PROJECT RULISON SAMPLING
BATTLEMENT MESA 36-13B TIER I WELL
ANNUAL PRODUCTION SAMPLING REPORT

NW ¼ SW ¼ SECTION 36, T7S, R95W
GARFIELD COUNTY, COLORADO

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1.0 Introduction

Caerus Oil & Gas, LLC (Caerus) acquired natural gas wells from Noble Energy (Noble) in the fall of 2014. Some of these wells are located in the vicinity of Project Rulison. Project Rulison was a subsurface nuclear test designed to stimulate production of natural gas from wells completed in tight gas sands of the Cretaceous age Williams Fork Formation. The acquisition of these natural gas wells by Caerus from Noble resulted in a delay of the December 2014. The COGCC approved the delay and the sampling was conducted in April 2015.

The Battlement Mesa 36-13B natural gas well discussed in this report is located within a one-mile radius of the Project Rulison underground nuclear test site. Project Rulison was conducted in September 1969 by the Atomic Energy Commission, a predecessor agency to the Department of Energy (DOE), and Austral Oil, a private oil and gas company in order to stimulate natural gas production from tight gas sands which was not economically viable using conventional exploration and production technology available at the time.

The Colorado Oil and Gas Conservation Commission (COGCC) is the state agency responsible for regulating oil and natural gas exploration and production activities in Colorado. The COGCC has attached conditions of approval that include sampling and monitoring to be performed during drilling and production to the permitting of natural gas well locations that are located within the three mile radius of Project Rulison. The three-mile radius and one-mile radius surrounding Project Rulison, and designation of sectors are shown on Figure 1.

This report presents the April 28, 2015 production monitoring results for natural gas and produced water samples collected from the separator for the Caerus Battlement Mesa 36-13B Tier 1 Well. The Battlement Mesa 36-13B began production in November 2008 and is currently in its sixth and final year of production sampling conducted annually. The location of the Battlement Mesa 36-13B well is shown on Figure 2.

1.1 Project Background

URS (now URS/AECOM) was contracted by Noble Energy, EnCana Oil & Gas (USA), Inc. (EnCana), and Williams Production RMT (Williams), who conducted natural gas well drilling operations in the vicinity of Project Rulison from 2006 to 2010, to develop a Rulison Sampling Analysis Plan (RSAP). Revision 3, issued in July 2010, describes the sampling and monitoring procedures used during drilling and production of natural gas within three-miles of Project Rulison. URS previously prepared the reports and completed their own data validation when the wells were owned by Noble.

Caerus retained Olsson to sample the natural gas and produced water from the Battlement Mesa 36-13B well, compare the data with the RSAP Table 5 values, and verify and validate the data. Olsson retained Diane Short & Associates, Inc. (DS&A) to perform an independent third party data review.

1.2 Scope of Work

Caerus retained Olsson to collect a natural gas and produced water sample from the Battlement Mesa 36-13B Tier I well to comply with the requirements of the COGCC/RSAP for all natural gas wells within a three-mile radius of the former Project Rulison site. Olsson is also responsible for reporting the results of the sampling, to compare the results with Table 5 of the RSAP, and to arrange for a third party data verification and validation of the data. DS&A performed the data verification and validation on the Caerus well data.

1.3 Tier I Zone Monitoring Requirements

In general, the RSAP requires all companies drilling or producing natural gas wells within specified zones and sectors surrounding the former Rulison site to review certain drilling data (gamma ray logs) and to sample certain production media (natural gas and produced water) to document the presence or absence of potential impacts associated with Project Rulison.

This RSAP has been adopted by the COGCC and outlines the required sampling and analysis for all operators within a three-mile radius of Project Rulison. Tier I wells are defined as those gas wells located within the one-mile radius of Project Rulison; whereas Tier II wells are defined as those gas wells located between two and three miles from Project Rulison.

According to the July 2010 Revision 3 of the URS RSAP, the Tier II well monitoring includes:

- Drilling Monitoring;
- Production Monitoring; and
- Baseline produced water and natural gas monitoring.

Battlement Mesa 36-13B is a Tier I well located within the one-mile radius of Project Rulison and is currently in the production monitoring program. Since the Battlement Mesa 36-13B well is the closest designated Tier I well in Sector 7, south-southwest of Project Rulison, it was sampled quarterly during the first year after it was drilled and completed, semi-annually for the second and third years, and annually thereafter.

1.4 Field Work

Olsson personnel met with the Caerus pumper on April 28, 2015 who assisted with the collection of the natural gas and produced water samples from the Battlement Mesa 36-13B. The samples were collected in laboratory provided containers following the methods described in the RSAP, Revision 3. The site location for the Battlement Mesa 36-13B well is shown on Figure 2.

The produced water samples were collected in bottleware provided by Isotech Laboratories Inc. (Isotech) of Champaign, Illinois and GEL Laboratories, LLC (GEL) of Charleston, South Carolina in accordance with the procedures described in Section 5.9 on page 5-17 of the RSAP. The produced water samples were stored on ice and shipped back to the laboratories in plastic coolers for overnight delivery. The coolers were sealed and shipped to the laboratories under chain-of-custody protocols.

The natural gas sample was collected as described in Section 5.10 on page 5-18 of the RSAP and the sample was contained in an evacuated 20-pound (19 liter) steel gas canister provided by Isotech. The natural gas sample was shipped back to Isotech following shipping of dangerous goods protocols.

1.5 Data and Records Review

Olsson has reviewed the laboratory analytical results and compared the results to the RSAP Revision 3 Table 5. The laboratory analytical results from Isotech and GEL are presented in Section 2.0. A discussion of the records review and comparison with the RSAP is presented in Section 2.3.

2.0 Laboratory Analytical Results

The following sections present the analytical results of the Battlement Mesa 36-13B natural gas sample and the produced water sample aliquots. Copies of the laboratory reports are presented in Appendix A and Appendix B.

2.1 Gas Sample Results

The Isotech results reported on June 12, 2015 show that tritium and carbon-14 (^{14}C) were not detected in the Battlement Mesa 36-13B natural gas sample (Job #28847). The laboratory reported that Tritium was < 10.0 tritium units (TU) and that ^{14}C was < 0.2 percent modern carbon (pMC) in methane. The $\delta\ ^{13}C$ isotopic signature as a measure of the ratio of stable isotopes of ^{13}C : ^{12}C was reported as -38.02 ‰.

Carbon monoxide, ethylene, helium, hydrogen argon, oxygen and propylene were reportedly not detected with results listed as “nd” under Chemical mol.% results column. Nitrogen was reported at 0.054 mol. %, carbon dioxide at 4.08 mol.%, methane at 88.29 mol.%, ethane at 5.66 mol.%, propane at 1.17 mol.%, Iso-butane at 0.243 mol. %, N-butane at 0.191 mol.%, Iso-pentane at 0.0760 mol.%, N-pentane at 0.0519 mol.%, and Hexanes + at 0.183 mol.%. The total British thermal units (BTU) per cubic foot (cf) dry (BTU/cu.ft. dry) at 60° F and 14.763 pounds per square inch of area (psia) was calculated at 1,054 and the Specific gravity was calculated at 0.646.

2.2 Produced Water Sample Results

The Isotech results reported on May 19, 2015 for the produced water sample collected on 04/28/2015 (Job # 28838) show that tritium was not detected in the Battlement Mesa 36-13B produced water sample. The result was reported as < 10.0 TU.

The GEL Laboratory results were received on May 22, 2015 for the Battlement Mesa 36-13B produced water sample, laboratory sample ID 372020001. The following summarizes the GEL results.

Gross Alpha Activity

The laboratory reported that gross alpha activity was not detected as the result was qualified with a “U.” The result was reported as 72.9 ± 58.6 picocuries per liter (pCi/L) with a minimum detectable concentration (MDC) of 94.1 pCi/L, a total propagated uncertainty (TPU) of ±59.5 pCi/L and a reporting limit (RL) of 5.00 pCi/L.

Gross Beta Activity

The laboratory reported that gross beta activity was detected in the Battlement Mesa 36-13B produced water sample of 181 ±44.1 pCi/L with a MDC of 65.2 pCi/L, a TPU of ±53.4 pCi/L, and a RL of 5.00 pCi/L.

Strontium-90

Strontium-90 was reportedly not detected in the Battlement Mesa 36-13B produced water sample. The results were qualified with a “U” and reported at -0.238 ±0.951 pCi/L. The MDC was reported as 1.87 pCi/L, the TPU ±0.952 pCi/L, and the RL was 2.00 pCi/L.

Technetium-99

Technetium-99 was reportedly not detected in the Battlement Mesa 36-13B produced water sample. The results were qualified with a “U” and reported at 0.848 ±16.0 pCi/L, a MDC of 27.3 pCi/L, a TPU of ±16.0 pCi/L, and a RL of 50.0 pCi/L.

Gamma Spectroscopy

The laboratory reported that 42 of the 49 radionuclides analyzed for using gamma spectroscopy were not detected above the laboratory MDC in the Battlement Mesa 36-13B produced water sample. The laboratory reported Actinium-228 at 30.7 ±29.2 pCi/L (MDC 28.9 pCi/L), Lead-212 at 24.4 ±14.5 pCi/L (MDC 11.4 pCi/L), Lead-214 at 29.8 ±12.9 pCi/L (MDC 15.8 pCi/L), Potassium at 174 ± 75.7 pCi/L (MDC 69.3 pCi/L), and Radium-228 at 30.7 ±29.2 pCi/L (MDC 28.9 pCi/L). The laboratory qualified the results for Bismuth-214 and Thallium-208 as “UI” indicating ‘uncertain identification’ meaning that they were not reported due to low abundance.

2.3 Results Comparison

The Tier I Production Monitoring requirements are presented in Section 4.1.3 on page 4-16 RSAP Revision 3, July 2010, and apply to natural gas wells within a 1-mile radius of Project Rulison. The selected radionuclide analytes for various media are listed in the RSAP Table 3. Production monitoring requires sampling of produced water and natural gas to be analyzed for the radiological analytes listed in RSAP Table 3.

Data quality assurance objectives are presented in Section 6 (page 6-1) of the RSAP and the stated purpose is to “detect an unanticipated migration of verified Rulison-related radionuclides from the subsurface nuclear cavity to producing gas wells or the environment within a three mile radius of Project Rulison.” The RSAP specifies a subset of radionuclides to monitor which include gas phase radionuclides, tritium, carbon-14, and krypton-85, and less mobile liquid phase radionuclides strontium-90 and technetium-99. Originally the RSAP also included chlorine-36 as liquid phase radionuclides, but this radionuclide was later removed from the program due to interference from the sample matrix.

Olsson compared the analytical results with the Table 5 Radionuclide Screening and Action Levels presented on page 4-30 of the RSAP and a summary is presented below.

Natural Gas

The Battlement Mesa 36-13B natural gas sample was submitted to Isotech for laboratory analysis of tritium and carbon-14 in the methane gas phase. Isotech reported that tritium and carbon-14 were not detected. Isotech subcontracted the carbon-14 analysis to Beta Analytic in Miami, Florida. The sample was analyzed using accelerator mass spectrometry (AMS)

technology which reportedly gives the most advanced precision and accuracy for carbon-14 measurements. Isotopic composition of carbon is relative to Vienna Pee Dee Belemnite (VPDB).

Isotech ran the tritium analysis of methane by beta spectrometry. Isotech reported that tritium was < 10.0 TU, (not detected) in the Battlement Mesa 36-13B natural gas sample, while Table 5 of the RSAP states that units are to be pCi/L of methane gas. One tritium unit (TU) is approximately equivalent to 3.24 pCi/L, so therefore, the reporting limit for tritium is 32.4 pCi/L.

The RSAP Table 5 Screening Level for tritium in natural gas is 7.5 pCi/L and the Action Level is 75 pCi/L. The Action Level for tritium in natural gas is 75 percent of the air effluent concentration (1E-7 µCi/mL) and the Screening Level is set at 10 percent of the action level. The Isotech results show that carbon-14 was not detected (< 0.2 pMC). The current RSAP Table 5 Screening Level and Action Level for carbon-14 says to "See Note 7"; however, the Table 5 footnotes only go up to 6.

Although Note 7 was cutoff on Table 5 in the current revision of the RSAP, it is present in the March 2008 RSAP version which says, "The carbon-14 (^{14}C) screening level is determined as background (plus or minus) 2 standard deviations; the action level is determined as background (plus or minus) 3 standard deviations."

Produced Water

Tritium

Isotech reported that tritium was < 10.0 TU (not detected) in the Battlement Mesa 36-13B produced water sample. Isotech performed the tritium analysis in-house using the direct count method which has a detection limit that ranges from 10 TU to 15 TU (32.4 pCi/L to 48.6 pCi/L). The RSAP Table 5 Screening Level for tritium in produced water is 400 pCi/L and the Action Level is 15,000 pCi/L. Therefore, the results show that tritium was not detected in the sample and the detection limit of approximately 32.4 pCi/L was below the Screening Level of 400 pCi/L for the produced water sample.

Tritium is the most mobile and abundant radionuclide in the Project Rulison inventory and as an isotope of hydrogen is most likely to be identified in the water phase. According to the rationale described in Section 4.6.2 on page 4-27 of the RSAP if the analyte result is if the "Radionuclide is not detected," then no action is required.

Gross Alpha and Beta Activity

According to Table 5 footnote 5, Gross alpha and beta activity screening levels are determined as background + 2 standard deviations; gross alpha and beta action levels are determined as background + 3 standard deviations. Note that gross alpha activity excludes the alpha activities contributed by radon and uranium and the gross beta activity excludes the beta activity contributed by potassium-40. According to the RSAP the USGS natural background for gross alpha activity ranged from below detection (< 0.4 pCi/L) to 18 pCi/L (as natural uranium equivalent).

Gross Beta activity was reported in the Battlement Mesa 36-13B produced water sample with an activity of 181 ±44.1 pCi/L and a MDA (MDC) of 65.2 pCi/L. The gamma spectroscopy results for the produced water sample also reported the presence of potassium-40, as well as the presence of naturally occurring uranium and thorium daughter products. No action is required since gross alpha activity was not detected and the gross beta activity is within the range of natural background and potassium-40 and other naturally occurring radionuclides were reported in the gamma spectroscopy results. According to the RSAP natural background for gross beta activity ranged from below detection (< 0.4 pCi/L) to 15 pCi/L (as strontium-90 and yttrium-90 equivalent).

Strontium-90

The laboratory reported that strontium-90 was not detected in the Battlement Mesa 36-13B produced water sample. The results were qualified with a "U" indicating that the radionuclide was not detected and a result of -0.238 ±0.951 pCi/L. The MDC was reported as 1.87 pCi/L, the TPU ±0.952 pCi/L, and the RL was 2.00 pCi/L. The RSAP Table 5, lists a Screening Level of 3 pCi/L and an Action Level of 6 pCi/L for Strontium-90. The Screening Level is set at 10 percent of the Action Level. No action is required since strontium-90 was not detected.

Technetium-99

The laboratory reported that technetium-99 was not detected in the Battlement Mesa 36-13B produced water sample. The results were qualified with a "U" indicating that the radionuclide was not detected with a result of 0.848 ±16.0 pCi/L, and a MDC of 27.3 pCi/L, a TPU of ±16.0 pCi/L, and a RL of 50.0 pCi/L. The RSAP Table 5 Screening Level for technetium-99 is set at 63 pCi/L and the Action Level is set at 630 pCi/L. No action is required since technetium-99 was not detected.

Gamma Spectroscopy

The laboratory reported that 42 of the 49 radionuclides analyzed for using gamma spectroscopy were not detected above the laboratory MDC in the Battlement Mesa 36-13B produced water sample. The laboratory reported Actinium-228 at 30.7 ±29.2 pCi/L (MDC 28.9 pCi/L), Lead-212 at 24.4 ±14.5 pCi/L (MDC 11.4 pCi/L), Lead-214 at 29.8 ±12.9 pCi/L (MDC 15.8 pCi/L), Potassium at 174 ± 75.7 pCi/L (MDC 69.3 pCi/L), and Radium-228 at 30.7 ±29.2 pCi/L (MDC 28.9 pCi/L).

These are naturally occurring radionuclides that are part of the Uranium or Thorium decay chain and are not related to Project Rulison. The laboratory qualified the results for Bismuth-214 and Thallium-208 as "UI" indicating 'uncertain identification' meaning that they were not reported due to low abundance.

The RSAP Table 5 refers to Footnote 6 which says that Gamma-emitting radionuclide screening levels and action levels are not specified; the screening and action level is based on the specific gamma-emitting radionuclide detected (e.g. ^{137}Cs). Since the gamma-emitting radionuclides are naturally occurring and were reported at low levels above the minimum detectable concentrations (MDC) these results are indicative of natural background radiation.

2.4 Independent Data Verification and Validation

Olsson retained Diane Short & Associates, Inc. (DS&A) to perform an independent third party data review of the Battlement Mesa 36-13B natural gas and produced water sample results. DS&A verified and validated the Isotech and GEL data based on the information that was provided to Olsson. The DS&A reports are included in Appendix C.

DS&A prepared two reports. One for the radiochemistry data quality review of Isotech reports 28838 and 28847 gas flow proportional counting (GFPC) and Liquid Scintillation (LSC) for Tritium analysis and Carbon-14 analysis in methane gas by combustion followed by LSC analysis for the natural gas and produced water samples and also GEL laboratory report 372020 for the evaluation of gross alpha/beta, strontium-90, and technetium-99 analysis in the produced water sample. The second report discusses the laboratory report 372020 gamma spectroscopy of the produced water sample performed by GEL.

Gas Flow Proportional Counting and Liquid Scintillation

DS&A's overall assessment of the laboratory reports states that the data are considered fully useable for project purposes with consideration of the qualifications or comments in DS&A's report. DS&A performed such validation as could be performed for tritium and carbon-14.

Isotech Laboratories provided additional QA/QC information on the tritium analysis on August 10 and August 31, 2015, and the signed chain-of-custody between Isotech and Beta Analytic. Beta Analytic, a subcontracted laboratory, performed the carbon-14 analysis. The documentation provided by Isotech for tritium analysis is sufficient for most validation purposes.

Documents provided by Beta Analytic on September 4, 2015 included general QA information, including certification documents and acceptable results for reference standards dated May 11, 2015. Although count data, run dates, blank results, and other specific QC are not available from Beta Analytic, the documentation is as complete as it has been historically for the two laboratories.

The results reported that tritium and carbon-14 were not detected in the natural gas sample. Isotech also analyzed for tritium in an aliquot of the produced water sample and tritium was reportedly not detected.

The GEL data contained analytical report forms, calibration and standardization data, detection and reporting limits, matrix spike (MS data, matrix spike duplicate (MSD) for the gross alpha and beta analysis, laboratory control sample data, sample blanks, chemical yield recoveries for strontium-90 and technetium-99, and calculations performed by the laboratory.

DS&A's overall assessment of the GEL laboratory data is that the data is considered fully useable for project purposes with consideration of the qualifications or comments.

No instances were observed of sample results where uncertainties are greater than the result or the result was reported as estimated a "J" qualified value with unrealistically low MDC values.

Gross alpha analysis indicated that there were no detections for gross alpha, but there was a detection for gross beta. The reporting limit is elevated due to matrix effects of the produced water sample which contains high TDS and the total weight must be kept to a level within the calibration range. This limits the sample size and therefore affects the reporting limits.

The matrix spikes for the GEL data were within control limits except for strontium-90, which was low, and the parent sample is qualified as JMS34 indicating that the matrix spike was not within control limits.

Except for gross alpha and beta, matrix duplicates, not matrix spike duplicates, were analyzed using the same samples as were used for the matrix spikes. All are reported within control limits. Matrix spike duplicates were analyzed for gross alpha and gross beta activity. The recoveries are reported within control limits, but the relative percent difference (RPD) was out of limits for the gross alpha (23.3%). Since the recoveries are within control limits no qualifier is required.

Method blanks were evaluated and all the necessary information was provided for gross alpha and beta. The measurement uncertainty is less than the MDC and the samples are all less than 5 times the MDC, so no qualifiers are required. The sample results for strontium-90 and technetium-99 are both reported as “non-detect” and the method blank raw results are less than the respective MDCs so no qualifications are required.

Gamma Spectroscopy Results Review

DS&A reviewed the GEL laboratory report 372020 for gamma spectroscopy (analytical method EPA 901.1) of the April 28, 2015 produced water sample from the Battlement Mesa 36-13B well. DS&A’s overall assessment of the gamma spectroscopy results was that the data are considered fully useable for project purposes with consideration of the qualifications or comments.

DS&A noted that GEL uses relative percent difference (RPD) to compare duplicate results. The duplicate error ratio (DER) is not provided in the GEL report, but the DER is provided in the EDD provided by GEL. DS&A noted 17 DER outliers relative to the DER limit of 1.0. Using the RPD, Bi-214 is at 28.9% RPD and has a DER value of 1.36. The Lead-212 (Pb-212) has an RPD of 52.8 and a DER of 2.4. The Lead-214 (Pb-214) has an RPD of 57.9 and a DER of 2.0. This reflects the fact that these two analytes are detections in the produced water sample and reported as non-detects in the duplicate.

DS&A noted that these are the only cases where both the DER and RPD are out of limits. The laboratory shows limits for the RPD of 0 to 100%, presumably because the results are low-level. The Pb-212 and Pb-214 are qualified as JMD#, where # is the RPD observed, since they represent detections in the sample.

With the exception of Lead-212 (Pb-212) and Lead-214 (Pb-214), all of the analytes with DER values outside of limits are cases where the analyte is not detected in the sample and since the RPD is not out of limits, no qualifiers are added to the sample results except for those already mentioned.

GEL reported five detections in the produced water sample, which were identified as Actinium-228 (Ac-228), Lead-212 (Pb-212), Lead-214 (Pb-214), Potassium-40 (K-40), and Radium-228 (Ra-228). The results for Ac-228, K-40, and Ra-228 were reportedly detected in both the sample and the duplicate, but Pb-212 and Pb-214 were not as noted above. All are low levels near the reporting limits, and all are naturally occurring radionuclides. DS&A notes that K-40 is expected to be present at low levels if potassium is present.

GEL indicates that they reject certain data due to high counting uncertainty of low abundance. All of these are associated with non-detected data. Results are qualified as “UI” in the GEL report (“UJQ” or “URQ” in the DS&A report) resulting in uncertain identification. These include the gamma spectroscopy results for Bismuth-214 (Bi-214) and Thallium-208 and also the duplicate sample runs for Cs-134 and Pb-212.

The R qualifier in the DS&A report is being applied to the duplicate sample for Cs-134 which is qualified as “UI” while the parent sample is reported as “U” in the EDD. The sample result for Cs-134 itself is unqualified.

The laboratory EDD also flags the duplicate result for Pb-212 as “UI” while the duplicate result for Pb-214 is indicated as “U” meaning that Pb-214 was not detected in the duplicate sample, but was reportedly detected in the parent sample. The sample and sample duplicate that present the best results and are unqualified should be used.

3.0 Findings

The following presents Olsson's assessment of the laboratory results in the context of the URS RSAP, Revision 3, July 2010, and the third party data verification and validation report.

3.1 Discussion of Laboratory Results

Isotech reported that tritium and carbon-14 were not detected in the natural gas sample collected from the Battlement Mesa 36-13B well on April 28, 2015. The results for tritium were reported < 10.0 TU (32.4 pCi/L) and the carbon-14 results were reported < 0.2 pMC. The tritium detection limit of 10.0 TU is above the RSAP Table 5 Screening level of 7.5 pCi/L, but the detection limit is below the Action Level of 75 pCi/L.

The results reported that carbon-14 was not detected, suggesting that the natural gas has been isolated from sources of modern carbon. The carbon-14 screening level is determined as background (plus or minus) 2 standard deviations; the action level is determined as background (plus or minus) 3 standard deviations.

Isotech reported that tritium was not detected (< 10.0 TU) in the produced water sample collected on April 28, 2015 from the Battlement Mesa 36-13B. This means the Istotech tritium detection limit is approximately 32.4 pCi/L, so it is below the RSAP Table 5 Screening Level of 400 pCi/L in surface water/groundwater, and the Action Level of 15,000 pCi/L. The U.S. EPA MCL for tritium is 20,000 pCi/L in drinking water.

The produced water is not a drinking water source. Historically, natural background tritium reportedly ranged from below detection (less than 700 pCi/L) to 1,984 pCi/L in pre-shot surface water sample results collected prior to Project Rulison that were due to higher atmospheric tritium concentrations at that time. Exposure to the natural gas and produced water by Caerus personnel, the public, and environment is limited. No action is necessary based on these results.

The GEL data for gross alpha indicate that gross alpha activity was not detected, but did indicate that gross beta activity was detected at 181 ±44.1 pCi/L and a MDA (MDC) of 65.2 pCi/L. The 50 pCi/L gross beta screening level in RSAP Table 5 is based on drinking water standards.

Gross beta activity is typically related to naturally occurring potassium-40 (40K) in the surface and subsurface rock. In this case potassium-40 and other naturally occurring radionuclides were reportedly detected at low levels in the produced water sample. The URS report notes that the gross beta activity was generally reported at an elevated reporting activity due to high total dissolved solids (TDS) in the produced water.

The results for strontium-90 and technetium-99 show that these radionuclides were not detected in the April 28, 2015 produced water sample from the Battlement Mesa 36-13B well. No action is necessary.

The results for the gamma spectroscopy shows that five gamma emitting radionuclides were detected at low-levels near the laboratory reporting limits. These included Actinium-228, Lead-

212, Lead-214, Potassium-40, and Radium-228. With the exception of potassium-40, these are all naturally occurring radionuclides that are daughter products of the uranium-238 and throrium-232 decay series. Potassium is common in clay minerals and potassium-40 is expected if potassium is present, since potassium-40 is one of the most abundant naturally occurring radionuclides. The low concentrations of these radionuclides are considered indicative of natural background.

3.2 Data Usability

Tritium and carbon-14 were not detected in the Battlement Mesa 36-13B natural gas sample, and tritium was not detected in the produced water sample. The documentation provided by Isotech for the tritium analysis is sufficient for most validation purposes. The tritium and carbon-14 analysis QA/QC documentation is as complete as it has been historically for Isotech and Beta Analytic.

Olsson concurs with DS&A's assessment that the Isotech and GEL laboratory data is fully useable for project purposes with consideration of the qualifications and comments provided by the laboratories and DS&A.

TABLES

TABLE 1

Natural Gas Sample Results Summary
Rulison Area Well Monitoring
Caerus Oil and Gas, LLC - Battlement Mesa 36-13B Tier I Well
Rulison Field, Garfield County, Colorado

Well Name/ No.	Sample Source	Latitude/	Longitude	Isotech Job No.	Isotech Lab No.	Sample Name	Date Sampled	CO %	H_2S %	He %	H_2 %	Ar %	O_2 %	CO_2 %	N_2 %	C_1 %	C_2 %	C_2H_4 %	C_3 %	iC_4 %	nC_4 %	iC_5 %	nC_5 %	C_6+ %	$^{14}C_1$ pMC	Std. Dev. (±)	Tritium TU	Std. Dev. (±)	Total BTU calc	Specific Gravity calc
Battlement Mesa 36-13B	Separator	39.392146	-107.952819	507200	28847	36-13B	4/28/2015	ND	NA	ND	ND	ND	ND	4.08	0.054	88.29	5.66	ND	1.17	0.243	0.191	0.0760	0.0519	0.183	< 0.2	N/A	< 10.0	N/A	1054	0.646

RSAP Screening Level: BG X 2 Std Dev — 7.5 pCi/L
RSAP Action Level: BG X 3 Std Dev — 75 pCi/L

$^{14}C_1$ - Carbon 14 — Carbon-14 (14C) Detection Limit is 1.0 pMC. Isotopic composition of carbon is relative to the Vienna Peedee Belemnite (VPDB).

Tritium — Tritium (^3H) Detection Limit 10.0 TU. Isotopic composition of hydrogen is relative to Vienna Standard Mean Ocean Water (VSMOW).

Std. Dev./ (±) — Standard Deviation (±) Uncertainty

Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol.% Chemical analysis based on standards accurate to within 2%.

Acronyms:
pMC - Percent Modern Carbon.
TU - Tritium Units (One TU is equivalent to 3.2 pCi/L of water)
< - Not Detected (ND) (Above Laboratory Method Detection Limit)
Std. Dev. (±) - Standard Deviation
BTU - British Thermal Units (cu. Ft. dry calcuated at 60°F and 14.73 psia)
calc - calculated value
N/A - not applicable
NA - not analyzed
ND - not detected
The RSAP Table 5 - Radionuclide Screening and Action Levels for Carbon-14 (14C) Screening Level is determined as background (plus or minus ±) 2 Standard Deviations and the Action Level is deterermined as background ± 3 Standard Deviations.
The current version of the RSAP is missing this footnote.

Gas Component:
CO - Carbon Monoxide
H_2S - Hydrogen Sulfide
He - Helium
H_2 - Hydrogen
Ar - Argon
CO_2 - Carbon Dioxide
N_2 - Nitrogen
C_1 - Methane
C_2 - Ethane
C_2H_4 - Ethylene
C_3 - Propane
iC_4 - Iso-Butane
nC_4 - N-Butane
iC_5 - Iso-Pentane
nC_5 - n-Pentane
C_6+ - Hexanes+

TABLE 2

PRODUCED WATER SAMPLE TRITIUM RESULTS SUMMARY
Caerus Oil and Gas, LLC -Battlement Mesa 36-13B Tier I Well Production Data
Rulison Field, Garfield County, Colorado

Well Name/Number	Sample Source	Latitude	Longitude	Qtr/ Qtr	Section	Township	Range	P.M.	Sample ID	Lab Job No.	Lab Number	Date Sampled	Time Sampled	Laboratory	Tritium (TU)	Tritium (pCi/L) calculated	Tritum Result Qualifier
Battlement Mesa 36-13B	Separator	39.392146	-107.95282	NWSW	36	7S	95W	6th	36-13B	506935	28838	4/28/2015	10:00	ISO	< 10.0	< 32.4	N/A

RSAP Screening Level:	400 pCi/L
RSAP Action Level:	15,000 pCi/L
EPA Drinking Water MCL:	20,000 pCi/L

Tritium (^3H) Detection Limit 10.0 TU. Isotopic composition of hydrogen is relative to Vienna Standard Mean Ocean Water (VSMOW).
Modern background levels for Tritium range from 100 pCi/L to 300 pCi/L

Abbreviations:
ISO - Isotech Laboratories, Inc. of Champaign, IL
TU - Tritium Units (One TU is equivalent to 3.24 pCi/L of water) Note: Isotech reported the tritium results in TU and Olsson Associates converted to equivalent picocuries per liter.
pCi/L - picocuries per liter
< - Result is less than the method detection limit

TABLE 3

Radiochemistry Gas Flow Proportional Counting/Liquid Scintillation Counting - Produced Water Sample Results Summary
Caerus Oil and Gas, LLC - Battlement Mesa 36-13B Tier I Well Production Monitoring
Rulison Field, Garfield County, Colorado

WELL NAME/ Sample ID	Sample Source	Latitude/	Longitude	QTR/ QTR	Section	Township	Range	P.M.	SAMPLE ID	DATE SAMPLED	TIME SAMPLED	Laboratory	GFPC Gross Alpha	Result ± Uncertainty (pCi/L)	Detection Limit (pCi/L)	GFPC Gross Beta	Result ± Uncertainty (pCi/L)	Detection Limit (pCi/L)	GFPC Chlorine-36	Result ± Uncertainty (pCi/L)	Detection Limit (pCi/L)	GFPC Strontium-90	Result ± Uncertainty (pCi/L)	Detection Limit (pCi/L)	LSA Technetium-99	Result (pCi/L)	Detection Limit (pCi/L)
Battlement Mesa 36-13B/ 36-13B	Separator	39.392146	-107.952819	NWSW	36	7S	95W	6th	36-13B	4/28/2015	10:00	GEL	U	72.9 ± 58.6	94.1	181	181 ± 44.1	65.2	NA	NA	NA	U	-0.238 ± 0.951	1.87	U	0.848 ± 16.0	27.3
												April 2015 GEL Reporting Limits (pCi/L):	5			5			N/A			2		2	50		
												RSAP Screening Level (pCi/L):	Background + 2 Standard Deviations			Background + 2 Standard Deviations			NE			3			63		
												RSAP Action Level (pCi/L):	Background + 3 Standard Deviations			Background + 3 Standard Deviations			NE			6			630		

Abbreviations:

pCi/L - picocuries per liter (activity in parts per trillion)

Qualifier

U - Result is less than the sample specific Minimum Detectable Concentration (MDC) or Minimum Detectable Activity (MDA), Method Detection Limit (MDL), Limits of Detection (LOD), total propogated uncertainty (TPU), or laboratory reporting limit (RL).

NS - Not Sampled

NA - Not Analyzed

N/A - Not Applicable

NE - Not Established

GFPC - Gas Flow Proportional Counting

LSA - Liquid Scintillation Analysis

RSAP - Rulison Sampling and Analysis Plan, Revision 3, July 2010, Table 5 Radionuclide Screening and Action Levels

The gross alpha and gross beta screening and action levels are determined as background + 2 standard deviations and background + 3 standard deviations, respectively.

Note: gross alpha activity excludes the alpha activity contributed by radon and uranium and the gross beta activity exlcudes the beta activity contributed by potassium-40.

TABLE 4

GAMMA SPECTROSCOPY PRODUCED WATER SAMPLE RESULTS SUMMARY
Caerus Oil and Gas, LLC - Battlement Mesa 36-13B Well 2015 Production Monitoring Results
Rulison Field, Garfield County, Colorado

WELL NAME/No.	Sample Collection Point	Latitude/ Longitude	QTR/QTR	SEC	TWP	RNG	P.M.	SAMPLE ID	DATE SAMPLED	TIME SAMPLED	Gamma Emitting Radionuclides	Ac-228 Result (pCi/L)	Am-241 Result (pCi/L)	Sb-124 Result (pCi/L)	Sb-125 Result (pCi/L)	Ba-133 Result (pCi/L)	Ba-140 Result (pCi/L)	Be-7 Result (pCi/L)	Bi-212 Result (pCi/L)	Bi-214 Result (pCi/L)	Ce-139 Result (pCi/L)	Ce-141 Result (pCi/L)	Ce-144 Result (pCi/L)	Cs-134 Result (pCi/L)	Cs-136 Result (pCi/L)	Cs-137 Result (pCi/L)	Cr-51 Result (pCi/L)	Co-56 Result (pCi/L)	Co-57 Result (pCi/L)	Co-58 Result (pCi/L)	Co-60 Result (pCi/L)	Eu-152 Result (pCi/L)	Eu-154 Result (pCi/L)	Eu-155 Result (pCi/L)	Ir-192 Result (pCi/L)	Fe-59 Result (pCi/L)	Kr-85 Result (pCi/L)
Battlement Mesa 36-13B	Separator	39.39215 -107.95282	NW SW	36	7S	95W	6th	36-13B	4/28/2015	10:00	Qualifier		U	U	U	U	U	U	U	UI	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
											Result	30.7	-4.17	-2.43	0.408	0.214	-8.94	5.51	78.1	0.00	0.701	2.79	-39.3	-0.281	2.07	3.66	-22.7	-3.9	-0.881	-2.47	-0.274	-11.4	2.39	-3.12	-1.74	5.15	NA
											Uncertainty (±)	29.2	8.72	8.89	10.3	5.01	23.5	32.6	83.3	14.6	3.62	10.6	30	4.59	6.95	4.43	35.1	3.61	2.94	5.21	3.97	15.9	10.1	12.5	3.69	7.13	NA
											MDC	28.9	13.0	17.1	18.9	7.97	34.6	60.7	124	25.1	6.38	11.4	40.9	8.14	13.9	8.77	60.8	5.86	5.07	7.38	7.62	20.0	20.7	21.6	6.50	17.1	NA
											April 2015 Reporting Limit (pCi/L):															10											
Sample was analyzed by GEL Laboratories, LLC in Charleston, SC											(Where Applicable)																										
											RSAP Screening Level:															15											
											RSAP Action Level:															150											

Four Rows:

1) Qualifier	The laboratory data qualifers are designated by one or two letters to provide information about the reported results.
2) Result	Results are the level of activity reported for the individual produced water sample.
3) Uncertainty (±)	The margin of error, or range of activity, when added to the result.
4) MDC	The laboratory minimum detectable concentration (MDC) for the analytical method.
	If the result is less than the reporting limits the radionuclide is reported as 'not detected' (U).

The qualifiers used in the laboratory reports are listed below:
U - Result is less than the sample specific Minimum Detectable Concentration (MDC) or Minimum Detectable Activity (MDA),
Method Detection Limit (MDL), Limits of Detection (LOD), total propogated uncertainty (TPU), or laboratory reporting limit (RL).
UI - Gamma Spectroscopy Uncertain Identification
NA - Not Analyzed
N/A - Not Applicable

Note: Values shown in blue represent a detection or an uncertain identification. The gamma emitting radionuclides that were detected are naturally occurring Actinium-228 (228Ac), Lead-212 (^{212}Pb), Lead-214 (^{214}Pb), Potassium-40 (40K), and Radium 228 (228Ra).
Bismuth-214 (214Bi) and Thallium-208 (^{208}Tl) are qualified with "UI" for uncertain identification due to low-abundance.

RSAP - Rulison Sampling and Analysis Plan, Revision 3, July 2010 - Table 5 Radionuclide Screening and Action Levels
Note 6 - Gamma-emitting radionuclide screening and action levels are not specified; the screening and action level is based on the specific gamma-emitting radionuclide detected (e.g., ^{137}Cs)

TABLE 4

GAMMA SPECTROSCOPY PRODUCED WATER SAMPLE RESULTS SUMMARY
Caerus Oil and Gas, LLC - Battlement Mesa 36-13B Tier I Well Production Monitoring Results
Rulison Field, Garfield County, Colorado

(Table Continued)

WELL NAME/No.	Sample Collection Point	Latitude/ Longitude	QTR/QTR	SEC	TWP	RNG	P.M.	SAMPLE ID	DATE SAMPLED	TIME SAMPLED	Gamma Emitting Radionuclides	Pb-210 Result (pCi/L)	Pb-212 Result (pCi/L)	Pb-214 Result (pCi/L)	Mn-54 Result (pCi/L)	Hg-203 Result (pCi/L)	Nd-147 Result (pCi/L)	Np-239 Result (pCi/L)	Nb-94 Result (pCi/L)	Nb-95 Result (pCi/L)	K-40 Result (pCi/L)	Pm-144 Result (pCi/L)	Pm-146 Result (pCi/L)	Ra-228 Result (pCi/L)	Ru-106 Result (pCi/L)	Ag-110m Result (pCi/L)	Na-22 Result (pCi/L)	Tl-208 Result (pCi/L)	Th-230 Result (pCi/L)	Th-234 Result (pCi/L)	Sn-113 Result (pCi/L)	U-235 Result (pCi/L)	U-238 Result (pCi/L)	Y-88 Result (pCi/L)	Zn-65 Result (pCi/L)	Zr-95 Result (pCi/L)
Battlement Mesa 36-13B	Separator	39.392146 -107.952819	NW SW	36	7S	95W	6th	36-13B	4/28/2015	10:00	Qualifier	U			U	U	U	U	U	U		U	U		U	U	U	UI	NA	U	U	U	U	U	U	U
											Result	21.6	24.4	29.8	3.23	-0.926	-22.3	-23.6	1.36	-0.186	174	1.16	-0.477	30.7	7.37	-3.4	0.838	0.00	NA	14.7	-2.36	-10.9	14.7	1.73	-3.35	9.02
											Uncertainty (±)	70.6	14.5	12.9	2.81	3.81	40.9	32.8	3.84	5.35	75.7	3.91	4.65	29.2	34.6	4.24	3.53	9.03	NA	105	4.85	30.8	105	3.55	10.6	10.2
											MDC	125	11.4	15.8	7.46	6.84	70.3	55.4	7.27	8.49	69.3	7.35	8.45	28.9	65.1	7.00	7.27	6.79	NA	132	8.48	42.6	132	8.27	15.9	14.0
											April 2015 Reporting Limits: (Where Applicable)																										
											RSAP Screening Level:																									
											RSAP Action Level:																									

Samples were all analyzed by GEL Laboratories, LLC in Charleston, SC

Four Rows:
1) Qualifier — The laboratory data qualifers are designated by one or two letters to provide information about the reported results.
2) Result — Results are the level of activity reported for the individual produced water sample.
3) Uncertainty (±) — The margin of error, or range of activity, when added to the result.
4) MDC — The laboratory minimum detectable concentration (MDC) for the analytical method. If the result is less than the reporting limits the radionuclide is reported as 'not detected' (U).

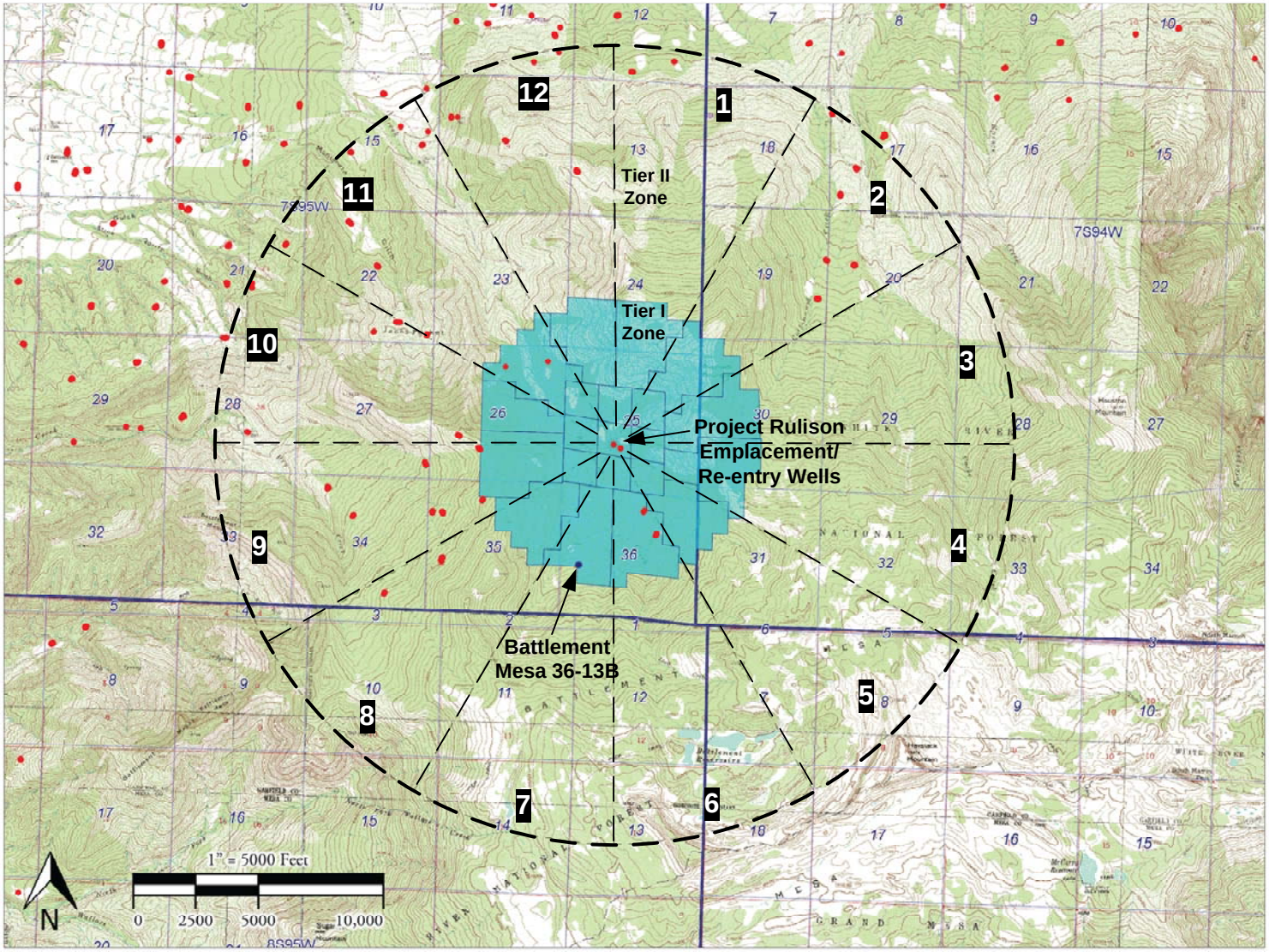
The qualifiers used in the laboratory reports are listed below:
U - Result is less than the sample specific Minimum Detectable Concentration (MDC) or Minimum Detectable Activity (MDA), Method Detection Limit (MDL), Limits of Detection (LOD), total propogated uncertainty (TPU), or laboratory reporting limit (RL).
UI - Gamma Spectroscopy Uncertain Identification
NS - Not Sampled
NA - Not Analyzed
N/A - Not Applicable

Note: Values shown in blue represent a detection. The gamma emitting radionuclides that were detected are naturally occurring Actinium-228 (^{228}Ac), Lead-212 (^{212}Pb), Lead-214 (^{214}Pb), Potassium-40 (40K),and Radium-228 (Ra-228).

Bismuth-214 (214Bi) and Thallium-208 (208Tl) were qualified with "UI" indicating uncertain identification - due to low abundance.

RSAP - Rulison Sampling and Analysis Plan, Revision 3, July 2010 - Table 5 Radionuclide Screening and Action Levels
Note 6 - Gamma-emitting radionuclide screening and action levels are not specified; the screening and action level is based on the specific gamma-emitting radionuclide detected (e.g., ^{137}Cs)

FIGURES



Base Map adapted from the COGCC GIS Database Map

LEGEND:

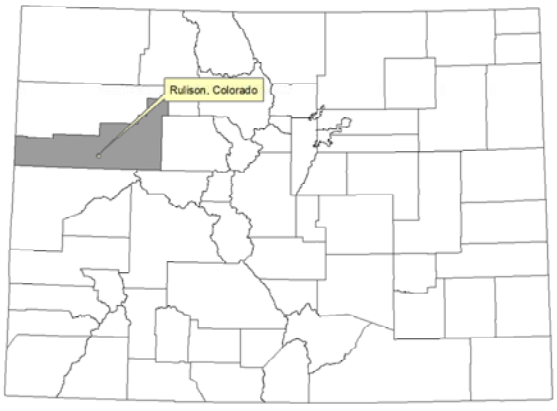
- Battlement Mesa 36-13B well location
- Other well location

Tier I Zone — Tier I wells

7 Sector Number

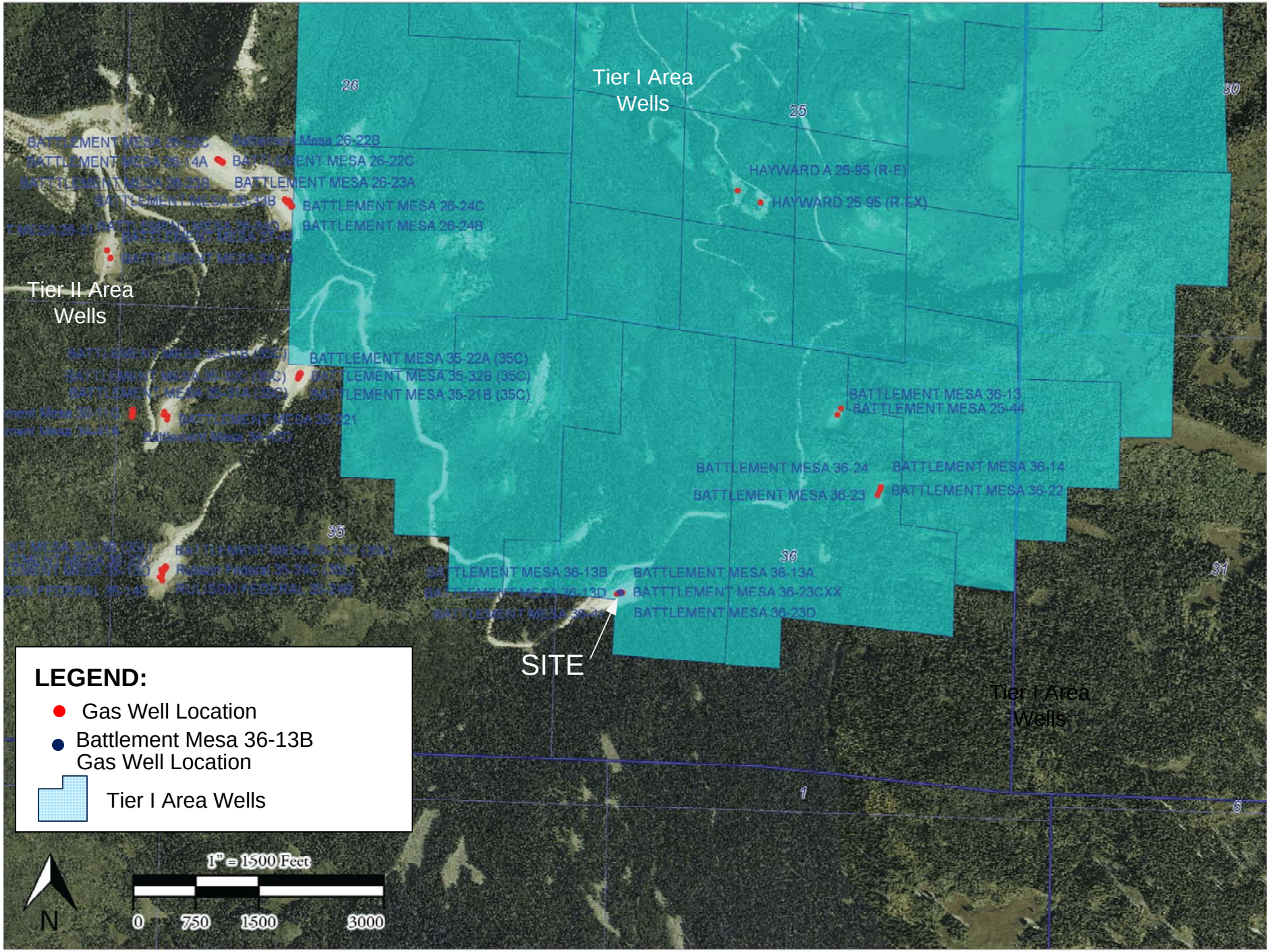
Project Rulison
3-Mile Radius Boundary and
Sector Dividing Lines

Colorado Index Map



N

PROJECT NO: 015-0982	Caerus Oil and Gas, LLC Tier I Gas Well Locations Project Rulison Area	OLSSON ASSOCIATES	4690 Table Mountain Dr. #200 Golden, CO 80403 TEL 303.237.2072 FAX 303.237-2659	FIGURE
DRAWN BY: BPC				1
DATE: 07/31/2015				



PROJECT NO: 015-0982 DRAWN BY: BPC DATE: 07/31/2015	Caerus Oil and Gas, LLC Battlement Mesa 36-13B Tier I Gas Well Location Rulison Area – Garfield County, Colorado	OLSSON ASSOCIATES 4690 Table Mountain Drive #200 Golden, Colorado 80403 TEL 303.237.2072 FAX 303.237.2659

FIGURE
2

APPENDIX A
ISOTECH LABORATORIES NATURAL GAS AND PRODUCED WATER ANALYTICAL RESULTS

ISOTECH
ISOTECH LABORATORIES INC

ANALYSIS REPORT

Lab #:	507200	Job #:	28847	IS-77083	Co. Job#:
Sample Name:	36-13B				Co. Lab#:
Company:	CAERUS Oil & Gas LLC				Cylinder: 6055
API/Well:					
Container:	Steel tank				
Field/Site Name:	Project Rulison Compliance				
Location:					
Formation/Depth:					
Sampling Point:					
Date Sampled:	4/28/2015 10:00	Date Received:	4/30/2015	Date Reported:	6/12/2015

Component	Chemical mol. %	$\delta^{13}C$ ‰	δD ‰	^{14}C conc. pMC	Tritium TU
Carbon Monoxide	nd				
Helium	nd				
Hydrogen	nd				
Argon	nd				
Oxygen	nd				
Nitrogen	0.054				
Carbon Dioxide	4.08				
Methane	88.29	-38.02		< 0.2	< 10.0
Ethane	5.66				
Ethylene	nd				
Propane	1.17				
Propylene	nd				
Iso-butane	0.243				
N-butane	0.191				
Iso-pentane	0.0760				
N-pentane	0.0519				
Hexanes +	0.183				

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 1054
Specific gravity, calculated: 0.646

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.

ISOTECH
ISOTECH LABORATORIES INC
www.isotechlabs.com

Isotech Gas Data

Job 28847
CoreTrac IS-77083

Isotech Lab No.	Sample Name	Sample Date	Sample Time	Field Name	GC Date	He %	H_2 %	$Ar+O_2$ %	Ar %	O_2 %	CO_2 %	N_2 %	CO %	C_1 %	C_2 %	C_2H_4 %	C_3 %	C_3H_6 %	iC_4 %	nC_4 %	iC_5 %	nC_5 %	C_6+ %	MS Date	$\delta^{13}C_1$ ‰	$^{14}C_1$ pMC	Tritium Date	Tritium C_1 TU
507200	36-13B	4/28/2015	10:00	Project Rulison Compliance	5/1/2015	nd	nd	na	nd	nd	4.08	0.054	nd	88.29	5.66	nd	1.17	nd	0.243	0.191	0.0760	0.0519	0.183	6/12/2015	-38.02	< 0.2	5/16/2015	< 10.0

nd = not detected, na = not analyzed

ISOTECH
ISOTECH LABORATORIES INC

ANALYSIS REPORT

Lab #:	506935	Job #:	28838	IS-77083	Co. Job#:
Sample Name:	36-13B				Co. Lab#:
Company:	CAERUS Oil & Gas LLC				
API/Well:					
Container:	1 Liter Plastic Bottle				
Field/Site Name:	Project Rulison Compliance				
Location:					
Formation/Depth:					
Sampling Point:					
Date Sampled:	4/28/2015 10:00	Date Received:	4/29/2015	Date Reported:	5/19/2015

δD of water	----------	na
$\delta^{18}O$ of water	----------	na
Tritium content of water	----------	< 10.0 TU
$\delta^{13}C$ of DIC	----------	na
^{14}C content of DIC	----------	na
$\delta^{15}N$ of nitrate	----------	na
$\delta^{18}O$ of nitrate	----------	na
$\delta^{34}S$ of sulfate	----------	na
$\delta^{18}O$ of sulfate	----------	na

Remarks:

ISOTECH®
ISOTECH LABORATORIES INC
www.isotechlabs.com

Isotech Water Data

Job 28838
Project Project Rulison Compliance
CoreTrac IS-77083

Isotech Lab No.	Sample Name	Sample Date	Sample Time	Field Name	Analysis Date	Tritium TU	Std. Dev.	Comments
506935	36-13B	4/28/2015	10:00	Project Rulison Compliance	5/16/2015	< 10.0		

ISOTECH
ISOTECH LABORATORIES INC
1308 Parkland Court Champaign, IL 61821 • (877) 362-4190 • www.isotechlabs.com

SEND DATA TO:

Name: JAKE JANICEK

Company: CAERUS OIL + GAS LLC

Address: 120 NORTH RAILROAD AVE PARACHUTE CO 81635

Phone: 970.285.9606

Email: jjanicek@caerusoilandgas.com

Project: Project Rulison Compliance.

Purchase Order #:

Location: 36-13B

Sampled By: K. RICHARDS

Circle one: (Standard) Priority Rush

SEND INVOICE TO (if different from SEND DATA TO):

Name: SAME

Company:

Address:

Phone:

Email:

Sample Description

Container Number	Sample Identification	Date Sampled	Time	Analysis Requested: TRITIUM	Analysis Requested: GAS CARBON-14 TPD		Comments
001	36-13B	4-28-15	1000	X			WATER
6055	36-13B	4/28/15	1000	X	X		GAS

Chain-of-Custody Record

Signature	Company	Date	Time
Relinquished by	OLSSON ASSOC.	4/28/15	1630
Received by	ISOTECH	4-30-15	8:50
Relinquished by			
Received by			
Relinquished by			
Received by			

Weatherford LABORATORIES

ISOTECH®
ISOTECH LABORATORIES INC
1308 Parkland Court Champaign, IL 61821 • (877) 362-4190 • www.isotechlabs.com

SEND DATA TO:

Name: JAKE JANICEK

Company: CAERUS OIL + GAS LLC

Address: 120 NORTH RAILROAD AVE PARACHUTE CO 81635

Phone: 970. 285. 9606

Email: jjanicek@caerusoilandgas.com

SEND INVOICE TO (if different from SEND DATA TO):

Name: SAME

Company:

Address:

Phone:

Email:

Project: Project Rulison Compliance.

Purchase Order #:

Location: 36-13B

Sampled By: K. RICHARDS

Circle one: (Standard) Priority Rush

Sample Description

Container Number	Sample Identification	Date Sampled	Time	Analysis Requested: TRITIUM	GAS/TPD CARBON-14		Comments
001	36-13B	4-28-15	1000	X			WATER
6055	36-13B	4/28/15	1000	X	X		GAS

Chain-of-Custody Record

Signature	Company	Date	Time
Relinquished by	Olsson Assoc.	4/28/15	1630
Received by	Isotech	4-29-15	955
Relinquished by			
Received by			
Relinquished by			
Received by			

Weatherford LABORATORIES

Samples Submitted to

Beta Analytic

Analysis Requested by

Carbon Rose

Isotech Laboratories, Inc.
1308 Parkland Court
Champaign, IL 61821-1826

ISOTECH

Sample Identification

Sample Number	Type or Description of Sample	Analyses & Services Requested: Carbon-14 Analysis	Tritium Enrichment	Tritium Analysis	Tritium Counting Only	Comments
507200	P101332 1.9 cc CO_2	X				

Chain of Custody Record

	Signature	Company	Date	Time
Relinquished by	Doug Riney	Shipped via UPS	5/4/15	10:00
Received by	M Hooper		5/8/15	
Relinquished by				
Received by				
Relinquished by				
Received by				

Upon receipt please sign this form and FAX a copy to (217) 398-3493.
The original should then be returned with the analytical results.

COUNTER 3 **Year 2015**
NIST and BLANK Values

JOB #	NIST date	count date	Value	+/-	SD	AVG NIST : (TU/cpm/g)			BLK date	count date	Value	+/-	SD	AVG BLK : (cpm)		
New cocktail batch	9-Jan(2)	13-Jan	449.25	+/-	2.98	449.25	+/-	2.98	9-Jan(2)	12-Jan	1.173	+/-	0.031	1.173	+/-	0.031
	9-Jan(1)	15-Jan	450.75	+/-	3.00	450.00	+/-	2.99	9-Jan(1)	14-Jan	1.210	+/-	0.032	1.191	+/-	0.032
	14-Jan	19-Jan	448.09	+/-	1.98	449.36	+/-	2.65	14-Jan	18-Jan	1.372	+/-	0.034	1.251	+/-	0.032
	21-Jan	26-Jan	448.42	+/-	2.97	449.13	+/-	2.73	21-Jan	25-Jan	1.168	+/-	0.031	1.230	+/-	0.032
	30-Jan	2-Feb	446.68	+/-	2.97	448.64	+/-	2.78	30-Jan	1-Feb	1.330	+/-	0.033	1.250	+/-	0.032
	30-Jan	6-Feb	453.23	+/-	3.04	449.40	+/-	2.82	2-Feb	5-Feb	1.308	+/-	0.033	1.260	+/-	0.032
	9-Feb	15-Feb	449.07	+/-	2.99	449.36	+/-	2.85	9-Feb	14-Feb	1.248	+/-	0.032	1.258	+/-	0.032
	17-Feb	25-Feb	448.44	+/-	3.00	449.24	+/-	2.87	17-Feb	24-Feb	1.295	+/-	0.033	1.263	+/-	0.032
	2-Mar	8-Mar	441.77	+/-	2.91	448.41	+/-	2.87	2-Mar	7-Mar	1.277	+/-	0.033	1.264	+/-	0.032
	2-Mar	17-Mar	449.18	+/-	2.99	448.49	+/-	2.88	2-Mar	16-Mar	1.258	+/-	0.032	1.264	+/-	0.032
	16-Mar	21-Mar	439.66	+/-	2.90	447.69	+/-	2.88	16-Mar	20-Mar	1.164	+/-	0.031	1.255	+/-	0.032
	10-Mar	22-Mar	448.77	+/-	2.58	447.78	+/-	2.86	10-Mar	23-Mar	1.236	+/-	0.032	1.253	+/-	0.032
									19-Mar	26-Mar	1.269	+/-	0.034	1.254	+/-	0.032
	31-Mar	6-Apr	454.25	+/-	3.07	448.27	+/-	2.88	31-Mar	5-Apr	1.281	+/-	0.033	1.256	+/-	0.032
	8-Apr	14-Apr	446.49	+/-	2.97	448.15	+/-	2.88	8-Apr	13-Apr	1.191	+/-	0.032	1.252	+/-	0.032
	17-Apr	23-Apr	454.75	+/-	3.07	448.59	+/-	2.89	17-Apr	21-Apr	1.213	+/-	0.032	1.249	+/-	0.032
	21-Apr	4-May	446.32	+/-	2.82	448.45	+/-	2.89	24-Apr	4-May	1.331	+/-	0.033	1.254	+/-	0.032
									28-Apr	12-May	1.231	+/-	0.034	1.253	+/-	0.032
28838, 28847 CRS	12-May	16-May	451.52	+/-	2.87	**448.63**	**+/-**	**2.89**	12-May	15-May	1.283	+/-	0.033	**1.254**	**+/-**	**0.032**

COUNTER #3

NIST standard calculations				
Standardization date	9/3/1998			
Standardized value	2.00900	Bq/gm		
Date of measurement	5/16/2015			
Value on above date	0.78587	Bq/gm =	6652	TU
Dilution factor	1			
Concentration of dilution	0.78587	Bq/gm =	6652.38	TU

Standard Activity				
Background count rate	1.283	+/-	0.033	cpm
Standard count rate	30.948	+/-	0.185	cpm
Net activity	29.665	+/-	0.188	cpm
Grams of sample	2.0135			grams
Net standard activity per gram	14.733	+/-	0.093	cpm/gm
TU/cpm/gm	451.52	+/-	2.87	

Counting efficiency		
total activity (dpm/g)	47.15	TU of std *0.007088
net activity (cpm)/g)	14.733	(std count - bkgrd count)/g
efficiency %	**31.25**	net activity/total activity*100%

DATA FILE	**404** counter 3			
JOB #	**28847,28838 CRS**			
Count dates:	**5-13 through 5-16-15**			
Position #	41	42	43	44
Sample ID	507200	506935	Blank	NIST 2.0135 g
Cocktail date	12-May	12-May	12-May	12-May
Date counted	13-May	14-May	15-May	16-May

LABORATORY # 507200

NIST standard calculations				
Standardization date	9/3/1998			
Standardized value	2.00900	Bq/gm		
Date of measurement	5/16/2015			
Value on above date	0.78587	Bq/gm =	6652	TU
Dilution factor	1			
Concentration of dilution	0.78587	Bq/gm =	6652.38	TU

Standard Activity				
Background count rate	1.283	+/-	0.033	cpm
Standard count rate	30.948	+/-	0.185	cpm
Net activity	29.665	+/-	0.188	cpm
Grams of sample	2.0135			grams
Net standard activity per gram	14.733	+/-	0.093	cpm/gm
TU/cpm/gm	451.52	+/-	2.87	

Sample Activity				
Background rate	1.283	+/-	0.033	cpm
Sample count rate	1.294	+/-	0.033	cpm
Net activity	0.012	+/-	0.0463	cpm
Grams of sample	10.0155			grams
Net sample activity per gram	0.0012	+/-	0.0046	cpm/gm
TU	0.53	+/-	2.089	

Sample Enrichment				
Initial amount of water	1			
final amount of water	1			
Enrichment factor	1	+/-	0.01	
Tf/To	1.00	+/-	0.010	
TRITIUM CONC. OF SAMPLE	**0.526**	**+/-**	**2.089**	**TU**

LABORATORY # 507200

SAMPLE SOURCE: **methane**

Avg Standard Activity				
TU/cpm/gm	**448.63**	**+/-**	**2.89**	

Sample Activity				
Background rate	1.254	+/-	0.032	cpm
Sample count rate	1.294	+/-	0.033	cpm
Net activity	0.040	+/-	0.0462	cpm
Grams of sample	10.0155			grams
Net sample activity per gram	0.0040	+/-	0.0046	cpm/gm
TU	1.78	+/-	2.069	

Sample Enrichment				
Initial amount of water	1			
final amount of water	1			
Enrichment factor	1	+/-	0.01	
Tf/To	1.00	+/-	0.010	
TRITIUM CONC. OF SAMPLE	**1.782**	**+/-**	**2.069**	**TU**

Report < 10.0 TU

LABORATORY # 506935

NIST standard calculations				
Standardization date	9/3/1998			
Standardized value	2.00900	Bq/gm		
Date of measurement	5/16/2015			
Value on above date	0.78587	Bq/gm =	6652	TU
Dilution factor	1			
Concentration of dilution	0.78587	Bq/gm =	6652.38	TU

Standard Activity				
Background count rate	1.283	+/-	0.033	cpm
Standard count rate	30.948	+/-	0.185	cpm
Net activity	29.665	+/-	0.188	cpm
Grams of sample	2.0135			grams
Net standard activity per gram	14.733	+/-	0.093	cpm/gm
TU/cpm/gm	451.52	+/-	2.87	

Sample Activity				
Background rate	1.283	+/-	0.033	cpm
Sample count rate	1.286	+/-	0.033	cpm
Net activity	0.003	+/-	0.0462	cpm
Grams of sample	10.0343			grams
Net sample activity per gram	0.0003	+/-	0.0046	cpm/gm
TU	0.15	+/-	2.081	

Sample Enrichment				
Initial amount of water	1			
final amount of water	1			
Enrichment factor	1	+/-	0.01	
Tf/To	1.00	+/-	0.010	
TRITIUM CONC. OF SAMPLE	**0.150**	**+/-**	**2.081**	**TU**

LABORATORY # 506935

SAMPLE SOURCE: **water**

Avg Standard Activity				
TU/cpm/gm	**448.63**	**+/-**	**2.89**	

Sample Activity				
Background rate	1.254	+/-	0.032	cpm
Sample count rate	1.286	+/-	0.033	cpm
Net activity	0.031	+/-	0.0461	cpm
Grams of sample	10.0343			grams
Net sample activity per gram	0.0031	+/-	0.0046	cpm/gm
TU	1.41	+/-	2.061	

Sample Enrichment				
Initial amount of water	1			
final amount of water	1			
Enrichment factor	1	+/-	0.01	
Tf/To	1.00	+/-	0.010	
TRITIUM CONC. OF SAMPLE	**1.406**	**+/-**	**2.061**	**TU**

Report < 10.0 TU

WED 13 MAY 2015 9:30

*** DIRECTORY PATH :C:\GWEN404 ***

PARAMETER GROUP: 8
ID: <150513>

00A PROGRAM MODE 6 ->

ORDER	POS	ID	CTIME	COUNTS	CUCNTS	MCW	REP	STD	STMS	STIME
1	41	507200 DC	100:00	NO LIM	NO LIM	1	12	Y	1/10	1:00
2	42	506935 DC	100:00	NO LIM	NO LIM	1	12	Y	1/10	1:00
3	43	BLANK 5-12	100:00	NO LIM	NO LIM	1	12	Y	1/10	1:00
4	44	NIST 5-12	100:00	NO LIM	NO LIM	1	9	Y	1/10	1:00

NUMBER OF CYCLES 1
COINCIDENCE BIAS (L/H) L

MCA INPUT TRIGG. INHIBIT MEMORY SPLIT
1 LRSUM DCOS G L*R
2 GSUM G L*R

WINDOW	CHANNELS	MCA	HALF
2	50- 190	1	2
3	60- 220	1	2
4	30- 190	1	2
5	40- 200	1	2
6	15- 200	1	2
7	15- 190	1	2
8	1- 1024	1	2

SELECTED PRINTOUT FOR TERMINAL 1 (A)

	CYC	POS	REP	CTIME	SQP	SQP%	STIME	ID	CPM3
Q014101N.001	1	41	1	100:01.781	750.71	0.15	1:01	**507200 DC**	**1.18**
Q014102N.001	1	41	2	100:01.899	748.81	0.16	1:02	**507200 DC**	**1.38**
Q014103N.001	1	41	3	100:01.893	750.42	0.19	1:02	**507200 DC**	**1.12**
Q014104N.001	1	41	4	100:01.893	748.32	0.18	1:02	**507200 DC**	**1.34**
Q014105N.001	1	41	5	100:01.899	747.52	0.25	1:02	**507200 DC**	**1.22**
Q014106N.001	1	41	6	100:01.899	750.54	0.17	1:02	**507200 DC**	**1.32**
Q014107N.001	1	41	7	100:01.899	748.92	0.16	1:02	**507200 DC**	**1.38**
Q014108N.001	1	41	8	100:01.899	747.94	0.13	1:02	**507200 DC**	**1.22**
Q014109N.001	1	41	9	100:01.899	748.8	0.19	1:02	**507200 DC**	**1.25**
Q014110N.001	1	41	10	100:01.899	748.58	0.14	1:02	**507200 DC**	**1.39**
Q014111N.001	1	41	11	100:01.899	748.18	0.21	1:02	**507200 DC**	**1.3**
Q014112N.001	1	41	12	100:01.899	750.36	0.11	1:02	**507200 DC**	**1.43**
Q024201N.001	1	42	1	100:01.899	750.44	0.13	1:02	**506935 DC**	**1.39**
Q024202N.001	1	42	2	100:01.899	748.09	0.22	1:02	**506935 DC**	**1.17**
Q024203N.001	1	42	3	100:01.899	747.55	0.15	1:02	**506935 DC**	**1.23**
Q024204N.001	1	42	4	100:01.899	749.43	0.12	1:02	**506935 DC**	**1.43**
Q024205N.001	1	42	5	100:01.899	746.83	0.2	1:02	**506935 DC**	**1.21**
Q024206N.001	1	42	6	100:01.899	747.29	0.17	1:02	**506935 DC**	**1.3**
Q024207N.001	1	42	7	100:01.899	746.7	0.14	1:02	**506935 DC**	**1.36**
Q024208N.001	1	42	8	100:01.899	746.63	0.23	1:02	**506935 DC**	**1.39**
Q024209N.001	1	42	9	100:01.900	749.47	0.16	1:02	**506935 DC**	**1.36**
Q024210N.001	1	42	10	100:01.900	747.88	0.18	1:02	**506935 DC**	**1.25**
Q024211N.001	1	42	11	100:01.893	747.29	0.23	1:02	**506935 DC**	**1.11**
Q024212N.001	1	42	12	100:01.893	745.5	0.18	1:02	**506935 DC**	**1.23**
Q034301N.001	1	43	1	100:01.899	748.25	0.19	1:02	**BLANK 5-12**	**1.35**
Q034302N.001	1	43	2	100:01.899	749.99	0.13	1:02	**BLANK 5-12**	**1.31**
Q034303N.001	1	43	3	100:01.899	749.44	0.15	1:02	**BLANK 5-12**	**1.21**
Q034304N.001	1	43	4	100:01.899	747.53	0.21	1:02	**BLANK 5-12**	**1.25**
Q034305N.001	1	43	5	100:01.899	750.84	0.17	1:02	**BLANK 5-12**	**1.17**
Q034306N.001	1	43	6	100:01.899	748.97	0.16	1:02	**BLANK 5-12**	**1.23**
Q034307N.001	1	43	7	100:01.893	747.53	0.18	1:02	**BLANK 5-12**	**1.31**
Q034308N.001	1	43	8	100:01.893	748.68	0.16	1:02	**BLANK 5-12**	**1.38**
Q034309N.001	1	43	9	100:01.899	748.62	0.15	1:02	**BLANK 5-12**	**1.16**
Q034310N.001	1	43	10	100:01.899	749.08	0.17	1:02	**BLANK 5-12**	**1.13**
Q034311N.001	1	43	11	100:01.899	747.47	0.13	1:02	**BLANK 5-12**	**1.55**
Q034312N.001	1	43	12	100:01.899	746.46	0.15	1:02	**BLANK 5-12**	**1.34**
Q044401N.001	1	44	1	100:01.899	749.66	0.14	1:02	**NIST 5-12**	**30.6**
Q044402N.001	1	44	2	100:01.893	750.29	0.16	1:02	**NIST 5-12**	**31.18**
Q044403N.001	1	44	3	100:01.893	750.01	0.15	1:02	**NIST 5-12**	**30.96**
Q044404N.001	1	44	4	100:01.899	749.74	0.19	1:02	**NIST 5-12**	**30.66**
Q044405N.001	1	44	5	100:01.899	751.03	0.15	1:02	**NIST 5-12**	**31.57**
Q044406N.001	1	44	6	100:01.899	751.52	0.21	1:02	**NIST 5-12**	**31.05**
Q044407N.001	1	44	7	100:01.899	748.8	0.17	1:02	**NIST 5-12**	**30.57**
Q044408N.001	1	44	8	100:01.899	748.06	0.14	1:02	**NIST 5-12**	**31.04**
Q044409N.001	1	44	9	100:01.899	749.44	0.2	1:02	**NIST 5-12**	**30.9**

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COUNTER 3 **Year 2015**
NIST and BLANK Values

JOB #	NIST date	count date	Value	+/-	SD	AVG NIST : (TU/cpm/g)	+/-		BLK date	count date	Value	+/-	SD	AVG BLK : (cpm)	+/-	
New cocktail batch	9-Jan(2)	13-Jan	449.25	+/-	2.98	449.25	+/-	2.98	9-Jan(2)	12-Jan	1.173	+/-	0.031	1.173	+/-	0.031
	9-Jan(1)	15-Jan	450.75	+/-	3.00	450.00	+/-	2.99	9-Jan(1)	14-Jan	1.210	+/-	0.032	1.191	+/-	0.032
	14-Jan	19-Jan	448.09	+/-	1.98	449.36	+/-	2.65	14-Jan	18-Jan	1.372	+/-	0.034	1.251	+/-	0.032
	21-Jan	26-Jan	448.42	+/-	2.97	449.13	+/-	2.73	21-Jan	25-Jan	1.168	+/-	0.031	1.230	+/-	0.032
	30-Jan	2-Feb	446.68	+/-	2.97	448.64	+/-	2.78	30-Jan	1-Feb	1.330	+/-	0.033	1.250	+/-	0.032
	30-Jan	6-Feb	453.23	+/-	3.04	449.40	+/-	2.82	2-Feb	5-Feb	1.308	+/-	0.033	1.260	+/-	0.032
	9-Feb	15-Feb	449.07	+/-	2.99	449.36	+/-	2.85	9-Feb	14-Feb	1.248	+/-	0.032	1.258	+/-	0.032
	17-Feb	25-Feb	448.44	+/-	3.00	449.24	+/-	2.87	17-Feb	24-Feb	1.295	+/-	0.033	1.263	+/-	0.032
	2-Mar	8-Mar	441.77	+/-	2.91	448.41	+/-	2.87	2-Mar	7-Mar	1.277	+/-	0.033	1.264	+/-	0.032
	2-Mar	17-Mar	449.18	+/-	2.99	448.49	+/-	2.88	2-Mar	16-Mar	1.258	+/-	0.032	1.264	+/-	0.032
	16-Mar	21-Mar	439.66	+/-	2.90	447.69	+/-	2.88	16-Mar	20-Mar	1.164	+/-	0.031	1.255	+/-	0.032
	10-Mar	22-Mar	448.77	+/-	2.58	447.78	+/-	2.86	10-Mar	23-Mar	1.236	+/-	0.032	1.253	+/-	0.032
									19-Mar	26-Mar	1.269	+/-	0.034	1.254	+/-	0.032
	31-Mar	6-Apr	454.25	+/-	3.07	448.27	+/-	2.88	31-Mar	5-Apr	1.281	+/-	0.033	1.256	+/-	0.032
	8-Apr	14-Apr	446.49	+/-	2.97	448.15	+/-	2.88	8-Apr	13-Apr	1.191	+/-	0.032	1.252	+/-	0.032
	17-Apr	23-Apr	454.75	+/-	3.07	448.59	+/-	2.89	17-Apr	21-Apr	1.213	+/-	0.032	1.249	+/-	0.032
	21-Apr	4-May	446.32	+/-	2.82	448.45	+/-	2.89	24-Apr	4-May	1.331	+/-	0.033	1.254	+/-	0.032
									28-Apr	12-May	1.231	+/-	0.034	1.253	+/-	0.032
28838, 28847 CRS	12-May	16-May	451.52	+/-	2.87	**448.63**	**+/-**	**2.89**	12-May	15-May	1.283	+/-	0.033	**1.254**	**+/-**	**0.032**

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Standards

Date	Lab/Std	QA/QC?	Comment	He	He %	Ar	Ar %	H2	H2 %	O2	O2 %	O2+Ar	O2+Ar %	CO2	CO2 %	N2	N2 %	CO	CO %	C1	C1 %	C2	C2 %	C2H4	C2H4 %	C3	C3 %	C3H6	C3H6 %	IC4	IC4 %	NC4	NC4 %	IC5	IC5 %	NC5	NC5 %	C6+	C6+ %	Raw Total
5/1/2015	sherry11	N	First of Day	0.01851	99.86	0.01574	102.04	0.01222	99.51	0.03015	97.42	0		1.46385	101.01	51.69023	100.14	0		39.07955	99.73	3.14347	100.5	0.46409	100.82	1.82184	100.55	0.13289	100.52	0.77676	100.05	0.76678	99.97	0.25144	99.4	0.2501	98.99	0.08238	95.35	97.8689
5/1/2015	sherry11	Y		0.01904	102.69	0.01581	102.5	0.01237	100.73	0.02968	95.9	0		1.44481	99.7	51.71912	100.19	0		39.07529	99.72	3.13974	100.38	0.46387	100.78	1.81963	100.43	0.13295	100.57	0.77625	99.99	0.76632	99.91	0.25165	99.49	0.25044	99.13	0.08302	96.1	98.3815
5/1/2015	HighChkStd	Y		0		0.00515		0		0.00141		0		0		9.83591	98.39	0		90.15696	100.17	0.00038		0.00018		0		0		0		0		0		0		0		99.0023

Date	Lab/Std	QA/QC	Comment	He	He %	Ar	Ar %	H2	H2 %	O2	O2 %	O2+Ar	O2+Ar %	CO2	CO2 %	N2	N2 %	CO	CO %	C1	C1 %	C2	C2 %	C2H4	C2H4 %	C3	C3 %	C3H6	C3H6 %	IC4	IC4 %	NC4	NC4 %	IC5	IC5 %	NC5	NC5 %	C6+	C6+ %	RAW TOTAL
5/1/2015	507204	lab	O2 diff <30 ppm	0.0015		0.36321		0.00548		0.02425		0		0.04737		83.90316		0		15.60579		0.01536		0.00034		0.00665		0.00208		0.00347		0.00387		0.00341		0.00223		0.01183		98.9124
5/1/2015	507204	rep		0.00109	31.27	0.36744	1.16	0.00519	5.52	0.02623	7.83	0		0.0452	4.67	83.91284	0.01	0		15.59287	0.08	0.01534	0.08	0.00032	6.08	0.00667	0.28	0.00207	0.51	0.00349	0.56	0.00388	0.24	0.00342	0.28	0.00222	0.47	0.01173	0.88	98.9313

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Results of Daily Instrument Check

Delta Plus: Dual Inlet Hydrogen Isotope Analysis

Date	**zero enrichment**	***ck std*** expected	***ck std*** measured
6/12/2015	**0.034**	**-11.23**	**-11.142**

Orca Standards

C1

Date Ran		
05/04/15	**-41.279**	**Orca 2229**

Expected Value **-41.30**

GPA Standards

C1

Date Ran		
05/04/15	**-43.220**	**GPA 1389**

Expected Value **-43.32**

PERRY JOHNSON LABORATORY ACCREDITATION, INC.

Certificate of Accreditation

Perry Johnson Laboratory Accreditation, Inc. has assessed the Laboratory of:

BETA Analytic, Inc.

4985 South West 74th Court, Miami, FL 33155

(Hereinafter called the Organization) and hereby declares that Organization is accredited in accordance with the recognized International Standard:

ISO/IEC 17025:2005

This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system
(as outlined by the joint ISO-ILAC-IAF Communiqué dated January 2009):

Measurement of Natural Levels of Radiocarbon by Accelerator Mass Spectrometry (AMS), Liquid Scintillation Counting (LSC) and/or Proportional Scintillation-Counter Method (PSM) and the Stable Isotope Ratios of Carbon, Nitrogen and Oxygen by Isotope Ratio Mass Spectrometry (IRMS)
(As detailed in the supplement)

Accreditation claims for such testing and/or calibration services shall only be made from addresses referenced within this certificate. This Accreditation is granted subject to the system rules governing the Accreditation referred to above, and the Organization hereby covenants with the Accreditation body's duty to observe and comply with the said rules.

For PJLA:

Tracy Szerszen
President/Operations Manager

Perry Johnson Laboratory Accreditation, Inc. (PJLA)
755 W. Big Beaver, Suite 1325
Troy, Michigan 48084

Initial Accreditation Date:	*Issue Date:*	*Expiration Date:*
November 1, 2008	November 12, 2014	February 28, 2017
Revision Date:	*Accreditation No:*	*Certificate No:*
May 11, 2015	59423	L14-353-R1

The validity of this certificate is maintained through ongoing assessments based on a continuous accreditation cycle. The validity of this certificate should be confirmed through the PJLA website: www.pjlabs.com

Certificate of Accreditation: Supplement

BETA Analytic Inc.
4985 South West 74th Court, Miami, FL 33155
Ron Hatfield Phone: 305-667-5167

Accreditation is granted to the facility to perform the following testing:

FIELD OF TEST	ITEMS, MATERIALS OR PRODUCTS TESTED	SPECIFIC TESTS OR PROPERTIES MEASURED	SPECIFICATION, STANDARD METHOD OR TECHNIQUE USED	RANGE (WHERE APPROPRIATE) AND DETECTION LIMIT
Chemical Testing [F]	Archaeological / Geological Materials and Water	Determination of Radiocarbon Age / Activity: Measurement of $^{14/13}C$, $^{14/12}C$, $^{13/12}C$	Determination of Radiocarbon Content; by the Benzene Method –Liquid Scintillation Counting (LSC), Proportional Scintillation-Counter Method (PSM) and Accelerator Mass Spectrometry (AMS)	Range (LSC or AMS): From Present Day back to 47 000 years BP Detection Limit (AMS or LSC): 47 000 BP
	Organic and Carbonate Materials	Determination of Stable Isotope Ratios: Measurement of $^{13/12}C$, $^{15/14}N$, $^{18/16}O$	Stable Isotope Ratios by: Isotope Ratio Mass Spectrometry (IRMS) ASTM D6866-B AMS Counting	Range: ¯100 per mil to 100 per mil Detection Limit: 0.05 mV mass 13 output
	Any Carbon containing material; solid, liquid or gaseous forms	Determination of the Biobased Carbon Content of Natural Range Materials: $^{14/13}C$, $^{14/12}C$ and $^{13/12}C$	ISO 13833 Annex A CEN/TS 16137 Annex D Method C ASTM D6866-C By LSC/PSM Counting ASTM D6866-B CEN/TS 16640 ISO 16620-1, 16620-2, 16620-3	Range: 0% pMC to 198% pMC Detection Limit: 0.28 pMC
	Any Carbon containing material; solid, liquid or gaseous forms Solid Materials; Specifically solid recovered fuels (SRF) or refuse derived fuels (RDF)	Determination of the Biobased Carbon Content of Natural Range Materials: $^{14/13}C$, $^{14/12}C$ and $^{13/12}C$ Determination of Bio-Carbon Content: Measurement of $^{14/13}C$, $^{14/12}C$ and $^{13/12}C$	ISO 13833 Annex B CEN/TS 16137 Annex B Method A ASTM D6866-B CEN/TS 16640 EN 15440 ISO 16620-1, 16620-2, 16620-3	Range: 0% pMC to 198% pMC Detection Limit: 0.37 pMC Range (AMS): 0% pMC to 198% pMC Detection Limit: 0.28 pMC
	Solid Materials; Specifically solid recovered fuels (SRF) or refuse derived fuels (RDF)	Determination of Bio-Carbon Content: Measurement of $^{14/13}C$, $^{14/12}C$ and $^{13/12}C$	CEN/TS 16640 EN 15440	Range (LSC/PSM): 0% pMC to 198% pMC Detection Limit: 0.37 pMC

1. The presence of a superscript F means that the laboratory performs testing of the indicated parameter at its fixed location. Example: Outside Micrometer[F] would mean that the laboratory performs this testing at its fixed location.

Signatories to the ILAC Mutual Recognition Arrangement

No.	Accreditation Body	Economy		Scope	Original Signing Date
1	Organismo Argentino de Acreditacion (OAA)	Argentina	1	Testing Calibration	11 Aug 2005 11 Aug 2005
2	National Association of Testing Authorities, Australia (NATA)	Australia	2	Testing Calibration	2 Nov 2000 2 Nov 2000
3	Bundesministerium fur Wirtschaft und Arbeit (BMWA)	Austria	3	Testing Calibration	22 Sept 2002 22 Sept 2002
4	(e) (p)Belgian Accreditation Structure (BELAC)	Belgium	4	Testing Calibration	1 Aug 2006 1 Aug 2006
5	(f)Coordenação Geral de Credenciamento General Coordination for Accreditation (CGCRE/INMETRO)	Brazil	5	Testing Calibration	2 Nov 2000 2 Nov 2000
6	Standards Council of Canada (SCC)	Canada	6	Testing Calibration	2 Nov 2000 2 Nov 2000
7	Canadian Association for Laboratory Accreditation Inc. (CALA)(r)	Canada	6	Testing	17 Nov 2005
8	(b) (o)China National Accreditation Service for Conformity Assessment (CNAS)	People's Republic of China	7	Testing Calibration	2 Nov 2000 2 Nov 2000
9	Ente Costarricense de Acreditación (ECA)	Costa Rica	8	Testing	16 Jan 2007
10	National Accreditation Body of Republica de Cuba (ONARC)	Cuba	9	Testing Calibration	17 Sept 2005 17 Sept 2005
11	Czech Accreditation Institute (CAI)	Czech Republic	10	Testing Calibration	2 Nov 2000 2 Nov 2000
12	Danish Accreditation (DANAK)	Denmark	11	Testing Calibration	2 Nov 2000 2 Nov 2000
13	National Laboratories Accreditation Bureau (NLAB)	Egypt	12	Testing Calibration	9 May 2005 9 May 2005
14	(g)Finnish Accreditation Service (FINAS)	Finland	13	Testing Calibration	2 Nov 2000 2 Nov 2000
15	Comite Francais d'Accreditation (COFRAC)	France	14	Testing Calibration	2 Nov 2000 2 Nov 2000
16	Deutsches Akkreditierungssytem Prufwesen (DAP)	Germany	15	Testing	2 Nov 2000
17	Deutsche Akkreditierungsstelle (DACH)	Germany	15	Testing	2 Nov 2000
18	Deutscher Kalibrierdienst (DKD)	Germany	15	Calibration	2 Nov 2000
19	Deutsche Akkreditierungsstelle Technik in Trägergemeinschaft für Akkreditierung German Association for Accreditation GmbH (DATech in TGA GmbH)	Germany	15	Testing	2 Nov 2000
20	(j)Hellenic Accreditation System S.A. (ESYD)	Greece	16	Testing Calibration	22 May 2004 22 May 2004
21	Oficina Guatemalteca de Acreditación (OGA)	Guatemala	17	Testing	26 June 2008
22	Hong Kong Accreditation Service (HKAS)	Hong Kong, China	18	Testing Calibration	2 Nov 2000 2 Nov 2000
23	National Accreditation Board for Testing and Calibration Laboratories (NABL)	India	19	Testing Calibration	2 Nov 2000 2 Nov 2000
24	National Accreditation Body of Indonesia (KAN)	Indonesia	20	Testing Calibration	20 June 2001 30 Dec 2003
25	(h)Irish National Accreditation Board (INAB)	Ireland	21	Testing Calibration	2 Nov 2000 2 Nov 2000
26	Israel Laboratory Accreditation Authority (ISRAC)	Israel	22	Testing Calibration	3 Nov 2001 3 Nov 2001

Signatories to the ILAC Mutual Recognition Arrangement

No.	Accreditation Body	Economy		Scope	Original Signing Date
27	[l]Sistema Nazionale per l'Accreditamento di Laboratori (SINAL)	Italy	23	Testing	2 Nov 2000
28	Servizio di Taratura in Italia (SIT)	Italy	23	Calibration	9 April 2003
29	Japan Accreditation Board for Conformity Assessment (JAB)	Japan	24	Testing Calibration	2 Nov 2000 28 July 2003
30	[a]International Accreditation Japan (IAJapan)	Japan	24	Testing Calibration	2 Nov 2000 2 Nov 2000
31	Voluntary EMC Laboratory Accreditation Center INC (VLAC)	Japan	24	Testing	16 Jan 2007
32	Korea Laboratory Accreditation Scheme (KOLAS)	Republic of Korea	25	Testing Calibration	2 Nov 2000 20 June 2001
33	Department of Standards Malaysia (DSM)	Malaysia	26	Testing Calibration	16 Jan 2003 19 Nov 2003
34	entidad mexicana de acreditación a.c. (ema)	Mexico	27	Testing Calibration	17 Nov 2005 17 Nov 2005
35	Dutch Accreditation Council (RvA)	The Netherlands	28	Testing Calibration	2 Nov 2000 2 Nov 2000
36	International Accreditation New Zealand (IANZ)	New Zealand	29	Testing Calibration	2 Nov 2000 2 Nov 2000
37	[k]Norsk Akkreditering (NA)	Norway	30	Testing Calibration	2 Nov 2000 2 Nov 2000
38	Pakistan National Accreditation Council (PNAC)	Pakistan	31	Testing Calibration	21 May 2009 21 May 2009
39	[q]Philippine Accreditation Office (PAO)	Philippines	32	Testing Calibration	17 Nov 2005 17 Nov 2005
40	Polish Centre for Accreditation (PCA)	Poland	33	Testing Calibration	19 Jan 2005 19 Jan 2005
41	Instituto Portugues de Acreditacao (IPAC)	Portugal	34	Testing Calibration	10 May 2006 10 May 2006
42	Romanian Accreditation Association (RENAR)	Romania	35	Testing Calibration	22 May 2004 28 May 2009
43	Association of Analytical Centers "Analitica" (AAC "Analitica")	Russian Federation	36	Testing	21 May 2009
44	Singapore Accreditation Council (SAC)	Singapore	37	Testing Calibration	2 Nov 2000 2 Nov 2000
45	Slovak National Accreditation Service (SNAS)	Slovakia	38	Testing Calibration	11 June 2001 11 June 2001
46	Slovenian Accreditation (SA)	Slovenia	39	Testing Calibration	28 Nov 2003 28 Nov 2003
47	South African National Accreditation System (SANAS)	South Africa	40	Testing Calibration	2 Nov 2000 2 Nov 2000
48	Entidad Nacional de Acreditacion (ENAC)	Spain	41	Testing Calibration	2 Nov 2000 2 Nov 2000
49	Swedish Board for Accreditation and Conformity Assessment (SWEDAC)	Sweden	42	Testing Calibration	2 Nov 2000 2 Nov 2000
50	Swiss Accreditation Services (SAS)	Switzerland	43	Testing Calibration	2 Nov 2000 2 Nov 2000
51	[d]Taiwan Accreditation Foundation (TAF)	Chinese Taipei	44	Testing Calibration	2 Nov 2000 2 Nov 2000

Signatories to the ILAC Mutual Recognition Arrangement

No.	Accreditation Body	Economy		Scope	Original Signing Date
52	[(m)]The Bureau of Laboratory Quality Standards, Department of Medical Sciences, Ministry of Public Health, Thailand (BLQS-DMSc)	Thailand	45	Testing	4 April 2003
53	[(i)] [(t)] National Standardization Council of Thailand – Office of the National Accreditation Council (NSC – ONAC)	Thailand	45	Testing Calibration	3 Nov 2001 3 Nov 2001
54	Bureau of Laboratory Accreditation, Department of Science Service, Ministry of Science and Technology (BLA-DSS)	Thailand	45	Testing	23 Aug 2006
55	Tunisian Accreditation Council (TUNAC)	Tunisia	46	Testing Calibration	2 Apr 2008 2 Apr 2008
56	Turkish Accreditation Agency (TURKAK)	Turkey	47	Testing Calibration	10 May 2006 10 May 2006
57	United Kingdom Accreditation Service (UKAS)	United Kingdom	48	Testing Calibration	2 Nov 2000 2 Nov 2000
58	American Association for Laboratory Accreditation (A2LA)	USA	49	Testing Calibration	2 Nov 2000 2 Nov 2000
59	National Voluntary Laboratory Accreditation Program (NVLAP)	USA	49	Testing Calibration	2 Nov 2000 2 Nov 2000
60	[(c)]International Accreditation Service, Inc (IAS)	USA	49	Testing Calibration	2 Nov 2000 9 May 2005
61	[(s)]ANSI-ASQ National Accreditation Board *doing business as* ACLASS	USA	49	Testing Calibration	14 Sept 2006 14 Sept 2006
62	Laboratory Accreditation Bureau (L-A-B)	USA	49	Testing Calibration	6 Dec 2007 6 Dec 2007
63	Perry Johnson Laboratory Accreditation, Inc. (PJLA)	USA	49	Testing Calibration	6 June 2008 21 May 2009
64	American Society of Crime Laboratory Directors/Laboratory Accreditation Board (ASCLD/LAB)	USA	49	Testing	7 April 2009
65	[(n)]Bureau of Accreditation (BoA)	Vietnam	50	Testing Calibration	2 Nov 2000 2 Nov 2000

(a) IAJapan was formed from a restructure of JCSS and JNLA on 1 April 2002.
(b) CNAL was formed from a restructure of CCIBLAC and CNACL on 20 Feb 2003
(c) IAS was formed from a restructure of ICBO on 1 Dec 2002
(d) TAF was formed from a restructure of CNLA on 16 April 2005
(e) BELTEST and BKO/OBE originally signed the MRA
(f) Diretoria de Credenciamento e Qualidade/Instituto Nacional de Metrologia, Normalizacao e Qualidade Industrial (INMETRO) originally signed the MRA
(g) FINAS, Finnish Accreditation Service Centre for Metrology and Accreditation originally signed the MRA. Their name changed to Finnish Accreditation Service (FINAS)
(h) The Irish National Accreditation Board (NAB) originally signed the MRA. NAB changed their name to Irish National Accreditation Board (INAB)
(i) Thai Laboratory Accreditation Scheme (TLAS) originally signed the MRA. TLAS changed their name to TISI
(j) Hellenic Accreditation Council originally signed the MRA. Hellenic Accrediation Council changed their name to Hellenic Accreditation System S.A. (ESYD)
(k) Norwegian Accreditation originally signed the MRA. Norwegian Accreditation changed their name to Norsk Akkreditering (NA)
(l) Sistema Nazionale per l'Accreditamento originally signed the MRA. Sistema Nazionale per l'Accreditamneto changed their name to Sistema Nazionale per l'Accreditamneto di Laboratori (SINAL)
(m) Bureau of Laboratory Quality Standards (BLQS) Department of Medical Sciences (DMSc) originally signed the MRA. Their name changed to The Bureau of Laboratory Quality Standards, Department of Medical Sciences, Ministry of Public Health, Thailand (BLQS-DMSc)
(n) Vietnam Laboratory Accreditation Scheme (VILAS/STAMEQ) originally signed the MRA. Their name changed to

Bureau of Accreditation (BoA)

(o) CNAS was formed from the merger of CNAL and CNAB

(p) BELTEST and BKO/OBE ceased to exist on 1 August 2006

(q) PAO was reinstated as a signatory by the APLAC MRA Council for testing and calibration on 10 December 2008. This follows the suspension as a result of the Resolution of the APLAC MRA Council on 5 June 2008 whereby the signatory status for calibration and testing for PAO was suspended.

(r) Canadian Association for Environmental Analytical Laboratories (CAEAL) originally signed the MRA. CAEAL changed its name to Canadian Association for Laboratory Accreditation Inc. (CALA) on 23 June 2008

(s) Assured Calibration and Laboratory Accreditation Select Services was acquired by ANSI-ASQ National Accreditation Board and are now know as ANSI-ASQ National Accreditation Board *doing business as* ACLASS as of 18 September 08

(t) TLAS changed their name to National Standardization Council of Thailand – Office of the National Accreditation Council on 29 January 2009.

APPENDIX B
GEL LABORATORY PRODUCED WATER SAMPLE ANALYTICAL RESULTS

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

May 22, 2015

Mr. James Hix
Olsson Associates
4690 Table Mountain Drive
Suite 200
Golden, Colorado 80403

Re: Caerus Battlement Mesa 36-13B
Work Order: 372020

Dear Mr. Hix:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on April 29, 2015. 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,

Chelsea Seagle

Chelsea Seagle for
Edith Kent
Project Manager

Purchase Order: 015-0982 Phase 100 Task 10001
Enclosures

Table of Contents

Case Narrative

Case Narrative
for
Olson Associates
SDG: 372020

May 22, 2015

Laboratory Identification:

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

Summary

Sample Receipt The sample arrived at GEL Laboratories LLC, Charleston, South Carolina on April 29, 2015 for analysis. The lab received a container for Tritium analysis but it was not requested on the chain. The client was notified and indicated that Tritium was not required. All sample containers arrived without any visible signs of tampering or breakage. Shipping container temperature was checked, documented, and within specifications. There are no additional comments concerning sample receipt.

Sample Identification The laboratory received the following sample:

Laboratory ID	Client ID
372020001	36-13B

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: General Narrative, Chain of Custody and Supporting Documentation, and data from the following fractions: Radiochemistry.

Chelsea Seagle
Chelsea Seagle for
Edith Kent
Project Manager

Chain of Custody and Supporting Documentation

Page: _____ of _____
Project #: _____
GEL Quote #: _____
COC Number (1): _____
PO Number:

GEL Chain of Custody and Analytical Request

GEL Work Order Number: 372020

GEL Laboratories, LLC
2040 Savage Road
Charleston, SC 29407
Phone: (843) 556-8171
Fax: (843) 766-1178

Client Name: CAERUS Phone #: 970.285.9606
Project/Site Name: 36-13B Fax #:
Address: 120 North Railroad Ave. Parachute CO 81635
Collected by: K. RICHARDS Send Results To:

Sample Analysis Requested (5) (Fill in the number of containers for each test)

Sample ID (* For composites - indicate start and stop date/time)	*Date Collected (mm-dd-yy)	*Time Collected (Military) (hhmm)	QC Code (2)	Field Filtered (3)	Sample Matrix (4)	Should this sample be considered: Radioactive	Should this sample be considered: TSCA Regulated	Total number of containers	GAB	GSR incl. Cs-137	Strontium 90	Technecium-99	<-- Preservative Type (6)	Comments
36-13B	4-28-15	1000			W			3	X	X	X	X		Note: extra sample is required for sample specific QC

TAT Requested: Normal: X Rush: Specify: (Subject to Surcharge) Fax Results: Yes / No Circle Deliverable: C of A / QC Summary / Level 1 / Level 2 / Level 3 / Level 4

Remarks: *Are there any known hazards applicable to these samples? If so, please list the hazards*

Sample Collection Time Zone: Eastern Pacific Central Other _____ Mountain

Chain of Custody Signatures

	Relinquished By (Signed)	Date	Time	Received by (Signed)	Date	Time
1		4/28/15	1630		04/29/15	0905
2						
3						

Sample Shipping and Delivery Details

GEL PM:
Method of Shipment: Date Shipped:
Airbill #:
Airbill #:

1.) Chain of Custody Number = Client Determined
2.) QC Codes: N = Normal Sample, TB = Trip Blank, FD = Field Duplicate, EB = Equipment Blank, MS = Matrix Spike Sample, MSD = Matrix Spike Duplicate Sample, G = Grab, C = Composite
3.) Field Filtered: For liquid matrices, indicate with a - Y - for yes the sample was field filtered or - N - for sample was not field filtered.
4.) Matrix Codes: DW=Drinking Water, GW=Groundwater, SW=Surface Water, WW=Waste Water, W=Water, SO=Soil, SD=Sediment, SL=Sludge, SS=Solid Waste, O=Oil, F=Filter, P=Wipe, U=Urine, F=Fecal, N=Nasal
5.) Sample Analysis Requested: Analytical method requested (i.e. 8260B, 6010B/7470A) and number of containers provided for each (i.e. *8260B* - 3, *6010B/7470A* - 1).
6.) Preservative Type: HA = Hydrochloric Acid, NI = Nitric Acid, SH = Sodium Hydroxide, SA = Sulfuric Acid, AA = Ascorbic Acid, HX = Hexane, ST = Sodium Thiosulfate, If no preservative is added = leave field blank

For Lab Receiving Use Only
Custody Seal Intact? YES NO
Cooler Temp: 5 C

WHITE = LABORATORY YELLOW = FILE PINK = CLIENT

GEL Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client:	OLSS	**SDG/AR/COC/Work Order:**	379020
Received By:	MK	**Date Received:**	4-29-15

Suspected Hazard Information	Yes	No	
COC/Samples marked as radioactive?		✓	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.
Classified Radioactive II or III by RSO?		✓	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): 0 cpm
COC/Samples marked containing PCBs?		✓	If yes, Were swipes taken of sample containers < action levels?
Package, COC, and/or Samples marked as beryllium or asbestos containing?		✓	If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group.
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) *all temperatures are recorded in Celsius 5C
2a	Daily check performed and passed on IR temperature gun?	✓			Temperature Device Serial #: 130532776 Secondary Temperature Device Serial # (If Applicable):
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	Do Low Level Perchlorate samples (EPA 6850) have headspace as required?		✓		Sample ID's and containers affected:
7	VOA vials free of headspace (defined as < 6mm bubble)?		✓		Sample ID's and containers affected:
8	Are Encore containers present?			✓	(If yes, immediately deliver to Volatiles laboratory)
9	Samples received within holding time?	✓			ID's and tests affected:
10	Sample ID's on COC match ID's on bottles?	✓			Sample ID's and containers affected:
11	Date & time on COC match date & time on bottles?	✓			Sample ID's affected:
12	Number of containers received match number indicated on COC?	✓			Sample ID's affected:
13	Are sample containers identifiable as GEL provided?	✓			
14	COC form is properly signed in relinquished/received sections?	✓			
15	Carrier and tracking number.	✓			Circle Applicable: (FedEx Air) FedEx Ground UPS Field Services Courier Other 5632 6808 7160

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials EM Date 4/29/15 Page 1 of 1 GL-CHL-SR-001 Rev 1

Subject: Receipt Issue for Workorder 372020
From: Edie Kent <emk@gel.com>
Date: Tue, 05 May 2015 09:16:42 -0400
To: jhix@olssonassociates.com
CC: "team.kent" <team.kent@gel.com>

This was not noted at login so I suspect there might have been a change in pH after receipt. The analytical lab contacted me to note that one of the containers received had a pH of 4 at the time it was checked in the lab. I directed the lab to add nitric to lower the pH as you and I had already discussed the possibility this would be needed.

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: RE: Caerus Battlement Mesa 36-13B Produced Water Samples Bottle Order
From: James Hix <jhix@olssonassociates.com>
Date: Tue, 5 May 2015 15:53:35 +0000
To: Edie Kent <emk@gel.com>
CC: team.kent <team.kent@gel.com>, "Lindsay Sanders (lsanders@ltenv.com)" <lsanders@ltenv.com>

Hi Edie,
We do not need to run the tritium in the water sample.
James

James W. Hix, PG| Olsson Associates
4690 Table Mountain Drive, Suite 200 | Golden, CO 80403 | jhix@olssonassociates.com
TEL 303.237.2072 | DIR 303.374.3139 | CELL 303.589.1572 | FAX 303.237.2659

-----Original Message-----
From: Edie Kent [mailto:emk@gel.com]
Sent: Wednesday, April 29, 2015 12:26 PM
To: James Hix
Cc: team.kent
Subject: Re: Caerus Battlement Mesa 36-13B Produced Water Samples Bottle Order

James:
The Tritium was not listed on your chain of custody but we did receive all 3 containers. Please verify that Tritium is required. A copy of the chain is attached.

Edie

James Hix wrote:

> Hi Edie,
>
> We need a sample kit for produced water from the Cearus Oil and Gas Battlement Mesa 36-13B natural gas well located in Garfield County, Colorado. We need to sample for gross alpha, gross beta, gamma-emitting radionuclides including Cesium-137, Tritium, Strontium-90, and Technetium-99.
>
> The sample is produced water from a natural gas well, so the bicarbonate is likely very high and we should add additional acid to the 2000 ml containers so they are not received out of pH specifications. Please add nitric acid to lower the pH. Please provide a level 4 QA/QC package with the data as well as an EDD. We will need to have this well sampled before April 30, 2015.
>
> We need to send the cooler to Tim Dobransky in our Grand Junction office at 760 Horizon Drive, Suite 102, Grand Junction, CO 81506. The telephone number is 970.263.7800. The Olsson Associates Project number for this is 015-0982 Phase 100 Task 10001.
>
> James
>
> James W. Hix, PG|* Olsson Associates*
>
> 4690 Table Mountain Drive, Suite 200 | Golden, CO 80403 |
> jhix@olssonassociates.com <mailto:jhix@olssonassociates.com>

TEL 303.237.2072 | DIR 303.374.3139 | CELL 303.589.1572 | FAX 303.237.2659

Description: Description: Description: Description: 1-Olsson-Color-Logo <http://www.olssonassociates.com/> Description: Description: Description: Description: facebook <http://www.facebook.com/#%21/OlssonAssociates> Description: Description: Description: Description: twitter <https://twitter.com/#%21/olsson_assoc> Description: Description: Description: Description: linkedin <http://www.linkedin.com/company/20374?trk=tyah>

--
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

Data Review Qualifier Definitions

Data Review Qualifier Definitions

Qualifier	Explanation
*	A quality control analyte recovery is outside of specified acceptance criteria
**	Analyte is a surrogate compound
<	Result is less than value reported
>	Result is greater than value reported
^	RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
A	The TIC is a suspected aldol-condensation product
B	Target analyte was detected in the associated blank
B	Metals-Either presence of analyte detected in the associated blank, or MDL/IDL < sample value < PQL
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
d	5-day BOD-The 2:1 depletion requirement was not met for this sample
E	Organics-Concentration of the target analyte exceeds the instrument calibration range
E	Metals-%difference of sample and SD is >10%. Sample concentration must meet flagging criteria
H	Analytical holding time was exceeded
h	Preparation or preservation holding time was exceeded
J	Value is estimated
N	Metals-The Matrix spike sample recovery is not within specified control limits
N	Organics-Presumptive evidence based on mass spectral library search to make a tentative identification of the analyte (TIC). Quantitation is based on nearest internal standard response factor
N/A	Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
ND	Analyte concentration is not detected above the reporting limit
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
Z	Paint Filter Test-Particulates passed through the filter, however no free liquids were observed.

P Organics-The concentrations between the primary and confirmation columns/detectors is >40% difference. For HPLC, the difference is >70%.

U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

Laboratory Certifications

List of current GEL Certifications as of 22 May 2015

State	Certification
Alaska	UST−110
Arkansas	88−0651
CLIA	42D0904046
California	2940 Interim
Colorado	SC00012
Connecticut	PH−0169
Delaware	SC000122013−10
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330−12−00283, P330−12−00284
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC000122013−10
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C−SC−01
Kansas NELAP	E−10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA150001
Maryland	270
Massachusetts	M−SC012
Michigan	9976
Mississippi	SC000122013−10
Nebraska	NE−OS−26−13
Nevada	SC000122014−1
New Hampshire NELAP	2054
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
Oklahoma	9904
Pennsylvania NELAP	68−00485
Plant Material Permit	PDEP−12−00260
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235−15−10
Utah NELAP	SC000122015−17
Vermont	VT87156
Virginia NELAP	460202
Washington	C780

Radiological Analysis

Radiochemistry
Technical Case Narrative
Olson Associates (OLSS)
SDG #: 372020

Method/Analysis Information

Product:	**Gammaspec, Gamma, Liquid (Standard List)**
Analytical Method:	EPA 901.1
Analytical Batch Number:	1475456

Sample ID	Client ID
372020001	36-13B
1203310162	Method Blank (MB)
1203310164	Laboratory Control Sample (LCS)
1203310163	372020001(36-13B) Sample Duplicate (DUP)

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-013 REV# 25.

Calibration Information:

Calibration Information
All initial and continuing calibration requirements have been met.

Standards Information
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

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: 372020001 (36-13B).

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.

Recounts
None of the samples in this sample set were recounted.

Miscellaneous Information:

Data Exception (DER) Documentation
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Sample-Specific MDA/MDC
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments
Additional comments were not required for this sample set.

Qualifier Information

Qualifier	Reason	Analyte	Sample	Client Sample
UI	Data rejected due to high counting uncertainty.	Cesium-134	1203310163	36-13B(372020001DUP)
		Thallium-208	372020001	36-13B
UI	Data rejected due to low abundance.	Bismuth-214	372020001	36-13B
		Lead-212	1203310163	36-13B(372020001DUP)

Method/Analysis Information

Product:	**GFPC, Sr90, liquid**
Analytical Method:	EPA 905.0 Modified
Analytical Batch Number:	1478361

Sample ID	Client ID
372020001	36-13B

1203317699	Method Blank (MB)
1203317702	Laboratory Control Sample (LCS)
1203317700	372020001(36-13B) Sample Duplicate (DUP)
1203317701	372020001(36-13B) Matrix Spike (MS)

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-004 REV# 17.

Calibration Information:

Calibration Information
All initial and continuing calibration requirements have been met.

Standards Information
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

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: 372020001 (36-13B).

QC Information
All of the QC samples meet the required acceptance limits with the following exceptions: Refer to Data Exception Report (DER).

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.

Recounts
Sample 1203317701 (36-13BMS) was recounted due to low recovery. The original count is being reported. Please see Data Exception Report 1413394.

Miscellaneous Information:

Data Exception (DER) Documentation
Data exception reports are generated to document any procedural anomalies that may deviate from referenced

SOP or contractual documents. The following DER was generated for this SDG: DER 1413394 was generated due to Failed Recovery for MS/MSD and or PS/PSD. 1. The matrix spike 1203317701 does not meet the recovery requirement due to the matrix of the sample. 1. The sample is produced water from a natural gas well. Reporting results

Sample-Specific MDA/MDC
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments
Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product:	**GFPC, Gross A/B, liquid**
Analytical Method:	EPA 900.0/SW846 9310
Analytical Batch Number:	1479317

Sample ID	Client ID
372020001	36-13B
1203320253	Method Blank (MB)
1203320257	Laboratory Control Sample (LCS)
1203320254	372020001(36-13B) Sample Duplicate (DUP)
1203320255	372020001(36-13B) Matrix Spike (MS)
1203320256	372020001(36-13B) Matrix Spike Duplicate (MSD)

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-001 REV# 18.

Calibration Information:

Calibration Information
All initial and continuing calibration requirements have been met.

Standards Information
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

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: 372020001 (36-13B).

QC Information
All of the QC samples meet the required acceptance limits with the following exceptions: The matrix spike and matrix spike duplicate, 1203320255 (36-13BMS) and 1203320256 (36-13BMSD), did not meet the alpha relative percent difference requirement; however, they do meet the recovery requirement. The blank, 1203320253 (MB), did not meet the alpha or beta detection limits due to keeping the blank volume consistent with the other sample aliquots.

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.

Gross Alpha/Beta Preparation Information
High hygroscopic salt content in evaporated samples can cause the sample mass to fluctuate due to moisture absorption. To minimize this interference, the salts are converted to oxides by heating the sample under a flame until a dull red color is obtained. The conversion to oxides stabilizes the sample weight and ensures that proper alpha/beta efficiencies are assigned for each sample. Volatile radioisotopes of carbon, hydrogen, technetium, polonium and cesium may be lost during sample heating.

Recounts
Sample 1203320255 (36-13BMS) was recounted due to high recovery. The recount is reported.

Miscellaneous Information:

Data Exception (DER) Documentation
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Sample-Specific MDA/MDC
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments
The matrix spike and matrix spike duplicate, 1203320255 (36-13BMS) and 1203320256 (36-13BMSD), aliquots were reduced to conserve sample volume. Samples 1203320254 (36-13BDUP) and 372020001 (36-13B) did not meet the alpha required detection limit due to low sample volume. No more volume could be used due to not exceeding the maximum net weight limit of the calibration curve. The samples counted for 500 minutes.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product:	**Liquid Scint Tc99, Liquid**
Analytical Method:	DOE EML HASL-300, Tc-02-RC Modified
Analytical Batch Number:	1475759

Sample ID	Client ID
372020001	36-13B
1203310931	Method Blank (MB)
1203310934	Laboratory Control Sample (LCS)
1203310932	372020001(36-13B) Sample Duplicate (DUP)
1203310933	372020001(36-13B) Matrix Spike (MS)

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-059 REV# 3.

Calibration Information:

Calibration Information
All initial and continuing calibration requirements have been met.

Standards Information
Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

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: 372020001 (36-13B).

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.

Recounts
None of the samples in this sample set were recounted.

Miscellaneous Information:

Data Exception (DER) Documentation
Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Sample-Specific MDA/MDC
The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments
Additional comments were not required for this sample set.

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.

GEL LABORATORIES LLC

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

Qualifier Definition Report
for

OLSS001 Olson Associates

Client SDG: 372020 GEL Work Order: 372020

The Qualifiers in this report are defined as follows:

* A quality control analyte recovery is outside of specified acceptance criteria

** Analyte is a Tracer compound

U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

UI Gamma Spectroscopy--Uncertain identification

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature: Theresa L Austin **Name: Theresa Austin**

Date: 26 MAY 2015 **Title: Group Leader**

DATA EXCEPTION REPORT

Mo.Day Yr.	**Division:**	**Quality Criteria:**	**Type:**
22-MAY-15	Radiochemistry	Specifications	Process
Instrument Type:	**Test / Method:**	**Matrix Type:**	**Client Code:**
GFPC	EPA 905.0 Modified	Liquid	OLSS
Batch ID:	**Sample Numbers:**		
1478361	See Below		

Potentially affected work order(s)(SDG): 372020

Application Issues:

Failed Recovery for MS/MSD, or PS/PSD

Specification and Requirements Exception Description:	**DER Disposition:**
1. The matrix spike 1203317701 does not meet the recovery requirement due to the matrix of the sample.	1. The sample is produced water from a natural gas well. Reporting results

Originator's Name:

Kenshalla Oston 22-MAY-15

Data Validator/Group Leader:

Theresa Austin 26-MAY-15

Sample Data Summary

GEL LABORATORIES LLC

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

Certificate of Analysis

Company : Olsson Associates
Address : 4690 Table Mountain Drive
Suite 200
Golden, Colorado 80403

Report Date: May 26, 2015

Contact: Mr. James Hix
Project: Caerus Battlement Mesa 36-13B

Client Sample ID: 36-13B
Sample ID: 372020001
Matrix: Water
Collect Date: 28-APR-15
Receive Date: 29-APR-15
Collector: Client

Project: OLSS00115
Client ID: OLSS001

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis													
Gammaspec, Gamma, Liquid (Standard List) "As Received"													
Actinium-228		30.7	+/-29.2	28.9	+/-29.4		pCi/L		MJH1	05/05/15	0648	1475456	1
Americium-241	U	-4.17	+/-8.72	13.0	+/-8.93		pCi/L						
Antimony-124	U	-2.43	+/-8.89	17.1	+/-8.96		pCi/L						
Antimony-125	U	0.408	+/-10.3	18.9	+/-10.3		pCi/L						
Barium-133	U	0.214	+/-5.01	7.97	+/-5.01		pCi/L						
Barium-140	U	-8.94	+/-23.5	34.6	+/-23.8		pCi/L						
Beryllium-7	U	5.51	+/-32.6	60.7	+/-32.7		pCi/L						
Bismuth-212	U	78.1	+/-83.3	124	+/-90.7		pCi/L						
Bismuth-214	UI	0.00	+/-14.6	25.1	+/-25.7		pCi/L						
Cerium-139	U	0.701	+/-3.62	6.38	+/-3.64		pCi/L						
Cerium-141	U	2.79	+/-10.6	11.4	+/-10.7		pCi/L						
Cerium-144	U	-39.3	+/-30.0	40.9	+/-35.1		pCi/L						
Cesium-134	U	-0.281	+/-4.59	8.14	+/-4.59		pCi/L						
Cesium-136	U	2.07	+/-6.95	13.9	+/-7.01		pCi/L						
Cesium-137	U	3.66	+/-4.43	8.77	+/-4.74	10.0	pCi/L						
Chromium-51	U	-22.7	+/-35.1	60.8	+/-36.7		pCi/L						
Cobalt-56	U	-3.9	+/-3.61	5.86	+/-4.02		pCi/L						
Cobalt-57	U	-0.881	+/-2.94	5.07	+/-2.96		pCi/L						
Cobalt-58	U	-2.47	+/-5.21	7.38	+/-5.33		pCi/L						
Cobalt-60	U	-0.274	+/-3.97	7.62	+/-3.97		pCi/L						
Europium-152	U	-11.4	+/-15.9	20.0	+/-16.7		pCi/L						
Europium-154	U	2.39	+/-10.1	20.7	+/-10.1		pCi/L						
Europium-155	U	-3.12	+/-12.5	21.6	+/-12.6		pCi/L						
Iridium-192	U	-1.74	+/-3.69	6.50	+/-3.78		pCi/L						
Iron-59	U	5.15	+/-7.13	17.1	+/-7.54		pCi/L						
Lead-210	U	21.6	+/-70.6	125	+/-71.3		pCi/L						
Lead-212		24.4	+/-14.5	11.4	+/-14.9		pCi/L						
Lead-214		29.8	+/-12.9	15.8	+/-13.3		pCi/L						
Manganese-54	U	3.23	+/-2.81	7.46	+/-2.83		pCi/L						
Mercury-203	U	-0.926	+/-3.81	6.84	+/-3.84		pCi/L						
Neodymium-147	U	-22.3	+/-40.9	70.3	+/-42.1		pCi/L						
Neptunium-239	U	-23.6	+/-32.8	55.4	+/-34.6		pCi/L						
Niobium-94	U	1.36	+/-3.84	7.27	+/-3.89		pCi/L						
Niobium-95	U	-0.186	+/-5.35	8.49	+/-5.35		pCi/L						
Potassium-40		174	+/-75.7	69.3	+/-77.1		pCi/L						
Promethium-144	U	1.16	+/-3.91	7.35	+/-3.94		pCi/L						
Promethium-146	U	-0.477	+/-4.65	8.45	+/-4.66		pCi/L						
Radium-228		30.7	+/-29.2	28.9	+/-29.4		pCi/L						
Ruthenium-106	U	7.37	+/-34.6	65.1	+/-34.8		pCi/L						
Silver-110m	U	-3.4	+/-4.24	7.00	+/-4.51		pCi/L						

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

Certificate of Analysis

Company : Olsson Associates
Address : 4690 Table Mountain Drive
Suite 200
Golden, Colorado 80403

Report Date: May 26, 2015

Contact: Mr. James Hix
Project: Caerus Battlement Mesa 36-13B

Client Sample ID: 36-13B
Sample ID: 372020001

Project: OLSS00115
Client ID: OLSS001

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis													
Gammaspec, Gamma, Liquid (Standard List) "As Received"													
Sodium-22	U	0.838	+/-3.53	7.27	+/-3.56		pCi/L						
Thallium-208	UI	0.00	+/-9.03	6.79	+/-9.05		pCi/L						
Thorium-234	U	14.7	+/-105	132	+/-105		pCi/L						
Tin-113	U	-2.36	+/-4.85	8.48	+/-4.97		pCi/L						
Uranium-235	U	-10.9	+/-30.8	42.6	+/-31.2		pCi/L						
Uranium-238	U	14.7	+/-105	132	+/-105		pCi/L						
Yttrium-88	U	1.73	+/-3.55	8.27	+/-3.63		pCi/L						
Zinc-65	U	-3.35	+/-10.6	15.9	+/-10.7		pCi/L						
Zirconium-95	U	9.02	+/-10.2	14.0	+/-11.0		pCi/L						
Rad Gas Flow Proportional Counting													
GFPC, Gross A/B, liquid "As Received"													
Alpha	U	72.9	+/-58.6	94.1	+/-59.9	5.00	pCi/L		KXB2	05/20/15	1921	1479317	2
Beta		181	+/-44.1	65.2	+/-53.4	5.00	pCi/L						
GFPC, Sr90, liquid "As Received"													
Strontium-90	U	-0.238	+/-0.951	1.87	+/-0.952	2.00	pCi/L		KSD1	05/21/15	1522	1478361	3
Rad Liquid Scintillation Analysis													
Liquid Scint Tc99, Liquid "As Received"													
Technetium-99	U	0.848	+/-16.0	27.3	+/-16.0	50.0	pCi/L		MYM 1	05/24/15	1555	1475759	4

The following Analytical Methods were performed

Method	Description
1	EPA 901.1
2	EPA 900.0/SW846 9310
3	EPA 905.0 Modified
4	DOE EML HASL-300, Tc-02-RC Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, liquid "As Received"	1478361	84.0	(25%-125%)
Technetium-99m Tracer	Liquid Scint Tc99, Liquid "As Received"	1475759	92.6	(15%-125%)

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

Certificate of Analysis

Company : Olsson Associates
Address : 4690 Table Mountain Drive
Suite 200
Golden, Colorado 80403

Report Date: May 26, 2015

Contact: Mr. James Hix
Project: Caerus Battlement Mesa 36-13B

Client Sample ID: 36-13B
Sample ID: 372020001

Project: OLSS00115
Client ID: OLSS001

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	**Test**						**Batch ID**		**Recovery%**	**Acceptable Limits**			

Notes:

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Quality Control Data

QC Summary

Report Date: May 26, 2015

Client : **Olsson Associates**
4690 Table Mountain Drive
Suite 200
Golden, Colorado

Contact: **Mr. James Hix**

Workorder: **372020**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Rad Gamma Spec										
Batch 1475456										
QC1203310163 372020001 DUP										
Actinium-228		30.7		33.0	pCi/L	7.25		(0% - 100%)	MJH1	05/05/1510:55
	Uncert:	+/-29.2		+/-23.4						
	TPU:	+/-29.4		+/-23.7						
Americium-241	U	-4.17	U	-21.1	pCi/L	0		N/A		
	Uncert:	+/-8.72		+/-31.0						
	TPU:	+/-8.93		+/-32.7						
Antimony-124	U	-2.43	U	2.15	pCi/L	0		N/A		
	Uncert:	+/-8.89		+/-6.88						
	TPU:	+/-8.96		+/-6.95						
Antimony-125	U	0.408	U	5.97	pCi/L	0		N/A		
	Uncert:	+/-10.3		+/-7.26						
	TPU:	+/-10.3		+/-7.76						
Barium-133	U	0.214	U	0.266	pCi/L	0		N/A		
	Uncert:	+/-5.01		+/-4.45						
	TPU:	+/-5.01		+/-4.46						
Barium-140	U	-8.94	U	19.6	pCi/L	0		N/A		
	Uncert:	+/-23.5		+/-14.5						
	TPU:	+/-23.8		+/-17.1						
Beryllium-7	U	5.51	U	-21.6	pCi/L	0		N/A		
	Uncert:	+/-32.6		+/-24.8						
	TPU:	+/-32.7		+/-26.7						
Bismuth-212	U	78.1	U	9.17	pCi/L	0		N/A		
	Uncert:	+/-83.3		+/-39.1						
	TPU:	+/-90.7		+/-39.3						
Bismuth-214	UI	0.00		18.8	pCi/L	28.9		(0% - 100%)		
	Uncert:	+/-14.6		+/-8.54						
	TPU:	+/-25.7		+/-8.74						
Cerium-139	U	0.701	U	-0.173	pCi/L	0		N/A		
	Uncert:	+/-3.62		+/-2.90						
	TPU:	+/-3.64		+/-2.90						
Cerium-141	U	2.79	U	-1.82	pCi/L	0		N/A		
	Uncert:	+/-10.6		+/-6.63						
	TPU:	+/-10.7		+/-6.68						
Cerium-144	U	-39.3	U	18.6	pCi/L	0		N/A		
	Uncert:	+/-30.0		+/-20.9						
	TPU:	+/-35.1		+/-22.6						
Cesium-134	U	-0.281	UI	0.00	pCi/L	0		N/A		
	Uncert:	+/-4.59		+/-4.26						
	TPU:	+/-4.59		+/-4.29						
Cesium-136	U	2.07	U	-0.81	pCi/L	0		N/A		
	Uncert:	+/-6.95		+/-3.89						

QC Summary

Workorder: 372020

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Rad Gamma Spec										
Batch 1475456										
	TPU:	+/-7.01		+/-3.91						
Cesium-137	U	3.66	U	-0.246	pCi/L	0			N/A	
	Uncert:	+/-4.43		+/-2.95						
	TPU:	+/-4.74		+/-2.95						
Chromium-51	U	-22.7	U	-13.5	pCi/L	0			N/A	
	Uncert:	+/-35.1		+/-28.3						
	TPU:	+/-36.7		+/-29.0						
Cobalt-56	U	-3.9	U	1.80	pCi/L	0			N/A	
	Uncert:	+/-3.61		+/-2.36						
	TPU:	+/-4.02		+/-2.50						
Cobalt-57	U	-0.881	U	-0.366	pCi/L	0			N/A	
	Uncert:	+/-2.94		+/-2.83						
	TPU:	+/-2.96		+/-2.83						
Cobalt-58	U	-2.47	U	-1.34	pCi/L	0			N/A	
	Uncert:	+/-5.21		+/-2.46						
	TPU:	+/-5.33		+/-2.54						
Cobalt-60	U	-0.274	U	0.148	pCi/L	0			N/A	
	Uncert:	+/-3.97		+/-2.47						
	TPU:	+/-3.97		+/-2.47						
Europium-152	U	-11.4	U	-3.05	pCi/L	0			N/A	
	Uncert:	+/-15.9		+/-10.2						
	TPU:	+/-16.7		+/-10.3						
Europium-154	U	2.39	U	6.29	pCi/L	0			N/A	
	Uncert:	+/-10.1		+/-8.03						
	TPU:	+/-10.1		+/-8.53						
Europium-155	U	-3.12	U	7.34	pCi/L	0			N/A	
	Uncert:	+/-12.5		+/-12.7						
	TPU:	+/-12.6		+/-13.1						
Iridium-192	U	-1.74	U	-0.493	pCi/L	0			N/A	
	Uncert:	+/-3.69		+/-2.97						
	TPU:	+/-3.78		+/-2.98						
Iron-59	U	5.15	U	-3.44	pCi/L	0			N/A	
	Uncert:	+/-7.13		+/-6.83						
	TPU:	+/-7.54		+/-7.03						
Lead-210	U	21.6	U	280	pCi/L	0			N/A	
	Uncert:	+/-70.6		+/-1160						
	TPU:	+/-71.3		+/-1160						
Lead-212		24.4	UI	0.00	pCi/L	52.8		(0% - 100%)		
	Uncert:	+/-14.5		+/-10.2						
	TPU:	+/-14.9		+/-13.3						
Lead-214		29.8	U	11.1	pCi/L	57.9		(0% - 100%)		
	Uncert:	+/-12.9		+/-11.4						
	TPU:	+/-13.3		+/-12.5						
Manganese-54	U	3.23	U	2.72	pCi/L	0			N/A	
	Uncert:	+/-2.81		+/-2.89						
	TPU:	+/-2.83		+/-3.15						

QC Summary

Workorder: 372020

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Rad Gamma Spec										
Batch 1475456										
Mercury-203	U	-0.926	U	-3.45	pCi/L	0		N/A		
	Uncert:	+/-3.81		+/-3.87						
	TPU:	+/-3.84		+/-4.19						
Neodymium-147	U	-22.3	U	1.95	pCi/L	0		N/A		
	Uncert:	+/-40.9		+/-27.0						
	TPU:	+/-42.1		+/-27.0						
Neptunium-239	U	-23.6	U	10.7	pCi/L	0		N/A		
	Uncert:	+/-32.8		+/-30.5						
	TPU:	+/-34.6		+/-30.9						
Niobium-94	U	1.36	U	-0.619	pCi/L	0		N/A		
	Uncert:	+/-3.84		+/-2.56						
	TPU:	+/-3.89		+/-2.57						
Niobium-95	U	-0.186	U	-0.0355	pCi/L	0		N/A		
	Uncert:	+/-5.35		+/-2.48						
	TPU:	+/-5.35		+/-2.48						
Potassium-40		174		147	pCi/L	16.6		(0% - 100%)		
	Uncert:	+/-75.7		+/-56.3						
	TPU:	+/-77.1		+/-57.9						
Promethium-144	U	1.16	U	-0.586	pCi/L	0		N/A		
	Uncert:	+/-3.91		+/-2.30						
	TPU:	+/-3.94		+/-2.32						
Promethium-146	U	-0.477	U	-1.03	pCi/L	0		N/A		
	Uncert:	+/-4.65		+/-3.54						
	TPU:	+/-4.66		+/-3.57						
Radium-228		30.7		33.0	pCi/L	7.25		(0% - 100%)		
	Uncert:	+/-29.2		+/-23.4						
	TPU:	+/-29.4		+/-23.7						
Ruthenium-106	U	7.37	U	8.40	pCi/L	0		N/A		
	Uncert:	+/-34.6		+/-22.9						
	TPU:	+/-34.8		+/-23.3						
Silver-110m	U	-3.4	U	1.35	pCi/L	0		N/A		
	Uncert:	+/-4.24		+/-2.47						
	TPU:	+/-4.51		+/-2.55						
Sodium-22	U	0.838	U	2.24	pCi/L	0		N/A		
	Uncert:	+/-3.53		+/-2.83						
	TPU:	+/-3.56		+/-3.01						
Thallium-208	UI	0.00		6.22	pCi/L	8.77		(0% - 100%)		
	Uncert:	+/-9.03		+/-4.09						
	TPU:	+/-9.05		+/-4.13						
Thorium-234	U	14.7	U	87.1	pCi/L	0		N/A		
	Uncert:	+/-105		+/-242						
	TPU:	+/-105		+/-246						
Tin-113	U	-2.36	U	2.09	pCi/L	0		N/A		
	Uncert:	+/-4.85		+/-3.47						
	TPU:	+/-4.97		+/-3.59						
Uranium-235	U	-10.9	U	-10.4	pCi/L	0		N/A		

QC Summary

Workorder: 372020

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Rad Gamma Spec										
Batch 1475456										
	Uncert:	+/-30.8		+/-25.3						
	TPU:	+/-31.2		+/-25.7						
Uranium-238	U	14.7	U	87.1	pCi/L	0		N/A		
	Uncert:	+/-105		+/-242						
	TPU:	+/-105		+/-246						
Yttrium-88	U	1.73	U	-0.942	pCi/L	0		N/A		
	Uncert:	+/-3.55		+/-3.06						
	TPU:	+/-3.63		+/-3.09						
Zinc-65	U	-3.35	U	4.46	pCi/L	0		N/A		
	Uncert:	+/-10.6		+/-4.70						
	TPU:	+/-10.7		+/-4.75						
Zirconium-95	U	9.02	U	3.24	pCi/L	0		N/A		
	Uncert:	+/-10.2		+/-7.13						
	TPU:	+/-11.0		+/-7.29						
QC1203310164 LCS										
Actinium-228			U	85.9	pCi/L				MJH1	05/05/1507:12
	Uncert:			+/-497						
	TPU:			+/-499						
Americium-241	34400			36500	pCi/L		106	(75%-125%)		
	Uncert:			+/-1210						
	TPU:			+/-3580						
Antimony-124			U	27.7	pCi/L					
	Uncert:			+/-59.6						
	TPU:			+/-60.9						
Antimony-125			U	-97.7	pCi/L					
	Uncert:			+/-262						
	TPU:			+/-266						
Barium-133			U	50.2	pCi/L					
	Uncert:			+/-127						
	TPU:			+/-129						
Barium-140			U	-13.5	pCi/L					
	Uncert:			+/-312						
	TPU:			+/-312						
Beryllium-7			U	435	pCi/L					
	Uncert:			+/-762						
	TPU:			+/-787						
Bismuth-212			U	-0.996	pCi/L					
	Uncert:			+/-1230						
	TPU:			+/-1230						
Bismuth-214			U	130	pCi/L					
	Uncert:			+/-167						
	TPU:			+/-177						
Cerium-139			U	93.9	pCi/L					
	Uncert:			+/-80.2						
	TPU:			+/-82.6						
Cerium-141			U	-40	pCi/L					

QC Summary

Workorder: 372020

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Rad Gamma Spec										
Batch 1475456										
	Uncert:			+/-119						
	TPU:			+/-120						
Cerium-144			U	-157	pCi/L					
	Uncert:			+/-585						
	TPU:			+/-590						
Cesium-134			U	70.3	pCi/L					
	Uncert:			+/-110						
	TPU:			+/-114						
Cesium-136			U	25.5	pCi/L					
	Uncert:			+/-168						
	TPU:			+/-169						
Cesium-137	13800			14000	pCi/L		102	(75%-125%)		
	Uncert:			+/-366						
	TPU:			+/-1200						
Chromium-51			U	242	pCi/L					
	Uncert:			+/-694						
	TPU:			+/-702						
Cobalt-56			U	15.8	pCi/L					
	Uncert:			+/-104						
	TPU:			+/-104						
Cobalt-57				731	pCi/L					
	Uncert:			+/-90.8						
	TPU:			+/-113						
Cobalt-58			U	-69	pCi/L					
	Uncert:			+/-99.1						
	TPU:			+/-104						
Cobalt-60	15700			16200	pCi/L		103	(75%-125%)		
	Uncert:			+/-441						
	TPU:			+/-1330						
Europium-152			U	-183	pCi/L					
	Uncert:			+/-255						
	TPU:			+/-269						
Europium-154			U	-59.2	pCi/L					
	Uncert:			+/-142						
	TPU:			+/-145						
Europium-155			U	-30.5	pCi/L					
	Uncert:			+/-294						
	TPU:			+/-295						
Iridium-192			U	-5.77	pCi/L					
	Uncert:			+/-80.9						
	TPU:			+/-81.0						
Iron-59			U	184	pCi/L					
	Uncert:			+/-213						
	TPU:			+/-230						
Lead-210				4.14E+05	pCi/L					
	Uncert:			+/-48500						
	TPU:									

QC Summary

Workorder: 372020

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Rad Gamma Spec										
Batch 1475456										
				+/-63000						
Lead-212			U	-30.9	pCi/L					
	Uncert:			+/-149						
	TPU:			+/-150						
Lead-214			U	113	pCi/L					
	Uncert:			+/-266						
	TPU:			+/-271						
Manganese-54			U	16.7	pCi/L					
	Uncert:			+/-103						
	TPU:			+/-104						
Mercury-203			U	116	pCi/L					
	Uncert:			+/-91.5						
	TPU:			+/-91.9						
Neodymium-147			U	246	pCi/L					
	Uncert:			+/-591						
	TPU:			+/-602						
Neptunium-239			U	15.2	pCi/L					
	Uncert:			+/-839						
	TPU:			+/-839						
Niobium-94			U	29.8	pCi/L					
	Uncert:			+/-79.1						
	TPU:			+/-80.2						
Niobium-95			U	31.9	pCi/L					
	Uncert:			+/-87.7						
	TPU:			+/-88.9						
Potassium-40			U	158	pCi/L					
	Uncert:			+/-354						
	TPU:			+/-362						
Promethium-144			U	-31.1	pCi/L					
	Uncert:			+/-78.4						
	TPU:			+/-79.7						
Promethium-146			U	-64.3	pCi/L					
	Uncert:			+/-119						
	TPU:			+/-122						
Radium-228			U	85.9	pCi/L					
	Uncert:			+/-497						
	TPU:			+/-499						
Ruthenium-106			U	-248	pCi/L					
	Uncert:			+/-743						
	TPU:			+/-752						
Silver-110m				327	pCi/L					
	Uncert:			+/-110						
	TPU:			+/-186						
Sodium-22			U	-20.8	pCi/L					
	Uncert:			+/-49.8						
	TPU:			+/-50.7						

QC Summary

Workorder: 372020

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Rad Gamma Spec										
Batch 1475456										
Thallium-208			U	137	pCi/L					
	Uncert:			+/-87.1						
	TPU:			+/-107						
Thorium-234			U	-3180	pCi/L					
	Uncert:			+/-5030						
	TPU:			+/-5280						
Tin-113			U	78.2	pCi/L					
	Uncert:			+/-156						
	TPU:			+/-156						
Uranium-235			U	-127	pCi/L					
	Uncert:			+/-511						
	TPU:			+/-515						
Uranium-238			U	-3180	pCi/L					
	Uncert:			+/-5030						
	TPU:			+/-5280						
Yttrium-88			U	28.3	pCi/L					
	Uncert:			+/-39.4						
	TPU:			+/-41.5						
Zinc-65				2470	pCi/L					
	Uncert:			+/-462						
	TPU:			+/-556						
Zirconium-95			U	110	pCi/L					
	Uncert:			+/-158						
	TPU:			+/-166						
QC1203310162 MB										
Actinium-228			U	0.317	pCi/L				MJH1	05/05/1512:14
	Uncert:			+/-7.37						
	TPU:			+/-7.37						
Americium-241			U	13.5	pCi/L					
	Uncert:			+/-13.0						
	TPU:			+/-14.4						
Antimony-124			U	0.749	pCi/L					
	Uncert:			+/-3.52						
	TPU:			+/-3.54						
Antimony-125			U	2.35	pCi/L					
	Uncert:			+/-6.15						
	TPU:			+/-6.25						
Barium-133			U	-1.2	pCi/L					
	Uncert:			+/-3.07						
	TPU:			+/-3.12						
Barium-140			U	4.21	pCi/L					
	Uncert:			+/-9.79						
	TPU:			+/-9.98						
Beryllium-7			U	3.67	pCi/L					
	Uncert:			+/-19.6						
	TPU:			+/-19.6						

QC Summary

Workorder: 372020

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Rad Gamma Spec										
Batch 1475456										
Bismuth-212			U	-42.2	pCi/L					
	Uncert:			+/-38.3						
	TPU:			+/-42.9						
Bismuth-214			U	-4.92	pCi/L					
	Uncert:			+/-6.03						
	TPU:			+/-6.44						
Cerium-139			U	-0.21	pCi/L					
	Uncert:			+/-2.06						
	TPU:			+/-2.06						
Cerium-141			U	-0.846	pCi/L					
	Uncert:			+/-4.34						
	TPU:			+/-4.35						
Cerium-144			U	-9.36	pCi/L					
	Uncert:			+/-13.9						
	TPU:			+/-14.6						
Cesium-134			U	0.578	pCi/L					
	Uncert:			+/-2.21						
	TPU:			+/-2.22						
Cesium-136			U	0.805	pCi/L					
	Uncert:			+/-3.49						
	TPU:			+/-3.51						
Cesium-137			U	1.05	pCi/L					
	Uncert:			+/-2.20						
	TPU:			+/-2.25						
Chromium-51			U	0.578	pCi/L					
	Uncert:			+/-18.2						
	TPU:			+/-18.2						
Cobalt-56			U	-0.00109	pCi/L					
	Uncert:			+/-2.64						
	TPU:			+/-2.64						
Cobalt-57			U	0.693	pCi/L					
	Uncert:			+/-1.87						
	TPU:			+/-1.89						
Cobalt-58			U	-0.799	pCi/L					
	Uncert:			+/-2.11						
	TPU:			+/-2.15						
Cobalt-60			U	1.16	pCi/L					
	Uncert:			+/-2.35						
	TPU:			+/-2.40						
Europium-152			U	-4.13	pCi/L					
	Uncert:			+/-7.20						
	TPU:			+/-7.45						
Europium-154			U	0.420	pCi/L					
	Uncert:			+/-6.50						
	TPU:			+/-6.50						
Europium-155			U	-2.79	pCi/L					

QC Summary

Workorder: 372020

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Rad Gamma Spec										
Batch 1475456										
	Uncert:			+/-7.76						
	TPU:			+/-7.87						
Iridium-192			U	-0.98	pCi/L					
	Uncert:			+/-2.13						
	TPU:			+/-2.18						
Iron-59			U	1.76	pCi/L					
	Uncert:			+/-4.15						
	TPU:			+/-4.23						
Lead-210			U	105	pCi/L					
	Uncert:			+/-454						
	TPU:			+/-454						
Lead-212			U	6.41	pCi/L					
	Uncert:			+/-8.03						
	TPU:			+/-8.57						
Lead-214			U	-7.47	pCi/L					
	Uncert:			+/-6.83						
	TPU:			+/-7.65						
Manganese-54			U	-0.0155	pCi/L					
	Uncert:			+/-2.29						
	TPU:			+/-2.29						
Mercury-203			U	0.960	pCi/L					
	Uncert:			+/-2.21						
	TPU:			+/-2.26						
Neodymium-147			U	4.94	pCi/L					
	Uncert:			+/-17.0						
	TPU:			+/-17.2						
Neptunium-239			U	22.9	pCi/L					
	Uncert:			+/-20.1						
	TPU:			+/-22.6						
Niobium-94			U	1.25	pCi/L					
	Uncert:			+/-2.38						
	TPU:			+/-2.45						
Niobium-95			U	0.980	pCi/L					
	Uncert:			+/-2.24						
	TPU:			+/-2.29						
Potassium-40			U	-9.85	pCi/L					
	Uncert:			+/-30.0						
	TPU:			+/-30.4						
Promethium-144			U	1.18	pCi/L					
	Uncert:			+/-2.63						
	TPU:			+/-2.69						
Promethium-146			U	-0.715	pCi/L					
	Uncert:			+/-3.57						
	TPU:			+/-3.58						
Radium-228			U	0.317	pCi/L					
	Uncert:			+/-7.37						
	TPU:									

QC Summary

Workorder: 372020

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Rad Gamma Spec										
Batch 1475456										
				+/-7.37						
Ruthenium-106			U	-9.61	pCi/L					
	Uncert:			+/-22.0						
	TPU:			+/-22.4						
Silver-110m			U	-0.154	pCi/L					
	Uncert:			+/-1.93						
	TPU:			+/-1.93						
Sodium-22			U	0.147	pCi/L					
	Uncert:			+/-2.28						
	TPU:			+/-2.28						
Thallium-208			U	1.25	pCi/L					
	Uncert:			+/-3.00						
	TPU:			+/-3.06						
Thorium-234			U	59.2	pCi/L					
	Uncert:			+/-132						
	TPU:			+/-133						
Tin-113			U	0.711	pCi/L					
	Uncert:			+/-3.07						
	TPU:			+/-3.09						
Uranium-235			U	-11.6	pCi/L					
	Uncert:			+/-17.9						
	TPU:			+/-18.7						
Uranium-238			U	59.2	pCi/L					
	Uncert:			+/-132						
	TPU:			+/-133						
Yttrium-88			U	0.754	pCi/L					
	Uncert:			+/-1.96						
	TPU:			+/-1.99						
Zinc-65			U	0.542	pCi/L					
	Uncert:			+/-4.28						
	TPU:			+/-4.29						
Zirconium-95			U	-0.838	pCi/L					
	Uncert:			+/-3.58						
	TPU:			+/-3.60						
Rad Gas Flow										
Batch 1478361										
QC1203317700 372020001 DUP										
Strontium-90	U	-0.238	U	-0.533	pCi/L	0		N/A	KSD1	05/21/1515:22
	Uncert:	+/-0.951		+/-0.589						
	TPU:	+/-0.952		+/-0.589						
QC1203317702 LCS										
Strontium-90	73.0			76.9	pCi/L		105	(75%-125%)	KSD1	05/21/1515:21
	Uncert:			+/-4.88						
	TPU:			+/-13.3						
QC1203317699 MB										
Strontium-90			U	-0.895	pCi/L				KSD1	05/21/1515:22

QC Summary

Workorder: **372020**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Rad Gas Flow										
Batch 1478361										
	Uncert:			+/-0.511						
	TPU:			+/-0.511						
QC1203317701 372020001 MS										
Strontium-90	73.1 U	-0.238		24.9	pCi/L		34.1 *	(75%-125%)	KSD1	05/21/1515:22
	Uncert:	+/-0.951		+/-2.79						
	TPU:	+/-0.952		+/-4.81						
Batch 1479317										
QC1203320254 372020001 DUP										
Alpha	U	72.9	U	-86.1	pCi/L	0		N/A	KXB2	05/20/1519:20
	Uncert:	+/-58.6		+/-76.5						
	TPU:	+/-59.9		+/-76.5						
Beta		181		203	pCi/L	11.7		(0% - 100%)		
	Uncert:	+/-44.1		+/-47.6						
	TPU:	+/-53.4		+/-59.2						
QC1203320257 LCS										
Alpha	4050			4420	pCi/L		109	(75%-125%)	KXB2	05/20/1517:47
	Uncert:			+/-400						
	TPU:			+/-832						
Beta	14600			16800	pCi/L		115	(75%-125%)		
	Uncert:			+/-608						
	TPU:			+/-2840						
QC1203320253 MB										
Alpha			U	-20.7	pCi/L				KXB2	05/20/1519:21
	Uncert:			+/-25.3						
	TPU:			+/-25.3						
Beta			U	-47.7	pCi/L					
	Uncert:			+/-44.1						
	TPU:			+/-44.1						
QC1203320255 372020001 MS										
Alpha	12200 U	72.9		11600	pCi/L		95.2	(75%-125%)	KXB2	05/21/1509:41
	Uncert:	+/-58.6		+/-1510						
	TPU:	+/-59.9		+/-2440						
Beta	43800	181		50600	pCi/L		115	(75%-125%)		
	Uncert:	+/-44.1		+/-1850						
	TPU:	+/-53.4		+/-8470						
QC1203320256 372020001 MSD										
Alpha	12200 U	72.9		14600	pCi/L	23.3 *	120	(0%-20%)	KXB2	05/20/1517:47
	Uncert:	+/-58.6		+/-1800						
	TPU:	+/-59.9		+/-3100						
Beta	43800	181		48500	pCi/L	4.32	110	(0%-20%)		
	Uncert:	+/-44.1		+/-1820						
	TPU:	+/-53.4		+/-8220						
Rad Liquid Scintillation										
Batch 1475759										
QC1203310932 372020001 DUP										

QC Summary

Workorder: 372020

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Rad Liquid Scintillation										
Batch 1475759										
Technetium-99	U	0.848	U	5.72	pCi/L	0			N/AMYM1	05/24/1518:02
	Uncert:	+/-16.0		+/-19.2						
	TPU:	+/-16.0		+/-19.2						
QC1203310934 LCS										
Technetium-99	861			851	pCi/L		98.9	(75%-125%)	MYM1	05/24/1520:10
	Uncert:			+/-25.0						
	TPU:			+/-97.7						
QC1203310931 MB										
Technetium-99			U	-3.52	pCi/L				MYM1	05/24/1516:59
	Uncert:			+/-11.7						
	TPU:			+/-11.7						
QC1203310933 372020001 MS										
Technetium-99	861 U	0.848		831	pCi/L		96.5	(75%-125%)	MYM1	05/24/1519:05
	Uncert:	+/-16.0		+/-27.7						
	TPU:	+/-16.0		+/-96.2						

Notes:

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

The Qualifiers in this report are defined as follows:

**	Analyte is a Tracer compound
<	Result is less than value reported
>	Result is greater than value reported
BD	Results are either below the MDC or tracer recovery is low
FA	Failed analysis.
H	Analytical holding time was exceeded
J	Value is estimated
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
M	M if above MDC and less than LLD
M	REMP Result > MDC/CL and < RDL
N/A	RPD or %Recovery limits do not apply.
N1	See case narrative
ND	Analyte concentration is not detected above the detection limit
NJ	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
Q	One or more quality control criteria have not been met. Refer to the applicable narrative or DER.
R	Sample results are rejected
U	Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
UI	Gamma Spectroscopy--Uncertain identification
UJ	Gamma Spectroscopy--Uncertain identification
UL	Not considered detected. The associated number is the reported concentration, which may be inaccurate due to a low bias.
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
Y	Other specific qualifiers were required to properly define the results. Consult case narrative.
^	RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.

QC Summary

Workorder: **372020**

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

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 or %RPD not applicable.
** Indicates analyte is a surrogate/tracer compound.
^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptence 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.
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.

Gamma Spectroscopy Raw Data

Radiochemistry Batch Checklist

18-May-2015

Batch# 1475456 Product: 86/OLSS Date: 5/18/15

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

Primary Review Performed By: JMeicleau 5/18/15

Secondary Review Performed By: SC 5/20/15

5/27/15

Gamma Spec Queue Sheet

04/30/2015

Batch #:1475456 Analyst: MJH1 First Client DueDate05/27/2015 Internal Due Date: 05/16/2015

Gamma LCS Isotope: Mixed Gamma LCS Code: 1604 Expiration Date: 4-1-38 Vol: 1.0SMP

Initials: MJH Prep Date: 5-4-15 Library: LIQUID Balance ID: 40109033

Sample ID	Client Description / Container ID	Type	Hazard Code	Client	Matrix	Collect Date	Geometry	Wet/Dry Aliquot (W/D) g / F	Detector	Sealing Date/Time (if Applicable)
372020001-1	36-13B	SAMPLE		OLSS001	WATER	28-APR-15 10:00:00	RR 2LMB	7.00	41	
1203310162-1	MB	MB		QC ACCOUNT	WATER	5-4-15	RR	2.00	14	
1203310163-1	DUP 36-13B(372020001)	DUP		QC ACCOUNT	WATER	28-APR-15 10:00:00	RR	2.00	32	
1203310164-1	LCS	LCS		QC ACCOUNT	WATER	5-4-15	RR 2LMB	2.00	6	

MJH 5-4-15

GEL Laboratories LLC, Radiochemistry Division

Data Reviewed By: JMeridieau 5/18/15

VAX/VMS Nuclide Identification Report Generated 5-MAY-2015 08:49:01.58

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*************************************************************************
*                          GEL Laboratories LLC                         *
*                            2040 Savage Road                           *
*                          Charleston, SC 29407                         *
*************************************************************************
Configuration    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G372020001.CNF;1
Background file  : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM41.CNF;63
                                       Background date  : 3-MAY-2015 09:11:00.
Sample date      : 28-APR-2015 10:00:00 Acquisition date : 5-MAY-2015 06:48:39.
Sample ID        : G372020001           Sample quantity  : 2.00000E+00 LITER
Detector name    : GAM41                Detector geometry: 2LMB
Elapsed live time: 0 02:00:00.00        Elapsed real time: 0 02:00:00.49  0.0%
Energy tolerance : 1.50000 keV          Analyst Initials : MJH1
Abundance limit  : 75.00000             Sensitivity      : 3.00000
Batch ID         : 1475456              Detector SN#     :
Matrix Spike ID  :                      LCS ID           : 1604
*************************************************************************
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	54.35*	53	256	3.42	108.29	101	12	7.36E-03	63.4	
2	1	57.86	40	75	1.73	115.31	113	31	5.55E-03	34.3	2.04E+00
3	1	63.04*	9	204	1.74	125.68	113	31	1.20E-03	362.9	
4	1	66.54	61	218	1.75	132.68	113	31	8.45E-03	48.7	
5	1	74.85*	33	265	1.76	149.32	144	14	4.54E-03	106.0	2.08E+00
6	1	77.03*	63	221	1.46	153.68	144	14	8.74E-03	46.9	
7	0	92.97*	4	350	1.50	185.58	177	17	5.82E-04	*****	
8	0	140.14	30	151	1.35	279.99	274	10	4.16E-03	79.1	
9	0	149.98	34	89	1.82	299.69	297	8	4.75E-03	50.9	
10	0	185.56*	35	132	1.60	370.91	366	12	4.92E-03	74.8	
11	0	239.08*	102	155	1.78	478.02	471	16	1.42E-02	30.3	
12	0	295.82	77	56	1.28	591.58	586	11	1.06E-02	22.3	
13	0	338.91*	20	65	1.51	677.81	671	10	2.72E-03	86.4	
14	0	352.19*	78	51	1.46	704.39	698	11	1.08E-02	22.0	
15	0	544.66	24	24	1.88	1089.58	1081	14	3.27E-03	49.1	
16	0	584.34*	34	52	1.93	1169.00	1161	19	4.75E-03	55.6	
17	0	609.48	99	30	2.05	1219.32	1210	17	1.38E-02	16.1	
18	0	728.30	21	24	3.01	1457.10	1449	14	2.92E-03	54.5	
19	0	757.64	18	18	1.70	1515.83	1509	15	2.48E-03	57.7	
20	0	806.14	28	22	3.02	1612.87	1604	21	3.85E-03	45.7	
21	0	834.55	12	5	1.21	1669.74	1665	9	1.60E-03	44.4	
22	0	911.65*	27	22	2.61	1824.02	1815	18	3.69E-03	48.6	
23	0	969.05	23	5	1.77	1938.89	1935	9	3.12E-03	27.1	
24	0	1017.80	26	4	5.82	2036.44	2027	18	3.56E-03	27.6	
25	5	1028.30	11	2	1.97	2057.45	2055	15	1.52E-03	34.6	2.01E-01
26	5	1032.28	17	1	2.72	2065.42	2055	15	2.32E-03	26.9	
27	0	1097.83	8	6	1.05	2196.60	2189	11	1.04E-03	70.7	
28	0	1100.89	8	6	1.41	2202.72	2199	10	1.09E-03	65.5	
29	0	1109.35	9	2	0.70	2219.64	2216	8	1.30E-03	41.4	
30	0	1166.06	13	3	0.63	2333.12	2327	12	1.85E-03	37.6	
31	0	1321.77	9	4	3.72	2644.71	2634	15	1.26E-03	57.6	
32	0	1367.79	14	0	0.62	2736.79	2731	13	1.94E-03	26.7	
33	0	1461.24*	42	9	2.30	2923.79	2914	15	5.87E-03	22.2	
34	0	1637.77	11	0	0.83	3277.00	3273	9	1.53E-03	30.2	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	1723.16	5	2	0.55	3447.86	3441	10	6.45E-04	78.4	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 5-MAY-2015 08:49:03

Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G372020001.CNF;1
Analyses by   : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title   : MJH1
Sample date   : 28-APR-2015 10:00:00 Acquisition date : 5-MAY-2015 06:48:39
Sample ID   : G372020001   Sample quantity : 2.0000 LITER
Sample type   : LIQUID   Sample geometry :
Detector name   : GAMMA41   Detector geometry: 2LMB
Elapsed live time: 0 02:00:00.00   Elapsed real time: 0 02:00:00.49   0.0%
Energy tolerance :   1.50 keV   Half life ratio :   10.00
Errors propagated: No   Systematic Error :   0.00 %
Efficiency type : Empirical   Efficiencies at : Peak Energy
Abundance limit :   75.00

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/LITER	Decay Corr pCi/LITER	2-Sigma %Error	Status
K-40	1460.82	10.66*	4.278E-01	1.738E+02	1.738E+02	44.43	OK
MN-54	834.85	99.98*	6.788E-01	3.180E+00	3.229E+00	88.89	OK
CU-67	91.27	7.00	2.842E+00	----- Line Not Found		-----	Absent
	93.31	16.10	2.829E+00	1.728E+00	1.109E+012	247.44	OK
	184.58	48.70*	2.125E+00	6.427E+00	4.124E+01	149.51	OK
RE-183	57.98	34.30*	2.985E+00	7.329E+00	7.848E+00	68.60	OK
	59.32	58.90	2.985E+00	4.268E+00	4.570E+00	68.60	OK
	67.24	12.90	2.978E+00	2.971E+01	3.182E+01	97.32	OK
	162.33	23.30	2.283E+00	----- Line Not Found		-----	Absent
TL-208	277.37	6.60	1.645E+00	----- Line Not Found		-----	Absent
	583.19	85.00*	9.182E-01	8.231E+00	8.288E+00	111.14	OK
	860.56	12.50	6.614E-01	----- Line Not Found		-----	Absent
PB-212	74.82	10.28	2.946E+00	2.024E+01	2.038E+01	211.99	OK
	77.11	17.10	2.935E+00	2.355E+01	2.371E+01	93.72	OK
	238.63	43.60*	1.820E+00	2.419E+01	2.435E+01	60.61	OK
	300.09	3.30	1.556E+00	----- Line Not Found		-----	Absent
PB-214	74.82	5.80	2.946E+00	3.588E+01	3.588E+01	211.99	OK
	77.11	9.70	2.935E+00	4.151E+01	4.151E+01	93.72	OK
	87.09	3.41	2.872E+00	----- Line Not Found		-----	Absent
	242.00	7.25	1.805E+00	----- Line Not Found		-----	Absent
	295.22	18.42	1.572E+00	4.967E+01	4.967E+01	44.59	OK
	351.93	35.60*	1.381E+00	2.979E+01	2.979E+01	44.00	OK
RA-226	186.21	3.59*	2.125E+00	8.719E+01	8.719E+01	149.51	OK
AC-228	338.32	11.27	1.422E+00	2.293E+01	2.298E+01	172.81	OK
	911.20	25.80*	6.299E-01	3.065E+01	3.072E+01	97.12	OK
	968.97	15.80	5.982E-01	4.468E+01	4.478E+01	54.16	OK
RA-228	338.32	11.27	1.422E+00	2.293E+01	2.298E+01	172.81	OK
	911.20	25.80*	6.299E-01	3.065E+01	3.072E+01	97.12	OK
	968.97	15.80	5.982E-01	4.468E+01	4.478E+01	54.16	OK
TH-228	74.82	10.28	2.946E+00	2.024E+01	2.038E+01	211.99	OK
	77.11	17.10	2.935E+00	2.355E+01	2.371E+01	93.72	OK
	238.63	43.60*	1.820E+00	2.419E+01	2.435E+01	60.61	OK
	300.09	3.30	1.556E+00	----- Line Not Found		-----	Absent
TH-230	67.67	0.38*	2.978E+00	1.009E+03	1.009E+03	97.32	OK
TH-232	63.81	0.26*	2.985E+00	2.093E+02	2.093E+02	725.82	OK
	140.88	0.02	2.450E+00	1.148E+04	1.148E+04	158.24	OK
TH-234	63.29	3.70*	2.985E+00	1.471E+01	1.471E+01	725.82	OK
	92.59	4.23	2.829E+00	6.576E+00	6.576E+002	247.44	OK
U-234	53.20	0.12*	2.976E+00	2.787E+03	2.787E+03	126.74	OK
	120.90	0.04	2.605E+00	----- Line Not Found		-----	Absent
U-238	63.29	3.70*	2.985E+00	1.471E+01	1.471E+01	725.82	OK
	92.59	4.23	2.829E+00	6.576E+00	6.576E+002	247.44	OK
AM-243	43.53	5.90	2.886E+00	----- Line Not Found		-----	Absent
	74.66	67.20*	2.946E+00	3.097E+00	3.097E+00	211.99	OK

Flag: "*" = Keyline

VAX/VMS Nuclide Identification Report Generated 05-MAY-2015 08:49:04.09

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration	: DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G372020001.CNF;1		
Acquisition date	: 5-MAY-2015 06:48:39	Sensitivity	: 3.000
Detector ID	: GAM41	Energy tolerance	: 1.500
Elapsed live time	: 0 02:00:00.00	Abundance limit	: 75.000
Elapsed real time	: 0 02:00:00.49	Half life ratio	: *****
Sample date	: 28-APR-2015 10:00:00	Analyst initials	: MJH1
Sample ID	: G372020001	Sample Quantity	: 2.0000E+00 LITER
Batch Number	: 1475456	Wet Weight	: 0.00000
Wet wt corr	: 1.00000	Dry Weight	: 0.00000
Nuclide Library	: LIQUID.NLB;4		

CALIBRATION INFORMATION

Eff. Cal. date	: 1-APR-2015 08:41:58	Eff. Geometry	: 2LMB
Eff. File	: DKA100:[CANBERRA.GAMMA]EFF_GAM41_2LMB.CNF;2		

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/LITER)	Cnt uncert (1.96-sigma)	MDA (pCi/LITER)
K-40	1.738E+02	7.569E+01	6.928E+01
MN-54	3.229E+00	2.813E+00	7.459E+00
CU-67	4.124E+01	6.042E+01	6.692E+01
RE-183	7.848E+00	5.276E+00	1.568E+01
TL-208	8.288E+00	9.027E+00	6.788E+00
PB-212	2.435E+01	1.447E+01	1.137E+01
PB-214	2.979E+01	1.285E+01	1.579E+01
RA-226	8.719E+01	1.277E+02	1.411E+02
AC-228	3.072E+01	2.924E+01	2.890E+01
RA-228	3.072E+01	2.924E+01	2.890E+01
TH-228	2.435E+01	1.447E+01	1.137E+01
TH-230	1.009E+03	9.621E+02	1.296E+03
TH-232	2.093E+02	1.489E+03	1.884E+03
TH-234	1.471E+01	1.046E+02	1.323E+02
U-234	2.787E+03	3.461E+03	3.725E+03
U-238	1.471E+01	1.046E+02	1.323E+02
AM-243	3.097E+00	6.434E+00	6.715E+00

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/LITER)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/LITER)	
BE-7	5.509E+00	3.259E+01	6.066E+01	NOT IDENT.
NA-22	8.382E-01	3.534E+00	7.266E+00	NOT IDENT.
NA-24	0.000E+00	6.491E+03	0.000E+00	SHORT HLIF
AL-26	2.723E+00	4.801E+00	1.039E+01	NOT IDENT.
SC-46	4.035E-01	3.162E+00	6.330E+00	NOT IDENT.
V-48	-6.495E-01	5.221E+00	9.819E+00	NOT IDENT.
CR-51	-2.265E+01	3.506E+01	6.081E+01	NOT IDENT.
MN-52	2.411E-01	9.763E+00	1.902E+01	NOT IDENT.
CO-56	-3.899E+00	3.605E+00	5.856E+00	NOT IDENT.
CO-57	-8.810E-01	2.935E+00	5.069E+00	NOT IDENT.
CO-58	-2.468E+00	5.208E+00	7.384E+00	NOT IDENT.
FE-59	5.147E+00	7.134E+00	1.714E+01	FAIL ABUN
CO-60	-2.740E-01	3.971E+00	7.621E+00	NOT IDENT.

ZN-65	-3.353E+00	1.055E+01	1.593E+01	NOT IDENT.
GE-68	6.005E+00	1.340E+02	2.564E+02	NOT IDENT.
AS-74	4.488E+00	8.774E+00	1.631E+01	NOT IDENT.
SE-75	3.891E-01	5.271E+00	9.220E+00	NOT IDENT.
BR-77	0.000E+00	2.034E+02	2.476E+02	FAIL ABUN
SR-82	7.883E+00	3.500E+01	6.479E+01	NOT IDENT.
RB-83	-3.340E+00	8.168E+00	1.427E+01	NOT IDENT.
RB-84	-2.807E+00	5.924E+00	1.064E+01	NOT IDENT.
KR-85	6.534E+02	1.205E+03	2.209E+03	NOT IDENT.
SR-85	3.147E+00	5.805E+00	1.064E+01	NOT IDENT.
RB-86	-2.152E+00	6.421E+01	1.214E+02	NOT IDENT.
Y-88	1.731E+00	3.545E+00	8.271E+00	NOT IDENT.
Y-91	-1.747E+03	1.987E+03	3.266E+03	NOT IDENT.
NB-94	1.355E+00	3.836E+00	7.266E+00	NOT IDENT.
NB-95	-1.861E-01	5.348E+00	8.487E+00	NOT IDENT.
NB-95M	0.000E+00	1.468E+01	2.610E+01	NOT IDENT.
ZR-95	9.022E+00	1.020E+01	1.397E+01	FAIL ABUN
MO-99	1.603E+01	1.595E+02	2.987E+02	FAIL ABUN
TC-99M	0.000E+00	7.801E+08	0.000E+00	SHORT HLIF
RH-101	3.455E+00	4.009E+00	7.137E+00	NOT IDENT.
RH-102M	1.545E+00	3.142E+00	6.053E+00	NOT IDENT.
RU-103	-1.832E+00	4.796E+00	8.369E+00	FAIL ABUN
RH-106	7.374E+00	3.464E+01	6.506E+01	NOT IDENT.
RU-106	7.374E+00	3.464E+01	6.506E+01	NOT IDENT.
AG-108M	1.351E+00	3.508E+00	6.609E+00	NOT IDENT.
CD-109	-8.795E+00	9.265E+01	1.398E+02	NOT IDENT.
AG-110M	-3.401E+00	4.237E+00	6.998E+00	NOT IDENT.
SN-113	-2.357E+00	4.848E+00	8.481E+00	NOT IDENT.
IN-114M	-1.858E+00	2.339E+01	3.493E+01	NOT IDENT.
CD-115	8.172E+00	1.044E+02	1.920E+02	NOT IDENT.
SN-117M	-4.336E-01	4.618E+00	8.009E+00	NOT IDENT.
I-123	0.000E+00	2.015E+04	0.000E+00	SHORT HLIF
TE-123M	-1.835E-01	3.490E+00	6.067E+00	NOT IDENT.
SB-124	-2.433E+00	8.885E+00	1.712E+01	NOT IDENT.
SB-125	4.082E-01	1.031E+01	1.891E+01	NOT IDENT.
TE-125M	-2.481E+02	1.082E+03	1.873E+03	NOT IDENT.
I-126	8.204E+00	1.730E+01	3.294E+01	NOT IDENT.
SB-126	2.032E+00	1.098E+01	1.790E+01	NOT IDENT.
SN-126	3.836E-01	9.147E+00	1.391E+01	FAIL ABUN
SB-127	1.982E+01	3.439E+01	6.699E+01	NOT IDENT.
I-131	-4.565E+00	6.705E+00	1.155E+01	NOT IDENT.
I-132	0.000E+00	1.858E+22	0.000E+00	SHORT HLIF
TE-132	-8.074E+00	1.385E+01	2.316E+01	NOT IDENT.
BA-133	2.143E-01	5.009E+00	7.972E+00	NOT IDENT.
I-133	-5.673E+02	1.005E+03	1.726E+03	NOT IDENT.
CS-134	-2.812E-01	4.587E+00	8.140E+00	NOT IDENT.
CS-135	1.735E+01	1.861E+01	3.455E+01	NOT IDENT.
I-135	0.000E+00	5.404E+08	0.000E+00	SHORT HLIF
CS-136	2.065E+00	6.945E+00	1.389E+01	NOT IDENT.
BA-137M	3.460E+00	4.194E+00	8.300E+00	NOT IDENT.
CS-137	3.655E+00	4.431E+00	8.768E+00	NOT IDENT.
CE-139	7.013E-01	3.623E+00	6.384E+00	NOT IDENT.
BA-140	-8.935E+00	2.347E+01	3.461E+01	NOT IDENT.
LA-140	4.584E-01	6.942E+00	1.391E+01	NOT IDENT.
CE-141	2.788E+00	1.062E+01	1.142E+01	NOT IDENT.
CE-143	4.470E+02	2.765E+02	4.931E+02	FAIL ABUN
CE-144	-3.929E+01	3.002E+01	4.086E+01	NOT IDENT.
PM-144	1.164E+00	3.905E+00	7.348E+00	NOT IDENT.
PR-144	8.530E+01	2.908E+02	5.470E+02	NOT IDENT.
PM-146	-4.765E-01	4.654E+00	8.447E+00	NOT IDENT.
ND-147	-2.228E+01	4.085E+01	7.033E+01	NOT IDENT.
PM-147	9.587E+03	8.763E+04	1.547E+05	NOT IDENT.
PM-149	9.860E+01	8.183E+02	1.501E+03	NOT IDENT.
EU-152	-1.141E+01	1.586E+01	1.999E+01	NOT IDENT.
GD-153	1.018E+00	1.028E+01	1.576E+01	NOT IDENT.
EU-154	2.385E+00	1.005E+01	2.067E+01	NOT IDENT.
EU-155	-3.121E+00	1.248E+01	2.161E+01	NOT IDENT.
HO-166M	8.103E+00	7.586E+00	1.526E+01	FAIL ABUN
TM-171	3.412E+02	6.512E+02	1.033E+03	FAIL ABUN
LU-176	-1.431E+00	3.017E+00	5.313E+00	NOT IDENT.
HF-181	-7.190E-01	4.311E+00	7.768E+00	FAIL ABUN
W-181	8.172E+00	5.494E+00	1.473E+01	FAIL ABUN
TA-182	8.029E+00	1.729E+01	3.502E+01	FAIL ABUN
RE-184	7.706E+00	1.372E+01	2.454E+01	NOT IDENT.
RE-188	-6.128E-01	2.194E+01	3.302E+01	FAIL ABUN
W-188	-2.440E+02	8.987E+02	1.373E+03	FAIL ABUN
OS-191	1.091E+01	1.447E+01	2.559E+01	FAIL ABUN
IR-192	-1.741E+00	3.693E+00	6.501E+00	FAIL ABUN

HG-203	-9.264E-01	3.814E+00	6.840E+00	NOT IDENT.
BI-207	4.506E+00	5.150E+00	1.109E+01	FAIL ABUN
PB-210	2.156E+01	7.058E+01	1.245E+02	NOT IDENT.
BI-211	0.000E+00	3.542E+01	6.156E+01	FAIL ABUN
PB-211	4.830E+01	8.209E+01	1.569E+02	NOT IDENT.
BI-212	7.807E+01	8.332E+01	1.244E+02	FAIL ABUN
BI-213	-3.137E+00	1.174E+01	2.095E+01	NOT IDENT.
BI-214	0.000E+00	1.458E+01	2.512E+01	FAIL ABUN
RN-219	2.023E+01	4.560E+01	8.644E+01	NOT IDENT.
FR-221	-7.647E+00	2.510E+01	4.283E+01	NOT IDENT.
RA-223	2.476E+01	7.378E+01	1.377E+02	FAIL ABUN
RA-224	0.000E+00	9.630E+01	1.744E+02	NOT IDENT.
AC-227	1.343E+01	3.196E+01	5.715E+01	NOT IDENT.
TH-227	1.343E+01	3.196E+01	5.715E+01	NOT IDENT.
TH-229	-5.310E+00	6.813E+01	1.147E+02	NOT IDENT.
PA-231	-1.145E+00	5.893E+01	9.280E+01	NOT IDENT.
TH-231	-3.337E+01	4.710E+01	7.428E+01	NOT IDENT.
PA-233	7.948E-02	7.495E+00	1.368E+01	NOT IDENT.
PA-234	9.598E-01	3.394E+01	6.465E+01	NOT IDENT.
PA-234M	-9.892E+01	5.201E+02	9.896E+02	NOT IDENT.
U-235	-1.089E+01	3.084E+01	4.255E+01	FAIL ABUN
NP-237	7.948E-02	7.495E+00	1.368E+01	NOT IDENT.
NP-238	-1.385E+02	1.464E+02	2.410E+02	FAIL ABUN
NP-239	-2.358E+01	3.281E+01	5.536E+01	NOT IDENT.
AM-241	-4.171E+00	8.720E+00	1.299E+01	NOT IDENT.
AM-242	-2.053E+00	8.059E+01	1.225E+02	NOT IDENT.
CM-243	3.214E+00	1.241E+01	2.204E+01	NOT IDENT.
CM-247	2.689E+00	4.224E+00	8.120E+00	NOT IDENT.
CF-249	3.791E-01	4.547E+00	8.361E+00	NOT IDENT.
CF-251	-1.726E+01	1.624E+01	2.648E+01	NOT IDENT.
CF-252	-6.884E+03	2.320E+04	3.456E+04	NOT IDENT.
ANH-511	-3.251E+00	5.852E+00	1.142E+01	NOT IDENT.

VAX/VMS Nuclide Identification Report Generated 5-MAY-2015 08:49:00.08

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.11	71	231	1.40	91.80	87	10	9.80E-03	42.0	
2	0	54.35	63	256	3.42	108.29	101	12	8.79E-03	52.2	
3	1	57.86	40	75	1.73	115.31	113	31	5.55E-03	34.3	2.04E+00
4	1	63.04	168	204	1.74	125.68	113	31	2.34E-02	18.0	
5	1	66.54	61	218	1.75	132.68	113	31	8.45E-03	48.7	
6	1	74.85	71	265	1.76	149.32	144	14	9.89E-03	46.7	2.08E+00
7	1	77.03	79	221	1.46	153.68	144	14	1.10E-02	36.2	
8	0	92.97	246	350	1.50	185.58	177	17	3.42E-02	18.7	
9	0	140.14	30	151	1.35	279.99	274	10	4.16E-03	79.1	
10	0	149.98	34	89	1.82	299.69	297	8	4.75E-03	50.9	
11	0	185.56	127	132	1.60	370.91	366	12	1.76E-02	20.2	
12	0	239.08	135	155	1.78	478.02	471	16	1.88E-02	22.3	
13	0	295.82	77	56	1.28	591.58	586	11	1.06E-02	22.3	
14	0	338.91	29	65	1.51	677.81	671	10	4.08E-03	54.5	
15	0	352.19	84	51	1.46	704.39	698	11	1.17E-02	19.8	
16	0	511.50	91	88	2.68	1023.22	1016	16	1.26E-02	25.3	
17	0	544.66	24	24	1.88	1089.58	1081	14	3.27E-03	49.1	
18	0	584.34	46	52	1.93	1169.00	1161	19	6.45E-03	40.1	
19	0	609.48	99	30	2.05	1219.32	1210	17	1.38E-02	16.1	
20	0	728.30	21	24	3.01	1457.10	1449	14	2.92E-03	54.5	
21	0	757.64	18	18	1.70	1515.83	1509	15	2.48E-03	57.7	
22	0	806.14	28	22	3.02	1612.87	1604	21	3.85E-03	45.7	
23	0	834.55	12	5	1.21	1669.74	1665	9	1.60E-03	44.4	
24	0	911.65	33	22	2.61	1824.02	1815	18	4.58E-03	37.9	
25	0	969.05	23	5	1.77	1938.89	1935	9	3.12E-03	27.1	
26	0	1017.80	26	4	5.82	2036.44	2027	18	3.56E-03	27.6	
27	5	1028.30	11	2	1.97	2057.45	2055	15	1.52E-03	34.6	2.01E-01
28	5	1032.28	17	1	2.72	2065.42	2055	15	2.32E-03	26.9	
29	0	1097.83	8	6	1.05	2196.60	2189	11	1.04E-03	70.7	
30	0	1100.89	8	6	1.41	2202.72	2199	10	1.09E-03	65.5	
31	0	1109.35	9	2	0.70	2219.64	2216	8	1.30E-03	41.4	
32	0	1166.06	13	3	0.63	2333.12	2327	12	1.85E-03	37.6	
33	0	1321.77	9	4	3.72	2644.71	2634	15	1.26E-03	57.6	
34	0	1367.79	14	0	0.62	2736.79	2731	13	1.94E-03	26.7	
35	0	1461.24	46	9	2.30	2923.79	2914	15	6.41E-03	19.7	
36	0	1637.77	11	0	0.83	3277.00	3273	9	1.53E-03	30.2	
37	0	1723.16	5	2	0.55	3447.86	3441	10	6.45E-04	78.4	

VAX/VMS Nuclide Identification Report Generated 5-MAY-2015 08:49:02.15

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/LITER	Decay Corr pCi/LITER	2-Sigma %Error
K-40	1460.82	42	10.66*	4.278E-01	1.738E+02	1.738E+02	44.43
MN-54	834.85	12	99.98*	6.788E-01	3.180E+00	3.229E+00	88.89
CU-67	91.27	------	7.00	2.842E+00	------ Line Not Found		------
	93.31	4	16.10	2.829E+00	1.728E+00	1.109E+01	2247.44
	184.58	35	48.70*	2.125E+00	6.427E+00	4.124E+01	149.51
RE-183	57.98	40	34.30*	2.985E+00	7.329E+00	7.848E+00	68.60
	59.32	40	58.90	2.985E+00	4.268E+00	4.570E+00	68.60
	67.24	61	12.90	2.978E+00	2.971E+01	3.182E+01	97.32
	162.33	------	23.30	2.283E+00	------ Line Not Found		------
TL-208	277.37	------	6.60	1.645E+00	------ Line Not Found		------
	583.19	34	85.00*	9.182E-01	8.231E+00	8.288E+00	111.14
	860.56	------	12.50	6.614E-01	------ Line Not Found		------
BI-211	72.87	------	1.23	2.955E+00	------ Line Not Found		------
	351.06	78	12.92*	1.381E+00	8.208E+01	8.213E+01	44.00
PB-212	74.82	33	10.28	2.946E+00	2.024E+01	2.038E+01	211.99
	77.11	63	17.10	2.935E+00	2.355E+01	2.371E+01	93.72
	238.63	102	43.60*	1.820E+00	2.419E+01	2.435E+01	60.61
	300.09	------	3.30	1.556E+00	------ Line Not Found		------
PB-214	74.82	33	5.80	2.946E+00	3.588E+01	3.588E+01	211.99
	77.11	63	9.70	2.935E+00	4.151E+01	4.151E+01	93.72
	87.09	------	3.41	2.872E+00	------ Line Not Found		------
	242.00	------	7.25	1.805E+00	------ Line Not Found		------
	295.22	77	18.42	1.572E+00	4.967E+01	4.967E+01	44.59
	351.93	78	35.60*	1.381E+00	2.979E+01	2.979E+01	44.00
RA-226	186.21	35	3.59*	2.125E+00	8.719E+01	8.719E+01	149.51
AC-228	338.32	20	11.27	1.422E+00	2.293E+01	2.298E+01	172.81
	911.20	27	25.80*	6.299E-01	3.065E+01	3.072E+01	97.12
	968.97	23	15.80	5.982E-01	4.468E+01	4.478E+01	54.16
RA-228	338.32	20	11.27	1.422E+00	2.293E+01	2.298E+01	172.81
	911.20	27	25.80*	6.299E-01	3.065E+01	3.072E+01	97.12
	968.97	23	15.80	5.982E-01	4.468E+01	4.478E+01	54.16
TH-228	74.82	33	10.28	2.946E+00	2.024E+01	2.038E+01	211.99
	77.11	63	17.10	2.935E+00	2.355E+01	2.371E+01	93.72
	238.63	102	43.60*	1.820E+00	2.419E+01	2.435E+01	60.61
	300.09	------	3.30	1.556E+00	------ Line Not Found		------
TH-230	67.67	61	0.38*	2.978E+00	1.009E+03	1.009E+03	97.32
TH-232	63.81	9	0.26*	2.985E+00	2.093E+02	2.093E+02	725.82
	140.88	30	0.02	2.450E+00	1.148E+04	1.148E+04	158.24
TH-234	63.29	9	3.70*	2.985E+00	1.471E+01	1.471E+01	725.82
	92.59	4	4.23	2.829E+00	6.576E+00	6.576E+00	2247.44
U-234	53.20	53	0.12*	2.976E+00	2.787E+03	2.787E+03	126.74
	120.90	------	0.04	2.605E+00	------ Line Not Found		------
U-238	63.29	9	3.70*	2.985E+00	1.471E+01	1.471E+01	725.82
	92.59	4	4.23	2.829E+00	6.576E+00	6.576E+00	2247.44
AM-243	43.53	------	5.90	2.886E+00	------ Line Not Found		------
	74.66	33	67.20*	2.946E+00	3.097E+00	3.097E+00	211.99

Flag: "*" = Keyline

Sample ID : G372020001 Acquisition date : 5-MAY-2015 06:48:39

Total number of lines in spectrum	35	
Number of unidentified lines	11	
Number of lines tentatively identified by NID	24	68.57%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/LITER	Decay Corr pCi/LITER	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.738E+02	1.738E+02	0.772E+02	44.43	
MN-54	312.05D	1.02	3.180E+00	3.229E+00	2.871E+00	88.89	
CU-67	61.83H	6.42	6.427E+00	4.124E+01	6.165E+01	149.51	
RE-183	70.00D	1.07	7.329E+00	7.848E+00	5.384E+00	68.60	
TL-208	1.91Y	1.01	8.231E+00	8.288E+00	9.211E+00	111.14	
BI-211	21.77Y	1.00	8.208E+01	8.213E+01	3.614E+01	44.00	
PB-212	1.91Y	1.01	2.419E+01	2.435E+01	1.476E+01	60.61	
PB-214	1600.00Y	1.00	2.979E+01	2.979E+01	1.311E+01	44.00	
RA-226	1600.00Y	1.00	8.719E+01	8.719E+01	13.04E+01	149.51	
AC-228	5.75Y	1.00	3.065E+01	3.072E+01	2.983E+01	97.12	
RA-228	5.75Y	1.00	3.065E+01	3.072E+01	2.983E+01	97.12	
TH-228	1.91Y	1.01	2.419E+01	2.435E+01	1.476E+01	60.61	
TH-230	7.54E+04Y	1.00	1.009E+03	1.009E+03	0.982E+03	97.32	
TH-232	1.41E+10Y	1.00	2.093E+02	2.093E+02	15.19E+02	725.82	
TH-234	4.47E+09Y	1.00	1.471E+01	1.471E+01	10.68E+01	725.82	
U-234	2.45E+05Y	1.00	2.787E+03	2.787E+03	3.532E+03	126.74	
U-238	4.47E+09Y	1.00	1.471E+01	1.471E+01	10.68E+01	725.82	
AM-243	7370.00Y	1.00	3.097E+00	3.097E+00	6.565E+00	211.99	
	Total Activity :		4.545E+03	4.581E+03			

Grand Total Activity : 4.545E+03 4.581E+03

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

Sample ID : G372020001 Acquisition date : 5-MAY-2015 06:48:39

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	149.98	34	89	1.82	299.69	297	8	4.75E-03	****	2.37E+00	
0	544.66	24	24	1.88	1089.58	1081	14	3.27E-03	98.3	9.74E-01	
0	609.48	99	30	2.05	1219.32	1210	17	1.38E-02	32.2	8.86E-01	T
0	728.30	21	24	3.01	1457.10	1449	14	2.92E-03	****	7.62E-01	T
0	757.64	18	18	1.70	1515.83	1509	15	2.48E-03	****	7.37E-01	T
0	806.14	28	22	3.02	1612.87	1604	21	3.85E-03	91.3	6.99E-01	
0	1017.80	26	4	5.82	2036.44	2027	18	3.56E-03	55.2	5.74E-01	
5	1028.30	11	2	1.97	2057.45	2055	15	1.52E-03	69.1	5.69E-01	T
5	1032.28	17	1	2.72	2065.42	2055	15	2.32E-03	53.8	5.67E-01	
0	1097.83	8	6	1.05	2196.60	2189	11	1.04E-03	****	5.39E-01	T
0	1100.89	8	6	1.41	2202.72	2199	10	1.09E-03	****	5.38E-01	
0	1109.35	9	2	0.70	2219.64	2216	8	1.30E-03	82.7	5.34E-01	
0	1166.06	13	3	0.63	2333.12	2327	12	1.85E-03	75.1	5.13E-01	
0	1321.77	9	4	3.72	2644.71	2634	15	1.26E-03	****	4.63E-01	
0	1367.79	14	0	0.62	2736.79	2731	13	1.94E-03	53.5	4.51E-01	T
0	1637.77	11	0	0.83	3277.00	3273	9	1.53E-03	60.3	3.92E-01	
0	1723.16	5	2	0.55	3447.86	3441	10	6.45E-04	****	3.77E-01	

Flags: "T" = Tentatively associated

VAX/VMS Nuclide Identification Report Generated 05-MAY-2015 08:49:09.72

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*************************************************************************
*                          GEL Laboratories LLC                         *
*                            2040 Savage Road                           *
*                          Charleston, SC 29407                         *
*************************************************************************
*                                                                       *
*                        DETECTOR AND SAMPLE DATA                       *
*                                                                       *
* Configuration    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G372020001.CNF;1    *
* Acquisition date :  5-MAY-2015 06:48:39 Sensitivity     : 3.000          *
* Detector ID      : GAM41                Energy tolerance: 1.500          *
* Elapsed live time:    0 02:00:00.00     Abundance limit : 75.000         *
* Elapsed real time:    0 02:00:00.49     Half life ratio : *****          *
* Sample date      : 28-APR-2015 10:00:00 Nuclide Library : LIQUID         *
* Sample ID        : G372020001           Analyst initials: MJH1           *
* Batch Number     : 1475456              Sample Quantity : 2.0000E+00 LITER  *
* Wet wt corr      :    1.00000           Wet Weight      :    0.00000     *
*                                         Dry Weight      :    0.00000     *
*************************************************************************
*                                                                       *
*                        CALIBRATION INFORMATION                        *
*                                                                       *
* Eff. Cal. date   :  1-APR-2015 08:41:58 Eff. Geometry   : 2LMB          *
* Eff. File        : DKA100:[CANBERRA.GAMMA]EFF_GAM41_2LMB.CNF;2          *
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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/LITER)
K-40	2.908E+01
MN-54	3.351E+00
CU-67	3.191E+01
RE-183	7.576E+00
TL-208	3.068E+00
PB-212	5.365E+00
PB-214	7.384E+00
RA-226	6.723E+01
AC-228	1.289E+01
RA-228	1.289E+01
TH-228	5.365E+00
TH-230	6.256E+02
TH-232	9.097E+02
TH-234	6.389E+01
U-234	1.792E+03
U-238	6.389E+01
AM-243	3.231E+00

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/LITER)	
BE-7	2.789E+01	NOT IDENT.
NA-22	3.099E+00	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	4.498E+00	NOT IDENT.
SC-46	2.748E+00	NOT IDENT.
V-48	4.331E+00	NOT IDENT.
CR-51	2.837E+01	NOT IDENT.
MN-52	8.134E+00	NOT IDENT.
CO-56	2.526E+00	NOT IDENT.
CO-57	2.419E+00	NOT IDENT.
CO-58	3.301E+00	NOT IDENT.
FE-59	7.645E+00	FAIL ABUN
CO-60	3.258E+00	NOT IDENT.
ZN-65	7.004E+00	NOT IDENT.

GE-68	1.136E+02	NOT IDENT.
AS-74	7.537E+00	NOT IDENT.
SE-75	4.348E+00	NOT IDENT.
BR-77	1.194E+02	FAIL ABUN
SR-82	2.959E+01	NOT IDENT.
RB-83	6.548E+00	NOT IDENT.
RB-84	4.666E+00	NOT IDENT.
KR-85	1.047E+03	NOT IDENT.
SR-85	5.044E+00	NOT IDENT.
RB-86	5.378E+01	NOT IDENT.
Y-88	3.393E+00	NOT IDENT.
Y-91	1.421E+03	NOT IDENT.
NB-94	3.311E+00	NOT IDENT.
NB-95	3.870E+00	NOT IDENT.
NB-95M	1.246E+01	NOT IDENT.
ZR-95	6.305E+00	FAIL ABUN
MO-99	1.335E+02	FAIL ABUN
TC-99M	0.000E+00	SHORT HLIF
RH-101	3.423E+00	NOT IDENT.
RH-102M	2.782E+00	NOT IDENT.
RU-103	3.886E+00	FAIL ABUN
RH-106	2.957E+01	NOT IDENT.
RU-106	2.957E+01	NOT IDENT.
AG-108M	3.067E+00	NOT IDENT.
CD-109	6.750E+01	NOT IDENT.
AG-110M	3.170E+00	NOT IDENT.
SN-113	3.922E+00	NOT IDENT.
IN-114M	1.661E+01	NOT IDENT.
CD-115	8.813E+01	NOT IDENT.
SN-117M	3.826E+00	NOT IDENT.
I-123	0.000E+00	SHORT HLIF
TE-123M	2.899E+00	NOT IDENT.
SB-124	7.051E+00	NOT IDENT.
SB-125	8.738E+00	NOT IDENT.
TE-125M	8.992E+02	NOT IDENT.
I-126	1.512E+01	NOT IDENT.
SB-126	8.050E+00	NOT IDENT.
SN-126	6.720E+00	FAIL ABUN
SB-127	3.052E+01	NOT IDENT.
I-131	5.356E+00	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	1.090E+01	NOT IDENT.
BA-133	3.689E+00	NOT IDENT.
I-133	7.900E+02	NOT IDENT.
CS-134	3.648E+00	NOT IDENT.
CS-135	1.634E+01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	6.133E+00	NOT IDENT.
BA-137M	3.810E+00	NOT IDENT.
CS-137	4.025E+00	NOT IDENT.
CE-139	3.048E+00	NOT IDENT.
BA-140	1.577E+01	NOT IDENT.
LA-140	5.985E+00	NOT IDENT.
CE-141	5.462E+00	NOT IDENT.
CE-143	2.345E+02	FAIL ABUN
CE-144	1.951E+01	NOT IDENT.
PM-144	3.349E+00	NOT IDENT.
PR-144	2.493E+02	NOT IDENT.
PM-146	3.879E+00	NOT IDENT.
ND-147	3.216E+01	NOT IDENT.
PM-147	7.395E+04	NOT IDENT.
PM-149	7.067E+02	NOT IDENT.
EU-152	9.317E+00	NOT IDENT.
GD-153	7.564E+00	NOT IDENT.
EU-154	8.817E+00	NOT IDENT.
EU-155	1.037E+01	NOT IDENT.
HO-166M	7.027E+00	FAIL ABUN
TM-171	4.985E+02	FAIL ABUN
LU-176	2.481E+00	NOT IDENT.
HF-181	3.558E+00	FAIL ABUN
W-181	7.094E+00	FAIL ABUN
TA-182	1.553E+01	FAIL ABUN
RE-184	1.107E+01	NOT IDENT.
RE-188	1.577E+01	FAIL ABUN
W-188	6.443E+02	FAIL ABUN
OS-191	1.229E+01	FAIL ABUN
IR-192	3.033E+00	FAIL ABUN
HG-203	3.211E+00	NOT IDENT.

BI-207	4.932E+00	FAIL ABUN
PB-210	6.025E+01	NOT IDENT.
BI-211	2.937E+01	FAIL ABUN
PB-211	7.307E+01	NOT IDENT.
BI-212	5.718E+01	FAIL ABUN
BI-213	9.634E+00	NOT IDENT.
BI-214	1.194E+01	FAIL ABUN
RN-219	4.015E+01	NOT IDENT.
FR-221	2.027E+01	NOT IDENT.
RA-223	6.455E+01	FAIL ABUN
RA-224	8.381E+01	NOT IDENT.
AC-227	2.705E+01	NOT IDENT.
TH-227	2.705E+01	NOT IDENT.
TH-229	5.460E+01	NOT IDENT.
PA-231	4.336E+01	NOT IDENT.
TH-231	3.583E+01	NOT IDENT.
PA-233	6.405E+00	NOT IDENT.
PA-234	2.887E+01	NOT IDENT.
PA-234M	4.431E+02	NOT IDENT.
U-235	2.033E+01	FAIL ABUN
NP-237	6.405E+00	NOT IDENT.
NP-238	1.042E+02	FAIL ABUN
NP-239	2.648E+01	NOT IDENT.
AM-241	6.259E+00	NOT IDENT.
AM-242	5.875E+01	NOT IDENT.
CM-243	1.058E+01	NOT IDENT.
CM-247	3.779E+00	NOT IDENT.
CF-249	3.882E+00	NOT IDENT.
CF-251	1.257E+01	NOT IDENT.
CF-252	1.658E+04	NOT IDENT.
ANH-511	5.464E+00	NOT IDENT.

VAX/VMS Nuclide Identification Report Generated 05-MAY-2015 08:49:14.60

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*****************************************************************************
*                            GEL Laboratories LLC                           *
*                              2040 Savage Road                             *
*                            Charleston, SC 29407                           *
*****************************************************************************
*                                                                           *
*                          DETECTOR AND SAMPLE DATA                         *
*                                                                           *
* Configuration    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G372020001.CNF;1   *
* Acquisition date :  5-MAY-2015 06:48:39 Sensitivity     : 3.000           *
* Detector ID      : GAM41                Energy tolerance: 1.500           *
* Elapsed live time:    0 02:00:00.00     Abundance limit : 75.000          *
* Elapsed real time:    0 02:00:00.49     Half life ratio : *****           *
* Sample date      : 28-APR-2015 10:00:00 Nuclide Library : LIQUID          *
* Sample ID        : G372020001           Analyst initials: MJH1            *
* Batch Number     : 1475456              Sample Quantity : 2.0000E+00 LITER *
*                                         Quantity Err(%) : 5.0000E-03 %    *
* Wet wt corr      :    1.00000           Wet Weight      :    0.00000      *
*                                         Dry Weight      :    0.00000      *
*****************************************************************************
*                                                                           *
*                          CALIBRATION INFORMATION                          *
*                                                                           *
* Eff. Cal. date   :  1-APR-2015 08:41:58 Eff. Geometry   : 2LMB            *
* Eff. File        : DKA100:[CANBERRA.GAMMA]EFF_GAM41_2LMB.CNF;2            *
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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/LITER)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.738E+02	7.710E+01	7.710E+01
MN-54	3.229E+00	2.826E+00	2.826E+00
CU-67	4.124E+01	6.058E+01	6.058E+01
RE-183	7.848E+00	5.338E+00	5.338E+00
TL-208	8.288E+00	9.053E+00	9.053E+00
PB-212	2.435E+01	1.485E+01	1.485E+01
PB-214	2.979E+01	1.330E+01	1.330E+01
RA-226	8.719E+01	1.281E+02	1.281E+02
AC-228	3.072E+01	2.937E+01	2.937E+01
RA-228	3.072E+01	2.937E+01	2.937E+01
TH-228	2.435E+01	1.485E+01	1.485E+01
TH-230	1.009E+03	9.780E+02	9.780E+02
TH-232	2.093E+02	1.489E+03	1.489E+03
TH-234	1.471E+01	1.047E+02	1.047E+02
U-234	2.787E+03	3.468E+03	3.468E+03
U-238	1.471E+01	1.047E+02	1.047E+02
AM-243	3.097E+00	6.440E+00	6.440E+00

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/LITER)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	5.509E+00	3.260E+01	3.269E+01	NOT IDENT.
NA-22	8.382E-01	3.535E+00	3.555E+00	NOT IDENT.
NA-24	1.239E+04	6.562E+03	8.618E+03	SHORT HLIF
AL-26	2.723E+00	4.805E+00	4.960E+00	NOT IDENT.
SC-46	4.035E-01	3.162E+00	3.167E+00	NOT IDENT.
V-48	-6.495E-01	5.222E+00	5.230E+00	NOT IDENT.
CR-51	-2.265E+01	3.519E+01	3.665E+01	NOT IDENT.
MN-52	2.411E-01	9.763E+00	9.764E+00	NOT IDENT.
CO-56	-3.899E+00	3.619E+00	4.024E+00	NOT IDENT.
CO-57	-8.810E-01	2.936E+00	2.963E+00	NOT IDENT.
CO-58	-2.468E+00	5.212E+00	5.330E+00	NOT IDENT.
FE-59	5.147E+00	7.173E+00	7.539E+00	FAIL ABUN
CO-60	-2.740E-01	3.971E+00	3.973E+00	NOT IDENT.

ZN-65	-3.353E+00	1.056E+01	1.067E+01	NOT IDENT.
GE-68	6.005E+00	1.340E+02	1.341E+02	NOT IDENT.
AS-74	4.488E+00	8.787E+00	9.017E+00	NOT IDENT.
SE-75	3.891E-01	5.272E+00	5.274E+00	NOT IDENT.
BR-77	3.424E+02	2.086E+02	2.595E+02	FAIL ABUN
SR-82	7.883E+00	3.500E+01	3.518E+01	NOT IDENT.
RB-83	-3.340E+00	8.184E+00	8.322E+00	NOT IDENT.
RB-84	-2.807E+00	5.928E+00	6.062E+00	NOT IDENT.
KR-85	6.534E+02	1.207E+03	1.242E+03	NOT IDENT.
SR-85	3.147E+00	5.811E+00	5.982E+00	NOT IDENT.
RB-86	-2.152E+00	6.421E+01	6.422E+01	NOT IDENT.
Y-88	1.731E+00	3.548E+00	3.632E+00	NOT IDENT.
Y-91	-1.747E+03	1.992E+03	2.142E+03	NOT IDENT.
NB-94	1.355E+00	3.837E+00	3.886E+00	NOT IDENT.
NB-95	-1.861E-01	5.348E+00	5.349E+00	NOT IDENT.
NB-95M	3.025E+01	1.534E+01	2.052E+01	NOT IDENT.
ZR-95	9.022E+00	1.023E+01	1.101E+01	FAIL ABUN
MO-99	1.603E+01	1.595E+02	1.596E+02	FAIL ABUN
TC-99M	5.031E+08	7.827E+08	8.149E+08	SHORT HLIF
RH-101	3.455E+00	4.064E+00	4.353E+00	NOT IDENT.
RH-102M	1.545E+00	3.147E+00	3.223E+00	NOT IDENT.
RU-103	-1.832E+00	4.798E+00	4.869E+00	FAIL ABUN
RH-106	7.374E+00	3.465E+01	3.481E+01	NOT IDENT.
RU-106	7.374E+00	3.465E+01	3.481E+01	NOT IDENT.
AG-108M	1.351E+00	3.510E+00	3.562E+00	NOT IDENT.
CD-109	-8.795E+00	9.266E+01	9.274E+01	NOT IDENT.
AG-110M	-3.401E+00	4.246E+00	4.514E+00	NOT IDENT.
SN-113	-2.357E+00	4.851E+00	4.966E+00	NOT IDENT.
IN-114M	-1.858E+00	2.339E+01	2.341E+01	NOT IDENT.
CD-115	8.172E+00	1.044E+02	1.044E+02	NOT IDENT.
SN-117M	-4.336E-01	4.618E+00	4.622E+00	NOT IDENT.
I-123	-1.165E+03	2.015E+04	2.016E+04	SHORT HLIF
TE-123M	-1.835E-01	3.491E+00	3.491E+00	NOT IDENT.
SB-124	-2.433E+00	8.887E+00	8.955E+00	NOT IDENT.
SB-125	4.082E-01	1.031E+01	1.031E+01	NOT IDENT.
TE-125M	-2.481E+02	1.082E+03	1.088E+03	NOT IDENT.
I-126	8.204E+00	1.732E+01	1.771E+01	NOT IDENT.
SB-126	2.032E+00	1.098E+01	1.102E+01	NOT IDENT.
SN-126	3.836E-01	9.147E+00	9.148E+00	FAIL ABUN
SB-127	1.982E+01	3.443E+01	3.557E+01	NOT IDENT.
I-131	-4.565E+00	6.723E+00	7.031E+00	NOT IDENT.
I-132	6.369E+21	1.878E+22	0.000E+00	SHORT HLIF
TE-132	-8.074E+00	1.390E+01	1.437E+01	NOT IDENT.
BA-133	2.143E-01	5.009E+00	5.010E+00	NOT IDENT.
I-133	-5.673E+02	1.007E+03	1.039E+03	NOT IDENT.
CS-134	-2.812E-01	4.587E+00	4.588E+00	NOT IDENT.
CS-135	1.735E+01	1.882E+01	2.038E+01	NOT IDENT.
I-135	5.335E+07	5.405E+08	5.411E+08	SHORT HLIF
CS-136	2.065E+00	6.951E+00	7.013E+00	NOT IDENT.
BA-137M	3.460E+00	4.203E+00	4.483E+00	NOT IDENT.
CS-137	3.655E+00	4.440E+00	4.736E+00	NOT IDENT.
CE-139	7.013E-01	3.626E+00	3.640E+00	NOT IDENT.
BA-140	-8.935E+00	2.348E+01	2.382E+01	NOT IDENT.
LA-140	4.584E-01	6.942E+00	6.945E+00	NOT IDENT.
CE-141	2.788E+00	1.062E+01	1.069E+01	NOT IDENT.
CE-143	4.470E+02	2.849E+02	3.490E+02	FAIL ABUN
CE-144	-3.929E+01	3.024E+01	3.505E+01	NOT IDENT.
PM-144	1.164E+00	3.906E+00	3.941E+00	NOT IDENT.
PR-144	8.530E+01	2.909E+02	2.934E+02	NOT IDENT.
PM-146	-4.765E-01	4.655E+00	4.659E+00	NOT IDENT.
ND-147	-2.228E+01	4.090E+01	4.211E+01	NOT IDENT.
PM-147	9.587E+03	8.764E+04	8.774E+04	NOT IDENT.
PM-149	9.860E+01	8.185E+02	8.197E+02	NOT IDENT.
EU-152	-1.141E+01	1.592E+01	1.673E+01	NOT IDENT.
GD-153	1.018E+00	1.028E+01	1.029E+01	NOT IDENT.
EU-154	2.385E+00	1.006E+01	1.011E+01	NOT IDENT.
EU-155	-3.121E+00	1.248E+01	1.256E+01	NOT IDENT.
HO-166M	8.103E+00	7.619E+00	8.449E+00	FAIL ABUN
TM-171	3.412E+02	6.518E+02	6.697E+02	FAIL ABUN
LU-176	-1.431E+00	3.024E+00	3.092E+00	NOT IDENT.
HF-181	-7.190E-01	4.312E+00	4.324E+00	FAIL ABUN
W-181	8.172E+00	5.877E+00	6.936E+00	FAIL ABUN
TA-182	8.029E+00	1.730E+01	1.768E+01	FAIL ABUN
RE-184	7.706E+00	1.375E+01	1.418E+01	NOT IDENT.
RE-188	-6.128E-01	2.194E+01	2.194E+01	FAIL ABUN
W-188	-2.440E+02	8.999E+02	9.066E+02	FAIL ABUN
OS-191	1.091E+01	1.450E+01	1.531E+01	FAIL ABUN
IR-192	-1.741E+00	3.701E+00	3.783E+00	FAIL ABUN

HG-203	-9.264E-01	3.817E+00	3.840E+00	NOT IDENT.
BI-207	4.506E+00	5.180E+00	5.564E+00	FAIL ABUN
PB-210	2.156E+01	7.060E+01	7.126E+01	NOT IDENT.
BI-211	8.213E+01	3.668E+01	5.212E+01	FAIL ABUN
PB-211	4.830E+01	8.220E+01	8.503E+01	NOT IDENT.
BI-212	7.807E+01	8.359E+01	9.069E+01	FAIL ABUN
BI-213	-3.137E+00	1.174E+01	1.183E+01	NOT IDENT.
BI-214	4.618E+01	1.508E+01	2.570E+01	FAIL ABUN
RN-219	2.023E+01	4.569E+01	4.659E+01	NOT IDENT.
FR-221	-7.647E+00	2.512E+01	2.535E+01	NOT IDENT.
RA-223	2.476E+01	7.387E+01	7.471E+01	FAIL ABUN
RA-224	2.664E+02	1.031E+02	1.583E+02	NOT IDENT.
AC-227	1.343E+01	3.206E+01	3.263E+01	NOT IDENT.
TH-227	1.343E+01	3.206E+01	3.263E+01	NOT IDENT.
TH-229	-5.310E+00	6.814E+01	6.818E+01	NOT IDENT.
PA-231	-1.145E+00	5.894E+01	5.894E+01	NOT IDENT.
TH-231	-3.337E+01	4.739E+01	4.972E+01	NOT IDENT.
PA-233	7.948E-02	7.495E+00	7.495E+00	NOT IDENT.
PA-234	9.598E-01	3.396E+01	3.396E+01	NOT IDENT.
PA-234M	-9.892E+01	5.203E+02	5.222E+02	NOT IDENT.
U-235	-1.089E+01	3.085E+01	3.124E+01	FAIL ABUN
NP-237	7.948E-02	7.495E+00	7.495E+00	NOT IDENT.
NP-238	-1.385E+02	1.470E+02	1.597E+02	FAIL ABUN
NP-239	-2.358E+01	3.288E+01	3.455E+01	NOT IDENT.
AM-241	-4.171E+00	8.726E+00	8.926E+00	NOT IDENT.
AM-242	-2.053E+00	8.059E+01	8.060E+01	NOT IDENT.
CM-243	3.214E+00	1.242E+01	1.250E+01	NOT IDENT.
CM-247	2.689E+00	4.253E+00	4.422E+00	NOT IDENT.
CF-249	3.791E-01	4.547E+00	4.551E+00	NOT IDENT.
CF-251	-1.726E+01	1.643E+01	1.818E+01	NOT IDENT.
CF-252	-6.884E+03	2.403E+04	2.423E+04	NOT IDENT.
ANH-511	-3.251E+00	5.859E+00	6.039E+00	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

GAMMA SPECTROSCOPY BACKGROUND REPORT

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	162.0243	88.34	268.0344	152.32	138.5044
46.54	175.4923	88.47	264.8186	152.43	138.5151
49.72	331.4832	89.96	266.8187	153.25	138.5925
51.35	279.1667	91.11	228.6692	323.87	148.9569
52.39	224.8830	91.27	228.7034	155.04	152.4672
53.20	214.1730	92.59	228.9841	156.02	155.7522
56.28	174.1983	93.31	229.1362	158.56	154.5483
57.36	174.4292	93.35	229.1448	158.97	0.0000
57.53	174.4653	94.56	178.0952	159.00	154.5932
57.53	174.4657	94.65	178.1096	162.33	154.9370
57.98	275.2083	94.67	178.1129	162.66	161.1692
59.32	259.9014	97.43	185.1113	163.33	150.9047
59.54	259.9698	98.43	181.9982	165.86	141.8382
61.49	260.5706	98.44	181.9993	176.31	138.6231
63.00	261.0291	99.53	182.1760	176.60	137.6058
63.29	261.1168	100.11	198.6904	177.52	152.2886
63.58	261.2039	100.20	198.7064	181.07	111.5072
63.81	261.2731	103.18	183.7482	184.41	132.6877
64.28	261.4137	103.37	183.7789	184.58	139.6859
64.99	261.6253	105.31	195.9631	143.76	137.3365
65.08	261.6520	106.12	186.1950	186.21	137.3781
66.73	262.1392	109.28	199.6039	190.27	129.6558
66.98	262.2126	111.00	163.0951	193.51	133.4183
67.24	262.2881	111.76	172.1537	198.01	109.8348
67.67	262.4140	116.24	179.7775	201.83	146.0674
67.75	262.4367	116.30	179.7863	205.31	100.7554
69.67	224.7395	116.74	187.8439	210.85	135.1189
70.83	225.0221	117.23	175.9232	218.12	113.2351
72.81	225.5005	99.53	145.3204	222.11	101.7069
72.87	225.5148	120.90	145.3615	227.09	100.9089
74.66	214.7253	121.12	152.4057	227.38	95.5560
74.82	214.7607	121.22	152.4175	228.16	100.9668
74.97	214.7948	121.78	160.5105	228.18	100.9679
77.11	236.1572	122.06	156.5323	116.74	100.9679
79.69	264.1619	123.07	172.7233	235.69	77.2871
80.12	267.4990	127.23	142.0497	235.96	77.2980
80.19	267.5176	129.43	153.3891	238.63	93.9673
80.57	264.3954	131.20	173.8046	238.98	93.9848
81.00	264.5097	133.02	212.4930	240.99	95.5250
81.07	258.0762	133.52	205.8241	242.00	95.5751
83.79	270.4984	136.00	135.2148	244.70	77.6501
84.21	251.1935	57.53	135.2425	252.40	81.5808
85.43	242.9878	136.47	140.3335	252.80	94.6529
86.55	246.4944	140.51	150.9217	256.23	92.6359
86.94	243.3418	140.88	156.0511	260.90	93.9439
87.09	243.3769	143.76	152.9736	264.66	89.7395
87.57	264.5915	144.24	140.2745	268.22	76.7402
88.03	267.9555	145.44	127.6306	269.46	77.8833

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
271.23	91.1247	404.85	49.3647	661.66	28.3310
273.65	90.1319	410.95	55.2976	664.57	32.5534
276.40	88.9660	414.70	42.7450	666.33	33.6198
277.37	78.9138	423.72	40.9362	666.50	29.4185
277.60	79.8394	427.09	45.8654	667.71	0.0000
278.00	79.8549	427.87	48.8068	677.62	25.2905
279.20	84.4924	433.94	47.9348	685.70	26.4008
279.54	87.2611	440.45	49.0260	695.00	29.6406
280.46	82.7051	453.88	44.3307	696.49	30.7110
283.69	79.1491	463.37	42.4992	696.51	30.7110
284.31	79.1719	468.07	55.4360	697.00	36.0109
285.41	80.1341	473.00	41.6462	697.49	40.2528
285.90	82.9156	475.06	34.7294	702.65	29.6993
287.50	92.5329	476.78	37.7279	706.68	40.3479
290.67	85.4739	477.60	40.7176	711.68	27.6419
293.27	76.0681	477.99	40.7231	720.70	23.7479
351.93	75.8715	482.18	42.7690	721.93	23.7552
295.96	74.0454	487.02	45.8264	722.78	20.1048
299.98	61.9944	492.35	49.8988	722.91	20.1055
300.09	68.3558	497.08	64.9689	723.31	23.7634
300.13	68.3573	511.00	47.1891	724.19	27.4255
301.36	68.3948	514.00	95.4735	727.33	27.7525
302.85	74.2773	520.40	49.3439	733.00	31.1516
256.23	67.8278	520.69	52.3703	735.93	25.6729
304.85	66.9097	522.65	0.0000	739.50	22.4838
306.78	77.1978	527.90	40.3760	744.23	28.9418
308.46	62.3634	529.59	48.4775	747.24	19.3088
311.90	72.7124	529.87	49.4915	752.31	33.1429
316.51	75.6623	531.02	48.4990	753.82	29.4710
319.41	76.6932	537.26	43.3864	756.73	9.2163
320.08	79.5215	546.56	0.0000	763.94	38.7766
321.04	71.1317	552.55	51.2624	765.80	33.9449
323.87	67.4700	563.25	64.2856	766.42	27.3037
325.23	72.1977	569.33	39.8680	766.84	31.0436
328.76	79.8198	946.00	39.8696	772.60	0.0000
333.37	82.2604	569.70	43.9614	776.52	33.4931
334.37	74.2278	583.19	29.7670	739.50	31.3429
338.28	65.9988	595.83	35.0279	778.90	36.7559
338.32	65.9996	427.87	53.0556	783.70	36.7981
311.90	63.0934	602.73	42.4704	785.37	32.4817
340.55	63.0955	604.72	42.4947	792.07	31.6040
344.28	86.2023	609.32	27.9240	795.86	26.0503
345.93	73.7756	610.33	31.9219	810.29	26.1392
351.06	60.6615	614.28	30.1822	344.28	26.1401
351.93	69.2165	618.01	30.4117	810.76	24.5082
356.01	50.4723	621.93	30.0992	815.77	24.5370
364.49	69.5685	630.19	0.0000	1048.07	25.1822
366.42	51.5012	631.29	35.3814	832.01	21.3456
356.01	71.0597	155.04	31.2335	834.85	26.2886
388.16	54.8256	633.25	29.1536	836.80	0.0000
388.63	50.9874	634.78	27.0823	846.77	26.3599
391.70	60.6788	635.95	25.0073	856.80	32.0813
264.66	55.0860	636.99	33.3522	860.56	30.2199
401.81	48.3419	645.85	31.3440	871.09	34.0777
402.40	47.3855	657.76	45.0725	873.19	24.6230

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
875.33	19.8973	1291.59	18.4784		
880.51	20.8686	1298.22	13.3605		
881.60	22.7712	1312.11	12.6187		
883.24	19.9321	1332.49	12.4030		
657.76	15.1911	1365.19	16.3663		
889.28	13.3057	1368.63	0.0000		
894.76	21.8858	1384.29	9.3811		
898.04	23.8059	1408.01	13.6017		
903.28	20.0197	1434.09	11.5567		
911.20	22.9189	1457.56	0.0000		
923.98	15.3214	1460.82	9.2310		
926.36	24.9100	1489.16	7.4170		
935.54	24.9585	1596.21	12.2454		
937.49	24.0086	1620.50	5.6717		
944.13	16.3487	1678.03	0.0000		
946.00	23.0897	1690.97	9.5471		
949.00	25.0297	1764.49	11.5719		
667.71	0.0000	1063.66	18.3367		
964.08	11.8300	1771.35	16.4086		
968.97	20.3005	1791.20	0.0000		
983.53	20.3613	1808.65	8.7303		
984.45	25.2143	1836.06	3.8940		
996.26	22.3583				
1001.03	18.4878				
1274.44	18.5017				
1025.87	6.8453				
1028.54	5.8705				
1037.84	22.3001				
1038.76	0.0000				
475.06	17.6742				
1048.07	15.7148				
1050.41	18.6700				
1063.66	11.8221				
1077.00	20.7422				
1077.34	19.7559				
1085.87	12.8622				
1099.25	0.0000				
1112.07	20.8806				
1112.84	19.1432				
1115.54	22.6357				
1120.29	18.9211				
1120.55	18.9218				
1221.41	15.9364				
1129.67	15.9615				
1131.51	0.0000				
1173.23	17.5977				
1189.05	17.1435				
1204.77	26.2929				
1221.41	15.2134				
1231.02	24.3825				
1235.36	16.2673				
1238.28	18.3101				
1260.41	0.0000				
1274.44	9.2122				
1274.54	9.2125				

VAX/VMS Nuclide Identification Report Generated 5-MAY-2015 14:15:52.93

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******************************************************************************
*                              GEL Laboratories LLC                          *
*                                2040 Savage Road                            *
*                              Charleston, SC 29407                          *
******************************************************************************
Configuration    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203310162.CNF;1
Background file  : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM14.CNF;444
                                            Background date  : 3-MAY-2015 09:09:14.
Sample date      : 4-MAY-2015 00:00:00. Acquisition date : 5-MAY-2015 12:14:59.
Sample ID        : G1203310162          Sample quantity  : 2.00000E+00 LITER
Detector name    : GAM14                Detector geometry: 2LMB
Elapsed live time: 0 02:00:00.00        Elapsed real time: 0 02:00:00.45  0.0%
Energy tolerance : 1.50000 keV          Analyst Initials : MJH1
Abundance limit  : 75.00000             Sensitivity      : 3.00000
Batch ID         : 1475456              Detector SN#     :
Matrix Spike ID  :                      LCS ID           : 1604
******************************************************************************
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	47.50*	7	60	1.49	95.05	91	8	9.59E-04	221.9	
2	0	64.00*	12	43	0.90	128.04	125	7	1.68E-03	114.0	
3	0	93.28*	4	98	1.26	186.60	182	11	5.04E-04	618.4	
4	0	128.49	20	53	2.18	257.03	253	8	2.83E-03	66.9	
5	0	149.66	20	40	0.98	299.37	296	7	2.78E-03	57.2	
6	0	187.11*	27	79	1.50	374.26	370	13	3.82E-03	75.2	
7	0	239.41*	30	77	2.41	478.88	474	12	4.23E-03	63.9	
8	0	294.99	25	28	1.53	590.03	586	8	3.52E-03	41.2	
9	0	441.53	13	27	0.55	883.11	875	12	1.81E-03	84.6	
10	1	444.34	17	12	1.53	888.74	886	20	2.36E-03	34.1	3.27E+00
11	1	449.61	24	16	1.54	899.28	886	20	3.37E-03	34.8	
12	0	511.49*	28	38	2.35	1023.04	1014	22	3.85E-03	77.6	
13	0	634.22	13	6	1.34	1268.50	1264	8	1.74E-03	43.8	
14	0	654.70	6	9	1.39	1309.45	1304	7	8.61E-04	93.2	
15	0	822.96	10	2	1.56	1645.97	1642	8	1.42E-03	39.2	
16	0	890.39	6	6	0.51	1780.83	1776	6	8.33E-04	76.4	
17	0	910.78*	0	0	1.29	1821.62	1816	10	4.97E-05	*****	
18	0	924.75	9	0	0.83	1849.56	1847	6	1.25E-03	33.3	
19	0	1035.78	6	10	2.95	2071.62	2062	13	8.85E-04	108.3	
20	0	1075.25	10	7	0.79	2150.55	2145	10	1.35E-03	61.6	
21	0	1635.49	4	5	1.12	3271.00	3263	9	4.86E-04	121.6	
22	0	1762.94*	3	0	1.50	3525.88	3521	9	4.09E-04	132.8	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 5-MAY-2015 14:15:54

Configuration	: DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203310162.CNF;1		
Analyses by	: PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4		
Sample title	: MJH1		
Sample date	: 4-MAY-2015 00:00:00	Acquisition date	: 5-MAY-2015 12:14:59
Sample ID	: G1203310162	Sample quantity	: 2.0000 LITER
Sample type	: LIQUID	Sample geometry	:
Detector name	: GAMMA14	Detector geometry	: 2LMB
Elapsed live time	: 0 02:00:00.00	Elapsed real time	: 0 02:00:00.45 0.0%
Energy tolerance	: 1.50 keV	Half life ratio	: 10.00
Errors propagated	: No	Systematic Error	: 0.00 %
Efficiency type	: Empirical	Efficiencies at	: Peak Energy
Abundance limit	: 75.00		

Interference Report

No interference correction performed

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/LITER	Decay Corr pCi/LITER	2-Sigma %Error
OS-191	63.29	12	15.70	1.035E+00	1.395E+01	1.496E+01	228.02
	64.99	12	26.70	1.035E+00	8.204E+00	8.797E+00	228.02
	129.43	20	26.50*	2.521E+00	5.716E+00	6.129E+00	133.72
PB-210	46.54	7	4.25*	2.920E-01	1.045E+02	1.045E+02	443.77
BI-213	440.45	13	25.94*	1.383E+00	6.799E+00	6.799E+00	169.23
RA-226	186.21	27	3.59*	2.326E+00	6.178E+01	6.178E+01	150.40
TH-232	63.81	12	0.26*	1.035E+00	8.425E+02	8.425E+02	228.02
	140.88	------	0.02	2.520E+00	------ Line Not Found		------
TH-234	63.29	12	3.70*	1.035E+00	5.920E+01	5.920E+01	228.02
	92.59	4	4.23	2.143E+00	7.514E+00	7.514E+00	1236.84
U-238	63.29	12	3.70*	1.035E+00	5.920E+01	5.920E+01	228.02
	92.59	4	4.23	2.143E+00	7.514E+00	7.514E+00	1236.84
ANH-511	511.00	28	100.00*	1.251E+00	4.159E+00	4.159E+00	155.25

Flag: "*" = Keyline

VAX/VMS Nuclide Identification Report Generated 05-MAY-2015 14:15:55.26

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*****************************************************************************
*                            GEL Laboratories LLC                           *
*                              2040 Savage Road                             *
*                            Charleston, SC 29407                           *
*****************************************************************************
*                                                                           *
*                          DETECTOR AND SAMPLE DATA                         *
*                                                                           *
* Configuration    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203310162.CNF;1  *
* Acquisition date :  5-MAY-2015 12:14:59 Sensitivity     : 3.000           *
* Detector ID      : GAM14                Energy tolerance: 1.500           *
* Elapsed live time:    0 02:00:00.00     Abundance limit : 75.000          *
* Elapsed real time:    0 02:00:00.45     Half life ratio : *****           *
* Sample date      :  4-MAY-2015 00:00:00 Analyst initials: MJH1            *
* Sample ID        : G1203310162          Sample Quantity : 2.0000E+00 LITER *
* Batch Number     : 1475456              Wet Weight      :    0.00000      *
* Wet wt corr      :    1.00000           Dry Weight      :    0.00000      *
* Nuclide Library  : LIQUID.NLB;4                                           *
*****************************************************************************
*                                                                           *
*                          CALIBRATION INFORMATION                          *
*                                                                           *
* Eff. Cal. date   : 12-MAR-2015 05:56:21 Eff. Geometry   : 2LMB            *
* Eff. File        : DKA100:[CANBERRA.GAMMA]EFF_GAM14_2LMB.CNF;12           *
*****************************************************************************
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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/LITER)	Cnt uncert (1.96-sigma)	MDA (pCi/LITER)
OS-191	6.129E+00	8.032E+00	9.512E+00
PB-210	1.045E+02	4.544E+02	5.957E+02
BI-213	6.799E+00	1.128E+01	1.228E+01
RA-226	6.178E+01	9.107E+01	8.700E+01
TH-232	8.425E+02	1.883E+03	2.590E+03
TH-234	5.920E+01	1.323E+02	1.762E+02
U-238	5.920E+01	1.323E+02	1.762E+02
ANH-511	4.159E+00	6.328E+00	3.482E+00

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/LITER)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/LITER)	
BE-7	3.671E+00	1.956E+01	3.697E+01	NOT IDENT.
NA-22	1.472E-01	2.278E+00	4.752E+00	NOT IDENT.
NA-24	4.752E+00	1.206E+01	2.730E+01	NOT IDENT.
AL-26	-1.659E+00	2.290E+00	4.451E+00	NOT IDENT.
K-40	-9.847E+00	3.004E+01	6.169E+01	NOT IDENT.
SC-46	1.367E+00	2.046E+00	4.982E+00	FAIL ABUN
V-48	-5.685E-01	2.096E+00	3.943E+00	NOT IDENT.
CR-51	5.779E-01	1.818E+01	3.400E+01	NOT IDENT.
MN-52	1.364E+00	3.018E+00	6.713E+00	NOT IDENT.
MN-54	-1.546E-02	2.286E+00	4.421E+00	NOT IDENT.
CO-56	-1.087E-03	2.641E+00	5.030E+00	NOT IDENT.
CO-57	6.932E-01	1.866E+00	3.431E+00	NOT IDENT.
CO-58	-7.985E-01	2.113E+00	3.872E+00	NOT IDENT.
FE-59	1.760E+00	4.145E+00	8.794E+00	NOT IDENT.
CO-60	1.161E+00	2.345E+00	5.274E+00	NOT IDENT.
ZN-65	5.421E-01	4.279E+00	8.711E+00	NOT IDENT.
CU-67	3.107E+00	6.410E+00	1.046E+01	FAIL ABUN
GE-68	7.961E+01	7.928E+01	1.694E+02	NOT IDENT.
AS-74	-3.663E+00	3.769E+00	6.361E+00	FAIL ABUN
SE-75	1.276E+00	3.242E+00	6.191E+00	NOT IDENT.
BR-77	1.901E+01	2.379E+01	3.016E+01	FAIL ABUN
SR-82	-2.663E+00	1.740E+01	3.252E+01	NOT IDENT.

RB-83	-6.051E-01	4.984E+00	7.867E+00	NOT IDENT.
RB-84	-9.475E-01	3.437E+00	6.356E+00	NOT IDENT.
KR-85	0.000E+00	6.670E+02	1.489E+03	NOT IDENT.
SR-85	0.000E+00	3.037E+00	6.780E+00	NOT IDENT.
RB-86	3.280E+01	3.146E+01	6.749E+01	NOT IDENT.
Y-88	7.536E-01	1.955E+00	4.799E+00	NOT IDENT.
Y-91	-4.983E+02	9.002E+02	1.643E+03	NOT IDENT.
NB-94	1.254E+00	2.378E+00	4.852E+00	NOT IDENT.
NB-95	9.799E-01	2.243E+00	4.618E+00	NOT IDENT.
NB-95M	-7.844E-01	8.823E+00	1.426E+01	NOT IDENT.
ZR-95	-8.375E-01	3.582E+00	6.793E+00	NOT IDENT.
MO-99	9.585E+00	2.226E+01	4.727E+01	NOT IDENT.
TC-99M	1.510E+02	1.367E+02	2.629E+02	NOT IDENT.
RH-101	2.229E+00	2.922E+00	4.456E+00	FAIL ABUN
RH-102M	1.115E+00	1.919E+00	3.858E+00	NOT IDENT.
RU-103	-1.019E+00	2.584E+00	4.476E+00	NOT IDENT.
RH-106	-9.607E+00	2.196E+01	4.002E+01	NOT IDENT.
RU-106	-9.607E+00	2.196E+01	4.002E+01	NOT IDENT.
AG-108M	-2.351E-01	2.011E+00	3.419E+00	NOT IDENT.
CD-109	3.047E+00	5.926E+01	1.020E+02	NOT IDENT.
AG-110M	-1.542E-01	1.931E+00	3.322E+00	NOT IDENT.
SN-113	7.110E-01	3.069E+00	5.804E+00	NOT IDENT.
IN-114M	-9.214E-01	1.317E+01	2.019E+01	NOT IDENT.
CD-115	-1.393E+00	1.236E+01	2.236E+01	NOT IDENT.
SN-117M	2.194E-01	2.318E+00	3.941E+00	NOT IDENT.
I-123	6.013E+00	1.590E+01	2.769E+01	NOT IDENT.
TE-123M	8.760E-01	2.260E+00	3.937E+00	NOT IDENT.
SB-124	7.492E-01	3.521E+00	8.550E+00	NOT IDENT.
SB-125	2.348E+00	6.151E+00	1.199E+01	NOT IDENT.
TE-125M	-3.680E+02	6.985E+02	1.145E+03	NOT IDENT.
I-126	-5.740E-01	6.552E+00	1.265E+01	NOT IDENT.
SB-126	-2.500E-01	4.931E+00	9.369E+00	NOT IDENT.
SN-126	1.843E+00	5.690E+00	1.049E+01	FAIL ABUN
SB-127	-5.241E-01	7.548E+00	1.452E+01	NOT IDENT.
I-131	2.376E-01	2.987E+00	5.514E+00	NOT IDENT.
I-132	0.000E+00	1.617E+05	0.000E+00	SHORT HLIF
TE-132	3.981E-01	2.822E+00	5.306E+00	NOT IDENT.
BA-133	-1.195E+00	3.074E+00	5.443E+00	NOT IDENT.
I-133	1.910E+00	7.762E+00	1.489E+01	NOT IDENT.
CS-134	5.777E-01	2.208E+00	4.575E+00	NOT IDENT.
CS-135	-2.191E+00	1.113E+01	2.032E+01	NOT IDENT.
I-135	-1.227E+02	4.057E+02	7.831E+02	NOT IDENT.
CS-136	8.049E-01	3.489E+00	6.970E+00	NOT IDENT.
BA-137M	9.959E-01	2.084E+00	4.383E+00	NOT IDENT.
CS-137	1.052E+00	2.201E+00	4.630E+00	NOT IDENT.
CE-139	-2.096E-01	2.056E+00	3.578E+00	NOT IDENT.
BA-140	4.207E+00	9.789E+00	1.891E+01	NOT IDENT.
LA-140	-4.207E+00	3.238E+00	4.366E+00	NOT IDENT.
CE-141	-8.461E-01	4.335E+00	6.447E+00	NOT IDENT.
CE-143	8.603E+00	1.038E+01	1.876E+01	NOT IDENT.
CE-144	-9.359E+00	1.391E+01	2.313E+01	NOT IDENT.
PM-144	1.180E+00	2.632E+00	5.188E+00	NOT IDENT.
PR-144	8.936E+01	1.958E+02	3.862E+02	NOT IDENT.
PM-146	-7.150E-01	3.568E+00	5.543E+00	FAIL ABUN
ND-147	4.941E+00	1.704E+01	3.272E+01	NOT IDENT.
PM-147	-1.040E+04	5.517E+04	9.668E+04	NOT IDENT.
PM-149	-4.850E+01	8.515E+01	1.498E+02	NOT IDENT.
EU-152	-4.128E+00	7.200E+00	1.249E+01	NOT IDENT.
GD-153	-3.005E+00	6.961E+00	1.060E+01	NOT IDENT.
EU-154	4.201E-01	6.498E+00	1.356E+01	NOT IDENT.
EU-155	-2.790E+00	7.761E+00	1.347E+01	NOT IDENT.
HO-166M	-3.893E-01	4.215E+00	8.016E+00	NOT IDENT.
TM-171	-8.922E+02	1.449E+03	2.535E+03	NOT IDENT.
LU-176	-3.080E-01	1.922E+00	3.512E+00	NOT IDENT.
HF-181	3.949E-02	2.271E+00	4.257E+00	NOT IDENT.
W-181	1.721E+00	1.627E+01	3.018E+01	FAIL ABUN
TA-182	-7.985E-02	9.364E+00	1.891E+01	NOT IDENT.
RE-183	-7.384E-02	1.548E+01	2.835E+01	NOT IDENT.
RE-184	-1.202E+00	5.530E+00	9.850E+00	NOT IDENT.
RE-188	2.902E-01	1.023E+01	1.811E+01	FAIL ABUN
W-188	3.720E+02	4.746E+02	8.649E+02	FAIL ABUN
IR-192	-9.797E-01	2.133E+00	3.777E+00	FAIL ABUN
HG-203	9.599E-01	2.213E+00	4.280E+00	NOT IDENT.
BI-207	5.135E-01	2.968E+00	6.039E+00	NOT IDENT.
TL-208	1.254E+00	3.001E+00	5.586E+00	NOT IDENT.
BI-211	7.580E+00	1.531E+01	2.960E+01	NOT IDENT.
PB-211	-1.411E+01	5.220E+01	9.324E+01	NOT IDENT.
BI-212	-4.221E+01	3.831E+01	5.752E+01	NOT IDENT.

PB-212	6.414E+00	8.027E+00	1.009E+01	FAIL ABUN
BI-214	-4.922E+00	6.028E+00	1.040E+01	NOT IDENT.
PB-214	-7.473E+00	6.825E+00	1.058E+01	FAIL ABUN
RN-219	-4.017E+00	3.116E+01	5.643E+01	NOT IDENT.
FR-221	-1.632E+00	1.433E+01	2.655E+01	NOT IDENT.
RA-223	-1.469E-01	4.618E+01	8.557E+01	FAIL ABUN
RA-224	3.956E+01	5.116E+01	9.066E+01	NOT IDENT.
AC-227	1.194E+01	1.898E+01	3.709E+01	NOT IDENT.
TH-227	1.194E+01	1.898E+01	3.709E+01	NOT IDENT.
AC-228	3.173E-01	7.369E+00	1.953E+01	FAIL ABUN
RA-228	3.173E-01	7.369E+00	1.953E+01	FAIL ABUN
TH-228	6.414E+00	8.027E+00	1.009E+01	FAIL ABUN
TH-229	-6.764E+00	4.284E+01	6.510E+01	NOT IDENT.
TH-230	2.778E+02	9.143E+02	1.547E+03	NOT IDENT.
PA-231	-1.464E+01	3.652E+01	6.484E+01	NOT IDENT.
TH-231	-1.654E+01	3.475E+01	6.005E+01	NOT IDENT.
PA-233	2.284E+00	4.476E+00	8.780E+00	FAIL ABUN
PA-234	1.059E+01	1.721E+01	3.773E+01	FAIL ABUN
PA-234M	-2.945E+02	3.322E+02	5.610E+02	NOT IDENT.
U-234	-2.783E+03	5.341E+03	9.430E+03	NOT IDENT.
U-235	-1.155E+01	1.789E+01	2.770E+01	FAIL ABUN
NP-237	2.284E+00	4.476E+00	8.780E+00	FAIL ABUN
NP-238	-1.033E+01	1.292E+01	2.102E+01	FAIL ABUN
NP-239	2.287E+01	2.005E+01	3.926E+01	NOT IDENT.
AM-241	1.354E+01	1.297E+01	2.503E+01	NOT IDENT.
AM-242	1.846E+01	4.844E+01	8.980E+01	NOT IDENT.
AM-243	-3.375E-01	4.526E+00	7.570E+00	NOT IDENT.
CM-243	-6.447E+00	7.792E+00	1.292E+01	NOT IDENT.
CM-247	6.092E-01	2.846E+00	5.353E+00	NOT IDENT.
CF-249	-2.764E+00	2.569E+00	4.090E+00	NOT IDENT.
CF-251	6.780E+00	9.360E+00	1.756E+01	NOT IDENT.
CF-252	1.367E+04	1.282E+04	2.520E+04	NOT IDENT.

VAX/VMS Nuclide Identification Report Generated 5-MAY-2015 14:15:50.65

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	47.50	23	60	1.49	95.05	91	8	3.25E-03	61.5	
2	0	64.00	35	43	0.90	128.04	125	7	4.80E-03	35.6	
3	0	93.28	79	98	1.26	186.60	182	11	1.10E-02	26.5	
4	0	128.49	20	53	2.18	257.03	253	8	2.83E-03	66.9	
5	0	149.66	20	40	0.98	299.37	296	7	2.78E-03	57.2	
6	0	187.11	73	79	1.50	374.26	370	13	1.01E-02	26.9	
7	0	239.41	45	77	2.41	478.88	474	12	6.29E-03	41.7	
8	0	294.99	25	28	1.53	590.03	586	8	3.52E-03	41.2	
9	0	441.53	13	27	0.55	883.11	875	12	1.81E-03	84.6	
10	1	444.34	17	12	1.53	888.74	886	20	2.36E-03	34.1	3.27E+00
11	1	449.61	24	16	1.54	899.28	886	20	3.37E-03	34.8	
12	0	511.49	164	38	2.35	1023.04	1014	22	2.28E-02	12.4	
13	0	634.22	13	6	1.34	1268.50	1264	8	1.74E-03	43.8	
14	0	654.70	6	9	1.39	1309.45	1304	7	8.61E-04	93.2	
15	0	822.96	10	2	1.56	1645.97	1642	8	1.42E-03	39.2	
16	0	890.39	6	6	0.51	1780.83	1776	6	8.33E-04	76.4	
17	0	910.78	13	0	1.29	1821.62	1816	10	1.81E-03	27.7	
18	0	924.75	9	0	0.83	1849.56	1847	6	1.25E-03	33.3	
19	0	1035.78	6	10	2.95	2071.62	2062	13	8.85E-04	108.3	
20	0	1075.25	10	7	0.79	2150.55	2145	10	1.35E-03	61.6	
21	0	1460.78	7	3	0.53	2921.59	2918	6	9.86E-04	53.6	
22	0	1635.49	4	5	1.12	3271.00	3263	9	4.86E-04	121.6	
23	0	1762.94	8	0	1.50	3525.88	3521	9	1.11E-03	35.4	

VAX/VMS Nuclide Identification Report Generated 5-MAY-2015 14:15:53.47

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/LITER	Decay Corr pCi/LITER	2-Sigma %Error
OS-191	63.29	12	15.70	1.035E+00	1.395E+01	1.496E+01	228.02
	64.99	12	26.70	1.035E+00	8.204E+00	8.797E+00	228.02
	129.43	20	26.50*	2.521E+00	5.716E+00	6.129E+00	133.72
PB-210	46.54	7	4.25*	2.920E-01	1.045E+02	1.045E+02	443.77
BI-213	440.45	13	25.94*	1.383E+00	6.799E+00	6.799E+00	169.23
RA-226	186.21	27	3.59*	2.326E+00	6.178E+01	6.178E+01	150.40
TH-232	63.81	12	0.26*	1.035E+00	8.425E+02	8.425E+02	228.02
	140.88	------	0.02	2.520E+00	------ Line Not Found		------
TH-234	63.29	12	3.70*	1.035E+00	5.920E+01	5.920E+01	228.02
	92.59	4	4.23	2.143E+00	7.514E+00	7.514E+00	1236.84
U-238	63.29	12	3.70*	1.035E+00	5.920E+01	5.920E+01	228.02
	92.59	4	4.23	2.143E+00	7.514E+00	7.514E+00	1236.84
ANH-511	511.00	28	100.00*	1.251E+00	4.159E+00	4.159E+00	155.25

Flag: "*" = Keyline

Sample ID : G1203310162 Acquisition date : 5-MAY-2015 12:14:59

Total number of lines in spectrum 22
Number of unidentified lines 9
Number of lines tentatively identified by NID 13 59.09%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/LITER	Decay Corr pCi/LITER	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
OS-191	15.40D	1.07	5.716E+00	6.129E+00	8.196E+00	133.72	
PB-210	22.20Y	1.00	1.045E+02	1.045E+02	4.636E+02	443.77	
BI-213	7340.00Y	1.00	6.799E+00	6.799E+00	11.51E+00	169.23	
RA-226	1600.00Y	1.00	6.178E+01	6.178E+01	9.292E+01	150.40	
TH-232	1.41E+10Y	1.00	8.425E+02	8.425E+02	19.21E+02	228.02	
TH-234	4.47E+09Y	1.00	5.920E+01	5.920E+01	13.50E+01	228.02	
U-238	4.47E+09Y	1.00	5.920E+01	5.920E+01	13.50E+01	228.02	
ANH-511	1.00E+09Y	1.00	4.159E+00	4.159E+00	6.458E+00	155.25	
	Total Activity :		1.144E+03	1.144E+03			
	Grand Total Activity :		1.144E+03	1.144E+03			

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

Sample ID : G1203310162 Acquisition date : 5-MAY-2015 12:14:59

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	149.66	20	40	0.98	299.37	296	7	2.78E-03	****	2.50E+00	
0	239.41	30	77	2.41	478.88	474	12	4.23E-03	****	2.05E+00	T
0	294.99	25	28	1.53	590.03	586	8	3.52E-03	82.3	1.80E+00	T
1	444.34	17	12	1.53	888.74	886	20	2.36E-03	68.3	1.38E+00	
1	449.61	24	16	1.54	899.28	886	20	3.37E-03	69.7	1.37E+00	
0	634.22	13	6	1.34	1268.50	1264	8	1.74E-03	87.6	1.08E+00	T
0	654.70	6	9	1.39	1309.45	1304	7	8.61E-04	****	1.05E+00	
0	822.96	10	2	1.56	1645.97	1642	8	1.42E-03	78.4	8.87E-01	
0	890.39	6	6	0.51	1780.83	1776	6	8.33E-04	****	8.35E-01	T
0	924.75	9	0	0.83	1849.56	1847	6	1.25E-03	66.7	8.11E-01	T
0	1035.78	6	10	2.95	2071.62	2062	13	8.85E-04	****	7.41E-01	
0	1075.25	10	7	0.79	2150.55	2145	10	1.35E-03	****	7.19E-01	
0	1635.49	4	5	1.12	3271.00	3263	9	4.86E-04	****	5.18E-01	
0	1762.94	3	0	1.50	3525.88	3521	9	4.09E-04	****	4.91E-01	

Flags: "T" = Tentatively associated

VAX/VMS Nuclide Identification Report Generated 05-MAY-2015 14:16:01.55

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*************************************************************************
*                          GEL Laboratories LLC                         *
*                            2040 Savage Road                           *
*                          Charleston, SC 29407                         *
*************************************************************************
*                                                                       *
*                        DETECTOR AND SAMPLE DATA                       *
*                                                                       *
* Configuration    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203310162.CNF;1   *
* Acquisition date :  5-MAY-2015 12:14:59 Sensitivity     : 3.000       *
* Detector ID      : GAM14                Energy tolerance: 1.500       *
* Elapsed live time:    0 02:00:00.00     Abundance limit : 75.000      *
* Elapsed real time:    0 02:00:00.45     Half life ratio : *****       *
* Sample date      :  4-MAY-2015 00:00:00 Nuclide Library : LIQUID       *
* Sample ID        : G1203310162          Analyst initials: MJH1        *
* Batch Number     : 1475456              Sample Quantity : 2.0000E+00 LITER  *
* Wet wt corr      :    1.00000           Wet Weight      :    0.00000  *
*                                         Dry Weight      :    0.00000  *
*************************************************************************
*                                                                       *
*                        CALIBRATION INFORMATION                        *
*                                                                       *
* Eff. Cal. date   : 12-MAR-2015 05:56:21 Eff. Geometry   : 2LMB        *
* Eff. File        : DKA100:[CANBERRA.GAMMA]EFF_GAM14_2LMB.CNF;12        *
*************************************************************************
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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/LITER)
OS-191	4.350E+00
PB-210	2.750E+02
BI-213	5.434E+00
RA-226	4.049E+01
TH-232	1.200E+03
TH-234	8.127E+01
U-238	8.127E+01
ANH-511	1.539E+00

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/LITER)	
BE-7	1.660E+01	NOT IDENT.
NA-22	1.971E+00	NOT IDENT.
NA-24	1.126E+01	NOT IDENT.
AL-26	1.699E+00	NOT IDENT.
K-40	2.663E+01	NOT IDENT.
SC-46	2.184E+00	FAIL ABUN
V-48	1.620E+00	NOT IDENT.
CR-51	1.545E+01	NOT IDENT.
MN-52	2.819E+00	NOT IDENT.
MN-54	1.921E+00	NOT IDENT.
CO-56	2.219E+00	NOT IDENT.
CO-57	1.597E+00	NOT IDENT.
CO-58	1.648E+00	NOT IDENT.
FE-59	3.747E+00	NOT IDENT.
CO-60	2.218E+00	NOT IDENT.
ZN-65	3.635E+00	NOT IDENT.
CU-67	4.896E+00	FAIL ABUN
GE-68	7.370E+01	NOT IDENT.
AS-74	2.775E+00	FAIL ABUN
SE-75	2.871E+00	NOT IDENT.
BR-77	1.424E+01	FAIL ABUN
SR-82	1.437E+01	NOT IDENT.
RB-83	3.473E+00	NOT IDENT.

RB-84	2.726E+00	NOT IDENT.
KR-85	6.975E+02	NOT IDENT.
SR-85	3.176E+00	NOT IDENT.
RB-86	2.942E+01	NOT IDENT.
Y-88	1.859E+00	NOT IDENT.
Y-91	6.701E+02	NOT IDENT.
NB-94	2.172E+00	NOT IDENT.
NB-95	2.033E+00	NOT IDENT.
NB-95M	6.629E+00	NOT IDENT.
ZR-95	2.895E+00	NOT IDENT.
MO-99	2.042E+01	NOT IDENT.
TC-99M	1.233E+02	NOT IDENT.
RH-101	2.080E+00	FAIL ABUN
RH-102M	1.727E+00	NOT IDENT.
RU-103	2.014E+00	NOT IDENT.
RH-106	1.767E+01	NOT IDENT.
RU-106	1.767E+01	NOT IDENT.
AG-108M	1.510E+00	NOT IDENT.
CD-109	4.759E+01	NOT IDENT.
AG-110M	1.403E+00	NOT IDENT.
SN-113	2.640E+00	NOT IDENT.
IN-114M	9.378E+00	NOT IDENT.
CD-115	9.964E+00	NOT IDENT.
SN-117M	1.843E+00	NOT IDENT.
I-123	1.298E+01	NOT IDENT.
TE-123M	1.846E+00	NOT IDENT.
SB-124	3.201E+00	NOT IDENT.
SB-125	5.393E+00	NOT IDENT.
TE-125M	5.329E+02	NOT IDENT.
I-126	5.518E+00	NOT IDENT.
SB-126	4.161E+00	NOT IDENT.
SN-126	4.902E+00	FAIL ABUN
SB-127	6.366E+00	NOT IDENT.
I-131	2.532E+00	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	2.462E+00	NOT IDENT.
BA-133	2.466E+00	NOT IDENT.
I-133	6.623E+00	NOT IDENT.
CS-134	1.961E+00	NOT IDENT.
CS-135	9.333E+00	NOT IDENT.
I-135	3.210E+02	NOT IDENT.
CS-136	3.017E+00	NOT IDENT.
BA-137M	1.922E+00	NOT IDENT.
CS-137	2.030E+00	NOT IDENT.
CE-139	1.658E+00	NOT IDENT.
BA-140	8.523E+00	NOT IDENT.
LA-140	1.634E+00	NOT IDENT.
CE-141	3.008E+00	NOT IDENT.
CE-143	8.670E+00	NOT IDENT.
CE-144	1.066E+01	NOT IDENT.
PM-144	2.340E+00	NOT IDENT.
PR-144	1.743E+02	NOT IDENT.
PM-146	2.485E+00	FAIL ABUN
ND-147	1.461E+01	NOT IDENT.
PM-147	4.479E+04	NOT IDENT.
PM-149	6.769E+01	NOT IDENT.
EU-152	5.663E+00	NOT IDENT.
GD-153	4.909E+00	NOT IDENT.
EU-154	5.624E+00	NOT IDENT.
EU-155	6.230E+00	NOT IDENT.
HO-166M	3.535E+00	NOT IDENT.
TM-171	1.156E+03	NOT IDENT.
LU-176	1.603E+00	NOT IDENT.
HF-181	1.881E+00	NOT IDENT.
W-181	1.398E+01	FAIL ABUN
TA-182	7.994E+00	NOT IDENT.
RE-183	1.316E+01	NOT IDENT.
RE-184	4.094E+00	NOT IDENT.
RE-188	8.392E+00	FAIL ABUN
W-188	3.974E+02	FAIL ABUN
IR-192	1.708E+00	FAIL ABUN
HG-203	1.970E+00	NOT IDENT.
BI-207	2.551E+00	NOT IDENT.
TL-208	2.532E+00	NOT IDENT.
BI-211	1.358E+01	NOT IDENT.
PB-211	4.206E+01	NOT IDENT.
BI-212	2.485E+01	NOT IDENT.
PB-212	4.761E+00	FAIL ABUN

BI-214	4.697E+00	NOT IDENT.
PB-214	4.848E+00	FAIL ABUN
RN-219	2.562E+01	NOT IDENT.
FR-221	1.225E+01	NOT IDENT.
RA-223	3.906E+01	FAIL ABUN
RA-224	4.231E+01	NOT IDENT.
AC-227	1.719E+01	NOT IDENT.
TH-227	1.719E+01	NOT IDENT.
AC-228	8.565E+00	FAIL ABUN
RA-228	8.565E+00	FAIL ABUN
TH-228	4.761E+00	FAIL ABUN
TH-229	3.005E+01	NOT IDENT.
TH-230	7.189E+02	NOT IDENT.
PA-231	2.977E+01	NOT IDENT.
TH-231	2.800E+01	NOT IDENT.
PA-233	4.013E+00	FAIL ABUN
PA-234	1.621E+01	FAIL ABUN
PA-234M	2.409E+02	NOT IDENT.
U-234	4.308E+03	NOT IDENT.
U-235	1.293E+01	FAIL ABUN
NP-237	4.013E+00	FAIL ABUN
NP-238	8.343E+00	FAIL ABUN
NP-239	1.835E+01	NOT IDENT.
AM-241	1.165E+01	NOT IDENT.
AM-242	4.181E+01	NOT IDENT.
AM-243	3.540E+00	NOT IDENT.
CM-243	5.942E+00	NOT IDENT.
CM-247	2.438E+00	NOT IDENT.
CF-249	1.791E+00	NOT IDENT.
CF-251	8.167E+00	NOT IDENT.
CF-252	1.175E+04	NOT IDENT.

VAX/VMS Nuclide Identification Report Generated 05-MAY-2015 14:16:06.96

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**********************************************************************
*                          GEL Laboratories LLC                      *
*                            2040 Savage Road                        *
*                          Charleston, SC 29407                      *
**********************************************************************
*                                                                    *
*                       DETECTOR AND SAMPLE DATA                     *
*                                                                    *
* Configuration    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203310162.CNF;1   *
* Acquisition date :  5-MAY-2015 12:14:59 Sensitivity     : 3.000    *
* Detector ID      : GAM14                Energy tolerance: 1.500    *
* Elapsed live time:    0 02:00:00.00     Abundance limit : 75.000   *
* Elapsed real time:    0 02:00:00.45     Half life ratio : *****    *
* Sample date      :  4-MAY-2015 00:00:00 Nuclide Library : LIQUID   *
* Sample ID        : G1203310162          Analyst initials: MJH1     *
* Batch Number     : 1475456              Sample Quantity : 2.0000E+00 LITER  *
*                                         Quantity Err(%) : 5.0000E-03 %      *
* Wet wt corr      :    1.00000           Wet Weight      :    0.00000        *
*                                         Dry Weight      :    0.00000        *
**********************************************************************
*                                                                    *
*                       CALIBRATION INFORMATION                      *
*                                                                    *
* Eff. Cal. date   : 12-MAR-2015 05:56:21 Eff. Geometry   : 2LMB     *
* Eff. File        : DKA100:[CANBERRA.GAMMA]EFF_GAM14_2LMB.CNF;12    *
**********************************************************************
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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/LITER)	Act Error (1.96-sigma)	TPU (1.96-sigma)
OS-191	6.129E+00	8.047E+00	8.047E+00
PB-210	1.045E+02	4.544E+02	4.544E+02
BI-213	6.799E+00	1.129E+01	1.129E+01
RA-226	6.178E+01	9.122E+01	9.122E+01
TH-232	8.425E+02	1.886E+03	1.886E+03
TH-234	5.920E+01	1.330E+02	1.330E+02
U-238	5.920E+01	1.330E+02	1.330E+02
ANH-511	4.159E+00	6.338E+00	6.338E+00

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/LITER)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	3.671E+00	1.956E+01	1.963E+01	NOT IDENT.
NA-22	1.472E-01	2.278E+00	2.279E+00	NOT IDENT.
NA-24	4.752E+00	1.206E+01	1.225E+01	NOT IDENT.
AL-26	-1.659E+00	2.293E+00	2.412E+00	NOT IDENT.
K-40	-9.847E+00	3.005E+01	3.038E+01	NOT IDENT.
SC-46	1.367E+00	2.050E+00	2.141E+00	FAIL ABUN
V-48	-5.685E-01	2.097E+00	2.112E+00	NOT IDENT.
CR-51	5.779E-01	1.818E+01	1.818E+01	NOT IDENT.
MN-52	1.364E+00	3.020E+00	3.082E+00	NOT IDENT.
MN-54	-1.546E-02	2.286E+00	2.286E+00	NOT IDENT.
CO-56	-1.087E-03	2.641E+00	2.641E+00	NOT IDENT.
CO-57	6.932E-01	1.867E+00	1.893E+00	NOT IDENT.
CO-58	-7.985E-01	2.114E+00	2.145E+00	NOT IDENT.
FE-59	1.760E+00	4.153E+00	4.228E+00	NOT IDENT.
CO-60	1.161E+00	2.347E+00	2.404E+00	NOT IDENT.
ZN-65	5.421E-01	4.280E+00	4.287E+00	NOT IDENT.
CU-67	3.107E+00	6.416E+00	6.567E+00	FAIL ABUN
GE-68	7.961E+01	7.992E+01	8.761E+01	NOT IDENT.
AS-74	-3.663E+00	3.789E+00	4.133E+00	FAIL ABUN
SE-75	1.276E+00	3.247E+00	3.297E+00	NOT IDENT.
BR-77	1.901E+01	2.389E+01	2.538E+01	FAIL ABUN
SR-82	-2.663E+00	1.740E+01	1.744E+01	NOT IDENT.

RB-83	-6.051E-01	4.985E+00	4.993E+00	NOT IDENT.
RB-84	-9.475E-01	3.439E+00	3.465E+00	NOT IDENT.
KR-85	1.885E+03	6.846E+02	1.091E+03	NOT IDENT.
SR-85	8.582E+00	3.117E+00	4.968E+00	NOT IDENT.
RB-86	3.280E+01	3.174E+01	3.501E+01	NOT IDENT.
Y-88	7.536E-01	1.956E+00	1.986E+00	NOT IDENT.
Y-91	-4.983E+02	9.011E+02	9.287E+02	NOT IDENT.
NB-94	1.254E+00	2.380E+00	2.446E+00	NOT IDENT.
NB-95	9.799E-01	2.244E+00	2.287E+00	NOT IDENT.
NB-95M	-7.844E-01	8.824E+00	8.831E+00	NOT IDENT.
ZR-95	-8.375E-01	3.583E+00	3.603E+00	NOT IDENT.
MO-99	9.585E+00	2.227E+01	2.269E+01	NOT IDENT.
TC-99M	1.510E+02	1.378E+02	1.537E+02	NOT IDENT.
RH-101	2.229E+00	2.952E+00	3.119E+00	FAIL ABUN
RH-102M	1.115E+00	1.923E+00	1.988E+00	NOT IDENT.
RU-103	-1.019E+00	2.585E+00	2.626E+00	NOT IDENT.
RH-106	-9.607E+00	2.197E+01	2.240E+01	NOT IDENT.
RU-106	-9.607E+00	2.197E+01	2.240E+01	NOT IDENT.
AG-108M	-2.351E-01	2.011E+00	2.013E+00	NOT IDENT.
CD-109	3.047E+00	5.926E+01	5.927E+01	NOT IDENT.
AG-110M	-1.542E-01	1.931E+00	1.933E+00	NOT IDENT.
SN-113	7.110E-01	3.069E+00	3.086E+00	NOT IDENT.
IN-114M	-9.214E-01	1.317E+01	1.318E+01	NOT IDENT.
CD-115	-1.393E+00	1.236E+01	1.237E+01	NOT IDENT.
SN-117M	2.194E-01	2.318E+00	2.320E+00	NOT IDENT.
I-123	6.013E+00	1.591E+01	1.614E+01	NOT IDENT.
TE-123M	8.760E-01	2.261E+00	2.295E+00	NOT IDENT.
SB-124	7.492E-01	3.521E+00	3.538E+00	NOT IDENT.
SB-125	2.348E+00	6.154E+00	6.245E+00	NOT IDENT.
TE-125M	-3.680E+02	6.992E+02	7.186E+02	NOT IDENT.
I-126	-5.740E-01	6.552E+00	6.557E+00	NOT IDENT.
SB-126	-2.500E-01	4.931E+00	4.933E+00	NOT IDENT.
SN-126	1.843E+00	5.692E+00	5.753E+00	FAIL ABUN
SB-127	-5.241E-01	7.548E+00	7.552E+00	NOT IDENT.
I-131	2.376E-01	2.988E+00	2.989E+00	NOT IDENT.
I-132	-3.411E+04	1.617E+05	1.624E+05	SHORT HLIF
TE-132	3.981E-01	2.823E+00	2.828E+00	NOT IDENT.
BA-133	-1.195E+00	3.077E+00	3.124E+00	NOT IDENT.
I-133	1.910E+00	7.765E+00	7.812E+00	NOT IDENT.
CS-134	5.777E-01	2.208E+00	2.224E+00	NOT IDENT.
CS-135	-2.191E+00	1.114E+01	1.118E+01	NOT IDENT.
I-135	-1.227E+02	4.059E+02	4.096E+02	NOT IDENT.
CS-136	8.049E-01	3.491E+00	3.509E+00	NOT IDENT.
BA-137M	9.959E-01	2.085E+00	2.133E+00	NOT IDENT.
CS-137	1.052E+00	2.203E+00	2.253E+00	NOT IDENT.
CE-139	-2.096E-01	2.057E+00	2.059E+00	NOT IDENT.
BA-140	4.207E+00	9.796E+00	9.977E+00	NOT IDENT.
LA-140	-4.207E+00	3.254E+00	3.766E+00	NOT IDENT.
CE-141	-8.461E-01	4.336E+00	4.353E+00	NOT IDENT.
CE-143	8.603E+00	1.045E+01	1.115E+01	NOT IDENT.
CE-144	-9.359E+00	1.394E+01	1.456E+01	NOT IDENT.
PM-144	1.180E+00	2.634E+00	2.687E+00	NOT IDENT.
PR-144	8.936E+01	1.959E+02	2.000E+02	NOT IDENT.
PM-146	-7.150E-01	3.568E+00	3.583E+00	FAIL ABUN
ND-147	4.941E+00	1.704E+01	1.719E+01	NOT IDENT.
PM-147	-1.040E+04	5.518E+04	5.538E+04	NOT IDENT.
PM-149	-4.850E+01	8.566E+01	8.841E+01	NOT IDENT.
EU-152	-4.128E+00	7.217E+00	7.453E+00	NOT IDENT.
GD-153	-3.005E+00	6.965E+00	7.096E+00	NOT IDENT.
EU-154	4.201E-01	6.498E+00	6.501E+00	NOT IDENT.
EU-155	-2.790E+00	7.765E+00	7.866E+00	NOT IDENT.
HO-166M	-3.893E-01	4.215E+00	4.219E+00	NOT IDENT.
TM-171	-8.922E+02	1.451E+03	1.506E+03	NOT IDENT.
LU-176	-3.080E-01	1.923E+00	1.928E+00	NOT IDENT.
HF-181	3.949E-02	2.271E+00	2.271E+00	NOT IDENT.
W-181	1.721E+00	1.628E+01	1.630E+01	FAIL ABUN
TA-182	-7.985E-02	9.364E+00	9.364E+00	NOT IDENT.
RE-183	-7.384E-02	1.548E+01	1.548E+01	NOT IDENT.
RE-184	-1.202E+00	5.532E+00	5.558E+00	NOT IDENT.
RE-188	2.902E-01	1.023E+01	1.023E+01	FAIL ABUN
W-188	3.720E+02	4.791E+02	5.076E+02	FAIL ABUN
IR-192	-9.797E-01	2.137E+00	2.182E+00	FAIL ABUN
HG-203	9.599E-01	2.218E+00	2.260E+00	NOT IDENT.
BI-207	5.135E-01	2.969E+00	2.978E+00	NOT IDENT.
TL-208	1.254E+00	3.003E+00	3.056E+00	NOT IDENT.
BI-211	7.580E+00	1.533E+01	1.571E+01	NOT IDENT.
PB-211	-1.411E+01	5.221E+01	5.260E+01	NOT IDENT.
BI-212	-4.221E+01	3.849E+01	4.294E+01	NOT IDENT.

PB-212	6.414E+00	8.064E+00	8.567E+00	FAIL ABUN
BI-214	-4.922E+00	6.041E+00	6.436E+00	NOT IDENT.
PB-214	-7.473E+00	6.873E+00	7.654E+00	FAIL ABUN
RN-219	-4.017E+00	3.116E+01	3.122E+01	NOT IDENT.
FR-221	-1.632E+00	1.433E+01	1.435E+01	NOT IDENT.
RA-223	-1.469E-01	4.618E+01	4.618E+01	FAIL ABUN
RA-224	3.956E+01	5.139E+01	5.439E+01	NOT IDENT.
AC-227	1.194E+01	1.910E+01	1.985E+01	NOT IDENT.
TH-227	1.194E+01	1.910E+01	1.985E+01	NOT IDENT.
AC-228	3.173E-01	7.369E+00	7.370E+00	FAIL ABUN
RA-228	3.173E-01	7.369E+00	7.370E+00	FAIL ABUN
TH-228	6.414E+00	8.064E+00	8.567E+00	FAIL ABUN
TH-229	-6.764E+00	4.285E+01	4.295E+01	NOT IDENT.
TH-230	2.778E+02	9.156E+02	9.241E+02	NOT IDENT.
PA-231	-1.464E+01	3.670E+01	3.729E+01	NOT IDENT.
TH-231	-1.654E+01	3.483E+01	3.562E+01	NOT IDENT.
PA-233	2.284E+00	4.487E+00	4.603E+00	FAIL ABUN
PA-234	1.059E+01	2.107E+01	2.161E+01	FAIL ABUN
PA-234M	-2.945E+02	3.340E+02	3.594E+02	NOT IDENT.
U-234	-2.783E+03	5.347E+03	5.493E+03	NOT IDENT.
U-235	-1.155E+01	1.791E+01	1.865E+01	FAIL ABUN
NP-237	2.284E+00	4.487E+00	4.603E+00	FAIL ABUN
NP-238	-1.033E+01	1.298E+01	1.379E+01	FAIL ABUN
NP-239	2.287E+01	2.014E+01	2.263E+01	NOT IDENT.
AM-241	1.354E+01	1.303E+01	1.439E+01	NOT IDENT.
AM-242	1.846E+01	4.855E+01	4.926E+01	NOT IDENT.
AM-243	-3.375E-01	4.526E+00	4.528E+00	NOT IDENT.
CM-243	-6.447E+00	7.825E+00	8.347E+00	NOT IDENT.
CM-247	6.092E-01	2.848E+00	2.861E+00	NOT IDENT.
CF-249	-2.764E+00	2.586E+00	2.871E+00	NOT IDENT.
CF-251	6.780E+00	9.400E+00	9.884E+00	NOT IDENT.
CF-252	1.367E+04	1.785E+04	1.888E+04	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

GAMMA SPECTROSCOPY BACKGROUND REPORT

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	10.9543	88.34	72.4083	152.32	51.2979
46.54	48.3154	88.47	72.4248	152.43	51.3045
49.72	37.5794	89.96	71.1003	153.25	41.4158
51.35	39.1308	91.11	59.1153	154.21	54.4006
52.39	46.7038	91.27	56.0990	155.04	53.1270
53.20	46.7962	92.59	55.7192	156.02	57.6219
56.28	52.7981	93.31	55.7872	158.56	57.7965
57.36	51.0406	93.35	55.7911	158.97	56.7125
57.53	51.0606	94.56	55.9047	159.00	56.7146
57.53	51.0609	94.65	55.9131	162.33	65.8678
57.98	56.7929	94.67	55.9150	162.66	75.9445
59.32	39.8768	97.43	62.8100	163.33	73.7679
59.54	39.8966	98.43	72.1197	165.86	56.0486
61.49	50.0887	98.44	72.1211	176.31	53.3077
63.00	60.3063	99.53	53.2902	176.60	45.3825
63.29	47.4135	100.11	41.0309	177.52	44.2928
63.58	47.4434	100.20	42.0627	181.07	63.8459
63.81	53.7000	103.18	53.6023	184.41	42.9073
64.28	53.7544	103.37	60.8362	184.58	58.3643
64.99	54.7978	105.31	57.9192	185.72	63.5915
65.08	54.8082	106.12	54.8857	186.21	60.1851
66.73	50.6580	109.28	58.2747	190.27	58.7156
66.98	62.2698	111.00	63.6434	193.51	51.9823
67.24	55.0590	111.76	55.3601	198.01	48.7407
67.67	50.7579	116.24	50.4709	201.83	47.7637
67.75	58.0185	116.30	50.4756	205.31	54.3588
69.67	66.0158	116.74	44.1943	210.85	52.0103
70.83	49.6286	117.23	43.1730	218.12	49.7109
72.81	75.2274	120.54	59.2496	222.11	43.6608
72.87	75.2364	120.90	56.1041	227.09	46.5486
74.66	66.6771	121.12	56.1219	227.38	46.5612
74.82	71.6024	121.22	57.1888	228.16	52.8669
74.97	71.6232	121.78	57.2344	228.18	52.8678
77.11	63.0531	122.06	53.0156	235.69	60.6272
79.69	70.2926	123.07	55.2148	235.96	60.6421
80.12	78.2755	127.23	64.0787	238.63	56.0830
80.19	78.2860	129.43	38.5634	238.98	56.1005
80.57	73.3831	131.20	46.7090	240.99	47.8609
81.00	64.5097	133.02	60.7087	242.00	50.8068
81.07	64.5180	133.52	60.3180	244.70	42.1969
83.79	74.8161	136.00	60.5163	252.40	54.0134
84.21	74.8730	136.28	58.3764	252.80	48.5371
85.43	71.0354	136.47	56.2286	256.23	42.2495
86.55	60.1501	140.51	51.0893	260.90	58.0906
86.94	60.1917	140.88	69.6016	264.66	47.1728
87.09	60.2078	143.76	62.2168	268.22	46.3837
87.57	61.2631	144.24	66.6232	269.46	43.6444
88.03	63.9261	145.44	49.2229	271.23	50.2171

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
273.65	41.9293	410.95	23.5622	664.57	16.7229
276.40	55.0955	414.70	22.5881	666.33	16.7348
277.37	51.4005	423.72	22.7086	666.50	17.6659
277.60	44.8667	427.09	23.7875	667.71	0.0000
278.00	43.9463	427.87	21.7290	677.62	14.0109
279.20	37.4365	433.94	20.7669	685.70	17.8055
279.54	36.5107	440.45	20.0104	695.00	17.8723
280.46	36.5369	453.88	28.5630	696.49	16.0006
283.69	35.6911	463.37	25.3345	696.51	16.0006
284.31	33.8291	468.07	20.1081	697.00	16.9453
285.41	40.4418	473.00	25.4674	697.49	22.5979
285.90	38.5758	475.06	16.9971	702.65	17.9271
287.50	37.6819	476.78	20.2026	706.68	23.6255
290.67	28.7083	477.60	23.4029	711.68	19.8849
293.27	33.3078	477.99	25.5355	720.70	21.8556
295.22	39.4228	482.18	19.1945	721.93	15.2113
295.96	40.9621	487.02	18.1746	722.78	15.2164
299.98	40.5801	492.35	23.5858	722.91	17.1193
300.09	40.5833	497.08	33.3164	723.31	15.2195
300.13	39.1352	511.00	19.4838	724.19	20.9338
301.36	49.5078	514.00	19.5134	727.33	25.7225
302.85	38.1256	520.40	20.8816	733.00	16.2313
304.50	37.2183	520.69	19.1442	735.93	21.0289
304.85	38.1830	522.65	0.0000	739.50	9.5715
306.78	39.1939	527.90	24.0162	744.23	16.3011
308.46	40.1998	529.59	18.5735	747.24	16.3198
311.90	29.7465	529.87	18.5761	752.31	11.5418
316.51	37.5486	531.02	19.6798	753.82	11.5485
319.41	30.8740	537.26	21.9336	756.73	13.4880
320.08	32.8192	546.56	28.6430	763.94	11.5922
321.04	35.7399	552.55	18.7821	765.80	13.5338
323.87	36.7800	563.25	14.4358	766.42	12.5699
325.23	37.7848	569.33	22.2723	766.84	14.5060
328.76	39.8220	569.50	21.1605	772.60	0.0000
333.37	29.2323	569.70	21.1628	776.52	21.3517
334.37	35.1035	583.19	17.9326	777.92	19.4204
338.28	34.2208	595.83	27.9560	778.90	19.4277
338.32	34.2219	600.60	25.3053	783.70	18.4884
340.48	25.4597	602.73	28.0430	785.37	23.3684
340.55	25.4608	604.72	30.7843	792.07	19.5210
344.28	41.2348	609.32	25.4037	795.86	9.7739
345.93	39.3152	610.33	24.5076	801.95	18.6108
351.06	33.5341	614.28	31.8247	810.29	12.7718
351.93	38.4879	618.01	22.7692	810.45	12.7724
356.01	37.6034	621.93	24.6329	810.76	14.7393
364.49	40.7998	630.19	0.0000	815.77	10.9372
366.42	36.8656	631.29	29.0079	818.51	9.8530
383.85	23.1737	632.98	20.1679	832.01	9.8999
388.16	31.3188	633.25	18.3364	834.85	14.8645
388.63	36.3807	634.78	6.1162	836.80	16.8576
391.70	30.3754	635.95	4.5895	846.77	18.9058
400.66	25.4524	636.99	10.7133	856.80	17.9723
401.81	34.6397	645.85	11.9831	860.56	8.9976
402.40	31.5946	657.76	10.8082	871.09	10.0330
404.85	32.6621	661.66	12.0631	873.19	14.0561

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
875.33	14.0660	1291.59	11.3101		
880.51	12.0773	1298.22	5.6643		
881.60	15.1022	1312.11	12.3139		
883.24	17.6290	1332.49	5.7112		
884.68	11.7584	1365.19	2.8777		
889.28	11.1031	1368.63	4.8000		
894.76	12.6401	1384.29	3.8540		
898.04	8.0984	1408.01	9.6875		
903.28	10.1404	1434.09	5.8469		
911.20	13.5553	1457.56	6.8573		
923.98	13.2710	1460.82	5.8818		
926.36	11.9190	1489.16	4.9320		
935.54	11.2707	1596.21	11.0989		
937.49	16.4039	1620.50	4.0562		
944.13	9.2465	1678.03	5.1288		
946.00	7.1960	1690.97	2.0567		
949.00	12.3478	1764.49	1.7880		
954.55	0.0000	1770.23	1.0441		
964.08	16.5410	1771.35	4.1774		
968.97	7.2476	1791.20	1.0483		
983.53	9.3601	1808.65	3.1550		
984.45	11.4434	1836.06	2.1140		
996.26	8.3523				
1001.03	14.6375				
1004.73	8.3736				
1025.87	5.8516				
1028.54	15.8115				
1037.84	14.0931				
1038.76	12.3349				
1046.59	14.8354				
1048.07	11.6617				
1050.41	8.4867				
1063.66	8.5191				
1077.00	5.3447				
1077.34	5.3452				
1085.87	6.4298				
1099.25	7.5298				
1112.07	8.6359				
1112.84	8.6379				
1115.54	7.5636				
1120.29	6.4916				
1120.55	6.4922				
1121.30	7.5756				
1129.67	6.5083				
1131.51	7.5968				
1173.23	18.6577				
1189.05	5.5103				
1204.77	11.0659				
1221.41	10.1872				
1231.02	10.2122				
1235.36	5.5764				
1238.28	13.0213				
1260.41	9.3526				
1274.44	7.5085				
1274.54	7.5085				

VAX/VMS Nuclide Identification Report Generated 5-MAY-2015 12:55:55.18

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*************************************************************************
*                          GEL Laboratories LLC                         *
*                            2040 Savage Road                           *
*                          Charleston, SC 29407                         *
*************************************************************************
Configuration    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203310163.CNF;1
Background file  : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM32.CNF;200
                                    Background date  : 3-MAY-2015 09:10:38.
Sample date      : 28-APR-2015 10:00:00 Acquisition date : 5-MAY-2015 10:55:22.
Sample ID        : G1203310163          Sample quantity  : 2.00000E+00 LITER
Detector name    : GAM32                Detector geometry: 2LMB
Elapsed live time: 0 02:00:00.00        Elapsed real time: 0 02:00:00.73  0.0%
Energy tolerance : 1.50000 keV          Analyst Initials : MJH1
Abundance limit  : 75.00000             Sensitivity      : 3.00000
Batch ID         : 1475456              Detector SN#     :
Matrix Spike ID  :                      LCS ID           : 1604
*************************************************************************
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	66.98	28	114	0.89	135.49	132	7	3.89E-03	66.3	
2	0	140.87*	20	167	1.20	283.25	277	11	2.85E-03	128.4	
3	9	183.91	9	24	1.08	369.31	368	12	1.31E-03	72.7	2.44E+00
4	9	186.18*	4	119	1.46	373.85	368	12	5.52E-04	561.8	
5	2	198.75*	24	77	1.45	398.98	393	15	3.37E-03	76.5	1.28E+00
6	2	200.51	21	68	1.45	402.50	393	15	2.86E-03	84.8	
7	0	205.51*	45	56	2.16	412.50	408	9	6.30E-03	35.2	
8	0	209.44	38	66	1.36	420.36	417	8	5.30E-03	39.9	
9	0	238.65*	83	113	1.13	478.78	473	11	1.16E-02	28.3	
10	0	295.90*	11	82	1.12	593.25	587	9	1.55E-03	157.6	
11	6	327.54	33	45	2.32	656.53	652	21	4.64E-03	42.1	1.04E+00
12	6	332.69	17	54	2.33	666.83	652	21	2.37E-03	88.8	
13	0	338.79*	50	55	1.51	679.03	673	13	6.90E-03	35.5	
14	0	352.38*	34	61	1.46	706.19	700	11	4.68E-03	52.4	
15	0	583.37*	33	19	1.64	1168.11	1162	11	4.59E-03	33.6	
16	0	605.35	12	11	1.37	1212.07	1210	6	1.68E-03	51.6	
17	0	609.76*	52	19	0.76	1220.88	1216	11	7.26E-03	23.2	
18	0	756.75	9	20	0.50	1514.82	1508	13	1.18E-03	112.5	
19	0	794.96	18	15	1.21	1591.23	1584	13	2.49E-03	51.6	
20	0	855.61	16	3	3.81	1712.52	1707	10	2.28E-03	30.6	
21	0	911.60	38	35	0.94	1824.47	1816	13	5.29E-03	36.1	
22	0	968.78*	14	11	1.74	1938.83	1935	7	2.00E-03	50.0	
23	0	1040.50	11	6	1.30	2082.25	2079	7	1.50E-03	50.1	
24	0	1105.58	24	4	5.48	2212.39	2204	18	3.35E-03	28.8	
25	0	1114.07	8	3	1.46	2229.38	2222	12	1.16E-03	53.8	
26	0	1120.22	16	6	1.13	2241.68	2238	10	2.22E-03	36.8	
27	0	1149.27	8	0	0.56	2299.75	2296	8	1.11E-03	35.4	
28	0	1231.42	6	5	1.31	2464.04	2460	7	8.33E-04	74.9	
29	0	1259.01	7	4	0.88	2519.21	2515	8	9.72E-04	62.3	
30	0	1294.81	9	2	0.70	2590.81	2585	9	1.19E-03	46.9	
31	0	1377.41	7	6	0.98	2755.98	2748	11	1.04E-03	71.1	
32	0	1461.04*	47	7	2.04	2923.22	2917	13	6.56E-03	19.5	
33	0	1510.25	8	0	0.83	3021.63	3018	7	1.11E-03	35.4	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 5-MAY-2015 12:55:56

Configuration	: DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203310163.CNF;1		
Analyses by	: PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4		
Sample title	: MJH1		
Sample date	: 28-APR-2015 10:00:00	Acquisition date	: 5-MAY-2015 10:55:22
Sample ID	: G1203310163	Sample quantity	: 2.0000 LITER
Sample type	: LIQUID	Sample geometry	:
Detector name	: GAMMA32	Detector geometry	: 2LMB
Elapsed live time	: 0 02:00:00.00	Elapsed real time	: 0 02:00:00.73 0.0%
Energy tolerance	: 1.50 keV	Half life ratio	: 10.00
Errors propagated	: No	Systematic Error	: 0.00 %
Efficiency type	: Empirical	Efficiencies at	: Peak Energy
Abundance limit	: 75.00		

Interference Report

No interference correction performed

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/LITER	Decay Corr pCi/LITER	2-Sigma %Error
K-40	1460.82	47	10.66*	5.651E-01	1.472E+02	1.472E+02	39.06
ZN-65	1115.54	8	50.60*	7.059E-01	4.371E+00	4.459E+00	107.53
CS-134	563.25	------	8.34	1.211E+00	------ Line Not Found		------
	569.33	------	15.37	1.202E+00	------ Line Not Found		------
	604.72	12	97.62	1.153E+00	2.011E+00	2.024E+00	103.19
	795.86	18	85.46*	9.417E-01	4.187E+00	4.214E+00	103.19
	801.95	------	8.69	9.351E-01	------ Line Not Found		------
	1365.19	------	3.02	5.948E-01	------ Line Not Found		------
TL-208	277.37	------	6.60	1.821E+00	------ Line Not Found		------
	583.19	33	85.00*	1.183E+00	6.174E+00	6.218E+00	67.11
	860.56	------	12.50	8.825E-01	------ Line Not Found		------
BI-211	72.87	------	1.23	1.117E+00	------ Line Not Found		------
	351.06	34	12.92*	1.598E+00	3.061E+01	3.063E+01	104.83
BI-214	609.32	52	45.49*	1.148E+00	1.878E+01	1.878E+01	46.40
	1120.29	16	14.92	7.026E-01	2.857E+01	2.857E+01	73.63
	1764.49	------	15.30	5.067E-01	------ Line Not Found		------
RA-226	186.21	4	3.59*	2.217E+00	9.369E+00	9.369E+00	1123.69
AC-228	338.32	50	11.27	1.633E+00	5.065E+01	5.077E+01	70.95
	911.20	38	25.80*	8.406E-01	3.296E+01	3.303E+01	72.24
	968.97	14	15.80	7.977E-01	2.147E+01	2.152E+01	99.93
RA-228	338.32	50	11.27	1.633E+00	5.065E+01	5.077E+01	70.95
	911.20	38	25.80*	8.406E-01	3.296E+01	3.303E+01	72.24
	968.97	14	15.80	7.977E-01	2.147E+01	2.152E+01	99.93
TH-230	67.67	28	0.38*	8.366E-01	1.653E+03	1.653E+03	132.50

Flag: "*" = Keyline

VAX/VMS Nuclide Identification Report Generated 05-MAY-2015 12:55:57.56

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**********************************************************************
*                          GEL Laboratories LLC                      *
*                            2040 Savage Road                        *
*                          Charleston, SC 29407                      *
**********************************************************************
*                                                                    *
*                       DETECTOR AND SAMPLE DATA                     *
*                                                                    *
* Configuration    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203310163.CNF;1  *
* Acquisition date :  5-MAY-2015 10:55:22 Sensitivity     : 3.000    *
* Detector ID      : GAM32                Energy tolerance: 1.500    *
* Elapsed live time:    0 02:00:00.00     Abundance limit : 75.000   *
* Elapsed real time:    0 02:00:00.73     Half life ratio : *****    *
* Sample date      : 28-APR-2015 10:00:00 Analyst initials: MJH1     *
* Sample ID        : G1203310163          Sample Quantity : 2.0000E+00 LITER  *
* Batch Number     : 1475456              Wet Weight      :    0.00000  *
* Wet wt corr      :    1.00000           Dry Weight      :    0.00000  *
* Nuclide Library  : LIQUID.NLB;4                                    *
**********************************************************************
*                                                                    *
*                       CALIBRATION INFORMATION                      *
*                                                                    *
* Eff. Cal. date   :  7-AUG-2014 15:41:28 Eff. Geometry   : 2LMB     *
* Eff. File        : DKA100:[CANBERRA.GAMMA]EFF_GAM32_2LMB.CNF;4     *
**********************************************************************
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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/LITER)	Cnt uncert (1.96-sigma)	MDA (pCi/LITER)
K-40	1.472E+02	5.634E+01	5.886E+01
ZN-65	4.459E+00	4.699E+00	7.141E+00
CS-134	4.214E+00	4.262E+00	2.583E+00
TL-208	6.218E+00	4.089E+00	4.822E+00
BI-211	3.063E+01	3.147E+01	3.367E+01
BI-214	1.878E+01	8.540E+00	9.627E+00
RA-226	9.369E+00	1.032E+02	1.197E+02
AC-228	3.303E+01	2.338E+01	2.766E+01
RA-228	3.303E+01	2.338E+01	2.766E+01
TH-230	1.653E+03	2.147E+03	2.640E+03

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/LITER)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/LITER)	
BE-7	-2.160E+01	2.477E+01	3.913E+01	NOT IDENT.
NA-22	2.241E+00	2.828E+00	6.220E+00	NOT IDENT.
NA-24	0.000E+00	7.503E+03	0.000E+00	SHORT HLIF
AL-26	-2.934E+00	2.534E+00	3.528E+00	NOT IDENT.
SC-46	-3.124E-01	2.393E+00	4.566E+00	FAIL ABUN
V-48	-1.044E+00	3.176E+00	5.843E+00	NOT IDENT.
CR-51	-1.345E+01	2.827E+01	4.927E+01	NOT IDENT.
MN-52	2.192E+00	6.709E+00	1.436E+01	NOT IDENT.
MN-54	2.723E+00	2.888E+00	6.047E+00	NOT IDENT.
CO-56	1.796E+00	2.360E+00	5.101E+00	NOT IDENT.
CO-57	-3.658E-01	2.827E+00	4.828E+00	NOT IDENT.
CO-58	-1.344E+00	2.463E+00	4.379E+00	NOT IDENT.
FE-59	-3.437E+00	6.830E+00	9.891E+00	NOT IDENT.
CO-60	1.477E-01	2.465E+00	4.950E+00	NOT IDENT.
CU-67	1.098E+01	1.566E+01	6.877E+01	FAIL ABUN
GE-68	1.967E+01	8.059E+01	1.628E+02	NOT IDENT.
AS-74	9.792E+00	5.876E+00	1.247E+01	NOT IDENT.
SE-75	2.635E-01	4.162E+00	7.600E+00	NOT IDENT.
BR-77	0.000E+00	1.504E+02	2.083E+02	FAIL ABUN
SR-82	1.827E+00	1.902E+01	3.708E+01	NOT IDENT.

RB-83	3.654E+00	5.545E+00	1.081E+01	NOT IDENT.
RB-84	-1.796E+00	4.042E+00	7.276E+00	NOT IDENT.
KR-85	-1.422E+03	8.937E+02	1.366E+03	NOT IDENT.
SR-85	-6.860E+00	4.313E+00	6.593E+00	NOT IDENT.
RB-86	5.516E+00	3.919E+01	7.759E+01	NOT IDENT.
Y-88	-9.422E-01	3.060E+00	5.804E+00	NOT IDENT.
Y-91	1.078E+03	1.250E+03	2.709E+03	NOT IDENT.
NB-94	-6.186E-01	2.557E+00	4.730E+00	NOT IDENT.
NB-95	-3.546E-02	2.478E+00	4.775E+00	NOT IDENT.
NB-95M	7.237E+00	1.165E+01	1.973E+01	NOT IDENT.
ZR-95	3.235E+00	7.129E+00	9.669E+00	FAIL ABUN
MO-99	-1.503E+01	1.272E+02	2.386E+02	FAIL ABUN
TC-99M	0.000E+00	1.430E+09	0.000E+00	SHORT HLIF
RH-101	-1.484E+00	3.423E+00	5.714E+00	FAIL ABUN
RH-102M	-2.683E+00	2.394E+00	3.758E+00	FAIL ABUN
RU-103	-1.896E+00	2.993E+00	5.022E+00	FAIL ABUN
RH-106	8.402E+00	2.294E+01	4.406E+01	NOT IDENT.
RU-106	8.402E+00	2.294E+01	4.406E+01	NOT IDENT.
AG-108M	2.062E+00	2.228E+00	4.521E+00	NOT IDENT.
CD-109	-6.539E+01	9.523E+01	1.581E+02	NOT IDENT.
AG-110M	1.354E+00	2.466E+00	5.036E+00	NOT IDENT.
SN-113	2.086E+00	3.465E+00	6.711E+00	NOT IDENT.
IN-114M	1.055E+01	1.714E+01	2.925E+01	NOT IDENT.
CD-115	5.501E+01	7.200E+01	1.438E+02	NOT IDENT.
SN-117M	1.349E+00	3.848E+00	6.743E+00	NOT IDENT.
I-123	0.000E+00	2.118E+04	0.000E+00	SHORT HLIF
TE-123M	-1.013E+00	2.957E+00	4.923E+00	NOT IDENT.
SB-124	2.146E+00	6.877E+00	1.465E+01	NOT IDENT.
SB-125	5.970E+00	7.263E+00	1.442E+01	NOT IDENT.
TE-125M	-2.034E+02	1.145E+03	1.802E+03	NOT IDENT.
I-126	-6.285E-01	1.143E+01	2.157E+01	NOT IDENT.
SB-126	9.967E-01	6.299E+00	1.238E+01	FAIL ABUN
SN-126	-5.736E+00	9.511E+00	1.588E+01	NOT IDENT.
SB-127	1.224E+01	2.338E+01	4.738E+01	NOT IDENT.
I-131	-1.676E+00	5.305E+00	9.348E+00	NOT IDENT.
I-132	0.000E+00	4.327E+22	0.000E+00	SHORT HLIF
TE-132	-2.174E+00	1.173E+01	2.113E+01	NOT IDENT.
BA-133	2.657E-01	4.454E+00	7.127E+00	NOT IDENT.
I-133	-1.397E+02	7.784E+02	1.382E+03	NOT IDENT.
CS-135	-1.537E+00	1.492E+01	2.689E+01	NOT IDENT.
I-135	0.000E+00	5.215E+08	0.000E+00	SHORT HLIF
CS-136	-8.102E-01	3.894E+00	7.419E+00	NOT IDENT.
BA-137M	-2.332E-01	2.790E+00	5.262E+00	NOT IDENT.
CS-137	-2.463E-01	2.947E+00	5.558E+00	NOT IDENT.
CE-139	-1.725E-01	2.898E+00	4.936E+00	NOT IDENT.
BA-140	1.957E+01	1.453E+01	3.018E+01	NOT IDENT.
LA-140	2.718E+00	4.522E+00	1.010E+01	FAIL ABUN
CE-141	-1.823E+00	6.627E+00	9.809E+00	NOT IDENT.
CE-143	1.033E+02	2.303E+02	3.836E+02	NOT IDENT.
CE-144	1.858E+01	2.092E+01	3.817E+01	NOT IDENT.
PM-144	-5.856E-01	2.304E+00	4.295E+00	NOT IDENT.
PR-144	-4.255E+01	1.718E+02	3.206E+02	NOT IDENT.
PM-146	-1.025E+00	3.537E+00	6.225E+00	NOT IDENT.
ND-147	1.949E+00	2.700E+01	4.964E+01	NOT IDENT.
PM-147	-6.139E+04	8.581E+04	1.405E+05	NOT IDENT.
PM-149	-4.850E+01	6.982E+02	1.262E+03	NOT IDENT.
EU-152	-3.054E+00	1.024E+01	1.576E+01	NOT IDENT.
GD-153	1.417E+00	9.523E+00	1.672E+01	NOT IDENT.
EU-154	6.292E+00	8.029E+00	1.764E+01	NOT IDENT.
EU-155	7.340E+00	1.267E+01	2.270E+01	NOT IDENT.
HO-166M	7.834E-01	3.989E+00	7.931E+00	FAIL ABUN
TM-171	-2.269E+03	4.731E+03	8.114E+03	FAIL ABUN
LU-176	-9.753E-01	2.348E+00	4.130E+00	FAIL ABUN
HF-181	-8.427E-01	3.412E+00	6.004E+00	NOT IDENT.
W-181	-1.288E+01	4.148E+01	7.176E+01	FAIL ABUN
TA-182	-1.257E+01	1.113E+01	1.651E+01	FAIL ABUN
RE-183	1.125E-02	3.789E+01	6.694E+01	FAIL ABUN
RE-184	-1.934E+00	9.959E+00	1.650E+01	NOT IDENT.
RE-188	-1.859E+00	1.648E+01	2.791E+01	NOT IDENT.
W-188	2.794E+01	6.748E+02	1.087E+03	NOT IDENT.
OS-191	4.702E+00	1.203E+01	2.125E+01	NOT IDENT.
IR-192	-4.932E-01	2.969E+00	5.323E+00	FAIL ABUN
HG-203	-3.446E+00	3.869E+00	6.584E+00	NOT IDENT.
BI-207	-1.249E-02	3.616E+00	6.951E+00	NOT IDENT.
PB-210	2.802E+02	1.155E+03	2.103E+03	NOT IDENT.
PB-211	-3.508E+01	6.353E+01	1.088E+02	NOT IDENT.
BI-212	9.171E+00	3.908E+01	7.702E+01	NOT IDENT.
PB-212	0.000E+00	1.018E+01	1.418E+01	FAIL ABUN

BI-213	-2.416E+00	8.009E+00	1.417E+01	NOT IDENT.
PB-214	1.111E+01	1.141E+01	1.641E+01	FAIL ABUN
RN-219	1.699E+01	3.510E+01	6.672E+01	NOT IDENT.
FR-221	8.459E-01	1.999E+01	3.656E+01	NOT IDENT.
RA-223	4.707E+01	6.169E+01	1.081E+02	FAIL ABUN
RA-224	1.078E+02	6.588E+01	1.208E+02	NOT IDENT.
AC-227	-2.222E+01	2.322E+01	3.920E+01	NOT IDENT.
TH-227	-2.222E+01	2.322E+01	3.920E+01	NOT IDENT.
TH-228	0.000E+00	1.018E+01	1.418E+01	FAIL ABUN
TH-229	-4.661E+01	5.487E+01	8.151E+01	FAIL ABUN
PA-231	2.938E+01	4.543E+01	8.632E+01	NOT IDENT.
TH-231	4.459E+01	5.531E+01	1.009E+02	NOT IDENT.
TH-232	-1.391E+03	3.532E+03	5.456E+03	FAIL ABUN
PA-233	-3.336E+00	5.789E+00	1.002E+01	NOT IDENT.
PA-234	3.217E+00	2.240E+01	4.370E+01	NOT IDENT.
PA-234M	2.195E+02	3.618E+02	7.340E+02	NOT IDENT.
TH-234	8.706E+01	2.416E+02	3.996E+02	NOT IDENT.
U-234	8.695E+03	1.685E+04	3.084E+04	NOT IDENT.
U-235	-1.038E+01	2.525E+01	3.643E+01	FAIL ABUN
NP-237	-3.336E+00	5.789E+00	1.002E+01	NOT IDENT.
NP-238	-1.625E+01	9.676E+01	1.828E+02	NOT IDENT.
U-238	8.706E+01	2.416E+02	3.996E+02	NOT IDENT.
NP-239	1.072E+01	3.045E+01	5.378E+01	NOT IDENT.
AM-241	-2.107E+01	3.103E+01	5.070E+01	NOT IDENT.
AM-242	2.274E+01	7.360E+01	1.305E+02	NOT IDENT.
AM-243	-7.214E-02	7.523E+00	1.309E+01	NOT IDENT.
CM-243	4.284E+00	1.243E+01	2.203E+01	NOT IDENT.
CM-247	1.739E+00	3.161E+00	6.058E+00	NOT IDENT.
CF-249	-2.884E+00	3.389E+00	5.627E+00	FAIL ABUN
CF-251	1.831E+01	1.405E+01	2.736E+01	NOT IDENT.
CF-252	2.021E+03	2.070E+04	3.614E+04	NOT IDENT.
ANH-511	-7.074E+00	4.709E+00	9.000E+00	NOT IDENT.

VAX/VMS Nuclide Identification Report Generated 5-MAY-2015 12:55:53.64

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	66.98	28	114	0.89	135.49	132	7	3.89E-03	66.3	
2	0	92.92	69	157	1.41	187.37	184	9	9.63E-03	35.0	
3	0	140.87	34	167	1.20	283.25	277	11	4.70E-03	76.1	
4	9	183.91	9	24	1.08	369.31	368	12	1.31E-03	72.7	2.44E+00
5	9	186.18	60	119	1.46	373.85	368	12	8.32E-03	35.8	
6	2	198.75	44	77	1.45	398.98	393	15	6.06E-03	40.3	1.28E+00
7	2	200.51	21	68	1.45	402.50	393	15	2.86E-03	84.8	
8	0	205.51	52	56	2.16	412.50	408	9	7.22E-03	29.5	
9	0	209.44	38	66	1.36	420.36	417	8	5.30E-03	39.9	
10	0	238.65	106	113	1.13	478.78	473	11	1.48E-02	21.6	
11	0	295.90	22	82	1.12	593.25	587	9	3.04E-03	78.1	
12	6	327.54	33	45	2.32	656.53	652	21	4.64E-03	42.1	1.04E+00
13	6	332.69	17	54	2.33	666.83	652	21	2.37E-03	88.8	
14	0	338.79	57	55	1.51	679.03	673	13	7.94E-03	29.9	
15	0	352.38	55	61	1.46	706.19	700	11	7.70E-03	30.3	
16	0	511.32	120	60	1.87	1024.04	1019	13	1.66E-02	16.5	
17	0	583.37	40	19	1.64	1168.11	1162	11	5.53E-03	26.6	
18	0	605.35	12	11	1.37	1212.07	1210	6	1.68E-03	51.6	
19	0	609.76	62	19	0.76	1220.88	1216	11	8.63E-03	18.6	
20	0	756.75	9	20	0.50	1514.82	1508	13	1.18E-03	112.5	
21	0	794.96	18	15	1.21	1591.23	1584	13	2.49E-03	51.6	
22	0	855.61	16	3	3.81	1712.52	1707	10	2.28E-03	30.6	
23	0	911.60	38	35	0.94	1824.47	1816	13	5.29E-03	36.1	
24	0	968.78	18	11	1.74	1938.83	1935	7	2.43E-03	38.9	
25	0	1040.50	11	6	1.30	2082.25	2079	7	1.50E-03	50.1	
26	0	1105.58	24	4	5.48	2212.39	2204	18	3.35E-03	28.8	
27	0	1114.07	8	3	1.46	2229.38	2222	12	1.16E-03	53.8	
28	0	1120.22	16	6	1.13	2241.68	2238	10	2.22E-03	36.8	
29	0	1149.27	8	0	0.56	2299.75	2296	8	1.11E-03	35.4	
30	0	1231.42	6	5	1.31	2464.04	2460	7	8.33E-04	74.9	
31	0	1259.01	7	4	0.88	2519.21	2515	8	9.72E-04	62.3	
32	0	1294.81	9	2	0.70	2590.81	2585	9	1.19E-03	46.9	
33	0	1377.41	7	6	0.98	2755.98	2748	11	1.04E-03	71.1	
34	0	1461.04	54	7	2.04	2923.22	2917	13	7.54E-03	16.7	
35	0	1510.25	8	0	0.83	3021.63	3018	7	1.11E-03	35.4	

VAX/VMS Nuclide Identification Report Generated 5-MAY-2015 12:55:55.73

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/LITER	Decay Corr pCi/LITER	2-Sigma %Error
K-40	1460.82	47	10.66*	5.651E-01	1.472E+02	1.472E+02	39.06
ZN-65	1115.54	8	50.60*	7.059E-01	4.371E+00	4.459E+00	107.53
CS-134	563.25	------	8.34	1.211E+00	------ Line Not Found		------
	569.33	------	15.37	1.202E+00	------ Line Not Found		------
	604.72	12	97.62	1.153E+00	2.011E+00	2.024E+00	103.19
	795.86	18	85.46*	9.417E-01	4.187E+00	4.214E+00	103.19
	801.95	------	8.69	9.351E-01	------ Line Not Found		------
	1365.19	------	3.02	5.948E-01	------ Line Not Found		------
TL-208	277.37	------	6.60	1.821E+00	------ Line Not Found		------
	583.19	33	85.00*	1.183E+00	6.174E+00	6.218E+00	67.11
	860.56	------	12.50	8.825E-01	------ Line Not Found		------
BI-211	72.87	------	1.23	1.117E+00	------ Line Not Found		------
	351.06	34	12.92*	1.598E+00	3.061E+01	3.063E+01	104.83
BI-214	609.32	52	45.49*	1.148E+00	1.878E+01	1.878E+01	46.40
	1120.29	16	14.92	7.026E-01	2.857E+01	2.857E+01	73.63
	1764.49	------	15.30	5.067E-01	------ Line Not Found		------
RA-226	186.21	4	3.59*	2.217E+00	9.369E+00	9.369E+00	1123.69
AC-228	338.32	50	11.27	1.633E+00	5.065E+01	5.077E+01	70.95
	911.20	38	25.80*	8.406E-01	3.296E+01	3.303E+01	72.24
	968.97	14	15.80	7.977E-01	2.147E+01	2.152E+01	99.93
RA-228	338.32	50	11.27	1.633E+00	5.065E+01	5.077E+01	70.95
	911.20	38	25.80*	8.406E-01	3.296E+01	3.303E+01	72.24
	968.97	14	15.80	7.977E-01	2.147E+01	2.152E+01	99.93
TH-230	67.67	28	0.38*	8.366E-01	1.653E+03	1.653E+03	132.50

Flag: "*" = Keyline

Sample ID : G1203310163 Acquisition date : 5-MAY-2015 10:55:22

Total number of lines in spectrum 33
Number of unidentified lines 6
Number of lines tentatively identified by NID 27 81.82%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/LITER	Decay Corr pCi/LITER	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.472E+02	1.472E+02	0.575E+02	39.06	
ZN-65	244.06D	1.02	4.371E+00	4.459E+00	4.795E+00	107.53	
CS-134	2.07Y	1.01	4.187E+00	4.214E+00	4.349E+00	103.19	
TL-208	1.91Y	1.01	6.174E+00	6.218E+00	4.173E+00	67.11	
BI-211	21.77Y	1.00	3.061E+01	3.063E+01	3.211E+01	104.83	
BI-214	1600.00Y	1.00	1.878E+01	1.878E+01	0.871E+01	46.40	
RA-226	1600.00Y	1.00	9.369E+00	9.369E+00	105.3E+00	1123.69	
AC-228	5.75Y	1.00	3.296E+01	3.303E+01	2.386E+01	72.24	
RA-228	5.75Y	1.00	3.296E+01	3.303E+01	2.386E+01	72.24	
TH-230	7.54E+04Y	1.00	1.653E+03	1.653E+03	2.190E+03	132.50	
Total Activity :			1.940E+03	1.940E+03			
Grand Total Activity :			1.940E+03	1.940E+03			

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

Sample ID : G1203310163 Acquisition date : 5-MAY-2015 10:55:22

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	140.87	20	167	1.20	283.25	277	11	2.85E-03	****	2.38E+00	T
9	183.91	9	24	1.08	369.31	368	12	1.31E-03	****	2.23E+00	T
2	198.75	24	77	1.45	398.98	393	15	3.37E-03	****	2.16E+00	T
2	200.51	21	68	1.45	402.50	393	15	2.86E-03	****	2.15E+00	T
0	205.51	45	56	2.16	412.50	408	9	6.30E-03	70.3	2.12E+00	T
0	209.44	38	66	1.36	420.36	417	8	5.30E-03	79.8	2.10E+00	T
0	238.65	83	113	1.13	478.78	473	11	1.16E-02	56.7	1.97E+00	T
0	295.90	11	82	1.12	593.25	587	9	1.55E-03	****	1.76E+00	T
6	327.54	33	45	2.32	656.53	652	21	4.64E-03	84.1	1.66E+00	T
6	332.69	17	54	2.33	666.83	652	21	2.37E-03	****	1.65E+00	T
0	756.75	9	20	0.50	1514.82	1508	13	1.18E-03	****	9.79E-01	T
0	855.61	16	3	3.81	1712.52	1707	10	2.28E-03	61.1	8.87E-01	T
0	1040.50	11	6	1.30	2082.25	2079	7	1.50E-03	****	7.50E-01	
0	1105.58	24	4	5.48	2212.39	2204	18	3.35E-03	57.6	7.11E-01	
0	1149.27	8	0	0.56	2299.75	2296	8	1.11E-03	70.7	6.87E-01	
0	1231.42	6	5	1.31	2464.04	2460	7	8.33E-04	****	6.47E-01	T
0	1259.01	7	4	0.88	2519.21	2515	8	9.72E-04	****	6.35E-01	T
0	1294.81	9	2	0.70	2590.81	2585	9	1.19E-03	93.8	6.21E-01	
0	1377.41	7	6	0.98	2755.98	2748	11	1.04E-03	****	5.91E-01	
0	1510.25	8	0	0.83	3021.63	3018	7	1.11E-03	70.7	5.52E-01	

Flags: "T" = Tentatively associated

VAX/VMS Nuclide Identification Report Generated 05-MAY-2015 12:56:03.21

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*************************************************************************
*                          GEL Laboratories LLC                         *
*                            2040 Savage Road                           *
*                          Charleston, SC 29407                         *
*************************************************************************
*                                                                       *
*                        DETECTOR AND SAMPLE DATA                       *
*                                                                       *
* Configuration    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203310163.CNF;1   *
* Acquisition date :  5-MAY-2015 10:55:22 Sensitivity     : 3.000          *
* Detector ID      : GAM32                Energy tolerance: 1.500          *
* Elapsed live time:    0 02:00:00.00     Abundance limit : 75.000         *
* Elapsed real time:    0 02:00:00.73     Half life ratio : *****          *
* Sample date      : 28-APR-2015 10:00:00 Nuclide Library : LIQUID         *
* Sample ID        : G1203310163          Analyst initials: MJH1           *
* Batch Number     : 1475456              Sample Quantity : 2.0000E+00 LITER  *
* Wet wt corr      :    1.00000           Wet Weight      :    0.00000     *
*                                         Dry Weight      :    0.00000     *
*************************************************************************
*                                                                       *
*                        CALIBRATION INFORMATION                        *
*                                                                       *
* Eff. Cal. date   :  7-AUG-2014 15:41:28 Eff. Geometry   : 2LMB          *
* Eff. File        : DKA100:[CANBERRA.GAMMA]EFF_GAM32_2LMB.CNF;4          *
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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/LITER)
K-40	2.522E+01
ZN-65	2.845E+00
CS-134	9.739E-01
TL-208	2.158E+00
BI-211	1.562E+01
BI-214	4.329E+00
RA-226	5.667E+01
AC-228	1.266E+01
RA-228	1.266E+01
TH-230	1.244E+03

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/LITER)	
BE-7	1.759E+01	NOT IDENT.
NA-22	2.705E+00	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	1.257E+00	NOT IDENT.
SC-46	1.970E+00	FAIL ABUN
V-48	2.484E+00	NOT IDENT.
CR-51	2.283E+01	NOT IDENT.
MN-52	6.116E+00	NOT IDENT.
MN-54	2.740E+00	NOT IDENT.
CO-56	2.249E+00	NOT IDENT.
CO-57	2.286E+00	NOT IDENT.
CO-58	1.895E+00	NOT IDENT.
FE-59	4.244E+00	NOT IDENT.
CO-60	2.055E+00	NOT IDENT.
CU-67	3.283E+01	FAIL ABUN
GE-68	7.036E+01	NOT IDENT.
AS-74	5.750E+00	NOT IDENT.
SE-75	3.561E+00	NOT IDENT.
BR-77	9.981E+01	FAIL ABUN
SR-82	1.642E+01	NOT IDENT.
RB-83	4.939E+00	NOT IDENT.

RB-84	3.144E+00	NOT IDENT.
KR-85	6.374E+02	NOT IDENT.
SR-85	3.076E+00	NOT IDENT.
RB-86	3.355E+01	NOT IDENT.
Y-88	2.366E+00	NOT IDENT.
Y-91	1.194E+03	NOT IDENT.
NB-94	2.120E+00	NOT IDENT.
NB-95	2.105E+00	NOT IDENT.
NB-95M	9.312E+00	NOT IDENT.
ZR-95	4.321E+00	FAIL ABUN
MO-99	1.068E+02	FAIL ABUN
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.700E+00	FAIL ABUN
RH-102M	1.681E+00	FAIL ABUN
RU-103	2.271E+00	FAIL ABUN
RH-106	1.975E+01	NOT IDENT.
RU-106	1.975E+01	NOT IDENT.
AG-108M	2.064E+00	NOT IDENT.
CD-109	7.509E+01	NOT IDENT.
AG-110M	2.267E+00	NOT IDENT.
SN-113	3.086E+00	NOT IDENT.
IN-114M	1.381E+01	NOT IDENT.
CD-115	6.530E+01	NOT IDENT.
SN-117M	3.193E+00	NOT IDENT.
I-123	0.000E+00	SHORT HLIF
TE-123M	2.328E+00	NOT IDENT.
SB-124	6.207E+00	NOT IDENT.
SB-125	6.617E+00	NOT IDENT.
TE-125M	8.554E+02	NOT IDENT.
I-126	9.742E+00	NOT IDENT.
SB-126	5.504E+00	FAIL ABUN
SN-126	7.545E+00	NOT IDENT.
SB-127	2.136E+01	NOT IDENT.
I-131	4.310E+00	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	9.908E+00	NOT IDENT.
BA-133	3.307E+00	NOT IDENT.
I-133	6.248E+02	NOT IDENT.
CS-135	1.260E+01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	3.091E+00	NOT IDENT.
BA-137M	2.371E+00	NOT IDENT.
CS-137	2.505E+00	NOT IDENT.
CE-139	2.327E+00	NOT IDENT.
BA-140	1.387E+01	NOT IDENT.
LA-140	4.317E+00	FAIL ABUN
CE-141	4.649E+00	NOT IDENT.
CE-143	1.800E+02	NOT IDENT.
CE-144	1.811E+01	NOT IDENT.
PM-144	1.900E+00	NOT IDENT.
PR-144	1.419E+02	NOT IDENT.
PM-146	2.831E+00	NOT IDENT.
ND-147	2.242E+01	NOT IDENT.
PM-147	6.644E+04	NOT IDENT.
PM-149	5.891E+02	NOT IDENT.
EU-152	7.293E+00	NOT IDENT.
GD-153	7.918E+00	NOT IDENT.
EU-154	7.669E+00	NOT IDENT.
EU-155	1.080E+01	NOT IDENT.
HO-166M	3.510E+00	FAIL ABUN
TM-171	3.825E+03	FAIL ABUN
LU-176	1.909E+00	FAIL ABUN
HF-181	2.738E+00	NOT IDENT.
W-181	3.390E+01	FAIL ABUN
TA-182	6.751E+00	FAIL ABUN
RE-183	3.164E+01	FAIL ABUN
RE-184	7.351E+00	NOT IDENT.
RE-188	1.322E+01	NOT IDENT.
W-188	5.055E+02	NOT IDENT.
OS-191	1.008E+01	NOT IDENT.
IR-192	2.469E+00	FAIL ABUN
HG-203	3.103E+00	NOT IDENT.
BI-207	3.014E+00	NOT IDENT.
PB-210	9.882E+02	NOT IDENT.
PB-211	4.987E+01	NOT IDENT.
BI-212	3.473E+01	NOT IDENT.
PB-212	6.794E+00	FAIL ABUN
BI-213	6.391E+00	NOT IDENT.

PB-214	7.762E+00	FAIL ABUN
RN-219	3.078E+01	NOT IDENT.
FR-221	1.721E+01	NOT IDENT.
RA-223	5.026E+01	FAIL ABUN
RA-224	5.727E+01	NOT IDENT.
AC-227	1.820E+01	NOT IDENT.
TH-227	1.820E+01	NOT IDENT.
TH-228	6.794E+00	FAIL ABUN
TH-229	3.813E+01	FAIL ABUN
PA-231	4.045E+01	NOT IDENT.
TH-231	4.807E+01	NOT IDENT.
TH-232	2.587E+03	FAIL ABUN
PA-233	4.626E+00	NOT IDENT.
PA-234	1.926E+01	NOT IDENT.
PA-234M	3.281E+02	NOT IDENT.
TH-234	1.895E+02	NOT IDENT.
U-234	1.461E+04	NOT IDENT.
U-235	1.725E+01	FAIL ABUN
NP-237	4.626E+00	NOT IDENT.
NP-238	7.846E+01	NOT IDENT.
U-238	1.895E+02	NOT IDENT.
NP-239	2.552E+01	NOT IDENT.
AM-241	2.393E+01	NOT IDENT.
AM-242	6.183E+01	NOT IDENT.
AM-243	6.236E+00	NOT IDENT.
CM-243	1.045E+01	NOT IDENT.
CM-247	2.792E+00	NOT IDENT.
CF-249	2.561E+00	FAIL ABUN
CF-251	1.304E+01	NOT IDENT.
CF-252	1.713E+04	NOT IDENT.
ANH-511	4.305E+00	NOT IDENT.

VAX/VMS Nuclide Identification Report Generated 05-MAY-2015 12:56:08.42

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*************************************************************************
*                          GEL Laboratories LLC                         *
*                            2040 Savage Road                           *
*                          Charleston, SC 29407                         *
*************************************************************************
*                                                                       *
*                        DETECTOR AND SAMPLE DATA                       *
*                                                                       *
* Configuration    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203310163.CNF;1   *
* Acquisition date :  5-MAY-2015 10:55:22 Sensitivity     : 3.000       *
* Detector ID      : GAM32                Energy tolerance: 1.500       *
* Elapsed live time:    0 02:00:00.00     Abundance limit : 75.000      *
* Elapsed real time:    0 02:00:00.73     Half life ratio : *****       *
* Sample date      : 28-APR-2015 10:00:00 Nuclide Library : LIQUID      *
* Sample ID        : G1203310163          Analyst initials: MJH1        *
* Batch Number     : 1475456              Sample Quantity : 2.0000E+00 LITER  *
*                                         Quantity Err(%) : 5.0000E-03 %      *
* Wet wt corr      :    1.00000           Wet Weight      :    0.00000  *
*                                         Dry Weight      :    0.00000  *
*************************************************************************
*                                                                       *
*                        CALIBRATION INFORMATION                        *
*                                                                       *
* Eff. Cal. date   :  7-AUG-2014 15:41:28 Eff. Geometry   : 2LMB        *
* Eff. File        : DKA100:[CANBERRA.GAMMA]EFF_GAM32_2LMB.CNF;4        *
*************************************************************************
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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/LITER)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.472E+02	5.786E+01	5.786E+01
ZN-65	4.459E+00	4.748E+00	4.748E+00
CS-134	4.214E+00	4.286E+00	4.286E+00
TL-208	6.218E+00	4.133E+00	4.133E+00
BI-211	3.063E+01	3.160E+01	3.160E+01
BI-214	1.878E+01	8.740E+00	8.740E+00
RA-226	9.369E+00	1.032E+02	1.032E+02
AC-228	3.303E+01	2.369E+01	2.369E+01
RA-228	3.303E+01	2.369E+01	2.369E+01
TH-230	1.653E+03	2.178E+03	2.178E+03

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/LITER)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-2.160E+01	2.485E+01	2.669E+01	NOT IDENT.
NA-22	2.241E+00	2.834E+00	3.009E+00	NOT IDENT.
NA-24	-4.924E+02	7.503E+03	7.506E+03	SHORT HLIF
AL-26	-2.934E+00	2.544E+00	2.867E+00	NOT IDENT.
SC-46	-3.124E-01	2.393E+00	2.397E+00	FAIL ABUN
V-48	-1.044E+00	3.178E+00	3.213E+00	NOT IDENT.
CR-51	-1.345E+01	2.831E+01	2.895E+01	NOT IDENT.
MN-52	2.192E+00	6.712E+00	6.784E+00	NOT IDENT.
MN-54	2.723E+00	2.903E+00	3.152E+00	NOT IDENT.
CO-56	1.796E+00	2.368E+00	2.502E+00	NOT IDENT.
CO-57	-3.658E-01	2.827E+00	2.832E+00	NOT IDENT.
CO-58	-1.344E+00	2.467E+00	2.540E+00	NOT IDENT.
FE-59	-3.437E+00	6.852E+00	7.025E+00	NOT IDENT.
CO-60	1.477E-01	2.465E+00	2.466E+00	NOT IDENT.
CU-67	1.098E+01	1.569E+01	1.645E+01	FAIL ABUN
GE-68	1.967E+01	8.064E+01	8.113E+01	NOT IDENT.
AS-74	9.792E+00	5.988E+00	7.439E+00	NOT IDENT.
SE-75	2.635E-01	4.163E+00	4.164E+00	NOT IDENT.
BR-77	2.708E+02	1.531E+02	1.958E+02	FAIL ABUN
SR-82	1.827E+00	1.903E+01	1.904E+01	NOT IDENT.

RB-83	3.654E+00	5.575E+00	5.814E+00	NOT IDENT.
RB-84	-1.796E+00	4.047E+00	4.127E+00	NOT IDENT.
KR-85	-1.422E+03	9.029E+02	1.107E+03	NOT IDENT.
SR-85	-6.860E+00	4.357E+00	5.342E+00	NOT IDENT.
RB-86	5.516E+00	3.920E+01	3.928E+01	NOT IDENT.
Y-88	-9.422E-01	3.060E+00	3.090E+00	NOT IDENT.
Y-91	1.078E+03	1.253E+03	1.344E+03	NOT IDENT.
NB-94	-6.186E-01	2.558E+00	2.573E+00	NOT IDENT.
NB-95	-3.546E-02	2.478E+00	2.478E+00	NOT IDENT.
NB-95M	7.237E+00	1.168E+01	1.213E+01	NOT IDENT.
ZR-95	3.235E+00	7.138E+00	7.285E+00	FAIL ABUN
MO-99	-1.503E+01	1.272E+02	1.274E+02	FAIL ABUN
TC-99M	5.682E+08	1.432E+09	1.454E+09	SHORT HLIF
RH-101	-1.484E+00	3.436E+00	3.501E+00	FAIL ABUN
RH-102M	-2.683E+00	2.415E+00	2.701E+00	FAIL ABUN
RU-103	-1.896E+00	2.998E+00	3.118E+00	FAIL ABUN
RH-106	8.402E+00	2.296E+01	2.327E+01	NOT IDENT.
RU-106	8.402E+00	2.296E+01	2.327E+01	NOT IDENT.
AG-108M	2.062E+00	2.234E+00	2.420E+00	NOT IDENT.
CD-109	-6.539E+01	9.579E+01	1.002E+02	NOT IDENT.
AG-110M	1.354E+00	2.470E+00	2.545E+00	NOT IDENT.
SN-113	2.086E+00	3.469E+00	3.594E+00	NOT IDENT.
IN-114M	1.055E+01	1.717E+01	1.781E+01	NOT IDENT.
CD-115	5.501E+01	7.221E+01	7.635E+01	NOT IDENT.
SN-117M	1.349E+00	3.850E+00	3.898E+00	NOT IDENT.
I-123	-7.039E+03	2.119E+04	2.143E+04	SHORT HLIF
TE-123M	-1.013E+00	2.959E+00	2.994E+00	NOT IDENT.
SB-124	2.146E+00	6.879E+00	6.947E+00	NOT IDENT.
SB-125	5.970E+00	7.280E+00	7.761E+00	NOT IDENT.
TE-125M	-2.034E+02	1.146E+03	1.149E+03	NOT IDENT.
I-126	-6.285E-01	1.143E+01	1.143E+01	NOT IDENT.
SB-126	9.967E-01	6.301E+00	6.317E+00	FAIL ABUN
SN-126	-5.736E+00	9.549E+00	9.893E+00	NOT IDENT.
SB-127	1.224E+01	2.342E+01	2.406E+01	NOT IDENT.
I-131	-1.676E+00	5.307E+00	5.361E+00	NOT IDENT.
I-132	-3.963E+22	4.677E+22	0.000E+00	SHORT HLIF
TE-132	-2.174E+00	1.173E+01	1.177E+01	NOT IDENT.
BA-133	2.657E-01	4.455E+00	4.456E+00	NOT IDENT.
I-133	-1.397E+02	7.785E+02	7.811E+02	NOT IDENT.
CS-135	-1.537E+00	1.492E+01	1.494E+01	NOT IDENT.
I-135	4.273E+08	5.277E+08	5.617E+08	SHORT HLIF
CS-136	-8.102E-01	3.897E+00	3.914E+00	NOT IDENT.
BA-137M	-2.332E-01	2.790E+00	2.792E+00	NOT IDENT.
CS-137	-2.463E-01	2.947E+00	2.950E+00	NOT IDENT.
CE-139	-1.725E-01	2.899E+00	2.900E+00	NOT IDENT.
BA-140	1.957E+01	1.464E+01	1.709E+01	NOT IDENT.
LA-140	2.718E+00	4.528E+00	4.691E+00	FAIL ABUN
CE-141	-1.823E+00	6.629E+00	6.680E+00	NOT IDENT.
CE-143	1.033E+02	2.306E+02	2.353E+02	NOT IDENT.
CE-144	1.858E+01	2.101E+01	2.262E+01	NOT IDENT.
PM-144	-5.856E-01	2.304E+00	2.320E+00	NOT IDENT.
PR-144	-4.255E+01	1.719E+02	1.730E+02	NOT IDENT.
PM-146	-1.025E+00	3.539E+00	3.569E+00	NOT IDENT.
ND-147	1.949E+00	2.700E+01	2.701E+01	NOT IDENT.
PM-147	-6.139E+04	8.606E+04	9.040E+04	NOT IDENT.
PM-149	-4.850E+01	6.983E+02	6.986E+02	NOT IDENT.
EU-152	-3.054E+00	1.025E+01	1.034E+01	NOT IDENT.
GD-153	1.417E+00	9.525E+00	9.546E+00	NOT IDENT.
EU-154	6.292E+00	8.046E+00	8.532E+00	NOT IDENT.
EU-155	7.340E+00	1.270E+01	1.313E+01	NOT IDENT.
HO-166M	7.834E-01	3.990E+00	4.005E+00	FAIL ABUN
TM-171	-2.269E+03	4.754E+03	4.863E+03	FAIL ABUN
LU-176	-9.753E-01	2.351E+00	2.391E+00	FAIL ABUN
HF-181	-8.427E-01	3.413E+00	3.434E+00	NOT IDENT.
W-181	-1.288E+01	4.167E+01	4.207E+01	FAIL ABUN
TA-182	-1.257E+01	1.118E+01	1.253E+01	FAIL ABUN
RE-183	1.125E-02	3.789E+01	3.789E+01	FAIL ABUN
RE-184	-1.934E+00	9.962E+00	1.000E+01	NOT IDENT.
RE-188	-1.859E+00	1.648E+01	1.650E+01	NOT IDENT.
W-188	2.794E+01	6.748E+02	6.749E+02	NOT IDENT.
OS-191	4.702E+00	1.204E+01	1.222E+01	NOT IDENT.
IR-192	-4.932E-01	2.969E+00	2.977E+00	FAIL ABUN
HG-203	-3.446E+00	3.890E+00	4.189E+00	NOT IDENT.
BI-207	-1.249E-02	3.616E+00	3.616E+00	NOT IDENT.
PB-210	2.802E+02	1.156E+03	1.163E+03	NOT IDENT.
PB-211	-3.508E+01	6.360E+01	6.553E+01	NOT IDENT.
BI-212	9.171E+00	3.909E+01	3.931E+01	NOT IDENT.
PB-212	1.833E+01	1.037E+01	1.326E+01	FAIL ABUN

BI-213	-2.416E+00	8.011E+00	8.085E+00	NOT IDENT.
PB-214	1.111E+01	1.146E+01	1.251E+01	FAIL ABUN
RN-219	1.699E+01	3.518E+01	3.601E+01	NOT IDENT.
FR-221	8.459E-01	1.999E+01	1.999E+01	NOT IDENT.
RA-223	4.707E+01	6.192E+01	6.546E+01	FAIL ABUN
RA-224	1.078E+02	6.693E+01	8.272E+01	NOT IDENT.
AC-227	-2.222E+01	2.351E+01	2.555E+01	NOT IDENT.
TH-227	-2.222E+01	2.351E+01	2.555E+01	NOT IDENT.
TH-228	1.833E+01	1.037E+01	1.326E+01	FAIL ABUN
TH-229	-4.661E+01	5.504E+01	5.892E+01	FAIL ABUN
PA-231	2.938E+01	4.596E+01	4.783E+01	NOT IDENT.
TH-231	4.459E+01	5.595E+01	5.945E+01	NOT IDENT.
TH-232	-1.391E+03	3.543E+03	3.598E+03	FAIL ABUN
PA-233	-3.336E+00	5.801E+00	5.993E+00	NOT IDENT.
PA-234	3.217E+00	2.270E+01	2.275E+01	NOT IDENT.
PA-234M	2.195E+02	3.629E+02	3.761E+02	NOT IDENT.
TH-234	8.706E+01	2.428E+02	2.459E+02	NOT IDENT.
U-234	8.695E+03	1.694E+04	1.739E+04	NOT IDENT.
U-235	-1.038E+01	2.527E+01	2.570E+01	FAIL ABUN
NP-237	-3.336E+00	5.801E+00	5.993E+00	NOT IDENT.
NP-238	-1.625E+01	9.678E+01	9.705E+01	NOT IDENT.
U-238	8.706E+01	2.428E+02	2.459E+02	NOT IDENT.
NP-239	1.072E+01	3.047E+01	3.085E+01	NOT IDENT.
AM-241	-2.107E+01	3.126E+01	3.267E+01	NOT IDENT.
AM-242	2.274E+01	7.374E+01	7.445E+01	NOT IDENT.
AM-243	-7.214E-02	7.523E+00	7.523E+00	NOT IDENT.
CM-243	4.284E+00	1.244E+01	1.259E+01	NOT IDENT.
CM-247	1.739E+00	3.177E+00	3.272E+00	NOT IDENT.
CF-249	-2.884E+00	3.403E+00	3.643E+00	FAIL ABUN
CF-251	1.831E+01	1.427E+01	1.648E+01	NOT IDENT.
CF-252	2.021E+03	2.078E+04	2.080E+04	NOT IDENT.
ANH-511	-7.074E+00	4.752E+00	5.723E+00	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

GAMMA SPECTROSCOPY BACKGROUND REPORT

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	87.2407	88.34	147.4701	152.32	101.1807
46.54	75.8143	88.47	130.3951	152.43	101.1914
49.72	70.2715	89.96	180.9971	153.25	105.8752
51.35	98.6899	91.11	154.4626	323.87	109.4292
52.39	103.9302	91.27	154.4956	155.04	110.6689
53.20	92.9721	92.59	118.2262	156.02	102.6962
56.28	113.8266	93.31	123.7188	158.56	96.0051
57.36	114.0479	93.35	123.7253	158.97	0.0000
57.53	105.9337	94.56	130.3885	159.00	111.0879
57.53	105.9342	94.65	162.7354	162.33	90.5414
57.98	99.9021	94.67	162.7400	162.66	90.5692
59.32	95.0295	97.43	102.7548	163.33	91.7874
59.54	102.2217	98.43	98.5551	165.86	92.0027
61.49	105.6443	98.44	98.5565	176.31	100.5145
63.00	87.9207	99.53	100.8631	176.60	100.5397
63.29	78.7043	100.11	105.2792	177.52	97.9736
63.58	101.9024	100.20	107.4620	181.07	120.4122
63.81	101.9417	103.18	113.3131	184.41	102.2906
64.28	106.6592	103.37	103.5318	184.58	102.3056
64.99	116.0711	105.31	109.2428	143.76	106.6727
65.08	126.9232	106.12	121.3797	186.21	106.7166
66.73	113.8168	109.28	119.6506	190.27	78.5287
66.98	104.5472	111.00	115.4969	193.51	94.4899
67.24	102.5202	111.76	103.4905	198.01	67.5384
67.67	88.6020	116.24	115.1021	201.83	46.8473
67.75	88.6133	116.30	115.1100	205.31	46.9782
69.67	101.3622	116.74	104.0948	210.85	75.4958
70.83	128.1069	117.23	98.6131	218.12	84.8659
72.81	106.5634	99.53	116.7808	222.11	97.0241
72.87	106.5732	120.90	122.3916	227.09	79.0129
74.66	133.0591	121.12	122.4218	227.38	79.9489
74.82	133.0914	121.22	123.5488	228.16	79.9954
74.97	129.9771	121.78	116.9442	228.18	80.9162
77.11	113.5717	122.06	110.2964	116.74	80.9162
79.69	130.8948	123.07	91.4596	235.69	76.9266
80.12	138.3713	127.23	110.9281	235.96	78.4215
80.19	138.3853	129.43	99.9620	238.63	93.5840
80.57	145.8606	131.20	113.6558	238.98	93.6079
81.00	143.8366	133.02	95.8368	240.99	63.8570
81.07	143.8512	133.52	90.2466	242.00	72.8199
83.79	114.6808	136.00	108.5791	244.70	89.3386
84.21	110.4989	57.53	108.6104	252.40	71.1108
85.43	117.0747	136.47	108.6318	252.80	73.9383
86.55	131.1160	140.51	98.8600	256.23	77.8666
86.94	137.5861	140.88	98.8972	260.90	68.7037
87.09	137.6150	143.76	107.7372	264.66	72.6539
87.57	140.9086	144.24	128.3215	268.22	75.6641
88.03	142.0661	145.44	119.9109	269.46	70.9946

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
271.23	72.0258	404.85	51.1620	661.66	29.1609
273.65	82.5820	410.95	40.0277	664.57	17.3319
276.40	85.5835	414.70	42.1593	666.33	30.1222
277.37	71.3654	423.72	38.2144	666.50	31.0366
277.60	77.0857	427.09	33.1045	667.71	0.0000
278.00	69.4912	427.87	27.9422	677.62	18.3276
279.20	76.2134	433.94	22.8345	685.70	21.1357
279.54	72.4189	440.45	33.3169	695.00	29.5000
280.46	76.2756	453.88	38.7654	696.49	23.0585
283.69	65.9257	463.37	33.6733	696.51	23.0585
284.31	63.0845	468.07	49.5639	697.00	15.6827
285.41	66.9548	473.00	25.3656	697.49	17.5305
285.90	67.9319	475.06	42.3151	702.65	28.6523
287.50	66.0857	476.78	40.2306	706.68	24.0633
290.67	58.3499	477.60	34.9497	711.68	17.6144
293.27	66.1356	477.99	28.6002	720.70	19.5270
351.93	73.9160	482.18	40.3275	721.93	26.0470
295.96	77.0313	487.02	36.1598	722.78	23.2629
299.98	69.5017	492.35	28.7823	722.91	23.2635
300.09	69.5061	497.08	40.5919	723.31	25.1279
300.13	60.4980	511.00	40.8357	724.19	26.9970
301.36	59.8998	514.00	106.5229	727.33	15.8425
302.85	63.8227	520.40	26.9722	733.00	29.8766
256.23	62.9192	520.69	26.9760	735.93	13.0836
304.85	58.0920	522.65	0.0000	739.50	26.1974
306.78	58.1607	527.90	21.6455	744.23	16.8671
308.46	40.7542	529.59	29.2420	747.24	22.5111
311.90	60.2858	529.87	32.4957	752.31	14.0925
316.51	58.5022	531.02	28.1757	753.82	18.7993
319.41	59.5796	537.26	21.7297	756.73	19.7577
320.08	63.5123	546.56	0.0000	763.94	24.7536
321.04	55.7267	552.55	19.6787	765.80	18.8711
323.87	42.3055	563.25	28.5462	766.42	20.7625
325.23	50.1797	569.33	18.7100	766.84	20.7652
328.76	56.5682	946.00	19.8116	772.60	0.0000
333.37	56.7193	569.70	19.8133	776.52	18.9351
334.37	35.4699	583.19	24.3445	739.50	20.8377
338.28	52.1394	595.83	20.0149	778.90	21.7916
338.32	52.1402	427.87	40.1023	783.70	18.0287
311.90	50.6227	602.73	14.2703	785.37	23.7341
340.55	50.6242	604.72	30.3468	792.07	26.9547
344.28	44.3898	609.32	26.8228	795.86	3.1748
345.93	46.0177	610.33	26.8330	810.29	16.2633
351.06	54.7029	614.28	19.7065	344.28	16.2641
351.93	54.7298	618.01	23.5462	810.76	20.0930
356.01	54.2547	621.93	20.2121	815.77	12.4573
364.49	53.1035	630.19	0.0000	1048.07	15.3449
366.42	39.1166	631.29	23.4362	832.01	29.8511
356.01	39.4796	155.04	24.3527	834.85	18.3112
388.16	49.7140	633.25	24.3554	836.80	0.0000
388.63	52.7704	634.78	26.1736	846.77	10.6388
391.70	33.5418	635.95	26.1850	856.80	17.7832
264.66	40.8429	636.99	30.7112	860.56	22.6583
401.81	38.8234	645.85	24.4668	871.09	24.3506
402.40	36.7910	657.76	20.0208	873.19	25.3398

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
875.33	14.6279	1291.59	5.4016		
880.51	19.5332	1298.22	5.4092		
881.60	18.5621	1312.11	13.0201		
883.24	15.6387	1332.49	7.6275		
657.76	16.6227	1365.19	9.8732		
889.28	14.6865	1368.63	0.0000		
894.76	19.6123	1384.29	4.0046		
898.04	17.6673	1408.01	6.4548		
903.28	25.2761	1434.09	8.3419		
911.20	39.4053	1457.56	0.0000		
923.98	9.8862	1460.82	12.1124		
926.36	14.8392	1489.16	11.2417		
935.54	20.8272	1596.21	6.6892		
937.49	17.8611	1620.50	3.8392		
944.13	19.8818	1678.03	0.0000		
946.00	16.9079	1690.97	7.7738		
949.00	15.9262	1764.49	7.8714		
667.71	0.0000	1063.66	5.9092		
964.08	21.6540	1771.35	5.9104		
968.97	25.0183	1791.20	0.0000		
983.53	14.0643	1808.65	9.9113		
984.45	14.0677	1836.06	8.9601		
996.26	23.1825				
1001.03	9.0826				
1274.44	21.2128				
1025.87	11.1719				
1028.54	9.1468				
1037.84	16.9784				
1038.76	0.0000				
475.06	7.6571				
1048.07	10.2134				
1050.41	14.3069				
1063.66	14.3541				
1077.00	12.3439				
1077.34	11.3164				
1085.87	12.3709				
1099.25	18.9618				
1112.07	0.0000				
1112.84	10.3765				
1115.54	5.1917				
1120.29	15.5925				
1120.55	14.2938				
1221.41	15.5962				
1129.67	13.5434				
1131.51	0.0000				
1173.23	11.5769				
1189.05	15.8438				
1204.77	9.5401				
1221.41	18.0874				
1231.02	14.9270				
1235.36	10.6724				
1238.28	6.4075				
1260.41	0.0000				
1274.44	7.5346				
1274.54	7.5346				

VAX/VMS Nuclide Identification Report Generated 5-MAY-2015 07:28:36.75

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203310164.CNF;1
Background file   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM06.CNF;440

		Background date	: 3-MAY-2015 09:08:37.
Sample date	: 4-MAY-2015 00:00:00.	Acquisition date	: 5-MAY-2015 07:12:54.
Sample ID	: G1203310164	Sample quantity	: 2.00000E+00 LITER
Detector name	: GAM06	Detector geometry	: 2LMB
Elapsed live time	: 0 00:15:00.00	Elapsed real time	: 0 00:15:04.37 0.5%
Energy tolerance	: 2.00000 keV	Analyst Initials	: MJH1
Abundance limit	: 75.00000	Sensitivity	: 3.00000
Batch ID	: 1475456	Detector SN#	:
Matrix Spike ID	:	LCS ID	: 1604

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.41	2293	4118	1.08	92.31	86	12	2.55E+00	6.0	
2	7	58.05	545	2497	1.65	115.58	112	12	6.06E-01	20.5	3.98E+00
3	7	59.58	5964	1465	1.00	118.64	112	12	6.63E+00	1.7	
4	6	86.54	121	1506	1.47	172.56	169	12	1.35E-01	63.0	9.76E-01
5	6	88.08	4221	1117	1.01	175.62	169	12	4.69E+00	2.0	
6	3	119.82	90	411	1.23	239.10	237	12	1.00E-01	30.9	7.20E-01
7	3	122.12*	937	933	1.15	243.70	237	12	1.04E+00	6.3	
8	0	136.24	120	1334	1.43	271.92	268	10	1.33E-01	57.6	
9	0	151.93	77	671	1.32	303.31	301	6	8.54E-02	54.6	
10	0	166.21	109	773	0.97	331.85	329	7	1.21E-01	43.6	
11	0	225.16	117	806	1.71	449.75	446	8	1.30E-01	43.2	
12	0	279.74	102	528	2.50	558.89	555	8	1.13E-01	40.4	
13	0	352.93*	38	579	1.53	705.26	697	10	4.20E-02	120.2	
14	0	391.02	44	567	1.06	781.44	777	10	4.92E-02	101.7	
15	0	661.64	7225	434	1.53	1322.74	1314	15	8.03E+00	1.3	
16	0	867.79	33	177	1.31	1735.15	1732	6	3.72E-02	65.4	
17	0	870.31	32	315	0.99	1740.18	1738	10	3.61E-02	103.1	
18	0	876.53	19	234	1.28	1752.64	1750	7	2.08E-02	137.9	
19	0	914.43	7	277	0.82	1828.46	1828	8	8.23E-03	389.5	
20	0	926.96	54	292	0.99	1853.53	1850	9	6.00E-02	58.5	
21	0	1040.30	33	254	2.69	2080.31	2078	10	3.66E-02	91.7	
22	0	1115.36	501	339	1.82	2230.52	2222	17	5.56E-01	9.6	
23	0	1173.01	6296	214	1.93	2345.87	2337	19	7.00E+00	1.4	
24	0	1332.20	5616	75	2.15	2664.47	2656	20	6.24E+00	1.4	
25	0	1421.09	5	9	1.41	2842.39	2836	9	5.48E-03	118.7	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 5-MAY-2015 07:28:38

Configuration	: DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203310164.CNF;1		
Analyses by	: PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4		
Sample title	: MJH1		
Sample date	: 4-MAY-2015 00:00:00	Acquisition date	: 5-MAY-2015 07:12:54
Sample ID	: G1203310164	Sample quantity	: 2.0000 LITER
Sample type	: LIQUID	Sample geometry	:
Detector name	: GAMMA6	Detector geometry	: 2LMB
Elapsed live time	: 0 00:15:00.00	Elapsed real time	: 0 00:15:04.37 0.5%
Energy tolerance	: 2.00 keV	Half life ratio	: 8.00
Errors propagated	: No	Systematic Error	: 0.00 %
Efficiency type	: Empirical	Efficiencies at	: Peak Energy
Abundance limit	: 75.00		

Interference Report

No interference correction performed

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/LITER	Decay Corr pCi/LITER	1-Sigma %Error
CO-57	122.06	937	85.60*	2.257E+00	7.281E+02	7.305E+02	6.34
	136.47	120	10.68	2.276E+00	7.420E+02	7.445E+02	57.63
CO-60	1173.23	6296	99.85	5.792E-01	1.634E+04	1.635E+04	1.38
	1332.49	5616	99.98*	5.221E-01	1.615E+04	1.616E+04	1.39
ZN-65	1115.54	501	50.60*	6.036E-01	2.460E+03	2.470E+03	9.55
CD-109	88.03	4221	3.70*	1.789E+00	9.576E+04	9.595E+04	2.00
SN-113	391.70	44	64.97*	1.320E+00	7.756E+01	7.818E+01	101.73
SN-126	64.28	------	9.60	8.942E-01	------ Line Not Found		------
	86.94	121	8.90	1.746E+00	1.172E+03	1.172E+03	63.03
	87.57	4221	37.00*	1.789E+00	9.576E+03	9.576E+03	2.00
BA-137M	661.66	7225	89.90*	9.100E-01	1.326E+04	1.326E+04	1.33
CS-137	661.66	7225	85.10*	9.100E-01	1.401E+04	1.401E+04	1.33
CE-139	165.86	109	80.00*	2.185E+00	9.329E+01	9.390E+01	43.56
PM-147	121.22	937	0.00*	2.257E+00	2.187E+07	2.189E+07	6.34
W-181	56.28	545	18.70	6.177E-01	7.087E+03	7.140E+03	20.47
	57.53	545	32.00*	6.177E-01	4.141E+03	4.172E+03	20.47
	65.08	------	10.60	9.300E-01	------ Line Not Found		------
	66.98	------	2.40	1.015E+00	------ Line Not Found		------
	136.28	120	0.03	2.276E+00	2.642E+05	2.661E+05	57.63
	152.32	77	0.08	2.242E+00	6.431E+04	6.479E+04	54.61
HG-203	70.83	------	3.69	1.182E+00	------ Line Not Found		------
	72.87	------	6.19	1.267E+00	------ Line Not Found		------
	279.20	102	81.56*	1.651E+00	1.133E+02	1.155E+02	40.43
PB-210	46.54	2293	4.25*	1.957E-01	4.139E+05	4.139E+05	5.98
BI-211	72.87	------	1.23	1.267E+00	------ Line Not Found		------
	351.06	38	12.92*	1.415E+00	3.108E+02	3.108E+02	120.24
TH-229	85.43	121	14.70	1.746E+00	7.094E+02	7.094E+02	63.03
	88.47	4221	24.00	1.789E+00	1.476E+04	1.476E+04	2.00
	193.51	------	4.41*	2.049E+00	------ Line Not Found		------
	210.85	------	2.80	1.960E+00	------ Line Not Found		------
AM-241	59.54	5964	35.90*	6.843E-01	3.645E+04	3.645E+04	1.69

Flag: "*" = Keyline

VAX/VMS Nuclide Identification Report Generated 05-MAY-2015 07:28:39.24

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration	DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203310164.CNF;1		
Acquisition date	5-MAY-2015 07:12:54	Sensitivity	3.000
Detector ID	GAM06	Energy tolerance	2.000
Elapsed live time	0 00:15:00.00	Abundance limit	75.000
Elapsed real time	0 00:15:04.37	Half life ratio	8.000
Sample date	4-MAY-2015 00:00:00	Analyst initials	MJH1
Sample ID	G1203310164	Sample Quantity	2.0000E+00 LITER
Batch Number	1475456	Wet Weight	0.00000
Wet wt corr	1.00000	Dry Weight	0.00000
Nuclide Library	LIQUID.NLB;4		

CALIBRATION INFORMATION

Eff. Cal. date	2-JUN-2014 11:42:38	Eff. Geometry	2LMB
Eff. File	DKA100:[CANBERRA.GAMMA]EFF_GAM06_2LMB.CNF;13		

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/LITER)	Cnt uncert (1.96-sigma)	MDA (pCi/LITER)
CO-57	7.305E+02	9.076E+01	1.137E+02
CO-60	1.616E+04	4.411E+02	9.724E+01
ZN-65	2.470E+03	4.623E+02	3.989E+02
CD-109	9.595E+04	3.767E+03	3.742E+03
SN-113	7.818E+01	1.559E+02	1.934E+02
SN-126	9.576E+03	3.760E+02	3.760E+02
BA-137M	1.326E+04	3.460E+02	1.546E+02
CS-137	1.401E+04	3.655E+02	1.634E+02
CE-139	9.390E+01	8.017E+01	1.186E+02
PM-147	2.189E+07	2.720E+06	3.410E+06
W-181	4.172E+03	1.674E+03	1.532E+03
HG-203	1.155E+02	9.151E+01	1.349E+02
PB-210	4.139E+05	4.850E+04	3.798E+04
BI-211	3.108E+02	7.325E+02	9.097E+02
TH-229	8.331E+01	1.306E+03	2.286E+03
AM-241	3.645E+04	1.206E+03	1.185E+03

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/LITER)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/LITER)	
BE-7	4.348E+02	7.618E+02	1.363E+03	NOT IDENT.
NA-22	-2.076E+01	4.981E+01	8.672E+01	NOT IDENT.
NA-24	1.087E+02	1.686E+02	3.392E+02	NOT IDENT.
AL-26	-1.061E+00	2.190E+01	4.609E+01	NOT IDENT.
K-40	1.584E+02	3.541E+02	7.049E+02	NOT IDENT.
SC-46	5.767E+01	1.162E+02	1.998E+02	NOT IDENT.
V-48	4.234E+01	1.212E+02	2.154E+02	NOT IDENT.
CR-51	2.422E+02	6.936E+02	1.195E+03	NOT IDENT.
MN-52	-1.339E+01	3.654E+01	6.544E+01	NOT IDENT.
MN-54	1.674E+01	1.034E+02	1.767E+02	NOT IDENT.
CO-56	1.578E+01	1.039E+02	1.775E+02	NOT IDENT.
CO-58	-6.897E+01	9.914E+01	1.644E+02	NOT IDENT.
FE-59	1.839E+02	2.132E+02	3.838E+02	NOT IDENT.
CU-67	-5.855E+01	1.627E+02	2.834E+02	NOT IDENT.

GE-68	-2.789E+03	3.606E+03	6.115E+03	NOT IDENT.
AS-74	5.869E+01	1.340E+02	2.375E+02	NOT IDENT.
SE-75	1.167E+01	1.101E+02	1.901E+02	FAIL ABUN
BR-77	-2.882E+02	4.127E+02	7.028E+02	NOT IDENT.
SR-82	7.186E+01	6.253E+02	1.076E+03	NOT IDENT.
RB-83	9.116E+01	1.625E+02	2.909E+02	NOT IDENT.
RB-84	-5.798E+01	1.884E+02	2.698E+02	NOT IDENT.
KR-85	-7.989E+03	1.739E+04	3.010E+04	NOT IDENT.
SR-85	-3.628E+01	7.897E+01	1.367E+02	NOT IDENT.
RB-86	-8.243E+02	1.398E+03	2.389E+03	NOT IDENT.
Y-88	2.831E+01	3.940E+01	8.430E+01	NOT IDENT.
Y-91	5.702E+03	2.832E+04	5.092E+04	NOT IDENT.
NB-94	2.977E+01	7.906E+01	1.388E+02	FAIL ABUN
NB-95	3.185E+01	8.770E+01	1.528E+02	NOT IDENT.
NB-95M	1.784E+02	2.670E+02	4.688E+02	NOT IDENT.
ZR-95	1.099E+02	1.579E+02	2.792E+02	NOT IDENT.
MO-99	-3.685E+02	9.273E+02	1.571E+03	NOT IDENT.
TC-99M	-1.408E+02	2.646E+03	3.877E+03	NOT IDENT.
RH-101	-8.314E+00	8.941E+01	1.407E+02	NOT IDENT.
RH-102M	-4.511E+01	8.399E+01	1.456E+02	NOT IDENT.
RU-103	1.632E+01	8.184E+01	1.450E+02	NOT IDENT.
RH-106	-2.484E+02	7.434E+02	1.278E+03	NOT IDENT.
RU-106	-2.484E+02	7.434E+02	1.278E+03	NOT IDENT.
AG-108M	-3.252E+01	8.844E+01	1.463E+02	NOT IDENT.
AG-110M	0.000E+00	1.103E+02	1.875E+02	NOT IDENT.
IN-114M	2.062E+00	3.760E+02	6.580E+02	NOT IDENT.
CD-115	2.205E+02	3.892E+02	6.969E+02	NOT IDENT.
SN-117M	7.575E+00	6.486E+01	1.148E+02	NOT IDENT.
I-123	-5.219E+01	3.254E+02	5.725E+02	NOT IDENT.
TE-123M	-1.047E+01	6.286E+01	1.106E+02	NOT IDENT.
SB-124	2.766E+01	5.957E+01	1.310E+02	NOT IDENT.
SB-125	-9.769E+01	2.621E+02	4.339E+02	NOT IDENT.
TE-125M	1.007E+03	2.302E+04	3.852E+04	NOT IDENT.
I-126	4.526E+00	2.937E+02	4.418E+02	NOT IDENT.
SB-126	9.224E+00	1.608E+02	2.782E+02	NOT IDENT.
SB-127	-1.432E+01	2.595E+02	4.488E+02	NOT IDENT.
I-131	-5.286E+01	9.642E+01	1.605E+02	NOT IDENT.
I-132	0.000E+00	1.158E+06	0.000E+00	SHORT HLIF
TE-132	1.839E+01	1.067E+02	1.637E+02	NOT IDENT.
BA-133	5.016E+01	1.272E+02	1.919E+02	NOT IDENT.
I-133	-2.176E+01	2.348E+02	4.110E+02	FAIL ABUN
CS-134	7.032E+01	1.098E+02	1.923E+02	NOT IDENT.
CS-135	6.642E+01	4.011E+02	6.931E+02	NOT IDENT.
I-135	-1.748E+03	5.262E+03	9.203E+03	FAIL ABUN
CS-136	2.545E+01	1.683E+02	2.662E+02	FAIL ABUN
BA-140	-1.346E+01	3.119E+02	5.468E+02	NOT IDENT.
LA-140	-1.905E+01	2.841E+01	4.996E+01	NOT IDENT.
CE-141	-3.997E+01	1.189E+02	1.945E+02	NOT IDENT.
CE-143	-5.285E+01	2.861E+02	4.880E+02	FAIL ABUN
CE-144	-1.571E+02	5.853E+02	8.537E+02	NOT IDENT.
PM-144	-3.114E+01	7.836E+01	1.333E+02	NOT IDENT.
PR-144	-2.319E+03	5.822E+03	9.905E+03	NOT IDENT.
PM-146	-6.429E+01	1.186E+02	2.062E+02	NOT IDENT.
ND-147	2.456E+02	5.914E+02	1.054E+03	NOT IDENT.
PM-149	7.805E+02	3.035E+03	5.248E+03	NOT IDENT.
EU-152	-1.831E+02	2.551E+02	4.240E+02	FAIL ABUN
GD-153	1.603E+02	2.250E+02	3.843E+02	NOT IDENT.
EU-154	-5.922E+01	1.421E+02	2.474E+02	FAIL ABUN
EU-155	-3.049E+01	2.942E+02	4.915E+02	FAIL ABUN
HO-166M	5.396E+01	1.459E+02	2.560E+02	FAIL ABUN
TM-171	-1.209E+05	1.029E+05	1.731E+05	NOT IDENT.
LU-176	1.124E+01	6.960E+01	1.196E+02	FAIL ABUN
HF-181	-1.981E+01	9.930E+01	1.737E+02	FAIL ABUN
TA-182	-3.269E+02	2.384E+02	3.788E+02	FAIL ABUN
RE-183	0.000E+00	1.571E+03	2.321E+03	FAIL ABUN
RE-184	-1.174E+02	3.173E+02	5.275E+02	NOT IDENT.
RE-188	2.979E+01	3.836E+02	6.007E+02	FAIL ABUN
W-188	-4.189E+02	1.590E+04	2.726E+04	FAIL ABUN
OS-191	5.892E+01	2.324E+02	3.877E+02	NOT IDENT.
IR-192	-5.766E+00	8.094E+01	1.379E+02	NOT IDENT.
BI-207	-8.515E+01	1.589E+02	2.722E+02	NOT IDENT.
TL-208	1.366E+02	8.706E+01	1.608E+02	NOT IDENT.
PB-211	1.876E+03	1.933E+03	3.356E+03	NOT IDENT.
BI-212	-9.957E-01	1.231E+03	2.122E+03	NOT IDENT.
PB-212	-3.091E+01	1.494E+02	2.574E+02	NOT IDENT.
BI-213	-3.453E+02	3.052E+02	4.913E+02	NOT IDENT.
BI-214	1.303E+02	1.665E+02	2.988E+02	NOT IDENT.
PB-214	1.128E+02	2.658E+02	3.296E+02	FAIL ABUN

RN-219	-8.006E+02	1.115E+03	1.833E+03	NOT IDENT.
FR-221	-7.466E+02	5.745E+02	9.692E+02	NOT IDENT.
RA-223	4.714E+02	1.646E+03	2.831E+03	NOT IDENT.
RA-224	9.518E+02	1.570E+03	2.752E+03	NOT IDENT.
RA-226	-8.467E+02	1.587E+03	2.752E+03	NOT IDENT.
AC-227	1.908E+02	6.694E+02	1.162E+03	NOT IDENT.
TH-227	1.908E+02	6.694E+02	1.162E+03	NOT IDENT.
AC-228	8.591E+01	4.974E+02	7.642E+02	NOT IDENT.
RA-228	8.591E+01	4.974E+02	7.642E+02	NOT IDENT.
TH-228	-3.091E+01	1.494E+02	2.574E+02	NOT IDENT.
TH-230	3.546E+04	3.810E+04	6.596E+04	NOT IDENT.
PA-231	-2.914E+02	1.197E+03	2.035E+03	NOT IDENT.
TH-231	8.493E+02	1.616E+03	2.462E+03	NOT IDENT.
TH-232	-6.897E+04	7.083E+04	1.054E+05	NOT IDENT.
PA-233	1.427E+02	1.687E+02	2.953E+02	NOT IDENT.
PA-234	-6.010E+02	1.039E+03	1.791E+03	FAIL ABUN
PA-234M	-3.668E+03	1.323E+04	2.300E+04	NOT IDENT.
TH-234	-3.175E+03	5.028E+03	7.554E+03	NOT IDENT.
U-234	-3.530E+05	3.949E+05	6.350E+05	FAIL ABUN
U-235	-1.267E+02	5.114E+02	8.389E+02	FAIL ABUN
NP-237	1.427E+02	1.687E+02	2.953E+02	NOT IDENT.
NP-238	1.874E+02	6.944E+02	1.231E+03	NOT IDENT.
U-238	-3.175E+03	5.028E+03	7.554E+03	NOT IDENT.
NP-239	1.516E+01	8.391E+02	1.245E+03	NOT IDENT.
AM-242	-7.997E+01	1.772E+03	2.971E+03	FAIL ABUN
AM-243	-8.127E+01	1.691E+02	2.839E+02	NOT IDENT.
CM-243	5.361E+01	2.976E+02	5.010E+02	NOT IDENT.
CM-247	-5.495E+01	1.019E+02	1.685E+02	FAIL ABUN
CF-249	3.714E+01	1.232E+02	1.841E+02	NOT IDENT.
CF-251	1.532E+02	3.136E+02	5.567E+02	NOT IDENT.
CF-252	-1.639E+05	4.948E+05	8.240E+05	NOT IDENT.
ANH-511	6.767E+01	7.615E+01	1.386E+02	NOT IDENT.

VAX/VMS Nuclide Identification Report Generated 5-MAY-2015 07:28:34.66

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.41	2293	4118	1.08	92.31	86	12	2.55E+00	6.0	
2	7	58.05	545	2497	1.65	115.58	112	12	6.06E-01	20.5	3.98E+00
3	7	59.58	5964	1465	1.00	118.64	112	12	6.63E+00	1.7	
4	6	86.54	121	1506	1.47	172.56	169	12	1.35E-01	63.0	9.76E-01
5	6	88.08	4221	1117	1.01	175.62	169	12	4.69E+00	2.0	
6	3	119.82	90	411	1.23	239.10	237	12	1.00E-01	30.9	7.20E-01
7	3	122.12	938	933	1.15	243.70	237	12	1.04E+00	6.3	
8	0	136.24	120	1334	1.43	271.92	268	10	1.33E-01	57.6	
9	0	151.93	77	671	1.32	303.31	301	6	8.54E-02	54.6	
10	0	166.21	109	773	0.97	331.85	329	7	1.21E-01	43.6	
11	0	225.16	117	806	1.71	449.75	446	8	1.30E-01	43.2	
12	0	279.74	102	528	2.50	558.89	555	8	1.13E-01	40.4	
13	0	352.93	40	579	1.53	705.26	697	10	4.40E-02	114.9	
14	0	391.02	44	567	1.06	781.44	777	10	4.92E-02	101.7	
15	0	661.64	7225	434	1.53	1322.74	1314	15	8.03E+00	1.3	
16	0	867.79	33	177	1.31	1735.15	1732	6	3.72E-02	65.4	
17	0	870.31	32	315	0.99	1740.18	1738	10	3.61E-02	103.1	
18	0	876.53	19	234	1.28	1752.64	1750	7	2.08E-02	137.9	
19	0	914.43	7	277	0.82	1828.46	1828	8	8.23E-03	389.5	
20	0	926.96	54	292	0.99	1853.53	1850	9	6.00E-02	58.5	
21	0	1040.30	33	254	2.69	2080.31	2078	10	3.66E-02	91.7	
22	0	1115.36	501	339	1.82	2230.52	2222	17	5.56E-01	9.6	
23	0	1173.01	6296	214	1.93	2345.87	2337	19	7.00E+00	1.4	
24	0	1332.20	5616	75	2.15	2664.47	2656	20	6.24E+00	1.4	
25	0	1421.09	5	9	1.41	2842.39	2836	9	5.48E-03	118.7	

VAX/VMS Nuclide Identification Report Generated 5-MAY-2015 07:28:37.30

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/LITER	Decay Corr pCi/LITER	1-Sigma %Error
CO-57	122.06	937	85.60*	2.257E+00	7.281E+02	7.305E+02	6.34
	136.47	120	10.68	2.276E+00	7.420E+02	7.445E+02	57.63
CO-60	1173.23	6296	99.85	5.792E-01	1.634E+04	1.635E+04	1.38
	1332.49	5616	99.98*	5.221E-01	1.615E+04	1.616E+04	1.39
ZN-65	1115.54	501	50.60*	6.036E-01	2.460E+03	2.470E+03	9.55
CD-109	88.03	4221	3.70*	1.789E+00	9.576E+04	9.595E+04	2.00
SN-113	391.70	44	64.97*	1.320E+00	7.756E+01	7.818E+01	101.73
SN-126	64.28	------	9.60	8.942E-01	------ Line Not Found		------
	86.94	121	8.90	1.746E+00	1.172E+03	1.172E+03	63.03
	87.57	4221	37.00*	1.789E+00	9.576E+03	9.576E+03	2.00
BA-137M	661.66	7225	89.90*	9.100E-01	1.326E+04	1.326E+04	1.33
CS-137	661.66	7225	85.10*	9.100E-01	1.401E+04	1.401E+04	1.33
CE-139	165.86	109	80.00*	2.185E+00	9.329E+01	9.390E+01	43.56
PM-147	121.22	937	0.00*	2.257E+00	2.187E+07	2.189E+07	6.34
W-181	56.28	545	18.70	6.177E-01	7.087E+03	7.140E+03	20.47
	57.53	545	32.00*	6.177E-01	4.141E+03	4.172E+03	20.47
	65.08	------	10.60	9.300E-01	------ Line Not Found		------
	66.98	------	2.40	1.015E+00	------ Line Not Found		------
	136.28	120	0.03	2.276E+00	2.642E+05	2.661E+05	57.63
	152.32	77	0.08	2.242E+00	6.431E+04	6.479E+04	54.61
HG-203	70.83	------	3.69	1.182E+00	------ Line Not Found		------
	72.87	------	6.19	1.267E+00	------ Line Not Found		------
	279.20	102	81.56*	1.651E+00	1.133E+02	1.155E+02	40.43
PB-210	46.54	2293	4.25*	1.957E-01	4.139E+05	4.139E+05	5.98
BI-211	72.87	------	1.23	1.267E+00	------ Line Not Found		------
	351.06	38	12.92*	1.415E+00	3.108E+02	3.108E+02	120.24
TH-229	85.43	121	14.70	1.746E+00	7.094E+02	7.094E+02	63.03
	88.47	4221	24.00	1.789E+00	1.476E+04	1.476E+04	2.00
	193.51	------	4.41*	2.049E+00	------ Line Not Found		------
	210.85	------	2.80	1.960E+00	------ Line Not Found		------
AM-241	59.54	5964	35.90*	6.843E-01	3.645E+04	3.645E+04	1.69

Flag: "*" = Keyline

Sample ID : G1203310164 Acquisition date : 5-MAY-2015 07:12:54

Total number of lines in spectrum 25
Number of unidentified lines 3
Number of lines tentatively identified by NID 22 88.00%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/LITER	Decay Corr pCi/LITER	Decay Corr 1-Sigma Error	1-Sigma %Error	Flags
CO-57	271.74D	1.00	7.281E+02	7.305E+02	0.463E+02	6.34	
CO-60	1925.28D	1.00	1.615E+04	1.616E+04	0.023E+04	1.39	
ZN-65	244.06D	1.00	2.460E+03	2.470E+03	0.236E+03	9.55	
CD-109	461.40D	1.00	9.576E+04	9.595E+04	0.192E+04	2.00	
SN-113	115.09D	1.01	7.756E+01	7.818E+01	7.953E+01	101.73	
SN-126	2.30E+05Y	1.00	9.576E+03	9.576E+03	0.192E+03	2.00	
BA-137M	30.08Y	1.00	1.326E+04	1.326E+04	0.018E+04	1.33	
CS-137	30.08Y	1.00	1.401E+04	1.401E+04	0.019E+04	1.33	
CE-139	137.64D	1.01	9.329E+01	9.390E+01	4.090E+01	43.56	
PM-147	2.62Y	1.00	2.187E+07	2.189E+07	0.139E+07	6.34	
W-181	121.20D	1.01	4.141E+03	4.172E+03	0.854E+03	20.47	
HG-203	46.59D	1.02	1.133E+02	1.155E+02	0.467E+02	40.43	
PB-210	22.20Y	1.00	4.139E+05	4.139E+05	0.247E+05	5.98	
BI-211	21.77Y	1.00	3.108E+02	3.108E+02	3.737E+02	120.24	
TH-229	7340.00Y	1.00	1.476E+04	1.476E+04	0.030E+04	2.00	K
AM-241	432.60Y	1.00	3.645E+04	3.645E+04	0.062E+04	1.69	
	Total Activity :		2.249E+07	2.251E+07			

Grand Total Activity : 2.249E+07 2.251E+07

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

Sample ID : G1203310164 Acquisition date : 5-MAY-2015 07:12:54

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
3	119.82	90	411	1.23	239.10	237	12	1.00E-01	30.9	2.25E+00	T
0	225.16	117	806	1.71	449.75	446	8	1.30E-01	43.2	1.89E+00	T
0	867.79	33	177	1.31	1735.15	1732	6	3.72E-02	65.4	7.39E-01	
0	870.31	32	315	0.99	1740.18	1738	10	3.61E-02	****	7.38E-01	T
0	876.53	19	234	1.28	1752.64	1750	7	2.08E-02	****	7.33E-01	T
0	914.43	7	277	0.82	1828.46	1828	8	8.23E-03	****	7.09E-01	
0	926.96	54	292	0.99	1853.53	1850	9	6.00E-02	58.5	7.02E-01	T
0	1040.30	33	254	2.69	2080.31	2078	10	3.66E-02	91.7	6.39E-01	T
0	1421.09	5	9	1.41	2842.39	2836	9	5.48E-03	****	4.96E-01	

Flags: "T" = Tentatively associated

VAX/VMS Nuclide Identification Report Generated 05-MAY-2015 07:28:44.75

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*************************************************************************
*                          GEL Laboratories LLC                         *
*                            2040 Savage Road                           *
*                          Charleston, SC 29407                         *
*************************************************************************
*                                                                       *
*                        DETECTOR AND SAMPLE DATA                       *
*                                                                       *
* Configuration    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203310164.CNF;1   *
* Acquisition date :  5-MAY-2015 07:12:54 Sensitivity     : 3.000       *
* Detector ID      : GAM06                Energy tolerance: 2.000       *
* Elapsed live time:    0 00:15:00.00     Abundance limit : 75.000      *
* Elapsed real time:    0 00:15:04.37     Half life ratio : 8.000       *
* Sample date      :  4-MAY-2015 00:00:00 Nuclide Library : LIQUID       *
* Sample ID        : G1203310164          Analyst initials: MJH1        *
* Batch Number     : 1475456              Sample Quantity : 2.0000E+00 LITER  *
* Wet wt corr      :    1.00000           Wet Weight      :    0.00000  *
*                                         Dry Weight      :    0.00000  *
*************************************************************************
*                                                                       *
*                        CALIBRATION INFORMATION                        *
*                                                                       *
* Eff. Cal. date   :  2-JUN-2014 11:42:38 Eff. Geometry   : 2LMB        *
* Eff. File        : DKA100:[CANBERRA.GAMMA]EFF_GAM06_2LMB.CNF;13       *
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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/LITER)
CO-57	5.582E+01
CO-60	4.475E+01
ZN-65	1.929E+02
CD-109	1.842E+03
SN-113	9.438E+01
SN-126	1.850E+02
BA-137M	7.488E+01
CS-137	7.910E+01
CE-139	5.816E+01
PM-147	1.674E+06
W-181	7.556E+02
HG-203	6.596E+01
PB-210	1.876E+04
BI-211	4.440E+02
TH-229	1.121E+03
AM-241	5.845E+02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/LITER)	
BE-7	6.645E+02	NOT IDENT.
NA-22	3.962E+01	NOT IDENT.
NA-24	1.527E+02	NOT IDENT.
AL-26	1.815E+01	NOT IDENT.
K-40	3.133E+02	NOT IDENT.
SC-46	9.710E+01	NOT IDENT.
V-48	1.045E+02	NOT IDENT.
CR-51	5.838E+02	NOT IDENT.
MN-52	2.788E+01	NOT IDENT.
MN-54	8.575E+01	NOT IDENT.
CO-56	8.609E+01	NOT IDENT.
CO-58	7.957E+01	NOT IDENT.
FE-59	1.860E+02	NOT IDENT.
CU-67	1.389E+02	NOT IDENT.
GE-68	2.957E+03	NOT IDENT.

