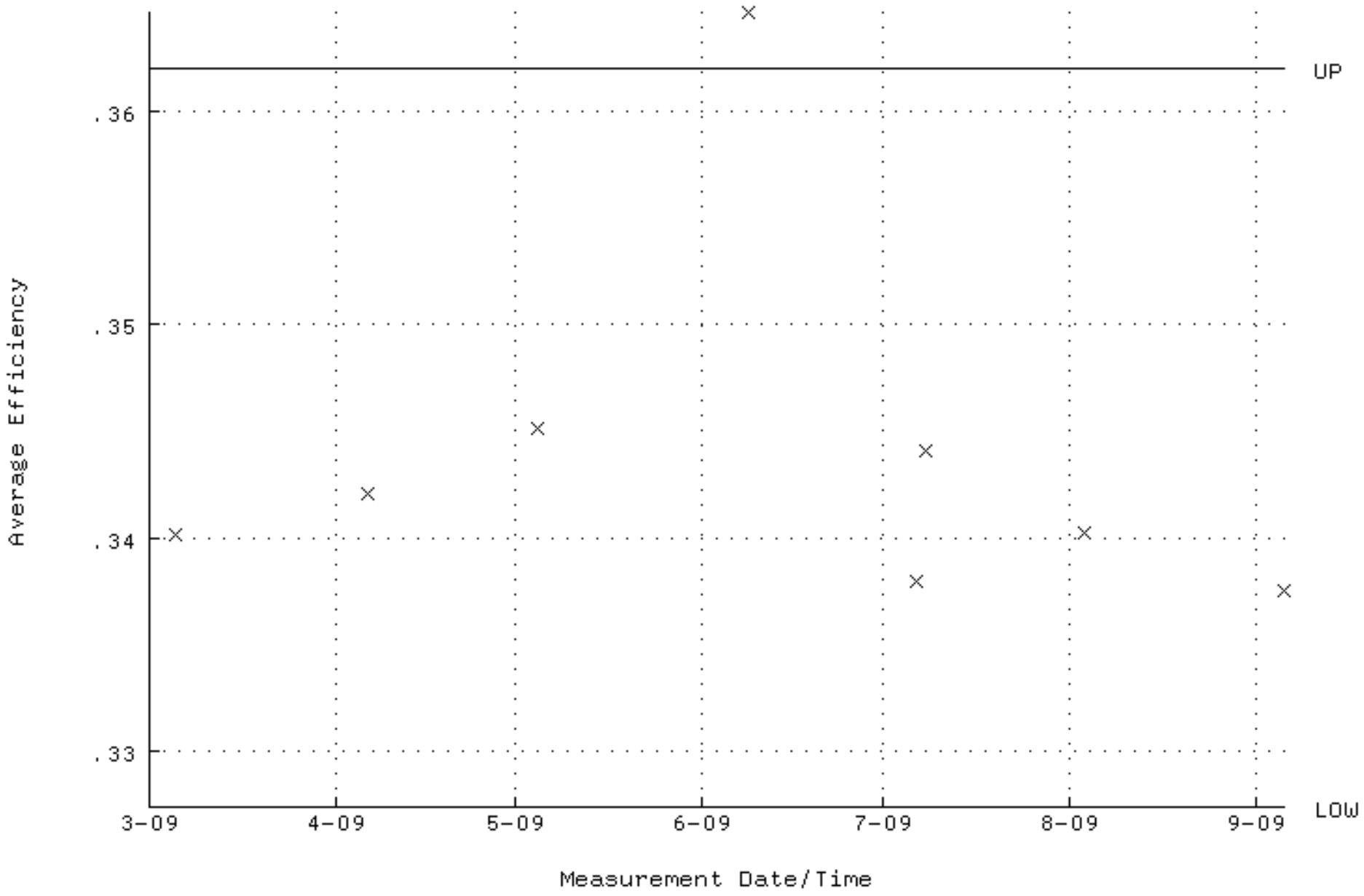
QA filename : DKA100:[ENV_ALPHA.QA.W]W037.QAF;4
Parameter Name : NLACTVTY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 5-MAR-2009 07:45:22 through 5-SEP-2009 12:00:00
Lower/Upper Lmts: 60.0000 through 105.000



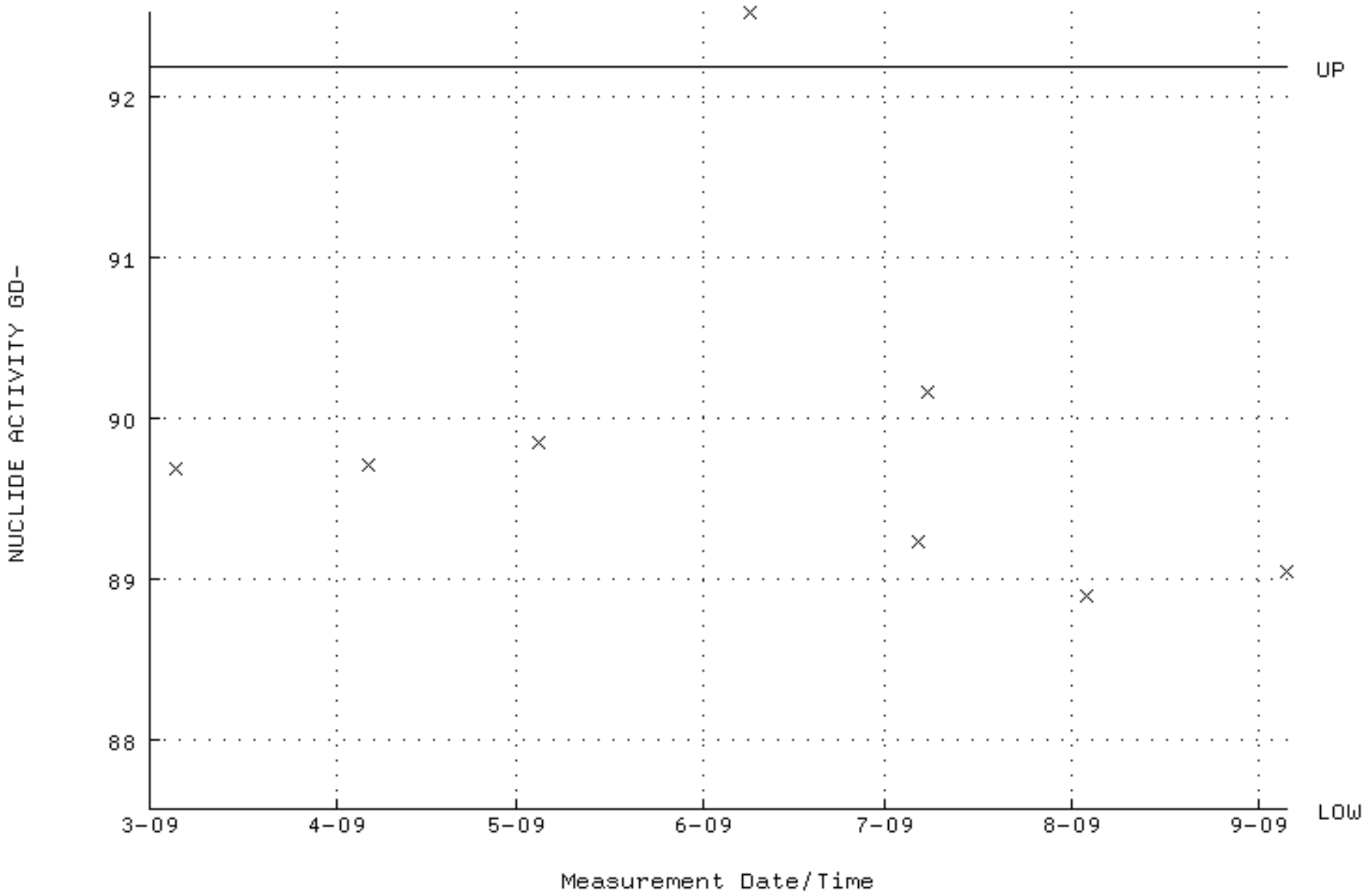
QA filename : DKA100:[ENV_ALPHA.QA.B]B037.QAF;1
Parameter Name : BACKRATE (Background Rate)
Start/End Dates : 1-MAR-2009 17:17:27 through 5-SEP-2009 12:00:00
Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



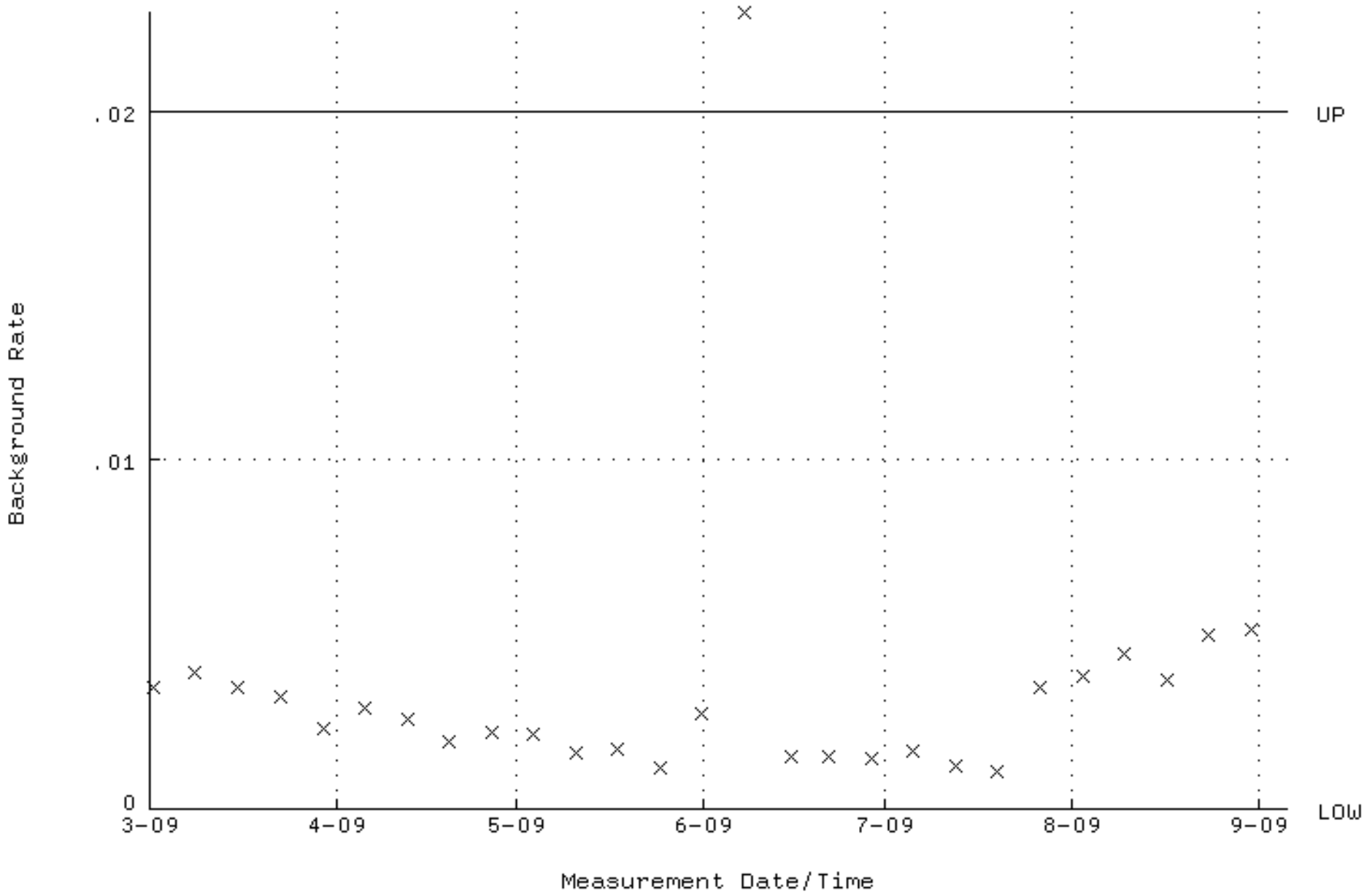
QA filename : DKA100:[ENV_ALPHA.QA.W]W038.QAF;3
Parameter Name : AVRGEFF (Average Efficiency)
Start/End Dates : 5-MAR-2009 07:45:22 through 5-SEP-2009 12:00:00
Lower/Upper Lmts: 0.327380 through 0.362086



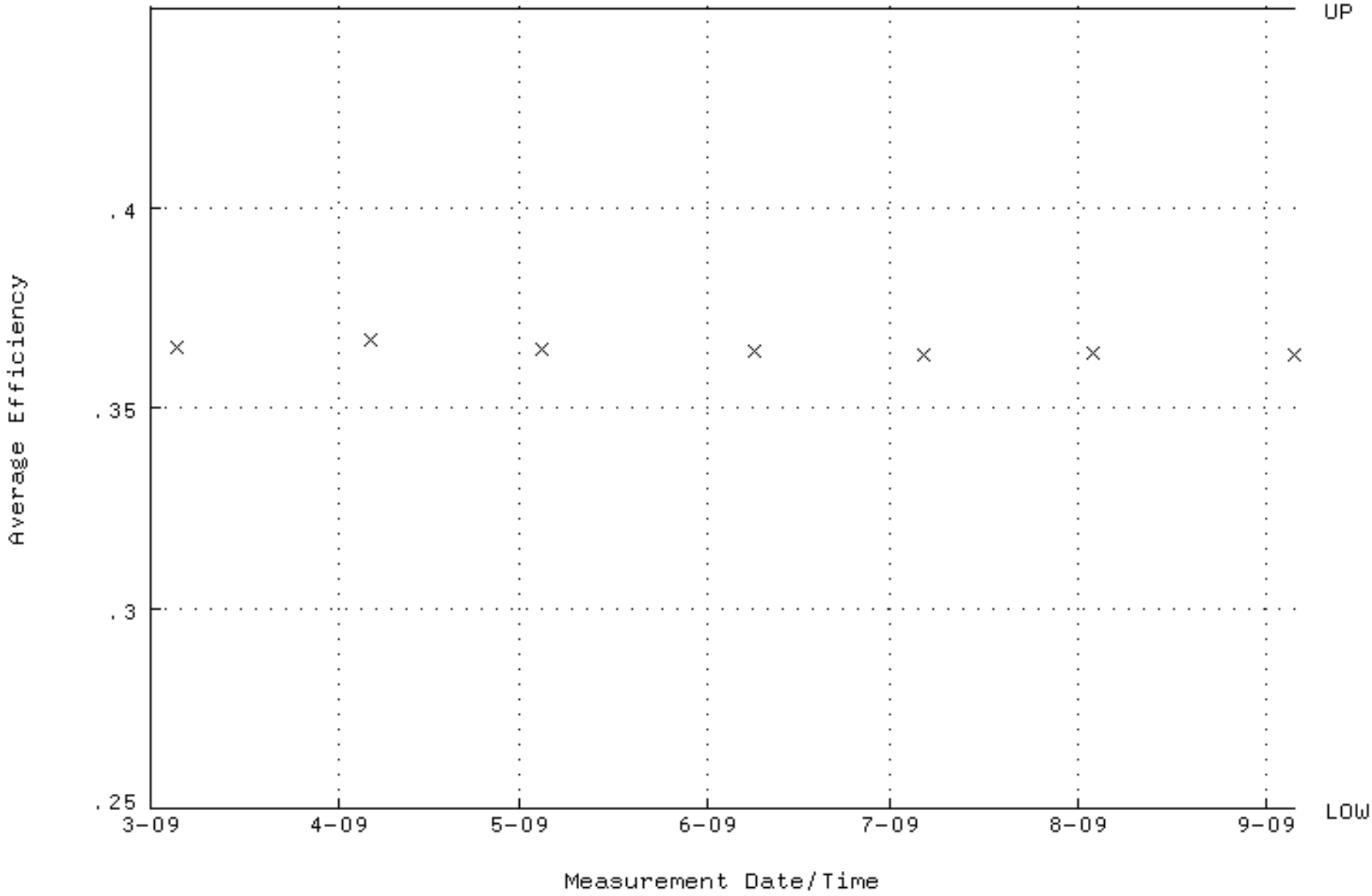
QA filename : DKA100:[ENV_ALPHA.QA.W]W038.QAF;3
Parameter Name : NLACTVTY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 5-MAR-2009 07:45:22 through 5-SEP-2009 12:00:00
Lower/Upper Lmts: 87.5715 through 92.1899



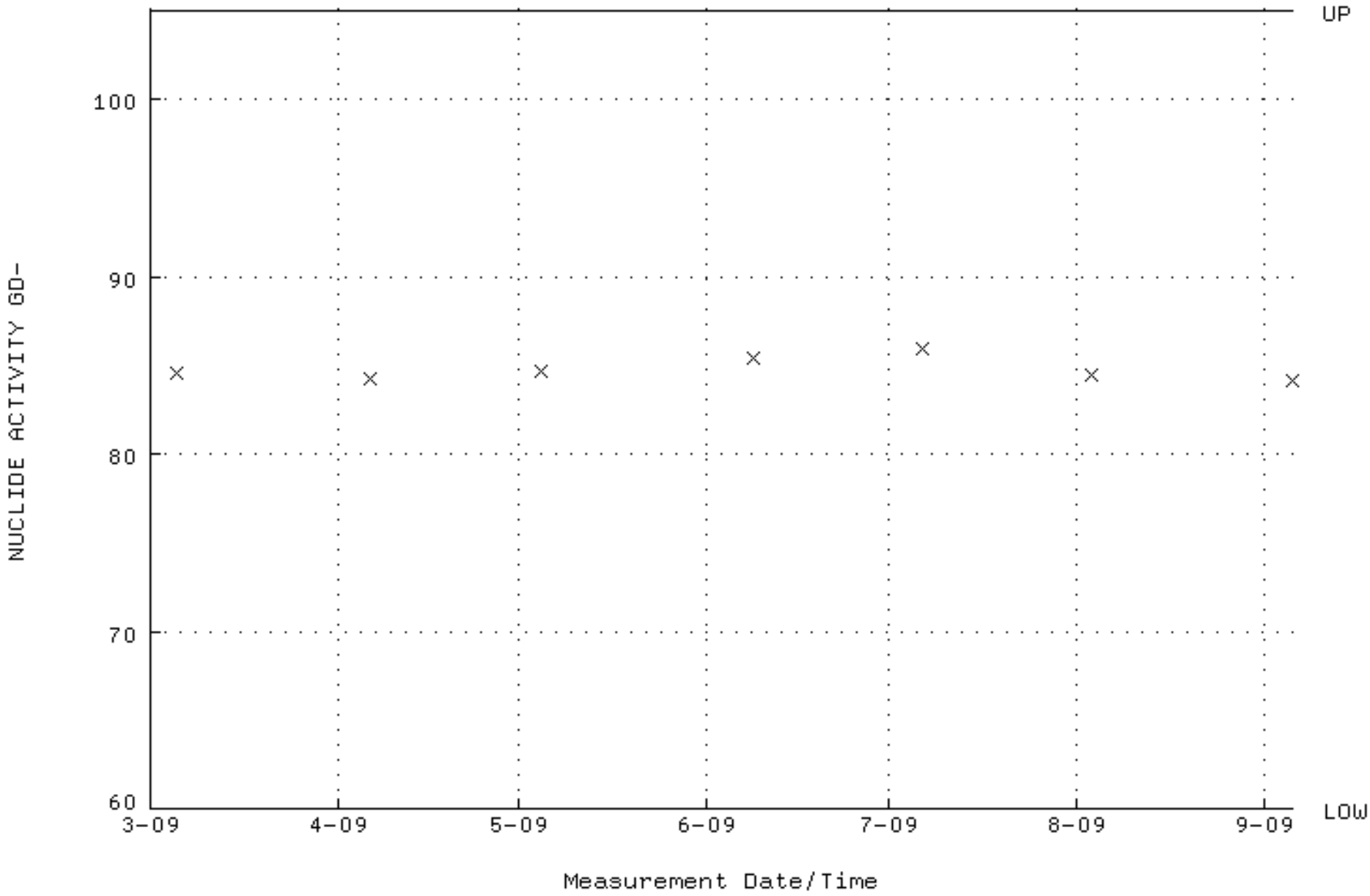
QA filename : DKA100:[ENV_ALPHA.QA.B]B038.QAF;1
Parameter Name : BACKRATE (Background Rate)
Start/End Dates : 1-MAR-2009 17:17:27 through 5-SEP-2009 12:00:00
Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



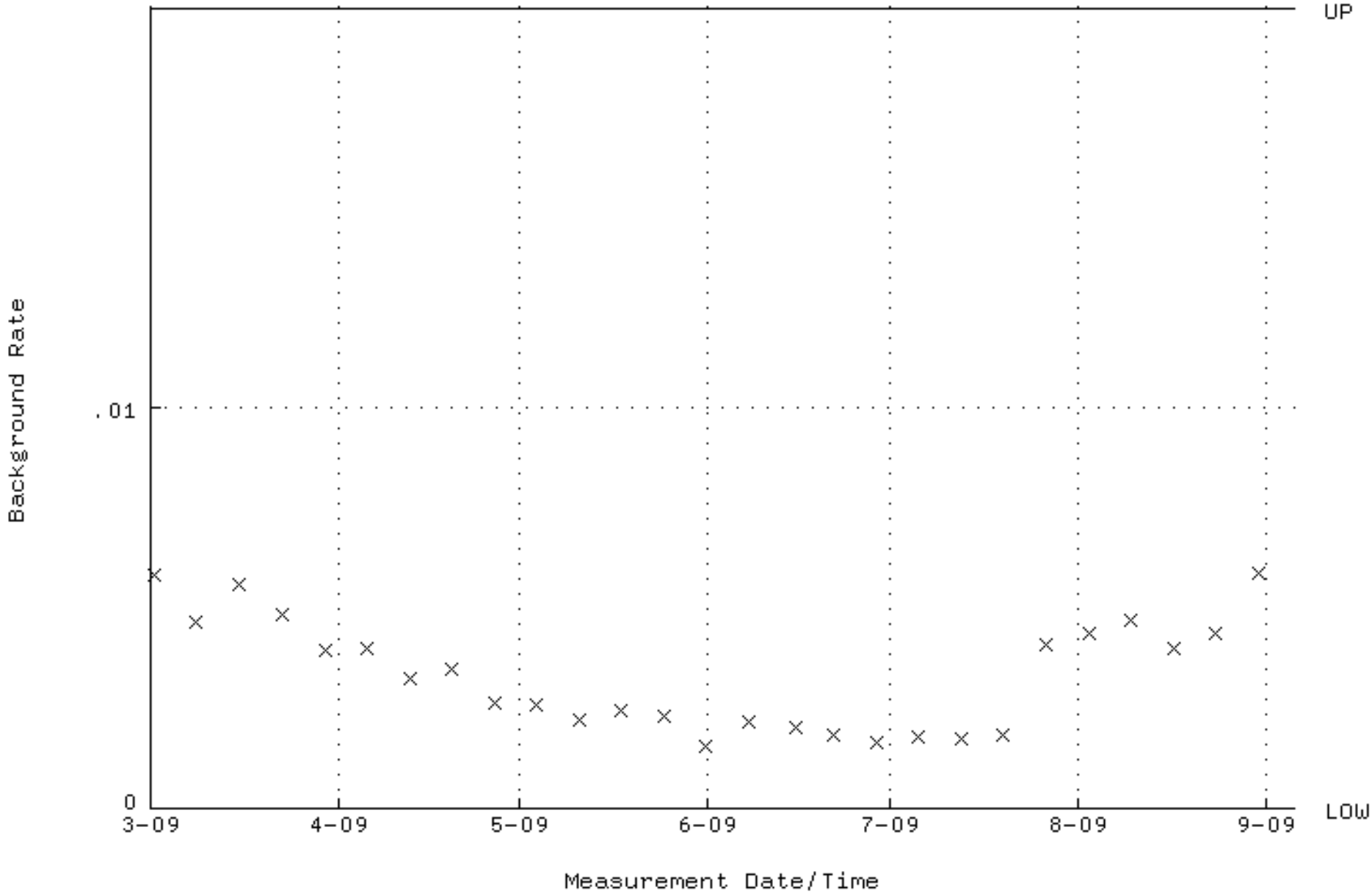
QA filename : DKA100:[ENV_ALPHA.QA.W]W039.QAF;3
Parameter Name : AVRGEFF (Average Efficiency)
Start/End Dates : 5-MAR-2009 07:45:22 through 5-SEP-2009 12:00:00
Lower/Upper Lmts: 0.250000 through 0.450000



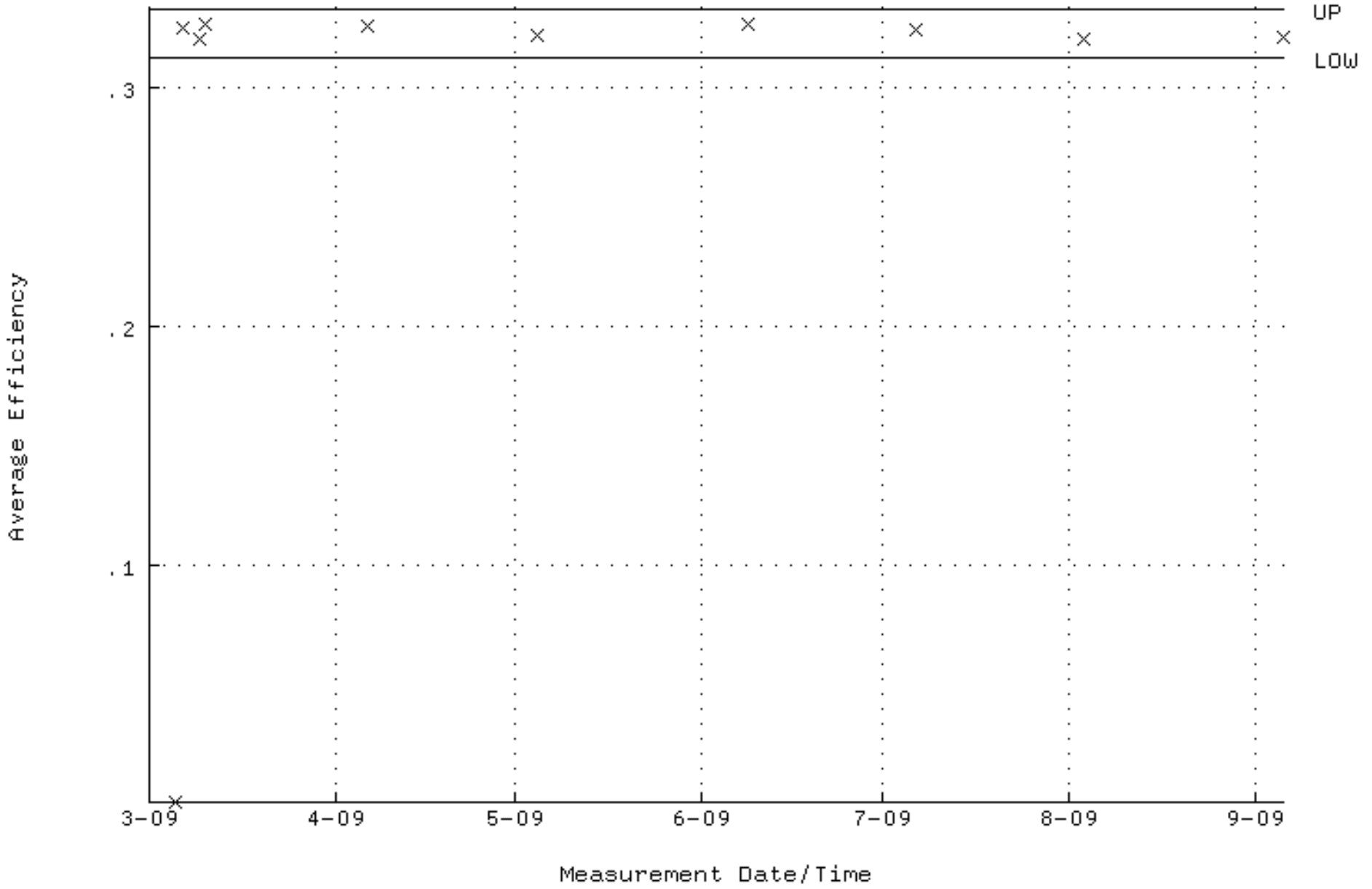
QA filename : DKA100:[ENV_ALPHA.QA.W]W039.QAF;3
Parameter Name : NLACTVTY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 5-MAR-2009 07:45:22 through 5-SEP-2009 12:00:00
Lower/Upper Lmts: 60.0000 through 105.000



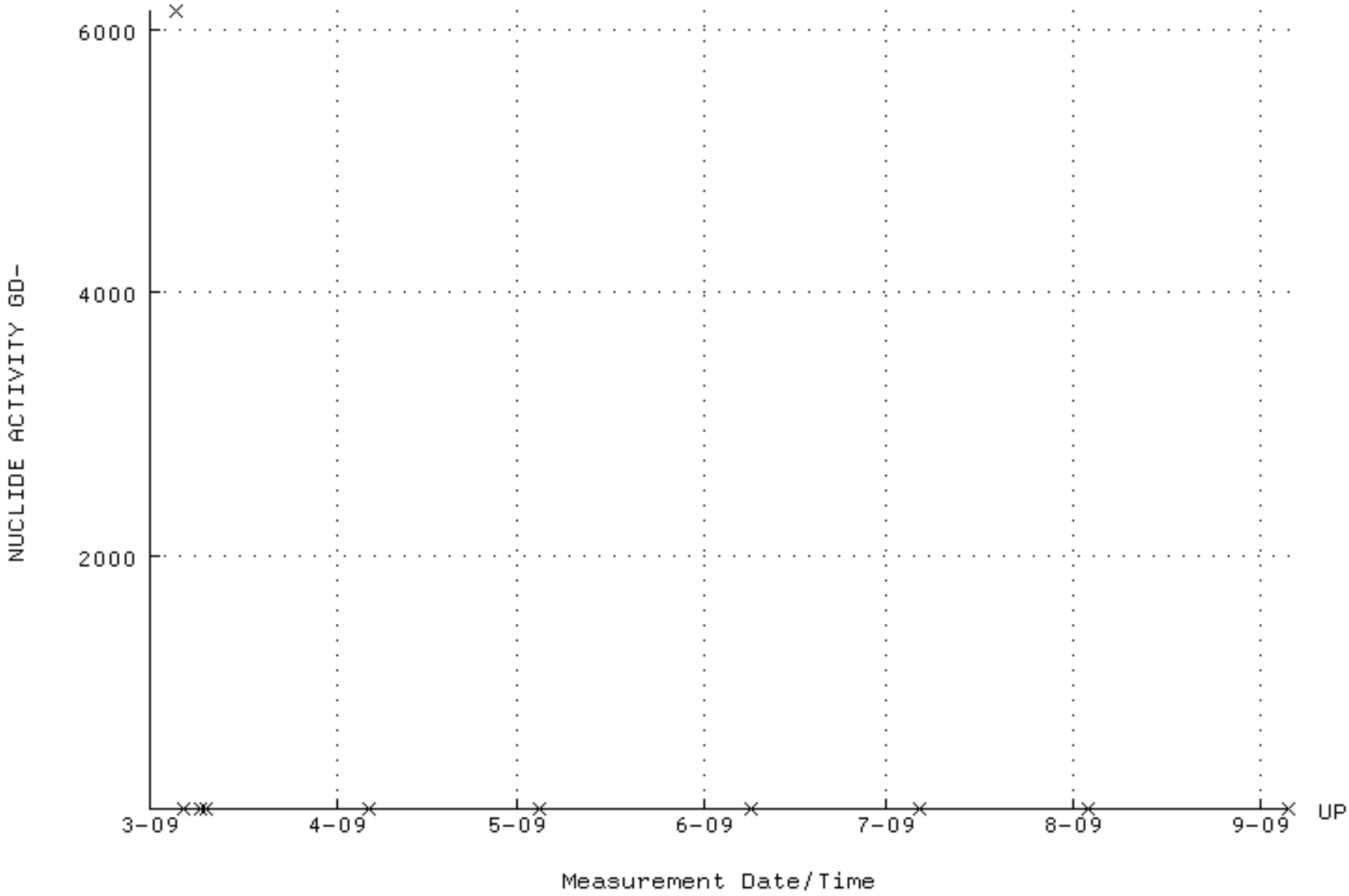
QA filename : DKA100:[ENV_ALPHA.QA.B]B039.QAF;1
Parameter Name : BACKRATE (Background Rate)
Start/End Dates : 1-MAR-2009 17:17:27 through 5-SEP-2009 12:00:00
Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



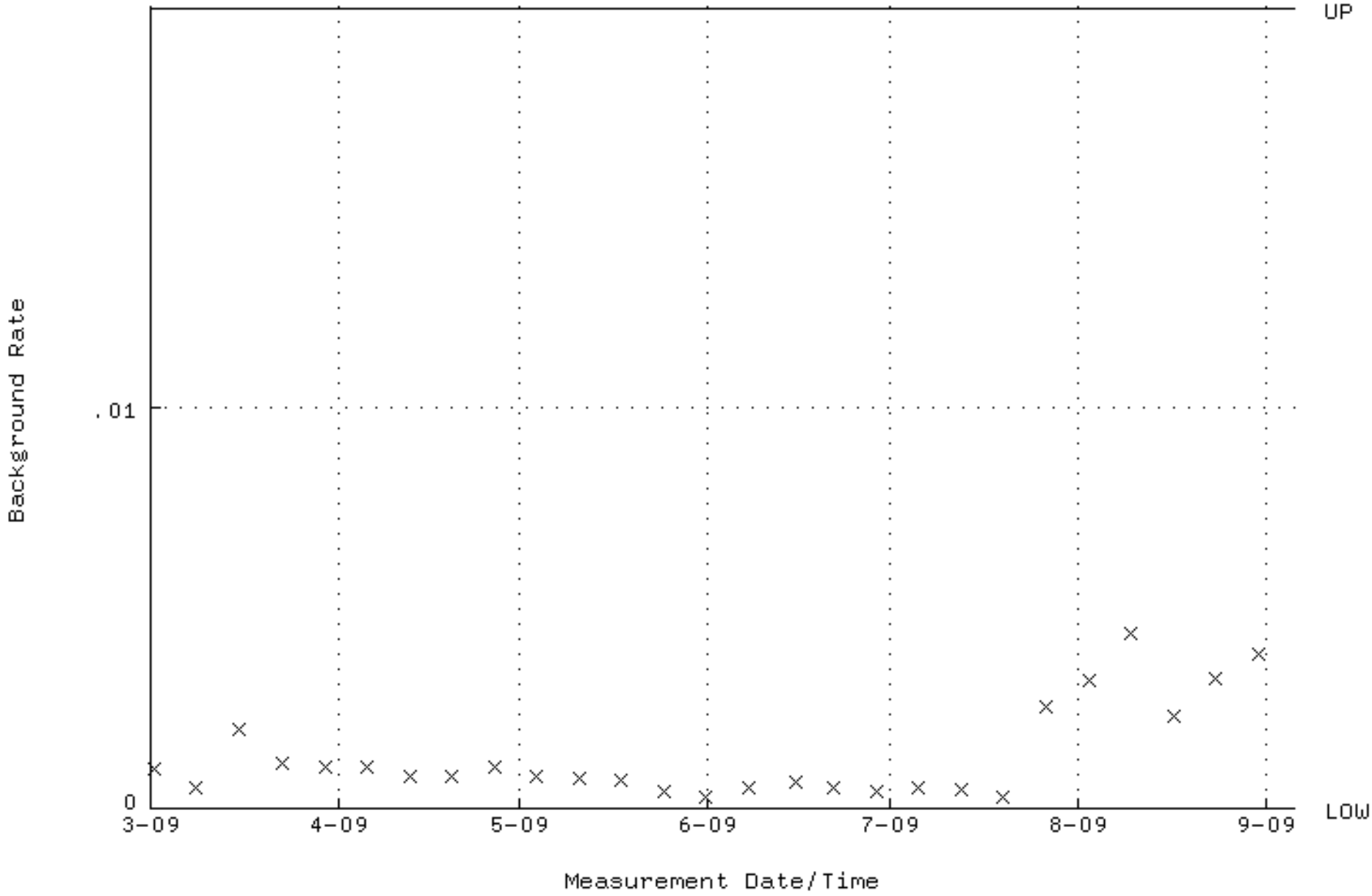
QA filename : DKA100:[ENV_ALPHA.QA.W]W040.QAF;3
Parameter Name : AVRGEFF (Average Efficiency)
Start/End Dates : 5-MAR-2009 07:45:22 through 5-SEP-2009 12:00:00
Lower/Upper Lmts: 0.313016 through 0.333016



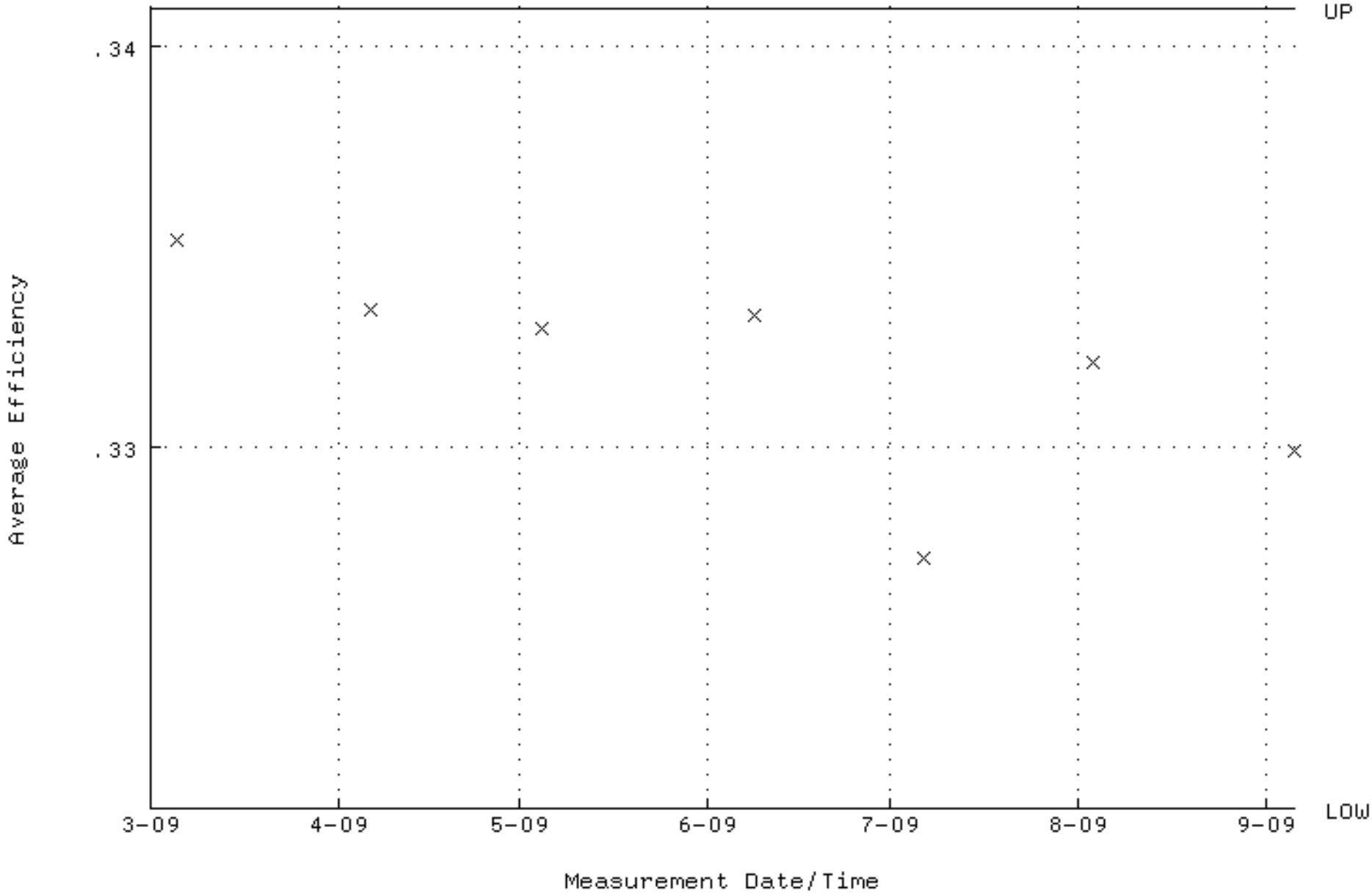
QA filename : DKA100:[ENV_ALPHA.QA.W]W040.QAF;3
Parameter Name : NLACTVTY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 5-MAR-2009 07:45:22 through 5-SEP-2009 12:00:00
Lower/Upper Lmts: 82.8065 through 91.5229



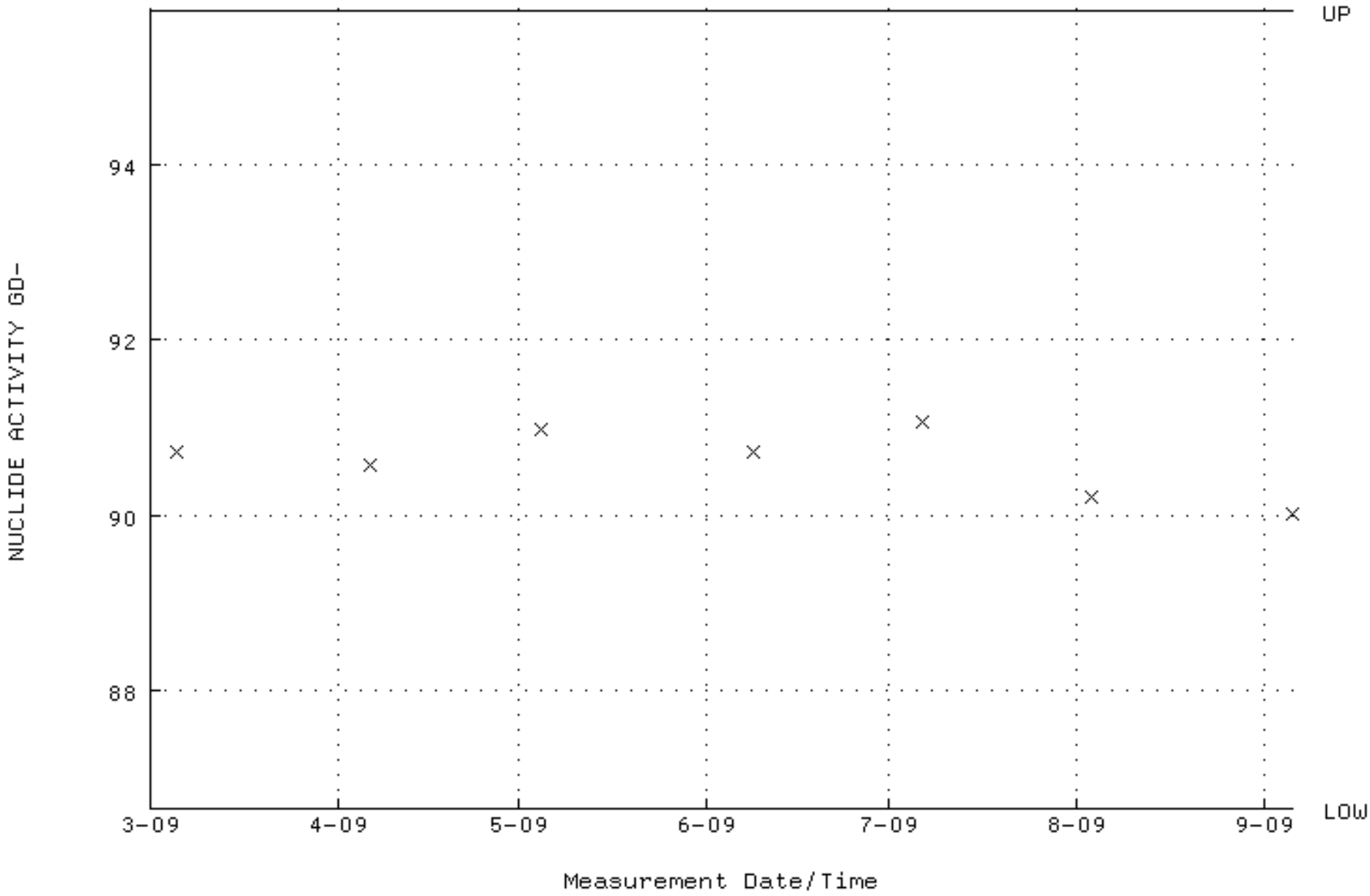
QA filename : DKA100:[ENV_ALPHA.QA.B]B040.QAF;1
Parameter Name : BACKRATE (Background Rate)
Start/End Dates : 1-MAR-2009 17:17:27 through 5-SEP-2009 12:00:00
Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



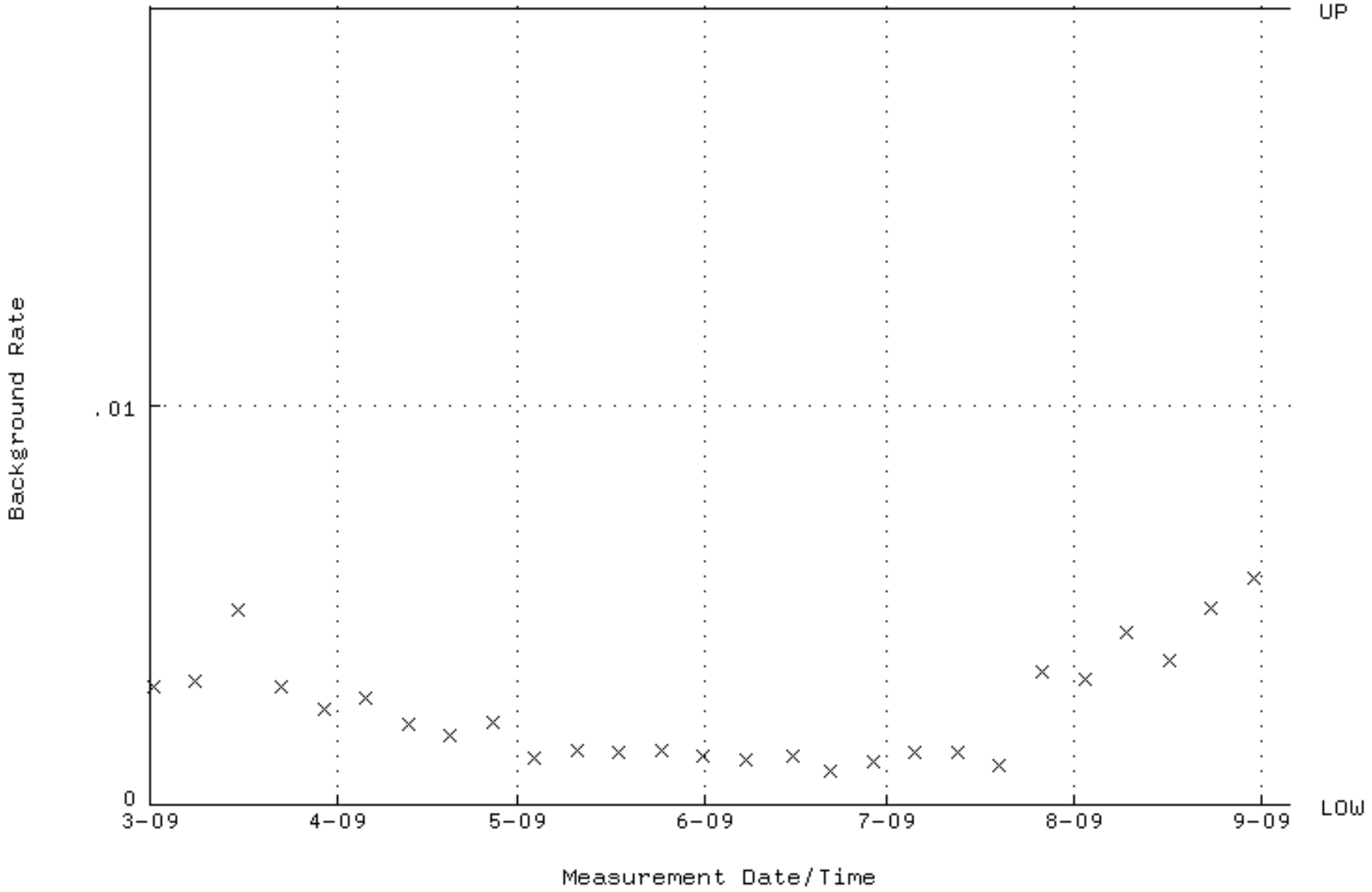
QA filename : DKA100:[ENV_ALPHA.QA.W]W041.QAF;5
Parameter Name : AVRGEFF (Average Efficiency)
Start/End Dates : 5-MAR-2009 07:45:22 through 5-SEP-2009 12:00:00
Lower/Upper Lmts: 0.320943 through 0.340943



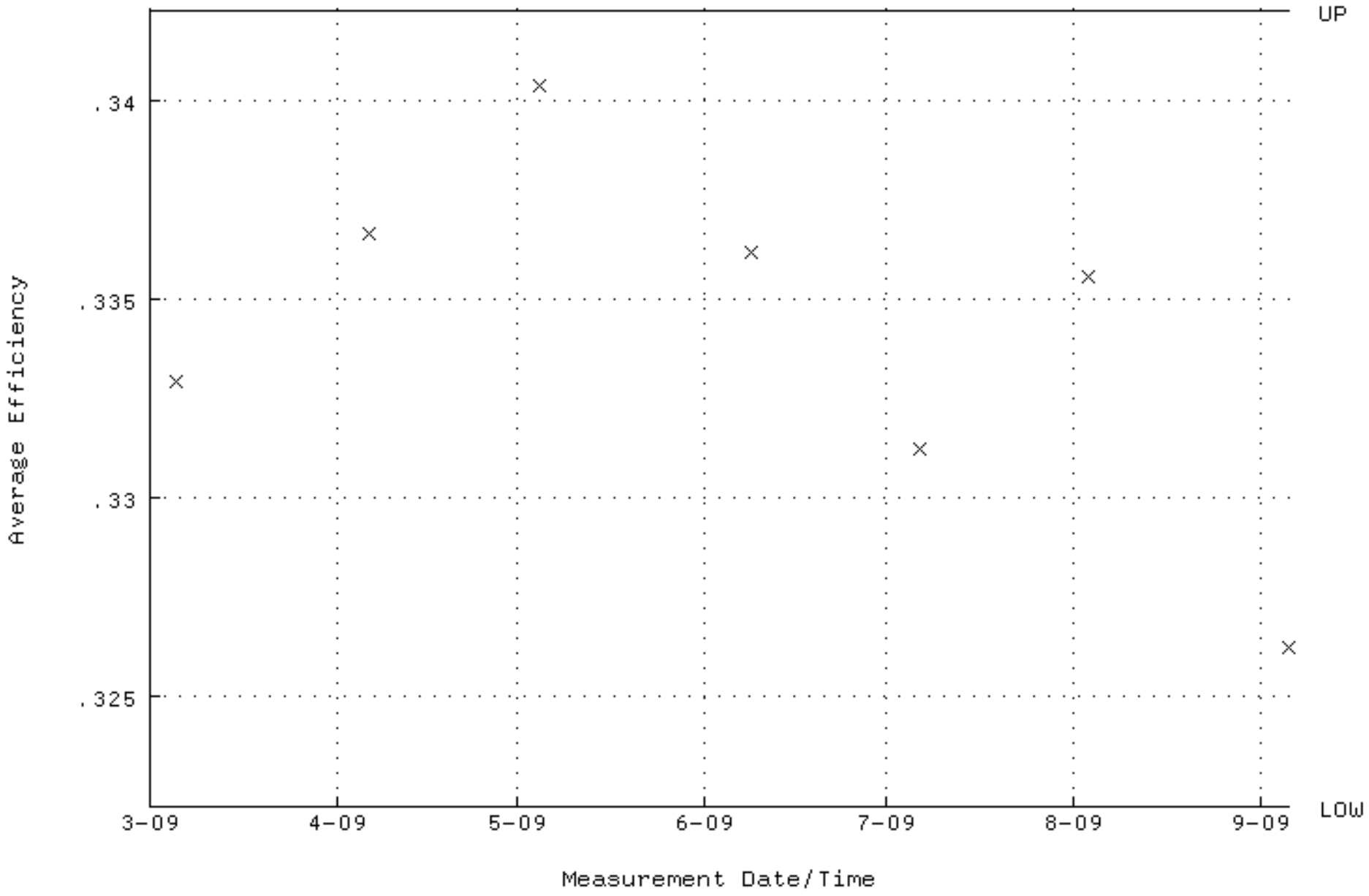
QA filename : DKA100:[ENV_ALPHA.QA.W]W041.QAF;5
Parameter Name : NLACTVTY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 5-MAR-2009 07:45:22 through 5-SEP-2009 12:00:00
Lower/Upper Lmts: 86.6435 through 95.7639