AS-74	1.151E+02	NOT IDENT.
SE-75	9.307E+01	FAIL ABUN
BR-77	3.445E+02	NOT IDENT.
SR-82	5.208E+02	NOT IDENT.
RB-83	1.413E+02	NOT IDENT.
RB-84	1.308E+02	NOT IDENT.
KR-85	1.462E+04	NOT IDENT.
SR-85	6.641E+01	NOT IDENT.
RB-86	1.155E+03	NOT IDENT.
Y-88	3.715E+01	NOT IDENT.
Y-91	2.407E+04	NOT IDENT.
NB-94	6.709E+01	FAIL ABUN
NB-95	7.390E+01	NOT IDENT.
NB-95M	2.300E+02	NOT IDENT.
ZR-95	1.351E+02	NOT IDENT.
MO-99	7.580E+02	NOT IDENT.
TC-99M	1.902E+03	NOT IDENT.
RH-101	6.909E+01	NOT IDENT.
RH-102M	7.097E+01	NOT IDENT.
RU-103	7.049E+01	NOT IDENT.
RH-106	6.179E+02	NOT IDENT.
RU-106	6.179E+02	NOT IDENT.
AG-108M	7.135E+01	NOT IDENT.
AG-110M	9.144E+01	NOT IDENT.
IN-114M	3.227E+02	NOT IDENT.
CD-115	3.383E+02	NOT IDENT.
SN-117M	5.630E+01	NOT IDENT.
I-123	2.807E+02	NOT IDENT.
TE-123M	5.422E+01	NOT IDENT.
SB-124	5.554E+01	NOT IDENT.
SB-125	2.116E+02	NOT IDENT.
TE-125M	1.892E+04	NOT IDENT.
I-126	2.137E+02	NOT IDENT.
SB-126	1.344E+02	NOT IDENT.
SB-127	2.167E+02	NOT IDENT.
I-131	7.828E+01	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	8.025E+01	NOT IDENT.
BA-133	9.366E+01	NOT IDENT.
I-133	1.994E+02	FAIL ABUN
CS-134	9.321E+01	NOT IDENT.
CS-135	3.392E+02	NOT IDENT.
I-135	4.251E+03	FAIL ABUN
CS-136	1.289E+02	FAIL ABUN
BA-140	2.651E+02	NOT IDENT.
LA-140	1.994E+01	NOT IDENT.
CE-141	9.538E+01	NOT IDENT.
CE-143	2.384E+02	FAIL ABUN
CE-144	4.190E+02	NOT IDENT.
PM-144	6.436E+01	NOT IDENT.
PR-144	4.782E+03	NOT IDENT.
PM-146	1.005E+02	NOT IDENT.
ND-147	5.113E+02	NOT IDENT.
PM-149	2.565E+03	NOT IDENT.
EU-152	2.068E+02	FAIL ABUN
GD-153	1.887E+02	NOT IDENT.
EU-154	1.130E+02	FAIL ABUN
EU-155	2.413E+02	FAIL ABUN
HO-166M	1.237E+02	FAIL ABUN
TM-171	8.548E+04	NOT IDENT.
LU-176	5.841E+01	FAIL ABUN
HF-181	8.465E+01	FAIL ABUN
TA-182	1.759E+02	FAIL ABUN
RE-183	1.151E+03	FAIL ABUN
RE-184	2.562E+02	NOT IDENT.
RE-188	2.946E+02	FAIL ABUN
W-188	1.332E+04	FAIL ABUN
OS-191	1.904E+02	NOT IDENT.
IR-192	6.736E+01	NOT IDENT.
BI-207	1.318E+02	NOT IDENT.
TL-208	7.803E+01	NOT IDENT.
PB-211	1.637E+03	NOT IDENT.
BI-212	1.026E+03	NOT IDENT.
PB-212	1.262E+02	NOT IDENT.
BI-213	2.394E+02	NOT IDENT.
BI-214	1.448E+02	NOT IDENT.
PB-214	1.608E+02	FAIL ABUN
RN-219	8.934E+02	NOT IDENT.

FR-221	4.756E+02	NOT IDENT.
RA-223	1.382E+03	NOT IDENT.
RA-224	1.349E+03	NOT IDENT.
RA-226	1.349E+03	NOT IDENT.
AC-227	5.693E+02	NOT IDENT.
TH-227	5.693E+02	NOT IDENT.
AC-228	3.712E+02	NOT IDENT.
RA-228	3.712E+02	NOT IDENT.
TH-228	1.262E+02	NOT IDENT.
TH-230	3.249E+04	NOT IDENT.
PA-231	9.940E+02	NOT IDENT.
TH-231	1.213E+03	NOT IDENT.
TH-232	5.182E+04	NOT IDENT.
PA-233	1.443E+02	NOT IDENT.
PA-234	8.717E+02	FAIL ABUN
PA-234M	1.114E+04	NOT IDENT.
TH-234	3.715E+03	NOT IDENT.
U-234	3.136E+05	FAIL ABUN
U-235	4.115E+02	FAIL ABUN
NP-237	1.443E+02	NOT IDENT.
NP-238	5.972E+02	NOT IDENT.
U-238	3.715E+03	NOT IDENT.
NP-239	6.114E+02	NOT IDENT.
AM-242	1.459E+03	FAIL ABUN
AM-243	1.398E+02	NOT IDENT.
CM-243	2.460E+02	NOT IDENT.
CM-247	8.213E+01	FAIL ABUN
CF-249	8.976E+01	NOT IDENT.
CF-251	2.730E+02	NOT IDENT.
CF-252	4.046E+05	NOT IDENT.
ANH-511	6.750E+01	NOT IDENT.

VAX/VMS Nuclide Identification Report Generated 05-MAY-2015 07:28:49.48

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*************************************************************************
*                          GEL Laboratories LLC                         *
*                            2040 Savage Road                           *
*                          Charleston, SC 29407                         *
*************************************************************************
*                                                                       *
*                        DETECTOR AND SAMPLE DATA                       *
*                                                                       *
* Configuration    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203310164.CNF;1   *
* Acquisition date :  5-MAY-2015 07:12:54 Sensitivity     : 3.000       *
* Detector ID      : GAM06                Energy tolerance: 2.000       *
* Elapsed live time:    0 00:15:00.00     Abundance limit : 75.000      *
* Elapsed real time:    0 00:15:04.37     Half life ratio : 8.000       *
* Sample date      :  4-MAY-2015 00:00:00 Nuclide Library : LIQUID       *
* Sample ID        : G1203310164          Analyst initials: MJH1        *
* Batch Number     : 1475456              Sample Quantity : 2.0000E+00 LITER  *
*                                         Quantity Err(%) : 5.0000E-03 %      *
* Wet wt corr      :    1.00000           Wet Weight      :    0.00000  *
*                                         Dry Weight      :    0.00000  *
*************************************************************************
*                                                                       *
*                        CALIBRATION INFORMATION                        *
*                                                                       *
* Eff. Cal. date   :  2-JUN-2014 11:42:38 Eff. Geometry   : 2LMB        *
* Eff. File        : DKA100:[CANBERRA.GAMMA]EFF_GAM06_2LMB.CNF;13       *
*************************************************************************
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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/LITER)	Act Error (1.96-sigma)	TPU (1.96-sigma)
CO-57	7.305E+02	1.128E+02	1.128E+02
CO-60	1.616E+04	1.325E+03	1.325E+03
ZN-65	2.470E+03	5.561E+02	5.561E+02
CD-109	9.595E+04	1.001E+04	1.001E+04
SN-113	7.818E+01	1.560E+02	1.560E+02
SN-126	9.576E+03	8.609E+02	8.609E+02
BA-137M	1.326E+04	1.135E+03	1.135E+03
CS-137	1.401E+04	1.198E+03	1.198E+03
CE-139	9.390E+01	8.257E+01	8.257E+01
PM-147	2.189E+07	3.379E+06	3.379E+06
W-181	4.172E+03	1.998E+03	1.998E+03
HG-203	1.155E+02	9.193E+01	9.193E+01
PB-210	4.139E+05	6.297E+04	6.297E+04
BI-211	3.108E+02	7.329E+02	7.329E+02
TH-229	8.331E+01	1.306E+03	1.306E+03
AM-241	3.645E+04	3.579E+03	3.579E+03

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/LITER)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	4.348E+02	7.626E+02	7.874E+02	NOT IDENT.
NA-22	-2.076E+01	4.984E+01	5.071E+01	NOT IDENT.
NA-24	1.087E+02	1.688E+02	1.758E+02	NOT IDENT.
AL-26	-1.061E+00	2.190E+01	2.190E+01	NOT IDENT.
K-40	1.584E+02	3.543E+02	3.615E+02	NOT IDENT.
SC-46	5.767E+01	1.164E+02	1.192E+02	NOT IDENT.
V-48	4.234E+01	1.213E+02	1.228E+02	NOT IDENT.
CR-51	2.422E+02	6.938E+02	7.024E+02	NOT IDENT.
MN-52	-1.339E+01	3.656E+01	3.705E+01	NOT IDENT.
MN-54	1.674E+01	1.034E+02	1.037E+02	NOT IDENT.
CO-56	1.578E+01	1.039E+02	1.042E+02	NOT IDENT.
CO-58	-6.897E+01	9.933E+01	1.041E+02	NOT IDENT.
FE-59	1.839E+02	2.147E+02	2.301E+02	NOT IDENT.
CU-67	-5.855E+01	1.628E+02	1.649E+02	NOT IDENT.

GE-68	-2.789E+03	3.621E+03	3.833E+03	NOT IDENT.
AS-74	5.869E+01	1.341E+02	1.367E+02	NOT IDENT.
SE-75	1.167E+01	1.101E+02	1.103E+02	FAIL ABUN
BR-77	-2.882E+02	4.133E+02	4.332E+02	NOT IDENT.
SR-82	7.186E+01	6.253E+02	6.261E+02	NOT IDENT.
RB-83	9.116E+01	1.631E+02	1.682E+02	NOT IDENT.
RB-84	-5.798E+01	1.885E+02	1.903E+02	NOT IDENT.
KR-85	-7.989E+03	1.740E+04	1.777E+04	NOT IDENT.
SR-85	-3.628E+01	7.903E+01	8.071E+01	NOT IDENT.
RB-86	-8.243E+02	1.402E+03	1.450E+03	NOT IDENT.
Y-88	2.831E+01	3.945E+01	4.147E+01	NOT IDENT.
Y-91	5.702E+03	2.832E+04	2.844E+04	NOT IDENT.
NB-94	2.977E+01	7.910E+01	8.023E+01	FAIL ABUN
NB-95	3.185E+01	8.774E+01	8.891E+01	NOT IDENT.
NB-95M	1.784E+02	2.676E+02	2.795E+02	NOT IDENT.
ZR-95	1.099E+02	1.582E+02	1.658E+02	NOT IDENT.
MO-99	-3.685E+02	9.280E+02	9.427E+02	NOT IDENT.
TC-99M	-1.408E+02	2.646E+03	2.647E+03	NOT IDENT.
RH-101	-8.314E+00	8.942E+01	8.950E+01	NOT IDENT.
RH-102M	-4.511E+01	8.415E+01	8.657E+01	NOT IDENT.
RU-103	1.632E+01	8.185E+01	8.218E+01	NOT IDENT.
RH-106	-2.484E+02	7.437E+02	7.521E+02	NOT IDENT.
RU-106	-2.484E+02	7.437E+02	7.521E+02	NOT IDENT.
AG-108M	-3.252E+01	8.848E+01	8.969E+01	NOT IDENT.
AG-110M	3.270E+02	1.135E+02	1.860E+02	NOT IDENT.
IN-114M	2.062E+00	3.760E+02	3.760E+02	NOT IDENT.
CD-115	2.205E+02	3.897E+02	4.022E+02	NOT IDENT.
SN-117M	7.575E+00	6.486E+01	6.495E+01	NOT IDENT.
I-123	-5.219E+01	3.254E+02	3.262E+02	NOT IDENT.
TE-123M	-1.047E+01	6.286E+01	6.304E+01	NOT IDENT.
SB-124	2.766E+01	5.960E+01	6.090E+01	NOT IDENT.
SB-125	-9.769E+01	2.622E+02	2.659E+02	NOT IDENT.
TE-125M	1.007E+03	2.303E+04	2.303E+04	NOT IDENT.
I-126	4.526E+00	2.937E+02	2.937E+02	NOT IDENT.
SB-126	9.224E+00	1.608E+02	1.609E+02	NOT IDENT.
SB-127	-1.432E+01	2.595E+02	2.596E+02	NOT IDENT.
I-131	-5.286E+01	9.652E+01	9.941E+01	NOT IDENT.
I-132	4.061E+05	1.159E+06	1.173E+06	SHORT HLIF
TE-132	1.839E+01	1.067E+02	1.071E+02	NOT IDENT.
BA-133	5.016E+01	1.273E+02	1.293E+02	NOT IDENT.
I-133	-2.176E+01	2.348E+02	2.350E+02	FAIL ABUN
CS-134	7.032E+01	1.100E+02	1.144E+02	NOT IDENT.
CS-135	6.642E+01	4.011E+02	4.023E+02	NOT IDENT.
I-135	-1.748E+03	5.266E+03	5.324E+03	FAIL ABUN
CS-136	2.545E+01	1.683E+02	1.687E+02	FAIL ABUN
BA-140	-1.346E+01	3.119E+02	3.119E+02	NOT IDENT.
LA-140	-1.905E+01	2.845E+01	2.972E+01	NOT IDENT.
CE-141	-3.997E+01	1.189E+02	1.203E+02	NOT IDENT.
CE-143	-5.285E+01	2.862E+02	2.872E+02	FAIL ABUN
CE-144	-1.571E+02	5.854E+02	5.897E+02	NOT IDENT.
PM-144	-3.114E+01	7.840E+01	7.965E+01	NOT IDENT.
PR-144	-2.319E+03	5.825E+03	5.918E+03	NOT IDENT.
PM-146	-6.429E+01	1.188E+02	1.223E+02	NOT IDENT.
ND-147	2.456E+02	5.918E+02	6.021E+02	NOT IDENT.
PM-149	7.805E+02	3.037E+03	3.057E+03	NOT IDENT.
EU-152	-1.831E+02	2.556E+02	2.686E+02	FAIL ABUN
GD-153	1.603E+02	2.253E+02	2.366E+02	NOT IDENT.
EU-154	-5.922E+01	1.422E+02	1.447E+02	FAIL ABUN
EU-155	-3.049E+01	2.943E+02	2.946E+02	FAIL ABUN
HO-166M	5.396E+01	1.460E+02	1.480E+02	FAIL ABUN
TM-171	-1.209E+05	1.037E+05	1.171E+05	NOT IDENT.
LU-176	1.124E+01	6.961E+01	6.979E+01	FAIL ABUN
HF-181	-1.981E+01	9.932E+01	9.972E+01	FAIL ABUN
TA-182	-3.269E+02	2.398E+02	2.815E+02	FAIL ABUN
RE-183	3.914E+03	1.637E+03	2.407E+03	FAIL ABUN
RE-184	-1.174E+02	3.175E+02	3.219E+02	NOT IDENT.
RE-188	2.979E+01	3.837E+02	3.839E+02	FAIL ABUN
W-188	-4.189E+02	1.590E+04	1.590E+04	FAIL ABUN
OS-191	5.892E+01	2.325E+02	2.340E+02	NOT IDENT.
IR-192	-5.766E+00	8.094E+01	8.098E+01	NOT IDENT.
BI-207	-8.515E+01	1.592E+02	1.638E+02	NOT IDENT.
TL-208	1.366E+02	8.779E+01	1.072E+02	NOT IDENT.
PB-211	1.876E+03	1.940E+03	2.116E+03	NOT IDENT.
BI-212	-9.957E-01	1.231E+03	1.231E+03	NOT IDENT.
PB-212	-3.091E+01	1.494E+02	1.501E+02	NOT IDENT.
BI-213	-3.453E+02	3.065E+02	3.438E+02	NOT IDENT.
BI-214	1.303E+02	1.668E+02	1.768E+02	NOT IDENT.
PB-214	1.128E+02	2.660E+02	2.708E+02	FAIL ABUN

RN-219	-8.006E+02	1.121E+03	1.178E+03	NOT IDENT.
FR-221	-7.466E+02	5.787E+02	6.695E+02	NOT IDENT.
RA-223	4.714E+02	1.646E+03	1.660E+03	NOT IDENT.
RA-224	9.518E+02	1.572E+03	1.629E+03	NOT IDENT.
RA-226	-8.467E+02	1.588E+03	1.634E+03	NOT IDENT.
AC-227	1.908E+02	6.700E+02	6.755E+02	NOT IDENT.
TH-227	1.908E+02	6.700E+02	6.755E+02	NOT IDENT.
AC-228	8.591E+01	4.975E+02	4.990E+02	NOT IDENT.
RA-228	8.591E+01	4.975E+02	4.990E+02	NOT IDENT.
TH-228	-3.091E+01	1.494E+02	1.501E+02	NOT IDENT.
TH-230	3.546E+04	3.860E+04	4.178E+04	NOT IDENT.
PA-231	-2.914E+02	1.199E+03	1.206E+03	NOT IDENT.
TH-231	8.493E+02	1.620E+03	1.665E+03	NOT IDENT.
TH-232	-6.897E+04	7.139E+04	7.786E+04	NOT IDENT.
PA-233	1.427E+02	1.691E+02	1.809E+02	NOT IDENT.
PA-234	-6.010E+02	1.247E+03	1.276E+03	FAIL ABUN
PA-234M	-3.668E+03	1.323E+04	1.334E+04	NOT IDENT.
TH-234	-3.175E+03	5.080E+03	5.278E+03	NOT IDENT.
U-234	-3.530E+05	3.965E+05	4.273E+05	FAIL ABUN
U-235	-1.267E+02	5.115E+02	5.147E+02	FAIL ABUN
NP-237	1.427E+02	1.691E+02	1.809E+02	NOT IDENT.
NP-238	1.874E+02	6.947E+02	6.998E+02	NOT IDENT.
U-238	-3.175E+03	5.080E+03	5.278E+03	NOT IDENT.
NP-239	1.516E+01	8.391E+02	8.392E+02	NOT IDENT.
AM-242	-7.997E+01	1.772E+03	1.772E+03	FAIL ABUN
AM-243	-8.127E+01	1.692E+02	1.731E+02	NOT IDENT.
CM-243	5.361E+01	2.977E+02	2.987E+02	NOT IDENT.
CM-247	-5.495E+01	1.024E+02	1.053E+02	FAIL ABUN
CF-249	3.714E+01	1.233E+02	1.244E+02	NOT IDENT.
CF-251	1.532E+02	3.142E+02	3.217E+02	NOT IDENT.
CF-252	-1.639E+05	5.167E+05	5.219E+05	NOT IDENT.
ANH-511	6.767E+01	7.635E+01	8.222E+01	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

GAMMA SPECTROSCOPY BACKGROUND REPORT

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	2089.4900	88.34	1211.9261	152.32	859.1146
46.54	2067.2683	88.47	1212.2311	152.43	859.2348
49.72	1919.6223	89.96	977.3889	153.25	841.5436
51.35	2052.9688	91.11	979.5106	154.21	861.8323
52.39	2136.3188	91.27	979.8029	155.04	834.4146
53.20	2155.3420	92.59	905.9283	156.02	813.0479
56.28	2132.8799	93.31	906.5006	158.56	826.2723
57.36	2241.8938	93.35	906.5701	158.97	835.4973
57.53	1673.0602	94.56	935.8102	159.00	835.5263
57.53	1673.0688	94.65	960.4296	162.33	808.3340
57.98	1674.9701	94.67	960.4617	162.66	808.6692
59.32	1680.6134	97.43	915.0381	163.33	792.3740
59.54	1681.5315	98.43	919.8878	165.86	837.4658
61.49	1128.0623	98.44	919.9053	176.31	795.1644
63.00	1151.5986	99.53	944.2159	176.60	786.4532
63.29	1182.2937	100.11	981.7011	177.52	792.7064
63.58	1235.4600	100.20	980.7850	181.07	799.6411
63.81	1236.1373	103.18	938.3801	184.41	837.2152
64.28	1256.9894	103.37	938.6873	184.58	837.3771
64.99	1265.3983	105.31	967.8209	185.72	893.8896
65.08	1204.8221	106.12	990.8619	186.21	873.4871
66.73	1262.6965	109.28	972.1203	190.27	850.1256
66.98	1263.4254	111.00	950.8135	193.51	836.7263
67.24	1237.0256	111.76	989.2454	198.01	851.9440
67.67	1270.4601	116.24	920.2811	201.83	812.0254
67.75	1270.6912	116.30	920.3702	205.31	817.8516
69.67	1339.9410	116.74	959.1101	210.85	856.2734
70.83	1372.8079	117.23	956.5411	218.12	1000.0985
72.81	1342.1400	120.54	944.2960	222.11	900.8098
72.87	1342.3143	120.90	944.8235	227.09	811.1364
74.66	1345.4716	121.12	945.1434	227.38	815.9227
74.82	1345.9333	121.22	945.2904	228.16	799.8320
74.97	1346.3618	121.78	946.1075	228.18	799.8448
77.11	1366.8678	122.06	946.5182	235.69	822.3979
79.69	1426.8958	123.07	898.3541	235.96	838.8874
80.12	1438.4944	127.23	940.0485	238.63	835.2855
80.19	1438.6996	129.43	936.8273	238.98	855.7331
80.57	1452.2385	131.20	895.4645	240.99	775.5856
81.00	1449.3649	133.02	952.5170	242.00	781.1456
81.07	1486.8726	133.52	937.9098	244.70	794.7257
83.79	1392.3915	136.00	866.2339	252.40	784.8720
84.21	1415.4503	136.28	866.5828	252.80	771.5403
85.43	1478.4305	136.47	866.8153	256.23	709.5422
86.55	1207.7506	140.51	895.7936	260.90	690.0029
86.94	1208.6597	140.88	848.1806	264.66	702.1465
87.09	1209.0115	143.76	874.5493	268.22	682.6552
87.57	1210.1316	144.24	848.6805	269.46	692.2932
88.03	1211.2048	145.44	867.3472	271.23	654.7877

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
273.65	650.2144	410.95	480.5262	664.57	302.5063
276.40	646.9969	414.70	519.0660	666.33	286.0159
277.37	630.0325	423.72	475.5681	666.50	286.0367
277.60	623.7930	427.09	515.3556	667.71	0.0000
278.00	624.0035	427.87	524.4745	677.62	269.2750
279.20	623.4496	433.94	539.7934	685.70	258.0692
279.54	613.6689	440.45	539.7048	695.00	268.2346
280.46	558.3167	453.88	528.9664	696.49	274.5088
283.69	603.0344	463.37	516.5138	696.51	274.5088
284.31	596.9457	468.07	529.7386	697.00	274.5681
285.41	604.1376	473.00	538.5300	697.49	275.6380
285.90	587.9315	475.06	528.2173	702.65	260.9500
287.50	580.6963	476.78	483.0806	706.68	283.8573
290.67	595.2971	477.60	469.6023	711.68	255.7983
293.27	599.6030	477.99	470.6165	720.70	267.0269
295.22	614.6964	482.18	487.3073	721.93	274.3529
295.96	599.9186	487.02	444.5509	722.78	261.0879
299.98	601.8764	492.35	427.4498	722.91	261.1003
300.09	594.8373	497.08	391.6255	723.31	273.4813
300.13	594.8597	511.00	381.5823	724.19	261.2368
301.36	589.3644	514.00	411.0984	727.33	274.9657
302.85	606.3190	520.40	350.7751	733.00	263.2115
304.50	545.0865	520.69	350.8209	735.93	263.5228
304.85	556.4316	522.65	0.0000	739.50	269.0835
306.78	580.7241	527.90	332.4454	744.23	291.3660
308.46	610.0629	529.59	351.5381	747.24	281.3412
311.90	541.1401	529.87	353.4730	752.31	309.9971
316.51	579.0260	531.02	333.9305	753.82	285.1982
319.41	574.1519	537.26	335.0226	756.73	258.4383
320.08	563.1255	546.56	343.2725	763.94	267.5313
321.04	576.9360	552.55	357.6314	765.80	270.8687
323.87	541.0146	563.25	304.1030	766.42	282.4387
325.23	559.1528	569.33	305.9861	766.84	290.8548
328.76	525.4122	569.50	305.0502	772.60	0.0000
333.37	539.7169	569.70	298.3656	776.52	300.3559
334.37	501.6151	583.19	279.1079	777.92	316.2852
338.28	560.4757	595.83	308.0225	778.90	310.0957
338.32	560.4921	600.60	315.5441	783.70	315.9375
340.48	546.7495	602.73	306.1117	785.37	309.8197
340.55	546.7814	604.72	342.5078	792.07	322.2382
344.28	559.8135	609.32	292.4010	795.86	293.0749
345.93	549.1461	610.33	309.1724	801.95	351.0168
351.06	543.6046	614.28	324.4463	810.29	342.5495
351.93	554.9064	618.01	283.7718	810.45	347.8925
356.01	517.6226	621.93	294.1237	810.76	339.4203
364.49	545.6183	630.19	0.0000	815.77	321.9294
366.42	509.0785	631.29	301.3215	818.51	320.1270
383.85	495.7831	632.98	316.3828	832.01	329.2380
388.16	484.2441	633.25	303.5672	834.85	339.2448
388.63	505.1614	634.78	319.6170	836.80	321.2206
391.70	526.9902	635.95	320.7727	846.77	328.8579
400.66	512.2266	636.99	312.9989	856.80	339.7885
401.81	523.5132	645.85	322.2123	860.56	342.4079
402.40	513.8986	657.76	318.2634	871.09	395.1782
404.85	460.0705	661.66	307.4647	873.19	397.2850

ENERGY	MDA COUNTS
875.33	344.9394
880.51	371.0283
881.60	354.7943
883.24	372.5989
884.68	366.1036
889.28	369.9763
894.76	401.3892
898.04	385.3716
903.28	401.4733
911.20	368.6855
923.98	392.4389
926.36	411.1035
935.54	410.5177
937.49	466.4150
944.13	424.6998
946.00	460.2960
949.00	439.3503
954.55	0.0000
964.08	384.4680
968.97	354.1597
983.53	339.8256
984.45	338.9795
996.26	315.6868
1001.03	324.6818
1004.73	292.8371
1025.87	333.8928
1028.54	342.7562
1037.84	339.7827
1038.76	330.0180
1046.59	292.9625
1048.07	298.2321
1050.41	289.3157
1063.66	338.7316
1077.00	313.9277
1077.34	321.7061
1085.87	300.1862
1099.25	282.8373
1112.07	300.4019
1112.84	308.8571
1115.54	282.2227
1120.29	228.7790
1120.55	218.7040
1121.30	232.2108
1129.67	189.8980
1131.51	187.0467
1173.23	178.2935
1189.05	120.0537
1204.77	94.4437
1221.41	89.8221
1231.02	78.9236
1235.36	66.8594
1238.28	56.7725
1260.41	56.0854
1274.44	45.0330
1274.54	45.0330
1291.59	66.8197
1298.22	48.3980
1312.11	49.6016
1332.49	44.6639
1365.19	25.1309
1368.63	18.8635
1384.29	14.7280
1408.01	21.1597
1434.09	14.9035
1457.56	21.4079
1460.82	16.0681
1489.16	14.0162
1596.21	10.4092
1620.50	10.4629
1678.03	8.6641
1690.97	6.7566
1764.49	8.8164
1770.23	13.7300
1771.35	11.7711
1791.20	7.8778
1808.65	4.9404
1836.06	10.9260

Method Calibration Data

GEL Laboratories, LLC
2040 Savage Road, Charleston, SC 29414
(843)556-8171

Gamma Spectrometer Geometry Calibration Package

Detector: Gamma 6 Geometry: 2LMB

		YES	NO	Comments
1)	Is all calibration standard information enclosed for:			
	the primary standard certificate?	✓		1705
	the secondard standard(s) documentation?	✓		1663
	the nuclide library used?	✓		
	the VMS certificate file?	✓		
2)	Is the energy calibration graph included?	✓		
3)	Is the detector efficiency curve printout included?	✓		
4)	Is the efficiency calibration report included and reviewed?	✓		
5)	Is the raw count data included for:			
	the calibration peak report?	✓		
	the calibration verification PEAK report?	✓		
	the calibration verification NID report?	✓		
	the last instrument background?	✓		
6)	Are the calibration verification calculations included?	✓		
7)	Are the instrument settings included: amp, HVPS, ADC settings?	✓		

Prepared By: R Fulton Date: 6/3/14

Reviewed By: M. Stamps Date: 6/9/14

Effective Date: 6/12/14

Eckert & Ziegler
Analytics

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.analyticsinc.com

1705

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

96489

2.0 Liter Solid in 230G GA-MA Beaker

Customer: GEL Laboratories, LLC
P.O. No.: GEL1407230, Item 1 Product Code: MIX-8400-EG-SD
Reference Date: 01-Apr-2014 12:00 PM EST **Grams of Master Source:** 0.0081739

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.
Density of solid matrix 1.15 g/cc.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty*, % Type u_A	u_B	U	Calibration Method*
Pb-210	46.5	8.109E+03	———	1.511E+03	0.1	1.6	3.2	4π LS
Am-241	59.5	1.580E+05	———	9.322E+02	0.1	1.6	3.2	4π LS
Cd-109	88.0	4.614E+02	1.648E+06	1.347E+03	0.5	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	8.913E+04	7.285E+02	0.4	1.7	3.5	HPGe
Ce-139	165.9	1.376E+02	1.257E+06	1.028E+03	0.4	1.7	3.5	HPGe
Hg-203	279.2	4.659E+01	2.682E+05	2.192E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.151E+02	1.781E+06	1.456E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	1.117E+06	9.127E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.294E+06	3.510E+03	0.5	1.7	3.5	HPGe
Zn-65	1115.6	2.439E+02	———	1.829E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.099E+05	1.716E+03	0.6	1.8	3.8	HPGe
Co-60	1332.5	1.925E+03	2.102E+06	1.718E+03	0.7	1.8	3.9	HPGe
Y-88	1836.1	1.066E+02	4.546E+06	3.716E+03	0.7	1.7	3.7	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

ANA Form005 Rev. —

ACCREDITED SOURCE CALIBRATION LABORATORY HEALTH PHYSICS SOCIETY

RC-S-065-134

Corporate Office
24937 Avenue Tibbitts Valencia, California 91355

Laboratory
1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

Source Prepared by: _____
K. Eardley, Radiochemist

QC Approved: _____ Date: 20MAY14
A. Chen, Spectroscopist

Standard Logbook

Serial ID:	1705	**Open/Reference Date:**	01-APR-14
Name:	Mixed Gamma 2LMB	**Received:**	01-APR-14
Type:	Source Material	**Expires:**	01-APR-15
Employee:	Maggie Stamps	**Verified:**	28-MAY-14
Supplier:	Eckert & Zeigler Analytics		
Description:	96489		
Comments:	None		

Analyte	Concentration	Analyte	Concentration

Eckert & Ziegler
Analytics

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404·352·8677
Fax 404·352·2837
www.analyticsinc.com

1663

CERTIFICATE OF CALIBRATION
Standard Radionuclide Source

93344

2.0 Liter Solid in 230G GA-MA Beaker

Customer: GEL Laboratories, LLC
P.O. No.: GEL 1303471, Item 8 Product Code: MIX-8400-EG-SD
Reference Date: 01-Apr-2013 12:00 PM EST **Grams of Master Source:** 0.0082376

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.
Density of solid matrix 1.16 g/cc.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty* , % Type u_A	u_B	U	Calibration Method*
Pb-210	46.5	8.109E+03	———	1.522E+03	0.1	2.1	4.1	4π LS
Am-241	59.5	1.580E+06	———	9.576E+02	0.1	1.7	3.5	4π LS
Cd-109	88.0	4.626E+02	1.620E+05	1.334E+03	0.5	2.3	4.7	HPGe
Co-57	122.1	2.718E+02	8.866E+04	7.303E+02	0.4	2.0	4.1	HPGe
Ce-139	165.9	1.376E+02	1.260E+05	1.030E+03	0.4	1.9	3.9	HPGe
Hg-203	279.2	4.681E+01	2.663E+05	2.185E+03	0.3	1.9	3.8	HPGe
Sn-113	391.7	1.151E+02	1.737E+05	1.431E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.098E+04	1.148E+05	9.432E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.178E+05	3.442E+03	0.5	1.9	3.9	HPGe
Zn-65	1115.6	2.441E+02	———	1.848E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.926E+03	2.103E+05	1.732E+03	0.6	1.9	4.0	HPGe
Co-60	1332.5	1.925E+03	2.104E+05	1.733E+03	0.7	1.9	4.0	HPGe
Y-88	1836.1	1.066E+02	4.423E+05	3.644E+03	0.7	1.9	4.0	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

Corporate Office
24937 Avenue Tibbitts Valencia, California 91355

Laboratory
1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

Source Prepared by: K. Eardley, Radiochemist

QA Approved: J.D. McCorvey, Counting Room Manager

Date: 25 APR 13

Standard Logbook

Serial ID:	1663	**Open/Reference Date:**	01-APR-13	**Density :**	1
Name:	Mixed gamma 2LMB	**Received:**	01-APR-13	**Lot Number :**	93344
Type:	Source Material	**Expires:**	08-MAY-39		
Employee:	Maggie Stamps	**Verified:**	08-MAY-13		
Supplier:	Eckert & Zeigler Analytics				
Description:	93344				
Comments:	None				

Analyte	Concentration	Analyte	Concentration

Nuclide Library Editor: ND_SC_LIB:CAL 3-JUN-2014 12:46:46.80

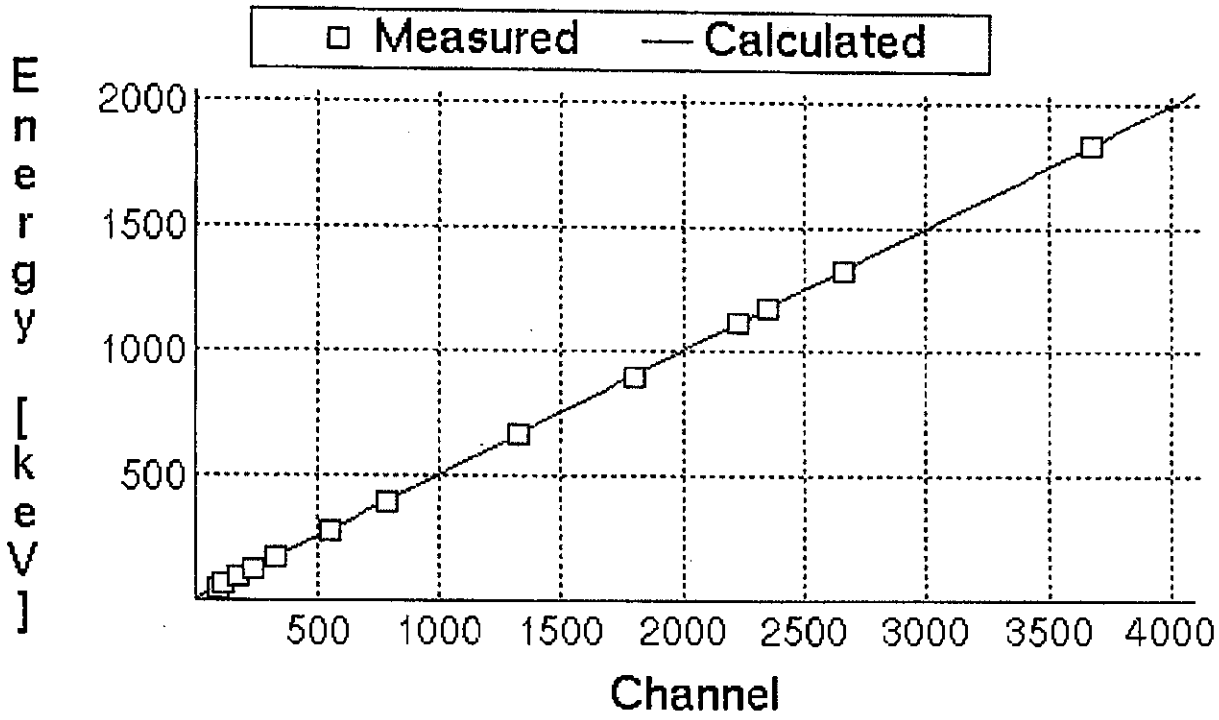
Title: Mixed Gamma + Am-241 & Pb-210

Nuclide Name	Nuclide Type	Half Life	Key Line?	No Wtmean?	Energy (keV)	%Abn
CO-57		271.74D	*		122.06	85.60
					136.47	10.68
CO-60		1925.28D			1173.23	99.85
			*		1332.49	99.98
ZN-65		244.06D	*		1115.54	50.60
SR-85		64.84D	*		514.00	96.00
Y-88		106.63D			898.04	93.70
			*		1836.06	99.20
CD-109		461.40D	*		88.03	3.70
SN-113		115.09D	*		391.70	64.97
I-129	FISSION	1.57E+07Y	*		29.62	56.60
					33.59	10.04
					39.58	7.51
CS-137		30.08Y	*		661.66	85.10
CE-139		137.64D	*		165.86	80.00
HG-203		46.59D			70.83	3.69
					72.87	6.19
			*		279.20	81.56
PB-210		22.20Y	*		46.54	4.25
AM-241		432.60Y	*		59.54	35.90
					0.00	0.00

Certificate Editor: ND_SC_CER:96489 3-JUN-2014 12:47:05.54

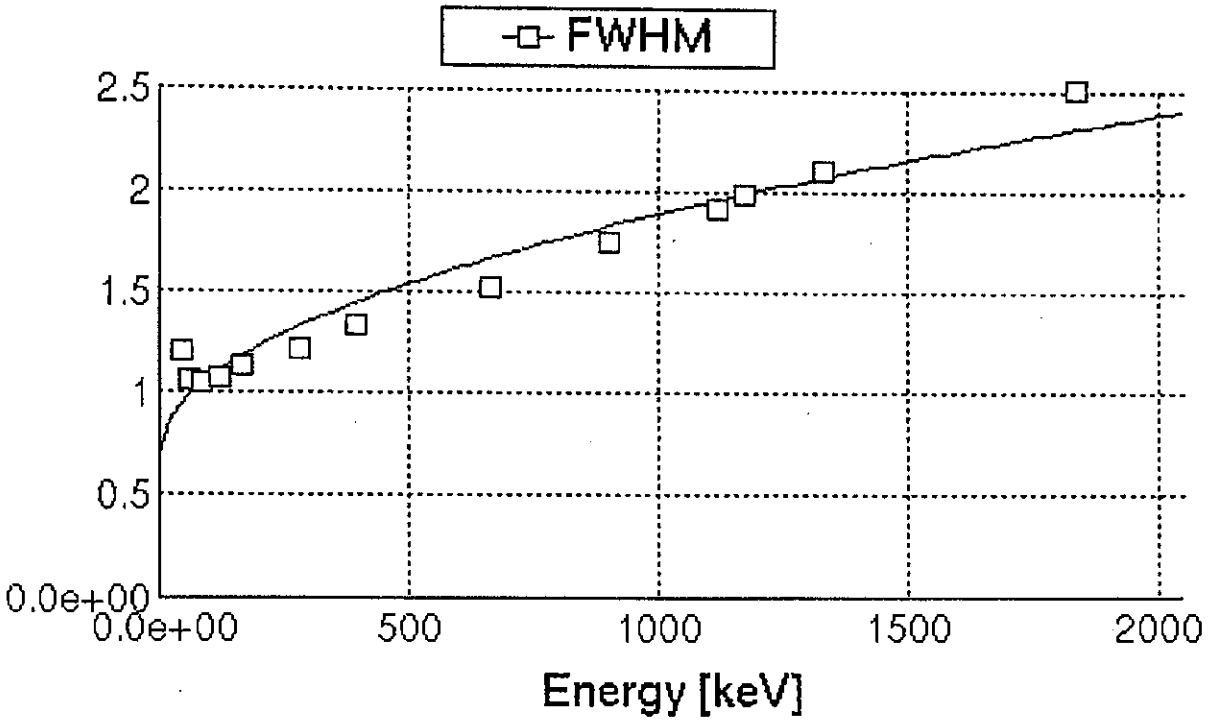
Title: 2LMB 96489
Quantity: 1.00 Assay date: 1-APR-2014 12:00:00.0

Nuclide Name	Half Life	Energy (keV)	Rate	% Err	% Abn	CAL/INIT
PB-210	22.20Y	46.5	1511	3.20	4.3	Yes
AM-241	432.60Y	59.5	932	3.20	35.9	Yes
CD-109	461.40D	88.0	1347	4.10	3.7	Yes
CO-57	271.74D	122.1	729	3.50	85.6	Yes
CE-139	137.64D	165.9	1028	3.50	80.0	Yes
HG-203	46.59D	279.2	2192	3.50	81.6	Yes
SN-113	115.09D	391.7	1456	3.90	65.0	Yes
CS-137	30.08Y	661.7	913	4.00	85.1	Yes
Y-88	106.63D	898.0	3510	3.50	93.7	Yes
ZN-65	244.06D	1115.6	1829	3.50	50.6	Yes
CO-60	1925.28D	1173.2	1716	3.80	99.8	Yes
CO-60	1925.28D	1332.5	1718	3.90	100.0	Yes
Y-88	106.63D	1836.1	3716	3.70	99.2	Yes



Datasource:
Energy = 2.427e-01 keV + 5.002e-01 *Ch + -9.577e-08 *Ch^2 [CHISQ = 3.209e-02]
FWHM = 6.954e-01 keV + 3.787e-02 *E^1/2 [CHISQ = 1.502e-02]
Lo Tail = 0.000e+00 keV + 0.000e+00 *E [CHISQ = 0.000e+00]

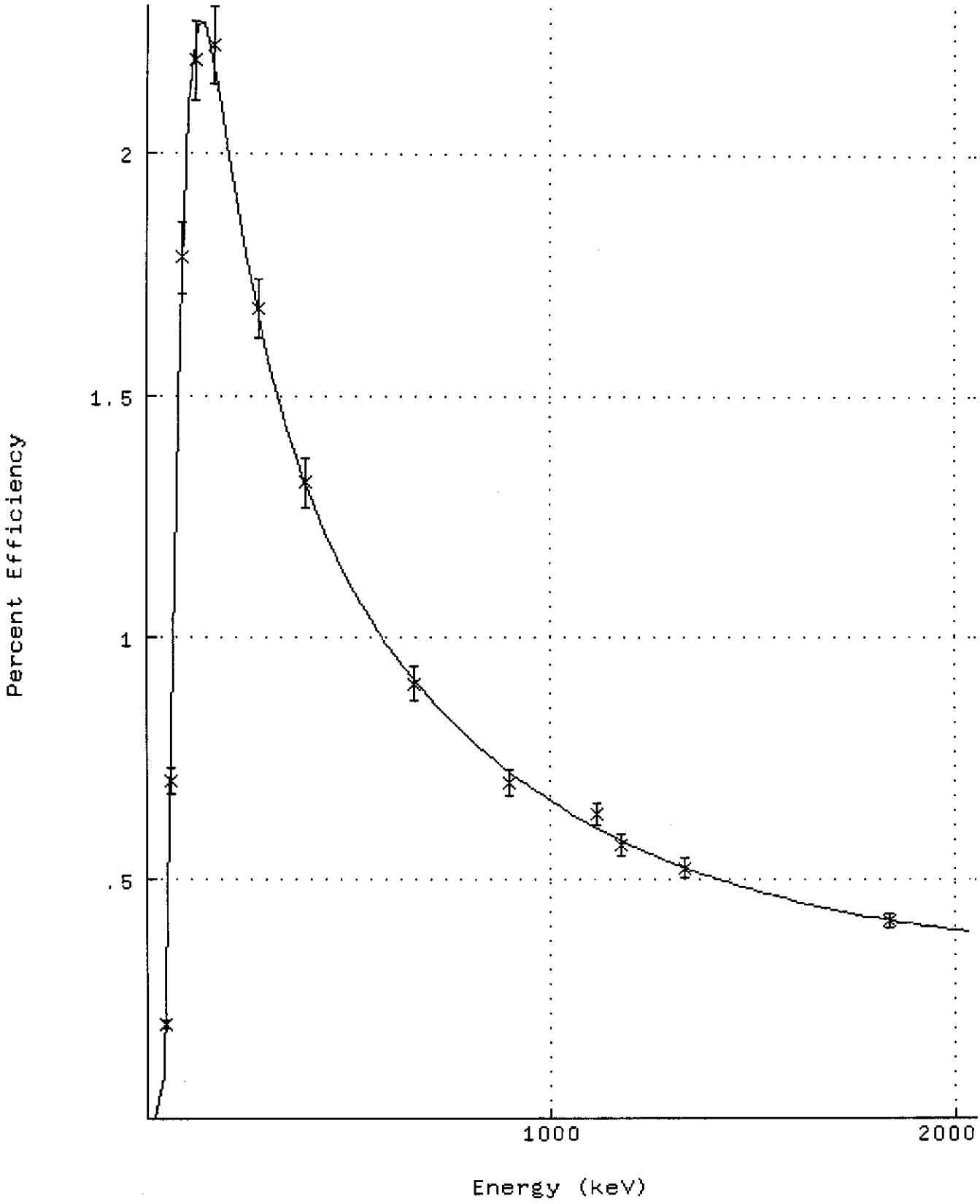
energy calibration 86 6/2/14



Datasource:
Energy = 2.427e-01 keV + 5.002e-01 *Ch + -9.577e-08 *Ch^2 [CHISQ = 3.209e-02]
FWHM = 6.954e-01 keV + 3.787e-02 *E^1/2 [CHISQ = 1.502e-02]
Lo Tail = 0.000e+00 keV + 0.000e+00 *E [CHISQ = 0.000e+00]

Shape calibration Y6 6/2/14

Spectrum : DKA100:[CANBERRA.GAMMA]EFF_GAM06_2LMB.CNF;13
Calib Date: 2-JUN-2014 11:42:
Detector : GAMMA6 Geometry : 2LMB
Fit type : 5 Deg. Empirical



Energy = 0.2427 + 0.5002*Channel + -9.5774E-08*(Channel**2)

Nbr	Centroid Channel	True Energy	Computed Energy	Difference
1	92.41	46.54	46.46	0.078
2	118.47	59.54	59.50	0.044
3	175.50	88.03	88.02	0.015
4	243.58	122.06	122.06	-0.003
5	331.22	165.86	165.89	-0.033
6	557.92	279.20	279.26	-0.056
7	782.94	391.70	391.77	-0.073
8	1322.91	661.66	661.73	-0.068
9	1795.73	898.04	898.07	-0.032
10	2230.86	1115.60	1115.53	0.069
11	2346.25	1173.23	1173.19	0.036
12	2664.88	1332.49	1332.40	0.086
13	3673.24	1836.06	1836.12	-0.064

FWHM Calibration Report

FWHM = 0.6954 + 3.7875E-02*(Energy**1/2)

Nbr	Energy	True FWHM	Computed FWHM	Difference
1	46.54	1.20	0.95	0.250
2	59.54	1.07	0.99	0.079
3	88.03	1.05	1.05	-0.002
4	122.06	1.07	1.11	-0.041
5	165.86	1.13	1.18	-0.049
6	279.20	1.21	1.33	-0.114
7	391.70	1.34	1.45	-0.109
8	661.66	1.53	1.67	-0.137
9	898.04	1.76	1.83	-0.072
10	1115.60	1.92	1.96	-0.039
11	1173.23	1.99	1.99	-0.001
12	1332.49	2.11	2.08	0.032
13	1836.06	2.52	2.32	0.203

Sample ID : 96489
Acquisition date : 2-JUN-2014 09:11:37

Eff = exp(a2 + a3*x + a4*x**2 + a5*x**3 + a6*x**4 + a7*x**5), x=ln(a1/energy)

a1	a2	a3	a4	a	a6	a7
941.3	-4.972	0.8035	-7.3006E-02	-7.3253E-02	0.1101	-4.0717E-02

Average Deviation = 1.70 % Reduced Chi-Square = 0.677

Nbr	Energy (keV)	Measured Efficiency	Efficiency Error	Computed Efficiency	Diff/ /Error	% Diff
1	46.54	1.96E-03	8.84E-05	1.99E-03	-0.40	-1.80
2	59.54	7.00E-03	2.60E-04	6.83E-03	0.67	2.48
3	88.03	1.78E-02	7.35E-04	1.79E-02	-0.08	-0.34
4	122.06	2.19E-02	7.96E-04	2.26E-02	-0.87	-3.16
5	165.86	2.22E-02	7.90E-04	2.19E-02	0.41	1.45
6	279.20	1.68E-02	5.97E-04	1.65E-02	0.41	1.45
7	391.70	1.32E-02	5.21E-04	1.32E-02	-0.02	-0.08
8	661.66	9.02E-03	3.69E-04	9.10E-03	-0.22	-0.89
9	898.04	6.97E-03	2.47E-04	7.20E-03	-0.91	-3.23
10	1115.60	6.35E-03	2.26E-04	6.04E-03	1.38	4.91
11	1173.23	5.70E-03	2.20E-04	5.79E-03	-0.43	-1.67
12	1332.49	5.21E-03	2.06E-04	5.22E-03	-0.03	-0.11
13	1836.06	4.10E-03	1.53E-04	4.12E-03	-0.13	-0.49

VMS Gamma Spectroscopy Report generated 3-JUN-2014 12:48:23

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]CAL_GAM06_2LMB_287077.CNF;1

---- Sample Information ----

Sample Title : 2LMB 96489
Sample ID : 96489 Sample Quantity : 1.00000E+00 SAMPLE
Sample Type : CAL Sample Geometry :
Sample Number : 287024 Spctrm Collector : gamma spec user
Sample Collector : Sample Analyst : gamma spec user

---- Sample Deposition Information ----

Dep. Correction? : No Dep. Duration :
Deposition Start : Deposition End : 1-APR-2014 12:00:00.

---- Sample Decay/Count Information ----

Sample Date : 1-APR-2014 12:00:00. Acquisition date : 2-JUN-2014 09:11:37.
Decay time : 61 21:11:37.13 % dead time : 1.9%
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:01:07.96

---- Detector Parameters ----

Energy cal. time : 2-JUN-2014 11:42:17. Energy cal. oper.: gamma spec user
Detector name : GAMMA6 Counting geometry: 2LMB
Effic. cal. time : 2-JUN-2014 11:42:38. Effic. cal. oper.: gamma spec user

---- Processing Parameters ----

Start channel : 1 End channel : 4096
Sensitivity : 3.00000 Gaussian Sens. : 10.00000
Critical level? : No Propagate Errors?: No
Efficiency Type : EMPIRICA Library-based eff: No
Energy tolerance : 2.00000 Half life ratio : 8.00000
Abundance limit : 75.00000 WTM error limit : 3.00000
MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	37.52	596	21796	1.80	74.53	72	6	1.65E-01	39.4	
2	0	46.36	10027	31834	1.12	92.22	88	9	2.79E+00	3.4	
3	0	59.41	24013	43159	1.12	118.30	112	12	6.67E+00	1.8	
4	6	70.74	2882	43680	1.80	140.95	133	16	8.01E-01	14.3	6.77E+00
5	6	72.87	2824	23871	0.97	145.21	133	16	7.84E-01	8.9	
6	3	81.06	535	12037	1.13	161.60	160	21	1.49E-01	26.8	1.34E+02
7	3	82.61	2495	31371	1.38	164.69	160	21	6.93E-01	12.3	
8	3	88.01	79968	23983	1.09	175.48	160	21	2.22E+01	0.5	
9	0	122.03	49502	42057	1.13	243.51	237	14	1.38E+01	1.0	
10	3	134.76	178	5449	0.92	268.96	268	9	4.93E-02	51.4	1.61E+00
11	3	136.47	6138	16437	1.04	272.40	268	9	1.71E+00	3.5	
12	0	157.19	268	14885	1.44	313.82	312	6	7.45E-02	72.2	
13	8	164.39	1308	16499	1.76	328.22	325	11	3.63E-01	21.8	5.55E+00
14	8	165.90	58914	15362	1.10	331.24	325	11	1.64E+01	0.5	
15	0	255.33	2138	12688	1.27	510.06	506	9	5.94E-01	9.7	
16	0	279.25	53359	14773	1.24	557.90	551	13	1.48E+01	0.6	
17	0	357.52	162	5176	1.18	714.44	713	7	4.51E-02	73.8	
18	0	391.75	47981	10281	1.36	782.89	775	15	1.33E+01	0.6	
19	0	510.91	4555	8938	2.49	1021.24	1012	17	1.27E+00	5.0	
20	0	544.07	116	3842	1.52	1087.56	1086	8	3.21E-02	93.1	
21	0	661.71	29770	7856	1.55	1322.88	1315	15	8.27E+00	0.9	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
22	0	712.30	192	2826	1.76	1424.07	1421	7	5.33E-02	46.7	
23	0	766.91	190	2158	1.48	1533.31	1531	6	5.27E-02	39.4	
24	0	770.17	218	2911	1.08	1539.85	1537	8	6.05E-02	43.4	
25	0	814.00	823	3783	1.78	1627.53	1623	10	2.29E-01	14.4	
26	0	838.64	226	3205	2.72	1676.82	1673	9	6.28E-02	45.7	
27	0	842.90	232	2865	0.67	1685.36	1682	8	6.43E-02	40.5	
28	0	898.06	59410	7618	1.73	1795.70	1787	18	1.65E+01	0.5	
29	0	961.83	103	2569	2.67	1923.31	1921	8	2.85E-02	86.2	
30	0	1015.01	62	2047	0.87	2029.72	2028	8	1.73E-02	126.9	
31	0	1073.03	84	1762	0.57	2145.81	2143	8	2.32E-02	87.5	
32	0	1115.51	35260	4025	1.92	2230.81	2221	18	9.79E+00	0.7	
33	0	1173.18	34732	2788	1.97	2346.21	2337	20	9.65E+00	0.7	
34	0	1232.91	60	1116	1.45	2465.76	2461	11	1.66E-02	109.1	
35	4	1325.08	1236	1601	3.04	2650.22	2643	31	3.43E-01	7.3	4.16E+00
36	4	1332.40	31541	1373	2.11	2664.88	2643	31	8.76E+00	0.6	
37	0	1398.52	32	845	1.91	2797.21	2793	9	8.78E-03	166.6	
38	0	1433.77	88	833	1.40	2867.77	2864	9	2.43E-02	60.4	
39	0	1668.15	49	662	1.18	3336.95	3334	9	1.35E-02	96.7	
40	0	1836.11	36886	627	2.49	3673.21	3661	25	1.02E+01	0.6	
41	0	1885.66	127	151	7.45	3772.42	3762	22	3.53E-02	26.4	

VAX/VMS Nuclide Identification Report Generated 2-JUN-2014 12:52:00.32

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]VER_GAM06_2LMB.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM06.CNF;392
Background date : 1-JUN-2014 08:52:00.
Sample date : 1-APR-2013 12:00:00. Acquisition date : 2-JUN-2014 11:51:13.
Sample ID : VER_GAM06_2LMB Sample quantity : 1.00000E+00 SAMPLE
Detector name : GAM06 Detector geometry: 2LMB
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:28.09 0.8%
Energy tolerance : 1.50000 keV Analyst Initials :
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID : Detector SN# :
Matrix Spike ID : LCS ID :

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.41	10711	17161	1.09	92.31	87	9	2.98E+00	2.4	
2	0	59.48	25577	17548	1.09	118.44	113	10	7.10E+00	1.2	
3	0	88.05	46633	19010	1.10	175.56	170	12	1.30E+01	0.8	
4	0	112.04	176	5486	0.85	223.53	222	5	4.89E-02	63.6	
5	6	120.45	811	4382	1.72	240.35	238	10	2.25E-01	11.7	2.94E+00
6	6	122.10	20378	6078	1.04	243.65	238	10	5.66E+00	0.9	
7	0	136.51	2516	8687	1.12	272.46	268	10	6.99E-01	7.2	
8	0	165.90	9995	6594	1.13	331.24	327	9	2.78E+00	1.8	
9	0	255.21	312	3803	1.57	509.82	507	7	8.68E-02	33.3	
10	0	278.60	197	3367	0.71	556.60	554	7	5.47E-02	49.4	
11	0	375.51	148	1962	0.94	750.42	748	6	4.10E-02	48.1	
12	0	391.71	5567	3435	1.33	782.81	777	11	1.55E+00	2.4	
13	0	510.91*	1523	3691	2.43	1021.23	1013	16	4.23E-01	9.3	
14	0	582.41*	76	1573	1.61	1164.25	1161	8	2.10E-02	91.5	
15	0	661.66	30958	2824	1.54	1322.77	1316	14	8.60E+00	0.7	
16	0	723.99	111	1282	1.55	1447.47	1444	8	3.07E-02	56.8	
17	0	757.50	15	1994	0.83	1514.49	1507	11	4.26E-03	564.4	
18	0	897.89	5937	4194	1.78	1795.36	1785	20	1.65E+00	3.0	
19	0	940.76	25	1861	0.80	1881.14	1880	8	6.87E-03	303.0	
20	0	1028.94	38	1183	0.88	2057.58	2057	8	1.05E-02	158.1	
21	0	1115.33	13145	2349	1.91	2230.46	2220	19	3.65E+00	1.2	
22	0	1126.33	84	778	0.63	2252.47	2249	8	2.34E-02	58.1	
23	0	1173.03	31512	1548	1.96	2345.92	2338	19	8.75E+00	0.6	
24	0	1332.21	28449	753	2.04	2664.49	2653	22	7.90E+00	0.6	
25	0	1474.50	16	193	3.82	2949.29	2941	14	4.54E-03	181.8	
26	0	1804.00*	25	84	4.11	3608.91	3595	20	7.03E-03	91.4	
27	0	1835.89	3481	137	2.43	3672.78	3661	24	9.67E-01	1.9	
28	0	1969.11	15	32	3.53	3939.52	3934	14	4.16E-03	83.7	
29	0	2006.60	21	26	5.07	4014.59	4005	13	5.81E-03	54.9	
30	0	2013.85	25	18	0.95	4029.11	4022	12	6.93E-03	39.5	

Flag: "*" = Peak area was modified by background subtraction

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/SAMPLE	Decay Corr pCi/SAMPLE	2-Sigma %Error
CO-57	122.06	20378	85.60*	2.257E+00	7.920E+03	2.354E+04	1.87
	136.47	2516	10.68	2.276E+00	7.773E+03	2.310E+04	14.43
CO-60	1173.23	31512	99.85	5.792E-01	4.091E+04	4.771E+04	1.28
	1332.49	28449	99.98*	5.221E-01	4.091E+04	4.771E+04	1.28
ZN-65	1115.54	13145	50.60*	6.036E-01	3.231E+04	1.086E+05	2.48
Y-88	898.04	5937	93.70	7.196E-01	6.611E+03	1.061E+05	5.94
	1836.06	3481	99.20*	4.119E-01	6.396E+03	1.027E+05	3.78
CD-109	88.03	46633	3.70*	1.788E+00	5.292E+05	1.005E+06	1.52
SN-113	391.70	5567	64.97*	1.318E+00	4.881E+03	6.389E+04	4.88
CS-137	661.66	30958	85.10*	9.099E-01	3.001E+04	3.083E+04	1.35
CE-139	165.86	9995	80.00*	2.187E+00	4.289E+03	3.684E+04	3.55
HG-203	70.83	------	3.69	1.182E+00	------ Line Not Found		------
	72.87	------	6.19	1.267E+00	------ Line Not Found		------
	279.20	197	81.56*	1.655E+00	1.096E+02	6.290E+04	98.72
PB-210	46.54	10711	4.25*	1.958E-01	9.665E+05	1.002E+06	4.82
AM-241	59.54	25577	35.90*	6.800E-01	7.866E+04	7.881E+04	2.31

Flag: "*" = Keyline

QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM06.QAF;1

Sample ID : Bkg Sample quantity : 1.00 ea
Sample date : 1-JUN-2014 08:52:00 Acquisition date : 1-JUN-2014 08:52:00
Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:03.82

Out-of-range Test: N-SIGMA

Parameter Description [Mean+/-Stdev]	Value	Deviation	Flag
*Spectrum Background Rate [1.53381+/-0.01263]	1.5050E+00	-2.28	Investigate

Flags: "*" means the out-of-range test is parameter-dependent

Approved by: RF Approval Date: 6 / 3 / 14

Sample ID : Bkg Acquisition date : 1-JUN-2014 08:52:00

VMS Gamma Spectroscopy Report generated 2-JUN-2014 01:32:07

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]BKG_BKG_GAM06__286952.CNF;1

---- Sample Information ----

Sample Title	: Weekly Background		
Sample ID	: Bkg	Sample Quantity	: 1.00000E+00 ea
Sample Type	: bkg	Sample Geometry	:
Sample Number	: 286952	Spctrm Collector	: gamma spec user
Sample Collector	:	Sample Analyst	: gamma spec user

---- Sample Deposition Information ----

Dep. Correction?	: No	Dep. Duration	:
Deposition Start	:	Deposition End	: 1-JUN-2014 08:52:00.

---- Sample Decay/Count Information ----

Sample Date	: 1-JUN-2014 08:52:00.	Acquisition date	: 1-JUN-2014 08:52:00.
Decay time	: 0 00:00:00.00	% dead time	: 0.0%
Elapsed live time	: 0 16:40:00.00	Elapsed real time	: 0 16:40:03.82

---- Detector Parameters ----

Energy cal. time	: 28-MAY-2013 09:11:38	Energy cal. oper.	: gamma spec user
Detector name	: GAMMA6	Counting geometry:	
Effic. cal. time	: 2-APR-2014 10:46:18.	Effic. cal. oper.	: gamma spec user

---- Processing Parameters ----

Start channel	: 1	End channel	: 4096
Sensitivity	: 3.00000	Gaussian Sens.	: 10.00000
Critical level?	: No	Propagate Errors?	: No
Efficiency Type	: SPLINE	Library-based eff	: No
Energy tolerance	: 2.00000	Half life ratio	: 8.00000
Abundance limit	: 75.00000	WTM error limit	: 3.00000
MDA Width (FWHM)	: 3.00000	MDA Confid Level	: 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.17	152	676	0.96	125.93	122	7	2.53E-03	29.5	
2	0	77.71	174	756	1.02	155.00	152	9	2.89E-03	29.6	
3	0	92.73	614	936	1.27	185.03	181	11	1.02E-02	10.5	
4	0	110.06	106	702	1.91	219.68	215	8	1.77E-03	44.3	
5	0	116.08	71	648	1.53	231.72	229	8	1.18E-03	63.5	
6	0	139.35	75	539	1.12	278.24	276	6	1.25E-03	50.1	
7	0	143.89	115	777	1.26	287.33	283	9	1.92E-03	44.8	
8	0	185.73	407	717	1.03	370.98	367	9	6.79E-03	12.9	
9	0	193.54	32	459	0.43	386.61	384	6	5.36E-04	107.2	
10	0	197.28	192	737	2.45	394.08	390	10	3.21E-03	27.3	
11	0	238.64	216	549	1.01	476.79	473	8	3.59E-03	20.0	
12	0	338.00	37	427	1.37	675.48	671	9	6.17E-04	102.6	
13	0	351.53	80	275	1.18	702.53	700	7	1.33E-03	36.2	
14	0	446.46	33	171	1.07	892.38	890	7	5.49E-04	68.8	
15	0	510.75	1169	487	2.72	1020.96	1012	19	1.95E-02	5.4	
16	0	536.90	24	177	1.53	1073.26	1071	9	4.04E-04	100.8	
17	0	570.00	62	187	1.01	1139.47	1134	10	1.04E-03	43.0	
18	0	583.21	126	184	1.48	1165.89	1161	11	2.11E-03	22.8	
19	0	599.22	68	245	0.92	1197.92	1192	11	1.14E-03	46.1	

20	0	609.19	152	345	1.70	1217.85	1212	17	2.54E-03	28.9
21	0	675.39	30	109	1.01	1350.26	1347	8	5.01E-04	62.7
22	0	785.91	33	120	1.17	1571.36	1564	12	5.50E-04	68.6
23	0	790.16	22	65	1.23	1579.87	1576	8	3.60E-04	69.1
24	0	807.61	234	335	6.25	1614.76	1598	41	3.91E-03	27.1
25	0	824.11	100	91	5.42	1647.78	1639	17	1.67E-03	24.2
26	0	849.72	16	116	1.37	1699.01	1696	11	2.64E-04	133.9
27	0	860.30	43	118	1.51	1720.18	1713	12	7.17E-04	53.0
28	0	910.77	62	110	2.03	1821.15	1815	11	1.03E-03	35.1
29	0	939.16	47	71	4.08	1877.94	1871	12	7.79E-04	39.1
30	0	969.16	53	98	2.32	1937.98	1931	12	8.80E-04	41.7
31	0	999.71	48	61	2.04	1999.11	1995	9	8.01E-04	32.6
32	0	1025.36	16	66	0.48	2050.43	2044	9	2.65E-04	96.0
33	0	1120.26	56	57	4.17	2240.31	2234	12	9.38E-04	30.4
34	0	1124.73	19	42	1.40	2249.26	2245	8	3.15E-04	63.7
35	4	1204.35	38	39	1.97	2408.58	2405	13	6.38E-04	31.6 5.94E+00
36	4	1207.05	33	42	2.02	2414.00	2405	13	5.45E-04	35.8
37	0	1458.72	85	68	2.60	2917.69	2905	21	1.42E-03	26.5
38	0	1490.86	17	68	7.05	2982.00	2967	18	2.81E-04	120.0
39	0	1612.81	12	33	0.76	3226.13	3221	10	2.02E-04	92.6
40	0	1730.05	8	43	3.83	3460.83	3451	13	1.41E-04	161.8
41	0	1763.47	57	34	2.10	3527.73	3521	15	9.49E-04	25.9
42	0	1803.61	16	33	2.82	3608.10	3598	13	2.58E-04	80.0
43	0	1817.33	20	43	4.81	3635.57	3623	17	3.37E-04	82.7
44	0	1837.63	29	26	6.81	3676.21	3668	17	4.75E-04	44.7
45	0	1899.89	15	26	0.66	3800.88	3791	15	2.47E-04	79.6
46	0	1941.77	18	15	1.43	3884.72	3880	9	3.05E-04	45.3
47	0	1950.21	8	20	2.23	3901.63	3894	10	1.33E-04	110.4

Master Verification Spreadsheet (solid standard)

Gamma Spectroscopy Calibration Verification

Instrument: GAMMA 06 Calibration Date: 6/2/2014

Geometry: 2LMB Manufacturer Standard Id: 93344

GEL Standard Id: 1663

Nuclide	Energy	Abundance (decimal)	Emission Rate (dps)	Calibrated Activity (pCi)	Measured Activity (pCi)	DIFFERENCE (%)
Am-241	59.5	0.359	957.5	7.2085E+04	7.881E+04	9.33
Cs-137	661.7	0.851	943.2	2.9955E+04	3.083E+04	2.92
Co-60	1173.2	0.9985	1732	4.6881E+04	4.771E+04	1.77
Co-60	1332.5	0.9998	1733	4.6847E+04	4.771E+04	1.84

Prepared By: R. Fercer Date: 6/3/14

Reviewed By: M. Stamps Date: 6/9/14

Validated by MJSH on 3/10/11

Verification results are considered acceptable if all differences are less than +/- 10%.

GEL Laboratories, LLC
2040 Savage Road, Charleston, SC 29414
(843)556-8171

Gamma Spectrometer Front End Electronics Setup
Detector: Gamma C

Date Performed: 6/3/14 Performed By: RC

High Voltage Power Supply	*Spectroscopy Amplifier*
Model No. 3106D High Voltage 3.00kV	Model No. 2026 Course Gain 100 Fine Gain .573 Time Constant 6 usec Input polarity positive BSLR rate na BSLR mode na Threshold na
ADC Model No. 8701 Gain 4K	
AIM Module Model No. ND556 Address 5A3:2	

GEL Laboratories, LLC
2040 Savage Road, Charleston, SC 29414
(843)556-8171

Gamma Spectrometer Geometry Calibration Package

Detector: Gamma14 Geometry: 2LMB

		YES	NO	Comments
1)	Is all calibration standard information enclosed for:			
	the primary standard certificate?	✓		1705
	the secondard standard(s) documentation?	✓		1663
	the nuclide library used?	✓		
	the VMS certificate file?	✓		
2)	Is the energy calibration graph included?	✓		
3)	Is the detector efficiency curve printout included?	✓		
4)	Is the efficiency calibration report included and reviewed?	✓		
5)	Is the raw count data included for:			
	the calibration peak report?	✓		
	the calibration verification PEAK report?	✓		
	the calibration verification NID report?	✓		
	the last instrument background?	✓		
6)	Are the calibration verification calculations included?	✓		
7)	Are the instrument settings included:			
	amp, HVPS, ADC settings?	✓		

Prepared By: R. Fuller Date: 3/12/15

Reviewed By: M Stamper Date: 3/13/15

Effective Date: 3/12/15

Eckert & Ziegler Analytics

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.analyticsinc.com

1705

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

96489

2.0 Liter Solid in 230G GA-MA Beaker

Customer: GEL Laboratories, LLC
P.O. No.: GEL1407230, Item 1 Product Code: MIX-8400-EG-SD
Reference Date: 01-Apr-2014 12:00 PM EST **Grams of Master Source:** 0.0081739

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.
Density of solid matrix 1.15 g/cc.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty*, % Type u_A	u_B	U	Calibration Method*
Pb-210	46.5	8.109E+03	———	1.511E+03	0.1	1.6	3.2	4π LS
Am-241	59.5	1.580E+06	———	9.322E+02	0.1	1.6	3.2	4π LS
Cd-109	88.0	4.614E+02	1.648E+05	1.347E+03	0.5	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	8.913E+04	7.285E+02	0.4	1.7	3.5	HPGe
Ce-139	165.9	1.376E+02	1.257E+05	1.028E+03	0.4	1.7	3.5	HPGe
Hg-203	279.2	4.689E+01	2.652E+05	2.192E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.151E+02	1.781E+05	1.456E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	1.117E+05	9.127E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.294E+05	3.510E+03	0.5	1.7	3.5	HPGe
Zn-65	1115.6	2.439E+02	———	1.829E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.099E+05	1.716E+03	0.6	1.8	3.8	HPGe
Co-60	1332.5	1.925E+03	2.102E+05	1.718E+03	0.7	1.8	3.9	HPGe
Y-88	1836.1	1.066E+02	4.546E+05	3.716E+03	0.7	1.7	3.7	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

ANA Form005 Rev. —

RC-S-065-134

Corporate Office
24937 Avenue Tibbitts Valencia, California 91355

Laboratory
1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

Source Prepared by: _____
K. Eardley, Radiochemist

QC Approved: _____ Date: 20MAY14
A. Chen, Spectroscopist

Standard Logbook

Serial ID: 1705
Name: Mixed Gamma 2LMB
Type: Source Material
Employee: Maggie Stamps
Supplier: Eckert & Zeigler Analytics
Description: 96489
Comments: None

Open/Reference Date: 01-APR-14
Received: 01-APR-14
Expires: 01-APR-15
Verified: 28-MAY-14

Analyte	Concentration	Analyte	Concentration

Eckert & Ziegler
Analytics

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404·352·8677
Fax 404·352·2837
www.analyticsinc.com

1663

CERTIFICATE OF CALIBRATION
Standard Radionuclide Source

93344

2.0 Liter Solid in 230G GA-MA Beaker

Customer: GEL Laboratories, LLC
P.O. No.: GEL 1303471, Item 8 Product Code: MIX-8400-EG-SD
Reference Date: 01-Apr-2013 12:00 PM EST **Grams of Master Source:** 0.0082376

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.
Density of solid matrix 1.18 g/cc.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty* , % Type u_A	u_B	U	Calibration Method*
Pb-210	46.5	8.109E+03	———	1.522E+03	0.1	2.1	4.1	4π LS
Am-241	59.5	1.580E+05	———	9.575E+02	0.1	1.7	3.5	4π LS
Cd-109	88.0	4.626E+02	1.620E+05	1.334E+03	0.5	2.3	4.7	HPGe
Co-57	122.1	2.718E+02	8.666E+04	7.303E+02	0.4	2.0	4.1	HPGe
Ce-139	165.9	1.376E+02	1.260E+05	1.030E+03	0.4	1.9	3.9	HPGe
Hg-203	279.2	4.661E+01	2.653E+05	2.185E+03	0.3	1.9	3.8	HPGe
Sn-113	391.7	1.151E+02	1.737E+05	1.431E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.098E+04	1.145E+05	9.432E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.178E+05	3.442E+03	0.5	1.9	3.9	HPGe
Zn-65	1115.5	2.441E+02	———	1.845E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.103E+05	1.732E+03	0.6	1.9	4.0	HPGe
Co-60	1332.5	1.925E+03	2.104E+05	1.733E+03	0.7	1.9	4.0	HPGe
Y-88	1836.1	1.066E+02	4.423E+05	3.644E+03	0.7	1.9	4.0	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

Corporate Office
24937 Avenue Tibbitts Valencia, California 91355

Laboratory
1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

Source Prepared by: _____
K. Eardley, Radiochemist

QA Approved: _____
J.D. McCorvey, Counting Room Manager

Date: 25 APR 13

Standard Logbook

Serial ID:	1663	**Open/Reference Date:**	01-APR-13	**Density :**	1
Name:	Mixed gamma 2LMB	**Received:**	01-APR-13	**Lot Number :**	93344
Type:	Source Material	**Expires:**	08-MAY-39		
Employee:	Maggie Stamps	**Verified:**	08-MAY-13		
Supplier:	Eckert & Zeigler Analytics				
Description:	93344				
Comments:	None				

Analyte	Concentration	Analyte	Concentration

Nuclide Library Editor: ND_SC_LIB:CAL 12-MAR-2015 10:15:14.85

Title: Mixed Gamma + Am-241 & Pb-210

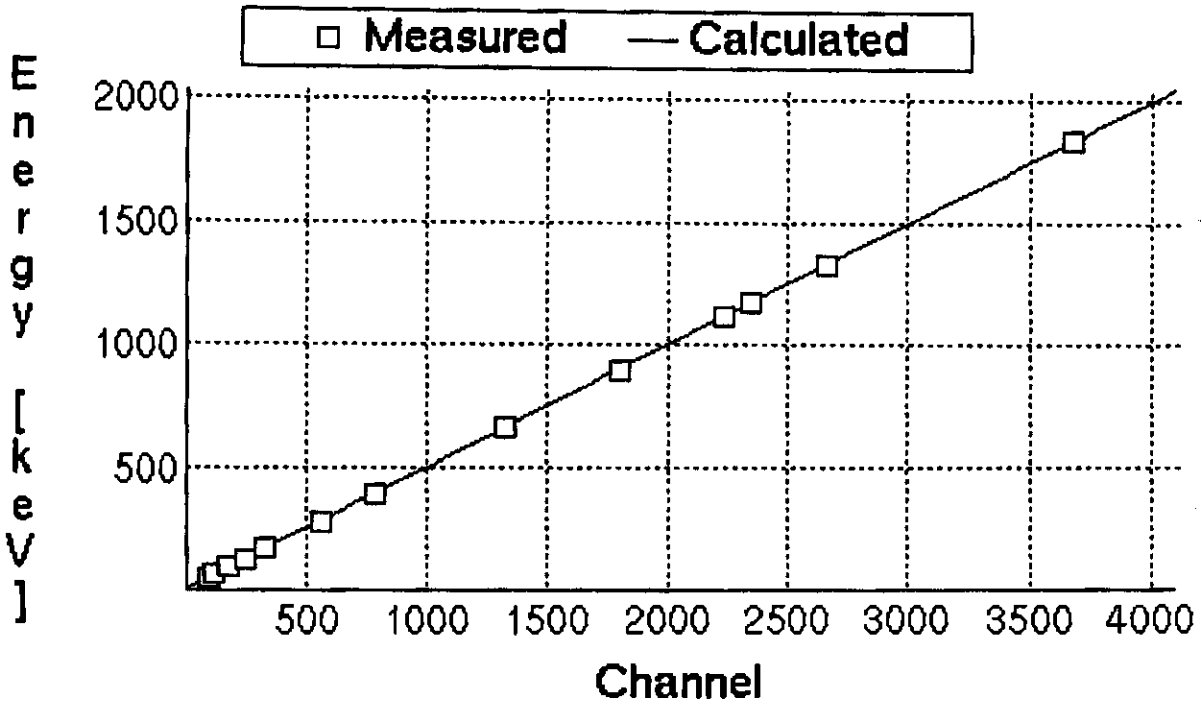
Nuclide Name	Nuclide Type	Half Life	Key Line?	No Wtmean?	Energy (keV)	%Abn
CO-57		271.74D	*		122.06	85.60
					136.47	10.68
CO-60		1925.28D			1173.23	99.85
			*		1332.49	99.98
ZN-65		244.06D	*		1115.54	50.60
SR-85		64.84D	*		514.00	96.00
Y-88		106.63D			898.04	93.70
			*		1836.06	99.20
CD-109		461.40D	*		88.03	3.70
SN-113		115.09D	*		391.70	64.97
I-129	FISSION	1.57E+07Y	*		29.62	56.60
					33.59	10.04
					39.58	7.51
CS-137		30.08Y	*		661.66	85.10
CE-139		137.64D	*		165.86	80.00
HG-203		46.59D			70.83	3.69
					72.87	6.19
			*		279.20	81.56
PB-210		22.20Y	*		46.54	4.25
AM-241		432.60Y	*		59.54	35.90
					0.00	0.00

Certificate Editor: ND_SC_CER:96489 12-MAR-2015 10:15:28.17

Title: 2LMB 96489
Quantity: 1.00

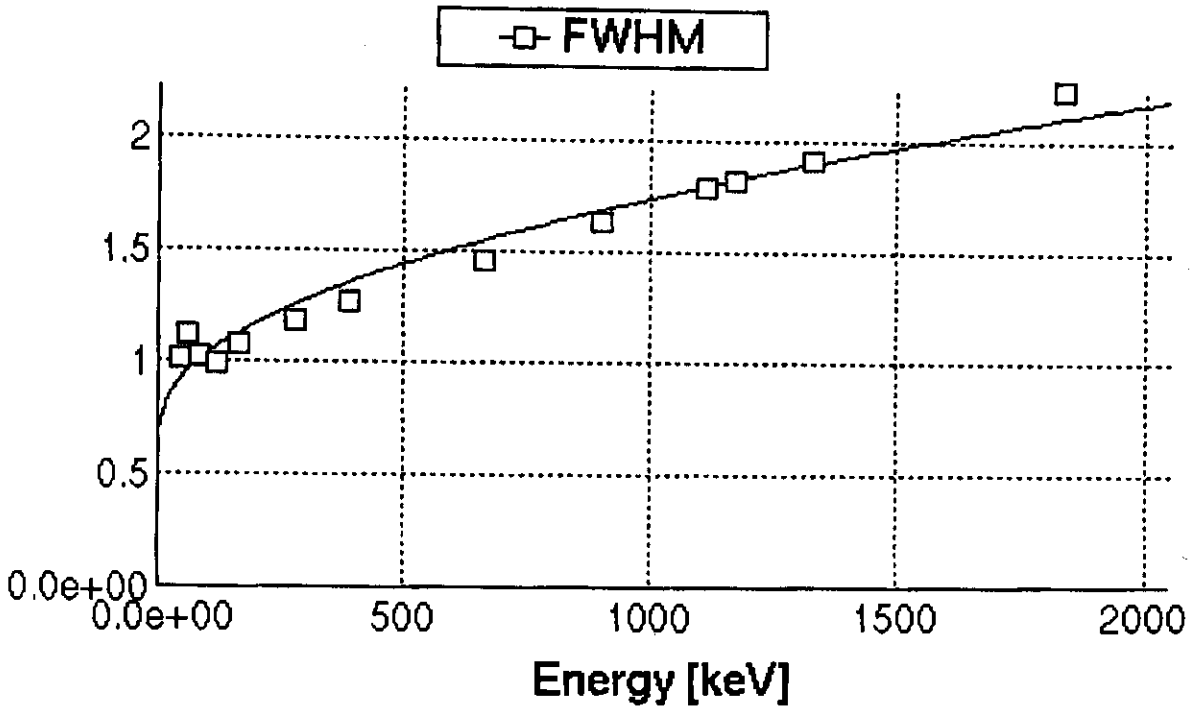
Assay date: 1-APR-2014 12:00:00.0

Nuclide Name	Half Life	Energy (keV)	Rate	% Err	% Abn	CAL/INIT
PB-210	22.20Y	46.5	1511	3.20	4.3	Yes
AM-241	432.60Y	59.5	932	3.20	35.9	Yes
CD-109	461.40D	88.0	1347	4.10	3.7	Yes
CO-57	271.74D	122.1	729	3.50	85.6	Yes
CE-139	137.64D	165.9	1028	3.50	80.0	Yes
HG-203	46.59D	279.2	2192	3.50	81.6	Yes
SN-113	115.09D	391.7	1456	3.90	65.0	Yes
CS-137	30.08Y	661.7	913	4.00	85.1	Yes
Y-88	106.63D	898.0	3510	3.50	93.7	Yes
ZN-65	244.06D	1115.6	1829	3.50	50.6	Yes
CO-60	1925.28D	1173.2	1716	3.80	99.8	Yes
CO-60	1925.28D	1332.5	1718	3.90	100.0	Yes
Y-88	106.63D	1836.1	3716	3.70	99.2	Yes



Datasource:
Energy = -2.020e-02 keV + 5.000e-01 *Ch + 5.667e-09 *Ch^2 [CHISQ = 1.421e-02]
FWHM = 6.942e-01 keV + 3.313e-02 *E^1/2 [CHISQ = 7.539e-03]
Lo Tail = 0.000e+00 keV + 0.000e+00 *E [CHISQ = 0.000e+00]

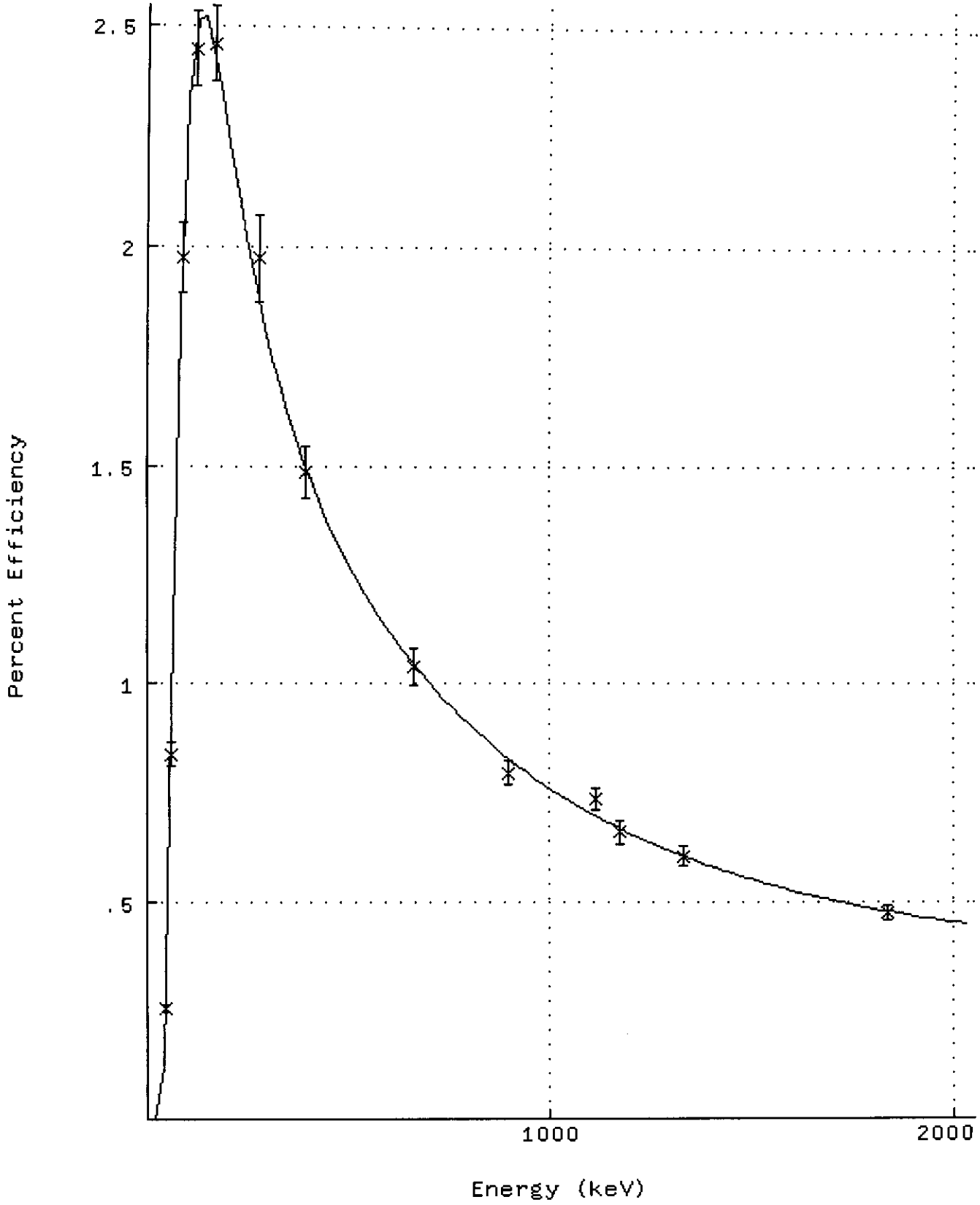
gam 14 Energy Calibration 3/2/15



Datasource:
Energy = -2.020e-02 keV + 5.000e-01 *Ch + 5.667e-09 *Ch^2 [CHISQ = 1.421e-02]
FWHM = 6.942e-01 keV + 3.313e-02 *E^1/2 [CHISQ = 7.539e-03]
Lo Tail = 0.000e+00 keV + 0.000e+00 *E [CHISQ = 0.000e+00]

gam14 Shape Calibration 3/2/15

Spectrum : DKA100:[CANBERRA.GAMMA]EFF_GAM14_2LMB.CNF;12
Calib Date: 12-MAR-2015 05:56
Detector : GAMMA14 Geometry : 2LMB
Fit type : 5 Deg. Empirical



Energy = -2.0202E-02 + 0.5000*Channel + 5.6669E-09*(Channel**2)

Nbr	Centroid Channel	True Energy	Computed Energy	Difference
1	92.85	46.54	46.40	0.137
2	119.13	59.54	59.55	-0.005
3	176.16	88.03	88.06	-0.027
4	244.27	122.06	122.11	-0.051
5	331.85	165.86	165.90	-0.043
6	558.50	279.20	279.22	-0.025
7	783.49	391.70	391.72	-0.017
8	1323.38	661.66	661.66	-0.001
9	1796.14	898.04	898.04	-0.001
10	2231.14	1115.60	1115.55	0.052
11	2346.50	1173.23	1173.23	0.004
12	2665.04	1332.49	1332.50	-0.011
13	3672.14	1836.06	1836.07	-0.013

FWHM Calibration Report

FWHM = 0.6942 + 3.3132E-02*(Energy**1/2)

Nbr	Energy	True FWHM	Computed FWHM	Difference
1	46.54	1.01	0.92	0.093
2	59.54	1.11	0.95	0.163
3	88.03	1.02	1.01	0.018
4	122.06	0.98	1.06	-0.076
5	165.86	1.07	1.12	-0.048
6	279.20	1.18	1.25	-0.070
7	391.70	1.27	1.35	-0.081
8	661.66	1.46	1.55	-0.091
9	898.04	1.64	1.69	-0.050
10	1115.60	1.79	1.80	-0.011
11	1173.23	1.83	1.83	0.001
12	1332.49	1.93	1.90	0.022
13	1836.06	2.24	2.11	0.129

Eff = exp(a2 + a3*x + a4*x**2 + a5*x**3 + a6*x**4 + a7*x**5), x=ln(a1/energy)

a1	a2	a3	a4	a5	a6	a7
941.3	-4.829	0.7854	-7.1592E-02	-6.3757E-02	9.6510E-02	-3.6591E-02

Average Deviation = 2.14 % Reduced Chi-Square = 0.988

Nbr	Energy (keV)	Measured Efficiency	Efficiency Error	Computed Efficiency	Diff/ /Error	% Diff
1	46.54	2.56E-03	8.31E-05	2.60E-03	-0.41	-1.32
2	59.54	8.39E-03	2.69E-04	8.15E-03	0.87	2.78
3	88.03	1.97E-02	8.09E-04	2.01E-02	-0.43	-1.78
4	122.06	2.44E-02	8.57E-04	2.50E-02	-0.70	-2.47
5	165.86	2.46E-02	8.64E-04	2.43E-02	0.23	0.82
6	279.20	1.97E-02	9.74E-04	1.87E-02	1.06	5.23
7	391.70	1.48E-02	5.82E-04	1.50E-02	-0.28	-1.09
8	661.66	1.04E-02	4.15E-04	1.04E-02	-0.16	-0.62
9	898.04	7.97E-03	2.81E-04	8.29E-03	-1.15	-4.06
10	1115.60	7.38E-03	2.59E-04	6.98E-03	1.54	5.39
11	1173.23	6.60E-03	2.51E-04	6.71E-03	-0.41	-1.56
12	1332.49	6.06E-03	2.36E-04	6.06E-03	0.00	0.00
13	1836.06	4.75E-03	1.77E-04	4.78E-03	-0.17	-0.64

VMS Gamma Spectroscopy Report generated 12-MAR-2015 10:15:07

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]CAL_GAM14_2LMB_322796.CNF;1

---- Sample Information ----

Sample Title : 2LMB 96489
Sample ID : 96489 Sample Quantity : 1.00000E+00 SAMPLE
Sample Type : CAL Sample Geometry :
Sample Number : 322753 Spctrm Collector : gamma spec user
Sample Collector : Sample Analyst : gamma spec user

---- Sample Deposition Information ----

Dep. Correction? : No Dep. Duration :
Deposition Start : Deposition End : 1-APR-2014 12:00:00.

---- Sample Decay/Count Information ----

Sample Date : 1-APR-2014 12:00:00. Acquisition date : 11-MAR-2015 11:55:56
Decay time : 343 23:55:56.76 % dead time : 0.9%
Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:48:35.78

---- Detector Parameters ----

Energy cal. time : 2-MAR-2015 16:20:30. Energy cal. oper.: gamma spec user
Detector name : GAMMA14 Counting geometry: 2LMB
Effic. cal. time : 12-MAR-2015 05:56:21 Effic. cal. oper.: gamma spec user

---- Processing Parameters ----

Start channel : 1 End channel : 4096
Sensitivity : 3.00000 Gaussian Sens. : 10.00000
Critical level? : No Propagate Errors?: No
Efficiency Type : EMPIRICA Library-based eff: No
Energy tolerance : 2.00000 Half life ratio : 8.00000
Abundance limit : 75.00000 WTM error limit : 3.00000
MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	41.31	21067	143144	1.95	82.66	81	6	3.51E-01	2.9	
2	0	46.70	225744	306898	1.00	93.44	87	11	3.76E+00	0.5	
3	10	50.63	10016	108954	2.41	101.31	99	25	1.67E-01	4.7	6.26E+02
4	10	52.52	16347	349073	2.42	105.09	99	25	2.72E-01	7.5	
5	10	54.97	33395	395891	2.43	109.99	99	25	5.57E-01	4.2	
6	10	57.98	73180	382273	2.45	116.01	99	25	1.22E+00	2.1	
7	10	60.02	492096	149036	1.05	120.08	99	25	8.20E+00	0.2	
8	10	68.25	12991	222569	2.51	136.55	133	15	2.17E-01	6.1	4.62E+00
9	10	70.38	8895	489067	2.53	140.81	133	15	1.48E-01	17.2	
10	10	81.05	13923	365964	2.57	162.15	156	29	2.32E-01	8.1	3.42E+02
11	10	83.83	33059	445194	2.35	167.70	156	29	5.51E-01	4.2	
12	10	86.34	72106	412398	2.36	172.72	156	29	1.20E+00	2.4	
13	10	88.53	979834	161640	1.02	177.10	156	29	1.63E+01	0.1	
14	0	93.05	1966	133990	1.87	186.14	184	6	3.28E-02	29.6	
15	0	103.21	1224	136596	1.50	206.46	204	6	2.04E-02	47.8	
16	0	122.53	448789	249281	1.01	245.10	239	12	7.48E+00	0.3	
17	0	136.94	56878	156761	0.99	273.92	270	9	9.48E-01	1.3	
18	0	166.32	270080	166805	1.07	332.69	327	11	4.50E+00	0.4	
19	0	241.32	997	73017	1.01	482.69	481	6	1.66E-02	43.0	
20	0	255.56	6957	77096	1.05	511.17	508	7	1.16E-01	6.7	
21	0	279.59	15200	84667	1.15	559.23	555	9	2.53E-01	3.5	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
22	0	311.04	1183	48660	1.69	622.14	620	6	1.97E-02	29.6	
23	0	358.74	577	54644	0.95	717.54	715	8	9.61E-03	70.3	
24	0	392.08	165224	82648	1.23	784.22	778	13	2.75E+00	0.4	
25	0	459.59	539	48829	2.40	919.24	916	8	8.98E-03	71.1	
26	0	511.34	33422	71586	2.57	1022.74	1016	15	5.57E-01	1.8	
27	0	561.15	558	32917	0.56	1122.35	1119	8	9.30E-03	56.5	
28	0	661.94	559323	65887	1.44	1323.94	1316	16	9.32E+00	0.2	
29	0	721.30	99	28470	2.52	1442.67	1442	8	1.64E-03	296.9	
30	0	727.13	275	28286	1.72	1454.31	1453	8	4.59E-03	105.8	
31	0	803.65	474	25917	1.31	1607.35	1605	7	7.90E-03	56.6	
32	0	807.39	472	22145	1.32	1614.85	1612	6	7.87E-03	50.0	
33	0	814.28	2582	33997	1.73	1628.62	1625	9	4.30E-02	13.0	
34	0	821.44	1423	30620	2.42	1642.94	1640	8	2.37E-02	21.4	
35	0	874.18	487	33663	1.78	1748.42	1746	8	8.11E-03	65.4	
36	0	880.32	86	34736	1.17	1760.70	1757	8	1.44E-03	374.2	
37	0	898.24	180344	64430	1.59	1796.53	1790	14	3.01E+00	0.4	
38	0	935.97	327	34241	0.64	1872.00	1870	8	5.45E-03	98.2	
39	0	989.79	344	25882	2.01	1979.64	1975	8	5.74E-03	81.2	
40	0	1005.32	316	24514	1.60	2010.69	2008	8	5.27E-03	85.9	
41	0	1115.68	306932	48407	1.76	2231.41	2222	19	5.12E+00	0.2	
42	0	1146.76	255	13042	1.12	2293.56	2291	8	4.25E-03	77.9	
43	0	1173.34	605071	29034	1.76	2346.72	2337	20	1.01E+01	0.1	
44	0	1275.48	172	4680	2.01	2551.01	2548	8	2.86E-03	69.5	
45	4	1325.45	3198	9748	2.78	2650.94	2642	37	5.33E-02	7.2	7.58E+01
46	4	1332.56	551630	5767	1.91	2665.16	2642	37	9.19E+00	0.1	
47	0	1389.57	123	3411	3.00	2779.18	2774	9	2.04E-03	86.6	
48	0	1393.89	219	2583	1.81	2787.81	2784	7	3.64E-03	39.2	
49	0	1461.01	175	2802	1.55	2922.05	2919	7	2.92E-03	50.7	
50	0	1697.54	112	2015	2.29	3395.08	3391	9	1.86E-03	73.3	
51	0	1708.29	91	1859	3.50	3416.59	3413	9	1.52E-03	86.3	
52	0	1712.21	146	1776	2.47	3424.42	3421	9	2.44E-03	52.6	
53	0	1835.95	113903	2737	2.15	3671.90	3661	22	1.90E+00	0.3	
54	0	1945.97	68	658	0.73	3891.92	3888	8	1.13E-03	66.6	
55	0	1993.64	39	811	0.85	3987.26	3984	10	6.55E-04	136.3	

VAX/VMS Nuclide Identification Report Generated 12-MAR-2015 07:21:31.87

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]VER_GAM14_2LMB.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM14.CNF;436

		Background date	: 6-MAR-2015 14:56:02.
Sample date	: 1-APR-2013 12:00:00.	Acquisition date	: 12-MAR-2015 06:20:40
Sample ID	: VER_GAM14_2LMB	Sample quantity	: 1.00000E+00 SAMPLE
Detector name	: GAM14	Detector geometry	: 2LMB
Elapsed live time	: 0 01:00:00.00	Elapsed real time	: 0 01:00:21.38 0.6%
Energy tolerance	: 1.50000 keV	Analyst Initials	:
Abundance limit	: 75.00000	Sensitivity	: 3.00000
Batch ID	:	Detector SN#	:
Matrix Spike ID	:	LCS ID	:

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	10	45.46*	1069	11104	1.40	90.97	87	10	2.97E-01	19.9	3.52E+00
2	10	46.69*	12352	6476	0.91	93.43	87	10	3.43E+00	1.4	
3	0	49.86	195	8135	1.79	99.76	98	6	5.41E-02	73.4	
4	0	59.82	30070	13346	0.99	119.68	114	10	8.35E+00	0.9	
5	0	79.74	189	7746	1.41	159.52	158	6	5.26E-02	73.8	
6	0	88.35	34553	13554	1.00	176.75	171	12	9.60E+00	0.9	
7	0	122.34	10967	7852	1.05	244.73	239	10	3.05E+00	1.8	
8	0	136.86	1074	5711	1.00	273.77	270	8	2.98E-01	12.6	
9	0	166.19	2632	5835	1.09	332.43	328	10	7.31E-01	5.8	
10	0	236.89	190	3165	1.94	473.83	472	6	5.28E-02	47.4	
11	0	310.50	215	2404	0.74	621.05	618	7	5.97E-02	38.4	
12	0	315.39	98	1683	1.36	630.83	629	5	2.71E-02	63.8	
13	0	348.03	117	2406	1.63	696.11	692	8	3.26E-02	73.1	
14	0	361.91	73	2213	0.77	723.88	722	7	2.02E-02	107.5	
15	0	391.84	1138	2630	1.15	783.73	779	9	3.16E-01	8.7	
16	0	490.89	112	1712	0.96	981.83	979	8	3.12E-02	64.8	
17	0	511.43*	890	2966	3.95	1022.92	1016	15	2.47E-01	13.8	
18	0	661.77	34754	2545	1.46	1323.60	1316	16	9.65E+00	0.6	
19	0	675.79	69	1026	0.70	1351.63	1350	8	1.91E-02	81.8	
20	0	682.83	98	1250	1.39	1365.72	1362	9	2.71E-02	66.2	
21	0	712.60	55	1094	1.72	1425.26	1424	8	1.53E-02	104.5	
22	0	897.99	1034	2108	1.67	1796.03	1791	11	2.87E-01	9.1	
23	0	912.08*	158	1309	0.98	1824.21	1821	7	4.39E-02	39.0	
24	0	953.38	79	1402	1.43	1906.82	1904	7	2.21E-02	78.9	
25	0	974.88	109	1232	1.45	1949.82	1946	8	3.01E-02	57.0	
26	0	1006.14	125	1085	1.00	2012.34	2010	8	3.48E-02	46.4	
27	0	1115.46	6833	1909	1.78	2230.97	2223	16	1.90E+00	1.9	
28	0	1173.15*	32990	1179	1.83	2346.34	2338	18	9.16E+00	0.6	
29	0	1332.34	29732	389	1.92	2664.72	2655	19	8.26E+00	0.6	
30	0	1422.44	18	74	1.49	2844.90	2840	10	5.00E-03	92.9	
31	0	1438.09	13	96	3.18	2876.21	2863	15	3.66E-03	165.3	
32	0	1749.18	14	33	0.83	3498.36	3490	11	3.89E-03	83.8	
33	0	1772.80	14	24	0.59	3545.60	3540	9	3.96E-03	69.7	
34	0	1835.78	679	35	2.30	3671.54	3661	20	1.89E-01	4.4	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit

Flag: "*" = Peak area was modified by background subtraction

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/SAMPLE	Decay Corr pCi/SAMPLE	2-Sigma %Error
CO-57	122.06	10967	85.60*	2.503E+00	3.842E+03	2.349E+04	3.57
	136.47	1074	10.68	2.524E+00	2.990E+03	1.828E+04	25.12
CO-60	1173.23	32990	99.85	6.707E-01	3.698E+04	4.775E+04	1.21
	1332.49	29732	99.98*	6.058E-01	3.685E+04	4.758E+04	1.20
ZN-65	1115.54	6833	50.60*	6.984E-01	1.452E+04	1.090E+05	3.75
Y-88	898.04	1034	93.70	8.294E-01	9.984E+02	1.007E+05	18.28
	1836.06	679	99.20*	4.784E-01	1.074E+03	1.083E+05	8.79
CD-109	88.03	34553	3.70*	2.015E+00	3.480E+05	1.011E+06	1.74
SN-113	391.70	1138	64.97*	1.499E+00	8.774E+02	6.305E+04	17.30
CS-137	661.66	34754	85.10*	1.043E+00	2.939E+04	3.073E+04	1.25
CE-139	165.86	2632	80.00*	2.433E+00	1.015E+03	3.622E+04	11.54
PB-210	46.54	12352	4.25*	2.648E-01	8.240E+05	8.755E+05	2.71
AM-241	59.54	30070	35.90*	8.289E-01	7.586E+04	7.610E+04	1.84

Flag: "*" = Keyline

QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM14.QAF;1

Sample ID : Bkg Sample quantity : 1.00 ea
Sample date : 6-MAR-2015 14:56:02 Acquisition date : 6-MAR-2015 14:56:02
Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:03.66

Out-of-range Test: N-SIGMA

Parameter Description [Mean+/-Stdev]	Value	Deviation	Flag
*Spectrum Background Rate [1.52167+/-0.01974]	1.2344E+00	-14.55	Action

OK

Flags: "*" means the out-of-range test is parameter-dependent

Approved by: RF Approval Date: 3 / 12 / 15

Sample ID : Bkg Acquisition date : 6-MAR-2015 14:56:02

VMS Gamma Spectroscopy Report generated 7-MAR-2015 07:36:16

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]BKG_BKG_GAM14__322300.CNF;1

---- Sample Information ----

Sample Title	: Weekly Background		
Sample ID	: Bkg	Sample Quantity	: 1.00000E+00 ea
Sample Type	: bkg	Sample Geometry	:
Sample Number	: 322300	Spctrm Collector	: gamma spec user
Sample Collector	:	Sample Analyst	: gamma spec user

---- Sample Deposition Information ----

Dep. Correction?	: No	Dep. Duration	:
Deposition Start	:	Deposition End	: 6-MAR-2015 14:56:02.

---- Sample Decay/Count Information ----

Sample Date	: 6-MAR-2015 14:56:02.	Acquisition date	: 6-MAR-2015 14:56:02.
Decay time	: 0 00:00:00.00	% dead time	: 0.0%
Elapsed live time	: 0 16:40:00.00	Elapsed real time	: 0 16:40:03.66

---- Detector Parameters ----

Energy cal. time	: 2-MAR-2015 16:20:30.	Energy cal. oper.	: gamma spec user
Detector name	: GAMMA14	Counting geometry:	
Effic. cal. time	: 6-MAR-2015 10:23:43.	Effic. cal. oper.	: gamma spec user

---- Processing Parameters ----

Start channel	: 1	End channel	: 4096
Sensitivity	: 3.00000	Gaussian Sens.	: 10.00000
Critical level?	: No	Propagate Errors?:	No
Efficiency Type	: SPLINE	Library-based eff:	No
Energy tolerance	: 2.00000	Half life ratio	: 8.00000
Abundance limit	: 75.00000	WTM error limit	: 3.00000
MDA Width (FWHM)	: 3.00000	MDA Confid Level	: 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.37	190	565	0.97	92.79	89	9	3.17E-03	23.7	
2	0	54.01	32	464	1.00	108.07	105	7	5.25E-04	114.8	
3	0	63.28	252	401	0.95	126.60	124	6	4.21E-03	14.0	
4	0	84.22	57	452	1.42	168.48	166	6	9.57E-04	60.2	
5	0	92.88	693	876	1.09	185.81	181	11	1.16E-02	9.1	
6	0	140.19	118	584	1.48	280.43	275	9	1.96E-03	38.3	
7	0	143.82	193	448	1.31	287.69	284	8	3.21E-03	20.4	
8	0	185.93	411	686	0.89	371.90	367	10	6.85E-03	12.9	
9	0	205.17	41	424	1.21	410.39	408	7	6.77E-04	85.6	
10	0	238.65	381	725	1.33	477.34	470	15	6.35E-03	16.2	
11	0	255.71	51	272	1.29	511.47	509	6	8.49E-04	53.2	
12	0	338.51	36	326	2.50	677.07	674	9	5.92E-04	93.0	
13	0	351.07	47	369	1.69	702.20	699	11	7.86E-04	79.9	
14	0	356.04	53	196	2.35	712.13	709	7	8.76E-04	46.3	
15	0	390.24	26	179	1.27	780.53	778	7	4.25E-04	89.1	
16	0	510.95	1158	379	2.15	1021.97	1014	17	1.93E-02	4.9	
17	0	569.92	36	110	1.36	1139.89	1137	6	6.06E-04	48.8	
18	0	584.02	57	239	2.43	1168.10	1161	12	9.58E-04	55.5	
19	0	608.37	67	245	2.01	1216.80	1213	12	1.12E-03	48.1	

20	0	620.54	31	90	0.98	1241.15	1238	7	5.09E-04	55.4	
21	0	768.44	27	84	1.16	1536.95	1533	8	4.50E-04	62.3	
22	0	794.49	35	129	1.54	1589.03	1582	12	5.90E-04	66.3	
23	0	803.43	66	127	1.18	1606.92	1600	14	1.10E-03	38.2	
24	0	860.51	39	89	1.47	1721.09	1717	10	6.53E-04	47.6	
25	0	910.81	53	97	1.64	1821.67	1818	10	8.76E-04	37.5	
26	0	970.25	62	126	0.75	1940.55	1934	14	1.04E-03	40.7	
27	0	1001.39	26	75	1.28	2002.84	1998	9	4.40E-04	62.0	
28	0	1014.61	27	38	1.60	2029.27	2025	8	4.58E-04	43.8	
29	0	1132.85	38	35	2.17	2265.75	2262	9	6.32E-04	32.7	
30	0	1172.51	35	78	2.57	2345.06	2337	19	5.75E-04	63.0	
31	0	1408.30	30	76	3.19	2816.63	2807	19	5.00E-04	72.0	
32	0	1461.20	59	66	2.29	2922.43	2914	14	9.76E-04	32.3	
33	0	1582.14	77	85	17.25	3164.31	3139	40	1.28E-03	42.6	
34	0	1668.42	24	14	1.04	3336.86	3333	10	4.02E-04	36.0	
35	0	1673.57	11	28	2.78	3347.15	3342	10	1.88E-04	92.1	
36	0	1680.89	22	41	3.08	3361.79	3352	19	3.71E-04	73.2	
37	0	1705.57	37	24	3.46	3411.15	3403	16	6.17E-04	33.9	
38	0	1722.35	27	66	8.69	3444.71	3427	26	4.54E-04	86.8	
39	0	1765.39	28	63	2.49	3530.78	3523	19	4.71E-04	69.3	
40	1	1794.50	32	27	2.10	3589.00	3585	20	5.31E-04	28.2	7.63E+00
41	1	1797.00	18	25	2.10	3594.00	3585	20	2.94E-04	67.9	
42	0	1940.70	24	19	2.31	3881.39	3874	13	3.98E-04	43.2	
43	0	1968.82	30	28	8.75	3937.61	3927	22	4.99E-04	48.3	
44	6	1990.85	28	27	3.85	3981.67	3976	21	4.75E-04	33.6	5.49E+00
45	6	1995.46	20	20	3.50	3990.90	3976	21	3.41E-04	54.1	

Master Verification Spreadsheet (solid standard)

Gamma Spectroscopy Calibration Verification

Instrument: GAMMA 14 Calibration Date: 3/11/2015

Geometry: 2LMB Manufacturer Standard Id: 93344

GEL Standard Id: 1663

Nuclide	Energy	Abundance (decimal)	Emission Rate (dps)	Calibrated Activity (pCi)	Measured Activity (pCi)	DIFFERENCE (%)
Am-241	59.5	0.359	957.5	7.2085E+04	7.610E+04	5.57
Cs-137	661.7	0.851	943.2	2.9955E+04	3.073E+04	2.59
Co-60	1173.2	0.9985	1732	4.6881E+04	4.775E+04	1.85
Co-60	1332.5	0.9998	1733	4.6847E+04	4.758E+04	1.56

Prepared By: R.F Uyen Date: 3/12/15

Reviewed By: M.J Stamps Date: 3/13/15

Validated by MJSH on 3/10/11

Verification results are considered acceptable if all differences are less than +/- 10%.

GEL Laboratories, LLC
2040 Savage Road, Charleston, SC 29414
(843)556-8171

Gamma Spectrometer Front End Electronics Setup

Detector: Gamma 14

Date Performed: 3/4/15 Performed By: RF

High Voltage Power Supply Model No. 3105 High Voltage 3.0Kv	***Spectroscopy Amplifier*** Model No. 671 Course Gain 20 Fine Gain 1.141 Time Constant 6 usec Input polarity Positive BSLR rate na BSLR mode na Threshold na
ADC Model No. 8701 Gain 4K	
AIM Module Model No. ND556 Address ICE:2	

GEL Laboratories, LLC
2040 Savage Road, Charleston, SC 29414
(843)556-8171

Gamma Spectrometer Geometry Calibration Package

Detector: Gamma 32 Geometry: 2Lms

	YES	NO	Comments
1) Is all calibration standard information enclosed for:			
the primary standard certificate?	✓		1705
the secondard standard(s) documentation?	✓		1663
the nuclide library used?	✓		
the VMS certificate file?	✓		
2) Is the energy calibration graph included?	✓		
3) Is the detector efficiency curve printout included?	✓		
4) Is the efficiency calibration report included and reviewed?	✓		
5) Is the raw count data included for:			
the calibration peak report?	✓		
the calibration verification PEAK report?	✓		
the calibration verification NID report?	✓		
the last instrument background?	✓		
6) Are the calibration verification calculations included?	✓		
7) Are the instrument settings included:			
amp, HVPS, ADC settings?	✓		

Prepared By: P. Pulley Date: 8/8/14

Reviewed By: M. Stamps Date: 8/8/14

Effective Date: 8/7/14

Eckert & Ziegler
Analytics

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.analyticsinc.com

1705

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

96489

2.0 Liter Solid in 230G GA-MA Beaker

Customer: GEL Laboratories, LLC
P.O. No.: GEL1407230, Item 1 Product Code: MIX-8400-EG-SD
Reference Date: 01-Apr-2014 12:00 PM EST **Grams of Master Source:** 0.0081739

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1996, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.
Density of solid matrix 1.15 g/cc.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty* , % Type u_A	u_B	U	Calibration Method*
Pb-210	46.5	8.109E+03	———	1.511E+03	0.1	1.6	3.2	4π LS
Am-241	59.5	1.580E+05	———	9.322E+02	0.1	1.6	3.2	4π LS
Cd-109	88.0	4.614E+02	1.648E+05	1.347E+03	0.5	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	5.913E+04	7.285E+02	0.4	1.7	3.5	HPGe
Ce-139	165.9	1.376E+02	1.267E+05	1.028E+03	0.4	1.7	3.5	HPGe
Hg-203	279.2	4.659E+01	2.682E+05	2.192E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.151E+02	1.781E+05	1.456E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	1.117E+05	9.127E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.294E+05	3.510E+03	0.5	1.7	3.5	HPGe
Zn-65	1115.6	2.439E+02	———	1.829E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.099E+05	1.716E+03	0.6	1.8	3.8	HPGe
Co-60	1332.5	1.925E+03	2.102E+05	1.718E+03	0.7	1.8	3.9	HPGe
Y-88	1836.1	1.086E+02	4.848E+05	3.716E+03	0.7	1.7	3.7	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

ANA Form005 Rev. —

RC-S-065-134

Corporate Office
24937 Avenue Tibbitts Valencia, California 91355

Laboratory
1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

Source Prepared by: _____
K. Eardley, Radiochemist

QC Approved: _____ Date: 20MAY14
A. Chen, Spectroscopist

Standard Logbook

Serial ID: 1705
Name: Mixed Gamma 2LMB
Type: Source Material
Employee: Maggie Stamps
Supplier: Eckert & Zeigler Analytics
Description: 96489
Comments: None

Open/Reference Date: 01-APR-14
Received: 01-APR-14
Expires: 01-APR-15
Verified: 28-MAY-14

Analyte	Concentration	Analyte	Concentration

Eckert & Ziegler
Analytics

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404·352·8677
Fax 404·352·2837
www.analyticsinc.com

1663

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

93344

2.0 Liter Solid in 230G GA-MA Beaker

Customer: GEL Laboratories, LLC
P.O. No.: GEL 1303471, Item 8 Product Code: MIX-8400-EG-SD
Reference Date: 01-Apr-2013 12:00 PM EST **Grams of Master Source:** 0.0082376

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.
Density of solid matrix 1.18 g/cc.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty* , % Type u_A	u_B	U	Calibration Method*
Pb-210	46.5	8.109E+03	———	1.522E+03	0.1	2.1	4.1	4π LS
Am-241	59.5	1.580E+05	———	9.575E+02	0.1	1.7	3.5	4π LS
Cd-109	88.0	4.628E+02	1.620E+05	1.334E+03	0.5	2.3	4.7	HPGe
Co-57	122.1	2.718E+02	8.866E+04	7.303E+02	0.4	2.0	4.1	HPGe
Ce-139	165.9	1.376E+02	1.250E+05	1.030E+03	0.4	1.9	3.9	HPGe
Hg-203	279.2	4.661E+01	2.653E+05	2.185E+03	0.3	1.9	3.8	HPGe
Sn-113	391.7	1.151E+02	1.737E+05	1.431E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.098E+04	1.145E+05	9.432E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.178E+05	3.442E+03	0.5	1.9	3.9	HPGe
Zn-65	1115.6	2.441E+02	———	1.848E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.103E+05	1.732E+03	0.6	1.9	4.0	HPGe
Co-60	1332.5	1.925E+03	2.104E+05	1.733E+03	0.7	1.9	4.0	HPGe
Y-88	1836.1	1.066E+02	4.423E+05	3.644E+03	0.7	1.9	4.0	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

Corporate Office
24937 Avenue Tibbitts Valencia, California 91355

Laboratory
1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

Source Prepared by: _____
K. Eardley, Radiochemist

QA Approved: _____ Date: 25 APR 13
J.D. McCorvey, Counting Room Manager

Standard Logbook

Serial ID:	1663	**Open/Reference Date:**	01-APR-13	**Density :**	1
Name:	Mixed gamma 2LMB	**Received:**	01-APR-13	**Lot Number :**	93344
Type:	Source Material	**Expires:**	08-MAY-39		
Employee:	Maggie Stamps	**Verified:**	08-MAY-13		
Supplier:	Eckert & Zeigler Analytics				

Description: 93344

Comments: None

Analyte	Concentration	Analyte	Concentration

Nuclide Library Editor: ND_SC_LIB:CAL 8-AUG-2014 13:06:04.09

Title: Mixed Gamma + Am-241 & Pb-210

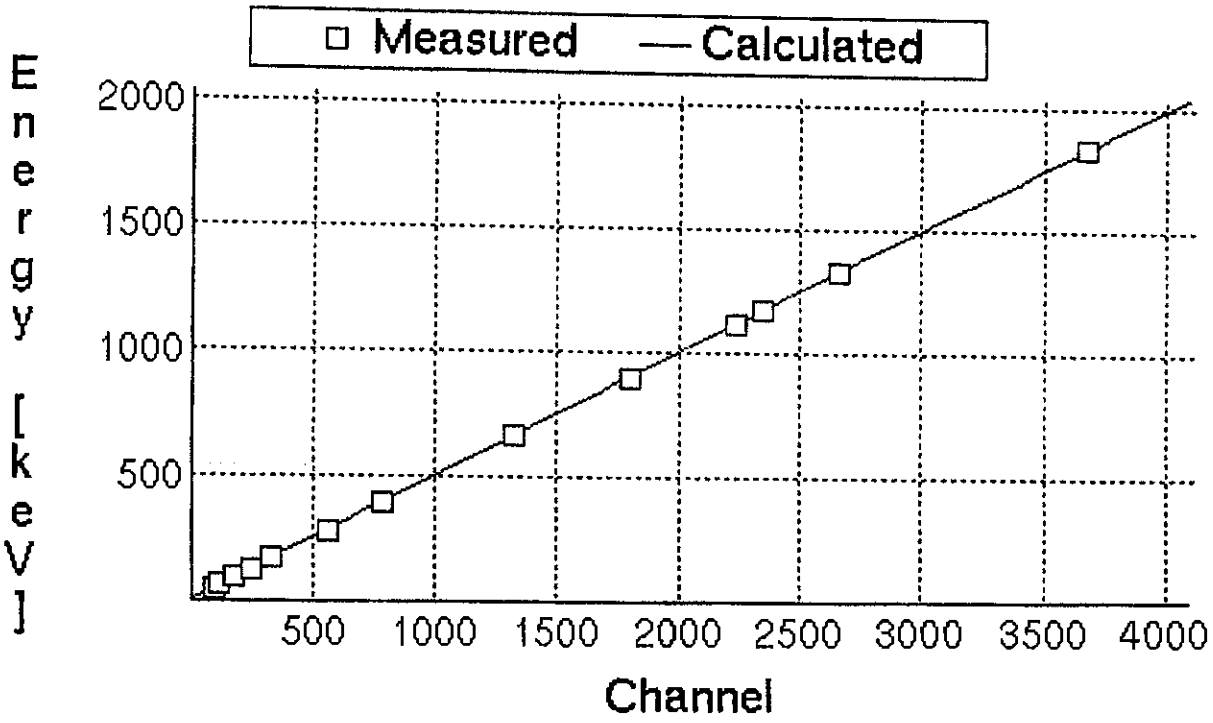
Nuclide Name	Nuclide Type	Half Life	Key Line?	No Wtmean?	Energy (keV)	%Abn
CO-57		271.74D	*		122.06	85.60
					136.47	10.68
CO-60		1925.28D			1173.23	99.85
			*		1332.49	99.98
ZN-65		244.06D	*		1115.54	50.60
SR-85		64.84D	*		514.00	96.00
Y-88		106.63D			898.04	93.70
			*		1836.06	99.20
CD-109		461.40D	*		88.03	3.70
SN-113		115.09D	*		391.70	64.97
I-129	FISSION	1.57E+07Y	*		29.62	56.60
					33.59	10.04
					39.58	7.51
CS-137		30.08Y	*		661.66	85.10
CE-139		137.64D	*		165.86	80.00
HG-203		46.59D			70.83	3.69
					72.87	6.19
			*		279.20	81.56
PB-210		22.20Y	*		46.54	4.25
AM-241		432.60Y	*		59.54	35.90
					0.00	0.00

Certificate Editor: ND_SC_CER:96489 8-AUG-2014 13:06:15.28

Title: 2LMB 96489
Quantity: 1.00

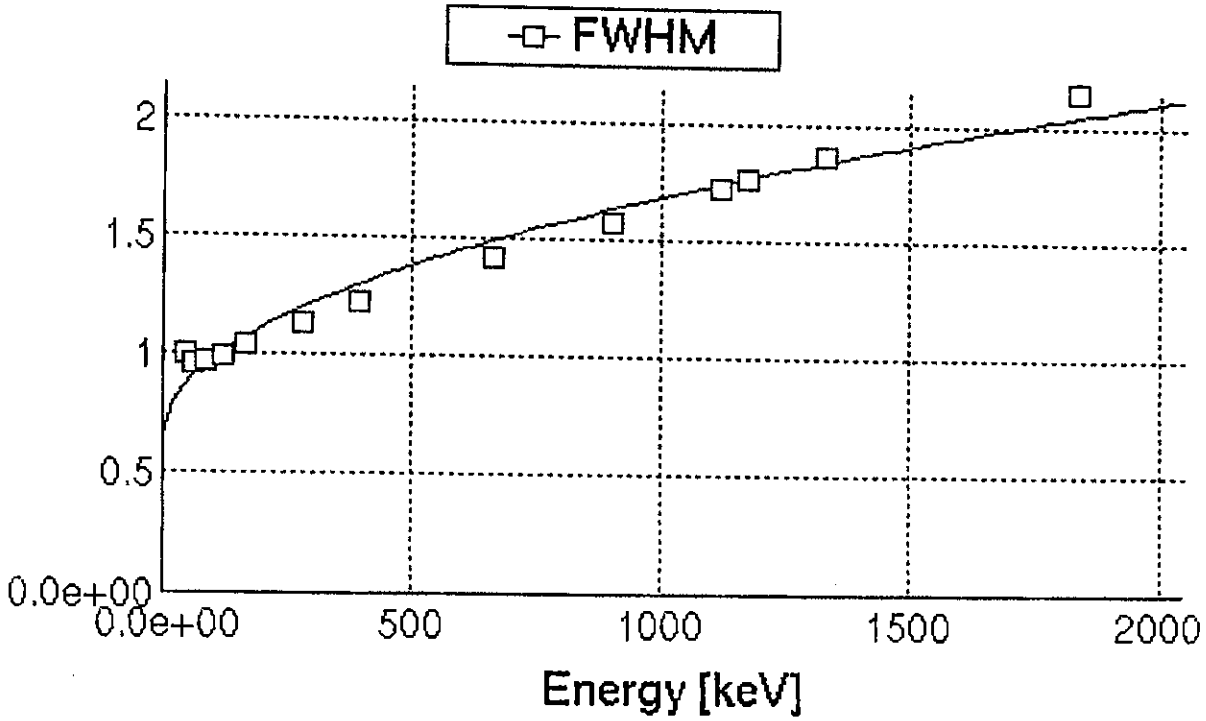
Assay date: 1-APR-2014 12:00:00.0

Nuclide Name	Half Life	Energy (keV)	Rate	% Err	% Abn	CAL/INIT
PB-210	22.20Y	46.5	1511	3.20	4.3	Yes
AM-241	432.60Y	59.5	932	3.20	35.9	Yes
CD-109	461.40D	88.0	1347	4.10	3.7	Yes
CO-57	271.74D	122.1	729	3.50	85.6	Yes
CE-139	137.64D	165.9	1028	3.50	80.0	Yes
HG-203	46.59D	279.2	2192	3.50	81.6	Yes
SN-113	115.09D	391.7	1456	3.90	65.0	Yes
CS-137	30.08Y	661.7	913	4.00	85.1	Yes
Y-88	106.63D	898.0	3510	3.50	93.7	Yes
ZN-65	244.06D	1115.6	1829	3.50	50.6	Yes
CO-60	1925.28D	1173.2	1716	3.80	99.8	Yes
CO-60	1925.28D	1332.5	1718	3.90	100.0	Yes
Y-88	106.63D	1836.1	3716	3.70	99.2	Yes



Datasource:
Energy = -6.406e-02 keV + 4.999e-01 *Ch + -9.380e-09 *Ch^2 [CHISQ = 3.651e-02]
FWHM = 6.548e-01 keV + 3.240e-02 *E^1/2 [CHISQ = 4.623e-03]
Lo Tail = 0.000e+00 keV + 0.000e+00 *E [CHISQ = 0.000e+00]

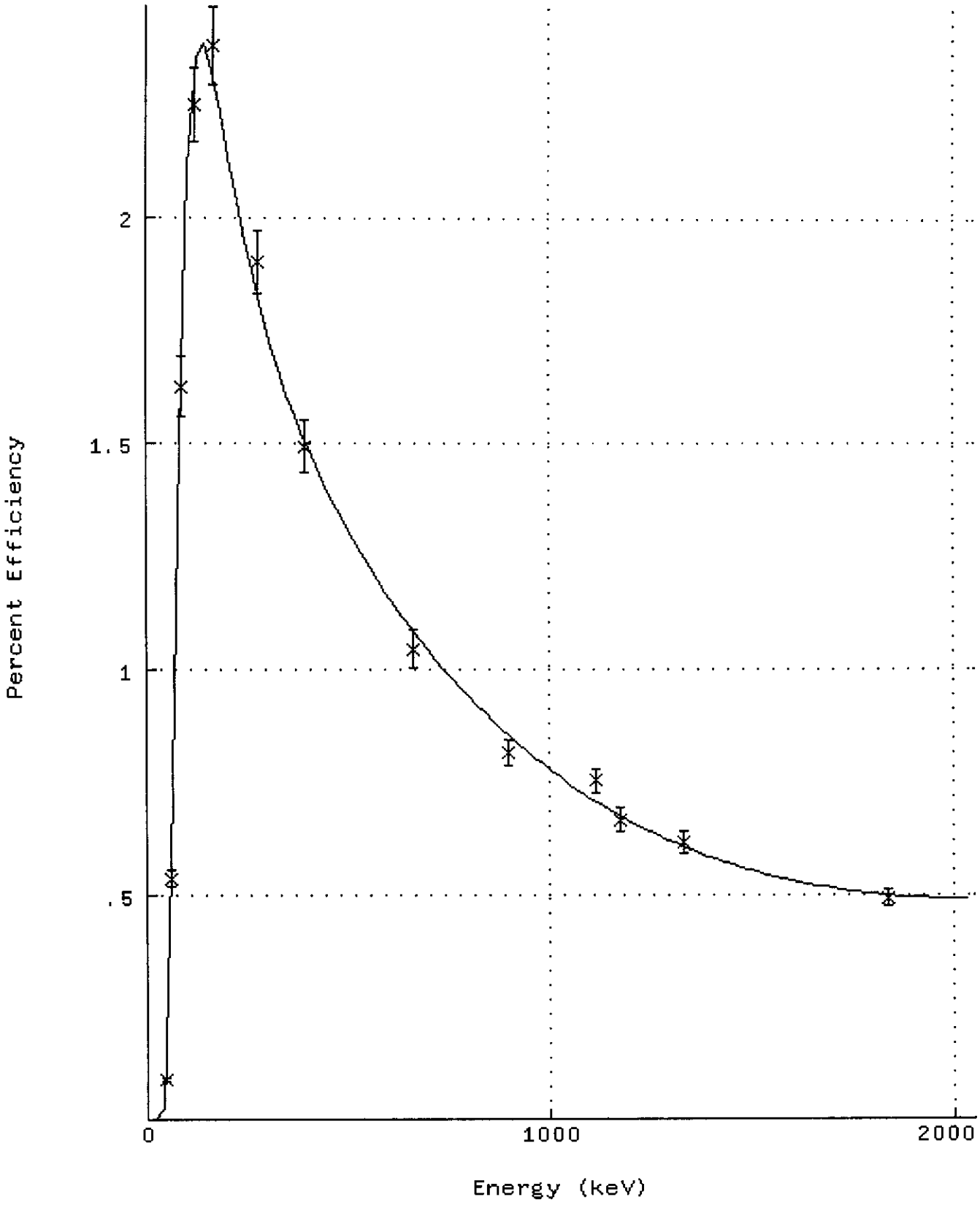
energy calibration #32 8/5/14



Datasource:
Energy = -6.406e-02 keV + 4.999e-01 *Ch + -9.380e-09 *Ch^2 [CHISQ = 3.651e-02]
FWHM = 6.548e-01 keV + 3.240e-02 *E^1/2 [CHISQ = 4.623e-03]
Lo Tail = 0.000e+00 keV + 0.000e+00 *E [CHISQ = 0.000e+00]

Shape calibration 832 8/5/14

Spectrum : DKA100:[CANBERRA.GAMMA]EFF_GAM32_2LMB.CNF;4
Calib Date: 7-AUG-2014 15:41:
Detector : GAMMA32 Geometry : 2LMB
Fit type : 5 Deg. Empirical



Energy = -0.7737 + 0.5001*Channel + -3.6574E-09*(Channel**2)

Nbr	Centroid Channel	True Energy	Computed Energy	Difference
1	94.49	46.54	46.48	0.061
2	120.55	59.54	59.51	0.030
3	177.63	88.03	88.05	-0.024
4	245.68	122.06	122.09	-0.025
5	333.28	165.86	165.89	-0.030
6	559.91	279.20	279.22	-0.023
7	784.86	391.70	391.71	-0.015
8	1324.66	661.66	661.65	0.007
9	1797.36	898.04	898.04	0.002
10	2232.33	1115.60	1115.55	0.047
11	2347.69	1173.23	1173.24	-0.007
12	2666.19	1332.49	1332.51	-0.019
13	3673.19	1836.06	1836.06	-0.005

FWHM Calibration Report

FWHM = 0.8095 + 2.7582E-02*(Energy**1/2)

Nbr	Energy	True FWHM	Computed FWHM	Difference
1	46.54	1.19	1.00	0.189
2	59.54	1.09	1.02	0.063
3	88.03	1.03	1.07	-0.039
4	122.06	1.07	1.11	-0.041
5	165.86	1.12	1.16	-0.040
6	279.20	1.19	1.27	-0.079
7	391.70	1.28	1.36	-0.080
8	661.66	1.46	1.52	-0.061
9	898.04	1.61	1.64	-0.028
10	1115.60	1.72	1.73	-0.008
11	1173.23	1.76	1.75	0.011
12	1332.49	1.83	1.82	0.014
13	1836.06	2.09	1.99	0.099

Sample ID : 96489
Acquisition date : 7-AUG-2014 11:20:38

Eff = exp(a2 + a3*x + a4*x**2 + a5*x**3 + a6*x**4 + a7*x**5), x=ln(a1/energy)

a1	a2	a3	a4	a5	a6	a7
941.3	-4.806	0.8611	-0.1209	-0.2489	0.2633	-7.4936E-02

Average Deviation = 3.98 % Reduced Chi-Square = 2.87

Nbr	Energy (keV)	Measured Efficiency	Efficiency Error	Computed Efficiency	Diff/ /Error	% Diff
1	46.54	8.90E-04	3.80E-05	9.41E-04	-1.33	-5.70
2	59.54	5.37E-03	1.82E-04	4.96E-03	2.28	7.72
3	88.03	1.63E-02	6.70E-04	1.74E-02	-1.69	-6.99
4	122.06	2.24E-02	7.99E-04	2.34E-02	-1.25	-4.45
5	165.86	2.37E-02	8.39E-04	2.31E-02	0.76	2.69
6	279.20	1.90E-02	6.79E-04	1.81E-02	1.23	4.39
7	391.70	1.49E-02	5.86E-04	1.51E-02	-0.24	-0.93
8	661.66	1.04E-02	4.21E-04	1.08E-02	-0.93	-3.73
9	898.04	8.14E-03	2.87E-04	8.51E-03	-1.32	-4.64
10	1115.60	7.53E-03	2.66E-04	7.05E-03	1.81	6.38
11	1173.23	6.66E-03	2.54E-04	6.75E-03	-0.34	-1.29
12	1332.49	6.15E-03	2.41E-04	6.06E-03	0.35	1.37
13	1836.06	4.93E-03	1.83E-04	5.00E-03	-0.39	-1.46

VMS Gamma Spectroscopy Report generated 8-AUG-2014 13:05:59

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]CAL_GAM32_2LMB_295558.CNF;1

---- Sample Information ----

Sample Title : 2LMB 96489
Sample ID : 96489 Sample Quantity : 1.00000E+00 SAMPLE
Sample Type : CAL Sample Geometry :
Sample Number : 295469 Spctrm Collector : gamma spec user
Sample Collector : Sample Analyst : gamma spec user

---- Sample Deposition Information ----

Dep. Correction? : No Dep. Duration :
Deposition Start : Deposition End : 1-APR-2014 12:00:00.

---- Sample Decay/Count Information ----

Sample Date : 1-APR-2014 12:00:00. Acquisition date : 7-AUG-2014 11:20:38.
Decay time : 127 23:20:38.08 % dead time : 1.5%
Elapsed live time: 0 02:26:22.01 Elapsed real time: 0 02:28:38.60

---- Detector Parameters ----

Energy cal. time : 19-AUG-2013 08:53:09 Energy cal. oper.: gamma spec user
Detector name : GAMMA32 Counting geometry: 2LMB
Effic. cal. time : 7-AUG-2014 15:41:28. Effic. cal. oper.: gamma spec user

---- Processing Parameters ----

Start channel : 1 End channel : 4096
Sensitivity : 3.00000 Gaussian Sens. : 10.00000
Critical level? : No Propagate Errors?: No
Efficiency Type : EMPIRICA Library-based eff: No
Energy tolerance : 2.00000 Half life ratio : 8.00000
Abundance limit : 75.00000 WTM error limit : 3.00000
MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	32.86	11224	23175	1.71	67.26	65	7	1.28E+00	2.4	
2	0	36.73	277	36758	0.81	75.00	72	7	3.15E-02	115.0	
3	1	40.83	391	35773	1.08	83.20	80	18	4.45E-02	80.1	1.84E+01
4	1	43.33	777	35359	1.09	88.20	80	18	8.85E-02	40.4	
5	1	46.33	11682	34760	1.10	94.20	80	18	1.33E+00	2.8	
6	0	59.32	43067	56401	1.11	120.16	114	10	4.90E+00	1.1	
7	0	67.43	198	39868	0.98	136.38	134	6	2.26E-02	159.0	
8	0	72.83	1955	41850	0.83	147.19	145	6	2.23E-01	16.7	
9	4	80.73	1961	49363	1.55	162.98	159	25	2.23E-01	18.5	3.15E+02
10	4	82.73	4872	62178	1.55	166.98	159	25	5.55E-01	9.2	
11	4	85.23	7976	60435	1.56	171.99	159	25	9.08E-01	5.8	
12	4	87.92	174008	42867	1.21	177.37	159	25	1.98E+01	0.3	
13	0	121.95	105447	78435	1.14	245.40	238	14	1.20E+01	0.6	
14	0	136.36	13556	44660	1.12	274.23	270	9	1.54E+00	2.9	
15	0	165.79	113542	47042	1.14	333.08	327	11	1.29E+01	0.5	
16	0	255.05	4180	24941	1.31	511.57	508	9	4.76E-01	7.0	
17	0	279.14	54795	27983	1.21	559.73	554	12	6.24E+00	0.7	
18	0	330.17	172	14419	0.94	661.78	659	8	1.96E-02	120.9	
19	0	391.61	89072	18994	1.30	784.65	778	13	1.01E+01	0.5	
20	0	510.88	10096	18110	2.68	1023.16	1015	16	1.15E+00	3.1	
21	0	586.58	95	8291	1.29	1174.54	1173	8	1.08E-02	167.0	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
22	0	597.52	199	7961	0.85	1196.41	1194	8	2.27E-02	77.9	
23	0	640.24	203	8436	1.07	1281.83	1280	8	2.31E-02	78.8	
24	0	661.56	83515	14143	1.46	1324.47	1318	13	9.51E+00	0.5	
25	0	809.18	220	4860	1.29	1619.66	1617	6	2.50E-02	50.6	
26	0	814.12	1229	7548	1.38	1629.55	1625	9	1.40E-01	13.1	
27	0	897.95	109767	14523	1.61	1797.18	1790	15	1.25E+01	0.4	
28	0	1098.70	209	3674	0.73	2198.63	2196	7	2.38E-02	48.5	
29	0	1115.46	84612	8847	1.72	2232.15	2223	17	9.63E+00	0.4	
30	0	1173.15	96300	5637	1.78	2347.51	2340	16	1.10E+01	0.4	
31	0	1293.10	67	1419	1.19	2587.38	2585	8	7.61E-03	98.6	
32	5	1324.95	2413	3166	2.92	2651.09	2643	33	2.75E-01	5.5	2.62E+00
33	5	1332.43	88572	2069	1.84	2666.03	2643	33	1.01E+01	0.4	
34	0	1425.85	178	1543	1.31	2852.84	2849	9	2.02E-02	40.6	
35	0	1518.79	89	1649	1.38	3038.72	3037	8	1.02E-02	79.4	
36	0	1731.34	42	851	3.39	3463.75	3461	12	4.74E-03	141.0	
37	0	1781.22	56	363	1.83	3563.52	3561	8	6.40E-03	60.1	
38	0	1836.02	70309	1035	2.08	3673.10	3662	21	8.01E+00	0.4	
39	0	1921.06	45	239	2.21	3843.17	3836	11	5.17E-03	67.7	

VAX/VMS Nuclide Identification Report Generated 7-AUG-2014 17:44:20.93

```
*******************************************************************************
*                              GEL Laboratories LLC                           *
*                                2040 Savage Road                             *
*                              Charleston, SC 29407                           *
*******************************************************************************
Configuration    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]VER_GAM32_2LMB.CNF;1
Background file  : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM32.CNF;161
                                   Background date  : 3-AUG-2014 13:09:46.
Sample date      : 1-APR-2013 12:00:00. Acquisition date : 7-AUG-2014 15:43:06.
Sample ID        : VER_GAM32_2LMB      Sample quantity  : 1.00000E+00 SAMPLE
Detector name    : GAM32               Detector geometry: 2LMB
Elapsed live time: 0 02:00:00.00       Elapsed real time: 0 02:00:54.11  0.7%
Energy tolerance : 1.50000 keV         Analyst Initials :
Abundance limit  : 75.00000            Sensitivity      : 3.00000
Batch ID         :                     Detector SN#     :
Matrix Spike ID  :                     LCS ID           :
*******************************************************************************
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	6	32.43	2834	2303	0.91	66.39	65	7	3.94E-01	3.2	8.18E+00
2	6	33.44	2218	9765	1.24	68.41	65	7	3.08E-01	8.0	
3	3	36.63	158	4481	1.07	74.80	74	7	2.20E-02	52.2	2.23E+00
4	3	38.14	100	11156	0.89	77.81	74	7	1.39E-02	58.9	
5	0	46.33	9780	21146	1.07	94.19	90	9	1.36E+00	2.9	
6	0	59.35	36610	29533	1.11	120.22	114	12	5.08E+00	1.1	
7	0	66.77*	409	16034	0.86	135.07	133	6	5.67E-02	49.1	
8	0	87.94	79021	31819	1.13	177.40	172	12	1.10E+01	0.6	
9	0	121.98	35190	20654	1.14	245.47	240	11	4.89E+00	1.0	
10	0	136.38	4412	14879	1.11	274.26	270	9	6.13E-01	5.2	
11	0	165.78	15136	15819	1.12	333.05	328	11	2.10E+00	1.8	
12	0	250.70	190	6817	1.04	502.87	500	6	2.65E-02	68.9	
13	0	254.93	339	6744	1.21	511.33	509	6	4.71E-02	38.7	
14	0	391.61	8082	8205	1.29	784.65	779	12	1.12E+00	2.5	
15	0	400.60	57	5272	0.54	802.62	799	8	7.93E-03	221.0	
16	0	510.98*	2723	7405	2.72	1023.36	1016	15	3.78E-01	7.2	
17	0	525.54	306	3600	1.76	1052.47	1049	8	4.26E-02	34.5	
18	0	529.33	235	3571	2.15	1060.04	1057	8	3.26E-02	44.5	
19	0	661.58	71602	6312	1.47	1324.51	1317	16	9.94E+00	0.4	
20	0	827.62	168	2690	2.02	1656.55	1654	7	2.34E-02	51.6	
21	0	897.97	8159	5753	1.66	1797.22	1792	12	1.13E+00	2.2	
22	0	919.26	112	3536	0.60	1839.79	1837	8	1.56E-02	92.1	
23	0	968.52*	132	3017	0.71	1938.30	1936	8	1.83E-02	72.7	
24	0	1115.48	25009	4283	1.75	2232.19	2225	15	3.47E+00	0.9	
25	0	1126.30	139	1824	1.45	2253.82	2249	9	1.93E-02	56.2	
26	0	1129.69	96	1521	0.93	2260.61	2258	8	1.34E-02	70.8	
27	0	1149.85	95	1314	1.79	2300.93	2299	8	1.32E-02	66.7	
28	0	1173.17	71612	2990	1.79	2347.56	2338	18	9.95E+00	0.4	
29	0	1332.44	66348	1015	1.81	2666.06	2656	20	9.21E+00	0.4	
30	0	1378.78	17	251	1.47	2758.73	2752	10	2.36E-03	176.8	
31	0	1447.99	54	294	1.69	2897.12	2892	13	7.45E-03	67.2	
32	0	1509.73	61	194	1.68	3020.60	3016	9	8.45E-03	43.5	
33	0	1637.46	32	151	1.69	3276.03	3273	8	4.47E-03	68.3	
34	0	1665.03	24	176	4.04	3331.16	3326	11	3.27E-03	111.7	

Sample ID : VER_GAM32_2LMB Acquisition date : 7-AUG-2014 15:43:06

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	1698.17	47	185	4.39	3397.43	3391	13	6.51E-03	62.4	
36	0	1710.80	53	205	5.41	3422.68	3415	15	7.34E-03	61.2	
37	0	1818.37	20	53	0.92	3637.80	3634	6	2.77E-03	62.6	
38	0	1836.05	5260	175	2.13	3673.16	3663	19	7.30E-01	1.5	
39	0	1875.39	25	118	6.20	3751.83	3739	16	3.42E-03	102.7	
40	0	1934.02	26	95	0.77	3869.08	3861	15	3.59E-03	84.1	

Flag: "*" = Peak area was modified by background subtraction

Sample ID : VER_GAM32_2LMB Acquisition date : 7-AUG-2014 15:43:06

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/SAMPLE	Decay Corr pCi/SAMPLE	2-Sigma %Error
CO-57	122.06	35190	85.60*	2.344E+00	6.584E+03	2.317E+04	1.91
	136.47	4412	10.68	2.383E+00	6.508E+03	2.290E+04	10.42
CO-60	1173.23	71612	99.85	6.749E-01	3.989E+04	4.764E+04	0.83
	1332.49	66348	99.98*	6.064E-01	4.108E+04	4.906E+04	0.81
ZN-65	1115.54	25009	50.60*	7.052E-01	2.631E+04	1.068E+05	1.70
Y-88	898.04	8159	93.70	8.515E-01	3.839E+03	9.475E+04	4.33
	1836.06	5260	99.20*	4.997E-01	3.983E+03	9.830E+04	3.01
CD-109	88.03	79021	3.70*	1.736E+00	4.618E+05	9.688E+05	1.16
SN-113	391.70	8082	64.97*	1.507E+00	3.099E+03	6.042E+04	5.00
CS-137	661.66	71602	85.10*	1.084E+00	2.915E+04	3.007E+04	0.90
CE-139	165.86	15136	80.00*	2.311E+00	3.073E+03	3.683E+04	3.61
PB-210	46.54	9780	4.25*	9.043E-02	9.552E+05	9.963E+05	5.74
AM-241	59.54	36610	35.90*	4.876E-01	7.850E+04	7.867E+04	2.15

Flag: "*" = Keyline

QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM32.QAF;1

Sample ID : Bkg Sample quantity : 1.00 ea
Sample date : 3-AUG-2014 13:09:46 Acquisition date : 3-AUG-2014 13:09:46
Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:05.00

Out-of-range Test: N-SIGMA

Parameter Description [Mean+/-Stdev]	Value	Deviation	Flag
*Spectrum Background Rate [1.41878+/-0.01284]	1.4054E+00	-1.04	

Flags: "*" means the out-of-range test is parameter-dependent

Approved by: RF Approval Date: 8 / 8 / 14

Sample ID : Bkg Acquisition date : 3-AUG-2014 13:09:46

VMS Gamma Spectroscopy Report generated 4-AUG-2014 05:49:52

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]BKG_BKG_GAM32__294938.CNF;1

---- Sample Information ----

Sample Title : Weekly Background
Sample ID : Bkg Sample Quantity : 1.00000E+00 ea
Sample Type : bkg Sample Geometry :
Sample Number : 294938 Spctrm Collector : gamma spec user
Sample Collector : Sample Analyst : gamma spec user

---- Sample Deposition Information ----

Dep. Correction? : No Dep. Duration :
Deposition Start : Deposition End : 3-AUG-2014 13:09:46.

---- Sample Decay/Count Information ----

Sample Date : 3-AUG-2014 13:09:46. Acquisition date : 3-AUG-2014 13:09:46.
Decay time : 0 00:00:00.00 % dead time : 0.0%
Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:05.00

---- Detector Parameters ----

Energy cal. time : 19-AUG-2013 08:53:09 Energy cal. oper.: gamma spec user
Detector name : GAMMA32 Counting geometry:
Effic. cal. time : 23-AUG-2013 13:31:39 Effic. cal. oper.: gamma spec user

---- Processing Parameters ----

Start channel : 1 End channel : 4096
Sensitivity : 3.00000 Gaussian Sens. : 10.00000
Critical level? : No Propagate Errors?: No
Efficiency Type : SPLINE Library-based eff: No
Energy tolerance : 2.00000 Half life ratio : 8.00000
Abundance limit : 75.00000 WTM error limit : 3.00000
MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	1	61.63	80	328	1.13	124.79	122	11	1.33E-03	36.3	1.48E+00
2	1	63.34	195	499	1.13	128.21	122	11	3.25E-03	20.5	
3	0	66.45	79	425	0.96	134.44	132	6	1.32E-03	42.9	
4	0	69.93	115	607	2.41	141.39	138	8	1.91E-03	38.2	
5	0	92.49	711	969	1.15	186.49	180	12	1.18E-02	9.5	
6	0	139.42	62	498	0.76	280.34	278	6	1.03E-03	58.5	
7	0	144.80	57	796	1.09	291.10	286	9	9.51E-04	90.3	
8	0	177.19	35	474	1.22	355.88	353	6	5.79E-04	100.7	
9	0	185.96	377	766	1.01	373.40	368	10	6.29E-03	14.7	
10	0	198.30	101	555	1.45	398.08	394	8	1.68E-03	41.6	
11	0	218.43	28	385	1.03	438.34	436	6	4.75E-04	110.4	
12	0	238.48	216	549	1.44	478.43	475	9	3.61E-03	20.6	
13	0	294.93	88	410	1.46	591.31	586	9	1.46E-03	43.1	
14	0	300.49	124	338	3.07	602.44	599	9	2.06E-03	28.2	
15	0	338.72	91	328	1.05	678.89	675	9	1.51E-03	37.8	
16	0	352.24	141	319	0.80	705.92	702	9	2.35E-03	24.3	
17	0	366.26	48	292	0.90	733.95	730	9	7.93E-04	66.8	
18	0	511.16	1289	441	2.53	1023.72	1016	18	2.15E-02	4.7	
19	0	583.77	38	259	1.02	1168.91	1163	12	6.32E-04	86.3	

20	0	598.92	122	477	4.15	1199.20	1191	19	2.03E-03	43.8
21	0	609.49	102	275	1.07	1220.35	1215	11	1.70E-03	33.0
22	0	644.90	42	124	1.45	1291.15	1288	9	6.96E-04	50.2
23	0	727.29	21	139	0.82	1455.90	1453	10	3.44E-04	110.1
24	0	795.38	83	188	6.72	1592.08	1580	21	1.38E-03	43.1
25	0	815.64	24	97	1.15	1632.59	1630	9	4.00E-04	76.1
26	0	911.83	121	98	1.89	1824.94	1818	15	2.02E-03	20.0
27	0	962.38	28	68	1.86	1926.03	1922	8	4.70E-04	55.0
28	0	969.11	25	113	0.61	1939.48	1935	11	4.09E-04	86.3
29	0	1001.55	60	93	1.65	2004.35	2000	10	1.00E-03	32.8
30	0	1190.60	6	49	1.60	2382.40	2376	8	1.07E-04	189.7
31	0	1238.76	57	69	4.08	2478.72	2472	17	9.52E-04	35.7
32	0	1263.74	14	34	1.45	2528.67	2524	9	2.38E-04	79.5
33	0	1349.07	29	139	8.78	2699.32	2674	27	4.75E-04	117.6
34	0	1363.59	6	42	1.32	2728.35	2721	10	1.06E-04	190.8
35	0	1426.42	20	72	4.42	2854.00	2839	18	3.33E-04	102.0
36	0	1461.52	93	52	1.41	2924.18	2918	13	1.55E-03	19.1
37	0	1533.22	25	39	2.78	3067.56	3060	13	4.17E-04	55.2
38	0	1562.05	9	33	1.06	3125.23	3117	10	1.54E-04	120.0
39	0	1595.27	5	35	1.19	3191.65	3185	9	8.79E-05	208.5
40	0	1766.49	48	51	1.63	3534.06	3528	15	8.06E-04	34.7
41	0	2021.63	25	25	2.89	4044.29	4036	15	4.14E-04	49.0

Master Verification Spreadsheet (solid standard)

Gamma Spectroscopy Calibration Verification

Instrument: GAMMA 32 Calibration Date: 8/7/2014

Geometry: 2LMB Manufacturer Standard Id: 93344

GEL Standard Id: 1663

Nuclide	Energy	Abundance (decimal)	Emission Rate (dps)	Calibrated Activity (pCi)	Measured Activity (pCi)	DIFFERENCE (%)
Am-241	59.5	0.359	957.5	7.2085E+04	7.867E+04	9.14
Cs-137	661.7	0.851	943.2	2.9955E+04	3.007E+04	0.38
Co-60	1173.2	0.9985	1732	4.6881E+04	4.764E+04	1.62
Co-60	1332.5	0.9998	1733	4.6847E+04	4.906E+04	4.72

Prepared By: R. Fuller Date: 8/8/14

Reviewed By: M. Stamps Date: 8/8/14

Validated by MJSH on 3/10/11

Verification results are considered acceptable if all differences are less than +/- 10%.

GEL Laboratories, LLC
2040 Savage Road, Charleston, SC 29414
(843)556-8171

Gamma Spectrometer Front End Electronics Setup

Detector: Gamma 32

Date Performed: 8/7/14 Performed By: RF

High Voltage Power Supply	***Spectroscopy Amplifier***
Model No. 3106D High Voltage 4.50 KV	Model No. 2026 Course Gain 5 Fine Gain 0.49 Time Constant 6 usec Input polarity positive BSLR rate na BSLR mode na Threshold na
ADC Model No. 8701 Gain 4K	
AIM Module Model No. UCS56 Address 226:1	

GEL Laboratories, LLC
2040 Savage Road, Charleston, SC 29414
(843)556-8171

Gamma Spectrometer Geometry Calibration Package

Detector: Gamma 41 Geometry: 2Lmb

		YES	NO	Comments
1)	Is all calibration standard information enclosed for:			
	the primary standard certificate?	✓		1705
	the secondard standard(s) documentation?	✓		1663
	the nuclide library used?	✓		
	the VMS certificate file?	✓		
2)	Is the energy calibration graph included?	✓		
3)	Is the detector efficiency curve printout included?	✓		
4)	Is the efficiency calibration report included and reviewed?	✓		
5)	Is the raw count data included for:			
	the calibration peak report?	✓		
	the calibration verification PEAK report?	✓		
	the calibration verification NID report?	✓		
	the last instrument background?	✓		
6)	Are the calibration verification calculations included?	✓		
7)	Are the instrument settings included: amp, HVPS, ADC settings?	✓		

Prepared By: L. Turek Date: 4/1/15

Reviewed By: M. Stamps Date: 4/1/15

Effective Date: 4/1/15

Eckert & Ziegler
Analytics

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.analyticsinc.com

1705

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

96489

2.0 Liter Solid in 230G GA-MA Beaker

Customer: GEL Laboratories, LLC
P.O. No.: GEL1407230, Item 1 **Product Code:** MIX-8400-EG-SD
Reference Date: 01-Apr-2014 12:00 PM EST **Grams of Master Source:** 0.0081739

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.
Density of solid matrix 1.15 g/cc.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty*, % Type u_A	u_B	U	Calibration Method*
Pb-210	46.5	8.109E+03	———	1.511E+03	0.1	1.6	3.2	4π LS
Am-241	59.5	1.580E+05	———	9.322E+02	0.1	1.6	3.2	4π LS
Cd-109	88.0	4.614E+02	1.648E+05	1.347E+03	0.5	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	8.913E+04	7.285E+02	0.4	1.7	3.5	HPGe
Ce-139	165.9	1.376E+02	1.257E+05	1.028E+03	0.4	1.7	3.5	HPGe
Hg-203	279.2	4.659E+01	2.682E+05	2.192E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.151E+02	1.781E+05	1.456E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	1.117E+05	9.127E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.294E+05	3.510E+03	0.5	1.7	3.5	HPGe
Zn-65	1115.6	2.439E+02	———	1.829E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.099E+05	1.716E+03	0.6	1.8	3.8	HPGe
Co-60	1332.5	1.925E+03	2.102E+05	1.718E+03	0.7	1.8	3.9	HPGe
Y-88	1836.1	1.066E+02	4.846E+05	3.716E+03	0.7	1.7	3.7	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

ANA Form005 Rev. —

RC-S-065-134

Corporate Office
24937 Avenue Tibbitts Valencia, California 91355

Laboratory
1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

Source Prepared by: _____
K. Eardley, Radiochemist

QC Approved: _____ Date: 20MAY14
A. Chen, Spectroscopist

Standard Logbook

Serial ID:	1705	**Open/Reference Date:**	01-APR-14
Name:	Mixed Gamma 2LMB	**Received:**	01-APR-14
Type:	Source Material	**Expires:**	01-APR-15
Employee:	Maggie Stamps	**Verified:**	28-MAY-14
Supplier:	Eckert & Zeigler Analytics		
Description:	96489		
Comments:	None		

Analyte	Concentration	Analyte	Concentration

Eckert & Ziegler
Analytics

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404·352·8677
Fax 404·352·2837
www.analyticsinc.com

1663

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

93344

2.0 Liter Solid in 230G GA-MA Beaker

Customer: GEL Laboratories, LLC
P.O. No.: GEL 1303471, Item 8 Product Code: MIX-8400-EG-SD
Reference Date: 01-Apr-2013 12:00 PM EST **Grams of Master Source:** 0.0082376

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.
Density of solid matrix 1.18 g/cc.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty* , % Type u_A	u_B	U	Calibration Method*
Pb-210	46.8	8.109E+03	———	1.522E+03	0.1	2.1	4.1	4π LS
Am-241	59.5	1.580E+05	———	9.575E+02	0.1	1.7	3.5	4π LS
Cd-109	88.0	4.626E+02	1.620E+05	1.334E+03	0.5	2.3	4.7	HPGe
Co-57	122.1	2.718E+02	8.866E+04	7.303E+02	0.4	2.0	4.1	HPGe
Ce-139	165.9	1.376E+02	1.260E+05	1.030E+03	0.4	1.9	3.9	HPGe
Hg-203	279.2	4.661E+01	2.653E+05	2.185E+03	0.3	1.9	3.8	HPGe
Sn-113	391.7	1.151E+02	1.737E+05	1.431E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.098E+04	1.145E+05	9.432E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.178E+05	3.442E+03	0.5	1.9	3.9	HPGe
Zn-65	1115.6	2.441E+02	———	1.848E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.103E+05	1.732E+03	0.5	1.9	4.0	HPGe
Co-60	1332.5	1.925E+03	2.104E+05	1.733E+03	0.7	1.9	4.0	HPGe
Y-88	1836.1	1.066E+02	4.423E+05	3.644E+03	0.7	1.9	4.0	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

Corporate Office
24937 Avenue Tibbitts Valencia, California 91355

Laboratory
1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

Source Prepared by: _____
K. Eardley, Radiochemist

QA Approved: _____ Date: 25 APR 13
J.D. McCorvey, Counting Room Manager

Standard Logbook

Serial ID:	1663	**Open/Reference Date:**	01-APR-13	**Density :**	1
Name:	Mixed gamma 2LMB	**Received:**	01-APR-13	**Lot Number :**	93344
Type:	Source Material	**Expires:**	08-MAY-39		
Employee:	Maggie Stamps	**Verified:**	08-MAY-13		
Supplier:	Eckert & Zeigler Analytics				
Description:	93344				
Comments:	None				

Analyte	Concentration	Analyte	Concentration

Nuclide Library Editor: ND_SC_LIB:CAL 1-APR-2015 09:28:19.74

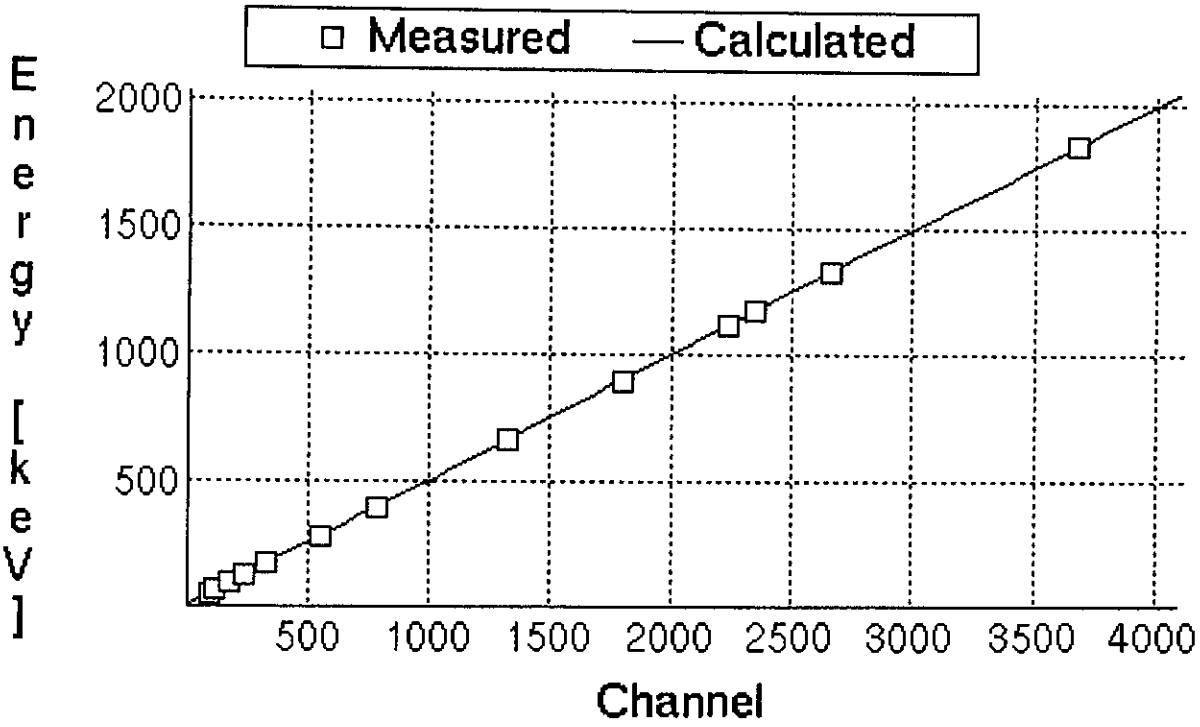
Title: Mixed Gamma + Am-241 & Pb-210

Nuclide Name	Nuclide Type	Half Life	Key Line?	No Wtmean?	Energy (keV)	%Abn
CO-57		271.74D	*		122.06	85.60
					136.47	10.68
CO-60		1925.28D			1173.23	99.85
			*		1332.49	99.98
ZN-65		244.06D	*		1115.54	50.60
SR-85		64.84D	*		514.00	96.00
Y-88		106.63D			898.04	93.70
			*		1836.06	99.20
CD-109		461.40D	*		88.03	3.70
SN-113		115.09D	*		391.70	64.97
I-129	FISSION	1.57E+07Y	*		29.62	56.60
					33.59	10.04
					39.58	7.51
CS-137		30.08Y	*		661.66	85.10
CE-139		137.64D	*		165.86	80.00
HG-203		46.59D			70.83	3.69
					72.87	6.19
			*		279.20	81.56
PB-210		22.20Y	*		46.54	4.25
AM-241		432.60Y	*		59.54	35.90
					0.00	0.00

Certificate Editor: ND_SC_CER:96489 1-APR-2015 09:28:33.25

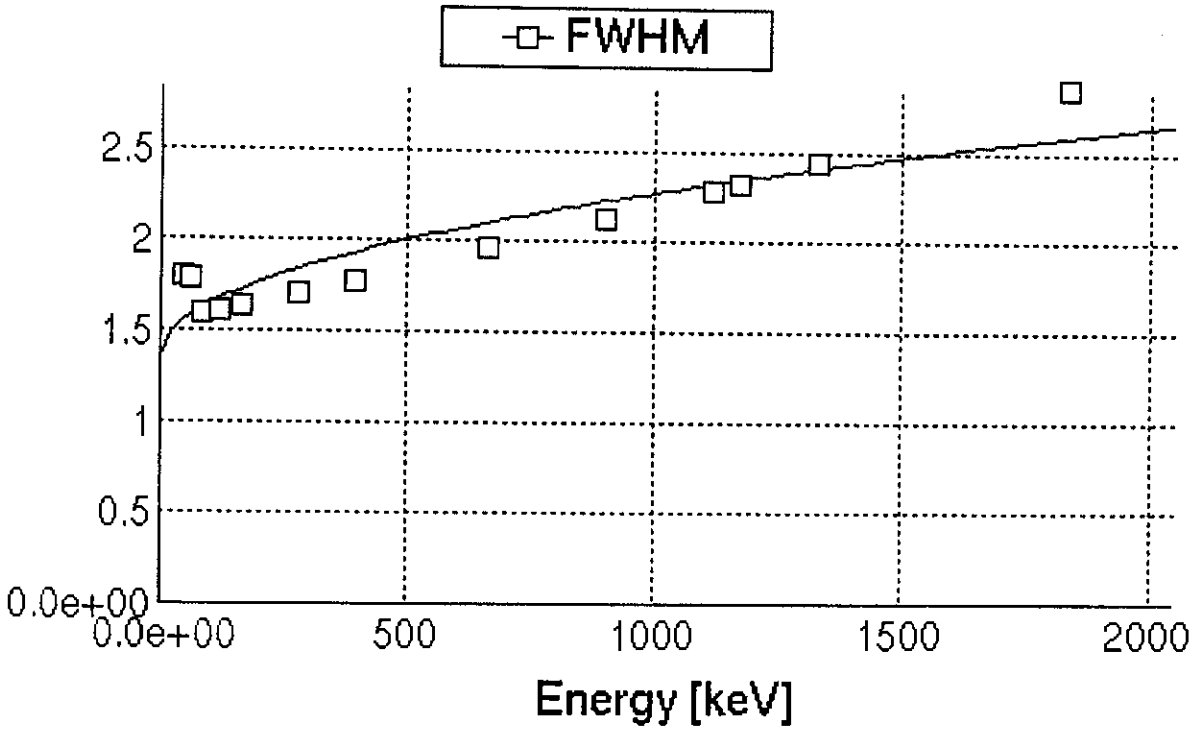
Title: 2LMB 96489
Quantity: 1.00 Assay date: 1-APR-2014 12:00:00.0

Nuclide Name	Half Life	Energy (keV)	Rate	% Err	% Abn	CAL/INIT
PB-210	22.20Y	46.5	1511	3.20	4.3	Yes
AM-241	432.60Y	59.5	932	3.20	35.9	Yes
CD-109	461.40D	88.0	1347	4.10	3.7	Yes
CO-57	271.74D	122.1	729	3.50	85.6	Yes
CE-139	137.64D	165.9	1028	3.50	80.0	Yes
HG-203	46.59D	279.2	2192	3.50	81.6	Yes
SN-113	115.09D	391.7	1456	3.90	65.0	Yes
CS-137	30.08Y	661.7	913	4.00	85.1	Yes
Y-88	106.63D	898.0	3510	3.50	93.7	Yes
ZN-65	244.06D	1115.6	1829	3.50	50.6	Yes
CO-60	1925.28D	1173.2	1716	3.80	99.8	Yes
CO-60	1925.28D	1332.5	1718	3.90	100.0	Yes
Y-88	106.63D	1836.1	3716	3.70	99.2	Yes



Datasource:
Energy = 2.470e-01 keV + 4.996e-01 *Ch + 2.336e-08 *Ch^2 [CHISQ = 2.623e-02]
FWHM = 1.350e+00 keV + 2.902e-02 *E^1/2 [CHISQ = 2.372e-02]
Lo Tail = 0.000e+00 keV + 0.000e+00 *E [CHISQ = 0.000e+00]

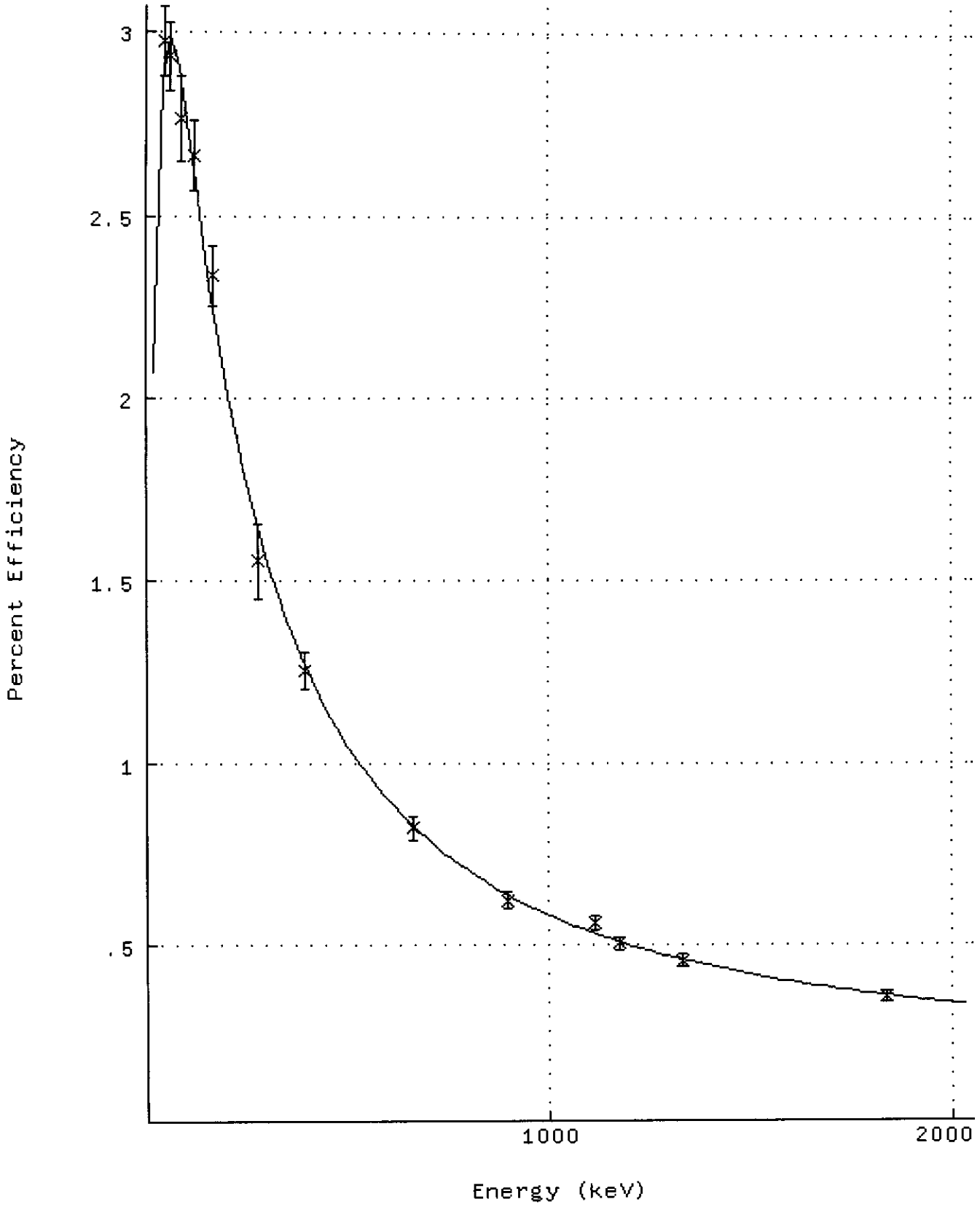
energy calibration γ41 3/18/13



Datasource:
Energy = 2.470e-01 keV + 4.996e-01 *Ch + 2.336e-08 *Ch^2 [CHISQ = 2.623e-02]
FWHM = 1.350e+00 keV + 2.902e-02 *E^1/2 [CHISQ = 2.372e-02]
Lo Tail = 0.000e+00 keV + 0.000e+00 *E [CHISQ = 0.000e+00]

Shape Calibration γ41 3/18/15

Spectrum : DKA100:[CANBERRA.GAMMA]EFF_GAM41_2LMB.CNF;2
Calib Date: 1-APR-2015 08:41:
Detector : GAMMA41 Geometry : 2LMB
Fit type : 4 Deg. Empirical



Energy = 0.2470 + 0.4996*Channel + 2.3362E-08*(Channel**2)

Nbr	Centroid Channel	True Energy	Computed Energy	Difference
1	92.38	46.54	46.40	0.140
2	118.64	59.54	59.52	0.018
3	175.73	88.03	88.05	-0.018
4	243.89	122.06	122.10	-0.041
5	331.57	165.86	165.91	-0.048
6	558.41	279.20	279.25	-0.051
7	783.56	391.70	391.75	-0.048
8	1323.76	661.66	661.67	-0.010
9	1796.78	898.04	898.04	0.005
10	2232.02	1115.60	1115.53	0.066
11	2347.45	1173.23	1173.22	0.012
12	2666.15	1332.49	1332.49	0.003
13	3673.81	1836.06	1836.09	-0.027

FWHM Calibration Report

FWHM = 1.350 + 2.9024E-02*(Energy**1/2)

Nbr	Energy	True FWHM	Computed FWHM	Difference
1	46.54	1.80	1.55	0.250
2	59.54	1.79	1.57	0.215
3	88.03	1.59	1.62	-0.030
4	122.06	1.61	1.67	-0.064
5	165.86	1.64	1.72	-0.088
6	279.20	1.71	1.84	-0.128
7	391.70	1.77	1.92	-0.156
8	661.66	1.96	2.10	-0.136
9	898.04	2.12	2.22	-0.103
10	1115.60	2.29	2.32	-0.032
11	1173.23	2.32	2.34	-0.020
12	1332.49	2.44	2.41	0.032
13	1836.06	2.85	2.59	0.260

Sample ID : 96489
Acquisition date : 31-MAR-2015 07:53:32

Eff = exp(a2 + a3*x + a4*x**2 + a5*x**3 + a6*x**4 + a7*x**5), x=ln(a1/energy)

a1	a2	a3	a4	a5	a6	a7
941.3	-5.094	0.8433	3.3341E-02	-5.3805E-02	2.2943E-03	0.0000E+00

Average Deviation = 2.43 % Reduced Chi-Square = 0.867

Nbr	Energy (keV)	Measured Efficiency	Efficiency Error	Computed Efficiency	Diff/ /Error	% Diff
1	46.54	2.97E-02	9.51E-04	2.92E-02	0.49	1.58
2	59.54	2.93E-02	9.37E-04	2.99E-02	-0.62	-1.99
3	88.03	2.76E-02	1.13E-03	2.86E-02	-0.93	-3.81
4	122.06	2.66E-02	9.33E-04	2.60E-02	0.68	2.38
5	165.86	2.33E-02	8.22E-04	2.26E-02	0.90	3.19
6	279.20	1.55E-02	1.02E-03	1.64E-02	-0.85	-5.58
7	391.70	1.25E-02	4.93E-04	1.27E-02	-0.39	-1.55
8	661.66	8.20E-03	3.28E-04	8.27E-03	-0.20	-0.80
9	898.04	6.23E-03	2.20E-04	6.38E-03	-0.70	-2.47
10	1115.60	5.63E-03	1.98E-04	5.32E-03	1.57	5.51
11	1173.23	5.04E-03	1.92E-04	5.10E-03	-0.31	-1.19
12	1332.49	4.59E-03	1.79E-04	4.60E-03	-0.08	-0.33
13	1836.06	3.56E-03	1.32E-04	3.60E-03	-0.31	-1.16

VMS Gamma Spectroscopy Report generated 1-APR-2015 09:28:14

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]CAL_GAM41_2LMB_324883.CNF;1

---- Sample Information ----

Sample Title : 2LMB 96489
Sample ID : 96489 Sample Quantity : 1.00000E+00 SAMPLE
Sample Type : CAL Sample Geometry :
Sample Number : 324789 Spctrm Collector : gamma spec user
Sample Collector : Sample Analyst : gamma spec user

---- Sample Deposition Information ----

Dep. Correction? : No Dep. Duration :
Deposition Start : Deposition End : 1-APR-2014 12:00:00.

---- Sample Decay/Count Information ----

Sample Date : 1-APR-2014 12:00:00. Acquisition date : 31-MAR-2015 07:53:32
Decay time : 363 19:53:32.10 % dead time : 0.7%
Elapsed live time: 0 18:40:00.00 Elapsed real time: 0 18:47:48.31

---- Detector Parameters ----

Energy cal. time : 18-MAR-2015 11:45:41 Energy cal. oper.: gamma spec user
Detector name : GAMMA41 Counting geometry: 2LMB
Effic. cal. time : 1-APR-2015 08:41:58. Effic. cal. oper.: gamma spec user

---- Processing Parameters ----

Start channel : 1 End channel : 4096
Sensitivity : 3.00000 Gaussian Sens. : 10.00000
Critical level? : No Propagate Errors?: No
Efficiency Type : EMPIRICA Library-based eff: No
Energy tolerance : 2.00000 Half life ratio : 8.00000
Abundance limit : 75.00000 WTM error limit : 3.00000
MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	2	43.54	697662	57438	1.86	86.65	83	43	1.04E+01	0.2	1.98E+04
2	2	46.52	2911234	191380	1.87	92.61	83	43	4.33E+01	0.1	
3	2	50.56	301608	297500	1.88	100.70	83	43	4.49E+00	0.5	
4	2	59.64	1831921	422228	1.91	118.88	83	43	2.73E+01	0.1	
5	0	68.56	72116	795908	4.65	136.74	131	15	1.07E+00	2.7	
6	0	78.48	2586	388410	2.24	156.58	153	8	3.85E-02	41.8	
7	8	85.53	77398	852054	3.46	170.70	160	23	1.15E+00	3.3	5.54E+01
8	8	88.17	1434457	323044	1.56	175.98	160	23	2.13E+01	0.1	
9	0	93.10	3163	210298	2.61	185.85	182	8	4.71E-02	25.2	
10	0	103.83	2048	197419	1.82	207.31	204	8	3.05E-02	37.7	
11	0	122.20	517166	312294	1.62	244.09	236	15	7.70E+00	0.3	
12	0	136.63	62220	190374	1.61	272.97	268	11	9.26E-01	1.4	
13	0	166.03	258182	227183	1.64	331.82	323	16	3.84E+00	0.5	
14	0	186.68	3825	167761	4.41	373.13	368	13	5.69E-02	22.1	
15	0	199.33	4235	115428	1.87	398.45	395	9	6.30E-02	14.5	
16	7	213.17	4576	153267	2.68	426.15	420	33	6.81E-02	17.2	3.20E+00
17	7	216.00	3312	128304	1.65	431.82	420	33	4.93E-02	20.4	
18	7	218.26	2476	128695	1.64	436.35	420	33	3.69E-02	27.3	
19	7	220.95	3214	219691	2.85	441.72	420	33	4.78E-02	33.5	
20	0	255.43	7054	90388	1.73	510.73	507	9	1.05E-01	7.8	
21	0	279.41	10237	86614	1.57	558.74	554	10	1.52E-01	5.5	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
22	0	310.77	1455	58371	0.95	621.49	618	8	2.17E-02	28.9	
23	0	326.40	461	61970	0.74	652.78	650	9	6.86E-03	97.4	
24	0	348.35	687	50866	1.34	696.71	693	8	1.02E-02	57.0	
25	0	352.54	811	50101	1.83	705.09	702	8	1.21E-02	47.9	
26	0	360.19	966	55147	1.73	720.41	717	9	1.44E-02	44.0	
27	0	391.90	137261	80673	1.75	783.87	777	14	2.04E+00	0.5	
28	0	511.19	28783	68914	2.78	1022.60	1015	16	4.28E-01	2.1	
29	0	522.02	280	40888	0.98	1044.27	1042	10	4.17E-03	135.0	
30	0	661.83	494361	63262	1.91	1324.08	1315	18	7.36E+00	0.2	
31	0	692.01	539	27933	1.69	1384.48	1380	8	8.02E-03	53.9	
32	0	760.99	209	32187	2.25	1522.52	1515	10	3.10E-03	161.2	
33	0	764.52	568	32244	0.63	1529.58	1525	10	8.45E-03	59.3	
34	0	814.12	2738	37980	1.85	1628.85	1624	11	4.07E-02	13.9	
35	0	822.10	1458	34998	2.11	1644.82	1640	10	2.17E-02	24.2	
36	0	887.27	409	24206	1.56	1775.23	1773	6	6.08E-03	60.4	
37	0	898.21	138091	67516	2.08	1797.12	1789	16	2.05E+00	0.5	
38	0	922.49	276	31415	1.37	1845.71	1841	8	4.11E-03	111.3	
39	0	979.73	432	27217	1.06	1960.27	1958	9	6.43E-03	69.1	
40	0	1091.39	277	22590	0.51	2183.71	2181	9	4.12E-03	98.0	
41	0	1115.72	247513	45599	2.20	2232.39	2222	20	3.68E+00	0.3	
42	0	1173.40	512069	26703	2.25	2347.82	2337	21	7.62E+00	0.2	
43	0	1201.97	80	9693	1.22	2404.98	2401	11	1.18E-03	240.2	
44	2	1325.65	2391	7097	2.91	2652.46	2641	36	3.56E-02	8.5	7.72E+01
45	2	1332.69	464516	5603	2.38	2666.56	2641	36	6.91E+00	0.2	
46	0	1367.72	192	3852	4.17	2736.64	2731	13	2.86E-03	67.0	
47	0	1413.53	160	3075	2.67	2828.33	2823	10	2.39E-03	65.2	
48	0	1421.19	67	3146	1.18	2843.64	2841	10	9.95E-04	157.4	
49	0	1545.81	203	2887	1.87	3093.00	3089	8	3.02E-03	46.5	
50	0	1596.82	62	4333	2.59	3195.07	3191	10	9.22E-04	199.1	
51	0	1608.79	109	3898	2.23	3219.02	3215	10	1.62E-03	108.3	
52	0	1655.31	65	2484	1.24	3312.11	3304	10	9.64E-04	144.8	
53	0	1836.31	83865	1825	2.61	3674.25	3661	24	1.25E+00	0.4	
54	0	1909.91	27	587	1.95	3821.52	3816	10	3.98E-04	170.7	
55	0	1943.38	62	572	0.56	3888.48	3885	10	9.28E-04	73.0	

VAX/VMS Nuclide Identification Report Generated 1-APR-2015 09:18:11.91

```
*****************************************************************************
*                            GEL Laboratories LLC                           *
*                              2040 Savage Road                             *
*                            Charleston, SC 29407                           *
*****************************************************************************
Configuration    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]VER_GAM41_2LMB.CNF;1
Background file  : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM41.CNF;58
                                   Background date  : 27-MAR-2015 15:11:29
Sample date      : 1-APR-2013 12:00:00. Acquisition date : 1-APR-2015 08:43:23.
Sample ID        : VER_GAM41_2LMB       Sample quantity  : 1.00000E+00 SAMPLE
Detector name    : GAM41                Detector geometry: 2LMB
Elapsed live time: 0 00:34:19.13        Elapsed real time: 0 00:34:29.66  0.5%
Energy tolerance : 1.50000 keV          Analyst Initials :
Abundance limit  : 75.00000             Sensitivity      : 3.00000
Batch ID         :                      Detector SN#     :
Matrix Spike ID  :                      LCS ID           :
*****************************************************************************
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	5	43.85	21388	8692	2.48	87.27	84	14	1.04E+01	1.1	1.16E+02
2	5	46.54*	69507	18318	1.53	92.65	84	14	3.38E+01	0.5	
3	0	51.73*	523	21863	2.69	103.05	97	8	2.54E-01	49.4	
4	0	59.52	53327	25337	1.59	118.63	110	16	2.59E+01	0.8	
5	10	68.11	2658	16623	4.12	135.84	126	27	1.29E+00	11.9	3.32E+00
6	10	73.55	613	11880	2.13	146.71	126	27	2.98E-01	36.7	
7	0	88.10	25893	11463	1.55	175.84	169	16	1.26E+01	1.1	
8	0	122.16	6412	5322	1.58	244.01	238	13	3.11E+00	2.7	
9	0	136.62	789	4120	1.85	272.95	267	12	3.83E-01	16.7	
10	0	165.99	1113	2986	1.60	331.73	327	10	5.40E-01	9.7	
11	0	290.58	62	1409	0.97	581.09	579	8	2.99E-02	106.0	
12	0	386.63	98	1154	2.34	773.31	769	9	4.77E-02	63.5	
13	0	391.67	564	1656	1.85	783.41	778	13	2.74E-01	15.4	
14	0	510.75*	275	1464	2.80	1021.72	1015	15	1.33E-01	31.0	
15	0	565.98	33	769	0.67	1132.25	1131	10	1.61E-02	157.5	
16	0	621.28	99	626	1.40	1242.92	1239	10	4.80E-02	48.5	
17	0	661.86	15700	1242	1.88	1324.14	1316	17	7.62E+00	0.9	
18	0	898.51	526	1175	2.10	1797.72	1791	14	2.56E-01	14.5	
19	0	904.06	120	868	2.71	1808.82	1805	10	5.84E-02	46.7	
20	0	1051.67	67	592	0.77	2104.21	2099	10	3.26E-02	69.1	
21	0	1115.75	2942	1128	2.23	2232.46	2221	23	1.43E+00	3.5	
22	0	1173.46	14333	446	2.20	2347.93	2337	20	6.96E+00	0.9	
23	0	1332.75	12907	79	2.35	2666.68	2656	21	6.27E+00	0.9	
24	0	1413.01	20	21	0.61	2827.27	2821	11	9.71E-03	50.4	
25	0	1445.33	19	11	1.71	2891.94	2888	10	9.45E-03	38.1	
26	0	1461.09*	24	64	11.18	2923.49	2902	27	1.16E-02	97.7	
27	0	1633.97	9	17	0.96	3269.41	3263	9	4.48E-03	88.3	
28	0	1820.31*	12	10	1.56	3642.25	3633	14	5.98E-03	62.9	
29	0	1836.38	251	19	2.59	3674.40	3666	19	1.22E-01	7.6	
30	0	2042.14	4	11	0.52	4086.08	4079	10	2.17E-03	141.6	

Flag: "*" = Peak area was modified by background subtraction

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/SAMPLE	Decay Corr pCi/SAMPLE	2-Sigma %Error
CO-57	122.06	6412	85.60*	2.595E+00	3.790E+03	2.439E+04	5.32
	136.47	789	10.68	2.478E+00	3.914E+03	2.519E+04	33.31
CO-60	1173.23	14333	99.85	5.102E-01	3.693E+04	4.803E+04	1.82
	1332.49	12907	99.98*	4.602E-01	3.682E+04	4.789E+04	1.79
ZN-65	1115.54	2942	50.60*	5.318E-01	1.435E+04	1.140E+05	6.99
Y-88	898.04	526	93.70	6.376E-01	1.157E+03	1.329E+05	28.94
	1836.06	251	99.20*	3.601E-01	9.223E+02	1.060E+05	15.12
CD-109	88.03	25893	3.70*	2.864E+00	3.207E+05	9.599E+05	2.26
SN-113	391.70	564	64.97*	1.272E+00	8.954E+02	7.263E+04	30.85
CS-137	661.66	15700	85.10*	8.266E-01	2.930E+04	3.068E+04	1.90
CE-139	165.86	1113	80.00*	2.257E+00	8.087E+02	3.192E+04	19.32
PB-210	46.54	69507	4.25*	2.923E+00	7.344E+05	7.817E+05	1.07
AM-241	59.54	53327	35.90*	2.986E+00	6.529E+04	6.550E+04	1.60

Flag: "*" = Keyline

QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM41.QAF;1

Sample ID : Bkg Sample quantity : 1.00 ea
Sample date : 27-MAR-2015 15:11:29 Acquisition date : 27-MAR-2015 15:11:29
Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:03.16

Out-of-range Test: N-SIGMA

Parameter Description [Mean+/-Stdev]	Value	Deviation	Flag
*Spectrum Background Rate [1.34072+/-0.01487]	1.3392E+00	-0.10	

Flags: "*" means the out-of-range test is parameter-dependent

Approved by: RP Approval Date: 4 / 1 / 15

Sample ID : Bkg Acquisition date : 27-MAR-2015 15:11:29

VMS Gamma Spectroscopy Report generated 28-MAR-2015 07:51:56

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]BKG_BKG_GAM41__324607.CNF;1

---- Sample Information ----

Sample Title : Weekly Background
Sample ID : Bkg Sample Quantity : 1.00000E+00 ea
Sample Type : bkg Sample Geometry :
Sample Number : 324607 Spctrm Collector : gamma spec user
Sample Collector : Sample Analyst : gamma spec user

---- Sample Deposition Information ----

Dep. Correction? : No Dep. Duration :
Deposition Start : Deposition End : 27-MAR-2015 15:11:29

---- Sample Decay/Count Information ----

Sample Date : 27-MAR-2015 15:11:29 Acquisition date : 27-MAR-2015 15:11:29
Decay time : 0 00:00:00.00 % dead time : 0.0%
Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:03.16

---- Detector Parameters ----

Energy cal. time : 18-MAR-2015 11:45:41 Energy cal. oper.: gamma spec user
Detector name : GAMMA41 Counting geometry:
Effic. cal. time : 25-MAR-2014 07:41:25 Effic. cal. oper.: gamma spec user

---- Processing Parameters ----

Start channel : 1 End channel : 4096
Sensitivity : 3.00000 Gaussian Sens. : 10.00000
Critical level? : No Propagate Errors?: No
Efficiency Type : SPLINE Library-based eff: No
Energy tolerance : 2.00000 Half life ratio : 8.00000
Abundance limit : 75.00000 WTM error limit : 3.00000
MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.60	956	1128	1.56	92.78	88	14	1.59E-02	8.2	
2	0	52.81	157	761	2.11	105.21	101	10	2.62E-03	33.7	
3	0	63.31	1376	1054	1.55	126.22	120	11	2.29E-02	5.3	
4	0	77.66	59	1008	0.90	154.95	153	10	9.81E-04	103.6	
5	0	83.86	187	1018	2.32	167.35	163	11	3.11E-03	33.8	
6	0	92.63	1973	1358	1.61	184.91	177	15	3.29E-02	4.7	
7	0	98.56	99	656	0.82	196.77	192	9	1.65E-03	48.0	
8	0	113.61	193	827	2.82	226.90	222	12	3.21E-03	30.9	
9	0	144.50	86	823	1.01	288.73	281	11	1.43E-03	65.9	
10	0	159.20	48	400	0.86	318.15	314	7	7.92E-04	71.8	
11	0	163.36	144	578	1.86	326.47	322	10	2.40E-03	32.3	
12	0	174.91	65	308	1.39	349.57	347	6	1.09E-03	44.3	
13	0	185.88	780	853	1.59	371.53	365	14	1.30E-02	8.7	
14	0	199.09	69	313	1.02	397.98	395	6	1.15E-03	42.6	
15	0	205.09	60	594	1.05	409.98	406	11	1.00E-03	79.6	
16	0	238.92	306	648	1.45	477.69	472	13	5.10E-03	18.1	
17	0	352.91	55	429	0.94	705.82	701	12	9.12E-04	77.3	
18	0	439.85	30	152	1.62	879.83	878	7	5.05E-04	69.2	
19	0	511.09	1117	470	2.94	1022.41	1013	19	1.86E-02	5.5	

20	0	558.42	39	151	1.96	1117.14	1114	9	6.56E-04	58.7	
21	0	570.29	58	186	0.85	1140.89	1136	10	9.63E-04	46.4	
22	0	582.52	105	238	1.89	1165.36	1158	14	1.75E-03	32.7	
23	0	672.51	86	317	9.26	1345.44	1335	23	1.43E-03	54.8	
24	0	786.14	65	129	4.49	1572.85	1565	14	1.09E-03	39.0	
25	1	965.11	46	104	2.25	1931.00	1896	48	7.65E-04	50.5	1.25E+00
26	1	969.33	42	71	2.03	1939.45	1896	48	7.02E-04	41.4	
27	0	1001.35	93	83	3.28	2003.52	1997	12	1.54E-03	22.3	
28	0	1087.18	25	132	6.14	2175.27	2166	17	4.16E-04	107.4	
29	0	1461.21	42	59	2.33	2923.72	2918	13	6.97E-04	40.8	
30	0	1502.82	27	29	4.01	3006.98	2999	13	4.47E-04	45.8	
31	0	1574.15	13	38	3.94	3149.71	3140	13	2.12E-04	104.7	
32	0	1587.16	28	34	3.94	3175.73	3169	14	4.63E-04	48.9	
33	0	1676.81	17	38	4.11	3355.12	3346	15	2.87E-04	81.3	
34	0	1710.76	58	63	13.45	3423.05	3405	32	9.65E-04	43.5	
35	0	1820.68	11	17	2.31	3642.99	3636	10	1.79E-04	79.1	
36	0	1828.52	7	30	2.78	3658.67	3649	11	1.11E-04	164.9	
37	0	1847.60	41	43	6.18	3696.85	3678	28	6.89E-04	47.0	
38	1	1899.42	39	36	2.88	3800.52	3787	26	6.57E-04	37.1	3.84E+00
39	1	1903.65	21	10	2.62	3809.00	3787	26	3.53E-04	35.4	
40	0	1952.73	7	24	1.45	3907.19	3900	9	1.08E-04	142.4	
41	0	1994.64	25	18	3.78	3991.03	3984	14	4.22E-04	40.4	

Master Verification Spreadsheet (solid standard)

Gamma Spectroscopy Calibration Verification

Instrument: GAMMA 41 Calibration Date: 3/31/2015

Geometry: 2LMB Manufacturer Standard Id: 93344

GEL Standard Id: 1663

Nuclide	Energy	Abundance (decimal)	Emission Rate (dps)	Calibrated Activity (pCi)	Measured Activity (pCi)	DIFFERENCE (%)
Am-241	59.5	0.359	957.5	7.2085E+04	6.550E+04	-9.13
Cs-137	661.7	0.851	943.2	2.9955E+04	3.068E+04	2.42
Co-60	1173.2	0.9985	1732	4.6881E+04	4.803E+04	2.45
Co-60	1332.5	0.9998	1733	4.6847E+04	4.789E+04	2.23

Prepared By: K. Tuttle Date: 4/1/15

Reviewed By: M Stamps Date: 4/1/15

Validated by MJSH on 3/10/11

Verification results are considered acceptable if all differences are less than +/- 10%.

GEL Laboratories, LLC
2040 Savage Road, Charleston, SC 29414
(843)556-8171

Gamma Spectrometer Front End Electronics Setup
Detector: Gamma 41

Date Performed: 3/18/15 Performed By: RF

High Voltage Power Supply Model No. 3106D High Voltage 3-50KV	***Spectroscopy Amplifier*** Model No. 2022 Course Gain 30 Fine Gain 0819 Time Constant 4 μsec Input polarity negative BSLR rate NG BSLR mode na Threshold na
ADC Model No. 8701 Gain 4K	
AIM Module Model No. 556 B Address 1117:1	

Continuing Calibration Data

Review of Gamma Spectrometer QA results (Daily calibration & background checks)
5-MAY-2015 11:24:34.28

Run Date	Detector	Parameter		Flag	
2-JAN-2015	GAM01	Cal Check may not have run since 5-MAY-2015			locked out
5-MAY-2015	GAM02	All Parameters Passed			
5-MAY-2015	GAM03	Cal Check	PSFWHM-662	Investigate	OK
5-MAY-2015	GAM04	All Parameters Passed			
5-MAY-2015	GAM05	Bkg Check	BACKRATE	Investigate	OK
5-MAY-2015	GAM06	All Parameters Passed			
5-MAY-2015	GAM07	All Parameters Passed			
5-MAY-2015	GAM08	Cal Check	NLACTVTY-59	Investigate	OK
----------	GAM09	Cal Check may not have run since 5-MAY-2015			locked out
5-MAY-2015	GAM09	Bkg Check	BACKRATE	Action	
5-MAY-2015	GAM10	Cal Check	NLACTVTY-1332	Investigate	
5-MAY-2015	GAM11	Cal Check	NLACTVTY-1332	Investigate	
1-MAY-2015	GAM12	Cal Check may not have run since 5-MAY-2015			locked out
3-MAY-2015	GAM12	Bkg Check may not have run since 5-MAY-2015			
5-MAY-2015	GAM13	Cal Check	PSFWHM-662	Investigate	OK
5-MAY-2015	GAM14	Cal Check	PSFWHM-59	Investigate	OK
5-MAY-2015	GAM15	All Parameters Passed			
5-MAY-2015	GAM16	Cal Check	PSFWHM-1332	Investigate	OK
5-MAY-2015	GAM17	Cal Check	PSFWHM-662	Action	locked out
5-MAY-2015	GAM17	Cal Check	NLACTVTY-662	Action	
5-MAY-2015	GAM17	Cal Check	NLACTVTY-1332	Investigate	
5-MAY-2015	GAM17	Cal Check	NLACTVTY-59	Action	
5-MAY-2015	GAM17	Cal Check	PSFWHM-59	Action	
5-MAY-2015	GAM18	All Parameters Passed			
5-MAY-2015	GAM19	All Parameters Passed			
5-MAY-2015	GAM20	Cal Check	PSFWHM-662	Investigate	OK
5-MAY-2015	GAM21	All Parameters Passed			
5-MAY-2015	GAM22	All Parameters Passed			

5-MAY-2015	GAM23	Cal Check	PSFWHM-662	Investigate OK
5-MAY-2015	GAM23	Cal Check	PSFWHM-1332	Action Below, OK
5-MAY-2015	GAM24	Cal Check	NLACTVTY-1332	Investigate OK
5-MAY-2015	GAM26	Cal Check	PSFWHM-662	Investigate OK
5-MAY-2015	GAM27	Cal Check	PSFWHM-1332	Investigate OK
5-MAY-2015	GAM27	Cal Check	NLACTVTY-1332	Investigate OK
5-MAY-2015	GAM28	All Parameters Passed		
5-MAY-2015	GAM29	All Parameters Passed		
5-MAY-2015	GAM30	All Parameters Passed		
5-MAY-2015	GAM31	Cal Check	PSFWHM-1332	Investigate OK
5-MAY-2015	GAM31	Bkg Check	BACKRATE	Investigate OK
5-MAY-2015	GAM32	Cal Check	PSFWHM-662	Action Below, OK
5-MAY-2015	GAM32	Cal Check	NLACTVTY-1332	Investigate OK
5-MAY-2015	GAM33	All Parameters Passed		
5-MAY-2015	GAM39	All Parameters Passed		
5-MAY-2015	GAM40	All Parameters Passed		
5-MAY-2015	GAM41	All Parameters Passed		
5-MAY-2015	GAM43	All Parameters Passed		
5-MAY-2015	GAM44	All Parameters Passed		
5-MAY-2015	WELL	All Parameters Passed		
5-MAY-2015	XRAY1	All Parameters Passed		
5-MAY-2015	XRAY2	Cal Check	PSFWHM-109	Investigate OK
5-MAY-2015	XRAY3	Cal Check	NLACTVTY-109	Investigate OK
5-MAY-2015	XRAY4	All Parameters Passed		
5-MAY-2015	XRAY6	All Parameters Passed		

APPROVAL DATE: 5/5/15 APPROVAL TIME: 12:41

APPROVED BY: RF PROCEDURE # GL-RAD-I-001

Report completed at 5-MAY-2015 11:29:40.89

Runlogs

Instrument Run Log

Instrument Type: GAMMA SPECTROMETER **Batch ID: 1475456**

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
372020001	SAMPLE	MJH1	GAM41	MAY-05-15 06:48:39	DONE	2LMB	01-APR-15 00:00
1203310164	LCS	MJH1	GAM06	MAY-05-15 07:12:54	DONE	2LMB	02-JUN-14 00:00
1203310163	DUP	MJH1	GAM32	MAY-05-15 10:55:22	DONE	2LMB	07-AUG-14 00:00
1203310162	MB	MJH1	GAM14	MAY-05-15 12:14:59	DONE	2LMB	12-MAR-15 00:00

Gas Flow Raw Data

Radiochemistry Batch Checklist

21-May-2015

Batch# 1479317 Product: GAB Date: 5/21/15

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.	✓		
Samples have been blank corrected (if required). Blank correction reported included (if required).			NA
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 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 than 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).			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.	✓		
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.	✓		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	✓		
Hit notification complete (if necessary)			NA
Batch entered into Case Narrative.	✓		
Batch Data Exception Reports (DER) completed, if applicable.			NA
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.			NA
Aliquot Correction completed if required.			NA
Review sample historical results if available (If REMP, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

Primary Review Performed By: 5/21/15

Secondary Review Performed By:

OLSS
5/27

Gross Alpha Beta Queue Sheet

05/18/2015 11:36:35

Batch #:1479317 Analyst:KXB2 First Client DueDate 05/27/2015 Internal Due Date 05/16/2015

Alpha Spike Isotope: Th-230 Spike Code: 1242-I Vol: 0.1 Balance #: 51204863
Beta Spike Isotope: Sr-90 Spike Code: 1243-N Vol: 0.1 Pipette #: 4497063
Alpha LCS Isotope: Th-230 LCS Code: 1242-I Vol: 0.1 Prep Date: 5-20-15
Beta LCS Isotope: Sr-90 LCS Code: 1243-N Vol: 0.1 Initials: BMF

Analytical Scale # 1113092273 Witness: ATM 5/20/15

1M HNO3: 2256865
Conc HNO3: 2227957.5
Conc HCl: —
Conc HF: —
Conc Boric: —

Sample ID	Client Description	Type	Hazard Code	RDL Alpha/Beta	Client	Matrix	Bkr#	Wet/Dry Aliquot (mL or g)	Carrier or Det#	Initial Wt (g)	Final Wt (g)	Net Wt (mg)
372020001-1	36-13B	SAMPLE	HZ	5 pCi/L	OLSS001	WATER	1	3	1B	7.7483 ~~7.7759~~	7.8217	73.4
1203320253-1	MB	MB		5 pCi/L	QC ACCOUNT	WATER	2	3	1D	7.7437	7.7435	0
1203320254-1	DUP 36-13B(372020001)	DUP		5 pCi/L	QC ACCOUNT	WATER	3	3	2A	7.7500 ~~7.7070~~	7.8209	70.9
1203320255-1	MS 36-13B(372020001)	MS		5 pCi/L	QC ACCOUNT	WATER	4	1	NOT USED A/1A	7.7761	7.8042	28.1
1203320256-1	MSD 36-13B(372020001)	MSD		5 pCi/L	QC ACCOUNT	WATER	5	1	A3	7.8302	7.8527	22.5
1203320257-1	LCS	LCS		5 pCi/L	QC ACCOUNT	WATER	6	3	B1	7.7956	7.7955	0

WIS. Volume

+ BMF 5-20-15

Have the planchets been flamed? (Yes) / No

Data Reviewed By: [signature] 5/21/15

Gross Alpha/Beta Liquid

Filename : GAB.XLS
File type : Excel
Version # : 1.3.10

Batch : 1479317
Analyst : KXB2
Prep Date : 5/20/2015
Alpha Method Uncertainty : 0.0829
Beta Method Uncertainty : 0.0821

Geometry: 2 inch Planchett

Procedure Code : GFCGANBL
Parmname1 : Alpha
Parmname2 : Beta
Required Alpha MDA : 5 pCi/L
Required Beta MDA : 5 pCi/L

Sample Characteristics						Count Raw Data				
Pos.	Sample ID	Sample Aliquot L	Sample Residue Wt. (mg)	Sample Aliquot StDev. L	Sample Date/Time	Detector ID	Counting Time (min.)	Gross Counts Alpha	Gross Counts Beta	Count Start Date/Time
1	372020001.1	0.0030	73.4	3.5304E-06	4/28/2015 10:00	1B	500	69	583	5/20/2015 19:21
2	1203320253.1	0.0030	0	3.5304E-06	5/20/2015 0:00	1D	500	56	543	5/20/2015 19:21
3	1203320254.1	0.0030	70.9	3.5304E-06	4/28/2015 10:00	2A	500	62	582	5/20/2015 19:20
4	1203320255.1	0.0010	28.1	3.3233E-06	4/28/2015 10:00	1A	60	241	3010	5/21/2015 9:41
5	1203320256.1	0.0010	22.5	3.3233E-06	4/28/2015 10:00	A3	60	271	2898	5/20/2015 17:47
6	1203320257.1	0.0030	0	3.5304E-06	5/20/2015 0:00	B1	60	487	3067	5/20/2015 17:47

Pipet, 0.1 ml Stdev : +/- 0.000200 ml
Pipet, 0.5 ml Stdev : +/- 0.001000 ml
Pipet, 1 ml Stdev : +/- 0.002000 ml

Analytical SOP: GL-RAD-A-001
Instrument SOP: GL-RAD-I-016, GL-RAD-I-006

Calibration Data		Alpha						Beta						Weekly Background			
														CPM			
Pos.	Counted on	Calibration Date	Calibration Due Date	Calibration Source Used	Detector Efficiency (cpm/dpm)	Det. Eff. Error (cpm/dpm)	X-Talk	Calibration Date	Calibration Due Date	Calibration Source Used	Detector Efficiency (cpm/dpm)	Det. Eff. Error (cpm/dpm)	X-Talk	Alpha	Beta	Count Start Date/Time	Count Time (min.)
1	PIC	10/1/2013	10/31/2015	Th230	0.1058	0.01356	0.11224	10/1/2013	10/31/2015	Sr90	0.4041	0.00711	0.00223	0.084	0.664	5/16/2015 16:06	500
2	PIC	10/1/2013	10/31/2015	Th230	0.2579	0.00996	0.03708	10/1/2013	10/31/2015	Sr90	0.4539	0.00692	0.01253	0.134	1.226	5/16/2015 16:06	500
3	PIC	10/1/2013	10/31/2015	Th230	0.0945	0.01946	0.20520	10/1/2013	10/31/2015	Sr90	0.3713	0.01914	0.00017	0.178	0.636	5/16/2015 16:06	500
4	PIC	10/1/2013	10/31/2015	Th230	0.1512	0.00667	0.12409	10/1/2013	10/31/2015	Sr90	0.4375	0.00738	0.00102	0.080	0.518	5/16/2015 16:06	500
5	LB4100	10/1/2013	10/31/2015	Th230	0.1349	0.02881	0.03222	10/1/2013	10/31/2015	Sr90	0.4364	0.01784	0.00012	0.132	1.204	5/16/2015 16:06	500
6	LB4100	10/1/2013	10/31/2015	Th230	0.2707	0.01406	0.01002	10/1/2013	10/31/2015	Sr90	0.4472	0.01796	0.00015	0.134	1.052	5/16/2015 16:06	500

Notes:
1 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date

* - RPD changed to 0% due to sample & dup activity below MDA

Alpha Spike S/N : 1242-I
Spike Exp Date : 8/12/2015
Spike Activity (dpm/ml): 269.90
Spike Volume Added: 0.10
Spike Nuclide: Th-230

Alpha LCS S/N : 1242-I
LCS Exp Date : 8/12/2015
LCS Activity (dpm/ml): 269.90
LCS Volume Added: 0.10
LCS Nuclide: Th-230

Alpha 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 %	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	60.5898	42.7769	5	94.0657	**72.9236**	39.04%	0.0540	0.0211	58.5897	59.9322		SAMPLE					
2	31.4011	22.1695	5	47.8316	**-20.7290**	100.83%	-0.0220	0.0222	25.3073	25.3080		MB					
3	98.7870	69.7445	5	149.0225	**-86.1237**	45.55%	-0.0540	0.0246	76.5382	76.5401	372020001.1	DUP	*	0.0%			
4	268.1739	189.3331	5	527.5860	**11572.2160**	6.62%	3.9367	0.2590	1512.2166	2438.3599	372020001.1	MS				12157.5672	95.2%
5	386.2310	272.6824	5	712.3358	**14622.8479**	6.91%	4.3847	0.2748	1798.9561	3096.6402	372020001.1	MSD		23.3%		12157.5672	120.3%
6	64.6409	45.6370	5	119.0095	**4423.9325**	4.82%	7.9827	0.3682	400.2807	832.3935		LCS				4052.5224	109.2%

Notes:
1 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date

Beta Spike S/N : 1243-N
Spike Exp Date : 5/6/2016
Spike Activity (dpm/ml): 486.34
Spike Volume Added: 0.10
Spike Nuclide: Sr-90

Beta LCS S/N : 1243-N
LCS Exp Date : 5/6/2016
LCS Activity (dpm/ml): 486.34
LCS Volume Added: 0.10
LCS Nuclide: Sr-90

Beta 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 %	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	44.6127	31.4969	5	65.2230	**180.7512**	12.07%	0.5020	0.0605	44.0540	53.3704		SAMPLE				
2	53.9767	38.1080	5	78.2009	**-47.6868**	48.58%	-0.1400	0.0680	44.0900	44.0902		MB				
3	47.5283	33.5554	5	69.5374	**203.2462**	11.52%	0.5280	0.0600	47.5604	59.2209	372020001.1	DUP	11.7%			
4	235.8904	166.5407	5	384.5599	**50603.6492**	2.01%	49.6487	0.9150	1846.3460	8469.1369	372020001.1	MS			43814.6970	115.1%
5	360.5775	254.5708	5	560.7555	**48465.8920**	2.63%	47.0960	0.8986	1818.0201	8215.6508	372020001.1	MSD	4.3%		43814.6970	110.2%
6	109.6333	77.4020	5	171.5927	**16783.0367**	2.58%	50.0647	0.9241	608.1945	2835.2986		LCS			14604.8990	114.9%

1479317r1

SampleID	Instr	Time (min.)	Alpha Counts	Beta Counts	Count Start Time	Count End Time	Machine	Batch ID
372020001	1B	500	69	583	5/20/2015 19:21	5/21/2015 3:41	PIC	1479317
1203320253	1D	500	56	543	5/20/2015 19:21	5/21/2015 3:41	PIC	1479317
1203320254	2A	500	62	582	5/20/2015 19:20	5/21/2015 3:40	PIC	1479317
1203320255	1A	60	241	3010	5/21/2015 9:41	5/21/2015 10:41	PIC	1479317
1203320256	A3	60	271	2898	5/20/2015 17:47	5/20/2015 18:47	LB4100	1479317
1203320257	B1	60	487	3067	5/20/2015 17:47	5/20/2015 18:47	LB4100	1479317

Radiochemistry Batch Checklist

22-May-2015

Batch# 1478361 Product: Sr-90 Date: 5/22/15

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			NA
Samples have been blank corrected (if required). Blank correction reported included (if required).			NA
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 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 than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	✓		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).	✓		
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.	✓		
Sample was correctly preserved if required.	✓		
Smears Taken for Radioactive batches.			NA
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	✓		DER 1413394
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.	✓		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	✓		
Hit notification complete (if necessary)			NA
Batch entered into Case Narrative.	✓		
Batch Data Exception Reports (DER) completed, if applicable.	✓		DER 1413394
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.	✓		DER 1413394
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.)	✓		

Primary Review Performed By: [signature] 5/22/15

Secondary Review Performed By: [signature]

OLSS
5/27

Strontium 90 Queue Sheet

05/13/15

Batch #: 1478361 Analyst: KSD1 First Client Due Date: 05/27/2015 Internal Due Date: 05/16/2015 Comments X

Sr-90 Spike Code: 1243N Expiration Date: 5/6/16 Vol: 0.1 Sr Sep. Date/time: 1330 5/21/15

Sr-90 LCS Code: 1243K Expiration Date: 5/6/16 Vol: 0.1

Sr Carrier Code: 1147Coo Exp Date: 11/25/15 Vol: 0.5 Sdt Wt: 8.1

Prep Date: 5/20/15 Initials: KO Pipet ID: 1791415 / 215415 Balance #: 5104803 Analytical Scale #: F305600 Witness: KB 5-20-15

Sample ID	Client Description	Type	RDL	Collection Date	Matrix	Client	Rad	Pos. #	Wet/Dry Aliquot (mL) or (g)	Det # 1 & 2	Initial Sr wt (g)	Final Sr wt (g)	Net Sr wt (mg)
372020001-1	36-13B	SAMPLE	2 pCi/L	APR-28-15 10:00 AM	WATER	OLSS001	HZ	1	300	7A	0.0230	0.0298	6.8
1203317699-1	MB for batch 1478361	MB	2 pCi/L		WATER	QC ACCOUNT		2	300	7B	0.0223	0.0296	7.3
1203317700-1	36-13B(372020001DUP)	DUP	2 pCi/L	APR-28-15 10:00 AM	WATER	QC ACCOUNT		3	300	7C	0.0223	0.0292	6.9
1203317701-1	36-13B(372020001MS)	MS	2 pCi/L	APR-28-15 10:00 AM	WATER	QC ACCOUNT		4	300	7D	0.0223	0.0290	6.7
1203317702-1	LCS for batch 1478361	LCS	2 pCi/L		WATER	QC ACCOUNT		5	300	8A	0.0224	0.0289	6.5

KO 5/22/15

Solid Sample Dissolution by: LEACH or DIGESTION (Circle One) Data Reviewed By: [signature] 5/22/15

S1478361

Strontium-90 Liquid

Filename : SR90.XLS
File type : Excel
Version # : 1.3.10

Carrier S/N : 2187760
Carrier Exp Date : 11/25/2015
Carrier Volume Added: 0.50
Carrier Weight (mg/ml): 16.20
Carrier Weight StDev.: 0.00

Batch : 1478361
Analyst : KSD1
Prep Date : 5/20/2015
Method Uncertainty : 0.0784

Geometry: Tuffryn Filter

Procedure Code :	GFC90SRL	
Parmname :	Strontium-90	
Required MDA :	2	pCi/L
Sr-90 Abundance :	1.00	
Halflife of Sr-90 :	28.90	years
Halflife of Y-90 :	64.053	hours

Sample Characteristics					**Carrier Calculations**				
Pos.	Sample ID	Sample Aliquot L	Sample Aliquot StDev. L	Sample Date/Time	Carrier Weight (mg) (Standard)	Net Weight (mg) (Sample)	Net Weight StDev. (mg)	Carrier Aliquot (mL)	Carrier Aliquot StDev. (mL)
1	372020001.1	0.3000	1.8459E-05	4/28/2015 10:00	16.20	6.80	0.036556	0.5	0.001000
2	1203317699.1	0.3000	1.8459E-05	5/20/2015 0:00	16.20	7.30	0.038705	0.5	0.001000
3	1203317700.1	0.3000	1.8459E-05	4/28/2015 10:00	16.20	6.90	0.036986	0.5	0.001000
4	1203317701.1	0.3000	1.8459E-05	4/28/2015 10:00	16.20	6.70	0.036127	0.5	0.001000
5	1203317702.1	0.3000	1.8459E-05	5/20/2015 0:00	16.20	6.50	0.035267	0.5	0.001000

Pipet, 0.1 ml Stdev : +/-	0.000200	ml
Pipet, 0.5 ml Stdev : +/-	0.001000	ml
Pipet, 1 ml Stdev : +/-	0.002000	ml

Analytical SOP: GL-RAD-A-004
Instrument SOP: GL-RAD-I-016

Count Raw Data

Pos.	Detector ID	Counting Time (min.)	Gross Counts Alpha	Gross Counts Beta	Gross Beta CPM	Count Start Date/Time	Strontium Separation Date/Time	Yttrium Ingrowth	Sr-90 Decay	Calculated Sample Recovery %	Sample Recovery Error %
1	7A	60	6	41	0.677	5/21/2015 15:22	5/21/2015 13:30	0.025	0.998	84.0%	0.79%
2	7B	60	3	12	0.197	5/21/2015 15:22	5/21/2015 13:30	0.025	1.000	90.1%	0.78%
3	7C	60	9	16	0.255	5/21/2015 15:22	5/21/2015 13:30	0.025	0.998	85.2%	0.78%
4	7D	60	7	371	6.176	5/21/2015 15:22	5/21/2015 13:30	0.025	0.998	82.7%	0.79%
5	8A	60	11	1053	17.500	5/21/2015 15:21	5/21/2015 13:30	0.025	1.000	80.2%	0.79%

Calibration Data

Pos.	Counted on	Calibration Date	Calibration Due Date	Detector Efficiency (cpm/dpm) Sr-90	Detector Efficiency (cpm/dpm) Y-90	Detector Efficiency Error (cpm/dpm)	Alpha X-Talk	Weekly Bkg CPM	Weekly Bkg Count Start Date/Time	Weekly Bkg Count Time (min.)
1	PIC	3/1/2013	2/29/2016	0.4029	0.5374	0.00594	0.06657	0.732	5/16/2015 16:05	500
2	PIC	3/1/2013	2/29/2016	0.3972	0.5395	0.00627	0.05267	0.418	5/16/2015 16:05	500
3	PIC	3/1/2013	2/29/2016	0.4019	0.5321	0.00790	0.08067	0.380	5/16/2015 16:05	500
4	PIC	3/1/2013	2/29/2016	0.3979	0.5367	0.01113	0.06501	0.538	5/16/2015 16:05	500
5	PIC	3/1/2013	2/29/2016	0.3935	0.5255	0.01579	0.27132	0.774	5/16/2015 16:05	500

S1478361

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

* - RPD changed to 0% due to sample & dup activity below MDA

Spike S/N :	1243-N
Spike Exp Date :	5/6/2016
Spike Activity (dpm/ml):	486.34
Spike Volume Added:	0.10
LCS S/N :	1243-N
LCS Exp Date :	5/6/2016
LCS Activity (dpm/ml):	486.34
LCS Volume Added:	0.10

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 %	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	1.1713	0.8269	2	1.8688	**-0.2379**	204.04%	-0.0553	0.1129	0.9514	0.9515		SAMPLE				
2	0.8347	0.5893	2	1.3813	**-0.8948**	29.13%	-0.2206	0.0642	0.5105	0.5106		MB				
3	0.8340	0.5888	2	1.3901	**-0.5331**	56.40%	-0.1254	0.0707	0.5892	0.5893	372020001.1	DUP	* 0.0%			
4	1.0315	0.7283	2	1.6774	**24.9056**	5.88%	5.6377	0.3225	2.7924	4.8149	372020001.1	MS			73.1281	34.1%
5	1.2884	0.9096	2	2.0492	**76.9451**	3.69%	16.7263	0.5415	4.8824	13.2820		LCS			73.0245	105.4%

1478361

SampleID	Instr	Time (min.)	Alpha Counts	Beta Counts	Count Start Time	Count End Time	Machine	Batch ID
372020001	7A	60	6	41	5/21/2015 15:22	5/21/2015 16:22	PIC	1478361
1203317699	7B	60	3	12	5/21/2015 15:22	5/21/2015 16:22	PIC	1478361
1203317700	7C	60	9	16	5/21/2015 15:22	5/21/2015 16:22	PIC	1478361
1203317701	7D	60	7	371	5/21/2015 15:22	5/21/2015 16:22	PIC	1478361
1203317702	8A	60	11	1053	5/21/2015 15:21	5/21/2015 16:21	PIC	1478361

Method Calibration Data

Gas Flow Proportional Counter Calibration Package

Method: Gross Alpha Beta

Instrument (circle one): (LB4100) / Protean

	Included/ Acceptable	Comments
Part 1: Efficiency determination		
1 Efficiency spreadsheet (eff pts, graphs, trendline equation)	✓	
2 Applicable portion of GFPC_Machines.XLS	✓	
3 Raw Data for Calibration standards	✓	
4 Verification Spreadsheet and Raw Data (recoveries 75%-125%)	✓	
5 Plateau graph and raw data	✓	
6 Standardization of Carrier (if applicable)		NA
Part 2. Documentation for Calibration Source		
1 Vendor Certificate	✓	
2 Standard Traceability Log (from LIMS)	✓	
3 Current Verification of Source	✓	
4 Source preparation sheet	✓	
Part 3. Documentation for Verification Source		
1 Vendor Certificate	✓	
2 Standard Traceability Log (from LIMS)	✓	
3 Current Verification of Source	✓	
4 Source preparation sheet	✓	
Part 4. Enter into LIMS		
1 Alpha LIMS instrument calibration updated	✓	

Primary Review of Package [signature] 9/30/14

Secondary Review of Package Amanda L. Lehr 9/30/14

Effective Date: 10/1/13

~~Exp. Date: 9/30/14~~ QAJ 9/30/14

Exp. Date: 10/30/15 QAJ 11/7/14

Calibration Verified 9/14 and expiration date extended QJS

GEL Laboratories
2040 Savage Road, Charleston, SC 29407
(843)556-8171

Alpha Calibration - LB4100 - Aug 2013

Standard Data		
	Isotope	Th-230
	Standard ID number	1105-A
	Half Life (days)	27532545
	Std. Act. (dpm/mL)	22077.2901
	Reference Date	6/14/2007
	Volume of spike (mL)	2.0
	Std. Nominal (dpm)	44152.08
	Decay Date	8/10/2013

Source Weight	
Source	Measured weight (mg)
1	1.0
2	13.3
3	24.0
4	49.8
5	46.9
6	73.4
7	84.9
8	109.4

The following detectors were not calibrated:

A4

*Background is considered neglible.

**Decay corrected to mid-point of count

Raw Count Data										
Detector (#)	Source ID (#)	Start Time	Count Time (min)	Alpha (counts)	Raw Alpha (cpm)	Th-230 (cpm)*	Decay Corrected Nominal (dpm)**	Th-230 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
A1	1	8/10/2013 15:00	5	39451	7890.2	7890.20	44152.08	0.1787	0.1744
A1	2	8/10/2013 15:23	5	27443	5488.6	5488.60	44152.08	0.1243	0.1374
A1	3	8/10/2013 15:16	5	27719	5543.8	5543.80	44152.08	0.1256	0.1149
A1	4	8/10/2013 15:09	5	20173	4034.6	4034.60	44152.08	0.0914	0.0868
A1	5	8/10/2013 15:32	5	18268	3653.6	3653.60	44152.08	0.0828	0.0886
A1	6	8/10/2013 16:01	5	17081	3416.2	3416.20	44152.08	0.0774	0.0770
A1	7	8/10/2013 15:54	5	15618	3123.6	3123.60	44152.08	0.0707	0.0721
A1	8	8/10/2013 15:46	5	10917	2183.4	2183.40	44152.08	0.0495	0.0490
A2	1	8/10/2013 15:09	5	45155	9031	9031.00	44152.08	0.2045	0.2002
A2	2	8/10/2013 15:00	5	31233	6246.6	6246.60	44152.08	0.1415	0.1594
A2	3	8/10/2013 15:23	5	34090	6818	6818.00	44152.08	0.1544	0.1337
A2	4	8/10/2013 15:16	5	23491	4698.2	4698.20	44152.08	0.1064	0.0991
A2	5	8/10/2013 15:46	5	18334	3666.8	3666.80	44152.08	0.0830	0.1015
A2	6	8/10/2013 15:32	5	21324	4264.8	4264.80	44152.08	0.0966	0.0865
A2	7	8/10/2013 16:01	5	16522	3304.4	3304.40	44152.08	0.0748	0.0817
A2	8	8/10/2013 15:54	5	14054	2810.8	2810.80	44152.08	0.0637	0.0629
A3	1	8/10/2013 15:16	5	46267	9253.4	9253.40	44152.08	0.2096	0.2022
A3	2	8/10/2013 15:09	5	30442	6088.4	6088.40	44152.08	0.1379	0.1587
A3	3	8/10/2013 15:00	5	32372	6474.4	6474.40	44152.08	0.1466	0.1316
A3	4	8/10/2013 15:23	5	23637	4727.4	4727.40	44152.08	0.1071	0.0964
A3	5	8/10/2013 15:54	5	19618	3923.6	3923.60	44152.08	0.0889	0.0988
A3	6	8/10/2013 15:46	5	18299	3659.8	3659.80	44152.08	0.0829	0.0842
A3	7	8/10/2013 15:32	5	17059	3411.8	3411.80	44152.08	0.0773	0.0792
A3	8	8/10/2013 16:01	5	12902	2580.4	2580.40	44152.08	0.0584	0.0575
B1	1	8/10/2013 15:39	5	60804	12160.8	12160.80	44152.08	0.2754	0.2646
B1	2	8/10/2013 16:01	5	38639	7727.8	7727.80	44152.08	0.1750	0.2032
B1	3	8/10/2013 15:54	5	40863	8172.6	8172.60	44152.08	0.1851	0.1668
B1	4	8/10/2013 15:46	5	30868	6173.6	6173.60	44152.08	0.1398	0.1253
B1	5	8/10/2013 15:00	5	25134	5026.8	5026.80	44152.08	0.1139	0.1276
B1	6	8/10/2013 15:25	5	27019	5403.8	5403.80	44152.08	0.1224	0.1153
B1	7	8/10/2013 15:16	5	21669	4333.8	4333.80	44152.08	0.0982	0.1098
B1	8	8/10/2013 15:09	5	17265	3453	3453.00	44152.08	0.0782	0.0753
B2	1	8/10/2013 15:46	5	54021	10804.2	10804.20	44152.08	0.2447	0.2433
B2	2	8/10/2013 15:39	5	41224	8244.8	8244.80	44152.08	0.1867	0.1955
B2	3	8/10/2013 16:01	5	39388	7877.6	7877.60	44152.08	0.1784	0.1655
B2	4	8/10/2013 15:54	5	29421	5884.2	5884.20	44152.08	0.1333	0.1251
B2	5	8/10/2013 15:09	5	24602	4920.4	4920.40	44152.08	0.1114	0.1280
B2	6	8/10/2013 15:00	5	25370	5074	5074.00	44152.08	0.1149	0.1092
B2	7	8/10/2013 15:25	5	21903	4380.6	4380.60	44152.08	0.0992	0.1022
B2	8	8/10/2013 15:16	5	16606	3321.2	3321.20	44152.08	0.0752	0.0751
B3	1	8/10/2013 15:54	5	50698	10139.6	10139.60	44152.08	0.2297	0.2228
B3	2	8/10/2013 15:46	5	34881	6976.2	6976.20	44152.08	0.1580	0.1836
B3	3	8/10/2013 15:39	5	40700	8140	8140.00	44152.08	0.1844	0.1576
B3	4	8/10/2013 16:01	5	27790	5558	5558.00	44152.08	0.1259	0.1183
B3	5	8/10/2013 15:16	5	22609	4521.8	4521.80	44152.08	0.1024	0.1215

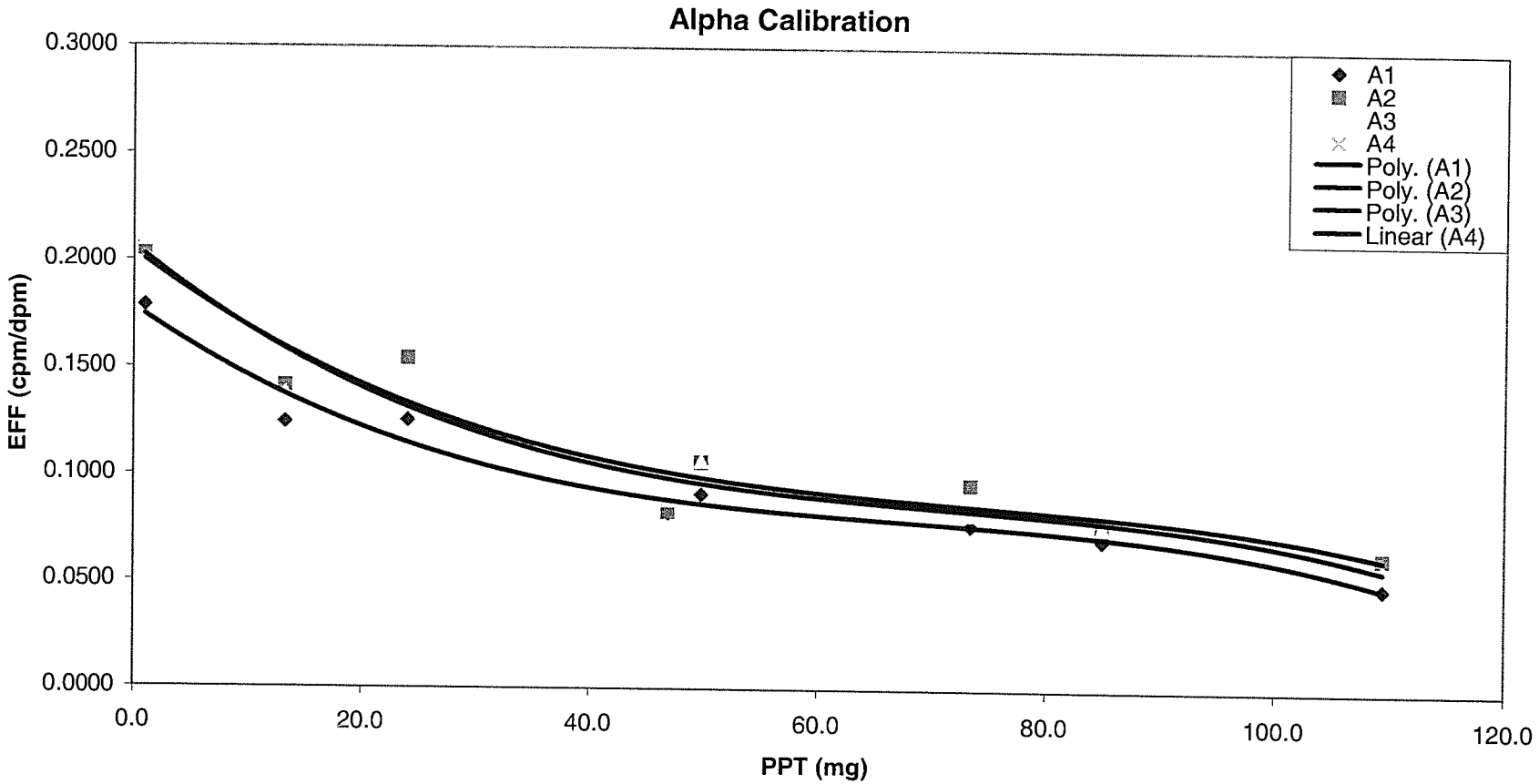
Raw Count Data										
Detector (#)	Source ID (#)	Start Time	Count Time (min)	Alpha (counts)	Raw Alpha (cpm)	Th-230 (cpm)*	Decay Corrected Nominal (dpm)**	Th-230 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
B3	6	8/10/2013 15:09	5	23937	4787.4	4787.40	44152.08	0.1084	0.0997
B3	7	8/10/2013 15:00	5	19086	3817.2	3817.20	44152.08	0.0865	0.0925
B3	8	8/10/2013 15:25	5	16160	3232	3232.00	44152.08	0.0732	0.0724
B4	1	8/10/2013 16:01	5	47472	9494.4	9494.40	44152.08	0.2150	0.2062
B4	2	8/10/2013 15:54	5	31710	6342	6342.00	44152.08	0.1436	0.1651
B4	3	8/10/2013 15:46	5	33347	6669.4	6669.40	44152.08	0.1511	0.1396
B4	4	8/10/2013 15:39	5	26770	5354	5354.00	44152.08	0.1213	0.1061
B4	5	8/10/2013 15:25	5	21589	4317.8	4317.80	44152.08	0.0978	0.1085
B4	6	8/10/2013 15:16	5	20884	4176.8	4176.80	44152.08	0.0946	0.0927
B4	7	8/10/2013 15:09	5	17279	3455.8	3455.80	44152.08	0.0783	0.0859
B4	8	8/10/2013 15:00	5	13304	2660.8	2660.80	44152.08	0.0603	0.0580
C1	1	8/10/2013 16:09	5	58913	11782.6	11782.60	44152.08	0.2669	0.2569
C1	2	8/10/2013 16:36	5	38126	7625.2	7625.20	44152.08	0.1727	0.1998
C1	3	8/10/2013 16:28	5	40886	8177.2	8177.20	44152.08	0.1852	0.1663
C1	4	8/10/2013 16:18	5	32621	6524.2	6524.20	44152.08	0.1478	0.1287
C1	5	8/10/2013 16:45	5	24910	4982	4982.00	44152.08	0.1128	0.1308
C1	6	8/10/2013 17:10	5	26573	5314.6	5314.60	44152.08	0.1204	0.1190
C1	7	8/10/2013 17:02	5	23541	4708.2	4708.20	44152.08	0.1066	0.1128
C1	8	8/10/2013 16:53	5	16918	3383.6	3383.60	44152.08	0.0766	0.0747
C2	1	8/10/2013 16:18	5	52523	10504.6	10504.60	44152.08	0.2379	0.2323
C2	2	8/10/2013 16:09	5	36922	7384.4	7384.40	44152.08	0.1672	0.1822
C2	3	8/10/2013 16:36	5	35507	7101.4	7101.40	44152.08	0.1608	0.1506
C2	4	8/10/2013 16:28	5	26653	5330.6	5330.60	44152.08	0.1207	0.1087
C2	5	8/10/2013 16:53	5	21928	4385.6	4385.60	44152.08	0.0993	0.1116
C2	6	8/10/2013 16:45	5	22091	4418.2	4418.20	44152.08	0.1001	0.0950
C2	7	8/10/2013 17:10	5	18346	3669.2	3669.20	44152.08	0.0831	0.0906
C2	8	8/10/2013 17:02	5	16476	3295.2	3295.20	44152.08	0.0746	0.0729
C3	1	8/10/2013 16:28	5	46580	9316	9316.00	44152.08	0.2110	0.2065
C3	2	8/10/2013 16:18	5	33758	6751.6	6751.60	44152.08	0.1529	0.1685
C3	3	8/10/2013 16:09	5	34931	6986.2	6986.20	44152.08	0.1582	0.1432
C3	4	8/10/2013 16:36	5	23855	4771	4771.00	44152.08	0.1081	0.1047
C3	5	8/10/2013 17:02	5	21758	4351.6	4351.60	44152.08	0.0986	0.1078
C3	6	8/10/2013 16:53	5	20363	4072.6	4072.60	44152.08	0.0922	0.0862
C3	7	8/10/2013 16:45	5	16348	3269.6	3269.60	44152.08	0.0741	0.0790
C3	8	8/10/2013 17:10	5	13284	2656.8	2656.80	44152.08	0.0602	0.0594
C4	1	8/10/2013 16:36	5	40698	8139.6	8139.60	44152.08	0.1844	0.1791
C4	2	8/10/2013 16:28	5	28204	5640.8	5640.80	44152.08	0.1278	0.1444
C4	3	8/10/2013 16:18	5	30592	6118.4	6118.40	44152.08	0.1386	0.1231
C4	4	8/10/2013 16:09	5	23371	4674.2	4674.20	44152.08	0.1059	0.0953
C4	5	8/10/2013 17:10	5	17830	3566	3566.00	44152.08	0.0808	0.0972
C4	6	8/10/2013 17:02	5	20501	4100.2	4100.20	44152.08	0.0929	0.0838
C4	7	8/10/2013 16:53	5	15231	3046.2	3046.20	44152.08	0.0690	0.0777
C4	8	8/10/2013 16:45	5	11799	2359.8	2359.80	44152.08	0.0534	0.0519
D1	1	8/10/2013 16:46	5	57216	11443.2	11443.20	44152.08	0.2592	0.2513
D1	2	8/10/2013 17:12	5	39526	7905.2	7905.20	44152.08	0.1790	0.2027
D1	3	8/10/2013 17:03	5	42333	8466.6	8466.60	44152.08	0.1918	0.1721
D1	4	8/10/2013 16:54	5	31443	6288.6	6288.60	44152.08	0.1424	0.1309
D1	5	8/10/2013 16:11	5	25974	5194.8	5194.80	44152.08	0.1177	0.1338
D1	6	8/10/2013 16:37	5	26974	5394.8	5394.80	44152.08	0.1222	0.1143
D1	7	8/10/2013 16:29	5	21632	4326.4	4326.40	44152.08	0.0980	0.1069
D1	8	8/10/2013 16:19	5	17640	3528	3528.00	44152.08	0.0799	0.0781
D2	1	8/10/2013 16:54	5	53496	10699.2	10699.20	44152.08	0.2423	0.2359
D2	2	8/10/2013 16:46	5	37349	7469.8	7469.80	44152.08	0.1692	0.1889
D2	3	8/10/2013 17:12	5	38857	7771.4	7771.40	44152.08	0.1760	0.1594
D2	4	8/10/2013 17:03	5	28870	5774	5774.00	44152.08	0.1308	0.1197
D2	5	8/10/2013 16:19	5	23759	4751.8	4751.80	44152.08	0.1076	0.1226
D2	6	8/10/2013 16:11	5	24308	4861.6	4861.60	44152.08	0.1101	0.1042
D2	7	8/10/2013 16:37	5	20010	4002	4002.00	44152.08	0.0906	0.0974
D2	8	8/10/2013 16:29	5	15950	3190	3190.00	44152.08	0.0723	0.0708
D3	1	8/10/2013 17:03	5	53239	10647.8	10647.80	44152.08	0.2412	0.2340
D3	2	8/10/2013 16:54	5	36771	7354.2	7354.20	44152.08	0.1666	0.1867
D3	3	8/10/2013 16:46	5	38062	7612.4	7612.40	44152.08	0.1724	0.1571
D3	4	8/10/2013 17:12	5	28693	5738.6	5738.60	44152.08	0.1300	0.1176
D3	5	8/10/2013 16:29	5	23403	4680.6	4680.60	44152.08	0.1060	0.1204

Raw Count Data										
Detector (#)	Source ID (#)	Start Time	Count Time (min)	Alpha (counts)	Raw Alpha (cpm)	Th-230 (cpm)*	Decay Corrected Nominal (dpm)**	Th-230 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
D3	6	8/10/2013 16:19	5	23871	4774.2	4774.20	44152.08	**0.1081**	0.1023
D3	7	8/10/2013 16:11	5	19319	3863.8	3863.80	44152.08	**0.0875**	0.0955
D3	8	8/10/2013 16:37	5	15510	3102	3102.00	44152.08	**0.0703**	0.0685
D4	1	8/10/2013 17:12	5	54761	10952.2	10952.20	44152.08	**0.2481**	0.2410
D4	2	8/10/2013 17:03	5	38334	7666.8	7666.80	44152.08	**0.1736**	0.1952
D4	3	8/10/2013 16:54	5	40785	8157	8157.00	44152.08	**0.1847**	0.1664
D4	4	8/10/2013 16:46	5	30940	6188	6188.00	44152.08	**0.1402**	0.1276
D4	5	8/10/2013 16:37	5	25013	5002.6	5002.60	44152.08	**0.1133**	0.1304
D4	6	8/10/2013 16:29	5	26164	5232.8	5232.80	44152.08	**0.1185**	0.1115
D4	7	8/10/2013 16:19	5	21174	4234.8	4234.80	44152.08	**0.0959**	0.1039
D4	8	8/10/2013 16:11	5	16867	3373.4	3373.40	44152.08	**0.0764**	0.0748
E1	1	9/26/2013 13:26	5	54720	10944	10944.00	44152.03	**0.2479**	0.2411
E1	2	9/26/2013 13:53	5	36926	7385.2	7385.20	44152.03	**0.1673**	0.1894
E1	3	9/26/2013 13:42	5	39311	7862.2	7862.20	44152.03	**0.1781**	0.1573
E1	4	9/26/2013 13:35	5	28883	5776.6	5776.60	44152.03	**0.1308**	0.1160
E1	5	9/26/2013 14:00	5	21453	4290.6	4290.60	44152.03	**0.0972**	0.1187
E1	6	9/26/2013 14:20	5	24158	4831.6	4831.60	44152.03	**0.1094**	0.1021
E1	7	9/26/2013 14:13	5	19633	3926.6	3926.60	44152.03	**0.0889**	0.0963
E1	8	9/26/2013 14:07	5	15963	3192.6	3192.60	44152.03	**0.0723**	0.0710
E2	1	9/26/2013 13:35	5	42735	8547	8547.00	44152.03	**0.1936**	0.1885
E2	2	9/26/2013 13:27	5	29263	5852.6	5852.60	44152.03	**0.1326**	0.1482
E2	3	9/26/2013 13:53	5	30194	6038.8	6038.80	44152.03	**0.1368**	0.1233
E2	4	9/26/2013 13:42	5	22598	4519.6	4519.60	44152.03	**0.1024**	0.0918
E2	5	9/26/2013 14:07	5	17592	3518.4	3518.40	44152.03	**0.0797**	0.0938
E2	6	9/26/2013 14:00	5	19245	3849	3849.00	44152.03	**0.0872**	0.0813
E2	7	9/26/2013 14:20	5	15525	3105	3105.00	44152.03	**0.0703**	0.0768
E2	8	9/26/2013 14:13	5	12674	2534.8	2534.80	44152.03	**0.0574**	0.0561
E3	1	9/26/2013 13:42	5	55065	11013	11013.00	44152.03	**0.2494**	0.2423
E3	2	9/26/2013 13:35	5	36771	7354.2	7354.20	44152.03	**0.1666**	0.1888
E3	3	9/26/2013 13:27	5	38761	7752.2	7752.20	44152.03	**0.1756**	0.1559
E3	4	9/26/2013 13:53	5	28406	5681.2	5681.20	44152.03	**0.1287**	0.1141
E3	5	9/26/2013 14:13	5	21314	4262.8	4262.80	44152.03	**0.0965**	0.1168
E3	6	9/26/2013 14:07	5	24023	4804.6	4804.60	44152.03	**0.1088**	0.1006
E3	7	9/26/2013 14:00	5	19048	3809.6	3809.60	44152.03	**0.0863**	0.0951
E3	8	9/26/2013 14:20	5	15600	3120	3120.00	44152.03	**0.0707**	0.0690
E4	1	9/26/2013 13:53	5	51629	10325.8	10325.80	44152.03	**0.2339**	0.2279
E4	2	9/26/2013 13:42	5	34755	6951	6951.00	44152.03	**0.1574**	0.1783
E4	3	9/26/2013 13:35	5	37195	7439	7439.00	44152.03	**0.1685**	0.1477
E4	4	9/26/2013 13:27	5	26585	5317	5317.00	44152.03	**0.1204**	0.1089
E4	5	9/26/2013 14:20	5	20222	4044.4	4044.40	44152.03	**0.0916**	0.1114
E4	6	9/26/2013 14:13	5	23211	4642.2	4642.20	44152.03	**0.1051**	0.0964
E4	7	9/26/2013 14:07	5	18446	3689.2	3689.20	44152.03	**0.0836**	0.0911
E4	8	9/26/2013 14:00	5	14959	2991.8	2991.80	44152.03	**0.0678**	0.0666
F1	1	9/26/2013 14:00	5	55321	11064.2	11064.20	44152.03	**0.2506**	0.2438
F1	2	9/26/2013 14:20	5	37122	7424.4	7424.40	44152.03	**0.1682**	0.1902
F1	3	9/26/2013 14:13	5	39263	7852.6	7852.60	44152.03	**0.1779**	0.1575
F1	4	9/26/2013 14:07	5	28765	5753	5753.00	44152.03	**0.1303**	0.1170
F1	5	9/26/2013 13:27	5	21963	4392.6	4392.60	44152.03	**0.0995**	0.1196
F1	6	9/26/2013 13:53	5	24985	4997	4997.00	44152.03	**0.1132**	0.1044
F1	7	9/26/2013 13:42	5	19889	3977.8	3977.80	44152.03	**0.0901**	0.0988
F1	8	9/26/2013 13:35	5	15956	3191.2	3191.20	44152.03	**0.0723**	0.0707
F2	1	9/26/2013 14:07	5	48479	9695.8	9695.80	44152.03	**0.2196**	0.2151
F2	2	9/26/2013 14:00	5	34059	6811.8	6811.80	44152.03	**0.1543**	0.1709
F2	3	9/26/2013 14:20	5	35641	7128.2	7128.20	44152.03	**0.1614**	0.1437
F2	4	9/26/2013 14:13	5	26207	5241.4	5241.40	44152.03	**0.1187**	0.1088
F2	5	9/26/2013 13:35	5	20487	4097.4	4097.40	44152.03	**0.0928**	0.1111
F2	6	9/26/2013 13:27	5	23397	4679.4	4679.40	44152.03	**0.1060**	0.0969
F2	7	9/26/2013 13:53	5	18598	3719.6	3719.60	44152.03	**0.0842**	0.0916
F2	8	9/26/2013 13:42	5	15213	3042.6	3042.60	44152.03	**0.0689**	0.0679
F3	1	9/26/2013 14:13	5	48976	9795.2	9795.20	44152.03	**0.2219**	0.2161
F3	2	9/26/2013 14:07	5	32849	6569.8	6569.80	44152.03	**0.1488**	0.1669
F3	3	9/26/2013 14:00	5	33848	6769.6	6769.60	44152.03	**0.1533**	0.1371
F3	4	9/26/2013 14:20	5	25199	5039.8	5039.80	44152.03	**0.1141**	0.1008
F3	5	9/26/2013 13:42	5	18720	3744	3744.00	44152.03	**0.0848**	0.1030

Raw Count Data									
Detector (#)	Source ID (#)	Start Time	Count Time (min)	Alpha (counts)	Raw Alpha (cpm)	Th-230 (cpm)*	Decay Corrected Nominal (dpm)**	Th-230 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
F3	6	9/26/2013 13:35	5	21531	4306.2	4306.20	44152.03	**0.0975**	0.0906
F3	7	9/26/2013 13:27	5	17356	3471.2	3471.20	44152.03	**0.0786**	0.0861
F3	8	9/26/2013 13:53	5	13899	2779.8	2779.80	44152.03	**0.0630**	0.0616
F4	1	9/26/2013 14:20	5	40304	8060.8	8060.80	44152.03	**0.1826**	0.1781
F4	2	9/26/2013 14:13	5	27326	5465.2	5465.20	44152.03	**0.1238**	0.1375
F4	3	9/26/2013 14:07	5	27595	5519	5519.00	44152.03	**0.1250**	0.1130
F4	4	9/26/2013 14:00	5	20614	4122.8	4122.80	44152.03	**0.0934**	0.0834
F4	5	9/26/2013 13:53	5	15894	3178.8	3178.80	44152.03	**0.0720**	0.0852
F4	6	9/26/2013 13:42	5	17715	3543	3543.00	44152.03	**0.0802**	0.0752
F4	7	9/26/2013 13:35	5	14544	2908.8	2908.80	44152.03	**0.0659**	0.0715
F4	8	9/26/2013 13:27	5	11508	2301.6	2301.60	44152.03	**0.0521**	0.0510
G1	1	9/26/2013 14:28	5	48654	9730.8	9730.80	44152.03	**0.2204**	0.2147
G1	2	9/26/2013 15:02	5	33061	6612.2	6612.20	44152.03	**0.1498**	0.1686
G1	3	9/26/2013 14:50	5	34912	6982.4	6982.40	44152.03	**0.1581**	0.1401
G1	4	9/26/2013 14:42	5	25742	5148.4	5148.40	44152.03	**0.1166**	0.1040
G1	5	9/26/2013 15:19	5	19241	3848.2	3848.20	44152.03	**0.0872**	0.1064
G1	6	9/26/2013 15:54	5	22059	4411.8	4411.80	44152.03	**0.0999**	0.0920
G1	7	9/26/2013 15:42	5	17469	3493.8	3493.80	44152.03	**0.0791**	0.0867
G1	8	9/26/2013 15:35	5	14076	2815.2	2815.20	44152.03	**0.0638**	0.0625
G2	1	9/26/2013 14:42	5	45998	9199.6	9199.60	44152.03	**0.2084**	0.2043
G2	2	9/26/2013 14:28	5	32652	6530.4	6530.40	44152.03	**0.1479**	0.1635
G2	3	9/26/2013 15:02	5	34236	6847.2	6847.20	44152.03	**0.1551**	0.1379
G2	4	9/26/2013 14:50	5	25392	5078.4	5078.40	44152.03	**0.1150**	0.1036
G2	5	9/26/2013 15:35	5	19080	3816	3816.00	44152.03	**0.0864**	0.1060
G2	6	9/26/2013 15:19	5	21705	4341	4341.00	44152.03	**0.0983**	0.0908
G2	7	9/26/2013 15:54	5	17585	3517	3517.00	44152.03	**0.0797**	0.0856
G2	8	9/26/2013 15:42	5	14536	2907.2	2907.20	44152.03	**0.0658**	0.0650
G3	1	9/26/2013 14:50	5	45655	9131	9131.00	44152.03	**0.2068**	0.2012
G3	2	9/26/2013 14:42	5	30893	6178.6	6178.60	44152.03	**0.1399**	0.1567
G3	3	9/26/2013 14:28	5	31725	6345	6345.00	44152.03	**0.1437**	0.1294
G3	4	9/26/2013 15:02	5	24039	4807.8	4807.80	44152.03	**0.1089**	0.0956
G3	5	9/26/2013 15:42	5	17765	3553	3553.00	44152.03	**0.0805**	0.0977
G3	6	9/26/2013 15:35	5	20514	4102.8	4102.80	44152.03	**0.0929**	0.0853
G3	7	9/26/2013 15:19	5	15991	3198.2	3198.20	44152.03	**0.0724**	0.0809
G3	8	9/26/2013 15:54	5	13332	2666.4	2666.40	44152.03	**0.0604**	0.0588
G4	1	9/26/2013 15:02	5	49434	9886.8	9886.80	44152.03	**0.2239**	0.2184
G4	2	9/26/2013 14:50	5	33309	6661.8	6661.80	44152.03	**0.1509**	0.1695
G4	3	9/26/2013 14:42	5	34769	6953.8	6953.80	44152.03	**0.1575**	0.1395
G4	4	9/26/2013 14:28	5	25017	5003.4	5003.40	44152.03	**0.1133**	0.1022
G4	5	9/26/2013 15:54	5	19083	3816.6	3816.60	44152.03	**0.0864**	0.1045
G4	6	9/26/2013 15:42	5	21931	4386.2	4386.20	44152.03	**0.0993**	0.0909
G4	7	9/26/2013 15:35	5	17292	3458.4	3458.40	44152.03	**0.0783**	0.0861
G4	8	9/26/2013 15:19	5	14074	2814.8	2814.80	44152.03	**0.0638**	0.0625
H1	1	9/26/2013 15:19	5	53647	10729.4	10729.40	44152.03	**0.2430**	0.2374
H1	2	9/26/2013 15:54	5	36854	7370.8	7370.80	44152.03	**0.1669**	0.1879
H1	3	9/26/2013 15:41	5	39595	7919	7919.00	44152.03	**0.1794**	0.1569
H1	4	9/26/2013 15:35	5	28707	5741.4	5741.40	44152.03	**0.1300**	0.1158
H1	5	9/26/2013 14:28	5	20905	4181	4181.00	44152.03	**0.0947**	0.1186
H1	6	9/26/2013 15:02	5	24003	4800.6	4800.60	44152.03	**0.1087**	0.1010
H1	7	9/26/2013 14:50	5	19658	3931.6	3931.60	44152.03	**0.0890**	0.0951
H1	8	9/26/2013 14:41	5	15930	3186	3186.00	44152.03	**0.0722**	0.0713
H2	1	9/26/2013 15:35	5	49532	9906.4	9906.40	44152.03	**0.2244**	0.2176
H2	2	9/26/2013 15:19	5	33034	6606.8	6606.80	44152.03	**0.1496**	0.1704
H2	3	9/26/2013 15:54	5	35116	7023.2	7023.20	44152.03	**0.1591**	0.1412
H2	4	9/26/2013 15:41	5	26333	5266.6	5266.60	44152.03	**0.1193**	0.1036
H2	5	9/26/2013 14:42	5	19122	3824.4	3824.40	44152.03	**0.0866**	0.1061
H2	6	9/26/2013 14:28	5	21134	4226.8	4226.80	44152.03	**0.0957**	0.0911
H2	7	9/26/2013 15:02	5	17648	3529.6	3529.60	44152.03	**0.0799**	0.0859
H2	8	9/26/2013 14:50	5	14137	2827.4	2827.40	44152.03	**0.0640**	0.0627
H3	1	9/26/2013 15:41	5	51661	10332.2	10332.20	44152.03	**0.2340**	0.2282
H3	2	9/26/2013 15:35	5	35151	7030.2	7030.20	44152.03	**0.1592**	0.1799
H3	3	9/26/2013 15:19	5	37786	7557.2	7557.20	44152.03	**0.1712**	0.1500
H3	4	9/26/2013 15:54	5	27330	5466	5466.00	44152.03	**0.1238**	0.1113
H3	5	9/26/2013 14:50	5	20453	4090.6	4090.60	44152.03	**0.0926**	0.1139

Raw Count Data										
Detector (#)	Source ID (#)	Start Time	Count Time (min)	Alpha (counts)	Raw Alpha (cpm)	Th-230 (cpm)*	Decay Corrected Nominal (dpm)**	Th-230 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
H3	6	9/26/2013 14:42	5	23536	4707.2	4707.20	44152.03	**0.1066**	0.0978
H3	7	9/26/2013 14:28	5	18671	3734.2	3734.20	44152.03	**0.0846**	0.0921
H3	8	9/26/2013 15:02	5	15112	3022.4	3022.40	44152.03	**0.0685**	0.0673
H4	1	9/26/2013 15:54	5	45198	9039.6	9039.60	44152.03	**0.2047**	0.1994
H4	2	9/26/2013 15:41	5	31053	6210.6	6210.60	44152.03	**0.1407**	0.1576
H4	3	9/26/2013 15:35	5	32426	6485.2	6485.20	44152.03	**0.1469**	0.1315
H4	4	9/26/2013 15:19	5	24380	4876	4876.00	44152.03	**0.1104**	0.0973
H4	5	9/26/2013 15:02	5	18104	3620.8	3620.80	44152.03	**0.0820**	0.0997
H4	6	9/26/2013 14:50	5	20098	4019.6	4019.60	44152.03	**0.0910**	0.0852
H4	7	9/26/2013 14:42	5	16273	3254.6	3254.60	44152.03	**0.0737**	0.0800
H4	8	9/26/2013 14:28	5	13189	2637.8	2637.80	44152.03	**0.0597**	0.0585
I1	1	8/10/2013 13:13	5	52823	10564.6	10564.60	44152.08	**0.2393**	0.2318
I1	2	8/10/2013 14:11	5	35693	7138.6	7138.60	44152.08	**0.1617**	0.1835
I1	3	8/10/2013 14:01	5	37771	7554.2	7554.20	44152.08	**0.1711**	0.1538
I1	4	8/10/2013 13:31	5	28004	5600.8	5600.80	44152.08	**0.1269**	0.1160
I1	5	8/10/2013 14:20	5	23164	4632.8	4632.80	44152.08	**0.1049**	0.1186
I1	6	8/10/2013 14:51	5	23946	4789.2	4789.20	44152.08	**0.1085**	0.1030
I1	7	8/10/2013 14:37	5	19804	3960.8	3960.80	44152.08	**0.0897**	0.0969
I1	8	8/10/2013 14:29	5	15669	3133.8	3133.80	44152.08	**0.0710**	0.0694
I2	1	8/10/2013 13:31	5	58257	11651.4	11651.40	44152.08	**0.2639**	0.2563
I2	2	8/10/2013 13:13	5	40054	8010.8	8010.80	44152.08	**0.1814**	0.2045
I2	3	8/10/2013 14:11	5	42404	8480.8	8480.80	44152.08	**0.1921**	0.1726
I2	4	8/10/2013 14:01	5	31370	6274	6274.00	44152.08	**0.1421**	0.1317
I2	5	8/10/2013 14:29	5	26309	5261.8	5261.80	44152.08	**0.1192**	0.1344
I2	6	8/10/2013 14:20	5	27501	5500.2	5500.20	44152.08	**0.1246**	0.1171
I2	7	8/10/2013 14:51	5	22543	4508.6	4508.60	44152.08	**0.1021**	0.1103
I2	8	8/10/2013 14:37	5	18067	3613.4	3613.40	44152.08	**0.0818**	0.0802
I3	1	8/10/2013 14:01	5	59102	11820.4	11820.40	44152.08	**0.2677**	0.2606
I3	2	8/10/2013 13:31	5	41263	8252.6	8252.60	44152.08	**0.1869**	0.2089
I3	3	8/10/2013 13:13	5	43275	8655	8655.00	44152.08	**0.1960**	0.1769
I3	4	8/10/2013 14:11	5	32321	6464.2	6464.20	44152.08	**0.1464**	0.1351
I3	5	8/10/2013 14:37	5	26778	5355.6	5355.60	44152.08	**0.1213**	0.1380
I3	6	8/10/2013 14:29	5	28089	5617.8	5617.80	44152.08	**0.1272**	0.1196
I3	7	8/10/2013 14:20	5	23008	4601.6	4601.60	44152.08	**0.1042**	0.1124
I3	8	8/10/2013 14:51	5	18446	3689.2	3689.20	44152.08	**0.0836**	0.0820
I4	1	8/10/2013 14:11	5	57921	11584.2	11584.20	44152.08	**0.2624**	0.2554
I4	2	8/10/2013 14:01	5	39818	7963.6	7963.60	44152.08	**0.1804**	0.2029
I4	3	8/10/2013 13:31	5	42202	8440.4	8440.40	44152.08	**0.1912**	0.1706
I4	4	8/10/2013 13:13	5	30814	6162.8	6162.80	44152.08	**0.1396**	0.1295
I4	5	8/10/2013 14:51	5	25516	5103.2	5103.20	44152.08	**0.1156**	0.1323
I4	6	8/10/2013 14:37	5	27230	5446	5446.00	44152.08	**0.1233**	0.1156
I4	7	8/10/2013 14:29	5	22436	4487.2	4487.20	44152.08	**0.1016**	0.1092
I4	8	8/10/2013 14:20	5	17951	3590.2	3590.20	44152.08	**0.0813**	0.0799
J1	1	8/10/2013 14:20	5	55750	11150	11150.00	44152.08	**0.2525**	0.2463
J1	2	8/10/2013 14:51	5	37934	7586.8	7586.80	44152.08	**0.1718**	0.1929
J1	3	8/10/2013 14:37	5	39810	7962	7962.00	44152.08	**0.1803**	0.1602
J1	4	8/10/2013 14:29	5	28982	5796.4	5796.40	44152.08	**0.1313**	0.1192
J1	5	8/10/2013 13:13	5	22838	4567.6	4567.60	44152.08	**0.1035**	0.1219
J1	6	8/10/2013 14:11	5	24534	4906.8	4906.80	44152.08	**0.1111**	0.1057
J1	7	8/10/2013 14:01	5	20801	4160.2	4160.20	44152.08	**0.0942**	0.0995
J1	8	8/10/2013 13:31	5	15617	3123.4	3123.40	44152.08	**0.0707**	0.0698
J2	1	8/10/2013 14:29	5	57503	11500.6	11500.60	44152.08	**0.2605**	0.2533
J2	2	8/10/2013 14:20	5	39509	7901.8	7901.80	44152.08	**0.1790**	0.2006
J2	3	8/10/2013 14:51	5	41066	8213.2	8213.20	44152.08	**0.1860**	0.1680
J2	4	8/10/2013 14:37	5	30691	6138.2	6138.20	44152.08	**0.1390**	0.1260
J2	5	8/10/2013 13:31	5	24812	4962.4	4962.40	44152.08	**0.1124**	0.1288
J2	6	8/10/2013 13:13	5	25577	5115.4	5115.40	44152.08	**0.1159**	0.1112
J2	7	8/10/2013 14:11	5	21740	4348	4348.00	44152.08	**0.0985**	0.1046
J2	8	8/10/2013 14:01	5	16940	3388	3388.00	44152.08	**0.0767**	0.0754
J3	1	8/10/2013 14:37	5	55730	11146	11146.00	44152.08	**0.2524**	0.2435
J3	2	8/10/2013 14:29	5	37407	7481.4	7481.40	44152.08	**0.1694**	0.1933
J3	3	8/10/2013 14:20	5	39250	7850	7850.00	44152.08	**0.1778**	0.1616
J3	4	8/10/2013 14:51	5	29168	5833.6	5833.60	44152.08	**0.1321**	0.1188
J3	5	8/10/2013 14:01	5	24012	4802.4	4802.40	44152.08	**0.1088**	0.1218

Raw Count Data									
Detector (#)	Source ID (#)	Start Time	Count Time (min)	Alpha (counts)	Raw Alpha (cpm)	Th-230 (cpm)*	Decay Corrected Nominal (dpm)**	Th-230 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
J3	6	8/10/2013 13:31	5	23627	4725.4	4725.40	44152.08	**0.1070**	0.1025
J3	7	8/10/2013 13:13	5	19361	3872.2	3872.20	44152.08	**0.0877**	0.0960
J3	8	8/10/2013 14:11	5	16147	3229.4	3229.40	44152.08	**0.0731**	0.0710
J4	1	8/10/2013 14:51	5	56608	11321.6	11321.60	44152.08	**0.2564**	0.2473
J4	2	8/10/2013 14:37	5	37888	7577.6	7577.60	44152.08	**0.1716**	0.1971
J4	3	8/10/2013 14:29	5	40729	8145.8	8145.80	44152.08	**0.1845**	0.1657
J4	4	8/10/2013 14:20	5	29953	5990.6	5990.60	44152.08	**0.1357**	0.1242
J4	5	8/10/2013 14:11	5	25078	5015.6	5015.60	44152.08	**0.1136**	0.1271
J4	6	8/10/2013 14:01	5	25327	5065.4	5065.40	44152.08	**0.1147**	0.1081
J4	7	8/10/2013 13:31	5	20203	4040.6	4040.60	44152.08	**0.0915**	0.1007
J4	8	8/10/2013 13:13	5	16141	3228.2	3228.20	44152.08	**0.0731**	0.0710

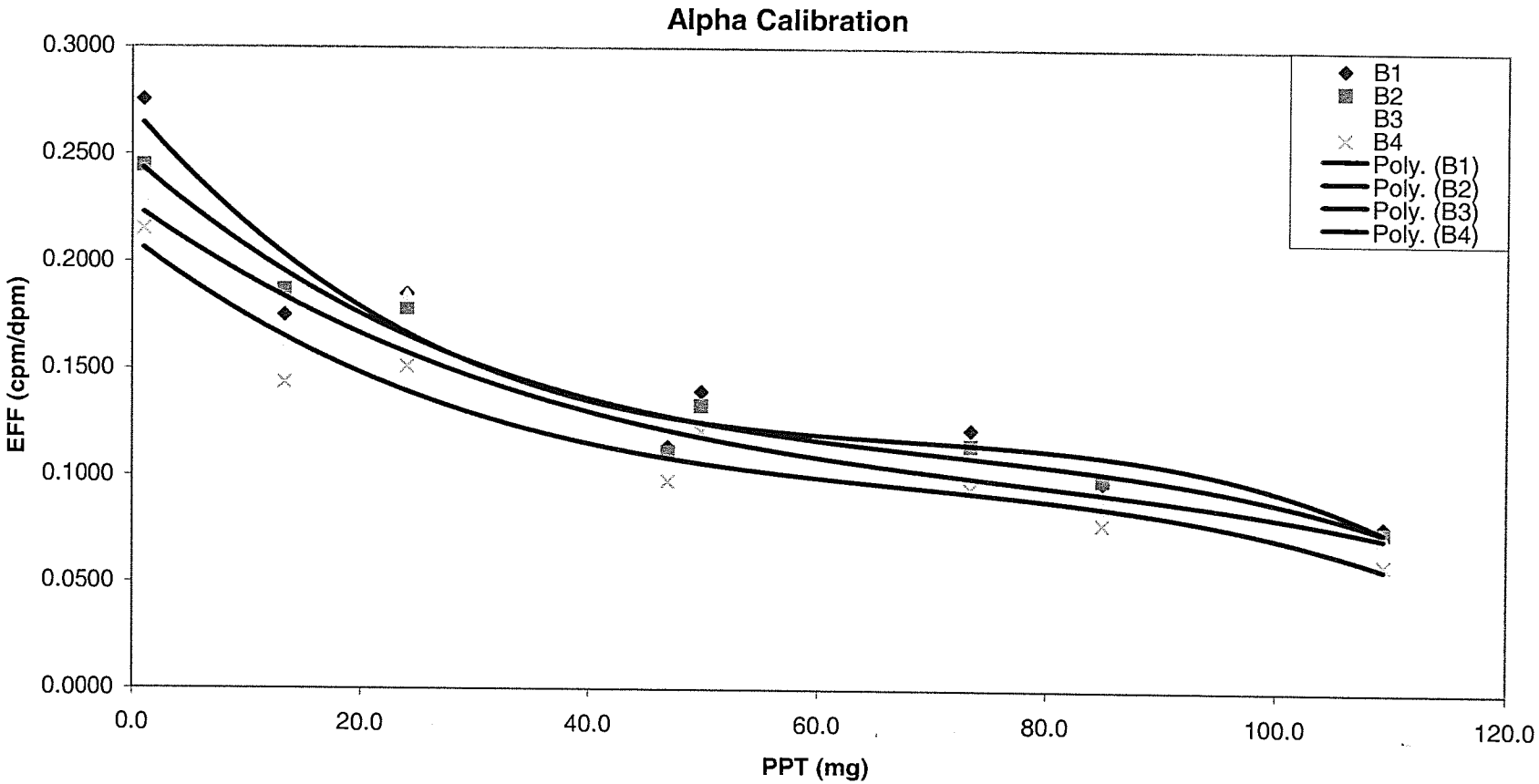


A1 $y = -2.328682E\text{-}07x^3 + 4.801743E\text{-}05x^2 - 3.645242E\text{-}03x + 1.779830E\text{-}01$

A2 $y = -2.147111E\text{-}07x^3 + 4.790063E\text{-}05x^2 - 3.960985E\text{-}03x + 2.040953E\text{-}01$

A3 $y = -2.453695E\text{-}07x^3 + 5.328563E\text{-}05x^2 - 4.254121E\text{-}03x + 2.064257E\text{-}01$

A4

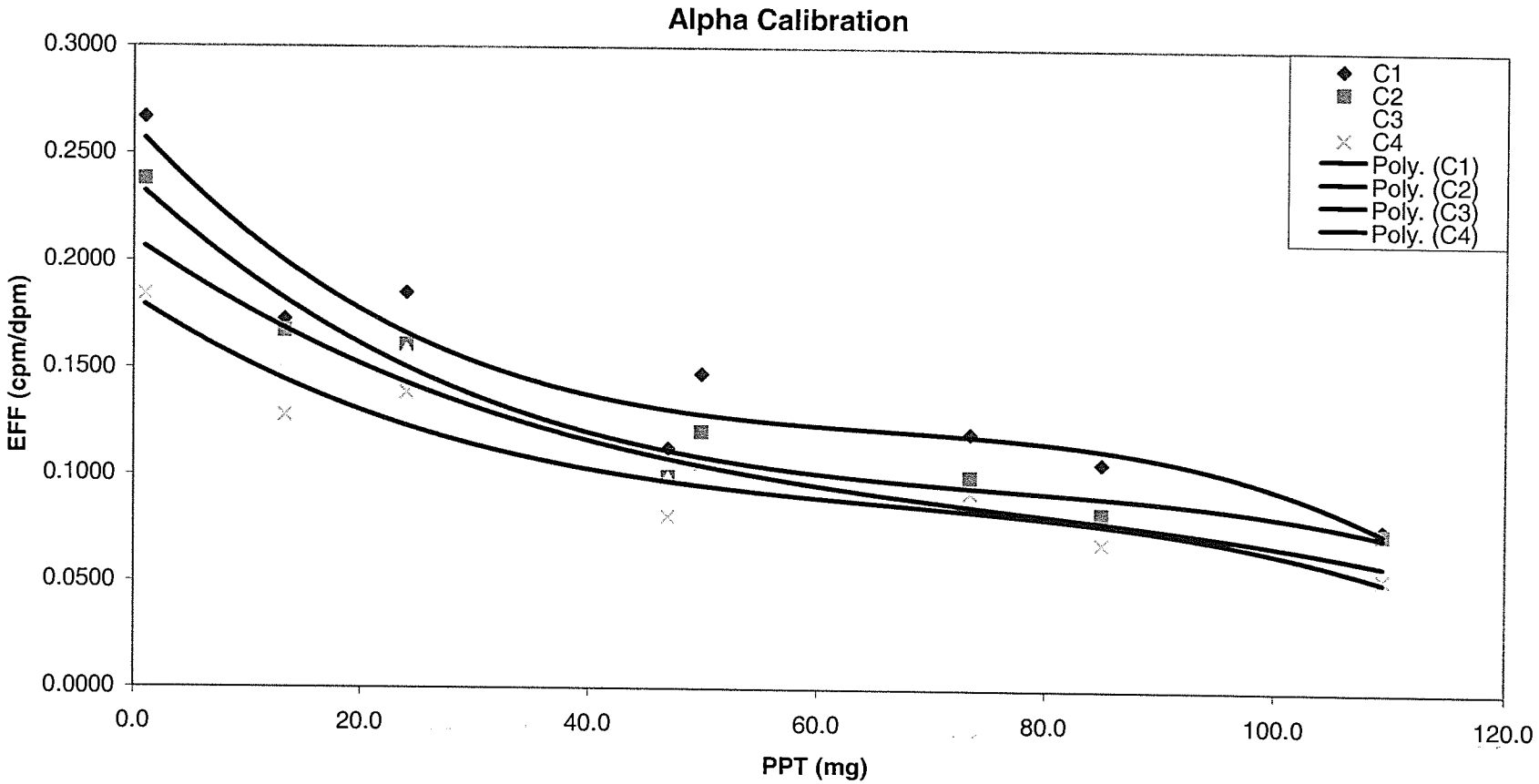


B1 $y = -4.157973E-07x^3 + 8.522647E-05x^2 - 6.133047E-03x + 2.706825E-01$

B2 $y = -2.643198E-07x^3 + 5.694109E-05x^2 - 4.644462E-03x + 2.478399E-01$

B3 $y = -1.677069E-07x^3 + 3.951569E-05x^2 - 3.723971E-03x + 2.264920E-01$

B4 $y = -2.494813E-07x^3 + 5.142555E-05x^2 - 4.031375E-03x + 2.101617E-01$

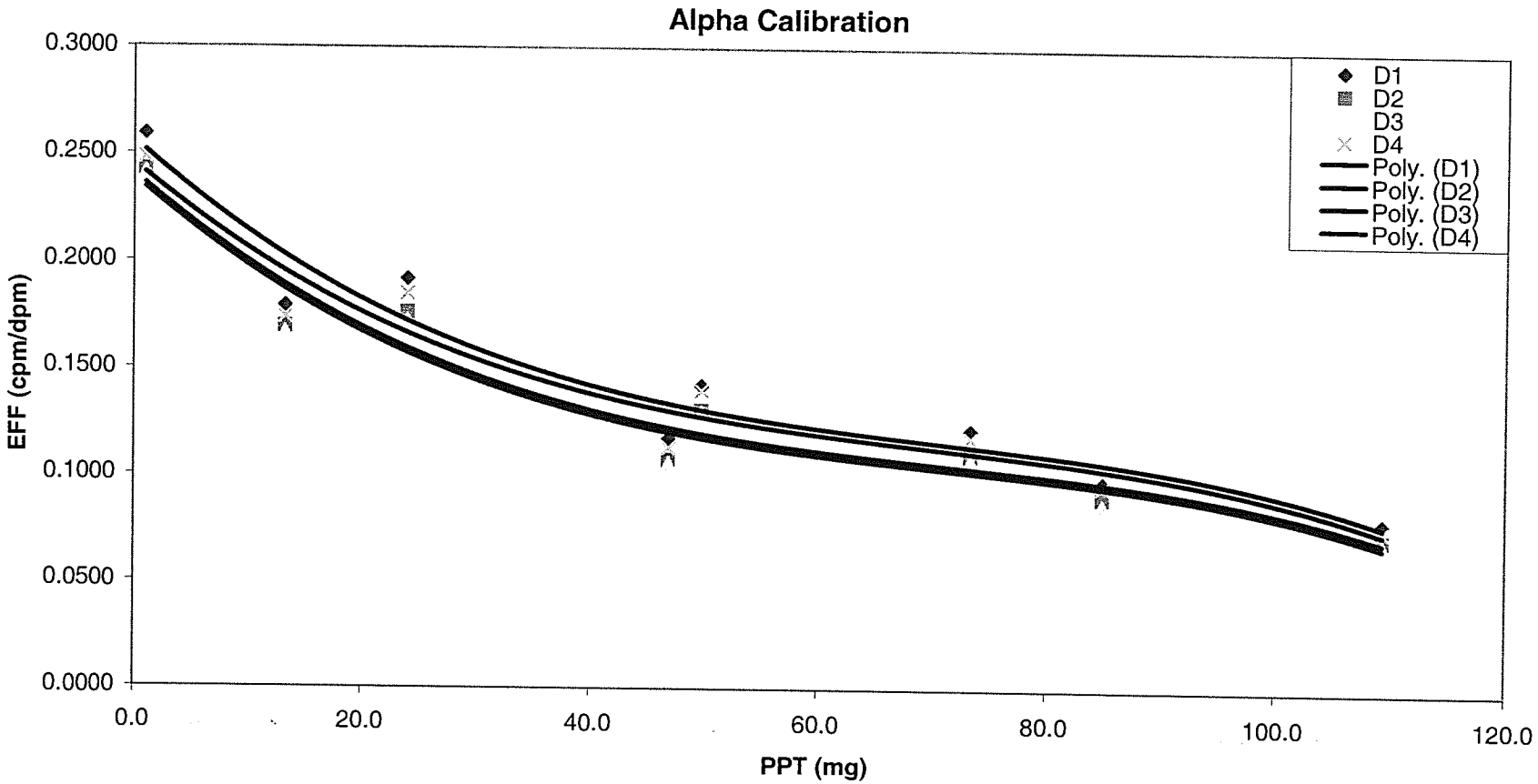


C1 $y = -4.096804E-07x^3 + 8.151979E-05x^2 - 5.732448E-03x + 2.625876E-01$

C2 $y = -2.533768E-07x^3 + 5.839991E-05x^2 - 4.856810E-03x + 2.370503E-01$

C3 $y = -1.593158E-07x^3 + 3.774753E-05x^2 - 3.599714E-03x + 2.100360E-01$

C4 $y = -2.190743E-07x^3 + 4.424358E-05x^2 - 3.411722E-03x + 1.825089E-01$

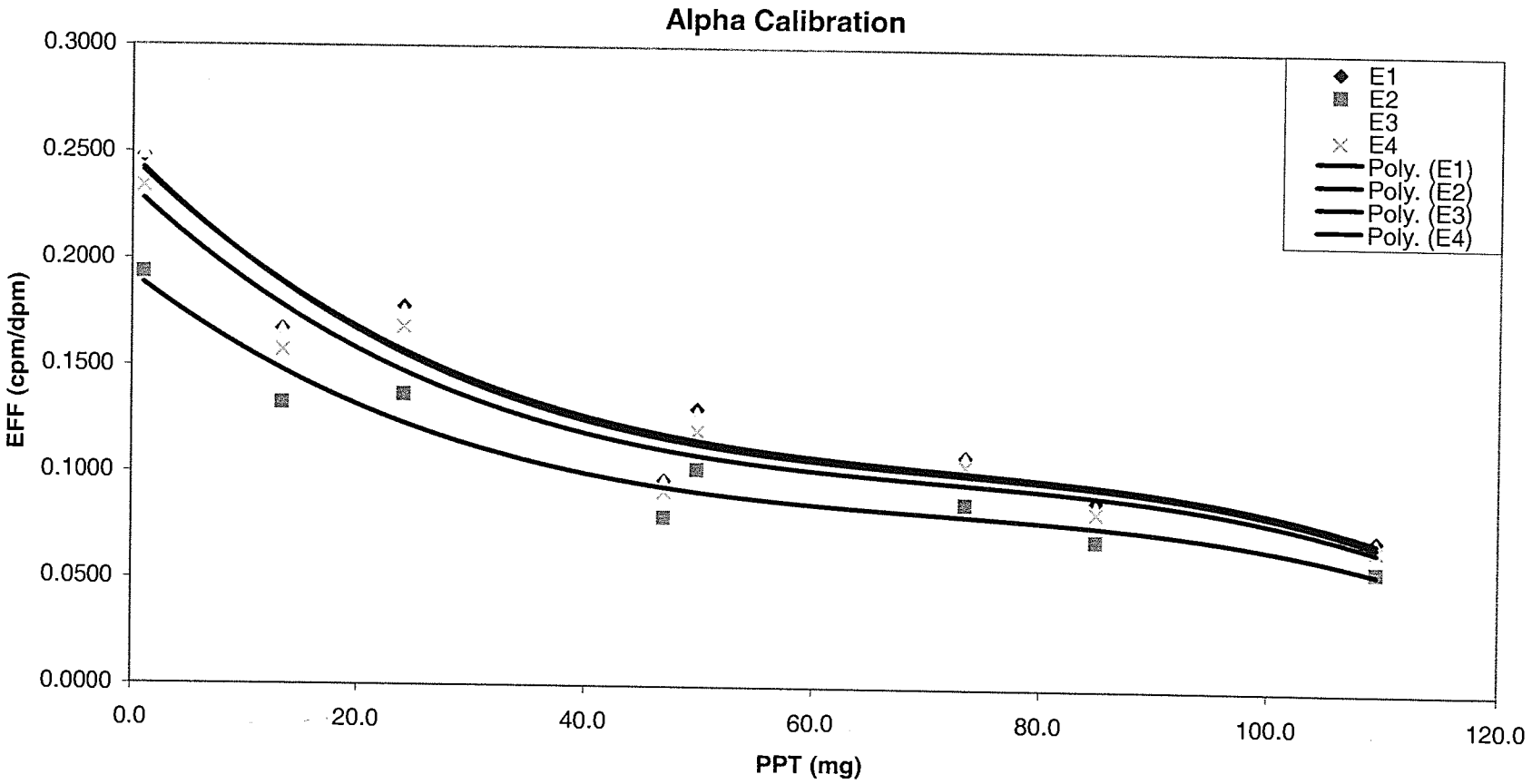


D1 $y = -2.721322E-07x^3 + 5.819057E-05x^2 - 4.735209E-03x + 2.559995E-01$

D2 $y = -2.613299E-07x^3 + 5.624678E-05x^2 - 4.575366E-03x + 2.403826E-01$

D3 $y = -2.661803E-07x^3 + 5.705303E-05x^2 - 4.610823E-03x + 2.385835E-01$

D4 $y = -2.610231E-07x^3 + 5.508141E-05x^2 - 4.461314E-03x + 2.453902E-01$

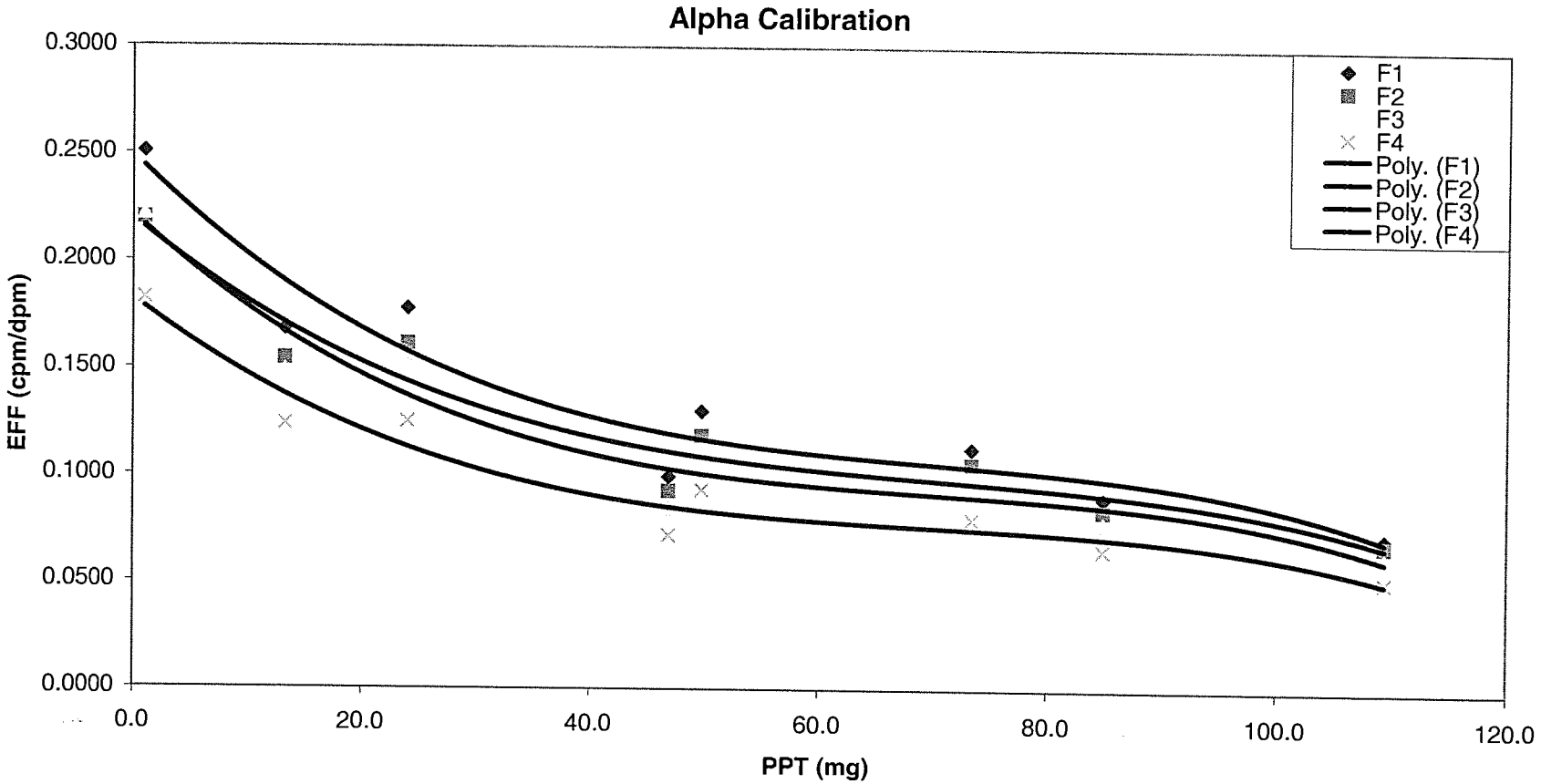


E1 $y = -2.944249E-07x^3 + 6.386145E-05x^2 - 5.063939E-03x + 2.461336E-01$

E2 $y = -2.361720E-07x^3 + 5.059947E-05x^2 - 3.954277E-03x + 1.923637E-01$

E3 $y = -3.104714E-07x^3 + 6.699926E-05x^2 - 5.245474E-03x + 2.474741E-01$

E4 $y = -2.893207E-07x^3 + 6.228420E-05x^2 - 4.869671E-03x + 2.326831E-01$

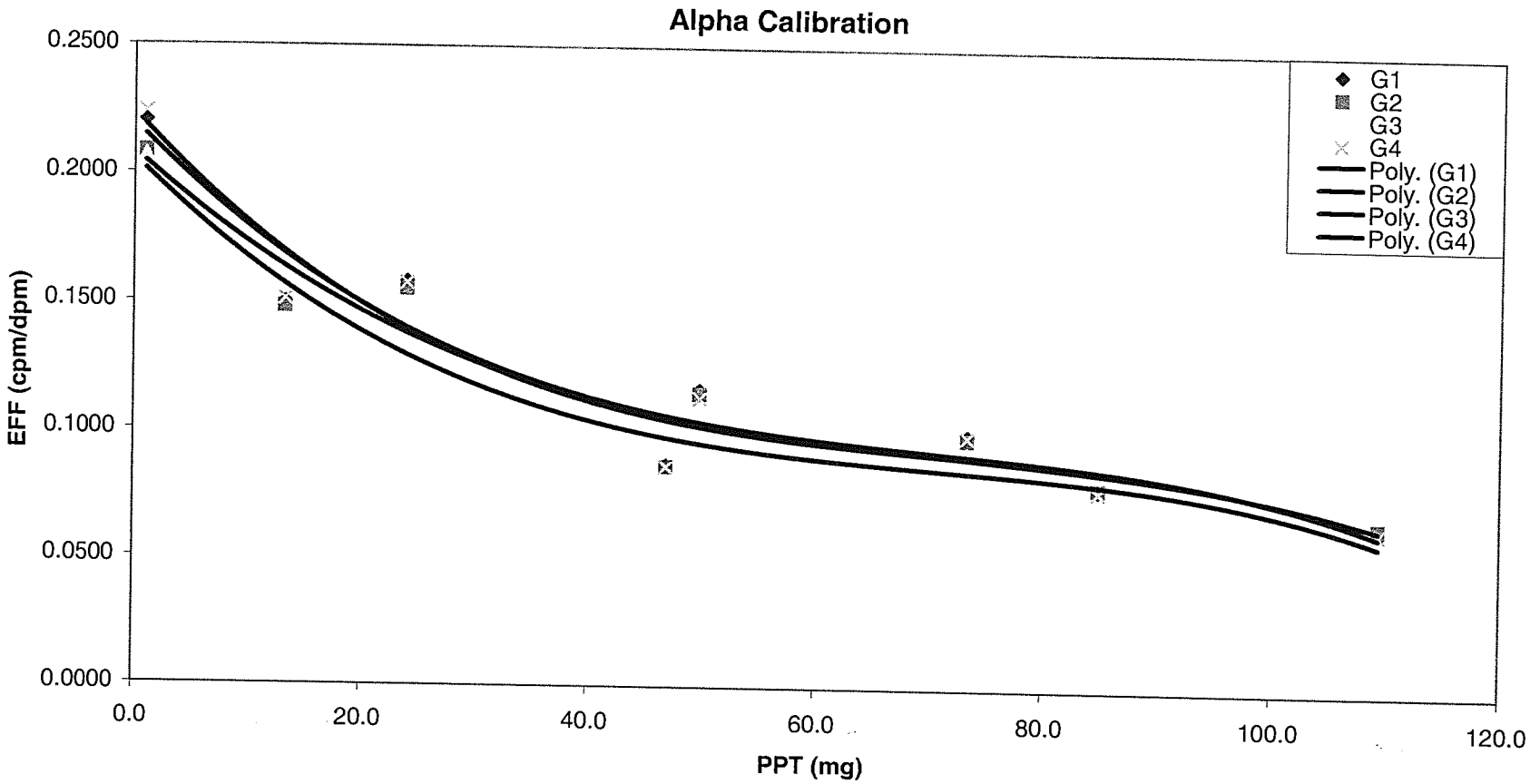


$F1_y = -3.257606E\text{-}07x^3 + 6.899259E\text{-}05x^2 - 5.278365E\text{-}03x + 2.489683E\text{-}01$

$F2_y = -2.594262E\text{-}07x^3 + 5.530814E\text{-}05x^2 - 4.330376E\text{-}03x + 2.193433E\text{-}01$

$F3_y = -3.033749E\text{-}07x^3 + 6.432344E\text{-}05x^2 - 4.862612E\text{-}03x + 2.208974E\text{-}01$

$F4_y = -2.529765E\text{-}07x^3 + 5.341564E\text{-}05x^2 - 4.013705E\text{-}03x + 1.820602E\text{-}01$

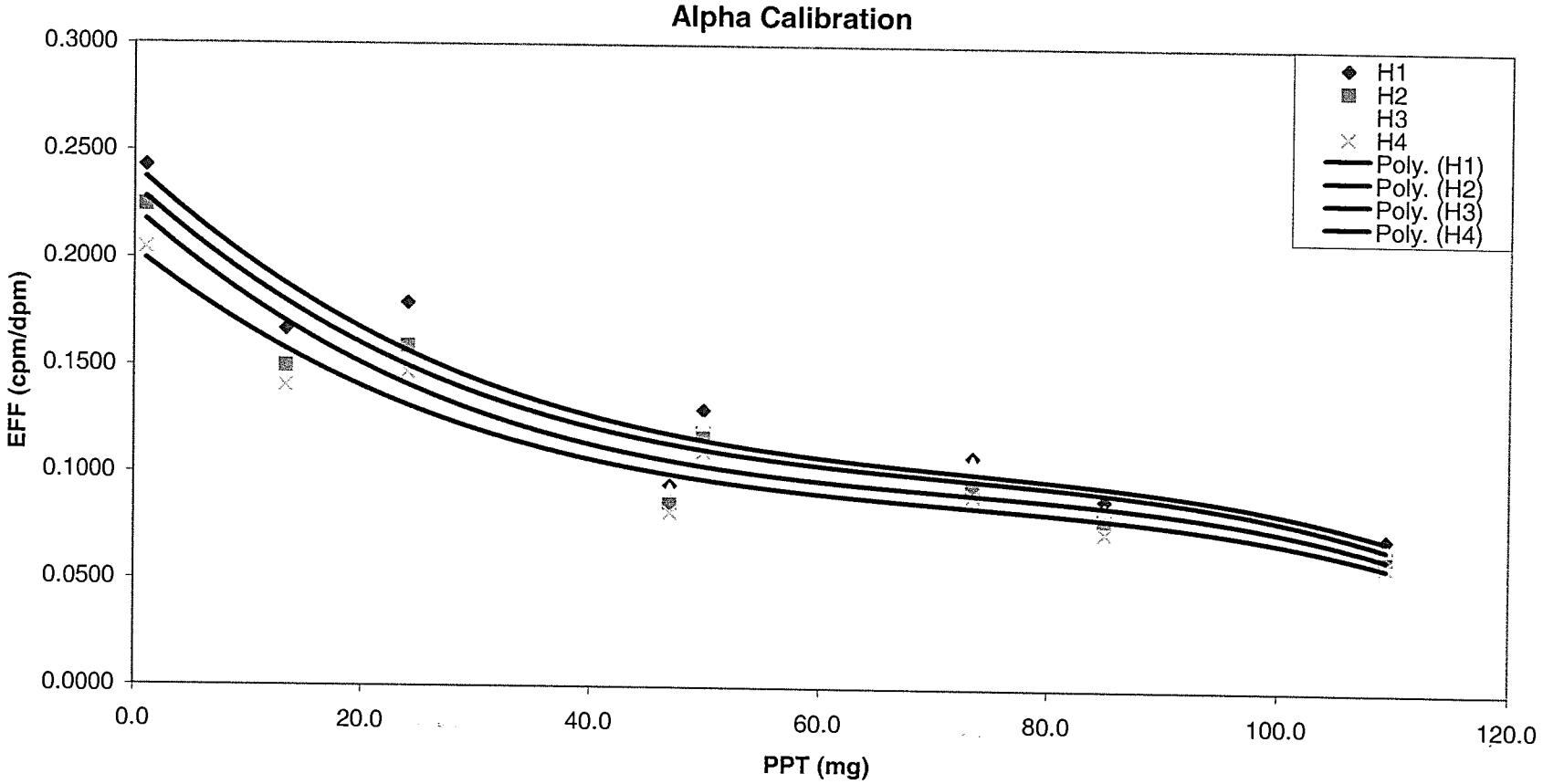


G1 $y = -2.724311E-07x^3 + 5.815453E-05x^2 - 4.534397E-03x + 2.192128E-01$

G2 $y = -2.206781E-07x^3 + 4.842290E-05x^2 - 3.964716E-03x + 2.081867E-01$

G3 $y = -2.671510E-07x^3 + 5.707172E-05x^2 - 4.388154E-03x + 2.055589E-01$

G4 $y = -2.903859E-07x^3 + 6.234454E-05x^2 - 4.813809E-03x + 2.231384E-01$

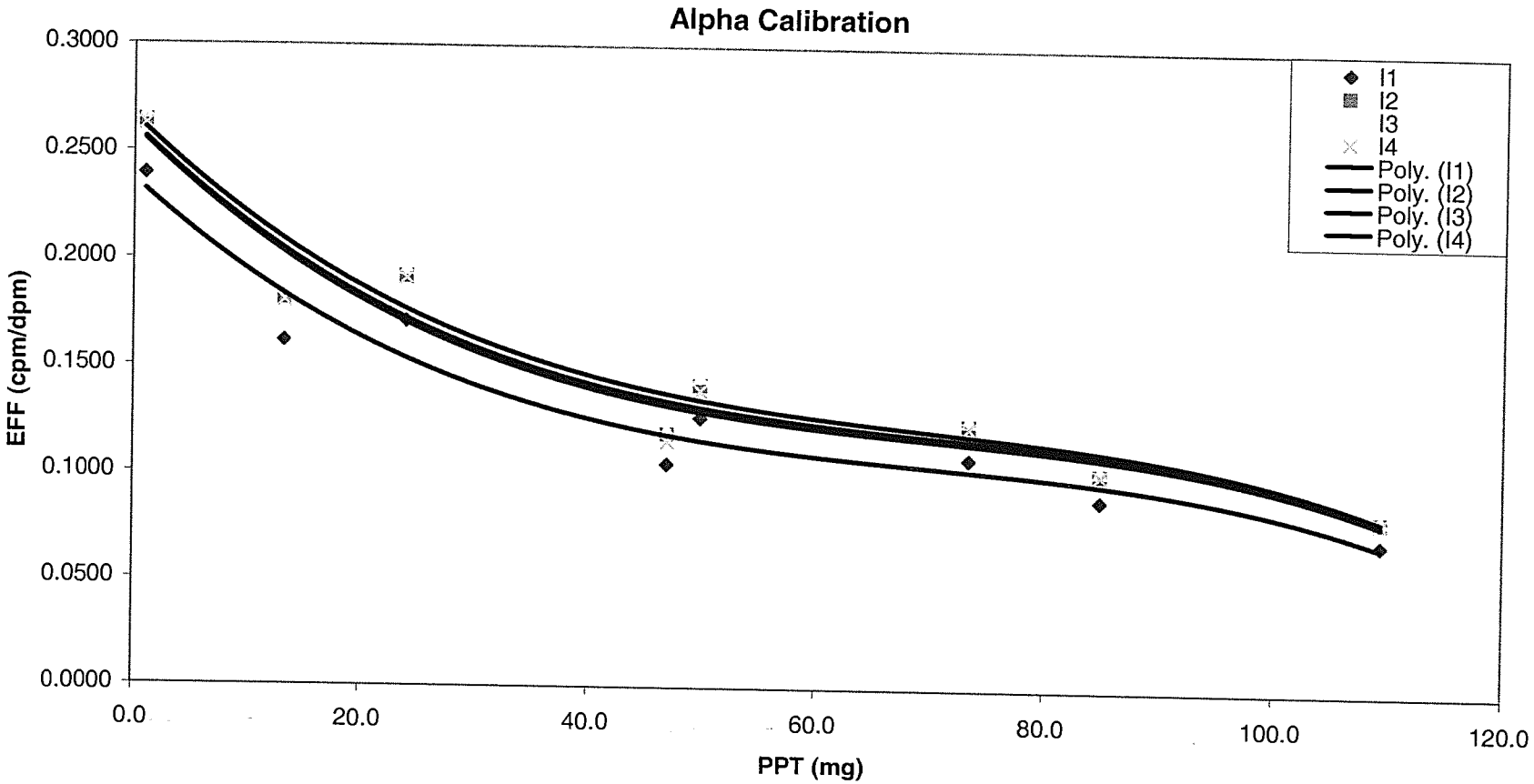


H1 $y = -2.689930E-07x^3 + 5.921211E-05x^2 - 4.820133E-03x + 2.421679E-01$

H2 $y = -2.704863E-07x^3 + 5.855799E-05x^2 - 4.626818E-03x + 2.222067E-01$

H3 $y = -2.753157E-07x^3 + 5.939350E-05x^2 - 4.715465E-03x + 2.328068E-01$

H4 $y = -2.355666E-07x^3 + 5.103185E-05x^2 - 4.088321E-03x + 2.034652E-01$

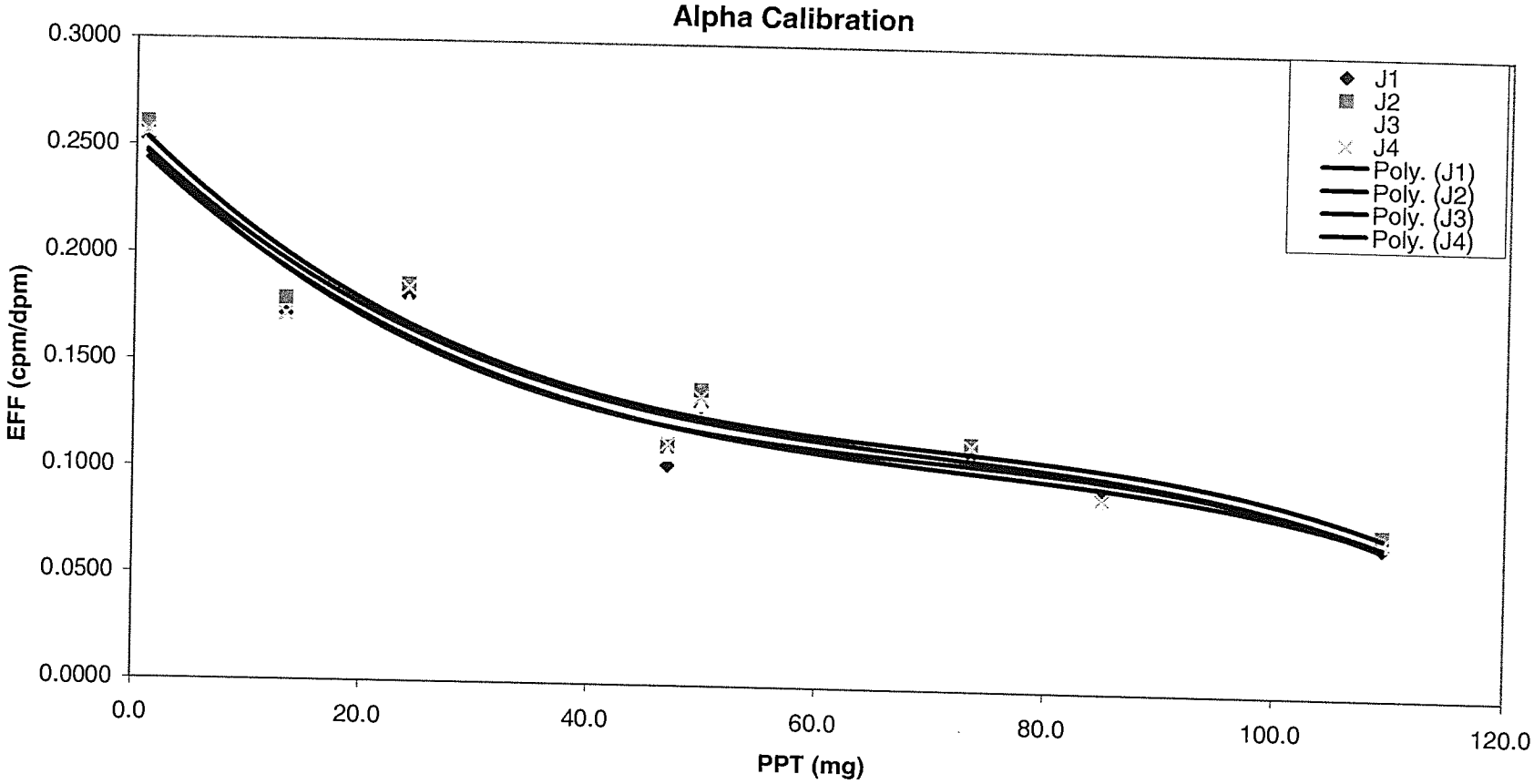


I1 $y = -2.904155E\text{-}07x^3 + 6.118384E\text{-}05x^2 - 4.745378E\text{-}03x + 2.364924E\text{-}01$

I2 $y = -3.103020E\text{-}07x^3 + 6.530136E\text{-}05x^2 - 5.086035E\text{-}03x + 2.613414E\text{-}01$

I3 $y = -3.037608E\text{-}07x^3 + 6.417544E\text{-}05x^2 - 5.064032E\text{-}03x + 2.656339E\text{-}01$

I4 $y = -3.148243E\text{-}07x^3 + 6.655813E\text{-}05x^2 - 5.164176E\text{-}03x + 2.605274E\text{-}01$



$J1_y = -3.245900E\text{-}07x^3 + 6.836196E\text{-}05x^2 - 5.254675E\text{-}03x + 2.514655E\text{-}01$

$J2_y = -3.098945E\text{-}07x^3 + 6.587287E\text{-}05x^2 - 5.171066E\text{-}03x + 2.584407E\text{-}01$

$J3_y = -2.667589E\text{-}07x^3 + 5.893603E\text{-}05x^2 - 4.875963E\text{-}03x + 2.483578E\text{-}01$

$J4_y = -2.890213E\text{-}07x^3 + 6.135766E\text{-}05x^2 - 4.909859E\text{-}03x + 2.521976E\text{-}01$

Current Calibration - LB4100

Geometry	2 inch Planchett				
Alpha	**Cal Date**	10/1/2013	**Exp Date**	9/30/2014	
LB4100	A0	A1	A2	A3	A4
A1	1.779830E-01	-3.645242E-03	4.801743E-05	-2.328682E-07	
A2	2.040953E-01	-3.960985E-03	4.790063E-05	-2.147111E-07	
A3	2.064257E-01	-4.254121E-03	5.328563E-05	-2.453695E-07	
A4	#N/A	#N/A	#N/A	#N/A	
B1	2.706825E-01	-6.133047E-03	8.522647E-05	-4.157973E-07	
B2	2.478399E-01	-4.644462E-03	5.694109E-05	-2.643198E-07	
B3	2.264920E-01	-3.723971E-03	3.951569E-05	-1.677069E-07	
B4	2.101617E-01	-4.031375E-03	5.142555E-05	-2.494813E-07	
C1	2.625876E-01	-5.732448E-03	8.151979E-05	-4.096804E-07	
C2	2.370503E-01	-4.856810E-03	5.839991E-05	-2.533768E-07	
C3	2.100360E-01	-3.599714E-03	3.774753E-05	-1.593158E-07	
C4	1.825089E-01	-3.411722E-03	4.424358E-05	-2.190743E-07	
D1	2.559995E-01	-4.735209E-03	5.819057E-05	-2.721322E-07	
D2	2.403826E-01	-4.575366E-03	5.624678E-05	-2.613299E-07	
D3	2.385835E-01	-4.610823E-03	5.705303E-05	-2.661803E-07	
D4	2.453902E-01	-4.461314E-03	5.508141E-05	-2.610231E-07	
E1	2.461336E-01	-5.063939E-03	6.386145E-05	-2.944249E-07	
E2	1.923637E-01	-3.954277E-03	5.059947E-05	-2.361720E-07	
E3	2.474741E-01	-5.245474E-03	6.699926E-05	-3.104714E-07	
E4	2.326831E-01	-4.869671E-03	6.228420E-05	-2.893207E-07	
F1	2.489683E-01	-5.278365E-03	6.899259E-05	-3.257606E-07	
F2	2.193433E-01	-4.330376E-03	5.530814E-05	-2.594262E-07	
F3	2.208974E-01	-4.862612E-03	6.432344E-05	-3.033749E-07	
F4	1.820602E-01	-4.013705E-03	5.341564E-05	-2.529765E-07	
G1	2.192128E-01	-4.534397E-03	5.815453E-05	-2.724311E-07	
G2	2.081867E-01	-3.964716E-03	4.842290E-05	-2.206781E-07	
G3	2.055589E-01	-4.388154E-03	5.707172E-05	-2.671510E-07	
G4	2.231384E-01	-4.813809E-03	6.234454E-05	-2.903859E-07	
H1	2.421679E-01	-4.820133E-03	5.921211E-05	-2.689930E-07	
H2	2.222067E-01	-4.626818E-03	5.855799E-05	-2.704863E-07	
H3	2.328068E-01	-4.715465E-03	5.939350E-05	-2.753157E-07	
H4	2.034652E-01	-4.088321E-03	5.103185E-05	-2.355666E-07	
I1	2.364924E-01	-4.745378E-03	6.118384E-05	-2.904155E-07	
I2	2.613414E-01	-5.086035E-03	6.530136E-05	-3.103020E-07	
I3	2.656339E-01	-5.064032E-03	6.417544E-05	-3.037608E-07	
I4	2.605274E-01	-5.164176E-03	6.655813E-05	-3.148243E-07	
J1	2.514655E-01	-5.254675E-03	6.836196E-05	-3.245900E-07	
J2	2.584407E-01	-5.171066E-03	6.587287E-05	-3.098945E-07	
J3	2.483578E-01	-4.875963E-03	5.893603E-05	-2.667589E-07	
J4	2.521976E-01	-4.909859E-03	6.135766E-05	-2.890213E-07	

LB4100_Alpha_Aug13_RawData.xls

SampleID	Instr	Time (min.)	Alpha Counts	Beta Counts	Count Start Time	Count End Time	Machine	Batch ID
T1	A1	5	39451	17242	8/10/2013 15:00	8/10/2013 15:05	LB4100	GABT13
T2	A1	5	27443	12474	8/10/2013 15:23	8/10/2013 15:28	LB4100	GABT13
T3	A1	5	27719	12646	8/10/2013 15:16	8/10/2013 15:21	LB4100	GABT13
T4	A1	5	20173	9293	8/10/2013 15:09	8/10/2013 15:14	LB4100	GABT13
T5	A1	5	18268	8401	8/10/2013 15:32	8/10/2013 15:37	LB4100	GABT13
T6	A1	5	17081	8602	8/10/2013 16:01	8/10/2013 16:06	LB4100	GABT13
T7	A1	5	15618	7637	8/10/2013 15:54	8/10/2013 15:59	LB4100	GABT13
T8	A1	5	10917	5845	8/10/2013 15:46	8/10/2013 15:51	LB4100	GABT13
T1	A2	5	45155	15718	8/10/2013 15:09	8/10/2013 15:14	LB4100	GABT13
T2	A2	5	31233	11582	8/10/2013 15:00	8/10/2013 15:05	LB4100	GABT13
T3	A2	5	34090	12485	8/10/2013 15:23	8/10/2013 15:28	LB4100	GABT13
T4	A2	5	23491	8940	8/10/2013 15:16	8/10/2013 15:21	LB4100	GABT13
T5	A2	5	18334	7203	8/10/2013 15:46	8/10/2013 15:51	LB4100	GABT13
T6	A2	5	21324	8675	8/10/2013 15:32	8/10/2013 15:37	LB4100	GABT13
T7	A2	5	16522	6803	8/10/2013 16:01	8/10/2013 16:06	LB4100	GABT13
T8	A2	5	14054	6031	8/10/2013 15:54	8/10/2013 15:59	LB4100	GABT13
T1	A3	5	46267	16571	8/10/2013 15:16	8/10/2013 15:21	LB4100	GABT13
T2	A3	5	30442	11541	8/10/2013 15:09	8/10/2013 15:14	LB4100	GABT13
T3	A3	5	32372	12115	8/10/2013 15:00	8/10/2013 15:05	LB4100	GABT13
T4	A3	5	23637	9509	8/10/2013 15:23	8/10/2013 15:28	LB4100	GABT13
T5	A3	5	19618	8053	8/10/2013 15:54	8/10/2013 15:59	LB4100	GABT13
T6	A3	5	18299	8094	8/10/2013 15:46	8/10/2013 15:51	LB4100	GABT13
T7	A3	5	17059	7331	8/10/2013 15:32	8/10/2013 15:37	LB4100	GABT13
T8	A3	5	12902	5985	8/10/2013 16:01	8/10/2013 16:06	LB4100	GABT13
T1	B1	5	60804	15106	8/10/2013 15:39	8/10/2013 15:44	LB4100	GABT13
T2	B1	5	38639	9846	8/10/2013 16:01	8/10/2013 16:06	LB4100	GABT13
T3	B1	5	40863	10321	8/10/2013 15:54	8/10/2013 15:59	LB4100	GABT13
T4	B1	5	30868	8272	8/10/2013 15:46	8/10/2013 15:51	LB4100	GABT13
T5	B1	5	25134	6598	8/10/2013 15:00	8/10/2013 15:05	LB4100	GABT13
T6	B1	5	27019	7793	8/10/2013 15:25	8/10/2013 15:30	LB4100	GABT13
T7	B1	5	21669	6451	8/10/2013 15:16	8/10/2013 15:21	LB4100	GABT13
T8	B1	5	17265	5400	8/10/2013 15:09	8/10/2013 15:14	LB4100	GABT13
T1	B2	5	54021	16420	8/10/2013 15:46	8/10/2013 15:51	LB4100	GABT13
T2	B2	5	41224	12658	8/10/2013 15:39	8/10/2013 15:44	LB4100	GABT13
T3	B2	5	39388	11935	8/10/2013 16:01	8/10/2013 16:06	LB4100	GABT13
T4	B2	5	29421	9151	8/10/2013 15:54	8/10/2013 15:59	LB4100	GABT13

T5	B2	5	24602	7589	8/10/2013 15:09	8/10/2013 15:14	LB4100	GABT13
T6	B2	5	25370	8388	8/10/2013 15:00	8/10/2013 15:05	LB4100	GABT13
T7	B2	5	21903	7470	8/10/2013 15:25	8/10/2013 15:30	LB4100	GABT13
T8	B2	5	16606	5768	8/10/2013 15:16	8/10/2013 15:21	LB4100	GABT13
T1	B3	5	50698	17845	8/10/2013 15:54	8/10/2013 15:59	LB4100	GABT13
T2	B3	5	34881	12444	8/10/2013 15:46	8/10/2013 15:51	LB4100	GABT13
T3	B3	5	40700	14394	8/10/2013 15:39	8/10/2013 15:44	LB4100	GABT13
T4	B3	5	27790	10145	8/10/2013 16:01	8/10/2013 16:06	LB4100	GABT13
T5	B3	5	22609	8451	8/10/2013 15:16	8/10/2013 15:21	LB4100	GABT13
T6	B3	5	23937	9366	8/10/2013 15:09	8/10/2013 15:14	LB4100	GABT13
T7	B3	5	19086	7512	8/10/2013 15:00	8/10/2013 15:05	LB4100	GABT13
T8	B3	5	16160	6882	8/10/2013 15:25	8/10/2013 15:30	LB4100	GABT13
T1	B4	5	47472	15695	8/10/2013 16:01	8/10/2013 16:06	LB4100	GABT13
T2	B4	5	31710	11105	8/10/2013 15:54	8/10/2013 15:59	LB4100	GABT13
T3	B4	5	33347	11419	8/10/2013 15:46	8/10/2013 15:51	LB4100	GABT13
T4	B4	5	26770	9583	8/10/2013 15:39	8/10/2013 15:44	LB4100	GABT13
T5	B4	5	21589	7592	8/10/2013 15:25	8/10/2013 15:30	LB4100	GABT13
T6	B4	5	20884	7883	8/10/2013 15:16	8/10/2013 15:21	LB4100	GABT13
T7	B4	5	17279	6469	8/10/2013 15:09	8/10/2013 15:14	LB4100	GABT13
T8	B4	5	13304	5413	8/10/2013 15:00	8/10/2013 15:05	LB4100	GABT13
T1	C1	5	58913	12531	8/10/2013 16:09	8/10/2013 16:14	LB4100	GABT13
T2	C1	5	38126	8332	8/10/2013 16:36	8/10/2013 16:41	LB4100	GABT13
T3	C1	5	40886	8619	8/10/2013 16:28	8/10/2013 16:33	LB4100	GABT13
T4	C1	5	32621	7610	8/10/2013 16:18	8/10/2013 16:23	LB4100	GABT13
T5	C1	5	24910	5408	8/10/2013 16:45	8/10/2013 16:50	LB4100	GABT13
T6	C1	5	26573	6167	8/10/2013 17:10	8/10/2013 17:15	LB4100	GABT13
T7	C1	5	23541	5508	8/10/2013 17:02	8/10/2013 17:07	LB4100	GABT13
T8	C1	5	16918	4257	8/10/2013 16:53	8/10/2013 16:58	LB4100	GABT13
T1	C2	5	52523	17244	8/10/2013 16:18	8/10/2013 16:23	LB4100	GABT13
T2	C2	5	36922	12414	8/10/2013 16:09	8/10/2013 16:14	LB4100	GABT13
T3	C2	5	35507	11882	8/10/2013 16:36	8/10/2013 16:41	LB4100	GABT13
T4	C2	5	26653	9375	8/10/2013 16:28	8/10/2013 16:33	LB4100	GABT13
T5	C2	5	21928	7646	8/10/2013 16:53	8/10/2013 16:58	LB4100	GABT13
T6	C2	5	22091	8386	8/10/2013 16:45	8/10/2013 16:50	LB4100	GABT13
T7	C2	5	18346	6987	8/10/2013 17:10	8/10/2013 17:15	LB4100	GABT13
T8	C2	5	16476	6612	8/10/2013 17:02	8/10/2013 17:07	LB4100	GABT13
T1	C3	5	46580	17367	8/10/2013 16:28	8/10/2013 16:33	LB4100	GABT13

T2	C3	5	33758	13114	8/10/2013 16:18	8/10/2013 16:23	LB4100	GABT13
T3	C3	5	34931	13284	8/10/2013 16:09	8/10/2013 16:14	LB4100	GABT13
T4	C3	5	23855	9813	8/10/2013 16:36	8/10/2013 16:41	LB4100	GABT13
T5	C3	5	21758	8842	8/10/2013 17:02	8/10/2013 17:07	LB4100	GABT13
T6	C3	5	20363	9117	8/10/2013 16:53	8/10/2013 16:58	LB4100	GABT13
T7	C3	5	16348	7281	8/10/2013 16:45	8/10/2013 16:50	LB4100	GABT13
T8	C3	5	13284	6270	8/10/2013 17:10	8/10/2013 17:15	LB4100	GABT13
T1	C4	5	40698	17696	8/10/2013 16:36	8/10/2013 16:41	LB4100	GABT13
T2	C4	5	28204	12333	8/10/2013 16:28	8/10/2013 16:33	LB4100	GABT13
T3	C4	5	30592	13219	8/10/2013 16:18	8/10/2013 16:23	LB4100	GABT13
T4	C4	5	23371	10482	8/10/2013 16:09	8/10/2013 16:14	LB4100	GABT13
T5	C4	5	17830	8130	8/10/2013 17:10	8/10/2013 17:15	LB4100	GABT13
T6	C4	5	20501	9922	8/10/2013 17:02	8/10/2013 17:07	LB4100	GABT13
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T8	C4	5	11799	6448	8/10/2013 16:45	8/10/2013 16:50	LB4100	GABT13
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T8	D1	5	17640	6977	8/10/2013 16:19	8/10/2013 16:24	LB4100	GABT13
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T3	D2	5	38857	15449	8/10/2013 17:12	8/10/2013 17:17	LB4100	GABT13
T4	D2	5	28870	11791	8/10/2013 17:03	8/10/2013 17:08	LB4100	GABT13
T5	D2	5	23759	9727	8/10/2013 16:19	8/10/2013 16:24	LB4100	GABT13
T6	D2	5	24308	10665	8/10/2013 16:11	8/10/2013 16:16	LB4100	GABT13
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T5	D3	5	23403	9404	8/10/2013 16:29	8/10/2013 16:34	LB4100	GABT13
T6	D3	5	23871	10629	8/10/2013 16:19	8/10/2013 16:24	LB4100	GABT13

T7	D3	5	19319	8524	8/10/2013 16:11	8/10/2013 16:16	LB4100	GABT13
T8	D3	5	15510	7445	8/10/2013 16:37	8/10/2013 16:42	LB4100	GABT13
T1	D4	5	54761	20503	8/10/2013 17:12	8/10/2013 17:17	LB4100	GABT13
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T6	D4	5	26164	10982	8/10/2013 16:29	8/10/2013 16:34	LB4100	GABT13
T7	D4	5	21174	8715	8/10/2013 16:19	8/10/2013 16:24	LB4100	GABT13
T8	D4	5	16867	7370	8/10/2013 16:11	8/10/2013 16:16	LB4100	GABT13
T1	E1	5	54720	14121	9/26/2013 13:26	9/26/2013 13:31	LB4100	GABT13
T2	E1	5	36926	10098	9/26/2013 13:53	9/26/2013 13:58	LB4100	GABT13
T3	E1	5	39311	10510	9/26/2013 13:42	9/26/2013 13:47	LB4100	GABT13
T4	E1	5	28883	8063	9/26/2013 13:35	9/26/2013 13:40	LB4100	GABT13
T5	E1	5	21453	6207	9/26/2013 14:00	9/26/2013 14:05	LB4100	GABT13
T6	E1	5	24158	7355	9/26/2013 14:20	9/26/2013 14:25	LB4100	GABT13
T7	E1	5	19633	5858	9/26/2013 14:13	9/26/2013 14:18	LB4100	GABT13
T8	E1	5	15963	5369	9/26/2013 14:07	9/26/2013 14:12	LB4100	GABT13
T1	E2	5	42735	17629	9/26/2013 13:35	9/26/2013 13:40	LB4100	GABT13
T2	E2	5	29263	12150	9/26/2013 13:27	9/26/2013 13:32	LB4100	GABT13
T3	E2	5	30194	12682	9/26/2013 13:53	9/26/2013 13:58	LB4100	GABT13
T4	E2	5	22598	9722	9/26/2013 13:42	9/26/2013 13:47	LB4100	GABT13
T5	E2	5	17592	7367	9/26/2013 14:07	9/26/2013 14:12	LB4100	GABT13
T6	E2	5	19245	9180	9/26/2013 14:00	9/26/2013 14:05	LB4100	GABT13
T7	E2	5	15525	7246	9/26/2013 14:20	9/26/2013 14:25	LB4100	GABT13
T8	E2	5	12674	6310	9/26/2013 14:13	9/26/2013 14:18	LB4100	GABT13
T1	E3	5	55065	15424	9/26/2013 13:42	9/26/2013 13:47	LB4100	GABT13
T2	E3	5	36771	10706	9/26/2013 13:35	9/26/2013 13:40	LB4100	GABT13
T3	E3	5	38761	11254	9/26/2013 13:27	9/26/2013 13:32	LB4100	GABT13
T4	E3	5	28406	8679	9/26/2013 13:53	9/26/2013 13:58	LB4100	GABT13
T5	E3	5	21314	6596	9/26/2013 14:13	9/26/2013 14:18	LB4100	GABT13
T6	E3	5	24023	7941	9/26/2013 14:07	9/26/2013 14:12	LB4100	GABT13
T7	E3	5	19048	6457	9/26/2013 14:00	9/26/2013 14:05	LB4100	GABT13
T8	E3	5	15600	5520	9/26/2013 14:20	9/26/2013 14:25	LB4100	GABT13
T1	E4	5	51629	16770	9/26/2013 13:53	9/26/2013 13:58	LB4100	GABT13
T2	E4	5	34755	11542	9/26/2013 13:42	9/26/2013 13:47	LB4100	GABT13
T3	E4	5	37195	12409	9/26/2013 13:35	9/26/2013 13:40	LB4100	GABT13

T4	E4	5	26585	9273	9/26/2013 13:27	9/26/2013 13:32	LB4100	GABT13
T5	E4	5	20222	7232	9/26/2013 14:20	9/26/2013 14:25	LB4100	GABT13
T6	E4	5	23211	8648	9/26/2013 14:13	9/26/2013 14:18	LB4100	GABT13
T7	E4	5	18446	6952	9/26/2013 14:07	9/26/2013 14:12	LB4100	GABT13
T8	E4	5	14959	6093	9/26/2013 14:00	9/26/2013 14:05	LB4100	GABT13
T1	F1	5	55321	16276	9/26/2013 14:00	9/26/2013 14:05	LB4100	GABT13
T2	F1	5	37122	11365	9/26/2013 14:20	9/26/2013 14:25	LB4100	GABT13
T3	F1	5	39263	11854	9/26/2013 14:13	9/26/2013 14:18	LB4100	GABT13
T4	F1	5	28765	8917	9/26/2013 14:07	9/26/2013 14:12	LB4100	GABT13
T5	F1	5	21963	6860	9/26/2013 13:27	9/26/2013 13:32	LB4100	GABT13
T6	F1	5	24985	8242	9/26/2013 13:53	9/26/2013 13:58	LB4100	GABT13
T7	F1	5	19889	6766	9/26/2013 13:42	9/26/2013 13:47	LB4100	GABT13
T8	F1	5	15956	5655	9/26/2013 13:35	9/26/2013 13:40	LB4100	GABT13
T1	F2	5	48479	17412	9/26/2013 14:07	9/26/2013 14:12	LB4100	GABT13
T2	F2	5	34059	11969	9/26/2013 14:00	9/26/2013 14:05	LB4100	GABT13
T3	F2	5	35641	12470	9/26/2013 14:20	9/26/2013 14:25	LB4100	GABT13
T4	F2	5	26207	9562	9/26/2013 14:13	9/26/2013 14:18	LB4100	GABT13
T5	F2	5	20487	7130	9/26/2013 13:35	9/26/2013 13:40	LB4100	GABT13
T6	F2	5	23397	8633	9/26/2013 13:27	9/26/2013 13:32	LB4100	GABT13
T7	F2	5	18598	6998	9/26/2013 13:53	9/26/2013 13:58	LB4100	GABT13
T8	F2	5	15213	5969	9/26/2013 13:42	9/26/2013 13:47	LB4100	GABT13
T1	F3	5	48976	17852	9/26/2013 14:13	9/26/2013 14:18	LB4100	GABT13
T2	F3	5	32849	12740	9/26/2013 14:07	9/26/2013 14:12	LB4100	GABT13
T3	F3	5	33848	13222	9/26/2013 14:00	9/26/2013 14:05	LB4100	GABT13
T4	F3	5	25199	9935	9/26/2013 14:20	9/26/2013 14:25	LB4100	GABT13
T5	F3	5	18720	7758	9/26/2013 13:42	9/26/2013 13:47	LB4100	GABT13
T6	F3	5	21531	9325	9/26/2013 13:35	9/26/2013 13:40	LB4100	GABT13
T7	F3	5	17356	7466	9/26/2013 13:27	9/26/2013 13:32	LB4100	GABT13
T8	F3	5	13899	6432	9/26/2013 13:53	9/26/2013 13:58	LB4100	GABT13
T1	F4	5	40304	18183	9/26/2013 14:20	9/26/2013 14:25	LB4100	GABT13
T2	F4	5	27326	12871	9/26/2013 14:13	9/26/2013 14:18	LB4100	GABT13
T3	F4	5	27595	13373	9/26/2013 14:07	9/26/2013 14:12	LB4100	GABT13
T4	F4	5	20614	10220	9/26/2013 14:00	9/26/2013 14:05	LB4100	GABT13
T5	F4	5	15894	7888	9/26/2013 13:53	9/26/2013 13:58	LB4100	GABT13
T6	F4	5	17715	9600	9/26/2013 13:42	9/26/2013 13:47	LB4100	GABT13
T7	F4	5	14544	7659	9/26/2013 13:35	9/26/2013 13:40	LB4100	GABT13
T8	F4	5	11508	6560	9/26/2013 13:27	9/26/2013 13:32	LB4100	GABT13

T1	G1	5	48654	15703	9/26/2013 14:28	9/26/2013 14:33	LB4100	GABT13
T2	G1	5	33061	10943	9/26/2013 15:02	9/26/2013 15:07	LB4100	GABT13
T3	G1	5	34912	11786	9/26/2013 14:50	9/26/2013 14:55	LB4100	GABT13
T4	G1	5	25742	8760	9/26/2013 14:42	9/26/2013 14:47	LB4100	GABT13
T5	G1	5	19241	6711	9/26/2013 15:19	9/26/2013 15:24	LB4100	GABT13
T6	G1	5	22059	8209	9/26/2013 15:54	9/26/2013 15:59	LB4100	GABT13
T7	G1	5	17469	6552	9/26/2013 15:42	9/26/2013 15:47	LB4100	GABT13
T8	G1	5	14076	5707	9/26/2013 15:35	9/26/2013 15:40	LB4100	GABT13
T1	G2	5	45998	17116	9/26/2013 14:42	9/26/2013 14:47	LB4100	GABT13
T2	G2	5	32652	11821	9/26/2013 14:28	9/26/2013 14:33	LB4100	GABT13
T3	G2	5	34236	12250	9/26/2013 15:02	9/26/2013 15:07	LB4100	GABT13
T4	G2	5	25392	9536	9/26/2013 14:50	9/26/2013 14:55	LB4100	GABT13
T5	G2	5	19080	7020	9/26/2013 15:35	9/26/2013 15:40	LB4100	GABT13
T6	G2	5	21705	8482	9/26/2013 15:19	9/26/2013 15:24	LB4100	GABT13
T7	G2	5	17585	6818	9/26/2013 15:54	9/26/2013 15:59	LB4100	GABT13
T8	G2	5	14536	5921	9/26/2013 15:42	9/26/2013 15:47	LB4100	GABT13
T1	G3	5	45655	18830	9/26/2013 14:50	9/26/2013 14:55	LB4100	GABT13
T2	G3	5	30893	13616	9/26/2013 14:42	9/26/2013 14:47	LB4100	GABT13
T3	G3	5	31725	13838	9/26/2013 14:28	9/26/2013 14:33	LB4100	GABT13
T4	G3	5	24039	10857	9/26/2013 15:02	9/26/2013 15:07	LB4100	GABT13
T5	G3	5	17765	8124	9/26/2013 15:42	9/26/2013 15:47	LB4100	GABT13
T6	G3	5	20514	9751	9/26/2013 15:35	9/26/2013 15:40	LB4100	GABT13
T7	G3	5	15991	7799	9/26/2013 15:19	9/26/2013 15:24	LB4100	GABT13
T8	G3	5	13332	6921	9/26/2013 15:54	9/26/2013 15:59	LB4100	GABT13
T1	G4	5	49434	16293	9/26/2013 15:02	9/26/2013 15:07	LB4100	GABT13
T2	G4	5	33309	11316	9/26/2013 14:50	9/26/2013 14:55	LB4100	GABT13
T3	G4	5	34769	11615	9/26/2013 14:42	9/26/2013 14:47	LB4100	GABT13
T4	G4	5	25017	8566	9/26/2013 14:28	9/26/2013 14:33	LB4100	GABT13
T5	G4	5	19083	6866	9/26/2013 15:54	9/26/2013 15:59	LB4100	GABT13
T6	G4	5	21931	8243	9/26/2013 15:42	9/26/2013 15:47	LB4100	GABT13
T7	G4	5	17292	6636	9/26/2013 15:35	9/26/2013 15:40	LB4100	GABT13
T8	G4	5	14074	5496	9/26/2013 15:19	9/26/2013 15:24	LB4100	GABT13
T1	H1	5	53647	17654	9/26/2013 15:19	9/26/2013 15:24	LB4100	GABT13
T2	H1	5	36854	12390	9/26/2013 15:54	9/26/2013 15:59	LB4100	GABT13
T3	H1	5	39595	12689	9/26/2013 15:41	9/26/2013 15:46	LB4100	GABT13
T4	H1	5	28707	9816	9/26/2013 15:35	9/26/2013 15:40	LB4100	GABT13
T5	H1	5	20905	7261	9/26/2013 14:28	9/26/2013 14:33	LB4100	GABT13

T6	H1	5	24003	8835	9/26/2013 15:02	9/26/2013 15:07	LB4100	GABT13
T7	H1	5	19658	7080	9/26/2013 14:50	9/26/2013 14:55	LB4100	GABT13
T8	H1	5	15930	6106	9/26/2013 14:41	9/26/2013 14:46	LB4100	GABT13
T1	H2	5	49532	18303	9/26/2013 15:35	9/26/2013 15:40	LB4100	GABT13
T2	H2	5	33034	12943	9/26/2013 15:19	9/26/2013 15:24	LB4100	GABT13
T3	H2	5	35116	13174	9/26/2013 15:54	9/26/2013 15:59	LB4100	GABT13
T4	H2	5	26333	10151	9/26/2013 15:41	9/26/2013 15:46	LB4100	GABT13
T5	H2	5	19122	7632	9/26/2013 14:42	9/26/2013 14:47	LB4100	GABT13
T6	H2	5	21134	9251	9/26/2013 14:28	9/26/2013 14:33	LB4100	GABT13
T7	H2	5	17648	7384	9/26/2013 15:02	9/26/2013 15:07	LB4100	GABT13
T8	H2	5	14137	6232	9/26/2013 14:50	9/26/2013 14:55	LB4100	GABT13
T1	H3	5	51661	18203	9/26/2013 15:41	9/26/2013 15:46	LB4100	GABT13
T2	H3	5	35151	12648	9/26/2013 15:35	9/26/2013 15:40	LB4100	GABT13
T3	H3	5	37786	13422	9/26/2013 15:19	9/26/2013 15:24	LB4100	GABT13
T4	H3	5	27330	10292	9/26/2013 15:54	9/26/2013 15:59	LB4100	GABT13
T5	H3	5	20453	7707	9/26/2013 14:50	9/26/2013 14:55	LB4100	GABT13
T6	H3	5	23536	9227	9/26/2013 14:42	9/26/2013 14:47	LB4100	GABT13
T7	H3	5	18671	7778	9/26/2013 14:28	9/26/2013 14:33	LB4100	GABT13
T8	H3	5	15112	6527	9/26/2013 15:02	9/26/2013 15:07	LB4100	GABT13
T1	H4	5	45198	18323	9/26/2013 15:54	9/26/2013 15:59	LB4100	GABT13
T2	H4	5	31053	12712	9/26/2013 15:41	9/26/2013 15:46	LB4100	GABT13
T3	H4	5	32426	13236	9/26/2013 15:35	9/26/2013 15:40	LB4100	GABT13
T4	H4	5	24380	10279	9/26/2013 15:19	9/26/2013 15:24	LB4100	GABT13
T5	H4	5	18104	7545	9/26/2013 15:02	9/26/2013 15:07	LB4100	GABT13
T6	H4	5	20098	9098	9/26/2013 14:50	9/26/2013 14:55	LB4100	GABT13
T7	H4	5	16273	7376	9/26/2013 14:42	9/26/2013 14:47	LB4100	GABT13
T8	H4	5	13189	6475	9/26/2013 14:28	9/26/2013 14:33	LB4100	GABT13
T1	I1	5	52823	11931	8/10/2013 13:13	8/10/2013 13:18	LB4100	GABT13
T2	I1	5	35693	8251	8/10/2013 14:11	8/10/2013 14:16	LB4100	GABT13
T3	I1	5	37771	8581	8/10/2013 14:01	8/10/2013 14:06	LB4100	GABT13
T4	I1	5	28004	6739	8/10/2013 13:31	8/10/2013 13:36	LB4100	GABT13
T5	I1	5	23164	5724	8/10/2013 14:20	8/10/2013 14:25	LB4100	GABT13
T6	I1	5	23946	6243	8/10/2013 14:51	8/10/2013 14:56	LB4100	GABT13
T7	I1	5	19804	5096	8/10/2013 14:37	8/10/2013 14:42	LB4100	GABT13
T8	I1	5	15669	4416	8/10/2013 14:29	8/10/2013 14:34	LB4100	GABT13
T1	I2	5	58257	12089	8/10/2013 13:31	8/10/2013 13:36	LB4100	GABT13
T2	I2	5	40054	8526	8/10/2013 13:13	8/10/2013 13:18	LB4100	GABT13

T3	I2	5	42404	8887	8/10/2013 14:11	8/10/2013 14:16	LB4100	GABT13
T4	I2	5	31370	6940	8/10/2013 14:01	8/10/2013 14:06	LB4100	GABT13
T5	I2	5	26309	5819	8/10/2013 14:29	8/10/2013 14:34	LB4100	GABT13
T6	I2	5	27501	6280	8/10/2013 14:20	8/10/2013 14:25	LB4100	GABT13
T7	I2	5	22543	5300	8/10/2013 14:51	8/10/2013 14:56	LB4100	GABT13
T8	I2	5	18067	4609	8/10/2013 14:37	8/10/2013 14:42	LB4100	GABT13
T1	I3	5	59102	12219	8/10/2013 14:01	8/10/2013 14:06	LB4100	GABT13
T2	I3	5	41263	8725	8/10/2013 13:31	8/10/2013 13:36	LB4100	GABT13
T3	I3	5	43275	8869	8/10/2013 13:13	8/10/2013 13:18	LB4100	GABT13
T4	I3	5	32321	7260	8/10/2013 14:11	8/10/2013 14:16	LB4100	GABT13
T5	I3	5	26778	6033	8/10/2013 14:37	8/10/2013 14:42	LB4100	GABT13
T6	I3	5	28089	6565	8/10/2013 14:29	8/10/2013 14:34	LB4100	GABT13
T7	I3	5	23008	5459	8/10/2013 14:20	8/10/2013 14:25	LB4100	GABT13
T8	I3	5	18446	4724	8/10/2013 14:51	8/10/2013 14:56	LB4100	GABT13
T1	I4	5	57921	12939	8/10/2013 14:11	8/10/2013 14:16	LB4100	GABT13
T2	I4	5	39818	9188	8/10/2013 14:01	8/10/2013 14:06	LB4100	GABT13
T3	I4	5	42202	9406	8/10/2013 13:31	8/10/2013 13:36	LB4100	GABT13
T4	I4	5	30814	7448	8/10/2013 13:13	8/10/2013 13:18	LB4100	GABT13
T5	I4	5	25516	6146	8/10/2013 14:51	8/10/2013 14:56	LB4100	GABT13
T6	I4	5	27230	6889	8/10/2013 14:37	8/10/2013 14:42	LB4100	GABT13
T7	I4	5	22436	5702	8/10/2013 14:29	8/10/2013 14:34	LB4100	GABT13
T8	I4	5	17951	4895	8/10/2013 14:20	8/10/2013 14:25	LB4100	GABT13
T1	J1	5	55750	12489	8/10/2013 14:20	8/10/2013 14:25	LB4100	GABT13
T2	J1	5	37934	8791	8/10/2013 14:51	8/10/2013 14:56	LB4100	GABT13
T3	J1	5	39810	8953	8/10/2013 14:37	8/10/2013 14:42	LB4100	GABT13
T4	J1	5	28982	6949	8/10/2013 14:29	8/10/2013 14:34	LB4100	GABT13
T5	J1	5	22838	5616	8/10/2013 13:13	8/10/2013 13:18	LB4100	GABT13
T6	J1	5	24534	6400	8/10/2013 14:11	8/10/2013 14:16	LB4100	GABT13
T7	J1	5	20801	5445	8/10/2013 14:01	8/10/2013 14:06	LB4100	GABT13
T8	J1	5	15617	4297	8/10/2013 13:31	8/10/2013 13:36	LB4100	GABT13
T1	J2	5	57503	11286	8/10/2013 14:29	8/10/2013 14:34	LB4100	GABT13
T2	J2	5	39509	8081	8/10/2013 14:20	8/10/2013 14:25	LB4100	GABT13
T3	J2	5	41066	8142	8/10/2013 14:51	8/10/2013 14:56	LB4100	GABT13
T4	J2	5	30691	6240	8/10/2013 14:37	8/10/2013 14:42	LB4100	GABT13
T5	J2	5	24812	5149	8/10/2013 13:31	8/10/2013 13:36	LB4100	GABT13
T6	J2	5	25577	5637	8/10/2013 13:13	8/10/2013 13:18	LB4100	GABT13
T7	J2	5	21740	4862	8/10/2013 14:11	8/10/2013 14:16	LB4100	GABT13

T8	J2	5	16940	4081	8/10/2013 14:01	8/10/2013 14:06	LB4100	GABT13
T1	J3	5	55730	11480	8/10/2013 14:37	8/10/2013 14:42	LB4100	GABT13
T2	J3	5	37407	8279	8/10/2013 14:29	8/10/2013 14:34	LB4100	GABT13
T3	J3	5	39250	8299	8/10/2013 14:20	8/10/2013 14:25	LB4100	GABT13
T4	J3	5	29168	6397	8/10/2013 14:51	8/10/2013 14:56	LB4100	GABT13
T5	J3	5	24012	5482	8/10/2013 14:01	8/10/2013 14:06	LB4100	GABT13
T6	J3	5	23627	5856	8/10/2013 13:31	8/10/2013 13:36	LB4100	GABT13
T7	J3	5	19361	4809	8/10/2013 13:13	8/10/2013 13:18	LB4100	GABT13
T8	J3	5	16147	4260	8/10/2013 14:11	8/10/2013 14:16	LB4100	GABT13
T1	J4	5	56608	12616	8/10/2013 14:51	8/10/2013 14:56	LB4100	GABT13
T2	J4	5	37888	9150	8/10/2013 14:37	8/10/2013 14:42	LB4100	GABT13
T3	J4	5	40729	9145	8/10/2013 14:29	8/10/2013 14:34	LB4100	GABT13
T4	J4	5	29953	7331	8/10/2013 14:20	8/10/2013 14:25	LB4100	GABT13
T5	J4	5	25078	6231	8/10/2013 14:11	8/10/2013 14:16	LB4100	GABT13
T6	J4	5	25327	6687	8/10/2013 14:01	8/10/2013 14:06	LB4100	GABT13
T7	J4	5	20203	5477	8/10/2013 13:31	8/10/2013 13:36	LB4100	GABT13
T8	J4	5	16141	4626	8/10/2013 13:13	8/10/2013 13:18	LB4100	GABT13

Beta Calibration - LB4100 - Sep 2013

Standard Data		
	Isotope	Sr-90
	Standard ID number	0133-T
	Half Life (days)	10555.725
	Std. Act. (dpm/mL)***	55362.7
	Reference Date	4/1/1996
	Volume of spike (mL)	0.5
	Std. Nominal (dpm)	18219.08
	Decay Date	9/9/2013

*** Includes activity of Y-90, which is in equilibrium.

Source Weight	
Source	Measured weight (mg)
1	0.0
2	12.8
3	27.7
4	50.8
5	60.8
6	73.2
7	98.4
8	115.8

The following detectors were not calibrated:

A4

*Background is considered neglible.

**Decay corrected to mid-point of cour

Raw Count Data										
Detector (#)	Source ID (#)	Start Time	Count Time (min)	Beta (counts)	Raw Beta (cpm)	Sr-90 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-90 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
A1	1	9/10/2013 15:42	5	41944	8388.80	8388.80	18217.10	**0.4605**	0.4518
A1	2	9/10/2013 16:05	2	16623	8311.50	8311.50	18217.08	**0.4562**	0.4424
A1	3	9/10/2013 15:59	2	14820	7410.00	7410.00	18217.09	**0.4068**	0.4315
A1	4	9/10/2013 15:54	2	14963	7481.50	7481.50	18217.09	**0.4107**	0.4145
A1	5	9/10/2013 16:09	2	14981	7490.50	7490.50	18217.08	**0.4112**	0.4072
A1	6	9/10/2013 16:22	2	14295	7147.50	7147.50	18217.07	**0.3924**	0.3981
A1	7	9/10/2013 16:18	2	13861	6930.50	6930.50	18217.07	**0.3804**	0.3796
A1	8	9/10/2013 16:15	2	13617	6808.50	6808.50	18217.08	**0.3737**	0.3669
A2	1	9/10/2013 15:54	2	17030	8515.00	8515.00	18217.09	**0.4674**	0.4533
A2	2	9/10/2013 15:42	5	40964	8192.80	8192.80	18217.10	**0.4497**	0.4445
A2	3	9/10/2013 16:05	2	14806	7403.00	7403.00	18217.08	**0.4064**	0.4343
A2	4	9/10/2013 15:59	2	14998	7499.00	7499.00	18217.09	**0.4116**	0.4184
A2	5	9/10/2013 16:15	2	15442	7721.00	7721.00	18217.08	**0.4238**	0.4116
A2	6	9/10/2013 16:09	2	14760	7380.00	7380.00	18217.08	**0.4051**	0.4031
A2	7	9/10/2013 16:22	2	14003	7001.50	7001.50	18217.07	**0.3843**	0.3857
A2	8	9/10/2013 16:18	2	13712	6856.00	6856.00	18217.07	**0.3764**	0.3738
A3	1	9/10/2013 15:59	2	16694	8347.00	8347.00	18217.09	**0.4582**	0.4513
A3	2	9/10/2013 15:54	2	16345	8172.50	8172.50	18217.09	**0.4486**	0.4428
A3	3	9/10/2013 15:42	5	37987	7597.40	7597.40	18217.10	**0.4170**	0.4329
A3	4	9/10/2013 16:05	2	15032	7516.00	7516.00	18217.08	**0.4126**	0.4176
A3	5	9/10/2013 16:18	2	15315	7657.50	7657.50	18217.07	**0.4203**	0.4110
A3	6	9/10/2013 16:15	2	14534	7267.00	7267.00	18217.08	**0.3989**	0.4028
A3	7	9/10/2013 16:09	2	14016	7008.00	7008.00	18217.08	**0.3847**	0.3861
A3	8	9/10/2013 16:22	2	13798	6899.00	6899.00	18217.07	**0.3787**	0.3746
B1	1	9/10/2013 16:09	2	16671	8335.50	8335.50	18217.08	**0.4576**	0.4472
B1	2	9/10/2013 16:22	2	16228	8114.00	8114.00	18217.07	**0.4454**	0.4384
B1	3	9/10/2013 16:18	2	14481	7240.50	7240.50	18217.07	**0.3975**	0.4282
B1	4	9/10/2013 16:15	2	15155	7577.50	7577.50	18217.08	**0.4160**	0.4123
B1	5	9/10/2013 15:42	5	38570	7714.00	7714.00	18217.10	**0.4234**	0.4055
B1	6	9/10/2013 16:05	2	14167	7083.50	7083.50	18217.08	**0.3888**	0.3970
B1	7	9/10/2013 15:59	2	13625	6812.50	6812.50	18217.09	**0.3740**	0.3797
B1	8	9/10/2013 15:54	2	13598	6799.00	6799.00	18217.09	**0.3732**	0.3677
B2	1	9/10/2013 16:15	2	17643	8821.50	8821.50	18217.08	**0.4842**	0.4684
B2	2	9/10/2013 16:09	2	16606	8303.00	8303.00	18217.08	**0.4558**	0.4597
B2	3	9/10/2013 16:22	2	15755	7877.50	7877.50	18217.07	**0.4324**	0.4495
B2	4	9/10/2013 16:18	2	15521	7760.50	7760.50	18217.07	**0.4260**	0.4338
B2	5	9/10/2013 15:54	2	15993	7996.50	7996.50	18217.09	**0.4390**	0.4270
B2	6	9/10/2013 15:42	5	38171	7634.20	7634.20	18217.10	**0.4191**	0.4186
B2	7	9/10/2013 16:05	2	14422	7211.00	7211.00	18217.08	**0.3958**	0.4015
B2	8	9/10/2013 15:59	2	14420	7210.00	7210.00	18217.09	**0.3958**	0.3896
B3	1	9/10/2013 16:19	2	16974	8487.00	8487.00	18217.07	**0.4659**	0.4712
B3	2	9/10/2013 16:15	2	17237	8618.50	8618.50	18217.08	**0.4731**	0.4612
B3	3	9/10/2013 16:09	2	15708	7854.00	7854.00	18217.08	**0.4311**	0.4497
B3	4	9/10/2013 16:22	2	15693	7846.50	7846.50	18217.07	**0.4307**	0.4317
B3	5	9/10/2013 15:59	2	16196	8098.00	8098.00	18217.09	**0.4445**	0.4240

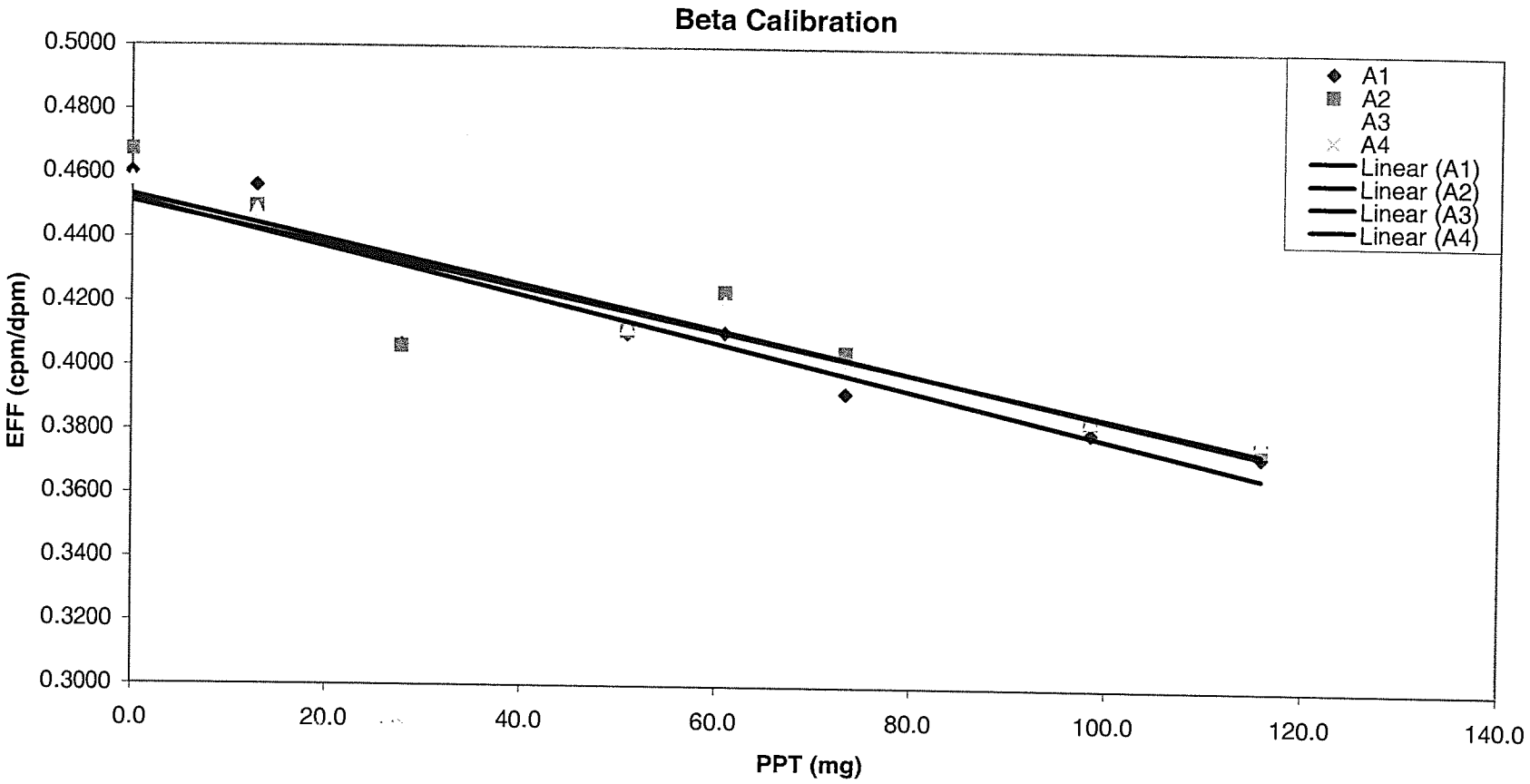
Detector (#)	Source ID (#)	Raw Count Data Start Time	Count Time (min)	Beta (counts)	Raw Beta (cpm)	Sr-90 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-90 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
B3	6	9/10/2013 15:54	2	15101	7550.50	7550.50	18217.09	**0.4145**	0.4143
B3	7	9/10/2013 15:42	5	35723	7144.60	7144.60	18217.10	**0.3922**	0.3947
B3	8	9/10/2013 16:05	2	13702	6851.00	6851.00	18217.08	**0.3761**	0.3812
B4	1	9/10/2013 16:22	2	15385	7692.50	7692.50	18217.07	**0.4223**	0.4119
B4	2	9/10/2013 16:19	2	14759	7379.50	7379.50	18217.07	**0.4051**	0.4053
B4	3	9/10/2013 16:15	2	13746	6873.00	6873.00	18217.08	**0.3773**	0.3976
B4	4	9/10/2013 16:09	2	13793	6896.50	6896.50	18217.08	**0.3786**	0.3857
B4	5	9/10/2013 16:05	2	14250	7125.00	7125.00	18217.08	**0.3911**	0.3805
B4	6	9/10/2013 16:00	2	14077	7038.50	7038.50	18217.09	**0.3864**	0.3741
B4	7	9/10/2013 15:54	2	13103	6551.50	6551.50	18217.09	**0.3596**	0.3611
B4	8	9/10/2013 15:42	5	31691	6338.20	6338.20	18217.10	**0.3479**	0.3521
C1	1	9/9/2013 16:39	2	17220	8610.00	8610.00	18218.25	**0.4726**	0.4618
C1	2	9/9/2013 17:15	2	16587	8293.50	8293.50	18218.22	**0.4552**	0.4537
C1	3	9/9/2013 17:06	2	15382	7691.00	7691.00	18218.23	**0.4222**	0.4443
C1	4	9/9/2013 17:02	2	15389	7694.50	7694.50	18218.23	**0.4224**	0.4296
C1	5	9/9/2013 16:58	2	15925	7962.50	7962.50	18218.24	**0.4371**	0.4233
C1	6	9/9/2013 16:52	2	15427	7713.50	7713.50	18218.24	**0.4234**	0.4154
C1	7	9/9/2013 16:47	2	14394	7197.00	7197.00	18218.24	**0.3950**	0.3994
C1	8	9/9/2013 16:43	2	14144	7072.00	7072.00	18218.25	**0.3882**	0.3884
C2	1	9/9/2013 16:43	2	17907	8953.50	8953.50	18218.25	**0.4915**	0.4808
C2	2	9/9/2013 16:39	2	17359	8679.50	8679.50	18218.25	**0.4764**	0.4709
C2	3	9/9/2013 17:15	2	15716	7858.00	7858.00	18218.22	**0.4313**	0.4593
C2	4	9/9/2013 17:06	2	15736	7868.00	7868.00	18218.23	**0.4319**	0.4413
C2	5	9/9/2013 17:02	2	16600	8300.00	8300.00	18218.23	**0.4556**	0.4336
C2	6	9/9/2013 16:58	2	15578	7789.00	7789.00	18218.24	**0.4275**	0.4239
C2	7	9/9/2013 16:52	2	14551	7275.50	7275.50	18218.24	**0.3994**	0.4043
C2	8	9/9/2013 16:47	2	14259	7129.50	7129.50	18218.24	**0.3913**	0.3908
C3	1	9/9/2013 16:47	2	17961	8980.50	8980.50	18218.24	**0.4929**	0.4816
C3	2	9/9/2013 16:43	2	17295	8647.50	8647.50	18218.25	**0.4747**	0.4720
C3	3	9/9/2013 16:39	2	16131	8065.50	8065.50	18218.25	**0.4427**	0.4609
C3	4	9/9/2013 17:15	2	16057	8028.50	8028.50	18218.22	**0.4407**	0.4436
C3	5	9/9/2013 17:06	2	16003	8001.50	8001.50	18218.23	**0.4392**	0.4361
C3	6	9/9/2013 17:02	2	15550	7775.00	7775.00	18218.23	**0.4268**	0.4268
C3	7	9/9/2013 16:58	2	14930	7465.00	7465.00	18218.24	**0.4098**	0.4080
C3	8	9/9/2013 16:52	2	14472	7236.00	7236.00	18218.24	**0.3972**	0.3950
C4	1	9/9/2013 16:52	2	18081	9040.50	9040.50	18218.24	**0.4962**	0.4817
C4	2	9/9/2013 16:47	2	17321	8660.50	8660.50	18218.24	**0.4754**	0.4724
C4	3	9/9/2013 16:43	2	15903	7951.50	7951.50	18218.25	**0.4365**	0.4615
C4	4	9/9/2013 16:39	2	15908	7954.00	7954.00	18218.25	**0.4366**	0.4446
C4	5	9/9/2013 17:15	2	16579	8289.50	8289.50	18218.22	**0.4550**	0.4373
C4	6	9/9/2013 17:06	2	15400	7700.00	7700.00	18218.23	**0.4227**	0.4283
C4	7	9/9/2013 17:02	2	14945	7472.50	7472.50	18218.23	**0.4102**	0.4099
C4	8	9/9/2013 16:58	2	14593	7296.50	7296.50	18218.24	**0.4005**	0.3972
D1	1	9/9/2013 16:58	2	16225	8112.50	8112.50	18218.24	**0.4453**	0.4505
D1	2	9/9/2013 16:52	2	17018	8509.00	8509.00	18218.24	**0.4671**	0.4440
D1	3	9/9/2013 16:47	2	15340	7670.00	7670.00	18218.24	**0.4210**	0.4363
D1	4	9/9/2013 16:43	2	15210	7605.00	7605.00	18218.25	**0.4174**	0.4245
D1	5	9/9/2013 16:39	2	15139	7569.50	7569.50	18218.25	**0.4155**	0.4194
D1	6	9/9/2013 17:15	2	15215	7607.50	7607.50	18218.22	**0.4176**	0.4130
D1	7	9/9/2013 17:06	2	14693	7346.50	7346.50	18218.23	**0.4032**	0.4001
D1	8	9/9/2013 17:02	2	14275	7137.50	7137.50	18218.23	**0.3918**	0.3911
D2	1	9/9/2013 17:02	2	19299	9649.50	9649.50	18218.23	**0.5297**	0.5181
D2	2	9/9/2013 16:58	2	18598	9299.00	9299.00	18218.24	**0.5104**	0.5086
D2	3	9/9/2013 16:52	2	17475	8737.50	8737.50	18218.24	**0.4796**	0.4976
D2	4	9/9/2013 16:47	2	17380	8690.00	8690.00	18218.24	**0.4770**	0.4804
D2	5	9/9/2013 16:43	2	17604	8802.00	8802.00	18218.25	**0.4831**	0.4730
D2	6	9/9/2013 16:39	2	16484	8242.00	8242.00	18218.25	**0.4524**	0.4638
D2	7	9/9/2013 17:15	2	16650	8325.00	8325.00	18218.22	**0.4570**	0.4451
D2	8	9/9/2013 17:06	2	15653	7826.50	7826.50	18218.23	**0.4296**	0.4322
D3	1	9/9/2013 17:06	2	19375	9687.50	9687.50	18218.23	**0.5317**	0.5192
D3	2	9/9/2013 17:02	2	18612	9306.00	9306.00	18218.23	**0.5108**	0.5095
D3	3	9/9/2013 16:58	2	17451	8725.50	8725.50	18218.24	**0.4789**	0.4983
D3	4	9/9/2013 16:52	2	17221	8610.50	8610.50	18218.24	**0.4726**	0.4808
D3	5	9/9/2013 16:47	2	17654	8827.00	8827.00	18218.24	**0.4845**	0.4733

Detector (#)	Source ID (#)	Raw Count Data Start Time	Count Time (min)	Beta (counts)	Raw Beta (cpm)	Sr-90 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-90 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
D3	6	9/9/2013 16:43	2	16893	8446.50	8446.50	18218.25	**0.4636**	0.4639
D3	7	9/9/2013 16:39	2	16296	8148.00	8148.00	18218.25	**0.4472**	0.4449
D3	8	9/9/2013 17:15	2	15749	7874.50	7874.50	18218.22	**0.4322**	0.4318
D4	1	9/9/2013 17:15	2	19439	9719.50	9719.50	18218.22	**0.5335**	0.5244
D4	2	9/9/2013 17:06	2	18995	9497.50	9497.50	18218.23	**0.5213**	0.5136
D4	3	9/9/2013 17:02	2	17544	8772.00	8772.00	18218.23	**0.4815**	0.5011
D4	4	9/9/2013 16:58	2	17145	8572.50	8572.50	18218.24	**0.4705**	0.4817
D4	5	9/9/2013 16:52	2	17590	8795.00	8795.00	18218.24	**0.4828**	0.4732
D4	6	9/9/2013 16:47	2	16815	8407.50	8407.50	18218.24	**0.4615**	0.4628
D4	7	9/9/2013 16:43	2	16371	8185.50	8185.50	18218.25	**0.4493**	0.4416
D4	8	9/9/2013 16:39	2	15484	7742.00	7742.00	18218.25	**0.4250**	0.4270
E1	1	9/9/2013 14:33	2	16911	8455.50	8455.50	18218.36	**0.4641**	0.4496
E1	2	9/9/2013 15:01	2	16143	8071.50	8071.50	18218.33	**0.4430**	0.4406
E1	3	9/9/2013 14:59	2	14763	7381.50	7381.50	18218.33	**0.4052**	0.4301
E1	4	9/9/2013 14:53	2	14977	7488.50	7488.50	18218.34	**0.4110**	0.4138
E1	5	9/9/2013 14:50	2	15123	7561.50	7561.50	18218.34	**0.4150**	0.4067
E1	6	9/9/2013 14:47	2	14526	7263.00	7263.00	18218.34	**0.3987**	0.3980
E1	7	9/9/2013 14:44	2	13746	6873.00	6873.00	18218.35	**0.3773**	0.3802
E1	8	9/9/2013 14:39	2	13575	6787.50	6787.50	18218.35	**0.3726**	0.3680
E2	1	9/9/2013 14:39	2	16793	8396.50	8396.50	18218.35	**0.4609**	0.4488
E2	2	9/9/2013 14:34	2	16324	8162.00	8162.00	18218.36	**0.4480**	0.4401
E2	3	9/9/2013 15:01	2	14576	7288.00	7288.00	18218.33	**0.4000**	0.4301
E2	4	9/9/2013 14:59	2	14989	7494.50	7494.50	18218.33	**0.4114**	0.4145
E2	5	9/9/2013 14:53	2	15153	7576.50	7576.50	18218.34	**0.4159**	0.4077
E2	6	9/9/2013 14:50	2	14712	7356.00	7356.00	18218.34	**0.4038**	0.3994
E2	7	9/9/2013 14:47	2	13919	6959.50	6959.50	18218.34	**0.3820**	0.3823
E2	8	9/9/2013 14:44	2	13536	6768.00	6768.00	18218.35	**0.3715**	0.3706
E3	1	9/9/2013 14:44	2	16656	8328.00	8328.00	18218.35	**0.4571**	0.4486
E3	2	9/9/2013 14:39	2	16041	8020.50	8020.50	18218.35	**0.4402**	0.4399
E3	3	9/9/2013 14:34	2	14927	7463.50	7463.50	18218.36	**0.4097**	0.4299
E3	4	9/9/2013 15:01	2	15061	7530.50	7530.50	18218.33	**0.4133**	0.4143
E3	5	9/9/2013 14:59	2	15477	7738.50	7738.50	18218.33	**0.4248**	0.4075
E3	6	9/9/2013 14:53	2	14420	7210.00	7210.00	18218.34	**0.3958**	0.3991
E3	7	9/9/2013 14:50	2	13966	6983.00	6983.00	18218.34	**0.3833**	0.3821
E3	8	9/9/2013 14:47	2	13397	6698.50	6698.50	18218.34	**0.3677**	0.3704
E4	1	9/9/2013 14:47	2	17333	8666.50	8666.50	18218.34	**0.4757**	0.4625
E4	2	9/9/2013 14:44	2	16703	8351.50	8351.50	18218.35	**0.4584**	0.4524
E4	3	9/9/2013 14:39	2	15155	7577.50	7577.50	18218.35	**0.4159**	0.4407
E4	4	9/9/2013 14:34	2	15336	7668.00	7668.00	18218.36	**0.4209**	0.4224
E4	5	9/9/2013 15:01	2	15392	7696.00	7696.00	18218.33	**0.4224**	0.4146
E4	6	9/9/2013 14:59	2	14474	7237.00	7237.00	18218.33	**0.3972**	0.4048
E4	7	9/9/2013 14:53	2	14066	7033.00	7033.00	18218.34	**0.3860**	0.3849
E4	8	9/9/2013 14:50	2	13728	6864.00	6864.00	18218.34	**0.3768**	0.3712
F1	1	9/9/2013 14:50	2	17509	8754.50	8754.50	18218.34	**0.4805**	0.4735
F1	2	9/9/2013 14:47	2	17204	8602.00	8602.00	18218.34	**0.4722**	0.4648
F1	3	9/9/2013 14:44	2	15886	7943.00	7943.00	18218.35	**0.4360**	0.4547
F1	4	9/9/2013 14:39	2	15702	7851.00	7851.00	18218.35	**0.4309**	0.4390
F1	5	9/9/2013 14:34	2	16079	8039.50	8039.50	18218.36	**0.4413**	0.4322
F1	6	9/9/2013 15:01	2	15539	7769.50	7769.50	18218.33	**0.4265**	0.4238
F1	7	9/9/2013 14:59	2	14815	7407.50	7407.50	18218.33	**0.4066**	0.4067
F1	8	9/9/2013 14:53	2	14420	7210.00	7210.00	18218.34	**0.3958**	0.3949
F2	1	9/9/2013 14:53	2	16914	8457.00	8457.00	18218.34	**0.4642**	0.4582
F2	2	9/9/2013 14:50	2	16530	8265.00	8265.00	18218.34	**0.4537**	0.4499
F2	3	9/9/2013 14:47	2	15394	7697.00	7697.00	18218.34	**0.4225**	0.4403
F2	4	9/9/2013 14:44	2	15303	7651.50	7651.50	18218.35	**0.4200**	0.4255
F2	5	9/9/2013 14:39	2	15856	7928.00	7928.00	18218.35	**0.4352**	0.4190
F2	6	9/9/2013 14:34	2	15058	7529.00	7529.00	18218.36	**0.4133**	0.4110
F2	7	9/9/2013 15:01	2	14103	7051.50	7051.50	18218.33	**0.3871**	0.3948
F2	8	9/9/2013 14:59	2	14081	7040.50	7040.50	18218.33	**0.3865**	0.3835
F3	1	9/9/2013 14:59	2	17719	8859.50	8859.50	18218.33	**0.4863**	0.4699
F3	2	9/9/2013 14:53	2	16760	8380.00	8380.00	18218.34	**0.4600**	0.4606
F3	3	9/9/2013 14:50	2	15724	7862.00	7862.00	18218.34	**0.4315**	0.4497
F3	4	9/9/2013 14:47	2	15350	7675.00	7675.00	18218.34	**0.4213**	0.4329
F3	5	9/9/2013 14:44	2	15706	7853.00	7853.00	18218.35	**0.4310**	0.4256

Detector (#)	Source ID (#)	Raw Count Data Start Time	Count Time (min)	Beta (counts)	Raw Beta (cpm)	Sr-90 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-90 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
F3	6	9/9/2013 14:39	2	15315	7657.50	7657.50	18218.35	**0.4203**	0.4166
F3	7	9/9/2013 14:34	2	14643	7321.50	7321.50	18218.36	**0.4019**	0.3982
F3	8	9/9/2013 15:01	2	14090	7045.00	7045.00	18218.33	**0.3867**	0.3855
F4	1	9/9/2013 15:01	2	17974	8987.00	8987.00	18218.33	**0.4933**	0.4769
F4	2	9/9/2013 14:59	2	17073	8536.50	8536.50	18218.33	**0.4686**	0.4672
F4	3	9/9/2013 14:53	2	15849	7924.50	7924.50	18218.34	**0.4350**	0.4560
F4	4	9/9/2013 14:50	2	15570	7785.00	7785.00	18218.34	**0.4273**	0.4387
F4	5	9/9/2013 14:47	2	16112	8056.00	8056.00	18218.34	**0.4422**	0.4311
F4	6	9/9/2013 14:44	2	15291	7645.50	7645.50	18218.35	**0.4197**	0.4218
F4	7	9/9/2013 14:39	2	14758	7379.00	7379.00	18218.35	**0.4050**	0.4028
F4	8	9/9/2013 14:34	2	14329	7164.50	7164.50	18218.36	**0.3933**	0.3897
G1	1	9/26/2013 10:36	2	16899	8449.50	8449.50	18198.23	**0.4643**	0.4573
G1	2	9/26/2013 10:53	2	16560	8280.00	8280.00	18198.21	**0.4550**	0.4481
G1	3	9/26/2013 10:46	2	15184	7592.00	7592.00	18198.22	**0.4172**	0.4374
G1	4	9/26/2013 10:40	2	15102	7551.00	7551.00	18198.22	**0.4149**	0.4209
G1	5	9/26/2013 11:00	2	15399	7699.50	7699.50	18198.21	**0.4231**	0.4137
G1	6	9/26/2013 11:31	2	14876	7438.00	7438.00	18198.18	**0.4087**	0.4048
G1	7	9/26/2013 11:25	2	14010	7005.00	7005.00	18198.19	**0.3849**	0.3867
G1	8	9/26/2013 11:03	2	13648	6824.00	6824.00	18198.20	**0.3750**	0.3742
G2	1	9/26/2013 10:40	2	17663	8831.50	8831.50	18198.22	**0.4853**	0.4647
G2	2	9/26/2013 10:36	2	16439	8219.50	8219.50	18198.23	**0.4517**	0.4558
G2	3	9/26/2013 10:53	2	15286	7643.00	7643.00	18198.21	**0.4200**	0.4455
G2	4	9/26/2013 10:46	2	15480	7740.00	7740.00	18198.22	**0.4253**	0.4295
G2	5	9/26/2013 11:03	2	15617	7808.50	7808.50	18198.20	**0.4291**	0.4226
G2	6	9/26/2013 11:00	2	15167	7583.50	7583.50	18198.21	**0.4167**	0.4141
G2	7	9/26/2013 11:31	2	14647	7323.50	7323.50	18198.18	**0.4024**	0.3966
G2	8	9/26/2013 11:25	2	13940	6970.00	6970.00	18198.19	**0.3830**	0.3846
G3	1	9/26/2013 10:46	2	17971	8985.50	8985.50	18198.22	**0.4938**	0.4740
G3	2	9/26/2013 10:40	2	16883	8441.50	8441.50	18198.22	**0.4639**	0.4650
G3	3	9/26/2013 10:36	2	15588	7794.00	7794.00	18198.23	**0.4283**	0.4544
G3	4	9/26/2013 10:53	2	15531	7765.50	7765.50	18198.21	**0.4267**	0.4381
G3	5	9/26/2013 11:25	2	16104	8052.00	8052.00	18198.19	**0.4425**	0.4310
G3	6	9/26/2013 11:03	2	15482	7741.00	7741.00	18198.20	**0.4254**	0.4222
G3	7	9/26/2013 11:00	2	14951	7475.50	7475.50	18198.21	**0.4108**	0.4044
G3	8	9/26/2013 11:31	2	14197	7098.50	7098.50	18198.18	**0.3901**	0.3921
G4	1	9/26/2013 10:53	2	17172	8586.00	8586.00	18198.21	**0.4718**	0.4610
G4	2	9/26/2013 10:46	2	16733	8366.50	8366.50	18198.22	**0.4597**	0.4517
G4	3	9/26/2013 10:40	2	15138	7569.00	7569.00	18198.22	**0.4159**	0.4409
G4	4	9/26/2013 10:36	2	15028	7514.00	7514.00	18198.23	**0.4129**	0.4241
G4	5	9/26/2013 11:31	2	15641	7820.50	7820.50	18198.18	**0.4297**	0.4169
G4	6	9/26/2013 11:25	2	14815	7407.50	7407.50	18198.19	**0.4070**	0.4079
G4	7	9/26/2013 11:03	2	14560	7280.00	7280.00	18198.20	**0.4000**	0.3896
G4	8	9/26/2013 11:00	2	13536	6768.00	6768.00	18198.21	**0.3719**	0.3770
H1	1	9/26/2013 11:00	2	17027	8513.50	8513.50	18198.21	**0.4678**	0.4535
H1	2	9/26/2013 11:31	2	16180	8090.00	8090.00	18198.18	**0.4445**	0.4453
H1	3	9/26/2013 11:25	2	14973	7486.50	7486.50	18198.19	**0.4114**	0.4357
H1	4	9/26/2013 11:03	2	15289	7644.50	7644.50	18198.20	**0.4201**	0.4209
H1	5	9/26/2013 10:36	2	15413	7706.50	7706.50	18198.23	**0.4235**	0.4145
H1	6	9/26/2013 10:53	2	14968	7484.00	7484.00	18198.21	**0.4112**	0.4066
H1	7	9/26/2013 10:46	2	14044	7022.00	7022.00	18198.22	**0.3859**	0.3904
H1	8	9/26/2013 10:40	2	13892	6946.00	6946.00	18198.22	**0.3817**	0.3792
H2	1	9/26/2013 11:03	2	17194	8597.00	8597.00	18198.20	**0.4724**	0.4571
H2	2	9/26/2013 11:00	2	16398	8199.00	8199.00	18198.21	**0.4505**	0.4488
H2	3	9/26/2013 11:31	2	15340	7670.00	7670.00	18198.18	**0.4215**	0.4392
H2	4	9/26/2013 11:25	2	15164	7582.00	7582.00	18198.19	**0.4166**	0.4242
H2	5	9/26/2013 10:40	2	15245	7622.50	7622.50	18198.22	**0.4189**	0.4177
H2	6	9/26/2013 10:36	2	14889	7444.50	7444.50	18198.23	**0.4091**	0.4097
H2	7	9/26/2013 10:53	2	14473	7236.50	7236.50	18198.21	**0.3976**	0.3934
H2	8	9/26/2013 10:46	2	14037	7018.50	7018.50	18198.22	**0.3857**	0.3821
H3	1	9/26/2013 11:25	2	17552	8776.00	8776.00	18198.19	**0.4822**	0.4681
H3	2	9/26/2013 11:03	2	16635	8317.50	8317.50	18198.20	**0.4571**	0.4592
H3	3	9/26/2013 11:00	2	15529	7764.50	7764.50	18198.21	**0.4267**	0.4488
H3	4	9/26/2013 11:31	2	15613	7806.50	7806.50	18198.18	**0.4290**	0.4327
H3	5	9/26/2013 10:46	2	15953	7976.50	7976.50	18198.22	**0.4383**	0.4258

Detector (#)	Source ID (#)	Raw Count Data Start Time	Count Time (min)	Beta (counts)	Raw Beta (cpm)	Sr-90 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-90 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
H3	6	9/26/2013 10:40	2	15329	7664.50	7664.50	18198.22	**0.4212**	0.4172
H3	7	9/26/2013 10:36	2	14369	7184.50	7184.50	18198.23	**0.3948**	0.3996
H3	8	9/26/2013 10:53	2	14185	7092.50	7092.50	18198.21	**0.3897**	0.3875
H4	1	9/26/2013 11:31	2	17097	8548.50	8548.50	18198.18	**0.4697**	0.4567
H4	2	9/26/2013 11:25	2	16376	8188.00	8188.00	18198.19	**0.4499**	0.4479
H4	3	9/26/2013 11:03	2	15008	7504.00	7504.00	18198.20	**0.4123**	0.4378
H4	4	9/26/2013 11:00	2	15103	7551.50	7551.50	18198.21	**0.4150**	0.4220
H4	5	9/26/2013 10:53	2	15640	7820.00	7820.00	18198.21	**0.4297**	0.4152
H4	6	9/26/2013 10:46	2	14911	7455.50	7455.50	18198.22	**0.4097**	0.4068
H4	7	9/26/2013 10:40	2	14298	7149.00	7149.00	18198.22	**0.3928**	0.3896
H4	8	9/26/2013 10:36	2	13628	6814.00	6814.00	18198.23	**0.3744**	0.3777
I1	1	9/9/2013 15:37	2	16107	8053.50	8053.50	18218.30	**0.4421**	0.4342
I1	2	9/9/2013 16:35	2	15780	7890.00	7890.00	18218.25	**0.4331**	0.4262
I1	3	9/9/2013 16:30	2	14528	7264.00	7264.00	18218.26	**0.3987**	0.4169
I1	4	9/9/2013 16:26	2	14324	7162.00	7162.00	18218.26	**0.3931**	0.4026
I1	5	9/9/2013 16:18	2	14933	7466.50	7466.50	18218.27	**0.4098**	0.3963
I1	6	9/9/2013 16:15	2	14042	7021.00	7021.00	18218.27	**0.3854**	0.3886
I1	7	9/9/2013 16:06	2	13572	6786.00	6786.00	18218.28	**0.3725**	0.3729
I1	8	9/9/2013 16:02	2	13304	6652.00	6652.00	18218.28	**0.3651**	0.3621
I2	1	9/9/2013 16:02	2	17133	8566.50	8566.50	18218.28	**0.4702**	0.4599
I2	2	9/9/2013 15:37	2	16766	8383.00	8383.00	18218.30	**0.4601**	0.4503
I2	3	9/9/2013 16:35	2	15058	7529.00	7529.00	18218.25	**0.4133**	0.4390
I2	4	9/9/2013 16:30	2	14984	7492.00	7492.00	18218.26	**0.4112**	0.4216
I2	5	9/9/2013 16:26	2	15544	7772.00	7772.00	18218.26	**0.4266**	0.4141
I2	6	9/9/2013 16:18	2	14785	7392.50	7392.50	18218.27	**0.4058**	0.4047
I2	7	9/9/2013 16:15	2	14052	7026.00	7026.00	18218.27	**0.3857**	0.3857
I2	8	9/9/2013 16:06	2	13662	6831.00	6831.00	18218.28	**0.3750**	0.3726
I3	1	9/9/2013 16:06	2	16777	8388.50	8388.50	18218.28	**0.4604**	0.4503
I3	2	9/9/2013 16:02	2	16493	8246.50	8246.50	18218.28	**0.4526**	0.4413
I3	3	9/9/2013 15:37	2	14621	7310.50	7310.50	18218.30	**0.4013**	0.4308
I3	4	9/9/2013 16:35	2	14775	7387.50	7387.50	18218.25	**0.4055**	0.4145
I3	5	9/9/2013 16:30	2	15367	7683.50	7683.50	18218.26	**0.4217**	0.4075
I3	6	9/9/2013 16:26	2	14583	7291.50	7291.50	18218.26	**0.4002**	0.3988
I3	7	9/9/2013 16:18	2	13862	6931.00	6931.00	18218.27	**0.3804**	0.3811
I3	8	9/9/2013 16:15	2	13509	6754.50	6754.50	18218.27	**0.3708**	0.3688
I4	1	9/9/2013 16:15	2	17024	8512.00	8512.00	18218.27	**0.4672**	0.4572
I4	2	9/9/2013 16:06	2	16421	8210.50	8210.50	18218.28	**0.4507**	0.4478
I4	3	9/9/2013 16:02	2	15315	7657.50	7657.50	18218.28	**0.4203**	0.4368
I4	4	9/9/2013 15:37	2	14962	7481.00	7481.00	18218.30	**0.4106**	0.4197
I4	5	9/9/2013 16:35	2	15512	7756.00	7756.00	18218.25	**0.4257**	0.4123
I4	6	9/9/2013 16:30	2	14499	7249.50	7249.50	18218.26	**0.3979**	0.4032
I4	7	9/9/2013 16:26	2	14177	7088.50	7088.50	18218.26	**0.3891**	0.3846
I4	8	9/9/2013 16:18	2	13548	6774.00	6774.00	18218.27	**0.3718**	0.3717
J1	1	9/9/2013 16:18	2	15980	7990.00	7990.00	18218.27	**0.4386**	0.4284
J1	2	9/9/2013 16:15	2	15477	7738.50	7738.50	18218.27	**0.4248**	0.4207
J1	3	9/9/2013 16:06	2	14175	7087.50	7087.50	18218.28	**0.3890**	0.4118
J1	4	9/9/2013 16:02	2	14437	7218.50	7218.50	18218.28	**0.3962**	0.3979
J1	5	9/9/2013 15:37	2	14668	7334.00	7334.00	18218.30	**0.4026**	0.3919
J1	6	9/9/2013 16:35	2	13906	6953.00	6953.00	18218.25	**0.3817**	0.3845
J1	7	9/9/2013 16:30	2	13573	6786.50	6786.50	18218.26	**0.3725**	0.3693
J1	8	9/9/2013 16:26	2	13047	6523.50	6523.50	18218.26	**0.3581**	0.3589
J2	1	9/9/2013 16:26	2	15826	7913.00	7913.00	18218.26	**0.4343**	0.4244
J2	2	9/9/2013 16:18	2	15410	7705.00	7705.00	18218.27	**0.4229**	0.4160
J2	3	9/9/2013 16:15	2	13921	6960.50	6960.50	18218.27	**0.3821**	0.4062
J2	4	9/9/2013 16:06	2	14028	7014.00	7014.00	18218.28	**0.3850**	0.3911
J2	5	9/9/2013 16:02	2	14510	7255.00	7255.00	18218.28	**0.3982**	0.3845
J2	6	9/9/2013 15:37	2	13767	6883.50	6883.50	18218.30	**0.3778**	0.3764
J2	7	9/9/2013 16:35	2	12780	6390.00	6390.00	18218.25	**0.3507**	0.3598
J2	8	9/9/2013 16:30	2	12959	6479.50	6479.50	18218.26	**0.3557**	0.3484
J3	1	9/9/2013 16:30	2	15950	7975.00	7975.00	18218.26	**0.4377**	0.4263
J3	2	9/9/2013 16:26	2	15398	7699.00	7699.00	18218.26	**0.4226**	0.4177
J3	3	9/9/2013 16:18	2	14110	7055.00	7055.00	18218.27	**0.3872**	0.4077
J3	4	9/9/2013 16:15	2	14013	7006.50	7006.50	18218.27	**0.3846**	0.3922
J3	5	9/9/2013 16:06	2	14341	7170.50	7170.50	18218.28	**0.3936**	0.3855

Detector (#)	Source ID (#)	Raw Count Data Start Time	Count Time (min)	Beta (counts)	Raw Beta (cpm)	Sr-90 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-90 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
J3	6	9/9/2013 16:02	2	13833	6916.50	6916.50	18218.28	**0.3796**	0.3771
J3	7	9/9/2013 15:37	2	12957	6478.50	6478.50	18218.30	**0.3556**	0.3602
J3	8	9/9/2013 16:35	2	12909	6454.50	6454.50	18218.25	**0.3543**	0.3485
J4	1	9/9/2013 16:35	2	15632	7816.00	7816.00	18218.25	**0.4290**	0.4200
J4	2	9/9/2013 16:30	2	15274	7637.00	7637.00	18218.26	**0.4192**	0.4134
J4	3	9/9/2013 16:26	2	13967	6983.50	6983.50	18218.26	**0.3833**	0.4058
J4	4	9/9/2013 16:18	2	14190	7095.00	7095.00	18218.27	**0.3894**	0.3941
J4	5	9/9/2013 16:15	2	14844	7422.00	7422.00	18218.27	**0.4074**	0.3889
J4	6	9/9/2013 16:06	2	13609	6804.50	6804.50	18218.28	**0.3735**	0.3826
J4	7	9/9/2013 16:02	2	13510	6755.00	6755.00	18218.28	**0.3708**	0.3698
J4	8	9/9/2013 15:37	2	13221	6610.50	6610.50	18218.30	**0.3628**	0.3609

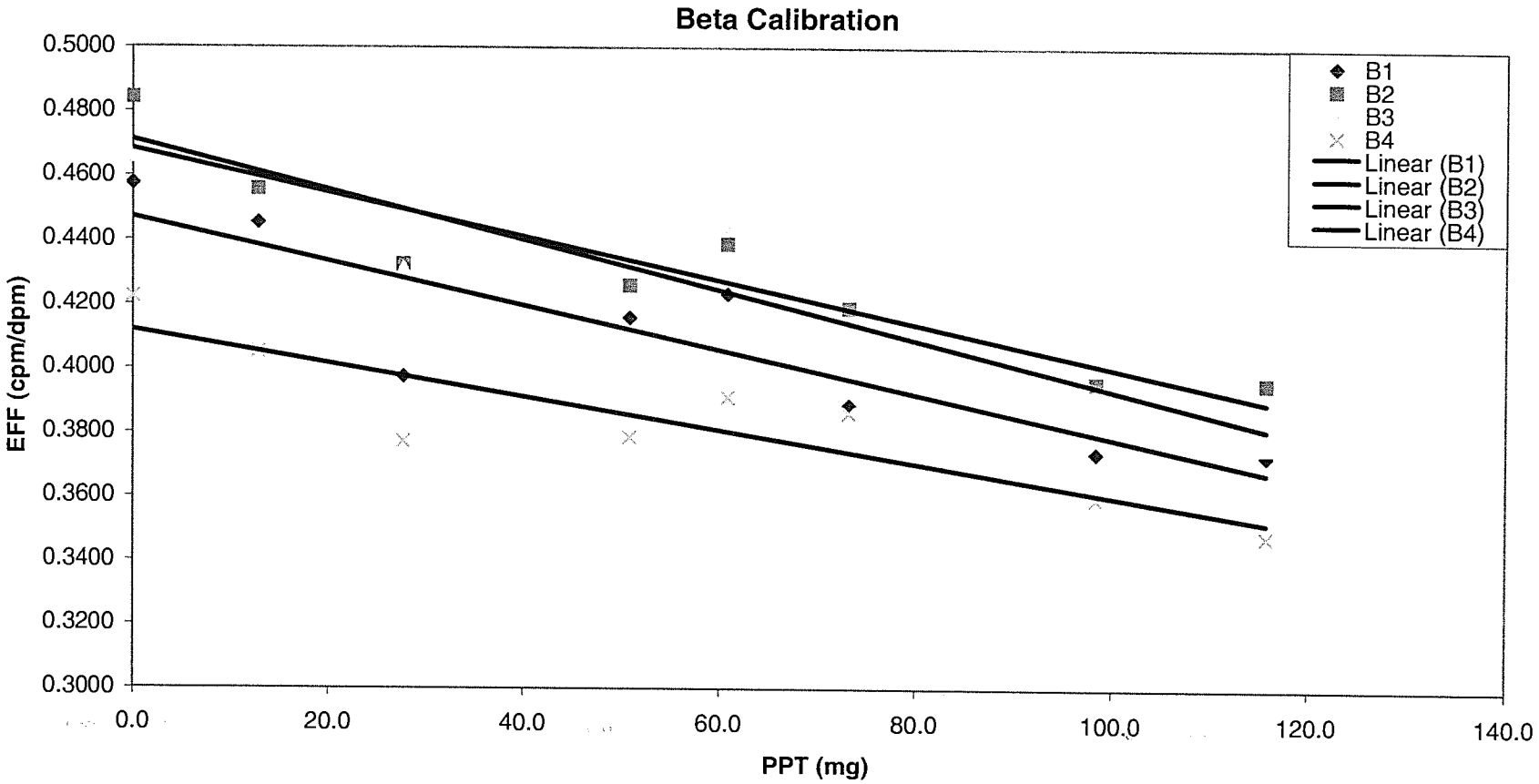


A1 y = -7.333825E-04x + 4.517776E-01

A2 y = -6.868451E-04x + 4.533345E-01

A3 y = -6.621341E-04x + 4.512640E-01

A4

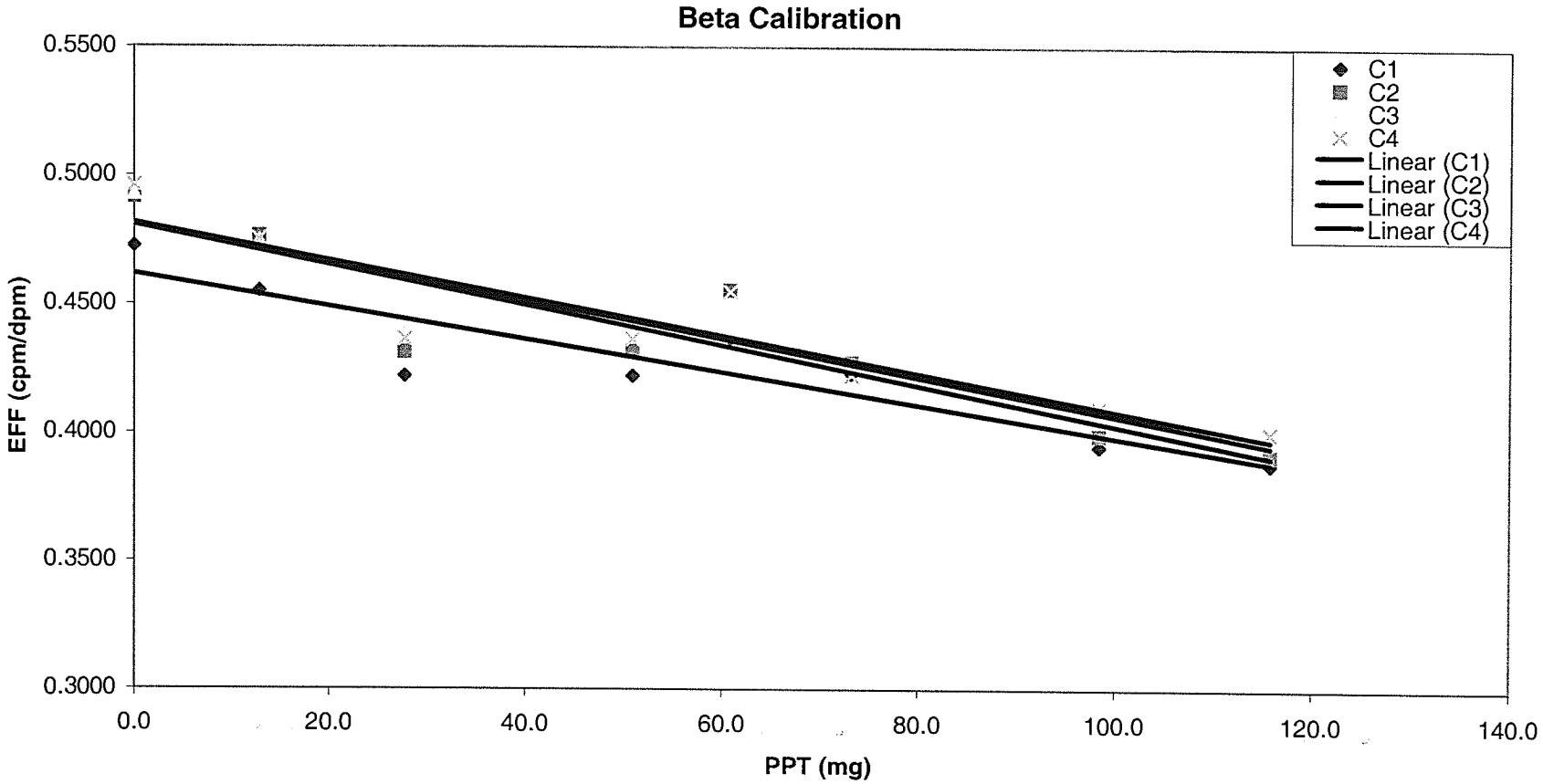


B1 y = -6.861698E-04x + 4.471782E-01

B2 y = -6.800834E-04x + 4.683737E-01

B3 y = -7.768793E-04x + 4.711931E-01

B4 y = -5.172153E-04x + 4.119467E-01

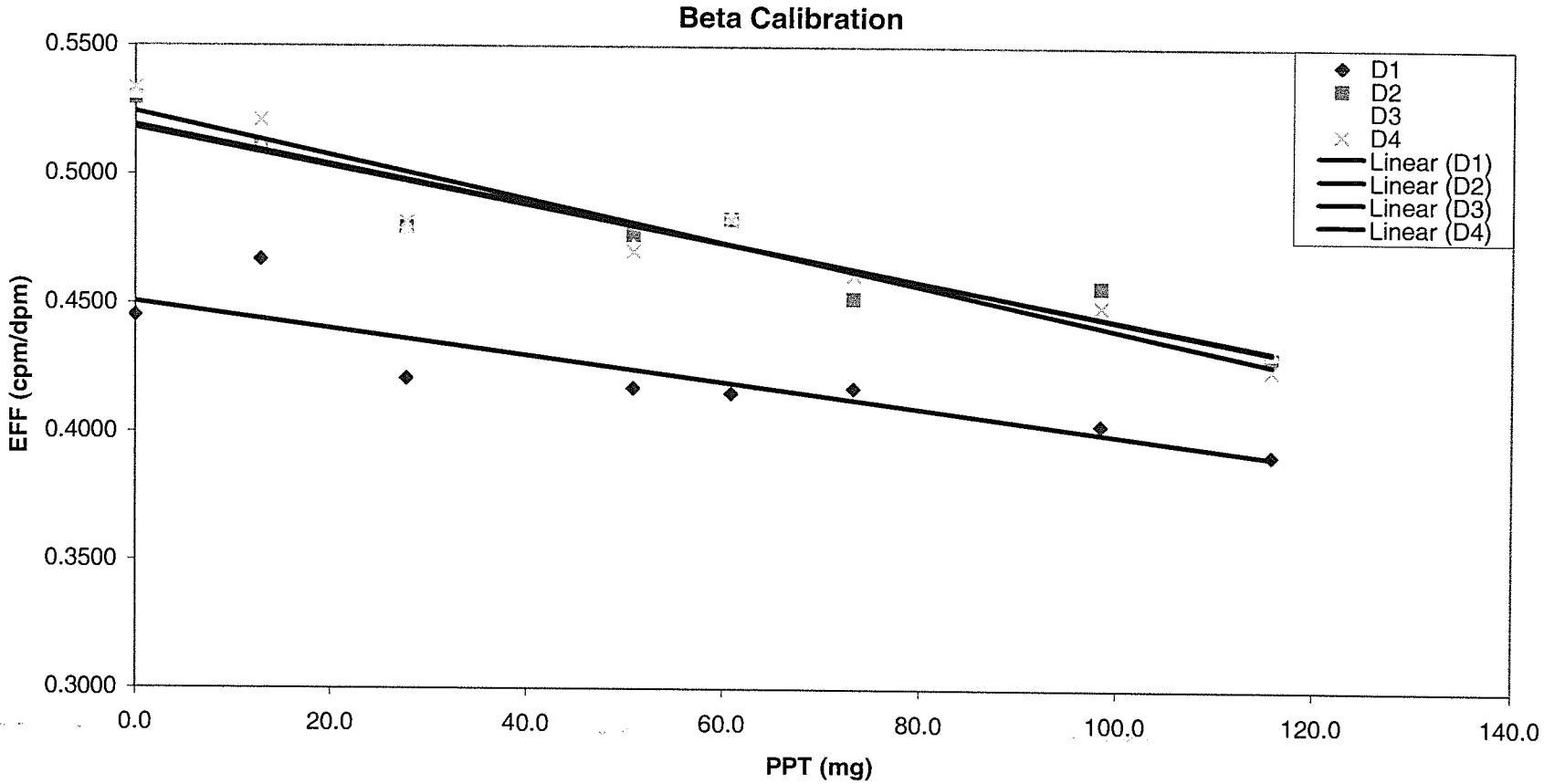


C1 y = -6.342067E-04x + 4.618452E-01

C2 y = -7.778612E-04x + 4.808455E-01

C3 y = -7.480082E-04x + 4.815829E-01

C4 y = -7.294338E-04x + 4.816980E-01

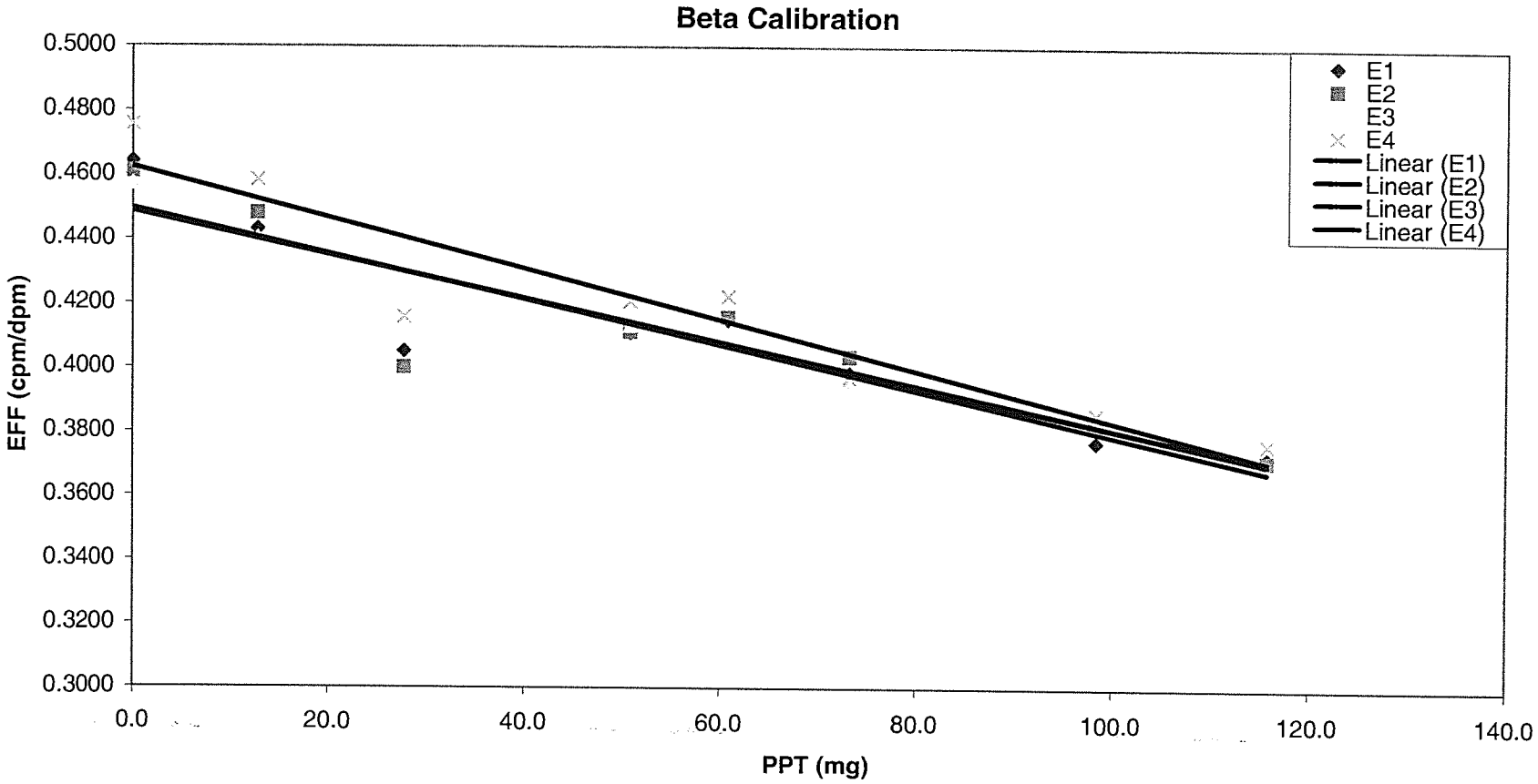


D1 y = -5.129339E-04x + 4.505411E-01

D2 y = -7.418491E-04x + 5.181032E-01

D3 y = -7.543282E-04x + 5.191593E-01

D4 y = -8.414364E-04x + 5.243977E-01

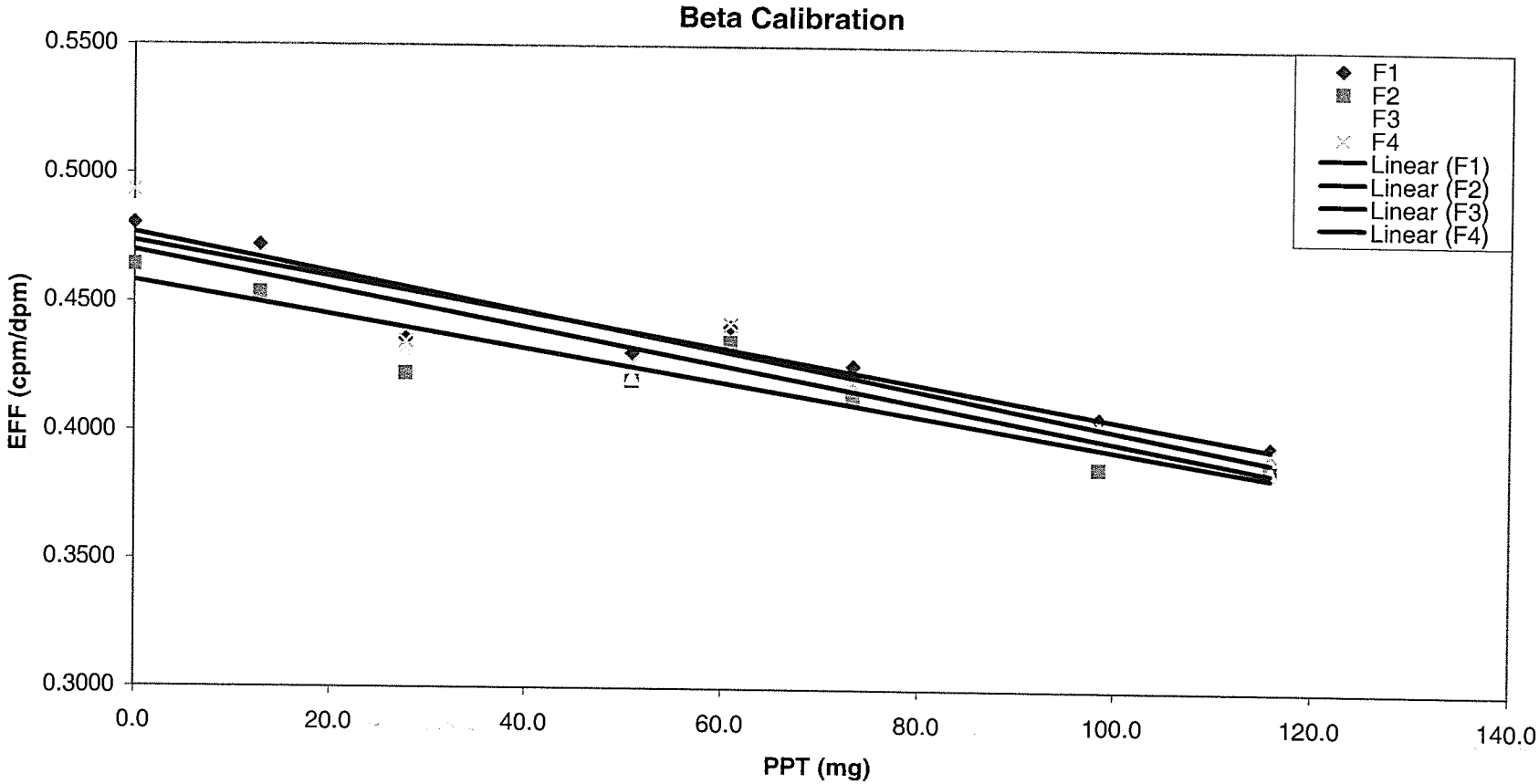


E1 y = -7.049993E-04x + 4.495943E-01

E2 y = -6.749213E-04x + 4.487583E-01

E3 y = -6.755336E-04x + 4.485964E-01

E4 y = -7.886521E-04x + 4.625023E-01

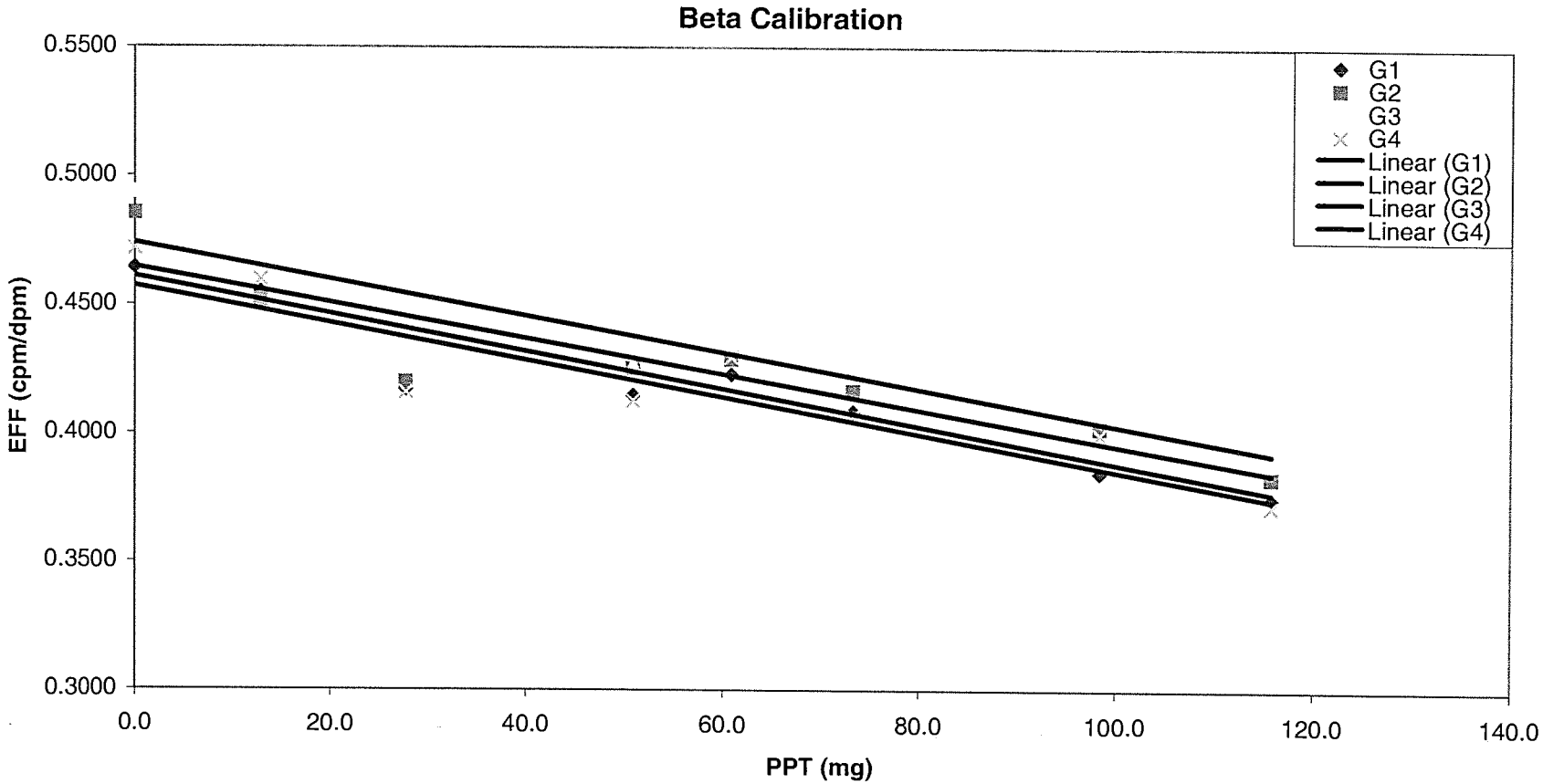


F1 y = -6.791416E-04x + 4.735259E-01

F2 y = -6.446490E-04x + 4.582001E-01

F3 y = -7.287168E-04x + 4.699131E-01

F4 y = -7.526203E-04x + 4.768834E-01

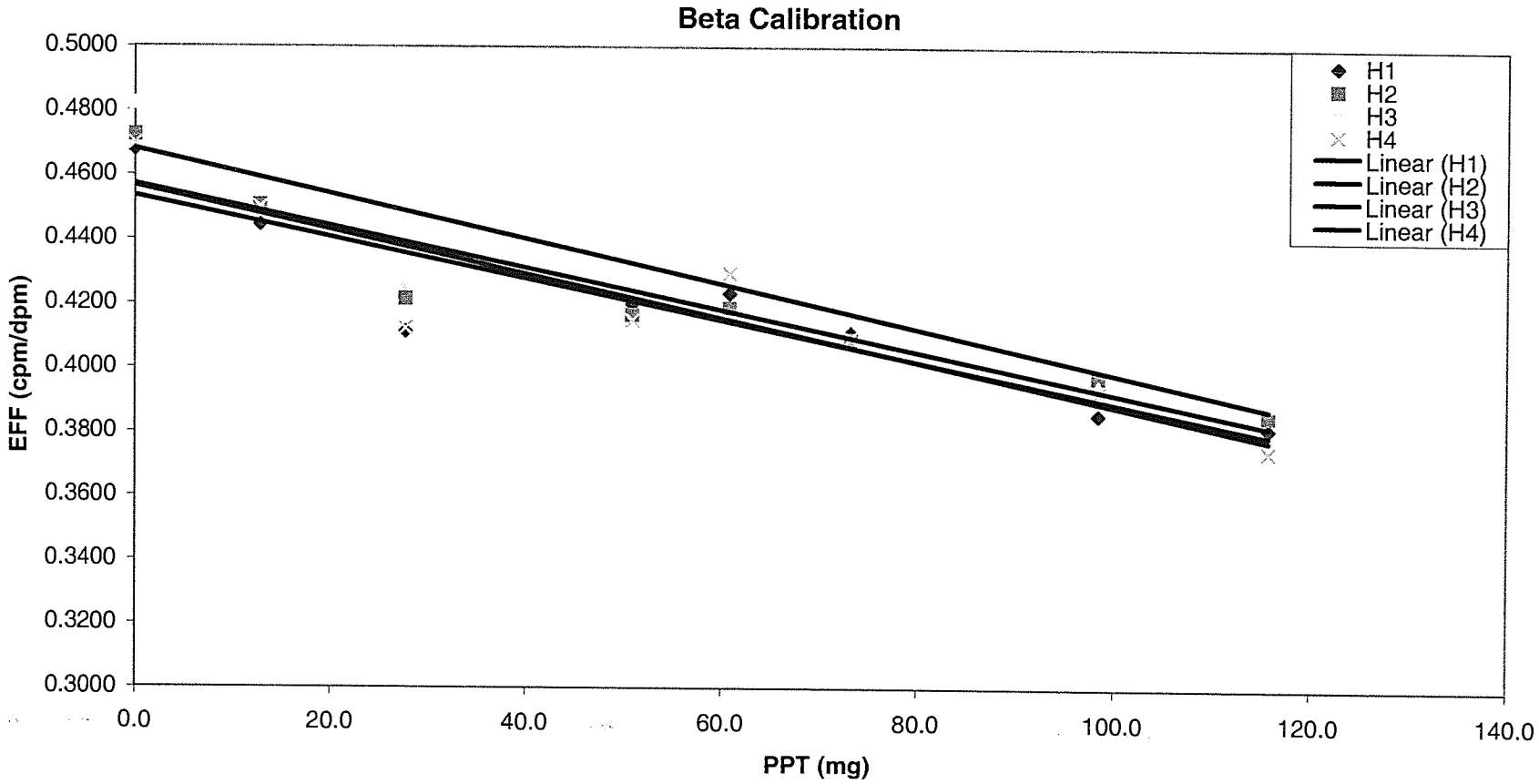


G1 y = -7.176299E-04x + 4.573162E-01

G2 y = -6.917745E-04x + 4.646913E-01

G3 y = -7.075361E-04x + 4.740333E-01

G4 y = -7.255933E-04x + 4.609992E-01

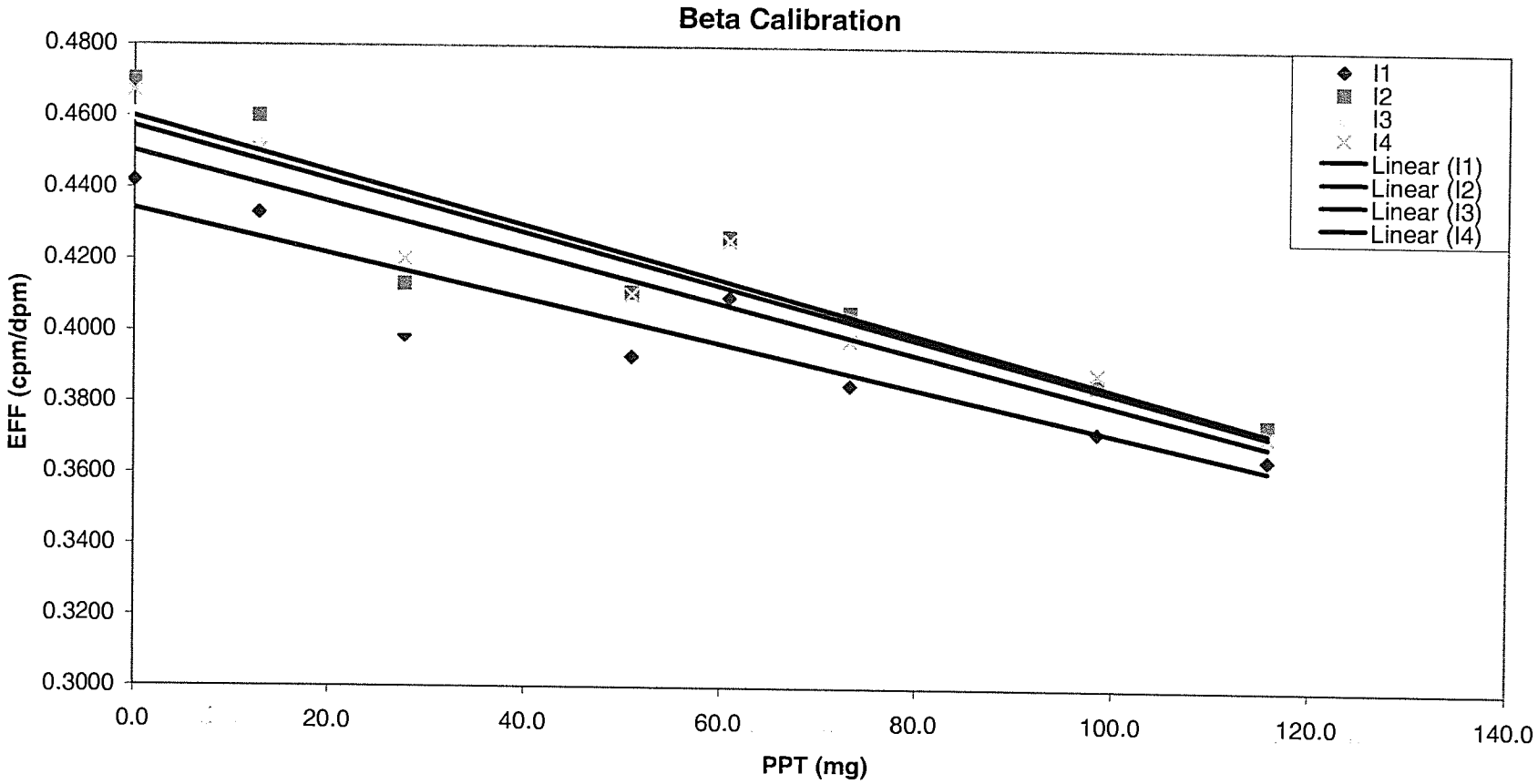


H1 y = -6.411768E-04x + 4.534870E-01

H2 y = -6.478484E-04x + 4.571300E-01

H3 y = -6.955425E-04x + 4.680786E-01

H4 y = -6.818099E-04x + 4.566638E-01

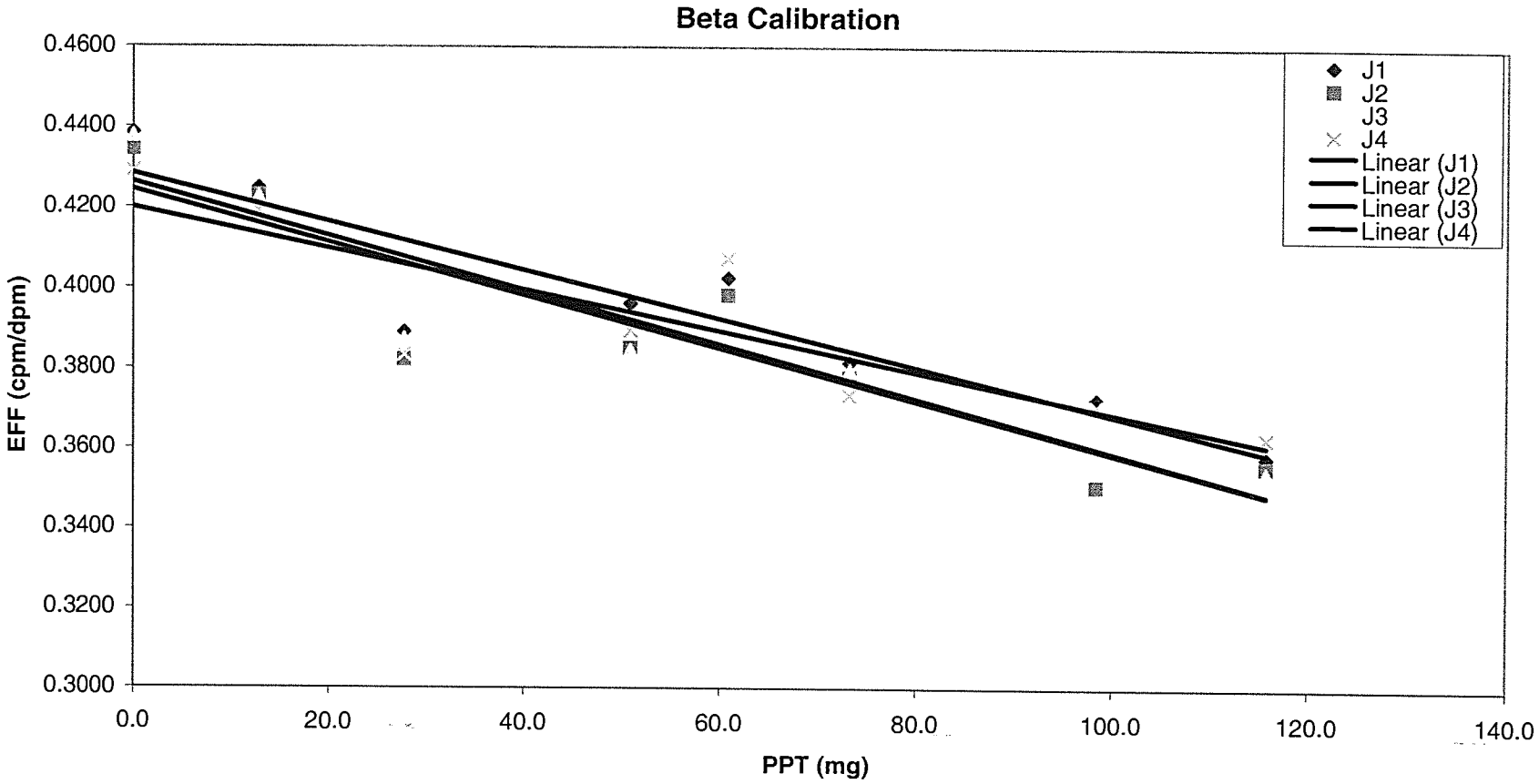


I1 y = -6.226241E-04x + 4.341816E-01

I2 y = -7.543857E-04x + 4.599250E-01

I3 y = -7.030587E-04x + 4.502543E-01

I4 y = -7.384135E-04x + 4.572430E-01



J1 y = -6.005571E-04x + 4.284168E-01

J2 y = -6.563185E-04x + 4.244063E-01

J3 y = -6.718829E-04x + 4.263249E-01

J4 y = -5.104191E-04x + 4.199794E-01

Current Calibration - LB4100

Geometry	2 inch Planchett				
Beta	**Cal Date**	10/1/2013	**Exp Date**	9/30/2014	
LB4100	A0	A1	A2	A3	A4
A1	4.517776E-01	-7.333825E-04			
A2	4.533345E-01	-6.868451E-04			
A3	4.512640E-01	-6.621341E-04			
A4	#N/A	#N/A			
B1	4.471782E-01	-6.861698E-04			
B2	4.683737E-01	-6.800834E-04			
B3	4.711931E-01	-7.768793E-04			
B4	4.119467E-01	-5.172153E-04			
C1	4.618452E-01	-6.342067E-04			
C2	4.808455E-01	-7.778612E-04			
C3	4.815829E-01	-7.480082E-04			
C4	4.816980E-01	-7.294338E-04			
D1	4.505411E-01	-5.129339E-04			
D2	5.181032E-01	-7.418491E-04			
D3	5.191593E-01	-7.543282E-04			
D4	5.243977E-01	-8.414364E-04			
E1	4.495943E-01	-7.049993E-04			
E2	4.487583E-01	-6.749213E-04			
E3	4.485964E-01	-6.755336E-04			
E4	4.625023E-01	-7.886521E-04			
F1	4.735259E-01	-6.791416E-04			
F2	4.582001E-01	-6.446490E-04			
F3	4.699131E-01	-7.287168E-04			
F4	4.768834E-01	-7.526203E-04			
G1	4.573162E-01	-7.176299E-04			
G2	4.646913E-01	-6.917745E-04			
G3	4.740333E-01	-7.075361E-04			
G4	4.609992E-01	-7.255933E-04			
H1	4.534870E-01	-6.411768E-04			
H2	4.571300E-01	-6.478484E-04			
H3	4.680786E-01	-6.955425E-04			
H4	4.566638E-01	-6.818099E-04			
I1	4.341816E-01	-6.226241E-04			
I2	4.599250E-01	-7.543857E-04			
I3	4.502543E-01	-7.030587E-04			
I4	4.572430E-01	-7.384135E-04			
J1	4.284168E-01	-6.005571E-04			
J2	4.244063E-01	-6.563185E-04			
J3	4.263249E-01	-6.718829E-04			
J4	4.199794E-01	-5.104191E-04			

LB4100_Beta_Sep13_RawData.xls

SampleID	Instr	Time (min.)	Alpha Counts	Beta Counts	Count Start Time	Count End Time	Machine	Batch ID
S1	A1	5	0	41944	9/10/2013 15:42	9/10/2013 15:47	LB4100	GABS13
S2	A1	2	2	16623	9/10/2013 16:05	9/10/2013 16:07	LB4100	GABS13
S3	A1	2	0	14820	9/10/2013 15:59	9/10/2013 16:01	LB4100	GABS13
S4	A1	2	1	14963	9/10/2013 15:54	9/10/2013 15:56	LB4100	GABS13
S5	A1	2	2	14981	9/10/2013 16:09	9/10/2013 16:11	LB4100	GABS13
S6	A1	2	3	14295	9/10/2013 16:22	9/10/2013 16:24	LB4100	GABS13
S7	A1	2	2	13861	9/10/2013 16:18	9/10/2013 16:20	LB4100	GABS13
S8	A1	2	1	13617	9/10/2013 16:15	9/10/2013 16:17	LB4100	GABS13
S1	A2	2	2	17030	9/10/2013 15:54	9/10/2013 15:56	LB4100	GABS13
S2	A2	5	7	40964	9/10/2013 15:42	9/10/2013 15:47	LB4100	GABS13
S3	A2	2	0	14806	9/10/2013 16:05	9/10/2013 16:07	LB4100	GABS13
S4	A2	2	1	14998	9/10/2013 15:59	9/10/2013 16:01	LB4100	GABS13
S5	A2	2	2	15442	9/10/2013 16:15	9/10/2013 16:17	LB4100	GABS13
S6	A2	2	5	14760	9/10/2013 16:09	9/10/2013 16:11	LB4100	GABS13
S7	A2	2	3	14003	9/10/2013 16:22	9/10/2013 16:24	LB4100	GABS13
S8	A2	2	3	13712	9/10/2013 16:18	9/10/2013 16:20	LB4100	GABS13
S1	A3	2	1	16694	9/10/2013 15:59	9/10/2013 16:01	LB4100	GABS13
S2	A3	2	0	16345	9/10/2013 15:54	9/10/2013 15:56	LB4100	GABS13
S3	A3	5	3	37987	9/10/2013 15:42	9/10/2013 15:47	LB4100	GABS13
S4	A3	2	1	15032	9/10/2013 16:05	9/10/2013 16:07	LB4100	GABS13
S5	A3	2	4	15315	9/10/2013 16:18	9/10/2013 16:20	LB4100	GABS13
S6	A3	2	3	14534	9/10/2013 16:15	9/10/2013 16:17	LB4100	GABS13
S7	A3	2	1	14016	9/10/2013 16:09	9/10/2013 16:11	LB4100	GABS13
S8	A3	2	3	13798	9/10/2013 16:22	9/10/2013 16:24	LB4100	GABS13
S1	B1	2	1	16671	9/10/2013 16:09	9/10/2013 16:11	LB4100	GABS13
S2	B1	2	3	16228	9/10/2013 16:22	9/10/2013 16:24	LB4100	GABS13
S3	B1	2	1	14481	9/10/2013 16:18	9/10/2013 16:20	LB4100	GABS13
S4	B1	2	2	15155	9/10/2013 16:15	9/10/2013 16:17	LB4100	GABS13
S5	B1	5	8	38570	9/10/2013 15:42	9/10/2013 15:47	LB4100	GABS13
S6	B1	2	1	14167	9/10/2013 16:05	9/10/2013 16:07	LB4100	GABS13
S7	B1	2	2	13625	9/10/2013 15:59	9/10/2013 16:01	LB4100	GABS13
S8	B1	2	4	13598	9/10/2013 15:54	9/10/2013 15:56	LB4100	GABS13
S1	B2	2	2	17643	9/10/2013 16:15	9/10/2013 16:17	LB4100	GABS13
S2	B2	2	1	16606	9/10/2013 16:09	9/10/2013 16:11	LB4100	GABS13
S3	B2	2	3	15755	9/10/2013 16:22	9/10/2013 16:24	LB4100	GABS13
S4	B2	2	1	15521	9/10/2013 16:18	9/10/2013 16:20	LB4100	GABS13

S5	B2	2	1	15993	9/10/2013 15:54	9/10/2013 15:56	LB4100	GABS13
S6	B2	5	9	38171	9/10/2013 15:42	9/10/2013 15:47	LB4100	GABS13
S7	B2	2	1	14422	9/10/2013 16:05	9/10/2013 16:07	LB4100	GABS13
S8	B2	2	4	14420	9/10/2013 15:59	9/10/2013 16:01	LB4100	GABS13
S1	B3	2	1	16974	9/10/2013 16:19	9/10/2013 16:21	LB4100	GABS13
S2	B3	2	2	17237	9/10/2013 16:15	9/10/2013 16:17	LB4100	GABS13
S3	B3	2	4	15708	9/10/2013 16:09	9/10/2013 16:11	LB4100	GABS13
S4	B3	2	1	15693	9/10/2013 16:22	9/10/2013 16:24	LB4100	GABS13
S5	B3	2	1	16196	9/10/2013 15:59	9/10/2013 16:01	LB4100	GABS13
S6	B3	2	1	15101	9/10/2013 15:54	9/10/2013 15:56	LB4100	GABS13
S7	B3	5	3	35723	9/10/2013 15:42	9/10/2013 15:47	LB4100	GABS13
S8	B3	2	3	13702	9/10/2013 16:05	9/10/2013 16:07	LB4100	GABS13
S1	B4	2	2	15385	9/10/2013 16:22	9/10/2013 16:24	LB4100	GABS13
S2	B4	2	5	14759	9/10/2013 16:19	9/10/2013 16:21	LB4100	GABS13
S3	B4	2	1	13746	9/10/2013 16:15	9/10/2013 16:17	LB4100	GABS13
S4	B4	2	1	13793	9/10/2013 16:09	9/10/2013 16:11	LB4100	GABS13
S5	B4	2	4	14250	9/10/2013 16:05	9/10/2013 16:07	LB4100	GABS13
S6	B4	2	0	14077	9/10/2013 16:00	9/10/2013 16:02	LB4100	GABS13
S7	B4	2	2	13103	9/10/2013 15:54	9/10/2013 15:56	LB4100	GABS13
S8	B4	5	5	31691	9/10/2013 15:42	9/10/2013 15:47	LB4100	GABS13
S1	C1	2	3	17220	9/9/2013 16:39	9/9/2013 16:41	LB4100	GABS13
S2	C1	2	2	16587	9/9/2013 17:15	9/9/2013 17:17	LB4100	GABS13
S3	C1	2	1	15382	9/9/2013 17:06	9/9/2013 17:08	LB4100	GABS13
S4	C1	2	1	15389	9/9/2013 17:02	9/9/2013 17:04	LB4100	GABS13
S5	C1	2	5	15925	9/9/2013 16:58	9/9/2013 17:00	LB4100	GABS13
S6	C1	2	3	15427	9/9/2013 16:52	9/9/2013 16:54	LB4100	GABS13
S7	C1	2	4	14394	9/9/2013 16:47	9/9/2013 16:49	LB4100	GABS13
S8	C1	2	6	14144	9/9/2013 16:43	9/9/2013 16:45	LB4100	GABS13
S1	C2	2	0	17907	9/9/2013 16:43	9/9/2013 16:45	LB4100	GABS13
S2	C2	2	4	17359	9/9/2013 16:39	9/9/2013 16:41	LB4100	GABS13
S3	C2	2	0	15716	9/9/2013 17:15	9/9/2013 17:17	LB4100	GABS13
S4	C2	2	1	15736	9/9/2013 17:06	9/9/2013 17:08	LB4100	GABS13
S5	C2	2	0	16600	9/9/2013 17:02	9/9/2013 17:04	LB4100	GABS13
S6	C2	2	2	15578	9/9/2013 16:58	9/9/2013 17:00	LB4100	GABS13
S7	C2	2	2	14551	9/9/2013 16:52	9/9/2013 16:54	LB4100	GABS13
S8	C2	2	5	14259	9/9/2013 16:47	9/9/2013 16:49	LB4100	GABS13
S1	C3	2	0	17961	9/9/2013 16:47	9/9/2013 16:49	LB4100	GABS13

S2	C3	2	0	17295	9/9/2013 16:43	9/9/2013 16:45	LB4100	GABS13
S3	C3	2	4	16131	9/9/2013 16:39	9/9/2013 16:41	LB4100	GABS13
S4	C3	2	3	16057	9/9/2013 17:15	9/9/2013 17:17	LB4100	GABS13
S5	C3	2	1	16003	9/9/2013 17:06	9/9/2013 17:08	LB4100	GABS13
S6	C3	2	0	15550	9/9/2013 17:02	9/9/2013 17:04	LB4100	GABS13
S7	C3	2	4	14930	9/9/2013 16:58	9/9/2013 17:00	LB4100	GABS13
S8	C3	2	2	14472	9/9/2013 16:52	9/9/2013 16:54	LB4100	GABS13
S1	C4	2	0	18081	9/9/2013 16:52	9/9/2013 16:54	LB4100	GABS13
S2	C4	2	1	17321	9/9/2013 16:47	9/9/2013 16:49	LB4100	GABS13
S3	C4	2	2	15903	9/9/2013 16:43	9/9/2013 16:45	LB4100	GABS13
S4	C4	2	1	15908	9/9/2013 16:39	9/9/2013 16:41	LB4100	GABS13
S5	C4	2	2	16579	9/9/2013 17:15	9/9/2013 17:17	LB4100	GABS13
S6	C4	2	2	15400	9/9/2013 17:06	9/9/2013 17:08	LB4100	GABS13
S7	C4	2	3	14945	9/9/2013 17:02	9/9/2013 17:04	LB4100	GABS13
S8	C4	2	2	14593	9/9/2013 16:58	9/9/2013 17:00	LB4100	GABS13
S1	D1	2	1	16225	9/9/2013 16:58	9/9/2013 17:00	LB4100	GABS13
S2	D1	2	4	17018	9/9/2013 16:52	9/9/2013 16:54	LB4100	GABS13
S3	D1	2	1	15340	9/9/2013 16:47	9/9/2013 16:49	LB4100	GABS13
S4	D1	2	0	15210	9/9/2013 16:43	9/9/2013 16:45	LB4100	GABS13
S5	D1	2	1	15139	9/9/2013 16:39	9/9/2013 16:41	LB4100	GABS13
S6	D1	2	3	15215	9/9/2013 17:15	9/9/2013 17:17	LB4100	GABS13
S7	D1	2	0	14693	9/9/2013 17:06	9/9/2013 17:08	LB4100	GABS13
S8	D1	2	1	14275	9/9/2013 17:02	9/9/2013 17:04	LB4100	GABS13
S1	D2	2	2	19299	9/9/2013 17:02	9/9/2013 17:04	LB4100	GABS13
S2	D2	2	0	18598	9/9/2013 16:58	9/9/2013 17:00	LB4100	GABS13
S3	D2	2	1	17475	9/9/2013 16:52	9/9/2013 16:54	LB4100	GABS13
S4	D2	2	0	17380	9/9/2013 16:47	9/9/2013 16:49	LB4100	GABS13
S5	D2	2	1	17604	9/9/2013 16:43	9/9/2013 16:45	LB4100	GABS13
S6	D2	2	5	16484	9/9/2013 16:39	9/9/2013 16:41	LB4100	GABS13
S7	D2	2	1	16650	9/9/2013 17:15	9/9/2013 17:17	LB4100	GABS13
S8	D2	2	4	15653	9/9/2013 17:06	9/9/2013 17:08	LB4100	GABS13
S1	D3	2	1	19375	9/9/2013 17:06	9/9/2013 17:08	LB4100	GABS13
S2	D3	2	3	18612	9/9/2013 17:02	9/9/2013 17:04	LB4100	GABS13
S3	D3	2	1	17451	9/9/2013 16:58	9/9/2013 17:00	LB4100	GABS13
S4	D3	2	1	17221	9/9/2013 16:52	9/9/2013 16:54	LB4100	GABS13
S5	D3	2	1	17654	9/9/2013 16:47	9/9/2013 16:49	LB4100	GABS13
S6	D3	2	1	16893	9/9/2013 16:43	9/9/2013 16:45	LB4100	GABS13

S7	D3	2	0	16296	9/9/2013 16:39	9/9/2013 16:41	LB4100	GABS13
S8	D3	2	4	15749	9/9/2013 17:15	9/9/2013 17:17	LB4100	GABS13
S1	D4	2	1	19439	9/9/2013 17:15	9/9/2013 17:17	LB4100	GABS13
S2	D4	2	4	18995	9/9/2013 17:06	9/9/2013 17:08	LB4100	GABS13
S3	D4	2	3	17544	9/9/2013 17:02	9/9/2013 17:04	LB4100	GABS13
S4	D4	2	1	17145	9/9/2013 16:58	9/9/2013 17:00	LB4100	GABS13
S5	D4	2	1	17590	9/9/2013 16:52	9/9/2013 16:54	LB4100	GABS13
S6	D4	2	2	16815	9/9/2013 16:47	9/9/2013 16:49	LB4100	GABS13
S7	D4	2	3	16371	9/9/2013 16:43	9/9/2013 16:45	LB4100	GABS13
S8	D4	2	3	15484	9/9/2013 16:39	9/9/2013 16:41	LB4100	GABS13
S1	E1	2	2	16911	9/9/2013 14:33	9/9/2013 14:35	LB4100	GABS13
S2	E1	2	1	16143	9/9/2013 15:01	9/9/2013 15:03	LB4100	GABS13
S3	E1	2	2	14763	9/9/2013 14:59	9/9/2013 15:01	LB4100	GABS13
S4	E1	2	1	14977	9/9/2013 14:53	9/9/2013 14:55	LB4100	GABS13
S5	E1	2	1	15123	9/9/2013 14:50	9/9/2013 14:52	LB4100	GABS13
S6	E1	2	2	14526	9/9/2013 14:47	9/9/2013 14:49	LB4100	GABS13
S7	E1	2	1	13746	9/9/2013 14:44	9/9/2013 14:46	LB4100	GABS13
S8	E1	2	0	13575	9/9/2013 14:39	9/9/2013 14:41	LB4100	GABS13
S1	E2	2	0	16793	9/9/2013 14:39	9/9/2013 14:41	LB4100	GABS13
S2	E2	2	4	16324	9/9/2013 14:34	9/9/2013 14:36	LB4100	GABS13
S3	E2	2	1	14576	9/9/2013 15:01	9/9/2013 15:03	LB4100	GABS13
S4	E2	2	1	14989	9/9/2013 14:59	9/9/2013 15:01	LB4100	GABS13
S5	E2	2	1	15153	9/9/2013 14:53	9/9/2013 14:55	LB4100	GABS13
S6	E2	2	4	14712	9/9/2013 14:50	9/9/2013 14:52	LB4100	GABS13
S7	E2	2	4	13919	9/9/2013 14:47	9/9/2013 14:49	LB4100	GABS13
S8	E2	2	6	13536	9/9/2013 14:44	9/9/2013 14:46	LB4100	GABS13
S1	E3	2	1	16656	9/9/2013 14:44	9/9/2013 14:46	LB4100	GABS13
S2	E3	2	3	16041	9/9/2013 14:39	9/9/2013 14:41	LB4100	GABS13
S3	E3	2	0	14927	9/9/2013 14:34	9/9/2013 14:36	LB4100	GABS13
S4	E3	2	1	15061	9/9/2013 15:01	9/9/2013 15:03	LB4100	GABS13
S5	E3	2	3	15477	9/9/2013 14:59	9/9/2013 15:01	LB4100	GABS13
S6	E3	2	3	14420	9/9/2013 14:53	9/9/2013 14:55	LB4100	GABS13
S7	E3	2	2	13966	9/9/2013 14:50	9/9/2013 14:52	LB4100	GABS13
S8	E3	2	2	13397	9/9/2013 14:47	9/9/2013 14:49	LB4100	GABS13
S1	E4	2	1	17333	9/9/2013 14:47	9/9/2013 14:49	LB4100	GABS13
S2	E4	2	1	16703	9/9/2013 14:44	9/9/2013 14:46	LB4100	GABS13
S3	E4	2	3	15155	9/9/2013 14:39	9/9/2013 14:41	LB4100	GABS13

S4	E4	2	3	15336	9/9/2013 14:34	9/9/2013 14:36	LB4100	GABS13
S5	E4	2	3	15392	9/9/2013 15:01	9/9/2013 15:03	LB4100	GABS13
S6	E4	2	3	14474	9/9/2013 14:59	9/9/2013 15:01	LB4100	GABS13
S7	E4	2	0	14066	9/9/2013 14:53	9/9/2013 14:55	LB4100	GABS13
S8	E4	2	2	13728	9/9/2013 14:50	9/9/2013 14:52	LB4100	GABS13
S1	F1	2	1	17509	9/9/2013 14:50	9/9/2013 14:52	LB4100	GABS13
S2	F1	2	4	17204	9/9/2013 14:47	9/9/2013 14:49	LB4100	GABS13
S3	F1	2	0	15886	9/9/2013 14:44	9/9/2013 14:46	LB4100	GABS13
S4	F1	2	3	15702	9/9/2013 14:39	9/9/2013 14:41	LB4100	GABS13
S5	F1	2	3	16079	9/9/2013 14:34	9/9/2013 14:36	LB4100	GABS13
S6	F1	2	2	15539	9/9/2013 15:01	9/9/2013 15:03	LB4100	GABS13
S7	F1	2	5	14815	9/9/2013 14:59	9/9/2013 15:01	LB4100	GABS13
S8	F1	2	1	14420	9/9/2013 14:53	9/9/2013 14:55	LB4100	GABS13
S1	F2	2	2	16914	9/9/2013 14:53	9/9/2013 14:55	LB4100	GABS13
S2	F2	2	2	16530	9/9/2013 14:50	9/9/2013 14:52	LB4100	GABS13
S3	F2	2	1	15394	9/9/2013 14:47	9/9/2013 14:49	LB4100	GABS13
S4	F2	2	1	15303	9/9/2013 14:44	9/9/2013 14:46	LB4100	GABS13
S5	F2	2	3	15856	9/9/2013 14:39	9/9/2013 14:41	LB4100	GABS13
S6	F2	2	1	15058	9/9/2013 14:34	9/9/2013 14:36	LB4100	GABS13
S7	F2	2	1	14103	9/9/2013 15:01	9/9/2013 15:03	LB4100	GABS13
S8	F2	2	1	14081	9/9/2013 14:59	9/9/2013 15:01	LB4100	GABS13
S1	F3	2	2	17719	9/9/2013 14:59	9/9/2013 15:01	LB4100	GABS13
S2	F3	2	3	16760	9/9/2013 14:53	9/9/2013 14:55	LB4100	GABS13
S3	F3	2	1	15724	9/9/2013 14:50	9/9/2013 14:52	LB4100	GABS13
S4	F3	2	2	15350	9/9/2013 14:47	9/9/2013 14:49	LB4100	GABS13
S5	F3	2	1	15706	9/9/2013 14:44	9/9/2013 14:46	LB4100	GABS13
S6	F3	2	2	15315	9/9/2013 14:39	9/9/2013 14:41	LB4100	GABS13
S7	F3	2	1	14643	9/9/2013 14:34	9/9/2013 14:36	LB4100	GABS13
S8	F3	2	2	14090	9/9/2013 15:01	9/9/2013 15:03	LB4100	GABS13
S1	F4	2	5	17974	9/9/2013 15:01	9/9/2013 15:03	LB4100	GABS13
S2	F4	2	1	17073	9/9/2013 14:59	9/9/2013 15:01	LB4100	GABS13
S3	F4	2	2	15849	9/9/2013 14:53	9/9/2013 14:55	LB4100	GABS13
S4	F4	2	2	15570	9/9/2013 14:50	9/9/2013 14:52	LB4100	GABS13
S5	F4	2	1	16112	9/9/2013 14:47	9/9/2013 14:49	LB4100	GABS13
S6	F4	2	2	15291	9/9/2013 14:44	9/9/2013 14:46	LB4100	GABS13
S7	F4	2	1	14758	9/9/2013 14:39	9/9/2013 14:41	LB4100	GABS13
S8	F4	2	1	14329	9/9/2013 14:34	9/9/2013 14:36	LB4100	GABS13

S1	G1	2	1	16899	9/26/2013 10:36	9/26/2013 10:38	LB4100	GABS13
S2	G1	2	0	16560	9/26/2013 10:53	9/26/2013 10:55	LB4100	GABS13
S3	G1	2	1	15184	9/26/2013 10:46	9/26/2013 10:48	LB4100	GABS13
S4	G1	2	2	15102	9/26/2013 10:40	9/26/2013 10:42	LB4100	GABS13
S5	G1	2	3	15399	9/26/2013 11:00	9/26/2013 11:02	LB4100	GABS13
S6	G1	2	1	14876	9/26/2013 11:31	9/26/2013 11:33	LB4100	GABS13
S7	G1	2	2	14010	9/26/2013 11:25	9/26/2013 11:27	LB4100	GABS13
S8	G1	2	1	13648	9/26/2013 11:03	9/26/2013 11:05	LB4100	GABS13
S1	G2	2	0	17663	9/26/2013 10:40	9/26/2013 10:42	LB4100	GABS13
S2	G2	2	1	16439	9/26/2013 10:36	9/26/2013 10:38	LB4100	GABS13
S3	G2	2	2	15286	9/26/2013 10:53	9/26/2013 10:55	LB4100	GABS13
S4	G2	2	4	15480	9/26/2013 10:46	9/26/2013 10:48	LB4100	GABS13
S5	G2	2	4	15617	9/26/2013 11:03	9/26/2013 11:05	LB4100	GABS13
S6	G2	2	1	15167	9/26/2013 11:00	9/26/2013 11:02	LB4100	GABS13
S7	G2	2	6	14647	9/26/2013 11:31	9/26/2013 11:33	LB4100	GABS13
S8	G2	2	3	13940	9/26/2013 11:25	9/26/2013 11:27	LB4100	GABS13
S1	G3	2	0	17971	9/26/2013 10:46	9/26/2013 10:48	LB4100	GABS13
S2	G3	2	1	16883	9/26/2013 10:40	9/26/2013 10:42	LB4100	GABS13
S3	G3	2	3	15588	9/26/2013 10:36	9/26/2013 10:38	LB4100	GABS13
S4	G3	2	8	15531	9/26/2013 10:53	9/26/2013 10:55	LB4100	GABS13
S5	G3	2	7	16104	9/26/2013 11:25	9/26/2013 11:27	LB4100	GABS13
S6	G3	2	2	15482	9/26/2013 11:03	9/26/2013 11:05	LB4100	GABS13
S7	G3	2	4	14951	9/26/2013 11:00	9/26/2013 11:02	LB4100	GABS13
S8	G3	2	3	14197	9/26/2013 11:31	9/26/2013 11:33	LB4100	GABS13
S1	G4	2	0	17172	9/26/2013 10:53	9/26/2013 10:55	LB4100	GABS13
S2	G4	2	4	16733	9/26/2013 10:46	9/26/2013 10:48	LB4100	GABS13
S3	G4	2	1	15138	9/26/2013 10:40	9/26/2013 10:42	LB4100	GABS13
S4	G4	2	4	15028	9/26/2013 10:36	9/26/2013 10:38	LB4100	GABS13
S5	G4	2	4	15641	9/26/2013 11:31	9/26/2013 11:33	LB4100	GABS13
S6	G4	2	3	14815	9/26/2013 11:25	9/26/2013 11:27	LB4100	GABS13
S7	G4	2	1	14560	9/26/2013 11:03	9/26/2013 11:05	LB4100	GABS13
S8	G4	2	2	13536	9/26/2013 11:00	9/26/2013 11:02	LB4100	GABS13
S1	H1	2	0	17027	9/26/2013 11:00	9/26/2013 11:02	LB4100	GABS13
S2	H1	2	0	16180	9/26/2013 11:31	9/26/2013 11:33	LB4100	GABS13
S3	H1	2	4	14973	9/26/2013 11:25	9/26/2013 11:27	LB4100	GABS13
S4	H1	2	3	15289	9/26/2013 11:03	9/26/2013 11:05	LB4100	GABS13
S5	H1	2	0	15413	9/26/2013 10:36	9/26/2013 10:38	LB4100	GABS13

S6	H1	2	5	14968	9/26/2013 10:53	9/26/2013 10:55	LB4100	GABS13
S7	H1	2	0	14044	9/26/2013 10:46	9/26/2013 10:48	LB4100	GABS13
S8	H1	2	7	13892	9/26/2013 10:40	9/26/2013 10:42	LB4100	GABS13
S1	H2	2	1	17194	9/26/2013 11:03	9/26/2013 11:05	LB4100	GABS13
S2	H2	2	2	16398	9/26/2013 11:00	9/26/2013 11:02	LB4100	GABS13
S3	H2	2	2	15340	9/26/2013 11:31	9/26/2013 11:33	LB4100	GABS13
S4	H2	2	7	15164	9/26/2013 11:25	9/26/2013 11:27	LB4100	GABS13
S5	H2	2	2	15245	9/26/2013 10:40	9/26/2013 10:42	LB4100	GABS13
S6	H2	2	1	14889	9/26/2013 10:36	9/26/2013 10:38	LB4100	GABS13
S7	H2	2	0	14473	9/26/2013 10:53	9/26/2013 10:55	LB4100	GABS13
S8	H2	2	2	14037	9/26/2013 10:46	9/26/2013 10:48	LB4100	GABS13
S1	H3	2	1	17552	9/26/2013 11:25	9/26/2013 11:27	LB4100	GABS13
S2	H3	2	2	16635	9/26/2013 11:03	9/26/2013 11:05	LB4100	GABS13
S3	H3	2	2	15529	9/26/2013 11:00	9/26/2013 11:02	LB4100	GABS13
S4	H3	2	6	15613	9/26/2013 11:31	9/26/2013 11:33	LB4100	GABS13
S5	H3	2	5	15953	9/26/2013 10:46	9/26/2013 10:48	LB4100	GABS13
S6	H3	2	3	15329	9/26/2013 10:40	9/26/2013 10:42	LB4100	GABS13
S7	H3	2	4	14369	9/26/2013 10:36	9/26/2013 10:38	LB4100	GABS13
S8	H3	2	1	14185	9/26/2013 10:53	9/26/2013 10:55	LB4100	GABS13
S1	H4	2	0	17097	9/26/2013 11:31	9/26/2013 11:33	LB4100	GABS13
S2	H4	2	4	16376	9/26/2013 11:25	9/26/2013 11:27	LB4100	GABS13
S3	H4	2	0	15008	9/26/2013 11:03	9/26/2013 11:05	LB4100	GABS13
S4	H4	2	1	15103	9/26/2013 11:00	9/26/2013 11:02	LB4100	GABS13
S5	H4	2	1	15640	9/26/2013 10:53	9/26/2013 10:55	LB4100	GABS13
S6	H4	2	2	14911	9/26/2013 10:46	9/26/2013 10:48	LB4100	GABS13
S7	H4	2	5	14298	9/26/2013 10:40	9/26/2013 10:42	LB4100	GABS13
S8	H4	2	1	13628	9/26/2013 10:36	9/26/2013 10:38	LB4100	GABS13
S1	I1	2	0	16107	9/9/2013 15:37	9/9/2013 15:39	LB4100	GABS13
S2	I1	2	4	15780	9/9/2013 16:35	9/9/2013 16:37	LB4100	GABS13
S3	I1	2	2	14528	9/9/2013 16:30	9/9/2013 16:32	LB4100	GABS13
S4	I1	2	3	14324	9/9/2013 16:26	9/9/2013 16:28	LB4100	GABS13
S5	I1	2	3	14933	9/9/2013 16:18	9/9/2013 16:20	LB4100	GABS13
S6	I1	2	6	14042	9/9/2013 16:15	9/9/2013 16:17	LB4100	GABS13
S7	I1	2	0	13572	9/9/2013 16:06	9/9/2013 16:08	LB4100	GABS13
S8	I1	2	5	13304	9/9/2013 16:02	9/9/2013 16:04	LB4100	GABS13
S1	I2	2	1	17133	9/9/2013 16:02	9/9/2013 16:04	LB4100	GABS13
S2	I2	2	1	16766	9/9/2013 15:37	9/9/2013 15:39	LB4100	GABS13

S3	I2	2	2	15058	9/9/2013 16:35	9/9/2013 16:37	LB4100	GABS13
S4	I2	2	1	14984	9/9/2013 16:30	9/9/2013 16:32	LB4100	GABS13
S5	I2	2	1	15544	9/9/2013 16:26	9/9/2013 16:28	LB4100	GABS13
S6	I2	2	2	14785	9/9/2013 16:18	9/9/2013 16:20	LB4100	GABS13
S7	I2	2	1	14052	9/9/2013 16:15	9/9/2013 16:17	LB4100	GABS13
S8	I2	2	3	13662	9/9/2013 16:06	9/9/2013 16:08	LB4100	GABS13
S1	I3	2	3	16777	9/9/2013 16:06	9/9/2013 16:08	LB4100	GABS13
S2	I3	2	2	16493	9/9/2013 16:02	9/9/2013 16:04	LB4100	GABS13
S3	I3	2	3	14621	9/9/2013 15:37	9/9/2013 15:39	LB4100	GABS13
S4	I3	2	3	14775	9/9/2013 16:35	9/9/2013 16:37	LB4100	GABS13
S5	I3	2	1	15367	9/9/2013 16:30	9/9/2013 16:32	LB4100	GABS13
S6	I3	2	2	14583	9/9/2013 16:26	9/9/2013 16:28	LB4100	GABS13
S7	I3	2	2	13862	9/9/2013 16:18	9/9/2013 16:20	LB4100	GABS13
S8	I3	2	1	13509	9/9/2013 16:15	9/9/2013 16:17	LB4100	GABS13
S1	I4	2	1	17024	9/9/2013 16:15	9/9/2013 16:17	LB4100	GABS13
S2	I4	2	0	16421	9/9/2013 16:06	9/9/2013 16:08	LB4100	GABS13
S3	I4	2	1	15315	9/9/2013 16:02	9/9/2013 16:04	LB4100	GABS13
S4	I4	2	2	14962	9/9/2013 15:37	9/9/2013 15:39	LB4100	GABS13
S5	I4	2	2	15512	9/9/2013 16:35	9/9/2013 16:37	LB4100	GABS13
S6	I4	2	3	14499	9/9/2013 16:30	9/9/2013 16:32	LB4100	GABS13
S7	I4	2	2	14177	9/9/2013 16:26	9/9/2013 16:28	LB4100	GABS13
S8	I4	2	3	13548	9/9/2013 16:18	9/9/2013 16:20	LB4100	GABS13
S1	J1	2	3	15980	9/9/2013 16:18	9/9/2013 16:20	LB4100	GABS13
S2	J1	2	3	15477	9/9/2013 16:15	9/9/2013 16:17	LB4100	GABS13
S3	J1	2	2	14175	9/9/2013 16:06	9/9/2013 16:08	LB4100	GABS13
S4	J1	2	2	14437	9/9/2013 16:02	9/9/2013 16:04	LB4100	GABS13
S5	J1	2	0	14668	9/9/2013 15:37	9/9/2013 15:39	LB4100	GABS13
S6	J1	2	2	13906	9/9/2013 16:35	9/9/2013 16:37	LB4100	GABS13
S7	J1	2	4	13573	9/9/2013 16:30	9/9/2013 16:32	LB4100	GABS13
S8	J1	2	2	13047	9/9/2013 16:26	9/9/2013 16:28	LB4100	GABS13
S1	J2	2	5	15826	9/9/2013 16:26	9/9/2013 16:28	LB4100	GABS13
S2	J2	2	0	15410	9/9/2013 16:18	9/9/2013 16:20	LB4100	GABS13
S3	J2	2	4	13921	9/9/2013 16:15	9/9/2013 16:17	LB4100	GABS13
S4	J2	2	3	14028	9/9/2013 16:06	9/9/2013 16:08	LB4100	GABS13
S5	J2	2	5	14510	9/9/2013 16:02	9/9/2013 16:04	LB4100	GABS13
S6	J2	2	4	13767	9/9/2013 15:37	9/9/2013 15:39	LB4100	GABS13
S7	J2	2	2	12780	9/9/2013 16:35	9/9/2013 16:37	LB4100	GABS13

S8	J2	2	3	12959	9/9/2013 16:30	9/9/2013 16:32	LB4100	GABS13
S1	J3	2	3	15950	9/9/2013 16:30	9/9/2013 16:32	LB4100	GABS13
S2	J3	2	1	15398	9/9/2013 16:26	9/9/2013 16:28	LB4100	GABS13
S3	J3	2	0	14110	9/9/2013 16:18	9/9/2013 16:20	LB4100	GABS13
S4	J3	2	3	14013	9/9/2013 16:15	9/9/2013 16:17	LB4100	GABS13
S5	J3	2	1	14341	9/9/2013 16:06	9/9/2013 16:08	LB4100	GABS13
S6	J3	2	2	13833	9/9/2013 16:02	9/9/2013 16:04	LB4100	GABS13
S7	J3	2	1	12957	9/9/2013 15:37	9/9/2013 15:39	LB4100	GABS13
S8	J3	2	2	12909	9/9/2013 16:35	9/9/2013 16:37	LB4100	GABS13
S1	J4	2	1	15632	9/9/2013 16:35	9/9/2013 16:37	LB4100	GABS13
S2	J4	2	3	15274	9/9/2013 16:30	9/9/2013 16:32	LB4100	GABS13
S3	J4	2	4	13967	9/9/2013 16:26	9/9/2013 16:28	LB4100	GABS13
S4	J4	2	1	14190	9/9/2013 16:18	9/9/2013 16:20	LB4100	GABS13
S5	J4	2	2	14844	9/9/2013 16:15	9/9/2013 16:17	LB4100	GABS13
S6	J4	2	4	13609	9/9/2013 16:06	9/9/2013 16:08	LB4100	GABS13
S7	J4	2	2	13510	9/9/2013 16:02	9/9/2013 16:04	LB4100	GABS13
S8	J4	2	1	13221	9/9/2013 15:37	9/9/2013 15:39	LB4100	GABS13

Alpha Xtalk Calibration - LB4100 - Sep 2013

Standard Data		
	Isotope	Po-210
	Standard ID number	1673-A
	Half Life (days)	138.38
	Std. Act. (dpm/mL)	22622.4159
	Reference Date	8/1/2013
	Volume of spike (mL)	2.0
	Std. Nominal (dpm)	33668.30
	Decay Date	9/29/2013

Source Weight	
Source	Measured weight (mg)
1	0.0
2	3.3
3	6.5
4	16.4
5	32.1
6	47.6
7	65.0
8	79.5

Raw Count Data						Po-210	Source	Calculated
Detector (#)	Source ID (#)	Start Time	Count Time (min)	Alpha (counts)	Beta (counts)	Xtalk (Beta/Alpha)	Measured Weight	Xtalk (Beta/Alpha)
A1	1	9/30/2013 20:39	3	18420	449	**2.4376%**	0.0	3.0202%
A1	2	9/30/2013 21:11	3	17017	699	**4.1077%**	3.3	3.6404%
A1	3	9/30/2013 21:07	3	14238	604	**4.2422%**	6.5	4.1350%
A1	4	9/30/2013 21:03	3	13822	765	**5.5347%**	16.4	5.0877%
A1	5	9/30/2013 20:59	3	12940	601	**4.6445%**	32.1	5.2892%
A1	6	9/30/2013 20:54	3	13622	643	**4.7203%**	47.6	4.7367%
A1	7	9/30/2013 20:49	3	11092	530	**4.7782%**	65.0	4.3805%
A1	8	9/30/2013 20:44	3	11112	559	**5.0306%**	79.5	5.2061%
A2	1	9/30/2013 20:44	3	21350	309	**1.4473%**	0.0	1.8687%
A2	2	9/30/2013 20:39	3	20911	516	**2.4676%**	3.3	2.2082%
A2	3	9/30/2013 21:11	3	16834	479	**2.8454%**	6.5	2.4813%
A2	4	9/30/2013 21:07	3	17395	499	**2.8686%**	16.4	3.0252%
A2	5	9/30/2013 21:03	3	15350	499	**3.2508%**	32.1	3.2211%
A2	6	9/30/2013 20:59	3	16643	462	**2.7759%**	47.6	3.0690%
A2	7	9/30/2013 20:54	3	12873	447	**3.4724%**	65.0	3.1288%
A2	8	9/30/2013 20:49	3	12744	477	**3.7429%**	79.5	3.8686%
A3	1	9/30/2013 20:49	3	21169	381	**1.7998%**	0.0	2.0645%
A3	2	9/30/2013 20:44	3	21072	531	**2.5199%**	3.3	2.3576%
A3	3	9/30/2013 20:39	3	16705	457	**2.7357%**	6.5	2.5951%
A3	4	9/30/2013 21:11	3	16784	538	**3.2054%**	16.4	3.0784%
A3	5	9/30/2013 21:07	3	15202	464	**3.0522%**	32.1	3.2803%
A3	6	9/30/2013 21:03	3	16169	504	**3.1171%**	47.6	3.1698%
A3	7	9/30/2013 20:59	3	12898	438	**3.3959%**	65.0	3.1963%
A3	8	9/30/2013 20:54	3	12720	466	**3.6635%**	79.5	3.7475%
A4	2	9/30/2013 20:53	0	0	78	**#DIV/0!**	3.3	#VALUE!
A4	3	9/30/2013 20:48	0.01	0	340	**#DIV/0!**	6.5	#VALUE!
A4	4	9/30/2013 20:43	0.01	0	407	**#DIV/0!**	16.4	#VALUE!
A4	6	9/30/2013 21:11	0	0	40	**#DIV/0!**	47.6	#VALUE!
A4	7	9/30/2013 21:07	0.01	0	155	**#DIV/0!**	65.0	#VALUE!
A4	8	9/30/2013 21:02	0	0	13	**#DIV/0!**	79.5	#VALUE!
B1	1	9/30/2013 20:59	3	25567	240	**0.9387%**	0.0	1.0018%
B1	2	9/30/2013 20:54	3	26019	284	**1.0915%**	3.3	1.2074%
B1	3	9/30/2013 20:49	3	21567	348	**1.6136%**	6.5	1.3723%
B1	4	9/30/2013 20:44	3	21292	361	**1.6955%**	16.4	1.6966%
B1	5	9/30/2013 20:39	3	19174	324	**1.6898%**	32.1	1.7965%
B1	6	9/30/2013 21:11	3	20279	343	**1.6914%**	47.6	1.6725%

Raw Count Data						Po-210	Source	Calculated
Detector (#)	Source ID (#)	Start Time	Count Time (min)	Alpha (counts)	Beta (counts)	Xtalk (Beta/Alpha)	Measured Weight	Xtalk (Beta/Alpha)
B1	7	9/30/2013 21:07	3	16560	283	1.7089%	65.0	1.6565%
B1	8	9/30/2013 21:03	3	16423	332	2.0216%	79.5	2.0474%
B2	1	9/30/2013 21:03	3	21163	337	1.5924%	0.0	1.8229%
B2	2	9/30/2013 20:59	3	21588	489	2.2651%	3.3	2.1278%
B2	3	9/30/2013 20:54	3	17391	446	2.5645%	6.5	2.3850%
B2	4	9/30/2013 20:49	3	17754	521	2.9345%	16.4	2.9696%
B2	5	9/30/2013 20:44	3	15805	537	3.3977%	32.1	3.4004%
B2	6	9/30/2013 20:39	3	16842	556	3.3013%	47.6	3.4987%
B2	7	9/30/2013 21:11	3	13040	500	3.8344%	65.0	3.6004%
B2	8	9/30/2013 21:07	3	13210	514	3.8910%	79.5	3.9761%
B3	1	9/30/2013 21:07	3	20623	293	1.4207%	0.0	1.6353%
B3	2	9/30/2013 21:03	3	20881	450	2.1551%	3.3	2.0307%
B3	3	9/30/2013 20:59	3	16898	415	2.4559%	6.5	2.3488%
B3	4	9/30/2013 20:54	3	16662	518	3.1089%	16.4	2.9785%
B3	5	9/30/2013 20:49	3	15515	463	2.9842%	32.1	3.1663%
B3	6	9/30/2013 20:44	3	16644	463	2.7818%	47.6	2.8704%
B3	7	9/30/2013 20:39	3	13813	396	2.8669%	65.0	2.6603%
B3	8	9/30/2013 21:11	3	13263	404	3.0461%	79.5	3.1292%
B4	1	9/30/2013 21:11	3	20779	357	1.7181%	0.0	1.7265%
B4	2	9/30/2013 21:07	3	20600	437	2.1214%	3.3	2.0106%
B4	3	9/30/2013 21:03	3	17014	346	2.0336%	6.5	2.2493%
B4	4	9/30/2013 20:59	3	16641	494	2.9686%	16.4	2.7837%
B4	5	9/30/2013 20:54	3	14997	465	3.1006%	32.1	3.1347%
B4	6	9/30/2013 20:49	3	15880	475	2.9912%	47.6	3.1170%
B4	7	9/30/2013 20:44	3	12666	396	3.1265%	65.0	2.9927%
B4	8	9/30/2013 20:39	3	12961	391	3.0167%	79.5	3.0621%
C1	1	9/30/2013 19:17	3	24513	279	1.1382%	0.0	1.2529%
C1	2	9/30/2013 19:55	3	24409	409	1.6756%	3.3	1.4374%
C1	3	9/30/2013 19:50	3	21052	322	1.5295%	6.5	1.5913%
C1	4	9/30/2013 19:44	3	19491	345	1.7700%	16.4	1.9272%
C1	5	9/30/2013 19:39	3	17773	409	2.3012%	32.1	2.1156%
C1	6	9/30/2013 19:33	3	18187	348	1.9135%	47.6	2.0411%
C1	7	9/30/2013 19:29	3	15759	301	1.9100%	65.0	1.8640%
C1	8	9/30/2013 19:22	3	15371	277	1.8021%	79.5	1.8107%
C2	1	9/30/2013 19:22	3	20716	461	2.2253%	0.0	2.6347%
C2	2	9/30/2013 19:17	3	20160	678	3.3631%	3.3	2.8830%
C2	3	9/30/2013 19:55	3	17390	521	2.9960%	6.5	3.0964%
C2	4	9/30/2013 19:50	3	16370	636	3.8852%	16.4	3.6002%
C2	5	9/30/2013 19:44	3	14635	531	3.6283%	32.1	3.9980%
C2	6	9/30/2013 19:39	3	15254	615	4.0317%	47.6	4.0501%
C2	7	9/30/2013 19:33	3	12680	525	4.1404%	65.0	3.9043%
C2	8	9/30/2013 19:29	3	12530	460	3.6712%	79.5	3.7744%
C3	1	9/30/2013 19:29	3	17189	463	2.6936%	0.0	2.9940%
C3	2	9/30/2013 19:22	3	17465	653	3.7389%	3.3	3.3914%
C3	3	9/30/2013 19:17	3	13556	495	3.6515%	6.5	3.7232%
C3	4	9/30/2013 19:55	3	13938	642	4.6061%	16.4	4.4555%
C3	5	9/30/2013 19:50	3	12360	606	4.9029%	32.1	4.9161%
C3	6	9/30/2013 19:44	3	12886	580	4.5010%	47.6	4.8915%
C3	7	9/30/2013 19:39	3	10566	553	5.2338%	65.0	4.8053%
C3	8	9/30/2013 19:33	3	10777	532	4.9364%	79.5	5.0872%
C4	1	9/30/2013 19:34	3	14662	381	2.5986%	0.0	3.0440%
C4	2	9/30/2013 19:29	3	15327	549	3.5819%	3.3	3.4183%
C4	3	9/30/2013 19:22	3	12549	520	4.1438%	6.5	3.7383%
C4	4	9/30/2013 19:17	3	11890	547	4.6005%	16.4	4.4892%
C4	5	9/30/2013 19:55	3	11266	545	4.8376%	32.1	5.0995%

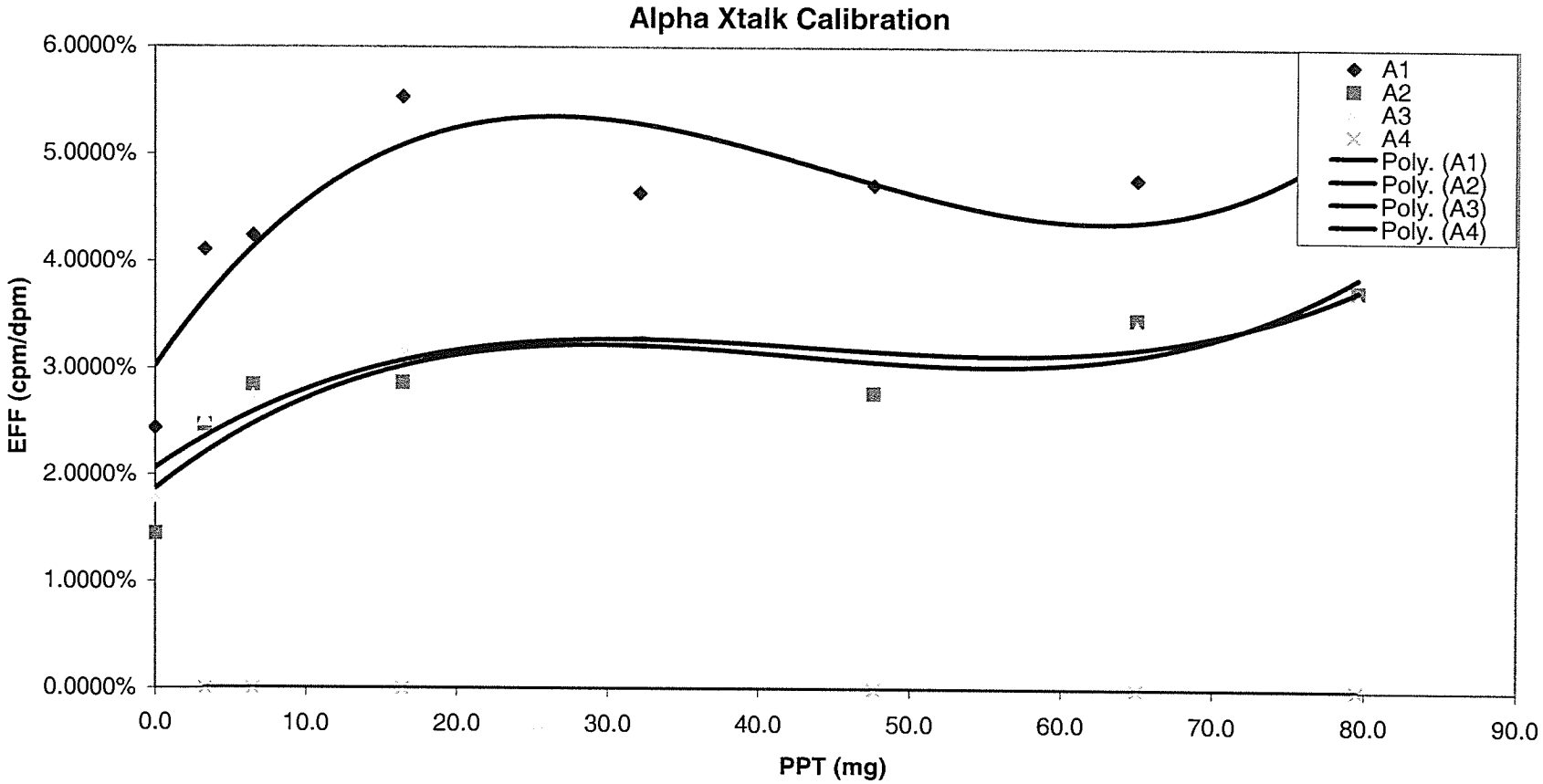
Raw Count Data						Po-210	Source	Calculated
Detector (#)	Source ID (#)	Start Time	Count Time (min)	Alpha (counts)	Beta (counts)	Xtalk (Beta/Alpha)	Measured Weight	Xtalk (Beta/Alpha)
C4	6	9/30/2013 19:50	3	11406	575	5.0412%	47.6	5.2789%
C4	7	9/30/2013 19:44	3	9292	539	5.8007%	65.0	5.3649%
C4	8	9/30/2013 19:39	3	9588	525	5.4756%	79.5	5.6467%
D1	1	9/30/2013 19:40	3	24496	397	1.6207%	0.0	1.8018%
D1	2	9/30/2013 19:35	3	24434	570	2.3328%	3.3	2.1401%
D1	3	9/30/2013 19:30	3	19812	449	2.2663%	6.5	2.4169%
D1	4	9/30/2013 19:23	3	19694	666	3.3817%	16.4	2.9955%
D1	5	9/30/2013 19:18	3	17806	538	3.0215%	32.1	3.2749%
D1	6	9/30/2013 19:56	3	19381	573	2.9565%	47.6	3.1665%
D1	7	9/30/2013 19:51	3	15655	544	3.4749%	65.0	3.1271%
D1	8	9/30/2013 19:45	3	15526	536	3.4523%	79.5	3.5839%
D2	1	9/30/2013 19:45	3	22812	379	1.6614%	0.0	1.9831%
D2	2	9/30/2013 19:40	3	23153	562	2.4273%	3.3	2.3945%
D2	3	9/30/2013 19:35	3	18268	566	3.0983%	6.5	2.7373%
D2	4	9/30/2013 19:30	3	18126	661	3.6467%	16.4	3.4898%
D2	5	9/30/2013 19:23	3	16237	601	3.7014%	32.1	3.9533%
D2	6	9/30/2013 19:18	3	17654	653	3.6989%	47.6	3.9189%
D2	7	9/30/2013 19:56	3	13925	590	4.2370%	65.0	3.8387%
D2	8	9/30/2013 19:51	3	13969	560	4.0089%	79.5	4.1643%
D3	1	9/30/2013 19:51	3	23020	359	1.5595%	0.0	1.8330%
D3	2	9/30/2013 19:45	3	23584	539	2.2854%	3.3	2.1977%
D3	3	9/30/2013 19:40	3	18592	498	2.6786%	6.5	2.4973%
D3	4	9/30/2013 19:35	3	19060	641	3.3631%	16.4	3.1311%
D3	5	9/30/2013 19:30	3	16669	543	3.2575%	32.1	3.4662%
D3	6	9/30/2013 19:23	3	18123	564	3.1121%	47.6	3.4004%
D3	7	9/30/2013 19:18	3	14345	554	3.8620%	65.0	3.4300%
D3	8	9/30/2013 19:56	3	14213	544	3.8275%	79.5	3.9901%
D4	1	9/30/2013 19:56	3	24458	368	1.5046%	0.0	1.6875%
D4	2	9/30/2013 19:51	3	24655	567	2.2997%	3.3	2.0418%
D4	3	9/30/2013 19:45	3	20643	458	2.2187%	6.5	2.3311%
D4	4	9/30/2013 19:40	3	19610	602	3.0699%	16.4	2.9330%
D4	5	9/30/2013 19:35	3	17845	560	3.1381%	32.1	3.2256%
D4	6	9/30/2013 19:30	3	18648	562	3.0137%	47.6	3.1420%
D4	7	9/30/2013 19:23	3	15241	516	3.3856%	65.0	3.2003%
D4	8	9/30/2013 19:18	3	15410	581	3.7703%	79.5	3.8394%
E1	1	9/29/2013 19:42	3	24802	289	1.1652%	0.0	1.2650%
E1	2	9/29/2013 20:16	3	24959	390	1.5626%	3.3	1.4998%
E1	3	9/29/2013 20:12	3	20668	354	1.7128%	6.5	1.6904%
E1	4	9/29/2013 20:07	3	19734	434	2.1993%	16.4	2.0786%
E1	5	9/29/2013 20:01	3	17859	369	2.0662%	32.1	2.2311%
E1	6	9/29/2013 19:56	3	19212	408	2.1237%	47.6	2.1012%
E1	7	9/29/2013 19:52	3	15476	322	2.0806%	65.0	2.0111%
E1	8	9/29/2013 19:47	3	15532	350	2.2534%	79.5	2.2865%
E2	1	9/29/2013 19:47	3	18122	472	2.6046%	0.0	2.7882%
E2	2	9/29/2013 19:42	3	18918	633	3.3460%	3.3	3.3302%
E2	3	9/29/2013 20:16	3	14820	589	3.9744%	6.5	3.7640%
E2	4	9/29/2013 20:12	3	14849	697	4.6939%	16.4	4.6107%
E2	5	9/29/2013 20:07	3	13331	628	4.7108%	32.1	4.8353%
E2	6	9/29/2013 20:01	3	14317	612	4.2746%	47.6	4.4275%
E2	7	9/29/2013 19:56	3	11829	529	4.4721%	65.0	4.2263%
E2	8	9/29/2013 19:52	3	11569	574	4.9615%	79.5	5.0557%
E3	1	9/29/2013 19:52	3	24174	302	1.2493%	0.0	1.3377%
E3	2	9/29/2013 19:47	3	24539	371	1.5119%	3.3	1.5149%
E3	3	9/29/2013 19:42	3	19901	362	1.8190%	6.5	1.6605%
E3	4	9/29/2013 20:16	3	19870	377	1.8973%	16.4	1.9704%

Raw Count Data						Po-210	Source	Calculated
Detector (#)	Source ID (#)	Start Time	Count Time (min)	Alpha (counts)	Beta (counts)	Xtalk (Beta/Alpha)	Measured Weight	Xtalk (Beta/Alpha)
E3	5	9/29/2013 20:12	3	17510	387	2.2102%	32.1	2.1464%
E3	6	9/29/2013 20:07	3	18837	377	2.0014%	47.6	2.1480%
E3	7	9/29/2013 20:01	3	15271	362	2.3705%	65.0	2.2361%
E3	8	9/29/2013 19:56	3	14674	376	2.5624%	79.5	2.6080%
E4	1	9/29/2013 19:56	3	23212	350	1.5078%	0.0	1.6116%
E4	2	9/29/2013 19:52	3	23389	459	1.9625%	3.3	1.8569%
E4	3	9/29/2013 19:47	3	19631	394	2.0070%	6.5	2.0618%
E4	4	9/29/2013 19:42	3	18584	499	2.6851%	16.4	2.5136%
E4	5	9/29/2013 20:16	3	16753	445	2.6562%	32.1	2.7915%
E4	6	9/29/2013 20:12	3	17284	463	2.6788%	47.6	2.7535%
E4	7	9/29/2013 20:07	3	14465	404	2.7929%	65.0	2.6431%
E4	8	9/29/2013 20:01	3	14874	398	2.6758%	79.5	2.7342%
F1	1	9/29/2013 20:01	3	24678	231	0.9361%	0.0	1.0875%
F1	2	9/29/2013 19:56	3	24892	353	1.4181%	3.3	1.3254%
F1	3	9/29/2013 19:52	3	20738	334	1.6106%	6.5	1.5246%
F1	4	9/29/2013 19:47	3	19788	396	2.0012%	16.4	1.9683%
F1	5	9/29/2013 19:42	3	18146	409	2.2539%	32.1	2.2658%
F1	6	9/29/2013 20:16	3	18935	399	2.1072%	47.6	2.2922%
F1	7	9/29/2013 20:12	3	15388	389	2.5279%	65.0	2.3150%
F1	8	9/29/2013 20:07	3	15382	384	2.4964%	79.5	2.5727%
F2	1	9/29/2013 20:07	3	20896	602	2.8809%	0.0	2.8930%
F2	2	9/29/2013 20:01	3	21440	744	3.4701%	3.3	3.3239%
F2	3	9/29/2013 19:56	3	17766	607	3.4166%	6.5	3.6684%
F2	4	9/29/2013 19:52	3	17400	786	4.5172%	16.4	4.3429%
F2	5	9/29/2013 19:47	3	15838	722	4.5587%	32.1	4.5575%
F2	6	9/29/2013 19:42	3	17070	717	4.2004%	47.6	4.3558%
F2	7	9/29/2013 20:16	3	13239	615	4.6454%	65.0	4.5005%
F2	8	9/29/2013 20:12	3	13058	725	5.5522%	79.5	5.5994%
F3	1	9/29/2013 20:12	3	20437	427	2.0893%	0.0	2.1896%
F3	2	10/1/2013 10:46	3	20456	619	3.0260%	3.3	2.6672%
F3	3	9/29/2013 20:01	3	16860	464	2.7521%	6.5	3.0606%
F3	4	9/29/2013 19:56	3	17071	665	3.8955%	16.4	3.8957%
F3	5	9/29/2013 19:52	3	14809	666	4.4973%	32.1	4.3280%
F3	6	9/29/2013 19:47	3	15850	630	3.9748%	47.6	4.1817%
F3	7	9/29/2013 19:42	3	12862	535	4.1595%	65.0	4.0396%
F3	8	9/29/2013 20:16	3	12604	562	4.4589%	79.5	4.4910%
F4	1	9/29/2013 20:16	3	16512	480	2.9070%	0.0	3.2214%
F4	2	9/29/2013 20:12	3	16861	641	3.8017%	3.3	3.7452%
F4	3	9/29/2013 20:08	3	13065	581	4.4470%	6.5	4.1834%
F4	4	9/29/2013 20:01	3	13707	743	5.4206%	16.4	5.1559%
F4	5	9/29/2013 19:56	3	11987	664	5.5393%	32.1	5.7883%
F4	6	9/29/2013 19:52	3	12508	682	5.4525%	47.6	5.7947%
F4	7	9/29/2013 19:47	3	10283	643	6.2530%	65.0	5.7382%
F4	8	9/29/2013 19:42	3	10667	637	5.9717%	79.5	6.1657%
G1	1	9/29/2013 20:20	3	22609	309	1.3667%	0.0	1.5232%
G1	2	9/29/2013 20:49	3	22199	416	1.8740%	3.3	1.7972%
G1	3	9/29/2013 20:45	3	18285	390	2.1329%	6.5	2.0235%
G1	4	9/29/2013 20:40	3	17698	448	2.5314%	16.4	2.5087%
G1	5	9/29/2013 20:36	3	15858	448	2.8251%	32.1	2.7786%
G1	6	9/29/2013 20:32	3	16854	411	2.4386%	47.6	2.7298%
G1	7	9/29/2013 20:28	3	13785	413	2.9960%	65.0	2.7023%
G1	8	9/29/2013 20:24	3	13618	397	2.9153%	79.5	3.0166%
G2	1	9/29/2013 20:24	3	19339	451	2.3321%	0.0	2.3879%
G2	2	9/29/2013 20:21	3	19925	519	2.6048%	3.3	2.7571%
G2	3	9/29/2013 20:49	3	15980	535	3.3479%	6.5	3.0677%

Detector (#)	Source ID (#)	Raw Count Data Start Time	Count Time (min)	Alpha (counts)	Beta (counts)	Po-210 Xtalk (Beta/Alpha)	Source Measured Weight	Calculated Xtalk (Beta/Alpha)
G2	4	9/29/2013 20:45	3	16460	610	3.7060%	16.4	3.7652%
G2	5	9/29/2013 20:40	3	14379	620	4.3118%	32.1	4.2315%
G2	6	9/29/2013 20:36	3	15254	607	3.9793%	47.6	4.2238%
G2	7	9/29/2013 20:32	3	12475	538	4.3126%	65.0	4.0839%
G2	8	9/29/2013 20:28	3	12339	508	4.1170%	79.5	4.1945%
G3	1	9/29/2013 20:28	3	19058	565	2.9646%	0.0	3.2592%
G3	2	9/29/2013 20:24	3	19428	752	3.8707%	3.3	3.8687%
G3	3	9/29/2013 20:21	3	15164	730	4.8140%	6.5	4.3620%
G3	4	9/29/2013 20:49	3	15449	825	5.3402%	16.4	5.3599%
G3	5	9/29/2013 20:45	3	14026	774	5.5183%	32.1	5.7419%
G3	6	9/29/2013 20:40	3	14956	809	5.4092%	47.6	5.4241%
G3	7	9/29/2013 20:36	3	11986	656	5.4731%	65.0	5.2946%
G3	8	9/29/2013 20:32	3	11949	731	6.1177%	79.5	6.1974%
G4	1	9/29/2013 20:32	3	21533	321	1.4907%	0.0	1.5458%
G4	2	9/29/2013 20:28	3	21842	382	1.7489%	3.3	1.8877%
G4	3	9/29/2013 20:24	3	18231	427	2.3422%	6.5	2.1678%
G4	4	9/29/2013 20:21	3	16981	498	2.9327%	16.4	2.7520%
G4	5	9/29/2013 20:49	3	15890	444	2.7942%	32.1	3.0192%
G4	6	9/29/2013 20:45	3	16735	475	2.8384%	47.6	2.8577%
G4	7	9/29/2013 20:40	3	13550	384	2.8339%	65.0	2.6887%
G4	8	9/29/2013 20:36	3	13646	396	2.9019%	79.5	2.9640%
H1	1	9/29/2013 20:36	3	23721	427	1.8001%	0.0	1.6729%
H1	2	9/29/2013 20:32	3	24473	552	2.2555%	3.3	2.1341%
H1	3	9/29/2013 20:28	3	20053	404	2.0147%	6.5	2.5076%
H1	4	9/29/2013 20:24	3	19159	680	3.5492%	16.4	3.2617%
H1	5	9/29/2013 20:20	3	17567	638	3.6318%	32.1	3.5309%
H1	6	9/29/2013 20:49	3	18331	538	2.9349%	47.6	3.2268%
H1	7	9/29/2013 20:45	3	14712	468	3.1811%	65.0	2.9737%
H1	8	9/29/2013 20:40	3	14663	495	3.3758%	79.5	3.4355%
H2	1	9/29/2013 20:40	3	20077	491	2.4456%	0.0	2.6917%
H2	2	9/29/2013 20:36	3	21256	686	3.2273%	3.3	3.1219%
H2	3	9/29/2013 20:32	3	17083	600	3.5123%	6.5	3.4665%
H2	4	9/29/2013 20:28	3	16737	766	4.5767%	16.4	4.1413%
H2	5	9/29/2013 20:24	3	15534	601	3.8689%	32.1	4.3282%
H2	6	9/29/2013 20:20	3	16007	632	3.9483%	47.6	4.0167%
H2	7	9/29/2013 20:49	3	12942	543	4.1956%	65.0	3.8730%
H2	8	9/29/2013 20:45	3	13267	585	4.4094%	79.5	4.5447%
H3	1	9/29/2013 20:45	3	22475	316	1.4060%	0.0	1.4065%
H3	2	9/29/2013 20:40	3	22897	408	1.7819%	3.3	1.7880%
H3	3	9/29/2013 20:36	3	18385	374	2.0343%	6.5	2.0985%
H3	4	9/29/2013 20:32	3	18320	530	2.8930%	16.4	2.7350%
H3	5	9/29/2013 20:28	3	16500	477	2.8909%	32.1	2.9928%
H3	6	9/29/2013 20:24	3	17771	487	2.7404%	47.6	2.7770%
H3	7	9/29/2013 20:20	3	14234	380	2.6697%	65.0	2.5857%
H3	8	9/29/2013 20:49	3	14209	414	2.9136%	79.5	2.9463%
H4	1	9/29/2013 20:49	3	18494	497	2.6874%	0.0	2.8443%
H4	2	9/29/2013 20:45	3	19070	627	3.2879%	3.3	3.2843%
H4	3	9/29/2013 20:40	3	15221	577	3.7908%	6.5	3.6419%
H4	4	9/29/2013 20:36	3	15625	712	4.5568%	16.4	4.3732%
H4	5	9/29/2013 20:32	3	14196	629	4.4308%	32.1	4.6725%
H4	6	9/29/2013 20:28	3	14885	655	4.4004%	47.6	4.4506%
H4	7	9/29/2013 20:24	3	12113	546	4.5076%	65.0	4.3141%
H4	8	9/29/2013 20:20	3	12254	586	4.7821%	79.5	4.8629%
I1	1	9/30/2013 19:59	3	24878	171	0.6874%	0.0	0.8018%
I1	2	9/30/2013 20:34	3	25470	248	0.9737%	3.3	0.9424%

Raw Count Data						Po-210	Source	Calculated
Detector (#)	Source ID (#)	Start Time	Count Time (min)	Alpha (counts)	Beta (counts)	Xtalk (Beta/Alpha)	Measured Weight	Xtalk (Beta/Alpha)
I1	3	9/30/2013 20:30	3	20830	246	1.1810%	6.5	1.0602%
I1	4	9/30/2013 20:26	3	20405	272	1.3330%	16.4	1.3219%
I1	5	9/30/2013 20:20	3	18319	268	1.4630%	32.1	1.4884%
I1	6	9/30/2013 20:16	3	20061	272	1.3559%	47.6	1.4741%
I1	7	9/30/2013 20:09	3	16034	251	1.5654%	65.0	1.4153%
I1	8	9/30/2013 20:05	3	15965	225	1.4093%	79.5	1.4645%
I2	1	9/30/2013 20:05	3	26894	166	0.6172%	0.0	0.6180%
I2	2	9/30/2013 19:59	3	27944	194	0.6942%	3.3	0.7912%
I2	3	9/30/2013 20:34	3	22909	233	1.0171%	6.5	0.9285%
I2	4	9/30/2013 20:30	3	22071	275	1.2460%	16.4	1.1894%
I2	5	9/30/2013 20:26	3	20678	253	1.2235%	32.1	1.2475%
I2	6	9/30/2013 20:20	3	21844	227	1.0392%	47.6	1.1376%
I2	7	9/30/2013 20:16	3	17420	226	1.2974%	65.0	1.1810%
I2	8	9/30/2013 20:09	3	17335	277	1.5979%	79.5	1.6394%
I3	1	9/30/2013 20:09	3	26243	186	0.7088%	0.0	0.8246%
I3	2	9/30/2013 20:05	3	27268	287	1.0525%	3.3	0.9941%
I3	3	9/30/2013 19:59	3	22189	264	1.1898%	6.5	1.1309%
I3	4	9/30/2013 20:34	3	22053	331	1.5009%	16.4	1.4050%
I3	5	9/30/2013 20:30	3	20299	277	1.3646%	32.1	1.4964%
I3	6	9/30/2013 20:26	3	20902	282	1.3492%	47.6	1.3782%
I3	7	9/30/2013 20:20	3	17064	238	1.3947%	65.0	1.2857%
I3	8	9/30/2013 20:16	3	17235	245	1.4215%	79.5	1.4671%
I4	1	9/30/2013 20:16	3	26454	184	0.6955%	0.0	0.7239%
I4	2	9/30/2013 20:09	3	26837	244	0.9092%	3.3	0.9267%
I4	3	9/30/2013 20:05	3	21826	250	1.1454%	6.5	1.0906%
I4	4	9/30/2013 19:59	3	21595	313	1.4494%	16.4	1.4196%
I4	5	9/30/2013 20:34	3	19480	284	1.4579%	32.1	1.5345%
I4	6	9/30/2013 20:30	3	20838	302	1.4493%	47.6	1.4082%
I4	7	9/30/2013 20:26	3	16950	226	1.3333%	65.0	1.3315%
I4	8	9/30/2013 20:20	3	16725	266	1.5904%	79.5	1.5955%
J1	1	9/30/2013 20:20	3	25454	235	0.9232%	0.0	1.0384%
J1	2	9/30/2013 20:16	3	26017	292	1.1223%	3.3	1.1699%
J1	3	9/30/2013 20:09	3	20844	311	1.4920%	6.5	1.2797%
J1	4	9/30/2013 20:05	3	20690	326	1.5756%	16.4	1.5208%
J1	5	9/30/2013 19:59	3	18698	278	1.4868%	32.1	1.6634%
J1	6	9/30/2013 20:34	3	19900	331	1.6633%	47.6	1.6281%
J1	7	9/30/2013 20:30	3	15764	254	1.6113%	65.0	1.5372%
J1	8	9/30/2013 20:26	3	16056	242	1.5072%	79.5	1.5442%
J2	1	9/30/2013 20:26	3	25506	162	0.6351%	0.0	0.7299%
J2	2	9/30/2013 20:20	3	25866	264	1.0206%	3.3	0.9119%
J2	3	9/30/2013 20:16	3	21357	226	1.0582%	6.5	1.0592%
J2	4	9/30/2013 20:09	3	20990	289	1.3768%	16.4	1.3560%
J2	5	9/30/2013 20:05	3	18647	264	1.4158%	32.1	1.4638%
J2	6	9/30/2013 19:59	3	19945	268	1.3437%	47.6	1.3552%
J2	7	9/30/2013 20:34	3	16347	218	1.3336%	65.0	1.2889%
J2	8	9/30/2013 20:30	3	16292	245	1.5038%	79.5	1.5228%
J3	1	9/30/2013 20:30	3	25318	143	0.5648%	0.0	0.6533%
J3	2	9/30/2013 20:26	3	25395	201	0.7915%	3.3	0.8014%
J3	3	9/30/2013 20:20	3	20882	218	1.0440%	6.5	0.9243%
J3	4	9/30/2013 20:16	3	20240	253	1.2500%	16.4	1.1908%
J3	5	9/30/2013 20:09	3	18358	225	1.2256%	32.1	1.3434%
J3	6	9/30/2013 20:05	3	19290	251	1.3012%	47.6	1.3107%
J3	7	9/30/2013 19:59	3	15554	208	1.3373%	65.0	1.2545%
J3	8	9/30/2013 20:34	3	15855	208	1.3119%	79.5	1.3479%
J4	1	9/30/2013 20:34	3	25356	205	0.8085%	0.0	0.9264%

Detector (#)	Source ID (#)	Raw Count Data Start Time	Count Time (min)	Alpha (counts)	Beta (counts)	Po-210 Xtalk (Beta/Alpha)	Source Measured Weight	Calculated Xtalk (Beta/Alpha)
J4	2	9/30/2013 20:30	3	25416	305	**1.2000%**	3.3	1.1570%
J4	3	9/30/2013 20:26	3	20638	306	**1.4827%**	6.5	1.3430%
J4	4	9/30/2013 20:20	3	20290	341	**1.6806%**	16.4	1.7136%
J4	5	9/30/2013 20:16	3	18253	324	**1.7751%**	32.1	1.8296%
J4	6	9/30/2013 20:09	3	18969	313	**1.6501%**	47.6	1.6560%
J4	7	9/30/2013 20:05	3	15927	249	**1.5634%**	65.0	1.5113%
J4	8	9/30/2013 19:59	3	15616	268	**1.7162%**	79.5	1.7396%

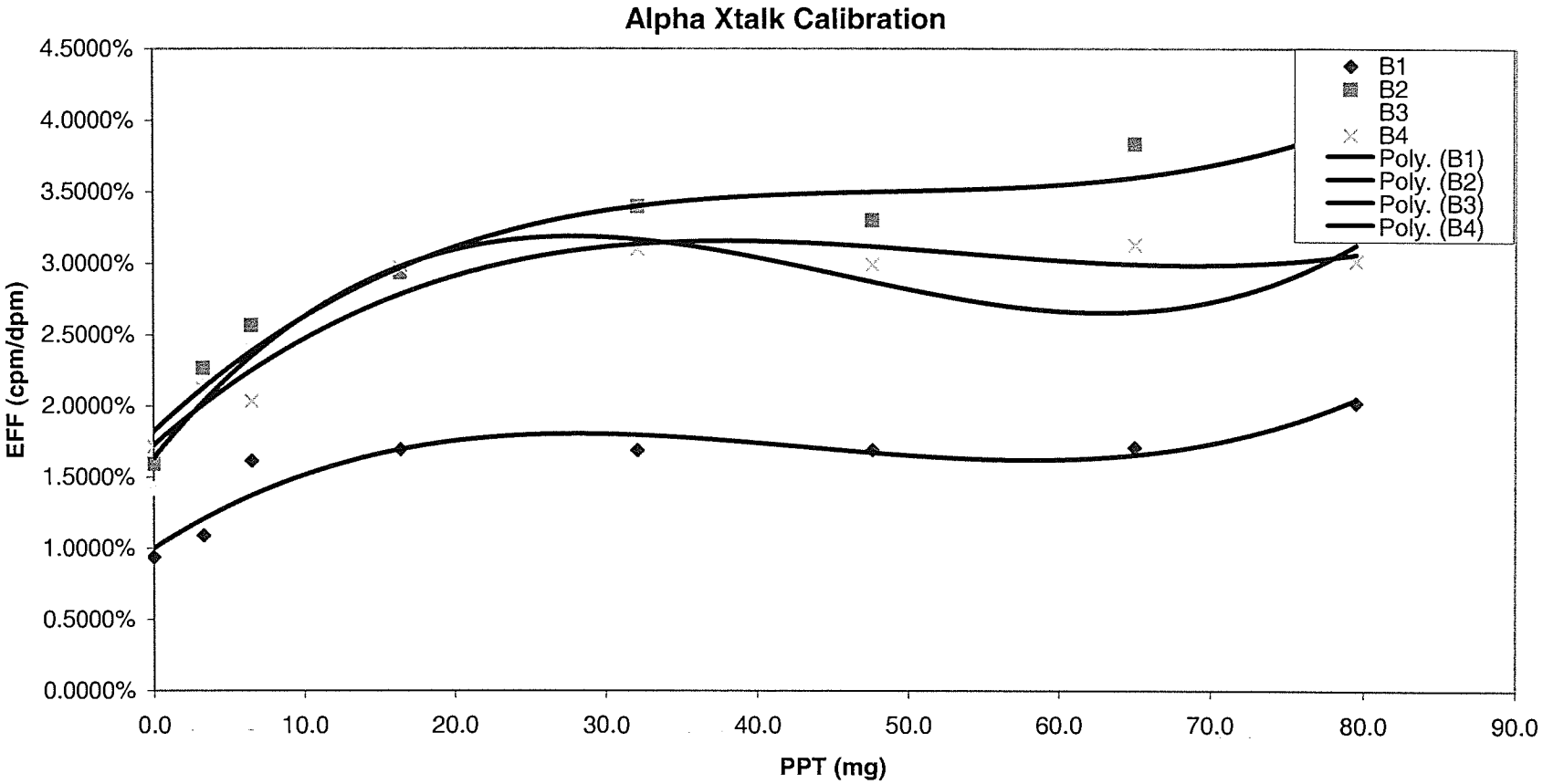


A1y = 4.146249E-07x^3 - 5.538381E-05x^2 + 2.057424E-03x + 3.020246E-02

A2y = 2.298098E-07x^3 - 2.922762E-05x^2 + 1.122699E-03x + 1.868747E-02

A3y = 1.858753E-07x^3 - 2.426781E-05x^2 + 9.662017E-04x + 2.064541E-02

A4y = 0.000000E+00

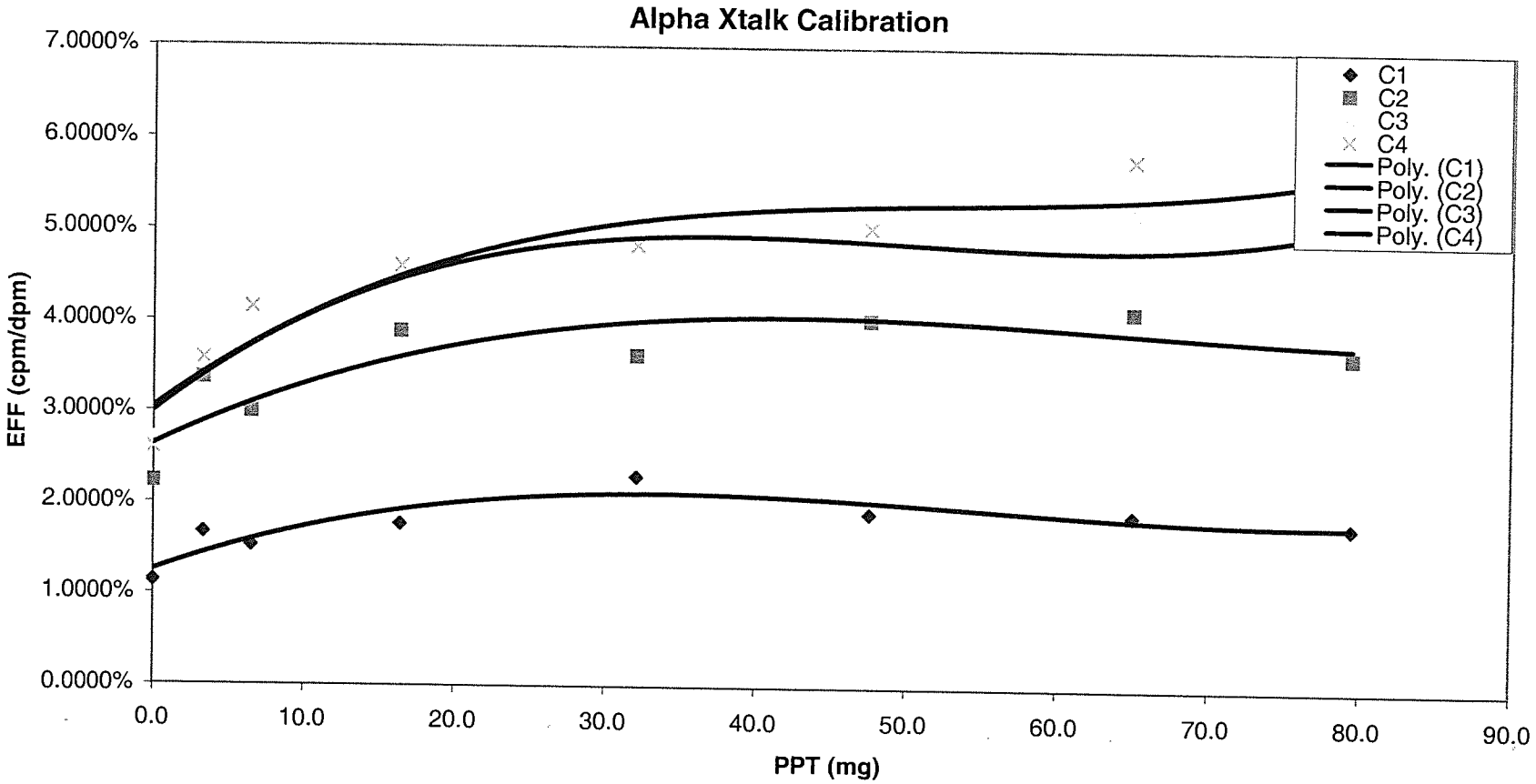


$B1_y = 1.389812E\text{-}07x^3 - 1.795847E\text{-}05x^2 + 6.808217E\text{-}04x + 1.001804E\text{-}02$

$B2_y = 1.359602E\text{-}07x^3 - 1.982668E\text{-}05x^2 + 9.877555E\text{-}04x + 1.822949E\text{-}02$

$B3_y = 2.486812E\text{-}07x^3 - 3.385096E\text{-}05x^2 + 1.307337E\text{-}03x + 1.635258E\text{-}02$

$B4_y = 1.173862E\text{-}07x^3 - 1.881072E\text{-}05x^2 + 9.215377E\text{-}04x + 1.726543E\text{-}02$

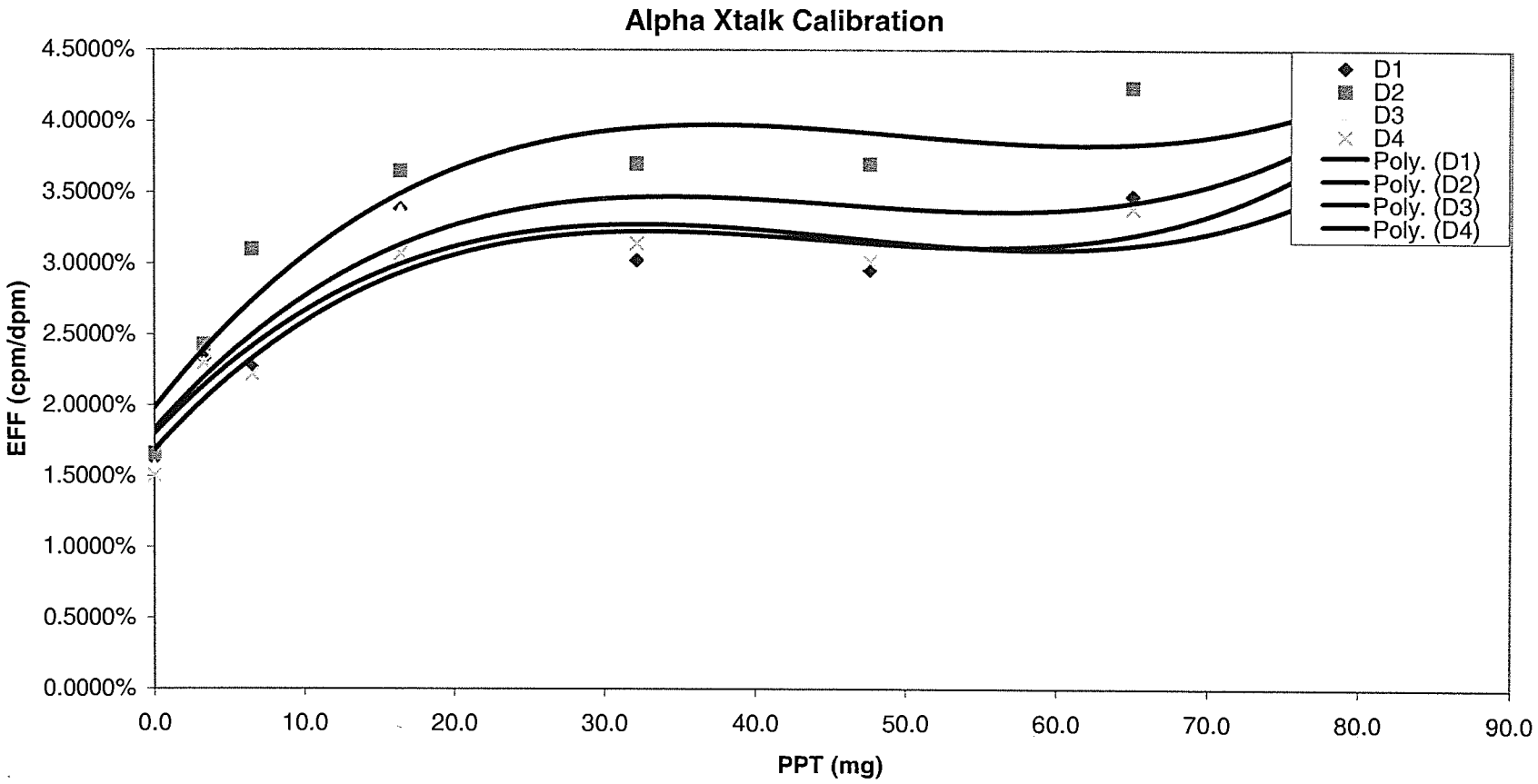


$C_1 = 7.732534E\text{-}08x^3 - 1.281928E\text{-}05x^2 + 6.005721E\text{-}04x + 1.252928E\text{-}02$

$C_2 = 7.148270E\text{-}08x^3 - 1.391300E\text{-}05x^2 + 7.976539E\text{-}04x + 2.634707E\text{-}02$

$C_3 = 1.829182E\text{-}07x^3 - 2.749154E\text{-}05x^2 + 1.292784E\text{-}03x + 2.994022E\text{-}02$

$C_4 = 1.384953E\text{-}07x^3 - 2.205856E\text{-}05x^2 + 1.205724E\text{-}03x + 3.043966E\text{-}02$

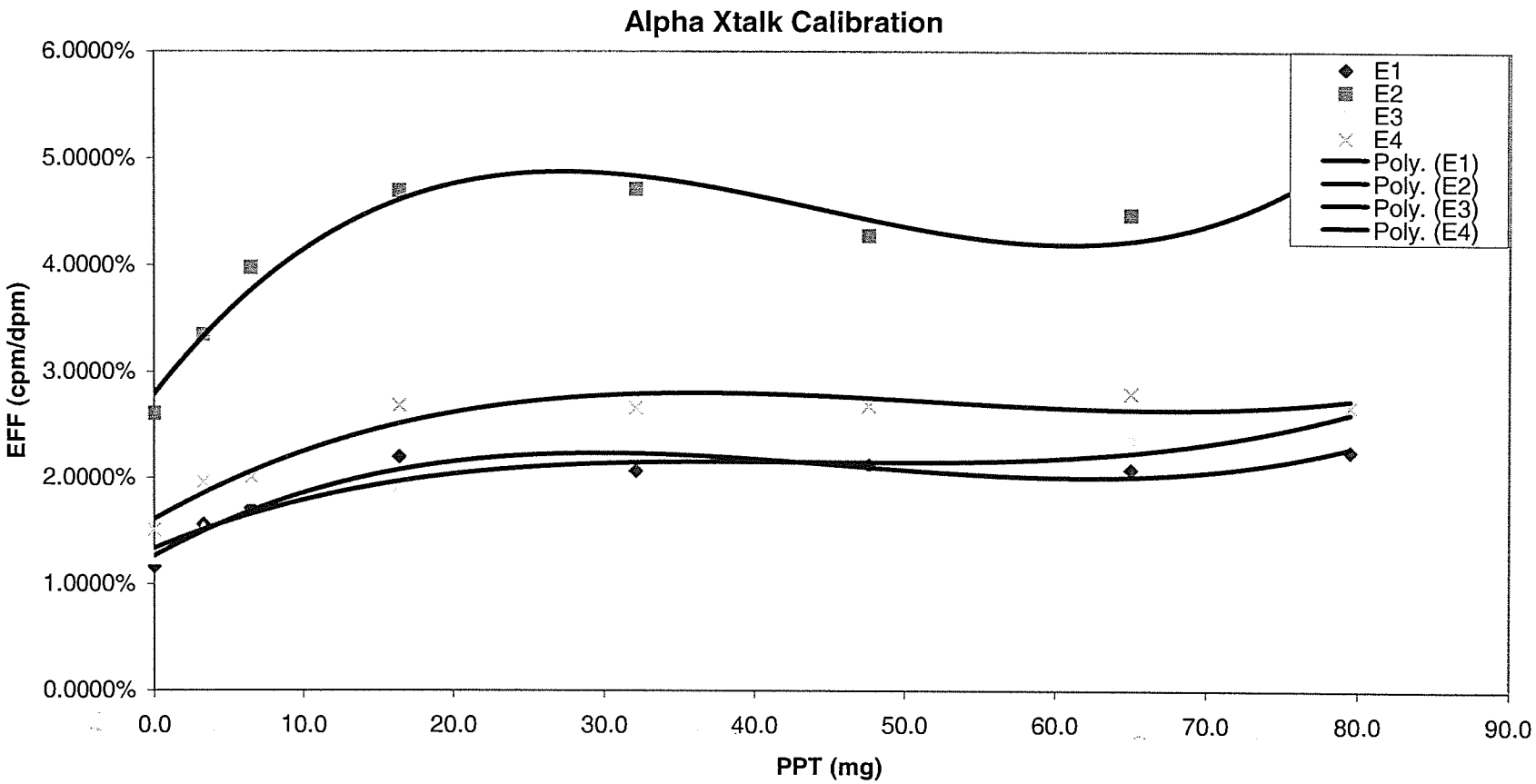


D1 $y = 1.930194E-07x^3 - 2.649339E-05x^2 + 1.110466E-03x + 1.801756E-02$

D2 $y = 1.943577E-07x^3 - 2.885048E-05x^2 + 1.339592E-03x + 1.983118E-02$

D3 $y = 2.059972E-07x^3 - 2.799905E-05x^2 + 1.195306E-03x + 1.832959E-02$

D4 $y = 2.132133E-07x^3 - 2.819296E-05x^2 + 1.164466E-03x + 1.687461E-02$

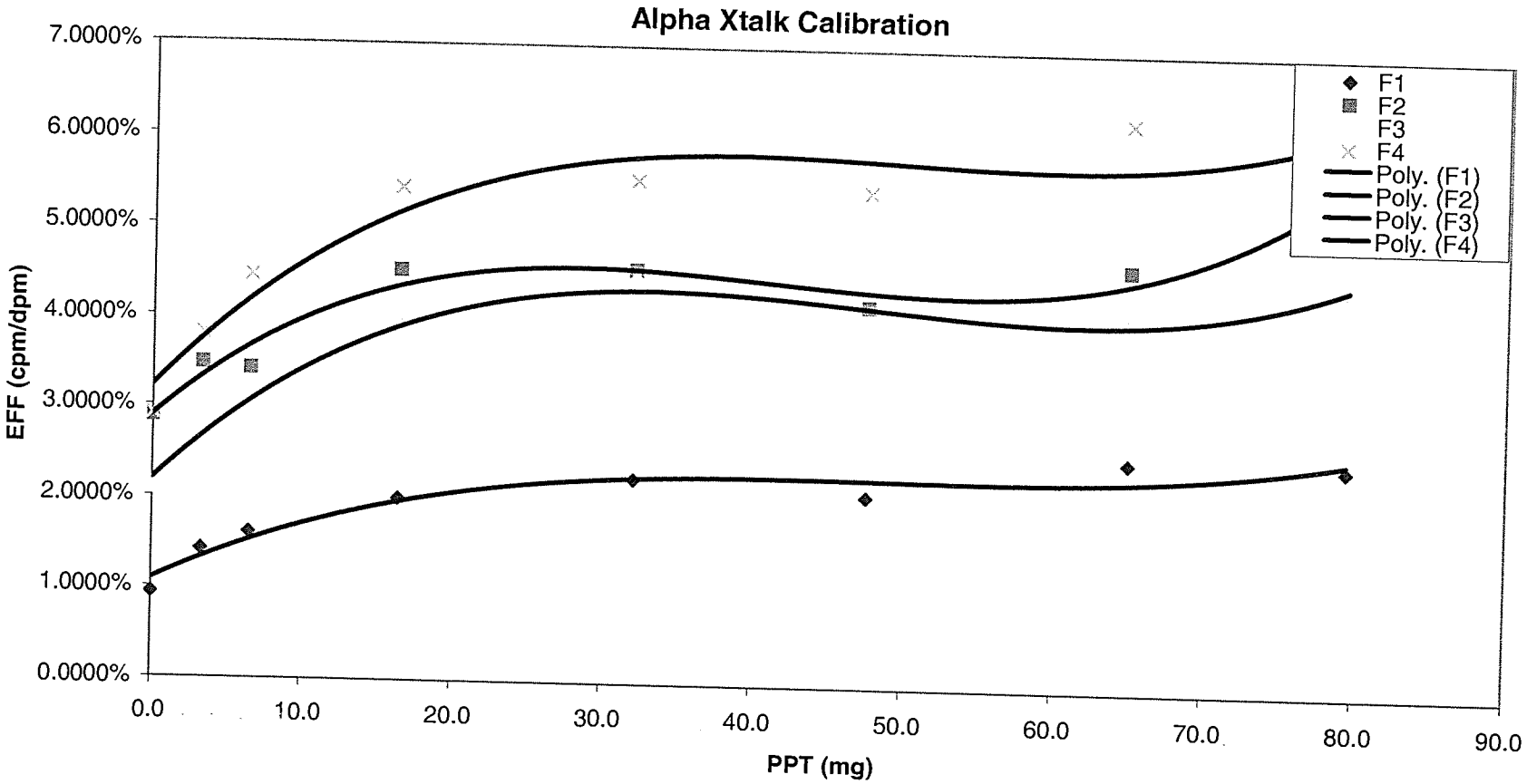


$E1 = 1.393228E-07x^3 - 1.918698E-05x^2 + 7.732934E-04x + 1.265028E-02$

$E2 = 3.601379E-07x^3 - 4.762829E-05x^2 + 1.795500E-03x + 2.788238E-02$

$E3 = 1.042964E-07x^3 - 1.358334E-05x^2 + 5.804791E-04x + 1.337715E-02$

$E4 = 1.084860E-07x^3 - 1.688222E-05x^2 + 7.976867E-04x + 1.611619E-02$

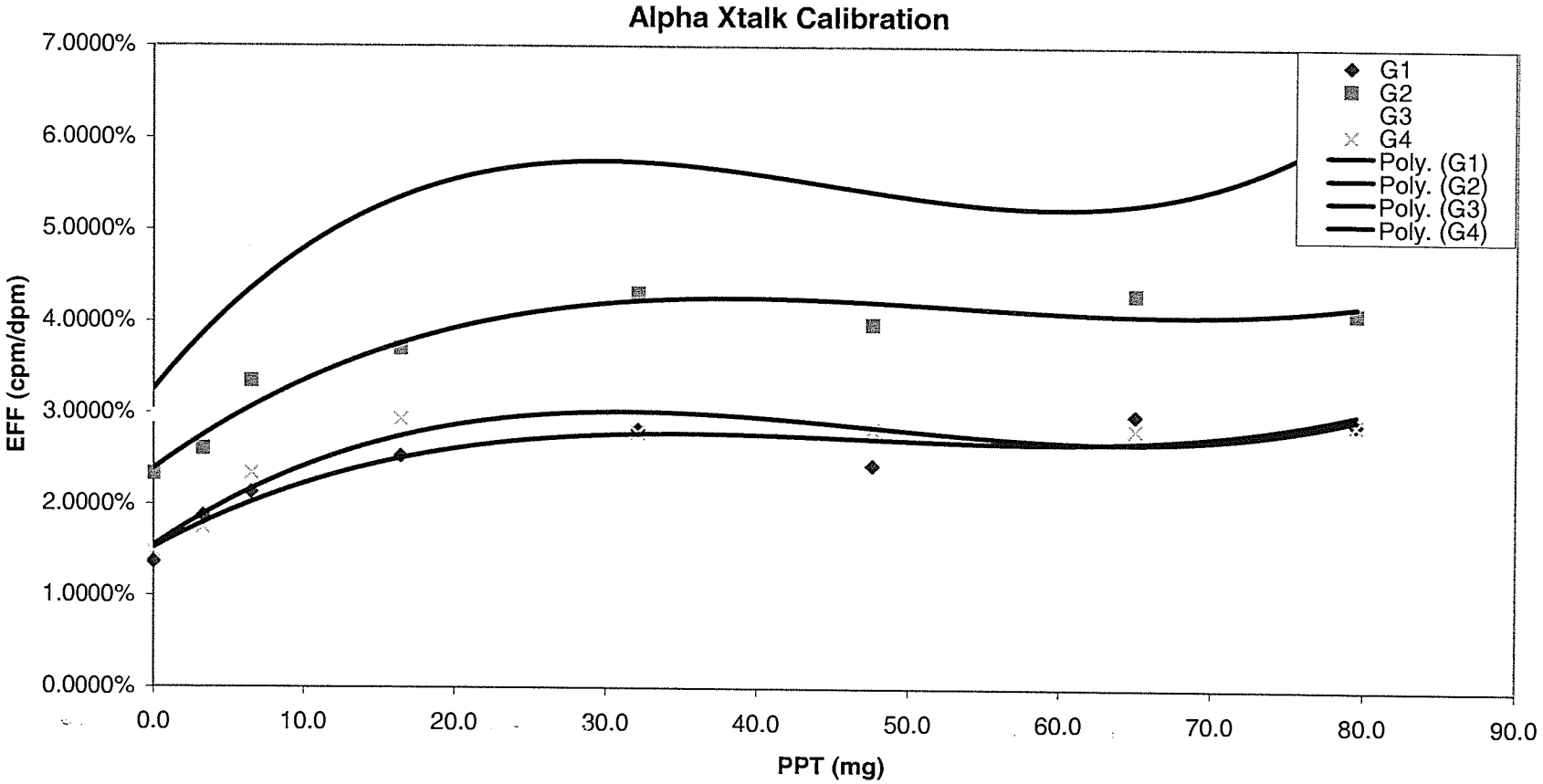


F1 $y = 1.113281E\text{-}07x^3 - 1.622696E\text{-}05x^2 + 7.732338E\text{-}04x + 1.087524E\text{-}02$

F2 $y = 3.094140E\text{-}07x^3 - 3.828805E\text{-}05x^2 + 1.428756E\text{-}03x + 2.893018E\text{-}02$

F3 $y = 2.517421E\text{-}07x^3 - 3.604120E\text{-}05x^2 + 1.563695E\text{-}03x + 2.189555E\text{-}02$

F4 $y = 2.399851E\text{-}07x^3 - 3.583930E\text{-}05x^2 + 1.702814E\text{-}03x + 3.221400E\text{-}02$

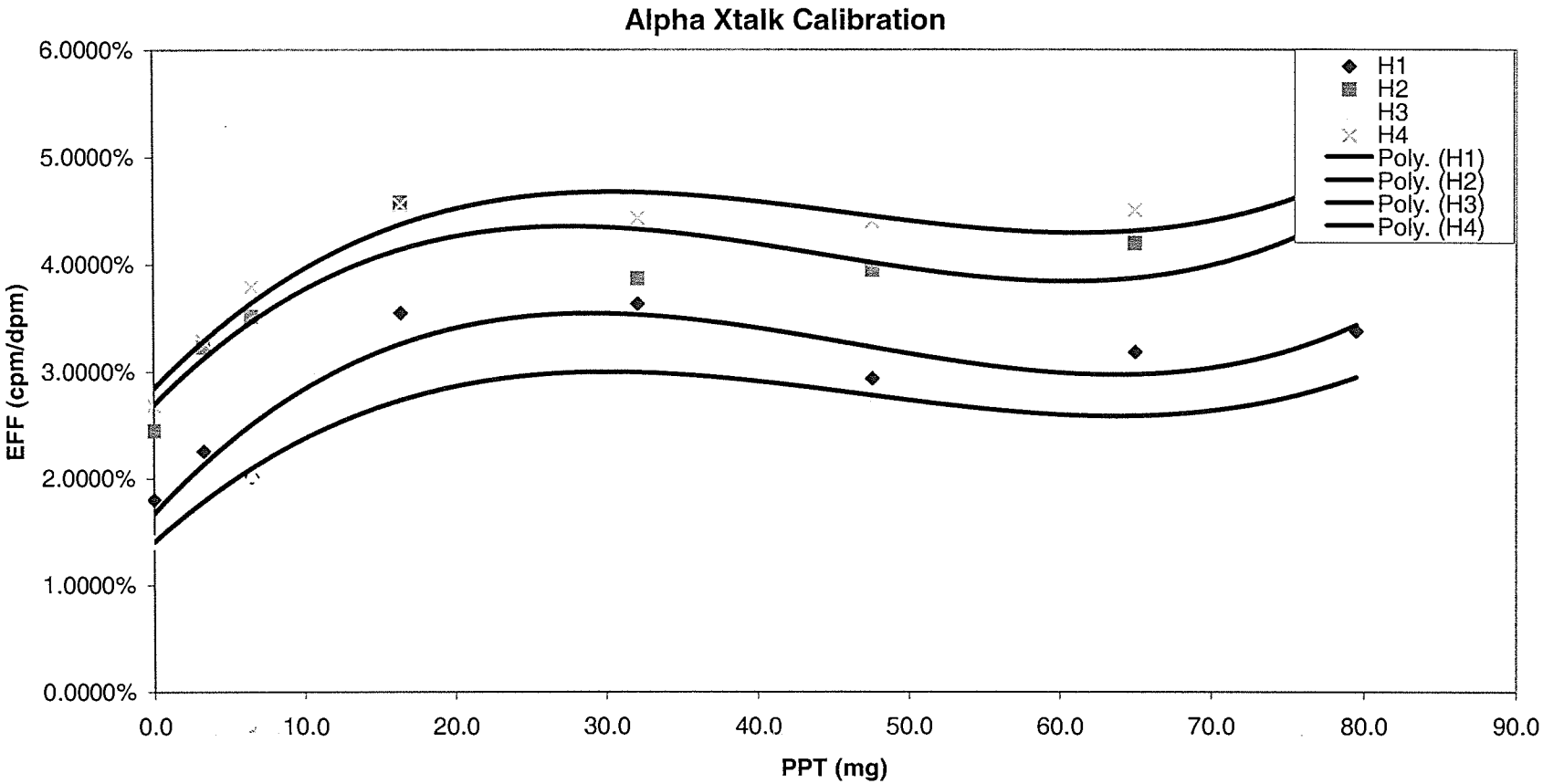


G1 $y = 1.438562E-07x^3 - 2.034207E-05x^2 + 8.958400E-04x + 1.523184E-02$

G2 $y = 1.519606E-07x^3 - 2.428098E-05x^2 + 1.197148E-03x + 2.387930E-02$

G3 $y = 3.772828E-07x^3 - 5.062424E-05x^2 + 2.009683E-03x + 3.259242E-02$

G4 $y = 1.853068E-07x^3 - 2.660004E-05x^2 + 1.121912E-03x + 1.545808E-02$

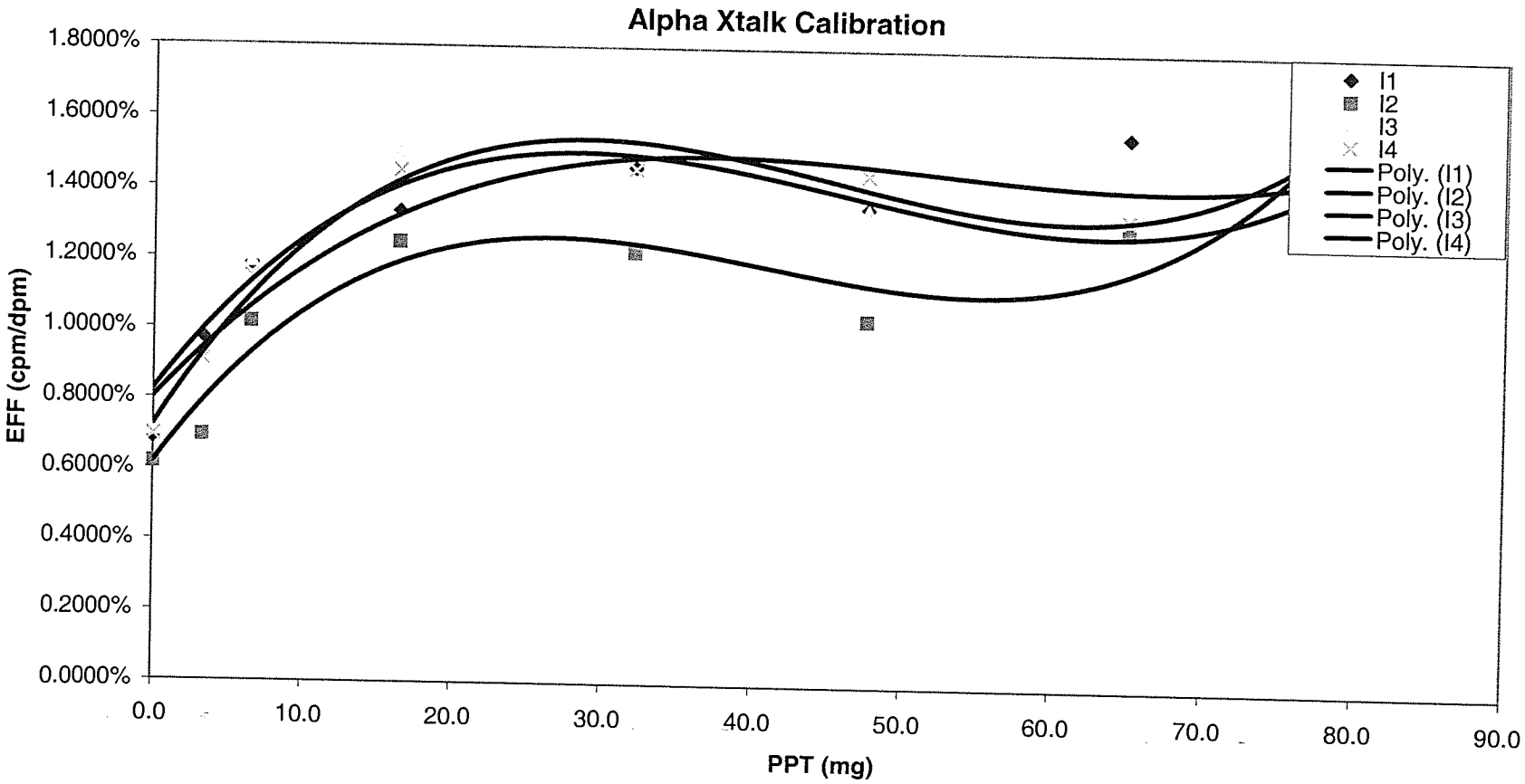


H1 $y = 2.742498E\text{-}07x^3 - 3.814038E\text{-}05x^2 + 1.520540E\text{-}03x + 1.672895E\text{-}02$

H2 $y = 2.850803E\text{-}07x^3 - 3.765343E\text{-}05x^2 + 1.424749E\text{-}03x + 2.691706E\text{-}02$

H3 $y = 2.184193E\text{-}07x^3 - 3.071521E\text{-}05x^2 + 1.255088E\text{-}03x + 1.406461E\text{-}02$

H4 $y = 2.606249E\text{-}07x^3 - 3.574430E\text{-}05x^2 + 1.448361E\text{-}03x + 2.844325E\text{-}02$

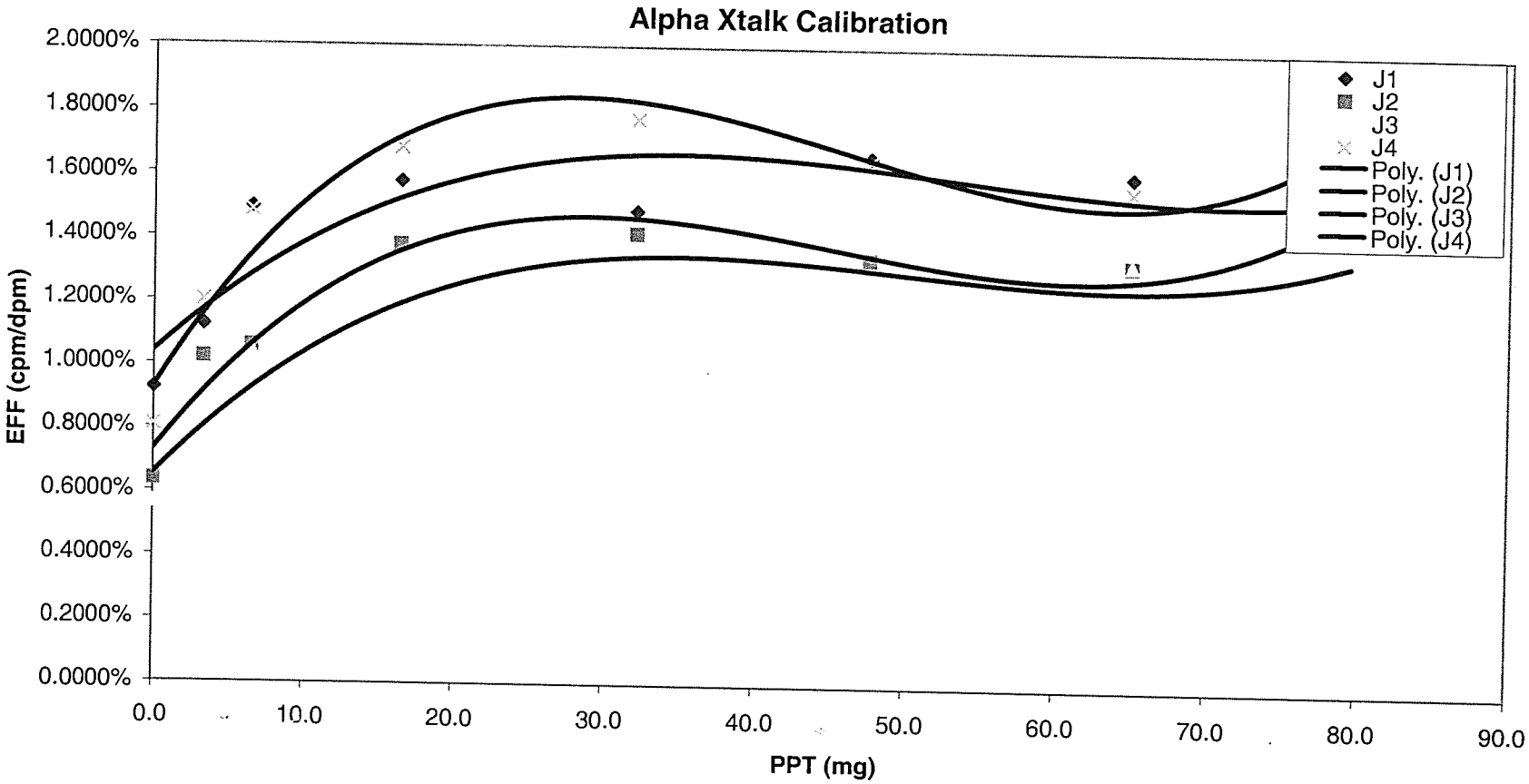


I1 $y = 6.059491E\text{-}08x^3 - 9.515941E\text{-}06x^2 + 4.569027E\text{-}04x + 8.018018E\text{-}03$

I2 $y = 1.311262E\text{-}07x^3 - 1.606059E\text{-}05x^2 + 5.765432E\text{-}04x + 6.179855E\text{-}03$

I3 $y = 1.030627E\text{-}07x^3 - 1.421182E\text{-}05x^2 + 5.592711E\text{-}04x + 8.246091E\text{-}03$

I4 $y = 1.254965E\text{-}07x^3 - 1.702031E\text{-}05x^2 + 6.695838E\text{-}04x + 7.238649E\text{-}03$



J1 $y = 5.656025E\text{-}08x^3 - 9.077691E\text{-}06x^2 + 4.278239E\text{-}04x + 1.038418E\text{-}02$

J2 $y = 1.114583E\text{-}07x^3 - 1.515810E\text{-}05x^2 + 6.003583E\text{-}04x + 7.299139E\text{-}03$

J3 $y = 7.111799E\text{-}08x^3 - 1.062910E\text{-}05x^2 + 4.829029E\text{-}04x + 6.533284E\text{-}03$

J4 $y = 1.406066E\text{-}07x^3 - 1.946979E\text{-}05x^2 + 7.614585E\text{-}04x + 9.264315E\text{-}03$

LB4100_Alpha Xtalk_Sep13_RawData.xls

SampleID	Instr	Time (min.)	Alpha Counts	Beta Counts	Count Start Time	Count End Time	Machine	Batch ID
1	A1	3	18420	449	9/30/2013 20:39	9/30/2013 20:42	LB4100	PO210X13
2	A1	3	17017	699	9/30/2013 21:11	9/30/2013 21:14	LB4100	PO210X13
3	A1	3	14238	604	9/30/2013 21:07	9/30/2013 21:10	LB4100	PO210X13
4	A1	3	13822	765	9/30/2013 21:03	9/30/2013 21:06	LB4100	PO210X13
5	A1	3	12940	601	9/30/2013 20:59	9/30/2013 21:02	LB4100	PO210X13
6	A1	3	13622	643	9/30/2013 20:54	9/30/2013 20:57	LB4100	PO210X13
7	A1	3	11092	530	9/30/2013 20:49	9/30/2013 20:52	LB4100	PO210X13
8	A1	3	11112	559	9/30/2013 20:44	9/30/2013 20:47	LB4100	PO210X13
1	A2	3	21350	309	9/30/2013 20:44	9/30/2013 20:47	LB4100	PO210X13
2	A2	3	20911	516	9/30/2013 20:39	9/30/2013 20:42	LB4100	PO210X13
3	A2	3	16834	479	9/30/2013 21:11	9/30/2013 21:14	LB4100	PO210X13
4	A2	3	17395	499	9/30/2013 21:07	9/30/2013 21:10	LB4100	PO210X13
5	A2	3	15350	499	9/30/2013 21:03	9/30/2013 21:06	LB4100	PO210X13
6	A2	3	16643	462	9/30/2013 20:59	9/30/2013 21:02	LB4100	PO210X13
7	A2	3	12873	447	9/30/2013 20:54	9/30/2013 20:57	LB4100	PO210X13
8	A2	3	12744	477	9/30/2013 20:49	9/30/2013 20:52	LB4100	PO210X13
1	A3	3	21169	381	9/30/2013 20:49	9/30/2013 20:52	LB4100	PO210X13
2	A3	3	21072	531	9/30/2013 20:44	9/30/2013 20:47	LB4100	PO210X13
3	A3	3	16705	457	9/30/2013 20:39	9/30/2013 20:42	LB4100	PO210X13
4	A3	3	16784	538	9/30/2013 21:11	9/30/2013 21:14	LB4100	PO210X13
5	A3	3	15202	464	9/30/2013 21:07	9/30/2013 21:10	LB4100	PO210X13
6	A3	3	16169	504	9/30/2013 21:03	9/30/2013 21:06	LB4100	PO210X13
7	A3	3	12898	438	9/30/2013 20:59	9/30/2013 21:02	LB4100	PO210X13
8	A3	3	12720	466	9/30/2013 20:54	9/30/2013 20:57	LB4100	PO210X13
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2	A4	0	0	78	9/30/2013 20:53	9/30/2013 20:53	LB4100	PO210X13
3	A4	0.01	0	340	9/30/2013 20:48	9/30/2013 20:48	LB4100	PO210X13
4	A4	0.01	0	407	9/30/2013 20:43	9/30/2013 20:43	LB4100	PO210X13
5	A4	0	0	0	9/30/2013 21:15	9/30/2013 21:15	LB4100	PO210X13
6	A4	0	0	40	9/30/2013 21:11	9/30/2013 21:11	LB4100	PO210X13
7	A4	0.01	0	155	9/30/2013 21:07	9/30/2013 21:07	LB4100	PO210X13
8	A4	0	0	13	9/30/2013 21:02	9/30/2013 21:02	LB4100	PO210X13
1	B1	3	25567	240	9/30/2013 20:59	9/30/2013 21:02	LB4100	PO210X13
2	B1	3	26019	284	9/30/2013 20:54	9/30/2013 20:57	LB4100	PO210X13
3	B1	3	21567	348	9/30/2013 20:49	9/30/2013 20:52	LB4100	PO210X13
4	B1	3	21292	361	9/30/2013 20:44	9/30/2013 20:47	LB4100	PO210X13

5	B1	3	19174	324	9/30/2013 20:39	9/30/2013 20:42	LB4100	PO210X13
6	B1	3	20279	343	9/30/2013 21:11	9/30/2013 21:14	LB4100	PO210X13
7	B1	3	16560	283	9/30/2013 21:07	9/30/2013 21:10	LB4100	PO210X13
8	B1	3	16423	332	9/30/2013 21:03	9/30/2013 21:06	LB4100	PO210X13
1	B2	3	21163	337	9/30/2013 21:03	9/30/2013 21:06	LB4100	PO210X13
2	B2	3	21588	489	9/30/2013 20:59	9/30/2013 21:02	LB4100	PO210X13
3	B2	3	17391	446	9/30/2013 20:54	9/30/2013 20:57	LB4100	PO210X13
4	B2	3	17754	521	9/30/2013 20:49	9/30/2013 20:52	LB4100	PO210X13
5	B2	3	15805	537	9/30/2013 20:44	9/30/2013 20:47	LB4100	PO210X13
6	B2	3	16842	556	9/30/2013 20:39	9/30/2013 20:42	LB4100	PO210X13
7	B2	3	13040	500	9/30/2013 21:11	9/30/2013 21:14	LB4100	PO210X13
8	B2	3	13210	514	9/30/2013 21:07	9/30/2013 21:10	LB4100	PO210X13
1	B3	3	20623	293	9/30/2013 21:07	9/30/2013 21:10	LB4100	PO210X13
2	B3	3	20881	450	9/30/2013 21:03	9/30/2013 21:06	LB4100	PO210X13
3	B3	3	16898	415	9/30/2013 20:59	9/30/2013 21:02	LB4100	PO210X13
4	B3	3	16662	518	9/30/2013 20:54	9/30/2013 20:57	LB4100	PO210X13
5	B3	3	15515	463	9/30/2013 20:49	9/30/2013 20:52	LB4100	PO210X13
6	B3	3	16644	463	9/30/2013 20:44	9/30/2013 20:47	LB4100	PO210X13
7	B3	3	13813	396	9/30/2013 20:39	9/30/2013 20:42	LB4100	PO210X13
8	B3	3	13263	404	9/30/2013 21:11	9/30/2013 21:14	LB4100	PO210X13
1	B4	3	20779	357	9/30/2013 21:11	9/30/2013 21:14	LB4100	PO210X13
2	B4	3	20600	437	9/30/2013 21:07	9/30/2013 21:10	LB4100	PO210X13
3	B4	3	17014	346	9/30/2013 21:03	9/30/2013 21:06	LB4100	PO210X13
4	B4	3	16641	494	9/30/2013 20:59	9/30/2013 21:02	LB4100	PO210X13
5	B4	3	14997	465	9/30/2013 20:54	9/30/2013 20:57	LB4100	PO210X13
6	B4	3	15880	475	9/30/2013 20:49	9/30/2013 20:52	LB4100	PO210X13
7	B4	3	12666	396	9/30/2013 20:44	9/30/2013 20:47	LB4100	PO210X13
8	B4	3	12961	391	9/30/2013 20:39	9/30/2013 20:42	LB4100	PO210X13
1	C1	3	24513	279	9/30/2013 19:17	9/30/2013 19:20	LB4100	PO210X13
2	C1	3	24409	409	9/30/2013 19:55	9/30/2013 19:58	LB4100	PO210X13
3	C1	3	21052	322	9/30/2013 19:50	9/30/2013 19:53	LB4100	PO210X13
4	C1	3	19491	345	9/30/2013 19:44	9/30/2013 19:47	LB4100	PO210X13
5	C1	3	17773	409	9/30/2013 19:39	9/30/2013 19:42	LB4100	PO210X13
6	C1	3	18187	348	9/30/2013 19:33	9/30/2013 19:36	LB4100	PO210X13
7	C1	3	15759	301	9/30/2013 19:29	9/30/2013 19:32	LB4100	PO210X13
8	C1	3	15371	277	9/30/2013 19:22	9/30/2013 19:25	LB4100	PO210X13
1	C2	3	20716	461	9/30/2013 19:22	9/30/2013 19:25	LB4100	PO210X13

Current Calibration - LB4100

Geometry Alpha X-talk	Cal Date	10/1/2013	Exp Date	9/30/2014	
LB4100	A0	A1	A2	A3	A4
A1	3.020246E-02	2.057424E-03	-5.538381E-05	4.146249E-07	
A2	1.868747E-02	1.122699E-03	-2.922762E-05	2.298098E-07	
A3	2.064541E-02	9.662017E-04	-2.426781E-05	1.858753E-07	
A4	#VALUE!	#VALUE!	#VALUE!	#VALUE!	
B1	1.001804E-02	6.808217E-04	-1.795847E-05	1.389812E-07	
B2	1.822949E-02	9.877555E-04	-1.982668E-05	1.359602E-07	
B3	1.635258E-02	1.307337E-03	-3.385096E-05	2.486812E-07	
B4	1.726543E-02	9.215377E-04	-1.881072E-05	1.173862E-07	
C1	1.252928E-02	6.005721E-04	-1.281928E-05	7.732534E-08	
C2	2.634707E-02	7.976539E-04	-1.391300E-05	7.148270E-08	
C3	2.994022E-02	1.292784E-03	-2.749154E-05	1.829182E-07	
C4	3.043966E-02	1.205724E-03	-2.205856E-05	1.384953E-07	
D1	1.801756E-02	1.110466E-03	-2.649339E-05	1.930194E-07	
D2	1.983118E-02	1.339592E-03	-2.885048E-05	1.943577E-07	
D3	1.832959E-02	1.195306E-03	-2.799905E-05	2.059972E-07	
D4	1.687461E-02	1.164466E-03	-2.819296E-05	2.132133E-07	
E1	1.265028E-02	7.732934E-04	-1.918698E-05	1.393228E-07	
E2	2.788238E-02	1.795500E-03	-4.762829E-05	3.601379E-07	
E3	1.337715E-02	5.804791E-04	-1.358334E-05	1.042964E-07	
E4	1.611619E-02	7.976867E-04	-1.688222E-05	1.084860E-07	
F1	1.087524E-02	7.732338E-04	-1.622696E-05	1.113281E-07	
F2	2.893018E-02	1.428756E-03	-3.828805E-05	3.094140E-07	
F3	2.189555E-02	1.563695E-03	-3.604120E-05	2.517421E-07	
F4	3.221400E-02	1.702814E-03	-3.583930E-05	2.399851E-07	
G1	1.523184E-02	8.958400E-04	-2.034207E-05	1.438562E-07	
G2	2.387930E-02	1.197148E-03	-2.428098E-05	1.519606E-07	
G3	3.259242E-02	2.009683E-03	-5.062424E-05	3.772828E-07	
G4	1.545808E-02	1.121912E-03	-2.660004E-05	1.853068E-07	
H1	1.672895E-02	1.520540E-03	-3.814038E-05	2.742498E-07	
H2	2.691706E-02	1.424749E-03	-3.765343E-05	2.850803E-07	
H3	1.406461E-02	1.255088E-03	-3.071521E-05	2.184193E-07	
H4	2.844325E-02	1.448361E-03	-3.574430E-05	2.606249E-07	
I1	8.018018E-03	4.569027E-04	-9.515941E-06	6.059491E-08	
I2	6.179855E-03	5.765432E-04	-1.606059E-05	1.311262E-07	
I3	8.246091E-03	5.592711E-04	-1.421182E-05	1.030627E-07	
I4	7.238649E-03	6.695838E-04	-1.702031E-05	1.254965E-07	
J1	1.038418E-02	4.278239E-04	-9.077691E-06	5.656025E-08	
J2	7.299139E-03	6.003583E-04	-1.515810E-05	1.114583E-07	
J3	6.533284E-03	4.829029E-04	-1.062910E-05	7.111799E-08	
J4	9.264315E-03	7.614585E-04	-1.946979E-05	1.406066E-07	

2	C2	3	20160	678	9/30/2013 19:17	9/30/2013 19:20	LB4100	PO210X13
3	C2	3	17390	521	9/30/2013 19:55	9/30/2013 19:58	LB4100	PO210X13
4	C2	3	16370	636	9/30/2013 19:50	9/30/2013 19:53	LB4100	PO210X13
5	C2	3	14635	531	9/30/2013 19:44	9/30/2013 19:47	LB4100	PO210X13
6	C2	3	15254	615	9/30/2013 19:39	9/30/2013 19:42	LB4100	PO210X13
7	C2	3	12680	525	9/30/2013 19:33	9/30/2013 19:36	LB4100	PO210X13
8	C2	3	12530	460	9/30/2013 19:29	9/30/2013 19:32	LB4100	PO210X13
1	C3	3	17189	463	9/30/2013 19:29	9/30/2013 19:32	LB4100	PO210X13
2	C3	3	17465	653	9/30/2013 19:22	9/30/2013 19:25	LB4100	PO210X13
3	C3	3	13556	495	9/30/2013 19:17	9/30/2013 19:20	LB4100	PO210X13
4	C3	3	13938	642	9/30/2013 19:55	9/30/2013 19:58	LB4100	PO210X13
5	C3	3	12360	606	9/30/2013 19:50	9/30/2013 19:53	LB4100	PO210X13
6	C3	3	12886	580	9/30/2013 19:44	9/30/2013 19:47	LB4100	PO210X13
7	C3	3	10566	553	9/30/2013 19:39	9/30/2013 19:42	LB4100	PO210X13
8	C3	3	10777	532	9/30/2013 19:33	9/30/2013 19:36	LB4100	PO210X13
1	C4	3	14662	381	9/30/2013 19:34	9/30/2013 19:37	LB4100	PO210X13
2	C4	3	15327	549	9/30/2013 19:29	9/30/2013 19:32	LB4100	PO210X13
3	C4	3	12549	520	9/30/2013 19:22	9/30/2013 19:25	LB4100	PO210X13
4	C4	3	11890	547	9/30/2013 19:17	9/30/2013 19:20	LB4100	PO210X13
5	C4	3	11266	545	9/30/2013 19:55	9/30/2013 19:58	LB4100	PO210X13
6	C4	3	11406	575	9/30/2013 19:50	9/30/2013 19:53	LB4100	PO210X13
7	C4	3	9292	539	9/30/2013 19:44	9/30/2013 19:47	LB4100	PO210X13
8	C4	3	9588	525	9/30/2013 19:39	9/30/2013 19:42	LB4100	PO210X13
1	D1	3	24496	397	9/30/2013 19:40	9/30/2013 19:43	LB4100	PO210X13
2	D1	3	24434	570	9/30/2013 19:35	9/30/2013 19:38	LB4100	PO210X13
3	D1	3	19812	449	9/30/2013 19:30	9/30/2013 19:33	LB4100	PO210X13
4	D1	3	19694	666	9/30/2013 19:23	9/30/2013 19:26	LB4100	PO210X13
5	D1	3	17806	538	9/30/2013 19:18	9/30/2013 19:21	LB4100	PO210X13
6	D1	3	19381	573	9/30/2013 19:56	9/30/2013 19:59	LB4100	PO210X13
7	D1	3	15655	544	9/30/2013 19:51	9/30/2013 19:54	LB4100	PO210X13
8	D1	3	15526	536	9/30/2013 19:45	9/30/2013 19:48	LB4100	PO210X13
1	D2	3	22812	379	9/30/2013 19:45	9/30/2013 19:48	LB4100	PO210X13
2	D2	3	23153	562	9/30/2013 19:40	9/30/2013 19:43	LB4100	PO210X13
3	D2	3	18268	566	9/30/2013 19:35	9/30/2013 19:38	LB4100	PO210X13
4	D2	3	18126	661	9/30/2013 19:30	9/30/2013 19:33	LB4100	PO210X13
5	D2	3	16237	601	9/30/2013 19:23	9/30/2013 19:26	LB4100	PO210X13
6	D2	3	17654	653	9/30/2013 19:18	9/30/2013 19:21	LB4100	PO210X13

7	D2	3	13925	590	9/30/2013 19:56	9/30/2013 19:59	LB4100	PO210X13
8	D2	3	13969	560	9/30/2013 19:51	9/30/2013 19:54	LB4100	PO210X13
1	D3	3	23020	359	9/30/2013 19:51	9/30/2013 19:54	LB4100	PO210X13
2	D3	3	23584	539	9/30/2013 19:45	9/30/2013 19:48	LB4100	PO210X13
3	D3	3	18592	498	9/30/2013 19:40	9/30/2013 19:43	LB4100	PO210X13
4	D3	3	19060	641	9/30/2013 19:35	9/30/2013 19:38	LB4100	PO210X13
5	D3	3	16669	543	9/30/2013 19:30	9/30/2013 19:33	LB4100	PO210X13
6	D3	3	18123	564	9/30/2013 19:23	9/30/2013 19:26	LB4100	PO210X13
7	D3	3	14345	554	9/30/2013 19:18	9/30/2013 19:21	LB4100	PO210X13
8	D3	3	14213	544	9/30/2013 19:56	9/30/2013 19:59	LB4100	PO210X13
1	D4	3	24458	368	9/30/2013 19:56	9/30/2013 19:59	LB4100	PO210X13
2	D4	3	24655	567	9/30/2013 19:51	9/30/2013 19:54	LB4100	PO210X13
3	D4	3	20643	458	9/30/2013 19:45	9/30/2013 19:48	LB4100	PO210X13
4	D4	3	19610	602	9/30/2013 19:40	9/30/2013 19:43	LB4100	PO210X13
5	D4	3	17845	560	9/30/2013 19:35	9/30/2013 19:38	LB4100	PO210X13
6	D4	3	18648	562	9/30/2013 19:30	9/30/2013 19:33	LB4100	PO210X13
7	D4	3	15241	516	9/30/2013 19:23	9/30/2013 19:26	LB4100	PO210X13
8	D4	3	15410	581	9/30/2013 19:18	9/30/2013 19:21	LB4100	PO210X13
1	E1	3	24802	289	9/29/2013 19:42	9/29/2013 19:45	LB4100	PO210X13
2	E1	3	24959	390	9/29/2013 20:16	9/29/2013 20:19	LB4100	PO210X13
3	E1	3	20668	354	9/29/2013 20:12	9/29/2013 20:15	LB4100	PO210X13
4	E1	3	19734	434	9/29/2013 20:07	9/29/2013 20:10	LB4100	PO210X13
5	E1	3	17859	369	9/29/2013 20:01	9/29/2013 20:04	LB4100	PO210X13
6	E1	3	19212	408	9/29/2013 19:56	9/29/2013 19:59	LB4100	PO210X13
7	E1	3	15476	322	9/29/2013 19:52	9/29/2013 19:55	LB4100	PO210X13
8	E1	3	15532	350	9/29/2013 19:47	9/29/2013 19:50	LB4100	PO210X13
1	E2	3	18122	472	9/29/2013 19:47	9/29/2013 19:50	LB4100	PO210X13
2	E2	3	18918	633	9/29/2013 19:42	9/29/2013 19:45	LB4100	PO210X13
3	E2	3	14820	589	9/29/2013 20:16	9/29/2013 20:19	LB4100	PO210X13
4	E2	3	14849	697	9/29/2013 20:12	9/29/2013 20:15	LB4100	PO210X13
5	E2	3	13331	628	9/29/2013 20:07	9/29/2013 20:10	LB4100	PO210X13
6	E2	3	14317	612	9/29/2013 20:01	9/29/2013 20:04	LB4100	PO210X13
7	E2	3	11829	529	9/29/2013 19:56	9/29/2013 19:59	LB4100	PO210X13
8	E2	3	11569	574	9/29/2013 19:52	9/29/2013 19:55	LB4100	PO210X13
1	E3	3	24174	302	9/29/2013 19:52	9/29/2013 19:55	LB4100	PO210X13
2	E3	3	24539	371	9/29/2013 19:47	9/29/2013 19:50	LB4100	PO210X13
3	E3	3	19901	362	9/29/2013 19:42	9/29/2013 19:45	LB4100	PO210X13

4	E3	3	19870	377	9/29/2013 20:16	9/29/2013 20:19	LB4100	PO210X13
5	E3	3	17510	387	9/29/2013 20:12	9/29/2013 20:15	LB4100	PO210X13
6	E3	3	18837	377	9/29/2013 20:07	9/29/2013 20:10	LB4100	PO210X13
7	E3	3	15271	362	9/29/2013 20:01	9/29/2013 20:04	LB4100	PO210X13
8	E3	3	14674	376	9/29/2013 19:56	9/29/2013 19:59	LB4100	PO210X13
1	E4	3	23212	350	9/29/2013 19:56	9/29/2013 19:59	LB4100	PO210X13
2	E4	3	23389	459	9/29/2013 19:52	9/29/2013 19:55	LB4100	PO210X13
3	E4	3	19631	394	9/29/2013 19:47	9/29/2013 19:50	LB4100	PO210X13
4	E4	3	18584	499	9/29/2013 19:42	9/29/2013 19:45	LB4100	PO210X13
5	E4	3	16753	445	9/29/2013 20:16	9/29/2013 20:19	LB4100	PO210X13
6	E4	3	17284	463	9/29/2013 20:12	9/29/2013 20:15	LB4100	PO210X13
7	E4	3	14465	404	9/29/2013 20:07	9/29/2013 20:10	LB4100	PO210X13
8	E4	3	14874	398	9/29/2013 20:01	9/29/2013 20:04	LB4100	PO210X13
1	F1	3	24678	231	9/29/2013 20:01	9/29/2013 20:04	LB4100	PO210X13
2	F1	3	24892	353	9/29/2013 19:56	9/29/2013 19:59	LB4100	PO210X13
3	F1	3	20738	334	9/29/2013 19:52	9/29/2013 19:55	LB4100	PO210X13
4	F1	3	19788	396	9/29/2013 19:47	9/29/2013 19:50	LB4100	PO210X13
5	F1	3	18146	409	9/29/2013 19:42	9/29/2013 19:45	LB4100	PO210X13
6	F1	3	18935	399	9/29/2013 20:16	9/29/2013 20:19	LB4100	PO210X13
7	F1	3	15388	389	9/29/2013 20:12	9/29/2013 20:15	LB4100	PO210X13
8	F1	3	15382	384	9/29/2013 20:07	9/29/2013 20:10	LB4100	PO210X13
1	F2	3	20896	602	9/29/2013 20:07	9/29/2013 20:10	LB4100	PO210X13
2	F2	3	21440	744	9/29/2013 20:01	9/29/2013 20:04	LB4100	PO210X13
3	F2	3	17766	607	9/29/2013 19:56	9/29/2013 19:59	LB4100	PO210X13
4	F2	3	17400	786	9/29/2013 19:52	9/29/2013 19:55	LB4100	PO210X13
5	F2	3	15838	722	9/29/2013 19:47	9/29/2013 19:50	LB4100	PO210X13
6	F2	3	17070	717	9/29/2013 19:42	9/29/2013 19:45	LB4100	PO210X13
7	F2	3	13239	615	9/29/2013 20:16	9/29/2013 20:19	LB4100	PO210X13
8	F2	3	13058	725	9/29/2013 20:12	9/29/2013 20:15	LB4100	PO210X13
1	F3	3	20437	427	9/29/2013 20:12	9/29/2013 20:15	LB4100	PO210X13
2	F3	3	20456	619	10/1/2013 10:46	10/1/2013 10:49	LB4100	PO210X13
3	F3	3	16860	464	9/29/2013 20:01	9/29/2013 20:04	LB4100	PO210X13
4	F3	3	17071	665	9/29/2013 19:56	9/29/2013 19:59	LB4100	PO210X13
5	F3	3	14809	666	9/29/2013 19:52	9/29/2013 19:55	LB4100	PO210X13
6	F3	3	15850	630	9/29/2013 19:47	9/29/2013 19:50	LB4100	PO210X13
7	F3	3	12862	535	9/29/2013 19:42	9/29/2013 19:45	LB4100	PO210X13
8	F3	3	12604	562	9/29/2013 20:16	9/29/2013 20:19	LB4100	PO210X13

1	F4	3	16512	480	9/29/2013 20:16	9/29/2013 20:19	LB4100	PO210X13
2	F4	3	16861	641	9/29/2013 20:12	9/29/2013 20:15	LB4100	PO210X13
3	F4	3	13065	581	9/29/2013 20:08	9/29/2013 20:11	LB4100	PO210X13
4	F4	3	13707	743	9/29/2013 20:01	9/29/2013 20:04	LB4100	PO210X13
5	F4	3	11987	664	9/29/2013 19:56	9/29/2013 19:59	LB4100	PO210X13
6	F4	3	12508	682	9/29/2013 19:52	9/29/2013 19:55	LB4100	PO210X13
7	F4	3	10283	643	9/29/2013 19:47	9/29/2013 19:50	LB4100	PO210X13
8	F4	3	10667	637	9/29/2013 19:42	9/29/2013 19:45	LB4100	PO210X13
1	G1	3	22609	309	9/29/2013 20:20	9/29/2013 20:23	LB4100	PO210X13
2	G1	3	22199	416	9/29/2013 20:49	9/29/2013 20:52	LB4100	PO210X13
3	G1	3	18285	390	9/29/2013 20:45	9/29/2013 20:48	LB4100	PO210X13
4	G1	3	17698	448	9/29/2013 20:40	9/29/2013 20:43	LB4100	PO210X13
5	G1	3	15858	448	9/29/2013 20:36	9/29/2013 20:39	LB4100	PO210X13
6	G1	3	16854	411	9/29/2013 20:32	9/29/2013 20:35	LB4100	PO210X13
7	G1	3	13785	413	9/29/2013 20:28	9/29/2013 20:31	LB4100	PO210X13
8	G1	3	13618	397	9/29/2013 20:24	9/29/2013 20:27	LB4100	PO210X13
1	G2	3	19339	451	9/29/2013 20:24	9/29/2013 20:27	LB4100	PO210X13
2	G2	3	19925	519	9/29/2013 20:21	9/29/2013 20:24	LB4100	PO210X13
3	G2	3	15980	535	9/29/2013 20:49	9/29/2013 20:52	LB4100	PO210X13
4	G2	3	16460	610	9/29/2013 20:45	9/29/2013 20:48	LB4100	PO210X13
5	G2	3	14379	620	9/29/2013 20:40	9/29/2013 20:43	LB4100	PO210X13
6	G2	3	15254	607	9/29/2013 20:36	9/29/2013 20:39	LB4100	PO210X13
7	G2	3	12475	538	9/29/2013 20:32	9/29/2013 20:35	LB4100	PO210X13
8	G2	3	12339	508	9/29/2013 20:28	9/29/2013 20:31	LB4100	PO210X13
1	G3	3	19058	565	9/29/2013 20:28	9/29/2013 20:31	LB4100	PO210X13
2	G3	3	19428	752	9/29/2013 20:24	9/29/2013 20:27	LB4100	PO210X13
3	G3	3	15164	730	9/29/2013 20:21	9/29/2013 20:24	LB4100	PO210X13
4	G3	3	15449	825	9/29/2013 20:49	9/29/2013 20:52	LB4100	PO210X13
5	G3	3	14026	774	9/29/2013 20:45	9/29/2013 20:48	LB4100	PO210X13
6	G3	3	14956	809	9/29/2013 20:40	9/29/2013 20:43	LB4100	PO210X13
7	G3	3	11986	656	9/29/2013 20:36	9/29/2013 20:39	LB4100	PO210X13
8	G3	3	11949	731	9/29/2013 20:32	9/29/2013 20:35	LB4100	PO210X13
1	G4	3	21533	321	9/29/2013 20:32	9/29/2013 20:35	LB4100	PO210X13
2	G4	3	21842	382	9/29/2013 20:28	9/29/2013 20:31	LB4100	PO210X13
3	G4	3	18231	427	9/29/2013 20:24	9/29/2013 20:27	LB4100	PO210X13
4	G4	3	16981	498	9/29/2013 20:21	9/29/2013 20:24	LB4100	PO210X13
5	G4	3	15890	444	9/29/2013 20:49	9/29/2013 20:52	LB4100	PO210X13

6	G4	3	16735	475	9/29/2013 20:45	9/29/2013 20:48	LB4100	PO210X13
7	G4	3	13550	384	9/29/2013 20:40	9/29/2013 20:43	LB4100	PO210X13
8	G4	3	13646	396	9/29/2013 20:36	9/29/2013 20:39	LB4100	PO210X13
1	H1	3	23721	427	9/29/2013 20:36	9/29/2013 20:39	LB4100	PO210X13
2	H1	3	24473	552	9/29/2013 20:32	9/29/2013 20:35	LB4100	PO210X13
3	H1	3	20053	404	9/29/2013 20:28	9/29/2013 20:31	LB4100	PO210X13
4	H1	3	19159	680	9/29/2013 20:24	9/29/2013 20:27	LB4100	PO210X13
5	H1	3	17567	638	9/29/2013 20:20	9/29/2013 20:23	LB4100	PO210X13
6	H1	3	18331	538	9/29/2013 20:49	9/29/2013 20:52	LB4100	PO210X13
7	H1	3	14712	468	9/29/2013 20:45	9/29/2013 20:48	LB4100	PO210X13
8	H1	3	14663	495	9/29/2013 20:40	9/29/2013 20:43	LB4100	PO210X13
1	H2	3	20077	491	9/29/2013 20:40	9/29/2013 20:43	LB4100	PO210X13
2	H2	3	21256	686	9/29/2013 20:36	9/29/2013 20:39	LB4100	PO210X13
3	H2	3	17083	600	9/29/2013 20:32	9/29/2013 20:35	LB4100	PO210X13
4	H2	3	16737	766	9/29/2013 20:28	9/29/2013 20:31	LB4100	PO210X13
5	H2	3	15534	601	9/29/2013 20:24	9/29/2013 20:27	LB4100	PO210X13
6	H2	3	16007	632	9/29/2013 20:20	9/29/2013 20:23	LB4100	PO210X13
7	H2	3	12942	543	9/29/2013 20:49	9/29/2013 20:52	LB4100	PO210X13
8	H2	3	13267	585	9/29/2013 20:45	9/29/2013 20:48	LB4100	PO210X13
1	H3	3	22475	316	9/29/2013 20:45	9/29/2013 20:48	LB4100	PO210X13
2	H3	3	22897	408	9/29/2013 20:40	9/29/2013 20:43	LB4100	PO210X13
3	H3	3	18385	374	9/29/2013 20:36	9/29/2013 20:39	LB4100	PO210X13
4	H3	3	18320	530	9/29/2013 20:32	9/29/2013 20:35	LB4100	PO210X13
5	H3	3	16500	477	9/29/2013 20:28	9/29/2013 20:31	LB4100	PO210X13
6	H3	3	17771	487	9/29/2013 20:24	9/29/2013 20:27	LB4100	PO210X13
7	H3	3	14234	380	9/29/2013 20:20	9/29/2013 20:23	LB4100	PO210X13
8	H3	3	14209	414	9/29/2013 20:49	9/29/2013 20:52	LB4100	PO210X13
1	H4	3	18494	497	9/29/2013 20:49	9/29/2013 20:52	LB4100	PO210X13
2	H4	3	19070	627	9/29/2013 20:45	9/29/2013 20:48	LB4100	PO210X13
3	H4	3	15221	577	9/29/2013 20:40	9/29/2013 20:43	LB4100	PO210X13
4	H4	3	15625	712	9/29/2013 20:36	9/29/2013 20:39	LB4100	PO210X13
5	H4	3	14196	629	9/29/2013 20:32	9/29/2013 20:35	LB4100	PO210X13
6	H4	3	14885	655	9/29/2013 20:28	9/29/2013 20:31	LB4100	PO210X13
7	H4	3	12113	546	9/29/2013 20:24	9/29/2013 20:27	LB4100	PO210X13
8	H4	3	12254	586	9/29/2013 20:20	9/29/2013 20:23	LB4100	PO210X13
1	I1	3	24878	171	9/30/2013 19:59	9/30/2013 20:02	LB4100	PO210X13
2	I1	3	25470	248	9/30/2013 20:34	9/30/2013 20:37	LB4100	PO210X13

3	I1	3	20830	246	9/30/2013 20:30	9/30/2013 20:33	LB4100	PO210X13
4	I1	3	20405	272	9/30/2013 20:26	9/30/2013 20:29	LB4100	PO210X13
5	I1	3	18319	268	9/30/2013 20:20	9/30/2013 20:23	LB4100	PO210X13
6	I1	3	20061	272	9/30/2013 20:16	9/30/2013 20:19	LB4100	PO210X13
7	I1	3	16034	251	9/30/2013 20:09	9/30/2013 20:12	LB4100	PO210X13
8	I1	3	15965	225	9/30/2013 20:05	9/30/2013 20:08	LB4100	PO210X13
1	I2	3	26894	166	9/30/2013 20:05	9/30/2013 20:08	LB4100	PO210X13
2	I2	3	27944	194	9/30/2013 19:59	9/30/2013 20:02	LB4100	PO210X13
3	I2	3	22909	233	9/30/2013 20:34	9/30/2013 20:37	LB4100	PO210X13
4	I2	3	22071	275	9/30/2013 20:30	9/30/2013 20:33	LB4100	PO210X13
5	I2	3	20678	253	9/30/2013 20:26	9/30/2013 20:29	LB4100	PO210X13
6	I2	3	21844	227	9/30/2013 20:20	9/30/2013 20:23	LB4100	PO210X13
7	I2	3	17420	226	9/30/2013 20:16	9/30/2013 20:19	LB4100	PO210X13
8	I2	3	17335	277	9/30/2013 20:09	9/30/2013 20:12	LB4100	PO210X13
1	I3	3	26243	186	9/30/2013 20:09	9/30/2013 20:12	LB4100	PO210X13
2	I3	3	27268	287	9/30/2013 20:05	9/30/2013 20:08	LB4100	PO210X13
3	I3	3	22189	264	9/30/2013 19:59	9/30/2013 20:02	LB4100	PO210X13
4	I3	3	22053	331	9/30/2013 20:34	9/30/2013 20:37	LB4100	PO210X13
5	I3	3	20299	277	9/30/2013 20:30	9/30/2013 20:33	LB4100	PO210X13
6	I3	3	20902	282	9/30/2013 20:26	9/30/2013 20:29	LB4100	PO210X13
7	I3	3	17064	238	9/30/2013 20:20	9/30/2013 20:23	LB4100	PO210X13
8	I3	3	17235	245	9/30/2013 20:16	9/30/2013 20:19	LB4100	PO210X13
1	I4	3	26454	184	9/30/2013 20:16	9/30/2013 20:19	LB4100	PO210X13
2	I4	3	26837	244	9/30/2013 20:09	9/30/2013 20:12	LB4100	PO210X13
3	I4	3	21826	250	9/30/2013 20:05	9/30/2013 20:08	LB4100	PO210X13
4	I4	3	21595	313	9/30/2013 19:59	9/30/2013 20:02	LB4100	PO210X13
5	I4	3	19480	284	9/30/2013 20:34	9/30/2013 20:37	LB4100	PO210X13
6	I4	3	20838	302	9/30/2013 20:30	9/30/2013 20:33	LB4100	PO210X13
7	I4	3	16950	226	9/30/2013 20:26	9/30/2013 20:29	LB4100	PO210X13
8	I4	3	16725	266	9/30/2013 20:20	9/30/2013 20:23	LB4100	PO210X13
1	J1	3	25454	235	9/30/2013 20:20	9/30/2013 20:23	LB4100	PO210X13
2	J1	3	26017	292	9/30/2013 20:16	9/30/2013 20:19	LB4100	PO210X13
3	J1	3	20844	311	9/30/2013 20:09	9/30/2013 20:12	LB4100	PO210X13
4	J1	3	20690	326	9/30/2013 20:05	9/30/2013 20:08	LB4100	PO210X13
5	J1	3	18698	278	9/30/2013 19:59	9/30/2013 20:02	LB4100	PO210X13
6	J1	3	19900	331	9/30/2013 20:34	9/30/2013 20:37	LB4100	PO210X13
7	J1	3	15764	254	9/30/2013 20:30	9/30/2013 20:33	LB4100	PO210X13

8	J1	3	16056	242	9/30/2013 20:26	9/30/2013 20:29	LB4100	PO210X13
1	J2	3	25506	162	9/30/2013 20:26	9/30/2013 20:29	LB4100	PO210X13
2	J2	3	25866	264	9/30/2013 20:20	9/30/2013 20:23	LB4100	PO210X13
3	J2	3	21357	226	9/30/2013 20:16	9/30/2013 20:19	LB4100	PO210X13
4	J2	3	20990	289	9/30/2013 20:09	9/30/2013 20:12	LB4100	PO210X13
5	J2	3	18647	264	9/30/2013 20:05	9/30/2013 20:08	LB4100	PO210X13
6	J2	3	19945	268	9/30/2013 19:59	9/30/2013 20:02	LB4100	PO210X13
7	J2	3	16347	218	9/30/2013 20:34	9/30/2013 20:37	LB4100	PO210X13
8	J2	3	16292	245	9/30/2013 20:30	9/30/2013 20:33	LB4100	PO210X13
1	J3	3	25318	143	9/30/2013 20:30	9/30/2013 20:33	LB4100	PO210X13
2	J3	3	25395	201	9/30/2013 20:26	9/30/2013 20:29	LB4100	PO210X13
3	J3	3	20882	218	9/30/2013 20:20	9/30/2013 20:23	LB4100	PO210X13
4	J3	3	20240	253	9/30/2013 20:16	9/30/2013 20:19	LB4100	PO210X13
5	J3	3	18358	225	9/30/2013 20:09	9/30/2013 20:12	LB4100	PO210X13
6	J3	3	19290	251	9/30/2013 20:05	9/30/2013 20:08	LB4100	PO210X13
7	J3	3	15554	208	9/30/2013 19:59	9/30/2013 20:02	LB4100	PO210X13
8	J3	3	15855	208	9/30/2013 20:34	9/30/2013 20:37	LB4100	PO210X13
1	J4	3	25356	205	9/30/2013 20:34	9/30/2013 20:37	LB4100	PO210X13
2	J4	3	25416	305	9/30/2013 20:30	9/30/2013 20:33	LB4100	PO210X13
3	J4	3	20638	306	9/30/2013 20:26	9/30/2013 20:29	LB4100	PO210X13
4	J4	3	20290	341	9/30/2013 20:20	9/30/2013 20:23	LB4100	PO210X13
5	J4	3	18253	324	9/30/2013 20:16	9/30/2013 20:19	LB4100	PO210X13
6	J4	3	18969	313	9/30/2013 20:09	9/30/2013 20:12	LB4100	PO210X13
7	J4	3	15927	249	9/30/2013 20:05	9/30/2013 20:08	LB4100	PO210X13
8	J4	3	15616	268	9/30/2013 19:59	9/30/2013 20:02	LB4100	PO210X13

Beta Xtalk Calibration - LB4100 - Sep 2013

Standard Data		
	Isotope	Sr-90
	Standard ID number	0133-T
	Half Life (days)	10555.725
	Std. Act. (dpm/mL)***	55362.7
	Reference Date	4/1/1996
	Volume of spike (mL)	0.5
	Std. Nominal (dpm)	18219.08
	Decay Date	9/9/2013

*** Includes activity of Y-90, which is in equilibrium.

Source Weight	
Source	Measured weight (mg)
1	0.0
2	12.8
3	27.7
4	50.8
5	60.8
6	73.2
7	98.4
8	115.8

The following detectors were not calibrated:

A4

Raw Count Data						Sr-90	Source	Average
Detector (#)	Source ID (#)	Start Time	Count Time (min)	Alpha (counts)	Beta (counts)	Xtalk (Alpha/Beta)	Measured Weight	Xtalk (Alpha/Beta)
A1	1	9/10/2013 15:42	5	0	41944	0.0000%	0.0	
A1	2	9/10/2013 16:05	2	2	16623	0.0120%	12.8	
A1	3	9/10/2013 15:59	2	0	14820	0.0000%	27.7	
A1	4	9/10/2013 15:54	2	1	14963	0.0067%	50.8	
A1	5	9/10/2013 16:09	2	2	14981	0.0134%	60.8	
A1	6	9/10/2013 16:22	2	3	14295	0.0210%	73.2	
A1	7	9/10/2013 16:18	2	2	13861	0.0144%	98.4	
A1	8	9/10/2013 16:15	2	1	13617	0.0073%	115.8	0.0094%
A2	1	9/10/2013 15:54	2	2	17030	0.0117%	0.0	
A2	2	9/10/2013 15:42	5	7	40964	0.0171%	12.8	
A2	3	9/10/2013 16:05	2	0	14806	0.0000%	27.7	
A2	4	9/10/2013 15:59	2	1	14998	0.0067%	50.8	
A2	5	9/10/2013 16:15	2	2	15442	0.0130%	60.8	
A2	6	9/10/2013 16:09	2	5	14760	0.0339%	73.2	
A2	7	9/10/2013 16:22	2	3	14003	0.0214%	98.4	
A2	8	9/10/2013 16:18	2	3	13712	0.0219%	115.8	0.0157%
A3	1	9/10/2013 15:59	2	1	16694	0.0060%	0.0	
A3	2	9/10/2013 15:54	2	0	16345	0.0000%	12.8	
A3	3	9/10/2013 15:42	5	3	37987	0.0079%	27.7	
A3	4	9/10/2013 16:05	2	1	15032	0.0067%	50.8	
A3	5	9/10/2013 16:18	2	4	15315	0.0261%	60.8	
A3	6	9/10/2013 16:15	2	3	14534	0.0206%	73.2	
A3	7	9/10/2013 16:09	2	1	14016	0.0071%	98.4	
A3	8	9/10/2013 16:22	2	3	13798	0.0217%	115.8	0.0120%
B1	1	9/10/2013 16:09	2	1	16671	0.0060%	0.0	
B1	2	9/10/2013 16:22	2	3	16228	0.0185%	12.8	
B1	3	9/10/2013 16:18	2	1	14481	0.0069%	27.7	
B1	4	9/10/2013 16:15	2	2	15155	0.0132%	50.8	
B1	5	9/10/2013 15:42	5	8	38570	0.0207%	60.8	
B1	6	9/10/2013 16:05	2	1	14167	0.0071%	73.2	
B1	7	9/10/2013 15:59	2	2	13625	0.0147%	98.4	
B1	8	9/10/2013 15:54	2	4	13598	0.0294%	115.8	0.0146%
B2	1	9/10/2013 16:15	2	2	17643	0.0113%	0.0	
B2	2	9/10/2013 16:09	2	1	16606	0.0060%	12.8	
B2	3	9/10/2013 16:22	2	3	15755	0.0190%	27.7	
B2	4	9/10/2013 16:18	2	1	15521	0.0064%	50.8	
B2	5	9/10/2013 15:54	2	1	15993	0.0063%	60.8	
B2	6	9/10/2013 15:42	5	9	38171	0.0236%	73.2	

Raw Count Data						Sr-90	Source	Average
Detector (#)	Source ID (#)	Start Time	Count Time (min)	Alpha (counts)	Beta (counts)	Xtalk (Alpha/Beta)	Measured Weight	Xtalk (Alpha/Beta)
B2	7	9/10/2013 16:05	2	1	14422	0.0069%	98.4	
B2	8	9/10/2013 15:59	2	4	14420	0.0277%	115.8	0.0134%
B3	1	9/10/2013 16:19	2	1	16974	0.0059%	0.0	
B3	2	9/10/2013 16:15	2	2	17237	0.0116%	12.8	
B3	3	9/10/2013 16:09	2	4	15708	0.0255%	27.7	
B3	4	9/10/2013 16:22	2	1	15693	0.0064%	50.8	
B3	5	9/10/2013 15:59	2	1	16196	0.0062%	60.8	
B3	6	9/10/2013 15:54	2	1	15101	0.0066%	73.2	
B3	7	9/10/2013 15:42	5	3	35723	0.0084%	98.4	
B3	8	9/10/2013 16:05	2	3	13702	0.0219%	115.8	0.0116%
B4	1	9/10/2013 16:22	2	2	15385	0.0130%	0.0	
B4	2	9/10/2013 16:19	2	5	14759	0.0339%	12.8	
B4	3	9/10/2013 16:15	2	1	13746	0.0073%	27.7	
B4	4	9/10/2013 16:09	2	1	13793	0.0073%	50.8	
B4	5	9/10/2013 16:05	2	4	14250	0.0281%	60.8	
B4	6	9/10/2013 16:00	2	0	14077	0.0000%	73.2	
B4	7	9/10/2013 15:54	2	2	13103	0.0153%	98.4	
B4	8	9/10/2013 15:42	5	5	31691	0.0158%	115.8	0.0151%
C1	1	9/9/2013 16:39	2	3	17220	0.0174%	0.0	
C1	2	9/9/2013 17:15	2	2	16587	0.0121%	12.8	
C1	3	9/9/2013 17:06	2	1	15382	0.0065%	27.7	
C1	4	9/9/2013 17:02	2	1	15389	0.0065%	50.8	
C1	5	9/9/2013 16:58	2	5	15925	0.0314%	60.8	
C1	6	9/9/2013 16:52	2	3	15427	0.0194%	73.2	
C1	7	9/9/2013 16:47	2	4	14394	0.0278%	98.4	
C1	8	9/9/2013 16:43	2	6	14144	0.0424%	115.8	0.0204%
C2	1	9/9/2013 16:43	2	0	17907	0.0000%	0.0	
C2	2	9/9/2013 16:39	2	4	17359	0.0230%	12.8	
C2	3	9/9/2013 17:15	2	0	15716	0.0000%	27.7	
C2	4	9/9/2013 17:06	2	1	15736	0.0064%	50.8	
C2	5	9/9/2013 17:02	2	0	16600	0.0000%	60.8	
C2	6	9/9/2013 16:58	2	2	15578	0.0128%	73.2	
C2	7	9/9/2013 16:52	2	2	14551	0.0137%	98.4	
C2	8	9/9/2013 16:47	2	5	14259	0.0351%	115.8	0.0114%
C3	1	9/9/2013 16:47	2	0	17961	0.0000%	0.0	
C3	2	9/9/2013 16:43	2	0	17295	0.0000%	12.8	
C3	3	9/9/2013 16:39	2	4	16131	0.0248%	27.7	
C3	4	9/9/2013 17:15	2	3	16057	0.0187%	50.8	
C3	5	9/9/2013 17:06	2	1	16003	0.0062%	60.8	
C3	6	9/9/2013 17:02	2	0	15550	0.0000%	73.2	
C3	7	9/9/2013 16:58	2	4	14930	0.0268%	98.4	
C3	8	9/9/2013 16:52	2	2	14472	0.0138%	115.8	0.0113%
C4	1	9/9/2013 16:52	2	0	18081	0.0000%	0.0	
C4	2	9/9/2013 16:47	2	1	17321	0.0058%	12.8	
C4	3	9/9/2013 16:43	2	2	15903	0.0126%	27.7	
C4	4	9/9/2013 16:39	2	1	15908	0.0063%	50.8	
C4	5	9/9/2013 17:15	2	2	16579	0.0121%	60.8	
C4	6	9/9/2013 17:06	2	2	15400	0.0130%	73.2	
C4	7	9/9/2013 17:02	2	3	14945	0.0201%	98.4	
C4	8	9/9/2013 16:58	2	2	14593	0.0137%	115.8	0.0104%
D1	1	9/9/2013 16:58	2	1	16225	0.0062%	0.0	
D1	2	9/9/2013 16:52	2	4	17018	0.0235%	12.8	
D1	3	9/9/2013 16:47	2	1	15340	0.0065%	27.7	
D1	4	9/9/2013 16:43	2	0	15210	0.0000%	50.8	
D1	5	9/9/2013 16:39	2	1	15139	0.0066%	60.8	
D1	6	9/9/2013 17:15	2	3	15215	0.0197%	73.2	

Detector (#)	Source ID (#)	Raw Count Data Start Time	Count Time (min)	Alpha (counts)	Beta (counts)	Sr-90 Xtalk (Alpha/Beta)	Source Measured Weight	Average Xtalk (Alpha/Beta)
D1	7	9/9/2013 17:06	2	0	14693	0.0000%	98.4	
D1	8	9/9/2013 17:02	2	1	14275	0.0070%	115.8	0.0087%
D2	1	9/9/2013 17:02	2	2	19299	0.0104%	0.0	
D2	2	9/9/2013 16:58	2	0	18598	0.0000%	12.8	
D2	3	9/9/2013 16:52	2	1	17475	0.0057%	27.7	
D2	4	9/9/2013 16:47	2	0	17380	0.0000%	50.8	
D2	5	9/9/2013 16:43	2	1	17604	0.0057%	60.8	
D2	6	9/9/2013 16:39	2	5	16484	0.0303%	73.2	
D2	7	9/9/2013 17:15	2	1	16650	0.0060%	98.4	
D2	8	9/9/2013 17:06	2	4	15653	0.0256%	115.8	0.0105%
D3	1	9/9/2013 17:06	2	1	19375	0.0052%	0.0	
D3	2	9/9/2013 17:02	2	3	18612	0.0161%	12.8	
D3	3	9/9/2013 16:58	2	1	17451	0.0057%	27.7	
D3	4	9/9/2013 16:52	2	1	17221	0.0058%	50.8	
D3	5	9/9/2013 16:47	2	1	17654	0.0057%	60.8	
D3	6	9/9/2013 16:43	2	1	16893	0.0059%	73.2	
D3	7	9/9/2013 16:39	2	0	16296	0.0000%	98.4	
D3	8	9/9/2013 17:15	2	4	15749	0.0254%	115.8	0.0087%
D4	1	9/9/2013 17:15	2	1	19439	0.0051%	0.0	
D4	2	9/9/2013 17:06	2	4	18995	0.0211%	12.8	
D4	3	9/9/2013 17:02	2	3	17544	0.0171%	27.7	
D4	4	9/9/2013 16:58	2	1	17145	0.0058%	50.8	
D4	5	9/9/2013 16:52	2	1	17590	0.0057%	60.8	
D4	6	9/9/2013 16:47	2	2	16815	0.0119%	73.2	
D4	7	9/9/2013 16:43	2	3	16371	0.0183%	98.4	
D4	8	9/9/2013 16:39	2	3	15484	0.0194%	115.8	0.0131%
E1	1	9/9/2013 14:33	2	2	16911	0.0118%	0.0	
E1	2	9/9/2013 15:01	2	1	16143	0.0062%	12.8	
E1	3	9/9/2013 14:59	2	2	14763	0.0135%	27.7	
E1	4	9/9/2013 14:53	2	1	14977	0.0067%	50.8	
E1	5	9/9/2013 14:50	2	1	15123	0.0066%	60.8	
E1	6	9/9/2013 14:47	2	2	14526	0.0138%	73.2	
E1	7	9/9/2013 14:44	2	1	13746	0.0073%	98.4	
E1	8	9/9/2013 14:39	2	0	13575	0.0000%	115.8	0.0082%
E2	1	9/9/2013 14:39	2	0	16793	0.0000%	0.0	
E2	2	9/9/2013 14:34	2	4	16324	0.0245%	12.8	
E2	3	9/9/2013 15:01	2	1	14576	0.0069%	27.7	
E2	4	9/9/2013 14:59	2	1	14989	0.0067%	50.8	
E2	5	9/9/2013 14:53	2	1	15153	0.0066%	60.8	
E2	6	9/9/2013 14:50	2	4	14712	0.0272%	73.2	
E2	7	9/9/2013 14:47	2	4	13919	0.0287%	98.4	
E2	8	9/9/2013 14:44	2	6	13536	0.0443%	115.8	0.0181%
E3	1	9/9/2013 14:44	2	1	16656	0.0060%	0.0	
E3	2	9/9/2013 14:39	2	3	16041	0.0187%	12.8	
E3	3	9/9/2013 14:34	2	0	14927	0.0000%	27.7	
E3	4	9/9/2013 15:01	2	1	15061	0.0066%	50.8	
E3	5	9/9/2013 14:59	2	3	15477	0.0194%	60.8	
E3	6	9/9/2013 14:53	2	3	14420	0.0208%	73.2	
E3	7	9/9/2013 14:50	2	2	13966	0.0143%	98.4	
E3	8	9/9/2013 14:47	2	2	13397	0.0149%	115.8	0.0126%
E4	1	9/9/2013 14:47	2	1	17333	0.0058%	0.0	
E4	2	9/9/2013 14:44	2	1	16703	0.0060%	12.8	
E4	3	9/9/2013 14:39	2	3	15155	0.0198%	27.7	
E4	4	9/9/2013 14:34	2	3	15336	0.0196%	50.8	
E4	5	9/9/2013 15:01	2	3	15392	0.0195%	60.8	
E4	6	9/9/2013 14:59	2	3	14474	0.0207%	73.2	

Detector (#)	Source ID (#)	Raw Count Data Start Time	Count Time (min)	Alpha (counts)	Beta (counts)	Sr-90 Xtalk (Alpha/Beta)	Source Measured Weight	Average Xtalk (Alpha/Beta)
E4	7	9/9/2013 14:53	2	0	14066	0.0000%	98.4	
E4	8	9/9/2013 14:50	2	2	13728	0.0146%	115.8	0.0132%
F1	1	9/9/2013 14:50	2	1	17509	0.0057%	0.0	
F1	2	9/9/2013 14:47	2	4	17204	0.0233%	12.8	
F1	3	9/9/2013 14:44	2	0	15886	0.0000%	27.7	
F1	4	9/9/2013 14:39	2	3	15702	0.0191%	50.8	
F1	5	9/9/2013 14:34	2	3	16079	0.0187%	60.8	
F1	6	9/9/2013 15:01	2	2	15539	0.0129%	73.2	
F1	7	9/9/2013 14:59	2	5	14815	0.0337%	98.4	
F1	8	9/9/2013 14:53	2	1	14420	0.0069%	115.8	0.0150%
F2	1	9/9/2013 14:53	2	2	16914	0.0118%	0.0	
F2	2	9/9/2013 14:50	2	2	16530	0.0121%	12.8	
F2	3	9/9/2013 14:47	2	1	15394	0.0065%	27.7	
F2	4	9/9/2013 14:44	2	1	15303	0.0065%	50.8	
F2	5	9/9/2013 14:39	2	3	15856	0.0189%	60.8	
F2	6	9/9/2013 14:34	2	1	15058	0.0066%	73.2	
F2	7	9/9/2013 15:01	2	1	14103	0.0071%	98.4	
F2	8	9/9/2013 14:59	2	1	14081	0.0071%	115.8	0.0096%
F3	1	9/9/2013 14:59	2	2	17719	0.0113%	0.0	
F3	2	9/9/2013 14:53	2	3	16760	0.0179%	12.8	
F3	3	9/9/2013 14:50	2	1	15724	0.0064%	27.7	
F3	4	9/9/2013 14:47	2	2	15350	0.0130%	50.8	
F3	5	9/9/2013 14:44	2	1	15706	0.0064%	60.8	
F3	6	9/9/2013 14:39	2	2	15315	0.0131%	73.2	
F3	7	9/9/2013 14:34	2	1	14643	0.0068%	98.4	
F3	8	9/9/2013 15:01	2	2	14090	0.0142%	115.8	0.0111%
F4	1	9/9/2013 15:01	2	5	17974	0.0278%	0.0	
F4	2	9/9/2013 14:59	2	1	17073	0.0059%	12.8	
F4	3	9/9/2013 14:53	2	2	15849	0.0126%	27.7	
F4	4	9/9/2013 14:50	2	2	15570	0.0128%	50.8	
F4	5	9/9/2013 14:47	2	1	16112	0.0062%	60.8	
F4	6	9/9/2013 14:44	2	2	15291	0.0131%	73.2	
F4	7	9/9/2013 14:39	2	1	14758	0.0068%	98.4	
F4	8	9/9/2013 14:34	2	1	14329	0.0070%	115.8	0.0115%
G1	1	9/26/2013 10:36	2	1	16899	0.0059%	0.0	
G1	2	9/26/2013 10:53	2	0	16560	0.0000%	12.8	
G1	3	9/26/2013 10:46	2	1	15184	0.0066%	27.7	
G1	4	9/26/2013 10:40	2	2	15102	0.0132%	50.8	
G1	5	9/26/2013 11:00	2	3	15399	0.0195%	60.8	
G1	6	9/26/2013 11:31	2	1	14876	0.0067%	73.2	
G1	7	9/26/2013 11:25	2	2	14010	0.0143%	98.4	
G1	8	9/26/2013 11:03	2	1	13648	0.0073%	115.8	0.0092%
G2	1	9/26/2013 10:40	2	0	17663	0.0000%	0.0	
G2	2	9/26/2013 10:36	2	1	16439	0.0061%	12.8	
G2	3	9/26/2013 10:53	2	2	15286	0.0131%	27.7	
G2	4	9/26/2013 10:46	2	4	15480	0.0258%	50.8	
G2	5	9/26/2013 11:03	2	4	15617	0.0256%	60.8	
G2	6	9/26/2013 11:00	2	1	15167	0.0066%	73.2	
G2	7	9/26/2013 11:31	2	6	14647	0.0410%	98.4	
G2	8	9/26/2013 11:25	2	3	13940	0.0215%	115.8	0.0175%
G3	1	9/26/2013 10:46	2	0	17971	0.0000%	0.0	
G3	2	9/26/2013 10:40	2	1	16883	0.0059%	12.8	
G3	3	9/26/2013 10:36	2	3	15588	0.0192%	27.7	
G3	4	9/26/2013 10:53	2	8	15531	0.0515%	50.8	
G3	5	9/26/2013 11:25	2	7	16104	0.0435%	60.8	
G3	6	9/26/2013 11:03	2	2	15482	0.0129%	73.2	

Detector (#)	Source ID (#)	Raw Count Data Start Time	Count Time (min)	Alpha (counts)	Beta (counts)	Sr-90 Xtalk (Alpha/Beta)	Source Measured Weight	Average Xtalk (Alpha/Beta)
G3	7	9/26/2013 11:00	2	4	14951	0.0268%	98.4	
G3	8	9/26/2013 11:31	2	3	14197	0.0211%	115.8	0.0226%
G4	1	9/26/2013 10:53	2	0	17172	0.0000%	0.0	
G4	2	9/26/2013 10:46	2	4	16733	0.0239%	12.8	
G4	3	9/26/2013 10:40	2	1	15138	0.0066%	27.7	
G4	4	9/26/2013 10:36	2	4	15028	0.0266%	50.8	
G4	5	9/26/2013 11:31	2	4	15641	0.0256%	60.8	
G4	6	9/26/2013 11:25	2	3	14815	0.0202%	73.2	
G4	7	9/26/2013 11:03	2	1	14560	0.0069%	98.4	
G4	8	9/26/2013 11:00	2	2	13536	0.0148%	115.8	0.0156%
H1	1	9/26/2013 11:00	2	0	17027	0.0000%	0.0	
H1	2	9/26/2013 11:31	2	0	16180	0.0000%	12.8	
H1	3	9/26/2013 11:25	2	4	14973	0.0267%	27.7	
H1	4	9/26/2013 11:03	2	3	15289	0.0196%	50.8	
H1	5	9/26/2013 10:36	2	0	15413	0.0000%	60.8	
H1	6	9/26/2013 10:53	2	5	14968	0.0334%	73.2	
H1	7	9/26/2013 10:46	2	0	14044	0.0000%	98.4	
H1	8	9/26/2013 10:40	2	7	13892	0.0504%	115.8	0.0163%
H2	1	9/26/2013 11:03	2	1	17194	0.0058%	0.0	
H2	2	9/26/2013 11:00	2	2	16398	0.0122%	12.8	
H2	3	9/26/2013 11:31	2	2	15340	0.0130%	27.7	
H2	4	9/26/2013 11:25	2	7	15164	0.0462%	50.8	
H2	5	9/26/2013 10:40	2	2	15245	0.0131%	60.8	
H2	6	9/26/2013 10:36	2	1	14889	0.0067%	73.2	
H2	7	9/26/2013 10:53	2	0	14473	0.0000%	98.4	
H2	8	9/26/2013 10:46	2	2	14037	0.0142%	115.8	0.0139%
H3	1	9/26/2013 11:25	2	1	17552	0.0057%	0.0	
H3	2	9/26/2013 11:03	2	2	16635	0.0120%	12.8	
H3	3	9/26/2013 11:00	2	2	15529	0.0129%	27.7	
H3	4	9/26/2013 11:31	2	6	15613	0.0384%	50.8	
H3	5	9/26/2013 10:46	2	5	15953	0.0313%	60.8	
H3	6	9/26/2013 10:40	2	3	15329	0.0196%	73.2	
H3	7	9/26/2013 10:36	2	4	14369	0.0278%	98.4	
H3	8	9/26/2013 10:53	2	1	14185	0.0070%	115.8	0.0194%
H4	1	9/26/2013 11:31	2	0	17097	0.0000%	0.0	
H4	2	9/26/2013 11:25	2	4	16376	0.0244%	12.8	
H4	3	9/26/2013 11:03	2	0	15008	0.0000%	27.7	
H4	4	9/26/2013 11:00	2	1	15103	0.0066%	50.8	
H4	5	9/26/2013 10:53	2	1	15640	0.0064%	60.8	
H4	6	9/26/2013 10:46	2	2	14911	0.0134%	73.2	
H4	7	9/26/2013 10:40	2	5	14298	0.0350%	98.4	
H4	8	9/26/2013 10:36	2	1	13628	0.0073%	115.8	0.0116%
I1	1	9/9/2013 15:37	2	0	16107	0.0000%	0.0	
I1	2	9/9/2013 16:35	2	4	15780	0.0253%	12.8	
I1	3	9/9/2013 16:30	2	2	14528	0.0138%	27.7	
I1	4	9/9/2013 16:26	2	3	14324	0.0209%	50.8	
I1	5	9/9/2013 16:18	2	3	14933	0.0201%	60.8	
I1	6	9/9/2013 16:15	2	6	14042	0.0427%	73.2	
I1	7	9/9/2013 16:06	2	0	13572	0.0000%	98.4	
I1	8	9/9/2013 16:02	2	5	13304	0.0376%	115.8	0.0201%
I2	1	9/9/2013 16:02	2	1	17133	0.0058%	0.0	
I2	2	9/9/2013 15:37	2	1	16766	0.0060%	12.8	
I2	3	9/9/2013 16:35	2	2	15058	0.0133%	27.7	
I2	4	9/9/2013 16:30	2	1	14984	0.0067%	50.8	
I2	5	9/9/2013 16:26	2	1	15544	0.0064%	60.8	
I2	6	9/9/2013 16:18	2	2	14785	0.0135%	73.2	

Raw Count Data						Sr-90	Source	Average
Detector (#)	Source ID (#)	Start Time	Count Time (min)	Alpha (counts)	Beta (counts)	Xtalk (Alpha/Beta)	Measured Weight	Xtalk (Alpha/Beta)
I2	7	9/9/2013 16:15	2	1	14052	**0.0071%**	98.4	
I2	8	9/9/2013 16:06	2	3	13662	**0.0220%**	115.8	0.0101%
I3	1	9/9/2013 16:06	2	3	16777	**0.0179%**	0.0	
I3	2	9/9/2013 16:02	2	2	16493	**0.0121%**	12.8	
I3	3	9/9/2013 15:37	2	3	14621	**0.0205%**	27.7	
I3	4	9/9/2013 16:35	2	3	14775	**0.0203%**	50.8	
I3	5	9/9/2013 16:30	2	1	15367	**0.0065%**	60.8	
I3	6	9/9/2013 16:26	2	2	14583	**0.0137%**	73.2	
I3	7	9/9/2013 16:18	2	2	13862	**0.0144%**	98.4	
I3	8	9/9/2013 16:15	2	1	13509	**0.0074%**	115.8	0.0141%
I4	1	9/9/2013 16:15	2	1	17024	**0.0059%**	0.0	
I4	2	9/9/2013 16:06	2	0	16421	**0.0000%**	12.8	
I4	3	9/9/2013 16:02	2	1	15315	**0.0065%**	27.7	
I4	4	9/9/2013 15:37	2	2	14962	**0.0134%**	50.8	
I4	5	9/9/2013 16:35	2	2	15512	**0.0129%**	60.8	
I4	6	9/9/2013 16:30	2	3	14499	**0.0207%**	73.2	
I4	7	9/9/2013 16:26	2	2	14177	**0.0141%**	98.4	
I4	8	9/9/2013 16:18	2	3	13548	**0.0221%**	115.8	0.0120%
J1	1	9/9/2013 16:18	2	3	15980	**0.0188%**	0.0	
J1	2	9/9/2013 16:15	2	3	15477	**0.0194%**	12.8	
J1	3	9/9/2013 16:06	2	2	14175	**0.0141%**	27.7	
J1	4	9/9/2013 16:02	2	2	14437	**0.0139%**	50.8	
J1	5	9/9/2013 15:37	2	0	14668	**0.0000%**	60.8	
J1	6	9/9/2013 16:35	2	2	13906	**0.0144%**	73.2	
J1	7	9/9/2013 16:30	2	4	13573	**0.0295%**	98.4	
J1	8	9/9/2013 16:26	2	2	13047	**0.0153%**	115.8	0.0157%
J2	1	9/9/2013 16:26	2	5	15826	**0.0316%**	0.0	
J2	2	9/9/2013 16:18	2	0	15410	**0.0000%**	12.8	
J2	3	9/9/2013 16:15	2	4	13921	**0.0287%**	27.7	
J2	4	9/9/2013 16:06	2	3	14028	**0.0214%**	50.8	
J2	5	9/9/2013 16:02	2	5	14510	**0.0345%**	60.8	
J2	6	9/9/2013 15:37	2	4	13767	**0.0291%**	73.2	
J2	7	9/9/2013 16:35	2	2	12780	**0.0156%**	98.4	
J2	8	9/9/2013 16:30	2	3	12959	**0.0231%**	115.8	0.0230%
J3	1	9/9/2013 16:30	2	3	15950	**0.0188%**	0.0	
J3	2	9/9/2013 16:26	2	1	15398	**0.0065%**	12.8	
J3	3	9/9/2013 16:18	2	0	14110	**0.0000%**	27.7	
J3	4	9/9/2013 16:15	2	3	14013	**0.0214%**	50.8	
J3	5	9/9/2013 16:06	2	1	14341	**0.0070%**	60.8	
J3	6	9/9/2013 16:02	2	2	13833	**0.0145%**	73.2	
J3	7	9/9/2013 15:37	2	1	12957	**0.0077%**	98.4	
J3	8	9/9/2013 16:35	2	2	12909	**0.0155%**	115.8	0.0114%
J4	1	9/9/2013 16:35	2	1	15632	**0.0064%**	0.0	
J4	2	9/9/2013 16:30	2	3	15274	**0.0196%**	12.8	
J4	3	9/9/2013 16:26	2	4	13967	**0.0286%**	27.7	
J4	4	9/9/2013 16:18	2	1	14190	**0.0070%**	50.8	
J4	5	9/9/2013 16:15	2	2	14844	**0.0135%**	60.8	
J4	6	9/9/2013 16:06	2	4	13609	**0.0294%**	73.2	
J4	7	9/9/2013 16:02	2	2	13510	**0.0148%**	98.4	
J4	8	9/9/2013 15:37	2	1	13221	**0.0076%**	115.8	0.0159%

Current Calibration - LB4100

Geometry					
Beta X-talk	**Cal Date**	10/1/2013	**Exp Date**	9/30/2014	
LB4100	A0	A1	A2	A3	A4
A1	9.353001E-05				
A2	1.570367E-04				
A3	1.202206E-04				
A4	#N/A				
B1	1.456034E-04				
B2	1.341828E-04				
B3	1.155254E-04				
B4	1.506418E-04				
C1	2.044153E-04				
C2	1.138083E-04				
C3	1.129259E-04				
C4	1.043312E-04				
D1	8.689356E-05				
D2	1.045736E-04				
D3	8.724951E-05				
D4	1.305176E-04				
E1	8.237656E-05				
E2	1.811099E-04				
E3	1.259785E-04				
E4	1.323747E-04				
F1	1.503509E-04				
F2	9.588521E-05				
F3	1.112823E-04				
F4	1.152256E-04				
G1	9.194161E-05				
G2	1.746224E-04				
G3	2.261869E-04				
G4	1.557435E-04				
H1	1.626625E-04				
H2	1.391198E-04				
H3	1.935363E-04				
H4	1.164522E-04				
I1	2.005754E-04				
I2	1.009908E-04				
I3	1.411043E-04				
I4	1.195075E-04				
J1	1.566268E-04				
J2	2.300329E-04				
J3	1.141924E-04				
J4	1.586973E-04				

LB4100_Beta Xtalk_Sep13_RawData.xls

SampleID	Instr	Time (min.)	Alpha Counts	Beta Counts	Count Start Time	Count End Time	Machine	Batch ID
S1	A1	5	0	41944	9/10/2013 15:42	9/10/2013 15:47	LB4100	GABS13
S2	A1	2	2	16623	9/10/2013 16:05	9/10/2013 16:07	LB4100	GABS13
S3	A1	2	0	14820	9/10/2013 15:59	9/10/2013 16:01	LB4100	GABS13
S4	A1	2	1	14963	9/10/2013 15:54	9/10/2013 15:56	LB4100	GABS13
S5	A1	2	2	14981	9/10/2013 16:09	9/10/2013 16:11	LB4100	GABS13
S6	A1	2	3	14295	9/10/2013 16:22	9/10/2013 16:24	LB4100	GABS13
S7	A1	2	2	13861	9/10/2013 16:18	9/10/2013 16:20	LB4100	GABS13
S8	A1	2	1	13617	9/10/2013 16:15	9/10/2013 16:17	LB4100	GABS13
S1	A2	2	2	17030	9/10/2013 15:54	9/10/2013 15:56	LB4100	GABS13
S2	A2	5	7	40964	9/10/2013 15:42	9/10/2013 15:47	LB4100	GABS13
S3	A2	2	0	14806	9/10/2013 16:05	9/10/2013 16:07	LB4100	GABS13
S4	A2	2	1	14998	9/10/2013 15:59	9/10/2013 16:01	LB4100	GABS13
S5	A2	2	2	15442	9/10/2013 16:15	9/10/2013 16:17	LB4100	GABS13
S6	A2	2	5	14760	9/10/2013 16:09	9/10/2013 16:11	LB4100	GABS13
S7	A2	2	3	14003	9/10/2013 16:22	9/10/2013 16:24	LB4100	GABS13
S8	A2	2	3	13712	9/10/2013 16:18	9/10/2013 16:20	LB4100	GABS13
S1	A3	2	1	16694	9/10/2013 15:59	9/10/2013 16:01	LB4100	GABS13
S2	A3	2	0	16345	9/10/2013 15:54	9/10/2013 15:56	LB4100	GABS13
S3	A3	5	3	37987	9/10/2013 15:42	9/10/2013 15:47	LB4100	GABS13
S4	A3	2	1	15032	9/10/2013 16:05	9/10/2013 16:07	LB4100	GABS13
S5	A3	2	4	15315	9/10/2013 16:18	9/10/2013 16:20	LB4100	GABS13
S6	A3	2	3	14534	9/10/2013 16:15	9/10/2013 16:17	LB4100	GABS13
S7	A3	2	1	14016	9/10/2013 16:09	9/10/2013 16:11	LB4100	GABS13
S8	A3	2	3	13798	9/10/2013 16:22	9/10/2013 16:24	LB4100	GABS13
S1	B1	2	1	16671	9/10/2013 16:09	9/10/2013 16:11	LB4100	GABS13
S2	B1	2	3	16228	9/10/2013 16:22	9/10/2013 16:24	LB4100	GABS13
S3	B1	2	1	14481	9/10/2013 16:18	9/10/2013 16:20	LB4100	GABS13
S4	B1	2	2	15155	9/10/2013 16:15	9/10/2013 16:17	LB4100	GABS13
S5	B1	5	8	38570	9/10/2013 15:42	9/10/2013 15:47	LB4100	GABS13
S6	B1	2	1	14167	9/10/2013 16:05	9/10/2013 16:07	LB4100	GABS13
S7	B1	2	2	13625	9/10/2013 15:59	9/10/2013 16:01	LB4100	GABS13
S8	B1	2	4	13598	9/10/2013 15:54	9/10/2013 15:56	LB4100	GABS13
S1	B2	2	2	17643	9/10/2013 16:15	9/10/2013 16:17	LB4100	GABS13
S2	B2	2	1	16606	9/10/2013 16:09	9/10/2013 16:11	LB4100	GABS13
S3	B2	2	3	15755	9/10/2013 16:22	9/10/2013 16:24	LB4100	GABS13
S4	B2	2	1	15521	9/10/2013 16:18	9/10/2013 16:20	LB4100	GABS13

S5	B2	2	1	15993	9/10/2013 15:54	9/10/2013 15:56	LB4100	GABS13
S6	B2	5	9	38171	9/10/2013 15:42	9/10/2013 15:47	LB4100	GABS13
S7	B2	2	1	14422	9/10/2013 16:05	9/10/2013 16:07	LB4100	GABS13
S8	B2	2	4	14420	9/10/2013 15:59	9/10/2013 16:01	LB4100	GABS13
S1	B3	2	1	16974	9/10/2013 16:19	9/10/2013 16:21	LB4100	GABS13
S2	B3	2	2	17237	9/10/2013 16:15	9/10/2013 16:17	LB4100	GABS13
S3	B3	2	4	15708	9/10/2013 16:09	9/10/2013 16:11	LB4100	GABS13
S4	B3	2	1	15693	9/10/2013 16:22	9/10/2013 16:24	LB4100	GABS13
S5	B3	2	1	16196	9/10/2013 15:59	9/10/2013 16:01	LB4100	GABS13
S6	B3	2	1	15101	9/10/2013 15:54	9/10/2013 15:56	LB4100	GABS13
S7	B3	5	3	35723	9/10/2013 15:42	9/10/2013 15:47	LB4100	GABS13
S8	B3	2	3	13702	9/10/2013 16:05	9/10/2013 16:07	LB4100	GABS13
S1	B4	2	2	15385	9/10/2013 16:22	9/10/2013 16:24	LB4100	GABS13
S2	B4	2	5	14759	9/10/2013 16:19	9/10/2013 16:21	LB4100	GABS13
S3	B4	2	1	13746	9/10/2013 16:15	9/10/2013 16:17	LB4100	GABS13
S4	B4	2	1	13793	9/10/2013 16:09	9/10/2013 16:11	LB4100	GABS13
S5	B4	2	4	14250	9/10/2013 16:05	9/10/2013 16:07	LB4100	GABS13
S6	B4	2	0	14077	9/10/2013 16:00	9/10/2013 16:02	LB4100	GABS13
S7	B4	2	2	13103	9/10/2013 15:54	9/10/2013 15:56	LB4100	GABS13
S8	B4	5	5	31691	9/10/2013 15:42	9/10/2013 15:47	LB4100	GABS13
S1	C1	2	3	17220	9/9/2013 16:39	9/9/2013 16:41	LB4100	GABS13
S2	C1	2	2	16587	9/9/2013 17:15	9/9/2013 17:17	LB4100	GABS13
S3	C1	2	1	15382	9/9/2013 17:06	9/9/2013 17:08	LB4100	GABS13
S4	C1	2	1	15389	9/9/2013 17:02	9/9/2013 17:04	LB4100	GABS13
S5	C1	2	5	15925	9/9/2013 16:58	9/9/2013 17:00	LB4100	GABS13
S6	C1	2	3	15427	9/9/2013 16:52	9/9/2013 16:54	LB4100	GABS13
S7	C1	2	4	14394	9/9/2013 16:47	9/9/2013 16:49	LB4100	GABS13
S8	C1	2	6	14144	9/9/2013 16:43	9/9/2013 16:45	LB4100	GABS13
S1	C2	2	0	17907	9/9/2013 16:43	9/9/2013 16:45	LB4100	GABS13
S2	C2	2	4	17359	9/9/2013 16:39	9/9/2013 16:41	LB4100	GABS13
S3	C2	2	0	15716	9/9/2013 17:15	9/9/2013 17:17	LB4100	GABS13
S4	C2	2	1	15736	9/9/2013 17:06	9/9/2013 17:08	LB4100	GABS13
S5	C2	2	0	16600	9/9/2013 17:02	9/9/2013 17:04	LB4100	GABS13
S6	C2	2	2	15578	9/9/2013 16:58	9/9/2013 17:00	LB4100	GABS13
S7	C2	2	2	14551	9/9/2013 16:52	9/9/2013 16:54	LB4100	GABS13
S8	C2	2	5	14259	9/9/2013 16:47	9/9/2013 16:49	LB4100	GABS13
S1	C3	2	0	17961	9/9/2013 16:47	9/9/2013 16:49	LB4100	GABS13

S2	C3	2	0	17295	9/9/2013 16:43	9/9/2013 16:45	LB4100	GABS13
S3	C3	2	4	16131	9/9/2013 16:39	9/9/2013 16:41	LB4100	GABS13
S4	C3	2	3	16057	9/9/2013 17:15	9/9/2013 17:17	LB4100	GABS13
S5	C3	2	1	16003	9/9/2013 17:06	9/9/2013 17:08	LB4100	GABS13
S6	C3	2	0	15550	9/9/2013 17:02	9/9/2013 17:04	LB4100	GABS13
S7	C3	2	4	14930	9/9/2013 16:58	9/9/2013 17:00	LB4100	GABS13
S8	C3	2	2	14472	9/9/2013 16:52	9/9/2013 16:54	LB4100	GABS13
S1	C4	2	0	18081	9/9/2013 16:52	9/9/2013 16:54	LB4100	GABS13
S2	C4	2	1	17321	9/9/2013 16:47	9/9/2013 16:49	LB4100	GABS13
S3	C4	2	2	15903	9/9/2013 16:43	9/9/2013 16:45	LB4100	GABS13
S4	C4	2	1	15908	9/9/2013 16:39	9/9/2013 16:41	LB4100	GABS13
S5	C4	2	2	16579	9/9/2013 17:15	9/9/2013 17:17	LB4100	GABS13
S6	C4	2	2	15400	9/9/2013 17:06	9/9/2013 17:08	LB4100	GABS13
S7	C4	2	3	14945	9/9/2013 17:02	9/9/2013 17:04	LB4100	GABS13
S8	C4	2	2	14593	9/9/2013 16:58	9/9/2013 17:00	LB4100	GABS13
S1	D1	2	1	16225	9/9/2013 16:58	9/9/2013 17:00	LB4100	GABS13
S2	D1	2	4	17018	9/9/2013 16:52	9/9/2013 16:54	LB4100	GABS13
S3	D1	2	1	15340	9/9/2013 16:47	9/9/2013 16:49	LB4100	GABS13
S4	D1	2	0	15210	9/9/2013 16:43	9/9/2013 16:45	LB4100	GABS13
S5	D1	2	1	15139	9/9/2013 16:39	9/9/2013 16:41	LB4100	GABS13
S6	D1	2	3	15215	9/9/2013 17:15	9/9/2013 17:17	LB4100	GABS13
S7	D1	2	0	14693	9/9/2013 17:06	9/9/2013 17:08	LB4100	GABS13
S8	D1	2	1	14275	9/9/2013 17:02	9/9/2013 17:04	LB4100	GABS13
S1	D2	2	2	19299	9/9/2013 17:02	9/9/2013 17:04	LB4100	GABS13
S2	D2	2	0	18598	9/9/2013 16:58	9/9/2013 17:00	LB4100	GABS13
S3	D2	2	1	17475	9/9/2013 16:52	9/9/2013 16:54	LB4100	GABS13
S4	D2	2	0	17380	9/9/2013 16:47	9/9/2013 16:49	LB4100	GABS13
S5	D2	2	1	17604	9/9/2013 16:43	9/9/2013 16:45	LB4100	GABS13
S6	D2	2	5	16484	9/9/2013 16:39	9/9/2013 16:41	LB4100	GABS13
S7	D2	2	1	16650	9/9/2013 17:15	9/9/2013 17:17	LB4100	GABS13
S8	D2	2	4	15653	9/9/2013 17:06	9/9/2013 17:08	LB4100	GABS13
S1	D3	2	1	19375	9/9/2013 17:06	9/9/2013 17:08	LB4100	GABS13
S2	D3	2	3	18612	9/9/2013 17:02	9/9/2013 17:04	LB4100	GABS13
S3	D3	2	1	17451	9/9/2013 16:58	9/9/2013 17:00	LB4100	GABS13
S4	D3	2	1	17221	9/9/2013 16:52	9/9/2013 16:54	LB4100	GABS13
S5	D3	2	1	17654	9/9/2013 16:47	9/9/2013 16:49	LB4100	GABS13
S6	D3	2	1	16893	9/9/2013 16:43	9/9/2013 16:45	LB4100	GABS13

S7	D3	2	0	16296	9/9/2013 16:39	9/9/2013 16:41	LB4100	GABS13
S8	D3	2	4	15749	9/9/2013 17:15	9/9/2013 17:17	LB4100	GABS13
S1	D4	2	1	19439	9/9/2013 17:15	9/9/2013 17:17	LB4100	GABS13
S2	D4	2	4	18995	9/9/2013 17:06	9/9/2013 17:08	LB4100	GABS13
S3	D4	2	3	17544	9/9/2013 17:02	9/9/2013 17:04	LB4100	GABS13
S4	D4	2	1	17145	9/9/2013 16:58	9/9/2013 17:00	LB4100	GABS13
S5	D4	2	1	17590	9/9/2013 16:52	9/9/2013 16:54	LB4100	GABS13
S6	D4	2	2	16815	9/9/2013 16:47	9/9/2013 16:49	LB4100	GABS13
S7	D4	2	3	16371	9/9/2013 16:43	9/9/2013 16:45	LB4100	GABS13
S8	D4	2	3	15484	9/9/2013 16:39	9/9/2013 16:41	LB4100	GABS13
S1	E1	2	2	16911	9/9/2013 14:33	9/9/2013 14:35	LB4100	GABS13
S2	E1	2	1	16143	9/9/2013 15:01	9/9/2013 15:03	LB4100	GABS13
S3	E1	2	2	14763	9/9/2013 14:59	9/9/2013 15:01	LB4100	GABS13
S4	E1	2	1	14977	9/9/2013 14:53	9/9/2013 14:55	LB4100	GABS13
S5	E1	2	1	15123	9/9/2013 14:50	9/9/2013 14:52	LB4100	GABS13
S6	E1	2	2	14526	9/9/2013 14:47	9/9/2013 14:49	LB4100	GABS13
S7	E1	2	1	13746	9/9/2013 14:44	9/9/2013 14:46	LB4100	GABS13
S8	E1	2	0	13575	9/9/2013 14:39	9/9/2013 14:41	LB4100	GABS13
S1	E2	2	0	16793	9/9/2013 14:39	9/9/2013 14:41	LB4100	GABS13
S2	E2	2	4	16324	9/9/2013 14:34	9/9/2013 14:36	LB4100	GABS13
S3	E2	2	1	14576	9/9/2013 15:01	9/9/2013 15:03	LB4100	GABS13
S4	E2	2	1	14989	9/9/2013 14:59	9/9/2013 15:01	LB4100	GABS13
S5	E2	2	1	15153	9/9/2013 14:53	9/9/2013 14:55	LB4100	GABS13
S6	E2	2	4	14712	9/9/2013 14:50	9/9/2013 14:52	LB4100	GABS13
S7	E2	2	4	13919	9/9/2013 14:47	9/9/2013 14:49	LB4100	GABS13
S8	E2	2	6	13536	9/9/2013 14:44	9/9/2013 14:46	LB4100	GABS13
S1	E3	2	1	16656	9/9/2013 14:44	9/9/2013 14:46	LB4100	GABS13
S2	E3	2	3	16041	9/9/2013 14:39	9/9/2013 14:41	LB4100	GABS13
S3	E3	2	0	14927	9/9/2013 14:34	9/9/2013 14:36	LB4100	GABS13
S4	E3	2	1	15061	9/9/2013 15:01	9/9/2013 15:03	LB4100	GABS13
S5	E3	2	3	15477	9/9/2013 14:59	9/9/2013 15:01	LB4100	GABS13
S6	E3	2	3	14420	9/9/2013 14:53	9/9/2013 14:55	LB4100	GABS13
S7	E3	2	2	13966	9/9/2013 14:50	9/9/2013 14:52	LB4100	GABS13
S8	E3	2	2	13397	9/9/2013 14:47	9/9/2013 14:49	LB4100	GABS13
S1	E4	2	1	17333	9/9/2013 14:47	9/9/2013 14:49	LB4100	GABS13
S2	E4	2	1	16703	9/9/2013 14:44	9/9/2013 14:46	LB4100	GABS13
S3	E4	2	3	15155	9/9/2013 14:39	9/9/2013 14:41	LB4100	GABS13

S4	E4	2	3	15336	9/9/2013 14:34	9/9/2013 14:36	LB4100	GABS13
S5	E4	2	3	15392	9/9/2013 15:01	9/9/2013 15:03	LB4100	GABS13
S6	E4	2	3	14474	9/9/2013 14:59	9/9/2013 15:01	LB4100	GABS13
S7	E4	2	0	14066	9/9/2013 14:53	9/9/2013 14:55	LB4100	GABS13
S8	E4	2	2	13728	9/9/2013 14:50	9/9/2013 14:52	LB4100	GABS13
S1	F1	2	1	17509	9/9/2013 14:50	9/9/2013 14:52	LB4100	GABS13
S2	F1	2	4	17204	9/9/2013 14:47	9/9/2013 14:49	LB4100	GABS13
S3	F1	2	0	15886	9/9/2013 14:44	9/9/2013 14:46	LB4100	GABS13
S4	F1	2	3	15702	9/9/2013 14:39	9/9/2013 14:41	LB4100	GABS13
S5	F1	2	3	16079	9/9/2013 14:34	9/9/2013 14:36	LB4100	GABS13
S6	F1	2	2	15539	9/9/2013 15:01	9/9/2013 15:03	LB4100	GABS13
S7	F1	2	5	14815	9/9/2013 14:59	9/9/2013 15:01	LB4100	GABS13
S8	F1	2	1	14420	9/9/2013 14:53	9/9/2013 14:55	LB4100	GABS13
S1	F2	2	2	16914	9/9/2013 14:53	9/9/2013 14:55	LB4100	GABS13
S2	F2	2	2	16530	9/9/2013 14:50	9/9/2013 14:52	LB4100	GABS13
S3	F2	2	1	15394	9/9/2013 14:47	9/9/2013 14:49	LB4100	GABS13
S4	F2	2	1	15303	9/9/2013 14:44	9/9/2013 14:46	LB4100	GABS13
S5	F2	2	3	15856	9/9/2013 14:39	9/9/2013 14:41	LB4100	GABS13
S6	F2	2	1	15058	9/9/2013 14:34	9/9/2013 14:36	LB4100	GABS13
S7	F2	2	1	14103	9/9/2013 15:01	9/9/2013 15:03	LB4100	GABS13
S8	F2	2	1	14081	9/9/2013 14:59	9/9/2013 15:01	LB4100	GABS13
S1	F3	2	2	17719	9/9/2013 14:59	9/9/2013 15:01	LB4100	GABS13
S2	F3	2	3	16760	9/9/2013 14:53	9/9/2013 14:55	LB4100	GABS13
S3	F3	2	1	15724	9/9/2013 14:50	9/9/2013 14:52	LB4100	GABS13
S4	F3	2	2	15350	9/9/2013 14:47	9/9/2013 14:49	LB4100	GABS13
S5	F3	2	1	15706	9/9/2013 14:44	9/9/2013 14:46	LB4100	GABS13
S6	F3	2	2	15315	9/9/2013 14:39	9/9/2013 14:41	LB4100	GABS13
S7	F3	2	1	14643	9/9/2013 14:34	9/9/2013 14:36	LB4100	GABS13
S8	F3	2	2	14090	9/9/2013 15:01	9/9/2013 15:03	LB4100	GABS13
S1	F4	2	5	17974	9/9/2013 15:01	9/9/2013 15:03	LB4100	GABS13
S2	F4	2	1	17073	9/9/2013 14:59	9/9/2013 15:01	LB4100	GABS13
S3	F4	2	2	15849	9/9/2013 14:53	9/9/2013 14:55	LB4100	GABS13
S4	F4	2	2	15570	9/9/2013 14:50	9/9/2013 14:52	LB4100	GABS13
S5	F4	2	1	16112	9/9/2013 14:47	9/9/2013 14:49	LB4100	GABS13
S6	F4	2	2	15291	9/9/2013 14:44	9/9/2013 14:46	LB4100	GABS13
S7	F4	2	1	14758	9/9/2013 14:39	9/9/2013 14:41	LB4100	GABS13
S8	F4	2	1	14329	9/9/2013 14:34	9/9/2013 14:36	LB4100	GABS13

S1	G1	2	1	16899	9/26/2013 10:36	9/26/2013 10:38	LB4100	GABS13
S2	G1	2	0	16560	9/26/2013 10:53	9/26/2013 10:55	LB4100	GABS13
S3	G1	2	1	15184	9/26/2013 10:46	9/26/2013 10:48	LB4100	GABS13
S4	G1	2	2	15102	9/26/2013 10:40	9/26/2013 10:42	LB4100	GABS13
S5	G1	2	3	15399	9/26/2013 11:00	9/26/2013 11:02	LB4100	GABS13
S6	G1	2	1	14876	9/26/2013 11:31	9/26/2013 11:33	LB4100	GABS13
S7	G1	2	2	14010	9/26/2013 11:25	9/26/2013 11:27	LB4100	GABS13
S8	G1	2	1	13648	9/26/2013 11:03	9/26/2013 11:05	LB4100	GABS13
S1	G2	2	0	17663	9/26/2013 10:40	9/26/2013 10:42	LB4100	GABS13
S2	G2	2	1	16439	9/26/2013 10:36	9/26/2013 10:38	LB4100	GABS13
S3	G2	2	2	15286	9/26/2013 10:53	9/26/2013 10:55	LB4100	GABS13
S4	G2	2	4	15480	9/26/2013 10:46	9/26/2013 10:48	LB4100	GABS13
S5	G2	2	4	15617	9/26/2013 11:03	9/26/2013 11:05	LB4100	GABS13
S6	G2	2	1	15167	9/26/2013 11:00	9/26/2013 11:02	LB4100	GABS13
S7	G2	2	6	14647	9/26/2013 11:31	9/26/2013 11:33	LB4100	GABS13
S8	G2	2	3	13940	9/26/2013 11:25	9/26/2013 11:27	LB4100	GABS13
S1	G3	2	0	17971	9/26/2013 10:46	9/26/2013 10:48	LB4100	GABS13
S2	G3	2	1	16883	9/26/2013 10:40	9/26/2013 10:42	LB4100	GABS13
S3	G3	2	3	15588	9/26/2013 10:36	9/26/2013 10:38	LB4100	GABS13
S4	G3	2	8	15531	9/26/2013 10:53	9/26/2013 10:55	LB4100	GABS13
S5	G3	2	7	16104	9/26/2013 11:25	9/26/2013 11:27	LB4100	GABS13
S6	G3	2	2	15482	9/26/2013 11:03	9/26/2013 11:05	LB4100	GABS13
S7	G3	2	4	14951	9/26/2013 11:00	9/26/2013 11:02	LB4100	GABS13
S8	G3	2	3	14197	9/26/2013 11:31	9/26/2013 11:33	LB4100	GABS13
S1	G4	2	0	17172	9/26/2013 10:53	9/26/2013 10:55	LB4100	GABS13
S2	G4	2	4	16733	9/26/2013 10:46	9/26/2013 10:48	LB4100	GABS13
S3	G4	2	1	15138	9/26/2013 10:40	9/26/2013 10:42	LB4100	GABS13
S4	G4	2	4	15028	9/26/2013 10:36	9/26/2013 10:38	LB4100	GABS13
S5	G4	2	4	15641	9/26/2013 11:31	9/26/2013 11:33	LB4100	GABS13
S6	G4	2	3	14815	9/26/2013 11:25	9/26/2013 11:27	LB4100	GABS13
S7	G4	2	1	14560	9/26/2013 11:03	9/26/2013 11:05	LB4100	GABS13
S8	G4	2	2	13536	9/26/2013 11:00	9/26/2013 11:02	LB4100	GABS13
S1	H1	2	0	17027	9/26/2013 11:00	9/26/2013 11:02	LB4100	GABS13
S2	H1	2	0	16180	9/26/2013 11:31	9/26/2013 11:33	LB4100	GABS13
S3	H1	2	4	14973	9/26/2013 11:25	9/26/2013 11:27	LB4100	GABS13
S4	H1	2	3	15289	9/26/2013 11:03	9/26/2013 11:05	LB4100	GABS13
S5	H1	2	0	15413	9/26/2013 10:36	9/26/2013 10:38	LB4100	GABS13

S6	H1	2	5	14968	9/26/2013 10:53	9/26/2013 10:55	LB4100	GABS13
S7	H1	2	0	14044	9/26/2013 10:46	9/26/2013 10:48	LB4100	GABS13
S8	H1	2	7	13892	9/26/2013 10:40	9/26/2013 10:42	LB4100	GABS13
S1	H2	2	1	17194	9/26/2013 11:03	9/26/2013 11:05	LB4100	GABS13
S2	H2	2	2	16398	9/26/2013 11:00	9/26/2013 11:02	LB4100	GABS13
S3	H2	2	2	15340	9/26/2013 11:31	9/26/2013 11:33	LB4100	GABS13
S4	H2	2	7	15164	9/26/2013 11:25	9/26/2013 11:27	LB4100	GABS13
S5	H2	2	2	15245	9/26/2013 10:40	9/26/2013 10:42	LB4100	GABS13
S6	H2	2	1	14889	9/26/2013 10:36	9/26/2013 10:38	LB4100	GABS13
S7	H2	2	0	14473	9/26/2013 10:53	9/26/2013 10:55	LB4100	GABS13
S8	H2	2	2	14037	9/26/2013 10:46	9/26/2013 10:48	LB4100	GABS13
S1	H3	2	1	17552	9/26/2013 11:25	9/26/2013 11:27	LB4100	GABS13
S2	H3	2	2	16635	9/26/2013 11:03	9/26/2013 11:05	LB4100	GABS13
S3	H3	2	2	15529	9/26/2013 11:00	9/26/2013 11:02	LB4100	GABS13
S4	H3	2	6	15613	9/26/2013 11:31	9/26/2013 11:33	LB4100	GABS13
S5	H3	2	5	15953	9/26/2013 10:46	9/26/2013 10:48	LB4100	GABS13
S6	H3	2	3	15329	9/26/2013 10:40	9/26/2013 10:42	LB4100	GABS13
S7	H3	2	4	14369	9/26/2013 10:36	9/26/2013 10:38	LB4100	GABS13
S8	H3	2	1	14185	9/26/2013 10:53	9/26/2013 10:55	LB4100	GABS13
S1	H4	2	0	17097	9/26/2013 11:31	9/26/2013 11:33	LB4100	GABS13
S2	H4	2	4	16376	9/26/2013 11:25	9/26/2013 11:27	LB4100	GABS13
S3	H4	2	0	15008	9/26/2013 11:03	9/26/2013 11:05	LB4100	GABS13
S4	H4	2	1	15103	9/26/2013 11:00	9/26/2013 11:02	LB4100	GABS13
S5	H4	2	1	15640	9/26/2013 10:53	9/26/2013 10:55	LB4100	GABS13
S6	H4	2	2	14911	9/26/2013 10:46	9/26/2013 10:48	LB4100	GABS13
S7	H4	2	5	14298	9/26/2013 10:40	9/26/2013 10:42	LB4100	GABS13
S8	H4	2	1	13628	9/26/2013 10:36	9/26/2013 10:38	LB4100	GABS13
S1	I1	2	0	16107	9/9/2013 15:37	9/9/2013 15:39	LB4100	GABS13
S2	I1	2	4	15780	9/9/2013 16:35	9/9/2013 16:37	LB4100	GABS13
S3	I1	2	2	14528	9/9/2013 16:30	9/9/2013 16:32	LB4100	GABS13
S4	I1	2	3	14324	9/9/2013 16:26	9/9/2013 16:28	LB4100	GABS13
S5	I1	2	3	14933	9/9/2013 16:18	9/9/2013 16:20	LB4100	GABS13
S6	I1	2	6	14042	9/9/2013 16:15	9/9/2013 16:17	LB4100	GABS13
S7	I1	2	0	13572	9/9/2013 16:06	9/9/2013 16:08	LB4100	GABS13
S8	I1	2	5	13304	9/9/2013 16:02	9/9/2013 16:04	LB4100	GABS13
S1	I2	2	1	17133	9/9/2013 16:02	9/9/2013 16:04	LB4100	GABS13
S2	I2	2	1	16766	9/9/2013 15:37	9/9/2013 15:39	LB4100	GABS13

S3	I2	2	2	15058	9/9/2013 16:35	9/9/2013 16:37	LB4100	GABS13
S4	I2	2	1	14984	9/9/2013 16:30	9/9/2013 16:32	LB4100	GABS13
S5	I2	2	1	15544	9/9/2013 16:26	9/9/2013 16:28	LB4100	GABS13
S6	I2	2	2	14785	9/9/2013 16:18	9/9/2013 16:20	LB4100	GABS13
S7	I2	2	1	14052	9/9/2013 16:15	9/9/2013 16:17	LB4100	GABS13
S8	I2	2	3	13662	9/9/2013 16:06	9/9/2013 16:08	LB4100	GABS13
S1	I3	2	3	16777	9/9/2013 16:06	9/9/2013 16:08	LB4100	GABS13
S2	I3	2	2	16493	9/9/2013 16:02	9/9/2013 16:04	LB4100	GABS13
S3	I3	2	3	14621	9/9/2013 15:37	9/9/2013 15:39	LB4100	GABS13
S4	I3	2	3	14775	9/9/2013 16:35	9/9/2013 16:37	LB4100	GABS13
S5	I3	2	1	15367	9/9/2013 16:30	9/9/2013 16:32	LB4100	GABS13
S6	I3	2	2	14583	9/9/2013 16:26	9/9/2013 16:28	LB4100	GABS13
S7	I3	2	2	13862	9/9/2013 16:18	9/9/2013 16:20	LB4100	GABS13
S8	I3	2	1	13509	9/9/2013 16:15	9/9/2013 16:17	LB4100	GABS13
S1	I4	2	1	17024	9/9/2013 16:15	9/9/2013 16:17	LB4100	GABS13
S2	I4	2	0	16421	9/9/2013 16:06	9/9/2013 16:08	LB4100	GABS13
S3	I4	2	1	15315	9/9/2013 16:02	9/9/2013 16:04	LB4100	GABS13
S4	I4	2	2	14962	9/9/2013 15:37	9/9/2013 15:39	LB4100	GABS13
S5	I4	2	2	15512	9/9/2013 16:35	9/9/2013 16:37	LB4100	GABS13
S6	I4	2	3	14499	9/9/2013 16:30	9/9/2013 16:32	LB4100	GABS13
S7	I4	2	2	14177	9/9/2013 16:26	9/9/2013 16:28	LB4100	GABS13
S8	I4	2	3	13548	9/9/2013 16:18	9/9/2013 16:20	LB4100	GABS13
S1	J1	2	3	15980	9/9/2013 16:18	9/9/2013 16:20	LB4100	GABS13
S2	J1	2	3	15477	9/9/2013 16:15	9/9/2013 16:17	LB4100	GABS13
S3	J1	2	2	14175	9/9/2013 16:06	9/9/2013 16:08	LB4100	GABS13
S4	J1	2	2	14437	9/9/2013 16:02	9/9/2013 16:04	LB4100	GABS13
S5	J1	2	0	14668	9/9/2013 15:37	9/9/2013 15:39	LB4100	GABS13
S6	J1	2	2	13906	9/9/2013 16:35	9/9/2013 16:37	LB4100	GABS13
S7	J1	2	4	13573	9/9/2013 16:30	9/9/2013 16:32	LB4100	GABS13
S8	J1	2	2	13047	9/9/2013 16:26	9/9/2013 16:28	LB4100	GABS13
S1	J2	2	5	15826	9/9/2013 16:26	9/9/2013 16:28	LB4100	GABS13
S2	J2	2	0	15410	9/9/2013 16:18	9/9/2013 16:20	LB4100	GABS13
S3	J2	2	4	13921	9/9/2013 16:15	9/9/2013 16:17	LB4100	GABS13
S4	J2	2	3	14028	9/9/2013 16:06	9/9/2013 16:08	LB4100	GABS13
S5	J2	2	5	14510	9/9/2013 16:02	9/9/2013 16:04	LB4100	GABS13
S6	J2	2	4	13767	9/9/2013 15:37	9/9/2013 15:39	LB4100	GABS13
S7	J2	2	2	12780	9/9/2013 16:35	9/9/2013 16:37	LB4100	GABS13

S8	J2	2	3	12959	9/9/2013 16:30	9/9/2013 16:32	LB4100	GABS13
S1	J3	2	3	15950	9/9/2013 16:30	9/9/2013 16:32	LB4100	GABS13
S2	J3	2	1	15398	9/9/2013 16:26	9/9/2013 16:28	LB4100	GABS13
S3	J3	2	0	14110	9/9/2013 16:18	9/9/2013 16:20	LB4100	GABS13
S4	J3	2	3	14013	9/9/2013 16:15	9/9/2013 16:17	LB4100	GABS13
S5	J3	2	1	14341	9/9/2013 16:06	9/9/2013 16:08	LB4100	GABS13
S6	J3	2	2	13833	9/9/2013 16:02	9/9/2013 16:04	LB4100	GABS13
S7	J3	2	1	12957	9/9/2013 15:37	9/9/2013 15:39	LB4100	GABS13
S8	J3	2	2	12909	9/9/2013 16:35	9/9/2013 16:37	LB4100	GABS13
S1	J4	2	1	15632	9/9/2013 16:35	9/9/2013 16:37	LB4100	GABS13
S2	J4	2	3	15274	9/9/2013 16:30	9/9/2013 16:32	LB4100	GABS13
S3	J4	2	4	13967	9/9/2013 16:26	9/9/2013 16:28	LB4100	GABS13
S4	J4	2	1	14190	9/9/2013 16:18	9/9/2013 16:20	LB4100	GABS13
S5	J4	2	2	14844	9/9/2013 16:15	9/9/2013 16:17	LB4100	GABS13
S6	J4	2	4	13609	9/9/2013 16:06	9/9/2013 16:08	LB4100	GABS13
S7	J4	2	2	13510	9/9/2013 16:02	9/9/2013 16:04	LB4100	GABS13
S8	J4	2	1	13221	9/9/2013 15:37	9/9/2013 15:39	LB4100	GABS13

Gross Alpha/Beta Liquid

Filename : GAB.XLS
File type : Excel
Version # : 1.3.8

Batch : 1082959
Analyst : NXL1
Prep Date : 8/29/2011

Alpha Spike S/N :	N/A	Beta Spike S/N :	N/A
Alpha Spike Exp Date :	N/A	Beta Spike Exp Date :	N/A
Alpha Spike Activity (dpm/ml):	N/A	Beta Spike Activity (dpm/ml):	N/A
Alpha Spike Volume Added:	N/A	Beta Spike Volume Added:	N/A
Alpha Spike Nuclide:	N/A	Beta Spike Nuclide:	N/A
Alpha LCS S/N :	1242-A	Beta LCS S/N :	1243-A
Alpha LCS Exp Date :	6/22/2013	Beta LCS Exp Date :	9/27/2013
AlphaLCS Activity (dpm/ml):	23216.97	Beta LCS Activity (dpm/ml):	211664.13
Alpha LCS Volume Added:	2.00	Beta LCS Volume Added:	0.10
Alpha LCS Nuclide:	Th-230	Beta LCS Nuclide:	Sr-90

Alpha Method Uncertainty : 0.0829
Beta Method Uncertainty : 0.0821

Geometry: 2 inch Planchett

Pipet, 0.1 ml Stdev : +/-	0.000200	ml	
Pipet, 0.5 ml Stdev : +/-	0.001000	ml	
Pipet, 1 ml Stdev : +/-	0.002000	ml	

Procedure Code :	GFCGANBL	
Parmname1 :	Alpha	
Parmname2 :	Beta	
Required Alpha MDA :	1	pCi/L
Required Beta MDA :	1	pCi/L

Sample Characteristics						Count Raw Data				
Pos.	Sample ID	Sample Aliquot L	Sample Residue Wt. (mg)	Sample Aliquot StDev. L	Sample Date/Time	Detector ID	Counting Time (min.)	Gross Counts Alpha	Gross Counts Beta	Count Start Date/Time
1	1202347886.1	1.0000	0	2.0399E-05	8/29/2011 0:00	A1	2	16513	44973	9/10/2013 16:30
2	1202347887.1	1.0000	10.4	2.0399E-05	8/29/2011 0:00	A2	2	15888	43408	9/10/2013 16:30
3	1202347888.1	1.0000	23.8	2.0399E-05	8/29/2011 0:00	A3	2	11746	38149	9/10/2013 16:30
4	~~1202347889.1~~	~~1.0000~~	~~44.2~~	~~2.0399E-05~~	~~8/29/2011 0:00~~	A4	~~0~~	~~0~~	~~14~~	~~9/10/2013 16:32~~
5	1202347890.1	1.0000	54.7	2.0399E-05	8/29/2011 0:00	B1	2	12155	35144	9/10/2013 16:30
6	1202347891.1	1.0000	73.9	2.0399E-05	8/29/2011 0:00	B2	2	10068	35761	9/10/2013 16:30
7	1202347892.1	1.0000	95.2	2.0399E-05	8/29/2011 0:00	B3	2	7692	33097	9/10/2013 16:30
8	1202347893.1	1.0000	103	2.0399E-05	8/29/2011 0:00	B4	2	5739	29375	9/10/2013 16:30
9	1202347894.1	1.0000	0	2.0399E-05	8/29/2011 0:00	C1	2	25411	43254	9/10/2013 16:13
10	1202347895.1	1.0000	10.4	2.0399E-05	8/29/2011 0:00	C2	2	17105	43464	9/10/2013 16:13
11	1202347896.1	1.0000	23.8	2.0399E-05	8/29/2011 0:00	C3	2	11304	39792	9/10/2013 16:13
12	1202347897.1	1.0000	44.2	2.0399E-05	8/29/2011 0:00	C4	2	9327	38329	9/10/2013 16:13
13	1202347898.1	1.0000	54.7	2.0399E-05	8/29/2011 0:00	D1	2	11489	37585	9/10/2013 16:14
14	1202347899.1	1.0000	73.9	2.0399E-05	8/29/2011 0:00	D2	2	9427	38787	9/10/2013 16:14
15	1202347900.1	1.0000	95.2	2.0399E-05	8/29/2011 0:00	D3	2	7885	36749	9/10/2013 16:14
16	1202347901.1	1.0000	103	2.0399E-05	8/29/2011 0:00	D4	2	7158	36274	9/10/2013 16:14
17	1202347902.1	1.0000	0	2.0399E-05	8/29/2011 0:00	E1	2	24039	43760	9/10/2013 16:19
18	1202347903.1	1.0000	10.4	2.0399E-05	8/29/2011 0:00	E2	2	13802	42045	9/10/2013 16:19
19	1202347904.1	1.0000	23.8	2.0399E-05	8/29/2011 0:00	E3	2	14247	38189	9/10/2013 16:19
20	1202347905.1	1.0000	44.2	2.0399E-05	8/29/2011 0:00	E4	2	11944	36749	9/10/2013 16:19
21	1202347906.1	1.0000	54.7	2.0399E-05	8/29/2011 0:00	F1	2	11826	37339	9/10/2013 16:19
22	1202347907.1	1.0000	73.9	2.0399E-05	8/29/2011 0:00	F2	2	9819	34836	9/10/2013 16:19
23	1202347908.1	1.0000	95.2	2.0399E-05	8/29/2011 0:00	F3	2	6915	33602	9/10/2013 16:19
24	1202347909.1	1.0000	103	2.0399E-05	8/29/2011 0:00	F4	2	4739	32374	9/10/2013 16:19
25	1202347910.1	1.0000	0	2.0399E-05	8/29/2011 0:00	G1	2	20867	44993	9/10/2013 16:24
26	1202347911.1	1.0000	10.4	2.0399E-05	8/29/2011 0:00	G2	2	15474	44309	9/10/2013 16:24
27	1202347912.1	1.0000	23.8	2.0399E-05	8/29/2011 0:00	G3	2	11286	40119	9/10/2013 16:24
28	1202347913.1	1.0000	44.2	2.0399E-05	8/29/2011 0:00	G4	2	11176	36978	9/10/2013 16:24
29	1202347914.1	1.0000	54.7	2.0399E-05	8/29/2011 0:00	H1	2	11734	36612	9/10/2013 16:24
30	1202347915.1	1.0000	73.9	2.0399E-05	8/29/2011 0:00	H2	2	9042	35178	9/10/2013 16:24
31	1202347916.1	1.0000	95.2	2.0399E-05	8/29/2011 0:00	H3	2	7905	33170	9/10/2013 16:24
32	1202347917.1	1.0000	103	2.0399E-05	8/29/2011 0:00	H4	2	5830	32212	9/10/2013 16:24
33	1202347918.1	1.0000	0	2.0399E-05	8/29/2011 0:00	I1	2	24148	42138	9/10/2013 16:06
34	1202347919.1	1.0000	10.4	2.0399E-05	8/29/2011 0:00	I2	2	20777	42189	9/10/2013 16:06
35	1202347920.1	1.0000	23.8	2.0399E-05	8/29/2011 0:00	I3	2	15956	36724	9/10/2013 16:06
36	1202347921.1	1.0000	44.2	2.0399E-05	8/29/2011 0:00	I4	2	14162	36277	9/10/2013 16:06
37	1202347922.1	1.0000	54.7	2.0399E-05	8/29/2011 0:00	J1	2	12118	33533	9/10/2013 16:06
38	1202347923.1	1.0000	73.9	2.0399E-05	8/29/2011 0:00	J2	2	11099	31462	9/10/2013 16:06
39	1202347924.1	1.0000	95.2	2.0399E-05	8/29/2011 0:00	J3	2	8618	29319	9/10/2013 16:06
40	1202347925.1	1.0000	103	2.0399E-05	8/29/2011 0:00	J4	2	7259	29668	9/10/2013 16:06

Analytical SOP: GL-RAD-A-001
Instrument SOP: GL-RAD-I-006

Calibration Data		Alpha						Beta						Weekly Background			
														CPM		Count	
Pos.	Counted on	Calibration Date	Calibration Due Date	Calibration Source Used	Detector Efficiency (cpm/dpm)	Det. Eff. Error (cpm/dpm)	X-Talk	Calibration Date	Calibration Due Date	Calibration Source Used	Detector Efficiency (cpm/dpm)	Det. Eff. Error (cpm/dpm)	X-Talk	Alpha	Beta	Start Date/Time	Count Time (min.)
1	LB4100	10/1/2012	9/30/2016	Th230	0.1780	0.02769	0.03020	10/1/2012	9/30/2016	Sr90	0.4518	0.02044	0.00009	0.128	1.326	9/9/2013 13:54	500
2	LB4100	10/1/2012	9/30/2016	Th230	0.1678	0.02957	0.02746	10/1/2012	9/30/2016	Sr90	0.4462	0.02268	0.00016	0.138	1.102	9/7/2013 17:27	500
3	LB4100	10/1/2012	9/30/2016	Th230	0.1321	0.02881	0.03240	10/1/2012	9/30/2016	Sr90	0.4355	0.01784	0.00012	0.112	1.188	9/7/2013 17:27	500
4	~~LB4100~~	~~10/1/2012~~	~~9/30/2016~~	~~Th230~~	~~0.0000~~	~~0.00000~~	~~0.00000~~	~~10/1/2012~~	~~9/30/2016~~	~~Sr90~~	~~0.0000~~	~~0.00000~~	~~0.00000~~	~~FAIL~~	~~FAIL~~	~~12:00:00 AM~~	0
5	LB4100	10/1/2012	9/30/2016	Th230	0.1222	0.01406	0.01627	10/1/2012	9/30/2016	Sr90	0.4096	0.01796	0.00015	0.404	1.124	9/8/2013 19:24	500
6	LB4100	10/1/2012	9/30/2016	Th230	0.1089	0.03002	0.03782	10/1/2012	9/30/2016	Sr90	0.4181	0.01415	0.00013	0.076	5.710	9/8/2013 19:24	500
7	LB4100	10/1/2012	9/30/2016	Th230	0.0854	0.03025	0.04858	10/1/2012	9/30/2016	Sr90	0.3972	0.01320	0.00012	0.062	16.104	9/8/2013 19:24	500
8	LB4100	10/1/2012	9/30/2016	Th230	0.0679	0.02055	0.04089	10/1/2012	9/30/2016	Sr90	0.3587	0.00972	0.00015	0.030	1.086	9/8/2013 19:24	500
9	LB4100	10/1/2012	9/30/2016	Th230	0.2626	0.02356	0.01253	10/1/2012	9/30/2016	Sr90	0.4618	0.01816	0.00020	0.136	1.494	9/8/2013 20:04	500
10	LB4100	10/1/2012	9/30/2016	Th230	0.1926	0.02436	0.03322	10/1/2012	9/30/2016	Sr90	0.4728	0.02351	0.00011	0.234	1.352	9/7/2013 17:52	500
11	LB4100	10/1/2012	9/30/2016	Th230	0.1436	0.02695	0.04760	10/1/2012	9/30/2016	Sr90	0.4638	0.02588	0.00011	0.142	1.282	9/7/2013 17:53	500
12	LB4100	10/1/2012	9/30/2016	Th230	0.0992	0.03542	0.05260	10/1/2012	9/30/2016	Sr90	0.4495	0.02683	0.00010	0.184	1.714	9/8/2013 20:04	500
13	LB4100	10/1/2012	9/30/2016	Th230	0.1266	0.03038	0.03108	10/1/2012	9/30/2016	Sr90	0.4225	0.02033	0.00009	0.146	1.008	9/8/2013 21:41	500
14	LB4100	10/1/2012	9/30/2016	Th230	0.1040	0.03665	0.03971	10/1/2012	9/30/2016	Sr90	0.4633	0.01910	0.00010	0.162	1.142	9/8/2013 21:41	500
15	LB4100	10/1/2012	9/30/2016	Th230	0.0870	0.04268	0.05610	10/1/2012	9/30/2016	Sr90	0.4473	0.02505	0.00009	0.120	0.998	9/8/2013 21:41	500
16	LB4100	10/1/2012	9/30/2016	Th230	0.0850	0.03190	0.07070	10/1/2012	9/30/2016	Sr90	0.4377	0.02356	0.00013	0.256	2.524	9/8/2013 21:41	500
17	LB4100	10/1/2012	9/30/2016	Th230	0.2461	0.01842	0.01265	10/1/2012	9/30/2016	Sr90	0.4496	0.02254	0.00008	0.048	1.208	9/7/2013 17:20	500
18	LB4100	10/1/2012	9/30/2016	Th230	0.1564	0.03047	0.04181	10/1/2012	9/30/2016	Sr90	0.4417	0.01894	0.00018	0.054	1.088	9/8/2013 19:26	500
19	LB4100	10/1/2012	9/30/2016	Th230	0.1564	0.02055	0.02090	10/1/2012	9/30/2016	Sr90	0.4325	0.01897	0.00013	0.166	1.132	9/7/2013 17:20	500
20	LB4100	10/1/2012	9/30/2016	Th230	0.1141	0.00769	0.02776	10/1/2012	9/30/2016	Sr90	0.4276	0.02127	0.00013	0.136	1.164	9/8/2013 19:26	500
21	LB4100	10/1/2012	9/30/2016	Th230	0.1134	0.01144	0.02284	10/1/2012	9/30/2016	Sr90	0.4364	0.00772	0.00015	0.074	1.442	9/7/2013 17:21	500
22	LB4100	10/1/2012	9/30/2016	Th230	0.0967	0.03128	0.05029	10/1/2012	9/30/2016	Sr90	0.4106	0.01365	0.00010	0.106	0.952	9/8/2013 19:27	500
23	LB4100	10/1/2012	9/30/2016	Th230	0.0792	0.02244	0.06132	10/1/2012	9/30/2016	Sr90	0.4005	0.00981	0.00011	0.096	0.992	9/7/2013 17:21	500
24	LB4100	10/1/2012	9/30/2016	Th230	0.0589	0.02862	0.08962	10/1/2012	9/30/2016	Sr90	0.3994	0.00850	0.00012	0.176	2.136	9/8/2013 19:27	500
25	LB4100	10/1/2012	9/30/2016	Th230	0.2192	0.03411	0.01523	10/1/2012	9/30/2016	Sr90	0.4573	0.01543	0.00009	0.118	0.978	9/7/2013 17:30	500
26	LB4100	10/1/2012	9/30/2016	Th230	0.1719	0.01976	0.03387	10/1/2012	9/30/2016	Sr90	0.4575	0.01349	0.00017	0.102	0.948	9/7/2013 17:30	500
27	LB4100	10/1/2012	9/30/2016	Th230	0.1298	0.02238	0.05683	10/1/2012	9/30/2016	Sr90	0.4572	0.01089	0.00023	0.192	1.504	9/8/2013 19:36	500
28	LB4100	10/1/2012	9/30/2016	Th230	0.1071	0.02077	0.02908	10/1/2012	9/30/2016	Sr90	0.4289	0.00938	0.00016	0.126	1.112	9/7/2013 17:30	500
29	LB4100	10/1/2012	9/30/2016	Th230	0.1116	0.01393	0.03067	10/1/2012	9/30/2016	Sr90	0.4184	0.00965	0.00016	0.128	1.090	9/8/2013 19:15	500
30	LB4100	10/1/2012	9/30/2016	Th230	0.0909	0.01701	0.04163	10/1/2012	9/30/2016	Sr90	0.4093	0.00948	0.00014	0.178	1.078	9/7/2013 17:20	500
31	LB4100	10/1/2012	9/30/2016	Th230	0.0846	0.01513	0.04363	10/1/2012	9/30/2016	Sr90	0.4019	0.00824	0.00019	0.124	1.304	9/8/2013 19:15	500
32	LB4100	10/1/2012	9/30/2016	Th230	0.0664	0.02054	0.08320	10/1/2012	9/30/2016	Sr90	0.3864	0.00628	0.00012	0.120	0.992	9/7/2013 17:20	500
33	LB4100	10/1/2012	9/30/2016	Th230	0.2365	0.00598	0.00802	10/1/2012	9/30/2016	Sr90	0.4342	0.01079	0.00020	0.112	0.744	9/7/2013 17:20	500
34	LB4100	10/1/2012	9/30/2016	Th230	0.2152	0.00564	0.01059	10/1/2012	9/30/2016	Sr90	0.4521	0.00589	0.00010	0.104	3.108	9/8/2013 18:10	500
35	LB4100	10/1/2012	9/30/2016	Th230	0.1774	0.01009	0.01490	10/1/2012	9/30/2016	Sr90	0.4335	0.01067	0.00014	0.124	1.184	9/8/2013 18:10	500
36	LB4100	10/1/2012	9/30/2016	Th230	0.1351	0.00692	0.01442	10/1/2012	9/30/2016	Sr90	0.4246	0.01280	0.00012	0.062	0.876	9/7/2013 17:20	500
37	LB4100	10/1/2012	9/30/2016	Th230	0.1155	0.01256	0.01588	10/1/2012	9/30/2016	Sr90	0.3956	0.01589	0.00016	0.068	1.008	9/7/2013 17:20	500
38	LB4100	10/1/2012	9/30/2016	Th230	0.1110	0.00765	0.01387	10/1/2012	9/30/2016	Sr90	0.3759	0.01035	0.00023	0.046	1.006	9/8/2013 18:10	500
39	LB4100	10/1/2012	9/30/2016	Th230	0.0881	0.01198	0.01753	10/1/2012	9/30/2016	Sr90	0.3624	0.01579	0.00011	0.134	0.856	9/8/2013 18:10	500
40	LB4100	10/1/2012	9/30/2016	Th230	0.0816	0.01086	0.03478	10/1/2012	9/30/2016	Sr90	0.3674	0.01072	0.00016	0.086	0.978	9/7/2013 17:20	500

Notes:
1 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date

Alpha 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	1.4948	1.0553	1	5.9070	**20890.4135**	0.0288	8256.3720	64.2515	318.7187	3593.7126		LCS			20916.1917	99.9%
2	1.6459	1.1620	1	6.3497	**21310.6049**	0.0306	7943.8620	63.0238	331.5211	3692.7710		LCS			20916.1917	101.9%
3	1.8846	1.3305	1	7.7778	**20025.4153**	0.0303	5872.8880	54.1895	362.3018	3465.0291		LCS			20916.1917	95.7%
4	#DIV/0!	#DIV/0!	1	#DIV/0!	**#VALUE!**	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!		LCS			20916.1917	#VALUE!
5	3.8692	2.7317	1	10.9946	**22399.5637**	0.0167	6077.0960	55.1249	398.4098	3714.5107		LCS			20916.1917	107.1%
6	1.8824	1.3290	1	8.8622	**20811.0271**	0.0316	5033.9240	50.1697	406.7163	3620.9356		LCS			20916.1917	99.5%
7	2.1681	1.5307	1	10.9728	**20274.6234**	0.0323	3845.9380	43.8520	453.3276	3537.6979		LCS			20916.1917	96.9%
8	1.8972	1.3395	1	12.6316	**19024.6013**	0.0244	2869.4700	37.8781	492.5985	3225.0099		LCS			20916.1917	91.0%
9	1.0444	0.7373	1	4.0478	**21787.5660**	0.0244	12705.3640	79.7041	267.9845	3691.3506		LCS			20916.1917	104.2%
10	1.8680	1.3188	1	6.1463	**19999.1565**	0.0255	8552.2660	65.3930	299.8084	3401.1485		LCS			20916.1917	95.6%
11	1.9514	1.3777	1	7.4608	**17722.3395**	0.0285	5651.8580	53.1601	326.8471	3046.7510		LCS			20916.1917	84.7%
12	3.2146	2.2695	1	11.3482	**21159.9419**	0.0369	4663.3160	48.2882	429.6383	3765.1036		LCS			20916.1917	101.2%
13	2.2452	1.5851	1	8.5092	**20440.0804**	0.0318	5744.3540	53.5934	373.8799	3557.8162		LCS			20916.1917	97.7%
14	2.8787	2.0324	1	10.5636	**20411.7452**	0.0381	4713.3380	48.5464	412.2411	3651.2078		LCS			20916.1917	97.6%
15	2.9593	2.0893	1	11.9409	**20392.8596**	0.0441	3942.3800	44.3988	450.3221	3755.4554		LCS			20916.1917	97.5%
16	4.4261	3.1249	1	14.1983	**18951.2570**	0.0340	3578.7440	42.3025	439.3562	3330.6509		LCS			20916.1917	90.6%
17	0.6619	0.4673	1	3.6798	**21993.5641**	0.0195	12019.4520	77.5226	278.0740	3671.8180		LCS			20916.1917	105.2%
18	1.1046	0.7798	1	5.8785	**19858.6861**	0.0316	6900.9460	58.7410	331.4963	3455.5973		LCS			20916.1917	94.9%
19	1.9372	1.3677	1	7.0556	**20509.4654**	0.0222	7123.3340	59.6804	336.9035	3450.9403		LCS			20916.1917	98.1%
20	2.4026	1.6963	1	9.3121	**23557.8968**	0.0120	5971.8640	54.6443	422.6730	3868.9493		LCS			20916.1917	112.6%
21	1.7845	1.2599	1	8.4803	**23485.1509**	0.0147	5912.9260	54.3737	423.4890	3877.1585		LCS			20916.1917	112.3%
22	2.5043	1.7680	1	10.5250	**22866.5456**	0.0329	4909.3940	49.5454	452.4600	3998.1265		LCS			20916.1917	109.3%
23	2.9095	2.0541	1	12.6405	**19655.7446**	0.0255	3457.4040	41.5782	463.5499	3342.8009		LCS			20916.1917	94.0%
24	5.2965	3.7394	1	18.9501	**18105.3624**	0.0321	2369.3240	34.4202	515.9342	3157.1145		LCS			20916.1917	86.6%
25	1.1653	0.8227	1	4.7277	**21434.8374**	0.0348	10433.3820	72.2271	290.8957	3778.0440		LCS			20916.1917	102.5%
26	1.3812	0.9752	1	5.8800	**20258.7424**	0.0213	7736.8980	62.1973	319.3671	3400.6629		LCS			20916.1917	96.9%
27	2.5094	1.7717	1	8.7470	**19559.6519**	0.0243	5642.8080	53.1178	361.1697	3314.2994		LCS			20916.1917	93.5%
28	2.4648	1.7402	1	9.7897	**23491.6656**	0.0228	5587.8740	52.8583	435.7730	3961.1088		LCS			20916.1917	112.3%
29	2.3829	1.6823	1	9.4165	**23657.9608**	0.0167	5866.8720	54.1618	428.2923	3923.3704		LCS			20916.1917	113.1%
30	3.4507	2.4363	1	12.3042	**22386.0230**	0.0200	4520.8220	47.5447	461.6927	3743.7589		LCS			20916.1917	107.0%
31	3.0939	2.1843	1	12.3518	**21017.9329**	0.0189	3952.3760	44.4550	463.7262	3505.0990		LCS			20916.1917	100.5%
32	3.8821	2.7408	1	15.6644	**19774.9259**	0.0244	2914.8800	38.1772	507.9654	3351.1203		LCS			20916.1917	94.5%
33	1.0523	0.7429	1	4.3430	**22989.2554**	0.0088	12073.8880	77.6981	290.0658	3757.6269		LCS			20916.1917	109.9%
34	1.1146	0.7869	1	4.7141	**21744.2193**	0.0089	10388.3960	72.0711	295.7344	3554.3033		LCS			20916.1917	104.0%
35	1.4764	1.0423	1	5.8941	**20254.5240**	0.0128	7977.8760	63.1585	314.3865	3331.2769		LCS			20916.1917	96.8%
36	1.3704	0.9675	1	6.9357	**23599.2335**	0.0109	7080.9380	59.5021	388.8020	3868.5962		LCS			20916.1917	112.8%
37	1.6796	1.1858	1	8.2238	**23628.7802**	0.0155	6058.9320	55.0409	420.8963	3907.4991		LCS			20916.1917	113.0%
38	1.4372	1.0146	1	8.1178	**22510.4315**	0.0122	5549.4540	52.6759	419.0683	3699.3385		LCS			20916.1917	107.6%
39	3.0882	2.1803	1	12.0260	**22010.9883**	0.0161	4308.8660	46.4166	464.9162	3644.7706		LCS			20916.1917	105.2%
40	2.6723	1.8867	1	12.0533	**20021.1893**	0.0160	3629.4140	42.5999	460.8925	3315.2614		LCS			20916.1917	95.7%

Notes:
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Beta 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	1.8954	1.3382	1	4.1719	**22170.4874**	0.0210	22485.1740	106.0342	207.2165	3723.4739		LCS			19068.8403	116.3%
2	1.7495	1.2352	1	3.9847	**21689.8318**	0.0232	21702.8980	104.1729	206.1280	3663.5351		LCS			19068.8403	113.7%
3	1.8611	1.3140	1	4.1794	**19531.0306**	0.0186	19073.3120	97.6589	197.9800	3254.6526		LCS			19068.8403	102.4%
4	#DIV/0!	#DIV/0!	1	#DIV/0!	**#VALUE!**	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!		LCS			19068.8403	#VALUE!
5	1.9246	1.3588	1	4.3669	**19212.4092**	0.0187	17570.8760	93.7337	202.0186	3189.0189		LCS			19068.8403	100.8%
6	4.2499	3.0005	1	7.6169	**19052.0328**	0.0151	17874.7900	94.5530	199.6558	3150.7758		LCS			19068.8403	99.9%
7	7.5123	5.3038	1	12.3085	**18535.3165**	0.0143	16532.3960	90.9631	202.1723	3062.1490		LCS			19068.8403	97.2%
8	2.1606	1.5254	1	4.9346	**18296.9902**	0.0113	14686.4140	85.6957	210.9419	2996.1568		LCS			19068.8403	96.0%
9	1.9680	1.3895	1	4.2419	**20936.6954**	0.0188	21625.5060	103.9880	198.7879	3481.7703		LCS			19068.8403	109.8%
10	1.8290	1.2913	1	4.0118	**20434.6681**	0.0240	21730.6480	104.2401	194.6709	3471.1662		LCS			19068.8403	107.2%
11	1.8155	1.2817	1	4.0203	**19061.5938**	0.0264	19894.7180	99.7397	189.8710	3265.7653		LCS			19068.8403	100.0%
12	2.1661	1.5293	1	4.5618	**18959.3098**	0.0273	19162.7860	97.8890	192.2865	3256.9403		LCS			19068.8403	99.4%
13	1.7672	1.2476	1	4.0946	**19845.0583**	0.0210	18791.4920	96.9343	202.5679	3327.5289		LCS			19068.8403	104.1%
14	1.7153	1.2110	1	3.8805	**18673.3237**	0.0198	19392.3580	98.4721	187.6602	3120.8248		LCS			19068.8403	97.9%
15	1.6606	1.1724	1	3.8553	**18278.2439**	0.0256	18373.5020	95.8502	189.1695	3118.3523		LCS			19068.8403	95.9%
16	2.6989	1.9055	1	5.3545	**18401.0898**	0.0241	18134.4760	95.2287	192.0724	3130.0345		LCS			19068.8403	96.5%
17	1.8179	1.2834	1	4.0597	**21768.1168**	0.0230	21878.7920	104.5945	205.3956	3663.5958		LCS			19068.8403	114.2%
18	1.7559	1.2397	1	4.0090	**21141.7481**	0.0196	21021.4120	102.5244	204.9106	3545.9530		LCS			19068.8403	110.9%
19	1.8293	1.2915	1	4.1451	**19729.8696**	0.0196	19093.3680	97.7100	199.4515	3290.1366		LCS			19068.8403	103.5%
20	1.8761	1.3245	1	4.2290	**19178.5755**	0.0219	18373.3360	95.8502	197.8854	3223.1404		LCS			19068.8403	100.6%
21	2.0463	1.4447	1	4.4378	**19130.7168**	0.0093	18668.0580	96.6165	195.4757	3120.6853		LCS			19068.8403	100.3%
22	1.7672	1.2477	1	4.1411	**18838.3899**	0.0147	17417.0480	93.3220	200.6828	3123.6276		LCS			19068.8403	98.8%
23	1.8491	1.3055	1	4.2979	**18655.0233**	0.0112	16800.0080	91.6543	202.0276	3068.5633		LCS			19068.8403	97.8%
24	2.7214	1.9213	1	5.5345	**18015.7196**	0.0102	16184.8640	89.9639	198.8855	2959.9538		LCS			19068.8403	94.5%
25	1.6081	1.1353	1	3.7481	**22001.2575**	0.0161	22495.5220	106.0578	204.7524	3633.7397		LCS			19068.8403	115.4%
26	1.5826	1.1173	1	3.7116	**21554.2930**	0.0143	22153.5520	105.2485	203.1099	3562.8054		LCS			19068.8403	113.0%
27	1.9947	1.4083	1	4.2944	**19446.1642**	0.0120	20057.9960	100.1487	193.3961	3213.7090		LCS			19068.8403	102.0%
28	1.8282	1.2907	1	4.1567	**19244.9009**	0.0107	18487.8880	96.1483	197.9067	3150.8278		LCS			19068.8403	100.9%
29	1.8555	1.3100	1	4.2348	**19512.7105**	0.0110	18304.9100	95.6713	201.8729	3199.2981		LCS			19068.8403	102.3%
30	1.8866	1.3319	1	4.3149	**19151.2278**	0.0109	17587.9220	93.7790	202.3093	3142.2782		LCS			19068.8403	100.4%
31	2.1131	1.4919	1	4.6651	**18395.4688**	0.0099	16583.6960	91.0632	200.0635	3012.9186		LCS			19068.8403	96.5%
32	1.9166	1.3531	1	4.4547	**18490.0728**	0.0084	16105.0080	89.7385	205.0232	3036.5893		LCS			19068.8403	97.0%
33	1.4773	1.0430	1	3.6422	**21757.2502**	0.0118	21068.2560	102.6377	208.7078	3553.6144		LCS			19068.8403	114.1%
34	2.8999	2.0473	1	5.5893	**20905.8156**	0.0076	21091.3920	102.6998	200.5664	3396.3262		LCS			19068.8403	109.6%
35	1.8665	1.3177	1	4.1941	**18954.3226**	0.0119	18360.8160	95.8175	195.1361	3101.8831		LCS			19068.8403	99.4%
36	1.6392	1.1573	1	3.9058	**19133.3242**	0.0138	18137.6240	95.2326	198.0175	3139.9636		LCS			19068.8403	100.3%
37	1.8874	1.3325	1	4.3732	**18982.0918**	0.0168	16765.4920	91.5601	204.3572	3135.8619		LCS			19068.8403	99.5%
38	1.9842	1.4008	1	4.5991	**18757.2155**	0.0118	15729.9940	88.6877	208.2998	3064.2865		LCS			19068.8403	98.4%
39	1.8987	1.3405	1	4.5456	**18128.1857**	0.0168	14658.6440	85.6140	208.5958	2993.2727		LCS			19068.8403	95.1%
40	2.0016	1.4131	1	4.6653	**18030.9201**	0.0122	14833.0220	86.1220	206.9525	2958.4581		LCS			19068.8403	94.6%

LB4100GABVerRaw.xls

SampleID	Instr	Time (min.)	Alpha Counts	Beta Counts	Count Start Time	Count End Time	Machine	Batch ID
V1	A1	2	16513	44973	9/10/2013 16:30	9/10/2013 16:32	LB4100	GABV13
V2	A2	2	15888	43408	9/10/2013 16:30	9/10/2013 16:32	LB4100	GABV13
V3	A3	2	11746	38149	9/10/2013 16:30	9/10/2013 16:32	LB4100	GABV13
V4	A4	0.01	0	14	9/10/2013 16:32	9/10/2013 16:32	LB4100	GABV13
V5	B1	2	12155	35144	9/10/2013 16:30	9/10/2013 16:32	LB4100	GABV13
V6	B2	2	10068	35761	9/10/2013 16:30	9/10/2013 16:32	LB4100	GABV13
V7	B3	2	7692	33097	9/10/2013 16:30	9/10/2013 16:32	LB4100	GABV13
V8	B4	2	5739	29375	9/10/2013 16:30	9/10/2013 16:32	LB4100	GABV13
V1	C1	2	25411	43254	9/10/2013 16:13	9/10/2013 16:15	LB4100	GABV13
V2	C2	2	17105	43464	9/10/2013 16:13	9/10/2013 16:15	LB4100	GABV13
V3	C3	2	11304	39792	9/10/2013 16:13	9/10/2013 16:15	LB4100	GABV13
V4	C4	2	9327	38329	9/10/2013 16:13	9/10/2013 16:15	LB4100	GABV13
V5	D1	2	11489	37585	9/10/2013 16:14	9/10/2013 16:16	LB4100	GABV13
V6	D2	2	9427	38787	9/10/2013 16:14	9/10/2013 16:16	LB4100	GABV13
V7	D3	2	7885	36749	9/10/2013 16:14	9/10/2013 16:16	LB4100	GABV13
V8	D4	2	7158	36274	9/10/2013 16:14	9/10/2013 16:16	LB4100	GABV13
V1	E1	2	24039	43760	9/10/2013 16:19	9/10/2013 16:21	LB4100	GABV13
V2	E2	2	13802	42045	9/10/2013 16:19	9/10/2013 16:21	LB4100	GABV13
V3	E3	2	14247	38189	9/10/2013 16:19	9/10/2013 16:21	LB4100	GABV13
V4	E4	2	11944	36749	9/10/2013 16:19	9/10/2013 16:21	LB4100	GABV13
V5	F1	2	11826	37339	9/10/2013 16:19	9/10/2013 16:21	LB4100	GABV13
V6	F2	2	9819	34836	9/10/2013 16:19	9/10/2013 16:21	LB4100	GABV13
V7	F3	2	6915	33602	9/10/2013 16:19	9/10/2013 16:21	LB4100	GABV13
V8	F4	2	4739	32374	9/10/2013 16:19	9/10/2013 16:21	LB4100	GABV13
V1	G1	2	20867	44993	9/10/2013 16:24	9/10/2013 16:26	LB4100	GABV13
V2	G2	2	15474	44309	9/10/2013 16:24	9/10/2013 16:26	LB4100	GABV13
V3	G3	2	11286	40119	9/10/2013 16:24	9/10/2013 16:26	LB4100	GABV13
V4	G4	2	11176	36978	9/10/2013 16:24	9/10/2013 16:26	LB4100	GABV13
V5	H1	2	11734	36612	9/10/2013 16:24	9/10/2013 16:26	LB4100	GABV13
V6	H2	2	9042	35178	9/10/2013 16:24	9/10/2013 16:26	LB4100	GABV13
V7	H3	2	7905	33170	9/10/2013 16:24	9/10/2013 16:26	LB4100	GABV13
V8	H4	2	5830	32212	9/10/2013 16:24	9/10/2013 16:26	LB4100	GABV13
V1	I1	2	24148	42138	9/10/2013 16:06	9/10/2013 16:08	LB4100	GABV13
V2	I2	2	20777	42189	9/10/2013 16:06	9/10/2013 16:08	LB4100	GABV13
V3	I3	2	15956	36724	9/10/2013 16:06	9/10/2013 16:08	LB4100	GABV13
V4	I4	2	14162	36277	9/10/2013 16:06	9/10/2013 16:08	LB4100	GABV13

V5	J1	2	12118	33533	9/10/2013 16:06	9/10/2013 16:08 LB4100	GABV13
V6	J2	2	11099	31462	9/10/2013 16:06	9/10/2013 16:08 LB4100	GABV13
V7	J3	2	8618	29319	9/10/2013 16:06	9/10/2013 16:08 LB4100	GABV13
V8	J4	2	7259	29668	9/10/2013 16:06	9/10/2013 16:08 LB4100	GABV13

Gross Alpha/Beta Liquid

Filename : GAB.XLS
File type : Excel
Version # : 1.3.10

Batch : 1082959
Analyst : NXL1
Prep Date : 8/29/2011
Alpha Method Uncertainty : 0.0829
Beta Method Uncertainty : 0.0821

Geometry: 2 inch Planchett

Procedure Code : GFCGANBL
Parmname1 : Alpha
Parmname2 : Beta
Required Alpha MDA : 1 pCi/L
Required Beta MDA : 1 pCi/L

Sample Characteristics						Count Raw Data				
Pos.	Sample ID	Sample Aliquot L	Sample Residue Wt. (mg)	Sample Aliquot StDev. L	Sample Date/Time	Detector ID	Counting Time (min.)	Gross Counts Alpha	Gross Counts Beta	Count Start Date/Time
1	1202347886.1	1.0000	0	2.0399E-05	8/29/2011 0:00	A1	2	16566	37064	9/27/2014 14:47
~~2~~	~~1202347887.1~~	~~1.0000~~	~~10.4~~	~~2.0399E-05~~	~~8/29/2011 0:00~~	~~A2~~	~~2~~	~~11486~~	~~34245~~	~~9/27/2014 14:47~~
3	1202347888.1	1.0000	23.8	2.0399E-05	8/29/2011 0:00	A3	2	9549	31723	9/27/2014 14:47
4	1202347889.1	1.0000	44.2	2.0399E-05	8/29/2011 0:00	A4	0	0	387	9/27/2014 14:50
5	1202347890.1	1.0000	54.7	2.0399E-05	8/29/2011 0:00	B1	2	11858	34817	9/27/2014 14:47
6	1202347891.1	1.0000	73.9	2.0399E-05	8/29/2011 0:00	B2	2	8875	33312	9/27/2014 14:47
7	1202347892.1	1.0000	95.2	2.0399E-05	8/29/2011 0:00	B3	2	7323	32477	9/27/2014 14:47
8	1202347893.1	1.0000	103	2.0399E-05	8/29/2011 0:00	B4	2	5088	28390	9/27/2014 14:47
9	1202347894.1	1.0000	0	2.0399E-05	8/29/2011 0:00	C1	2	23534	39728	9/27/2014 14:38
10	1202347895.1	1.0000	10.4	2.0399E-05	8/29/2011 0:00	C2	2	15870	40358	9/27/2014 14:38
11	1202347896.1	1.0000	23.8	2.0399E-05	8/29/2011 0:00	C3	2	10556	34872	9/27/2014 14:38
12	1202347897.1	1.0000	44.2	2.0399E-05	8/29/2011 0:00	C4	2	7892	33600	9/27/2014 14:38
~~13~~	~~1202347898.1~~	~~1.0000~~	~~54.7~~	~~2.0399E-05~~	~~8/29/2011 0:00~~	~~D1~~	~~2~~	4	~~10939~~	~~9/27/2014 14:42~~
~~14~~	~~1202347899.1~~	~~1.0000~~	~~73.9~~	~~2.0399E-05~~	~~8/29/2011 0:00~~	~~D2~~	~~2~~	~~13483~~	~~50707~~	~~9/27/2014 14:42~~
~~15~~	~~1202347900.1~~	~~1.0000~~	~~95.2~~	~~2.0399E-05~~	~~8/29/2011 0:00~~	~~D3~~	~~2~~	~~12399~~	~~47614~~	~~9/27/2014 14:42~~
16	1202347901.1	1.0000	103	2.0399E-05	8/29/2011 0:00	D4	2	9111	46228	9/27/2014 14:42
17	1202347902.1	1.0000	0	2.0399E-05	8/29/2011 0:00	E1	2	24224	43642	9/27/2014 14:31
18	1202347903.1	1.0000	10.4	2.0399E-05	8/29/2011 0:00	E2	2	14653	42846	9/27/2014 14:31
19	1202347904.1	1.0000	23.8	2.0399E-05	8/29/2011 0:00	E3	2	14226	36817	9/27/2014 14:31
20	1202347905.1	1.0000	44.2	2.0399E-05	8/29/2011 0:00	E4	2	10402	35109	9/27/2014 14:31
21	1202347906.1	1.0000	54.7	2.0399E-05	8/29/2011 0:00	F1	2	12345	37658	9/27/2014 14:31
22	1202347907.1	1.0000	73.9	2.0399E-05	8/29/2011 0:00	F2	2	8511	35955	9/27/2014 14:31
~~23~~	~~1202347908.1~~	~~1.0000~~	~~95.2~~	~~2.0399E-05~~	~~8/29/2011 0:00~~	~~F3~~	~~2~~	~~9419~~	~~34114~~	~~9/30/2014 12:00~~
24	1202347909.1	1.0000	103	2.0399E-05	8/29/2011 0:00	F4	2	5586	32896	9/27/2014 14:31
25	1202347910.1	1.0000	0	2.0399E-05	8/29/2011 0:00	G1	2	19641	44324	9/27/2014 14:35
26	1202347911.1	1.0000	10.4	2.0399E-05	8/29/2011 0:00	G2	2	14482	43831	9/27/2014 14:35
27	1202347912.1	1.0000	23.8	2.0399E-05	8/29/2011 0:00	G3	2	10264	38260	9/27/2014 14:35
28	1202347913.1	1.0000	44.2	2.0399E-05	8/29/2011 0:00	G4	2	10933	35418	9/27/2014 14:35
29	1202347914.1	1.0000	54.7	2.0399E-05	8/29/2011 0:00	H1	2	10694	35706	9/27/2014 14:35
30	1202347915.1	1.0000	73.9	2.0399E-05	8/29/2011 0:00	H2	2	8453	33192	9/27/2014 14:35
31	1202347916.1	1.0000	95.2	2.0399E-05	8/29/2011 0:00	H3	2	7470	31636	9/27/2014 14:35
32	1202347917.1	1.0000	103	2.0399E-05	8/29/2011 0:00	H4	2	5443	30290	9/27/2014 14:35
33	1202347918.1	1.0000	0	2.0399E-05	8/29/2011 0:00	I1	2	24525	41989	9/27/2014 14:27
34	1202347919.1	1.0000	10.4	2.0399E-05	8/29/2011 0:00	I2	2	21017	42124	9/27/2014 14:27
35	1202347920.1	1.0000	23.8	2.0399E-05	8/29/2011 0:00	I3	2	16282	35620	9/27/2014 14:27
36	1202347921.1	1.0000	44.2	2.0399E-05	8/29/2011 0:00	I4	2	13597	35302	9/27/2014 14:27
37	1202347922.1	1.0000	54.7	2.0399E-05	8/29/2011 0:00	J1	2	11641	32921	9/27/2014 14:27
38	1202347923.1	1.0000	73.9	2.0399E-05	8/29/2011 0:00	J2	2	10494	30619	9/27/2014 14:27
39	1202347924.1	1.0000	95.2	2.0399E-05	8/29/2011 0:00	J3	2	8857	29681	9/27/2014 14:27
40	1202347925.1	1.0000	103	2.0399E-05	8/29/2011 0:00	J4	2	7055	29581	9/27/2014 14:27

Pipet, 0.1 ml Stdev : +/- 0.000200 ml
Pipet, 0.5 ml Stdev : +/- 0.001000 ml
Pipet, 1 ml Stdev : +/- 0.002000 ml

Analytical SOP: GL-RAD-A-001
Instrument SOP: GL-RAD-I-006

Calibration Data		Alpha						Beta						Weekly Background			
Pos.	Counted on	Calibration Date	Calibration Due Date	Calibration Source Used	Detector Efficiency (cpm/dpm)	Det. Eff. Error (cpm/dpm)	X-Talk	Calibration Date	Calibration Due Date	Calibration Source Used	Detector Efficiency (cpm/dpm)	Det. Eff. Error (cpm/dpm)	X-Talk	CPM Alpha	CPM Beta	Count Start Date/Time	Count Time (min.)
1	LB4100	10/1/2013	9/30/2014	Th230	0.1780	0.02769	0.03020	10/1/2013	9/30/2014	Sr90	0.4518	0.02044	0.00009	0.104	1.306	9/21/2014 16:53	500
~~2~~	~~LB4100~~	~~10/1/2013~~	~~9/30/2014~~	~~Th230~~	~~0.1678~~	~~0.02957~~	~~0.02746~~	~~10/1/2013~~	~~9/30/2014~~	~~Sr90~~	~~0.4462~~	~~0.02268~~	~~0.00016~~	~~0.124~~	~~1.150~~	~~9/21/2014 16:53~~	~~500~~
3	LB4100	10/1/2013	9/30/2014	Th230	0.1321	0.02881	0.03240	10/1/2013	9/30/2014	Sr90	0.4355	0.01784	0.00012	0.108	1.196	9/21/2014 16:53	500
4	LB4100	10/1/2013	9/30/2014	Th230	0.0000	0.00000	0.00000	10/1/2013	9/30/2014	Sr90	0.0000	0.00000	0.00000	FAIL	FAIL	12:00:00 AM	0
5	LB4100	10/1/2013	9/30/2014	Th230	0.1222	0.01406	0.01627	10/1/2013	9/30/2014	Sr90	0.4096	0.01796	0.00015	0.112	0.994	9/21/2014 16:33	500
6	LB4100	10/1/2013	9/30/2014	Th230	0.1089	0.03002	0.03782	10/1/2013	9/30/2014	Sr90	0.4181	0.01415	0.00013	0.176	1.124	9/21/2014 16:33	500
7	LB4100	10/1/2013	9/30/2014	Th230	0.0854	0.03025	0.04858	10/1/2013	9/30/2014	Sr90	0.3972	0.01320	0.00012	0.218	1.432	9/21/2014 16:33	500
8	LB4100	10/1/2013	9/30/2014	Th230	0.0679	0.02055	0.04089	10/1/2013	9/30/2014	Sr90	0.3587	0.00972	0.00015	0.074	1.506	9/21/2014 16:33	500
9	LB4100	10/1/2013	9/30/2014	Th230	0.2626	0.02356	0.01253	10/1/2013	9/30/2014	Sr90	0.4618	0.01816	0.00020	0.414	1.486	9/21/2014 17:08	500
10	LB4100	10/1/2013	9/30/2014	Th230	0.1926	0.02436	0.03322	10/1/2013	9/30/2014	Sr90	0.4728	0.02351	0.00011	0.104	1.530	9/21/2014 17:08	500
11	LB4100	10/1/2013	9/30/2014	Th230	0.1436	0.02695	0.04760	10/1/2013	9/30/2014	Sr90	0.4638	0.02588	0.00011	0.200	1.334	9/21/2014 17:08	500
12	LB4100	10/1/2013	9/30/2014	Th230	0.0992	0.03542	0.05260	10/1/2013	9/30/2014	Sr90	0.4495	0.02683	0.00010	0.100	2.204	9/22/2014 17:44	500
~~13~~	~~LB4100~~	~~10/1/2013~~	~~9/30/2014~~	~~Th230~~	~~0.1266~~	~~0.03038~~	~~0.03108~~	~~10/1/2013~~	~~9/30/2014~~	~~Sr90~~	~~0.4225~~	~~0.02033~~	~~0.00009~~	~~0.000~~	~~0.256~~	~~9/21/2014 19:28~~	~~500~~
~~14~~	~~LB4100~~	~~10/1/2013~~	~~9/30/2014~~	~~Th230~~	~~0.1040~~	~~0.03665~~	~~0.03971~~	~~10/1/2013~~	~~9/30/2014~~	~~Sr90~~	~~0.4633~~	~~0.01910~~	~~0.00010~~	~~0.288~~	~~1.270~~	~~9/21/2014 19:28~~	~~500~~
~~15~~	~~LB4100~~	~~10/1/2013~~	~~9/30/2014~~	~~Th230~~	~~0.0870~~	~~0.04268~~	~~0.05610~~	~~10/1/2013~~	~~9/30/2014~~	~~Sr90~~	~~0.4473~~	~~0.02505~~	~~0.00009~~	~~0.292~~	~~1.430~~	~~9/21/2014 19:28~~	~~500~~
16	LB4100	10/1/2013	9/30/2014	Th230	0.0850	0.03190	0.07070	10/1/2013	9/30/2014	Sr90	0.4377	0.02356	0.00013	0.138	1.468	9/21/2014 19:28	500
17	LB4100	10/1/2013	9/30/2014	Th230	0.2461	0.01842	0.01265	10/1/2013	9/30/2014	Sr90	0.4496	0.02254	0.00008	0.202	1.326	9/21/2014 15:08	500
18	LB4100	10/1/2013	9/30/2014	Th230	0.1564	0.03047	0.04181	10/1/2013	9/30/2014	Sr90	0.4417	0.01894	0.00018	0.278	1.678	9/21/2014 15:08	500
19	LB4100	10/1/2013	9/30/2014	Th230	0.1564	0.02055	0.02090	10/1/2013	9/30/2014	Sr90	0.4325	0.01897	0.00013	0.134	1.342	9/21/2014 15:08	500
20	LB4100	10/1/2013	9/30/2014	Th230	0.1141	0.00769	0.02776	10/1/2013	9/30/2014	Sr90	0.4276	0.02127	0.00013	0.244	1.392	9/21/2014 15:08	500
21	LB4100	10/1/2013	9/30/2014	Th230	0.1134	0.01144	0.02284	10/1/2013	9/30/2014	Sr90	0.4364	0.00772	0.00015	0.618	2.112	9/21/2014 15:08	500
22	LB4100	10/1/2013	9/30/2014	Th230	0.0967	0.03128	0.05029	10/1/2013	9/30/2014	Sr90	0.4106	0.01365	0.00010	0.558	1.652	9/21/2014 15:08	500
~~23~~	~~LB4100~~	~~10/1/2013~~	~~9/30/2014~~	~~Th230~~	~~0.0792~~	~~0.02244~~	~~0.06132~~	~~10/1/2013~~	~~9/30/2014~~	~~Sr90~~	~~0.4005~~	~~0.00981~~	~~0.00011~~	~~0.298~~	~~1.212~~	~~9/27/2014 16:19~~	~~500~~
24	LB4100	10/1/2013	9/30/2014	Th230	0.0589	0.02862	0.08962	10/1/2013	9/30/2014	Sr90	0.3994	0.00850	0.00012	0.182	1.258	9/21/2014 15:08	500
25	LB4100	10/1/2013	9/30/2014	Th230	0.2192	0.03411	0.01523	10/1/2013	9/30/2014	Sr90	0.4573	0.01543	0.00009	0.266	1.280	9/22/2014 12:14	500
26	LB4100	10/1/2013	9/30/2014	Th230	0.1719	0.01976	0.03387	10/1/2013	9/30/2014	Sr90	0.4575	0.01349	0.00017	0.156	1.474	9/21/2014 15:07	500
27	LB4100	10/1/2013	9/30/2014	Th230	0.1298	0.02238	0.05683	10/1/2013	9/30/2014	Sr90	0.4572	0.01089	0.00023	0.160	1.216	9/21/2014 15:07	500
28	LB4100	10/1/2013	9/30/2014	Th230	0.1071	0.02077	0.02908	10/1/2013	9/30/2014	Sr90	0.4289	0.00938	0.00016	0.102	0.872	9/22/2014 12:14	500
29	LB4100	10/1/2013	9/30/2014	Th230	0.1116	0.01393	0.03067	10/1/2013	9/30/2014	Sr90	0.4184	0.00965	0.00016	0.098	0.898	9/21/2014 15:08	500
30	LB4100	10/1/2013	9/30/2014	Th230	0.0909	0.01701	0.04163	10/1/2013	9/30/2014	Sr90	0.4093	0.00948	0.00014	0.152	1.036	9/21/2014 15:08	500
31	LB4100	10/1/2013	9/30/2014	Th230	0.0846	0.01513	0.04363	10/1/2013	9/30/2014	Sr90	0.4019	0.00824	0.00019	0.128	1.350	9/21/2014 15:08	500
32	LB4100	10/1/2013	9/30/2014	Th230	0.0664	0.02054	0.08320	10/1/2013	9/30/2014	Sr90	0.3864	0.00628	0.00012	0.250	1.194	9/21/2014 15:08	500
33	LB4100	10/1/2013	9/30/2014	Th230	0.2365	0.00598	0.00802	10/1/2013	9/30/2014	Sr90	0.4342	0.01079	0.00020	0.198	1.562	9/21/2014 14:50	500
34	LB4100	10/1/2013	9/30/2014	Th230	0.2152	0.00564	0.01059	10/1/2013	9/30/2014	Sr90	0.4521	0.00589	0.00010	0.118	2.834	9/21/2014 14:50	500
35	LB4100	10/1/2013	9/30/2014	Th230	0.1774	0.01009	0.01490	10/1/2013	9/30/2014	Sr90	0.4335	0.01067	0.00014	0.166	1.874	9/22/2014 12:04	500
36	LB4100	10/1/2013	9/30/2014	Th230	0.1351	0.00692	0.01442	10/1/2013	9/30/2014	Sr90	0.4246	0.01280	0.00012	0.076	1.204	9/21/2014 14:50	500
37	LB4100	10/1/2013	9/30/2014	Th230	0.1155	0.01256	0.01588	10/1/2013	9/30/2014	Sr90	0.3956	0.01589	0.00016	0.218	1.354	9/21/2014 14:59	500
38	LB4100	10/1/2013	9/30/2014	Th230	0.1110	0.00765	0.01387	10/1/2013	9/30/2014	Sr90	0.3759	0.01035	0.00023	0.290	0.930	9/21/2014 14:59	500
39	LB4100	10/1/2013	9/30/2014	Th230	0.0881	0.01198	0.01753	10/1/2013	9/30/2014	Sr90	0.3624	0.01579	0.00011	0.098	0.906	9/21/2014 14:59	500
40	LB4100	10/1/2013	9/30/2014	Th230	0.0816	0.01086	0.03478	10/1/2013	9/30/2014	Sr90	0.3674	0.01072	0.00016	0.174	1.170	9/21/2014 14:59	500

Notes:
1 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date

Alpha Spike S/N :	N/A
Spike Exp Date :	N/A
Spike Activity (dpm/ml):	N/A
Spike Volume Added:	N/A
Spike Nuclide:	N/A
Alpha LCS S/N :	1242-A
LCS Exp Date :	1/8/2014
LCS Activity (dpm/ml):	23216.97
LCS Volume Added:	2.00
LCS Nuclide:	Th-230

Alpha 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 %	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	1.3474	0.9513	1	5.6988	**20958.4782**	2.88%	8282.8960	64.3545	319.2297	3605.2121		LCS			20916.1917	100.2%
~~2~~	~~1.5602~~	~~1.1015~~	~~1~~	~~6.2287~~	~~**15405.5253**~~	~~3.10%~~	~~5742.8760~~	~~53.5864~~	~~281.8779~~	~~2673.7442~~		~~LCS~~			~~20916.1917~~	~~73.7%~~
3	1.8506	1.3066	1	7.7298	**16279.6103**	3.06%	4774.3920	48.8595	326.6664	2820.4525		LCS			20916.1917	77.8%
4	#DIV/0!	#DIV/0!	1	#DIV/0!	**#VALUE!**	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!		LCS			20916.1917	#VALUE!
5	2.0372	1.4383	1	8.4078	**21853.1417**	1.68%	5928.8880	54.4472	393.5122	3624.4414		LCS			20916.1917	104.5%
6	2.8646	2.0224	1	10.2490	**18344.0931**	3.18%	4437.3240	47.1036	381.8600	3194.5038		LCS			20916.1917	87.7%
7	4.0654	2.8702	1	13.6519	**19300.8775**	3.24%	3661.2820	42.7873	442.3205	3369.2371		LCS			20916.1917	92.3%
8	2.9797	2.1037	1	14.1601	**16865.0696**	2.49%	2543.9260	35.6651	463.8190	2863.3952		LCS			20916.1917	80.6%
9	1.8221	1.2864	1	5.1460	**20177.7772**	2.44%	11766.5860	76.7040	257.8973	3419.3218		LCS			20916.1917	96.5%
10	1.2453	0.8792	1	5.2671	**18555.4554**	2.56%	7934.8960	62.9881	288.7823	3156.5803		LCS			20916.1917	88.7%
11	2.3159	1.6351	1	7.9755	**16549.8235**	2.87%	5277.8000	51.3712	315.8481	2846.2676		LCS			20916.1917	79.1%
12	2.3698	1.6731	1	10.1554	**17904.3679**	3.72%	3945.9000	44.4185	395.2078	3189.6394		LCS			20916.1917	85.6%
~~13~~	~~0.000E+00~~	~~0.000E+00~~	~~1~~	~~5.3390~~	~~**5.4270**~~	~~50.09%~~	~~2.0000~~	~~1.0000~~	~~6.9762~~	~~7.0842~~		~~LCS~~			~~20916.1917~~	~~0.0%~~
~~14~~	~~3.8383~~	~~2.7099~~	~~1~~	~~11.9185~~	~~**29194.8069**~~	~~3.77%~~	~~6741.2120~~	~~58.0582~~	~~493.0124~~	~~5212.0871~~		~~LCS~~			~~20916.1917~~	~~139.6%~~
~~15~~	~~4.6163~~	~~3.2592~~	~~1~~	~~14.2806~~	~~**32069.1134**~~	~~4.36%~~	~~6199.2080~~	~~55.6754~~	~~564.6973~~	~~5889.8021~~		~~LCS~~			~~20916.1917~~	~~153.3%~~
16	3.2497	2.2943	1	12.5371	**24122.9235**	3.36%	4555.3620	47.7258	495.6828	4231.6492		LCS			20916.1917	115.3%
17	1.3579	0.9587	1	4.6625	**22162.5759**	1.95%	12111.7980	77.8203	279.1419	3699.9480		LCS			20916.1917	106.0%
18	2.5062	1.7694	1	7.8577	**21082.9593**	3.16%	7326.2220	60.5248	341.5631	3667.5716		LCS			20916.1917	100.8%
19	1.7405	1.2288	1	6.7779	**20479.5647**	2.22%	7112.8660	59.6364	336.6551	3445.8932		LCS			20916.1917	97.9%
20	3.2181	2.2720	1	10.4637	**20515.2075**	1.25%	5200.7560	50.9951	394.4465	3372.3575		LCS			20916.1917	98.1%
21	5.1570	3.6409	1	13.2424	**24514.0739**	1.46%	6171.8820	55.5540	432.6820	4045.9473		LCS			20916.1917	117.2%
22	5.7457	4.0565	1	15.1020	**19817.0091**	3.31%	4254.9420	46.1276	421.2471	3468.5660		LCS			20916.1917	94.7%
~~23~~	~~5.1261~~	~~3.6181~~	~~1~~	~~15.7705~~	~~**26776.0506**~~	~~2.47%~~	~~4709.2020~~	~~48.5258~~	~~541.0069~~	~~4541.4547~~		~~LCS~~			~~20916.1917~~	~~128.0%~~
24	5.3860	3.8026	1	19.0765	**21343.8422**	3.16%	2792.8180	37.3698	560.1462	3713.8753		LCS			20916.1917	102.0%
25	1.7496	1.2352	1	5.5527	**20174.9703**	3.48%	9820.2340	70.0732	282.2208	3556.6745		LCS			20916.1917	96.5%
26	1.7082	1.2060	1	6.3416	**18959.3054**	2.14%	7240.8440	60.1706	308.9607	3183.5896		LCS			20916.1917	90.6%
27	2.2908	1.6173	1	8.4382	**17787.7888**	2.45%	5131.8400	50.6557	344.4289	3015.9641		LCS			20916.1917	85.0%
28	2.2177	1.5657	1	9.4407	**22981.2229**	2.29%	5466.3980	52.2805	431.0095	3875.5183		LCS			20916.1917	109.9%
29	2.0850	1.4720	1	8.9959	**21560.4321**	1.70%	5346.9020	51.7059	408.8720	3577.7206		LCS			20916.1917	103.1%
30	3.1888	2.2513	1	11.9343	**20927.7534**	2.02%	4226.3480	45.9701	446.4021	3501.7545		LCS			20916.1917	100.1%
31	3.1434	2.2193	1	12.4217	**19861.1407**	1.90%	3734.8720	43.2146	450.7866	3313.8970		LCS			20916.1917	95.0%
32	5.6034	3.9560	1	18.0948	**18461.2286**	2.46%	2721.2500	36.8884	490.8164	3131.0700		LCS			20916.1917	88.3%
33	1.3992	0.9878	1	4.8327	**23348.1587**	0.88%	12262.3020	78.3023	292.3213	3816.0903		LCS			20916.1917	111.6%
34	1.1872	0.8382	1	4.8167	**21995.4234**	0.89%	10508.3820	72.4862	297.4376	3595.2134		LCS			20916.1917	105.2%
35	1.7082	1.2060	1	6.2215	**20668.5799**	1.28%	8140.8340	63.8005	317.5819	3399.0194		LCS			20916.1917	98.8%
36	1.5172	1.0712	1	7.1431	**22657.5814**	1.10%	6798.4240	58.3031	380.9673	3715.0271		LCS			20916.1917	108.3%
37	3.0072	2.1231	1	10.0986	**22697.8702**	1.56%	5820.2820	53.9467	412.5293	3754.4834		LCS			20916.1917	108.5%
38	3.6085	2.5476	1	11.1837	**21281.9934**	1.24%	5246.7100	51.2201	407.4868	3498.8212		LCS			20916.1917	101.7%
39	2.6410	1.8646	1	11.3945	**22621.7460**	1.60%	4428.4020	47.0558	471.3188	3745.0604		LCS			20916.1917	108.2%
40	3.8012	2.6837	1	13.6472	**19457.7068**	1.61%	3527.3260	41.9970	454.3701	3222.9117		LCS			20916.1917	93.0%

Notes:
1 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date

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

Beta LCS S/N : 1243-A
LCS Exp Date : 2/12/2014
LCS Activity (dpm/ml): 211664.13
LCS Volume Added: 0.10
LCS Nuclide: Sr-90

Beta 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 %	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	1.8811	1.3280	1	4.1517	**18226.8261**	2.11%	18530.6940	96.2601	188.1155	3069.6385		LCS			19068.8403	95.6%
~~2~~	~~1.7872~~	~~1.2618~~	~~1~~	~~4.0379~~	~~**17125.5688**~~	~~2.33%~~	~~17121.3500~~	~~92.5270~~	~~183.0841~~	~~2891.3757~~		~~LCS~~			~~19068.8403~~	~~89.8%~~
3	1.8674	1.3184	1	4.1882	**16244.5755**	1.87%	15860.3040	89.0548	180.5373	2707.4021		LCS			19068.8403	85.2%
4	#DIV/0!	#DIV/0!	1	#DIV/0!	**#VALUE!**	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!		LCS			19068.8403	#VALUE!
5	1.8098	1.2778	1	4.2049	**19035.4227**	1.87%	17407.5060	93.2966	201.0766	3159.4275		LCS			19068.8403	99.8%
6	1.8856	1.3312	1	4.2785	**17762.0802**	1.52%	16654.8760	91.2579	192.6980	2936.1725		LCS			19068.8403	93.1%
7	2.2402	1.5816	1	4.8641	**18210.5883**	1.43%	16237.0680	90.1069	200.2693	3007.5613		LCS			19068.8403	95.5%
8	2.5443	1.7963	1	5.4764	**17694.6587**	1.14%	14193.4940	84.2467	207.3751	2895.8463		LCS			19068.8403	92.8%
9	1.9628	1.3857	1	4.2344	**19228.6688**	1.88%	19862.5140	99.6594	190.5132	3198.3860		LCS			19068.8403	100.8%
10	1.9456	1.3736	1	4.1765	**18974.3158**	2.40%	20177.4700	100.4465	187.5863	3223.4580		LCS			19068.8403	99.5%
11	1.8519	1.3075	1	4.0718	**16689.5396**	2.64%	17434.6660	93.3702	177.7458	2862.6244		LCS			19068.8403	87.5%
12	2.4562	1.7341	1	4.9716	**16626.9147**	2.74%	16797.7960	91.6515	180.0340	2855.6832		LCS			19068.8403	87.2%
~~13~~	~~0.8906~~	~~0.6287~~	~~1~~	~~2.8568~~	~~**5831.2212**~~	~~2.25%~~	~~5469.2440~~	~~52.2948~~	~~109.2829~~	~~972.8352~~		~~LCS~~			~~19068.8403~~	~~30.6%~~
~~14~~	~~1.8089~~	~~1.2771~~	~~1~~	~~4.0126~~	~~**24389.8447**~~	~~1.96%~~	~~25352.2300~~	~~112.5911~~	~~214.5670~~	~~4078.2164~~		~~LCS~~			~~19068.8403~~	~~127.9%~~
~~15~~	~~1.9878~~	~~1.4034~~	~~1~~	~~4.3172~~	~~**23620.4952**~~	~~2.55%~~	~~23805.5700~~	~~109.1032~~	~~215.3256~~	~~4038.5867~~		~~LCS~~			~~19068.8403~~	~~123.9%~~
16	2.0583	1.4532	1	4.4500	**23452.7672**	2.40%	23112.5320	107.5035	216.8301	3987.6350		LCS			19068.8403	123.0%
17	1.9046	1.3447	1	4.1922	**21707.7138**	2.30%	21819.6740	104.4534	205.1184	3653.7121		LCS			19068.8403	113.8%
18	2.1806	1.5396	1	4.6087	**21531.4039**	1.96%	21421.3220	103.4964	206.8533	3613.2985		LCS			19068.8403	112.9%
19	1.9917	1.4062	1	4.3745	**19015.4387**	1.97%	18407.1580	95.9388	195.8360	3172.1074		LCS			19068.8403	99.7%
20	2.0516	1.4484	1	4.4769	**18337.1485**	2.19%	17553.1080	93.6870	193.4194	3079.5233		LCS			19068.8403	96.2%
21	2.4765	1.7484	1	5.0453	**19288.5513**	0.93%	18826.8880	97.0284	196.3090	3147.1846		LCS			19068.8403	101.2%
22	2.3280	1.6436	1	4.9329	**19487.5682**	1.46%	17975.8480	94.8090	203.8804	3223.6380		LCS			19068.8403	102.2%
~~23~~	~~2.0439~~	~~1.4430~~	~~1~~	~~4.5729~~	~~**18856.3369**~~	~~1.12%~~	~~17055.7880~~	~~92.3499~~	~~203.5609~~	~~3115.1810~~		~~LCS~~			~~19068.8403~~	~~98.9%~~
24	2.0885	1.4745	1	4.6408	**18268.2867**	1.01%	16446.7420	90.6863	200.4824	3007.7386		LCS			19068.8403	95.8%
25	1.8397	1.2988	1	4.0751	**21680.6788**	1.61%	22160.7200	105.2663	203.2245	3579.7445		LCS			19068.8403	113.7%
26	1.9734	1.3932	1	4.2634	**21334.9990**	1.43%	21914.0260	104.6793	202.0113	3524.3468		LCS			19068.8403	111.9%
27	1.7936	1.2663	1	4.0104	**18559.2715**	1.20%	19128.7840	97.8008	188.8623	3065.0994		LCS			19068.8403	97.3%
28	1.6189	1.1430	1	3.8612	**18429.7253**	1.08%	17708.1280	94.0984	193.6871	3018.1980		LCS			19068.8403	96.6%
29	1.6842	1.1890	1	3.9929	**19042.4021**	1.10%	17852.1020	94.4802	199.3595	3120.3146		LCS			19068.8403	99.9%
30	1.8494	1.3057	1	4.2624	**18071.8093**	1.10%	16594.9640	91.0934	196.5156	2965.2428		LCS			19068.8403	94.8%
31	2.1500	1.5179	1	4.7172	**17546.3190**	1.00%	15816.6500	88.9326	195.3827	2873.8692		LCS			19068.8403	92.0%
32	2.1027	1.4845	1	4.7175	**17388.4154**	0.85%	15143.8060	87.0201	198.8125	2855.7684		LCS			19068.8403	91.2%
33	2.1405	1.5112	1	4.5787	**21677.5420**	1.18%	20992.9380	102.4561	208.3385	3540.9326		LCS			19068.8403	113.7%
34	2.7691	1.9550	1	5.4046	**20872.4399**	0.76%	21059.1660	102.6207	200.4118	3391.1459		LCS			19068.8403	109.5%
35	2.3482	1.6578	1	4.8742	**18377.5272**	1.19%	17808.1260	94.3663	192.1806	3008.6965		LCS			19068.8403	96.4%
36	1.9217	1.3567	1	4.3048	**18620.1240**	1.39%	17649.7960	93.9441	195.3384	3055.6795		LCS			19068.8403	97.6%
37	2.1875	1.5444	1	4.7969	**18637.5542**	1.68%	16459.1460	90.7207	202.4838	3078.6840		LCS			19068.8403	97.7%
38	1.9077	1.3469	1	4.4912	**18257.2449**	1.18%	15308.5700	87.4914	205.4903	2982.3805		LCS			19068.8403	95.7%
39	1.9533	1.3791	1	4.6228	**18350.5193**	1.68%	14839.5940	86.1409	209.8796	3030.1327		LCS			19068.8403	96.2%
40	2.1893	1.5457	1	4.9303	**17981.7024**	1.22%	14789.3300	85.9957	206.6489	2949.7651		LCS			19068.8403	94.3%

LB4100_GAB_SEP14_Ver_RawData.xls

SampleID	Instr	Time (min.)	Alpha Counts	Beta Counts	Count Start Time	Count End Time	Machine	Batch ID
V1	A1	2	16566	37064	9/27/2014 14:47	9/27/2014 14:49	LB4100	GABV14
V2	A2	2	11486	34245	9/27/2014 14:47	9/27/2014 14:49	LB4100	GABV14
V3	A3	2	9549	31723	9/27/2014 14:47	9/27/2014 14:49	LB4100	GABV14
V4	A4	0.01	0	387	9/27/2014 14:50	9/27/2014 14:50	LB4100	GABV14
V5	B1	2	11858	34817	9/27/2014 14:47	9/27/2014 14:49	LB4100	GABV14
V6	B2	2	8875	33312	9/27/2014 14:47	9/27/2014 14:49	LB4100	GABV14
V7	B3	2	7323	32477	9/27/2014 14:47	9/27/2014 14:49	LB4100	GABV14
V8	B4	2	5088	28390	9/27/2014 14:47	9/27/2014 14:49	LB4100	GABV14
V1	C1	2	23534	39728	9/27/2014 14:38	9/27/2014 14:40	LB4100	GABV14
V2	C2	2	15870	40358	9/27/2014 14:38	9/27/2014 14:40	LB4100	GABV14
V3	C3	2	10556	34872	9/27/2014 14:38	9/27/2014 14:40	LB4100	GABV14
V4	C4	2	7892	33600	9/27/2014 14:38	9/27/2014 14:40	LB4100	GABV14
V5	D1	2	4	10939	9/27/2014 14:42	9/27/2014 14:44	LB4100	GABV14
V6	D2	2	13483	50707	9/27/2014 14:42	9/27/2014 14:44	LB4100	GABV14
V7	D3	2	12399	47614	9/27/2014 14:42	9/27/2014 14:44	LB4100	GABV14
V8	D4	2	9111	46228	9/27/2014 14:42	9/27/2014 14:44	LB4100	GABV14
V1	E1	2	24224	43642	9/27/2014 14:31	9/27/2014 14:33	LB4100	GABV14
V2	E2	2	14653	42846	9/27/2014 14:31	9/27/2014 14:33	LB4100	GABV14
V3	E3	2	14226	36817	9/27/2014 14:31	9/27/2014 14:33	LB4100	GABV14
V4	E4	2	10402	35109	9/27/2014 14:31	9/27/2014 14:33	LB4100	GABV14
V5	F1	2	12345	37658	9/27/2014 14:31	9/27/2014 14:33	LB4100	GABV14
V6	F2	2	8511	35955	9/27/2014 14:31	9/27/2014 14:33	LB4100	GABV14
V7	F3	2	9419	34114	9/30/2014 12:00	9/30/2014 12:02	LB4100	GABV14
V8	F4	2	5586	32896	9/27/2014 14:31	9/27/2014 14:33	LB4100	GABV14
V1	G1	2	19641	44324	9/27/2014 14:35	9/27/2014 14:37	LB4100	GABV14
V2	G2	2	14482	43831	9/27/2014 14:35	9/27/2014 14:37	LB4100	GABV14
V3	G3	2	10264	38260	9/27/2014 14:35	9/27/2014 14:37	LB4100	GABV14
V4	G4	2	10933	35418	9/27/2014 14:35	9/27/2014 14:37	LB4100	GABV14
V5	H1	2	10694	35706	9/27/2014 14:35	9/27/2014 14:37	LB4100	GABV14
V6	H2	2	8453	33192	9/27/2014 14:35	9/27/2014 14:37	LB4100	GABV14
V7	H3	2	7470	31636	9/27/2014 14:35	9/27/2014 14:37	LB4100	GABV14
V8	H4	2	5443	30290	9/27/2014 14:35	9/27/2014 14:37	LB4100	GABV14
V1	I1	2	24525	41989	9/27/2014 14:27	9/27/2014 14:29	LB4100	GABV14
V2	I2	2	21017	42124	9/27/2014 14:27	9/27/2014 14:29	LB4100	GABV14
V3	I3	2	16282	35620	9/27/2014 14:27	9/27/2014 14:29	LB4100	GABV14
V4	I4	2	13597	35302	9/27/2014 14:27	9/27/2014 14:29	LB4100	GABV14

V5	J1	2	11641	32921	9/27/2014 14:27	9/27/2014 14:29	LB4100	GABV14
V6	J2	2	10494	30619	9/27/2014 14:27	9/27/2014 14:29	LB4100	GABV14
V7	J3	2	8857	29681	9/27/2014 14:27	9/27/2014 14:29	LB4100	GABV14
V8	J4	2	7055	29581	9/27/2014 14:27	9/27/2014 14:29	LB4100	GABV14

Detector #	Sample I.D.	Pgm time (min)	Total (counts)	Voltage	%slope/100V	Date/Time
A1	Sr-90'	0.11	1	750	1.2	7/1/2009 15:09
A1	Sr-90'	0.12	1	780	2.2	7/1/2009 15:09
A1	Sr-90'	0.5	71	810	3.6	7/1/2009 15:10
A1	Sr-90'	0.5	197	840	6.3	7/1/2009 15:11
A1	Sr-90'	0.5	436	870	9.1	7/1/2009 15:11
A1	Sr-90'	0.5	768	900	11.7	7/1/2009 15:12
A1	Sr-90'	0.5	1146	930	14.3	7/1/2009 15:12
A1	Sr-90'	0.5	1601	960	17.2	7/1/2009 15:13
A1	Sr-90'	0.5	2167	990	20.3	7/1/2009 15:14
A1	Sr-90'	0.5	2839	1020	23.6	7/1/2009 15:14
A1	Sr-90'	0.5	3575	1050	27.3	7/1/2009 15:15
A1	Sr-90'	0.5	4430	1080	33.0	7/1/2009 15:16
A1	Sr-90'	0.5	5461	1110	38.9	7/1/2009 15:16
A1	Sr-90'	0.5	6850	1140	44.3	7/1/2009 15:17
A1	Sr-90'	0.5	8198	1170	46.9	7/1/2009 15:18
A1	Sr-90'	0.5	9713	1200	44.5	7/1/2009 15:18
A1	Sr-90'	0.5	11070	1230	40.2	7/1/2009 15:19
A1	Sr-90'	0.5	12096	1260	32.3	7/1/2009 15:20
A1	Sr-90'	0.5	13036	1290	23.4	7/1/2009 15:20
A1	Sr-90'	0.5	13569	1320	14.3	7/1/2009 15:21
A1	Sr-90'	0.5	13839	1350	7.0	7/1/2009 15:21
A1	Sr-90'	0.5	13834	1380	5.3	7/1/2009 15:22
A1	Sr-90'	0.5	13947	1410	3.7	7/1/2009 15:23
A1	Sr-90'	0.5	14310	1440	4.9	7/1/2009 15:23
A1	Sr-90'	0.5	14159	1470	1.6	7/1/2009 15:24
A1	Sr-90'	0.5	14463	1500	-0.7	7/1/2009 15:25
A1	Sr-90'	0.5	14107	1530	0.8	7/1/2009 15:25
A1	Sr-90'	0.5	14237	1560	-1.5	7/1/2009 15:53
A1	Sr-90'	0.5	14392	1590	0.1	7/1/2009 15:53
A1	Sr-90'	0.5	14095	1620	16.5	7/1/2009 15:54
A1	Sr-90'	0.5	14197	1650	16.6	7/1/2009 15:55
A2	Sr-90'	0.11	5	750	16.4	7/1/2009 15:09
A2	Sr-90'	0.5	52	780	16.3	7/1/2009 15:09
A2	Sr-90'	0.5	164	810	5.3	7/1/2009 15:10
A2	Sr-90'	0.5	362	840	8.4	7/1/2009 15:11
A2	Sr-90'	0.5	643	870	11.5	7/1/2009 15:11
A2	Sr-90'	0.5	1065	900	15.3	7/1/2009 15:12
A2	Sr-90'	0.5	1537	930	19.4	7/1/2009 15:12
A2	Sr-90'	0.5	2206	960	23.9	7/1/2009 15:13
A2	Sr-90'	0.5	2982	990	29.1	7/1/2009 15:14
A2	Sr-90'	0.5	3922	1020	32.4	7/1/2009 15:14
A2	Sr-90'	0.5	5045	1050	38.2	7/1/2009 15:15
A2	Sr-90'	0.5	6034	1080	44.5	7/1/2009 15:16
A2	Sr-90'	0.5	7649	1110	49.6	7/1/2009 15:16
A2	Sr-90'	0.5	9297	1140	57.5	7/1/2009 15:17
A2	Sr-90'	0.5	10846	1170	55.5	7/1/2009 15:18
A2	Sr-90'	0.5	13066	1200	52.9	7/1/2009 15:18
A2	Sr-90'	0.5	14085	1230	46.3	7/1/2009 15:19
A2	Sr-90'	0.5	15618	1260	35.4	7/1/2009 15:20
A2	Sr-90'	0.5	16518	1290	29.3	7/1/2009 15:20
A2	Sr-90'	0.5	17153	1320	18.3	7/1/2009 15:21
A2	Sr-90'	0.5	17712	1350	9.3	7/1/2009 15:21
A2	Sr-90'	0.5	17772	1380	1.8	7/1/2009 15:22
A2	Sr-90'	0.5	17602	1410	-1.3	7/1/2009 15:23
A2	Sr-90'	0.5	17483	1440	-1.1	7/1/2009 15:23
A2	Sr-90'	0.5	17666	1470	1.0	7/1/2009 15:24
A2	Sr-90'	0.5	17571	1500	2.6	7/1/2009 15:25
A2	Sr-90'	0.5	17710	1530	2.0	7/1/2009 15:25
A2	Sr-90'	0.5	17851	1560	1.0	7/1/2009 15:53
A2	Sr-90'	0.5	17830	1590	-1.5	7/1/2009 15:53
A2	Sr-90'	0.5	17655	1620	20.6	7/1/2009 15:54
A2	Sr-90'	0.5	17586	1650	20.6	7/1/2009 15:55
A3	Sr-90'	0.12	2	750	20.5	7/1/2009 15:09
A3	Sr-90'	0.11	10	780	20.3	7/1/2009 15:09
A3	Sr-90'	0.5	158	810	6.3	7/1/2009 15:10
A3	Sr-90'	0.5	412	840	9.8	7/1/2009 15:11
A3	Sr-90'	0.5	752	870	13.1	7/1/2009 15:11
A3	Sr-90'	0.5	1186	900	16.1	7/1/2009 15:12

A3	Sr-90'	0.5	1743	930		20.3	7/1/2009 15:12
A3	Sr-90'	0.5	2332	960		24.4	7/1/2009 15:13
A3	Sr-90'	0.5	3228	990		28.2	7/1/2009 15:14
A3	Sr-90'	0.5	4102	1020		33.6	7/1/2009 15:14
A3	Sr-90'	0.5	5082	1050		38.9	7/1/2009 15:15
A3	Sr-90'	0.5	6439	1080		47.4	7/1/2009 15:16
A3	Sr-90'	0.5	7892	1110		54.0	7/1/2009 15:16
A3	Sr-90'	0.5	9804	1140		56.5	7/1/2009 15:17
A3	Sr-90'	0.5	11495	1170		55.1	7/1/2009 15:18
A3	Sr-90'	0.5	13109	1200		49.0	7/1/2009 15:18
A3	Sr-90'	0.5	14504	1230		41.8	7/1/2009 15:19
A3	Sr-90'	0.5	15649	1260		31.8	7/1/2009 15:20
A3	Sr-90'	0.5	16497	1290		21.3	7/1/2009 15:20
A3	Sr-90'	0.5	16882	1320		11.8	7/1/2009 15:21
A3	Sr-90'	0.5	17082	1350		6.1	7/1/2009 15:21
A3	Sr-90'	0.5	17120	1380		5.1	7/1/2009 15:22
A3	Sr-90'	0.5	17292	1410		4.4	7/1/2009 15:23
A3	Sr-90'	0.5	17541	1440		3.6	7/1/2009 15:23
A3	Sr-90'	0.5	17524	1470		1.1	7/1/2009 15:24
A3	Sr-90'	0.5	17542	1500		-0.5	7/1/2009 15:25
A3	Sr-90'	0.5	17462	1530		-0.2	7/1/2009 15:25
A3	Sr-90'	0.5	17501	1560		-0.4	7/1/2009 15:53
A3	Sr-90'	0.5	17517	1590		0.0	7/1/2009 15:53
A3	Sr-90'	0.5	17449	1620		-0.4	7/1/2009 15:54
A3	Sr-90'	0.5	17488	1650		-0.5	7/1/2009 15:55
A4	Sr-90'	0.12	0			1.3	7/1/2009 15:09
A4	Sr-90'	0.11	0		#DIV/0!		7/1/2009 15:09
A4	Sr-90'	0.12	0		#DIV/0!		7/1/2009 15:10
A4	Sr-90'	0.12	0		#DIV/0!		7/1/2009 15:11
A4	Sr-90'	0.12	0		#DIV/0!		7/1/2009 15:11
A4	Sr-90'	0.12	0		#DIV/0!		7/1/2009 15:12
A4	Sr-90'	0.12	0		#DIV/0!		7/1/2009 15:12
A4	Sr-90'	0.12	0		#DIV/0!		7/1/2009 15:13
A4	Sr-90'	0.11	0		#DIV/0!		7/1/2009 15:14
A4	Sr-90'	0.11	0		#DIV/0!		7/1/2009 15:14
A4	Sr-90'	0.11	0		#DIV/0!		7/1/2009 15:15
A4	Sr-90'	0.11	0		#DIV/0!		7/1/2009 15:16
A4	Sr-90'	0.11	0		#DIV/0!		7/1/2009 15:16
A4	Sr-90'	0.11	0		#DIV/0!		7/1/2009 15:17
A4	Sr-90'	0.11	0		#DIV/0!		7/1/2009 15:18
A4	Sr-90'	0.11	0		#DIV/0!		7/1/2009 15:18
A4	Sr-90'	0.11	0		#DIV/0!		7/1/2009 15:19
A4	Sr-90'	0.11	0		#DIV/0!		7/1/2009 15:20
A4	Sr-90'	0.12	0		#DIV/0!		7/1/2009 15:20
A4	Sr-90'	0.11	0		#DIV/0!		7/1/2009 15:21
A4	Sr-90'	0.11	0		#DIV/0!		7/1/2009 15:21
A4	Sr-90'	0.12	0		#DIV/0!		7/1/2009 15:22
A4	Sr-90'	0.12	0		#DIV/0!		7/1/2009 15:23
A4	Sr-90'	0.12	0		#DIV/0!		7/1/2009 15:23
A4	Sr-90'	0.12	0		#DIV/0!		7/1/2009 15:24
A4	Sr-90'	0.13	0		#DIV/0!		7/1/2009 15:25
A4	Sr-90'	0.12	0		#DIV/0!		7/1/2009 15:25
A4	Sr-90'	0.12	0		#DIV/0!		7/1/2009 15:26
A4	Sr-90'	0.12	0		#DIV/0!		7/1/2009 15:53
A4	Sr-90'	0.12	0		#DIV/0!		7/1/2009 15:54
A4	Sr-90'	0.12	0			0.1	7/1/2009 15:55
B1	Sr-90'	0.11	2	750		1.2	7/1/2009 15:09
B1	Sr-90'	0.12	5	780		2.8	7/1/2009 15:09
B1	Sr-90'	0.5	74	810		4.9	7/1/2009 15:10
B1	Sr-90'	0.5	259	840		8.8	7/1/2009 15:10
B1	Sr-90'	0.5	604	870		12.3	7/1/2009 15:11
B1	Sr-90'	0.5	1066	900		16.1	7/1/2009 15:12
B1	Sr-90'	0.5	1521	930		20.5	7/1/2009 15:12
B1	Sr-90'	0.5	2215	960		24.7	7/1/2009 15:13
B1	Sr-90'	0.5	3106	990		29.4	7/1/2009 15:14
B1	Sr-90'	0.5	3985	1020		34.3	7/1/2009 15:14
B1	Sr-90'	0.5	5047	1050		39.2	7/1/2009 15:15
B1	Sr-90'	0.5	6386	1080		46.0	7/1/2009 15:16
B1	Sr-90'	0.5	7782	1110		53.3	7/1/2009 15:16
B1	Sr-90'	0.5	9521	1140		58.8	7/1/2009 15:17