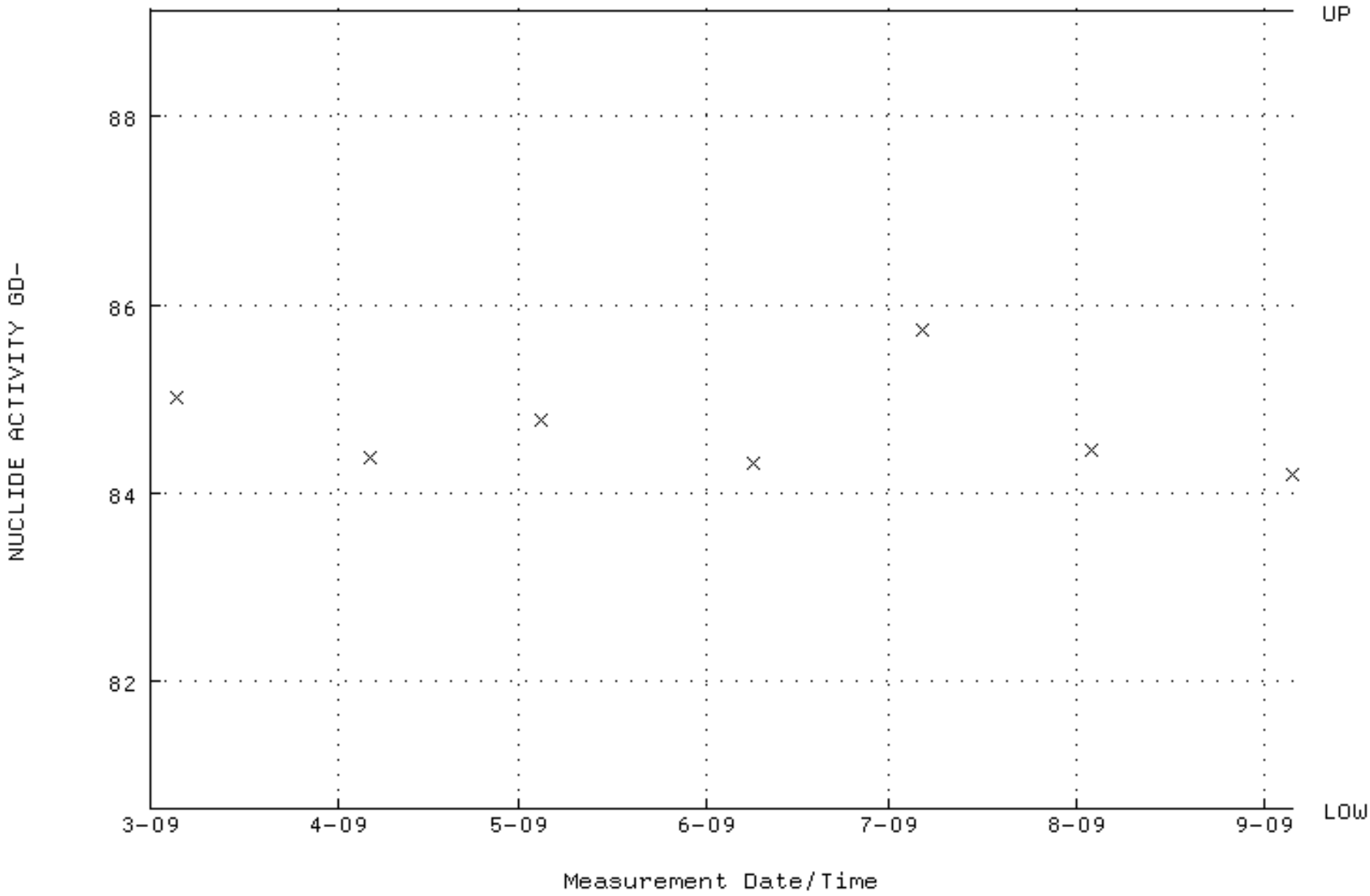
QA filename : DKA100:[ENV_ALPHA.QA.B]B041.QAF;1
Parameter Name : BACKRATE (Background Rate)
Start/End Dates : 1-MAR-2009 17:17:27 through 5-SEP-2009 12:00:00
Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



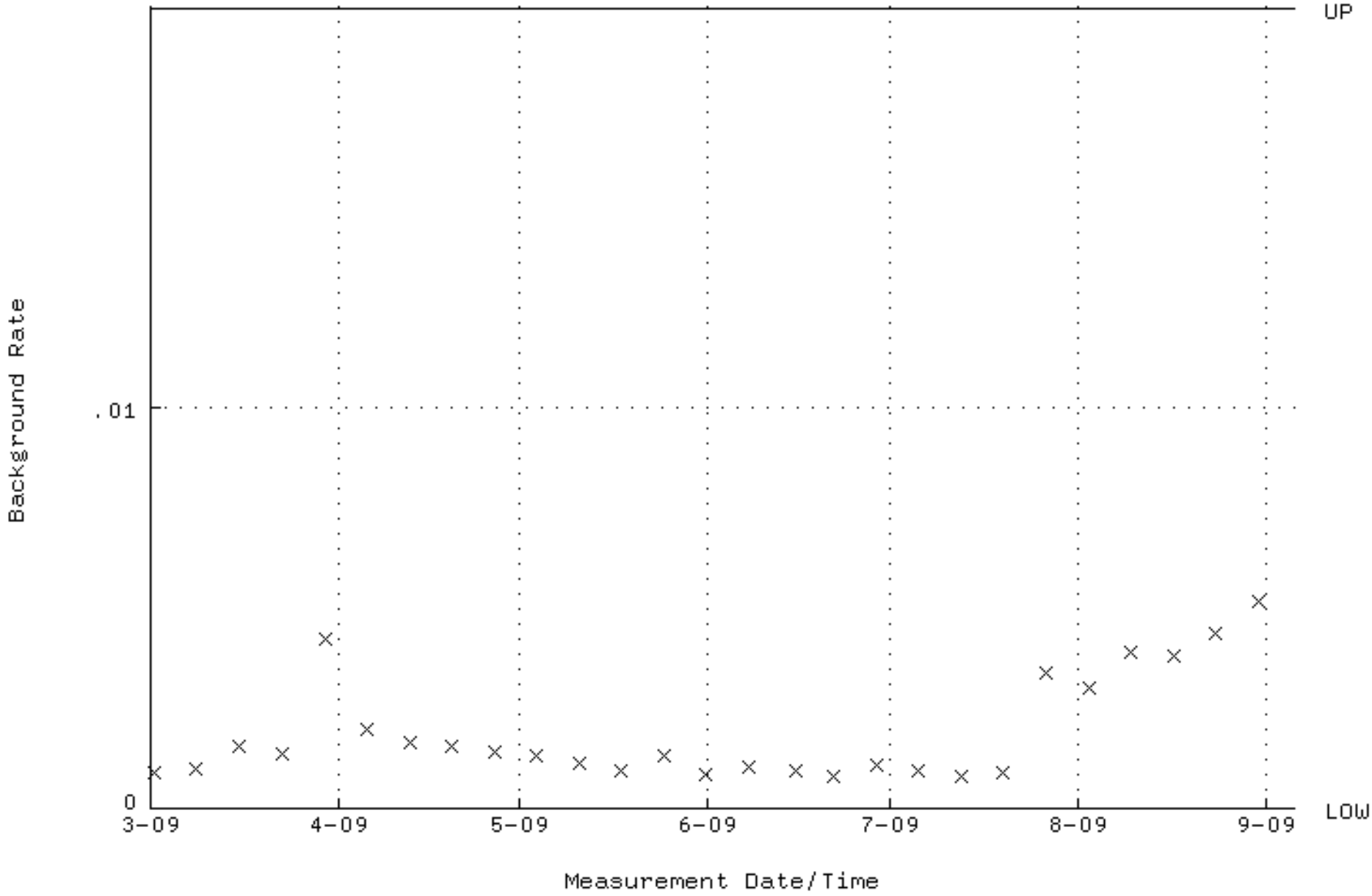
QA filename : DKA100:[ENV_ALPHA.QA.W]W042.QAF;3
Parameter Name : AVRGEFF (Average Efficiency)
Start/End Dates : 5-MAR-2009 07:45:22 through 5-SEP-2009 12:00:00
Lower/Upper Lmts: 0.322243 through 0.342243



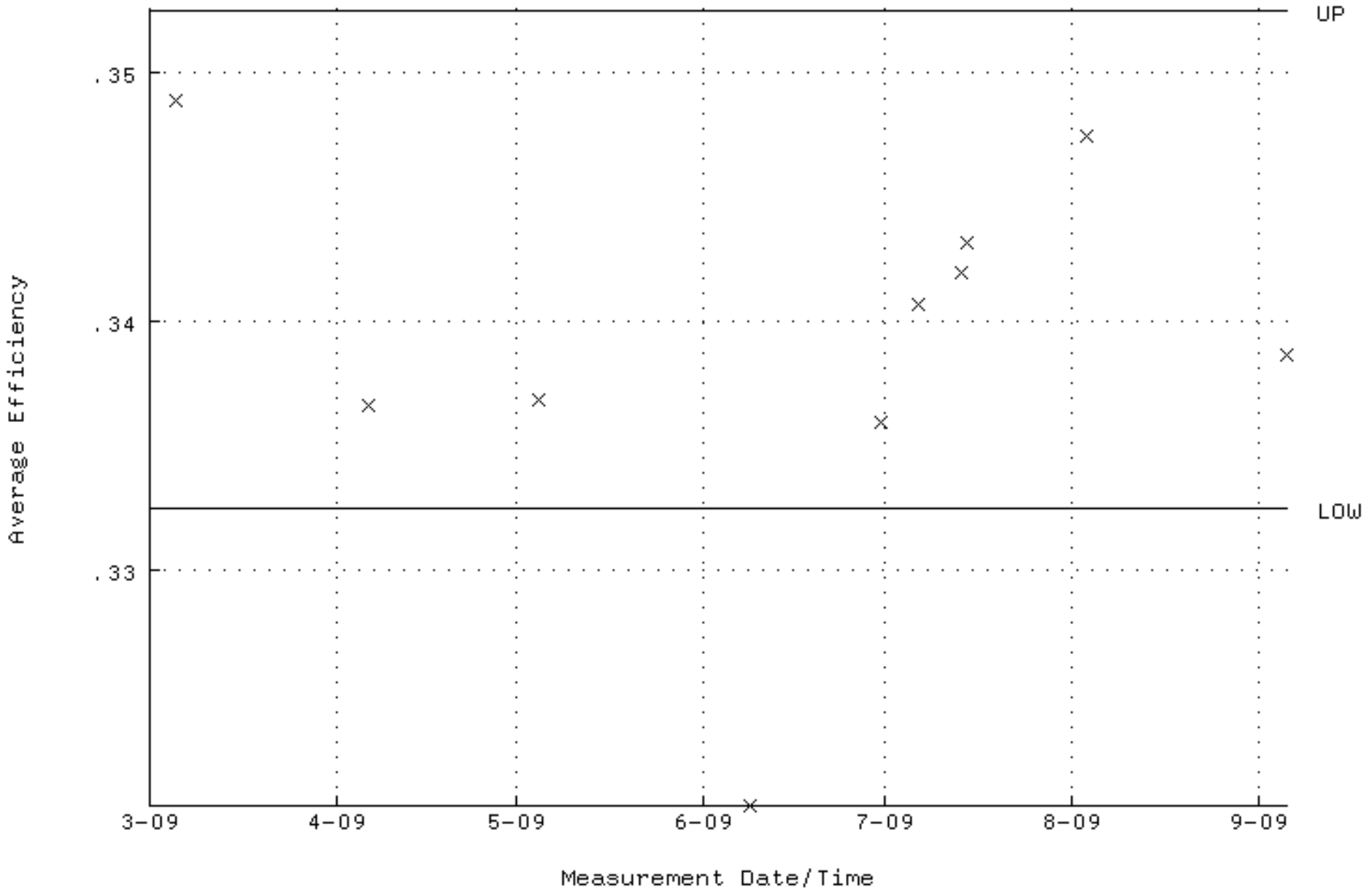
QA filename : DKA100:[ENV_ALPHA.QA.W]W042.QAF;3
Parameter Name : NLACTVTY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 5-MAR-2009 07:45:22 through 5-SEP-2009 12:00:00
Lower/Upper Lmts: 80.6389 through 89.1273



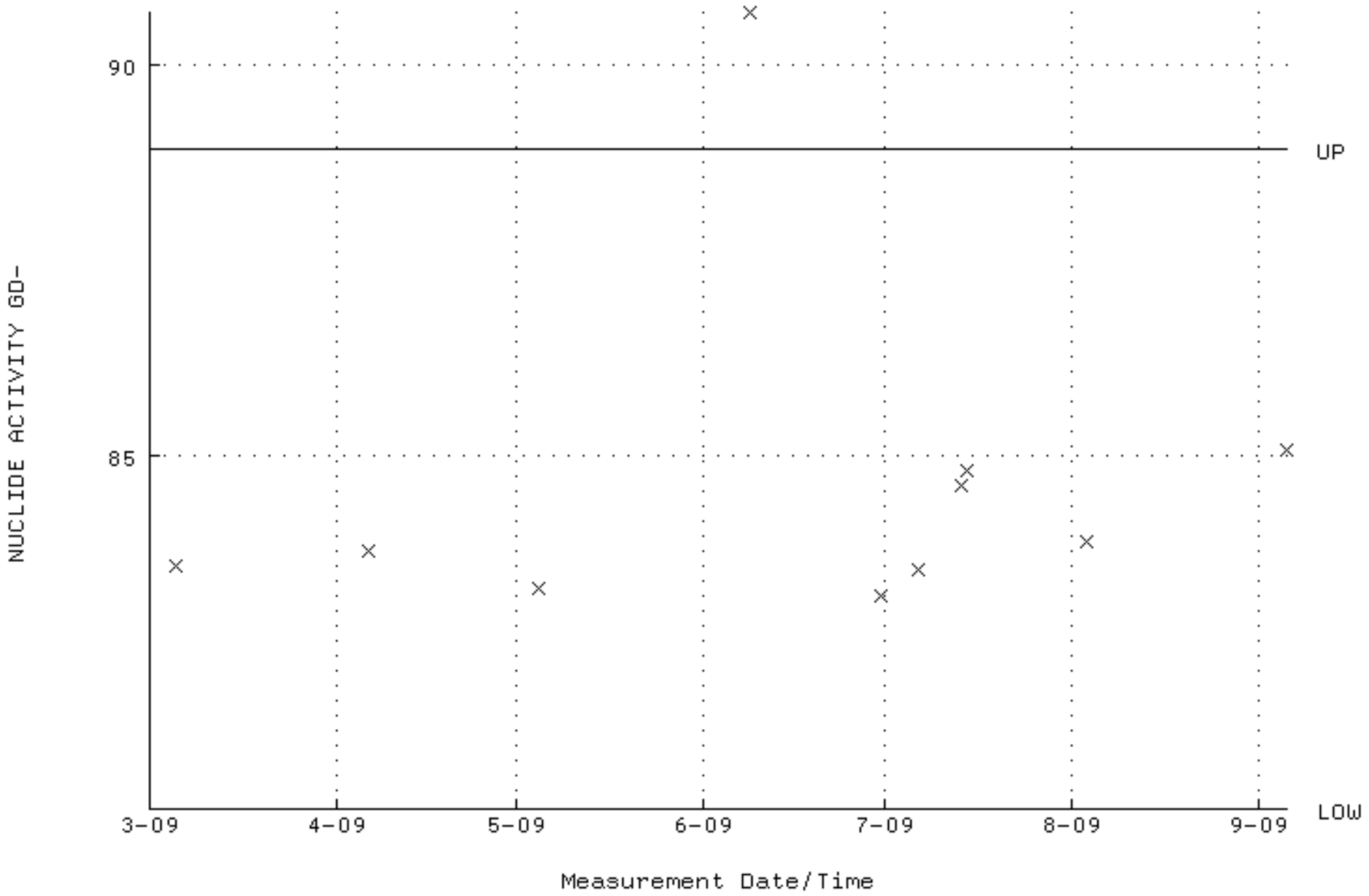
QA filename : DKA100:[ENV_ALPHA.QA.B]B042.QAF;1
Parameter Name : BACKRATE (Background Rate)
Start/End Dates : 1-MAR-2009 17:17:27 through 5-SEP-2009 12:00:00
Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



QA filename : DKA100:[ENV_ALPHA.QA.W]W045.QAF;5
Parameter Name : AVRGEFF (Average Efficiency)
Start/End Dates : 5-MAR-2009 07:45:23 through 5-SEP-2009 12:00:00
Lower/Upper Lmts: 0.332472 through 0.352472

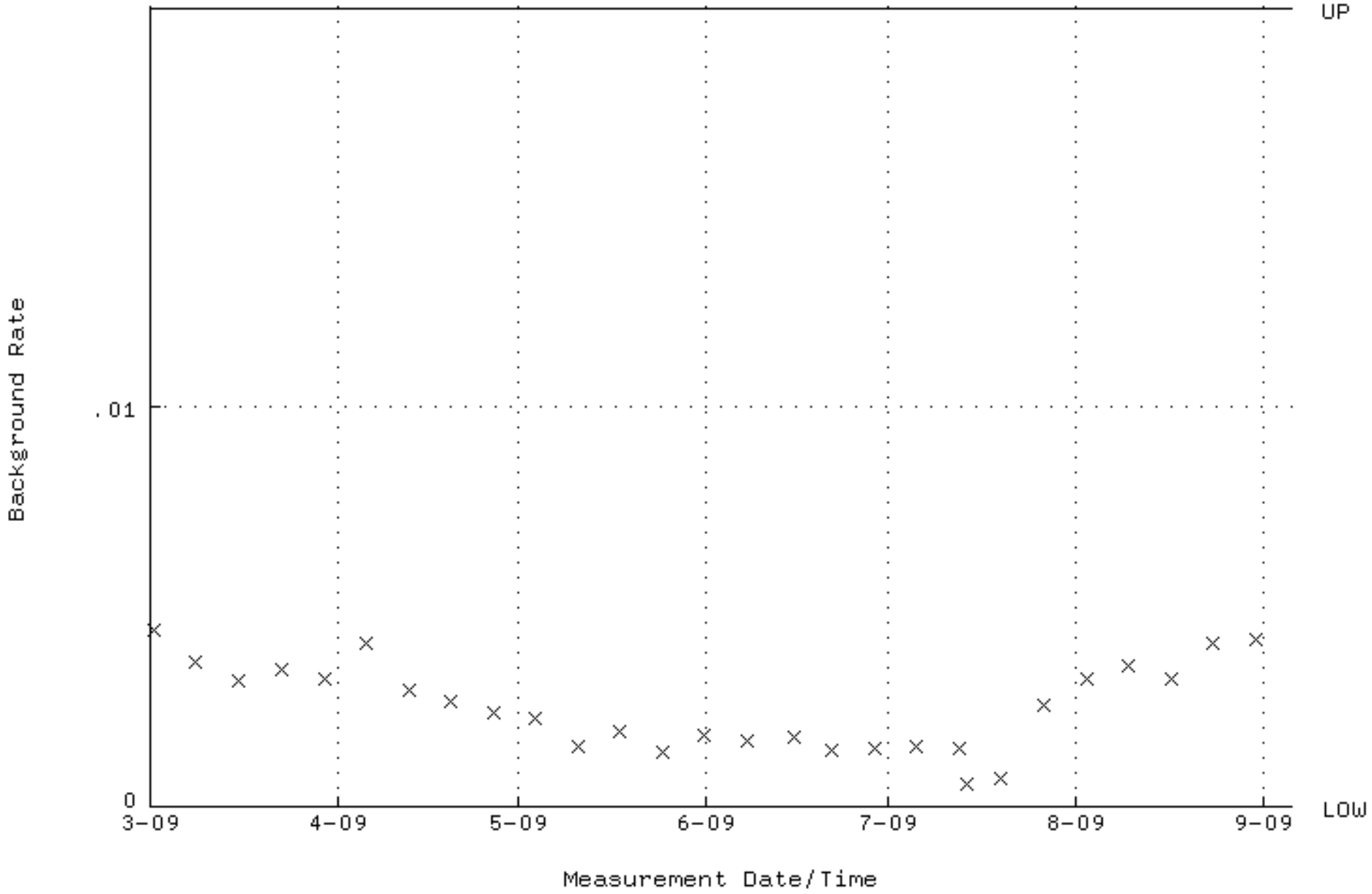


QA filename : DKA100:[ENV_ALPHA.QA.W]W045.QAF;5
Parameter Name : NLACTVTY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 5-MAR-2009 07:45:23 through 5-SEP-2009 12:00:00
Lower/Upper Lmts: 80.4622 through 88.9320

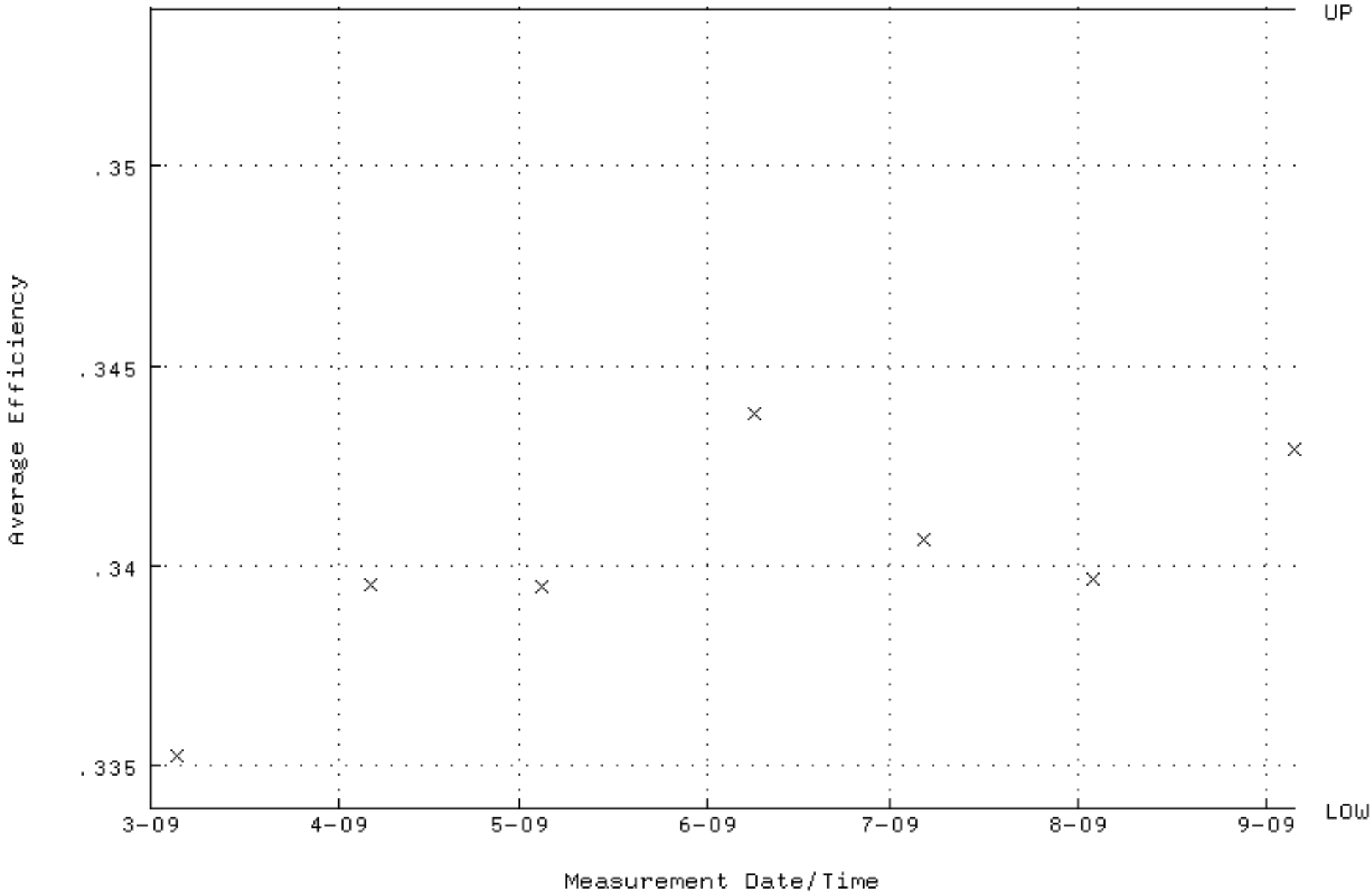


T01

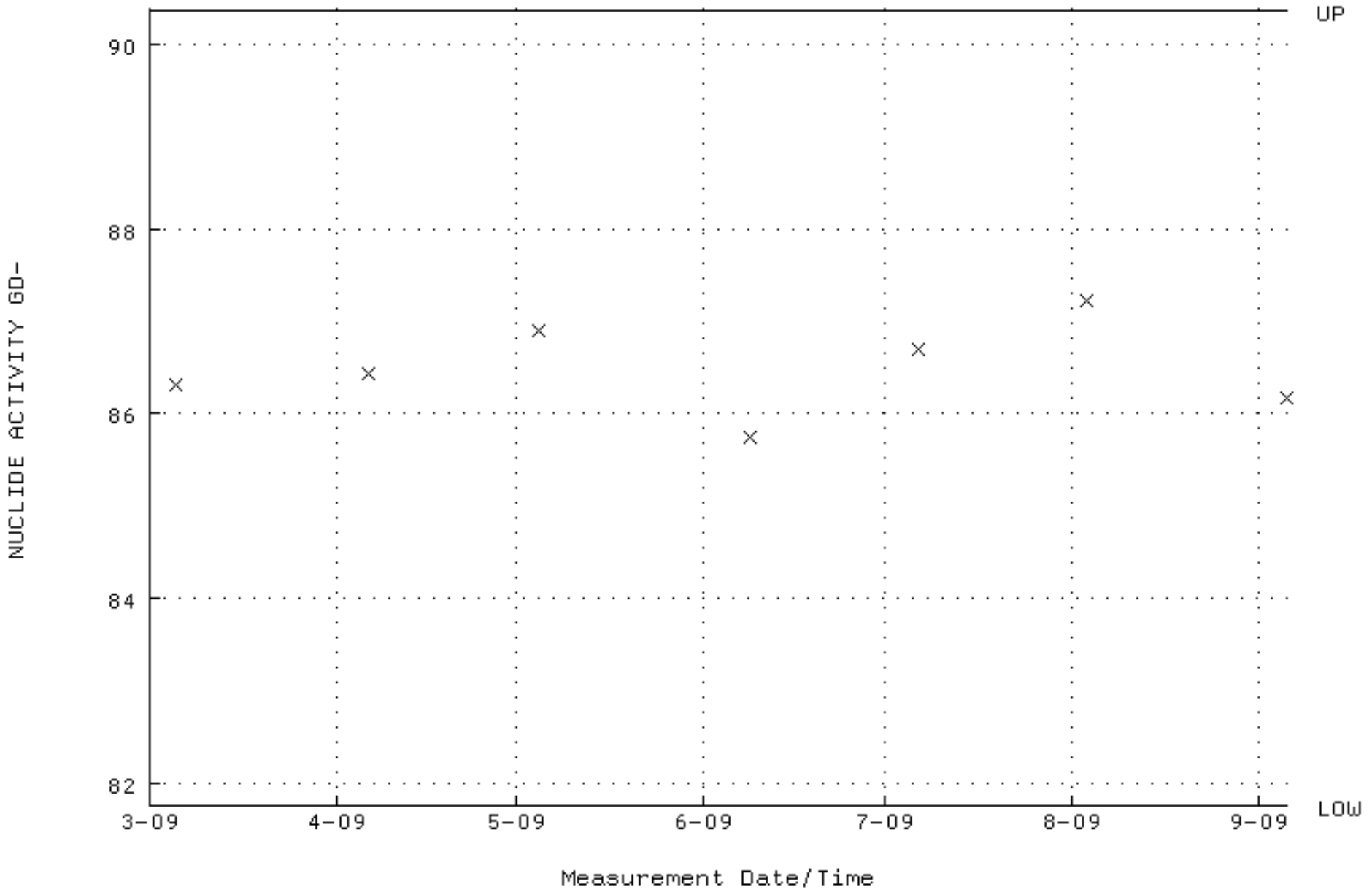
QA filename : DKA100:[ENV_ALPHA.QA.B]B045.QAF;1
Parameter Name : BACKRATE (Background Rate)
Start/End Dates : 1-MAR-2009 17:17:28 through 5-SEP-2009 12:00:00
Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



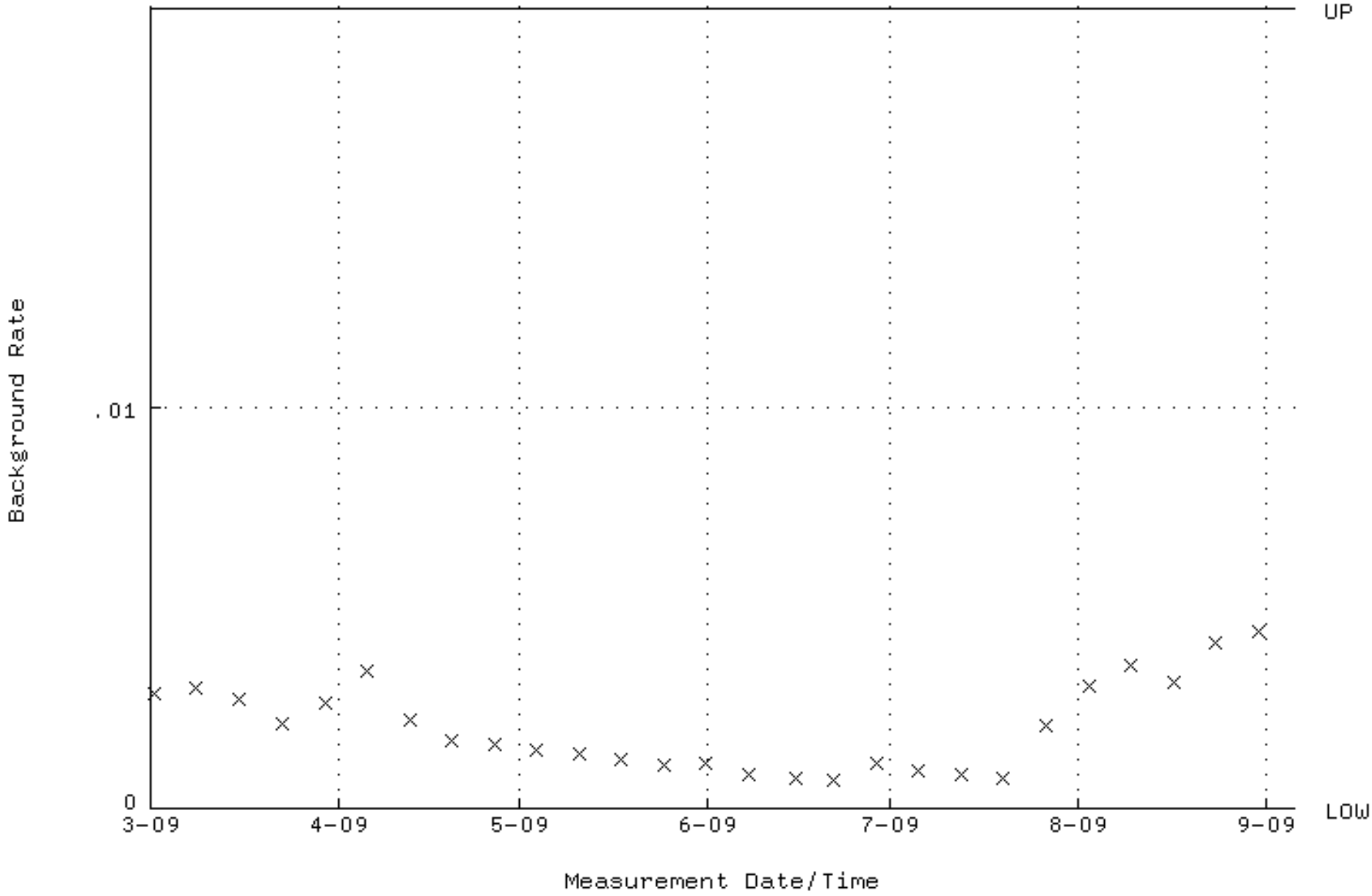
QA filename : DKA100:[ENV_ALPHA.QA.W]W046.QAF;4
Parameter Name : AVRGEFF (Average Efficiency)
Start/End Dates : 5-MAR-2009 07:45:23 through 5-SEP-2009 12:00:00
Lower/Upper Lmts: 0.333927 through 0.353927



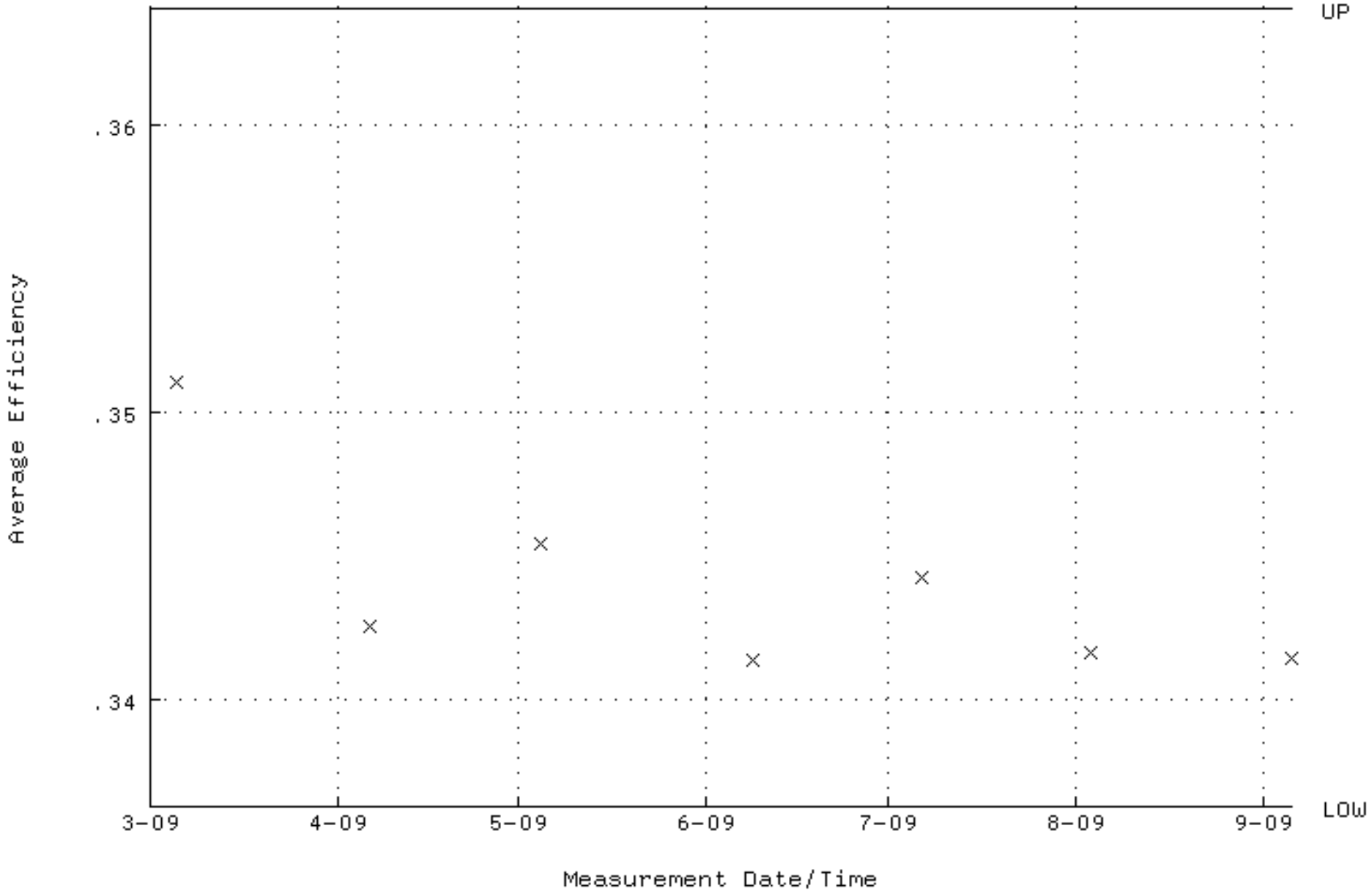
QA filename : DKA100:[ENV_ALPHA.QA.W]W046.QAF;4
Parameter Name : NLACTVTY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 5-MAR-2009 07:45:23 through 5-SEP-2009 12:00:00
Lower/Upper Lmts: 81.7568 through 90.3628



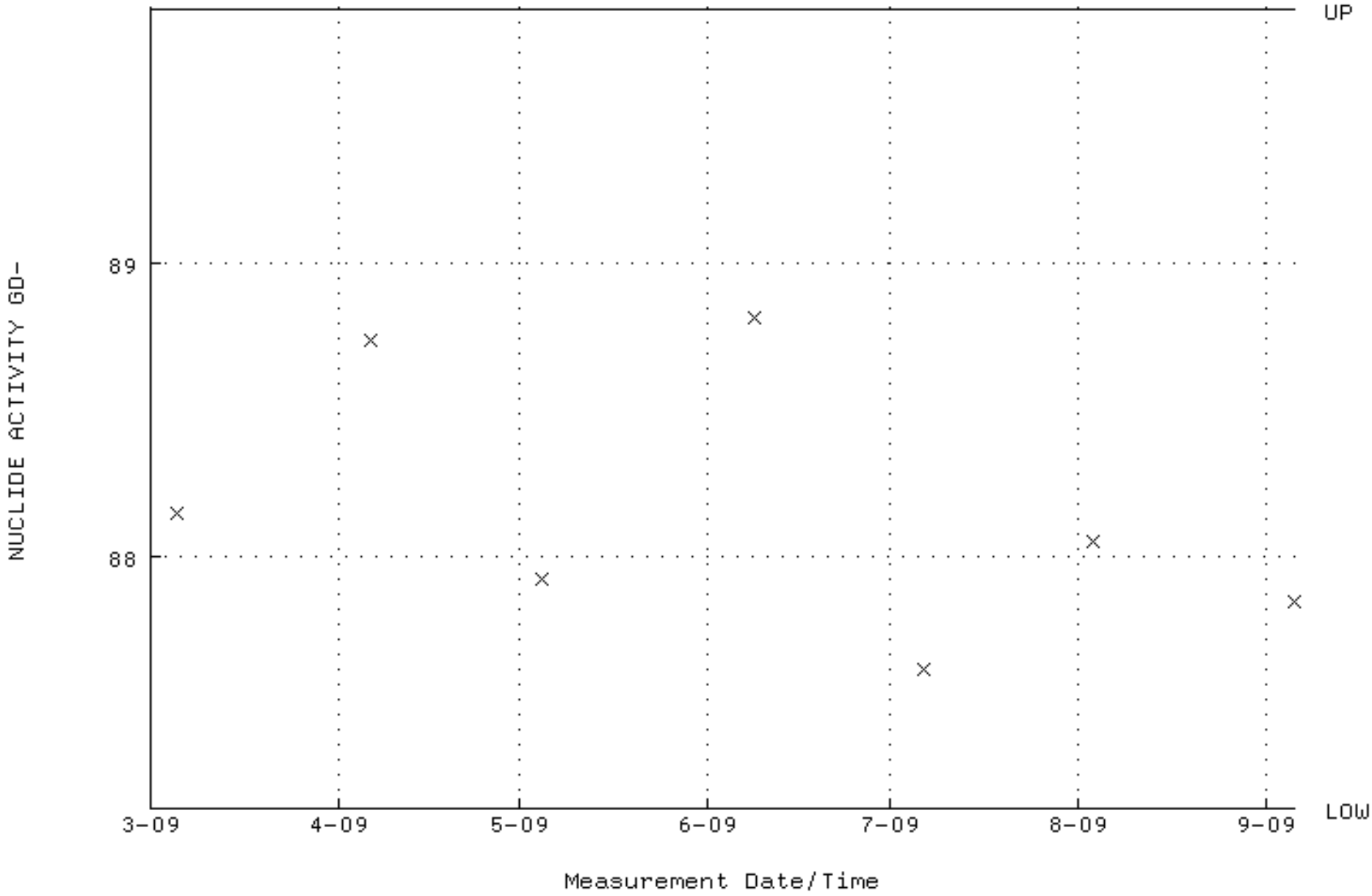
QA filename : DKA100:[ENV_ALPHA.QA.B]B046.QAF;1
Parameter Name : BACKRATE (Background Rate)
Start/End Dates : 1-MAR-2009 17:17:28 through 5-SEP-2009 12:00:00
Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



QA filename : DKA100:[ENV_ALPHA.QA.W]W047.QAF;5
Parameter Name : AVRGEFF (Average Efficiency)
Start/End Dates : 5-MAR-2009 07:45:23 through 5-SEP-2009 12:00:00
Lower/Upper Lmts: 0.336276 through 0.364038

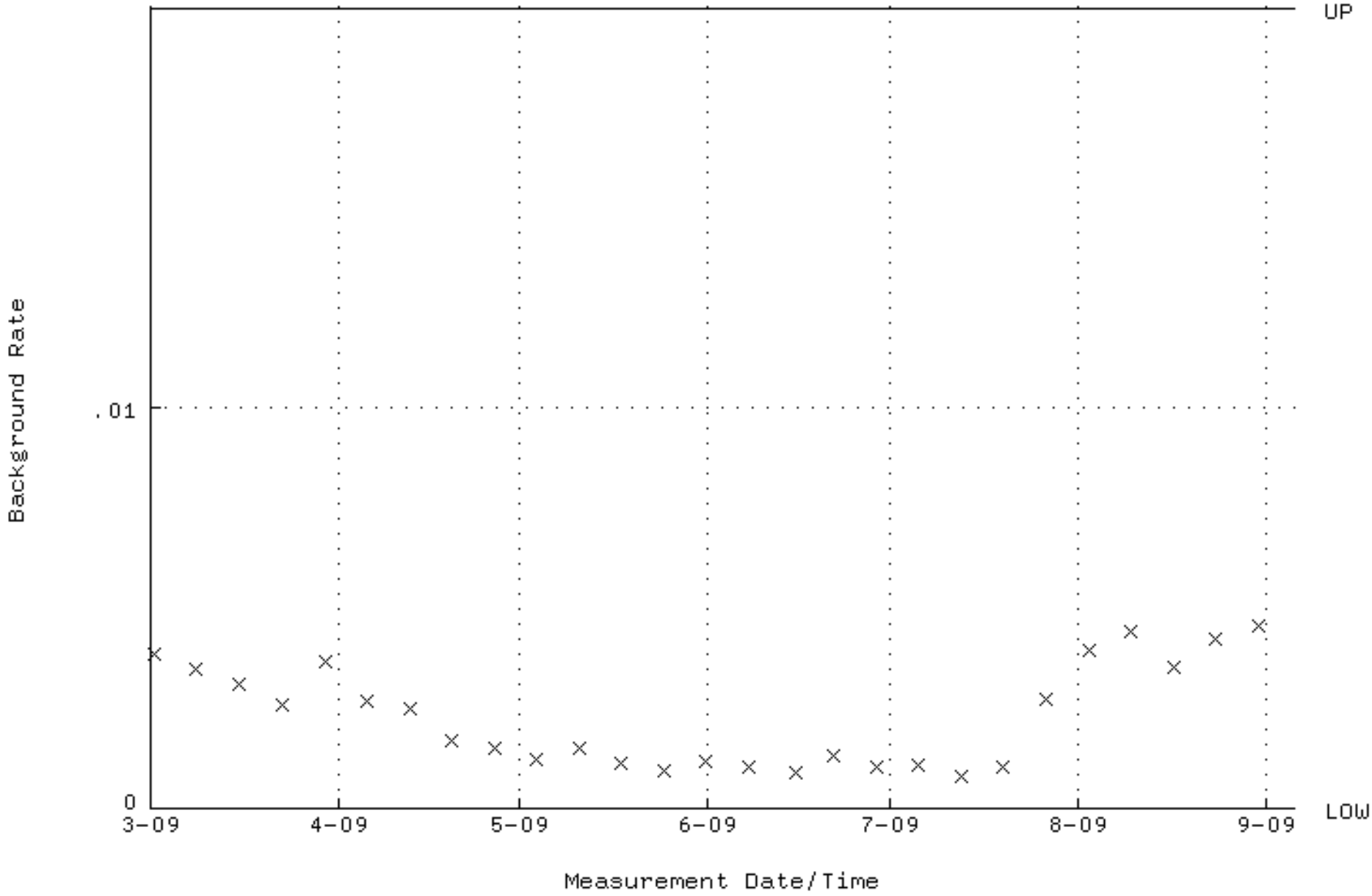


QA filename : DKA100:[ENV_ALPHA.QA.W]W047.QAF;5
Parameter Name : NLACTVTY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 5-MAR-2009 07:45:23 through 5-SEP-2009 12:00:00
Lower/Upper Lmts: 87.1403 through 89.8631

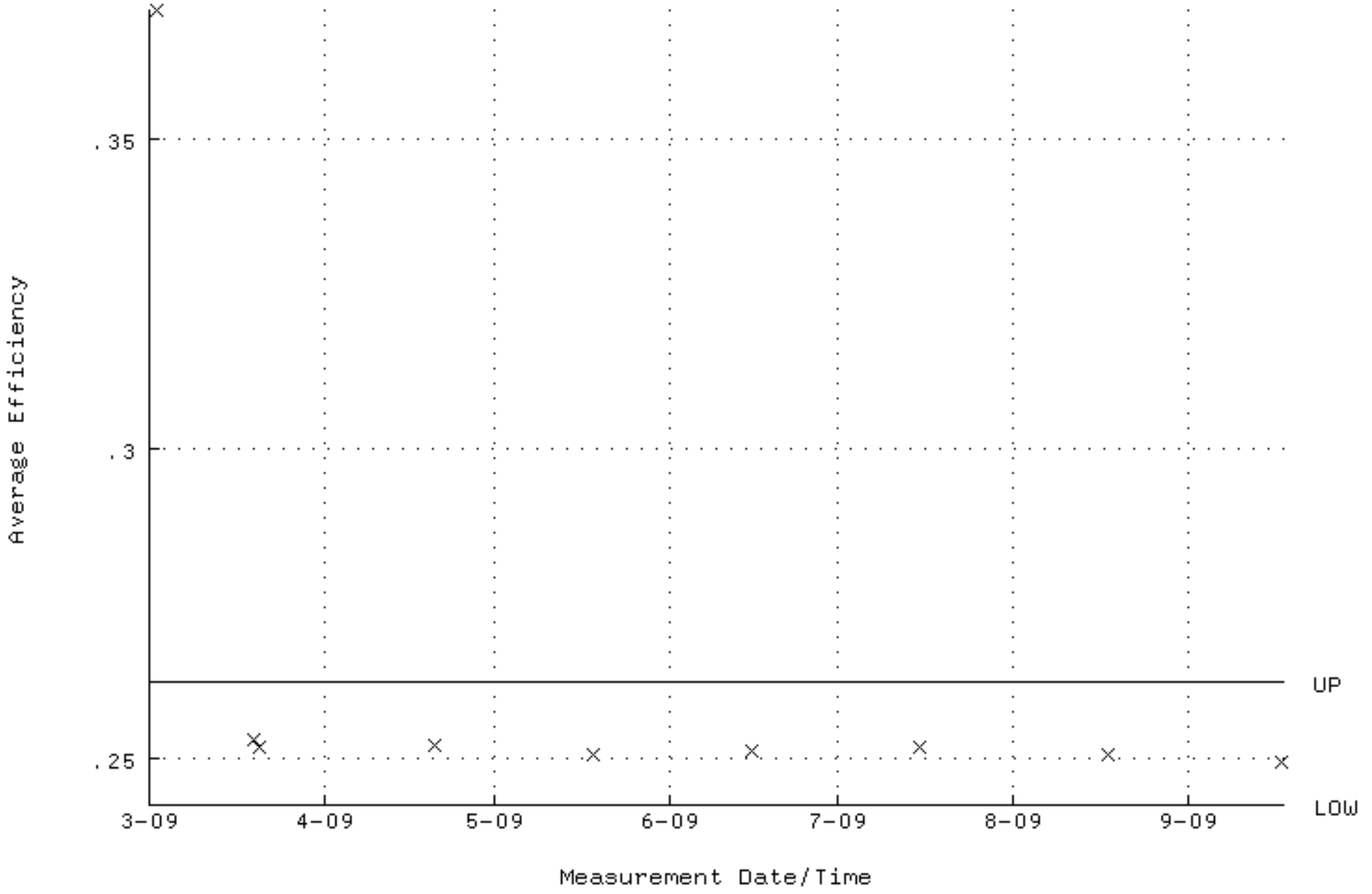


807

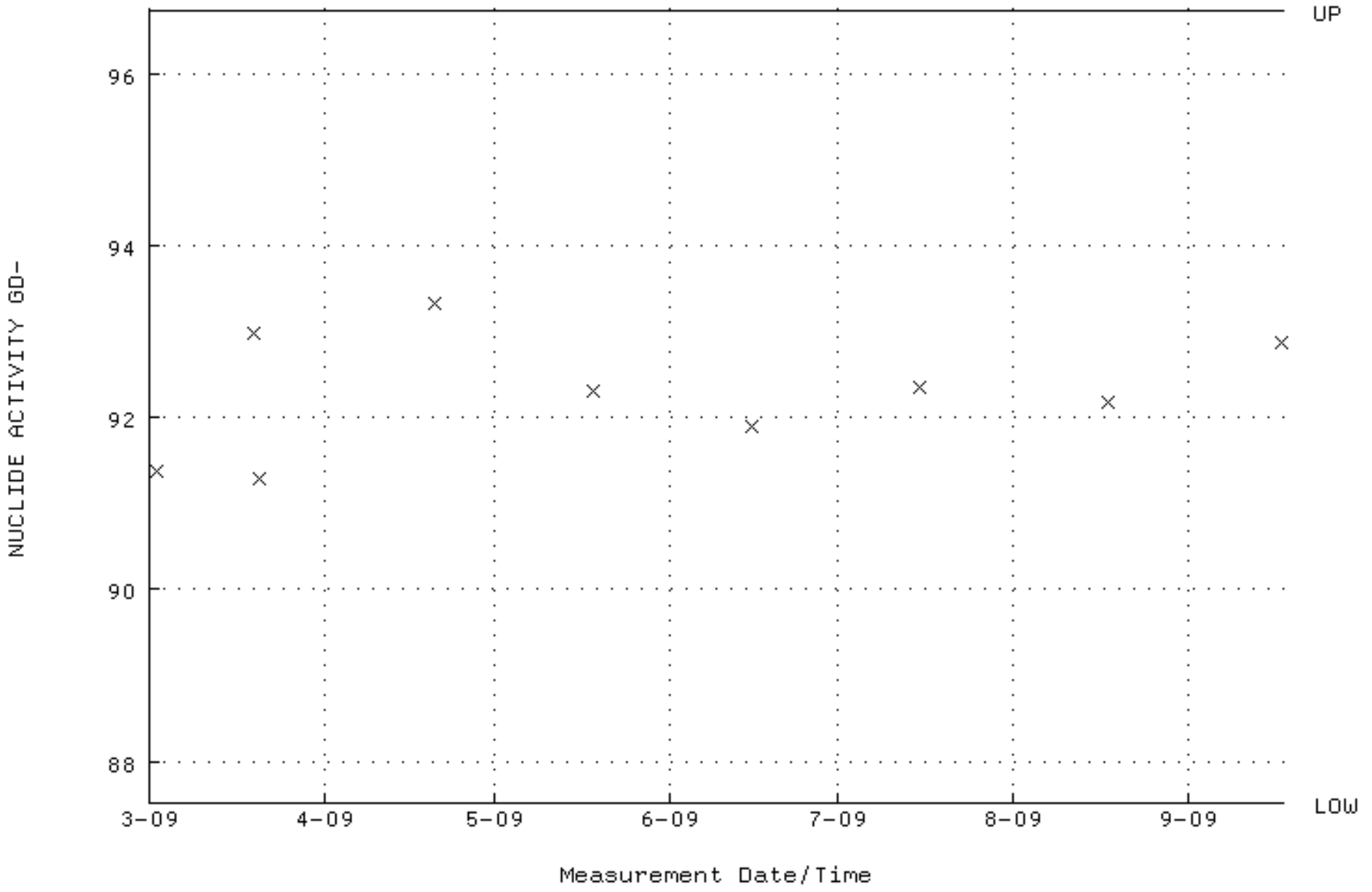
QA filename : DKA100:[ENV_ALPHA.QA.B]B047.QAF;2
Parameter Name : BACKRATE (Background Rate)
Start/End Dates : 1-MAR-2009 17:17:28 through 5-SEP-2009 12:00:00
Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



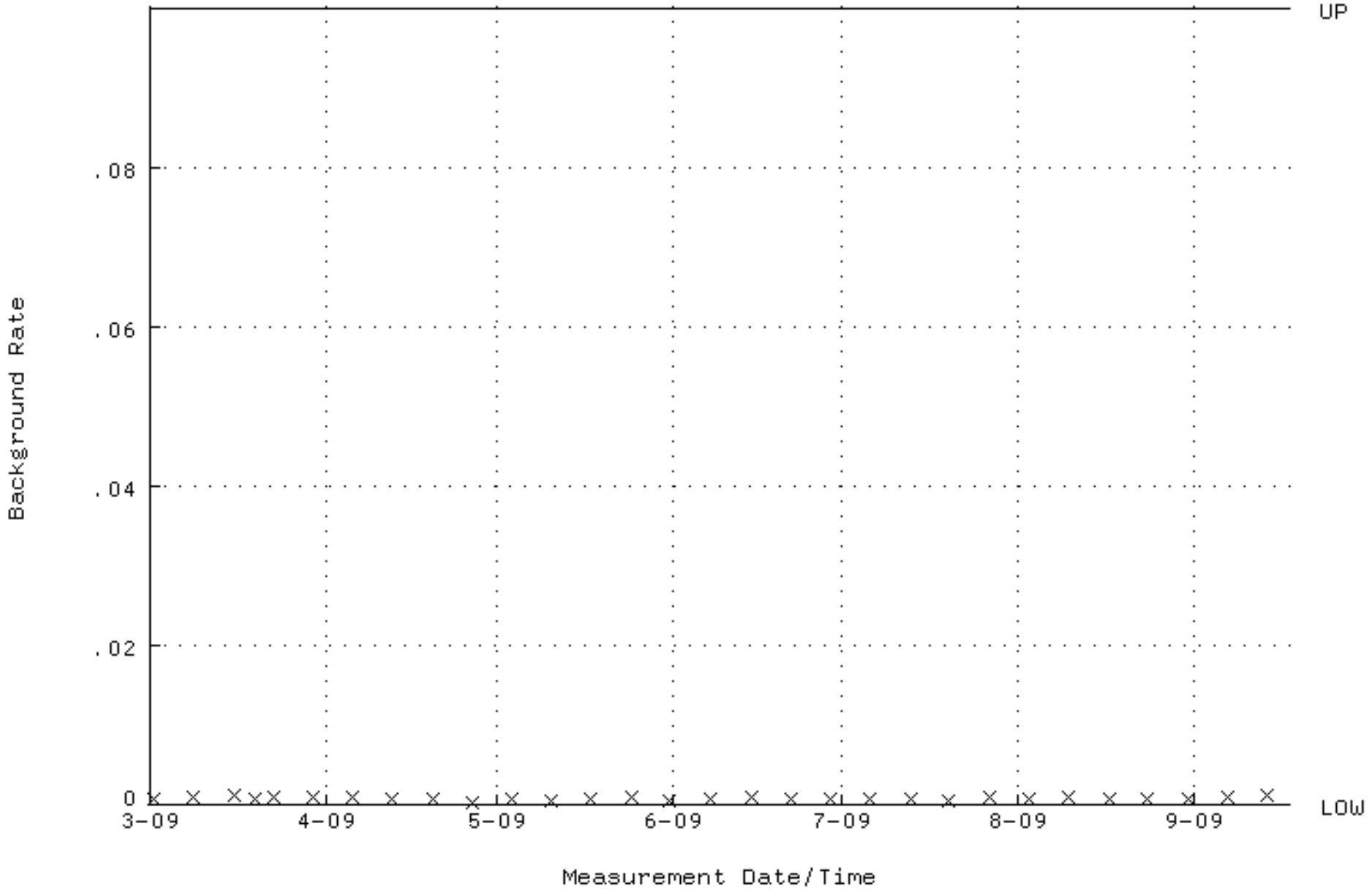
QA filename : DKA100:[ENV_ALPHA.QA.W]W113.QAF;1
Parameter Name : AVRGEFF (Average Efficiency)
Start/End Dates : 2-MAR-2009 11:07:45 through 17-SEP-2009 12:00:00
Lower/Upper Lmts: 0.242598 through 0.262598



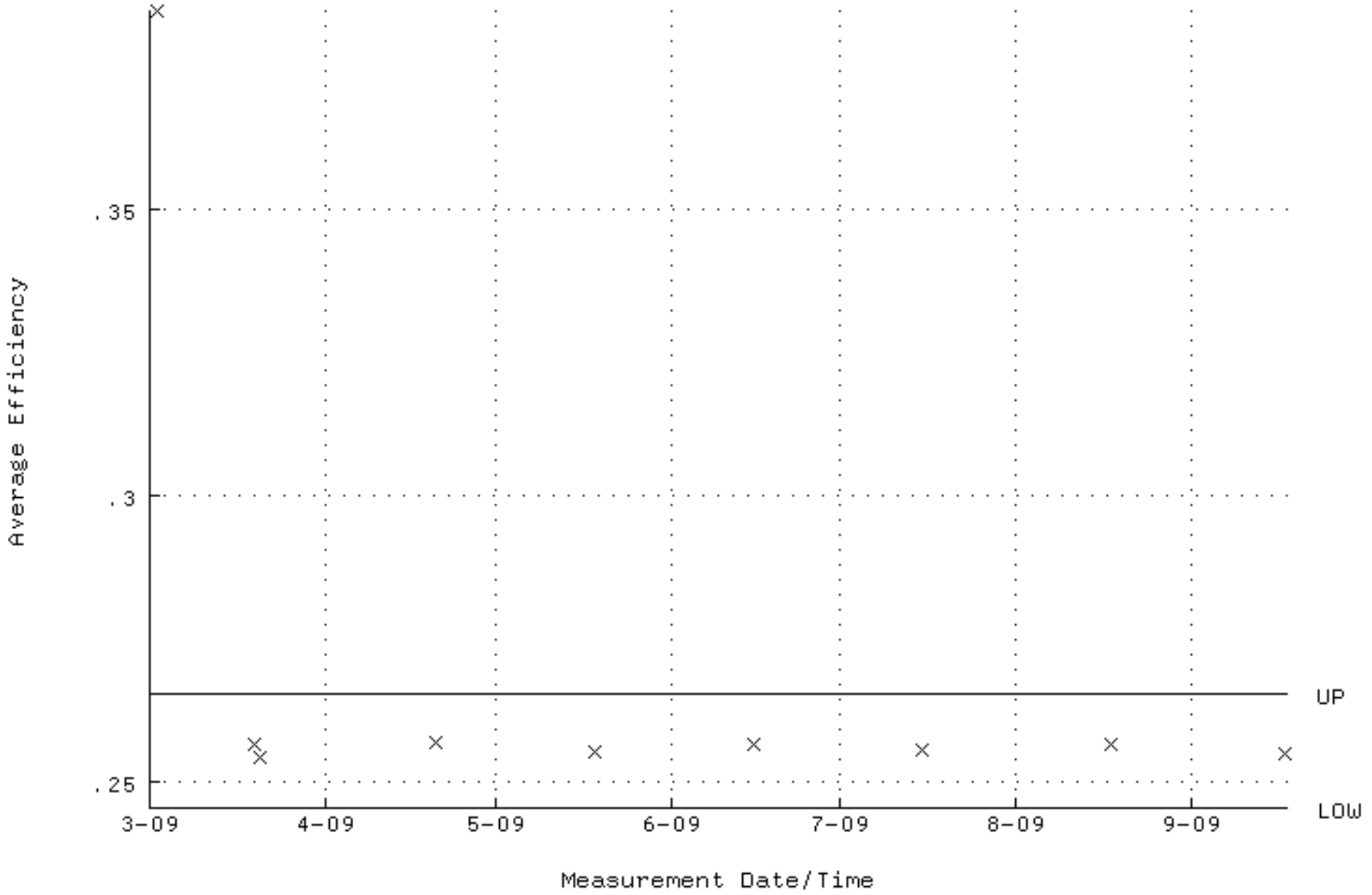
QA filename : DKA100:[ENV_ALPHA.QA.W]W113.QAF;1
Parameter Name : NLACTVTY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 2-MAR-2009 11:07:45 through 17-SEP-2009 12:00:00
Lower/Upper Lmts: 87.5172 through 96.7296



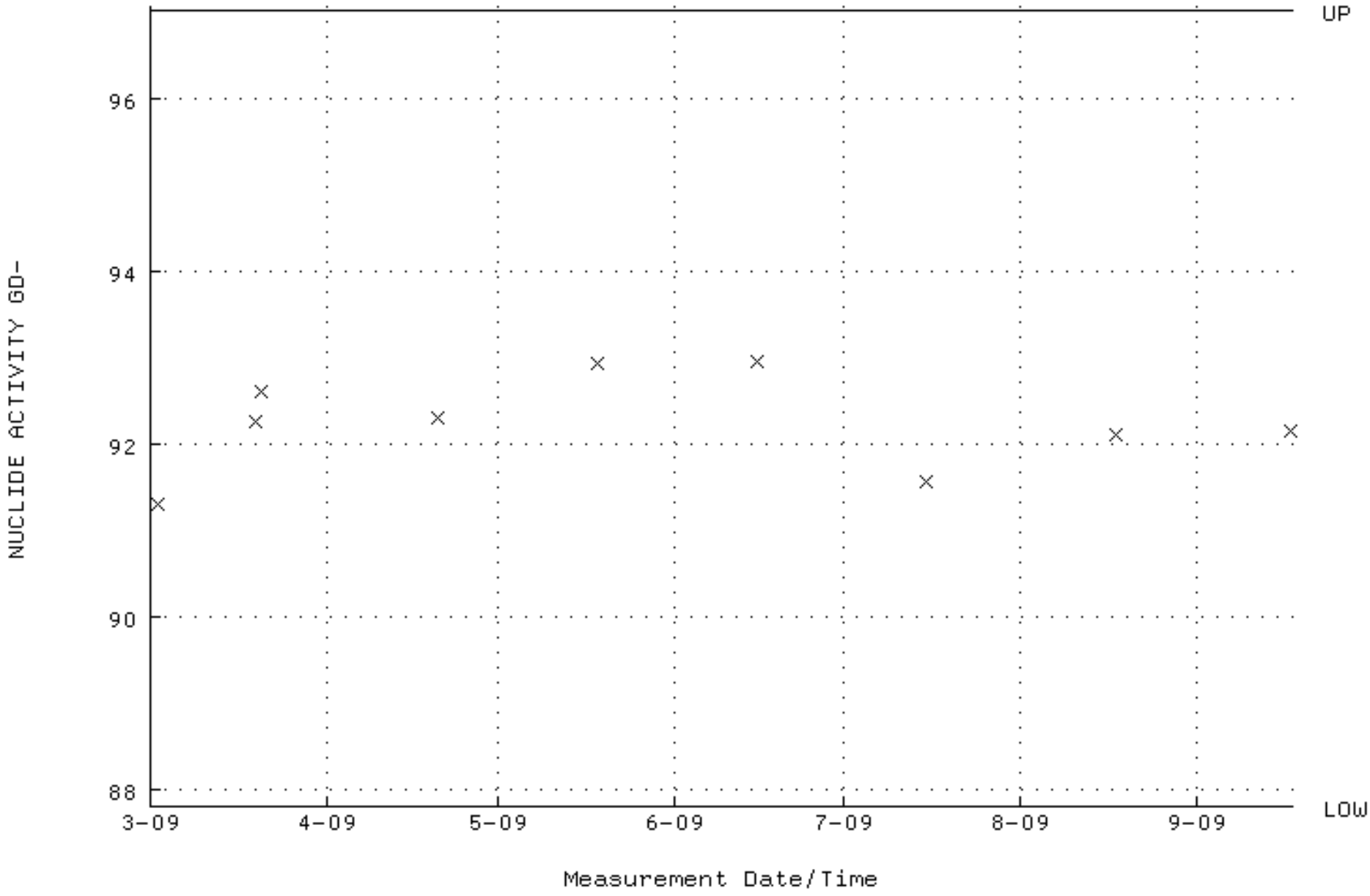
QA filename : DKA100:[ENV_ALPHA.QA.B]B113.QAF;2
Parameter Name : BACKRATE (Background Rate)
Start/End Dates : 1-MAR-2009 17:17:42 through 17-SEP-2009 12:00:00
Lower/Upper Lmts: 0.000000E+00 through 0.100000



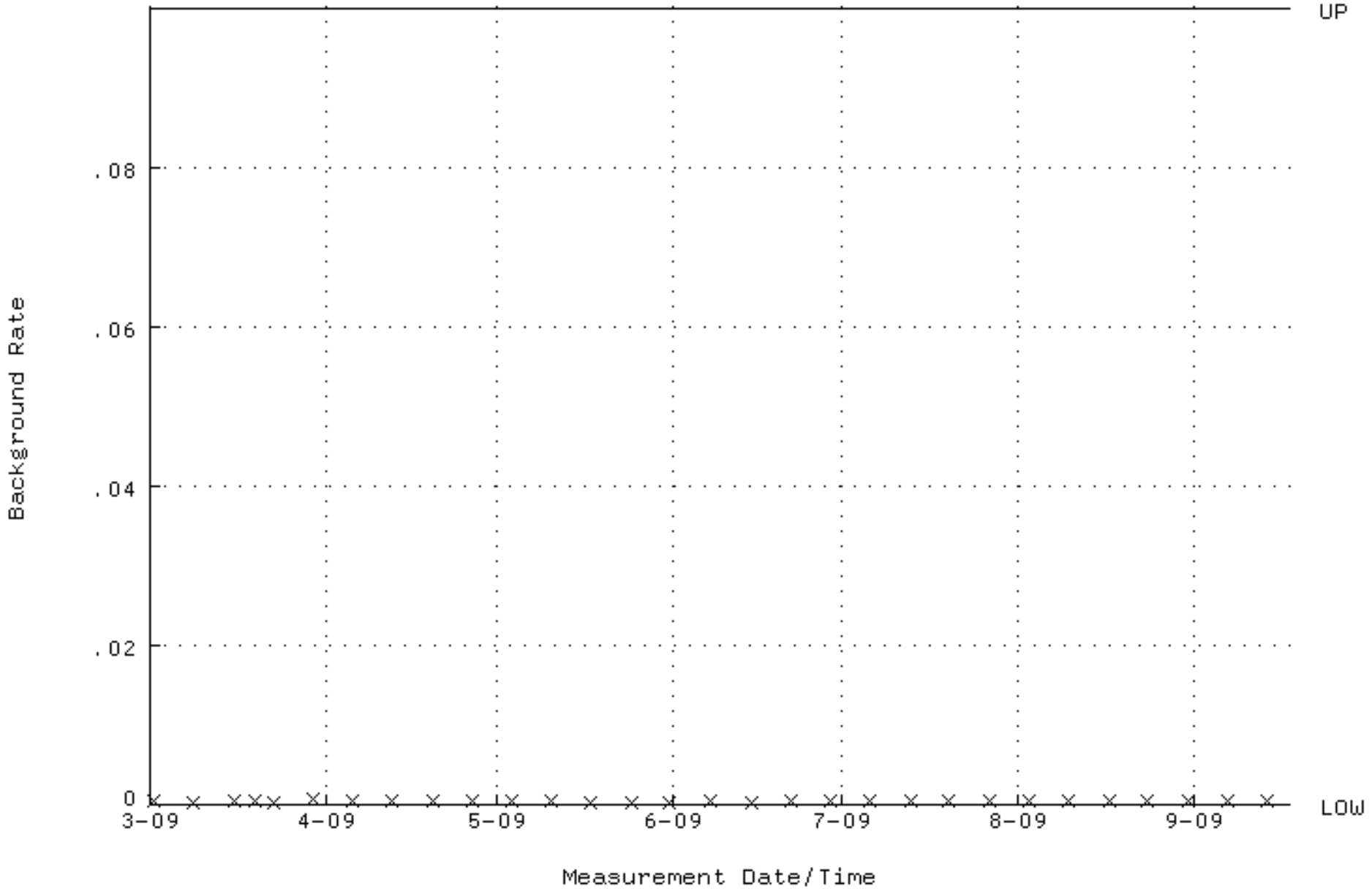
QA filename : DKA100:[ENV_ALPHA.QA.W]W114.QAF;1
Parameter Name : AVRGEFF (Average Efficiency)
Start/End Dates : 2-MAR-2009 11:07:52 through 17-SEP-2009 12:00:00
Lower/Upper Lmts: 0.245499 through 0.265499



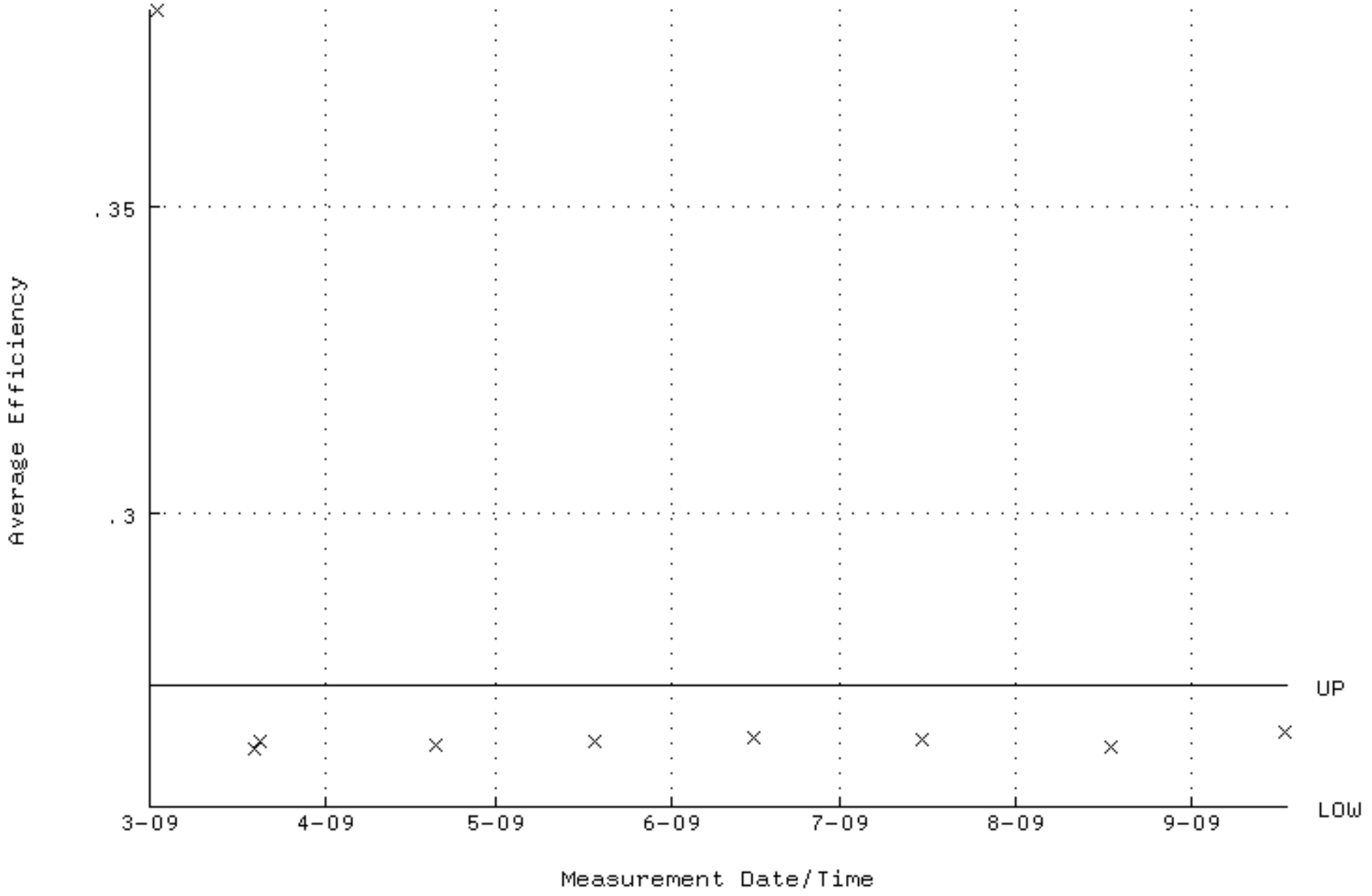
QA filename : DKA100:[ENV_ALPHA.QA.W]W114.QAF;1
Parameter Name : NLACTVTY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 2-MAR-2009 11:07:52 through 17-SEP-2009 12:00:00
Lower/Upper Lmts: 87.8108 through 97.0540



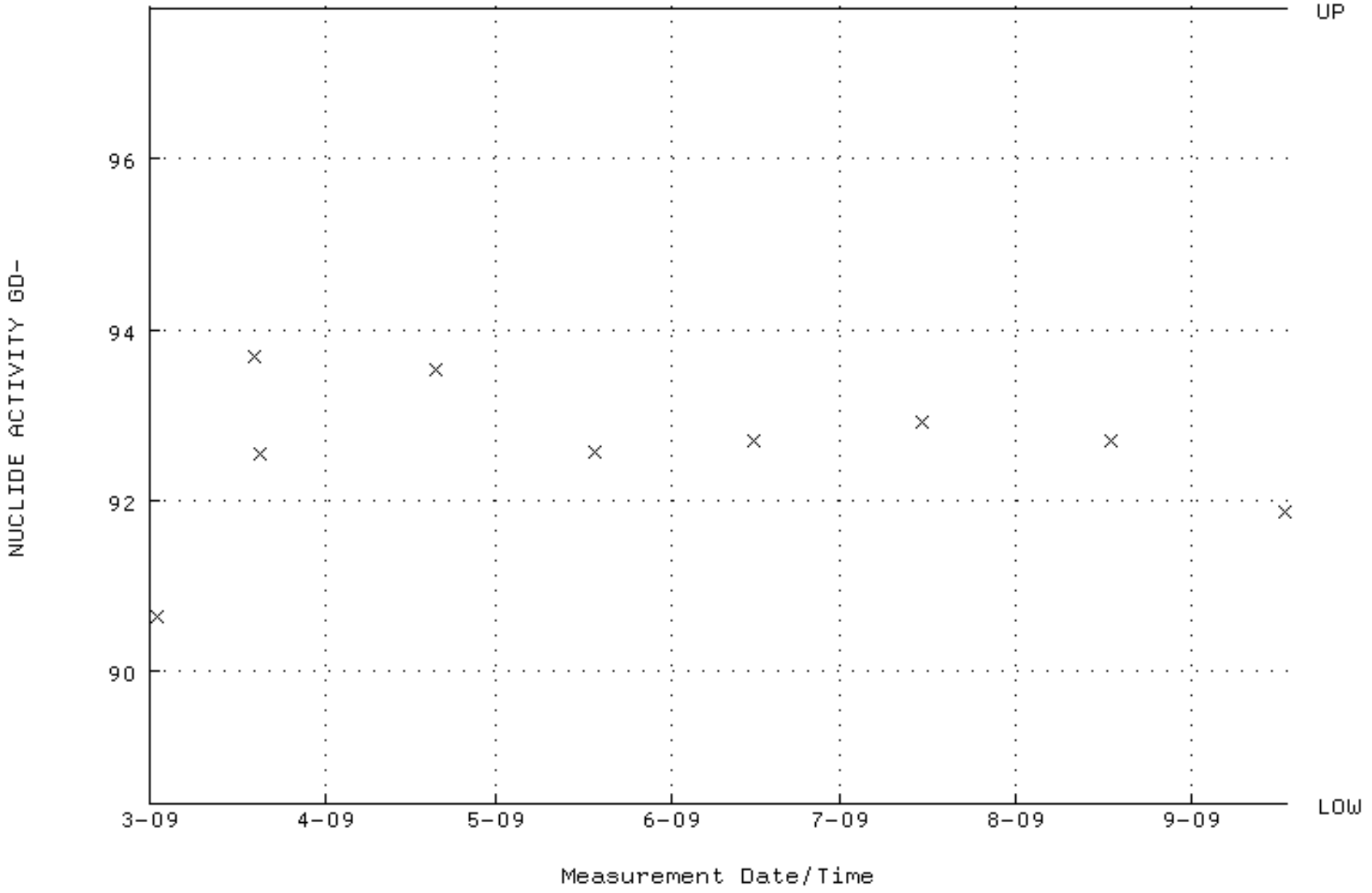
QA filename : DKA100:[ENV_ALPHA.QA.B]B114.QAF;1
Parameter Name : BACKRATE (Background Rate)
Start/End Dates : 1-MAR-2009 17:17:51 through 17-SEP-2009 12:00:00
Lower/Upper Lmts: 0.000000E+00 through 0.100000



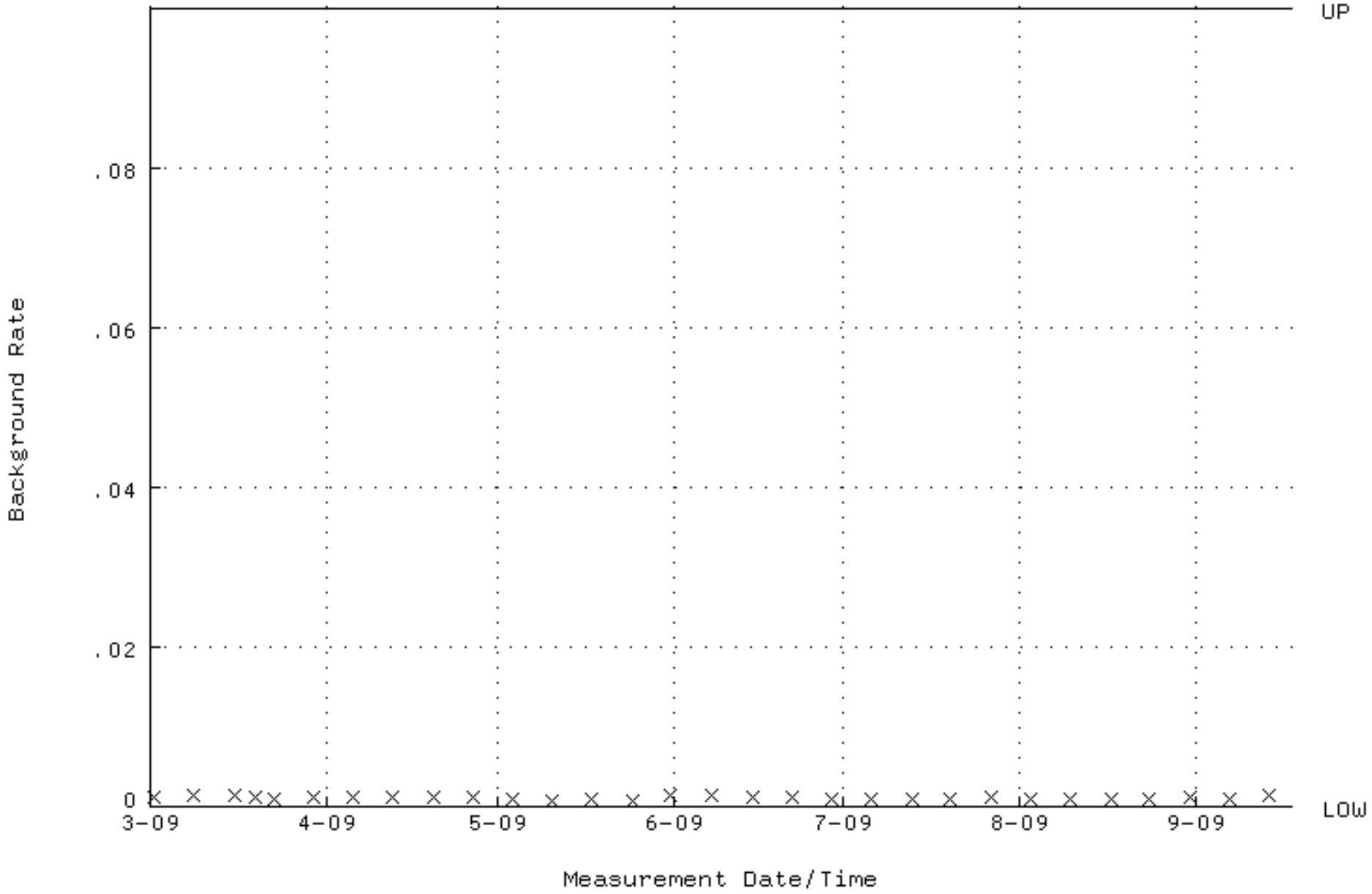
QA filename : DKA100:[ENV_ALPHA.QA.W]W116.QAF;1
Parameter Name : AVRGEFF (Average Efficiency)
Start/End Dates : 2-MAR-2009 11:08:07 through 17-SEP-2009 12:00:00
Lower/Upper Lmts: 0.251950 through 0.271950



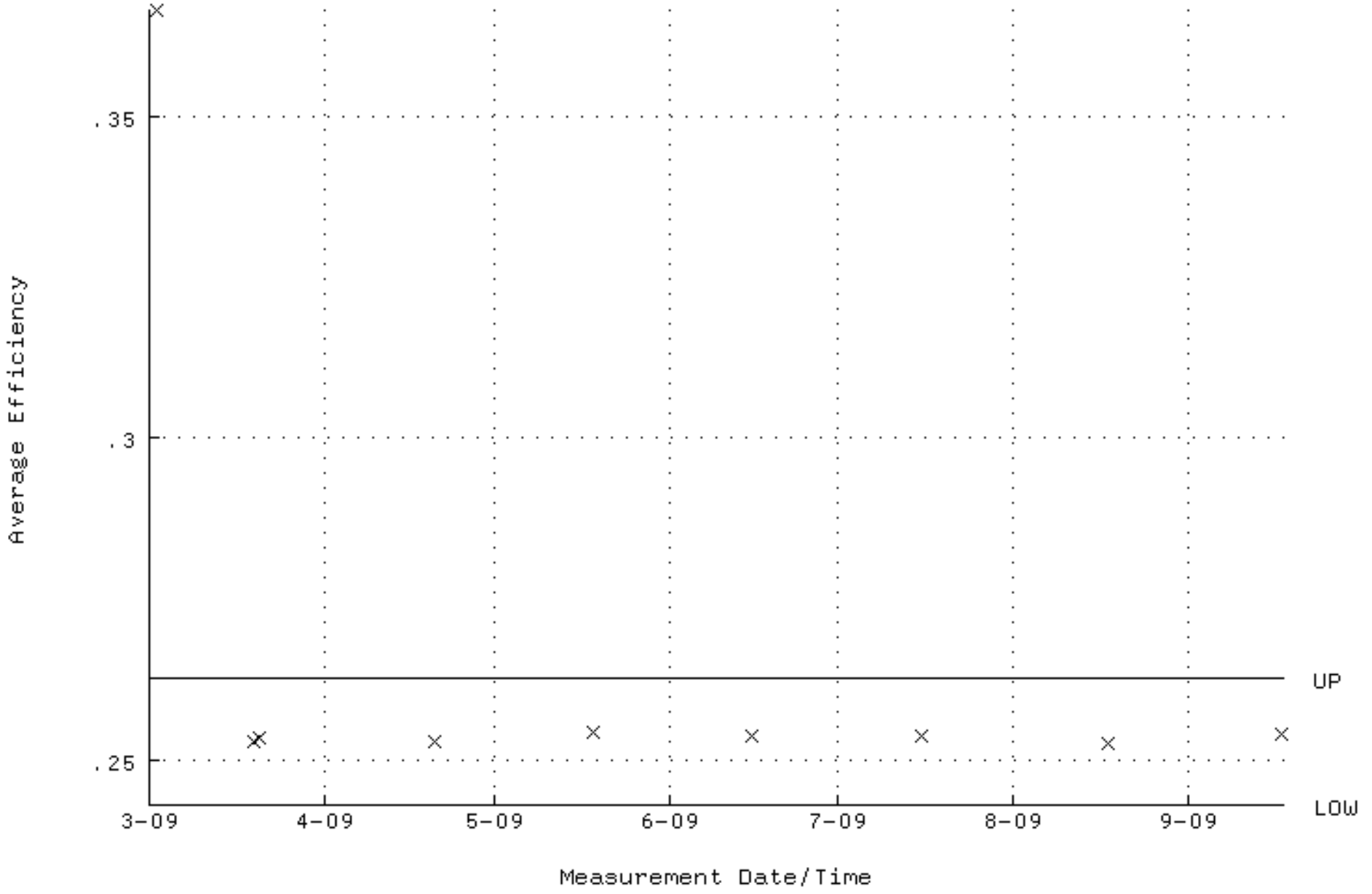
QA filename : DKA100:[ENV_ALPHA.QA.W]W116.QAF;1
Parameter Name : NLACTVTY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 2-MAR-2009 11:08:07 through 17-SEP-2009 12:00:00
Lower/Upper Lmts: 88.4515 through 97.7621



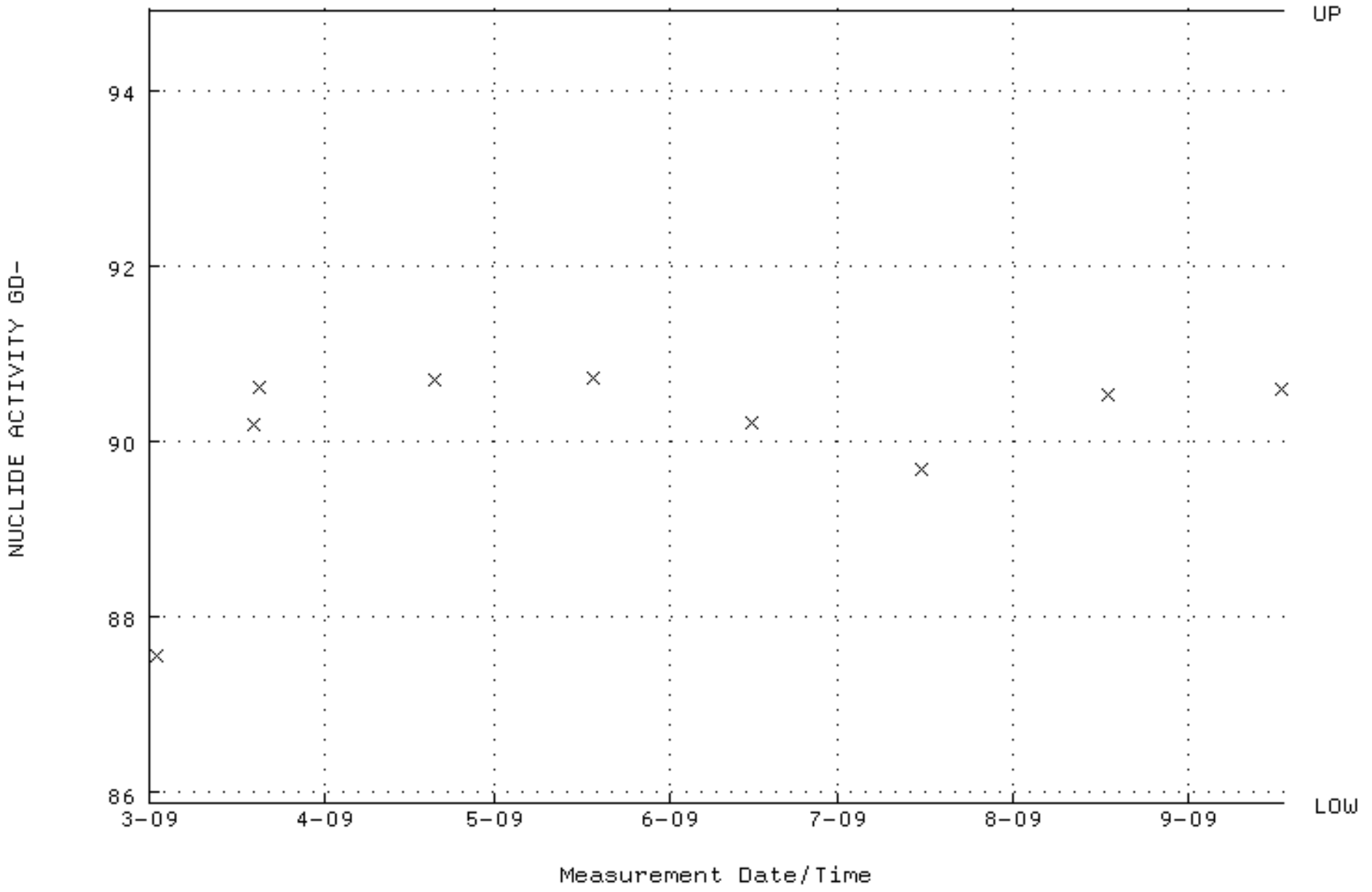
QA filename : DKA100:[ENV_ALPHA.QA.B]B116.QAF;1
Parameter Name : BACKRATE (Background Rate)
Start/End Dates : 1-MAR-2009 17:18:01 through 17-SEP-2009 12:00:00
Lower/Upper Lmts: 0.000000E+00 through 0.100000



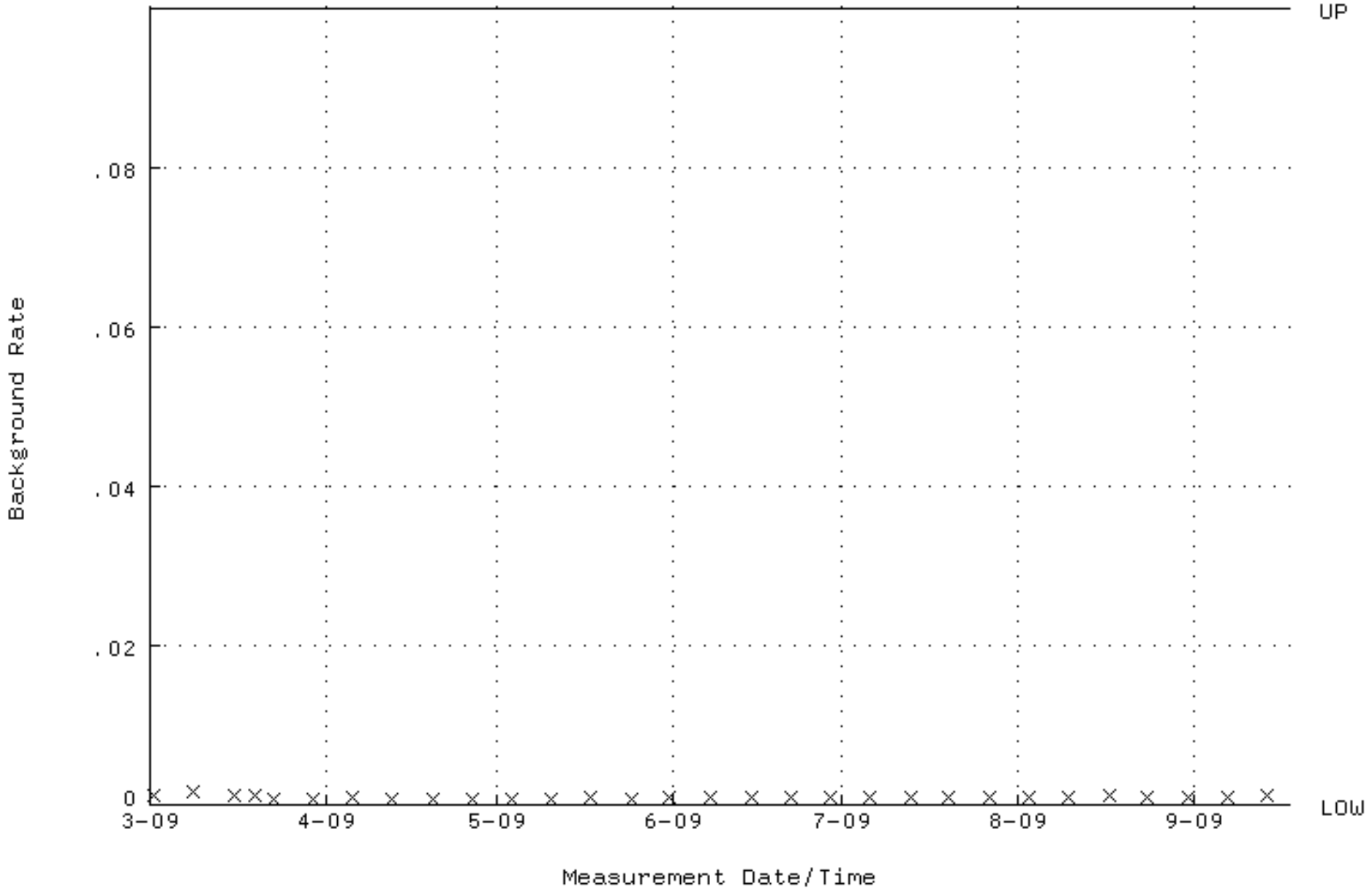
QA filename : DKA100:[ENV_ALPHA.QA.W]W117.QAF;1
Parameter Name : AVRGEFF (Average Efficiency)
Start/End Dates : 2-MAR-2009 11:08:13 through 17-SEP-2009 12:00:00
Lower/Upper Lmts: 0.242940 through 0.262940



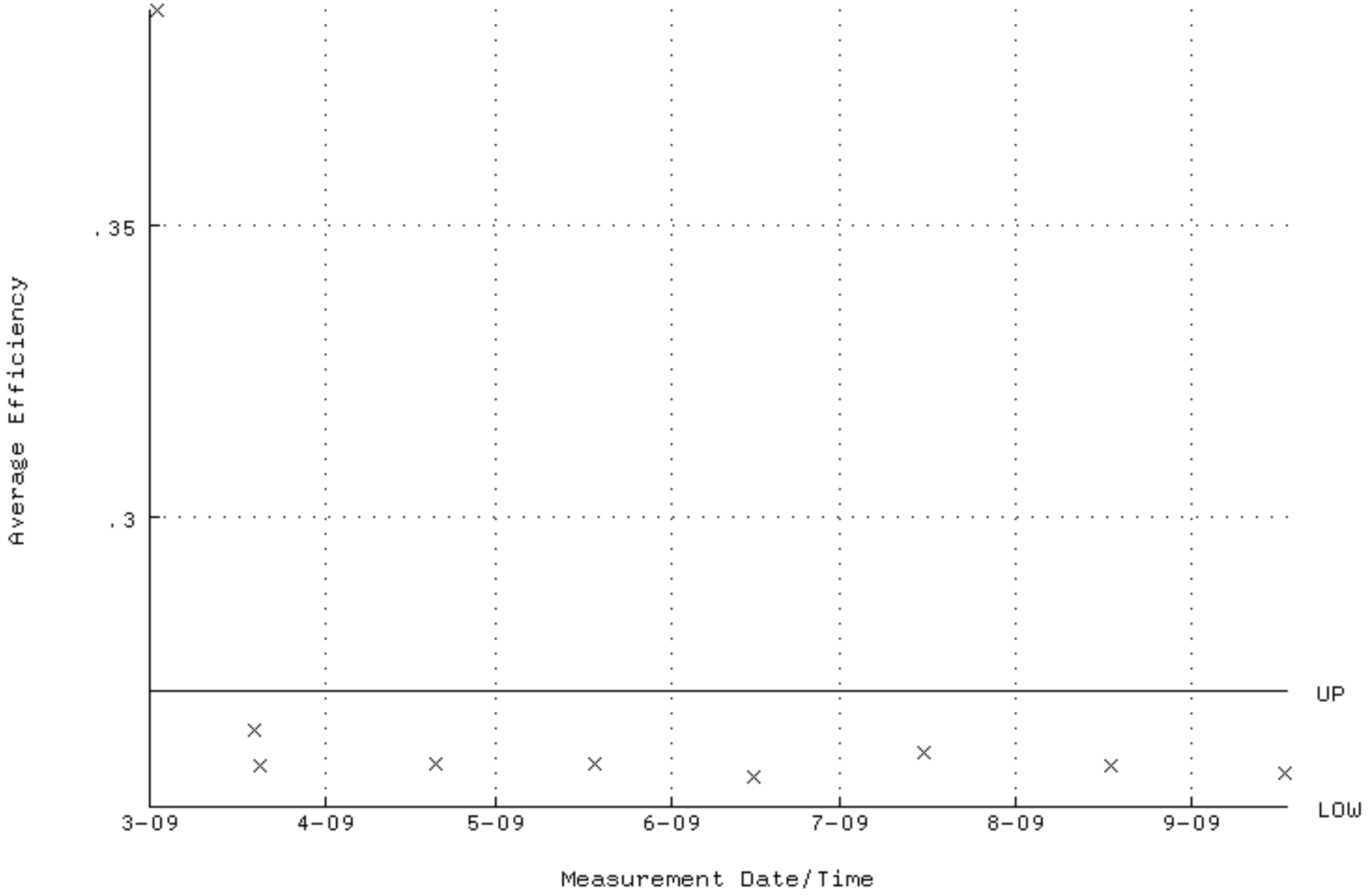
QA filename : DKA100:[ENV_ALPHA.QA.W]W117.QAF;1
Parameter Name : NLACTVTY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 2-MAR-2009 11:08:13 through 17-SEP-2009 12:00:00
Lower/Upper Lmts: 85.8693 through 94.9081



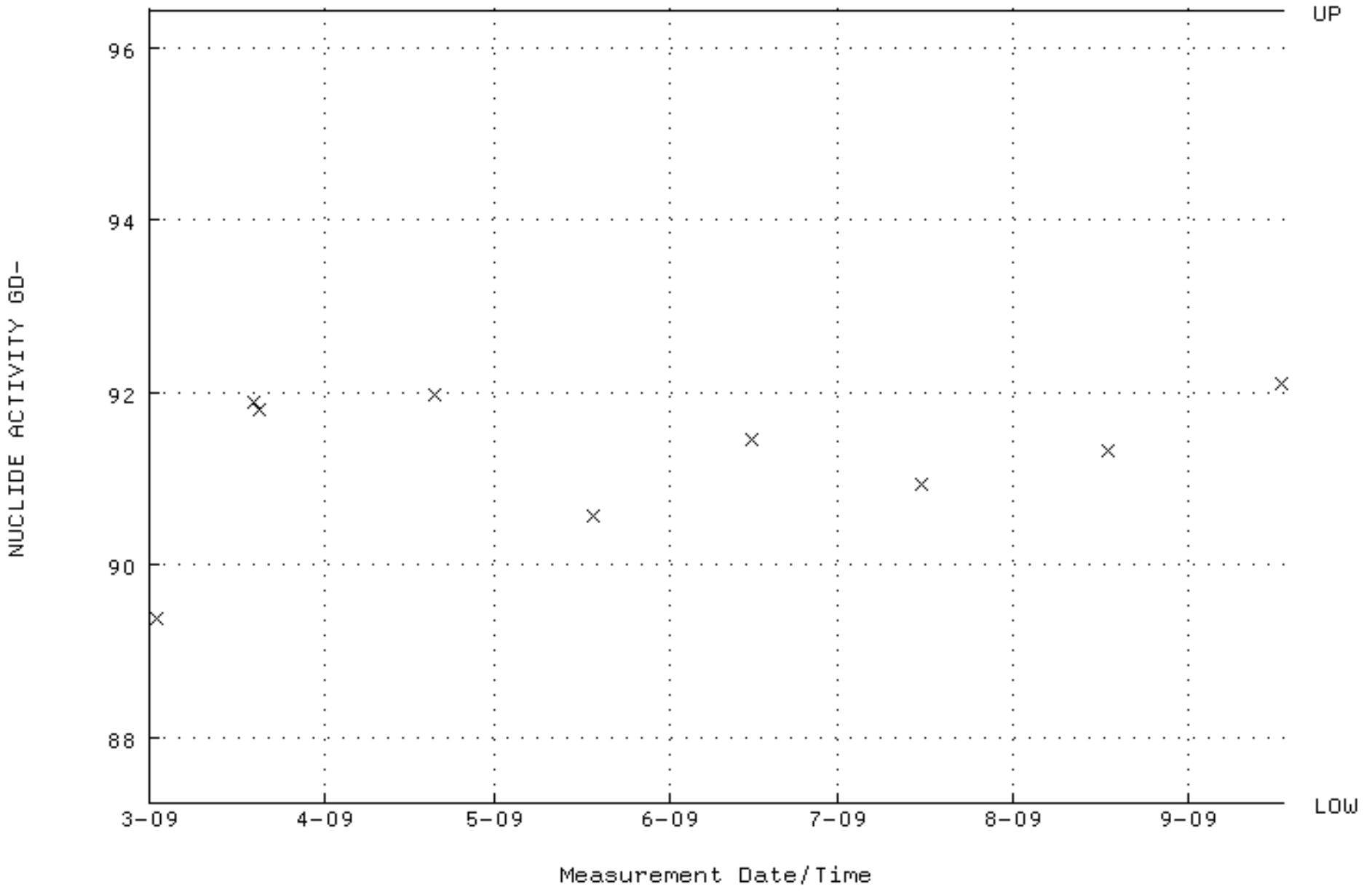
QA filename : DKA100:[ENV_ALPHA.QA.B]B117.QAF;1
Parameter Name : BACKRATE (Background Rate)
Start/End Dates : 1-MAR-2009 17:18:05 through 17-SEP-2009 12:00:00
Lower/Upper Lmts: 0.000000E+00 through 0.100000



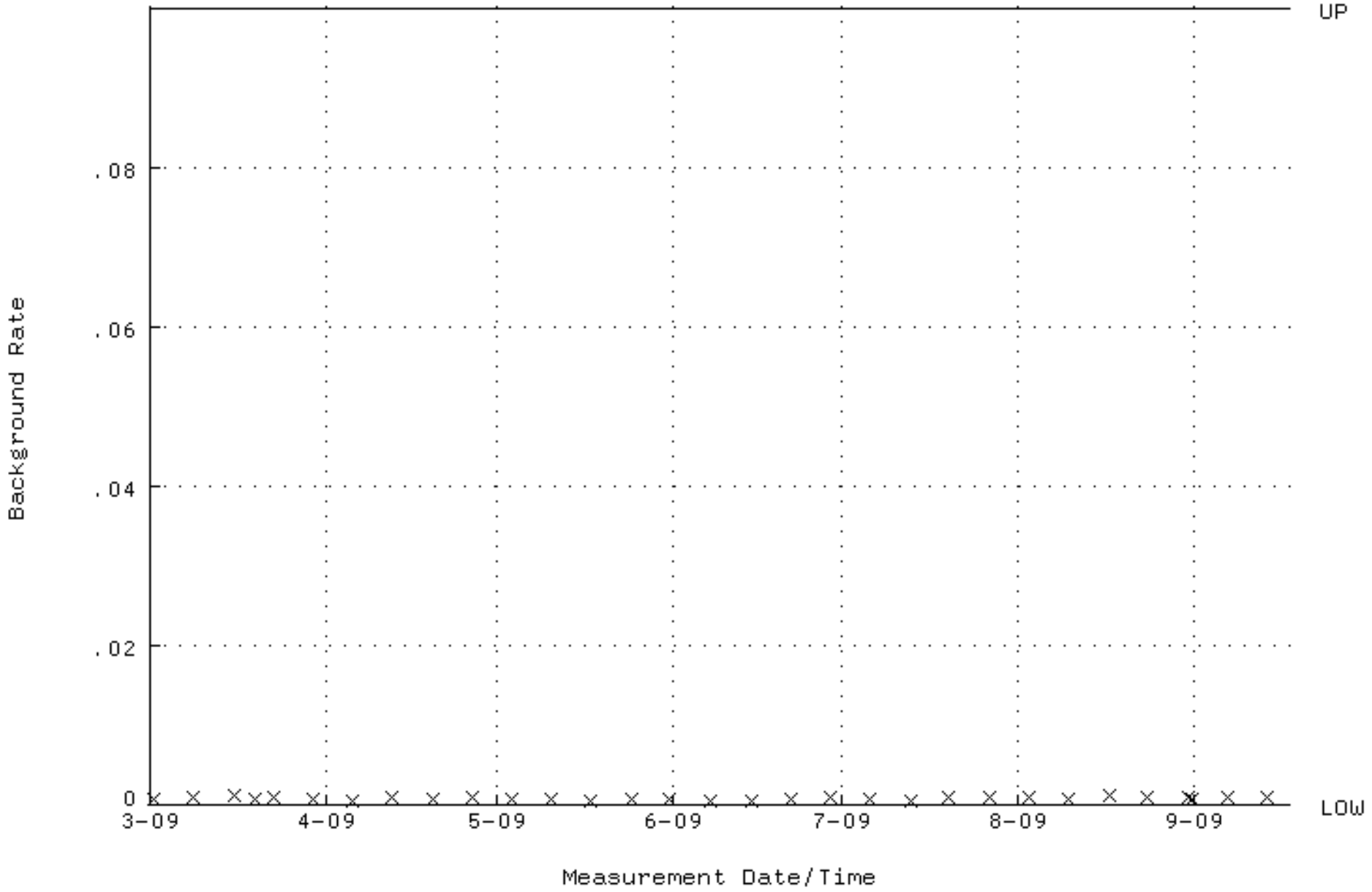
QA filename : DKA100:[ENV_ALPHA.QA.W]W118.QAF;1
Parameter Name : AVRGEFF (Average Efficiency)
Start/End Dates : 2-MAR-2009 11:08:21 through 17-SEP-2009 12:00:00
Lower/Upper Lmts: 0.250490 through 0.270490



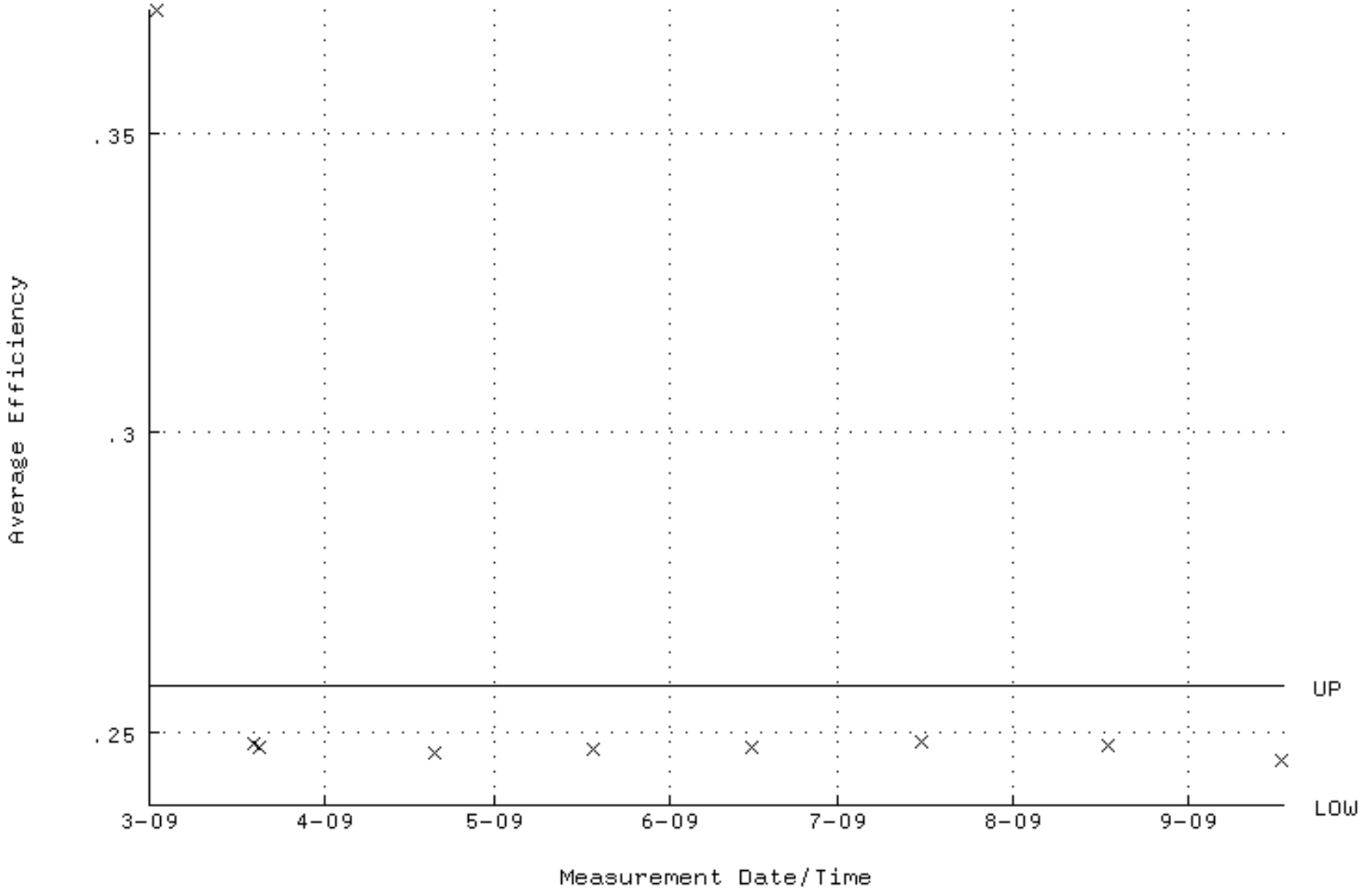
QA filename : DKA100:[ENV_ALPHA.QA.W]W118.QAF;1
Parameter Name : NLACTVTY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 2-MAR-2009 11:08:21 through 17-SEP-2009 12:00:00
Lower/Upper Lmts: 87.2440 through 96.4276