B1	Sr-90'	0.5	11467	1170	61.3	7/1/2009 15:18
B1	Sr-90'	0.5	13368	1200	60.4	7/1/2009 15:18
B1	Sr-90'	0.5	15059	1230	52.4	7/1/2009 15:19
B1	Sr-90'	0.5	16782	1260	40.4	7/1/2009 15:20
B1	Sr-90'	0.5	17615	1290	27.3	7/1/2009 15:20
B1	Sr-90'	0.5	18143	1320	17.5	7/1/2009 15:21
B1	Sr-90'	0.5	18471	1350	17.1	7/1/2009 15:22
B1	Sr-90'	0.5	18973	1380	14.4	7/1/2009 15:22
B1	Sr-90'	0.5	19758	1410	12.4	7/1/2009 15:23
B1	Sr-90'	0.5	19657	1440	11.1	7/1/2009 15:24
B1	Sr-90'	0.5	19984	1470	5.9	7/1/2009 15:25
B1	Sr-90'	0.49	20518	1500	4.2	7/1/2009 15:26
B1	Sr-90'	0.47	20211	1530	1.5	7/1/2009 15:54
B1	Sr-90'	0.43	20172	1560	0.2	7/1/2009 15:55
B1	Sr-90'	0.41	20383	1590	1.5	7/1/2009 15:57
B1	Sr-90'	0.4	20465	1620		7/1/2009 15:58
B1	Sr-90'	0.39	20290	1650		7/1/2009 16:00
B2	Sr-90'	0.11	0	750		7/1/2009 15:09
B2	Sr-90'	0.11	9	780		7/1/2009 15:09
B2	Sr-90'	0.5	109	810	5.8	7/1/2009 15:10
B2	Sr-90'	0.5	325	840	9.8	7/1/2009 15:10
B2	Sr-90'	0.5	717	870	13.6	7/1/2009 15:11
B2	Sr-90'	0.5	1181	900	17.1	7/1/2009 15:12
B2	Sr-90'	0.5	1714	930	21.6	7/1/2009 15:12
B2	Sr-90'	0.5	2393	960	26.7	7/1/2009 15:13
B2	Sr-90'	0.5	3345	990	34.1	7/1/2009 15:14
B2	Sr-90'	0.5	4370	1020	41.0	7/1/2009 15:14
B2	Sr-90'	0.5	5845	1050	47.3	7/1/2009 15:15
B2	Sr-90'	0.5	7288	1080	53.3	7/1/2009 15:16
B2	Sr-90'	0.5	8981	1110	59.1	7/1/2009 15:16
B2	Sr-90'	0.5	10794	1140	66.4	7/1/2009 15:17
B2	Sr-90'	0.5	12959	1170	70.8	7/1/2009 15:18
B2	Sr-90'	0.5	15256	1200	68.7	7/1/2009 15:18
B2	Sr-90'	0.5	17372	1230	55.6	7/1/2009 15:19
B2	Sr-90'	0.5	18895	1260	39.3	7/1/2009 15:20
B2	Sr-90'	0.5	19482	1290	27.6	7/1/2009 15:20
B2	Sr-90'	0.49	20099	1320	15.3	7/1/2009 15:21
B2	Sr-90'	0.5	20913	1350	7.7	7/1/2009 15:22
B2	Sr-90'	0.48	20468	1380	0.8	7/1/2009 15:22
B2	Sr-90'	0.46	20449	1410	-1.9	7/1/2009 15:23
B2	Sr-90'	0.46	20458	1440	1.9	7/1/2009 15:24
B2	Sr-90'	0.45	20631	1470	-0.2	7/1/2009 15:25
B2	Sr-90'	0.43	20659	1500	-0.4	7/1/2009 15:26
B2	Sr-90'	0.4	20326	1530	-4.0	7/1/2009 15:54
B2	Sr-90'	0.37	20546	1560	-1.6	7/1/2009 15:55
B2	Sr-90'	0.35	20090	1590	1.1	7/1/2009 15:57
B2	Sr-90'	0.34	20530	1620		7/1/2009 15:58
B2	Sr-90'	0.33	20505	1650		7/1/2009 16:00
B3	Sr-90'	0.16	4	750		7/1/2009 15:09
B3	Sr-90'	0.11	7	780		7/1/2009 15:09
B3	Sr-90'	0.5	123	810	5.1	7/1/2009 15:10
B3	Sr-90'	0.5	351	840	8.9	7/1/2009 15:10
B3	Sr-90'	0.5	602	870	12.1	7/1/2009 15:11
B3	Sr-90'	0.5	1104	900	16.3	7/1/2009 15:12
B3	Sr-90'	0.5	1561	930	20.0	7/1/2009 15:12
B3	Sr-90'	0.5	2320	960	23.4	7/1/2009 15:13
B3	Sr-90'	0.5	3001	990	28.5	7/1/2009 15:14
B3	Sr-90'	0.5	3889	1020	32.8	7/1/2009 15:14
B3	Sr-90'	0.5	5051	1050	39.8	7/1/2009 15:15
B3	Sr-90'	0.5	6217	1080	46.0	7/1/2009 15:16
B3	Sr-90'	0.5	7803	1110	53.0	7/1/2009 15:16
B3	Sr-90'	0.5	9410	1140	58.7	7/1/2009 15:17
B3	Sr-90'	0.5	11403	1170	61.2	7/1/2009 15:18
B3	Sr-90'	0.5	13228	1200	58.5	7/1/2009 15:18
B3	Sr-90'	0.5	15074	1230	47.7	7/1/2009 15:19
B3	Sr-90'	0.5	16346	1260	34.9	7/1/2009 15:20
B3	Sr-90'	0.5	17002	1290	21.9	7/1/2009 15:20
B3	Sr-90'	0.5	17498	1320	17.0	7/1/2009 15:21
B3	Sr-90'	0.5	17784	1350	19.0	7/1/2009 15:22
B3	Sr-90'	0.5	18505	1380	19.3	7/1/2009 15:22

B3	Sr-90'	0.5	19344	1410	19.5	7/1/2009 15:23
B3	Sr-90'	0.5	19614	1440	14.7	7/1/2009 15:24
B3	Sr-90'	0.5	20160	1470	8.1	7/1/2009 15:25
B3	Sr-90'	0.49	20302	1500	4.3	7/1/2009 15:26
B3	Sr-90'	0.46	20220	1530	0.7	7/1/2009 15:54
B3	Sr-90'	0.42	20225	1560	1.2	7/1/2009 15:55
B3	Sr-90'	0.4	20304	1590	1.4	7/1/2009 15:57
B3	Sr-90'	0.39	20442	1620		7/1/2009 15:58
B3	Sr-90'	0.38	20327	1650		7/1/2009 16:00
B4	Sr-90'	0.12	0	750		7/1/2009 15:09
B4	Sr-90'	0.11	6	780		7/1/2009 15:09
B4	Sr-90'	0.5	96	810	5.1	7/1/2009 15:10
B4	Sr-90'	0.5	302	840	8.3	7/1/2009 15:10
B4	Sr-90'	0.5	616	870	11.7	7/1/2009 15:11
B4	Sr-90'	0.5	992	900	15.1	7/1/2009 15:12
B4	Sr-90'	0.5	1511	930	18.6	7/1/2009 15:12
B4	Sr-90'	0.5	2118	960	22.1	7/1/2009 15:13
B4	Sr-90'	0.5	2837	990	26.1	7/1/2009 15:14
B4	Sr-90'	0.5	3650	1020	32.3	7/1/2009 15:14
B4	Sr-90'	0.5	4667	1050	38.3	7/1/2009 15:15
B4	Sr-90'	0.5	6052	1080	44.6	7/1/2009 15:16
B4	Sr-90'	0.5	7378	1110	51.6	7/1/2009 15:16
B4	Sr-90'	0.5	8977	1140	54.8	7/1/2009 15:17
B4	Sr-90'	0.5	10948	1170	57.4	7/1/2009 15:18
B4	Sr-90'	0.5	12490	1200	54.0	7/1/2009 15:18
B4	Sr-90'	0.5	14225	1230	42.7	7/1/2009 15:19
B4	Sr-90'	0.5	15436	1260	31.5	7/1/2009 15:20
B4	Sr-90'	0.5	15887	1290	20.5	7/1/2009 15:20
B4	Sr-90'	0.5	16380	1320	16.2	7/1/2009 15:21
B4	Sr-90'	0.5	16833	1350	18.5	7/1/2009 15:22
B4	Sr-90'	0.5	17391	1380	17.3	7/1/2009 15:22
B4	Sr-90'	0.5	18163	1410	16.2	7/1/2009 15:23
B4	Sr-90'	0.5	18306	1440	15.9	7/1/2009 15:24
B4	Sr-90'	0.5	18799	1470	17.1	7/1/2009 15:25
B4	Sr-90'	0.5	19464	1500	16.9	7/1/2009 15:53
B4	Sr-90'	0.48	20148	1530	13.5	7/1/2009 15:54
B4	Sr-90'	0.45	20170	1560	7.4	7/1/2009 15:55
B4	Sr-90'	0.43	20474	1590	1.8	7/1/2009 15:57
B4	Sr-90'	0.42	20404	1620	23.6	7/1/2009 15:58
B4	Sr-90'	0.4	20306	1650	23.8	7/1/2009 16:00
C1	Sr-90'	0.11	3	750	23.7	7/1/2009 15:09
C1	Sr-90'	0.12	8	780	23.5	7/1/2009 15:09
C1	Sr-90'	0.5	135	810	5.9	7/1/2009 15:10
C1	Sr-90'	0.5	353	840	9.2	7/1/2009 15:10
C1	Sr-90'	0.5	711	870	12.0	7/1/2009 15:11
C1	Sr-90'	0.5	1103	900	14.8	7/1/2009 15:11
C1	Sr-90'	0.5	1565	930	18.4	7/1/2009 15:12
C1	Sr-90'	0.5	2153	960	22.0	7/1/2009 15:13
C1	Sr-90'	0.5	2943	990	26.8	7/1/2009 15:13
C1	Sr-90'	0.5	3707	1020	31.9	7/1/2009 15:14
C1	Sr-90'	0.5	4809	1050	37.8	7/1/2009 15:15
C1	Sr-90'	0.5	6002	1080	44.8	7/1/2009 15:15
C1	Sr-90'	0.5	7464	1110	49.4	7/1/2009 15:16
C1	Sr-90'	0.5	9096	1140	54.5	7/1/2009 15:16
C1	Sr-90'	0.5	10669	1170	56.4	7/1/2009 15:17
C1	Sr-90'	0.5	12567	1200	51.0	7/1/2009 15:18
C1	Sr-90'	0.5	14181	1230	44.2	7/1/2009 15:18
C1	Sr-90'	0.5	14993	1260	33.0	7/1/2009 15:19
C1	Sr-90'	0.5	16093	1290	22.2	7/1/2009 15:20
C1	Sr-90'	0.5	16566	1320	14.2	7/1/2009 15:20
C1	Sr-90'	0.5	16722	1350	6.5	7/1/2009 15:21
C1	Sr-90'	0.5	16806	1380	5.5	7/1/2009 15:22
C1	Sr-90'	0.5	16948	1410	4.8	7/1/2009 15:22
C1	Sr-90'	0.5	17275	1440	1.1	7/1/2009 15:23
C1	Sr-90'	0.5	17203	1470	-0.4	7/1/2009 15:23
C1	Sr-90'	0.5	16846	1500	-1.1	7/1/2009 15:24
C1	Sr-90'	0.5	17103	1530	-1.1	7/1/2009 15:25
C1	Sr-90'	0.5	17160	1560	0.7	7/1/2009 15:25
C1	Sr-90'	0.5	16887	1590	-1.3	7/1/2009 15:26
C1	Sr-90'	0.5	17065	1620		7/1/2009 15:27

C1	Sr-90'	0.5	16958	1650		7/1/2009 15:27
C2	Sr-90'	0.11	0	750		7/1/2009 15:09
C2	Sr-90'	0.12	1	780		7/1/2009 15:09
C2	Sr-90'	0.5	47	810	3.2	7/1/2009 15:10
C2	Sr-90'	0.5	176	840	5.8	7/1/2009 15:10
C2	Sr-90'	0.5	397	870	9.0	7/1/2009 15:11
C2	Sr-90'	0.5	700	900	12.3	7/1/2009 15:11
C2	Sr-90'	0.5	1129	930	15.6	7/1/2009 15:12
C2	Sr-90'	0.5	1653	960	19.5	7/1/2009 15:13
C2	Sr-90'	0.5	2258	990	24.3	7/1/2009 15:13
C2	Sr-90'	0.5	3063	1020	28.9	7/1/2009 15:14
C2	Sr-90'	0.5	4071	1050	33.8	7/1/2009 15:15
C2	Sr-90'	0.5	5074	1080	39.0	7/1/2009 15:15
C2	Sr-90'	0.5	6319	1110	46.0	7/1/2009 15:16
C2	Sr-90'	0.5	7785	1140	53.8	7/1/2009 15:17
C2	Sr-90'	0.5	9615	1170	56.3	7/1/2009 15:17
C2	Sr-90'	0.5	11493	1200	55.4	7/1/2009 15:18
C2	Sr-90'	0.5	12903	1230	51.4	7/1/2009 15:18
C2	Sr-90'	0.5	14448	1260	43.4	7/1/2009 15:19
C2	Sr-90'	0.5	15845	1290	36.3	7/1/2009 15:20
C2	Sr-90'	0.5	16538	1320	26.0	7/1/2009 15:20
C2	Sr-90'	0.5	17303	1350	16.2	7/1/2009 15:21
C2	Sr-90'	0.5	17622	1380	8.3	7/1/2009 15:22
C2	Sr-90'	0.5	17729	1410	1.2	7/1/2009 15:22
C2	Sr-90'	0.5	17572	1440	-0.5	7/1/2009 15:23
C2	Sr-90'	0.5	17507	1470	0.5	7/1/2009 15:23
C2	Sr-90'	0.5	17657	1500	2.7	7/1/2009 15:24
C2	Sr-90'	0.5	17758	1530	1.4	7/1/2009 15:25
C2	Sr-90'	0.5	17852	1560	1.7	7/1/2009 15:25
C2	Sr-90'	0.5	17621	1590	0.7	7/1/2009 15:26
C2	Sr-90'	0.5	17984	1620		7/1/2009 15:27
C2	Sr-90'	0.5	17797	1650		7/1/2009 15:27
C3	Sr-90'	0.11	0	750		7/1/2009 15:09
C3	Sr-90'	0.11	1	780		7/1/2009 15:09
C3	Sr-90'	0.11	5	810	3.3	7/1/2009 15:10
C3	Sr-90'	0.5	146	840	6.5	7/1/2009 15:10
C3	Sr-90'	0.5	419	870	10.9	7/1/2009 15:11
C3	Sr-90'	0.5	776	900	14.3	7/1/2009 15:11
C3	Sr-90'	0.5	1319	930	17.7	7/1/2009 15:12
C3	Sr-90'	0.5	1837	960	21.7	7/1/2009 15:13
C3	Sr-90'	0.5	2548	990	25.2	7/1/2009 15:13
C3	Sr-90'	0.5	3420	1020	31.1	7/1/2009 15:14
C3	Sr-90'	0.5	4313	1050	36.7	7/1/2009 15:15
C3	Sr-90'	0.5	5621	1080	42.8	7/1/2009 15:15
C3	Sr-90'	0.5	6946	1110	51.9	7/1/2009 15:16
C3	Sr-90'	0.5	8517	1140	58.5	7/1/2009 15:17
C3	Sr-90'	0.5	10649	1170	64.5	7/1/2009 15:17
C3	Sr-90'	0.5	12537	1200	67.2	7/1/2009 15:18
C3	Sr-90'	0.5	14612	1230	64.4	7/1/2009 15:18
C3	Sr-90'	0.5	16617	1260	56.7	7/1/2009 15:19
C3	Sr-90'	0.5	18266	1290	44.5	7/1/2009 15:20
C3	Sr-90'	0.5	19218	1320	30.5	7/1/2009 15:20
C3	Sr-90'	0.5	19990	1350	17.2	7/1/2009 15:21
C3	Sr-90'	0.5	20330	1380	9.3	7/1/2009 15:22
C3	Sr-90'	0.5	20293	1410	3.9	7/1/2009 15:22
C3	Sr-90'	0.5	20457	1440	1.2	7/1/2009 15:23
C3	Sr-90'	0.49	20504	1470	2.9	7/1/2009 15:23
C3	Sr-90'	0.49	20402	1500	-0.1	7/1/2009 15:24
C3	Sr-90'	0.5	20751	1530	-0.7	7/1/2009 15:25
C3	Sr-90'	0.49	20326	1560	1.1	7/1/2009 15:25
C3	Sr-90'	0.49	20435	1590	1.3	7/1/2009 15:26
C3	Sr-90'	0.5	20730	1620		7/1/2009 15:27
C3	Sr-90'	0.5	20748	1650		7/1/2009 15:27
C4	Sr-90'	0.12	0	750		7/1/2009 15:09
C4	Sr-90'	0.11	0	780		7/1/2009 15:09
C4	Sr-90'	0.11	2	810	2.1	7/1/2009 15:10
C4	Sr-90'	0.5	103	840	4.3	7/1/2009 15:10
C4	Sr-90'	0.5	259	870	6.9	7/1/2009 15:11
C4	Sr-90'	0.5	521	900	9.3	7/1/2009 15:11
C4	Sr-90'	0.5	831	930	11.9	7/1/2009 15:12

C4	Sr-90'	0.5	1210	960	14.4	7/1/2009 15:13
C4	Sr-90'	0.5	1699	990	17.6	7/1/2009 15:13
C4	Sr-90'	0.5	2244	1020	21.6	7/1/2009 15:14
C4	Sr-90'	0.5	2955	1050	25.8	7/1/2009 15:15
C4	Sr-90'	0.5	3821	1080	31.0	7/1/2009 15:15
C4	Sr-90'	0.5	4783	1110	35.5	7/1/2009 15:16
C4	Sr-90'	0.5	5977	1140	38.8	7/1/2009 15:17
C4	Sr-90'	0.5	7204	1170	43.3	7/1/2009 15:17
C4	Sr-90'	0.5	8425	1200	44.9	7/1/2009 15:18
C4	Sr-90'	0.5	10053	1230	42.6	7/1/2009 15:18
C4	Sr-90'	0.5	11280	1260	36.6	7/1/2009 15:19
C4	Sr-90'	0.5	12165	1290	28.3	7/1/2009 15:20
C4	Sr-90'	0.5	12855	1320	20.1	7/1/2009 15:20
C4	Sr-90'	0.5	13515	1350	13.9	7/1/2009 15:21
C4	Sr-90'	0.5	13616	1380	8.4	7/1/2009 15:22
C4	Sr-90'	0.5	13872	1410	4.0	7/1/2009 15:22
C4	Sr-90'	0.5	13942	1440	3.0	7/1/2009 15:23
C4	Sr-90'	0.5	13948	1470	1.3	7/1/2009 15:23
C4	Sr-90'	0.5	14027	1500	3.1	7/1/2009 15:24
C4	Sr-90'	0.5	14021	1530	2.0	7/1/2009 15:25
C4	Sr-90'	0.5	14373	1560	0.9	7/1/2009 15:25
C4	Sr-90'	0.5	14078	1590	0.1	7/1/2009 15:26
C4	Sr-90'	0.5	14134	1620		7/1/2009 15:27
C4	Sr-90'	0.5	14161	1650		7/1/2009 15:27
D1	Sr-90'	0.11	0	750		7/1/2009 15:09
D1	Sr-90'	0.11	1	780		7/1/2009 15:09
D1	Sr-90'	0.5	72	810	5.0	7/1/2009 15:10
D1	Sr-90'	0.5	270	840	8.8	7/1/2009 15:11
D1	Sr-90'	0.5	615	870	13.4	7/1/2009 15:11
D1	Sr-90'	0.5	1053	900	17.1	7/1/2009 15:12
D1	Sr-90'	0.5	1693	930	20.6	7/1/2009 15:13
D1	Sr-90'	0.5	2291	960	23.8	7/1/2009 15:14
D1	Sr-90'	0.5	3080	990	28.2	7/1/2009 15:15
D1	Sr-90'	0.5	3936	1020	34.8	7/1/2009 15:15
D1	Sr-90'	0.5	5093	1050	40.1	7/1/2009 15:16
D1	Sr-90'	0.5	6502	1080	48.6	7/1/2009 15:17
D1	Sr-90'	0.5	7816	1110	56.3	7/1/2009 15:18
D1	Sr-90'	0.5	9861	1140	62.6	7/1/2009 15:19
D1	Sr-90'	0.5	11853	1170	66.5	7/1/2009 15:19
D1	Sr-90'	0.5	13871	1200	63.1	7/1/2009 15:20
D1	Sr-90'	0.5	15783	1230	56.3	7/1/2009 15:21
D1	Sr-90'	0.5	17367	1260	45.6	7/1/2009 15:22
D1	Sr-90'	0.5	18552	1290	32.7	7/1/2009 15:22
D1	Sr-90'	0.5	19322	1320	19.4	7/1/2009 15:23
D1	Sr-90'	0.5	19713	1350	10.4	7/1/2009 15:24
D1	Sr-90'	0.5	19695	1380	5.3	7/1/2009 15:25
D1	Sr-90'	0.5	19923	1410	2.4	7/1/2009 15:26
D1	Sr-90'	0.5	20015	1440	-0.9	7/1/2009 15:26
D1	Sr-90'	0.5	19909	1470	-2.8	7/1/2009 15:27
D1	Sr-90'	0.5	19560	1500	-3.0	7/1/2009 15:28
D1	Sr-90'	0.5	19731	1530	-0.4	7/1/2009 15:29
D1	Sr-90'	0.5	19656	1560	1.3	7/1/2009 15:30
D1	Sr-90'	0.5	19805	1590	0.8	7/1/2009 15:30
D1	Sr-90'	0.5	19711	1620		7/1/2009 15:31
D1	Sr-90'	0.5	19827	1650		7/1/2009 15:32
D2	Sr-90'	0.11	2	750		7/1/2009 15:09
D2	Sr-90'	0.11	0	780		7/1/2009 15:09
D2	Sr-90'	0.12	8	810	3.7	7/1/2009 15:10
D2	Sr-90'	0.5	183	840	7.3	7/1/2009 15:11
D2	Sr-90'	0.5	461	870	11.1	7/1/2009 15:11
D2	Sr-90'	0.5	873	900	14.3	7/1/2009 15:12
D2	Sr-90'	0.5	1331	930	17.1	7/1/2009 15:13
D2	Sr-90'	0.5	1899	960	20.1	7/1/2009 15:14
D2	Sr-90'	0.5	2520	990	24.9	7/1/2009 15:15
D2	Sr-90'	0.5	3298	1020	30.4	7/1/2009 15:15
D2	Sr-90'	0.5	4359	1050	36.7	7/1/2009 15:16
D2	Sr-90'	0.5	5534	1080	42.9	7/1/2009 15:17
D2	Sr-90'	0.5	6912	1110	48.8	7/1/2009 15:18
D2	Sr-90'	0.5	8458	1140	55.7	7/1/2009 15:19
D2	Sr-90'	0.5	10221	1170	60.7	7/1/2009 15:19

D2	Sr-90'	0.5	12229	1200	59.3	7/1/2009 15:20
D2	Sr-90'	0.5	14132	1230	54.2	7/1/2009 15:21
D2	Sr-90'	0.5	15397	1260	44.8	7/1/2009 15:22
D2	Sr-90'	0.5	16761	1290	32.3	7/1/2009 15:22
D2	Sr-90'	0.5	17632	1320	23.4	7/1/2009 15:23
D2	Sr-90'	0.5	17862	1350	14.5	7/1/2009 15:24
D2	Sr-90'	0.5	18357	1380	8.4	7/1/2009 15:25
D2	Sr-90'	0.5	18569	1410	4.9	7/1/2009 15:26
D2	Sr-90'	0.5	18543	1440	-2.0	7/1/2009 15:26
D2	Sr-90'	0.5	18507	1470	-1.9	7/1/2009 15:27
D2	Sr-90'	0.5	18087	1500	-0.4	7/1/2009 15:28
D2	Sr-90'	0.5	18508	1530	1.2	7/1/2009 15:29
D2	Sr-90'	0.5	18487	1560	2.0	7/1/2009 15:30
D2	Sr-90'	0.5	18483	1590		7/1/2009 15:30
D2	Sr-90'	0.5	18406	1620		7/1/2009 15:31
D2	Sr-90'	0.5	18558	1650		7/1/2009 15:32
D3	Sr-90'	0.11	0	750		7/1/2009 15:09
D3	Sr-90'	0.11	2	780		7/1/2009 15:09
D3	Sr-90'	0.11	13	810	3.5	7/1/2009 15:10
D3	Sr-90'	0.5	180	840	7.3	7/1/2009 15:11
D3	Sr-90'	0.5	443	870	11.9	7/1/2009 15:11
D3	Sr-90'	0.5	889	900	16.7	7/1/2009 15:12
D3	Sr-90'	0.5	1450	930	21.0	7/1/2009 15:13
D3	Sr-90'	0.5	2177	960	24.5	7/1/2009 15:14
D3	Sr-90'	0.5	2948	990	29.5	7/1/2009 15:15
D3	Sr-90'	0.5	3811	1020	35.9	7/1/2009 15:15
D3	Sr-90'	0.5	5065	1050	43.8	7/1/2009 15:16
D3	Sr-90'	0.5	6499	1080	51.6	7/1/2009 15:17
D3	Sr-90'	0.5	8172	1110	58.7	7/1/2009 15:18
D3	Sr-90'	0.5	10000	1140	67.5	7/1/2009 15:19
D3	Sr-90'	0.5	12119	1170	72.7	7/1/2009 15:19
D3	Sr-90'	0.5	14648	1200	75.0	7/1/2009 15:20
D3	Sr-90'	0.5	16756	1230	69.6	7/1/2009 15:21
D3	Sr-90'	0.5	18932	1260	50.7	7/1/2009 15:22
D3	Sr-90'	0.49	20419	1290	28.7	7/1/2009 15:22
D3	Sr-90'	0.47	20417	1320	7.9	7/1/2009 15:23
D3	Sr-90'	0.45	20316	1350	1.1	7/1/2009 15:24
D3	Sr-90'	0.44	20172	1380	-0.5	7/1/2009 15:25
D3	Sr-90'	0.45	20699	1410	3.2	7/1/2009 15:26
D3	Sr-90'	0.44	20157	1440	0.3	7/1/2009 15:26
D3	Sr-90'	0.45	20796	1470	-3.9	7/1/2009 15:27
D3	Sr-90'	0.44	20171	1500	-0.2	7/1/2009 15:28
D3	Sr-90'	0.44	20106	1530	0.5	7/1/2009 15:29
D3	Sr-90'	0.44	20476	1560	4.9	7/1/2009 15:30
D3	Sr-90'	0.45	20713	1590	3.7	7/1/2009 15:30
D3	Sr-90'	0.45	20599	1620		7/1/2009 15:31
D3	Sr-90'	0.45	20602	1650		7/1/2009 15:32
D4	Sr-90'	0.11	1	750		7/1/2009 15:09
D4	Sr-90'	0.11	1	780		7/1/2009 15:09
D4	Sr-90'	0.11	7	810	3.2	7/1/2009 15:10
D4	Sr-90'	0.5	147	840	7.0	7/1/2009 15:11
D4	Sr-90'	0.5	404	870	11.2	7/1/2009 15:11
D4	Sr-90'	0.5	853	900	15.0	7/1/2009 15:12
D4	Sr-90'	0.5	1327	930	17.8	7/1/2009 15:13
D4	Sr-90'	0.5	1936	960	20.5	7/1/2009 15:14
D4	Sr-90'	0.5	2527	990	24.2	7/1/2009 15:15
D4	Sr-90'	0.5	3323	1020	29.1	7/1/2009 15:15
D4	Sr-90'	0.5	4264	1050	36.1	7/1/2009 15:16
D4	Sr-90'	0.5	5435	1080	42.7	7/1/2009 15:17
D4	Sr-90'	0.5	6888	1110	51.1	7/1/2009 15:18
D4	Sr-90'	0.5	8412	1140	56.9	7/1/2009 15:19
D4	Sr-90'	0.5	10433	1170	59.9	7/1/2009 15:19
D4	Sr-90'	0.5	12204	1200	61.4	7/1/2009 15:20
D4	Sr-90'	0.5	13978	1230	56.9	7/1/2009 15:21
D4	Sr-90'	0.5	15844	1260	49.4	7/1/2009 15:22
D4	Sr-90'	0.5	17152	1290	38.6	7/1/2009 15:22
D4	Sr-90'	0.5	18022	1320	24.6	7/1/2009 15:23
D4	Sr-90'	0.5	18681	1350	14.6	7/1/2009 15:24
D4	Sr-90'	0.5	18775	1380	10.1	7/1/2009 15:25
D4	Sr-90'	0.5	18959	1410	5.8	7/1/2009 15:26

D4	Sr-90'	0.5	19392	1440	2.8	7/1/2009 15:26
D4	Sr-90'	0.5	19243	1470	-2.5	7/1/2009 15:27
D4	Sr-90'	0.5	19058	1500	-4.4	7/1/2009 15:28
D4	Sr-90'	0.5	18753	1530	-2.5	7/1/2009 15:29
D4	Sr-90'	0.5	18970	1560	2.3	7/1/2009 15:30
D4	Sr-90'	0.5	18909	1590	2.7	7/1/2009 15:30
D4	Sr-90'	0.5	19318	1620		7/1/2009 15:31
D4	Sr-90'	0.5	18979	1650		7/1/2009 15:32
E1	Sr-90'	0.11	2	750		7/1/2009 16:53
E1	Sr-90'	0.11	5	780		7/1/2009 16:54
E1	Sr-90'	0.5	105	810	4.8	7/1/2009 16:54
E1	Sr-90'	0.5	272	840	7.7	7/1/2009 16:55
E1	Sr-90'	0.5	586	870	10.2	7/1/2009 16:55
E1	Sr-90'	0.5	917	900	12.7	7/1/2009 16:56
E1	Sr-90'	0.5	1310	930	15.1	7/1/2009 16:57
E1	Sr-90'	0.5	1822	960	17.8	7/1/2009 16:57
E1	Sr-90'	0.5	2394	990	21.9	7/1/2009 16:58
E1	Sr-90'	0.5	3047	1020	26.4	7/1/2009 16:59
E1	Sr-90'	0.5	3979	1050	30.7	7/1/2009 16:59
E1	Sr-90'	0.5	4991	1080	36.2	7/1/2009 17:00
E1	Sr-90'	0.5	6025	1110	40.8	7/1/2009 17:00
E1	Sr-90'	0.5	7460	1140	44.7	7/1/2009 17:01
E1	Sr-90'	0.5	8857	1170	46.7	7/1/2009 17:02
E1	Sr-90'	0.5	10283	1200	42.6	7/1/2009 17:02
E1	Sr-90'	0.5	11614	1230	36.4	7/1/2009 17:03
E1	Sr-90'	0.5	12474	1260	28.4	7/1/2009 17:04
E1	Sr-90'	0.5	13226	1290	20.6	7/1/2009 17:04
E1	Sr-90'	0.5	13737	1320	14.1	7/1/2009 17:05
E1	Sr-90'	0.5	14075	1350	7.7	7/1/2009 17:05
E1	Sr-90'	0.5	14159	1380	3.5	7/1/2009 17:06
E1	Sr-90'	0.5	14167	1410	2.0	7/1/2009 17:07
E1	Sr-90'	0.5	14219	1440	3.8	7/1/2009 17:07
E1	Sr-90'	0.5	14348	1470	3.2	7/1/2009 17:08
E1	Sr-90'	0.5	14643	1500	0.4	7/1/2009 17:09
E1	Sr-90'	0.5	14432	1530	-0.1	7/1/2009 17:09
E1	Sr-90'	0.5	14241	1560	-0.1	7/1/2009 17:10
E1	Sr-90'	0.5	14536	1590	2.5	7/1/2009 17:10
E1	Sr-90'	0.5	14569	1620		7/1/2009 17:11
E1	Sr-90'	0.5	14650	1650		7/1/2009 17:12
E2	Sr-90'	0.11	1	750		7/1/2009 16:53
E2	Sr-90'	0.11	3	780		7/1/2009 16:54
E2	Sr-90'	0.5	81	810	4.5	7/1/2009 16:54
E2	Sr-90'	0.5	238	840	7.9	7/1/2009 16:55
E2	Sr-90'	0.5	551	870	11.3	7/1/2009 16:55
E2	Sr-90'	0.5	958	900	15.1	7/1/2009 16:56
E2	Sr-90'	0.5	1416	930	18.1	7/1/2009 16:57
E2	Sr-90'	0.5	2066	960	21.2	7/1/2009 16:57
E2	Sr-90'	0.5	2713	990	25.8	7/1/2009 16:58
E2	Sr-90'	0.5	3496	1020	30.6	7/1/2009 16:59
E2	Sr-90'	0.5	4569	1050	37.2	7/1/2009 16:59
E2	Sr-90'	0.5	5734	1080	44.5	7/1/2009 17:00
E2	Sr-90'	0.5	7168	1110	50.7	7/1/2009 17:00
E2	Sr-90'	0.5	8866	1140	56.4	7/1/2009 17:01
E2	Sr-90'	0.5	10605	1170	58.5	7/1/2009 17:02
E2	Sr-90'	0.5	12472	1200	55.9	7/1/2009 17:02
E2	Sr-90'	0.5	14141	1230	48.8	7/1/2009 17:03
E2	Sr-90'	0.5	15488	1260	37.9	7/1/2009 17:04
E2	Sr-90'	0.5	16420	1290	27.4	7/1/2009 17:04
E2	Sr-90'	0.5	17015	1320	19.0	7/1/2009 17:05
E2	Sr-90'	0.5	17485	1350	12.1	7/1/2009 17:05
E2	Sr-90'	0.5	17805	1380	6.0	7/1/2009 17:06
E2	Sr-90'	0.5	17843	1410	2.5	7/1/2009 17:07
E2	Sr-90'	0.5	17729	1440	0.6	7/1/2009 17:07
E2	Sr-90'	0.5	17899	1470	0.2	7/1/2009 17:08
E2	Sr-90'	0.5	17869	1500	1.8	7/1/2009 17:09
E2	Sr-90'	0.5	17806	1530	0.0	7/1/2009 17:09
E2	Sr-90'	0.5	18040	1560	2.2	7/1/2009 17:10
E2	Sr-90'	0.5	17819	1590	1.9	7/1/2009 17:10
E2	Sr-90'	0.5	18188	1620		7/1/2009 17:11
E2	Sr-90'	0.5	18023	1650		7/1/2009 17:12

E3	Sr-90'	0.11	6	750		7/1/2009 16:53
E3	Sr-90'	0.5	100	780		7/1/2009 16:54
E3	Sr-90'	0.5	299	810	8.2	7/1/2009 16:54
E3	Sr-90'	0.5	562	840	12.0	7/1/2009 16:55
E3	Sr-90'	0.5	998	870	15.3	7/1/2009 16:55
E3	Sr-90'	0.5	1557	900	18.2	7/1/2009 16:56
E3	Sr-90'	0.5	2103	930	21.5	7/1/2009 16:57
E3	Sr-90'	0.5	2734	960	25.7	7/1/2009 16:57
E3	Sr-90'	0.5	3637	990	32.2	7/1/2009 16:58
E3	Sr-90'	0.5	4648	1020	38.0	7/1/2009 16:59
E3	Sr-90'	0.5	5981	1050	43.0	7/1/2009 16:59
E3	Sr-90'	0.5	7264	1080	48.2	7/1/2009 17:00
E3	Sr-90'	0.5	8773	1110	52.4	7/1/2009 17:00
E3	Sr-90'	0.5	10478	1140	56.1	7/1/2009 17:01
E3	Sr-90'	0.5	12239	1170	54.1	7/1/2009 17:02
E3	Sr-90'	0.5	13953	1200	47.1	7/1/2009 17:02
E3	Sr-90'	0.5	15145	1230	37.8	7/1/2009 17:03
E3	Sr-90'	0.5	16088	1260	27.2	7/1/2009 17:04
E3	Sr-90'	0.5	16835	1290	18.2	7/1/2009 17:04
E3	Sr-90'	0.5	17187	1320	9.6	7/1/2009 17:05
E3	Sr-90'	0.5	17323	1350	4.3	7/1/2009 17:05
E3	Sr-90'	0.5	17281	1380	4.2	7/1/2009 17:06
E3	Sr-90'	0.5	17438	1410	2.2	7/1/2009 17:07
E3	Sr-90'	0.5	17763	1440	1.7	7/1/2009 17:07
E3	Sr-90'	0.5	17411	1470	-0.9	7/1/2009 17:08
E3	Sr-90'	0.5	17545	1500	-0.4	7/1/2009 17:09
E3	Sr-90'	0.5	17408	1530	2.9	7/1/2009 17:09
E3	Sr-90'	0.5	17704	1560	1.8	7/1/2009 17:10
E3	Sr-90'	0.5	17768	1590	0.6	7/1/2009 17:10
E3	Sr-90'	0.5	17641	1620		7/1/2009 17:11
E3	Sr-90'	0.5	17535	1650		7/1/2009 17:12
E4	Sr-90'	0.12	0	750		7/1/2009 16:53
E4	Sr-90'	0.12	1	780		7/1/2009 16:54
E4	Sr-90'	0.5	62	810	3.5	7/1/2009 16:54
E4	Sr-90'	0.5	205	840	6.0	7/1/2009 16:55
E4	Sr-90'	0.5	428	870	8.7	7/1/2009 16:55
E4	Sr-90'	0.5	712	900	12.1	7/1/2009 16:56
E4	Sr-90'	0.5	1114	930	15.5	7/1/2009 16:57
E4	Sr-90'	0.5	1670	960	17.6	7/1/2009 16:57
E4	Sr-90'	0.5	2269	990	21.0	7/1/2009 16:58
E4	Sr-90'	0.5	2774	1020	25.3	7/1/2009 16:59
E4	Sr-90'	0.5	3713	1050	30.9	7/1/2009 16:59
E4	Sr-90'	0.5	4742	1080	38.0	7/1/2009 17:00
E4	Sr-90'	0.5	5922	1110	41.9	7/1/2009 17:00
E4	Sr-90'	0.5	7364	1140	46.6	7/1/2009 17:01
E4	Sr-90'	0.5	8687	1170	48.0	7/1/2009 17:02
E4	Sr-90'	0.5	10345	1200	46.5	7/1/2009 17:02
E4	Sr-90'	0.5	11633	1230	42.6	7/1/2009 17:03
E4	Sr-90'	0.5	12867	1260	35.1	7/1/2009 17:04
E4	Sr-90'	0.5	13814	1290	27.5	7/1/2009 17:04
E4	Sr-90'	0.5	14521	1320	17.8	7/1/2009 17:05
E4	Sr-90'	0.5	14937	1350	11.4	7/1/2009 17:05
E4	Sr-90'	0.5	14976	1380	6.8	7/1/2009 17:06
E4	Sr-90'	0.5	15298	1410	4.0	7/1/2009 17:07
E4	Sr-90'	0.5	15356	1440	3.4	7/1/2009 17:07
E4	Sr-90'	0.5	15348	1470	2.5	7/1/2009 17:08
E4	Sr-90'	0.5	15467	1500	1.5	7/1/2009 17:09
E4	Sr-90'	0.5	15614	1530	-0.3	7/1/2009 17:09
E4	Sr-90'	0.5	15441	1560	-2.2	7/1/2009 17:10
E4	Sr-90'	0.5	15310	1590	-0.7	7/1/2009 17:10
E4	Sr-90'	0.5	15285	1620		7/1/2009 17:11
E4	Sr-90'	0.5	15594	1650		7/1/2009 17:12
F1	Sr-90'	0.11	1	750		7/1/2009 16:53
F1	Sr-90'	0.5	41	780		7/1/2009 16:54
F1	Sr-90'	0.5	140	810	5.8	7/1/2009 16:54
F1	Sr-90'	0.5	386	840	9.6	7/1/2009 16:55
F1	Sr-90'	0.5	692	870	13.4	7/1/2009 16:55
F1	Sr-90'	0.5	1203	900	17.5	7/1/2009 16:56
F1	Sr-90'	0.5	1739	930	22.0	7/1/2009 16:57
F1	Sr-90'	0.5	2486	960	24.4	7/1/2009 16:57

F1	Sr-90'	0.5	3345	990	28.3	7/1/2009 16:58
F1	Sr-90'	0.5	4063	1020	33.4	7/1/2009 16:59
F1	Sr-90'	0.5	5218	1050	39.9	7/1/2009 16:59
F1	Sr-90'	0.5	6559	1080	49.9	7/1/2009 17:00
F1	Sr-90'	0.5	8089	1110	56.9	7/1/2009 17:00
F1	Sr-90'	0.5	10105	1140	63.2	7/1/2009 17:01
F1	Sr-90'	0.5	11973	1170	63.6	7/1/2009 17:02
F1	Sr-90'	0.5	14100	1200	60.5	7/1/2009 17:02
F1	Sr-90'	0.5	15625	1230	51.4	7/1/2009 17:03
F1	Sr-90'	0.5	17349	1260	40.8	7/1/2009 17:04
F1	Sr-90'	0.5	18058	1290	29.0	7/1/2009 17:04
F1	Sr-90'	0.5	19007	1320	16.9	7/1/2009 17:05
F1	Sr-90'	0.5	19153	1350	11.1	7/1/2009 17:05
F1	Sr-90'	0.5	19337	1380	4.5	7/1/2009 17:06
F1	Sr-90'	0.5	19560	1410	4.6	7/1/2009 17:07
F1	Sr-90'	0.5	19474	1440	2.9	7/1/2009 17:07
F1	Sr-90'	0.5	19777	1470	2.2	7/1/2009 17:08
F1	Sr-90'	0.5	19660	1500	2.0	7/1/2009 17:09
F1	Sr-90'	0.5	19795	1530	1.4	7/1/2009 17:09
F1	Sr-90'	0.5	19765	1560	1.5	7/1/2009 17:10
F1	Sr-90'	0.5	19927	1590	-0.9	7/1/2009 17:10
F1	Sr-90'	0.5	19825	1620		7/1/2009 17:11
F1	Sr-90'	0.5	19634	1650		7/1/2009 17:12
F2	Sr-90'	0.11	3	750		7/1/2009 16:53
F2	Sr-90'	0.5	75	780		7/1/2009 16:54
F2	Sr-90'	0.5	255	810	8.6	7/1/2009 16:54
F2	Sr-90'	0.5	549	840	12.8	7/1/2009 16:55
F2	Sr-90'	0.5	1053	870	16.1	7/1/2009 16:56
F2	Sr-90'	0.5	1600	900	20.7	7/1/2009 16:56
F2	Sr-90'	0.5	2150	930	24.4	7/1/2009 16:57
F2	Sr-90'	0.5	3108	960	30.2	7/1/2009 16:57
F2	Sr-90'	0.5	3956	990	37.2	7/1/2009 16:58
F2	Sr-90'	0.5	5225	1020	43.1	7/1/2009 16:59
F2	Sr-90'	0.5	6673	1050	52.0	7/1/2009 16:59
F2	Sr-90'	0.5	8221	1080	57.9	7/1/2009 17:00
F2	Sr-90'	0.5	10263	1110	65.3	7/1/2009 17:00
F2	Sr-90'	0.5	12122	1140	70.5	7/1/2009 17:01
F2	Sr-90'	0.5	14514	1170	70.5	7/1/2009 17:02
F2	Sr-90'	0.5	16669	1200	64.7	7/1/2009 17:02
F2	Sr-90'	0.5	18558	1230	50.8	7/1/2009 17:03
F2	Sr-90'	0.5	19798	1260	30.8	7/1/2009 17:04
F2	Sr-90'	0.5	20571	1290	14.2	7/1/2009 17:04
F2	Sr-90'	0.48	20276	1320	4.2	7/1/2009 17:05
F2	Sr-90'	0.48	20444	1350	-2.3	7/1/2009 17:05
F2	Sr-90'	0.48	20498	1380	-0.7	7/1/2009 17:06
F2	Sr-90'	0.47	20110	1410	0.6	7/1/2009 17:07
F2	Sr-90'	0.47	20341	1440	0.6	7/1/2009 17:07
F2	Sr-90'	0.48	20608	1470	2.6	7/1/2009 17:08
F2	Sr-90'	0.47	20343	1500	1.8	7/1/2009 17:09
F2	Sr-90'	0.48	20506	1530	-0.2	7/1/2009 17:09
F2	Sr-90'	0.48	20655	1560	1.8	7/1/2009 17:10
F2	Sr-90'	0.47	20420	1590	-0.3	7/1/2009 17:10
F2	Sr-90'	0.48	20663	1620		7/1/2009 17:11
F2	Sr-90'	0.47	20459	1650		7/1/2009 17:12
F3	Sr-90'	0.11	4	750		7/1/2009 16:53
F3	Sr-90'	0.5	50	780		7/1/2009 16:54
F3	Sr-90'	0.5	177	810	6.3	7/1/2009 16:54
F3	Sr-90'	0.5	380	840	10.6	7/1/2009 16:55
F3	Sr-90'	0.5	779	870	14.1	7/1/2009 16:56
F3	Sr-90'	0.5	1332	900	17.5	7/1/2009 16:56
F3	Sr-90'	0.5	1821	930	21.0	7/1/2009 16:57
F3	Sr-90'	0.5	2490	960	24.7	7/1/2009 16:57
F3	Sr-90'	0.5	3348	990	30.7	7/1/2009 16:58
F3	Sr-90'	0.5	4268	1020	37.1	7/1/2009 16:59
F3	Sr-90'	0.5	5535	1050	43.6	7/1/2009 16:59
F3	Sr-90'	0.5	6954	1080	49.9	7/1/2009 17:00
F3	Sr-90'	0.5	8548	1110	54.8	7/1/2009 17:00
F3	Sr-90'	0.5	10239	1140	59.6	7/1/2009 17:01
F3	Sr-90'	0.5	12114	1170	60.8	7/1/2009 17:02
F3	Sr-90'	0.5	14106	1200	57.4	7/1/2009 17:02

F3	Sr-90'	0.5	15735	1230	48.0	7/1/2009 17:03
F3	Sr-90'	0.5	17035	1260	35.4	7/1/2009 17:04
F3	Sr-90'	0.5	17852	1290	25.4	7/1/2009 17:04
F3	Sr-90'	0.5	18355	1320	15.1	7/1/2009 17:05
F3	Sr-90'	0.5	18889	1350	7.9	7/1/2009 17:05
F3	Sr-90'	0.5	18778	1380	4.9	7/1/2009 17:06
F3	Sr-90'	0.5	18827	1410	2.1	7/1/2009 17:07
F3	Sr-90'	0.5	19124	1440	2.7	7/1/2009 17:07
F3	Sr-90'	0.5	19026	1470	1.2	7/1/2009 17:08
F3	Sr-90'	0.5	19090	1500	-0.3	7/1/2009 17:09
F3	Sr-90'	0.5	19021	1530	0.7	7/1/2009 17:09
F3	Sr-90'	0.5	19089	1560	1.2	7/1/2009 17:10
F3	Sr-90'	0.5	19128	1590	2.1	7/1/2009 17:10
F3	Sr-90'	0.5	19221	1620		7/1/2009 17:11
F3	Sr-90'	0.5	19274	1650		7/1/2009 17:12
F4	Sr-90'	0.12	0	750		7/1/2009 16:53
F4	Sr-90'	0.11	0	780		7/1/2009 16:54
F4	Sr-90'	0.5	125	810	5.6	7/1/2009 16:54
F4	Sr-90'	0.5	346	840	9.4	7/1/2009 16:55
F4	Sr-90'	0.5	671	870	13.3	7/1/2009 16:56
F4	Sr-90'	0.5	1133	900	16.8	7/1/2009 16:56
F4	Sr-90'	0.5	1726	930	20.4	7/1/2009 16:57
F4	Sr-90'	0.5	2343	960	24.5	7/1/2009 16:57
F4	Sr-90'	0.5	3123	990	28.7	7/1/2009 16:58
F4	Sr-90'	0.5	4105	1020	34.6	7/1/2009 16:59
F4	Sr-90'	0.5	5144	1050	40.7	7/1/2009 16:59
F4	Sr-90'	0.5	6524	1080	46.8	7/1/2009 17:00
F4	Sr-90'	0.5	8020	1110	53.6	7/1/2009 17:00
F4	Sr-90'	0.5	9687	1140	59.4	7/1/2009 17:01
F4	Sr-90'	0.5	11603	1170	59.9	7/1/2009 17:02
F4	Sr-90'	0.5	13644	1200	58.2	7/1/2009 17:02
F4	Sr-90'	0.5	15027	1230	50.3	7/1/2009 17:03
F4	Sr-90'	0.5	16711	1260	38.9	7/1/2009 17:04
F4	Sr-90'	0.5	17608	1290	27.3	7/1/2009 17:04
F4	Sr-90'	0.5	18185	1320	15.4	7/1/2009 17:05
F4	Sr-90'	0.5	18391	1350	9.8	7/1/2009 17:05
F4	Sr-90'	0.5	18626	1380	5.6	7/1/2009 17:06
F4	Sr-90'	0.5	18863	1410	3.4	7/1/2009 17:07
F4	Sr-90'	0.5	18792	1440	2.1	7/1/2009 17:07
F4	Sr-90'	0.5	18816	1470	-0.5	7/1/2009 17:08
F4	Sr-90'	0.5	18962	1500	1.5	7/1/2009 17:09
F4	Sr-90'	0.5	18700	1530	1.6	7/1/2009 17:09
F4	Sr-90'	0.5	19073	1560	0.5	7/1/2009 17:10
F4	Sr-90'	0.5	18996	1590	1.6	7/1/2009 17:10
F4	Sr-90'	0.5	18893	1620		7/1/2009 17:11
F4	Sr-90'	0.5	19035	1650		7/1/2009 17:12
G1	Sr-90'	0.11	2	750		7/1/2009 16:53
G1	Sr-90'	0.11	8	780		7/1/2009 16:54
G1	Sr-90'	0.5	142	810	5.3	7/1/2009 16:54
G1	Sr-90'	0.5	309	840	8.5	7/1/2009 16:54
G1	Sr-90'	0.5	643	870	11.6	7/1/2009 16:55
G1	Sr-90'	0.5	1029	900	14.5	7/1/2009 16:56
G1	Sr-90'	0.5	1529	930	17.1	7/1/2009 16:56
G1	Sr-90'	0.5	2045	960	20.8	7/1/2009 16:57
G1	Sr-90'	0.5	2698	990	24.9	7/1/2009 16:58
G1	Sr-90'	0.5	3567	1020	30.5	7/1/2009 16:58
G1	Sr-90'	0.5	4501	1050	34.9	7/1/2009 16:59
G1	Sr-90'	0.5	5717	1080	42.1	7/1/2009 16:59
G1	Sr-90'	0.5	6865	1110	49.7	7/1/2009 17:00
G1	Sr-90'	0.5	8707	1140	54.5	7/1/2009 17:01
G1	Sr-90'	0.5	10467	1170	57.3	7/1/2009 17:01
G1	Sr-90'	0.5	12095	1200	52.8	7/1/2009 17:02
G1	Sr-90'	0.5	13759	1230	47.4	7/1/2009 17:03
G1	Sr-90'	0.5	14976	1260	37.0	7/1/2009 17:03
G1	Sr-90'	0.5	16137	1290	25.1	7/1/2009 17:04
G1	Sr-90'	0.5	16455	1320	16.0	7/1/2009 17:04
G1	Sr-90'	0.5	16791	1350	8.1	7/1/2009 17:05
G1	Sr-90'	0.5	17045	1380	5.8	7/1/2009 17:05
G1	Sr-90'	0.5	17060	1410	2.2	7/1/2009 17:06
G1	Sr-90'	0.5	17183	1440	0.5	7/1/2009 17:07

G1	Sr-90'	0.5	17051	1470	-0.1	7/1/2009 17:08
G1	Sr-90'	0.5	17124	1500	0.2	7/1/2009 17:08
G1	Sr-90'	0.5	17071	1530	1.3	7/1/2009 17:09
G1	Sr-90'	0.5	17202	1560	0.7	7/1/2009 17:09
G1	Sr-90'	0.5	17214	1590	1.5	7/1/2009 17:10
G1	Sr-90'	0.5	17159	1620		7/1/2009 17:11
G1	Sr-90'	0.5	17321	1650		7/1/2009 17:11
G2	Sr-90'	0.11	2	750		7/1/2009 16:53
G2	Sr-90'	0.11	8	780		7/1/2009 16:54
G2	Sr-90'	0.5	148	810	5.7	7/1/2009 16:54
G2	Sr-90'	0.5	324	840	9.1	7/1/2009 16:54
G2	Sr-90'	0.5	700	870	12.3	7/1/2009 16:55
G2	Sr-90'	0.5	1101	900	15.5	7/1/2009 16:56
G2	Sr-90'	0.5	1601	930	18.8	7/1/2009 16:56
G2	Sr-90'	0.5	2197	960	23.0	7/1/2009 16:57
G2	Sr-90'	0.5	2979	990	28.0	7/1/2009 16:58
G2	Sr-90'	0.5	3866	1020	33.2	7/1/2009 16:58
G2	Sr-90'	0.5	4971	1050	38.4	7/1/2009 16:59
G2	Sr-90'	0.5	6177	1080	44.0	7/1/2009 16:59
G2	Sr-90'	0.5	7579	1110	50.4	7/1/2009 17:00
G2	Sr-90'	0.5	9156	1140	56.2	7/1/2009 17:01
G2	Sr-90'	0.5	11042	1170	59.0	7/1/2009 17:01
G2	Sr-90'	0.5	12872	1200	58.2	7/1/2009 17:02
G2	Sr-90'	0.5	14577	1230	50.9	7/1/2009 17:03
G2	Sr-90'	0.5	16124	1260	38.8	7/1/2009 17:03
G2	Sr-90'	0.5	17054	1290	26.4	7/1/2009 17:04
G2	Sr-90'	0.5	17456	1320	16.4	7/1/2009 17:04
G2	Sr-90'	0.5	17867	1350	9.5	7/1/2009 17:05
G2	Sr-90'	0.5	18172	1380	5.6	7/1/2009 17:06
G2	Sr-90'	0.5	18119	1410	3.2	7/1/2009 17:06
G2	Sr-90'	0.5	18174	1440	2.4	7/1/2009 17:07
G2	Sr-90'	0.5	18347	1470	2.6	7/1/2009 17:08
G2	Sr-90'	0.5	18411	1500	2.6	7/1/2009 17:08
G2	Sr-90'	0.5	18383	1530	0.5	7/1/2009 17:09
G2	Sr-90'	0.5	18551	1560	0.4	7/1/2009 17:09
G2	Sr-90'	0.5	18352	1590	-1.0	7/1/2009 17:10
G2	Sr-90'	0.5	18482	1620		7/1/2009 17:11
G2	Sr-90'	0.5	18274	1650		7/1/2009 17:11
G3	Sr-90'	0.11	1	750		7/1/2009 16:53
G3	Sr-90'	0.12	0	780		7/1/2009 16:54
G3	Sr-90'	0.5	43	810	2.8	7/1/2009 16:54
G3	Sr-90'	0.5	140	840	6.1	7/1/2009 16:54
G3	Sr-90'	0.5	346	870	10.0	7/1/2009 16:55
G3	Sr-90'	0.5	770	900	13.8	7/1/2009 16:56
G3	Sr-90'	0.5	1233	930	17.3	7/1/2009 16:56
G3	Sr-90'	0.5	1759	960	21.4	7/1/2009 16:57
G3	Sr-90'	0.5	2451	990	25.6	7/1/2009 16:58
G3	Sr-90'	0.5	3366	1020	31.4	7/1/2009 16:58
G3	Sr-90'	0.5	4276	1050	35.9	7/1/2009 16:59
G3	Sr-90'	0.5	5558	1080	42.3	7/1/2009 16:59
G3	Sr-90'	0.5	6744	1110	49.0	7/1/2009 17:00
G3	Sr-90'	0.5	8480	1140	55.9	7/1/2009 17:01
G3	Sr-90'	0.5	10165	1170	63.6	7/1/2009 17:01
G3	Sr-90'	0.5	12235	1200	67.0	7/1/2009 17:02
G3	Sr-90'	0.5	14404	1230	67.4	7/1/2009 17:03
G3	Sr-90'	0.5	16407	1260	59.3	7/1/2009 17:03
G3	Sr-90'	0.5	18185	1290	47.6	7/1/2009 17:04
G3	Sr-90'	0.5	19233	1320	33.5	7/1/2009 17:04
G3	Sr-90'	0.5	20131	1350	19.1	7/1/2009 17:05
G3	Sr-90'	0.5	20459	1380	9.5	7/1/2009 17:06
G3	Sr-90'	0.49	20432	1410	3.7	7/1/2009 17:06
G3	Sr-90'	0.49	20500	1440	1.6	7/1/2009 17:07
G3	Sr-90'	0.49	20665	1470	-0.3	7/1/2009 17:08
G3	Sr-90'	0.49	20578	1500	-1.6	7/1/2009 17:08
G3	Sr-90'	0.48	20348	1530	-1.6	7/1/2009 17:09
G3	Sr-90'	0.48	20420	1560	1.5	7/1/2009 17:09
G3	Sr-90'	0.48	20503	1590	3.3	7/1/2009 17:10
G3	Sr-90'	0.48	20725	1620		7/1/2009 17:11
G3	Sr-90'	0.48	20692	1650		7/1/2009 17:11
G4	Sr-90'	0.12	0	750		7/1/2009 16:53

G4	Sr-90'	0.12	2	780		7/1/2009 16:54
G4	Sr-90'	0.12	10	810	2.1	7/1/2009 16:54
G4	Sr-90'	0.5	96	840	4.3	7/1/2009 16:54
G4	Sr-90'	0.5	266	870	7.1	7/1/2009 16:55
G4	Sr-90'	0.5	522	900	9.6	7/1/2009 16:56
G4	Sr-90'	0.5	858	930	11.1	7/1/2009 16:56
G4	Sr-90'	0.5	1238	960	13.8	7/1/2009 16:57
G4	Sr-90'	0.5	1580	990	16.0	7/1/2009 16:58
G4	Sr-90'	0.5	2232	1020	19.4	7/1/2009 16:58
G4	Sr-90'	0.5	2756	1050	24.6	7/1/2009 16:59
G4	Sr-90'	0.5	3567	1080	28.0	7/1/2009 16:59
G4	Sr-90'	0.5	4603	1110	33.4	7/1/2009 17:00
G4	Sr-90'	0.5	5501	1140	38.6	7/1/2009 17:01
G4	Sr-90'	0.5	6802	1170	41.7	7/1/2009 17:01
G4	Sr-90'	0.5	8262	1200	44.3	7/1/2009 17:02
G4	Sr-90'	0.5	9472	1230	42.5	7/1/2009 17:03
G4	Sr-90'	0.5	10818	1260	38.5	7/1/2009 17:03
G4	Sr-90'	0.5	11904	1290	32.4	7/1/2009 17:04
G4	Sr-90'	0.5	12821	1320	23.7	7/1/2009 17:04
G4	Sr-90'	0.5	13335	1350	16.3	7/1/2009 17:05
G4	Sr-90'	0.5	13662	1380	8.9	7/1/2009 17:06
G4	Sr-90'	0.5	13925	1410	5.9	7/1/2009 17:06
G4	Sr-90'	0.5	13865	1440	2.8	7/1/2009 17:07
G4	Sr-90'	0.5	14125	1470	0.9	7/1/2009 17:08
G4	Sr-90'	0.5	13975	1500	2.0	7/1/2009 17:08
G4	Sr-90'	0.5	14009	1530	2.4	7/1/2009 17:09
G4	Sr-90'	0.5	14226	1560	3.7	7/1/2009 17:09
G4	Sr-90'	0.5	14366	1590	2.1	7/1/2009 17:10
G4	Sr-90'	0.5	14354	1620		7/1/2009 17:11
G4	Sr-90'	0.5	14254	1650		7/1/2009 17:11
H1	Sr-90'	0.11	3	750		7/1/2009 16:53
H1	Sr-90'	0.12	4	780		7/1/2009 16:54
H1	Sr-90'	0.5	120	810	5.0	7/1/2009 16:54
H1	Sr-90'	0.5	277	840	8.3	7/1/2009 16:55
H1	Sr-90'	0.5	613	870	11.3	7/1/2009 16:55
H1	Sr-90'	0.5	1000	900	15.1	7/1/2009 16:56
H1	Sr-90'	0.5	1459	930	18.3	7/1/2009 16:56
H1	Sr-90'	0.5	2112	960	22.4	7/1/2009 16:57
H1	Sr-90'	0.5	2797	990	26.1	7/1/2009 16:58
H1	Sr-90'	0.5	3684	1020	31.3	7/1/2009 16:58
H1	Sr-90'	0.5	4585	1050	36.5	7/1/2009 16:59
H1	Sr-90'	0.5	5908	1080	43.0	7/1/2009 17:00
H1	Sr-90'	0.5	7164	1110	49.9	7/1/2009 17:00
H1	Sr-90'	0.5	8847	1140	54.0	7/1/2009 17:01
H1	Sr-90'	0.5	10607	1170	56.0	7/1/2009 17:01
H1	Sr-90'	0.5	12293	1200	52.8	7/1/2009 17:02
H1	Sr-90'	0.5	13845	1230	45.0	7/1/2009 17:03
H1	Sr-90'	0.5	15147	1260	35.9	7/1/2009 17:03
H1	Sr-90'	0.5	15927	1290	24.6	7/1/2009 17:04
H1	Sr-90'	0.5	16632	1320	15.7	7/1/2009 17:05
H1	Sr-90'	0.5	16799	1350	10.3	7/1/2009 17:05
H1	Sr-90'	0.5	17067	1380	6.6	7/1/2009 17:06
H1	Sr-90'	0.5	17254	1410	5.4	7/1/2009 17:06
H1	Sr-90'	0.5	17390	1440	2.6	7/1/2009 17:07
H1	Sr-90'	0.5	17444	1470	-1.0	7/1/2009 17:08
H1	Sr-90'	0.5	17357	1500	-0.5	7/1/2009 17:08
H1	Sr-90'	0.5	17121	1530	1.8	7/1/2009 17:09
H1	Sr-90'	0.5	17478	1560	3.5	7/1/2009 17:10
H1	Sr-90'	0.5	17655	1590	2.8	7/1/2009 17:10
H1	Sr-90'	0.5	17621	1620	20.4	7/1/2009 17:11
H1	Sr-90'	0.5	17476	1650		7/1/2009 17:11
H2	Sr-90'	0.11	0	750		7/1/2009 16:53
H2	Sr-90'	0.11	2	780		7/1/2009 16:54
H2	Sr-90'	0.11	9	810	3.0	7/1/2009 16:54
H2	Sr-90'	0.5	130	840	5.7	7/1/2009 16:55
H2	Sr-90'	0.5	386	870	8.8	7/1/2009 16:55
H2	Sr-90'	0.5	671	900	11.9	7/1/2009 16:56
H2	Sr-90'	0.5	1065	930	14.0	7/1/2009 16:56
H2	Sr-90'	0.5	1570	960	18.0	7/1/2009 16:57
H2	Sr-90'	0.5	2032	990	22.2	7/1/2009 16:58

H2	Sr-90'	0.5	2889	1020	26.1	7/1/2009 16:58
H2	Sr-90'	0.5	3732	1050	31.4	7/1/2009 16:59
H2	Sr-90'	0.5	4634	1080	34.9	7/1/2009 17:00
H2	Sr-90'	0.5	5875	1110	40.7	7/1/2009 17:00
H2	Sr-90'	0.5	7057	1140	46.8	7/1/2009 17:01
H2	Sr-90'	0.5	8628	1170	52.3	7/1/2009 17:01
H2	Sr-90'	0.5	10272	1200	54.8	7/1/2009 17:02
H2	Sr-90'	0.5	12110	1230	50.3	7/1/2009 17:03
H2	Sr-90'	0.5	13536	1260	42.6	7/1/2009 17:03
H2	Sr-90'	0.5	14535	1290	31.4	7/1/2009 17:04
H2	Sr-90'	0.5	15451	1320	21.6	7/1/2009 17:05
H2	Sr-90'	0.5	15866	1350	13.4	7/1/2009 17:05
H2	Sr-90'	0.5	16110	1380	7.8	7/1/2009 17:06
H2	Sr-90'	0.5	16214	1410	5.3	7/1/2009 17:06
H2	Sr-90'	0.5	16443	1440	2.9	7/1/2009 17:07
H2	Sr-90'	0.5	16489	1470	1.2	7/1/2009 17:08
H2	Sr-90'	0.5	16408	1500	0.0	7/1/2009 17:08
H2	Sr-90'	0.5	16413	1530	1.6	7/1/2009 17:09
H2	Sr-90'	0.5	16476	1560	0.9	7/1/2009 17:10
H2	Sr-90'	0.5	16689	1590	0.2	7/1/2009 17:10
H2	Sr-90'	0.5	16407	1620		7/1/2009 17:11
H2	Sr-90'	0.5	16470	1650		7/1/2009 17:11
H3	Sr-90'	0.11	0	750		7/1/2009 16:53
H3	Sr-90'	0.11	2	780		7/1/2009 16:54
H3	Sr-90'	0.11	10	810	2.2	7/1/2009 16:54
H3	Sr-90'	0.5	107	840	5.0	7/1/2009 16:55
H3	Sr-90'	0.5	281	870	8.6	7/1/2009 16:55
H3	Sr-90'	0.5	620	900	12.4	7/1/2009 16:56
H3	Sr-90'	0.5	1041	930	16.8	7/1/2009 16:56
H3	Sr-90'	0.5	1590	960	20.0	7/1/2009 16:57
H3	Sr-90'	0.5	2316	990	24.3	7/1/2009 16:58
H3	Sr-90'	0.5	2989	1020	29.6	7/1/2009 16:58
H3	Sr-90'	0.5	3989	1050	35.8	7/1/2009 16:59
H3	Sr-90'	0.5	5187	1080	42.4	7/1/2009 17:00
H3	Sr-90'	0.5	6593	1110	48.1	7/1/2009 17:00
H3	Sr-90'	0.5	8042	1140	56.1	7/1/2009 17:01
H3	Sr-90'	0.5	9778	1170	62.8	7/1/2009 17:01
H3	Sr-90'	0.5	12005	1200	68.0	7/1/2009 17:02
H3	Sr-90'	0.5	14024	1230	67.5	7/1/2009 17:03
H3	Sr-90'	0.5	16121	1260	59.0	7/1/2009 17:03
H3	Sr-90'	0.5	17840	1290	49.1	7/1/2009 17:04
H3	Sr-90'	0.5	18952	1320	33.9	7/1/2009 17:05
H3	Sr-90'	0.5	19970	1350	20.2	7/1/2009 17:05
H3	Sr-90'	0.5	20148	1380	11.3	7/1/2009 17:06
H3	Sr-90'	0.5	20279	1410	3.1	7/1/2009 17:06
H3	Sr-90'	0.5	20488	1440	1.9	7/1/2009 17:07
H3	Sr-90'	0.49	20260	1470	1.2	7/1/2009 17:08
H3	Sr-90'	0.5	20448	1500	0.3	7/1/2009 17:08
H3	Sr-90'	0.49	20478	1530	0.5	7/1/2009 17:09
H3	Sr-90'	0.49	20420	1560	-1.7	7/1/2009 17:10
H3	Sr-90'	0.49	20351	1590	-1.3	7/1/2009 17:10
H3	Sr-90'	0.49	20252	1620		7/1/2009 17:11
H3	Sr-90'	0.49	20370	1650		7/1/2009 17:11
H4	Sr-90'	0.12	1	750		7/1/2009 16:53
H4	Sr-90'	0.11	3	780		7/1/2009 16:54
H4	Sr-90'	0.11	6	810	2.6	7/1/2009 16:54
H4	Sr-90'	0.5	150	840	5.2	7/1/2009 16:55
H4	Sr-90'	0.5	313	870	8.6	7/1/2009 16:55
H4	Sr-90'	0.5	632	900	11.7	7/1/2009 16:56
H4	Sr-90'	0.5	1050	930	16.1	7/1/2009 16:56
H4	Sr-90'	0.5	1541	960	19.0	7/1/2009 16:57
H4	Sr-90'	0.5	2266	990	21.7	7/1/2009 16:58
H4	Sr-90'	0.5	2881	1020	26.3	7/1/2009 16:58
H4	Sr-90'	0.5	3633	1050	31.4	7/1/2009 16:59
H4	Sr-90'	0.5	4798	1080	36.1	7/1/2009 17:00
H4	Sr-90'	0.5	6014	1110	42.2	7/1/2009 17:00
H4	Sr-90'	0.5	7109	1140	46.2	7/1/2009 17:01
H4	Sr-90'	0.5	8810	1170	50.5	7/1/2009 17:01
H4	Sr-90'	0.5	10328	1200	53.0	7/1/2009 17:02
H4	Sr-90'	0.5	11973	1230	48.7	7/1/2009 17:03

H4	Sr-90'	0.5	13484	1260	43.5	7/1/2009 17:03
H4	Sr-90'	0.5	14544	1290	33.5	7/1/2009 17:04
H4	Sr-90'	0.5	15574	1320	21.0	7/1/2009 17:05
H4	Sr-90'	0.5	15946	1350	13.2	7/1/2009 17:05
H4	Sr-90'	0.5	15928	1380	8.1	7/1/2009 17:06
H4	Sr-90'	0.5	16344	1410	7.2	7/1/2009 17:06
H4	Sr-90'	0.5	16589	1440	5.8	7/1/2009 17:07
H4	Sr-90'	0.5	16693	1470	1.0	7/1/2009 17:08
H4	Sr-90'	0.5	16624	1500	0.0	7/1/2009 17:08
H4	Sr-90'	0.5	16474	1530	-1.0	7/1/2009 17:09
H4	Sr-90'	0.5	16692	1560	-0.1	7/1/2009 17:10
H4	Sr-90'	0.5	16507	1590	-0.7	7/1/2009 17:10
H4	Sr-90'	0.5	16597	1620		7/1/2009 17:11
H4	Sr-90'	0.5	16414	1650		7/1/2009 17:11
I1	Sr-90	0.5	123	750	18.9	1/27/2011 10:01
I1	Sr-90	0.5	268	780	18.6	1/27/2011 10:01
I1	Sr-90	0.5	584	810	9.6	1/27/2011 10:02
I1	Sr-90	0.5	867	840	12.4	1/27/2011 10:03
I1	Sr-90	0.5	1256	870	15.1	1/27/2011 10:03
I1	Sr-90	0.5	1797	900	17.5	1/27/2011 10:04
I1	Sr-90	0.5	2382	930	20.8	1/27/2011 10:05
I1	Sr-90	0.5	2927	960	24.5	1/27/2011 10:05
I1	Sr-90	0.5	3808	990	29.9	1/27/2011 10:06
I1	Sr-90	0.5	4757	1020	34.4	1/27/2011 10:07
I1	Sr-90	0.5	5949	1050	39.8	1/27/2011 10:07
I1	Sr-90	0.5	7017	1080	42.7	1/27/2011 10:08
I1	Sr-90	0.5	8641	1110	43.8	1/27/2011 10:08
I1	Sr-90	0.5	9823	1140	43.7	1/27/2011 10:09
I1	Sr-90	0.5	11116	1170	36.7	1/27/2011 10:10
I1	Sr-90	0.5	12334	1200	28.5	1/27/2011 10:10
I1	Sr-90	0.5	12896	1230	18.7	1/27/2011 10:11
I1	Sr-90	0.5	13215	1260	9.7	1/27/2011 10:12
I1	Sr-90	0.5	13483	1290	6.5	1/27/2011 10:12
I1	Sr-90	0.5	13490	1320	4.5	1/27/2011 10:13
I1	Sr-90	0.5	13739	1350	2.2	1/27/2011 10:13
I1	Sr-90	0.5	13768	1380	1.8	1/27/2011 10:14
I1	Sr-90	0.5	13669	1410	0.0	1/27/2011 10:15
I1	Sr-90	0.5	13797	1440	0.7	1/27/2011 10:15
I1	Sr-90	0.5	13731	1470	0.1	1/27/2011 10:16
I1	Sr-90	0.5	13846	1500	-0.1	1/27/2011 10:17
I1	Sr-90	0.5	13654	1530	1.1	1/27/2011 10:17
I1	Sr-90	0.5	13826	1560	1.5	1/27/2011 10:18
I1	Sr-90	0.5	13901	1590	3.2	1/27/2011 10:18
I1	Sr-90	0.5	13942	1620	16.1	1/27/2011 10:19
I1	Sr-90	0.5	14075	1650	16.2	1/27/2011 10:20
I2	Sr-90	0.5	59	750	16.1	1/27/2011 10:01
I2	Sr-90	0.5	171	780	16.0	1/27/2011 10:01
I2	Sr-90	0.5	413	810	10.2	1/27/2011 10:02
I2	Sr-90	0.5	765	840	14.7	1/27/2011 10:03
I2	Sr-90	0.5	1299	870	18.6	1/27/2011 10:03
I2	Sr-90	0.5	1931	900	22.6	1/27/2011 10:04
I2	Sr-90	0.5	2626	930	26.9	1/27/2011 10:05
I2	Sr-90	0.5	3495	960	32.0	1/27/2011 10:05
I2	Sr-90	0.5	4556	990	36.2	1/27/2011 10:06
I2	Sr-90	0.5	5768	1020	42.1	1/27/2011 10:07
I2	Sr-90	0.5	6917	1050	50.6	1/27/2011 10:07
I2	Sr-90	0.5	8632	1080	59.4	1/27/2011 10:08
I2	Sr-90	0.5	10708	1110	64.5	1/27/2011 10:08
I2	Sr-90	0.5	12783	1140	63.6	1/27/2011 10:09
I2	Sr-90	0.5	14516	1170	56.5	1/27/2011 10:10
I2	Sr-90	0.5	16266	1200	43.1	1/27/2011 10:10
I2	Sr-90	0.5	17438	1230	28.9	1/27/2011 10:11
I2	Sr-90	0.5	17789	1260	16.6	1/27/2011 10:12
I2	Sr-90	0.5	18087	1290	10.0	1/27/2011 10:12
I2	Sr-90	0.5	18433	1320	5.9	1/27/2011 10:13
I2	Sr-90	0.5	18610	1350	2.4	1/27/2011 10:13
I2	Sr-90	0.5	18415	1380	0.5	1/27/2011 10:14
I2	Sr-90	0.5	18457	1410	-1.2	1/27/2011 10:15
I2	Sr-90	0.5	18578	1440	-2.3	1/27/2011 10:15
I2	Sr-90	0.5	18346	1470	-1.8	1/27/2011 10:16

I2	Sr-90	0.5	18133	1500	-0.7	1/27/2011 10:17
I2	Sr-90	0.5	18411	1530	1.6	1/27/2011 10:17
I2	Sr-90	0.5	18435	1560	3.5	1/27/2011 10:18
I2	Sr-90	0.5	18432	1590	-0.2	1/27/2011 10:18
I2	Sr-90	0.5	18646	1620	21.2	1/27/2011 10:19
I2	Sr-90	0.5	18270	1650	21.2	1/27/2011 10:20
I3	Sr-90	0.5	154	750	21.1	1/27/2011 10:01
I3	Sr-90	0.5	362	780	20.6	1/27/2011 10:01
I3	Sr-90	0.5	717	810	14.2	1/27/2011 10:02
I3	Sr-90	0.5	1227	840	18.8	1/27/2011 10:03
I3	Sr-90	0.5	1845	870	22.1	1/27/2011 10:03
I3	Sr-90	0.5	2619	900	26.4	1/27/2011 10:04
I3	Sr-90	0.5	3329	930	31.0	1/27/2011 10:05
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I3	Sr-90	0.5	7283	1020	53.0	1/27/2011 10:07
I3	Sr-90	0.5	8786	1050	61.6	1/27/2011 10:07
I3	Sr-90	0.5	10788	1080	66.6	1/27/2011 10:08
I3	Sr-90	0.5	13064	1110	66.9	1/27/2011 10:08
I3	Sr-90	0.5	15140	1140	60.2	1/27/2011 10:09
I3	Sr-90	0.5	16644	1170	46.6	1/27/2011 10:10
I3	Sr-90	0.5	18029	1200	34.2	1/27/2011 10:10
I3	Sr-90	0.5	18614	1230	23.1	1/27/2011 10:11
I3	Sr-90	0.5	19281	1260	10.6	1/27/2011 10:12
I3	Sr-90	0.5	19484	1290	6.5	1/27/2011 10:12
I3	Sr-90	0.5	19183	1320	0.8	1/27/2011 10:13
I3	Sr-90	0.5	19645	1350	1.1	1/27/2011 10:13
I3	Sr-90	0.5	19325	1380	2.4	1/27/2011 10:14
I3	Sr-90	0.5	19574	1410	-1.1	1/27/2011 10:15
I3	Sr-90	0.5	19575	1440	-1.2	1/27/2011 10:15
I3	Sr-90	0.5	19349	1470	-2.3	1/27/2011 10:16
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I3	Sr-90	0.5	19438	1560	2.1	1/27/2011 10:18
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I3	Sr-90	0.5	19577	1620	22.6	1/27/2011 10:19
I3	Sr-90	0.5	19380	1650	22.6	1/27/2011 10:20
I4	Sr-90	0.11	7	750	22.5	1/27/2011 10:00
I4	Sr-90	0.5	130	780	22.2	1/27/2011 10:01
I4	Sr-90	0.5	348	810	8.9	1/27/2011 10:02
I4	Sr-90	0.5	686	840	11.9	1/27/2011 10:03
I4	Sr-90	0.5	1062	870	15.7	1/27/2011 10:03
I4	Sr-90	0.5	1562	900	19.2	1/27/2011 10:04
I4	Sr-90	0.5	2268	930	23.3	1/27/2011 10:05
I4	Sr-90	0.5	2966	960	28.2	1/27/2011 10:05
I4	Sr-90	0.5	3857	990	32.2	1/27/2011 10:06
I4	Sr-90	0.5	4995	1020	38.9	1/27/2011 10:07
I4	Sr-90	0.5	6078	1050	45.5	1/27/2011 10:07
I4	Sr-90	0.5	7697	1080	52.2	1/27/2011 10:08
I4	Sr-90	0.5	9336	1110	56.5	1/27/2011 10:08
I4	Sr-90	0.5	11190	1140	54.7	1/27/2011 10:09
I4	Sr-90	0.5	12811	1170	48.6	1/27/2011 10:10
I4	Sr-90	0.5	14166	1200	37.6	1/27/2011 10:10
I4	Sr-90	0.5	15132	1230	24.1	1/27/2011 10:11
I4	Sr-90	0.5	15674	1260	13.8	1/27/2011 10:12
I4	Sr-90	0.5	15676	1290	6.6	1/27/2011 10:12
I4	Sr-90	0.5	15961	1320	3.5	1/27/2011 10:13
I4	Sr-90	0.5	15975	1350	4.1	1/27/2011 10:13
I4	Sr-90	0.5	16050	1380	1.2	1/27/2011 10:14
I4	Sr-90	0.5	16239	1410	2.5	1/27/2011 10:15
I4	Sr-90	0.5	16010	1440	1.1	1/27/2011 10:15
I4	Sr-90	0.5	16371	1470	0.1	1/27/2011 10:16
I4	Sr-90	0.5	16155	1500	0.4	1/27/2011 10:17
I4	Sr-90	0.5	16176	1530	0.2	1/27/2011 10:17
I4	Sr-90	0.5	16160	1560	0.4	1/27/2011 10:18
I4	Sr-90	0.5	16393	1590	-0.8	1/27/2011 10:18
I4	Sr-90	0.5	16100	1620	18.8	1/27/2011 10:19
I4	Sr-90	0.5	16079	1650	18.8	1/27/2011 10:20
J1	Sr-90	0.11	10	750	18.6	1/27/2011 10:00
J1	Sr-90	0.5	119	780	18.4	1/27/2011 10:01

J1	Sr-90	0.5	316	810	9.1	1/27/2011 10:01
J1	Sr-90	0.5	660	840	12.9	1/27/2011 10:02
J1	Sr-90	0.5	1111	870	15.9	1/27/2011 10:03
J1	Sr-90	0.5	1652	900	19.2	1/27/2011 10:03
J1	Sr-90	0.5	2205	930	22.2	1/27/2011 10:04
J1	Sr-90	0.5	2986	960	26.6	1/27/2011 10:05
J1	Sr-90	0.5	3780	990	32.8	1/27/2011 10:05
J1	Sr-90	0.5	4856	1020	39.1	1/27/2011 10:06
J1	Sr-90	0.5	6195	1050	47.2	1/27/2011 10:06
J1	Sr-90	0.5	7645	1080	54.9	1/27/2011 10:07
J1	Sr-90	0.5	9463	1110	58.6	1/27/2011 10:08
J1	Sr-90	0.5	11453	1140	61.1	1/27/2011 10:08
J1	Sr-90	0.5	13083	1170	58.1	1/27/2011 10:09
J1	Sr-90	0.5	15007	1200	48.1	1/27/2011 10:10
J1	Sr-90	0.5	16406	1230	38.0	1/27/2011 10:10
J1	Sr-90	0.5	17006	1260	27.4	1/27/2011 10:11
J1	Sr-90	0.5	17784	1290	17.1	1/27/2011 10:11
J1	Sr-90	0.5	18433	1320	10.7	1/27/2011 10:12
J1	Sr-90	0.5	18263	1350	4.1	1/27/2011 10:13
J1	Sr-90	0.5	18375	1380	1.6	1/27/2011 10:13
J1	Sr-90	0.5	18431	1410	2.0	1/27/2011 10:14
J1	Sr-90	0.5	18585	1440	2.8	1/27/2011 10:15
J1	Sr-90	0.5	18462	1470	3.2	1/27/2011 10:15
J1	Sr-90	0.5	18776	1500	1.2	1/27/2011 10:16
J1	Sr-90	0.5	18813	1530	0.4	1/27/2011 10:16
J1	Sr-90	0.5	18590	1560	-1.2	1/27/2011 10:17
J1	Sr-90	0.5	18619	1590	-0.3	1/27/2011 10:18
J1	Sr-90	0.5	18698	1620		1/27/2011 10:18
J1	Sr-90	0.5	18719	1650		1/27/2011 10:19
J2	Sr-90	0.11	7	750		1/27/2011 10:00
J2	Sr-90	0.5	151	780		1/27/2011 10:01
J2	Sr-90	0.5	376	810	10.4	1/27/2011 10:01
J2	Sr-90	0.5	774	840	14.1	1/27/2011 10:02
J2	Sr-90	0.5	1253	870	18.2	1/27/2011 10:03
J2	Sr-90	0.5	1832	900	21.4	1/27/2011 10:03
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J2	Sr-90	0.5	10687	1110	66.9	1/27/2011 10:08
J2	Sr-90	0.5	12771	1140	66.8	1/27/2011 10:08
J2	Sr-90	0.5	14852	1170	62.4	1/27/2011 10:09
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J3	Sr-90	0.5	14621	1200	51.6	1/27/2011 10:10
J3	Sr-90	0.5	15968	1230	39.6	1/27/2011 10:10
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J3	Sr-90	0.5	17875	1320	12.6	1/27/2011 10:12
J3	Sr-90	0.5	18126	1350	6.3	1/27/2011 10:13
J3	Sr-90	0.5	18337	1380	4.4	1/27/2011 10:13
J3	Sr-90	0.5	18271	1410	1.5	1/27/2011 10:14
J3	Sr-90	0.5	18460	1440	0.5	1/27/2011 10:15
J3	Sr-90	0.5	18291	1470	-0.4	1/27/2011 10:15
J3	Sr-90	0.5	18399	1500	-0.1	1/27/2011 10:16
J3	Sr-90	0.5	18247	1530	0.5	1/27/2011 10:16
J3	Sr-90	0.5	18472	1560	1.1	1/27/2011 10:17
J3	Sr-90	0.5	18335	1590	1.3	1/27/2011 10:18
J3	Sr-90	0.5	18525	1620		1/27/2011 10:18
J3	Sr-90	0.5	18422	1650		1/27/2011 10:19
J4	Sr-90	0.11	1	750		1/27/2011 10:00
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J4	Sr-90	0.5	166	810	6.8	1/27/2011 10:01
J4	Sr-90	0.5	433	840	10.9	1/27/2011 10:02
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J4	Sr-90	0.5	1347	900	17.4	1/27/2011 10:03
J4	Sr-90	0.5	1829	930	20.3	1/27/2011 10:04
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J4	Sr-90	0.5	17979	1500	-0.3	1/27/2011 10:16
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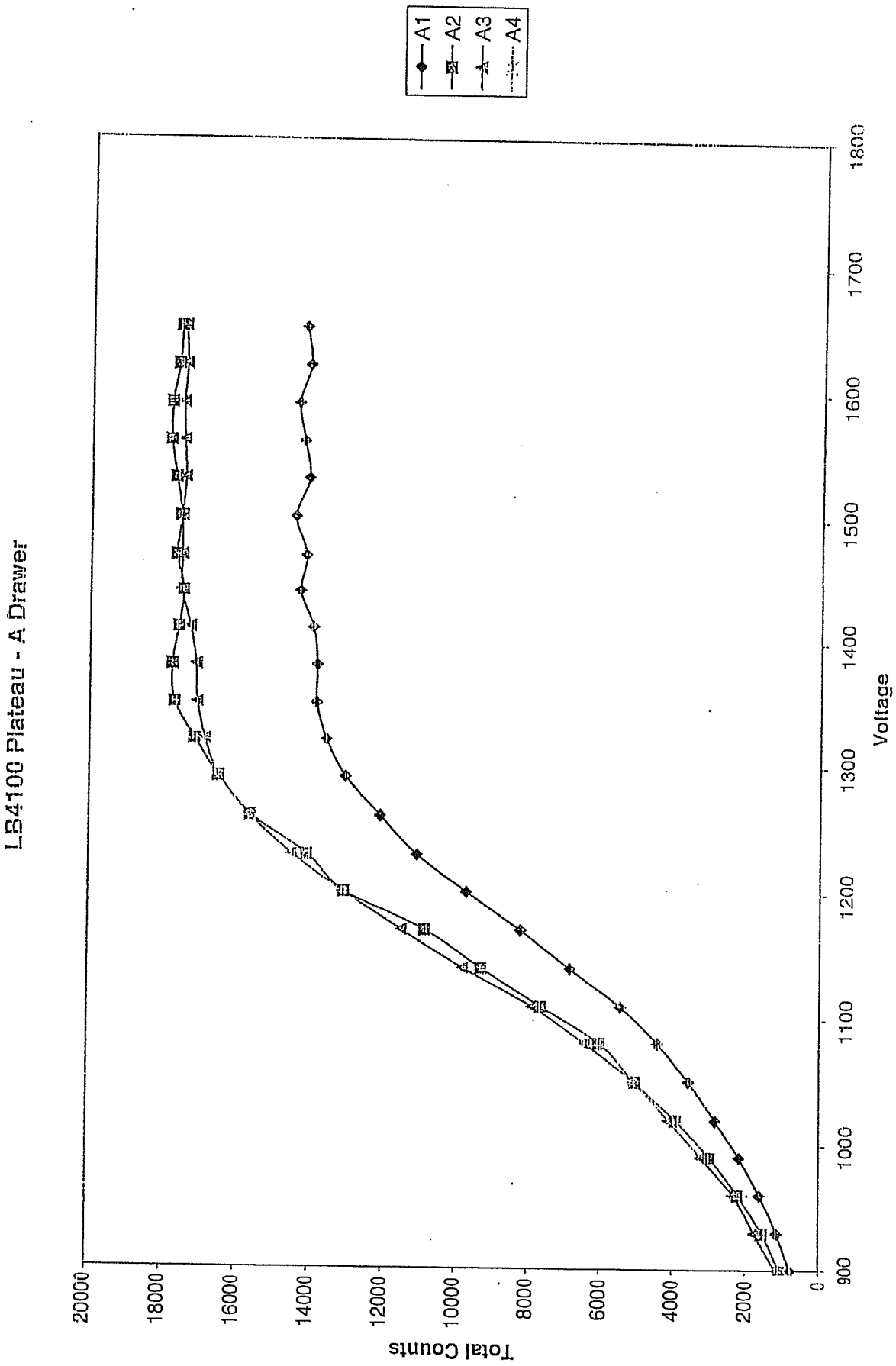
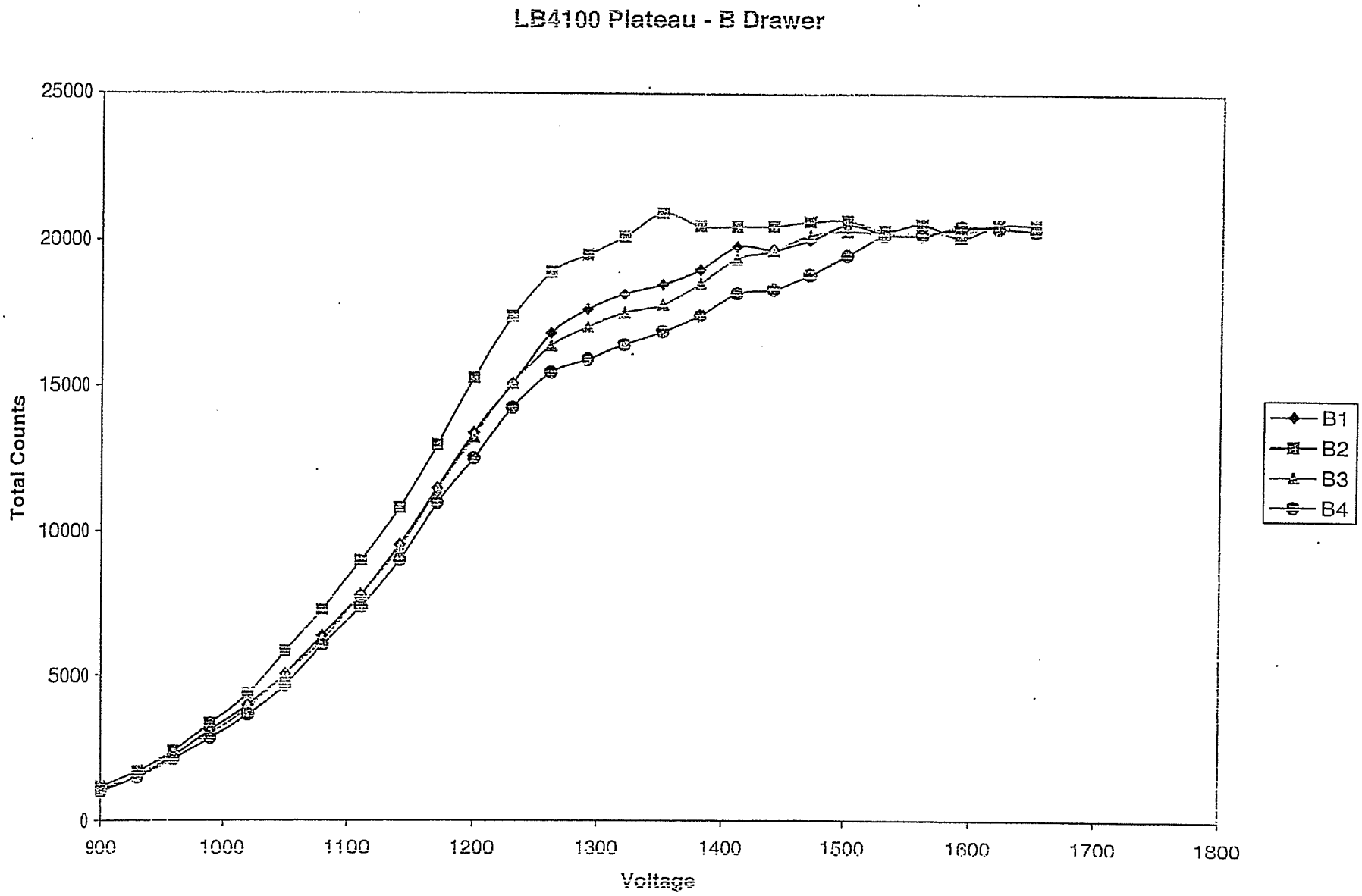
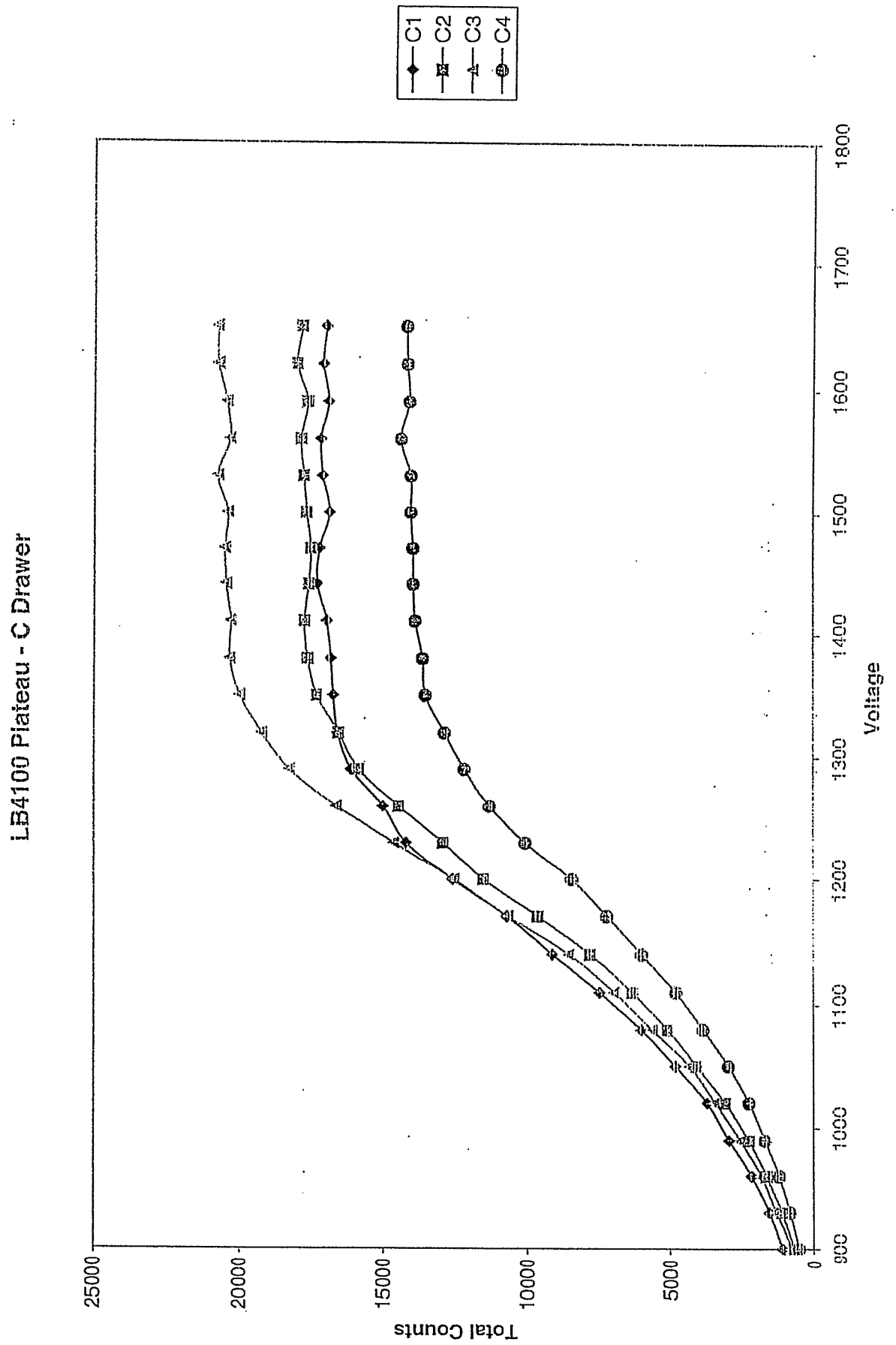
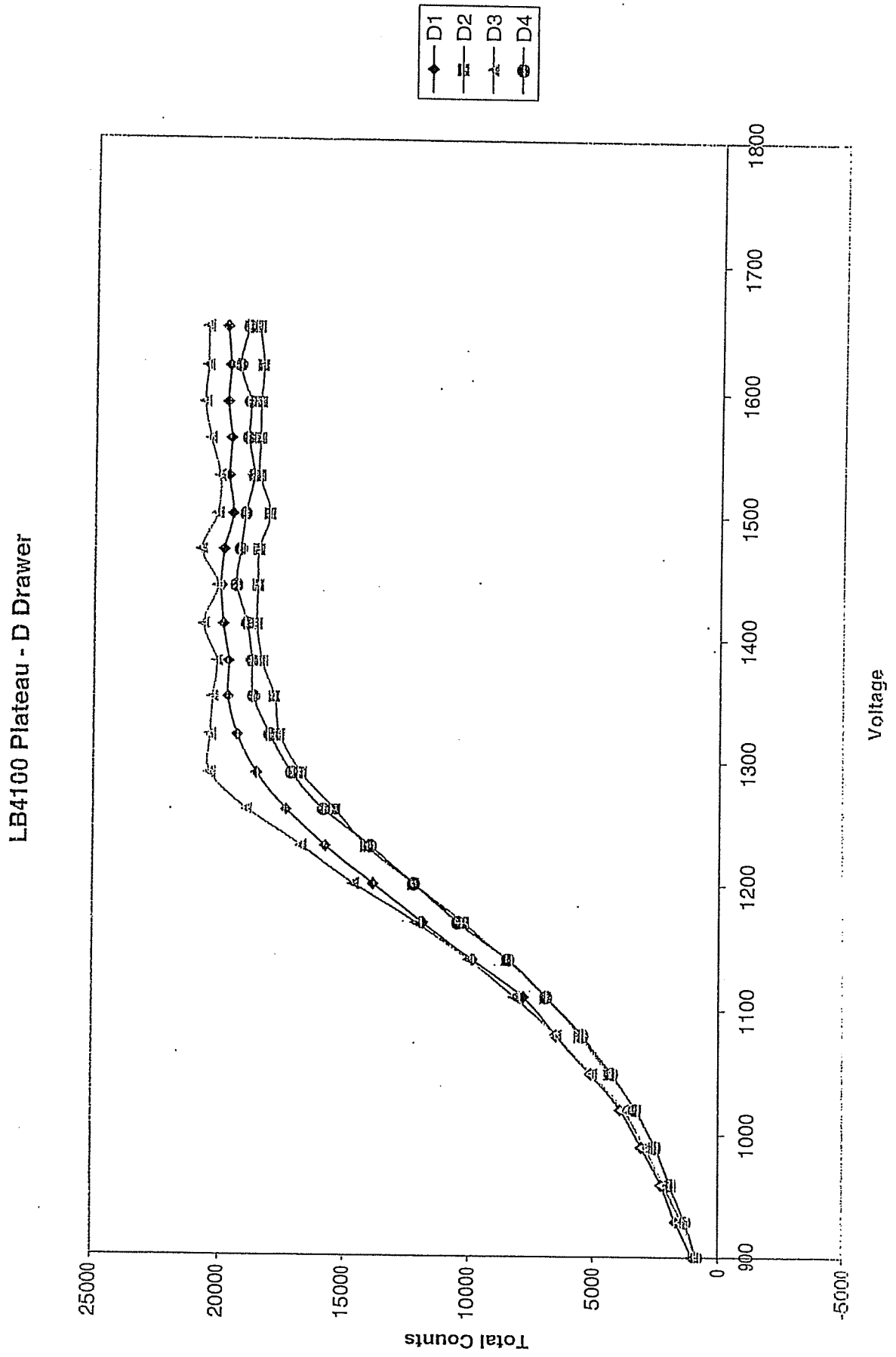
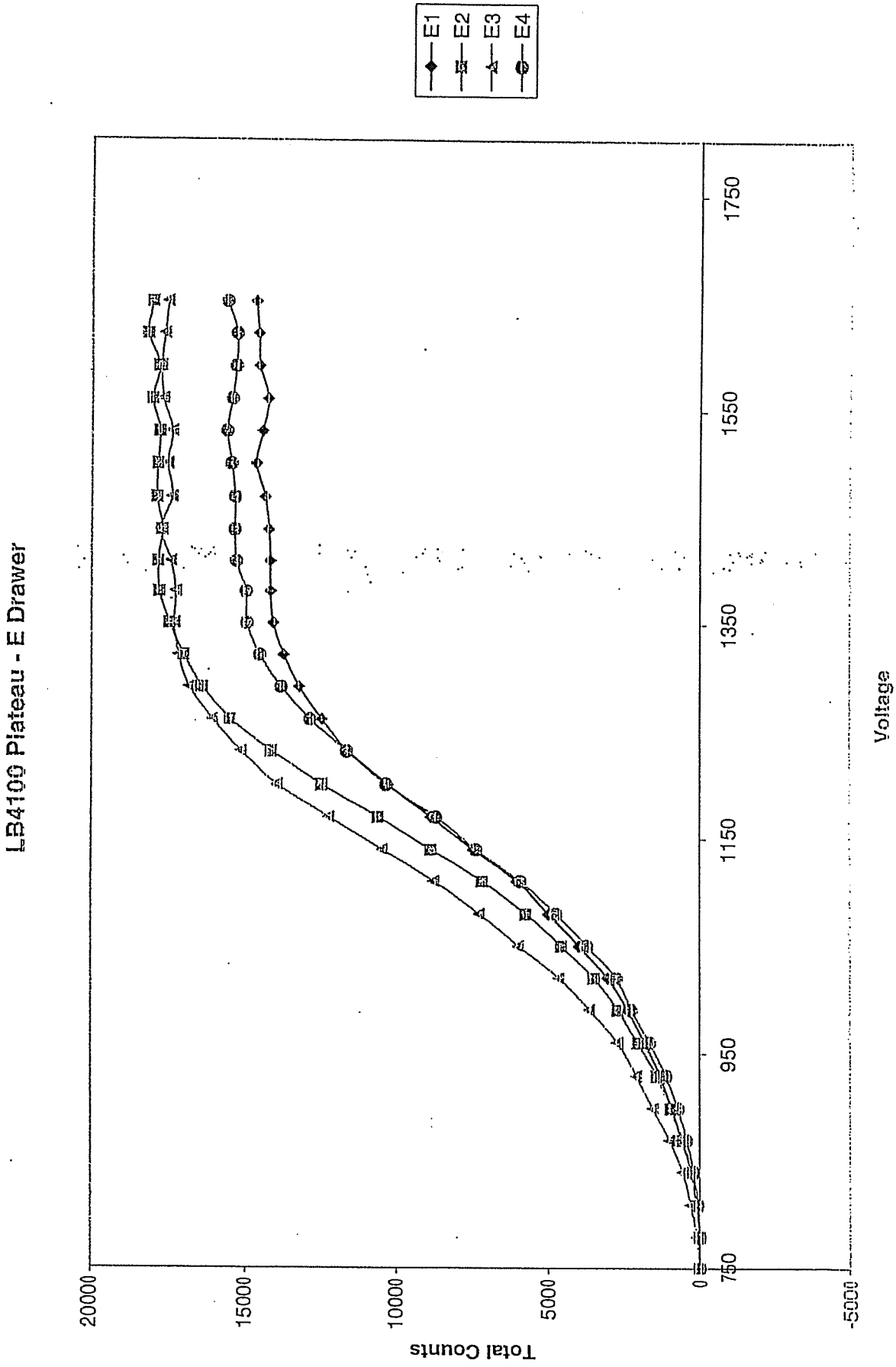
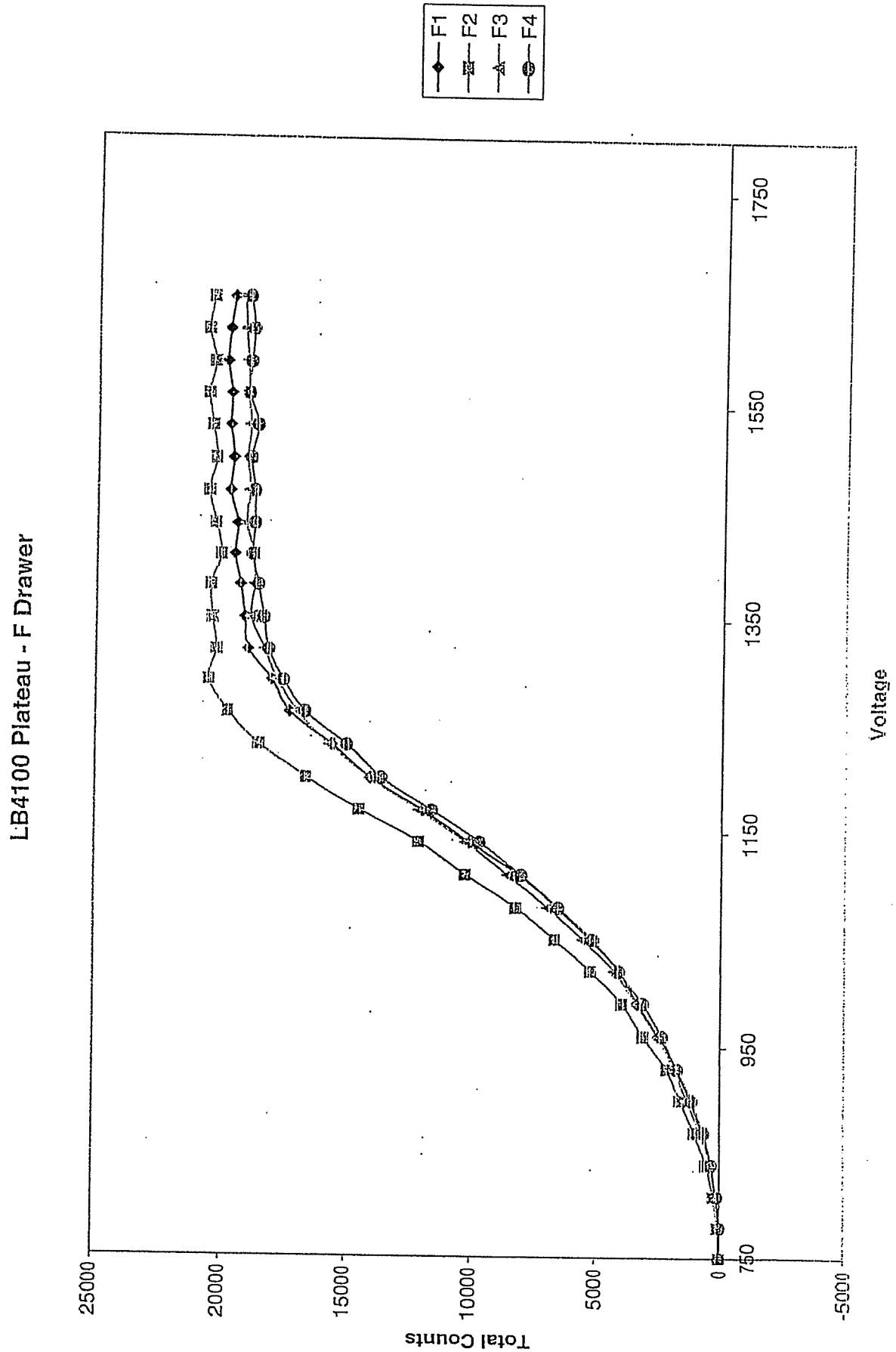

LB4100 Plateau - A Drawer
A1
A2
A3
A4
Total Counts
Voltage
0
2000
4000
6000
8000
10000
12000
14000
16000
18000
20000
900
1000
1100
1200
1300
1400
1500
1600
1700
1800

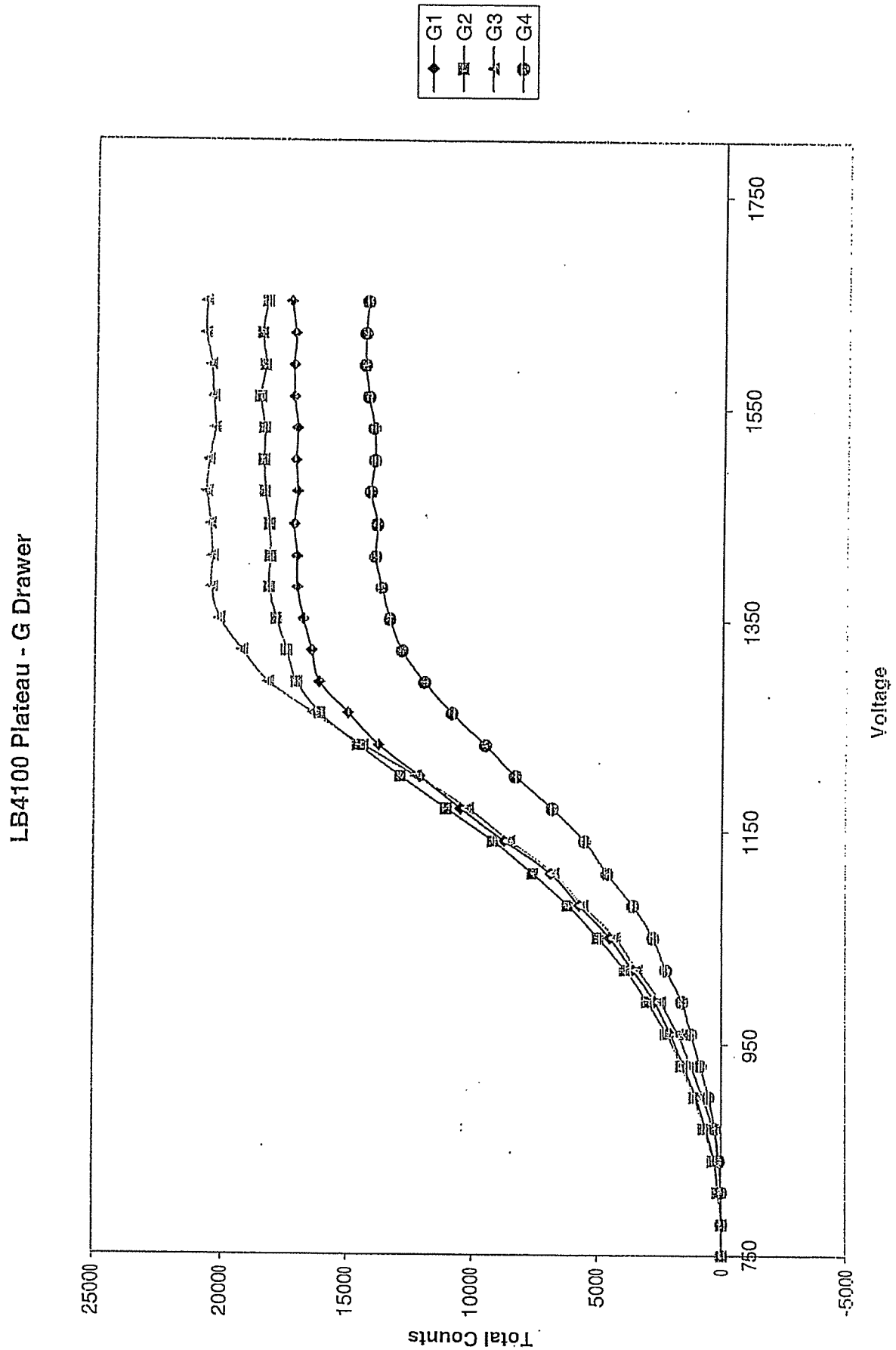

LB4100 Plateau - B Drawer
Total Counts
25000
20000
15000
10000
5000
0
900
1000
1100
1200
1300
1400
1500
1600
1700
1800
Voltage
B1
B2
B3
B4

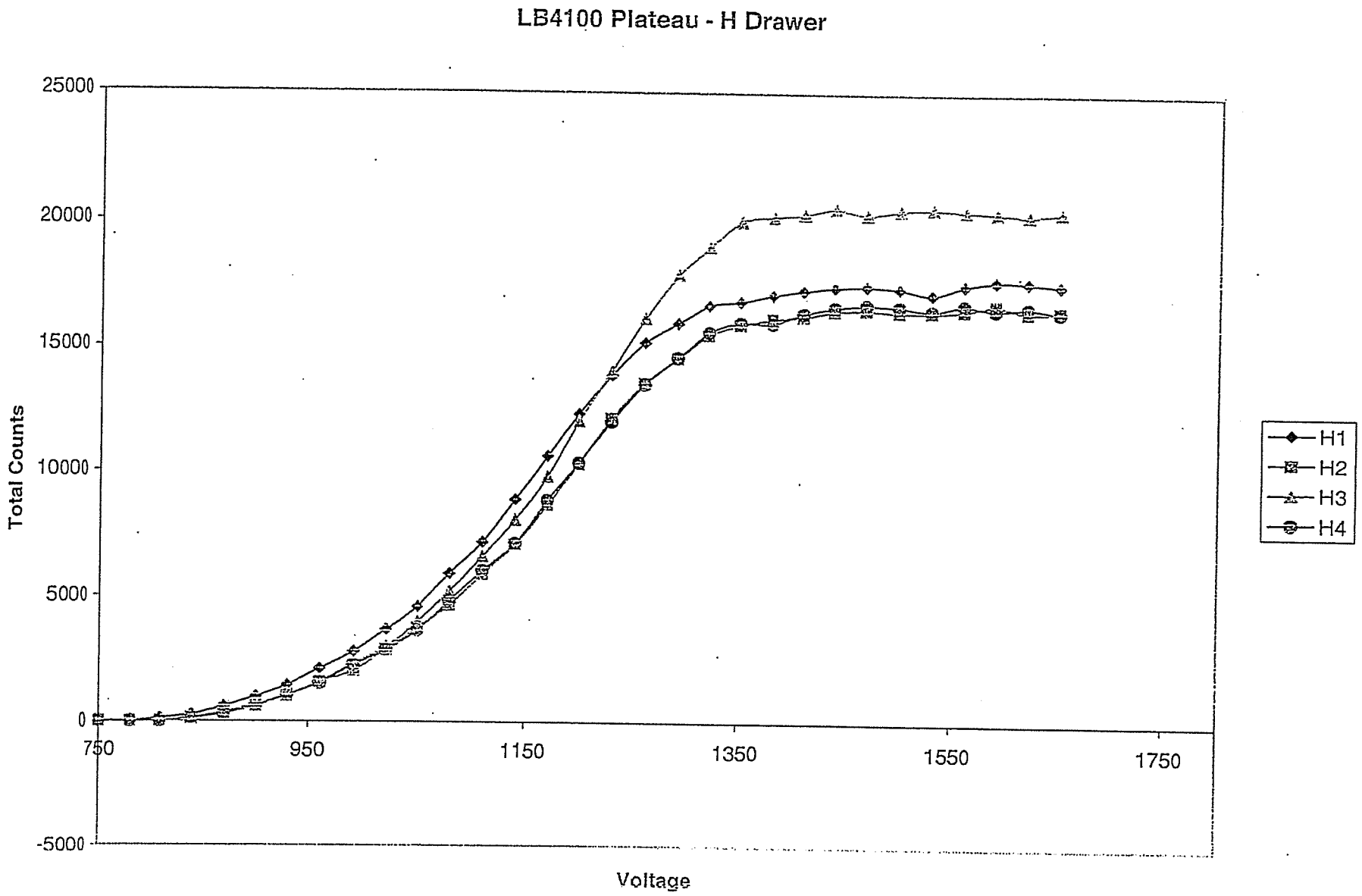

LB4100 Plateau - C Drawer
C1
C2
C3
C4
Total Counts
Voltage
0
5000
10000
15000
20000
25000
900
1000
1100
1200
1300
1400
1500
1600
1700
1800

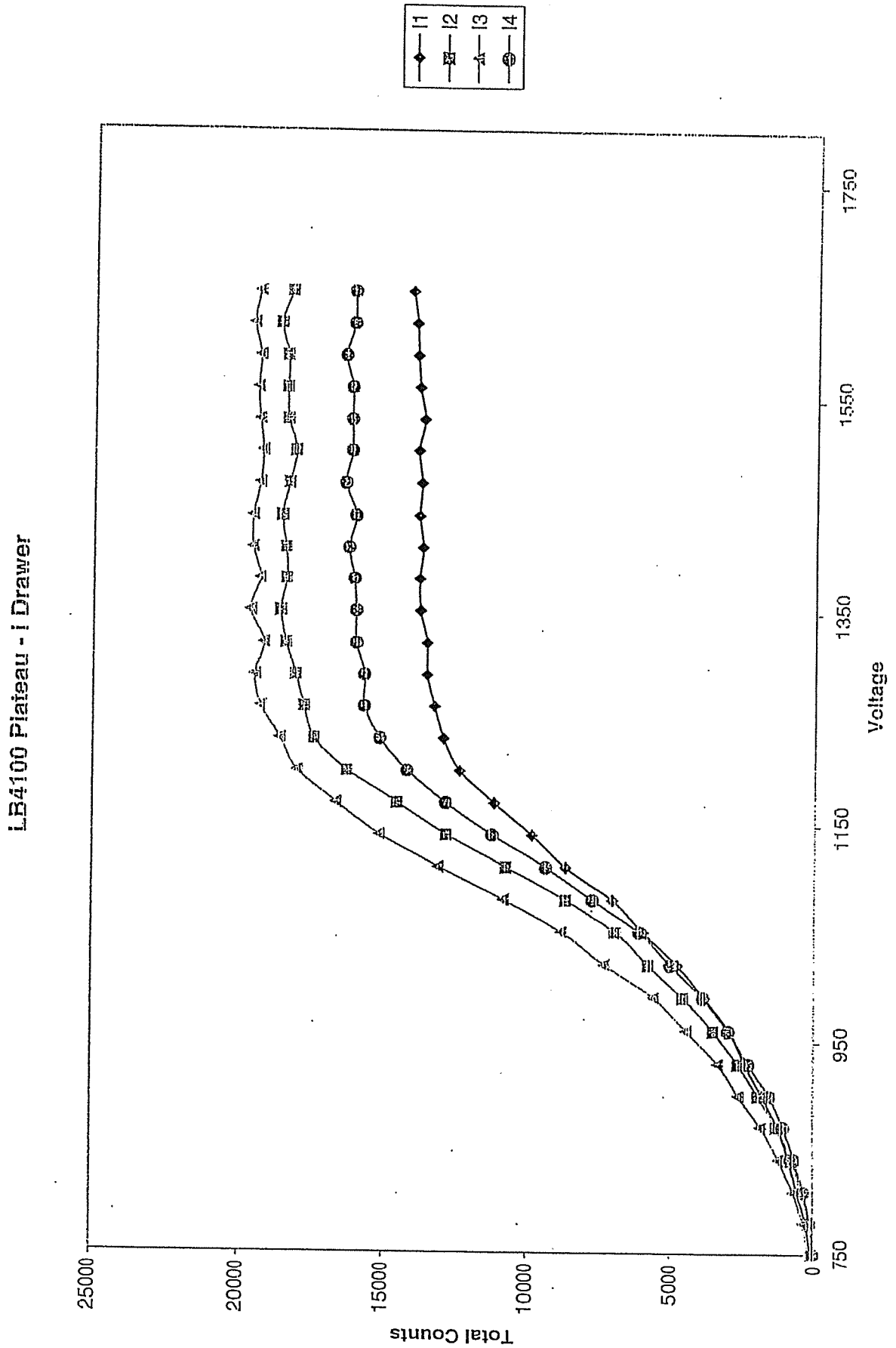

LB4100 Plateau - D Drawer
D1
D2
D3
D4
Total Counts
25000
20000
15000
10000
5000
0
-5000
900
1000
1100
1200
1300
1400
1500
1600
1700
1800
Voltage

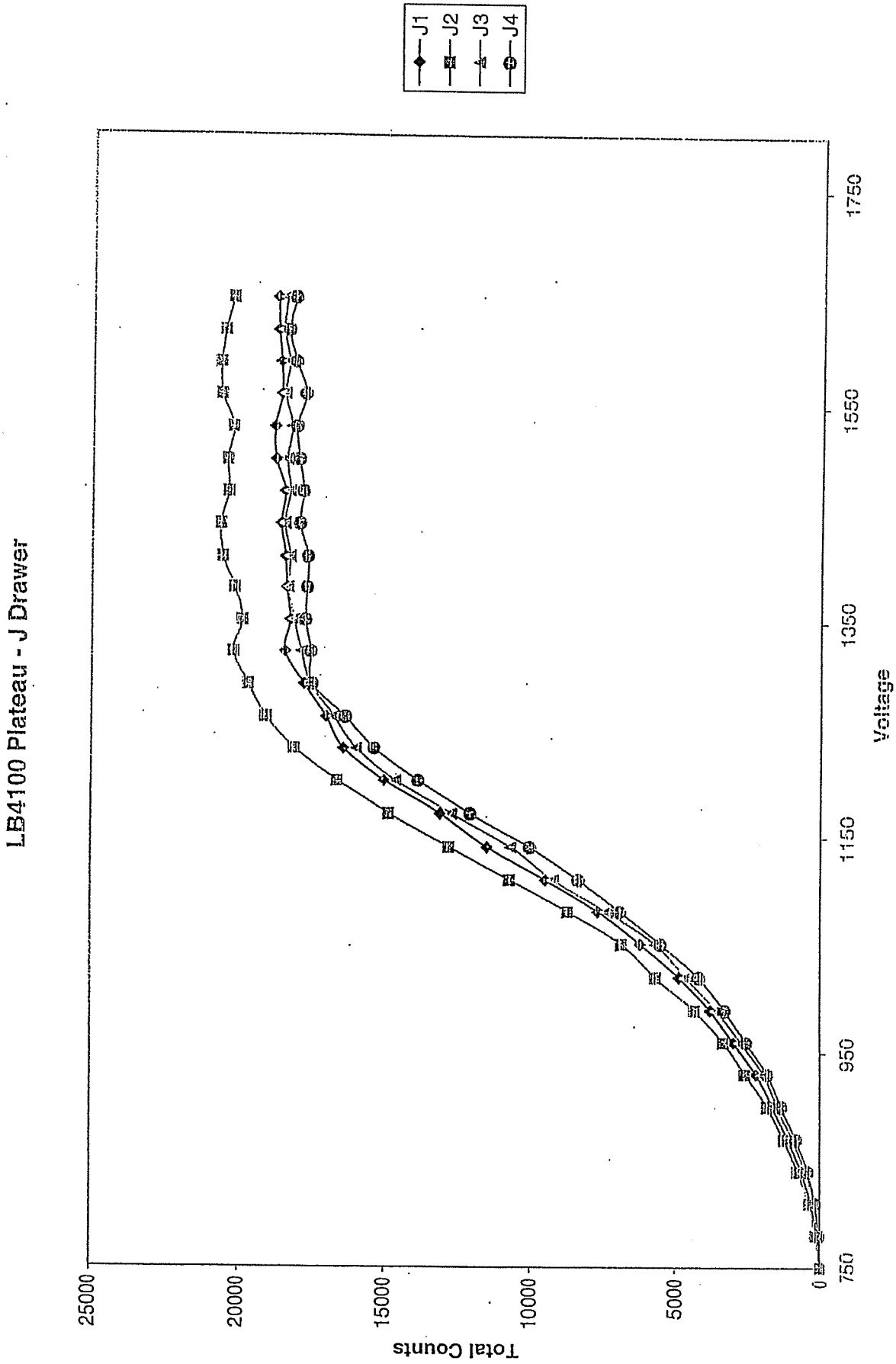

LB4100 Plateau - E Drawer
E1
E2
E3
E4
Total Counts
20000
15000
10000
5000
0
-5000
750
950
1150
1350
1550
1750
Voltage


LB4100 Plateau - F Drawer
F1
F2
F3
F4
Total Counts
25000
20000
15000
10000
5000
0
-5000
750
950
1150
1350
1550
1750
Voltage


LB4100 Plateau - G Drawer
G1
G2
G3
G4
Total Counts
25000
20000
15000
10000
5000
0
-5000
750
950
1150
1350
1550
1750
Voltage


LB4100 Plateau - H Drawer
25000
20000
15000
10000
5000
0
-5000
Total Counts
750
950
1150
1350
1550
1750
Voltage
H1
H2
H3
H4


LB4100 Plateau - i Drawer
I1
I2
I3
I4
Total Counts
25000
20000
15000
10000
5000
0
750
950
1150
1350
1550
1750
Voltage


LB4100 Plateau - J Drawer
J1
J2
J3
J4
Total Counts
25000
20000
15000
10000
5000
0
750
950
1150
1350
1550
1750
Voltage

Eckert & Ziegler
Analytics

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404·352·8677
Fax 404·352·2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION
Standard Radionuclide Source

1105

75251-278

Th-230 5 mL Liquid in Flame Sealed Vial

This standard radionuclide source was prepared gravimetrically from a calibrated master solution. The master solution was calibrated by liquid scintillation counting.

Radionuclide purity and calibration were checked with germanium gamma-ray spectrometry and liquid scintillation counting. 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:	Th-230
ACTIVITY (Bq):	3.832 E4
HALF-LIFE:	7.538 E4 years
CALIBRATION DATE:	June 14, 2007 12:00 EST
RELATIVE EXPANDED UNCERTAINTY (k=2):	2.0%

Impurities: γ-impurities <0.1%, α-impurities <0.01%

5.09604 grams 0.5M HNO_3 solution.

P O NUMBER 2744RD, Item 3

SOURCE PREPARED BY: D Kiesman for
M. D. Dimitrova, Radiochemist

Q A APPROVED:

RECEIVED 6/25/07

RC-S-045-146

Standard Traceability Log Rad

Source Material Info	
Parent Code:	1105
Prepared By:	Daniel Roy
Carrier Conc:	0.5M HNO3
Reference Date:	06/14/2007
Ampoule Mass (g):	5.09604 g
Uncertainty:	+/- 2 %
LogBook No:	RC-S-045-146

A Solution Material Info	
Isotope:	Thorium-230
Prepared By:	Daniel Roy
Prep Date:	07/23/2008
Verification Date:	01/09/2013
Expiration Date:	01/08/2014
Primary Code:	1105-A
Dilution(mL):	100 mL
Mass of Parent(g):	4.8933 g
Density(g/mL):	1.0137
Balance ID:	38080204

Calculations Converting parent activity to dpm/mL|dpm/g

(Mass of parent(g)) * (Parm Activity (Bq)) * (conversion dpm to Bq) / (Ampoule Mass(g) *(Dilution Vol)) = Parent Activity (dpm/mL)
(Mass of parent(g)) * (Parm Activity (Bq)) * (conversion dpm to Bq) / Density / (Ampoule Mass (g) * (Dilution Vol)) = Parent Activity (dpm/g)
(4.8933 g) * (38320 Bq) * (60 dpm/Bq) / (5.09604 g * 100 mL) = 22077.2901 dpm/mL
(4.8933 g) * (38320 Bq) * (60 dpm/Bq) / (1.0137 g/mL)/ (5.09604 g * 100 mL) = 21779.7999 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

Verification for Th-230 Standard 1105-A

v1.0.2

Instrument	Silver
Analyst	BF1
Verification Prep Date	1/8/2013

Standard Information	
Isotope	Th-230
Serial Number	1105-A
Isotope Halflife	7.5380E+04 Y
Reference Date	6/14/2007
Ref. Act. (DPM/mL)	22077.2901
Amount of Std. (mL)	0.1
Standard Prep Date	7/23/2008

Std #	Count Date	Quench Number	Gross cpm	Bkg cpm
1	1/9/2013	89.40	2285.68	46.20
2	1/9/2013	91.40	2290.23	46.20
3	1/9/2013	92.60	2305.98	46.20

Std #	Net cpm	Calculated Avg. Eff.	Standard dpm/mL	Measured dpm
1	2239.48	1.011815	22133.30	2213.33
2	2244.03	1.011815	22178.26	2217.83
3	2259.78	1.011815	22333.93	2233.39

	dpm/mL
Mean Value =	22215.16
Stdev =	105.2811441
Certificate Value* =	**22076.2**
Two sigma =	210.562
10 % of Mean =	2221.516
Rule A (Pass/Fail)	Pass
% Recovery	100.63%
Rule B (Pass/Fail)	Pass
Expiration Date	1/8/2014

Verification Rules

Rule A = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.

Rule B = The determined mean value shall be within 5% of the certificate value.

*** Certificate Value is decay corrected to Count Date.**

The analyst prepared three standard verification sources for Th-230 source 1105-A by transferring 0.1 mL portions of the standard into glass liquid scintillation vials. 10 mL of Ecoscint Ultra 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 10 mL of Ecoscint Ultra liquid scintillation cocktail. The standard verification vials and background source were dark adapted for at least two hours and counted on LSCSilver for Th-230 source standard verification. The Th-230 efficiency calibration which was used for verification calculations was performed on 1/9/2013 using Th-230 source 1242-A.

Standard results for each verification source was calculated as follows:

Source dpm/mL = (A - B)/(C)(D)

where:

A = Ver. source cpm,
B = BKG cpm,
C = System efficiency (cpm/dpm), and
D = volume used for standard verification.

RAD-M-001

1-11-13

Amanda L. Lehr
1/25/13

General Engineering Laboratories
GFC Calibration Source Preparation Sheet

Applicable SOP Number: GL-RAD-A-001

Isotope: Th-230

Date Standards Prepared: 8-29-11

Standard ID: 1105-A

Matrix of Planchett/Filter: 47 mm Concentric rings SS planchette

Amount Used (g or (ml)): 2.0

Standard Activity (DPM/g or (mL)): 22077.2901

Residue/Carrier Agent: USGS Cal solution B

Reference Date: 6-14-07

Pipette ID Used: 10183301

Expiration Date: 6-22-13

Balance ID Used: 111302-1018

	Standard Number	Residue Volume(mL)	Initial Wt. (g)	Final Wt. (g)	Net Wt. (mg)
	T_1	0	7.5959	7.5969	1.0
	T_2	2.5	7.5548	7.5681	13.3
	T_3	5	7.5914	7.6154	24.0
	T_4	10	7.5645	7.6143	49.8
	T_5	12	7.5671	7.6140	46.9
	T_6	15	7.5697	7.6431	73.4
	T_7	20	7.5964	7.6813	84.9
	T_8	25	7.5722	7.6816	109.4
NL 11/27/12					

Prepared By: [signature] Date: 8-29-11

Reviewed By: [signature] Date: ~~10/4/12~~ NL 11/27/12

Nycomed Amersham plc
Amersham Laboratories

0133

NAMAS
CALIBRATION
No. 0146

ISSUED BY:	Nycomed Amersham plc Radiation & Radioactivity Calibration Laboratory Amersham Laboratories White Lion Road Amersham Buckinghamshire HP7 9LL	ISSUED FOR:	AEA Technology plc Isotrak Amersham Laboratories White Lion Road Amersham Buckinghamshire HP7 9LL

Description Principal radionuclide: Strontium-90

Product code: SIZ64
Solution number: S6/7/19

Measurement Reference time: 1200 GMT on 1 April 1996

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 by 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 W. F. Case

Date of issue 11 May 1999

LC-S-023-0607

Nycomed Amersham

W F Case

0133

UKAS ACCREDITED CALIBRATION LABORATORY No. 0146

Measurement

Reference time for solution number S6/7/19:	1200 GMT on 1 April 1996	
Radioactive concentration of strontium-90:	477.1	kilobecquerels per gram of solution
which is equivalent to:	12.89	microcuries per gram of solution
Mass of solution:	5.0669	grams
Total activity of strontium-90:	2.417	megabecquerels
which is equivalent to:	65.3	microcuries

Method of measurement used (see page 3 of the certificate): K

Calibration dates: 25 March 1996 to 27 March 1996

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.

Accuracy

Expanded uncertainty in the radioactive concentration quoted above: ± 0.80 %

Combined Type A uncertainty : ± 0.05 %

Combined Type B uncertainty : ± 0.40 %

Radionuclidic purity

The estimated activities of any radioactive impurities found by high-resolution gamma ray spectrometry, or in any other examination of the solution, are listed below expressed as percentages of the activity of the principal radionuclide at the reference time.

Other radionuclides 0.0005(3) %

Chemical composition

0.1 M HCl containing 100 micrograms of strontium and 100 micrograms of yttrium per ml.

Physical data

Recommended half life: 29.12 ± 0.24 years (1 year = 365.25 days)

Strontium-90: 100% beta particle emission.
Yttrium-90: 100% beta particle emission. Half life 64.1 ± 0.1 hours.

The activity of the yttrium-90 is equal to the activity of the strontium-90.

Remarks

This product meets the quality assurance requirements for achieving traceability to NIST as defined in ANSI N42.22-1995.

Tests made over a period of 2 years on standardised solutions of strontium-90 stored in glass ampoules have shown that loss of strontium-90 from solution is negligible other than by radioactive decay.

Q(-5-073-060

UKAS ACCREDITED CALIBRATION LABORATORY No. 0146

Methods of measurement

The measurement techniques listed below are currently in use at Nycomed Amersham for the absolute standardisation of radioactive solutions. The methods used for this standardisation are indicated on page 2 of the certificate.

Using a gas flow proportional counter

A	4 pi beta counting
B	4 pi alpha counting
C	4 pi internal conversion electron counting
D	4 pi coincidence counting
E	4 pi anticoincidence counting
F	4 pi coincidence and anticoincidence counting

Using a liquid scintillation counter

G	4 pi coincidence counting
H	4 pi anticoincidence counting
J	4 pi coincidence and anticoincidence counting
K	4 pi efficiency tracing

SI unit of radioactivity

The S.I. unit of radioactivity is the becquerel

1 becquerel (Bq) = 1 nuclear transformation per second, therefore
1 curie (Ci) = 3.7×10^{10} becquerels exactly

Useful conversion factors are:

1 microcurie (μCi)	=	3.7×10^{4}	Bq	=	37 kilobecquerels (kBq)
1 millicurie (mCi)	=	3.7×10^{7}	Bq	=	37 megabecquerels (MBq)
1 kilobecquerel (kBq)	=	27.027 nanocuries (nCi)			
1 megabecquerel (MBq)	=	27.027 microcuries (μCi)			

RC-5-023-060B

Standard Traceability Log Rad

Source Material Info	
Parent Code:	0133
Prepared By:	Joe Davis
Carrier Conc:	0.1 M HCL
Reference Date:	04/01/1996
Ampoule Mass (g):	5.0669 g
Uncertainty:	+/- .8 %
LogBook No:	RC S 023 060

A Solution Material Info	
Isotope:	Strontium-90
Prepared By:	Aadli Abdul-Kareem
Prep Date:	09/25/1999
Verification Date:	08/13/2013
Expiration Date:	08/13/2014
Primary Code:	0133-A
Dilution(mL):	100 mL
Mass of Parent(g):	4.8374 g
Density(g/mL):	1.0041
Balance ID:	38080204

Calculations Converting parent activity to dpm/mL|dpm/g

(Mass of parent(g)) * (Parm Activity (uCi/g)) * (conversion dpm to uCi) / (Dilution Vol) = Parent Activity (dpm/mL)
(Mass of parent(g)) * (Parm Activity (uCi/g)) * (conversion dpm to uCi) / Density (g/mL)/ (Dilution Vol) = Parent Activity (dpm/g)
(4.8374 g) * (12.89 uCi/g) * (2220000 dpm/uCi) / (100 mL) = 1384260.7092 dpm/mL
(4.8374 g) * (12.89 uCi/g) * (2220000 dpm/uCi) / (1.0041 g/mL) / (100 mL) = 1378622.1492 dpm/g

Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
08/13/2013	Christina Kimball	.0050588	100	0133-BB	69.7424 dpm/mL	08/13/2013	08/13/2014
04/18/2003	Lonnie Morris	.3247	1000	0133-M	447.6386 dpm/mL	04/16/2004	04/16/2005
05/25/2004	Amanda Fehr	.361	1000	0133-N	497.6826 dpm/mL	05/24/2005	05/24/2006
07/22/2005	Brenda Burke	.098	500	0133-O	270.2099 dpm/mL	09/21/2006	09/21/2007
08/15/2005	Amanda Fehr	.1582	500	0133-P	436.196 dpm/mL	08/15/2005	08/15/2006
12/20/2005	Amanda Fehr	.3248	1000	0133-Q	447.78 dpm/mL	12/20/2005	12/20/2006
10/27/2006	Julie Strock	.000924958	100	0133-R	12.7516809 dpm/mL	10/27/2006	10/27/2007
11/17/2006	Amanda Fehr	.289	1000	0133-S	398.42 dpm/mL	11/17/2006	11/17/2007

11/17/2006	Angela Johnson	2.0079	100	0133-T	27681.35 dpm/mL	09/27/2012	09/27/2013
12/19/2006	Amanda Fehr	.35	1000	0133-U	482.52 dpm/mL	07/26/2007	12/19/2007
05/08/2007	Julie Strock	.010019421	100	0133-V	138.202 dpm/mL	04/29/2008	04/29/2009
07/11/2007	Daniel Roy	.3527	1000	0133-W	486.24 dpm/ml	07/11/2008	07/11/2009
04/29/2009	Tina Schoneman	.0100581	100	0133-X	138.666 dpm/mL	04/29/2010	04/29/2011
04/18/2011	Christina Kimball	.010141	100	0133-Y	139.8124 dpm/mL	04/11/2012	04/11/2013
07/31/2012	Christina Kimball	.01013	100	0133-Z	139.6486 dpm/mL	07/26/2013	07/26/2014

GEL Laboratories LLC
Version 1.0 9/18/2000

Verification for Sr-90 Standard 0133-T

v1.0.1

Instrument	Red
Analyst	BXF1
Verification Prep Date	9/27/2012

Standard Information	
Isotope	Sr-90
Serial Number	0133-T
Isotope Halflife	28.9000 Y
Reference Date	4/1/1996
Ref. Act. (DPM/mL)	27681.35
Amount of Std. (mL)	1.0
Standard Prep Date	9/27/2012

Std #	Count Date	Quench Number	Gross cpm	Bkg cpm
1	9/27/2012	97.90	38626.66	37.60
2	9/27/2012	97.70	38200.00	37.60
3	9/27/2012	97.80	38330.00	37.60

Std #	Net cpm	Calculated Avg. Eff.	Standard dpm/mL	Measured dpm
1	38589.06	2.042732	18890.91	18890.91
2	38162.40	2.042732	18682.04	18682.04
3	38292.40	2.042732	18745.68	18745.68

	dpm/mL
Mean Value =	18772.88
Stdev =	107.0564993
Certificate Value* =	**18639.0**
Two sigma =	214.113
10 % of Mean =	1877.288
Rule A (Pass/Fail)	**Pass**
% Recovery	100.72%
Rule B (Pass/Fail)	**Pass**
Expiration Date	**9/27/2013**

Verification Rules

Rule A = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.

Rule B = The determined mean value shall be within 5% of the certificate value.

*** Certificate Value is decay corrected to Count Date.**

The analyst prepared three standard verification sources for Sr-90 source 0133-T by transferring 1 mL portions of the standard into glass liquid scintillation vials. 10 mL of Ecoscint Ultra 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 10 mL of Ecoscint Ultra liquid scintillation cocktail. The standard verification vials and background source were dark adapted for at least two hours and counted on LSCRed for Sr-90 source standard verification. The Sr-90 efficiency calibration which was used for verification calculations was performed on 9/27/2012 using Sr-90 source 1243-A.

Standard results for each verification source was calculated as follows:

Source dpm/mL = (A - B)/(C)(D)

where:

A = Ver. source cpm,
B = BKG cpm,
C = System efficiency (cpm/dpm), and
D = volume used for standard verification.

RAD-M-001

Amanda L. Fehr 11/2/12

General Engineering Laboratories
GFC ~~Verification~~ Source Preparation Sheet
Calibration

Applicable SOP Number: GL-RAD-A-001

Isotope: Sr-90

Date Standards Prepared: 8-29-11

Standard ID: 0133-T

Matrix of Vial/Planchett: 47 mm Concentric Ring SS planchette

Amount Used (g or (ml)): 0.5

Standard Activity (DPM/g or (mL)): 27681.35

Residue/Carrier Agent: USGS Cal Solution B

Reference Date: 4-1-96

Pipette ID Used: 351921

Expiration Date: 9-27-13

Balance ID Used: 1113621018

	Standard Number	Residue Volume(mL)	Initial Wt. (g)	Final Wt. (g)	Net Wt. (mg)
	S_1	0.0	7.6097	7.6093	0
	S_2	2.5	7.5695	7.5823	12.8
	S_3	5	7.5778	7.6055	27.7
	S_4	10	7.5837	7.6345	50.8
	S_5	12	7.5925	7.6533	60.8
	S_6	15	7.5592	7.6324	73.2
	S_7	20	7.5925	7.6909	98.4
	S_8	25	7.5363	7.6521	115.8
NL 11/27/12					

Prepared By: _____ Date: 8-29-11

Reviewed By: _____ Date: ~~10/1/12~~ NL 11/27/12

NL 9/27/13

General Engineering Laboratories
GFC Calibration Source Preparation Sheet
Alpha Crosstalk

Applicable SOP Number: GL-RAD-A-001

Isotope: Po-210

Date Standards Prepared: 9/27/13

Standard ID: 1673-A

Matrix of Planchett/Filter: 47 mm concentric ring S.S. planchette

Amount Used (g or (mL)): 2.0

Standard Activity (DPM/g or (mL)): 22622.4159

Residue/Carrier Agent: tap water

Reference Date: 8/1/13

Pipette ID Used: 1608405

Expiration Date: 8/26/14

Balance ID Used: F30560

	Standard Number	Residue Volume(mL) (tapwater)	Initial Wt. (g)	Final Wt. (g)	Net Wt. (mg)	
	P1	∅	7.6765	7.6765	0.0	
	P2	5	7.6486	7.6519	3.3	
	P3	10	7.6430	~~7.6480~~ [initials 9/27/13]	7.6495	6.5
	P4	15	7.7009	7.7173	16.4	
	P5	20	7.6602	7.6923	32.1	
	P6	25	7.6423	7.6899	47.6	
	P7	30	7.6766	7.7416	65.0	
	P8	35	7.6391	7.7186	79.5	wt ✓

[initials] 9/27/13

Prepared By: Amanda L. [signature] Date: 9/27/13

Reviewed By: [signature] Date: 10/1/13

Eckert & Ziegler
Isotope Products

24937 Avenue Tibbitts
Valencia, California 91355

Tel 661•309•1010
Fax 661•257•8303

1673

CERTIFICATE OF CALIBRATION
ALPHA STANDARD SOLUTION

Radionuclide:	Po-210	**Customer:**	GENERAL ENGINEERING LABS.
Half-life:	138.376 ± 0.002 days	**P.O. No.:**	GEL1304374
Catalog No.:	7310	**Reference Date:**	1-Aug-13 12:00 PST
Source No.:	1686-39	**Contained Radioactivity:**	1.050 µCi 38.85 kBq

Physical Description:

A.	Mass of solution:	5.19741 g in 5 mL flame-sealed ampoule
B.	Chemical form:	$PoCl_4$ in 2M HCl
C.	Carrier content:	None
D.	Density:	1.033 g/mL @ 20°C

Radioimpurities:

None detected

Radionuclide Concentration: 0.2020 µCi/g, 7.474 kBq/g

Method of Calibration:

This source was prepared from a weighed aliquot of solution whose activity in µCi/g was determined using a liquid scintillation counter.

Uncertainty of Measurement:

A.	Type A (random) uncertainty:	± 0.5 %
B.	Type B (systematic) uncertainty:	± 3.0 %
C.	Uncertainty in aliquot weighing:	± 0.0 %
D.	Total uncertainty at the 99% confidence level:	± 3.0 %

Notes:

- See reverse side for leak test(s) performed on this source.
- EZIP participates in a NIST measurement assurance program to establish and maintain implicit traceability for a number of nuclides, based on the blind assay (and later NIST certification) of Standard Reference Materials (as in NRC Regulatory Guide 4.15).
- Nuclear data was taken from NCRP Report No. 58, 1985.
- This source has a working life of 9 months.

RECEIVED 7/16/13

Daniel James Van Dalsem
Quality Control

1-Jul-13
Date

EZIP Ref. No.: 1686-39

RC-S-065-02

Standard Traceability Log Rad

Source Material Info	
Parent Code:	1673
Prepared By:	Gregory Ramsay
Carrier Conc:	2M HCl
Reference Date:	08/01/2013
Ampoule Mass (g):	5.19741 g
Uncertainty:	+/- 1.172 %
LogBook No:	RC-S-065-102

A Solution Material Info	
Isotope:	Polonium-210
Prepared By:	Tim Chandler
Prep Date:	07/29/2013
Verification Date:	08/26/2013
Expiration Date:	08/26/2014
Primary Code:	1673-A
Dilution(mL):	100 mL
Mass of Parent(g):	5.0441 g
Density(g/mL):	1.0315
Balance ID:	38080204

Calculations Converting parent activity to dpm/mL|dpm/g

(Mass of parent(g)) * (Parm Activity (kbq)) * (conversion dpm to kbq) / (Ampoule Mass(g) *(Dilution Vol)) = Parent Activity (dpm/mL)
(Mass of parent(g)) * (Parm Activity (kbq)) * (conversion dpm to kbq) / Density / (Ampoule Mass (g) * (Dilution Vol)) = Parent Activity (dpm/g)
(5.0441 g) * (38.85 kbq) * (60000 dpm/kbq) / (5.19741 g * 100 mL) = 22622.4160 dpm/mL
(5.0441 g) * (38.85 kbq) * (60000 dpm/kbq) / (1.0315 g/mL)/ (5.19741 g * 100 mL) = 21932.2093 dpm/g

Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
07/31/2013	Tim Chandler	2.8134	100	1673-B	617.040778 dpm/mL	08/07/2013	08/07/2014
08/21/2013	Christina Kimball	.3091	100	1673-C	67.79246 dpm/mL	08/26/2013	08/26/2014

GEL Laboratories LLC
Version 1.0 9/18/2000

Verification for Po-210 Standard 1673-A

v1.0

Analyst	TC1
Verification Prep Date	7/30/2013

Tracer Information	
Isotope	Po-209
Serial Number	1423-F
Amount of Std. (mL)	0.1
Expiration Date	8/2/2013

Standard Information	
Isotope	Po-210
Serial Number	1673-A
Isotope Halflife	138.3800 D
Reference Date	8/1/2013
Ref. Act. (dpm/mL)	22622.4159
Amount of Std. (mL)	0.0001
Standard Prep Date	7/29/2013

Std #	Count Date	Activity pCi	Standard dpm/mL
1	7/30/2013	1.040	23088.00
2	7/30/2013	1.120	24864.00
3	7/30/2013	1.020	22644.00
	Mean Value =	1.060	23532.000
	Stdev =	0.052915026	1174.713582

	pCi	dpm/mL
Certificate Value* =	**1.0293**	**22850.1868**
Two sigma =	0.1058	2349.4272
10 % of Mean =	0.1060	2353.2000
Rule A (Pass/Fail)	**Pass**	**Pass**
% Recovery	102.98%	102.98%
Rule B (Pass/Fail)	**Pass**	**Pass**
Expiration Date	**7/30/2014**	

Verification Rules

Rule A = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.

Rule B = The determined mean value shall be within 5% of the certificate value.

*** Certificate Value is decay corrected to Verification Prep Date.**

The analyst prepared three standard verification sources for Po-210 standard 1673-A using 0.0001 mL for each source. Each standard was combined with 0.1 mL of Po-209 standard 1423-F and was diluted in a plastic cup containing 2 grams of ascorbic acid and 75 mL of 1M HCl. The polonium was plated onto a nickel disc by spinning with a stir bar in the solution for 4 hours. The samples were prepared for counting following routine procedures for alpha spectroscopy source preparation. Each source was counted using routine alpha spec procedures. DPM values for Po-210 were calculated by comparison to Po-209 certified values.

7/31/13

7-31-13

Alpha Spectroscopy Software Version 3.3.16
effective date: 12-Jun-2013

GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

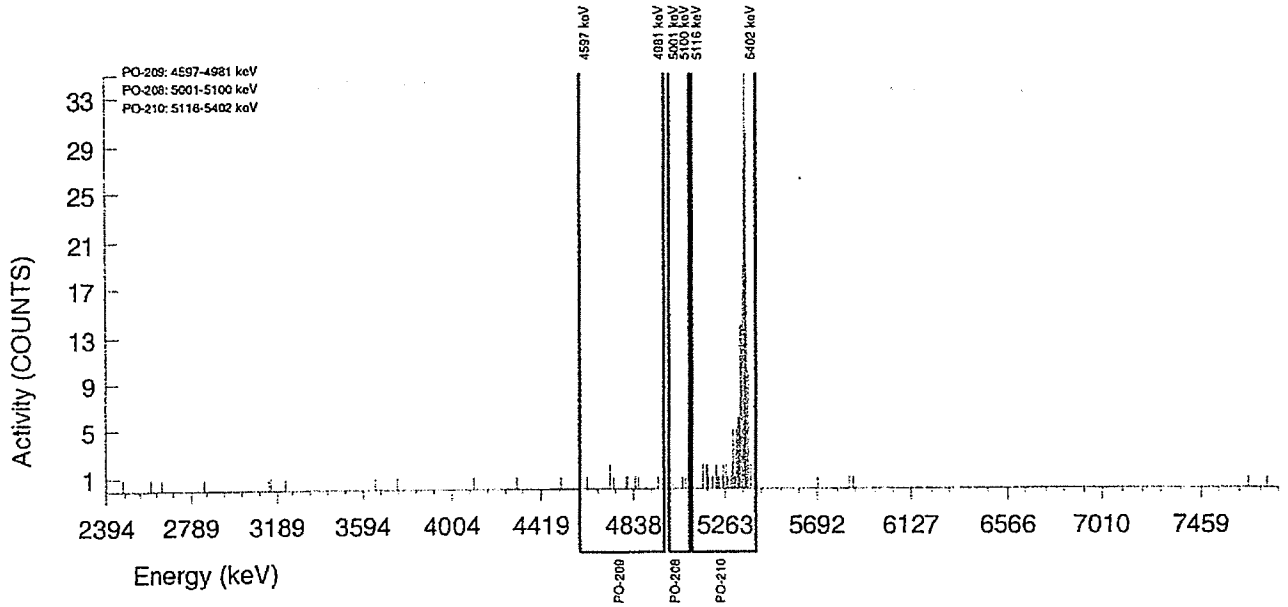
Instrument SOP: GL-RAD-I-009
Analytical SOP:

BATCH NUMBER : 1318659	CHAMBER : 069	LIB FILE : PO
SAMPLE ID : S1202918178_PO	DETECTOR S/N : 78795	BKG FILE : B069.CNF;1481
SAMPLE QTY : 1.000 L +/-0.500 %	AVERAGE %EFFICIENCY : 33.2166	BKG DATE : 27-Jul-2013
SAMPLE DATE : 30-Jul-2013 00:00:00	AVERAGE %EFF ERROR : 0.6386	BKG LIVE TIME(SEC) : 60000.00
ANALYST : TC1	COUNT DATE : 30-Jul-2013 17:47:46	EFF FILE : W069.CNF;410
% YIELD : 0.8 +/-48.240 %	ELAPSED LIVE TIME(SEC) : 30300.00	CAL DATE : 08-Jul-2013

TRACER
ID : 1423-F
NUCLIDE : PO-209
NOMINAL : 5.2508E+00 dpm
RESULTS : 4.1720E-02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/L	1.96-sigma TPU pCi/L	MDA pCi/L	Lc pCi/L	1.96-sigma cnt Unc pCi/L
PO-208	5080.00	5035.21	0.000	5.000	5.000	0.000	0.0000	100.000	1.69E+00	2.30E+00	1.01E+00	0.00E+00	1.66E+00
PO-209	4882.00	4792.13	4.908	9.000	6.980	2.020	1.4213	99.740	2.37E+00	3.16E+00	2.96E+00	9.72E-01	2.23E+00
PO-210	5304.38	5333.72	21.922	220.000	219.495	0.505	0.7106	100.000	7.45E+01	7.12E+01	1.99E+00	4.87E-01	9.90E+00



TDC
7-31-13

Alpha Spectroscopy Software Version 3.3.16
effective date: 12-Jun-2013

GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

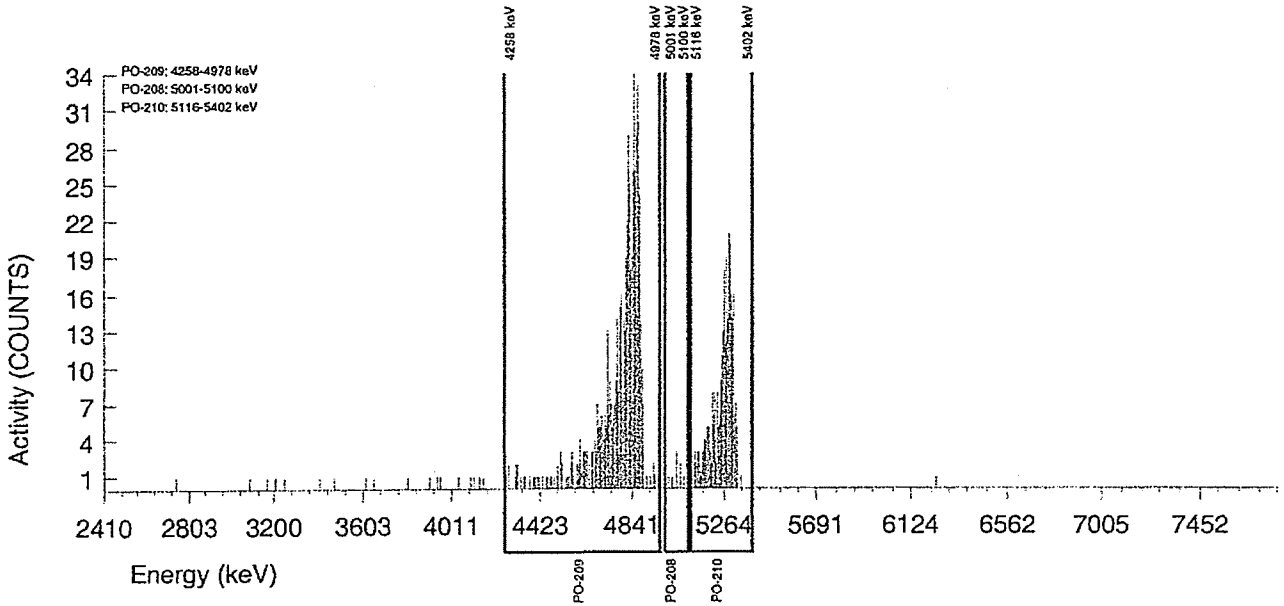
Instrument SOP: GL-RAD-I-009
Analytical SOP:

BATCH NUMBER : 1318659	CHAMBER : 070	LIB FILE : PO
SAMPLE ID : S1202918179_PO	DETECTOR S/N : 78262	BKG FILE : B070.CNF;1483
SAMPLE QTY : 1.000 L +/-0.500 %	AVERAGE %EFFICIENCY : 34.5949	BKG DATE : 27-Jul-2013
SAMPLE DATE : 30-Jul-2013 00:00:00	AVERAGE %EFF ERROR : 0.6645	BKG LIVE TIME(SEC) : 60000.00
ANALYST : TC1	COUNT DATE : 30-Jul-2013 17:47:46	EFF FILE : W070.CNF;400
% YIELD : 73.2 +/-5.273 %	ELAPSED LIVE TIME(SEC) : 30300.00	CAL DATE : 08-Jul-2013

TRACER	LCS
ID : 1423-F	ID
NUCLIDE : PO-209	NUCLIDE
NOMINAL : 5.2508E+00 dpm	NOMINAL (pCi/L)
RESULTS : 3.8451E+00 dpm	% RECOVERY

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/L	1.96-sigma TPU pCi/L	MDA pCi/L	Lc pCi/L	1.96-sigma cnt Unc pCi/L
PO-208	5080.00	5057.08	0.000	11.000	11.000	0.000	0.0000	100.000	3.88E-02	2.45E-02	1.06E-02	0.00E+00	2.42E-02
PO-209	4882.00	4787.03	63.543	671.000	669.990	1.010	1.0050	99.740	2.37E+00	3.17E-01	2.49E-02	7.16E-03	1.79E-01
PO-210	5304.38	5260.28	52.655	296.000	294.990	1.010	1.0050	100.000	1.04E+00	1.66E-01	2.50E-02	7.17E-03	1.20E-01



TAC
7-31-13

Alpha Spectroscopy Software Version 3.3.16
effective date: 12-Jun-2013

GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

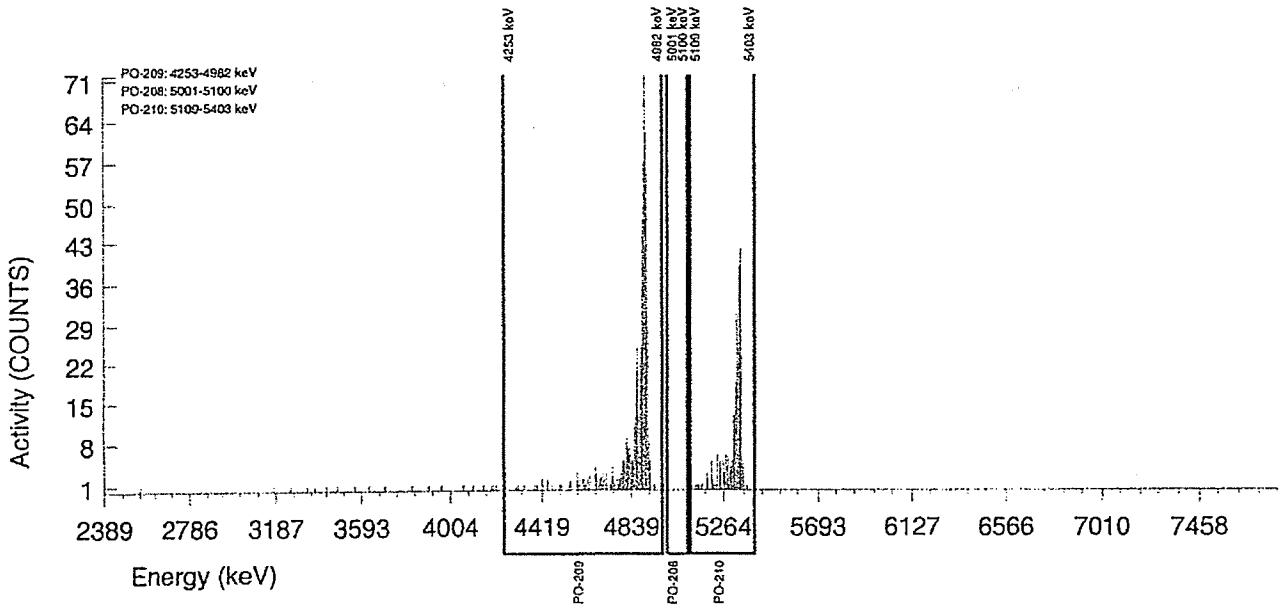
Instrument SOP: GL-RAD-I-009
Analytical SOP:

BATCH NUMBER : 1318659	CHAMBER : 071	LIB FILE : PO
SAMPLE ID : S1202918180_PO	DETECTOR S/N : 80020	BKG FILE : B071.CNF;1476
SAMPLE QTY : 1.000 L +/-0.500 %	AVERAGE %EFFICIENCY : 32.2871	BKG DATE : 27-Jul-2013
SAMPLE DATE : 30-Jul-2013 00:00:00	AVERAGE %EFF ERROR : 0.6210	BKG LIVE TIME(SEC) : 59999.99
ANALYST : TC1	COUNT DATE : 30-Jul-2013 17:47:47	EFF FILE : W071.CNF;382
% YIELD : 72.0 +/-5.403 %	ELAPSED LIVE TIME(SEC) : 30299.99	CAL DATE : 08-Jul-2013

TRACER	LCS
ID : 1423-F	ID
NUCLIDE : PO-209	NUCLIDE
NOMINAL : 5.2508E+00 dpm	NOMINAL (pCi/L)
RESULTS : 3.7786E+00 dpm	% RECOVERY

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/L	1.96-sigma TPU pCi/L	MDA pCi/L	Lc pCi/L	1.96-sigma cnt Unc pCi/L
PO-208	5080.00	5050.46	0.000	0.000	-0.505	0.505	0.7106	100.000	-1.94E-03	9.26E-03	2.25E-02	5.51E-03	9.25E-03
PO-209	4882.00	4849.53	25.915	616.000	614.485	1.515	1.2309	99.740	2.37E+00	3.26E-01	3.07E-02	9.56E-03	1.88E-01
PO-210	5304.38	5305.73	24.591	291.000	291.000	0.000	0.0000	100.000	1.12E+00	1.81E-01	1.16E-02	0.00E+00	1.29E-01



TRC
7-31-13

Alpha Spectroscopy Software Version 3.3.16
effective date: 12-Jun-2013

GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

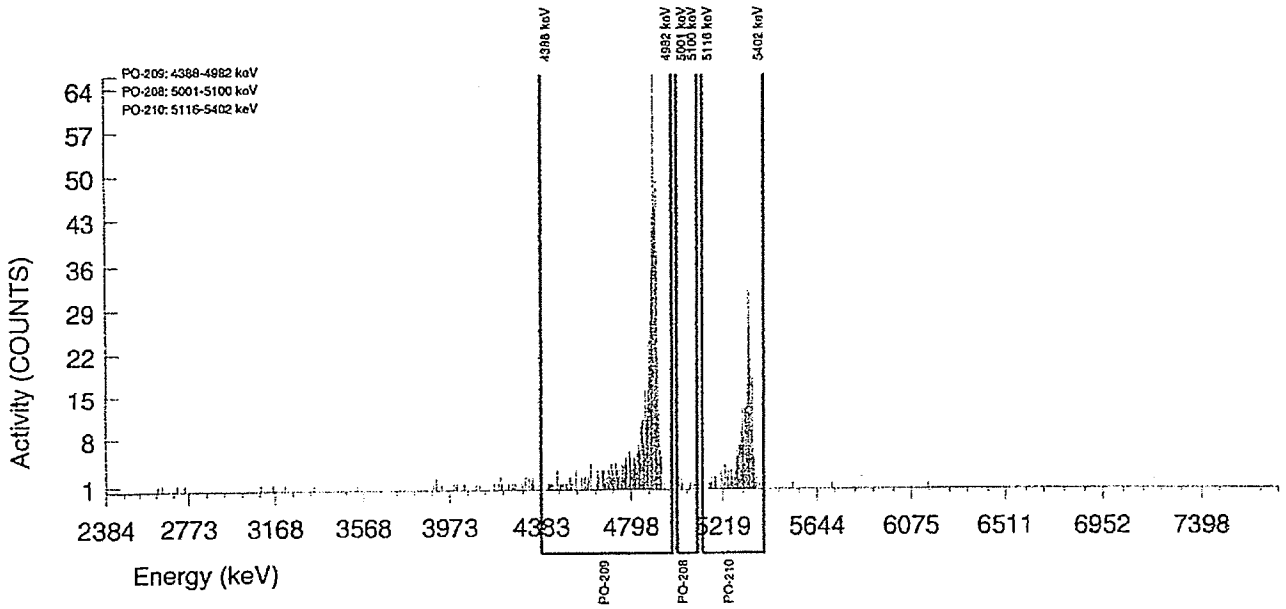
Instrument SOP: GL-RAD-I-009
Analytical SOP:

BATCH NUMBER : 1318659	CHAMBER : 072	LIB FILE : PO
SAMPLE ID : S1202918181_PO	DETECTOR S/N : 67584	BKG FILE : B072.CNF;1483
SAMPLE QTY : 1.000 L +/-0.500 %	AVERAGE %EFFICIENCY : 32.3134	BKG DATE : 27-Jul-2013
SAMPLE DATE : 30-Jul-2013 00:00:00	AVERAGE %EFF ERROR : 0.6215	BKG LIVE TIME(SEC) : 59999.99
ANALYST : TC1	COUNT DATE : 30-Jul-2013 17:47:47	EFF FILE : W072.CNF;388
% YIELD : 70.6 +/-5.438 %	ELAPSED LIVE TIME(SEC) : 30299.99	CAL DATE : 08-Jul-2013

TRACER	LCS
ID : 1423-F	ID
NUCLIDE : PO-209	NUCLIDE
NOMINAL : 5.2508E+00 dpm	NOMINAL (pCi/L)
RESULTS : 3.7078E+00 dpm	% RECOVERY

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/L	1.96-sigma TPU pCi/L	MDA pCi/L	Lc pCi/L	1.96-sigma cnt Unc pCi/L
PO-208	5080.00	5045.35	16.930	10.000	10.000	0.000	0.0000	100.000	3.91E-02	2.61E-02	1.17E-02	0.00E+00	2.57E-02
PO-209	4882.00	4846.67	26.817	607.000	603.465	3.535	1.8802	99.740	2.37E+00	3.29E-01	4.15E-02	1.49E-02	1.90E-01
PO-210	5304.38	5309.14	26.139	261.000	260.495	0.505	0.7106	100.000	1.02E+00	1.70E-01	2.30E-02	5.63E-03	1.25E-01



TDC
7-31-13

Polonium Queue Sheet

Verification of Po-210 1673-A

30-JUL-13

Batch #: 1318659 Analyst:TC1 First Client Due Date: Internal Due Date:16-AUG-13

Tracer Isotope: Po-209 Tracer Code: 1423-F Expiration Date: 8-2-13 Vol: 0.1

LCS Isotope: Po-210 LCS Code: 1673-A Expiration Date: ~~7-30-13~~ 7/31/13 ~~8/30/13~~ Vol: 0.0001

Spike Isotope: Po-210 Spike Code: N/A Expiration Date: N/A Vol: N/A

Prep Date: 7-30-13 Initials: TOC Pipet ID: 1840022 Balance ID: 1113021618 Witness: N/A

Sample ID	Client Description	Type	Hazard Code	Min CRDL	Matrix	Client	Collection Date	Pos.	Label #	Wet/Dry Aliquot (g/l/f)	Po Det #
1202918178-1	MB for batch 1318659	MB		.05 pCi/L	WATER	QC ACCOUNT	25-JUL-13	1	1	1.0	69
1202918179-1	LCS for batch 1318659	LCS		.05 pCi/L	WATER	QC ACCOUNT	25-JUL-13	2	2	1.0	70
1202918180-1	LCS for batch 1318659	LCS		.05 pCi/L	WATER	QC ACCOUNT	25-JUL-13	3	3	1.0	71
1202918181-1	LCS for batch 1318659	LCS		.05 pCi/L	WATER	QC ACCOUNT	25-JUL-13	4	4	1.0	72

MB: spiked with Po-210 1673-A 0.1mL only

took 0.1ml diluted up to 100ml then took 0.1ml for aliquot = 0.0001mL

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

Data Reviewed By: [signature] 7-31-13

General Engineering Laboratories
GFC Verification Source Preparation Sheet

Applicable SOP Number: GL-RAD-A-001

Isotope: Th-230 / Sr-90

Date Standards Prepared: 8-29-11

Standard ID: 1242-A / 1243-A

Matrix of Vial/Planchett: 47mm concentric ring SS planchette

Amount Used (g or ml): 2.0 / 0.1

Standard Activity (DPM/g or mL): 23217.6149 / 226951.763

Residue/Carrier Agent: USGS cal solution B

Reference Date: 8-25-08 / 10-1-08

Pipette ID Used: 10183301 / 1795419

Expiration Date: ~~7-5-12~~ (AP) 10/1/12 / ~~7-5-12~~ (AP) 10/1/12
6/22/13 / 11/31/13

Balance ID Used: 1113021018

	Standard Number	Residue Volume(mL)	Initial Wt. (g)	Final Wt. (g)	Net Wt. (mg)
	V_1	0	7.5843	7.5840	0
	V_2	2.5	7.5812	7.5916	10.4
	V_3	5	7.5944	7.6182	23.8
	V_4	10	7.6239	7.6681	44.2
	V_5	12	7.5984	7.6531	54.7
	V_6	15	7.6059	7.6798	73.9
	V_7	20	7.6178	7.7130	95.2
	V_8	25	7.5955	7.6985	103

wt ✓

8/29/11

Prepared By: _____ Date: 8-29-11

Reviewed By: _____ Date: 9/15/11

Eckert & Ziegler
Analytics

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
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Fax 404·352·2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

1242

78148-278

Th-230 5 mL Liquid in Flame Sealed Vial

Customer: General Engineerings Labs
P.O. No.: 7311RD, Item 1

This standard radionuclide source was prepared gravimetrically from a calibrated master solution. The master solution was calibrated by liquid scintillation counting.

Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry and liquid scintillation counting. 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:	Th-230
Activity (Bq):	4.021 E4
Half-Life:	7.538 E4 years
Calibration Date:	August 25, 2008 12:00 EST
Relative Expanded Uncertainty (k=2):	2.0%

Comments:
Impurities: γ-impurities <0.1%, α-impurities <0.04%
5.07467 grams 0.5M HNO3 solution.

Source Prepared By: MTaskaeva
M. I. Taskaeva, Radiochemist

QA Approved: DMM
D. M. Montgomery, QA Manager

Date: 9-4-08

RECEIVED 9/11/08
RC-S-048-123

End of Certificate

Standard Traceability Log Rad

Source Material Info	
Parent Code:	1242
Prepared By:	Daniel Roy
Carrier Conc:	0.5M HNO3
Reference Date:	08/25/2008
Ampoule Mass (g):	5.07467 g
Uncertainty:	+/- 2 %
LogBook No:	RC-S-048-123

A Solution Material Info	
Isotope:	Thorium-230
Prepared By:	Ashley Drochter
Prep Date:	11/10/2009
Verification Date:	01/09/0203
Expiration Date:	01/08/2014
Primary Code:	1242-A
Dilution(mL):	100 mL
Mass of Parent(g):	4.8836 g
Density(g/mL):	1.0597
Balance ID:	38080204

Calculations Converting parent activity to dpm/mL|dpm/g

(Mass of parent(g)) * (Parm Activity (Bq)) * (conversion dpm to Bq) / (Ampoule Mass(g) *(Dilution Vol)) = Parent Activity (dpm/mL)
(Mass of parent(g)) * (Parm Activity (Bq)) * (conversion dpm to Bq) / Density / (Ampoule Mass (g) * (Dilution Vol)) = Parent Activity (dpm/g)
(4.8836 g) * (40210 Bq) * (60 dpm/Bq) / (5.07467 g * 100 mL) = 23217.6149 dpm/mL
(4.8836 g) * (40210 Bq) * (60 dpm/Bq) / (1.0597 g/mL)/ (5.07467 g * 100 mL) = 21908.6601 dpm/g

Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
12/01/2009	Bethany Fiem	6.3855	500	1242-B	279.79548 dpm/mL	12/02/2009	12/02/2010
08/03/2010	Gregory Ramsay	12.8745	1000	1242-C	282.063 dpm/mL	07/30/2013	07/30/2014
07/05/2011	Bethany Fiem	12.1975	1000	1242-D	267.2309 dpm/mL	06/22/2012	06/22/2013
01/12/2012	Christina Kimball	.105	500	1242-E	4.6008 dpm/mL	01/14/2013	01/14/2014
01/08/2013	Bethany Fiem	12.5093	1000	1242-F	274.062 dpm/mL	01/09/2013	01/08/2014
08/26/2013	Christina Kimball	.012512	100	1242-G	2.74129 dpm/mL	08/29/2013	08/29/2014

GEL Laboratories LLC
Version 1.0 9/18/2000

Verification for Th-230 Standard 1242-A

v1.0.2

Instrument	Silver
Analyst	BF1
Verification Prep Date	1/8/2013

Standard Information	
Isotope	Th-230
Serial Number	1242-A
Isotope Halflife	7.5380E+04 Y
Reference Date	8/25/2008
Ref. Act. (DPM/mL)	23217.6149
Amount of Std. (mL)	0.1
Standard Prep Date	11/10/2009

Std #	Count Date	Quench Number	Gross cpm	Bkg cpm
1	1/9/2013	94.80	2359.06	44.40
2	1/9/2013	95.00	2395.24	44.40
3	1/9/2013	94.90	2439.04	44.40

Std #	Net cpm	Calculated Avg. Eff.	Standard dpm/mL	Measured dpm
1	2314.66	1.025255	22576.43	2257.64
2	2350.84	1.025255	22929.32	2292.93
3	2394.64	1.025255	23356.53	2335.65

	dpm/mL
Mean Value =	22954.09
Stdev =	390.6388834
Certificate Value* =	23216.7
Two sigma =	781.278
10 % of Mean =	2295.409
Rule A (Pass/Fail)	Pass
% Recovery	98.87%
Rule B (Pass/Fail)	Pass
Expiration Date	1/8/2014

Verification Rules

Rule A = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.

Rule B = The determined mean value shall be within 5% of the certificate value.

*** Certificate Value is decay corrected to Count Date.**

The analyst prepared three standard verification sources for Th-230 source 1242-A by transferring 0.1 mL portions of the standard into glass liquid scintillation vials. 10 mL of Ecoscint Ultra 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 10 mL of Ecoscint Ultra liquid scintillation cocktail. The standard verification vials and background source were dark adapted for at least two hours and counted on LSCSilver for Th-230 source standard verification. The Th-230 efficiency calibration which was used for verification calculations was performed on 1/9/2013 using Th-230 source 1105-A.

Standard results for each verification source was calculated as follows:

Source dpm/mL = (A - B)/(C)(D)

where:

A = Ver. source cpm,
B = BKG cpm,
C = System efficiency (cpm/dpm), and
D = volume used for standard verification.

RAD-M-001

1-11-13

Amanda L. Fehr 1-11-13

Eckert & Ziegler
Analytics

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Atlanta, Georgia 30318
Tel 404•352•8677
Fax 404•352•2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION
Standard Radionuclide Source

1243

78352-278

Sr-90 10 mL Liquid in Flame Sealed Vial

Customer: General Engineering Labs/Charleston, SC
P.O. No.: 7312 RD, Item 3

This standard radionuclide source was prepared gravimetrically from a calibrated master solution. The master solution was calibrated by liquid scintillation counting.

Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry and liquid scintillation counting. 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:	Sr-90
Activity (Bq):	3.856 E5
Half-Life:	28.79 years
Calibration Date:	October 1, 2008 12:00 EST
Relative Expanded Uncertainty (k=2):	1.7%

Comments:
Impurities: γ-impurities <0.1%
10.41484 grams 0.1M HCl solution with 30 μg/g Sr carrier.

NOTE: This source also contains Y-90 in secular equilibrium with Sr-90. The Y-90 activity is equal to the Sr-90 activity. Since Sr-90 and Y-90 both decay 100% by beta emission, the total beta emission rate for the source is twice the certified Sr-90 activity. The half-life for Y-90 is 64.08 hours.

Source Prepared By: _____
W. Mao, Radiochemist

QA Approved: _____ Date: 10/3/08
D. M. Montgomery, QA Manager

RECEIVED

Standard Traceability Log Rad

Source Material Info	
Parent Code:	1243
Prepared By:	Daniel Roy
Carrier Conc:	0.1M HCL
Reference Date:	10/01/2008
Ampoule Mass (g):	10.41484 g
Uncertainty:	+/- 1.7 %
LogBook No:	RC-S-048-124

A Solution Material Info	
Isotope:	Strontium-90
Prepared By:	Daniel Roy
Prep Date:	12/19/2008
Verification Date:	02/12/2013
Expiration Date:	02/12/2014
Primary Code:	1243-A
Dilution(mL):	100 mL
Mass of Parent(g):	10.2164 g
Density(g/mL):	0.9991
Balance ID:	38080204

Calculations Converting parent activity to dpm/mL|dpm/g

(Mass of parent(g)) * (Parm Activity (Bq)) * (conversion dpm to Bq) / (Ampoule Mass(g) *(Dilution Vol)) = Parent Activity (dpm/mL)
(Mass of parent(g)) * (Parm Activity (Bq)) * (conversion dpm to Bq) / Density / (Ampoule Mass (g) * (Dilution Vol)) = Parent Activity (dpm/g)
(10.2164 g) * (385600 Bq) * (60 dpm/Bq) / (10.41484 g * 100 mL) = 226951.7634 dpm/mL
(10.2164 g) * (385600 Bq) * (60 dpm/Bq) / (0.9991 g/mL)/ (10.41484 g * 100 mL) = 227146.2010 dpm/g

Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
01/21/2010	Bethany Fiem	2.2467	1000	1243-B	510.329369 dpm/mL	01/21/2010	01/21/2011
08/03/2010	Bethany Fiem	2.5604	1000	1243-C	581.5851 dpm/mL	08/03/2010	08/03/2011
01/12/2011	Bethany Fiem	2.4946	1000	1243-D	566.6389 dpm/mL	01/12/2011	01/12/2012
08/12/2011	Tim Chandler	3.3115	100	1243-G	18.7877 dpm/mL	08/11/2011	08/11/2012
08/17/2011	Tim Chandler	2.5541	100	1243-H	14.49064 dpm/mL	08/18/2011	08/16/2012
06/21/2011	Tim Chandler	.0235	100	1243-E	53.37936 dpm/mL	06/25/2012	06/20/2013
07/05/2011	Bethany Fiem	2.6072	1000	1243-F	592.2156 dpm/mL	07/05/2011	07/05/2012

01/31/2012	Gregory Ramsay	2.6792	1000	1243-I	608.5701 dpm/ml	01/31/2012	01/31/2013
08/29/2012	Bethany Fiem	2.6799	1000	1243-J	608.729104 dpm/mL	09/14/2012	09/11/2013
02/12/2013	Gregory Ramsay	2.6526	1000	1243-K	602.528 dpm/ml	02/12/2013	02/12/2014

GEL Laboratories LLC
Version 1.0 9/18/2000

Verification for Sr-90 Standard 1243-A

v1.0.2

Instrument	GOLD
Analyst	BF
Verification Prep Date	2/12/2013

Standard Information	
Isotope	Sr-90
Serial Number	1243-A
Isotope Halflife	28.9000 Y
Reference Date	10/1/2008
Ref. Act. (DPM/mL)	226951.7634
Amount of Std. (mL)	0.1
Standard Prep Date	12/19/2008

Std #	Count Date	Quench Number	Gross cpm	Bkg cpm
1	2/12/2013	55.70	41976.00	38.20
2	2/12/2013	56.10	41080.00	38.20
3	2/12/2013	56.00	42256.00	38.20

Std #	Net cpm	Calculated Avg. Eff.	Standard dpm/mL	Measured dpm
1	41937.80	1.986325	211132.62	21113.26
2	41041.80	1.986325	206621.78	20662.18
3	42217.80	1.986325	212542.26	21254.23

	dpm/mL
Mean Value =	210098.89
Stdev =	3092.649469
Certificate Value* =	**204384.1**
Two sigma =	6185.299
10 % of Mean =	21009.889
Rule A (Pass/Fail)	Pass
% Recovery	102.80%
Rule B (Pass/Fail)	Pass
Expiration Date	2/12/2014

Verification Rules

Rule A = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.

Rule B = The determined mean value shall be within 5% of the certificate value.

*** Certificate Value is decay corrected to Count Date.**

The analyst prepared three standard verification sources for Sr-90 source 1243-A by transferring 0.1 mL portions of the standard into glass liquid scintillation vials. 10 mL of Ecoscint Ultra 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 10 mL of Ecoscint Ultra liquid scintillation cocktail. The standard verification vials and background source were dark adapted for at least two hours and counted on LSCGOLD for Sr-90 source standard verification. The Sr-90 efficiency calibration which was used for verification calculations was performed on 2/12/2013 using Sr-90 source 1244-A.

Standard results for each verification source was calculated as follows:

Source dpm/mL = (A - B)/(C)(D)

where:

A = Ver. source cpm,
B = BKG cpm,
C = System efficiency (cpm/dpm), and
D = volume used for standard verification.

RAD-M-001

2-13-13

Amanda L. Fehr

Gas Flow Proportional Counter Calibration Package

Method: Strontium 89/90

Instrument (circle one): LB4100 / Protean

	Included/ Acceptable	Comments
Part 1: Efficiency determination		
1 Efficiency spreadsheet (eff pts, graphs, trendline equation)	✓	
2 Applicable portion of GFPC_Machines.XLS	✓	
3 Raw Data for Calibration standards	✓	
4 Verification Spreadsheet and Raw Data (recoveries 75%-125%)	✓	
5 Plateau graph and raw data	✓	
6 Standardization of Carrier (if applicable)	✓	
Part 2. Documentation for Calibration Source		
1 Vendor Certificate	✓	
2 Standard Traceability Log (from LIMS)	✓	
3 Current Verification of Source	✓	
4 Source preparation sheet	✓	
Part 3. Documentation for Verification Source		
1 Vendor Certificate	✓	
2 Standard Traceability Log (from LIMS)	✓	
3 Current Verification of Source	✓	
4 Source preparation sheet	✓	
Part 4. Enter into LIMS		
1 Alpha LIMS instrument calibration updated	✓	

Primary Review of Package [signature]

Secondary Review of Package Amanda Lehr

Effective Date:
3-1-13
~~3-1-15~~ ML 3/3/15

exp. date 2/29/16

GEL Laboratories
2040 Savage Road, Charleston, SC 29407
(843)556-8171

Sr-89 Calibration - PIC - Feb 2013

Standard Data		
	Isotope	Sr-89
	Standard ID number	1633-A
	Half Life (days)	50.53
	Std. Act. (dpm/mL)	123593.8614
	Reference Date	12/13/2012
	Volume of spike (mL)	1.0
	Std. Nominal (dpm)	51371.24
	Decay Date	2/15/2013

Carrier Data		Std ID Std weight	1858443 17.73	mg/mL
Source	Measured weight (mg)	Vol. Carrier Added (mL)	Theoretical weight (mg)	***Recovery
1	1.9	0.1	1.77	100.0%
2	3.5	0.2	3.55	98.7%
3	6.9	0.4	7.09	97.3%
4	8.3	0.5	8.87	93.6%
5	13.5	0.8	14.18	95.2%
6	17.6	1	17.73	99.3%
7	26.6	1.5	26.60	100.0%
8	36.1	2.1	37.23	97.0%

***Recovery values exceeding 100% will be evaluated at 100%.

The following detectors were not calibrated:

12A

*Background is considered neglible.
**Decay corrected to mid-point of count

Detector (#)	Source ID (#)	Raw Count Data Start Time	Count Time (min)	Beta (counts)	Raw Beta (cpm)	Recovery (%)	Yield Corrected Sr-89 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-89 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
1A	1	2/15/2013 16:21	1	22671	22671.00	100.0%	22671.00	50892.77	0.4455	0.5143
1A	2	2/15/2013 16:30	1	24304	24304.00	98.7%	24623.42	50888.38	0.4839	0.5095
1A	3	2/15/2013 16:28	1	25873	25873.00	97.3%	26592.94	50889.58	0.5226	0.4993
1A	4	2/15/2013 16:24	1	24881	24881.00	93.6%	26574.71	50891.32	0.5222	0.4951
1A	5	2/15/2013 16:33	1	25969	25969.00	95.2%	27284.76	50887.10	0.5362	0.4794
1A	6	2/15/2013 16:39	1	23419	23419.00	99.3%	23591.98	50884.19	0.4636	0.4671
1A	7	2/15/2013 16:37	1	25270	25270.00	100.0%	25270.00	50885.14	0.4966	0.4401
1A	8	2/15/2013 16:35	1	17057	17057.00	97.0%	17592.33	50886.14	0.3457	0.4115
1B	1	2/15/2013 16:24	1	22892	22892.00	100.0%	22892.00	50891.24	0.4498	0.5191
1B	2	2/15/2013 16:22	1	24815	24815.00	98.7%	25141.14	50892.67	0.4940	0.5141
1B	3	2/15/2013 16:30	1	25632	25632.00	97.3%	26345.24	50888.35	0.5177	0.5037
1B	4	2/15/2013 16:28	1	25351	25351.00	93.6%	27076.70	50889.55	0.5321	0.4994
1B	5	2/15/2013 16:35	1	26005	26005.00	95.2%	27322.59	50886.07	0.5369	0.4833
1B	6	2/15/2013 16:33	1	23585	23585.00	99.3%	23759.21	50887.06	0.4669	0.4707
1B	7	2/15/2013 16:39	1	25562	25562.00	100.0%	25562.00	50884.16	0.5024	0.4430
1B	8	2/15/2013 16:37	1	17129	17129.00	97.0%	17666.59	50885.13	0.3472	0.4137
1C	1	2/15/2013 16:28	1	23030	23030.00	100.0%	23030.00	50889.54	0.4525	0.5246
1C	2	2/15/2013 16:25	1	25093	25093.00	98.7%	25422.79	50891.21	0.4996	0.5192
1C	3	2/15/2013 16:22	1	26245	26245.00	97.3%	26975.30	50892.57	0.5300	0.5077
1C	4	2/15/2013 16:31	1	25504	25504.00	93.6%	27240.12	50888.31	0.5353	0.5030
1C	5	2/15/2013 16:37	1	25732	25732.00	95.2%	27035.75	50885.07	0.5313	0.4855
1C	6	2/15/2013 16:35	1	23516	23516.00	99.3%	23689.70	50886.03	0.4655	0.4717
1C	7	2/15/2013 16:33	1	25862	25862.00	100.0%	25862.00	50887.03	0.5082	0.4414
1C	8	2/15/2013 16:39	1	16780	16780.00	97.0%	17306.64	50884.12	0.3401	0.4094
1D	1	2/15/2013 16:31	1	23237	23237.00	100.0%	23237.00	50888.28	0.4566	0.5225
1D	2	2/15/2013 16:28	1	24810	24810.00	98.7%	25136.07	50889.50	0.4939	0.5173
1D	3	2/15/2013 16:25	1	26179	26179.00	97.3%	26907.46	50891.17	0.5287	0.5062
1D	4	2/15/2013 16:22	1	25241	25241.00	93.6%	26959.21	50892.51	0.5297	0.5016
1D	5	2/15/2013 16:39	1	26012	26012.00	95.2%	27329.94	50884.08	0.5371	0.4846
1D	6	2/15/2013 16:37	1	23271	23271.00	99.3%	23442.89	50885.05	0.4607	0.4713
1D	7	2/15/2013 16:35	1	25607	25607.00	100.0%	25607.00	50886.00	0.5032	0.4419
1D	8	2/15/2013 16:33	1	17078	17078.00	97.0%	17613.99	50887.01	0.3461	0.4109
2A	1	2/15/2013 16:33	1	22234	22234.00	100.0%	22234.00	50886.97	0.4369	0.5053
2A	2	2/15/2013 16:39	1	23993	23993.00	98.7%	24308.34	50884.06	0.4777	0.5006
2A	3	2/15/2013 16:37	1	25476	25476.00	97.3%	26184.90	50885.01	0.5146	0.4907
2A	4	2/15/2013 16:35	1	24595	24595.00	93.6%	26269.24	50885.96	0.5162	0.4866
2A	5	2/15/2013 16:22	1	25135	25135.00	95.2%	26408.51	50892.44	0.5189	0.4713
2A	6	2/15/2013 16:31	1	22948	22948.00	99.3%	23117.50	50888.22	0.4543	0.4593
2A	7	2/15/2013 16:28	1	25149	25149.00	100.0%	25149.00	50889.46	0.4942	0.4330
2A	8	2/15/2013 16:25	1	16736	16736.00	97.0%	17261.26	50891.14	0.3392	0.4052
2B	1	2/15/2013 16:35	1	21501	21501.00	100.0%	21501.00	50885.93	0.4225	0.4850
2B	2	2/15/2013 16:33	1	23103	23103.00	98.7%	23406.64	50886.92	0.4600	0.4806
2B	3	2/15/2013 16:39	1	24238	24238.00	97.3%	24912.45	50884.02	0.4896	0.4714
2B	4	2/15/2013 16:37	1	23758	23758.00	93.6%	25375.26	50884.98	0.4987	0.4676
2B	5	2/15/2013 16:25	1	23999	23999.00	95.2%	25214.95	50891.10	0.4955	0.4534
2B	6	2/15/2013 16:22	1	22186	22186.00	99.3%	22349.87	50892.40	0.4392	0.4422
2B	7	2/15/2013 16:31	1	24035	24035.00	100.0%	24035.00	50888.20	0.4723	0.4177
2B	8	2/15/2013 16:28	1	16377	16377.00	97.0%	16890.99	50889.43	0.3319	0.3918
2C	1	2/15/2013 16:37	1	22296	22296.00	100.0%	22296.00	50884.96	0.4382	0.5061
2C	2	2/15/2013 16:36	1	23951	23951.00	98.7%	24265.78	50885.89	0.4769	0.5019
2C	3	2/15/2013 16:33	1	25463	25463.00	97.3%	26171.54	50886.87	0.5143	0.4931
2C	4	2/15/2013 16:39	1	24962	24962.00	93.6%	26661.22	50883.99	0.5240	0.4894
2C	5	2/15/2013 16:28	1	25437	25437.00	95.2%	26725.81	50889.38	0.5252	0.4758
2C	6	2/15/2013 16:25	1	23144	23144.00	99.3%	23314.95	50891.06	0.4581	0.4651
2C	7	2/15/2013 16:22	1	25548	25548.00	100.0%	25548.00	50892.31	0.5020	0.4416
2C	8	2/15/2013 16:31	1	17333	17333.00	97.0%	17877.00	50888.17	0.3513	0.4168
2D	1	2/15/2013 16:39	1	22601	22601.00	100.0%	22601.00	50883.96	0.4442	0.5098

Raw Count Data											
Detector (#)	Source ID (#)	Start Time	Count Time (min)	Beta (counts)	Raw Beta (cpm)	Recovery (%)	Yield Corrected Sr-89 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-89 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
2D	2	2/15/2013 16:38	1	24333	24333.00	98.7%	24652.81	50884.92	0.4845	0.5053
2D	3	2/15/2013 16:36	1	25432	25432.00	97.3%	26139.67	50885.86	0.5137	0.4956
2D	4	2/15/2013 16:34	1	24784	24784.00	93.6%	26471.10	50886.85	0.5202	0.4916
2D	5	2/15/2013 16:31	1	25497	25497.00	95.2%	26788.85	50888.12	0.5264	0.4769
2D	6	2/15/2013 16:28	1	23111	23111.00	99.3%	23281.71	50889.36	0.4575	0.4652
2D	7	2/15/2013 16:25	1	25715	25715.00	100.0%	25715.00	50891.02	0.5053	0.4396
2D	8	2/15/2013 16:22	1	17022	17022.00	97.0%	17556.24	50892.25	0.3450	0.4127
3A	1	2/15/2013 17:08	1	22713	22713.00	100.0%	22713.00	50870.09	0.4465	0.5136
3A	2	2/15/2013 17:16	1	24219	24219.00	98.7%	24537.31	50866.48	0.4824	0.5082
3A	3	2/15/2013 17:13	1	25568	25568.00	97.3%	26279.46	50867.78	0.5166	0.4966
3A	4	2/15/2013 17:11	1	24790	24790.00	93.6%	26477.51	50868.84	0.5205	0.4919
3A	5	2/15/2013 17:20	1	25636	25636.00	95.2%	26934.89	50864.33	0.5295	0.4742
3A	6	2/15/2013 17:28	1	22922	22922.00	99.3%	23091.31	50860.34	0.4540	0.4603
3A	7	2/15/2013 17:26	1	25188	25188.00	100.0%	25188.00	50861.29	0.4952	0.4297
3A	8	2/15/2013 17:23	1	16133	16133.00	97.0%	16639.33	50862.81	0.3271	0.3974
3B	1	2/15/2013 17:11	1	22710	22710.00	100.0%	22710.00	50868.83	0.4464	0.5168
3B	2	2/15/2013 17:08	1	24287	24287.00	98.7%	24606.20	50870.03	0.4837	0.5111
3B	3	2/15/2013 17:16	1	25785	25785.00	97.3%	26502.50	50866.44	0.5210	0.4990
3B	4	2/15/2013 17:13	1	25095	25095.00	93.6%	26803.27	50867.74	0.5269	0.4941
3B	5	2/15/2013 17:23	1	25479	25479.00	95.2%	26769.94	50862.77	0.5263	0.4756
3B	6	2/15/2013 17:20	1	23180	23180.00	99.3%	23351.22	50864.25	0.4591	0.4611
3B	7	2/15/2013 17:28	1	25229	25229.00	100.0%	25229.00	50860.31	0.4960	0.4291
3B	8	2/15/2013 17:26	1	15914	15914.00	97.0%	16413.46	50861.27	0.3227	0.3954
3C	1	2/15/2013 17:13	1	22789	22789.00	100.0%	22789.00	50867.71	0.4480	0.5218
3C	2	2/15/2013 17:11	1	24757	24757.00	98.7%	25082.38	50868.78	0.4931	0.5163
3C	3	2/15/2013 17:08	1	25765	25765.00	97.3%	26481.94	50869.95	0.5206	0.5047
3C	4	2/15/2013 17:16	1	25700	25700.00	93.6%	27449.46	50866.42	0.5396	0.4999
3C	5	2/15/2013 17:26	1	25884	25884.00	95.2%	27195.46	50861.23	0.5347	0.4821
3C	6	2/15/2013 17:23	1	23317	23317.00	99.3%	23489.23	50862.74	0.4618	0.4680
3C	7	2/15/2013 17:20	1	25638	25638.00	100.0%	25638.00	50864.20	0.5040	0.4372
3C	8	2/15/2013 17:28	1	16405	16405.00	97.0%	16919.87	50860.27	0.3327	0.4047
3D	1	2/15/2013 17:16	1	22440	22440.00	100.0%	22440.00	50866.39	0.4412	0.5133
3D	2	2/15/2013 17:13	1	24241	24241.00	98.7%	24559.60	50867.67	0.4828	0.5079
3D	3	2/15/2013 17:11	1	25787	25787.00	97.3%	26504.55	50868.75	0.5210	0.4963
3D	4	2/15/2013 17:09	1	24974	24974.00	93.6%	26674.04	50869.88	0.5244	0.4915
3D	5	2/15/2013 17:28	1	25471	25471.00	95.2%	26761.53	50860.24	0.5262	0.4737
3D	6	2/15/2013 17:26	1	22855	22855.00	99.3%	23023.82	50861.19	0.4527	0.4597
3D	7	2/15/2013 17:23	1	24979	24979.00	100.0%	24979.00	50862.70	0.4911	0.4289
3D	8	2/15/2013 17:20	1	16191	16191.00	97.0%	16699.16	50864.17	0.3283	0.3964
4A	1	2/15/2013 17:20	1	22414	22414.00	100.0%	22414.00	50864.14	0.4407	0.5128
4A	2	2/15/2013 17:28	1	24462	24462.00	98.7%	24783.50	50860.22	0.4873	0.5079
4A	3	2/15/2013 17:27	1	25519	25519.00	97.3%	26229.09	50861.15	0.5157	0.4974
4A	4	2/15/2013 17:23	1	25109	25109.00	93.6%	26818.23	50862.66	0.5273	0.4931
4A	5	2/15/2013 17:09	1	25709	25709.00	95.2%	27011.59	50869.83	0.5310	0.4771
4A	6	2/15/2013 17:16	1	23050	23050.00	99.3%	23220.26	50866.35	0.4565	0.4645
4A	7	2/15/2013 17:13	1	25348	25348.00	100.0%	25348.00	50867.64	0.4983	0.4368
4A	8	2/15/2013 17:11	1	16794	16794.00	97.0%	17321.08	50868.71	0.3405	0.4076
4B	1	2/15/2013 17:24	1	22758	22758.00	100.0%	22758.00	50862.63	0.4474	0.5134
4B	2	2/15/2013 17:20	1	24066	24066.00	98.7%	24382.30	50864.09	0.4794	0.5086
4B	3	2/15/2013 17:29	1	25905	25905.00	97.3%	26625.83	50860.18	0.5235	0.4983
4B	4	2/15/2013 17:27	1	25162	25162.00	93.6%	26874.83	50861.12	0.5284	0.4940
4B	5	2/15/2013 17:11	1	25354	25354.00	95.2%	26638.60	50868.66	0.5237	0.4783
4B	6	2/15/2013 17:09	1	23302	23302.00	99.3%	23474.12	50869.77	0.4615	0.4658
4B	7	2/15/2013 17:16	1	25359	25359.00	100.0%	25359.00	50866.30	0.4985	0.4386
4B	8	2/15/2013 17:13	1	16980	16980.00	97.0%	17512.92	50867.60	0.3443	0.4098
4C	1	2/15/2013 17:27	1	23173	23173.00	100.0%	23173.00	50861.10	0.4556	0.5244
4C	2	2/15/2013 17:24	1	25035	25035.00	98.7%	25364.03	50862.60	0.4987	0.5189
4C	3	2/15/2013 17:21	1	25859	25859.00	97.3%	26578.55	50864.07	0.5225	0.5073
4C	4	2/15/2013 17:29	1	25412	25412.00	93.6%	27141.85	50860.14	0.5337	0.5025
4C	5	2/15/2013 17:13	1	26023	26023.00	95.2%	27341.50	50867.55	0.5375	0.4847
4C	6	2/15/2013 17:11	1	23478	23478.00	99.3%	23651.42	50868.63	0.4650	0.4707
4C	7	2/15/2013 17:09	1	25643	25643.00	100.0%	25643.00	50869.71	0.5041	0.4399
4C	8	2/15/2013 17:16	1	16702	16702.00	97.0%	17226.19	50866.26	0.3387	0.4074
4D	1	2/15/2013 17:29	1	22653	22653.00	100.0%	22653.00	50860.10	0.4454	0.5205
4D	2	2/15/2013 17:27	1	24739	24739.00	98.7%	25064.14	50861.06	0.4928	0.5149
4D	3	2/15/2013 17:24	1	25941	25941.00	97.3%	26662.84	50862.55	0.5242	0.5032
4D	4	2/15/2013 17:21	1	25276	25276.00	93.6%	26996.60	50864.03	0.5308	0.4984
4D	5	2/15/2013 17:16	1	25947	25947.00	95.2%	27261.65	50866.22	0.5359	0.4804
4D	6	2/15/2013 17:13	1	23091	23091.00	99.3%	23261.56	50867.51	0.4573	0.4663
4D	7	2/15/2013 17:11	1	25813	25813.00	100.0%	25813.00	50868.58	0.5074	0.4352
4D	8	2/15/2013 17:09	1	16149	16149.00	97.0%	16655.84	50869.66	0.3274	0.4024
5A	1	2/15/2013 13:38	1	23403	23403.00	100.0%	23403.00	50972.23	0.4591	0.5263
5A	2	2/15/2013 14:12	1	25086	25086.00	98.7%	25415.70	50955.57	0.4988	0.5219
5A	3	2/15/2013 13:48	1	26469	26469.00	97.3%	27205.53	50967.40	0.5338	0.5124
5A	4	2/15/2013 13:45	1	25794	25794.00	93.6%	27549.86	50968.82	0.5405	0.5085
5A	5	2/15/2013 14:15	1	26347	26347.00	95.2%	27681.91	50953.88	0.5433	0.4940

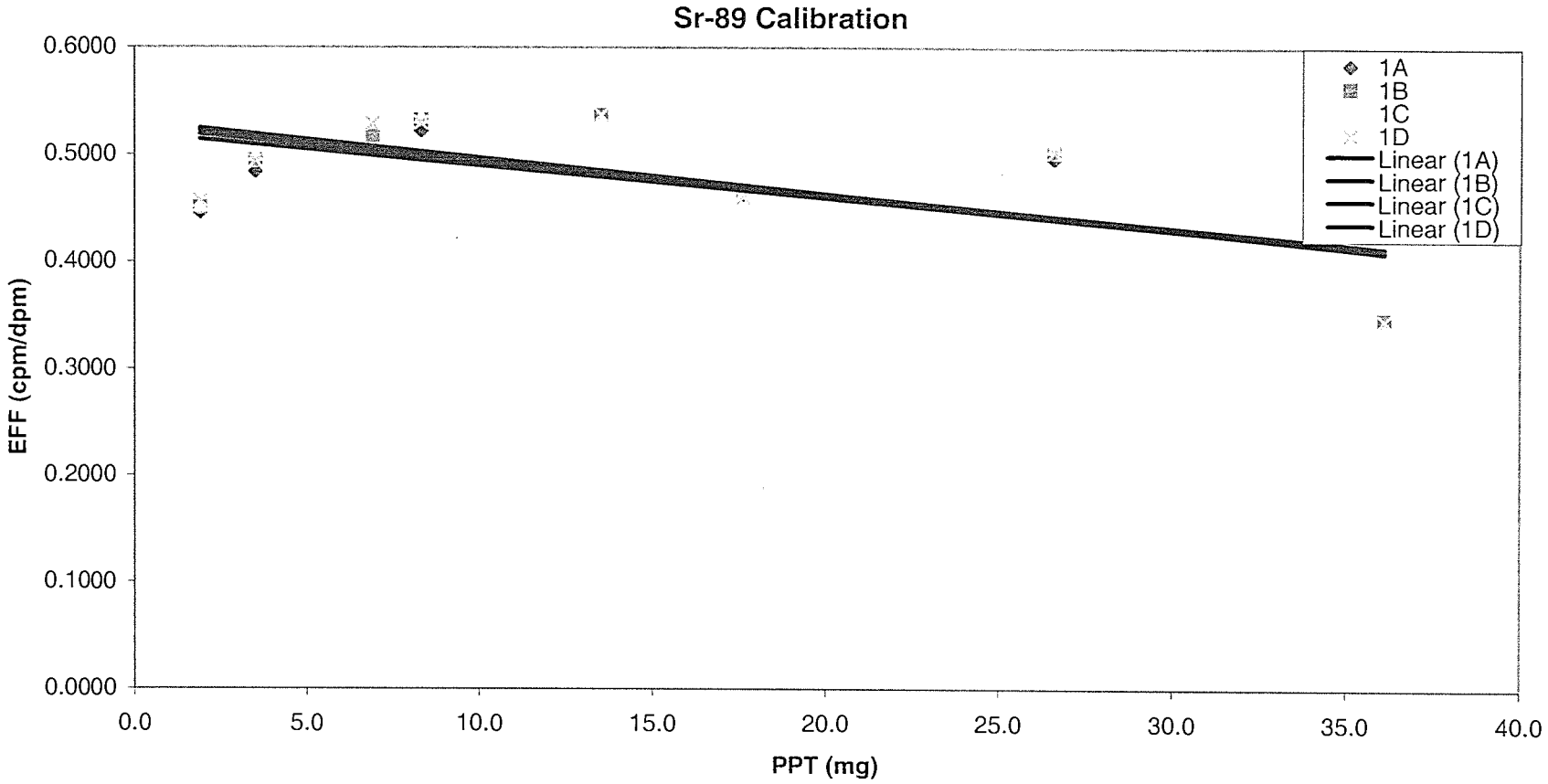
Detector (#)	Source ID (#)	Raw Count Data Start Time	Count Time (min)	Beta (counts)	Raw Beta (cpm)	Recovery (%)	Yield Corrected Sr-89 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-89 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
5A	6	2/15/2013 14:30	1	24007	24007.00	99.3%	24184.32	50946.54	0.4747	0.4826
5A	7	2/15/2013 14:27	1	26340	26340.00	100.0%	26340.00	50948.05	0.5170	0.4575
5A	8	2/15/2013 14:25	1	18123	18123.00	97.0%	18691.79	50949.39	0.3669	0.4310
5B	1	2/15/2013 13:45	1	23574	23574.00	100.0%	23574.00	50968.78	0.4625	0.5274
5B	2	2/15/2013 13:38	1	25221	25221.00	98.7%	25552.48	50972.23	0.5013	0.5227
5B	3	2/15/2013 14:12	1	26417	26417.00	97.3%	27152.08	50955.53	0.5329	0.5128
5B	4	2/15/2013 13:48	1	25811	25811.00	93.6%	27568.01	50967.35	0.5409	0.5088
5B	5	2/15/2013 14:25	1	26405	26405.00	95.2%	27742.85	50949.32	0.5445	0.4936
5B	6	2/15/2013 14:15	1	23663	23663.00	99.3%	23837.78	50953.83	0.4678	0.4817
5B	7	2/15/2013 14:31	1	26124	26124.00	100.0%	26124.00	50946.50	0.5128	0.4555
5B	8	2/15/2013 14:27	1	18167	18167.00	97.0%	18737.17	50947.99	0.3678	0.4279
5C	1	2/15/2013 13:48	1	23369	23369.00	100.0%	23369.00	50967.32	0.4585	0.5266
5C	2	2/15/2013 13:45	1	25051	25051.00	98.7%	25380.24	50968.73	0.4980	0.5217
5C	3	2/15/2013 13:38	1	26297	26297.00	97.3%	27028.74	50972.23	0.5303	0.5112
5C	4	2/15/2013 14:12	1	26150	26150.00	93.6%	27930.09	50955.49	0.5481	0.5069
5C	5	2/15/2013 14:28	1	26199	26199.00	95.2%	27526.42	50947.95	0.5403	0.4908
5C	6	2/15/2013 14:25	1	23488	23488.00	99.3%	23661.49	50949.26	0.4644	0.4782
5C	7	2/15/2013 14:16	1	25842	25842.00	100.0%	25842.00	50953.76	0.5072	0.4504
5C	8	2/15/2013 14:31	1	17798	17798.00	97.0%	18356.59	50946.45	0.3603	0.4211
5D	1	2/15/2013 14:12	1	23109	23109.00	100.0%	23109.00	50955.42	0.4535	0.5190
5D	2	2/15/2013 13:48	1	24806	24806.00	98.7%	25132.02	50967.28	0.4931	0.5147
5D	3	2/15/2013 13:45	1	26008	26008.00	97.3%	26731.70	50968.69	0.5245	0.5056
5D	4	2/15/2013 13:38	1	25558	25558.00	93.6%	27297.79	50972.23	0.5355	0.5018
5D	5	2/15/2013 14:31	1	26045	26045.00	95.2%	27364.61	50946.41	0.5371	0.4879
5D	6	2/15/2013 14:28	1	23651	23651.00	99.3%	23825.69	50947.63	0.4677	0.4768
5D	7	2/15/2013 14:25	1	25829	25829.00	100.0%	25829.00	50949.18	0.5070	0.4526
5D	8	2/15/2013 14:16	1	18148	18148.00	97.0%	18717.58	50953.71	0.3673	0.4271
6A	1	2/15/2013 14:16	1	22130	22130.00	100.0%	22130.00	50953.45	0.4343	0.4933
6A	2	2/15/2013 14:31	1	24034	24034.00	98.7%	24349.88	50946.16	0.4780	0.4901
6A	3	2/15/2013 14:28	1	24798	24798.00	97.3%	25488.03	50947.64	0.5003	0.4835
6A	4	2/15/2013 14:26	1	24454	24454.00	93.6%	26118.64	50948.80	0.5126	0.4807
6A	5	2/15/2013 13:38	1	24903	24903.00	95.2%	26164.75	50972.02	0.5133	0.4706
6A	6	2/15/2013 14:13	1	22477	22477.00	99.3%	22643.02	50954.98	0.4444	0.4625
6A	7	2/15/2013 13:48	1	24857	24857.00	100.0%	24857.00	50966.92	0.4877	0.4449
6A	8	2/15/2013 13:45	1	18846	18846.00	97.0%	19437.48	50968.41	0.3814	0.4263
6B	1	2/15/2013 14:26	1	22530	22530.00	100.0%	22530.00	50948.63	0.4422	0.5126
6B	2	2/15/2013 14:16	1	25573	25573.00	98.7%	25909.10	50953.38	0.5085	0.5090
6B	3	2/15/2013 14:31	1	25565	25565.00	97.3%	26276.37	50946.11	0.5158	0.5014
6B	4	2/15/2013 14:28	1	25190	25190.00	93.6%	26904.74	50947.58	0.5281	0.4982
6B	5	2/15/2013 13:46	1	25651	25651.00	95.2%	26950.65	50968.31	0.5288	0.4865
6B	6	2/15/2013 13:41	1	23552	23552.00	99.3%	23725.96	50970.56	0.4655	0.4773
6B	7	2/15/2013 14:13	1	25638	25638.00	100.0%	25638.00	50954.91	0.5032	0.4571
6B	8	2/15/2013 13:49	1	19075	19075.00	97.0%	19673.67	50966.85	0.3860	0.4358
6C	1	2/15/2013 14:28	1	22479	22479.00	100.0%	22479.00	50947.53	0.4412	0.5091
6C	2	2/15/2013 14:26	1	24382	24382.00	98.7%	24702.45	50948.63	0.4849	0.5050
6C	3	2/15/2013 14:17	1	25764	25764.00	97.3%	26480.91	50953.28	0.5197	0.4964
6C	4	2/15/2013 14:31	1	25070	25070.00	93.6%	26776.57	50946.05	0.5256	0.4928
6C	5	2/15/2013 13:49	1	25538	25538.00	95.2%	26831.93	50966.78	0.5265	0.4796
6C	6	2/15/2013 13:46	1	23213	23213.00	99.3%	23384.46	50968.22	0.4588	0.4692
6C	7	2/15/2013 13:38	1	25525	25525.00	100.0%	25525.00	50972.02	0.5008	0.4463
6C	8	2/15/2013 14:13	1	17935	17935.00	97.0%	18497.89	50954.86	0.3630	0.4221
6D	1	2/15/2013 14:32	1	11648	11648.00	100.0%	11648.00	50946.01	0.2286	0.3015
6D	2	2/15/2013 14:29	1	13066	13066.00	98.7%	13237.72	50947.40	0.2598	0.2955
6D	3	2/15/2013 14:26	1	12930	12930.00	97.3%	13289.79	50948.60	0.2608	0.2828
6D	4	2/15/2013 14:17	1	15725	15725.00	93.6%	16795.44	50953.26	0.3296	0.2776
6D	5	2/15/2013 14:13	1	12091	12091.00	95.2%	12703.61	50954.81	0.2493	0.2581
6D	6	2/15/2013 13:50	1	17778	17778.00	99.3%	17909.31	50966.02	0.3514	0.2428
6D	7	2/15/2013 13:46	1	16245	16245.00	100.0%	16245.00	50968.15	0.3187	0.2091
6D	8	2/15/2013 13:38	1	2109	2109.00	97.0%	2175.19	50972.03	0.0427	0.1736
7A	1	2/15/2013 14:40	1	23154	23154.00	100.0%	23154.00	50942.13	0.4545	0.5239
7A	2	2/15/2013 14:57	1	24947	24947.00	98.7%	25274.87	50933.78	0.4962	0.5194
7A	3	2/15/2013 14:54	1	26400	26400.00	97.3%	27134.61	50935.10	0.5327	0.5097
7A	4	2/15/2013 14:51	1	25726	25726.00	93.6%	27477.23	50936.44	0.5394	0.5058
7A	5	2/15/2013 15:00	1	26121	26121.00	95.2%	27444.46	50932.43	0.5388	0.4910
7A	6	2/15/2013 15:13	1	23722	23722.00	99.3%	23897.22	50925.78	0.4693	0.4794
7A	7	2/15/2013 15:09	1	26485	26485.00	100.0%	26485.00	50927.86	0.5200	0.4538
7A	8	2/15/2013 15:05	1	17724	17724.00	97.0%	18280.27	50929.64	0.3589	0.4269
7B	1	2/15/2013 14:51	1	23235	23235.00	100.0%	23235.00	50936.42	0.4562	0.5241
7B	2	2/15/2013 14:40	1	25027	25027.00	98.7%	25355.93	50941.89	0.4977	0.5193
7B	3	2/15/2013 14:57	1	26374	26374.00	97.3%	27107.89	50933.73	0.5322	0.5090
7B	4	2/15/2013 14:54	1	25565	25565.00	93.6%	27305.27	50935.08	0.5361	0.5048
7B	5	2/15/2013 15:06	1	25913	25913.00	95.2%	27225.93	50929.20	0.5346	0.4890
7B	6	2/15/2013 15:00	1	23710	23710.00	99.3%	23885.13	50932.39	0.4690	0.4766
7B	7	2/15/2013 15:13	1	26047	26047.00	100.0%	26047.00	50925.78	0.5115	0.4494
7B	8	2/15/2013 15:09	1	17556	17556.00	97.0%	18107.00	50927.83	0.3555	0.4206
7C	1	2/15/2013 14:54	1	23070	23070.00	100.0%	23070.00	50934.94	0.4529	0.5213

Detector (#)	Source ID (#)	Raw Count Data Start Time	Count Time (min)	Beta (counts)	Raw Beta (cpm)	Recovery (%)	Yield Corrected Sr-89 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-89 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
7C	2	2/15/2013 14:52	1	24941	24941.00	98.7%	25268.80	50936.26	0.4961	0.5165
7C	3	2/15/2013 14:41	1	25992	25992.00	97.3%	26715.26	50941.51	0.5244	0.5063
7C	4	2/15/2013 14:57	1	25550	25550.00	93.6%	27289.25	50933.71	0.5358	0.5020
7C	5	2/15/2013 15:09	1	26073	26073.00	95.2%	27394.03	50927.78	0.5379	0.4864
7C	6	2/15/2013 15:06	1	23471	23471.00	99.3%	23644.37	50929.17	0.4643	0.4741
7C	7	2/15/2013 15:00	1	25731	25731.00	100.0%	25731.00	50932.34	0.5052	0.4470
7C	8	2/15/2013 15:13	1	17544	17544.00	97.0%	18094.62	50925.73	0.3553	0.4184
7D	1	2/15/2013 14:57	1	22969	22969.00	100.0%	22969.00	50933.67	0.4510	0.5216
7D	2	2/15/2013 14:54	1	25017	25017.00	98.7%	25345.79	50934.88	0.4976	0.5168
7D	3	2/15/2013 14:52	1	26248	26248.00	97.3%	26978.38	50936.26	0.5296	0.5067
7D	4	2/15/2013 14:41	1	25375	25375.00	93.6%	27102.33	50941.33	0.5320	0.5025
7D	5	2/15/2013 15:14	1	25995	25995.00	95.2%	27312.08	50925.62	0.5363	0.4870
7D	6	2/15/2013 15:09	1	23670	23670.00	99.3%	23844.84	50927.74	0.4682	0.4748
7D	7	2/15/2013 15:06	1	25810	25810.00	100.0%	25810.00	50929.13	0.5068	0.4479
7D	8	2/15/2013 15:00	1	17546	17546.00	97.0%	18096.68	50932.31	0.3553	0.4195
8A	1	2/15/2013 15:00	1	22652	22652.00	100.0%	22652.00	50932.27	0.4447	0.5143
8A	2	2/15/2013 15:14	1	24637	24637.00	98.7%	24960.80	50925.54	0.4901	0.5098
8A	3	2/15/2013 15:09	1	25565	25565.00	97.3%	26276.37	50927.64	0.5160	0.5002
8A	4	2/15/2013 15:07	1	25423	25423.00	93.6%	27153.60	50929.02	0.5332	0.4962
8A	5	2/15/2013 14:45	1	25896	25896.00	95.2%	27208.06	50939.61	0.5341	0.4814
8A	6	2/15/2013 14:57	1	23169	23169.00	99.3%	23340.13	50933.62	0.4582	0.4698
8A	7	2/15/2013 14:55	1	25611	25611.00	100.0%	25611.00	50934.81	0.5028	0.4443
8A	8	2/15/2013 14:52	1	17494	17494.00	97.0%	18043.05	50936.23	0.3542	0.4174
8B	1	2/15/2013 15:07	1	22319	22319.00	100.0%	22319.00	50928.99	0.4382	0.5087
8B	2	2/15/2013 15:00	1	24615	24615.00	98.7%	24938.51	50932.22	0.4896	0.5037
8B	3	2/15/2013 15:14	1	25451	25451.00	97.3%	26159.20	50925.42	0.5137	0.4931
8B	4	2/15/2013 15:09	1	24461	24461.00	93.6%	26126.12	50927.61	0.5130	0.4888
8B	5	2/15/2013 14:52	1	25258	25258.00	95.2%	26537.74	50936.18	0.5210	0.4727
8B	6	2/15/2013 14:45	1	22990	22990.00	99.3%	23159.81	50939.55	0.4547	0.4600
8B	7	2/15/2013 14:57	1	25222	25222.00	100.0%	25222.00	50933.57	0.4952	0.4320
8B	8	2/15/2013 14:55	1	16601	16601.00	97.0%	17122.02	50934.75	0.3362	0.4026
8C	1	2/15/2013 15:10	1	22927	22927.00	100.0%	22927.00	50927.57	0.4502	0.5208
8C	2	2/15/2013 15:07	1	25010	25010.00	98.7%	25338.70	50928.95	0.4975	0.5164
8C	3	2/15/2013 15:00	1	26237	26237.00	97.3%	26967.07	50932.19	0.5295	0.5068
8C	4	2/15/2013 15:14	1	25433	25433.00	93.6%	27164.28	50925.42	0.5334	0.5029
8C	5	2/15/2013 14:55	1	26120	26120.00	95.2%	27443.41	50934.67	0.5388	0.4883
8C	6	2/15/2013 14:52	1	23608	23608.00	99.3%	23782.38	50936.11	0.4669	0.4768
8C	7	2/15/2013 14:45	1	26024	26024.00	100.0%	26024.00	50939.45	0.5109	0.4516
8C	8	2/15/2013 14:57	1	17848	17848.00	97.0%	18408.16	50933.53	0.3614	0.4249
8D	1	2/15/2013 15:14	1	23697	23697.00	100.0%	23697.00	50925.42	0.4653	0.5332
8D	2	2/15/2013 15:10	1	25697	25697.00	98.7%	26034.73	50927.53	0.5112	0.5284
8D	3	2/15/2013 15:07	1	26831	26831.00	97.3%	27577.60	50928.92	0.5415	0.5182
8D	4	2/15/2013 15:00	1	26060	26060.00	93.6%	27833.96	50932.14	0.5465	0.5139
8D	5	2/15/2013 14:57	1	26234	26234.00	95.2%	27563.19	50933.49	0.5412	0.4983
8D	6	2/15/2013 14:55	1	23718	23718.00	99.3%	23893.19	50934.64	0.4691	0.4859
8D	7	2/15/2013 14:52	1	26787	26787.00	100.0%	26787.00	50936.06	0.5259	0.4588
8D	8	2/15/2013 14:45	1	18085	18085.00	97.0%	18652.60	50939.40	0.3662	0.4302
9A	1	2/15/2013 12:54	1	23046	23046.00	100.0%	23046.00	50993.19	0.4519	0.5206
9A	2	2/15/2013 13:04	1	25056	25056.00	98.7%	25385.31	50988.47	0.4979	0.5173
9A	3	2/15/2013 13:00	1	26656	26656.00	97.3%	27397.73	50990.45	0.5373	0.5103
9A	4	2/15/2013 12:57	1	25929	25929.00	93.6%	27694.05	50991.87	0.5431	0.5074
9A	5	2/15/2013 13:07	1	26267	26267.00	95.2%	27597.86	50987.08	0.5413	0.4968
9A	6	2/15/2013 13:17	1	23993	23993.00	99.3%	24170.22	50982.11	0.4741	0.4883
9A	7	2/15/2013 13:14	1	26420	26420.00	100.0%	26420.00	50983.52	0.5182	0.4698
9A	8	2/15/2013 13:10	1	19631	19631.00	97.0%	20247.12	50985.51	0.3971	0.4503
9B	1	2/15/2013 12:57	1	22752	22752.00	100.0%	22752.00	50991.83	0.4462	0.5071
9B	2	2/15/2013 12:54	1	24464	24464.00	98.7%	24785.53	50993.19	0.4861	0.5039
9B	3	2/15/2013 13:04	1	25548	25548.00	97.3%	26258.90	50988.45	0.5150	0.4971
9B	4	2/15/2013 13:00	1	25161	25161.00	93.6%	26873.77	50990.41	0.5270	0.4943
9B	5	2/15/2013 13:10	1	25785	25785.00	95.2%	27091.44	50985.46	0.5314	0.4839
9B	6	2/15/2013 13:07	1	23221	23221.00	99.3%	23392.52	50987.03	0.4588	0.4757
9B	7	2/15/2013 13:17	1	25852	25852.00	100.0%	25852.00	50982.05	0.5071	0.4577
9B	8	2/15/2013 13:14	1	19119	19119.00	97.0%	19719.05	50983.48	0.3868	0.4387
9C	1	2/15/2013 13:00	1	22898	22898.00	100.0%	22898.00	50990.37	0.4491	0.5117
9C	2	2/15/2013 12:57	1	24745	24745.00	98.7%	25070.22	50991.71	0.4917	0.5084
9C	3	2/15/2013 12:54	1	25810	25810.00	97.3%	26528.19	50993.19	0.5202	0.5015
9C	4	2/15/2013 13:04	1	25450	25450.00	93.6%	27182.44	50988.39	0.5331	0.4986
9C	5	2/15/2013 13:14	1	26012	26012.00	95.2%	27329.94	50983.43	0.5361	0.4880
9C	6	2/15/2013 13:10	1	23438	23438.00	99.3%	23611.12	50985.41	0.4631	0.4797
9C	7	2/15/2013 13:07	1	25678	25678.00	100.0%	25678.00	50986.97	0.5036	0.4613
9C	8	2/15/2013 13:17	1	19493	19493.00	97.0%	20104.79	50982.00	0.3944	0.4420
9D	1	2/15/2013 13:04	1	22005	22005.00	100.0%	22005.00	50988.37	0.4316	0.4903
9D	2	2/15/2013 13:00	1	23660	23660.00	98.7%	23970.96	50990.33	0.4701	0.4874
9D	3	2/15/2013 12:58	1	24728	24728.00	97.3%	25416.08	50991.64	0.4984	0.4814
9D	4	2/15/2013 12:54	1	24408	24408.00	93.6%	26069.51	50993.19	0.5112	0.4789
9D	5	2/15/2013 13:18	1	24915	24915.00	95.2%	26177.36	50981.96	0.5135	0.4697

Raw Count Data											
Detector (#)	Source ID (#)	Start Time	Count Time (min)	Beta (counts)	Raw Beta (cpm)	Recovery (%)	Yield Corrected Sr-89 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-89 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
9D	6	2/15/2013 13:15	1	22693	22693.00	99.3%	22860.62	50983.38	0.4484	0.4624
9D	7	2/15/2013 13:10	1	25159	25159.00	100.0%	25159.00	50985.39	0.4935	0.4465
9D	8	2/15/2013 13:07	1	18766	18766.00	97.0%	19354.97	50986.91	0.3796	0.4297
10A	1	2/15/2013 13:07	1	22993	22993.00	100.0%	22993.00	50986.88	0.4510	0.5156
10A	2	2/15/2013 13:18	1	24908	24908.00	98.7%	25235.36	50981.83	0.4950	0.5124
10A	3	2/15/2013 13:15	1	25972	25972.00	97.3%	26694.70	50983.34	0.5236	0.5056
10A	4	2/15/2013 13:11	1	25551	25551.00	93.6%	27290.32	50985.34	0.5353	0.5028
10A	5	2/15/2013 12:54	1	26172	26172.00	95.2%	27498.05	50993.17	0.5392	0.4923
10A	6	2/15/2013 13:04	1	24100	24100.00	99.3%	24278.01	50988.32	0.4761	0.4841
10A	7	2/15/2013 13:00	1	26093	26093.00	100.0%	26093.00	50990.27	0.5117	0.4661
10A	8	2/15/2013 12:58	1	19475	19475.00	97.0%	20086.22	50991.60	0.3939	0.4470
10B	1	2/15/2013 13:11	1	22828	22828.00	100.0%	22828.00	50985.31	0.4477	0.5123
10B	2	2/15/2013 13:07	1	24594	24594.00	98.7%	24917.24	50986.84	0.4887	0.5090
10B	3	2/15/2013 13:18	1	25749	25749.00	97.3%	26465.49	50981.83	0.5191	0.5020
10B	4	2/15/2013 13:15	1	25497	25497.00	93.6%	27232.64	50983.30	0.5341	0.4991
10B	5	2/15/2013 12:58	1	26074	26074.00	95.2%	27395.08	50991.54	0.5372	0.4883
10B	6	2/15/2013 12:54	1	23956	23956.00	99.3%	24132.95	50993.17	0.4733	0.4798
10B	7	2/15/2013 13:05	1	25717	25717.00	100.0%	25717.00	50988.27	0.5044	0.4611
10B	8	2/15/2013 13:00	1	19206	19206.00	97.0%	19808.78	50990.23	0.3885	0.4414
10C	1	2/15/2013 13:15	1	22920	22920.00	100.0%	22920.00	50983.26	0.4496	0.5136
10C	2	2/15/2013 13:11	1	24784	24784.00	98.7%	25109.73	50985.27	0.4925	0.5104
10C	3	2/15/2013 13:08	1	25610	25610.00	97.3%	26322.63	50986.80	0.5163	0.5038
10C	4	2/15/2013 13:18	1	25623	25623.00	93.6%	27367.22	50981.83	0.5368	0.5010
10C	5	2/15/2013 13:01	1	26296	26296.00	95.2%	27628.33	50990.18	0.5418	0.4908
10C	6	2/15/2013 12:58	1	23777	23777.00	99.3%	23952.63	50991.49	0.4697	0.4827
10C	7	2/15/2013 12:54	1	26396	26396.00	100.0%	26396.00	50993.17	0.5176	0.4650
10C	8	2/15/2013 13:05	1	19243	19243.00	97.0%	19846.94	50988.24	0.3892	0.4463
10D	1	2/15/2013 13:18	1	22791	22791.00	100.0%	22791.00	50981.78	0.4470	0.5126
10D	2	2/15/2013 13:15	1	24951	24951.00	98.7%	25278.93	50983.22	0.4958	0.5097
10D	3	2/15/2013 13:11	1	26000	26000.00	97.3%	26723.48	50985.23	0.5241	0.5037
10D	4	2/15/2013 13:08	1	25540	25540.00	93.6%	27278.57	50986.75	0.5350	0.5012
10D	5	2/15/2013 13:05	1	25889	25889.00	95.2%	27200.71	50988.18	0.5335	0.4919
10D	6	2/15/2013 13:01	1	23854	23854.00	99.3%	24030.19	50990.14	0.4713	0.4846
10D	7	2/15/2013 12:58	1	26394	26394.00	100.0%	26394.00	50991.44	0.5176	0.4686
10D	8	2/15/2013 12:54	1	19760	19760.00	97.0%	20380.17	50993.17	0.3997	0.4517
11A	1	2/15/2013 12:26	1	19465	19465.00	100.0%	19465.00	51007.16	0.3816	0.4304
11A	2	2/15/2013 12:37	1	20978	20978.00	98.7%	21253.71	51001.72	0.4167	0.4286
11A	3	2/15/2013 12:34	1	21798	21798.00	97.3%	22404.55	51003.25	0.4393	0.4248
11A	4	2/15/2013 12:30	1	21585	21585.00	93.6%	23054.34	51004.95	0.4520	0.4233
11A	5	2/15/2013 12:39	1	22052	22052.00	95.2%	23169.30	51000.53	0.4543	0.4174
11A	6	2/15/2013 12:48	1	20207	20207.00	99.3%	20356.26	50996.49	0.3992	0.4128
11A	7	2/15/2013 12:45	1	21925	21925.00	100.0%	21925.00	50997.59	0.4299	0.4028
11A	8	2/15/2013 12:43	1	17769	17769.00	97.0%	18326.68	50998.96	0.3594	0.3921
11B	1	2/15/2013 12:30	1	22955	22955.00	100.0%	22955.00	51004.91	0.4501	0.5077
11B	2	2/15/2013 12:26	1	24624	24624.00	98.7%	24947.63	51007.09	0.4891	0.5053
11B	3	2/15/2013 12:37	1	25818	25818.00	97.3%	26536.41	51001.67	0.5203	0.5002
11B	4	2/15/2013 12:34	1	25455	25455.00	93.6%	27187.78	51003.21	0.5331	0.4981
11B	5	2/15/2013 12:43	1	25722	25722.00	95.2%	27025.25	50998.90	0.5299	0.4902
11B	6	2/15/2013 12:39	1	23486	23486.00	99.3%	23659.48	51000.49	0.4639	0.4841
11B	7	2/15/2013 12:48	1	26243	26243.00	100.0%	26243.00	50996.44	0.5146	0.4705
11B	8	2/15/2013 12:45	1	20341	20341.00	97.0%	20979.40	50997.52	0.4114	0.4562
11C	1	2/15/2013 12:34	1	22849	22849.00	100.0%	22849.00	51003.17	0.4480	0.5084
11C	2	2/15/2013 12:30	1	24747	24747.00	98.7%	25072.25	51004.83	0.4916	0.5055
11C	3	2/15/2013 12:26	1	25794	25794.00	97.3%	26511.75	51007.04	0.5198	0.4994
11C	4	2/15/2013 12:37	1	25259	25259.00	93.6%	26978.44	51001.63	0.5290	0.4969
11C	5	2/15/2013 12:46	1	25754	25754.00	95.2%	27058.87	50997.48	0.5306	0.4876
11C	6	2/15/2013 12:43	1	23292	23292.00	99.3%	23464.04	50998.79	0.4601	0.4803
11C	7	2/15/2013 12:39	1	26032	26032.00	100.0%	26032.00	51000.45	0.5104	0.4642
11C	8	2/15/2013 12:48	1	19787	19787.00	97.0%	20408.02	50996.40	0.4002	0.4472
11D	1	2/15/2013 12:37	1	23032	23032.00	100.0%	23032.00	51001.60	0.4516	0.5100
11D	2	2/15/2013 12:34	1	24975	24975.00	98.7%	25303.24	51003.13	0.4961	0.5079
11D	3	2/15/2013 12:31	1	26164	26164.00	97.3%	26892.04	51004.78	0.5272	0.5036
11D	4	2/15/2013 12:26	1	25392	25392.00	93.6%	27120.49	51006.98	0.5317	0.5018
11D	5	2/15/2013 12:48	1	26139	26139.00	95.2%	27463.38	50996.36	0.5385	0.4951
11D	6	2/15/2013 12:46	1	23587	23587.00	99.3%	23761.22	50997.43	0.4659	0.4899
11D	7	2/15/2013 12:43	1	26126	26126.00	100.0%	26126.00	50998.71	0.5123	0.4784
11D	8	2/15/2013 12:40	1	21236	21236.00	97.0%	21902.49	51000.41	0.4295	0.4662
12B	1	2/15/2013 12:43	1	11423	11423.00	100.0%	11423.00	50998.62	0.2240	0.2534
12B	2	2/15/2013 12:40	1	12283	12283.00	98.7%	12444.43	51000.35	0.2440	0.2527
12B	3	2/15/2013 12:48	1	13000	13000.00	97.3%	13361.74	50996.30	0.2620	0.2511
12B	4	2/15/2013 12:46	1	12474	12474.00	93.6%	13323.13	50997.35	0.2613	0.2505
12B	5	2/15/2013 12:31	1	13323	13323.00	95.2%	13998.03	51004.70	0.2744	0.2481
12B	6	2/15/2013 12:26	1	12524	12524.00	99.3%	12616.51	51006.87	0.2473	0.2462
12B	7	2/15/2013 12:37	1	12656	12656.00	100.0%	12656.00	51001.51	0.2481	0.2421
12B	8	2/15/2013 12:35	1	10909	10909.00	97.0%	11251.38	51002.78	0.2206	0.2377
12C	1	2/15/2013 12:46	1	10621	10621.00	100.0%	10621.00	50997.31	0.2083	0.2324

Detector (#)	Source ID (#)	Raw Count Data Start Time	Count Time (min)	Beta (counts)	Raw Beta (cpm)	Recovery (%)	Yield Corrected Sr-89 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-89 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
12C	2	2/15/2013 12:43	1	10886	10886.00	98.7%	11029.07	50998.58	0.2163	0.2293
12C	3	2/15/2013 12:40	1	10093	10093.00	97.3%	10373.85	51000.32	0.2034	0.2226
12C	4	2/15/2013 12:48	1	12768	12768.00	93.6%	13637.15	50996.26	0.2674	0.2199
12C	5	2/15/2013 12:35	1	11356	11356.00	95.2%	11931.37	51002.73	0.2339	0.2097
12C	6	2/15/2013 12:31	1	10436	10436.00	99.3%	10513.08	51004.66	0.2061	0.2017
12C	7	2/15/2013 12:26	1	8655	8655.00	100.0%	8655.00	51006.80	0.1697	0.1841
12C	8	2/15/2013 12:37	1	7925	7925.00	97.0%	8173.73	51001.47	0.1603	0.1655
12D	1	2/15/2013 12:48	1	22275	22275.00	100.0%	22275.00	50996.21	0.4368	0.4874
12D	2	2/15/2013 12:46	1	23929	23929.00	98.7%	24243.50	50997.26	0.4754	0.4857
12D	3	2/15/2013 12:43	1	24816	24816.00	97.3%	25506.53	50998.52	0.5001	0.4823
12D	4	2/15/2013 12:40	1	24308	24308.00	93.6%	25962.70	51000.28	0.5091	0.4809
12D	5	2/15/2013 12:37	1	25022	25022.00	95.2%	26289.78	51001.42	0.5155	0.4756
12D	6	2/15/2013 12:35	1	22695	22695.00	99.3%	22862.63	51002.67	0.4483	0.4715
12D	7	2/15/2013 12:31	1	25156	25156.00	100.0%	25156.00	51004.58	0.4932	0.4624
12D	8	2/15/2013 12:27	1	20790	20790.00	97.0%	21442.50	51006.74	0.4204	0.4528
13A	1	2/15/2013 11:39	1	22743	22743.00	100.0%	22743.00	51030.02	0.4457	0.5033
13A	2	2/15/2013 11:49	1	24809	24809.00	98.7%	25135.06	51024.88	0.4926	0.5019
13A	3	2/15/2013 11:47	1	26030	26030.00	97.3%	26754.31	51025.93	0.5243	0.4988
13A	4	2/15/2013 11:45	1	25231	25231.00	93.6%	26948.53	51027.01	0.5281	0.4976
13A	5	2/15/2013 12:12	1	25679	25679.00	95.2%	26980.07	51013.70	0.5289	0.4929
13A	6	2/15/2013 12:22	1	23601	23601.00	99.3%	23775.33	51009.16	0.4661	0.4892
13A	7	2/15/2013 12:19	1	26108	26108.00	100.0%	26108.00	51010.44	0.5118	0.4810
13A	8	2/15/2013 12:16	1	21741	21741.00	97.0%	22423.34	51011.99	0.4396	0.4725
13B	1	2/15/2013 11:45	1	23326	23326.00	100.0%	23326.00	51026.99	0.4571	0.5143
13B	2	2/15/2013 11:39	1	25000	25000.00	98.7%	25328.57	51029.95	0.4963	0.5129
13B	3	2/15/2013 11:49	1	26432	26432.00	97.3%	27167.50	51024.83	0.5324	0.5100
13B	4	2/15/2013 11:47	1	25874	25874.00	93.6%	27635.30	51025.87	0.5416	0.5087
13B	5	2/15/2013 12:16	1	26690	26690.00	95.2%	28042.29	51011.93	0.5497	0.5042
13B	6	2/15/2013 12:12	1	24326	24326.00	99.3%	24505.68	51013.66	0.4804	0.5006
13B	7	2/15/2013 12:22	1	26586	26586.00	100.0%	26586.00	51009.10	0.5212	0.4927
13B	8	2/15/2013 12:19	1	22201	22201.00	97.0%	22897.78	51010.30	0.4489	0.4843
13C	1	2/15/2013 11:47	1	23080	23080.00	100.0%	23080.00	51025.84	0.4523	0.5099
13C	2	2/15/2013 11:45	1	24850	24850.00	98.7%	25176.60	51026.95	0.4934	0.5081
13C	3	2/15/2013 11:39	1	26077	26077.00	97.3%	26802.62	51029.89	0.5252	0.5041
13C	4	2/15/2013 11:49	1	25534	25534.00	93.6%	27272.16	51024.79	0.5345	0.5025
13C	5	2/15/2013 12:19	1	26440	26440.00	95.2%	27779.63	51010.25	0.5446	0.4965
13C	6	2/15/2013 12:16	1	23843	23843.00	99.3%	24019.11	51011.90	0.4709	0.4917
13C	7	2/15/2013 12:12	1	25844	25844.00	100.0%	25844.00	51013.62	0.5066	0.4813
13C	8	2/15/2013 12:22	1	21603	21603.00	97.0%	22281.01	51009.05	0.4368	0.4702
13D	1	2/15/2013 11:49	1	22759	22759.00	100.0%	22759.00	51024.77	0.4460	0.4983
13D	2	2/15/2013 11:47	1	24457	24457.00	98.7%	24778.43	51025.80	0.4856	0.4970
13D	3	2/15/2013 11:45	1	25628	25628.00	97.3%	26341.13	51026.90	0.5162	0.4942
13D	4	2/15/2013 11:39	1	25066	25066.00	93.6%	26772.30	51029.83	0.5246	0.4930
13D	5	2/15/2013 12:22	1	25723	25723.00	95.2%	27026.30	51009.00	0.5298	0.4888
13D	6	2/15/2013 12:19	1	23187	23187.00	99.3%	23358.27	51010.21	0.4579	0.4854
13D	7	2/15/2013 12:16	1	25552	25552.00	100.0%	25552.00	51011.79	0.5009	0.4780
13D	8	2/15/2013 12:12	1	21943	21943.00	97.0%	22631.68	51013.58	0.4436	0.4701
14A	1	2/15/2013 12:12	1	21875	21875.00	100.0%	21875.00	51013.88	0.4288	0.4926
14A	2	2/15/2013 12:22	1	24524	24524.00	98.7%	24846.32	51008.96	0.4871	0.4919
14A	3	2/15/2013 12:18	1	25512	25512.00	97.3%	26221.90	51010.63	0.5140	0.4903
14A	4	2/15/2013 12:16	1	24999	24999.00	93.6%	26700.74	51011.71	0.5234	0.4896
14A	5	2/15/2013 11:39	1	25660	25660.00	95.2%	26960.11	51029.77	0.5283	0.4872
14A	6	2/15/2013 11:50	1	23262	23262.00	99.3%	23433.82	51024.72	0.4593	0.4853
14A	7	2/15/2013 11:47	1	25922	25922.00	100.0%	25922.00	51025.75	0.5080	0.4811
14A	8	2/15/2013 11:45	1	22048	22048.00	97.0%	22739.98	51026.84	0.4456	0.4767
14B	1	2/15/2013 12:16	1	23056	23056.00	100.0%	23056.00	51011.67	0.4520	0.5052
14B	2	2/15/2013 12:12	1	24712	24712.00	98.7%	25036.79	51013.83	0.4908	0.5041
14B	3	2/15/2013 12:22	1	25936	25936.00	97.3%	26657.70	51008.92	0.5226	0.5020
14B	4	2/15/2013 12:19	1	25683	25683.00	93.6%	27431.30	51010.58	0.5378	0.5011
14B	5	2/15/2013 11:45	1	25954	25954.00	95.2%	27269.00	51026.78	0.5344	0.4977
14B	6	2/15/2013 11:39	1	23872	23872.00	99.3%	24048.33	51029.70	0.4713	0.4951
14B	7	2/15/2013 11:50	1	26271	26271.00	100.0%	26271.00	51024.67	0.5149	0.4893
14B	8	2/15/2013 11:48	1	22456	22456.00	97.0%	23160.78	51025.67	0.4539	0.4832
14C	1	2/15/2013 12:19	1	22999	22999.00	100.0%	22999.00	51010.54	0.4509	0.5104
14C	2	2/15/2013 12:16	1	25216	25216.00	98.7%	25547.41	51011.62	0.5008	0.5091
14C	3	2/15/2013 12:12	1	26170	26170.00	97.3%	26898.21	51013.79	0.5273	0.5062
14C	4	2/15/2013 12:22	1	25729	25729.00	93.6%	27480.43	51008.89	0.5387	0.5050
14C	5	2/15/2013 11:48	1	26457	26457.00	95.2%	27797.49	51025.63	0.5448	0.5005
14C	6	2/15/2013 11:45	1	23806	23806.00	99.3%	23981.84	51026.73	0.4700	0.4971
14C	7	2/15/2013 11:39	1	26330	26330.00	100.0%	26330.00	51029.60	0.5160	0.4894
14C	8	2/15/2013 11:50	1	22288	22288.00	97.0%	22987.51	51024.61	0.4505	0.4813
14D	1	2/15/2013 12:22	1	22297	22297.00	100.0%	22297.00	51008.86	0.4371	0.4895
14D	2	2/15/2013 12:19	1	24355	24355.00	98.7%	24675.09	51010.51	0.4837	0.4890
14D	3	2/15/2013 12:17	1	25319	25319.00	97.3%	26023.53	51011.58	0.5101	0.4877
14D	4	2/15/2013 12:12	1	24492	24492.00	93.6%	26159.23	51013.75	0.5128	0.4872
14D	5	2/15/2013 11:50	1	25239	25239.00	95.2%	26517.78	51024.57	0.5197	0.4853

Detector (#)	Source ID (#)	Raw Count Data Start Time	Count Time (min)	Beta (counts)	Raw Beta (cpm)	Recovery (%)	Yield Corrected Sr-89 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-89 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
14D	6	2/15/2013 11:48	1	23452	23452.00	99.3%	23625.23	51025.59	0.4630	0.4839
14D	7	2/15/2013 11:45	1	25637	25637.00	100.0%	25637.00	51026.68	0.5024	0.4806
14D	8	2/15/2013 11:40	1	22338	22338.00	97.0%	23039.08	51029.54	0.4515	0.4772

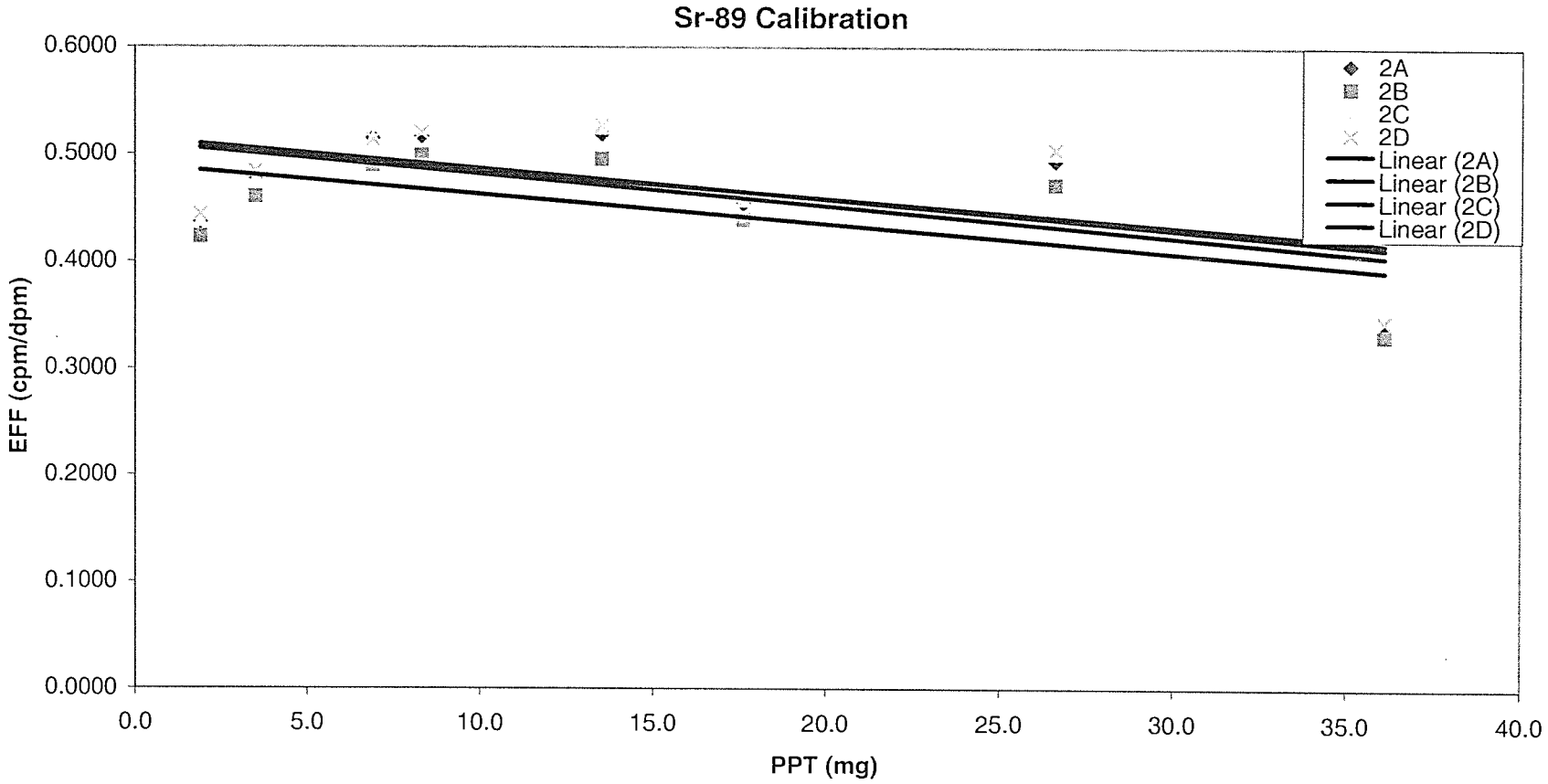


1A y = -3.005961E-03x + 5.200147E-01

1B y = -3.080004E-03x + 5.249165E-01

1C y = -3.366481E-03x + 5.309699E-01

1D y = -3.264044E-03x + 5.286987E-01

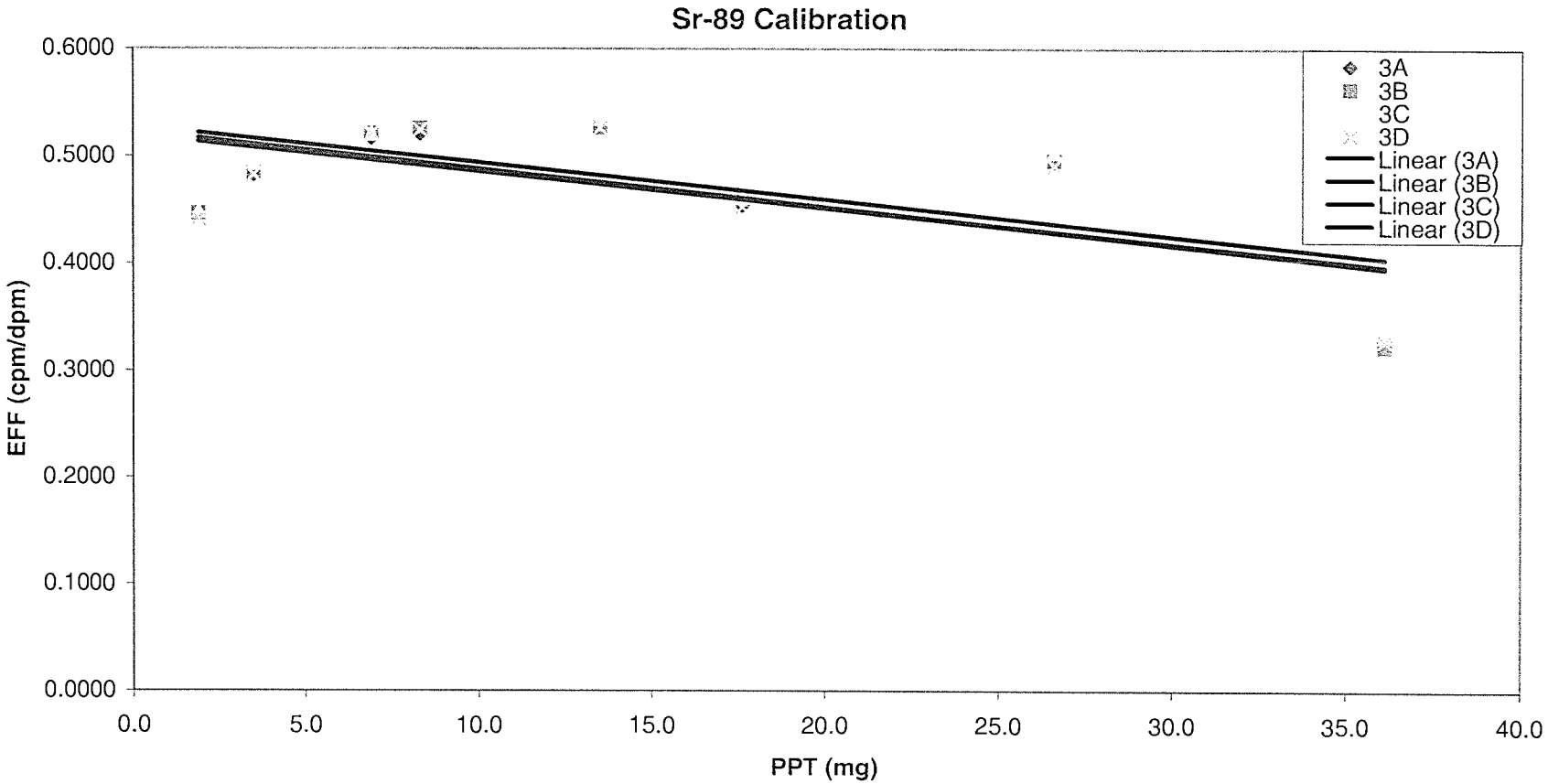


2A y = -2.928324E-03x + 5.108792E-01

2B y = -2.726292E-03x + 4.901900E-01

2C y = -2.610435E-03x + 5.110680E-01

2D y = -2.840738E-03x + 5.152130E-01

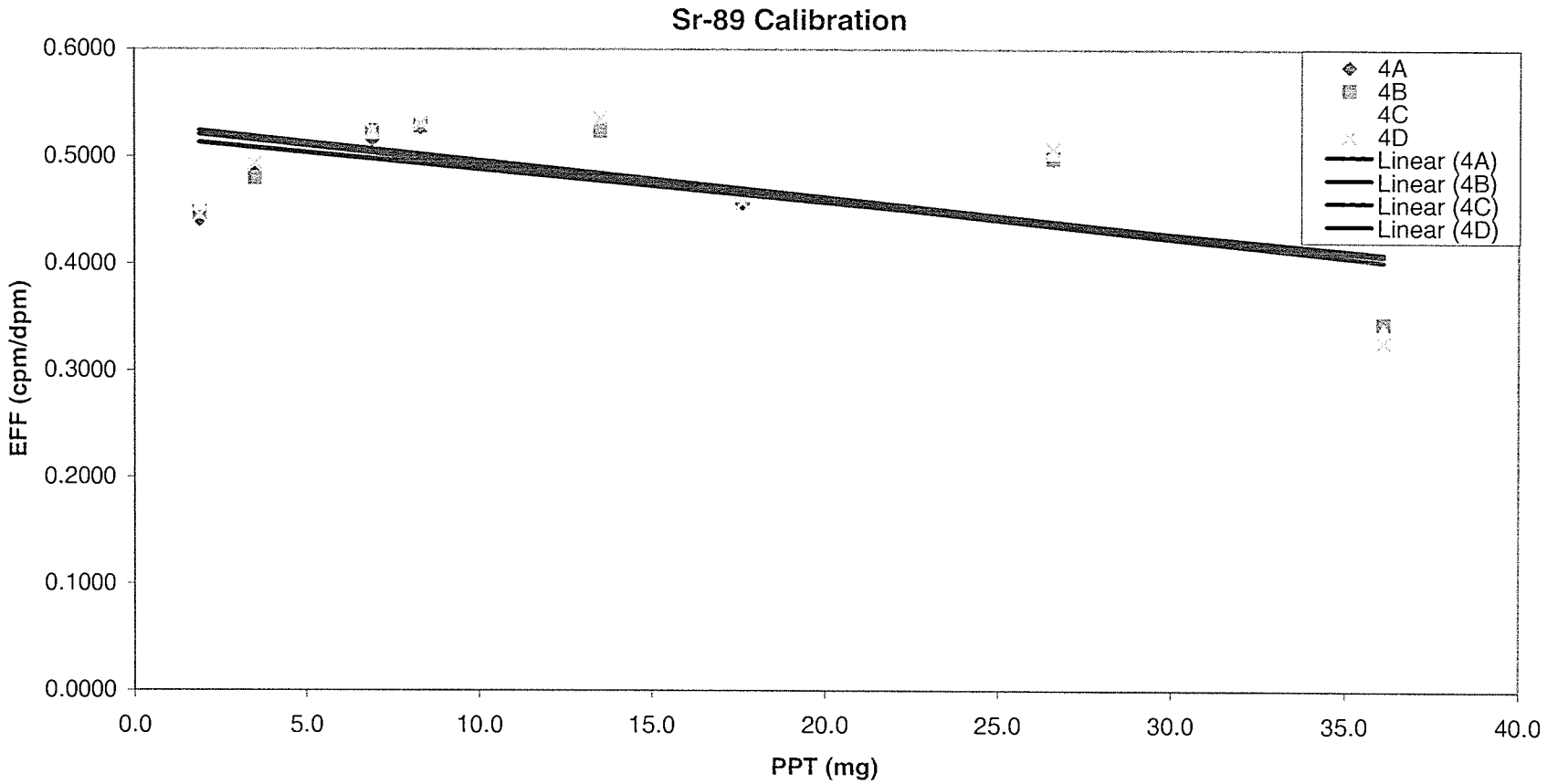


3A y = -3.397329E-03x + 5.200735E-01

3B y = -3.549394E-03x + 5.235380E-01

3C y = -3.425019E-03x + 5.282955E-01

3D y = -3.418573E-03x + 5.198403E-01

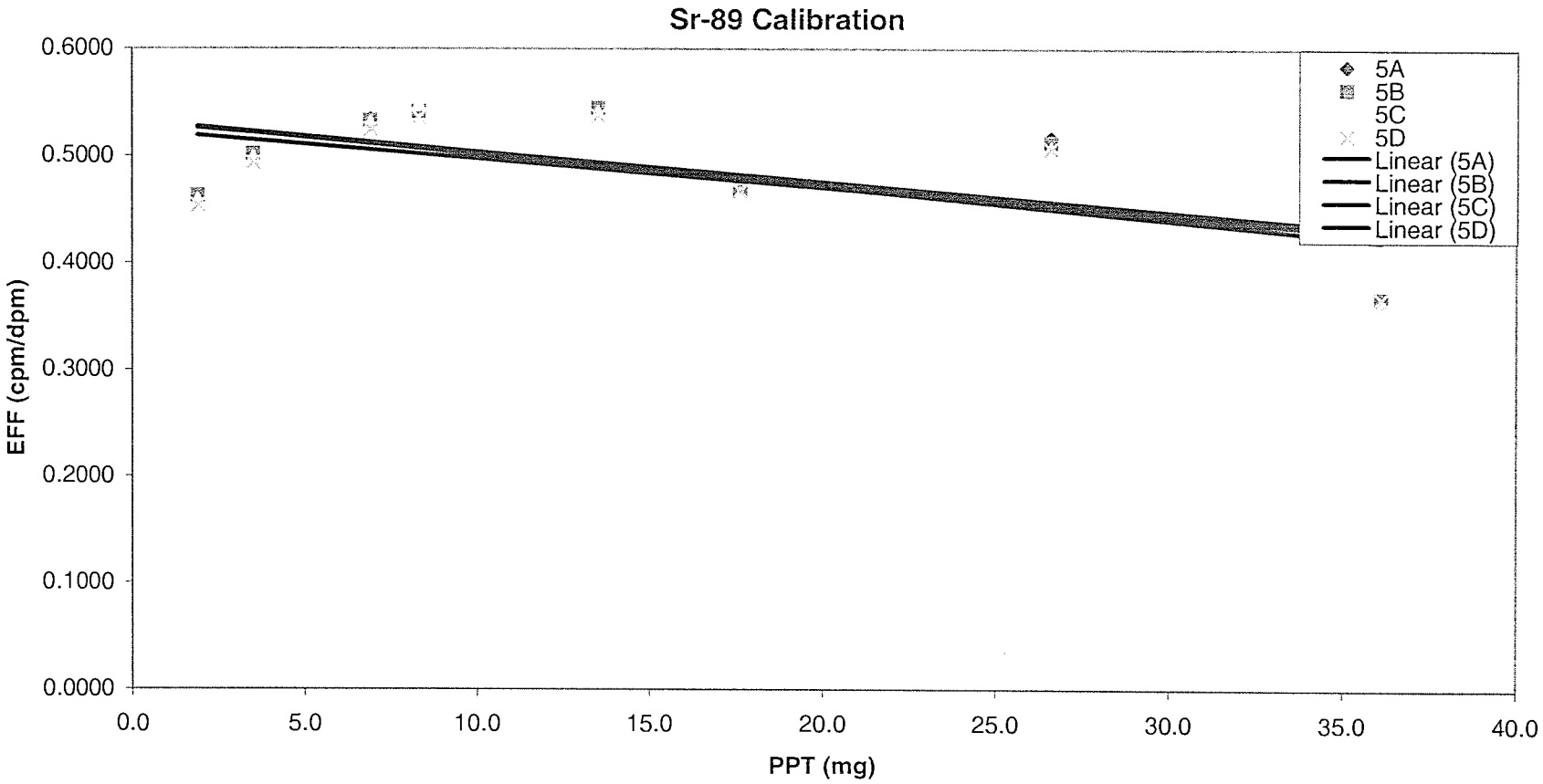


4A y = -3.075203E-03x + 5.186287E-01

4B y = -3.030756E-03x + 5.191729E-01

4C y = -3.419356E-03x + 5.308582E-01

4D y = -3.451883E-03x + 5.270219E-01

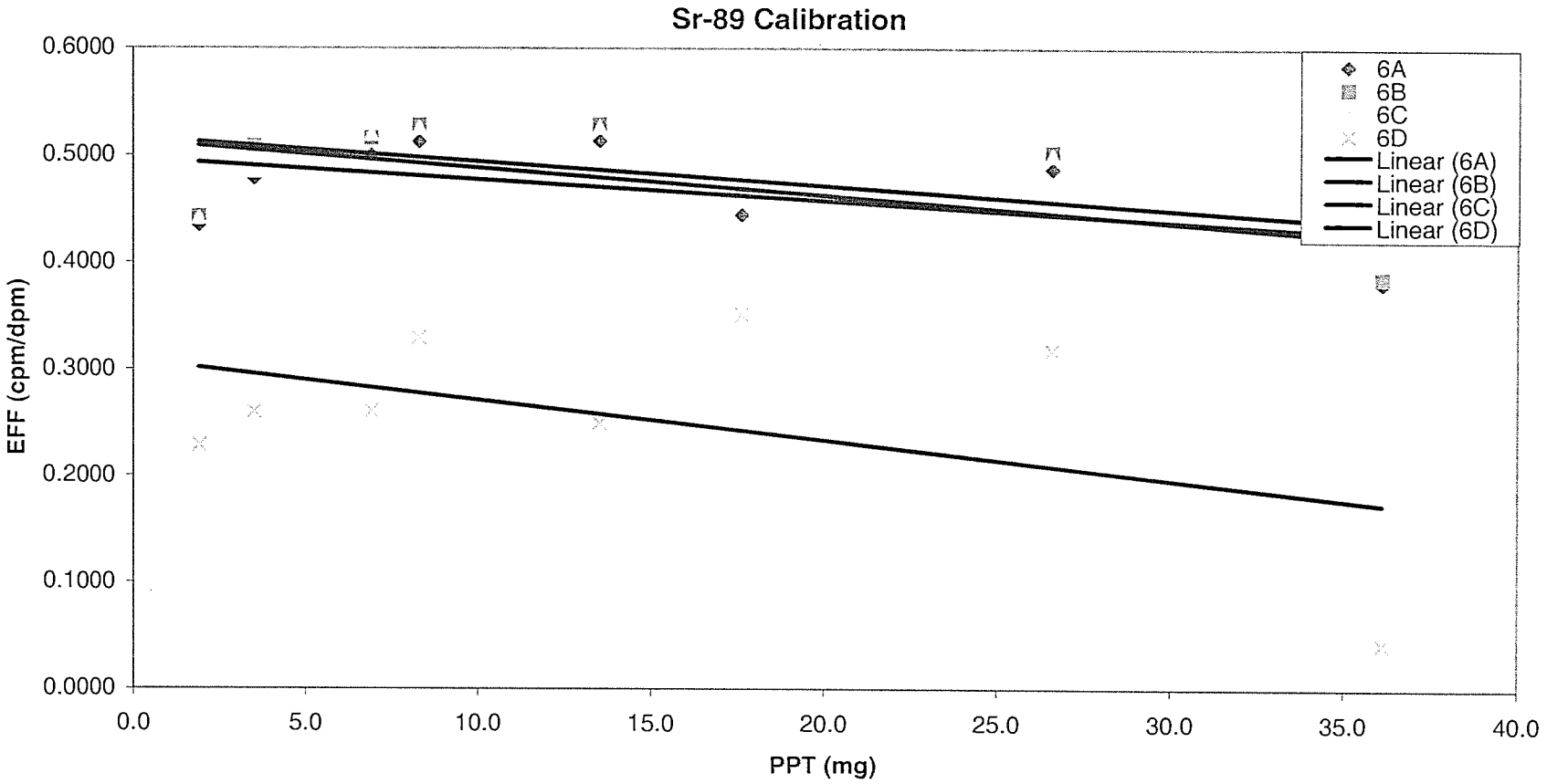


5A y = -2.786676E-03x + 5.316072E-01

5B y = -2.907347E-03x + 5.328835E-01

5C y = -3.085316E-03x + 5.324992E-01

5D y = -2.688295E-03x + 5.241561E-01

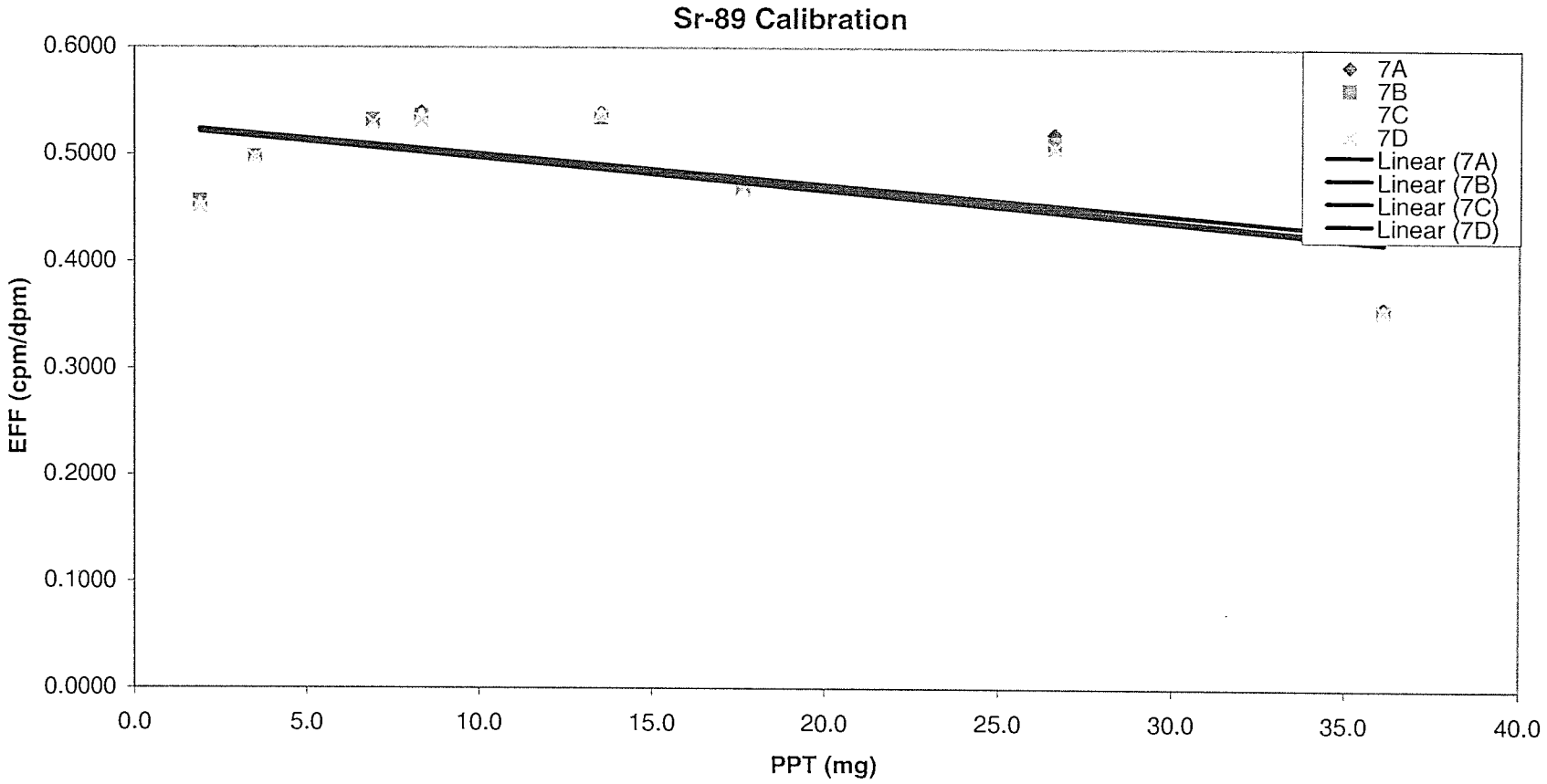


6A y = -1.958586E-03x + 4.970023E-01

6B y = -2.245183E-03x + 5.168520E-01

6C y = -2.542606E-03x + 5.139116E-01

6D y = -3.741354E-03x + 3.086324E-01

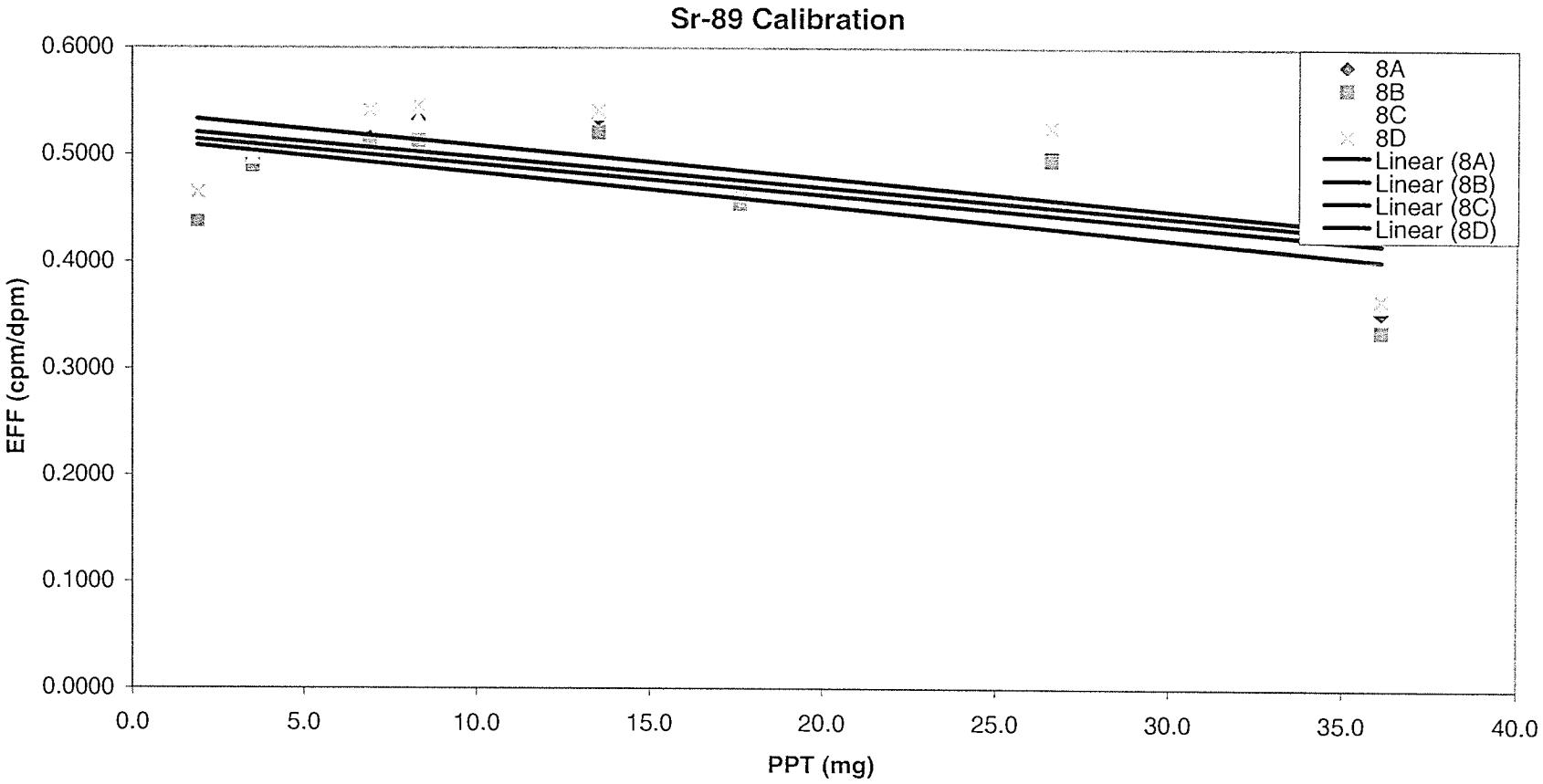


7A y = -2.837544E-03x + 5.293261E-01

7B y = -3.027427E-03x + 5.298861E-01

7C y = -3.010349E-03x + 5.270355E-01

7D y = -2.984826E-03x + 5.272911E-01

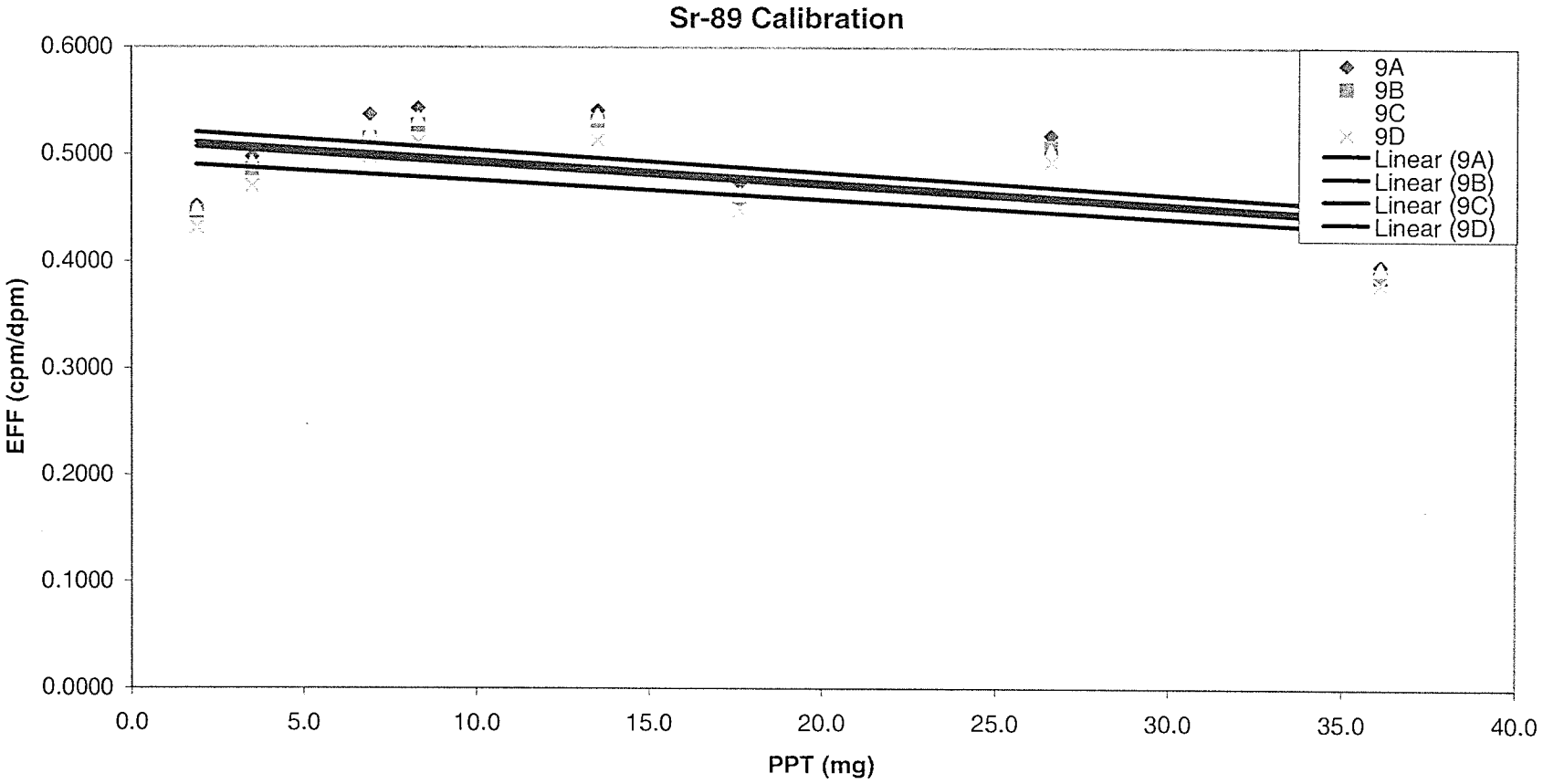


8A y = -2.835923E-03x + 5.197323E-01

8B y = -3.101285E-03x + 5.145438E-01

8C y = -2.803963E-03x + 5.261718E-01

8D y = -3.013335E-03x + 5.389462E-01

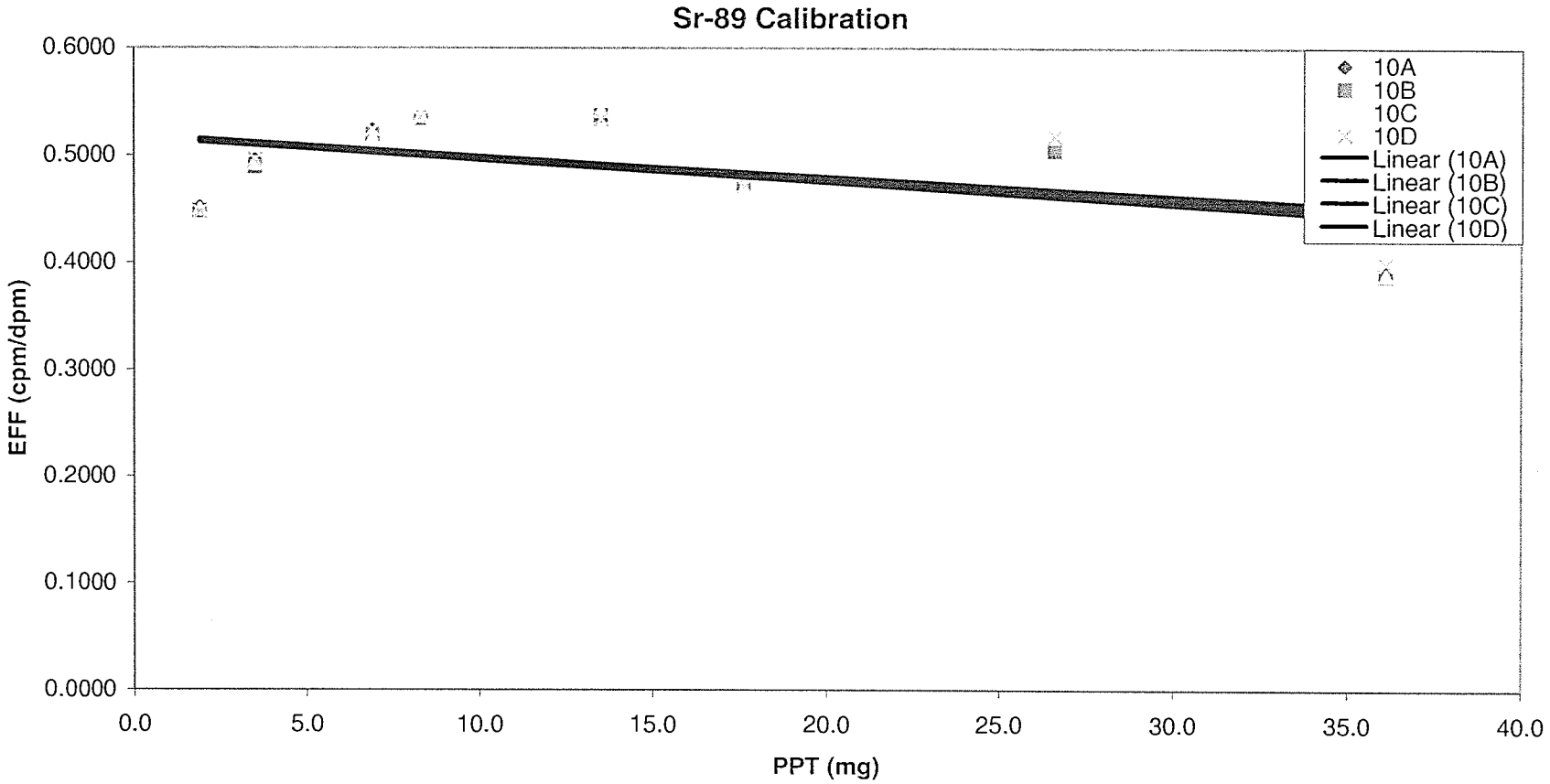


9A y = -2.054823E-03x + 5.244978E-01

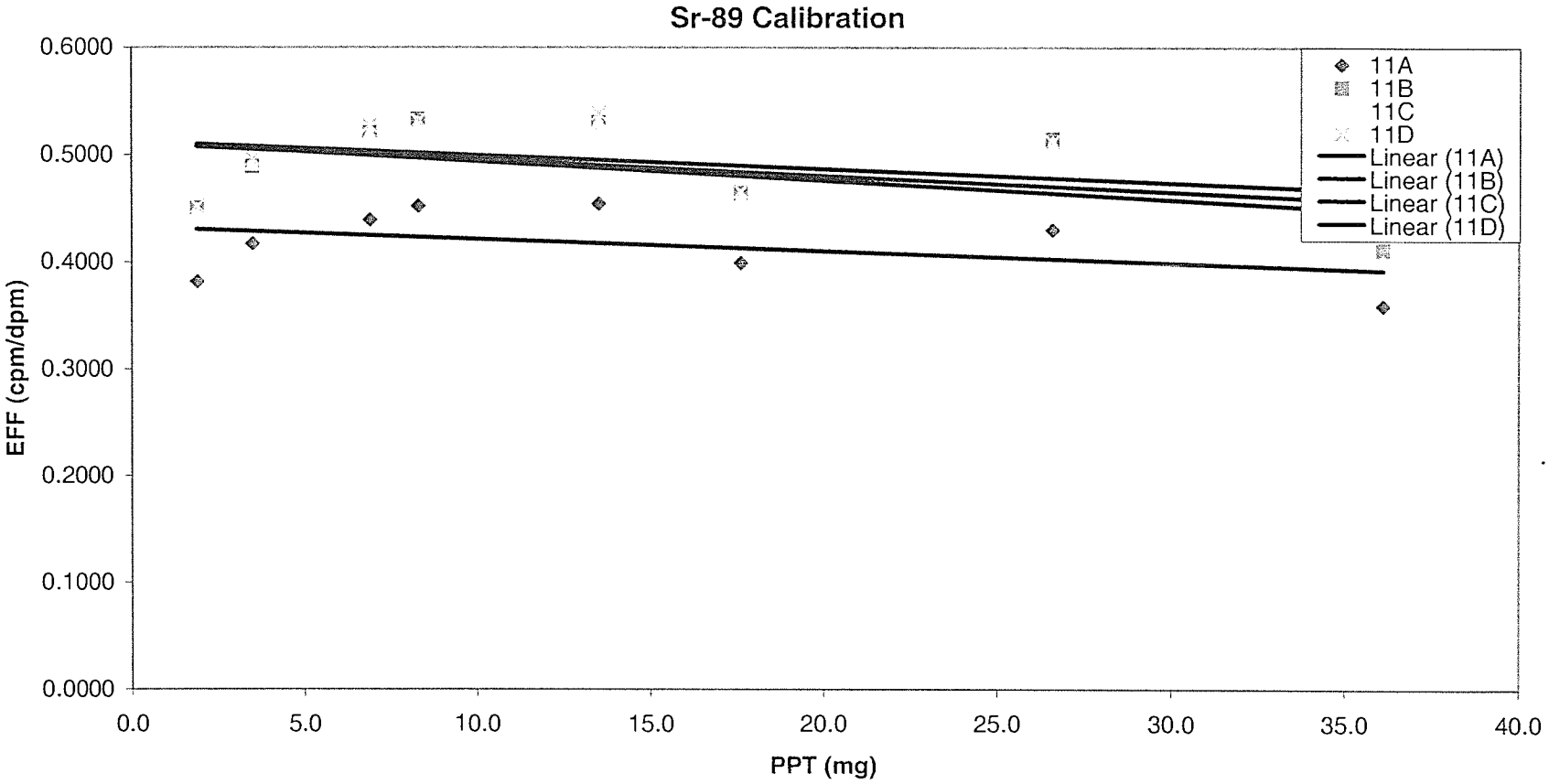
9B y = -1.999215E-03x + 5.108739E-01

9C y = -2.037484E-03x + 5.155334E-01

9D y = -1.771991E-03x + 4.936228E-01



10A	y = -2.004084E-03x + 5.193880E-01
10B	y = -2.073233E-03x + 5.162797E-01
10C	y = -1.966967E-03x + 5.173243E-01
10D	y = -1.780592E-03x + 5.159685E-01

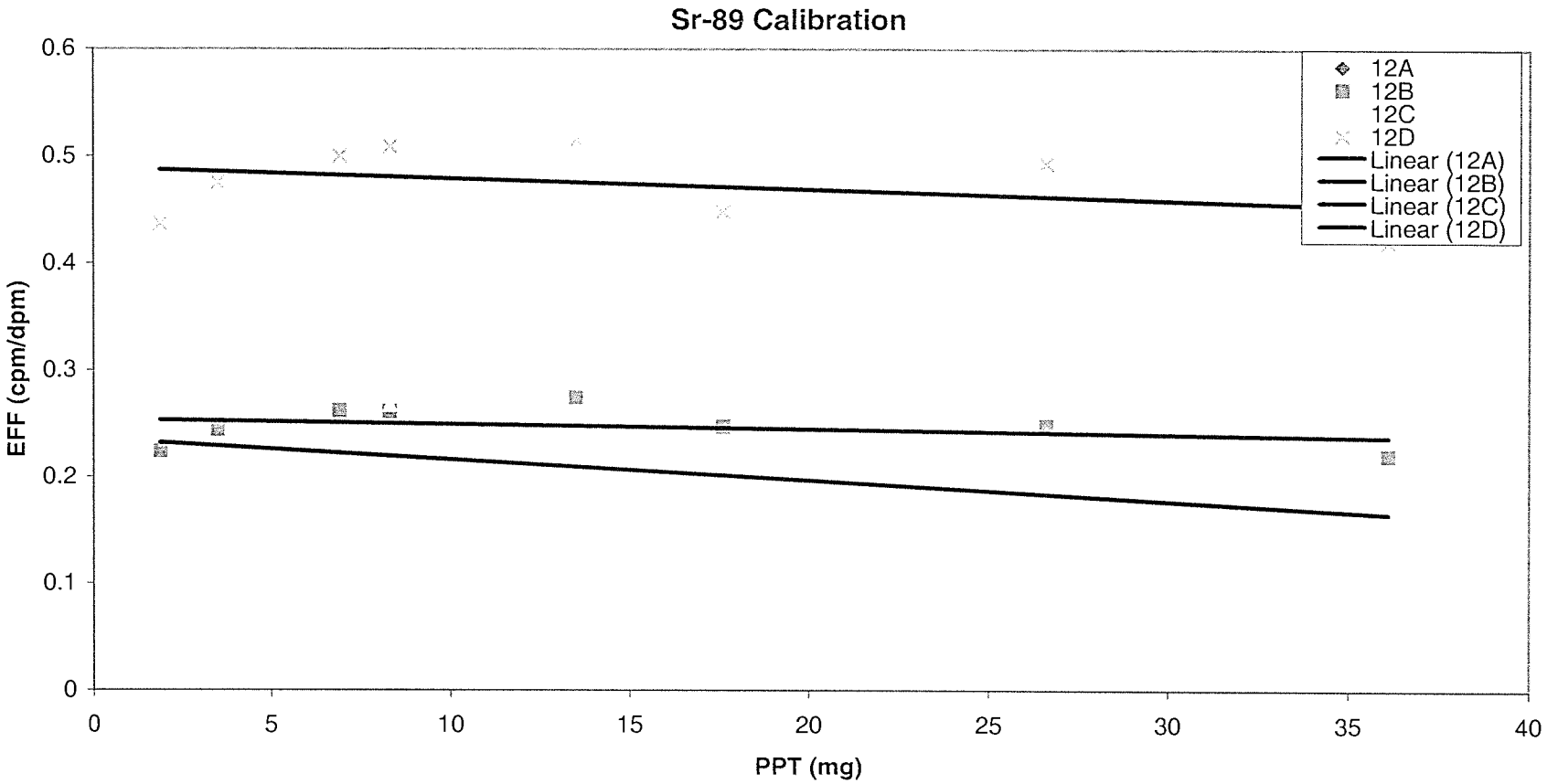


11A y = -1.120388E-03x + 4.325664E-01

11B y = -1.508069E-03x + 5.106068E-01

11C y = -1.789395E-03x + 5.117872E-01

11D y = -1.280551E-03x + 5.124197E-01

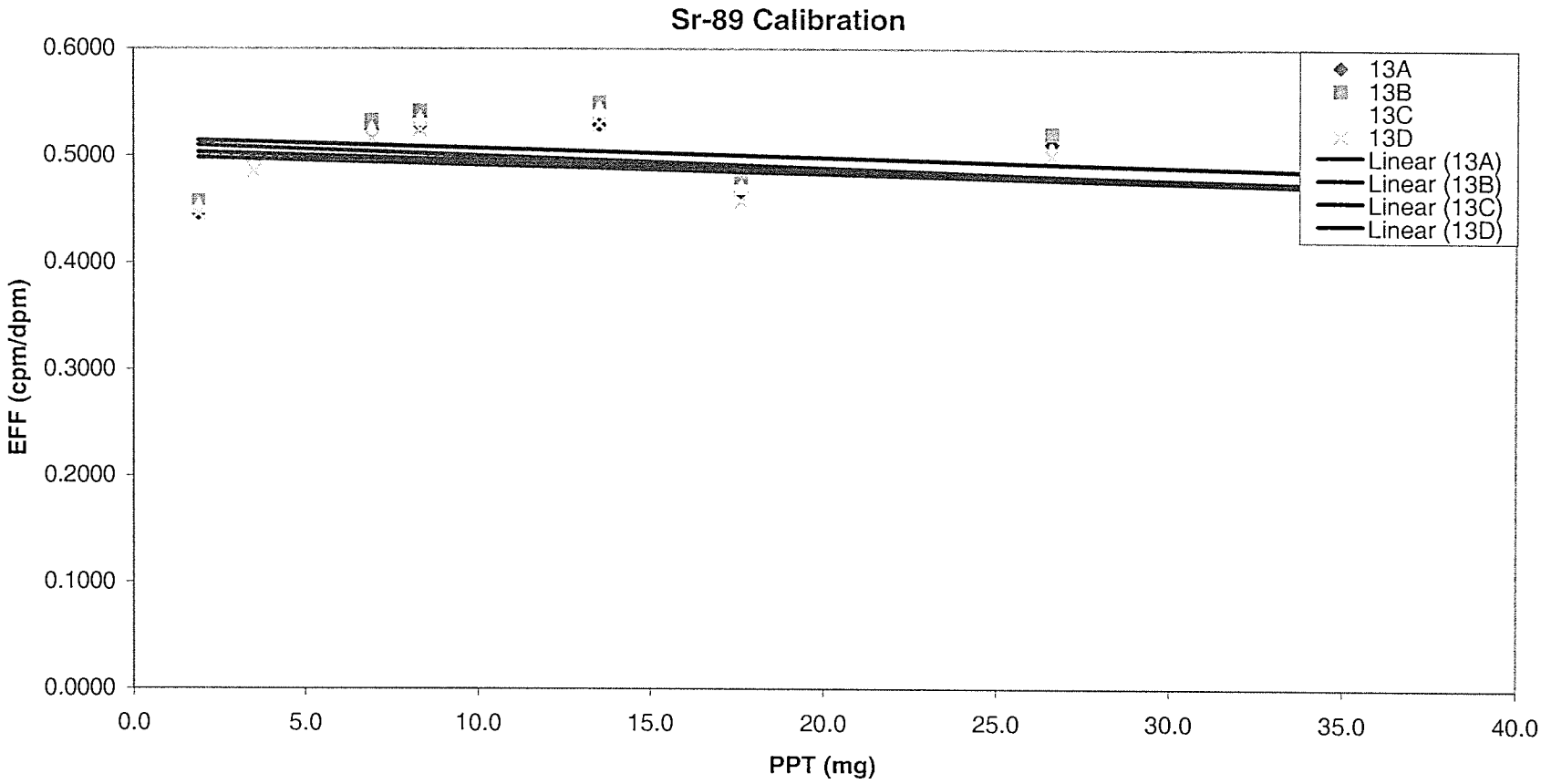


12A

12B y = -4.613917E-04x + 2.543237E-01

12C y = -1.955441E-03x + 2.361321E-01

12D y = -1.008951E-03x + 4.892691E-01

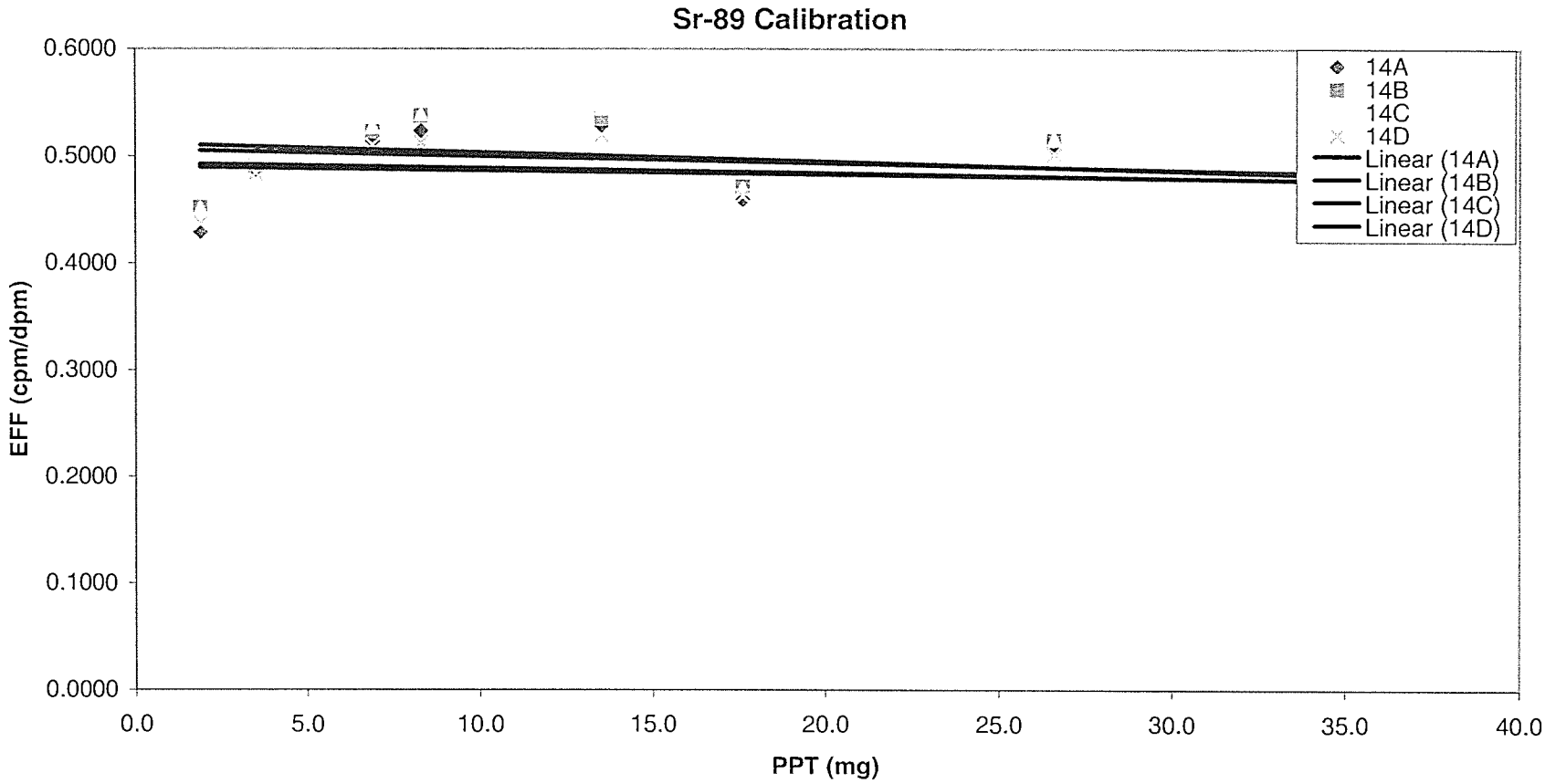


13A y = -9.030103E-04x + 5.050504E-01

13B y = -8.773138E-04x + 5.160069E-01

13C y = -1.160236E-03x + 5.121285E-01

13D y = -8.242116E-04x + 4.998858E-01



14A	y = -4.660381E-04x + 4.934923E-01
14B	y = -6.436680E-04x + 5.064001E-01
14C	y = -8.515606E-04x + 5.120459E-01
14D	y = -3.622979E-04x + 4.902315E-01

Current Calibration - PIC

Geometry	Tuffryn Filter				
Sr-89	**Cal Date**	3/1/2013	**Exp Date**	2/29/2016	
Protean	A0	A1	A2	A3	A4
1A	5.200147E-01	-3.005961E-03			
1B	5.249165E-01	-3.080004E-03			
1C	5.309699E-01	-3.366481E-03			
1D	5.286987E-01	-3.264044E-03			
2A	5.108792E-01	-2.928324E-03			
2B	4.901900E-01	-2.726292E-03			
2C	5.110680E-01	-2.610435E-03			
2D	5.152130E-01	-2.840738E-03			
3A	5.200735E-01	-3.397329E-03			
3B	5.235380E-01	-3.549394E-03			
3C	5.282955E-01	-3.425019E-03			
3D	5.198403E-01	-3.418573E-03			
4A	5.186287E-01	-3.075203E-03			
4B	5.191729E-01	-3.030756E-03			
4C	5.308582E-01	-3.419356E-03			
4D	5.270219E-01	-3.451883E-03			
5A	5.316072E-01	-2.786676E-03			
5B	5.328835E-01	-2.907347E-03			
5C	5.324992E-01	-3.085316E-03			
5D	5.241561E-01	-2.688295E-03			
6A	4.970023E-01	-1.958586E-03			
6B	5.168520E-01	-2.245183E-03			
6C	5.139116E-01	-2.542606E-03			
6D	3.086324E-01	-3.741354E-03			
7A	5.293261E-01	-2.837544E-03			
7B	5.298861E-01	-3.027427E-03			
7C	5.270355E-01	-3.010349E-03			
7D	5.272911E-01	-2.984826E-03			
8A	5.197323E-01	-2.835923E-03			
8B	5.145438E-01	-3.101285E-03			
8C	5.261718E-01	-2.803963E-03			
8D	5.389462E-01	-3.013335E-03			
9A	5.244978E-01	-2.054823E-03			
9B	5.108739E-01	-1.999215E-03			
9C	5.155334E-01	-2.037484E-03			
9D	4.936228E-01	-1.771991E-03			
10A	5.193880E-01	-2.004084E-03			
10B	5.162797E-01	-2.073233E-03			
10C	5.173243E-01	-1.966967E-03			
10D	5.159685E-01	-1.780592E-03			
11A	4.325664E-01	-1.120388E-03			
11B	5.106068E-01	-1.508069E-03			
11C	5.117872E-01	-1.789395E-03			
11D	5.124197E-01	-1.280551E-03			
12A	#N/A	#N/A			
12B	2.543237E-01	-4.613917E-04			
12C	2.361321E-01	-1.955441E-03			
12D	4.892691E-01	-1.008951E-03			
13A	5.050504E-01	-9.030103E-04			
13B	5.160069E-01	-8.773138E-04			
13C	5.121285E-01	-1.160236E-03			
13D	4.998858E-01	-8.242116E-04			
14A	4.934923E-01	-4.660381E-04			
14B	5.064001E-01	-6.436680E-04			
14C	5.120459E-01	-8.515606E-04			
14D	4.902315E-01	-3.622979E-04			

PIC_Sr-89_Feb13_RawData.xls

SampleID	Instr	Time (min.)	Alpha Counts	Beta Counts	Count Start Time	Count End Time	Machine	Batch ID
C1	1A	1	3	22671	2/15/2013 16:21	2/15/2013 16:22	PIC	SR89C13
C2	1A	1	3	24304	2/15/2013 16:30	2/15/2013 16:31	PIC	SR89C13
C3	1A	1	3	25873	2/15/2013 16:28	2/15/2013 16:29	PIC	SR89C13
C4	1A	1	5	24881	2/15/2013 16:24	2/15/2013 16:25	PIC	SR89C13
C5	1A	1	5	25969	2/15/2013 16:33	2/15/2013 16:34	PIC	SR89C13
C6	1A	1	4	23419	2/15/2013 16:39	2/15/2013 16:40	PIC	SR89C13
C7	1A	1	6	25270	2/15/2013 16:37	2/15/2013 16:38	PIC	SR89C13
C8	1A	1	6	17057	2/15/2013 16:35	2/15/2013 16:36	PIC	SR89C13
C1	1B	1	14	22892	2/15/2013 16:24	2/15/2013 16:25	PIC	SR89C13
C2	1B	1	22	24815	2/15/2013 16:22	2/15/2013 16:23	PIC	SR89C13
C3	1B	1	22	25632	2/15/2013 16:30	2/15/2013 16:31	PIC	SR89C13
C4	1B	1	17	25351	2/15/2013 16:28	2/15/2013 16:29	PIC	SR89C13
C5	1B	1	31	26005	2/15/2013 16:35	2/15/2013 16:36	PIC	SR89C13
C6	1B	1	14	23585	2/15/2013 16:33	2/15/2013 16:34	PIC	SR89C13
C7	1B	1	23	25562	2/15/2013 16:39	2/15/2013 16:40	PIC	SR89C13
C8	1B	1	22	17129	2/15/2013 16:37	2/15/2013 16:38	PIC	SR89C13
C1	1C	1	252	23030	2/15/2013 16:28	2/15/2013 16:29	PIC	SR89C13
C2	1C	1	277	25093	2/15/2013 16:25	2/15/2013 16:26	PIC	SR89C13
C3	1C	1	288	26245	2/15/2013 16:22	2/15/2013 16:23	PIC	SR89C13
C4	1C	1	311	25504	2/15/2013 16:31	2/15/2013 16:32	PIC	SR89C13
C5	1C	1	309	25732	2/15/2013 16:37	2/15/2013 16:38	PIC	SR89C13
C6	1C	1	299	23516	2/15/2013 16:35	2/15/2013 16:36	PIC	SR89C13
C7	1C	1	318	25862	2/15/2013 16:33	2/15/2013 16:34	PIC	SR89C13
C8	1C	1	174	16780	2/15/2013 16:39	2/15/2013 16:40	PIC	SR89C13
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C2	1D	1	223	24810	2/15/2013 16:28	2/15/2013 16:29	PIC	SR89C13
C3	1D	1	247	26179	2/15/2013 16:25	2/15/2013 16:26	PIC	SR89C13
C4	1D	1	248	25241	2/15/2013 16:22	2/15/2013 16:23	PIC	SR89C13
C5	1D	1	218	26012	2/15/2013 16:39	2/15/2013 16:40	PIC	SR89C13
C6	1D	1	220	23271	2/15/2013 16:37	2/15/2013 16:38	PIC	SR89C13
C7	1D	1	261	25607	2/15/2013 16:35	2/15/2013 16:36	PIC	SR89C13
C8	1D	1	154	17078	2/15/2013 16:33	2/15/2013 16:34	PIC	SR89C13
C1	2A	1	8	22234	2/15/2013 16:33	2/15/2013 16:34	PIC	SR89C13
C2	2A	1	11	23993	2/15/2013 16:39	2/15/2013 16:40	PIC	SR89C13
C3	2A	1	8	25476	2/15/2013 16:37	2/15/2013 16:38	PIC	SR89C13
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C7	2A	1	11	25149	2/15/2013 16:28	2/15/2013 16:29	PIC	SR89C13
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C1	2B	1	0	21501	2/15/2013 16:35	2/15/2013 16:36	PIC	SR89C13
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C7	2B	1	0	24035	2/15/2013 16:31	2/15/2013 16:32	PIC	SR89C13
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C5	2C	1	98	25437	2/15/2013 16:28	2/15/2013 16:29	PIC	SR89C13
C6	2C	1	108	23144	2/15/2013 16:25	2/15/2013 16:26	PIC	SR89C13
C7	2C	1	99	25548	2/15/2013 16:22	2/15/2013 16:23	PIC	SR89C13
C8	2C	1	61	17333	2/15/2013 16:31	2/15/2013 16:32	PIC	SR89C13
C1	2D	1	42	22601	2/15/2013 16:39	2/15/2013 16:40	PIC	SR89C13
C2	2D	1	41	24333	2/15/2013 16:38	2/15/2013 16:39	PIC	SR89C13
C3	2D	1	43	25432	2/15/2013 16:36	2/15/2013 16:37	PIC	SR89C13
C4	2D	1	56	24784	2/15/2013 16:34	2/15/2013 16:35	PIC	SR89C13
C5	2D	1	32	25497	2/15/2013 16:31	2/15/2013 16:32	PIC	SR89C13
C6	2D	1	40	23111	2/15/2013 16:28	2/15/2013 16:29	PIC	SR89C13
C7	2D	1	58	25715	2/15/2013 16:25	2/15/2013 16:26	PIC	SR89C13
C8	2D	1	37	17022	2/15/2013 16:22	2/15/2013 16:23	PIC	SR89C13
C1	3A	1	389	22713	2/15/2013 17:08	2/15/2013 17:09	PIC	SR89C13
C2	3A	1	405	24219	2/15/2013 17:16	2/15/2013 17:17	PIC	SR89C13
C3	3A	1	428	25568	2/15/2013 17:13	2/15/2013 17:14	PIC	SR89C13
C4	3A	1	397	24790	2/15/2013 17:11	2/15/2013 17:12	PIC	SR89C13
C5	3A	1	436	25636	2/15/2013 17:20	2/15/2013 17:21	PIC	SR89C13
C6	3A	1	429	22922	2/15/2013 17:28	2/15/2013 17:29	PIC	SR89C13
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C8	3A	1	237	16133	2/15/2013 17:23	2/15/2013 17:24	PIC	SR89C13
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C4	3B	1	396	25095	2/15/2013 17:13	2/15/2013 17:14	PIC	SR89C13
C5	3B	1	375	25479	2/15/2013 17:23	2/15/2013 17:24	PIC	SR89C13
C6	3B	1	360	23180	2/15/2013 17:20	2/15/2013 17:21	PIC	SR89C13
C7	3B	1	384	25229	2/15/2013 17:28	2/15/2013 17:29	PIC	SR89C13
C8	3B	1	259	15914	2/15/2013 17:26	2/15/2013 17:27	PIC	SR89C13
C1	3C	1	157	22789	2/15/2013 17:13	2/15/2013 17:14	PIC	SR89C13
C2	3C	1	179	24757	2/15/2013 17:11	2/15/2013 17:12	PIC	SR89C13
C3	3C	1	159	25765	2/15/2013 17:08	2/15/2013 17:09	PIC	SR89C13
C4	3C	1	176	25700	2/15/2013 17:16	2/15/2013 17:17	PIC	SR89C13
C5	3C	1	163	25884	2/15/2013 17:26	2/15/2013 17:27	PIC	SR89C13
C6	3C	1	162	23317	2/15/2013 17:23	2/15/2013 17:24	PIC	SR89C13
C7	3C	1	156	25638	2/15/2013 17:20	2/15/2013 17:21	PIC	SR89C13
C8	3C	1	115	16405	2/15/2013 17:28	2/15/2013 17:29	PIC	SR89C13
C1	3D	1	140	22440	2/15/2013 17:16	2/15/2013 17:17	PIC	SR89C13
C2	3D	1	176	24241	2/15/2013 17:13	2/15/2013 17:14	PIC	SR89C13
C3	3D	1	170	25787	2/15/2013 17:11	2/15/2013 17:12	PIC	SR89C13
C4	3D	1	163	24974	2/15/2013 17:09	2/15/2013 17:10	PIC	SR89C13
C5	3D	1	150	25471	2/15/2013 17:28	2/15/2013 17:29	PIC	SR89C13
C6	3D	1	163	22855	2/15/2013 17:26	2/15/2013 17:27	PIC	SR89C13
C7	3D	1	147	24979	2/15/2013 17:23	2/15/2013 17:24	PIC	SR89C13
C8	3D	1	104	16191	2/15/2013 17:20	2/15/2013 17:21	PIC	SR89C13
C1	4A	1	156	22414	2/15/2013 17:20	2/15/2013 17:21	PIC	SR89C13
C2	4A	1	140	24462	2/15/2013 17:28	2/15/2013 17:29	PIC	SR89C13
C3	4A	1	132	25519	2/15/2013 17:27	2/15/2013 17:28	PIC	SR89C13
C4	4A	1	149	25109	2/15/2013 17:23	2/15/2013 17:24	PIC	SR89C13
C5	4A	1	147	25709	2/15/2013 17:09	2/15/2013 17:10	PIC	SR89C13
C6	4A	1	134	23050	2/15/2013 17:16	2/15/2013 17:17	PIC	SR89C13
C7	4A	1	143	25348	2/15/2013 17:13	2/15/2013 17:14	PIC	SR89C13
C8	4A	1	111	16794	2/15/2013 17:11	2/15/2013 17:12	PIC	SR89C13
C1	4B	1	0	22758	2/15/2013 17:24	2/15/2013 17:25	PIC	SR89C13
C2	4B	1	0	24066	2/15/2013 17:20	2/15/2013 17:21	PIC	SR89C13
C3	4B	1	0	25905	2/15/2013 17:29	2/15/2013 17:30	PIC	SR89C13
C4	4B	1	0	25162	2/15/2013 17:27	2/15/2013 17:28	PIC	SR89C13
C5	4B	1	0	25354	2/15/2013 17:11	2/15/2013 17:12	PIC	SR89C13
C6	4B	1	0	23302	2/15/2013 17:09	2/15/2013 17:10	PIC	SR89C13

C7	4B	1	0	25359	2/15/2013 17:16	2/15/2013 17:17	PIC	SR89C13
C8	4B	1	0	16980	2/15/2013 17:13	2/15/2013 17:14	PIC	SR89C13
C1	4C	1	92	23173	2/15/2013 17:27	2/15/2013 17:28	PIC	SR89C13
C2	4C	1	95	25035	2/15/2013 17:24	2/15/2013 17:25	PIC	SR89C13
C3	4C	1	112	25859	2/15/2013 17:21	2/15/2013 17:22	PIC	SR89C13
C4	4C	1	107	25412	2/15/2013 17:29	2/15/2013 17:30	PIC	SR89C13
C5	4C	1	105	26023	2/15/2013 17:13	2/15/2013 17:14	PIC	SR89C13
C6	4C	1	87	23478	2/15/2013 17:11	2/15/2013 17:12	PIC	SR89C13
C7	4C	1	97	25643	2/15/2013 17:09	2/15/2013 17:10	PIC	SR89C13
C8	4C	1	71	16702	2/15/2013 17:16	2/15/2013 17:17	PIC	SR89C13
C1	4D	1	286	22653	2/15/2013 17:29	2/15/2013 17:30	PIC	SR89C13
C2	4D	1	296	24739	2/15/2013 17:27	2/15/2013 17:28	PIC	SR89C13
C3	4D	1	336	25941	2/15/2013 17:24	2/15/2013 17:25	PIC	SR89C13
C4	4D	1	268	25276	2/15/2013 17:21	2/15/2013 17:22	PIC	SR89C13
C5	4D	1	303	25947	2/15/2013 17:16	2/15/2013 17:17	PIC	SR89C13
C6	4D	1	262	23091	2/15/2013 17:13	2/15/2013 17:14	PIC	SR89C13
C7	4D	1	277	25813	2/15/2013 17:11	2/15/2013 17:12	PIC	SR89C13
C8	4D	1	173	16149	2/15/2013 17:09	2/15/2013 17:10	PIC	SR89C13
C1	5A	1	95	23403	2/15/2013 13:38	2/15/2013 13:39	PIC	SR89C13
C2	5A	1	79	25086	2/15/2013 14:12	2/15/2013 14:13	PIC	SR89C13
C3	5A	1	94	26469	2/15/2013 13:48	2/15/2013 13:49	PIC	SR89C13
C4	5A	1	67	25794	2/15/2013 13:45	2/15/2013 13:46	PIC	SR89C13
C5	5A	1	56	26347	2/15/2013 14:15	2/15/2013 14:16	PIC	SR89C13
C6	5A	1	82	24007	2/15/2013 14:30	2/15/2013 14:31	PIC	SR89C13
C7	5A	1	80	26340	2/15/2013 14:27	2/15/2013 14:28	PIC	SR89C13
C8	5A	1	56	18123	2/15/2013 14:25	2/15/2013 14:26	PIC	SR89C13
C1	5B	1	82	23574	2/15/2013 13:45	2/15/2013 13:46	PIC	SR89C13
C2	5B	1	93	25221	2/15/2013 13:38	2/15/2013 13:39	PIC	SR89C13
C3	5B	1	106	26417	2/15/2013 14:12	2/15/2013 14:13	PIC	SR89C13
C4	5B	1	81	25811	2/15/2013 13:48	2/15/2013 13:49	PIC	SR89C13
C5	5B	1	86	26405	2/15/2013 14:25	2/15/2013 14:26	PIC	SR89C13
C6	5B	1	95	23663	2/15/2013 14:15	2/15/2013 14:16	PIC	SR89C13
C7	5B	1	88	26124	2/15/2013 14:31	2/15/2013 14:32	PIC	SR89C13
C8	5B	1	66	18167	2/15/2013 14:27	2/15/2013 14:28	PIC	SR89C13
C1	5C	1	76	23369	2/15/2013 13:48	2/15/2013 13:49	PIC	SR89C13
C2	5C	1	106	25051	2/15/2013 13:45	2/15/2013 13:46	PIC	SR89C13
C3	5C	1	83	26297	2/15/2013 13:38	2/15/2013 13:39	PIC	SR89C13

C4	5C	1	86	26150	2/15/2013 14:12	2/15/2013 14:13	PIC	SR89C13
C5	5C	1	93	26199	2/15/2013 14:28	2/15/2013 14:29	PIC	SR89C13
C6	5C	1	90	23488	2/15/2013 14:25	2/15/2013 14:26	PIC	SR89C13
C7	5C	1	85	25842	2/15/2013 14:16	2/15/2013 14:17	PIC	SR89C13
C8	5C	1	60	17798	2/15/2013 14:31	2/15/2013 14:32	PIC	SR89C13
C1	5D	1	82	23109	2/15/2013 14:12	2/15/2013 14:13	PIC	SR89C13
C2	5D	1	114	24806	2/15/2013 13:48	2/15/2013 13:49	PIC	SR89C13
C3	5D	1	99	26008	2/15/2013 13:45	2/15/2013 13:46	PIC	SR89C13
C4	5D	1	92	25558	2/15/2013 13:38	2/15/2013 13:39	PIC	SR89C13
C5	5D	1	94	26045	2/15/2013 14:31	2/15/2013 14:32	PIC	SR89C13
C6	5D	1	105	23651	2/15/2013 14:28	2/15/2013 14:29	PIC	SR89C13
C7	5D	1	106	25829	2/15/2013 14:25	2/15/2013 14:26	PIC	SR89C13
C8	5D	1	79	18148	2/15/2013 14:16	2/15/2013 14:17	PIC	SR89C13
C1	6A	1	1	22130	2/15/2013 14:16	2/15/2013 14:17	PIC	SR89C13
C2	6A	1	2	24034	2/15/2013 14:31	2/15/2013 14:32	PIC	SR89C13
C3	6A	1	1	24798	2/15/2013 14:28	2/15/2013 14:29	PIC	SR89C13
C4	6A	1	0	24454	2/15/2013 14:26	2/15/2013 14:27	PIC	SR89C13
C5	6A	1	1	24903	2/15/2013 13:38	2/15/2013 13:39	PIC	SR89C13
C6	6A	1	0	22477	2/15/2013 14:13	2/15/2013 14:14	PIC	SR89C13
C7	6A	1	5	24857	2/15/2013 13:48	2/15/2013 13:49	PIC	SR89C13
C8	6A	1	3	18846	2/15/2013 13:45	2/15/2013 13:46	PIC	SR89C13
C1	6B	1	57	22530	2/15/2013 14:26	2/15/2013 14:27	PIC	SR89C13
C2	6B	1	68	25573	2/15/2013 14:16	2/15/2013 14:17	PIC	SR89C13
C3	6B	1	68	25565	2/15/2013 14:31	2/15/2013 14:32	PIC	SR89C13
C4	6B	1	69	25190	2/15/2013 14:28	2/15/2013 14:29	PIC	SR89C13
C5	6B	1	68	25651	2/15/2013 13:46	2/15/2013 13:47	PIC	SR89C13
C6	6B	1	66	23552	2/15/2013 13:41	2/15/2013 13:42	PIC	SR89C13
C7	6B	1	83	25638	2/15/2013 14:13	2/15/2013 14:14	PIC	SR89C13
C8	6B	1	56	19075	2/15/2013 13:49	2/15/2013 13:50	PIC	SR89C13
C1	6C	1	13	22479	2/15/2013 14:28	2/15/2013 14:29	PIC	SR89C13
C2	6C	1	10	24382	2/15/2013 14:26	2/15/2013 14:27	PIC	SR89C13
C3	6C	1	10	25764	2/15/2013 14:17	2/15/2013 14:18	PIC	SR89C13
C4	6C	1	6	25070	2/15/2013 14:31	2/15/2013 14:32	PIC	SR89C13
C5	6C	1	18	25538	2/15/2013 13:49	2/15/2013 13:50	PIC	SR89C13
C6	6C	1	16	23213	2/15/2013 13:46	2/15/2013 13:47	PIC	SR89C13
C7	6C	1	7	25525	2/15/2013 13:38	2/15/2013 13:39	PIC	SR89C13
C8	6C	1	6	17935	2/15/2013 14:13	2/15/2013 14:14	PIC	SR89C13

C1	6D	1	0	11648	2/15/2013 14:32	2/15/2013 14:33	PIC	SR89C13
C2	6D	1	0	13066	2/15/2013 14:29	2/15/2013 14:30	PIC	SR89C13
C3	6D	1	0	12930	2/15/2013 14:26	2/15/2013 14:27	PIC	SR89C13
C4	6D	1	0	15725	2/15/2013 14:17	2/15/2013 14:18	PIC	SR89C13
C5	6D	1	0	12091	2/15/2013 14:13	2/15/2013 14:14	PIC	SR89C13
C6	6D	1	0	17778	2/15/2013 13:50	2/15/2013 13:51	PIC	SR89C13
C7	6D	1	0	16245	2/15/2013 13:46	2/15/2013 13:47	PIC	SR89C13
C8	6D	1	1	2109	2/15/2013 13:38	2/15/2013 13:39	PIC	SR89C13
C1	7A	1	131	23154	2/15/2013 14:40	2/15/2013 14:41	PIC	SR89C13
C2	7A	1	141	24947	2/15/2013 14:57	2/15/2013 14:58	PIC	SR89C13
C3	7A	1	185	26400	2/15/2013 14:54	2/15/2013 14:55	PIC	SR89C13
C4	7A	1	154	25726	2/15/2013 14:51	2/15/2013 14:52	PIC	SR89C13
C5	7A	1	172	26121	2/15/2013 15:00	2/15/2013 15:01	PIC	SR89C13
C6	7A	1	120	23722	2/15/2013 15:13	2/15/2013 15:14	PIC	SR89C13
C7	7A	1	173	26485	2/15/2013 15:09	2/15/2013 15:10	PIC	SR89C13
C8	7A	1	121	17724	2/15/2013 15:05	2/15/2013 15:06	PIC	SR89C13
C1	7B	1	167	23235	2/15/2013 14:51	2/15/2013 14:52	PIC	SR89C13
C2	7B	1	184	25027	2/15/2013 14:40	2/15/2013 14:41	PIC	SR89C13
C3	7B	1	191	26374	2/15/2013 14:57	2/15/2013 14:58	PIC	SR89C13
C4	7B	1	181	25565	2/15/2013 14:54	2/15/2013 14:55	PIC	SR89C13
C5	7B	1	200	25913	2/15/2013 15:06	2/15/2013 15:07	PIC	SR89C13
C6	7B	1	161	23710	2/15/2013 15:00	2/15/2013 15:01	PIC	SR89C13
C7	7B	1	160	26047	2/15/2013 15:13	2/15/2013 15:14	PIC	SR89C13
C8	7B	1	136	17556	2/15/2013 15:09	2/15/2013 15:10	PIC	SR89C13
C1	7C	1	59	23070	2/15/2013 14:54	2/15/2013 14:55	PIC	SR89C13
C2	7C	1	59	24941	2/15/2013 14:52	2/15/2013 14:53	PIC	SR89C13
C3	7C	1	79	25992	2/15/2013 14:41	2/15/2013 14:42	PIC	SR89C13
C4	7C	1	83	25550	2/15/2013 14:57	2/15/2013 14:58	PIC	SR89C13
C5	7C	1	68	26073	2/15/2013 15:09	2/15/2013 15:10	PIC	SR89C13
C6	7C	1	60	23471	2/15/2013 15:06	2/15/2013 15:07	PIC	SR89C13
C7	7C	1	67	25731	2/15/2013 15:00	2/15/2013 15:01	PIC	SR89C13
C8	7C	1	46	17544	2/15/2013 15:13	2/15/2013 15:14	PIC	SR89C13
C1	7D	1	96	22969	2/15/2013 14:57	2/15/2013 14:58	PIC	SR89C13
C2	7D	1	94	25017	2/15/2013 14:54	2/15/2013 14:55	PIC	SR89C13
C3	7D	1	138	26248	2/15/2013 14:52	2/15/2013 14:53	PIC	SR89C13
C4	7D	1	90	25375	2/15/2013 14:41	2/15/2013 14:42	PIC	SR89C13
C5	7D	1	127	25995	2/15/2013 15:14	2/15/2013 15:15	PIC	SR89C13

C6	7D	1	106	23670	2/15/2013 15:09	2/15/2013 15:10	PIC	SR89C13
C7	7D	1	120	25810	2/15/2013 15:06	2/15/2013 15:07	PIC	SR89C13
C8	7D	1	55	17546	2/15/2013 15:00	2/15/2013 15:01	PIC	SR89C13
C1	8A	1	5	22652	2/15/2013 15:00	2/15/2013 15:01	PIC	SR89C13
C2	8A	1	13	24637	2/15/2013 15:14	2/15/2013 15:15	PIC	SR89C13
C3	8A	1	21	25565	2/15/2013 15:09	2/15/2013 15:10	PIC	SR89C13
C4	8A	1	21	25423	2/15/2013 15:07	2/15/2013 15:08	PIC	SR89C13
C5	8A	1	17	25896	2/15/2013 14:45	2/15/2013 14:46	PIC	SR89C13
C6	8A	1	11	23169	2/15/2013 14:57	2/15/2013 14:58	PIC	SR89C13
C7	8A	1	21	25611	2/15/2013 14:55	2/15/2013 14:56	PIC	SR89C13
C8	8A	1	18	17494	2/15/2013 14:52	2/15/2013 14:53	PIC	SR89C13
C1	8B	1	1	22319	2/15/2013 15:07	2/15/2013 15:08	PIC	SR89C13
C2	8B	1	0	24615	2/15/2013 15:00	2/15/2013 15:01	PIC	SR89C13
C3	8B	1	1	25451	2/15/2013 15:14	2/15/2013 15:15	PIC	SR89C13
C4	8B	1	0	24461	2/15/2013 15:09	2/15/2013 15:10	PIC	SR89C13
C5	8B	1	0	25258	2/15/2013 14:52	2/15/2013 14:53	PIC	SR89C13
C6	8B	1	0	22990	2/15/2013 14:45	2/15/2013 14:46	PIC	SR89C13
C7	8B	1	0	25222	2/15/2013 14:57	2/15/2013 14:58	PIC	SR89C13
C8	8B	1	0	16601	2/15/2013 14:55	2/15/2013 14:56	PIC	SR89C13
C1	8C	1	22	22927	2/15/2013 15:10	2/15/2013 15:11	PIC	SR89C13
C2	8C	1	23	25010	2/15/2013 15:07	2/15/2013 15:08	PIC	SR89C13
C3	8C	1	17	26237	2/15/2013 15:00	2/15/2013 15:01	PIC	SR89C13
C4	8C	1	18	25433	2/15/2013 15:14	2/15/2013 15:15	PIC	SR89C13
C5	8C	1	21	26120	2/15/2013 14:55	2/15/2013 14:56	PIC	SR89C13
C6	8C	1	24	23608	2/15/2013 14:52	2/15/2013 14:53	PIC	SR89C13
C7	8C	1	14	26024	2/15/2013 14:45	2/15/2013 14:46	PIC	SR89C13
C8	8C	1	13	17848	2/15/2013 14:57	2/15/2013 14:58	PIC	SR89C13
C1	8D	1	31	23697	2/15/2013 15:14	2/15/2013 15:15	PIC	SR89C13
C2	8D	1	37	25697	2/15/2013 15:10	2/15/2013 15:11	PIC	SR89C13
C3	8D	1	57	26831	2/15/2013 15:07	2/15/2013 15:08	PIC	SR89C13
C4	8D	1	37	26060	2/15/2013 15:00	2/15/2013 15:01	PIC	SR89C13
C5	8D	1	49	26234	2/15/2013 14:57	2/15/2013 14:58	PIC	SR89C13
C6	8D	1	34	23718	2/15/2013 14:55	2/15/2013 14:56	PIC	SR89C13
C7	8D	1	43	26787	2/15/2013 14:52	2/15/2013 14:53	PIC	SR89C13
C8	8D	1	21	18085	2/15/2013 14:45	2/15/2013 14:46	PIC	SR89C13
C1	9A	1	42	23046	2/15/2013 12:54	2/15/2013 12:55	PIC	SR89C13
C2	9A	1	33	25056	2/15/2013 13:04	2/15/2013 13:05	PIC	SR89C13

C3	9A	1	49	26656	2/15/2013 13:00	2/15/2013 13:01	PIC	SR89C13
C4	9A	1	37	25929	2/15/2013 12:57	2/15/2013 12:58	PIC	SR89C13
C5	9A	1	48	26267	2/15/2013 13:07	2/15/2013 13:08	PIC	SR89C13
C6	9A	1	30	23993	2/15/2013 13:17	2/15/2013 13:18	PIC	SR89C13
C7	9A	1	47	26420	2/15/2013 13:14	2/15/2013 13:15	PIC	SR89C13
C8	9A	1	32	19631	2/15/2013 13:10	2/15/2013 13:11	PIC	SR89C13
C1	9B	1	22	22752	2/15/2013 12:57	2/15/2013 12:58	PIC	SR89C13
C2	9B	1	29	24464	2/15/2013 12:54	2/15/2013 12:55	PIC	SR89C13
C3	9B	1	27	25548	2/15/2013 13:04	2/15/2013 13:05	PIC	SR89C13
C4	9B	1	17	25161	2/15/2013 13:00	2/15/2013 13:01	PIC	SR89C13
C5	9B	1	24	25785	2/15/2013 13:10	2/15/2013 13:11	PIC	SR89C13
C6	9B	1	16	23221	2/15/2013 13:07	2/15/2013 13:08	PIC	SR89C13
C7	9B	1	25	25852	2/15/2013 13:17	2/15/2013 13:18	PIC	SR89C13
C8	9B	1	16	19119	2/15/2013 13:14	2/15/2013 13:15	PIC	SR89C13
C1	9C	1	40	22898	2/15/2013 13:00	2/15/2013 13:01	PIC	SR89C13
C2	9C	1	43	24745	2/15/2013 12:57	2/15/2013 12:58	PIC	SR89C13
C3	9C	1	47	25810	2/15/2013 12:54	2/15/2013 12:55	PIC	SR89C13
C4	9C	1	39	25450	2/15/2013 13:04	2/15/2013 13:05	PIC	SR89C13
C5	9C	1	33	26012	2/15/2013 13:14	2/15/2013 13:15	PIC	SR89C13
C6	9C	1	45	23438	2/15/2013 13:10	2/15/2013 13:11	PIC	SR89C13
C7	9C	1	35	25678	2/15/2013 13:07	2/15/2013 13:08	PIC	SR89C13
C8	9C	1	36	19493	2/15/2013 13:17	2/15/2013 13:18	PIC	SR89C13
C1	9D	1	0	22005	2/15/2013 13:04	2/15/2013 13:05	PIC	SR89C13
C2	9D	1	0	23660	2/15/2013 13:00	2/15/2013 13:01	PIC	SR89C13
C3	9D	1	0	24728	2/15/2013 12:58	2/15/2013 12:59	PIC	SR89C13
C4	9D	1	1	24408	2/15/2013 12:54	2/15/2013 12:55	PIC	SR89C13
C5	9D	1	1	24915	2/15/2013 13:18	2/15/2013 13:19	PIC	SR89C13
C6	9D	1	1	22693	2/15/2013 13:15	2/15/2013 13:16	PIC	SR89C13
C7	9D	1	2	25159	2/15/2013 13:10	2/15/2013 13:11	PIC	SR89C13
C8	9D	1	0	18766	2/15/2013 13:07	2/15/2013 13:08	PIC	SR89C13
C1	10A	1	10	22993	2/15/2013 13:07	2/15/2013 13:08	PIC	SR89C13
C2	10A	1	25	24908	2/15/2013 13:18	2/15/2013 13:19	PIC	SR89C13
C3	10A	1	16	25972	2/15/2013 13:15	2/15/2013 13:16	PIC	SR89C13
C4	10A	1	22	25551	2/15/2013 13:11	2/15/2013 13:12	PIC	SR89C13
C5	10A	1	17	26172	2/15/2013 12:54	2/15/2013 12:55	PIC	SR89C13
C6	10A	1	19	24100	2/15/2013 13:04	2/15/2013 13:05	PIC	SR89C13
C7	10A	1	14	26093	2/15/2013 13:00	2/15/2013 13:01	PIC	SR89C13

C8	10A	1	6	19475	2/15/2013 12:58	2/15/2013 12:59	PIC	SR89C13
C1	10B	1	41	22828	2/15/2013 13:11	2/15/2013 13:12	PIC	SR89C13
C2	10B	1	48	24594	2/15/2013 13:07	2/15/2013 13:08	PIC	SR89C13
C3	10B	1	42	25749	2/15/2013 13:18	2/15/2013 13:19	PIC	SR89C13
C4	10B	1	30	25497	2/15/2013 13:15	2/15/2013 13:16	PIC	SR89C13
C5	10B	1	51	26074	2/15/2013 12:58	2/15/2013 12:59	PIC	SR89C13
C6	10B	1	35	23956	2/15/2013 12:54	2/15/2013 12:55	PIC	SR89C13
C7	10B	1	37	25717	2/15/2013 13:05	2/15/2013 13:06	PIC	SR89C13
C8	10B	1	24	19206	2/15/2013 13:00	2/15/2013 13:01	PIC	SR89C13
C1	10C	1	36	22920	2/15/2013 13:15	2/15/2013 13:16	PIC	SR89C13
C2	10C	1	50	24784	2/15/2013 13:11	2/15/2013 13:12	PIC	SR89C13
C3	10C	1	53	25610	2/15/2013 13:08	2/15/2013 13:09	PIC	SR89C13
C4	10C	1	49	25623	2/15/2013 13:18	2/15/2013 13:19	PIC	SR89C13
C5	10C	1	55	26296	2/15/2013 13:01	2/15/2013 13:02	PIC	SR89C13
C6	10C	1	42	23777	2/15/2013 12:58	2/15/2013 12:59	PIC	SR89C13
C7	10C	1	38	26396	2/15/2013 12:54	2/15/2013 12:55	PIC	SR89C13
C8	10C	1	29	19243	2/15/2013 13:05	2/15/2013 13:06	PIC	SR89C13
C1	10D	1	25	22791	2/15/2013 13:18	2/15/2013 13:19	PIC	SR89C13
C2	10D	1	27	24951	2/15/2013 13:15	2/15/2013 13:16	PIC	SR89C13
C3	10D	1	25	26000	2/15/2013 13:11	2/15/2013 13:12	PIC	SR89C13
C4	10D	1	18	25540	2/15/2013 13:08	2/15/2013 13:09	PIC	SR89C13
C5	10D	1	25	25889	2/15/2013 13:05	2/15/2013 13:06	PIC	SR89C13
C6	10D	1	21	23854	2/15/2013 13:01	2/15/2013 13:02	PIC	SR89C13
C7	10D	1	21	26394	2/15/2013 12:58	2/15/2013 12:59	PIC	SR89C13
C8	10D	1	19	19760	2/15/2013 12:54	2/15/2013 12:55	PIC	SR89C13
C1	11A	1	0	19465	2/15/2013 12:26	2/15/2013 12:27	PIC	SR89C13
C2	11A	1	0	20978	2/15/2013 12:37	2/15/2013 12:38	PIC	SR89C13
C3	11A	1	0	21798	2/15/2013 12:34	2/15/2013 12:35	PIC	SR89C13
C4	11A	1	0	21585	2/15/2013 12:30	2/15/2013 12:31	PIC	SR89C13
C5	11A	1	1	22052	2/15/2013 12:39	2/15/2013 12:40	PIC	SR89C13
C6	11A	1	0	20207	2/15/2013 12:48	2/15/2013 12:49	PIC	SR89C13
C7	11A	1	0	21925	2/15/2013 12:45	2/15/2013 12:46	PIC	SR89C13
C8	11A	1	0	17769	2/15/2013 12:43	2/15/2013 12:44	PIC	SR89C13
C1	11B	1	0	22955	2/15/2013 12:30	2/15/2013 12:31	PIC	SR89C13
C2	11B	1	0	24624	2/15/2013 12:26	2/15/2013 12:27	PIC	SR89C13
C3	11B	1	1	25818	2/15/2013 12:37	2/15/2013 12:38	PIC	SR89C13
C4	11B	1	1	25455	2/15/2013 12:34	2/15/2013 12:35	PIC	SR89C13

C5	11B	1	2	25722	2/15/2013 12:43	2/15/2013 12:44	PIC	SR89C13
C6	11B	1	1	23486	2/15/2013 12:39	2/15/2013 12:40	PIC	SR89C13
C7	11B	1	0	26243	2/15/2013 12:48	2/15/2013 12:49	PIC	SR89C13
C8	11B	1	1	20341	2/15/2013 12:45	2/15/2013 12:46	PIC	SR89C13
C1	11C	1	0	22849	2/15/2013 12:34	2/15/2013 12:35	PIC	SR89C13
C2	11C	1	0	24747	2/15/2013 12:30	2/15/2013 12:31	PIC	SR89C13
C3	11C	1	0	25794	2/15/2013 12:26	2/15/2013 12:27	PIC	SR89C13
C4	11C	1	0	25259	2/15/2013 12:37	2/15/2013 12:38	PIC	SR89C13
C5	11C	1	0	25754	2/15/2013 12:46	2/15/2013 12:47	PIC	SR89C13
C6	11C	1	0	23292	2/15/2013 12:43	2/15/2013 12:44	PIC	SR89C13
C7	11C	1	0	26032	2/15/2013 12:39	2/15/2013 12:40	PIC	SR89C13
C8	11C	1	1	19787	2/15/2013 12:48	2/15/2013 12:49	PIC	SR89C13
C1	11D	1	0	23032	2/15/2013 12:37	2/15/2013 12:38	PIC	SR89C13
C2	11D	1	0	24975	2/15/2013 12:34	2/15/2013 12:35	PIC	SR89C13
C3	11D	1	0	26164	2/15/2013 12:31	2/15/2013 12:32	PIC	SR89C13
C4	11D	1	0	25392	2/15/2013 12:26	2/15/2013 12:27	PIC	SR89C13
C5	11D	1	0	26139	2/15/2013 12:48	2/15/2013 12:49	PIC	SR89C13
C6	11D	1	0	23587	2/15/2013 12:46	2/15/2013 12:47	PIC	SR89C13
C7	11D	1	0	26126	2/15/2013 12:43	2/15/2013 12:44	PIC	SR89C13
C8	11D	1	0	21236	2/15/2013 12:40	2/15/2013 12:41	PIC	SR89C13
C1	12A	1	0	0	2/15/2013 12:40	2/15/2013 12:41	PIC	SR89C13
C2	12A	1	0	0	2/15/2013 12:48	2/15/2013 12:49	PIC	SR89C13
C3	12A	1	0	0	2/15/2013 12:46	2/15/2013 12:47	PIC	SR89C13
C4	12A	1	0	0	2/15/2013 12:43	2/15/2013 12:44	PIC	SR89C13
C5	12A	1	0	0	2/15/2013 12:26	2/15/2013 12:27	PIC	SR89C13
C6	12A	1	0	0	2/15/2013 12:37	2/15/2013 12:38	PIC	SR89C13
C7	12A	1	0	0	2/15/2013 12:34	2/15/2013 12:35	PIC	SR89C13
C8	12A	1	0	0	2/15/2013 12:31	2/15/2013 12:32	PIC	SR89C13
C1	12B	1	0	11423	2/15/2013 12:43	2/15/2013 12:44	PIC	SR89C13
C2	12B	1	0	12283	2/15/2013 12:40	2/15/2013 12:41	PIC	SR89C13
C3	12B	1	0	13000	2/15/2013 12:48	2/15/2013 12:49	PIC	SR89C13
C4	12B	1	0	12474	2/15/2013 12:46	2/15/2013 12:47	PIC	SR89C13
C5	12B	1	0	13323	2/15/2013 12:31	2/15/2013 12:32	PIC	SR89C13
C6	12B	1	0	12524	2/15/2013 12:26	2/15/2013 12:27	PIC	SR89C13
C7	12B	1	0	12656	2/15/2013 12:37	2/15/2013 12:38	PIC	SR89C13
C8	12B	1	0	10909	2/15/2013 12:35	2/15/2013 12:36	PIC	SR89C13
C1	12C	1	0	10621	2/15/2013 12:46	2/15/2013 12:47	PIC	SR89C13

C2	12C	1	0	10886	2/15/2013 12:43	2/15/2013 12:44	PIC	SR89C13
C3	12C	1	0	10093	2/15/2013 12:40	2/15/2013 12:41	PIC	SR89C13
C4	12C	1	0	12768	2/15/2013 12:48	2/15/2013 12:49	PIC	SR89C13
C5	12C	1	0	11356	2/15/2013 12:35	2/15/2013 12:36	PIC	SR89C13
C6	12C	1	0	10436	2/15/2013 12:31	2/15/2013 12:32	PIC	SR89C13
C7	12C	1	0	8655	2/15/2013 12:26	2/15/2013 12:27	PIC	SR89C13
C8	12C	1	0	7925	2/15/2013 12:37	2/15/2013 12:38	PIC	SR89C13
C1	12D	1	0	22275	2/15/2013 12:48	2/15/2013 12:49	PIC	SR89C13
C2	12D	1	0	23929	2/15/2013 12:46	2/15/2013 12:47	PIC	SR89C13
C3	12D	1	2	24816	2/15/2013 12:43	2/15/2013 12:44	PIC	SR89C13
C4	12D	1	0	24308	2/15/2013 12:40	2/15/2013 12:41	PIC	SR89C13
C5	12D	1	0	25022	2/15/2013 12:37	2/15/2013 12:38	PIC	SR89C13
C6	12D	1	0	22695	2/15/2013 12:35	2/15/2013 12:36	PIC	SR89C13
C7	12D	1	0	25156	2/15/2013 12:31	2/15/2013 12:32	PIC	SR89C13
C8	12D	1	1	20790	2/15/2013 12:27	2/15/2013 12:28	PIC	SR89C13
C1	13A	1	0	22743	2/15/2013 11:39	2/15/2013 11:40	PIC	SR89C13
C2	13A	1	0	24809	2/15/2013 11:49	2/15/2013 11:50	PIC	SR89C13
C3	13A	1	0	26030	2/15/2013 11:47	2/15/2013 11:48	PIC	SR89C13
C4	13A	1	0	25231	2/15/2013 11:45	2/15/2013 11:46	PIC	SR89C13
C5	13A	1	0	25679	2/15/2013 12:12	2/15/2013 12:13	PIC	SR89C13
C6	13A	1	0	23601	2/15/2013 12:22	2/15/2013 12:23	PIC	SR89C13
C7	13A	1	0	26108	2/15/2013 12:19	2/15/2013 12:20	PIC	SR89C13
C8	13A	1	3	21741	2/15/2013 12:16	2/15/2013 12:17	PIC	SR89C13
C1	13B	1	0	23326	2/15/2013 11:45	2/15/2013 11:46	PIC	SR89C13
C2	13B	1	0	25000	2/15/2013 11:39	2/15/2013 11:40	PIC	SR89C13
C3	13B	1	0	26432	2/15/2013 11:49	2/15/2013 11:50	PIC	SR89C13
C4	13B	1	0	25874	2/15/2013 11:47	2/15/2013 11:48	PIC	SR89C13
C5	13B	1	0	26690	2/15/2013 12:16	2/15/2013 12:17	PIC	SR89C13
C6	13B	1	0	24326	2/15/2013 12:12	2/15/2013 12:13	PIC	SR89C13
C7	13B	1	0	26586	2/15/2013 12:22	2/15/2013 12:23	PIC	SR89C13
C8	13B	1	1	22201	2/15/2013 12:19	2/15/2013 12:20	PIC	SR89C13
C1	13C	1	0	23080	2/15/2013 11:47	2/15/2013 11:48	PIC	SR89C13
C2	13C	1	0	24850	2/15/2013 11:45	2/15/2013 11:46	PIC	SR89C13
C3	13C	1	0	26077	2/15/2013 11:39	2/15/2013 11:40	PIC	SR89C13
C4	13C	1	0	25534	2/15/2013 11:49	2/15/2013 11:50	PIC	SR89C13
C5	13C	1	0	26440	2/15/2013 12:19	2/15/2013 12:20	PIC	SR89C13
C6	13C	1	0	23843	2/15/2013 12:16	2/15/2013 12:17	PIC	SR89C13

C7	13C	1	1	25844	2/15/2013 12:12	2/15/2013 12:13	PIC	SR89C13
C8	13C	1	0	21603	2/15/2013 12:22	2/15/2013 12:23	PIC	SR89C13
C1	13D	1	0	22759	2/15/2013 11:49	2/15/2013 11:50	PIC	SR89C13
C2	13D	1	0	24457	2/15/2013 11:47	2/15/2013 11:48	PIC	SR89C13
C3	13D	1	1	25628	2/15/2013 11:45	2/15/2013 11:46	PIC	SR89C13
C4	13D	1	0	25066	2/15/2013 11:39	2/15/2013 11:40	PIC	SR89C13
C5	13D	1	0	25723	2/15/2013 12:22	2/15/2013 12:23	PIC	SR89C13
C6	13D	1	0	23187	2/15/2013 12:19	2/15/2013 12:20	PIC	SR89C13
C7	13D	1	0	25552	2/15/2013 12:16	2/15/2013 12:17	PIC	SR89C13
C8	13D	1	0	21943	2/15/2013 12:12	2/15/2013 12:13	PIC	SR89C13
C1	14A	1	0	21875	2/15/2013 12:12	2/15/2013 12:13	PIC	SR89C13
C2	14A	1	0	24524	2/15/2013 12:22	2/15/2013 12:23	PIC	SR89C13
C3	14A	1	0	25512	2/15/2013 12:18	2/15/2013 12:19	PIC	SR89C13
C4	14A	1	0	24999	2/15/2013 12:16	2/15/2013 12:17	PIC	SR89C13
C5	14A	1	0	25660	2/15/2013 11:39	2/15/2013 11:40	PIC	SR89C13
C6	14A	1	0	23262	2/15/2013 11:50	2/15/2013 11:51	PIC	SR89C13
C7	14A	1	0	25922	2/15/2013 11:47	2/15/2013 11:48	PIC	SR89C13
C8	14A	1	0	22048	2/15/2013 11:45	2/15/2013 11:46	PIC	SR89C13
C1	14B	1	1	23056	2/15/2013 12:16	2/15/2013 12:17	PIC	SR89C13
C2	14B	1	1	24712	2/15/2013 12:12	2/15/2013 12:13	PIC	SR89C13
C3	14B	1	0	25936	2/15/2013 12:22	2/15/2013 12:23	PIC	SR89C13
C4	14B	1	0	25683	2/15/2013 12:19	2/15/2013 12:20	PIC	SR89C13
C5	14B	1	1	25954	2/15/2013 11:45	2/15/2013 11:46	PIC	SR89C13
C6	14B	1	0	23872	2/15/2013 11:39	2/15/2013 11:40	PIC	SR89C13
C7	14B	1	0	26271	2/15/2013 11:50	2/15/2013 11:51	PIC	SR89C13
C8	14B	1	0	22456	2/15/2013 11:48	2/15/2013 11:49	PIC	SR89C13
C1	14C	1	0	22999	2/15/2013 12:19	2/15/2013 12:20	PIC	SR89C13
C2	14C	1	0	25216	2/15/2013 12:16	2/15/2013 12:17	PIC	SR89C13
C3	14C	1	0	26170	2/15/2013 12:12	2/15/2013 12:13	PIC	SR89C13
C4	14C	1	0	25729	2/15/2013 12:22	2/15/2013 12:23	PIC	SR89C13
C5	14C	1	0	26457	2/15/2013 11:48	2/15/2013 11:49	PIC	SR89C13
C6	14C	1	0	23806	2/15/2013 11:45	2/15/2013 11:46	PIC	SR89C13
C7	14C	1	0	26330	2/15/2013 11:39	2/15/2013 11:40	PIC	SR89C13
C8	14C	1	0	22288	2/15/2013 11:50	2/15/2013 11:51	PIC	SR89C13
C1	14D	1	0	22297	2/15/2013 12:22	2/15/2013 12:23	PIC	SR89C13
C2	14D	1	0	24355	2/15/2013 12:19	2/15/2013 12:20	PIC	SR89C13
C3	14D	1	0	25319	2/15/2013 12:17	2/15/2013 12:18	PIC	SR89C13

C4	14D	1	0	24492	2/15/2013 12:12	2/15/2013 12:13	PIC	SR89C13
C5	14D	1	0	25239	2/15/2013 11:50	2/15/2013 11:51	PIC	SR89C13
C6	14D	1	0	23452	2/15/2013 11:48	2/15/2013 11:49	PIC	SR89C13
C7	14D	1	0	25637	2/15/2013 11:45	2/15/2013 11:46	PIC	SR89C13
C8	14D	1	0	22338	2/15/2013 11:40	2/15/2013 11:41	PIC	SR89C13

Sr-90 Calibration - PIC - Mar 2013

Standard Data		
	Isotope	Sr-90
	Standard ID number	1244-A
	Half Life (days)	10555.725
	Std. Act. (dpm/mL)	21333.9626
	Reference Date	10/1/2008
	Volume of spike (mL)	0.5
	Std. Nominal (dpm)	9577.30
	Decay Date	3/30/2013

Separation Date/Time	3/29/2013 14:10
Y-90 Half Life (days)	2.668875

The following detectors were not calibrated:
12A, 12B, 12C, 12D

Carrier Data		Std ID	1858443	
		Std weight	17.1	mg/mL
Source	Measured weight (mg)	Vol. Carrier Added (mL)	Theoretical weight (mg)	***Recovery
1	3.3	0.2	3.42	96.5%
2	7.3	0.4	6.84	100.0%
3	8.5	0.5	8.55	99.4%
4	12.2	0.7	11.97	100.0%
5	17.2	1	17.10	100.0%
6	26.6	1.5	25.65	100.0%
7	31.0	1.8	30.78	100.0%

***Recovery values exceeding 100% will be evaluated at 100%.

*Background is considered neglible.
**Decay corrected to mid-point of cou

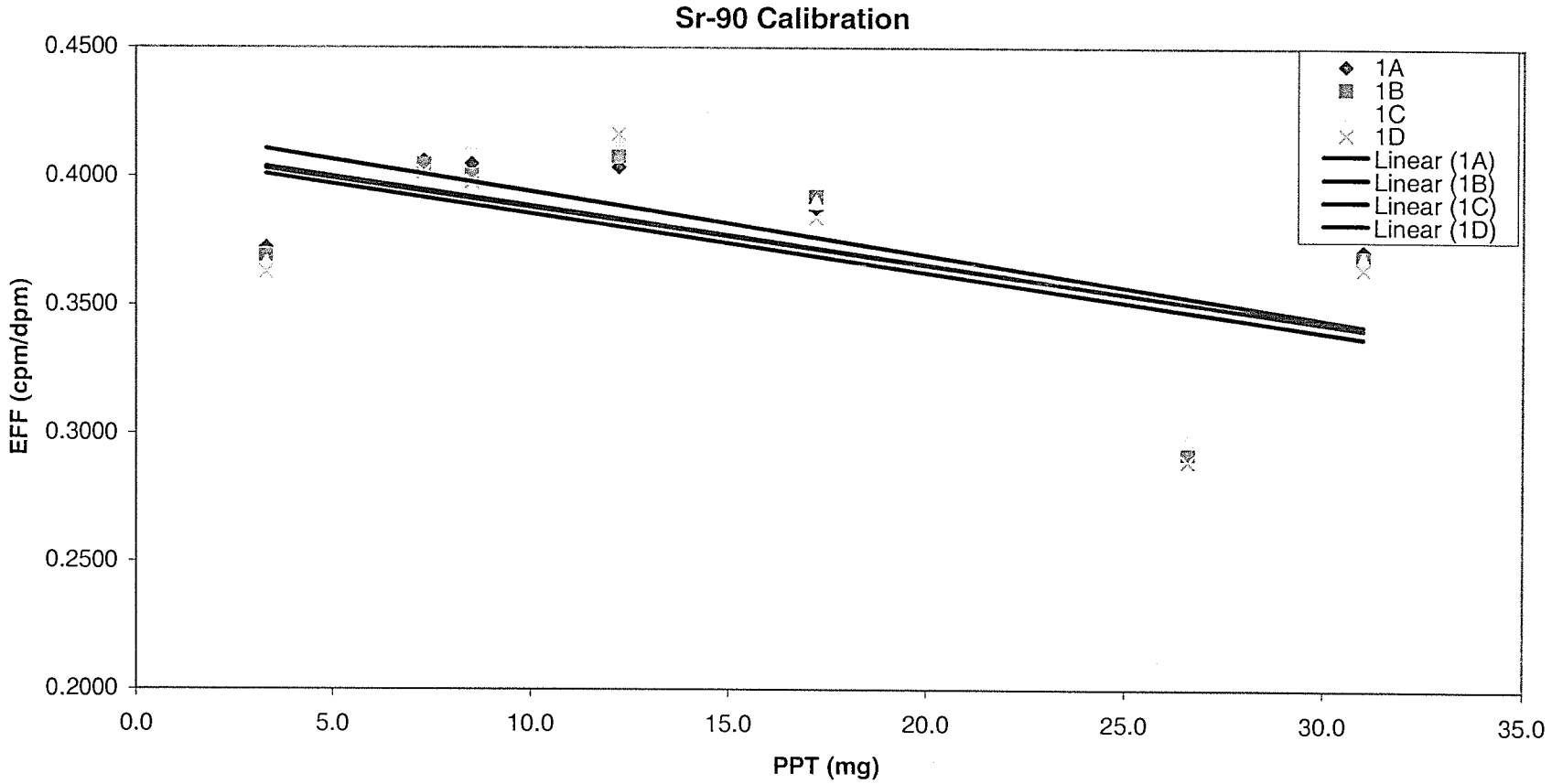
Detector (#)	Source ID (#)	Raw Count Data Start Time	Count Time (min)	Beta (counts)	Raw Beta (cpm)	Recovery (%)	Yttrium Efficiency (cpm/dpm)	Y-90 Ingrowth	Corrected Sr-90 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-90 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
1A	1	3/30/2013 12:17	3	14094	4698.00	96.5%	0.53530	0.21317	3565.42	9576.98	0.3723	0.4039
1A	2	3/30/2013 13:18	3	15073	5024.33	100.0%	0.53530	0.22169	3887.83	9576.95	0.4060	0.3948
1A	3	3/30/2013 13:10	3	15044	5014.67	99.4%	0.53530	0.22059	3877.15	9576.96	0.4048	0.3921
1A	4	3/30/2013 13:02	3	14969	4989.67	100.0%	0.53530	0.21950	3864.39	9576.96	0.4035	0.3836
1A	5	3/30/2013 12:55	3	14480	4826.67	100.0%	0.53530	0.21852	3706.40	9576.96	0.3870	0.3722
1A	6	3/30/2013 12:41	3	11753	3917.67	100.0%	0.53530	0.21653	2807.61	9576.97	0.2932	0.3508
1A	7	3/30/2013 12:33	3	13985	4661.67	100.0%	0.53530	0.21541	3557.36	9576.97	0.3714	0.3408
1B	1	3/30/2013 12:25	3	14015	4671.67	96.5%	0.53354	0.21423	3537.22	9576.98	0.3693	0.4030
1B	2	3/30/2013 12:17	3	14889	4963.00	100.0%	0.53354	0.21318	3873.70	9576.98	0.4045	0.3941
1B	3	3/30/2013 13:18	3	14916	4972.00	99.4%	0.53354	0.22169	3832.59	9576.95	0.4002	0.3914
1B	4	3/30/2013 13:10	3	15096	5032.00	100.0%	0.53354	0.22059	3904.87	9576.96	0.4077	0.3831
1B	5	3/30/2013 13:02	3	14632	4877.33	100.0%	0.53354	0.21946	3755.95	9576.96	0.3922	0.3719
1B	6	3/30/2013 12:55	3	11749	3916.33	100.0%	0.53354	0.21849	2799.92	9576.96	0.2924	0.3508
1B	7	3/30/2013 12:41	3	13913	4637.67	100.0%	0.53354	0.21649	3531.48	9576.97	0.3687	0.3409
1C	1	3/30/2013 12:33	3	13961	4653.67	96.5%	0.53619	0.21541	3507.31	9576.97	0.3662	0.4107
1C	2	3/30/2013 12:25	3	15401	5133.67	100.0%	0.53619	0.21423	4033.58	9576.98	0.4212	0.4008
1C	3	3/30/2013 12:18	3	15175	5058.33	99.4%	0.53619	0.21322	3956.99	9576.98	0.4132	0.3979
1C	4	3/30/2013 13:18	3	15289	5096.33	100.0%	0.53619	0.22169	3957.94	9576.95	0.4133	0.3887
1C	5	3/30/2013 13:10	3	14609	4869.67	100.0%	0.53619	0.22059	3736.93	9576.96	0.3902	0.3764
1C	6	3/30/2013 13:02	3	11924	3974.67	100.0%	0.53619	0.21946	2847.70	9576.96	0.2973	0.3531
1C	7	3/30/2013 12:55	3	13954	4651.33	100.0%	0.53619	0.21849	3529.37	9576.96	0.3685	0.3422
1D	1	3/30/2013 12:41	3	13844	4614.67	96.5%	0.53094	0.21649	3473.83	9576.97	0.3627	0.4009
1D	2	3/30/2013 12:33	3	14825	4941.67	100.0%	0.53094	0.21541	3846.37	9576.97	0.4016	0.3917
1D	3	3/30/2013 12:25	3	14718	4906.00	99.4%	0.53094	0.21423	3810.27	9576.98	0.3979	0.3890
1D	4	3/30/2013 12:18	3	15215	5071.67	100.0%	0.53094	0.21323	3987.43	9576.98	0.4164	0.3805
1D	5	3/30/2013 13:18	3	14413	4804.33	100.0%	0.53094	0.22169	3677.09	9576.95	0.3840	0.3691
1D	6	3/30/2013 13:10	3	11672	3890.67	100.0%	0.53094	0.22059	2769.01	9576.96	0.2891	0.3475
1D	7	3/30/2013 13:02	3	13819	4606.33	100.0%	0.53094	0.21946	3490.40	9576.96	0.3645	0.3374
2A	1	3/30/2013 12:55	3	13666	4555.33	96.5%	0.51176	0.21853	3445.37	9576.96	0.3598	0.3955
2A	2	3/30/2013 12:41	3	14488	4829.33	100.0%	0.51176	0.21654	3768.06	9576.97	0.3935	0.3867
2A	3	3/30/2013 12:33	3	14873	4957.67	99.4%	0.51176	0.21541	3895.69	9576.97	0.4068	0.3840
2A	4	3/30/2013 12:25	3	14469	4823.00	100.0%	0.51176	0.21423	3773.02	9576.98	0.3940	0.3758
2A	5	3/30/2013 12:18	3	14051	4683.67	100.0%	0.51176	0.21325	3638.49	9576.98	0.3799	0.3647
2A	6	3/30/2013 13:18	3	11610	3870.00	100.0%	0.51176	0.22168	2783.51	9576.95	0.2906	0.3439
2A	7	3/30/2013 13:10	3	13591	4530.33	100.0%	0.51176	0.22059	3449.18	9576.96	0.3602	0.3341
2B	1	3/30/2013 13:02	3	13529	4509.67	96.5%	0.51601	0.21951	3385.45	9576.96	0.3535	0.3921
2B	2	3/30/2013 12:55	3	14792	4930.67	100.0%	0.51601	0.21853	3850.76	9576.96	0.4021	0.3843
2B	3	3/30/2013 12:41	3	14576	4858.67	99.4%	0.51601	0.21654	3782.28	9576.97	0.3949	0.3820
2B	4	3/30/2013 12:33	3	14582	4860.67	100.0%	0.51601	0.21541	3796.13	9576.97	0.3964	0.3747
2B	5	3/30/2013 12:25	3	14089	4696.33	100.0%	0.51601	0.21428	3637.42	9576.98	0.3798	0.3649
2B	6	3/30/2013 12:18	3	11449	3816.33	100.0%	0.51601	0.21327	2762.41	9576.98	0.2884	0.3465
2B	7	3/30/2013 13:18	3	13840	4613.33	100.0%	0.51601	0.22168	3517.82	9576.95	0.3673	0.3379
2C	1	3/30/2013 13:10	3	13679	4559.67	96.5%	0.51812	0.22059	3425.28	9576.96	0.3577	0.3937
2C	2	3/30/2013 13:02	3	14707	4902.33	100.0%	0.51812	0.21951	3813.12	9576.96	0.3982	0.3872
2C	3	3/30/2013 12:55	3	14753	4917.67	99.4%	0.51812	0.21853	3826.96	9576.96	0.3996	0.3853
2C	4	3/30/2013 12:41	3	14853	4951.00	100.0%	0.51812	0.21653	3876.57	9576.97	0.4048	0.3793
2C	5	3/30/2013 12:33	3	14390	4796.67	100.0%	0.51812	0.21541	3727.79	9576.97	0.3892	0.3712
2C	6	3/30/2013 12:25	3	11397	3799.00	100.0%	0.51812	0.21428	2735.76	9576.98	0.2857	0.3560
2C	7	3/30/2013 12:18	3	14284	4761.33	100.0%	0.51812	0.21329	3703.01	9576.98	0.3867	0.3489
2D	1	3/30/2013 13:18	3	13865	4621.67	96.5%	0.51988	0.22168	3477.80	9576.95	0.3631	0.3954
2D	2	3/30/2013 13:10	3	14898	4966.00	100.0%	0.51988	0.22059	3867.69	9576.96	0.4039	0.3870
2D	3	3/30/2013 13:02	3	14524	4841.33	99.4%	0.51988	0.21951	3741.99	9576.96	0.3907	0.3845
2D	4	3/30/2013 12:55	3	14804	4934.67	100.0%	0.51988	0.21853	3846.65	9576.96	0.4017	0.3768
2D	5	3/30/2013 12:41	3	14073	4691.00	100.0%	0.51988	0.21653	3612.91	9576.97	0.3772	0.3664
2D	6	3/30/2013 12:33	3	11483	3827.67	100.0%	0.51988	0.21541	2755.15	9576.97	0.2877	0.3469
2D	7	3/30/2013 12:25	3	13847	4615.67	100.0%	0.51988	0.21428	3548.81	9576.98	0.3706	0.3377
3A	1	3/30/2013 12:21	3	13645	4548.33	96.5%	0.53079	0.21370	3422.53	9576.98	0.3574	0.3908
3A	2	3/30/2013 13:21	3	14564	4854.67	100.0%	0.53079	0.22223	3725.02	9576.95	0.3890	0.3817
3A	3	3/30/2013 13:14	3	14572	4857.33	99.4%	0.53079	0.22116	3726.48	9576.96	0.3891	0.3790
3A	4	3/30/2013 13:06	3	14839	4946.33	100.0%	0.53079	0.22010	3827.48	9576.96	0.3997	0.3706
3A	5	3/30/2013 12:58	3	14177	4725.67	100.0%	0.53079	0.21896	3612.62	9576.96	0.3772	0.3594
3A	6	3/30/2013 12:51	3	11303	3767.67	100.0%	0.53079	0.21793	2659.85	9576.97	0.2777	0.3381
3A	7	3/30/2013 12:37	3	13572	4524.00	100.0%	0.53079	0.21601	3425.94	9576.97	0.3577	0.3282
3B	1	3/30/2013 12:29	3	13621	4540.33	96.5%	0.53063	0.21488	3408.64	9576.97	0.3559	0.3883
3B	2	3/30/2013 12:21	3	14585	4861.67	100.0%	0.53063	0.21370	3775.68	9576.98	0.3942	0.3805
3B	3	3/30/2013 13:21	3	14415	4805.00	99.4%	0.53063	0.22223	3669.05	9576.95	0.3831	0.3782
3B	4	3/30/2013 13:14	3	14709	4903.00	100.0%	0.53063	0.22116	3779.10	9576.96	0.3946	0.3710
3B	5	3/30/2013 13:06	3	14272	4757.33	100.0%	0.53063	0.22010	3638.81	9576.96	0.3800	0.3613
3B	6	3/30/2013 12:58	3	11627	3875.67	100.0%	0.53063	0.21894	2763.04	9576.96	0.2885	0.3431
3B	7	3/30/2013 12:51	3	13684	4561.33	100.0%	0.53063	0.21793	3453.84	9576.97	0.3606	0.3346
3C	1	3/30/2013 12:37	3	14011	4670.33	96.5%	0.53195	0.21601	3529.85	9576.97	0.3686	0.4047