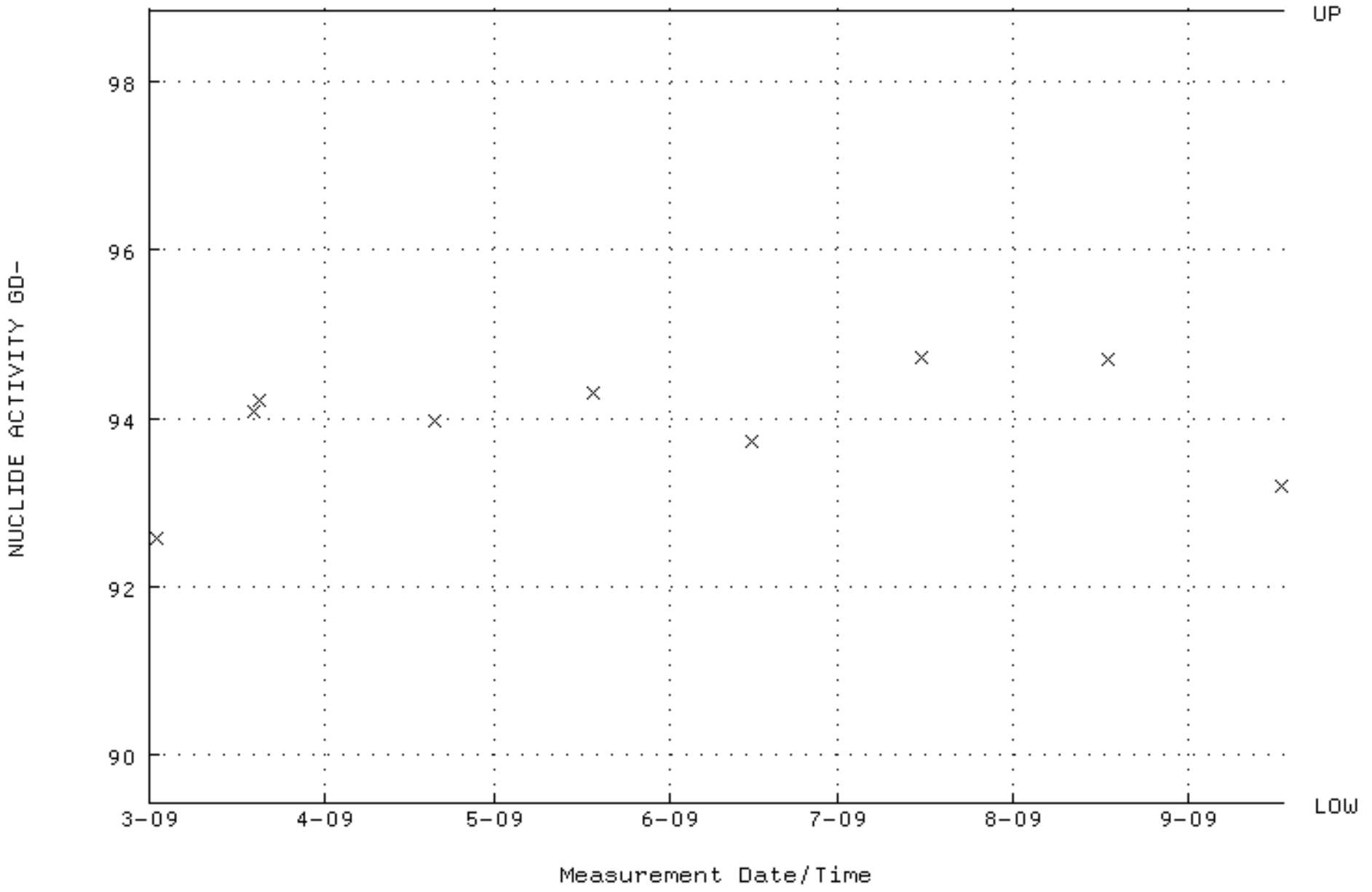
QA filename : DKA100:[ENV_ALPHA.QA.B]B118.QAF;1
Parameter Name : BACKRATE (Background Rate)
Start/End Dates : 1-MAR-2009 17:18:09 through 17-SEP-2009 12:00:00
Lower/Upper Lmts: 0.000000E+00 through 0.100000



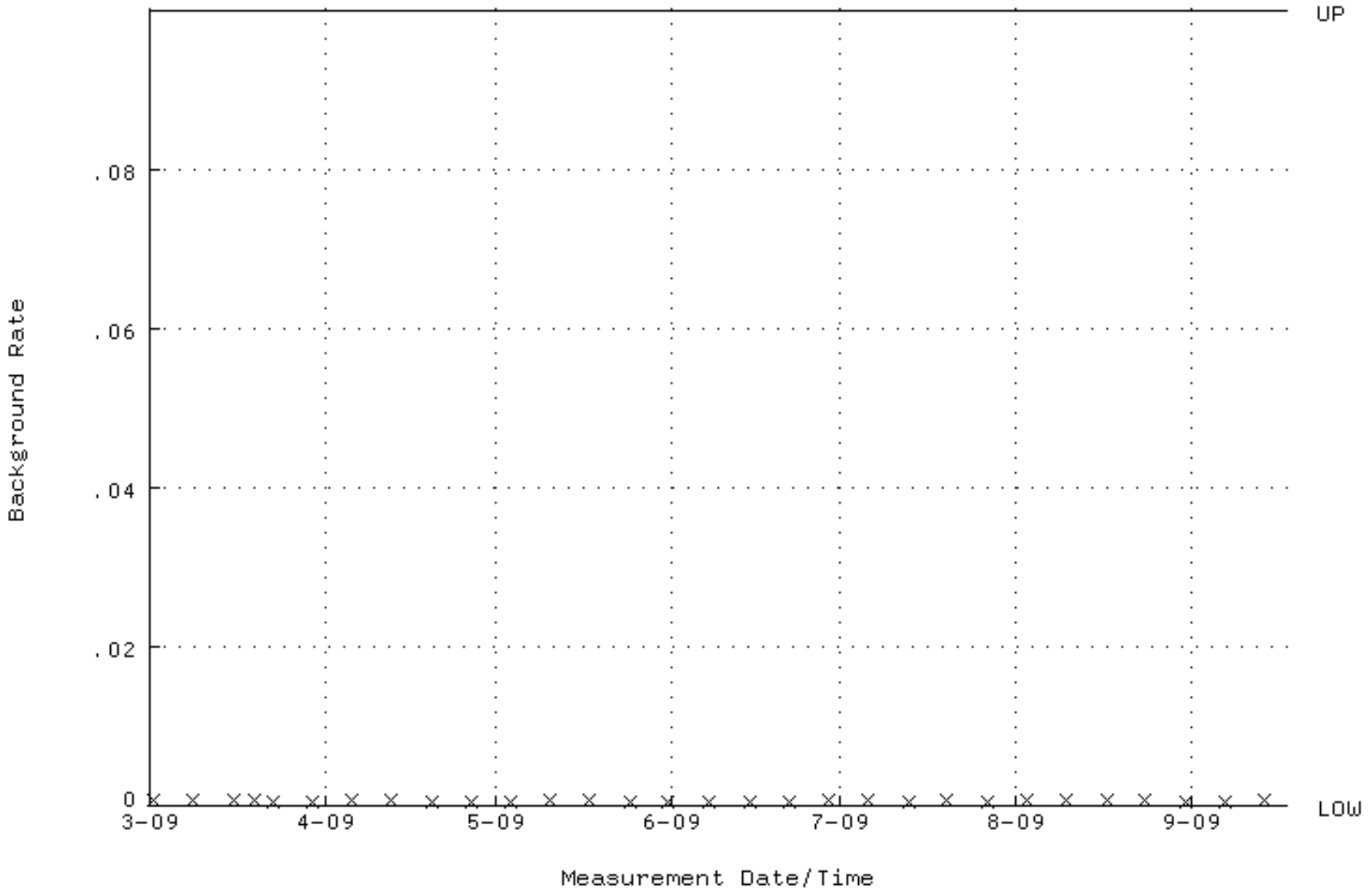
QA filename : DKA100:[ENV_ALPHA.QA.W]W121.QAF;1
Parameter Name : AVRGEFF (Average Efficiency)
Start/End Dates : 2-MAR-2009 11:08:28 through 17-SEP-2009 12:00:00
Lower/Upper Lmts: 0.237686 through 0.257686



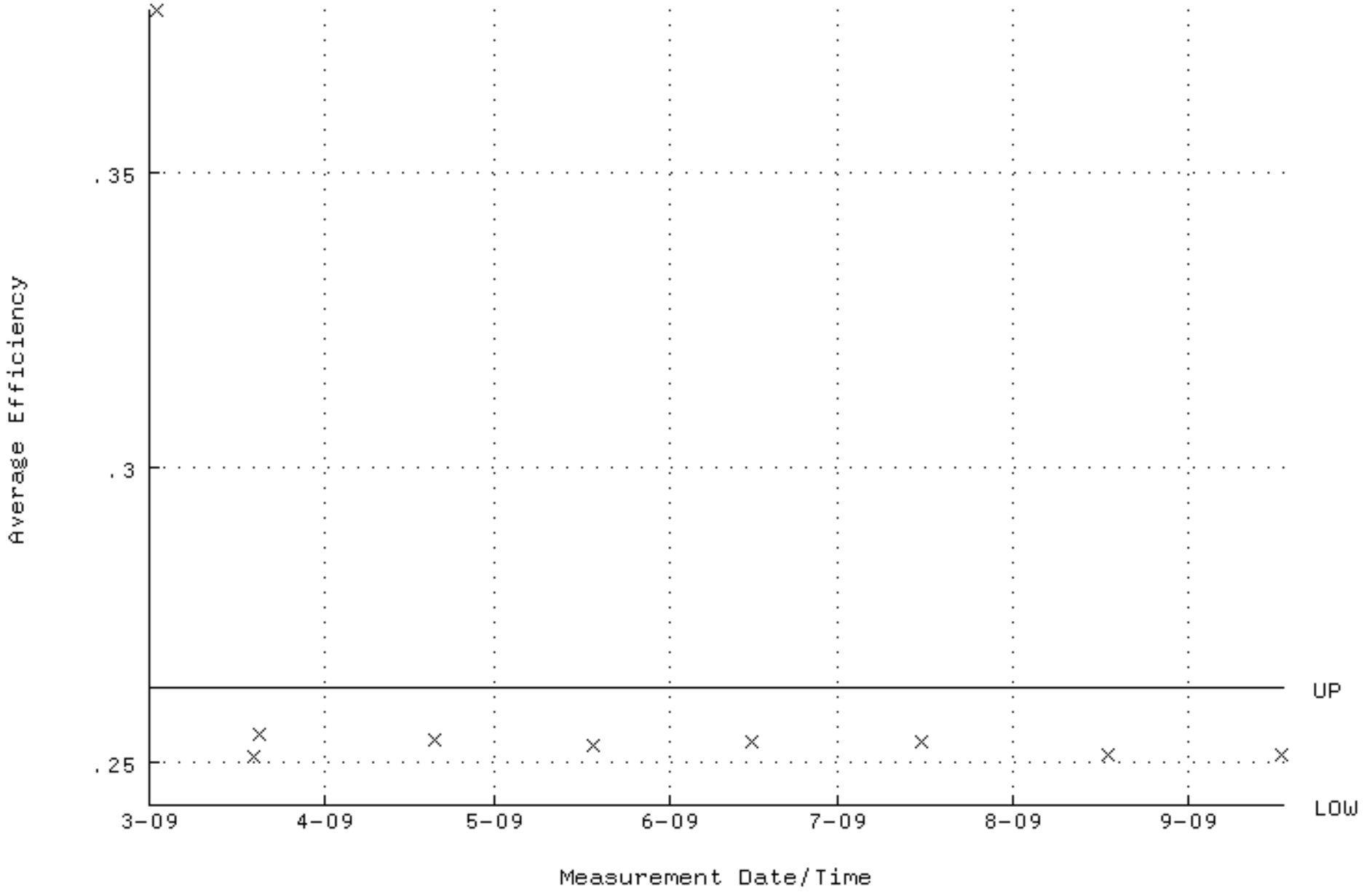
QA filename : DKA100:[ENV_ALPHA.QA.W]W121.QAF;1
Parameter Name : NLACTVTY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 2-MAR-2009 11:08:28 through 17-SEP-2009 12:00:00
Lower/Upper Lmts: 89.4263 through 98.8395



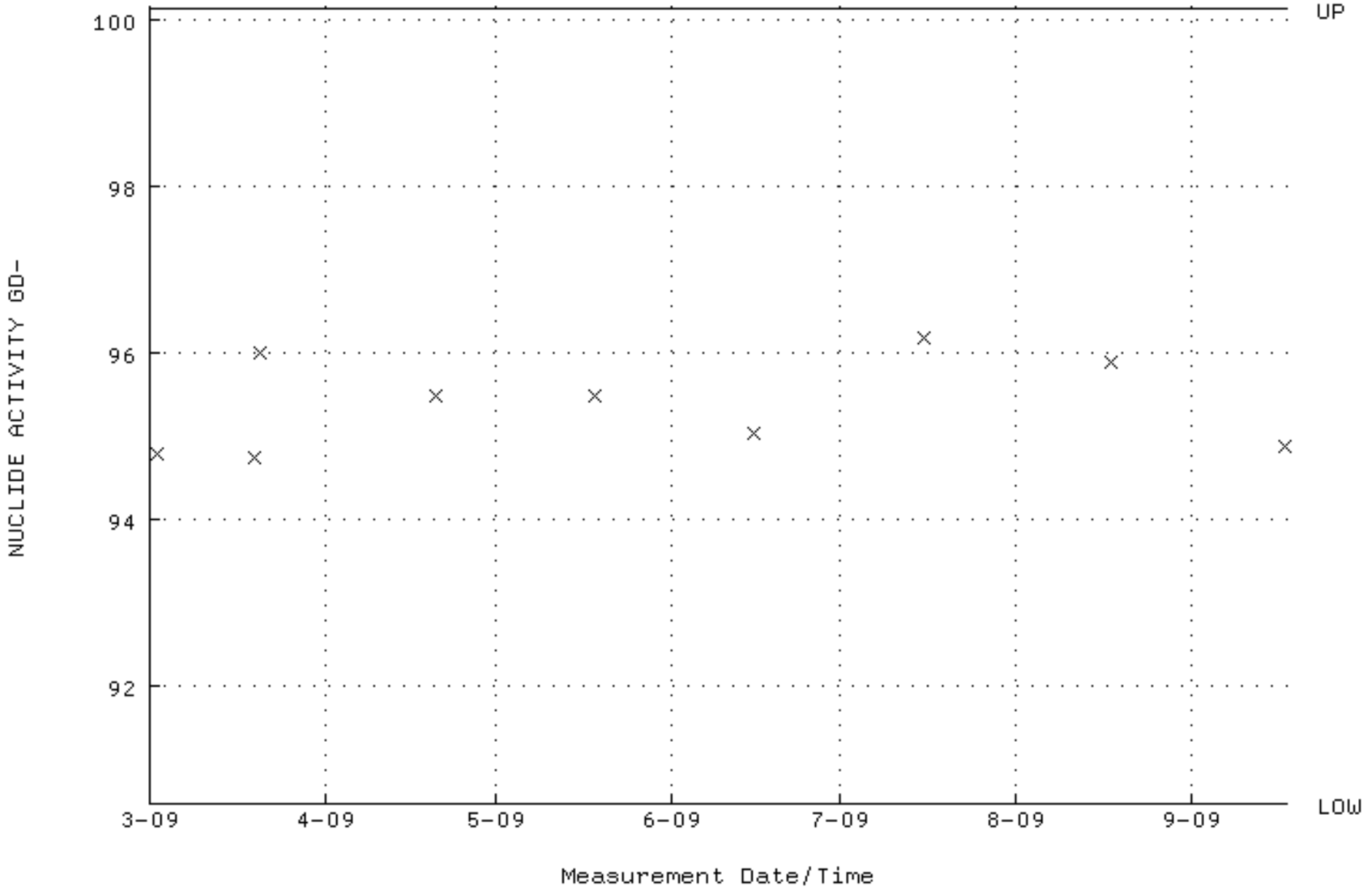
QA filename : DKA100:[ENV_ALPHA.QA.B]B121.QAF;1
Parameter Name : BACKRATE (Background Rate)
Start/End Dates : 1-MAR-2009 17:18:21 through 17-SEP-2009 12:00:00
Lower/Upper Lmts: 0.000000E+00 through 0.100000



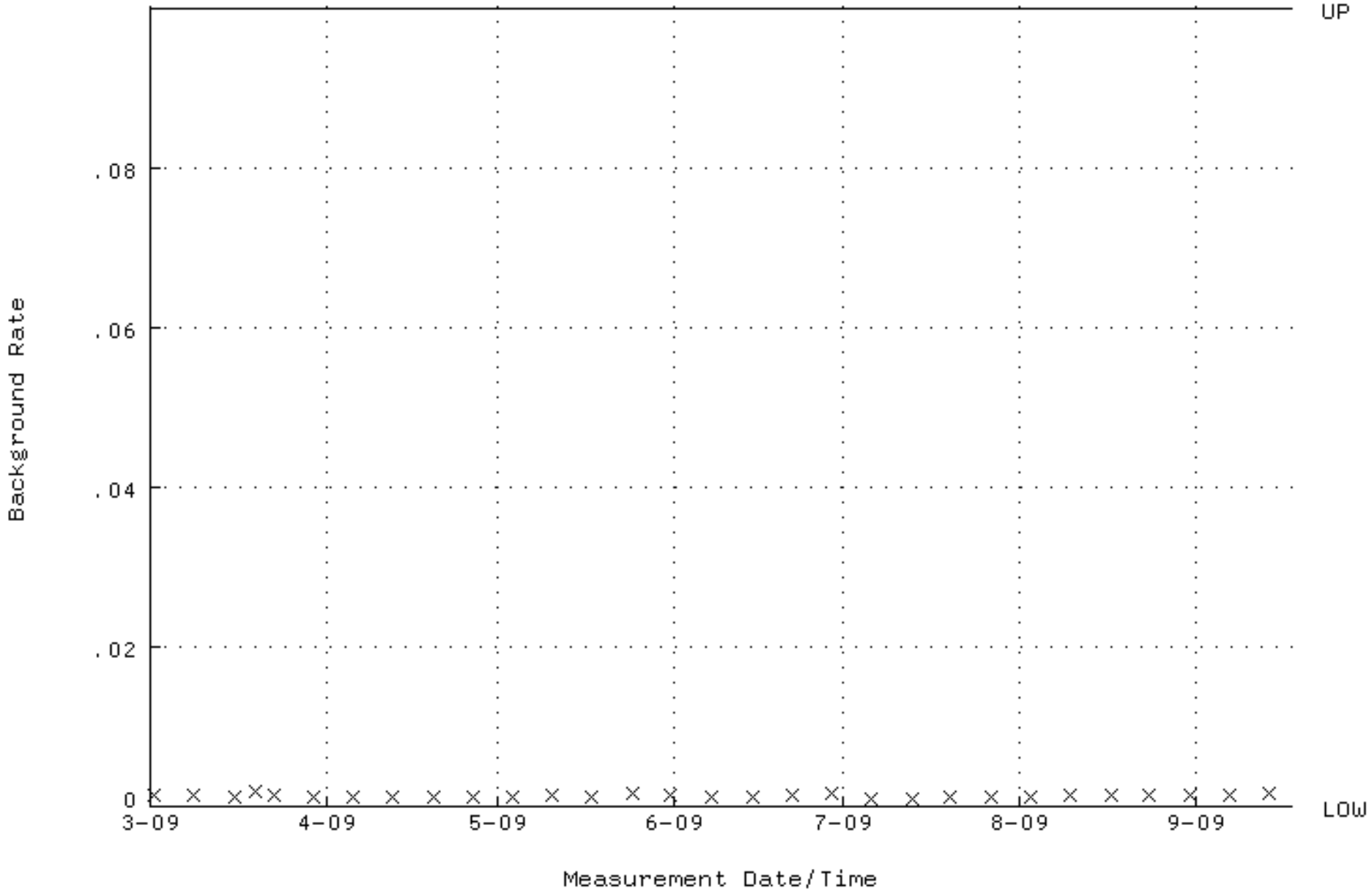
QA filename : DKA100:[ENV_ALPHA.QA.W]W122.QAF;1
Parameter Name : AVRGEFF (Average Efficiency)
Start/End Dates : 2-MAR-2009 11:08:34 through 17-SEP-2009 12:00:00
Lower/Upper Lmts: 0.242659 through 0.262659



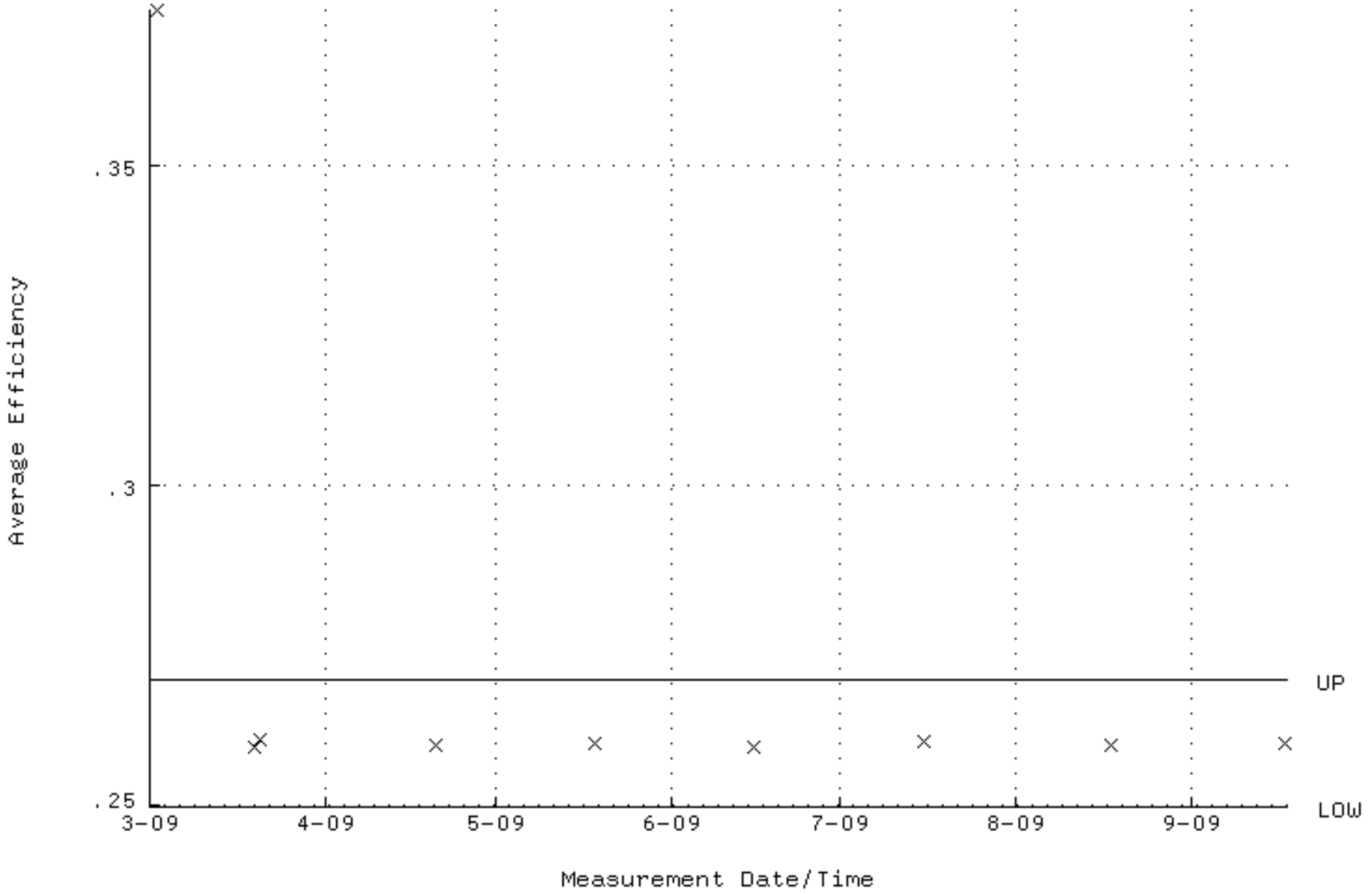
QA filename : DKA100:[ENV_ALPHA.QA.W]W122.QAF;1
Parameter Name : NLACTVTY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 2-MAR-2009 11:08:34 through 17-SEP-2009 12:00:00
Lower/Upper Lmts: 90.5949 through 100.131



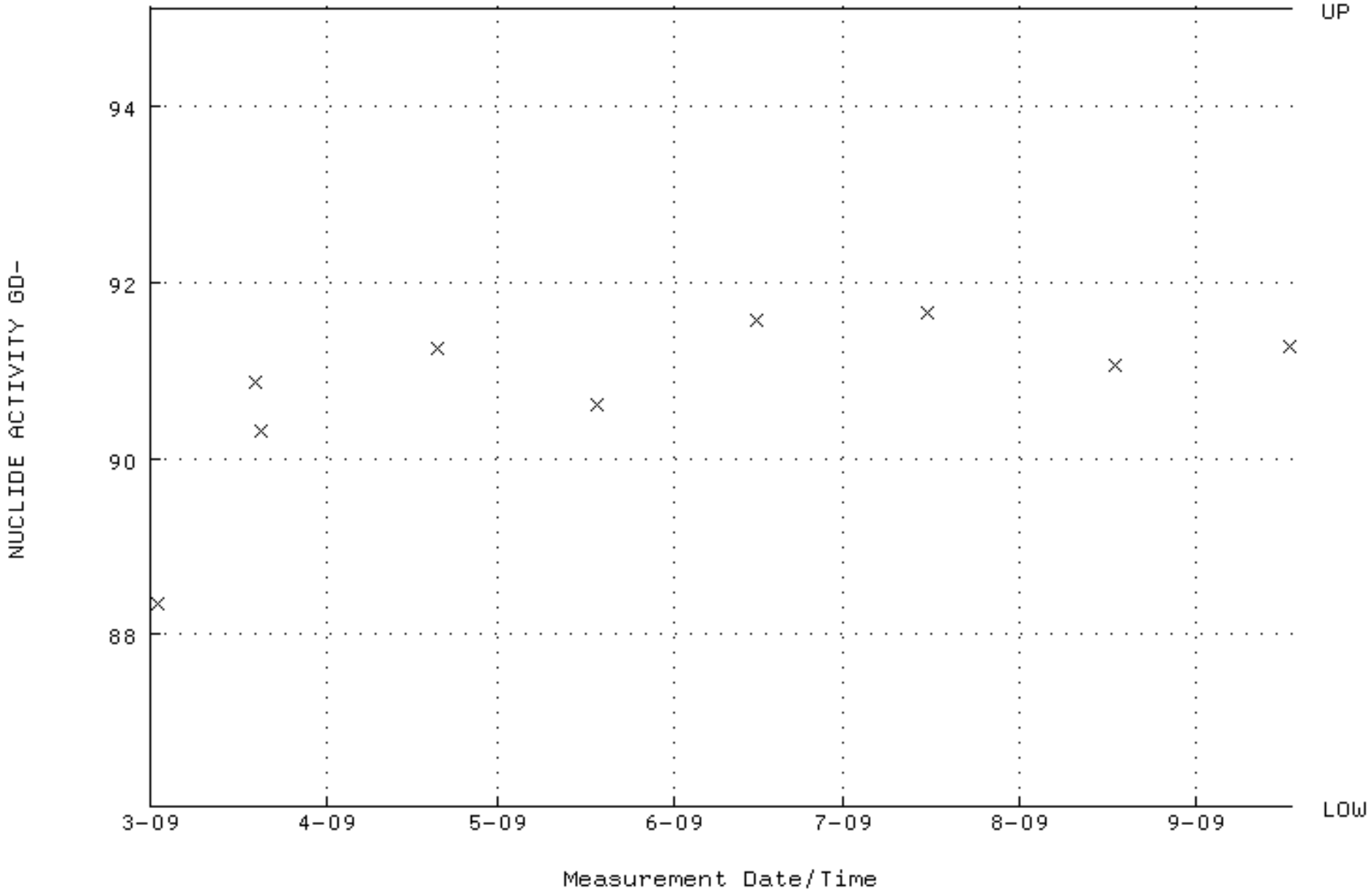
QA filename : DKA100:[ENV_ALPHA.QA.B]B122.QAF;1
Parameter Name : BACKRATE (Background Rate)
Start/End Dates : 1-MAR-2009 17:18:26 through 17-SEP-2009 12:00:00
Lower/Upper Lmts: 0.000000E+00 through 0.100000



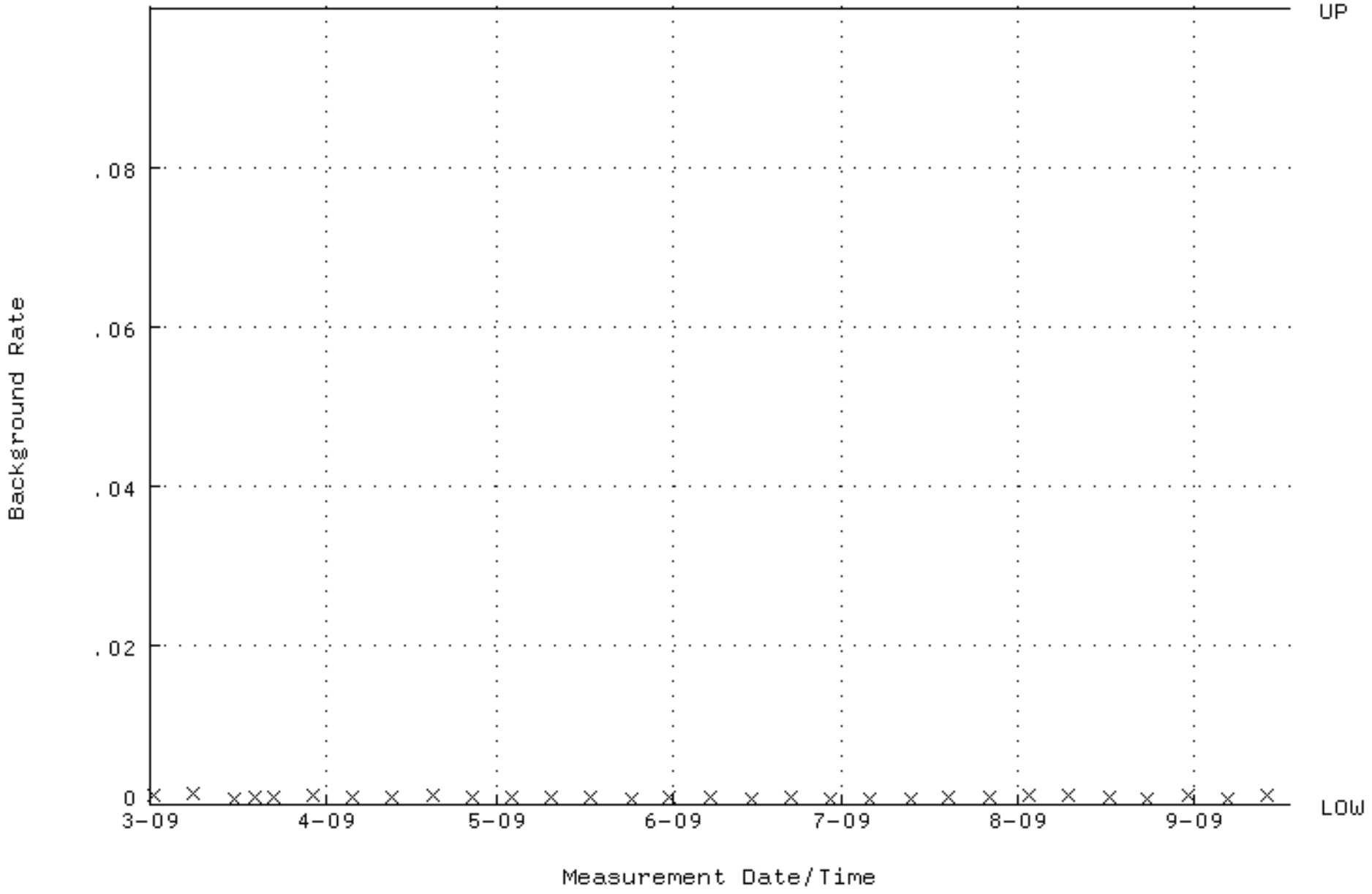
QA filename : DKA100:[ENV_ALPHA.QA.W]W123.QAF;1
Parameter Name : AVRGEFF (Average Efficiency)
Start/End Dates : 2-MAR-2009 11:08:41 through 17-SEP-2009 12:00:00
Lower/Upper Lmts: 0.249752 through 0.269752



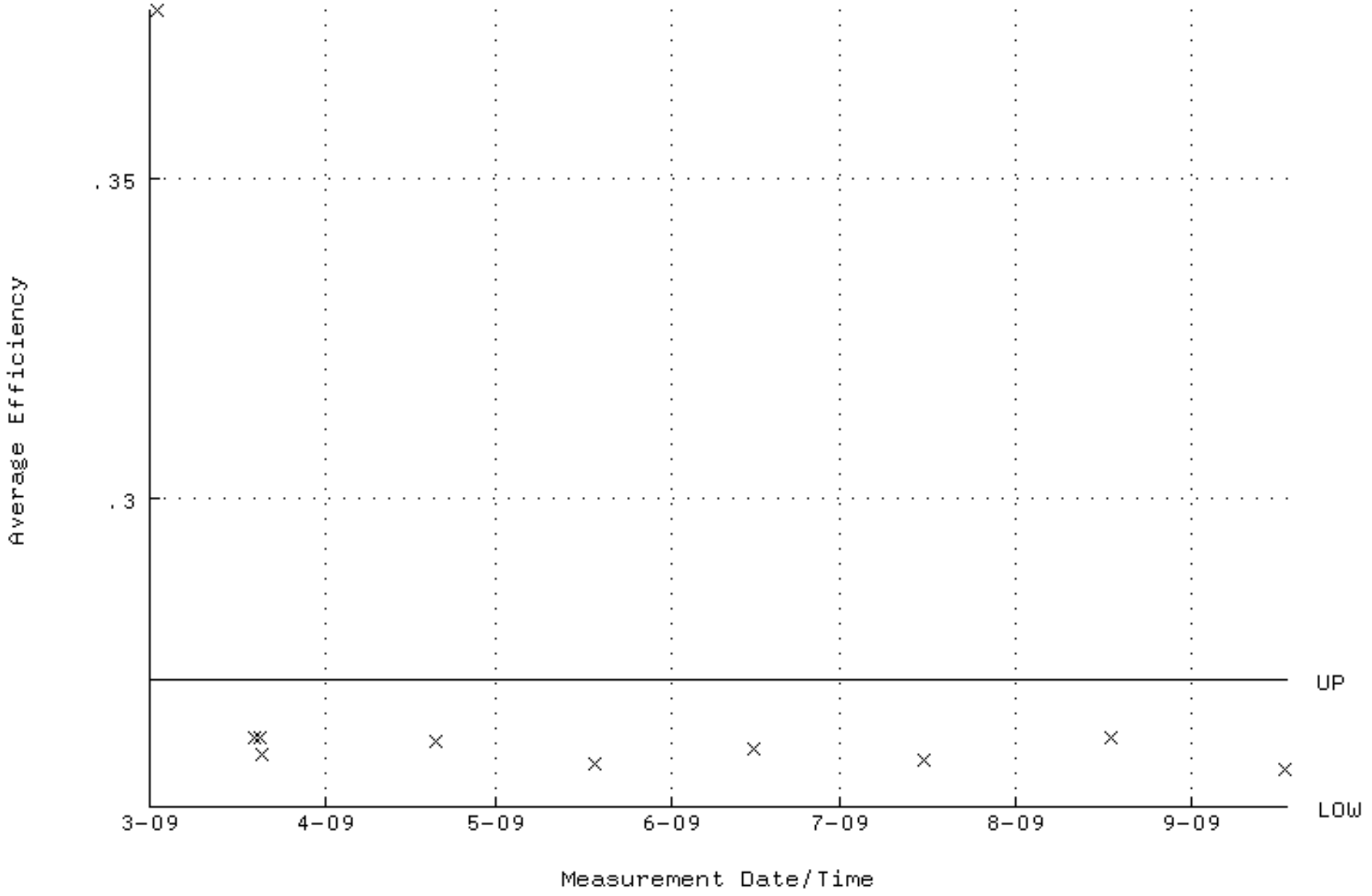
QA filename : DKA100:[ENV_ALPHA.QA.W]W123.QAF;1
Parameter Name : NLACTVTY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 2-MAR-2009 11:08:41 through 17-SEP-2009 12:00:00
Lower/Upper Lmts: 86.0496 through 95.1074



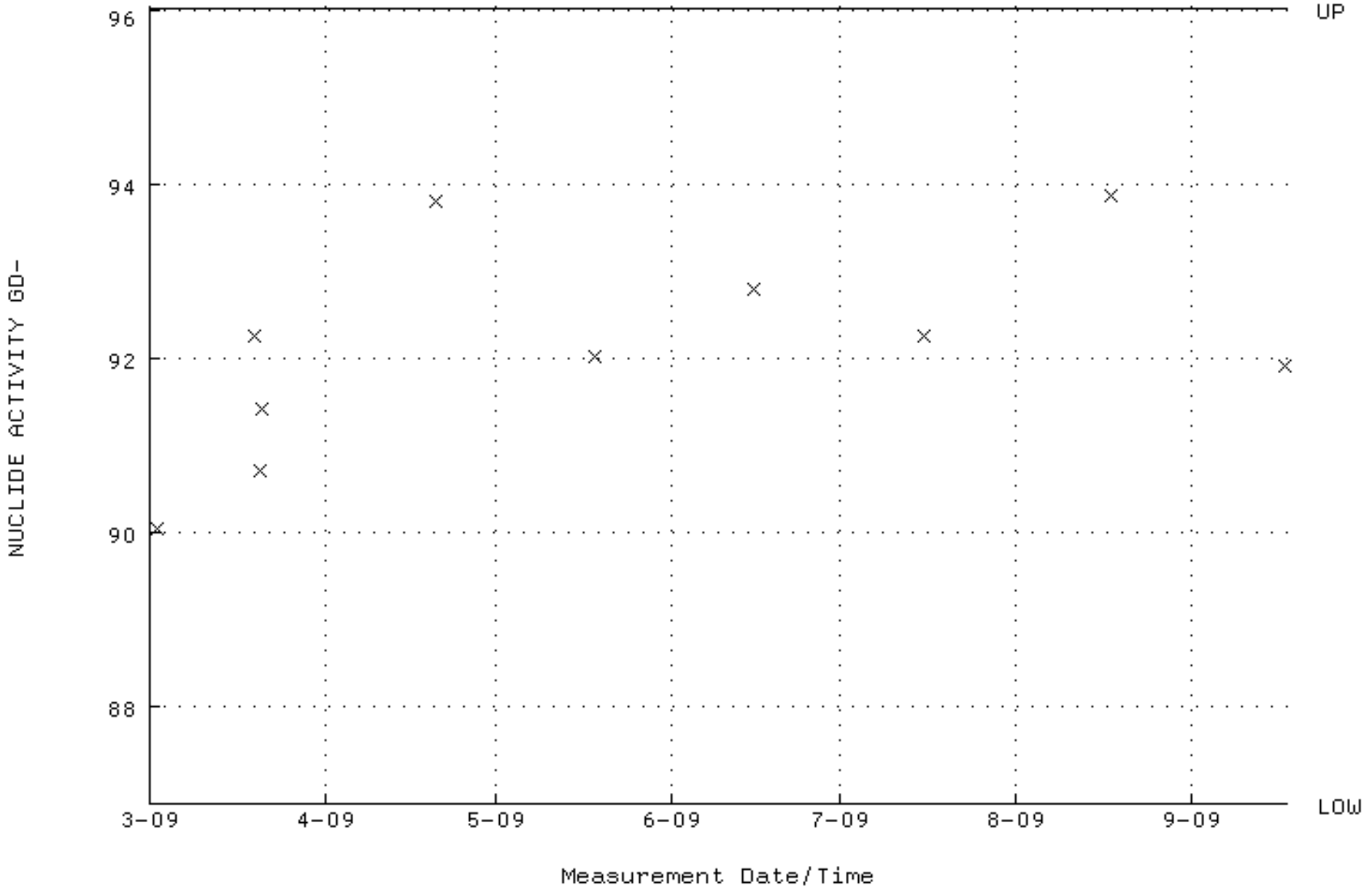
QA filename : DKA100:[ENV_ALPHA.QA.B]B123.QAF;1
Parameter Name : BACKRATE (Background Rate)
Start/End Dates : 1-MAR-2009 17:18:30 through 17-SEP-2009 12:00:00
Lower/Upper Lmts: 0.000000E+00 through 0.100000



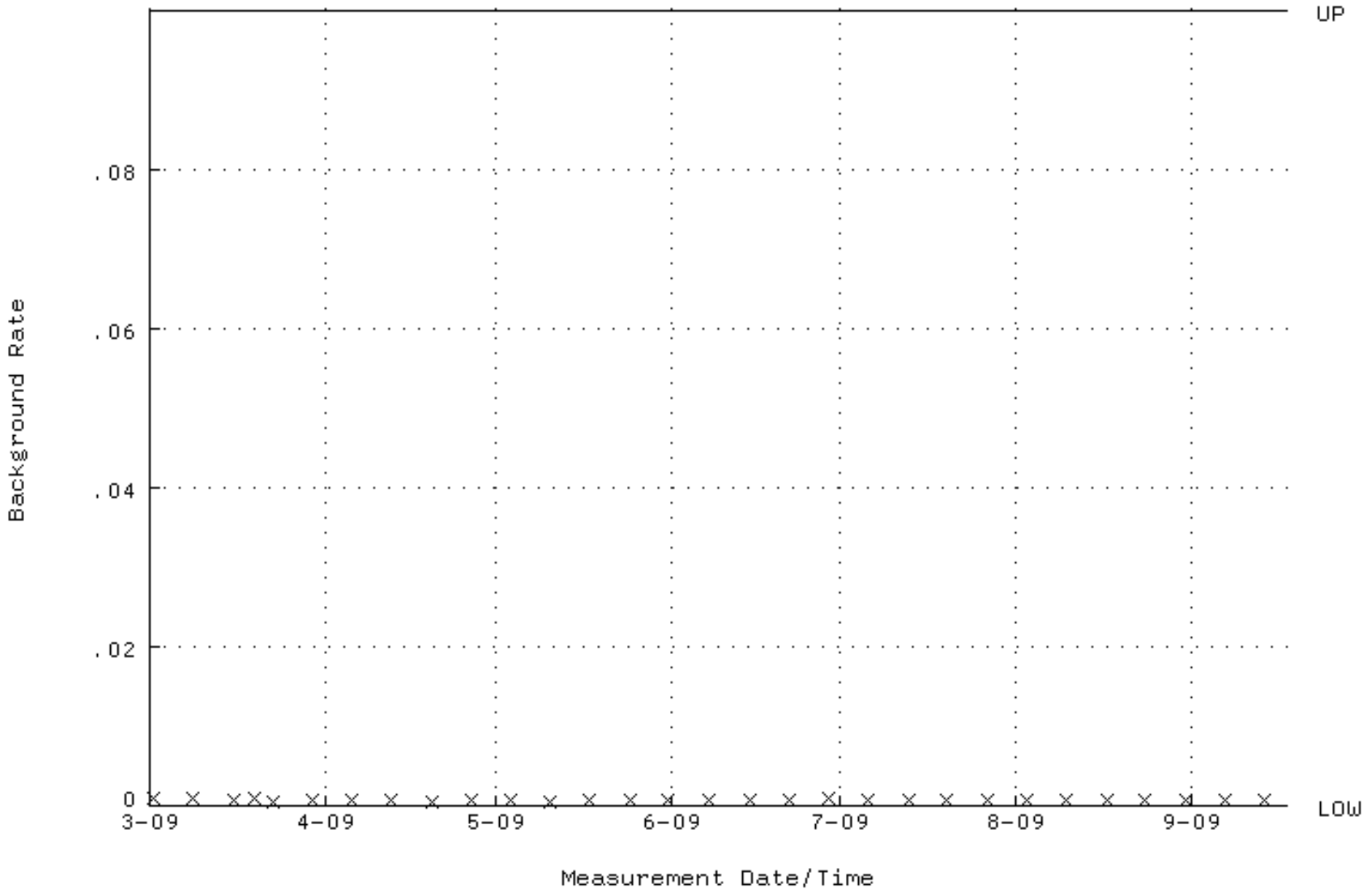
QA filename : DKA100:[ENV_ALPHA.QA.W]W124.QAF;1
Parameter Name : AVRGEFF (Average Efficiency)
Start/End Dates : 2-MAR-2009 11:08:48 through 17-SEP-2009 12:00:00
Lower/Upper Lmts: 0.251398 through 0.271398



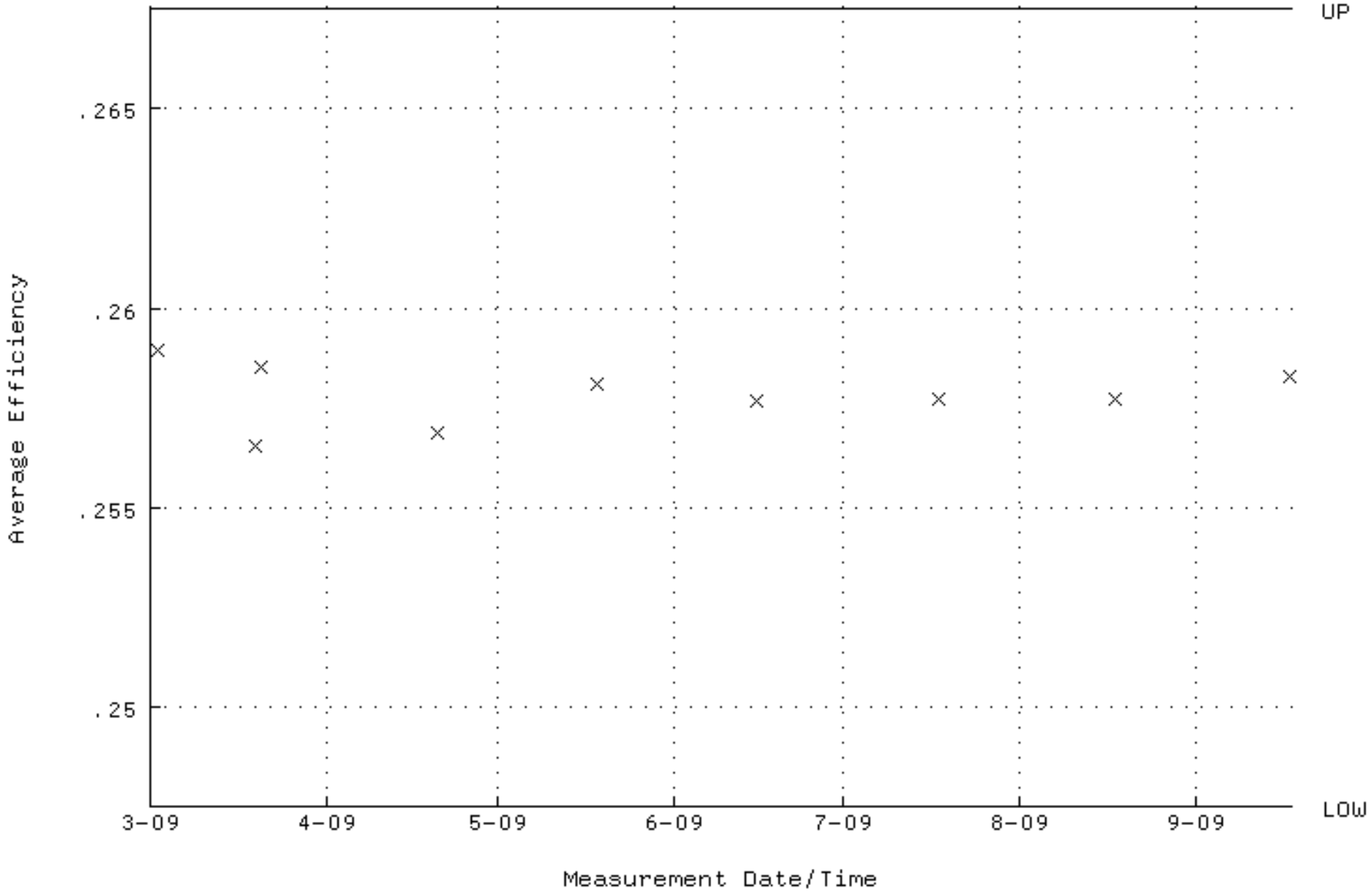
QA filename : DKA100:[ENV_ALPHA.QA.W]W124.QAF;1
Parameter Name : NLACTVTY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 2-MAR-2009 11:08:48 through 17-SEP-2009 12:00:00
Lower/Upper Lmts: 86.8862 through 96.0322



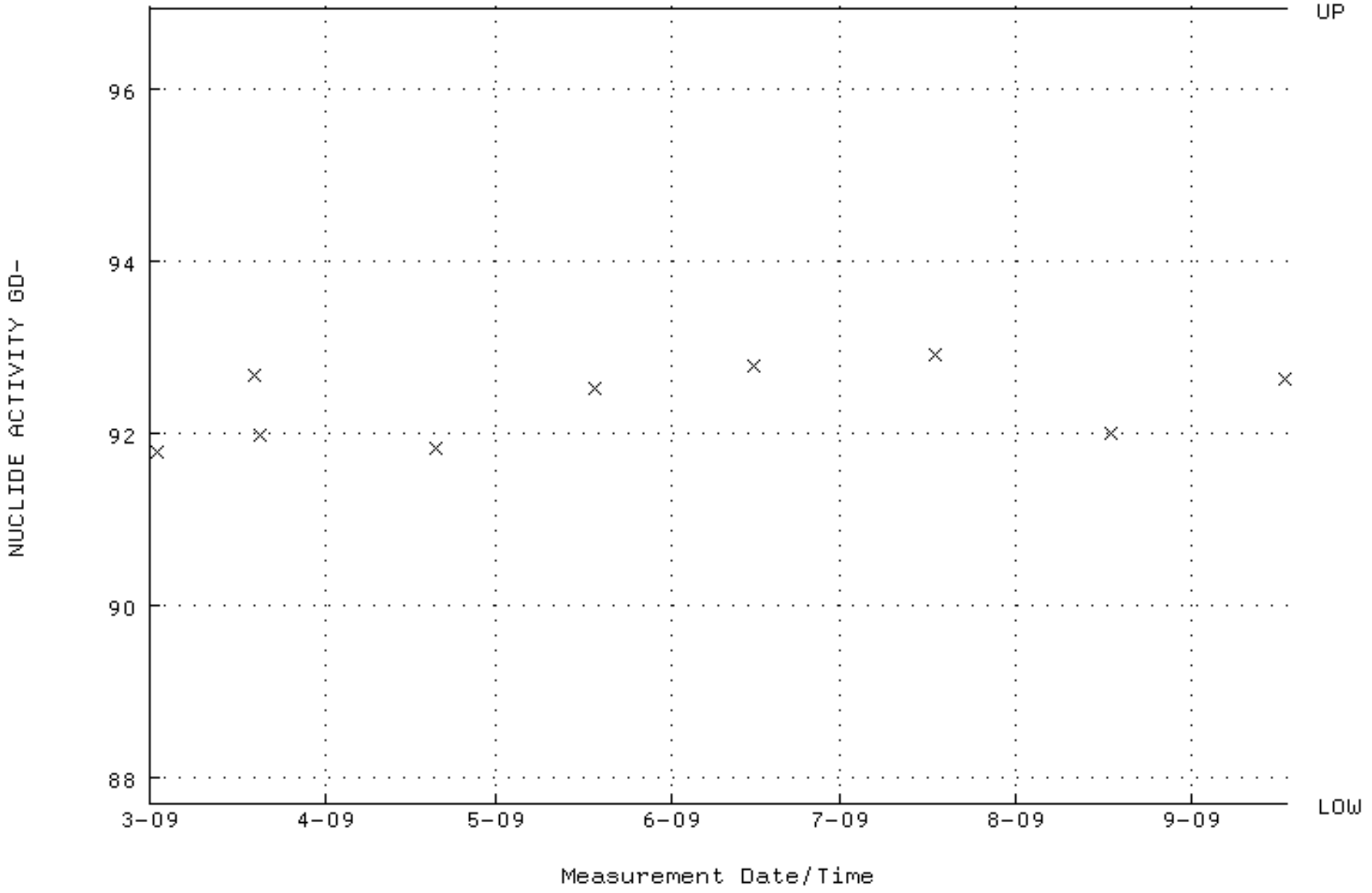
QA filename : DKA100:[ENV_ALPHA.QA.B]B124.QAF;1
Parameter Name : BACKRATE (Background Rate)
Start/End Dates : 1-MAR-2009 17:18:33 through 17-SEP-2009 12:00:00
Lower/Upper Lmts: 0.000000E+00 through 0.100000



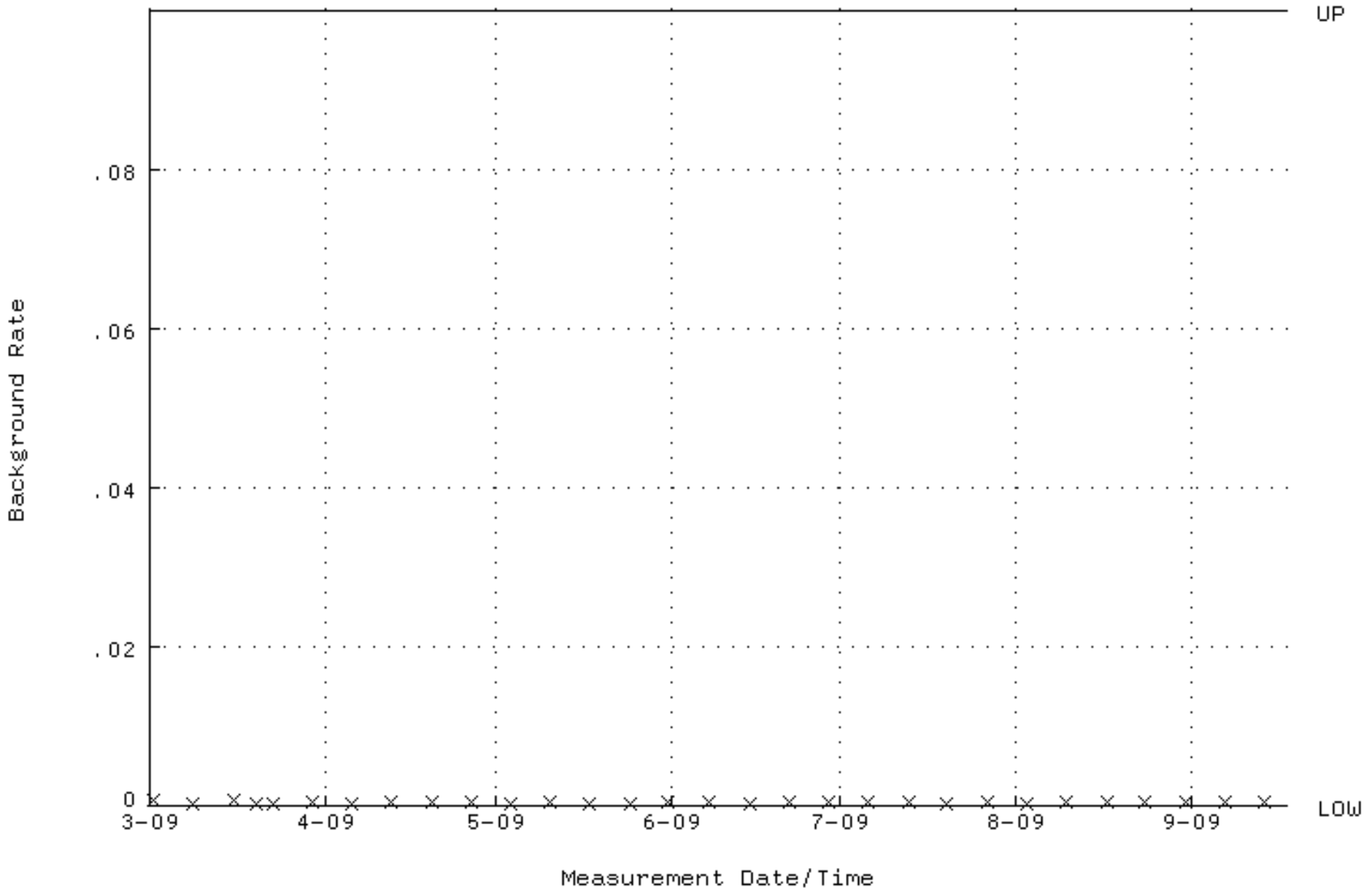
QA filename : DKA100:[ENV_ALPHA.QA.W]W125.QAF;1
Parameter Name : AVRGEFF (Average Efficiency)
Start/End Dates : 2-MAR-2009 11:08:55 through 17-SEP-2009 12:00:00
Lower/Upper Lmts: 0.247512 through 0.267512



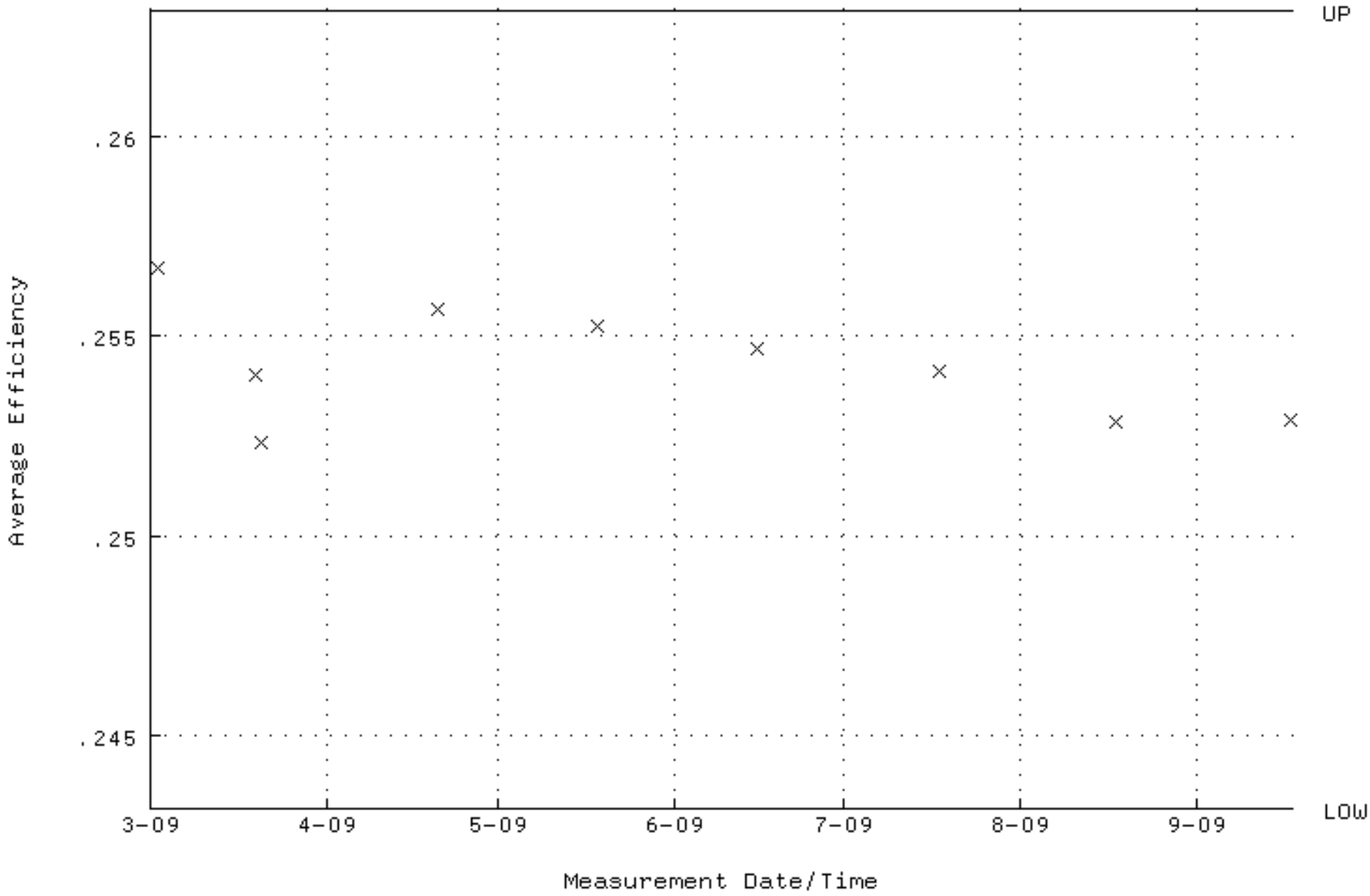
QA filename : DKA100:[ENV_ALPHA.QA.W]W125.QAF;1
Parameter Name : NLACTVTY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 2-MAR-2009 11:08:55 through 17-SEP-2009 12:00:00
Lower/Upper Lmts: 87.6956 through 96.9268



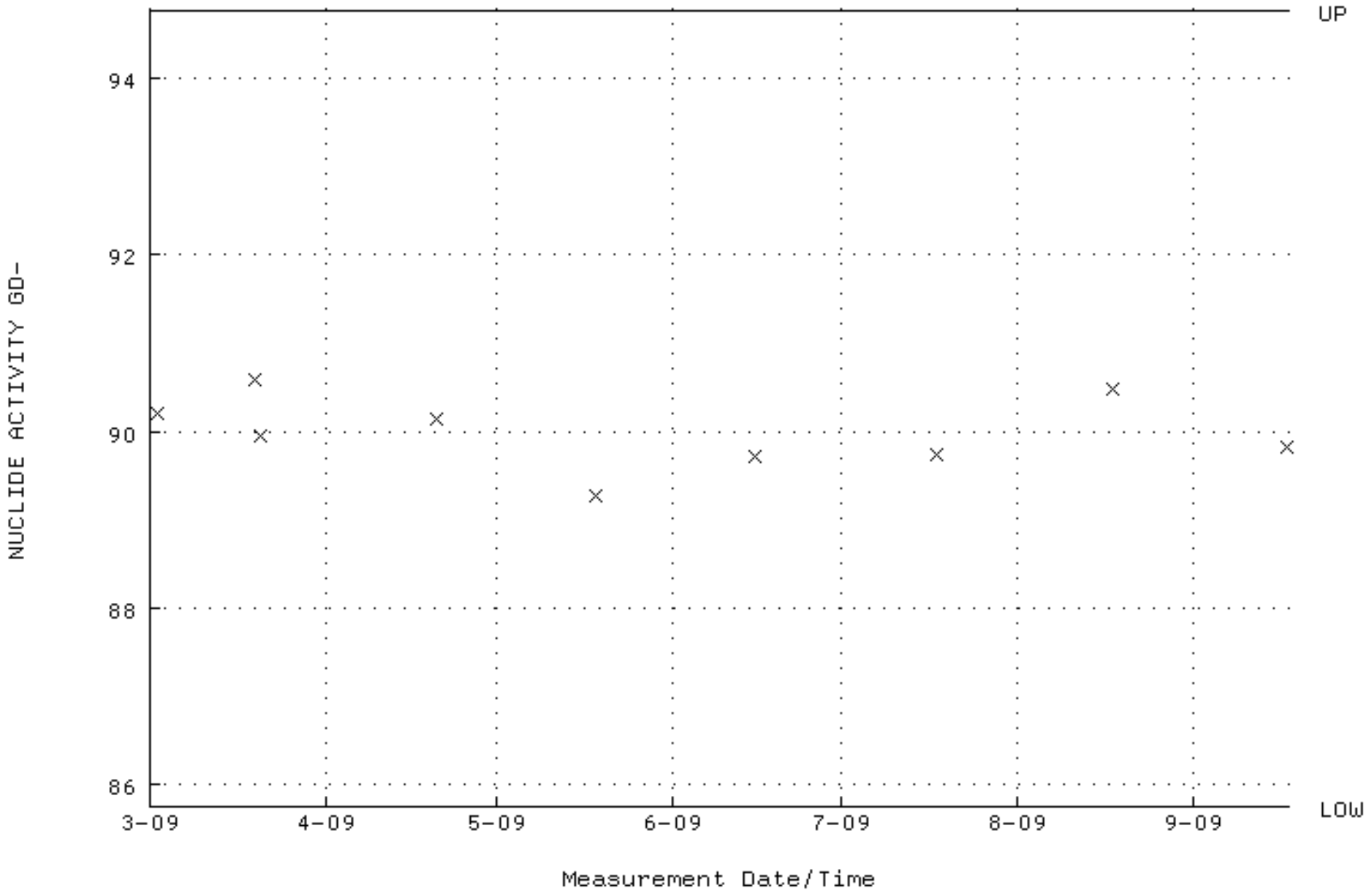
QA filename : DKA100:[ENV_ALPHA.QA.B]B125.QAF;1
Parameter Name : BACKRATE (Background Rate)
Start/End Dates : 1-MAR-2009 17:18:39 through 17-SEP-2009 12:00:00
Lower/Upper Lmts: 0.000000E+00 through 0.100000



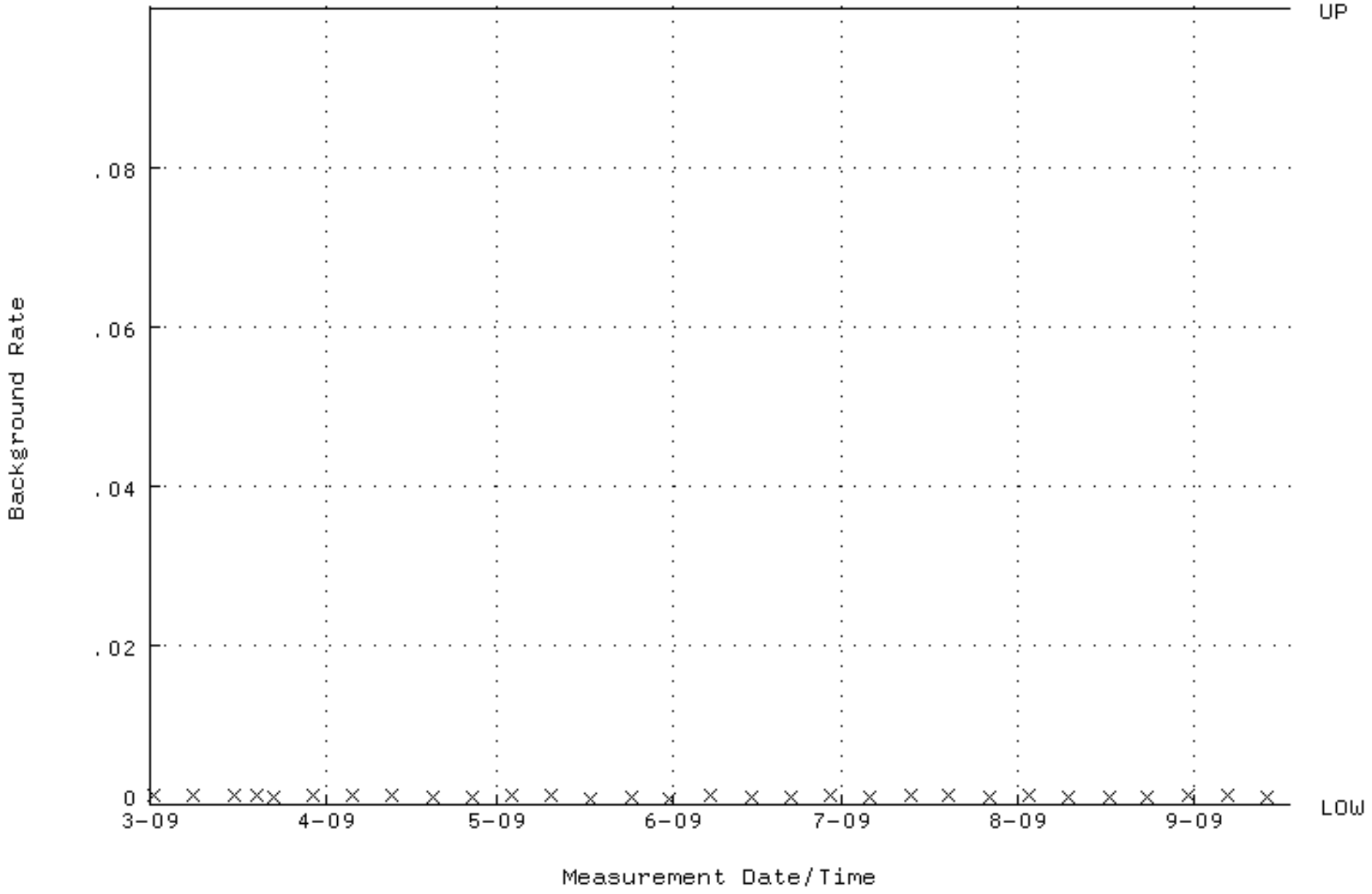
QA filename : DKA100:[ENV_ALPHA.QA.W]W126.QAF;1
Parameter Name : AVRGEFF (Average Efficiency)
Start/End Dates : 2-MAR-2009 11:09:01 through 17-SEP-2009 12:00:00
Lower/Upper Lmts: 0.243156 through 0.263156



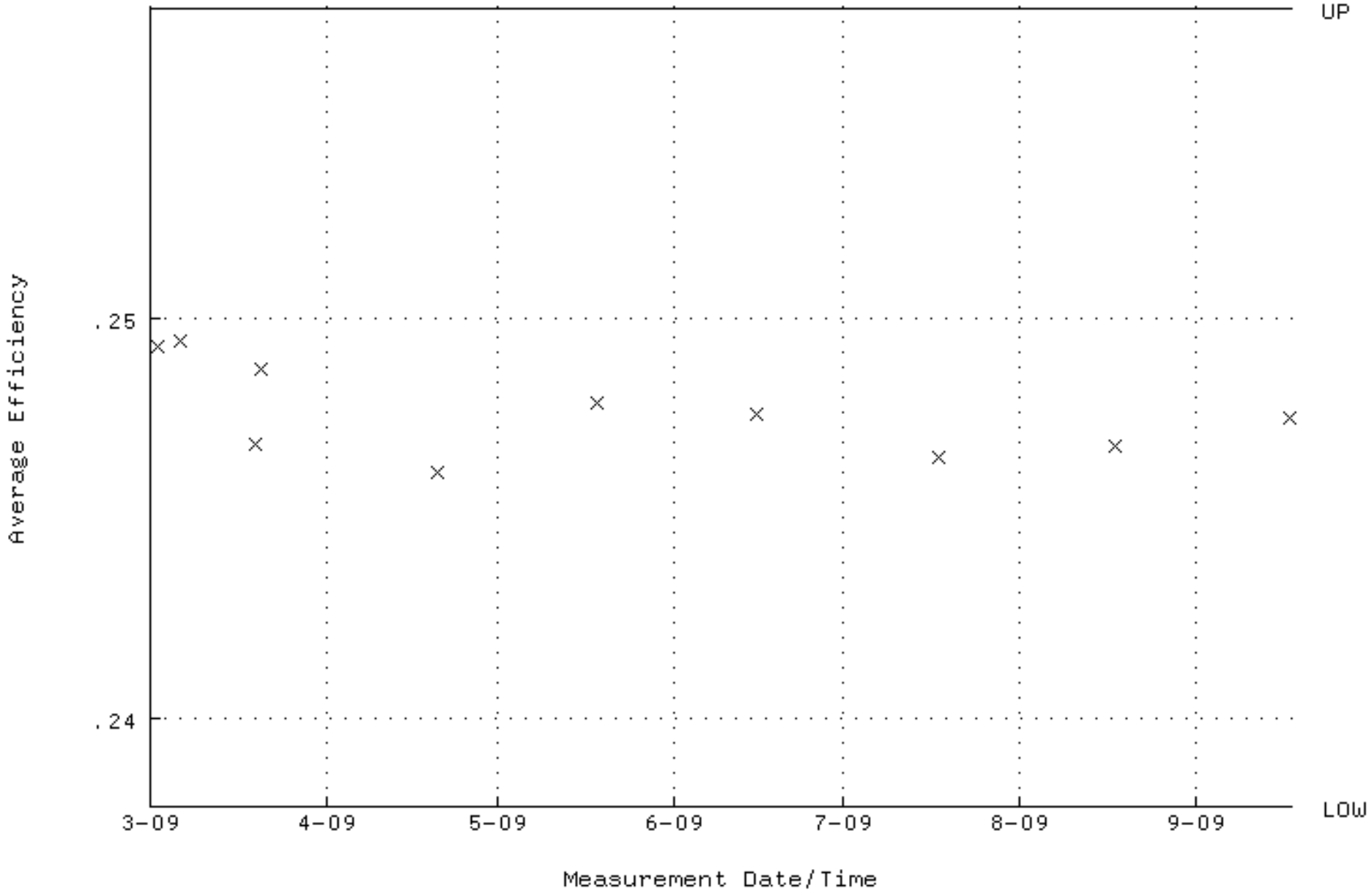
QA filename : DKA100:[ENV_ALPHA.QA.W]W126.QAF;1
Parameter Name : NLACTVTY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 2-MAR-2009 11:09:01 through 17-SEP-2009 12:00:00
Lower/Upper Lmts: 85.7449 through 94.7707



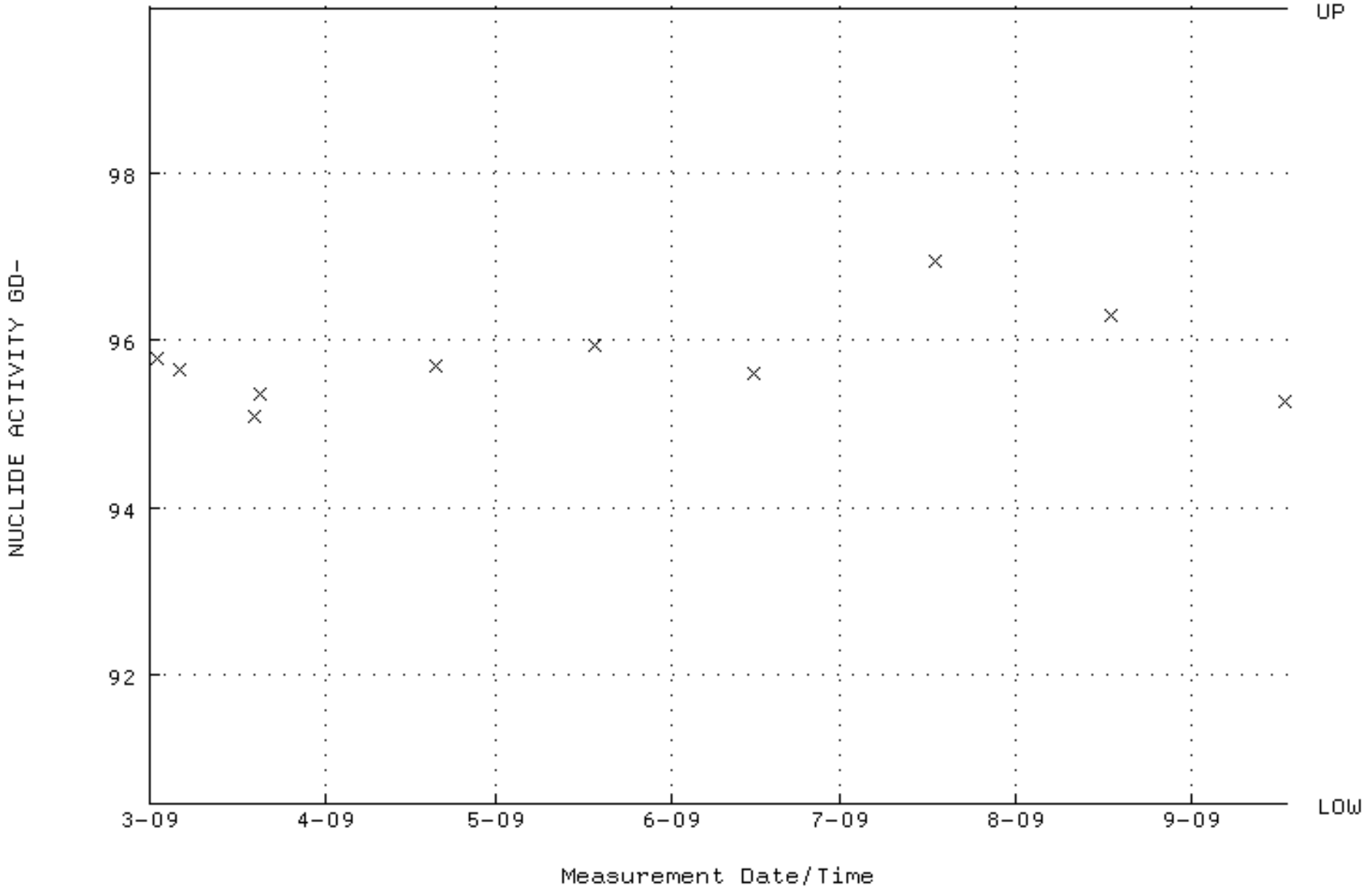
QA filename : DKA100:[ENV_ALPHA.QA.B]B126.QAF;1
Parameter Name : BACKRATE (Background Rate)
Start/End Dates : 1-MAR-2009 17:18:43 through 17-SEP-2009 12:00:00
Lower/Upper Lmts: 0.000000E+00 through 0.100000



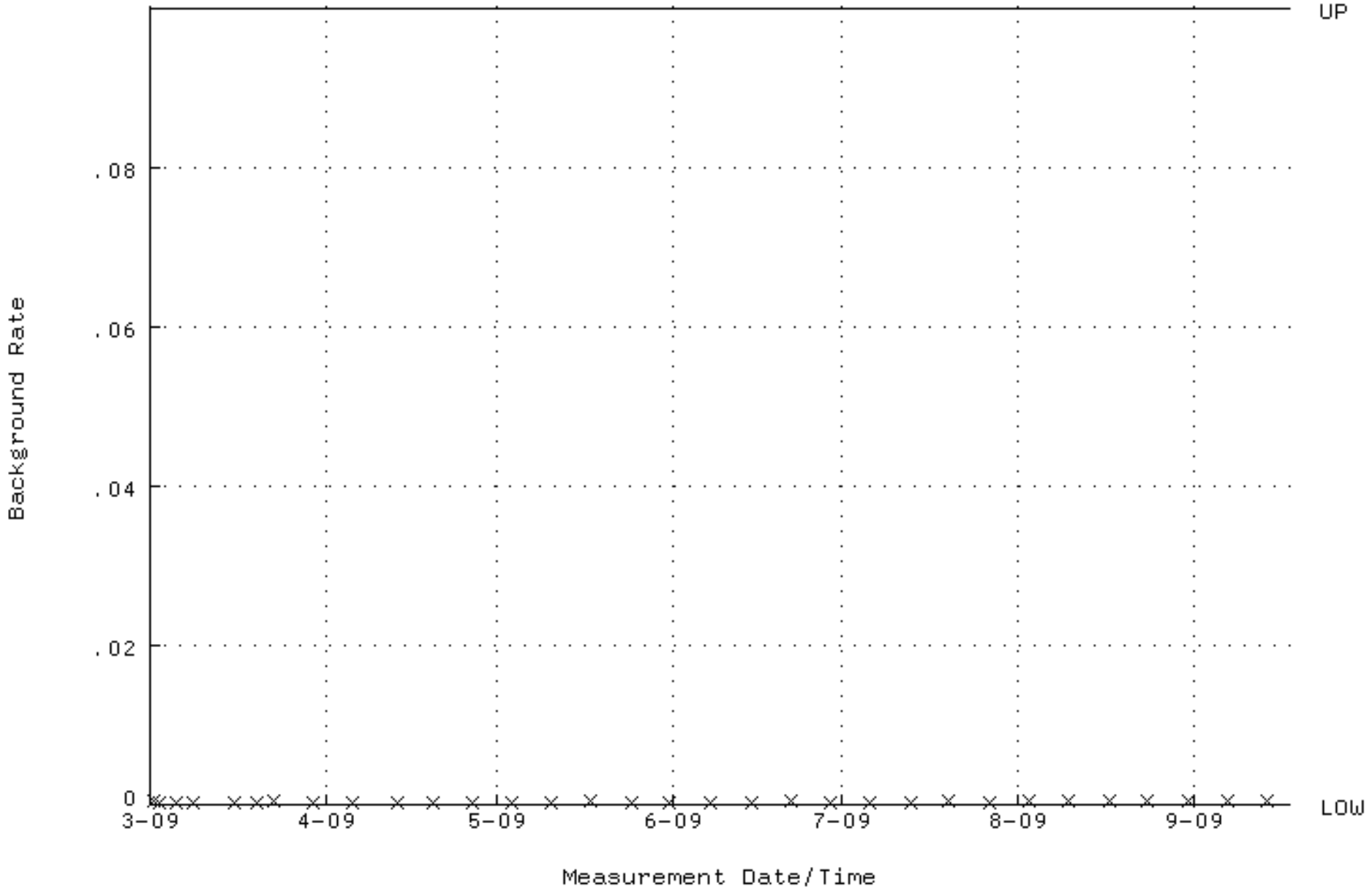
QA filename : DKA100:[ENV_ALPHA.QA.W]W127.QAF;1
Parameter Name : AVRGEFF (Average Efficiency)
Start/End Dates : 2-MAR-2009 11:09:07 through 17-SEP-2009 12:00:00
Lower/Upper Lmts: 0.237773 through 0.257773



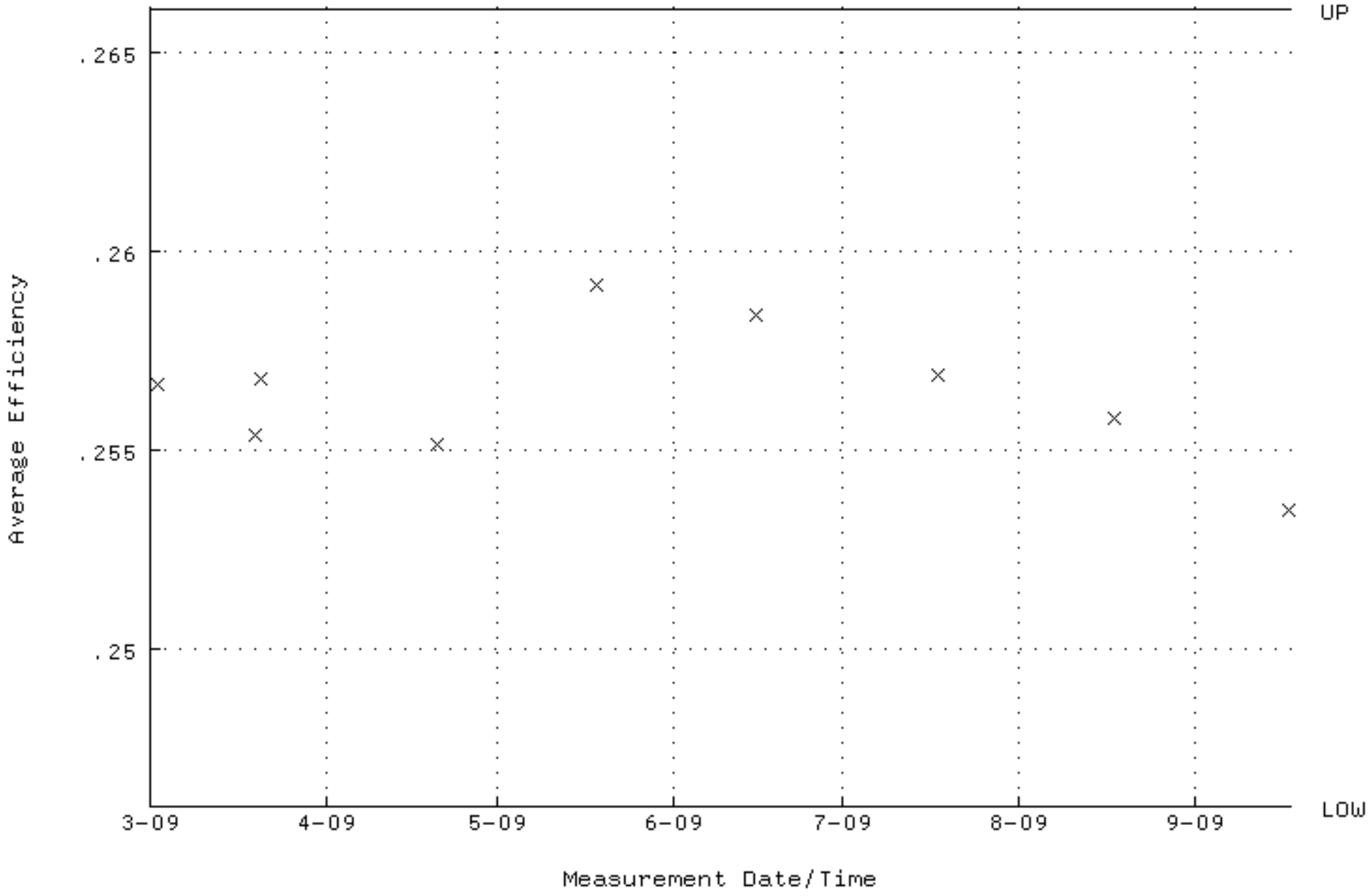
QA filename : DKA100:[ENV_ALPHA.QA.W]W127.QAF;1
Parameter Name : NLACTVTY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 2-MAR-2009 11:09:07 through 17-SEP-2009 12:00:00
Lower/Upper Lmts: 90.4503 through 99.9713



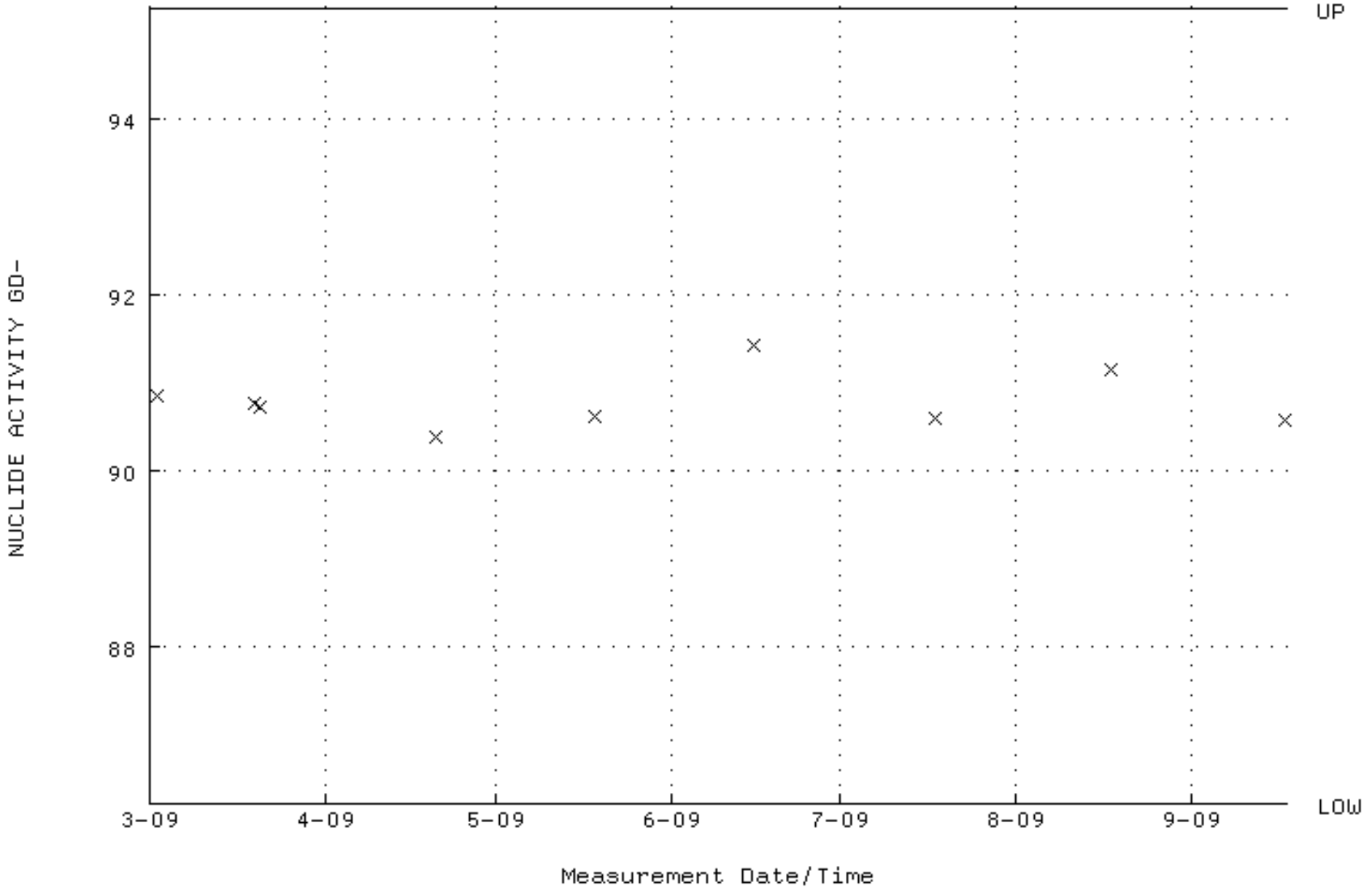
QA filename : DKA100:[ENV_ALPHA.QA.B]B127.QAF;1
Parameter Name : BACKRATE (Background Rate)
Start/End Dates : 1-MAR-2009 17:18:47 through 17-SEP-2009 12:00:00
Lower/Upper Lmts: 0.000000E+00 through 0.100000



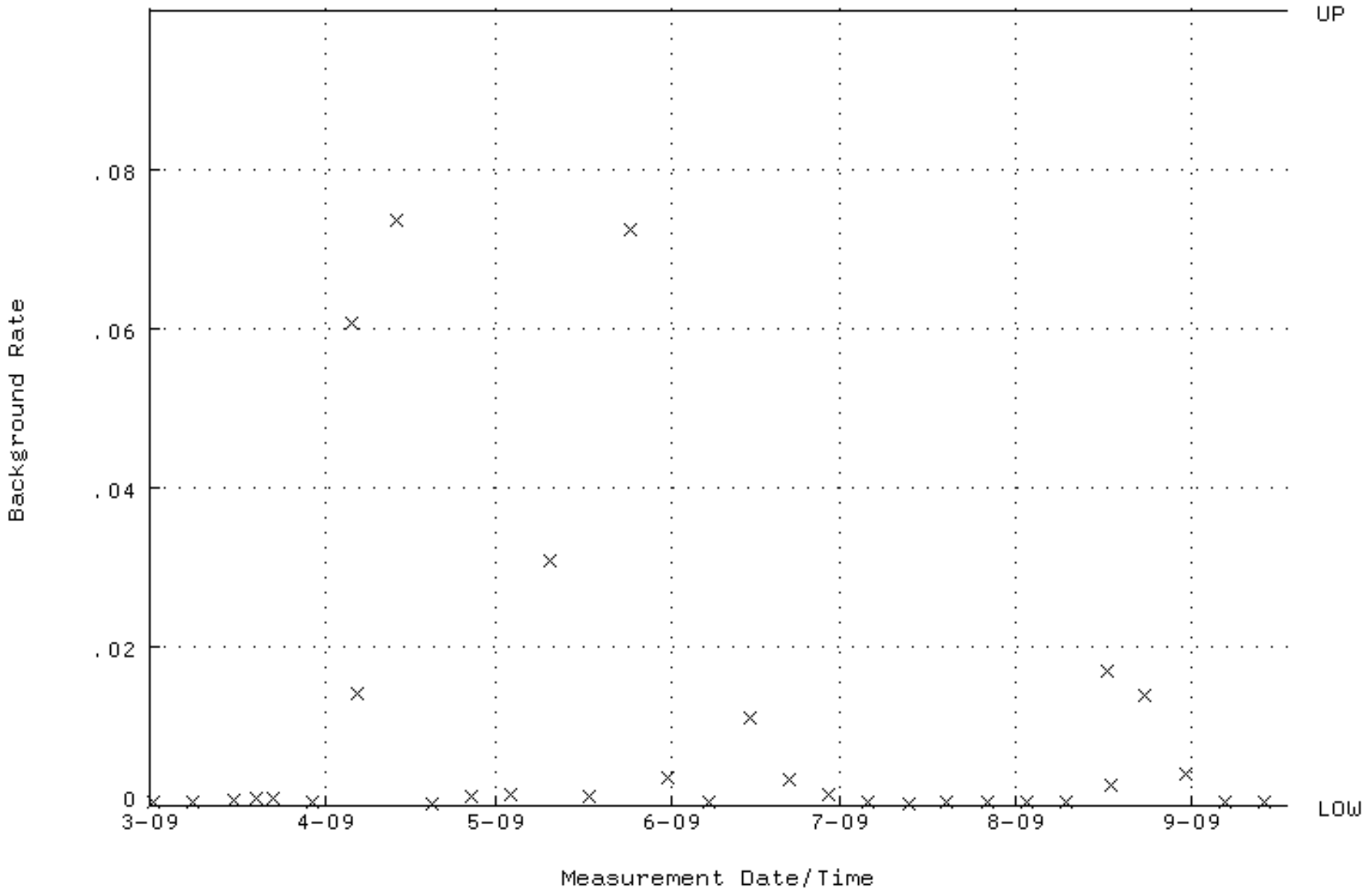
QA filename : DKA100:[ENV_ALPHA.QA.W]W128.QAF;1
Parameter Name : AVRGEFF (Average Efficiency)
Start/End Dates : 2-MAR-2009 11:09:14 through 17-SEP-2009 12:00:00
Lower/Upper Lmts: 0.246062 through 0.266062



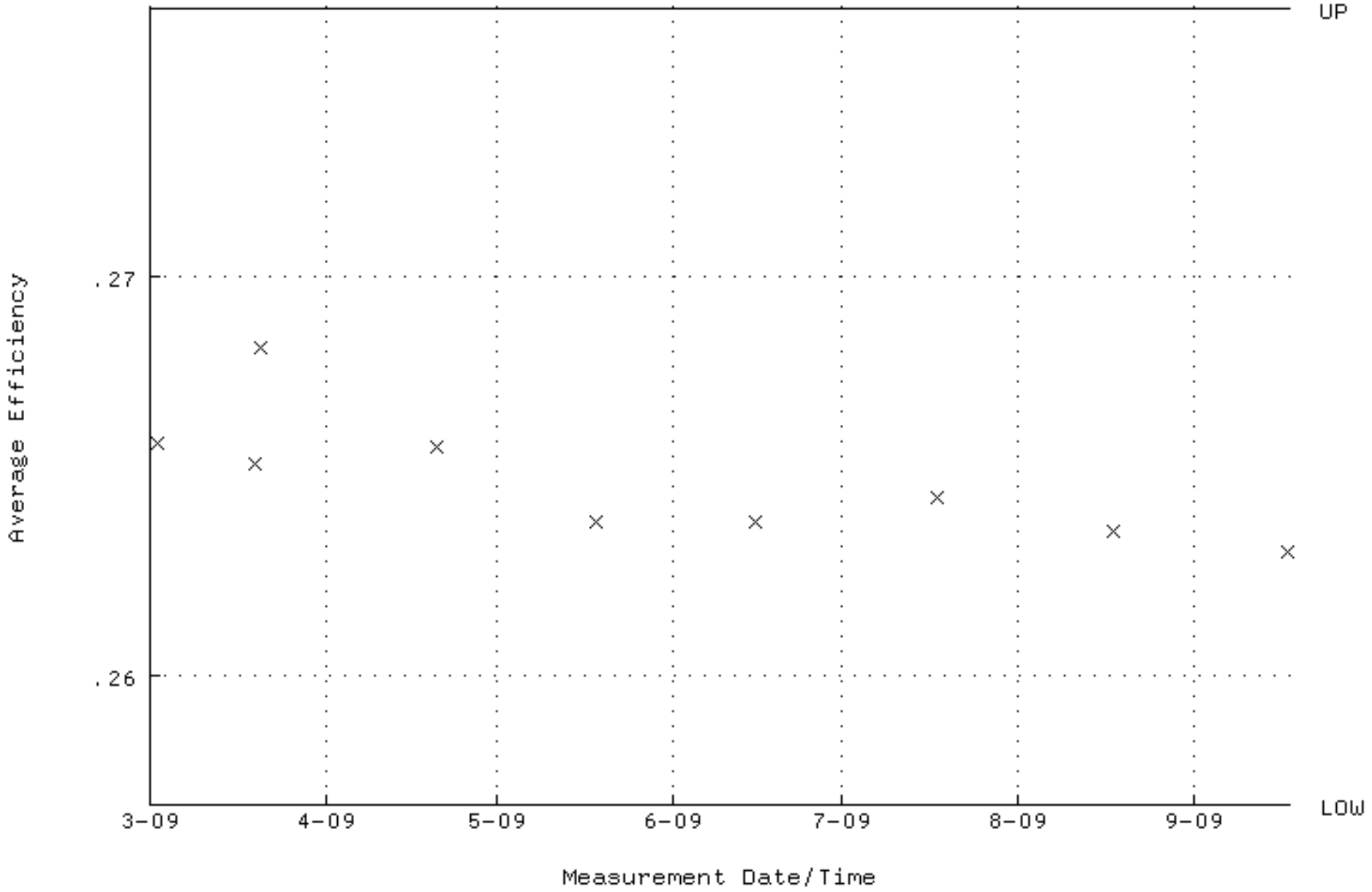
QA filename : DKA100:[ENV_ALPHA.QA.W]W128.QAF;1
Parameter Name : NLACTVTY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 2-MAR-2009 11:09:14 through 17-SEP-2009 12:00:00
Lower/Upper Lmts: 86.1964 through 95.2697



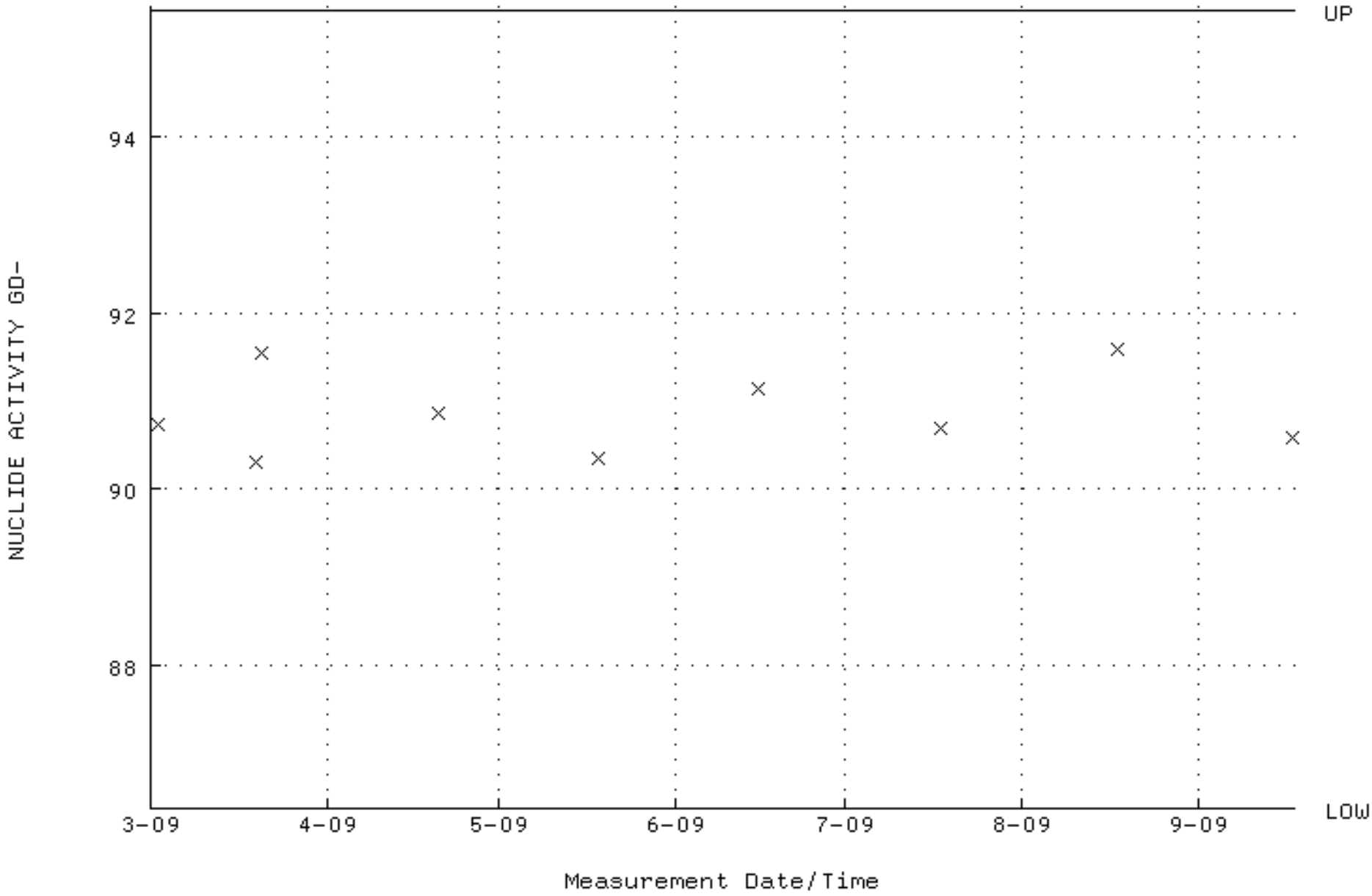
QA filename : DKA100:[ENV_ALPHA.QA.B]B128.QAF;1
Parameter Name : BACKRATE (Background Rate)
Start/End Dates : 1-MAR-2009 17:18:51 through 17-SEP-2009 12:00:00
Lower/Upper Lmts: 0.000000E+00 through 0.100000



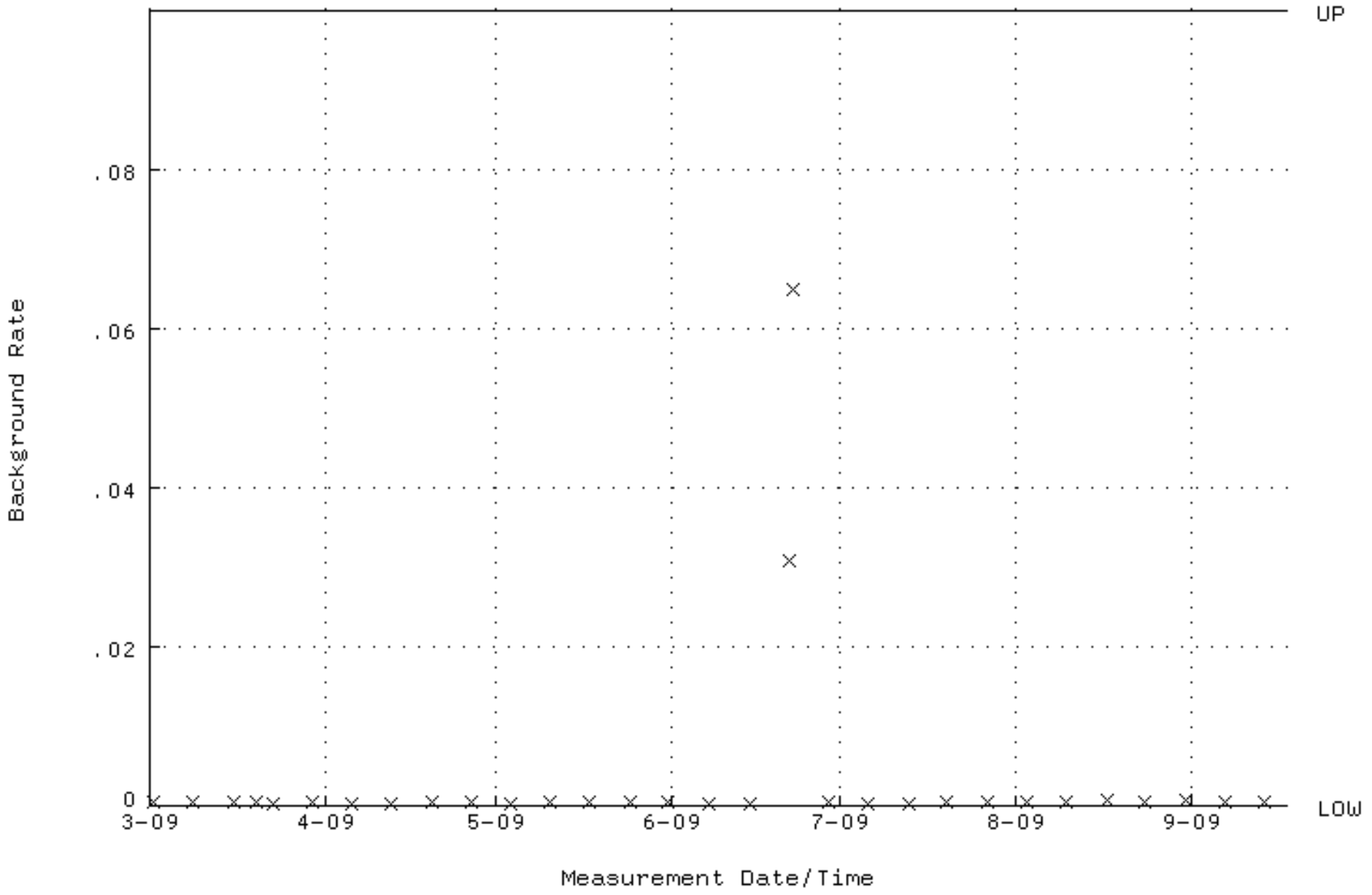
QA filename : DKA100:[ENV_ALPHA.QA.W]W129.QAF;1
Parameter Name : AVRGEFF (Average Efficiency)
Start/End Dates : 2-MAR-2009 11:09:20 through 17-SEP-2009 12:00:00
Lower/Upper Lmts: 0.256741 through 0.276741



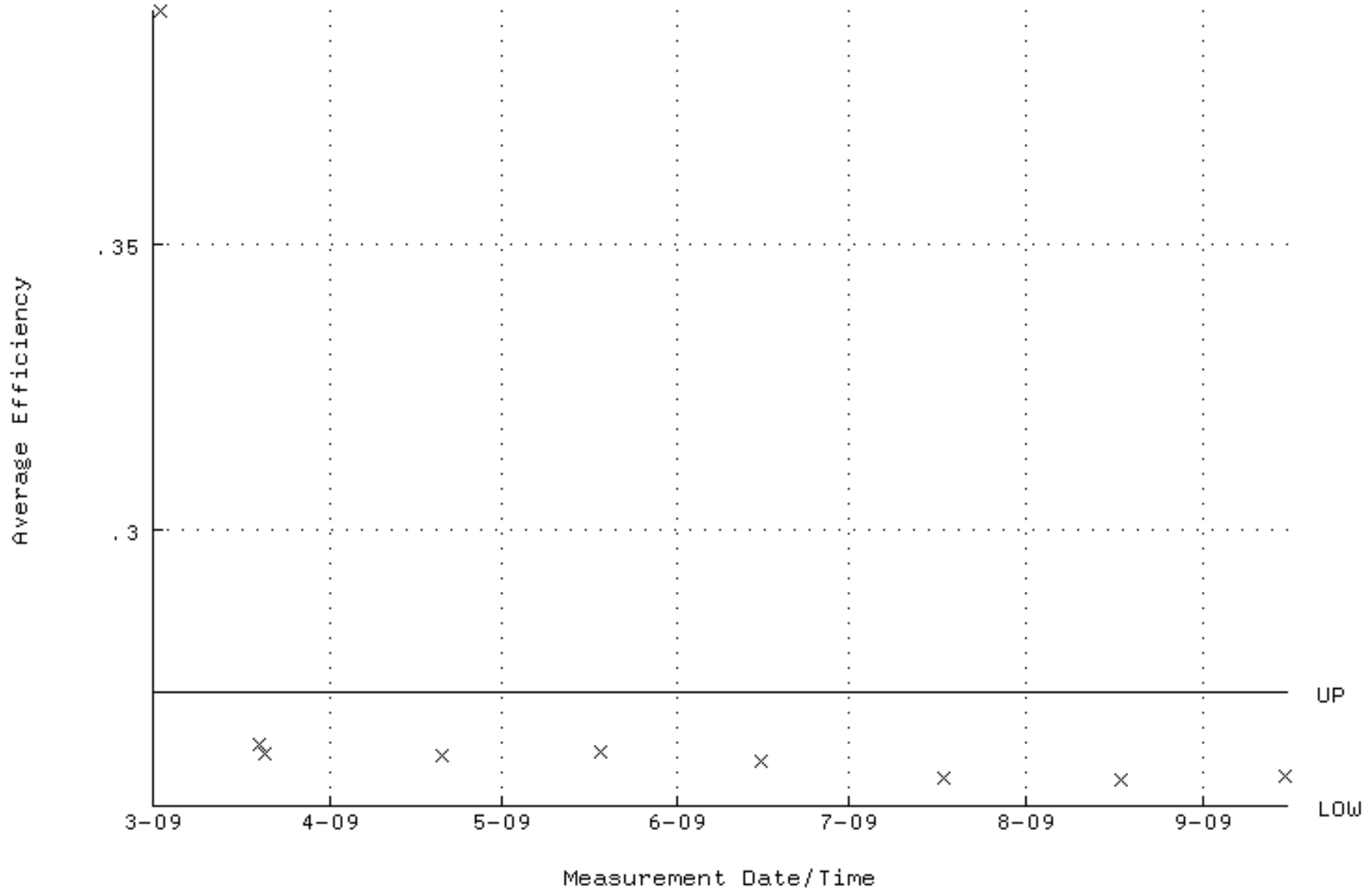
QA filename : DKA100:[ENV_ALPHA.QA.W]W129.QAF;1
Parameter Name : NLACTVTY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 2-MAR-2009 11:09:20 through 17-SEP-2009 12:00:00
Lower/Upper Lmts: 86.3646 through 95.4556