Detector (#)	Source ID (#)	Raw Count Data Start Time	Count Time (min)	Beta (counts)	Raw Beta (cpm)	Recovery (%)	Yttrium Efficiency (cpm/dpm)	Y-90 Ingrowth	Corrected Sr-90 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-90 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
3C	2	3/30/2013 12:29	3	15274	5091.33	100.0%	0.53195	0.21488	3996.63	9576.97	0.4173	0.3956
3C	3	3/30/2013 12:21	3	14723	4907.67	99.4%	0.53195	0.21370	3812.58	9576.98	0.3981	0.3929
3C	4	3/30/2013 13:21	3	15163	5054.33	100.0%	0.53195	0.22223	3922.22	9576.95	0.4095	0.3846
3C	5	3/30/2013 13:14	3	14420	4806.67	100.0%	0.53195	0.22116	3679.97	9576.96	0.3843	0.3733
3C	6	3/30/2013 13:06	3	11833	3944.33	100.0%	0.53195	0.22010	2823.06	9576.96	0.2948	0.3520
3C	7	3/30/2013 12:58	3	14051	4683.67	100.0%	0.53195	0.21895	3568.26	9576.96	0.3726	0.3421
3D	1	3/30/2013 12:51	3	13662	4554.00	96.5%	0.52104	0.21793	3426.97	9576.97	0.3578	0.3947
3D	2	3/30/2013 12:37	3	14617	4872.33	100.0%	0.52104	0.21601	3794.43	9576.97	0.3962	0.3857
3D	3	3/30/2013 12:29	3	14360	4786.67	99.4%	0.52104	0.21488	3708.10	9576.97	0.3872	0.3830
3D	4	3/30/2013 12:21	3	14989	4996.33	100.0%	0.52104	0.21370	3929.97	9576.98	0.4104	0.3748
3D	5	3/30/2013 13:21	3	14309	4769.67	100.0%	0.52104	0.22222	3660.77	9576.95	0.3822	0.3636
3D	6	3/30/2013 13:14	3	11533	3844.33	100.0%	0.52104	0.22116	2740.74	9576.96	0.2862	0.3426
3D	7	3/30/2013 13:06	3	13555	4518.33	100.0%	0.52104	0.22010	3420.03	9576.96	0.3571	0.3328
4A	1	3/30/2013 12:58	3	14023	4674.33	96.5%	0.53002	0.21898	3522.35	9576.96	0.3678	0.4038
4A	2	3/30/2013 12:51	3	14894	4964.67	100.0%	0.53002	0.21794	3858.41	9576.97	0.4029	0.3945
4A	3	3/30/2013 12:37	3	14985	4995.00	99.4%	0.53002	0.21599	3892.19	9576.97	0.4064	0.3917
4A	4	3/30/2013 12:30	3	15019	5006.33	100.0%	0.53002	0.21491	3915.47	9576.97	0.4088	0.3832
4A	5	3/30/2013 12:21	3	14476	4825.33	100.0%	0.53002	0.21372	3740.47	9576.98	0.3906	0.3716
4A	6	3/30/2013 13:21	3	11639	3879.67	100.0%	0.53002	0.22220	2751.79	9576.95	0.2873	0.3499
4A	7	3/30/2013 13:14	3	14014	4671.33	100.0%	0.53002	0.22119	3548.59	9576.95	0.3705	0.3397
4B	1	3/30/2013 13:06	3	13871	4623.67	96.5%	0.53481	0.22006	3455.57	9576.96	0.3608	0.4026
4B	2	3/30/2013 12:58	3	15191	5063.67	100.0%	0.53481	0.21898	3942.07	9576.96	0.4116	0.3939
4B	3	3/30/2013 12:51	3	15008	5002.67	99.4%	0.53481	0.21794	3879.86	9576.97	0.4051	0.3913
4B	4	3/30/2013 12:37	3	15000	5000.00	100.0%	0.53481	0.21599	3893.74	9576.97	0.4066	0.3832
4B	5	3/30/2013 12:30	3	14550	4850.00	100.0%	0.53481	0.21490	3749.30	9576.97	0.3915	0.3722
4B	6	3/30/2013 12:21	3	11562	3854.00	100.0%	0.53481	0.21372	2759.36	9576.98	0.2881	0.3517
4B	7	3/30/2013 13:21	3	14136	4712.00	100.0%	0.53481	0.22220	3573.94	9576.95	0.3732	0.3421
4C	1	3/30/2013 13:14	3	14091	4697.00	96.5%	0.53734	0.22119	3517.34	9576.95	0.3673	0.4013
4C	2	3/30/2013 13:06	3	15137	5045.67	100.0%	0.53734	0.22006	3913.20	9576.96	0.4086	0.3939
4C	3	3/30/2013 12:58	3	15020	5006.67	99.4%	0.53734	0.21898	3873.12	9576.96	0.4044	0.3917
4C	4	3/30/2013 12:51	3	15005	5001.67	100.0%	0.53734	0.21794	3880.13	9576.97	0.4052	0.3848
4C	5	3/30/2013 12:37	3	14581	4860.33	100.0%	0.53734	0.21599	3748.83	9576.97	0.3914	0.3756
4C	6	3/30/2013 12:30	3	11676	3892.00	100.0%	0.53734	0.21490	2786.08	9576.97	0.2909	0.3582
4C	7	3/30/2013 12:21	3	14439	4813.00	100.0%	0.53734	0.21375	3713.00	9576.98	0.3877	0.3501
4D	1	3/30/2013 13:21	3	13872	4624.00	96.5%	0.53162	0.22220	3451.58	9576.95	0.3604	0.3956
4D	2	3/30/2013 13:14	3	15024	5008.00	100.0%	0.53162	0.22119	3881.86	9576.95	0.4053	0.3870
4D	3	3/30/2013 13:06	3	14688	4896.00	99.4%	0.53162	0.22006	3769.01	9576.96	0.3935	0.3844
4D	4	3/30/2013 12:58	3	14941	4980.33	100.0%	0.53162	0.21899	3865.41	9576.96	0.4036	0.3765
4D	5	3/30/2013 12:51	3	14023	4674.33	100.0%	0.53162	0.21794	3564.75	9576.97	0.3722	0.3658
4D	6	3/30/2013 12:37	3	11509	3836.33	100.0%	0.53162	0.21599	2736.67	9576.97	0.2858	0.3457
4D	7	3/30/2013 12:30	3	13924	4641.33	100.0%	0.53162	0.21490	3547.19	9576.97	0.3704	0.3363
5A	1	3/30/2013 13:25	3	14335	4778.33	96.5%	0.53718	0.22270	3590.98	9576.95	0.3750	0.4129
5A	2	3/30/2013 14:15	3	15370	5123.33	100.0%	0.53718	0.22970	3941.61	9576.93	0.4116	0.4010
5A	3	3/30/2013 14:07	3	15373	5124.33	99.4%	0.53718	0.22864	3941.17	9576.93	0.4115	0.3974
5A	4	3/30/2013 14:00	3	15258	5086.00	100.0%	0.53718	0.22766	3914.80	9576.93	0.4088	0.3863
5A	5	3/30/2013 13:53	3	14748	4916.00	100.0%	0.53718	0.22668	3749.83	9576.94	0.3915	0.3714
5A	6	3/30/2013 13:47	3	11926	3975.33	100.0%	0.53718	0.22573	2814.04	9576.94	0.2938	0.3434
5A	7	3/30/2013 13:40	3	13537	4512.33	100.0%	0.53718	0.22477	3356.01	9576.94	0.3504	0.3302
5B	1	3/30/2013 13:32	3	14174	4724.67	96.5%	0.53788	0.22367	3530.60	9576.95	0.3687	0.4096
5B	2	3/30/2013 13:25	3	15365	5121.67	100.0%	0.53788	0.22270	3974.51	9576.95	0.4150	0.3982
5B	3	3/30/2013 14:15	3	15151	5050.33	99.4%	0.53788	0.22966	3860.34	9576.93	0.4031	0.3947
5B	4	3/30/2013 14:07	3	15253	5084.33	100.0%	0.53788	0.22864	3906.57	9576.93	0.4079	0.3841
5B	5	3/30/2013 14:00	3	14820	4940.00	100.0%	0.53788	0.22763	3767.44	9576.93	0.3934	0.3698
5B	6	3/30/2013 13:53	3	11897	3965.67	100.0%	0.53788	0.22668	2797.98	9576.94	0.2922	0.3429
5B	7	3/30/2013 13:47	3	13533	4511.00	100.0%	0.53788	0.22582	3347.73	9576.94	0.3496	0.3303
5C	1	3/30/2013 13:39	3	14333	4777.67	96.5%	0.53909	0.22471	3575.31	9576.94	0.3733	0.4158
5C	2	3/30/2013 13:32	3	15507	5169.00	100.0%	0.53909	0.22367	4014.22	9576.95	0.4192	0.4019
5C	3	3/30/2013 13:25	3	15162	5054.00	99.4%	0.53909	0.22270	3897.48	9576.95	0.4070	0.3978
5C	4	3/30/2013 14:15	3	15436	5145.33	100.0%	0.53909	0.22966	3959.63	9576.93	0.4135	0.3850
5C	5	3/30/2013 14:07	3	14618	4872.67	100.0%	0.53909	0.22854	3692.76	9576.93	0.3856	0.3677
5C	6	3/30/2013 14:00	3	11698	3899.33	100.0%	0.53909	0.22763	2724.11	9576.93	0.2844	0.3351
5C	7	3/30/2013 13:54	3	13285	4428.33	100.0%	0.53909	0.22673	3257.78	9576.94	0.3402	0.3199
5D	1	3/30/2013 13:47	3	14052	4684.00	96.5%	0.53831	0.22582	3477.48	9576.94	0.3631	0.4061
5D	2	3/30/2013 13:39	3	15099	5033.00	100.0%	0.53831	0.22471	3874.51	9576.94	0.4046	0.3938
5D	3	3/30/2013 13:32	3	14907	4969.00	99.4%	0.53831	0.22366	3809.14	9576.95	0.3977	0.3901
5D	4	3/30/2013 13:25	3	15249	5083.00	100.0%	0.53831	0.22270	3934.92	9576.95	0.4109	0.3788
5D	5	3/30/2013 14:15	3	14837	4945.67	100.0%	0.53831	0.22966	3761.66	9576.93	0.3928	0.3634
5D	6	3/30/2013 14:07	3	11545	3848.33	100.0%	0.53831	0.22854	2670.13	9576.93	0.2788	0.3346
5D	7	3/30/2013 14:00	3	13288	4429.33	100.0%	0.53831	0.22763	3255.82	9576.93	0.3400	0.3211
6A	1	3/30/2013 13:54	3	13113	4371.00	96.5%	0.47877	0.22672	3293.68	9576.94	0.3439	0.3892
6A	2	3/30/2013 13:47	3	14330	4776.67	100.0%	0.47877	0.22582	3741.28	9576.94	0.3907	0.3766
6A	3	3/30/2013 13:39	3	14044	4681.33	99.4%	0.47877	0.22473	3644.85	9576.94	0.3806	0.3728
6A	4	3/30/2013 13:32	3	14336	4778.67	100.0%	0.47877	0.22367	3753.12	9576.95	0.3919	0.3612
6A	5	3/30/2013 13:25	3	13718	4572.67	100.0%	0.47877	0.22273	3551.44	9576.95	0.3708	0.3455
6A	6	3/30/2013 14:15	3	11049	3683.00	100.0%	0.47877	0.22964	2630.07	9576.93	0.2746	0.3159
6A	7	3/30/2013 14:07	3	12072	4024.00	100.0%	0.47877	0.22860	2975.83	9576.93	0.3107	0.3021
6B	1	3/30/2013 14:00	3	12617	4205.67	96.5%	0.44887	0.22766	3191.42	9576.93	0.3332	0.3740
6B	2	3/30/2013 13:54	3	13913	4637.67	100.0%	0.44887	0.22673	3662.97	9576.94	0.3825	0.3632
6B	3	3/30/2013 13:46	3	13094	4364.67	99.4%	0.44887	0.22573	3388.60	9576.94	0.3538	0.3600
6B	4	3/30/2013 13:39	3	13831	4610.33	100.0%	0.44887	0.22473	3644.24	9576.94	0.3805	0.3500
6B	5	3/30/2013 13:32	3	13414	4471.33	100.0%	0.44887	0.22371	3509.65	9576.95	0.3665	0.3366
6B	6	3/30/2013 13:25	3	10672	3557.33	100.0%	0.44887	0.22272	2599.89	9576.95	0.2715	0.3112
6B	7	3/30/2013 14:15	3	11765	3921.67	100.0%	0.44887	0.22969	2934.25	9576.93	0.3064	0.2994
6C	1	3/30/2013 14:07	3	14081	4693.67	96.5%	0.51012	0.22860	3536.25	9576.93	0.3692	0.4020
6C	2	3/30/2013 14:00	3	14961	4987.00	100.0%	0.51012	0.22766	3874.82	9576.93	0.4046	0.3932
6C	3	3/30/2013 13:53	3	15089	5029.67	99.4%	0.51012	0.22668	3915.76	9576.94	0.4089	0.3905
6C	4	3/30/2013 13:46	3	14784	4928.00	100.0%	0.51012	0.22573	3825.24	9576.94	0.3994	0.3823
6C	5	3/30/2013 13:39	3	14305	4768.33	100.0%	0.51012	0.22473	3670.43	9576.94	0.3833	0.3713
6C	6	3/30/2013 13:32	3	11626	3875.33	100.0%	0.51012	0.22371	2782.44	9576.95	0.2905	0.3505

Detector (#)	Source ID (#)	Raw Count Data Start Time	Count Time (min)	Beta (counts)	Raw Beta (cpm)	Recovery (%)	Yttrium Efficiency (cpm/dpm)	Y-90 Ingrowth	Corrected Sr-90 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-90 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
6C	7	3/30/2013 13:25	3	14025	4675.00	100.0%	0.51012	0.22272	3586.91	9576.95	0.3745	0.3407
6D	1	3/30/2013 14:15	3	12095	4031.67	96.5%	0.45548	0.22969	2993.29	9576.93	0.3126	0.3433
6D	2	3/30/2013 14:07	3	12930	4310.00	100.0%	0.45548	0.22860	3312.81	9576.93	0.3459	0.3355
6D	3	3/30/2013 14:00	3	12868	4289.33	99.4%	0.45548	0.22765	3290.45	9576.93	0.3436	0.3332
6D	4	3/30/2013 13:53	3	12981	4327.00	100.0%	0.45548	0.22667	3338.24	9576.94	0.3486	0.3260
6D	5	3/30/2013 13:46	3	12417	4139.00	100.0%	0.45548	0.22573	3154.36	9576.94	0.3294	0.3164
6D	6	3/30/2013 13:39	3	9991	3330.33	100.0%	0.45548	0.22473	2350.04	9576.94	0.2454	0.2982
6D	7	3/30/2013 13:32	3	12032	4010.67	100.0%	0.45548	0.22371	3034.84	9576.95	0.3169	0.2897
7A	1	3/30/2013 13:28	3	14545	4848.33	96.5%	0.53735	0.22316	3658.13	9576.95	0.3820	0.4141
7A	2	3/30/2013 14:18	3	15303	5101.00	100.0%	0.53735	0.23017	3916.52	9576.93	0.4090	0.4013
7A	3	3/30/2013 14:11	3	15303	5101.00	99.4%	0.53735	0.22917	3914.70	9576.93	0.4088	0.3975
7A	4	3/30/2013 14:04	3	15216	5072.00	100.0%	0.53735	0.22812	3898.05	9576.93	0.4070	0.3857
7A	5	3/30/2013 13:57	3	14738	4912.67	100.0%	0.53735	0.22716	3743.65	9576.94	0.3909	0.3697
7A	6	3/30/2013 13:50	3	11695	3898.33	100.0%	0.53735	0.22622	2734.17	9576.94	0.2855	0.3396
7A	7	3/30/2013 13:43	3	13540	4513.33	100.0%	0.53735	0.22523	3354.28	9576.94	0.3502	0.3255
7B	1	3/30/2013 13:36	3	14155	4718.33	96.5%	0.53953	0.22424	3517.55	9576.95	0.3673	0.4106
7B	2	3/30/2013 13:28	3	15340	5113.33	100.0%	0.53953	0.22316	3960.24	9576.95	0.4135	0.3972
7B	3	3/30/2013 14:18	3	15172	5057.33	99.4%	0.53953	0.23010	3861.38	9576.93	0.4032	0.3932
7B	4	3/30/2013 14:11	3	15304	5101.33	100.0%	0.53953	0.22917	3917.19	9576.93	0.4090	0.3808
7B	5	3/30/2013 14:03	3	14547	4849.00	100.0%	0.53953	0.22808	3670.51	9576.93	0.3833	0.3641
7B	6	3/30/2013 13:57	3	11731	3910.33	100.0%	0.53953	0.22716	2736.58	9576.94	0.2857	0.3327
7B	7	3/30/2013 13:50	3	13123	4374.33	100.0%	0.53953	0.22626	3205.23	9576.94	0.3347	0.3180
7C	1	3/30/2013 13:43	3	14289	4763.00	96.5%	0.53213	0.22523	3573.45	9576.94	0.3731	0.4137
7C	2	3/30/2013 13:36	3	15396	5132.00	100.0%	0.53213	0.22424	3989.24	9576.95	0.4165	0.4006
7C	3	3/30/2013 13:28	3	15144	5048.00	99.4%	0.53213	0.22316	3904.02	9576.95	0.4076	0.3967
7C	4	3/30/2013 14:18	3	15243	5081.00	100.0%	0.53213	0.23010	3908.34	9576.93	0.4081	0.3846
7C	5	3/30/2013 14:11	3	14647	4882.33	100.0%	0.53213	0.22918	3714.40	9576.93	0.3878	0.3682
7C	6	3/30/2013 14:03	3	11785	3928.33	100.0%	0.53213	0.22808	2765.98	9576.93	0.2888	0.3375
7C	7	3/30/2013 13:57	3	13310	4436.67	100.0%	0.53213	0.22716	3279.00	9576.94	0.3424	0.3232
7D	1	3/30/2013 13:50	3	14208	4736.00	96.5%	0.53666	0.22626	3530.81	9576.94	0.3687	0.4092
7D	2	3/30/2013 13:43	3	15261	5087.00	100.0%	0.53666	0.22523	3929.42	9576.94	0.4103	0.3960
7D	3	3/30/2013 13:36	3	14845	4948.33	99.4%	0.53666	0.22424	3789.07	9576.95	0.3956	0.3920
7D	4	3/30/2013 13:28	3	15230	5076.67	100.0%	0.53666	0.22317	3929.68	9576.95	0.4103	0.3798
7D	5	3/30/2013 14:18	3	14768	4922.67	100.0%	0.53666	0.23011	3740.01	9576.93	0.3905	0.3632
7D	6	3/30/2013 14:11	3	11438	3812.67	100.0%	0.53666	0.22918	2634.79	9576.93	0.2751	0.3322
7D	7	3/30/2013 14:03	3	13266	4422.00	100.0%	0.53666	0.22808	3249.75	9576.93	0.3393	0.3176
8A	1	3/30/2013 13:57	3	13895	4631.67	96.5%	0.52553	0.22719	3446.66	9576.94	0.3599	0.4057
8A	2	3/30/2013 13:50	3	14992	4997.33	100.0%	0.52553	0.22628	3858.47	9576.94	0.4029	0.3905
8A	3	3/30/2013 13:43	3	14765	4921.67	99.4%	0.52553	0.22519	3781.62	9576.94	0.3949	0.3859
8A	4	3/30/2013 13:36	3	15068	5022.67	100.0%	0.52553	0.22427	3893.92	9576.95	0.4066	0.3718
8A	5	3/30/2013 13:28	3	14209	4736.33	100.0%	0.52553	0.22320	3612.98	9576.95	0.3773	0.3527
8A	6	3/30/2013 14:18	3	11132	3710.67	100.0%	0.52553	0.23013	2552.44	9576.93	0.2665	0.3168
8A	7	3/30/2013 14:12	3	12521	4173.67	100.0%	0.52553	0.22923	3019.94	9576.93	0.3153	0.3000
8B	1	3/30/2013 14:04	3	13736	4578.67	96.5%	0.51282	0.22811	3417.63	9576.93	0.3569	0.4011
8B	2	3/30/2013 13:57	3	14887	4962.33	100.0%	0.51282	0.22719	3846.56	9576.94	0.4016	0.3886
8B	3	3/30/2013 13:50	3	14532	4844.00	99.4%	0.51282	0.22621	3726.50	9576.94	0.3891	0.3848
8B	4	3/30/2013 13:43	3	14897	4965.67	100.0%	0.51282	0.22519	3859.69	9576.94	0.4030	0.3732
8B	5	3/30/2013 13:36	3	14465	4821.67	100.0%	0.51282	0.22427	3720.21	9576.95	0.3885	0.3576
8B	6	3/30/2013 13:28	3	11620	3873.33	100.0%	0.51282	0.22320	2777.15	9576.95	0.2900	0.3283
8B	7	3/30/2013 14:18	3	12555	4185.00	100.0%	0.51282	0.23015	3054.66	9576.93	0.3190	0.3145
8C	1	3/30/2013 14:12	3	14553	4851.00	96.5%	0.53584	0.22923	3631.87	9576.93	0.3792	0.4099
8C	2	3/30/2013 14:04	3	15356	5118.67	100.0%	0.53584	0.22811	3948.07	9576.93	0.4122	0.3991
8C	3	3/30/2013 13:57	3	14984	4994.67	99.4%	0.53584	0.22717	3822.04	9576.94	0.3991	0.3958
8C	4	3/30/2013 13:50	3	15283	5094.33	100.0%	0.53584	0.22621	3933.50	9576.94	0.4107	0.3858
8C	5	3/30/2013 13:43	3	14518	4839.33	100.0%	0.53584	0.22519	3683.72	9576.94	0.3846	0.3723
8C	6	3/30/2013 13:36	3	12272	4090.67	100.0%	0.53584	0.22427	2939.78	9576.95	0.3070	0.3468
8C	7	3/30/2013 13:28	3	13541	4513.67	100.0%	0.53584	0.22320	3368.29	9576.95	0.3517	0.3349
8D	1	3/30/2013 14:18	3	14393	4797.67	96.5%	0.54197	0.23015	3559.64	9576.93	0.3717	0.4137
8D	2	3/30/2013 14:12	3	15368	5122.67	100.0%	0.54197	0.22923	3932.84	9576.93	0.4107	0.4025
8D	3	3/30/2013 14:04	3	15551	5183.67	99.4%	0.54197	0.22810	3992.74	9576.93	0.4169	0.3992
8D	4	3/30/2013 13:57	3	15442	5147.33	100.0%	0.54197	0.22717	3968.22	9576.94	0.4144	0.3888
8D	5	3/30/2013 13:50	3	14977	4992.33	100.0%	0.54197	0.22620	3818.24	9576.94	0.3987	0.3749
8D	6	3/30/2013 13:43	3	11985	3995.00	100.0%	0.54197	0.22519	2826.18	9576.94	0.2951	0.3486
8D	7	3/30/2013 13:36	3	13737	4579.00	100.0%	0.54197	0.22427	3414.94	9576.95	0.3566	0.3363
9A	1	3/30/2013 14:22	3	14571	4857.00	96.5%	0.53774	0.23062	3626.15	9576.93	0.3786	0.4201
9A	2	3/30/2013 15:14	3	15738	5246.00	100.0%	0.53774	0.23789	4020.87	9576.90	0.4199	0.4045
9A	3	3/30/2013 15:07	3	15197	5065.67	99.4%	0.53774	0.23689	3838.56	9576.91	0.4008	0.3999
9A	4	3/30/2013 14:57	3	15737	5245.67	100.0%	0.53774	0.23556	4032.58	9576.91	0.4211	0.3855
9A	5	3/30/2013 14:50	3	14772	4924.00	100.0%	0.53774	0.23457	3715.98	9576.91	0.3880	0.3660
9A	6	3/30/2013 14:42	3	11700	3900.00	100.0%	0.53774	0.23349	2697.54	9576.92	0.2817	0.3294
9A	7	3/30/2013 14:35	3	13004	4334.67	100.0%	0.53774	0.23253	3137.16	9576.92	0.3276	0.3123
9B	1	3/30/2013 14:28	3	14063	4687.67	96.5%	0.52675	0.23155	3477.09	9576.92	0.3631	0.4037
9B	2	3/30/2013 14:22	3	14946	4982.00	100.0%	0.52675	0.23063	3818.55	9576.93	0.3987	0.3890
9B	3	3/30/2013 15:15	3	14825	4941.67	99.4%	0.52675	0.23795	3734.25	9576.90	0.3899	0.3846
9B	4	3/30/2013 15:07	3	15236	5078.67	100.0%	0.52675	0.23692	3883.52	9576.91	0.4055	0.3709
9B	5	3/30/2013 14:57	3	14428	4809.33	100.0%	0.52675	0.23552	3621.23	9576.91	0.3781	0.3525
9B	6	3/30/2013 14:50	3	11183	3727.67	100.0%	0.52675	0.23460	2544.19	9576.91	0.2657	0.3178
9B	7	3/30/2013 14:43	3	12700	4233.33	100.0%	0.52675	0.23354	3055.23	9576.92	0.3190	0.3016
9C	1	3/30/2013 14:35	3	14218	4739.33	96.5%	0.53222	0.23248	3511.30	9576.92	0.3666	0.4182
9C	2	3/30/2013 14:28	3	15402	5134.00	100.0%	0.53222	0.23156	3953.74	9576.92	0.4128	0.4000
9C	3	3/30/2013 14:21	3	15296	5098.67	99.4%	0.53222	0.23057	3916.53	9576.93	0.4090	0.3945
9C	4	3/30/2013 15:15	3	15315	5105.00	100.0%	0.53222	0.23795	3892.16	9576.90	0.4064	0.3776
9C	5	3/30/2013 15:07	3	14853	4951.00	100.0%	0.53222	0.23692	3743.42	9576.91	0.3909	0.3548
9C	6	3/30/2013 14:57	3	10978	3659.33	100.0%	0.53222	0.23552	2458.88	9576.91	0.2568	0.3119
9C	7	3/30/2013 14:50	3	12385	4128.33	100.0%	0.53222	0.23460	2932.54	9576.91	0.3062	0.2918
9D	1	3/30/2013 14:43	3	13987	4662.33	96.5%	0.51007	0.23353	3480.06	9576.92	0.3634	0.4105
9D	2	3/30/2013 14:35	3	15196	5065.33	100.0%	0.51007	0.23248	3929.71	9576.92	0.4103	0.3933
9D	3	3/30/2013 14:28	3	14760	4920.00	99.4%	0.51007	0.23156	3782.21	9576.92	0.3949	0.3882
9D	4	3/30/2013 14:21	3	14958	4986.00	100.0%	0.51007	0.23057	3859.69	9576.93	0.4030	0.3723

Detector (#)	Source ID (#)	Raw Count Data Start Time	Count Time (min)	Beta (counts)	Raw Beta (cpm)	Recovery (%)	Yttrium Efficiency (cpm/dpm)	Y-90 Ingrowth	Corrected Sr-90 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-90 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
9D	5	3/30/2013 15:15	3	14493	4831.00	100.0%	0.51007	0.23795	3668.64	9576.90	**0.3831**	0.3509
9D	6	3/30/2013 15:07	3	10632	3544.00	100.0%	0.51007	0.23691	2386.70	9576.91	**0.2492**	0.3105
9D	7	3/30/2013 14:57	3	12459	4153.00	100.0%	0.51007	0.23552	3002.50	9576.91	**0.3135**	0.2917
10A	1	3/30/2013 14:50	3	14585	4861.67	96.5%	0.53055	0.23461	3626.29	9576.91	**0.3786**	0.4169
10A	2	3/30/2013 14:43	3	15225	5075.00	100.0%	0.53055	0.23354	3888.38	9576.92	**0.4060**	0.3995
10A	3	3/30/2013 14:35	3	15080	5026.67	99.4%	0.53055	0.23248	3838.51	9576.92	**0.4008**	0.3943
10A	4	3/30/2013 14:28	3	15107	5035.67	100.0%	0.53055	0.23156	3859.11	9576.92	**0.4030**	0.3782
10A	5	3/30/2013 14:21	3	14855	4951.67	100.0%	0.53055	0.23058	3780.08	9576.93	**0.3947**	0.3565
10A	6	3/30/2013 15:15	3	11188	3729.33	100.0%	0.53055	0.23795	2520.29	9576.90	**0.2632**	0.3156
10A	7	3/30/2013 15:07	3	12557	4185.67	100.0%	0.53055	0.23692	2981.89	9576.91	**0.3114**	0.2965
10B	1	3/30/2013 14:57	3	14134	4711.33	96.5%	0.52680	0.23556	3479.69	9576.91	**0.3633**	0.4101
10B	2	3/30/2013 14:50	3	15177	5059.00	100.0%	0.52680	0.23457	3875.59	9576.91	**0.4047**	0.3940
10B	3	3/30/2013 14:43	3	14709	4903.00	99.4%	0.52680	0.23354	3717.83	9576.92	**0.3882**	0.3892
10B	4	3/30/2013 14:35	3	15366	5122.00	100.0%	0.52680	0.23254	3948.80	9576.92	**0.4123**	0.3743
10B	5	3/30/2013 14:29	3	14785	4928.33	100.0%	0.52680	0.23160	3759.89	9576.92	**0.3926**	0.3542
10B	6	3/30/2013 14:22	3	11381	3793.67	100.0%	0.52680	0.23060	2630.24	9576.93	**0.2746**	0.3163
10B	7	3/30/2013 15:14	3	12244	4081.33	100.0%	0.52680	0.23789	2881.16	9576.90	**0.3008**	0.2986
10C	1	3/30/2013 15:07	3	14391	4797.00	96.5%	0.52915	0.23688	3552.94	9576.91	**0.3710**	0.4094
10C	2	3/30/2013 14:57	3	15140	5046.67	100.0%	0.52915	0.23556	3852.93	9576.91	**0.4023**	0.3955
10C	3	3/30/2013 14:50	3	14971	4990.33	99.4%	0.52915	0.23457	3794.65	9576.91	**0.3962**	0.3913
10C	4	3/30/2013 14:42	3	15541	5180.33	100.0%	0.52915	0.23350	3997.05	9576.92	**0.4174**	0.3784
10C	5	3/30/2013 14:36	3	14457	4819.00	100.0%	0.52915	0.23254	3640.56	9576.92	**0.3801**	0.3610
10C	6	3/30/2013 14:29	3	11591	3863.67	100.0%	0.52915	0.23159	2690.04	9576.92	**0.2809**	0.3282
10C	7	3/30/2013 14:22	3	12946	4315.33	100.0%	0.52915	0.23060	3146.72	9576.93	**0.3286**	0.3129
10D	1	3/30/2013 15:14	3	14192	4730.67	96.5%	0.53332	0.23789	3471.45	9576.90	**0.3625**	0.4099
10D	2	3/30/2013 15:07	3	15388	5129.33	100.0%	0.53332	0.23688	3919.44	9576.91	**0.4093**	0.3959
10D	3	3/30/2013 14:57	3	15273	5091.00	99.4%	0.53332	0.23556	3880.76	9576.91	**0.4052**	0.3916
10D	4	3/30/2013 14:50	3	15258	5086.00	100.0%	0.53332	0.23457	3887.93	9576.91	**0.4060**	0.3786
10D	5	3/30/2013 14:42	3	14721	4907.00	100.0%	0.53332	0.23350	3714.38	9576.92	**0.3878**	0.3610
10D	6	3/30/2013 14:36	3	11720	3906.67	100.0%	0.53332	0.23254	2718.92	9576.92	**0.2839**	0.3279
10D	7	3/30/2013 14:29	3	12821	4273.67	100.0%	0.53332	0.23160	3090.77	9576.92	**0.3227**	0.3124
11A	1	3/30/2013 15:28	3	13341	4447.00	96.5%	0.46775	0.23976	3333.90	9576.90	**0.3481**	0.3959
11A	2	3/30/2013 15:31	3	14364	4788.00	100.0%	0.46775	0.24023	3711.86	9576.90	**0.3876**	0.3772
11A	3	3/30/2013 15:35	3	14259	4753.00	99.4%	0.46775	0.24072	3668.31	9576.89	**0.3830**	0.3716
11A	4	3/30/2013 15:38	3	14370	4790.00	100.0%	0.46775	0.24121	3709.47	9576.89	**0.3873**	0.3543
11A	5	3/30/2013 15:43	3	13698	4566.00	100.0%	0.46775	0.24183	3482.71	9576.89	**0.3637**	0.3309
11A	6	3/30/2013 15:47	3	9866	3288.67	100.0%	0.46775	0.24234	2203.07	9576.89	**0.2300**	0.2870
11A	7	3/30/2013 15:51	3	11413	3804.33	100.0%	0.46775	0.24292	2716.15	9576.89	**0.2836**	0.2664
11B	1	3/30/2013 15:54	3	14495	4831.67	96.5%	0.53231	0.24340	3545.73	9576.88	**0.3702**	0.4201
11B	2	3/30/2013 15:28	3	15572	5190.67	100.0%	0.53231	0.23976	3968.40	9576.90	**0.4144**	0.4011
11B	3	3/30/2013 15:31	3	15188	5062.67	99.4%	0.53231	0.24024	3830.78	9576.90	**0.4000**	0.3953
11B	4	3/30/2013 15:35	3	15612	5204.00	100.0%	0.53231	0.24073	3976.79	9576.89	**0.4152**	0.3777
11B	5	3/30/2013 15:39	3	14881	4960.33	100.0%	0.53231	0.24122	3730.64	9576.89	**0.3895**	0.3539
11B	6	3/30/2013 15:43	3	11037	3679.00	100.0%	0.53231	0.24183	2446.17	9576.89	**0.2554**	0.3091
11B	7	3/30/2013 15:47	3	12343	4114.33	100.0%	0.53231	0.24235	2878.87	9576.89	**0.3006**	0.2882
11C	1	3/30/2013 15:51	3	14267	4755.67	96.5%	0.52945	0.24294	3479.05	9576.89	**0.3633**	0.4152
11C	2	3/30/2013 15:55	3	15354	5118.00	100.0%	0.52945	0.24341	3883.80	9576.88	**0.4055**	0.3956
11C	3	3/30/2013 15:28	3	15138	5046.00	99.4%	0.52945	0.23976	3823.14	9576.90	**0.3992**	0.3897
11C	4	3/30/2013 15:31	3	15373	5124.33	100.0%	0.52945	0.24025	3906.14	9576.89	**0.4079**	0.3716
11C	5	3/30/2013 15:35	3	14902	4967.33	100.0%	0.52945	0.24074	3746.66	9576.89	**0.3912**	0.3470
11C	6	3/30/2013 15:39	3	10342	3447.33	100.0%	0.52945	0.24123	2224.18	9576.89	**0.2322**	0.3009
11C	7	3/30/2013 15:43	3	12297	4099.00	100.0%	0.52945	0.24184	2872.74	9576.89	**0.3000**	0.2793
11D	1	3/30/2013 15:47	3	14538	4846.00	96.5%	0.53406	0.24237	3561.31	9576.89	**0.3719**	0.4230
11D	2	3/30/2013 15:51	3	15591	5197.00	100.0%	0.53406	0.24295	3954.43	9576.89	**0.4129**	0.4023
11D	3	3/30/2013 15:55	3	15511	5170.33	99.4%	0.53406	0.24342	3918.04	9576.88	**0.4091**	0.3961
11D	4	3/30/2013 15:28	3	15573	5191.00	100.0%	0.53406	0.23976	3964.73	9576.90	**0.4140**	0.3770
11D	5	3/30/2013 15:32	3	14769	4923.00	100.0%	0.53406	0.24026	3694.18	9576.89	**0.3857**	0.3512
11D	6	3/30/2013 15:35	3	10450	3483.33	100.0%	0.53406	0.24075	2252.00	9576.89	**0.2351**	0.3027
11D	7	3/30/2013 15:39	3	12426	4142.00	100.0%	0.53406	0.24124	2908.14	9576.89	**0.3037**	0.2800
13A	1	3/30/2013 14:31	3	14517	4839.00	96.5%	0.53002	0.23188	3619.17	9576.92	**0.3779**	0.4202
13A	2	3/30/2013 15:25	3	15416	5138.67	100.0%	0.53002	0.23932	3923.88	9576.90	**0.4097**	0.4041
13A	3	3/30/2013 15:16	3	15553	5184.33	99.4%	0.53002	0.23816	3968.33	9576.90	**0.4144**	0.3993
13A	4	3/30/2013 15:09	3	15547	5182.33	100.0%	0.53002	0.23718	3978.39	9576.90	**0.4154**	0.3844
13A	5	3/30/2013 14:59	3	14769	4923.00	100.0%	0.53002	0.23585	3725.83	9576.91	**0.3890**	0.3643
13A	6	3/30/2013 14:53	3	11476	3825.33	100.0%	0.53002	0.23491	2632.92	9576.91	**0.2749**	0.3266
13A	7	3/30/2013 14:44	3	12935	4311.67	100.0%	0.53002	0.23378	3125.02	9576.92	**0.3263**	0.3089
13B	1	3/30/2013 14:37	3	14929	4976.33	96.5%	0.54385	0.23280	3719.73	9576.92	**0.3884**	0.4290
13B	2	3/30/2013 14:31	3	15677	5225.67	100.0%	0.54385	0.23188	4017.94	9576.92	**0.4195**	0.4105
13B	3	3/30/2013 15:25	3	15456	5152.00	99.4%	0.54385	0.23932	3898.20	9576.90	**0.4070**	0.4049
13B	4	3/30/2013 15:16	3	15818	5272.67	100.0%	0.54385	0.23816	4032.25	9576.90	**0.4210**	0.3878
13B	5	3/30/2013 15:09	3	15205	5068.33	100.0%	0.54385	0.23718	3833.01	9576.90	**0.4002**	0.3646
13B	6	3/30/2013 14:59	3	11264	3754.67	100.0%	0.54385	0.23585	2526.27	9576.91	**0.2638**	0.3211
13B	7	3/30/2013 14:53	3	12827	4275.67	100.0%	0.54385	0.23491	3052.16	9576.91	**0.3187**	0.3007
13C	1	3/30/2013 14:44	3	13771	4590.33	96.5%	0.49054	0.23378	3452.11	9576.92	**0.3605**	0.4084
13C	2	3/30/2013 14:37	3	14798	4932.67	100.0%	0.49054	0.23280	3838.98	9576.92	**0.4009**	0.3907
13C	3	3/30/2013 14:31	3	14645	4881.67	99.4%	0.49054	0.23188	3785.90	9576.92	**0.3953**	0.3854
13C	4	3/30/2013 15:25	3	15000	5000.00	100.0%	0.49054	0.23932	3875.71	9576.90	**0.4047**	0.3690
13C	5	3/30/2013 15:16	3	14263	4754.33	100.0%	0.49054	0.23816	3635.49	9576.90	**0.3796**	0.3469
13C	6	3/30/2013 15:09	3	10434	3478.00	100.0%	0.49054	0.23718	2363.75	9576.90	**0.2468**	0.3053
13C	7	3/30/2013 14:59	3	12050	4016.67	100.0%	0.49054	0.23585	2908.67	9576.91	**0.3037**	0.2858
13D	1	3/30/2013 14:53	3	14215	4738.33	96.5%	0.52636	0.23491	3511.08	9576.91	**0.3666**	0.4177
13D	2	3/30/2013 14:44	3	15393	5131.00	100.0%	0.52636	0.23378	3952.50	9576.92	**0.4127**	0.4009
13D	3	3/30/2013 14:37	3	15231	5077.00	99.4%	0.52636	0.23280	3896.55	9576.92	**0.4069**	0.3958
13D	4	3/30/2013 14:31	3	15518	5172.67	100.0%	0.52636	0.23188	4003.76	9576.92	**0.4181**	0.3802
13D	5	3/30/2013 15:25	3	14852	4950.67	100.0%	0.52636	0.23932	3744.28	9576.90	**0.3910**	0.3591
13D	6	3/30/2013 15:16	3	11056	3685.33	100.0%	0.52636	0.23816	2484.81	9576.90	**0.2595**	0.3195
13D	7	3/30/2013 15:09	3	12768	4256.00	100.0%	0.52636	0.23718	3060.37	9576.90	**0.3196**	0.3010
14A	1	3/30/2013 14:59	3	13882	4627.33	96.5%	0.49881	0.23586	3459.65	9576.91	**0.3612**	0.4155
14A	2	3/30/2013 14:52	3	14985	4995.00	100.0%	0.49881	0.23488	3872.95	9576.91	**0.4044**	0.3955

Detector (#)	Source ID (#)	Raw Count Data Start Time	Count Time (min)	Beta (counts)	Raw Beta (cpm)	Recovery (%)	Yttrium Efficiency (cpm/dpm)	Y-90 Ingrowth	Corrected Sr-90 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-90 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
14A	3	3/30/2013 14:45	3	14874	4958.00	99.4%	0.49881	0.23380	3834.57	9576.92	**0.4004**	0.3896
14A	4	3/30/2013 14:38	3	15344	5114.67	100.0%	0.49881	0.23285	4002.34	9576.92	**0.4179**	0.3711
14A	5	3/30/2013 14:31	3	14151	4717.00	100.0%	0.49881	0.23189	3609.23	9576.92	**0.3769**	0.3462
14A	6	3/30/2013 15:24	3	10357	3452.33	100.0%	0.49881	0.23929	2309.23	9576.90	**0.2411**	0.2993
14A	7	3/30/2013 15:16	3	11816	3938.67	100.0%	0.49881	0.23816	2800.94	9576.90	**0.2925**	0.2773
14B	1	3/30/2013 15:09	3	14442	4814.00	96.5%	0.52166	0.23715	3586.15	9576.90	**0.3745**	0.4137
14B	2	3/30/2013 14:59	3	15221	5073.67	100.0%	0.52166	0.23585	3895.37	9576.91	**0.4067**	0.3971
14B	3	3/30/2013 14:52	3	14787	4929.00	99.4%	0.52166	0.23488	3748.66	9576.91	**0.3914**	0.3922
14B	4	3/30/2013 14:45	3	15252	5084.00	100.0%	0.52166	0.23380	3915.99	9576.92	**0.4089**	0.3768
14B	5	3/30/2013 14:38	3	14644	4881.33	100.0%	0.52166	0.23285	3718.06	9576.92	**0.3882**	0.3561
14B	6	3/30/2013 14:31	3	11477	3825.67	100.0%	0.52166	0.23189	2667.19	9576.92	**0.2785**	0.3171
14B	7	3/30/2013 15:24	3	12308	4102.67	100.0%	0.52166	0.23929	2907.21	9576.90	**0.3036**	0.2988
14C	1	3/30/2013 15:16	3	14188	4729.33	96.5%	0.52711	0.23816	3483.34	9576.90	**0.3637**	0.4031
14C	2	3/30/2013 15:09	3	15087	5029.00	100.0%	0.52711	0.23715	3831.85	9576.90	**0.4001**	0.3911
14C	3	3/30/2013 14:59	3	14907	4969.00	99.4%	0.52711	0.23585	3771.38	9576.91	**0.3938**	0.3875
14C	4	3/30/2013 14:52	3	15149	5049.67	100.0%	0.52711	0.23488	3863.96	9576.91	**0.4035**	0.3765
14C	5	3/30/2013 14:45	3	14790	4930.00	100.0%	0.52711	0.23379	3749.78	9576.92	**0.3915**	0.3616
14C	6	3/30/2013 14:38	3	11904	3968.00	100.0%	0.52711	0.23284	2792.58	9576.92	**0.2916**	0.3335
14C	7	3/30/2013 14:31	3	12979	4326.33	100.0%	0.52711	0.23189	3155.73	9576.92	**0.3295**	0.3204
14D	1	3/30/2013 15:24	3	13129	4376.33	96.5%	0.47151	0.23929	3256.50	9576.90	**0.3400**	0.3850
14D	2	3/30/2013 15:16	3	14162	4720.67	100.0%	0.47151	0.23816	3645.22	9576.90	**0.3806**	0.3723
14D	3	3/30/2013 15:09	3	14253	4751.00	99.4%	0.47151	0.23715	3673.84	9576.90	**0.3836**	0.3685
14D	4	3/30/2013 14:59	3	14346	4782.00	100.0%	0.47151	0.23585	3716.98	9576.91	**0.3881**	0.3567
14D	5	3/30/2013 14:52	3	13660	4553.33	100.0%	0.47151	0.23488	3492.70	9576.91	**0.3647**	0.3409
14D	6	3/30/2013 14:45	3	10732	3577.33	100.0%	0.47151	0.23379	2521.62	9576.92	**0.2633**	0.3110
14D	7	3/30/2013 14:38	3	12093	4031.00	100.0%	0.47151	0.23284	2979.57	9576.92	**0.3111**	0.2971

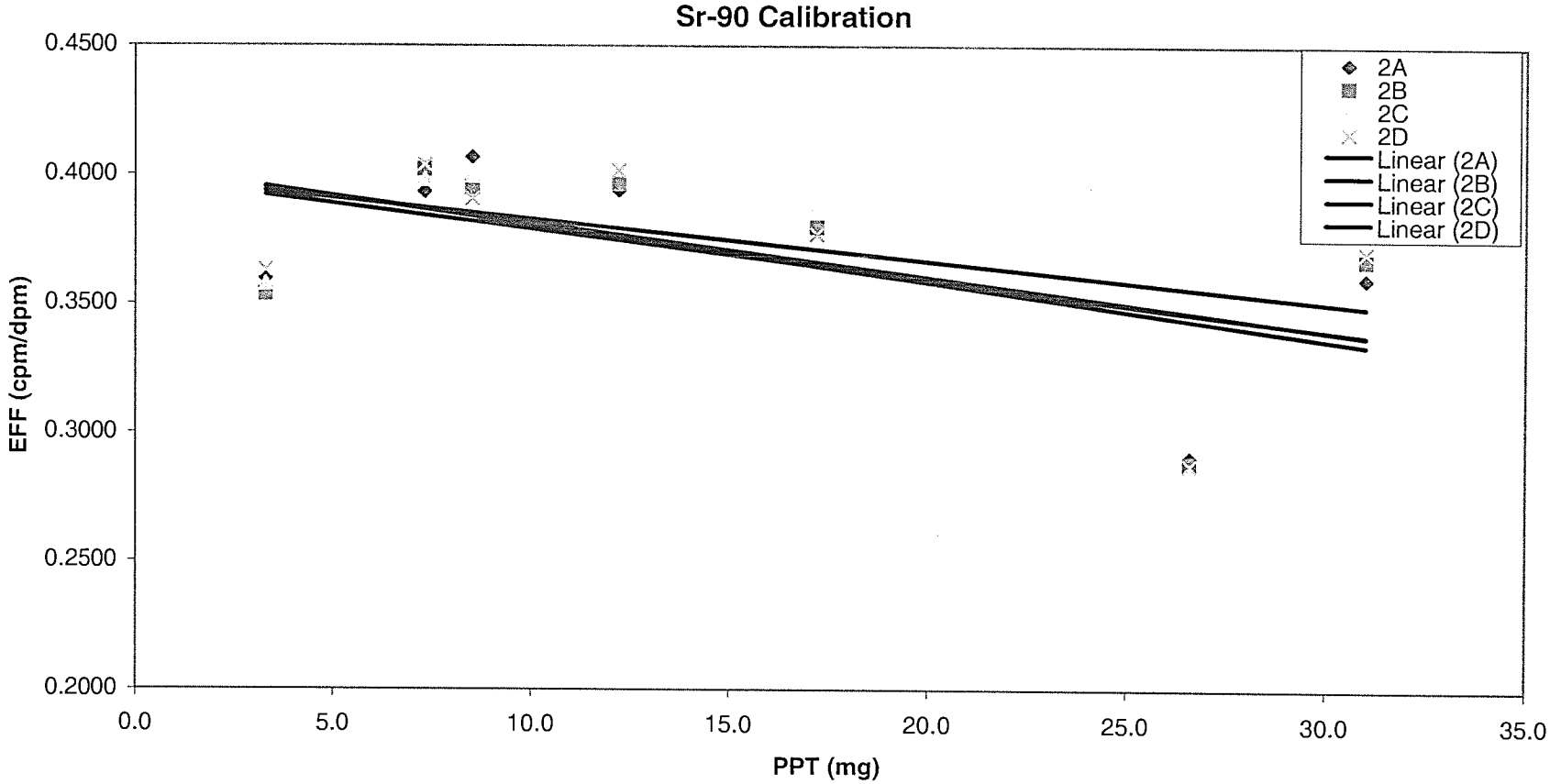


1A y = -2.279414E-03x + 4.114385E-01

1B y = -2.242680E-03x + 4.104277E-01

1C y = -2.472545E-03x + 4.188951E-01

1D y = -2.290631E-03x + 4.084494E-01

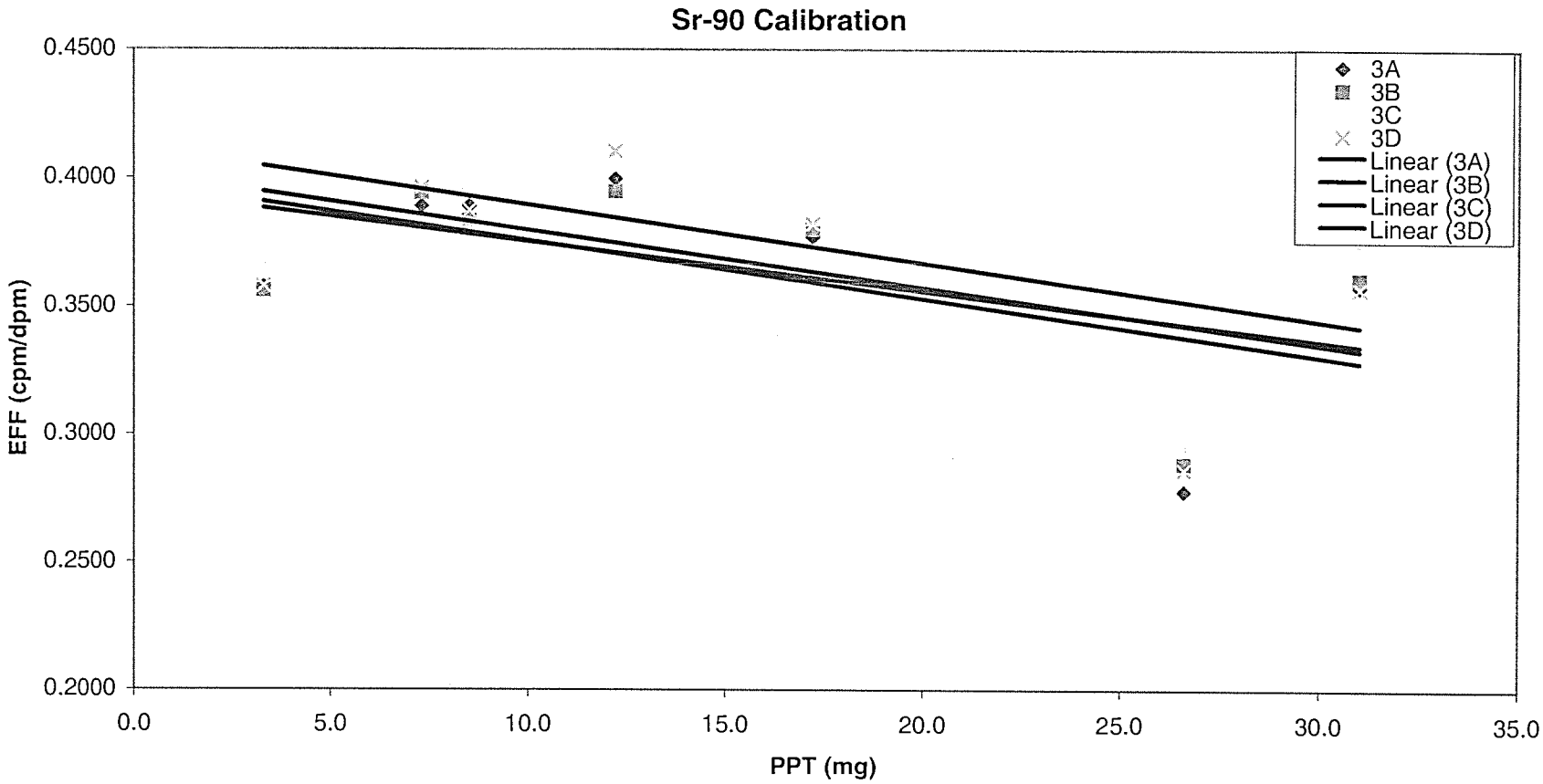


2A y = -2.217073E-03x + 4.028435E-01

2B y = -1.958094E-03x + 3.986039E-01

2C y = -1.615998E-03x + 3.990307E-01

2D y = -2.080413E-03x + 4.022292E-01

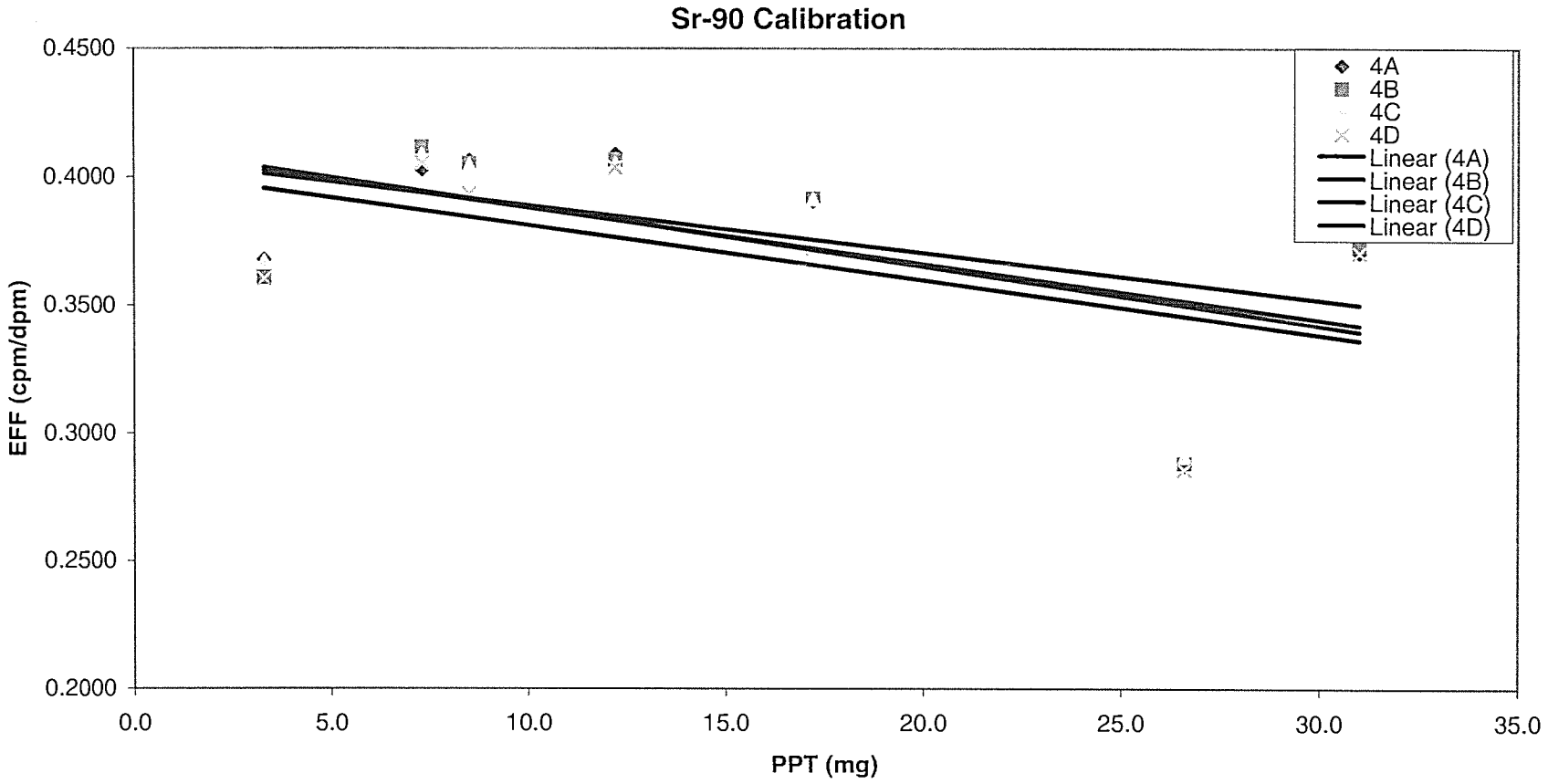


3A y = -2.259677E-03x + 3.982176E-01

3B y = -1.939291E-03x + 3.946777E-01

3C y = -2.259665E-03x + 4.121296E-01

3D y = -2.234962E-03x + 4.020361E-01

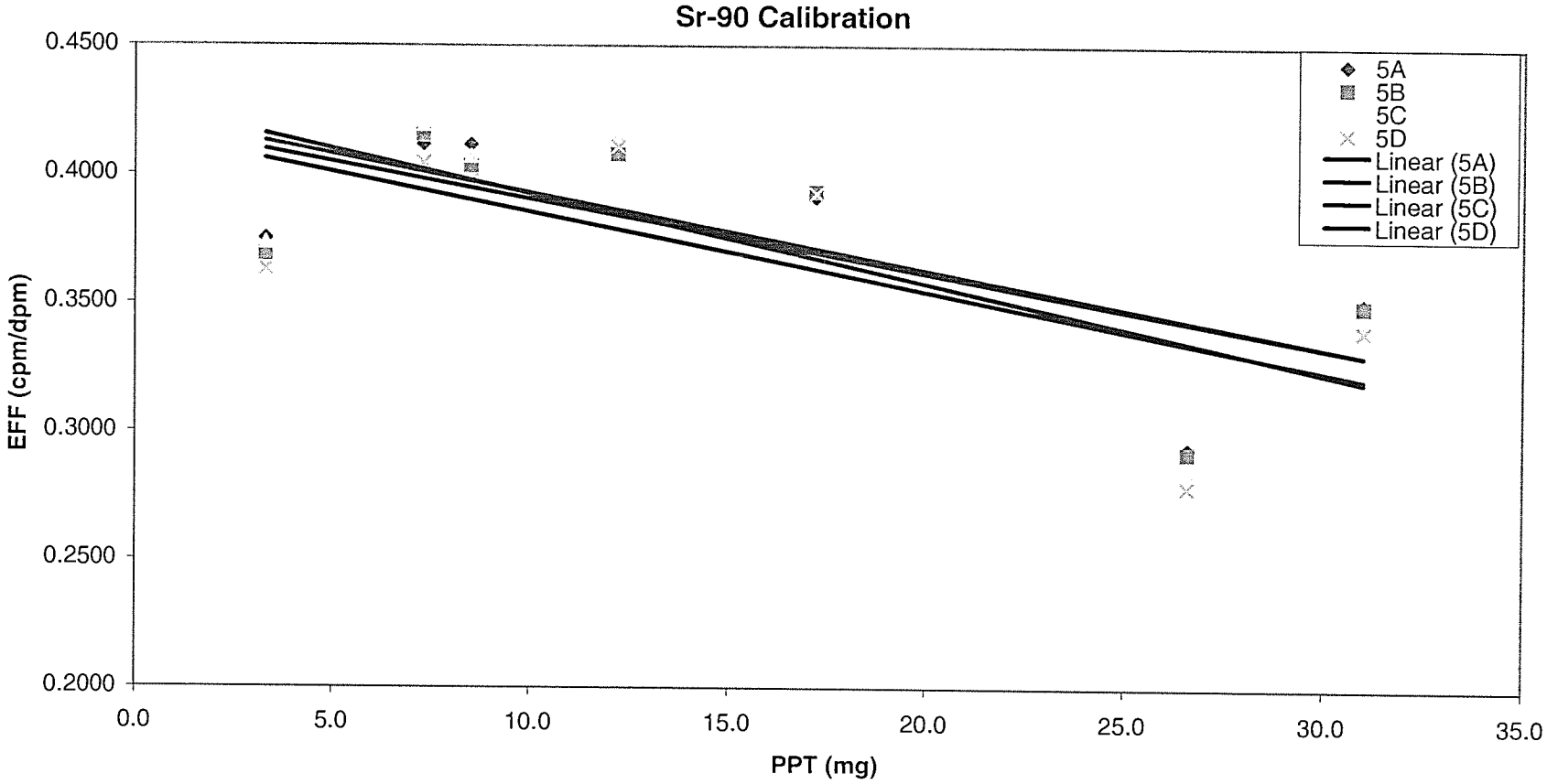


4A y = -2.314786E-03x + 4.114242E-01

4B y = -2.186682E-03x + 4.098489E-01

4C y = -1.846963E-03x + 4.073528E-01

4D y = -2.140852E-03x + 4.026301E-01

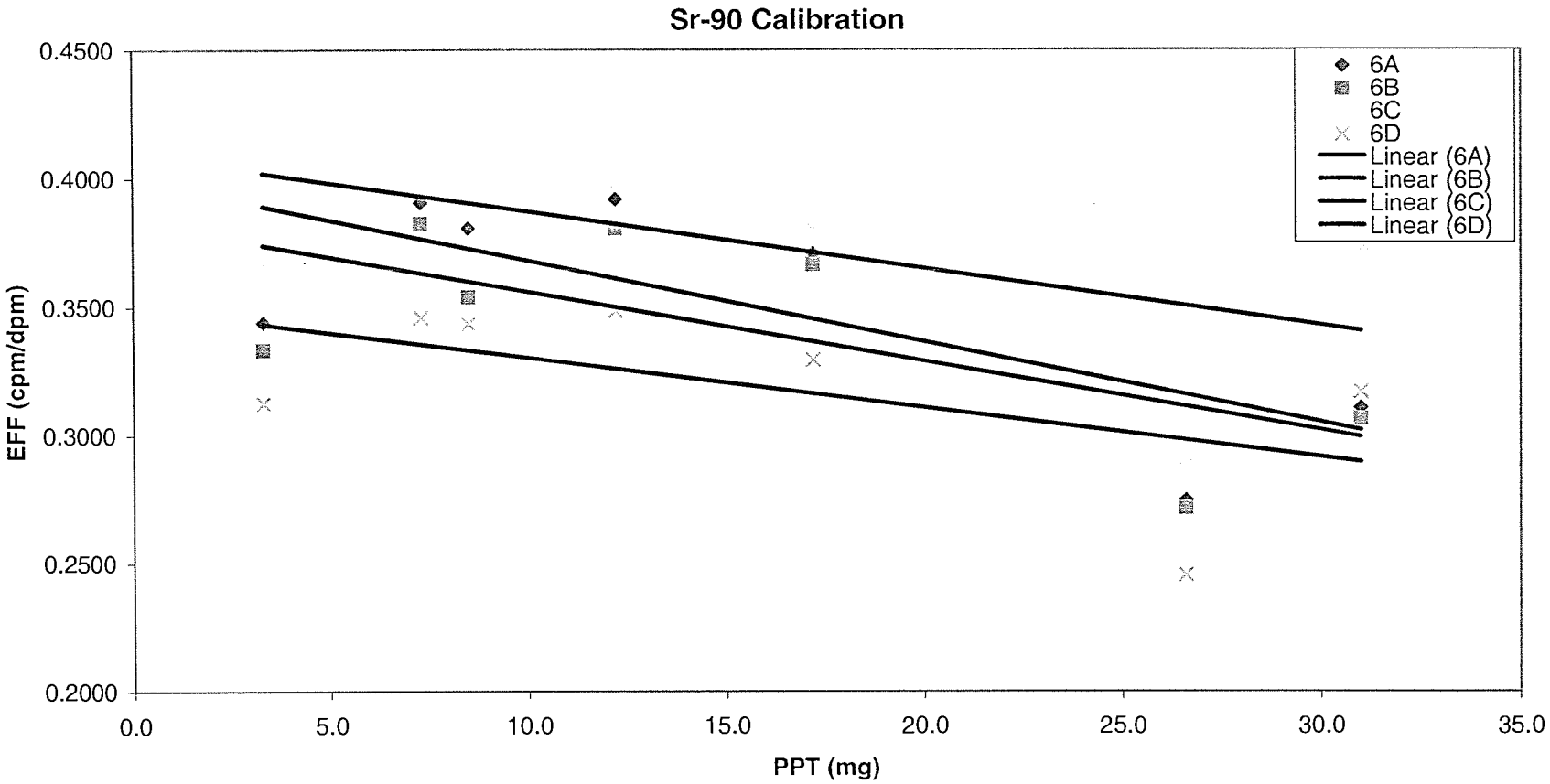


5A y = -2.984003E-03x + 4.227495E-01

5B y = -2.863352E-03x + 4.190820E-01

5C y = -3.460598E-03x + 4.271818E-01

5D y = -3.068168E-03x + 4.161972E-01

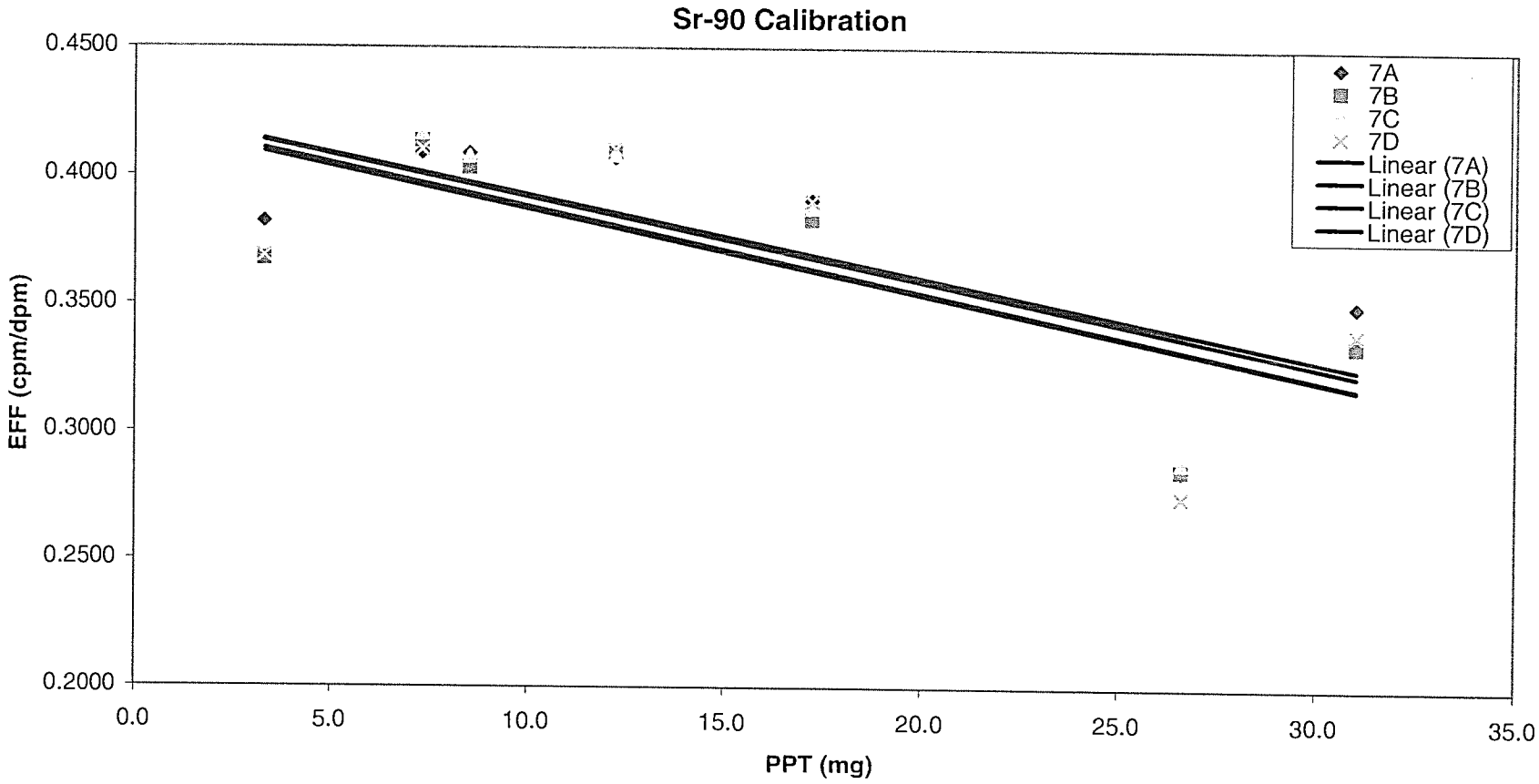


6A y = -3.144071E-03x + 3.995459E-01

6B y = -2.693844E-03x + 3.828880E-01

6C y = -2.212101E-03x + 4.093105E-01

6D y = -1.934101E-03x + 3.496389E-01

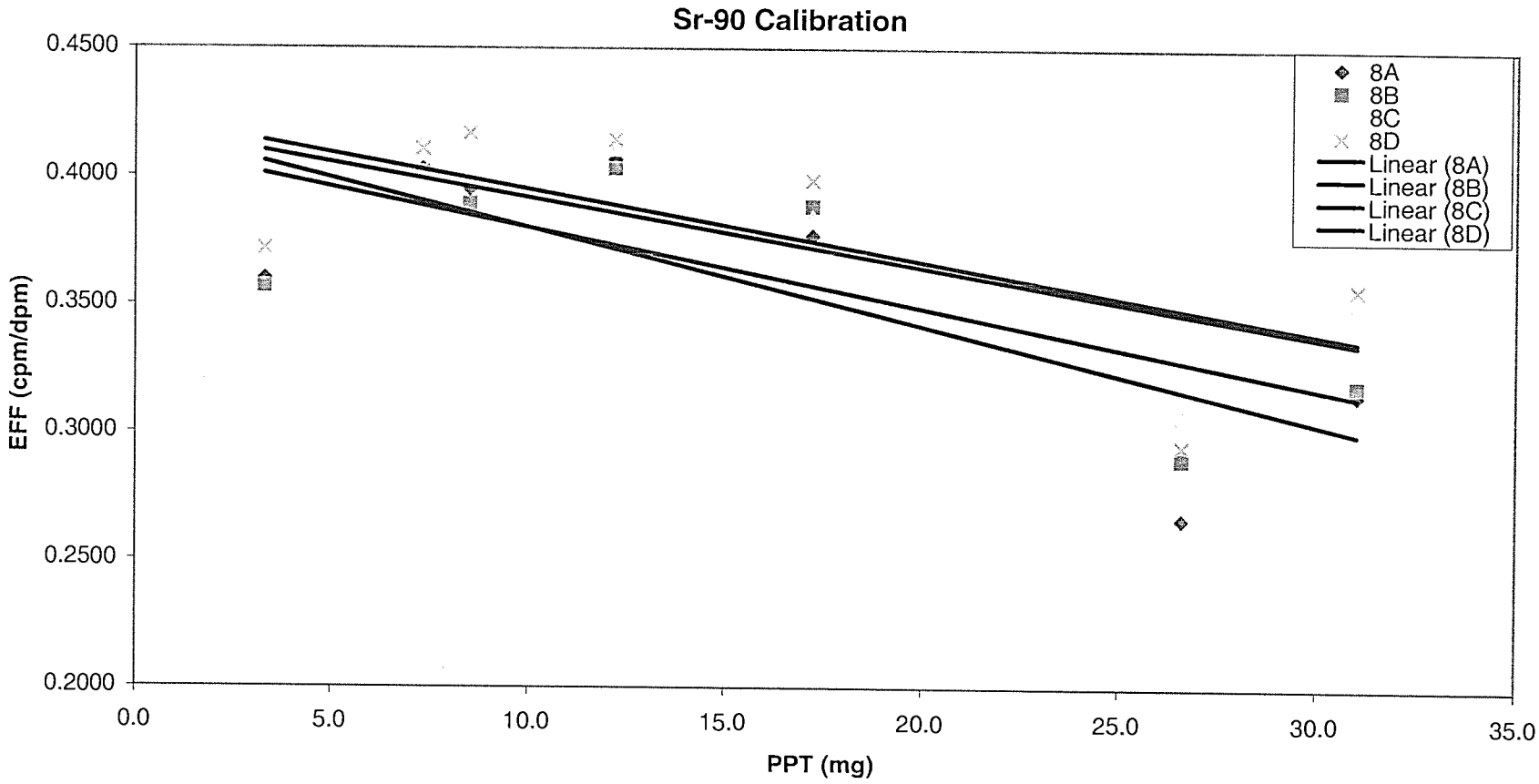


7A y = -3.200040E-03x + 4.246974E-01

7B y = -3.340259E-03x + 4.215895E-01

7C y = -3.267580E-03x + 4.244522E-01

7D y = -3.305734E-03x + 4.200945E-01

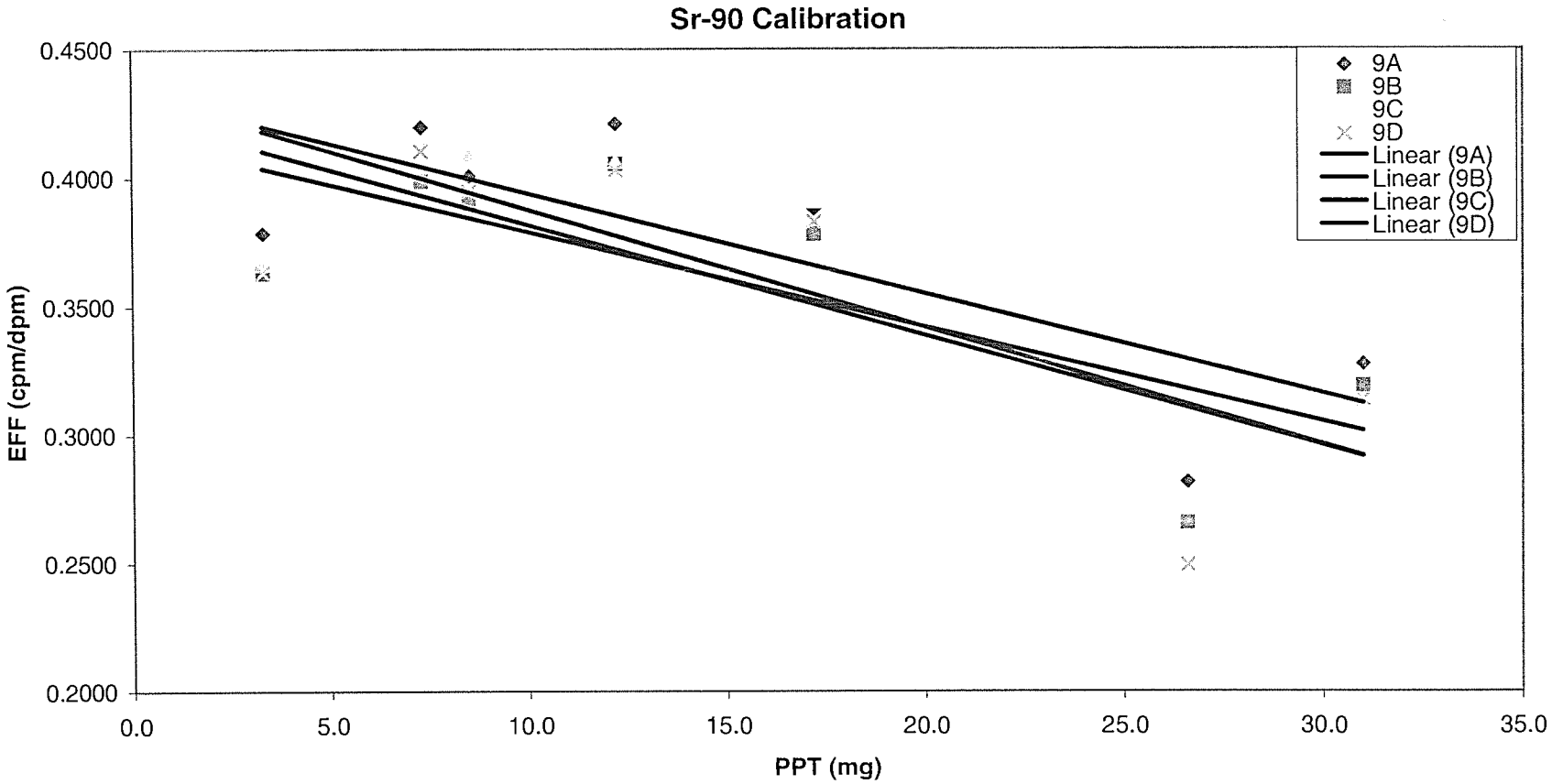


8A y = -3.815539E-03x + 4.183121E-01

8B y = -3.124360E-03x + 4.113619E-01

8C y = -2.707227E-03x + 4.188353E-01

8D y = -2.796572E-03x + 4.229571E-01

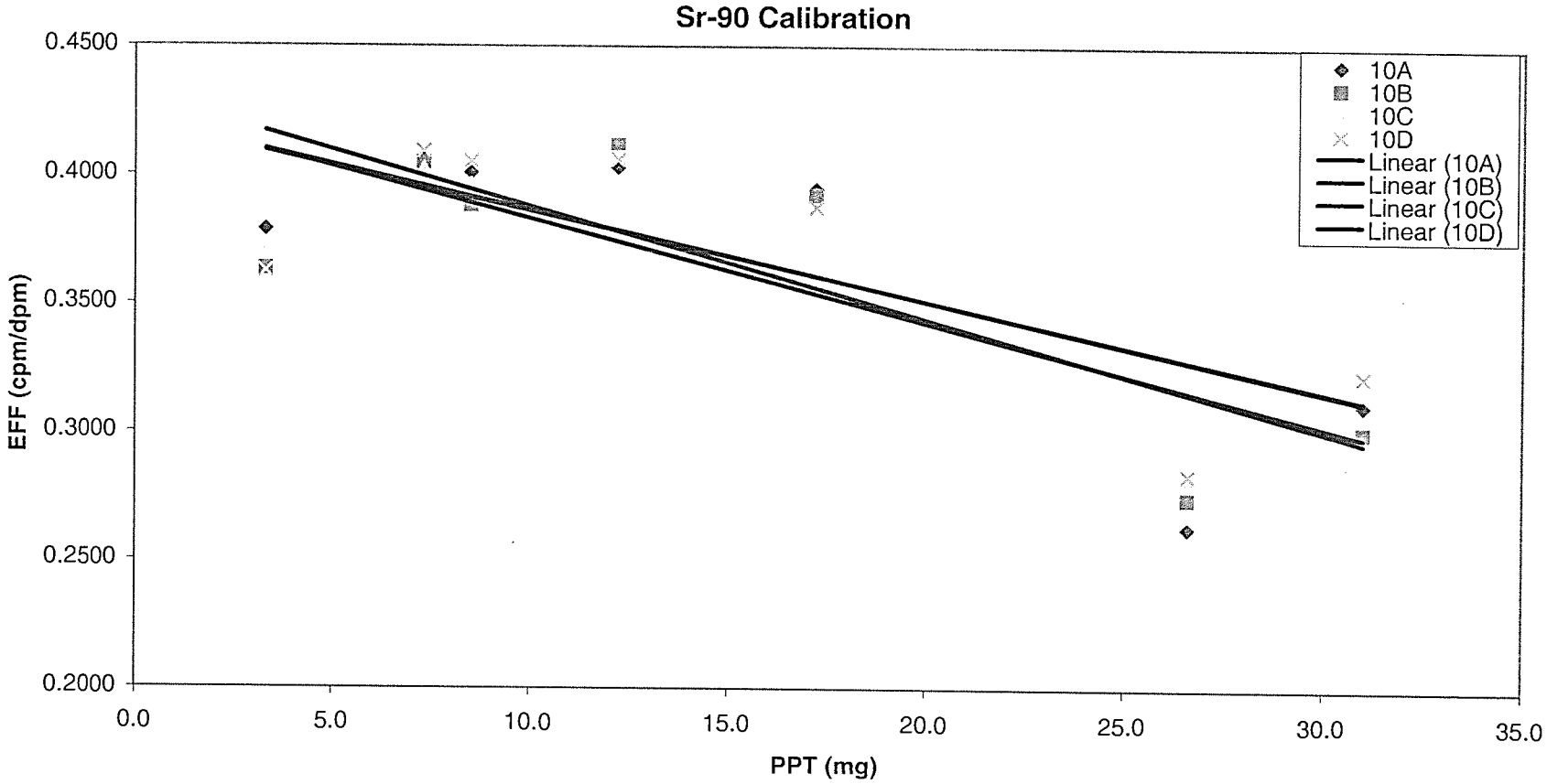


9A y = -3.891363E-03x + 4.329295E-01

9B y = -3.688512E-03x + 4.159108E-01

9C y = -4.563783E-03x + 4.332722E-01

9D y = -4.290468E-03x + 4.246685E-01

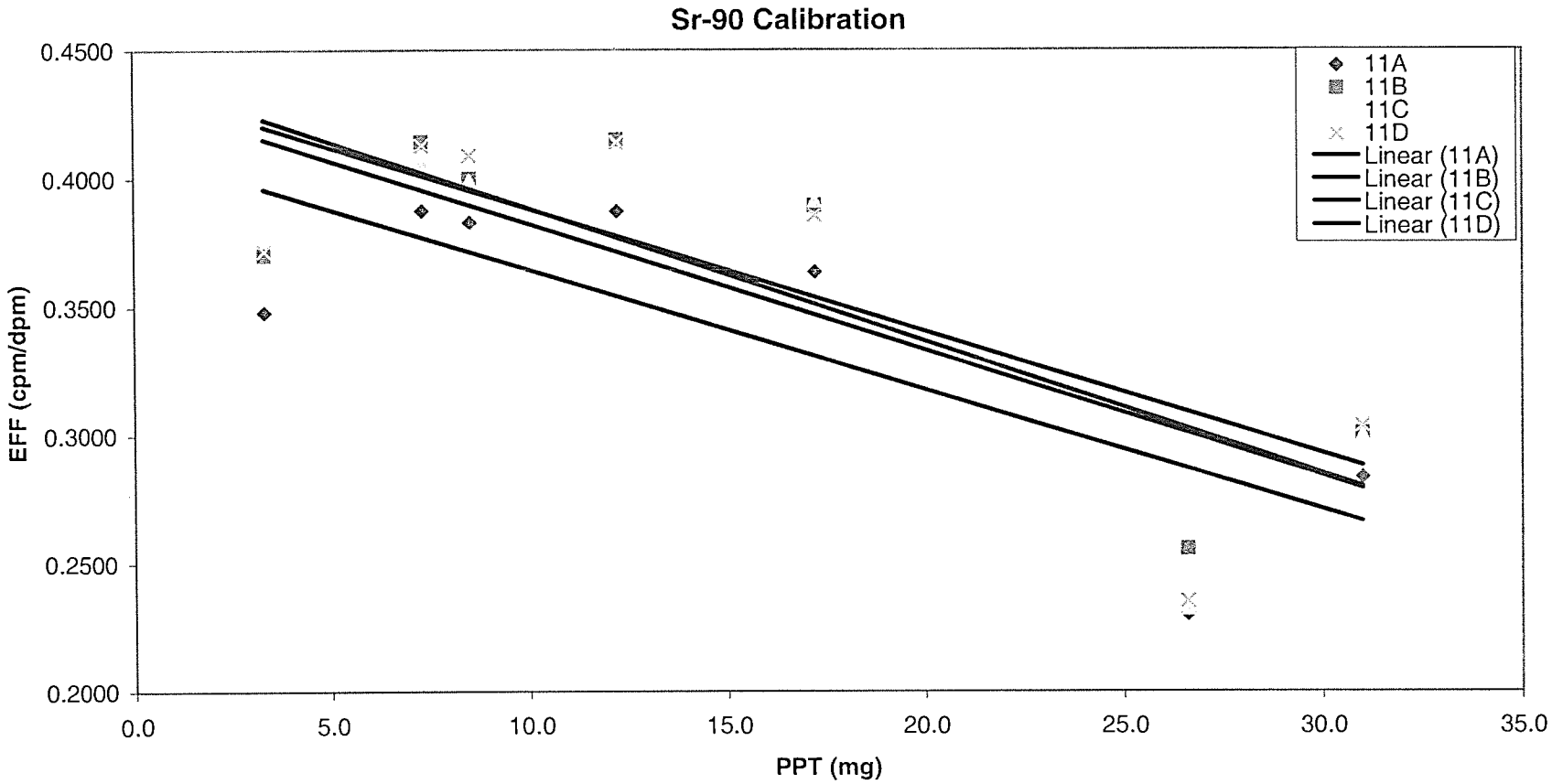


10A y = -4.347820E-03x + 4.312815E-01

10B y = -4.022619E-03x + 4.233487E-01

10C y = -3.484999E-03x + 4.208936E-01

10D y = -3.519529E-03x + 4.215478E-01

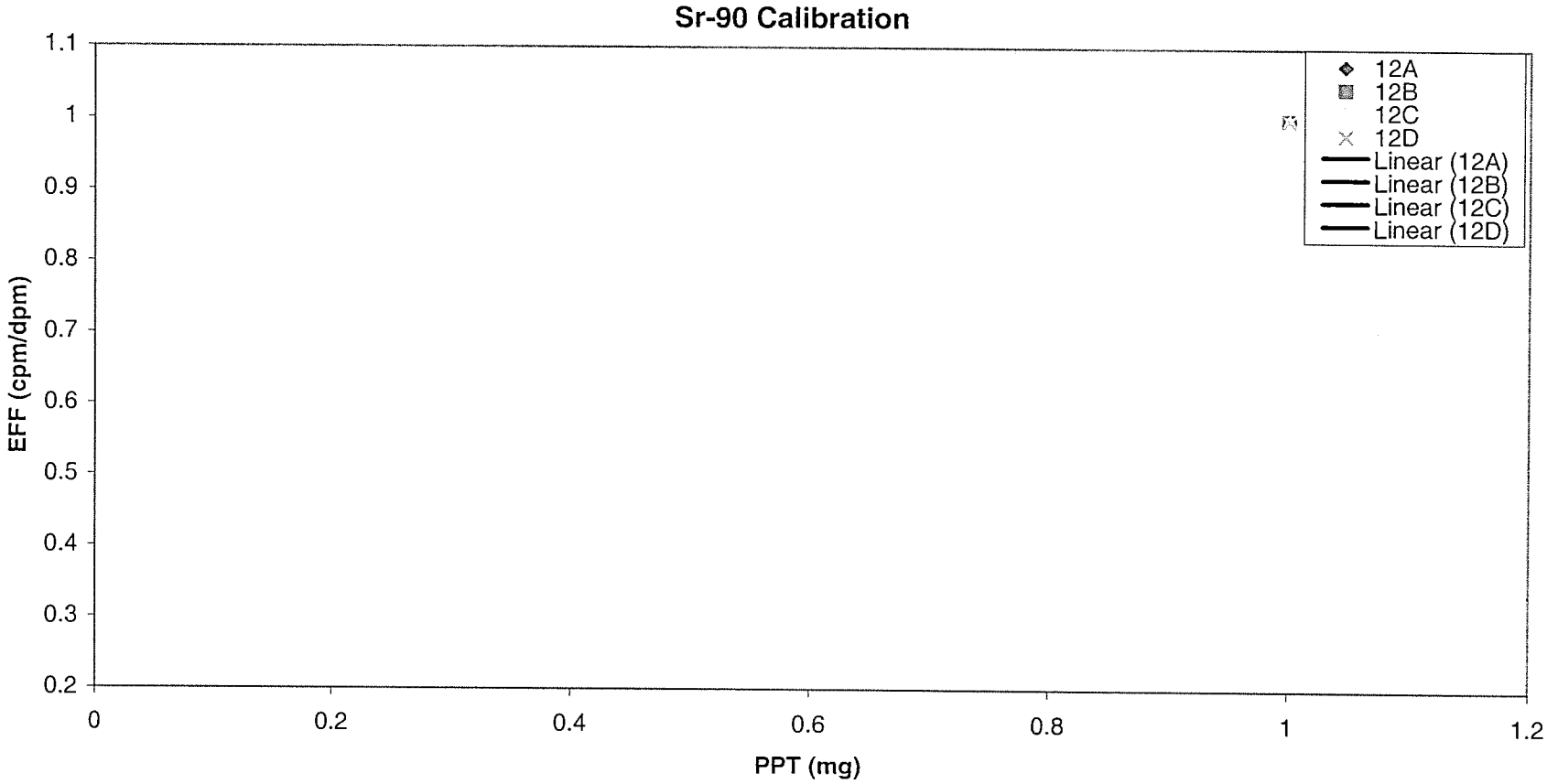


11A y = -4.676337E-03x + 4.113641E-01

11B y = -4.763146E-03x + 4.358297E-01

11C y = -4.907925E-03x + 4.314356E-01

11D y = -5.162403E-03x + 4.400233E-01



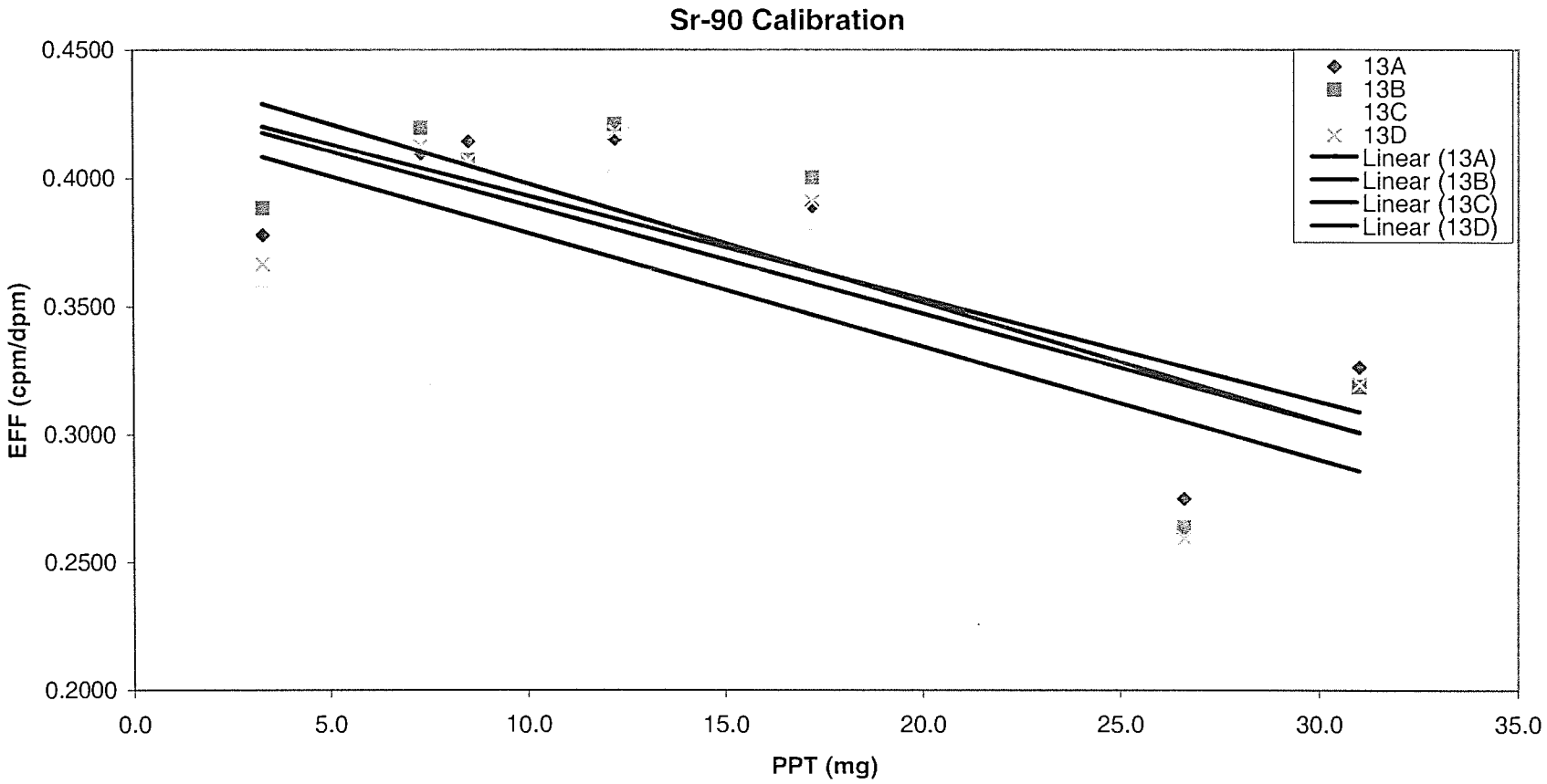
12A

12B

12C

12D

*Detectors not used in this calibration cycle. AP

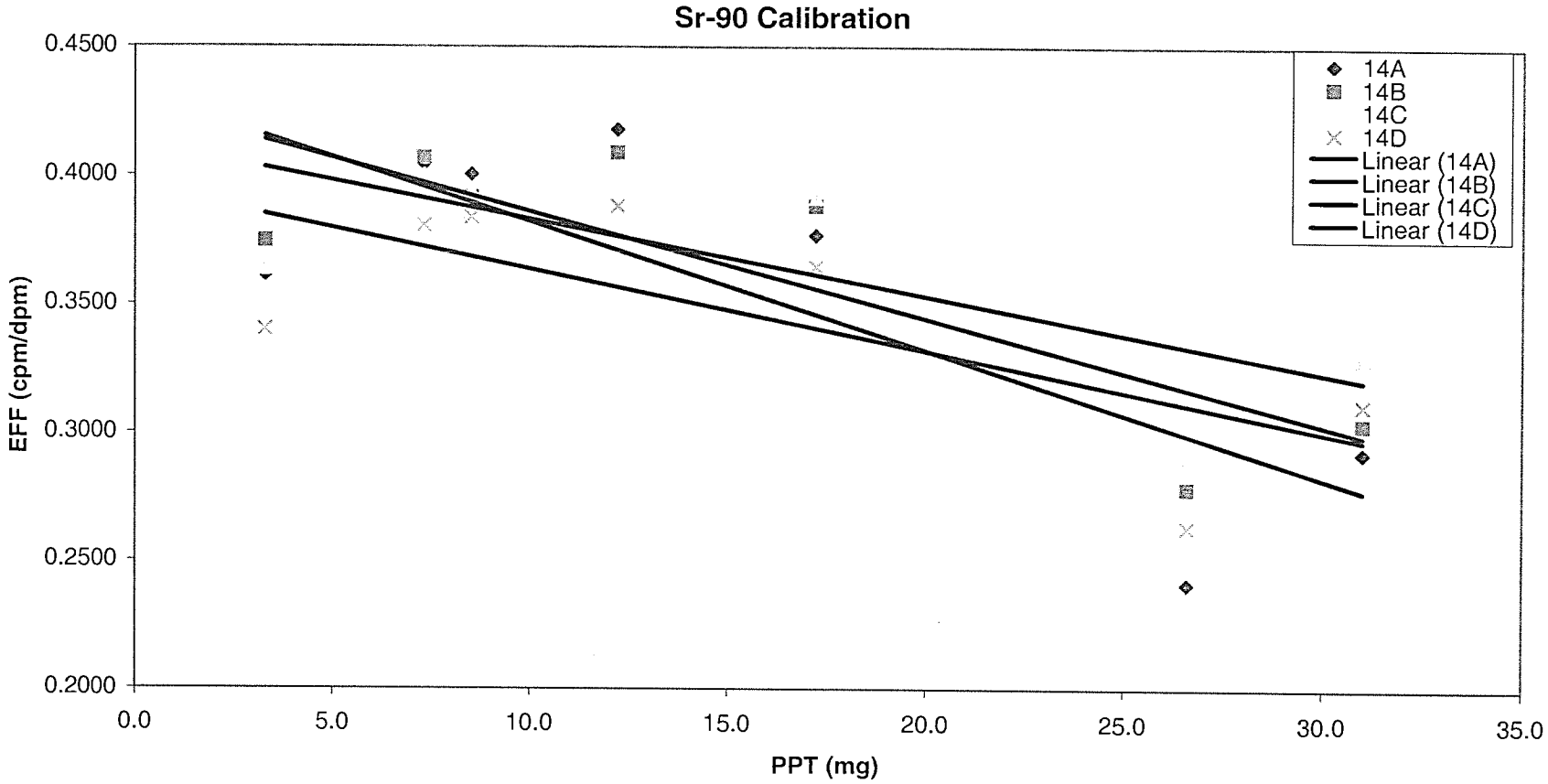


13A y = -4.016750E-03x + 4.334086E-01

13B y = -4.631961E-03x + 4.443149E-01

13C y = -4.427953E-03x + 4.230399E-01

13D y = -4.215610E-03x + 4.316464E-01



14A y = -4.987729E-03x + 4.319463E-01

14B y = -4.148939E-03x + 4.274329E-01

14C y = -2.983884E-03x + 4.129063E-01

14D y = -3.175399E-03x + 3.954898E-01

Current Calibration - PIC

Geometry	Tuffryn Filter				
Sr-90	**Cal Date**	3/1/2013	**Exp Date**	2/29/2016	
Protean	A0	A1	A2	A3	A4
1A	0.41143847	-0.002279414			
1B	0.410427683	-0.00224268			
1C	0.418895096	-0.002472545			
1D	0.408449379	-0.002290631			
2A	0.402843494	-0.002217073			
2B	0.398603925	-0.001958094			
2C	0.399030724	-0.001615998			
2D	0.402229217	-0.002080413			
3A	0.398217582	-0.002259677			
3B	0.394677675	-0.001939291			
3C	0.412129631	-0.002259665			
3D	0.40203608	-0.002234962			
4A	0.411424228	-0.002314786			
4B	0.409848915	-0.002186682			
4C	0.407352802	-0.001846963			
4D	0.402630068	-0.002140852			
5A	0.42274955	-0.002984003			
5B	0.419082045	-0.002863352			
5C	0.427181761	-0.003460598			
5D	0.416197152	-0.003068168			
6A	0.399545918	-0.003144071			
6B	0.382887952	-0.002693844			
6C	0.409310486	-0.002212101			
6D	0.349638926	-0.001934101			
7A	0.42469743	-0.00320004			
7B	0.421589453	-0.003340259			
7C	0.424452179	-0.00326758			
7D	0.420094489	-0.003305734			
8A	0.418312101	-0.003815539			
8B	0.411361878	-0.00312436			
8C	0.418835271	-0.002707227			
8D	0.422957114	-0.002796572			
9A	0.432929492	-0.003891363			
9B	0.415910836	-0.003688512			
9C	0.433272217	-0.004563783			
9D	0.424668518	-0.004290468			
10A	0.431281464	-0.00434782			
10B	0.423348658	-0.004022619			
10C	0.420893575	-0.003484999			
10D	0.421547844	-0.003519529			
11A	0.411364122	-0.004676337			
11B	0.435829671	-0.004763146			
11C	0.431435603	-0.004907925			
11D	0.440023259	-0.005162403			
12A	#N/A	#N/A			
12B	#N/A	#N/A			
12C	#N/A	#N/A			
12D	#N/A	#N/A			
13A	0.433408627	-0.00401675			
13B	0.4443149	-0.004631961			
13C	0.423039928	-0.004427953			
13D	0.431646407	-0.00421561			
14A	0.431946318	-0.004987729			
14B	0.427432897	-0.004148939			
14C	0.412906275	-0.002983884			
14D	0.395489834	-0.003175399			

PIC_Sr-90_Mar13_RawData.xls

SampleID	Instr	Time (min.)	Alpha Counts	Beta Counts	Count Start Time	Count End Time	Machine	Batch ID
S1	1A	3	9	14094	3/30/2013 12:17	3/30/2013 12:20	PIC	Sr90S13
S2	1A	3	13	15073	3/30/2013 13:18	3/30/2013 13:21	PIC	Sr90S13
S3	1A	3	10	15044	3/30/2013 13:10	3/30/2013 13:13	PIC	Sr90S13
S4	1A	3	9	14969	3/30/2013 13:02	3/30/2013 13:05	PIC	Sr90S13
S5	1A	3	21	14480	3/30/2013 12:55	3/30/2013 12:58	PIC	Sr90S13
S6	1A	3	18	11753	3/30/2013 12:41	3/30/2013 12:44	PIC	Sr90S13
S7	1A	3	11	13985	3/30/2013 12:33	3/30/2013 12:36	PIC	Sr90S13
S1	1B	3	21	14015	3/30/2013 12:25	3/30/2013 12:28	PIC	Sr90S13
S2	1B	3	21	14889	3/30/2013 12:17	3/30/2013 12:20	PIC	Sr90S13
S3	1B	3	28	14916	3/30/2013 13:18	3/30/2013 13:21	PIC	Sr90S13
S4	1B	3	19	15096	3/30/2013 13:10	3/30/2013 13:13	PIC	Sr90S13
S5	1B	3	32	14632	3/30/2013 13:02	3/30/2013 13:05	PIC	Sr90S13
S6	1B	3	26	11749	3/30/2013 12:55	3/30/2013 12:58	PIC	Sr90S13
S7	1B	3	27	13913	3/30/2013 12:41	3/30/2013 12:44	PIC	Sr90S13
S1	1C	3	290	13961	3/30/2013 12:33	3/30/2013 12:36	PIC	Sr90S13
S2	1C	3	258	15401	3/30/2013 12:25	3/30/2013 12:28	PIC	Sr90S13
S3	1C	3	242	15175	3/30/2013 12:18	3/30/2013 12:21	PIC	Sr90S13
S4	1C	3	290	15289	3/30/2013 13:18	3/30/2013 13:21	PIC	Sr90S13
S5	1C	3	283	14609	3/30/2013 13:10	3/30/2013 13:13	PIC	Sr90S13
S6	1C	3	199	11924	3/30/2013 13:02	3/30/2013 13:05	PIC	Sr90S13
S7	1C	3	266	13954	3/30/2013 12:55	3/30/2013 12:58	PIC	Sr90S13
S1	1D	3	206	13844	3/30/2013 12:41	3/30/2013 12:44	PIC	Sr90S13
S2	1D	3	183	14825	3/30/2013 12:33	3/30/2013 12:36	PIC	Sr90S13
S3	1D	3	193	14718	3/30/2013 12:25	3/30/2013 12:28	PIC	Sr90S13
S4	1D	3	197	15215	3/30/2013 12:18	3/30/2013 12:21	PIC	Sr90S13
S5	1D	3	185	14413	3/30/2013 13:18	3/30/2013 13:21	PIC	Sr90S13
S6	1D	3	142	11672	3/30/2013 13:10	3/30/2013 13:13	PIC	Sr90S13
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S5	2A	3	6	14051	3/30/2013 12:18	3/30/2013 12:21	PIC	Sr90S13
S6	2A	3	1	11610	3/30/2013 13:18	3/30/2013 13:21	PIC	Sr90S13
S7	2A	3	2	13591	3/30/2013 13:10	3/30/2013 13:13	PIC	Sr90S13
S1	2B	3	0	13529	3/30/2013 13:02	3/30/2013 13:05	PIC	Sr90S13

S2	2B	3	2	14792	3/30/2013 12:55	3/30/2013 12:58	PIC	Sr90S13
S3	2B	3	0	14576	3/30/2013 12:41	3/30/2013 12:44	PIC	Sr90S13
S4	2B	3	1	14582	3/30/2013 12:33	3/30/2013 12:36	PIC	Sr90S13
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S6	2B	3	2	11449	3/30/2013 12:18	3/30/2013 12:21	PIC	Sr90S13
S7	2B	3	1	13840	3/30/2013 13:18	3/30/2013 13:21	PIC	Sr90S13
S1	2C	3	22	13679	3/30/2013 13:10	3/30/2013 13:13	PIC	Sr90S13
S2	2C	3	38	14707	3/30/2013 13:02	3/30/2013 13:05	PIC	Sr90S13
S3	2C	3	27	14753	3/30/2013 12:55	3/30/2013 12:58	PIC	Sr90S13
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S5	2C	3	31	14390	3/30/2013 12:33	3/30/2013 12:36	PIC	Sr90S13
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S7	2C	3	19	14284	3/30/2013 12:18	3/30/2013 12:21	PIC	Sr90S13
S1	2D	3	7	13865	3/30/2013 13:18	3/30/2013 13:21	PIC	Sr90S13
S2	2D	3	17	14898	3/30/2013 13:10	3/30/2013 13:13	PIC	Sr90S13
S3	2D	3	17	14524	3/30/2013 13:02	3/30/2013 13:05	PIC	Sr90S13
S4	2D	3	16	14804	3/30/2013 12:55	3/30/2013 12:58	PIC	Sr90S13
S5	2D	3	15	14073	3/30/2013 12:41	3/30/2013 12:44	PIC	Sr90S13
S6	2D	3	13	11483	3/30/2013 12:33	3/30/2013 12:36	PIC	Sr90S13
S7	2D	3	15	13847	3/30/2013 12:25	3/30/2013 12:28	PIC	Sr90S13
S1	3A	3	441	13645	3/30/2013 12:21	3/30/2013 12:24	PIC	Sr90S13
S2	3A	3	405	14564	3/30/2013 13:21	3/30/2013 13:24	PIC	Sr90S13
S3	3A	3	425	14572	3/30/2013 13:14	3/30/2013 13:17	PIC	Sr90S13
S4	3A	3	446	14839	3/30/2013 13:06	3/30/2013 13:09	PIC	Sr90S13
S5	3A	3	402	14177	3/30/2013 12:58	3/30/2013 13:01	PIC	Sr90S13
S6	3A	3	305	11303	3/30/2013 12:51	3/30/2013 12:54	PIC	Sr90S13
S7	3A	3	410	13572	3/30/2013 12:37	3/30/2013 12:40	PIC	Sr90S13
S1	3B	3	359	13621	3/30/2013 12:29	3/30/2013 12:32	PIC	Sr90S13
S2	3B	3	365	14585	3/30/2013 12:21	3/30/2013 12:24	PIC	Sr90S13
S3	3B	3	376	14415	3/30/2013 13:21	3/30/2013 13:24	PIC	Sr90S13
S4	3B	3	365	14709	3/30/2013 13:14	3/30/2013 13:17	PIC	Sr90S13
S5	3B	3	338	14272	3/30/2013 13:06	3/30/2013 13:09	PIC	Sr90S13
S6	3B	3	265	11627	3/30/2013 12:58	3/30/2013 13:01	PIC	Sr90S13
S7	3B	3	337	13684	3/30/2013 12:51	3/30/2013 12:54	PIC	Sr90S13
S1	3C	3	144	14011	3/30/2013 12:37	3/30/2013 12:40	PIC	Sr90S13
S2	3C	3	155	15274	3/30/2013 12:29	3/30/2013 12:32	PIC	Sr90S13
S3	3C	3	165	14723	3/30/2013 12:21	3/30/2013 12:24	PIC	Sr90S13

S4	3C	3	170	15163	3/30/2013 13:21	3/30/2013 13:24	PIC	Sr90S13
S5	3C	3	159	14420	3/30/2013 13:14	3/30/2013 13:17	PIC	Sr90S13
S6	3C	3	143	11833	3/30/2013 13:06	3/30/2013 13:09	PIC	Sr90S13
S7	3C	3	175	14051	3/30/2013 12:58	3/30/2013 13:01	PIC	Sr90S13
S1	3D	3	135	13662	3/30/2013 12:51	3/30/2013 12:54	PIC	Sr90S13
S2	3D	3	152	14617	3/30/2013 12:37	3/30/2013 12:40	PIC	Sr90S13
S3	3D	3	150	14360	3/30/2013 12:29	3/30/2013 12:32	PIC	Sr90S13
S4	3D	3	160	14989	3/30/2013 12:21	3/30/2013 12:24	PIC	Sr90S13
S5	3D	3	152	14309	3/30/2013 13:21	3/30/2013 13:24	PIC	Sr90S13
S6	3D	3	111	11533	3/30/2013 13:14	3/30/2013 13:17	PIC	Sr90S13
S7	3D	3	135	13555	3/30/2013 13:06	3/30/2013 13:09	PIC	Sr90S13
S1	4A	3	128	14023	3/30/2013 12:58	3/30/2013 13:01	PIC	Sr90S13
S2	4A	3	128	14894	3/30/2013 12:51	3/30/2013 12:54	PIC	Sr90S13
S3	4A	3	131	14985	3/30/2013 12:37	3/30/2013 12:40	PIC	Sr90S13
S4	4A	3	113	15019	3/30/2013 12:30	3/30/2013 12:33	PIC	Sr90S13
S5	4A	3	115	14476	3/30/2013 12:21	3/30/2013 12:24	PIC	Sr90S13
S6	4A	3	88	11639	3/30/2013 13:21	3/30/2013 13:24	PIC	Sr90S13
S7	4A	3	114	14014	3/30/2013 13:14	3/30/2013 13:17	PIC	Sr90S13
S1	4B	3	2	13871	3/30/2013 13:06	3/30/2013 13:09	PIC	Sr90S13
S2	4B	3	0	15191	3/30/2013 12:58	3/30/2013 13:01	PIC	Sr90S13
S3	4B	3	0	15008	3/30/2013 12:51	3/30/2013 12:54	PIC	Sr90S13
S4	4B	3	0	15000	3/30/2013 12:37	3/30/2013 12:40	PIC	Sr90S13
S5	4B	3	1	14550	3/30/2013 12:30	3/30/2013 12:33	PIC	Sr90S13
S6	4B	3	0	11562	3/30/2013 12:21	3/30/2013 12:24	PIC	Sr90S13
S7	4B	3	0	14136	3/30/2013 13:21	3/30/2013 13:24	PIC	Sr90S13
S1	4C	3	108	14091	3/30/2013 13:14	3/30/2013 13:17	PIC	Sr90S13
S2	4C	3	104	15137	3/30/2013 13:06	3/30/2013 13:09	PIC	Sr90S13
S3	4C	3	104	15020	3/30/2013 12:58	3/30/2013 13:01	PIC	Sr90S13
S4	4C	3	105	15005	3/30/2013 12:51	3/30/2013 12:54	PIC	Sr90S13
S5	4C	3	105	14581	3/30/2013 12:37	3/30/2013 12:40	PIC	Sr90S13
S6	4C	3	74	11676	3/30/2013 12:30	3/30/2013 12:33	PIC	Sr90S13
S7	4C	3	130	14439	3/30/2013 12:21	3/30/2013 12:24	PIC	Sr90S13
S1	4D	3	287	13872	3/30/2013 13:21	3/30/2013 13:24	PIC	Sr90S13
S2	4D	3	308	15024	3/30/2013 13:14	3/30/2013 13:17	PIC	Sr90S13
S3	4D	3	344	14688	3/30/2013 13:06	3/30/2013 13:09	PIC	Sr90S13
S4	4D	3	324	14941	3/30/2013 12:58	3/30/2013 13:01	PIC	Sr90S13
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S6	4D	3	266	11509	3/30/2013 12:37	3/30/2013 12:40	PIC	Sr90S13
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S3	5A	3	93	15373	3/30/2013 14:07	3/30/2013 14:10	PIC	Sr90S13
S4	5A	3	92	15258	3/30/2013 14:00	3/30/2013 14:03	PIC	Sr90S13
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S2	5B	3	69	15365	3/30/2013 13:25	3/30/2013 13:28	PIC	Sr90S13
S3	5B	3	79	15151	3/30/2013 14:15	3/30/2013 14:18	PIC	Sr90S13
S4	5B	3	82	15253	3/30/2013 14:07	3/30/2013 14:10	PIC	Sr90S13
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S7	5B	3	76	13533	3/30/2013 13:47	3/30/2013 13:50	PIC	Sr90S13
S1	5C	3	76	14333	3/30/2013 13:39	3/30/2013 13:42	PIC	Sr90S13
S2	5C	3	88	15507	3/30/2013 13:32	3/30/2013 13:35	PIC	Sr90S13
S3	5C	3	87	15162	3/30/2013 13:25	3/30/2013 13:28	PIC	Sr90S13
S4	5C	3	76	15436	3/30/2013 14:15	3/30/2013 14:18	PIC	Sr90S13
S5	5C	3	75	14618	3/30/2013 14:07	3/30/2013 14:10	PIC	Sr90S13
S6	5C	3	50	11698	3/30/2013 14:00	3/30/2013 14:03	PIC	Sr90S13
S7	5C	3	60	13285	3/30/2013 13:54	3/30/2013 13:57	PIC	Sr90S13
S1	5D	3	71	14052	3/30/2013 13:47	3/30/2013 13:50	PIC	Sr90S13
S2	5D	3	93	15099	3/30/2013 13:39	3/30/2013 13:42	PIC	Sr90S13
S3	5D	3	110	14907	3/30/2013 13:32	3/30/2013 13:35	PIC	Sr90S13
S4	5D	3	82	15249	3/30/2013 13:25	3/30/2013 13:28	PIC	Sr90S13
S5	5D	3	76	14837	3/30/2013 14:15	3/30/2013 14:18	PIC	Sr90S13
S6	5D	3	84	11545	3/30/2013 14:07	3/30/2013 14:10	PIC	Sr90S13
S7	5D	3	78	13288	3/30/2013 14:00	3/30/2013 14:03	PIC	Sr90S13
S1	6A	3	0	13113	3/30/2013 13:54	3/30/2013 13:57	PIC	Sr90S13
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S3	6A	3	0	14044	3/30/2013 13:39	3/30/2013 13:42	PIC	Sr90S13
S4	6A	3	0	14336	3/30/2013 13:32	3/30/2013 13:35	PIC	Sr90S13
S5	6A	3	0	13718	3/30/2013 13:25	3/30/2013 13:28	PIC	Sr90S13
S6	6A	3	1	11049	3/30/2013 14:15	3/30/2013 14:18	PIC	Sr90S13
S7	6A	3	0	12072	3/30/2013 14:07	3/30/2013 14:10	PIC	Sr90S13

S1	6B	3	1	12617	3/30/2013 14:00	3/30/2013 14:03	PIC	Sr90S13
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S3	6B	3	0	13094	3/30/2013 13:46	3/30/2013 13:49	PIC	Sr90S13
S4	6B	3	0	13831	3/30/2013 13:39	3/30/2013 13:42	PIC	Sr90S13
S5	6B	3	0	13414	3/30/2013 13:32	3/30/2013 13:35	PIC	Sr90S13
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S7	6B	3	0	11765	3/30/2013 14:15	3/30/2013 14:18	PIC	Sr90S13
S1	6C	3	2	14081	3/30/2013 14:07	3/30/2013 14:10	PIC	Sr90S13
S2	6C	3	3	14961	3/30/2013 14:00	3/30/2013 14:03	PIC	Sr90S13
S3	6C	3	3	15089	3/30/2013 13:53	3/30/2013 13:56	PIC	Sr90S13
S4	6C	3	1	14784	3/30/2013 13:46	3/30/2013 13:49	PIC	Sr90S13
S5	6C	3	0	14305	3/30/2013 13:39	3/30/2013 13:42	PIC	Sr90S13
S6	6C	3	3	11626	3/30/2013 13:32	3/30/2013 13:35	PIC	Sr90S13
S7	6C	3	1	14025	3/30/2013 13:25	3/30/2013 13:28	PIC	Sr90S13
S1	6D	3	17	12095	3/30/2013 14:15	3/30/2013 14:18	PIC	Sr90S13
S2	6D	3	16	12930	3/30/2013 14:07	3/30/2013 14:10	PIC	Sr90S13
S3	6D	3	22	12868	3/30/2013 14:00	3/30/2013 14:03	PIC	Sr90S13
S4	6D	3	17	12981	3/30/2013 13:53	3/30/2013 13:56	PIC	Sr90S13
S5	6D	3	18	12417	3/30/2013 13:46	3/30/2013 13:49	PIC	Sr90S13
S6	6D	3	13	9991	3/30/2013 13:39	3/30/2013 13:42	PIC	Sr90S13
S7	6D	3	25	12032	3/30/2013 13:32	3/30/2013 13:35	PIC	Sr90S13
S1	7A	3	137	14545	3/30/2013 13:28	3/30/2013 13:31	PIC	Sr90S13
S2	7A	3	148	15303	3/30/2013 14:18	3/30/2013 14:21	PIC	Sr90S13
S3	7A	3	143	15303	3/30/2013 14:11	3/30/2013 14:14	PIC	Sr90S13
S4	7A	3	150	15216	3/30/2013 14:04	3/30/2013 14:07	PIC	Sr90S13
S5	7A	3	129	14738	3/30/2013 13:57	3/30/2013 14:00	PIC	Sr90S13
S6	7A	3	102	11695	3/30/2013 13:50	3/30/2013 13:53	PIC	Sr90S13
S7	7A	3	112	13540	3/30/2013 13:43	3/30/2013 13:46	PIC	Sr90S13
S1	7B	3	156	14155	3/30/2013 13:36	3/30/2013 13:39	PIC	Sr90S13
S2	7B	3	155	15340	3/30/2013 13:28	3/30/2013 13:31	PIC	Sr90S13
S3	7B	3	151	15172	3/30/2013 14:18	3/30/2013 14:21	PIC	Sr90S13
S4	7B	3	152	15304	3/30/2013 14:11	3/30/2013 14:14	PIC	Sr90S13
S5	7B	3	143	14547	3/30/2013 14:03	3/30/2013 14:06	PIC	Sr90S13
S6	7B	3	104	11731	3/30/2013 13:57	3/30/2013 14:00	PIC	Sr90S13
S7	7B	3	128	13123	3/30/2013 13:50	3/30/2013 13:53	PIC	Sr90S13
S1	7C	3	52	14289	3/30/2013 13:43	3/30/2013 13:46	PIC	Sr90S13
S2	7C	3	55	15396	3/30/2013 13:36	3/30/2013 13:39	PIC	Sr90S13

S3	7C	3	67	15144	3/30/2013 13:28	3/30/2013 13:31	PIC	Sr90S13
S4	7C	3	45	15243	3/30/2013 14:18	3/30/2013 14:21	PIC	Sr90S13
S5	7C	3	47	14647	3/30/2013 14:11	3/30/2013 14:14	PIC	Sr90S13
S6	7C	3	34	11785	3/30/2013 14:03	3/30/2013 14:06	PIC	Sr90S13
S7	7C	3	44	13310	3/30/2013 13:57	3/30/2013 14:00	PIC	Sr90S13
S1	7D	3	86	14208	3/30/2013 13:50	3/30/2013 13:53	PIC	Sr90S13
S2	7D	3	82	15261	3/30/2013 13:43	3/30/2013 13:46	PIC	Sr90S13
S3	7D	3	100	14845	3/30/2013 13:36	3/30/2013 13:39	PIC	Sr90S13
S4	7D	3	107	15230	3/30/2013 13:28	3/30/2013 13:31	PIC	Sr90S13
S5	7D	3	83	14768	3/30/2013 14:18	3/30/2013 14:21	PIC	Sr90S13
S6	7D	3	53	11438	3/30/2013 14:11	3/30/2013 14:14	PIC	Sr90S13
S7	7D	3	74	13266	3/30/2013 14:03	3/30/2013 14:06	PIC	Sr90S13
S1	8A	3	7	13895	3/30/2013 13:57	3/30/2013 14:00	PIC	Sr90S13
S2	8A	3	4	14992	3/30/2013 13:50	3/30/2013 13:53	PIC	Sr90S13
S3	8A	3	3	14765	3/30/2013 13:43	3/30/2013 13:46	PIC	Sr90S13
S4	8A	3	6	15068	3/30/2013 13:36	3/30/2013 13:39	PIC	Sr90S13
S5	8A	3	5	14209	3/30/2013 13:28	3/30/2013 13:31	PIC	Sr90S13
S6	8A	3	4	11132	3/30/2013 14:18	3/30/2013 14:21	PIC	Sr90S13
S7	8A	3	2	12521	3/30/2013 14:12	3/30/2013 14:15	PIC	Sr90S13
S1	8B	3	1	13736	3/30/2013 14:04	3/30/2013 14:07	PIC	Sr90S13
S2	8B	3	1	14887	3/30/2013 13:57	3/30/2013 14:00	PIC	Sr90S13
S3	8B	3	0	14532	3/30/2013 13:50	3/30/2013 13:53	PIC	Sr90S13
S4	8B	3	0	14897	3/30/2013 13:43	3/30/2013 13:46	PIC	Sr90S13
S5	8B	3	0	14465	3/30/2013 13:36	3/30/2013 13:39	PIC	Sr90S13
S6	8B	3	0	11620	3/30/2013 13:28	3/30/2013 13:31	PIC	Sr90S13
S7	8B	3	0	12555	3/30/2013 14:18	3/30/2013 14:21	PIC	Sr90S13
S1	8C	3	13	14553	3/30/2013 14:12	3/30/2013 14:15	PIC	Sr90S13
S2	8C	3	10	15356	3/30/2013 14:04	3/30/2013 14:07	PIC	Sr90S13
S3	8C	3	17	14984	3/30/2013 13:57	3/30/2013 14:00	PIC	Sr90S13
S4	8C	3	18	15283	3/30/2013 13:50	3/30/2013 13:53	PIC	Sr90S13
S5	8C	3	6	14518	3/30/2013 13:43	3/30/2013 13:46	PIC	Sr90S13
S6	8C	3	16	12272	3/30/2013 13:36	3/30/2013 13:39	PIC	Sr90S13
S7	8C	3	13	13541	3/30/2013 13:28	3/30/2013 13:31	PIC	Sr90S13
S1	8D	3	27	14393	3/30/2013 14:18	3/30/2013 14:21	PIC	Sr90S13
S2	8D	3	24	15368	3/30/2013 14:12	3/30/2013 14:15	PIC	Sr90S13
S3	8D	3	32	15551	3/30/2013 14:04	3/30/2013 14:07	PIC	Sr90S13
S4	8D	3	19	15442	3/30/2013 13:57	3/30/2013 14:00	PIC	Sr90S13

S5	8D	3	24	14977	3/30/2013 13:50	3/30/2013 13:53	PIC	Sr90S13
S6	8D	3	20	11985	3/30/2013 13:43	3/30/2013 13:46	PIC	Sr90S13
S7	8D	3	16	13737	3/30/2013 13:36	3/30/2013 13:39	PIC	Sr90S13
S1	9A	3	28	14571	3/30/2013 14:22	3/30/2013 14:25	PIC	Sr90S13
S2	9A	3	30	15738	3/30/2013 15:14	3/30/2013 15:17	PIC	Sr90S13
S3	9A	3	30	15197	3/30/2013 15:07	3/30/2013 15:10	PIC	Sr90S13
S4	9A	3	34	15737	3/30/2013 14:57	3/30/2013 15:00	PIC	Sr90S13
S5	9A	3	30	14772	3/30/2013 14:50	3/30/2013 14:53	PIC	Sr90S13
S6	9A	3	27	11700	3/30/2013 14:42	3/30/2013 14:45	PIC	Sr90S13
S7	9A	3	27	13004	3/30/2013 14:35	3/30/2013 14:38	PIC	Sr90S13
S1	9B	3	16	14063	3/30/2013 14:28	3/30/2013 14:31	PIC	Sr90S13
S2	9B	3	12	14946	3/30/2013 14:22	3/30/2013 14:25	PIC	Sr90S13
S3	9B	3	23	14825	3/30/2013 15:15	3/30/2013 15:18	PIC	Sr90S13
S4	9B	3	19	15236	3/30/2013 15:07	3/30/2013 15:10	PIC	Sr90S13
S5	9B	3	16	14428	3/30/2013 14:57	3/30/2013 15:00	PIC	Sr90S13
S6	9B	3	16	11183	3/30/2013 14:50	3/30/2013 14:53	PIC	Sr90S13
S7	9B	3	21	12700	3/30/2013 14:43	3/30/2013 14:46	PIC	Sr90S13
S1	9C	3	44	14218	3/30/2013 14:35	3/30/2013 14:38	PIC	Sr90S13
S2	9C	3	32	15402	3/30/2013 14:28	3/30/2013 14:31	PIC	Sr90S13
S3	9C	3	30	15296	3/30/2013 14:21	3/30/2013 14:24	PIC	Sr90S13
S4	9C	3	38	15315	3/30/2013 15:15	3/30/2013 15:18	PIC	Sr90S13
S5	9C	3	41	14853	3/30/2013 15:07	3/30/2013 15:10	PIC	Sr90S13
S6	9C	3	26	10978	3/30/2013 14:57	3/30/2013 15:00	PIC	Sr90S13
S7	9C	3	26	12385	3/30/2013 14:50	3/30/2013 14:53	PIC	Sr90S13
S1	9D	3	2	13987	3/30/2013 14:43	3/30/2013 14:46	PIC	Sr90S13
S2	9D	3	0	15196	3/30/2013 14:35	3/30/2013 14:38	PIC	Sr90S13
S3	9D	3	1	14760	3/30/2013 14:28	3/30/2013 14:31	PIC	Sr90S13
S4	9D	3	0	14958	3/30/2013 14:21	3/30/2013 14:24	PIC	Sr90S13
S5	9D	3	2	14493	3/30/2013 15:15	3/30/2013 15:18	PIC	Sr90S13
S6	9D	3	1	10632	3/30/2013 15:07	3/30/2013 15:10	PIC	Sr90S13
S7	9D	3	0	12459	3/30/2013 14:57	3/30/2013 15:00	PIC	Sr90S13
S1	10A	3	12	14585	3/30/2013 14:50	3/30/2013 14:53	PIC	Sr90S13
S2	10A	3	11	15225	3/30/2013 14:43	3/30/2013 14:46	PIC	Sr90S13
S3	10A	3	9	15080	3/30/2013 14:35	3/30/2013 14:38	PIC	Sr90S13
S4	10A	3	18	15107	3/30/2013 14:28	3/30/2013 14:31	PIC	Sr90S13
S5	10A	3	9	14855	3/30/2013 14:21	3/30/2013 14:24	PIC	Sr90S13
S6	10A	3	11	11188	3/30/2013 15:15	3/30/2013 15:18	PIC	Sr90S13

S7	10A	3	9	12557	3/30/2013 15:07	3/30/2013 15:10	PIC	Sr90S13
S1	10B	3	32	14134	3/30/2013 14:57	3/30/2013 15:00	PIC	Sr90S13
S2	10B	3	32	15177	3/30/2013 14:50	3/30/2013 14:53	PIC	Sr90S13
S3	10B	3	34	14709	3/30/2013 14:43	3/30/2013 14:46	PIC	Sr90S13
S4	10B	3	38	15366	3/30/2013 14:35	3/30/2013 14:38	PIC	Sr90S13
S5	10B	3	38	14785	3/30/2013 14:29	3/30/2013 14:32	PIC	Sr90S13
S6	10B	3	31	11381	3/30/2013 14:22	3/30/2013 14:25	PIC	Sr90S13
S7	10B	3	28	12244	3/30/2013 15:14	3/30/2013 15:17	PIC	Sr90S13
S1	10C	3	34	14391	3/30/2013 15:07	3/30/2013 15:10	PIC	Sr90S13
S2	10C	3	48	15140	3/30/2013 14:57	3/30/2013 15:00	PIC	Sr90S13
S3	10C	3	26	14971	3/30/2013 14:50	3/30/2013 14:53	PIC	Sr90S13
S4	10C	3	40	15541	3/30/2013 14:42	3/30/2013 14:45	PIC	Sr90S13
S5	10C	3	39	14457	3/30/2013 14:36	3/30/2013 14:39	PIC	Sr90S13
S6	10C	3	28	11591	3/30/2013 14:29	3/30/2013 14:32	PIC	Sr90S13
S7	10C	3	30	12946	3/30/2013 14:22	3/30/2013 14:25	PIC	Sr90S13
S1	10D	3	20	14192	3/30/2013 15:14	3/30/2013 15:17	PIC	Sr90S13
S2	10D	3	26	15388	3/30/2013 15:07	3/30/2013 15:10	PIC	Sr90S13
S3	10D	3	13	15273	3/30/2013 14:57	3/30/2013 15:00	PIC	Sr90S13
S4	10D	3	19	15258	3/30/2013 14:50	3/30/2013 14:53	PIC	Sr90S13
S5	10D	3	29	14721	3/30/2013 14:42	3/30/2013 14:45	PIC	Sr90S13
S6	10D	3	22	11720	3/30/2013 14:36	3/30/2013 14:39	PIC	Sr90S13
S7	10D	3	20	12821	3/30/2013 14:29	3/30/2013 14:32	PIC	Sr90S13
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S2	11A	3	0	14364	3/30/2013 15:31	3/30/2013 15:34	PIC	Sr90S13
S3	11A	3	0	14259	3/30/2013 15:35	3/30/2013 15:38	PIC	Sr90S13
S4	11A	3	1	14370	3/30/2013 15:38	3/30/2013 15:41	PIC	Sr90S13
S5	11A	3	0	13698	3/30/2013 15:43	3/30/2013 15:46	PIC	Sr90S13
S6	11A	3	0	9866	3/30/2013 15:47	3/30/2013 15:50	PIC	Sr90S13
S7	11A	3	2	11413	3/30/2013 15:51	3/30/2013 15:54	PIC	Sr90S13
S1	11B	3	0	14495	3/30/2013 15:54	3/30/2013 15:57	PIC	Sr90S13
S2	11B	3	0	15572	3/30/2013 15:28	3/30/2013 15:31	PIC	Sr90S13
S3	11B	3	0	15188	3/30/2013 15:31	3/30/2013 15:34	PIC	Sr90S13
S4	11B	3	0	15612	3/30/2013 15:35	3/30/2013 15:38	PIC	Sr90S13
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S6	11B	3	0	11037	3/30/2013 15:43	3/30/2013 15:46	PIC	Sr90S13
S7	11B	3	0	12343	3/30/2013 15:47	3/30/2013 15:50	PIC	Sr90S13
S1	11C	3	1	14267	3/30/2013 15:51	3/30/2013 15:54	PIC	Sr90S13

S2	11C	3	0	15354	3/30/2013 15:55	3/30/2013 15:58	PIC	Sr90S13
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S4	11C	3	0	15373	3/30/2013 15:31	3/30/2013 15:34	PIC	Sr90S13
S5	11C	3	1	14902	3/30/2013 15:35	3/30/2013 15:38	PIC	Sr90S13
S6	11C	3	1	10342	3/30/2013 15:39	3/30/2013 15:42	PIC	Sr90S13
S7	11C	3	0	12297	3/30/2013 15:43	3/30/2013 15:46	PIC	Sr90S13
S1	11D	3	1	14538	3/30/2013 15:47	3/30/2013 15:50	PIC	Sr90S13
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S3	13A	3	1	15553	3/30/2013 15:16	3/30/2013 15:19	PIC	Sr90S13
S4	13A	3	1	15547	3/30/2013 15:09	3/30/2013 15:12	PIC	Sr90S13
S5	13A	3	0	14769	3/30/2013 14:59	3/30/2013 15:02	PIC	Sr90S13
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S1	13B	3	2	14929	3/30/2013 14:37	3/30/2013 14:40	PIC	Sr90S13
S2	13B	3	0	15677	3/30/2013 14:31	3/30/2013 14:34	PIC	Sr90S13
S3	13B	3	0	15456	3/30/2013 15:25	3/30/2013 15:28	PIC	Sr90S13
S4	13B	3	1	15818	3/30/2013 15:16	3/30/2013 15:19	PIC	Sr90S13
S5	13B	3	0	15205	3/30/2013 15:09	3/30/2013 15:12	PIC	Sr90S13
S6	13B	3	1	11264	3/30/2013 14:59	3/30/2013 15:02	PIC	Sr90S13
S7	13B	3	0	12827	3/30/2013 14:53	3/30/2013 14:56	PIC	Sr90S13
S1	13C	3	1	13771	3/30/2013 14:44	3/30/2013 14:47	PIC	Sr90S13
S2	13C	3	0	14798	3/30/2013 14:37	3/30/2013 14:40	PIC	Sr90S13
S3	13C	3	0	14645	3/30/2013 14:31	3/30/2013 14:34	PIC	Sr90S13
S4	13C	3	1	15000	3/30/2013 15:25	3/30/2013 15:28	PIC	Sr90S13
S5	13C	3	0	14263	3/30/2013 15:16	3/30/2013 15:19	PIC	Sr90S13
S6	13C	3	1	10434	3/30/2013 15:09	3/30/2013 15:12	PIC	Sr90S13
S7	13C	3	1	12050	3/30/2013 14:59	3/30/2013 15:02	PIC	Sr90S13
S1	13D	3	0	14215	3/30/2013 14:53	3/30/2013 14:56	PIC	Sr90S13
S2	13D	3	1	15393	3/30/2013 14:44	3/30/2013 14:47	PIC	Sr90S13
S3	13D	3	0	15231	3/30/2013 14:37	3/30/2013 14:40	PIC	Sr90S13

S4	13D	3	0	15518	3/30/2013 14:31	3/30/2013 14:34	PIC	Sr90S13
S5	13D	3	0	14852	3/30/2013 15:25	3/30/2013 15:28	PIC	Sr90S13
S6	13D	3	1	11056	3/30/2013 15:16	3/30/2013 15:19	PIC	Sr90S13
S7	13D	3	1	12768	3/30/2013 15:09	3/30/2013 15:12	PIC	Sr90S13
S1	14A	3	0	13882	3/30/2013 14:59	3/30/2013 15:02	PIC	Sr90S13
S2	14A	3	1	14985	3/30/2013 14:52	3/30/2013 14:55	PIC	Sr90S13
S3	14A	3	0	14874	3/30/2013 14:45	3/30/2013 14:48	PIC	Sr90S13
S4	14A	3	0	15344	3/30/2013 14:38	3/30/2013 14:41	PIC	Sr90S13
S5	14A	3	1	14151	3/30/2013 14:31	3/30/2013 14:34	PIC	Sr90S13
S6	14A	3	1	10357	3/30/2013 15:24	3/30/2013 15:27	PIC	Sr90S13
S7	14A	3	0	11816	3/30/2013 15:16	3/30/2013 15:19	PIC	Sr90S13
S1	14B	3	0	14442	3/30/2013 15:09	3/30/2013 15:12	PIC	Sr90S13
S2	14B	3	0	15221	3/30/2013 14:59	3/30/2013 15:02	PIC	Sr90S13
S3	14B	3	1	14787	3/30/2013 14:52	3/30/2013 14:55	PIC	Sr90S13
S4	14B	3	0	15252	3/30/2013 14:45	3/30/2013 14:48	PIC	Sr90S13
S5	14B	3	0	14644	3/30/2013 14:38	3/30/2013 14:41	PIC	Sr90S13
S6	14B	3	0	11477	3/30/2013 14:31	3/30/2013 14:34	PIC	Sr90S13
S7	14B	3	1	12308	3/30/2013 15:24	3/30/2013 15:27	PIC	Sr90S13
S1	14C	3	1	14188	3/30/2013 15:16	3/30/2013 15:19	PIC	Sr90S13
S2	14C	3	1	15087	3/30/2013 15:09	3/30/2013 15:12	PIC	Sr90S13
S3	14C	3	0	14907	3/30/2013 14:59	3/30/2013 15:02	PIC	Sr90S13
S4	14C	3	0	15149	3/30/2013 14:52	3/30/2013 14:55	PIC	Sr90S13
S5	14C	3	0	14790	3/30/2013 14:45	3/30/2013 14:48	PIC	Sr90S13
S6	14C	3	1	11904	3/30/2013 14:38	3/30/2013 14:41	PIC	Sr90S13
S7	14C	3	0	12979	3/30/2013 14:31	3/30/2013 14:34	PIC	Sr90S13
S1	14D	3	0	13129	3/30/2013 15:24	3/30/2013 15:27	PIC	Sr90S13
S2	14D	3	0	14162	3/30/2013 15:16	3/30/2013 15:19	PIC	Sr90S13
S3	14D	3	0	14253	3/30/2013 15:09	3/30/2013 15:12	PIC	Sr90S13
S4	14D	3	0	14346	3/30/2013 14:59	3/30/2013 15:02	PIC	Sr90S13
S5	14D	3	0	13660	3/30/2013 14:52	3/30/2013 14:55	PIC	Sr90S13
S6	14D	3	0	10732	3/30/2013 14:45	3/30/2013 14:48	PIC	Sr90S13
S7	14D	3	0	12093	3/30/2013 14:38	3/30/2013 14:41	PIC	Sr90S13

Y-90 Calibration - PIC - Mar 2013

Standard Data		
	Isotope	Sr-90
	Standard ID number	1244-A
	Half Life (days)	10555.725
	Std. Act. (dpm/mL)	21333.9626
	Reference Date	10/1/2008
	Volume of spike (mL)	0.5
	Std. Nominal (dpm)	9577.30
	Decay Date	3/30/2013

Separation Date/Time 3/29/2013 13:05
Y-90 Half Life (days) 2.668875
The following detectors were not calibrated:
12A, 12B, 12C, 12D

Carrier Data		Std ID 1892786 Std weight 31.85 mg/mL		
Source	Measured weight (mg)	Vol. Carrier Added (mL)	Theoretical weight (mg)	***Recovery
1	15.9	0.5	15.93	99.8%
2	16.1	0.5	15.93	100.0%
3	16.0	0.5	15.93	100.0%
4	16.1	0.5	15.93	100.0%
5	16.0	0.5	15.93	100.0%
6	16.2	0.5	15.93	100.0%
7	15.9	0.5	15.93	99.8%
8	16.4	0.5	15.93	100.0%

***Recovery values exceeding 100% will be evaluated at 100%.

*Background is considered neglible.
**Decay corrected to mid-point of cour

Raw Count Data											
Detector (#)	Source ID (#)	Start Time	Count Time (min)	Beta (counts)	Raw Beta (cpm)	Recovery (%)	Y-90 Decay	Corrected Sr-90 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-90 Efficiency (cpm/dpm)	Average Efficiency (cpm/dpm)
1A	1	3/30/2013 14:46	3	11551	3850.33	99.8%	0.75713	5093.40	9576.92	0.5318	
1A	2	3/30/2013 15:50	3	11713	3904.33	100.0%	0.74845	5216.59	9576.89	0.5447	
1A	3	3/30/2013 15:42	3	11569	3856.33	100.0%	0.74950	5145.23	9576.89	0.5373	
1A	4	3/30/2013 15:34	3	11605	3868.33	100.0%	0.75061	5153.60	9576.89	0.5381	
1A	5	3/30/2013 15:24	3	11518	3839.33	100.0%	0.75196	5105.76	9576.90	0.5331	
1A	6	3/30/2013 15:14	3	10892	3630.67	100.0%	0.75326	4819.97	9576.90	0.5033	
1A	7	3/30/2013 15:06	3	11867	3955.67	99.8%	0.75430	5252.42	9576.91	0.5484	
1A	8	3/30/2013 14:56	3	11847	3949.00	100.0%	0.75572	5225.48	9576.91	0.5456	0.5353
1B	1	3/30/2013 14:56	3	11717	3905.67	99.8%	0.75569	5176.46	9576.91	0.5405	
1B	2	3/30/2013 14:46	3	11796	3932.00	100.0%	0.75708	5193.61	9576.91	0.5423	
1B	3	3/30/2013 15:49	3	11430	3810.00	100.0%	0.74847	5090.40	9576.89	0.5315	
1B	4	3/30/2013 15:42	3	11535	3845.00	100.0%	0.74953	5129.91	9576.89	0.5357	
1B	5	3/30/2013 15:33	3	11451	3817.00	100.0%	0.75064	5084.98	9576.89	0.5310	
1B	6	3/30/2013 15:24	3	10732	3577.33	100.0%	0.75196	4757.32	9576.90	0.4967	
1B	7	3/30/2013 15:14	3	11951	3983.67	99.8%	0.75328	5296.74	9576.90	0.5531	
1B	8	3/30/2013 15:07	3	11648	3882.67	100.0%	0.75428	5147.52	9576.91	0.5375	0.5335
1C	1	3/30/2013 15:07	3	11759	3919.67	99.8%	0.75428	5204.74	9576.91	0.5435	
1C	2	3/30/2013 14:56	3	11847	3949.00	100.0%	0.75569	5225.68	9576.91	0.5457	
1C	3	3/30/2013 14:47	3	11562	3854.00	100.0%	0.75700	5091.13	9576.91	0.5316	
1C	4	3/30/2013 15:49	3	11823	3941.00	100.0%	0.74847	5265.42	9576.89	0.5498	
1C	5	3/30/2013 15:42	3	11680	3893.33	100.0%	0.74953	5194.39	9576.89	0.5424	
1C	6	3/30/2013 15:33	3	10544	3514.67	100.0%	0.75064	4682.23	9576.89	0.4889	
1C	7	3/30/2013 15:24	3	11779	3926.33	99.8%	0.75196	5229.67	9576.90	0.5461	
1C	8	3/30/2013 15:14	3	11722	3907.33	100.0%	0.75328	5187.09	9576.90	0.5416	0.5362
1D	1	3/30/2013 15:14	3	11522	3840.67	99.8%	0.75328	5106.61	9576.90	0.5332	
1D	2	3/30/2013 15:07	3	11771	3923.67	100.0%	0.75426	5201.98	9576.91	0.5432	
1D	3	3/30/2013 14:56	3	11535	3845.00	100.0%	0.75569	5088.06	9576.91	0.5313	
1D	4	3/30/2013 14:48	3	11874	3958.00	100.0%	0.75682	5229.77	9576.91	0.5461	
1D	5	3/30/2013 15:49	3	11432	3810.67	100.0%	0.74847	5091.29	9576.89	0.5316	
1D	6	3/30/2013 15:42	3	10327	3442.33	100.0%	0.74952	4592.69	9576.89	0.4796	
1D	7	3/30/2013 15:33	3	11718	3906.00	99.8%	0.75064	5211.74	9576.89	0.5442	
1D	8	3/30/2013 15:24	3	11631	3877.00	100.0%	0.75196	5155.83	9576.90	0.5384	0.5309
2A	1	3/30/2013 15:24	3	11102	3700.67	99.8%	0.75196	4929.12	9576.90	0.5147	
2A	2	3/30/2013 15:14	3	11053	3684.33	100.0%	0.75326	4891.20	9576.90	0.5107	
2A	3	3/30/2013 15:07	3	11160	3720.00	100.0%	0.75426	4931.98	9576.91	0.5150	
2A	4	3/30/2013 14:56	3	11334	3778.00	100.0%	0.75569	4999.43	9576.91	0.5220	
2A	5	3/30/2013 14:49	3	11092	3697.33	100.0%	0.75673	4885.96	9576.91	0.5102	
2A	6	3/30/2013 15:50	3	10202	3400.67	100.0%	0.74845	4543.64	9576.89	0.4744	
2A	7	3/30/2013 15:42	3	11309	3769.67	99.8%	0.74949	5037.55	9576.89	0.5260	
2A	8	3/30/2013 15:33	3	11236	3745.33	100.0%	0.75064	4989.55	9576.89	0.5210	0.5118
2B	1	3/30/2013 15:34	3	11237	3745.67	99.8%	0.75060	4998.08	9576.89	0.5219	
2B	2	3/30/2013 15:23	3	11258	3752.67	100.0%	0.75200	4990.23	9576.90	0.5211	
2B	3	3/30/2013 15:14	3	11080	3693.33	100.0%	0.75330	4902.85	9576.90	0.5119	
2B	4	3/30/2013 15:06	3	11228	3742.67	100.0%	0.75430	4961.81	9576.91	0.5181	
2B	5	3/30/2013 14:56	3	11031	3677.00	100.0%	0.75572	4865.54	9576.91	0.5080	
2B	6	3/30/2013 14:49	3	10699	3566.33	100.0%	0.75673	4712.85	9576.91	0.4921	
2B	7	3/30/2013 15:50	3	11366	3788.67	99.8%	0.74844	5070.02	9576.89	0.5294	
2B	8	3/30/2013 15:42	3	11316	3772.00	100.0%	0.74949	5032.75	9576.89	0.5255	0.5160
2C	1	3/30/2013 15:42	3	11254	3751.33	99.8%	0.74949	5013.06	9576.89	0.5235	
2C	2	3/30/2013 15:34	3	11196	3732.00	100.0%	0.75060	4972.00	9576.89	0.5192	
2C	3	3/30/2013 15:23	3	11123	3707.67	100.0%	0.75200	4930.41	9576.90	0.5148	
2C	4	3/30/2013 15:14	3	11257	3752.33	100.0%	0.75330	4981.17	9576.90	0.5201	
2C	5	3/30/2013 15:06	3	11037	3679.00	100.0%	0.75430	4877.40	9576.91	0.5093	
2C	6	3/30/2013 14:56	3	10818	3606.00	100.0%	0.75572	4771.59	9576.91	0.4982	
2C	7	3/30/2013 14:49	3	11625	3875.00	99.8%	0.75666	5129.23	9576.91	0.5356	
2C	8	3/30/2013 15:50	3	11273	3757.67	100.0%	0.74844	5020.64	9576.89	0.5242	0.5181
2D	1	3/30/2013 15:50	3	11170	3723.33	99.8%	0.74844	4982.59	9576.89	0.5203	
2D	2	3/30/2013 15:42	3	11062	3687.33	100.0%	0.74949	4919.80	9576.89	0.5137	
2D	3	3/30/2013 15:34	3	11193	3731.00	100.0%	0.75060	4970.68	9576.89	0.5190	
2D	4	3/30/2013 15:23	3	11423	3807.67	100.0%	0.75200	5063.39	9576.90	0.5287	
2D	5	3/30/2013 15:14	3	11240	3746.67	100.0%	0.75330	4973.67	9576.90	0.5193	
2D	6	3/30/2013 15:06	3	10285	3428.33	100.0%	0.75430	4545.08	9576.91	0.4746	

Detector (#)	Source ID (#)	Raw Count Data Start Time	Count Time (min)	Beta (counts)	Raw Beta (cpm)	Recovery (%)	Y-90 Decay	Corrected Sr-90 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-90 Efficiency (cpm/dpm)	Average Efficiency (cpm/dpm)
2D	7	3/30/2013 14:56	3	11687	3895.67	99.8%	0.75572	5163.01	9576.91	0.5391	
2D	8	3/30/2013 14:49	3	11832	3944.00	100.0%	0.75666	5212.35	9576.91	0.5443	0.5199
3A	1	3/30/2013 14:53	3	11701	3900.33	99.8%	0.75616	5166.20	9576.91	0.5394	
3A	2	3/30/2013 16:22	3	11614	3871.33	100.0%	0.74414	5202.44	9576.87	0.5432	
3A	3	3/30/2013 15:46	3	11501	3833.67	100.0%	0.74893	5118.83	9576.89	0.5345	
3A	4	3/30/2013 15:38	3	11680	3893.33	100.0%	0.75002	5191.00	9576.89	0.5420	
3A	5	3/30/2013 15:28	3	11179	3726.33	100.0%	0.75134	4959.57	9576.90	0.5179	
3A	6	3/30/2013 15:19	3	10626	3542.00	100.0%	0.75252	4706.82	9576.90	0.4915	
3A	7	3/30/2013 15:10	3	11829	3943.00	99.8%	0.75379	5239.13	9576.90	0.5471	
3A	8	3/30/2013 15:03	3	11508	3836.00	100.0%	0.75475	5082.48	9576.91	0.5307	0.5308
3B	1	3/30/2013 15:03	3	11658	3886.00	99.8%	0.75475	5156.83	9576.91	0.5385	
3B	2	3/30/2013 14:53	3	11625	3875.00	100.0%	0.75616	5124.60	9576.91	0.5351	
3B	3	3/30/2013 16:22	3	11173	3724.33	100.0%	0.74414	5004.89	9576.87	0.5226	
3B	4	3/30/2013 15:46	3	11497	3832.33	100.0%	0.74893	5117.05	9576.89	0.5343	
3B	5	3/30/2013 15:38	3	11424	3808.00	100.0%	0.75002	5077.23	9576.89	0.5302	
3B	6	3/30/2013 15:28	3	10607	3535.67	100.0%	0.75134	4705.79	9576.90	0.4914	
3B	7	3/30/2013 15:19	3	11866	3955.33	99.8%	0.75252	5264.35	9576.90	0.5497	
3B	8	3/30/2013 15:10	3	11767	3922.33	100.0%	0.75379	5203.48	9576.90	0.5433	0.5306
3C	1	3/30/2013 15:10	3	11610	3870.00	99.8%	0.75379	5142.14	9576.90	0.5369	
3C	2	3/30/2013 15:03	3	11528	3842.67	100.0%	0.75475	5091.32	9576.91	0.5316	
3C	3	3/30/2013 14:53	3	11751	3917.00	100.0%	0.75616	5180.14	9576.91	0.5409	
3C	4	3/30/2013 16:22	3	11509	3836.33	100.0%	0.74414	5155.40	9576.87	0.5383	
3C	5	3/30/2013 15:46	3	11490	3830.00	100.0%	0.74893	5113.94	9576.89	0.5340	
3C	6	3/30/2013 15:38	3	10363	3454.33	100.0%	0.75002	4605.67	9576.89	0.4809	
3C	7	3/30/2013 15:28	3	11782	3927.33	99.8%	0.75134	5235.32	9576.90	0.5467	
3C	8	3/30/2013 15:19	3	11810	3936.67	100.0%	0.75252	5231.28	9576.90	0.5462	0.5319
3D	1	3/30/2013 15:19	3	11458	3819.33	99.8%	0.75252	5083.34	9576.90	0.5308	
3D	2	3/30/2013 15:10	3	11260	3753.33	100.0%	0.75379	4979.30	9576.90	0.5199	
3D	3	3/30/2013 15:03	3	11499	3833.00	100.0%	0.75475	5078.49	9576.91	0.5303	
3D	4	3/30/2013 14:53	3	11444	3814.67	100.0%	0.75616	5044.78	9576.91	0.5268	
3D	5	3/30/2013 16:22	3	11039	3679.67	100.0%	0.74414	4944.87	9576.87	0.5163	
3D	6	3/30/2013 15:46	3	10203	3401.00	100.0%	0.74893	4541.12	9576.89	0.4742	
3D	7	3/30/2013 15:38	3	11594	3864.67	99.8%	0.75002	5160.87	9576.89	0.5389	
3D	8	3/30/2013 15:28	3	11466	3822.00	100.0%	0.75134	5086.90	9576.90	0.5312	0.5210
4A	1	3/30/2013 15:28	3	11533	3844.33	99.8%	0.75137	5124.48	9576.90	0.5351	
4A	2	3/30/2013 15:19	3	11688	3896.00	100.0%	0.75252	5177.27	9576.90	0.5406	
4A	3	3/30/2013 15:10	3	11649	3883.00	100.0%	0.75382	5151.12	9576.90	0.5379	
4A	4	3/30/2013 15:03	3	11603	3867.67	100.0%	0.75477	5124.27	9576.91	0.5351	
4A	5	3/30/2013 14:53	3	11409	3803.00	100.0%	0.75618	5029.20	9576.91	0.5251	
4A	6	3/30/2013 16:21	3	10217	3405.67	100.0%	0.74416	4576.51	9576.87	0.4779	
4A	7	3/30/2013 15:46	3	11782	3927.33	99.8%	0.74895	5252.00	9576.89	0.5484	
4A	8	3/30/2013 15:38	3	11639	3879.67	100.0%	0.75001	5172.80	9576.89	0.5401	0.5300
4B	1	3/30/2013 15:38	3	11605	3868.33	99.8%	0.75001	5165.80	9576.89	0.5394	
4B	2	3/30/2013 15:28	3	11505	3835.00	100.0%	0.75137	5104.03	9576.90	0.5330	
4B	3	3/30/2013 15:19	3	11446	3815.33	100.0%	0.75252	5070.08	9576.90	0.5294	
4B	4	3/30/2013 15:10	3	11555	3851.67	100.0%	0.75383	5109.47	9576.90	0.5335	
4B	5	3/30/2013 15:03	3	11501	3833.67	100.0%	0.75477	5079.23	9576.91	0.5304	
4B	6	3/30/2013 14:53	3	11310	3770.00	100.0%	0.75618	4985.57	9576.91	0.5206	
4B	7	3/30/2013 16:21	3	11770	3923.33	99.8%	0.74416	5280.43	9576.87	0.5514	
4B	8	3/30/2013 15:46	3	11638	3879.33	100.0%	0.74895	5179.67	9576.89	0.5409	0.5348
4C	1	3/30/2013 15:46	3	11691	3897.00	99.8%	0.74895	5211.44	9576.89	0.5442	
4C	2	3/30/2013 15:38	3	11555	3851.67	100.0%	0.75001	5135.47	9576.89	0.5362	
4C	3	3/30/2013 15:28	3	11702	3900.67	100.0%	0.75137	5191.43	9576.90	0.5421	
4C	4	3/30/2013 15:19	3	11727	3909.00	100.0%	0.75252	5194.56	9576.90	0.5424	
4C	5	3/30/2013 15:10	3	11434	3811.33	100.0%	0.75383	5055.97	9576.90	0.5279	
4C	6	3/30/2013 15:03	3	10920	3640.00	100.0%	0.75477	4822.65	9576.91	0.5036	
4C	7	3/30/2013 14:53	3	12089	4029.67	99.8%	0.75618	5337.34	9576.91	0.5573	
4C	8	3/30/2013 16:21	3	11653	3884.33	100.0%	0.74416	5219.73	9576.87	0.5450	0.5373
4D	1	3/30/2013 16:21	3	11486	3828.67	99.8%	0.74416	5153.02	9576.87	0.5381	
4D	2	3/30/2013 15:46	3	11498	3832.67	100.0%	0.74896	5117.33	9576.89	0.5343	
4D	3	3/30/2013 15:38	3	11268	3756.00	100.0%	0.75001	5007.91	9576.89	0.5229	
4D	4	3/30/2013 15:28	3	11646	3882.00	100.0%	0.75137	5166.55	9576.90	0.5395	
4D	5	3/30/2013 15:19	3	11638	3879.33	100.0%	0.75252	5155.14	9576.90	0.5383	
4D	6	3/30/2013 15:10	3	10716	3572.00	100.0%	0.75383	4738.48	9576.90	0.4948	
4D	7	3/30/2013 15:03	3	11892	3964.00	99.8%	0.75478	5260.15	9576.91	0.5493	
4D	8	3/30/2013 14:53	3	11641	3880.33	100.0%	0.75618	5131.48	9576.91	0.5358	0.5316
5A	1	3/30/2013 16:26	3	11655	3885.00	99.8%	0.74359	5232.90	9576.87	0.5464	
5A	2	3/30/2013 17:24	3	11486	3828.67	100.0%	0.73586	5202.99	9576.85	0.5433	
5A	3	3/30/2013 17:16	3	11067	3689.00	100.0%	0.73693	5005.90	9576.85	0.5227	
5A	4	3/30/2013 17:08	3	11784	3928.00	100.0%	0.73797	5322.71	9576.85	0.5558	
5A	5	3/30/2013 16:59	3	11476	3825.33	100.0%	0.73910	5175.65	9576.86	0.5404	
5A	6	3/30/2013 16:51	3	10191	3397.00	100.0%	0.74024	4589.06	9576.86	0.4792	
5A	7	3/30/2013 16:43	3	11950	3983.33	99.8%	0.74133	5381.71	9576.86	0.5619	
5A	8	3/30/2013 16:34	3	11683	3894.33	100.0%	0.74243	5245.41	9576.87	0.5477	0.5372
5B	1	3/30/2013 16:34	3	11610	3870.00	99.8%	0.74244	5220.72	9576.87	0.5451	
5B	2	3/30/2013 16:26	3	11459	3819.67	100.0%	0.74358	5136.88	9576.87	0.5364	
5B	3	3/30/2013 17:24	3	11519	3839.67	100.0%	0.73586	5217.94	9576.85	0.5448	
5B	4	3/30/2013 17:15	3	11560	3853.33	100.0%	0.73695	5228.79	9576.85	0.5460	
5B	5	3/30/2013 17:08	3	11373	3791.00	100.0%	0.73798	5136.99	9576.85	0.5364	
5B	6	3/30/2013 16:59	3	10226	3408.67	100.0%	0.73912	4611.80	9576.86	0.4816	
5B	7	3/30/2013 16:51	3	11833	3944.33	99.8%	0.74025	5336.74	9576.86	0.5573	

Detector (#)	Source ID (#)	Raw Count Data Start Time	Count Time (min)	Beta (counts)	Raw Beta (cpm)	Recovery (%)	Y-90 Decay	Corrected Sr-90 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-90 Efficiency (cpm/dpm)	Average Efficiency (cpm/dpm)
5B	8	3/30/2013 16:42	3	11831	3943.67	100.0%	0.74134	5319.62	9576.86	0.5555	0.5379
5C	1	3/30/2013 16:42	3	11633	3877.67	99.8%	0.74134	5238.82	9576.86	0.5470	
5C	2	3/30/2013 16:34	3	11756	3918.67	100.0%	0.74244	5278.07	9576.87	0.5511	
5C	3	3/30/2013 16:26	3	11398	3799.33	100.0%	0.74355	5109.72	9576.87	0.5335	
5C	4	3/30/2013 17:24	3	11733	3911.00	100.0%	0.73586	5314.89	9576.85	0.5550	
5C	5	3/30/2013 17:15	3	11330	3776.67	100.0%	0.73695	5124.75	9576.85	0.5351	
5C	6	3/30/2013 17:08	3	10272	3424.00	100.0%	0.73798	4639.68	9576.85	0.4845	
5C	7	3/30/2013 16:59	3	11798	3932.67	99.8%	0.73912	5329.12	9576.86	0.5565	
5C	8	3/30/2013 16:51	3	11698	3899.33	100.0%	0.74025	5267.58	9576.86	0.5500	0.5391
5D	1	3/30/2013 16:51	3	11647	3882.33	99.8%	0.74025	5252.87	9576.86	0.5485	
5D	2	3/30/2013 16:42	3	11618	3872.67	100.0%	0.74134	5223.87	9576.86	0.5455	
5D	3	3/30/2013 16:34	3	11265	3755.00	100.0%	0.74244	5057.63	9576.87	0.5281	
5D	4	3/30/2013 16:26	3	11705	3901.67	100.0%	0.74354	5247.44	9576.87	0.5479	
5D	5	3/30/2013 17:24	3	11262	3754.00	100.0%	0.73586	5101.53	9576.85	0.5327	
5D	6	3/30/2013 17:15	3	10373	3457.67	100.0%	0.73695	4691.88	9576.85	0.4899	
5D	7	3/30/2013 17:08	3	11696	3898.67	99.8%	0.73798	5291.19	9576.85	0.5525	
5D	8	3/30/2013 16:59	3	11921	3973.67	100.0%	0.73912	5376.23	9576.86	0.5614	0.5383
6A	1	3/30/2013 16:59	3	10267	3422.33	99.8%	0.73912	4637.59	9576.86	0.4842	
6A	2	3/30/2013 16:51	3	10393	3464.33	100.0%	0.74025	4679.94	9576.86	0.4887	
6A	3	3/30/2013 16:42	3	10000	3333.33	100.0%	0.74134	4496.37	9576.86	0.4695	
6A	4	3/30/2013 16:34	3	10268	3422.67	100.0%	0.74244	4610.02	9576.87	0.4814	
6A	5	3/30/2013 16:26	3	10193	3397.67	100.0%	0.74353	4569.67	9576.87	0.4772	
6A	6	3/30/2013 17:24	3	9216	3072.00	100.0%	0.73587	4174.64	9576.85	0.4359	
6A	7	3/30/2013 17:15	3	10341	3447.00	99.8%	0.73695	4684.77	9576.85	0.4892	
6A	8	3/30/2013 17:08	3	10688	3562.67	100.0%	0.73798	4827.57	9576.85	0.5041	0.4788
6B	1	3/30/2013 17:07	3	9650	3216.67	99.8%	0.73802	4365.37	9576.85	0.4558	
6B	2	3/30/2013 16:59	3	9600	3200.00	100.0%	0.73916	4329.24	9576.86	0.4521	
6B	3	3/30/2013 16:50	3	9488	3162.67	100.0%	0.74029	4272.20	9576.86	0.4461	
6B	4	3/30/2013 16:42	3	9316	3105.33	100.0%	0.74138	4188.59	9576.86	0.4374	
6B	5	3/30/2013 16:34	3	9565	3188.33	100.0%	0.74249	4294.14	9576.87	0.4484	
6B	6	3/30/2013 16:26	3	8925	2975.00	100.0%	0.74351	4001.29	9576.87	0.4178	
6B	7	3/30/2013 17:23	3	9759	3253.00	99.8%	0.73591	4427.33	9576.85	0.4623	
6B	8	3/30/2013 17:15	3	9976	3325.33	100.0%	0.73695	4512.30	9576.85	0.4712	0.4489
6C	1	3/30/2013 17:15	3	11087	3695.67	99.8%	0.73695	5022.71	9576.85	0.5245	
6C	2	3/30/2013 17:07	3	10791	3597.00	100.0%	0.73802	4873.84	9576.85	0.5089	
6C	3	3/30/2013 16:59	3	10739	3579.67	100.0%	0.73916	4842.90	9576.86	0.5057	
6C	4	3/30/2013 16:50	3	11188	3729.33	100.0%	0.74029	5037.67	9576.86	0.5260	
6C	5	3/30/2013 16:42	3	10825	3608.33	100.0%	0.74138	4867.06	9576.86	0.5082	
6C	6	3/30/2013 16:34	3	9783	3261.00	100.0%	0.74249	4392.01	9576.87	0.4586	
6C	7	3/30/2013 16:26	3	11152	3717.33	99.8%	0.74350	5007.66	9576.87	0.5229	
6C	8	3/30/2013 17:23	3	11124	3708.00	100.0%	0.73591	5038.67	9576.85	0.5261	0.5101
6D	1	3/30/2013 17:23	3	9649	3216.33	99.8%	0.73591	4377.44	9576.85	0.4571	
6D	2	3/30/2013 17:15	3	9827	3275.67	100.0%	0.73695	4444.91	9576.85	0.4641	
6D	3	3/30/2013 17:07	3	9547	3182.33	100.0%	0.73802	4311.98	9576.85	0.4503	
6D	4	3/30/2013 16:59	3	9754	3251.33	100.0%	0.73916	4398.70	9576.86	0.4593	
6D	5	3/30/2013 16:50	3	9554	3184.67	100.0%	0.74029	4301.92	9576.86	0.4492	
6D	6	3/30/2013 16:42	3	8807	2935.67	100.0%	0.74138	3959.73	9576.86	0.4135	
6D	7	3/30/2013 16:34	3	9897	3299.00	99.8%	0.74249	4450.17	9576.87	0.4647	
6D	8	3/30/2013 16:26	3	10375	3458.33	100.0%	0.74348	4651.53	9576.87	0.4857	0.4555
7A	1	3/30/2013 16:30	3	11560	3853.33	99.8%	0.74307	5193.85	9576.87	0.5423	
7A	2	3/30/2013 17:27	3	11626	3875.33	100.0%	0.73534	5270.10	9576.84	0.5503	
7A	3	3/30/2013 17:19	3	11273	3757.67	100.0%	0.73642	5102.60	9576.85	0.5328	
7A	4	3/30/2013 17:11	3	11725	3908.33	100.0%	0.73748	5299.56	9576.85	0.5534	
7A	5	3/30/2013 17:03	3	11401	3800.33	100.0%	0.73857	5145.55	9576.85	0.5373	
7A	6	3/30/2013 16:55	3	10164	3388.00	100.0%	0.73970	4580.23	9576.86	0.4783	
7A	7	3/30/2013 16:47	3	11939	3979.67	99.8%	0.74080	5380.59	9576.86	0.5618	
7A	8	3/30/2013 16:38	3	11566	3855.33	100.0%	0.74190	5196.58	9576.87	0.5426	0.5374
7B	1	3/30/2013 16:38	3	11760	3920.00	99.8%	0.74190	5292.07	9576.87	0.5526	
7B	2	3/30/2013 16:30	3	11681	3893.67	100.0%	0.74307	5239.97	9576.87	0.5471	
7B	3	3/30/2013 17:27	3	11371	3790.33	100.0%	0.73534	5154.50	9576.84	0.5382	
7B	4	3/30/2013 17:19	3	11697	3899.00	100.0%	0.73642	5294.52	9576.85	0.5528	
7B	5	3/30/2013 17:11	3	11369	3789.67	100.0%	0.73748	5138.65	9576.85	0.5366	
7B	6	3/30/2013 17:03	3	10315	3438.33	100.0%	0.73857	4655.41	9576.85	0.4861	
7B	7	3/30/2013 16:55	3	11866	3955.33	99.8%	0.73970	5355.63	9576.86	0.5592	
7B	8	3/30/2013 16:46	3	11568	3856.00	100.0%	0.74080	5205.17	9576.86	0.5435	0.5395
7C	1	3/30/2013 16:47	3	11611	3870.33	99.8%	0.74080	5232.75	9576.86	0.5464	
7C	2	3/30/2013 16:38	3	11340	3780.00	100.0%	0.74190	5095.05	9576.87	0.5320	
7C	3	3/30/2013 16:30	3	11305	3768.33	100.0%	0.74307	5071.30	9576.87	0.5295	
7C	4	3/30/2013 17:27	3	11354	3784.67	100.0%	0.73534	5146.80	9576.84	0.5374	
7C	5	3/30/2013 17:19	3	11424	3808.00	100.0%	0.73642	5170.95	9576.85	0.5399	
7C	6	3/30/2013 17:11	3	10295	3431.67	100.0%	0.73748	4653.22	9576.85	0.4859	
7C	7	3/30/2013 17:03	3	11620	3873.33	99.8%	0.73857	5252.65	9576.85	0.5485	
7C	8	3/30/2013 16:55	3	11421	3807.00	100.0%	0.73970	5146.69	9576.86	0.5374	0.5321
7D	1	3/30/2013 16:55	3	11688	3896.00	99.8%	0.73970	5275.29	9576.86	0.5508	
7D	2	3/30/2013 16:47	3	11681	3893.67	100.0%	0.74080	5256.03	9576.86	0.5488	
7D	3	3/30/2013 16:38	3	11287	3762.33	100.0%	0.74190	5071.24	9576.87	0.5295	
7D	4	3/30/2013 16:30	3	11695	3898.33	100.0%	0.74307	5246.25	9576.87	0.5478	
7D	5	3/30/2013 17:27	3	11332	3777.33	100.0%	0.73534	5136.82	9576.84	0.5364	
7D	6	3/30/2013 17:19	3	10278	3426.00	100.0%	0.73642	4652.24	9576.85	0.4858	
7D	7	3/30/2013 17:11	3	11645	3881.67	99.8%	0.73748	5271.68	9576.85	0.5505	
7D	8	3/30/2013 17:03	3	11537	3845.67	100.0%	0.73857	5206.94	9576.85	0.5437	0.5367

Detector (#)	Source ID (#)	Raw Count Data Start Time	Count Time (min)	Beta (counts)	Raw Beta (cpm)	Recovery (%)	Y-90 Decay	Corrected Sr-90 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-90 Efficiency (cpm/dpm)	Average Efficiency (cpm/dpm)
8A	1	3/30/2013 17:03	3	11089	3696.33	99.8%	0.73859	5012.42	9576.85	0.5234	
8A	2	3/30/2013 16:55	3	11355	3785.00	100.0%	0.73972	5116.78	9576.86	0.5343	
8A	3	3/30/2013 16:46	3	11121	3707.00	100.0%	0.74083	5003.86	9576.86	0.5225	
8A	4	3/30/2013 16:38	3	11478	3826.00	100.0%	0.74193	5156.82	9576.87	0.5385	
8A	5	3/30/2013 16:30	3	11256	3752.00	100.0%	0.74304	5049.52	9576.87	0.5273	
8A	6	3/30/2013 17:27	3	10002	3334.00	100.0%	0.73537	4533.77	9576.84	0.4734	
8A	7	3/30/2013 17:19	3	11411	3803.67	99.8%	0.73645	5173.02	9576.85	0.5402	
8A	8	3/30/2013 17:11	3	11544	3848.00	100.0%	0.73750	5217.59	9576.85	0.5448	0.5255
8B	1	3/30/2013 17:11	3	11077	3692.33	99.8%	0.73750	5014.41	9576.85	0.5236	
8B	2	3/30/2013 17:03	3	11109	3703.00	100.0%	0.73859	5013.58	9576.85	0.5235	
8B	3	3/30/2013 16:55	3	11001	3667.00	100.0%	0.73973	4957.23	9576.86	0.5176	
8B	4	3/30/2013 16:46	3	11116	3705.33	100.0%	0.74083	5001.61	9576.86	0.5223	
8B	5	3/30/2013 16:38	3	10804	3601.33	100.0%	0.74193	4854.01	9576.87	0.5068	
8B	6	3/30/2013 16:30	3	9694	3231.33	100.0%	0.74305	4348.77	9576.87	0.4541	
8B	7	3/30/2013 17:27	3	11250	3750.00	99.8%	0.73537	5107.49	9576.84	0.5333	
8B	8	3/30/2013 17:19	3	11031	3677.00	100.0%	0.73645	4992.90	9576.85	0.5214	0.5128
8C	1	3/30/2013 17:19	3	11611	3870.33	99.8%	0.73645	5263.69	9576.85	0.5496	
8C	2	3/30/2013 17:11	3	11556	3852.00	100.0%	0.73751	5223.00	9576.85	0.5454	
8C	3	3/30/2013 17:03	3	11315	3771.67	100.0%	0.73859	5106.55	9576.85	0.5332	
8C	4	3/30/2013 16:55	3	11562	3854.00	100.0%	0.73973	5210.03	9576.86	0.5440	
8C	5	3/30/2013 16:46	3	11426	3808.67	100.0%	0.74083	5141.09	9576.86	0.5368	
8C	6	3/30/2013 16:38	3	10288	3429.33	100.0%	0.74193	4622.18	9576.87	0.4826	
8C	7	3/30/2013 16:30	3	11706	3902.00	99.8%	0.74305	5259.62	9576.87	0.5492	
8C	8	3/30/2013 17:27	3	11532	3844.00	100.0%	0.73537	5227.30	9576.84	0.5458	0.5358
8D	1	3/30/2013 17:27	3	11532	3844.00	99.8%	0.73537	5235.52	9576.84	0.5467	
8D	2	3/30/2013 17:19	3	11838	3946.00	100.0%	0.73644	5358.18	9576.85	0.5595	
8D	3	3/30/2013 17:11	3	11402	3800.67	100.0%	0.73751	5153.40	9576.85	0.5381	
8D	4	3/30/2013 17:03	3	11541	3847.00	100.0%	0.73859	5208.56	9576.85	0.5439	
8D	5	3/30/2013 16:55	3	11561	3853.67	100.0%	0.73972	5209.59	9576.86	0.5440	
8D	6	3/30/2013 16:46	3	10407	3469.00	100.0%	0.74083	4682.61	9576.86	0.4890	
8D	7	3/30/2013 16:38	3	11975	3991.67	99.8%	0.74193	5388.58	9576.87	0.5627	
8D	8	3/30/2013 16:30	3	11785	3928.33	100.0%	0.74304	5286.82	9576.87	0.5520	0.5420
9A	1	3/30/2013 17:32	3	11659	3886.33	99.8%	0.73476	5297.57	9576.84	0.5532	
9A	2	3/30/2013 18:41	3	11487	3829.00	100.0%	0.72567	5276.49	9576.81	0.5510	
9A	3	3/30/2013 18:30	3	11268	3756.00	100.0%	0.72712	5165.61	9576.82	0.5394	
9A	4	3/30/2013 18:17	3	11367	3789.00	100.0%	0.72882	5198.80	9576.82	0.5429	
9A	5	3/30/2013 18:07	3	11199	3733.00	100.0%	0.73018	5112.42	9576.83	0.5338	
9A	6	3/30/2013 17:58	3	10112	3370.67	100.0%	0.73134	4608.90	9576.83	0.4813	
9A	7	3/30/2013 17:49	3	11654	3884.67	99.8%	0.73244	5312.08	9576.83	0.5547	
9A	8	3/30/2013 17:40	3	11504	3834.67	100.0%	0.73364	5226.88	9576.84	0.5458	0.5377
9B	1	3/30/2013 17:40	3	11269	3756.33	99.8%	0.73367	5128.00	9576.84	0.5355	
9B	2	3/30/2013 17:32	3	11252	3750.67	100.0%	0.73474	5104.75	9576.84	0.5330	
9B	3	3/30/2013 18:41	3	10930	3643.33	100.0%	0.72567	5020.64	9576.81	0.5242	
9B	4	3/30/2013 18:30	3	11070	3690.00	100.0%	0.72713	5074.72	9576.82	0.5299	
9B	5	3/30/2013 18:17	3	10957	3652.33	100.0%	0.72881	5011.36	9576.82	0.5233	
9B	6	3/30/2013 18:06	3	9962	3320.67	100.0%	0.73021	4547.57	9576.83	0.4749	
9B	7	3/30/2013 17:58	3	11504	3834.67	99.8%	0.73136	5251.47	9576.83	0.5484	
9B	8	3/30/2013 17:49	3	11466	3822.00	100.0%	0.73246	5218.04	9576.83	0.5449	0.5267
9C	1	3/30/2013 17:49	3	11302	3767.33	99.8%	0.73246	5151.50	9576.83	0.5379	
9C	2	3/30/2013 17:40	3	11541	3847.00	100.0%	0.73367	5243.53	9576.84	0.5475	
9C	3	3/30/2013 17:32	3	11133	3711.00	100.0%	0.73474	5050.76	9576.84	0.5274	
9C	4	3/30/2013 18:41	3	11241	3747.00	100.0%	0.72567	5163.51	9576.81	0.5392	
9C	5	3/30/2013 18:30	3	11355	3785.00	100.0%	0.72713	5205.37	9576.82	0.5435	
9C	6	3/30/2013 18:17	3	9940	3313.33	100.0%	0.72880	4546.26	9576.82	0.4747	
9C	7	3/30/2013 18:06	3	11315	3771.67	99.8%	0.73021	5173.32	9576.83	0.5402	
9C	8	3/30/2013 17:58	3	11501	3833.67	100.0%	0.73136	5241.86	9576.83	0.5473	0.5322
9D	1	3/30/2013 17:58	3	10904	3634.67	99.8%	0.73136	4977.58	9576.83	0.5198	
9D	2	3/30/2013 17:49	3	10843	3614.33	100.0%	0.73246	4934.52	9576.83	0.5153	
9D	3	3/30/2013 17:40	3	10806	3602.00	100.0%	0.73367	4909.59	9576.84	0.5127	
9D	4	3/30/2013 17:32	3	11058	3686.00	100.0%	0.73474	5016.75	9576.84	0.5238	
9D	5	3/30/2013 18:41	3	10540	3513.33	100.0%	0.72567	4841.51	9576.81	0.5055	
9D	6	3/30/2013 18:30	3	9592	3197.33	100.0%	0.72713	4397.17	9576.82	0.4591	
9D	7	3/30/2013 18:17	3	10852	3617.33	99.8%	0.72879	4971.26	9576.82	0.5191	
9D	8	3/30/2013 18:06	3	11020	3673.33	100.0%	0.73021	5030.55	9576.83	0.5253	0.5101
10A	1	3/30/2013 18:07	3	11136	3712.00	99.8%	0.73019	5091.62	9576.83	0.5317	
10A	2	3/30/2013 17:58	3	11627	3875.67	100.0%	0.73134	5299.43	9576.83	0.5534	
10A	3	3/30/2013 17:49	3	11376	3792.00	100.0%	0.73244	5177.22	9576.83	0.5406	
10A	4	3/30/2013 17:40	3	11242	3747.33	100.0%	0.73364	5107.84	9576.84	0.5334	
10A	5	3/30/2013 17:32	3	11144	3714.67	100.0%	0.73473	5055.83	9576.84	0.5279	
10A	6	3/30/2013 18:41	3	10013	3337.67	100.0%	0.72567	4599.43	9576.81	0.4803	
10A	7	3/30/2013 18:30	3	11308	3769.33	99.8%	0.72711	5192.11	9576.82	0.5422	
10A	8	3/30/2013 18:17	3	11203	3734.33	100.0%	0.72878	5124.07	9576.82	0.5350	0.5305
10B	1	3/30/2013 18:17	3	11287	3762.33	99.8%	0.72877	5170.67	9576.82	0.5399	
10B	2	3/30/2013 18:06	3	11442	3814.00	100.0%	0.73022	5223.05	9576.83	0.5454	
10B	3	3/30/2013 17:57	3	11205	3735.00	100.0%	0.73138	5106.77	9576.83	0.5332	
10B	4	3/30/2013 17:49	3	11271	3757.00	100.0%	0.73243	5129.49	9576.83	0.5356	
10B	5	3/30/2013 17:40	3	10906	3635.33	100.0%	0.73366	4955.07	9576.84	0.5174	
10B	6	3/30/2013 17:32	3	10051	3350.33	100.0%	0.73477	4559.71	9576.84	0.4761	
10B	7	3/30/2013 18:41	3	11185	3728.33	99.8%	0.72567	5145.86	9576.81	0.5373	
10B	8	3/30/2013 18:30	3	11060	3686.67	100.0%	0.72715	5069.99	9576.82	0.5294	0.5268
10C	1	3/30/2013 18:30	3	11164	3721.33	99.8%	0.72715	5125.72	9576.82	0.5352	

Detector (#)	Source ID (#)	Raw Count Data Start Time	Count Time (min)	Beta (counts)	Raw Beta (cpm)	Recovery (%)	Y-90 Decay	Corrected Sr-90 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-90 Efficiency (cpm/dpm)	Average Efficiency (cpm/dpm)
10C	2	3/30/2013 18:17	3	11215	3738.33	100.0%	0.72876	5129.69	9576.82	0.5356	
10C	3	3/30/2013 18:06	3	11291	3763.67	100.0%	0.73023	5154.07	9576.83	0.5382	
10C	4	3/30/2013 17:57	3	11187	3729.00	100.0%	0.73138	5098.56	9576.83	0.5324	
10C	5	3/30/2013 17:49	3	11206	3735.33	100.0%	0.73249	5099.52	9576.83	0.5325	
10C	6	3/30/2013 17:40	3	9876	3292.00	100.0%	0.73366	4487.10	9576.84	0.4685	
10C	7	3/30/2013 17:32	3	11580	3860.00	99.8%	0.73477	5261.61	9576.84	0.5494	
10C	8	3/30/2013 18:41	3	11286	3762.00	100.0%	0.72567	5184.18	9576.81	0.5413	0.5291
10D	1	3/30/2013 18:41	3	11152	3717.33	99.8%	0.72567	5130.70	9576.81	0.5357	
10D	2	3/30/2013 18:30	3	11354	3784.67	100.0%	0.72715	5204.77	9576.82	0.5435	
10D	3	3/30/2013 18:17	3	11090	3696.67	100.0%	0.72875	5072.60	9576.82	0.5297	
10D	4	3/30/2013 18:06	3	11325	3775.00	100.0%	0.73024	5169.56	9576.83	0.5398	
10D	5	3/30/2013 17:57	3	11230	3743.33	100.0%	0.73138	5118.17	9576.83	0.5344	
10D	6	3/30/2013 17:49	3	10120	3373.33	100.0%	0.73249	4605.27	9576.83	0.4809	
10D	7	3/30/2013 17:40	3	11635	3878.33	99.8%	0.73366	5294.61	9576.84	0.5529	
10D	8	3/30/2013 17:32	3	11605	3868.33	100.0%	0.73477	5264.69	9576.84	0.5497	0.5333
11A	1	3/30/2013 18:56	3	9741	3247.00	99.8%	0.72375	4493.38	9576.81	0.4692	
11A	2	3/30/2013 18:59	3	9916	3305.33	100.0%	0.72328	4569.91	9576.80	0.4772	
11A	3	3/30/2013 19:03	3	9726	3242.00	100.0%	0.72283	4485.17	9576.80	0.4683	
11A	4	3/30/2013 19:06	3	9922	3307.33	100.0%	0.72238	4578.41	9576.80	0.4781	
11A	5	3/30/2013 19:10	3	9559	3186.33	100.0%	0.72188	4413.92	9576.80	0.4609	
11A	6	3/30/2013 19:14	3	8701	2900.33	100.0%	0.72142	4020.33	9576.80	0.4198	
11A	7	3/30/2013 19:17	3	9858	3286.00	99.8%	0.72096	4564.98	9576.80	0.4767	
11A	8	3/30/2013 19:21	3	10182	3394.00	100.0%	0.72050	4710.64	9576.79	0.4919	0.4678
11B	1	3/30/2013 19:21	3	11084	3694.67	99.8%	0.72049	5136.07	9576.79	0.5363	
11B	2	3/30/2013 18:55	3	11264	3754.67	100.0%	0.72377	5187.67	9576.81	0.5417	
11B	3	3/30/2013 18:59	3	11176	3725.33	100.0%	0.72327	5150.67	9576.80	0.5378	
11B	4	3/30/2013 19:03	3	11078	3692.67	100.0%	0.72282	5108.71	9576.80	0.5334	
11B	5	3/30/2013 19:06	3	11235	3745.00	100.0%	0.72237	5184.34	9576.80	0.5413	
11B	6	3/30/2013 19:10	3	9954	3318.00	100.0%	0.72187	4596.41	9576.80	0.4800	
11B	7	3/30/2013 19:14	3	11315	3771.67	99.8%	0.72141	5236.42	9576.80	0.5468	
11B	8	3/30/2013 19:17	3	11208	3736.00	100.0%	0.72095	5182.04	9576.80	0.5411	0.5323
11C	1	3/30/2013 19:17	3	11241	3747.00	99.8%	0.72094	5205.55	9576.80	0.5436	
11C	2	3/30/2013 19:21	3	11141	3713.67	100.0%	0.72048	5154.43	9576.79	0.5382	
11C	3	3/30/2013 18:55	3	10818	3606.00	100.0%	0.72377	4982.26	9576.81	0.5202	
11C	4	3/30/2013 18:59	3	11117	3705.67	100.0%	0.72326	5123.54	9576.80	0.5350	
11C	5	3/30/2013 19:03	3	10902	3634.00	100.0%	0.72280	5027.64	9576.80	0.5250	
11C	6	3/30/2013 19:06	3	9885	3295.00	100.0%	0.72234	4561.54	9576.80	0.4763	
11C	7	3/30/2013 19:10	3	11500	3833.33	99.8%	0.72186	5318.74	9576.80	0.5554	
11C	8	3/30/2013 19:14	3	11232	3744.00	100.0%	0.72140	5189.91	9576.80	0.5419	0.5295
11D	1	3/30/2013 19:14	3	11225	3741.67	99.8%	0.72139	5194.91	9576.80	0.5424	
11D	2	3/30/2013 19:17	3	11169	3723.00	100.0%	0.72093	5164.15	9576.80	0.5392	
11D	3	3/30/2013 19:21	3	11003	3667.67	100.0%	0.72047	5090.67	9576.79	0.5316	
11D	4	3/30/2013 18:55	3	11450	3816.67	100.0%	0.72377	5273.35	9576.81	0.5506	
11D	5	3/30/2013 18:59	3	11115	3705.00	100.0%	0.72325	5122.70	9576.80	0.5349	
11D	6	3/30/2013 19:03	3	10052	3350.67	100.0%	0.72279	4635.72	9576.80	0.4841	
11D	7	3/30/2013 19:06	3	11275	3758.33	99.8%	0.72234	5211.21	9576.80	0.5441	
11D	8	3/30/2013 19:10	3	11312	3770.67	100.0%	0.72185	5223.62	9576.80	0.5454	0.5341
13A	1	3/30/2013 17:42	3	11235	3745.00	99.8%	0.73343	5114.19	9576.84	0.5340	
13A	2	3/30/2013 18:52	3	11208	3736.00	100.0%	0.72422	5158.67	9576.81	0.5387	
13A	3	3/30/2013 18:42	3	11169	3723.00	100.0%	0.72553	5131.41	9576.81	0.5358	
13A	4	3/30/2013 18:32	3	11398	3799.33	100.0%	0.72684	5227.20	9576.82	0.5458	
13A	5	3/30/2013 18:16	3	10869	3623.00	100.0%	0.72900	4969.84	9576.82	0.5189	
13A	6	3/30/2013 18:08	3	9992	3330.67	100.0%	0.73004	4562.30	9576.83	0.4764	
13A	7	3/30/2013 17:59	3	11451	3817.00	99.8%	0.73116	5228.66	9576.83	0.5460	
13A	8	3/30/2013 17:50	3	11458	3819.33	100.0%	0.73234	5215.25	9576.83	0.5446	0.5300
13B	1	3/30/2013 17:50	3	11616	3872.00	99.8%	0.73234	5295.45	9576.83	0.5529	
13B	2	3/30/2013 17:42	3	11784	3928.00	100.0%	0.73342	5355.74	9576.84	0.5592	
13B	3	3/30/2013 18:52	3	11414	3804.67	100.0%	0.72422	5253.48	9576.81	0.5486	
13B	4	3/30/2013 18:42	3	11721	3907.00	100.0%	0.72553	5385.02	9576.81	0.5623	
13B	5	3/30/2013 18:32	3	11341	3780.33	100.0%	0.72684	5201.06	9576.82	0.5431	
13B	6	3/30/2013 18:16	3	10020	3340.00	100.0%	0.72900	4581.64	9576.82	0.4784	
13B	7	3/30/2013 18:08	3	11591	3863.67	99.8%	0.73004	5300.72	9576.83	0.5535	
13B	8	3/30/2013 17:59	3	11611	3870.33	100.0%	0.73116	5293.39	9576.83	0.5527	0.5438
13C	1	3/30/2013 17:59	3	10571	3523.67	99.8%	0.73116	4826.86	9576.83	0.5040	
13C	2	3/30/2013 17:50	3	10471	3490.33	100.0%	0.73234	4765.97	9576.83	0.4977	
13C	3	3/30/2013 17:42	3	10006	3335.33	100.0%	0.73342	4547.65	9576.84	0.4749	
13C	4	3/30/2013 18:52	3	10545	3515.00	100.0%	0.72422	4853.51	9576.81	0.5068	
13C	5	3/30/2013 18:42	3	10119	3373.00	100.0%	0.72553	4649.02	9576.81	0.4854	
13C	6	3/30/2013 18:32	3	9281	3093.67	100.0%	0.72684	4256.33	9576.82	0.4444	
13C	7	3/30/2013 18:16	3	10583	3527.67	99.8%	0.72900	4846.68	9576.82	0.5061	
13C	8	3/30/2013 18:08	3	10593	3531.00	100.0%	0.73004	4836.72	9576.83	0.5050	0.4905
13D	1	3/30/2013 18:08	3	11247	3749.00	99.8%	0.73004	5143.41	9576.83	0.5371	
13D	2	3/30/2013 17:59	3	11383	3794.33	100.0%	0.73116	5189.47	9576.83	0.5419	
13D	3	3/30/2013 17:50	3	11166	3722.00	100.0%	0.73234	5082.31	9576.83	0.5307	
13D	4	3/30/2013 17:42	3	11081	3693.67	100.0%	0.73342	5036.23	9576.84	0.5259	
13D	5	3/30/2013 18:52	3	10857	3619.00	100.0%	0.72422	4997.11	9576.81	0.5218	
13D	6	3/30/2013 18:42	3	9916	3305.33	100.0%	0.72553	4555.75	9576.81	0.4757	
13D	7	3/30/2013 18:32	3	11472	3824.00	99.8%	0.72684	5269.41	9576.82	0.5502	
13D	8	3/30/2013 18:16	3	11052	3684.00	100.0%	0.72900	5053.50	9576.82	0.5277	0.5264
14A	1	3/30/2013 18:16	3	10482	3494.00	99.8%	0.72899	4800.44	9576.82	0.5013	
14A	2	3/30/2013 18:08	3	10501	3500.33	100.0%	0.73004	4794.74	9576.83	0.5007	

Detector (#)	Source ID (#)	Raw Count Data Start Time	Count Time (min)	Beta (counts)	Raw Beta (cpm)	Recovery (%)	Y-90 Decay	Corrected Sr-90 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-90 Efficiency (cpm/dpm)	Average Efficiency (cpm/dpm)
14A	3	3/30/2013 17:59	3	10445	3481.67	100.0%	0.73117	4761.81	9576.83	0.4972	
14A	4	3/30/2013 17:50	3	10843	3614.33	100.0%	0.73235	4935.26	9576.83	0.5153	
14A	5	3/30/2013 17:42	3	10518	3506.00	100.0%	0.73342	4780.36	9576.84	0.4992	
14A	6	3/30/2013 18:52	3	9358	3119.33	100.0%	0.72421	4307.20	9576.81	0.4498	
14A	7	3/30/2013 18:42	3	10784	3594.67	99.8%	0.72553	4962.36	9576.81	0.5182	
14A	8	3/30/2013 18:32	3	10628	3542.67	100.0%	0.72683	4874.13	9576.82	0.5090	0.4988
14B	1	3/30/2013 18:32	3	11086	3695.33	99.8%	0.72683	5092.17	9576.82	0.5317	
14B	2	3/30/2013 18:16	3	11179	3726.33	100.0%	0.72899	5111.61	9576.82	0.5337	
14B	3	3/30/2013 18:08	3	10895	3631.67	100.0%	0.73003	4974.65	9576.83	0.5194	
14B	4	3/30/2013 17:59	3	11247	3749.00	100.0%	0.73117	5127.40	9576.83	0.5354	
14B	5	3/30/2013 17:50	3	10884	3628.00	100.0%	0.73235	4953.93	9576.83	0.5173	
14B	6	3/30/2013 17:42	3	10007	3335.67	100.0%	0.73342	4548.12	9576.84	0.4749	
14B	7	3/30/2013 18:52	3	11217	3739.00	99.8%	0.72421	5170.98	9576.81	0.5399	
14B	8	3/30/2013 18:42	3	10856	3618.67	100.0%	0.72553	4987.65	9576.81	0.5208	0.5217
14C	1	3/30/2013 18:42	3	11122	3707.33	99.8%	0.72553	5117.90	9576.81	0.5344	
14C	2	3/30/2013 18:32	3	11162	3720.67	100.0%	0.72683	5119.03	9576.82	0.5345	
14C	3	3/30/2013 18:16	3	11091	3697.00	100.0%	0.72899	5071.37	9576.82	0.5295	
14C	4	3/30/2013 18:08	3	11118	3706.00	100.0%	0.73003	5076.48	9576.83	0.5301	
14C	5	3/30/2013 17:59	3	11059	3686.33	100.0%	0.73117	5041.69	9576.83	0.5264	
14C	6	3/30/2013 17:50	3	9894	3298.00	100.0%	0.73235	4503.32	9576.83	0.4702	
14C	7	3/30/2013 17:42	3	11536	3845.33	99.8%	0.73342	5251.28	9576.84	0.5483	
14C	8	3/30/2013 18:52	3	11305	3768.33	100.0%	0.72421	5203.36	9576.81	0.5433	0.5271
14D	1	3/30/2013 18:52	3	9871	3290.33	99.8%	0.72421	4550.48	9576.81	0.4752	
14D	2	3/30/2013 18:42	3	10046	3348.67	100.0%	0.72553	4615.51	9576.81	0.4819	
14D	3	3/30/2013 18:32	3	9868	3289.33	100.0%	0.72683	4525.58	9576.82	0.4726	
14D	4	3/30/2013 18:16	3	10294	3431.33	100.0%	0.72899	4706.94	9576.82	0.4915	
14D	5	3/30/2013 18:08	3	9934	3311.33	100.0%	0.73003	4535.86	9576.83	0.4736	
14D	6	3/30/2013 17:59	3	8873	2957.67	100.0%	0.73117	4045.13	9576.83	0.4224	
14D	7	3/30/2013 17:50	3	10119	3373.00	99.8%	0.73235	4612.99	9576.83	0.4817	
14D	8	3/30/2013 17:42	3	9971	3323.67	100.0%	0.73342	4531.76	9576.84	0.4732	0.4715

Current Calibration - PIC

Geometry	Tuffryn Filter				
Y-90	**Cal Date**	3/1/2013	**Exp Date**	2/29/2016	
Protean	A0	A1	A2	A3	A4
1A	0.535304055				
1B	0.533535497				
1C	0.536190536				
1D	0.530938646				
2A	0.51175777				
2B	0.516009051				
2C	0.518115288				
2D	0.519878156				
3A	0.530788725				
3B	0.530628805				
3C	0.531947055				
3D	0.52104126				
4A	0.530020898				
4B	0.534806249				
4C	0.537342491				
4D	0.531618644				
5A	0.537184388				
5B	0.537878299				
5C	0.539094245				
5D	0.538311193				
6A	0.47876549				
6B	0.448874397				
6C	0.510116558				
6D	0.455477739				
7A	0.537350793				
7B	0.539528953				
7C	0.532134615				
7D	0.536664946				
8A	0.525534978				
8B	0.512824805				
8C	0.535841961				
8D	0.541973929				
9A	0.537739915				
9B	0.526747213				
9C	0.532223445				
9D	0.510071357				
10A	0.53054558				
10B	0.526800283				
10C	0.529147521				
10D	0.53332346				
11A	0.467754557				
11B	0.532306372				
11C	0.52945152				
11D	0.534055369				
12A	#N/A				
12B	#N/A				
12C	#N/A				
12D	#N/A				
13A	0.530023306				
13B	0.543845414				
13C	0.490542778				
13D	0.526364364				
14A	0.498812368				
14B	0.521656537				
14C	0.52711146				
14D	0.471506043				

PIC_Y-90_Mar13_RawData.xls

SampleID	Instr	Time (min.)	Alpha Counts	Beta Counts	Count Start Time	Count End Time	Machine	Batch ID
Y1	1A	3	10	11551	3/30/2013 14:46	3/30/2013 14:49	PIC	Sr90Y13
Y2	1A	3	5	11713	3/30/2013 15:50	3/30/2013 15:53	PIC	Sr90Y13
Y3	1A	3	10	11569	3/30/2013 15:42	3/30/2013 15:45	PIC	Sr90Y13
Y4	1A	3	5	11605	3/30/2013 15:34	3/30/2013 15:37	PIC	Sr90Y13
Y5	1A	3	13	11518	3/30/2013 15:24	3/30/2013 15:27	PIC	Sr90Y13
Y6	1A	3	6	10892	3/30/2013 15:14	3/30/2013 15:17	PIC	Sr90Y13
Y7	1A	3	6	11867	3/30/2013 15:06	3/30/2013 15:09	PIC	Sr90Y13
Y8	1A	3	5	11847	3/30/2013 14:56	3/30/2013 14:59	PIC	Sr90Y13
Y1	1B	3	12	11717	3/30/2013 14:56	3/30/2013 14:59	PIC	Sr90Y13
Y2	1B	3	8	11796	3/30/2013 14:46	3/30/2013 14:49	PIC	Sr90Y13
Y3	1B	3	10	11430	3/30/2013 15:49	3/30/2013 15:52	PIC	Sr90Y13
Y4	1B	3	12	11535	3/30/2013 15:42	3/30/2013 15:45	PIC	Sr90Y13
Y5	1B	3	9	11451	3/30/2013 15:33	3/30/2013 15:36	PIC	Sr90Y13
Y6	1B	3	8	10732	3/30/2013 15:24	3/30/2013 15:27	PIC	Sr90Y13
Y7	1B	3	14	11951	3/30/2013 15:14	3/30/2013 15:17	PIC	Sr90Y13
Y8	1B	3	16	11648	3/30/2013 15:07	3/30/2013 15:10	PIC	Sr90Y13
Y1	1C	3	96	11759	3/30/2013 15:07	3/30/2013 15:10	PIC	Sr90Y13
Y2	1C	3	104	11847	3/30/2013 14:56	3/30/2013 14:59	PIC	Sr90Y13
Y3	1C	3	98	11562	3/30/2013 14:47	3/30/2013 14:50	PIC	Sr90Y13
Y4	1C	3	91	11823	3/30/2013 15:49	3/30/2013 15:52	PIC	Sr90Y13
Y5	1C	3	106	11680	3/30/2013 15:42	3/30/2013 15:45	PIC	Sr90Y13
Y6	1C	3	88	10544	3/30/2013 15:33	3/30/2013 15:36	PIC	Sr90Y13
Y7	1C	3	100	11779	3/30/2013 15:24	3/30/2013 15:27	PIC	Sr90Y13
Y8	1C	3	89	11722	3/30/2013 15:14	3/30/2013 15:17	PIC	Sr90Y13
Y1	1D	3	68	11522	3/30/2013 15:14	3/30/2013 15:17	PIC	Sr90Y13
Y2	1D	3	83	11771	3/30/2013 15:07	3/30/2013 15:10	PIC	Sr90Y13
Y3	1D	3	75	11535	3/30/2013 14:56	3/30/2013 14:59	PIC	Sr90Y13
Y4	1D	3	73	11874	3/30/2013 14:48	3/30/2013 14:51	PIC	Sr90Y13
Y5	1D	3	66	11432	3/30/2013 15:49	3/30/2013 15:52	PIC	Sr90Y13
Y6	1D	3	79	10327	3/30/2013 15:42	3/30/2013 15:45	PIC	Sr90Y13
Y7	1D	3	79	11718	3/30/2013 15:33	3/30/2013 15:36	PIC	Sr90Y13
Y8	1D	3	91	11631	3/30/2013 15:24	3/30/2013 15:27	PIC	Sr90Y13
Y1	2A	3	2	11102	3/30/2013 15:24	3/30/2013 15:27	PIC	Sr90Y13
Y2	2A	3	0	11053	3/30/2013 15:14	3/30/2013 15:17	PIC	Sr90Y13
Y3	2A	3	1	11160	3/30/2013 15:07	3/30/2013 15:10	PIC	Sr90Y13
Y4	2A	3	2	11334	3/30/2013 14:56	3/30/2013 14:59	PIC	Sr90Y13

Y5	2A	3	0	11092	3/30/2013 14:49	3/30/2013 14:52	PIC	Sr90Y13
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Y7	2A	3	0	11309	3/30/2013 15:42	3/30/2013 15:45	PIC	Sr90Y13
Y8	2A	3	0	11236	3/30/2013 15:33	3/30/2013 15:36	PIC	Sr90Y13
Y1	2B	3	0	11237	3/30/2013 15:34	3/30/2013 15:37	PIC	Sr90Y13
Y2	2B	3	1	11258	3/30/2013 15:23	3/30/2013 15:26	PIC	Sr90Y13
Y3	2B	3	2	11080	3/30/2013 15:14	3/30/2013 15:17	PIC	Sr90Y13
Y4	2B	3	0	11228	3/30/2013 15:06	3/30/2013 15:09	PIC	Sr90Y13
Y5	2B	3	1	11031	3/30/2013 14:56	3/30/2013 14:59	PIC	Sr90Y13
Y6	2B	3	0	10699	3/30/2013 14:49	3/30/2013 14:52	PIC	Sr90Y13
Y7	2B	3	0	11366	3/30/2013 15:50	3/30/2013 15:53	PIC	Sr90Y13
Y8	2B	3	0	11316	3/30/2013 15:42	3/30/2013 15:45	PIC	Sr90Y13
Y1	2C	3	8	11254	3/30/2013 15:42	3/30/2013 15:45	PIC	Sr90Y13
Y2	2C	3	8	11196	3/30/2013 15:34	3/30/2013 15:37	PIC	Sr90Y13
Y3	2C	3	8	11123	3/30/2013 15:23	3/30/2013 15:26	PIC	Sr90Y13
Y4	2C	3	12	11257	3/30/2013 15:14	3/30/2013 15:17	PIC	Sr90Y13
Y5	2C	3	9	11037	3/30/2013 15:06	3/30/2013 15:09	PIC	Sr90Y13
Y6	2C	3	19	10818	3/30/2013 14:56	3/30/2013 14:59	PIC	Sr90Y13
Y7	2C	3	7	11625	3/30/2013 14:49	3/30/2013 14:52	PIC	Sr90Y13
Y8	2C	3	13	11273	3/30/2013 15:50	3/30/2013 15:53	PIC	Sr90Y13
Y1	2D	3	5	11170	3/30/2013 15:50	3/30/2013 15:53	PIC	Sr90Y13
Y2	2D	3	3	11062	3/30/2013 15:42	3/30/2013 15:45	PIC	Sr90Y13
Y3	2D	3	6	11193	3/30/2013 15:34	3/30/2013 15:37	PIC	Sr90Y13
Y4	2D	3	7	11423	3/30/2013 15:23	3/30/2013 15:26	PIC	Sr90Y13
Y5	2D	3	5	11240	3/30/2013 15:14	3/30/2013 15:17	PIC	Sr90Y13
Y6	2D	3	4	10285	3/30/2013 15:06	3/30/2013 15:09	PIC	Sr90Y13
Y7	2D	3	8	11687	3/30/2013 14:56	3/30/2013 14:59	PIC	Sr90Y13
Y8	2D	3	9	11832	3/30/2013 14:49	3/30/2013 14:52	PIC	Sr90Y13
Y1	3A	3	168	11701	3/30/2013 14:53	3/30/2013 14:56	PIC	Sr90Y13
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Y3	3A	3	144	11501	3/30/2013 15:46	3/30/2013 15:49	PIC	Sr90Y13
Y4	3A	3	161	11680	3/30/2013 15:38	3/30/2013 15:41	PIC	Sr90Y13
Y5	3A	3	140	11179	3/30/2013 15:28	3/30/2013 15:31	PIC	Sr90Y13
Y6	3A	3	125	10626	3/30/2013 15:19	3/30/2013 15:22	PIC	Sr90Y13
Y7	3A	3	148	11829	3/30/2013 15:10	3/30/2013 15:13	PIC	Sr90Y13
Y8	3A	3	152	11508	3/30/2013 15:03	3/30/2013 15:06	PIC	Sr90Y13
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Y3	3B	3	124	11173	3/30/2013 16:22	3/30/2013 16:25	PIC	Sr90Y13
Y4	3B	3	111	11497	3/30/2013 15:46	3/30/2013 15:49	PIC	Sr90Y13
Y5	3B	3	125	11424	3/30/2013 15:38	3/30/2013 15:41	PIC	Sr90Y13
Y6	3B	3	114	10607	3/30/2013 15:28	3/30/2013 15:31	PIC	Sr90Y13
Y7	3B	3	141	11866	3/30/2013 15:19	3/30/2013 15:22	PIC	Sr90Y13
Y8	3B	3	141	11767	3/30/2013 15:10	3/30/2013 15:13	PIC	Sr90Y13
Y1	3C	3	63	11610	3/30/2013 15:10	3/30/2013 15:13	PIC	Sr90Y13
Y2	3C	3	60	11528	3/30/2013 15:03	3/30/2013 15:06	PIC	Sr90Y13
Y3	3C	3	47	11751	3/30/2013 14:53	3/30/2013 14:56	PIC	Sr90Y13
Y4	3C	3	74	11509	3/30/2013 16:22	3/30/2013 16:25	PIC	Sr90Y13
Y5	3C	3	64	11490	3/30/2013 15:46	3/30/2013 15:49	PIC	Sr90Y13
Y6	3C	3	48	10363	3/30/2013 15:38	3/30/2013 15:41	PIC	Sr90Y13
Y7	3C	3	57	11782	3/30/2013 15:28	3/30/2013 15:31	PIC	Sr90Y13
Y8	3C	3	67	11810	3/30/2013 15:19	3/30/2013 15:22	PIC	Sr90Y13
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Y2	3D	3	54	11260	3/30/2013 15:10	3/30/2013 15:13	PIC	Sr90Y13
Y3	3D	3	50	11499	3/30/2013 15:03	3/30/2013 15:06	PIC	Sr90Y13
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Y5	3D	3	56	11039	3/30/2013 16:22	3/30/2013 16:25	PIC	Sr90Y13
Y6	3D	3	42	10203	3/30/2013 15:46	3/30/2013 15:49	PIC	Sr90Y13
Y7	3D	3	70	11594	3/30/2013 15:38	3/30/2013 15:41	PIC	Sr90Y13
Y8	3D	3	61	11466	3/30/2013 15:28	3/30/2013 15:31	PIC	Sr90Y13
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Y2	4A	3	53	11688	3/30/2013 15:19	3/30/2013 15:22	PIC	Sr90Y13
Y3	4A	3	58	11649	3/30/2013 15:10	3/30/2013 15:13	PIC	Sr90Y13
Y4	4A	3	51	11603	3/30/2013 15:03	3/30/2013 15:06	PIC	Sr90Y13
Y5	4A	3	36	11409	3/30/2013 14:53	3/30/2013 14:56	PIC	Sr90Y13
Y6	4A	3	50	10217	3/30/2013 16:21	3/30/2013 16:24	PIC	Sr90Y13
Y7	4A	3	47	11782	3/30/2013 15:46	3/30/2013 15:49	PIC	Sr90Y13
Y8	4A	3	53	11639	3/30/2013 15:38	3/30/2013 15:41	PIC	Sr90Y13
Y1	4B	3	0	11605	3/30/2013 15:38	3/30/2013 15:41	PIC	Sr90Y13
Y2	4B	3	1	11505	3/30/2013 15:28	3/30/2013 15:31	PIC	Sr90Y13
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Y4	4B	3	0	11555	3/30/2013 15:10	3/30/2013 15:13	PIC	Sr90Y13
Y5	4B	3	2	11501	3/30/2013 15:03	3/30/2013 15:06	PIC	Sr90Y13
Y6	4B	3	0	11310	3/30/2013 14:53	3/30/2013 14:56	PIC	Sr90Y13

Y7	4B	3	1	11770	3/30/2013 16:21	3/30/2013 16:24	PIC	Sr90Y13
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Y1	4C	3	39	11691	3/30/2013 15:46	3/30/2013 15:49	PIC	Sr90Y13
Y2	4C	3	59	11555	3/30/2013 15:38	3/30/2013 15:41	PIC	Sr90Y13
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Y4	4C	3	39	11727	3/30/2013 15:19	3/30/2013 15:22	PIC	Sr90Y13
Y5	4C	3	49	11434	3/30/2013 15:10	3/30/2013 15:13	PIC	Sr90Y13
Y6	4C	3	39	10920	3/30/2013 15:03	3/30/2013 15:06	PIC	Sr90Y13
Y7	4C	3	46	12089	3/30/2013 14:53	3/30/2013 14:56	PIC	Sr90Y13
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Y1	4D	3	122	11486	3/30/2013 16:21	3/30/2013 16:24	PIC	Sr90Y13
Y2	4D	3	123	11498	3/30/2013 15:46	3/30/2013 15:49	PIC	Sr90Y13
Y3	4D	3	114	11268	3/30/2013 15:38	3/30/2013 15:41	PIC	Sr90Y13
Y4	4D	3	115	11646	3/30/2013 15:28	3/30/2013 15:31	PIC	Sr90Y13
Y5	4D	3	125	11638	3/30/2013 15:19	3/30/2013 15:22	PIC	Sr90Y13
Y6	4D	3	107	10716	3/30/2013 15:10	3/30/2013 15:13	PIC	Sr90Y13
Y7	4D	3	133	11892	3/30/2013 15:03	3/30/2013 15:06	PIC	Sr90Y13
Y8	4D	3	137	11641	3/30/2013 14:53	3/30/2013 14:56	PIC	Sr90Y13
Y1	5A	3	28	11655	3/30/2013 16:26	3/30/2013 16:29	PIC	Sr90Y13
Y2	5A	3	27	11486	3/30/2013 17:24	3/30/2013 17:27	PIC	Sr90Y13
Y3	5A	3	28	11067	3/30/2013 17:16	3/30/2013 17:19	PIC	Sr90Y13
Y4	5A	3	28	11784	3/30/2013 17:08	3/30/2013 17:11	PIC	Sr90Y13
Y5	5A	3	27	11476	3/30/2013 16:59	3/30/2013 17:02	PIC	Sr90Y13
Y6	5A	3	26	10191	3/30/2013 16:51	3/30/2013 16:54	PIC	Sr90Y13
Y7	5A	3	23	11950	3/30/2013 16:43	3/30/2013 16:46	PIC	Sr90Y13
Y8	5A	3	29	11683	3/30/2013 16:34	3/30/2013 16:37	PIC	Sr90Y13
Y1	5B	3	30	11610	3/30/2013 16:34	3/30/2013 16:37	PIC	Sr90Y13
Y2	5B	3	15	11459	3/30/2013 16:26	3/30/2013 16:29	PIC	Sr90Y13
Y3	5B	3	24	11519	3/30/2013 17:24	3/30/2013 17:27	PIC	Sr90Y13
Y4	5B	3	25	11560	3/30/2013 17:15	3/30/2013 17:18	PIC	Sr90Y13
Y5	5B	3	33	11373	3/30/2013 17:08	3/30/2013 17:11	PIC	Sr90Y13
Y6	5B	3	36	10226	3/30/2013 16:59	3/30/2013 17:02	PIC	Sr90Y13
Y7	5B	3	28	11833	3/30/2013 16:51	3/30/2013 16:54	PIC	Sr90Y13
Y8	5B	3	30	11831	3/30/2013 16:42	3/30/2013 16:45	PIC	Sr90Y13
Y1	5C	3	38	11633	3/30/2013 16:42	3/30/2013 16:45	PIC	Sr90Y13
Y2	5C	3	19	11756	3/30/2013 16:34	3/30/2013 16:37	PIC	Sr90Y13
Y3	5C	3	36	11398	3/30/2013 16:26	3/30/2013 16:29	PIC	Sr90Y13

Y4	5C	3	37	11733	3/30/2013 17:24	3/30/2013 17:27	PIC	Sr90Y13
Y5	5C	3	27	11330	3/30/2013 17:15	3/30/2013 17:18	PIC	Sr90Y13
Y6	5C	3	25	10272	3/30/2013 17:08	3/30/2013 17:11	PIC	Sr90Y13
Y7	5C	3	27	11798	3/30/2013 16:59	3/30/2013 17:02	PIC	Sr90Y13
Y8	5C	3	22	11698	3/30/2013 16:51	3/30/2013 16:54	PIC	Sr90Y13
Y1	5D	3	28	11647	3/30/2013 16:51	3/30/2013 16:54	PIC	Sr90Y13
Y2	5D	3	28	11618	3/30/2013 16:42	3/30/2013 16:45	PIC	Sr90Y13
Y3	5D	3	36	11265	3/30/2013 16:34	3/30/2013 16:37	PIC	Sr90Y13
Y4	5D	3	31	11705	3/30/2013 16:26	3/30/2013 16:29	PIC	Sr90Y13
Y5	5D	3	36	11262	3/30/2013 17:24	3/30/2013 17:27	PIC	Sr90Y13
Y6	5D	3	36	10373	3/30/2013 17:15	3/30/2013 17:18	PIC	Sr90Y13
Y7	5D	3	42	11696	3/30/2013 17:08	3/30/2013 17:11	PIC	Sr90Y13
Y8	5D	3	31	11921	3/30/2013 16:59	3/30/2013 17:02	PIC	Sr90Y13
Y1	6A	3	0	10267	3/30/2013 16:59	3/30/2013 17:02	PIC	Sr90Y13
Y2	6A	3	0	10393	3/30/2013 16:51	3/30/2013 16:54	PIC	Sr90Y13
Y3	6A	3	0	10000	3/30/2013 16:42	3/30/2013 16:45	PIC	Sr90Y13
Y4	6A	3	0	10268	3/30/2013 16:34	3/30/2013 16:37	PIC	Sr90Y13
Y5	6A	3	1	10193	3/30/2013 16:26	3/30/2013 16:29	PIC	Sr90Y13
Y6	6A	3	0	9216	3/30/2013 17:24	3/30/2013 17:27	PIC	Sr90Y13
Y7	6A	3	0	10341	3/30/2013 17:15	3/30/2013 17:18	PIC	Sr90Y13
Y8	6A	3	0	10688	3/30/2013 17:08	3/30/2013 17:11	PIC	Sr90Y13
Y1	6B	3	0	9650	3/30/2013 17:07	3/30/2013 17:10	PIC	Sr90Y13
Y2	6B	3	0	9600	3/30/2013 16:59	3/30/2013 17:02	PIC	Sr90Y13
Y3	6B	3	0	9488	3/30/2013 16:50	3/30/2013 16:53	PIC	Sr90Y13
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Y5	6B	3	0	9565	3/30/2013 16:34	3/30/2013 16:37	PIC	Sr90Y13
Y6	6B	3	0	8925	3/30/2013 16:26	3/30/2013 16:29	PIC	Sr90Y13
Y7	6B	3	0	9759	3/30/2013 17:23	3/30/2013 17:26	PIC	Sr90Y13
Y8	6B	3	0	9976	3/30/2013 17:15	3/30/2013 17:18	PIC	Sr90Y13
Y1	6C	3	0	11087	3/30/2013 17:15	3/30/2013 17:18	PIC	Sr90Y13
Y2	6C	3	2	10791	3/30/2013 17:07	3/30/2013 17:10	PIC	Sr90Y13
Y3	6C	3	3	10739	3/30/2013 16:59	3/30/2013 17:02	PIC	Sr90Y13
Y4	6C	3	2	11188	3/30/2013 16:50	3/30/2013 16:53	PIC	Sr90Y13
Y5	6C	3	1	10825	3/30/2013 16:42	3/30/2013 16:45	PIC	Sr90Y13
Y6	6C	3	3	9783	3/30/2013 16:34	3/30/2013 16:37	PIC	Sr90Y13
Y7	6C	3	1	11152	3/30/2013 16:26	3/30/2013 16:29	PIC	Sr90Y13
Y8	6C	3	0	11124	3/30/2013 17:23	3/30/2013 17:26	PIC	Sr90Y13

Y1	6D	3	15	9649	3/30/2013 17:23	3/30/2013 17:26	PIC	Sr90Y13
Y2	6D	3	12	9827	3/30/2013 17:15	3/30/2013 17:18	PIC	Sr90Y13
Y3	6D	3	14	9547	3/30/2013 17:07	3/30/2013 17:10	PIC	Sr90Y13
Y4	6D	3	20	9754	3/30/2013 16:59	3/30/2013 17:02	PIC	Sr90Y13
Y5	6D	3	19	9554	3/30/2013 16:50	3/30/2013 16:53	PIC	Sr90Y13
Y6	6D	3	6	8807	3/30/2013 16:42	3/30/2013 16:45	PIC	Sr90Y13
Y7	6D	3	17	9897	3/30/2013 16:34	3/30/2013 16:37	PIC	Sr90Y13
Y8	6D	3	20	10375	3/30/2013 16:26	3/30/2013 16:29	PIC	Sr90Y13
Y1	7A	3	54	11560	3/30/2013 16:30	3/30/2013 16:33	PIC	Sr90Y13
Y2	7A	3	51	11626	3/30/2013 17:27	3/30/2013 17:30	PIC	Sr90Y13
Y3	7A	3	43	11273	3/30/2013 17:19	3/30/2013 17:22	PIC	Sr90Y13
Y4	7A	3	61	11725	3/30/2013 17:11	3/30/2013 17:14	PIC	Sr90Y13
Y5	7A	3	53	11401	3/30/2013 17:03	3/30/2013 17:06	PIC	Sr90Y13
Y6	7A	3	50	10164	3/30/2013 16:55	3/30/2013 16:58	PIC	Sr90Y13
Y7	7A	3	43	11939	3/30/2013 16:47	3/30/2013 16:50	PIC	Sr90Y13
Y8	7A	3	53	11566	3/30/2013 16:38	3/30/2013 16:41	PIC	Sr90Y13
Y1	7B	3	58	11760	3/30/2013 16:38	3/30/2013 16:41	PIC	Sr90Y13
Y2	7B	3	58	11681	3/30/2013 16:30	3/30/2013 16:33	PIC	Sr90Y13
Y3	7B	3	79	11371	3/30/2013 17:27	3/30/2013 17:30	PIC	Sr90Y13
Y4	7B	3	53	11697	3/30/2013 17:19	3/30/2013 17:22	PIC	Sr90Y13
Y5	7B	3	65	11369	3/30/2013 17:11	3/30/2013 17:14	PIC	Sr90Y13
Y6	7B	3	52	10315	3/30/2013 17:03	3/30/2013 17:06	PIC	Sr90Y13
Y7	7B	3	65	11866	3/30/2013 16:55	3/30/2013 16:58	PIC	Sr90Y13
Y8	7B	3	45	11568	3/30/2013 16:46	3/30/2013 16:49	PIC	Sr90Y13
Y1	7C	3	20	11611	3/30/2013 16:47	3/30/2013 16:50	PIC	Sr90Y13
Y2	7C	3	22	11340	3/30/2013 16:38	3/30/2013 16:41	PIC	Sr90Y13
Y3	7C	3	33	11305	3/30/2013 16:30	3/30/2013 16:33	PIC	Sr90Y13
Y4	7C	3	26	11354	3/30/2013 17:27	3/30/2013 17:30	PIC	Sr90Y13
Y5	7C	3	18	11424	3/30/2013 17:19	3/30/2013 17:22	PIC	Sr90Y13
Y6	7C	3	17	10295	3/30/2013 17:11	3/30/2013 17:14	PIC	Sr90Y13
Y7	7C	3	28	11620	3/30/2013 17:03	3/30/2013 17:06	PIC	Sr90Y13
Y8	7C	3	19	11421	3/30/2013 16:55	3/30/2013 16:58	PIC	Sr90Y13
Y1	7D	3	52	11688	3/30/2013 16:55	3/30/2013 16:58	PIC	Sr90Y13
Y2	7D	3	42	11681	3/30/2013 16:47	3/30/2013 16:50	PIC	Sr90Y13
Y3	7D	3	28	11287	3/30/2013 16:38	3/30/2013 16:41	PIC	Sr90Y13
Y4	7D	3	39	11695	3/30/2013 16:30	3/30/2013 16:33	PIC	Sr90Y13
Y5	7D	3	27	11332	3/30/2013 17:27	3/30/2013 17:30	PIC	Sr90Y13

Y6	7D	3	31	10278	3/30/2013 17:19	3/30/2013 17:22	PIC	Sr90Y13
Y7	7D	3	27	11645	3/30/2013 17:11	3/30/2013 17:14	PIC	Sr90Y13
Y8	7D	3	31	11537	3/30/2013 17:03	3/30/2013 17:06	PIC	Sr90Y13
Y1	8A	3	1	11089	3/30/2013 17:03	3/30/2013 17:06	PIC	Sr90Y13
Y2	8A	3	4	11355	3/30/2013 16:55	3/30/2013 16:58	PIC	Sr90Y13
Y3	8A	3	0	11121	3/30/2013 16:46	3/30/2013 16:49	PIC	Sr90Y13
Y4	8A	3	5	11478	3/30/2013 16:38	3/30/2013 16:41	PIC	Sr90Y13
Y5	8A	3	0	11256	3/30/2013 16:30	3/30/2013 16:33	PIC	Sr90Y13
Y6	8A	3	3	10002	3/30/2013 17:27	3/30/2013 17:30	PIC	Sr90Y13
Y7	8A	3	1	11411	3/30/2013 17:19	3/30/2013 17:22	PIC	Sr90Y13
Y8	8A	3	3	11544	3/30/2013 17:11	3/30/2013 17:14	PIC	Sr90Y13
Y1	8B	3	0	11077	3/30/2013 17:11	3/30/2013 17:14	PIC	Sr90Y13
Y2	8B	3	0	11109	3/30/2013 17:03	3/30/2013 17:06	PIC	Sr90Y13
Y3	8B	3	0	11001	3/30/2013 16:55	3/30/2013 16:58	PIC	Sr90Y13
Y4	8B	3	0	11116	3/30/2013 16:46	3/30/2013 16:49	PIC	Sr90Y13
Y5	8B	3	1	10804	3/30/2013 16:38	3/30/2013 16:41	PIC	Sr90Y13
Y6	8B	3	0	9694	3/30/2013 16:30	3/30/2013 16:33	PIC	Sr90Y13
Y7	8B	3	0	11250	3/30/2013 17:27	3/30/2013 17:30	PIC	Sr90Y13
Y8	8B	3	0	11031	3/30/2013 17:19	3/30/2013 17:22	PIC	Sr90Y13
Y1	8C	3	6	11611	3/30/2013 17:19	3/30/2013 17:22	PIC	Sr90Y13
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Y3	8C	3	7	11315	3/30/2013 17:03	3/30/2013 17:06	PIC	Sr90Y13
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Y5	8C	3	4	11426	3/30/2013 16:46	3/30/2013 16:49	PIC	Sr90Y13
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Y8	8D	3	12	11785	3/30/2013 16:30	3/30/2013 16:33	PIC	Sr90Y13
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Y3	9A	3	12	11268	3/30/2013 18:30	3/30/2013 18:33	PIC	Sr90Y13
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Y5	9B	3	13	10957	3/30/2013 18:17	3/30/2013 18:20	PIC	Sr90Y13
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Y7	9B	3	8	11504	3/30/2013 17:58	3/30/2013 18:01	PIC	Sr90Y13
Y8	9B	3	7	11466	3/30/2013 17:49	3/30/2013 17:52	PIC	Sr90Y13
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Y7	9D	3	0	10852	3/30/2013 18:17	3/30/2013 18:20	PIC	Sr90Y13
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Y2	10C	3	10	11215	3/30/2013 18:17	3/30/2013 18:20	PIC	Sr90Y13
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Y7	10C	3	22	11580	3/30/2013 17:32	3/30/2013 17:35	PIC	Sr90Y13
Y8	10C	3	16	11286	3/30/2013 18:41	3/30/2013 18:44	PIC	Sr90Y13
Y1	10D	3	6	11152	3/30/2013 18:41	3/30/2013 18:44	PIC	Sr90Y13
Y2	10D	3	11	11354	3/30/2013 18:30	3/30/2013 18:33	PIC	Sr90Y13
Y3	10D	3	15	11090	3/30/2013 18:17	3/30/2013 18:20	PIC	Sr90Y13
Y4	10D	3	11	11325	3/30/2013 18:06	3/30/2013 18:09	PIC	Sr90Y13
Y5	10D	3	9	11230	3/30/2013 17:57	3/30/2013 18:00	PIC	Sr90Y13
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Y3	11A	3	0	9726	3/30/2013 19:03	3/30/2013 19:06	PIC	Sr90Y13
Y4	11A	3	0	9922	3/30/2013 19:06	3/30/2013 19:09	PIC	Sr90Y13
Y5	11A	3	0	9559	3/30/2013 19:10	3/30/2013 19:13	PIC	Sr90Y13
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Y1	11B	3	0	11084	3/30/2013 19:21	3/30/2013 19:24	PIC	Sr90Y13
Y2	11B	3	0	11264	3/30/2013 18:55	3/30/2013 18:58	PIC	Sr90Y13
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Y1	11C	3	1	11241	3/30/2013 19:17	3/30/2013 19:20	PIC	Sr90Y13
Y2	11C	3	0	11141	3/30/2013 19:21	3/30/2013 19:24	PIC	Sr90Y13
Y3	11C	3	0	10818	3/30/2013 18:55	3/30/2013 18:58	PIC	Sr90Y13
Y4	11C	3	0	11117	3/30/2013 18:59	3/30/2013 19:02	PIC	Sr90Y13
Y5	11C	3	0	10902	3/30/2013 19:03	3/30/2013 19:06	PIC	Sr90Y13
Y6	11C	3	0	9885	3/30/2013 19:06	3/30/2013 19:09	PIC	Sr90Y13
Y7	11C	3	0	11500	3/30/2013 19:10	3/30/2013 19:13	PIC	Sr90Y13
Y8	11C	3	0	11232	3/30/2013 19:14	3/30/2013 19:17	PIC	Sr90Y13
Y1	11D	3	0	11225	3/30/2013 19:14	3/30/2013 19:17	PIC	Sr90Y13
Y2	11D	3	0	11169	3/30/2013 19:17	3/30/2013 19:20	PIC	Sr90Y13
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Y4	11D	3	1	11450	3/30/2013 18:55	3/30/2013 18:58	PIC	Sr90Y13
Y5	11D	3	0	11115	3/30/2013 18:59	3/30/2013 19:02	PIC	Sr90Y13
Y6	11D	3	0	10052	3/30/2013 19:03	3/30/2013 19:06	PIC	Sr90Y13
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Y1	13A	3	0	11235	3/30/2013 17:42	3/30/2013 17:45	PIC	Sr90Y13
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Y3	13A	3	0	11169	3/30/2013 18:42	3/30/2013 18:45	PIC	Sr90Y13
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Y8	13B	3	0	11611	3/30/2013 17:59	3/30/2013 18:02	PIC	Sr90Y13
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Y5	14B	3	0	10884	3/30/2013 17:50	3/30/2013 17:53	PIC	Sr90Y13
Y6	14B	3	1	10007	3/30/2013 17:42	3/30/2013 17:45	PIC	Sr90Y13
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Y2	14C	3	0	11162	3/30/2013 18:32	3/30/2013 18:35	PIC	Sr90Y13
Y3	14C	3	0	11091	3/30/2013 18:16	3/30/2013 18:19	PIC	Sr90Y13
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Y6	14C	3	2	9894	3/30/2013 17:50	3/30/2013 17:53	PIC	Sr90Y13

Y7	14C	3	1	11536	3/30/2013 17:42	3/30/2013 17:45	PIC	Sr90Y13
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Y5	14D	3	1	9934	3/30/2013 18:08	3/30/2013 18:11	PIC	Sr90Y13
Y6	14D	3	0	8873	3/30/2013 17:59	3/30/2013 18:02	PIC	Sr90Y13
Y7	14D	3	0	10119	3/30/2013 17:50	3/30/2013 17:53	PIC	Sr90Y13
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Strontium-89 & 90 Liquid

Filename : SR8990.XLS
File type : Excel
Version # : 1.3.9

Batch : 1082959
Analyst : BXF1
Prep Date : 2/25/2015
Sr-89 Method Uncertainty : 0.0829
Sr-90 Method Uncertainty : 0.0821

Geometry: Tuffryn Filter

Sr Carrier S/N : 2187760
Carrier Exp Date : 11/25/2015
Carrier Volume Added: 0.50
Carrier Weight (mg/ml): 16.20
Carrier Weight StDev.: 0.00

Y Carrier S/N : 2214065
Carrier Exp Date : 2/4/2016
Carrier Volume Added: 0.50
Carrier Weight (mg/ml): 31.60
Carrier Weight StDev.: 0.08

Procedure Code : GFCGANBL
Parmname1 : Strontium-89
Parmname2 : Strontium-90
Required MDA Sr-89 : 1 pCi/L
Required MDA Sr-90 : 1 pCi/L
Sr-89 Abundance : 1.00
Sr-90 Abundance : 1.00
Halflife of Sr-89 : 50.53 days
Halflife of Sr-90 : 28.9 years
Halflife of Y-90 : 64.053 hours

Sample Characteristics					Carrier Calculations							
					Net Weight (mg)		Net Weight StDev. (mg)		Carrier Aliquot (mL)		Carrier Aliquot StDev. (mL)	
Pos.	Sample ID	Sample Aliquot L	Sample Aliquot StDev. L	Sample Date/Time	Sr	Y	Sr	Y	Sr	Y	Sr	Y
1	1202347886.1	0.3000	1.8459E-05	2/25/2015 0:00	7.0	15.9	0.037416	0.075668	0.5	0.5	0.001000	0.001000
2	1202347887.1	0.3000	1.8459E-05	2/25/2015 0:00	7.1	15.9	0.037846	0.075668	0.5	0.5	0.001000	0.001000
3	1202347888.1	0.3000	1.8459E-05	2/25/2015 0:00	7.4	15.2	0.039135	0.072660	0.5	0.5	0.001000	0.001000
4	1202347889.1	0.3000	1.8459E-05	2/25/2015 0:00	8.0	15.2	0.041714	0.072660	0.5	0.5	0.001000	0.001000
5	1202347890.1	0.3000	1.8459E-05	2/25/2015 0:00	7.4	15.3	0.039135	0.073089	0.5	0.5	0.001000	0.001000
6	1202347891.1	0.3000	1.8459E-05	2/25/2015 0:00	7.3	15.5	0.038705	0.073949	0.5	0.5	0.001000	0.001000
7	1202347892.1	0.3000	1.8459E-05	2/25/2015 0:00	7.9	16.3	0.041284	0.077387	0.5	0.5	0.001000	0.001000
8	1202347893.1	0.3000	1.8459E-05	2/25/2015 0:00	7.7	15.6	0.040425	0.074379	0.5	0.5	0.001000	0.001000
9	1202347894.1	0.3000	1.8459E-05	2/25/2015 0:00	7.0	15.9	0.037416	0.075668	0.5	0.5	0.001000	0.001000
10	1202347895.1	0.3000	1.8459E-05	2/25/2015 0:00	7.1	15.9	0.037846	0.075668	0.5	0.5	0.001000	0.001000
11	1202347896.1	0.3000	1.8459E-05	2/25/2015 0:00	7.4	15.2	0.039135	0.072660	0.5	0.5	0.001000	0.001000
12	1202347897.1	0.3000	1.8459E-05	2/25/2015 0:00	8.0	15.2	0.041714	0.072660	0.5	0.5	0.001000	0.001000
13	1202347898.1	0.3000	1.8459E-05	2/25/2015 0:00	7.4	15.3	0.039135	0.073089	0.5	0.5	0.001000	0.001000
14	1202347899.1	0.3000	1.8459E-05	2/25/2015 0:00	7.3	15.5	0.038705	0.073949	0.5	0.5	0.001000	0.001000
15	1202347900.1	0.3000	1.8459E-05	2/25/2015 0:00	7.9	16.3	0.041284	0.077387	0.5	0.5	0.001000	0.001000
16	1202347901.1	0.3000	1.8459E-05	2/25/2015 0:00	7.7	15.6	0.040425	0.074379	0.5	0.5	0.001000	0.001000
17	1202347902.1	0.3000	1.8459E-05	2/25/2015 0:00	7.0	15.9	0.037416	0.075668	0.5	0.5	0.001000	0.001000
18	1202347903.1	0.3000	1.8459E-05	2/25/2015 0:00	7.1	15.9	0.037846	0.075668	0.5	0.5	0.001000	0.001000
19	1202347904.1	0.3000	1.8459E-05	2/25/2015 0:00	7.4	15.2	0.039135	0.072660	0.5	0.5	0.001000	0.001000
20	1202347905.1	0.3000	1.8459E-05	2/25/2015 0:00	8.0	15.2	0.041714	0.072660	0.5	0.5	0.001000	0.001000
21	1202347906.1	0.3000	1.8459E-05	2/25/2015 0:00	7.4	15.3	0.039135	0.073089	0.5	0.5	0.001000	0.001000
22	1202347907.1	0.3000	1.8459E-05	2/25/2015 0:00	7.3	15.5	0.038705	0.073949	0.5	0.5	0.001000	0.001000
23	1202347908.1	0.3000	1.8459E-05	2/25/2015 0:00	7.9	16.3	0.041284	0.077387	0.5	0.5	0.001000	0.001000
~~24~~	~~1202347909.1~~	~~0.3000~~	~~1.8459E-05~~	~~2/25/2015 0:00~~	~~7.7~~	~~15.6~~	~~0.040425~~	~~0.074379~~	~~0.5~~	~~0.5~~	~~0.001000~~	~~0.001000~~
25	1202347910.1	0.3000	1.8459E-05	2/25/2015 0:00	7.0	15.9	0.037416	0.075668	0.5	0.5	0.001000	0.001000
26	1202347911.1	0.3000	1.8459E-05	2/25/2015 0:00	7.1	15.9	0.037846	0.075668	0.5	0.5	0.001000	0.001000
27	1202347912.1	0.3000	1.8459E-05	2/25/2015 0:00	7.4	15.2	0.039135	0.072660	0.5	0.5	0.001000	0.001000
28	1202347913.1	0.3000	1.8459E-05	2/25/2015 0:00	8.0	15.2	0.041714	0.072660	0.5	0.5	0.001000	0.001000
29	1202347914.1	0.3000	1.8459E-05	2/25/2015 0:00	7.4	15.3	0.039135	0.073089	0.5	0.5	0.001000	0.001000
30	1202347915.1	0.3000	1.8459E-05	2/25/2015 0:00	7.3	15.5	0.038705	0.073949	0.5	0.5	0.001000	0.001000
31	1202347916.1	0.3000	1.8459E-05	2/25/2015 0:00	7.9	16.3	0.041284	0.077387	0.5	0.5	0.001000	0.001000
32	1202347917.1	0.3000	1.8459E-05	2/25/2015 0:00	7.7	15.6	0.040425	0.074379	0.5	0.5	0.001000	0.001000
33	1202347918.1	0.3000	1.8459E-05	2/25/2015 0:00	7.0	15.9	0.037416	0.075668	0.5	0.5	0.001000	0.001000
34	1202347919.1	0.3000	1.8459E-05	2/25/2015 0:00	7.1	15.9	0.037846	0.075668	0.5	0.5	0.001000	0.001000
35	1202347920.1	0.3000	1.8459E-05	2/25/2015 0:00	7.4	15.2	0.039135	0.072660	0.5	0.5	0.001000	0.001000
36	1202347921.1	0.3000	1.8459E-05	2/25/2015 0:00	8.0	15.2	0.041714	0.072660	0.5	0.5	0.001000	0.001000
37	1202347922.1	0.3000	1.8459E-05	2/25/2015 0:00	7.4	15.3	0.039135	0.073089	0.5	0.5	0.001000	0.001000
38	1202347923.1	0.3000	1.8459E-05	2/25/2015 0:00	7.3	15.5	0.038705	0.073949	0.5	0.5	0.001000	0.001000
39	1202347924.1	0.3000	1.8459E-05	2/25/2015 0:00	7.9	16.3	0.041284	0.077387	0.5	0.5	0.001000	0.001000
40	1202347925.1	0.3000	1.8459E-05	2/25/2015 0:00	7.7	15.6	0.040425	0.074379	0.5	0.5	0.001000	0.001000

Pipet, 0.1 ml Stdev : +/- 0.000200 ml
Pipet, 0.5 ml Stdev : +/- 0.001000 ml
Pipet, 1 ml Stdev : +/- 0.002000 ml
Pipet, 5 ml Stdev : +/- 0.010000 ml

Analytical SOP: GL-RAD-A-001
Instrument SOP: GL-RAD-I-016

1st Count Raw Data							1st Count Calibration Data									
Pos.	Detector ID	Counting Time (min.)	Gross Counts Alpha	Gross Counts Beta	Gross Beta CPM	Count Start Date/Time	Counted on	Calibration Date	Calibration Due Date	Detector Efficiency (cpm/dpm) Sr-89	Detector Efficiency (cpm/dpm) Sr-90	Detector Efficiency Error (cpm/dpm)	Alpha X-Talk	Weekly Bkg CPM	Weekly Bkg Count Start Date/Time	Weekly Bkg Count Time (min.)
1	1A	8	8	4585	573.024	2/26/2015 4:54	PIC	3/1/2013	2/28/2015	0.4990	0.3955	0.00738	0.10099	0.666	2/21/2015 17:49	500
2	1B	8	19	5055	631.627	2/26/2015 4:54	PIC	3/1/2013	2/28/2015	0.5030	0.3945	0.00711	0.10449	0.726	2/21/2015 17:49	500
3	1C	8	97	5023	627.416	2/26/2015 4:55	PIC	3/1/2013	2/28/2015	0.5061	0.4006	0.00847	0.03785	0.492	2/21/2015 17:49	500
4	1D	8	63	5474	683.876	2/26/2015 4:55	PIC	3/1/2013	2/28/2015	0.5026	0.3901	0.00692	0.04752	1.124	2/21/2015 17:49	500
5	2A	8	6	5231	653.725	2/26/2015 4:55	PIC	3/1/2013	2/28/2015	0.4892	0.3864	0.01914	0.19984	0.712	2/21/2015 17:49	500
6	2B	8	3	5055	631.779	2/26/2015 4:55	PIC	3/1/2013	2/28/2015	0.4703	0.3843	0.02111	0.25664	1.194	2/21/2015 17:49	500
7	2C	8	53	5234	653.749	2/26/2015 4:55	PIC	3/1/2013	2/28/2015	0.4904	0.3863	0.01274	0.07565	0.402	2/21/2015 17:49	500
8	2D	8	12	5408	675.648	2/26/2015 4:55	PIC	3/1/2013	2/28/2015	0.4933	0.3862	0.00745	0.23440	1.582	2/21/2015 17:49	500
9	3A	8	125	4671	583.031	2/26/2015 5:05	PIC	3/1/2013	2/28/2015	0.4963	0.3824	0.01401	0.05400	0.982	2/21/2015 17:50	500
10	3B	8	55	4919	614.654	2/26/2015 5:05	PIC	3/1/2013	2/28/2015	0.4983	0.3809	0.01614	0.03213	1.370	2/21/2015 17:50	500
11	3C	8	42	4889	610.858	2/26/2015 5:05	PIC	3/1/2013	2/28/2015	0.5030	0.3954	0.00988	0.05095	0.748	2/21/2015 17:50	500
12	3D	8	29	5384	672.779	2/26/2015 5:05	PIC	3/1/2013	2/28/2015	0.4925	0.3842	0.02297	0.06102	0.434	2/21/2015 17:50	500
13	4A	8	43	5267	658.138	2/26/2015 5:05	PIC	3/1/2013	2/28/2015	0.4959	0.3943	0.01123	0.04408	1.144	2/21/2015 17:50	500
14	4B	8	4	5446	680.648	2/26/2015 5:06	PIC	3/1/2013	2/28/2015	0.4970	0.3939	0.01519	0.20420	1.454	2/21/2015 17:50	500
15	4C	8	43	5430	678.423	2/26/2015 5:06	PIC	3/1/2013	2/28/2015	0.5038	0.3928	0.00889	0.06078	0.628	2/21/2015 17:50	500
16	4D	8	117	5452	681.002	2/26/2015 5:06	PIC	3/1/2013	2/28/2015	0.5004	0.3861	0.00773	0.03408	1.648	2/21/2015 17:50	500
17	5A	8	19	4642	580.128	2/26/2015 5:16	PIC	3/1/2013	2/28/2015	0.5121	0.4019	0.00851	0.05155	1.314	2/21/2015 17:50	500
18	5B	8	32	4877	609.432	2/26/2015 5:16	PIC	3/1/2013	2/28/2015	0.5122	0.3988	0.00426	0.04823	0.632	2/21/2015 17:50	500
19	5C	8	15	5163	645.268	2/26/2015 5:16	PIC	3/1/2013	2/28/2015	0.5097	0.4016	0.00657	0.05732	0.986	2/21/2015 17:51	500
20	5D	8	32	5823	727.712	2/26/2015 5:16	PIC	3/1/2013	2/28/2015	0.5026	0.3917	0.00925	0.04086	1.678	2/21/2015 17:51	500
21	6A	8	51	5313	663.782	2/26/2015 5:15	PIC	3/1/2013	2/28/2015	0.4825	0.3763	0.02228	0.05388	1.858	2/21/2015 17:46	500
22	6B	8	57	5242	654.969	2/26/2015 5:15	PIC	3/1/2013	2/28/2015	0.5005	0.3632	0.00851	0.03939	1.076	2/21/2015 17:47	500
23	6C	8	7	5450	681.212	2/26/2015 5:15	PIC	3/1/2013	2/28/2015	0.4938	0.3918	0.01970	0.04327	1.232	2/21/2015 17:47	500
~~24~~	~~6D~~	~~8~~	~~0~~	~~0~~	~~0.000~~	~~2/26/2015 5:15~~	~~PIC~~	~~3/1/2013~~	~~2/28/2015~~	~~0.2798~~	~~0.3347~~	~~0.01311~~	~~0.00000~~	~~0.000~~	~~12:00:00 AM~~	~~0~~
25	7A	8	4	4737	592.092	2/26/2015 5:26	PIC	3/1/2013	2/28/2015	0.5095	0.4023	0.00594	0.06695	0.726	2/21/2015 17:47	500
26	7B	8	11	5045	630.553	2/26/2015 5:26	PIC	3/1/2013	2/28/2015	0.5084	0.3979	0.00627	0.05240	0.474	2/21/2015 17:47	500
27	7C	8	2	4979	622.355	2/26/2015 5:26	PIC	3/1/2013	2/28/2015	0.5048	0.4003	0.00790	0.08169	0.408	2/21/2015 17:47	500
28	7D	8	4	5517	689.592	2/26/2015 5:26	PIC	3/1/2013	2/28/2015	0.5034	0.3936	0.01113	0.06691	0.542	2/21/2015 17:47	500
29	8A	8	10	5236	654.154	2/26/2015 5:26	PIC	3/1/2013	2/28/2015	0.4987	0.3901	0.01579	0.27679	0.728	2/21/2015 17:47	500
30	8B	8	3	5276	659.391	2/26/2015 5:26	PIC	3/1/2013	2/28/2015	0.4919	0.3886	0.02148	0.29078	0.670	2/21/2015 17:47	500
31	8C	8	2	5516	689.425	2/26/2015 5:26	PIC	3/1/2013	2/28/2015	0.5040	0.3974	0.01955	0.30027	0.540	2/21/2015 17:47	500
32	8D	8	18	5588	698.345	2/26/2015 5:26	PIC	3/1/2013	2/28/2015	0.5157	0.4014	0.00609	0.06882	1.862	2/21/2015 17:47	500
33	9A	8	8	4317	539.276	2/26/2015 5:37	PIC	3/1/2013	2/28/2015	0.5101	0.4057	0.00758	0.34891	0.654	2/21/2015 17:47	500
34	9B	8	16	4773	596.490	2/26/2015 5:37	PIC	3/1/2013	2/28/2015	0.4967	0.3897	0.00754	0.06745	0.688	2/21/2015 17:48	500
35	9C	8	14	4772	596.383	2/26/2015 5:37	PIC	3/1/2013	2/28/2015	0.5005	0.3995	0.00584	0.06703	0.684	2/21/2015 17:48	500
36	9D	8	28	5376	671.819	2/26/2015 5:37	PIC	3/1/2013	2/28/2015	0.4794	0.3903	0.02610	0.05173	0.600	2/21/2015 17:48	500
37	10A	8	10	5351	668.711	2/26/2015 5:37	PIC	3/1/2013	2/28/2015	0.5046	0.3991	0.00651	0.13144	0.636	2/21/2015 17:48	500
38	10B	8	3	5053	631.599	2/26/2015 5:37	PIC	3/1/2013	2/28/2015	0.5011	0.3940	0.00652	0.07000	0.566	2/21/2015 17:48	500
39	10C	8	14	5471	683.742	2/26/2015 5:37	PIC	3/1/2013	2/28/2015	0.5018	0.3934	0.00638	0.07623	0.566	2/21/2015 17:48	500
40	10D	8	8	5431	678.783	2/26/2015 5:37	PIC	3/1/2013	2/28/2015	0.5023	0.3944	0.00557	0.09173	0.908	2/21/2015 17:48	500

2nd Count Raw Data							2nd Count Calibration Data								
Pos.	Detector ID	Counting Time (min.)	Gross Counts Alpha	Gross Counts Beta	Gross Beta CPM	Count Start Date/Time	Counted on	Calibration Date	Calibration Due Date	Detector Efficiency Y-90 (cpm/dpm)	Detector Efficiency Error (cpm/dpm)	Alpha X-Talk	Weekly Bkg CPM	Weekly Bkg Count Start Date/Time	Weekly Bkg Count Time (min.)
1	1A	10	0	713	71.300	3/2/2015 10:43	PIC	3/1/2013	2/28/2015	0.5353	0.00738	0.10099	0.516	2/28/2015 16:41	500
2	1B	10	2	761	76.079	3/2/2015 10:43	PIC	3/1/2013	2/28/2015	0.5335	0.00711	0.10449	0.708	2/28/2015 16:41	500
3	1C	10	8	830	82.970	3/2/2015 10:43	PIC	3/1/2013	2/28/2015	0.5362	0.00847	0.03785	0.570	2/28/2015 16:41	500
4	1D	10	6	857	85.671	3/2/2015 10:43	PIC	3/1/2013	2/28/2015	0.5309	0.00692	0.04752	1.126	2/28/2015 16:41	500
5	2A	10	4	759	75.820	3/2/2015 10:44	PIC	3/1/2013	2/28/2015	0.5118	0.01914	0.19984	0.576	2/28/2015 16:41	500
6	2B	10	0	736	73.600	3/2/2015 10:44	PIC	3/1/2013	2/28/2015	0.5160	0.02111	0.25664	1.016	2/28/2015 16:41	500
7	2C	10	4	889	88.870	3/2/2015 10:44	PIC	3/1/2013	2/28/2015	0.5181	0.01274	0.07565	0.490	2/28/2015 16:41	500
8	2D	10	2	871	87.053	3/2/2015 10:44	PIC	3/1/2013	2/28/2015	0.5199	0.00745	0.23440	1.698	2/28/2015 16:41	500
9	3A	10	21	711	70.987	3/2/2015 10:57	PIC	3/1/2013	2/28/2015	0.5308	0.01401	0.05400	0.824	2/28/2015 16:41	500
10	3B	10	5	779	77.884	3/2/2015 10:57	PIC	3/1/2013	2/28/2015	0.5306	0.01614	0.03213	1.524	2/28/2015 16:41	500
11	3C	10	1	782	78.195	3/2/2015 10:57	PIC	3/1/2013	2/28/2015	0.5319	0.00988	0.05095	0.698	2/28/2015 16:41	500
12	3D	10	0	805	80.500	3/2/2015 10:57	PIC	3/1/2013	2/28/2015	0.5210	0.02297	0.06102	0.434	2/28/2015 16:41	500
13	4A	10	6	737	73.674	3/2/2015 10:57	PIC	3/1/2013	2/28/2015	0.5300	0.01123	0.04408	1.120	2/28/2015 16:41	500
14	4B	10	4	737	73.618	3/2/2015 10:57	PIC	3/1/2013	2/28/2015	0.5348	0.01519	0.20420	1.492	2/28/2015 16:41	500
15	4C	10	4	841	84.076	3/2/2015 10:57	PIC	3/1/2013	2/28/2015	0.5373	0.00889	0.06078	0.650	2/28/2015 16:41	500
16	4D	10	8	849	84.873	3/2/2015 10:57	PIC	3/1/2013	2/28/2015	0.5316	0.00773	0.03408	1.698	2/28/2015 16:41	500
17	5A	10	4	742	74.179	3/2/2015 11:09	PIC	3/1/2013	2/28/2015	0.5372	0.00851	0.05155	1.332	2/28/2015 16:41	500
18	5B	10	2	872	87.190	3/2/2015 11:09	PIC	3/1/2013	2/28/2015	0.5379	0.00426	0.04823	0.712	2/28/2015 16:41	500
19	5C	10	2	813	81.289	3/2/2015 11:09	PIC	3/1/2013	2/28/2015	0.5391	0.00657	0.05732	0.842	2/28/2015 16:41	500
20	5D	10	1	896	89.596	3/2/2015 11:09	PIC	3/1/2013	2/28/2015	0.5383	0.00925	0.04086	1.624	2/28/2015 16:41	500
21	6A	10	1	878	87.795	3/2/2015 11:10	PIC	3/1/2013	2/28/2015	0.4788	0.02228	0.05388	1.742	3/1/2015 10:26	500
22	6B	10	4	770	76.984	3/2/2015 11:10	PIC	3/1/2013	2/28/2015	0.4489	0.00851	0.03939	1.026	2/28/2015 16:41	500
23	6C	10	0	810	81.000	3/2/2015 11:13	PIC	3/1/2013	2/28/2015	0.5101	0.01970	0.04327	1.150	2/28/2015 16:41	500
~~24~~	~~6D~~	~~10~~	~~0~~	~~0~~	~~0.000~~	~~3/2/2015 11:13~~	~~PIC~~	~~3/1/2013~~	~~2/28/2015~~	~~0.4555~~	~~0.01311~~	~~0.00000~~	~~FAIL~~	~~12:00:00 AM~~	~~0~~
25	7A	10	0	702	70.200	3/2/2015 11:24	PIC	3/1/2013	2/28/2015	0.5374	0.00594	0.06695	0.856	2/28/2015 16:41	500
26	7B	10	2	816	81.590	3/2/2015 11:24	PIC	3/1/2013	2/28/2015	0.5395	0.00627	0.05240	0.520	2/28/2015 16:41	500
27	7C	10	1	771	77.092	3/2/2015 11:24	PIC	3/1/2013	2/28/2015	0.5321	0.00790	0.08169	0.432	2/28/2015 16:41	500
28	7D	10	1	839	83.893	3/2/2015 11:24	PIC	3/1/2013	2/28/2015	0.5367	0.01113	0.06691	0.608	2/28/2015 16:41	500
29	8A	10	2	810	80.945	3/2/2015 11:24	PIC	3/1/2013	2/28/2015	0.5255	0.01579	0.27679	0.866	2/28/2015 16:41	500
30	8B	10	2	721	72.042	3/2/2015 11:25	PIC	3/1/2013	2/28/2015	0.5128	0.02148	0.29078	0.744	2/28/2015 16:41	500
31	8C	10	0	780	78.000	3/2/2015 11:25	PIC	3/1/2013	2/28/2015	0.5358	0.01955	0.30027	0.506	2/28/2015 16:41	500
32	8D	10	1	835	83.493	3/2/2015 11:25	PIC	3/1/2013	2/28/2015	0.5420	0.00609	0.06882	2.006	2/28/2015 16:41	500
33	9A	10	1	742	74.165	3/2/2015 11:38	PIC	3/1/2013	2/28/2015	0.5377	0.00758	0.34891	0.498	2/28/2015 16:40	500
34	9B	10	2	786	78.587	3/2/2015 11:38	PIC	3/1/2013	2/28/2015	0.5267	0.00754	0.06745	0.674	2/28/2015 16:41	500
35	9C	10	1	750	74.993	3/2/2015 11:38	PIC	3/1/2013	2/28/2015	0.5322	0.00584	0.06703	0.610	2/28/2015 16:41	500
36	9D	10	3	841	84.084	3/2/2015 11:38	PIC	3/1/2013	2/28/2015	0.5101	0.02610	0.05173	0.484	2/28/2015 16:41	500
37	10A	10	2	754	75.374	3/2/2015 11:38	PIC	3/1/2013	2/28/2015	0.5305	0.00651	0.13144	0.690	2/28/2015 16:41	500
38	10B	10	0	742	74.200	3/2/2015 11:39	PIC	3/1/2013	2/28/2015	0.5268	0.00652	0.07000	0.564	2/28/2015 16:41	500
39	10C	10	0	849	84.900	3/2/2015 11:39	PIC	3/1/2013	2/28/2015	0.5291	0.00638	0.07623	0.520	2/28/2015 16:41	500
40	10D	10	3	852	85.172	3/2/2015 11:39	PIC	3/1/2013	2/28/2015	0.5333	0.00557	0.09173	0.666	2/28/2015 16:41	500

Correction Factors

Pos.	Separation Date/Time Strontium	Separation Date/Time Yttrium	Yttrium Ingrowth (Sr-89 calc)	Yttrium Ingrowth (Sr-90 calc)	Yttrium Decay	Decay from Sample Date Sr-89	Decay from Sample Date Sr-90	Net Count Rate Y-90	Net Count Rate Sr-90	Gross CPM Sr-89	Calculated Sample Recovery % Sr	Calculated Sample Recovery % Y	Sample Recovery % Error Sr	Sample Recovery % Error Y
1	2/25/2015 14:40	3/2/2015 8:55	0.1435	0.7096	0.9797	0.9836	0.9999	16.9077	74.7595	481.356781	86.4%	101%	0.78%	0.75%
2	2/25/2015 14:40	3/2/2015 8:55	0.1435	0.7096	0.9797	0.9836	0.9999	17.7532	79.6728	534.20086	87.7%	101%	0.78%	0.75%
3	2/25/2015 14:40	3/2/2015 8:55	0.1435	0.7096	0.9797	0.9836	0.9999	18.6249	92.0647	516.72639	91.4%	96.2%	0.77%	0.75%
4	2/25/2015 14:40	3/2/2015 8:55	0.1436	0.7096	0.9797	0.9836	0.9999	17.6800	92.9046	573.291216	98.8%	96.2%	0.76%	0.75%
5	2/25/2015 14:40	3/2/2015 8:55	0.1436	0.7096	0.9796	0.9836	0.9999	17.0144	84.4184	552.292246	91.4%	96.8%	0.77%	0.75%
6	2/25/2015 14:40	3/2/2015 8:55	0.1436	0.7096	0.9796	0.9836	0.9999	16.6409	79.2841	535.853841	90.1%	98.1%	0.78%	0.75%
7	2/25/2015 14:40	3/2/2015 8:55	0.1436	0.7096	0.9796	0.9836	0.9999	18.7261	91.8935	543.129227	97.5%	103%	0.77%	0.74%
8	2/25/2015 14:40	3/2/2015 8:55	0.1436	0.7096	0.9796	0.9836	0.9999	18.5576	92.4052	564.685567	95.1%	98.7%	0.77%	0.75%
9	2/25/2015 14:40	3/2/2015 8:55	0.1451	0.7096	0.9773	0.9835	0.9999	16.9950	72.4428	493.593375	86.4%	101%	0.78%	0.75%
10	2/25/2015 14:40	3/2/2015 8:55	0.1452	0.7096	0.9773	0.9835	0.9999	18.2383	78.5578	517.858101	87.7%	101%	0.78%	0.75%
11	2/25/2015 14:40	3/2/2015 8:55	0.1452	0.7096	0.9773	0.9835	0.9999	17.7616	86.3592	506.736715	91.4%	96.2%	0.77%	0.75%
12	2/25/2015 14:40	3/2/2015 8:55	0.1452	0.7096	0.9773	0.9835	0.9999	16.9762	88.4975	567.305052	98.8%	96.2%	0.76%	0.75%
13	2/25/2015 14:40	3/2/2015 8:55	0.1452	0.7096	0.9773	0.9835	0.9999	16.6330	80.3880	561.117151	91.4%	96.8%	0.77%	0.75%
14	2/25/2015 14:40	3/2/2015 8:55	0.1452	0.7096	0.9773	0.9835	0.9999	16.7638	78.0964	585.787693	90.1%	98.1%	0.78%	0.75%
15	2/25/2015 14:40	3/2/2015 8:55	0.1453	0.7096	0.9772	0.9835	0.9999	17.9195	85.2491	575.25465	97.5%	103%	0.77%	0.74%
16	2/25/2015 14:40	3/2/2015 8:55	0.1453	0.7096	0.9772	0.9835	0.9999	18.3347	88.2513	574.415605	95.1%	98.7%	0.77%	0.75%
17	2/25/2015 14:40	3/2/2015 8:55	0.1468	0.7096	0.9752	0.9834	0.9999	17.8813	78.2672	483.979035	86.4%	101%	0.78%	0.75%
18	2/25/2015 14:40	3/2/2015 8:55	0.1468	0.7096	0.9752	0.9834	0.9999	20.9285	92.0756	496.427979	87.7%	101%	0.78%	0.75%
19	2/25/2015 14:40	3/2/2015 8:55	0.1468	0.7096	0.9752	0.9834	0.9999	18.6798	90.0296	536.558108	91.4%	96.2%	0.77%	0.75%
20	2/25/2015 14:40	3/2/2015 8:55	0.1468	0.7096	0.9752	0.9834	0.9999	18.8955	96.1608	612.655258	98.8%	96.2%	0.76%	0.75%
21	2/25/2015 14:40	3/2/2015 8:55	0.1468	0.7096	0.9750	0.9834	0.9999	19.9827	100.9647	542.834046	91.4%	96.8%	0.77%	0.75%
22	2/25/2015 14:40	3/2/2015 8:55	0.1468	0.7096	0.9750	0.9834	0.9999	17.8808	90.5758	546.512688	90.1%	98.1%	0.78%	0.75%
23	2/25/2015 14:40	3/2/2015 8:55	0.1468	0.7096	0.9745	0.9834	0.9999	17.3779	85.9918	577.842386	97.5%	103%	0.77%	0.74%
~~24~~	~~2/25/2015 14:40~~	~~3/2/2015 8:55~~	~~0.1468~~	~~0.7096~~	~~0.9745~~	~~0.9834~~	~~0.9999~~	#VALUE!	#VALUE!	#VALUE!	~~95.1%~~	~~98.7%~~	~~0.77%~~	~~0.76%~~
25	2/25/2015 14:40	3/2/2015 8:55	0.1484	0.7096	0.9726	0.9833	0.9999	17.2596	74.7624	500.069539	86.4%	101%	0.78%	0.75%
26	2/25/2015 14:40	3/2/2015 8:55	0.1484	0.7096	0.9725	0.9833	0.9999	19.8943	86.0961	524.56248	87.7%	101%	0.78%	0.75%
27	2/25/2015 14:40	3/2/2015 8:55	0.1484	0.7096	0.9725	0.9833	0.9999	18.0494	86.8683	517.436923	91.4%	96.2%	0.77%	0.75%
28	2/25/2015 14:40	3/2/2015 8:55	0.1484	0.7096	0.9725	0.9833	0.9999	18.1392	92.0336	579.418746	98.8%	96.2%	0.76%	0.75%
29	2/25/2015 14:40	3/2/2015 8:55	0.1484	0.7096	0.9724	0.9833	0.9999	18.8571	88.9634	546.333544	91.4%	96.8%	0.77%	0.75%
30	2/25/2015 14:40	3/2/2015 8:55	0.1484	0.7096	0.9724	0.9833	0.9999	17.0200	79.8144	562.556535	90.1%	98.1%	0.78%	0.75%
31	2/25/2015 14:40	3/2/2015 8:55	0.1484	0.7096	0.9724	0.9833	0.9999	17.0947	80.7593	591.570876	97.5%	103%	0.77%	0.74%
32	2/25/2015 14:40	3/2/2015 8:55	0.1484	0.7096	0.9723	0.9833	0.9999	18.4432	88.6083	591.293702	95.1%	98.7%	0.77%	0.75%
33	2/25/2015 14:40	3/2/2015 8:55	0.1500	0.7096	0.9701	0.9832	0.9999	18.5795	80.2371	440.459529	86.4%	101%	0.78%	0.75%
34	2/25/2015 14:40	3/2/2015 8:55	0.1500	0.7096	0.9701	0.9832	0.9999	19.3760	83.2248	493.889266	87.7%	101%	0.78%	0.75%
35	2/25/2015 14:40	3/2/2015 8:55	0.1501	0.7096	0.9701	0.9832	0.9999	17.7517	84.3252	494.305799	91.4%	96.2%	0.77%	0.75%
36	2/25/2015 14:40	3/2/2015 8:55	0.1501	0.7096	0.9700	0.9832	0.9999	18.4590	96.6267	556.733319	98.8%	96.2%	0.76%	0.75%
37	2/25/2015 14:40	3/2/2015 8:55	0.1501	0.7096	0.9700	0.9832	0.9999	17.8336	84.3023	566.574747	91.4%	96.8%	0.77%	0.75%
38	2/25/2015 14:40	3/2/2015 8:55	0.1501	0.7096	0.9700	0.9832	0.9999	17.8249	81.5726	532.201241	90.1%	98.1%	0.78%	0.75%
39	2/25/2015 14:40	3/2/2015 8:55	0.1501	0.7096	0.9699	0.9832	0.9999	18.8754	88.3578	576.508409	97.5%	103%	0.77%	0.74%
40	2/25/2015 14:40	3/2/2015 8:55	0.1501	0.7096	0.9699	0.9832	0.9999	19.3951	91.9920	567.396128	95.1%	98.7%	0.77%	0.75%

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

Sr-89 Spike S/N : N/A
Spike Exp Date : N/A
Spike Activity (dpm/ml): N/A
Spike Volume Added: N/A

Sr-89 LCS S/N : 1717-A
LCS Exp Date : 5/19/2015
LCS Activity (dpm/ml): 6101.21
LCS Volume Added: 0.20

SR-89 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 %	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	2.3990	1.6937	1	4.7150	**1701.7473**	1.94%	480.6908	7.7570	53.8243	285.6395		LCS			1832.1950	92.9%
2	2.4494	1.7293	1	4.7569	**1846.9313**	1.86%	533.4749	8.1717	55.4504	309.1999		LCS			1832.1950	100.8%
3	1.9232	1.3578	1	3.9538	**1704.5922**	1.93%	516.2344	8.0369	52.0138	286.4159		LCS			1832.1950	93.0%
4	2.7074	1.9114	1	4.9761	**1759.6586**	1.80%	572.1672	8.4654	51.0283	294.1044		LCS			1832.1950	96.0%
5	2.3932	1.6896	1	4.6601	**1884.0347**	2.56%	551.5802	8.3089	55.6263	328.5656		LCS			1832.1950	102.8%
6	3.2680	2.3072	1	5.9651	**1925.7428**	2.72%	534.6598	8.1844	57.7780	339.3573		LCS			1832.1950	105.1%
7	1.6802	1.1862	1	3.5693	**1732.0948**	2.12%	542.7272	8.2397	51.5413	294.3252		LCS			1832.1950	94.5%
8	3.3996	2.4002	1	6.0210	**1832.9908**	1.84%	563.1036	8.4017	53.6039	306.7996		LCS			1832.1950	100.0%
9	2.9290	2.0679	1	5.4708	**1753.5478**	2.26%	492.6114	7.8550	54.8044	299.8183		LCS			1832.1950	95.7%
10	3.3969	2.3983	1	6.1072	**1805.2105**	2.37%	516.4881	8.0458	55.1180	311.0013		LCS			1832.1950	98.5%
11	2.3862	1.6847	1	4.6153	**1681.2556**	2.01%	505.9887	7.9589	51.8323	283.5714		LCS			1832.1950	91.8%
12	1.7170	1.2122	1	3.6014	**1779.2851**	2.84%	566.8711	8.4210	51.8064	316.4104		LCS			1832.1950	97.1%
13	2.9931	2.1131	1	5.4901	**1887.1934**	2.02%	559.9732	8.3751	55.3215	318.8740		LCS			1832.1950	103.0%
14	3.4125	2.4092	1	6.0966	**1991.5473**	2.25%	584.3337	8.5572	57.1636	340.9717		LCS			1832.1950	108.7%
15	2.0444	1.4434	1	4.0518	**1785.3078**	1.89%	574.6267	8.4799	51.6383	299.6309		LCS			1832.1950	97.4%
16	3.4209	2.4152	1	6.0339	**1838.1726**	1.84%	572.7676	8.4738	53.3018	307.7342		LCS			1832.1950	100.3%
17	3.2839	2.3185	1	5.9308	**1665.2717**	1.98%	482.6650	7.7782	52.5985	280.2025		LCS			1832.1950	90.9%
18	2.2448	1.5848	1	4.4449	**1686.0190**	1.82%	495.7960	7.8775	52.5053	281.5219		LCS			1832.1950	92.0%
19	2.7038	1.9089	1	5.0475	**1756.2708**	1.84%	535.5721	8.1897	52.6380	293.7248		LCS			1832.1950	95.9%
20	3.3082	2.3356	1	5.8246	**1879.1527**	1.87%	610.9773	8.7513	52.7553	315.3601		LCS			1832.1950	102.6%
21	3.9204	2.7679	1	6.8347	**1873.8424**	2.81%	540.9760	8.2376	55.9257	332.3131		LCS			1832.1950	102.3%
22	2.9158	2.0586	1	5.3867	**1846.4694**	1.90%	545.4367	8.2654	54.8423	309.9146		LCS			1832.1950	100.8%
23	2.9218	2.0628	1	5.3145	**1827.9915**	2.58%	576.6104	8.4990	52.8098	319.4422		LCS			1832.1950	99.8%
~~24~~	~~#DIV/0!~~	~~#DIV/0!~~	~~1~~	~~#DIV/0!~~	~~#VALUE!~~	~~#VALUE!~~	~~#VALUE!~~	~~#VALUE!~~	~~#VALUE!~~	~~#VALUE!~~		~~LCS~~			~~1832.1950~~	~~#VALUE!~~
25	2.4539	1.7325	1	4.7656	**1731.9104**	1.86%	499.3435	7.9063	53.7474	289.6921		LCS			1832.1950	94.5%
26	1.9590	1.3830	1	4.0511	**1795.9119**	1.84%	524.0885	8.0976	54.3868	300.3435		LCS			1832.1950	98.0%
27	1.7563	1.2400	1	3.7218	**1712.1269**	1.91%	517.0289	8.0424	52.1992	287.2661		LCS			1832.1950	93.4%
28	1.8775	1.3255	1	3.8028	**1777.9067**	2.00%	578.8767	8.5105	51.2311	300.1675		LCS			1832.1950	97.0%
29	2.3744	1.6763	1	4.6094	**1828.5394**	2.32%	545.6055	8.2640	54.2838	314.2388		LCS			1832.1950	99.8%
30	2.3411	1.6529	1	4.5974	**1935.4508**	2.73%	561.8865	8.3858	56.6150	341.4423		LCS			1832.1950	105.6%
31	1.8955	1.3382	1	3.8413	**1835.9971**	2.55%	591.0309	8.5993	52.3576	320.4383		LCS			1832.1950	100.2%
32	3.5291	2.4916	1	6.1511	**1835.8874**	1.76%	589.4317	8.5974	52.4851	306.2289		LCS			1832.1950	100.2%
33	2.3263	1.6424	1	4.5839	**1523.6155**	2.01%	439.8055	7.4202	50.3830	256.3962		LCS			1832.1950	83.2%
34	2.4160	1.7057	1	4.7269	**1730.0952**	1.93%	493.2013	7.8573	54.0227	290.3784		LCS			1832.1950	94.4%
35	2.2939	1.6195	1	4.4916	**1648.8369**	1.86%	493.6218	7.8606	51.4632	275.8333		LCS			1832.1950	90.0%
36	2.0744	1.4645	1	4.1385	**1793.6189**	3.11%	556.1333	8.3422	52.7339	324.9677		LCS			1832.1950	97.9%
37	2.1939	1.5489	1	4.3403	**1875.0368**	1.80%	565.9387	8.4156	54.6492	313.1765		LCS			1832.1950	102.3%
38	2.1123	1.4913	1	4.2507	**1797.6719**	1.84%	531.6352	8.1564	54.0567	300.6175		LCS			1832.1950	98.1%
39	1.9494	1.3763	1	3.9228	**1797.2854**	1.78%	575.9424	8.4891	51.9225	300.0523		LCS			1832.1950	98.1%
40	2.5308	1.7868	1	4.7731	**1811.9921**	1.76%	566.4881	8.4218	52.7990	302.2157		LCS			1832.1950	98.9%

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

Sr-90 Spike S/N : N/A
Spike Exp Date : N/A
Spike Activity (dpm/ml): N/A
Spike Volume Added: N/A

Sr-90 LCS S/N : 1243-M
LCS Exp Date : 8/12/2015
LCS Activity (dpm/ml): 526.13
LCS Volume Added: 0.50

SR-90 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 %	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	2.4803	1.7511	1	4.8942	**328.4368**	3.92%	70.7840	2.6704	16.8826	58.5549		LCS			394.9899	83.2%
2	2.8739	2.0290	1	5.4350	**345.9475**	3.80%	75.3711	2.7585	17.2509	61.3487		LCS			394.9899	87.6%
3	2.5753	1.8182	1	5.0116	**377.7141**	3.67%	82.3997	2.8806	17.9909	66.5891		LCS			394.9899	95.6%
4	3.3813	2.3873	1	6.0592	**362.0386**	3.61%	84.5455	2.9274	17.0787	63.6397		LCS			394.9899	91.7%
5	2.6948	1.9026	1	5.2366	**359.0356**	4.20%	75.2441	2.7538	17.9018	64.8872		LCS			394.9899	90.9%
6	3.5518	2.5076	1	6.4359	**343.7101**	4.36%	72.5840	2.7133	17.5043	62.6159		LCS			394.9899	87.0%
7	2.1587	1.5240	1	4.2913	**366.2554**	3.68%	88.3797	2.9813	16.8313	64.5917		LCS			394.9899	92.7%
8	4.2933	3.0311	1	7.3904	**377.9140**	3.61%	85.3551	2.9511	17.7999	66.4459		LCS			394.9899	95.7%
9	3.1689	2.2372	1	5.8819	**329.1472**	4.12%	70.1626	2.6646	16.9895	59.2493		LCS			394.9899	83.3%
10	4.2501	3.0006	1	7.3892	**353.2813**	4.06%	76.3599	2.7913	17.5518	63.4353		LCS			394.9899	89.4%
11	2.8797	2.0331	1	5.4557	**358.9566**	3.82%	77.4969	2.7966	17.6053	63.6951		LCS			394.9899	90.9%
12	2.1444	1.5139	1	4.3401	**350.2223**	4.29%	80.0660	2.8374	16.8684	63.5836		LCS			394.9899	88.7%
13	3.6371	2.5678	1	6.5212	**335.0805**	3.98%	72.5536	2.7147	17.0398	59.9148		LCS			394.9899	84.8%
14	4.1629	2.9390	1	7.2520	**330.3300**	4.13%	72.1263	2.7138	16.8923	59.4908		LCS			394.9899	83.6%
15	2.4030	1.6966	1	4.5947	**334.1523**	3.66%	83.4257	2.8998	15.7856	58.8828		LCS			394.9899	84.6%
16	4.2085	2.9712	1	7.2445	**360.9860**	3.66%	83.1747	2.9139	17.1876	63.6123		LCS			394.9899	91.4%
17	3.9894	2.8166	1	7.0267	**338.3888**	3.91%	72.8474	2.7241	17.1617	60.3035		LCS			394.9899	85.7%
18	2.8720	2.0276	1	5.4275	**395.5430**	3.52%	86.4784	2.9530	18.3185	69.2566		LCS			394.9899	100.1%
19	3.1276	2.2081	1	5.7902	**368.4679**	3.68%	80.4465	2.8514	17.7124	64.9819		LCS			394.9899	93.3%
20	4.0237	2.8408	1	6.9544	**373.2661**	3.61%	87.9719	2.9938	17.2272	65.6010		LCS			394.9899	94.5%
21	5.0333	3.5536	1	8.6446	**440.9993**	4.17%	86.0526	2.9636	20.5936	79.5907		LCS			394.9899	111.6%
22	4.1227	2.9107	1	7.4622	**415.4580**	3.82%	75.9582	2.7750	20.5797	73.7534		LCS			394.9899	105.2%
23	3.3765	2.3838	1	6.0370	**337.8608**	4.14%	79.8500	2.8465	16.3222	60.8904		LCS			394.9899	85.5%
~~24~~	~~#DIV/0!~~	~~#DIV/0!~~	~~1~~	~~#DIV/0!~~	~~#VALUE!~~	~~#VALUE!~~	~~#VALUE!~~	~~#VALUE!~~	~~#VALUE!~~	~~#VALUE!~~		~~LCS~~			~~394.9899~~	~~#VALUE!~~
25	3.2058	2.2633	1	5.9235	**322.8858**	3.94%	69.3440	2.6499	16.6889	57.6270		LCS			394.9899	81.7%
26	2.4535	1.7322	1	4.8361	**370.6730**	3.66%	81.0695	2.8566	17.6658	65.2940		LCS			394.9899	93.8%
27	2.2757	1.6067	1	4.6092	**356.6852**	3.78%	76.6598	2.7767	17.4739	63.1941		LCS			394.9899	90.3%
28	2.4763	1.7483	1	4.7768	**355.4338**	3.73%	83.2853	2.8966	16.7193	62.8150		LCS			394.9899	90.0%
29	3.2414	2.2885	1	5.9812	**374.8348**	3.96%	80.0786	2.8454	18.0125	66.9660		LCS			394.9899	94.9%
30	3.0809	2.1752	1	5.7903	**342.2297**	4.40%	71.2978	2.6843	17.4250	62.4769		LCS			394.9899	86.6%
31	2.1368	1.5086	1	4.2282	**312.8210**	4.17%	77.4940	2.7930	15.2470	56.4513		LCS			394.9899	79.2%
32	4.5095	3.1837	1	7.6510	**348.6515**	3.68%	81.4871	2.8902	16.7223	61.4694		LCS			394.9899	88.3%
33	2.4496	1.7294	1	4.8582	**343.6319**	3.85%	73.6671	2.7235	17.1404	61.0657		LCS			394.9899	87.0%
34	2.8683	2.0251	1	5.4586	**365.8052**	3.75%	77.9125	2.8036	17.7588	64.7178		LCS			394.9899	92.6%
35	2.7106	1.9137	1	5.2266	**346.9122**	3.80%	74.3833	2.7387	17.2320	61.5203		LCS			394.9899	87.8%
36	2.3304	1.6453	1	4.6411	**376.3305**	4.40%	83.6005	2.8999	17.6107	68.7232		LCS			394.9899	95.3%
37	2.8733	2.0286	1	5.4517	**347.1593**	3.81%	74.6837	2.7457	17.2172	61.5800		LCS			394.9899	87.9%
38	2.6179	1.8483	1	5.1019	**344.9483**	3.83%	73.6360	2.7242	17.2145	61.2515		LCS			394.9899	87.3%
39	2.1991	1.5526	1	4.3347	**345.8087**	3.59%	84.3800	2.9139	16.1082	60.7332		LCS			394.9899	87.5%
40	2.6472	1.8689	1	5.0456	**368.3672**	3.58%	84.5065	2.9187	17.1608	64.6590		LCS			394.9899	93.3%

Strontium-89 & 90 Liquid

Filename : SR8990.XLS
File type : Excel
Version # : 1.3.9

Batch : 1082959
Analyst : BXF1
Prep Date : 2/25/2015
Sr-89 Method Uncertainty : 0.0829
Sr-90 Method Uncertainty : 0.0821

Geometry: Tuffryn Filter

Sr Carrier S/N : 2187760
Carrier Exp Date : 11/25/2015
Carrier Volume Added: 0.50
Carrier Weight (mg/ml): 16.20
Carrier Weight StDev.: 0.00

Y Carrier S/N : 2214065
Carrier Exp Date : 2/4/2016
Carrier Volume Added: 0.50
Carrier Weight (mg/ml): 31.60
Carrier Weight StDev.: 0.08

Procedure Code : GFCGANBL
Parmname1 : Strontium-89
Parmname2 : Strontium-90
Required MDA Sr-89 : 1 pCi/L
Required MDA Sr-90 : 1 pCi/L
Sr-89 Abundance : 1.00
Sr-90 Abundance : 1.00
Halflife of Sr-89 : 50.53 days
Halflife of Sr-90 : 28.9 years
Halflife of Y-90 : 64.053 hours

Sample Characteristics					Carrier Calculations							
					Net Weight (mg)		Net Weight StDev. (mg)		Carrier Aliquot (mL)		Carrier Aliquot StDev. (mL)	
Pos.	Sample ID	Sample Aliquot L	Sample Aliquot StDev. L	Sample Date/Time	Sr	Y	Sr	Y	Sr	Y	Sr	Y
1	1202347886.1	0.3000	1.8459E-05	2/25/2015 0:00	7.0	15.9	0.037416	0.075668	0.5	0.5	0.001000	0.001000
2	1202347887.1	0.3000	1.8459E-05	2/25/2015 0:00	7.1	15.9	0.037846	0.075668	0.5	0.5	0.001000	0.001000
3	1202347888.1	0.3000	1.8459E-05	2/25/2015 0:00	7.4	15.2	0.039135	0.072660	0.5	0.5	0.001000	0.001000
4	1202347889.1	0.3000	1.8459E-05	2/25/2015 0:00	8.0	15.2	0.041714	0.072660	0.5	0.5	0.001000	0.001000
~~5~~	~~1202347890.1~~	~~0.3000~~	~~1.8459E-05~~	~~2/25/2015 0:00~~	~~7.4~~	~~15.3~~	~~0.039135~~	~~0.073089~~	~~0.5~~	~~0.5~~	~~0.001000~~	~~0.001000~~
~~6~~	~~1202347891.1~~	~~0.3000~~	~~1.8459E-05~~	~~2/25/2015 0:00~~	~~7.3~~	~~15.5~~	~~0.038705~~	~~0.073949~~	~~0.5~~	~~0.5~~	~~0.001000~~	~~0.001000~~
~~7~~	~~1202347892.1~~	~~0.3000~~	~~1.8459E-05~~	~~2/25/2015 0:00~~	~~7.9~~	~~16.3~~	~~0.041284~~	~~0.077387~~	~~0.5~~	~~0.5~~	~~0.001000~~	~~0.001000~~
~~8~~	~~1202347893.1~~	~~0.3000~~	~~1.8459E-05~~	~~2/25/2015 0:00~~	~~7.7~~	~~15.6~~	~~0.040425~~	~~0.074379~~	~~0.5~~	~~0.5~~	~~0.001000~~	~~0.001000~~
9	1202347894.1	0.3000	1.8459E-05	2/25/2015 0:00	7.0	15.9	0.037416	0.075668	0.5	0.5	0.001000	0.001000
10	1202347895.1	0.3000	1.8459E-05	2/25/2015 0:00	7.1	15.9	0.037846	0.075668	0.5	0.5	0.001000	0.001000
~~11~~	~~1202347896.1~~	~~0.3000~~	~~1.8459E-05~~	~~2/25/2015 0:00~~	~~7.4~~	~~15.2~~	~~0.039135~~	~~0.072660~~	~~0.5~~	~~0.5~~	~~0.001000~~	~~0.001000~~
12	1202347897.1	0.3000	1.8459E-05	2/25/2015 0:00	8.0	15.2	0.041714	0.072660	0.5	0.5	0.001000	0.001000
13	1202347898.1	0.3000	1.8459E-05	2/25/2015 0:00	7.4	15.3	0.039135	0.073089	0.5	0.5	0.001000	0.001000
14	1202347899.1	0.3000	1.8459E-05	2/25/2015 0:00	7.3	15.5	0.038705	0.073949	0.5	0.5	0.001000	0.001000
15	1202347900.1	0.3000	1.8459E-05	2/25/2015 0:00	7.9	16.3	0.041284	0.077387	0.5	0.5	0.001000	0.001000
16	1202347901.1	0.3000	1.8459E-05	2/25/2015 0:00	7.7	15.6	0.040425	0.074379	0.5	0.5	0.001000	0.001000

Pipet, 0.1 ml Stdev : +/- 0.000200 ml
Pipet, 0.5 ml Stdev : +/- 0.001000 ml
Pipet, 1 ml Stdev : +/- 0.002000 ml
Pipet, 5 ml Stdev : +/- 0.010000 ml

Analytical SOP: GL-RAD-A-001
Instrument SOP: GL-RAD-I-016

1st Count Raw Data							1st Count Calibration Data									
Pos.	Detector ID	Counting Time (min.)	Gross Counts Alpha	Gross Counts Beta	Gross Beta CPM	Count Start Date/Time	Counted on	Calibration Date	Calibration Due Date	Detector Efficiency (cpm/dpm) Sr-89	Detector Efficiency (cpm/dpm) Sr-90	Detector Efficiency Error (cpm/dpm)	Alpha X-Talk	Weekly Bkg CPM	Weekly Bkg Count Start Date/Time	Weekly Bkg Count Time (min.)
1	11A	9	1	5215	579.423	2/26/2015 5:49	PIC	3/1/2013	2/28/2015	0.4247	0.3786	0.01317	0.19341	0.636	2/21/2015 17:47	500
2	11B	9	0	5678	630.889	2/26/2015 5:49	PIC	3/1/2013	2/28/2015	0.4999	0.4020	0.00697	0.11932	0.846	2/21/2015 17:47	500
3	11C	9	0	5707	634.111	2/26/2015 5:49	PIC	3/1/2013	2/28/2015	0.4985	0.3951	0.01278	0.11969	1.210	2/21/2015 17:47	500
4	11D	9	0	6317	701.889	2/26/2015 5:49	PIC	3/1/2013	2/28/2015	0.5022	0.3987	0.01068	0.10464	0.432	2/21/2015 17:48	500
~~5~~	~~12A~~	~~9~~	~~1~~	~~5945~~	~~660.539~~	~~2/26/2015 5:49~~	~~PIC~~	~~3/1/2013~~	~~2/28/2015~~	~~0.0000~~	~~0.0000~~	~~0.01964~~	~~0.15330~~	~~1.296~~	~~2/21/2015 17:47~~	~~500~~
~~6~~	~~12B~~	~~9~~	~~0~~	~~5799~~	~~644.333~~	~~2/26/2015 5:49~~	~~PIC~~	~~3/1/2013~~	~~2/28/2015~~	~~0.2510~~	~~0.0000~~	~~0.01114~~	~~0.24912~~	~~1.132~~	~~2/21/2015 17:47~~	~~500~~
~~7~~	~~12C~~	~~9~~	4	~~6263~~	~~695.860~~	~~2/26/2015 5:49~~	~~PIC~~	~~3/1/2013~~	~~2/28/2015~~	~~0.2207~~	~~0.0000~~	~~0.01666~~	~~0.06475~~	~~4.168~~	~~2/21/2015 17:47~~	~~500~~
~~8~~	~~12D~~	~~9~~	~~1~~	~~6111~~	~~678.990~~	~~2/26/2015 5:49~~	~~PIC~~	~~3/1/2013~~	~~2/28/2015~~	~~0.4815~~	~~0.0000~~	~~0.01845~~	~~0.09058~~	~~0.934~~	~~2/21/2015 17:47~~	~~500~~
9	13A	9	1	5171	574.546	2/26/2015 5:59	PIC	3/1/2013	2/28/2015	0.4987	0.4053	0.00714	0.08725	0.600	2/21/2015 17:47	1000
10	13B	9	0	5591	621.222	2/26/2015 5:59	PIC	3/1/2013	2/28/2015	0.5098	0.4114	0.00967	0.09947	1.384	2/21/2015 17:47	1000
~~11~~	~~13C~~	~~9~~	~~0~~	~~0~~	~~0.000~~	~~2/26/2015 5:59~~	~~PIC~~	~~3/1/2013~~	~~2/28/2015~~	~~0.5035~~	~~0.3903~~	~~0.01708~~	~~0.28497~~	~~0.000~~	~~12:00:00 AM~~	~~0~~
12	13D	9	1	5915	657.212	2/26/2015 5:59	PIC	3/1/2013	2/28/2015	0.4933	0.3979	0.01144	0.08976	0.715	2/21/2015 17:47	1000
13	14A	9	0	6019	668.778	2/26/2015 5:59	PIC	3/1/2013	2/28/2015	0.4900	0.3950	0.02119	0.29871	0.449	2/21/2015 17:46	1000
14	14B	9	1	5765	640.530	2/26/2015 5:59	PIC	3/1/2013	2/28/2015	0.5017	0.3971	0.01028	0.22915	0.359	2/21/2015 17:46	1000
15	14C	9	0	6150	683.333	2/26/2015 5:59	PIC	3/1/2013	2/28/2015	0.5053	0.3893	0.01828	0.39591	1.232	2/21/2015 17:47	1000
16	14D	9	0	6296	699.556	2/26/2015 5:59	PIC	3/1/2013	2/28/2015	0.4874	0.3710	0.00738	0.28636	0.423	2/21/2015 17:47	1000

2nd Count Raw Data							2nd Count Calibration Data								
Pos.	Detector ID	Counting Time (min.)	Gross Counts Alpha	Gross Counts Beta	Gross Beta CPM	Count Start Date/Time	Counted on	Calibration Date	Calibration Due Date	Detector Efficiency Y-90 (cpm/dpm)	Detector Efficiency Error (cpm/dpm)	Alpha X-Talk	Weekly Bkg CPM	Weekly Bkg Count Start Date/Time	Weekly Bkg Count Time (min.)
1	11A	10	0	701	70.100	3/2/2015 11:56	PIC	3/1/2013	2/28/2015	0.4678	0.01317	0.19341	0.722	2/28/2015 16:42	500
2	11B	10	0	757	75.700	3/2/2015 11:56	PIC	3/1/2013	2/28/2015	0.5323	0.00697	0.11932	0.832	2/28/2015 16:42	500
3	11C	10	0	795	79.500	3/2/2015 11:56	PIC	3/1/2013	2/28/2015	0.5295	0.01278	0.11969	1.068	2/28/2015 16:42	500
4	11D	10	1	850	84.990	3/2/2015 11:56	PIC	3/1/2013	2/28/2015	0.5341	0.01068	0.10464	0.498	2/28/2015 16:42	500
~~5~~	~~12A~~	~~10~~	~~0~~	~~785~~	~~78.500~~	~~3/2/2015 11:56~~	~~PIC~~	~~3/1/2013~~	~~2/28/2015~~	~~0.0000~~	~~0.01964~~	~~0.15330~~	~~1.284~~	~~2/28/2015 16:42~~	~~500~~
~~6~~	~~12B~~	~~10~~	~~0~~	~~808~~	~~80.800~~	~~3/2/2015 11:56~~	~~PIC~~	~~3/1/2013~~	~~2/28/2015~~	~~0.0000~~	~~0.01114~~	~~0.24912~~	~~1.048~~	~~2/28/2015 16:42~~	~~500~~
~~7~~	~~12C~~	~~10~~	~~1~~	~~875~~	~~87.494~~	~~3/2/2015 11:56~~	~~PIC~~	~~3/1/2013~~	~~2/28/2015~~	~~0.0000~~	~~0.01666~~	~~0.06475~~	~~3.988~~	~~2/28/2015 16:42~~	~~500~~
~~8~~	~~12D~~	~~10~~	~~0~~	~~817~~	~~81.700~~	~~3/2/2015 12:04~~	~~PIC~~	~~3/1/2013~~	~~2/28/2015~~	~~0.0000~~	~~0.01845~~	~~0.09058~~	~~0.848~~	~~2/28/2015 16:42~~	~~500~~
9	13A	10	1	697	69.691	3/2/2015 12:17	PIC	3/1/2013	2/28/2015	0.5300	0.00714	0.08725	0.601	2/28/2015 16:42	1000
10	13B	10	0	716	71.600	3/2/2015 12:17	PIC	3/1/2013	2/28/2015	0.5438	0.00967	0.09947	1.285	2/28/2015 16:42	1000
~~11~~	~~13C~~	~~10~~	~~0~~	~~0~~	~~0.000~~	~~3/2/2015 12:17~~	~~PIC~~	~~3/1/2013~~	~~2/28/2015~~	~~0.4905~~	~~0.01708~~	~~0.28497~~	~~FAIL~~	~~12:00:00 AM~~	~~0~~
12	13D	10	0	695	69.500	3/2/2015 12:17	PIC	3/1/2013	2/28/2015	0.5264	0.01144	0.08976	0.709	2/28/2015 16:42	1000
13	14A	10	1	753	75.270	3/2/2015 12:17	PIC	3/1/2013	2/28/2015	0.4988	0.02119	0.29871	0.466	2/28/2015 16:42	1000
14	14B	10	1	726	72.577	3/2/2015 14:05	PIC	3/1/2013	2/28/2015	0.5217	0.01028	0.22915	0.349	2/28/2015 16:43	1000
15	14C	10	0	840	84.000	3/2/2015 12:17	PIC	3/1/2013	2/28/2015	0.5271	0.01828	0.39591	1.104	2/28/2015 16:42	1000
16	14D	10	2	804	80.343	3/2/2015 12:17	PIC	3/1/2013	2/28/2015	0.4715	0.00738	0.28636	0.465	2/28/2015 16:42	1000

Correction Factors

Pos.	Separation Date/Time Strontium	Separation Date/Time Yttrium	Yttrium Ingrowth (Sr-89 calc)	Yttrium Ingrowth (Sr-90 calc)	Yttrium Decay	Decay from Sample Date Sr-89	Decay from Sample Date Sr-90	Net Count Rate Y-90	Net Count Rate Sr-90	Gross CPM Sr-89	Calculated Sample Recovery % Sr	Calculated Sample Recovery % Y	Sample Recovery % Error Sr	Sample Recovery % Error Y
1	2/25/2015 14:40	3/2/2015 8:55	0.1520	0.7096	0.9669	0.9831	0.9999	17.7905	81.3461	480.286295	86.4%	101%	0.78%	0.75%
2	2/25/2015 14:40	3/2/2015 8:55	0.1520	0.7096	0.9669	0.9831	0.9999	18.9279	81.9014	530.059575	87.7%	101%	0.78%	0.75%
3	2/25/2015 14:40	3/2/2015 8:55	0.1520	0.7096	0.9669	0.9831	0.9999	19.0251	88.6879	526.398057	91.4%	96.2%	0.77%	0.75%
4	2/25/2015 14:40	3/2/2015 8:55	0.1520	0.7096	0.9669	0.9831	0.9999	18.9578	95.5809	587.350139	98.8%	96.2%	0.76%	0.75%
~~5~~	~~2/25/2015 14:40~~	~~3/2/2015 8:55~~	~~0.1520~~	~~0.7096~~	~~0.9669~~	~~0.9831~~	~~0.9999~~	~~#DIV/0!~~	~~#DIV/0!~~	~~#DIV/0!~~	~~91.4%~~	~~96.8%~~	~~0.77%~~	~~0.75%~~
~~6~~	~~2/25/2015 14:40~~	~~3/2/2015 8:55~~	~~0.1520~~	~~0.7096~~	~~0.9669~~	~~0.9831~~	~~0.9999~~	~~#DIV/0!~~	~~#DIV/0!~~	~~#DIV/0!~~	~~90.1%~~	~~98.1%~~	~~0.78%~~	~~0.75%~~
~~7~~	~~2/25/2015 14:40~~	~~3/2/2015 8:55~~	~~0.1520~~	~~0.7096~~	~~0.9669~~	~~0.9831~~	~~0.9999~~	~~#DIV/0!~~	~~#DIV/0!~~	~~#DIV/0!~~	~~97.5%~~	~~103%~~	~~0.77%~~	~~0.74%~~
~~8~~	~~2/25/2015 14:40~~	~~3/2/2015 8:55~~	~~0.1520~~	~~0.7096~~	~~0.9655~~	~~0.9831~~	~~0.9999~~	~~#DIV/0!~~	~~#DIV/0!~~	~~#DIV/0!~~	~~95.1%~~	~~98.7%~~	~~0.77%~~	~~0.75%~~
9	2/25/2015 14:40	3/2/2015 8:55	0.1535	0.7096	0.9632	0.9830	0.9999	17.9599	76.8180	479.767928	86.4%	101%	0.78%	0.75%
10	2/25/2015 14:40	3/2/2015 8:55	0.1535	0.7096	0.9632	0.9830	0.9999	18.0211	77.3464	525.854683	87.7%	101%	0.78%	0.75%
~~11~~	~~2/25/2015 14:40~~	~~3/2/2015 8:55~~	~~0.1535~~	~~0.7096~~	~~0.9632~~	~~0.9830~~	~~0.9999~~	~~#VALUE!~~	~~#VALUE!~~	~~#VALUE!~~	~~91.4%~~	~~96.2%~~	~~0.77%~~	~~0.75%~~
12	2/25/2015 14:40	3/2/2015 8:55	0.1535	0.7096	0.9632	0.9830	0.9999	15.6471	79.0988	562.466334	98.8%	96.2%	0.76%	0.75%
13	2/25/2015 14:40	3/2/2015 8:55	0.1535	0.7096	0.9632	0.9830	0.9999	18.3941	89.5197	560.863967	91.4%	96.8%	0.77%	0.75%
14	2/25/2015 14:40	3/2/2015 8:55	0.1535	0.7096	0.9447	0.9830	0.9999	18.3560	83.6245	538.549664	90.1%	98.1%	0.78%	0.75%
15	2/25/2015 14:40	3/2/2015 8:55	0.1535	0.7096	0.9632	0.9830	0.9999	19.0930	86.8444	577.395935	97.5%	103%	0.77%	0.74%
16	2/25/2015 14:40	3/2/2015 8:55	0.1535	0.7096	0.9632	0.9830	0.9999	18.8757	93.1558	587.524028	95.1%	98.7%	0.77%	0.75%

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

Sr-89 Spike S/N : N/A
Spike Exp Date : N/A
Spike Activity (dpm/ml): N/A
Spike Volume Added: N/A

Sr-89 LCS S/N : 1717-A
LCS Exp Date : 5/19/2015
LCS Activity (dpm/ml): 6101.21
LCS Volume Added: 0.20

SR-89 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 %	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	2.6006	1.8360	1	5.0591	**1995.9716**	2.16%	479.6503	7.3052	59.5826	339.7669		LCS			1832.1950	108.9%
2	2.5124	1.7738	1	4.7094	**1844.6928**	1.79%	529.2136	7.6745	52.4320	308.2333		LCS			1832.1950	100.7%
3	2.8907	2.0408	1	5.1995	**1761.2147**	2.09%	525.1881	7.6479	50.2688	298.9455		LCS			1832.1950	96.1%
4	1.5861	1.1198	1	3.2662	**1807.4502**	1.90%	586.9181	8.0785	48.7613	304.1899		LCS			1832.1950	98.6%
~~5~~	~~#DIV/0!~~	~~#DIV/0!~~	~~1~~	~~#DIV/0!~~	~~**#DIV/0!**~~	~~#DIV/0!~~	~~#DIV/0!~~	~~#DIV/0!~~	~~#DIV/0!~~	~~#DIV/0!~~		~~LCS~~			~~1832.1950~~	~~#DIV/0!~~
~~6~~	~~5.6305~~	~~3.9752~~	~~1~~	~~10.2014~~	~~**#DIV/0!**~~	~~#DIV/0!~~	~~#DIV/0!~~	~~#DIV/0!~~	~~#DIV/0!~~	~~#DIV/0!~~		~~LCS~~			~~1832.1950~~	~~#DIV/0!~~
~~7~~	~~11.3529~~	~~8.0153~~	~~1~~	~~18.3960~~	~~**#DIV/0!**~~	~~#DIV/0!~~	~~#DIV/0!~~	~~#DIV/0!~~	~~#DIV/0!~~	~~#DIV/0!~~		~~LCS~~			~~1832.1950~~	~~#DIV/0!~~
~~8~~	~~2.5271~~	~~1.7842~~	~~1~~	~~4.6807~~	~~**#DIV/0!**~~	~~#DIV/0!~~	~~#DIV/0!~~	~~#DIV/0!~~	~~#DIV/0!~~	~~#DIV/0!~~		~~LCS~~			~~1832.1950~~	~~#DIV/0!~~
9	2.1417	1.5121	1	4.2056	**1698.2421**	1.86%	479.1679	7.3012	50.7183	284.3546		LCS			1832.1950	92.7%
10	3.1375	2.2151	1	5.5697	**1792.9025**	1.92%	524.4707	7.6439	51.2163	301.4486		LCS			1832.1950	97.9%
~~11~~	~~#DIV/0!~~	~~#DIV/0!~~	~~1~~	~~#DIV/0!~~	~~**#VALUE!**~~	~~#VALUE!~~	~~#VALUE!~~	~~#VALUE!~~	~~#VALUE!~~	~~#VALUE!~~		~~LCS~~			~~1832.1950~~	~~#VALUE!~~
12	2.0683	1.4602	1	3.9656	**1761.2654**	1.97%	561.7513	7.9055	48.5810	297.2110		LCS			1832.1950	96.1%
13	1.7837	1.2593	1	3.6559	**1912.1320**	2.66%	560.4150	7.8942	52.7926	336.3226		LCS			1832.1950	104.4%
14	1.5792	1.1149	1	3.3560	**1818.2044**	1.93%	538.1907	7.7356	51.2219	306.0566		LCS			1832.1950	99.2%
15	2.6839	1.8949	1	4.8229	**1785.7815**	2.42%	576.1639	8.0098	48.6584	309.4790		LCS			1832.1950	97.5%
16	1.6727	1.1809	1	3.4607	**1935.4142**	1.74%	587.1010	8.0797	52.2048	323.0696		LCS			1832.1950	105.6%

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

Sr-90 Spike S/N :	N/A
Spike Exp Date :	N/A
Spike Activity (dpm/ml):	N/A
Spike Volume Added:	N/A
Sr-90 LCS S/N :	1243-M
LCS Exp Date :	8/12/2015
LCS Activity (dpm/ml):	526.13
LCS Volume Added:	0.50

SR-90 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 %	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	3.4020	2.4019	1	6.4178	**373.2801**	4.11%	69.3780	2.6479	19.1580	67.1597		LCS			394.9899	94.5%
2	3.1639	2.2338	1	5.8659	**348.9838**	3.81%	74.8680	2.7517	17.2480	61.9227		LCS			394.9899	88.4%
3	3.6171	2.5537	1	6.5185	**368.9079**	3.89%	78.4320	2.8200	17.8361	65.6850		LCS			394.9899	93.4%
4	2.2650	1.5991	1	4.4923	**364.4346**	3.69%	84.4915	2.9155	16.9102	64.2912		LCS			394.9899	92.3%
~~5~~	~~#DIV/0!~~	~~#DIV/0!~~	~~1~~	~~#DIV/0!~~	~~**#DIV/0!**~~	~~4.19%~~	~~77.2160~~	~~2.8022~~	~~#DIV/0!~~	~~#DIV/0!~~		~~LCS~~			~~394.9899~~	~~#DIV/0!~~
~~6~~	~~#DIV/0!~~	~~#DIV/0!~~	~~1~~	~~#DIV/0!~~	~~**#DIV/0!**~~	~~3.81%~~	~~79.7520~~	~~2.8429~~	~~#DIV/0!~~	~~#DIV/0!~~		~~LCS~~			~~394.9899~~	~~#DIV/0!~~
~~7~~	~~#DIV/0!~~	~~#DIV/0!~~	~~1~~	~~#DIV/0!~~	~~**#DIV/0!**~~	~~3.99%~~	~~83.5055~~	~~2.9593~~	~~#DIV/0!~~	~~#DIV/0!~~		~~LCS~~			~~394.9899~~	~~#DIV/0!~~
~~8~~	~~#DIV/0!~~	~~#DIV/0!~~	~~1~~	~~#DIV/0!~~	~~**#DIV/0!**~~	~~4.06%~~	~~80.8520~~	~~2.8586~~	~~#DIV/0!~~	~~#DIV/0!~~		~~LCS~~			~~394.9899~~	~~#DIV/0!~~
9	2.7362	1.9318	1	5.2935	**329.3128**	3.96%	69.0903	2.6400	16.8569	58.8291		LCS			394.9899	83.4%
10	3.8443	2.7141	1	6.8022	**322.0318**	4.00%	70.3150	2.6761	16.4181	57.6351		LCS			394.9899	81.5%
~~11~~	~~#DIV/0!~~	~~#DIV/0!~~	~~1~~	~~#DIV/0!~~	~~**#VALUE!**~~	~~#VALUE!~~	~~#VALUE!~~	~~#VALUE!~~	~~#VALUE!~~	~~#VALUE!~~		~~LCS~~			~~394.9899~~	~~#VALUE!~~
12	2.7391	1.9338	1	5.1855	**302.1992**	4.07%	68.7910	2.6364	15.5151	54.2738		LCS			394.9899	76.5%
13	2.5168	1.7769	1	5.0474	**372.4432**	4.30%	74.8041	2.7436	18.2989	67.6605		LCS			394.9899	94.3%
14	2.1247	1.5000	1	4.4572	**350.8097**	3.94%	72.2281	2.6941	17.1922	62.6170		LCS			394.9899	88.8%
15	3.2231	2.2755	1	5.7938	**343.4025**	4.02%	82.8960	2.8985	16.0846	61.5136		LCS			394.9899	86.9%
16	2.5068	1.7699	1	5.0291	**396.5611**	3.70%	79.8777	2.8346	18.8514	69.9968		LCS			394.9899	100.4%

TOTVERPIC.xls

SampleID	Instr	Time (min.)	Alpha Counts	Beta Counts	Count Start Time	Count End Time	Machine
First Count							
V1	1A	8	8	4585	2/26/2015 4:54	2/26/2015 5:02	PIC
V2	1B	8	19	5055	2/26/2015 4:54	2/26/2015 5:02	PIC
V3	1C	8	97	5023	2/26/2015 4:55	2/26/2015 5:03	PIC
V4	1D	8	63	5474	2/26/2015 4:55	2/26/2015 5:03	PIC
V5	2A	8	6	5231	2/26/2015 4:55	2/26/2015 5:03	PIC
V6	2B	8	3	5055	2/26/2015 4:55	2/26/2015 5:03	PIC
V7	2C	8	53	5234	2/26/2015 4:55	2/26/2015 5:03	PIC
V8	2D	8	12	5408	2/26/2015 4:55	2/26/2015 5:03	PIC
V1	3A	8	125	4671	2/26/2015 5:05	2/26/2015 5:13	PIC
V2	3B	8	55	4919	2/26/2015 5:05	2/26/2015 5:13	PIC
V3	3C	8	42	4889	2/26/2015 5:05	2/26/2015 5:13	PIC
V4	3D	8	29	5384	2/26/2015 5:05	2/26/2015 5:13	PIC
V5	4A	8	43	5267	2/26/2015 5:05	2/26/2015 5:13	PIC
V6	4B	8	4	5446	2/26/2015 5:06	2/26/2015 5:14	PIC
V7	4C	8	43	5430	2/26/2015 5:06	2/26/2015 5:14	PIC
V8	4D	8	117	5452	2/26/2015 5:06	2/26/2015 5:14	PIC
V1	5A	8	19	4642	2/26/2015 5:16	2/26/2015 5:24	PIC
V2	5B	8	32	4877	2/26/2015 5:16	2/26/2015 5:24	PIC
V3	5C	8	15	5163	2/26/2015 5:16	2/26/2015 5:24	PIC
V4	5D	8	32	5823	2/26/2015 5:16	2/26/2015 5:24	PIC
V5	6A	8	51	5313	2/26/2015 5:15	2/26/2015 5:23	PIC
V6	6B	8	57	5242	2/26/2015 5:15	2/26/2015 5:23	PIC
V7	6C	8	7	5450	2/26/2015 5:15	2/26/2015 5:23	PIC
V8	6D	8	0	0	2/26/2015 5:15	2/26/2015 5:23	PIC
V1	7A	8	4	4737	2/26/2015 5:26	2/26/2015 5:34	PIC
V2	7B	8	11	5045	2/26/2015 5:26	2/26/2015 5:34	PIC
V3	7C	8	2	4979	2/26/2015 5:26	2/26/2015 5:34	PIC
V4	7D	8	4	5517	2/26/2015 5:26	2/26/2015 5:34	PIC
V5	8A	8	10	5236	2/26/2015 5:26	2/26/2015 5:34	PIC
V6	8B	8	3	5276	2/26/2015 5:26	2/26/2015 5:34	PIC
V7	8C	8	2	5516	2/26/2015 5:26	2/26/2015 5:34	PIC
V8	8D	8	18	5588	2/26/2015 5:26	2/26/2015 5:34	PIC
V1	9A	8	8	4317	2/26/2015 5:37	2/26/2015 5:45	PIC

V2	9B	8	16	4773	2/26/2015 5:37	2/26/2015 5:45 PIC
V3	9C	8	14	4772	2/26/2015 5:37	2/26/2015 5:45 PIC
V4	9D	8	28	5376	2/26/2015 5:37	2/26/2015 5:45 PIC
V5	10A	8	10	5351	2/26/2015 5:37	2/26/2015 5:45 PIC
V6	10B	8	3	5053	2/26/2015 5:37	2/26/2015 5:45 PIC
V7	10C	8	14	5471	2/26/2015 5:37	2/26/2015 5:45 PIC
V8	10D	8	8	5431	2/26/2015 5:37	2/26/2015 5:45 PIC
V1	11A	9	1	5215	2/26/2015 5:49	2/26/2015 5:58 PIC
V2	11B	9	0	5678	2/26/2015 5:49	2/26/2015 5:58 PIC
V3	11C	9	0	5707	2/26/2015 5:49	2/26/2015 5:58 PIC
V4	11D	9	0	6317	2/26/2015 5:49	2/26/2015 5:58 PIC
V5	12A	9	1	5945	2/26/2015 5:49	2/26/2015 5:58 PIC
V6	12B	9	0	5799	2/26/2015 5:49	2/26/2015 5:58 PIC
V7	12C	9	4	6263	2/26/2015 5:49	2/26/2015 5:58 PIC
V8	12D	9	1	6111	2/26/2015 5:49	2/26/2015 5:58 PIC
V1	13A	9	1	5171	2/26/2015 5:59	2/26/2015 6:08 PIC
V2	13B	9	0	5591	2/26/2015 5:59	2/26/2015 6:08 PIC
V3	13C	9	0	0	2/26/2015 5:59	2/26/2015 6:08 PIC
V4	13D	9	1	5915	2/26/2015 5:59	2/26/2015 6:08 PIC
V5	14A	9	0	6019	2/26/2015 5:59	2/26/2015 6:08 PIC
V6	14B	9	1	5765	2/26/2015 5:59	2/26/2015 6:08 PIC
V7	14C	9	0	6150	2/26/2015 5:59	2/26/2015 6:08 PIC
V8	14D	9	0	6296	2/26/2015 5:59	2/26/2015 6:08 PIC

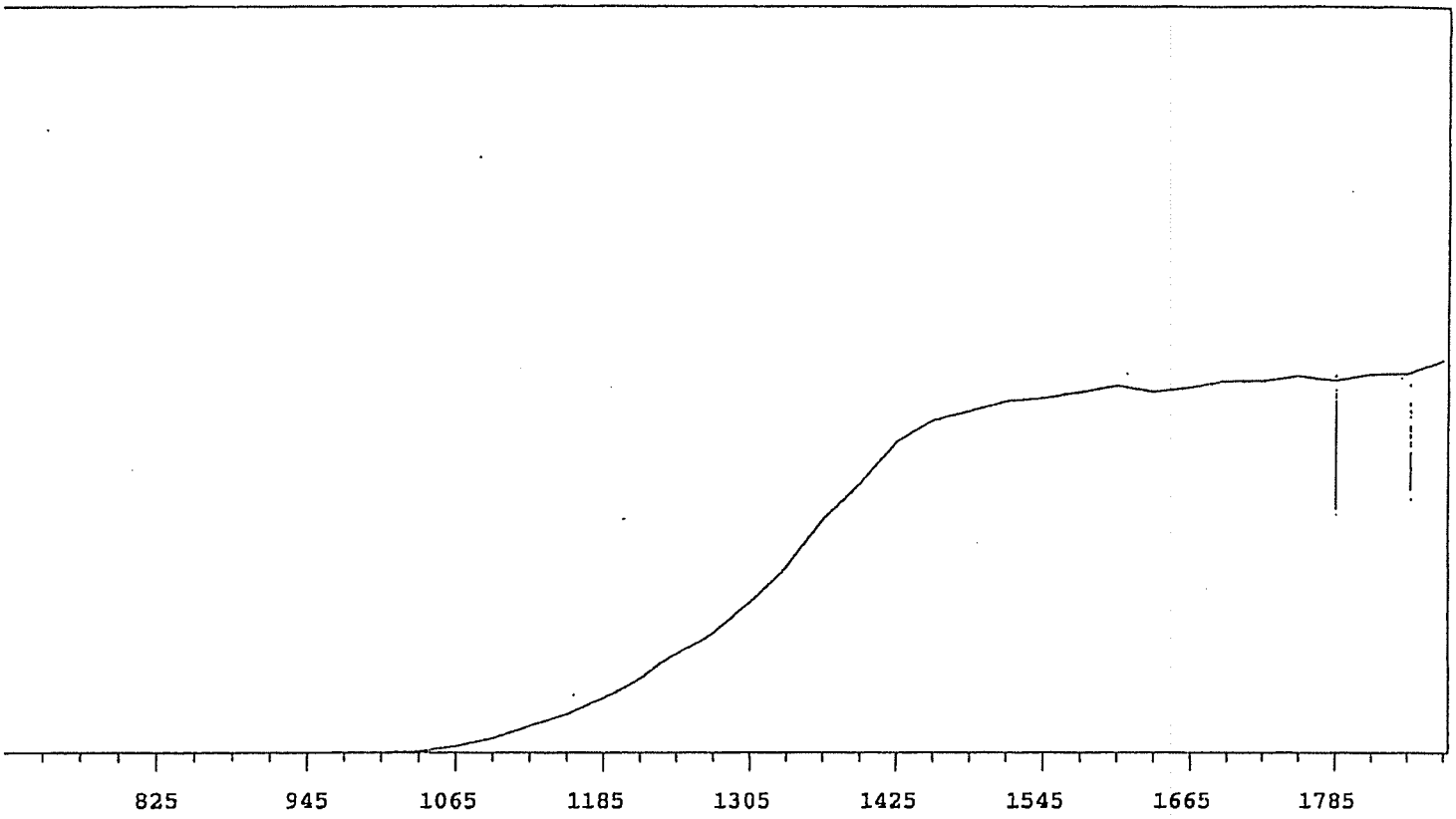
TOTVER2ndPIC.xls

SampleID	Instr	Time (min.)	Alpha Counts	Beta Counts	Count Start Time	Count End Time	Machine	Batch ID
Second Count								
V1	1A	10	0	713	3/2/2015 10:43	3/2/2015 10:53	PIC	Srv15
V2	1B	10	2	761	3/2/2015 10:43	3/2/2015 10:53	PIC	Srv15
V3	1C	10	8	830	3/2/2015 10:43	3/2/2015 10:53	PIC	Srv15
V4	1D	10	6	857	3/2/2015 10:43	3/2/2015 10:53	PIC	Srv15
V5	2A	10	4	759	3/2/2015 10:44	3/2/2015 10:54	PIC	Srv15
V6	2B	10	0	736	3/2/2015 10:44	3/2/2015 10:54	PIC	Srv15
V7	2C	10	4	889	3/2/2015 10:44	3/2/2015 10:54	PIC	Srv15
V8	2D	10	2	871	3/2/2015 10:44	3/2/2015 10:54	PIC	Srv15
V1	3A	10	21	711	3/2/2015 10:57	3/2/2015 11:07	PIC	Srv15
V2	3B	10	5	779	3/2/2015 10:57	3/2/2015 11:07	PIC	Srv15
V3	3C	10	1	782	3/2/2015 10:57	3/2/2015 11:07	PIC	Srv15
V4	3D	10	0	805	3/2/2015 10:57	3/2/2015 11:07	PIC	Srv15
V5	4A	10	6	737	3/2/2015 10:57	3/2/2015 11:07	PIC	Srv15
V6	4B	10	4	737	3/2/2015 10:57	3/2/2015 11:07	PIC	Srv15
V7	4C	10	4	841	3/2/2015 10:57	3/2/2015 11:07	PIC	Srv15
V8	4D	10	8	849	3/2/2015 10:57	3/2/2015 11:07	PIC	Srv15
V1	5A	10	4	742	3/2/2015 11:09	3/2/2015 11:19	PIC	Srv15
V2	5B	10	2	872	3/2/2015 11:09	3/2/2015 11:19	PIC	Srv15
V3	5C	10	2	813	3/2/2015 11:09	3/2/2015 11:19	PIC	Srv15
V4	5D	10	1	896	3/2/2015 11:09	3/2/2015 11:19	PIC	Srv15
V5	6A	10	1	878	3/2/2015 11:10	3/2/2015 11:20	PIC	Srv15
V6	6B	10	4	770	3/2/2015 11:10	3/2/2015 11:20	PIC	Srv15
V7	6C	10	0	810	3/2/2015 11:13	3/2/2015 11:23	PIC	Srv15
V7	6D	10	0	0	3/2/2015 11:13	3/2/2015 11:23	PIC	Srv15
V1	7A	10	0	702	3/2/2015 11:24	3/2/2015 11:34	PIC	Srv15
V2	7B	10	2	816	3/2/2015 11:24	3/2/2015 11:34	PIC	Srv15
V3	7C	10	1	771	3/2/2015 11:24	3/2/2015 11:34	PIC	Srv15
V4	7D	10	1	839	3/2/2015 11:24	3/2/2015 11:34	PIC	Srv15
V5	8A	10	2	810	3/2/2015 11:24	3/2/2015 11:34	PIC	Srv15
V6	8B	10	2	721	3/2/2015 11:25	3/2/2015 11:35	PIC	Srv15
V7	8C	10	0	780	3/2/2015 11:25	3/2/2015 11:35	PIC	Srv15
V8	8D	10	1	835	3/2/2015 11:25	3/2/2015 11:35	PIC	Srv15

V1	9A	10	1	742	3/2/2015 11:38	3/2/2015 11:48 PIC	Srv15
V2	9B	10	2	786	3/2/2015 11:38	3/2/2015 11:48 PIC	Srv15
V3	9C	10	1	750	3/2/2015 11:38	3/2/2015 11:48 PIC	Srv15
V4	9D	10	3	841	3/2/2015 11:38	3/2/2015 11:48 PIC	Srv15
V5	10A	10	2	754	3/2/2015 11:38	3/2/2015 11:48 PIC	Srv15
V6	10B	10	0	742	3/2/2015 11:39	3/2/2015 11:49 PIC	Srv15
V7	10C	10	0	849	3/2/2015 11:39	3/2/2015 11:49 PIC	Srv15
V8	10D	10	3	852	3/2/2015 11:39	3/2/2015 11:49 PIC	Srv15
V1	11A	10	0	701	3/2/2015 11:56	3/2/2015 12:06 PIC	Srv15
V2	11B	10	0	757	3/2/2015 11:56	3/2/2015 12:06 PIC	Srv15
V3	11C	10	0	795	3/2/2015 11:56	3/2/2015 12:06 PIC	Srv15
V4	11D	10	1	850	3/2/2015 11:56	3/2/2015 12:06 PIC	Srv15
V5	12A	10	0	785	3/2/2015 11:56	3/2/2015 12:06 PIC	Srv15
V6	12B	10	0	808	3/2/2015 11:56	3/2/2015 12:06 PIC	Srv15
V7	12C	10	1	875	3/2/2015 11:56	3/2/2015 12:06 PIC	Srv15
V8	12D	10	0	817	3/2/2015 12:04	3/2/2015 12:14 PIC	Srv15
V1	13A	10	1	697	3/2/2015 12:17	3/2/2015 12:27 PIC	Srv15
V2	13B	10	0	716	3/2/2015 12:17	3/2/2015 12:27 PIC	Srv15
V3	13C	10	0	0	3/2/2015 12:17	3/2/2015 12:27 PIC	Srv15
V4	13D	10	0	695	3/2/2015 12:17	3/2/2015 12:27 PIC	Srv15
V5	14A	10	1	753	3/2/2015 12:17	3/2/2015 12:27 PIC	Srv15
V6	14B	10	1	726	3/2/2015 14:05	3/2/2015 14:15 PIC	Srv15
V7	14C	10	0	840	3/2/2015 12:17	3/2/2015 12:27 PIC	Srv15
V8	14D	10	2	804	3/2/2015 12:17	3/2/2015 12:27 PIC	Srv15

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

Alpha Volts: 1575 Beta Volts: 1575



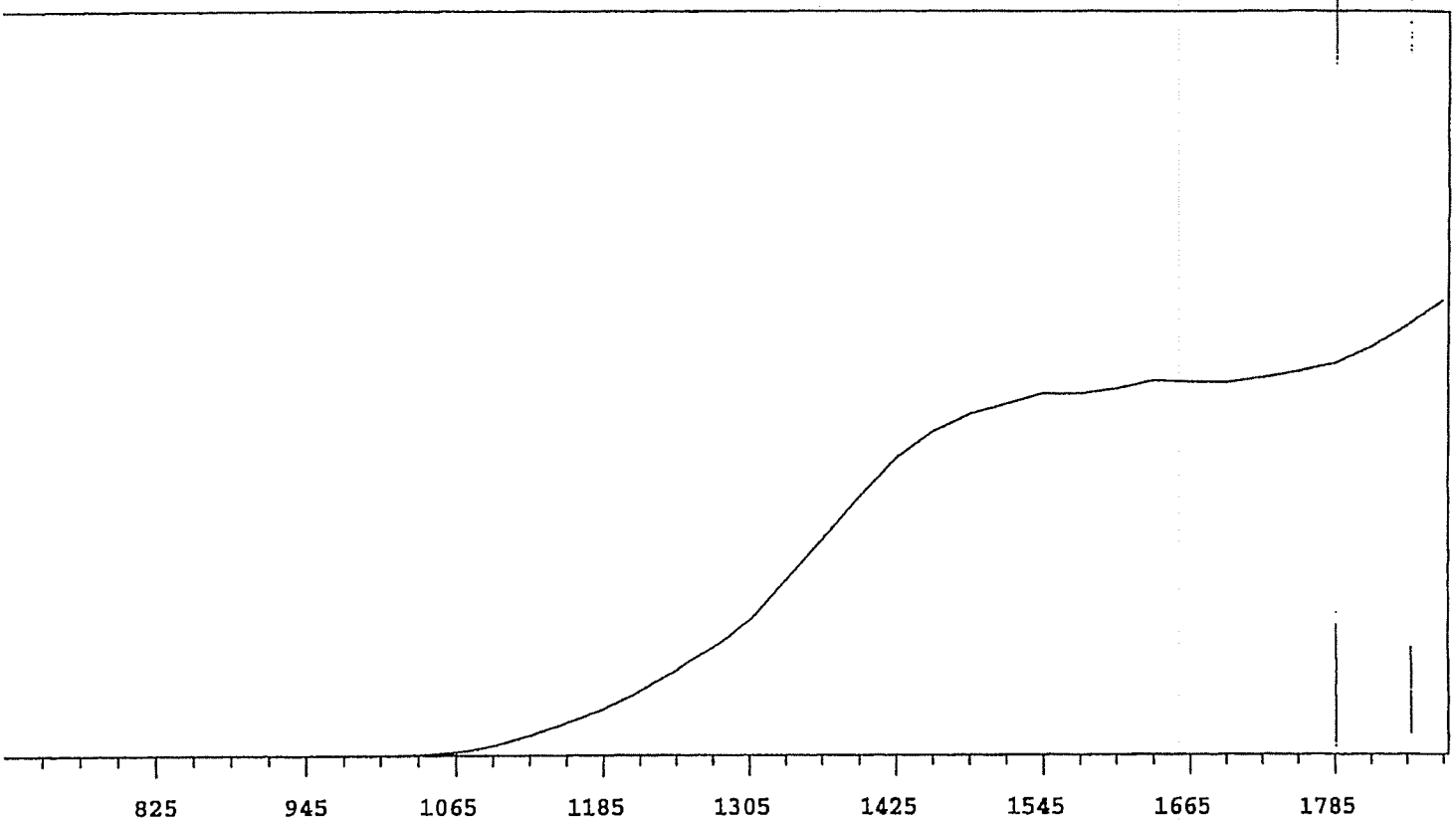
VOLTS	COUNTS	%/100 Volts
705	1	
735	1	
765	0	
795	0	+0.00
825	0	>100
855	1	>100
885	0	+55.56
915	2	+66.67
945	0	>100
975	2	>100
1005	42	>100
1035	145	>100
1065	544	>100
1095	1136	>100
1125	1967	>100
1155	2845	>100
1185	4078	>100
1215	5483	+93.18
1245	7400	+83.35
1275	9328	+75.40

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	

9/1/09

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

Alpha Volts: 1575 Beta Volts: 1575

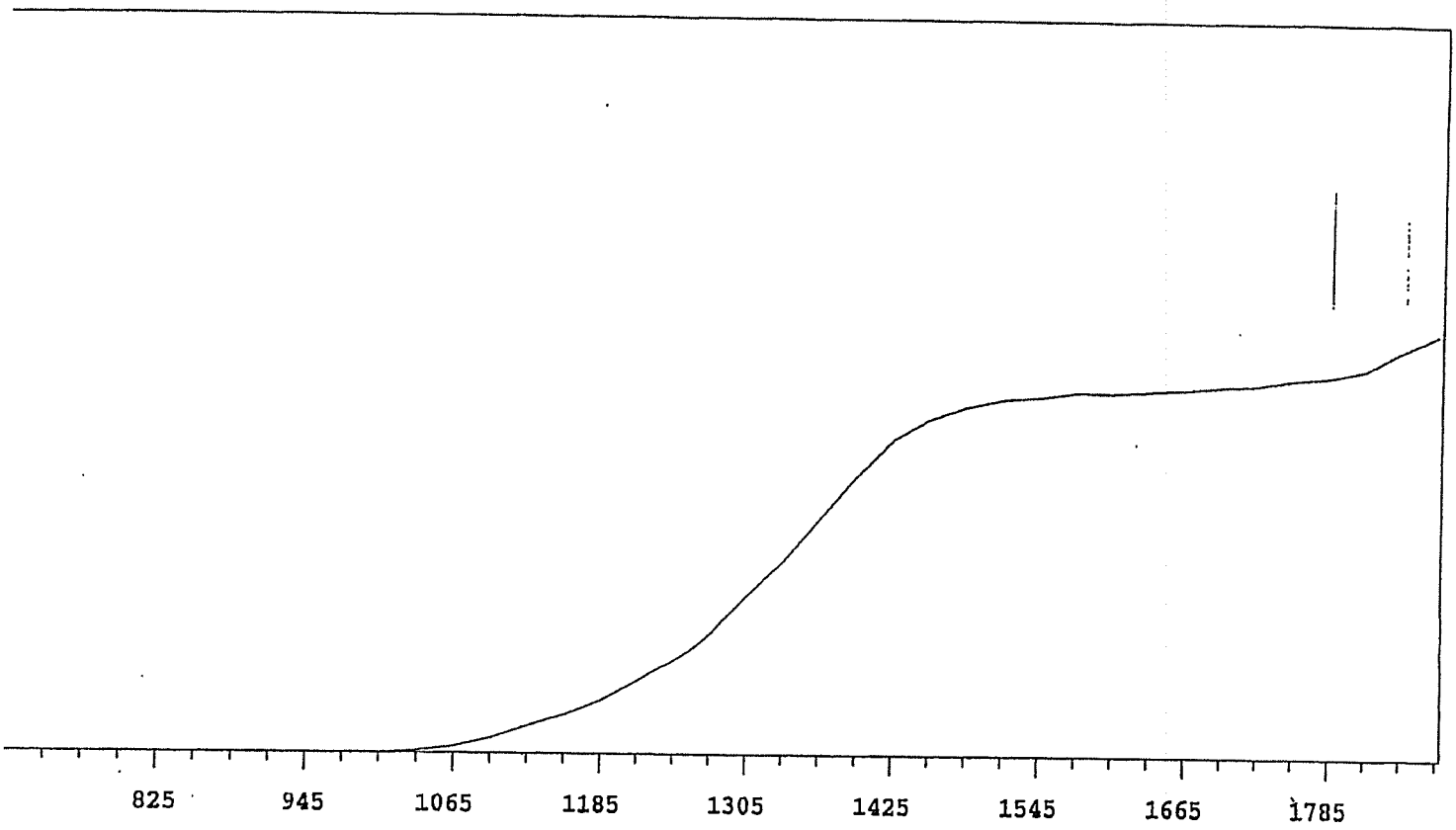


VOLTS	COUNTS	%/100 Volts
705	1	
735	0	
765	0	+55.56
795	1	+83.33
825	1	+55.56
855	0	>100
885	1	+0.00
915	0	+0.00
945	1	>100
975	0	>100
1005	4	>100
1035	56	>100
1065	292	>100
1095	890	>100
1125	1841	>100
1155	2936	>100
1185	4179	>100
1215	5837	>100
1245	7821	+91.28
1275	10638	+83.88

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

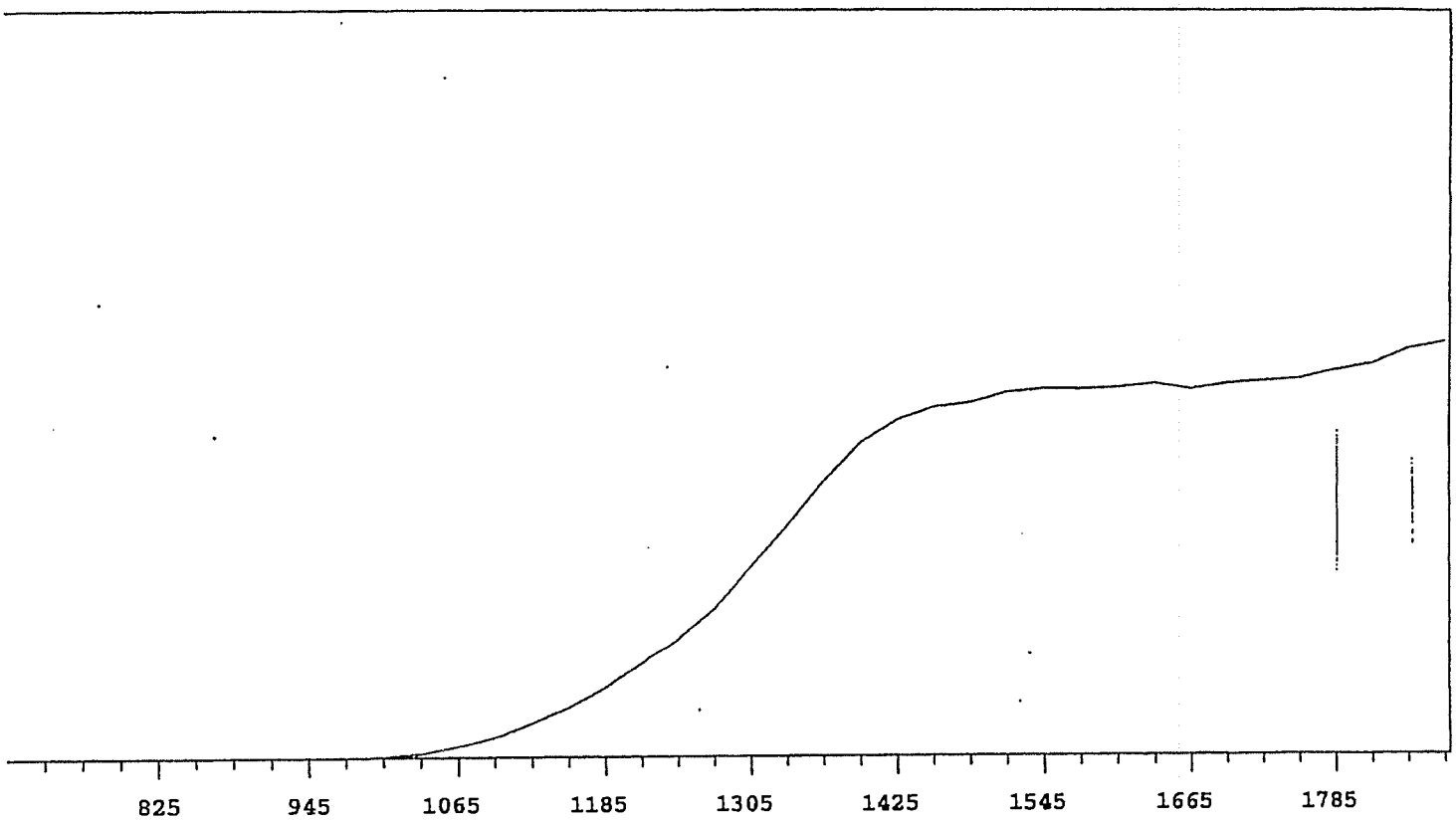


VOLTS	COUNTS	%/100 Volts
705	1	
735	0	
765	1	+0.00
795	0	>100
825	1	-55.56
855	1	+55.56
885	0	>100
915	1	>100
945	0	>100
975	4	>100
1005	32	>100
1035	206	>100
1065	639	>100
1095	1416	>100
1125	2551	>100
1155	3619	>100
1185	5037	+98.68
1215	6875	+91.19
1245	8915	+85.53
1275	11519	+77.28

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

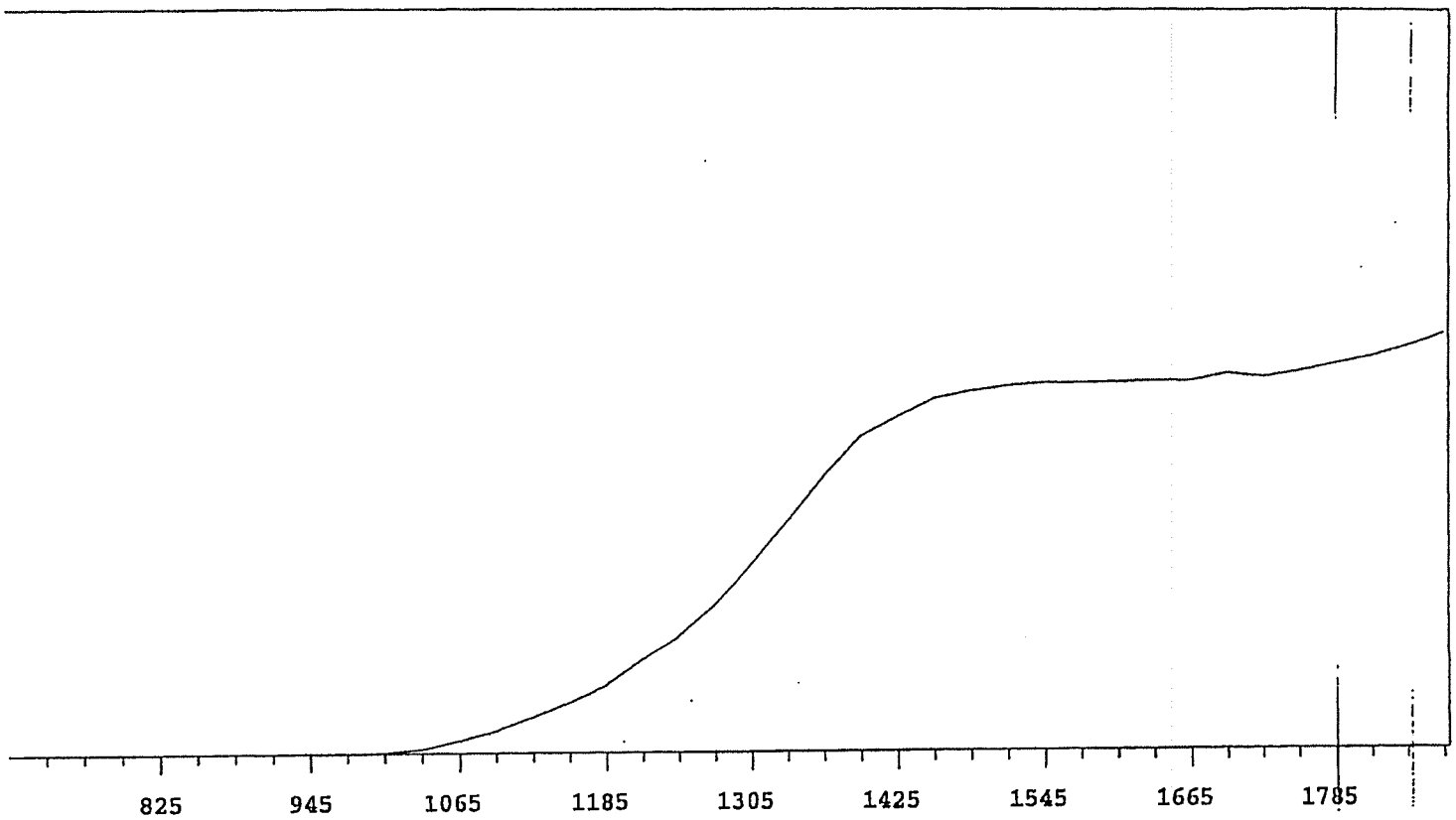


VOLTS	COUNTS	%/100 Volts
705	0	
735	1	
765	0	+0.00
795	1	+0.00
825	0	+0.00
855	1	>100
885	0	>100
915	0	>100
945	0	>100
975	8	>100
1005	75	>100
1035	303	>100
1065	872	>100
1095	1656	>100
1125	2729	>100
1155	3862	>100
1185	5425	+98.19
1215	7256	+88.82
1245	9510	+81.89
1275	11944	+74.07

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

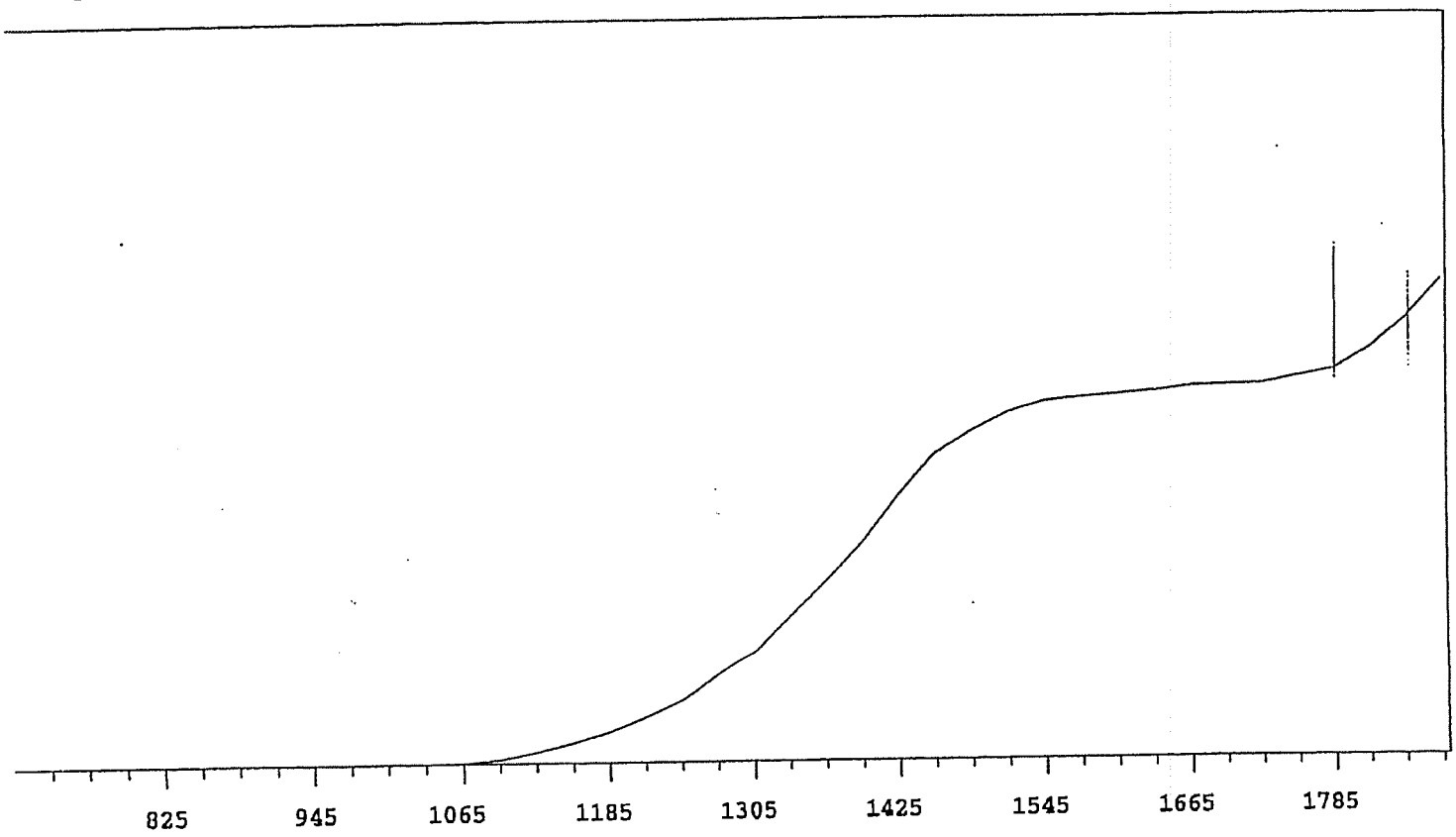


VOLTS	COUNTS	%/100 Volts
705	0	
735	1	
765	0	+83.33
795	0	-83.33
825	1	>100
855	0	>100
885	1	+100.00
915	1	>100
945	2	>100
975	12	>100
1005	91	>100
1035	421	>100
1065	1239	>100
1095	2155	>100
1125	3527	>100
1155	4974	>100
1185	6647	+97.44
1215	9250	+89.00
1245	12041	+82.15
1275	15094	+73.81

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

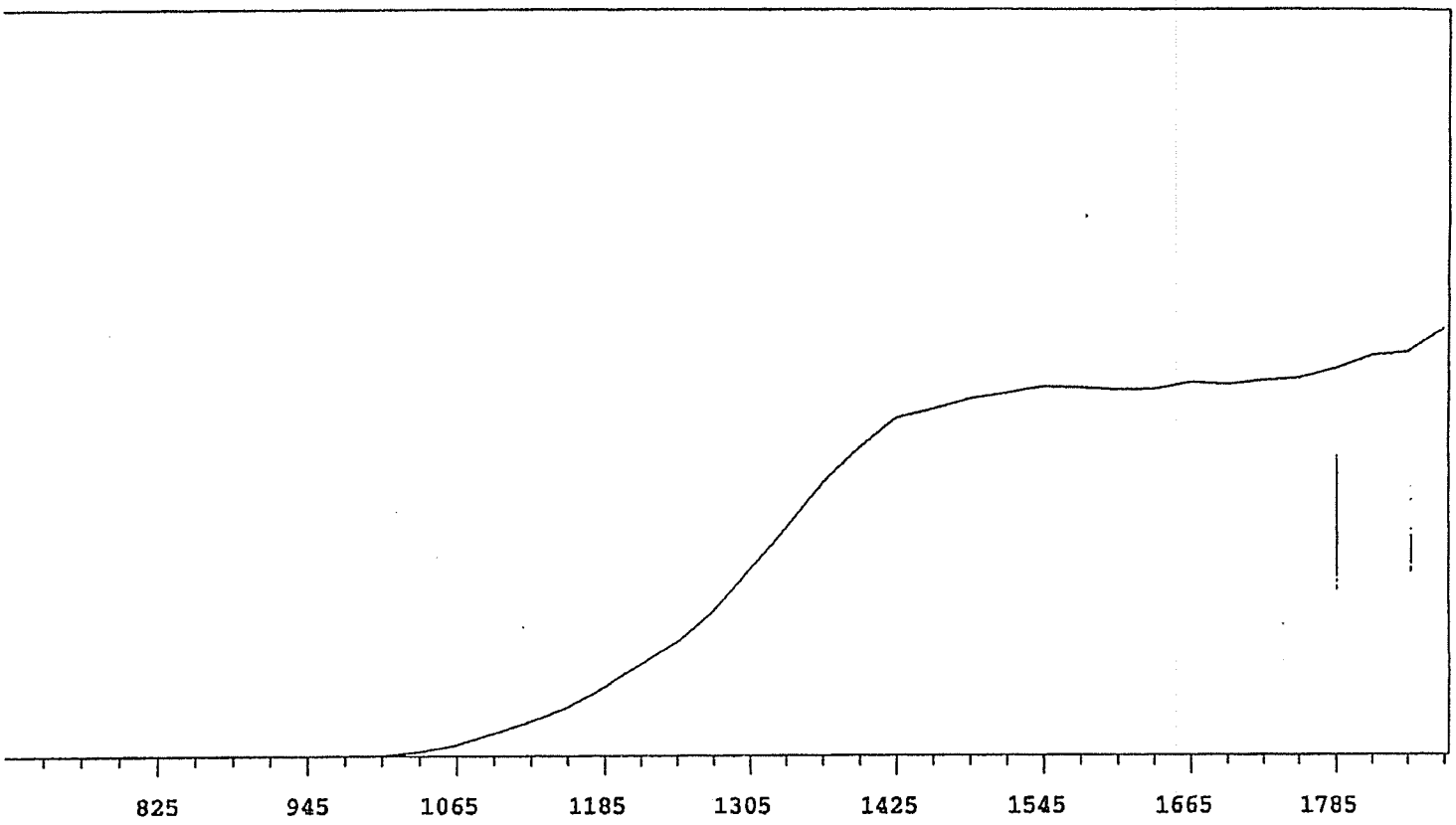


VOLTS	COUNTS	%/100 Volts
705	0	
735	1	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	1	>100
975	2	>100
1005	3	>100
1035	14	>100
1065	127	>100
1095	500	>100
1125	1332	>100
1155	2373	>100
1185	3614	>100
1215	5227	>100
1245	7060	+97.33
1275	9574	+90.30

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

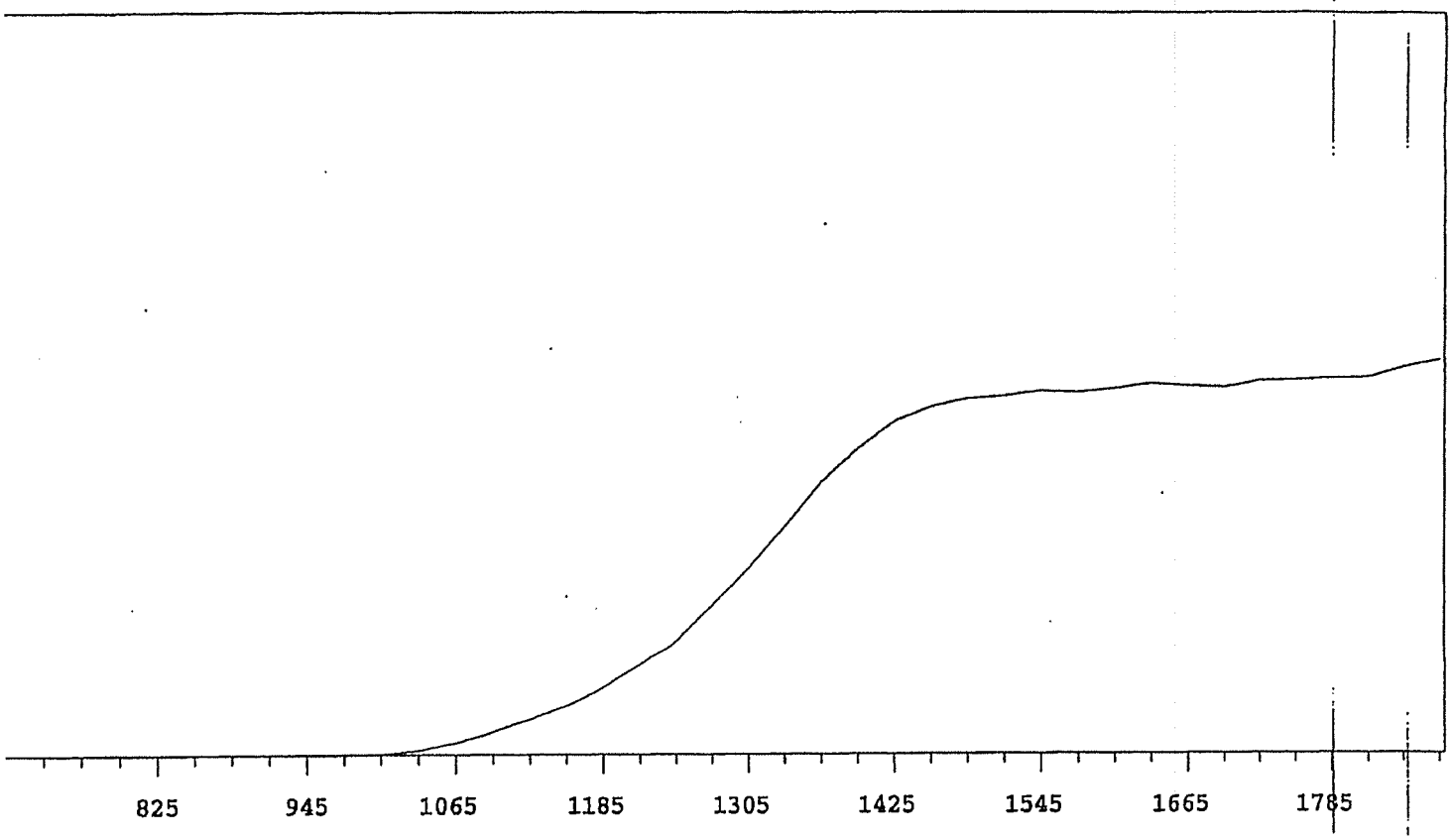


VOLTS	COUNTS	%/100 Volts
705	1	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	1	>100
945	0	>100
975	17	>100
1005	87	>100
1035	438	>100
1065	1055	>100
1095	2114	>100
1125	3282	>100
1155	4625	>100
1185	6554	+97.66
1215	8743	+88.09
1245	11345	+81.31
1275	14261	+74.60

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

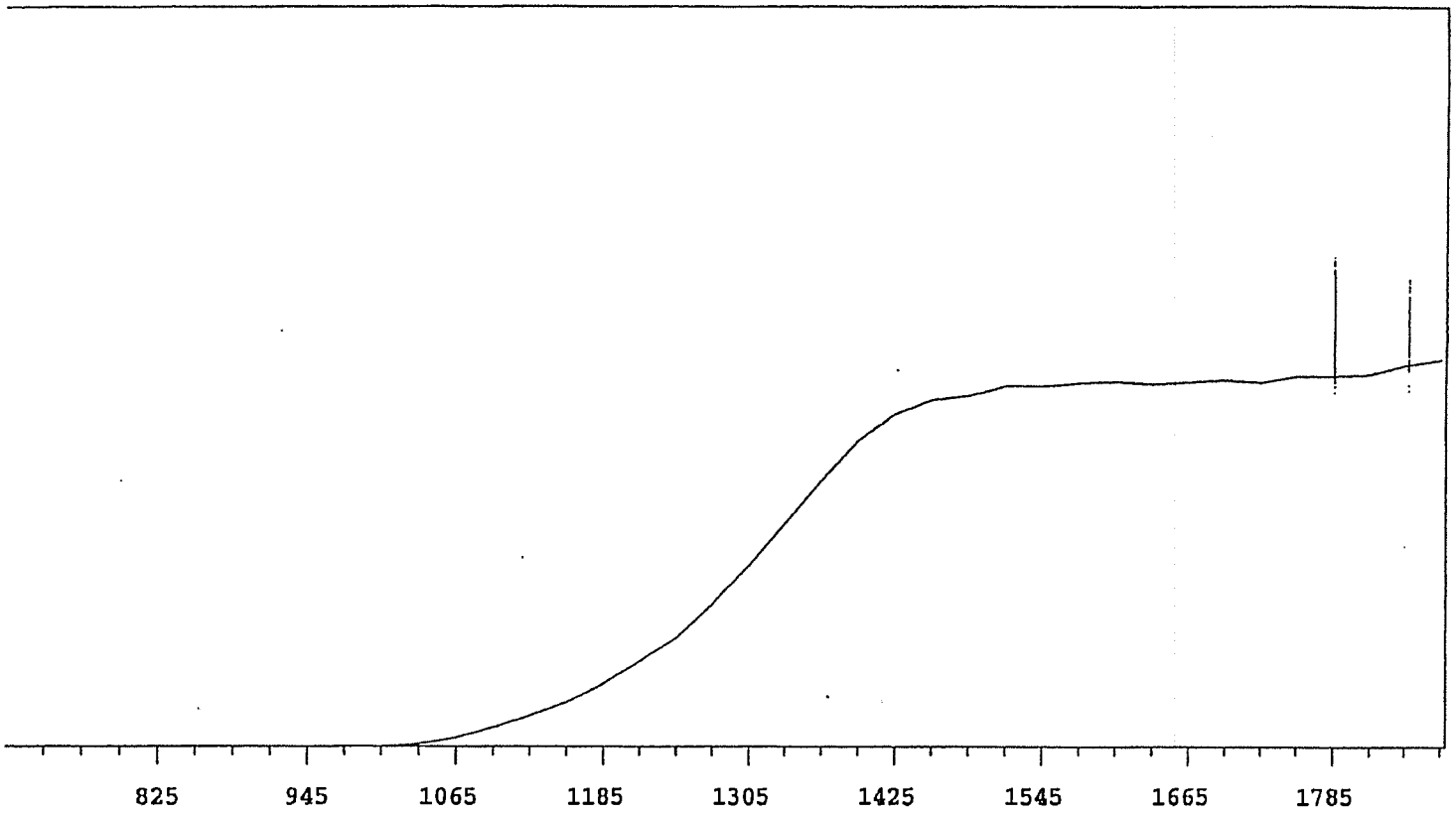


VOLTS	COUNTS	%/100 Volts
705	1	
735	0	
765	0	+83.33
795	2	+55.56
825	1	>100
855	0	>100
885	0	>100
915	0	>100
945	2	>100
975	9	>100
1005	89	>100
1035	439	>100
1065	1198	>100
1095	2164	>100
1125	3436	>100
1155	4917	>100
1185	6762	+96.59
1215	9006	+89.14
1245	11800	+81.34
1275	15132	+73.59