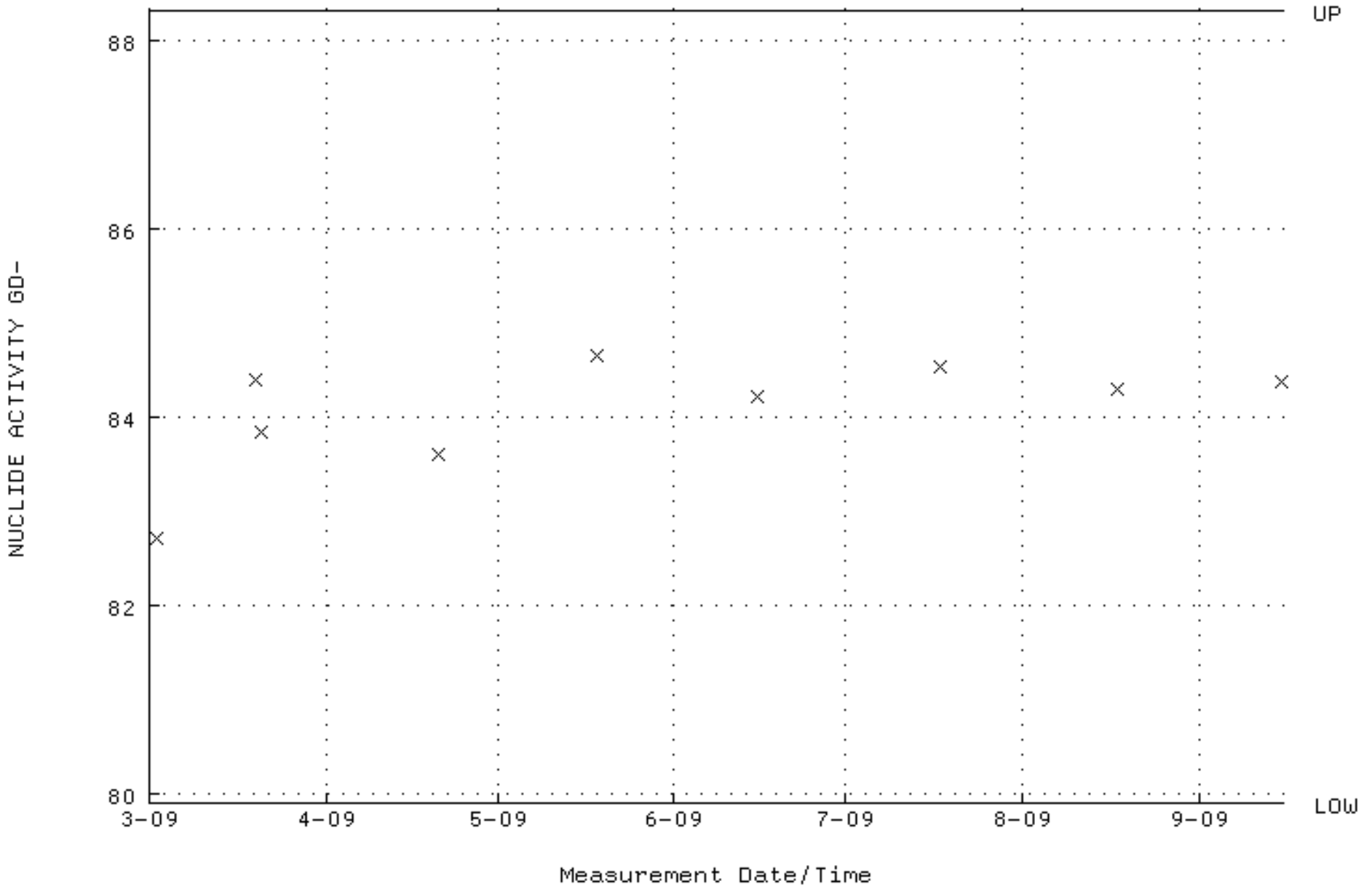
QA filename : DKA100:[ENV_ALPHA.QA.B]B129.QAF;1
Parameter Name : BACKRATE (Background Rate)
Start/End Dates : 1-MAR-2009 17:18:55 through 17-SEP-2009 12:00:00
Lower/Upper Lmts: 0.000000E+00 through 0.100000



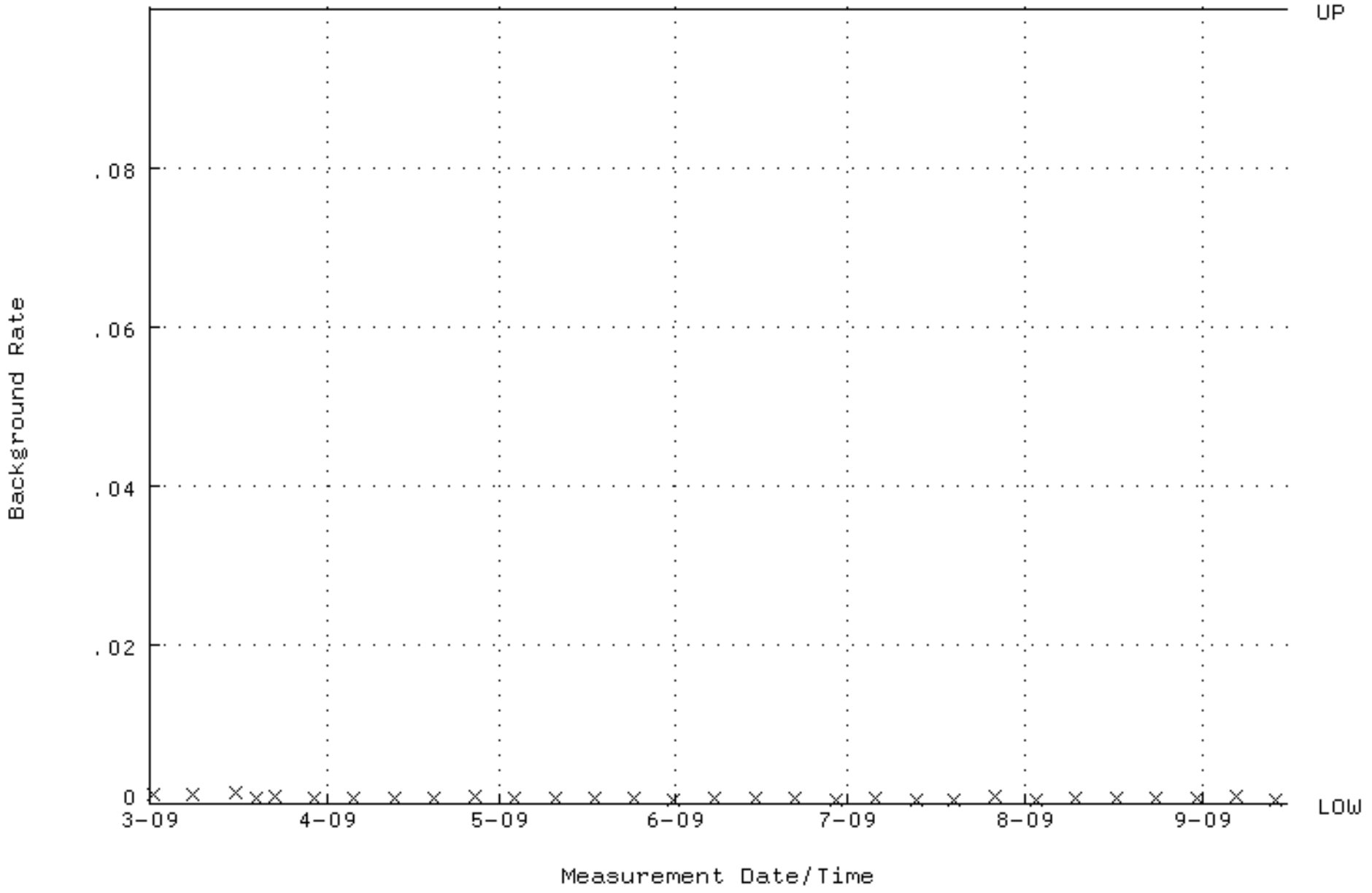
QA filename : DKA100:[ENV_ALPHA.QA.W]W154.QAF;1
Parameter Name : AVRGEFF (Average Efficiency)
Start/End Dates : 2-MAR-2009 11:11:36 through 15-SEP-2009 12:00:00
Lower/Upper Lmts: 0.251386 through 0.271386



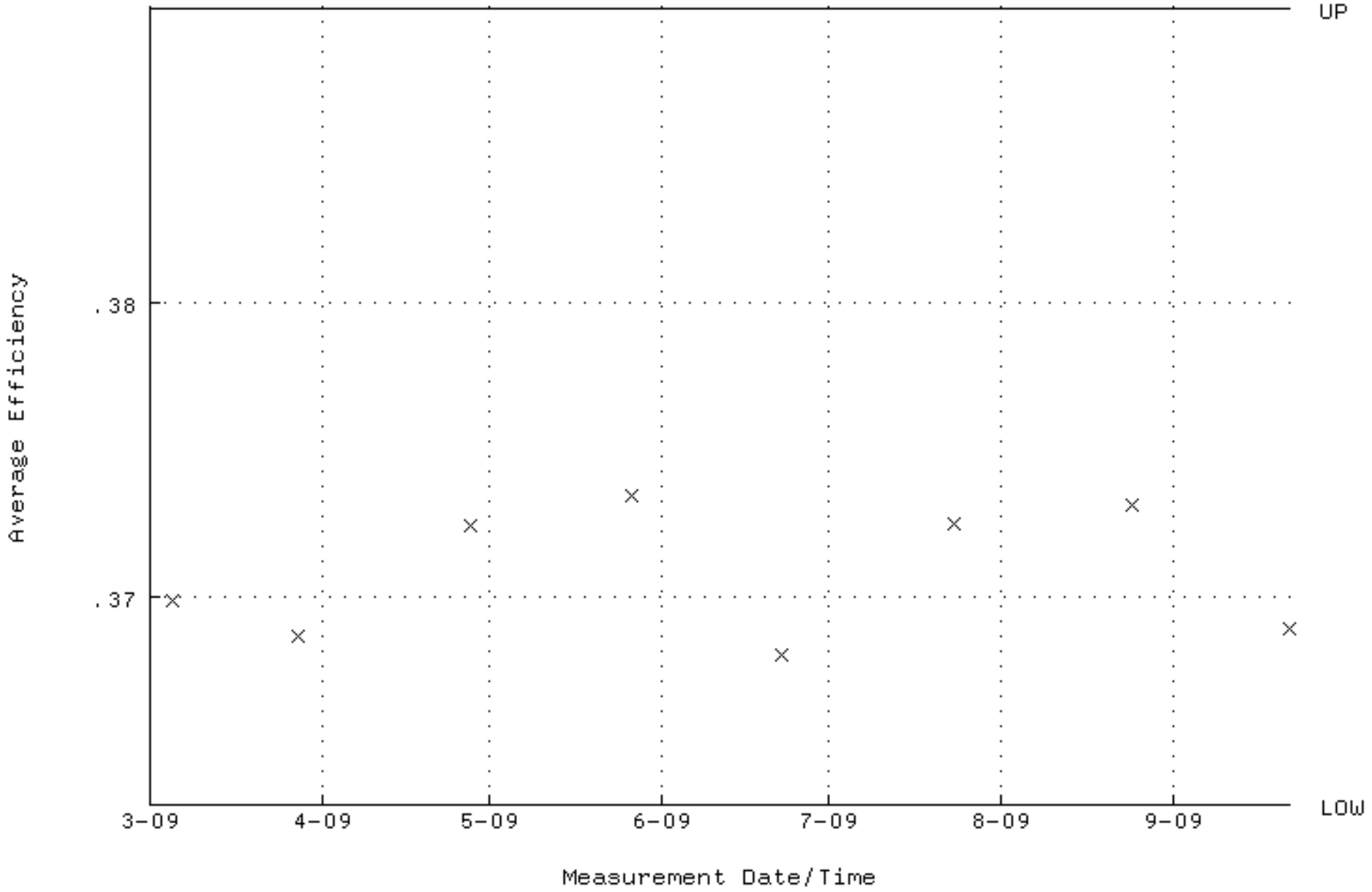
QA filename : DKA100:[ENV_ALPHA.QA.W]W154.QAF;1
Parameter Name : NLACTVTY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 2-MAR-2009 11:11:36 through 15-SEP-2009 12:00:00
Lower/Upper Lmts: 79.9003 through 88.3109



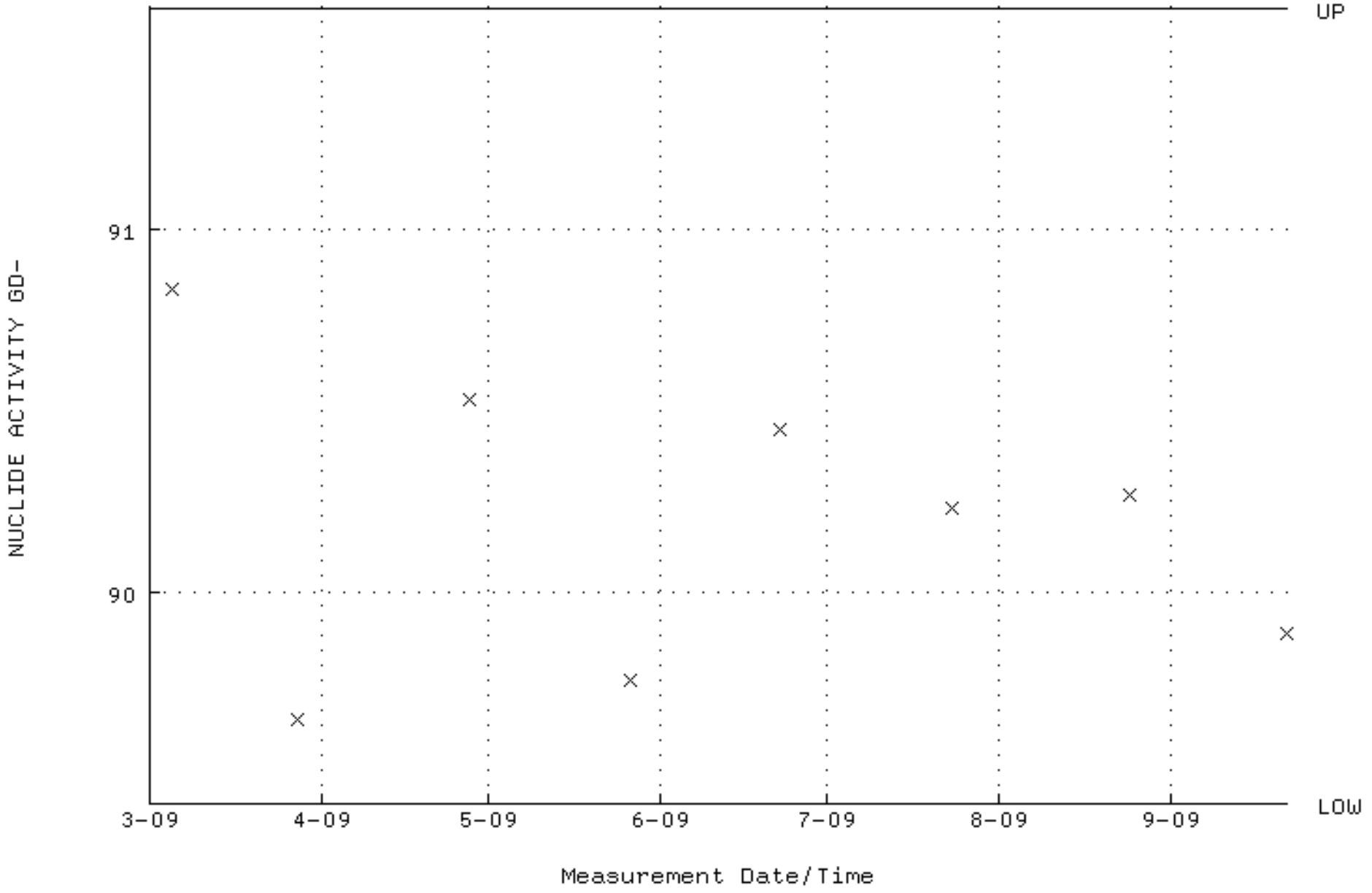
QA filename : DKA100:[ENV_ALPHA.QA.B]B154.QAF;1
Parameter Name : BACKRATE (Background Rate)
Start/End Dates : 1-MAR-2009 17:20:36 through 15-SEP-2009 12:00:00
Lower/Upper Lmts: 0.000000E+00 through 0.100000



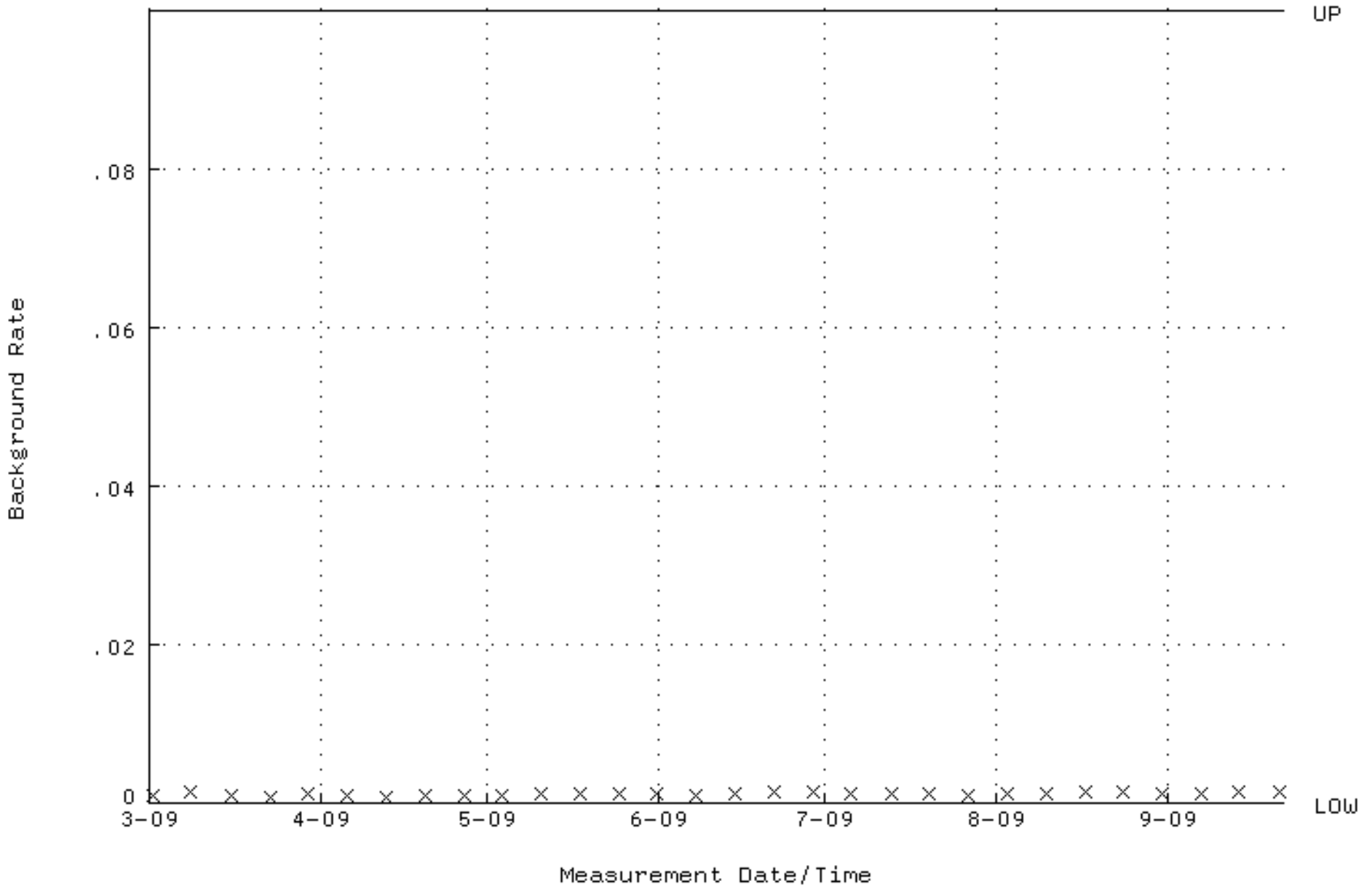
QA filename : DKA100:[ENV_ALPHA.QA.W]W161.QAF;1
Parameter Name : AVRGEFF (Average Efficiency)
Start/End Dates : 4-MAR-2009 22:37:34 through 21-SEP-2009 12:00:00
Lower/Upper Lmts: 0.362982 through 0.389932



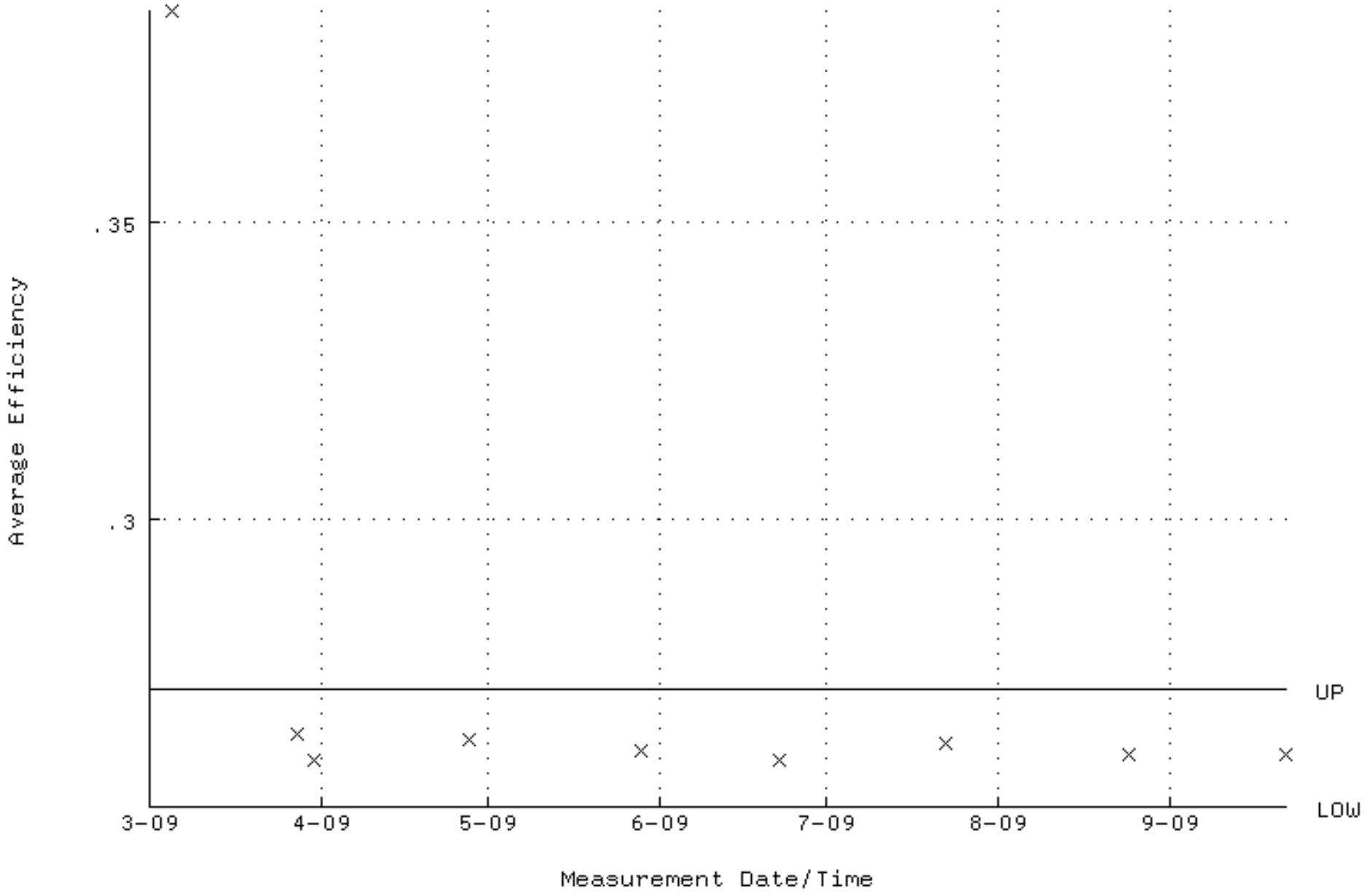
QA filename : DKA100:[ENV_ALPHA.QA.W]W161.QAF;1
Parameter Name : NLACTVTY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 4-MAR-2009 22:37:34 through 21-SEP-2009 12:00:00
Lower/Upper Lmts: 89.4216 through 91.6054



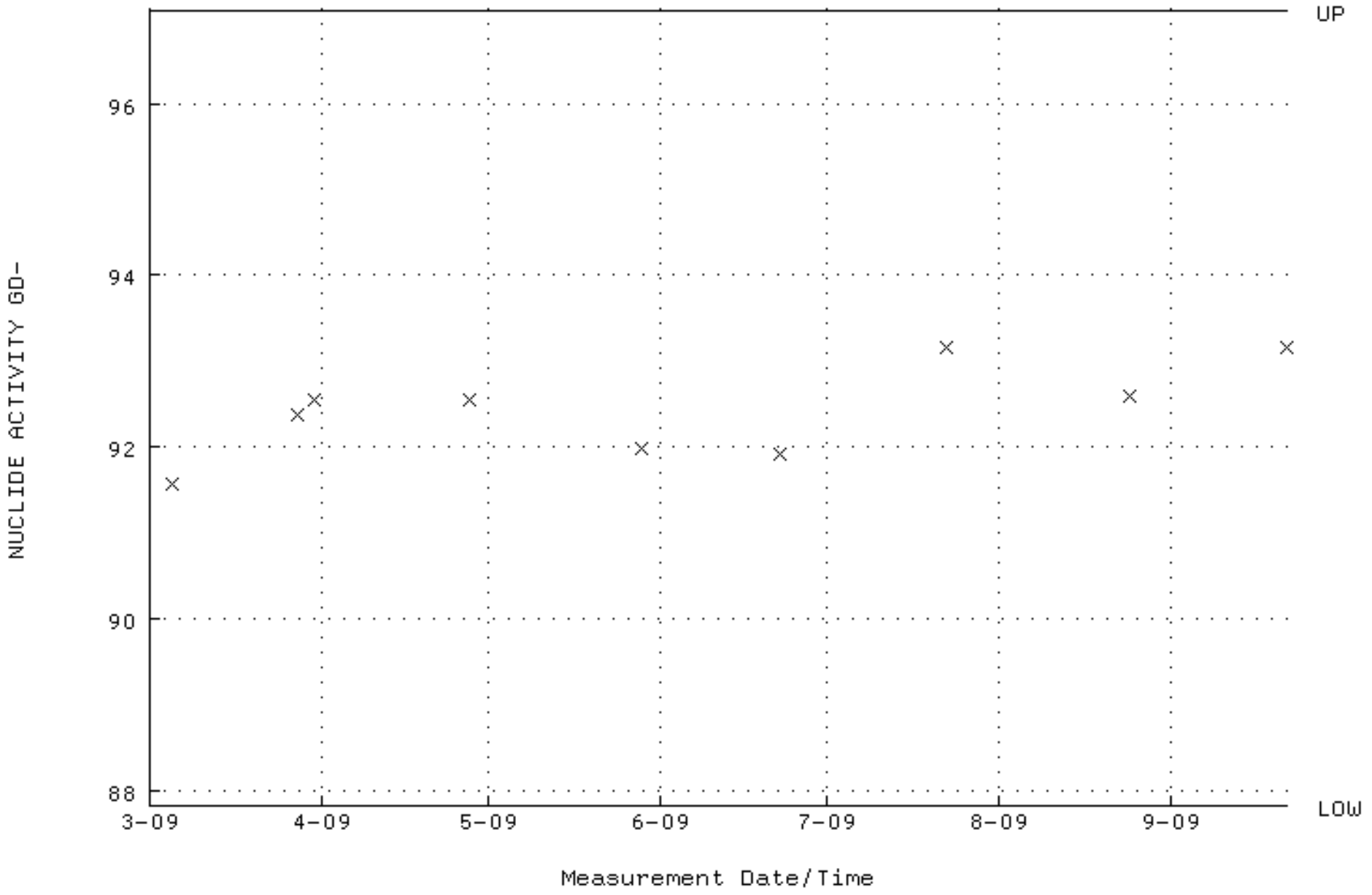
QA filename : DKA100:[ENV_ALPHA.QA.B]B161.QAF;1
Parameter Name : BACKRATE (Background Rate)
Start/End Dates : 1-MAR-2009 17:21:03 through 21-SEP-2009 12:00:00
Lower/Upper Lmts: 0.000000E+00 through 0.100000



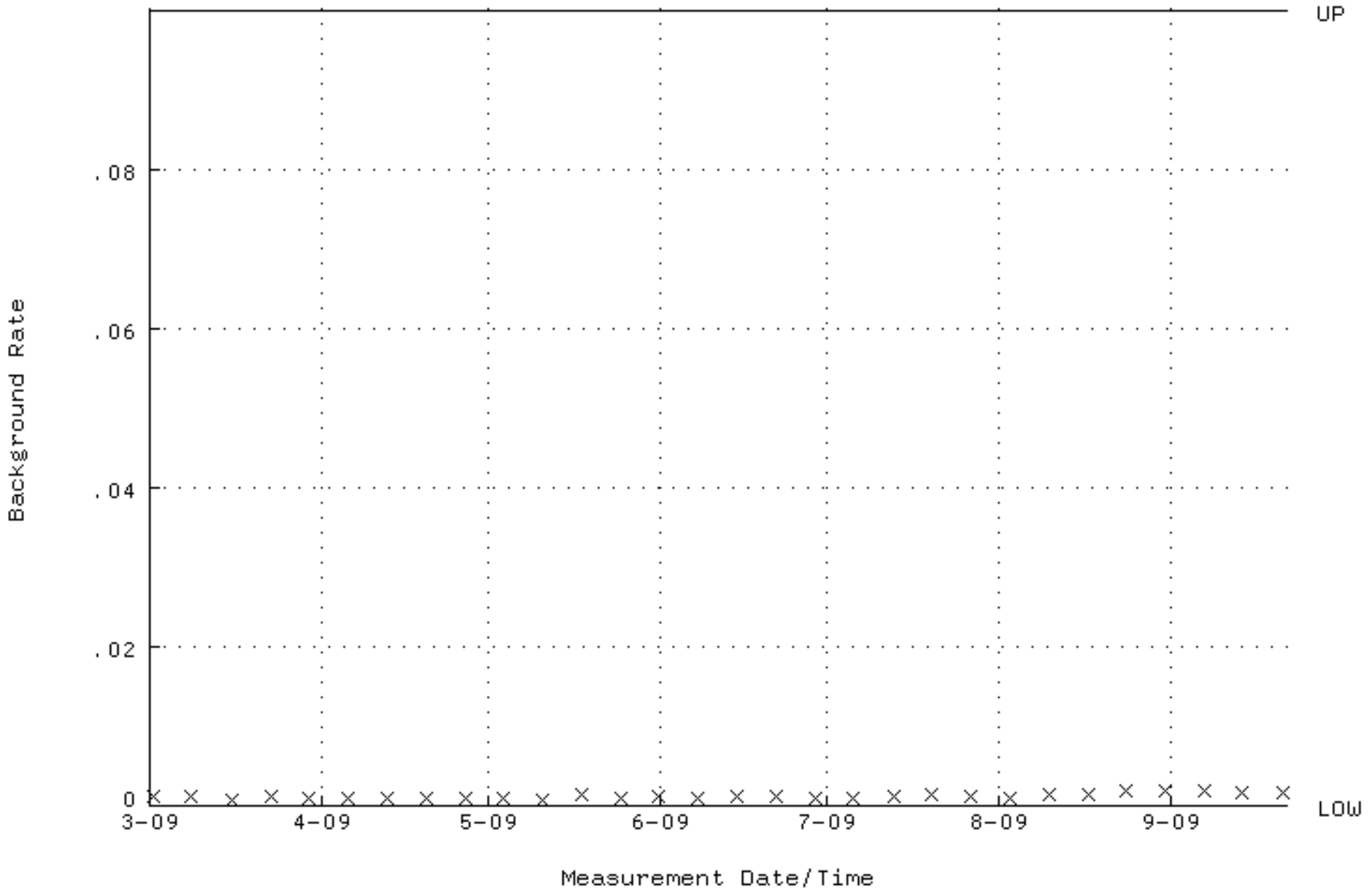
QA filename : DKA100:[ENV_ALPHA.QA.W]W173.QAF;1
Parameter Name : AVRGEFF (Average Efficiency)
Start/End Dates : 4-MAR-2009 22:38:28 through 21-SEP-2009 12:00:00
Lower/Upper Lmts: 0.251498 through 0.271498



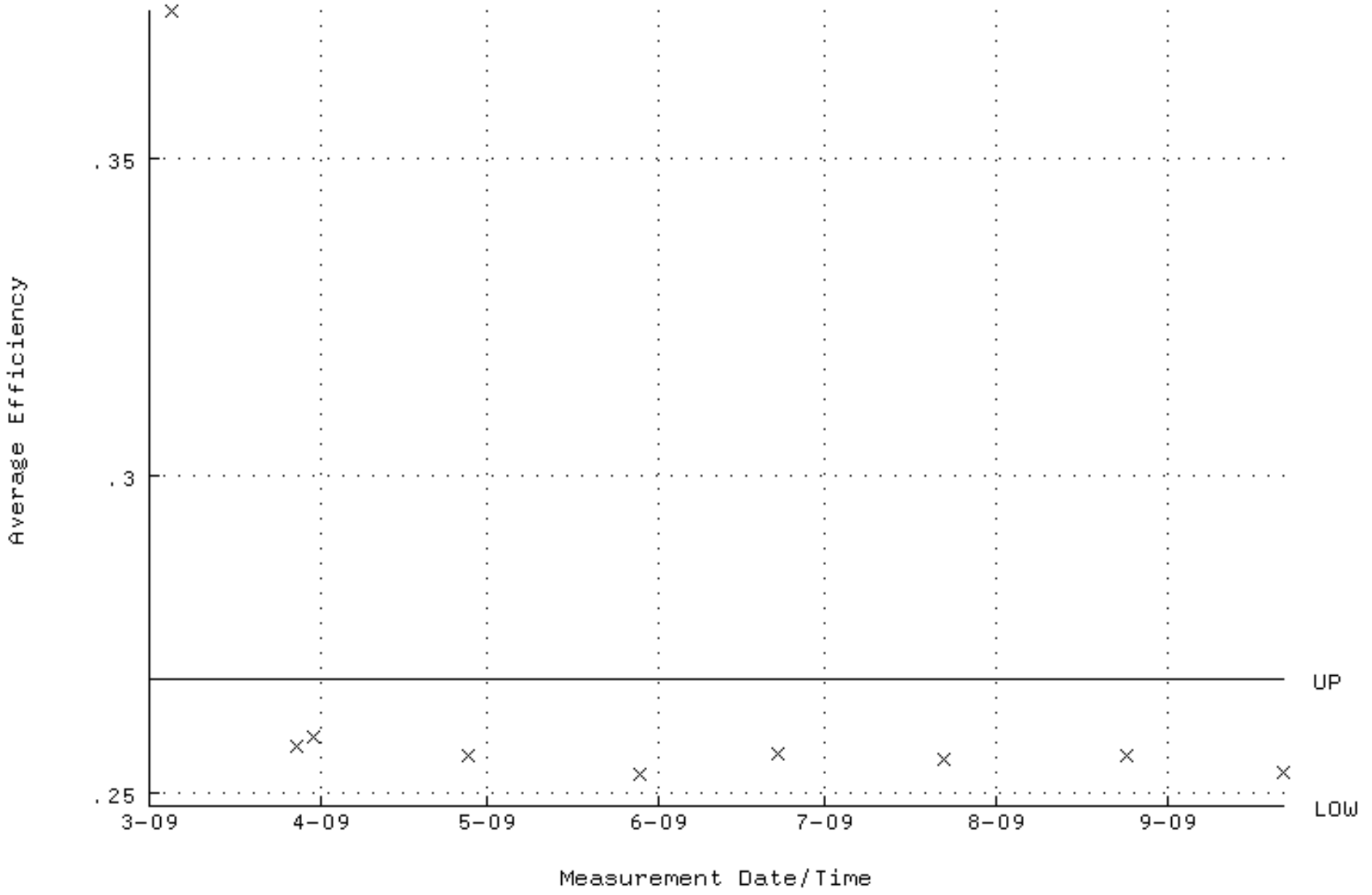
QA filename : DKA100:[ENV_ALPHA.QA.W]W173.QAF;1
Parameter Name : NLACTVTY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 4-MAR-2009 22:38:28 through 21-SEP-2009 12:00:00
Lower/Upper Lmts: 87.8322 through 97.0776



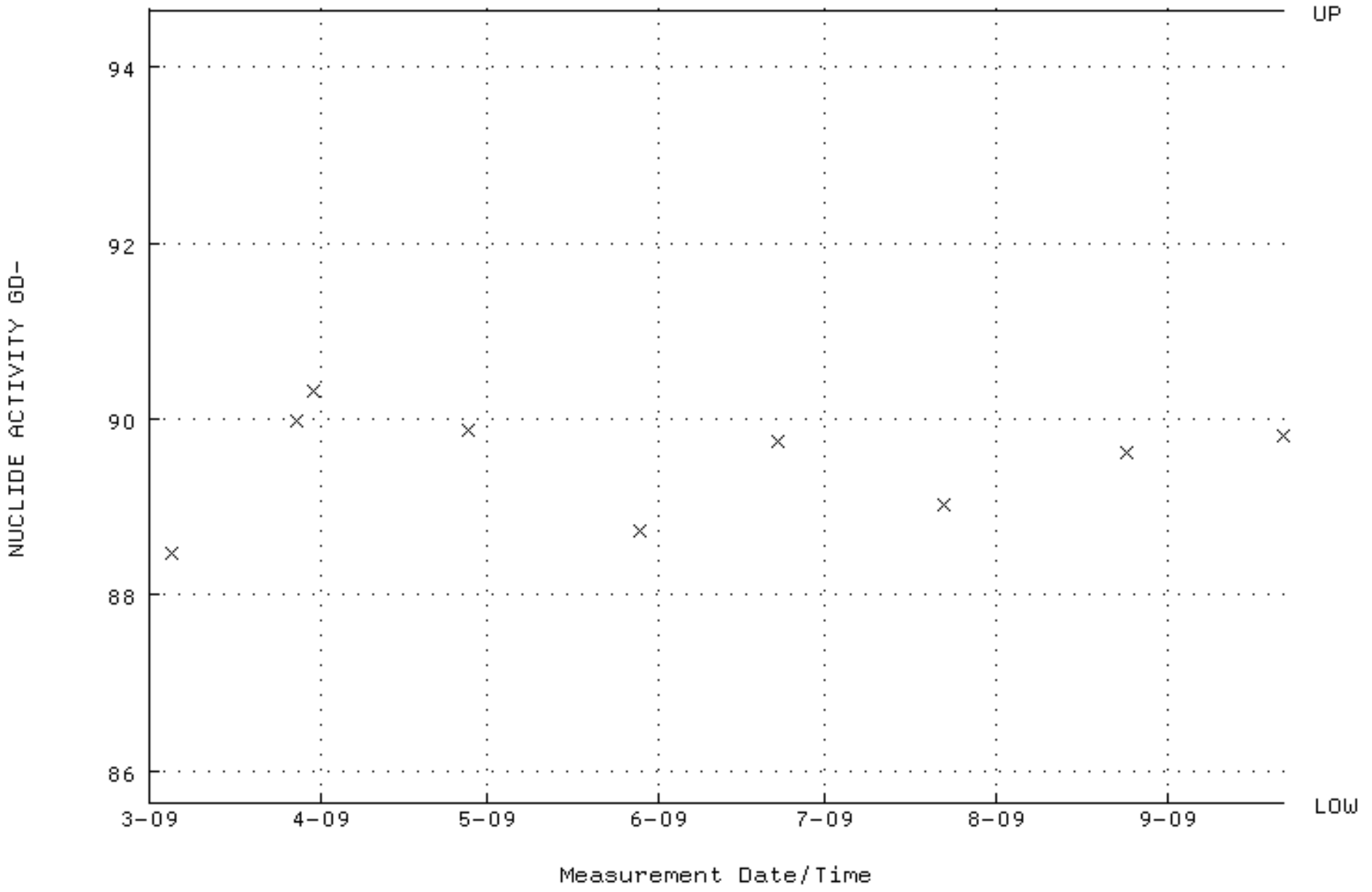
QA filename : DKA100:[ENV_ALPHA.QA.B]B173.QAF;1
Parameter Name : BACKRATE (Background Rate)
Start/End Dates : 1-MAR-2009 17:21:46 through 21-SEP-2009 12:00:00
Lower/Upper Lmts: 0.000000E+00 through 0.100000



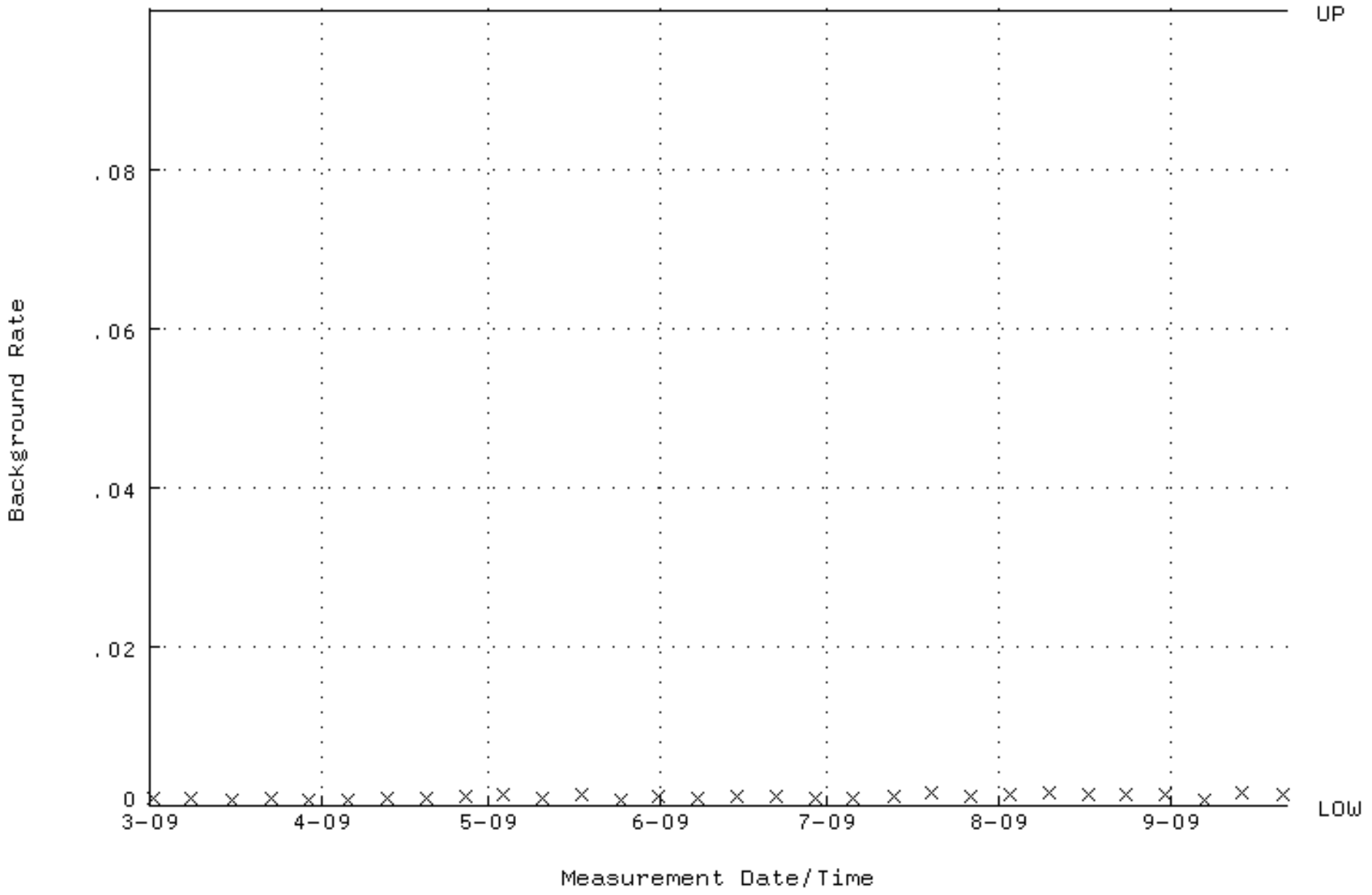
QA filename : DKA100:[ENV_ALPHA.QA.W]W174.QAF;1
Parameter Name : AVRGEFF (Average Efficiency)
Start/End Dates : 4-MAR-2009 22:38:33 through 21-SEP-2009 12:00:00
Lower/Upper Lmts: 0.248038 through 0.268038



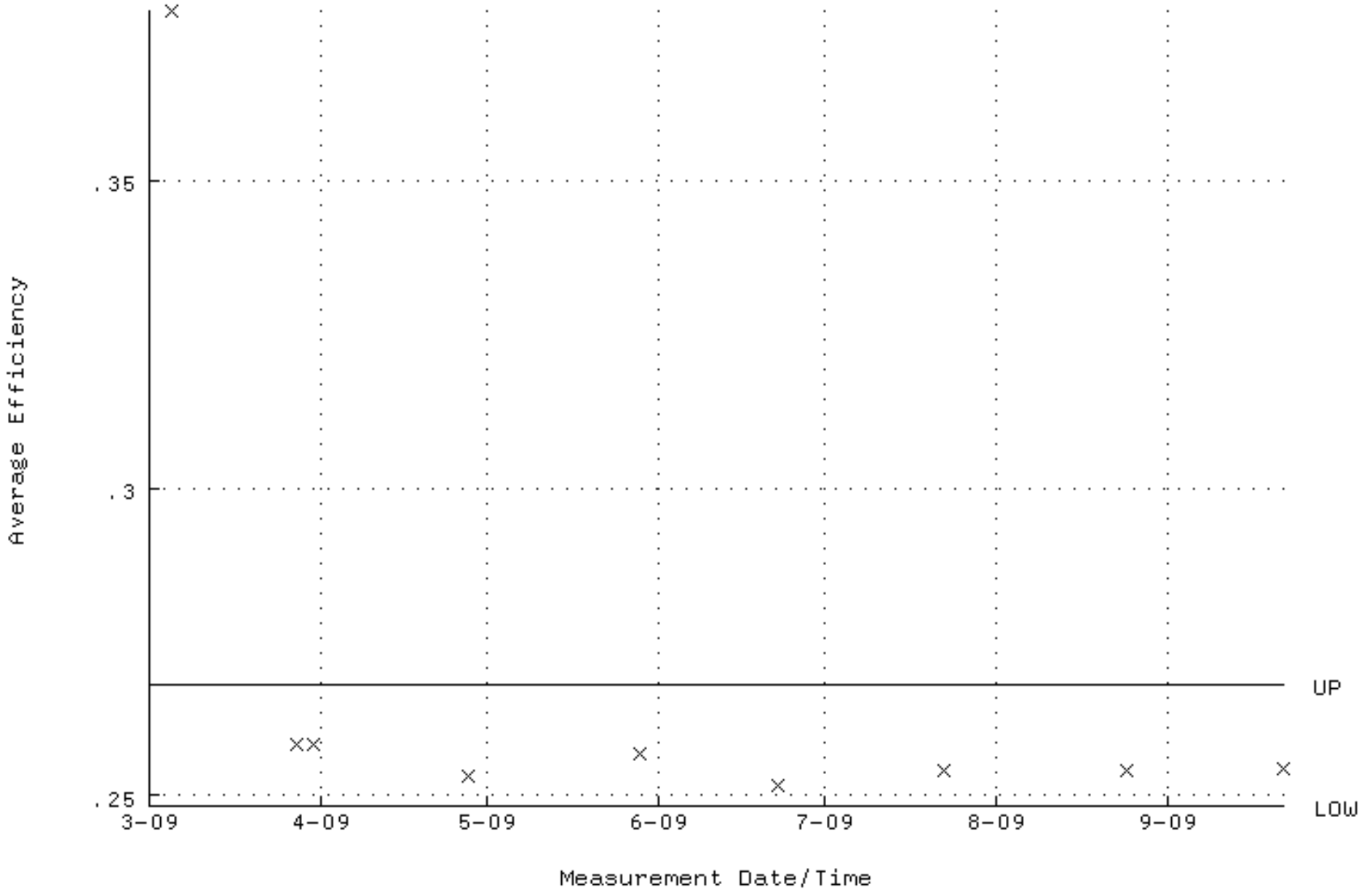
QA filename : DKA100:[ENV_ALPHA.QA.W]W174.QAF;1
Parameter Name : NLACTVTY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 4-MAR-2009 22:38:33 through 21-SEP-2009 12:00:00
Lower/Upper Lmts: 85.6304 through 94.6442



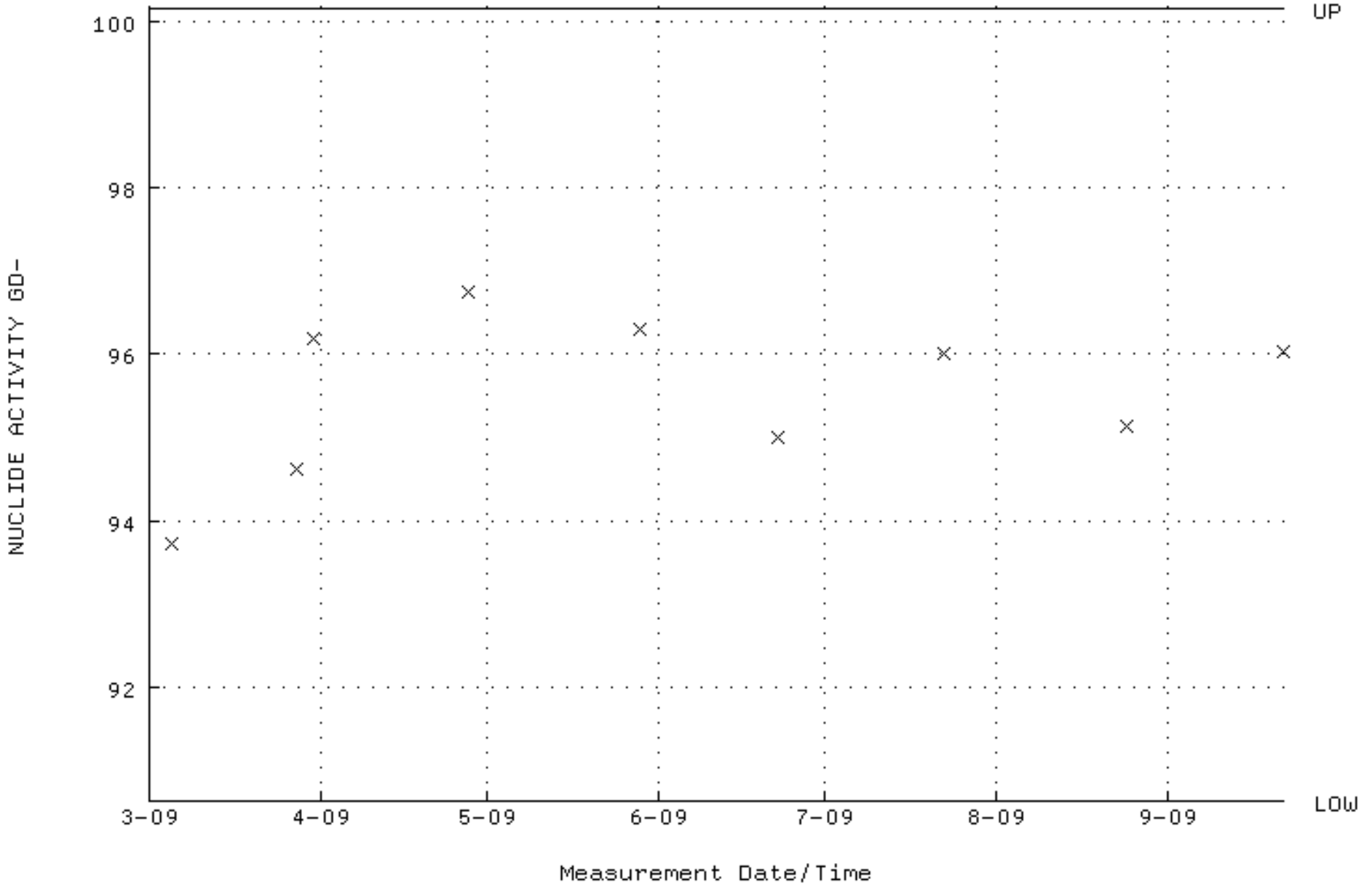
QA filename : DKA100:[ENV_ALPHA.QA.B]B174.QAF;1
Parameter Name : BACKRATE (Background Rate)
Start/End Dates : 1-MAR-2009 17:21:50 through 21-SEP-2009 12:00:00
Lower/Upper Lmts: 0.000000E+00 through 0.100000



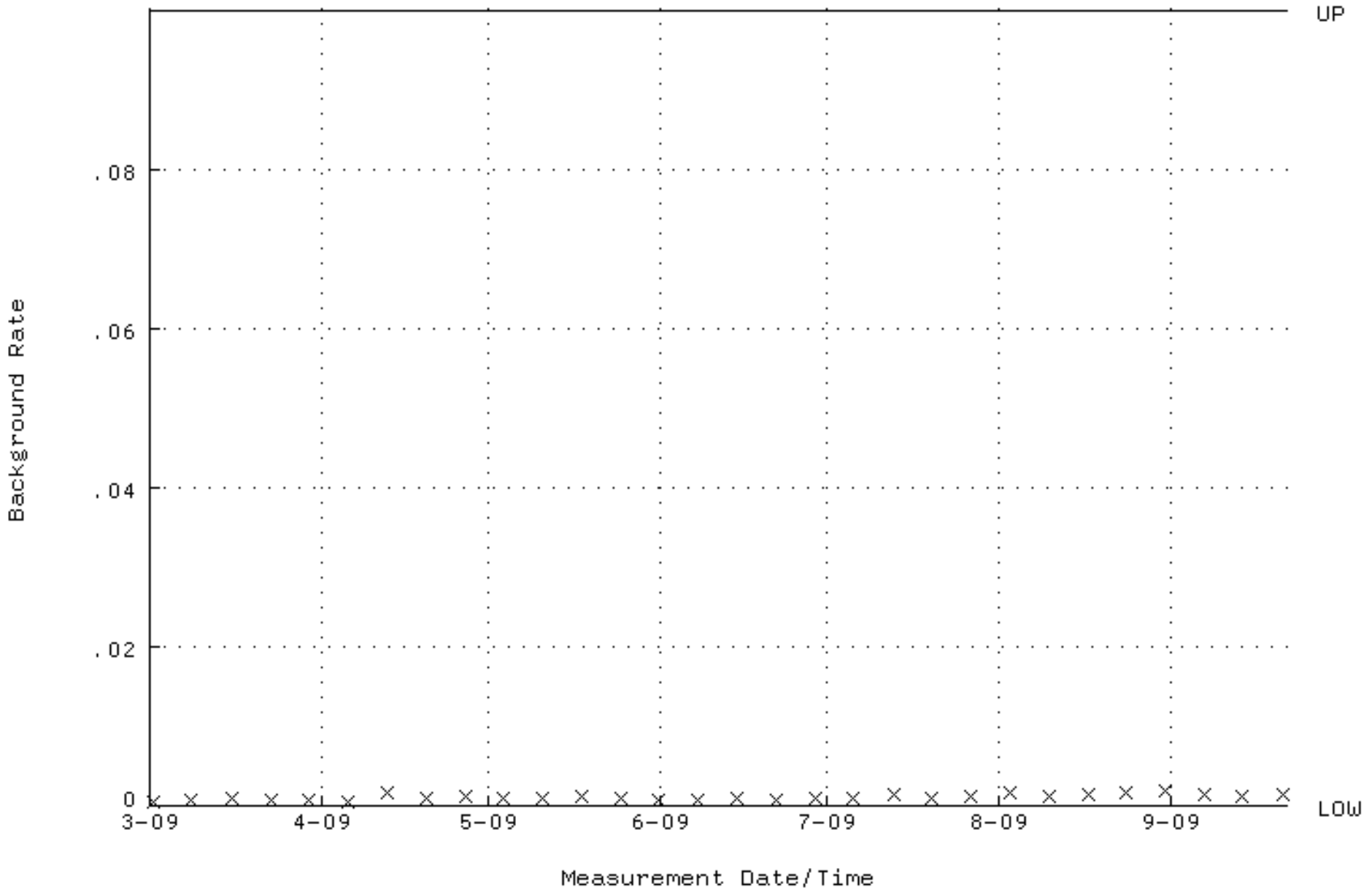
QA filename : DKA100:[ENV_ALPHA.QA.W]W175.QAF;1
Parameter Name : AVRGEFF (Average Efficiency)
Start/End Dates : 4-MAR-2009 22:38:37 through 21-SEP-2009 12:00:00
Lower/Upper Lmts: 0.248296 through 0.268296



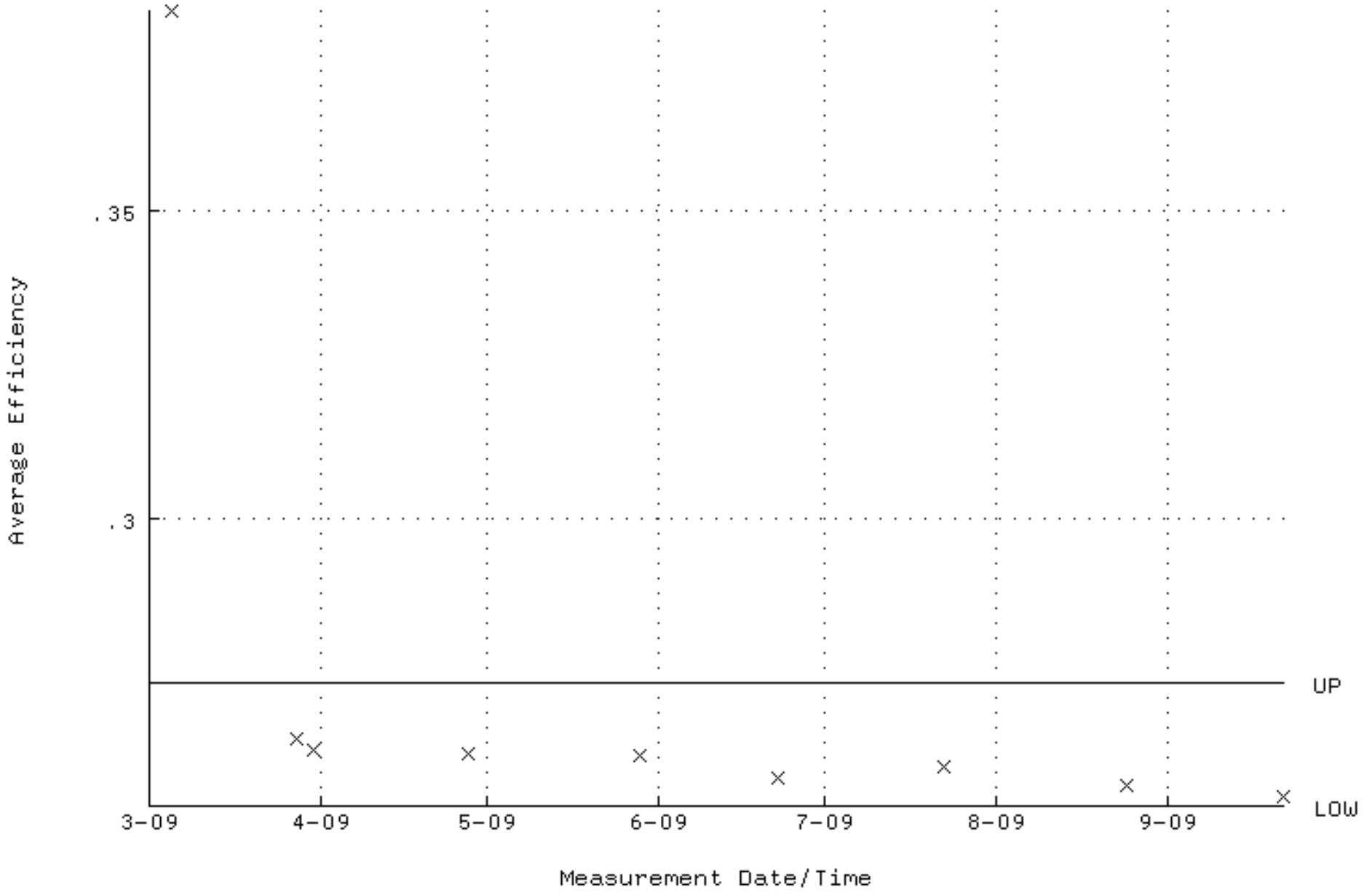
QA filename : DKA100:[ENV_ALPHA.QA.W]W175.QAF;1
Parameter Name : NLACTVTY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 4-MAR-2009 22:38:37 through 21-SEP-2009 12:00:00
Lower/Upper Lmts: 90.6224 through 100.162



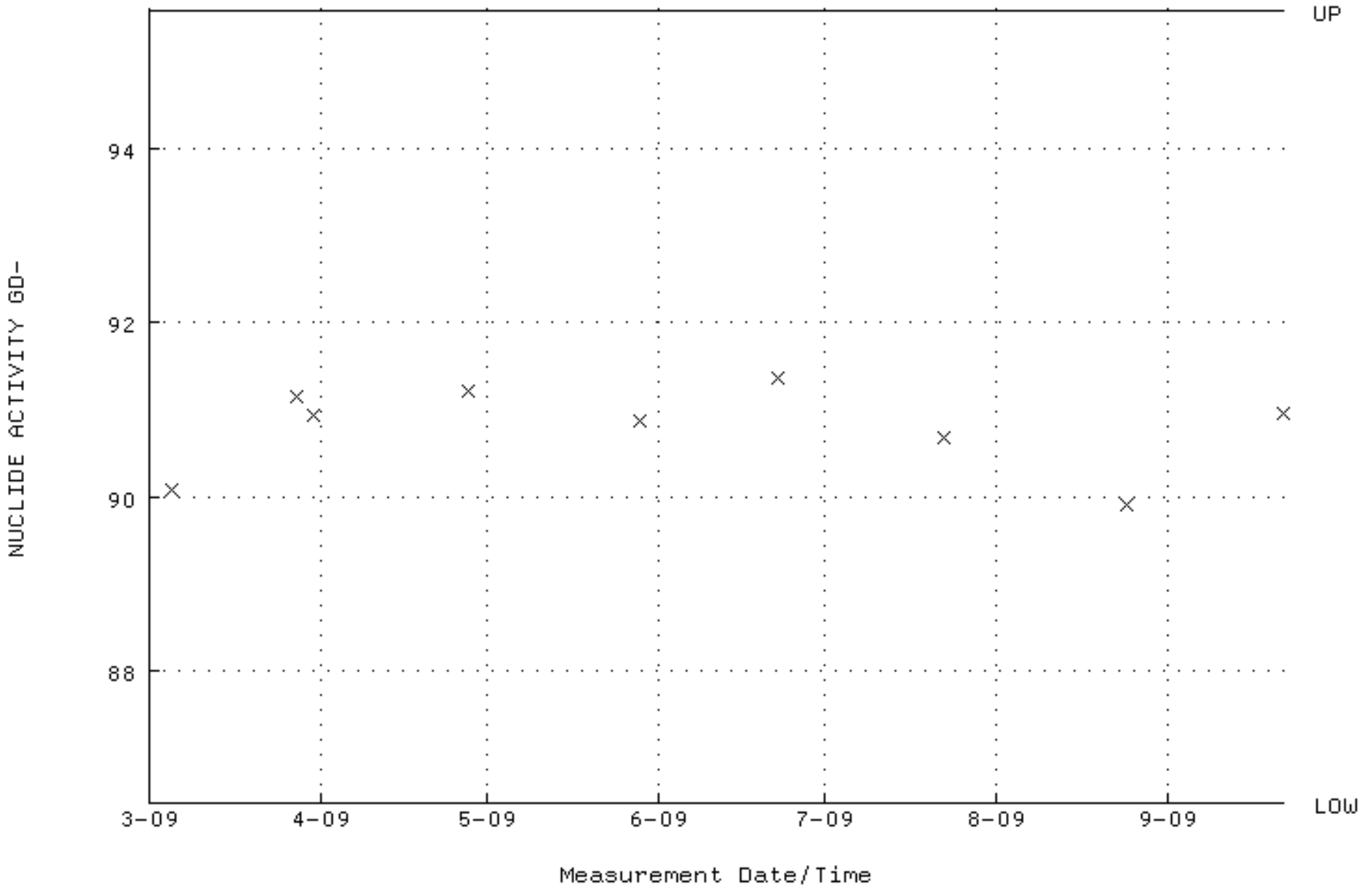
QA filename : DKA100:[ENV_ALPHA.QA.B]B175.QAF;1
Parameter Name : BACKRATE (Background Rate)
Start/End Dates : 1-MAR-2009 17:21:54 through 21-SEP-2009 12:00:00
Lower/Upper Lmts: 0.000000E+00 through 0.100000



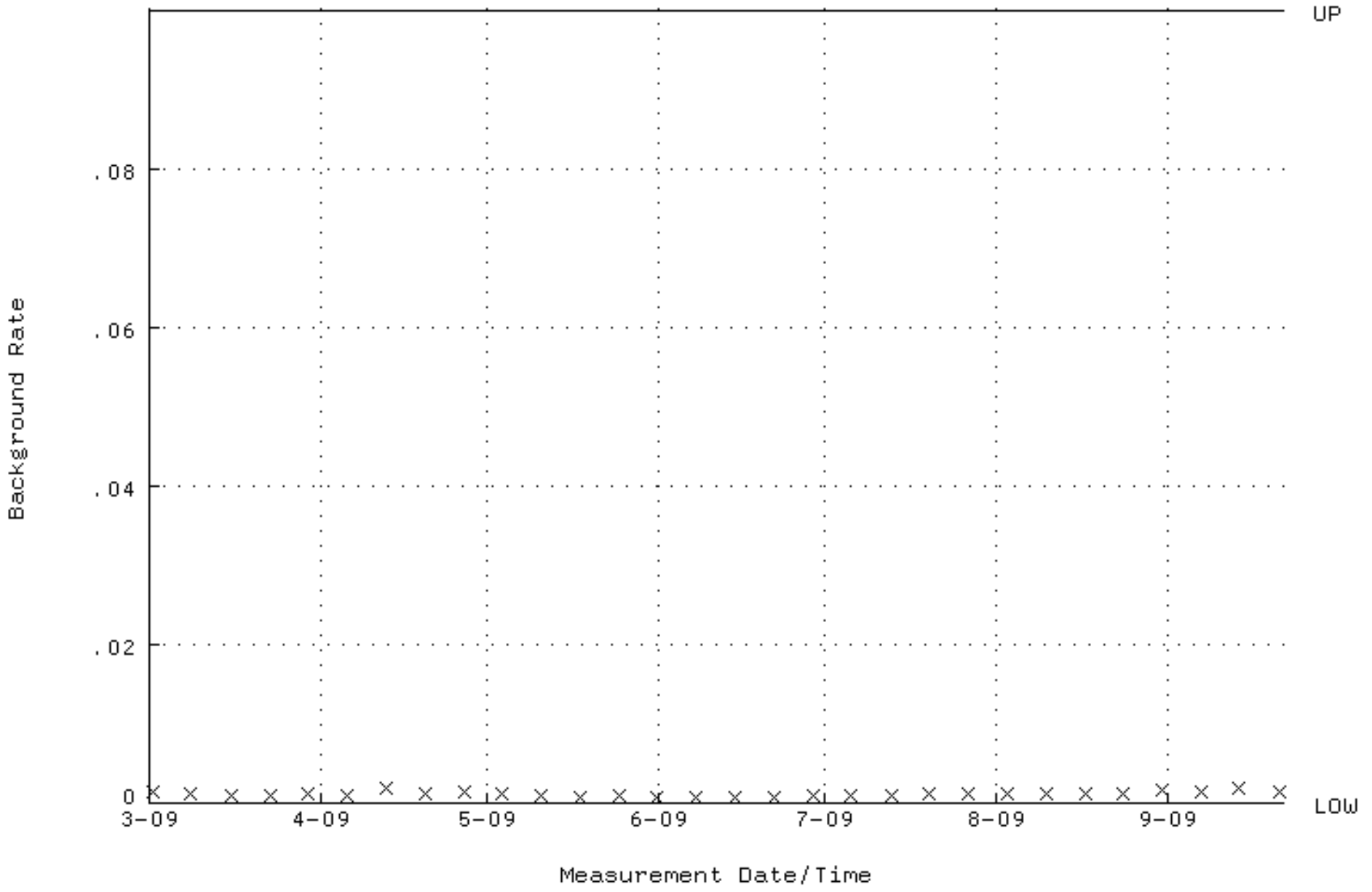
QA filename : DKA100:[ENV_ALPHA.QA.W]W176.QAF;1
Parameter Name : AVRGEFF (Average Efficiency)
Start/End Dates : 4-MAR-2009 22:38:41 through 21-SEP-2009 12:00:00
Lower/Upper Lmts: 0.253285 through 0.273285



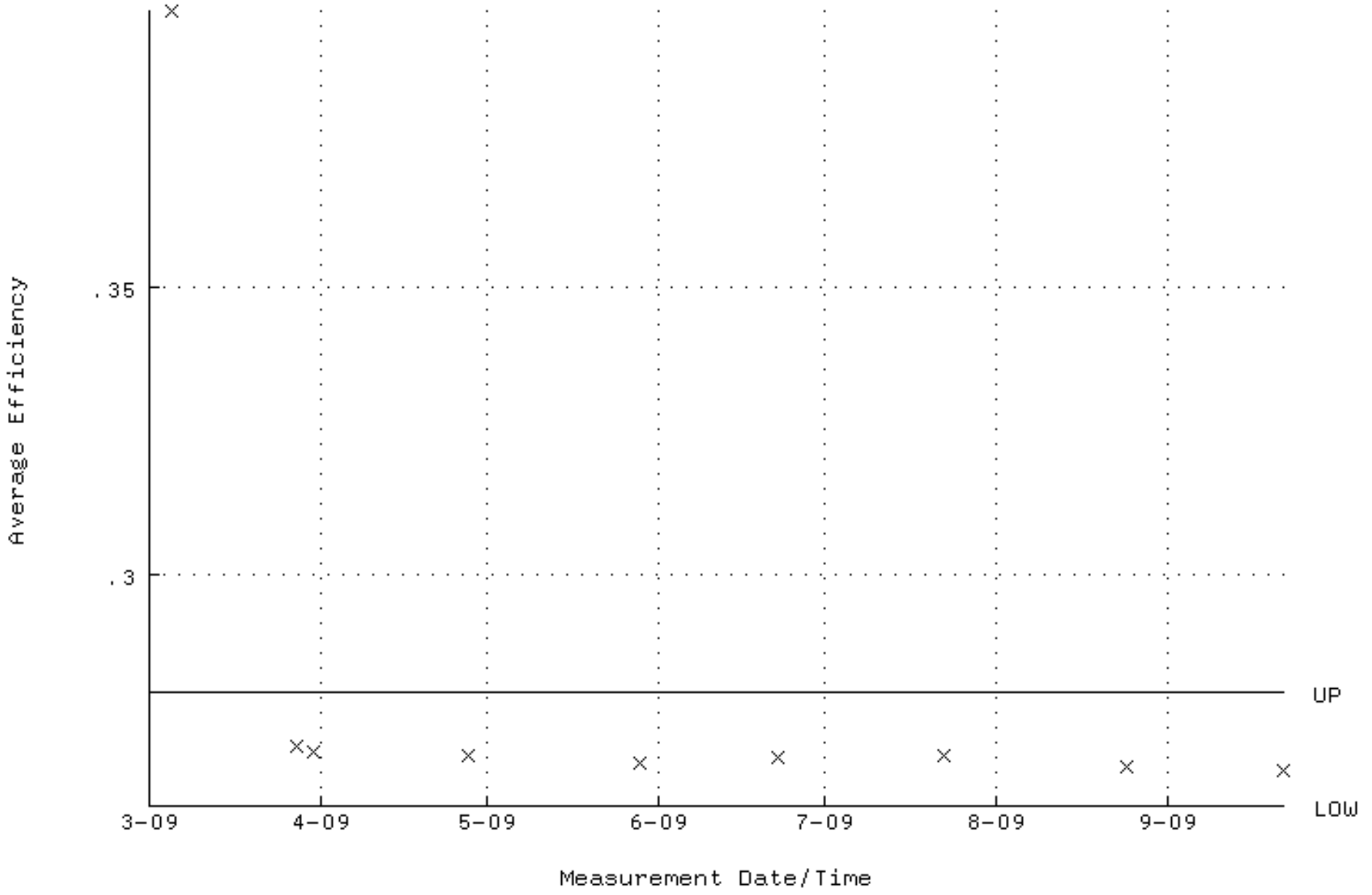
QA filename : DKA100:[ENV_ALPHA.QA.W]W176.QAF;1
Parameter Name : NLACTVTY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 4-MAR-2009 22:38:41 through 21-SEP-2009 12:00:00
Lower/Upper Lmts: 86.4817 through 95.5851



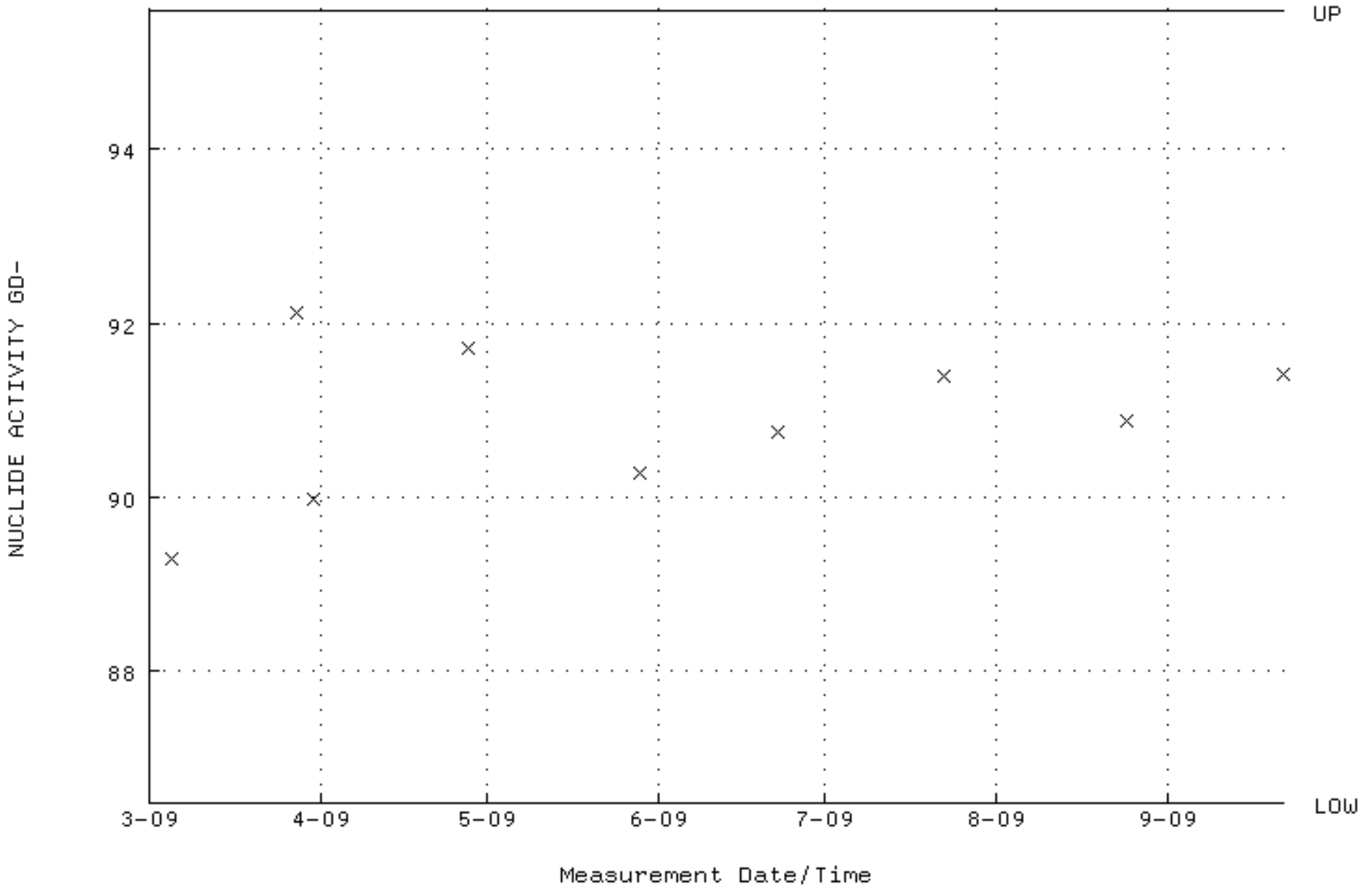
QA filename : DKA100:[ENV_ALPHA.QA.B]B176.QAF;1
Parameter Name : BACKRATE (Background Rate)
Start/End Dates : 1-MAR-2009 17:21:58 through 21-SEP-2009 12:00:00
Lower/Upper Lmts: 0.000000E+00 through 0.100000



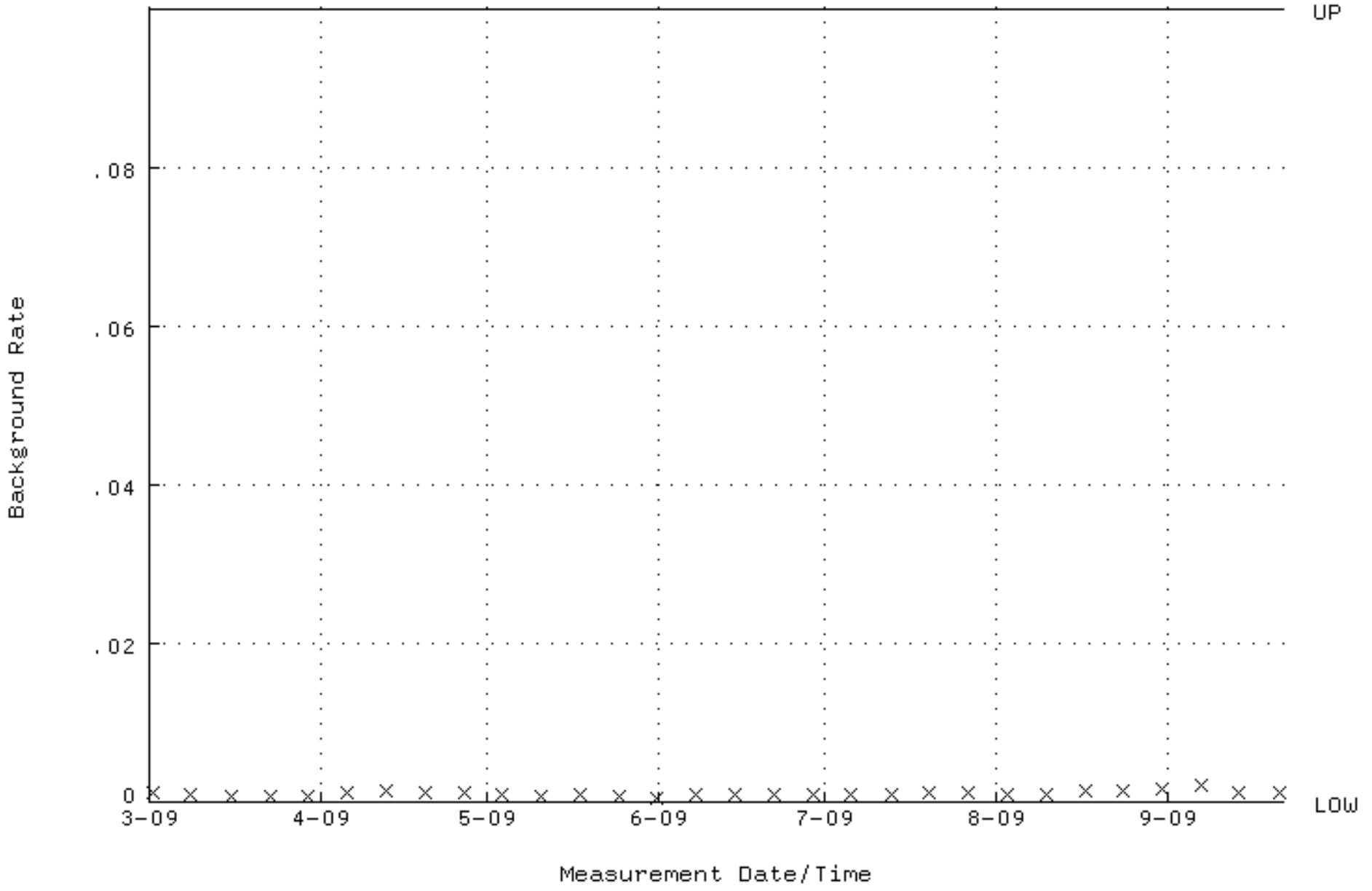
QA filename : DKA100:[ENV_ALPHA.QA.W]W177.QAF;1
Parameter Name : AVRGEFF (Average Efficiency)
Start/End Dates : 4-MAR-2009 22:38:46 through 21-SEP-2009 12:00:00
Lower/Upper Lmts: 0.259935 through 0.279935



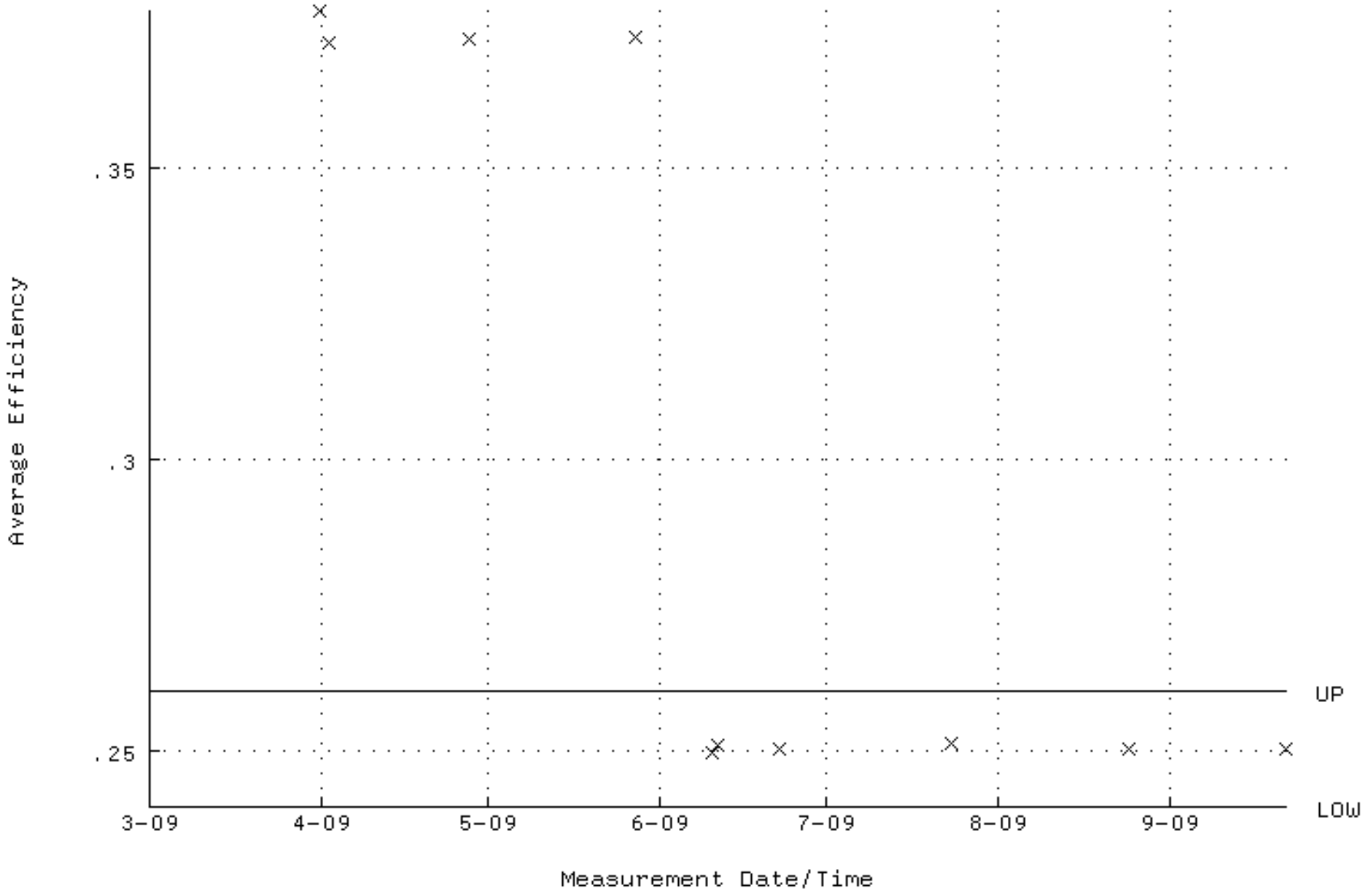
QA filename : DKA100:[ENV_ALPHA.QA.W]W177.QAF;1
Parameter Name : NLACTVTY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 4-MAR-2009 22:38:46 through 21-SEP-2009 12:00:00
Lower/Upper Lmts: 86.4857 through 95.5895



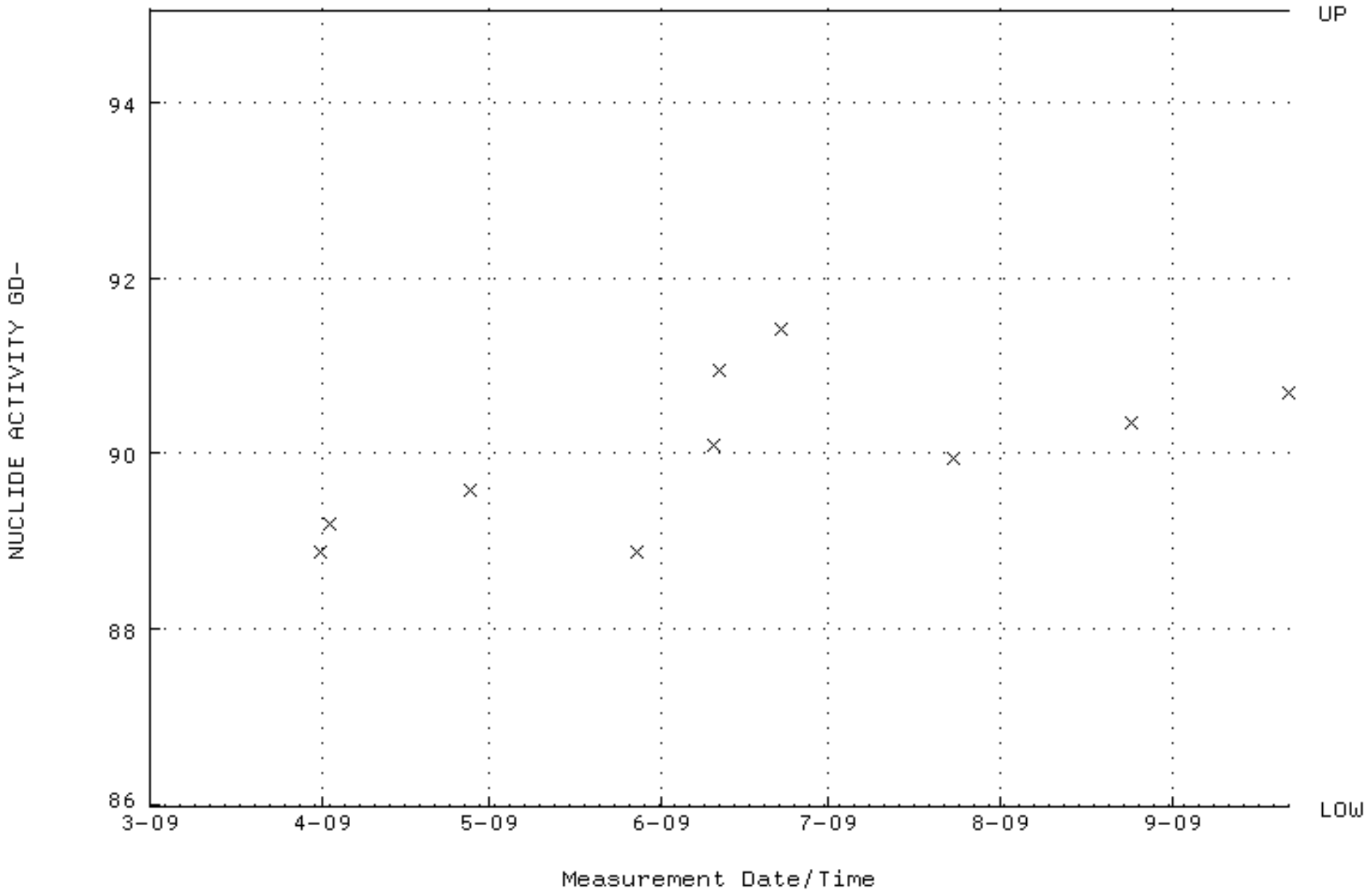
QA filename : DKA100:[ENV_ALPHA.QA.B]B177.QAF;1
Parameter Name : BACKRATE (Background Rate)
Start/End Dates : 1-MAR-2009 17:22:02 through 21-SEP-2009 12:00:00
Lower/Upper Lmts: 0.000000E+00 through 0.100000



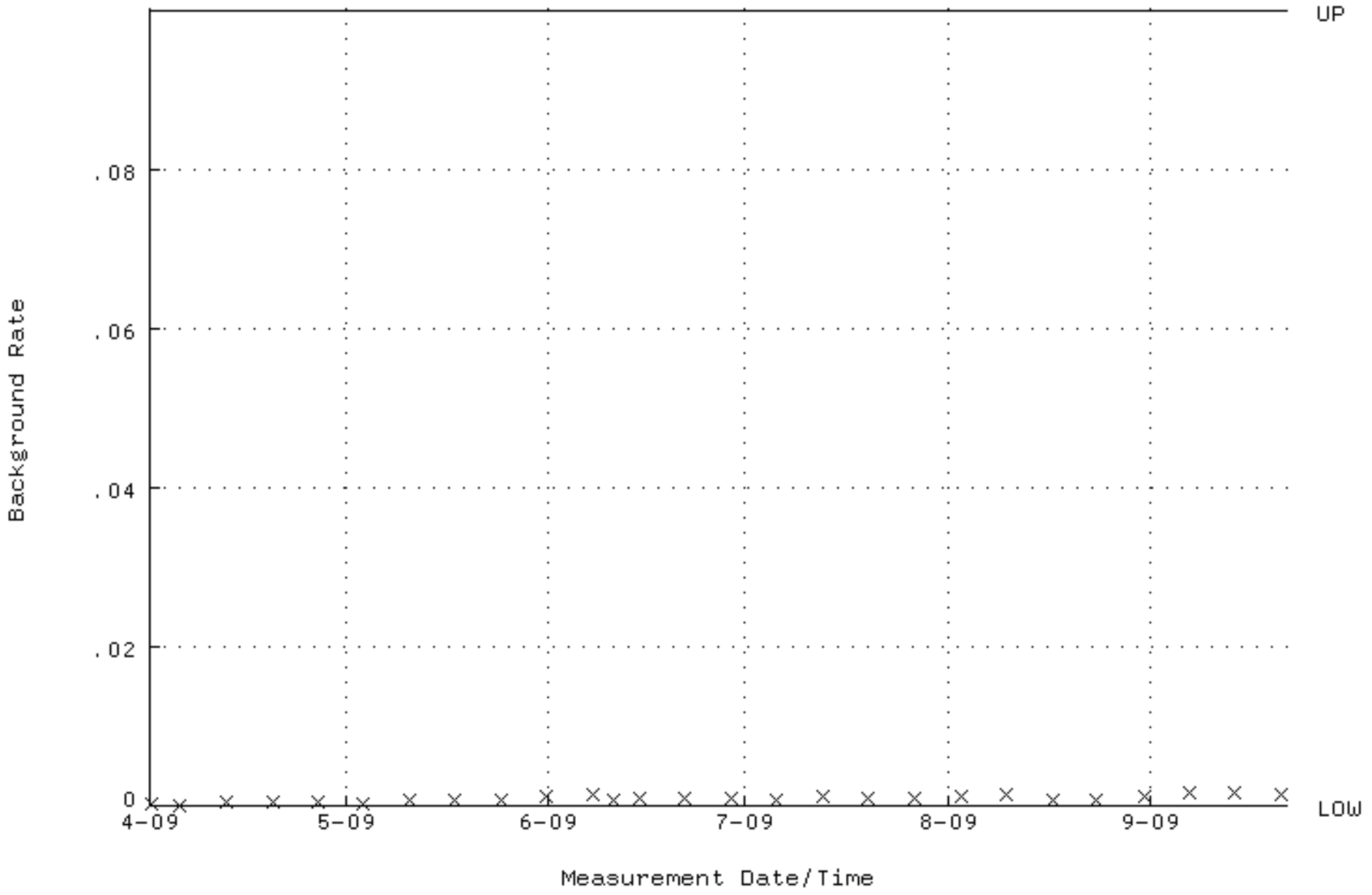
QA filename : DKA100:[ENV_ALPHA.QA.W]W199.QAF;1
Parameter Name : AVRGEFF (Average Efficiency)
Start/End Dates : 31-MAR-2009 15:10:22 through 21-SEP-2009 12:00:00
Lower/Upper Lmts: 0.240278 through 0.260278



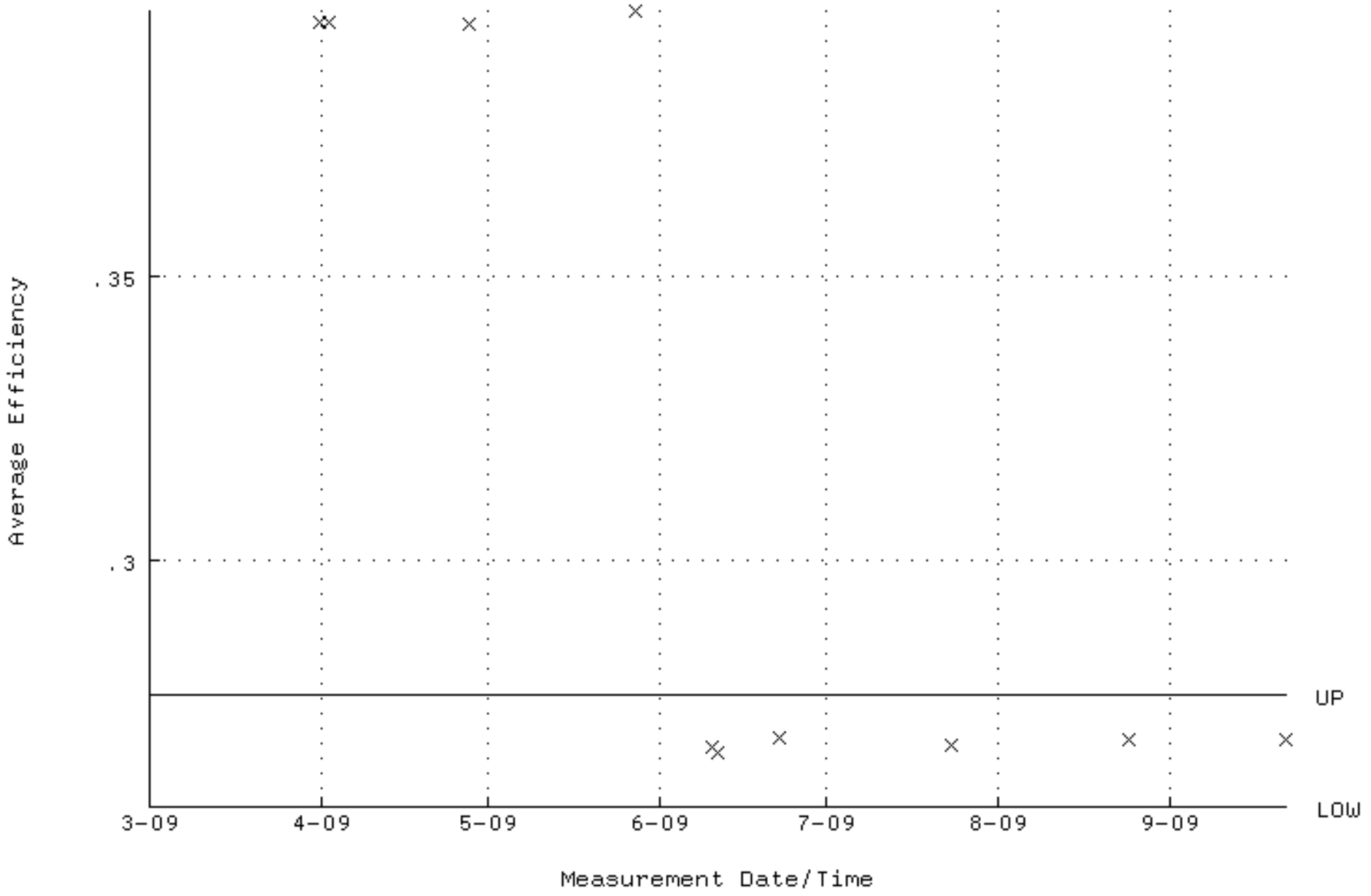
QA filename : DKA100:[ENV_ALPHA.QA.W]W199.QAF;1
Parameter Name : NLACTVTY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 31-MAR-2009 15:10:22 through 21-SEP-2009 12:00:00
Lower/Upper Lmts: 85.9853 through 95.0363



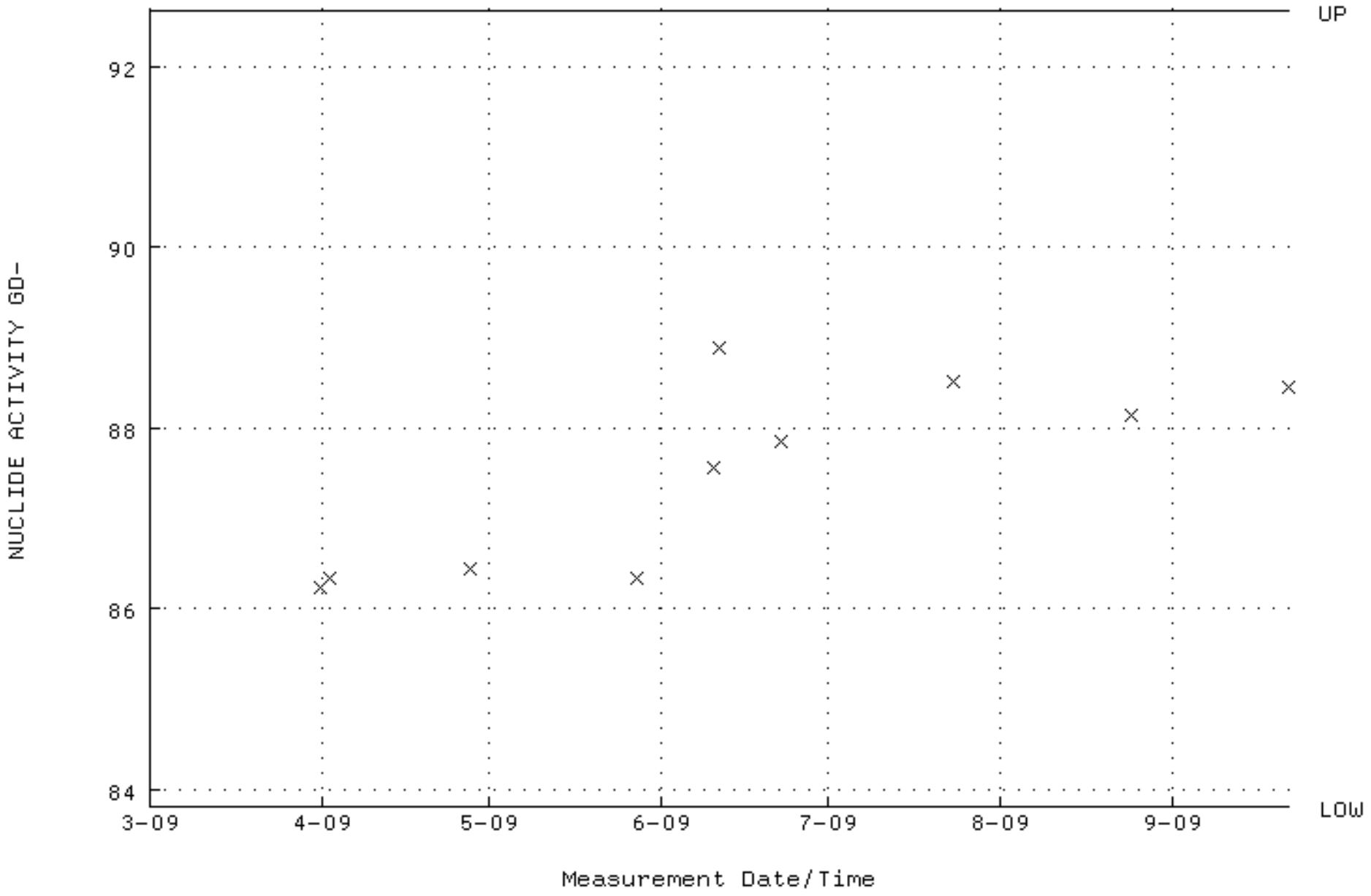
QA filename : DKA100:[ENV_ALPHA.QA.B]B199.QAF;1
Parameter Name : BACKRATE (Background Rate)
Start/End Dates : 1-APR-2009 08:02:28 through 21-SEP-2009 12:00:00
Lower/Upper Lmts: 0.000000E+00 through 0.100000



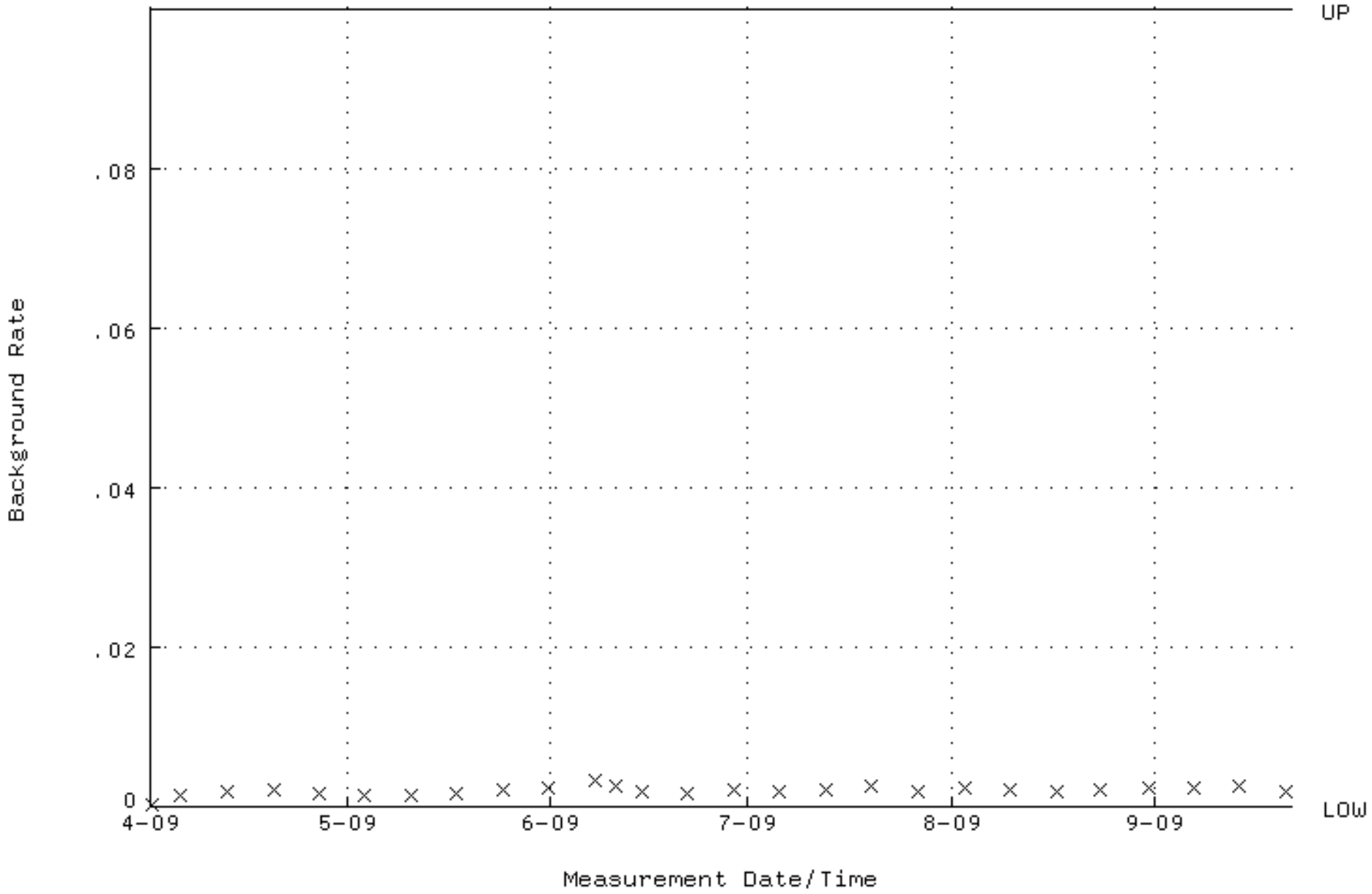
QA filename : DKA100:[ENV_ALPHA.QA.W]W200.QAF;1
Parameter Name : AVRGEFF (Average Efficiency)
Start/End Dates : 31-MAR-2009 15:10:24 through 21-SEP-2009 12:00:00
Lower/Upper Lmts: 0.256586 through 0.276586



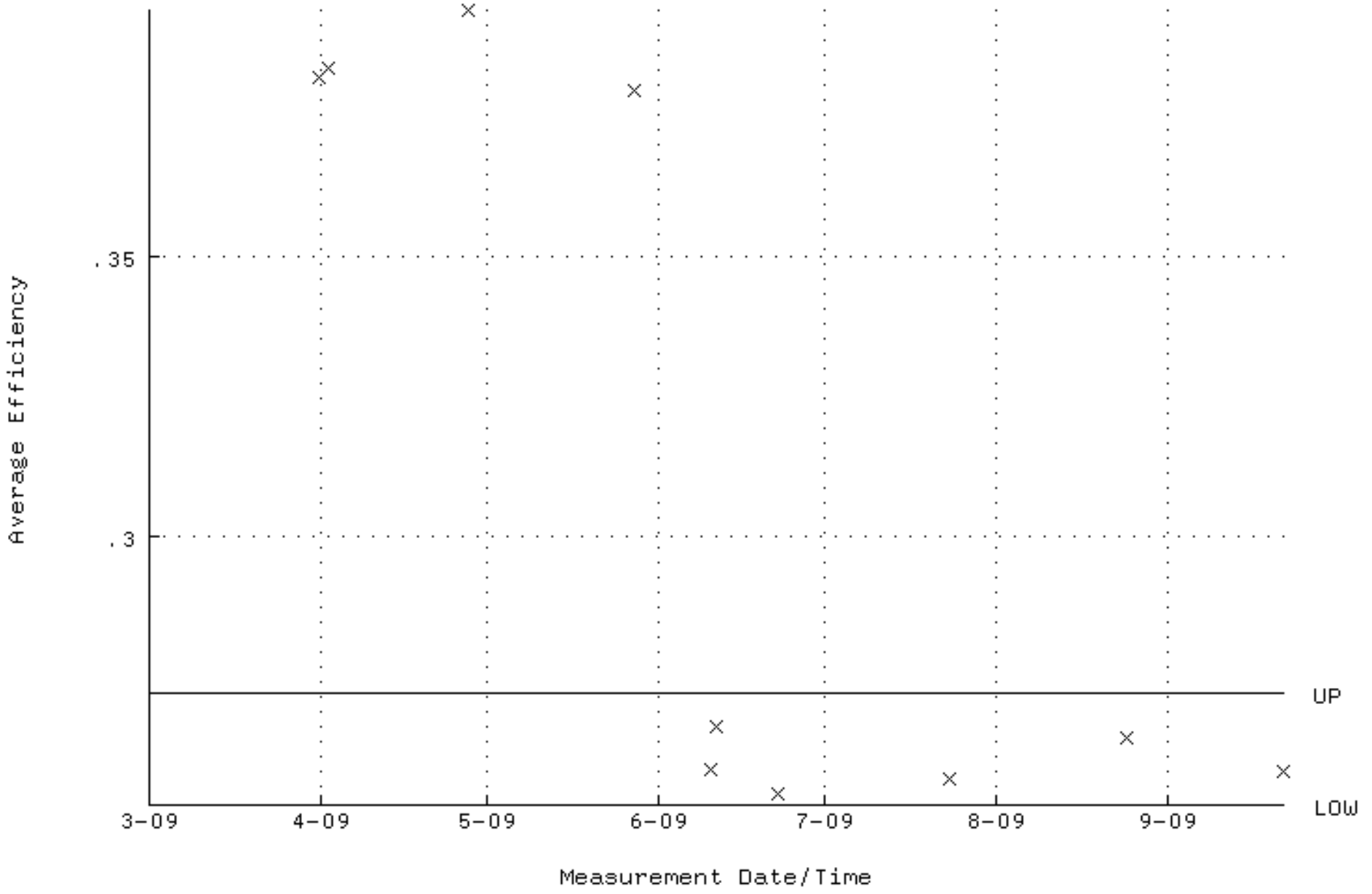
QA filename : DKA100:[ENV_ALPHA.QA.W]W200.QAF;1
Parameter Name : NLACTVTY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 31-MAR-2009 15:10:24 through 21-SEP-2009 12:00:00
Lower/Upper Lmts: 83.8028 through 92.6242