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

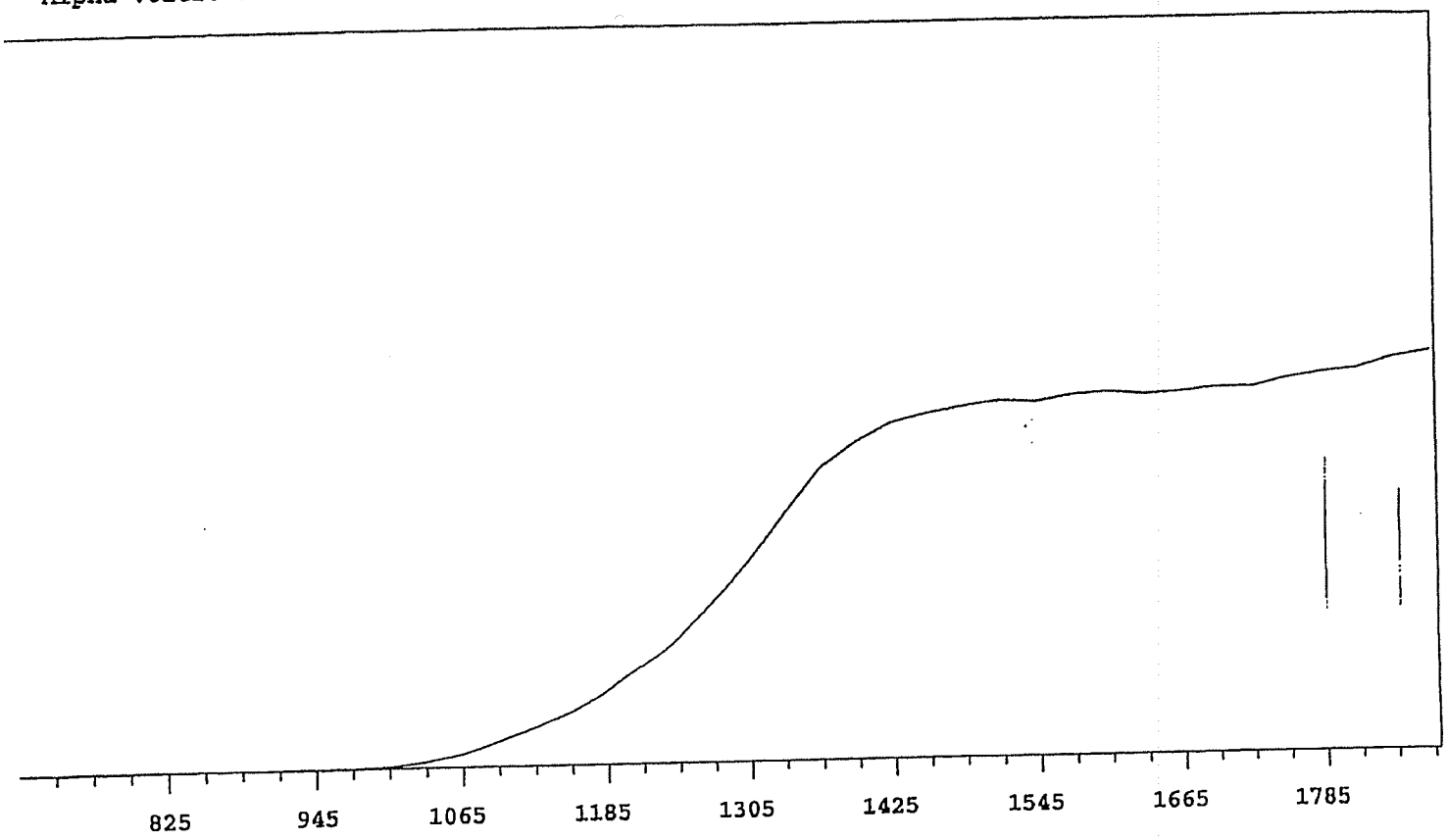


VOLTS	COUNTS	%/100 Volts
705	1	
735	0	
765	0	+55.56
795	1	>100
825	1	+0.00
855	1	>100
885	0	>100
915	0	>100
945	0	>100
975	9	>100
1005	53	>100
1035	302	>100
1065	878	>100
1095	1805	>100
1125	2887	>100
1155	4163	>100
1185	5842	+99.81
1215	7959	+90.90
1245	10323	+83.03
1275	13250	+75.91

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

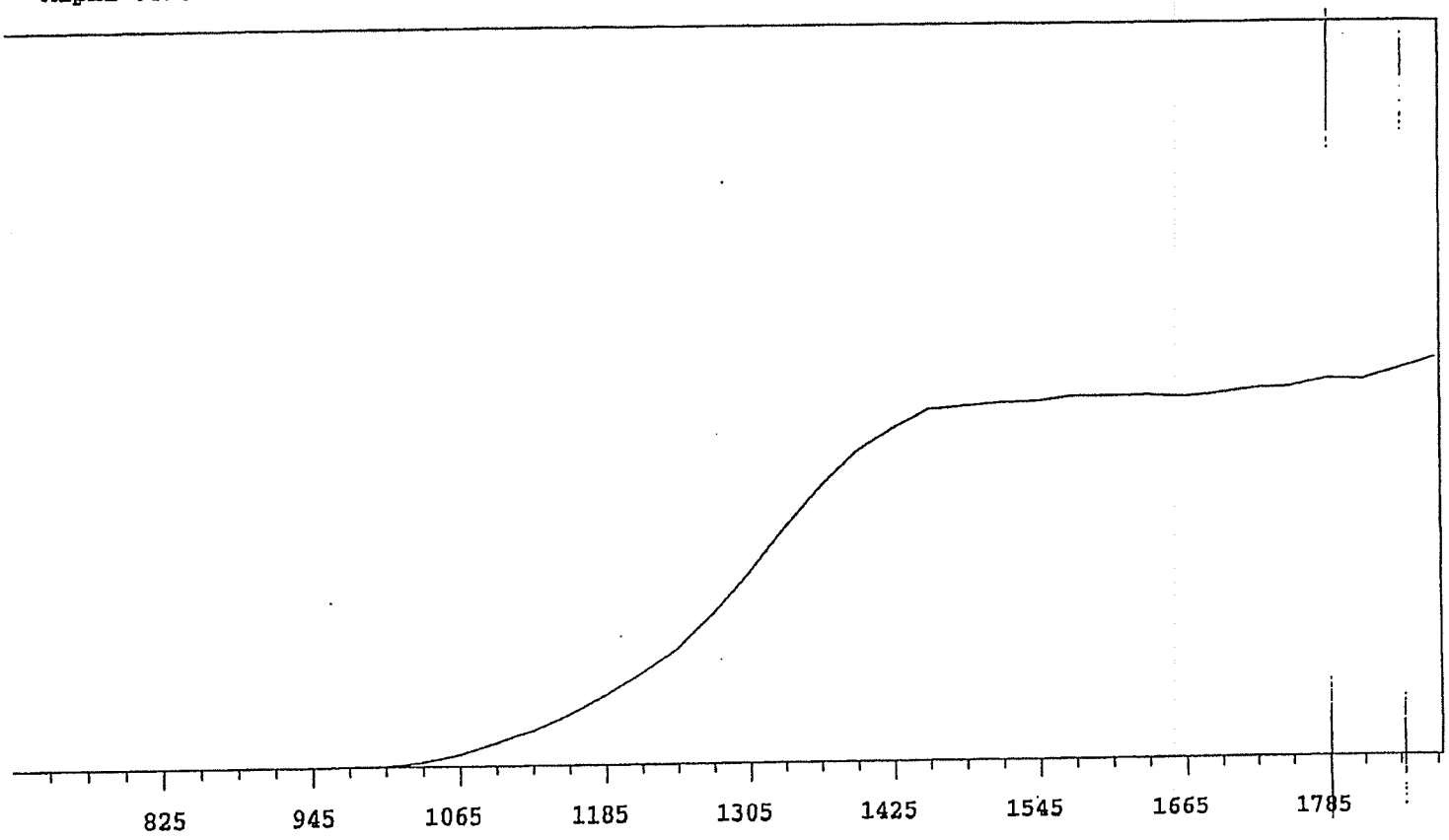


VOLTS	COUNTS	%/100 Volts
705	1	
735	1	
765	0	-55.56
795	0	>100
825	1	>100
855	3	+33.33
885	0	+0.00
915	1	>100
945	2	>100
975	29	>100
1005	165	>100
1035	613	>100
1065	1394	>100
1095	2558	>100
1125	3702	>100
1155	5222	>100
1185	7161	+96.06
1215	9507	+89.18
1245	12552	+81.52
1275	16030	+73.64

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

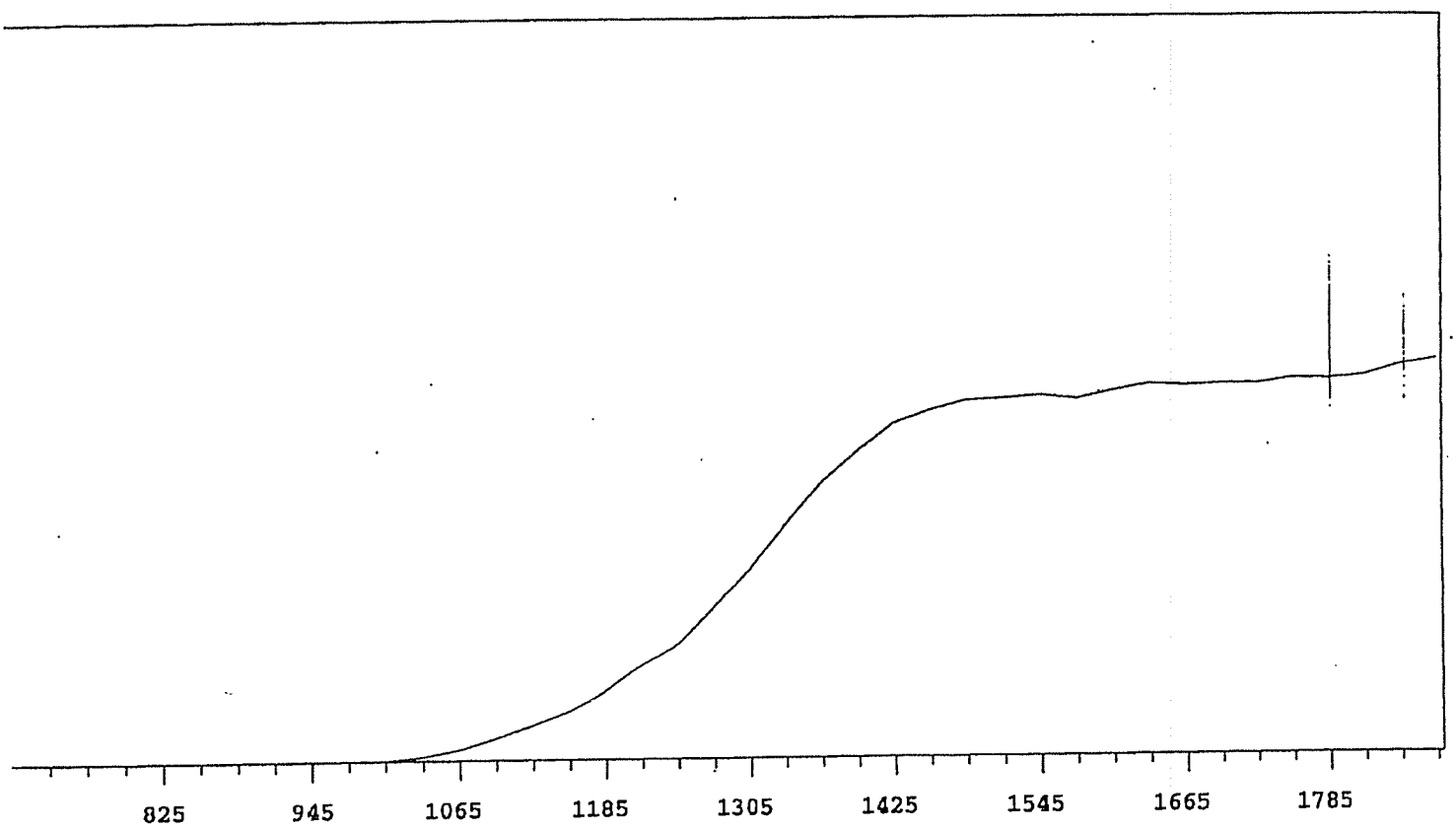


VOLTS	COUNTS	%/100 Volts
705	1	
735	1	
765	1	
795	0	>100
825	0	+0.00
855	0	>100
885	1	>100
915	1	>100
945	1	>100
975	17	>100
1005	122	>100
1035	533	>100
1065	1287	>100
1095	2493	>100
1125	3753	>100
1155	5482	>100
1185	7538	+99.39
1215	10305	+90.31
1245	13415	+82.57
1275	17141	+75.13

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

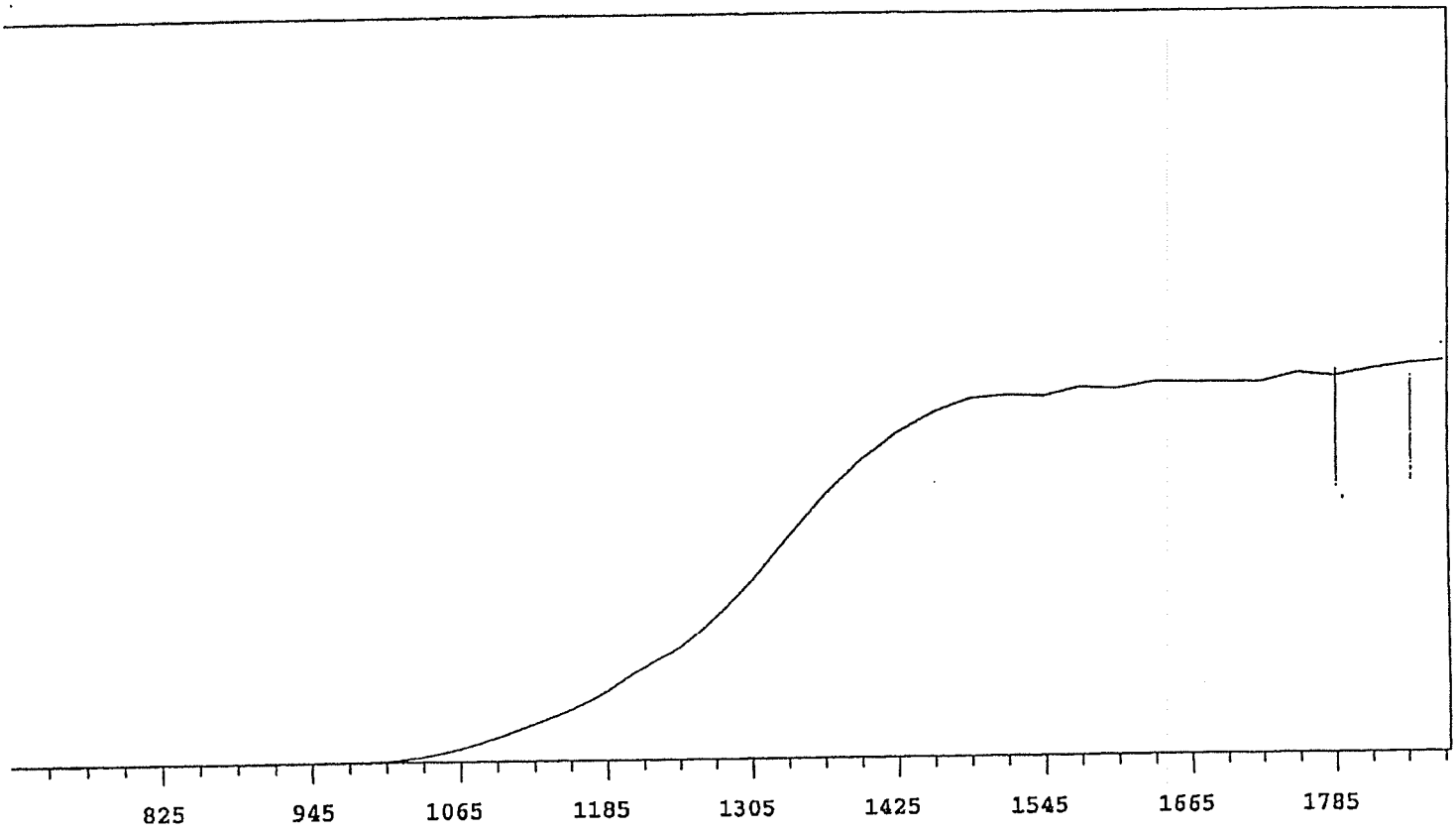


VOLTS	COUNTS	%/100 Volts
705	0	
735	1	
765	0	+0.00
795	1	>100
825	0	+83.33
855	0	-83.33
885	1	>100
915	0	>100
945	1	>100
975	12	>100
1005	51	>100
1035	298	>100
1065	848	>100
1095	1649	>100
1125	2535	>100
1155	3602	>100
1185	5036	+98.31
1215	6880	+91.37
1245	8822	+82.29
1275	11546	+74.61

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

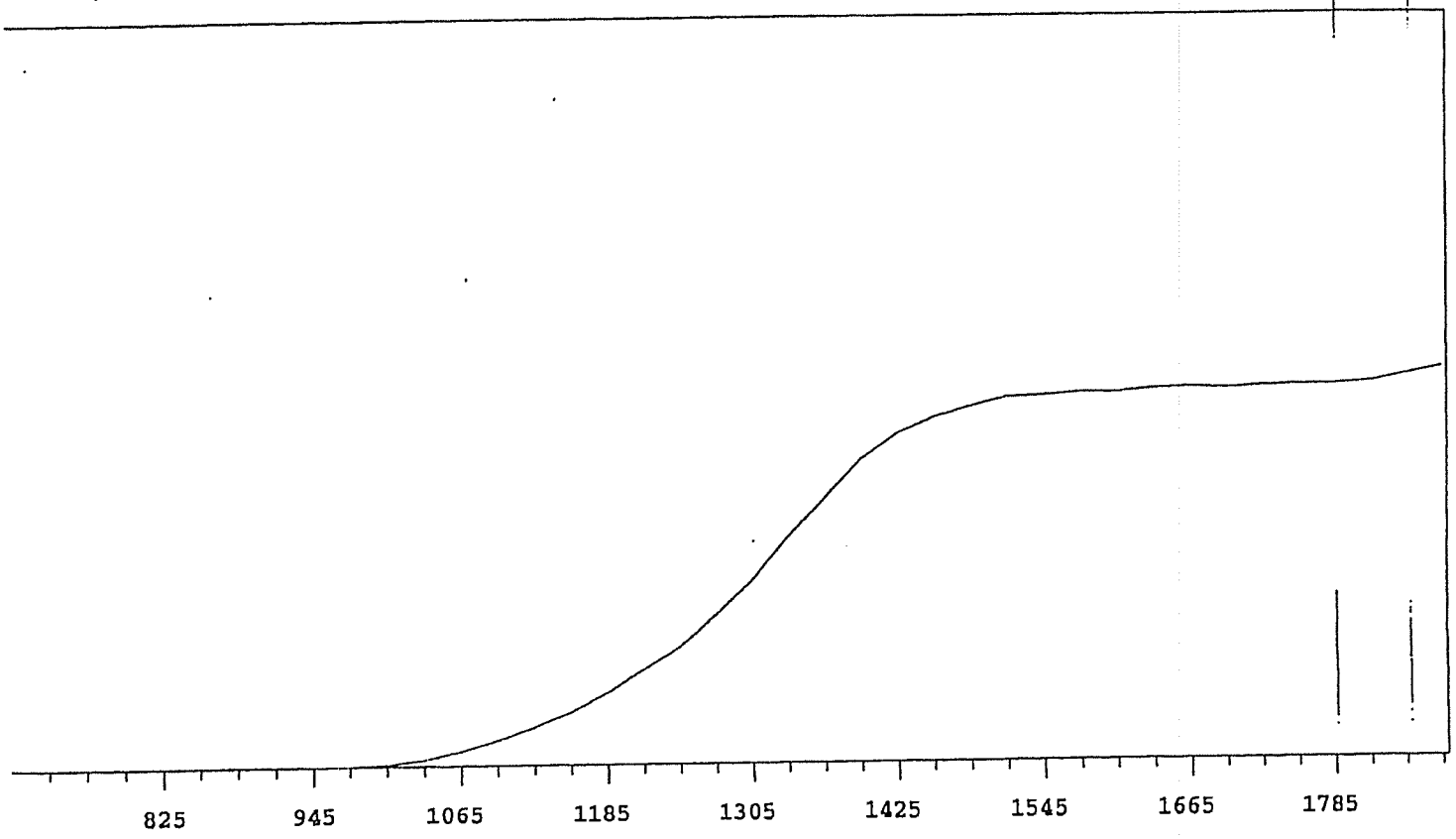


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	2	+55.56
855	1	>100
885	0	-55.56
915	3	>100
945	0	>100
975	16	>100
1005	114	>100
1035	451	>100
1065	1100	>100
1095	2068	>100
1125	3189	>100
1155	4386	>100
1185	6094	+94.81
1215	8184	+87.09
1245	10489	+78.88
1275	13273	+72.66

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

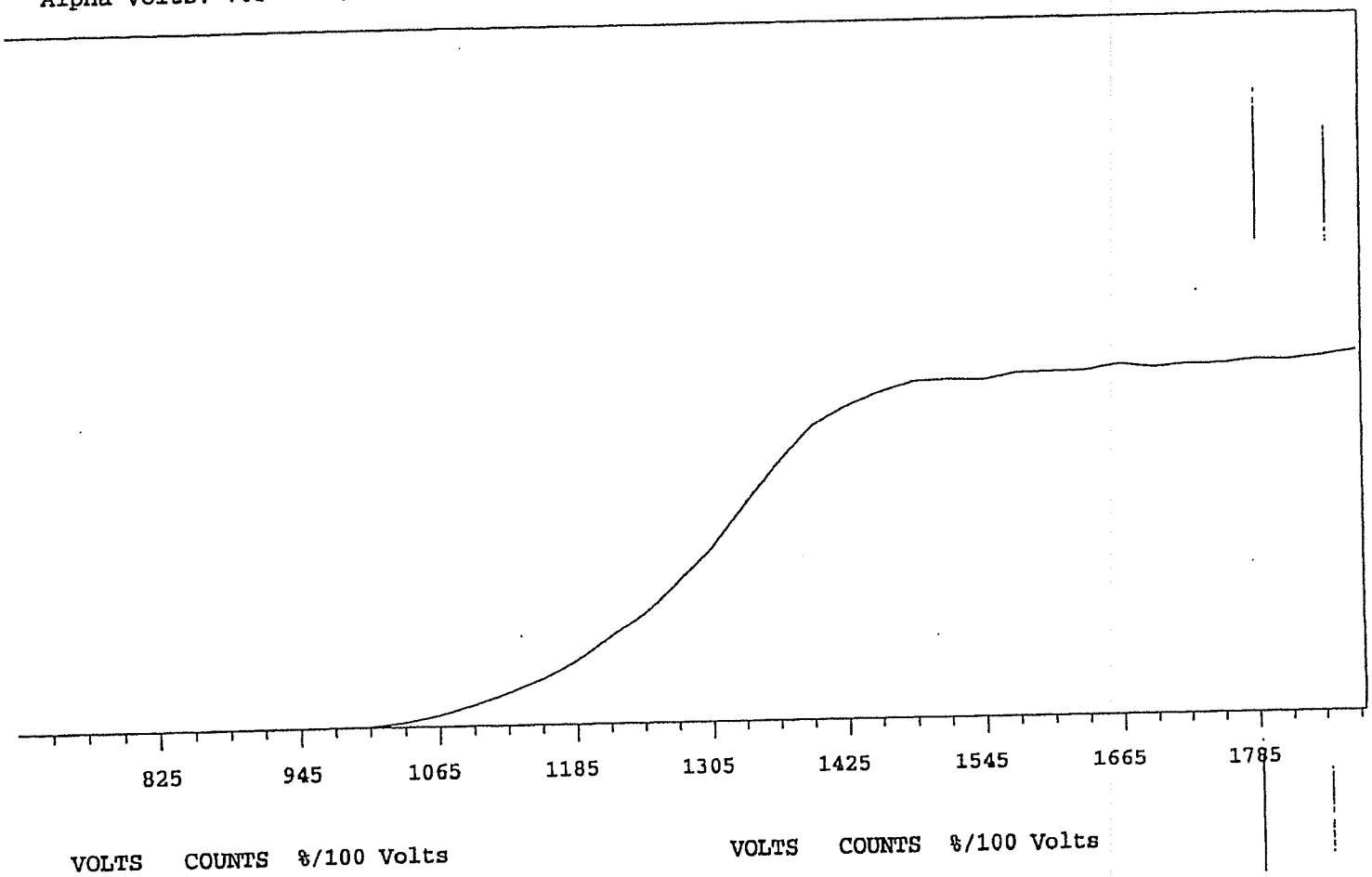


VOLTS	COUNTS	%/100 Volts
705	0	
735	1	
765	0	+0.00
795	1	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	2	>100
975	31	>100
1005	176	>100
1035	550	>100
1065	1218	>100
1095	2114	>100
1125	3212	>100
1155	4416	>100
1185	6066	+92.28
1215	7936	+85.60
1245	10288	+76.79
1275	13020	+70.59

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

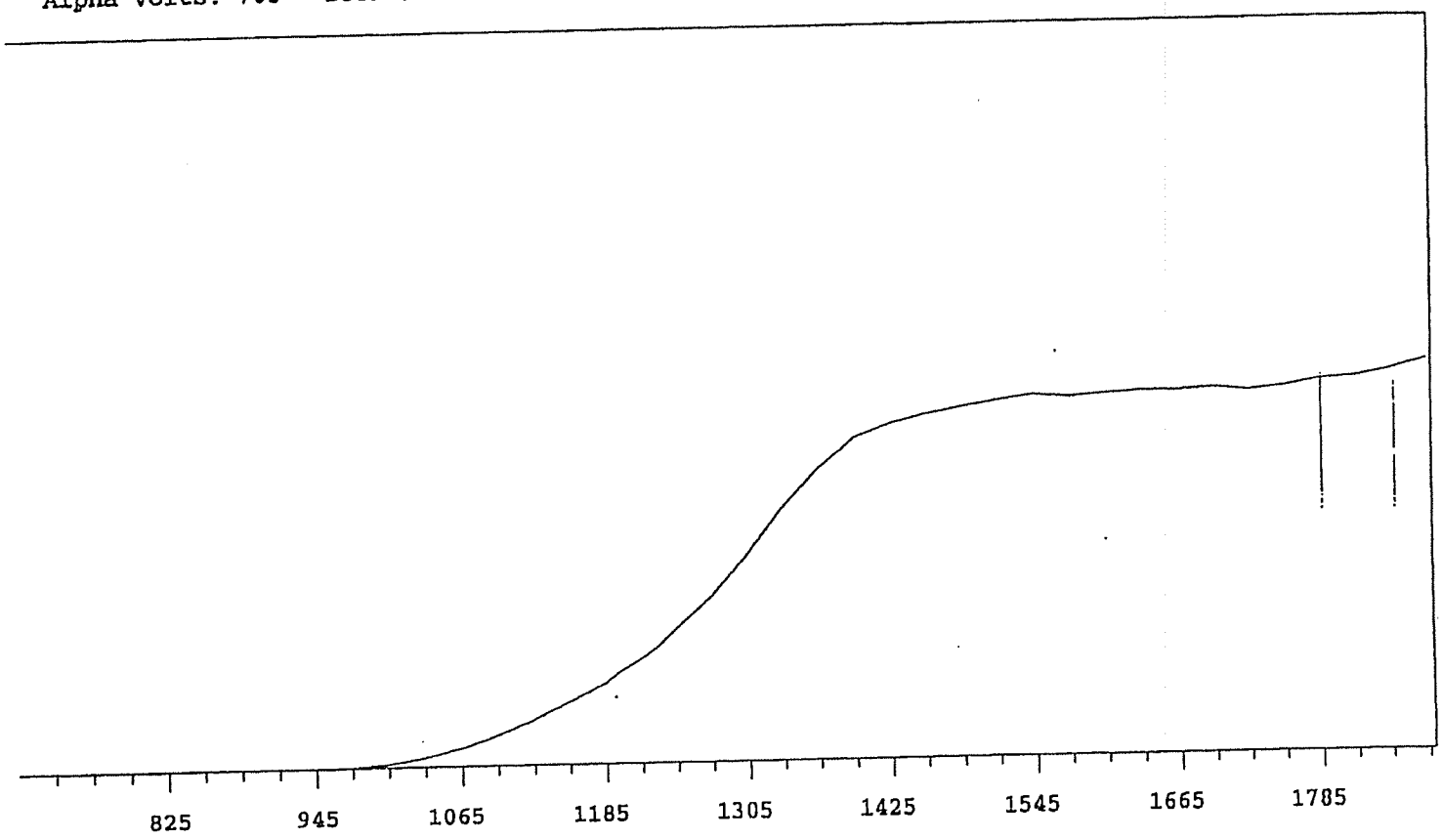


VOLTS	COUNTS	%/100 Volts
705	0	
735	1	
765	0	+55.56
795	2	+0.00
825	0	-55.56
855	1	>100
885	0	>100
915	0	>100
945	2	>100
975	24	>100
1005	134	>100
1035	558	>100
1065	1361	>100
1095	2511	>100
1125	3762	>100
1155	5246	>100
1185	7268	+96.29
1215	9733	+88.98
1245	12701	+79.94
1275	16176	+73.13

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

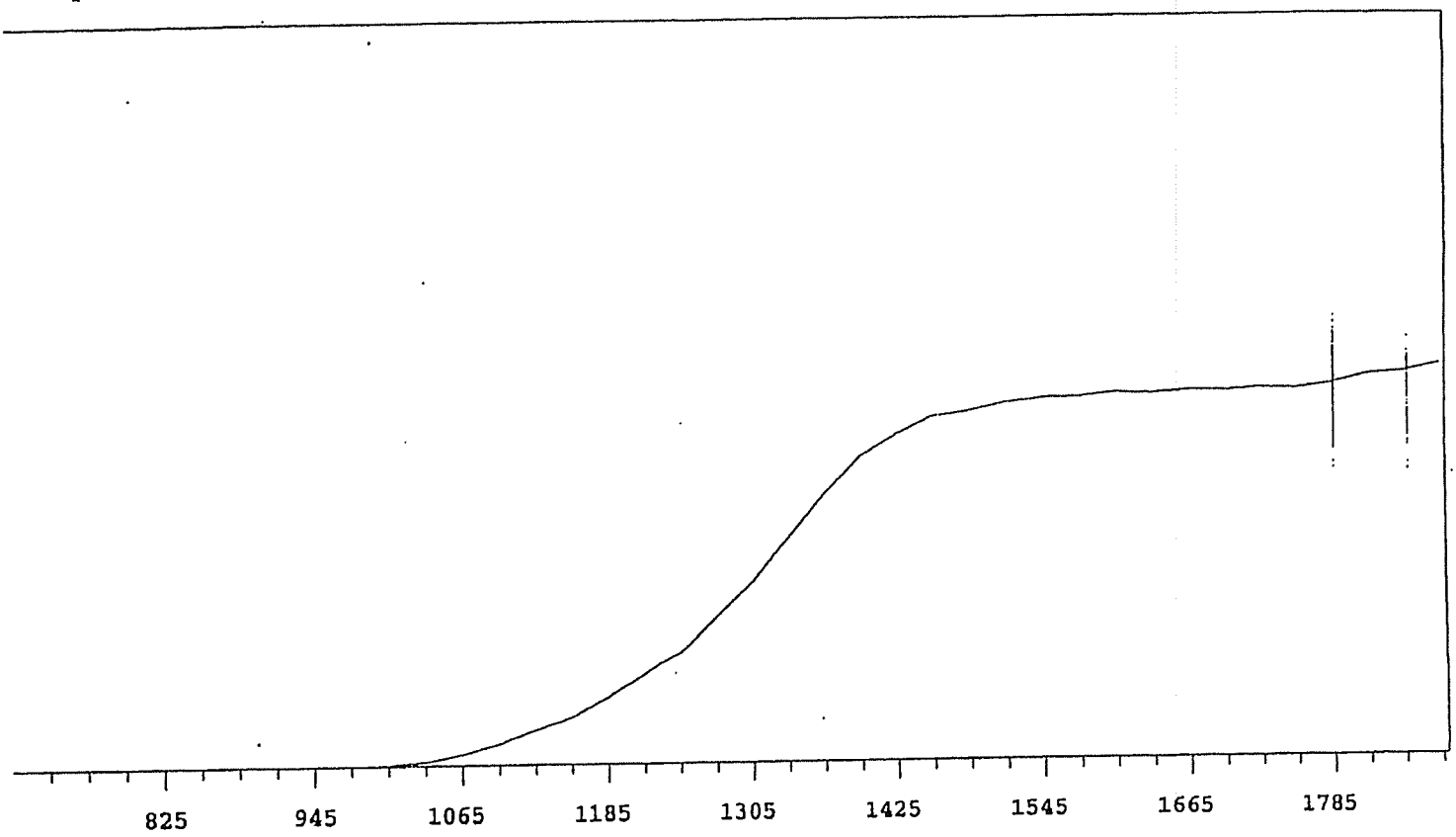


VOLTS	COUNTS	%/100 Volts
705	1	
735	0	
765	0	+0.00
795	0	>100
825	1	+83.33
855	1	+55.56
885	0	+0.00
915	1	>100
945	1	>100
975	60	>100
1005	297	>100
1035	855	>100
1065	1647	>100
1095	2700	>100
1125	3921	>100
1155	5471	+96.54
1185	7042	+90.21
1215	9405	+82.23
1245	12266	+76.33
1275	14989	+69.38

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

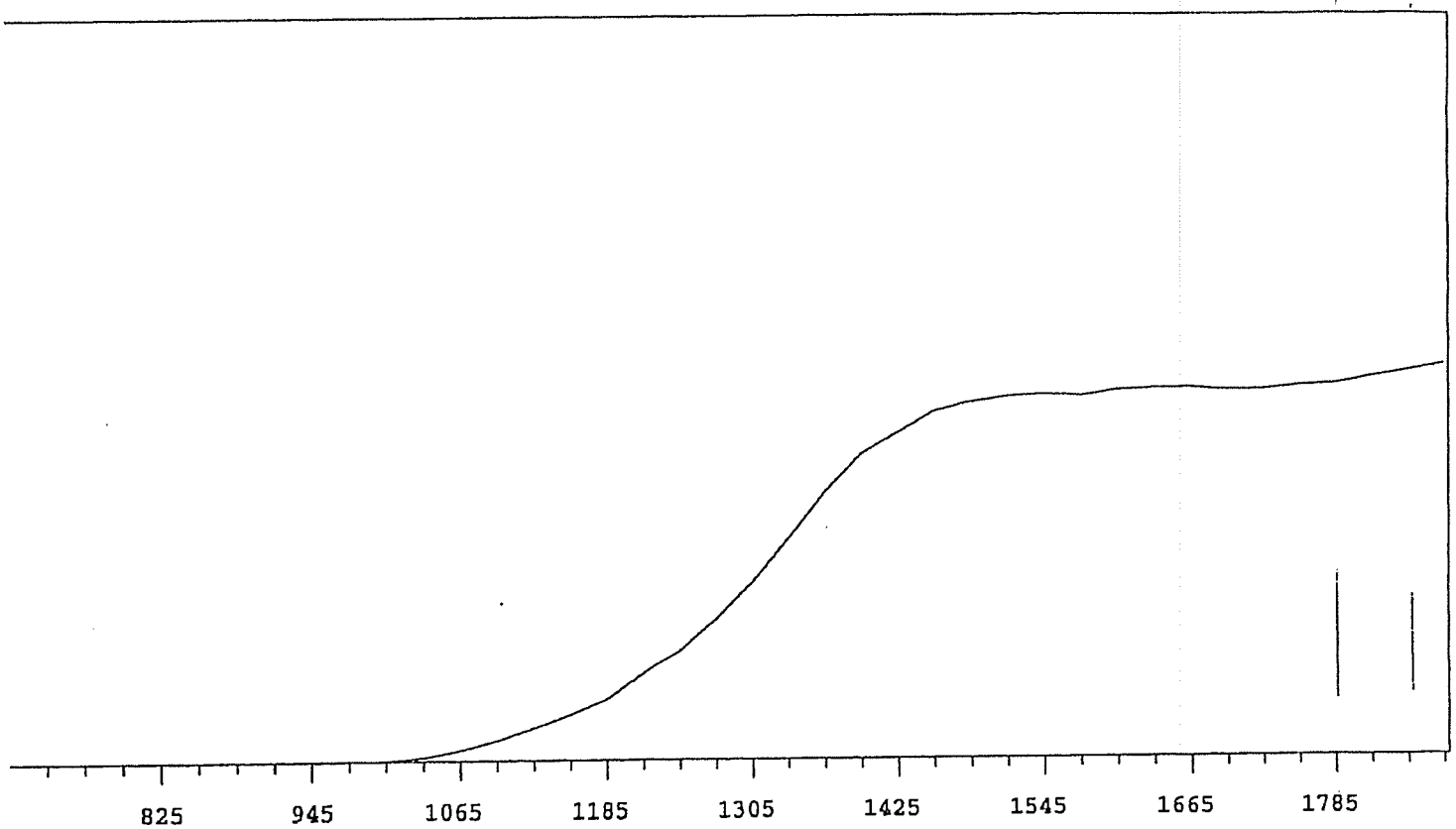


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	1	
795	1	+83.33
825	1	-83.33
855	1	>100
885	0	-55.56
915	0	>100
945	1	>100
975	9	>100
1005	76	>100
1035	308	>100
1065	814	>100
1095	1600	>100
1125	2598	>100
1155	3596	>100
1185	5065	+96.05
1215	6773	+90.23
1245	8717	+81.43
1275	11391	+74.83

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

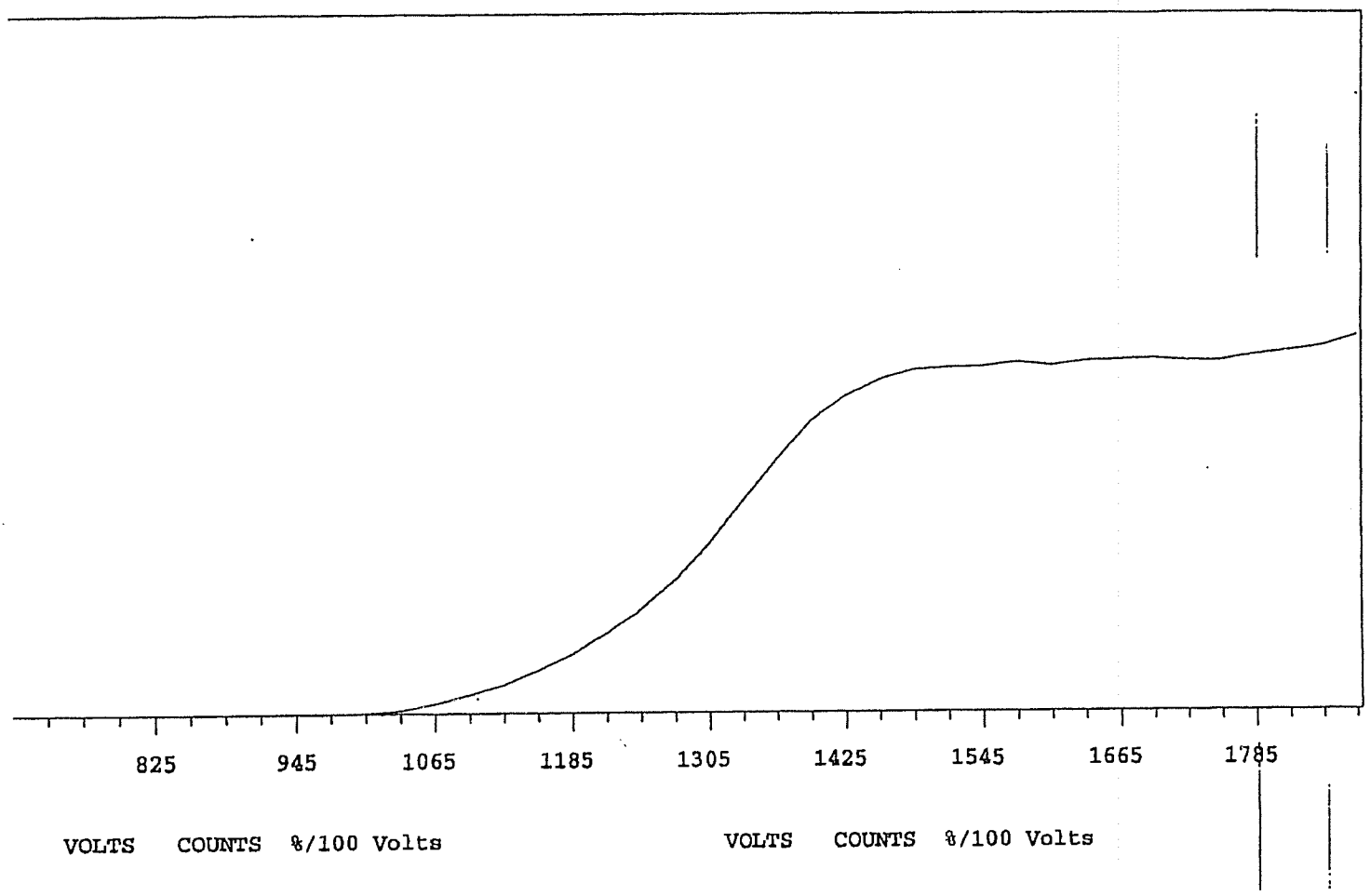
Alpha Volts: 705 Beta Volts: 1575



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
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

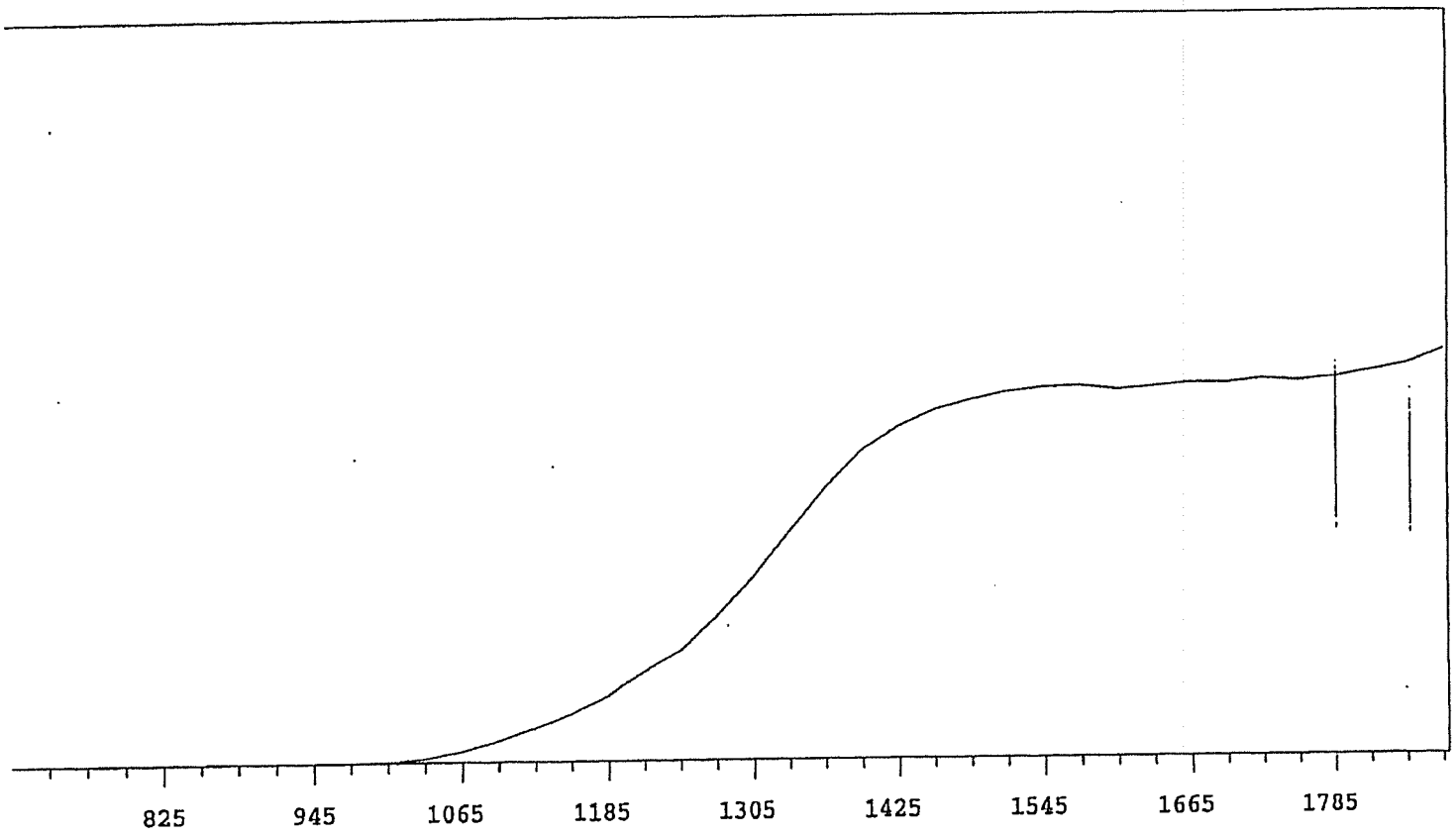
Alpha Volts: 705 Beta Volts: 1575



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
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

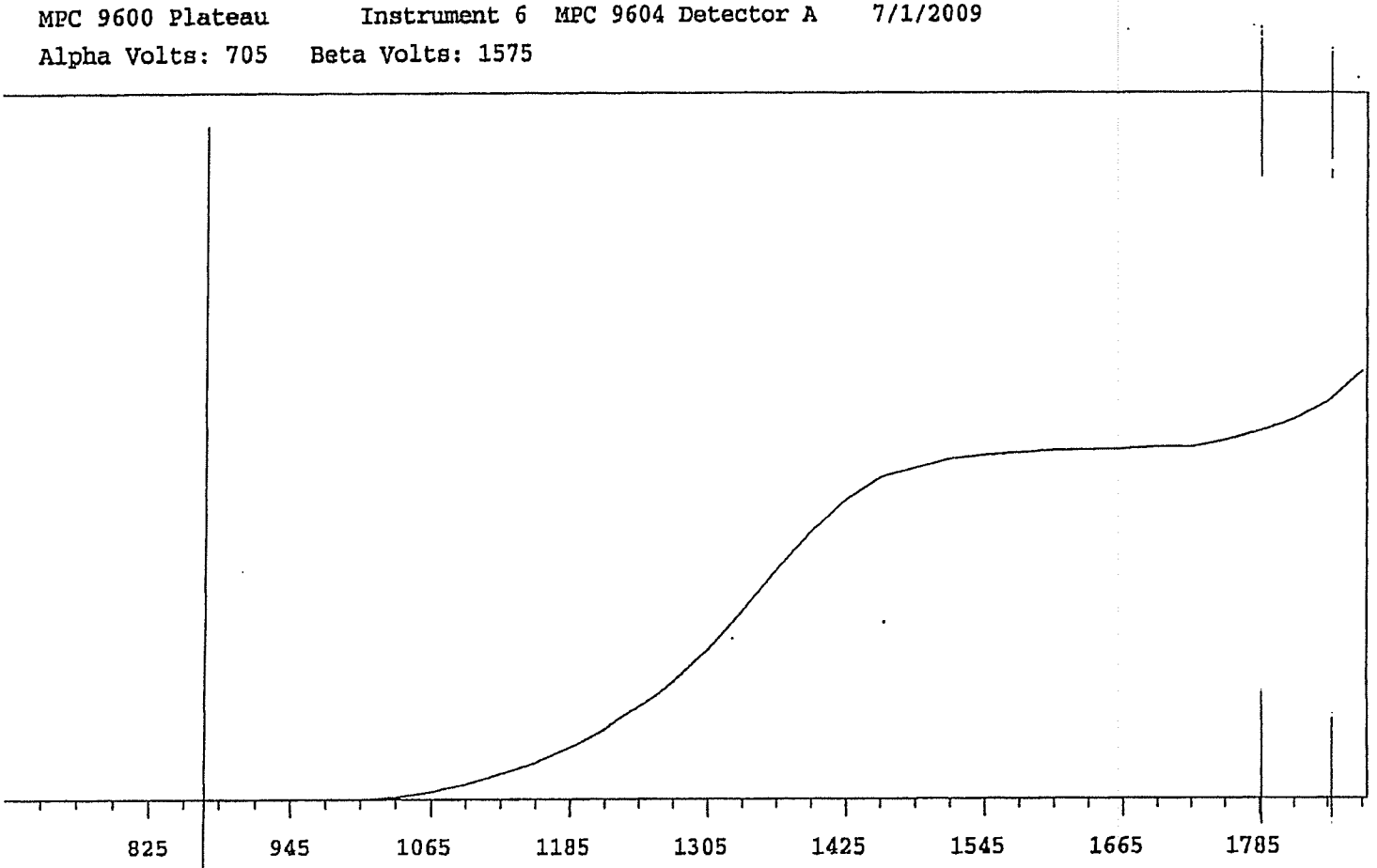


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	0	>100
975	6	>100
1005	81	>100
1035	318	>100
1065	897	>100
1095	1710	>100
1125	2714	>100
1155	3925	>100
1185	5395	+97.31
1215	7282	+88.49
1245	9426	+81.36
1275	12007	+75.65

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

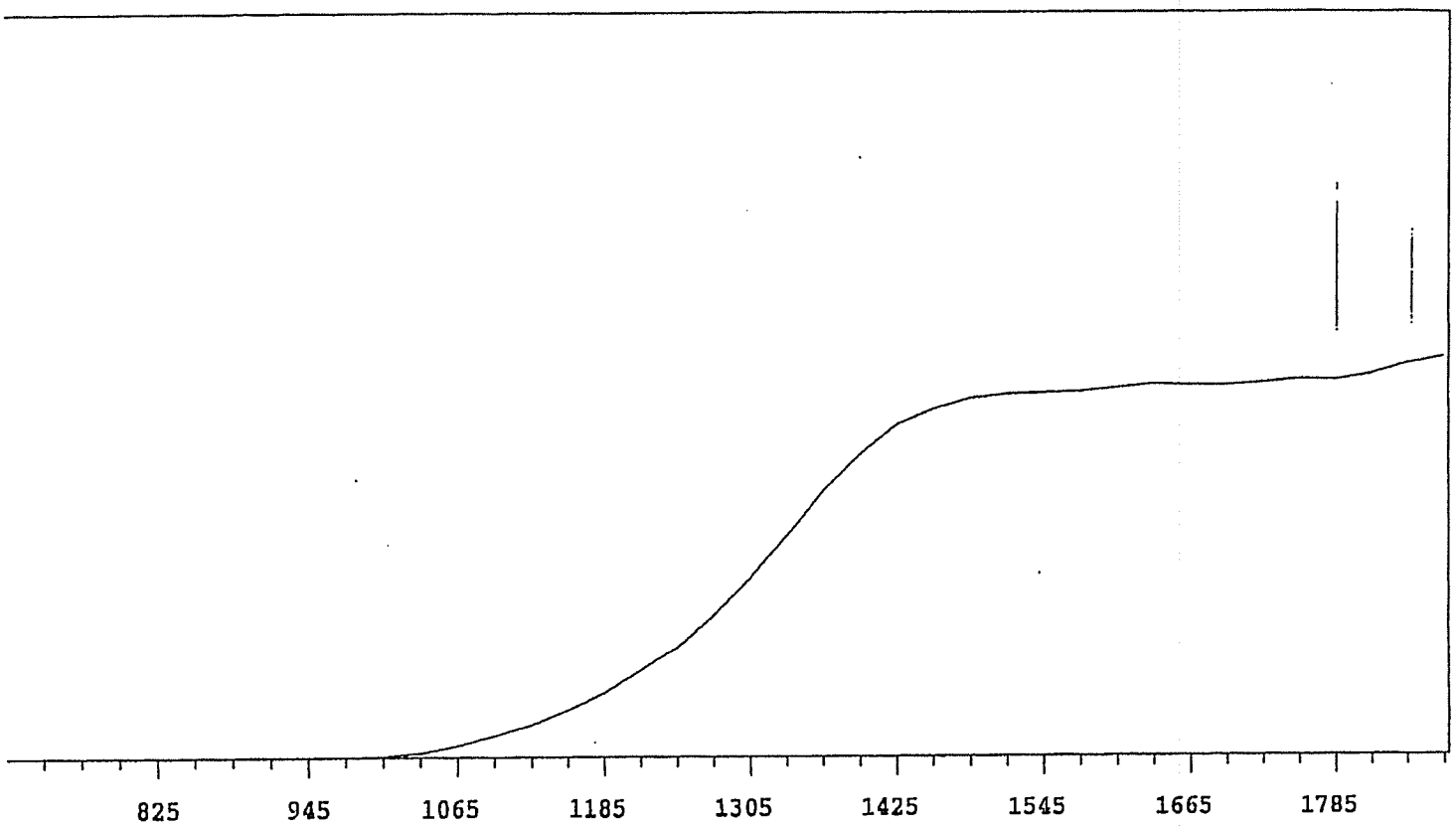
Alpha Volts: 705 Beta Volts: 1575



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	16217	+71.57
735	0		1335	20184	+63.76
765	0		1365	24605	+53.98
795	0	>100	1395	28528	+41.40
825	0	>100	1425	31675	+28.02
855	0	>100	1455	33899	+17.93
885	0	>100	1485	34826	+10.65
915	0	>100	1515	35815	+6.13
945	0	>100	1545	36225	+4.15
975	7	>100	1575	36456	+2.28
1005	31	>100	1605	36747	+1.47
1035	238	>100	1635	36801	+1.26
1065	810	>100	1665	36859	+0.85
1095	1637	>100	1695	37095	+1.85
1125	2743	>100	1725	37072	+4.01
1155	3932	>100	1755	37724	+6.65
1185	5579	>100	1785	38802	+10.33
1215	7602	+94.41	1815	40036	+14.71
1245	10078	+84.86	1845	41975	
1275	13091	+77.67	1875	45123	

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

Alpha Volts: 705 Beta Volts: 1575

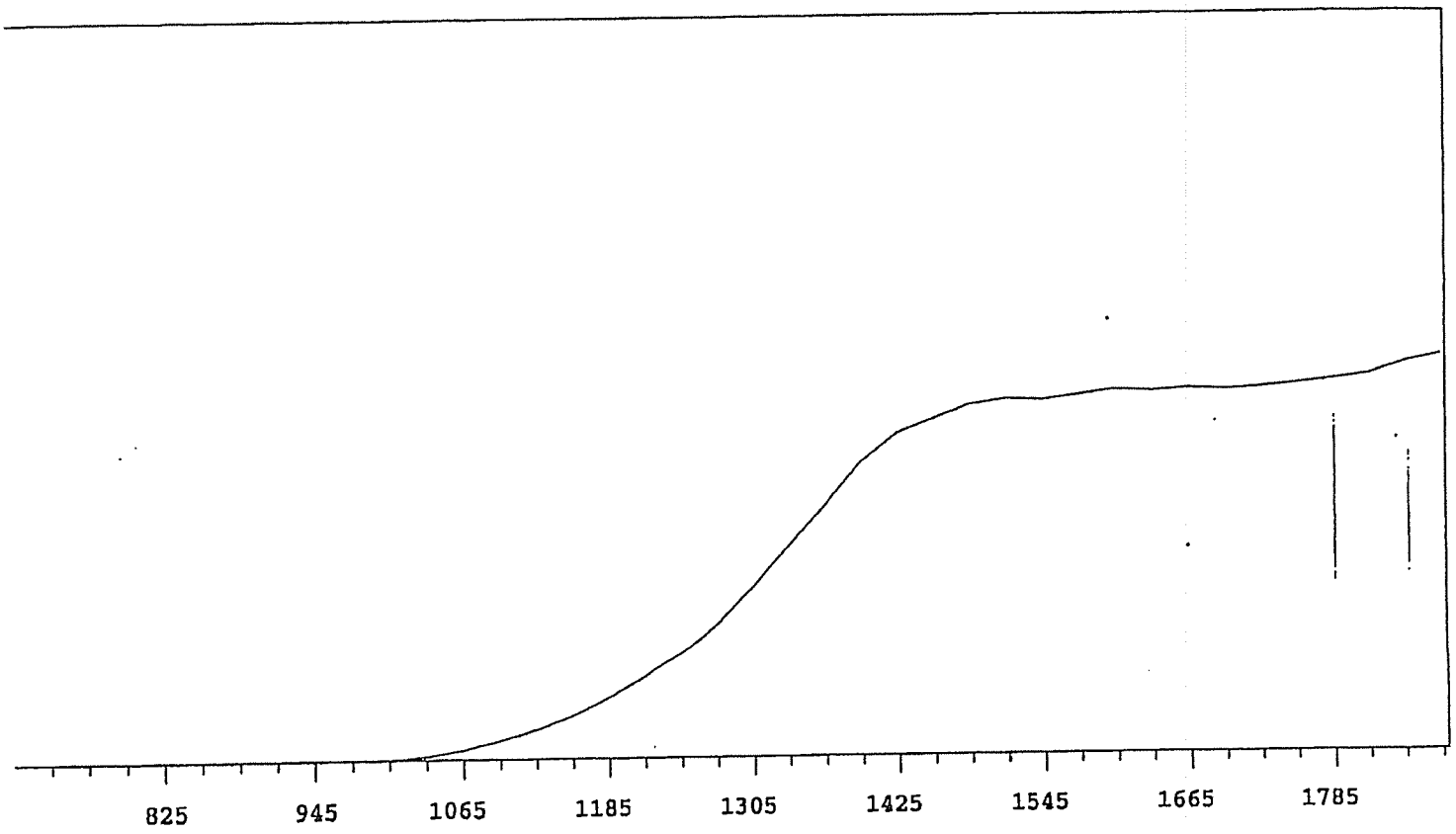


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	1	+83.33
855	1	-83.33
885	0	>100
915	0	>100
945	5	>100
975	18	>100
1005	125	>100
1035	482	>100
1065	1255	>100
1095	2318	>100
1125	3540	>100
1155	5288	>100
1185	7168	+98.51
1215	9760	+88.48
1245	12656	+81.52
1275	16065	+74.58

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

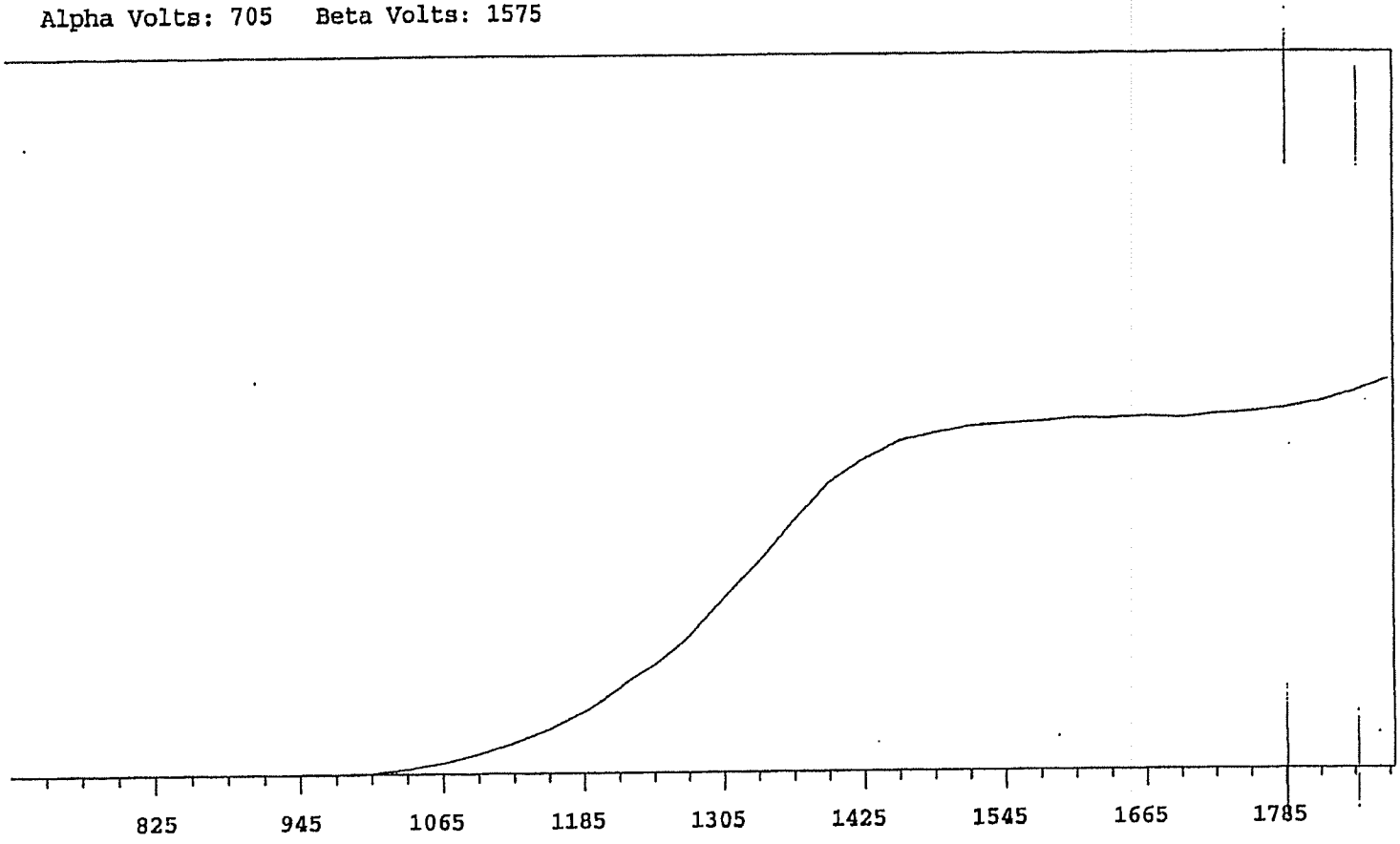


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	1	+0.00
795	0	>100
825	0	+0.00
855	0	>100
885	1	>100
915	1	>100
945	2	>100
975	8	>100
1005	70	>100
1035	353	>100
1065	990	>100
1095	1956	>100
1125	3024	>100
1155	4400	>100
1185	6173	+99.75
1215	8230	+89.85
1245	10904	+82.36
1275	13747	+76.18

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

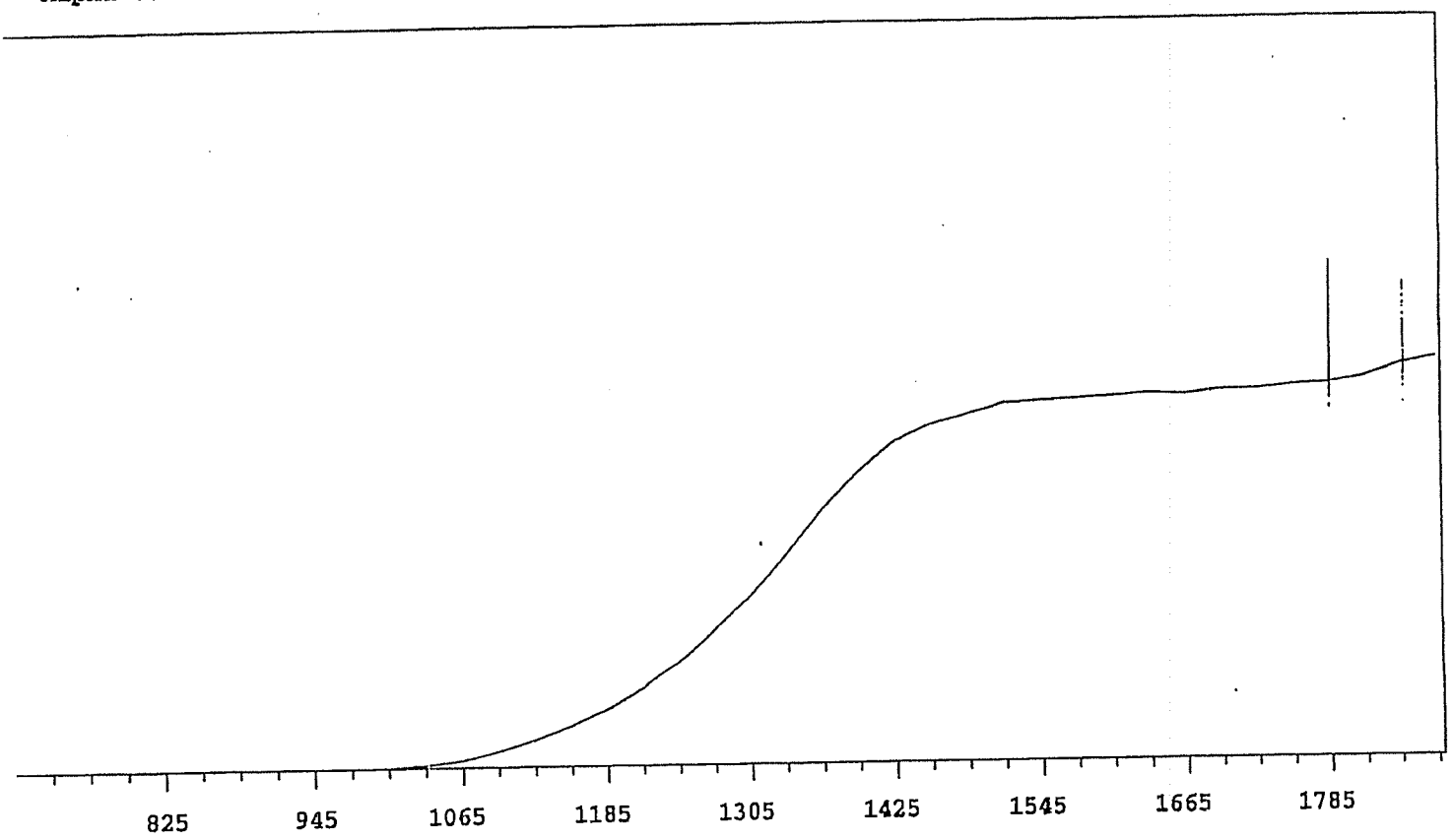


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	1	+0.00
825	0	>100
855	0	+0.00
885	0	>100
915	1	>100
945	0	>100
975	14	>100
1005	109	>100
1035	481	>100
1065	1177	>100
1095	2133	>100
1125	3243	>100
1155	4554	>100
1185	6285	+98.38
1215	8468	+89.75
1245	11266	+83.13
1275	14088	+74.43

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

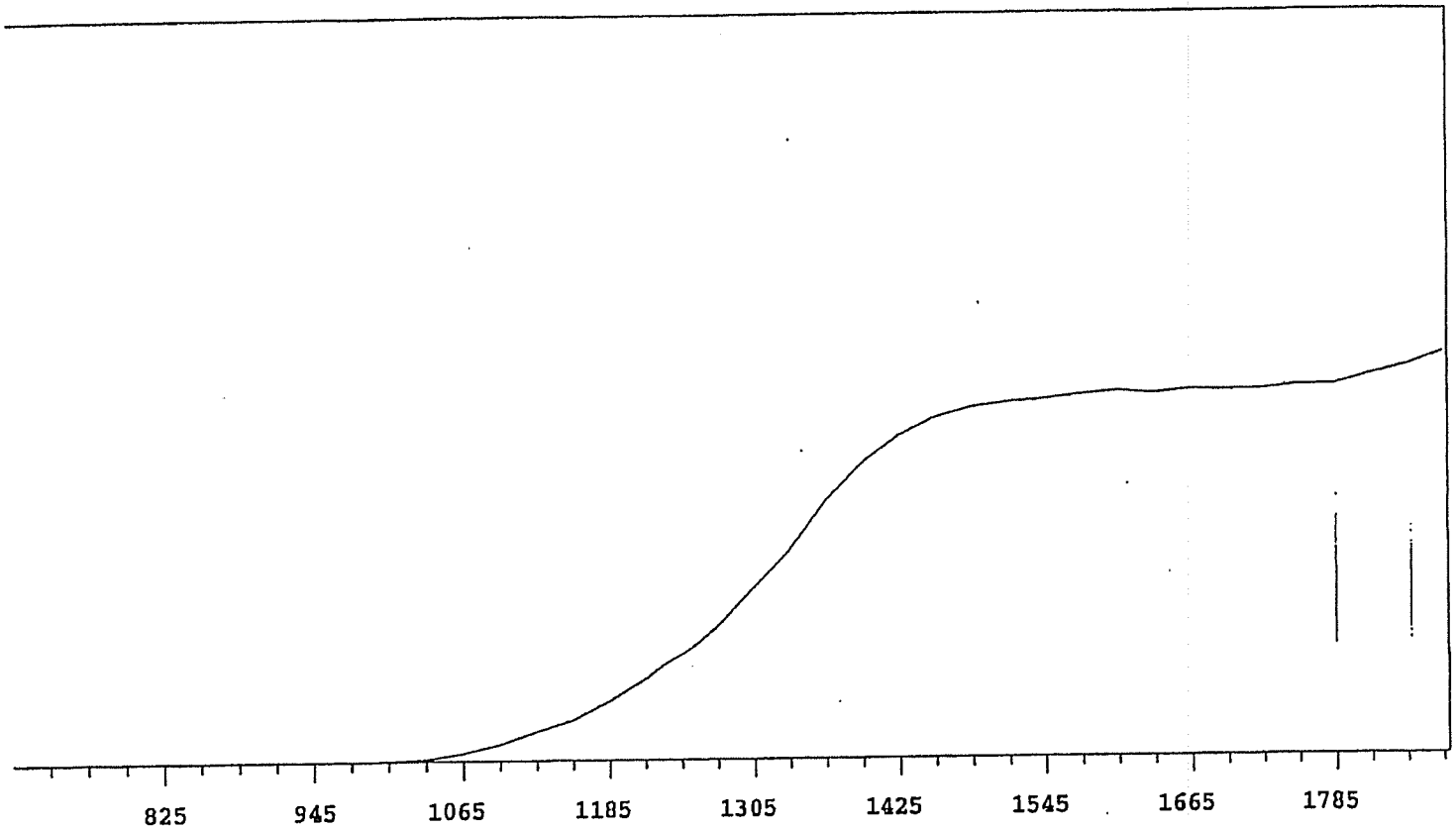


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	1	+83.33
855	1	-83.33
885	0	-55.56
915	0	>100
945	1	>100
975	3	>100
1005	42	>100
1035	242	>100
1065	613	>100
1095	1353	>100
1125	2213	>100
1155	3256	>100
1185	4474	>100
1215	5932	+94.10
1245	8072	+87.32
1275	10579	+79.61

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

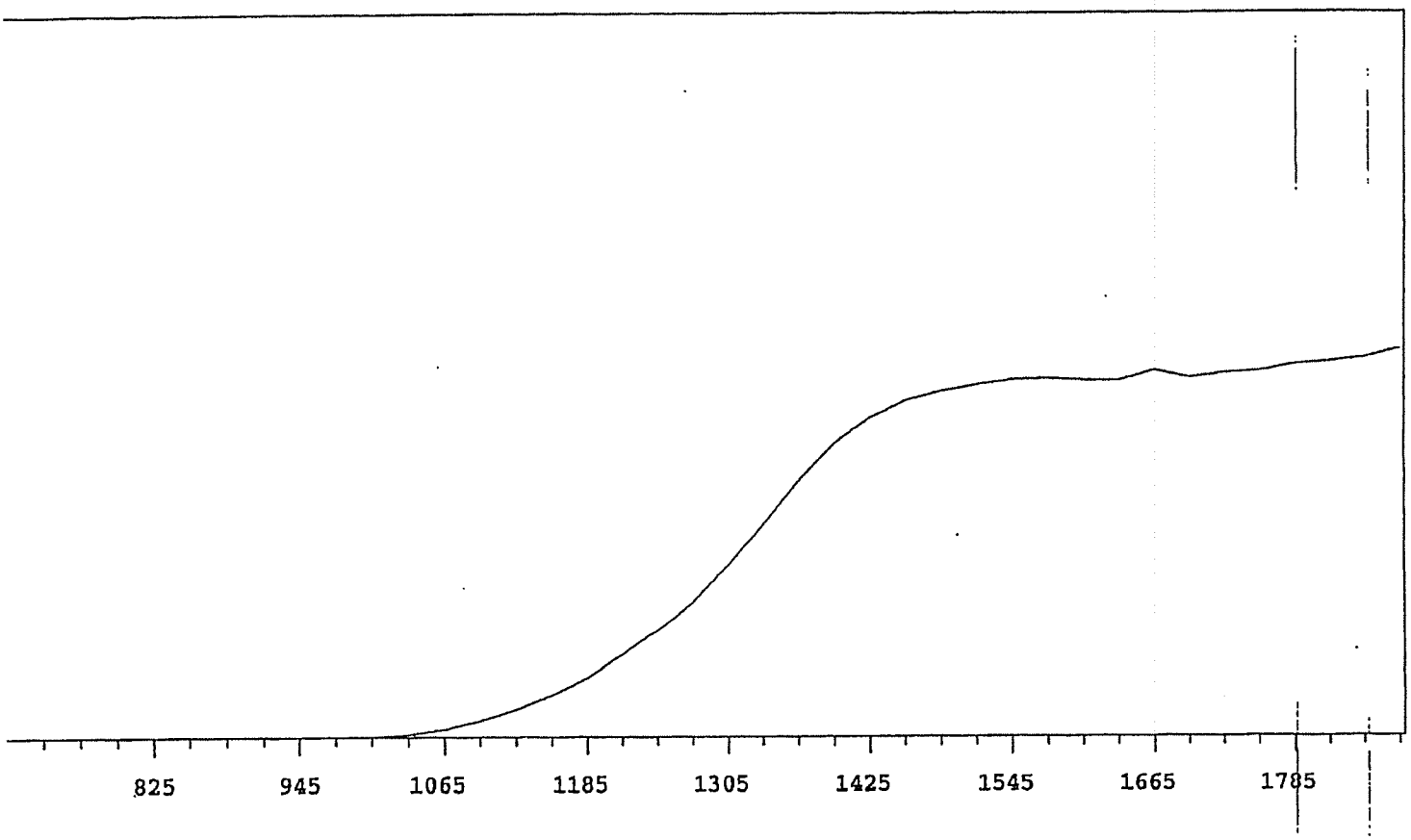


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	1	>100
945	1	>100
975	3	>100
1005	34	>100
1035	221	>100
1065	825	>100
1095	1709	>100
1125	2873	>100
1155	4078	>100
1185	5858	>100
1215	7809	+91.82
1245	10336	+85.02
1275	13215	+77.79

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

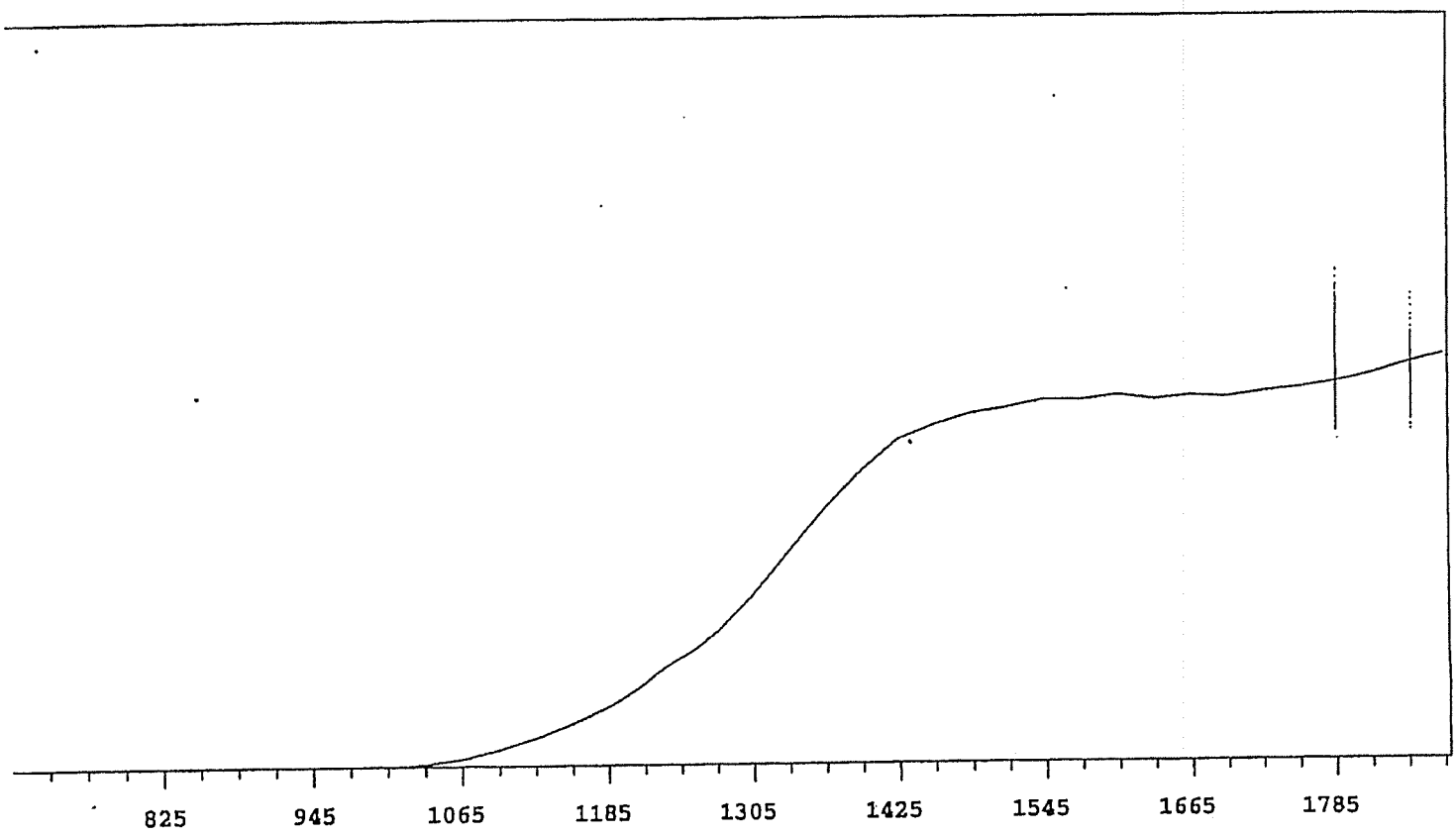


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	0	>100
975	4	>100
1005	57	>100
1035	277	>100
1065	817	>100
1095	1666	>100
1125	2766	>100
1155	4077	>100
1185	5667	>100
1215	7694	+91.50
1245	10209	+84.83
1275	12950	+77.50

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

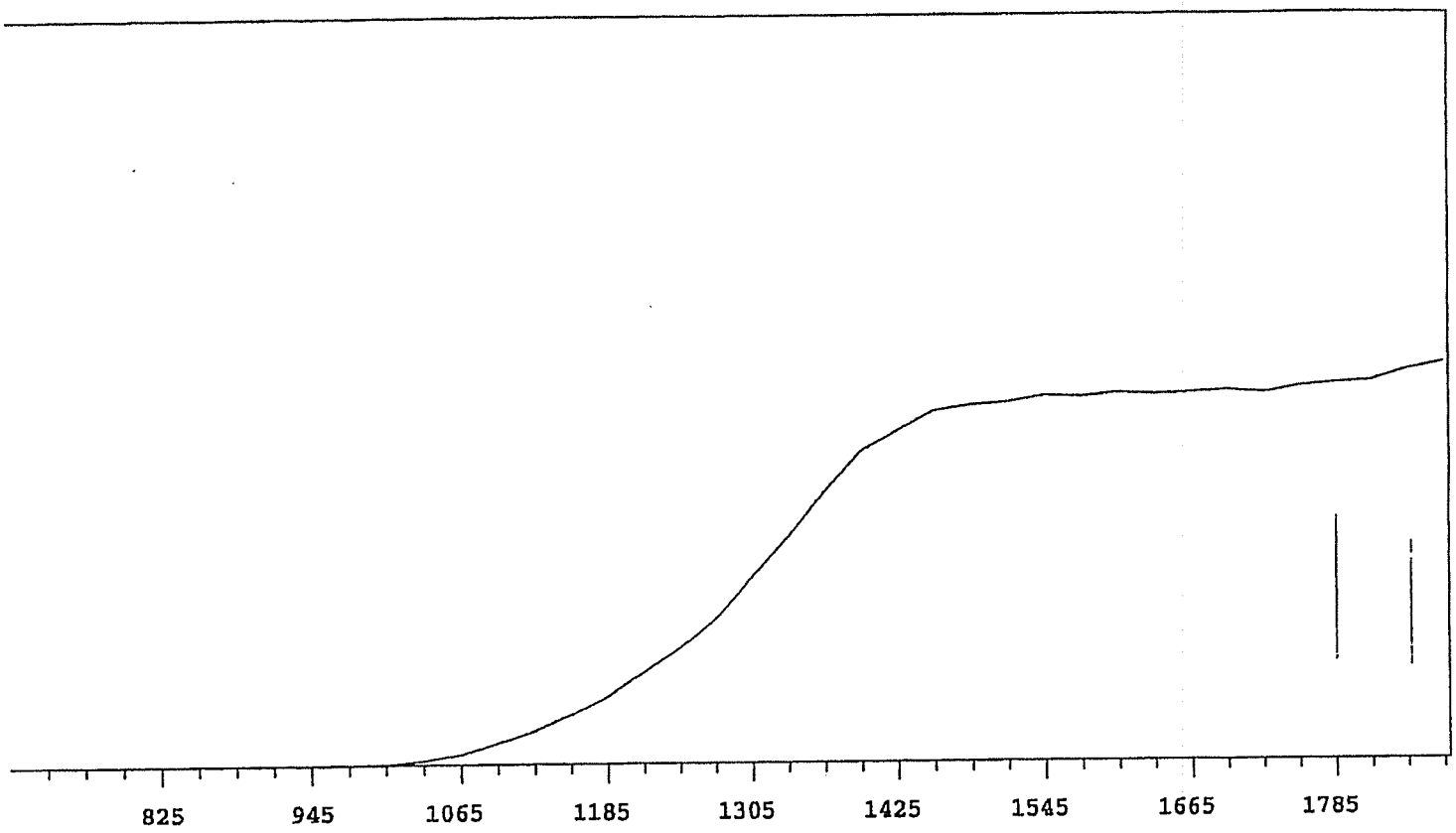


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	0	>100
975	5	>100
1005	29	>100
1035	204	>100
1065	609	>100
1095	1354	>100
1125	2316	>100
1155	3418	>100
1185	4654	>100
1215	6455	+92.99
1245	8669	+86.45
1275	10931	+79.15

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

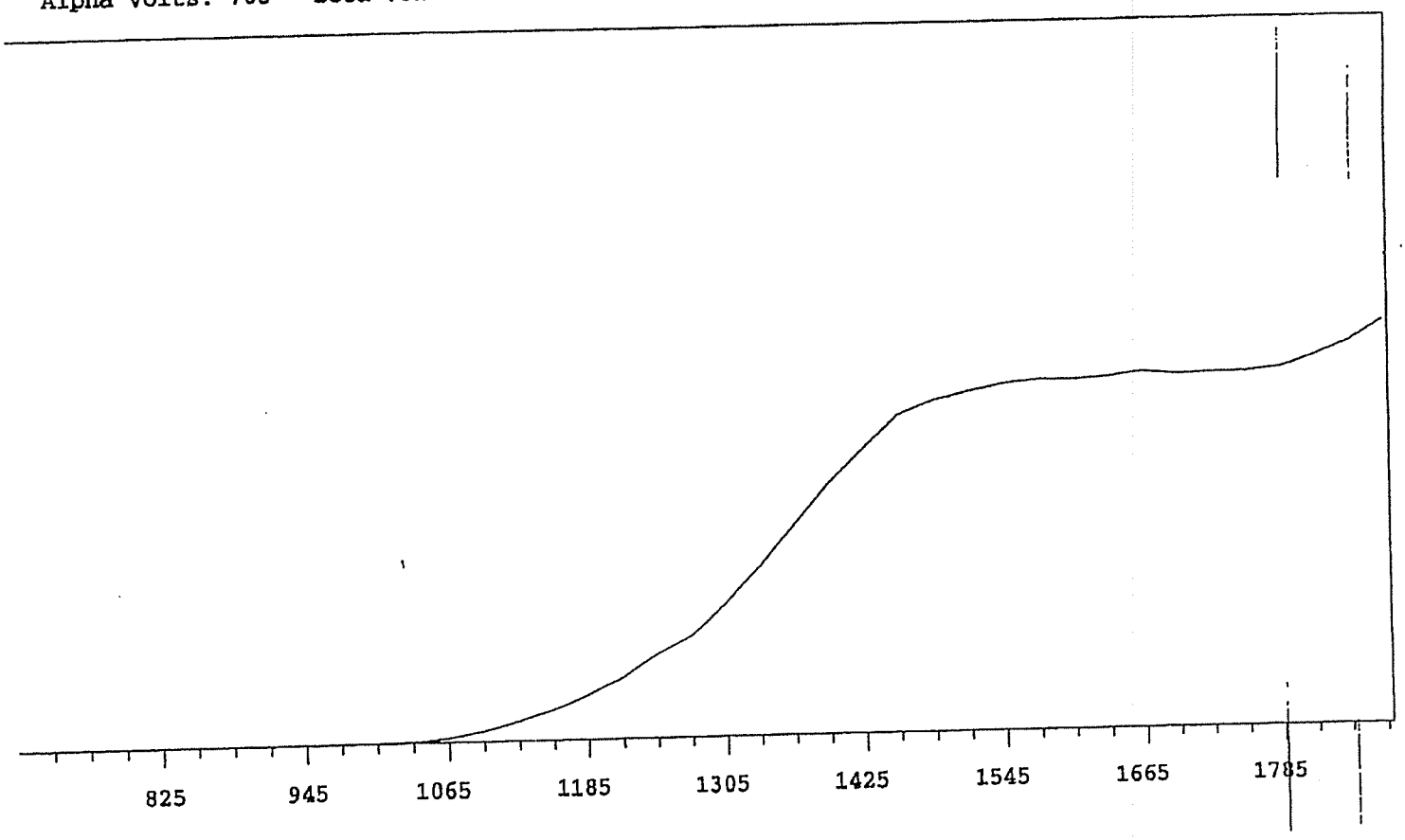


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	1	>100
975	9	>100
1005	96	>100
1035	468	>100
1065	1084	>100
1095	2286	>100
1125	3479	>100
1155	4912	>100
1185	6819	+98.23
1215	9153	+89.05
1245	12105	+83.21
1275	15122	+75.24

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

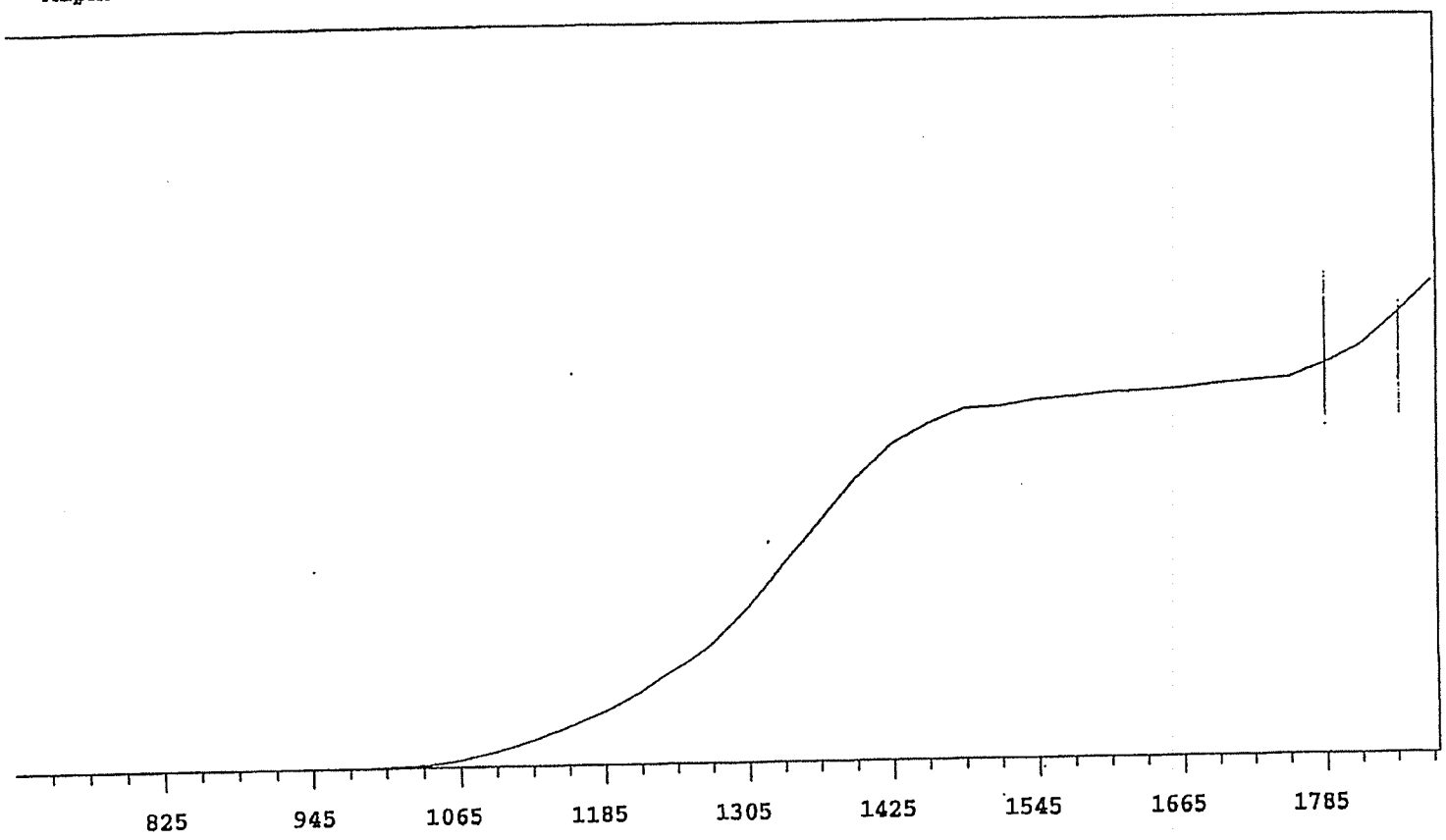


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	0	>100
975	0	>100
1005	20	>100
1035	122	>100
1065	511	>100
1095	1263	>100
1125	2390	>100
1155	3641	>100
1185	5246	>100
1215	7212	+98.32
1245	9897	+89.80
1275	12742	+82.40

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

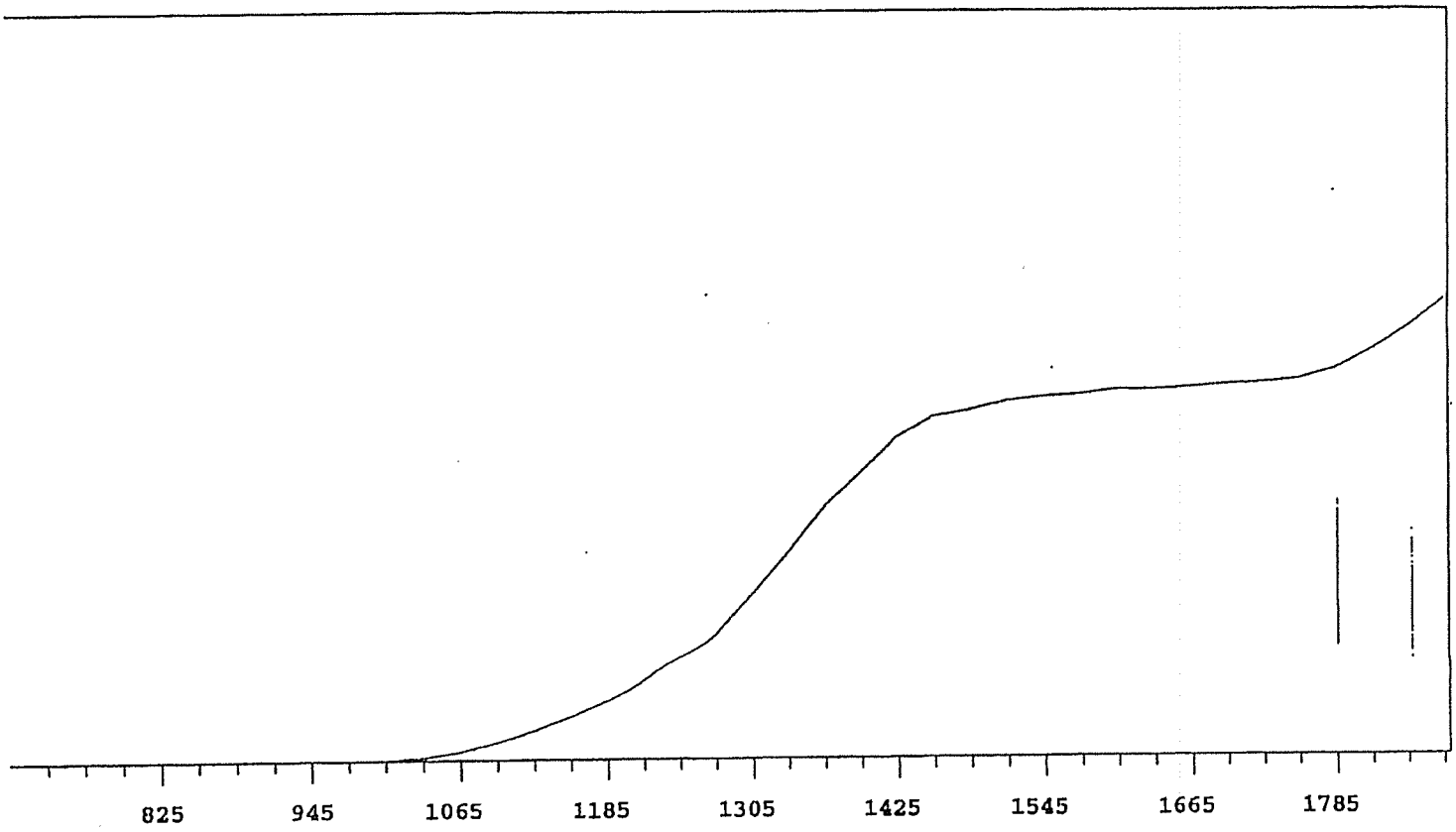


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	0	>100
975	4	>100
1005	46	>100
1035	202	>100
1065	697	>100
1095	1532	>100
1125	2614	>100
1155	3953	>100
1185	5474	>100
1215	7466	+93.09
1245	9842	+86.73
1275	12814	+80.29

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

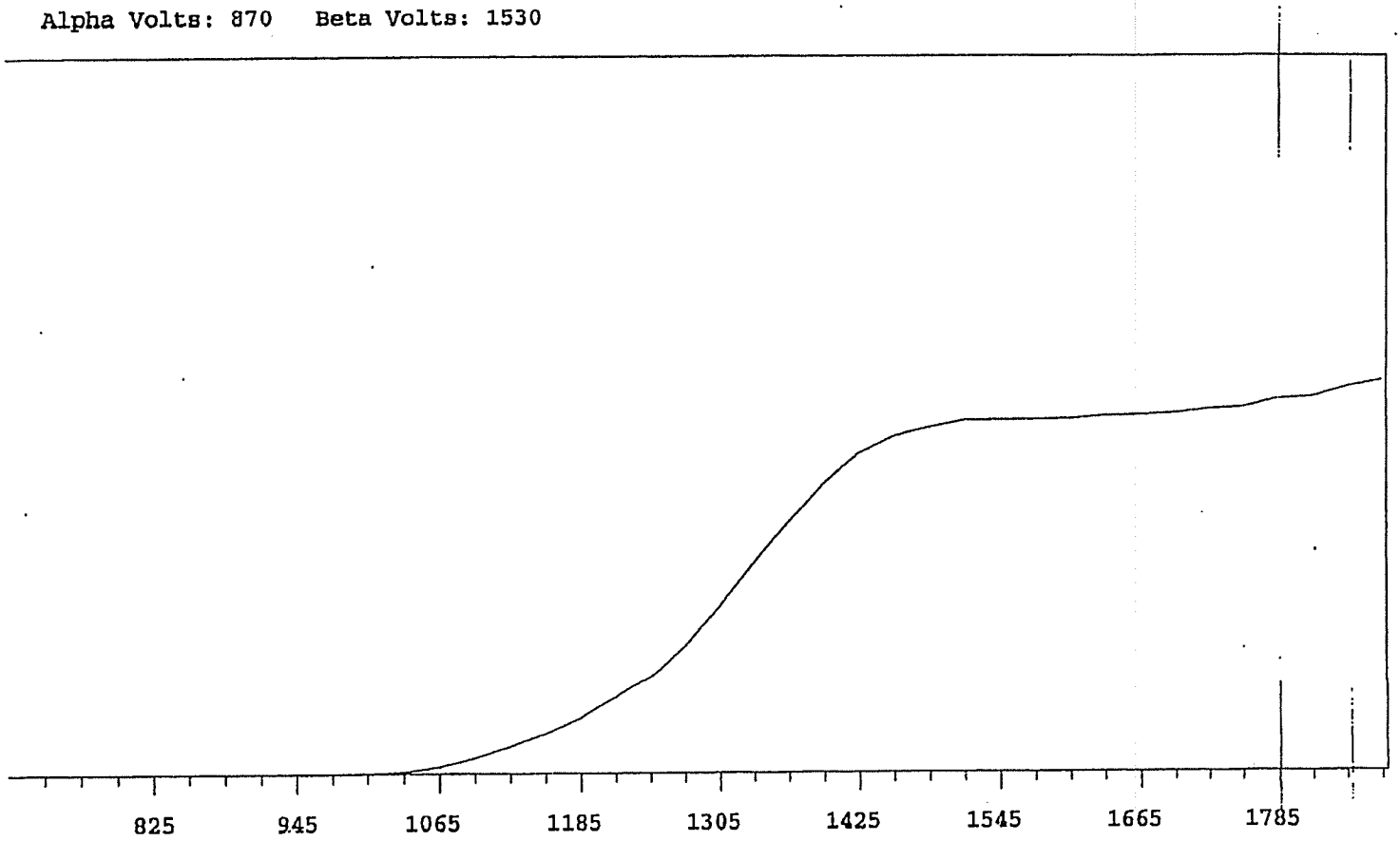
Alpha Volts: 705 Beta Volts: 1575



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
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

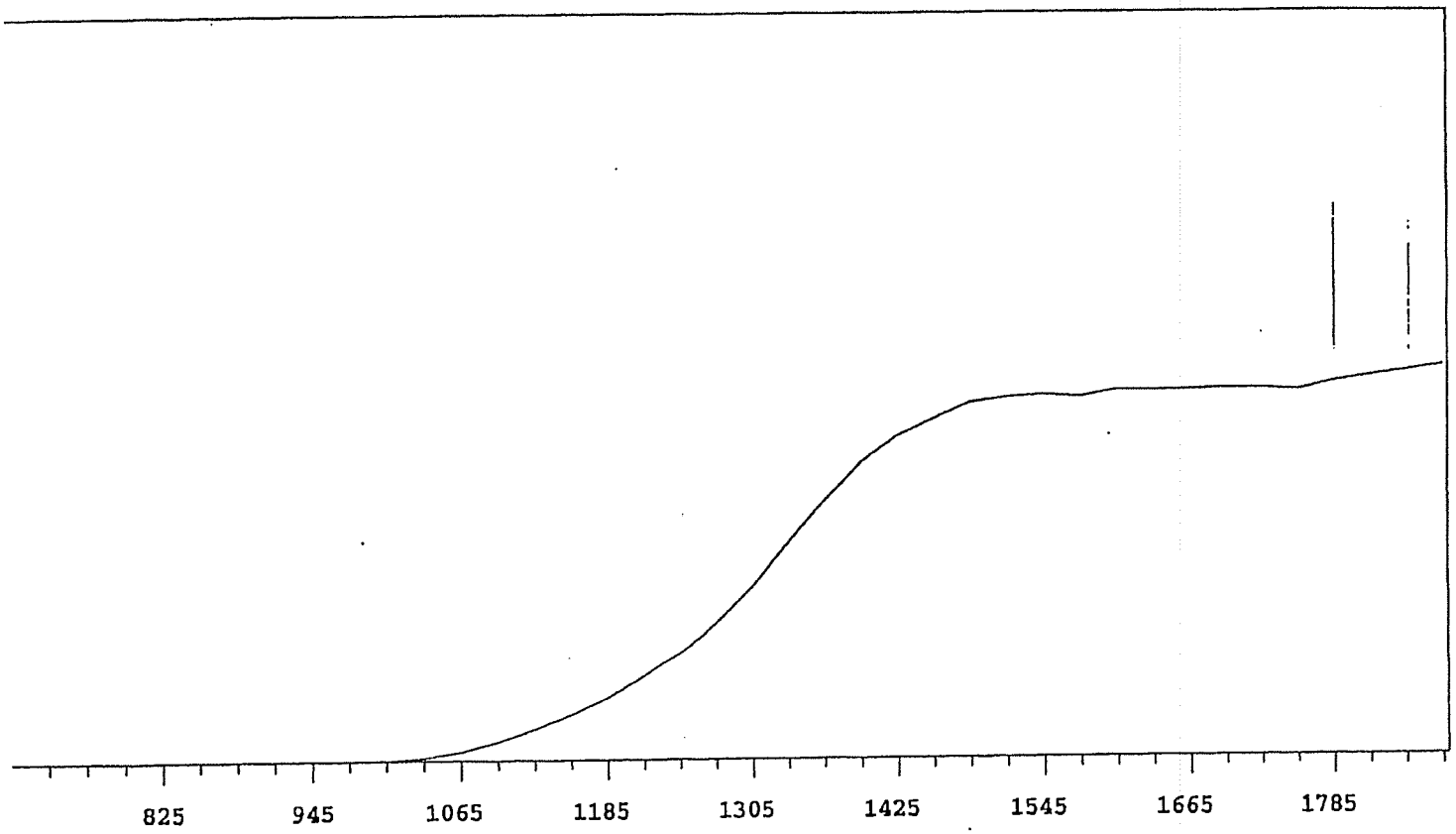


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	1	+0.00
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	0	>100
975	2	>100
1005	33	>100
1035	203	>100
1065	668	>100
1095	1403	>100
1125	2545	>100
1155	3800	>100
1185	5363	>100
1215	7355	+95.00
1245	9807	+87.69
1275	12700	+80.28

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

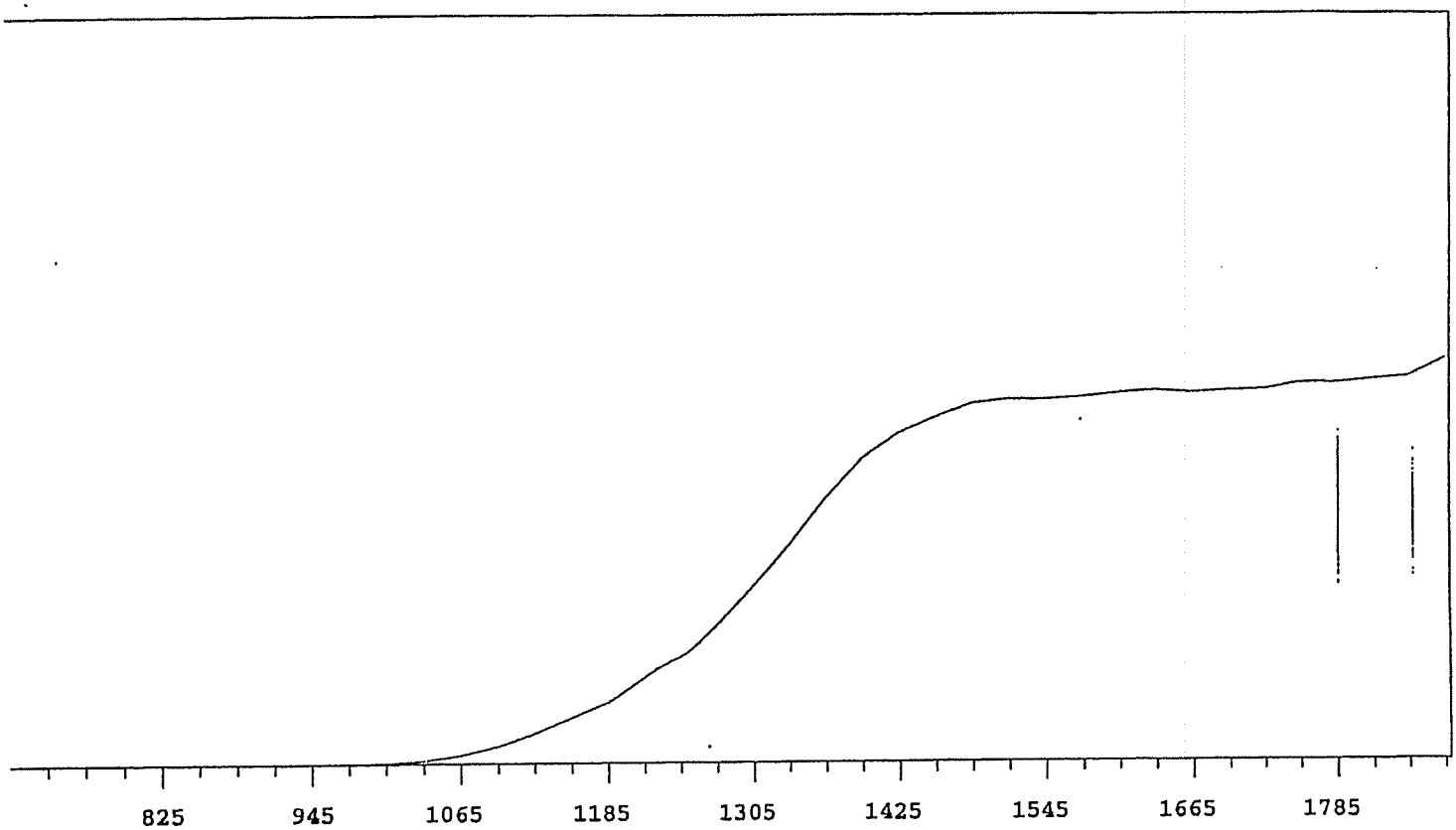


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	0	>100
975	4	>100
1005	45	>100
1035	300	>100
1065	836	>100
1095	1742	>100
1125	2896	>100
1155	4198	>100
1185	5849	>100
1215	7887	+92.20
1245	10561	+83.55
1275	13442	+76.62

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

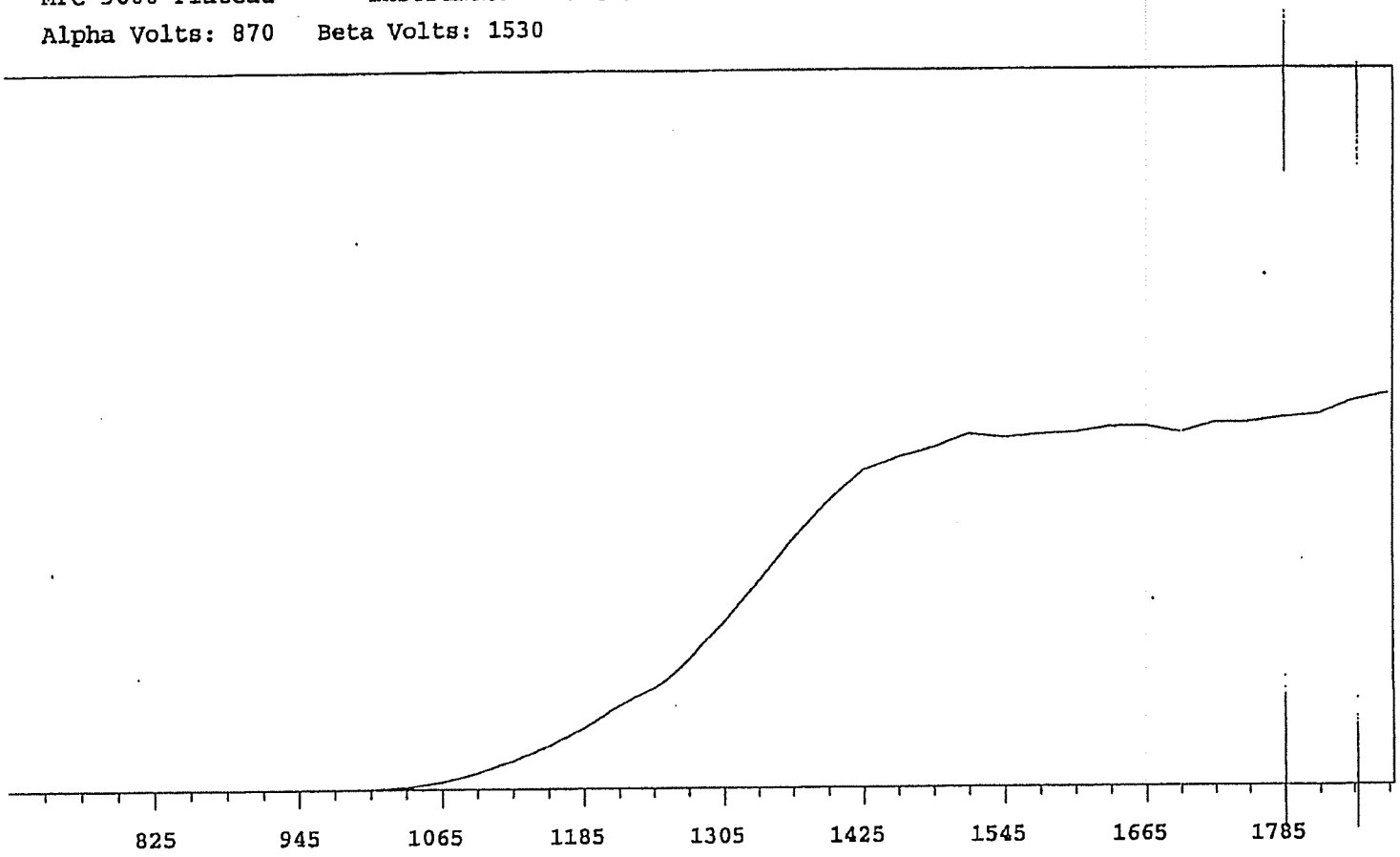


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	1	>100
915	1	>100
945	2	>100
975	3	>100
1005	64	>100
1035	349	>100
1065	970	>100
1095	1982	>100
1125	3328	>100
1155	5012	>100
1185	6669	>100
1215	9448	+92.67
1245	12293	+86.58
1275	15917	+76.99

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

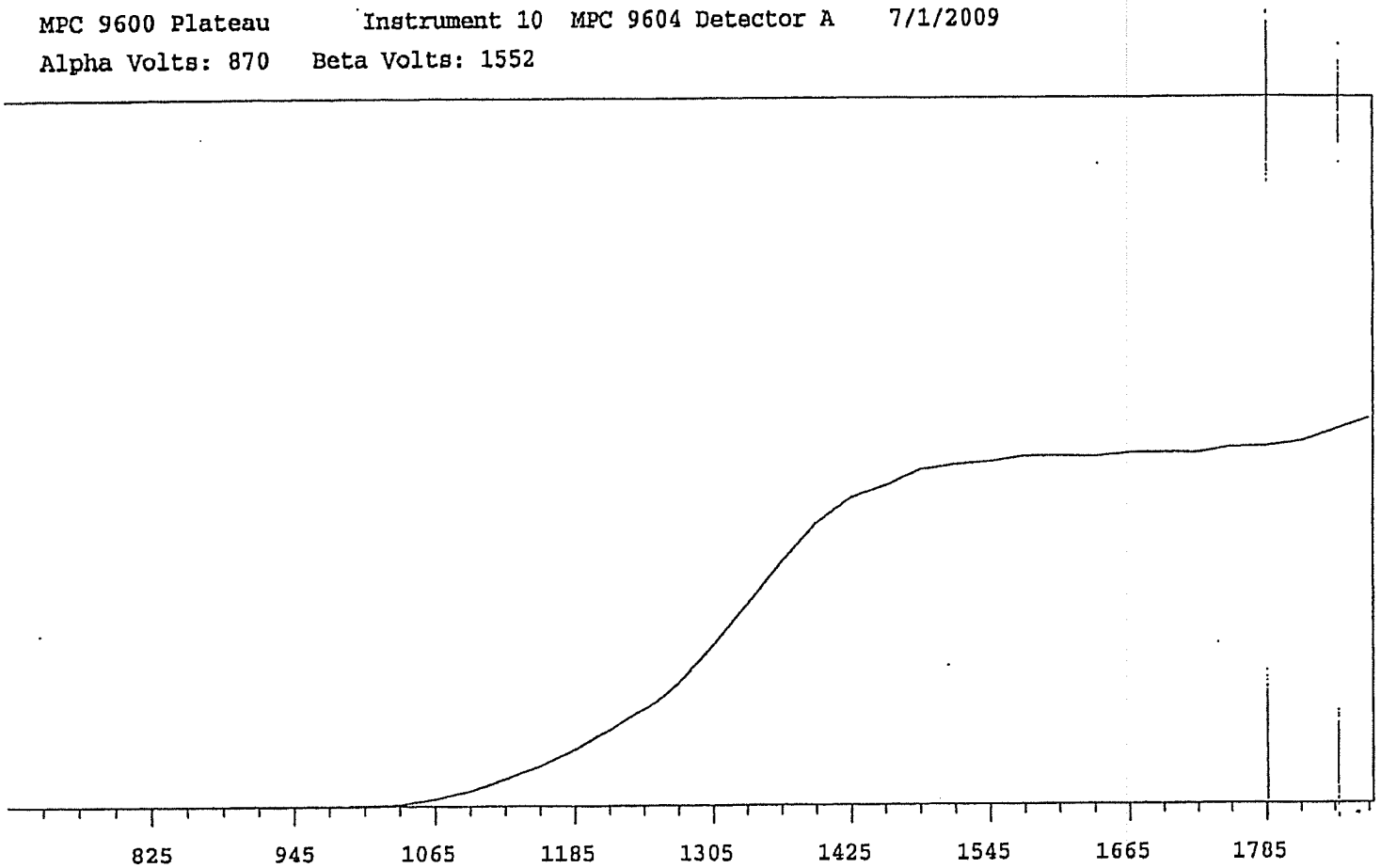


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	1	>100
945	0	>100
975	5	>100
1005	35	>100
1035	186	>100
1065	618	>100
1095	1280	>100
1125	2141	>100
1155	3268	>100
1185	4659	>100
1215	6343	+90.68
1245	8064	+83.46
1275	10497	+77.03

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

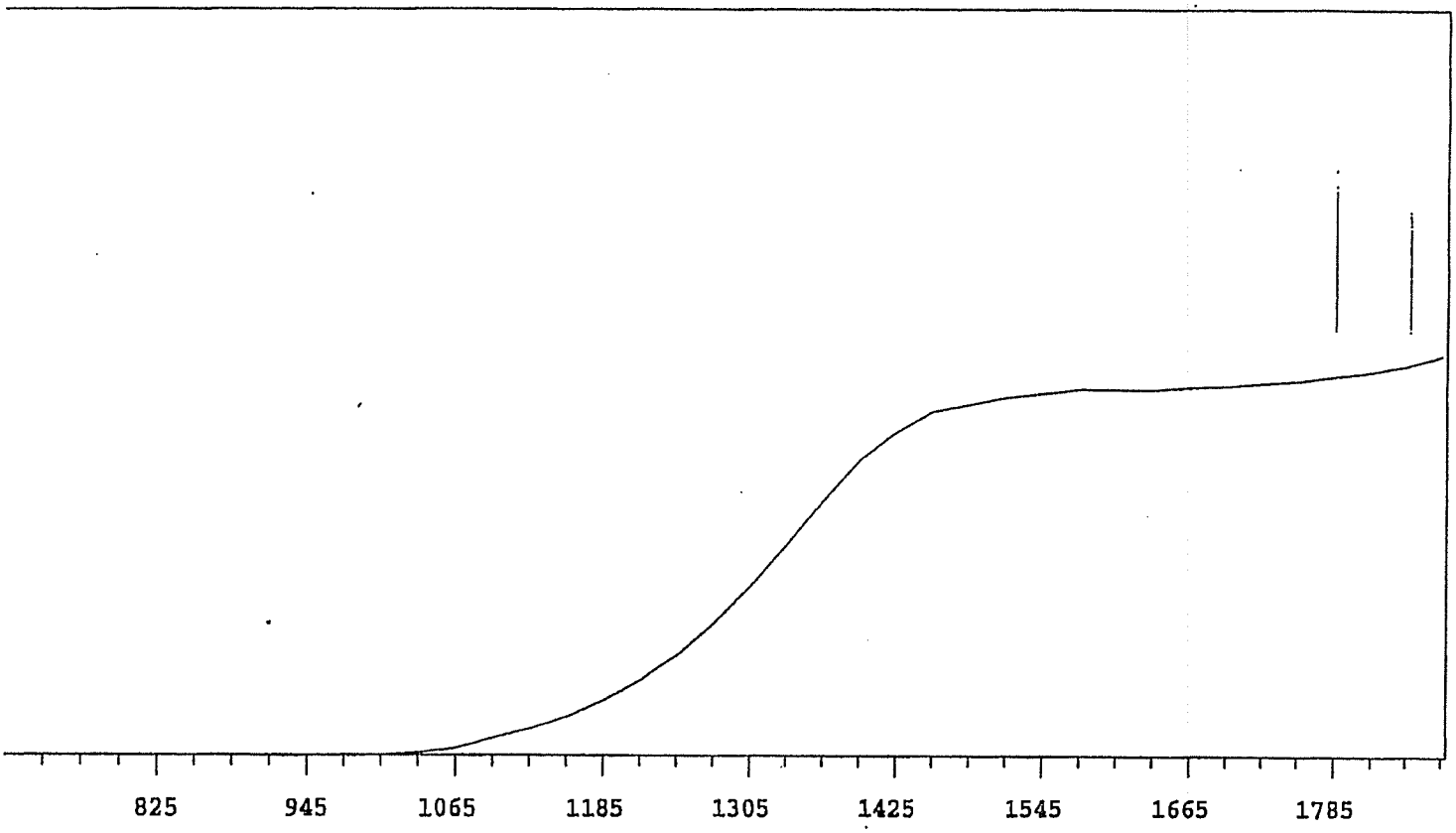


VOLTS	COUNTS	%/100 Volts
705	0	
735	1	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	0	>100
975	1	>100
1005	37	>100
1035	198	>100
1065	687	>100
1095	1491	>100
1125	2580	>100
1155	3920	>100
1185	5588	>100
1215	7384	+91.32
1245	9794	+84.81
1275	12572	+79.73

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

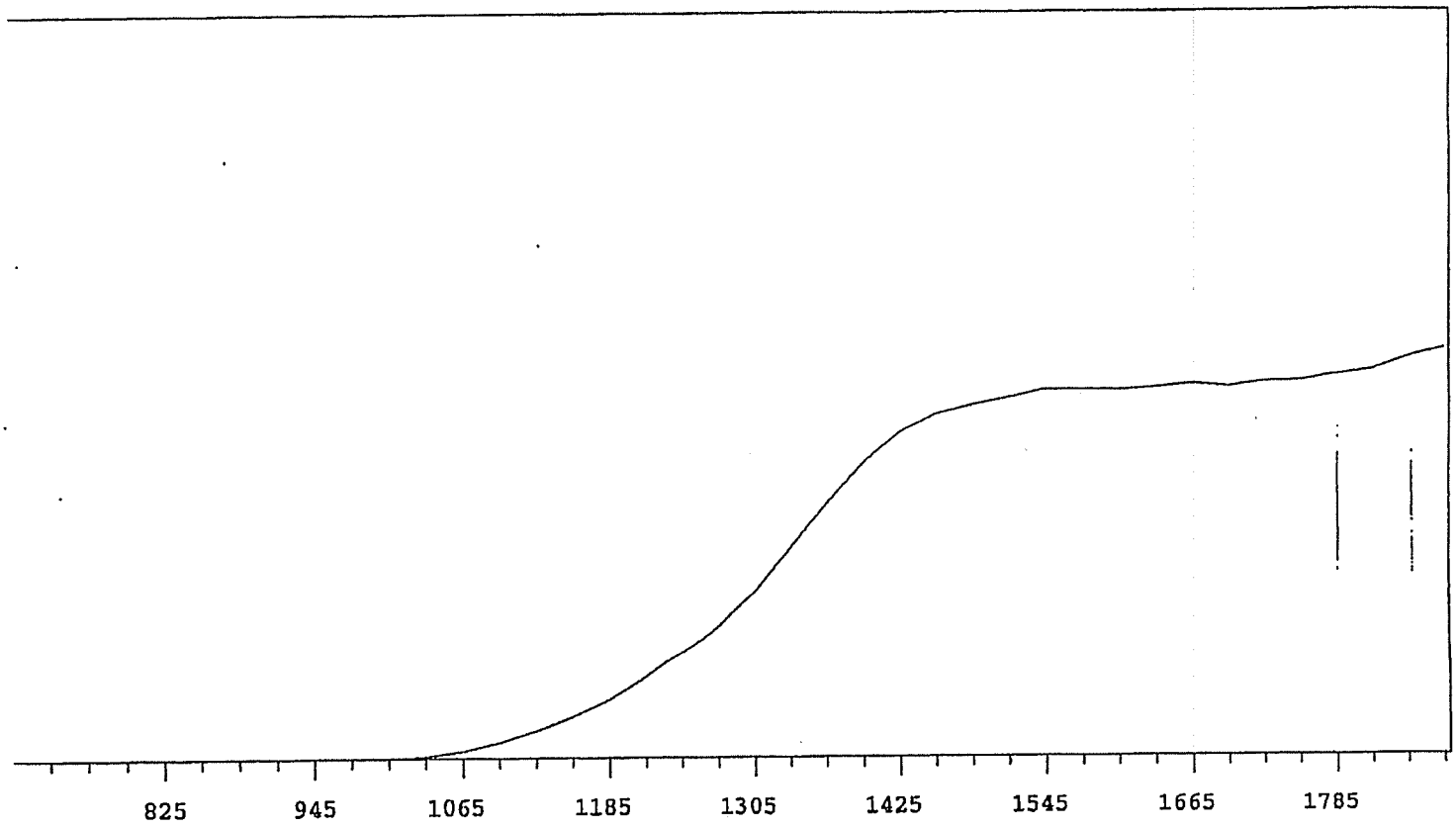


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	1	>100
975	7	>100
1005	28	>100
1035	190	>100
1065	597	>100
1095	1474	>100
1125	2383	>100
1155	3680	>100
1185	5131	>100
1215	6808	+89.95
1245	8990	+83.03
1275	11493	+77.30

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

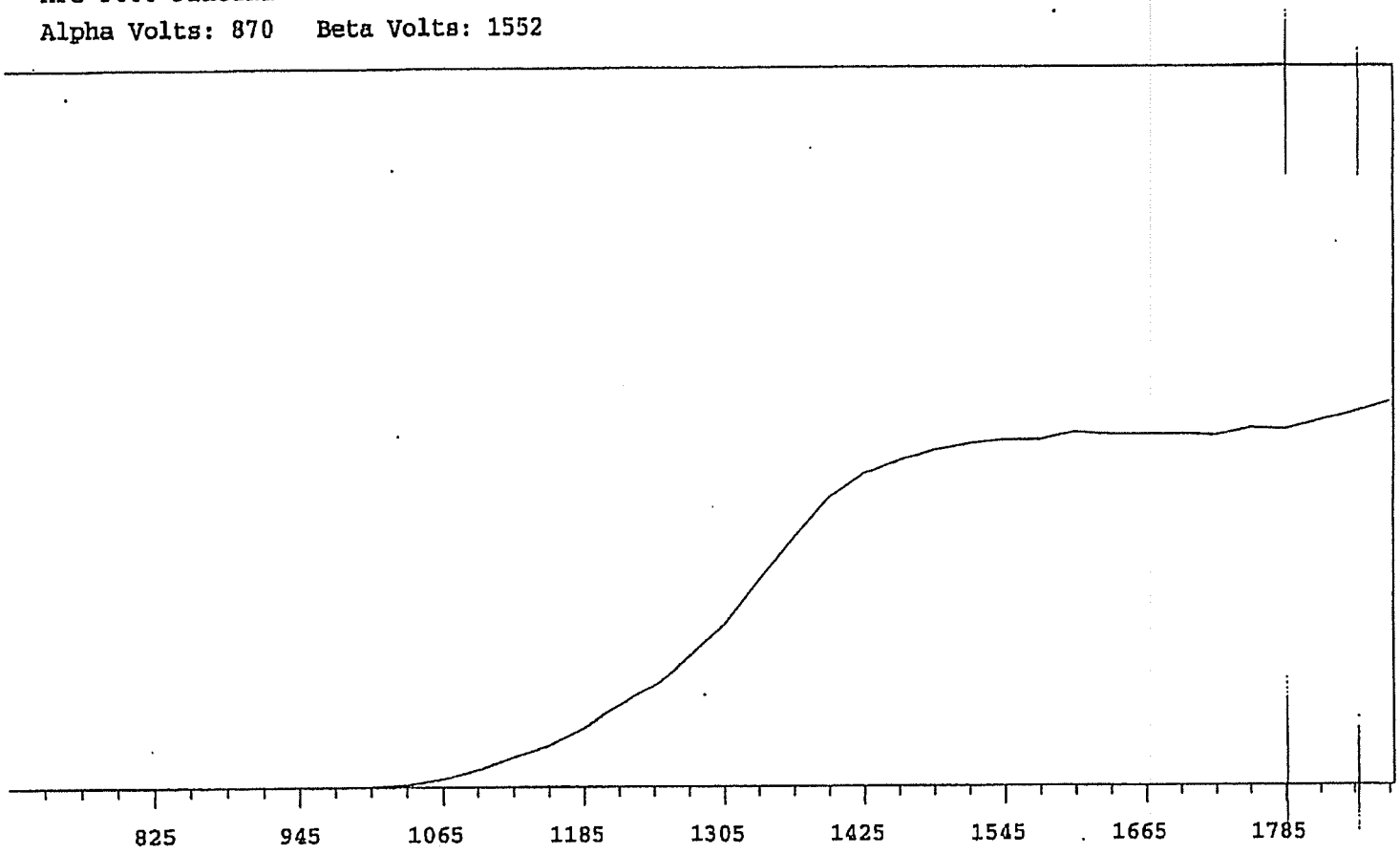
Alpha Volts: 870 Beta Volts: 1552



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
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

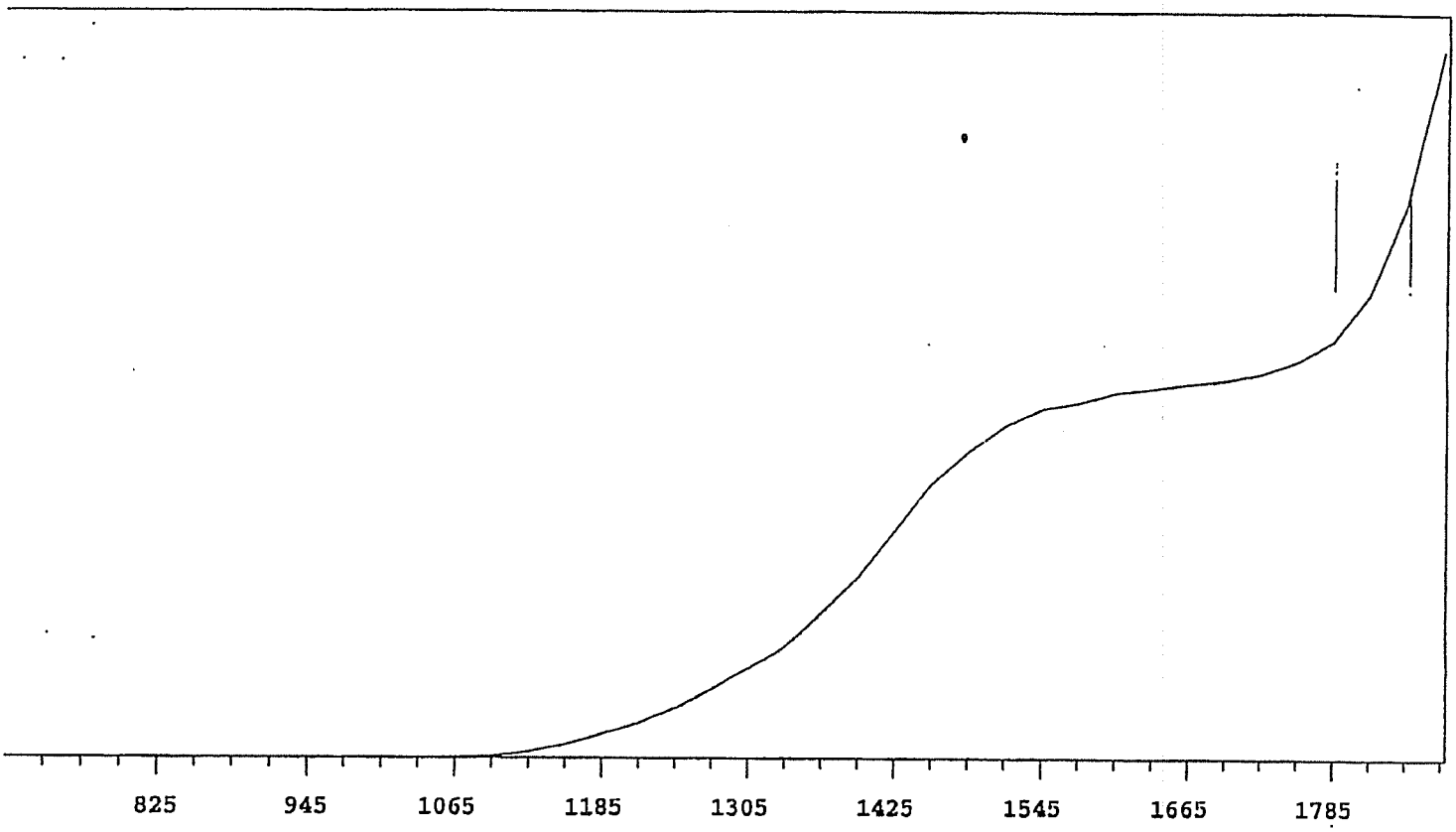
Alpha Volts: 870 Beta Volts: 1552



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	

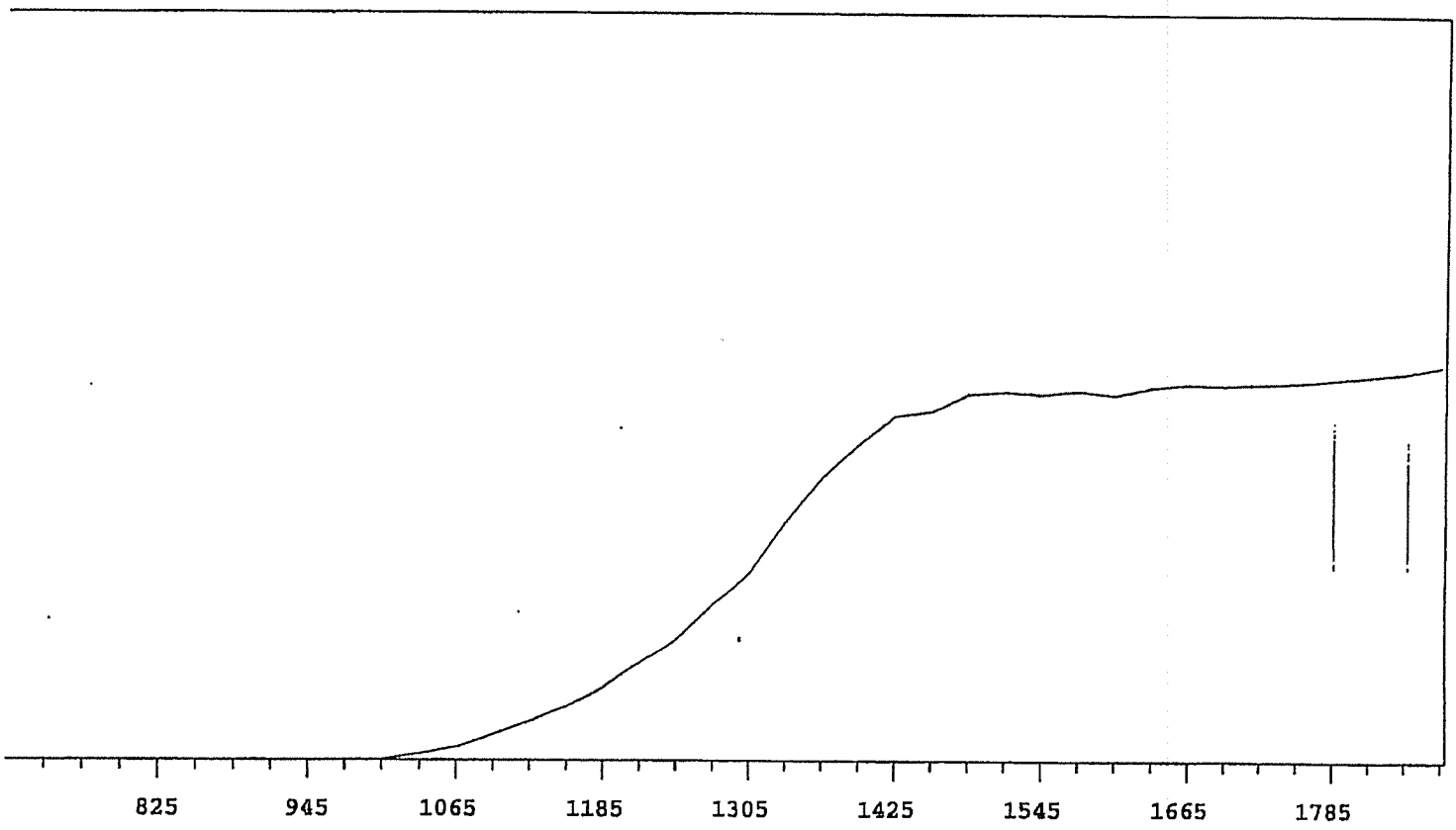
Plateau 7/1/09 Instrument 11 MPC 9604 Detector A 7/1/2009
Alpha Volts: 1515 Beta Volts: 1515



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

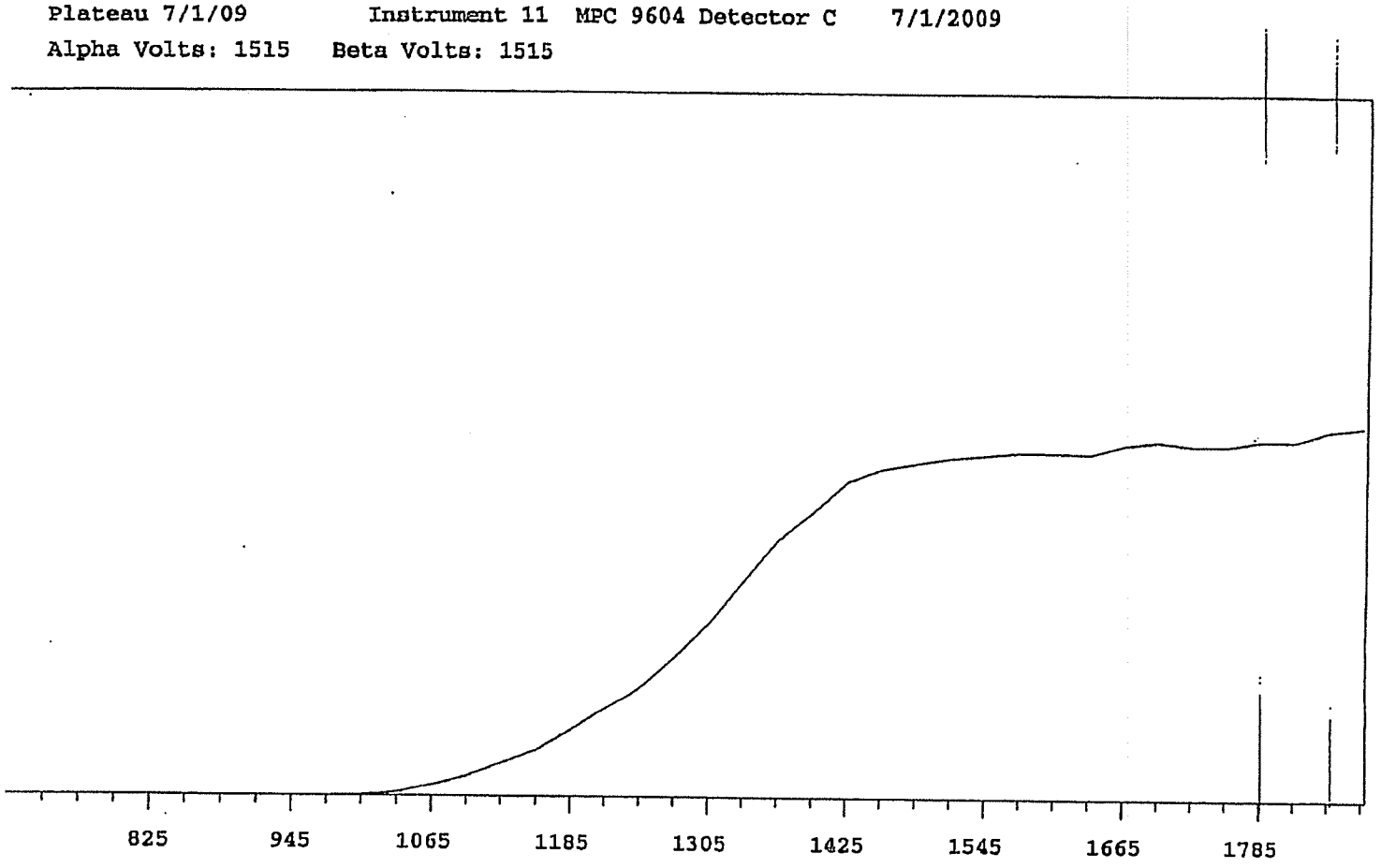


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	1	>100
945	0	>100
975	11	>100
1005	47	>100
1035	280	>100
1065	610	>100
1095	1192	>100
1125	1789	>100
1155	2466	>100
1185	3337	+94.91
1215	4526	+88.85
1245	5885	+78.40
1275	7518	+72.09

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

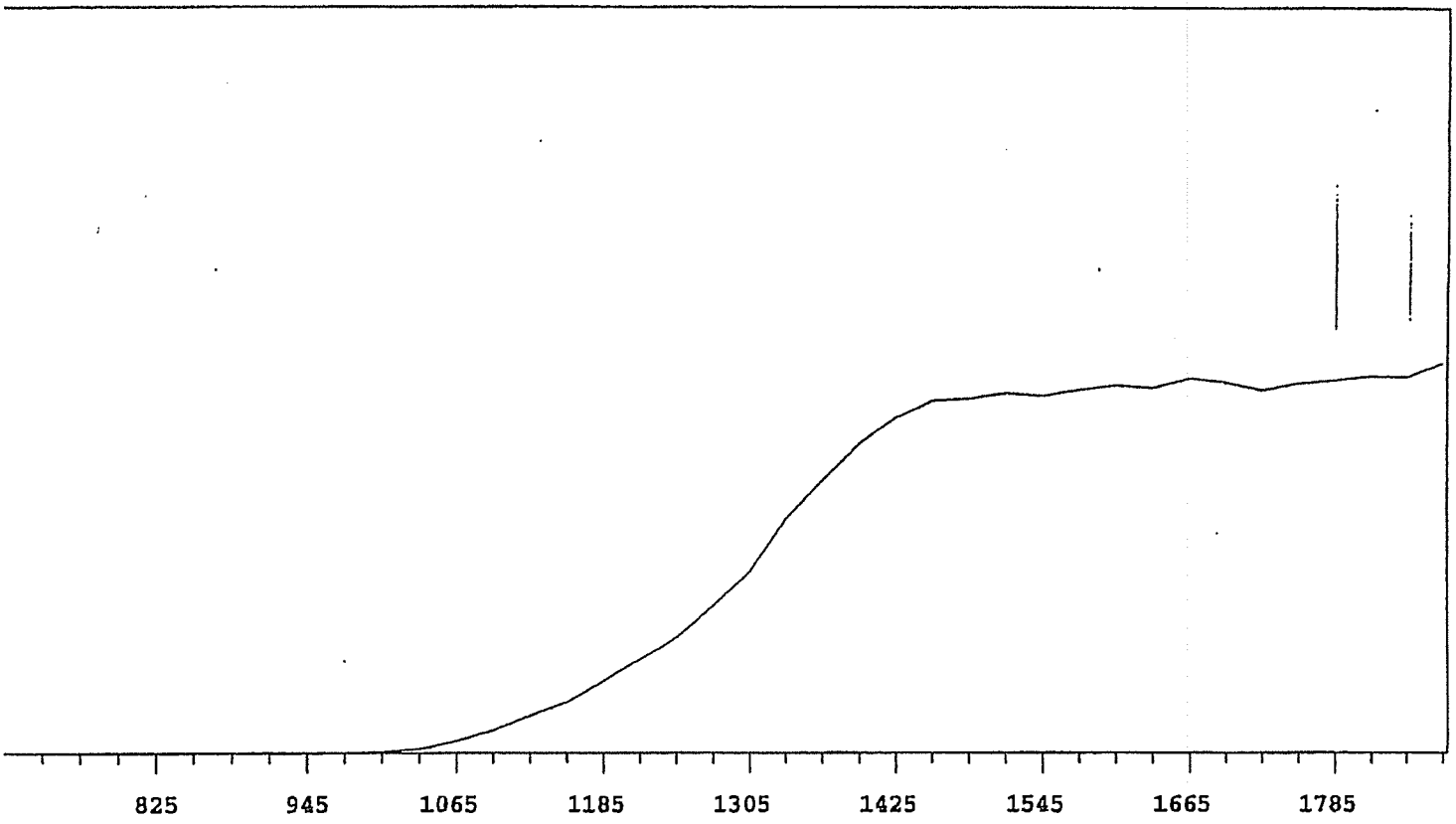
Alpha Volts: 1515 Beta Volts: 1515



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	

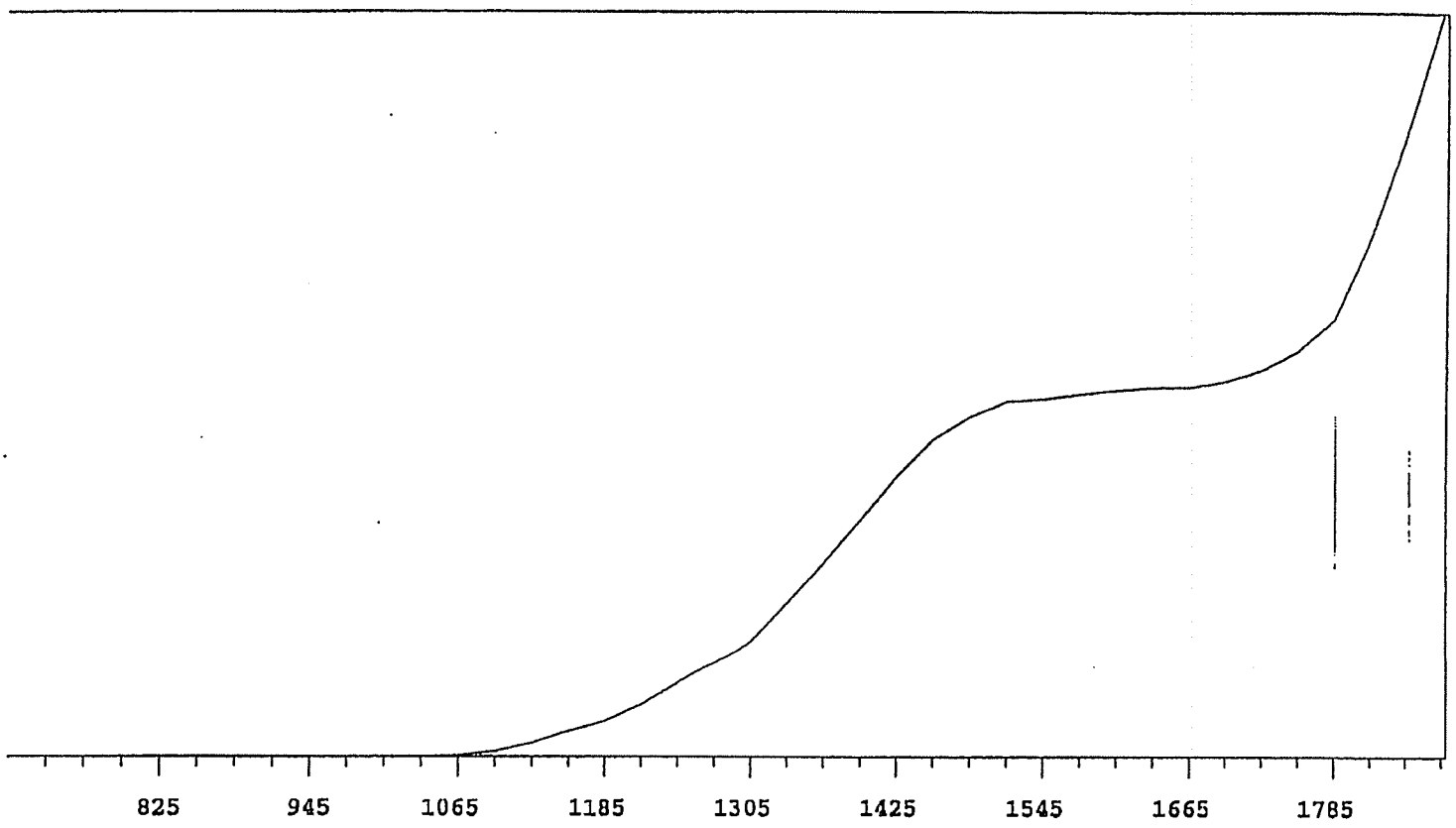
Plateau 7/1/09 Instrument 11 MPC 9604 Detector D 7/1/2009
Alpha Volts: 1515 Beta Volts: 1515



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	7679	+65.97
735	0		1335	9737	+57.57
765	0		1365	11301	+45.87
795	0	>100	1395	12767	+31.71
825	0	>100	1425	13767	+19.90
855	1	+83.33	1455	14399	+10.72
885	1	+55.56	1485	14467	+4.38
915	0	>100	1515	14671	+2.12
945	1	>100	1545	14576	+2.61
975	9	>100	1575	14808	+1.80
1005	60	>100	1605	14974	+3.15
1035	173	>100	1635	14872	+1.76
1065	480	>100	1665	15248	-0.41
1095	911	>100	1695	15067	-0.27
1125	1508	>100	1725	14784	-0.43
1155	2024	>100	1755	15044	+2.01
1185	2872	+97.38	1785	15163	+2.82
1215	3858	+89.30	1815	15333	+3.61
1245	5070	+78.02	1845	15278	
1275	6322	+73.30	1875	15817	

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

Alpha Volts: 705 Beta Volts: 1515

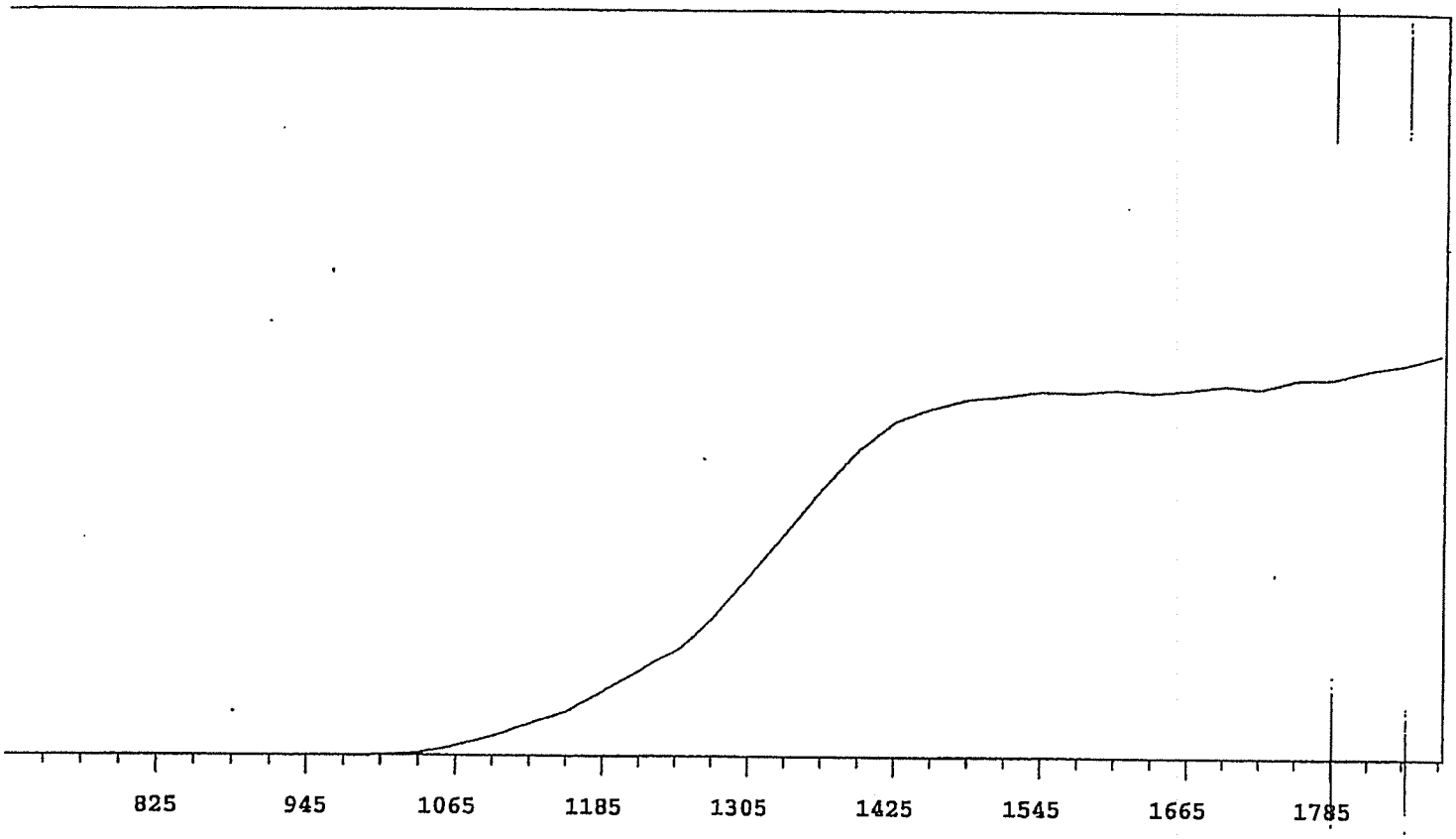


VOLTS	COUNTS	%/100 Volts
705	0	
735	1	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	0	>100
975	1	>100
1005	3	>100
1035	17	>100
1065	84	>100
1095	267	>100
1125	709	>100
1155	1299	>100
1185	1813	>100
1215	2638	>100
1245	3777	+96.47
1275	4915	+87.98

VOLTS	COUNTS	%/100 Volts
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

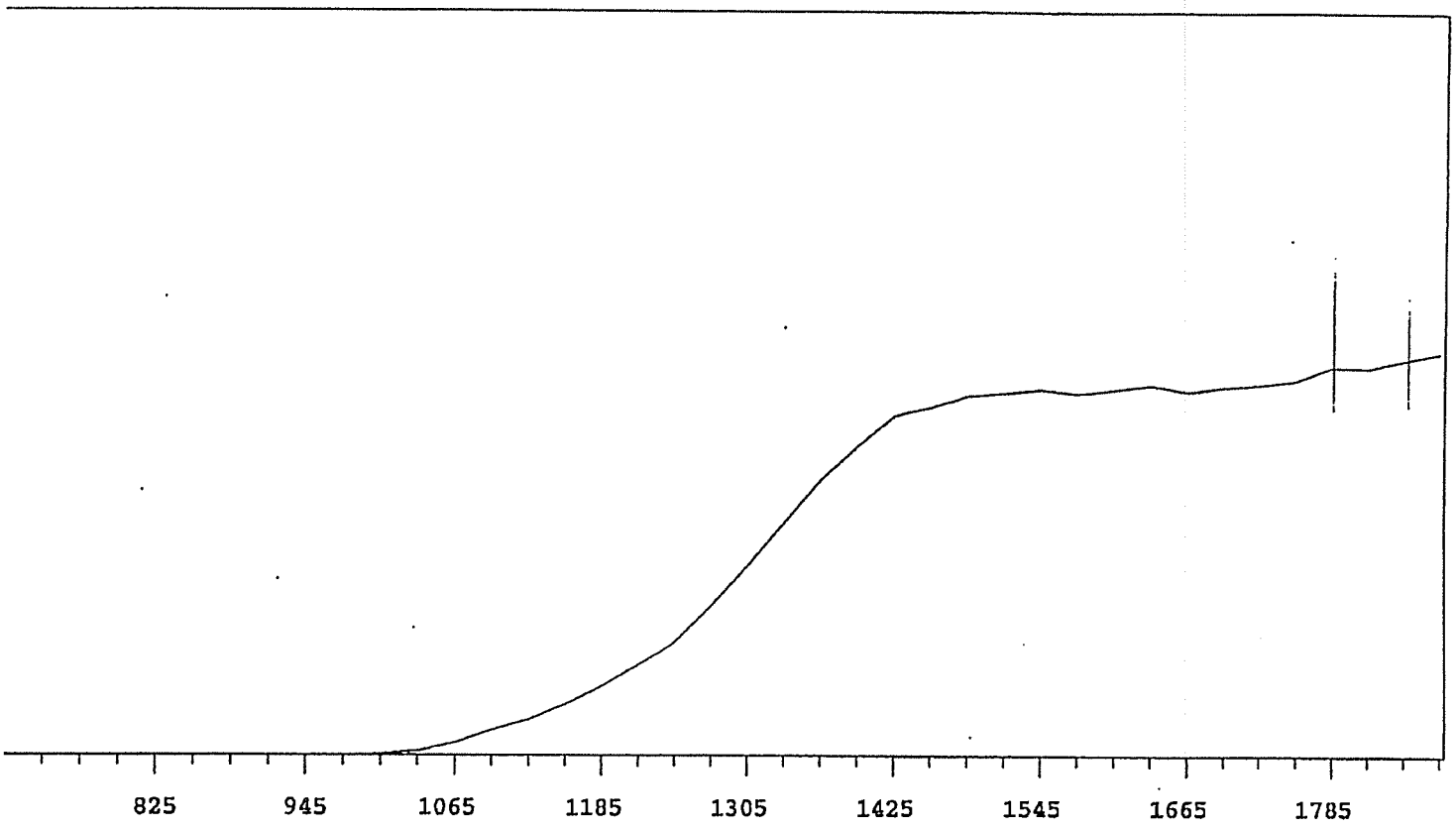
Alpha Volts: 705 · Beta Volts: 1515



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	

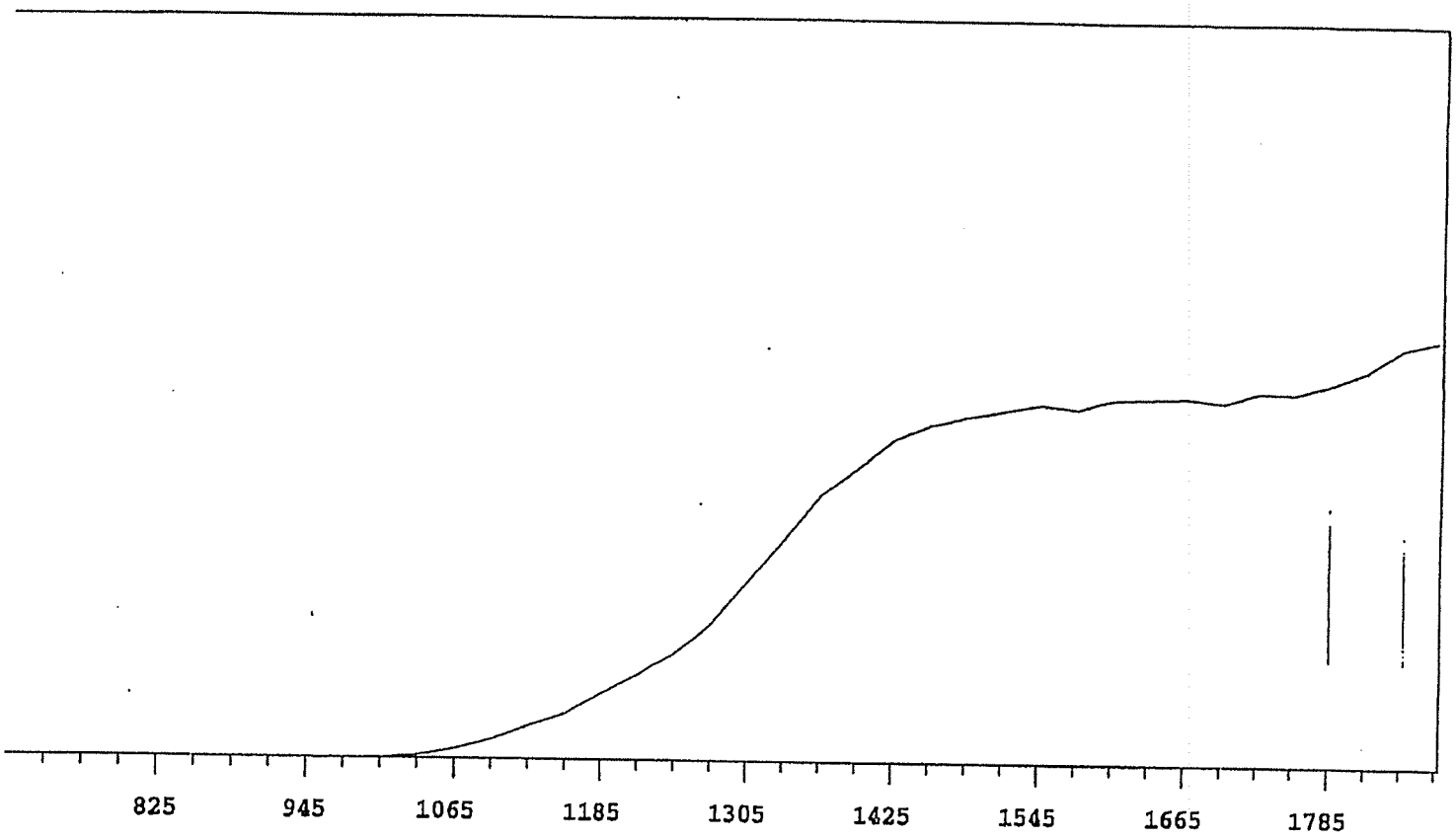
Plateau 7/1/09 Instrument 12 MPC 9604 Detector C 7/1/2009
Alpha Volts: 705 Beta Volts: 1515



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	

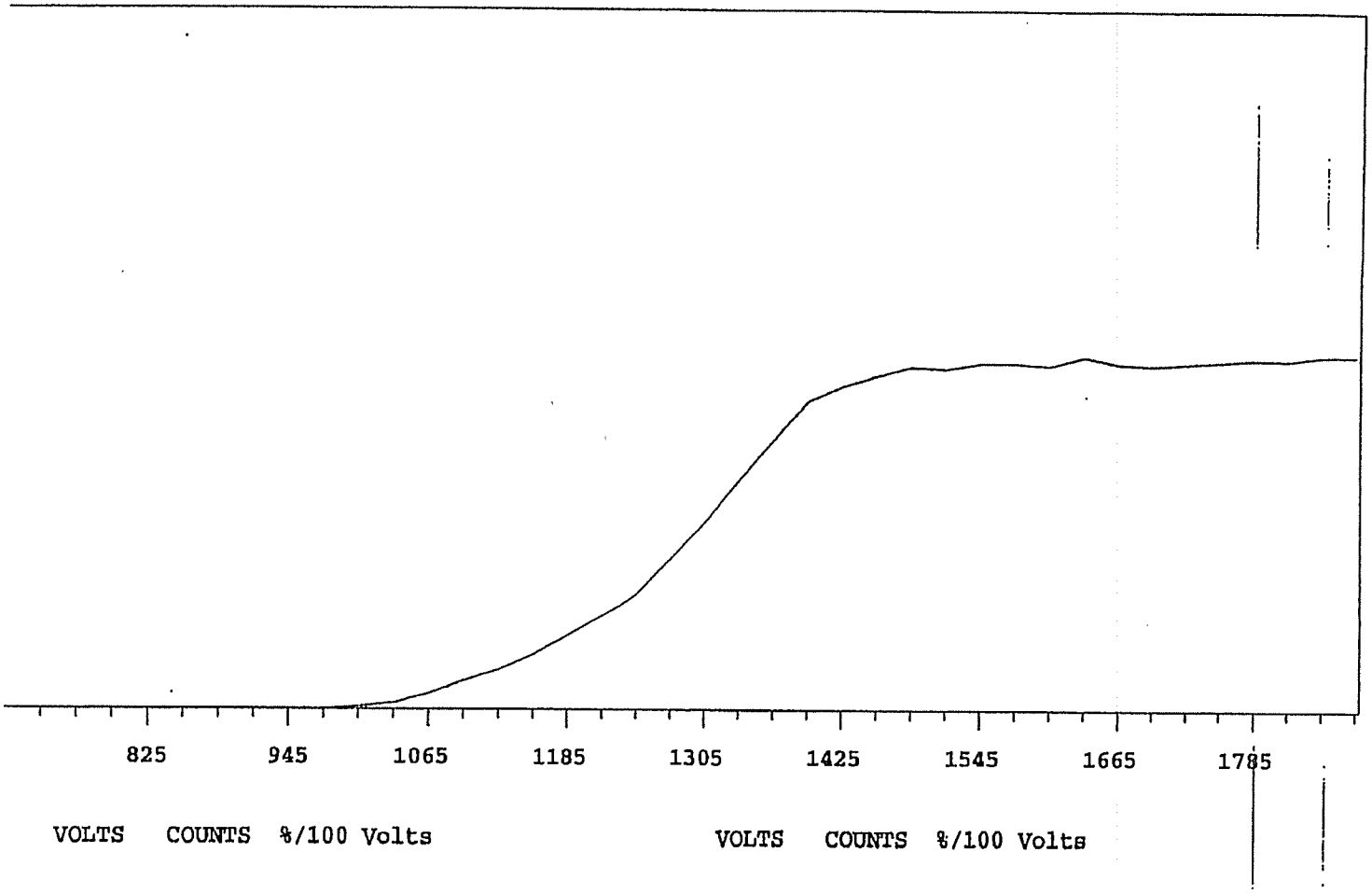
Plateau 7/1/09 Instrument 12 MPC 9604 Detector D 7/1/2009
Alpha Volts: 705 Beta Volts: 1515



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

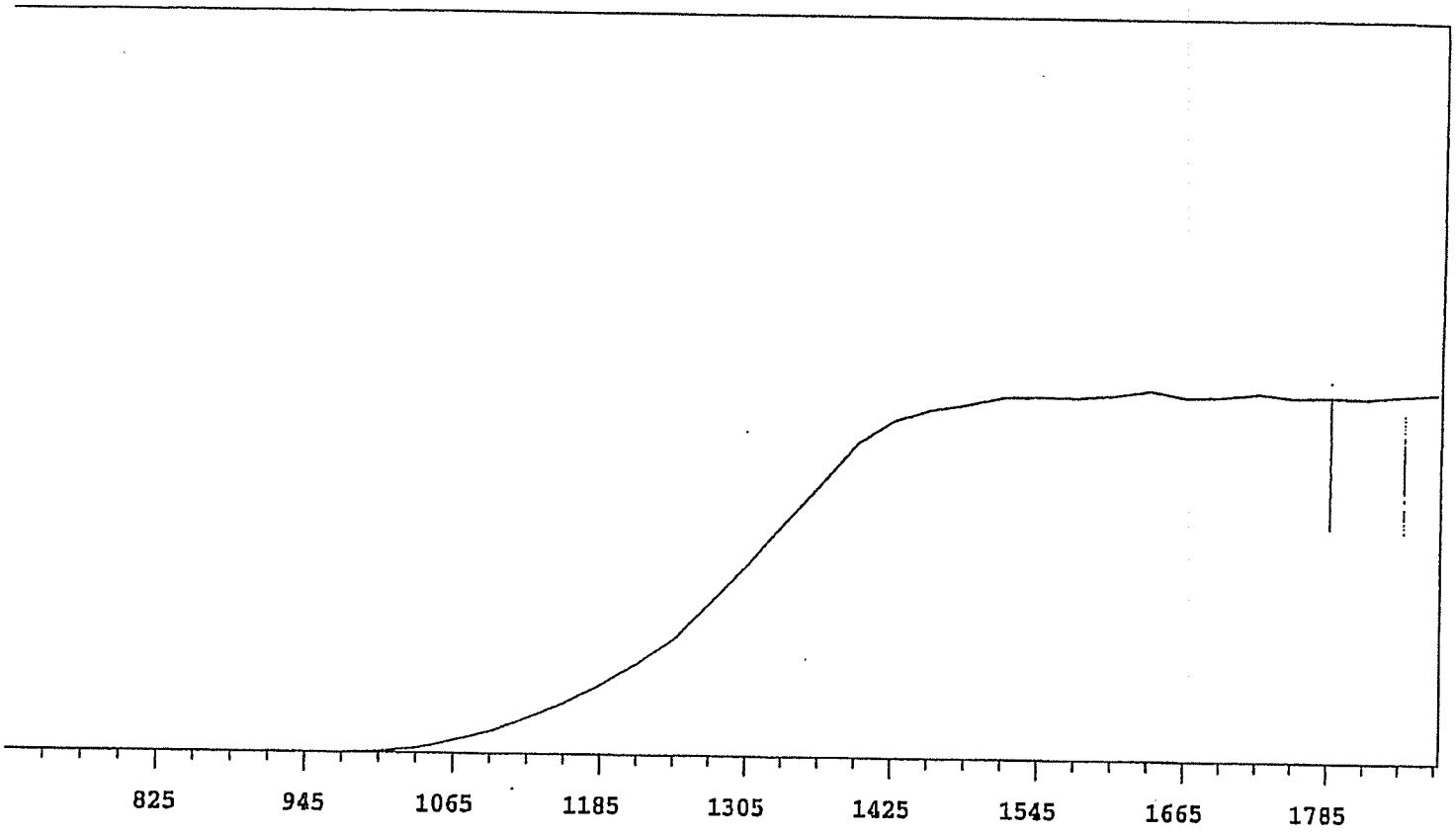
VOLTS	COUNTS	%/100 Volts
1305	9144	+69.92
1335	11120	+58.43
1365	13399	+45.40
1395	14711	+32.57
1425	16134	+20.69
1455	16805	+13.46
1485	17209	+7.90
1515	17500	+4.31
1545	17812	+3.48
1575	17629	+2.80
1605	18066	+2.23
1635	18122	+1.44
1665	18166	+1.20
1695	17967	+1.60
1725	18469	+3.41
1755	18409	+6.35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

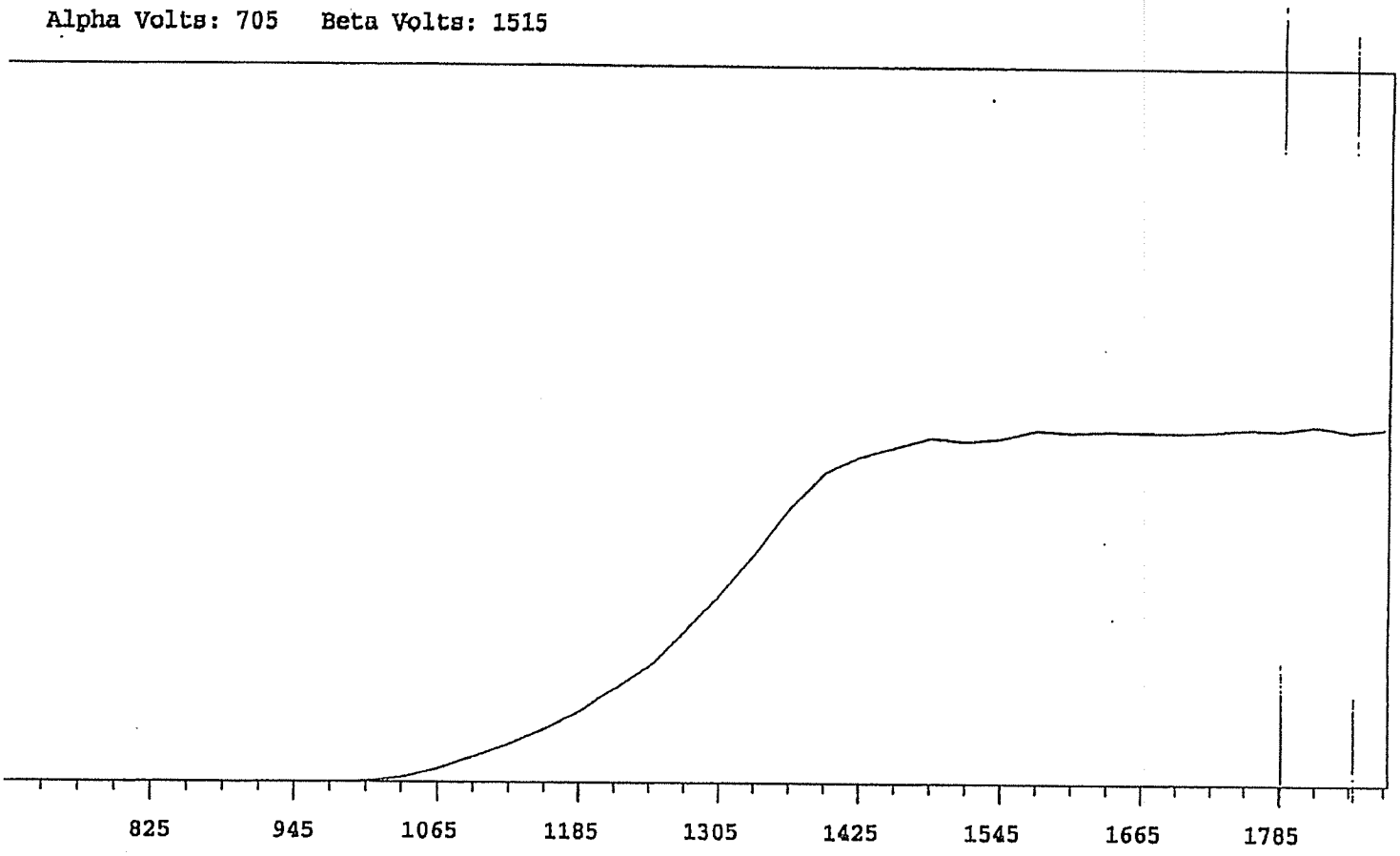
Plateau 7/1/09 Instrument 13 MPC 9604 Detector B 7/1/2009
Alpha Volts: 705 Beta Volts: 1515



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

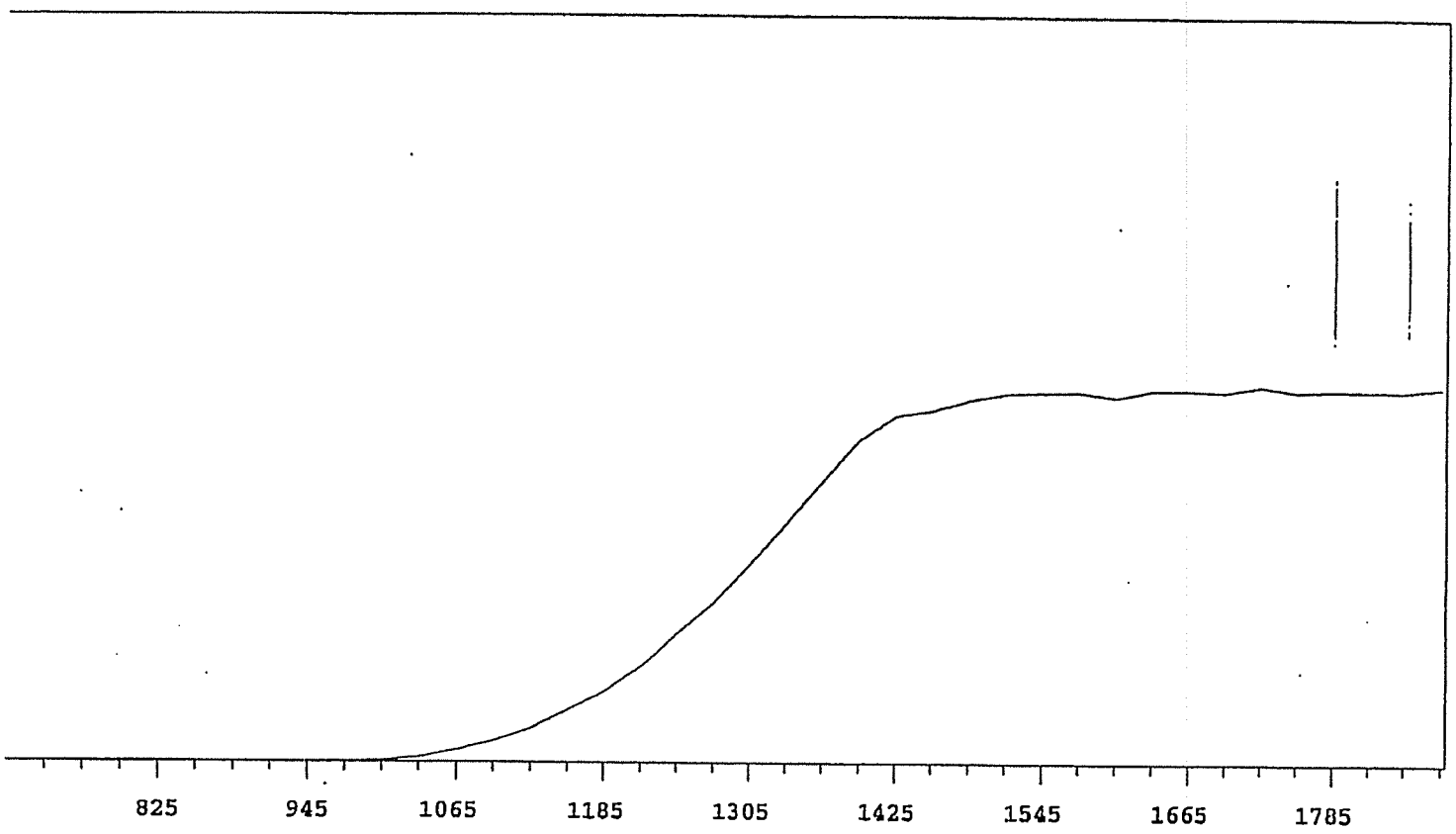


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	0	>100
975	9	>100
1005	93	>100
1035	325	>100
1065	834	>100
1095	1525	>100
1125	2318	>100
1155	3233	>100
1185	4357	+92.07
1215	5755	+85.64
1245	7438	+78.35
1275	9463	+70.89

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

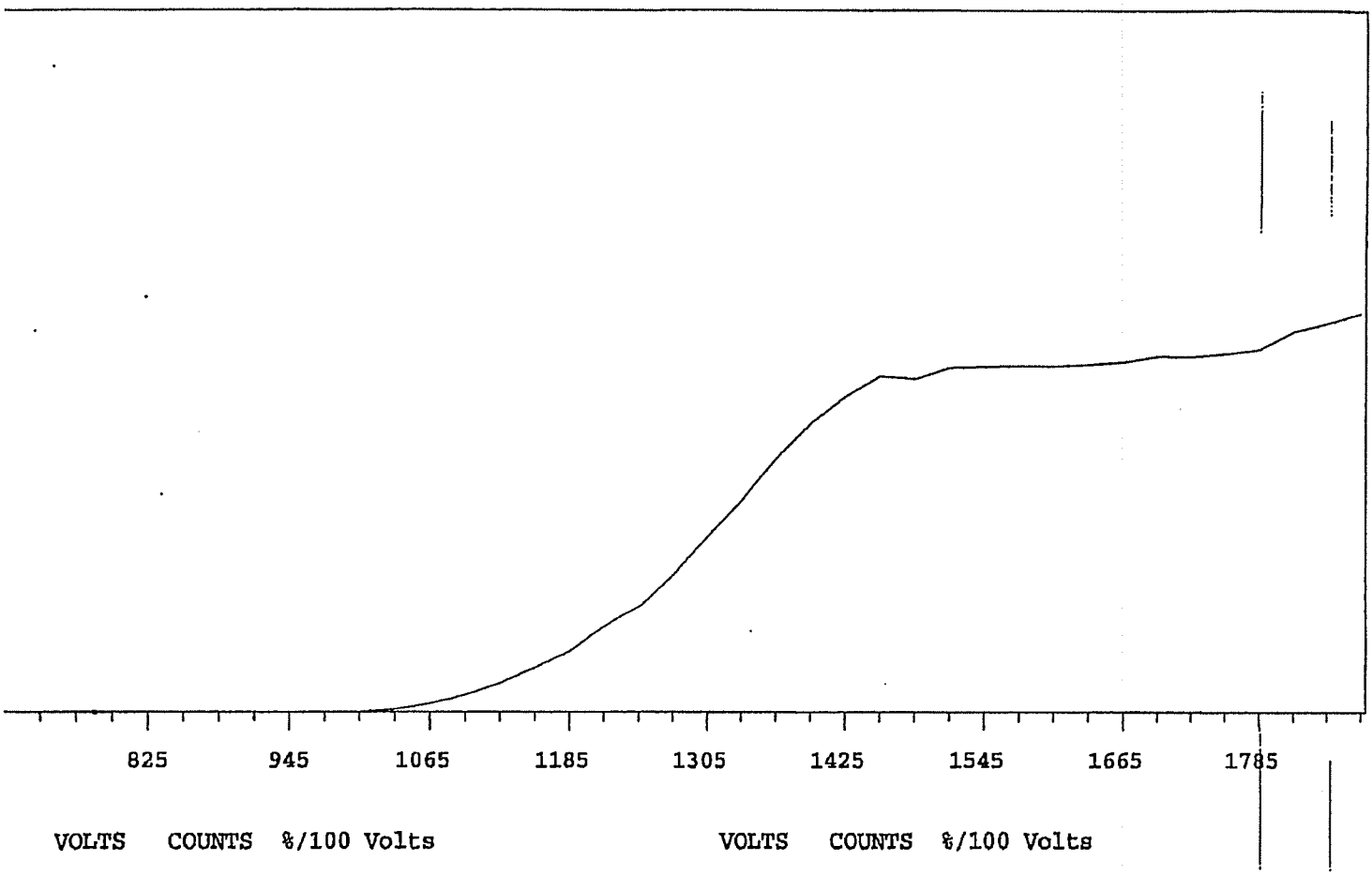


VOLTS	COUNTS	%/100 Volts
705	1	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	0	>100
975	9	>100
1005	58	>100
1035	228	>100
1065	544	>100
1095	936	>100
1125	1468	>100
1155	2110	>100
1185	2770	+94.71
1215	3670	+85.91
1245	4937	+79.46
1275	6066	+70.79

VOLTS	COUNTS	%/100 Volts
1305	7524	+61.93
1335	9002	+55.36
1365	10542	+44.70
1395	12064	+31.21
1425	12981	+19.20
1455	13192	+10.41
1485	13570	+5.93
1515	13820	+4.08
1545	13866	+0.75
1575	13880	+0.21
1605	13695	+0.59
1635	13950	+0.77
1665	13954	+1.92
1695	13911	+0.19
1725	14116	+0.02
1755	13908	-0.24
1785	13960	-0.81
1815	13939	+0.71
1845	13931	
1875	14071	

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

Alpha Volts: 705 Beta Volts: 1515

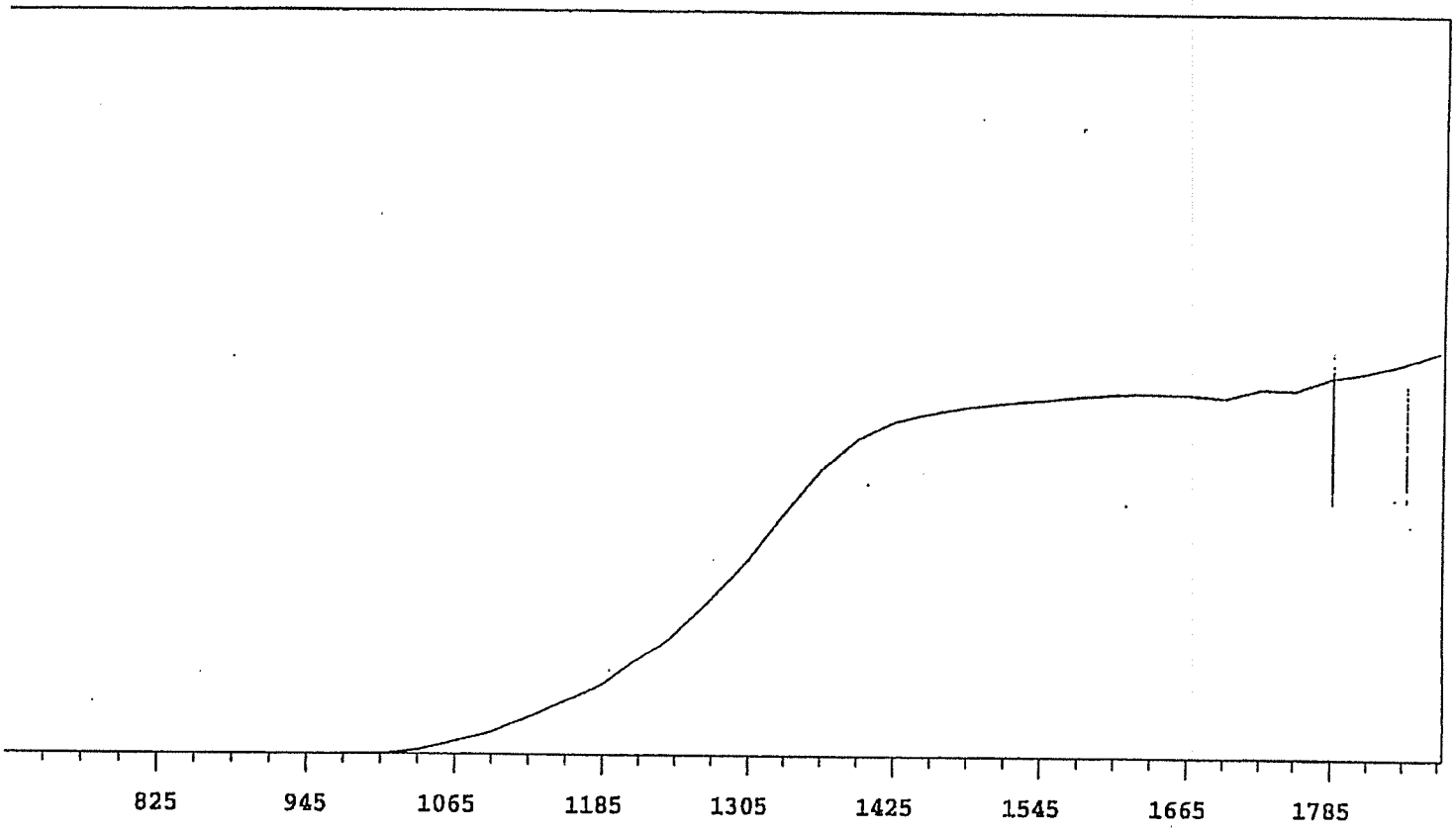


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	1	+0.00
915	0	>100
945	0	>100
975	0	>100
1005	18	>100
1035	137	>100
1065	430	>100
1095	865	>100
1125	1444	>100
1155	2151	>100
1185	2981	>100
1215	4168	+92.14
1245	5377	+84.73
1275	6924	+74.92

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

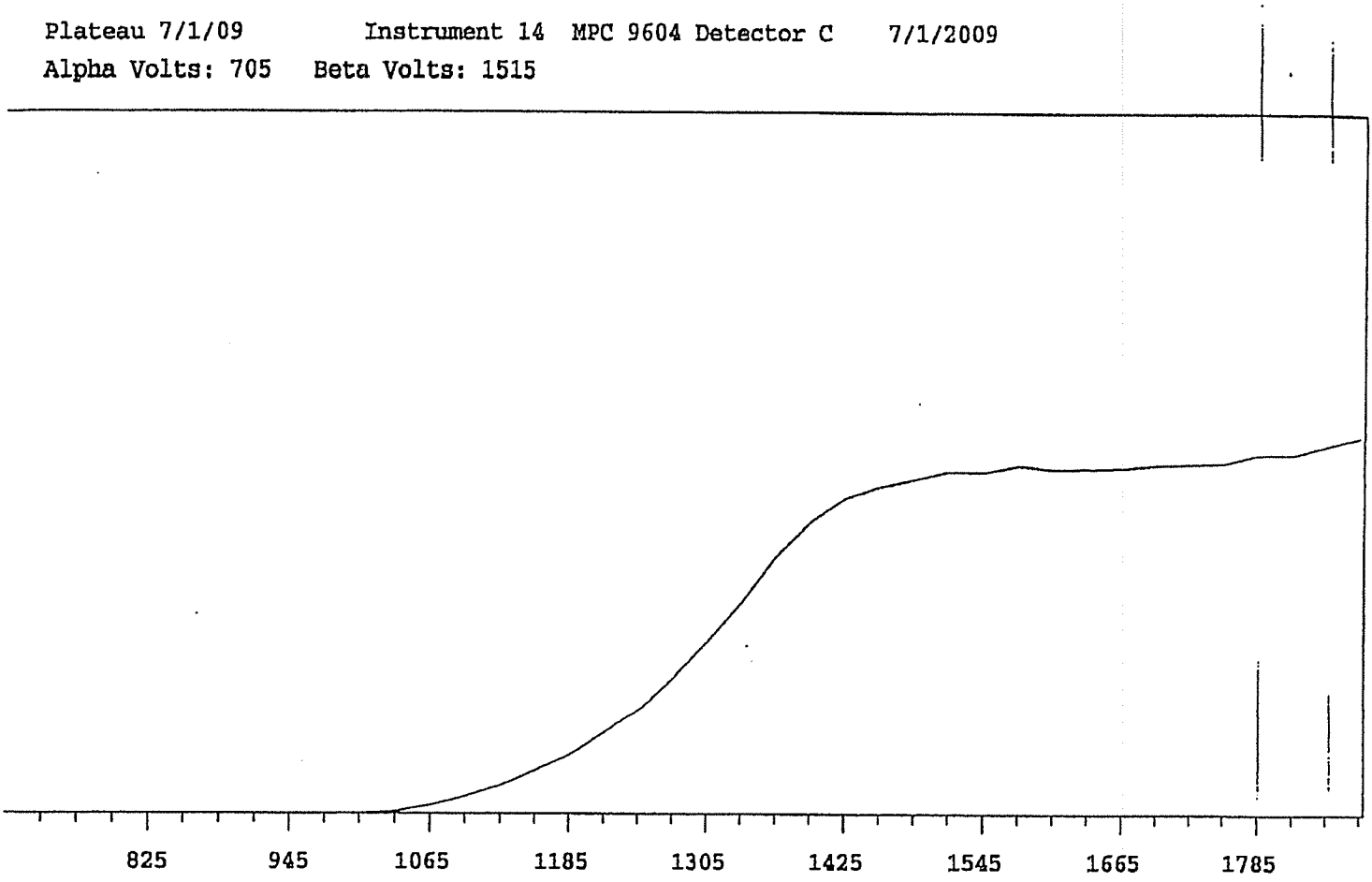
Alpha Volts: 705 Beta Volts: 1515



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	

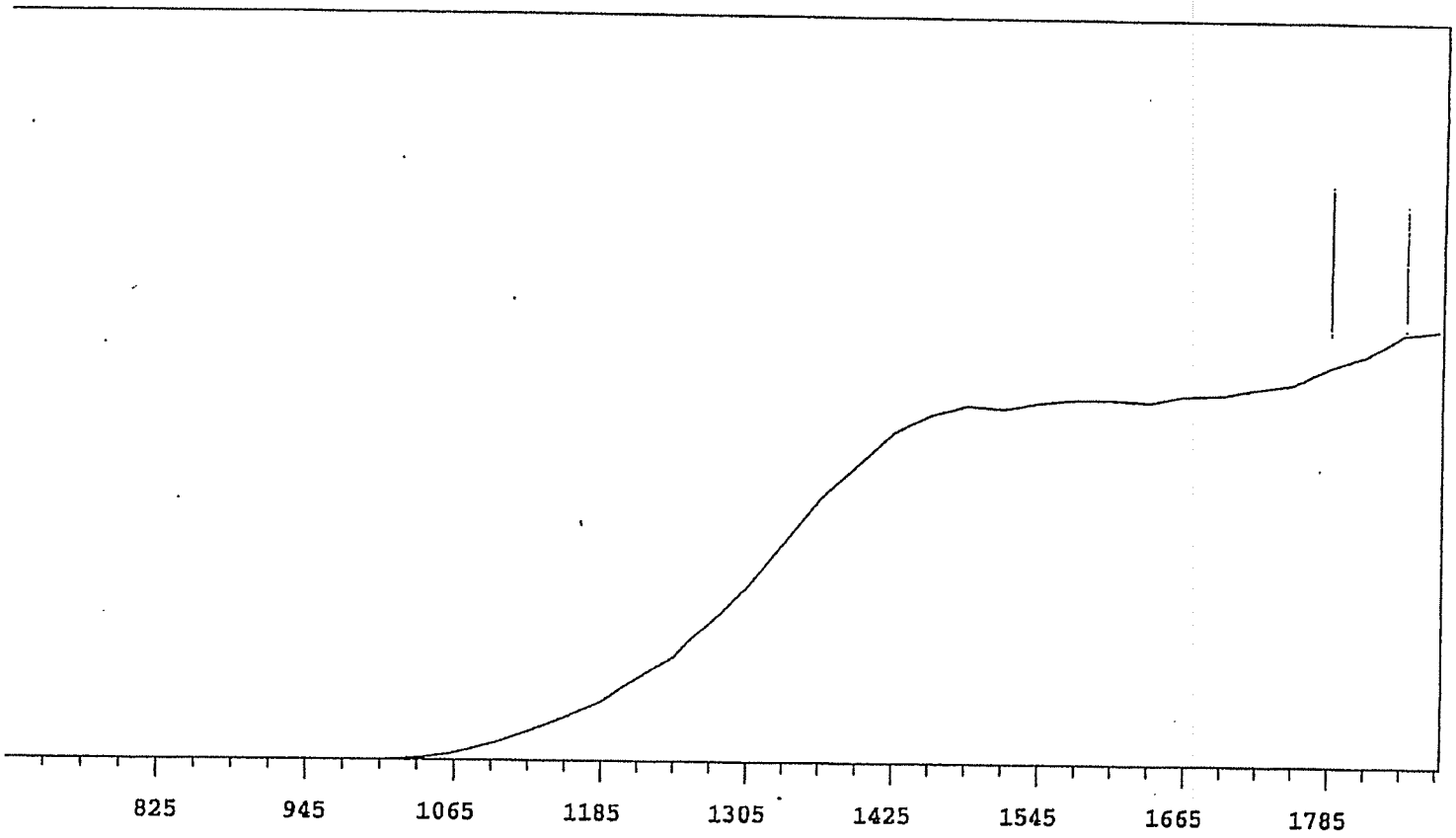
Plateau 7/1/09 Instrument 14 MPC 9604 Detector C 7/1/2009
Alpha Volts: 705 Beta Volts: 1515



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	

Standardization of Strontium Carrier 2187760

v1.2.1

Analyst	TC1

Standard Information	
Isotope	Strontium
Serial Number	2187760
Amount of Std. (mL)	1.0
Standard Prepared	11/25/2014

Parent Information	
Parent Serial #	2130149.6
Parent Exp. Date	7/11/2016

Std #	Weight of carrier added (g)	Weight of crucible or filter (g)	Weight of crucible or filter + ppt. (g)	Weight of ppt. (g)	mg Strontium/mL	mg Strontium/g
1	1.0162	17.4737	17.4899	0.0162	16.20	15.94
2	1.0172	19.9408	19.9570	0.0162	16.20	15.93
3	1.0189	18.3027	18.3189	0.0162	16.20	15.90
4	1.0173	19.4245	19.4407	0.0162	16.20	15.92

Mean Value (mg/mL) =	16.20
Stdev (mg/mL) =	± 0.00
1.0% of Mean Value =	0.162000
	Pass
Expiration Date	**11/25/2015**
Mean Value (mg/1.0mL) =	16.20

Standardization Rule

A satisfactory standardization is obtained when results give a standard deviation of less than 1.0% of the mean value.

12/1/14

Standardization of Strontium Carrier 1858443

v1.2

Analyst	VXC2

Standard Information	
Isotope	Strontium
Serial Number	1858443
Amount of Std. (mL)	1.0
Standard Prepared	12/11/2012

Parent Information	
Parent Serial #	1747929
Parent Exp. Date	3/5/2014

Std #	Weight of carrier added (g)	Weight of crucible or filter (g)	Weight of crucible or filter + ppt. (g)	Weight of ppt. (g)	mg Strontium/mL	mg Strontium/g
1	1.0326	0.0248	0.0426	0.0178	17.80	17.24
2	1.0306	0.0248	0.0423	0.0175	17.50	16.98
3	1.0299	0.0248	0.0426	0.0178	17.80	17.28
4	1.0299	0.0248	0.0426	0.0178	17.80	17.28

Mean Value (mg/mL) = 17.73
Stdev (mg/mL) = ± 0.15
1.0% of Mean Value = 0.177250
Pass
Expiration Date 12/11/2013

Mean Value (mg/1.0mL) = 17.73

Standardization Rule

A satisfactory standardization is obtained when results give a standard deviation of less than 1.0% of the mean value.

V. [illegible]
12/11/12

Standardization of Yttrium Carrier 2214065

v1.2.1

Analyst	BXF1

Standard Information	
Isotope	Yttrium
Serial Number	2214065
Amount of Std. (mL)	1.0
Standard Prepared	2/26/2015

Parent Information	
Parent Serial #	2074346.1
Parent Exp. Date	2/24/2016

Std #	Weight of carrier added (g)	Weight of crucible or filter (g)	Weight of crucible or filter + ppt. (g)	Weight of ppt. (g)	mg Yttrium/mL	mg Yttrium/g
1	1.0200	0.0234	0.0549	0.0315	31.50	30.88
2	1.0200	0.0230	0.0547	0.0317	31.70	31.08
3	1.0400	0.0232	0.0548	0.0316	31.60	30.38
4	1.0200	0.0234	0.0550	0.0316	31.60	30.98

Mean Value (mg/mL) =	31.60
Stdev (mg/mL) =	± 0.08
1.0% of Mean Value =	0.316000
	Pass
Expiration Date	2/24/2016
Mean Value (mg/1.0mL) =	31.60

Standardization Rule

A satisfactory standardization is obtained when results give a standard deviation of less than 1.0% of the mean value.

2-26-15

M 3/2/15

Standardization of Yttrium Carrier 1892786

v1.2

Analyst	JXR1

Standard Information	
Isotope	Yttrium
Serial Number	1892786
Amount of Std. (mL)	1.0
Standard Prepared	3/15/2013

Parent Information	
Parent Serial #	1731870.1
Parent Exp. Date	1/26/2014

Std #	Weight of carrier added (g)	Weight of crucible or filter (g)	Weight of crucible or filter + ppt. (g)	Weight of ppt. (g)	mg Yttrium /mL	mg Yttrium /g
1	1.0100	0.0242	0.0560	0.0318	31.80	31.49
2	1.0200	0.0242	0.0562	0.0320	32.00	31.37
3	1.0100	0.0242	0.0559	0.0317	31.70	31.39
4	1.0100	0.0242	0.0561	0.0319	31.90	31.58

Mean Value (mg/mL) = 31.85
Stdev (mg/mL) = ± 0.13
1.0% of Mean Value = 0.318500
Pass
Expiration Date 1/26/2014

Mean Value (mg/1.0mL) = 31.85

Standardization Rule

A satisfactory standardization is obtained when results give a standard deviation of less than 1.0% of the mean value.

Jennifer L. Robb

Eckert & Ziegler
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CERTIFICATE OF CALIBRATION
Standard Radionuclide Source

92552
Sr-89 5 mL Liquid in Flame Sealed Vial

1633

Customer: General Engineering Labs
P.O. No.: GEL1202747, Item 6 Product Code: 8089

This standard radionuclide source was prepared gravimetrically from a master solution, calibrated by Eckert & Ziegler Analytics. The master solution was calibrated by liquid scintillation counting. Radionuclide calibration and purity were checked by germanium gamma-ray spectrometry, liquid scintillation counting, and/or alpha spectrometry, as applicable. The nuclear decay rate and reference date for this source are given below. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

			Uncertainty*, % Type			
Isotope	Half-Life, Days	Activity (Bq)	u_A	u_B	U	Reference Date (12:00 PM EST)
Sr-89	5.053E+01	2.121E+05	0.1	0.9	1.8	12/13/2012

***Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

Comments:
Impurities: γ-impurities<0.1%.
5.07181 g 0.1M HCl solution with approximately 30 µg/g Sr carrier.

Source Prepared by: _____
K.J. Eardley, Radiochemist

QA Approved: _____ Date: 11 DEC 12
J.D. McCorvey, Counting Room Manager

RECEIVED 12/14/12 JDM

ACCREDITED SOURCE CALIBRATION LABORATORY HEALTH PHYSICS SOCIETY FOUNDED 1956

Single Isotope Certificate Rev 3, 23 August 2012

RC-S-065-062

Standard Traceability Log Rad

Source Material Info	
Parent Code:	1633
Prepared By:	Ashley Drochter
Carrier Conc:	0.1M HCl
Reference Date:	12/13/2012
Ampoule Mass (g):	5.07181 g
Uncertainty:	+/- 1.8 %
LogBook No:	RC-S-065-062

A Solution Material Info	
Isotope:	Strontium-89
Prepared By:	Bethany Fiem
Prep Date:	01/08/2013
Verification Date:	01/09/2013
Expiration Date:	08/22/2013
Primary Code:	1633-A
Dilution(mL):	100 mL
Mass of Parent(g):	4.9257 g
Density(g/mL):	0.9986
Balance ID:	38080204

Calculations Converting parent activity to dpm/mL|dpm/g

(Mass of parent(g)) * (Parm Activity (Bq)) * (conversion dpm to Bq) / (Ampoule Mass(g) *(Dilution Vol)) = Parent Activity (dpm/mL)
(Mass of parent(g)) * (Parm Activity (Bq)) * (conversion dpm to Bq) / Density / (Ampoule Mass (g) * (Dilution Vol)) = Parent Activity (dpm/g)
(4.9257 g) * (212100 Bq) * (60 dpm/Bq) / (5.07181 g * 100 mL) = 123593.8614 dpm/mL
(4.9257 g) * (212100 Bq) * (60 dpm/Bq) / (0.9986 g/mL)/ (5.07181 g * 100 mL) = 123767.0118 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

Verification for Sr-89 Standard 1633-A

v1.0.2

Instrument	Silver
Analyst	BF1
Verification Prep Date	1/8/2013

Standard Information	
Isotope	Sr-89
Serial Number	1633-A
Isotope Halflife	50.5300 D
Reference Date	12/13/2012
Ref. Act. (DPM/mL)	123593.8614
Amount of Std. (mL)	0.1
Standard Prep Date	1/8/2013

Std #	Count Date	Quench Number	Gross cpm	Bkg cpm
1	1/9/2013	89.20	8539.17	44.60
2	1/9/2013	88.90	8565.00	44.60
3	1/9/2013	88.90	8571.67	44.60

Std #	Net cpm	Calculated Avg. Eff.	Standard dpm/mL	Measured dpm
1	8494.57	1.011371	83990.64	8399.06
2	8520.40	1.011371	84246.04	8424.60
3	8527.07	1.011371	84311.99	8431.20

	dpm/mL
Mean Value =	84182.89
Stdev =	169.7251269
Certificate Value* =	85338.6
Two sigma =	339.450
10 % of Mean =	8418.289
Rule A (Pass/Fail)	Pass
% Recovery	98.65%
Rule B (Pass/Fail)	Pass
Expiration Date	8/22/2013

Verification Rules

Rule A = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.

Rule B = The determined mean value shall be within 5% of the certificate value.

*** Certificate Value is decay corrected to Count Date.**

The analyst prepared three standard verification sources for Sr-89 source 1633-A by transferring 0.1 mL portions of the standard into glass liquid scintillation vials. 10 mL of Ecoscint Ultra 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 10 mL of Ecoscint Ultra liquid scintillation cocktail. The standard verification vials and background source were dark adapted for at least two hours and counted on LSCSilver for Sr-89 source standard verification. The Sr-89 efficiency calibration which was used for verification calculations was performed on 1/9/2013 using Sr-89 source 1618-A.

Standard results for each verification source was calculated as follows:

Source dpm/mL = (A - B)/(C)(D)

where:

A = Ver. source cpm,
B = BKG cpm,
C = System efficiency (cpm/dpm), and
D = volume used for standard verification.

RAD-M-001

Amanda L Fisher
1/11/13

General Engineering Laboratories
GFC Calibration Source Preparation Sheet

Applicable SOP Number: GL-RAD-A-004

Isotope: Sr-89

Date Standards Prepared: 2-14-13

Standard ID: 1633-A

Matrix of Planchett/Filter: Sr Carbonate ppt on 25mm 0.45um filter

Amount Used (g or (ml)): 1.0

Standard Activity (DPM/g or mL): 123593.861 *

Residue/Carrier Agent: Sr Carrier 1858443 exp 12-11-13

Reference Date: 12-13-12

Pipette ID Used: 4043264

Expiration Date: 8-22-13

Balance ID Used: 1113021018

*Not decay corrected

	Standard Number	Residue Volume(mL)	Initial Wt. (g)	Final Wt. (g)	Net Wt. (mg)
	C_1	0.1	0.0246	0.0265	1.9
	C_2	0.2	0.0241	0.0276	3.5
	C_3	0.4	0.0246	0.0315	6.9
	C_4	0.5	0.0242	0.0325	8.3
	C_5	0.8	0.0236	0.0371	13.5
	C_6	1.0	0.0236	0.0412	17.6
	C_7	1.5	0.0236	0.0502	26.6
	C_8	2.1	0.0238	0.0599	36.1

wl ✓ NL 2/25/13

PR 2/14/13

Prepared By: [signature] Date: 2-14-13

Reviewed By: [signature] Date: 2/25/13

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CERTIFICATE OF CALIBRATION
Standard Radionuclide Source

1244

78351-278

Sr-90 5 mL Liquid in Flame Sealed Vial

Customer: General Engineering Labs/Charleston, SC
P.O. No.: 7312 RD, Item 2

This standard radionuclide source was prepared gravimetrically from a calibrated master solution. The master solution was calibrated by liquid scintillation counting.

Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry and liquid scintillation counting. 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:	Sr-90
Activity (Bq):	3.691 E4
Half-Life:	28.79 years
Calibration Date:	October 1, 2008 12:00 EST
Relative Expanded Uncertainty (k=2):	1.7%

Comments:
Impurities: γ-impurities <0.1%
5.01862 grams 0.1M HCl solution with 30 µg/g Sr carrier.

NOTE: This source also contains Y-90 in secular equilibrium with Sr-90. The Y-90 activity is equal to the Sr-90 activity. Since Sr-90 and Y-90 both decay 100% by beta emission, the total beta emission rate for the source is twice the certified Sr-90 activity. The half-life for Y-90 is 64.08 hours.

Source Prepared By: _____
W. Mao, Radiochemist

QA Approved: _____ Date: 10/3/08
D. M. Montgomery, QA Manager

RECEIVED 10/7/08
RC-S-048-125

End of Certificate

Standard Traceability Log Rad

Source Material Info	
Parent Code:	1244
Prepared By:	Daniel Roy
Carrier Conc:	0.1M HCL
Reference Date:	10/01/2008
Ampoule Mass (g):	5.01862 g
Uncertainty:	+/- 1.7 %
LogBook No:	RC-S-048-125

A Solution Material Info	
Isotope:	Strontium-90
Prepared By:	Gregory Ramsay
Prep Date:	02/12/2013
Verification Date:	02/12/2013
Expiration Date:	02/12/2014
Primary Code:	1244-A
Dilution(mL):	100 mL
Mass of Parent(g):	4.8346 g
Density(g/mL):	0.9984
Balance ID:	38080204

Calculations Converting parent activity to dpm/mL|dpm/g

(Mass of parent(g)) * (Parm Activity (Bq)) * (conversion dpm to Bq) / (Ampoule Mass(g) *(Dilution Vol)) = Parent Activity (dpm/mL)
(Mass of parent(g)) * (Parm Activity (Bq)) * (conversion dpm to Bq) / Density / (Ampoule Mass (g) * (Dilution Vol)) = Parent Activity (dpm/g)
(4.8346 g) * (36910 Bq) * (60 dpm/Bq) / (5.01862 g * 100 mL) = 21333.9626 dpm/mL
(4.8346 g) * (36910 Bq) * (60 dpm/Bq) / (0.9984 g/mL)/ (5.01862 g * 100 mL) = 21367.7236 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

Verification for Sr-90 Standard 1244-A

v1.0.2

Instrument	GOLD
Analyst	BF
Verification Prep Date	2/12/2013

Standard Information	
Isotope	Sr-90
Serial Number	1244-A
Isotope Halflife	28.9000 Y
Reference Date	10/1/2008
Ref. Act. (DPM/mL)	21333.9626
Amount of Std. (mL)	0.1
Standard Prep Date	2/12/2013

Std #	Count Date	Quench Number	Gross cpm	Bkg cpm
1	2/12/2013	57.70	3807.92	38.20
2	2/12/2013	55.70	3846.92	38.20
3	2/12/2013	56.20	3861.54	38.20

Std #	Net cpm	Calculated Avg. Eff.	Standard dpm/mL	Measured dpm
1	3769.72	2.046222	18422.83	1842.28
2	3808.72	2.046222	18613.42	1861.34
3	3823.34	2.046222	18684.87	1868.49

	dpm/mL
Mean Value =	18573.71
Stdev =	135.4612019
Certificate Value* =	19212.6
Two sigma =	270.922
10 % of Mean =	1857.371
Rule A (Pass/Fail)	Pass
% Recovery	96.67%
Rule B (Pass/Fail)	Pass
Expiration Date	2/12/2014

Verification Rules

Rule A = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.

Rule B = The determined mean value shall be within 5% of the certificate value.

* Certificate Value is decay corrected to Count Date.

The analyst prepared three standard verification sources for Sr-90 source 1244-A by transferring 0.1 mL portions of the standard into glass liquid scintillation vials. 10 mL of Ecoscint Ultra 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 10 mL of Ecoscint Ultra liquid scintillation cocktail. The standard verification vials and background source were dark adapted for at least two hours and counted on LSCGOLD for Sr-90 source standard verification. The Sr-90 efficiency calibration which was used for verification calculations was performed on 2/12/2013 using Sr-90 source 1243-A.

Standard results for each verification source was calculated as follows:

Source dpm/mL = (A - B)/(C)(D)

where:

A = Ver. source cpm,
B = BKG cpm,
C = System efficiency (cpm/dpm), and
D = volume used for standard verification.

RAD-M-001

Amanda Lehn 2/14/13

BF 2-13-13

General Engineering Laboratories
GFC Calibration Source Preparation Sheet
Sr-90 (Sr portion)

Applicable SOP Number: GL-RAD-A-004

Isotope: Sr-90

Date Standards Prepared: 3/29/13

Standard ID: 1244-A

Matrix of Planchett/Filter: Sr Carbonate ppt on 25mm 0.45 µm filter

Amount Used (g or ml): 0.5

Standard Activity (DPM/g or mL): ~~21333.9629~~ 21333.9626 (AP 3/29/13)

Residue/Carrier Agent: Sr carrier 1858443

Reference Date: 10/1/08

Pipette ID Used: 1795419 / 2154115 / 4043264 / 11518634

Expiration Date: 2/12/14

Balance ID Used: 1113021018

Std carrier wt. 121 mg/mL

Sep Date/Time: 3-29-13 / 1410

	Standard Number	Residue Volume(mL)	Initial Wt. (g)	Final Wt. (g)	Net Wt. (mg)	
	S1	0.2	0.0239	0.0272	3.3	
	S2	0.4	0.0241	0.0314	7.3	
	S3	0.5	~~0.0243~~ 0.0243	0.0328	8.5	0.0243
	S4	0.7	0.0243	0.0365	12.2	
	S5	1.0	0.0245	0.0417	17.2	
	S6	1.5	0.0246	0.0512	26.6	
	S7	1.8	0.0246	0.0556	31.0	
	S8	2.1	0.0247	0.0608	36.1	(AP 3/29/13)

(AP 3/29/13) (AP 3/29/13) (AP 3/29/13) *NL 4/1/13

Prepared By: [signature] Date: 3-29-13

Reviewed By: [signature] Date: 4/1/13

General Engineering Laboratories
GFC Calibration Source Preparation Sheet
Sr-90 Yttrium Portion

Applicable SOP Number: GL-RAD-A-004

Isotope: Sr-90 (Y-90)

Date Standards Prepared: 3/29/13

Standard ID: 1244-A

Matrix of Planchett/Filter: Yttrium oxalate ppt on 25 mm 0.45 μm filter

Amount Used (g or ml): 0.5

Standard Activity (DPM/g or mL): 21333.9626

Residue/Carrier Agent: Y# carrier 1892786

Reference Date: 10/1/08

Pipette ID Used: 2154115

Expiration Date: 2/12/14

Balance ID Used: ~~35~~ 1113021018 (3-29-13)

Std carrier wt. 31.86 mg/mL

Sep date/time: 3/29/13 1305

	Standard Number	Residue Volume(mL)	Initial Wt. (g)	Final Wt. (g)	Net Wt. (mg)
	Y1	0.5	0.0239	0.0398	15.9
	Y2	0.5	0.0240	0.0401	16.1
	Y3	0.5	0.0242	0.0402	16.0
	Y4	0.5	0.0242	0.0403	16.1
	Y5	0.5	0.0244	0.0404	16.0
	Y6	0.5	0.0245	0.0407	16.2
	Y7	0.5	0.0245	0.0404	15.9
	Y8	0.5	0.0249	0.0413	16.4

W ✓

AP 3/29/13

Prepared By: [signature] Date: 3-29-13

Reviewed By: [signature] Date: 4/1/13

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CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

1717

98369

Sr-89 5 mL Liquid in Flame Sealed Vial

Customer: GEL Laboratories, LLC
P.O. No.: GEL 1408580, Item 10 Product Code: 8089

This standard radionuclide source was prepared gravimetrically from a master solution, calibrated by Eckert & Ziegler Analytics. The master solution was calibrated by liquid scintillation counting. Radionuclide calibration and purity were checked by germanium gamma-ray spectrometry, liquid scintillation counting, and/or alpha spectrometry, as applicable. The nuclear decay rate and reference date for this source are given below. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Isotope	Half-Life, Days	Activity (Bq)	Uncertainty* , % Type u_A	u_B	U	Reference Date (12:00 PM EST)
Sr-89	5.056E+01	2.079E+06	0.1	1.0	2.0	09/09/2014

***Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

Comments:
Impurities: γ-impurities<0.1%.
5.01466 g 0.1M HCl solution with approximately 30 µg/g Sr carrier.

Source Prepared by: _____
R. Ormsby, Radiochemist

QC Approved: _____ Date: 9SEP14
J. S. Lahr, Spectroscopist

RECEIVED 10/10/14

ANA Form005 Rev. —

Single Isotope Certificate Rev 5, 22 May 2014

ACCREDITED SOURCE CALIBRATION LABORATORY HEALTH PHYSICS SOCIETY FOUNDED 1956

GL-CED-247- 010

Corporate Office
24937 Avenue Tibbitts Valencia, California 91355

Laboratory
1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

Standard Traceability Log Rad

Source Material Info	
Parent Code:	1717
Prepared By:	Gregory Ramsay
Carrier Conc:	0.1M HCl
Reference Date:	09/09/2014
Ampoule Mass (g):	5.01466 g
Uncertainty:	+/- 1 %
LogBook No:	GL-CED-297-010

A Solution Material Info	
Isotope:	Strontium-89
Prepared By:	Gregory Ramsay
Prep Date:	11/05/2014
Verification Date:	11/05/2014
Expiration Date:	05/19/2015
Primary Code:	1717-A
Dilution(mL):	200 mL
Mass of Parent(g):	4.983 g
Density(g/mL):	0.9976
Balance ID:	38080204

Calculations Converting parent activity to dpm/mL|dpm/g

(Mass of parent(g)) * (Parm Activity (Bq)) * (conversion dpm to Bq) / (Ampoule Mass(g) *(Dilution Vol)) = Parent Activity (dpm/mL)
(Mass of parent(g)) * (Parm Activity (Bq)) * (conversion dpm to Bq) / Density / (Ampoule Mass (g) * (Dilution Vol)) = Parent Activity (dpm/g)
(4.983 g) * (207900 Bq) * (60 dpm/Bq) / (5.01466 g * 200 mL) = 61976.2277 dpm/mL
(4.983 g) * (207900 Bq) * (60 dpm/Bq) / (0.9976 g/mL)/ (5.01466 g * 200 mL) = 62125.3285 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

Verification for Sr-89 Standard 1717-A

v1.0.2

Instrument	Gold
Analyst	GXR1
Verification Prep Date	11/5/2014

Standard Information	
Isotope	Sr-89
Serial Number	1717-A
Isotope Halflife	50.5300 D
Reference Date	9/9/2014
Ref. Act. (DPM/mL)	61976.2277
Amount of Std. (mL)	0.1
Standard Prep Date	11/5/2014

Std #	Count Date	Quench Number	Gross cpm	Bkg cpm
1	11/5/2014	54.00	2864.00	33.40
2	11/5/2014	55.80	2853.24	33.40
3	11/5/2014	55.90	2851.55	33.40

Std #	Net cpm	Calculated Avg. Eff.	Standard dpm/mL	Measured dpm
1	2830.60	1.040671	27199.76	2719.98
2	2819.84	1.040671	27096.36	2709.64
3	2818.15	1.040671	27080.12	2708.01

	dpm/mL
Mean Value =	27125.41
Stdev =	64.89297192
Certificate Value* =	28356.4
Two sigma =	129.786
10 % of Mean =	2712.541
Rule A (Pass/Fail)	Pass
% Recovery	95.66%
Rule B (Pass/Fail)	Pass
Expiration Date	5/19/2015

Verification Rules

Rule A = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.

Rule B = The determined mean value shall be within 5% of the certificate value.

*** Certificate Value is decay corrected to Count Date.**

The analyst prepared three standard verification sources for Sr-89 source 1717-A by transferring 0.1 mL portions of the standard into glass liquid scintillation vials. 10 mL of Ecoscint Ultra 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 10 mL of Ecoscint Ultra liquid scintillation cocktail. The standard verification vials and background source were dark adapted for at least two hours and counted on LSCGold for Sr-89 source standard verification. The Sr-89 efficiency calibration which was used for verification calculations was performed on 11/5/2014 using Sr-89 source 1688-A.

Standard results for each verification source was calculated as follows:

Source dpm/mL = (A - B)/(C)(D)

where:

A = Ver. source cpm,
B = BKG cpm,
C = System efficiency (cpm/dpm), and
D = volume used for standard verification.

RAD-M-001

11/6/14

Amanda Fehr 11/7/14

Eckert & Ziegler
Analytics

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404•352•8677
Fax 404•352•2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION
Standard Radionuclide Source

1243

78352-278

Sr-90 10 mL Liquid in Flame Sealed Vial

Customer: General Engineering Labs/Charleston, SC
P.O. No.: 7312 RD, Item 3

This standard radionuclide source was prepared gravimetrically from a calibrated master solution. The master solution was calibrated by liquid scintillation counting.

Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry and liquid scintillation counting. 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:	Sr-90
Activity (Bq):	3.856 E5
Half-Life:	28.79 years
Calibration Date:	October 1, 2008 12:00 EST
Relative Expanded Uncertainty (k=2):	1.7%

Comments:
Impurities: γ-impurities <0.1%
10.41484 grams 0.1M HCl solution with 30 μg/g Sr carrier.

NOTE: This source also contains Y-90 in secular equilibrium with Sr-90. The Y-90 activity is equal to the Sr-90 activity. Since Sr-90 and Y-90 both decay 100% by beta emission, the total beta emission rate for the source is twice the certified Sr-90 activity. The half-life for Y-90 is 64.08 hours.

Source Prepared By: _____
W. Mao, Radiochemist

QA Approved: _____ Date: 10/3/08
D. M. Montgomery, QA Manager

RECEIVED

Standard Traceability Log Rad

Source Material Info	
Parent Code:	1243
Prepared By:	Daniel Roy
Carrier Conc:	0.1M HCL
Reference Date:	10/01/2008
Ampoule Mass (g):	10.41484 g
Uncertainty:	+/- .85 %
LogBook No:	RC-S-048-124

A Solution Material Info	
Isotope:	Strontium-90
Prepared By:	Daniel Roy
Prep Date:	12/19/2008
Verification Date:	12/04/2013
Expiration Date:	12/04/2014
Primary Code:	1243-A
Dilution(mL):	100 mL
Mass of Parent(g):	10.2164 g
Density(g/mL):	0.9991
Balance ID:	38080204

Calculations Converting parent activity to dpm/mL|dpm/g

(Mass of parent(g)) * (Parm Activity (Bq)) * (conversion dpm to Bq) / (Ampoule Mass(g) *(Dilution Vol)) = Parent Activity (dpm/mL)
(Mass of parent(g)) * (Parm Activity (Bq)) * (conversion dpm to Bq) / Density / (Ampoule Mass (g) * (Dilution Vol)) = Parent Activity (dpm/g)
(10.2164 g) * (385600 Bq) * (60 dpm/Bq) / (10.41484 g * 100 mL) = 226951.7634 dpm/mL
(10.2164 g) * (385600 Bq) * (60 dpm/Bq) / (0.9991 g/mL)/ (10.41484 g * 100 mL) = 227146.2010 dpm/g

Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
01/21/2010	Bethany Fiem	2.2467	1000	1243-B	510.329369 dpm/mL	01/21/2010	01/21/2011
08/03/2010	Bethany Fiem	2.5604	1000	1243-C	581.5851 dpm/mL	08/03/2010	08/03/2011
01/12/2011	Bethany Fiem	2.4946	1000	1243-D	566.6389 dpm/mL	01/12/2011	01/12/2012
08/12/2011	Tim Chandler	3.3115	100	1243-G	18.7877 dpm/mL	03/26/2014	03/25/2015
08/17/2011	Tim Chandler	2.5541	100	1243-H	14.49064 dpm/mL	03/26/2014	03/25/2015
06/21/2011	Tim Chandler	.0235	100	1243-E	53.37936 dpm/mL	03/19/2014	06/20/2014
07/05/2011	Bethany Fiem	2.6072	1000	1243-F	592.2156 dpm/mL	07/05/2011	07/05/2012

01/31/2012	Gregory Ramsay	2.6792	1000	1243-I	608.5701 dpm/ml	01/31/2012	01/31/2013
08/29/2012	Bethany Fiem	2.6799	1000	1243-J	608.729104 dpm/mL	09/14/2012	09/11/2013
02/12/2013	Gregory Ramsay	2.6526	1000	1243-K	602.528 dpm/ml	01/15/2014	01/15/2015
12/04/2013	Gregory Ramsay	2.5347	1000	1243-L	575.747476 dpm/ml	12/04/2013	12/04/2014
08/11/2014	Gregory Ramsay	2.7006	1000	1243-M	613.431 dpm/mL	08/12/2014	08/12/2015

GEL Laboratories LLC
Version 1.0 9/18/2000

Verification for Sr-90 Standard 1243-M

v1.0.2

Instrument	Red
Analyst	GXR1
Verification Prep Date	8/12/2014

Standard Information	
Isotope	Sr-90
Serial Number	1243-M
Isotope Halflife	28.9000 Y
Reference Date	10/1/2008
Ref. Act. (DPM/mL)	613.431
Amount of Std. (mL)	0.1
Standard Prep Date	8/11/2014

Std #	Count Date	Quench Number	Gross cpm	Bkg cpm
1	8/13/2014	56.00	155.80	49.40
2	8/13/2014	56.00	152.20	49.40
3	8/13/2014	57.20	151.20	49.40

Std #	Net cpm	Calculated Avg. Eff.	Standard dpm/mL	Measured dpm
1	106.40	1.983091	536.54	53.65
2	102.80	1.983091	518.38	51.84
3	101.80	1.983091	513.34	51.33

	dpm/mL
Mean Value =	522.75
Stdev =	12.19997561
Certificate Value* =	532.9
Two sigma =	24.400
10 % of Mean =	52.275
Rule A (Pass/Fail)	Pass
% Recovery	98.09%
Rule B (Pass/Fail)	Pass
Expiration Date	8/12/2015

Verification Rules

Rule A = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.

Rule B = The determined mean value shall be within 5% of the certificate value.

*** Certificate Value is decay corrected to Count Date.**

The analyst prepared three standard verification sources for Sr-90 source 1243-M by transferring 0.1 mL portions of the standard into glass liquid scintillation vials. 10 mL of Ecoscint Ultra 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 10 mL of Ecoscint Ultra liquid scintillation cocktail. The standard verification vials and background source were dark adapted for at least two hours and counted on LSCRed for Sr-90 source standard verification. The Sr-90 efficiency calibration which was used for verification calculations was performed on 8/12/2014 using Sr-90 source 1244-A.

Standard results for each verification source was calculated as follows:

Source dpm/mL = (A - B)/(C)(D)

where:

A = Ver. source cpm,
B = BKG cpm,
C = System efficiency (cpm/dpm), and
D = volume used for standard verification.

RAD-M-001

8/13/14

Amanda Lehr 8/28/14

Strontium 89/90 Queue Sheet

Instrument Verification

03/02/15

Batch #: 1459992 Analyst: BXF1 First Client Due Date: Internal Due Date: 03/07/2015 Comments

Sr-89/90 Spike Code(s): — / — Expiration Date: — / — Vol(s): — / — Sr Sep. Date/time: 2-25-15 1948

Sr-89/90 LCS Code(s): 1717-A / 1243-M Expiration Date: 5-1-15 / 8-12-15 Vol(s): 0.2 / 0.5 Y Sep. Date/time: 3-2-15 0855

Sr Carrier Code: 2187760 Exp Date: 11-25-15 Vol: 0.5 Sdt Wt: 8.1 Y Carrier Code: 2214065 Exp Date: 2-4-16 Vol: 0.5 Sdt Wt: 15.8

Prep Date: 2-25-15 Initials: BMF Pipet ID: 1795419 / 2154115 ~~1167295~~ Balance #: 5201863 Analytical Scale #: 1113021618 Witness: N/A

Sample ID	Client Description	Type	RDL	Date Collected	Matrix	Client	Rad	Pos #	Wet/Dry Aliquot (mL) or (g)	Det # 1 & 2	Initial Sr wt (g)	Final Sr wt (g)	Net Sr wt (mg)	Initial Y wt (g)	Final Y wt (g)	Net Y wt (mg)
1203270742-1	LCS for batch 1459992	LCS			DRINKING WATQC	ACCOUNT		1	300		0.0228	0.0298	7.0	0.0236	0.0395	15.9
1203270743-1	LCS for batch 1459992	LCS			DRINKING WATQC	ACCOUNT		2	300		0.0232	0.0303	7.1	0.0236	0.0395	15.9
1203270744-1	LCS for batch 1459992	LCS			DRINKING WATQC	ACCOUNT		3	300		0.0232	0.0306	7.4	0.0236	0.0388	15.2
1203270745-1	LCS for batch 1459992	LCS			DRINKING WATQC	ACCOUNT		4	300		0.0234	0.0314	8.0	0.0236	0.0388	15.2
1203270746-1	LCS for batch 1459992	LCS			DRINKING WATQC	ACCOUNT		5	300		0.0238	0.0312	7.4	0.0236	0.0389	15.3
1203270747-1	LCS for batch 1459992	LCS			DRINKING WATQC	ACCOUNT		6	300		0.0226	0.0299	7.3	0.0236	0.0391	15.5
1203270748-1	LCS for batch 1459992	LCS			DRINKING WATQC	ACCOUNT		7	300		0.0240	0.0319	7.9	0.0236	0.0399	16.3
1203270749-1	LCS for batch 1459992	LCS			DRINKING WATQC	ACCOUNT		8	300		0.0232	0.0309	7.7	0.0236	0.0392	15.6

wt ✓ wt ✓

Solid Sample Dissolution by: LEACH or DIGESTION
Circle One

Data Reviewed By: [signature]

Gas Flow Proportional Counter Calibration Package

Method: Gross Alpha Beta

Instrument (circle one): LB4100 / (Protean)

Part 1: Efficiency determination	Included/ Acceptable	Comments
1 Efficiency spreadsheet (eff pts, graphs, trendline equation)	✓	
2 Applicable portion of GFPC_Machines.XLS	✓	
3 Raw Data for Calibration standards	✓	
4 Verification Spreadsheet and Raw Data (recoveries 75%-125%)	✓	
5 Plateau graph and raw data	✓	
6 Standardization of Carrier (if applicable)		NA

Part 2. Documentation for Calibration Source		
1 Vendor Certificate	✓	
2 Standard Traceability Log (from LIMS)	✓	
3 Current Verification of Source	✓	
4 Source preparation sheet	✓	

Part 3. Documentation for Verification Source		
1 Vendor Certificate	✓	
2 Standard Traceability Log (from LIMS)	✓	
3 Current Verification of Source	✓	
4 Source preparation sheet	✓	

Part 4. Enter into LIMS		
1 Alpha LIMS instrument calibration updated	✓	

Primary Review of Package [signature]

Secondary Review of Package Amanda L. Lehn

Effective Date: 10/1/13

~~Exp 9/30/14~~ (AF) 9/30/14

*Exp 10/30/14 15 AMF 11/7/14

Calibration verified 9/14 and expiration date extended. AMF

GEL Laboratories
2040 Savage Road, Charleston, SC 29407
(843)556-8171

Alpha Calibration - PIC - Sep 2013

Standard Data	
Isotope	Th-230
Standard ID number	1105-A
Half Life (days)	27532545
Std. Act. (dpm/mL)	22077.2901
Reference Date	6/14/2007
Volume of spike (mL)	2.0
Std. Nominal (dpm)	44152.03
Decay Date	9/21/2013

Source Weight	
Source	Measured weight (mg)
1	1.0
2	13.3
3	24.0
4	49.8
5	46.9
6	73.4
7	84.9
8	109.4

The following detectors were not calibrated:

6D

*Background is considered neglible.

**Decay corrected to mid-point of count

Detector (#)	Source ID (#)	Raw Count Data Start Time	Count Time (min)	Alpha (counts)	Raw Alpha (cpm)	Th-230 (cpm)*	Decay Corrected Nominal (dpm)**	Th-230 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
1A	1	9/21/2013 11:55	3	32784	10928	10928.00	44152.03	**0.2475**	0.2414
1A	2	9/21/2013 12:11	3	22813	7604.333333	7604.33	44152.03	**0.1722**	0.1918
1A	3	9/21/2013 12:06	3	23639	7879.666667	7879.67	44152.03	**0.1785**	0.1606
1A	4	9/21/2013 12:01	3	17546	5848.666667	5848.67	44152.03	**0.1325**	0.1194
1A	5	9/21/2013 12:17	3	13712	4570.666667	4570.67	44152.03	**0.1035**	0.1222
1A	6	9/21/2013 13:10	3	14898	4966	4966.00	44152.03	**0.1125**	0.1049
1A	7	9/21/2013 12:30	3	12120	4040	4040.00	44152.03	**0.0915**	0.0993
1A	8	9/21/2013 12:25	3	10340	3446.666667	3446.67	44152.03	**0.0781**	0.0766
1B	1	9/21/2013 12:01	3	32860	10953.33333	10953.33	44152.03	**0.2481**	0.2409
1B	2	9/21/2013 11:55	3	22231	7410.333333	7410.33	44152.03	**0.1678**	0.1904
1B	3	9/21/2013 12:11	3	23731	7910.333333	7910.33	44152.03	**0.1792**	0.1591
1B	4	9/21/2013 12:06	3	17337	5779	5779.00	44152.03	**0.1309**	0.1189
1B	5	9/21/2013 12:25	3	13715	4571.666667	4571.67	44152.03	**0.1035**	0.1216
1B	6	9/21/2013 12:17	3	15109	5036.333333	5036.33	44152.03	**0.1141**	0.1058
1B	7	9/21/2013 13:10	3	12212	4070.666667	4070.67	44152.03	**0.0922**	0.1007
1B	8	9/21/2013 12:30	3	10447	3482.333333	3482.33	44152.03	**0.0789**	0.0773
1C	1	9/21/2013 12:06	3	35697	11899	11899.00	44152.03	**0.2695**	0.2641
1C	2	9/21/2013 12:01	3	25411	8470.333333	8470.33	44152.03	**0.1918**	0.2114
1C	3	9/21/2013 11:55	3	26429	8809.666667	8809.67	44152.03	**0.1995**	0.1786
1C	4	9/21/2013 12:11	3	20030	6676.666667	6676.67	44152.03	**0.1512**	0.1359
1C	5	9/21/2013 12:30	3	15082	5027.333333	5027.33	44152.03	**0.1139**	0.1388
1C	6	9/21/2013 12:25	3	17451	5817	5817.00	44152.03	**0.1317**	0.1212
1C	7	9/21/2013 12:17	3	14082	4694	4694.00	44152.03	**0.1063**	0.1152
1C	8	9/21/2013 13:10	3	12006	4002	4002.00	44152.03	**0.0906**	0.0893
1D	1	9/21/2013 12:12	3	34323	11441	11441.00	44152.03	**0.2591**	0.2529
1D	2	9/21/2013 12:06	3	23855	7951.666667	7951.67	44152.03	**0.1801**	0.2006
1D	3	9/21/2013 12:01	3	24855	8285	8285.00	44152.03	**0.1876**	0.1681
1D	4	9/21/2013 11:55	3	18421	6140.333333	6140.33	44152.03	**0.1391**	0.1257
1D	5	9/21/2013 13:11	3	14280	4760	4760.00	44152.03	**0.1078**	0.1285
1D	6	9/21/2013 12:30	3	15997	5332.333333	5332.33	44152.03	**0.1208**	0.1111
1D	7	9/21/2013 12:25	3	12740	4246.666667	4246.67	44152.03	**0.0962**	0.1053
1D	8	9/21/2013 12:17	3	10833	3611	3611.00	44152.03	**0.0818**	0.0802
2A	1	9/21/2013 12:17	3	29700	9900	9900.00	44152.03	**0.2242**	0.2191
2A	2	9/21/2013 13:14	3	20776	6925.333333	6925.33	44152.03	**0.1569**	0.1730
2A	3	9/21/2013 12:30	3	21048	7016	7016.00	44152.03	**0.1589**	0.1441
2A	4	9/21/2013 12:25	3	15649	5216.333333	5216.33	44152.03	**0.1181**	0.1062
2A	5	9/21/2013 11:55	3	12134	4044.666667	4044.67	44152.03	**0.0916**	0.1087
2A	6	9/21/2013 12:12	3	13418	4472.666667	4472.67	44152.03	**0.1013**	0.0936
2A	7	9/21/2013 12:06	3	10757	3585.666667	3585.67	44152.03	**0.0812**	0.0890
2A	8	9/21/2013 12:01	3	9446	3148.666667	3148.67	44152.03	**0.0713**	0.0699
2B	1	9/21/2013 12:25	3	29286	9762	9762.00	44152.03	**0.2211**	0.2143
2B	2	9/21/2013 12:17	3	19486	6495.333333	6495.33	44152.03	**0.1471**	0.1688
2B	3	9/21/2013 13:11	3	21112	7037.333333	7037.33	44152.03	**0.1594**	0.1403
2B	4	9/21/2013 12:31	3	15045	5015	5015.00	44152.03	**0.1136**	0.1026
2B	5	9/21/2013 12:01	3	11888	3962.666667	3962.67	44152.03	**0.0898**	0.1052

Detector (#)	Source ID (#)	Raw Count Data Start Time	Count Time (min)	Alpha (counts)	Raw Alpha (cpm)	Th-230 (cpm)*	Decay Corrected Nominal (dpm)**	Th-230 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
2B	6	9/21/2013 11:55	3	12365	4121.666667	4121.67	44152.03	**0.0934**	0.0897
2B	7	9/21/2013 12:12	3	10660	3553.333333	3553.33	44152.03	**0.0805**	0.0849
2B	8	9/21/2013 12:06	3	8758	2919.333333	2919.33	44152.03	**0.0661**	0.0651
2C	1	9/21/2013 12:31	3	31828	10609.33333	10609.33	44152.03	**0.2403**	0.2320
2C	2	9/21/2013 12:25	3	21276	7092	7092.00	44152.03	**0.1606**	0.1829
2C	3	9/21/2013 12:17	3	22293	7431	7431.00	44152.03	**0.1683**	0.1527
2C	4	9/21/2013 13:11	3	17820	5940	5940.00	44152.03	**0.1345**	0.1142
2C	5	9/21/2013 12:06	3	12796	4265.333333	4265.33	44152.03	**0.0966**	0.1168
2C	6	9/21/2013 12:01	3	14098	4699.333333	4699.33	44152.03	**0.1064**	0.1016
2C	7	9/21/2013 11:55	3	11561	3853.666667	3853.67	44152.03	**0.0873**	0.0961
2C	8	9/21/2013 12:12	3	9707	3235.666667	3235.67	44152.03	**0.0733**	0.0711
2D	1	9/21/2013 13:11	3	30217	10072.33333	10072.33	44152.03	**0.2281**	0.2215
2D	2	9/21/2013 12:31	3	20065	6688.333333	6688.33	44152.03	**0.1515**	0.1717
2D	3	9/21/2013 12:26	3	20977	6992.333333	6992.33	44152.03	**0.1584**	0.1412
2D	4	9/21/2013 12:17	3	15157	5052.333333	5052.33	44152.03	**0.1144**	0.1031
2D	5	9/21/2013 12:12	3	11944	3981.333333	3981.33	44152.03	**0.0902**	0.1055
2D	6	9/21/2013 12:06	3	13034	4344.666667	4344.67	44152.03	**0.0984**	0.0924
2D	7	9/21/2013 12:01	3	10808	3602.666667	3602.67	44152.03	**0.0816**	0.0885
2D	8	9/21/2013 11:55	3	9209	3069.666667	3069.67	44152.03	**0.0695**	0.0681
3A	1	9/21/2013 13:37	3	32867	10955.66667	10955.67	44152.03	**0.2481**	0.2418
3A	2	9/21/2013 13:58	3	22729	7576.333333	7576.33	44152.03	**0.1716**	0.1929
3A	3	9/21/2013 13:54	3	24233	8077.666667	8077.67	44152.03	**0.1830**	0.1624
3A	4	9/21/2013 13:42	3	18027	6009	6009.00	44152.03	**0.1361**	0.1227
3A	5	9/21/2013 14:04	3	13893	4631	4631.00	44152.03	**0.1049**	0.1254
3A	6	9/21/2013 14:27	3	15397	5132.333333	5132.33	44152.03	**0.1162**	0.1089
3A	7	9/21/2013 14:21	3	12762	4254	4254.00	44152.03	**0.0963**	0.1032
3A	8	9/21/2013 14:08	3	10584	3528	3528.00	44152.03	**0.0799**	0.0787
3B	1	9/21/2013 13:42	3	34650	11550	11550.00	44152.03	**0.2616**	0.2547
3B	2	9/21/2013 13:37	3	23720	7906.666667	7906.67	44152.03	**0.1791**	0.2019
3B	3	9/21/2013 13:59	3	25293	8431	8431.00	44152.03	**0.1910**	0.1693
3B	4	9/21/2013 13:54	3	18818	6272.666667	6272.67	44152.03	**0.1421**	0.1276
3B	5	9/21/2013 14:08	3	14380	4793.333333	4793.33	44152.03	**0.1086**	0.1303
3B	6	9/21/2013 14:04	3	16136	5378.666667	5378.67	44152.03	**0.1218**	0.1138
3B	7	9/21/2013 14:27	3	13297	4432.333333	4432.33	44152.03	**0.1004**	0.1082
3B	8	9/21/2013 14:21	3	11074	3691.333333	3691.33	44152.03	**0.0836**	0.0822
3C	1	9/21/2013 13:54	3	34481	11493.66667	11493.67	44152.03	**0.2603**	0.2535
3C	2	9/21/2013 13:42	3	23638	7879.333333	7879.33	44152.03	**0.1785**	0.1997
3C	3	9/21/2013 13:37	3	24524	8174.666667	8174.67	44152.03	**0.1851**	0.1663
3C	4	9/21/2013 13:59	3	18286	6095.333333	6095.33	44152.03	**0.1381**	0.1236
3C	5	9/21/2013 14:21	3	14081	4693.666667	4693.67	44152.03	**0.1063**	0.1265
3C	6	9/21/2013 14:08	3	15773	5257.666667	5257.67	44152.03	**0.1191**	0.1101
3C	7	9/21/2013 14:04	3	12628	4209.333333	4209.33	44152.03	**0.0953**	0.1048
3C	8	9/21/2013 14:27	3	10960	3653.333333	3653.33	44152.03	**0.0827**	0.0810
3D	1	9/21/2013 13:59	3	34102	11367.33333	11367.33	44152.03	**0.2575**	0.2521
3D	2	9/21/2013 13:54	3	24222	8074	8074.00	44152.03	**0.1829**	0.2014
3D	3	9/21/2013 13:42	3	24963	8321	8321.00	44152.03	**0.1885**	0.1698
3D	4	9/21/2013 13:37	3	18801	6267	6267.00	44152.03	**0.1419**	0.1285
3D	5	9/21/2013 14:27	3	14569	4856.333333	4856.33	44152.03	**0.1100**	0.1313
3D	6	9/21/2013 14:21	3	16343	5447.666667	5447.67	44152.03	**0.1234**	0.1137
3D	7	9/21/2013 14:08	3	13062	4354	4354.00	44152.03	**0.0986**	0.1073
3D	8	9/21/2013 14:04	3	10888	3629.333333	3629.33	44152.03	**0.0822**	0.0808
4A	1	9/21/2013 14:04	3	32181	10727	10727.00	44152.03	**0.2430**	0.2377
4A	2	9/21/2013 14:28	3	22446	7482	7482.00	44152.03	**0.1695**	0.1888
4A	3	9/21/2013 14:21	3	23793	7931	7931.00	44152.03	**0.1796**	0.1591
4A	4	9/21/2013 14:08	3	18037	6012.333333	6012.33	44152.03	**0.1362**	0.1223
4A	5	9/21/2013 13:37	3	13477	4492.333333	4492.33	44152.03	**0.1017**	0.1247
4A	6	9/21/2013 13:59	3	15862	5287.333333	5287.33	44152.03	**0.1198**	0.1108
4A	7	9/21/2013 13:54	3	12967	4322.333333	4322.33	44152.03	**0.0979**	0.1053
4A	8	9/21/2013 13:42	3	10525	3508.333333	3508.33	44152.03	**0.0795**	0.0784
4B	1	9/21/2013 14:08	3	29911	9970.333333	9970.33	44152.03	**0.2258**	0.2200
4B	2	9/21/2013 14:04	3	20651	6883.666667	6883.67	44152.03	**0.1559**	0.1754
4B	3	9/21/2013 14:28	3	21933	7311	7311.00	44152.03	**0.1656**	0.1471
4B	4	9/21/2013 14:21	3	16141	5380.333333	5380.33	44152.03	**0.1219**	0.1087
4B	5	9/21/2013 13:42	3	12225	4075	4075.00	44152.03	**0.0923**	0.1114

Detector (#)	Source ID (#)	Raw Count Data Start Time	Count Time (min)	Alpha (counts)	Raw Alpha (cpm)	Th-230 (cpm)*	Decay Corrected Nominal (dpm)**	Th-230 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
4B	6	9/21/2013 13:37	3	13296	4432	4432.00	44152.03	**0.1004**	0.0943
4B	7	9/21/2013 13:59	3	10976	3658.666667	3658.67	44152.03	**0.0829**	0.0889
4B	8	9/21/2013 13:54	3	9260	3086.666667	3086.67	44152.03	**0.0699**	0.0688
4C	1	9/21/2013 14:21	3	32449	10816.33333	10816.33	44152.03	**0.2450**	0.2391
4C	2	9/21/2013 14:08	3	22946	7648.666667	7648.67	44152.03	**0.1732**	0.1914
4C	3	9/21/2013 14:04	3	23536	7845.333333	7845.33	44152.03	**0.1777**	0.1616
4C	4	9/21/2013 14:28	3	18146	6048.666667	6048.67	44152.03	**0.1370**	0.1223
4C	5	9/21/2013 13:55	3	13940	4646.666667	4646.67	44152.03	**0.1052**	0.1250
4C	6	9/21/2013 13:42	3	15454	5151.333333	5151.33	44152.03	**0.1167**	0.1081
4C	7	9/21/2013 13:38	3	12326	4108.666667	4108.67	44152.03	**0.0931**	0.1021
4C	8	9/21/2013 13:59	3	10498	3499.333333	3499.33	44152.03	**0.0793**	0.0776
4D	1	9/21/2013 14:28	3	33901	11300.33333	11300.33	44152.03	**0.2559**	0.2504
4D	2	9/21/2013 14:21	3	24021	8007	8007.00	44152.03	**0.1814**	0.2012
4D	3	9/21/2013 14:08	3	25284	8428	8428.00	44152.03	**0.1909**	0.1702
4D	4	9/21/2013 14:04	3	18749	6249.666667	6249.67	44152.03	**0.1415**	0.1288
4D	5	9/21/2013 13:59	3	14533	4844.333333	4844.33	44152.03	**0.1097**	0.1317
4D	6	9/21/2013 13:55	3	16344	5448	5448.00	44152.03	**0.1234**	0.1137
4D	7	9/21/2013 13:42	3	13203	4401	4401.00	44152.03	**0.0997**	0.1077
4D	8	9/21/2013 13:38	3	11301	3767	3767.00	44152.03	**0.0853**	0.0841
5A	1	9/21/2013 15:24	3	35298	11766	11766.00	44152.03	**0.2665**	0.2601
5A	2	9/21/2013 15:36	3	24641	8213.666667	8213.67	44152.03	**0.1860**	0.2068
5A	3	9/21/2013 15:32	3	25653	8551	8551.00	44152.03	**0.1937**	0.1738
5A	4	9/21/2013 15:28	3	19290	6430	6430.00	44152.03	**0.1456**	0.1314
5A	5	9/21/2013 15:42	3	14891	4963.666667	4963.67	44152.03	**0.1124**	0.1342
5A	6	9/21/2013 15:55	3	16850	5616.666667	5616.67	44152.03	**0.1272**	0.1169
5A	7	9/21/2013 15:50	3	13374	4458	4458.00	44152.03	**0.1010**	0.1108
5A	8	9/21/2013 15:46	3	11292	3764	3764.00	44152.03	**0.0853**	0.0836
5B	1	9/21/2013 15:28	3	34606	11535.33333	11535.33	44152.03	**0.2613**	0.2546
5B	2	9/21/2013 15:24	3	24023	8007.666667	8007.67	44152.03	**0.1814**	0.2027
5B	3	9/21/2013 15:36	3	25151	8383.666667	8383.67	44152.03	**0.1899**	0.1703
5B	4	9/21/2013 15:32	3	19220	6406.666667	6406.67	44152.03	**0.1451**	0.1281
5B	5	9/21/2013 15:46	3	14241	4747	4747.00	44152.03	**0.1075**	0.1310
5B	6	9/21/2013 15:42	3	16270	5423.333333	5423.33	44152.03	**0.1228**	0.1135
5B	7	9/21/2013 15:55	3	12984	4328	4328.00	44152.03	**0.0980**	0.1077
5B	8	9/21/2013 15:51	3	11198	3732.666667	3732.67	44152.03	**0.0845**	0.0828
5C	1	9/21/2013 15:32	3	34487	11495.66667	11495.67	44152.03	**0.2604**	0.2550
5C	2	9/21/2013 15:28	3	24200	8066.666667	8066.67	44152.03	**0.1827**	0.2019
5C	3	9/21/2013 15:24	3	25025	8341.666667	8341.67	44152.03	**0.1889**	0.1689
5C	4	9/21/2013 15:36	3	18566	6188.666667	6188.67	44152.03	**0.1402**	0.1260
5C	5	9/21/2013 15:51	3	14028	4676	4676.00	44152.03	**0.1059**	0.1289
5C	6	9/21/2013 15:47	3	16102	5367.333333	5367.33	44152.03	**0.1216**	0.1119
5C	7	9/21/2013 15:43	3	12997	4332.333333	4332.33	44152.03	**0.0981**	0.1064
5C	8	9/21/2013 15:55	3	11072	3690.666667	3690.67	44152.03	**0.0836**	0.0823
5D	1	9/21/2013 15:37	3	35093	11697.66667	11697.67	44152.03	**0.2649**	0.2594
5D	2	9/21/2013 15:32	3	24961	8320.333333	8320.33	44152.03	**0.1884**	0.2087
5D	3	9/21/2013 15:28	3	26253	8751	8751.00	44152.03	**0.1982**	0.1768
5D	4	9/21/2013 15:24	3	19810	6603.333333	6603.33	44152.03	**0.1496**	0.1342
5D	5	9/21/2013 15:55	3	14883	4961	4961.00	44152.03	**0.1124**	0.1372
5D	6	9/21/2013 15:51	3	16996	5665.333333	5665.33	44152.03	**0.1283**	0.1184
5D	7	9/21/2013 15:47	3	13693	4564.333333	4564.33	44152.03	**0.1034**	0.1118
5D	8	9/21/2013 15:43	3	11533	3844.333333	3844.33	44152.03	**0.0871**	0.0858
6A	1	9/21/2013 15:43	3	34640	11546.66667	11546.67	44152.03	**0.2615**	0.2559
6A	2	9/21/2013 15:55	3	24443	8147.666667	8147.67	44152.03	**0.1845**	0.2042
6A	3	9/21/2013 15:51	3	25419	8473	8473.00	44152.03	**0.1919**	0.1719
6A	4	9/21/2013 15:47	3	19138	6379.333333	6379.33	44152.03	**0.1445**	0.1300
6A	5	9/21/2013 15:24	3	14561	4853.666667	4853.67	44152.03	**0.1099**	0.1328
6A	6	9/21/2013 15:37	3	16553	5517.666667	5517.67	44152.03	**0.1250**	0.1156
6A	7	9/21/2013 15:33	3	13454	4484.666667	4484.67	44152.03	**0.1016**	0.1099
6A	8	9/21/2013 15:28	3	11480	3826.666667	3826.67	44152.03	**0.0867**	0.0854
6B	1	9/21/2013 15:47	3.01	35103	11662.12625	11662.13	44152.03	**0.2641**	0.2586
6B	2	9/21/2013 15:43	3	24931	8310.333333	8310.33	44152.03	**0.1882**	0.2075
6B	3	9/21/2013 15:55	3	25892	8630.666667	8630.67	44152.03	**0.1955**	0.1757
6B	4	9/21/2013 15:51	3	19672	6557.333333	6557.33	44152.03	**0.1485**	0.1337
6B	5	9/21/2013 15:29	3	14964	4988	4988.00	44152.03	**0.1130**	0.1366

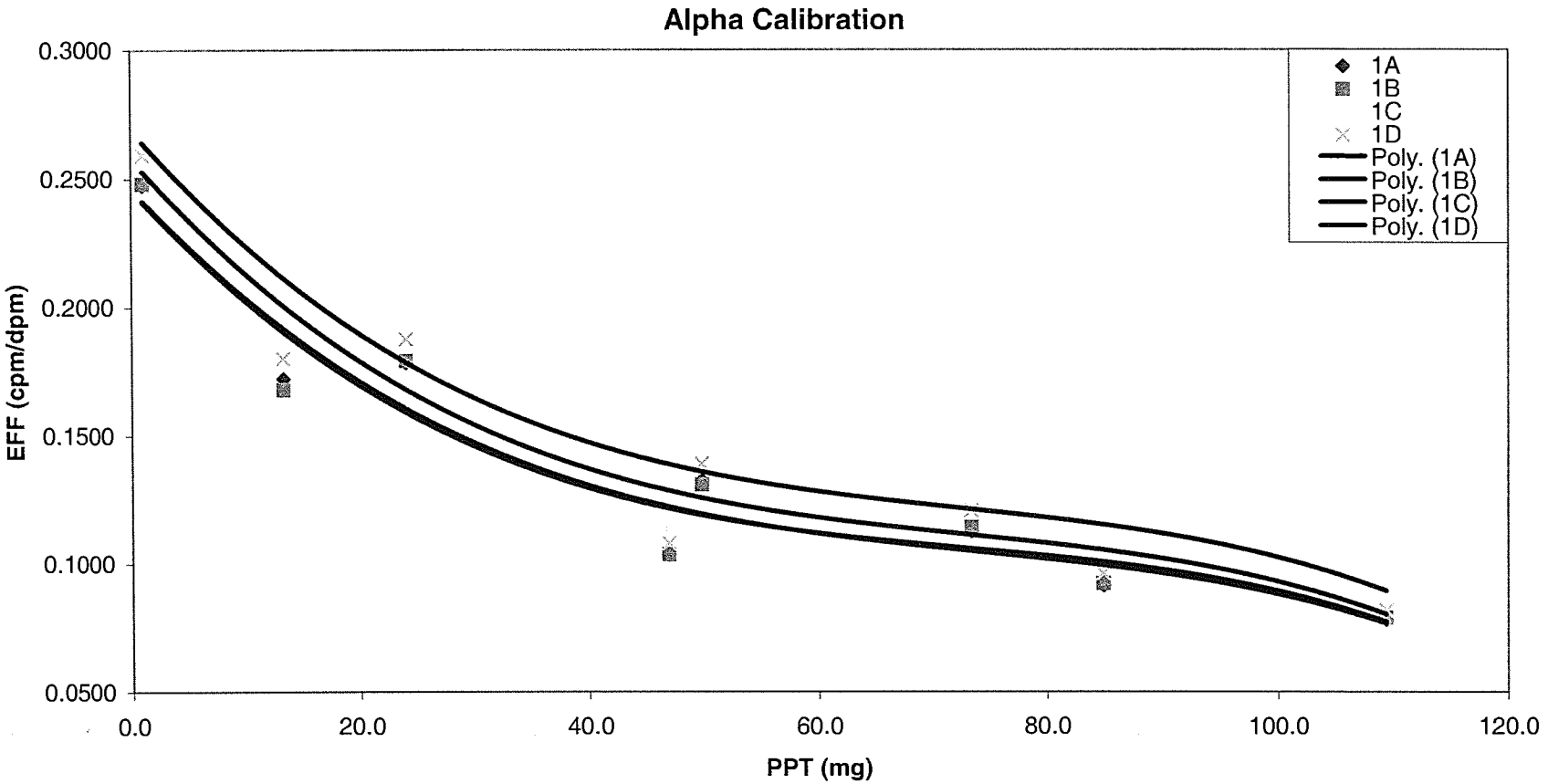
Detector (#)	Source ID (#)	Raw Count Data Start Time	Count Time (min)	Alpha (counts)	Raw Alpha (cpm)	Th-230 (cpm)*	Decay Corrected Nominal (dpm)**	Th-230 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
6B	6	9/21/2013 15:24	3	17201	5733.666667	5733.67	44152.03	0.1299	0.1186
6B	7	9/21/2013 15:38	3	13552	4517.333333	4517.33	44152.03	0.1023	0.1123
6B	8	9/21/2013 15:33	3	11614	3871.333333	3871.33	44152.03	0.0877	0.0861
6C	1	9/21/2013 15:51	3	34522	11507.33333	11507.33	44152.03	0.2606	0.2554
6C	2	9/21/2013 15:47	3	24738	8246	8246.00	44152.03	0.1868	0.2049
6C	3	9/21/2013 15:43	3	25354	8451.333333	8451.33	44152.03	0.1914	0.1730
6C	4	9/21/2013 15:55	3	19155	6385	6385.00	44152.03	0.1446	0.1303
6C	5	9/21/2013 15:33	3	14724	4908	4908.00	44152.03	0.1112	0.1333
6C	6	9/21/2013 15:29	3	16503	5501	5501.00	44152.03	0.1246	0.1149
6C	7	9/21/2013 15:24	3	13310	4436.666667	4436.67	44152.03	0.1005	0.1092
6C	8	9/21/2013 15:38	3	11686	3895.333333	3895.33	44152.03	0.0882	0.0868
7A	1	9/21/2013 14:32	3	34511	11503.66667	11503.67	44152.03	0.2605	0.2547
7A	2	9/21/2013 15:01	3	24026	8008.666667	8008.67	44152.03	0.1814	0.2012
7A	3	9/21/2013 14:47	3	24877	8292.333333	8292.33	44152.03	0.1878	0.1684
7A	4	9/21/2013 14:40	3	18816	6272	6272.00	44152.03	0.1421	0.1269
7A	5	9/21/2013 15:06	3	14162	4720.666667	4720.67	44152.03	0.1069	0.1296
7A	6	9/21/2013 15:19	3	16266	5422	5422.00	44152.03	0.1228	0.1136
7A	7	9/21/2013 15:15	3	13146	4382	4382.00	44152.03	0.0992	0.1079
7A	8	9/21/2013 15:10	3	10895	3631.666667	3631.67	44152.03	0.0823	0.0808
7B	1	9/21/2013 14:40	3	34525	11508.33333	11508.33	44152.03	0.2607	0.2552
7B	2	9/21/2013 14:32	3	24246	8082	8082.00	44152.03	0.1830	0.2027
7B	3	9/21/2013 15:01	3	25236	8412	8412.00	44152.03	0.1905	0.1700
7B	4	9/21/2013 14:47	3	18582	6194	6194.00	44152.03	0.1403	0.1273
7B	5	9/21/2013 15:10	3	14332	4777.333333	4777.33	44152.03	0.1082	0.1302
7B	6	9/21/2013 15:06	3	16250	5416.666667	5416.67	44152.03	0.1227	0.1128
7B	7	9/21/2013 15:19	3	13092	4364	4364.00	44152.03	0.0988	0.1072
7B	8	9/21/2013 15:15	3	11162	3720.666667	3720.67	44152.03	0.0843	0.0830
7C	1	9/21/2013 14:47	3	33244	11081.33333	11081.33	44152.03	0.2510	0.2447
7C	2	9/21/2013 14:40	3	22887	7629	7629.00	44152.03	0.1728	0.1939
7C	3	9/21/2013 14:32	3	24232	8077.333333	8077.33	44152.03	0.1829	0.1626
7C	4	9/21/2013 15:01	3	18072	6024	6024.00	44152.03	0.1364	0.1228
7C	5	9/21/2013 15:15	3	13832	4610.666667	4610.67	44152.03	0.1044	0.1254
7C	6	9/21/2013 15:10	3	15615	5205	5205.00	44152.03	0.1179	0.1095
7C	7	9/21/2013 15:06	3	12686	4228.666667	4228.67	44152.03	0.0958	0.1037
7C	8	9/21/2013 15:19	3	10423	3474.333333	3474.33	44152.03	0.0787	0.0773
7D	1	9/21/2013 15:01	3	33954	11318	11318.00	44152.03	0.2563	0.2505
7D	2	9/21/2013 14:47	3	23537	7845.666667	7845.67	44152.03	0.1777	0.1969
7D	3	9/21/2013 14:40	3	24153	8051	8051.00	44152.03	0.1823	0.1639
7D	4	9/21/2013 14:35	3	18055	6018.333333	6018.33	44152.03	0.1363	0.1225
7D	5	9/21/2013 15:19	3	13819	4606.333333	4606.33	44152.03	0.1043	0.1252
7D	6	9/21/2013 15:15	3	15810	5270	5270.00	44152.03	0.1194	0.1097
7D	7	9/21/2013 15:10	3	12625	4208.333333	4208.33	44152.03	0.0953	0.1045
7D	8	9/21/2013 15:06	3	10656	3552	3552.00	44152.03	0.0804	0.0789
8A	1	9/21/2013 15:06	3	31018	10339.33333	10339.33	44152.03	0.2342	0.2279
8A	2	9/21/2013 15:20	3	20343	6781	6781.00	44152.03	0.1536	0.1729
8A	3	9/21/2013 15:15	3	20884	6961.333333	6961.33	44152.03	0.1577	0.1404
8A	4	9/21/2013 15:11	3	15866	5288.666667	5288.67	44152.03	0.1198	0.1039
8A	5	9/21/2013 14:33	3	11157	3719	3719.00	44152.03	0.0842	0.1059
8A	6	9/21/2013 15:01	3	14292	4764	4764.00	44152.03	0.1079	0.0972
8A	7	9/21/2013 14:47	3	11017	3672.333333	3672.33	44152.03	0.0832	0.0943
8A	8	9/21/2013 14:40	3	9518	3172.666667	3172.67	44152.03	0.0719	0.0698
8B	1	9/21/2013 15:11	3	28600	9533.333333	9533.33	44152.03	0.2159	0.2105
8B	2	9/21/2013 15:06	3	19779	6593	6593.00	44152.03	0.1493	0.1652
8B	3	9/21/2013 15:20	3	19917	6639	6639.00	44152.03	0.1504	0.1375
8B	4	9/21/2013 15:15	3	15271	5090.333333	5090.33	44152.03	0.1153	0.1026
8B	5	9/21/2013 14:41	3	11870	3956.666667	3956.67	44152.03	0.0896	0.1048
8B	6	9/21/2013 14:33	3	12916	4305.333333	4305.33	44152.03	0.0975	0.0921
8B	7	9/21/2013 15:01	3	10742	3580.666667	3580.67	44152.03	0.0811	0.0879
8B	8	9/21/2013 14:47	3	9109	3036.333333	3036.33	44152.03	0.0688	0.0673
8C	1	9/21/2013 15:15	3	28210	9403.333333	9403.33	44152.03	0.2130	0.2069
8C	2	9/21/2013 15:11	3	19081	6360.333333	6360.33	44152.03	0.1441	0.1619
8C	3	9/21/2013 15:06	3	19710	6570	6570.00	44152.03	0.1488	0.1342
8C	4	9/21/2013 15:20	3	14764	4921.333333	4921.33	44152.03	0.1115	0.0998
8C	5	9/21/2013 14:47	3	11487	3829	3829.00	44152.03	0.0867	0.1020

Detector (#)	Source ID (#)	Raw Count Data Start Time	Count Time (min)	Alpha (counts)	Raw Alpha (cpm)	Th-230 (cpm)*	Decay Corrected Nominal (dpm)**	Th-230 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
8C	6	9/21/2013 14:41	3	12906	4302	4302.00	44152.03	**0.0974**	0.0897
8C	7	9/21/2013 14:33	3	10203	3401	3401.00	44152.03	**0.0770**	0.0858
8C	8	9/21/2013 15:02	3	8954	2984.666667	2984.67	44152.03	**0.0676**	0.0659
8D	1	9/21/2013 15:20	3	36410	12136.66667	12136.67	44152.03	**0.2749**	0.2672
8D	2	9/21/2013 15:15	3	24895	8298.333333	8298.33	44152.03	**0.1879**	0.2116
8D	3	9/21/2013 15:11	3	26284	8761.333333	8761.33	44152.03	**0.1984**	0.1776
8D	4	9/21/2013 15:06	3	19836	6612	6612.00	44152.03	**0.1498**	0.1351
8D	5	9/21/2013 15:02	3	15467	5155.666667	5155.67	44152.03	**0.1168**	0.1379
8D	6	9/21/2013 14:48	3	17495	5831.666667	5831.67	44152.03	**0.1321**	0.1214
8D	7	9/21/2013 14:41	3	13775	4591.666667	4591.67	44152.03	**0.1040**	0.1151
8D	8	9/21/2013 14:33	3	11499	3833	3833.00	44152.03	**0.0868**	0.0848
9A	1	9/21/2013 16:00	3	33021	11007	11007.00	44152.03	**0.2493**	0.2443
9A	2	9/21/2013 16:16	3	23032	7677.333333	7677.33	44152.03	**0.1739**	0.1923
9A	3	9/21/2013 16:11	3	23881	7960.333333	7960.33	44152.03	**0.1803**	0.1606
9A	4	9/21/2013 16:06	3	17779	5926.333333	5926.33	44152.03	**0.1342**	0.1214
9A	5	9/21/2013 16:22	3	13532	4510.666667	4510.67	44152.03	**0.1022**	0.1239
9A	6	9/21/2013 16:55	3	15658	5219.333333	5219.33	44152.03	**0.1182**	0.1097
9A	7	9/21/2013 16:44	3	12938	4312.666667	4312.67	44152.03	**0.0977**	0.1046
9A	8	9/21/2013 16:26	3	10528	3509.333333	3509.33	44152.03	**0.0795**	0.0785
9B	1	9/21/2013 16:06	3	33850	11283.33333	11283.33	44152.03	**0.2556**	0.2504
9B	2	9/21/2013 16:00	3	23703	7901	7901.00	44152.03	**0.1789**	0.1981
9B	3	9/21/2013 16:16	3	24689	8229.666667	8229.67	44152.03	**0.1864**	0.1658
9B	4	9/21/2013 16:11	3	18446	6148.666667	6148.67	44152.03	**0.1393**	0.1250
9B	5	9/21/2013 16:26	3	13872	4624	4624.00	44152.03	**0.1047**	0.1277
9B	6	9/21/2013 16:22	3	15785	5261.666667	5261.67	44152.03	**0.1192**	0.1121
9B	7	9/21/2013 16:55	3	13389	4463	4463.00	44152.03	**0.1011**	0.1068
9B	8	9/21/2013 16:44	3	10887	3629	3629.00	44152.03	**0.0822**	0.0814
9C	1	9/21/2013 16:11	3	32916	10972	10972.00	44152.03	**0.2485**	0.2426
9C	2	9/21/2013 16:06	3	22817	7605.666667	7605.67	44152.03	**0.1723**	0.1921
9C	3	9/21/2013 16:00	3	23769	7923	7923.00	44152.03	**0.1794**	0.1605
9C	4	9/21/2013 16:16	3	17607	5869	5869.00	44152.03	**0.1329**	0.1189
9C	5	9/21/2013 16:44	3	13402	4467.333333	4467.33	44152.03	**0.1012**	0.1218
9C	6	9/21/2013 16:26	3	14862	4954	4954.00	44152.03	**0.1122**	0.1048
9C	7	9/21/2013 16:22	3	12234	4078	4078.00	44152.03	**0.0924**	0.0995
9C	8	9/21/2013 16:55	3	10433	3477.666667	3477.67	44152.03	**0.0788**	0.0775
9D	1	9/21/2013 16:16	3	33282	11094	11094.00	44152.03	**0.2513**	0.2446
9D	2	9/21/2013 16:11	3	22766	7588.666667	7588.67	44152.03	**0.1719**	0.1921
9D	3	9/21/2013 16:06	3	23521	7840.333333	7840.33	44152.03	**0.1776**	0.1601
9D	4	9/21/2013 16:00	3	17565	5855	5855.00	44152.03	**0.1326**	0.1208
9D	5	9/21/2013 16:55	3	14061	4687	4687.00	44152.03	**0.1062**	0.1233
9D	6	9/21/2013 16:44	3	15713	5237.666667	5237.67	44152.03	**0.1186**	0.1091
9D	7	9/21/2013 16:26	3	12463	4154.333333	4154.33	44152.03	**0.0941**	0.1040
9D	8	9/21/2013 16:22	3	10479	3493	3493.00	44152.03	**0.0791**	0.0773
10A	1	9/21/2013 16:22	3	31737	10579	10579.00	44152.03	**0.2396**	0.2333
10A	2	9/21/2013 16:55	3	21436	7145.333333	7145.33	44152.03	**0.1618**	0.1824
10A	3	9/21/2013 16:44	3	22591	7530.333333	7530.33	44152.03	**0.1706**	0.1512
10A	4	9/21/2013 16:27	3	16666	5555.333333	5555.33	44152.03	**0.1258**	0.1120
10A	5	9/21/2013 16:00	3	12482	4160.666667	4160.67	44152.03	**0.0942**	0.1145
10A	6	9/21/2013 16:17	3	14269	4756.333333	4756.33	44152.03	**0.1077**	0.1001
10A	7	9/21/2013 16:12	3	11635	3878.333333	3878.33	44152.03	**0.0878**	0.0954
10A	8	9/21/2013 16:06	3	9699	3233	3233.00	44152.03	**0.0732**	0.0719
10B	1	9/21/2013 16:27	3	33745	11248.33333	11248.33	44152.03	**0.2548**	0.2498
10B	2	9/21/2013 16:22	3	23835	7945	7945.00	44152.03	**0.1799**	0.1992
10B	3	9/21/2013 16:55	3	25067	8355.666667	8355.67	44152.03	**0.1892**	0.1675
10B	4	9/21/2013 16:44	3	18512	6170.666667	6170.67	44152.03	**0.1398**	0.1254
10B	5	9/21/2013 16:06	3	13721	4573.666667	4573.67	44152.03	**0.1036**	0.1283
10B	6	9/21/2013 16:01	3	15717	5239	5239.00	44152.03	**0.1187**	0.1100
10B	7	9/21/2013 16:17	3	12891	4297	4297.00	44152.03	**0.0973**	0.1038
10B	8	9/21/2013 16:12	3	10561	3520.333333	3520.33	44152.03	**0.0797**	0.0789
10C	1	9/21/2013 16:45	3	33380	11126.66667	11126.67	44152.03	**0.2520**	0.2456
10C	2	9/21/2013 16:27	3	23219	7739.666667	7739.67	44152.03	**0.1753**	0.1961
10C	3	9/21/2013 16:23	3	24431	8143.666667	8143.67	44152.03	**0.1844**	0.1647
10C	4	9/21/2013 16:55	3	18197	6065.666667	6065.67	44152.03	**0.1374**	0.1218
10C	5	9/21/2013 16:12	3	13536	4512	4512.00	44152.03	**0.1022**	0.1249

Detector (#)	Source ID (#)	Raw Count Data Start Time	Count Time (min)	Alpha (counts)	Raw Alpha (cpm)	Th-230 (cpm)*	Decay Corrected Nominal (dpm)**	Th-230 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
10C	6	9/21/2013 16:06	3	15298	5099.333333	5099.33	44152.03	**0.1155**	0.1055
10C	7	9/21/2013 16:01	3	11866	3955.333333	3955.33	44152.03	**0.0896**	0.0993
10C	8	9/21/2013 16:17	3	10358	3452.666667	3452.67	44152.03	**0.0782**	0.0765
10D	1	9/21/2013 16:55	3	33428	11142.66667	11142.67	44152.03	**0.2524**	0.2458
10D	2	9/21/2013 16:45	3	23124	7708	7708.00	44152.03	**0.1746**	0.1953
10D	3	9/21/2013 16:27	3	24189	8063	8063.00	44152.03	**0.1826**	0.1638
10D	4	9/21/2013 16:23	3	17799	5933	5933.00	44152.03	**0.1344**	0.1225
10D	5	9/21/2013 16:17	3	14233	4744.333333	4744.33	44152.03	**0.1075**	0.1253
10D	6	9/21/2013 16:12	3	15356	5118.666667	5118.67	44152.03	**0.1159**	0.1079
10D	7	9/21/2013 16:06	3	12444	4148	4148.00	44152.03	**0.0939**	0.1020
10D	8	9/21/2013 16:01	3	10444	3481.333333	3481.33	44152.03	**0.0788**	0.0774
11A	1	9/21/2013 17:14	3	31536	10512	10512.00	44152.03	**0.2381**	0.2320
11A	2	9/21/2013 17:30	3	21515	7171.666667	7171.67	44152.03	**0.1624**	0.1820
11A	3	9/21/2013 17:26	3	22447	7482.333333	7482.33	44152.03	**0.1695**	0.1515
11A	4	9/21/2013 17:20	3	16858	5619.333333	5619.33	44152.03	**0.1273**	0.1137
11A	5	9/21/2013 17:38	3	12786	4262	4262.00	44152.03	**0.0965**	0.1161
11A	6	9/21/2013 17:54	3	14688	4896	4896.00	44152.03	**0.1109**	0.1025
11A	7	9/21/2013 17:48	3	11809	3936.333333	3936.33	44152.03	**0.0892**	0.0976
11A	8	9/21/2013 17:43	3	9872	3290.666667	3290.67	44152.03	**0.0745**	0.0730
11B	1	9/21/2013 17:20	3	33943	11314.33333	11314.33	44152.03	**0.2563**	0.2502
11B	2	9/21/2013 17:15	3	23643	7881	7881.00	44152.03	**0.1785**	0.1992
11B	3	9/21/2013 17:30	3	24928	8309.333333	8309.33	44152.03	**0.1882**	0.1677
11B	4	9/21/2013 17:26	3	18744	6248	6248.00	44152.03	**0.1415**	0.1274
11B	5	9/21/2013 17:43	3	14300	4766.666667	4766.67	44152.03	**0.1080**	0.1300
11B	6	9/21/2013 17:38	3	16255	5418.333333	5418.33	44152.03	**0.1227**	0.1138
11B	7	9/21/2013 17:54	3	13220	4406.666667	4406.67	44152.03	**0.0998**	0.1080
11B	8	9/21/2013 17:48	3	11032	3677.333333	3677.33	44152.03	**0.0833**	0.0819
11C	1	9/21/2013 17:26	3	33630	11210	11210.00	44152.03	**0.2539**	0.2484
11C	2	9/21/2013 17:20	3	23494	7831.333333	7831.33	44152.03	**0.1774**	0.1966
11C	3	9/21/2013 17:15	3	24413	8137.666667	8137.67	44152.03	**0.1843**	0.1647
11C	4	9/21/2013 17:30	3	18215	6071.666667	6071.67	44152.03	**0.1375**	0.1246
11C	5	9/21/2013 17:48	3	13995	4665	4665.00	44152.03	**0.1057**	0.1272
11C	6	9/21/2013 17:43	3	16148	5382.666667	5382.67	44152.03	**0.1219**	0.1120
11C	7	9/21/2013 17:38	3	12997	4332.333333	4332.33	44152.03	**0.0981**	0.1067
11C	8	9/21/2013 17:54	3	10971	3657	3657.00	44152.03	**0.0828**	0.0815
11D	1	9/21/2013 17:30	3	33907	11302.33333	11302.33	44152.03	**0.2560**	0.2498
11D	2	9/21/2013 17:26	3	23489	7829.666667	7829.67	44152.03	**0.1773**	0.1984
11D	3	9/21/2013 17:20	3	24821	8273.666667	8273.67	44152.03	**0.1874**	0.1666
11D	4	9/21/2013 17:15	3	18451	6150.333333	6150.33	44152.03	**0.1393**	0.1258
11D	5	9/21/2013 17:55	3	14157	4719	4719.00	44152.03	**0.1069**	0.1285
11D	6	9/21/2013 17:48	3	16092	5364	5364.00	44152.03	**0.1215**	0.1123
11D	7	9/21/2013 17:43	3	13040	4346.666667	4346.67	44152.03	**0.0984**	0.1067
11D	8	9/21/2013 17:38	3	10935	3645	3645.00	44152.03	**0.0826**	0.0812
12A	1	9/21/2013 17:38	3	32456	10818.66667	10818.67	44152.03	**0.2450**	0.2383
12A	2	9/21/2013 17:55	3	21802	7267.333333	7267.33	44152.03	**0.1646**	0.1859
12A	3	9/21/2013 17:48	3	22934	7644.666667	7644.67	44152.03	**0.1731**	0.1541
12A	4	9/21/2013 17:43	3	17262	5754	5754.00	44152.03	**0.1303**	0.1153
12A	5	9/21/2013 17:15	3	12852	4284	4284.00	44152.03	**0.0970**	0.1177
12A	6	9/21/2013 17:30	3	14907	4969	4969.00	44152.03	**0.1125**	0.1045
12A	7	9/21/2013 17:26	3	12083	4027.666667	4027.67	44152.03	**0.0912**	0.0998
12A	8	9/21/2013 17:20	3	10056	3352	3352.00	44152.03	**0.0759**	0.0743
12B	1	9/21/2013 17:43	3	30251	10083.66667	10083.67	44152.03	**0.2284**	0.2225
12B	2	9/21/2013 17:38	3	20781	6927	6927.00	44152.03	**0.1569**	0.1750
12B	3	9/21/2013 17:55	3	21415	7138.333333	7138.33	44152.03	**0.1617**	0.1457
12B	4	9/21/2013 17:48	3	16066	5355.333333	5355.33	44152.03	**0.1213**	0.1085
12B	5	9/21/2013 17:20	3	12378	4126	4126.00	44152.03	**0.0934**	0.1110
12B	6	9/21/2013 17:15	3	13821	4607	4607.00	44152.03	**0.1043**	0.0968
12B	7	9/21/2013 17:30	3	11134	3711.333333	3711.33	44152.03	**0.0841**	0.0921
12B	8	9/21/2013 17:26	3	9428	3142.666667	3142.67	44152.03	**0.0712**	0.0697
12C	1	9/21/2013 17:49	3	34746	11582	11582.00	44152.03	**0.2623**	0.2571
12C	2	9/21/2013 17:43	3	24831	8277	8277.00	44152.03	**0.1875**	0.2069
12C	3	9/21/2013 17:38	3	26089	8696.333333	8696.33	44152.03	**0.1970**	0.1758
12C	4	9/21/2013 17:55	3	19901	6633.666667	6633.67	44152.03	**0.1502**	0.1353
12C	5	9/21/2013 17:26	3	14946	4982	4982.00	44152.03	**0.1128**	0.1380

Detector (#)	Source ID (#)	Raw Count Data Start Time	Count Time (min)	Alpha (counts)	Raw Alpha (cpm)	Th-230 (cpm)*	Decay Corrected Nominal (dpm)**	Th-230 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
12C	6	9/21/2013 17:20	3	17435	5811.666667	5811.67	44152.03	**0.1316**	0.1206
12C	7	9/21/2013 17:15	3	13919	4639.666667	4639.67	44152.03	**0.1051**	0.1141
12C	8	9/21/2013 17:30	3	11590	3863.333333	3863.33	44152.03	**0.0875**	0.0862
12D	1	9/21/2013 17:58	3	35190	11730	11730.00	44152.03	**0.2657**	0.2600
12D	2	9/21/2013 17:50	3	24798	8266	8266.00	44152.03	**0.1872**	0.2080
12D	3	9/21/2013 17:43	3	26193	8731	8731.00	44152.03	**0.1977**	0.1757
12D	4	9/21/2013 17:39	3	19472	6490.666667	6490.67	44152.03	**0.1470**	0.1338
12D	5	9/21/2013 17:34	3	15034	5011.333333	5011.33	44152.03	**0.1135**	0.1366
12D	6	9/21/2013 17:26	3	17055	5685	5685.00	44152.03	**0.1288**	0.1191
12D	7	9/21/2013 17:21	3	13912	4637.333333	4637.33	44152.03	**0.1050**	0.1129
12D	8	9/21/2013 17:15	3	11547	3849	3849.00	44152.03	**0.0872**	0.0860
13A	1	9/24/2013 13:17	3	33152	11050.66667	11050.67	44152.03	**0.2503**	0.2446
13A	2	9/24/2013 14:41	3	23078	7692.666667	7692.67	44152.03	**0.1742**	0.1947
13A	3	9/24/2013 13:46	3	24520	8173.333333	8173.33	44152.03	**0.1851**	0.1635
13A	4	9/24/2013 13:32	3	18174	6058	6058.00	44152.03	**0.1372**	0.1227
13A	5	9/24/2013 14:46	3	13415	4471.666667	4471.67	44152.03	**0.1013**	0.1255
13A	6	9/24/2013 15:07	3	15671	5223.666667	5223.67	44152.03	**0.1183**	0.1080
13A	7	9/24/2013 15:02	3	12323	4107.666667	4107.67	44152.03	**0.0930**	0.1017
13A	8	9/24/2013 14:56	3	10175	3391.666667	3391.67	44152.03	**0.0768**	0.0755
13B	1	9/24/2013 13:32	3	34830	11610	11610.00	44152.03	**0.2630**	0.2565
13B	2	9/24/2013 13:17	3	23984	7994.666667	7994.67	44152.03	**0.1811**	0.2023
13B	3	9/24/2013 14:41	3	25002	8334	8334.00	44152.03	**0.1888**	0.1688
13B	4	9/24/2013 13:46	3	18646	6215.333333	6215.33	44152.03	**0.1408**	0.1258
13B	5	9/24/2013 14:56	3	14129	4709.666667	4709.67	44152.03	**0.1067**	0.1287
13B	6	9/24/2013 14:46	3	16053	5351	5351.00	44152.03	**0.1212**	0.1119
13B	7	9/24/2013 15:07	3	12891	4297	4297.00	44152.03	**0.0973**	0.1064
13B	8	9/24/2013 15:02	3	10937	3645.666667	3645.67	44152.03	**0.0826**	0.0810
13C	1	9/24/2013 13:46	3	31485	10495	10495.00	44152.03	**0.2377**	0.2330
13C	2	9/24/2013 13:32	3	21633	7211	7211.00	44152.03	**0.1633**	0.1793
13C	3	9/24/2013 13:17	3	21567	7189	7189.00	44152.03	**0.1628**	0.1467
13C	4	9/24/2013 14:41	3	15140	5046.666667	5046.67	44152.03	**0.1143**	0.1071
13C	5	9/24/2013 15:03	3	12481	4160.333333	4160.33	44152.03	**0.0942**	0.1095
13C	6	9/24/2013 14:57	3	14384	4794.666667	4794.67	44152.03	**0.1086**	0.0967
13C	7	9/24/2013 14:46	3	10915	3638.333333	3638.33	44152.03	**0.0824**	0.0926
13C	8	9/24/2013 15:07	3	9343	3114.333333	3114.33	44152.03	**0.0705**	0.0690
13D	1	9/24/2013 14:41	3	34076	11358.66667	11358.67	44152.03	**0.2573**	0.2515
13D	2	9/24/2013 13:47	3	23732	7910.666667	7910.67	44152.03	**0.1792**	0.2000
13D	3	9/24/2013 13:32	3	25098	8366	8366.00	44152.03	**0.1895**	0.1679
13D	4	9/24/2013 13:17	3	18359	6119.666667	6119.67	44152.03	**0.1386**	0.1258
13D	5	9/24/2013 15:07	3	14132	4710.666667	4710.67	44152.03	**0.1067**	0.1287
13D	6	9/24/2013 15:03	3	15861	5287	5287.00	44152.03	**0.1197**	0.1106
13D	7	9/24/2013 14:57	3	12758	4252.666667	4252.67	44152.03	**0.0963**	0.1040
13D	8	9/24/2013 14:47	3	10278	3426	3426.00	44152.03	**0.0776**	0.0765
14A	1	9/24/2013 14:47	3	29322	9774	9774.00	44152.03	**0.2214**	0.2153
14A	2	9/24/2013 15:07	3	19626	6542	6542.00	44152.03	**0.1482**	0.1668
14A	3	9/24/2013 15:03	3	20310	6770	6770.00	44152.03	**0.1533**	0.1371
14A	4	9/24/2013 14:57	3	14784	4928	4928.00	44152.03	**0.1116**	0.0999
14A	5	9/24/2013 13:18	3	11427	3809	3809.00	44152.03	**0.0863**	0.1023
14A	6	9/24/2013 14:41	3	12612	4204	4204.00	44152.03	**0.0952**	0.0890
14A	7	9/24/2013 13:47	3	10306	3435.333333	3435.33	44152.03	**0.0778**	0.0847
14A	8	9/24/2013 13:32	3	8525	2841.666667	2841.67	44152.03	**0.0644**	0.0630
14B	1	9/24/2013 14:57	3	33858	11286	11286.00	44152.03	**0.2556**	0.2474
14B	2	9/24/2013 14:47	3	22912	7637.333333	7637.33	44152.03	**0.1730**	0.1962
14B	3	9/24/2013 15:07	3	24110	8036.666667	8036.67	44152.03	**0.1820**	0.1641
14B	4	9/24/2013 15:03	3	18154	6051.333333	6051.33	44152.03	**0.1371**	0.1218
14B	5	9/24/2013 13:32	3	14018	4672.666667	4672.67	44152.03	**0.1058**	0.1247
14B	6	9/24/2013 13:19	3	15566	5188.666667	5188.67	44152.03	**0.1175**	0.1071
14B	7	9/24/2013 14:41	3	11797	3932.333333	3932.33	44152.03	**0.0891**	0.1014
14B	8	9/24/2013 13:47	3	10722	3574	3574.00	44152.03	**0.0809**	0.0784
14C	1	9/24/2013 15:03	3	28799	9599.666667	9599.67	44152.03	**0.2174**	0.2122
14C	2	9/24/2013 14:57	3	19866	6622	6622.00	44152.03	**0.1500**	0.1652
14C	3	9/24/2013 14:47	3	19804	6601.333333	6601.33	44152.03	**0.1495**	0.1368
14C	4	9/24/2013 15:07	3	15117	5039	5039.00	44152.03	**0.1141**	0.1025
14C	5	9/24/2013 13:47	3	11851	3950.333333	3950.33	44152.03	**0.0895**	0.1046

Detector (#)	Source ID (#)	Raw Count Data Start Time	Count Time (min)	Alpha (counts)	Raw Alpha (cpm)	Th-230 (cpm)*	Decay Corrected Nominal (dpm)**	Th-230 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
14C	6	9/24/2013 13:32	3	13162	4387.333333	4387.33	44152.03	**0.0994**	0.0917
14C	7	9/24/2013 13:19	3	10263	3421	3421.00	44152.03	**0.0775**	0.0860
14C	8	9/24/2013 14:41	3	7765	2588.333333	2588.33	44152.03	**0.0586**	0.0570
14D	1	9/24/2013 15:08	3	29961	9987	9987.00	44152.03	**0.2262**	0.2205
14D	2	9/24/2013 15:03	3	20083	6694.333333	6694.33	44152.03	**0.1516**	0.1701
14D	3	9/24/2013 14:57	3	20800	6933.333333	6933.33	44152.03	**0.1570**	0.1397
14D	4	9/24/2013 14:47	3	15303	5101	5101.00	44152.03	**0.1155**	0.1033
14D	5	9/24/2013 14:41	3	11530	3843.333333	3843.33	44152.03	**0.0870**	0.1055
14D	6	9/24/2013 13:47	3	13494	4498	4498.00	44152.03	**0.1019**	0.0935
14D	7	9/24/2013 13:32	3	10713	3571	3571.00	44152.03	**0.0809**	0.0890
14D	8	9/24/2013 13:19	3	8595	2865	2865.00	44152.03	**0.0649**	0.0635

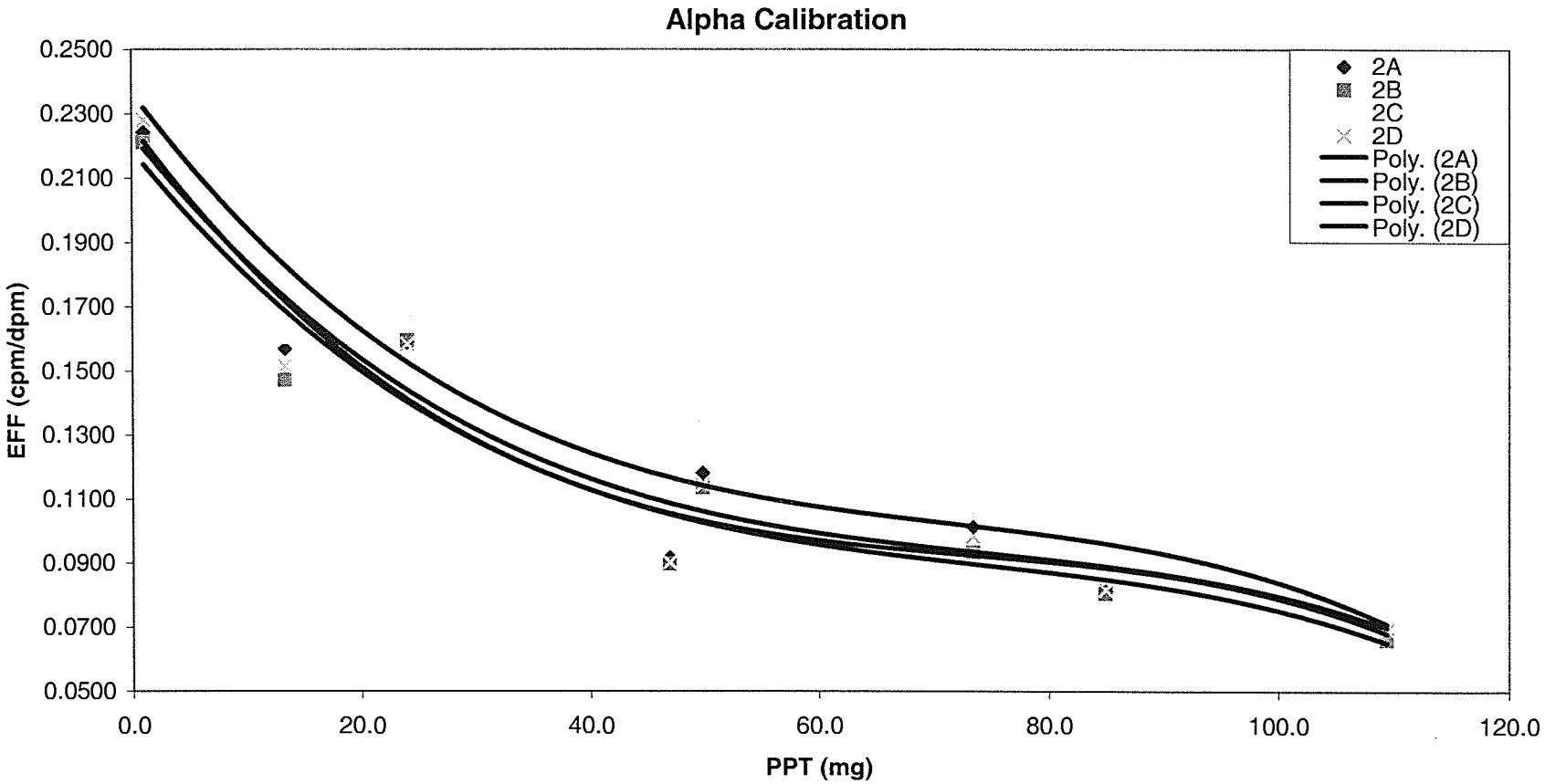


$1A_y = -2.664039E\text{-}07x^3 + 5.911765E\text{-}05x^2 - 4.828693E\text{-}03x + 2.461567E\text{-}01$

$1B_y = -2.853570E\text{-}07x^3 + 6.234190E\text{-}05x^2 - 4.945475E\text{-}03x + 2.458112E\text{-}01$

$1C_y = -2.957531E\text{-}07x^3 + 6.440061E\text{-}05x^2 - 5.149981E\text{-}03x + 2.692142E\text{-}01$

$1D_y = -2.913983E\text{-}07x^3 + 6.369762E\text{-}05x^2 - 5.105374E\text{-}03x + 2.579401E\text{-}01$

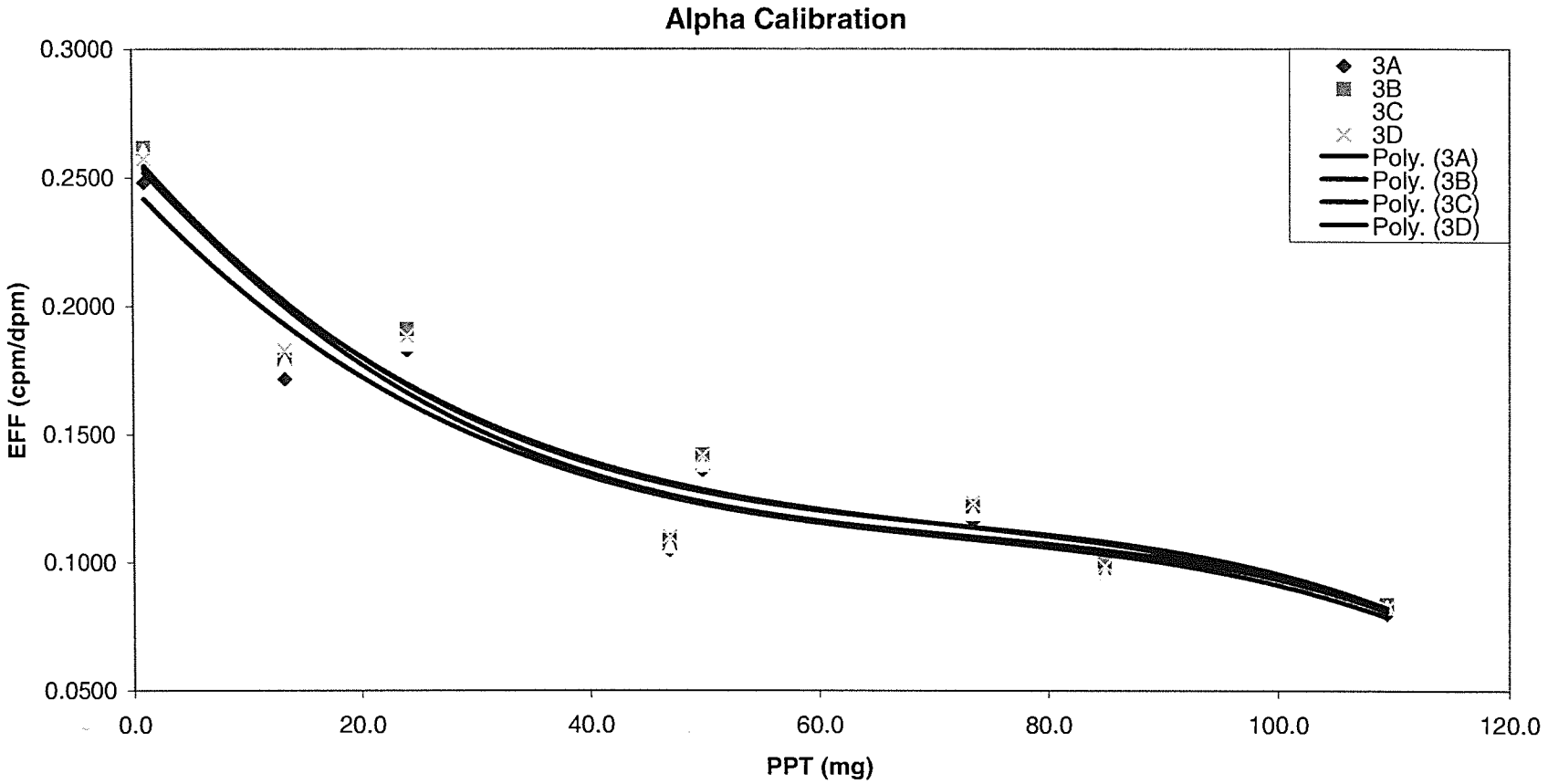


$2A_y = -2.460395E\text{-}07x^3 + 5.516754E\text{-}05x^2 - 4.495309E\text{-}03x + 2.235872E\text{-}01$

$2B_y = -2.428927E\text{-}07x^3 + 5.422406E\text{-}05x^2 - 4.428481E\text{-}03x + 2.186698E\text{-}01$

$2C_y = -2.870015E\text{-}07x^3 + 6.155325E\text{-}05x^2 - 4.813190E\text{-}03x + 2.367252E\text{-}01$

$2D_y = -2.854058E\text{-}07x^3 + 6.267482E\text{-}05x^2 - 4.887012E\text{-}03x + 2.263182E\text{-}01$

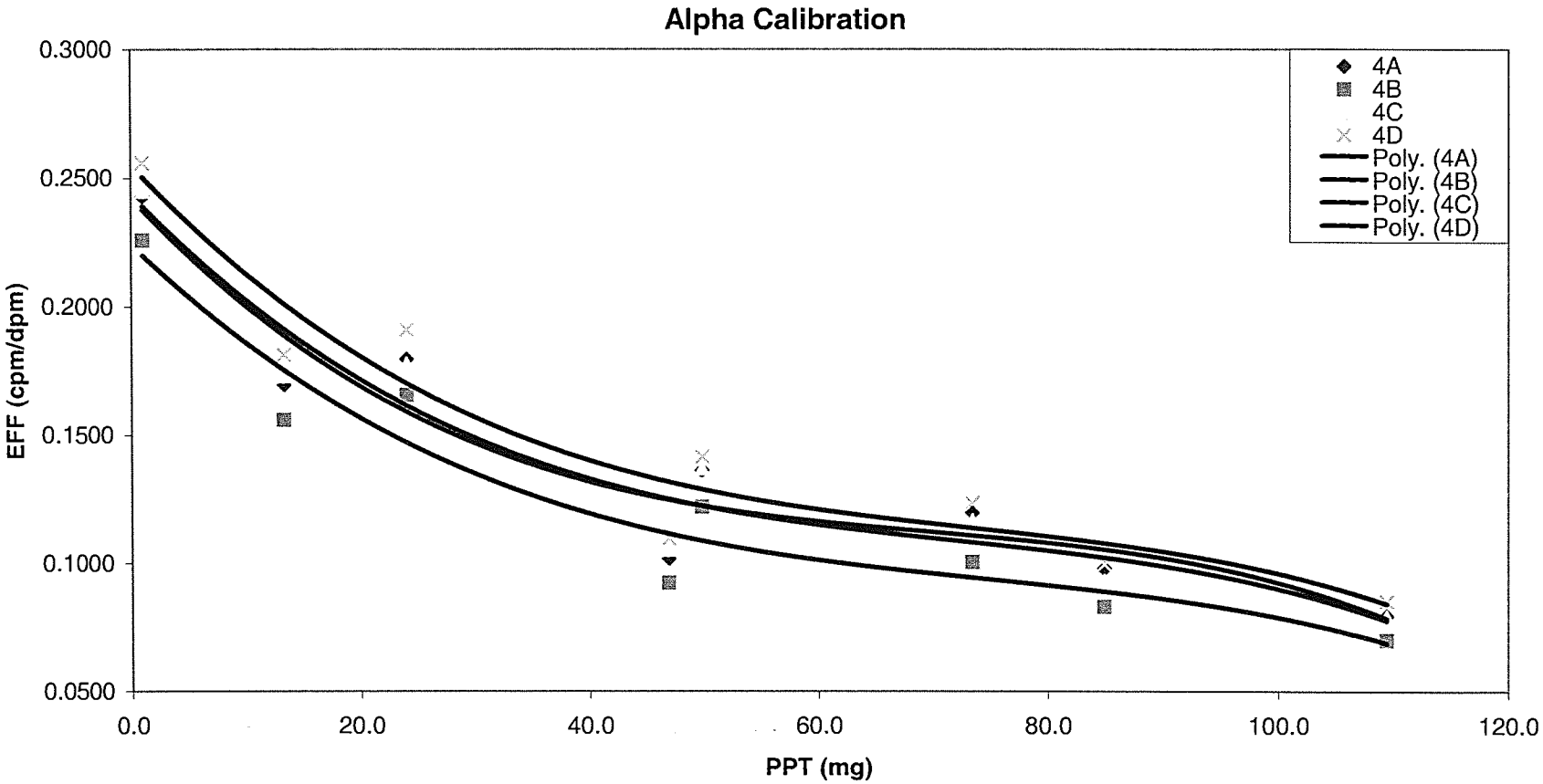


$3A_y = -2.759509E\text{-}07x^3 + 5.990523E\text{-}05x^2 - 4.785168E\text{-}03x + 2.465586E\text{-}01$

$3B_y = -3.036794E\text{-}07x^3 + 6.565928E\text{-}05x^2 - 5.171842E\text{-}03x + 2.598075E\text{-}01$

$3C_y = -3.017244E\text{-}07x^3 + 6.627880E\text{-}05x^2 - 5.264249E\text{-}03x + 2.586823E\text{-}01$

$3D_y = -2.865536E\text{-}07x^3 + 6.188443E\text{-}05x^2 - 4.950744E\text{-}03x + 2.569587E\text{-}01$

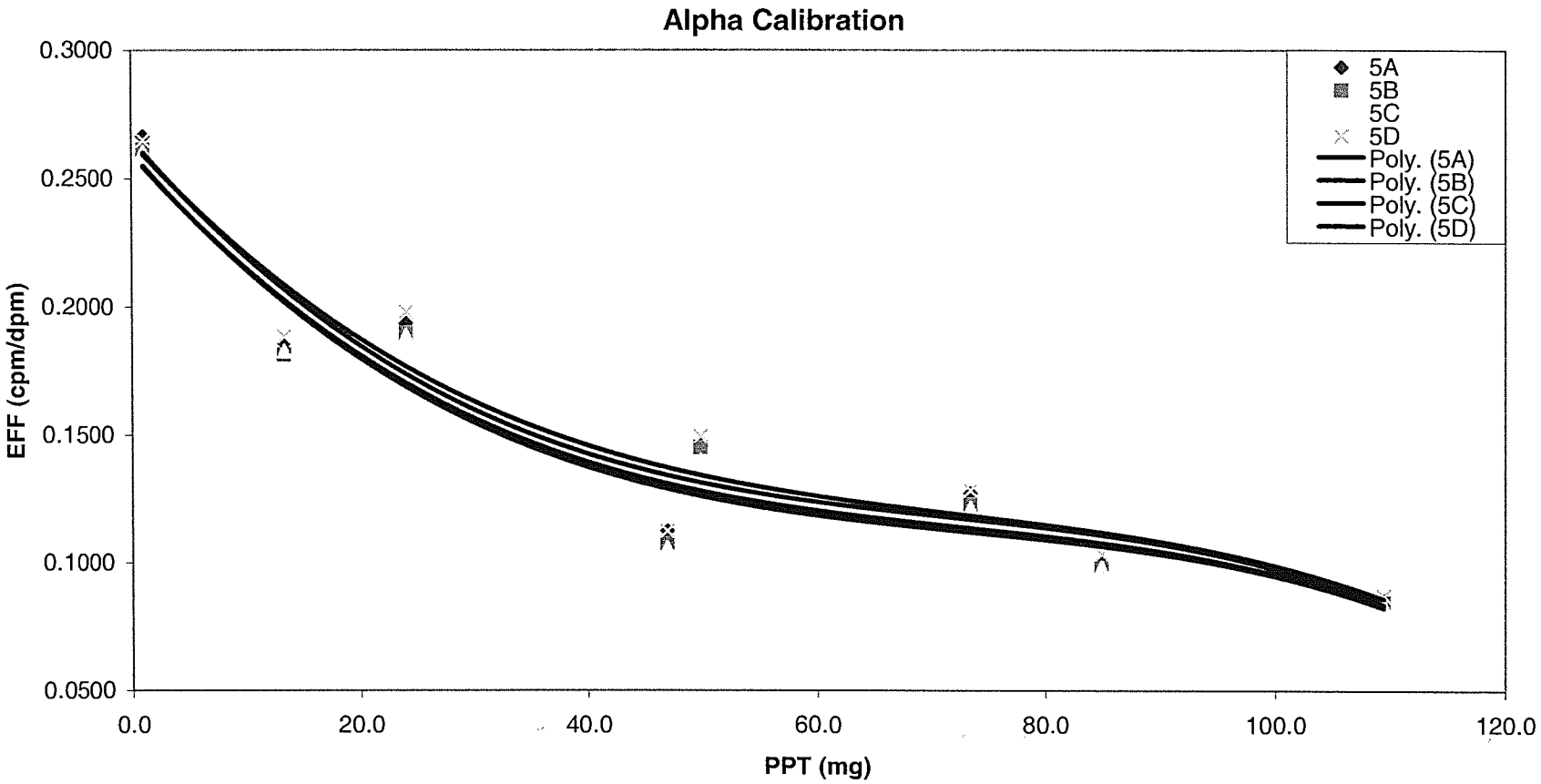


$4A_y = -3.021688E\text{-}07x^3 + 6.340226E\text{-}05x^2 - 4.819213E\text{-}03x + 2.424117E\text{-}01$

$4B_y = -2.284188E\text{-}07x^3 + 5.145036E\text{-}05x^2 - 4.315405E\text{-}03x + 2.242144E\text{-}01$

$4C_y = -2.665324E\text{-}07x^3 + 5.785644E\text{-}05x^2 - 4.658210E\text{-}03x + 2.437071E\text{-}01$

$4D_y = -2.645337E\text{-}07x^3 + 5.846024E\text{-}05x^2 - 4.793104E\text{-}03x + 2.551821E\text{-}01$

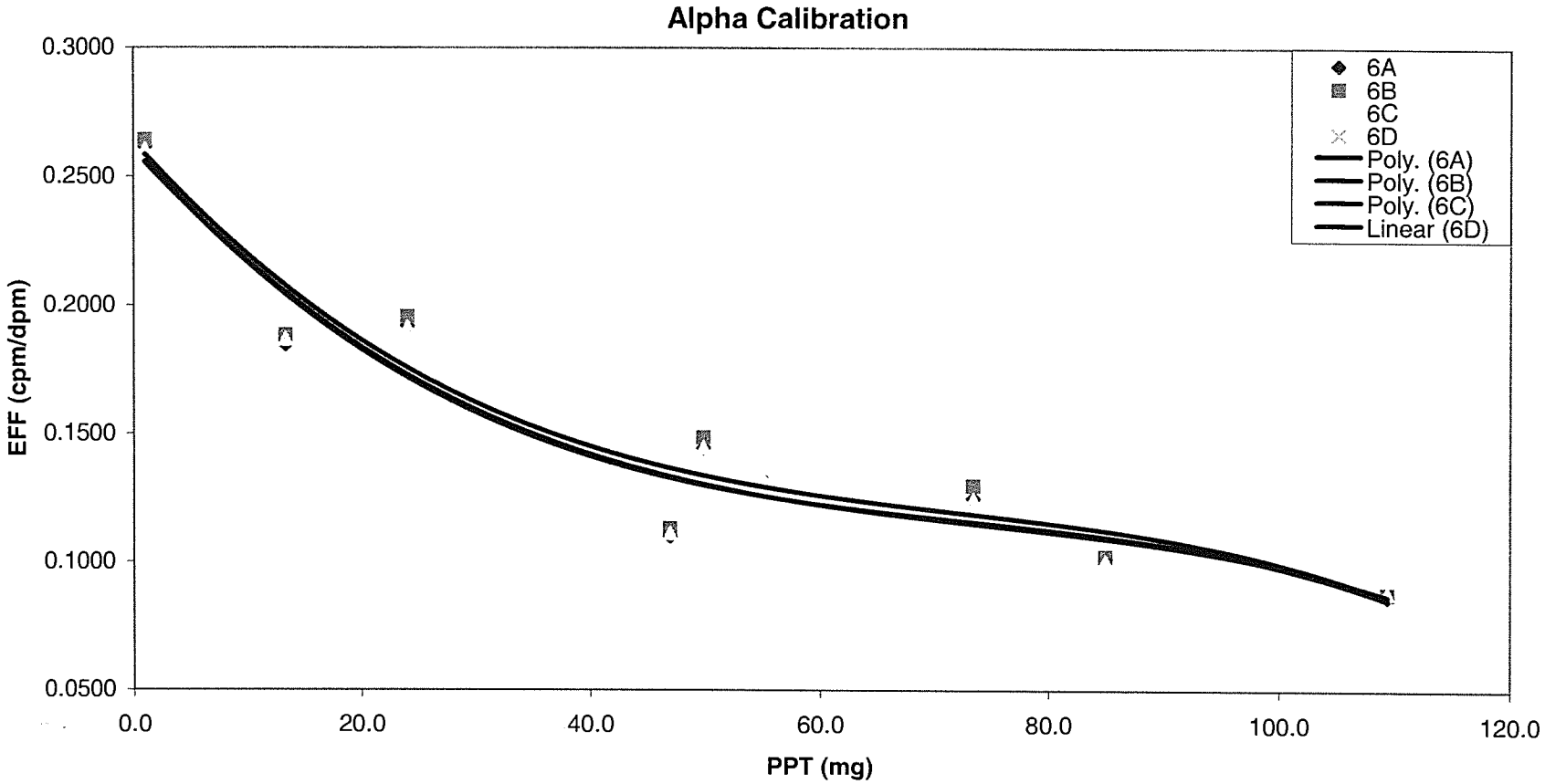


$5A_y = -3.067529E\text{-}07x^3 + 6.608809E\text{-}05x^2 - 5.219761E\text{-}03x + 2.652953E\text{-}01$

$5B_y = -2.881994E\text{-}07x^3 + 6.306604E\text{-}05x^2 - 5.066104E\text{-}03x + 2.595626E\text{-}01$

$5C_y = -2.944088E\text{-}07x^3 + 6.477653E\text{-}05x^2 - 5.188095E\text{-}03x + 2.601287E\text{-}01$

$5D_y = -2.765175E\text{-}07x^3 + 6.045534E\text{-}05x^2 - 4.935300E\text{-}03x + 2.642477E\text{-}01$

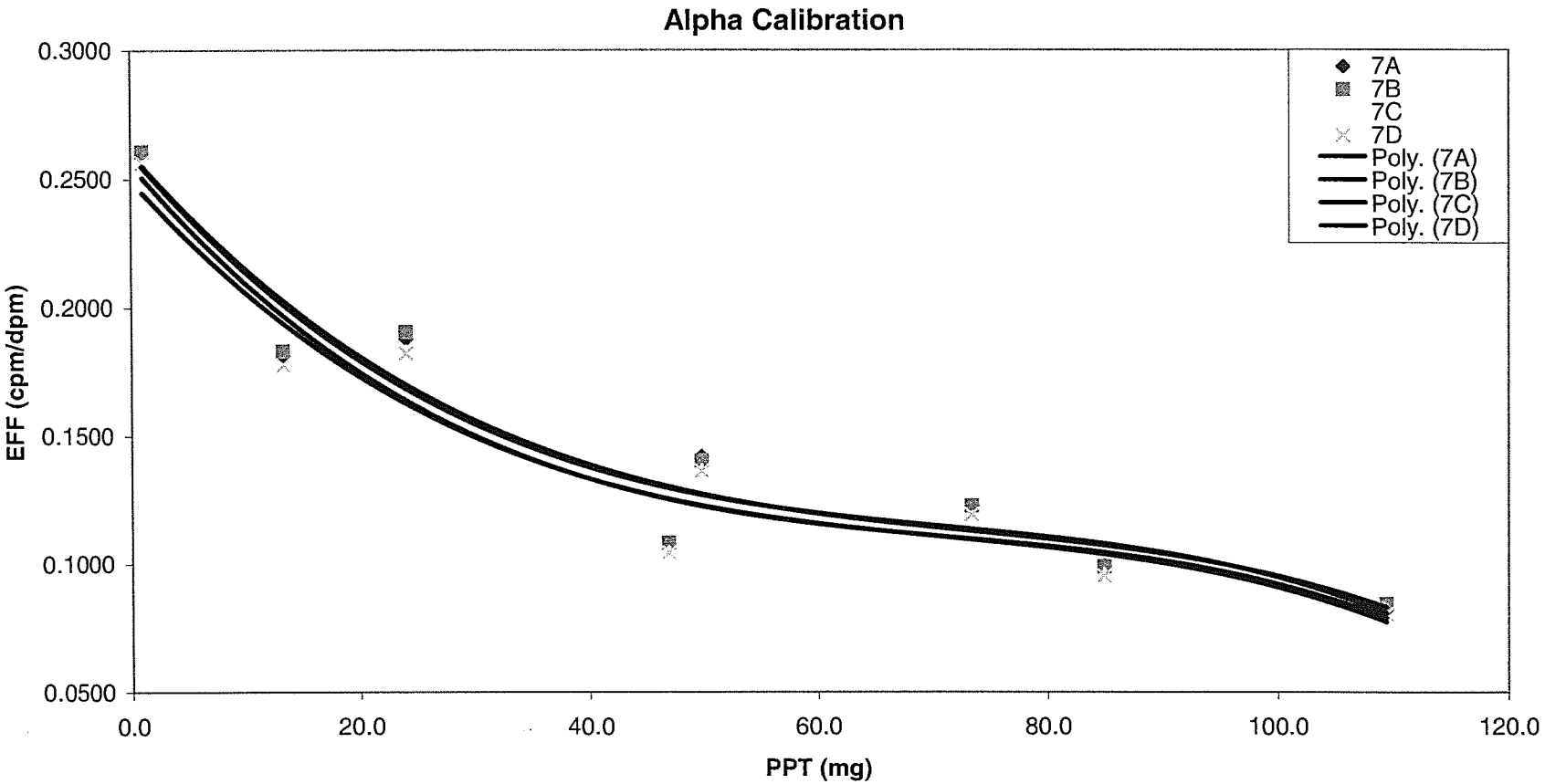


6A $y = -2.875027E-07x^3 + 6.296286E-05x^2 - 5.051686E-03x + 2.608836E-01$

6B $y = -2.846922E-07x^3 + 6.183626E-05x^2 - 4.978844E-03x + 2.634906E-01$

6C $y = -2.636623E-07x^3 + 5.915044E-05x^2 - 4.900282E-03x + 2.602168E-01$

6D

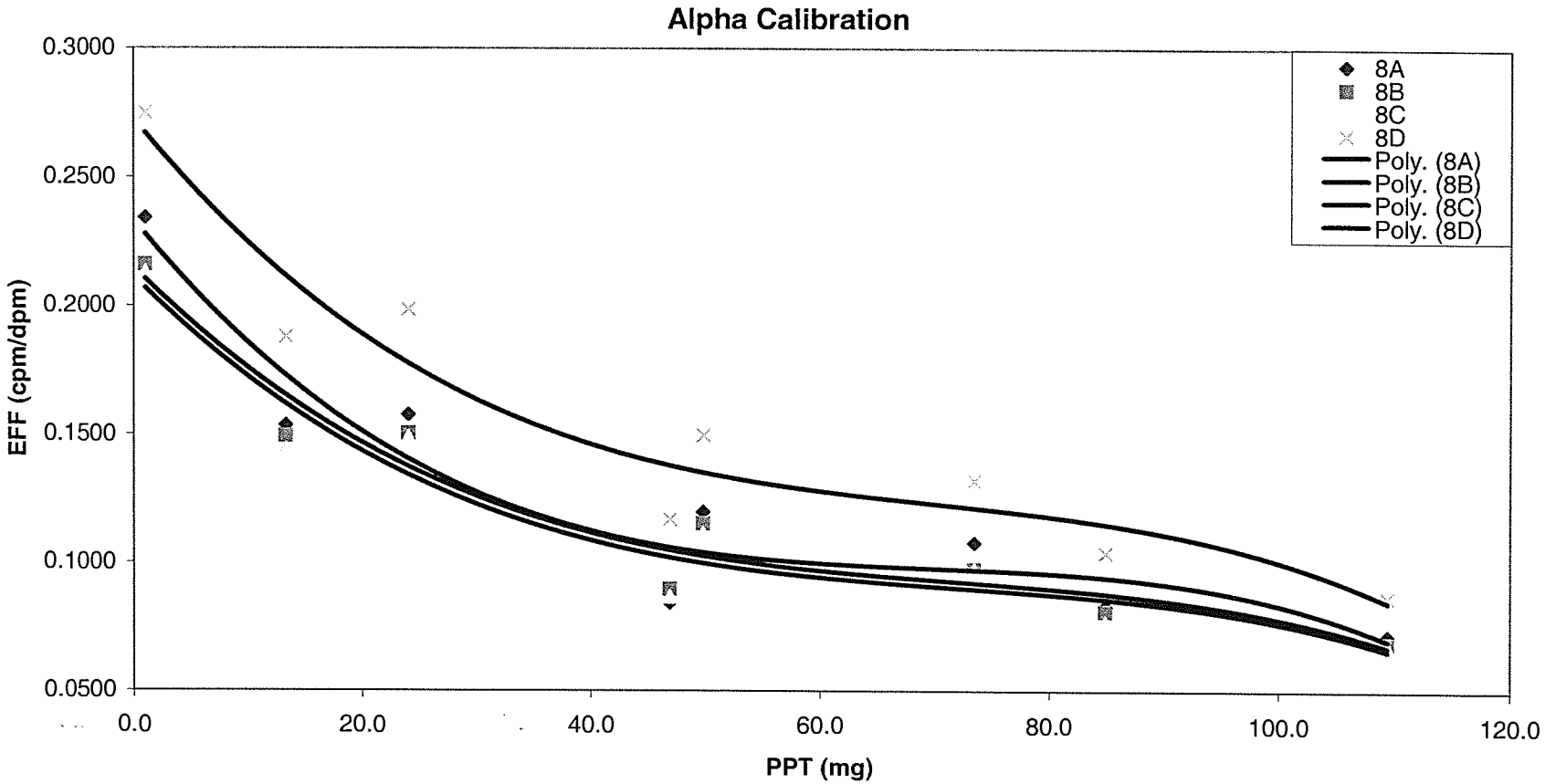


$7A_y = -3.155866E\text{-}07x^3 + 6.757336E\text{-}05x^2 - 5.252047E\text{-}03x + 2.598460E\text{-}01$

$7B_y = -2.882892E\text{-}07x^3 + 6.348472E\text{-}05x^2 - 5.114432E\text{-}03x + 2.602013E\text{-}01$

$7C_y = -2.976395E\text{-}07x^3 + 6.368638E\text{-}05x^2 - 4.979532E\text{-}03x + 2.495744E\text{-}01$

$7D_y = -3.138330E\text{-}07x^3 + 6.771888E\text{-}05x^2 - 5.268667E\text{-}03x + 2.557161E\text{-}01$

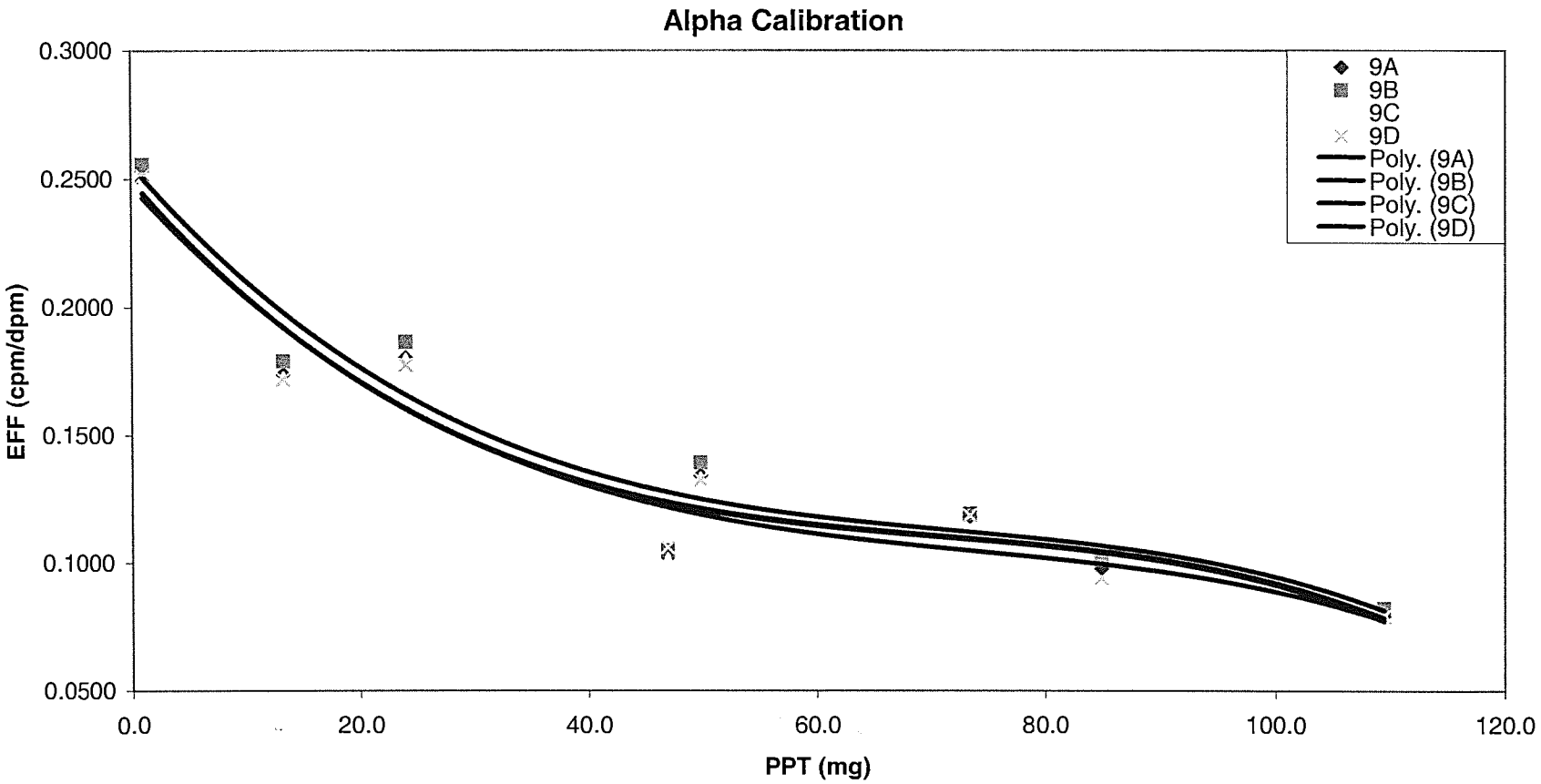


$8A_y = -3.604285E\text{-}07x^3 + 7.588707E\text{-}05x^2 - 5.482177E\text{-}03x + 2.332719E\text{-}01$

$8B_y = -2.625815E\text{-}07x^3 + 5.700169E\text{-}05x^2 - 4.441782E\text{-}03x + 2.148498E\text{-}01$

$8C_y = -2.618601E\text{-}07x^3 + 5.695287E\text{-}05x^2 - 4.425708E\text{-}03x + 2.112666E\text{-}01$

$8D_y = -3.381777E\text{-}07x^3 + 7.135158E\text{-}05x^2 - 5.475670E\text{-}03x + 2.726210E\text{-}01$

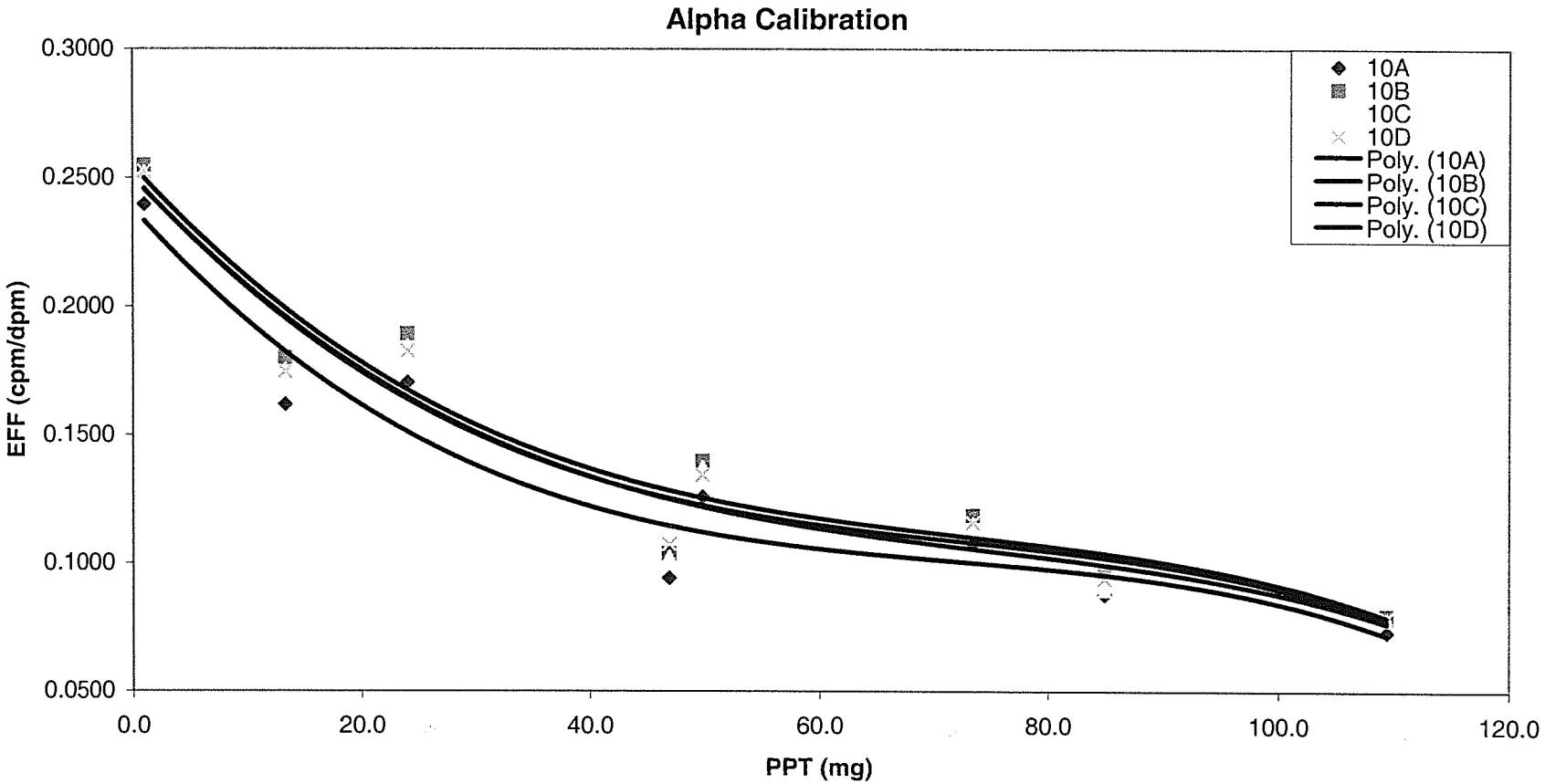


$9A_y = -3.151259E\text{-}07x^3 + 6.708001E\text{-}05x^2 - 5.129044E\text{-}03x + 2.493831E\text{-}01$

$9B_y = -3.047880E\text{-}07x^3 + 6.577583E\text{-}05x^2 - 5.139659E\text{-}03x + 2.555128E\text{-}01$

$9C_y = -2.715113E\text{-}07x^3 + 6.045223E\text{-}05x^2 - 4.917011E\text{-}03x + 2.474097E\text{-}01$

$9D_y = -3.208690E\text{-}07x^3 + 6.807174E\text{-}05x^2 - 5.183355E\text{-}03x + 2.497461E\text{-}01$

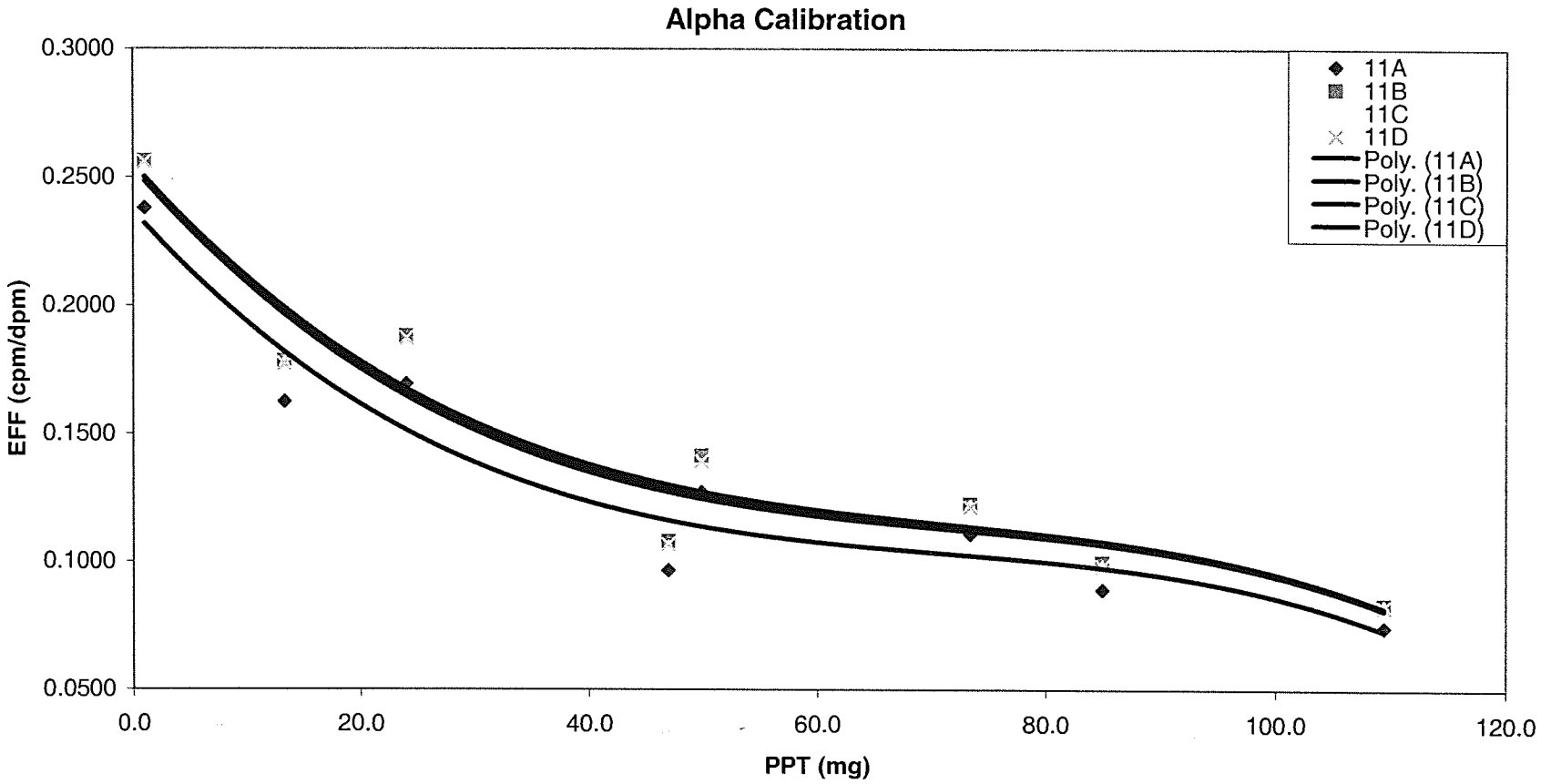


10A $y = -2.964325E-07x^3 + 6.421068E-05x^2 - 4.997674E-03x + 2.382492E-01$

10B $y = -2.753037E-07x^3 + 6.044307E-05x^2 - 4.924385E-03x + 2.546994E-01$

10C $y = -2.529662E-07x^3 + 5.690026E-05x^2 - 4.786185E-03x + 2.503282E-01$

10D $y = -2.797946E-07x^3 + 6.116318E-05x^2 - 4.927171E-03x + 2.507149E-01$

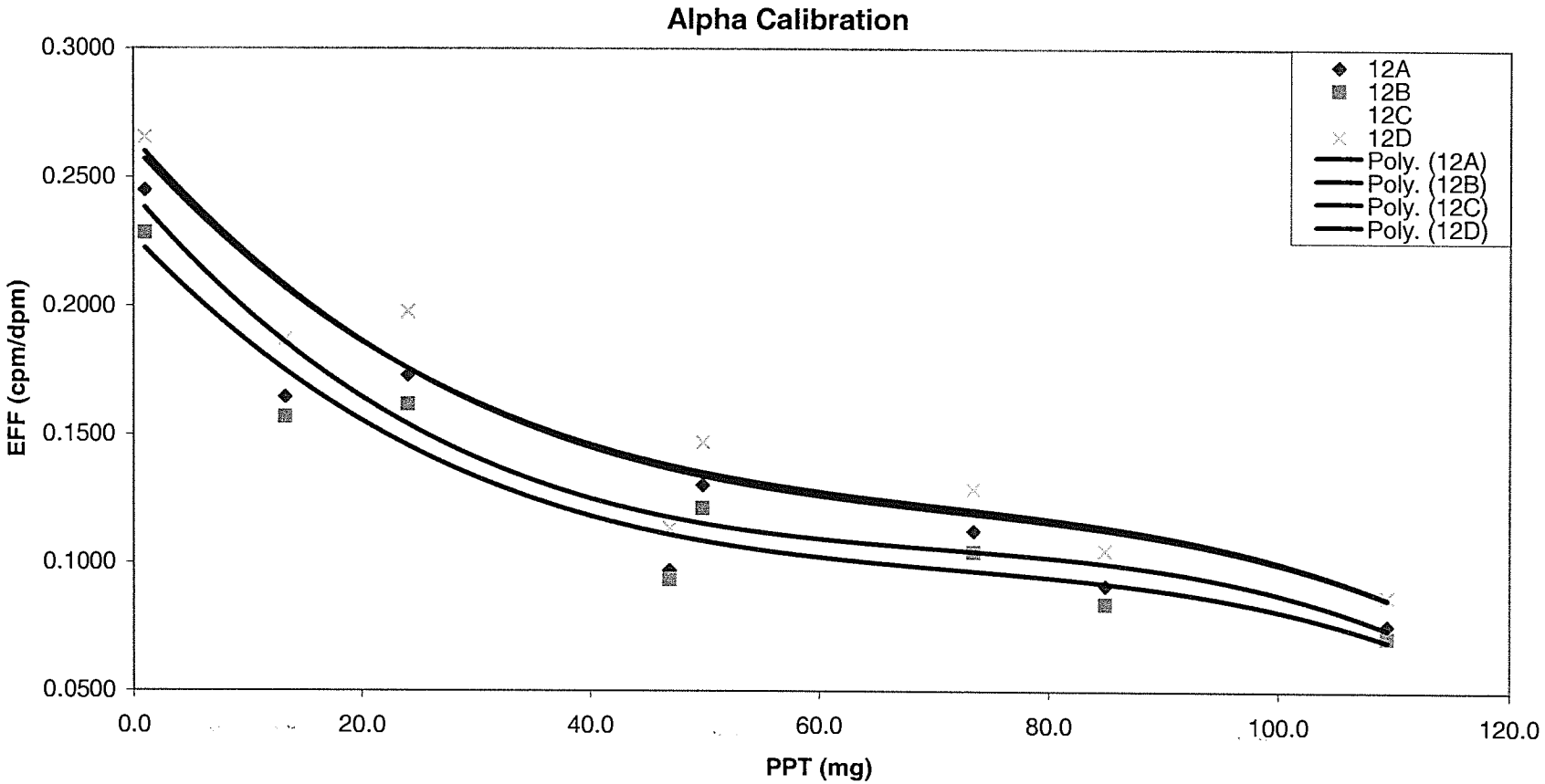


11A $y = -3.008748E\text{-}07x^3 + 6.425159E\text{-}05x^2 - 4.925764E\text{-}03x + 2.368372E\text{-}01$

11B $y = -2.952243E\text{-}07x^3 + 6.348283E\text{-}05x^2 - 4.994627E\text{-}03x + 2.551131E\text{-}01$

11C $y = -3.042670E\text{-}07x^3 + 6.549221E\text{-}05x^2 - 5.095094E\text{-}03x + 2.534510E\text{-}01$

11D $y = -2.962615E\text{-}07x^3 + 6.399789E\text{-}05x^2 - 5.042522E\text{-}03x + 2.548176E\text{-}01$

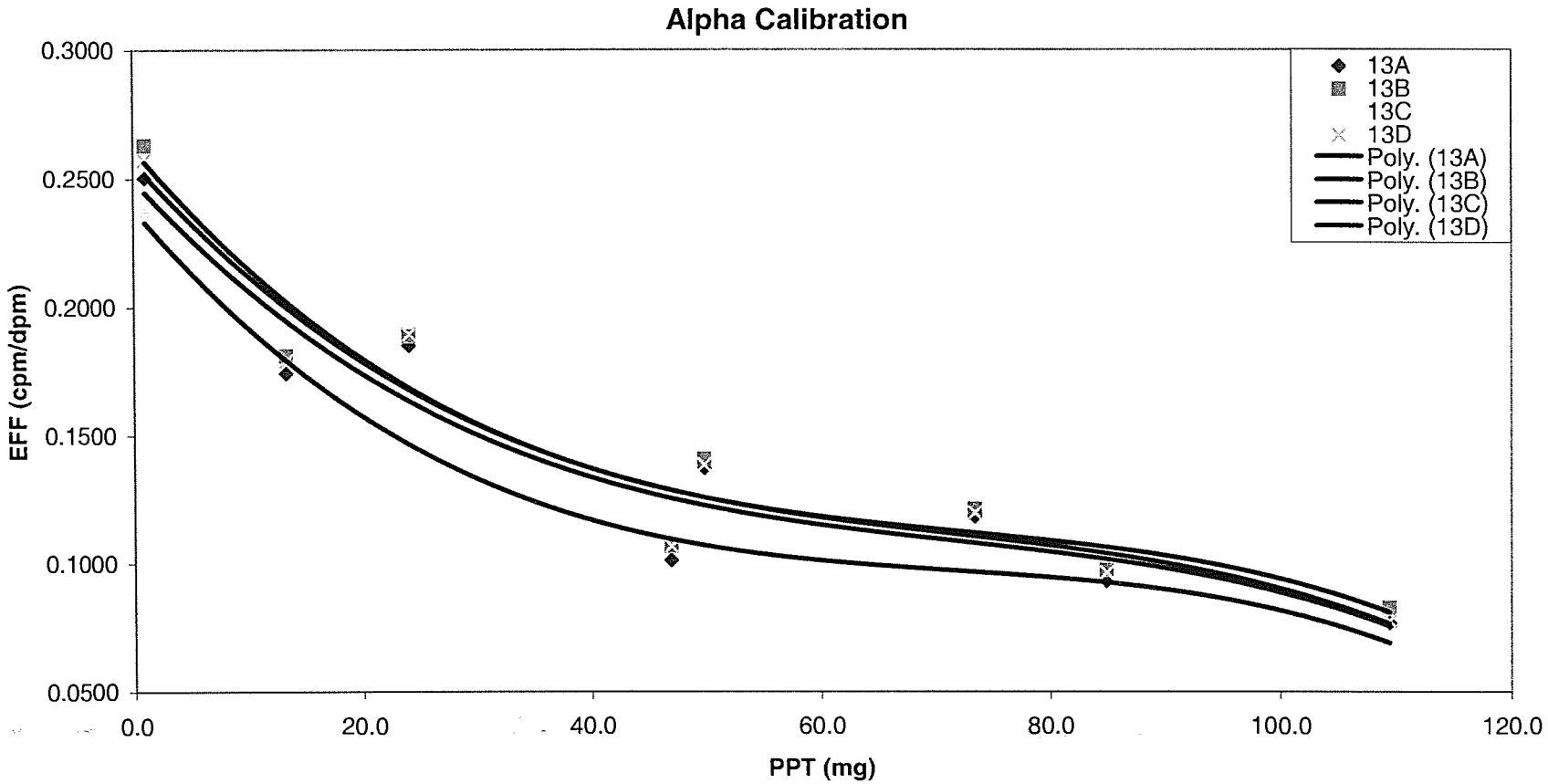


12A $y = -3.208477E-07x^3 + 6.828761E-05x^2 - 5.176202E-03x + 2.433812E-01$

12B $y = -2.744088E-07x^3 + 5.949425E-05x^2 - 4.663972E-03x + 2.271441E-01$

12C $y = -2.909677E-07x^3 + 6.204861E-05x^2 - 4.911957E-03x + 2.619436E-01$

12D $y = -2.963796E-07x^3 + 6.395867E-05x^2 - 5.085884E-03x + 2.650265E-01$

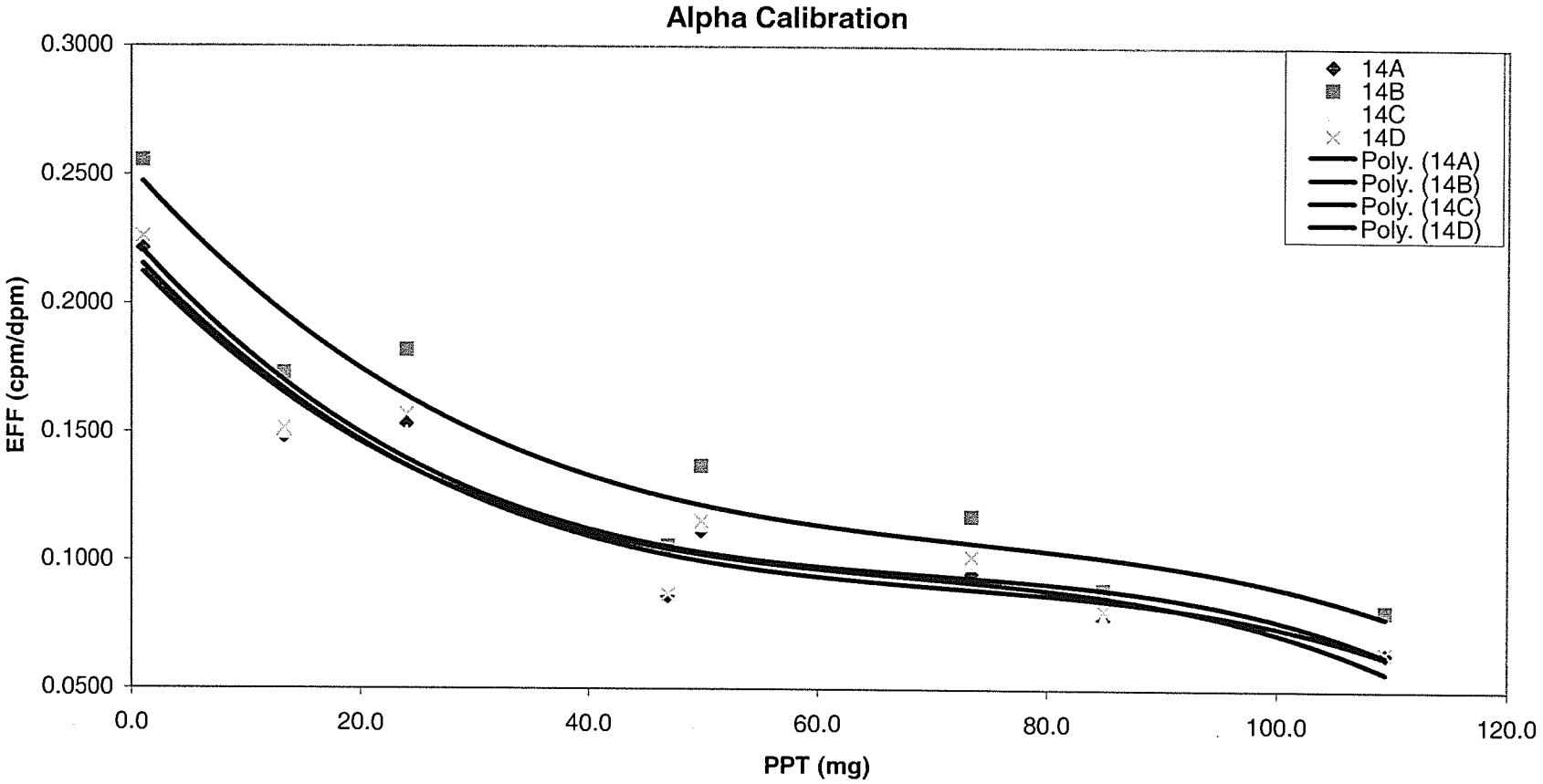


13A $y = -2.817775E-07x^3 + 6.089057E-05x^2 - 4.878783E-03x + 2.494555E-01$

13B $y = -3.080031E-07x^3 + 6.708965E-05x^2 - 5.305198E-03x + 2.616947E-01$

13C $y = -3.229161E-07x^3 + 6.963577E-05x^2 - 5.300503E-03x + 2.382577E-01$

13D $y = -2.920696E-07x^3 + 6.289923E-05x^2 - 5.030800E-03x + 2.564416E-01$



14A $y = -2.824098E-07x^3 + 6.134606E-05x^2 - 4.766814E-03x + 2.200459E-01$

14B $y = -2.753075E-07x^3 + 6.114246E-05x^2 - 4.983358E-03x + 2.522986E-01$

14C $y = -3.064315E-07x^3 + 6.280312E-05x^2 - 4.664398E-03x + 2.168437E-01$

14D $y = -3.177157E-07x^3 + 6.688939E-05x^2 - 4.995778E-03x + 2.254479E-01$

Current Calibration - PIC

Geometry	2 inch Planchett				
Alpha	**Cal Date**	10/1/2013	**Exp Date**	9/30/2014	
Protean	A0	A1	A2	A3	A4
1A	2.461567E-01	-4.828693E-03	5.911765E-05	-2.664039E-07	
1B	2.458112E-01	-4.945475E-03	6.234190E-05	-2.853570E-07	
1C	2.692142E-01	-5.149981E-03	6.440061E-05	-2.957531E-07	
1D	2.579401E-01	-5.105374E-03	6.369762E-05	-2.913983E-07	
2A	2.235872E-01	-4.495309E-03	5.516754E-05	-2.460395E-07	
2B	2.186698E-01	-4.428481E-03	5.422406E-05	-2.428927E-07	
2C	2.367252E-01	-4.813190E-03	6.155325E-05	-2.870015E-07	
2D	2.263182E-01	-4.887012E-03	6.267482E-05	-2.854058E-07	
3A	2.465586E-01	-4.785168E-03	5.990523E-05	-2.759509E-07	
3B	2.598075E-01	-5.171842E-03	6.565928E-05	-3.036794E-07	
3C	2.586823E-01	-5.264249E-03	6.627880E-05	-3.017244E-07	
3D	2.569587E-01	-4.950744E-03	6.188443E-05	-2.865536E-07	
4A	2.424117E-01	-4.819213E-03	6.340226E-05	-3.021688E-07	
4B	2.242144E-01	-4.315405E-03	5.145036E-05	-2.284188E-07	
4C	2.437071E-01	-4.658210E-03	5.785644E-05	-2.665324E-07	
4D	2.551821E-01	-4.793104E-03	5.846024E-05	-2.645337E-07	
5A	2.652953E-01	-5.219761E-03	6.608809E-05	-3.067529E-07	
5B	2.595626E-01	-5.066104E-03	6.306604E-05	-2.881994E-07	
5C	2.601287E-01	-5.188095E-03	6.477653E-05	-2.944088E-07	
5D	2.642477E-01	-4.935300E-03	6.045534E-05	-2.765175E-07	
6A	2.608836E-01	-5.051686E-03	6.296286E-05	-2.875027E-07	
6B	2.634906E-01	-4.978844E-03	6.183626E-05	-2.846922E-07	
6C	2.602168E-01	-4.900282E-03	5.915044E-05	-2.636623E-07	
6D	#N/A	#N/A	#N/A	#N/A	
7A	2.598460E-01	-5.252047E-03	6.757336E-05	-3.155866E-07	
7B	2.602013E-01	-5.114432E-03	6.348472E-05	-2.882892E-07	
7C	2.495744E-01	-4.979532E-03	6.368638E-05	-2.976395E-07	
7D	2.557161E-01	-5.268667E-03	6.771888E-05	-3.138330E-07	
8A	2.332719E-01	-5.482177E-03	7.588707E-05	-3.604285E-07	
8B	2.148498E-01	-4.441782E-03	5.700169E-05	-2.625815E-07	
8C	2.112666E-01	-4.425708E-03	5.695287E-05	-2.618601E-07	
8D	2.726210E-01	-5.475670E-03	7.135158E-05	-3.381777E-07	
9A	2.493831E-01	-5.129044E-03	6.708001E-05	-3.151259E-07	
9B	2.555128E-01	-5.139659E-03	6.577583E-05	-3.047880E-07	
9C	2.474097E-01	-4.917011E-03	6.045223E-05	-2.715113E-07	
9D	2.497461E-01	-5.183355E-03	6.807174E-05	-3.208690E-07	
10A	2.382492E-01	-4.997674E-03	6.421068E-05	-2.964325E-07	
10B	2.546994E-01	-4.924385E-03	6.044307E-05	-2.753037E-07	
10C	2.503282E-01	-4.786185E-03	5.690026E-05	-2.529662E-07	
10D	2.507149E-01	-4.927171E-03	6.116318E-05	-2.797946E-07	
11A	2.368372E-01	-4.925764E-03	6.425159E-05	-3.008748E-07	
11B	2.551131E-01	-4.994627E-03	6.348283E-05	-2.952243E-07	
11C	2.534510E-01	-5.095094E-03	6.549221E-05	-3.042670E-07	
11D	2.548176E-01	-5.042522E-03	6.399789E-05	-2.962615E-07	
12A	2.433812E-01	-5.176202E-03	6.828761E-05	-3.208477E-07	
12B	2.271441E-01	-4.663972E-03	5.949425E-05	-2.744088E-07	
12C	2.619436E-01	-4.911957E-03	6.204861E-05	-2.909677E-07	
12D	2.650265E-01	-5.085884E-03	6.395867E-05	-2.963796E-07	
13A	2.494555E-01	-4.878783E-03	6.089057E-05	-2.817775E-07	
13B	2.616947E-01	-5.305198E-03	6.708965E-05	-3.080031E-07	
13C	2.382577E-01	-5.300503E-03	6.963577E-05	-3.229161E-07	
13D	2.564416E-01	-5.030800E-03	6.289923E-05	-2.920696E-07	
14A	2.200459E-01	-4.766814E-03	6.134606E-05	-2.824098E-07	
14B	2.522986E-01	-4.983358E-03	6.114246E-05	-2.753075E-07	
14C	2.168437E-01	-4.664398E-03	6.280312E-05	-3.064315E-07	
14D	2.254479E-01	-4.995778E-03	6.688939E-05	-3.177157E-07	

PIC_Alpha_Sep13_RawData.xls

SampleID	Instr	Time (min.)	Alpha Counts	Beta Counts	Count Start Time	Count End Time	Machine	Batch ID
T1	10A	3	31737	13715	9/21/2013 16:22	9/21/2013 16:25	PIC	GABT13
T2	10A	3	21436	10212	9/21/2013 16:55	9/21/2013 16:58	PIC	GABT13
T3	10A	3	22591	10728	9/21/2013 16:44	9/21/2013 16:47	PIC	GABT13
T4	10A	3	16666	8336	9/21/2013 16:27	9/21/2013 16:30	PIC	GABT13
T5	10A	3	12482	6394	9/21/2013 16:00	9/21/2013 16:03	PIC	GABT13
T6	10A	3	14269	7749	9/21/2013 16:17	9/21/2013 16:20	PIC	GABT13
T7	10A	3	11635	6112	9/21/2013 16:12	9/21/2013 16:15	PIC	GABT13
T8	10A	3	9699	5595	9/21/2013 16:06	9/21/2013 16:09	PIC	GABT13
T1	10B	3	33745	11392	9/21/2013 16:27	9/21/2013 16:30	PIC	GABT13
T2	10B	3	23835	8611	9/21/2013 16:22	9/21/2013 16:25	PIC	GABT13
T3	10B	3	25067	8665	9/21/2013 16:55	9/21/2013 16:58	PIC	GABT13
T4	10B	3	18512	6943	9/21/2013 16:44	9/21/2013 16:47	PIC	GABT13
T5	10B	3	13721	5076	9/21/2013 16:06	9/21/2013 16:09	PIC	GABT13
T6	10B	3	15717	6304	9/21/2013 16:01	9/21/2013 16:04	PIC	GABT13
T7	10B	3	12891	5141	9/21/2013 16:17	9/21/2013 16:20	PIC	GABT13
T8	10B	3	10561	4474	9/21/2013 16:12	9/21/2013 16:15	PIC	GABT13
T1	10C	3	33380	11774	9/21/2013 16:45	9/21/2013 16:48	PIC	GABT13
T2	10C	3	23219	9039	9/21/2013 16:27	9/21/2013 16:30	PIC	GABT13
T3	10C	3	24431	9446	9/21/2013 16:23	9/21/2013 16:26	PIC	GABT13
T4	10C	3	18197	7173	9/21/2013 16:55	9/21/2013 16:58	PIC	GABT13
T5	10C	3	13536	5691	9/21/2013 16:12	9/21/2013 16:15	PIC	GABT13
T6	10C	3	15298	6795	9/21/2013 16:06	9/21/2013 16:09	PIC	GABT13
T7	10C	3	11866	5272	9/21/2013 16:01	9/21/2013 16:04	PIC	GABT13
T8	10C	3	10358	4886	9/21/2013 16:17	9/21/2013 16:20	PIC	GABT13
T1	10D	3	33428	12324	9/21/2013 16:55	9/21/2013 16:58	PIC	GABT13
T2	10D	3	23124	9522	9/21/2013 16:45	9/21/2013 16:48	PIC	GABT13
T3	10D	3	24189	9889	9/21/2013 16:27	9/21/2013 16:30	PIC	GABT13
T4	10D	3	17799	7701	9/21/2013 16:23	9/21/2013 16:26	PIC	GABT13
T5	10D	3	14233	5882	9/21/2013 16:17	9/21/2013 16:20	PIC	GABT13
T6	10D	3	15356	6981	9/21/2013 16:12	9/21/2013 16:15	PIC	GABT13
T7	10D	3	12444	5741	9/21/2013 16:06	9/21/2013 16:09	PIC	GABT13
T8	10D	3	10444	5123	9/21/2013 16:01	9/21/2013 16:04	PIC	GABT13
T1	11A	3	31536	14355	9/21/2013 17:14	9/21/2013 17:17	PIC	GABT13
T2	11A	3	21515	11385	9/21/2013 17:30	9/21/2013 17:33	PIC	GABT13
T3	11A	3	22447	11910	9/21/2013 17:26	9/21/2013 17:29	PIC	GABT13
T4	11A	3	16858	9111	9/21/2013 17:20	9/21/2013 17:23	PIC	GABT13

T5	11A	3	12786	6886	9/21/2013 17:38	9/21/2013 17:41	PIC	GABT13
T6	11A	3	14688	8463	9/21/2013 17:54	9/21/2013 17:57	PIC	GABT13
T7	11A	3	11809	6589	9/21/2013 17:48	9/21/2013 17:51	PIC	GABT13
T8	11A	3	9872	5974	9/21/2013 17:43	9/21/2013 17:46	PIC	GABT13
T1	11B	3	33943	13019	9/21/2013 17:20	9/21/2013 17:23	PIC	GABT13
T2	11B	3	23643	10047	9/21/2013 17:15	9/21/2013 17:18	PIC	GABT13
T3	11B	3	24928	10312	9/21/2013 17:30	9/21/2013 17:33	PIC	GABT13
T4	11B	3	18744	8268	9/21/2013 17:26	9/21/2013 17:29	PIC	GABT13
T5	11B	3	14300	6218	9/21/2013 17:43	9/21/2013 17:46	PIC	GABT13
T6	11B	3	16255	7667	9/21/2013 17:38	9/21/2013 17:41	PIC	GABT13
T7	11B	3	13220	6175	9/21/2013 17:54	9/21/2013 17:57	PIC	GABT13
T8	11B	3	11032	5489	9/21/2013 17:48	9/21/2013 17:51	PIC	GABT13
T1	11C	3	33630	13546	9/21/2013 17:26	9/21/2013 17:29	PIC	GABT13
T2	11C	3	23494	10489	9/21/2013 17:20	9/21/2013 17:23	PIC	GABT13
T3	11C	3	24413	10772	9/21/2013 17:15	9/21/2013 17:18	PIC	GABT13
T4	11C	3	18215	8621	9/21/2013 17:30	9/21/2013 17:33	PIC	GABT13
T5	11C	3	13995	6642	9/21/2013 17:48	9/21/2013 17:51	PIC	GABT13
T6	11C	3	16148	7920	9/21/2013 17:43	9/21/2013 17:46	PIC	GABT13
T7	11C	3	12997	6441	9/21/2013 17:38	9/21/2013 17:41	PIC	GABT13
T8	11C	3	10971	5853	9/21/2013 17:54	9/21/2013 17:57	PIC	GABT13
T1	11D	3	33907	12985	9/21/2013 17:30	9/21/2013 17:33	PIC	GABT13
T2	11D	3	23489	9879	9/21/2013 17:26	9/21/2013 17:29	PIC	GABT13
T3	11D	3	24821	10029	9/21/2013 17:20	9/21/2013 17:23	PIC	GABT13
T4	11D	3	18451	7846	9/21/2013 17:15	9/21/2013 17:18	PIC	GABT13
T5	11D	3	14157	6075	9/21/2013 17:55	9/21/2013 17:58	PIC	GABT13
T6	11D	3	16092	7484	9/21/2013 17:48	9/21/2013 17:51	PIC	GABT13
T7	11D	3	13040	5859	9/21/2013 17:43	9/21/2013 17:46	PIC	GABT13
T8	11D	3	10935	5307	9/21/2013 17:38	9/21/2013 17:41	PIC	GABT13
T1	12A	3	32456	14229	9/21/2013 17:38	9/21/2013 17:41	PIC	GABT13
T2	12A	3	21802	11140	9/21/2013 17:55	9/21/2013 17:58	PIC	GABT13
T3	12A	3	22934	11653	9/21/2013 17:48	9/21/2013 17:51	PIC	GABT13
T4	12A	3	17262	9018	9/21/2013 17:43	9/21/2013 17:46	PIC	GABT13
T5	12A	3	12852	6998	9/21/2013 17:15	9/21/2013 17:18	PIC	GABT13
T6	12A	3	14907	8494	9/21/2013 17:30	9/21/2013 17:33	PIC	GABT13
T7	12A	3	12083	6777	9/21/2013 17:26	9/21/2013 17:29	PIC	GABT13
T8	12A	3	10056	5938	9/21/2013 17:20	9/21/2013 17:23	PIC	GABT13
T1	12B	3	30251	16273	9/21/2013 17:43	9/21/2013 17:46	PIC	GABT13

T2	12B	3	20781	12570	9/21/2013 17:38	9/21/2013 17:41	PIC	GABT13
T3	12B	3	21415	13057	9/21/2013 17:55	9/21/2013 17:58	PIC	GABT13
T4	12B	3	16066	10218	9/21/2013 17:48	9/21/2013 17:51	PIC	GABT13
T5	12B	3	12378	7671	9/21/2013 17:20	9/21/2013 17:23	PIC	GABT13
T6	12B	3	13821	9756	9/21/2013 17:15	9/21/2013 17:18	PIC	GABT13
T7	12B	3	11134	7625	9/21/2013 17:30	9/21/2013 17:33	PIC	GABT13
T8	12B	3	9428	6696	9/21/2013 17:26	9/21/2013 17:29	PIC	GABT13
T1	12C	3	34746	11919	9/21/2013 17:49	9/21/2013 17:52	PIC	GABT13
T2	12C	3	24831	8898	9/21/2013 17:43	9/21/2013 17:46	PIC	GABT13
T3	12C	3	26089	9310	9/21/2013 17:38	9/21/2013 17:41	PIC	GABT13
T4	12C	3	19901	7297	9/21/2013 17:55	9/21/2013 17:58	PIC	GABT13
T5	12C	3	14946	5616	9/21/2013 17:26	9/21/2013 17:29	PIC	GABT13
T6	12C	3	17435	6847	9/21/2013 17:20	9/21/2013 17:23	PIC	GABT13
T7	12C	3	13919	5533	9/21/2013 17:15	9/21/2013 17:18	PIC	GABT13
T8	12C	3	11590	4773	9/21/2013 17:30	9/21/2013 17:33	PIC	GABT13
T1	12D	3	35190	13006	9/21/2013 17:58	9/21/2013 18:01	PIC	GABT13
T2	12D	3	24798	9783	9/21/2013 17:50	9/21/2013 17:53	PIC	GABT13
T3	12D	3	26193	10078	9/21/2013 17:43	9/21/2013 17:46	PIC	GABT13
T4	12D	3	19472	8191	9/21/2013 17:39	9/21/2013 17:42	PIC	GABT13
T5	12D	3	15034	6319	9/21/2013 17:34	9/21/2013 17:37	PIC	GABT13
T6	12D	3	17055	7465	9/21/2013 17:26	9/21/2013 17:29	PIC	GABT13
T7	12D	3	13912	6228	9/21/2013 17:21	9/21/2013 17:24	PIC	GABT13
T8	12D	3	11547	5459	9/21/2013 17:15	9/21/2013 17:18	PIC	GABT13
T1	13A	3	33152	12661	9/24/2013 13:17	9/24/2013 13:20	PIC	GABT13
T2	13A	3	23078	9408	9/24/2013 14:41	9/24/2013 14:44	PIC	GABT13
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T4	13A	3	18174	7729	9/24/2013 13:32	9/24/2013 13:35	PIC	GABT13
T5	13A	3	13415	5743	9/24/2013 14:46	9/24/2013 14:49	PIC	GABT13
T6	13A	3	15671	7087	9/24/2013 15:07	9/24/2013 15:10	PIC	GABT13
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T1	13B	3	34830	13320	9/24/2013 13:32	9/24/2013 13:35	PIC	GABT13
T2	13B	3	23984	10328	9/24/2013 13:17	9/24/2013 13:20	PIC	GABT13
T3	13B	3	25002	10593	9/24/2013 14:41	9/24/2013 14:44	PIC	GABT13
T4	13B	3	18646	8130	9/24/2013 13:46	9/24/2013 13:49	PIC	GABT13
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T6	13B	3	16053	7603	9/24/2013 14:46	9/24/2013 14:49	PIC	GABT13

T7	13B	3	12891	6230	9/24/2013 15:07	9/24/2013 15:10	PIC	GABT13
T8	13B	3	10937	5393	9/24/2013 15:02	9/24/2013 15:05	PIC	GABT13
T1	13C	3	31485	15284	9/24/2013 13:46	9/24/2013 13:49	PIC	GABT13
T2	13C	3	21633	12020	9/24/2013 13:32	9/24/2013 13:35	PIC	GABT13
T3	13C	3	21567	13069	9/24/2013 13:17	9/24/2013 13:20	PIC	GABT13
T4	13C	3	15140	11076	9/24/2013 14:41	9/24/2013 14:44	PIC	GABT13
T5	13C	3	12481	7312	9/24/2013 15:03	9/24/2013 15:06	PIC	GABT13
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T7	13C	3	10915	7310	9/24/2013 14:46	9/24/2013 14:49	PIC	GABT13
T8	13C	3	9343	6579	9/24/2013 15:07	9/24/2013 15:10	PIC	GABT13
T1	13D	3	34076	12507	9/24/2013 14:41	9/24/2013 14:44	PIC	GABT13
T2	13D	3	23732	9224	9/24/2013 13:47	9/24/2013 13:50	PIC	GABT13
T3	13D	3	25098	9613	9/24/2013 13:32	9/24/2013 13:35	PIC	GABT13
T4	13D	3	18359	7606	9/24/2013 13:17	9/24/2013 13:20	PIC	GABT13
T5	13D	3	14132	5861	9/24/2013 15:07	9/24/2013 15:10	PIC	GABT13
T6	13D	3	15861	7075	9/24/2013 15:03	9/24/2013 15:06	PIC	GABT13
T7	13D	3	12758	5485	9/24/2013 14:57	9/24/2013 15:00	PIC	GABT13
T8	13D	3	10278	4917	9/24/2013 14:47	9/24/2013 14:50	PIC	GABT13
T1	14A	3	29322	17551	9/24/2013 14:47	9/24/2013 14:50	PIC	GABT13
T2	14A	3	19626	13996	9/24/2013 15:07	9/24/2013 15:10	PIC	GABT13
T3	14A	3	20310	14143	9/24/2013 15:03	9/24/2013 15:06	PIC	GABT13
T4	14A	3	14784	11401	9/24/2013 14:57	9/24/2013 15:00	PIC	GABT13
T5	14A	3	11427	8589	9/24/2013 13:18	9/24/2013 13:21	PIC	GABT13
T6	14A	3	12612	10618	9/24/2013 14:41	9/24/2013 14:44	PIC	GABT13
T7	14A	3	10306	8267	9/24/2013 13:47	9/24/2013 13:50	PIC	GABT13
T8	14A	3	8525	7226	9/24/2013 13:32	9/24/2013 13:35	PIC	GABT13
T1	14B	3	33858	16145	9/24/2013 14:57	9/24/2013 15:00	PIC	GABT13
T2	14B	3	22912	13397	9/24/2013 14:47	9/24/2013 14:50	PIC	GABT13
T3	14B	3	24110	13525	9/24/2013 15:07	9/24/2013 15:10	PIC	GABT13
T4	14B	3	18154	10733	9/24/2013 15:03	9/24/2013 15:06	PIC	GABT13
T5	14B	3	14018	7795	9/24/2013 13:32	9/24/2013 13:35	PIC	GABT13
T6	14B	3	15566	10147	9/24/2013 13:19	9/24/2013 13:22	PIC	GABT13
T7	14B	3	11797	8270	9/24/2013 14:41	9/24/2013 14:44	PIC	GABT13
T8	14B	3	10722	6999	9/24/2013 13:47	9/24/2013 13:50	PIC	GABT13
T1	14C	3	28799	17946	9/24/2013 15:03	9/24/2013 15:06	PIC	GABT13
T2	14C	3	19866	13907	9/24/2013 14:57	9/24/2013 15:00	PIC	GABT13
T3	14C	3	19804	14810	9/24/2013 14:47	9/24/2013 14:50	PIC	GABT13

T4	14C	3	15117	11753	9/24/2013 15:07	9/24/2013 15:10	PIC	GABT13
T5	14C	3	11851	8546	9/24/2013 13:47	9/24/2013 13:50	PIC	GABT13
T6	14C	3	13162	10561	9/24/2013 13:32	9/24/2013 13:35	PIC	GABT13
T7	14C	3	10263	8385	9/24/2013 13:19	9/24/2013 13:22	PIC	GABT13
T8	14C	3	7765	7763	9/24/2013 14:41	9/24/2013 14:44	PIC	GABT13
T1	14D	3	29961	17438	9/24/2013 15:08	9/24/2013 15:11	PIC	GABT13
T2	14D	3	20083	13691	9/24/2013 15:03	9/24/2013 15:06	PIC	GABT13
T3	14D	3	20800	14595	9/24/2013 14:57	9/24/2013 15:00	PIC	GABT13
T4	14D	3	15303	11252	9/24/2013 14:47	9/24/2013 14:50	PIC	GABT13
T5	14D	3	11530	8561	9/24/2013 14:41	9/24/2013 14:44	PIC	GABT13
T6	14D	3	13494	10958	9/24/2013 13:47	9/24/2013 13:50	PIC	GABT13
T7	14D	3	10713	8356	9/24/2013 13:32	9/24/2013 13:35	PIC	GABT13
T8	14D	3	8595	7590	9/24/2013 13:19	9/24/2013 13:22	PIC	GABT13
T1	1A	3	32784	12352	9/21/2013 11:55	9/21/2013 11:58	PIC	GABT13
T2	1A	3	22813	9418	9/21/2013 12:11	9/21/2013 12:14	PIC	GABT13
T3	1A	3	23639	9640	9/21/2013 12:06	9/21/2013 12:09	PIC	GABT13
T4	1A	3	17546	7827	9/21/2013 12:01	9/21/2013 12:04	PIC	GABT13
T5	1A	3	13712	5896	9/21/2013 12:17	9/21/2013 12:20	PIC	GABT13
T6	1A	3	14898	7151	9/21/2013 13:10	9/21/2013 13:13	PIC	GABT13
T7	1A	3	12120	5691	9/21/2013 12:30	9/21/2013 12:33	PIC	GABT13
T8	1A	3	10340	4981	9/21/2013 12:25	9/21/2013 12:28	PIC	GABT13
T1	1B	3	32860	12710	9/21/2013 12:01	9/21/2013 12:04	PIC	GABT13
T2	1B	3	22231	9503	9/21/2013 11:55	9/21/2013 11:58	PIC	GABT13
T3	1B	3	23731	9690	9/21/2013 12:11	9/21/2013 12:14	PIC	GABT13
T4	1B	3	17337	7744	9/21/2013 12:06	9/21/2013 12:09	PIC	GABT13
T5	1B	3	13715	5908	9/21/2013 12:25	9/21/2013 12:28	PIC	GABT13
T6	1B	3	15109	7009	9/21/2013 12:17	9/21/2013 12:20	PIC	GABT13
T7	1B	3	12212	5572	9/21/2013 13:10	9/21/2013 13:13	PIC	GABT13
T8	1B	3	10447	5013	9/21/2013 12:30	9/21/2013 12:33	PIC	GABT13
T1	1C	3	35697	11255	9/21/2013 12:06	9/21/2013 12:09	PIC	GABT13
T2	1C	3	25411	8099	9/21/2013 12:01	9/21/2013 12:04	PIC	GABT13
T3	1C	3	26429	8423	9/21/2013 11:55	9/21/2013 11:58	PIC	GABT13
T4	1C	3	20030	6606	9/21/2013 12:11	9/21/2013 12:14	PIC	GABT13
T5	1C	3	15082	5178	9/21/2013 12:30	9/21/2013 12:33	PIC	GABT13
T6	1C	3	17451	6016	9/21/2013 12:25	9/21/2013 12:28	PIC	GABT13
T7	1C	3	14082	4941	9/21/2013 12:17	9/21/2013 12:20	PIC	GABT13
T8	1C	3	12006	4365	9/21/2013 13:10	9/21/2013 13:13	PIC	GABT13

T1	1D	3	34323	11007	9/21/2013 12:12	9/21/2013 12:15	PIC	GABT13
T2	1D	3	23855	8119	9/21/2013 12:06	9/21/2013 12:09	PIC	GABT13
T3	1D	3	24855	8337	9/21/2013 12:01	9/21/2013 12:04	PIC	GABT13
T4	1D	3	18421	6409	9/21/2013 11:55	9/21/2013 11:58	PIC	GABT13
T5	1D	3	14280	5123	9/21/2013 13:11	9/21/2013 13:14	PIC	GABT13
T6	1D	3	15997	5950	9/21/2013 12:30	9/21/2013 12:33	PIC	GABT13
T7	1D	3	12740	4744	9/21/2013 12:25	9/21/2013 12:28	PIC	GABT13
T8	1D	3	10833	4189	9/21/2013 12:17	9/21/2013 12:20	PIC	GABT13
T1	2A	3	29700	14885	9/21/2013 12:17	9/21/2013 12:20	PIC	GABT13
T2	2A	3	20776	10901	9/21/2013 13:14	9/21/2013 13:17	PIC	GABT13
T3	2A	3	21048	11469	9/21/2013 12:30	9/21/2013 12:33	PIC	GABT13
T4	2A	3	15649	9030	9/21/2013 12:25	9/21/2013 12:28	PIC	GABT13
T5	2A	3	12134	7056	9/21/2013 11:55	9/21/2013 11:58	PIC	GABT13
T6	2A	3	13418	8351	9/21/2013 12:12	9/21/2013 12:15	PIC	GABT13
T7	2A	3	10757	6817	9/21/2013 12:06	9/21/2013 12:09	PIC	GABT13
T8	2A	3	9446	5721	9/21/2013 12:01	9/21/2013 12:04	PIC	GABT13
T1	2B	3	29286	15511	9/21/2013 12:25	9/21/2013 12:28	PIC	GABT13
T2	2B	3	19486	12142	9/21/2013 12:17	9/21/2013 12:20	PIC	GABT13
T3	2B	3	21112	12186	9/21/2013 13:11	9/21/2013 13:14	PIC	GABT13
T4	2B	3	15045	9703	9/21/2013 12:31	9/21/2013 12:34	PIC	GABT13
T5	2B	3	11888	7426	9/21/2013 12:01	9/21/2013 12:04	PIC	GABT13
T6	2B	3	12365	8823	9/21/2013 11:55	9/21/2013 11:58	PIC	GABT13
T7	2B	3	10660	7037	9/21/2013 12:12	9/21/2013 12:15	PIC	GABT13
T8	2B	3	8758	6246	9/21/2013 12:06	9/21/2013 12:09	PIC	GABT13
T1	2C	3	31828	10844	9/21/2013 12:31	9/21/2013 12:34	PIC	GABT13
T2	2C	3	21276	7924	9/21/2013 12:25	9/21/2013 12:28	PIC	GABT13
T3	2C	3	22293	8467	9/21/2013 12:17	9/21/2013 12:20	PIC	GABT13
T4	2C	3	17820	6476	9/21/2013 13:11	9/21/2013 13:14	PIC	GABT13
T5	2C	3	12796	5191	9/21/2013 12:06	9/21/2013 12:09	PIC	GABT13
T6	2C	3	14098	5718	9/21/2013 12:01	9/21/2013 12:04	PIC	GABT13
T7	2C	3	11561	4871	9/21/2013 11:55	9/21/2013 11:58	PIC	GABT13
T8	2C	3	9707	4250	9/21/2013 12:12	9/21/2013 12:15	PIC	GABT13
T1	2D	3	30217	14558	9/21/2013 13:11	9/21/2013 13:14	PIC	GABT13
T2	2D	3	20065	11482	9/21/2013 12:31	9/21/2013 12:34	PIC	GABT13
T3	2D	3	20977	11960	9/21/2013 12:26	9/21/2013 12:29	PIC	GABT13
T4	2D	3	15157	9227	9/21/2013 12:17	9/21/2013 12:20	PIC	GABT13
T5	2D	3	11944	7145	9/21/2013 12:12	9/21/2013 12:15	PIC	GABT13

T6	2D	3	13034	8197	9/21/2013 12:06	9/21/2013 12:09	PIC	GABT13
T7	2D	3	10808	6605	9/21/2013 12:01	9/21/2013 12:04	PIC	GABT13
T8	2D	3	9209	5698	9/21/2013 11:55	9/21/2013 11:58	PIC	GABT13
T1	3A	3	32867	11079	9/21/2013 13:37	9/21/2013 13:40	PIC	GABT13
T2	3A	3	22729	7716	9/21/2013 13:58	9/21/2013 14:01	PIC	GABT13
T3	3A	3	24233	8128	9/21/2013 13:54	9/21/2013 13:57	PIC	GABT13
T4	3A	3	18027	6393	9/21/2013 13:42	9/21/2013 13:45	PIC	GABT13
T5	3A	3	13893	4996	9/21/2013 14:04	9/21/2013 14:07	PIC	GABT13
T6	3A	3	15397	5822	9/21/2013 14:27	9/21/2013 14:30	PIC	GABT13
T7	3A	3	12762	4784	9/21/2013 14:21	9/21/2013 14:24	PIC	GABT13
T8	3A	3	10584	4181	9/21/2013 14:08	9/21/2013 14:11	PIC	GABT13
T1	3B	3	34650	10474	9/21/2013 13:42	9/21/2013 13:45	PIC	GABT13
T2	3B	3	23720	7555	9/21/2013 13:37	9/21/2013 13:40	PIC	GABT13
T3	3B	3	25293	7862	9/21/2013 13:59	9/21/2013 14:02	PIC	GABT13
T4	3B	3	18818	6313	9/21/2013 13:54	9/21/2013 13:57	PIC	GABT13
T5	3B	3	14380	4869	9/21/2013 14:08	9/21/2013 14:11	PIC	GABT13
T6	3B	3	16136	5602	9/21/2013 14:04	9/21/2013 14:07	PIC	GABT13
T7	3B	3	13297	4447	9/21/2013 14:27	9/21/2013 14:30	PIC	GABT13
T8	3B	3	11074	4174	9/21/2013 14:21	9/21/2013 14:24	PIC	GABT13
T1	3C	3	34481	11160	9/21/2013 13:54	9/21/2013 13:57	PIC	GABT13
T2	3C	3	23638	7994	9/21/2013 13:42	9/21/2013 13:45	PIC	GABT13
T3	3C	3	24524	8552	9/21/2013 13:37	9/21/2013 13:40	PIC	GABT13
T4	3C	3	18286	6650	9/21/2013 13:59	9/21/2013 14:02	PIC	GABT13
T5	3C	3	14081	5194	9/21/2013 14:21	9/21/2013 14:24	PIC	GABT13
T6	3C	3	15773	5891	9/21/2013 14:08	9/21/2013 14:11	PIC	GABT13
T7	3C	3	12628	4951	9/21/2013 14:04	9/21/2013 14:07	PIC	GABT13
T8	3C	3	10960	4310	9/21/2013 14:27	9/21/2013 14:30	PIC	GABT13
T1	3D	3	34102	10925	9/21/2013 13:59	9/21/2013 14:02	PIC	GABT13
T2	3D	3	24222	7950	9/21/2013 13:54	9/21/2013 13:57	PIC	GABT13
T3	3D	3	24963	8229	9/21/2013 13:42	9/21/2013 13:45	PIC	GABT13
T4	3D	3	18801	6416	9/21/2013 13:37	9/21/2013 13:40	PIC	GABT13
T5	3D	3	14569	5036	9/21/2013 14:27	9/21/2013 14:30	PIC	GABT13
T6	3D	3	16343	5822	9/21/2013 14:21	9/21/2013 14:24	PIC	GABT13
T7	3D	3	13062	4719	9/21/2013 14:08	9/21/2013 14:11	PIC	GABT13
T8	3D	3	10888	4269	9/21/2013 14:04	9/21/2013 14:07	PIC	GABT13
T1	4A	3	32181	10442	9/21/2013 14:04	9/21/2013 14:07	PIC	GABT13
T2	4A	3	22446	7505	9/21/2013 14:28	9/21/2013 14:31	PIC	GABT13

T3	4A	3	23793	8225	9/21/2013 14:21	9/21/2013 14:24	PIC	GABT13
T4	4A	3	18037	6512	9/21/2013 14:08	9/21/2013 14:11	PIC	GABT13
T5	4A	3	13477	5085	9/21/2013 13:37	9/21/2013 13:40	PIC	GABT13
T6	4A	3	15862	5916	9/21/2013 13:59	9/21/2013 14:02	PIC	GABT13
T7	4A	3	12967	4811	9/21/2013 13:54	9/21/2013 13:57	PIC	GABT13
T8	4A	3	10525	4272	9/21/2013 13:42	9/21/2013 13:45	PIC	GABT13
T1	4B	3	29911	14055	9/21/2013 14:08	9/21/2013 14:11	PIC	GABT13
T2	4B	3	20651	11106	9/21/2013 14:04	9/21/2013 14:07	PIC	GABT13
T3	4B	3	21933	11364	9/21/2013 14:28	9/21/2013 14:31	PIC	GABT13
T4	4B	3	16141	9000	9/21/2013 14:21	9/21/2013 14:24	PIC	GABT13
T5	4B	3	12225	6949	9/21/2013 13:42	9/21/2013 13:45	PIC	GABT13
T6	4B	3	13296	8498	9/21/2013 13:37	9/21/2013 13:40	PIC	GABT13
T7	4B	3	10976	6617	9/21/2013 13:59	9/21/2013 14:02	PIC	GABT13
T8	4B	3	9260	5925	9/21/2013 13:54	9/21/2013 13:57	PIC	GABT13
T1	4C	3	32449	10840	9/21/2013 14:21	9/21/2013 14:24	PIC	GABT13
T2	4C	3	22946	8045	9/21/2013 14:08	9/21/2013 14:11	PIC	GABT13
T3	4C	3	23536	8406	9/21/2013 14:04	9/21/2013 14:07	PIC	GABT13
T4	4C	3	18146	6588	9/21/2013 14:28	9/21/2013 14:31	PIC	GABT13
T5	4C	3	13940	5242	9/21/2013 13:55	9/21/2013 13:58	PIC	GABT13
T6	4C	3	15454	5981	9/21/2013 13:42	9/21/2013 13:45	PIC	GABT13
T7	4C	3	12326	4812	9/21/2013 13:38	9/21/2013 13:41	PIC	GABT13
T8	4C	3	10498	4329	9/21/2013 13:59	9/21/2013 14:02	PIC	GABT13
T1	4D	3	33901	10685	9/21/2013 14:28	9/21/2013 14:31	PIC	GABT13
T2	4D	3	24021	7554	9/21/2013 14:21	9/21/2013 14:24	PIC	GABT13
T3	4D	3	25284	8023	9/21/2013 14:08	9/21/2013 14:11	PIC	GABT13
T4	4D	3	18749	6136	9/21/2013 14:04	9/21/2013 14:07	PIC	GABT13
T5	4D	3	14533	4800	9/21/2013 13:59	9/21/2013 14:02	PIC	GABT13
T6	4D	3	16344	5688	9/21/2013 13:55	9/21/2013 13:58	PIC	GABT13
T7	4D	3	13203	4574	9/21/2013 13:42	9/21/2013 13:45	PIC	GABT13
T8	4D	3	11301	4020	9/21/2013 13:38	9/21/2013 13:41	PIC	GABT13
T1	5A	3	35298	11386	9/21/2013 15:24	9/21/2013 15:27	PIC	GABT13
T2	5A	3	24641	8391	9/21/2013 15:36	9/21/2013 15:39	PIC	GABT13
T3	5A	3	25653	8662	9/21/2013 15:32	9/21/2013 15:35	PIC	GABT13
T4	5A	3	19290	6964	9/21/2013 15:28	9/21/2013 15:31	PIC	GABT13
T5	5A	3	14891	5270	9/21/2013 15:42	9/21/2013 15:45	PIC	GABT13
T6	5A	3	16850	6329	9/21/2013 15:55	9/21/2013 15:58	PIC	GABT13
T7	5A	3	13374	5188	9/21/2013 15:50	9/21/2013 15:53	PIC	GABT13

T8	5A	3	11292	4501	9/21/2013 15:46	9/21/2013 15:49	PIC	GABT13
T1	5B	3	34606	11270	9/21/2013 15:28	9/21/2013 15:31	PIC	GABT13
T2	5B	3	24023	8309	9/21/2013 15:24	9/21/2013 15:27	PIC	GABT13
T3	5B	3	25151	8616	9/21/2013 15:36	9/21/2013 15:39	PIC	GABT13
T4	5B	3	19220	6654	9/21/2013 15:32	9/21/2013 15:35	PIC	GABT13
T5	5B	3	14241	5189	9/21/2013 15:46	9/21/2013 15:49	PIC	GABT13
T6	5B	3	16270	6040	9/21/2013 15:42	9/21/2013 15:45	PIC	GABT13
T7	5B	3	12984	4913	9/21/2013 15:55	9/21/2013 15:58	PIC	GABT13
T8	5B	3	11198	4377	9/21/2013 15:51	9/21/2013 15:54	PIC	GABT13
T1	5C	3	34487	11506	9/21/2013 15:32	9/21/2013 15:35	PIC	GABT13
T2	5C	3	24200	8337	9/21/2013 15:28	9/21/2013 15:31	PIC	GABT13
T3	5C	3	25025	8766	9/21/2013 15:24	9/21/2013 15:27	PIC	GABT13
T4	5C	3	18566	6829	9/21/2013 15:36	9/21/2013 15:39	PIC	GABT13
T5	5C	3	14028	5259	9/21/2013 15:51	9/21/2013 15:54	PIC	GABT13
T6	5C	3	16102	6152	9/21/2013 15:47	9/21/2013 15:50	PIC	GABT13
T7	5C	3	12997	4861	9/21/2013 15:43	9/21/2013 15:46	PIC	GABT13
T8	5C	3	11072	4440	9/21/2013 15:55	9/21/2013 15:58	PIC	GABT13
T1	5D	3	35093	10453	9/21/2013 15:37	9/21/2013 15:40	PIC	GABT13
T2	5D	3	24961	7474	9/21/2013 15:32	9/21/2013 15:35	PIC	GABT13
T3	5D	3	26253	7872	9/21/2013 15:28	9/21/2013 15:31	PIC	GABT13
T4	5D	3	19810	6057	9/21/2013 15:24	9/21/2013 15:27	PIC	GABT13
T5	5D	3	14883	4796	9/21/2013 15:55	9/21/2013 15:58	PIC	GABT13
T6	5D	3	16996	5558	9/21/2013 15:51	9/21/2013 15:54	PIC	GABT13
T7	5D	3	13693	4503	9/21/2013 15:47	9/21/2013 15:50	PIC	GABT13
T8	5D	3	11533	4110	9/21/2013 15:43	9/21/2013 15:46	PIC	GABT13
T1	6A	3	34640	10809	9/21/2013 15:43	9/21/2013 15:46	PIC	GABT13
T2	6A	3	24443	7792	9/21/2013 15:55	9/21/2013 15:58	PIC	GABT13
T3	6A	3	25419	8002	9/21/2013 15:51	9/21/2013 15:54	PIC	GABT13
T4	6A	3	19138	6254	9/21/2013 15:47	9/21/2013 15:50	PIC	GABT13
T5	6A	3	14561	4892	9/21/2013 15:24	9/21/2013 15:27	PIC	GABT13
T6	6A	3	16553	5736	9/21/2013 15:37	9/21/2013 15:40	PIC	GABT13
T7	6A	3	13454	4753	9/21/2013 15:33	9/21/2013 15:36	PIC	GABT13
T8	6A	3	11480	4052	9/21/2013 15:28	9/21/2013 15:31	PIC	GABT13
T1	6B	3.01	35103	11056	9/21/2013 15:47	9/21/2013 15:50	PIC	GABT13
T2	6B	3	24931	7856	9/21/2013 15:43	9/21/2013 15:46	PIC	GABT13
T3	6B	3	25892	8220	9/21/2013 15:55	9/21/2013 15:58	PIC	GABT13
T4	6B	3	19672	6530	9/21/2013 15:51	9/21/2013 15:54	PIC	GABT13

T5	6B	3	14964	5099	9/21/2013 15:29	9/21/2013 15:32	PIC	GABT13
T6	6B	3	17201	6184	9/21/2013 15:24	9/21/2013 15:27	PIC	GABT13
T7	6B	3	13552	4906	9/21/2013 15:38	9/21/2013 15:41	PIC	GABT13
T8	6B	3	11614	4281	9/21/2013 15:33	9/21/2013 15:36	PIC	GABT13
T1	6C	3	34522	10905	9/21/2013 15:51	9/21/2013 15:54	PIC	GABT13
T2	6C	3	24738	7921	9/21/2013 15:47	9/21/2013 15:50	PIC	GABT13
T3	6C	3	25354	8213	9/21/2013 15:43	9/21/2013 15:46	PIC	GABT13
T4	6C	3	19155	6228	9/21/2013 15:55	9/21/2013 15:58	PIC	GABT13
T5	6C	3	14724	4897	9/21/2013 15:33	9/21/2013 15:36	PIC	GABT13
T6	6C	3	16503	5718	9/21/2013 15:29	9/21/2013 15:32	PIC	GABT13
T7	6C	3	13310	4686	9/21/2013 15:24	9/21/2013 15:27	PIC	GABT13
T8	6C	3	11686	4010	9/21/2013 15:38	9/21/2013 15:41	PIC	GABT13
T1	7A	3	34511	12043	9/21/2013 14:32	9/21/2013 14:35	PIC	GABT13
T2	7A	3	24026	9145	9/21/2013 15:01	9/21/2013 15:04	PIC	GABT13
T3	7A	3	24877	9216	9/21/2013 14:47	9/21/2013 14:50	PIC	GABT13
T4	7A	3	18816	7304	9/21/2013 14:40	9/21/2013 14:43	PIC	GABT13
T5	7A	3	14162	5734	9/21/2013 15:06	9/21/2013 15:09	PIC	GABT13
T6	7A	3	16266	6547	9/21/2013 15:19	9/21/2013 15:22	PIC	GABT13
T7	7A	3	13146	5473	9/21/2013 15:15	9/21/2013 15:18	PIC	GABT13
T8	7A	3	10895	4811	9/21/2013 15:10	9/21/2013 15:13	PIC	GABT13
T1	7B	3	34525	11539	9/21/2013 14:40	9/21/2013 14:43	PIC	GABT13
T2	7B	3	24246	8491	9/21/2013 14:32	9/21/2013 14:35	PIC	GABT13
T3	7B	3	25236	8729	9/21/2013 15:01	9/21/2013 15:04	PIC	GABT13
T4	7B	3	18582	6833	9/21/2013 14:47	9/21/2013 14:50	PIC	GABT13
T5	7B	3	14332	5407	9/21/2013 15:10	9/21/2013 15:13	PIC	GABT13
T6	7B	3	16250	6236	9/21/2013 15:06	9/21/2013 15:09	PIC	GABT13
T7	7B	3	13092	5120	9/21/2013 15:19	9/21/2013 15:22	PIC	GABT13
T8	7B	3	11162	4558	9/21/2013 15:15	9/21/2013 15:18	PIC	GABT13
T1	7C	3	33244	12198	9/21/2013 14:47	9/21/2013 14:50	PIC	GABT13
T2	7C	3	22887	9301	9/21/2013 14:40	9/21/2013 14:43	PIC	GABT13
T3	7C	3	24232	9667	9/21/2013 14:32	9/21/2013 14:35	PIC	GABT13
T4	7C	3	18072	7621	9/21/2013 15:01	9/21/2013 15:04	PIC	GABT13
T5	7C	3	13832	5834	9/21/2013 15:15	9/21/2013 15:18	PIC	GABT13
T6	7C	3	15615	6970	9/21/2013 15:10	9/21/2013 15:13	PIC	GABT13
T7	7C	3	12686	5643	9/21/2013 15:06	9/21/2013 15:09	PIC	GABT13
T8	7C	3	10423	5047	9/21/2013 15:19	9/21/2013 15:22	PIC	GABT13
T1	7D	3	33954	11457	9/21/2013 15:01	9/21/2013 15:04	PIC	GABT13

T2	7D	3	23537	8640	9/21/2013 14:47	9/21/2013 14:50	PIC	GABT13
T3	7D	3	24153	8987	9/21/2013 14:40	9/21/2013 14:43	PIC	GABT13
T4	7D	3	18055	7352	9/21/2013 14:35	9/21/2013 14:38	PIC	GABT13
T5	7D	3	13819	5470	9/21/2013 15:19	9/21/2013 15:22	PIC	GABT13
T6	7D	3	15810	6495	9/21/2013 15:15	9/21/2013 15:18	PIC	GABT13
T7	7D	3	12625	5313	9/21/2013 15:10	9/21/2013 15:13	PIC	GABT13
T8	7D	3	10656	4717	9/21/2013 15:06	9/21/2013 15:09	PIC	GABT13
T1	8A	3	31018	14612	9/21/2013 15:06	9/21/2013 15:09	PIC	GABT13
T2	8A	3	20343	12274	9/21/2013 15:20	9/21/2013 15:23	PIC	GABT13
T3	8A	3	20884	12693	9/21/2013 15:15	9/21/2013 15:18	PIC	GABT13
T4	8A	3	15866	9739	9/21/2013 15:11	9/21/2013 15:14	PIC	GABT13
T5	8A	3	11157	8318	9/21/2013 14:33	9/21/2013 14:36	PIC	GABT13
T6	8A	3	14292	8293	9/21/2013 15:01	9/21/2013 15:04	PIC	GABT13
T7	8A	3	11017	7106	9/21/2013 14:47	9/21/2013 14:50	PIC	GABT13
T8	8A	3	9518	6071	9/21/2013 14:40	9/21/2013 14:43	PIC	GABT13
T1	8B	3	28600	17256	9/21/2013 15:11	9/21/2013 15:14	PIC	GABT13
T2	8B	3	19779	13177	9/21/2013 15:06	9/21/2013 15:09	PIC	GABT13
T3	8B	3	19917	14162	9/21/2013 15:20	9/21/2013 15:23	PIC	GABT13
T4	8B	3	15271	10887	9/21/2013 15:15	9/21/2013 15:18	PIC	GABT13
T5	8B	3	11870	8125	9/21/2013 14:41	9/21/2013 14:44	PIC	GABT13
T6	8B	3	12916	9645	9/21/2013 14:33	9/21/2013 14:36	PIC	GABT13
T7	8B	3	10742	7823	9/21/2013 15:01	9/21/2013 15:04	PIC	GABT13
T8	8B	3	9109	6918	9/21/2013 14:47	9/21/2013 14:50	PIC	GABT13
T1	8C	3	28210	17064	9/21/2013 15:15	9/21/2013 15:18	PIC	GABT13
T2	8C	3	19081	13394	9/21/2013 15:11	9/21/2013 15:14	PIC	GABT13
T3	8C	3	19710	13759	9/21/2013 15:06	9/21/2013 15:09	PIC	GABT13
T4	8C	3	14764	10763	9/21/2013 15:20	9/21/2013 15:23	PIC	GABT13
T5	8C	3	11487	8101	9/21/2013 14:47	9/21/2013 14:50	PIC	GABT13
T6	8C	3	12906	9825	9/21/2013 14:41	9/21/2013 14:44	PIC	GABT13
T7	8C	3	10203	7909	9/21/2013 14:33	9/21/2013 14:36	PIC	GABT13
T8	8C	3	8954	6818	9/21/2013 15:02	9/21/2013 15:05	PIC	GABT13
T1	8D	3	36410	12037	9/21/2013 15:20	9/21/2013 15:23	PIC	GABT13
T2	8D	3	24895	8761	9/21/2013 15:15	9/21/2013 15:18	PIC	GABT13
T3	8D	3	26284	9029	9/21/2013 15:11	9/21/2013 15:14	PIC	GABT13
T4	8D	3	19836	7087	9/21/2013 15:06	9/21/2013 15:09	PIC	GABT13
T5	8D	3	15467	5654	9/21/2013 15:02	9/21/2013 15:05	PIC	GABT13
T6	8D	3	17495	6388	9/21/2013 14:48	9/21/2013 14:51	PIC	GABT13

T7	8D	3	13775	5376	9/21/2013 14:41	9/21/2013 14:44	PIC	GABT13
T8	8D	3	11499	4760	9/21/2013 14:33	9/21/2013 14:36	PIC	GABT13
T1	9A	3	33021	12504	9/21/2013 16:00	9/21/2013 16:03	PIC	GABT13
T2	9A	3	23032	9558	9/21/2013 16:16	9/21/2013 16:19	PIC	GABT13
T3	9A	3	23881	9695	9/21/2013 16:11	9/21/2013 16:14	PIC	GABT13
T4	9A	3	17779	7715	9/21/2013 16:06	9/21/2013 16:09	PIC	GABT13
T5	9A	3	13532	5898	9/21/2013 16:22	9/21/2013 16:25	PIC	GABT13
T6	9A	3	15658	7108	9/21/2013 16:55	9/21/2013 16:58	PIC	GABT13
T7	9A	3	12938	5858	9/21/2013 16:44	9/21/2013 16:47	PIC	GABT13
T8	9A	3	10528	5068	9/21/2013 16:26	9/21/2013 16:29	PIC	GABT13
T1	9B	3	33850	12109	9/21/2013 16:06	9/21/2013 16:09	PIC	GABT13
T2	9B	3	23703	8896	9/21/2013 16:00	9/21/2013 16:03	PIC	GABT13
T3	9B	3	24689	9121	9/21/2013 16:16	9/21/2013 16:19	PIC	GABT13
T4	9B	3	18446	7298	9/21/2013 16:11	9/21/2013 16:14	PIC	GABT13
T5	9B	3	13872	5468	9/21/2013 16:26	9/21/2013 16:29	PIC	GABT13
T6	9B	3	15785	6655	9/21/2013 16:22	9/21/2013 16:25	PIC	GABT13
T7	9B	3	13389	5403	9/21/2013 16:55	9/21/2013 16:58	PIC	GABT13
T8	9B	3	10887	4752	9/21/2013 16:44	9/21/2013 16:47	PIC	GABT13
T1	9C	3	32916	11976	9/21/2013 16:11	9/21/2013 16:14	PIC	GABT13
T2	9C	3	22817	8984	9/21/2013 16:06	9/21/2013 16:09	PIC	GABT13
T3	9C	3	23769	9049	9/21/2013 16:00	9/21/2013 16:03	PIC	GABT13
T4	9C	3	17607	7373	9/21/2013 16:16	9/21/2013 16:19	PIC	GABT13
T5	9C	3	13402	5503	9/21/2013 16:44	9/21/2013 16:47	PIC	GABT13
T6	9C	3	14862	6649	9/21/2013 16:26	9/21/2013 16:29	PIC	GABT13
T7	9C	3	12234	5360	9/21/2013 16:22	9/21/2013 16:25	PIC	GABT13
T8	9C	3	10433	4760	9/21/2013 16:55	9/21/2013 16:58	PIC	GABT13
T1	9D	3	33282	11666	9/21/2013 16:16	9/21/2013 16:19	PIC	GABT13
T2	9D	3	22766	8684	9/21/2013 16:11	9/21/2013 16:14	PIC	GABT13
T3	9D	3	23521	9264	9/21/2013 16:06	9/21/2013 16:09	PIC	GABT13
T4	9D	3	17565	7204	9/21/2013 16:00	9/21/2013 16:03	PIC	GABT13
T5	9D	3	14061	5043	9/21/2013 16:55	9/21/2013 16:58	PIC	GABT13
T6	9D	3	15713	6373	9/21/2013 16:44	9/21/2013 16:47	PIC	GABT13
T7	9D	3	12463	5122	9/21/2013 16:26	9/21/2013 16:29	PIC	GABT13
T8	9D	3	10479	4493	9/21/2013 16:22	9/21/2013 16:25	PIC	GABT13

Beta Calibration - PIC - Sep 2013

Standard Data		
	Isotope	Sr-90
	Standard ID number	0133-T
	Half Life (days)	10555.725
	Std. Act. (dpm/mL)***	55362.7
	Reference Date	4/1/1996
	Volume of spike (mL)	0.5
	Std. Nominal (dpm)	18204.73
	Decay Date	9/21/2013

*** Includes activity of Y-90, which is in equilibrium.

Source Weight	
Source	Measured weight (mg)
1	0.0
2	12.8
3	27.7
4	50.8
5	60.8
6	73.2
7	98.4
8	115.8

The following detectors were not calibrated:

6D

*Background is considered neglible.