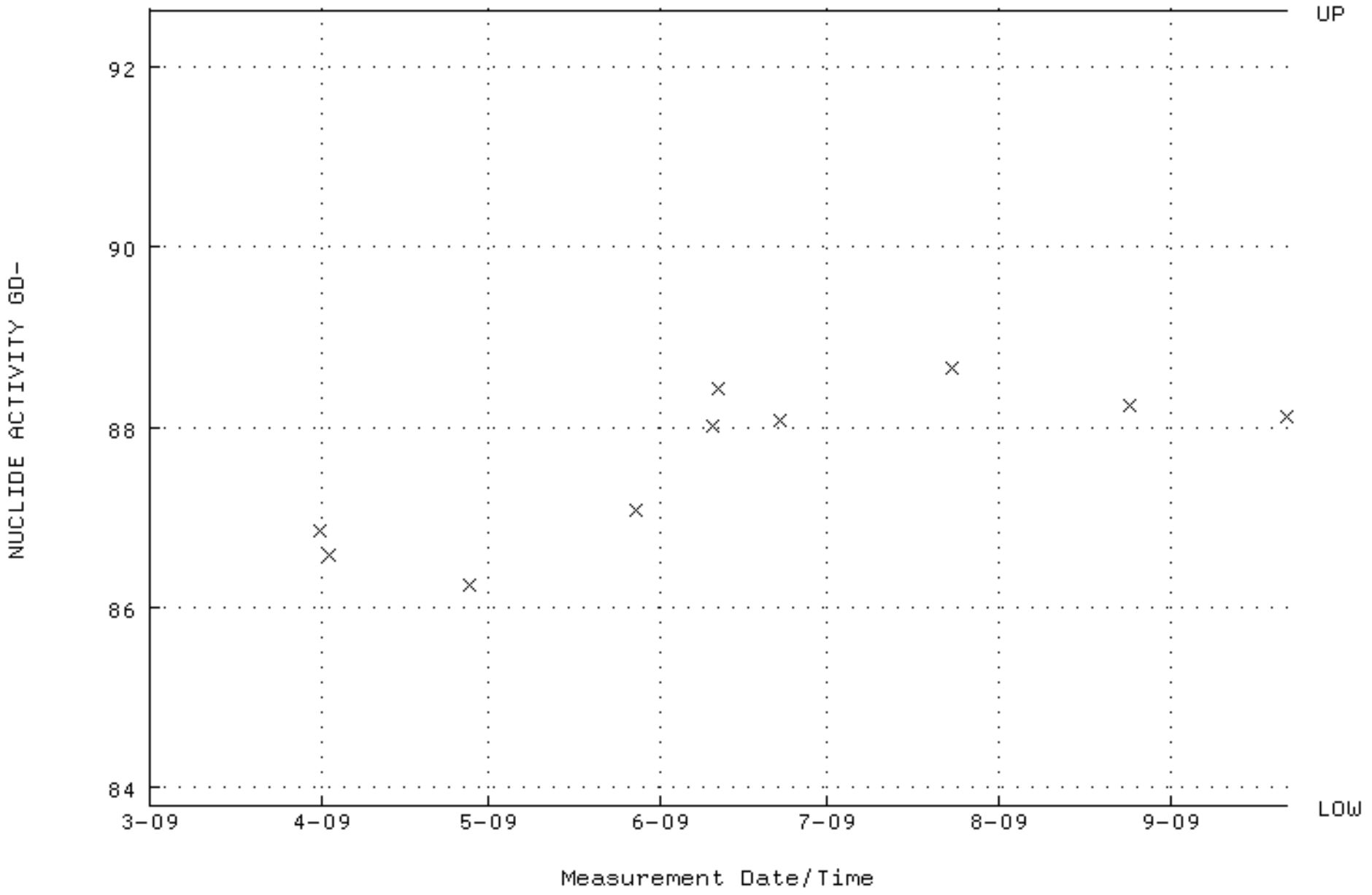
QA filename : DKA100:[ENV_ALPHA.QA.B]B200.QAF;1
Parameter Name : BACKRATE (Background Rate)
Start/End Dates : 1-APR-2009 08:02:33 through 21-SEP-2009 12:00:00
Lower/Upper Lmts: 0.000000E+00 through 0.100000



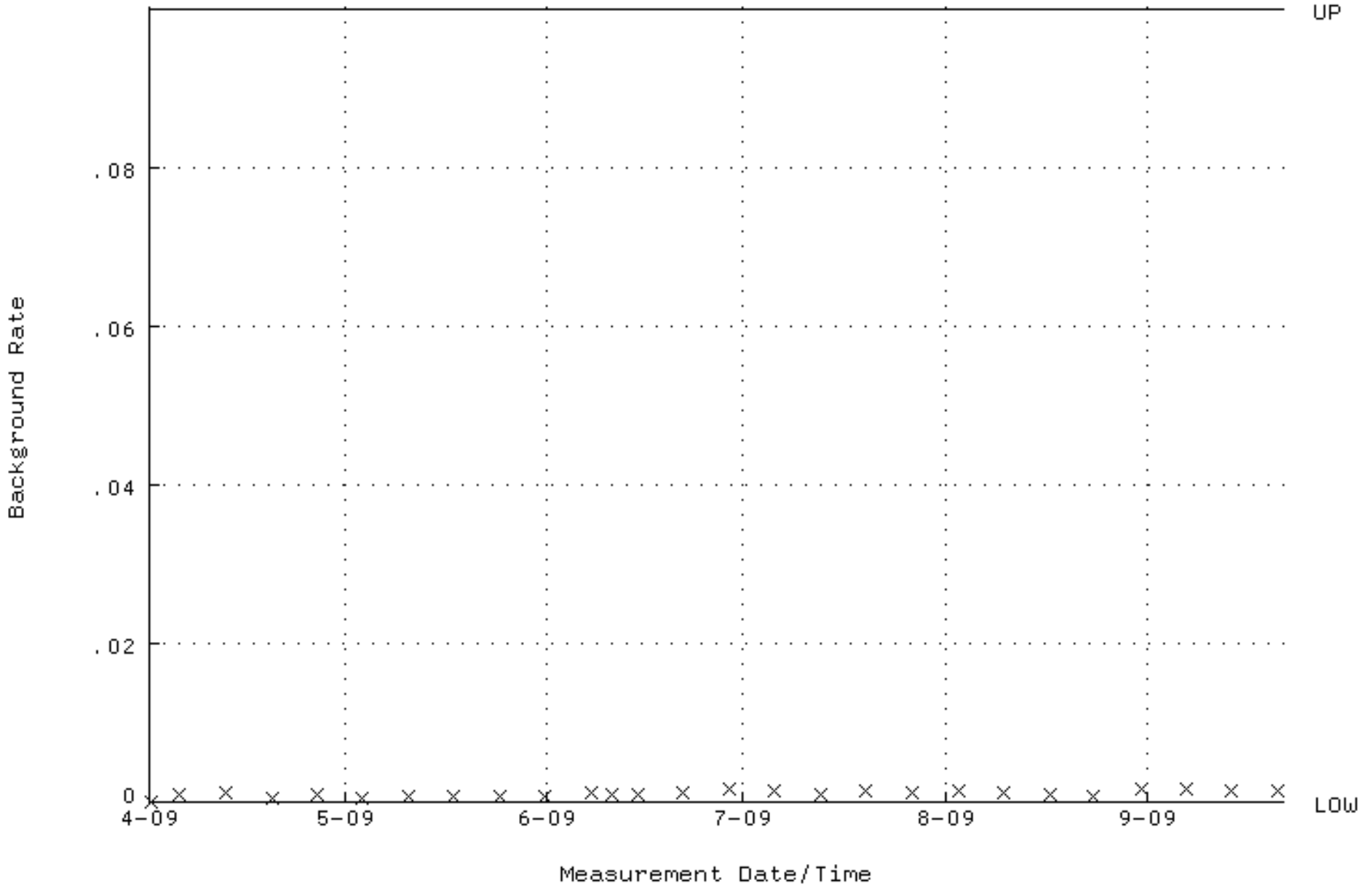
QA filename : DKA100:[ENV_ALPHA.QA.W]W203.QAF;1
Parameter Name : AVRGEFF (Average Efficiency)
Start/End Dates : 31-MAR-2009 15:10:29 through 21-SEP-2009 12:00:00
Lower/Upper Lmts: 0.252203 through 0.272203



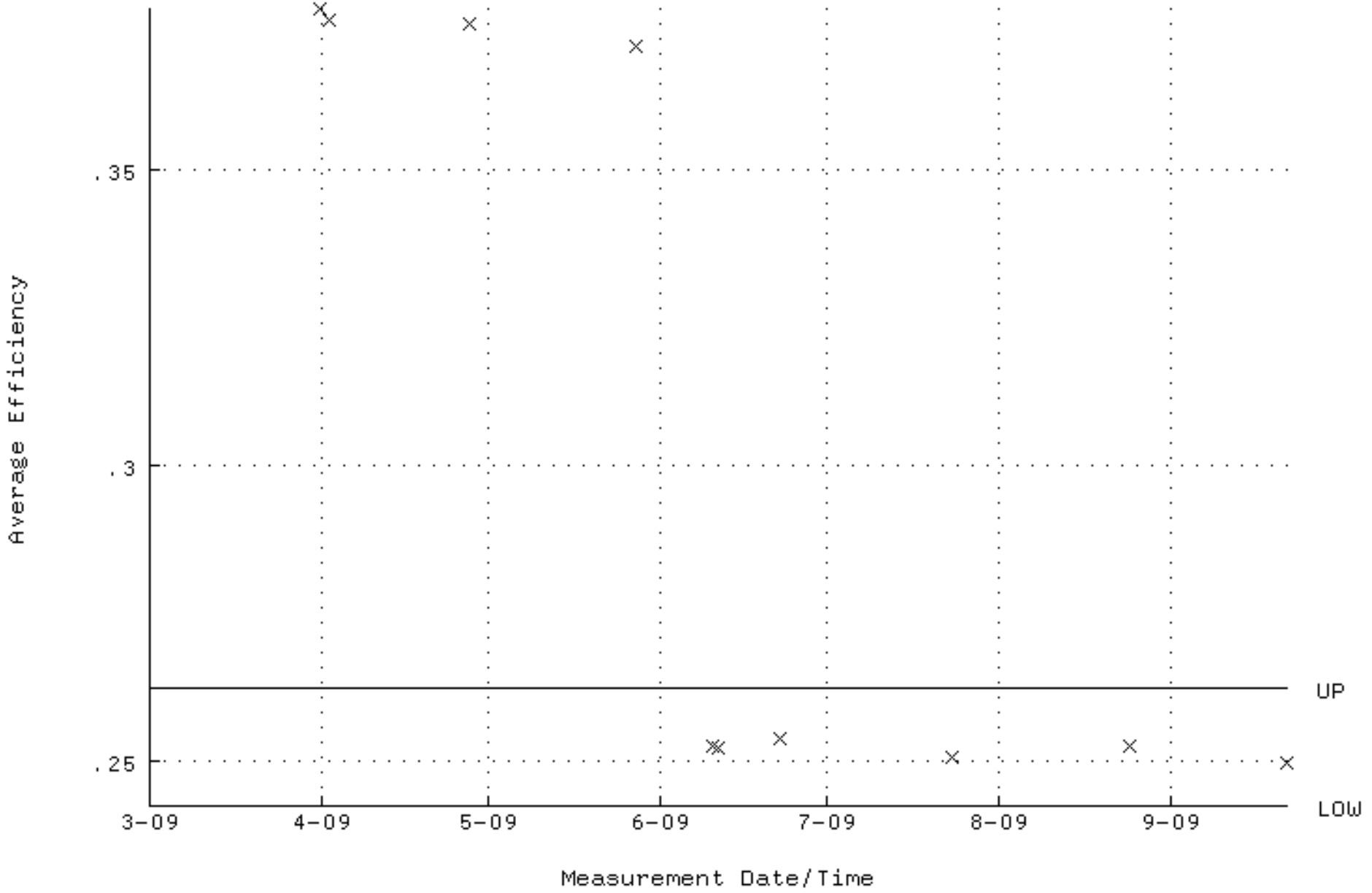
QA filename : DKA100:[ENV_ALPHA.QA.W]W203.QAF;1
Parameter Name : NLACTVTY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 31-MAR-2009 15:10:29 through 21-SEP-2009 12:00:00
Lower/Upper Lmts: 83.7993 through 92.6203



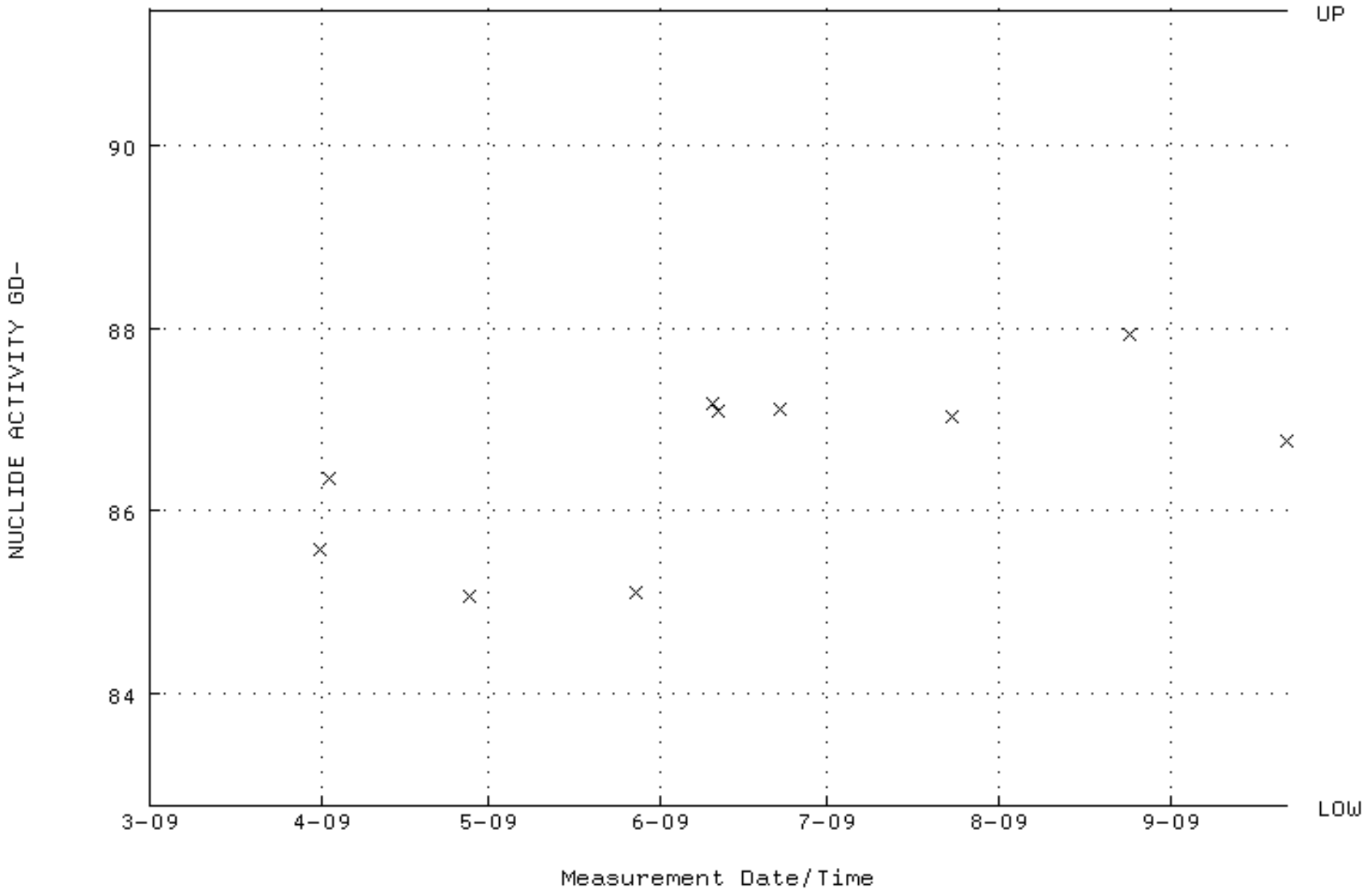
QA filename : DKA100:[ENV_ALPHA.QA.B]B203.QAF;1
Parameter Name : BACKRATE (Background Rate)
Start/End Dates : 1-APR-2009 08:02:49 through 21-SEP-2009 12:00:00
Lower/Upper Lmts: 0.000000E+00 through 0.100000



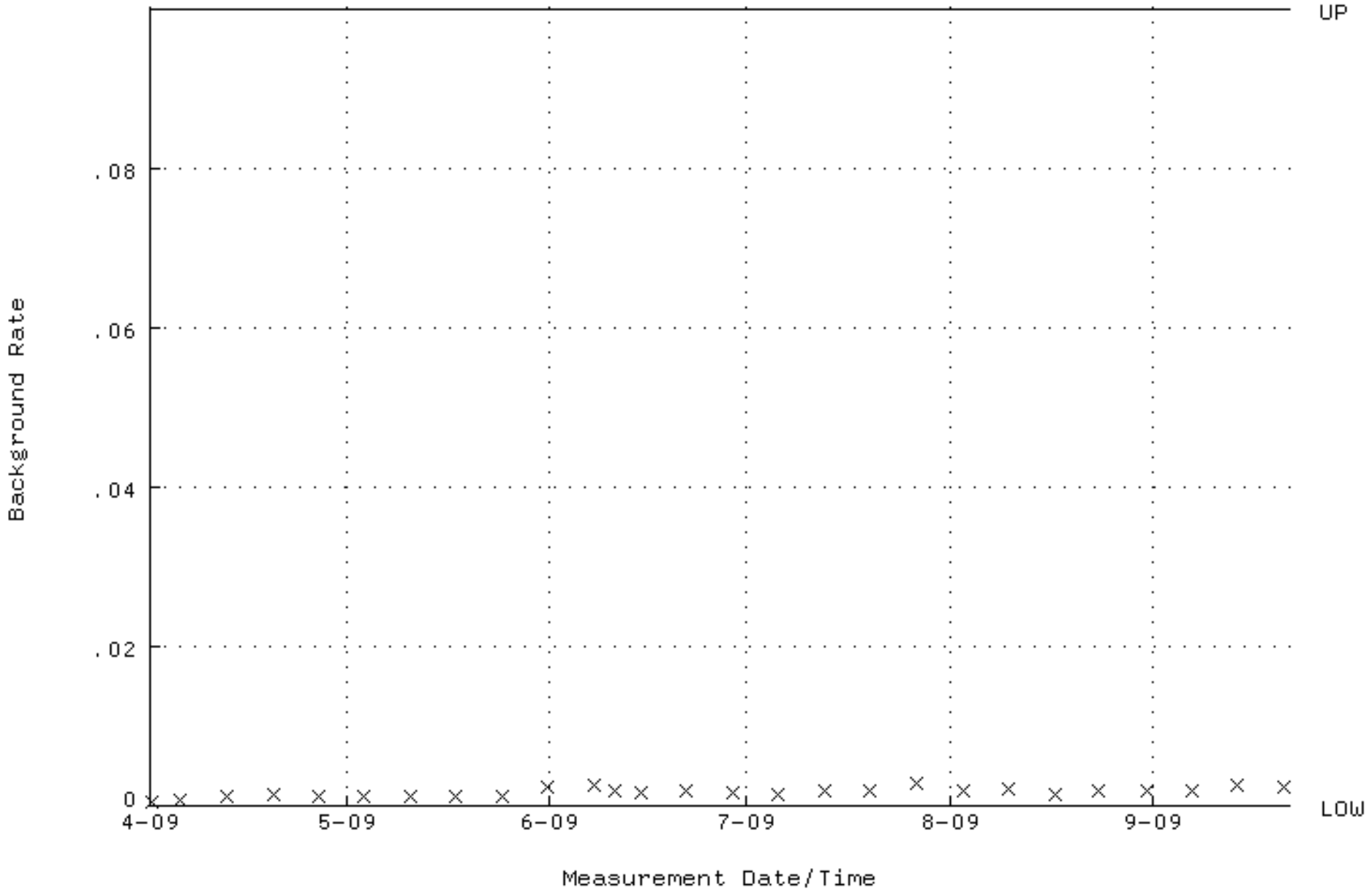
QA filename : DKA100:[ENV_ALPHA.QA.W]W204.QAF;1
Parameter Name : AVRGEFF (Average Efficiency)
Start/End Dates : 31-MAR-2009 15:10:31 through 21-SEP-2009 12:00:00
Lower/Upper Lmts: 0.242368 through 0.262368



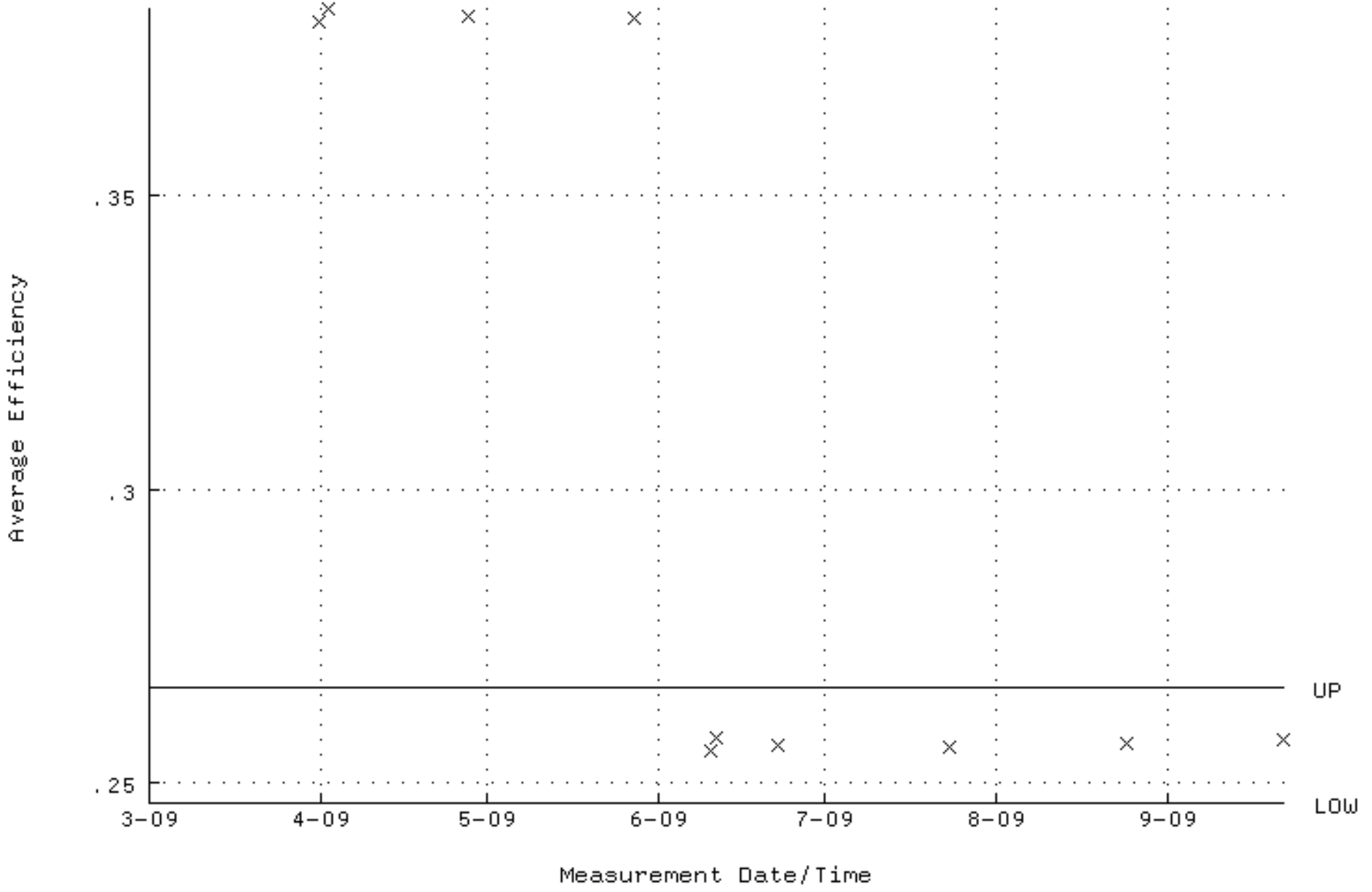
QA filename : DKA100:[ENV_ALPHA.QA.W]W204.QAF;1
Parameter Name : NLACTVTY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 31-MAR-2009 15:10:31 through 21-SEP-2009 12:00:00
Lower/Upper Lmts: 82.7661 through 91.4783



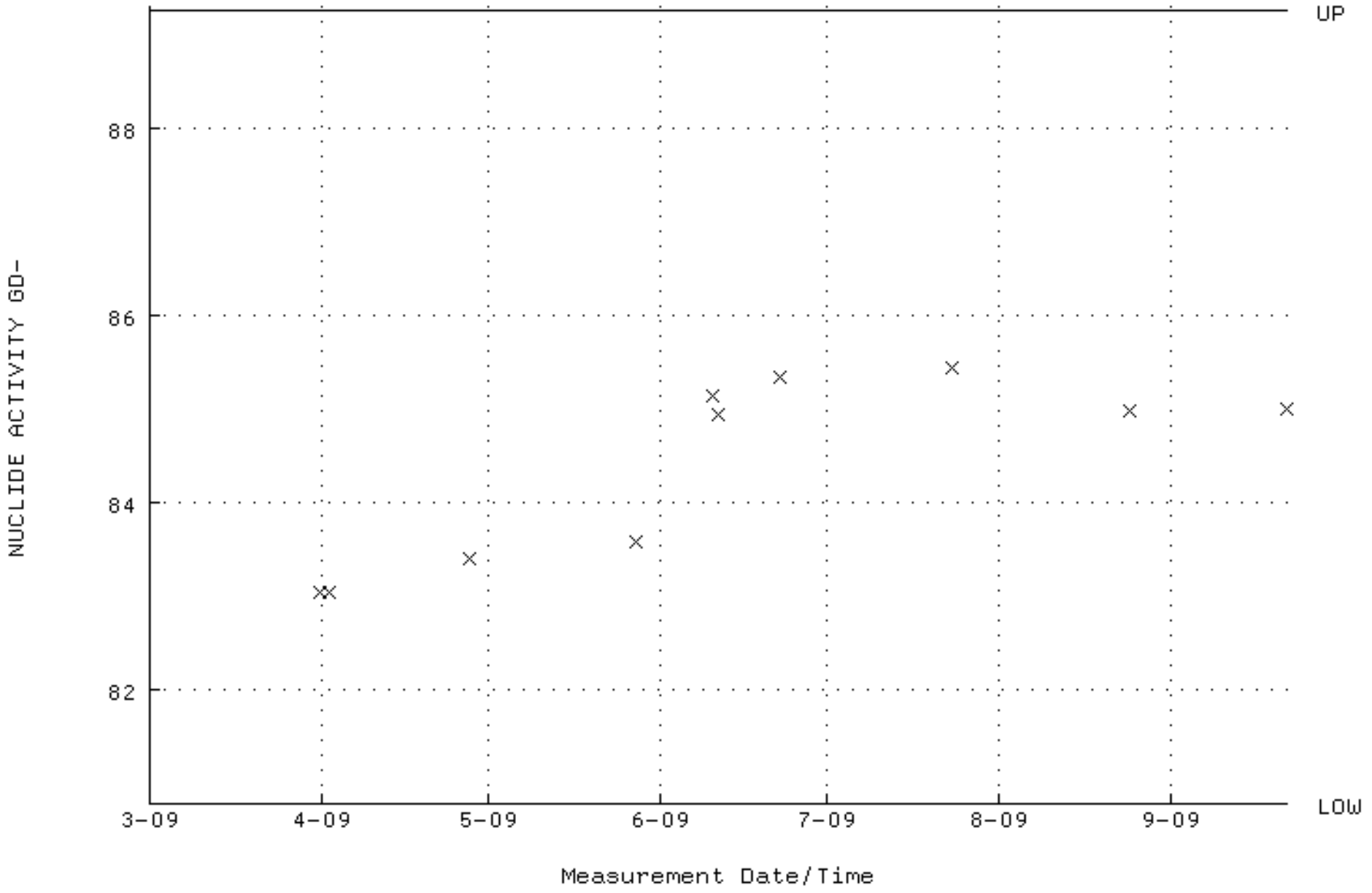
QA filename : DKA100:[ENV_ALPHA.QA.B]B204.QAF;1
Parameter Name : BACKRATE (Background Rate)
Start/End Dates : 1-APR-2009 08:02:55 through 21-SEP-2009 12:00:00
Lower/Upper Lmts: 0.000000E+00 through 0.100000



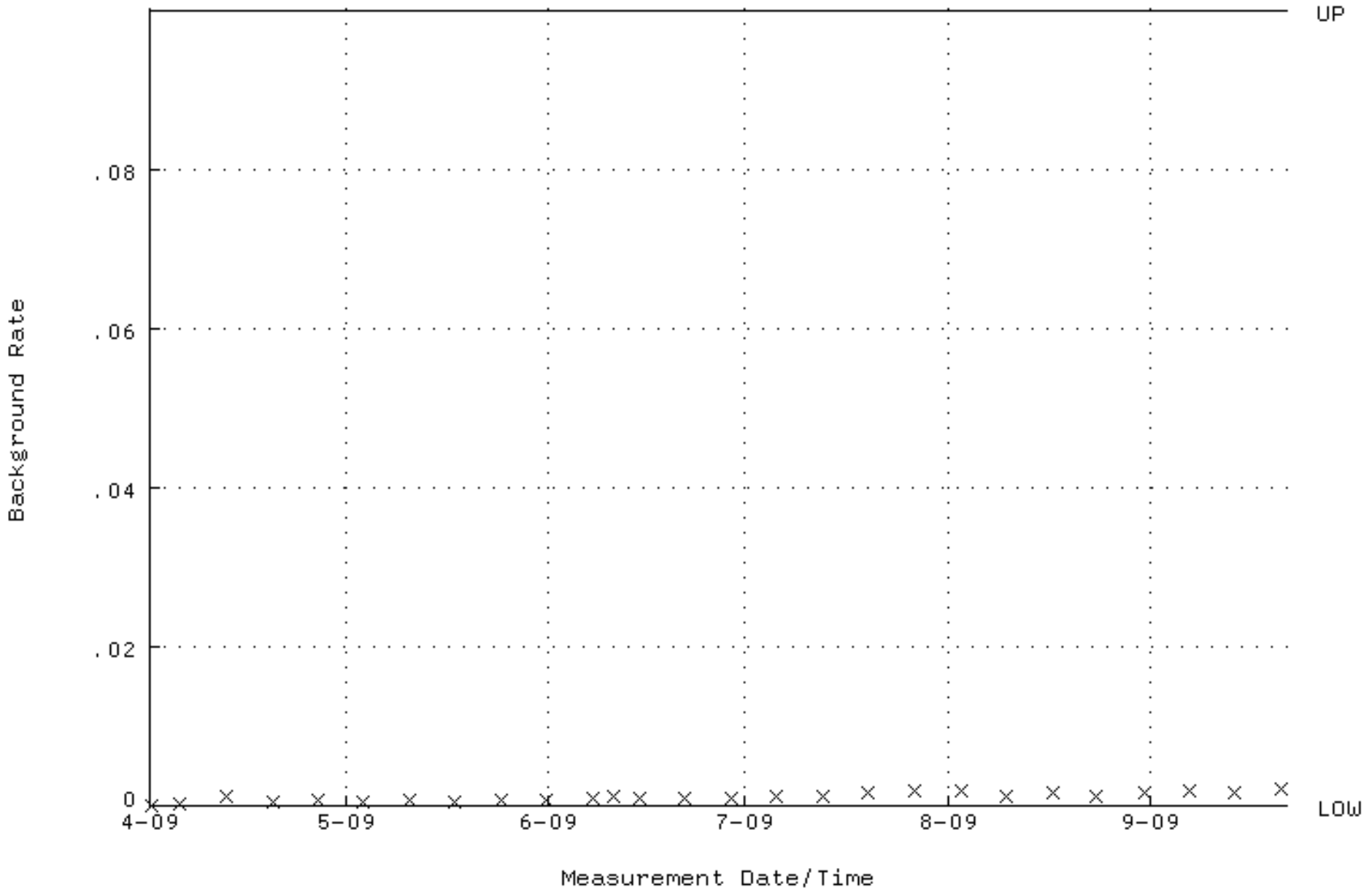
QA filename : DKA100:[ENV_ALPHA.QA.W]W207.QAF;1
Parameter Name : AVRGEFF (Average Efficiency)
Start/End Dates : 31-MAR-2009 15:10:38 through 21-SEP-2009 12:00:00
Lower/Upper Lmts: 0.246432 through 0.266432



QA filename : DKA100:[ENV_ALPHA.QA.W]W207.QAF;1
Parameter Name : NLACTVTY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 31-MAR-2009 15:10:38 through 21-SEP-2009 12:00:00
Lower/Upper Lmts: 80.7759 through 89.2787



QA filename : DKA100:[ENV_ALPHA.QA.B]B207.QAF;1
Parameter Name : BACKRATE (Background Rate)
Start/End Dates : 1-APR-2009 08:03:11 through 21-SEP-2009 12:00:00
Lower/Upper Lmts: 0.000000E+00 through 0.100000



RUNLOGS

Instrument Run Log

Instrument Type: GFPC **Batch ID: 900849**

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
1201919341	LCS	JXC5	PIC14B	21-SEP-09 15:56	DONE	CeF on 25mm Filter	02-JUL-09 00:00
236077020	SAMPLE	JXC5	PIC12B	21-SEP-09 15:56	DUSE	CeF on 25mm Filter	02-JUL-09 00:00
1201919338	MB	JXC5	PIC12C	21-SEP-09 15:56	DONE	CeF on 25mm Filter	02-JUL-09 00:00
1201919339	DUP	JXC5	PIC12D	21-SEP-09 15:56	DUSE	CeF on 25mm Filter	02-JUL-09 00:00
236077018	SAMPLE	JXC5	PIC11D	21-SEP-09 15:56	DONE	CeF on 25mm Filter	02-JUL-09 00:00
1201919340	MS	JXC5	PIC13C	21-SEP-09 15:57	DONE	CeF on 25mm Filter	02-JUL-09 00:00
236077001	SAMPLE	JXC5	PIC3D	21-SEP-09 16:02	DUSE	CeF on 25mm Filter	02-JUL-09 00:00
236077002	SAMPLE	JXC5	PIC4A	21-SEP-09 16:02	DONE	CeF on 25mm Filter	02-JUL-09 00:00
236077012	SAMPLE	JXC5	PIC9A	21-SEP-09 16:04	DUSE	CeF on 25mm Filter	02-JUL-09 00:00
236077014	SAMPLE	JXC5	PIC9B	21-SEP-09 16:04	DUSE	CeF on 25mm Filter	02-JUL-09 00:00
236077009	SAMPLE	JXC5	PIC8A	21-SEP-09 16:04	DUSE	CeF on 25mm Filter	02-JUL-09 00:00
236077010	SAMPLE	JXC5	PIC8B	21-SEP-09 16:04	DUSE	CeF on 25mm Filter	02-JUL-09 00:00
236077011	SAMPLE	JXC5	PIC8C	21-SEP-09 16:04	DUSE	CeF on 25mm Filter	02-JUL-09 00:00
236077015	SAMPLE	JXC5	PIC10A	21-SEP-09 16:04	DONE	CeF on 25mm Filter	02-JUL-09 00:00
236077016	SAMPLE	JXC5	PIC10C	21-SEP-09 16:04	DONE	CeF on 25mm Filter	02-JUL-09 00:00
236077017	SAMPLE	JXC5	PIC10D	21-SEP-09 16:04	DONE	CeF on 25mm Filter	02-JUL-09 00:00
236077006	SAMPLE	JXC5	PIC6A	21-SEP-09 16:04	DONE	CeF on 25mm Filter	02-JUL-09 00:00
236077007	SAMPLE	JXC5	PIC6B	21-SEP-09 16:04	DUSE	CeF on 25mm Filter	02-JUL-09 00:00
236077008	SAMPLE	JXC5	PIC6D	21-SEP-09 16:04	DONE	CeF on 25mm Filter	02-JUL-09 00:00
236077003	SAMPLE	JXC5	PIC5B	21-SEP-09 16:04	DONE	CeF on 25mm Filter	02-JUL-09 00:00
236077004	SAMPLE	JXC5	PIC5C	21-SEP-09 16:04	DONE	CeF on 25mm Filter	02-JUL-09 00:00
236077005	SAMPLE	JXC5	PIC5D	21-SEP-09 16:04	DUSE	CeF on 25mm Filter	02-JUL-09 00:00
1201919339	DUP	JXC5	PIC10D	21-SEP-09 17:34	DONE	CeF on 25mm Filter	02-JUL-09 00:00
236077001	SAMPLE	JXC5	PIC3D	21-SEP-09 17:34	DONE	CeF on 25mm Filter	02-JUL-09 00:00
236077005	SAMPLE	JXC5	PIC5D	21-SEP-09 17:34	DONE	CeF on 25mm Filter	02-JUL-09 00:00
236077007	SAMPLE	JXC5	PIC6B	21-SEP-09 17:34	DONE	CeF on 25mm Filter	02-JUL-09 00:00
236077009	SAMPLE	JXC5	PIC8A	21-SEP-09 17:34	DONE	CeF on 25mm Filter	02-JUL-09 00:00
236077010	SAMPLE	JXC5	PIC8B	21-SEP-09 17:34	DONE	CeF on 25mm Filter	02-JUL-09 00:00
236077011	SAMPLE	JXC5	PIC8C	21-SEP-09 17:35	DONE	CeF on 25mm Filter	02-JUL-09 00:00
236077012	SAMPLE	JXC5	PIC9A	21-SEP-09 17:35	DONE	CeF on 25mm Filter	02-JUL-09 00:00
236077014	SAMPLE	JXC5	PIC9B	21-SEP-09 17:35	DONE	CeF on 25mm Filter	02-JUL-09 00:00
236077020	SAMPLE	JXC5	PIC10C	21-SEP-09 17:35	DONE	CeF on 25mm Filter	02-JUL-09 00:00

Instrument Run Log

Instrument Type: ALPHA SPECTROMETER **Batch ID: 901446**

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
235860015	SAMPLE	CXM2	1039	16-SEP-09 17:56	DONE		
236077013	SAMPLE	CXM2	1040	16-SEP-09 17:56	DONE		
236077019	SAMPLE	CXM2	1041	16-SEP-09 17:56	DONE		
236077021	SAMPLE	CXM2	1042	16-SEP-09 17:56	DONE		
236238008	SAMPLE	CXM2	1043	16-SEP-09 17:56	DONE		
236534011	SAMPLE	CXM2	1044	16-SEP-09 17:56	DUSE		
1201920746	MB	CXM2	1045	16-SEP-09 17:56	DONE		
1201920747	LCS	CXM2	1046	16-SEP-09 17:56	DONE		
1201920748	LCSD	CXM2	1047	16-SEP-09 17:56	DONE		
236534011	SAMPLE	CXM2	1193	18-SEP-09 19:36	DONE		

Instrument Run Log

Instrument Type: ALPHA SPECTROMETER **Batch ID: 901448**

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
236077013	SAMPLE	CXM2	1125	17-SEP-09 19:57	DONE		
236077019	SAMPLE	CXM2	1154	17-SEP-09 19:57	DONE		
236077021	SAMPLE	CXM2	1161	17-SEP-09 19:57	DONE		
236238008	SAMPLE	CXM2	1162	17-SEP-09 19:57	DONE		
236534011	SAMPLE	CXM2	1166	17-SEP-09 19:57	DONE		
1201920750	LCS	CXM2	1013	17-SEP-09 20:03	DONE		
235860015	SAMPLE	CXM2	1014	17-SEP-09 20:03	DONE		
1201920751	LCSD	CXM2	1016	17-SEP-09 20:03	DONE		
1201920749	MB	CXM2	1177	18-SEP-09 08:01	DUSE		
1201920749	MB	CXM2	1121	18-SEP-09 19:36	DONE		

Instrument Run Log

Instrument Type: GFPC **Batch ID: 902602**

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
236077013	SAMPLE	MXS2	PIC5A	18-SEP-09 18:46	DONE	CeF on 25mm Filter	02-JUL-09 00:00
236077019	SAMPLE	MXS2	PIC5C	18-SEP-09 18:46	DONE	CeF on 25mm Filter	02-JUL-09 00:00
236077021	SAMPLE	MXS2	PIC5D	18-SEP-09 18:46	DONE	CeF on 25mm Filter	02-JUL-09 00:00
236238008	SAMPLE	MXS2	PIC6A	18-SEP-09 18:46	DONE	CeF on 25mm Filter	02-JUL-09 00:00
236534011	SAMPLE	MXS2	PIC6B	18-SEP-09 18:46	DONE	CeF on 25mm Filter	02-JUL-09 00:00
236699016	SAMPLE	MXS2	PIC7A	18-SEP-09 18:46	DONE	CeF on 25mm Filter	02-JUL-09 00:00
236817014	SAMPLE	MXS2	PIC7B	18-SEP-09 18:46	DONE	CeF on 25mm Filter	02-JUL-09 00:00
236934020	SAMPLE	MXS2	PIC7C	18-SEP-09 18:46	DONE	CeF on 25mm Filter	02-JUL-09 00:00
1201923559	MB	MXS2	PIC7D	18-SEP-09 18:46	DONE	CeF on 25mm Filter	02-JUL-09 00:00
1201923560	LCS	MXS2	PIC8A	18-SEP-09 18:46	DONE	CeF on 25mm Filter	02-JUL-09 00:00
1201923561	LCSD	MXS2	PIC8B	18-SEP-09 18:46	DONE	CeF on 25mm Filter	02-JUL-09 00:00

Instrument Run Log

Instrument Type: ALPHA SPECTROMETER **Batch ID: 903844**

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
236077001	SAMPLE	MXE1	1028	24-SEP-09 13:58	DUSE		
236077002	SAMPLE	MXE1	1029	24-SEP-09 13:58	DUSE		
236077003	SAMPLE	MXE1	1030	24-SEP-09 13:58	DUSE		
236077004	SAMPLE	MXE1	1179	25-SEP-09 12:31	DUSE		
236077005	SAMPLE	MXE1	1180	25-SEP-09 12:31	DUSE		
236077006	SAMPLE	MXE1	1181	25-SEP-09 12:31	DUSE		
236077007	SAMPLE	MXE1	1182	25-SEP-09 12:31	DUSE		
236077008	SAMPLE	MXE1	1186	25-SEP-09 12:31	DUSE		
236077009	SAMPLE	MXE1	1191	25-SEP-09 12:31	DUSE		
236077010	SAMPLE	MXE1	1192	25-SEP-09 12:31	DUSE		
236077011	SAMPLE	MXE1	1199	25-SEP-09 12:31	DUSE		
236077012	SAMPLE	MXE1	1200	25-SEP-09 12:31	DUSE		
236077014	SAMPLE	MXE1	1201	25-SEP-09 12:31	DUSE		
236077015	SAMPLE	MXE1	1202	25-SEP-09 12:31	DUSE		
236077016	SAMPLE	MXE1	1203	25-SEP-09 12:31	DUSE		
1201926676	DUP	MXE1	1204	25-SEP-09 12:31	DUSE		
236077017	SAMPLE	MXE1	1205	25-SEP-09 12:31	DUSE		
236077018	SAMPLE	MXE1	1206	25-SEP-09 12:31	DUSE		
1201926677	MS	MXE1	1207	25-SEP-09 12:31	DUSE		
236077020	SAMPLE	MXE1	1208	25-SEP-09 12:31	DUSE		
1201926675	MB	MXE1	1045	25-SEP-09 12:33	DUSE		
1201926678	LCS	MXE1	1047	25-SEP-09 12:33	DUSE		
236077015	SAMPLE	MXE1	1199	28-SEP-09 14:34	DONE		
236077016	SAMPLE	MXE1	1200	28-SEP-09 14:34	DONE		
236077020	SAMPLE	MXE1	1203	28-SEP-09 14:34	DONE		
1201926676	DUP	MXE1	1204	28-SEP-09 14:34	DONE		
236077001	SAMPLE	MXE1	1025	28-SEP-09 14:34	DONE		
236077002	SAMPLE	MXE1	1026	28-SEP-09 14:34	DONE		
236077003	SAMPLE	MXE1	1027	28-SEP-09 14:34	DONE		
236077004	SAMPLE	MXE1	1028	28-SEP-09 14:34	DONE		
236077005	SAMPLE	MXE1	1029	28-SEP-09 14:34	DONE		
236077006	SAMPLE	MXE1	1030	28-SEP-09 14:34	DONE		
1201926677	MS	MXE1	1207	28-SEP-09 14:34	DONE		
236077007	SAMPLE	MXE1	1037	28-SEP-09 14:34	DONE		
236077008	SAMPLE	MXE1	1038	28-SEP-09 14:34	DONE		
236077009	SAMPLE	MXE1	1039	28-SEP-09 14:34	DONE		
236077010	SAMPLE	MXE1	1040	28-SEP-09 14:34	DONE		
236077011	SAMPLE	MXE1	1041	28-SEP-09 14:34	DONE		
236077012	SAMPLE	MXE1	1042	28-SEP-09 14:34	DONE		
236077014	SAMPLE	MXE1	1173	29-SEP-09 19:36	DONE		
236077017	SAMPLE	MXE1	1174	29-SEP-09 19:36	DONE		
236077018	SAMPLE	MXE1	1175	29-SEP-09 19:36	DONE		
1201926675	MB	MXE1	1176	29-SEP-09 19:36	DONE		
1201926678	LCS	MXE1	1177	29-SEP-09 19:36	DONE		

Instrument Run Log

Instrument Type: ALPHA SPECTROMETER **Batch ID: 903847**

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
236077012	SAMPLE	MXE1	1113	24-SEP-09 15:15	DUSE		
236077020	SAMPLE	MXE1	1114	24-SEP-09 15:15	DONE		
1201926679	MB	MXE1	1116	24-SEP-09 15:15	DONE		
1201926680	DUP	MXE1	1117	24-SEP-09 15:15	DONE		
1201926681	MS	MXE1	1118	24-SEP-09 15:16	DONE		
1201926682	LCS	MXE1	1121	24-SEP-09 15:16	DONE		
236077014	SAMPLE	MXE1	1122	24-SEP-09 15:16	DUSE		
236077015	SAMPLE	MXE1	1123	24-SEP-09 15:16	DUSE		
236077016	SAMPLE	MXE1	1124	24-SEP-09 15:16	DUSE		
236077017	SAMPLE	MXE1	1125	24-SEP-09 15:16	DUSE		
236077018	SAMPLE	MXE1	1126	24-SEP-09 15:16	DONE		
236077001	SAMPLE	MXE1	1008	24-SEP-09 15:20	DUSE		
236077002	SAMPLE	MXE1	1009	24-SEP-09 15:20	DUSE		
236077003	SAMPLE	MXE1	1010	24-SEP-09 15:20	DUSE		
236077004	SAMPLE	MXE1	1011	24-SEP-09 15:20	DUSE		
236077005	SAMPLE	MXE1	1012	24-SEP-09 15:20	DONE		
236077006	SAMPLE	MXE1	1019	24-SEP-09 15:20	DUSE		
236077007	SAMPLE	MXE1	1020	24-SEP-09 15:20	DUSE		
236077008	SAMPLE	MXE1	1021	24-SEP-09 15:20	DONE		
236077009	SAMPLE	MXE1	1022	24-SEP-09 15:20	DUSE		
236077010	SAMPLE	MXE1	1023	24-SEP-09 15:20	DUSE		
236077011	SAMPLE	MXE1	1024	24-SEP-09 15:20	DUSE		
236077001	SAMPLE	MXE1	1113	29-SEP-09 19:39	DONE		
236077002	SAMPLE	MXE1	1114	29-SEP-09 19:39	DONE		
236077003	SAMPLE	MXE1	1116	29-SEP-09 19:39	DONE		
236077004	SAMPLE	MXE1	1117	29-SEP-09 19:39	DONE		
236077006	SAMPLE	MXE1	1118	29-SEP-09 19:39	DONE		
236077007	SAMPLE	MXE1	1121	29-SEP-09 19:39	DONE		
236077009	SAMPLE	MXE1	1122	29-SEP-09 19:39	DONE		
236077010	SAMPLE	MXE1	1123	29-SEP-09 19:39	DONE		
236077011	SAMPLE	MXE1	1124	29-SEP-09 19:39	DONE		
236077012	SAMPLE	MXE1	1125	29-SEP-09 19:39	DONE		
236077014	SAMPLE	MXE1	1126	29-SEP-09 19:39	DONE		
236077015	SAMPLE	MXE1	1127	29-SEP-09 19:39	DONE		
236077016	SAMPLE	MXE1	1128	29-SEP-09 19:39	DONE		
236077017	SAMPLE	MXE1	1129	29-SEP-09 19:39	DONE		

Instrument Run Log

Instrument Type: LUCAS CELL DETECTOR **Batch ID: 904060**

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
236077001	SAMPLE	KSD1	LUCAS1	25-SEP-09 16:40	DONE	Lucas Cell	31-AUG-09 00:00
236077002	SAMPLE	KSD1	LUCAS2	25-SEP-09 16:40	DONE	Lucas Cell	19-DEC-08 00:00
236077003	SAMPLE	KSD1	LUCAS3	25-SEP-09 16:40	DONE	Lucas Cell	04-FEB-09 00:00
236077004	SAMPLE	KSD1	LUCAS4	25-SEP-09 16:40	DONE	Lucas Cell	02-MAR-09 00:00
236077005	SAMPLE	KSD1	LUCAS5	25-SEP-09 16:40	DONE	Lucas Cell	25-MAR-09 00:00
236077006	SAMPLE	KSD1	LUCAS6	25-SEP-09 16:40	DONE	Lucas Cell	04-AUG-09 00:00
236077007	SAMPLE	KSD1	LUCAS1	25-SEP-09 17:15	DONE	Lucas Cell	31-AUG-09 00:00
236077008	SAMPLE	KSD1	LUCAS2	25-SEP-09 17:15	DONE	Lucas Cell	19-DEC-08 00:00
236077009	SAMPLE	KSD1	LUCAS3	25-SEP-09 17:15	DONE	Lucas Cell	04-FEB-09 00:00
236077010	SAMPLE	KSD1	LUCAS4	25-SEP-09 17:15	DONE	Lucas Cell	02-MAR-09 00:00
236077011	SAMPLE	KSD1	LUCAS5	25-SEP-09 17:15	DONE	Lucas Cell	25-MAR-09 00:00
236077012	SAMPLE	KSD1	LUCAS6	25-SEP-09 17:15	DONE	Lucas Cell	04-AUG-09 00:00
236077014	SAMPLE	KSD1	LUCAS1	25-SEP-09 17:50	DONE	Lucas Cell	31-AUG-09 00:00
236077015	SAMPLE	KSD1	LUCAS2	25-SEP-09 17:50	DONE	Lucas Cell	19-DEC-08 00:00
236077016	SAMPLE	KSD1	LUCAS3	25-SEP-09 17:50	DONE	Lucas Cell	04-FEB-09 00:00
236077017	SAMPLE	KSD1	LUCAS4	25-SEP-09 17:50	DONE	Lucas Cell	02-MAR-09 00:00
236077018	SAMPLE	KSD1	LUCAS5	25-SEP-09 17:50	DONE	Lucas Cell	25-MAR-09 00:00
236077020	SAMPLE	KSD1	LUCAS6	25-SEP-09 17:50	DONE	Lucas Cell	04-AUG-09 00:00
1201927088	MB	KSD1	LUCAS1	25-SEP-09 18:25	DONE	Lucas Cell	31-AUG-09 00:00
1201927089	DUP	KSD1	LUCAS2	25-SEP-09 18:25	DONE	Lucas Cell	19-DEC-08 00:00
1201927090	MS	KSD1	LUCAS3	25-SEP-09 18:25	DONE	Lucas Cell	04-FEB-09 00:00
1201927091	LCS	KSD1	LUCAS4	25-SEP-09 18:25	DONE	Lucas Cell	02-MAR-09 00:00

Instrument Run Log

Instrument Type: LUCAS CELL DETECTOR **Batch ID: 904649**

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
236077013	SAMPLE	KSD1	LUCAS5	25-SEP-09 09:30	DONE	Lucas Cell	25-MAR-09 00:00
236077019	SAMPLE	KSD1	LUCAS6	25-SEP-09 09:30	DONE	Lucas Cell	04-AUG-09 00:00
236077021	SAMPLE	KSD1	LUCAS1	25-SEP-09 10:05	DONE	Lucas Cell	31-AUG-09 00:00
236817014	SAMPLE	KSD1	LUCAS3	25-SEP-09 10:05	DONE	Lucas Cell	04-FEB-09 00:00
237010013	SAMPLE	KSD1	LUCAS5	25-SEP-09 10:05	DONE	Lucas Cell	25-MAR-09 00:00
237170005	SAMPLE	KSD1	LUCAS6	25-SEP-09 10:05	DONE	Lucas Cell	04-AUG-09 00:00
236699016	SAMPLE	KSD1	LUCAS2	25-SEP-09 10:30	DONE	Lucas Cell	19-DEC-08 00:00
237170020	SAMPLE	KSD1	LUCAS1	25-SEP-09 10:40	DONE	Lucas Cell	31-AUG-09 00:00
1201928562	MB	KSD1	LUCAS3	25-SEP-09 10:40	DONE	Lucas Cell	04-FEB-09 00:00
1201928563	LCS	KSD1	LUCAS4	25-SEP-09 10:40	DONE	Lucas Cell	02-MAR-09 00:00
1201928564	LCSD	KSD1	LUCAS5	25-SEP-09 10:40	DONE	Lucas Cell	25-MAR-09 00:00
237343006	SAMPLE	KSD1	LUCAS2	25-SEP-09 11:10	DONE	Lucas Cell	19-DEC-08 00:00
236938020	SAMPLE	KSD1	LUCAS4	25-SEP-09 12:40	DONE	Lucas Cell	02-MAR-09 00:00