**Decay corrected to mid-point of cour

Detector (#)	Source ID (#)	Raw Count Data Start Time	Count Time (min)	Beta (counts)	Raw Beta (cpm)	Sr-90 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-90 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
1A	1	9/21/2013 13:30	3	25625	8541.67	8541.67	18204.06	**0.4692**	0.4570
1A	2	9/21/2013 13:53	3	25019	8339.67	8339.67	18204.04	**0.4581**	0.4481
1A	3	9/21/2013 13:40	3	22593	7531.00	7531.00	18204.05	**0.4137**	0.4378
1A	4	9/21/2013 13:36	3	22383	7461.00	7461.00	18204.05	**0.4099**	0.4218
1A	5	9/21/2013 13:57	3	23109	7703.00	7703.00	18204.03	**0.4231**	0.4149
1A	6	9/21/2013 14:20	3	22120	7373.33	7373.33	18204.02	**0.4050**	0.4063
1A	7	9/21/2013 14:06	3	21380	7126.67	7126.67	18204.03	**0.3915**	0.3888
1A	8	9/21/2013 14:02	3	20797	6932.33	6932.33	18204.03	**0.3808**	0.3768
1B	1	9/21/2013 13:36	3	25604	8534.67	8534.67	18204.05	**0.4688**	0.4518
1B	2	9/21/2013 13:30	3	24236	8078.67	8078.67	18204.06	**0.4438**	0.4435
1B	3	9/21/2013 13:53	3	22325	7441.67	7441.67	18204.04	**0.4088**	0.4338
1B	4	9/21/2013 13:40	3	22268	7422.67	7422.67	18204.05	**0.4077**	0.4188
1B	5	9/21/2013 14:02	3	23291	7763.67	7763.67	18204.03	**0.4265**	0.4123
1B	6	9/21/2013 13:57	3	22223	7407.67	7407.67	18204.03	**0.4069**	0.4043
1B	7	9/21/2013 14:20	3	21257	7085.67	7085.67	18204.02	**0.3892**	0.3879
1B	8	9/21/2013 14:07	3	20600	6866.67	6866.67	18204.03	**0.3772**	0.3766
1C	1	9/21/2013 13:41	3	26407	8802.33	8802.33	18204.05	**0.4835**	0.4644
1C	2	9/21/2013 13:36	3	24969	8323.00	8323.00	18204.05	**0.4572**	0.4549
1C	3	9/21/2013 13:30	3	22919	7639.67	7639.67	18204.06	**0.4197**	0.4439
1C	4	9/21/2013 13:53	3	22445	7481.67	7481.67	18204.04	**0.4110**	0.4268
1C	5	9/21/2013 14:07	3	23570	7856.67	7856.67	18204.03	**0.4316**	0.4194
1C	6	9/21/2013 14:02	3	22340	7446.67	7446.67	18204.03	**0.4091**	0.4102
1C	7	9/21/2013 13:57	3	21628	7209.33	7209.33	18204.03	**0.3960**	0.3916
1C	8	9/21/2013 14:20	3	20846	6948.67	6948.67	18204.02	**0.3817**	0.3787
1D	1	9/21/2013 13:53	3	25634	8544.67	8544.67	18204.04	**0.4694**	0.4539
1D	2	9/21/2013 13:41	3	24501	8167.00	8167.00	18204.05	**0.4486**	0.4449
1D	3	9/21/2013 13:36	3	22573	7524.33	7524.33	18204.05	**0.4133**	0.4344
1D	4	9/21/2013 13:30	3	22099	7366.33	7366.33	18204.06	**0.4047**	0.4182
1D	5	9/21/2013 14:20	3	22891	7630.33	7630.33	18204.02	**0.4192**	0.4112
1D	6	9/21/2013 14:07	3	22081	7360.33	7360.33	18204.03	**0.4043**	0.4024
1D	7	9/21/2013 14:02	3	21132	7044.00	7044.00	18204.03	**0.3869**	0.3847
1D	8	9/21/2013 13:58	3	20524	6841.33	6841.33	18204.03	**0.3758**	0.3725
2A	1	9/21/2013 13:58	3	23125	7708.33	7708.33	18204.03	**0.4234**	0.4147
2A	2	9/21/2013 14:20	3	22846	7615.33	7615.33	18204.02	**0.4183**	0.4069
2A	3	9/21/2013 14:07	3	20461	6820.33	6820.33	18204.03	**0.3747**	0.3977
2A	4	9/21/2013 14:02	3	20333	6777.67	6777.67	18204.03	**0.3723**	0.3836
2A	5	9/21/2013 13:31	3	21066	7022.00	7022.00	18204.06	**0.3857**	0.3775
2A	6	9/21/2013 13:53	3	20302	6767.33	6767.33	18204.04	**0.3717**	0.3699
2A	7	9/21/2013 13:41	3	19482	6494.00	6494.00	18204.05	**0.3567**	0.3544
2A	8	9/21/2013 13:36	3	18865	6288.33	6288.33	18204.05	**0.3454**	0.3438
2B	1	9/21/2013 14:02	3	22785	7595.00	7595.00	18204.03	**0.4172**	0.4082
2B	2	9/21/2013 13:58	3	22179	7393.00	7393.00	18204.03	**0.4061**	0.4003
2B	3	9/21/2013 14:20	3	20359	6786.33	6786.33	18204.02	**0.3728**	0.3911
2B	4	9/21/2013 14:07	3	19835	6611.67	6611.67	18204.03	**0.3632**	0.3769
2B	5	9/21/2013 13:36	3	21151	7050.33	7050.33	18204.05	**0.3873**	0.3707

Detector (#)	Source ID (#)	Raw Count Data Start Time	Count Time (min)	Beta (counts)	Raw Beta (cpm)	Sr-90 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-90 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
2B	6	9/21/2013 13:31	3	19660	6553.33	6553.33	18204.06	**0.3600**	0.3631
2B	7	9/21/2013 13:53	3	19215	6405.00	6405.00	18204.04	**0.3518**	0.3475
2B	8	9/21/2013 13:41	3	18355	6118.33	6118.33	18204.05	**0.3361**	0.3368
2C	1	9/21/2013 14:07	3	23809	7936.33	7936.33	18204.03	**0.4360**	0.4199
2C	2	9/21/2013 14:02	3	22311	7437.00	7437.00	18204.03	**0.4085**	0.4129
2C	3	9/21/2013 13:58	3	21118	7039.33	7039.33	18204.03	**0.3867**	0.4047
2C	4	9/21/2013 14:20	3	20958	6986.00	6986.00	18204.02	**0.3838**	0.3921
2C	5	9/21/2013 13:41	3	21668	7222.67	7222.67	18204.05	**0.3968**	0.3866
2C	6	9/21/2013 13:37	3	20769	6923.00	6923.00	18204.05	**0.3803**	0.3798
2C	7	9/21/2013 13:31	3	20374	6791.33	6791.33	18204.06	**0.3731**	0.3660
2C	8	9/21/2013 13:53	3	19290	6430.00	6430.00	18204.04	**0.3532**	0.3565
2D	1	9/21/2013 14:20	3	23028	7676.00	7676.00	18204.02	**0.4217**	0.4058
2D	2	9/21/2013 14:07	3	21788	7262.67	7262.67	18204.03	**0.3990**	0.3981
2D	3	9/21/2013 14:03	3	19932	6644.00	6644.00	18204.03	**0.3650**	0.3892
2D	4	9/21/2013 13:58	3	20266	6755.33	6755.33	18204.03	**0.3711**	0.3753
2D	5	9/21/2013 13:53	3	20864	6954.67	6954.67	18204.04	**0.3820**	0.3693
2D	6	9/21/2013 13:41	3	19378	6459.33	6459.33	18204.05	**0.3548**	0.3618
2D	7	9/21/2013 13:37	3	19163	6387.67	6387.67	18204.05	**0.3509**	0.3466
2D	8	9/21/2013 13:31	3	18448	6149.33	6149.33	18204.06	**0.3378**	0.3362
3A	1	9/21/2013 12:02	3	24286	8095.33	8095.33	18204.13	**0.4447**	0.4313
3A	2	9/21/2013 12:18	3	23428	7809.33	7809.33	18204.12	**0.4290**	0.4232
3A	3	9/21/2013 12:13	3	21194	7064.67	7064.67	18204.12	**0.3881**	0.4139
3A	4	9/21/2013 12:07	3	21238	7079.33	7079.33	18204.13	**0.3889**	0.3994
3A	5	9/21/2013 12:26	3	22086	7362.00	7362.00	18204.11	**0.4044**	0.3932
3A	6	9/21/2013 13:24	3	21312	7104.00	7104.00	18204.06	**0.3902**	0.3854
3A	7	9/21/2013 13:19	3	20136	6712.00	6712.00	18204.07	**0.3687**	0.3696
3A	8	9/21/2013 13:12	3	19693	6564.33	6564.33	18204.07	**0.3606**	0.3587
3B	1	9/21/2013 12:07	3	25317	8439.00	8439.00	18204.13	**0.4636**	0.4488
3B	2	9/21/2013 12:02	3	24358	8119.33	8119.33	18204.13	**0.4460**	0.4405
3B	3	9/21/2013 12:18	3	22204	7401.33	7401.33	18204.12	**0.4066**	0.4307
3B	4	9/21/2013 12:13	3	22090	7363.33	7363.33	18204.12	**0.4045**	0.4156
3B	5	9/21/2013 13:12	3	22953	7651.00	7651.00	18204.07	**0.4203**	0.4091
3B	6	9/21/2013 12:27	3	21791	7263.67	7263.67	18204.11	**0.3990**	0.4010
3B	7	9/21/2013 13:24	3	21142	7047.33	7047.33	18204.06	**0.3871**	0.3845
3B	8	9/21/2013 13:19	3	20555	6851.67	6851.67	18204.07	**0.3764**	0.3732
3C	1	9/21/2013 12:13	3	25442	8480.67	8480.67	18204.12	**0.4659**	0.4525
3C	2	9/21/2013 12:07	3	24503	8167.67	8167.67	18204.13	**0.4487**	0.4435
3C	3	9/21/2013 12:02	3	22403	7467.67	7467.67	18204.13	**0.4102**	0.4331
3C	4	9/21/2013 12:18	3	22022	7340.67	7340.67	18204.12	**0.4032**	0.4168
3C	5	9/21/2013 13:20	3	23164	7721.33	7721.33	18204.07	**0.4242**	0.4098
3C	6	9/21/2013 13:12	3	21951	7317.00	7317.00	18204.07	**0.4019**	0.4011
3C	7	9/21/2013 12:27	3	20923	6974.33	6974.33	18204.11	**0.3831**	0.3833
3C	8	9/21/2013 13:24	3	20428	6809.33	6809.33	18204.06	**0.3741**	0.3711
3D	1	9/21/2013 12:18	3	24704	8234.67	8234.67	18204.12	**0.4524**	0.4423
3D	2	9/21/2013 12:13	3	23963	7987.67	7987.67	18204.12	**0.4388**	0.4343
3D	3	9/21/2013 12:07	3	22298	7432.67	7432.67	18204.13	**0.4083**	0.4250
3D	4	9/21/2013 12:02	3	21817	7272.33	7272.33	18204.13	**0.3995**	0.4107
3D	5	9/21/2013 13:24	3	22704	7568.00	7568.00	18204.06	**0.4157**	0.4045
3D	6	9/21/2013 13:20	3	21537	7179.00	7179.00	18204.07	**0.3944**	0.3968
3D	7	9/21/2013 13:12	3	20982	6994.00	6994.00	18204.07	**0.3842**	0.3811
3D	8	9/21/2013 12:27	3	20298	6766.00	6766.00	18204.11	**0.3717**	0.3703
4A	1	9/21/2013 12:27	3	24165	8055.00	8055.00	18204.11	**0.4425**	0.4375
4A	2	9/21/2013 13:24	3	23633	7877.67	7877.67	18204.06	**0.4327**	0.4297
4A	3	9/21/2013 13:20	3	22390	7463.33	7463.33	18204.07	**0.4100**	0.4207
4A	4	9/21/2013 13:12	3	21559	7186.33	7186.33	18204.07	**0.3948**	0.4066
4A	5	9/21/2013 12:03	3	22516	7505.33	7505.33	18204.13	**0.4123**	0.4005
4A	6	9/21/2013 12:19	3	21729	7243.00	7243.00	18204.12	**0.3979**	0.3930
4A	7	9/21/2013 12:13	3	20553	6851.00	6851.00	18204.12	**0.3763**	0.3777
4A	8	9/21/2013 12:07	3	20009	6669.67	6669.67	18204.13	**0.3664**	0.3671
4B	1	9/21/2013 13:12	3	25102	8367.33	8367.33	18204.07	**0.4596**	0.4460
4B	2	9/21/2013 12:27	3	24143	8047.67	8047.67	18204.11	**0.4421**	0.4374
4B	3	9/21/2013 13:25	3	21901	7300.33	7300.33	18204.06	**0.4010**	0.4275
4B	4	9/21/2013 13:20	3	22047	7349.00	7349.00	18204.07	**0.4037**	0.4121
4B	5	9/21/2013 12:08	3	22736	7578.67	7578.67	18204.13	**0.4163**	0.4055

Detector (#)	Source ID (#)	Raw Count Data Start Time	Count Time (min)	Beta (counts)	Raw Beta (cpm)	Sr-90 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-90 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
4B	6	9/21/2013 12:03	3	21870	7290.00	7290.00	18204.13	0.4005	0.3972
4B	7	9/21/2013 12:19	3	21039	7013.00	7013.00	18204.12	0.3852	0.3804
4B	8	9/21/2013 12:13	3	20015	6671.67	6671.67	18204.12	0.3665	0.3688
4C	1	9/21/2013 13:20	3	24607	8202.33	8202.33	18204.07	0.4506	0.4329
4C	2	9/21/2013 13:12	3	23130	7710.00	7710.00	18204.07	0.4235	0.4260
4C	3	9/21/2013 12:27	3	21352	7117.33	7117.33	18204.11	0.3910	0.4179
4C	4	9/21/2013 13:25	3	22152	7384.00	7384.00	18204.06	0.4056	0.4053
4C	5	9/21/2013 12:13	3	22261	7420.33	7420.33	18204.12	0.4076	0.3999
4C	6	9/21/2013 12:08	3	21527	7175.67	7175.67	18204.13	0.3942	0.3932
4C	7	9/21/2013 12:03	3	20985	6995.00	6995.00	18204.13	0.3843	0.3795
4C	8	9/21/2013 12:19	3	20088	6696.00	6696.00	18204.12	0.3678	0.3700
4D	1	9/21/2013 13:25	3	25199	8399.67	8399.67	18204.06	0.4614	0.4453
4D	2	9/21/2013 13:20	3	23618	7872.67	7872.67	18204.07	0.4325	0.4362
4D	3	9/21/2013 13:13	3	22248	7416.00	7416.00	18204.07	0.4074	0.4256
4D	4	9/21/2013 12:27	3	21918	7306.00	7306.00	18204.11	0.4013	0.4092
4D	5	9/21/2013 12:19	3	22494	7498.00	7498.00	18204.12	0.4119	0.4021
4D	6	9/21/2013 12:13	3	21560	7186.67	7186.67	18204.12	0.3948	0.3933
4D	7	9/21/2013 12:08	3	20559	6853.00	6853.00	18204.13	0.3765	0.3754
4D	8	9/21/2013 12:03	3	19888	6629.33	6629.33	18204.13	0.3642	0.3630
5A	1	9/21/2013 14:24	3	26044	8681.33	8681.33	18204.01	0.4769	0.4628
5A	2	9/21/2013 14:45	3	24973	8324.33	8324.33	18204.00	0.4573	0.4535
5A	3	9/21/2013 14:38	3	22977	7659.00	7659.00	18204.00	0.4207	0.4428
5A	4	9/21/2013 14:34	3	22672	7557.33	7557.33	18204.00	0.4151	0.4260
5A	5	9/21/2013 15:00	3	23532	7844.00	7844.00	18203.98	0.4309	0.4188
5A	6	9/21/2013 15:13	3	22258	7419.33	7419.33	18203.97	0.4076	0.4099
5A	7	9/21/2013 15:09	3	21577	7192.33	7192.33	18203.98	0.3951	0.3916
5A	8	9/21/2013 15:04	3	20799	6933.00	6933.00	18203.98	0.3809	0.3791
5B	1	9/21/2013 14:34	3	25846	8615.33	8615.33	18204.00	0.4733	0.4590
5B	2	9/21/2013 14:24	3	24804	8268.00	8268.00	18204.01	0.4542	0.4499
5B	3	9/21/2013 14:45	3	22810	7603.33	7603.33	18204.00	0.4177	0.4393
5B	4	9/21/2013 14:38	3	22478	7492.67	7492.67	18204.00	0.4116	0.4228
5B	5	9/21/2013 15:04	3	23360	7786.67	7786.67	18203.98	0.4277	0.4157
5B	6	9/21/2013 15:00	3	22017	7339.00	7339.00	18203.98	0.4032	0.4069
5B	7	9/21/2013 15:13	3	21376	7125.33	7125.33	18203.97	0.3914	0.3889
5B	8	9/21/2013 15:09	3	20752	6917.33	6917.33	18203.98	0.3800	0.3765
5C	1	9/21/2013 14:39	3	25881	8627.00	8627.00	18204.00	0.4739	0.4606
5C	2	9/21/2013 14:34	3	25038	8346.00	8346.00	18204.00	0.4585	0.4510
5C	3	9/21/2013 14:24	3	22892	7630.67	7630.67	18204.01	0.4192	0.4398
5C	4	9/21/2013 14:45	3	22178	7392.67	7392.67	18204.00	0.4061	0.4225
5C	5	9/21/2013 15:09	3	23120	7706.67	7706.67	18203.98	0.4234	0.4150
5C	6	9/21/2013 15:04	3	22262	7420.67	7420.67	18203.98	0.4076	0.4056
5C	7	9/21/2013 15:00	3	21171	7057.00	7057.00	18203.98	0.3877	0.3867
5C	8	9/21/2013 15:13	3	20671	6890.33	6890.33	18203.97	0.3785	0.3737
5D	1	9/21/2013 14:45	3	25415	8471.67	8471.67	18204.00	0.4654	0.4552
5D	2	9/21/2013 14:39	3	24521	8173.67	8173.67	18204.00	0.4490	0.4464
5D	3	9/21/2013 14:34	3	22700	7566.67	7566.67	18204.00	0.4157	0.4363
5D	4	9/21/2013 14:24	3	22605	7535.00	7535.00	18204.01	0.4139	0.4206
5D	5	9/21/2013 15:13	3	23311	7770.33	7770.33	18203.97	0.4268	0.4138
5D	6	9/21/2013 15:09	3	22277	7425.67	7425.67	18203.98	0.4079	0.4053
5D	7	9/21/2013 15:04	3	21113	7037.67	7037.67	18203.98	0.3866	0.3882
5D	8	9/21/2013 15:00	3	20574	6858.00	6858.00	18203.98	0.3767	0.3763
6A	1	9/21/2013 15:00	3	25444	8481.33	8481.33	18203.98	0.4659	0.4515
6A	2	9/21/2013 15:14	3	24148	8049.33	8049.33	18203.97	0.4422	0.4427
6A	3	9/21/2013 15:09	3	22561	7520.33	7520.33	18203.98	0.4131	0.4324
6A	4	9/21/2013 15:04	3	22213	7404.33	7404.33	18203.98	0.4067	0.4165
6A	5	9/21/2013 14:26	3	23089	7696.33	7696.33	18204.01	0.4228	0.4096
6A	6	9/21/2013 14:46	3	21889	7296.33	7296.33	18203.99	0.4008	0.4011
6A	7	9/21/2013 14:39	3	21003	7001.00	7001.00	18204.00	0.3846	0.3837
6A	8	9/21/2013 14:35	3	20384	6794.67	6794.67	18204.00	0.3733	0.3717
6B	1	9/21/2013 15:05	3	25842	8614.00	8614.00	18203.98	0.4732	0.4606
6B	2	9/21/2013 15:00	3	24756	8252.00	8252.00	18203.98	0.4533	0.4511
6B	3	9/21/2013 15:14	3	22966	7655.33	7655.33	18203.97	0.4205	0.4402
6B	4	9/21/2013 15:10	3	22553	7517.67	7517.67	18203.98	0.4130	0.4232
6B	5	9/21/2013 14:35	3	23518	7839.33	7839.33	18204.00	0.4306	0.4158

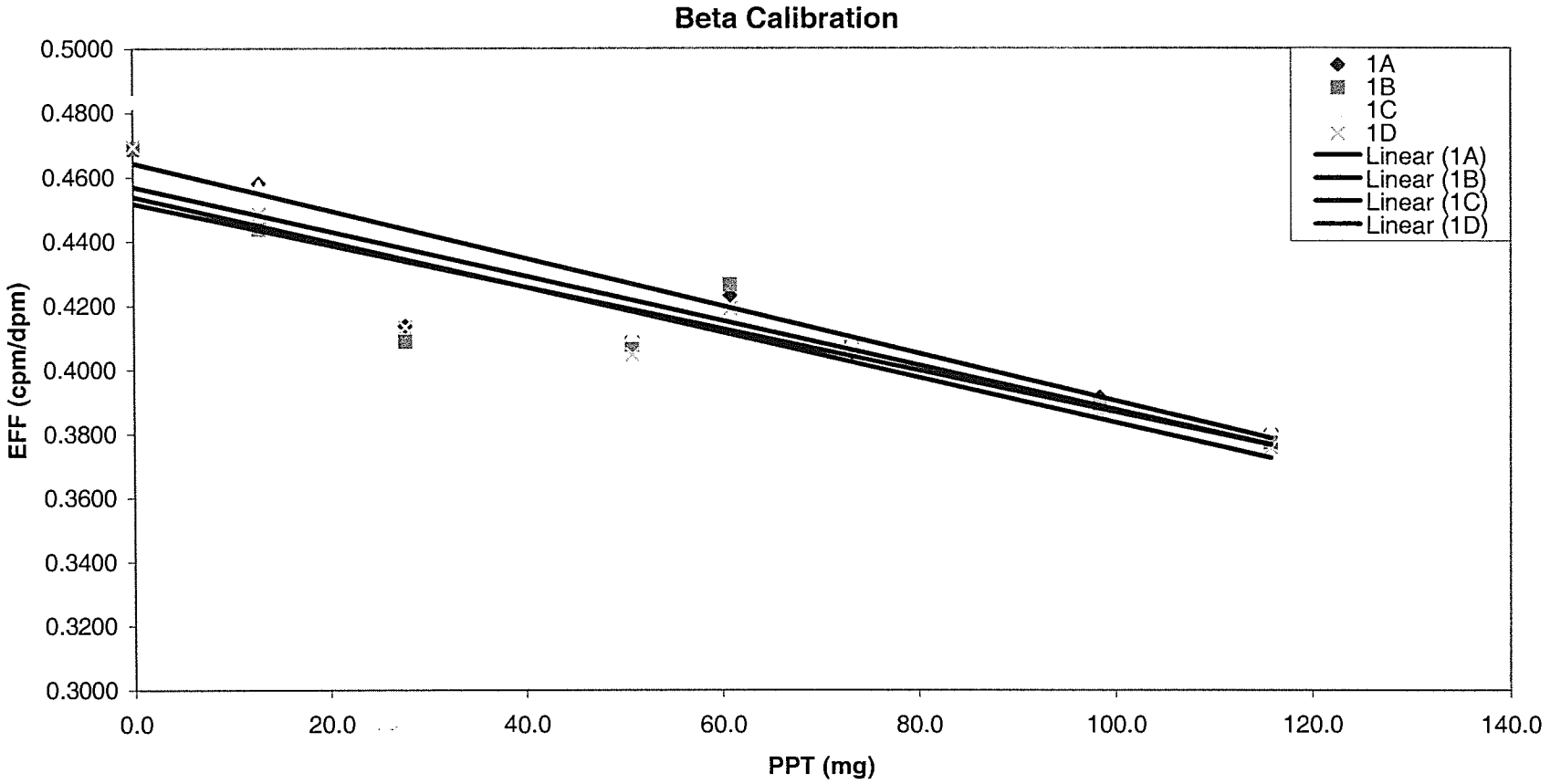
Detector (#)	Source ID (#)	Raw Count Data Start Time	Count Time (min)	Beta (counts)	Raw Beta (cpm)	Sr-90 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-90 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
6B	6	9/21/2013 14:28	3	21991	7330.33	7330.33	18204.01	**0.4027**	0.4067
6B	7	9/21/2013 14:46	3	21384	7128.00	7128.00	18203.99	**0.3916**	0.3881
6B	8	9/21/2013 14:39	3	20538	6846.00	6846.00	18204.00	**0.3761**	0.3753
6C	1	9/21/2013 15:10	3	25095	8365.00	8365.00	18203.98	**0.4595**	0.4481
6C	2	9/21/2013 15:05	3	24324	8108.00	8108.00	18203.98	**0.4454**	0.4397
6C	3	9/21/2013 15:00	3	22361	7453.67	7453.67	18203.98	**0.4095**	0.4298
6C	4	9/21/2013 15:14	3	22007	7335.67	7335.67	18203.97	**0.4030**	0.4145
6C	5	9/21/2013 14:39	3	23024	7674.67	7674.67	18204.00	**0.4216**	0.4079
6C	6	9/21/2013 14:35	3	21525	7175.00	7175.00	18204.00	**0.3941**	0.3997
6C	7	9/21/2013 14:28	3	21308	7102.67	7102.67	18204.01	**0.3902**	0.3830
6C	8	9/21/2013 14:46	3	20267	6755.67	6755.67	18203.99	**0.3711**	0.3715
7A	1	9/21/2013 15:24	3	25836	8612.00	8612.00	18203.96	**0.4731**	0.4576
7A	2	9/21/2013 15:38	3	24812	8270.67	8270.67	18203.95	**0.4543**	0.4487
7A	3	9/21/2013 15:33	3	22637	7545.67	7545.67	18203.96	**0.4145**	0.4383
7A	4	9/21/2013 15:29	3	22367	7455.67	7455.67	18203.96	**0.4096**	0.4222
7A	5	9/21/2013 15:44	3	23254	7751.33	7751.33	18203.95	**0.4258**	0.4153
7A	6	9/21/2013 15:57	3	22113	7371.00	7371.00	18203.94	**0.4049**	0.4066
7A	7	9/21/2013 15:52	3	21394	7131.33	7131.33	18203.94	**0.3917**	0.3890
7A	8	9/21/2013 15:48	3	20794	6931.33	6931.33	18203.94	**0.3808**	0.3769
7B	1	9/21/2013 15:29	3	25947	8649.00	8649.00	18203.96	**0.4751**	0.4600
7B	2	9/21/2013 15:25	3	24962	8320.67	8320.67	18203.96	**0.4571**	0.4510
7B	3	9/21/2013 15:38	3	22788	7596.00	7596.00	18203.95	**0.4173**	0.4405
7B	4	9/21/2013 15:33	3	22297	7432.33	7432.33	18203.96	**0.4083**	0.4243
7B	5	9/21/2013 15:48	3	23465	7821.67	7821.67	18203.94	**0.4297**	0.4173
7B	6	9/21/2013 15:44	3	22274	7424.67	7424.67	18203.95	**0.4079**	0.4085
7B	7	9/21/2013 15:57	3	21551	7183.67	7183.67	18203.94	**0.3946**	0.3908
7B	8	9/21/2013 15:52	3	20819	6939.67	6939.67	18203.94	**0.3812**	0.3786
7C	1	9/21/2013 15:34	3	24857	8285.67	8285.67	18203.96	**0.4552**	0.4437
7C	2	9/21/2013 15:29	3	24176	8058.67	8058.67	18203.96	**0.4427**	0.4354
7C	3	9/21/2013 15:25	3	22112	7370.67	7370.67	18203.96	**0.4049**	0.4257
7C	4	9/21/2013 15:38	3	21602	7200.67	7200.67	18203.95	**0.3956**	0.4108
7C	5	9/21/2013 15:53	3	22837	7612.33	7612.33	18203.94	**0.4182**	0.4043
7C	6	9/21/2013 15:48	3	21615	7205.00	7205.00	18203.94	**0.3958**	0.3963
7C	7	9/21/2013 15:44	3	20772	6924.00	6924.00	18203.95	**0.3804**	0.3800
7C	8	9/21/2013 15:57	3	20339	6779.67	6779.67	18203.94	**0.3724**	0.3688
7D	1	9/21/2013 15:39	3	25491	8497.00	8497.00	18203.95	**0.4668**	0.4544
7D	2	9/21/2013 15:34	3	24470	8156.67	8156.67	18203.96	**0.4481**	0.4453
7D	3	9/21/2013 15:29	3	22692	7564.00	7564.00	18203.96	**0.4155**	0.4348
7D	4	9/21/2013 15:25	3	22394	7464.67	7464.67	18203.96	**0.4101**	0.4186
7D	5	9/21/2013 15:57	3	22949	7649.67	7649.67	18203.94	**0.4202**	0.4115
7D	6	9/21/2013 15:53	3	22151	7383.67	7383.67	18203.94	**0.4056**	0.4028
7D	7	9/21/2013 15:48	3	20830	6943.33	6943.33	18203.94	**0.3814**	0.3850
7D	8	9/21/2013 15:44	3	20618	6872.67	6872.67	18203.95	**0.3775**	0.3728
8A	1	9/21/2013 15:44	3	22437	7479.00	7479.00	18203.95	**0.4108**	0.4006
8A	2	9/21/2013 15:57	3	21492	7164.00	7164.00	18203.94	**0.3935**	0.3924
8A	3	9/21/2013 15:53	3	20337	6779.00	6779.00	18203.94	**0.3724**	0.3828
8A	4	9/21/2013 15:48	3	19590	6530.00	6530.00	18203.94	**0.3587**	0.3681
8A	5	9/21/2013 15:25	3	19913	6637.67	6637.67	18203.96	**0.3646**	0.3617
8A	6	9/21/2013 15:39	3	19463	6487.67	6487.67	18203.95	**0.3564**	0.3537
8A	7	9/21/2013 15:34	3	18241	6080.33	6080.33	18203.95	**0.3340**	0.3376
8A	8	9/21/2013 15:30	3	18172	6057.33	6057.33	18203.96	**0.3327**	0.3265
8B	1	9/21/2013 15:48	3	22367	7455.67	7455.67	18203.94	**0.4096**	0.4014
8B	2	9/21/2013 15:44	3	21728	7242.67	7242.67	18203.95	**0.3979**	0.3940
8B	3	9/21/2013 15:57	3	20205	6735.00	6735.00	18203.94	**0.3700**	0.3855
8B	4	9/21/2013 15:53	3	19767	6589.00	6589.00	18203.94	**0.3620**	0.3723
8B	5	9/21/2013 15:30	3	20729	6909.67	6909.67	18203.96	**0.3796**	0.3666
8B	6	9/21/2013 15:25	3	19567	6522.33	6522.33	18203.96	**0.3583**	0.3595
8B	7	9/21/2013 15:39	3	18959	6319.67	6319.67	18203.95	**0.3472**	0.3451
8B	8	9/21/2013 15:34	3	18303	6101.00	6101.00	18203.95	**0.3351**	0.3351
8C	1	9/21/2013 15:53	3	21830	7276.67	7276.67	18203.94	**0.3997**	0.3922
8C	2	9/21/2013 15:48	3	21368	7122.67	7122.67	18203.94	**0.3913**	0.3847
8C	3	9/21/2013 15:44	3	19704	6568.00	6568.00	18203.95	**0.3608**	0.3760
8C	4	9/21/2013 15:57	3	19401	6467.00	6467.00	18203.94	**0.3553**	0.3626
8C	5	9/21/2013 15:34	3	19818	6606.00	6606.00	18203.95	**0.3629**	0.3568

Detector (#)	Source ID (#)	Raw Count Data Start Time	Count Time (min)	Beta (counts)	Raw Beta (cpm)	Sr-90 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-90 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
8C	6	9/21/2013 15:30	3	19029	6343.00	6343.00	18203.96	**0.3484**	0.3495
8C	7	9/21/2013 15:25	3	18223	6074.33	6074.33	18203.96	**0.3337**	0.3348
8C	8	9/21/2013 15:39	3	17983	5994.33	5994.33	18203.95	**0.3293**	0.3247
8D	1	9/21/2013 15:57	3	25811	8603.67	8603.67	18203.94	**0.4726**	0.4600
8D	2	9/21/2013 15:53	3	24854	8284.67	8284.67	18203.94	**0.4551**	0.4510
8D	3	9/21/2013 15:48	3	22758	7586.00	7586.00	18203.94	**0.4167**	0.4406
8D	4	9/21/2013 15:44	3	22505	7501.67	7501.67	18203.95	**0.4121**	0.4244
8D	5	9/21/2013 15:39	3	23615	7871.67	7871.67	18203.95	**0.4324**	0.4174
8D	6	9/21/2013 15:34	3	22557	7519.00	7519.00	18203.95	**0.4130**	0.4087
8D	7	9/21/2013 15:30	3	21368	7122.67	7122.67	18203.96	**0.3913**	0.3910
8D	8	9/21/2013 15:25	3	20679	6893.00	6893.00	18203.96	**0.3787**	0.3788
9A	1	9/21/2013 17:01	3	26109	8703.00	8703.00	18203.88	**0.4781**	0.4646
9A	2	9/21/2013 17:16	3	25227	8409.00	8409.00	18203.87	**0.4619**	0.4548
9A	3	9/21/2013 17:11	3	22999	7666.33	7666.33	18203.87	**0.4211**	0.4433
9A	4	9/21/2013 17:07	3	22512	7504.00	7504.00	18203.88	**0.4122**	0.4255
9A	5	9/21/2013 17:21	3	23507	7835.67	7835.67	18203.87	**0.4304**	0.4177
9A	6	9/21/2013 17:37	3	21945	7315.00	7315.00	18203.85	**0.4018**	0.4082
9A	7	9/21/2013 17:31	3	21492	7164.00	7164.00	18203.86	**0.3935**	0.3887
9A	8	9/21/2013 17:27	3	20691	6897.00	6897.00	18203.86	**0.3789**	0.3753
9B	1	9/21/2013 17:07	3	25990	8663.33	8663.33	18203.88	**0.4759**	0.4607
9B	2	9/21/2013 17:01	3	24930	8310.00	8310.00	18203.88	**0.4565**	0.4516
9B	3	9/21/2013 17:16	3	22796	7598.67	7598.67	18203.87	**0.4174**	0.4411
9B	4	9/21/2013 17:11	3	22590	7530.00	7530.00	18203.87	**0.4136**	0.4247
9B	5	9/21/2013 17:27	3	23152	7717.33	7717.33	18203.86	**0.4239**	0.4176
9B	6	9/21/2013 17:21	3	22396	7465.33	7465.33	18203.87	**0.4101**	0.4088
9B	7	9/21/2013 17:37	3	21751	7250.33	7250.33	18203.85	**0.3983**	0.3909
9B	8	9/21/2013 17:32	3	20646	6882.00	6882.00	18203.86	**0.3781**	0.3786
9C	1	9/21/2013 17:12	3	25465	8488.33	8488.33	18203.87	**0.4663**	0.4530
9C	2	9/21/2013 17:07	3	24707	8235.67	8235.67	18203.88	**0.4524**	0.4442
9C	3	9/21/2013 17:01	3	22353	7451.00	7451.00	18203.88	**0.4093**	0.4340
9C	4	9/21/2013 17:16	3	22173	7391.00	7391.00	18203.87	**0.4060**	0.4181
9C	5	9/21/2013 17:32	3	22883	7627.67	7627.67	18203.86	**0.4190**	0.4113
9C	6	9/21/2013 17:27	3	22218	7406.00	7406.00	18203.86	**0.4068**	0.4028
9C	7	9/21/2013 17:21	3	20983	6994.33	6994.33	18203.87	**0.3842**	0.3855
9C	8	9/21/2013 17:37	3	20661	6887.00	6887.00	18203.85	**0.3783**	0.3736
9D	1	9/21/2013 17:16	3	24913	8304.33	8304.33	18203.87	**0.4562**	0.4414
9D	2	9/21/2013 17:12	3	23917	7972.33	7972.33	18203.87	**0.4379**	0.4327
9D	3	9/21/2013 17:07	3	21731	7243.67	7243.67	18203.88	**0.3979**	0.4226
9D	4	9/21/2013 17:01	3	21652	7217.33	7217.33	18203.88	**0.3965**	0.4069
9D	5	9/21/2013 17:37	3	22477	7492.33	7492.33	18203.85	**0.4116**	0.4001
9D	6	9/21/2013 17:32	3	21347	7115.67	7115.67	18203.86	**0.3909**	0.3917
9D	7	9/21/2013 17:28	3	20518	6839.33	6839.33	18203.86	**0.3757**	0.3746
9D	8	9/21/2013 17:21	3	20002	6667.33	6667.33	18203.87	**0.3663**	0.3628
10A	1	9/21/2013 17:21	3	25003	8334.33	8334.33	18203.87	**0.4578**	0.4457
10A	2	9/21/2013 17:37	3	24350	8116.67	8116.67	18203.85	**0.4459**	0.4372
10A	3	9/21/2013 17:32	3	22013	7337.67	7337.67	18203.86	**0.4031**	0.4274
10A	4	9/21/2013 17:28	3	21667	7222.33	7222.33	18203.86	**0.3967**	0.4121
10A	5	9/21/2013 17:02	3	22954	7651.33	7651.33	18203.88	**0.4203**	0.4055
10A	6	9/21/2013 17:17	3	21760	7253.33	7253.33	18203.87	**0.3985**	0.3973
10A	7	9/21/2013 17:12	3	20689	6896.33	6896.33	18203.87	**0.3788**	0.3806
10A	8	9/21/2013 17:07	3	20403	6801.00	6801.00	18203.88	**0.3736**	0.3691
10B	1	9/21/2013 17:28	3	25413	8471.00	8471.00	18203.86	**0.4653**	0.4513
10B	2	9/21/2013 17:21	3	24409	8136.33	8136.33	18203.87	**0.4470**	0.4430
10B	3	9/21/2013 17:37	3	22490	7496.67	7496.67	18203.85	**0.4118**	0.4333
10B	4	9/21/2013 17:32	3	22490	7496.67	7496.67	18203.86	**0.4118**	0.4183
10B	5	9/21/2013 17:07	3	22772	7590.67	7590.67	18203.88	**0.4170**	0.4118
10B	6	9/21/2013 17:02	3	21996	7332.00	7332.00	18203.88	**0.4028**	0.4037
10B	7	9/21/2013 17:17	3	21251	7083.67	7083.67	18203.87	**0.3891**	0.3873
10B	8	9/21/2013 17:12	3	20748	6916.00	6916.00	18203.87	**0.3799**	0.3760
10C	1	9/21/2013 17:32	3	25627	8542.33	8542.33	18203.86	**0.4693**	0.4562
10C	2	9/21/2013 17:28	3	24800	8266.67	8266.67	18203.86	**0.4541**	0.4472
10C	3	9/21/2013 17:21	3	22496	7498.67	7498.67	18203.87	**0.4119**	0.4366
10C	4	9/21/2013 17:37	3	22381	7460.33	7460.33	18203.85	**0.4098**	0.4203
10C	5	9/21/2013 17:12	3	23254	7751.33	7751.33	18203.87	**0.4258**	0.4132

Detector (#)	Source ID (#)	Raw Count Data Start Time	Count Time (min)	Beta (counts)	Raw Beta (cpm)	Sr-90 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-90 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
10C	6	9/21/2013 17:07	3	21971	7323.67	7323.67	18203.88	0.4023	0.4045
10C	7	9/21/2013 17:02	3	21225	7075.00	7075.00	18203.88	0.3887	0.3867
10C	8	9/21/2013 17:17	3	20600	6866.67	6866.67	18203.87	0.3772	0.3744
10D	1	9/21/2013 17:37	3	25707	8569.00	8569.00	18203.85	0.4707	0.4571
10D	2	9/21/2013 17:32	3	24666	8222.00	8222.00	18203.86	0.4517	0.4487
10D	3	9/21/2013 17:28	3	22551	7517.00	7517.00	18203.86	0.4129	0.4389
10D	4	9/21/2013 17:21	3	22518	7506.00	7506.00	18203.87	0.4123	0.4237
10D	5	9/21/2013 17:17	3	23963	7987.67	7987.67	18203.87	0.4388	0.4171
10D	6	9/21/2013 17:12	3	22285	7428.33	7428.33	18203.87	0.4081	0.4090
10D	7	9/21/2013 17:07	3	21399	7133.00	7133.00	18203.88	0.3918	0.3924
10D	8	9/21/2013 17:02	3	20830	6943.33	6943.33	18203.88	0.3814	0.3809
11A	1	9/21/2013 16:16	3	23343	7781.00	7781.00	18203.92	0.4274	0.4187
11A	2	9/21/2013 16:30	3	23076	7692.00	7692.00	18203.91	0.4225	0.4119
11A	3	9/21/2013 16:25	3	20922	6974.00	6974.00	18203.91	0.3831	0.4041
11A	4	9/21/2013 16:21	3	20687	6895.67	6895.67	18203.92	0.3788	0.3918
11A	5	9/21/2013 16:36	3	21368	7122.67	7122.67	18203.90	0.3913	0.3866
11A	6	9/21/2013 17:08	3	21140	7046.67	7046.67	18203.88	0.3871	0.3800
11A	7	9/21/2013 16:57	3	20106	6702.00	6702.00	18203.89	0.3682	0.3667
11A	8	9/21/2013 16:40	3	19597	6532.33	6532.33	18203.90	0.3588	0.3575
11B	1	9/21/2013 16:21	3	25687	8562.33	8562.33	18203.92	0.4704	0.4568
11B	2	9/21/2013 16:16	3	24716	8238.67	8238.67	18203.92	0.4526	0.4478
11B	3	9/21/2013 16:30	3	22599	7533.00	7533.00	18203.91	0.4138	0.4372
11B	4	9/21/2013 16:25	3	22423	7474.33	7474.33	18203.91	0.4106	0.4208
11B	5	9/21/2013 16:40	3	23148	7716.00	7716.00	18203.90	0.4239	0.4137
11B	6	9/21/2013 16:36	3	22238	7412.67	7412.67	18203.90	0.4072	0.4049
11B	7	9/21/2013 17:08	3	21184	7061.33	7061.33	18203.88	0.3879	0.3871
11B	8	9/21/2013 16:57	3	20581	6860.33	6860.33	18203.89	0.3769	0.3747
11C	1	9/21/2013 16:25	3	25944	8648.00	8648.00	18203.91	0.4751	0.4586
11C	2	9/21/2013 16:21	3	24751	8250.33	8250.33	18203.92	0.4532	0.4497
11C	3	9/21/2013 16:16	3	22621	7540.33	7540.33	18203.92	0.4142	0.4394
11C	4	9/21/2013 16:30	3	22444	7481.33	7481.33	18203.91	0.4110	0.4234
11C	5	9/21/2013 16:57	3	23360	7786.67	7786.67	18203.89	0.4277	0.4164
11C	6	9/21/2013 16:40	3	22361	7453.67	7453.67	18203.90	0.4095	0.4078
11C	7	9/21/2013 16:36	3	21503	7167.67	7167.67	18203.90	0.3937	0.3903
11C	8	9/21/2013 17:08	3	20724	6908.00	6908.00	18203.88	0.3795	0.3783
11D	1	9/21/2013 16:30	3	25789	8596.33	8596.33	18203.91	0.4722	0.4597
11D	2	9/21/2013 16:26	3	24851	8283.67	8283.67	18203.91	0.4550	0.4501
11D	3	9/21/2013 16:21	3	22574	7524.67	7524.67	18203.92	0.4134	0.4389
11D	4	9/21/2013 16:17	3	22497	7499.00	7499.00	18203.92	0.4119	0.4215
11D	5	9/21/2013 17:08	3	23408	7802.67	7802.67	18203.88	0.4286	0.4139
11D	6	9/21/2013 16:58	3	22214	7404.67	7404.67	18203.89	0.4068	0.4046
11D	7	9/21/2013 16:40	3	21079	7026.33	7026.33	18203.90	0.3860	0.3856
11D	8	9/21/2013 16:36	3	20358	6786.00	6786.00	18203.90	0.3728	0.3725
12A	1	9/21/2013 16:36	3	25088	8362.67	8362.67	18203.90	0.4594	0.4453
12A	2	9/21/2013 17:08	3	24334	8111.33	8111.33	18203.88	0.4456	0.4370
12A	3	9/21/2013 16:58	3	22035	7345.00	7345.00	18203.89	0.4035	0.4273
12A	4	9/21/2013 16:40	3	21621	7207.00	7207.00	18203.90	0.3959	0.4123
12A	5	9/21/2013 16:17	3	22780	7593.33	7593.33	18203.92	0.4171	0.4059
12A	6	9/21/2013 16:30	3	21800	7266.67	7266.67	18203.91	0.3992	0.3978
12A	7	9/21/2013 16:26	3	20729	6909.67	6909.67	18203.91	0.3796	0.3815
12A	8	9/21/2013 16:21	3	20591	6863.67	6863.67	18203.92	0.3770	0.3702
12B	1	9/21/2013 16:40	3	23678	7892.67	7892.67	18203.90	0.4336	0.4180
12B	2	9/21/2013 16:36	3	22544	7514.67	7514.67	18203.90	0.4128	0.4090
12B	3	9/21/2013 17:09	3	20388	6796.00	6796.00	18203.88	0.3733	0.3985
12B	4	9/21/2013 16:58	3	20391	6797.00	6797.00	18203.89	0.3734	0.3823
12B	5	9/21/2013 16:21	3	21250	7083.33	7083.33	18203.92	0.3891	0.3753
12B	6	9/21/2013 16:17	3	19693	6564.33	6564.33	18203.92	0.3606	0.3666
12B	7	9/21/2013 16:30	3	19347	6449.00	6449.00	18203.91	0.3543	0.3489
12B	8	9/21/2013 16:26	3	18471	6157.00	6157.00	18203.91	0.3382	0.3367
12C	1	9/21/2013 16:58	3	25849	8616.33	8616.33	18203.89	0.4733	0.4600
12C	2	9/21/2013 16:40	3	24804	8268.00	8268.00	18203.90	0.4542	0.4509
12C	3	9/21/2013 16:36	3	22706	7568.67	7568.67	18203.90	0.4158	0.4404
12C	4	9/21/2013 17:09	3	22573	7524.33	7524.33	18203.88	0.4133	0.4241
12C	5	9/21/2013 16:26	3	23680	7893.33	7893.33	18203.91	0.4336	0.4170

Detector (#)	Source ID (#)	Raw Count Data Start Time	Count Time (min)	Beta (counts)	Raw Beta (cpm)	Sr-90 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-90 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
12C	6	9/21/2013 16:22	3	22297	7432.33	7432.33	18203.92	**0.4083**	0.4083
12C	7	9/21/2013 16:17	3	21578	7192.67	7192.67	18203.92	**0.3951**	0.3905
12C	8	9/21/2013 16:31	3	20526	6842.00	6842.00	18203.91	**0.3759**	0.3782
12D	1	9/21/2013 17:09	3	26384	8794.67	8794.67	18203.88	**0.4831**	0.4684
12D	2	9/21/2013 17:03	3	25368	8456.00	8456.00	18203.88	**0.4645**	0.4598
12D	3	9/21/2013 16:41	3	23293	7764.33	7764.33	18203.90	**0.4265**	0.4496
12D	4	9/21/2013 16:36	3	22898	7632.67	7632.67	18203.90	**0.4193**	0.4339
12D	5	9/21/2013 16:31	3	23905	7968.33	7968.33	18203.91	**0.4377**	0.4271
12D	6	9/21/2013 16:26	3	23037	7679.00	7679.00	18203.91	**0.4218**	0.4187
12D	7	9/21/2013 16:22	3	22185	7395.00	7395.00	18203.92	**0.4062**	0.4016
12D	8	9/21/2013 16:17	3	21281	7093.67	7093.67	18203.92	**0.3897**	0.3898
13A	1	9/24/2013 15:16	3	25299	8433.00	8433.00	18200.38	**0.4633**	0.4495
13A	2	9/24/2013 16:07	3	24154	8051.33	8051.33	18200.34	**0.4424**	0.4413
13A	3	9/24/2013 16:02	3	22411	7470.33	7470.33	18200.35	**0.4105**	0.4319
13A	4	9/24/2013 15:46	3	22123	7374.33	7374.33	18200.36	**0.4052**	0.4171
13A	5	9/24/2013 16:12	3	23299	7766.33	7766.33	18200.34	**0.4267**	0.4108
13A	6	9/24/2013 17:06	3	21941	7313.67	7313.67	18200.29	**0.4018**	0.4029
13A	7	9/24/2013 16:28	3	21501	7167.00	7167.00	18200.32	**0.3938**	0.3868
13A	8	9/24/2013 16:21	3	20330	6776.67	6776.67	18200.33	**0.3723**	0.3757
13B	1	9/24/2013 15:46	3	25707	8569.00	8569.00	18200.36	**0.4708**	0.4592
13B	2	9/24/2013 15:16	3	25003	8334.33	8334.33	18200.38	**0.4579**	0.4505
13B	3	9/24/2013 16:07	3	22716	7572.00	7572.00	18200.34	**0.4160**	0.4402
13B	4	9/24/2013 16:02	3	22665	7555.00	7555.00	18200.35	**0.4151**	0.4244
13B	5	9/24/2013 16:21	3	23407	7802.33	7802.33	18200.33	**0.4287**	0.4176
13B	6	9/24/2013 16:12	3	22288	7429.33	7429.33	18200.34	**0.4082**	0.4091
13B	7	9/24/2013 17:06	3	21552	7184.00	7184.00	18200.29	**0.3947**	0.3918
13B	8	9/24/2013 16:28	3	20809	6936.33	6936.33	18200.32	**0.3811**	0.3799
13C	1	9/24/2013 16:02	3	24439	8146.33	8146.33	18200.35	**0.4476**	0.4301
13C	2	9/24/2013 15:46	3	23471	7823.67	7823.67	18200.36	**0.4299**	0.4216
13C	3	9/24/2013 15:16	3	20847	6949.00	6949.00	18200.38	**0.3818**	0.4118
13C	4	9/24/2013 16:07	3	21047	7015.67	7015.67	18200.34	**0.3855**	0.3964
13C	5	9/24/2013 16:28	3	21798	7266.00	7266.00	18200.32	**0.3992**	0.3898
13C	6	9/24/2013 16:21	3	20780	6926.67	6926.67	18200.33	**0.3806**	0.3816
13C	7	9/24/2013 16:12	3	19932	6644.00	6644.00	18200.34	**0.3650**	0.3648
13C	8	9/24/2013 17:06	3	19649	6549.67	6549.67	18200.29	**0.3599**	0.3533
13D	1	9/24/2013 16:08	3	25369	8456.33	8456.33	18200.34	**0.4646**	0.4500
13D	2	9/24/2013 16:02	3	24423	8141.00	8141.00	18200.35	**0.4473**	0.4411
13D	3	9/24/2013 15:46	3	22268	7422.67	7422.67	18200.36	**0.4078**	0.4308
13D	4	9/24/2013 15:16	3	22067	7355.67	7355.67	18200.38	**0.4041**	0.4148
13D	5	9/24/2013 17:06	3	22700	7566.67	7566.67	18200.29	**0.4157**	0.4079
13D	6	9/24/2013 16:28	3	21712	7237.33	7237.33	18200.32	**0.3976**	0.3993
13D	7	9/24/2013 16:22	3	20958	6986.00	6986.00	18200.33	**0.3838**	0.3819
13D	8	9/24/2013 16:12	3	20458	6819.33	6819.33	18200.34	**0.3747**	0.3699
14A	1	9/24/2013 16:12	3	25239	8413.00	8413.00	18200.34	**0.4622**	0.4448
14A	2	9/24/2013 17:06	3	23924	7974.67	7974.67	18200.29	**0.4382**	0.4358
14A	3	9/24/2013 16:29	3	21860	7286.67	7286.67	18200.32	**0.4004**	0.4254
14A	4	9/24/2013 16:22	3	22077	7359.00	7359.00	18200.33	**0.4043**	0.4092
14A	5	9/24/2013 15:16	3	22308	7436.00	7436.00	18200.38	**0.4086**	0.4022
14A	6	9/24/2013 16:08	3	21266	7088.67	7088.67	18200.34	**0.3895**	0.3936
14A	7	9/24/2013 16:02	3	20788	6929.33	6929.33	18200.35	**0.3807**	0.3759
14A	8	9/24/2013 15:46	3	20028	6676.00	6676.00	18200.36	**0.3668**	0.3638
14B	1	9/24/2013 16:22	3	26392	8797.33	8797.33	18200.33	**0.4834**	0.4701
14B	2	9/24/2013 16:12	3	25423	8474.33	8474.33	18200.34	**0.4656**	0.4606
14B	3	9/24/2013 17:06	3	23499	7833.00	7833.00	18200.29	**0.4304**	0.4495
14B	4	9/24/2013 16:29	3	22910	7636.67	7636.67	18200.32	**0.4196**	0.4324
14B	5	9/24/2013 15:46	3	23778	7926.00	7926.00	18200.36	**0.4355**	0.4250
14B	6	9/24/2013 15:17	3	22469	7489.67	7489.67	18200.38	**0.4115**	0.4158
14B	7	9/24/2013 16:08	3	21921	7307.00	7307.00	18200.34	**0.4015**	0.3972
14B	8	9/24/2013 16:02	3	21162	7054.00	7054.00	18200.35	**0.3876**	0.3843
14C	1	9/24/2013 16:29	3	24820	8273.33	8273.33	18200.32	**0.4546**	0.4411
14C	2	9/24/2013 16:22	3	24032	8010.67	8010.67	18200.33	**0.4401**	0.4329
14C	3	9/24/2013 16:12	3	21582	7194.00	7194.00	18200.34	**0.3953**	0.4234
14C	4	9/24/2013 17:06	3	21926	7308.67	7308.67	18200.29	**0.4016**	0.4087
14C	5	9/24/2013 16:02	3	22686	7562.00	7562.00	18200.35	**0.4155**	0.4024

Detector (#)	Source ID (#)	Raw Count Data Start Time	Count Time (min)	Beta (counts)	Raw Beta (cpm)	Sr-90 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-90 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
14C	6	9/24/2013 15:47	3	21331	7110.33	7110.33	18200.36	**0.3907**	0.3945
14C	7	9/24/2013 15:17	3	20928	6976.00	6976.00	18200.38	**0.3833**	0.3784
14C	8	9/24/2013 16:08	3	20079	6693.00	6693.00	18200.34	**0.3677**	0.3673
14D	1	9/24/2013 17:06	3	25905	8635.00	8635.00	18200.29	**0.4744**	0.4627
14D	2	9/24/2013 16:29	3	25199	8399.67	8399.67	18200.32	**0.4615**	0.4535
14D	3	9/24/2013 16:22	3	23027	7675.67	7675.67	18200.33	**0.4217**	0.4428
14D	4	9/24/2013 16:12	3	22602	7534.00	7534.00	18200.34	**0.4139**	0.4263
14D	5	9/24/2013 16:08	3	23468	7822.67	7822.67	18200.34	**0.4298**	0.4192
14D	6	9/24/2013 16:02	3	22259	7419.67	7419.67	18200.35	**0.4077**	0.4103
14D	7	9/24/2013 15:47	3	21431	7143.67	7143.67	18200.36	**0.3925**	0.3923
14D	8	9/24/2013 15:17	3	21039	7013.00	7013.00	18200.38	**0.3853**	0.3798

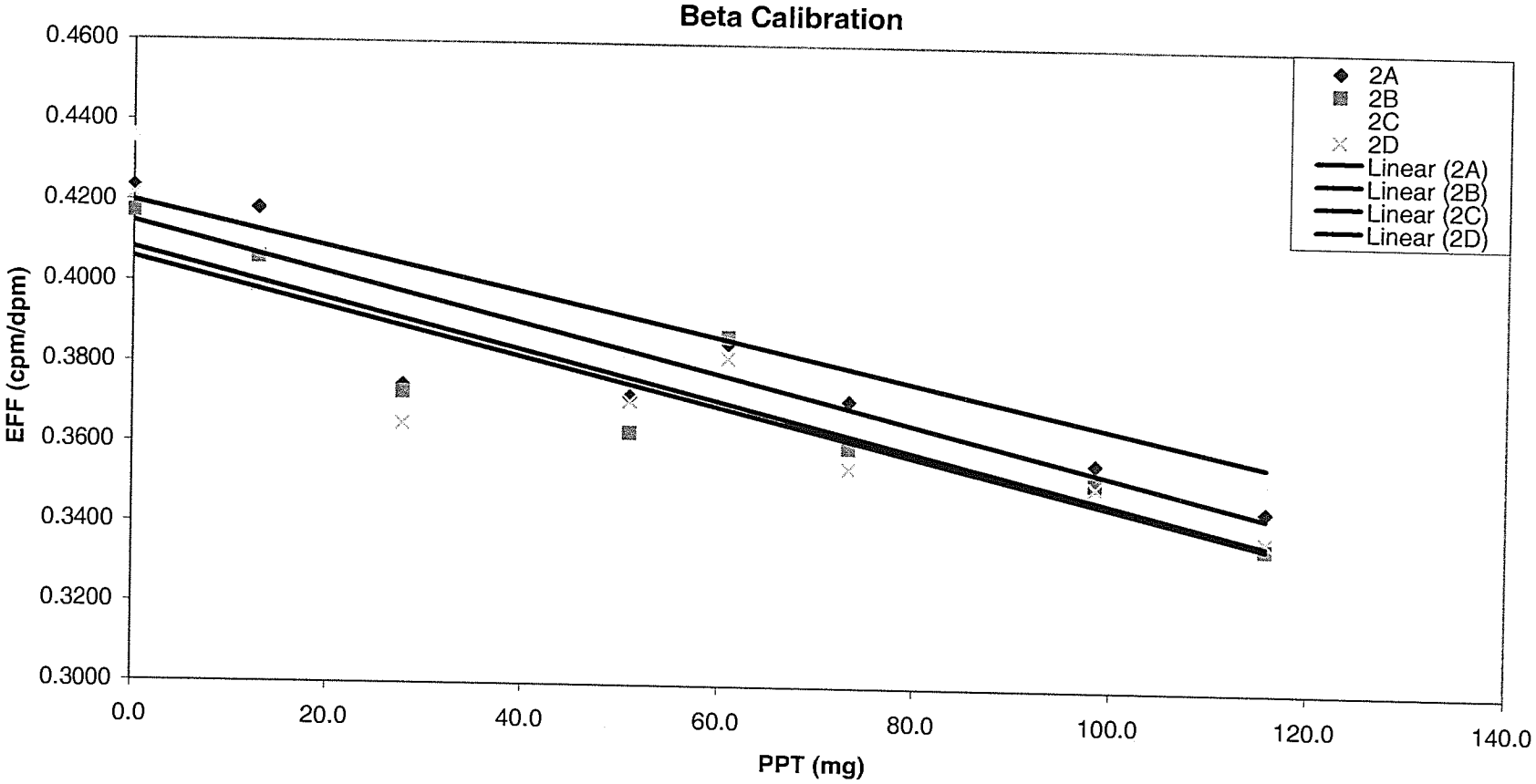


1A y = -6.927004E-04x + 4.569778E-01

1B y = -6.489090E-04x + 4.517750E-01

1C y = -7.396285E-04x + 4.643580E-01

1D y = -7.027723E-04x + 4.538896E-01

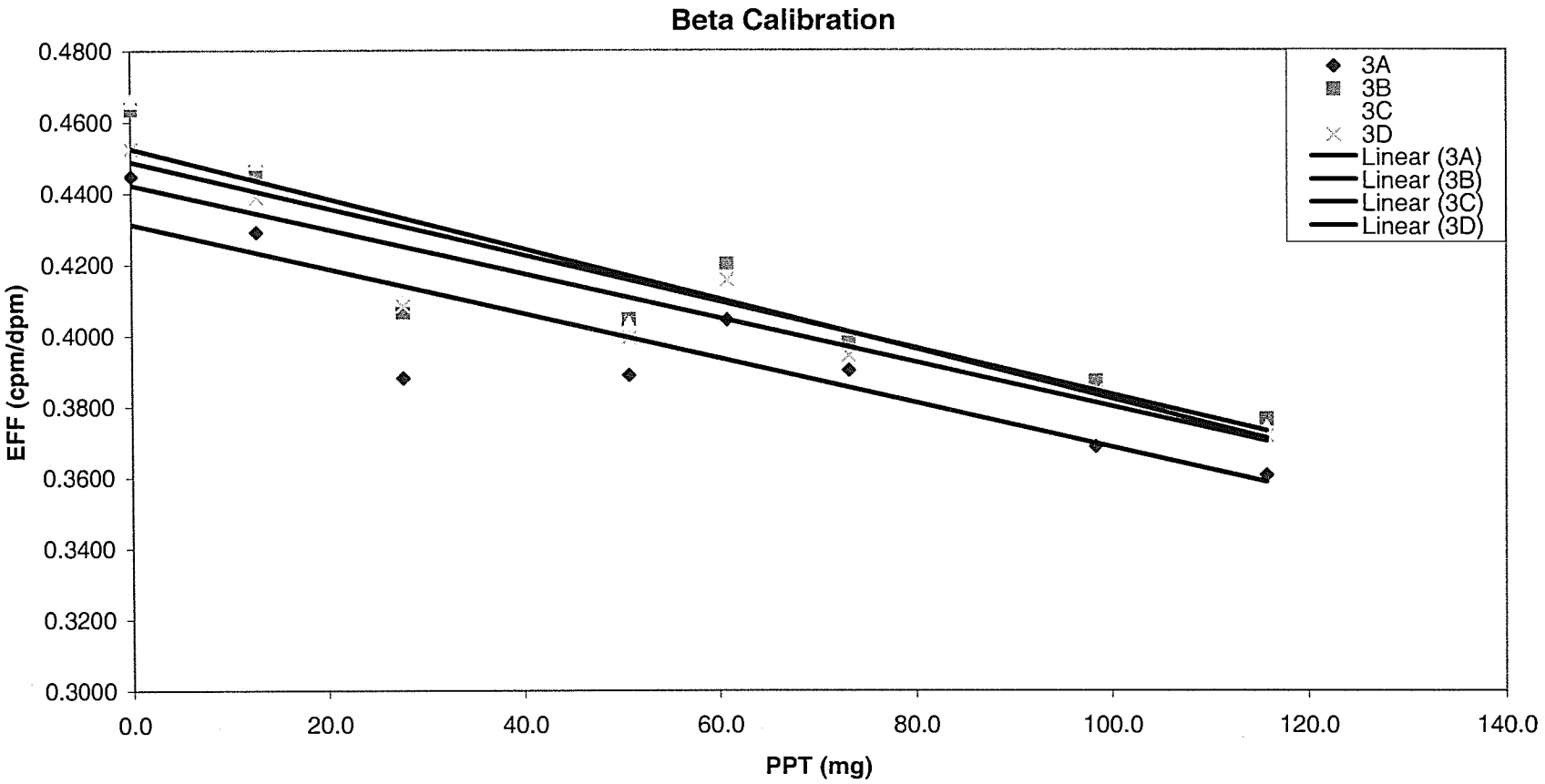


2A y = -6.128691E-04x + 4.147205E-01

2B y = -6.164420E-04x + 4.081852E-01

2C y = -5.473804E-04x + 4.198593E-01

2D y = -6.012719E-04x + 4.058137E-01

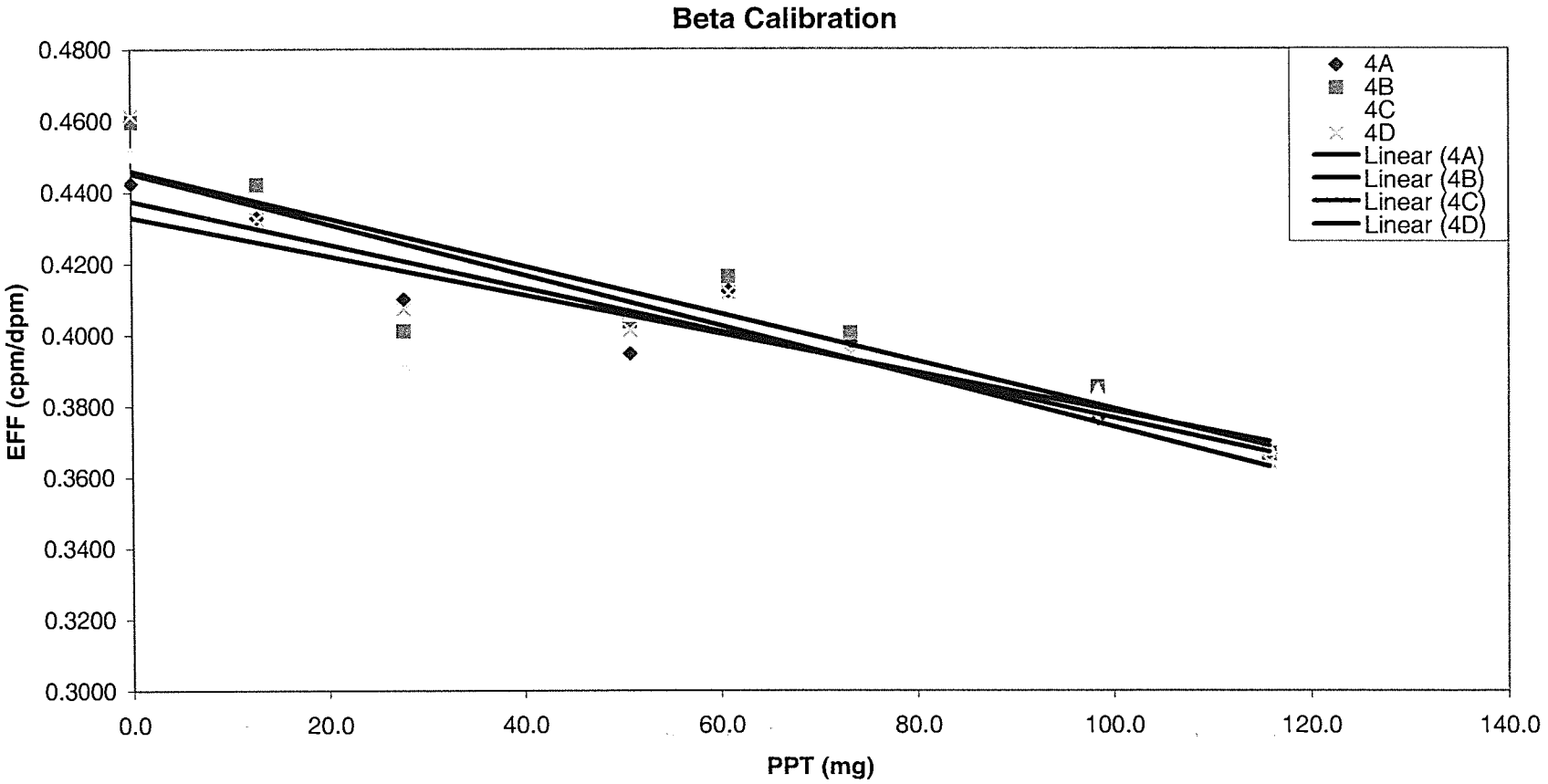


3A y = -6.268001E-04x + 4.312616E-01

3B y = -6.535905E-04x + 4.488401E-01

3C y = -7.032192E-04x + 4.525416E-01

3D y = -6.214772E-04x + 4.422533E-01

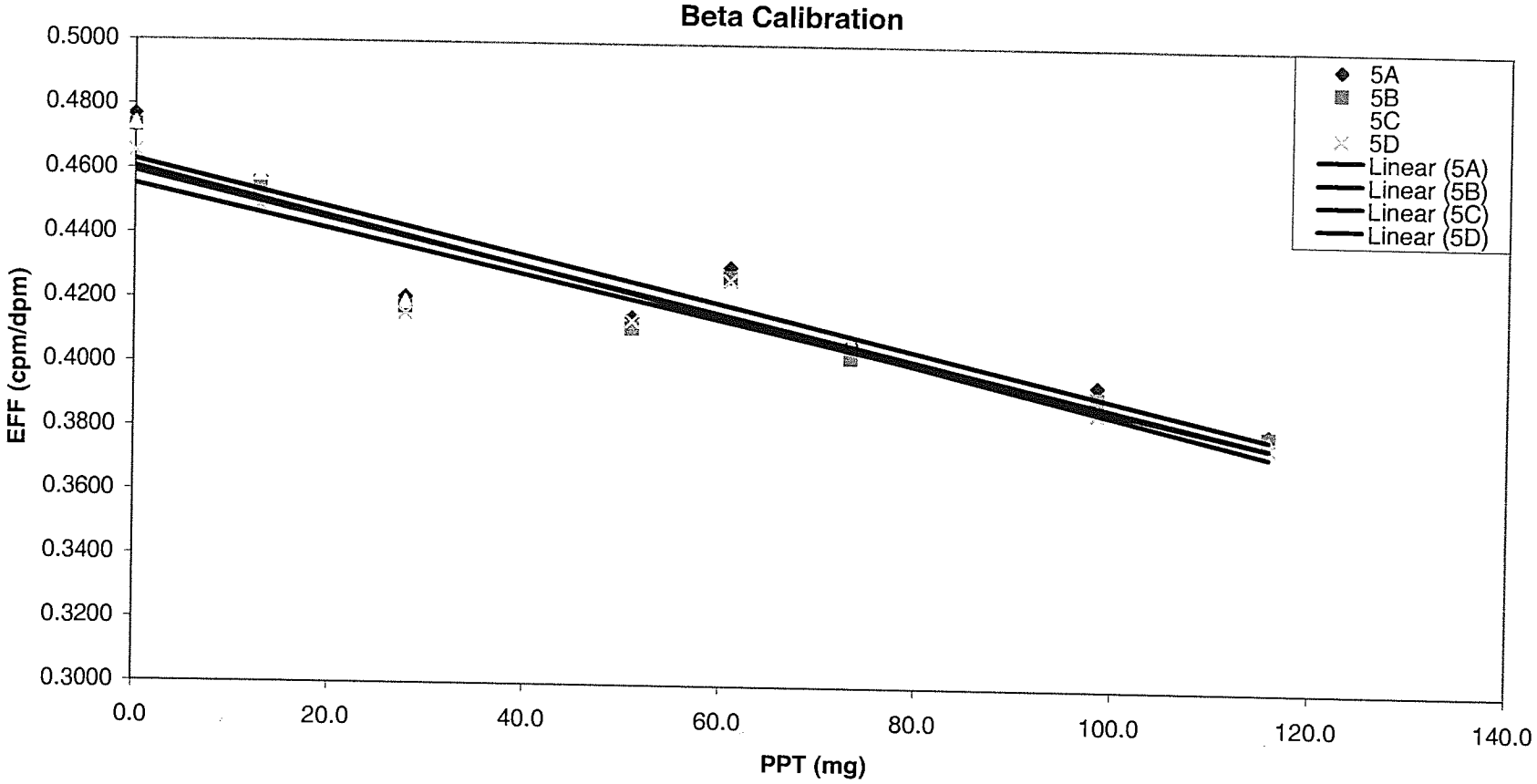


4A y = -6.083781E-04x + 4.375305E-01

4B y = -6.661295E-04x + 4.459653E-01

4C y = -5.429665E-04x + 4.329024E-01

4D y = -7.103401E-04x + 4.452607E-01

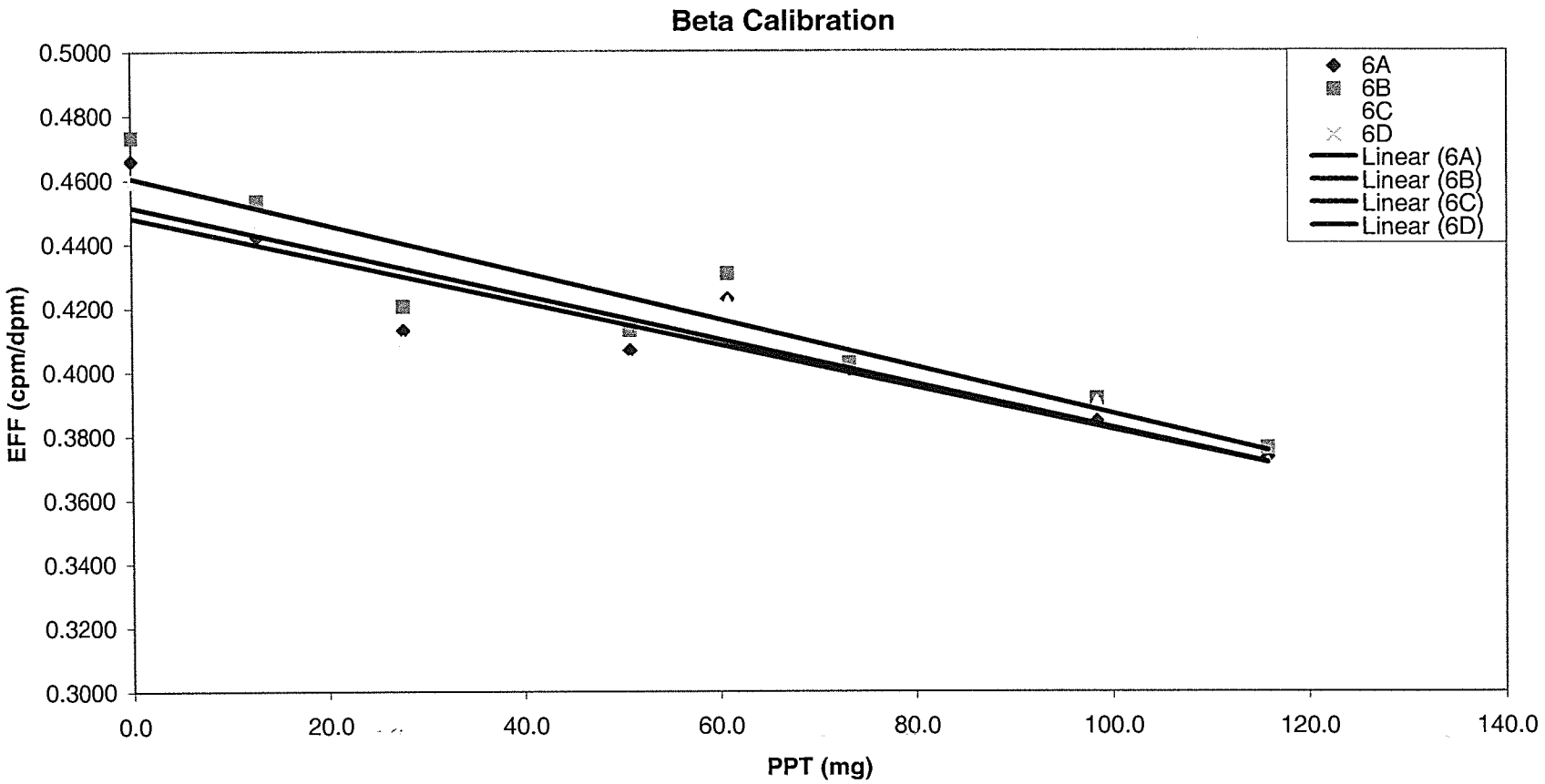


5A y = -7.229994E-04x + 4.627772E-01

5B y = -7.129095E-04x + 4.590436E-01

5C y = -7.503590E-04x + 4.605746E-01

5D y = -6.806751E-04x + 4.551510E-01

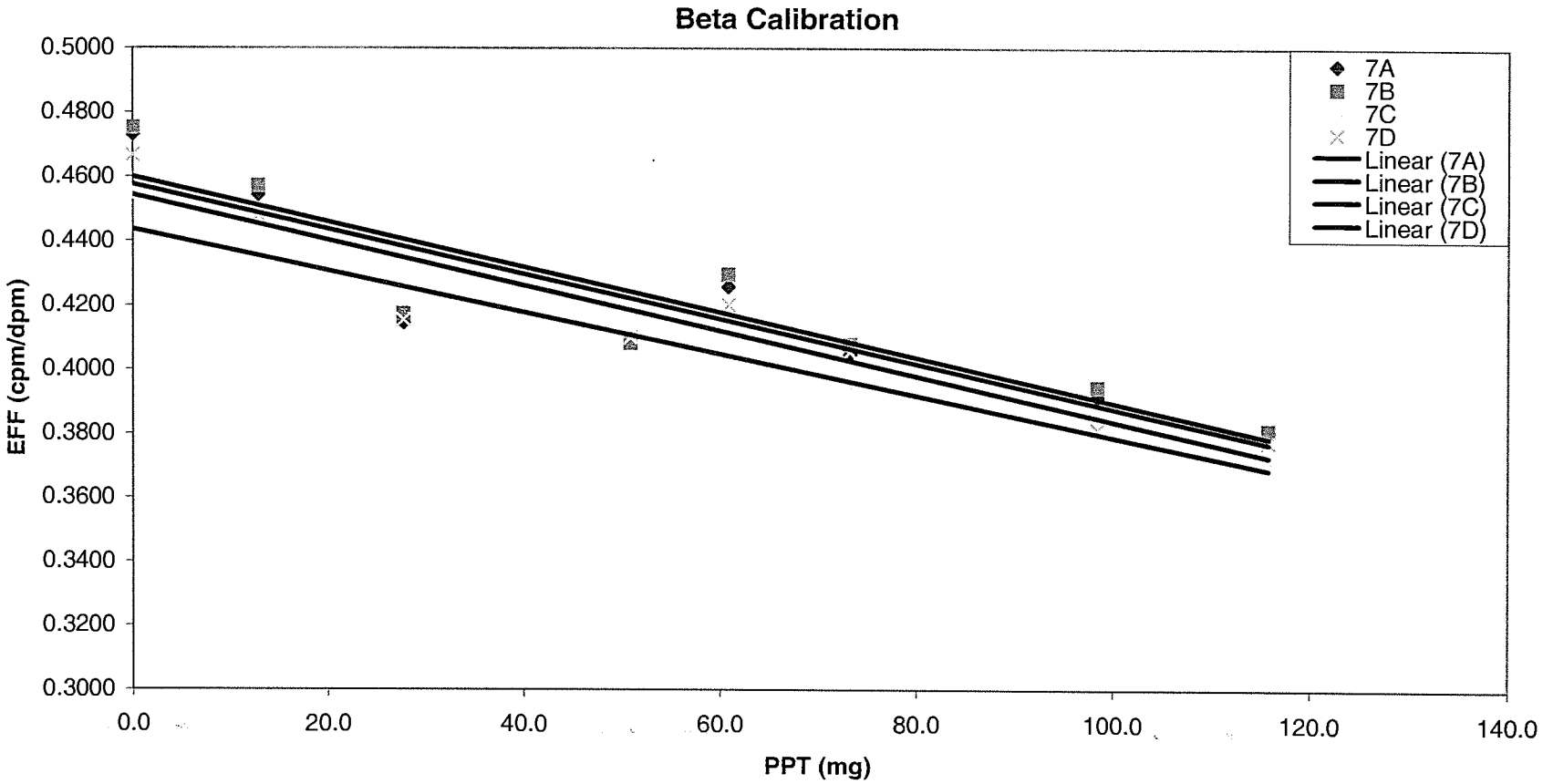


6A y = -6.889561E-04x + 4.515203E-01

6B y = -7.360502E-04x + 4.605553E-01

6C y = -6.616602E-04x + 4.481439E-01

6D

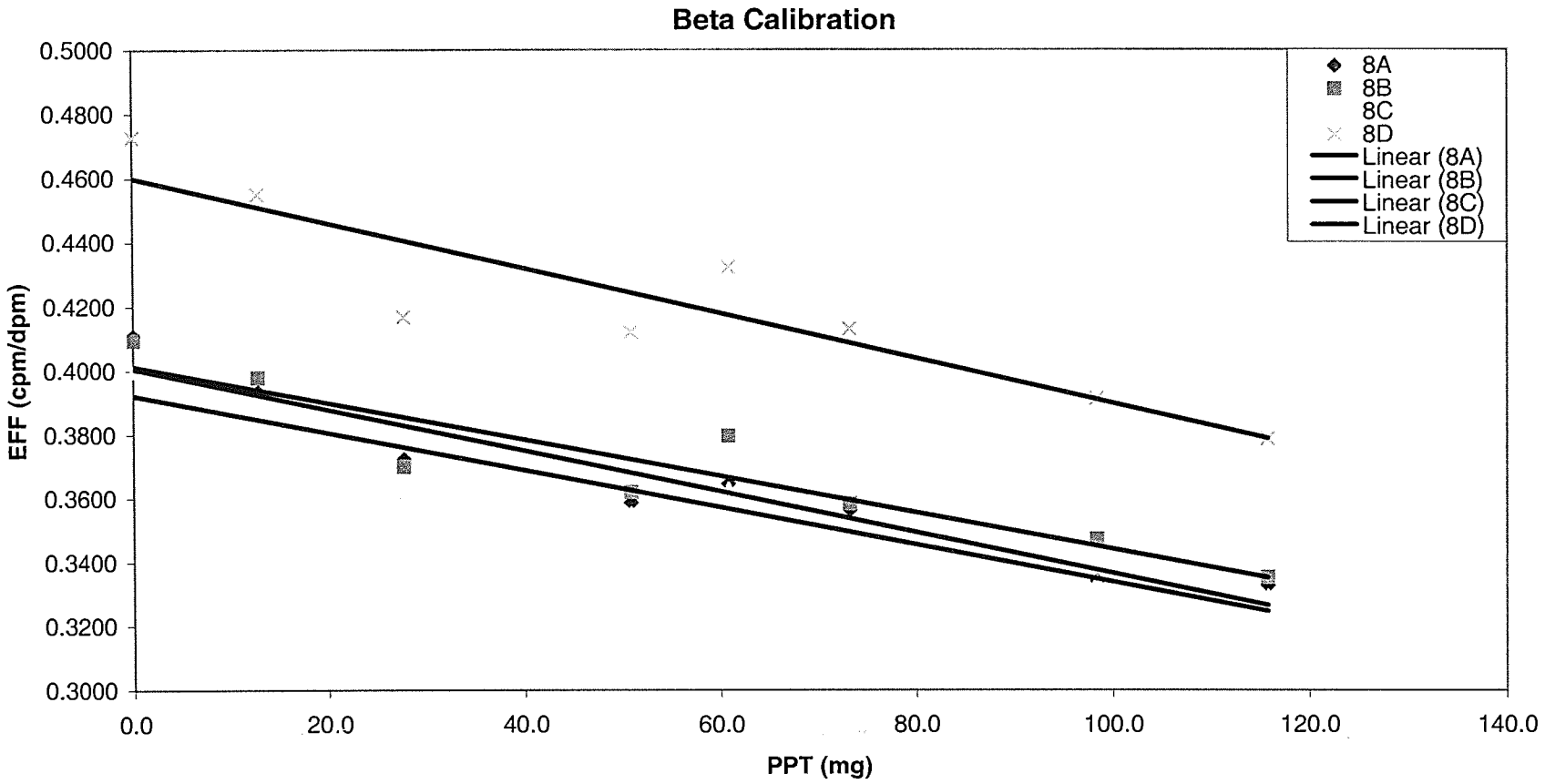


7A y = -6.972433E-04x + 4.576437E-01

7B y = -7.031579E-04x + 4.600195E-01

7C y = -6.466976E-04x + 4.436582E-01

7D y = -7.045032E-04x + 4.543529E-01

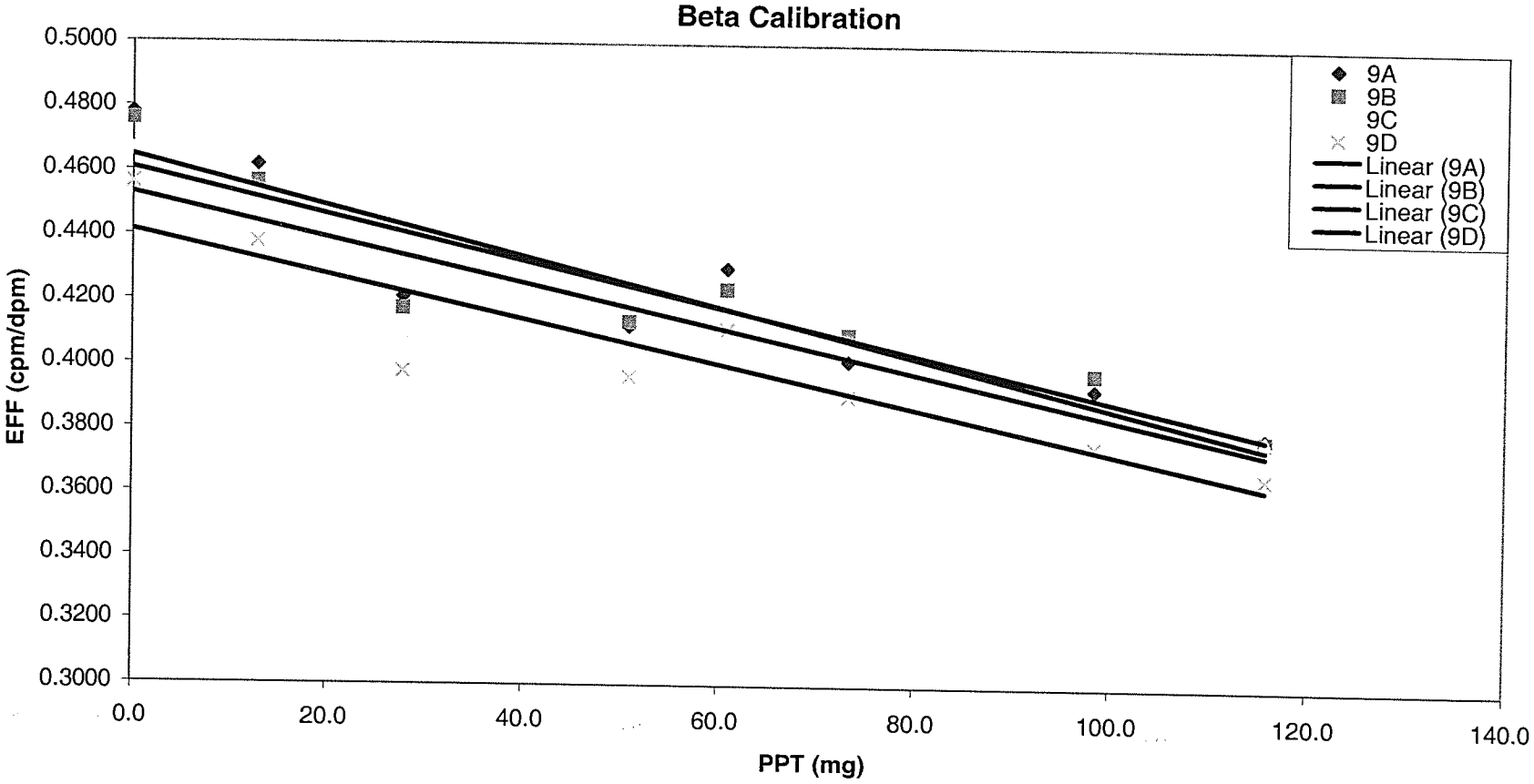


8A y = -6.397370E-04x + 4.005539E-01

8B y = -5.719455E-04x + 4.013616E-01

8C y = -5.827588E-04x + 3.921844E-01

8D y = -7.006997E-04x + 4.599852E-01

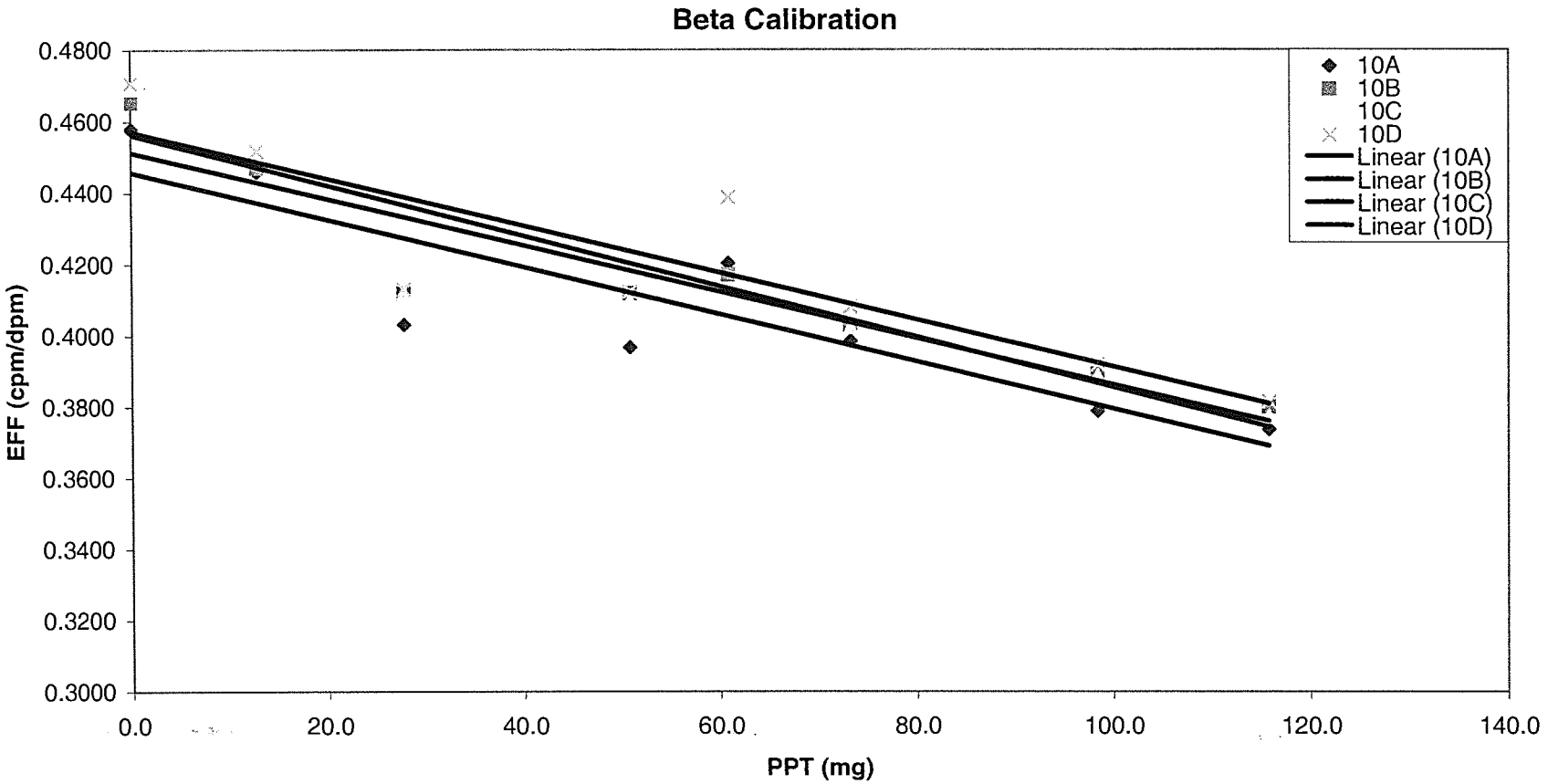


9A y = -7.712603E-04x + 4.646303E-01

9B y = -7.093436E-04x + 4.607000E-01

9C y = -6.859081E-04x + 4.529853E-01

9D y = -6.793796E-04x + 4.414431E-01

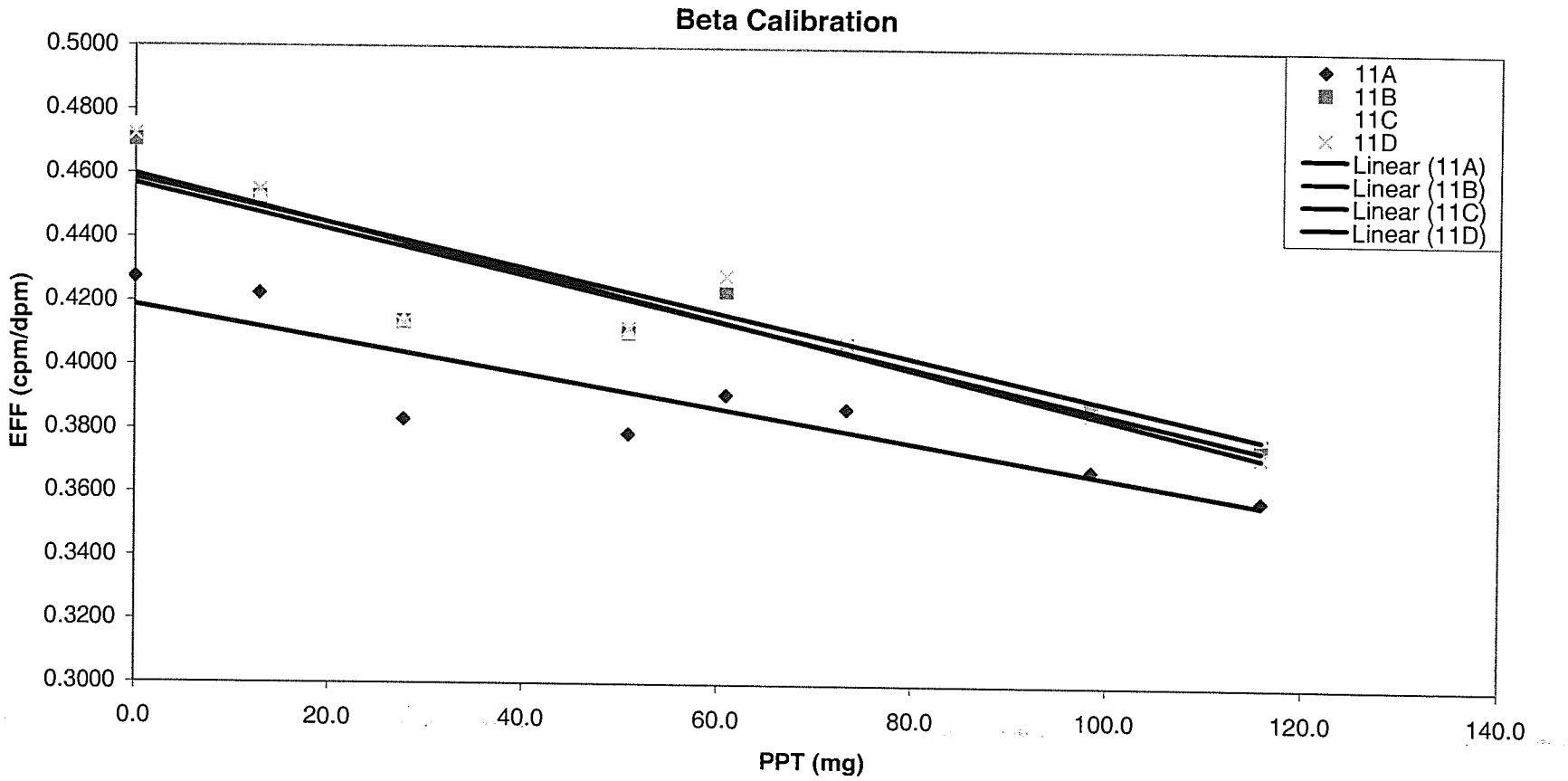


10A y = -6.615045E-04x + 4.456844E-01

10B y = -6.499602E-04x + 4.512988E-01

10C y = -7.067580E-04x + 4.562159E-01

10D y = -6.580339E-04x + 4.571213E-01

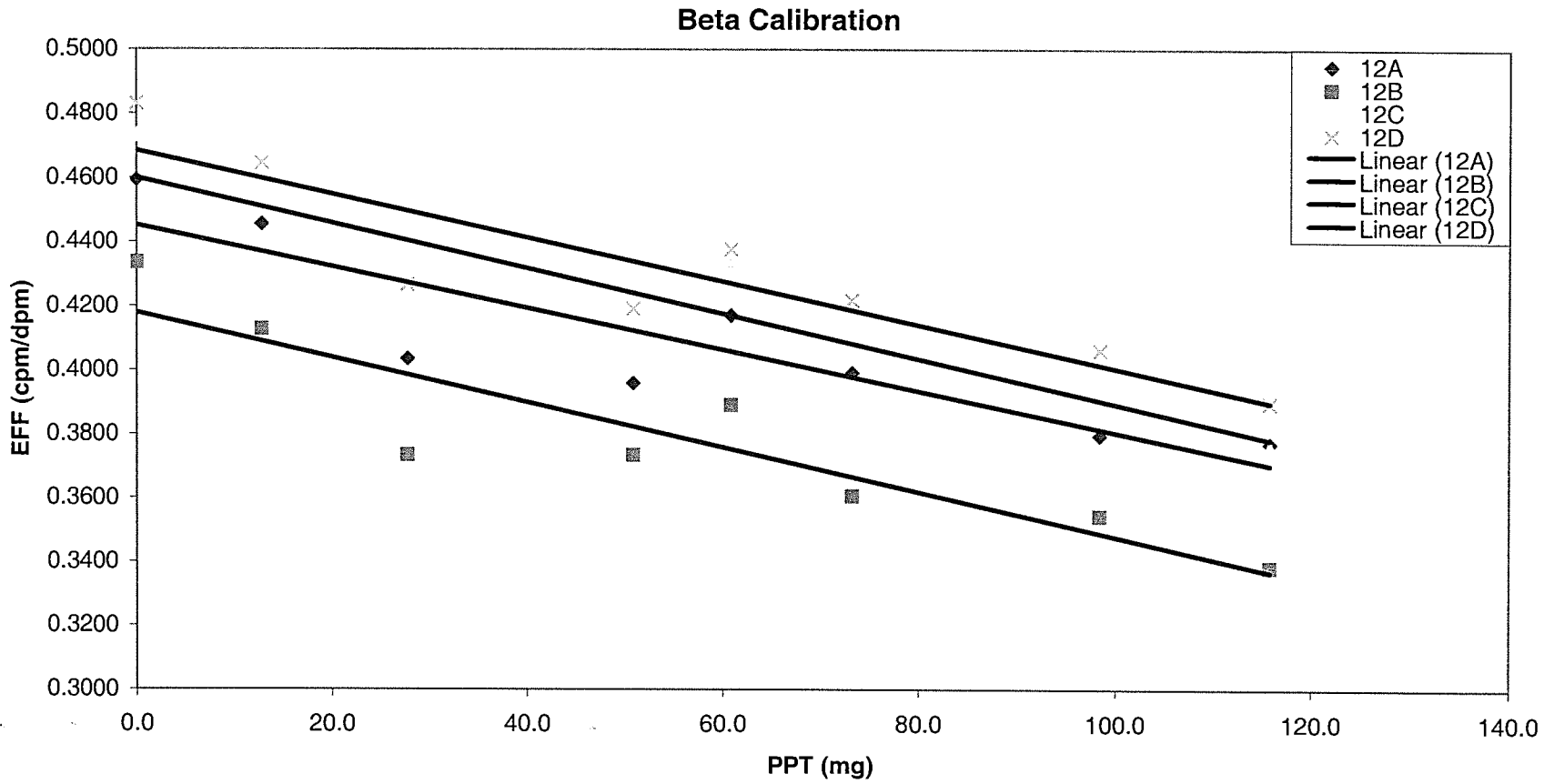


11A y = -5.284830E-04x + 4.186913E-01

11B y = -7.090028E-04x + 4.568466E-01

11C y = -6.934547E-04x + 4.585834E-01

11D y = -7.534850E-04x + 4.597344E-01

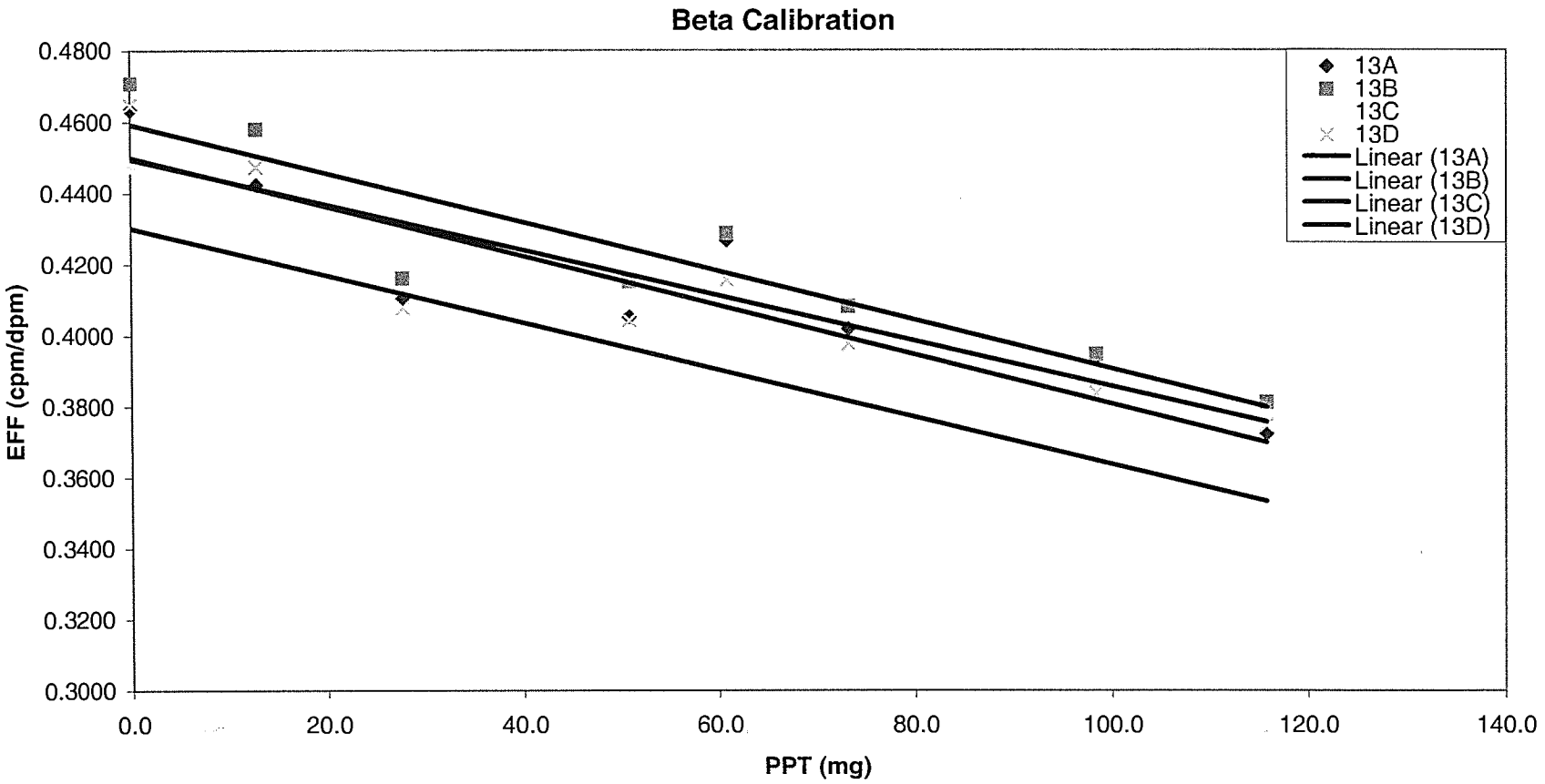


12A y = -6.480081E-04x + 4.452603E-01

12B y = -7.016092E-04x + 4.179551E-01

12C y = -7.061049E-04x + 4.599765E-01

12D y = -6.795877E-04x + 4.684490E-01

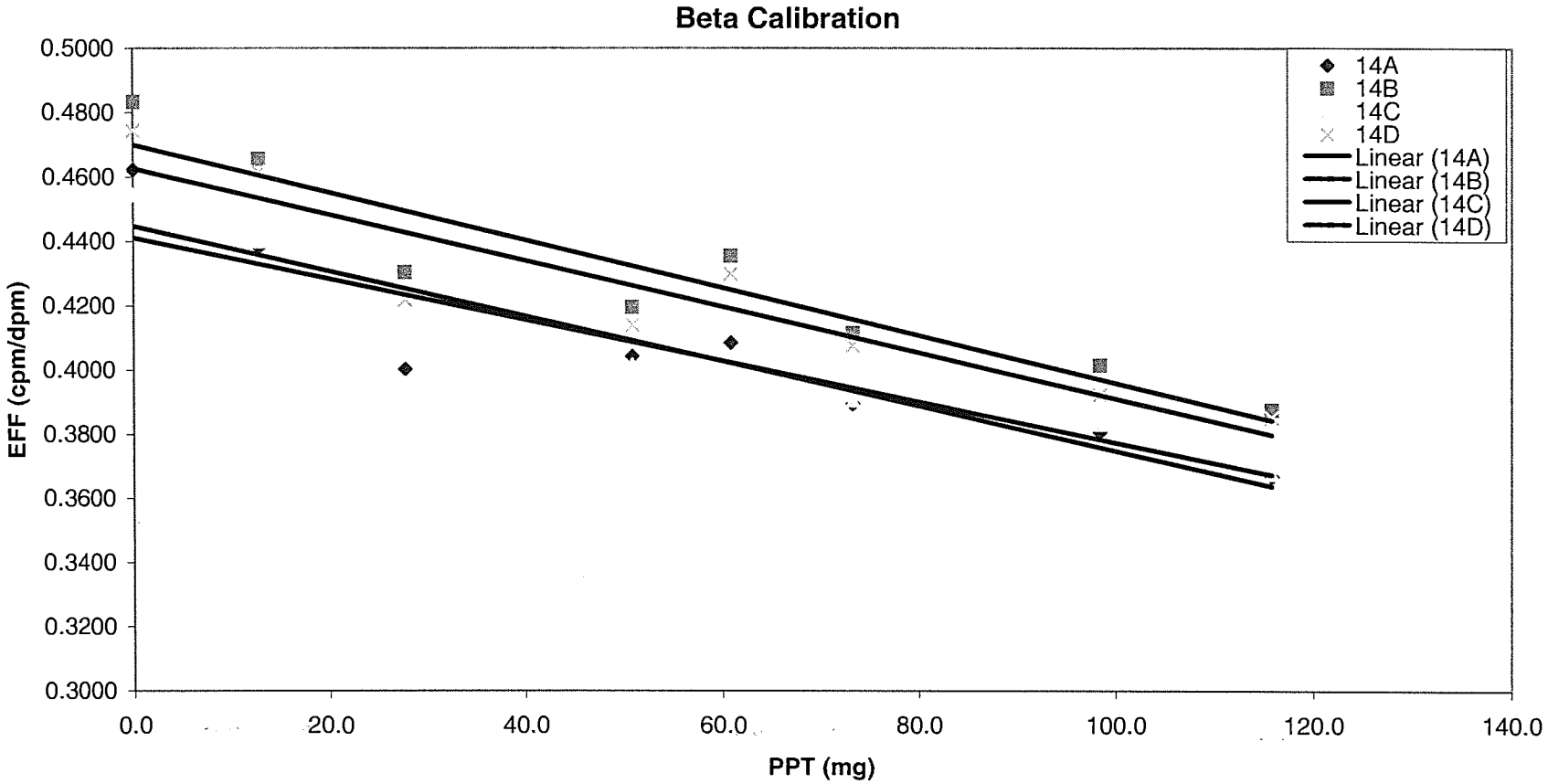


13A y = -6.370479E-04x + 4.495001E-01

13B y = -6.854007E-04x + 4.592283E-01

13C y = -6.633969E-04x + 4.301262E-01

13D y = -6.920231E-04x + 4.499952E-01



14A y = -6.996115E-04x + 4.447689E-01

14B y = -7.405652E-04x + 4.700587E-01

14C y = -6.371666E-04x + 4.410957E-01

14D y = -7.152994E-04x + 4.626635E-01

Current Calibration - PIC

Geometry	2 inch Planchett				
Beta	**Cal Date**	10/1/2013	**Exp Date**	9/30/2014	
Protean	A0	A1	A2	A3	A4
1A	4.569778E-01	-6.927004E-04			
1B	4.517750E-01	-6.489090E-04			
1C	4.643580E-01	-7.396285E-04			
1D	4.538896E-01	-7.027723E-04			
2A	4.147205E-01	-6.128691E-04			
2B	4.081852E-01	-6.164420E-04			
2C	4.198593E-01	-5.473804E-04			
2D	4.058137E-01	-6.012719E-04			
3A	4.312616E-01	-6.268001E-04			
3B	4.488401E-01	-6.535905E-04			
3C	4.525416E-01	-7.032192E-04			
3D	4.422533E-01	-6.214772E-04			
4A	4.375305E-01	-6.083781E-04			
4B	4.459653E-01	-6.661295E-04			
4C	4.329024E-01	-5.429665E-04			
4D	4.452607E-01	-7.103401E-04			
5A	4.627772E-01	-7.229994E-04			
5B	4.590436E-01	-7.129095E-04			
5C	4.605746E-01	-7.503590E-04			
5D	4.551510E-01	-6.806751E-04			
6A	4.515203E-01	-6.889561E-04			
6B	4.605553E-01	-7.360502E-04			
6C	4.481439E-01	-6.616602E-04			
6D	#N/A	#N/A			
7A	4.576437E-01	-6.972433E-04			
7B	4.600195E-01	-7.031579E-04			
7C	4.436582E-01	-6.466976E-04			
7D	4.543529E-01	-7.045032E-04			
8A	4.005539E-01	-6.397370E-04			
8B	4.013616E-01	-5.719455E-04			
8C	3.921844E-01	-5.827588E-04			
8D	4.599852E-01	-7.006997E-04			
9A	4.646303E-01	-7.712603E-04			
9B	4.607000E-01	-7.093436E-04			
9C	4.529853E-01	-6.859081E-04			
9D	4.414431E-01	-6.793796E-04			
10A	4.456844E-01	-6.615045E-04			
10B	4.512988E-01	-6.499602E-04			
10C	4.562159E-01	-7.067580E-04			
10D	4.571213E-01	-6.580339E-04			
11A	4.186913E-01	-5.284830E-04			
11B	4.568466E-01	-7.090028E-04			
11C	4.585834E-01	-6.934547E-04			
11D	4.597344E-01	-7.534850E-04			
12A	4.452603E-01	-6.480081E-04			
12B	4.179551E-01	-7.016092E-04			
12C	4.599765E-01	-7.061049E-04			
12D	4.684490E-01	-6.795877E-04			
13A	4.495001E-01	-6.370479E-04			
13B	4.592283E-01	-6.854007E-04			
13C	4.301262E-01	-6.633969E-04			
13D	4.499952E-01	-6.920231E-04			
14A	4.447689E-01	-6.996115E-04			
14B	4.700587E-01	-7.405652E-04			
14C	4.410957E-01	-6.371666E-04			
14D	4.626635E-01	-7.152994E-04			

PIC_Beta_Sep13_RawData.xls

SampleID	Instr	Time (min.)	Alpha Counts	Beta Counts	Count Start Time	Count End Time	Machine	Batch ID
S1	10A	3	16	25003	9/21/2013 17:21	9/21/2013 17:24	PIC	GABS13
S2	10A	3	17	24350	9/21/2013 17:37	9/21/2013 17:40	PIC	GABS13
S3	10A	3	9	22013	9/21/2013 17:32	9/21/2013 17:35	PIC	GABS13
S4	10A	3	22	21667	9/21/2013 17:28	9/21/2013 17:31	PIC	GABS13
S5	10A	3	13	22954	9/21/2013 17:02	9/21/2013 17:05	PIC	GABS13
S6	10A	3	16	21760	9/21/2013 17:17	9/21/2013 17:20	PIC	GABS13
S7	10A	3	12	20689	9/21/2013 17:12	9/21/2013 17:15	PIC	GABS13
S8	10A	3	15	20403	9/21/2013 17:07	9/21/2013 17:10	PIC	GABS13
S1	10B	3	89	25413	9/21/2013 17:28	9/21/2013 17:31	PIC	GABS13
S2	10B	3	84	24409	9/21/2013 17:21	9/21/2013 17:24	PIC	GABS13
S3	10B	3	84	22490	9/21/2013 17:37	9/21/2013 17:40	PIC	GABS13
S4	10B	3	65	22490	9/21/2013 17:32	9/21/2013 17:35	PIC	GABS13
S5	10B	3	86	22772	9/21/2013 17:07	9/21/2013 17:10	PIC	GABS13
S6	10B	3	63	21996	9/21/2013 17:02	9/21/2013 17:05	PIC	GABS13
S7	10B	3	56	21251	9/21/2013 17:17	9/21/2013 17:20	PIC	GABS13
S8	10B	3	61	20748	9/21/2013 17:12	9/21/2013 17:15	PIC	GABS13
S1	10C	3	85	25627	9/21/2013 17:32	9/21/2013 17:35	PIC	GABS13
S2	10C	3	61	24800	9/21/2013 17:28	9/21/2013 17:31	PIC	GABS13
S3	10C	3	65	22496	9/21/2013 17:21	9/21/2013 17:24	PIC	GABS13
S4	10C	3	62	22381	9/21/2013 17:37	9/21/2013 17:40	PIC	GABS13
S5	10C	3	76	23254	9/21/2013 17:12	9/21/2013 17:15	PIC	GABS13
S6	10C	3	74	21971	9/21/2013 17:07	9/21/2013 17:10	PIC	GABS13
S7	10C	3	47	21225	9/21/2013 17:02	9/21/2013 17:05	PIC	GABS13
S8	10C	3	68	20600	9/21/2013 17:17	9/21/2013 17:20	PIC	GABS13
S1	10D	3	54	25707	9/21/2013 17:37	9/21/2013 17:40	PIC	GABS13
S2	10D	3	58	24666	9/21/2013 17:32	9/21/2013 17:35	PIC	GABS13
S3	10D	3	47	22551	9/21/2013 17:28	9/21/2013 17:31	PIC	GABS13
S4	10D	3	53	22518	9/21/2013 17:21	9/21/2013 17:24	PIC	GABS13
S5	10D	3	43	23963	9/21/2013 17:17	9/21/2013 17:20	PIC	GABS13
S6	10D	3	57	22285	9/21/2013 17:12	9/21/2013 17:15	PIC	GABS13
S7	10D	3	40	21399	9/21/2013 17:07	9/21/2013 17:10	PIC	GABS13
S8	10D	3	31	20830	9/21/2013 17:02	9/21/2013 17:05	PIC	GABS13
S1	11A	3	0	23343	9/21/2013 16:16	9/21/2013 16:19	PIC	GABS13
S2	11A	3	8	23076	9/21/2013 16:30	9/21/2013 16:33	PIC	GABS13
S3	11A	3	3	20922	9/21/2013 16:25	9/21/2013 16:28	PIC	GABS13
S4	11A	3	7	20687	9/21/2013 16:21	9/21/2013 16:24	PIC	GABS13

S5	11A	3	3	21368	9/21/2013 16:36	9/21/2013 16:39	PIC GABS13
S6	11A	3	5	21140	9/21/2013 17:08	9/21/2013 17:11	PIC GABS13
S7	11A	3	1	20106	9/21/2013 16:57	9/21/2013 17:00	PIC GABS13
S8	11A	3	5	19597	9/21/2013 16:40	9/21/2013 16:43	PIC GABS13
S1	11B	3	1	25687	9/21/2013 16:21	9/21/2013 16:24	PIC GABS13
S2	11B	3	5	24716	9/21/2013 16:16	9/21/2013 16:19	PIC GABS13
S3	11B	3	5	22599	9/21/2013 16:30	9/21/2013 16:33	PIC GABS13
S4	11B	3	9	22423	9/21/2013 16:25	9/21/2013 16:28	PIC GABS13
S5	11B	3	5	23148	9/21/2013 16:40	9/21/2013 16:43	PIC GABS13
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S7	11B	3	2	21184	9/21/2013 17:08	9/21/2013 17:11	PIC GABS13
S8	11B	3	2	20581	9/21/2013 16:57	9/21/2013 17:00	PIC GABS13
S1	11C	3	2	25944	9/21/2013 16:25	9/21/2013 16:28	PIC GABS13
S2	11C	3	5	24751	9/21/2013 16:21	9/21/2013 16:24	PIC GABS13
S3	11C	3	7	22621	9/21/2013 16:16	9/21/2013 16:19	PIC GABS13
S4	11C	3	14	22444	9/21/2013 16:30	9/21/2013 16:33	PIC GABS13
S5	11C	3	3	23360	9/21/2013 16:57	9/21/2013 17:00	PIC GABS13
S6	11C	3	3	22361	9/21/2013 16:40	9/21/2013 16:43	PIC GABS13
S7	11C	3	8	21503	9/21/2013 16:36	9/21/2013 16:39	PIC GABS13
S8	11C	3	5	20724	9/21/2013 17:08	9/21/2013 17:11	PIC GABS13
S1	11D	3	1	25789	9/21/2013 16:30	9/21/2013 16:33	PIC GABS13
S2	11D	3	5	24851	9/21/2013 16:26	9/21/2013 16:29	PIC GABS13
S3	11D	3	4	22574	9/21/2013 16:21	9/21/2013 16:24	PIC GABS13
S4	11D	3	5	22497	9/21/2013 16:17	9/21/2013 16:20	PIC GABS13
S5	11D	3	2	23408	9/21/2013 17:08	9/21/2013 17:11	PIC GABS13
S6	11D	3	3	22214	9/21/2013 16:58	9/21/2013 17:01	PIC GABS13
S7	11D	3	4	21079	9/21/2013 16:40	9/21/2013 16:43	PIC GABS13
S8	11D	3	4	20358	9/21/2013 16:36	9/21/2013 16:39	PIC GABS13
S1	12A	3	2	25088	9/21/2013 16:36	9/21/2013 16:39	PIC GABS13
S2	12A	3	1	24334	9/21/2013 17:08	9/21/2013 17:11	PIC GABS13
S3	12A	3	3	22035	9/21/2013 16:58	9/21/2013 17:01	PIC GABS13
S4	12A	3	2	21621	9/21/2013 16:40	9/21/2013 16:43	PIC GABS13
S5	12A	3	3	22780	9/21/2013 16:17	9/21/2013 16:20	PIC GABS13
S6	12A	3	2	21800	9/21/2013 16:30	9/21/2013 16:33	PIC GABS13
S7	12A	3	2	20729	9/21/2013 16:26	9/21/2013 16:29	PIC GABS13
S8	12A	3	2	20591	9/21/2013 16:21	9/21/2013 16:24	PIC GABS13
S1	12B	3	1	23678	9/21/2013 16:40	9/21/2013 16:43	PIC GABS13

S2	12B	3	4	22544	9/21/2013 16:36	9/21/2013 16:39	PIC	GABS13
S3	12B	3	5	20388	9/21/2013 17:09	9/21/2013 17:12	PIC	GABS13
S4	12B	3	7	20391	9/21/2013 16:58	9/21/2013 17:01	PIC	GABS13
S5	12B	3	3	21250	9/21/2013 16:21	9/21/2013 16:24	PIC	GABS13
S6	12B	3	6	19693	9/21/2013 16:17	9/21/2013 16:20	PIC	GABS13
S7	12B	3	5	19347	9/21/2013 16:30	9/21/2013 16:33	PIC	GABS13
S8	12B	3	4	18471	9/21/2013 16:26	9/21/2013 16:29	PIC	GABS13
S1	12C	3	12	25849	9/21/2013 16:58	9/21/2013 17:01	PIC	GABS13
S2	12C	3	14	24804	9/21/2013 16:40	9/21/2013 16:43	PIC	GABS13
S3	12C	3	9	22706	9/21/2013 16:36	9/21/2013 16:39	PIC	GABS13
S4	12C	3	11	22573	9/21/2013 17:09	9/21/2013 17:12	PIC	GABS13
S5	12C	3	11	23680	9/21/2013 16:26	9/21/2013 16:29	PIC	GABS13
S6	12C	3	12	22297	9/21/2013 16:22	9/21/2013 16:25	PIC	GABS13
S7	12C	3	14	21578	9/21/2013 16:17	9/21/2013 16:20	PIC	GABS13
S8	12C	3	13	20526	9/21/2013 16:31	9/21/2013 16:34	PIC	GABS13
S1	12D	3	3	26384	9/21/2013 17:09	9/21/2013 17:12	PIC	GABS13
S2	12D	3	11	25368	9/21/2013 17:03	9/21/2013 17:06	PIC	GABS13
S3	12D	3	8	23293	9/21/2013 16:41	9/21/2013 16:44	PIC	GABS13
S4	12D	3	11	22898	9/21/2013 16:36	9/21/2013 16:39	PIC	GABS13
S5	12D	3	2	23905	9/21/2013 16:31	9/21/2013 16:34	PIC	GABS13
S6	12D	3	4	23037	9/21/2013 16:26	9/21/2013 16:29	PIC	GABS13
S7	12D	3	8	22185	9/21/2013 16:22	9/21/2013 16:25	PIC	GABS13
S8	12D	3	6	21281	9/21/2013 16:17	9/21/2013 16:20	PIC	GABS13
S1	13A	3	6	25299	9/24/2013 15:16	9/24/2013 15:19	PIC	GABS13
S2	13A	3	2	24154	9/24/2013 16:07	9/24/2013 16:10	PIC	GABS13
S3	13A	3	6	22411	9/24/2013 16:02	9/24/2013 16:05	PIC	GABS13
S4	13A	3	10	22123	9/24/2013 15:46	9/24/2013 15:49	PIC	GABS13
S5	13A	3	1	23299	9/24/2013 16:12	9/24/2013 16:15	PIC	GABS13
S6	13A	3	4	21941	9/24/2013 17:06	9/24/2013 17:09	PIC	GABS13
S7	13A	3	3	21501	9/24/2013 16:28	9/24/2013 16:31	PIC	GABS13
S8	13A	3	2	20330	9/24/2013 16:21	9/24/2013 16:24	PIC	GABS13
S1	13B	3	3	25707	9/24/2013 15:46	9/24/2013 15:49	PIC	GABS13
S2	13B	3	2	25003	9/24/2013 15:16	9/24/2013 15:19	PIC	GABS13
S3	13B	3	7	22716	9/24/2013 16:07	9/24/2013 16:10	PIC	GABS13
S4	13B	3	6	22665	9/24/2013 16:02	9/24/2013 16:05	PIC	GABS13
S5	13B	3	3	23407	9/24/2013 16:21	9/24/2013 16:24	PIC	GABS13
S6	13B	3	1	22288	9/24/2013 16:12	9/24/2013 16:15	PIC	GABS13

S7	13B	3	3	21552	9/24/2013 17:06	9/24/2013 17:09	PIC	GABS13
S8	13B	3	6	20809	9/24/2013 16:28	9/24/2013 16:31	PIC	GABS13
S1	13C	3	1	24439	9/24/2013 16:02	9/24/2013 16:05	PIC	GABS13
S2	13C	3	6	23471	9/24/2013 15:46	9/24/2013 15:49	PIC	GABS13
S3	13C	3	2	20847	9/24/2013 15:16	9/24/2013 15:19	PIC	GABS13
S4	13C	3	6	21047	9/24/2013 16:07	9/24/2013 16:10	PIC	GABS13
S5	13C	3	3	21798	9/24/2013 16:28	9/24/2013 16:31	PIC	GABS13
S6	13C	3	6	20780	9/24/2013 16:21	9/24/2013 16:24	PIC	GABS13
S7	13C	3	4	19932	9/24/2013 16:12	9/24/2013 16:15	PIC	GABS13
S8	13C	3	4	19649	9/24/2013 17:06	9/24/2013 17:09	PIC	GABS13
S1	13D	3	7	25369	9/24/2013 16:08	9/24/2013 16:11	PIC	GABS13
S2	13D	3	0	24423	9/24/2013 16:02	9/24/2013 16:05	PIC	GABS13
S3	13D	3	5	22268	9/24/2013 15:46	9/24/2013 15:49	PIC	GABS13
S4	13D	3	7	22067	9/24/2013 15:16	9/24/2013 15:19	PIC	GABS13
S5	13D	3	7	22700	9/24/2013 17:06	9/24/2013 17:09	PIC	GABS13
S6	13D	3	6	21712	9/24/2013 16:28	9/24/2013 16:31	PIC	GABS13
S7	13D	3	4	20958	9/24/2013 16:22	9/24/2013 16:25	PIC	GABS13
S8	13D	3	5	20458	9/24/2013 16:12	9/24/2013 16:15	PIC	GABS13
S1	14A	3	3	25239	9/24/2013 16:12	9/24/2013 16:15	PIC	GABS13
S2	14A	3	3	23924	9/24/2013 17:06	9/24/2013 17:09	PIC	GABS13
S3	14A	3	2	21860	9/24/2013 16:29	9/24/2013 16:32	PIC	GABS13
S4	14A	3	7	22077	9/24/2013 16:22	9/24/2013 16:25	PIC	GABS13
S5	14A	3	5	22308	9/24/2013 15:16	9/24/2013 15:19	PIC	GABS13
S6	14A	3	1	21266	9/24/2013 16:08	9/24/2013 16:11	PIC	GABS13
S7	14A	3	6	20788	9/24/2013 16:02	9/24/2013 16:05	PIC	GABS13
S8	14A	3	4	20028	9/24/2013 15:46	9/24/2013 15:49	PIC	GABS13
S1	14B	3	1	26392	9/24/2013 16:22	9/24/2013 16:25	PIC	GABS13
S2	14B	3	3	25423	9/24/2013 16:12	9/24/2013 16:15	PIC	GABS13
S3	14B	3	5	23499	9/24/2013 17:06	9/24/2013 17:09	PIC	GABS13
S4	14B	3	12	22910	9/24/2013 16:29	9/24/2013 16:32	PIC	GABS13
S5	14B	3	7	23778	9/24/2013 15:46	9/24/2013 15:49	PIC	GABS13
S6	14B	3	4	22469	9/24/2013 15:17	9/24/2013 15:20	PIC	GABS13
S7	14B	3	0	21921	9/24/2013 16:08	9/24/2013 16:11	PIC	GABS13
S8	14B	3	6	21162	9/24/2013 16:02	9/24/2013 16:05	PIC	GABS13
S1	14C	3	0	24820	9/24/2013 16:29	9/24/2013 16:32	PIC	GABS13
S2	14C	3	5	24032	9/24/2013 16:22	9/24/2013 16:25	PIC	GABS13
S3	14C	3	2	21582	9/24/2013 16:12	9/24/2013 16:15	PIC	GABS13

S4	14C	3	7	21926	9/24/2013 17:06	9/24/2013 17:09	PIC	GABS13
S5	14C	3	3	22686	9/24/2013 16:02	9/24/2013 16:05	PIC	GABS13
S6	14C	3	6	21331	9/24/2013 15:47	9/24/2013 15:50	PIC	GABS13
S7	14C	3	4	20928	9/24/2013 15:17	9/24/2013 15:20	PIC	GABS13
S8	14C	3	4	20079	9/24/2013 16:08	9/24/2013 16:11	PIC	GABS13
S1	14D	3	2	25905	9/24/2013 17:06	9/24/2013 17:09	PIC	GABS13
S2	14D	3	4	25199	9/24/2013 16:29	9/24/2013 16:32	PIC	GABS13
S3	14D	3	5	23027	9/24/2013 16:22	9/24/2013 16:25	PIC	GABS13
S4	14D	3	7	22602	9/24/2013 16:12	9/24/2013 16:15	PIC	GABS13
S5	14D	3	2	23468	9/24/2013 16:08	9/24/2013 16:11	PIC	GABS13
S6	14D	3	5	22259	9/24/2013 16:02	9/24/2013 16:05	PIC	GABS13
S7	14D	3	7	21431	9/24/2013 15:47	9/24/2013 15:50	PIC	GABS13
S8	14D	3	2	21039	9/24/2013 15:17	9/24/2013 15:20	PIC	GABS13
S1	1A	3	20	25625	9/21/2013 13:30	9/21/2013 13:33	PIC	GABS13
S2	1A	3	18	25019	9/21/2013 13:53	9/21/2013 13:56	PIC	GABS13
S3	1A	3	21	22593	9/21/2013 13:40	9/21/2013 13:43	PIC	GABS13
S4	1A	3	28	22383	9/21/2013 13:36	9/21/2013 13:39	PIC	GABS13
S5	1A	3	23	23109	9/21/2013 13:57	9/21/2013 14:00	PIC	GABS13
S6	1A	3	24	22120	9/21/2013 14:20	9/21/2013 14:23	PIC	GABS13
S7	1A	3	27	21380	9/21/2013 14:06	9/21/2013 14:09	PIC	GABS13
S8	1A	3	24	20797	9/21/2013 14:02	9/21/2013 14:05	PIC	GABS13
S1	1B	3	63	25604	9/21/2013 13:36	9/21/2013 13:39	PIC	GABS13
S2	1B	3	54	24236	9/21/2013 13:30	9/21/2013 13:33	PIC	GABS13
S3	1B	3	50	22325	9/21/2013 13:53	9/21/2013 13:56	PIC	GABS13
S4	1B	3	59	22268	9/21/2013 13:40	9/21/2013 13:43	PIC	GABS13
S5	1B	3	48	23291	9/21/2013 14:02	9/21/2013 14:05	PIC	GABS13
S6	1B	3	33	22223	9/21/2013 13:57	9/21/2013 14:00	PIC	GABS13
S7	1B	3	45	21257	9/21/2013 14:20	9/21/2013 14:23	PIC	GABS13
S8	1B	3	53	20600	9/21/2013 14:07	9/21/2013 14:10	PIC	GABS13
S1	1C	3	442	26407	9/21/2013 13:41	9/21/2013 13:44	PIC	GABS13
S2	1C	3	422	24969	9/21/2013 13:36	9/21/2013 13:39	PIC	GABS13
S3	1C	3	435	22919	9/21/2013 13:30	9/21/2013 13:33	PIC	GABS13
S4	1C	3	414	22445	9/21/2013 13:53	9/21/2013 13:56	PIC	GABS13
S5	1C	3	404	23570	9/21/2013 14:07	9/21/2013 14:10	PIC	GABS13
S6	1C	3	360	22340	9/21/2013 14:02	9/21/2013 14:05	PIC	GABS13
S7	1C	3	348	21628	9/21/2013 13:57	9/21/2013 14:00	PIC	GABS13
S8	1C	3	320	20846	9/21/2013 14:20	9/21/2013 14:23	PIC	GABS13

S1	1D	3	357	25634	9/21/2013 13:53	9/21/2013 13:56	PIC	GABS13
S2	1D	3	286	24501	9/21/2013 13:41	9/21/2013 13:44	PIC	GABS13
S3	1D	3	286	22573	9/21/2013 13:36	9/21/2013 13:39	PIC	GABS13
S4	1D	3	313	22099	9/21/2013 13:30	9/21/2013 13:33	PIC	GABS13
S5	1D	3	284	22891	9/21/2013 14:20	9/21/2013 14:23	PIC	GABS13
S6	1D	3	258	22081	9/21/2013 14:07	9/21/2013 14:10	PIC	GABS13
S7	1D	3	240	21132	9/21/2013 14:02	9/21/2013 14:05	PIC	GABS13
S8	1D	3	254	20524	9/21/2013 13:58	9/21/2013 14:01	PIC	GABS13
S1	2A	3	2	23125	9/21/2013 13:58	9/21/2013 14:01	PIC	GABS13
S2	2A	3	6	22846	9/21/2013 14:20	9/21/2013 14:23	PIC	GABS13
S3	2A	3	1	20461	9/21/2013 14:07	9/21/2013 14:10	PIC	GABS13
S4	2A	3	6	20333	9/21/2013 14:02	9/21/2013 14:05	PIC	GABS13
S5	2A	3	5	21066	9/21/2013 13:31	9/21/2013 13:34	PIC	GABS13
S6	2A	3	3	20302	9/21/2013 13:53	9/21/2013 13:56	PIC	GABS13
S7	2A	3	3	19482	9/21/2013 13:41	9/21/2013 13:44	PIC	GABS13
S8	2A	3	3	18865	9/21/2013 13:36	9/21/2013 13:39	PIC	GABS13
S1	2B	3	3	22785	9/21/2013 14:02	9/21/2013 14:05	PIC	GABS13
S2	2B	3	4	22179	9/21/2013 13:58	9/21/2013 14:01	PIC	GABS13
S3	2B	3	4	20359	9/21/2013 14:20	9/21/2013 14:23	PIC	GABS13
S4	2B	3	4	19835	9/21/2013 14:07	9/21/2013 14:10	PIC	GABS13
S5	2B	3	0	21151	9/21/2013 13:36	9/21/2013 13:39	PIC	GABS13
S6	2B	3	3	19660	9/21/2013 13:31	9/21/2013 13:34	PIC	GABS13
S7	2B	3	2	19215	9/21/2013 13:53	9/21/2013 13:56	PIC	GABS13
S8	2B	3	4	18355	9/21/2013 13:41	9/21/2013 13:44	PIC	GABS13
S1	2C	3	48	23809	9/21/2013 14:07	9/21/2013 14:10	PIC	GABS13
S2	2C	3	44	22311	9/21/2013 14:02	9/21/2013 14:05	PIC	GABS13
S3	2C	3	36	21118	9/21/2013 13:58	9/21/2013 14:01	PIC	GABS13
S4	2C	3	60	20958	9/21/2013 14:20	9/21/2013 14:23	PIC	GABS13
S5	2C	3	38	21668	9/21/2013 13:41	9/21/2013 13:44	PIC	GABS13
S6	2C	3	47	20769	9/21/2013 13:37	9/21/2013 13:40	PIC	GABS13
S7	2C	3	45	20374	9/21/2013 13:31	9/21/2013 13:34	PIC	GABS13
S8	2C	3	49	19290	9/21/2013 13:53	9/21/2013 13:56	PIC	GABS13
S1	2D	3	4	23028	9/21/2013 14:20	9/21/2013 14:23	PIC	GABS13
S2	2D	3	3	21788	9/21/2013 14:07	9/21/2013 14:10	PIC	GABS13
S3	2D	3	4	19932	9/21/2013 14:03	9/21/2013 14:06	PIC	GABS13
S4	2D	3	8	20266	9/21/2013 13:58	9/21/2013 14:01	PIC	GABS13
S5	2D	3	10	20864	9/21/2013 13:53	9/21/2013 13:56	PIC	GABS13

S6	2D	3	2	19378	9/21/2013 13:41	9/21/2013 13:44	PIC	GABS13
S7	2D	3	6	19163	9/21/2013 13:37	9/21/2013 13:40	PIC	GABS13
S8	2D	3	3	18448	9/21/2013 13:31	9/21/2013 13:34	PIC	GABS13
S1	3A	3	271	24286	9/21/2013 12:02	9/21/2013 12:05	PIC	GABS13
S2	3A	3	279	23428	9/21/2013 12:18	9/21/2013 12:21	PIC	GABS13
S3	3A	3	251	21194	9/21/2013 12:13	9/21/2013 12:16	PIC	GABS13
S4	3A	3	218	21238	9/21/2013 12:07	9/21/2013 12:10	PIC	GABS13
S5	3A	3	273	22086	9/21/2013 12:26	9/21/2013 12:29	PIC	GABS13
S6	3A	3	262	21312	9/21/2013 13:24	9/21/2013 13:27	PIC	GABS13
S7	3A	3	226	20136	9/21/2013 13:19	9/21/2013 13:22	PIC	GABS13
S8	3A	3	258	19693	9/21/2013 13:12	9/21/2013 13:15	PIC	GABS13
S1	3B	3	508	25317	9/21/2013 12:07	9/21/2013 12:10	PIC	GABS13
S2	3B	3	475	24358	9/21/2013 12:02	9/21/2013 12:05	PIC	GABS13
S3	3B	3	449	22204	9/21/2013 12:18	9/21/2013 12:21	PIC	GABS13
S4	3B	3	396	22090	9/21/2013 12:13	9/21/2013 12:16	PIC	GABS13
S5	3B	3	467	22953	9/21/2013 13:12	9/21/2013 13:15	PIC	GABS13
S6	3B	3	434	21791	9/21/2013 12:27	9/21/2013 12:30	PIC	GABS13
S7	3B	3	402	21142	9/21/2013 13:24	9/21/2013 13:27	PIC	GABS13
S8	3B	3	374	20555	9/21/2013 13:19	9/21/2013 13:22	PIC	GABS13
S1	3C	3	218	25442	9/21/2013 12:13	9/21/2013 12:16	PIC	GABS13
S2	3C	3	256	24503	9/21/2013 12:07	9/21/2013 12:10	PIC	GABS13
S3	3C	3	181	22403	9/21/2013 12:02	9/21/2013 12:05	PIC	GABS13
S4	3C	3	164	22022	9/21/2013 12:18	9/21/2013 12:21	PIC	GABS13
S5	3C	3	182	23164	9/21/2013 13:20	9/21/2013 13:23	PIC	GABS13
S6	3C	3	193	21951	9/21/2013 13:12	9/21/2013 13:15	PIC	GABS13
S7	3C	3	202	20923	9/21/2013 12:27	9/21/2013 12:30	PIC	GABS13
S8	3C	3	185	20428	9/21/2013 13:24	9/21/2013 13:27	PIC	GABS13
S1	3D	3	181	24704	9/21/2013 12:18	9/21/2013 12:21	PIC	GABS13
S2	3D	3	184	23963	9/21/2013 12:13	9/21/2013 12:16	PIC	GABS13
S3	3D	3	156	22298	9/21/2013 12:07	9/21/2013 12:10	PIC	GABS13
S4	3D	3	138	21817	9/21/2013 12:02	9/21/2013 12:05	PIC	GABS13
S5	3D	3	189	22704	9/21/2013 13:24	9/21/2013 13:27	PIC	GABS13
S6	3D	3	163	21537	9/21/2013 13:20	9/21/2013 13:23	PIC	GABS13
S7	3D	3	157	20982	9/21/2013 13:12	9/21/2013 13:15	PIC	GABS13
S8	3D	3	131	20298	9/21/2013 12:27	9/21/2013 12:30	PIC	GABS13
S1	4A	3	202	24165	9/21/2013 12:27	9/21/2013 12:30	PIC	GABS13
S2	4A	3	192	23633	9/21/2013 13:24	9/21/2013 13:27	PIC	GABS13

S3	4A	3	144	22390	9/21/2013 13:20	9/21/2013 13:23	PIC	GABS13
S4	4A	3	160	21559	9/21/2013 13:12	9/21/2013 13:15	PIC	GABS13
S5	4A	3	163	22516	9/21/2013 12:03	9/21/2013 12:06	PIC	GABS13
S6	4A	3	129	21729	9/21/2013 12:19	9/21/2013 12:22	PIC	GABS13
S7	4A	3	140	20553	9/21/2013 12:13	9/21/2013 12:16	PIC	GABS13
S8	4A	3	108	20009	9/21/2013 12:07	9/21/2013 12:10	PIC	GABS13
S1	4B	3	3	25102	9/21/2013 13:12	9/21/2013 13:15	PIC	GABS13
S2	4B	3	7	24143	9/21/2013 12:27	9/21/2013 12:30	PIC	GABS13
S3	4B	3	3	21901	9/21/2013 13:25	9/21/2013 13:28	PIC	GABS13
S4	4B	3	7	22047	9/21/2013 13:20	9/21/2013 13:23	PIC	GABS13
S5	4B	3	5	22736	9/21/2013 12:08	9/21/2013 12:11	PIC	GABS13
S6	4B	3	1	21870	9/21/2013 12:03	9/21/2013 12:06	PIC	GABS13
S7	4B	3	5	21039	9/21/2013 12:19	9/21/2013 12:22	PIC	GABS13
S8	4B	3	4	20015	9/21/2013 12:13	9/21/2013 12:16	PIC	GABS13
S1	4C	3	74	24607	9/21/2013 13:20	9/21/2013 13:23	PIC	GABS13
S2	4C	3	67	23130	9/21/2013 13:12	9/21/2013 13:15	PIC	GABS13
S3	4C	3	49	21352	9/21/2013 12:27	9/21/2013 12:30	PIC	GABS13
S4	4C	3	56	22152	9/21/2013 13:25	9/21/2013 13:28	PIC	GABS13
S5	4C	3	76	22261	9/21/2013 12:13	9/21/2013 12:16	PIC	GABS13
S6	4C	3	65	21527	9/21/2013 12:08	9/21/2013 12:11	PIC	GABS13
S7	4C	3	43	20985	9/21/2013 12:03	9/21/2013 12:06	PIC	GABS13
S8	4C	3	62	20088	9/21/2013 12:19	9/21/2013 12:22	PIC	GABS13
S1	4D	3	491	25199	9/21/2013 13:25	9/21/2013 13:28	PIC	GABS13
S2	4D	3	420	23618	9/21/2013 13:20	9/21/2013 13:23	PIC	GABS13
S3	4D	3	374	22248	9/21/2013 13:13	9/21/2013 13:16	PIC	GABS13
S4	4D	3	418	21918	9/21/2013 12:27	9/21/2013 12:30	PIC	GABS13
S5	4D	3	391	22494	9/21/2013 12:19	9/21/2013 12:22	PIC	GABS13
S6	4D	3	373	21560	9/21/2013 12:13	9/21/2013 12:16	PIC	GABS13
S7	4D	3	363	20559	9/21/2013 12:08	9/21/2013 12:11	PIC	GABS13
S8	4D	3	346	19888	9/21/2013 12:03	9/21/2013 12:06	PIC	GABS13
S1	5A	3	128	26044	9/21/2013 14:24	9/21/2013 14:27	PIC	GABS13
S2	5A	3	131	24973	9/21/2013 14:45	9/21/2013 14:48	PIC	GABS13
S3	5A	3	131	22977	9/21/2013 14:38	9/21/2013 14:41	PIC	GABS13
S4	5A	3	136	22672	9/21/2013 14:34	9/21/2013 14:37	PIC	GABS13
S5	5A	3	129	23532	9/21/2013 15:00	9/21/2013 15:03	PIC	GABS13
S6	5A	3	119	22258	9/21/2013 15:13	9/21/2013 15:16	PIC	GABS13
S7	5A	3	101	21577	9/21/2013 15:09	9/21/2013 15:12	PIC	GABS13

S8	5A	3	104	20799	9/21/2013 15:04	9/21/2013 15:07	PIC	GABS13
S1	5B	3	100	25846	9/21/2013 14:34	9/21/2013 14:37	PIC	GABS13
S2	5B	3	126	24804	9/21/2013 14:24	9/21/2013 14:27	PIC	GABS13
S3	5B	3	94	22810	9/21/2013 14:45	9/21/2013 14:48	PIC	GABS13
S4	5B	3	104	22478	9/21/2013 14:38	9/21/2013 14:41	PIC	GABS13
S5	5B	3	108	23360	9/21/2013 15:04	9/21/2013 15:07	PIC	GABS13
S6	5B	3	95	22017	9/21/2013 15:00	9/21/2013 15:03	PIC	GABS13
S7	5B	3	97	21376	9/21/2013 15:13	9/21/2013 15:16	PIC	GABS13
S8	5B	3	75	20752	9/21/2013 15:09	9/21/2013 15:12	PIC	GABS13
S1	5C	3	93	25881	9/21/2013 14:39	9/21/2013 14:42	PIC	GABS13
S2	5C	3	105	25038	9/21/2013 14:34	9/21/2013 14:37	PIC	GABS13
S3	5C	3	93	22892	9/21/2013 14:24	9/21/2013 14:27	PIC	GABS13
S4	5C	3	91	22178	9/21/2013 14:45	9/21/2013 14:48	PIC	GABS13
S5	5C	3	83	23120	9/21/2013 15:09	9/21/2013 15:12	PIC	GABS13
S6	5C	3	84	22262	9/21/2013 15:04	9/21/2013 15:07	PIC	GABS13
S7	5C	3	79	21171	9/21/2013 15:00	9/21/2013 15:03	PIC	GABS13
S8	5C	3	87	20671	9/21/2013 15:13	9/21/2013 15:16	PIC	GABS13
S1	5D	3	160	25415	9/21/2013 14:45	9/21/2013 14:48	PIC	GABS13
S2	5D	3	150	24521	9/21/2013 14:39	9/21/2013 14:42	PIC	GABS13
S3	5D	3	150	22700	9/21/2013 14:34	9/21/2013 14:37	PIC	GABS13
S4	5D	3	145	22605	9/21/2013 14:24	9/21/2013 14:27	PIC	GABS13
S5	5D	3	133	23311	9/21/2013 15:13	9/21/2013 15:16	PIC	GABS13
S6	5D	3	151	22277	9/21/2013 15:09	9/21/2013 15:12	PIC	GABS13
S7	5D	3	145	21113	9/21/2013 15:04	9/21/2013 15:07	PIC	GABS13
S8	5D	3	143	20574	9/21/2013 15:00	9/21/2013 15:03	PIC	GABS13
S1	6A	3	133	25444	9/21/2013 15:00	9/21/2013 15:03	PIC	GABS13
S2	6A	3	112	24148	9/21/2013 15:14	9/21/2013 15:17	PIC	GABS13
S3	6A	3	86	22561	9/21/2013 15:09	9/21/2013 15:12	PIC	GABS13
S4	6A	3	113	22213	9/21/2013 15:04	9/21/2013 15:07	PIC	GABS13
S5	6A	3	85	23089	9/21/2013 14:26	9/21/2013 14:29	PIC	GABS13
S6	6A	3	92	21889	9/21/2013 14:46	9/21/2013 14:49	PIC	GABS13
S7	6A	3	83	21003	9/21/2013 14:39	9/21/2013 14:42	PIC	GABS13
S8	6A	3	96	20384	9/21/2013 14:35	9/21/2013 14:38	PIC	GABS13
S1	6B	3	271	25842	9/21/2013 15:05	9/21/2013 15:08	PIC	GABS13
S2	6B	3	204	24756	9/21/2013 15:00	9/21/2013 15:03	PIC	GABS13
S3	6B	3	183	22966	9/21/2013 15:14	9/21/2013 15:17	PIC	GABS13
S4	6B	3	191	22553	9/21/2013 15:10	9/21/2013 15:13	PIC	GABS13

S5	6B	3	207	23518	9/21/2013 14:35	9/21/2013 14:38	PIC	GABS13
S6	6B	3	192	21991	9/21/2013 14:28	9/21/2013 14:31	PIC	GABS13
S7	6B	3	169	21384	9/21/2013 14:46	9/21/2013 14:49	PIC	GABS13
S8	6B	3	192	20538	9/21/2013 14:39	9/21/2013 14:42	PIC	GABS13
S1	6C	3	211	25095	9/21/2013 15:10	9/21/2013 15:13	PIC	GABS13
S2	6C	3	188	24324	9/21/2013 15:05	9/21/2013 15:08	PIC	GABS13
S3	6C	3	166	22361	9/21/2013 15:00	9/21/2013 15:03	PIC	GABS13
S4	6C	3	188	22007	9/21/2013 15:14	9/21/2013 15:17	PIC	GABS13
S5	6C	3	191	23024	9/21/2013 14:39	9/21/2013 14:42	PIC	GABS13
S6	6C	3	157	21525	9/21/2013 14:35	9/21/2013 14:38	PIC	GABS13
S7	6C	3	154	21308	9/21/2013 14:28	9/21/2013 14:31	PIC	GABS13
S8	6C	3	152	20267	9/21/2013 14:46	9/21/2013 14:49	PIC	GABS13
S1	7A	3	26	25836	9/21/2013 15:24	9/21/2013 15:27	PIC	GABS13
S2	7A	3	29	24812	9/21/2013 15:38	9/21/2013 15:41	PIC	GABS13
S3	7A	3	31	22637	9/21/2013 15:33	9/21/2013 15:36	PIC	GABS13
S4	7A	3	25	22367	9/21/2013 15:29	9/21/2013 15:32	PIC	GABS13
S5	7A	3	25	23254	9/21/2013 15:44	9/21/2013 15:47	PIC	GABS13
S6	7A	3	28	22113	9/21/2013 15:57	9/21/2013 16:00	PIC	GABS13
S7	7A	3	30	21394	9/21/2013 15:52	9/21/2013 15:55	PIC	GABS13
S8	7A	3	23	20794	9/21/2013 15:48	9/21/2013 15:51	PIC	GABS13
S1	7B	3	45	25947	9/21/2013 15:29	9/21/2013 15:32	PIC	GABS13
S2	7B	3	57	24962	9/21/2013 15:25	9/21/2013 15:28	PIC	GABS13
S3	7B	3	56	22788	9/21/2013 15:38	9/21/2013 15:41	PIC	GABS13
S4	7B	3	55	22297	9/21/2013 15:33	9/21/2013 15:36	PIC	GABS13
S5	7B	3	51	23465	9/21/2013 15:48	9/21/2013 15:51	PIC	GABS13
S6	7B	3	42	22274	9/21/2013 15:44	9/21/2013 15:47	PIC	GABS13
S7	7B	3	45	21551	9/21/2013 15:57	9/21/2013 16:00	PIC	GABS13
S8	7B	3	35	20819	9/21/2013 15:52	9/21/2013 15:55	PIC	GABS13
S1	7C	3	8	24857	9/21/2013 15:34	9/21/2013 15:37	PIC	GABS13
S2	7C	3	8	24176	9/21/2013 15:29	9/21/2013 15:32	PIC	GABS13
S3	7C	3	7	22112	9/21/2013 15:25	9/21/2013 15:28	PIC	GABS13
S4	7C	3	14	21602	9/21/2013 15:38	9/21/2013 15:41	PIC	GABS13
S5	7C	3	18	22837	9/21/2013 15:53	9/21/2013 15:56	PIC	GABS13
S6	7C	3	11	21615	9/21/2013 15:48	9/21/2013 15:51	PIC	GABS13
S7	7C	3	16	20772	9/21/2013 15:44	9/21/2013 15:47	PIC	GABS13
S8	7C	3	5	20339	9/21/2013 15:57	9/21/2013 16:00	PIC	GABS13
S1	7D	3	21	25491	9/21/2013 15:39	9/21/2013 15:42	PIC	GABS13

S2	7D	3	26	24470	9/21/2013 15:34	9/21/2013 15:37	PIC	GABS13
S3	7D	3	18	22692	9/21/2013 15:29	9/21/2013 15:32	PIC	GABS13
S4	7D	3	18	22394	9/21/2013 15:25	9/21/2013 15:28	PIC	GABS13
S5	7D	3	25	22949	9/21/2013 15:57	9/21/2013 16:00	PIC	GABS13
S6	7D	3	19	22151	9/21/2013 15:53	9/21/2013 15:56	PIC	GABS13
S7	7D	3	15	20830	9/21/2013 15:48	9/21/2013 15:51	PIC	GABS13
S8	7D	3	16	20618	9/21/2013 15:44	9/21/2013 15:47	PIC	GABS13
S1	8A	3	3	22437	9/21/2013 15:44	9/21/2013 15:47	PIC	GABS13
S2	8A	3	2	21492	9/21/2013 15:57	9/21/2013 16:00	PIC	GABS13
S3	8A	3	5	20337	9/21/2013 15:53	9/21/2013 15:56	PIC	GABS13
S4	8A	3	7	19590	9/21/2013 15:48	9/21/2013 15:51	PIC	GABS13
S5	8A	3	6	19913	9/21/2013 15:25	9/21/2013 15:28	PIC	GABS13
S6	8A	3	5	19463	9/21/2013 15:39	9/21/2013 15:42	PIC	GABS13
S7	8A	3	1	18241	9/21/2013 15:34	9/21/2013 15:37	PIC	GABS13
S8	8A	3	3	18172	9/21/2013 15:30	9/21/2013 15:33	PIC	GABS13
S1	8B	3	3	22367	9/21/2013 15:48	9/21/2013 15:51	PIC	GABS13
S2	8B	3	1	21728	9/21/2013 15:44	9/21/2013 15:47	PIC	GABS13
S3	8B	3	3	20205	9/21/2013 15:57	9/21/2013 16:00	PIC	GABS13
S4	8B	3	7	19767	9/21/2013 15:53	9/21/2013 15:56	PIC	GABS13
S5	8B	3	4	20729	9/21/2013 15:30	9/21/2013 15:33	PIC	GABS13
S6	8B	3	3	19567	9/21/2013 15:25	9/21/2013 15:28	PIC	GABS13
S7	8B	3	1	18959	9/21/2013 15:39	9/21/2013 15:42	PIC	GABS13
S8	8B	3	2	18303	9/21/2013 15:34	9/21/2013 15:37	PIC	GABS13
S1	8C	3	2	21830	9/21/2013 15:53	9/21/2013 15:56	PIC	GABS13
S2	8C	3	6	21368	9/21/2013 15:48	9/21/2013 15:51	PIC	GABS13
S3	8C	3	0	19704	9/21/2013 15:44	9/21/2013 15:47	PIC	GABS13
S4	8C	3	5	19401	9/21/2013 15:57	9/21/2013 16:00	PIC	GABS13
S5	8C	3	6	19818	9/21/2013 15:34	9/21/2013 15:37	PIC	GABS13
S6	8C	3	5	19029	9/21/2013 15:30	9/21/2013 15:33	PIC	GABS13
S7	8C	3	1	18223	9/21/2013 15:25	9/21/2013 15:28	PIC	GABS13
S8	8C	3	2	17983	9/21/2013 15:39	9/21/2013 15:42	PIC	GABS13
S1	8D	3	40	25811	9/21/2013 15:57	9/21/2013 16:00	PIC	GABS13
S2	8D	3	34	24854	9/21/2013 15:53	9/21/2013 15:56	PIC	GABS13
S3	8D	3	27	22758	9/21/2013 15:48	9/21/2013 15:51	PIC	GABS13
S4	8D	3	40	22505	9/21/2013 15:44	9/21/2013 15:47	PIC	GABS13
S5	8D	3	38	23615	9/21/2013 15:39	9/21/2013 15:42	PIC	GABS13
S6	8D	3	30	22557	9/21/2013 15:34	9/21/2013 15:37	PIC	GABS13

S7	8D	3	29	21368	9/21/2013 15:30	9/21/2013 15:33	PIC	GABS13
S8	8D	3	37	20679	9/21/2013 15:25	9/21/2013 15:28	PIC	GABS13
S1	9A	3	54	26109	9/21/2013 17:01	9/21/2013 17:04	PIC	GABS13
S2	9A	3	47	25227	9/21/2013 17:16	9/21/2013 17:19	PIC	GABS13
S3	9A	3	51	22999	9/21/2013 17:11	9/21/2013 17:14	PIC	GABS13
S4	9A	3	60	22512	9/21/2013 17:07	9/21/2013 17:10	PIC	GABS13
S5	9A	3	50	23507	9/21/2013 17:21	9/21/2013 17:24	PIC	GABS13
S6	9A	3	48	21945	9/21/2013 17:37	9/21/2013 17:40	PIC	GABS13
S7	9A	3	39	21492	9/21/2013 17:31	9/21/2013 17:34	PIC	GABS13
S8	9A	3	46	20691	9/21/2013 17:27	9/21/2013 17:30	PIC	GABS13
S1	9B	3	60	25990	9/21/2013 17:07	9/21/2013 17:10	PIC	GABS13
S2	9B	3	59	24930	9/21/2013 17:01	9/21/2013 17:04	PIC	GABS13
S3	9B	3	54	22796	9/21/2013 17:16	9/21/2013 17:19	PIC	GABS13
S4	9B	3	58	22590	9/21/2013 17:11	9/21/2013 17:14	PIC	GABS13
S5	9B	3	69	23152	9/21/2013 17:27	9/21/2013 17:30	PIC	GABS13
S6	9B	3	59	22396	9/21/2013 17:21	9/21/2013 17:24	PIC	GABS13
S7	9B	3	54	21751	9/21/2013 17:37	9/21/2013 17:40	PIC	GABS13
S8	9B	3	51	20646	9/21/2013 17:32	9/21/2013 17:35	PIC	GABS13
S1	9C	3	62	25465	9/21/2013 17:12	9/21/2013 17:15	PIC	GABS13
S2	9C	3	50	24707	9/21/2013 17:07	9/21/2013 17:10	PIC	GABS13
S3	9C	3	69	22353	9/21/2013 17:01	9/21/2013 17:04	PIC	GABS13
S4	9C	3	53	22173	9/21/2013 17:16	9/21/2013 17:19	PIC	GABS13
S5	9C	3	68	22883	9/21/2013 17:32	9/21/2013 17:35	PIC	GABS13
S6	9C	3	55	22218	9/21/2013 17:27	9/21/2013 17:30	PIC	GABS13
S7	9C	3	65	20983	9/21/2013 17:21	9/21/2013 17:24	PIC	GABS13
S8	9C	3	52	20661	9/21/2013 17:37	9/21/2013 17:40	PIC	GABS13
S1	9D	3	59	24913	9/21/2013 17:16	9/21/2013 17:19	PIC	GABS13
S2	9D	3	72	23917	9/21/2013 17:12	9/21/2013 17:15	PIC	GABS13
S3	9D	3	46	21731	9/21/2013 17:07	9/21/2013 17:10	PIC	GABS13
S4	9D	3	64	21652	9/21/2013 17:01	9/21/2013 17:04	PIC	GABS13
S5	9D	3	57	22477	9/21/2013 17:37	9/21/2013 17:40	PIC	GABS13
S6	9D	3	73	21347	9/21/2013 17:32	9/21/2013 17:35	PIC	GABS13
S7	9D	3	53	20518	9/21/2013 17:28	9/21/2013 17:31	PIC	GABS13
S8	9D	3	42	20002	9/21/2013 17:21	9/21/2013 17:24	PIC	GABS13

Alpha Xtalk Calibration - PIC - Sep 2013

Standard Data		
	Isotope	Po-210
	Standard ID number	1673-A
	Half Life (days)	138.38
	Std. Act. (dpm/mL)	22622.4159
	Reference Date	8/1/2013
	Volume of spike (mL)	2.0
	Std. Nominal (dpm)	33837.37
	Decay Date	9/28/2013

Source Weight	
Source	Measured weight (mg)
1	0.0
2	3.3
3	6.5
4	16.4
5	32.1
6	47.6
7	65.0
8	79.5

The following detectors were not calibrated:

6D

Raw Count Data								
Detector (#)	Source ID (#)	Start Time	Count Time (min)	Alpha (counts)	Beta (counts)	Po-210 Xtalk (Beta/Alpha)	Source Measured Weight	Calculated Xtalk (Beta/Alpha)
1A	1	9/28/2013 10:34	3	24383	1661	6.8121%	0.0	7.8272%
1A	2	9/28/2013 10:49	3	24805	2203	8.8813%	3.3	9.0145%
1A	3	9/28/2013 10:43	3	20231	2291	11.3242%	6.5	9.9667%
1A	4	9/28/2013 10:39	3	19233	2414	12.5513%	16.4	11.8324%
1A	5	9/28/2013 10:54	3	18031	2001	11.0976%	32.1	12.3232%
1A	6	9/28/2013 11:11	3	18807	2060	10.9534%	47.6	11.3478%
1A	7	9/28/2013 11:06	3	15185	1794	11.8143%	65.0	10.6375%
1A	8	9/28/2013 11:01	3	15065	1738	11.5367%	79.5	12.0216%
1B	1	9/28/2013 10:39	3	24552	1834	7.4699%	0.0	8.1970%
1B	2	9/28/2013 10:34	3	24776	2434	9.8240%	3.3	9.3565%
1B	3	9/28/2013 10:49	3	20578	2130	10.3509%	6.5	10.2932%
1B	4	9/28/2013 10:44	3	19206	2532	13.1834%	16.4	12.1671%
1B	5	9/28/2013 11:01	3	17964	2100	11.6900%	32.1	12.7611%
1B	6	9/28/2013 10:54	3	18540	2153	11.6127%	47.6	11.8531%
1B	7	9/28/2013 11:12	3	15291	1808	11.8239%	65.0	10.9772%
1B	8	9/28/2013 11:06	3	15112	1741	11.5206%	79.5	11.8703%
1C	1	9/28/2013 10:44	3	26155	706	2.6993%	0.0	2.8926%
1C	2	9/28/2013 10:39	3	27237	947	3.4769%	3.3	3.3348%
1C	3	9/28/2013 10:34	3	22120	823	3.7206%	6.5	3.6954%
1C	4	9/28/2013 10:49	3	21824	1011	4.6325%	16.4	4.4386%
1C	5	9/28/2013 11:06	3	20082	912	4.5414%	32.1	4.7498%
1C	6	9/28/2013 11:02	3	20813	920	4.4203%	47.6	4.5046%
1C	7	9/28/2013 10:54	3	17039	762	4.4721%	65.0	4.2635%
1C	8	9/28/2013 11:12	3	16753	762	4.5484%	79.5	4.6324%
1D	1	9/28/2013 10:49	3	25215	890	3.5296%	0.0	3.7078%
1D	2	9/28/2013 10:44	3	26170	1103	4.2147%	3.3	4.1935%
1D	3	9/28/2013 10:39	3	21375	993	4.6456%	6.5	4.5900%
1D	4	9/28/2013 10:34	3	20570	1198	5.8240%	16.4	5.4082%
1D	5	9/28/2013 11:12	3	18973	1010	5.3234%	32.1	5.7434%
1D	6	9/28/2013 11:06	3	19898	1069	5.3724%	47.6	5.4389%
1D	7	9/28/2013 11:02	3	16180	869	5.3708%	65.0	5.0757%
1D	8	9/28/2013 10:54	3	16030	835	5.2090%	79.5	5.3320%
2A	1	9/28/2013 10:55	3	22128	3791	17.1321%	0.0	17.3424%
2A	2	9/28/2013 11:12	3	22805	4285	18.7897%	3.3	18.6402%
2A	3	9/28/2013 11:06	3	18493	3487	18.8558%	6.5	19.7136%
2A	4	9/28/2013 11:02	3	17586	4245	24.1385%	16.4	22.0042%
2A	5	9/28/2013 10:34	3	16304	3546	21.7493%	32.1	23.1166%
2A	6	9/28/2013 10:49	3	16892	3662	21.6789%	47.6	22.3374%

Detector (#)	Source ID (#)	Raw Count Data Start Time	Count Time (min)	Alpha (counts)	Beta (counts)	Po-210 Xtalk (Beta/Alpha)	Source Measured Weight	Calculated Xtalk (Beta/Alpha)
2A	7	9/28/2013 10:44	3	13827	3066	22.1740%	65.0	20.8570%
2A	8	9/28/2013 10:39	3	13979	2782	19.9013%	79.5	20.4080%
2B	1	9/28/2013 11:02	3	21823	4499	20.6159%	0.0	21.8896%
2B	2	9/28/2013 10:55	3	21515	5370	24.9593%	3.3	23.7889%
2B	3	9/28/2013 11:12	3	17951	4396	24.4889%	6.5	25.3250%
2B	4	9/28/2013 11:06	3	16474	5189	31.4981%	16.4	28.3992%
2B	5	9/28/2013 10:39	3	15897	4133	25.9986%	32.1	29.3176%
2B	6	9/28/2013 10:35	3	16154	4552	28.1788%	47.6	27.5984%
2B	7	9/28/2013 10:49	3	13337	3558	26.6777%	65.0	25.5487%
2B	8	9/28/2013 10:44	3	13300	3398	25.5489%	79.5	26.0989%
2C	1	9/28/2013 11:06	3	23795	1386	5.8248%	0.0	6.0131%
2C	2	9/28/2013 11:02	3	24158	1672	6.9211%	3.3	6.7428%
2C	3	9/28/2013 10:55	3	20717	1461	7.0522%	6.5	7.3374%
2C	4	9/28/2013 11:12	3	18926	1752	9.2571%	16.4	8.5575%
2C	5	9/28/2013 10:44	3	17182	1498	8.7184%	32.1	9.0365%
2C	6	9/28/2013 10:40	3	17756	1424	8.0198%	47.6	8.5540%
2C	7	9/28/2013 10:35	3	14968	1302	8.6986%	65.0	7.9966%
2C	8	9/28/2013 10:49	3	14465	1178	8.1438%	79.5	8.3979%
2D	1	9/28/2013 11:12	3	22067	4223	19.1372%	0.0	19.7326%
2D	2	9/28/2013 11:06	3	21959	4924	22.4236%	3.3	21.5182%
2D	3	9/28/2013 11:02	3	18527	3944	21.2879%	6.5	22.9655%
2D	4	9/28/2013 10:55	3	16990	4963	29.2113%	16.4	25.8754%
2D	5	9/28/2013 10:49	3	16296	3907	23.9752%	32.1	26.7410%
2D	6	9/28/2013 10:44	3	16646	4180	25.1111%	47.6	24.9902%
2D	7	9/28/2013 10:40	3	13729	3270	23.8182%	65.0	22.6079%
2D	8	9/28/2013 10:35	3	13993	3058	21.8538%	79.5	22.3876%
3A	1	9/28/2013 11:17	3	24316	1007	4.1413%	0.0	4.2876%
3A	2	9/28/2013 12:00	3	25057	1175	4.6893%	3.3	4.8679%
3A	3	9/28/2013 11:27	3	21107	1173	5.5574%	6.5	5.3354%
3A	4	9/28/2013 11:23	3	19994	1350	6.7520%	16.4	6.2625%
3A	5	9/28/2013 12:05	3	18364	1103	6.0063%	32.1	6.5285%
3A	6	9/28/2013 12:22	3	19172	1144	5.9670%	47.6	6.0379%
3A	7	9/28/2013 12:18	3	15343	909	5.9245%	65.0	5.5690%
3A	8	9/28/2013 12:14	3	14977	878	5.8623%	79.5	6.0115%
3B	1	9/28/2013 11:23	3	25137	578	2.2994%	0.0	2.5381%
3B	2	9/28/2013 11:17	3	25279	694	2.7454%	3.3	2.8814%
3B	3	9/28/2013 12:00	3	21707	776	3.5749%	6.5	3.1650%
3B	4	9/28/2013 11:27	3	20350	816	4.0098%	16.4	3.7706%
3B	5	9/28/2013 12:14	3	18766	707	3.7675%	32.1	4.0887%
3B	6	9/28/2013 12:06	3	19186	724	3.7736%	47.6	3.9709%
3B	7	9/28/2013 12:23	3	15800	665	4.2089%	65.0	3.8050%
3B	8	9/28/2013 12:18	3	15326	591	3.8562%	79.5	4.0158%
3C	1	9/28/2013 11:27	3	25221	987	3.9134%	0.0	4.0896%
3C	2	9/28/2013 11:23	3	25616	1221	4.7666%	3.3	4.5836%
3C	3	9/28/2013 11:18	3	21224	1020	4.8059%	6.5	4.9921%
3C	4	9/28/2013 12:00	3	20272	1287	6.3487%	16.4	5.8676%
3C	5	9/28/2013 12:18	3	18956	1137	5.9981%	32.1	6.3347%
3C	6	9/28/2013 12:14	3	19478	1165	5.9811%	47.6	6.1711%
3C	7	9/28/2013 12:06	3	15879	999	6.2913%	65.0	5.9252%
3C	8	9/28/2013 12:23	3	15868	962	6.0625%	79.5	6.2038%
3D	1	9/28/2013 12:01	3	25060	1188	4.7406%	0.0	4.8892%
3D	2	9/28/2013 11:27	3	25866	1464	5.6599%	3.3	5.4581%
3D	3	9/28/2013 11:23	3	21471	1220	5.6821%	6.5	5.9165%
3D	4	9/28/2013 11:18	3	20662	1511	7.3129%	16.4	6.8289%
3D	5	9/28/2013 12:23	3	19025	1271	6.6807%	32.1	7.1220%
3D	6	9/28/2013 12:18	3	20014	1356	6.7753%	47.6	6.7328%

Raw Count Data						Po-210	Source	Calculated
Detector (#)	Source ID (#)	Start Time	Count Time (min)	Alpha (counts)	Beta (counts)	Xtalk (Beta/Alpha)	Measured Weight	Xtalk (Beta/Alpha)
3D	7	9/28/2013 12:14	3	16029	1068	6.6629%	65.0	6.4863%
3D	8	9/28/2013 12:06	3	15777	1126	7.1370%	79.5	7.2177%
4A	1	9/28/2013 12:06	3	24259	823	3.3926%	0.0	3.5535%
4A	2	9/28/2013 12:23	3	25050	987	3.9401%	3.3	3.9691%
4A	3	9/28/2013 12:18	3	21255	945	4.4460%	6.5	4.3184%
4A	4	9/28/2013 12:14	3	19862	1078	5.4274%	16.4	5.1003%
4A	5	9/28/2013 11:18	3	18568	980	5.2779%	32.1	5.6126%
4A	6	9/28/2013 12:01	3	18661	1022	5.4767%	47.6	5.5824%
4A	7	9/28/2013 11:27	3	15692	892	5.6844%	65.0	5.3895%
4A	8	9/28/2013 11:23	3	15125	810	5.3554%	79.5	5.4748%
4B	1	9/28/2013 12:14	3	22311	3371	15.1091%	0.0	16.5676%
4B	2	9/28/2013 12:06	3	22303	4318	19.3606%	3.3	18.4902%
4B	3	9/28/2013 12:23	3	18675	3811	20.4070%	6.5	20.0675%
4B	4	9/28/2013 12:18	3	16960	4227	24.9233%	16.4	23.3633%
4B	5	9/28/2013 11:23	3	16207	3809	23.5022%	32.1	24.8011%
4B	6	9/28/2013 11:19	3	16836	3739	22.2084%	47.6	23.5848%
4B	7	9/28/2013 12:01	3	13681	3282	23.9895%	65.0	21.7911%
4B	8	9/28/2013 11:28	3	13533	2874	21.2370%	79.5	22.0715%
4C	1	9/28/2013 12:18	3	24643	1166	4.7316%	0.0	4.9532%
4C	2	9/28/2013 12:14	3	25722	1405	5.4623%	3.3	5.4832%
4C	3	9/28/2013 12:06	3	21018	1289	6.1328%	6.5	5.9137%
4C	4	9/28/2013 12:23	3	20337	1438	7.0709%	16.4	6.7929%
4C	5	9/28/2013 11:28	3	18775	1296	6.9028%	32.1	7.1588%
4C	6	9/28/2013 11:23	3	19904	1326	6.6620%	47.6	6.9241%
4C	7	9/28/2013 11:19	3	15923	1159	7.2788%	65.0	6.8532%
4C	8	9/28/2013 12:01	3	15756	1181	7.4956%	79.5	7.6576%
4D	1	9/28/2013 12:23	3	25033	611	2.4408%	0.0	2.5177%
4D	2	9/28/2013 12:18	3	25788	740	2.8696%	3.3	2.9489%
4D	3	9/28/2013 12:14	3	21843	765	3.5023%	6.5	3.2950%
4D	4	9/28/2013 12:06	3	20627	820	3.9754%	16.4	3.9753%
4D	5	9/28/2013 12:01	3	19214	793	4.1272%	32.1	4.1663%
4D	6	9/28/2013 11:28	3	19752	739	3.7414%	47.6	3.8387%
4D	7	9/28/2013 11:23	3	16209	611	3.7695%	65.0	3.6329%
4D	8	9/28/2013 11:19	3	15831	657	4.1501%	79.5	4.2014%
5A	1	9/28/2013 12:27	3	25791	972	3.7688%	0.0	4.0975%
5A	2	9/28/2013 12:40	3	26249	1150	4.3811%	3.3	4.6438%
5A	3	9/28/2013 12:36	3	21361	1202	5.6271%	6.5	5.0921%
5A	4	9/28/2013 12:32	3	20823	1378	6.6177%	16.4	6.0307%
5A	5	9/28/2013 12:46	3	19318	1130	5.8495%	32.1	6.4486%
5A	6	9/28/2013 13:00	3	20169	1156	5.7316%	47.6	6.1215%
5A	7	9/28/2013 12:56	3	16302	1043	6.3980%	65.0	5.6463%
5A	8	9/28/2013 12:51	3	16311	893	5.4748%	79.5	5.7680%
5B	1	9/28/2013 12:32	3	25329	913	3.6046%	0.0	3.8896%
5B	2	9/28/2013 12:28	3	25989	1178	4.5327%	3.3	4.3649%
5B	3	9/28/2013 12:41	3	21385	1023	4.7837%	6.5	4.7566%
5B	4	9/28/2013 12:36	3	20834	1259	6.0430%	16.4	5.5889%
5B	5	9/28/2013 12:51	3	19130	1047	5.4731%	32.1	6.0131%
5B	6	9/28/2013 12:46	3	19939	1170	5.8679%	47.6	5.8361%
5B	7	9/28/2013 13:00	3	16302	957	5.8704%	65.0	5.6069%
5B	8	9/28/2013 12:56	3	16111	935	5.8035%	79.5	5.9228%
5C	1	9/28/2013 12:36	3	24987	1071	4.2862%	0.0	4.5203%
5C	2	9/28/2013 12:32	3	25899	1356	5.2357%	3.3	5.1217%
5C	3	9/28/2013 12:28	3	21143	1186	5.6094%	6.5	5.6103%
5C	4	9/28/2013 12:41	3	20400	1431	7.0147%	16.4	6.6061%
5C	5	9/28/2013 12:56	3	18620	1261	6.7723%	32.1	6.9844%
5C	6	9/28/2013 12:51	3	19514	1201	6.1546%	47.6	6.5966%

Detector (#)	Source ID (#)	Raw Count Data Start Time	Count Time (min)	Alpha (counts)	Beta (counts)	Po-210 Xtalk (Beta/Alpha)	Source Measured Weight	Calculated Xtalk (Beta/Alpha)
5C	7	9/28/2013 12:46	3	16664	1132	6.7931%	65.0	6.2171%
5C	8	9/28/2013 13:00	3	15900	1032	6.4906%	79.5	6.7001%
5D	1	9/28/2013 12:41	3	25263	782	3.0954%	0.0	3.2106%
5D	2	9/28/2013 12:36	3	26469	944	3.5664%	3.3	3.6140%
5D	3	9/28/2013 12:32	3	21902	875	3.9951%	6.5	3.9478%
5D	4	9/28/2013 12:28	3	21226	1068	5.0316%	16.4	4.6670%
5D	5	9/28/2013 13:00	3	19336	941	4.8666%	32.1	5.0713%
5D	6	9/28/2013 12:56	3	20849	972	4.6621%	47.6	4.9900%
5D	7	9/28/2013 12:51	3	16540	884	5.3446%	65.0	4.8973%
5D	8	9/28/2013 12:46	3	16288	831	5.1019%	79.5	5.2658%
6A	1	9/28/2013 12:47	3	25388	1010	3.9783%	0.0	4.1421%
6A	2	9/28/2013 13:00	3	26085	1282	4.9147%	3.3	4.7672%
6A	3	9/28/2013 12:56	3	21554	1130	5.2426%	6.5	5.2656%
6A	4	9/28/2013 12:51	3	20801	1330	6.3939%	16.4	6.2241%
6A	5	9/28/2013 12:28	3	19007	1200	6.3135%	32.1	6.4221%
6A	6	9/28/2013 12:41	3	19966	1134	5.6797%	47.6	5.8596%
6A	7	9/28/2013 12:37	3	16179	930	5.7482%	65.0	5.4972%
6A	8	9/28/2013 12:32	3	16286	1016	6.2385%	79.5	6.3314%
6B	1	9/28/2013 12:51	3	25721	713	2.7721%	0.0	3.1045%
6B	2	9/28/2013 12:47	3	26877	958	3.5644%	3.3	3.5223%
6B	3	9/28/2013 13:01	3	21843	916	4.1936%	6.5	3.8634%
6B	4	9/28/2013 12:56	3	21221	1022	4.8160%	16.4	4.5700%
6B	5	9/28/2013 12:32	3	19704	893	4.5321%	32.1	4.8827%
6B	6	9/28/2013 12:28	3	20537	927	4.5138%	47.6	4.6893%
6B	7	9/28/2013 12:41	3	16530	816	4.9365%	65.0	4.5352%
6B	8	9/28/2013 12:37	3	16553	797	4.8148%	79.5	4.9757%
6C	1	9/28/2013 12:56	3	25963	810	3.1198%	0.0	3.4493%
6C	2	9/28/2013 12:51	3	26699	1059	3.9664%	3.3	3.8675%
6C	3	9/28/2013 12:47	3	21740	977	4.4940%	6.5	4.2017%
6C	4	9/28/2013 13:01	3	20975	1049	5.0012%	16.4	4.8510%
6C	5	9/28/2013 12:37	3	19449	934	4.8023%	32.1	5.0189%
6C	6	9/28/2013 12:33	3	20296	908	4.4738%	47.6	4.7145%
6C	7	9/28/2013 12:28	3	16193	811	5.0083%	65.0	4.6093%
6C	8	9/28/2013 12:41	3	16261	843	5.1842%	79.5	5.3378%
7A	1	9/29/2013 17:21	3	25046	1276	5.0946%	0.0	5.0849%
7A	2	9/29/2013 17:50	3	26168	1546	5.9080%	3.3	5.9148%
7A	3	9/29/2013 17:46	3	21617	1350	6.2451%	6.5	6.5987%
7A	4	9/29/2013 17:42	3	20539	1808	8.8028%	16.4	8.0489%
7A	5	9/29/2013 17:38	3	18601	1545	8.3060%	32.1	8.7634%
7A	6	9/29/2013 17:34	3	19428	1591	8.1892%	47.6	8.3821%
7A	7	9/29/2013 17:30	3	15978	1313	8.2175%	65.0	7.8162%
7A	8	9/29/2013 17:26	3	15944	1273	7.9842%	79.5	8.1384%
7B	1	9/29/2013 17:26	3	25563	913	3.5716%	0.0	4.0787%
7B	2	9/29/2013 17:21	3	25922	1315	5.0729%	3.3	4.6717%
7B	3	9/29/2013 17:50	3	21461	1130	5.2654%	6.5	5.1580%
7B	4	9/29/2013 17:46	3	20701	1343	6.4876%	16.4	6.1756%
7B	5	9/29/2013 17:42	3	18995	1203	6.3332%	32.1	6.6443%
7B	6	9/29/2013 17:38	3	19999	1200	6.0003%	47.6	6.3532%
7B	7	9/29/2013 17:34	3	16062	1056	6.5745%	65.0	6.0074%
7B	8	9/29/2013 17:30	3	15982	987	6.1757%	79.5	6.3923%
7C	1	9/29/2013 17:30	3	24732	1459	5.8992%	0.0	6.3213%
7C	2	9/29/2013 17:26	3	25041	1892	7.5556%	3.3	7.2397%
7C	3	9/29/2013 17:21	3	20727	1666	8.0378%	6.5	7.9838%
7C	4	9/29/2013 17:51	3	19910	1974	9.9146%	16.4	9.4868%
7C	5	9/29/2013 17:46	3	18308	1739	9.4986%	32.1	10.0117%
7C	6	9/29/2013 17:42	3	19221	1782	9.2711%	47.6	9.3555%

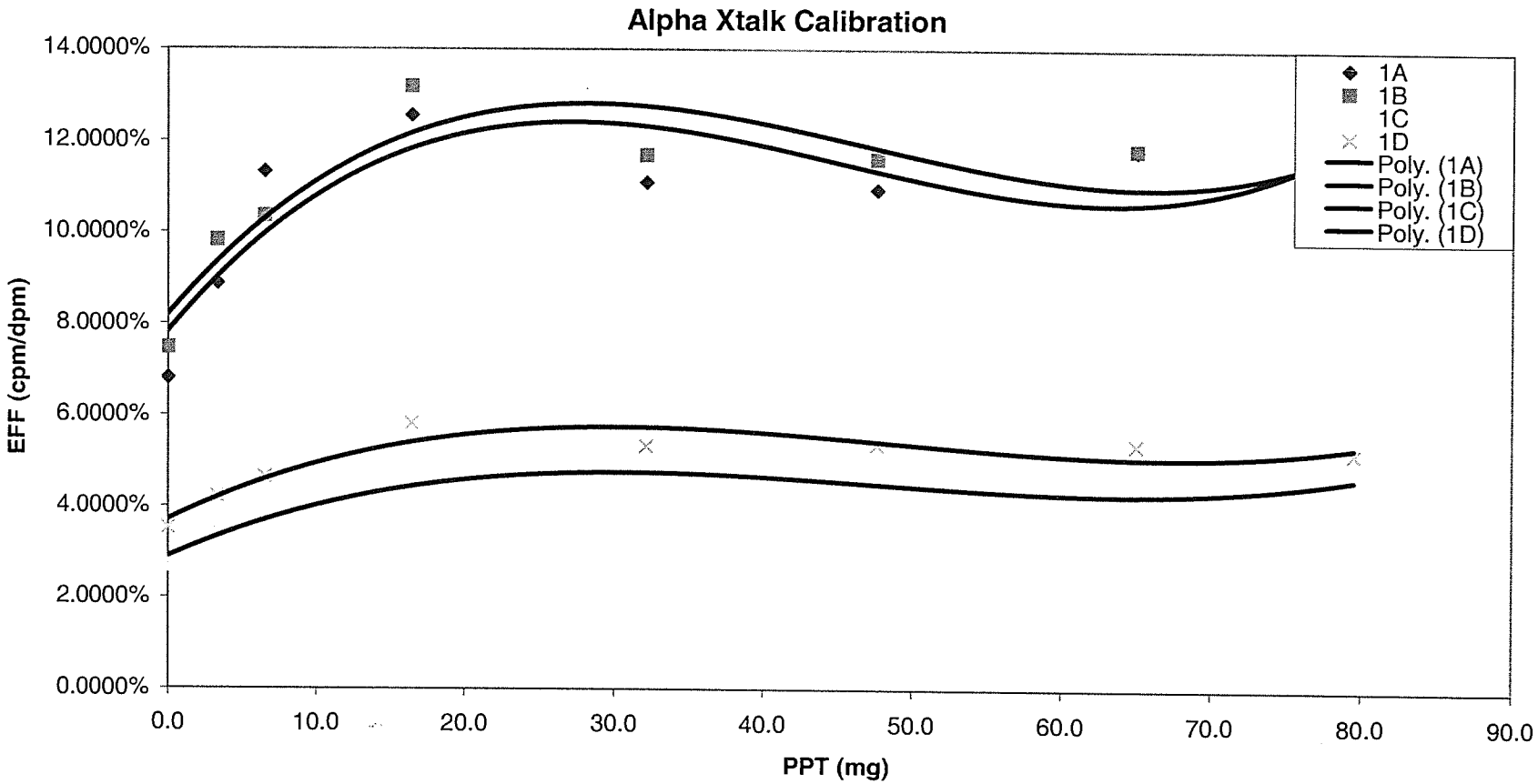
Detector (#)	Source ID (#)	Raw Count Data Start Time	Count Time (min)	Alpha (counts)	Beta (counts)	Po-210 Xtalk (Beta/Alpha)	Source Measured Weight	Calculated Xtalk (Beta/Alpha)
7C	7	9/29/2013 17:38	3	15597	1419	9.0979%	65.0	8.7148%
7C	8	9/29/2013 17:34	3	15483	1435	9.2682%	79.5	9.4296%
7D	1	9/29/2013 17:34	3	24637	1202	4.8788%	0.0	5.2798%
7D	2	9/29/2013 17:30	3	25087	1587	6.3260%	3.3	5.9332%
7D	3	9/29/2013 17:26	3	20852	1352	6.4838%	6.5	6.4702%
7D	4	9/29/2013 17:21	3	20046	1564	7.8021%	16.4	7.6012%
7D	5	9/29/2013 17:51	3	18113	1440	7.9501%	32.1	8.1479%
7D	6	9/29/2013 17:46	3	19149	1458	7.6140%	47.6	7.8665%
7D	7	9/29/2013 17:42	3	15498	1228	7.9236%	65.0	7.5296%
7D	8	9/29/2013 17:38	3	15655	1226	7.8314%	79.5	7.9813%
8A	1	9/29/2013 17:38	3	21426	4961	23.1541%	0.0	22.0825%
8A	2	9/29/2013 17:34	3	22354	5198	23.2531%	3.3	24.8937%
8A	3	9/29/2013 17:30	3	17698	4860	27.4607%	6.5	27.1315%
8A	4	9/29/2013 17:26	3	16875	5207	30.8563%	16.4	31.3871%
8A	5	9/29/2013 17:21	3	14681	5117	34.8546%	32.1	31.9129%
8A	6	9/29/2013 17:51	3	17172	4209	24.5108%	47.6	28.4564%
8A	7	9/29/2013 17:46	3	13656	3721	27.2481%	65.0	24.7857%
8A	8	9/29/2013 17:42	3	13763	3452	25.0817%	79.5	25.7698%
8B	1	9/29/2013 17:43	3	21186	5505	25.9841%	0.0	24.9176%
8B	2	9/29/2013 17:39	3	21892	5890	26.9048%	3.3	26.9841%
8B	3	9/29/2013 17:34	3	18297	4728	25.8403%	6.5	28.6941%
8B	4	9/29/2013 17:30	3	16678	5892	35.3280%	16.4	32.3452%
8B	5	9/29/2013 17:26	3	15668	5148	32.8568%	32.1	34.1113%
8B	6	9/29/2013 17:21	3	16307	5311	32.5688%	47.6	32.8251%
8B	7	9/29/2013 17:51	3	13369	4138	30.9522%	65.0	30.3313%
8B	8	9/29/2013 17:47	3	13555	3955	29.1774%	79.5	29.4038%
8C	1	9/29/2013 17:47	3.01	21166	5404	25.5315%	0.0	25.4814%
8C	2	9/29/2013 17:43	3	21574	5931	27.4914%	3.3	27.6169%
8C	3	9/29/2013 17:39	3	17944	4993	27.8255%	6.5	29.3600%
8C	4	9/29/2013 17:34	3	16447	5979	36.3531%	16.4	32.9364%
8C	5	9/29/2013 17:31	3	15215	4930	32.4022%	32.1	34.2127%
8C	6	9/29/2013 17:26	3	16355	5056	30.9141%	47.6	32.3019%
8C	7	9/29/2013 17:21	3	13106	4139	31.5810%	65.0	29.3678%
8C	8	9/29/2013 17:51	3	13493	3751	27.7996%	79.5	28.6213%
8D	1	9/29/2013 17:51	3	25596	1311	5.1219%	0.0	5.1967%
8D	2	9/29/2013 17:47	3	26892	1573	5.8493%	3.3	6.0174%
8D	3	9/29/2013 17:43	3	21837	1487	6.8095%	6.5	6.6706%
8D	4	9/29/2013 17:39	3	21096	1756	8.3239%	16.4	7.9245%
8D	5	9/29/2013 17:35	3	19454	1522	7.8236%	32.1	8.2036%
8D	6	9/29/2013 17:31	3	20229	1513	7.4794%	47.6	7.5668%
8D	7	9/29/2013 17:26	3	16725	1282	7.6652%	65.0	7.3744%
8D	8	9/29/2013 17:21	3	16469	1446	8.7801%	79.5	8.8989%
9A	1	9/29/2013 19:02	3	18427	6057	32.8702%	0.0	31.8861%
9A	2	9/29/2013 19:31	3	19414	6378	32.8526%	3.3	33.4294%
9A	3	9/29/2013 19:27	3	16105	5133	31.8721%	6.5	34.7094%
9A	4	9/29/2013 19:23	3	14477	6083	42.0184%	16.4	37.4532%
9A	5	9/29/2013 19:18	3	14035	5088	36.2522%	32.1	38.7648%
9A	6	9/29/2013 19:14	3	14655	5429	37.0454%	47.6	37.6553%
9A	7	9/29/2013 19:11	3	11783	4351	36.9261%	65.0	35.3174%
9A	8	9/29/2013 19:07	3	12025	3998	33.2474%	79.5	33.8688%
9B	1	9/29/2013 19:07	3	25303	1168	4.6161%	0.0	5.0061%
9B	2	9/29/2013 19:02	3	25759	1584	6.1493%	3.3	5.9062%
9B	3	9/29/2013 19:31	3	21388	1462	6.8356%	6.5	6.6260%
9B	4	9/29/2013 19:27	3	20413	1666	8.1615%	16.4	8.0264%
9B	5	9/29/2013 19:23	3	18670	1530	8.1950%	32.1	8.3768%
9B	6	9/29/2013 19:18	3	19624	1449	7.3838%	47.6	7.6593%

Detector (#)	Source ID (#)	Raw Count Data Start Time	Count Time (min)	Alpha (counts)	Beta (counts)	Po-210 Xtalk (Beta/Alpha)	Source Measured Weight	Calculated Xtalk (Beta/Alpha)
9B	7	9/29/2013 19:14	3	15973	1226	7.6755%	65.0	7.2567%
9B	8	9/29/2013 19:11	3	15958	1340	8.3970%	79.5	8.5561%
9C	1	9/29/2013 19:11	3	24939	1186	4.7556%	0.0	4.9759%
9C	2	9/29/2013 19:07	3	25068	1485	5.9239%	3.3	5.8343%
9C	3	9/29/2013 19:02	3	21058	1400	6.6483%	6.5	6.5304%
9C	4	9/29/2013 19:31	3	19969	1632	8.1727%	16.4	7.9406%
9C	5	9/29/2013 19:27	3	18372	1498	8.1537%	32.1	8.4588%
9C	6	9/29/2013 19:23	3	18991	1494	7.8669%	47.6	7.9072%
9C	7	9/29/2013 19:18	3	15847	1213	7.6544%	65.0	7.4352%
9C	8	9/29/2013 19:15	3	15412	1260	8.1754%	79.5	8.2687%
9D	1	9/29/2013 19:15	3	25578	902	3.5265%	0.0	3.7739%
9D	2	9/29/2013 19:11	3	26284	1239	4.7139%	3.3	4.4236%
9D	3	9/29/2013 19:07	3	21930	1063	4.8472%	6.5	4.9550%
9D	4	9/29/2013 19:02	3	21026	1333	6.3398%	16.4	6.0585%
9D	5	9/29/2013 19:31	3	19381	1206	6.2226%	32.1	6.5380%
9D	6	9/29/2013 19:27	3	20186	1248	6.1825%	47.6	6.1777%
9D	7	9/29/2013 19:23	3	16310	967	5.9289%	65.0	5.7595%
9D	8	9/29/2013 19:18	3	16253	990	6.0912%	79.5	6.1665%
10A	1	9/29/2013 19:18	3	23424	2378	10.1520%	0.0	10.7130%
10A	2	9/29/2013 19:15	3	23984	2816	11.7412%	3.3	11.9144%
10A	3	9/29/2013 19:11	3	19399	2613	13.4698%	6.5	12.8976%
10A	4	9/29/2013 19:07	3	18647	2980	15.9811%	16.4	14.9402%
10A	5	9/29/2013 19:02	3	17064	2515	14.7386%	32.1	15.8116%
10A	6	9/29/2013 19:31	3	18029	2637	14.6264%	47.6	15.0742%
10A	7	9/29/2013 19:27	3	14464	2195	15.1756%	65.0	14.1067%
10A	8	9/29/2013 19:23	3	14794	2092	14.1409%	79.5	14.5678%
10B	1	9/29/2013 19:23	3	24853	1270	5.1100%	0.0	5.3791%
10B	2	9/29/2013 19:19	3	25492	1698	6.6609%	3.3	6.1926%
10B	3	9/29/2013 19:15	3	21207	1369	6.4554%	6.5	6.8535%
10B	4	9/29/2013 19:11	3	19963	1728	8.6560%	16.4	8.1979%
10B	5	9/29/2013 19:07	3	18472	1565	8.4723%	32.1	8.6923%
10B	6	9/29/2013 19:02	3	19151	1496	7.8116%	47.6	8.1235%
10B	7	9/29/2013 19:31	3	15675	1245	7.9426%	65.0	7.5124%
10B	8	9/29/2013 19:27	3	15453	1217	7.8755%	79.5	8.0330%
10C	1	9/29/2013 19:27	3	24397	1404	5.7548%	0.0	5.8205%
10C	2	9/29/2013 19:23	3	25018	1709	6.8311%	3.3	6.6705%
10C	3	9/29/2013 19:19	3	20713	1447	6.9860%	6.5	7.3604%
10C	4	9/29/2013 19:15	3	19553	1827	9.3438%	16.4	8.7616%
10C	5	9/29/2013 19:11	3	18215	1635	8.9761%	32.1	9.2770%
10C	6	9/29/2013 19:07	3	18974	1606	8.4642%	47.6	8.7033%
10C	7	9/29/2013 19:02	3	15585	1327	8.5146%	65.0	8.1373%
10C	8	9/29/2013 19:32	3	15543	1346	8.6598%	79.5	8.7999%
10D	1	9/29/2013 19:31	3	24465	1711	6.9937%	0.0	7.3820%
10D	2	9/29/2013 19:27	3	25323	2138	8.4429%	3.3	8.2382%
10D	3	9/29/2013 19:23	3	20657	1853	8.9703%	6.5	8.9405%
10D	4	9/29/2013 19:19	3	19714	2174	11.0277%	16.4	10.4091%
10D	5	9/29/2013 19:15	3	18223	1930	10.5910%	32.1	11.0685%
10D	6	9/29/2013 19:11	3	18973	1929	10.1671%	47.6	10.5915%
10D	7	9/29/2013 19:07	3	15170	1617	10.6592%	65.0	9.9534%
10D	8	9/29/2013 19:02	3	15406	1547	10.0415%	79.5	10.3102%
11A	1	9/29/2013 18:08	3	22552	3569	15.8256%	0.0	16.0845%
11A	2	9/29/2013 19:07	3	23435	4045	17.2605%	3.3	17.7727%
11A	3	9/29/2013 19:00	3	18738	3688	19.6819%	6.5	19.1486%
11A	4	9/29/2013 18:52	3	17900	4101	22.9106%	16.4	21.9703%
11A	5	9/29/2013 18:45	3	16500	3713	22.5030%	32.1	23.0508%
11A	6	9/29/2013 18:36	3	17447	3634	20.8288%	47.6	21.8406%

Detector (#)	Source ID (#)	Raw Count Data Start Time	Count Time (min)	Alpha (counts)	Beta (counts)	Po-210 Xtalk (Beta/Alpha)	Source Measured Weight	Calculated Xtalk (Beta/Alpha)
11A	7	9/29/2013 18:28	3	13934	3019	**21.6664%**	65.0	20.3164%
11A	8	9/29/2013 18:16	3	14197	2898	**20.4128%**	79.5	20.9059%
11B	1	9/29/2013 18:16	3	24608	2081	**8.4566%**	0.0	9.1098%
11B	2	9/29/2013 18:08	3	25250	2761	**10.9347%**	3.3	10.5635%
11B	3	9/29/2013 19:07	3	21154	2460	**11.6290%**	6.5	11.7363%
11B	4	9/29/2013 19:00	3	19466	3001	**15.4166%**	16.4	14.0741%
11B	5	9/29/2013 18:52	3	18279	2506	**13.7097%**	32.1	14.7965%
11B	6	9/29/2013 18:45	3	19384	2531	**13.0572%**	47.6	13.6589%
11B	7	9/29/2013 18:35	3	15571	2154	**13.8334%**	65.0	12.6286%
11B	8	9/29/2013 18:28	3	15551	2087	**13.4204%**	79.5	13.8899%
11C	1	9/29/2013 18:28	3	24504	2173	**8.8679%**	0.0	9.3752%
11C	2	9/29/2013 18:16	3	25228	2743	**10.8728%**	3.3	10.6576%
11C	3	9/29/2013 18:08	3	20522	2444	**11.9092%**	6.5	11.7065%
11C	4	9/29/2013 19:07	3	19896	2874	**14.4451%**	16.4	13.8835%
11C	5	9/29/2013 19:00	3	18034	2603	**14.4338%**	32.1	14.8214%
11C	6	9/29/2013 18:52	3	19304	2589	**13.4117%**	47.6	14.0858%
11C	7	9/29/2013 18:45	3	15645	2212	**14.1387%**	65.0	13.2031%
11C	8	9/29/2013 18:35	3	15795	2145	**13.5802%**	79.5	13.9265%
11D	1	9/29/2013 18:35	3	24668	1868	**7.5726%**	0.0	7.8580%
11D	2	9/29/2013 18:28	3	25472	2347	**9.2140%**	3.3	9.0840%
11D	3	9/29/2013 18:16	3	20808	2057	**9.8856%**	6.5	10.0679%
11D	4	9/29/2013 18:08	3	19788	2564	**12.9573%**	16.4	12.0008%
11D	5	9/29/2013 19:07	3	18427	2184	**11.8522%**	32.1	12.5298%
11D	6	9/29/2013 19:00	3	19431	2164	**11.1368%**	47.6	11.5586%
11D	7	9/29/2013 18:52	3	15470	1804	**11.6613%**	65.0	10.8810%
11D	8	9/29/2013 18:45	3	15279	1844	**12.0689%**	79.5	12.3685%
12A	1	9/29/2013 18:45	3	23718	2817	**11.8771%**	0.0	12.4488%
12A	2	9/29/2013 18:35	3	23935	3441	**14.3764%**	3.3	13.8717%
12A	3	9/29/2013 18:28	3	19852	2931	**14.7643%**	6.5	15.0380%
12A	4	9/29/2013 18:16	3	18651	3470	**18.6049%**	16.4	17.4740%
12A	5	9/29/2013 18:08	3	17481	3068	**17.5505%**	32.1	18.5708%
12A	6	9/29/2013 19:07	3	18175	3196	**17.5846%**	47.6	17.8131%
12A	7	9/29/2013 19:00	3	14640	2583	**17.6434%**	65.0	16.8668%
12A	8	9/29/2013 18:52	3	14529	2517	**17.3240%**	79.5	17.6421%
12B	1	9/29/2013 18:52	3	22117	4551	**20.5769%**	0.0	20.9013%
12B	2	9/29/2013 18:45	3	22345	5419	**24.2515%**	3.3	22.9056%
12B	3	9/29/2013 18:35	3	18570	4092	**22.0355%**	6.5	24.5464%
12B	4	9/29/2013 18:28	3	17100	5293	**30.9532%**	16.4	27.9552%
12B	5	9/29/2013 18:16	3	16044	4406	**27.4620%**	32.1	29.3936%
12B	6	9/29/2013 18:08	3	16781	4682	**27.9006%**	47.6	28.1001%
12B	7	9/29/2013 19:07	3	13689	3747	**27.3723%**	65.0	26.3194%
12B	8	9/29/2013 19:00	3	13793	3643	**26.4119%**	79.5	26.8425%
12C	1	9/29/2013 19:00	3	25769	1184	**4.5947%**	0.0	4.8697%
12C	2	9/29/2013 18:52	3	26340	1599	**6.0706%**	3.3	5.6234%
12C	3	9/29/2013 18:45	3	21943	1263	**5.7558%**	6.5	6.2394%
12C	4	9/29/2013 18:35	3	21022	1745	**8.3008%**	16.4	7.5184%
12C	5	9/29/2013 18:28	3	19225	1432	**7.4486%**	32.1	8.0887%
12C	6	9/29/2013 18:16	3	20187	1554	**7.6980%**	47.6	7.7292%
12C	7	9/29/2013 18:08	3	16576	1284	**7.7461%**	65.0	7.3975%
12C	8	9/29/2013 19:07	3	16129	1282	**7.9484%**	79.5	8.0968%
12D	1	9/29/2013 19:07	3	25737	1552	**6.0302%**	0.0	6.3999%
12D	2	9/29/2013 19:00	3	26401	2090	**7.9164%**	3.3	7.6854%
12D	3	9/29/2013 18:52	3	22016	1858	**8.4393%**	6.5	8.7200%
12D	4	9/29/2013 18:45	3	20876	2508	**12.0138%**	16.4	10.7713%
12D	5	9/29/2013 18:35	3	19216	1976	**10.2831%**	32.1	11.3921%
12D	6	9/29/2013 18:28	3	20440	2112	**10.3327%**	47.6	10.4374%

Raw Count Data						Po-210	Source	Calculated
Detector (#)	Source ID (#)	Start Time	Count Time (min)	Alpha (counts)	Beta (counts)	Xtalk (Beta/Alpha)	Measured Weight	Xtalk (Beta/Alpha)
12D	7	9/29/2013 18:16	3	16320	1701	10.4228%	65.0	9.7483%
12D	8	9/29/2013 18:08	3	16345	1792	10.9636%	79.5	11.2475%
13A	1	9/29/2013 18:11	3	24814	1515	6.1054%	0.0	6.6755%
13A	2	9/29/2013 19:11	3	25538	2089	8.1800%	3.3	7.7377%
13A	3	9/29/2013 19:04	3	20873	1799	8.6188%	6.5	8.6033%
13A	4	9/29/2013 18:56	3	19705	2179	11.0581%	16.4	10.3847%
13A	5	9/29/2013 18:49	3	18289	1891	10.3395%	32.1	11.1278%
13A	6	9/29/2013 18:41	3	19181	2012	10.4895%	47.6	10.5538%
13A	7	9/29/2013 18:32	3	15614	1647	10.5482%	65.0	10.0372%
13A	8	9/29/2013 18:22	3	15447	1670	10.8112%	79.5	11.0307%
13B	1	9/29/2013 18:22	3	25436	1788	7.0294%	0.0	7.7066%
13B	2	9/29/2013 18:11	3	25935	2446	9.4313%	3.3	8.8561%
13B	3	9/29/2013 19:11	3	21595	2093	9.6921%	6.5	9.7907%
13B	4	9/29/2013 19:04	3	20520	2586	12.6023%	16.4	11.7018%
13B	5	9/29/2013 18:56	3	18970	2193	11.5604%	32.1	12.4740%
13B	6	9/29/2013 18:49	3	20301	2363	11.6398%	47.6	11.8571%
13B	7	9/29/2013 18:41	3	16437	1995	12.1373%	65.0	11.4048%
13B	8	9/29/2013 18:32	3	15956	1978	12.3966%	79.5	12.6980%
13C	1	9/29/2013 18:32	3	21655	5234	24.1699%	0.0	23.7914%
13C	2	9/29/2013 18:22	3	21919	6254	28.5323%	3.3	26.1014%
13C	3	9/29/2013 18:11	3	19170	4345	22.6656%	6.5	28.0144%
13C	4	9/29/2013 19:11	3	16567	5983	36.1140%	16.4	32.1250%
13C	5	9/29/2013 19:04	3	15861	5163	32.5515%	32.1	34.3006%
13C	6	9/29/2013 18:56	3	16305	5429	33.2965%	47.6	33.3837%
13C	7	9/29/2013 18:49	3	13431	4349	32.3803%	65.0	31.7517%
13C	8	9/29/2013 18:41	3	13496	4325	32.0465%	79.5	32.2885%
13D	1	9/29/2013 18:41	3	24865	1603	6.4468%	0.0	6.9421%
13D	2	9/29/2013 18:32	3	25667	2148	8.3687%	3.3	7.8880%
13D	3	9/29/2013 18:22	3	21211	1788	8.4296%	6.5	8.6600%
13D	4	9/29/2013 18:11	3	20290	2259	11.1336%	16.4	10.2547%
13D	5	9/29/2013 19:11	3	18619	1867	10.0274%	32.1	10.9354%
13D	6	9/29/2013 19:04	3	19548	2041	10.4410%	47.6	10.4337%
13D	7	9/29/2013 18:56	3	15631	1630	10.4280%	65.0	9.9510%
13D	8	9/29/2013 18:49	3	15736	1662	10.5618%	79.5	10.7719%
14A	1	9/29/2013 18:49	3	21398	5191	24.2593%	0.0	24.9178%
14A	2	9/29/2013 18:41	3	21897	6041	27.5883%	3.3	27.3791%
14A	3	9/29/2013 18:32	3	17886	5207	29.1122%	6.5	29.3749%
14A	4	9/29/2013 18:22	3	16628	5913	35.5605%	16.4	33.4100%
14A	5	9/29/2013 18:11	3	15479	5122	33.0900%	32.1	34.7963%
14A	6	9/29/2013 19:10	3	16485	5309	32.2050%	47.6	32.9126%
14A	7	9/29/2013 19:04	3	13323	4323	32.4476%	65.0	30.8379%
14A	8	9/29/2013 18:56	3	13268	4189	31.5722%	79.5	32.2066%
14B	1	9/29/2013 18:56	3	24017	4394	18.2954%	0.0	19.0424%
14B	2	9/29/2013 18:49	3	24515	5278	21.5297%	3.3	20.9685%
14B	3	9/29/2013 18:41	3	20449	4492	21.9668%	6.5	22.5580%
14B	4	9/29/2013 18:32	3	19198	5432	28.2946%	16.4	25.9431%
14B	5	9/29/2013 18:22	3	17898	4548	25.4107%	32.1	27.6598%
14B	6	9/29/2013 18:11	3	18623	5014	26.9237%	47.6	26.8470%
14B	7	9/29/2013 19:10	3	15203	4056	26.6789%	65.0	25.6056%
14B	8	9/29/2013 19:04	3	15299	3964	25.9102%	79.5	26.3856%
14C	1	9/29/2013 19:04	3	20042	6576	32.8111%	0.0	33.8532%
14C	2	9/29/2013 18:56	3	20185	7605	37.6765%	3.3	36.5198%
14C	3	9/29/2013 18:49	3	17044	6278	36.8341%	6.5	38.7326%
14C	4	9/29/2013 18:41	3	15413	7420	48.1412%	16.4	43.5107%
14C	5	9/29/2013 18:32	3	14511	6120	42.1749%	32.1	46.0811%
14C	6	9/29/2013 18:22	3	15106	6783	44.9027%	47.6	45.0005%

Detector (#)	Source ID (#)	Raw Count Data Start Time	Count Time (min)	Alpha (counts)	Beta (counts)	Po-210 Xtalk (Beta/Alpha)	Source Measured Weight	Calculated Xtalk (Beta/Alpha)
14C	7	9/29/2013 18:11	3	12381	5559	**44.8994%**	65.0	42.8726%
14C	8	9/29/2013 19:10	3	12260	5167	**42.1452%**	79.5	43.0145%
14D	1	9/29/2013 19:10	3	21782	5049	**23.1797%**	0.0	23.7789%
14D	2	9/29/2013 19:04	3	22206	5822	**26.2181%**	3.3	26.1077%
14D	3	9/29/2013 18:56	3	18447	5066	**27.4625%**	6.5	28.0086%
14D	4	9/29/2013 18:49	3	16969	5919	**34.8813%**	16.4	31.9347%
14D	5	9/29/2013 18:41	3	15866	4924	**31.0349%**	32.1	33.5867%
14D	6	9/29/2013 18:32	3	16642	5325	**31.9974%**	47.6	32.2624%
14D	7	9/29/2013 18:22	3	13200	4277	**32.4015%**	65.0	30.8447%
14D	8	9/29/2013 18:11	3	13360	4259	**31.8787%**	79.5	32.5304%

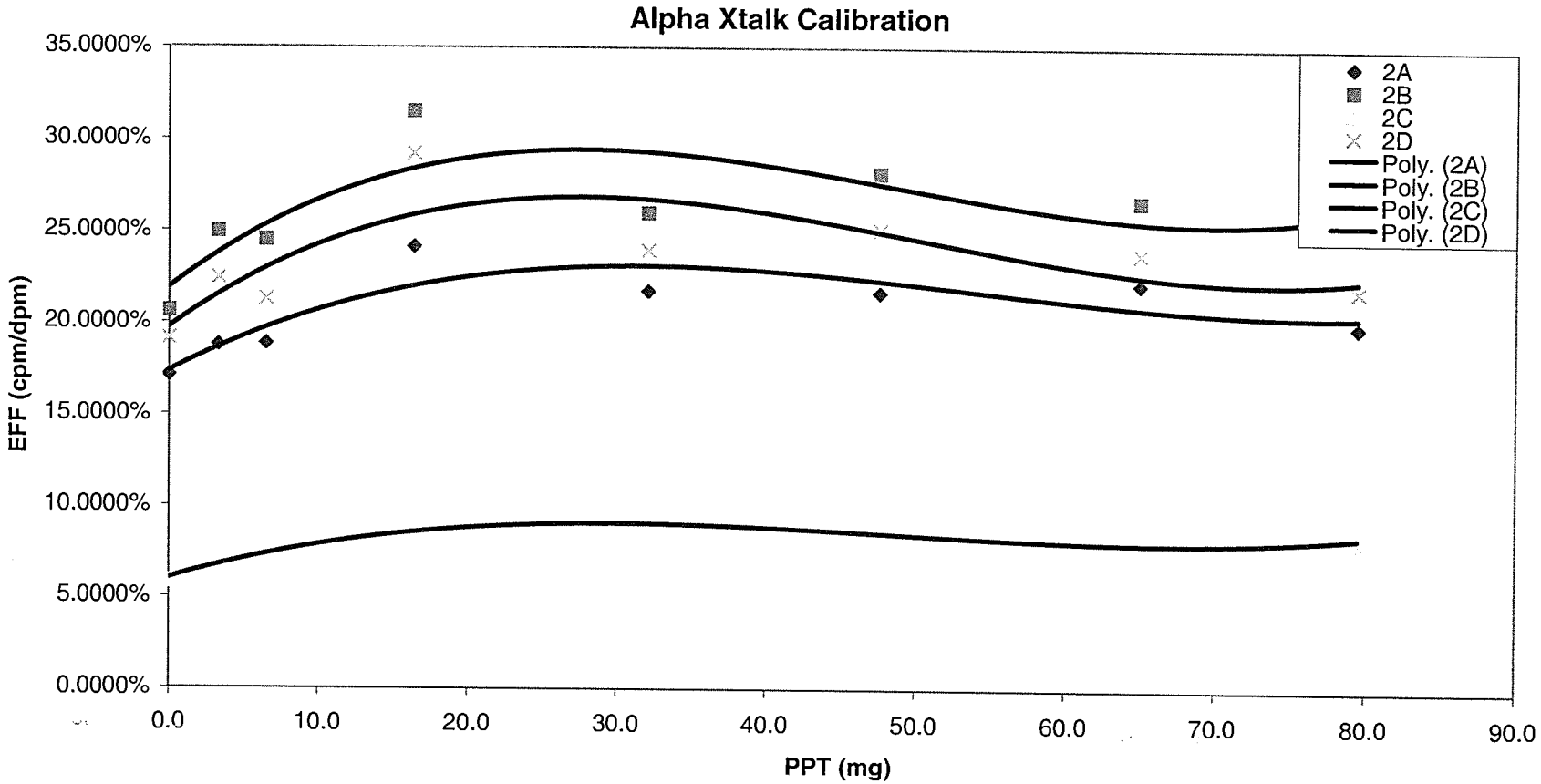


1A $y = 7.594635E-07x^3 - 1.031744E-04x^2 + 3.929950E-03x + 7.827241E-02$

1B $y = 6.874343E-07x^3 - 9.696660E-05x^2 + 3.826143E-03x + 8.196985E-02$

1C $y = 2.473057E-07x^3 - 3.518821E-05x^2 + 1.453269E-03x + 2.892608E-02$

1D $y = 2.627522E-07x^3 - 3.839188E-05x^2 + 1.595805E-03x + 3.707757E-02$

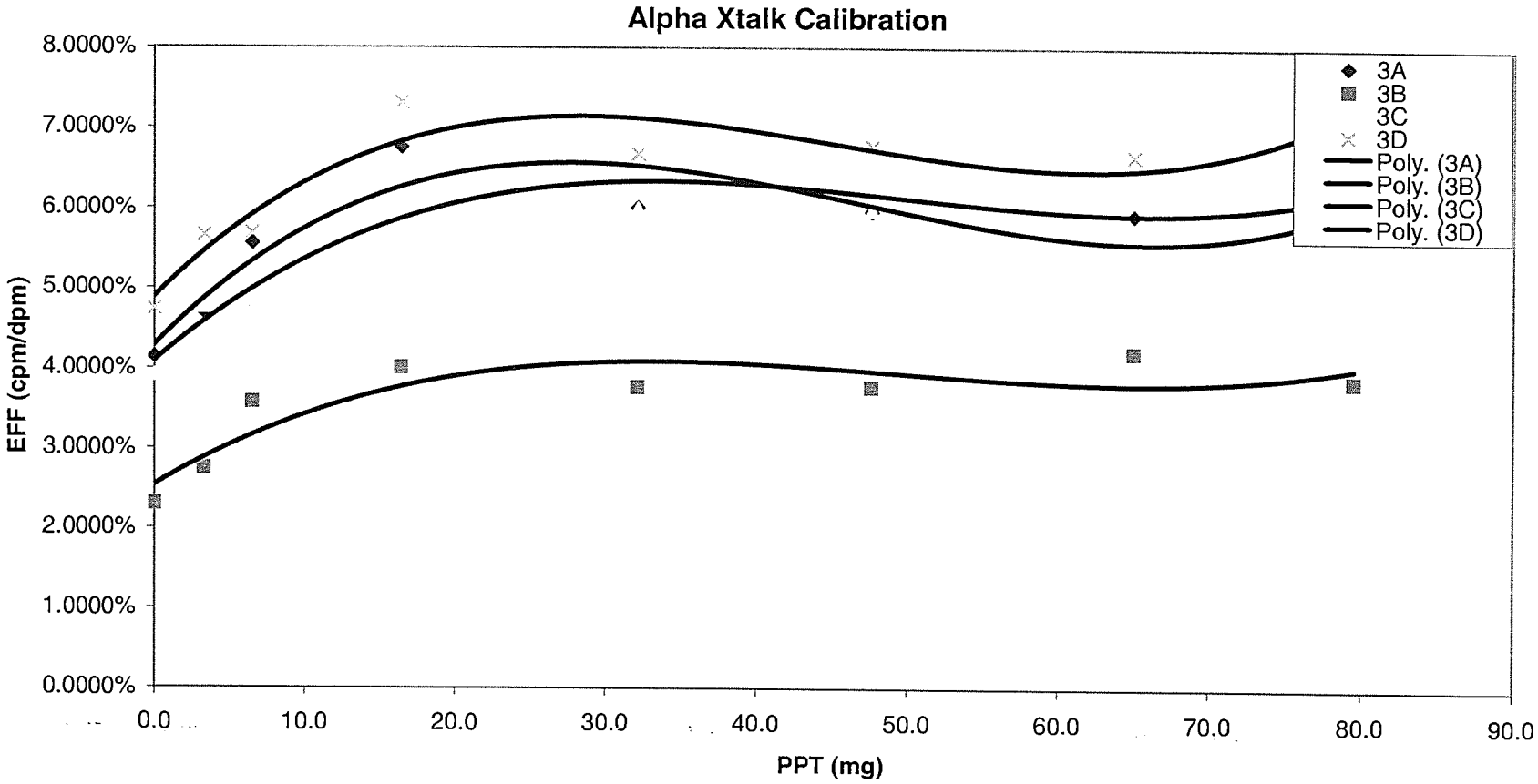


2A $y = 5.810864E-07x^3 - 9.466370E-05x^2 + 4.238758E-03x + 1.734244E-01$

2B $y = 1.074182E-06x^3 - 1.575273E-04x^2 + 6.263786E-03x + 2.188958E-01$

2C $y = 4.007389E-07x^3 - 5.826446E-05x^2 + 2.399226E-03x + 6.013077E-02$

2D $y = 9.586927E-07x^3 - 1.460055E-04x^2 + 5.882230E-03x + 1.973259E-01$

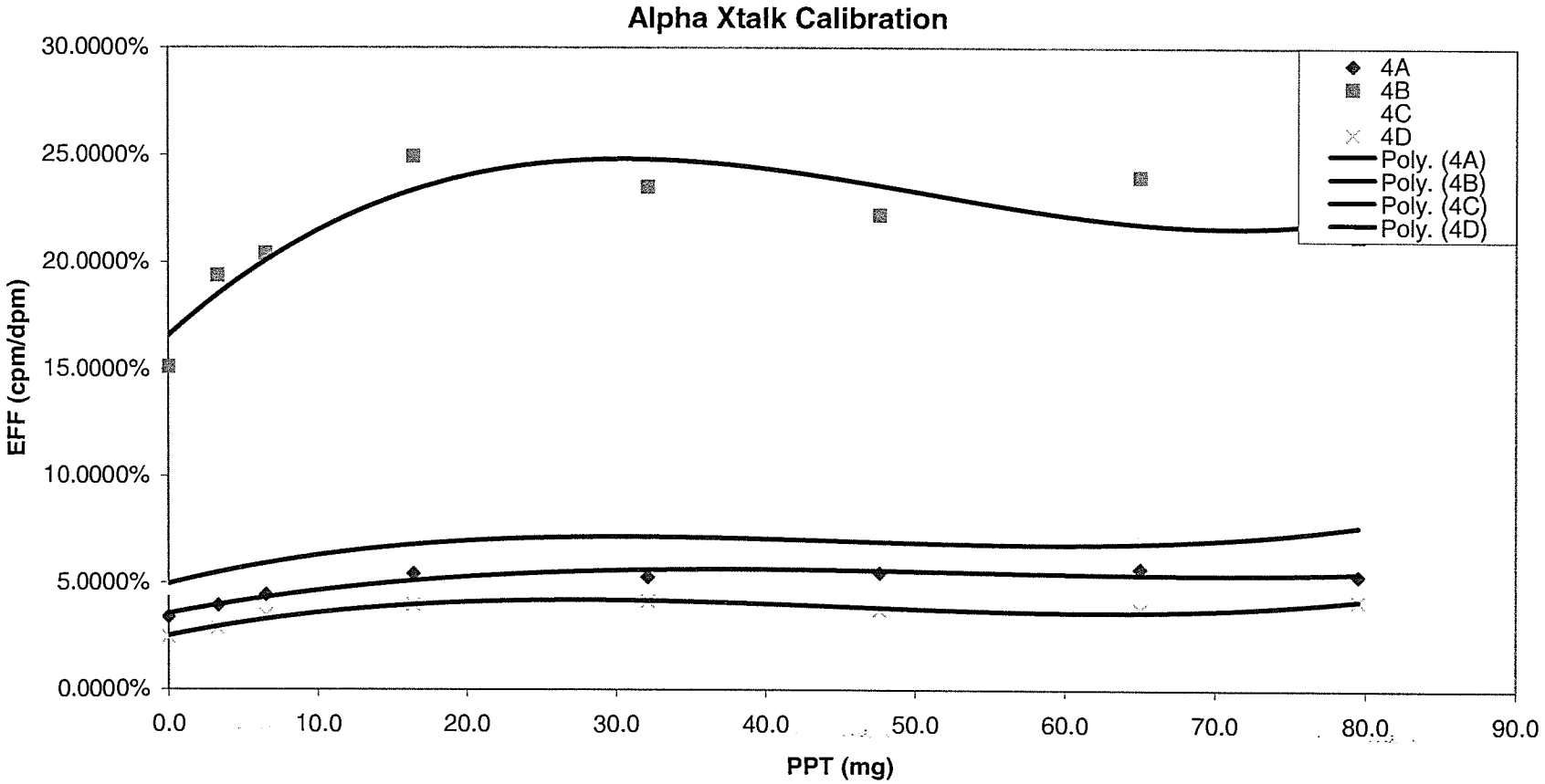


3A $y = 3.499233E\text{-}07x^3 - 4.920473E\text{-}05x^2 + 1.917011E\text{-}03x + 4.287615E\text{-}02$

3B $y = 1.716394E\text{-}07x^3 - 2.542473E\text{-}05x^2 + 1.122325E\text{-}03x + 2.538148E\text{-}02$

3C $y = 2.434329E\text{-}07x^3 - 3.631193E\text{-}05x^2 + 1.614184E\text{-}03x + 4.089564E\text{-}02$

3D $y = 3.571480E\text{-}07x^3 - 4.835300E\text{-}05x^2 + 1.879700E\text{-}03x + 4.889174E\text{-}02$

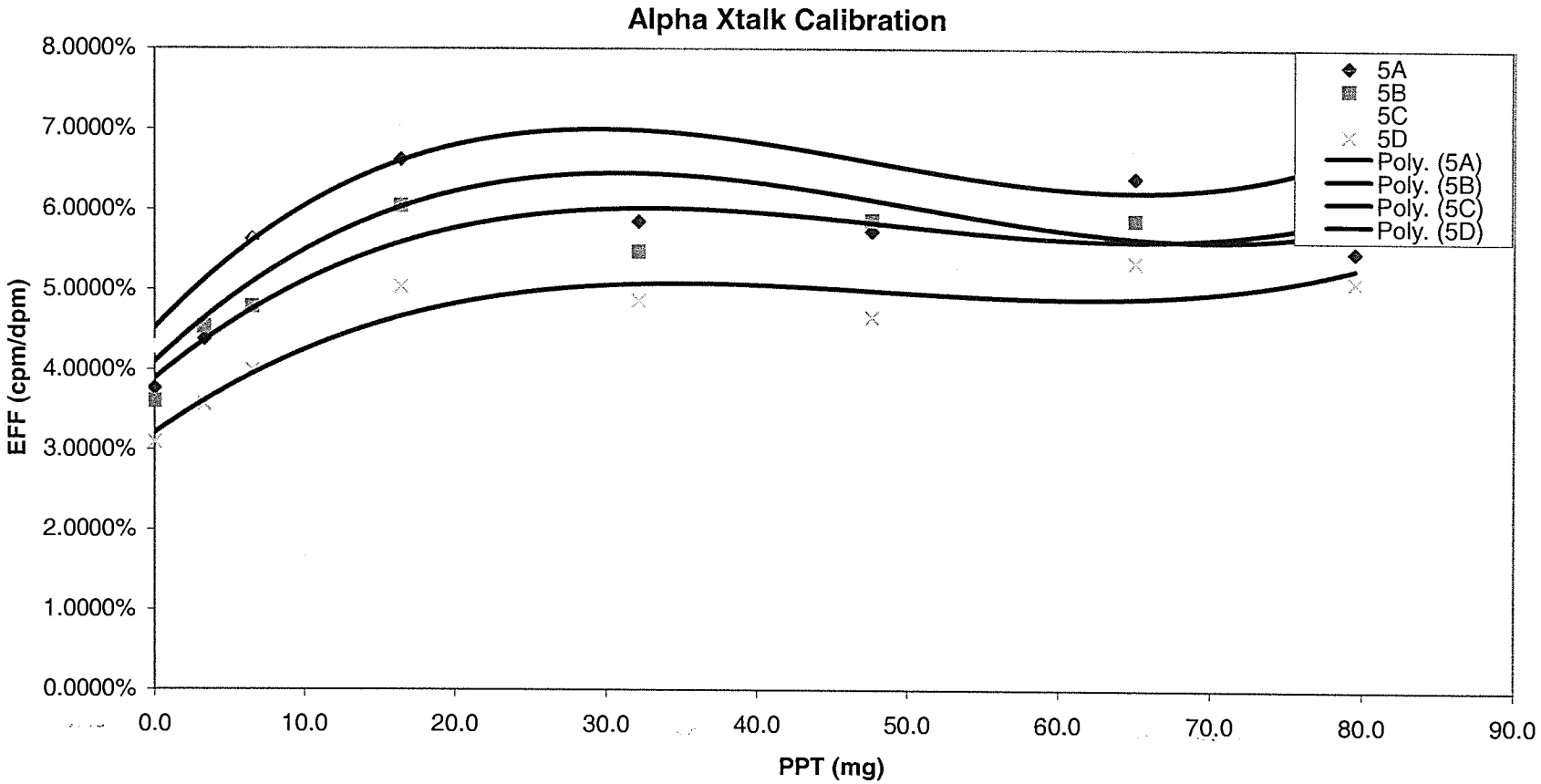


4A $y = 1.708662E-07x^3 - 2.750311E-05x^2 + 1.348251E-03x + 3.553498E-02$

4B $y = 9.675298E-07x^3 - 1.474834E-04x^2 + 6.302217E-03x + 1.656760E-01$

4C $y = 3.227857E-07x^3 - 4.334194E-05x^2 + 1.745777E-03x + 4.953165E-02$

4D $y = 2.778185E-07x^3 - 3.737147E-05x^2 + 1.426932E-03x + 2.517713E-02$

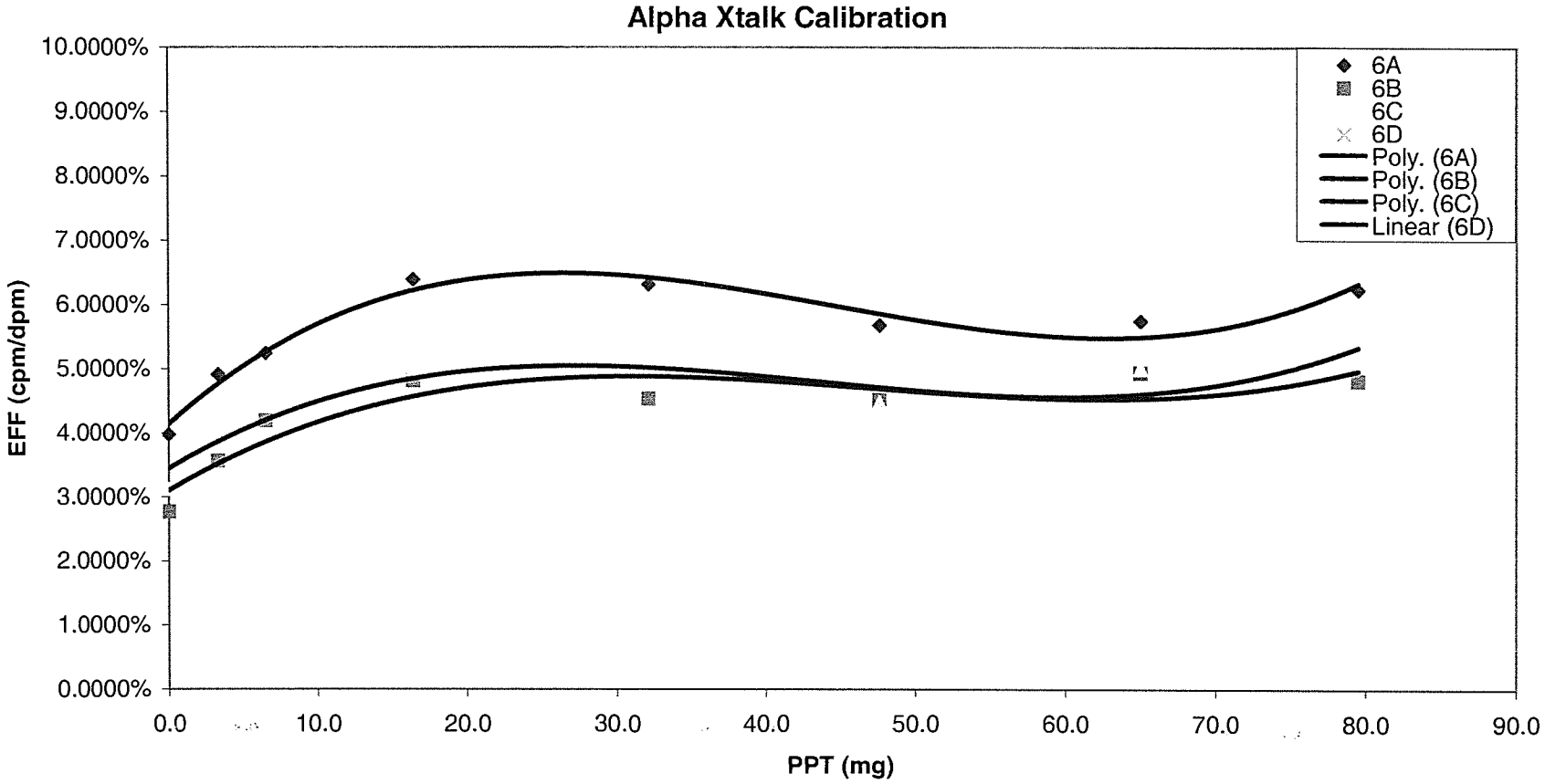


5A $y = 2.759235E-07x^3 - 4.181222E-05x^2 + 1.790288E-03x + 4.097519E-02$

5B $y = 2.425168E-07x^3 - 3.562565E-05x^2 + 1.555231E-03x + 3.889570E-02$

5C $y = 3.439531E-07x^3 - 4.879524E-05x^2 + 1.979540E-03x + 4.520306E-02$

5D $y = 2.038893E-07x^3 - 2.952907E-05x^2 + 1.317440E-03x + 3.210630E-02$

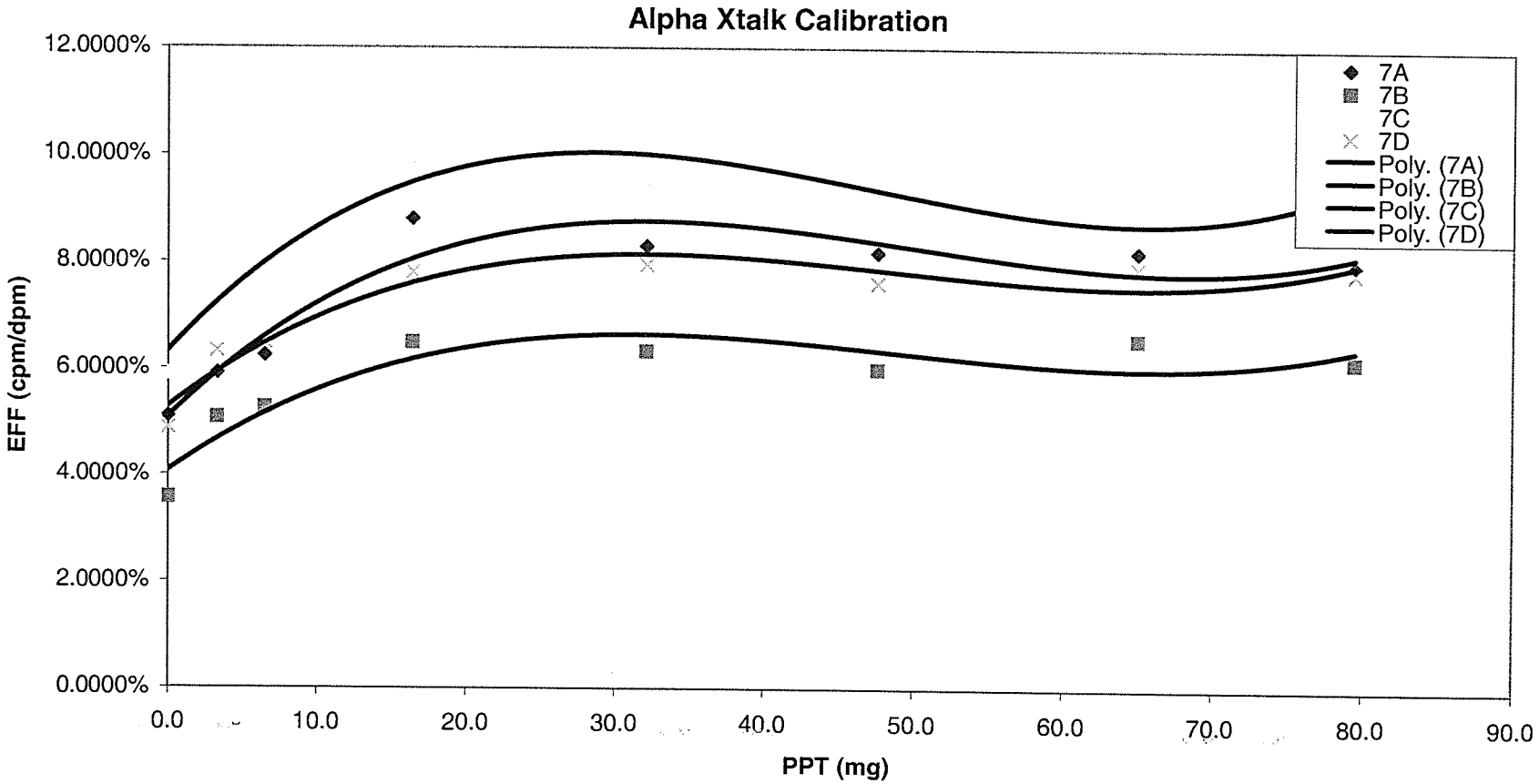


6A $y = 4.191221E-07x^3 - 5.594868E-05x^2 + 2.074343E-03x + 4.142131E-02$

6B $y = 2.362976E-07x^3 - 3.309202E-05x^2 + 1.372734E-03x + 3.104491E-02$

6C $y = 2.850867E-07x^3 - 3.712003E-05x^2 + 1.386774E-03x + 3.449302E-02$

6D

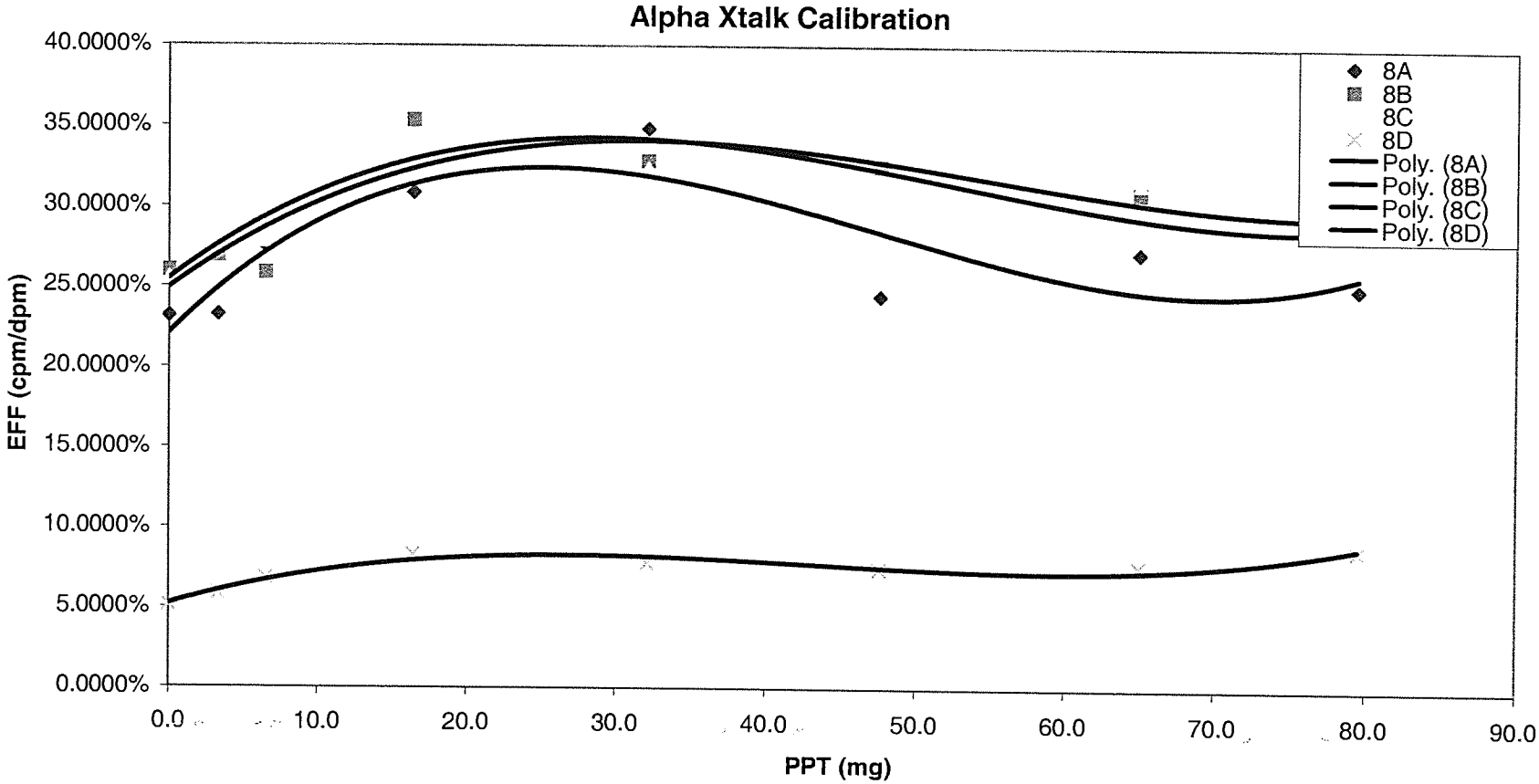


7A $y = 4.128525E\text{-}07x^3 - 6.214764E\text{-}05x^2 + 2.715506E\text{-}03x + 5.084852E\text{-}02$

7B $y = 3.139340E\text{-}07x^3 - 4.575758E\text{-}05x^2 + 1.944599E\text{-}03x + 4.078697E\text{-}02$

7C $y = 5.342045E\text{-}07x^3 - 7.562344E\text{-}05x^2 + 3.026736E\text{-}03x + 6.321283E\text{-}02$

7D $y = 3.417990E\text{-}07x^3 - 4.982558E\text{-}05x^2 + 2.140682E\text{-}03x + 5.279833E\text{-}02$

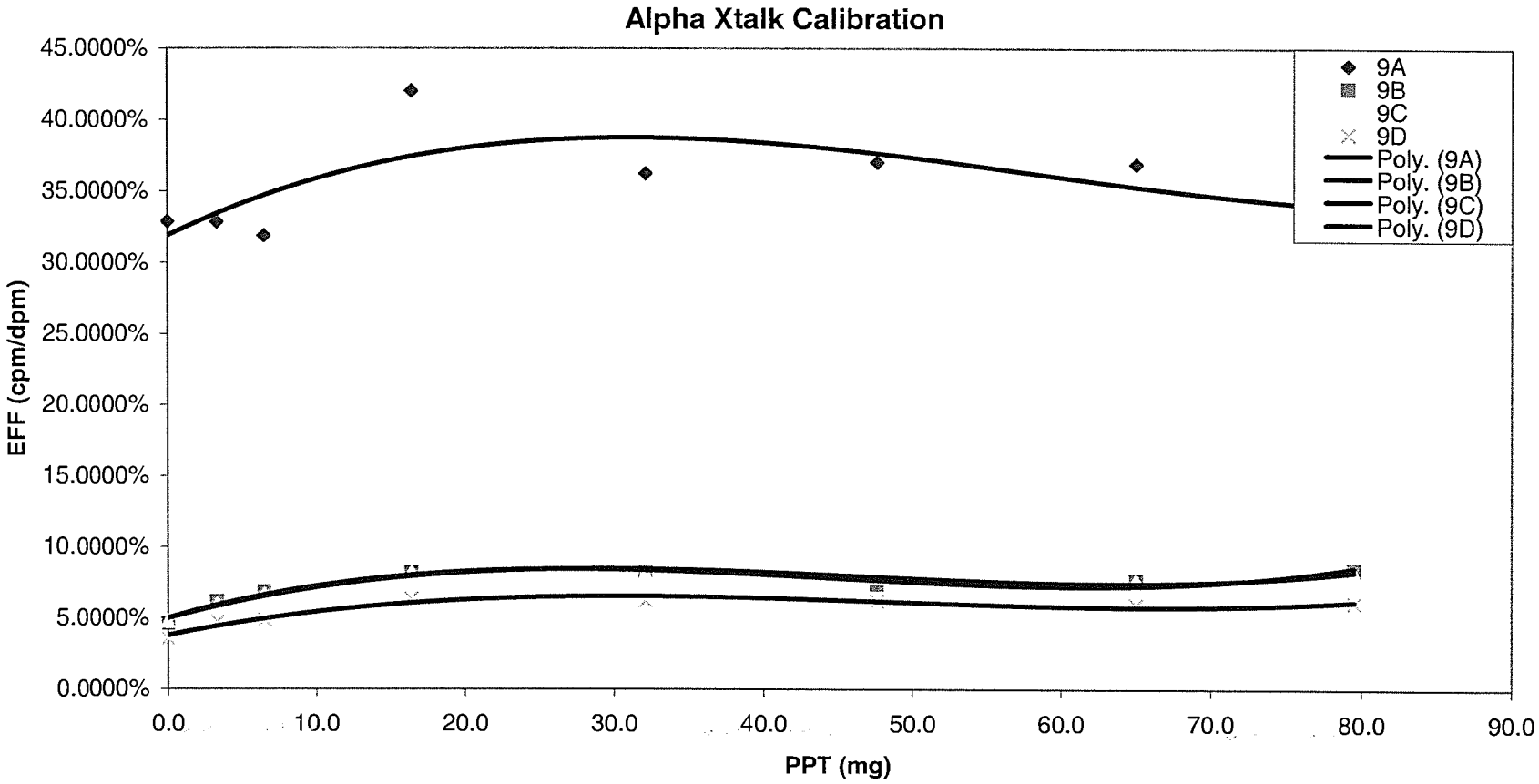


8A $y = 1.766854E\text{-}06x^3 - 2.520044E\text{-}04x^2 + 9.331203E\text{-}03x + 2.208246E\text{-}01$

8B $y = 9.117207E\text{-}07x^3 - 1.502662E\text{-}04x^2 + 6.748167E\text{-}03x + 2.491760E\text{-}01$

8C $y = 1.065514E\text{-}06x^3 - 1.679634E\text{-}04x^2 + 7.013727E\text{-}03x + 2.548144E\text{-}01$

8D $y = 5.759302E\text{-}07x^3 - 7.421136E\text{-}05x^2 + 2.725455E\text{-}03x + 5.196739E\text{-}02$

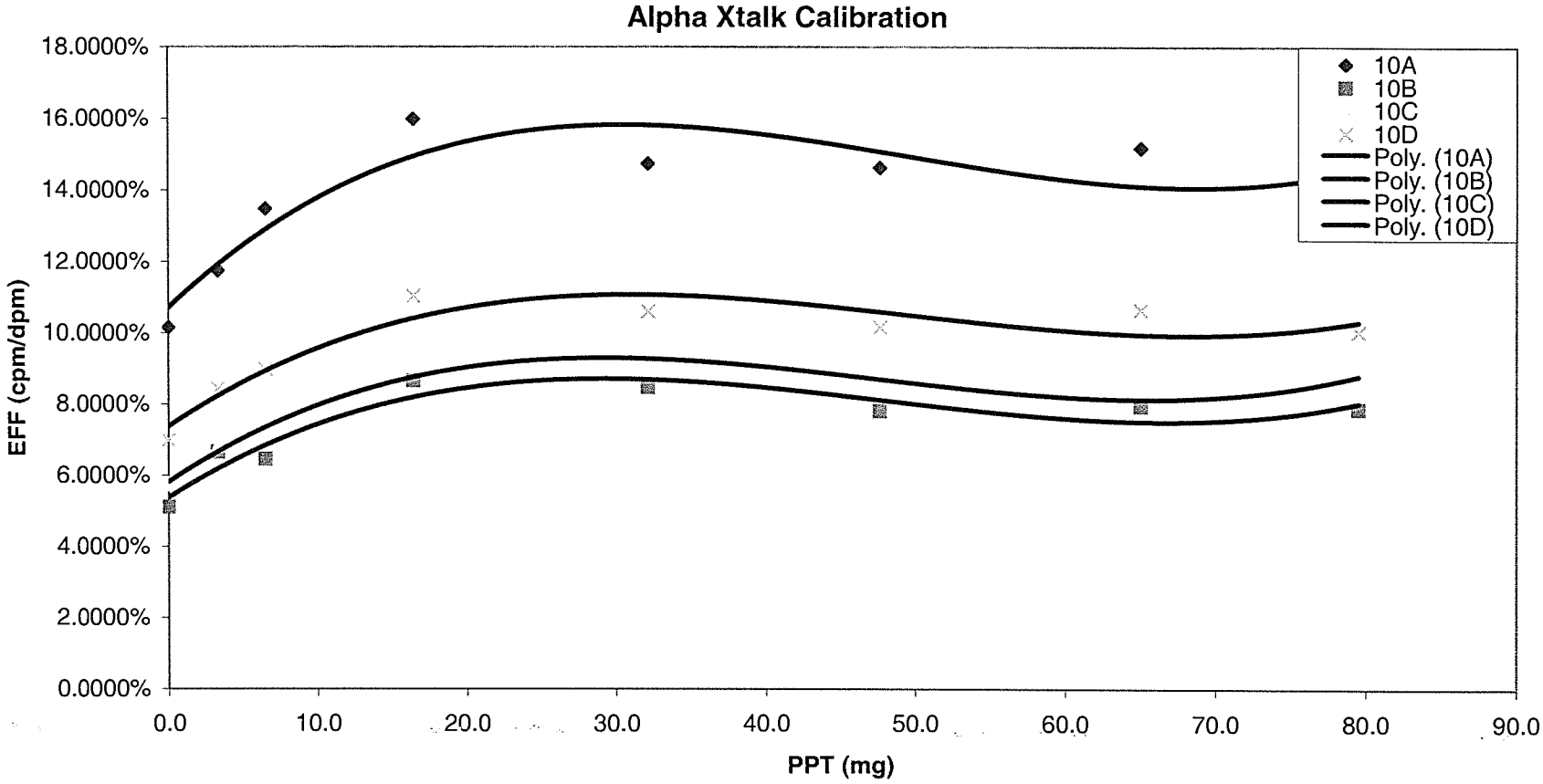


9A $y = 6.304017E-07x^3 - 1.103001E-04x^2 + 5.033961E-03x + 3.188606E-01$

9B $y = 5.972531E-07x^3 - 7.938585E-05x^2 + 2.982927E-03x + 5.006128E-02$

9C $y = 5.052770E-07x^3 - 7.054130E-05x^2 + 2.828747E-03x + 4.975861E-02$

9D $y = 3.496949E-07x^3 - 5.084321E-05x^2 + 2.132832E-03x + 3.773850E-02$

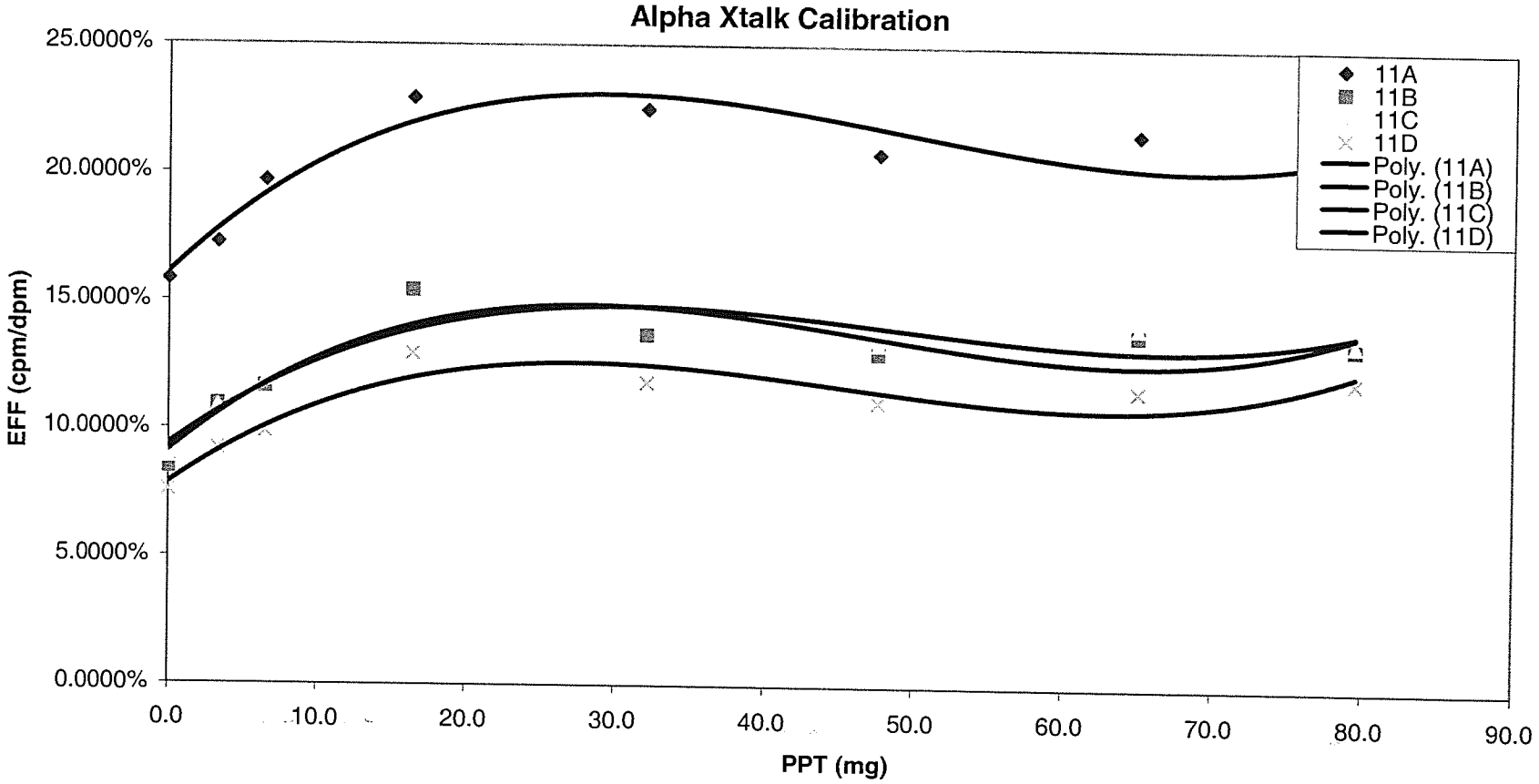


10A $y = 6.295806E-07x^3 - 9.354133E-05x^2 + 3.942306E-03x + 1.071303E-01$

10B $y = 4.596032E-07x^3 - 6.602443E-05x^2 + 2.677959E-03x + 5.379125E-02$

10C $y = 4.886156E-07x^3 - 6.934015E-05x^2 + 2.799132E-03x + 5.820509E-02$

10D $y = 4.430732E-07x^3 - 6.590523E-05x^2 + 2.807467E-03x + 7.381956E-02$

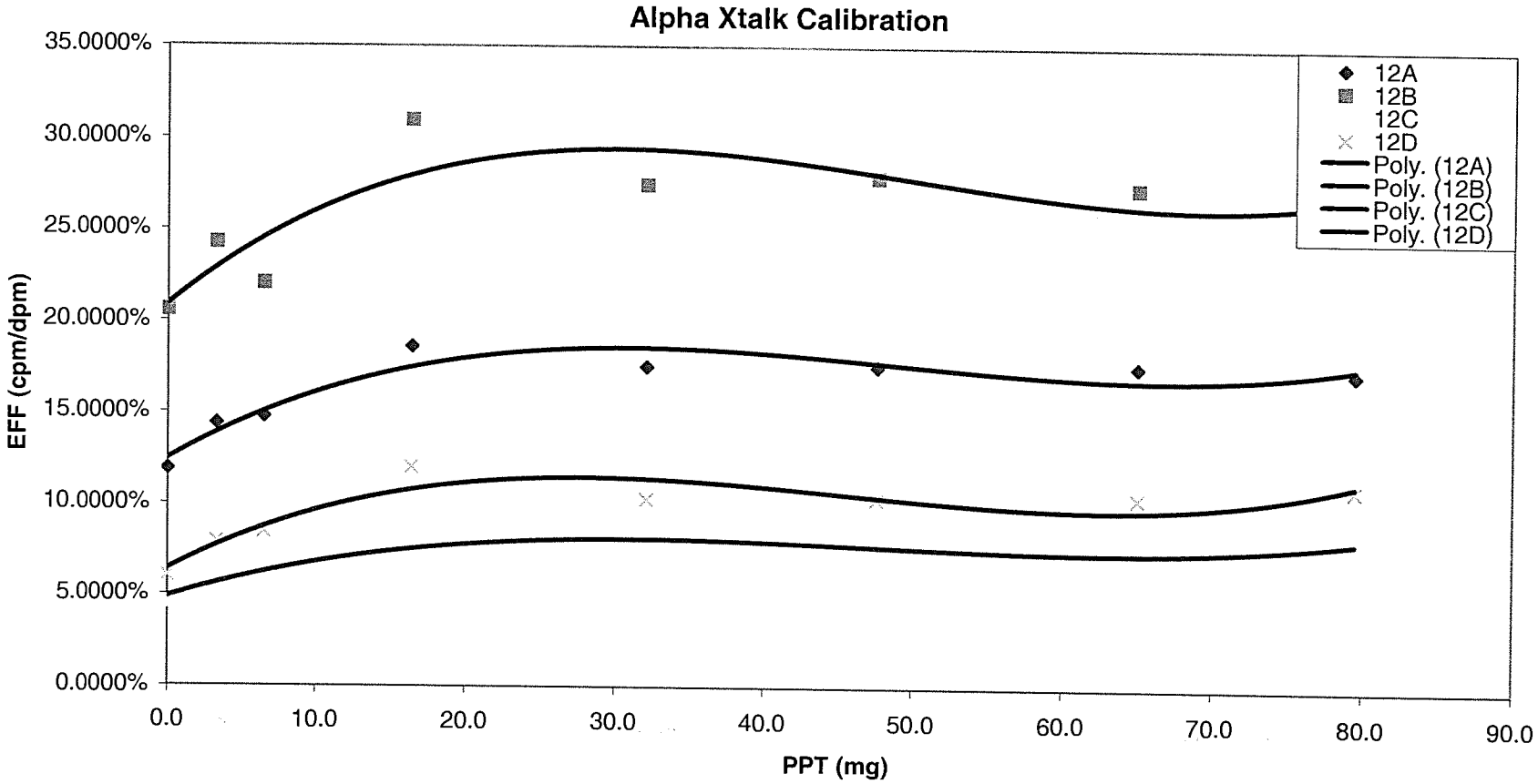


11A $y = 9.092391E\text{-}07x^3 - 1.344608E\text{-}04x^2 + 5.549478E\text{-}03x + 1.608452E\text{-}01$

11B $y = 8.760469E\text{-}07x^3 - 1.224562E\text{-}04x^2 + 4.799707E\text{-}03x + 9.109776E\text{-}02$

11C $y = 6.864198E\text{-}07x^3 - 1.003206E\text{-}04x^2 + 4.209624E\text{-}03x + 9.375205E\text{-}02$

11D $y = 7.838426E\text{-}07x^3 - 1.062118E\text{-}04x^2 + 4.057104E\text{-}03x + 7.858043E\text{-}02$

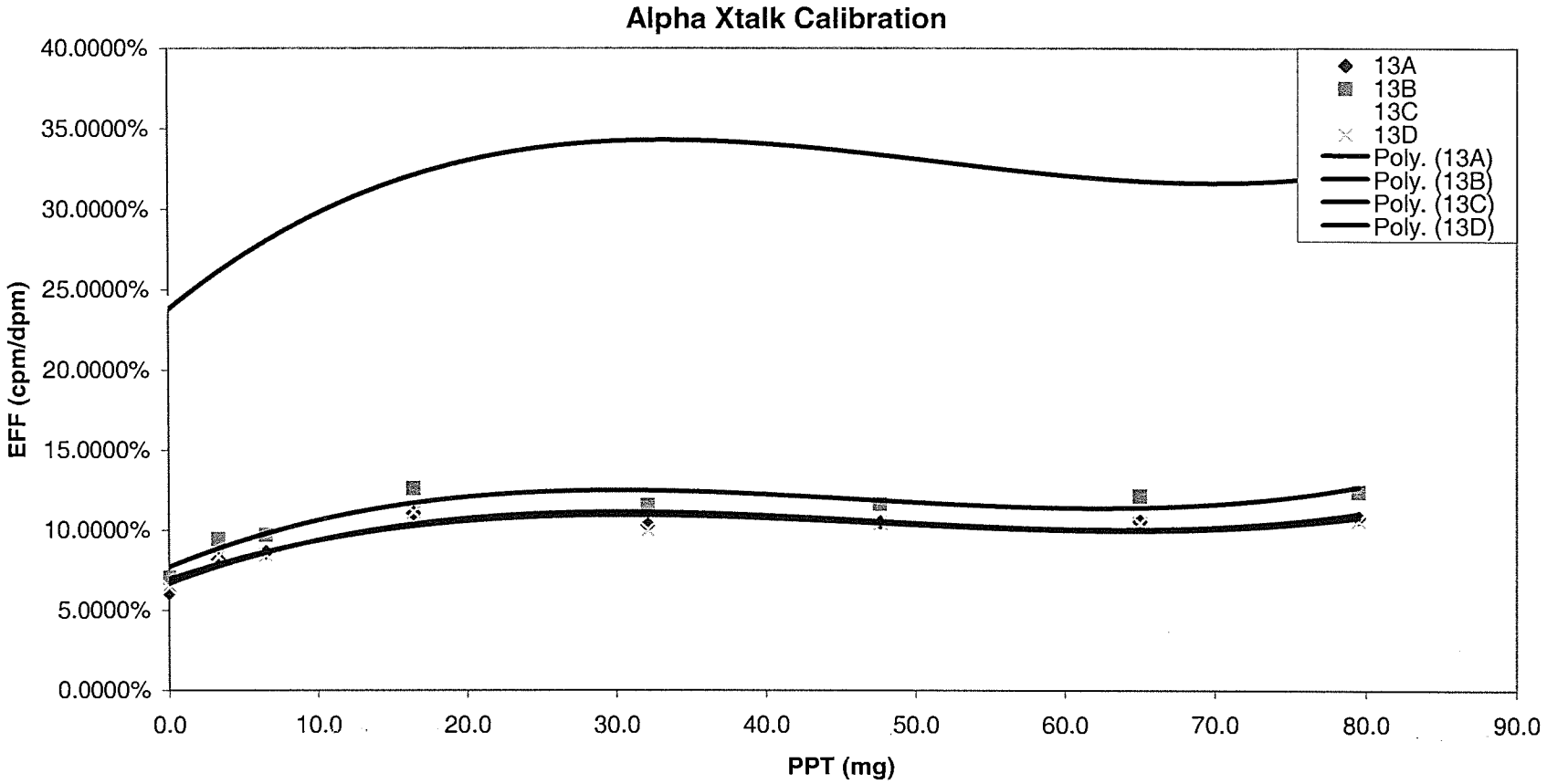


12A $y = 7.486322E\text{-}07x^3 - 1.100013E\text{-}04x^2 + 4.666807E\text{-}03x + 1.244876E\text{-}01$

12B $y = 1.036503E\text{-}06x^3 - 1.557214E\text{-}04x^2 + 6.576215E\text{-}03x + 2.090130E\text{-}01$

12C $y = 4.184401E\text{-}07x^3 - 5.929049E\text{-}05x^2 + 2.474862E\text{-}03x + 4.869745E\text{-}02$

12D $y = 8.046165E\text{-}07x^3 - 1.097415E\text{-}04x^2 + 4.248843E\text{-}03x + 6.399859E\text{-}02$

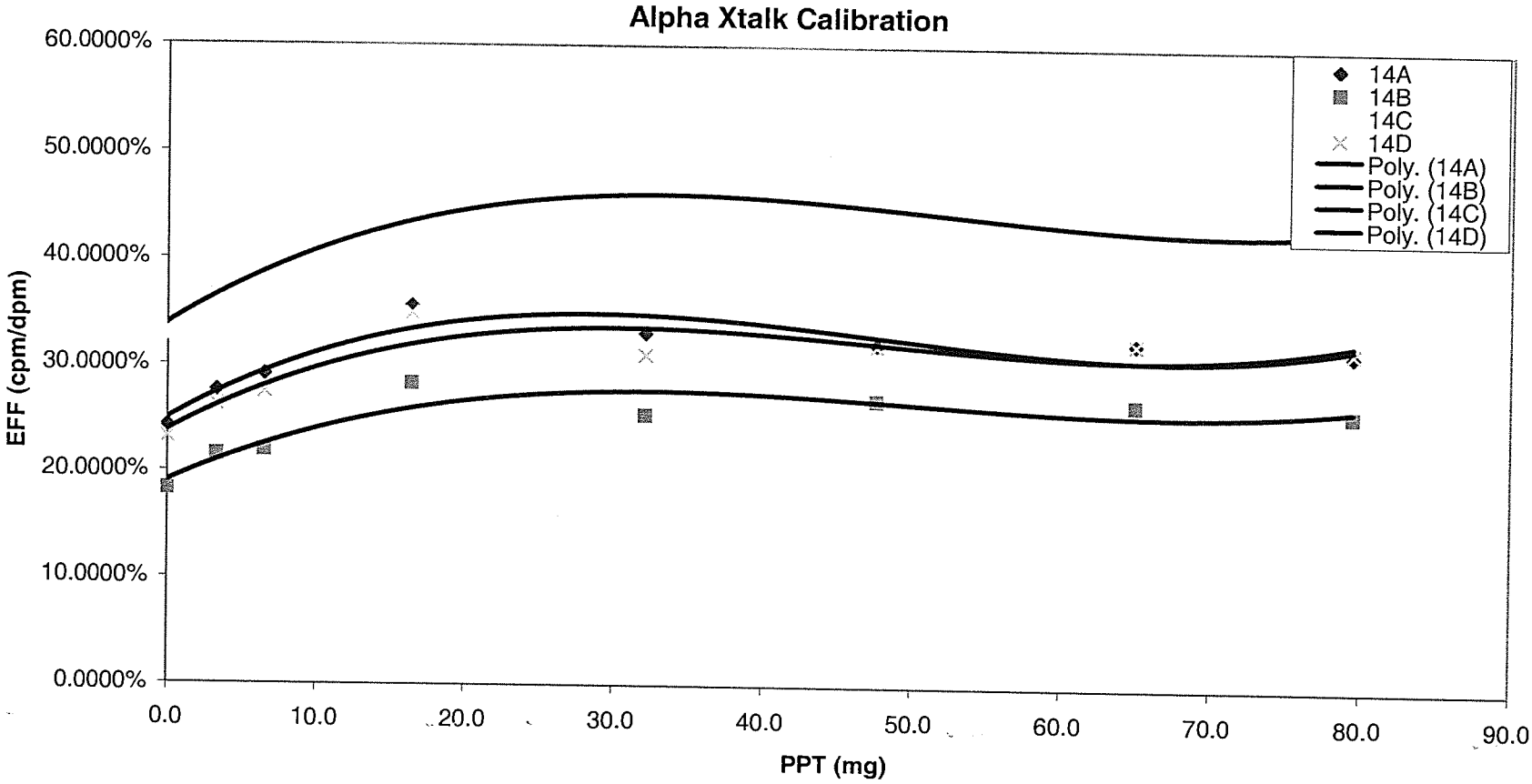


13A $y = 6.023498E-07x^3 - 8.492706E-05x^2 + 3.492530E-03x + 6.675455E-02$

13B $y = 6.732310E-07x^3 - 9.321981E-05x^2 + 3.783847E-03x + 7.706553E-02$

13C $y = 1.087340E-06x^3 - 1.678677E-04x^2 + 7.542047E-03x + 2.379142E-01$

13D $y = 5.282912E-07x^3 - 7.503950E-05x^2 + 3.108447E-03x + 6.942060E-02$



14A $y = 1.398148E\text{-}06x^3 - 2.016154E\text{-}04x^2 + 8.108614E\text{-}03x + 2.491776E\text{-}01$

14B $y = 9.487814E\text{-}07x^3 - 1.430334E\text{-}04x^2 + 6.298294E\text{-}03x + 1.904240E\text{-}01$

14C $y = 1.210676E\text{-}06x^3 - 1.911657E\text{-}04x^2 + 8.698270E\text{-}03x + 3.385315E\text{-}01$

14D $y = 1.282239E\text{-}06x^3 - 1.843340E\text{-}04x^2 + 7.651297E\text{-}03x + 2.377888E\text{-}01$

Current Calibration - PIC

Geometry

Alpha X-talk **Cal Date** 10/1/2013 **Exp Date** 9/30/2014

Protean	A0	A1	A2	A3	A4
1A	7.827241E-02	3.929950E-03	-1.031744E-04	7.594635E-07	
1B	8.196985E-02	3.826143E-03	-9.696660E-05	6.874343E-07	
1C	2.892608E-02	1.453269E-03	-3.518821E-05	2.473057E-07	
1D	3.707757E-02	1.595805E-03	-3.839188E-05	2.627522E-07	
2A	1.734244E-01	4.238758E-03	-9.466370E-05	5.810864E-07	
2B	2.188958E-01	6.263786E-03	-1.575273E-04	1.074182E-06	
2C	6.013077E-02	2.399226E-03	-5.826446E-05	4.007389E-07	
2D	1.973259E-01	5.882230E-03	-1.460055E-04	9.586927E-07	
3A	4.287615E-02	1.917011E-03	-4.920473E-05	3.499233E-07	
3B	2.538148E-02	1.122325E-03	-2.542473E-05	1.716394E-07	
3C	4.089564E-02	1.614184E-03	-3.631193E-05	2.434329E-07	
3D	4.889174E-02	1.879700E-03	-4.835300E-05	3.571480E-07	
4A	3.553498E-02	1.348251E-03	-2.750311E-05	1.708662E-07	
4B	1.656760E-01	6.302217E-03	-1.474834E-04	9.675298E-07	
4C	4.953165E-02	1.745777E-03	-4.334194E-05	3.227857E-07	
4D	2.517713E-02	1.426932E-03	-3.737147E-05	2.778185E-07	
5A	4.097519E-02	1.790288E-03	-4.181222E-05	2.759235E-07	
5B	3.889570E-02	1.555231E-03	-3.562565E-05	2.425168E-07	
5C	4.520306E-02	1.979540E-03	-4.879524E-05	3.439531E-07	
5D	3.210630E-02	1.317440E-03	-2.952907E-05	2.038893E-07	
6A	4.142131E-02	2.074343E-03	-5.594868E-05	4.191221E-07	
6B	3.104491E-02	1.372734E-03	-3.309202E-05	2.362976E-07	
6C	3.449302E-02	1.386774E-03	-3.712003E-05	2.850867E-07	
6D	#N/A	#N/A	#N/A	#N/A	
7A	5.084852E-02	2.715506E-03	-6.214764E-05	4.128525E-07	
7B	4.078697E-02	1.944599E-03	-4.575758E-05	3.139340E-07	
7C	6.321283E-02	3.026736E-03	-7.562344E-05	5.342045E-07	
7D	5.279833E-02	2.140682E-03	-4.982558E-05	3.417990E-07	
8A	2.208246E-01	9.331203E-03	-2.520044E-04	1.766854E-06	
8B	2.491760E-01	6.748167E-03	-1.502662E-04	9.117207E-07	
8C	2.548144E-01	7.013727E-03	-1.679634E-04	1.065514E-06	
8D	5.196739E-02	2.725455E-03	-7.421136E-05	5.759302E-07	
9A	3.188606E-01	5.033961E-03	-1.103001E-04	6.304017E-07	
9B	5.006128E-02	2.982927E-03	-7.938585E-05	5.972531E-07	
9C	4.975861E-02	2.828747E-03	-7.054130E-05	5.052770E-07	
9D	3.773850E-02	2.132832E-03	-5.084321E-05	3.496949E-07	
10A	1.071303E-01	3.942306E-03	-9.354133E-05	6.295806E-07	
10B	5.379125E-02	2.677959E-03	-6.602443E-05	4.596032E-07	
10C	5.820509E-02	2.799132E-03	-6.934015E-05	4.886156E-07	
10D	7.381956E-02	2.807467E-03	-6.590523E-05	4.430732E-07	
11A	1.608452E-01	5.549478E-03	-1.344608E-04	9.092391E-07	
11B	9.109776E-02	4.799707E-03	-1.224562E-04	8.760469E-07	
11C	9.375205E-02	4.209624E-03	-1.003206E-04	6.864198E-07	
11D	7.858043E-02	4.057104E-03	-1.062118E-04	7.838426E-07	
12A	1.244876E-01	4.666807E-03	-1.100013E-04	7.486322E-07	
12B	2.090130E-01	6.576215E-03	-1.557214E-04	1.036503E-06	
12C	4.869745E-02	2.474862E-03	-5.929049E-05	4.184401E-07	
12D	6.399859E-02	4.248843E-03	-1.097415E-04	8.046165E-07	
13A	6.675455E-02	3.492530E-03	-8.492706E-05	6.023498E-07	
13B	7.706553E-02	3.783847E-03	-9.321981E-05	6.732310E-07	
13C	2.379142E-01	7.542047E-03	-1.678677E-04	1.087340E-06	
13D	6.942060E-02	3.108447E-03	-7.503950E-05	5.282912E-07	
14A	2.491776E-01	8.108614E-03	-2.016154E-04	1.398148E-06	
14B	1.904240E-01	6.298294E-03	-1.430334E-04	9.487814E-07	
14C	3.385315E-01	8.698270E-03	-1.911657E-04	1.210676E-06	
14D	2.377888E-01	7.651297E-03	-1.843340E-04	1.282239E-06	

PIC_Alpha Xtalk_Sep13_RawData.xls

SampleID	Instr	Time (min.)	Alpha Counts	Beta Counts	Count Start Time	Count End Time	Machine	Batch ID
X1	10A	3	23424	2378	9/29/2013 19:18	9/29/2013 19:21	PIC	PO210X13
X2	10A	3	23984	2816	9/29/2013 19:15	9/29/2013 19:18	PIC	PO210X13
X3	10A	3	19399	2613	9/29/2013 19:11	9/29/2013 19:14	PIC	PO210X13
X4	10A	3	18647	2980	9/29/2013 19:07	9/29/2013 19:10	PIC	PO210X13
X5	10A	3	17064	2515	9/29/2013 19:02	9/29/2013 19:05	PIC	PO210X13
X6	10A	3	18029	2637	9/29/2013 19:31	9/29/2013 19:34	PIC	PO210X13
X7	10A	3	14464	2195	9/29/2013 19:27	9/29/2013 19:30	PIC	PO210X13
X8	10A	3	14794	2092	9/29/2013 19:23	9/29/2013 19:26	PIC	PO210X13
X1	10B	3	24853	1270	9/29/2013 19:23	9/29/2013 19:26	PIC	PO210X13
X2	10B	3	25492	1698	9/29/2013 19:19	9/29/2013 19:22	PIC	PO210X13
X3	10B	3	21207	1369	9/29/2013 19:15	9/29/2013 19:18	PIC	PO210X13
X4	10B	3	19963	1728	9/29/2013 19:11	9/29/2013 19:14	PIC	PO210X13
X5	10B	3	18472	1565	9/29/2013 19:07	9/29/2013 19:10	PIC	PO210X13
X6	10B	3	19151	1496	9/29/2013 19:02	9/29/2013 19:05	PIC	PO210X13
X7	10B	3	15675	1245	9/29/2013 19:31	9/29/2013 19:34	PIC	PO210X13
X8	10B	3	15453	1217	9/29/2013 19:27	9/29/2013 19:30	PIC	PO210X13
X1	10C	3	24397	1404	9/29/2013 19:27	9/29/2013 19:30	PIC	PO210X13
X2	10C	3	25018	1709	9/29/2013 19:23	9/29/2013 19:26	PIC	PO210X13
X3	10C	3	20713	1447	9/29/2013 19:19	9/29/2013 19:22	PIC	PO210X13
X4	10C	3	19553	1827	9/29/2013 19:15	9/29/2013 19:18	PIC	PO210X13
X5	10C	3	18215	1635	9/29/2013 19:11	9/29/2013 19:14	PIC	PO210X13
X6	10C	3	18974	1606	9/29/2013 19:07	9/29/2013 19:10	PIC	PO210X13
X7	10C	3	15585	1327	9/29/2013 19:02	9/29/2013 19:05	PIC	PO210X13
X8	10C	3	15543	1346	9/29/2013 19:32	9/29/2013 19:35	PIC	PO210X13
X1	10D	3	24465	1711	9/29/2013 19:31	9/29/2013 19:34	PIC	PO210X13
X2	10D	3	25323	2138	9/29/2013 19:27	9/29/2013 19:30	PIC	PO210X13
X3	10D	3	20657	1853	9/29/2013 19:23	9/29/2013 19:26	PIC	PO210X13
X4	10D	3	19714	2174	9/29/2013 19:19	9/29/2013 19:22	PIC	PO210X13
X5	10D	3	18223	1930	9/29/2013 19:15	9/29/2013 19:18	PIC	PO210X13
X6	10D	3	18973	1929	9/29/2013 19:11	9/29/2013 19:14	PIC	PO210X13
X7	10D	3	15170	1617	9/29/2013 19:07	9/29/2013 19:10	PIC	PO210X13
X8	10D	3	15406	1547	9/29/2013 19:02	9/29/2013 19:05	PIC	PO210X13
X1	11A	3	22552	3569	9/29/2013 18:08	9/29/2013 18:11	PIC	PO210X13
X2	11A	3	23435	4045	9/29/2013 19:07	9/29/2013 19:10	PIC	PO210X13
X3	11A	3	18738	3688	9/29/2013 19:00	9/29/2013 19:03	PIC	PO210X13
X4	11A	3	17900	4101	9/29/2013 18:52	9/29/2013 18:55	PIC	PO210X13

X5	11A	3	16500	3713	9/29/2013 18:45	9/29/2013 18:48	PIC	PO210X13
X6	11A	3	17447	3634	9/29/2013 18:36	9/29/2013 18:39	PIC	PO210X13
X7	11A	3	13934	3019	9/29/2013 18:28	9/29/2013 18:31	PIC	PO210X13
X8	11A	3	14197	2898	9/29/2013 18:16	9/29/2013 18:19	PIC	PO210X13
X1	11B	3	24608	2081	9/29/2013 18:16	9/29/2013 18:19	PIC	PO210X13
X2	11B	3	25250	2761	9/29/2013 18:08	9/29/2013 18:11	PIC	PO210X13
X3	11B	3	21154	2460	9/29/2013 19:07	9/29/2013 19:10	PIC	PO210X13
X4	11B	3	19466	3001	9/29/2013 19:00	9/29/2013 19:03	PIC	PO210X13
X5	11B	3	18279	2506	9/29/2013 18:52	9/29/2013 18:55	PIC	PO210X13
X6	11B	3	19384	2531	9/29/2013 18:45	9/29/2013 18:48	PIC	PO210X13
X7	11B	3	15571	2154	9/29/2013 18:35	9/29/2013 18:38	PIC	PO210X13
X8	11B	3	15551	2087	9/29/2013 18:28	9/29/2013 18:31	PIC	PO210X13
X1	11C	3	24504	2173	9/29/2013 18:28	9/29/2013 18:31	PIC	PO210X13
X2	11C	3	25228	2743	9/29/2013 18:16	9/29/2013 18:19	PIC	PO210X13
X3	11C	3	20522	2444	9/29/2013 18:08	9/29/2013 18:11	PIC	PO210X13
X4	11C	3	19896	2874	9/29/2013 19:07	9/29/2013 19:10	PIC	PO210X13
X5	11C	3	18034	2603	9/29/2013 19:00	9/29/2013 19:03	PIC	PO210X13
X6	11C	3	19304	2589	9/29/2013 18:52	9/29/2013 18:55	PIC	PO210X13
X7	11C	3	15645	2212	9/29/2013 18:45	9/29/2013 18:48	PIC	PO210X13
X8	11C	3	15795	2145	9/29/2013 18:35	9/29/2013 18:38	PIC	PO210X13
X1	11D	3	24668	1868	9/29/2013 18:35	9/29/2013 18:38	PIC	PO210X13
X2	11D	3	25472	2347	9/29/2013 18:28	9/29/2013 18:31	PIC	PO210X13
X3	11D	3	20808	2057	9/29/2013 18:16	9/29/2013 18:19	PIC	PO210X13
X4	11D	3	19788	2564	9/29/2013 18:08	9/29/2013 18:11	PIC	PO210X13
X5	11D	3	18427	2184	9/29/2013 19:07	9/29/2013 19:10	PIC	PO210X13
X6	11D	3	19431	2164	9/29/2013 19:00	9/29/2013 19:03	PIC	PO210X13
X7	11D	3	15470	1804	9/29/2013 18:52	9/29/2013 18:55	PIC	PO210X13
X8	11D	3	15279	1844	9/29/2013 18:45	9/29/2013 18:48	PIC	PO210X13
X1	12A	3	23718	2817	9/29/2013 18:45	9/29/2013 18:48	PIC	PO210X13
X2	12A	3	23935	3441	9/29/2013 18:35	9/29/2013 18:38	PIC	PO210X13
X3	12A	3	19852	2931	9/29/2013 18:28	9/29/2013 18:31	PIC	PO210X13
X4	12A	3	18651	3470	9/29/2013 18:16	9/29/2013 18:19	PIC	PO210X13
X5	12A	3	17481	3068	9/29/2013 18:08	9/29/2013 18:11	PIC	PO210X13
X6	12A	3	18175	3196	9/29/2013 19:07	9/29/2013 19:10	PIC	PO210X13
X7	12A	3	14640	2583	9/29/2013 19:00	9/29/2013 19:03	PIC	PO210X13
X8	12A	3	14529	2517	9/29/2013 18:52	9/29/2013 18:55	PIC	PO210X13
X1	12B	3	22117	4551	9/29/2013 18:52	9/29/2013 18:55	PIC	PO210X13

X2	12B	3	22345	5419	9/29/2013 18:45	9/29/2013 18:48	PIC	PO210X13
X3	12B	3	18570	4092	9/29/2013 18:35	9/29/2013 18:38	PIC	PO210X13
X4	12B	3	17100	5293	9/29/2013 18:28	9/29/2013 18:31	PIC	PO210X13
X5	12B	3	16044	4406	9/29/2013 18:16	9/29/2013 18:19	PIC	PO210X13
X6	12B	3	16781	4682	9/29/2013 18:08	9/29/2013 18:11	PIC	PO210X13
X7	12B	3	13689	3747	9/29/2013 19:07	9/29/2013 19:10	PIC	PO210X13
X8	12B	3	13793	3643	9/29/2013 19:00	9/29/2013 19:03	PIC	PO210X13
X1	12C	3	25769	1184	9/29/2013 19:00	9/29/2013 19:03	PIC	PO210X13
X2	12C	3	26340	1599	9/29/2013 18:52	9/29/2013 18:55	PIC	PO210X13
X3	12C	3	21943	1263	9/29/2013 18:45	9/29/2013 18:48	PIC	PO210X13
X4	12C	3	21022	1745	9/29/2013 18:35	9/29/2013 18:38	PIC	PO210X13
X5	12C	3	19225	1432	9/29/2013 18:28	9/29/2013 18:31	PIC	PO210X13
X6	12C	3	20187	1554	9/29/2013 18:16	9/29/2013 18:19	PIC	PO210X13
X7	12C	3	16576	1284	9/29/2013 18:08	9/29/2013 18:11	PIC	PO210X13
X8	12C	3	16129	1282	9/29/2013 19:07	9/29/2013 19:10	PIC	PO210X13
X1	12D	3	25737	1552	9/29/2013 19:07	9/29/2013 19:10	PIC	PO210X13
X2	12D	3	26401	2090	9/29/2013 19:00	9/29/2013 19:03	PIC	PO210X13
X3	12D	3	22016	1858	9/29/2013 18:52	9/29/2013 18:55	PIC	PO210X13
X4	12D	3	20876	2508	9/29/2013 18:45	9/29/2013 18:48	PIC	PO210X13
X5	12D	3	19216	1976	9/29/2013 18:35	9/29/2013 18:38	PIC	PO210X13
X6	12D	3	20440	2112	9/29/2013 18:28	9/29/2013 18:31	PIC	PO210X13
X7	12D	3	16320	1701	9/29/2013 18:16	9/29/2013 18:19	PIC	PO210X13
X8	12D	3	16345	1792	9/29/2013 18:08	9/29/2013 18:11	PIC	PO210X13
X1	13A	3	24814	1515	9/29/2013 18:11	9/29/2013 18:14	PIC	PO210X13
X2	13A	3	25538	2089	9/29/2013 19:11	9/29/2013 19:14	PIC	PO210X13
X3	13A	3	20873	1799	9/29/2013 19:04	9/29/2013 19:07	PIC	PO210X13
X4	13A	3	19705	2179	9/29/2013 18:56	9/29/2013 18:59	PIC	PO210X13
X5	13A	3	18289	1891	9/29/2013 18:49	9/29/2013 18:52	PIC	PO210X13
X6	13A	3	19181	2012	9/29/2013 18:41	9/29/2013 18:44	PIC	PO210X13
X7	13A	3	15614	1647	9/29/2013 18:32	9/29/2013 18:35	PIC	PO210X13
X8	13A	3	15447	1670	9/29/2013 18:22	9/29/2013 18:25	PIC	PO210X13
X1	13B	3	25436	1788	9/29/2013 18:22	9/29/2013 18:25	PIC	PO210X13
X2	13B	3	25935	2446	9/29/2013 18:11	9/29/2013 18:14	PIC	PO210X13
X3	13B	3	21595	2093	9/29/2013 19:11	9/29/2013 19:14	PIC	PO210X13
X4	13B	3	20520	2586	9/29/2013 19:04	9/29/2013 19:07	PIC	PO210X13
X5	13B	3	18970	2193	9/29/2013 18:56	9/29/2013 18:59	PIC	PO210X13
X6	13B	3	20301	2363	9/29/2013 18:49	9/29/2013 18:52	PIC	PO210X13

X7	13B	3	16437	1995	9/29/2013 18:41	9/29/2013 18:44	PIC	PO210X13
X8	13B	3	15956	1978	9/29/2013 18:32	9/29/2013 18:35	PIC	PO210X13
X1	13C	3	21655	5234	9/29/2013 18:32	9/29/2013 18:35	PIC	PO210X13
X2	13C	3	21919	6254	9/29/2013 18:22	9/29/2013 18:25	PIC	PO210X13
X3	13C	3	19170	4345	9/29/2013 18:11	9/29/2013 18:14	PIC	PO210X13
X4	13C	3	16567	5983	9/29/2013 19:11	9/29/2013 19:14	PIC	PO210X13
X5	13C	3	15861	5163	9/29/2013 19:04	9/29/2013 19:07	PIC	PO210X13
X6	13C	3	16305	5429	9/29/2013 18:56	9/29/2013 18:59	PIC	PO210X13
X7	13C	3	13431	4349	9/29/2013 18:49	9/29/2013 18:52	PIC	PO210X13
X8	13C	3	13496	4325	9/29/2013 18:41	9/29/2013 18:44	PIC	PO210X13
X1	13D	3	24865	1603	9/29/2013 18:41	9/29/2013 18:44	PIC	PO210X13
X2	13D	3	25667	2148	9/29/2013 18:32	9/29/2013 18:35	PIC	PO210X13
X3	13D	3	21211	1788	9/29/2013 18:22	9/29/2013 18:25	PIC	PO210X13
X4	13D	3	20290	2259	9/29/2013 18:11	9/29/2013 18:14	PIC	PO210X13
X5	13D	3	18619	1867	9/29/2013 19:11	9/29/2013 19:14	PIC	PO210X13
X6	13D	3	19548	2041	9/29/2013 19:04	9/29/2013 19:07	PIC	PO210X13
X7	13D	3	15631	1630	9/29/2013 18:56	9/29/2013 18:59	PIC	PO210X13
X8	13D	3	15736	1662	9/29/2013 18:49	9/29/2013 18:52	PIC	PO210X13
X1	14A	3	21398	5191	9/29/2013 18:49	9/29/2013 18:52	PIC	PO210X13
X2	14A	3	21897	6041	9/29/2013 18:41	9/29/2013 18:44	PIC	PO210X13
X3	14A	3	17886	5207	9/29/2013 18:32	9/29/2013 18:35	PIC	PO210X13
X4	14A	3	16628	5913	9/29/2013 18:22	9/29/2013 18:25	PIC	PO210X13
X5	14A	3	15479	5122	9/29/2013 18:11	9/29/2013 18:14	PIC	PO210X13
X6	14A	3	16485	5309	9/29/2013 19:10	9/29/2013 19:13	PIC	PO210X13
X7	14A	3	13323	4323	9/29/2013 19:04	9/29/2013 19:07	PIC	PO210X13
X8	14A	3	13268	4189	9/29/2013 18:56	9/29/2013 18:59	PIC	PO210X13
X1	14B	3	24017	4394	9/29/2013 18:56	9/29/2013 18:59	PIC	PO210X13
X2	14B	3	24515	5278	9/29/2013 18:49	9/29/2013 18:52	PIC	PO210X13
X3	14B	3	20449	4492	9/29/2013 18:41	9/29/2013 18:44	PIC	PO210X13
X4	14B	3	19198	5432	9/29/2013 18:32	9/29/2013 18:35	PIC	PO210X13
X5	14B	3	17898	4548	9/29/2013 18:22	9/29/2013 18:25	PIC	PO210X13
X6	14B	3	18623	5014	9/29/2013 18:11	9/29/2013 18:14	PIC	PO210X13
X7	14B	3	15203	4056	9/29/2013 19:10	9/29/2013 19:13	PIC	PO210X13
X8	14B	3	15299	3964	9/29/2013 19:04	9/29/2013 19:07	PIC	PO210X13
X1	14C	3	20042	6576	9/29/2013 19:04	9/29/2013 19:07	PIC	PO210X13
X2	14C	3	20185	7605	9/29/2013 18:56	9/29/2013 18:59	PIC	PO210X13
X3	14C	3	17044	6278	9/29/2013 18:49	9/29/2013 18:52	PIC	PO210X13

X4	14C	3	15413	7420	9/29/2013 18:41	9/29/2013 18:44	PIC	PO210X13
X5	14C	3	14511	6120	9/29/2013 18:32	9/29/2013 18:35	PIC	PO210X13
X6	14C	3	15106	6783	9/29/2013 18:22	9/29/2013 18:25	PIC	PO210X13
X7	14C	3	12381	5559	9/29/2013 18:11	9/29/2013 18:14	PIC	PO210X13
X8	14C	3	12260	5167	9/29/2013 19:10	9/29/2013 19:13	PIC	PO210X13
X1	14D	3	21782	5049	9/29/2013 19:10	9/29/2013 19:13	PIC	PO210X13
X2	14D	3	22206	5822	9/29/2013 19:04	9/29/2013 19:07	PIC	PO210X13
X3	14D	3	18447	5066	9/29/2013 18:56	9/29/2013 18:59	PIC	PO210X13
X4	14D	3	16969	5919	9/29/2013 18:49	9/29/2013 18:52	PIC	PO210X13
X5	14D	3	15866	4924	9/29/2013 18:41	9/29/2013 18:44	PIC	PO210X13
X6	14D	3	16642	5325	9/29/2013 18:32	9/29/2013 18:35	PIC	PO210X13
X7	14D	3	13200	4277	9/29/2013 18:22	9/29/2013 18:25	PIC	PO210X13
X8	14D	3	13360	4259	9/29/2013 18:11	9/29/2013 18:14	PIC	PO210X13
X1	1A	3	24383	1661	9/28/2013 10:34	9/28/2013 10:37	PIC	PO210X13
X2	1A	3	24805	2203	9/28/2013 10:49	9/28/2013 10:52	PIC	PO210X13
X3	1A	3	20231	2291	9/28/2013 10:43	9/28/2013 10:46	PIC	PO210X13
X4	1A	3	19233	2414	9/28/2013 10:39	9/28/2013 10:42	PIC	PO210X13
X5	1A	3	18031	2001	9/28/2013 10:54	9/28/2013 10:57	PIC	PO210X13
X6	1A	3	18807	2060	9/28/2013 11:11	9/28/2013 11:14	PIC	PO210X13
X7	1A	3	15185	1794	9/28/2013 11:06	9/28/2013 11:09	PIC	PO210X13
X8	1A	3	15065	1738	9/28/2013 11:01	9/28/2013 11:04	PIC	PO210X13
X1	1B	3	24552	1834	9/28/2013 10:39	9/28/2013 10:42	PIC	PO210X13
X2	1B	3	24776	2434	9/28/2013 10:34	9/28/2013 10:37	PIC	PO210X13
X3	1B	3	20578	2130	9/28/2013 10:49	9/28/2013 10:52	PIC	PO210X13
X4	1B	3	19206	2532	9/28/2013 10:44	9/28/2013 10:47	PIC	PO210X13
X5	1B	3	17964	2100	9/28/2013 11:01	9/28/2013 11:04	PIC	PO210X13
X6	1B	3	18540	2153	9/28/2013 10:54	9/28/2013 10:57	PIC	PO210X13
X7	1B	3	15291	1808	9/28/2013 11:12	9/28/2013 11:15	PIC	PO210X13
X8	1B	3	15112	1741	9/28/2013 11:06	9/28/2013 11:09	PIC	PO210X13
X1	1C	3	26155	706	9/28/2013 10:44	9/28/2013 10:47	PIC	PO210X13
X2	1C	3	27237	947	9/28/2013 10:39	9/28/2013 10:42	PIC	PO210X13
X3	1C	3	22120	823	9/28/2013 10:34	9/28/2013 10:37	PIC	PO210X13
X4	1C	3	21824	1011	9/28/2013 10:49	9/28/2013 10:52	PIC	PO210X13
X5	1C	3	20082	912	9/28/2013 11:06	9/28/2013 11:09	PIC	PO210X13
X6	1C	3	20813	920	9/28/2013 11:02	9/28/2013 11:05	PIC	PO210X13
X7	1C	3	17039	762	9/28/2013 10:54	9/28/2013 10:57	PIC	PO210X13
X8	1C	3	16753	762	9/28/2013 11:12	9/28/2013 11:15	PIC	PO210X13

X1	1D	3	25215	890	9/28/2013 10:49	9/28/2013 10:52	PIC	PO210X13
X2	1D	3	26170	1103	9/28/2013 10:44	9/28/2013 10:47	PIC	PO210X13
X3	1D	3	21375	993	9/28/2013 10:39	9/28/2013 10:42	PIC	PO210X13
X4	1D	3	20570	1198	9/28/2013 10:34	9/28/2013 10:37	PIC	PO210X13
X5	1D	3	18973	1010	9/28/2013 11:12	9/28/2013 11:15	PIC	PO210X13
X6	1D	3	19898	1069	9/28/2013 11:06	9/28/2013 11:09	PIC	PO210X13
X7	1D	3	16180	869	9/28/2013 11:02	9/28/2013 11:05	PIC	PO210X13
X8	1D	3	16030	835	9/28/2013 10:54	9/28/2013 10:57	PIC	PO210X13
X1	2A	3	22128	3791	9/28/2013 10:55	9/28/2013 10:58	PIC	PO210X13
X2	2A	3	22805	4285	9/28/2013 11:12	9/28/2013 11:15	PIC	PO210X13
X3	2A	3	18493	3487	9/28/2013 11:06	9/28/2013 11:09	PIC	PO210X13
X4	2A	3	17586	4245	9/28/2013 11:02	9/28/2013 11:05	PIC	PO210X13
X5	2A	3	16304	3546	9/28/2013 10:34	9/28/2013 10:37	PIC	PO210X13
X6	2A	3	16892	3662	9/28/2013 10:49	9/28/2013 10:52	PIC	PO210X13
X7	2A	3	13827	3066	9/28/2013 10:44	9/28/2013 10:47	PIC	PO210X13
X8	2A	3	13979	2782	9/28/2013 10:39	9/28/2013 10:42	PIC	PO210X13
X1	2B	3	21823	4499	9/28/2013 11:02	9/28/2013 11:05	PIC	PO210X13
X2	2B	3	21515	5370	9/28/2013 10:55	9/28/2013 10:58	PIC	PO210X13
X3	2B	3	17951	4396	9/28/2013 11:12	9/28/2013 11:15	PIC	PO210X13
X4	2B	3	16474	5189	9/28/2013 11:06	9/28/2013 11:09	PIC	PO210X13
X5	2B	3	15897	4133	9/28/2013 10:39	9/28/2013 10:42	PIC	PO210X13
X6	2B	3	16154	4552	9/28/2013 10:35	9/28/2013 10:38	PIC	PO210X13
X7	2B	3	13337	3558	9/28/2013 10:49	9/28/2013 10:52	PIC	PO210X13
X8	2B	3	13300	3398	9/28/2013 10:44	9/28/2013 10:47	PIC	PO210X13
X1	2C	3	23795	1386	9/28/2013 11:06	9/28/2013 11:09	PIC	PO210X13
X2	2C	3	24158	1672	9/28/2013 11:02	9/28/2013 11:05	PIC	PO210X13
X3	2C	3	20717	1461	9/28/2013 10:55	9/28/2013 10:58	PIC	PO210X13
X4	2C	3	18926	1752	9/28/2013 11:12	9/28/2013 11:15	PIC	PO210X13
X5	2C	3	17182	1498	9/28/2013 10:44	9/28/2013 10:47	PIC	PO210X13
X6	2C	3	17756	1424	9/28/2013 10:40	9/28/2013 10:43	PIC	PO210X13
X7	2C	3	14968	1302	9/28/2013 10:35	9/28/2013 10:38	PIC	PO210X13
X8	2C	3	14465	1178	9/28/2013 10:49	9/28/2013 10:52	PIC	PO210X13
X1	2D	3	22067	4223	9/28/2013 11:12	9/28/2013 11:15	PIC	PO210X13
X2	2D	3	21959	4924	9/28/2013 11:06	9/28/2013 11:09	PIC	PO210X13
X3	2D	3	18527	3944	9/28/2013 11:02	9/28/2013 11:05	PIC	PO210X13
X4	2D	3	16990	4963	9/28/2013 10:55	9/28/2013 10:58	PIC	PO210X13
X5	2D	3	16296	3907	9/28/2013 10:49	9/28/2013 10:52	PIC	PO210X13

X6	2D	3	16646	4180	9/28/2013 10:44	9/28/2013 10:47	PIC	PO210X13
X7	2D	3	13729	3270	9/28/2013 10:40	9/28/2013 10:43	PIC	PO210X13
X8	2D	3	13993	3058	9/28/2013 10:35	9/28/2013 10:38	PIC	PO210X13
X1	3A	3	24316	1007	9/28/2013 11:17	9/28/2013 11:20	PIC	PO210X13
X2	3A	3	25057	1175	9/28/2013 12:00	9/28/2013 12:03	PIC	PO210X13
X3	3A	3	21107	1173	9/28/2013 11:27	9/28/2013 11:30	PIC	PO210X13
X4	3A	3	19994	1350	9/28/2013 11:23	9/28/2013 11:26	PIC	PO210X13
X5	3A	3	18364	1103	9/28/2013 12:05	9/28/2013 12:08	PIC	PO210X13
X6	3A	3	19172	1144	9/28/2013 12:22	9/28/2013 12:25	PIC	PO210X13
X7	3A	3	15343	909	9/28/2013 12:18	9/28/2013 12:21	PIC	PO210X13
X8	3A	3	14977	878	9/28/2013 12:14	9/28/2013 12:17	PIC	PO210X13
X1	3B	3	25137	578	9/28/2013 11:23	9/28/2013 11:26	PIC	PO210X13
X2	3B	3	25279	694	9/28/2013 11:17	9/28/2013 11:20	PIC	PO210X13
X3	3B	3	21707	776	9/28/2013 12:00	9/28/2013 12:03	PIC	PO210X13
X4	3B	3	20350	816	9/28/2013 11:27	9/28/2013 11:30	PIC	PO210X13
X5	3B	3	18766	707	9/28/2013 12:14	9/28/2013 12:17	PIC	PO210X13
X6	3B	3	19186	724	9/28/2013 12:06	9/28/2013 12:09	PIC	PO210X13
X7	3B	3	15800	665	9/28/2013 12:23	9/28/2013 12:26	PIC	PO210X13
X8	3B	3	15326	591	9/28/2013 12:18	9/28/2013 12:21	PIC	PO210X13
X1	3C	3	25221	987	9/28/2013 11:27	9/28/2013 11:30	PIC	PO210X13
X2	3C	3	25616	1221	9/28/2013 11:23	9/28/2013 11:26	PIC	PO210X13
X3	3C	3	21224	1020	9/28/2013 11:18	9/28/2013 11:21	PIC	PO210X13
X4	3C	3	20272	1287	9/28/2013 12:00	9/28/2013 12:03	PIC	PO210X13
X5	3C	3	18956	1137	9/28/2013 12:18	9/28/2013 12:21	PIC	PO210X13
X6	3C	3	19478	1165	9/28/2013 12:14	9/28/2013 12:17	PIC	PO210X13
X7	3C	3	15879	999	9/28/2013 12:06	9/28/2013 12:09	PIC	PO210X13
X8	3C	3	15868	962	9/28/2013 12:23	9/28/2013 12:26	PIC	PO210X13
X1	3D	3	25060	1188	9/28/2013 12:01	9/28/2013 12:04	PIC	PO210X13
X2	3D	3	25866	1464	9/28/2013 11:27	9/28/2013 11:30	PIC	PO210X13
X3	3D	3	21471	1220	9/28/2013 11:23	9/28/2013 11:26	PIC	PO210X13
X4	3D	3	20662	1511	9/28/2013 11:18	9/28/2013 11:21	PIC	PO210X13
X5	3D	3	19025	1271	9/28/2013 12:23	9/28/2013 12:26	PIC	PO210X13
X6	3D	3	20014	1356	9/28/2013 12:18	9/28/2013 12:21	PIC	PO210X13
X7	3D	3	16029	1068	9/28/2013 12:14	9/28/2013 12:17	PIC	PO210X13
X8	3D	3	15777	1126	9/28/2013 12:06	9/28/2013 12:09	PIC	PO210X13
X1	4A	3	24259	823	9/28/2013 12:06	9/28/2013 12:09	PIC	PO210X13
X2	4A	3	25050	987	9/28/2013 12:23	9/28/2013 12:26	PIC	PO210X13

X3	4A	3	21255	945	9/28/2013 12:18	9/28/2013 12:21	PIC	PO210X13
X4	4A	3	19862	1078	9/28/2013 12:14	9/28/2013 12:17	PIC	PO210X13
X5	4A	3	18568	980	9/28/2013 11:18	9/28/2013 11:21	PIC	PO210X13
X6	4A	3	18661	1022	9/28/2013 12:01	9/28/2013 12:04	PIC	PO210X13
X7	4A	3	15692	892	9/28/2013 11:27	9/28/2013 11:30	PIC	PO210X13
X8	4A	3	15125	810	9/28/2013 11:23	9/28/2013 11:26	PIC	PO210X13
X1	4B	3	22311	3371	9/28/2013 12:14	9/28/2013 12:17	PIC	PO210X13
X2	4B	3	22303	4318	9/28/2013 12:06	9/28/2013 12:09	PIC	PO210X13
X3	4B	3	18675	3811	9/28/2013 12:23	9/28/2013 12:26	PIC	PO210X13
X4	4B	3	16960	4227	9/28/2013 12:18	9/28/2013 12:21	PIC	PO210X13
X5	4B	3	16207	3809	9/28/2013 11:23	9/28/2013 11:26	PIC	PO210X13
X6	4B	3	16836	3739	9/28/2013 11:19	9/28/2013 11:22	PIC	PO210X13
X7	4B	3	13681	3282	9/28/2013 12:01	9/28/2013 12:04	PIC	PO210X13
X8	4B	3	13533	2874	9/28/2013 11:28	9/28/2013 11:31	PIC	PO210X13
X1	4C	3	24643	1166	9/28/2013 12:18	9/28/2013 12:21	PIC	PO210X13
X2	4C	3	25722	1405	9/28/2013 12:14	9/28/2013 12:17	PIC	PO210X13
X3	4C	3	21018	1289	9/28/2013 12:06	9/28/2013 12:09	PIC	PO210X13
X4	4C	3	20337	1438	9/28/2013 12:23	9/28/2013 12:26	PIC	PO210X13
X5	4C	3	18775	1296	9/28/2013 11:28	9/28/2013 11:31	PIC	PO210X13
X6	4C	3	19904	1326	9/28/2013 11:23	9/28/2013 11:26	PIC	PO210X13
X7	4C	3	15923	1159	9/28/2013 11:19	9/28/2013 11:22	PIC	PO210X13
X8	4C	3	15756	1181	9/28/2013 12:01	9/28/2013 12:04	PIC	PO210X13
X1	4D	3	25033	611	9/28/2013 12:23	9/28/2013 12:26	PIC	PO210X13
X2	4D	3	25788	740	9/28/2013 12:18	9/28/2013 12:21	PIC	PO210X13
X3	4D	3	21843	765	9/28/2013 12:14	9/28/2013 12:17	PIC	PO210X13
X4	4D	3	20627	820	9/28/2013 12:06	9/28/2013 12:09	PIC	PO210X13
X5	4D	3	19214	793	9/28/2013 12:01	9/28/2013 12:04	PIC	PO210X13
X6	4D	3	19752	739	9/28/2013 11:28	9/28/2013 11:31	PIC	PO210X13
X7	4D	3	16209	611	9/28/2013 11:23	9/28/2013 11:26	PIC	PO210X13
X8	4D	3	15831	657	9/28/2013 11:19	9/28/2013 11:22	PIC	PO210X13
X1	5A	3	25791	972	9/28/2013 12:27	9/28/2013 12:30	PIC	PO210X13
X2	5A	3	26249	1150	9/28/2013 12:40	9/28/2013 12:43	PIC	PO210X13
X3	5A	3	21361	1202	9/28/2013 12:36	9/28/2013 12:39	PIC	PO210X13
X4	5A	3	20823	1378	9/28/2013 12:32	9/28/2013 12:35	PIC	PO210X13
X5	5A	3	19318	1130	9/28/2013 12:46	9/28/2013 12:49	PIC	PO210X13
X6	5A	3	20169	1156	9/28/2013 13:00	9/28/2013 13:03	PIC	PO210X13
X7	5A	3	16302	1043	9/28/2013 12:56	9/28/2013 12:59	PIC	PO210X13

X8	5A	3	16311	893	9/28/2013 12:51	9/28/2013 12:54	PIC	PO210X13
X1	5B	3	25329	913	9/28/2013 12:32	9/28/2013 12:35	PIC	PO210X13
X2	5B	3	25989	1178	9/28/2013 12:28	9/28/2013 12:31	PIC	PO210X13
X3	5B	3	21385	1023	9/28/2013 12:41	9/28/2013 12:44	PIC	PO210X13
X4	5B	3	20834	1259	9/28/2013 12:36	9/28/2013 12:39	PIC	PO210X13
X5	5B	3	19130	1047	9/28/2013 12:51	9/28/2013 12:54	PIC	PO210X13
X6	5B	3	19939	1170	9/28/2013 12:46	9/28/2013 12:49	PIC	PO210X13
X7	5B	3	16302	957	9/28/2013 13:00	9/28/2013 13:03	PIC	PO210X13
X8	5B	3	16111	935	9/28/2013 12:56	9/28/2013 12:59	PIC	PO210X13
X1	5C	3	24987	1071	9/28/2013 12:36	9/28/2013 12:39	PIC	PO210X13
X2	5C	3	25899	1356	9/28/2013 12:32	9/28/2013 12:35	PIC	PO210X13
X3	5C	3	21143	1186	9/28/2013 12:28	9/28/2013 12:31	PIC	PO210X13
X4	5C	3	20400	1431	9/28/2013 12:41	9/28/2013 12:44	PIC	PO210X13
X5	5C	3	18620	1261	9/28/2013 12:56	9/28/2013 12:59	PIC	PO210X13
X6	5C	3	19514	1201	9/28/2013 12:51	9/28/2013 12:54	PIC	PO210X13
X7	5C	3	16664	1132	9/28/2013 12:46	9/28/2013 12:49	PIC	PO210X13
X8	5C	3	15900	1032	9/28/2013 13:00	9/28/2013 13:03	PIC	PO210X13
X1	5D	3	25263	782	9/28/2013 12:41	9/28/2013 12:44	PIC	PO210X13
X2	5D	3	26469	944	9/28/2013 12:36	9/28/2013 12:39	PIC	PO210X13
X3	5D	3	21902	875	9/28/2013 12:32	9/28/2013 12:35	PIC	PO210X13
X4	5D	3	21226	1068	9/28/2013 12:28	9/28/2013 12:31	PIC	PO210X13
X5	5D	3	19336	941	9/28/2013 13:00	9/28/2013 13:03	PIC	PO210X13
X6	5D	3	20849	972	9/28/2013 12:56	9/28/2013 12:59	PIC	PO210X13
X7	5D	3	16540	884	9/28/2013 12:51	9/28/2013 12:54	PIC	PO210X13
X8	5D	3	16288	831	9/28/2013 12:46	9/28/2013 12:49	PIC	PO210X13
X1	6A	3	25388	1010	9/28/2013 12:47	9/28/2013 12:50	PIC	PO210X13
X2	6A	3	26085	1282	9/28/2013 13:00	9/28/2013 13:03	PIC	PO210X13
X3	6A	3	21554	1130	9/28/2013 12:56	9/28/2013 12:59	PIC	PO210X13
X4	6A	3	20801	1330	9/28/2013 12:51	9/28/2013 12:54	PIC	PO210X13
X5	6A	3	19007	1200	9/28/2013 12:28	9/28/2013 12:31	PIC	PO210X13
X6	6A	3	19966	1134	9/28/2013 12:41	9/28/2013 12:44	PIC	PO210X13
X7	6A	3	16179	930	9/28/2013 12:37	9/28/2013 12:40	PIC	PO210X13
X8	6A	3	16286	1016	9/28/2013 12:32	9/28/2013 12:35	PIC	PO210X13
X1	6B	3	25721	713	9/28/2013 12:51	9/28/2013 12:54	PIC	PO210X13
X2	6B	3	26877	958	9/28/2013 12:47	9/28/2013 12:50	PIC	PO210X13
X3	6B	3	21843	916	9/28/2013 13:01	9/28/2013 13:04	PIC	PO210X13
X4	6B	3	21221	1022	9/28/2013 12:56	9/28/2013 12:59	PIC	PO210X13

X5	6B	3	19704	893	9/28/2013 12:32	9/28/2013 12:35	PIC	PO210X13
X6	6B	3	20537	927	9/28/2013 12:28	9/28/2013 12:31	PIC	PO210X13
X7	6B	3	16530	816	9/28/2013 12:41	9/28/2013 12:44	PIC	PO210X13
X8	6B	3	16553	797	9/28/2013 12:37	9/28/2013 12:40	PIC	PO210X13
X1	6C	3	25963	810	9/28/2013 12:56	9/28/2013 12:59	PIC	PO210X13
X2	6C	3	26699	1059	9/28/2013 12:51	9/28/2013 12:54	PIC	PO210X13
X3	6C	3	21740	977	9/28/2013 12:47	9/28/2013 12:50	PIC	PO210X13
X4	6C	3	20975	1049	9/28/2013 13:01	9/28/2013 13:04	PIC	PO210X13
X5	6C	3	19449	934	9/28/2013 12:37	9/28/2013 12:40	PIC	PO210X13
X6	6C	3	20296	908	9/28/2013 12:33	9/28/2013 12:36	PIC	PO210X13
X7	6C	3	16193	811	9/28/2013 12:28	9/28/2013 12:31	PIC	PO210X13
X8	6C	3	16261	843	9/28/2013 12:41	9/28/2013 12:44	PIC	PO210X13
X1	7A	3	25046	1276	9/29/2013 17:21	9/29/2013 17:24	PIC	PO210X13
X2	7A	3	26168	1546	9/29/2013 17:50	9/29/2013 17:53	PIC	PO210X13
X3	7A	3	21617	1350	9/29/2013 17:46	9/29/2013 17:49	PIC	PO210X13
X4	7A	3	20539	1808	9/29/2013 17:42	9/29/2013 17:45	PIC	PO210X13
X5	7A	3	18601	1545	9/29/2013 17:38	9/29/2013 17:41	PIC	PO210X13
X6	7A	3	19428	1591	9/29/2013 17:34	9/29/2013 17:37	PIC	PO210X13
X7	7A	3	15978	1313	9/29/2013 17:30	9/29/2013 17:33	PIC	PO210X13
X8	7A	3	15944	1273	9/29/2013 17:26	9/29/2013 17:29	PIC	PO210X13
X1	7B	3	25563	913	9/29/2013 17:26	9/29/2013 17:29	PIC	PO210X13
X2	7B	3	25922	1315	9/29/2013 17:21	9/29/2013 17:24	PIC	PO210X13
X3	7B	3	21461	1130	9/29/2013 17:50	9/29/2013 17:53	PIC	PO210X13
X4	7B	3	20701	1343	9/29/2013 17:46	9/29/2013 17:49	PIC	PO210X13
X5	7B	3	18995	1203	9/29/2013 17:42	9/29/2013 17:45	PIC	PO210X13
X6	7B	3	19999	1200	9/29/2013 17:38	9/29/2013 17:41	PIC	PO210X13
X7	7B	3	16062	1056	9/29/2013 17:34	9/29/2013 17:37	PIC	PO210X13
X8	7B	3	15982	987	9/29/2013 17:30	9/29/2013 17:33	PIC	PO210X13
X1	7C	3	24732	1459	9/29/2013 17:30	9/29/2013 17:33	PIC	PO210X13
X2	7C	3	25041	1892	9/29/2013 17:26	9/29/2013 17:29	PIC	PO210X13
X3	7C	3	20727	1666	9/29/2013 17:21	9/29/2013 17:24	PIC	PO210X13
X4	7C	3	19910	1974	9/29/2013 17:51	9/29/2013 17:54	PIC	PO210X13
X5	7C	3	18308	1739	9/29/2013 17:46	9/29/2013 17:49	PIC	PO210X13
X6	7C	3	19221	1782	9/29/2013 17:42	9/29/2013 17:45	PIC	PO210X13
X7	7C	3	15597	1419	9/29/2013 17:38	9/29/2013 17:41	PIC	PO210X13
X8	7C	3	15483	1435	9/29/2013 17:34	9/29/2013 17:37	PIC	PO210X13
X1	7D	3	24637	1202	9/29/2013 17:34	9/29/2013 17:37	PIC	PO210X13

X2	7D	3	25087	1587	9/29/2013 17:30	9/29/2013 17:33	PIC	PO210X13
X3	7D	3	20852	1352	9/29/2013 17:26	9/29/2013 17:29	PIC	PO210X13
X4	7D	3	20046	1564	9/29/2013 17:21	9/29/2013 17:24	PIC	PO210X13
X5	7D	3	18113	1440	9/29/2013 17:51	9/29/2013 17:54	PIC	PO210X13
X6	7D	3	19149	1458	9/29/2013 17:46	9/29/2013 17:49	PIC	PO210X13
X7	7D	3	15498	1228	9/29/2013 17:42	9/29/2013 17:45	PIC	PO210X13
X8	7D	3	15655	1226	9/29/2013 17:38	9/29/2013 17:41	PIC	PO210X13
X1	8A	3	21426	4961	9/29/2013 17:38	9/29/2013 17:41	PIC	PO210X13
X2	8A	3	22354	5198	9/29/2013 17:34	9/29/2013 17:37	PIC	PO210X13
X3	8A	3	17698	4860	9/29/2013 17:30	9/29/2013 17:33	PIC	PO210X13
X4	8A	3	16875	5207	9/29/2013 17:26	9/29/2013 17:29	PIC	PO210X13
X5	8A	3	14681	5117	9/29/2013 17:21	9/29/2013 17:24	PIC	PO210X13
X6	8A	3	17172	4209	9/29/2013 17:51	9/29/2013 17:54	PIC	PO210X13
X7	8A	3	13656	3721	9/29/2013 17:46	9/29/2013 17:49	PIC	PO210X13
X8	8A	3	13763	3452	9/29/2013 17:42	9/29/2013 17:45	PIC	PO210X13
X1	8B	3	21186	5505	9/29/2013 17:43	9/29/2013 17:46	PIC	PO210X13
X2	8B	3	21892	5890	9/29/2013 17:39	9/29/2013 17:42	PIC	PO210X13
X3	8B	3	18297	4728	9/29/2013 17:34	9/29/2013 17:37	PIC	PO210X13
X4	8B	3	16678	5892	9/29/2013 17:30	9/29/2013 17:33	PIC	PO210X13
X5	8B	3	15668	5148	9/29/2013 17:26	9/29/2013 17:29	PIC	PO210X13
X6	8B	3	16307	5311	9/29/2013 17:21	9/29/2013 17:24	PIC	PO210X13
X7	8B	3	13369	4138	9/29/2013 17:51	9/29/2013 17:54	PIC	PO210X13
X8	8B	3	13555	3955	9/29/2013 17:47	9/29/2013 17:50	PIC	PO210X13
X1	8C	3.01	21166	5404	9/29/2013 17:47	9/29/2013 17:50	PIC	PO210X13
X2	8C	3	21574	5931	9/29/2013 17:43	9/29/2013 17:46	PIC	PO210X13
X3	8C	3	17944	4993	9/29/2013 17:39	9/29/2013 17:42	PIC	PO210X13
X4	8C	3	16447	5979	9/29/2013 17:34	9/29/2013 17:37	PIC	PO210X13
X5	8C	3	15215	4930	9/29/2013 17:31	9/29/2013 17:34	PIC	PO210X13
X6	8C	3	16355	5056	9/29/2013 17:26	9/29/2013 17:29	PIC	PO210X13
X7	8C	3	13106	4139	9/29/2013 17:21	9/29/2013 17:24	PIC	PO210X13
X8	8C	3	13493	3751	9/29/2013 17:51	9/29/2013 17:54	PIC	PO210X13
X1	8D	3	25596	1311	9/29/2013 17:51	9/29/2013 17:54	PIC	PO210X13
X2	8D	3	26892	1573	9/29/2013 17:47	9/29/2013 17:50	PIC	PO210X13
X3	8D	3	21837	1487	9/29/2013 17:43	9/29/2013 17:46	PIC	PO210X13
X4	8D	3	21096	1756	9/29/2013 17:39	9/29/2013 17:42	PIC	PO210X13
X5	8D	3	19454	1522	9/29/2013 17:35	9/29/2013 17:38	PIC	PO210X13
X6	8D	3	20229	1513	9/29/2013 17:31	9/29/2013 17:34	PIC	PO210X13

X7	8D	3	16725	1282	9/29/2013 17:26	9/29/2013 17:29	PIC	PO210X13
X8	8D	3	16469	1446	9/29/2013 17:21	9/29/2013 17:24	PIC	PO210X13
X1	9A	3	18427	6057	9/29/2013 19:02	9/29/2013 19:05	PIC	PO210X13
X2	9A	3	19414	6378	9/29/2013 19:31	9/29/2013 19:34	PIC	PO210X13
X3	9A	3	16105	5133	9/29/2013 19:27	9/29/2013 19:30	PIC	PO210X13
X4	9A	3	14477	6083	9/29/2013 19:23	9/29/2013 19:26	PIC	PO210X13
X5	9A	3	14035	5088	9/29/2013 19:18	9/29/2013 19:21	PIC	PO210X13
X6	9A	3	14655	5429	9/29/2013 19:14	9/29/2013 19:17	PIC	PO210X13
X7	9A	3	11783	4351	9/29/2013 19:11	9/29/2013 19:14	PIC	PO210X13
X8	9A	3	12025	3998	9/29/2013 19:07	9/29/2013 19:10	PIC	PO210X13
X1	9B	3	25303	1168	9/29/2013 19:07	9/29/2013 19:10	PIC	PO210X13
X2	9B	3	25759	1584	9/29/2013 19:02	9/29/2013 19:05	PIC	PO210X13
X3	9B	3	21388	1462	9/29/2013 19:31	9/29/2013 19:34	PIC	PO210X13
X4	9B	3	20413	1666	9/29/2013 19:27	9/29/2013 19:30	PIC	PO210X13
X5	9B	3	18670	1530	9/29/2013 19:23	9/29/2013 19:26	PIC	PO210X13
X6	9B	3	19624	1449	9/29/2013 19:18	9/29/2013 19:21	PIC	PO210X13
X7	9B	3	15973	1226	9/29/2013 19:14	9/29/2013 19:17	PIC	PO210X13
X8	9B	3	15958	1340	9/29/2013 19:11	9/29/2013 19:14	PIC	PO210X13
X1	9C	3	24939	1186	9/29/2013 19:11	9/29/2013 19:14	PIC	PO210X13
X2	9C	3	25068	1485	9/29/2013 19:07	9/29/2013 19:10	PIC	PO210X13
X3	9C	3	21058	1400	9/29/2013 19:02	9/29/2013 19:05	PIC	PO210X13
X4	9C	3	19969	1632	9/29/2013 19:31	9/29/2013 19:34	PIC	PO210X13
X5	9C	3	18372	1498	9/29/2013 19:27	9/29/2013 19:30	PIC	PO210X13
X6	9C	3	18991	1494	9/29/2013 19:23	9/29/2013 19:26	PIC	PO210X13
X7	9C	3	15847	1213	9/29/2013 19:18	9/29/2013 19:21	PIC	PO210X13
X8	9C	3	15412	1260	9/29/2013 19:15	9/29/2013 19:18	PIC	PO210X13
X1	9D	3	25578	902	9/29/2013 19:15	9/29/2013 19:18	PIC	PO210X13
X2	9D	3	26284	1239	9/29/2013 19:11	9/29/2013 19:14	PIC	PO210X13
X3	9D	3	21930	1063	9/29/2013 19:07	9/29/2013 19:10	PIC	PO210X13
X4	9D	3	21026	1333	9/29/2013 19:02	9/29/2013 19:05	PIC	PO210X13
X5	9D	3	19381	1206	9/29/2013 19:31	9/29/2013 19:34	PIC	PO210X13
X6	9D	3	20186	1248	9/29/2013 19:27	9/29/2013 19:30	PIC	PO210X13
X7	9D	3	16310	967	9/29/2013 19:23	9/29/2013 19:26	PIC	PO210X13
X8	9D	3	16253	990	9/29/2013 19:18	9/29/2013 19:21	PIC	PO210X13

Beta Xtalk Calibration - PIC - Sep 2013

Standard Data		
	Isotope	Sr-90
	Standard ID number	0133-T
	Half Life (days)	10555.725
	Std. Act. (dpm/mL)***	55362.7
	Reference Date	4/1/1996
	Volume of spike (mL)	0.5
	Std. Nominal (dpm)	18204.73
	Decay Date	9/21/2013

*** Includes activity of Y-90, which is in equilibrium.

Source Weight	
Source	Measured weight (mg)
1	0.0
2	12.8
3	27.7
4	50.8
5	60.8
6	73.2
7	98.4
8	115.8

The following detectors were not calibrated:

6D

Raw Count Data						Sr-90	Source	Average
Detector (#)	Source ID (#)	Start Time	Count Time (min)	Alpha (counts)	Beta (counts)	Xtalk (Alpha/Beta)	Measured Weight	Xtalk (Alpha/Beta)
1A	1	9/21/2013 13:30	3	20	25625	0.0780%	0.0	
1A	2	9/21/2013 13:53	3	18	25019	0.0719%	12.8	
1A	3	9/21/2013 13:40	3	21	22593	0.0929%	27.7	
1A	4	9/21/2013 13:36	3	28	22383	0.1251%	50.8	
1A	5	9/21/2013 13:57	3	23	23109	0.0995%	60.8	
1A	6	9/21/2013 14:20	3	24	22120	0.1085%	73.2	
1A	7	9/21/2013 14:06	3	27	21380	0.1263%	98.4	
1A	8	9/21/2013 14:02	3	24	20797	0.1154%	115.8	0.1022%
1B	1	9/21/2013 13:36	3	63	25604	0.2461%	0.0	
1B	2	9/21/2013 13:30	3	54	24236	0.2228%	12.8	
1B	3	9/21/2013 13:53	3	50	22325	0.2240%	27.7	
1B	4	9/21/2013 13:40	3	59	22268	0.2650%	50.8	
1B	5	9/21/2013 14:02	3	48	23291	0.2061%	60.8	
1B	6	9/21/2013 13:57	3	33	22223	0.1485%	73.2	
1B	7	9/21/2013 14:20	3	45	21257	0.2117%	98.4	
1B	8	9/21/2013 14:07	3	53	20600	0.2573%	115.8	0.2227%
1C	1	9/21/2013 13:41	3	442	26407	1.6738%	0.0	
1C	2	9/21/2013 13:36	3	422	24969	1.6901%	12.8	
1C	3	9/21/2013 13:30	3	435	22919	1.8980%	27.7	
1C	4	9/21/2013 13:53	3	414	22445	1.8445%	50.8	
1C	5	9/21/2013 14:07	3	404	23570	1.7140%	60.8	
1C	6	9/21/2013 14:02	3	360	22340	1.6115%	73.2	
1C	7	9/21/2013 13:57	3	348	21628	1.6090%	98.4	
1C	8	9/21/2013 14:20	3	320	20846	1.5351%	115.8	1.6970%
1D	1	9/21/2013 13:53	3	357	25634	1.3927%	0.0	
1D	2	9/21/2013 13:41	3	286	24501	1.1673%	12.8	
1D	3	9/21/2013 13:36	3	286	22573	1.2670%	27.7	
1D	4	9/21/2013 13:30	3	313	22099	1.4164%	50.8	
1D	5	9/21/2013 14:20	3	284	22891	1.2407%	60.8	
1D	6	9/21/2013 14:07	3	258	22081	1.1684%	73.2	
1D	7	9/21/2013 14:02	3	240	21132	1.1357%	98.4	
1D	8	9/21/2013 13:58	3	254	20524	1.2376%	115.8	1.2532%
2A	1	9/21/2013 13:58	3	2	23125	0.0086%	0.0	
2A	2	9/21/2013 14:20	3	6	22846	0.0263%	12.8	
2A	3	9/21/2013 14:07	3	1	20461	0.0049%	27.7	
2A	4	9/21/2013 14:02	3	6	20333	0.0295%	50.8	
2A	5	9/21/2013 13:31	3	5	21066	0.0237%	60.8	
2A	6	9/21/2013 13:53	3	3	20302	0.0148%	73.2	

Detector (#)	Source ID (#)	Raw Count Data Start Time	Count Time (min)	Alpha (counts)	Beta (counts)	Sr-90 Xtalk (Alpha/Beta)	Source Measured Weight	Average Xtalk (Alpha/Beta)
2A	7	9/21/2013 13:41	3	3	19482	0.0154%	98.4	
2A	8	9/21/2013 13:36	3	3	18865	0.0159%	115.8	0.0174%
2B	1	9/21/2013 14:02	3	3	22785	0.0132%	0.0	
2B	2	9/21/2013 13:58	3	4	22179	0.0180%	12.8	
2B	3	9/21/2013 14:20	3	4	20359	0.0196%	27.7	
2B	4	9/21/2013 14:07	3	4	19835	0.0202%	50.8	
2B	5	9/21/2013 13:36	3	0	21151	0.0000%	60.8	
2B	6	9/21/2013 13:31	3	3	19660	0.0153%	73.2	
2B	7	9/21/2013 13:53	3	2	19215	0.0104%	98.4	
2B	8	9/21/2013 13:41	3	4	18355	0.0218%	115.8	0.0148%
2C	1	9/21/2013 14:07	3	48	23809	0.2016%	0.0	
2C	2	9/21/2013 14:02	3	44	22311	0.1972%	12.8	
2C	3	9/21/2013 13:58	3	36	21118	0.1705%	27.7	
2C	4	9/21/2013 14:20	3	60	20958	0.2863%	50.8	
2C	5	9/21/2013 13:41	3	38	21668	0.1754%	60.8	
2C	6	9/21/2013 13:37	3	47	20769	0.2263%	73.2	
2C	7	9/21/2013 13:31	3	45	20374	0.2209%	98.4	
2C	8	9/21/2013 13:53	3	49	19290	0.2540%	115.8	0.2165%
2D	1	9/21/2013 14:20	3	4	23028	0.0174%	0.0	
2D	2	9/21/2013 14:07	3	3	21788	0.0138%	12.8	
2D	3	9/21/2013 14:03	3	4	19932	0.0201%	27.7	
2D	4	9/21/2013 13:58	3	8	20266	0.0395%	50.8	
2D	5	9/21/2013 13:53	3	10	20864	0.0479%	60.8	
2D	6	9/21/2013 13:41	3	2	19378	0.0103%	73.2	
2D	7	9/21/2013 13:37	3	6	19163	0.0313%	98.4	
2D	8	9/21/2013 13:31	3	3	18448	0.0163%	115.8	0.0246%
3A	1	9/21/2013 12:02	3	271	24286	1.1159%	0.0	
3A	2	9/21/2013 12:18	3	279	23428	1.1909%	12.8	
3A	3	9/21/2013 12:13	3	251	21194	1.1843%	27.7	
3A	4	9/21/2013 12:07	3	218	21238	1.0265%	50.8	
3A	5	9/21/2013 12:26	3	273	22086	1.2361%	60.8	
3A	6	9/21/2013 13:24	3	262	21312	1.2294%	73.2	
3A	7	9/21/2013 13:19	3	226	20136	1.1224%	98.4	
3A	8	9/21/2013 13:12	3	258	19693	1.3101%	115.8	1.1769%
3B	1	9/21/2013 12:07	3	508	25317	2.0066%	0.0	
3B	2	9/21/2013 12:02	3	475	24358	1.9501%	12.8	
3B	3	9/21/2013 12:18	3	449	22204	2.0222%	27.7	
3B	4	9/21/2013 12:13	3	396	22090	1.7927%	50.8	
3B	5	9/21/2013 13:12	3	467	22953	2.0346%	60.8	
3B	6	9/21/2013 12:27	3	434	21791	1.9916%	73.2	
3B	7	9/21/2013 13:24	3	402	21142	1.9014%	98.4	
3B	8	9/21/2013 13:19	3	374	20555	1.8195%	115.8	1.9398%
3C	1	9/21/2013 12:13	3	218	25442	0.8569%	0.0	
3C	2	9/21/2013 12:07	3	256	24503	1.0448%	12.8	
3C	3	9/21/2013 12:02	3	181	22403	0.8079%	27.7	
3C	4	9/21/2013 12:18	3	164	22022	0.7447%	50.8	
3C	5	9/21/2013 13:20	3	182	23164	0.7857%	60.8	
3C	6	9/21/2013 13:12	3	193	21951	0.8792%	73.2	
3C	7	9/21/2013 12:27	3	202	20923	0.9654%	98.4	
3C	8	9/21/2013 13:24	3	185	20428	0.9056%	115.8	0.8738%
3D	1	9/21/2013 12:18	3	181	24704	0.7327%	0.0	
3D	2	9/21/2013 12:13	3	184	23963	0.7679%	12.8	
3D	3	9/21/2013 12:07	3	156	22298	0.6996%	27.7	
3D	4	9/21/2013 12:02	3	138	21817	0.6325%	50.8	
3D	5	9/21/2013 13:24	3	189	22704	0.8325%	60.8	
3D	6	9/21/2013 13:20	3	163	21537	0.7568%	73.2	

Detector (#)	Source ID (#)	Raw Count Data Start Time	Count Time (min)	Alpha (counts)	Beta (counts)	Sr-90 Xtalk (Alpha/Beta)	Source Measured Weight	Average Xtalk (Alpha/Beta)
3D	7	9/21/2013 13:12	3	157	20982	0.7483%	98.4	
3D	8	9/21/2013 12:27	3	131	20298	0.6454%	115.8	0.7270%
4A	1	9/21/2013 12:27	3	202	24165	0.8359%	0.0	
4A	2	9/21/2013 13:24	3	192	23633	0.8124%	12.8	
4A	3	9/21/2013 13:20	3	144	22390	0.6431%	27.7	
4A	4	9/21/2013 13:12	3	160	21559	0.7421%	50.8	
4A	5	9/21/2013 12:03	3	163	22516	0.7239%	60.8	
4A	6	9/21/2013 12:19	3	129	21729	0.5937%	73.2	
4A	7	9/21/2013 12:13	3	140	20553	0.6812%	98.4	
4A	8	9/21/2013 12:07	3	108	20009	0.5398%	115.8	0.6965%
4B	1	9/21/2013 13:12	3	3	25102	0.0120%	0.0	
4B	2	9/21/2013 12:27	3	7	24143	0.0290%	12.8	
4B	3	9/21/2013 13:25	3	3	21901	0.0137%	27.7	
4B	4	9/21/2013 13:20	3	7	22047	0.0318%	50.8	
4B	5	9/21/2013 12:08	3	5	22736	0.0220%	60.8	
4B	6	9/21/2013 12:03	3	1	21870	0.0046%	73.2	
4B	7	9/21/2013 12:19	3	5	21039	0.0238%	98.4	
4B	8	9/21/2013 12:13	3	4	20015	0.0200%	115.8	0.0196%
4C	1	9/21/2013 13:20	3	74	24607	0.3007%	0.0	
4C	2	9/21/2013 13:12	3	67	23130	0.2897%	12.8	
4C	3	9/21/2013 12:27	3	49	21352	0.2295%	27.7	
4C	4	9/21/2013 13:25	3	56	22152	0.2528%	50.8	
4C	5	9/21/2013 12:13	3	76	22261	0.3414%	60.8	
4C	6	9/21/2013 12:08	3	65	21527	0.3019%	73.2	
4C	7	9/21/2013 12:03	3	43	20985	0.2049%	98.4	
4C	8	9/21/2013 12:19	3	62	20088	0.3086%	115.8	0.2787%
4D	1	9/21/2013 13:25	3	491	25199	1.9485%	0.0	
4D	2	9/21/2013 13:20	3	420	23618	1.7783%	12.8	
4D	3	9/21/2013 13:13	3	374	22248	1.6810%	27.7	
4D	4	9/21/2013 12:27	3	418	21918	1.9071%	50.8	
4D	5	9/21/2013 12:19	3	391	22494	1.7382%	60.8	
4D	6	9/21/2013 12:13	3	373	21560	1.7301%	73.2	
4D	7	9/21/2013 12:08	3	363	20559	1.7657%	98.4	
4D	8	9/21/2013 12:03	3	346	19888	1.7397%	115.8	1.7861%
5A	1	9/21/2013 14:24	3	128	26044	0.4915%	0.0	
5A	2	9/21/2013 14:45	3	131	24973	0.5246%	12.8	
5A	3	9/21/2013 14:38	3	131	22977	0.5701%	27.7	
5A	4	9/21/2013 14:34	3	136	22672	0.5999%	50.8	
5A	5	9/21/2013 15:00	3	129	23532	0.5482%	60.8	
5A	6	9/21/2013 15:13	3	119	22258	0.5346%	73.2	
5A	7	9/21/2013 15:09	3	101	21577	0.4681%	98.4	
5A	8	9/21/2013 15:04	3	104	20799	0.5000%	115.8	0.5296%
5B	1	9/21/2013 14:34	3	100	25846	0.3869%	0.0	
5B	2	9/21/2013 14:24	3	126	24804	0.5080%	12.8	
5B	3	9/21/2013 14:45	3	94	22810	0.4121%	27.7	
5B	4	9/21/2013 14:38	3	104	22478	0.4627%	50.8	
5B	5	9/21/2013 15:04	3	108	23360	0.4623%	60.8	
5B	6	9/21/2013 15:00	3	95	22017	0.4315%	73.2	
5B	7	9/21/2013 15:13	3	97	21376	0.4538%	98.4	
5B	8	9/21/2013 15:09	3	75	20752	0.3614%	115.8	0.4348%
5C	1	9/21/2013 14:39	3	93	25881	0.3593%	0.0	
5C	2	9/21/2013 14:34	3	105	25038	0.4194%	12.8	
5C	3	9/21/2013 14:24	3	93	22892	0.4063%	27.7	
5C	4	9/21/2013 14:45	3	91	22178	0.4103%	50.8	
5C	5	9/21/2013 15:09	3	83	23120	0.3590%	60.8	
5C	6	9/21/2013 15:04	3	84	22262	0.3773%	73.2	

Raw Count Data						Sr-90	Source	Average
Detector (#)	Source ID (#)	Start Time	Count Time (min)	Alpha (counts)	Beta (counts)	Xtalk (Alpha/Beta)	Measured Weight	Xtalk (Alpha/Beta)
5C	7	9/21/2013 15:00	3	79	21171	0.3732%	98.4	
5C	8	9/21/2013 15:13	3	87	20671	0.4209%	115.8	0.3907%
5D	1	9/21/2013 14:45	3	160	25415	0.6295%	0.0	
5D	2	9/21/2013 14:39	3	150	24521	0.6117%	12.8	
5D	3	9/21/2013 14:34	3	150	22700	0.6608%	27.7	
5D	4	9/21/2013 14:24	3	145	22605	0.6415%	50.8	
5D	5	9/21/2013 15:13	3	133	23311	0.5705%	60.8	
5D	6	9/21/2013 15:09	3	151	22277	0.6778%	73.2	
5D	7	9/21/2013 15:04	3	145	21113	0.6868%	98.4	
5D	8	9/21/2013 15:00	3	143	20574	0.6951%	115.8	0.6467%
6A	1	9/21/2013 15:00	3	133	25444	0.5227%	0.0	
6A	2	9/21/2013 15:14	3	112	24148	0.4638%	12.8	
6A	3	9/21/2013 15:09	3	86	22561	0.3812%	27.7	
6A	4	9/21/2013 15:04	3	113	22213	0.5087%	50.8	
6A	5	9/21/2013 14:26	3	85	23089	0.3681%	60.8	
6A	6	9/21/2013 14:46	3	92	21889	0.4203%	73.2	
6A	7	9/21/2013 14:39	3	83	21003	0.3952%	98.4	
6A	8	9/21/2013 14:35	3	96	20384	0.4710%	115.8	0.4414%
6B	1	9/21/2013 15:05	3	271	25842	1.0487%	0.0	
6B	2	9/21/2013 15:00	3	204	24756	0.8240%	12.8	
6B	3	9/21/2013 15:14	3	183	22966	0.7968%	27.7	
6B	4	9/21/2013 15:10	3	191	22553	0.8469%	50.8	
6B	5	9/21/2013 14:35	3	207	23518	0.8802%	60.8	
6B	6	9/21/2013 14:28	3	192	21991	0.8731%	73.2	
6B	7	9/21/2013 14:46	3	169	21384	0.7903%	98.4	
6B	8	9/21/2013 14:39	3	192	20538	0.9349%	115.8	0.8744%
6C	1	9/21/2013 15:10	3	211	25095	0.8408%	0.0	
6C	2	9/21/2013 15:05	3	188	24324	0.7729%	12.8	
6C	3	9/21/2013 15:00	3	166	22361	0.7424%	27.7	
6C	4	9/21/2013 15:14	3	188	22007	0.8543%	50.8	
6C	5	9/21/2013 14:39	3	191	23024	0.8296%	60.8	
6C	6	9/21/2013 14:35	3	157	21525	0.7294%	73.2	
6C	7	9/21/2013 14:28	3	154	21308	0.7227%	98.4	
6C	8	9/21/2013 14:46	3	152	20267	0.7500%	115.8	0.7803%
7A	1	9/21/2013 15:24	3	26	25836	0.1006%	0.0	
7A	2	9/21/2013 15:38	3	29	24812	0.1169%	12.8	
7A	3	9/21/2013 15:33	3	31	22637	0.1369%	27.7	
7A	4	9/21/2013 15:29	3	25	22367	0.1118%	50.8	
7A	5	9/21/2013 15:44	3	25	23254	0.1075%	60.8	
7A	6	9/21/2013 15:57	3	28	22113	0.1266%	73.2	
7A	7	9/21/2013 15:52	3	30	21394	0.1402%	98.4	
7A	8	9/21/2013 15:48	3	23	20794	0.1106%	115.8	0.1189%
7B	1	9/21/2013 15:29	3	45	25947	0.1734%	0.0	
7B	2	9/21/2013 15:25	3	57	24962	0.2283%	12.8	
7B	3	9/21/2013 15:38	3	56	22788	0.2457%	27.7	
7B	4	9/21/2013 15:33	3	55	22297	0.2467%	50.8	
7B	5	9/21/2013 15:48	3	51	23465	0.2173%	60.8	
7B	6	9/21/2013 15:44	3	42	22274	0.1886%	73.2	
7B	7	9/21/2013 15:57	3	45	21551	0.2088%	98.4	
7B	8	9/21/2013 15:52	3	35	20819	0.1681%	115.8	0.2096%
7C	1	9/21/2013 15:34	3	8	24857	0.0322%	0.0	
7C	2	9/21/2013 15:29	3	8	24176	0.0331%	12.8	
7C	3	9/21/2013 15:25	3	7	22112	0.0317%	27.7	
7C	4	9/21/2013 15:38	3	14	21602	0.0648%	50.8	
7C	5	9/21/2013 15:53	3	18	22837	0.0788%	60.8	
7C	6	9/21/2013 15:48	3	11	21615	0.0509%	73.2	

Raw Count Data						Sr-90	Source	Average
Detector (#)	Source ID (#)	Start Time	Count Time (min)	Alpha (counts)	Beta (counts)	Xtalk (Alpha/Beta)	Measured Weight	Xtalk (Alpha/Beta)
7C	7	9/21/2013 15:44	3	16	20772	0.0770%	98.4	
7C	8	9/21/2013 15:57	3	5	20339	0.0246%	115.8	0.0491%
7D	1	9/21/2013 15:39	3	21	25491	0.0824%	0.0	
7D	2	9/21/2013 15:34	3	26	24470	0.1063%	12.8	
7D	3	9/21/2013 15:29	3	18	22692	0.0793%	27.7	
7D	4	9/21/2013 15:25	3	18	22394	0.0804%	50.8	
7D	5	9/21/2013 15:57	3	25	22949	0.1089%	60.8	
7D	6	9/21/2013 15:53	3	19	22151	0.0858%	73.2	
7D	7	9/21/2013 15:48	3	15	20830	0.0720%	98.4	
7D	8	9/21/2013 15:44	3	16	20618	0.0776%	115.8	0.0866%
8A	1	9/21/2013 15:44	3	3	22437	0.0134%	0.0	
8A	2	9/21/2013 15:57	3	2	21492	0.0093%	12.8	
8A	3	9/21/2013 15:53	3	5	20337	0.0246%	27.7	
8A	4	9/21/2013 15:48	3	7	19590	0.0357%	50.8	
8A	5	9/21/2013 15:25	3	6	19913	0.0301%	60.8	
8A	6	9/21/2013 15:39	3	5	19463	0.0257%	73.2	
8A	7	9/21/2013 15:34	3	1	18241	0.0055%	98.4	
8A	8	9/21/2013 15:30	3	3	18172	0.0165%	115.8	0.0201%
8B	1	9/21/2013 15:48	3	3	22367	0.0134%	0.0	
8B	2	9/21/2013 15:44	3	1	21728	0.0046%	12.8	
8B	3	9/21/2013 15:57	3	3	20205	0.0148%	27.7	
8B	4	9/21/2013 15:53	3	7	19767	0.0354%	50.8	
8B	5	9/21/2013 15:30	3	4	20729	0.0193%	60.8	
8B	6	9/21/2013 15:25	3	3	19567	0.0153%	73.2	
8B	7	9/21/2013 15:39	3	1	18959	0.0053%	98.4	
8B	8	9/21/2013 15:34	3	2	18303	0.0109%	115.8	0.0149%
8C	1	9/21/2013 15:53	3	2	21830	0.0092%	0.0	
8C	2	9/21/2013 15:48	3	6	21368	0.0281%	12.8	
8C	3	9/21/2013 15:44	3	0	19704	0.0000%	27.7	
8C	4	9/21/2013 15:57	3	5	19401	0.0258%	50.8	
8C	5	9/21/2013 15:34	3	6	19818	0.0303%	60.8	
8C	6	9/21/2013 15:30	3	5	19029	0.0263%	73.2	
8C	7	9/21/2013 15:25	3	1	18223	0.0055%	98.4	
8C	8	9/21/2013 15:39	3	2	17983	0.0111%	115.8	0.0170%
8D	1	9/21/2013 15:57	3	40	25811	0.1550%	0.0	
8D	2	9/21/2013 15:53	3	34	24854	0.1368%	12.8	
8D	3	9/21/2013 15:48	3	27	22758	0.1186%	27.7	
8D	4	9/21/2013 15:44	3	40	22505	0.1777%	50.8	
8D	5	9/21/2013 15:39	3	38	23615	0.1609%	60.8	
8D	6	9/21/2013 15:34	3	30	22557	0.1330%	73.2	
8D	7	9/21/2013 15:30	3	29	21368	0.1357%	98.4	
8D	8	9/21/2013 15:25	3	37	20679	0.1789%	115.8	0.1496%
9A	1	9/21/2013 17:01	3	54	26109	0.2068%	0.0	
9A	2	9/21/2013 17:16	3	47	25227	0.1863%	12.8	
9A	3	9/21/2013 17:11	3	51	22999	0.2217%	27.7	
9A	4	9/21/2013 17:07	3	60	22512	0.2665%	50.8	
9A	5	9/21/2013 17:21	3	50	23507	0.2127%	60.8	
9A	6	9/21/2013 17:37	3	48	21945	0.2187%	73.2	
9A	7	9/21/2013 17:31	3	39	21492	0.1815%	98.4	
9A	8	9/21/2013 17:27	3	46	20691	0.2223%	115.8	0.2146%
9B	1	9/21/2013 17:07	3	60	25990	0.2309%	0.0	
9B	2	9/21/2013 17:01	3	59	24930	0.2367%	12.8	
9B	3	9/21/2013 17:16	3	54	22796	0.2369%	27.7	
9B	4	9/21/2013 17:11	3	58	22590	0.2568%	50.8	
9B	5	9/21/2013 17:27	3	69	23152	0.2980%	60.8	
9B	6	9/21/2013 17:21	3	59	22396	0.2634%	73.2	

Detector (#)	Source ID (#)	Raw Count Data Start Time	Count Time (min)	Alpha (counts)	Beta (counts)	Sr-90 Xtalk (Alpha/Beta)	Source Measured Weight	Average Xtalk (Alpha/Beta)
9B	7	9/21/2013 17:37	3	54	21751	0.2483%	98.4	
9B	8	9/21/2013 17:32	3	51	20646	0.2470%	115.8	0.2522%
9C	1	9/21/2013 17:12	3	62	25465	0.2435%	0.0	
9C	2	9/21/2013 17:07	3	50	24707	0.2024%	12.8	
9C	3	9/21/2013 17:01	3	69	22353	0.3087%	27.7	
9C	4	9/21/2013 17:16	3	53	22173	0.2390%	50.8	
9C	5	9/21/2013 17:32	3	68	22883	0.2972%	60.8	
9C	6	9/21/2013 17:27	3	55	22218	0.2475%	73.2	
9C	7	9/21/2013 17:21	3	65	20983	0.3098%	98.4	
9C	8	9/21/2013 17:37	3	52	20661	0.2517%	115.8	0.2625%
9D	1	9/21/2013 17:16	3	59	24913	0.2368%	0.0	
9D	2	9/21/2013 17:12	3	72	23917	0.3010%	12.8	
9D	3	9/21/2013 17:07	3	46	21731	0.2117%	27.7	
9D	4	9/21/2013 17:01	3	64	21652	0.2956%	50.8	
9D	5	9/21/2013 17:37	3	57	22477	0.2536%	60.8	
9D	6	9/21/2013 17:32	3	73	21347	0.3420%	73.2	
9D	7	9/21/2013 17:28	3	53	20518	0.2583%	98.4	
9D	8	9/21/2013 17:21	3	42	20002	0.2100%	115.8	0.2636%
10A	1	9/21/2013 17:21	3	16	25003	0.0640%	0.0	
10A	2	9/21/2013 17:37	3	17	24350	0.0698%	12.8	
10A	3	9/21/2013 17:32	3	9	22013	0.0409%	27.7	
10A	4	9/21/2013 17:28	3	22	21667	0.1015%	50.8	
10A	5	9/21/2013 17:02	3	13	22954	0.0566%	60.8	
10A	6	9/21/2013 17:17	3	16	21760	0.0735%	73.2	
10A	7	9/21/2013 17:12	3	12	20689	0.0580%	98.4	
10A	8	9/21/2013 17:07	3	15	20403	0.0735%	115.8	0.0672%
10B	1	9/21/2013 17:28	3	89	25413	0.3502%	0.0	
10B	2	9/21/2013 17:21	3	84	24409	0.3441%	12.8	
10B	3	9/21/2013 17:37	3	84	22490	0.3735%	27.7	
10B	4	9/21/2013 17:32	3	65	22490	0.2890%	50.8	
10B	5	9/21/2013 17:07	3	86	22772	0.3777%	60.8	
10B	6	9/21/2013 17:02	3	63	21996	0.2864%	73.2	
10B	7	9/21/2013 17:17	3	56	21251	0.2635%	98.4	
10B	8	9/21/2013 17:12	3	61	20748	0.2940%	115.8	0.3223%
10C	1	9/21/2013 17:32	3	85	25627	0.3317%	0.0	
10C	2	9/21/2013 17:28	3	61	24800	0.2460%	12.8	
10C	3	9/21/2013 17:21	3	65	22496	0.2889%	27.7	
10C	4	9/21/2013 17:37	3	62	22381	0.2770%	50.8	
10C	5	9/21/2013 17:12	3	76	23254	0.3268%	60.8	
10C	6	9/21/2013 17:07	3	74	21971	0.3368%	73.2	
10C	7	9/21/2013 17:02	3	47	21225	0.2214%	98.4	
10C	8	9/21/2013 17:17	3	68	20600	0.3301%	115.8	0.2948%
10D	1	9/21/2013 17:37	3	54	25707	0.2101%	0.0	
10D	2	9/21/2013 17:32	3	58	24666	0.2351%	12.8	
10D	3	9/21/2013 17:28	3	47	22551	0.2084%	27.7	
10D	4	9/21/2013 17:21	3	53	22518	0.2354%	50.8	
10D	5	9/21/2013 17:17	3	43	23963	0.1794%	60.8	
10D	6	9/21/2013 17:12	3	57	22285	0.2558%	73.2	
10D	7	9/21/2013 17:07	3	40	21399	0.1869%	98.4	
10D	8	9/21/2013 17:02	3	31	20830	0.1488%	115.8	0.2075%
11A	1	9/21/2013 16:16	3	0	23343	0.0000%	0.0	
11A	2	9/21/2013 16:30	3	8	23076	0.0347%	12.8	
11A	3	9/21/2013 16:25	3	3	20922	0.0143%	27.7	
11A	4	9/21/2013 16:21	3	7	20687	0.0338%	50.8	
11A	5	9/21/2013 16:36	3	3	21368	0.0140%	60.8	
11A	6	9/21/2013 17:08	3	5	21140	0.0237%	73.2	

Detector (#)	Source ID (#)	Raw Count Data Start Time	Count Time (min)	Alpha (counts)	Beta (counts)	Sr-90 Xtalk (Alpha/Beta)	Source Measured Weight	Average Xtalk (Alpha/Beta)
11A	7	9/21/2013 16:57	3	1	20106	0.0050%	98.4	
11A	8	9/21/2013 16:40	3	5	19597	0.0255%	115.8	0.0189%
11B	1	9/21/2013 16:21	3	1	25687	0.0039%	0.0	
11B	2	9/21/2013 16:16	3	5	24716	0.0202%	12.8	
11B	3	9/21/2013 16:30	3	5	22599	0.0221%	27.7	
11B	4	9/21/2013 16:25	3	9	22423	0.0401%	50.8	
11B	5	9/21/2013 16:40	3	5	23148	0.0216%	60.8	
11B	6	9/21/2013 16:36	3	2	22238	0.0090%	73.2	
11B	7	9/21/2013 17:08	3	2	21184	0.0094%	98.4	
11B	8	9/21/2013 16:57	3	2	20581	0.0097%	115.8	0.0170%
11C	1	9/21/2013 16:25	3	2	25944	0.0077%	0.0	
11C	2	9/21/2013 16:21	3	5	24751	0.0202%	12.8	
11C	3	9/21/2013 16:16	3	7	22621	0.0309%	27.7	
11C	4	9/21/2013 16:30	3	14	22444	0.0624%	50.8	
11C	5	9/21/2013 16:57	3	3	23360	0.0128%	60.8	
11C	6	9/21/2013 16:40	3	3	22361	0.0134%	73.2	
11C	7	9/21/2013 16:36	3	8	21503	0.0372%	98.4	
11C	8	9/21/2013 17:08	3	5	20724	0.0241%	115.8	0.0261%
11D	1	9/21/2013 16:30	3	1	25789	0.0039%	0.0	
11D	2	9/21/2013 16:26	3	5	24851	0.0201%	12.8	
11D	3	9/21/2013 16:21	3	4	22574	0.0177%	27.7	
11D	4	9/21/2013 16:17	3	5	22497	0.0222%	50.8	
11D	5	9/21/2013 17:08	3	2	23408	0.0085%	60.8	
11D	6	9/21/2013 16:58	3	3	22214	0.0135%	73.2	
11D	7	9/21/2013 16:40	3	4	21079	0.0190%	98.4	
11D	8	9/21/2013 16:36	3	4	20358	0.0196%	115.8	0.0156%
12A	1	9/21/2013 16:36	3	2	25088	0.0080%	0.0	
12A	2	9/21/2013 17:08	3	1	24334	0.0041%	12.8	
12A	3	9/21/2013 16:58	3	3	22035	0.0136%	27.7	
12A	4	9/21/2013 16:40	3	2	21621	0.0093%	50.8	
12A	5	9/21/2013 16:17	3	3	22780	0.0132%	60.8	
12A	6	9/21/2013 16:30	3	2	21800	0.0092%	73.2	
12A	7	9/21/2013 16:26	3	2	20729	0.0096%	98.4	
12A	8	9/21/2013 16:21	3	2	20591	0.0097%	115.8	0.0096%
12B	1	9/21/2013 16:40	3	1	23678	0.0042%	0.0	
12B	2	9/21/2013 16:36	3	4	22544	0.0177%	12.8	
12B	3	9/21/2013 17:09	3	5	20388	0.0245%	27.7	
12B	4	9/21/2013 16:58	3	7	20391	0.0343%	50.8	
12B	5	9/21/2013 16:21	3	3	21250	0.0141%	60.8	
12B	6	9/21/2013 16:17	3	6	19693	0.0305%	73.2	
12B	7	9/21/2013 16:30	3	5	19347	0.0258%	98.4	
12B	8	9/21/2013 16:26	3	4	18471	0.0217%	115.8	0.0216%
12C	1	9/21/2013 16:58	3	12	25849	0.0464%	0.0	
12C	2	9/21/2013 16:40	3	14	24804	0.0564%	12.8	
12C	3	9/21/2013 16:36	3	9	22706	0.0396%	27.7	
12C	4	9/21/2013 17:09	3	11	22573	0.0487%	50.8	
12C	5	9/21/2013 16:26	3	11	23680	0.0465%	60.8	
12C	6	9/21/2013 16:22	3	12	22297	0.0538%	73.2	
12C	7	9/21/2013 16:17	3	14	21578	0.0649%	98.4	
12C	8	9/21/2013 16:31	3	13	20526	0.0633%	115.8	0.0525%
12D	1	9/21/2013 17:09	3	3	26384	0.0114%	0.0	
12D	2	9/21/2013 17:03	3	11	25368	0.0434%	12.8	
12D	3	9/21/2013 16:41	3	8	23293	0.0343%	27.7	
12D	4	9/21/2013 16:36	3	11	22898	0.0480%	50.8	
12D	5	9/21/2013 16:31	3	2	23905	0.0084%	60.8	
12D	6	9/21/2013 16:26	3	4	23037	0.0174%	73.2	

Detector (#)	Source ID (#)	Raw Count Data Start Time	Count Time (min)	Alpha (counts)	Beta (counts)	Sr-90 Xtalk (Alpha/Beta)	Source Measured Weight	Average Xtalk (Alpha/Beta)
12D	7	9/21/2013 16:22	3	8	22185	0.0361%	98.4	
12D	8	9/21/2013 16:17	3	6	21281	0.0282%	115.8	0.0284%
13A	1	9/24/2013 15:16	3	6	25299	0.0237%	0.0	
13A	2	9/24/2013 16:07	3	2	24154	0.0083%	12.8	
13A	3	9/24/2013 16:02	3	6	22411	0.0268%	27.7	
13A	4	9/24/2013 15:46	3	10	22123	0.0452%	50.8	
13A	5	9/24/2013 16:12	3	1	23299	0.0043%	60.8	
13A	6	9/24/2013 17:06	3	4	21941	0.0182%	73.2	
13A	7	9/24/2013 16:28	3	3	21501	0.0140%	98.4	
13A	8	9/24/2013 16:21	3	2	20330	0.0098%	115.8	0.0188%
13B	1	9/24/2013 15:46	3	3	25707	0.0117%	0.0	
13B	2	9/24/2013 15:16	3	2	25003	0.0080%	12.8	
13B	3	9/24/2013 16:07	3	7	22716	0.0308%	27.7	
13B	4	9/24/2013 16:02	3	6	22665	0.0265%	50.8	
13B	5	9/24/2013 16:21	3	3	23407	0.0128%	60.8	
13B	6	9/24/2013 16:12	3	1	22288	0.0045%	73.2	
13B	7	9/24/2013 17:06	3	3	21552	0.0139%	98.4	
13B	8	9/24/2013 16:28	3	6	20809	0.0288%	115.8	0.0171%
13C	1	9/24/2013 16:02	3	1	24439	0.0041%	0.0	
13C	2	9/24/2013 15:46	3	6	23471	0.0256%	12.8	
13C	3	9/24/2013 15:16	3	2	20847	0.0096%	27.7	
13C	4	9/24/2013 16:07	3	6	21047	0.0285%	50.8	
13C	5	9/24/2013 16:28	3	3	21798	0.0138%	60.8	
13C	6	9/24/2013 16:21	3	6	20780	0.0289%	73.2	
13C	7	9/24/2013 16:12	3	4	19932	0.0201%	98.4	
13C	8	9/24/2013 17:06	3	4	19649	0.0204%	115.8	0.0189%
13D	1	9/24/2013 16:08	3	7	25369	0.0276%	0.0	
13D	2	9/24/2013 16:02	3	0	24423	0.0000%	12.8	
13D	3	9/24/2013 15:46	3	5	22268	0.0225%	27.7	
13D	4	9/24/2013 15:16	3	7	22067	0.0317%	50.8	
13D	5	9/24/2013 17:06	3	7	22700	0.0308%	60.8	
13D	6	9/24/2013 16:28	3	6	21712	0.0276%	73.2	
13D	7	9/24/2013 16:22	3	4	20958	0.0191%	98.4	
13D	8	9/24/2013 16:12	3	5	20458	0.0244%	115.8	0.0230%
14A	1	9/24/2013 16:12	3	3	25239	0.0119%	0.0	
14A	2	9/24/2013 17:06	3	3	23924	0.0125%	12.8	
14A	3	9/24/2013 16:29	3	2	21860	0.0091%	27.7	
14A	4	9/24/2013 16:22	3	7	22077	0.0317%	50.8	
14A	5	9/24/2013 15:16	3	5	22308	0.0224%	60.8	
14A	6	9/24/2013 16:08	3	1	21266	0.0047%	73.2	
14A	7	9/24/2013 16:02	3	6	20788	0.0289%	98.4	
14A	8	9/24/2013 15:46	3	4	20028	0.0200%	115.8	0.0177%
14B	1	9/24/2013 16:22	3	1	26392	0.0038%	0.0	
14B	2	9/24/2013 16:12	3	3	25423	0.0118%	12.8	
14B	3	9/24/2013 17:06	3	5	23499	0.0213%	27.7	
14B	4	9/24/2013 16:29	3	12	22910	0.0524%	50.8	
14B	5	9/24/2013 15:46	3	7	23778	0.0294%	60.8	
14B	6	9/24/2013 15:17	3	4	22469	0.0178%	73.2	
14B	7	9/24/2013 16:08	3	0	21921	0.0000%	98.4	
14B	8	9/24/2013 16:02	3	6	21162	0.0284%	115.8	0.0206%
14C	1	9/24/2013 16:29	3	0	24820	0.0000%	0.0	
14C	2	9/24/2013 16:22	3	5	24032	0.0208%	12.8	
14C	3	9/24/2013 16:12	3	2	21582	0.0093%	27.7	
14C	4	9/24/2013 17:06	3	7	21926	0.0319%	50.8	
14C	5	9/24/2013 16:02	3	3	22686	0.0132%	60.8	
14C	6	9/24/2013 15:47	3	6	21331	0.0281%	73.2	

Detector (#)	Source ID (#)	Raw Count Data Start Time	Count Time (min)	Alpha (counts)	Beta (counts)	Sr-90 Xtalk (Alpha/Beta)	Source Measured Weight	Average Xtalk (Alpha/Beta)
14C	7	9/24/2013 15:17	3	4	20928	**0.0191%**	98.4	
14C	8	9/24/2013 16:08	3	4	20079	**0.0199%**	115.8	0.0178%
14D	1	9/24/2013 17:06	3	2	25905	**0.0077%**	0.0	
14D	2	9/24/2013 16:29	3	4	25199	**0.0159%**	12.8	
14D	3	9/24/2013 16:22	3	5	23027	**0.0217%**	27.7	
14D	4	9/24/2013 16:12	3	7	22602	**0.0310%**	50.8	
14D	5	9/24/2013 16:08	3	2	23468	**0.0085%**	60.8	
14D	6	9/24/2013 16:02	3	5	22259	**0.0225%**	73.2	
14D	7	9/24/2013 15:47	3	7	21431	**0.0327%**	98.4	
14D	8	9/24/2013 15:17	3	2	21039	**0.0095%**	115.8	0.0187%

Current Calibration - PIC

Geometry
Beta X-talk

Protean	Cal Date	10/1/2013	Exp Date	9/30/2014	
	A0	A1	A2	A3	A4
1A	1.022191E-03				
1B	2.226678E-03				
1C	1.696998E-02				
1D	1.253215E-02				
2A	1.739007E-04				
2B	1.480946E-04				
2C	2.165168E-03				
2D	2.456314E-04				
3A	1.176928E-02				
3B	1.939830E-02				
3C	8.737820E-03				
3D	7.269509E-03				
4A	6.965207E-03				
4B	1.958849E-04				
4C	2.786976E-03				
4D	1.786080E-02				
5A	5.296226E-03				
5B	4.348336E-03				
5C	3.907030E-03				
5D	6.467152E-03				
6A	4.413757E-03				
6B	8.743589E-03				
6C	7.802520E-03				
6D	#N/A				
7A	1.188994E-03				
7B	2.096274E-03				
7C	4.913259E-04				
7D	8.658276E-04				
8A	2.010084E-04				
8B	1.488820E-04				
8C	1.702166E-04				
8D	1.495879E-03				
9A	2.145775E-03				
9B	2.522389E-03				
9C	2.624654E-03				
9D	2.636224E-03				
10A	6.723928E-04				
10B	3.223075E-03				
10C	2.948472E-03				
10D	2.074942E-03				
11A	1.887800E-04				
11B	1.701720E-04				
11C	2.610271E-04				
11D	1.557698E-04				
12A	9.581431E-05				
12B	2.161303E-04				
12C	5.246508E-04				
12D	2.838761E-04				
13A	1.878553E-04				
13B	1.712672E-04				
13C	1.885235E-04				
13D	2.297071E-04				
14A	1.765414E-04				
14B	2.060497E-04				
14C	1.779809E-04				
14D	1.867909E-04				

PIC_Beta Xtalk_Sep13_RawData.xls

SampleID	Instr	Time (min.)	Alpha Counts	Beta Counts	Count Start Time	Count End Time	Machine	Batch ID
S1	10A	3	16	25003	9/21/2013 17:21	9/21/2013 17:24	PIC	GABS13
S2	10A	3	17	24350	9/21/2013 17:37	9/21/2013 17:40	PIC	GABS13
S3	10A	3	9	22013	9/21/2013 17:32	9/21/2013 17:35	PIC	GABS13
S4	10A	3	22	21667	9/21/2013 17:28	9/21/2013 17:31	PIC	GABS13
S5	10A	3	13	22954	9/21/2013 17:02	9/21/2013 17:05	PIC	GABS13
S6	10A	3	16	21760	9/21/2013 17:17	9/21/2013 17:20	PIC	GABS13
S7	10A	3	12	20689	9/21/2013 17:12	9/21/2013 17:15	PIC	GABS13
S8	10A	3	15	20403	9/21/2013 17:07	9/21/2013 17:10	PIC	GABS13
S1	10B	3	89	25413	9/21/2013 17:28	9/21/2013 17:31	PIC	GABS13
S2	10B	3	84	24409	9/21/2013 17:21	9/21/2013 17:24	PIC	GABS13
S3	10B	3	84	22490	9/21/2013 17:37	9/21/2013 17:40	PIC	GABS13
S4	10B	3	65	22490	9/21/2013 17:32	9/21/2013 17:35	PIC	GABS13
S5	10B	3	86	22772	9/21/2013 17:07	9/21/2013 17:10	PIC	GABS13
S6	10B	3	63	21996	9/21/2013 17:02	9/21/2013 17:05	PIC	GABS13
S7	10B	3	56	21251	9/21/2013 17:17	9/21/2013 17:20	PIC	GABS13
S8	10B	3	61	20748	9/21/2013 17:12	9/21/2013 17:15	PIC	GABS13
S1	10C	3	85	25627	9/21/2013 17:32	9/21/2013 17:35	PIC	GABS13
S2	10C	3	61	24800	9/21/2013 17:28	9/21/2013 17:31	PIC	GABS13
S3	10C	3	65	22496	9/21/2013 17:21	9/21/2013 17:24	PIC	GABS13
S4	10C	3	62	22381	9/21/2013 17:37	9/21/2013 17:40	PIC	GABS13
S5	10C	3	76	23254	9/21/2013 17:12	9/21/2013 17:15	PIC	GABS13
S6	10C	3	74	21971	9/21/2013 17:07	9/21/2013 17:10	PIC	GABS13
S7	10C	3	47	21225	9/21/2013 17:02	9/21/2013 17:05	PIC	GABS13
S8	10C	3	68	20600	9/21/2013 17:17	9/21/2013 17:20	PIC	GABS13
S1	10D	3	54	25707	9/21/2013 17:37	9/21/2013 17:40	PIC	GABS13
S2	10D	3	58	24666	9/21/2013 17:32	9/21/2013 17:35	PIC	GABS13
S3	10D	3	47	22551	9/21/2013 17:28	9/21/2013 17:31	PIC	GABS13
S4	10D	3	53	22518	9/21/2013 17:21	9/21/2013 17:24	PIC	GABS13
S5	10D	3	43	23963	9/21/2013 17:17	9/21/2013 17:20	PIC	GABS13
S6	10D	3	57	22285	9/21/2013 17:12	9/21/2013 17:15	PIC	GABS13
S7	10D	3	40	21399	9/21/2013 17:07	9/21/2013 17:10	PIC	GABS13
S8	10D	3	31	20830	9/21/2013 17:02	9/21/2013 17:05	PIC	GABS13
S1	11A	3	0	23343	9/21/2013 16:16	9/21/2013 16:19	PIC	GABS13
S2	11A	3	8	23076	9/21/2013 16:30	9/21/2013 16:33	PIC	GABS13
S3	11A	3	3	20922	9/21/2013 16:25	9/21/2013 16:28	PIC	GABS13
S4	11A	3	7	20687	9/21/2013 16:21	9/21/2013 16:24	PIC	GABS13

S5	11A	3	3	21368	9/21/2013 16:36	9/21/2013 16:39	PIC	GABS13
S6	11A	3	5	21140	9/21/2013 17:08	9/21/2013 17:11	PIC	GABS13
S7	11A	3	1	20106	9/21/2013 16:57	9/21/2013 17:00	PIC	GABS13
S8	11A	3	5	19597	9/21/2013 16:40	9/21/2013 16:43	PIC	GABS13
S1	11B	3	1	25687	9/21/2013 16:21	9/21/2013 16:24	PIC	GABS13
S2	11B	3	5	24716	9/21/2013 16:16	9/21/2013 16:19	PIC	GABS13
S3	11B	3	5	22599	9/21/2013 16:30	9/21/2013 16:33	PIC	GABS13
S4	11B	3	9	22423	9/21/2013 16:25	9/21/2013 16:28	PIC	GABS13
S5	11B	3	5	23148	9/21/2013 16:40	9/21/2013 16:43	PIC	GABS13
S6	11B	3	2	22238	9/21/2013 16:36	9/21/2013 16:39	PIC	GABS13
S7	11B	3	2	21184	9/21/2013 17:08	9/21/2013 17:11	PIC	GABS13
S8	11B	3	2	20581	9/21/2013 16:57	9/21/2013 17:00	PIC	GABS13
S1	11C	3	2	25944	9/21/2013 16:25	9/21/2013 16:28	PIC	GABS13
S2	11C	3	5	24751	9/21/2013 16:21	9/21/2013 16:24	PIC	GABS13
S3	11C	3	7	22621	9/21/2013 16:16	9/21/2013 16:19	PIC	GABS13
S4	11C	3	14	22444	9/21/2013 16:30	9/21/2013 16:33	PIC	GABS13
S5	11C	3	3	23360	9/21/2013 16:57	9/21/2013 17:00	PIC	GABS13
S6	11C	3	3	22361	9/21/2013 16:40	9/21/2013 16:43	PIC	GABS13
S7	11C	3	8	21503	9/21/2013 16:36	9/21/2013 16:39	PIC	GABS13
S8	11C	3	5	20724	9/21/2013 17:08	9/21/2013 17:11	PIC	GABS13
S1	11D	3	1	25789	9/21/2013 16:30	9/21/2013 16:33	PIC	GABS13
S2	11D	3	5	24851	9/21/2013 16:26	9/21/2013 16:29	PIC	GABS13
S3	11D	3	4	22574	9/21/2013 16:21	9/21/2013 16:24	PIC	GABS13
S4	11D	3	5	22497	9/21/2013 16:17	9/21/2013 16:20	PIC	GABS13
S5	11D	3	2	23408	9/21/2013 17:08	9/21/2013 17:11	PIC	GABS13
S6	11D	3	3	22214	9/21/2013 16:58	9/21/2013 17:01	PIC	GABS13
S7	11D	3	4	21079	9/21/2013 16:40	9/21/2013 16:43	PIC	GABS13
S8	11D	3	4	20358	9/21/2013 16:36	9/21/2013 16:39	PIC	GABS13
S1	12A	3	2	25088	9/21/2013 16:36	9/21/2013 16:39	PIC	GABS13
S2	12A	3	1	24334	9/21/2013 17:08	9/21/2013 17:11	PIC	GABS13
S3	12A	3	3	22035	9/21/2013 16:58	9/21/2013 17:01	PIC	GABS13
S4	12A	3	2	21621	9/21/2013 16:40	9/21/2013 16:43	PIC	GABS13
S5	12A	3	3	22780	9/21/2013 16:17	9/21/2013 16:20	PIC	GABS13
S6	12A	3	2	21800	9/21/2013 16:30	9/21/2013 16:33	PIC	GABS13
S7	12A	3	2	20729	9/21/2013 16:26	9/21/2013 16:29	PIC	GABS13
S8	12A	3	2	20591	9/21/2013 16:21	9/21/2013 16:24	PIC	GABS13
S1	12B	3	1	23678	9/21/2013 16:40	9/21/2013 16:43	PIC	GABS13

S2	12B	3	4	22544	9/21/2013 16:36	9/21/2013 16:39	PIC	GABS13
S3	12B	3	5	20388	9/21/2013 17:09	9/21/2013 17:12	PIC	GABS13
S4	12B	3	7	20391	9/21/2013 16:58	9/21/2013 17:01	PIC	GABS13
S5	12B	3	3	21250	9/21/2013 16:21	9/21/2013 16:24	PIC	GABS13
S6	12B	3	6	19693	9/21/2013 16:17	9/21/2013 16:20	PIC	GABS13
S7	12B	3	5	19347	9/21/2013 16:30	9/21/2013 16:33	PIC	GABS13
S8	12B	3	4	18471	9/21/2013 16:26	9/21/2013 16:29	PIC	GABS13
S1	12C	3	12	25849	9/21/2013 16:58	9/21/2013 17:01	PIC	GABS13
S2	12C	3	14	24804	9/21/2013 16:40	9/21/2013 16:43	PIC	GABS13
S3	12C	3	9	22706	9/21/2013 16:36	9/21/2013 16:39	PIC	GABS13
S4	12C	3	11	22573	9/21/2013 17:09	9/21/2013 17:12	PIC	GABS13
S5	12C	3	11	23680	9/21/2013 16:26	9/21/2013 16:29	PIC	GABS13
S6	12C	3	12	22297	9/21/2013 16:22	9/21/2013 16:25	PIC	GABS13
S7	12C	3	14	21578	9/21/2013 16:17	9/21/2013 16:20	PIC	GABS13
S8	12C	3	13	20526	9/21/2013 16:31	9/21/2013 16:34	PIC	GABS13
S1	12D	3	3	26384	9/21/2013 17:09	9/21/2013 17:12	PIC	GABS13
S2	12D	3	11	25368	9/21/2013 17:03	9/21/2013 17:06	PIC	GABS13
S3	12D	3	8	23293	9/21/2013 16:41	9/21/2013 16:44	PIC	GABS13
S4	12D	3	11	22898	9/21/2013 16:36	9/21/2013 16:39	PIC	GABS13
S5	12D	3	2	23905	9/21/2013 16:31	9/21/2013 16:34	PIC	GABS13
S6	12D	3	4	23037	9/21/2013 16:26	9/21/2013 16:29	PIC	GABS13
S7	12D	3	8	22185	9/21/2013 16:22	9/21/2013 16:25	PIC	GABS13
S8	12D	3	6	21281	9/21/2013 16:17	9/21/2013 16:20	PIC	GABS13
S1	13A	3	6	25299	9/24/2013 15:16	9/24/2013 15:19	PIC	GABS13
S2	13A	3	2	24154	9/24/2013 16:07	9/24/2013 16:10	PIC	GABS13
S3	13A	3	6	22411	9/24/2013 16:02	9/24/2013 16:05	PIC	GABS13
S4	13A	3	10	22123	9/24/2013 15:46	9/24/2013 15:49	PIC	GABS13
S5	13A	3	1	23299	9/24/2013 16:12	9/24/2013 16:15	PIC	GABS13
S6	13A	3	4	21941	9/24/2013 17:06	9/24/2013 17:09	PIC	GABS13
S7	13A	3	3	21501	9/24/2013 16:28	9/24/2013 16:31	PIC	GABS13
S8	13A	3	2	20330	9/24/2013 16:21	9/24/2013 16:24	PIC	GABS13
S1	13B	3	3	25707	9/24/2013 15:46	9/24/2013 15:49	PIC	GABS13
S2	13B	3	2	25003	9/24/2013 15:16	9/24/2013 15:19	PIC	GABS13
S3	13B	3	7	22716	9/24/2013 16:07	9/24/2013 16:10	PIC	GABS13
S4	13B	3	6	22665	9/24/2013 16:02	9/24/2013 16:05	PIC	GABS13
S5	13B	3	3	23407	9/24/2013 16:21	9/24/2013 16:24	PIC	GABS13
S6	13B	3	1	22288	9/24/2013 16:12	9/24/2013 16:15	PIC	GABS13

S7	13B	3	3	21552	9/24/2013 17:06	9/24/2013 17:09	PIC	GABS13
S8	13B	3	6	20809	9/24/2013 16:28	9/24/2013 16:31	PIC	GABS13
S1	13C	3	1	24439	9/24/2013 16:02	9/24/2013 16:05	PIC	GABS13
S2	13C	3	6	23471	9/24/2013 15:46	9/24/2013 15:49	PIC	GABS13
S3	13C	3	2	20847	9/24/2013 15:16	9/24/2013 15:19	PIC	GABS13
S4	13C	3	6	21047	9/24/2013 16:07	9/24/2013 16:10	PIC	GABS13
S5	13C	3	3	21798	9/24/2013 16:28	9/24/2013 16:31	PIC	GABS13
S6	13C	3	6	20780	9/24/2013 16:21	9/24/2013 16:24	PIC	GABS13
S7	13C	3	4	19932	9/24/2013 16:12	9/24/2013 16:15	PIC	GABS13
S8	13C	3	4	19649	9/24/2013 17:06	9/24/2013 17:09	PIC	GABS13
S1	13D	3	7	25369	9/24/2013 16:08	9/24/2013 16:11	PIC	GABS13
S2	13D	3	0	24423	9/24/2013 16:02	9/24/2013 16:05	PIC	GABS13
S3	13D	3	5	22268	9/24/2013 15:46	9/24/2013 15:49	PIC	GABS13
S4	13D	3	7	22067	9/24/2013 15:16	9/24/2013 15:19	PIC	GABS13
S5	13D	3	7	22700	9/24/2013 17:06	9/24/2013 17:09	PIC	GABS13
S6	13D	3	6	21712	9/24/2013 16:28	9/24/2013 16:31	PIC	GABS13
S7	13D	3	4	20958	9/24/2013 16:22	9/24/2013 16:25	PIC	GABS13
S8	13D	3	5	20458	9/24/2013 16:12	9/24/2013 16:15	PIC	GABS13
S1	14A	3	3	25239	9/24/2013 16:12	9/24/2013 16:15	PIC	GABS13
S2	14A	3	3	23924	9/24/2013 17:06	9/24/2013 17:09	PIC	GABS13
S3	14A	3	2	21860	9/24/2013 16:29	9/24/2013 16:32	PIC	GABS13
S4	14A	3	7	22077	9/24/2013 16:22	9/24/2013 16:25	PIC	GABS13
S5	14A	3	5	22308	9/24/2013 15:16	9/24/2013 15:19	PIC	GABS13
S6	14A	3	1	21266	9/24/2013 16:08	9/24/2013 16:11	PIC	GABS13
S7	14A	3	6	20788	9/24/2013 16:02	9/24/2013 16:05	PIC	GABS13
S8	14A	3	4	20028	9/24/2013 15:46	9/24/2013 15:49	PIC	GABS13
S1	14B	3	1	26392	9/24/2013 16:22	9/24/2013 16:25	PIC	GABS13
S2	14B	3	3	25423	9/24/2013 16:12	9/24/2013 16:15	PIC	GABS13
S3	14B	3	5	23499	9/24/2013 17:06	9/24/2013 17:09	PIC	GABS13
S4	14B	3	12	22910	9/24/2013 16:29	9/24/2013 16:32	PIC	GABS13
S5	14B	3	7	23778	9/24/2013 15:46	9/24/2013 15:49	PIC	GABS13
S6	14B	3	4	22469	9/24/2013 15:17	9/24/2013 15:20	PIC	GABS13
S7	14B	3	0	21921	9/24/2013 16:08	9/24/2013 16:11	PIC	GABS13
S8	14B	3	6	21162	9/24/2013 16:02	9/24/2013 16:05	PIC	GABS13
S1	14C	3	0	24820	9/24/2013 16:29	9/24/2013 16:32	PIC	GABS13
S2	14C	3	5	24032	9/24/2013 16:22	9/24/2013 16:25	PIC	GABS13
S3	14C	3	2	21582	9/24/2013 16:12	9/24/2013 16:15	PIC	GABS13

S4	14C	3	7	21926	9/24/2013 17:06	9/24/2013 17:09	PIC	GABS13
S5	14C	3	3	22686	9/24/2013 16:02	9/24/2013 16:05	PIC	GABS13
S6	14C	3	6	21331	9/24/2013 15:47	9/24/2013 15:50	PIC	GABS13
S7	14C	3	4	20928	9/24/2013 15:17	9/24/2013 15:20	PIC	GABS13
S8	14C	3	4	20079	9/24/2013 16:08	9/24/2013 16:11	PIC	GABS13
S1	14D	3	2	25905	9/24/2013 17:06	9/24/2013 17:09	PIC	GABS13
S2	14D	3	4	25199	9/24/2013 16:29	9/24/2013 16:32	PIC	GABS13
S3	14D	3	5	23027	9/24/2013 16:22	9/24/2013 16:25	PIC	GABS13
S4	14D	3	7	22602	9/24/2013 16:12	9/24/2013 16:15	PIC	GABS13
S5	14D	3	2	23468	9/24/2013 16:08	9/24/2013 16:11	PIC	GABS13
S6	14D	3	5	22259	9/24/2013 16:02	9/24/2013 16:05	PIC	GABS13
S7	14D	3	7	21431	9/24/2013 15:47	9/24/2013 15:50	PIC	GABS13
S8	14D	3	2	21039	9/24/2013 15:17	9/24/2013 15:20	PIC	GABS13
S1	1A	3	20	25625	9/21/2013 13:30	9/21/2013 13:33	PIC	GABS13
S2	1A	3	18	25019	9/21/2013 13:53	9/21/2013 13:56	PIC	GABS13
S3	1A	3	21	22593	9/21/2013 13:40	9/21/2013 13:43	PIC	GABS13
S4	1A	3	28	22383	9/21/2013 13:36	9/21/2013 13:39	PIC	GABS13
S5	1A	3	23	23109	9/21/2013 13:57	9/21/2013 14:00	PIC	GABS13
S6	1A	3	24	22120	9/21/2013 14:20	9/21/2013 14:23	PIC	GABS13
S7	1A	3	27	21380	9/21/2013 14:06	9/21/2013 14:09	PIC	GABS13
S8	1A	3	24	20797	9/21/2013 14:02	9/21/2013 14:05	PIC	GABS13
S1	1B	3	63	25604	9/21/2013 13:36	9/21/2013 13:39	PIC	GABS13
S2	1B	3	54	24236	9/21/2013 13:30	9/21/2013 13:33	PIC	GABS13
S3	1B	3	50	22325	9/21/2013 13:53	9/21/2013 13:56	PIC	GABS13
S4	1B	3	59	22268	9/21/2013 13:40	9/21/2013 13:43	PIC	GABS13
S5	1B	3	48	23291	9/21/2013 14:02	9/21/2013 14:05	PIC	GABS13
S6	1B	3	33	22223	9/21/2013 13:57	9/21/2013 14:00	PIC	GABS13
S7	1B	3	45	21257	9/21/2013 14:20	9/21/2013 14:23	PIC	GABS13
S8	1B	3	53	20600	9/21/2013 14:07	9/21/2013 14:10	PIC	GABS13
S1	1C	3	442	26407	9/21/2013 13:41	9/21/2013 13:44	PIC	GABS13
S2	1C	3	422	24969	9/21/2013 13:36	9/21/2013 13:39	PIC	GABS13
S3	1C	3	435	22919	9/21/2013 13:30	9/21/2013 13:33	PIC	GABS13
S4	1C	3	414	22445	9/21/2013 13:53	9/21/2013 13:56	PIC	GABS13
S5	1C	3	404	23570	9/21/2013 14:07	9/21/2013 14:10	PIC	GABS13
S6	1C	3	360	22340	9/21/2013 14:02	9/21/2013 14:05	PIC	GABS13
S7	1C	3	348	21628	9/21/2013 13:57	9/21/2013 14:00	PIC	GABS13
S8	1C	3	320	20846	9/21/2013 14:20	9/21/2013 14:23	PIC	GABS13

S1	1D	3	357	25634	9/21/2013 13:53	9/21/2013 13:56	PIC	GABS13
S2	1D	3	286	24501	9/21/2013 13:41	9/21/2013 13:44	PIC	GABS13
S3	1D	3	286	22573	9/21/2013 13:36	9/21/2013 13:39	PIC	GABS13
S4	1D	3	313	22099	9/21/2013 13:30	9/21/2013 13:33	PIC	GABS13
S5	1D	3	284	22891	9/21/2013 14:20	9/21/2013 14:23	PIC	GABS13
S6	1D	3	258	22081	9/21/2013 14:07	9/21/2013 14:10	PIC	GABS13
S7	1D	3	240	21132	9/21/2013 14:02	9/21/2013 14:05	PIC	GABS13
S8	1D	3	254	20524	9/21/2013 13:58	9/21/2013 14:01	PIC	GABS13
S1	2A	3	2	23125	9/21/2013 13:58	9/21/2013 14:01	PIC	GABS13
S2	2A	3	6	22846	9/21/2013 14:20	9/21/2013 14:23	PIC	GABS13
S3	2A	3	1	20461	9/21/2013 14:07	9/21/2013 14:10	PIC	GABS13
S4	2A	3	6	20333	9/21/2013 14:02	9/21/2013 14:05	PIC	GABS13
S5	2A	3	5	21066	9/21/2013 13:31	9/21/2013 13:34	PIC	GABS13
S6	2A	3	3	20302	9/21/2013 13:53	9/21/2013 13:56	PIC	GABS13
S7	2A	3	3	19482	9/21/2013 13:41	9/21/2013 13:44	PIC	GABS13
S8	2A	3	3	18865	9/21/2013 13:36	9/21/2013 13:39	PIC	GABS13
S1	2B	3	3	22785	9/21/2013 14:02	9/21/2013 14:05	PIC	GABS13
S2	2B	3	4	22179	9/21/2013 13:58	9/21/2013 14:01	PIC	GABS13
S3	2B	3	4	20359	9/21/2013 14:20	9/21/2013 14:23	PIC	GABS13
S4	2B	3	4	19835	9/21/2013 14:07	9/21/2013 14:10	PIC	GABS13
S5	2B	3	0	21151	9/21/2013 13:36	9/21/2013 13:39	PIC	GABS13
S6	2B	3	3	19660	9/21/2013 13:31	9/21/2013 13:34	PIC	GABS13
S7	2B	3	2	19215	9/21/2013 13:53	9/21/2013 13:56	PIC	GABS13
S8	2B	3	4	18355	9/21/2013 13:41	9/21/2013 13:44	PIC	GABS13
S1	2C	3	48	23809	9/21/2013 14:07	9/21/2013 14:10	PIC	GABS13
S2	2C	3	44	22311	9/21/2013 14:02	9/21/2013 14:05	PIC	GABS13
S3	2C	3	36	21118	9/21/2013 13:58	9/21/2013 14:01	PIC	GABS13
S4	2C	3	60	20958	9/21/2013 14:20	9/21/2013 14:23	PIC	GABS13
S5	2C	3	38	21668	9/21/2013 13:41	9/21/2013 13:44	PIC	GABS13
S6	2C	3	47	20769	9/21/2013 13:37	9/21/2013 13:40	PIC	GABS13
S7	2C	3	45	20374	9/21/2013 13:31	9/21/2013 13:34	PIC	GABS13
S8	2C	3	49	19290	9/21/2013 13:53	9/21/2013 13:56	PIC	GABS13
S1	2D	3	4	23028	9/21/2013 14:20	9/21/2013 14:23	PIC	GABS13
S2	2D	3	3	21788	9/21/2013 14:07	9/21/2013 14:10	PIC	GABS13
S3	2D	3	4	19932	9/21/2013 14:03	9/21/2013 14:06	PIC	GABS13
S4	2D	3	8	20266	9/21/2013 13:58	9/21/2013 14:01	PIC	GABS13
S5	2D	3	10	20864	9/21/2013 13:53	9/21/2013 13:56	PIC	GABS13

S6	2D	3	2	19378	9/21/2013 13:41	9/21/2013 13:44	PIC	GABS13
S7	2D	3	6	19163	9/21/2013 13:37	9/21/2013 13:40	PIC	GABS13
S8	2D	3	3	18448	9/21/2013 13:31	9/21/2013 13:34	PIC	GABS13
S1	3A	3	271	24286	9/21/2013 12:02	9/21/2013 12:05	PIC	GABS13
S2	3A	3	279	23428	9/21/2013 12:18	9/21/2013 12:21	PIC	GABS13
S3	3A	3	251	21194	9/21/2013 12:13	9/21/2013 12:16	PIC	GABS13
S4	3A	3	218	21238	9/21/2013 12:07	9/21/2013 12:10	PIC	GABS13
S5	3A	3	273	22086	9/21/2013 12:26	9/21/2013 12:29	PIC	GABS13
S6	3A	3	262	21312	9/21/2013 13:24	9/21/2013 13:27	PIC	GABS13
S7	3A	3	226	20136	9/21/2013 13:19	9/21/2013 13:22	PIC	GABS13
S8	3A	3	258	19693	9/21/2013 13:12	9/21/2013 13:15	PIC	GABS13
S1	3B	3	508	25317	9/21/2013 12:07	9/21/2013 12:10	PIC	GABS13
S2	3B	3	475	24358	9/21/2013 12:02	9/21/2013 12:05	PIC	GABS13
S3	3B	3	449	22204	9/21/2013 12:18	9/21/2013 12:21	PIC	GABS13
S4	3B	3	396	22090	9/21/2013 12:13	9/21/2013 12:16	PIC	GABS13
S5	3B	3	467	22953	9/21/2013 13:12	9/21/2013 13:15	PIC	GABS13
S6	3B	3	434	21791	9/21/2013 12:27	9/21/2013 12:30	PIC	GABS13
S7	3B	3	402	21142	9/21/2013 13:24	9/21/2013 13:27	PIC	GABS13
S8	3B	3	374	20555	9/21/2013 13:19	9/21/2013 13:22	PIC	GABS13
S1	3C	3	218	25442	9/21/2013 12:13	9/21/2013 12:16	PIC	GABS13
S2	3C	3	256	24503	9/21/2013 12:07	9/21/2013 12:10	PIC	GABS13
S3	3C	3	181	22403	9/21/2013 12:02	9/21/2013 12:05	PIC	GABS13
S4	3C	3	164	22022	9/21/2013 12:18	9/21/2013 12:21	PIC	GABS13
S5	3C	3	182	23164	9/21/2013 13:20	9/21/2013 13:23	PIC	GABS13
S6	3C	3	193	21951	9/21/2013 13:12	9/21/2013 13:15	PIC	GABS13
S7	3C	3	202	20923	9/21/2013 12:27	9/21/2013 12:30	PIC	GABS13
S8	3C	3	185	20428	9/21/2013 13:24	9/21/2013 13:27	PIC	GABS13
S1	3D	3	181	24704	9/21/2013 12:18	9/21/2013 12:21	PIC	GABS13
S2	3D	3	184	23963	9/21/2013 12:13	9/21/2013 12:16	PIC	GABS13
S3	3D	3	156	22298	9/21/2013 12:07	9/21/2013 12:10	PIC	GABS13
S4	3D	3	138	21817	9/21/2013 12:02	9/21/2013 12:05	PIC	GABS13
S5	3D	3	189	22704	9/21/2013 13:24	9/21/2013 13:27	PIC	GABS13
S6	3D	3	163	21537	9/21/2013 13:20	9/21/2013 13:23	PIC	GABS13
S7	3D	3	157	20982	9/21/2013 13:12	9/21/2013 13:15	PIC	GABS13
S8	3D	3	131	20298	9/21/2013 12:27	9/21/2013 12:30	PIC	GABS13
S1	4A	3	202	24165	9/21/2013 12:27	9/21/2013 12:30	PIC	GABS13
S2	4A	3	192	23633	9/21/2013 13:24	9/21/2013 13:27	PIC	GABS13

S3	4A	3	144	22390	9/21/2013 13:20	9/21/2013 13:23	PIC	GABS13
S4	4A	3	160	21559	9/21/2013 13:12	9/21/2013 13:15	PIC	GABS13
S5	4A	3	163	22516	9/21/2013 12:03	9/21/2013 12:06	PIC	GABS13
S6	4A	3	129	21729	9/21/2013 12:19	9/21/2013 12:22	PIC	GABS13
S7	4A	3	140	20553	9/21/2013 12:13	9/21/2013 12:16	PIC	GABS13
S8	4A	3	108	20009	9/21/2013 12:07	9/21/2013 12:10	PIC	GABS13
S1	4B	3	3	25102	9/21/2013 13:12	9/21/2013 13:15	PIC	GABS13
S2	4B	3	7	24143	9/21/2013 12:27	9/21/2013 12:30	PIC	GABS13
S3	4B	3	3	21901	9/21/2013 13:25	9/21/2013 13:28	PIC	GABS13
S4	4B	3	7	22047	9/21/2013 13:20	9/21/2013 13:23	PIC	GABS13
S5	4B	3	5	22736	9/21/2013 12:08	9/21/2013 12:11	PIC	GABS13
S6	4B	3	1	21870	9/21/2013 12:03	9/21/2013 12:06	PIC	GABS13
S7	4B	3	5	21039	9/21/2013 12:19	9/21/2013 12:22	PIC	GABS13
S8	4B	3	4	20015	9/21/2013 12:13	9/21/2013 12:16	PIC	GABS13
S1	4C	3	74	24607	9/21/2013 13:20	9/21/2013 13:23	PIC	GABS13
S2	4C	3	67	23130	9/21/2013 13:12	9/21/2013 13:15	PIC	GABS13
S3	4C	3	49	21352	9/21/2013 12:27	9/21/2013 12:30	PIC	GABS13
S4	4C	3	56	22152	9/21/2013 13:25	9/21/2013 13:28	PIC	GABS13
S5	4C	3	76	22261	9/21/2013 12:13	9/21/2013 12:16	PIC	GABS13
S6	4C	3	65	21527	9/21/2013 12:08	9/21/2013 12:11	PIC	GABS13
S7	4C	3	43	20985	9/21/2013 12:03	9/21/2013 12:06	PIC	GABS13
S8	4C	3	62	20088	9/21/2013 12:19	9/21/2013 12:22	PIC	GABS13
S1	4D	3	491	25199	9/21/2013 13:25	9/21/2013 13:28	PIC	GABS13
S2	4D	3	420	23618	9/21/2013 13:20	9/21/2013 13:23	PIC	GABS13
S3	4D	3	374	22248	9/21/2013 13:13	9/21/2013 13:16	PIC	GABS13
S4	4D	3	418	21918	9/21/2013 12:27	9/21/2013 12:30	PIC	GABS13
S5	4D	3	391	22494	9/21/2013 12:19	9/21/2013 12:22	PIC	GABS13
S6	4D	3	373	21560	9/21/2013 12:13	9/21/2013 12:16	PIC	GABS13
S7	4D	3	363	20559	9/21/2013 12:08	9/21/2013 12:11	PIC	GABS13
S8	4D	3	346	19888	9/21/2013 12:03	9/21/2013 12:06	PIC	GABS13
S1	5A	3	128	26044	9/21/2013 14:24	9/21/2013 14:27	PIC	GABS13
S2	5A	3	131	24973	9/21/2013 14:45	9/21/2013 14:48	PIC	GABS13
S3	5A	3	131	22977	9/21/2013 14:38	9/21/2013 14:41	PIC	GABS13
S4	5A	3	136	22672	9/21/2013 14:34	9/21/2013 14:37	PIC	GABS13
S5	5A	3	129	23532	9/21/2013 15:00	9/21/2013 15:03	PIC	GABS13
S6	5A	3	119	22258	9/21/2013 15:13	9/21/2013 15:16	PIC	GABS13
S7	5A	3	101	21577	9/21/2013 15:09	9/21/2013 15:12	PIC	GABS13

S8	5A	3	104	20799	9/21/2013 15:04	9/21/2013 15:07	PIC	GABS13
S1	5B	3	100	25846	9/21/2013 14:34	9/21/2013 14:37	PIC	GABS13
S2	5B	3	126	24804	9/21/2013 14:24	9/21/2013 14:27	PIC	GABS13
S3	5B	3	94	22810	9/21/2013 14:45	9/21/2013 14:48	PIC	GABS13
S4	5B	3	104	22478	9/21/2013 14:38	9/21/2013 14:41	PIC	GABS13
S5	5B	3	108	23360	9/21/2013 15:04	9/21/2013 15:07	PIC	GABS13
S6	5B	3	95	22017	9/21/2013 15:00	9/21/2013 15:03	PIC	GABS13
S7	5B	3	97	21376	9/21/2013 15:13	9/21/2013 15:16	PIC	GABS13
S8	5B	3	75	20752	9/21/2013 15:09	9/21/2013 15:12	PIC	GABS13
S1	5C	3	93	25881	9/21/2013 14:39	9/21/2013 14:42	PIC	GABS13
S2	5C	3	105	25038	9/21/2013 14:34	9/21/2013 14:37	PIC	GABS13
S3	5C	3	93	22892	9/21/2013 14:24	9/21/2013 14:27	PIC	GABS13
S4	5C	3	91	22178	9/21/2013 14:45	9/21/2013 14:48	PIC	GABS13
S5	5C	3	83	23120	9/21/2013 15:09	9/21/2013 15:12	PIC	GABS13
S6	5C	3	84	22262	9/21/2013 15:04	9/21/2013 15:07	PIC	GABS13
S7	5C	3	79	21171	9/21/2013 15:00	9/21/2013 15:03	PIC	GABS13
S8	5C	3	87	20671	9/21/2013 15:13	9/21/2013 15:16	PIC	GABS13
S1	5D	3	160	25415	9/21/2013 14:45	9/21/2013 14:48	PIC	GABS13
S2	5D	3	150	24521	9/21/2013 14:39	9/21/2013 14:42	PIC	GABS13
S3	5D	3	150	22700	9/21/2013 14:34	9/21/2013 14:37	PIC	GABS13
S4	5D	3	145	22605	9/21/2013 14:24	9/21/2013 14:27	PIC	GABS13
S5	5D	3	133	23311	9/21/2013 15:13	9/21/2013 15:16	PIC	GABS13
S6	5D	3	151	22277	9/21/2013 15:09	9/21/2013 15:12	PIC	GABS13
S7	5D	3	145	21113	9/21/2013 15:04	9/21/2013 15:07	PIC	GABS13
S8	5D	3	143	20574	9/21/2013 15:00	9/21/2013 15:03	PIC	GABS13
S1	6A	3	133	25444	9/21/2013 15:00	9/21/2013 15:03	PIC	GABS13
S2	6A	3	112	24148	9/21/2013 15:14	9/21/2013 15:17	PIC	GABS13
S3	6A	3	86	22561	9/21/2013 15:09	9/21/2013 15:12	PIC	GABS13
S4	6A	3	113	22213	9/21/2013 15:04	9/21/2013 15:07	PIC	GABS13
S5	6A	3	85	23089	9/21/2013 14:26	9/21/2013 14:29	PIC	GABS13
S6	6A	3	92	21889	9/21/2013 14:46	9/21/2013 14:49	PIC	GABS13
S7	6A	3	83	21003	9/21/2013 14:39	9/21/2013 14:42	PIC	GABS13
S8	6A	3	96	20384	9/21/2013 14:35	9/21/2013 14:38	PIC	GABS13
S1	6B	3	271	25842	9/21/2013 15:05	9/21/2013 15:08	PIC	GABS13
S2	6B	3	204	24756	9/21/2013 15:00	9/21/2013 15:03	PIC	GABS13
S3	6B	3	183	22966	9/21/2013 15:14	9/21/2013 15:17	PIC	GABS13
S4	6B	3	191	22553	9/21/2013 15:10	9/21/2013 15:13	PIC	GABS13

S5	6B	3	207	23518	9/21/2013 14:35	9/21/2013 14:38	PIC	GABS13
S6	6B	3	192	21991	9/21/2013 14:28	9/21/2013 14:31	PIC	GABS13
S7	6B	3	169	21384	9/21/2013 14:46	9/21/2013 14:49	PIC	GABS13
S8	6B	3	192	20538	9/21/2013 14:39	9/21/2013 14:42	PIC	GABS13
S1	6C	3	211	25095	9/21/2013 15:10	9/21/2013 15:13	PIC	GABS13
S2	6C	3	188	24324	9/21/2013 15:05	9/21/2013 15:08	PIC	GABS13
S3	6C	3	166	22361	9/21/2013 15:00	9/21/2013 15:03	PIC	GABS13
S4	6C	3	188	22007	9/21/2013 15:14	9/21/2013 15:17	PIC	GABS13
S5	6C	3	191	23024	9/21/2013 14:39	9/21/2013 14:42	PIC	GABS13
S6	6C	3	157	21525	9/21/2013 14:35	9/21/2013 14:38	PIC	GABS13
S7	6C	3	154	21308	9/21/2013 14:28	9/21/2013 14:31	PIC	GABS13
S8	6C	3	152	20267	9/21/2013 14:46	9/21/2013 14:49	PIC	GABS13
S1	7A	3	26	25836	9/21/2013 15:24	9/21/2013 15:27	PIC	GABS13
S2	7A	3	29	24812	9/21/2013 15:38	9/21/2013 15:41	PIC	GABS13
S3	7A	3	31	22637	9/21/2013 15:33	9/21/2013 15:36	PIC	GABS13
S4	7A	3	25	22367	9/21/2013 15:29	9/21/2013 15:32	PIC	GABS13
S5	7A	3	25	23254	9/21/2013 15:44	9/21/2013 15:47	PIC	GABS13
S6	7A	3	28	22113	9/21/2013 15:57	9/21/2013 16:00	PIC	GABS13
S7	7A	3	30	21394	9/21/2013 15:52	9/21/2013 15:55	PIC	GABS13
S8	7A	3	23	20794	9/21/2013 15:48	9/21/2013 15:51	PIC	GABS13
S1	7B	3	45	25947	9/21/2013 15:29	9/21/2013 15:32	PIC	GABS13
S2	7B	3	57	24962	9/21/2013 15:25	9/21/2013 15:28	PIC	GABS13
S3	7B	3	56	22788	9/21/2013 15:38	9/21/2013 15:41	PIC	GABS13
S4	7B	3	55	22297	9/21/2013 15:33	9/21/2013 15:36	PIC	GABS13
S5	7B	3	51	23465	9/21/2013 15:48	9/21/2013 15:51	PIC	GABS13
S6	7B	3	42	22274	9/21/2013 15:44	9/21/2013 15:47	PIC	GABS13
S7	7B	3	45	21551	9/21/2013 15:57	9/21/2013 16:00	PIC	GABS13
S8	7B	3	35	20819	9/21/2013 15:52	9/21/2013 15:55	PIC	GABS13
S1	7C	3	8	24857	9/21/2013 15:34	9/21/2013 15:37	PIC	GABS13
S2	7C	3	8	24176	9/21/2013 15:29	9/21/2013 15:32	PIC	GABS13
S3	7C	3	7	22112	9/21/2013 15:25	9/21/2013 15:28	PIC	GABS13
S4	7C	3	14	21602	9/21/2013 15:38	9/21/2013 15:41	PIC	GABS13
S5	7C	3	18	22837	9/21/2013 15:53	9/21/2013 15:56	PIC	GABS13
S6	7C	3	11	21615	9/21/2013 15:48	9/21/2013 15:51	PIC	GABS13
S7	7C	3	16	20772	9/21/2013 15:44	9/21/2013 15:47	PIC	GABS13
S8	7C	3	5	20339	9/21/2013 15:57	9/21/2013 16:00	PIC	GABS13
S1	7D	3	21	25491	9/21/2013 15:39	9/21/2013 15:42	PIC	GABS13

S2	7D	3	26	24470	9/21/2013 15:34	9/21/2013 15:37	PIC	GABS13
S3	7D	3	18	22692	9/21/2013 15:29	9/21/2013 15:32	PIC	GABS13
S4	7D	3	18	22394	9/21/2013 15:25	9/21/2013 15:28	PIC	GABS13
S5	7D	3	25	22949	9/21/2013 15:57	9/21/2013 16:00	PIC	GABS13
S6	7D	3	19	22151	9/21/2013 15:53	9/21/2013 15:56	PIC	GABS13
S7	7D	3	15	20830	9/21/2013 15:48	9/21/2013 15:51	PIC	GABS13
S8	7D	3	16	20618	9/21/2013 15:44	9/21/2013 15:47	PIC	GABS13
S1	8A	3	3	22437	9/21/2013 15:44	9/21/2013 15:47	PIC	GABS13
S2	8A	3	2	21492	9/21/2013 15:57	9/21/2013 16:00	PIC	GABS13
S3	8A	3	5	20337	9/21/2013 15:53	9/21/2013 15:56	PIC	GABS13
S4	8A	3	7	19590	9/21/2013 15:48	9/21/2013 15:51	PIC	GABS13
S5	8A	3	6	19913	9/21/2013 15:25	9/21/2013 15:28	PIC	GABS13
S6	8A	3	5	19463	9/21/2013 15:39	9/21/2013 15:42	PIC	GABS13
S7	8A	3	1	18241	9/21/2013 15:34	9/21/2013 15:37	PIC	GABS13
S8	8A	3	3	18172	9/21/2013 15:30	9/21/2013 15:33	PIC	GABS13
S1	8B	3	3	22367	9/21/2013 15:48	9/21/2013 15:51	PIC	GABS13
S2	8B	3	1	21728	9/21/2013 15:44	9/21/2013 15:47	PIC	GABS13
S3	8B	3	3	20205	9/21/2013 15:57	9/21/2013 16:00	PIC	GABS13
S4	8B	3	7	19767	9/21/2013 15:53	9/21/2013 15:56	PIC	GABS13
S5	8B	3	4	20729	9/21/2013 15:30	9/21/2013 15:33	PIC	GABS13
S6	8B	3	3	19567	9/21/2013 15:25	9/21/2013 15:28	PIC	GABS13
S7	8B	3	1	18959	9/21/2013 15:39	9/21/2013 15:42	PIC	GABS13
S8	8B	3	2	18303	9/21/2013 15:34	9/21/2013 15:37	PIC	GABS13
S1	8C	3	2	21830	9/21/2013 15:53	9/21/2013 15:56	PIC	GABS13
S2	8C	3	6	21368	9/21/2013 15:48	9/21/2013 15:51	PIC	GABS13
S3	8C	3	0	19704	9/21/2013 15:44	9/21/2013 15:47	PIC	GABS13
S4	8C	3	5	19401	9/21/2013 15:57	9/21/2013 16:00	PIC	GABS13
S5	8C	3	6	19818	9/21/2013 15:34	9/21/2013 15:37	PIC	GABS13
S6	8C	3	5	19029	9/21/2013 15:30	9/21/2013 15:33	PIC	GABS13
S7	8C	3	1	18223	9/21/2013 15:25	9/21/2013 15:28	PIC	GABS13
S8	8C	3	2	17983	9/21/2013 15:39	9/21/2013 15:42	PIC	GABS13
S1	8D	3	40	25811	9/21/2013 15:57	9/21/2013 16:00	PIC	GABS13
S2	8D	3	34	24854	9/21/2013 15:53	9/21/2013 15:56	PIC	GABS13
S3	8D	3	27	22758	9/21/2013 15:48	9/21/2013 15:51	PIC	GABS13
S4	8D	3	40	22505	9/21/2013 15:44	9/21/2013 15:47	PIC	GABS13
S5	8D	3	38	23615	9/21/2013 15:39	9/21/2013 15:42	PIC	GABS13
S6	8D	3	30	22557	9/21/2013 15:34	9/21/2013 15:37	PIC	GABS13

S7	8D	3	29	21368	9/21/2013 15:30	9/21/2013 15:33	PIC	GABS13
S8	8D	3	37	20679	9/21/2013 15:25	9/21/2013 15:28	PIC	GABS13
S1	9A	3	54	26109	9/21/2013 17:01	9/21/2013 17:04	PIC	GABS13
S2	9A	3	47	25227	9/21/2013 17:16	9/21/2013 17:19	PIC	GABS13
S3	9A	3	51	22999	9/21/2013 17:11	9/21/2013 17:14	PIC	GABS13
S4	9A	3	60	22512	9/21/2013 17:07	9/21/2013 17:10	PIC	GABS13
S5	9A	3	50	23507	9/21/2013 17:21	9/21/2013 17:24	PIC	GABS13
S6	9A	3	48	21945	9/21/2013 17:37	9/21/2013 17:40	PIC	GABS13
S7	9A	3	39	21492	9/21/2013 17:31	9/21/2013 17:34	PIC	GABS13
S8	9A	3	46	20691	9/21/2013 17:27	9/21/2013 17:30	PIC	GABS13
S1	9B	3	60	25990	9/21/2013 17:07	9/21/2013 17:10	PIC	GABS13
S2	9B	3	59	24930	9/21/2013 17:01	9/21/2013 17:04	PIC	GABS13
S3	9B	3	54	22796	9/21/2013 17:16	9/21/2013 17:19	PIC	GABS13
S4	9B	3	58	22590	9/21/2013 17:11	9/21/2013 17:14	PIC	GABS13
S5	9B	3	69	23152	9/21/2013 17:27	9/21/2013 17:30	PIC	GABS13
S6	9B	3	59	22396	9/21/2013 17:21	9/21/2013 17:24	PIC	GABS13
S7	9B	3	54	21751	9/21/2013 17:37	9/21/2013 17:40	PIC	GABS13
S8	9B	3	51	20646	9/21/2013 17:32	9/21/2013 17:35	PIC	GABS13
S1	9C	3	62	25465	9/21/2013 17:12	9/21/2013 17:15	PIC	GABS13
S2	9C	3	50	24707	9/21/2013 17:07	9/21/2013 17:10	PIC	GABS13
S3	9C	3	69	22353	9/21/2013 17:01	9/21/2013 17:04	PIC	GABS13
S4	9C	3	53	22173	9/21/2013 17:16	9/21/2013 17:19	PIC	GABS13
S5	9C	3	68	22883	9/21/2013 17:32	9/21/2013 17:35	PIC	GABS13
S6	9C	3	55	22218	9/21/2013 17:27	9/21/2013 17:30	PIC	GABS13
S7	9C	3	65	20983	9/21/2013 17:21	9/21/2013 17:24	PIC	GABS13
S8	9C	3	52	20661	9/21/2013 17:37	9/21/2013 17:40	PIC	GABS13
S1	9D	3	59	24913	9/21/2013 17:16	9/21/2013 17:19	PIC	GABS13
S2	9D	3	72	23917	9/21/2013 17:12	9/21/2013 17:15	PIC	GABS13
S3	9D	3	46	21731	9/21/2013 17:07	9/21/2013 17:10	PIC	GABS13
S4	9D	3	64	21652	9/21/2013 17:01	9/21/2013 17:04	PIC	GABS13
S5	9D	3	57	22477	9/21/2013 17:37	9/21/2013 17:40	PIC	GABS13
S6	9D	3	73	21347	9/21/2013 17:32	9/21/2013 17:35	PIC	GABS13
S7	9D	3	53	20518	9/21/2013 17:28	9/21/2013 17:31	PIC	GABS13
S8	9D	3	42	20002	9/21/2013 17:21	9/21/2013 17:24	PIC	GABS13

Gross Alpha/Beta Liquid

Filename : GAB.XLS
File type : Excel
Version # : 1.3.8

Batch : 1082959
Analyst : NXL1
Prep Date : 8/29/2011

Alpha Spike S/N :	N/A	**Beta Spike S/N :**	N/A
Alpha Spike Exp Date :	N/A	**Beta Spike Exp Date :**	N/A
Alpha Spike Activity (dpm/ml):	N/A	**Beta Spike Activity (dpm/ml):**	N/A
Alpha Spike Volume Added:	N/A	**Beta Spike Volume Added:**	N/A
Alpha Spike Nuclide:	N/A	**Beta Spike Nuclide:**	N/A
Alpha LCS S/N :	1242-A	**Beta LCS S/N :**	1243-A
Alpha LCS Exp Date :	6/22/2013	**Beta LCS Exp Date :**	9/27/2013
AlphaLCS Activity (dpm/ml):	23216.97	**Beta LCS Activity (dpm/ml):**	211664.13
Alpha LCS Volume Added:	2.00	**Beta LCS Volume Added:**	0.10
Alpha LCS Nuclide:	Th-230	**Beta LCS Nuclide:**	Sr-90

Alpha Method Uncertainty : 0.0829
Beta Method Uncertainty : 0.0821

Geometry: 2 inch Planchett

Pipet, 0.1 ml Stdev : +/-	0.000200	ml
Pipet, 0.5 ml Stdev : +/-	0.001000	ml
Pipet, 1 ml Stdev : +/-	0.002000	ml

Procedure Code :	GFCGANBL	
Parmname1 :	Alpha	
Parmname2 :	Beta	
Required Alpha MDA :	1	pCi/L
Required Beta MDA :	1	pCi/L

Sample Characteristics						Count Raw Data				
Pos.	Sample ID	Sample Aliquot L	Sample Residue Wt. (mg)	Sample Aliquot StDev. L	Sample Date/Time	Detector ID	Counting Time (min.)	Gross Counts Alpha	Gross Counts Beta	Count Start Date/Time
1	1202347886.1	1.0000	0	2.0399E-05	8/29/2011 0:00	1A	2	23592	45806	9/21/2013 13:21
2	1202347887.1	1.0000	10.4	2.0399E-05	8/29/2011 0:00	1B	2	18833	43797	9/21/2013 13:21
3	1202347888.1	1.0000	23.8	2.0399E-05	8/29/2011 0:00	1C	2	16796	38423	9/21/2013 13:21
4	1202347889.1	1.0000	44.2	2.0399E-05	8/29/2011 0:00	1D	2	14234	36643	9/21/2013 13:21
5	1202347890.1	1.0000	54.7	2.0399E-05	8/29/2011 0:00	2A	2	10703	34673	9/21/2013 13:21
6	1202347891.1	1.0000	73.9	2.0399E-05	8/29/2011 0:00	2B	2	8760	32873	9/21/2013 13:21
7	1202347892.1	1.0000	95.2	2.0399E-05	8/29/2011 0:00	2C	2	8406	30884	9/21/2013 13:21
8	1202347893.1	1.0000	103	2.0399E-05	8/29/2011 0:00	2D	2	6292	29301	9/21/2013 13:22
9	1202347894.1	1.0000	0	2.0399E-05	8/29/2011 0:00	3A	2	24216	42765	9/21/2013 13:31
10	1202347895.1	1.0000	10.4	2.0399E-05	8/29/2011 0:00	3B	2	20218	42262	9/21/2013 13:32
11	1202347896.1	1.0000	23.8	2.0399E-05	8/29/2011 0:00	3C	2	15320	37512	9/21/2013 13:32
12	1202347897.1	1.0000	44.2	2.0399E-05	8/29/2011 0:00	3D	2	14003	36197	9/21/2013 13:32
13	1202347898.1	1.0000	54.7	2.0399E-05	8/29/2011 0:00	4A	2	12330	34418	9/21/2013 13:32
14	1202347899.1	1.0000	73.9	2.0399E-05	8/29/2011 0:00	4B	2	9452	35173	9/21/2013 13:32
15	1202347900.1	1.0000	95.2	2.0399E-05	8/29/2011 0:00	4C	2	8857	31629	9/21/2013 13:32
16	1202347901.1	1.0000	103	2.0399E-05	8/29/2011 0:00	4D	2	8154	30378	9/21/2013 13:32
17	1202347902.1	1.0000	0	2.0399E-05	8/29/2011 0:00	5A	2	25440	46458	9/21/2013 12:08
18	1202347903.1	1.0000	10.4	2.0399E-05	8/29/2011 0:00	5B	2	19808	43863	9/21/2013 12:08
19	1202347904.1	1.0000	23.8	2.0399E-05	8/29/2011 0:00	5C	2	15610	38606	9/21/2013 12:08
20	1202347905.1	1.0000	44.2	2.0399E-05	8/29/2011 0:00	5D	2	14638	36556	9/21/2013 12:08
21	1202347906.1	1.0000	54.7	2.0399E-05	8/29/2011 0:00	6A	2	13248	35713	9/21/2013 12:10
22	1202347907.1	1.0000	73.9	2.0399E-05	8/29/2011 0:00	6B	2	11775	34829	9/21/2013 12:10
23	1202347908.1	1.0000	95.2	2.0399E-05	8/29/2011 0:00	6C	2	9876	31502	9/21/2013 12:11
~~24~~	~~1202347909.1~~	~~1.0000~~	~~103~~	~~2.0399E-05~~	~~8/29/2011 0:00~~	~~6D~~	~~2~~	~~0~~	~~0~~	~~9/21/2013 12:11~~
25	1202347910.1	1.0000	0	2.0399E-05	8/29/2011 0:00	7A	2	24570	46292	9/21/2013 12:15
26	1202347911.1	1.0000	10.4	2.0399E-05	8/29/2011 0:00	7B	2	19830	43657	9/21/2013 12:15
27	1202347912.1	1.0000	23.8	2.0399E-05	8/29/2011 0:00	7C	2	14850	38544	9/21/2013 12:15
28	1202347913.1	1.0000	44.2	2.0399E-05	8/29/2011 0:00	7D	2	13473	37809	9/21/2013 12:15
29	1202347914.1	1.0000	54.7	2.0399E-05	8/29/2011 0:00	8A	2	9411	33431	9/21/2013 12:15
30	1202347915.1	1.0000	73.9	2.0399E-05	8/29/2011 0:00	8B	2	8626	32884	9/21/2013 12:16
31	1202347916.1	1.0000	95.2	2.0399E-05	8/29/2011 0:00	8C	2	6894	30183	9/21/2013 12:16
32	1202347917.1	1.0000	103	2.0399E-05	8/29/2011 0:00	8D	2	8200	32110	9/21/2013 12:16
33	1202347918.1	1.0000	0	2.0399E-05	8/29/2011 0:00	9A	2	23921	47306	9/21/2013 12:20
34	1202347919.1	1.0000	10.4	2.0399E-05	8/29/2011 0:00	9B	2	19296	44434	9/21/2013 12:20
35	1202347920.1	1.0000	23.8	2.0399E-05	8/29/2011 0:00	9C	2	14435	38894	9/21/2013 12:20
36	1202347921.1	1.0000	44.2	2.0399E-05	8/29/2011 0:00	9D	2	12908	36500	9/21/2013 12:21
37	1202347922.1	1.0000	54.7	2.0399E-05	8/29/2011 0:00	10A	2	10944	36700	9/21/2013 12:21
38	1202347923.1	1.0000	73.9	2.0399E-05	8/29/2011 0:00	10B	2	10676	34602	9/21/2013 12:21
39	1202347924.1	1.0000	95.2	2.0399E-05	8/29/2011 0:00	10C	2	8798	32964	9/21/2013 12:21
40	1202347925.1	1.0000	103	2.0399E-05	8/29/2011 0:00	10D	2	7450	32649	9/21/2013 12:21

Analytical SOP: GL-RAD-A-001
Instrument SOP: GL-RAD-I-016

Calibration Data		Alpha						Beta						Weekly Background			
Pos.	Counted on	Calibration Date	Calibration Due Date	Calibration Source Used	Detector Efficiency (cpm/dpm)	Det. Eff. Error (cpm/dpm)	X-Talk	Calibration Date	Calibration Due Date	Calibration Source Used	Detector Efficiency (cpm/dpm)	Det. Eff. Error (cpm/dpm)	X-Talk	CPM Alpha	CPM Beta	Count Start Date/Time	Count Time (min.)
1	PIC	10/1/2012	9/30/2016	Th230	0.2462	0.00667	0.07827	10/1/2012	9/30/2016	Sr90	0.4570	0.00738	0.00102	0.104	0.616	9/14/2013 18:26	500
2	PIC	10/1/2012	9/30/2016	Th230	0.2008	0.01356	0.11205	10/1/2012	9/30/2016	Sr90	0.4450	0.00711	0.00223	0.124	0.504	9/14/2013 18:26	500
3	PIC	10/1/2012	9/30/2016	Th230	0.1791	0.00967	0.04692	10/1/2012	9/30/2016	Sr90	0.4468	0.00847	0.01697	0.158	0.858	9/14/2013 18:26	500
4	PIC	10/1/2012	9/30/2016	Th230	0.1316	0.00996	0.05530	10/1/2012	9/30/2016	Sr90	0.4228	0.00692	0.01253	0.144	0.574	9/14/2013 18:26	500
5	PIC	10/1/2012	9/30/2016	Th230	0.1025	0.01946	0.21715	10/1/2012	9/30/2016	Sr90	0.3812	0.01914	0.00017	0.116	0.600	9/14/2013 18:26	500
6	PIC	10/1/2012	9/30/2016	Th230	0.0895	0.02011	0.25502	10/1/2012	9/30/2016	Sr90	0.3626	0.02111	0.00015	0.040	0.646	9/14/2013 18:26	500
7	PIC	10/1/2012	9/30/2016	Th230	0.0887	0.01156	0.10624	10/1/2012	9/30/2016	Sr90	0.3677	0.01274	0.00217	0.124	0.512	9/14/2013 18:26	500
8	PIC	10/1/2012	9/30/2016	Th230	0.0760	0.01278	0.30181	10/1/2012	9/30/2016	Sr90	0.3439	0.00745	0.00025	0.188	1.990	9/14/2013 18:26	500
9	PIC	10/1/2012	9/30/2016	Th230	0.2466	0.02940	0.04288	10/1/2012	9/30/2016	Sr90	0.4313	0.01401	0.01177	0.134	1.714	9/15/2013 12:32	500
10	PIC	10/1/2012	9/30/2016	Th230	0.2128	0.00853	0.03450	10/1/2012	9/30/2016	Sr90	0.4420	0.01614	0.01940	0.204	0.638	9/14/2013 18:26	500
11	PIC	10/1/2012	9/30/2016	Th230	0.1669	0.00568	0.06203	10/1/2012	9/30/2016	Sr90	0.4358	0.00988	0.00874	0.194	1.202	9/14/2013 18:26	500
12	PIC	10/1/2012	9/30/2016	Th230	0.1343	0.00657	0.06835	10/1/2012	9/30/2016	Sr90	0.4148	0.02297	0.00727	0.112	0.484	9/14/2013 18:26	500
13	PIC	10/1/2012	9/30/2016	Th230	0.1191	0.01036	0.05496	10/1/2012	9/30/2016	Sr90	0.4043	0.01123	0.00697	0.134	1.020	9/14/2013 18:26	500
14	PIC	10/1/2012	9/30/2016	Th230	0.0941	0.00704	0.21645	10/1/2012	9/30/2016	Sr90	0.3967	0.01519	0.00020	0.114	1.036	9/14/2013 18:26	500
15	PIC	10/1/2012	9/30/2016	Th230	0.0946	0.01587	0.10142	10/1/2012	9/30/2016	Sr90	0.3812	0.00889	0.00279	0.174	0.796	9/14/2013 18:26	500
16	PIC	10/1/2012	9/30/2016	Th230	0.0926	0.00613	0.07926	10/1/2012	9/30/2016	Sr90	0.3721	0.00773	0.01786	0.192	2.692	9/15/2013 12:32	500
17	PIC	10/1/2012	9/30/2016	Th230	0.2653	0.00491	0.04098	10/1/2012	9/30/2016	Sr90	0.4628	0.00851	0.00530	0.124	0.534	9/14/2013 18:25	500
18	PIC	10/1/2012	9/30/2016	Th230	0.2134	0.01152	0.05149	10/1/2012	9/30/2016	Sr90	0.4516	0.00426	0.00435	0.158	8.378	9/15/2013 12:32	500
19	PIC	10/1/2012	9/30/2016	Th230	0.1694	0.01161	0.06931	10/1/2012	9/30/2016	Sr90	0.4427	0.00657	0.00391	0.240	4.354	9/15/2013 12:32	500
20	PIC	10/1/2012	9/30/2016	Th230	0.1403	0.00639	0.05025	10/1/2012	9/30/2016	Sr90	0.4251	0.00925	0.00647	0.146	1.948	9/14/2013 18:26	500
21	PIC	10/1/2012	9/30/2016	Th230	0.1259	0.02108	0.05608	10/1/2012	9/30/2016	Sr90	0.4138	0.02228	0.00441	0.234	0.748	9/15/2013 12:32	500
22	PIC	10/1/2012	9/30/2016	Th230	0.1184	0.01195	0.04713	10/1/2012	9/30/2016	Sr90	0.4062	0.00851	0.00874	0.128	0.522	9/14/2013 18:26	500
23	PIC	10/1/2012	9/30/2016	Th230	0.1023	0.01553	0.07607	10/1/2012	9/30/2016	Sr90	0.3852	0.01970	0.00780	0.140	0.914	9/14/2013 18:26	500
~~24~~	~~PIC~~	~~10/1/2012~~	~~9/30/2016~~	~~Th230~~	~~0.0000~~	~~0.01442~~	~~0.00000~~	~~10/1/2012~~	~~9/30/2016~~	~~Sr90~~	~~0.0000~~	~~0.01311~~	~~0.00000~~	~~FAIL~~	~~FAIL~~	~~12:00:00 AM~~	~~0~~
25	PIC	10/1/2012	9/30/2016	Th230	0.2598	0.00525	0.05085	10/1/2012	9/30/2016	Sr90	0.4576	0.00594	0.00119	0.122	0.576	9/14/2013 18:26	500
26	PIC	10/1/2012	9/30/2016	Th230	0.2136	0.00479	0.05641	10/1/2012	9/30/2016	Sr90	0.4527	0.00627	0.00210	0.074	0.606	9/14/2013 18:26	500
27	PIC	10/1/2012	9/30/2016	Th230	0.1631	0.00790	0.09961	10/1/2012	9/30/2016	Sr90	0.4283	0.00790	0.00049	0.146	0.400	9/14/2013 18:26	500
28	PIC	10/1/2012	9/30/2016	Th230	0.1280	0.00619	0.07959	10/1/2012	9/30/2016	Sr90	0.4232	0.01113	0.00087	0.162	0.546	9/14/2013 18:26	500
29	PIC	10/1/2012	9/30/2016	Th230	0.1015	0.01473	0.26640	10/1/2012	9/30/2016	Sr90	0.3656	0.01579	0.00020	0.160	0.354	9/14/2013 18:26	500
30	PIC	10/1/2012	9/30/2016	Th230	0.0919	0.01664	0.29519	10/1/2012	9/30/2016	Sr90	0.3591	0.02148	0.00015	0.100	0.430	9/14/2013 18:26	500
31	PIC	10/1/2012	9/30/2016	Th230	0.0802	0.01321	0.31959	10/1/2012	9/30/2016	Sr90	0.3367	0.01955	0.00017	0.096	0.326	9/14/2013 18:26	500
32	PIC	10/1/2012	9/30/2016	Th230	0.0961	0.00794	0.17472	10/1/2012	9/30/2016	Sr90	0.3878	0.00609	0.00150	0.096	1.068	9/14/2013 18:26	500
33	PIC	10/1/2012	9/30/2016	Th230	0.2494	0.00726	0.31886	10/1/2012	9/30/2016	Sr90	0.4646	0.00758	0.00215	0.076	0.776	9/14/2013 18:26	500
34	PIC	10/1/2012	9/30/2016	Th230	0.2088	0.00633	0.07317	10/1/2012	9/30/2016	Sr90	0.4533	0.00754	0.00252	0.114	0.782	9/14/2013 18:26	500
35	PIC	10/1/2012	9/30/2016	Th230	0.1610	0.01265	0.08394	10/1/2012	9/30/2016	Sr90	0.4367	0.00584	0.00262	0.126	1.110	9/14/2013 18:26	500
36	PIC	10/1/2012	9/30/2016	Th230	0.1259	0.02427	0.06288	10/1/2012	9/30/2016	Sr90	0.4114	0.02610	0.00264	0.114	1.926	9/15/2013 12:32	500
37	PIC	10/1/2012	9/30/2016	Th230	0.1085	0.01461	0.14593	10/1/2012	9/30/2016	Sr90	0.4095	0.00651	0.00067	0.164	0.932	9/14/2013 18:26	500
38	PIC	10/1/2012	9/30/2016	Th230	0.1098	0.00844	0.07661	10/1/2012	9/30/2016	Sr90	0.4033	0.00652	0.00322	0.124	0.820	9/14/2013 18:26	500
39	PIC	10/1/2012	9/30/2016	Th230	0.0921	0.00710	0.11783	10/1/2012	9/30/2016	Sr90	0.3889	0.00638	0.00295	0.100	0.396	9/14/2013 18:26	500
40	PIC	10/1/2012	9/30/2016	Th230	0.0864	0.00583	0.14796	10/1/2012	9/30/2016	Sr90	0.3893	0.00557	0.00207	0.116	0.918	9/14/2013 18:26	500

Notes:
1 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date

Alpha 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	0.9742	0.6878	1	4.1205	**21542.8667**	0.0093	11795.8960	76.7984	275.4507	3529.4329		LCS			20916.1917	103.0%
2	1.3041	0.9207	1	5.2063	**21014.1603**	0.0154	9416.3760	68.6167	301.6955	3490.8957		LCS			20916.1917	100.5%
3	1.6501	1.1650	1	6.1018	**20297.1162**	0.0124	8397.8420	64.7997	319.3682	3469.1388		LCS			20916.1917	97.0%
4	2.1449	1.5143	1	8.1644	**23580.9455**	0.0130	7116.8560	59.6532	400.3179	4007.7537		LCS			20916.1917	112.7%
5	2.4711	1.7446	1	10.0818	**23506.1206**	0.0217	5351.3840	51.7277	445.5931	3950.6323		LCS			20916.1917	112.4%
6	1.6616	1.1731	1	9.8951	**22030.3267**	0.0228	4379.9600	46.7974	461.6048	3714.2751		LCS			20916.1917	105.3%
7	2.9507	2.0832	1	11.7803	**21163.4935**	0.0159	4202.8760	45.8421	456.0687	3529.4468		LCS			20916.1917	101.2%
8	4.2423	2.9951	1	14.8804	**18623.2171**	0.0179	3145.8120	39.6611	460.7226	3099.6347		LCS			20916.1917	89.0%
9	1.1040	0.7795	1	4.2994	**21660.7163**	0.0301	12107.8660	77.8075	278.6148	3823.6884		LCS			20916.1917	103.6%
10	1.5785	1.1144	1	5.4043	**20532.2868**	0.0111	10108.7960	71.0950	294.9921	3507.9376		LCS			20916.1917	98.2%
11	1.9628	1.3858	1	6.8207	**20234.7420**	0.0099	7659.8060	61.8870	327.4374	3383.4768		LCS			20916.1917	96.7%
12	1.8532	1.3084	1	7.6481	**23043.2561**	0.0107	7001.3880	59.1671	388.9870	3847.5519		LCS			20916.1917	110.2%
13	2.2865	1.6143	1	8.9041	**22872.3607**	0.0137	6164.8660	55.5203	411.7392	3841.6845		LCS			20916.1917	109.4%
14	2.6682	1.8837	1	10.9478	**22605.7570**	0.0125	4725.8860	48.6107	456.0794	3717.0680		LCS			20916.1917	108.1%
15	3.2777	2.3141	1	11.7679	**20868.2196**	0.0191	4428.3260	47.0558	438.9948	3514.5710		LCS			20916.1917	99.8%
16	3.5175	2.4834	1	12.2608	**18505.0707**	0.0127	4076.8080	45.1498	430.3167	3258.4647		LCS			20916.1917	88.5%
17	0.9870	0.6969	1	3.9406	**21388.4516**	0.0080	12719.8760	79.7496	265.4007	3525.3661		LCS			20916.1917	102.3%
18	1.3853	0.9780	1	5.1227	**20706.6931**	0.0135	9903.8420	70.3705	291.1760	3442.1933		LCS			20916.1917	99.0%
19	2.1509	1.5185	1	7.0263	**20556.0699**	0.0141	7804.7600	62.4700	325.6305	3421.0722		LCS			20916.1917	98.3%
20	2.0247	1.4294	1	7.6735	**23112.3176**	0.0104	7318.8540	60.4938	380.5738	3847.2121		LCS			20916.1917	110.5%
21	2.8574	2.0173	1	9.4017	**23418.2787**	0.0228	6623.7660	57.5500	403.5987	3993.9286		LCS			20916.1917	112.0%
22	2.2478	1.5870	1	8.8827	**21826.8888**	0.0151	5887.3720	54.2563	404.7221	3700.5254		LCS			20916.1917	104.4%
23	2.7197	1.9201	1	10.4448	**21200.4445**	0.0185	4937.8600	49.6890	428.8137	3619.6036		LCS			20916.1917	101.4%
~~24~~	~~#DIV/0!~~	~~#DIV/0!~~	~~1~~	~~#DIV/0!~~	~~**#VALUE!**~~	~~#VALUE!~~	~~#VALUE!~~	~~#VALUE!~~	~~#VALUE!~~	~~#VALUE!~~		~~LCS~~			~~20916.1917~~	~~#VALUE!~~
25	0.9996	0.7057	1	4.0117	**21248.4778**	0.0083	12284.8780	78.3741	266.2929	3477.4222		LCS			20916.1917	101.6%
26	0.9472	0.6688	1	4.5015	**20817.1392**	0.0086	9914.9260	70.4095	291.0905	3416.2301		LCS			20916.1917	99.5%
27	1.7419	1.2298	1	6.6017	**20476.9058**	0.0114	7424.8540	60.9303	329.7767	3362.7289		LCS			20916.1917	97.9%
28	2.3376	1.6504	1	8.5778	**23641.2275**	0.0106	6736.3380	58.0366	400.1851	3882.0753		LCS			20916.1917	113.0%
29	2.9315	2.0697	1	10.7984	**20873.7881**	0.0180	4705.3400	48.5052	422.0506	3472.9865		LCS			20916.1917	99.8%
30	2.5581	1.8060	1	10.9622	**21121.6502**	0.0198	4312.9000	46.4381	446.0010	3530.6799		LCS			20916.1917	101.0%
31	2.8739	2.0290	1	12.4858	**19352.1652**	0.0179	3446.9040	41.5151	457.1786	3219.0762		LCS			20916.1917	92.5%
32	2.3985	1.6934	1	10.4207	**19112.9039**	0.0136	4099.9040	45.2769	416.1381	3165.6073		LCS			20916.1917	91.4%
33	0.8220	0.5804	1	3.8701	**21511.9449**	0.0097	11960.4240	77.3321	273.7762	3534.2913		LCS			20916.1917	102.8%
34	1.2023	0.8488	1	4.9332	**20689.6223**	0.0096	9647.8860	69.4550	293.6365	3403.9179		LCS			20916.1917	98.9%
35	1.6398	1.1577	1	6.5131	**20054.2724**	0.0151	7217.3740	60.0729	329.4917	3335.9833		LCS			20916.1917	95.9%
36	1.9939	1.4077	1	8.1813	**22914.8241**	0.0258	6453.8860	56.8067	398.2909	3928.9258		LCS			20916.1917	109.6%
37	2.7759	1.9598	1	10.1480	**22669.0418**	0.0175	5471.8360	52.3068	425.6912	3772.6906		LCS			20916.1917	108.4%
38	2.3855	1.6842	1	9.5236	**21675.2850**	0.0128	5337.8760	51.6624	415.5157	3601.5136		LCS			20916.1917	103.6%
39	2.5529	1.8024	1	10.9400	**21273.8146**	0.0128	4398.9000	46.8988	449.5147	3536.7466		LCS			20916.1917	101.7%
40	2.9328	2.0706	1	11.9654	**19252.7513**	0.0130	3724.8840	43.1567	441.2164	3195.3862		LCS			20916.1917	92.0%

Notes:
1 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date

Beta 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	1.2772	0.9017	1	3.2820	**21665.1381**	0.0087	22902.3840	107.0117	206.7470	3653.2393		LCS			19068.8403	113.6%
2	1.1863	0.8375	1	3.1933	**21096.9417**	0.0086	21897.9960	104.6387	207.5915	3586.0428		LCS			19068.8403	110.6%
3	1.5418	1.0885	1	3.6895	**18972.2965**	0.0099	19210.6420	98.0089	193.6866	3139.3804		LCS			19068.8403	99.5%
4	1.3324	0.9407	1	3.4794	**19098.5772**	0.0087	18320.9260	95.7118	199.8508	3158.2018		LCS			19068.8403	100.2%
5	1.5111	1.0668	1	3.9062	**19112.2206**	0.0199	17335.9000	93.1034	215.6353	3391.6866		LCS			19068.8403	100.2%
6	1.6482	1.1636	1	4.1905	**19028.7148**	0.0218	16435.8540	90.6546	220.7135	3399.2902		LCS			19068.8403	99.8%
7	1.4469	1.0215	1	3.8804	**18367.1163**	0.0140	15441.4880	87.8692	210.9545	3087.2082		LCS			19068.8403	96.3%
8	3.0505	2.1537	1	6.2722	**17944.2715**	0.0095	14648.5100	85.5877	219.7375	3108.1098		LCS			19068.8403	94.1%
9	2.2575	1.5938	1	4.7543	**21789.8742**	0.0148	21380.7860	103.3985	211.6784	3651.6938		LCS			19068.8403	114.3%
10	1.3437	0.9487	1	3.4259	**21176.9019**	0.0169	21130.3620	102.7886	205.2976	3537.1577		LCS			19068.8403	111.1%
11	1.8707	1.3208	1	4.1919	**18893.9717**	0.0111	18754.7980	96.8401	196.1851	3147.9692		LCS			19068.8403	99.1%
12	1.2473	0.8806	1	3.3901	**19134.5256**	0.0236	18098.0160	95.1276	202.4825	3290.3783		LCS			19068.8403	100.3%
13	1.8578	1.3116	1	4.2947	**18796.9880**	0.0125	17207.9800	92.7605	202.5879	3120.8034		LCS			19068.8403	98.6%
14	1.9078	1.3469	1	4.3969	**18804.8215**	0.0161	17585.4640	93.7723	208.6766	3274.0988		LCS			19068.8403	98.6%
15	1.7404	1.2287	1	4.2299	**18155.1915**	0.0105	15813.7040	88.9227	205.9441	3031.4273		LCS			19068.8403	95.2%
16	3.2790	2.3150	1	6.4458	**17993.0220**	0.0096	15186.3080	87.1465	206.7751	2978.5698		LCS			19068.8403	94.4%
17	1.1742	0.8290	1	3.1181	**22102.4212**	0.0097	23228.4660	107.7706	205.6039	3663.5309		LCS			19068.8403	115.9%
18	4.7659	3.3647	1	8.2256	**21357.2727**	0.0064	21923.1220	104.7176	204.7106	3529.2538		LCS			19068.8403	112.0%
19	3.5049	2.4745	1	6.4752	**19085.3581**	0.0083	19298.6460	98.2421	195.9185	3175.8713		LCS			19068.8403	100.1%
20	2.4417	1.7239	1	5.0373	**18977.7413**	0.0106	18276.0520	95.5981	198.5624	3142.5580		LCS			19068.8403	99.5%
21	1.5541	1.0972	1	3.8271	**19031.2795**	0.0229	17855.7520	94.4894	201.5857	3246.8640		LCS			19068.8403	99.8%
22	1.3228	0.9339	1	3.5314	**19005.1039**	0.0101	17413.9780	93.3127	202.8361	3130.9880		LCS			19068.8403	99.7%
23	1.8458	1.3032	1	4.3607	**17980.9622**	0.0205	15750.0860	88.7440	203.4267	3055.0727		LCS			19068.8403	94.3%
~~24~~	~~#DIV/0!~~	~~#DIV/0!~~	~~1~~	~~#DIV/0!~~	~~#VALUE!~~	~~#VALUE!~~	~~#VALUE!~~	~~#VALUE!~~	~~#VALUE!~~	~~#VALUE!~~		~~LCS~~			~~19068.8403~~	~~#VALUE!~~
25	1.2332	0.8707	1	3.2177	**22166.7662**	0.0075	23145.4240	107.5779	207.5384	3681.3672		LCS			19068.8403	116.2%
26	1.2787	0.9028	1	3.2981	**21162.5419**	0.0079	21827.8940	104.4713	203.7432	3511.0559		LCS			19068.8403	111.0%
27	1.0982	0.7753	1	3.1283	**19491.8892**	0.0094	19271.6000	98.1631	202.3658	3283.0522		LCS			19068.8403	102.2%
28	1.2983	0.9166	1	3.4298	**19549.8839**	0.0123	18903.9540	97.2227	202.8200	3273.6428		LCS			19068.8403	102.5%
29	1.2103	0.8545	1	3.5573	**19052.0951**	0.0167	16715.1460	91.4207	220.7948	3382.3141		LCS			19068.8403	99.9%
30	1.3579	0.9587	1	3.7990	**19027.3656**	0.0222	16441.5700	90.6697	222.9237	3437.7847		LCS			19068.8403	99.8%
31	1.2610	0.8903	1	3.7873	**18715.4465**	0.0204	15091.1740	86.8663	227.7738	3347.3410		LCS			19068.8403	98.1%
32	1.9816	1.3990	1	4.5403	**17814.8379**	0.0083	16053.9320	89.5963	203.9721	3015.7281		LCS			19068.8403	93.4%
33	1.4099	0.9954	1	3.4450	**19233.0508**	0.0089	23652.2240	108.7497	206.6445	3711.3337		LCS			19068.8403	100.9%
34	1.4506	1.0241	1	3.5388	**21373.9875**	0.0089	22216.2180	105.3969	205.2690	3573.1240		LCS			19068.8403	112.1%
35	1.7942	1.2667	1	4.0808	**19435.0441**	0.0077	19445.8900	98.6078	199.3748	3242.2668		LCS			19068.8403	101.9%
36	2.5084	1.7710	1	5.1843	**19535.1800**	0.0266	18248.0740	95.5249	204.9934	3379.7375		LCS			19068.8403	102.4%
37	1.7531	1.2377	1	4.1254	**19305.5960**	0.0083	18349.0680	95.7862	206.5153	3264.6679		LCS			19068.8403	101.2%
38	1.6698	1.1789	1	4.0333	**18867.5874**	0.0085	17300.1800	93.0081	203.6251	3126.0406		LCS			19068.8403	98.9%
39	1.2032	0.8495	1	3.4362	**18488.2059**	0.0084	16481.6040	90.7800	206.0719	3087.7791		LCS			19068.8403	97.0%
40	1.8300	1.2920	1	4.3194	**18247.8878**	0.0079	16323.5820	90.3452	204.8683	3052.8554		LCS			19068.8403	95.7%

Gross Alpha/Beta Liquid

Filename : GAB.XLS
File type : Excel
Version # : 1.3.8

Batch : 1082959
Analyst : NXL1
Prep Date : 8/29/2011

Alpha Spike S/N :	N/A	**Beta Spike S/N :**	N/A
Alpha Spike Exp Date :	N/A	**Beta Spike Exp Date :**	N/A
Alpha Spike Activity (dpm/ml):	N/A	**Beta Spike Activity (dpm/ml):**	N/A
Alpha Spike Volume Added:	N/A	**Beta Spike Volume Added:**	N/A
Alpha Spike Nuclide:	N/A	**Beta Spike Nuclide:**	N/A
Alpha LCS S/N :	1242-A	**Beta LCS S/N :**	1243-A
Alpha LCS Exp Date :	6/22/2013	**Beta LCS Exp Date :**	9/27/2013
AlphaLCS Activity (dpm/ml):	23216.97	**Beta LCS Activity (dpm/ml):**	211664.13
Alpha LCS Volume Added:	2.00	**Beta LCS Volume Added:**	0.10
Alpha LCS Nuclide:	Th-230	**Beta LCS Nuclide:**	Sr-90

Alpha Method Uncertainty : 0.0829
Beta Method Uncertainty : 0.0821

Geometry: 2 inch Planchett

Pipet, 0.1 ml Stdev : +/-	0.000200	ml	
Pipet, 0.5 ml Stdev : +/-	0.001000	ml	
Pipet, 1 ml Stdev : +/-	0.002000	ml	

Procedure Code :	GFCGANBL	
Parmname1 :	Alpha	
Parmname2 :	Beta	
Required Alpha MDA :	1	pCi/L
Required Beta MDA :	1	pCi/L

Sample Characteristics						Count Raw Data				
Pos.	Sample ID	Sample Aliquot L	Sample Residue Wt. (mg)	Sample Aliquot StDev. L	Sample Date/Time	Detector ID	Counting Time (min.)	Gross Counts Alpha	Gross Counts Beta	Count Start Date/Time
1	1202347886.1	1.0000	0	2.0399E-05	8/29/2011 0:00	11A	2	22226	45030	9/21/2013 12:36
2	1202347887.1	1.0000	10.4	2.0399E-05	8/29/2011 0:00	11B	2	19131	44735	9/21/2013 12:36
3	1202347888.1	1.0000	23.8	2.0399E-05	8/29/2011 0:00	11C	2	14862	40050	9/21/2013 12:36
4	1202347889.1	1.0000	44.2	2.0399E-05	8/29/2011 0:00	11D	2	13293	38227	9/21/2013 12:36
5	1202347890.1	1.0000	54.7	2.0399E-05	8/29/2011 0:00	12A	2	11196	37057	9/21/2013 12:37
6	1202347891.1	1.0000	73.9	2.0399E-05	8/29/2011 0:00	12B	2	8682	32807	9/21/2013 12:37
7	1202347892.1	1.0000	95.2	2.0399E-05	8/29/2011 0:00	12C	2	9544	33079	9/21/2013 12:37
8	1202347893.1	1.0000	103	2.0399E-05	8/29/2011 0:00	12D	2	8013	33682	9/21/2013 12:37
9	1202347894.1	1.0000	0	2.0399E-05	8/29/2011 0:00	13A	2	23967	46435	9/21/2013 12:41
10	1202347895.1	1.0000	10.4	2.0399E-05	8/29/2011 0:00	13B	2	19604	45723	9/21/2013 12:41
11	1202347896.1	1.0000	23.8	2.0399E-05	8/29/2011 0:00	13C	2	12572	38019	9/21/2013 12:41
12	1202347897.1	1.0000	44.2	2.0399E-05	8/29/2011 0:00	13D	2	13559	37385	9/21/2013 12:41
13	1202347898.1	1.0000	54.7	2.0399E-05	8/29/2011 0:00	14A	2	9770	38250	9/21/2013 12:41
14	1202347899.1	1.0000	73.9	2.0399E-05	8/29/2011 0:00	14B	2	10494	38059	9/21/2013 12:42
15	1202347900.1	1.0000	95.2	2.0399E-05	8/29/2011 0:00	14C	2	6702	34514	9/21/2013 12:42
16	1202347901.1	1.0000	103	2.0399E-05	8/29/2011 0:00	14D	2	6095	34591	9/21/2013 12:42

Analytical SOP: GL-RAD-A-001
Instrument SOP: GL-RAD-I-016

Calibration Data		Alpha						Beta						Weekly Background			
														CPM		Count	Count
Pos.	Counted on	Calibration Date	Calibration Due Date	Calibration Source Used	Detector Efficiency (cpm/dpm)	Det. Eff. Error (cpm/dpm)	X-Talk	Calibration Date	Calibration Due Date	Calibration Source Used	Detector Efficiency (cpm/dpm)	Det. Eff. Error (cpm/dpm)	X-Talk	Alpha	Beta	Start Date/Time	Time (min.)
1	PIC	10/1/2012	9/30/2016	Th230	0.2368	0.00693	0.16085	10/1/2012	9/30/2016	Sr90	0.4187	0.01317	0.00019	0.046	0.394	9/14/2013 18:38	500
2	PIC	10/1/2012	9/30/2016	Th230	0.2097	0.00743	0.12876	10/1/2012	9/30/2016	Sr90	0.4495	0.00697	0.00017	0.232	4.818	9/15/2013 12:45	500
3	PIC	10/1/2012	9/30/2016	Th230	0.1652	0.01271	0.14637	10/1/2012	9/30/2016	Sr90	0.4421	0.01278	0.00026	0.100	0.726	9/14/2013 18:38	500
4	PIC	10/1/2012	9/30/2016	Th230	0.1314	0.01128	0.11809	10/1/2012	9/30/2016	Sr90	0.4264	0.01068	0.00016	0.162	0.878	9/14/2013 18:38	500
5	PIC	10/1/2012	9/30/2016	Th230	0.1121	0.01685	0.17315	10/1/2012	9/30/2016	Sr90	0.4098	0.01964	0.00010	0.112	0.732	9/15/2013 12:45	500
6	PIC	10/1/2012	9/30/2016	Th230	0.0966	0.01035	0.26288	10/1/2012	9/30/2016	Sr90	0.3661	0.01114	0.00022	0.148	1.364	9/14/2013 18:38	500
7	PIC	10/1/2012	9/30/2016	Th230	0.1056	0.02199	0.10798	10/1/2012	9/30/2016	Sr90	0.3928	0.01666	0.00052	0.090	0.558	9/14/2013 18:38	500
8	PIC	10/1/2012	9/30/2016	Th230	0.0959	0.01863	0.21661	10/1/2012	9/30/2016	Sr90	0.3985	0.01845	0.00028	0.088	0.608	9/15/2013 12:45	500
9	PIC	10/1/2012	9/30/2016	Th230	0.2495	0.00669	0.06675	10/1/2012	9/30/2016	Sr90	0.4495	0.00714	0.00019	0.036	0.739	9/14/2013 18:38	1000
10	PIC	10/1/2012	9/30/2016	Th230	0.2134	0.01043	0.10709	10/1/2012	9/30/2016	Sr90	0.4521	0.00967	0.00017	0.058	2.305	9/15/2013 12:43	1000
11	PIC	10/1/2012	9/30/2016	Th230	0.1472	0.02157	0.33699	10/1/2012	9/30/2016	Sr90	0.4143	0.01708	0.00019	0.027	0.716	9/14/2013 18:38	1000
12	PIC	10/1/2012	9/30/2016	Th230	0.1317	0.01236	0.10583	10/1/2012	9/30/2016	Sr90	0.4194	0.01144	0.00023	0.038	1.204	9/14/2013 18:38	1000
13	PIC	10/1/2012	9/30/2016	Th230	0.0966	0.02505	0.31830	10/1/2012	9/30/2016	Sr90	0.4065	0.02119	0.00018	0.049	1.132	9/14/2013 18:38	1000
14	PIC	10/1/2012	9/30/2016	Th230	0.1068	0.01557	0.25764	10/1/2012	9/30/2016	Sr90	0.4153	0.01028	0.00021	0.013	0.937	9/14/2013 18:38	1000
15	PIC	10/1/2012	9/30/2016	Th230	0.0776	0.02173	0.47864	10/1/2012	9/30/2016	Sr90	0.3804	0.01828	0.00018	0.020	0.367	9/14/2013 18:38	1000
16	PIC	10/1/2012	9/30/2016	Th230	0.0733	0.01512	0.47141	10/1/2012	9/30/2016	Sr90	0.3890	0.00738	0.00019	0.011	0.568	9/14/2013 18:38	1000

Notes:
1 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date

Alpha 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	0.6734	0.4754	1	3.8038	**21128.0983**	0.0096	11112.9540	74.5419	277.8777	3457.4549		LCS			20916.1917	101.0%
2	1.7080	1.2059	1	5.6338	**20538.3825**	0.0104	9565.2680	69.1574	291.1635	3364.4971		LCS			20916.1917	98.2%
3	1.4236	1.0051	1	6.1006	**20249.6193**	0.0151	7430.9000	60.9549	325.7960	3346.9018		LCS			20916.1917	96.8%
4	2.2781	1.6083	1	8.3594	**22776.6934**	0.0142	6646.3380	57.6476	387.3829	3756.6554		LCS			20916.1917	108.9%
5	2.2210	1.5680	1	9.1660	**22496.1642**	0.0193	5597.8880	52.9056	416.8498	3754.4023		LCS			20916.1917	107.6%
6	2.9602	2.0900	1	11.1716	**20216.6245**	0.0149	4340.8520	46.5886	425.6224	3340.2991		LCS			20916.1917	96.7%
7	2.1120	1.4911	1	9.3790	**20312.9991**	0.0243	4771.9100	48.8467	408.2851	3445.2254		LCS			20916.1917	97.1%
8	2.3013	1.6248	1	10.2984	**18804.6384**	0.0217	4006.4120	44.7577	412.2414	3162.4201		LCS			20916.1917	89.9%
9	0.5650	0.3989	1	3.5064	**21631.0817**	0.0093	11983.4640	77.4064	273.9598	3538.0469		LCS			20916.1917	103.4%
10	0.8383	0.5918	1	4.3494	**20678.9694**	0.0126	9801.9420	70.0071	289.5934	3400.1854		LCS			20916.1917	98.9%
11	0.8293	0.5855	1	5.7613	**19225.3094**	0.0233	6285.9730	56.0625	336.2612	3247.1050		LCS			20916.1917	91.9%
12	1.0992	0.7761	1	6.6809	**23165.5175**	0.0151	6779.4620	58.2216	390.1772	3827.9848		LCS			20916.1917	110.8%
13	1.7017	1.2014	1	9.3951	**22755.2861**	0.0270	4884.9510	49.4217	451.5395	3891.4810		LCS			20916.1917	108.8%
14	0.7929	0.5598	1	7.4443	**22107.3336**	0.0184	5246.9870	51.2201	423.2994	3682.0340		LCS			20916.1917	105.7%
15	1.3540	0.9560	1	10.6201	**19436.1733**	0.0249	3350.9800	40.9329	465.7635	3300.8220		LCS			20916.1917	92.9%
16	1.0624	0.7501	1	10.7136	**18698.7445**	0.0198	3047.4890	39.0352	469.9416	3127.1766		LCS			20916.1917	89.4%

Notes:
1 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date

Beta 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	1.1148	0.7871	1	3.1879	**22299.3585**	0.0140	22514.6060	106.1014	223.7331	3953.9493		LCS			19068.8403	116.9%
2	3.6315	2.5639	1	6.6310	**21177.0295**	0.0084	22362.6820	105.7533	207.7272	3625.2680		LCS			19068.8403	111.1%
3	1.4333	1.0119	1	3.5522	**19295.1891**	0.0137	20024.2740	100.0625	199.8363	3328.7701		LCS			19068.8403	101.2%
4	1.6340	1.1536	1	3.8917	**19360.1055**	0.0118	19112.6220	97.7586	202.3998	3282.3805		LCS			19068.8403	101.5%
5	1.5525	1.0961	1	3.8409	**19299.5014**	0.0203	18527.7680	96.2510	207.3582	3375.8867		LCS			19068.8403	101.2%
6	2.3722	1.6748	1	5.1952	**18776.8098**	0.0124	16402.1360	90.5635	218.3984	3284.4795		LCS			19068.8403	98.5%
7	1.4143	0.9985	1	3.7174	**18377.4944**	0.0175	16538.9420	90.9382	204.4218	3121.2365		LCS			19068.8403	96.4%
8	1.4552	1.0274	1	3.7506	**18057.0157**	0.0192	16840.3920	91.7633	203.3278	3146.4989		LCS			19068.8403	94.7%
9	1.4207	1.0031	1	3.5093	**22464.2003**	0.0085	23216.7610	107.7439	211.6245	3763.9379		LCS			19068.8403	117.8%
10	2.4947	1.7613	1	5.0171	**21729.8976**	0.0107	22859.1950	106.9147	208.7882	3696.2229		LCS			19068.8403	114.0%
11	1.5171	1.0711	1	3.7730	**18362.6387**	0.0178	19008.7840	97.4923	207.7396	3402.9896		LCS			19068.8403	96.3%
12	1.9436	1.3722	1	4.3554	**19304.1451**	0.0126	18691.2960	96.6760	203.5098	3267.8929		LCS			19068.8403	101.2%
13	1.9444	1.3728	1	4.4077	**19468.5152**	0.0218	19123.8680	97.7880	212.3871	3528.2444		LCS			19068.8403	102.1%
14	1.7314	1.2224	1	4.0716	**19171.4059**	0.0115	19028.5630	97.5436	207.3517	3353.2782		LCS			19068.8403	100.5%
15	1.1830	0.8352	1	3.4464	**18533.3336**	0.0191	17256.6330	92.8897	215.5696	3375.3132		LCS			19068.8403	97.2%
16	1.4393	1.0162	1	3.7694	**18364.0364**	0.0091	17294.9320	92.9933	211.0663	3242.6499		LCS			19068.8403	96.3%

ProteanGABVerRaw.xls

SampleID	Instr	Time (min.)	Alpha Counts	Beta Counts	Count Start Time	Count End Time	Machine	Batch ID
V1	1A	2	23592	45806	9/21/2013 13:21	9/21/2013 13:23	PIC	GABV13
V2	1B	2	18833	43797	9/21/2013 13:21	9/21/2013 13:23	PIC	GABV13
V3	1C	2	16796	38423	9/21/2013 13:21	9/21/2013 13:23	PIC	GABV13
V4	1D	2	14234	36643	9/21/2013 13:21	9/21/2013 13:23	PIC	GABV13
V5	2A	2	10703	34673	9/21/2013 13:21	9/21/2013 13:23	PIC	GABV13
V6	2B	2	8760	32873	9/21/2013 13:21	9/21/2013 13:23	PIC	GABV13
V7	2C	2	8406	30884	9/21/2013 13:21	9/21/2013 13:23	PIC	GABV13
V8	2D	2	6292	29301	9/21/2013 13:22	9/21/2013 13:24	PIC	GABV13
V1	3A	2	24216	42765	9/21/2013 13:31	9/21/2013 13:33	PIC	GABV13
V2	3B	2	20218	42262	9/21/2013 13:32	9/21/2013 13:34	PIC	GABV13
V3	3C	2	15320	37512	9/21/2013 13:32	9/21/2013 13:34	PIC	GABV13
V4	3D	2	14003	36197	9/21/2013 13:32	9/21/2013 13:34	PIC	GABV13
V5	4A	2	12330	34418	9/21/2013 13:32	9/21/2013 13:34	PIC	GABV13
V6	4B	2	9452	35173	9/21/2013 13:32	9/21/2013 13:34	PIC	GABV13
V7	4C	2	8857	31629	9/21/2013 13:32	9/21/2013 13:34	PIC	GABV13
V8	4D	2	8154	30378	9/21/2013 13:32	9/21/2013 13:34	PIC	GABV13
V1	5A	2	25440	46458	9/21/2013 12:08	9/21/2013 12:10	PIC	GABV13
V2	5B	2	19808	43863	9/21/2013 12:08	9/21/2013 12:10	PIC	GABV13
V3	5C	2	15610	38606	9/21/2013 12:08	9/21/2013 12:10	PIC	GABV13
V4	5D	2	14638	36556	9/21/2013 12:08	9/21/2013 12:10	PIC	GABV13
V5	6A	2	13248	35713	9/21/2013 12:10	9/21/2013 12:12	PIC	GABV13
V6	6B	2	11775	34829	9/21/2013 12:10	9/21/2013 12:12	PIC	GABV13
V7	6C	2	9876	31502	9/21/2013 12:11	9/21/2013 12:13	PIC	GABV13
V1	7A	2	24570	46292	9/21/2013 12:15	9/21/2013 12:17	PIC	GABV13
V2	7B	2	19830	43657	9/21/2013 12:15	9/21/2013 12:17	PIC	GABV13
V3	7C	2	14850	38544	9/21/2013 12:15	9/21/2013 12:17	PIC	GABV13
V4	7D	2	13473	37809	9/21/2013 12:15	9/21/2013 12:17	PIC	GABV13
V5	8A	2	9411	33431	9/21/2013 12:15	9/21/2013 12:17	PIC	GABV13
V6	8B	2	8626	32884	9/21/2013 12:16	9/21/2013 12:18	PIC	GABV13
V7	8C	2	6894	30183	9/21/2013 12:16	9/21/2013 12:18	PIC	GABV13
V8	8D	2	8200	32110	9/21/2013 12:16	9/21/2013 12:18	PIC	GABV13
V1	9A	2	23921	47306	9/21/2013 12:20	9/21/2013 12:22	PIC	GABV13
V2	9B	2	19296	44434	9/21/2013 12:20	9/21/2013 12:22	PIC	GABV13
V3	9C	2	14435	38894	9/21/2013 12:20	9/21/2013 12:22	PIC	GABV13
V4	9D	2	12908	36500	9/21/2013 12:21	9/21/2013 12:23	PIC	GABV13
V5	10A	2	10944	36700	9/21/2013 12:21	9/21/2013 12:23	PIC	GABV13

V6	10B	2	10676	34602	9/21/2013 12:21	9/21/2013 12:23 PIC	GABV13
V7	10C	2	8798	32964	9/21/2013 12:21	9/21/2013 12:23 PIC	GABV13
V8	10D	2	7450	32649	9/21/2013 12:21	9/21/2013 12:23 PIC	GABV13
V1	11A	2	22226	45030	9/21/2013 12:36	9/21/2013 12:38 PIC	GABV13
V2	11B	2	19131	44735	9/21/2013 12:36	9/21/2013 12:38 PIC	GABV13
V3	11C	2	14862	40050	9/21/2013 12:36	9/21/2013 12:38 PIC	GABV13
V4	11D	2	13293	38227	9/21/2013 12:36	9/21/2013 12:38 PIC	GABV13
V5	12A	2	11196	37057	9/21/2013 12:37	9/21/2013 12:39 PIC	GABV13
V6	12B	2	8682	32807	9/21/2013 12:37	9/21/2013 12:39 PIC	GABV13
V7	12C	2	9544	33079	9/21/2013 12:37	9/21/2013 12:39 PIC	GABV13
V8	12D	2	8013	33682	9/21/2013 12:37	9/21/2013 12:39 PIC	GABV13
V1	13A	2	23967	46435	9/21/2013 12:41	9/21/2013 12:43 PIC	GABV13
V2	13B	2	19604	45723	9/21/2013 12:41	9/21/2013 12:43 PIC	GABV13
V3	13C	2	12572	38019	9/21/2013 12:41	9/21/2013 12:43 PIC	GABV13
V4	13D	2	13559	37385	9/21/2013 12:41	9/21/2013 12:43 PIC	GABV13
V5	14A	2	9770	38250	9/21/2013 12:41	9/21/2013 12:43 PIC	GABV13
V6	14B	2	10494	38059	9/21/2013 12:42	9/21/2013 12:44 PIC	GABV13
V7	14C	2	6702	34514	9/21/2013 12:42	9/21/2013 12:44 PIC	GABV13
V8	14D	2	6095	34591	9/21/2013 12:42	9/21/2013 12:44 PIC	GABV13

Gross Alpha/Beta Liquid

Filename : GAB.XLS
File type : Excel
Version # : 1.3.10

Batch : 1082959
Analyst : NXL1
Prep Date : 8/29/2011
Alpha Method Uncertainty : 0.0829
Beta Method Uncertainty : 0.0821

Geometry: 2 inch Planchett

Procedure Code : GFCGANBL
Parmname1 : Alpha
Parmname2 : Beta
Required Alpha MDA : 1 pCi/L
Required Beta MDA : 1 pCi/L

Sample Characteristics						Count Raw Data				
Pos.	Sample ID	Sample Aliquot L	Sample Residue Wt. (mg)	Sample Aliquot StDev. L	Sample Date/Time	Detector ID	Counting Time (min.)	Gross Counts Alpha	Gross Counts Beta	Count Start Date/Time
1	1202347886.1	1.0000	0	2.0399E-05	8/29/2011 0:00	1A	1	11831	22480	9/27/2014 12:02
2	1202347887.1	1.0000	10.4	2.0399E-05	8/29/2011 0:00	1B	1	9138	21347	9/27/2014 12:03
3	1202347888.1	1.0000	23.8	2.0399E-05	8/29/2011 0:00	1C	1	7609	18869	9/27/2014 12:03
4	1202347889.1	1.0000	44.2	2.0399E-05	8/29/2011 0:00	1D	1	6581	18152	9/27/2014 12:03
5	1202347890.1	1.0000	54.7	2.0399E-05	8/29/2011 0:00	2A	1	5436	17053	9/27/2014 12:03
6	1202347891.1	1.0000	73.9	2.0399E-05	8/29/2011 0:00	2B	1	4041	15723	9/27/2014 12:03
7	1202347892.1	1.0000	95.2	2.0399E-05	8/29/2011 0:00	2C	1	4373	15442	9/27/2014 12:03
8	1202347893.1	1.0000	103	2.0399E-05	8/29/2011 0:00	2D	1	3014	13794	9/27/2014 12:03
9	1202347894.1	1.0000	0	2.0399E-05	8/29/2011 0:00	3A	1	12436	21429	9/27/2014 12:06
10	1202347895.1	1.0000	10.4	2.0399E-05	8/29/2011 0:00	3B	1	9414	20238	9/27/2014 12:06
11	1202347896.1	1.0000	23.8	2.0399E-05	8/29/2011 0:00	3C	1	7342	18072	9/27/2014 12:06
12	1202347897.1	1.0000	44.2	2.0399E-05	8/29/2011 0:00	3D	1	6227	17297	9/27/2014 12:06
13	1202347898.1	1.0000	54.7	2.0399E-05	8/29/2011 0:00	4A	1	6067	17626	9/27/2014 12:06
14	1202347899.1	1.0000	73.9	2.0399E-05	8/29/2011 0:00	4B	1	4041	17110	9/27/2014 12:07
15	1202347900.1	1.0000	95.2	2.0399E-05	8/29/2011 0:00	4C	1	4693	15913	9/27/2014 12:07
16	1202347901.1	1.0000	103	2.0399E-05	8/29/2011 0:00	4D	1	3884	15218	9/27/2014 12:07
17	1202347902.1	1.0000	0	2.0399E-05	8/29/2011 0:00	5A	1	12791	22984	9/27/2014 12:21
18	1202347903.1	1.0000	10.4	2.0399E-05	8/29/2011 0:00	5B	1	10210	21626	9/27/2014 12:21
19	1202347904.1	1.0000	23.8	2.0399E-05	8/29/2011 0:00	5C	1	7990	18827	9/27/2014 12:22
20	1202347905.1	1.0000	44.2	2.0399E-05	8/29/2011 0:00	5D	1	6940	18536	9/27/2014 12:22
21	1202347906.1	1.0000	54.7	2.0399E-05	8/29/2011 0:00	6A	1	6047	17379	9/27/2014 12:21
22	1202347907.1	1.0000	73.9	2.0399E-05	8/29/2011 0:00	6B	1	5560	16564	9/27/2014 12:22
23	1202347908.1	1.0000	95.2	2.0399E-05	8/29/2011 0:00	6C	1	4231	14757	9/27/2014 12:22
~~24~~	~~1202347909.1~~	~~1.0000~~	~~103~~	~~2.0399E-05~~	~~8/29/2011 0:00~~	~~6D~~	~~1~~	~~0~~	~~0~~	~~9/27/2014 12:22~~
25	1202347910.1	1.0000	0	2.0399E-05	8/29/2011 0:00	7A	1	12010	22603	9/27/2014 12:23
26	1202347911.1	1.0000	10.4	2.0399E-05	8/29/2011 0:00	7B	1	9831	21529	9/27/2014 12:23
27	1202347912.1	1.0000	23.8	2.0399E-05	8/29/2011 0:00	7C	1	6701	17906	9/27/2014 12:23
28	1202347913.1	1.0000	44.2	2.0399E-05	8/29/2011 0:00	7D	1	6027	17670	9/27/2014 12:23
~~29~~	~~1202347914.1~~	~~1.0000~~	~~54.7~~	~~2.0399E-05~~	~~8/29/2011 0:00~~	~~8A~~	~~2~~	~~12069~~	~~35281~~	~~9/30/2014 11:54~~
30	1202347915.1	1.0000	73.9	2.0399E-05	8/29/2011 0:00	8B	1	5052	17026	9/27/2014 12:23
31	1202347916.1	1.0000	95.2	2.0399E-05	8/29/2011 0:00	8C	1	4367	15652	9/27/2014 12:23
32	1202347917.1	1.0000	103	2.0399E-05	8/29/2011 0:00	8D	1	4107	16085	9/27/2014 12:23
33	1202347918.1	1.0000	0	2.0399E-05	8/29/2011 0:00	9A	1	12078	23423	9/27/2014 12:26
34	1202347919.1	1.0000	10.4	2.0399E-05	8/29/2011 0:00	9B	1	9650	21768	9/27/2014 12:26
35	1202347920.1	1.0000	23.8	2.0399E-05	8/29/2011 0:00	9C	1	7271	18921	9/27/2014 12:26
36	1202347921.1	1.0000	44.2	2.0399E-05	8/29/2011 0:00	9D	1	6612	18436	9/27/2014 12:26
37	1202347922.1	1.0000	54.7	2.0399E-05	8/29/2011 0:00	10A	1	5005	17427	9/27/2014 12:26
~~38~~	~~1202347923.1~~	~~1.0000~~	~~73.9~~	~~2.0399E-05~~	~~8/29/2011 0:00~~	~~10B~~	~~2~~	~~7144~~	~~31062~~	~~9/30/2014 11:55~~
39	1202347924.1	1.0000	95.2	2.0399E-05	8/29/2011 0:00	10C	1	4691	16340	9/27/2014 12:26
40	1202347925.1	1.0000	103	2.0399E-05	8/29/2011 0:00	10D	1	3307	15756	9/27/2014 12:26

Pipet, 0.1 ml Stdev : +/- 0.000200 ml
Pipet, 0.5 ml Stdev : +/- 0.001000 ml
Pipet, 1 ml Stdev : +/- 0.002000 ml

Analytical SOP: GL-RAD-A-001
Instrument SOP: GL-RAD-I-016

Calibration Data		Alpha						Beta						Weekly Background			
Pos.	Counted on	Calibration Date	Calibration Due Date	Calibration Source Used	Detector Efficiency (cpm/dpm)	Det. Eff. Error (cpm/dpm)	X-Talk	Calibration Date	Calibration Due Date	Calibration Source Used	Detector Efficiency (cpm/dpm)	Det. Eff. Error (cpm/dpm)	X-Talk	Alpha CPM	Beta CPM	Count Start Date/Time	Count Time (min.)
1	PIC	10/1/2013	9/30/2014	Th230	0.2462	0.00667	0.07827	10/1/2013	9/30/2014	Sr90	0.4570	0.00738	0.00102	0.110	0.524	9/21/2014 13:02	500
2	PIC	10/1/2013	9/30/2014	Th230	0.2008	0.01356	0.11205	10/1/2013	9/30/2014	Sr90	0.4450	0.00711	0.00223	0.108	0.542	9/21/2014 13:02	500
3	PIC	10/1/2013	9/30/2014	Th230	0.1791	0.00967	0.04692	10/1/2013	9/30/2014	Sr90	0.4468	0.00847	0.01697	0.186	0.656	9/21/2014 13:02	500
4	PIC	10/1/2013	9/30/2014	Th230	0.1316	0.00996	0.05530	10/1/2013	9/30/2014	Sr90	0.4228	0.00692	0.01253	0.116	0.642	9/21/2014 13:02	500
5	PIC	10/1/2013	9/30/2014	Th230	0.1025	0.01946	0.21715	10/1/2013	9/30/2014	Sr90	0.3812	0.01914	0.00017	0.112	0.580	9/21/2014 13:03	500
6	PIC	10/1/2013	9/30/2014	Th230	0.0895	0.02011	0.25502	10/1/2013	9/30/2014	Sr90	0.3626	0.02111	0.00015	0.084	1.168	9/21/2014 13:03	500
7	PIC	10/1/2013	9/30/2014	Th230	0.0887	0.01156	0.10624	10/1/2013	9/30/2014	Sr90	0.3677	0.01274	0.00217	0.122	0.482	9/21/2014 13:03	500
8	PIC	10/1/2013	9/30/2014	Th230	0.0760	0.01278	0.30181	10/1/2013	9/30/2014	Sr90	0.3439	0.00745	0.00025	0.114	1.418	9/21/2014 13:03	500
9	PIC	10/1/2013	9/30/2014	Th230	0.2466	0.02940	0.04288	10/1/2013	9/30/2014	Sr90	0.4313	0.01401	0.01177	1.416	1.334	9/21/2014 13:03	500
10	PIC	10/1/2013	9/30/2014	Th230	0.2128	0.00853	0.03450	10/1/2013	9/30/2014	Sr90	0.4420	0.01614	0.01940	0.230	0.680	9/21/2014 13:03	500
11	PIC	10/1/2013	9/30/2014	Th230	0.1669	0.00568	0.06203	10/1/2013	9/30/2014	Sr90	0.4358	0.00988	0.00874	0.146	0.716	9/21/2014 13:03	500
12	PIC	10/1/2013	9/30/2014	Th230	0.1343	0.00657	0.06835	10/1/2013	9/30/2014	Sr90	0.4148	0.02297	0.00727	0.174	0.608	9/22/2014 7:40	500
13	PIC	10/1/2013	9/30/2014	Th230	0.1191	0.01036	0.05496	10/1/2013	9/30/2014	Sr90	0.4043	0.01123	0.00697	0.156	0.980	9/21/2014 13:03	500
14	PIC	10/1/2013	9/30/2014	Th230	0.0941	0.00704	0.21645	10/1/2013	9/30/2014	Sr90	0.3967	0.01519	0.00020	0.660	3.150	9/21/2014 13:03	500
15	PIC	10/1/2013	9/30/2014	Th230	0.0946	0.01587	0.10142	10/1/2013	9/30/2014	Sr90	0.3812	0.00889	0.00279	0.276	0.650	9/21/2014 13:03	500
16	PIC	10/1/2013	9/30/2014	Th230	0.0926	0.00613	0.07926	10/1/2013	9/30/2014	Sr90	0.3721	0.00773	0.01786	0.208	1.670	9/21/2014 13:03	500
17	PIC	10/1/2013	9/30/2014	Th230	0.2653	0.00491	0.04098	10/1/2013	9/30/2014	Sr90	0.4628	0.00851	0.00530	0.178	0.602	9/21/2014 13:15	500
18	PIC	10/1/2013	9/30/2014	Th230	0.2134	0.01152	0.05149	10/1/2013	9/30/2014	Sr90	0.4516	0.00426	0.00435	0.176	0.600	9/22/2014 13:03	500
19	PIC	10/1/2013	9/30/2014	Th230	0.1694	0.01161	0.06931	10/1/2013	9/30/2014	Sr90	0.4427	0.00657	0.00391	0.158	0.644	9/21/2014 13:16	500
20	PIC	10/1/2013	9/30/2014	Th230	0.1403	0.00639	0.05025	10/1/2013	9/30/2014	Sr90	0.4251	0.00925	0.00647	0.216	1.898	9/21/2014 13:16	500
21	PIC	10/1/2013	9/30/2014	Th230	0.1259	0.02108	0.05608	10/1/2013	9/30/2014	Sr90	0.4138	0.02228	0.00441	0.372	1.828	9/22/2014 13:03	500
22	PIC	10/1/2013	9/30/2014	Th230	0.1184	0.01195	0.04713	10/1/2013	9/30/2014	Sr90	0.4062	0.00851	0.00874	0.282	1.656	9/21/2014 13:16	500
23	PIC	10/1/2013	9/30/2014	Th230	0.1023	0.01553	0.07607	10/1/2013	9/30/2014	Sr90	0.3852	0.01970	0.00780	0.226	1.296	9/22/2014 9:34	500
~~24~~	~~PIC~~	~~10/1/2013~~	~~9/30/2014~~	~~Th230~~	~~0.0000~~	~~0.01442~~	~~0.00000~~	~~10/1/2013~~	~~9/30/2014~~	~~Sr90~~	~~0.0000~~	~~0.01311~~	~~0.00000~~	~~FAIL~~	~~FAIL~~	~~12:00:00 AM~~	~~0~~
25	PIC	10/1/2013	9/30/2014	Th230	0.2598	0.00525	0.05085	10/1/2013	9/30/2014	Sr90	0.4576	0.00594	0.00119	0.264	0.752	9/21/2014 13:17	500
26	PIC	10/1/2013	9/30/2014	Th230	0.2136	0.00479	0.05641	10/1/2013	9/30/2014	Sr90	0.4527	0.00627	0.00210	0.248	0.784	9/21/2014 13:17	500
27	PIC	10/1/2013	9/30/2014	Th230	0.1631	0.00790	0.09961	10/1/2013	9/30/2014	Sr90	0.4283	0.00790	0.00049	0.320	0.668	9/21/2014 13:17	500
28	PIC	10/1/2013	9/30/2014	Th230	0.1280	0.00619	0.07959	10/1/2013	9/30/2014	Sr90	0.4232	0.01113	0.00087	0.160	0.500	9/21/2014 13:17	500
~~29~~	~~PIC~~	~~10/1/2013~~	~~9/30/2014~~	~~Th230~~	~~0.1015~~	~~0.01473~~	~~0.26640~~	~~10/1/2013~~	~~9/30/2014~~	~~Sr90~~	~~0.3656~~	~~0.01579~~	~~0.00020~~	~~0.110~~	~~0.622~~	~~9/27/2014 16:11~~	~~500~~
30	PIC	10/1/2013	9/30/2014	Th230	0.0919	0.01664	0.29519	10/1/2013	9/30/2014	Sr90	0.3591	0.02148	0.00015	0.180	0.560	9/21/2014 13:17	500
31	PIC	10/1/2013	9/30/2014	Th230	0.0802	0.01321	0.31959	10/1/2013	9/30/2014	Sr90	0.3367	0.01955	0.00017	0.182	0.478	9/21/2014 13:17	500
32	PIC	10/1/2013	9/30/2014	Th230	0.0961	0.00794	0.17472	10/1/2013	9/30/2014	Sr90	0.3878	0.00609	0.00150	0.110	0.814	9/21/2014 13:17	500
33	PIC	10/1/2013	9/30/2014	Th230	0.2494	0.00726	0.31886	10/1/2013	9/30/2014	Sr90	0.4646	0.00758	0.00215	0.188	0.622	9/21/2014 13:41	500
34	PIC	10/1/2013	9/30/2014	Th230	0.2088	0.00633	0.07317	10/1/2013	9/30/2014	Sr90	0.4533	0.00754	0.00252	0.130	0.688	9/21/2014 13:41	500
35	PIC	10/1/2013	9/30/2014	Th230	0.1610	0.01265	0.08394	10/1/2013	9/30/2014	Sr90	0.4367	0.00584	0.00262	0.156	0.530	9/21/2014 13:41	500
36	PIC	10/1/2013	9/30/2014	Th230	0.1259	0.02427	0.06288	10/1/2013	9/30/2014	Sr90	0.4114	0.02610	0.00264	0.116	0.658	9/21/2014 13:42	500
37	PIC	10/1/2013	9/30/2014	Th230	0.1085	0.01461	0.14593	10/1/2013	9/30/2014	Sr90	0.4095	0.00651	0.00067	0.158	1.270	9/21/2014 13:42	500
~~38~~	~~PIC~~	~~10/1/2013~~	~~9/30/2014~~	~~Th230~~	~~0.1098~~	~~0.00844~~	~~0.07661~~	~~10/1/2013~~	~~9/30/2014~~	~~Sr90~~	~~0.4033~~	~~0.00652~~	~~0.00322~~	~~0.048~~	~~0.092~~	~~9/27/2014 16:11~~	~~500~~
39	PIC	10/1/2013	9/30/2014	Th230	0.0921	0.00710	0.11783	10/1/2013	9/30/2014	Sr90	0.3889	0.00638	0.00295	0.094	0.526	9/21/2014 13:42	500
40	PIC	10/1/2013	9/30/2014	Th230	0.0864	0.00583	0.14796	10/1/2013	9/30/2014	Sr90	0.3893	0.00557	0.00207	0.234	0.930	9/21/2014 13:42	500

Notes:
1 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date

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

Alpha LCS S/N : 1242-A
LCS Exp Date : 1/8/2014
LCS Activity (dpm/ml): 23216.97
LCS Volume Added: 2.00
LCS Nuclide: Th-230

Alpha 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 %	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	1.4155	0.9994	1	7.4886	**21607.6947**	1.14%	11830.8900	108.7704	390.1235	3550.6040		LCS			20916.1917	103.3%
2	1.7194	1.2139	1	9.1577	**20392.1982**	1.71%	9137.8920	95.5929	420.3051	3401.0503		LCS			20916.1917	97.5%
3	2.5294	1.7857	1	11.1152	**18327.6700**	1.50%	7608.8140	87.2296	429.9150	3159.2332		LCS			20916.1917	87.6%
4	2.7198	1.9202	1	14.1119	**21753.1276**	1.58%	6580.8840	81.1234	544.3992	3727.3655		LCS			20916.1917	104.0%
5	3.4305	2.4220	1	18.0290	**23877.7329**	2.37%	5435.8880	73.7292	635.1194	4037.6736		LCS			20916.1917	114.2%
6	3.4019	2.4018	1	19.9013	**20324.5864**	2.55%	4040.9160	63.5689	627.0364	3457.5272		LCS			20916.1917	97.2%
7	4.1350	2.9194	1	21.0663	**22026.3996**	1.90%	4372.8780	66.1287	657.8931	3700.3755		LCS			20916.1917	105.3%
8	4.6673	3.2951	1	24.3706	**17842.5672**	2.22%	3013.8860	54.8999	637.7445	3005.1083		LCS			20916.1917	85.3%
9	5.0705	3.5798	1	12.6404	**22256.6143**	3.07%	12434.5840	111.5168	399.3222	3936.7331		LCS			20916.1917	106.4%
10	2.3679	1.6718	1	9.6945	**19097.6073**	1.34%	9413.7700	97.0258	402.5858	3279.9803		LCS			20916.1917	91.3%
11	2.4057	1.6984	1	11.4952	**19392.5851**	1.30%	7341.8540	85.6855	453.3525	3259.4912		LCS			20916.1917	92.7%
12	3.2633	2.3039	1	14.6707	**20464.7072**	1.43%	6226.8260	78.9113	518.7928	3443.6679		LCS			20916.1917	97.8%
13	3.4855	2.4608	1	16.2726	**22490.4870**	1.65%	6066.8440	77.8910	577.6405	3802.9507		LCS			20916.1917	107.5%
14	9.0701	6.4036	1	27.1678	**19324.5776**	1.72%	4040.3400	63.5689	596.4212	3209.7499		LCS			20916.1917	92.4%
15	5.8322	4.1176	1	22.5146	**22125.3981**	2.16%	4692.7240	68.5055	639.1037	3750.1046		LCS			20916.1917	105.8%
16	5.1725	3.6518	1	21.8917	**17563.9748**	1.72%	3883.7920	62.3217	593.9808	3133.8114		LCS			20916.1917	84.0%
17	1.6708	1.1796	1	7.4529	**21511.1155**	1.01%	12790.8220	113.0973	376.3793	3554.9496		LCS			20916.1917	102.8%
18	2.0656	1.4584	1	9.2500	**21355.4567**	1.52%	10209.8240	101.0445	418.0980	3560.4557		LCS			20916.1917	102.1%
19	2.4656	1.7407	1	11.4599	**21053.2387**	1.61%	7989.8420	89.3868	465.9368	3517.2965		LCS			20916.1917	100.7%
20	3.4793	2.4564	1	14.5421	**21890.2400**	1.36%	6939.7840	83.3067	524.0923	3667.6965		LCS			20916.1917	104.7%
21	5.0899	3.5935	1	17.9212	**21360.7811**	2.47%	6046.6280	77.7625	545.3491	3668.0354		LCS			20916.1917	102.1%
22	4.7137	3.3279	1	18.0734	**20608.1925**	1.80%	5559.7180	74.5654	556.2164	3517.8649		LCS			20916.1917	98.5%
23	4.8820	3.4467	1	20.1025	**18121.2693**	2.19%	4230.7740	65.0461	561.3447	3130.1924		LCS			20916.1917	86.6%
~~24~~	~~#DIV/0!~~	~~#DIV/0!~~	~~1~~	~~#DIV/0!~~	~~**#VALUE!**~~	~~#VALUE!~~	~~#VALUE!~~	~~#VALUE!~~	~~#VALUE!~~	~~#VALUE!~~		~~LCS~~			~~20916.1917~~	~~#VALUE!~~
25	2.0774	1.4667	1	8.1339	**20772.6305**	1.05%	12009.7360	109.5901	372.3562	3409.9478		LCS			20916.1917	99.3%
26	2.4499	1.7297	1	9.7873	**20640.9144**	1.12%	9830.7520	99.1514	409.9166	3399.7119		LCS			20916.1917	98.7%
27	3.6433	2.5722	1	13.4286	**18479.0191**	1.45%	6700.6800	81.8596	443.0539	3052.4460		LCS			20916.1917	88.3%
28	3.2821	2.3172	1	15.1886	**21148.9345**	1.43%	6026.8400	77.6338	535.3149	3495.9245		LCS			20916.1917	101.1%
~~29~~	~~2.4307~~	~~1.7161~~	~~1~~	~~10.0912~~	~~**26773.0958**~~	~~1.73%~~	~~6034.3900~~	~~54.0295~~	~~477.9497~~	~~4446.7014~~		~~LCS~~			~~20916.1917~~	~~128.0%~~
30	4.8488	3.4233	1	21.5468	**24742.0067**	2.18%	5051.8200	71.0774	682.6416	4158.8625		LCS			20916.1917	118.3%
31	5.5905	3.9469	1	24.7495	**24520.2109**	2.01%	4366.8180	66.0833	727.7326	4101.9195		LCS			20916.1917	117.2%
32	3.6274	2.5609	1	19.1897	**19145.4526**	1.75%	4106.8900	64.0859	589.0103	3198.1903		LCS			20916.1917	91.5%
33	1.8266	1.2896	1	7.9980	**21724.8695**	1.16%	12077.8120	109.9000	389.0752	3579.4638		LCS			20916.1917	103.9%
34	1.8139	1.2806	1	9.0323	**20696.3447**	1.20%	9649.8700	98.2344	415.3078	3417.2570		LCS			20916.1917	98.9%
35	2.5779	1.8200	1	12.0352	**20207.7663**	1.72%	7270.8440	85.2702	467.6954	3376.8107		LCS			20916.1917	96.6%
36	2.8416	2.0062	1	14.7440	**23478.2626**	2.72%	6611.8840	81.3142	570.1214	4044.7561		LCS			20916.1917	112.2%
37	3.8495	2.7177	1	17.8922	**20732.5564**	2.03%	5004.8420	70.7460	575.7562	3476.6787		LCS			20916.1917	99.1%
~~38~~	~~1.4842~~	~~1.0478~~	~~1~~	~~8.2510~~	~~**14452.1817**~~	~~1.45%~~	~~3571.9520~~	~~42.2611~~	~~339.9021~~	~~2417.9452~~		~~LCS~~			~~20916.1917~~	~~69.1%~~
39	3.4969	2.4688	1	19.6082	**22703.8272**	1.62%	4690.9060	68.4909	656.4696	3798.0977		LCS			20916.1917	108.5%
40	5.8850	4.1548	1	23.9580	**17077.9515**	1.83%	3306.7660	57.5065	587.9232	2870.3874		LCS			20916.1917	81.6%

Notes:
1 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date

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

Beta LCS S/N : 1243-A
LCS Exp Date : 2/12/2014
LCS Activity (dpm/ml): 211664.13
LCS Volume Added: 0.10
LCS Nuclide: Sr-90

Beta 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 %	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	1.6642	1.1749	1	5.3070	**21245.5704**	1.00%	22479.4760	149.9333	289.6717	3591.7330		LCS			19068.8403	111.4%
2	1.7380	1.2270	1	5.4907	**20570.2669**	0.99%	21346.4580	146.1061	289.8583	3501.8769		LCS			19068.8403	107.9%
3	1.9047	1.3447	1	5.7142	**18664.4898**	1.12%	18868.3440	137.3645	271.4615	3089.5177		LCS			19068.8403	97.9%
4	1.9909	1.4056	1	6.0071	**18949.5069**	1.01%	18151.3580	134.7294	281.3213	3135.3467		LCS			19068.8403	99.4%
5	2.0989	1.4819	1	6.5088	**18755.5569**	2.06%	17052.4200	130.5871	302.4507	3343.1847		LCS			19068.8403	98.4%
6	3.1311	2.2106	1	8.1477	**18249.1632**	2.26%	15721.8320	125.3914	305.2860	3259.0836		LCS			19068.8403	95.7%
7	1.9834	1.4003	1	6.4752	**18345.0302**	1.51%	15441.5180	124.2658	298.3347	3094.4132		LCS			19068.8403	96.2%
8	3.6380	2.5685	1	9.0666	**16875.2804**	1.13%	13792.5820	117.4479	301.5351	2934.7090		LCS			19068.8403	88.5%
9	2.8137	1.9865	1	7.1064	**21824.1510**	1.56%	21427.6660	146.3865	299.6838	3665.8170		LCS			19068.8403	114.4%
10	1.9599	1.3837	1	5.8244	**20291.3054**	1.76%	20237.3200	142.2603	284.1336	3393.8691		LCS			19068.8403	106.4%
11	2.0399	1.4402	1	5.9811	**18207.8751**	1.24%	18071.2840	134.4321	272.3416	3039.5713		LCS			19068.8403	95.5%
12	1.9750	1.3944	1	6.0467	**18321.4607**	2.42%	17296.3920	131.5181	279.9410	3151.1355		LCS			19068.8403	96.1%
13	2.5727	1.8164	1	6.9756	**19267.6890**	1.35%	17625.0200	132.7630	289.9530	3202.8466		LCS			19068.8403	101.0%
14	4.6999	3.3182	1	10.0425	**18429.7530**	1.70%	17106.8500	130.8052	291.0878	3191.8148		LCS			19068.8403	96.6%
15	2.2219	1.5687	1	6.6823	**18240.0565**	1.19%	15912.3500	126.1467	292.1545	3057.2812		LCS			19068.8403	95.7%
16	3.6487	2.5760	1	8.7838	**18047.8836**	1.12%	15216.3300	123.3613	292.7031	2991.6117		LCS			19068.8403	94.6%
17	1.7614	1.2436	1	5.4072	**21861.0491**	1.08%	22983.3980	151.6048	289.2304	3630.7051		LCS			19068.8403	114.6%
18	1.8019	1.2722	1	5.5365	**21044.6132**	0.80%	21625.4000	147.0578	287.4809	3487.3338		LCS			19068.8403	110.4%
19	1.9044	1.3445	1	5.7414	**18591.7699**	0.98%	18826.3560	137.2115	273.6330	3104.3316		LCS			19068.8403	97.5%
20	3.4051	2.4040	1	7.9872	**19271.3860**	1.18%	18534.1020	136.1470	282.7845	3193.1081		LCS			19068.8403	101.1%
21	3.4324	2.4233	1	8.1121	**18545.5765**	2.35%	17377.1720	131.8294	281.2477	3166.2596		LCS			19068.8403	97.3%
22	3.3287	2.3501	1	8.0272	**18077.7240**	1.15%	16562.3440	128.7012	279.7611	2984.7509		LCS			19068.8403	94.8%
23	3.1053	2.1924	1	7.8934	**16880.8954**	2.14%	14755.7040	121.4784	278.4633	2869.3823		LCS			19068.8403	88.5%
~~24~~	~~#DIV/0!~~	~~#DIV/0!~~	~~1~~	~~#DIV/0!~~	~~**#VALUE!**~~	~~#VALUE!~~	~~#VALUE!~~	~~#VALUE!~~	~~#VALUE!~~	~~#VALUE!~~		~~LCS~~			~~19068.8403~~	~~#VALUE!~~
25	1.9908	1.4055	1	5.7638	**21645.8914**	0.89%	22602.2480	150.3429	290.0405	3600.9555		LCS			19068.8403	113.5%
26	2.0548	1.4507	1	5.8865	**20869.0727**	0.93%	21528.2160	146.7276	286.1529	3468.8398		LCS			19068.8403	109.4%
27	2.0050	1.4155	1	5.9865	**18130.7074**	1.09%	17905.3320	133.8133	275.8595	3056.9708		LCS			19068.8403	95.1%
28	1.7553	1.2393	1	5.6716	**18296.0879**	1.34%	17669.5000	132.9286	277.3074	3066.5553		LCS			19068.8403	95.9%
~~29~~	~~1.6043~~	~~1.1327~~	~~1~~	~~4.1137~~	~~**19755.3094**~~	~~1.67%~~	~~17639.8780~~	~~93.9162~~	~~226.8217~~	~~3569.0352~~		~~LCS~~			~~19068.8403~~	~~103.6%~~
30	2.1894	1.5457	1	6.8547	**19486.1368**	2.28%	17025.4400	130.4837	320.8118	3566.8311		LCS			19068.8403	102.2%
31	2.1572	1.5230	1	7.0595	**19071.7417**	2.11%	15651.5220	125.1080	328.0480	3479.0845		LCS			19068.8403	100.0%
32	2.4441	1.7256	1	6.9357	**17848.5578**	1.00%	16084.1860	126.8267	288.7295	3028.2882		LCS			19068.8403	93.6%
33	1.7833	1.2590	1	5.4265	**18973.8966**	1.00%	23422.3780	153.0457	290.8150	3681.0721		LCS			19068.8403	99.5%
34	1.9223	1.3572	1	5.6953	**20927.7805**	1.01%	21767.3120	147.5398	287.3458	3506.9348		LCS			19068.8403	109.7%
35	1.7516	1.2366	1	5.5680	**18888.3988**	0.93%	18920.4700	137.5536	278.1193	3160.9511		LCS			19068.8403	99.1%
36	2.0714	1.4624	1	6.2095	**19729.3392**	2.71%	18435.3420	135.7792	291.3780	3420.5682		LCS			19068.8403	103.5%
37	2.8912	2.0412	1	7.3825	**18364.8887**	1.00%	17425.7300	132.0114	284.6168	3107.2408		LCS			19068.8403	96.3%
~~38~~	~~1.8366~~	~~1.2967~~	~~1~~	~~4.2688~~	~~**17041.4168**~~	~~0.86%~~	~~15530.0080~~	~~88.1221~~	~~192.9281~~	~~2806.8595~~		~~LCS~~			~~19068.8403~~	~~89.4%~~
39	1.9591	1.3831	1	6.2408	**18283.7472**	1.01%	16339.4740	127.8280	290.1715	3068.0795		LCS			19068.8403	95.9%
40	2.6022	1.8372	1	7.1452	**17661.7022**	0.97%	15755.0700	125.5229	284.6380	2953.6365		LCS			19068.8403	92.6%

Gross Alpha/Beta Liquid

Filename : GAB.XLS
File type : Excel
Version # : 1.3.10

Batch : 1082959
Analyst : NXL1
Prep Date : 8/29/2011
Alpha Method Uncertainty : 0.0829
Beta Method Uncertainty : 0.0821

Geometry: 2 inch Planchett

Procedure Code : GFCGANBL
Parmname1 : Alpha
Parmname2 : Beta
Required Alpha MDA : 1 pCi/L
Required Beta MDA : 1 pCi/L

Sample Characteristics						Count Raw Data				
Pos.	Sample ID	Sample Aliquot L	Sample Residue Wt. (mg)	Sample Aliquot StDev. L	Sample Date/Time	Detector ID	Counting Time (min.)	Gross Counts Alpha	Gross Counts Beta	Count Start Date/Time
1	1202347886.1	1.0000	0	2.0399E-05	8/29/2011 0:00	11A	1	12060	22920	9/27/2014 12:30
2	1202347887.1	1.0000	10.4	2.0399E-05	8/29/2011 0:00	11B	1	10028	22122	9/27/2014 12:31
3	1202347888.1	1.0000	23.8	2.0399E-05	8/29/2011 0:00	11C	1	6132	18982	9/27/2014 12:31
4	1202347889.1	1.0000	44.2	2.0399E-05	8/29/2011 0:00	11D	1	6637	18640	9/27/2014 12:31
5	1202347890.1	1.0000	54.7	2.0399E-05	8/29/2011 0:00	12A	1	4985	18194	9/27/2014 12:31
6	1202347891.1	1.0000	73.9	2.0399E-05	8/29/2011 0:00	12B	1	4917	16906	9/27/2014 12:31
7	1202347892.1	1.0000	95.2	2.0399E-05	8/29/2011 0:00	12C	1	4642	16392	9/27/2014 12:31
~~8~~	~~1202347893.1~~	~~1.0000~~	~~103~~	~~2.0399E-05~~	~~8/29/2011 0:00~~	~~12D~~	~~2~~	~~6389~~	~~31138~~	~~9/30/2014 11:57~~
9	1202347894.1	1.0000	0	2.0399E-05	8/29/2011 0:00	13A	1	12289	22586	9/27/2014 12:33
10	1202347895.1	1.0000	10.4	2.0399E-05	8/29/2011 0:00	13B	1	9964	22061	9/27/2014 12:33
11	1202347896.1	1.0000	23.8	2.0399E-05	8/29/2011 0:00	13C	1	7329	19251	9/27/2014 12:33
12	1202347897.1	1.0000	44.2	2.0399E-05	8/29/2011 0:00	13D	1	5919	17699	9/27/2014 12:33
13	1202347898.1	1.0000	54.7	2.0399E-05	8/29/2011 0:00	14A	1	4627	18603	9/27/2014 12:33
14	1202347899.1	1.0000	73.9	2.0399E-05	8/29/2011 0:00	14B	1	4832	17401	9/27/2014 12:33
15	1202347900.1	1.0000	95.2	2.0399E-05	8/29/2011 0:00	14C	1	3764	15224	9/27/2014 12:33
~~16~~	~~1202347901.1~~	~~1.0000~~	~~103~~	~~2.0399E-05~~	~~8/29/2011 0:00~~	~~14D~~	2	~~4515~~	~~33079~~	~~9/30/2014 12:01~~

Pipet, 0.1 ml Stdev : +/- 0.000200 ml
Pipet, 0.5 ml Stdev : +/- 0.001000 ml
Pipet, 1 ml Stdev : +/- 0.002000 ml

Analytical SOP: GL-RAD-A-001
Instrument SOP: GL-RAD-I-016

Calibration Data		Alpha						Beta						Weekly Background			
Pos.	Counted on	Calibration Date	Calibration Due Date	Calibration Source Used	Detector Efficiency (cpm/dpm)	Det. Eff. Error (cpm/dpm)	X-Talk	Calibration Date	Calibration Due Date	Calibration Source Used	Detector Efficiency (cpm/dpm)	Det. Eff. Error (cpm/dpm)	X-Talk	CPM Alpha	CPM Beta	Count Start Date/Time	Count Time (min.)
1	PIC	10/1/2013	9/30/2014	Th230	0.2368	0.00693	0.16085	10/1/2013	9/30/2014	Sr90	0.4187	0.01317	0.00019	0.164	0.730	9/21/2014 13:41	500
2	PIC	10/1/2013	9/30/2014	Th230	0.2097	0.00743	0.12876	10/1/2013	9/30/2014	Sr90	0.4495	0.00697	0.00017	0.120	0.526	9/21/2014 13:42	500
3	PIC	10/1/2013	9/30/2014	Th230	0.1652	0.01271	0.14637	10/1/2013	9/30/2014	Sr90	0.4421	0.01278	0.00026	0.118	0.670	9/21/2014 13:42	500
4	PIC	10/1/2013	9/30/2014	Th230	0.1314	0.01128	0.11809	10/1/2013	9/30/2014	Sr90	0.4264	0.01068	0.00016	0.142	0.460	9/21/2014 13:42	500
5	PIC	10/1/2013	9/30/2014	Th230	0.1121	0.01685	0.17315	10/1/2013	9/30/2014	Sr90	0.4098	0.01964	0.00010	0.198	1.354	9/21/2014 13:42	500
6	PIC	10/1/2013	9/30/2014	Th230	0.0966	0.01035	0.26288	10/1/2013	9/30/2014	Sr90	0.3661	0.01114	0.00022	0.106	1.058	9/21/2014 13:42	500
7	PIC	10/1/2013	9/30/2014	Th230	0.1056	0.02199	0.10798	10/1/2013	9/30/2014	Sr90	0.3928	0.01666	0.00052	0.276	1.252	9/21/2014 13:42	500
~~8~~	~~PIC~~	~~10/1/2013~~	~~9/30/2014~~	~~Th230~~	~~0.0959~~	~~0.01863~~	~~0.21661~~	~~10/1/2013~~	~~9/30/2014~~	~~Sr90~~	~~0.3985~~	~~0.01845~~	~~0.00028~~	~~0.048~~	~~0.760~~	~~9/27/2014 16:11~~	~~500~~
9	PIC	10/1/2013	9/30/2014	Th230	0.2495	0.00669	0.06675	10/1/2013	9/30/2014	Sr90	0.4495	0.00714	0.00019	0.075	0.710	9/21/2014 14:41	1000
10	PIC	10/1/2013	9/30/2014	Th230	0.2134	0.01043	0.10709	10/1/2013	9/30/2014	Sr90	0.4521	0.00967	0.00017	0.050	0.870	9/21/2014 14:41	1000
11	PIC	10/1/2013	9/30/2014	Th230	0.1472	0.02157	0.33699	10/1/2013	9/30/2014	Sr90	0.4143	0.01708	0.00019	0.049	0.268	9/21/2014 14:41	1000
12	PIC	10/1/2013	9/30/2014	Th230	0.1317	0.01236	0.10583	10/1/2013	9/30/2014	Sr90	0.4194	0.01144	0.00023	0.081	0.738	9/21/2014 14:41	1000
13	PIC	10/1/2013	9/30/2014	Th230	0.0966	0.02505	0.31830	10/1/2013	9/30/2014	Sr90	0.4065	0.02119	0.00018	0.033	1.329	9/21/2014 14:41	1000
14	PIC	10/1/2013	9/30/2014	Th230	0.1068	0.01557	0.25764	10/1/2013	9/30/2014	Sr90	0.4153	0.01028	0.00021	0.036	1.836	9/21/2014 14:41	1000
15	PIC	10/1/2013	9/30/2014	Th230	0.0776	0.02173	0.47864	10/1/2013	9/30/2014	Sr90	0.3804	0.01828	0.00018	0.027	1.396	9/21/2014 14:41	1000
~~16~~	~~PIC~~	~~10/1/2013~~	~~9/30/2014~~	~~Th230~~	~~0.0733~~	~~0.01512~~	~~0.47141~~	~~10/1/2013~~	~~9/30/2014~~	~~Sr90~~	~~0.3890~~	~~0.00738~~	~~0.00019~~	~~0.028~~	~~0.995~~	~~9/27/2014 16:34~~	~~1000~~

Notes:
1 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date

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

Alpha LCS S/N : 1242-A
LCS Exp Date : 1/8/2014
LCS Activity (dpm/ml): 23216.97
LCS Volume Added: 2.00
LCS Nuclide: Th-230

Alpha 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 %	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	1.7964	1.2683	1	8.2424	**22928.8665**	1.14%	12059.8360	109.8180	409.3801	3762.2497		LCS			20916.1917	109.6%
2	1.7355	1.2253	1	8.8947	**21532.1804**	1.24%	10027.8800	100.1399	421.6045	3539.1854		LCS			20916.1917	102.9%
3	2.1848	1.5425	1	11.2659	**16707.9730**	1.80%	6131.8820	78.3071	418.5412	2780.3865		LCS			20916.1917	79.9%
4	3.0133	2.1274	1	14.5402	**22744.4442**	1.67%	6636.8580	81.4678	547.4505	3771.2458		LCS			20916.1917	108.7%
5	4.1720	2.9455	1	17.9508	**20031.7102**	2.20%	4984.8020	70.6045	556.3021	3368.7954		LCS			20916.1917	95.8%
6	3.5394	2.4989	1	18.9810	**22901.1082**	1.76%	4916.8940	70.1213	640.6114	3807.0099		LCS			20916.1917	109.5%
7	5.2254	3.6892	1	20.1719	**19758.1456**	2.64%	4641.7240	68.1322	569.4832	3375.9965		LCS			20916.1917	94.5%
~~8~~	~~1.6996~~	~~1.2000~~	~~1~~	~~9.4488~~	~~**14990.7377**~~	~~2.24%~~	~~3194.4520~~	~~39.9656~~	~~368.1039~~	~~2526.9472~~		~~LCS~~			~~20916.1917~~	~~71.7%~~
9	1.1528	0.8139	1	7.0450	**22182.8775**	1.12%	12288.9250	110.8558	392.3452	3638.5541		LCS			20916.1917	106.1%
10	1.1001	0.7767	1	7.8850	**21021.1805**	1.45%	9963.9500	99.8198	412.9174	3468.4914		LCS			20916.1917	100.5%
11	1.5791	1.1149	1	11.4103	**22416.8817**	2.45%	7328.9510	85.6096	513.4840	3800.3641		LCS			20916.1917	107.2%
12	2.2685	1.6016	1	13.4607	**20223.9467**	1.79%	5918.9190	76.9350	515.5873	3364.4188		LCS			20916.1917	96.7%
13	1.9740	1.3937	1	16.7717	**21553.1325**	2.90%	4626.9670	68.0221	621.4815	3713.4417		LCS			20916.1917	103.0%
14	1.8650	1.3167	1	15.2829	**20358.8083**	2.12%	4831.9640	69.5126	574.4743	3416.9507		LCS			20916.1917	97.3%
15	2.2238	1.5700	1	20.5564	**21835.8912**	2.72%	3763.9730	61.3514	698.1007	3736.3332		LCS			20916.1917	104.4%
~~16~~	~~1.6951~~	~~1.1967~~	~~1~~	~~11.6069~~	~~**13847.0914**~~	~~2.12%~~	~~2257.4720~~	~~33.5969~~	~~404.4696~~	~~2325.6378~~		~~LCS~~			~~20916.1917~~	~~66.2%~~

Notes:
1 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date

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

Beta LCS S/N : 1243-A
LCS Exp Date : 2/12/2014
LCS Activity (dpm/ml): 211664.13
LCS Volume Added: 0.10
LCS Nuclide: Sr-90

Beta 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 %	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	2.1439	1.5136	1	6.2548	**22570.8433**	1.47%	22919.2700	151.3935	319.2394	4031.2267		LCS			19068.8403	118.4%
2	1.6952	1.1968	1	5.4002	**20875.6181**	0.97%	22121.4740	148.7347	292.1539	3592.1735		LCS			19068.8403	109.5%
3	1.9452	1.3734	1	5.8035	**18426.2299**	1.47%	18981.3300	137.7752	275.1529	3161.6990		LCS			19068.8403	96.6%
4	1.6710	1.1797	1	5.5284	**18861.5606**	1.29%	18639.5400	136.5284	282.6689	3207.5219		LCS			19068.8403	98.9%
5	2.9830	2.1061	1	7.5096	**19047.8183**	2.10%	18192.6460	134.8851	290.5897	3321.3028		LCS			19068.8403	99.9%
6	2.9517	2.0839	1	7.8590	**19209.1477**	1.35%	16904.9420	130.0231	313.5570	3392.1958		LCS			19068.8403	100.7%
7	2.9931	2.1131	1	7.6670	**18223.6309**	1.84%	16390.7480	128.0313	287.8041	3100.0166		LCS			19068.8403	95.6%
~~8~~	~~1.6270~~	~~1.1487~~	~~1~~	~~3.0931~~	~~**16817.6835**~~	~~1.03%~~	~~15568.2400~~	~~88.2298~~	~~195.4984~~	~~2909.3033~~		~~LCS~~			~~19068.8403~~	~~88.2%~~
9	1.9684	1.3897	1	5.7858	**21810.9577**	0.98%	22585.2900	150.2864	295.1841	3667.6688		LCS			19068.8403	114.4%
10	2.1664	1.5295	1	6.0481	**20916.4627**	1.18%	22060.1300	148.5295	290.0555	3573.1150		LCS			19068.8403	109.7%
11	1.3120	0.9263	1	5.1140	**18243.5632**	1.85%	19250.7320	138.7480	295.6485	3452.5578		LCS			19068.8403	95.7%
12	2.1509	1.5185	1	6.2591	**18335.4204**	1.37%	17698.2620	133.0376	280.0535	3100.9419		LCS			19068.8403	96.2%
13	2.9780	2.1025	1	7.5293	**18980.8588**	2.24%	18601.6710	136.3928	296.2333	3438.4629		LCS			19068.8403	99.5%
14	3.4258	2.4186	1	8.0910	**17520.1921**	1.28%	17399.1640	131.9129	280.4116	3073.0926		LCS			19068.8403	91.9%
15	3.2612	2.3024	1	8.1570	**15890.9197**	2.00%	15222.6040	123.3856	286.3415	2985.1533		LCS			19068.8403	83.3%
~~16~~	~~1.9050~~	~~1.3450~~	~~1~~	~~4.4269~~	~~**17919.3465**~~	~~0.92%~~	~~16538.5050~~	~~90.9382~~	~~206.4018~~	~~3101.1270~~		~~LCS~~			~~19068.8403~~	~~94.0%~~

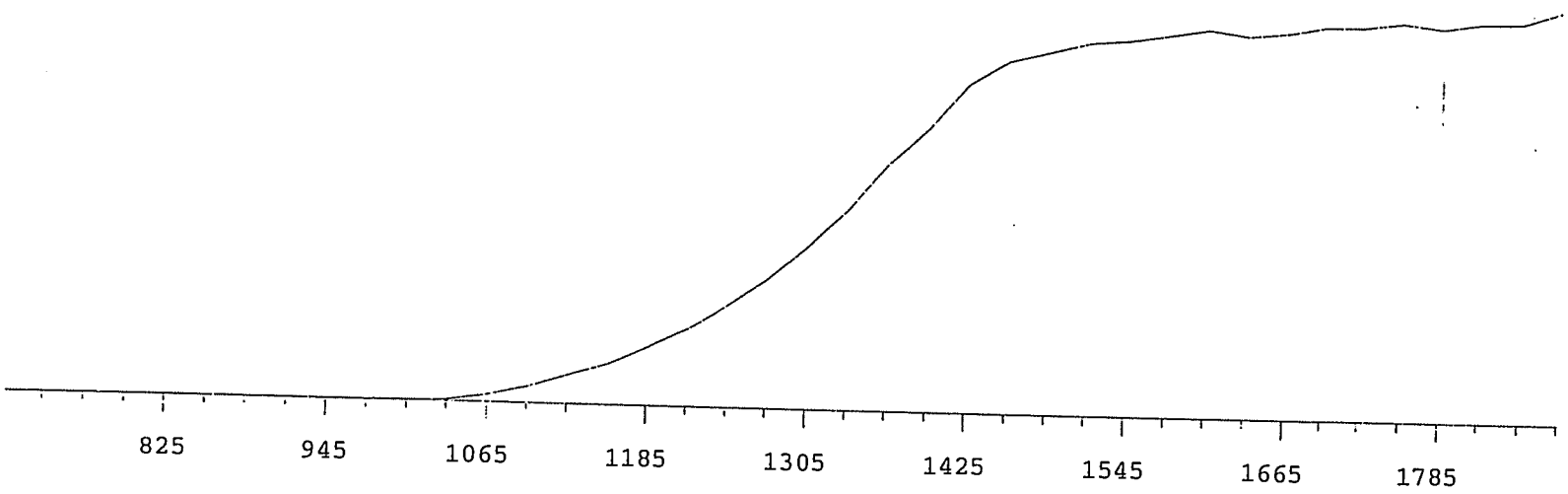
PIC_GAB_SEP14_Ver_RawData.xls

SampleID	Instr	Time (min.)	Alpha Counts	Beta Counts	Count Start Time	Count End Time	Machine	Batch ID
V1	1A	1	11831	22480	9/27/2014 12:02	9/27/2014 12:03	PIC	GABV14
V2	1B	1	9138	21347	9/27/2014 12:03	9/27/2014 12:04	PIC	GABV14
V3	1C	1	7609	18869	9/27/2014 12:03	9/27/2014 12:04	PIC	GABV14
V4	1D	1	6581	18152	9/27/2014 12:03	9/27/2014 12:04	PIC	GABV14
V5	2A	1	5436	17053	9/27/2014 12:03	9/27/2014 12:04	PIC	GABV14
V6	2B	1	4041	15723	9/27/2014 12:03	9/27/2014 12:04	PIC	GABV14
V7	2C	1	4373	15442	9/27/2014 12:03	9/27/2014 12:04	PIC	GABV14
V8	2D	1	3014	13794	9/27/2014 12:03	9/27/2014 12:04	PIC	GABV14
V1	3A	1	12436	21429	9/27/2014 12:06	9/27/2014 12:07	PIC	GABV14
V2	3B	1	9414	20238	9/27/2014 12:06	9/27/2014 12:07	PIC	GABV14
V3	3C	1	7342	18072	9/27/2014 12:06	9/27/2014 12:07	PIC	GABV14
V4	3D	1	6227	17297	9/27/2014 12:06	9/27/2014 12:07	PIC	GABV14
V5	4A	1	6067	17626	9/27/2014 12:06	9/27/2014 12:07	PIC	GABV14
V6	4B	1	4041	17110	9/27/2014 12:07	9/27/2014 12:08	PIC	GABV14
V7	4C	1	4693	15913	9/27/2014 12:07	9/27/2014 12:08	PIC	GABV14
V8	4D	1	3884	15218	9/27/2014 12:07	9/27/2014 12:08	PIC	GABV14
V1	5A	1	12791	22984	9/27/2014 12:21	9/27/2014 12:22	PIC	GABV14
V2	5B	1	10210	21626	9/27/2014 12:21	9/27/2014 12:22	PIC	GABV14
V3	5C	1	7990	18827	9/27/2014 12:22	9/27/2014 12:23	PIC	GABV14
V4	5D	1	6940	18536	9/27/2014 12:22	9/27/2014 12:23	PIC	GABV14
V5	6A	1	6047	17379	9/27/2014 12:21	9/27/2014 12:22	PIC	GABV14
V6	6B	1	5560	16564	9/27/2014 12:22	9/27/2014 12:23	PIC	GABV14
V7	6C	1	4231	14757	9/27/2014 12:22	9/27/2014 12:23	PIC	GABV14
V8	6D	1	0	0	9/27/2014 12:22	9/27/2014 12:23	PIC	GABV14
V1	7A	1	12010	22603	9/27/2014 12:23	9/27/2014 12:24	PIC	GABV14
V2	7B	1	9831	21529	9/27/2014 12:23	9/27/2014 12:24	PIC	GABV14
V3	7C	1	6701	17906	9/27/2014 12:23	9/27/2014 12:24	PIC	GABV14
V4	7D	1	6027	17670	9/27/2014 12:23	9/27/2014 12:24	PIC	GABV14
V5	8A	2	12069	35281	9/30/2014 11:54	9/30/2014 11:56	PIC	GABV14
V6	8B	1	5052	17026	9/27/2014 12:23	9/27/2014 12:24	PIC	GABV14
V7	8C	1	4367	15652	9/27/2014 12:23	9/27/2014 12:24	PIC	GABV14
V8	8D	1	4107	16085	9/27/2014 12:23	9/27/2014 12:24	PIC	GABV14
V1	9A	1	12078	23423	9/27/2014 12:26	9/27/2014 12:27	PIC	GABV14
V2	9B	1	9650	21768	9/27/2014 12:26	9/27/2014 12:27	PIC	GABV14
V3	9C	1	7271	18921	9/27/2014 12:26	9/27/2014 12:27	PIC	GABV14
V4	9D	1	6612	18436	9/27/2014 12:26	9/27/2014 12:27	PIC	GABV14

V5	10A	1	5005	17427	9/27/2014 12:26	9/27/2014 12:27	PIC	GABV14
V6	10B	2	7144	31062	9/30/2014 11:55	9/30/2014 11:57	PIC	GABV14
V7	10C	1	4691	16340	9/27/2014 12:26	9/27/2014 12:27	PIC	GABV14
V8	10D	1	3307	15756	9/27/2014 12:26	9/27/2014 12:27	PIC	GABV14
V1	11A	1	12060	22920	9/27/2014 12:30	9/27/2014 12:31	PIC	GABV14
V2	11B	1	10028	22122	9/27/2014 12:31	9/27/2014 12:32	PIC	GABV14
V3	11C	1	6132	18982	9/27/2014 12:31	9/27/2014 12:32	PIC	GABV14
V4	11D	1	6637	18640	9/27/2014 12:31	9/27/2014 12:32	PIC	GABV14
V5	12A	1	4985	18194	9/27/2014 12:31	9/27/2014 12:32	PIC	GABV14
V6	12B	1	4917	16906	9/27/2014 12:31	9/27/2014 12:32	PIC	GABV14
V7	12C	1	4642	16392	9/27/2014 12:31	9/27/2014 12:32	PIC	GABV14
V8	12D	2	6389	31138	9/30/2014 11:57	9/30/2014 11:59	PIC	GABV14
V1	13A	1	12289	22586	9/27/2014 12:33	9/27/2014 12:34	PIC	GABV14
V2	13B	1	9964	22061	9/27/2014 12:33	9/27/2014 12:34	PIC	GABV14
V3	13C	1	7329	19251	9/27/2014 12:33	9/27/2014 12:34	PIC	GABV14
V4	13D	1	5919	17699	9/27/2014 12:33	9/27/2014 12:34	PIC	GABV14
V5	14A	1	4627	18603	9/27/2014 12:33	9/27/2014 12:34	PIC	GABV14
V6	14B	1	4832	17401	9/27/2014 12:33	9/27/2014 12:34	PIC	GABV14
V7	14C	1	3764	15224	9/27/2014 12:33	9/27/2014 12:34	PIC	GABV14
V8	14D	2	4515	33079	9/30/2014 12:01	9/30/2014 12:03	PIC	GABV14

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

Alpha Volts: 1575 Beta Volts: 1575

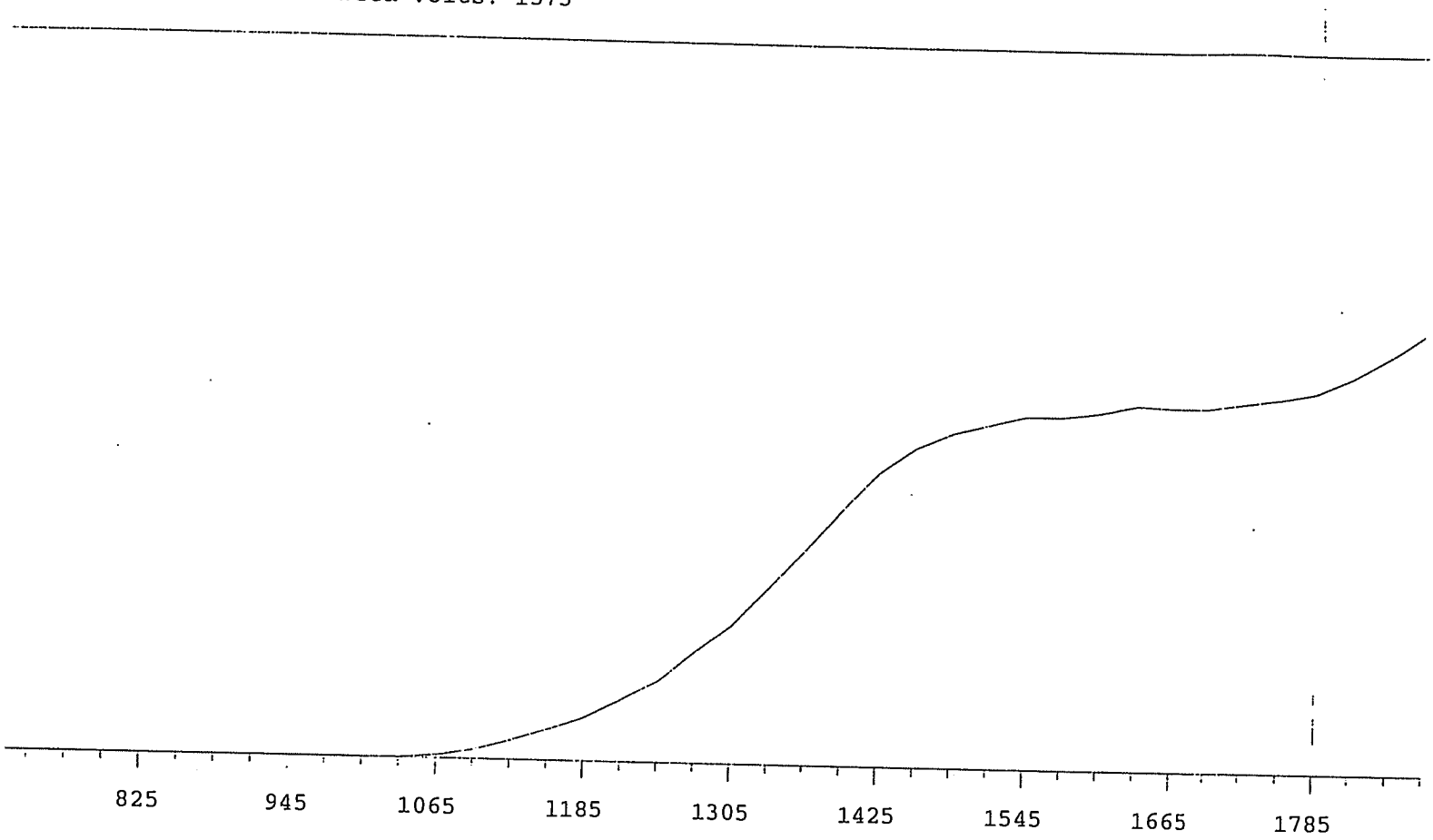


VOLTS	COUNTS	%/100 Volts
705	1	
735	1	
765	0	
795	0	+0.00
825	0	>100
855	1	>100
885	0	+55.56
915	2	+66.67
945	0	>100
975	2	>100
1005	42	>100
1035	145	>100
1065	544	>100
1095	1136	>100
1125	1967	>100
1155	2845	>100
1185	4078	>100
1215	5483	+93.18
1245	7400	+83.35
1275	9328	+75.40

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

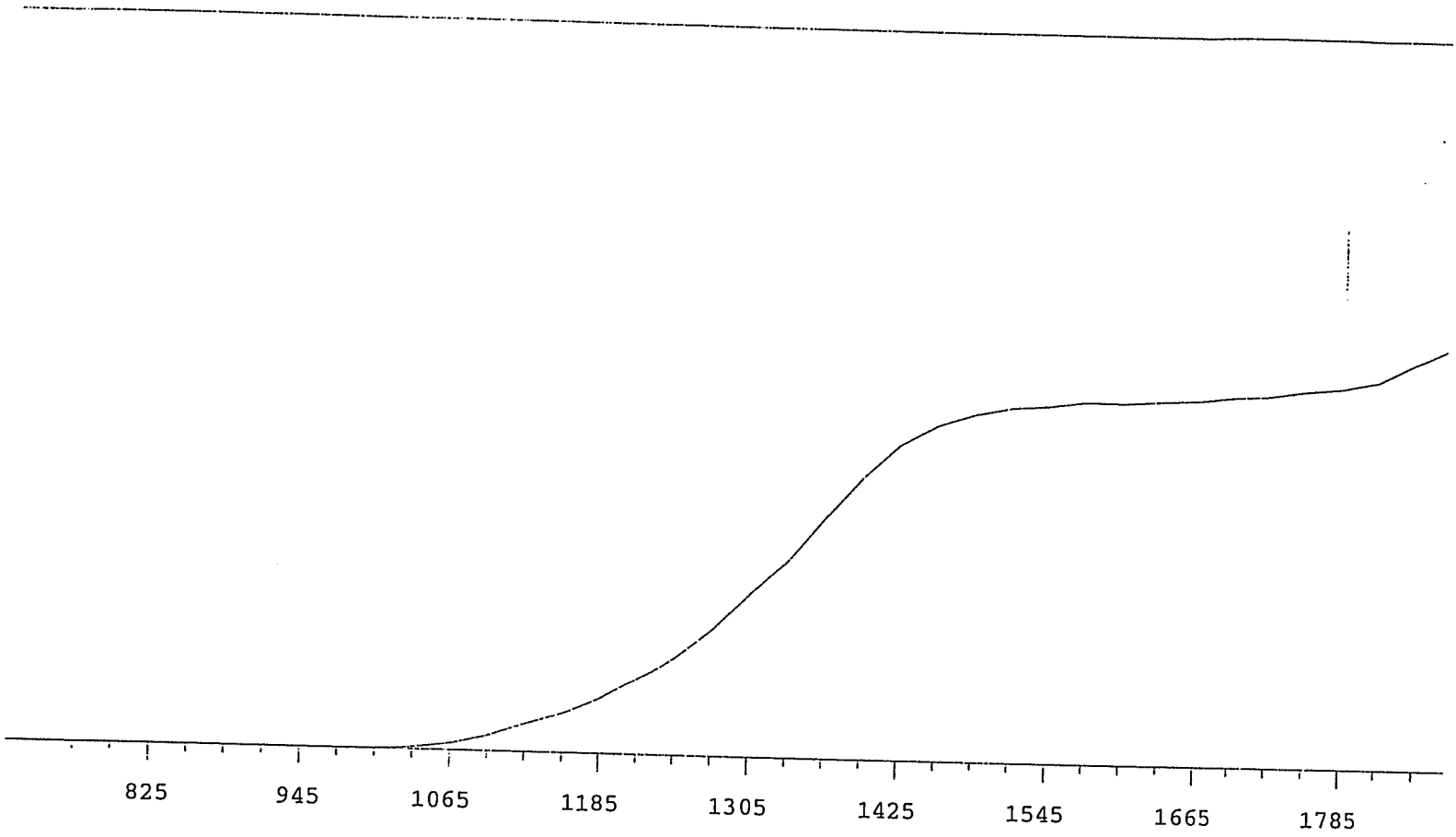
Alpha Volts: 1575 Beta Volts: 1575



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

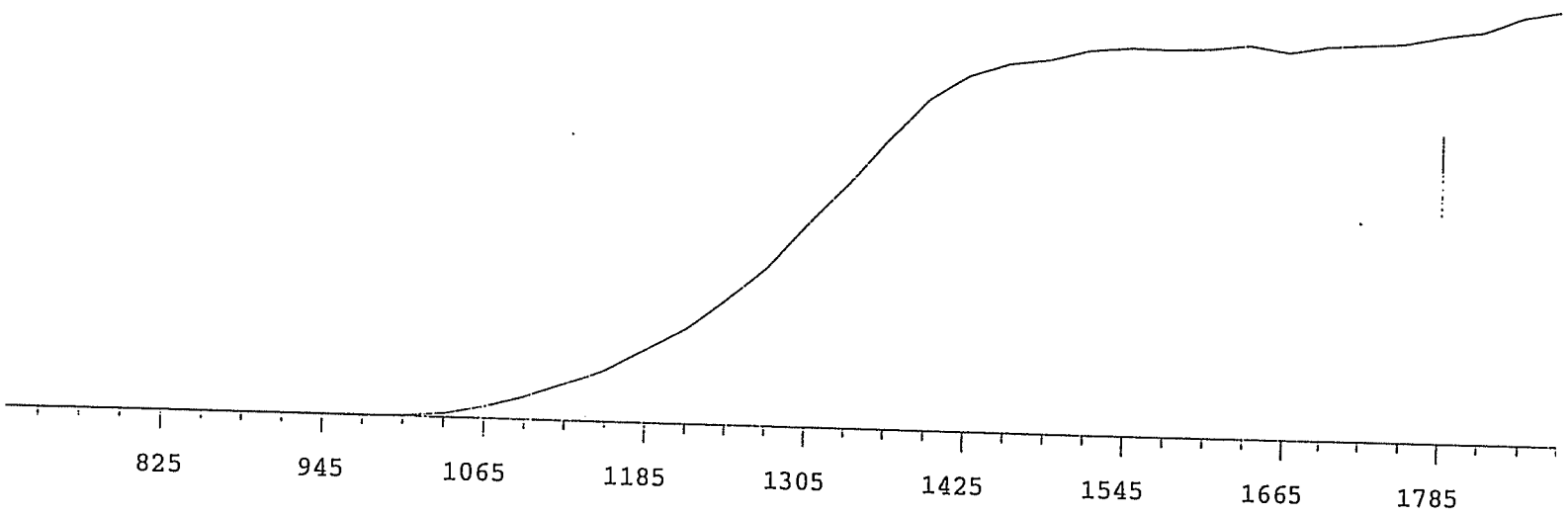
VOLTS	COUNTS	%/100 Volts
1305	13188	+75.92
1335	16818	+67.60
1365	20420	+59.86
1395	24341	+47.85
1425	27854	+35.51
1455	30288	+23.26
1485	31798	+14.54
1515	32622	+8.32
1545	33496	+5.11
1575	33475	+4.43
1605	33903	+3.09
1635	34654	+2.46
1665	34485	+1.74
1695	34445	+1.84
1725	34908	+3.91
1755	35401	+6.80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

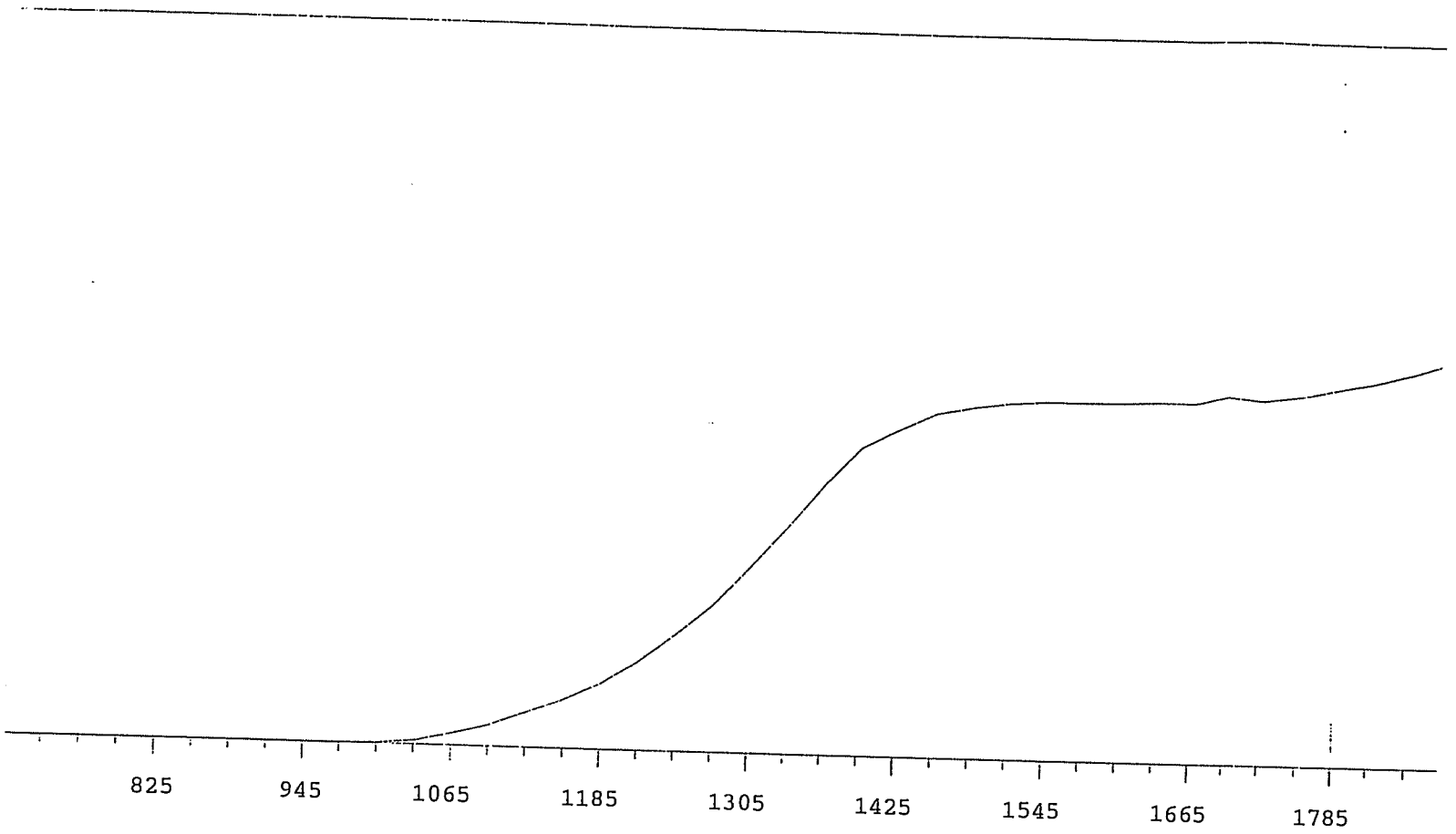


VOLTS	COUNTS	%/100 Volts
705	0	
735	1	
765	0	+0.00
795	1	+0.00
825	0	+0.00
855	1	>100
885	0	>100
915	0	>100
945	0	>100
975	8	>100
1005	75	>100
1035	303	>100
1065	872	>100
1095	1656	>100
1125	2729	>100
1155	3862	>100
1185	5425	+98.19
1215	7256	+88.82
1245	9510	+81.89
1275	11944	+74.07

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

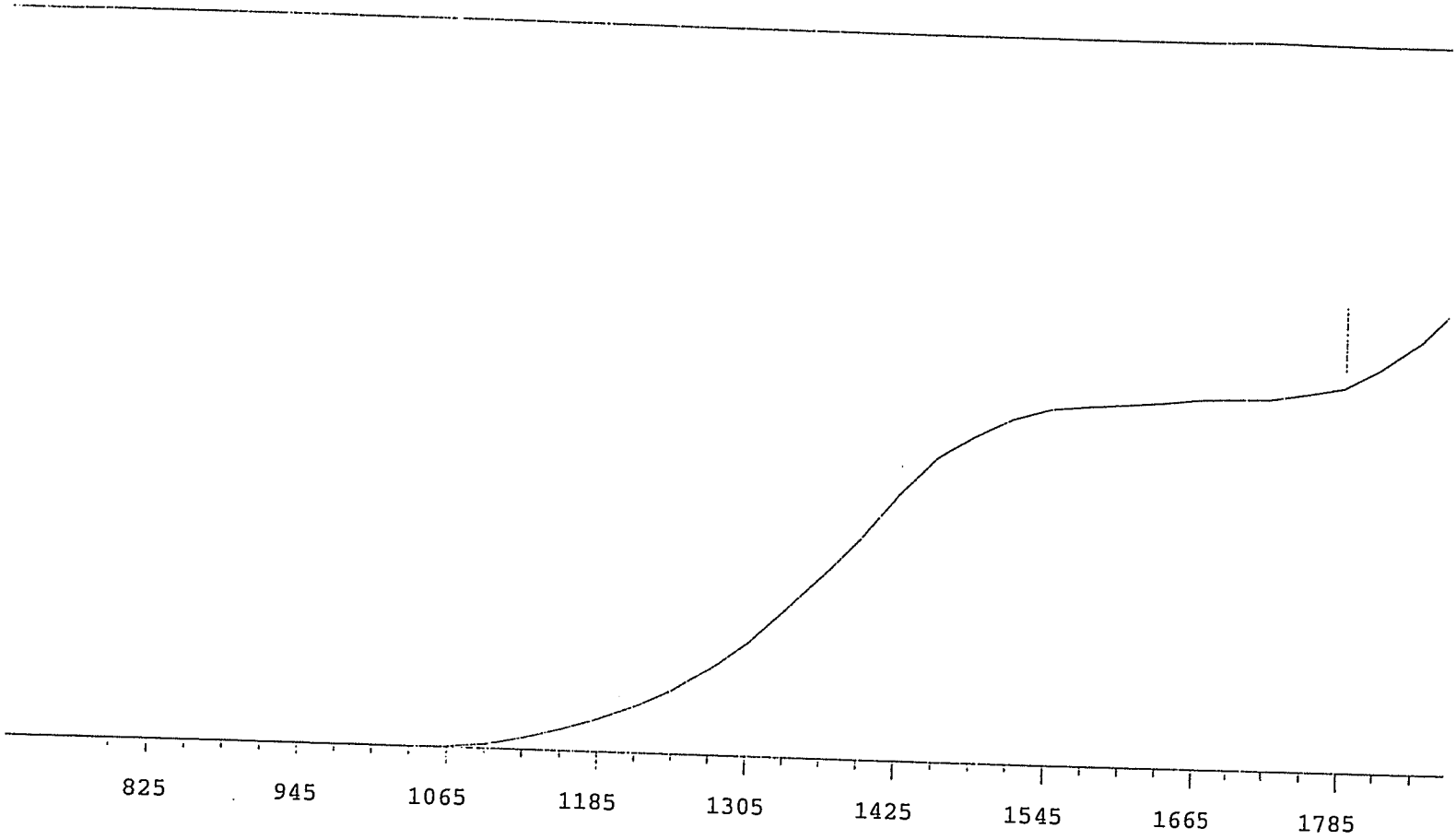


VOLTS	COUNTS	%/100 Volts
705	0	
735	1	
765	0	+83.33
795	0	-83.33
825	1	>100
855	0	>100
885	1	+100.00
915	1	>100
945	2	>100
975	12	>100
1005	91	>100
1035	421	>100
1065	1239	>100
1095	2155	>100
1125	3527	>100
1155	4974	>100
1185	6647	+97.44
1215	9250	+89.00
1245	12041	+82.15
1275	15094	+73.81

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

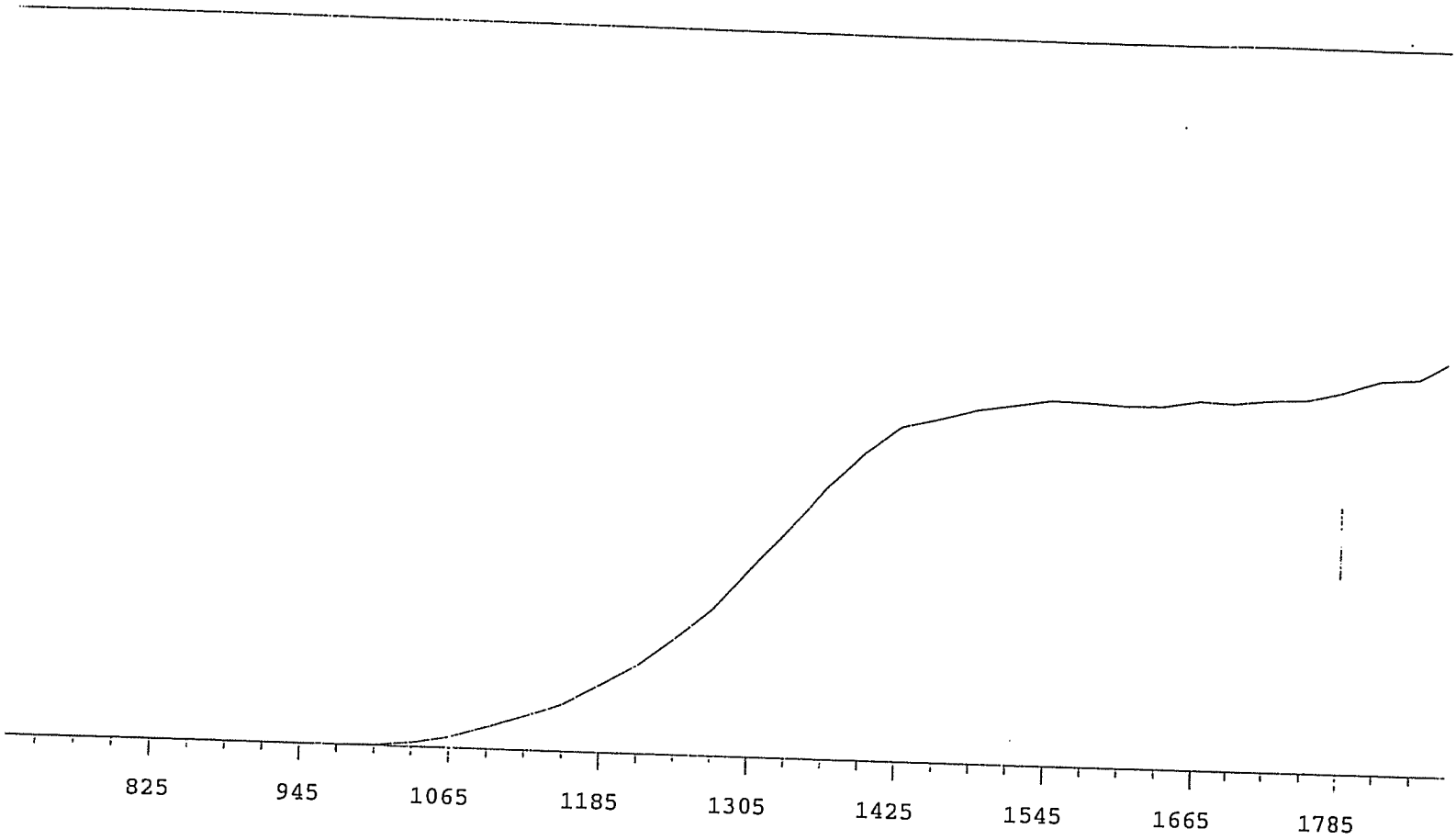


VOLTS	COUNTS	%/100 Volts
705	0	
735	1	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	1	>100
975	2	>100
1005	3	>100
1035	14	>100
1065	127	>100
1095	500	>100
1125	1332	>100
1155	2373	>100
1185	3614	>100
1215	5227	>100
1245	7060	+97.33
1275	9574	+90.30

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

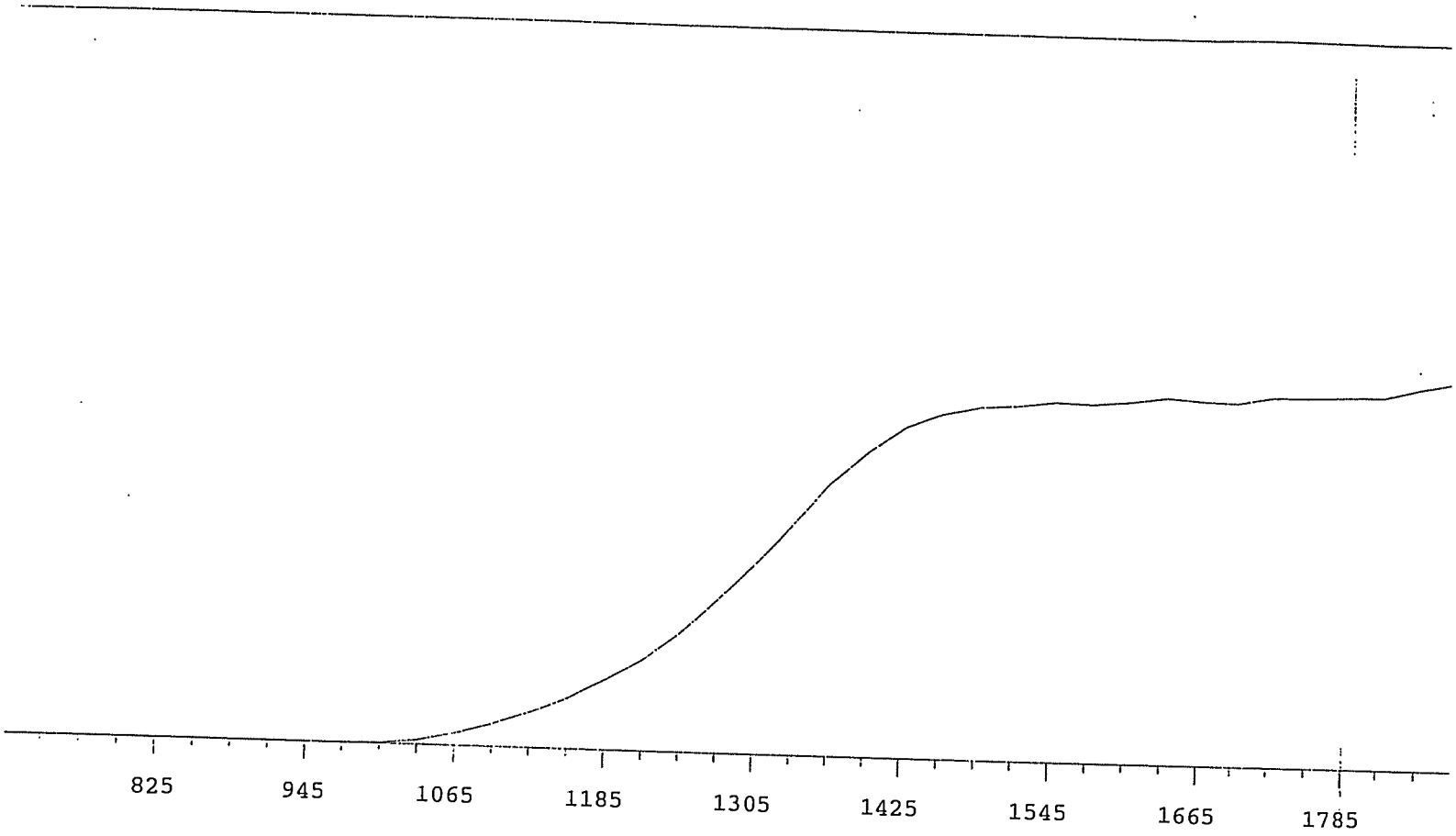


VOLTS	COUNTS	%/100 Volts
705	1	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	1	>100
945	0	>100
975	17	>100
1005	87	>100
1035	438	>100
1065	1055	>100
1095	2114	>100
1125	3282	>100
1155	4625	>100
1185	6554	+97.66
1215	8743	+88.09
1245	11345	+81.31
1275	14261	+74.60

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

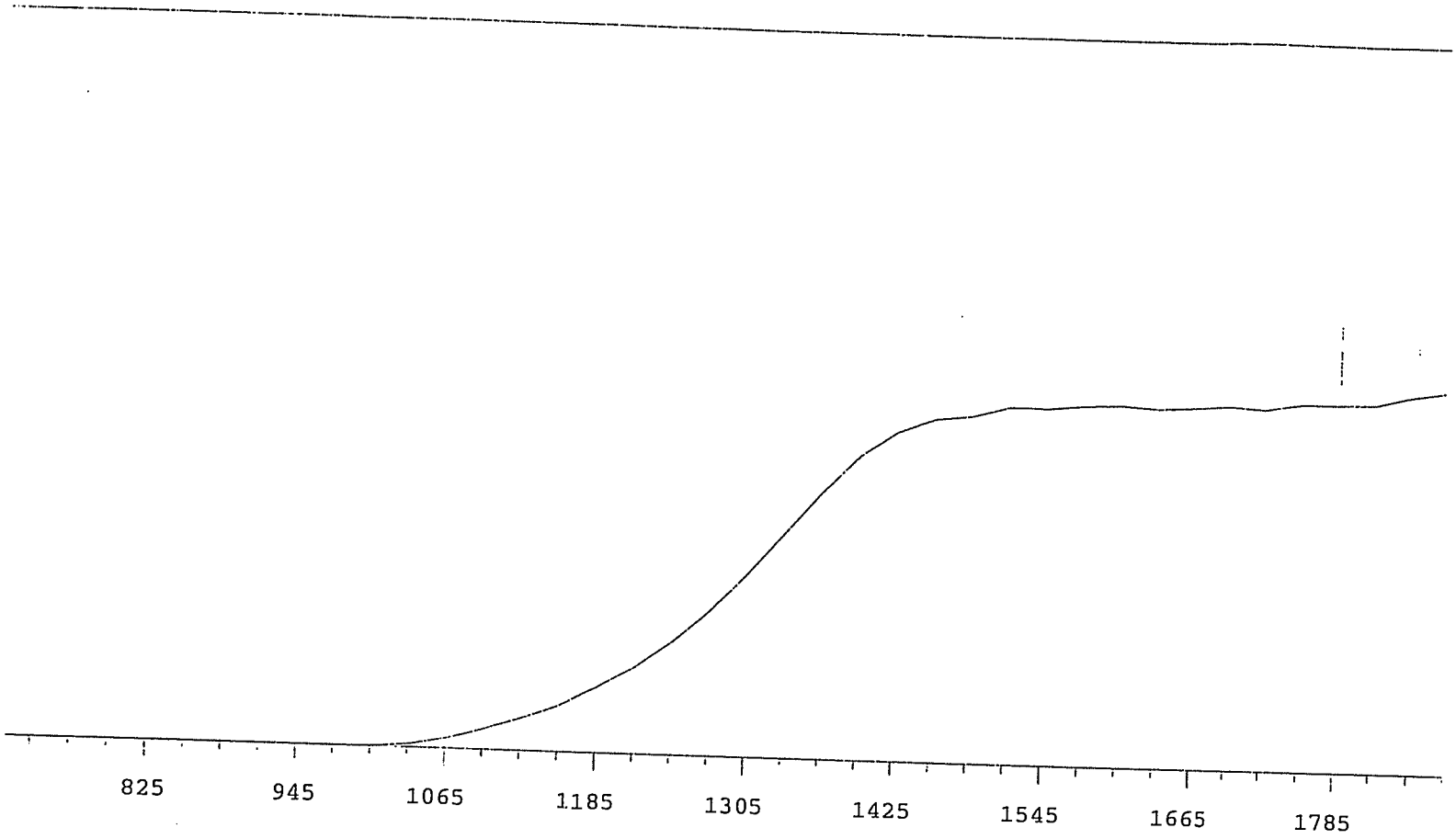
Alpha Volts: 705 Beta Volts: 1575



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	

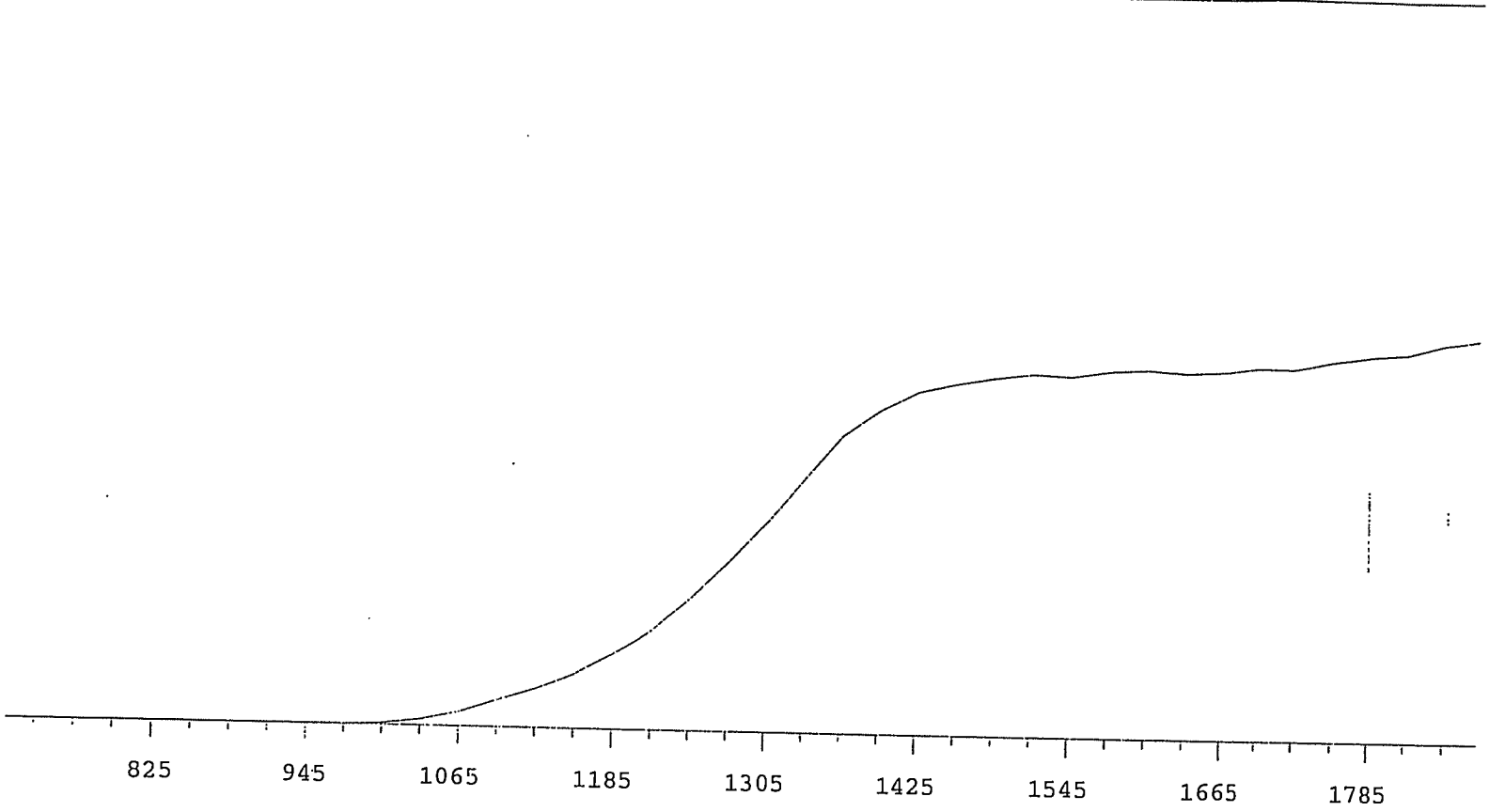
MPC 9600 Plateau Instrument 3 MPC 9604 Detector A 7/1/2009
Alpha Volts: 705 Beta Volts: 1575



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	

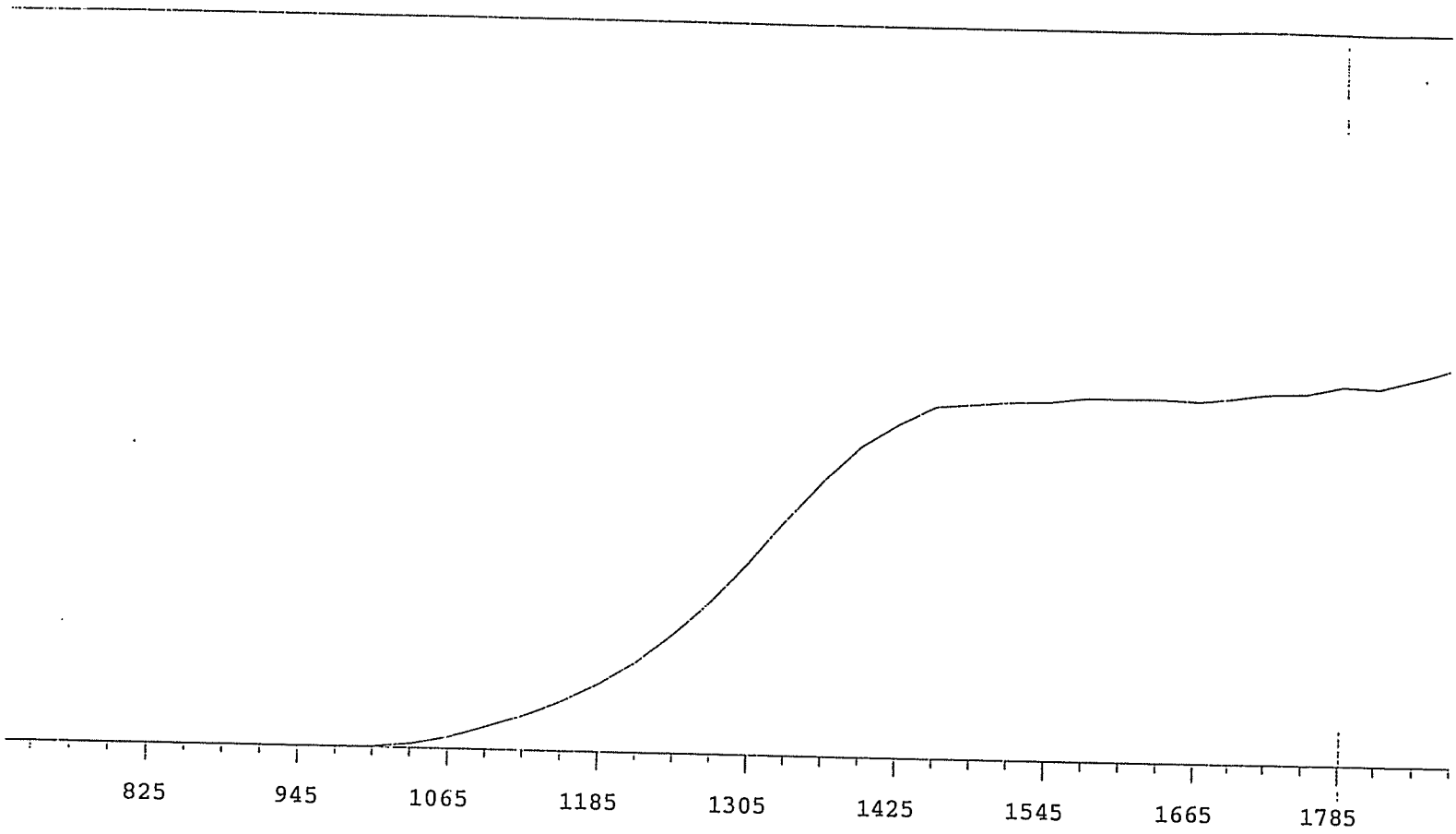
MPC 9600 Plateau Instrument 3 MPC 9604 Detector B 7/1/2009
Alpha Volts: 705 Beta Volts: 1575



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	

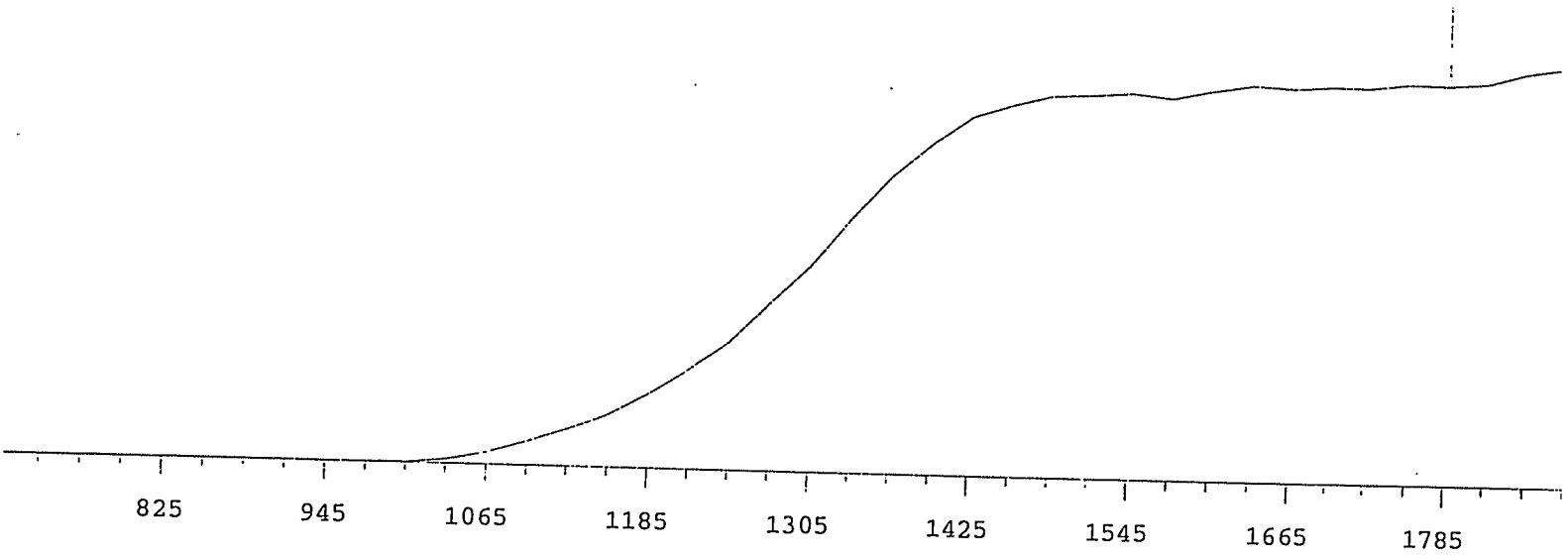
MPC 9600 Plateau Instrument 3 MPC 9604 Detector C 7/1/2009
Alpha Volts: 705 Beta Volts: 1575



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	

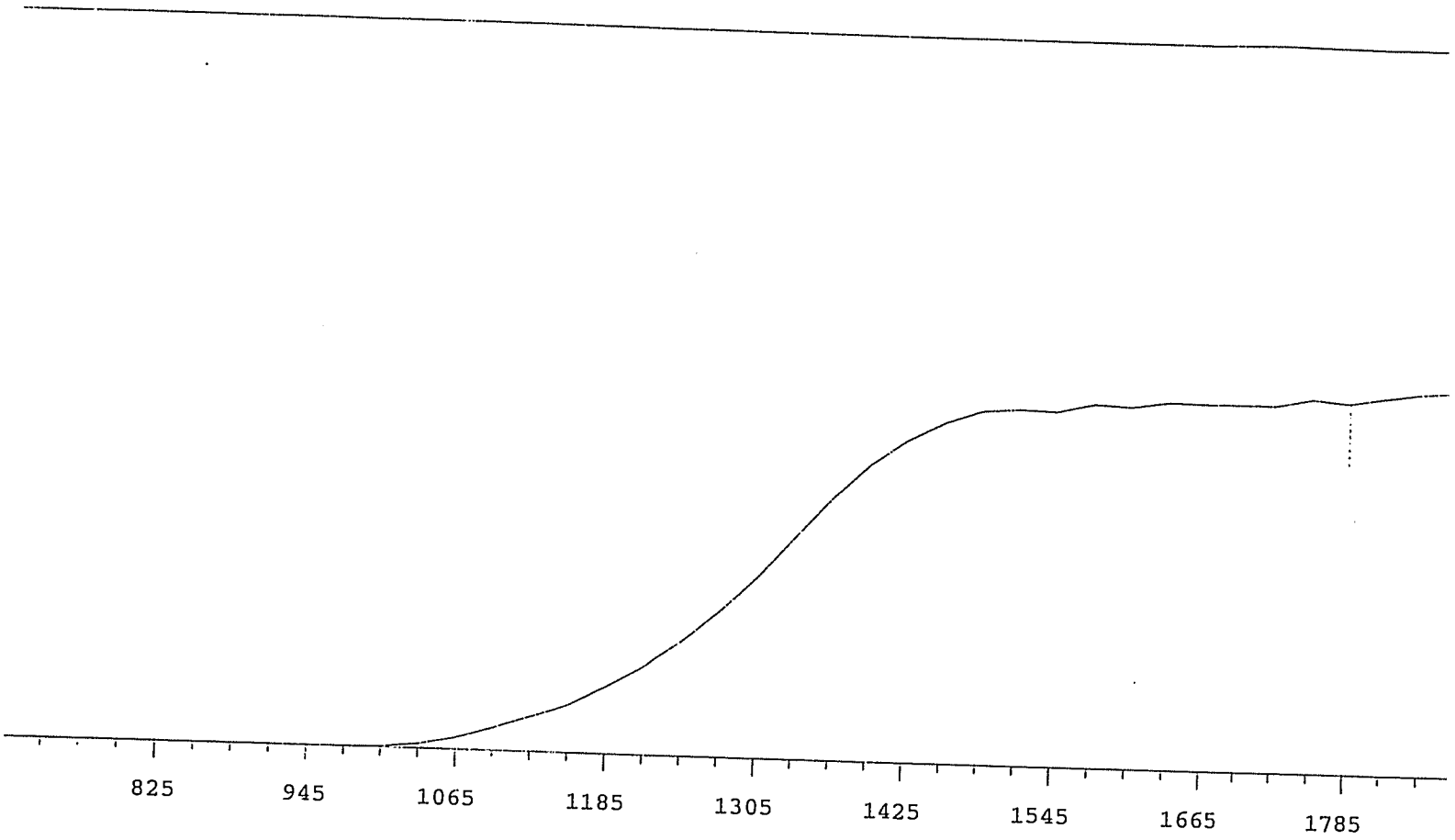
MPC 9600 Plateau Instrument 3 MPC 9604 Detector D 7/1/2009
Alpha Volts: 705 Beta Volts: 1575



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

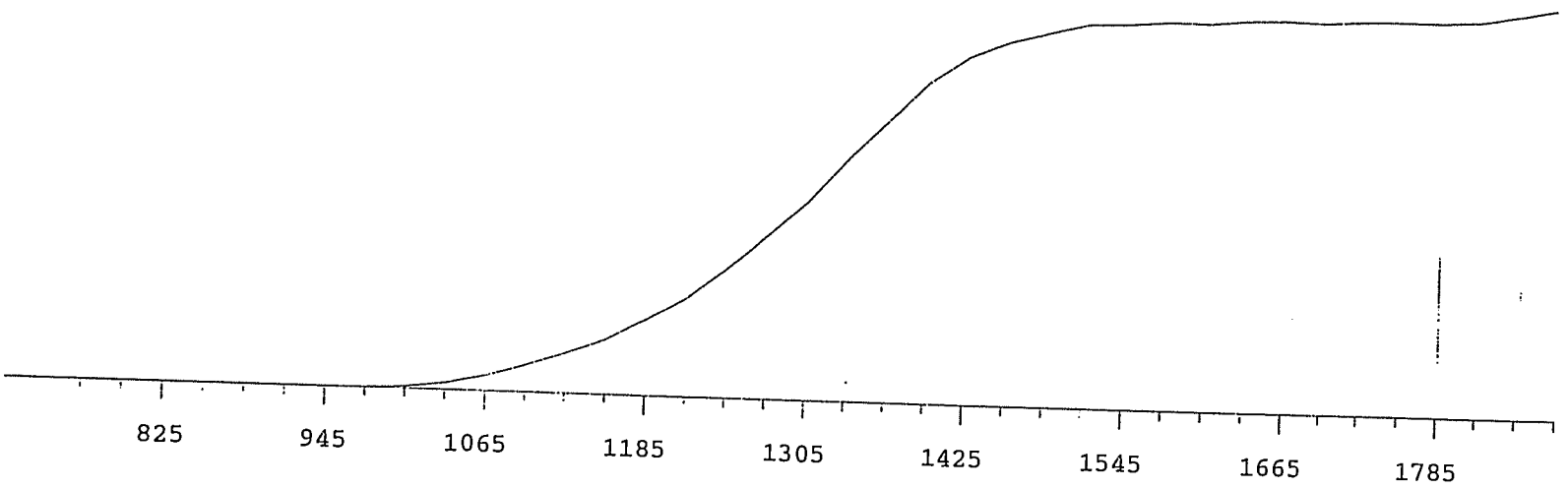


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	2	+55.56
855	1	>100
885	0	-55.56
915	3	>100
945	0	>100
975	16	>100
1005	114	>100
1035	451	>100
1065	1100	>100
1095	2068	>100
1125	3189	>100
1155	4386	>100
1185	6094	+94.81
1215	8184	+87.09
1245	10489	+78.88
1275	13273	+72.66

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

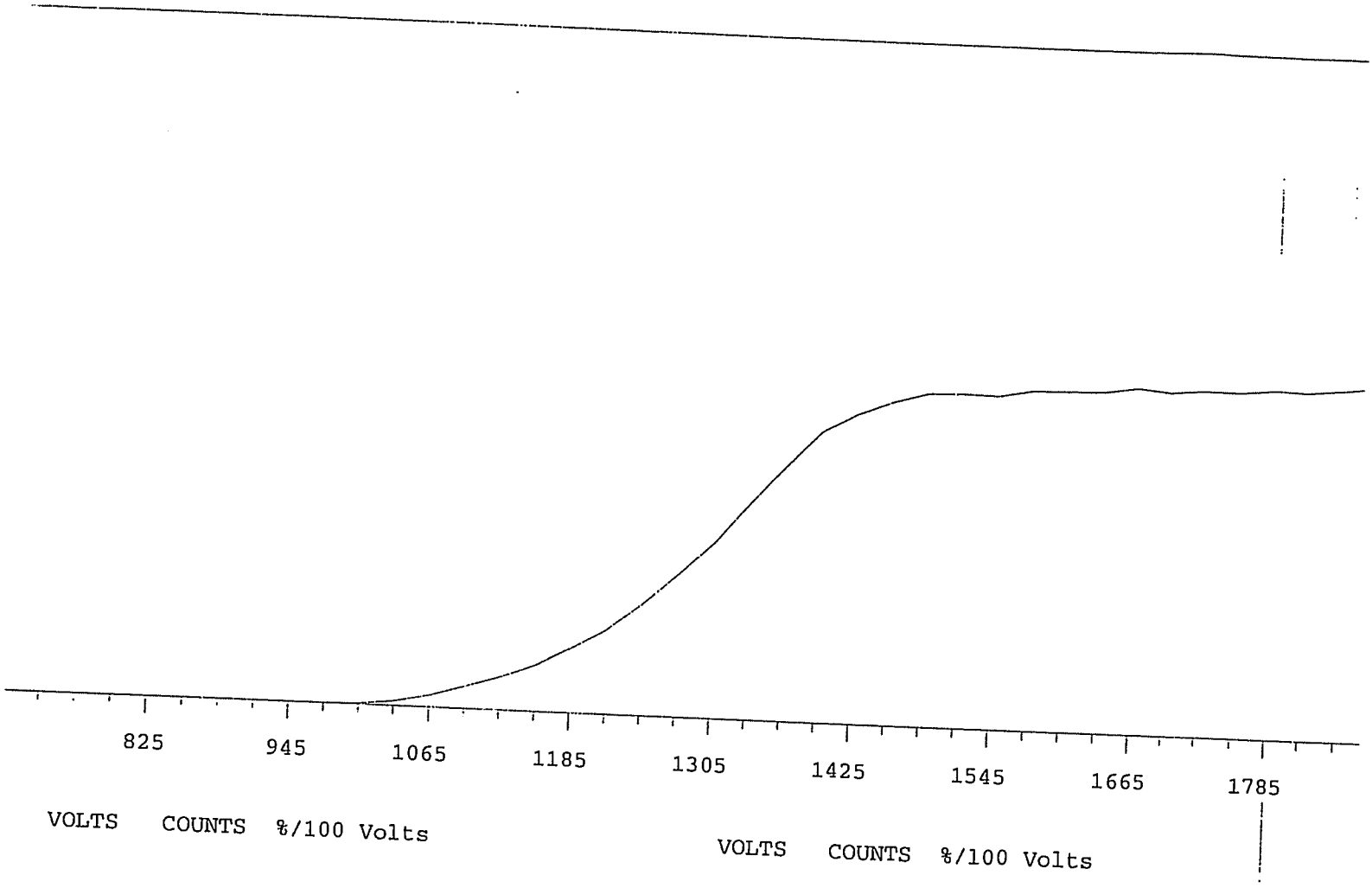


VOLTS	COUNTS	%/100 Volts
705	0	
735	1	
765	0	+0.00
795	1	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	2	>100
975	31	>100
1005	176	>100
1035	550	>100
1065	1218	>100
1095	2114	>100
1125	3212	>100
1155	4416	>100
1185	6066	+92.28
1215	7936	+85.60
1245	10288	+76.79
1275	13020	+70.59

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

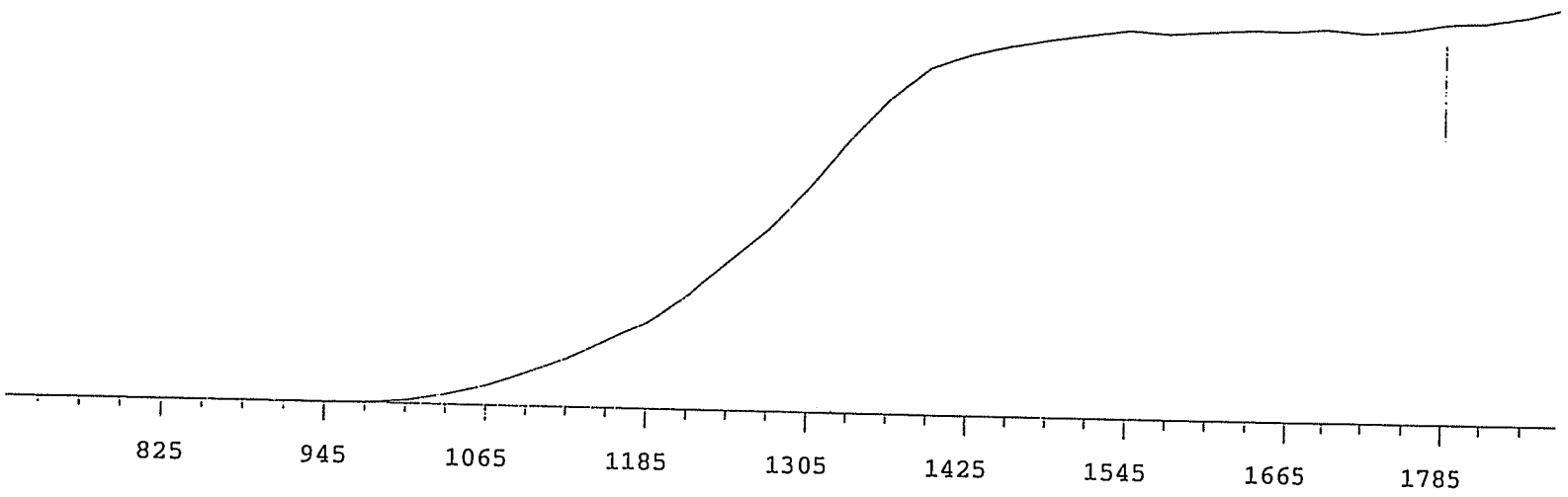
Alpha Volts: 705 Beta Volts: 1575



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	

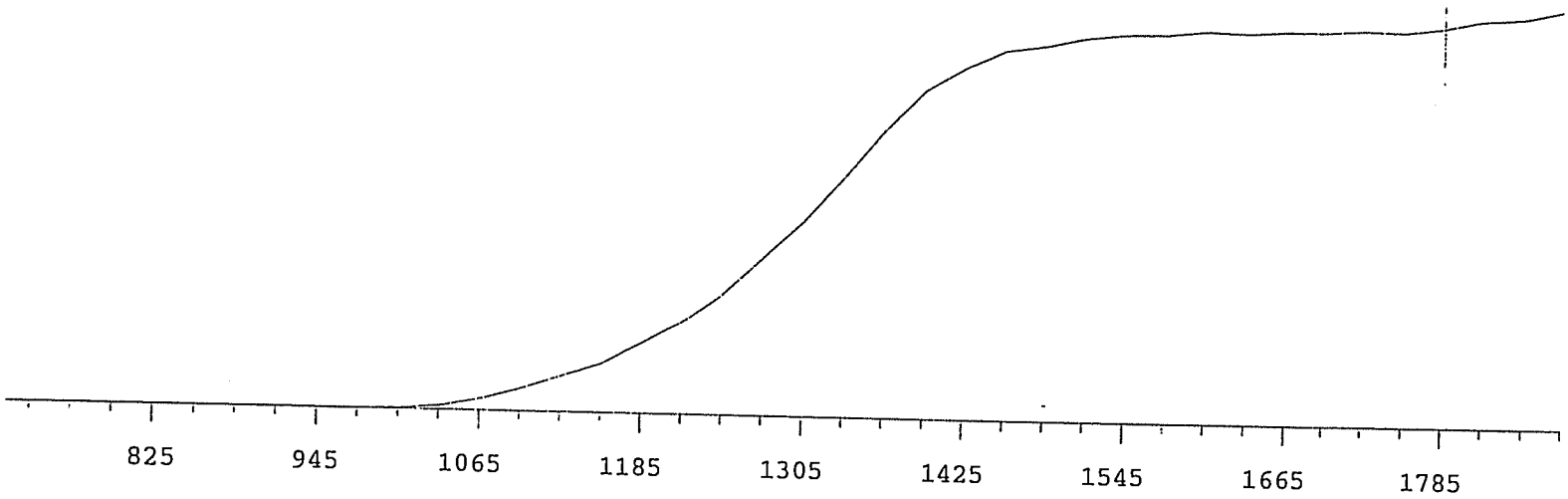
MPC 9600 Plateau Instrument 4 MPC 9604 Detector D 7/1/2009
Alpha Volts: 705 Beta Volts: 1575



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

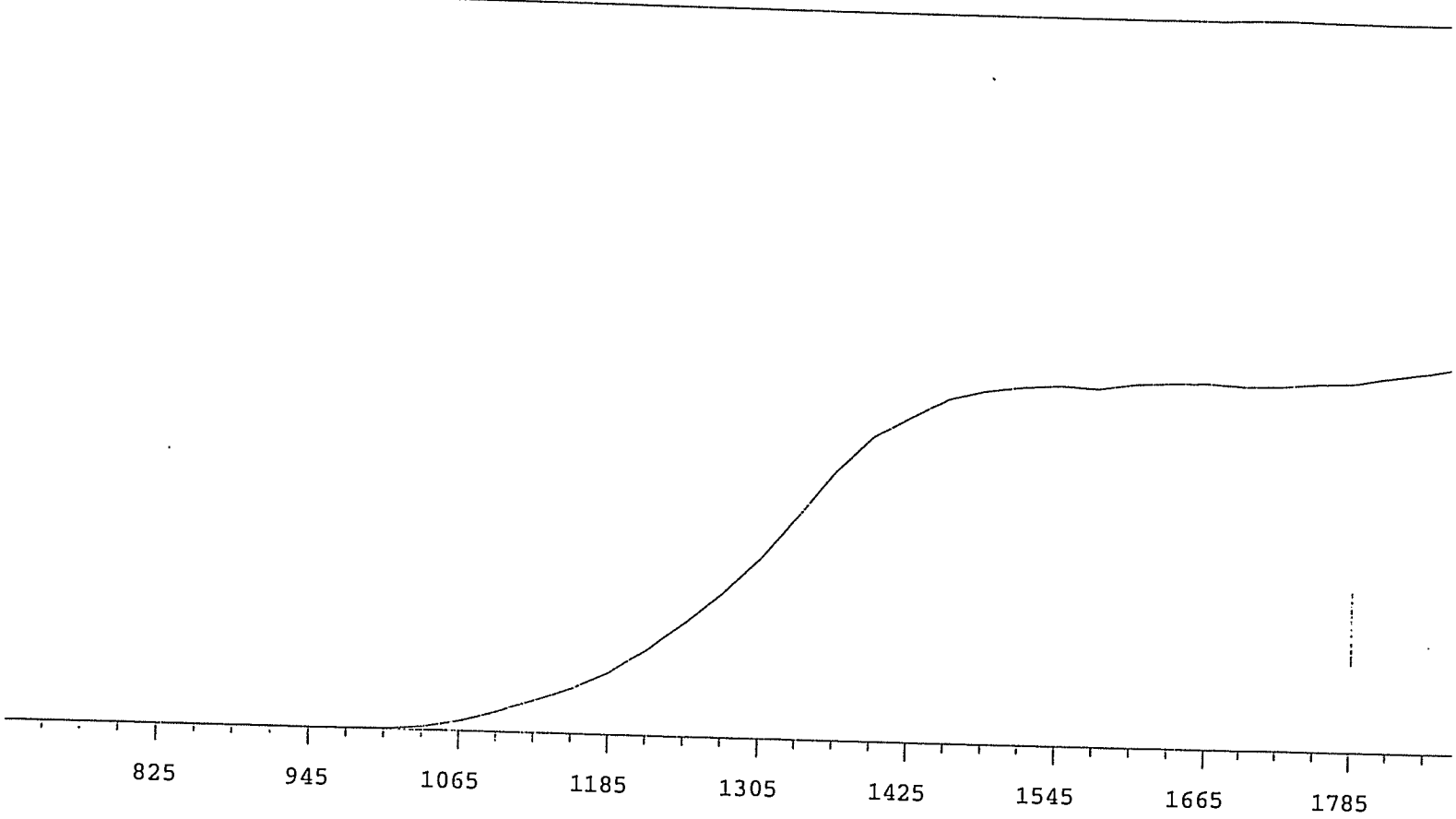


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	1	
795	1	+83.33
825	1	-83.33
855	1	>100
885	0	-55.56
915	0	>100
945	1	>100
975	9	>100
1005	76	>100
1035	308	>100
1065	814	>100
1095	1600	>100
1125	2598	>100
1155	3596	>100
1185	5065	+96.05
1215	6773	+90.23
1245	8717	+81.43
1275	11391	+74.83

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

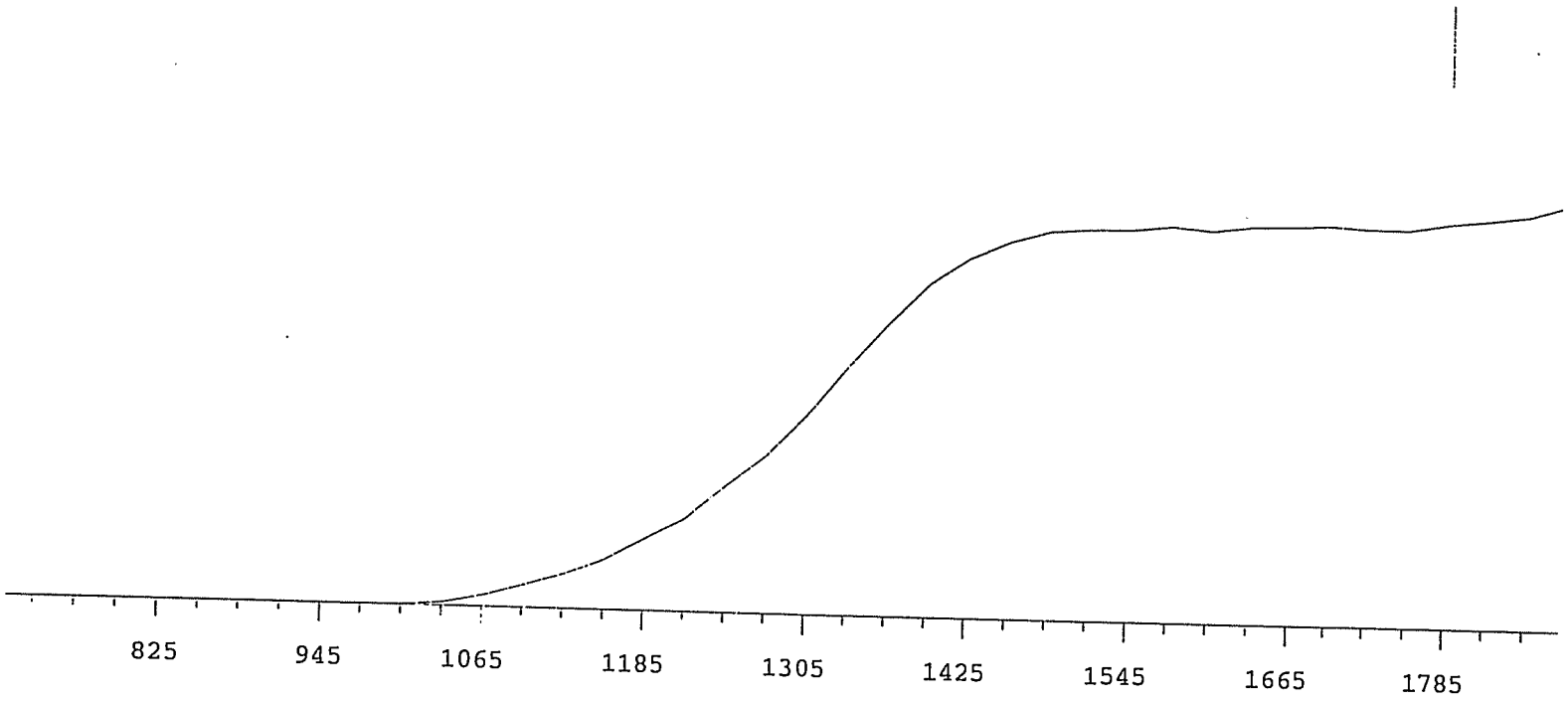


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	1	>100
855	1	+41.67
885	2	-33.33
915	0	>100
945	1	>100
975	17	>100
1005	87	>100
1035	336	>100
1065	1010	>100
1095	1955	>100
1125	3124	>100
1155	4486	>100
1185	6017	>100
1215	8507	+91.20
1245	11148	+82.59
1275	14003	+74.21

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

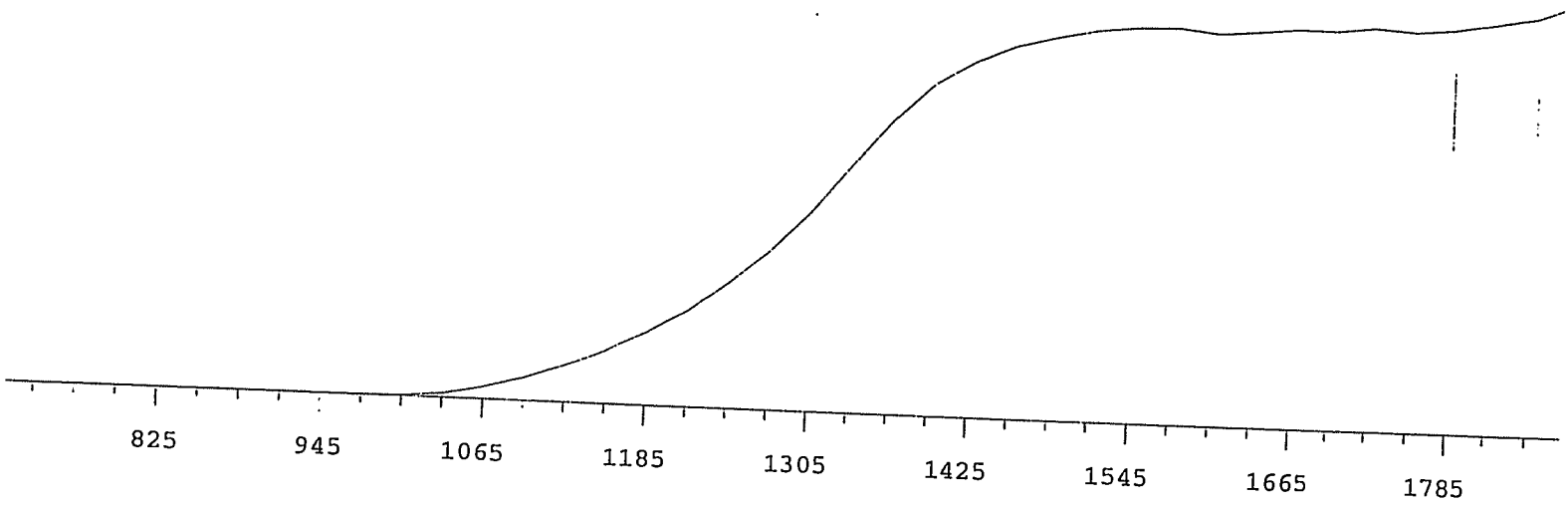


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	1	>100
885	0	>100
915	1	>100
945	2	>100
975	7	>100
1005	56	>100
1035	305	>100
1065	982	>100
1095	1874	>100
1125	2890	>100
1155	4260	>100
1185	6001	>100
1215	8050	+91.54
1245	10895	+82.98
1275	13556	+76.26

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

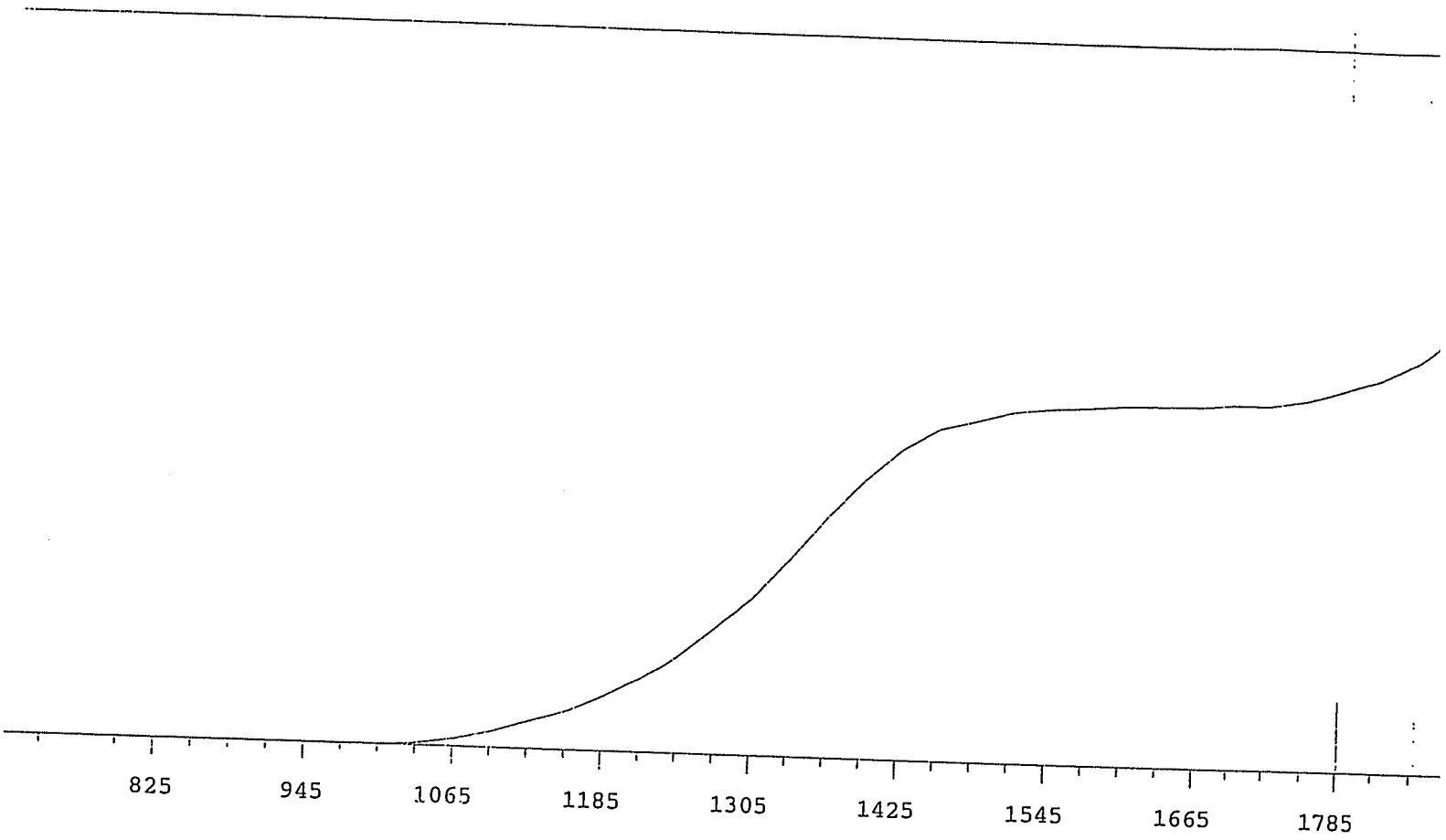


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	0	>100
975	6	>100
1005	81	>100
1035	318	>100
1065	897	>100
1095	1710	>100
1125	2714	>100
1155	3925	>100
1185	5395	+97.31
1215	7282	+88.49
1245	9426	+81.36
1275	12007	+75.65

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

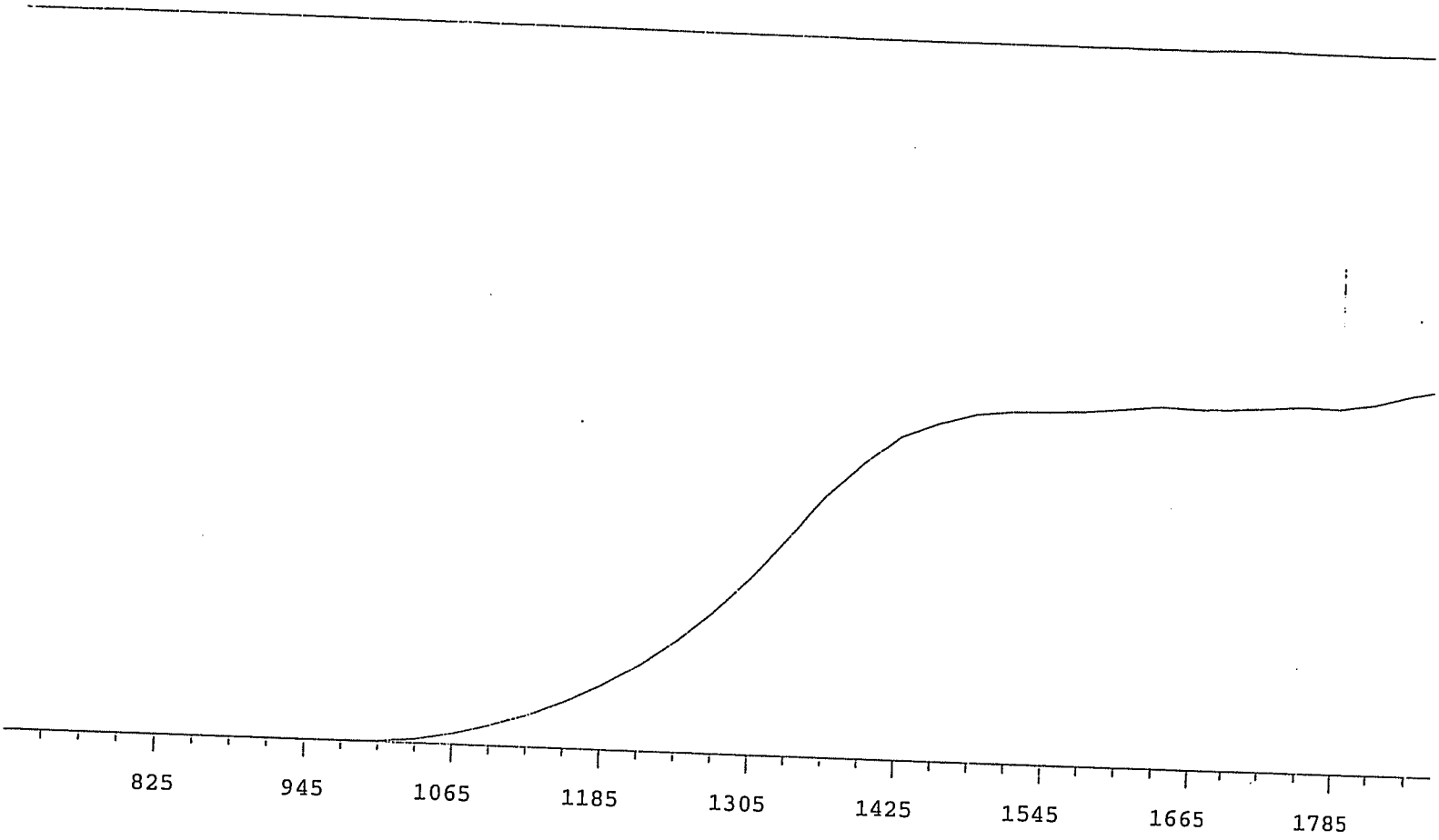


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	0	>100
975	7	>100
1005	31	>100
1035	238	>100
1065	810	>100
1095	1637	>100
1125	2743	>100
1155	3932	>100
1185	5579	>100
1215	7602	+94.41
1245	10078	+84.86
1275	13091	+77.67

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

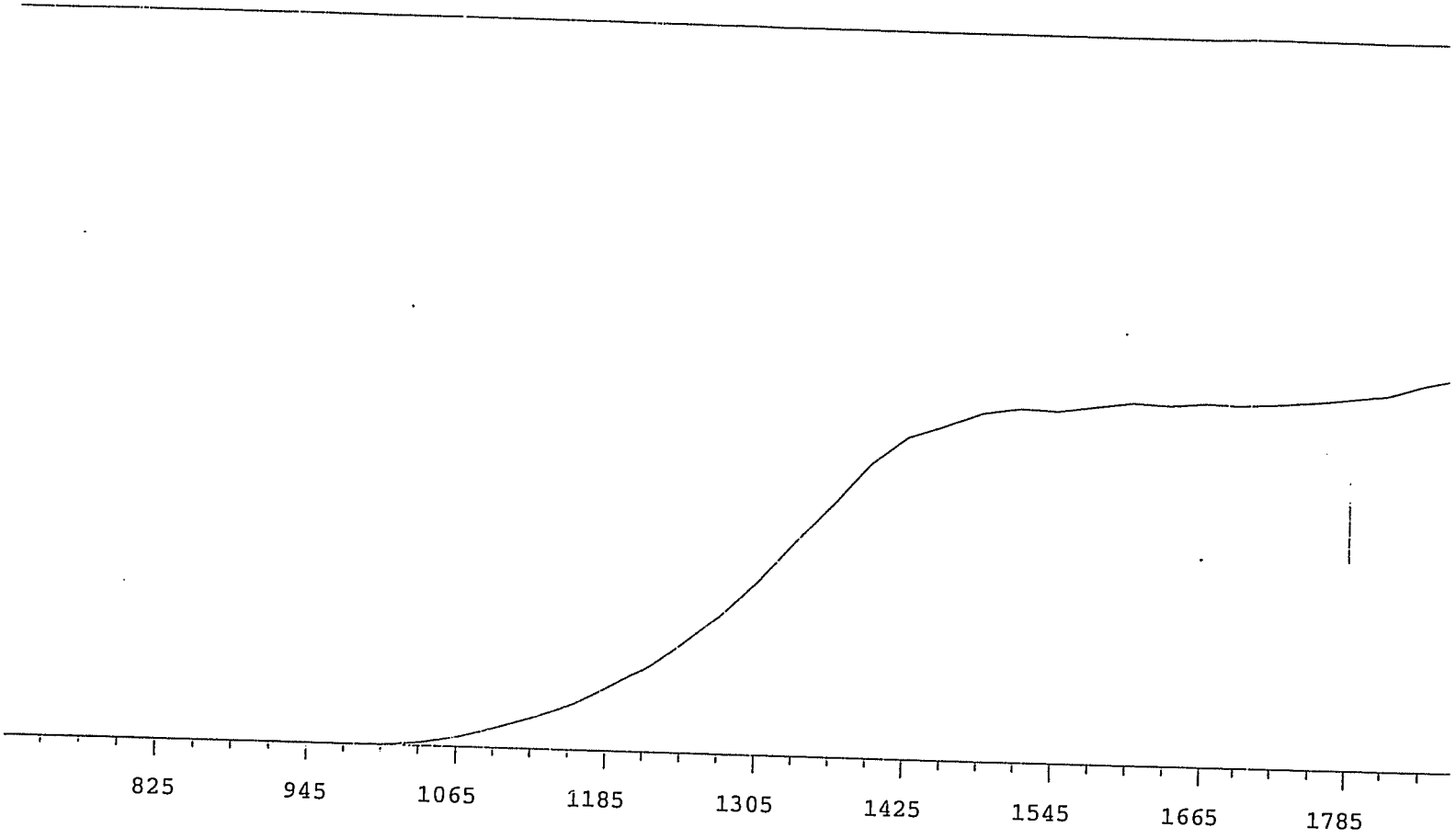
Alpha Volts: 705 Beta Volts: 1575



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	

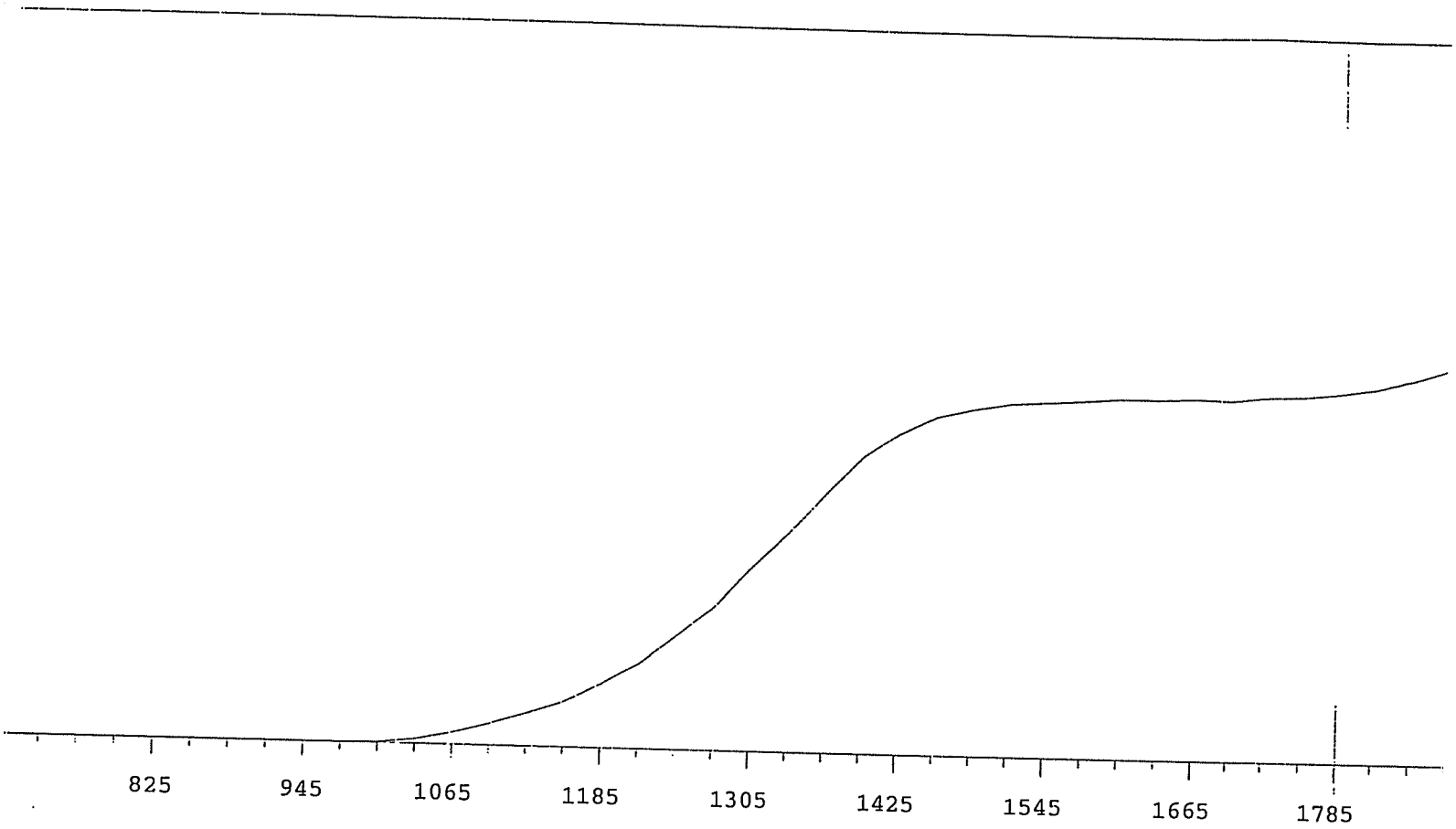
MPC 9600 Plateau Instrument 6 MPC 9604 Detector C 7/1/2009
Alpha Volts: 705 Beta Volts: 1575



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	

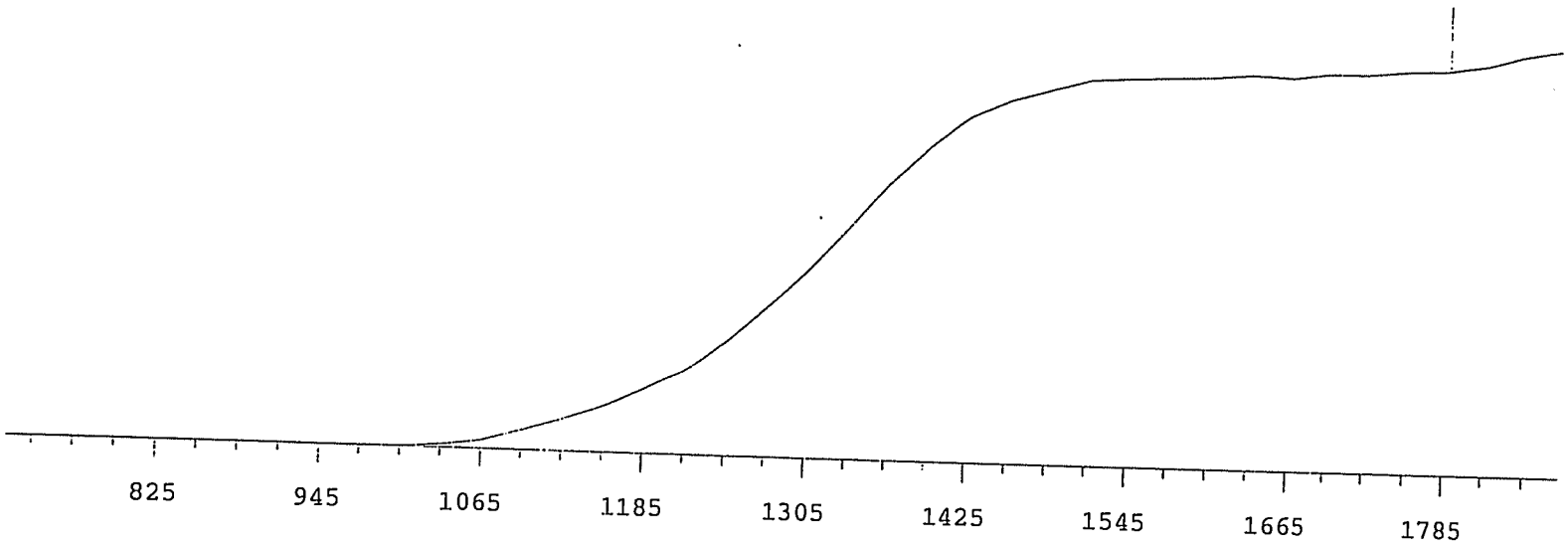
MPC 9600 Plateau Instrument 6 MPC 9604 Detector D 7/1/2009
Alpha Volts: 705 Beta Volts: 1575



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
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

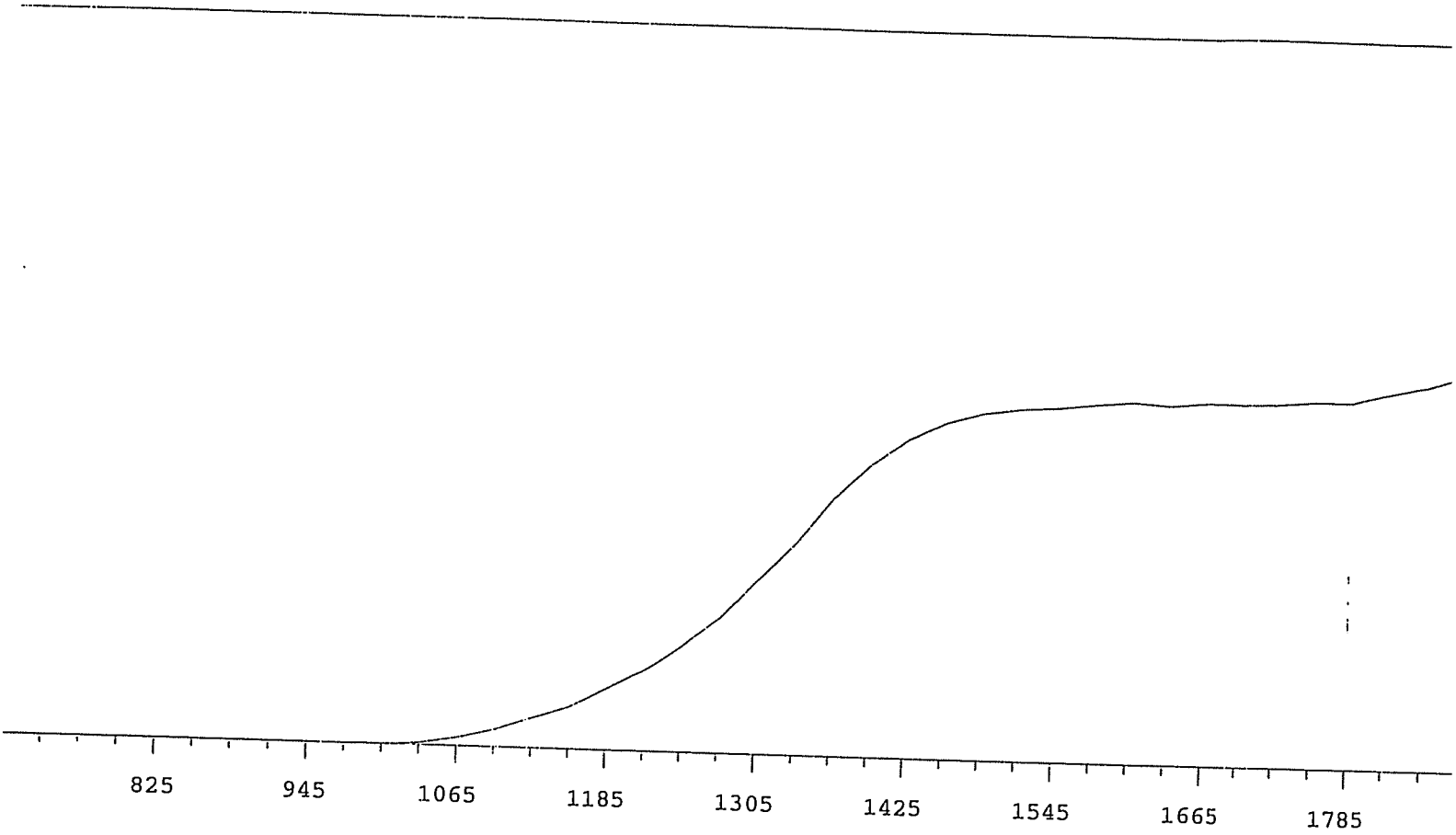
Alpha Volts: 705 Beta Volts: 1575



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	

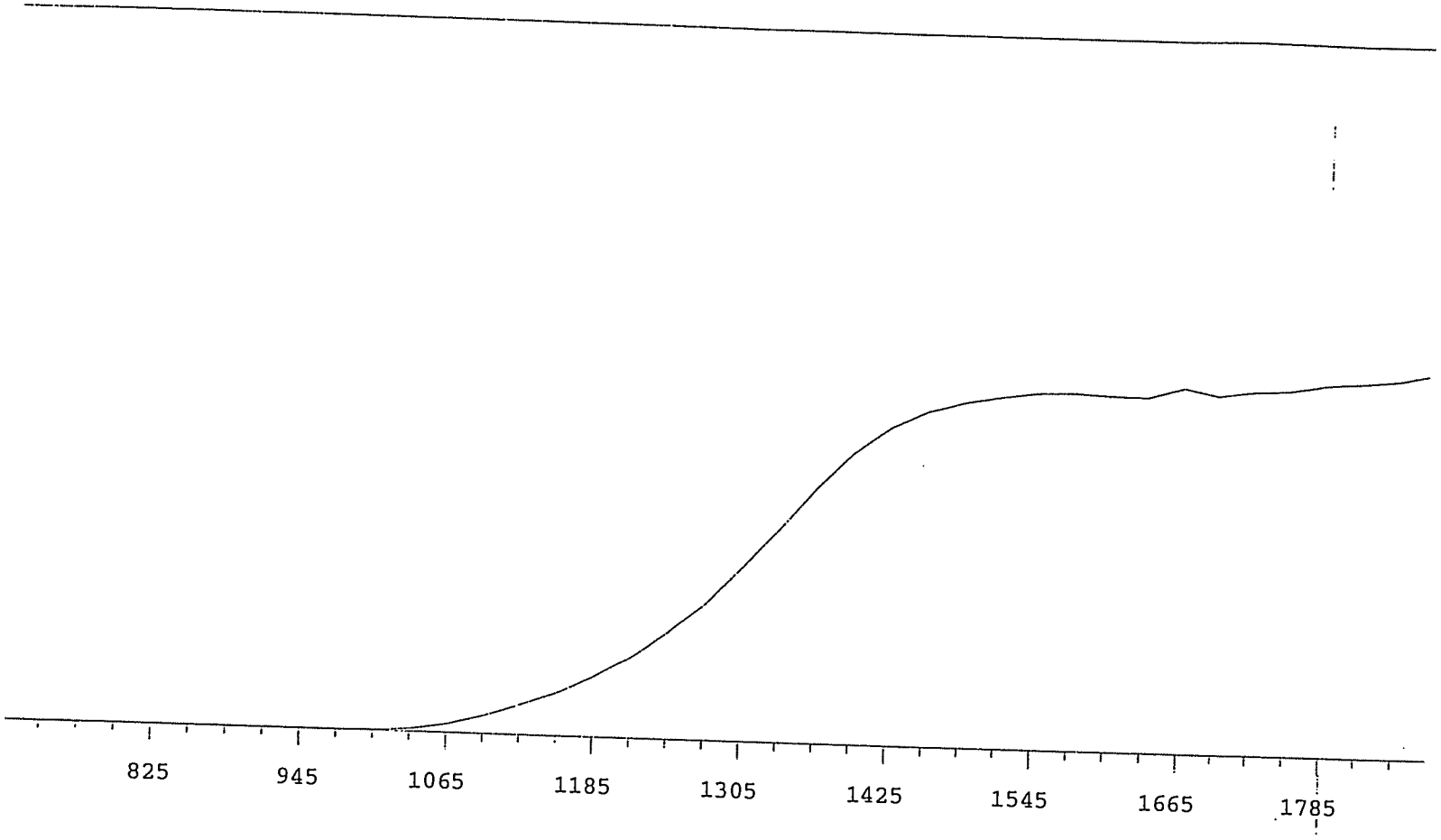
MPC 9600 Plateau Instrument 7 MPC 9604 Detector B 7/1/2009
Alpha Volts: 705 Beta Volts: 1575



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

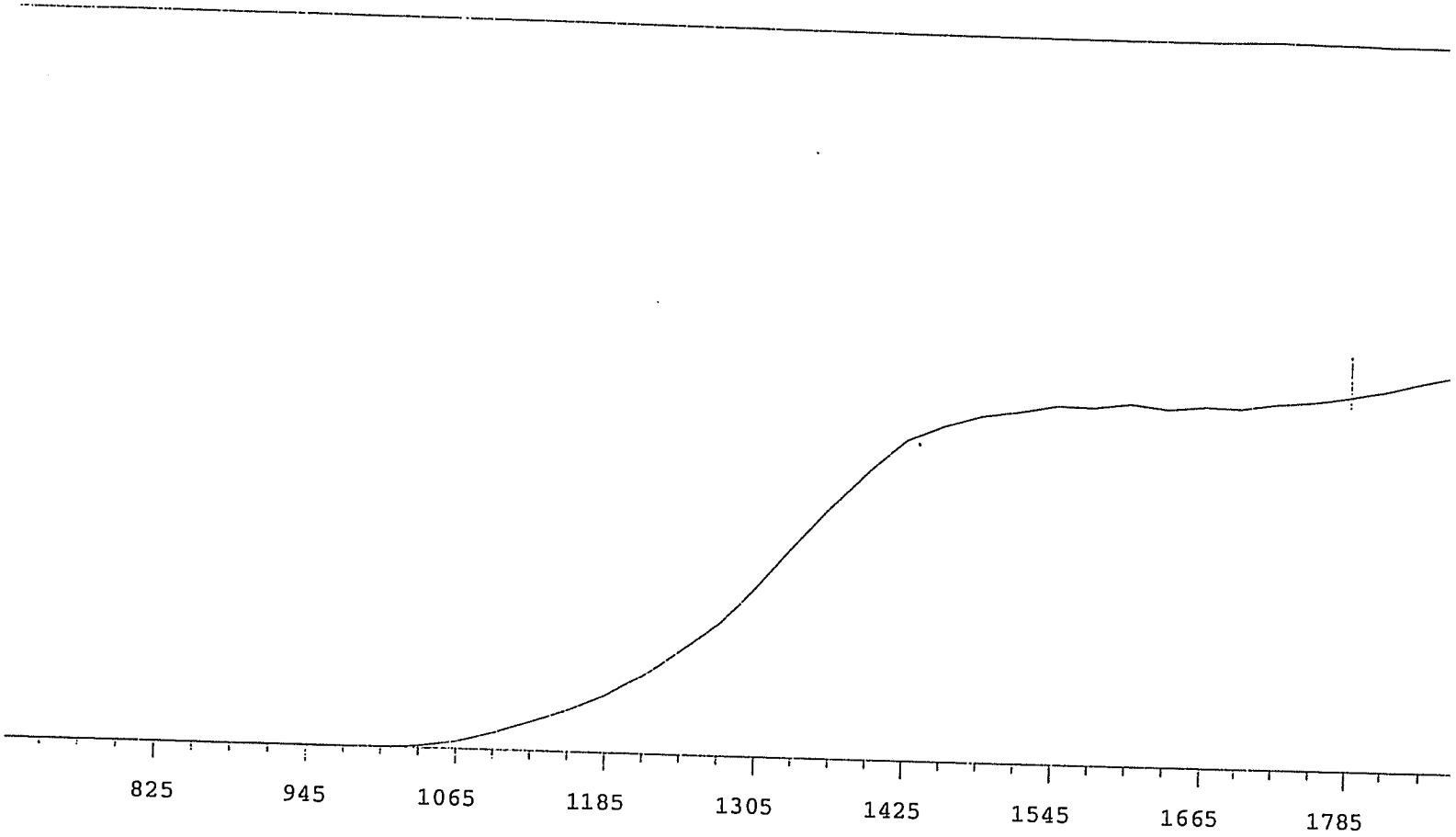


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	0	>100
975	4	>100
1005	57	>100
1035	277	>100
1065	817	>100
1095	1666	>100
1125	2766	>100
1155	4077	>100
1185	5667	>100
1215	7694	+91.50
1245	10209	+84.83
1275	12950	+77.50

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

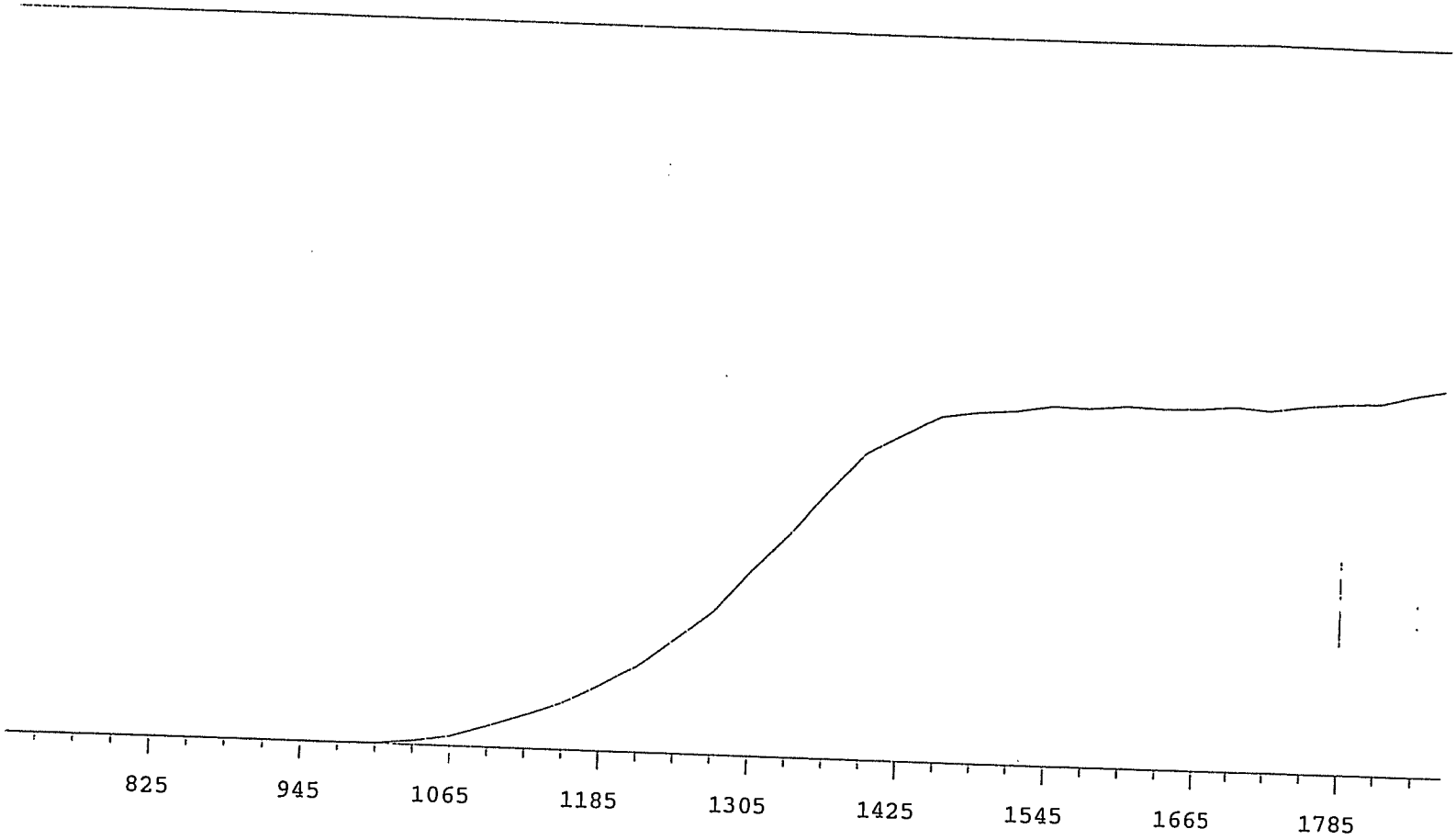
Alpha Volts: 705 Beta Volts: 1575



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	

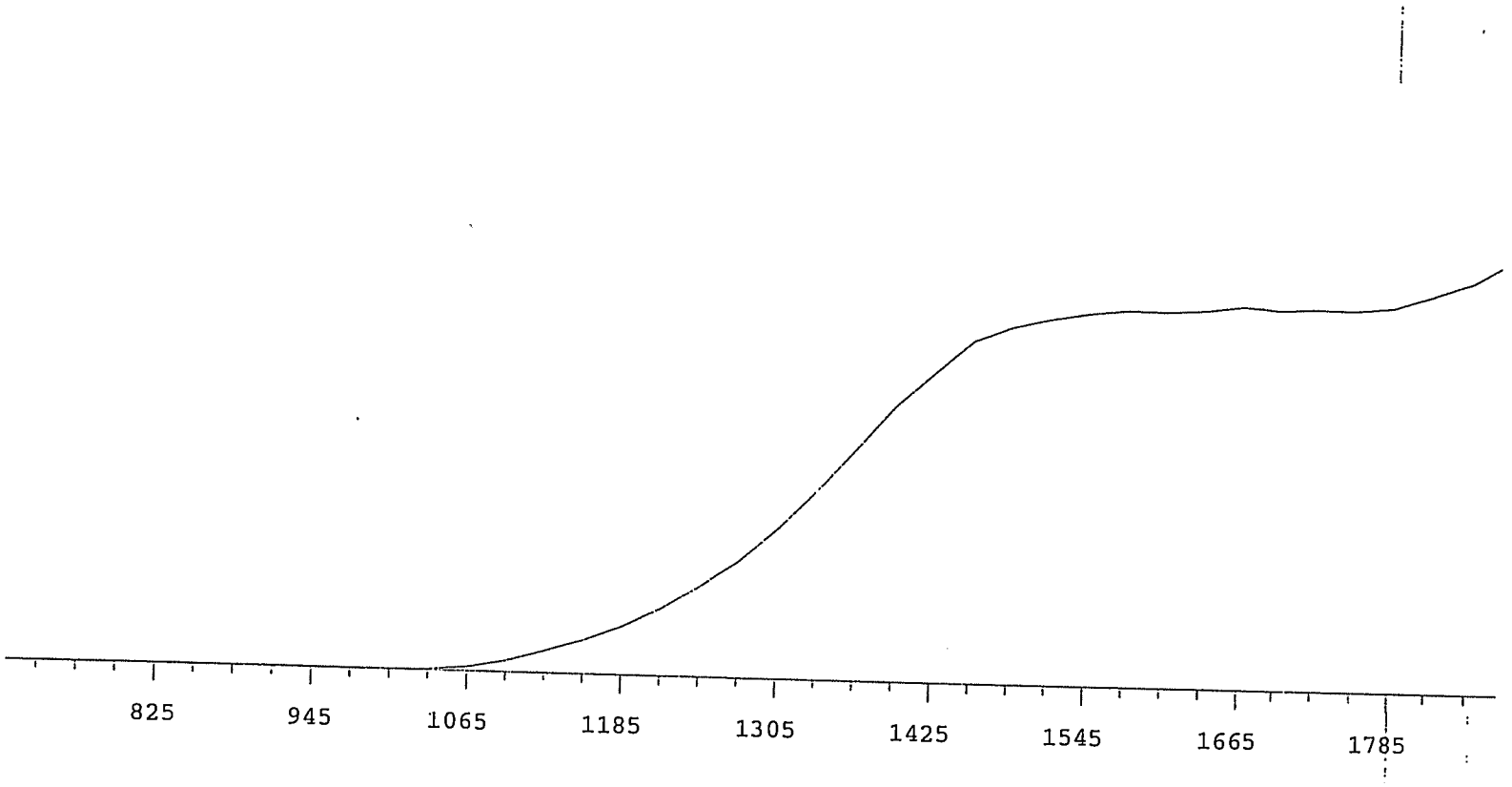
MPC 9600 Plateau Instrument 8 MPC 9604 Detector A 7/1/2009
Alpha Volts: 705 Beta Volts: 1575



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	

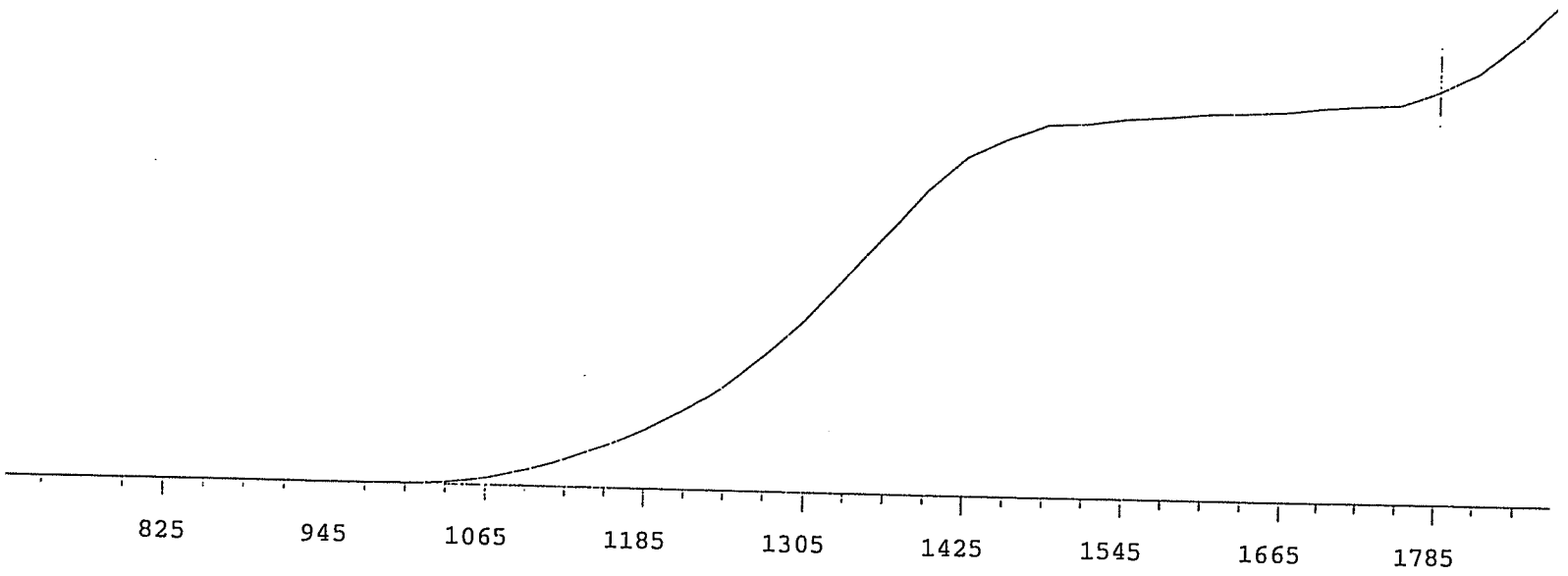
MPC 9600 Plateau Instrument 8 MPC 9604 Detector B 7/1/2009
Alpha Volts: 705 Beta Volts: 1575



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	

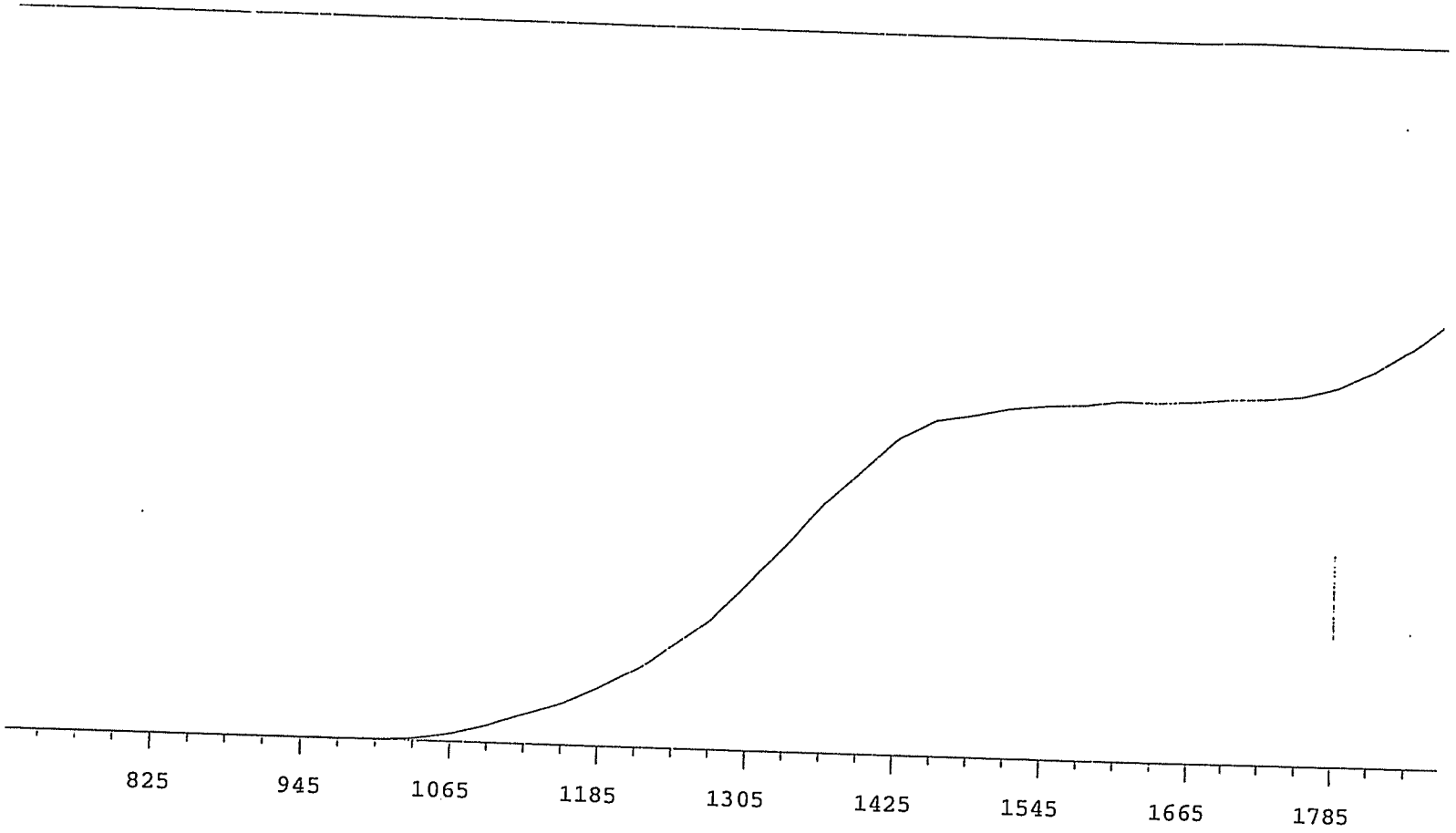
MPC 9600 Plateau Instrument 8 MPC 9604 Detector C 7/1/2009
Alpha Volts: 705 Beta Volts: 1575



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

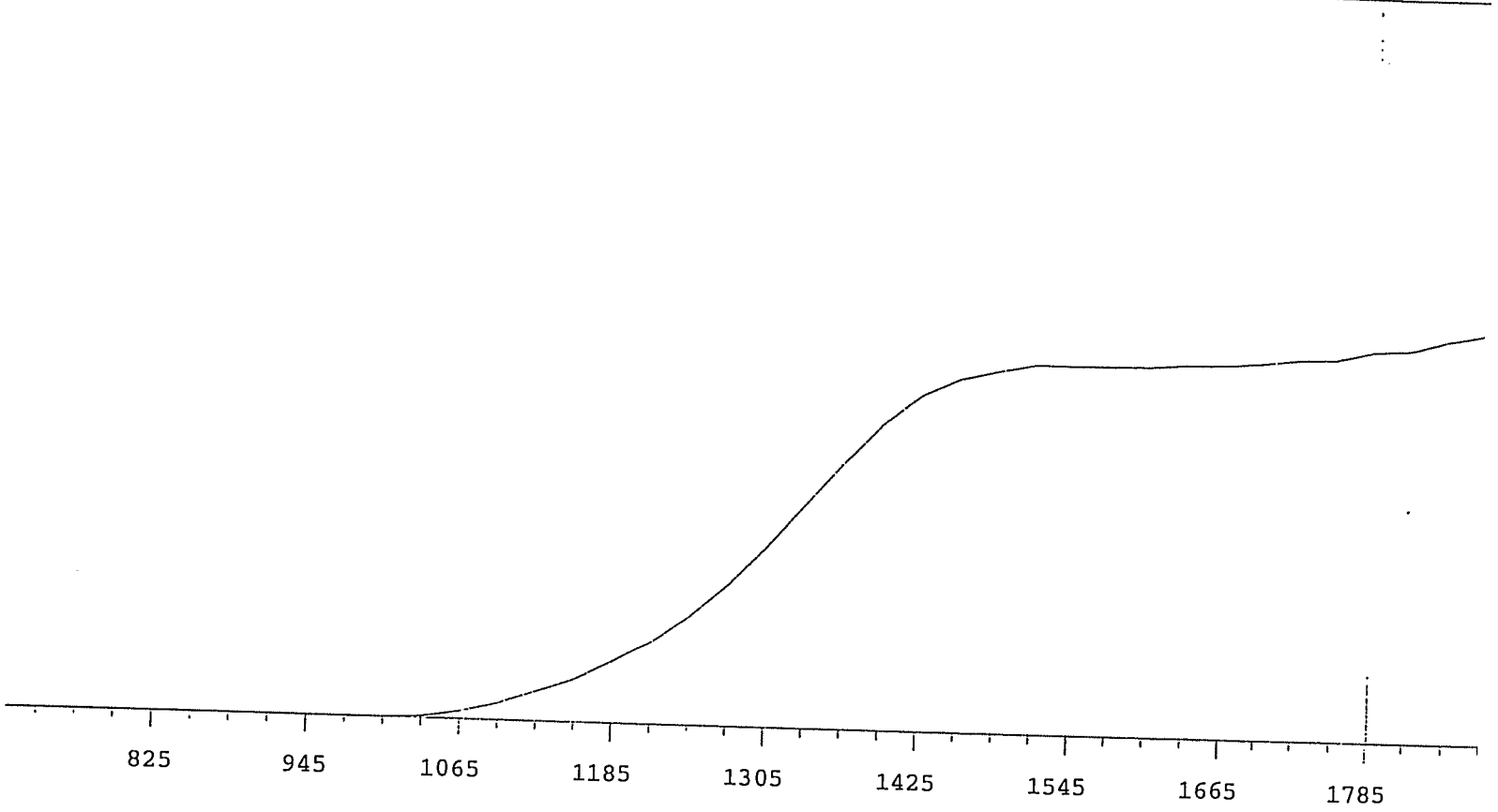
VOLTS	COUNTS	%/100 Volts
1305	16303	+72.82
1335	20309	+64.32
1365	24364	+53.82
1395	28527	+40.95
1425	31774	+28.74
1455	33631	+16.87
1485	35030	+9.25
1515	35208	+5.21
1545	35741	+3.27
1575	36019	+2.95
1605	36373	+2.21
1635	36484	+2.27
1665	36713	+2.28
1695	37093	+2.46
1725	37325	+4.17
1755	37543	+7.52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

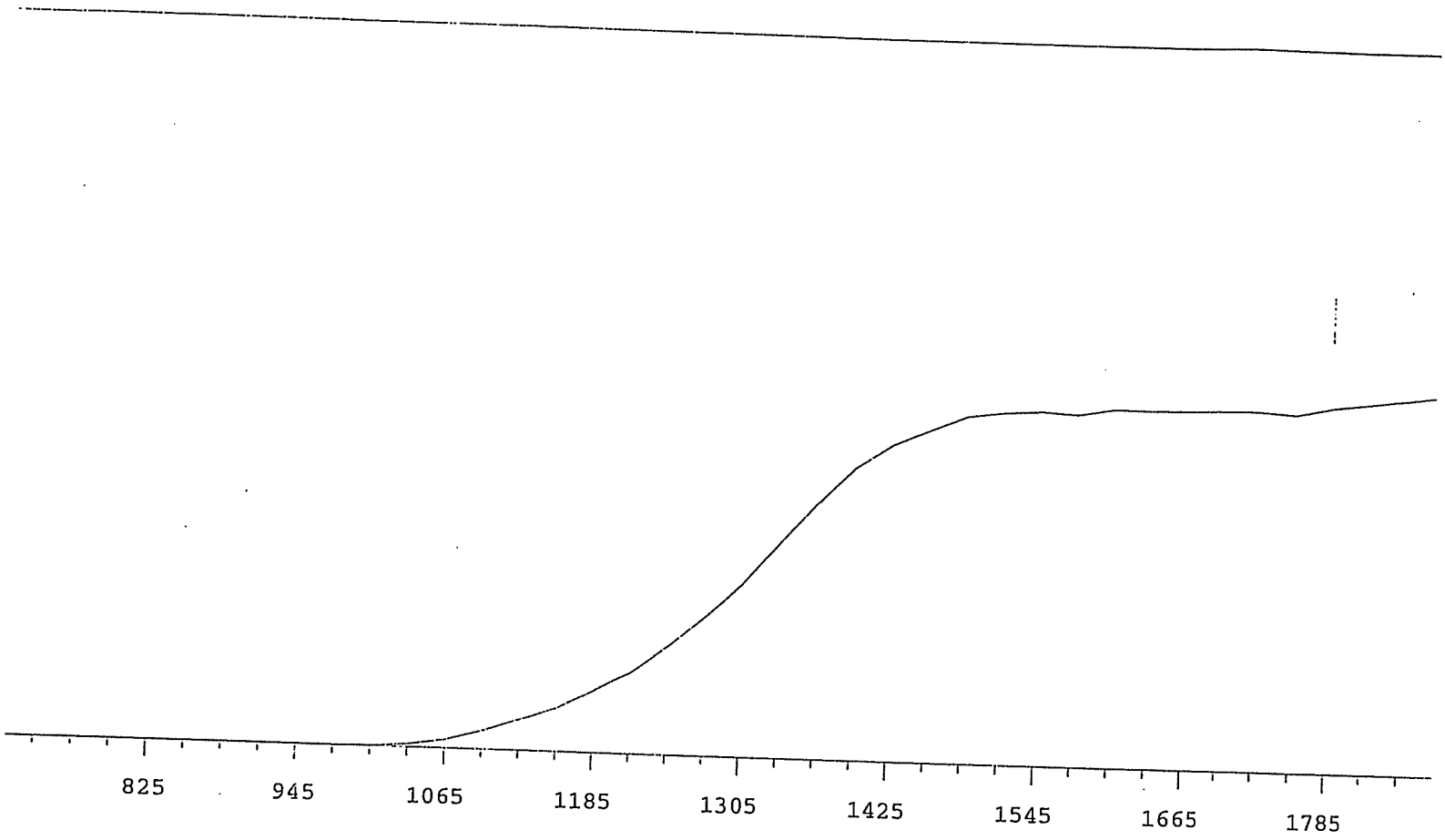


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	1	+0.00
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	0	>100
975	2	>100
1005	33	>100
1035	203	>100
1065	668	>100
1095	1403	>100
1125	2545	>100
1155	3800	>100
1185	5363	>100
1215	7355	+95.00
1245	9807	+87.69
1275	12700	+80.28

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

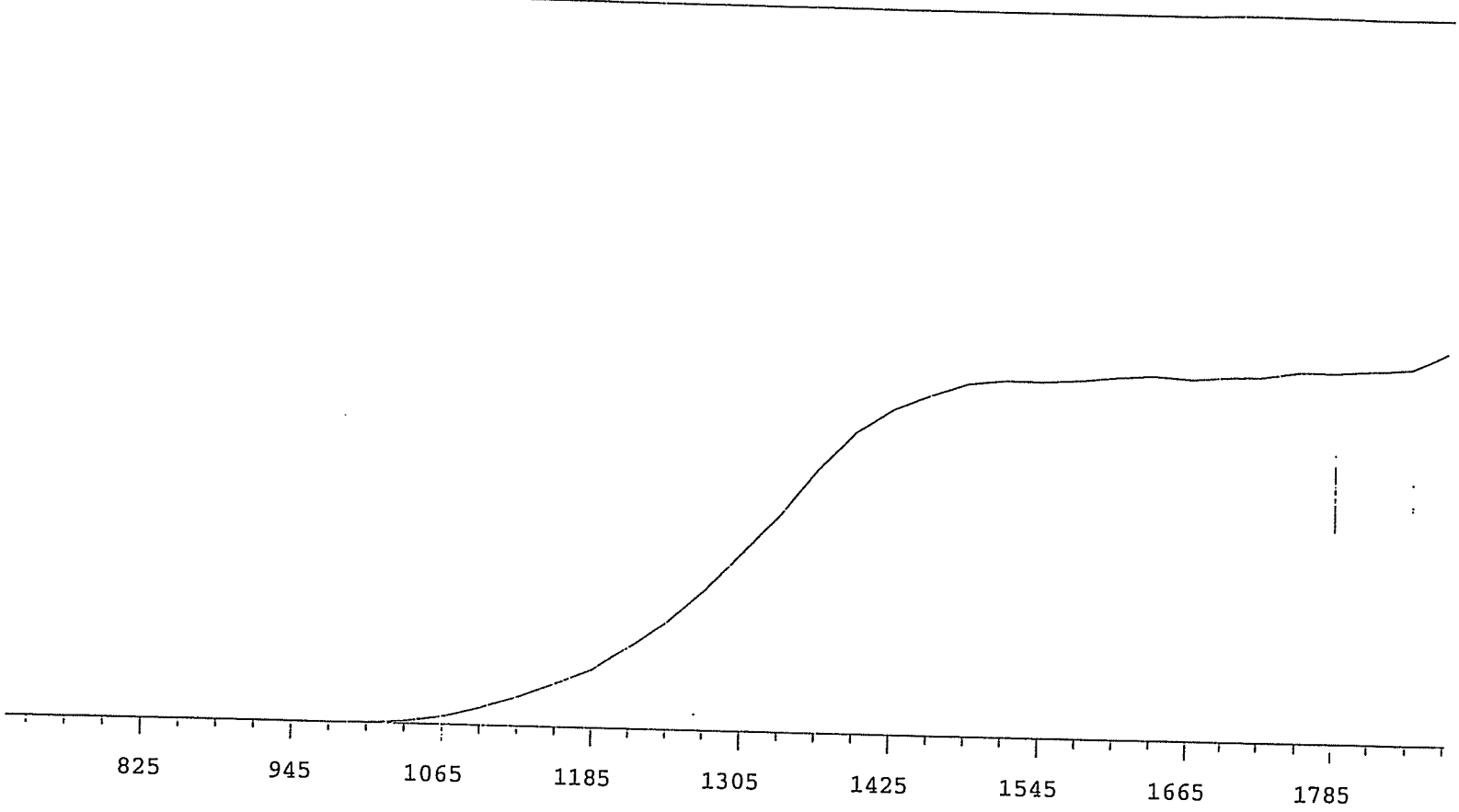
Alpha Volts: 870 Beta Volts: 1530



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

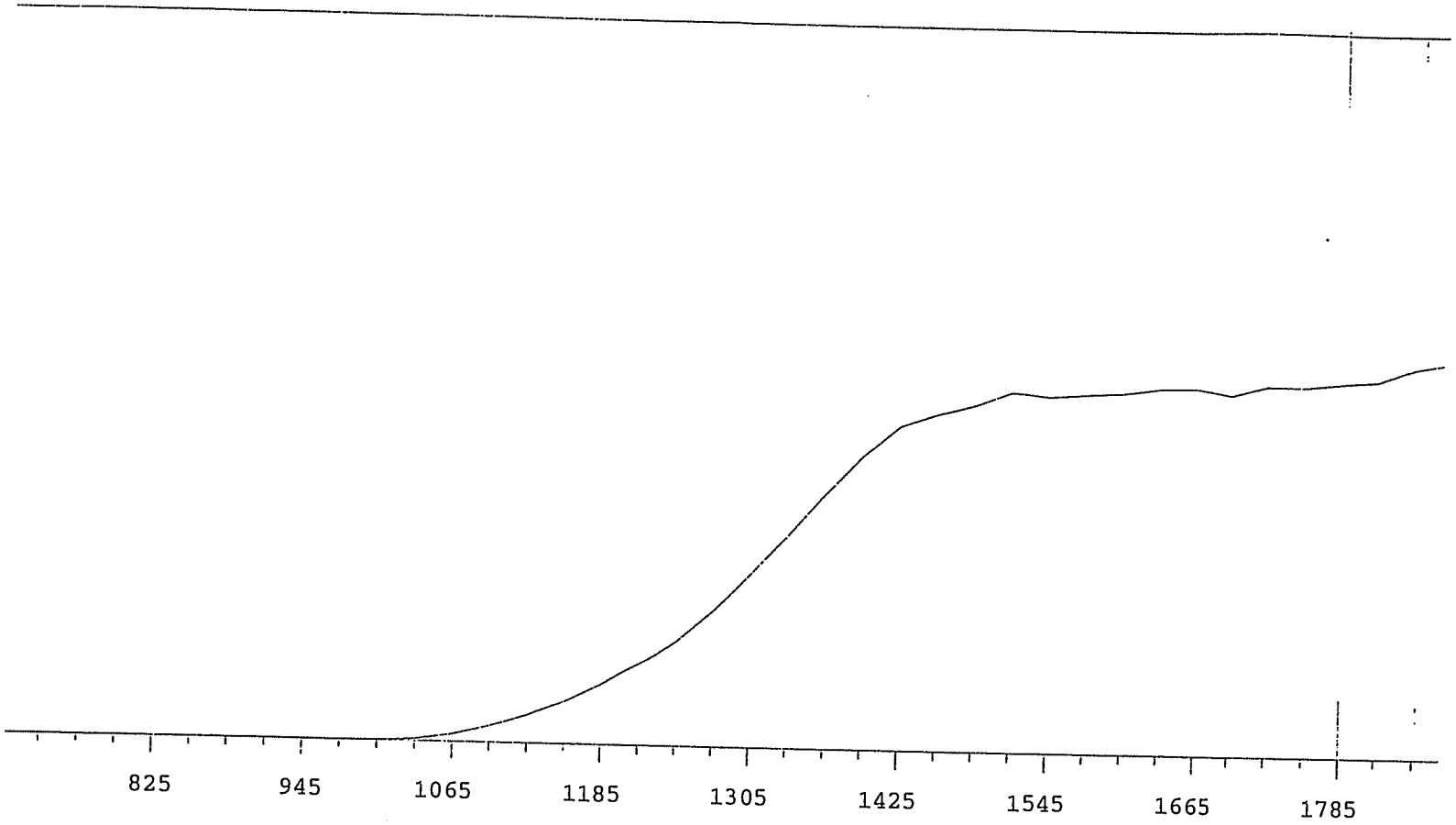


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	1	>100
915	1	>100
945	2	>100
975	3	>100
1005	64	>100
1035	349	>100
1065	970	>100
1095	1982	>100
1125	3328	>100
1155	5012	>100
1185	6669	>100
1215	9448	+92.67
1245	12293	+86.58
1275	15917	+76.99

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

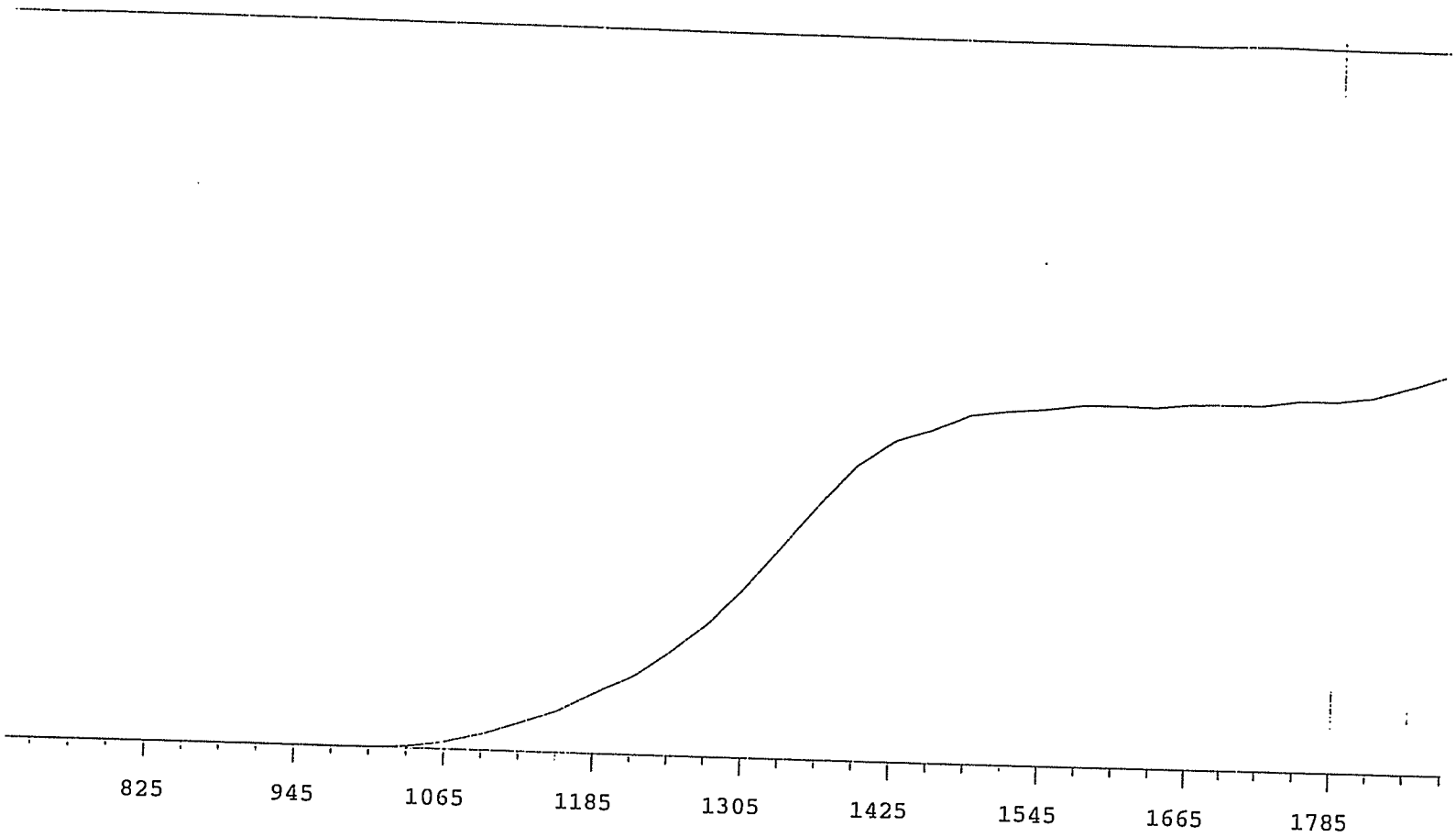
Alpha Volts: 870 Beta Volts: 1530



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	

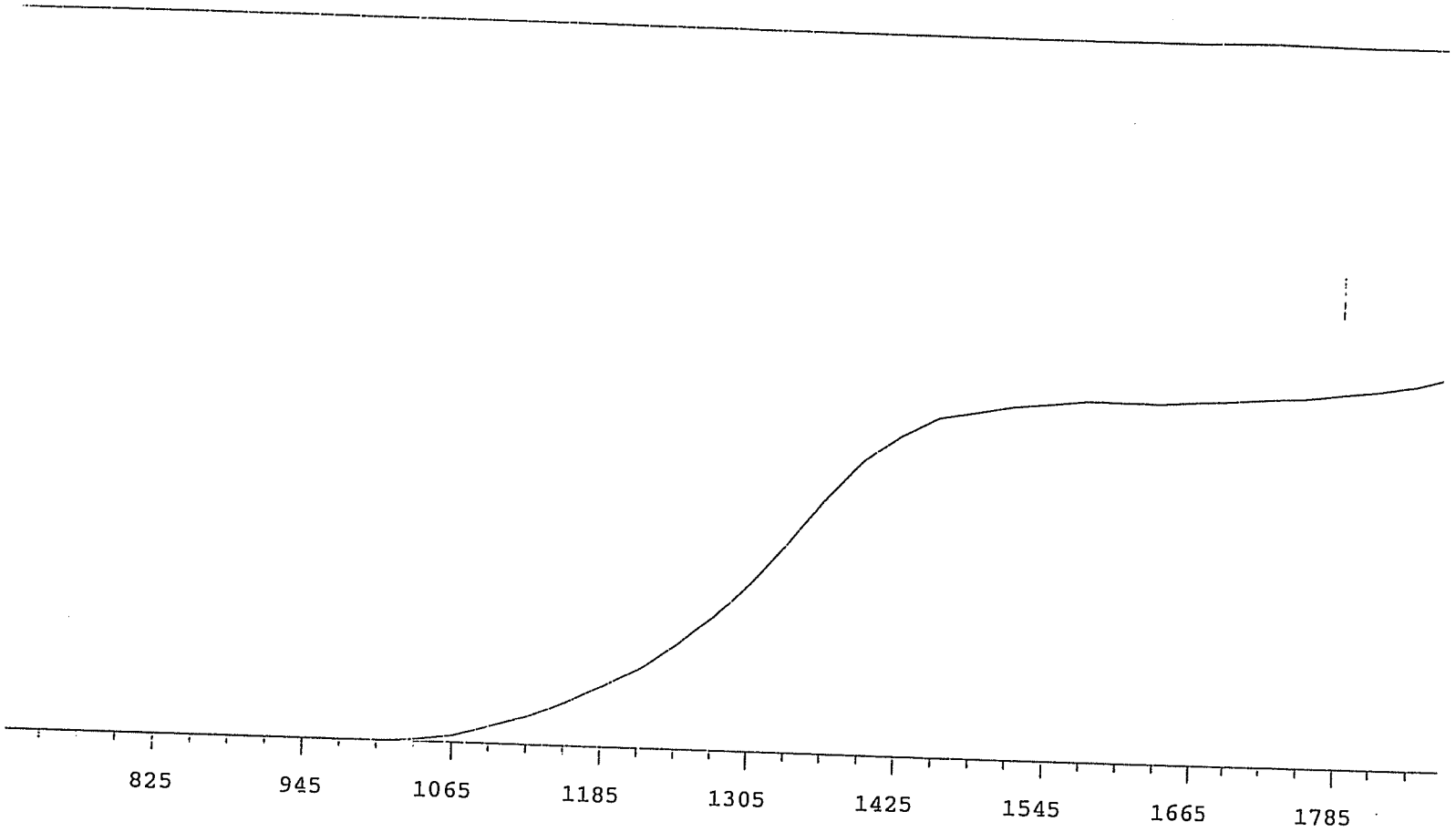
MPC 9600 Plateau Instrument 10 MPC 9604 Detector A 7/1/2009
Alpha Volts: 870 Beta Volts: 1552



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

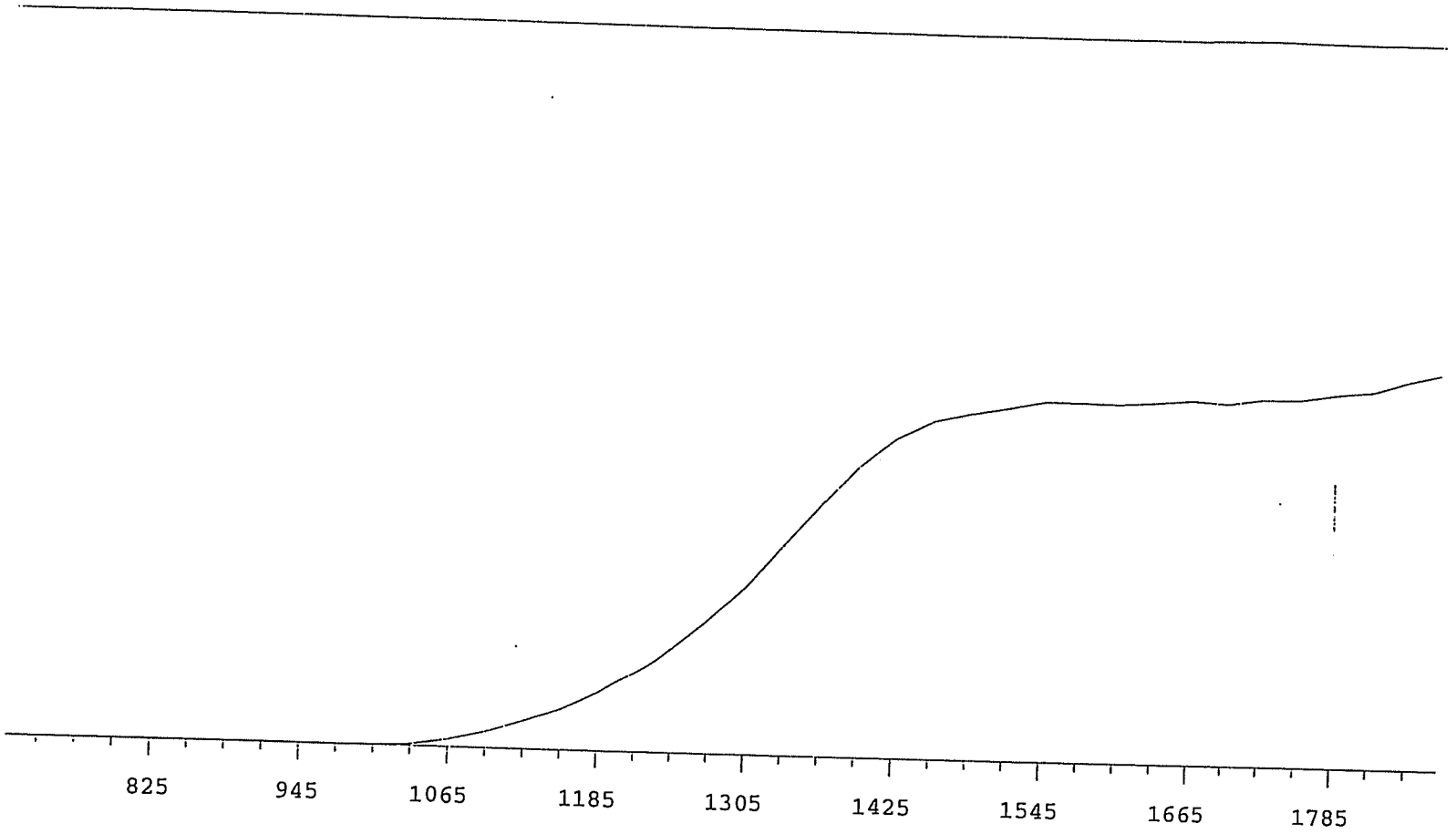


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	1	>100
975	7	>100
1005	28	>100
1035	190	>100
1065	597	>100
1095	1474	>100
1125	2383	>100
1155	3680	>100
1185	5131	>100
1215	6808	+89.95
1245	8990	+83.03
1275	11493	+77.30

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

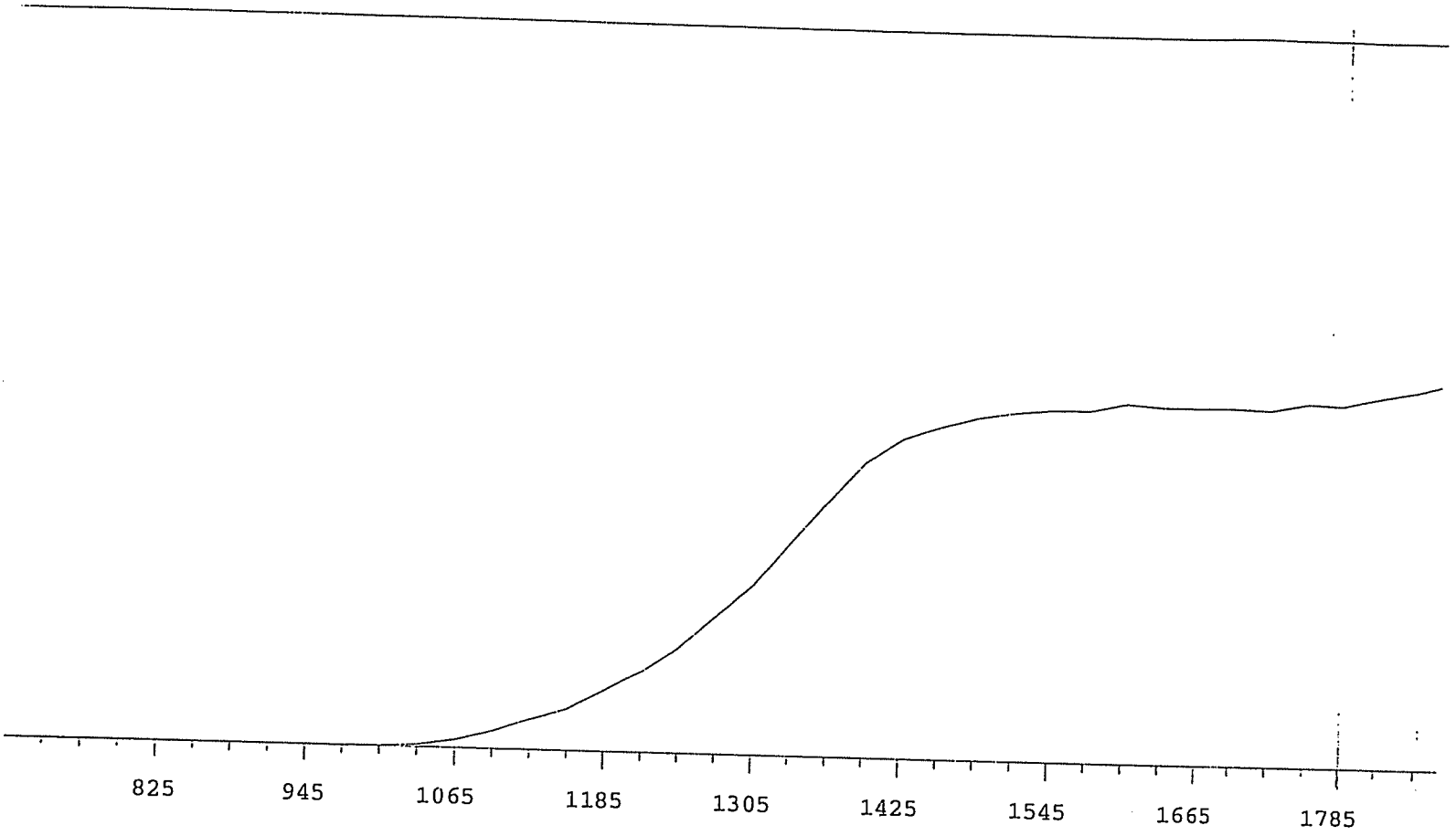


VOLTS	COUNTS	%/100 Volts
705	1	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	1	>100
915	0	>100
945	2	>100
975	2	>100
1005	36	>100
1035	220	>100
1065	780	>100
1095	1712	>100
1125	2926	>100
1155	4297	>100
1185	6097	>100
1215	8397	+95.11
1245	11155	+85.84
1275	14430	+78.79

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

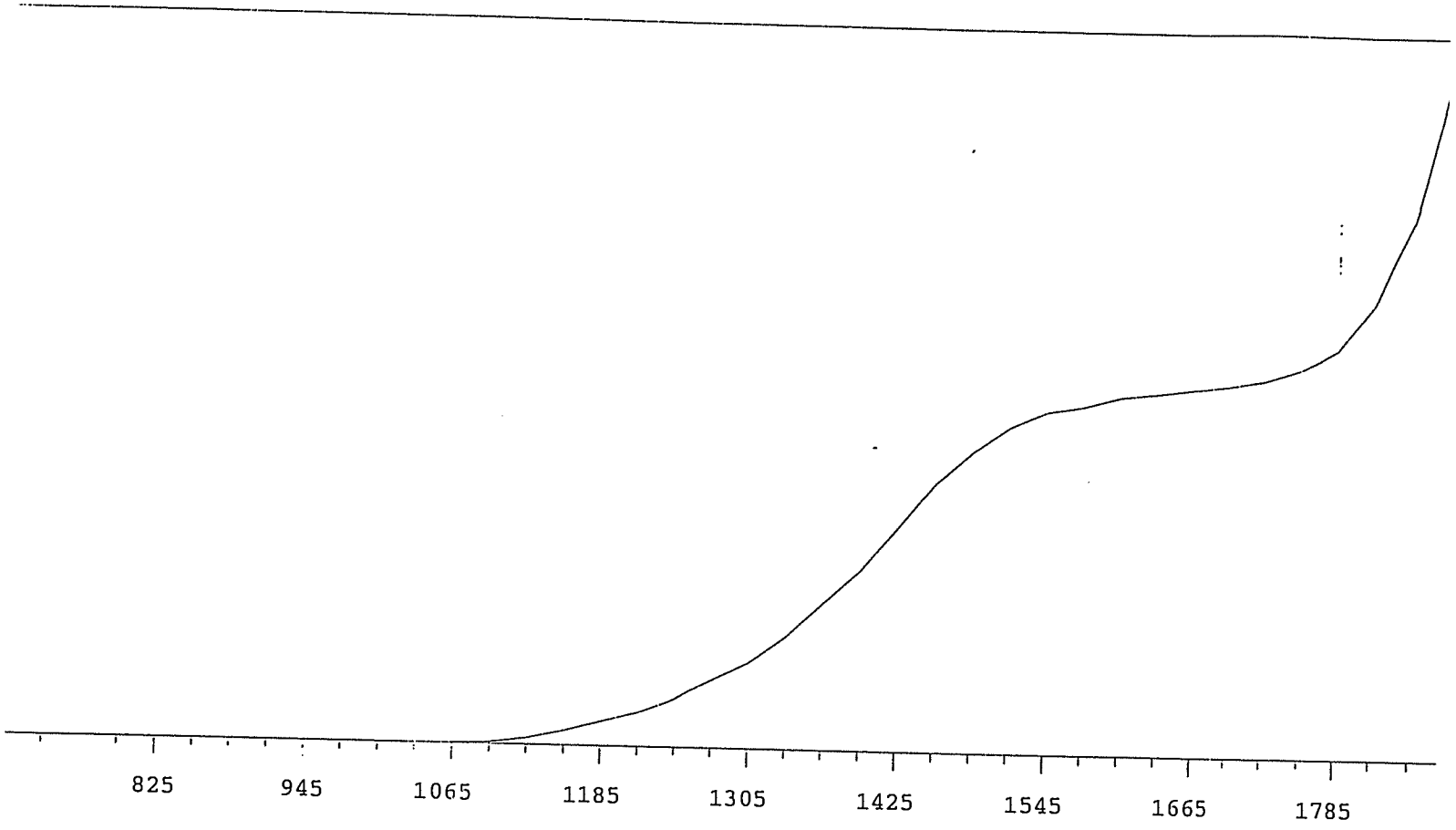


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	0	>100
975	3	>100
1005	49	>100
1035	244	>100
1065	764	>100
1095	1584	>100
1125	2677	>100
1155	3763	>100
1185	5395	>100
1215	7350	+93.71
1245	9655	+83.52
1275	12504	+76.82

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

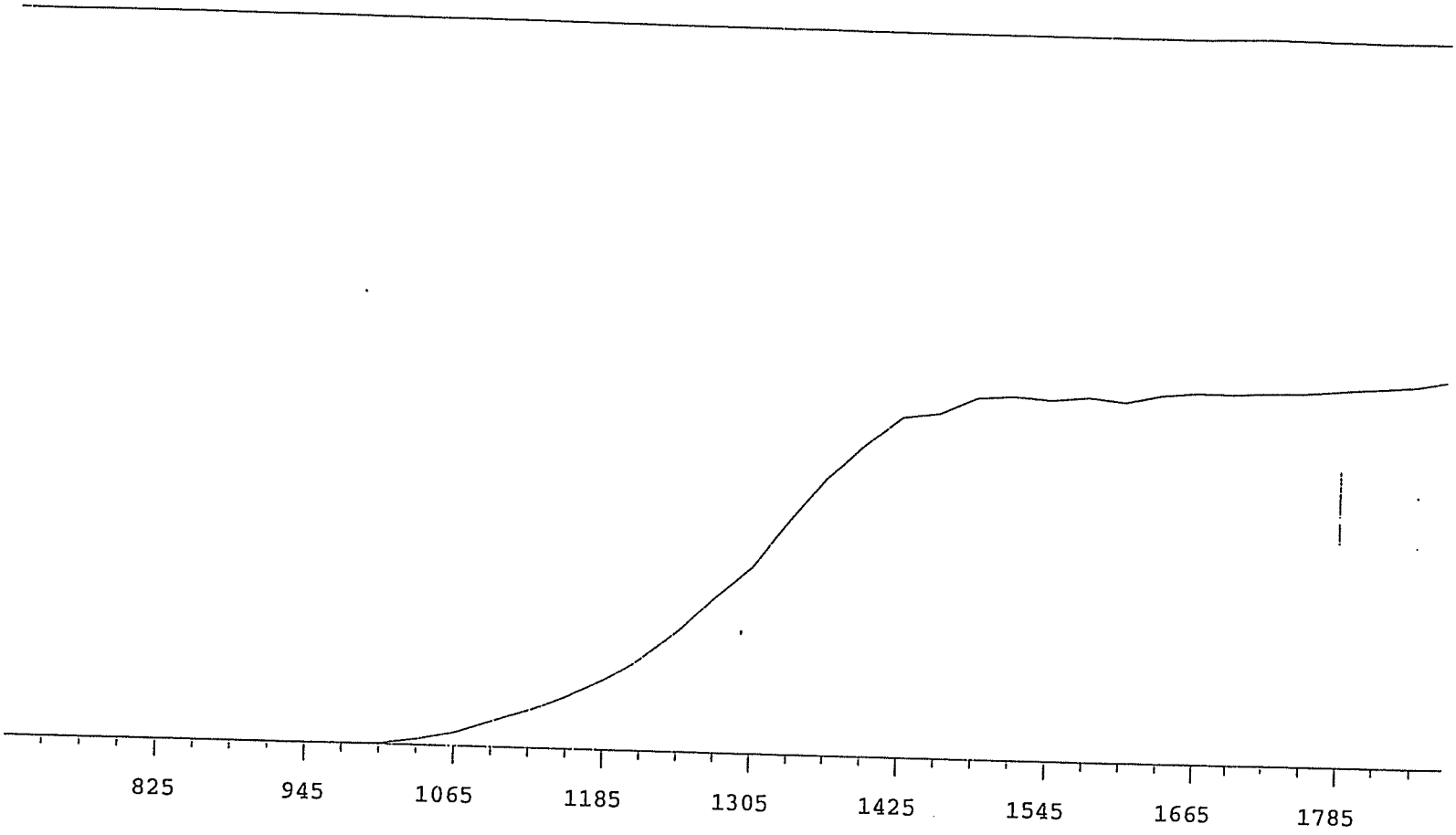


VOLTS	COUNTS	%/100 Volts
705	0	
735	1	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	1	+0.00
975	0	>100
1005	0	>100
1035	2	>100
1065	9	>100
1095	61	>100
1125	248	>100
1155	528	>100
1185	882	>100
1215	1270	>100
1245	1786	>100
1275	2478	+93.67

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

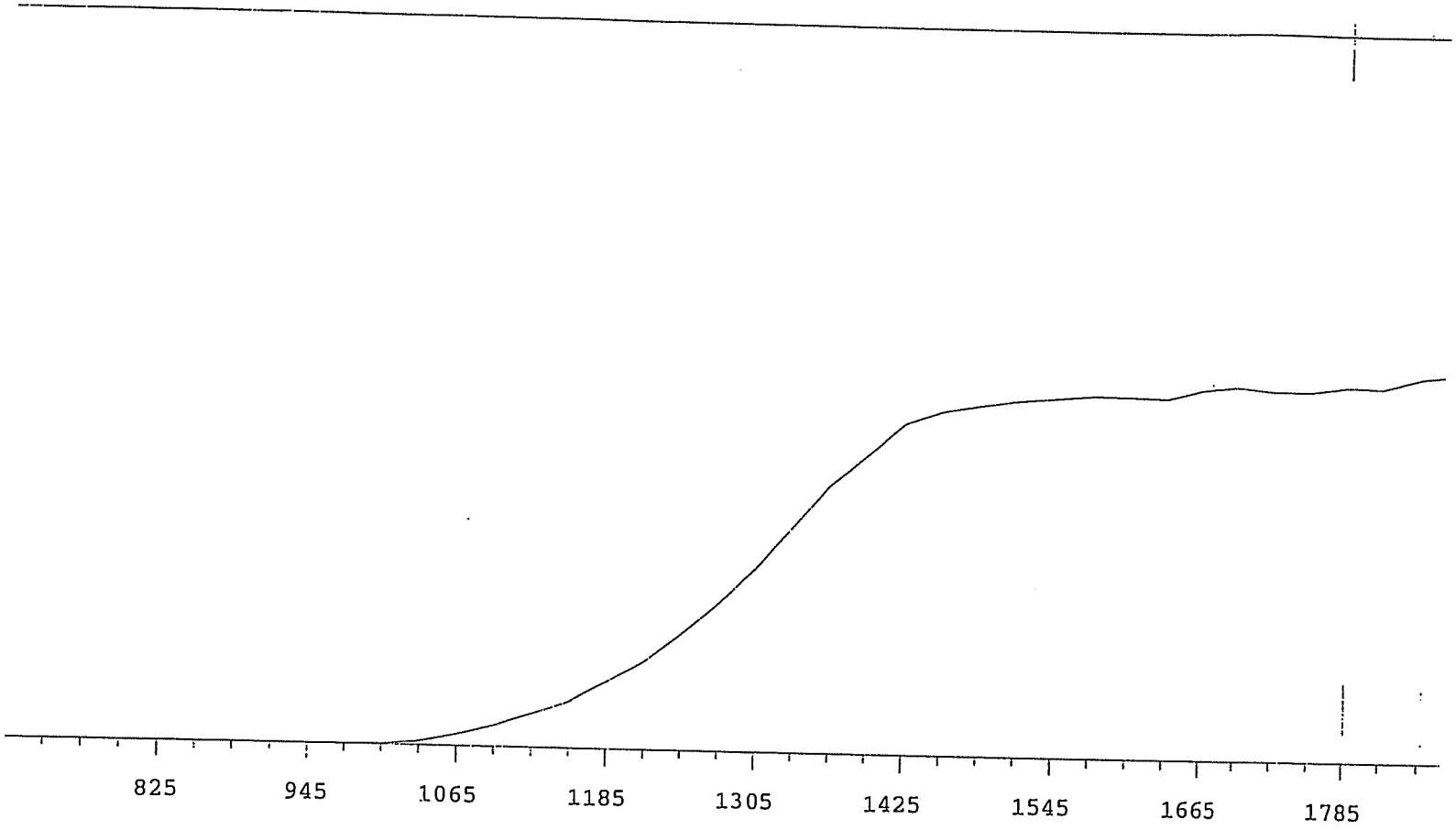
Alpha Volts: 1515 Beta Volts: 1515



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	

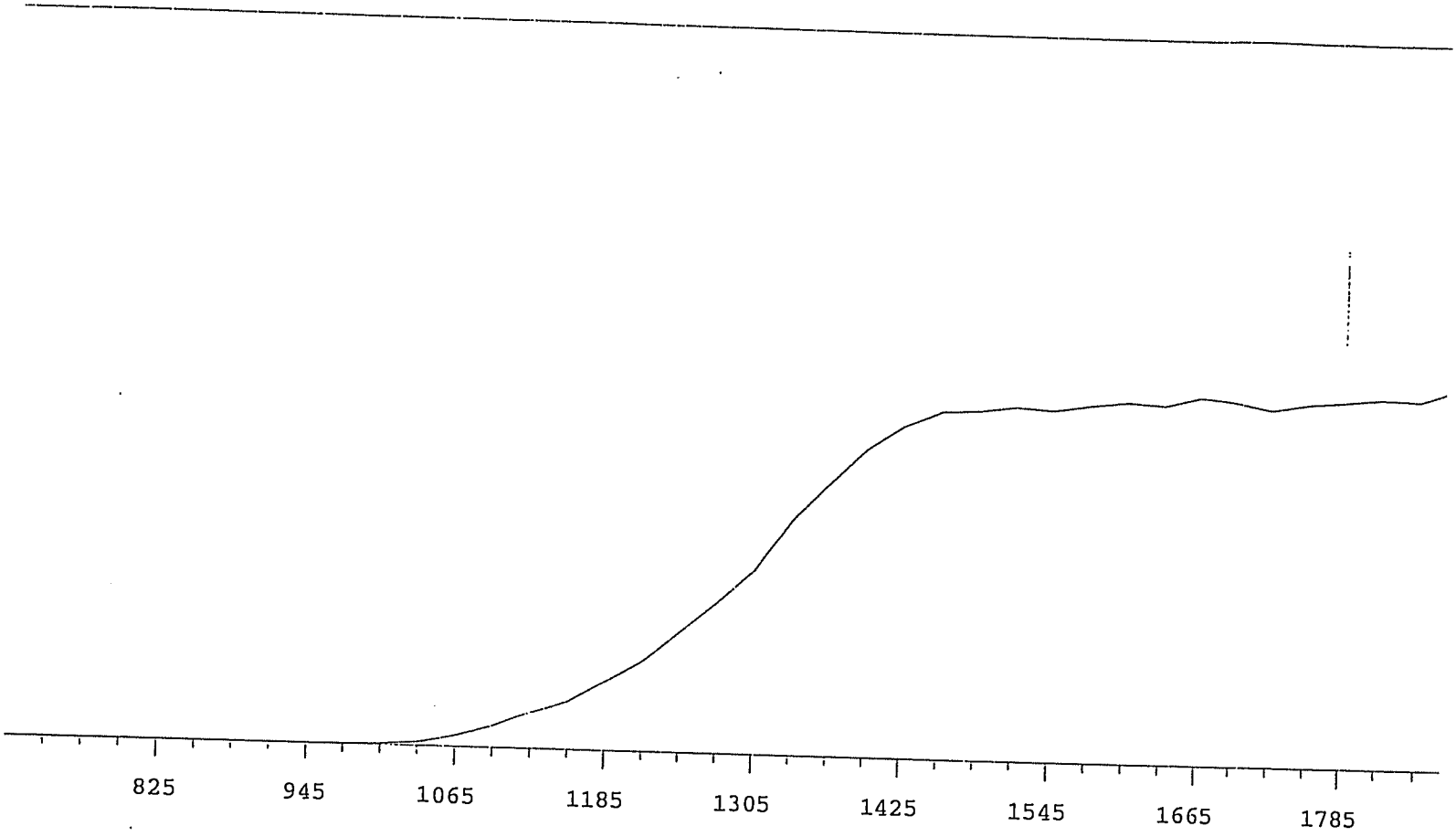
Plateau 7/1/09 Instrument 11 MPC 9604 Detector C 7/1/2009
Alpha Volts: 1515 Beta Volts: 1515



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	

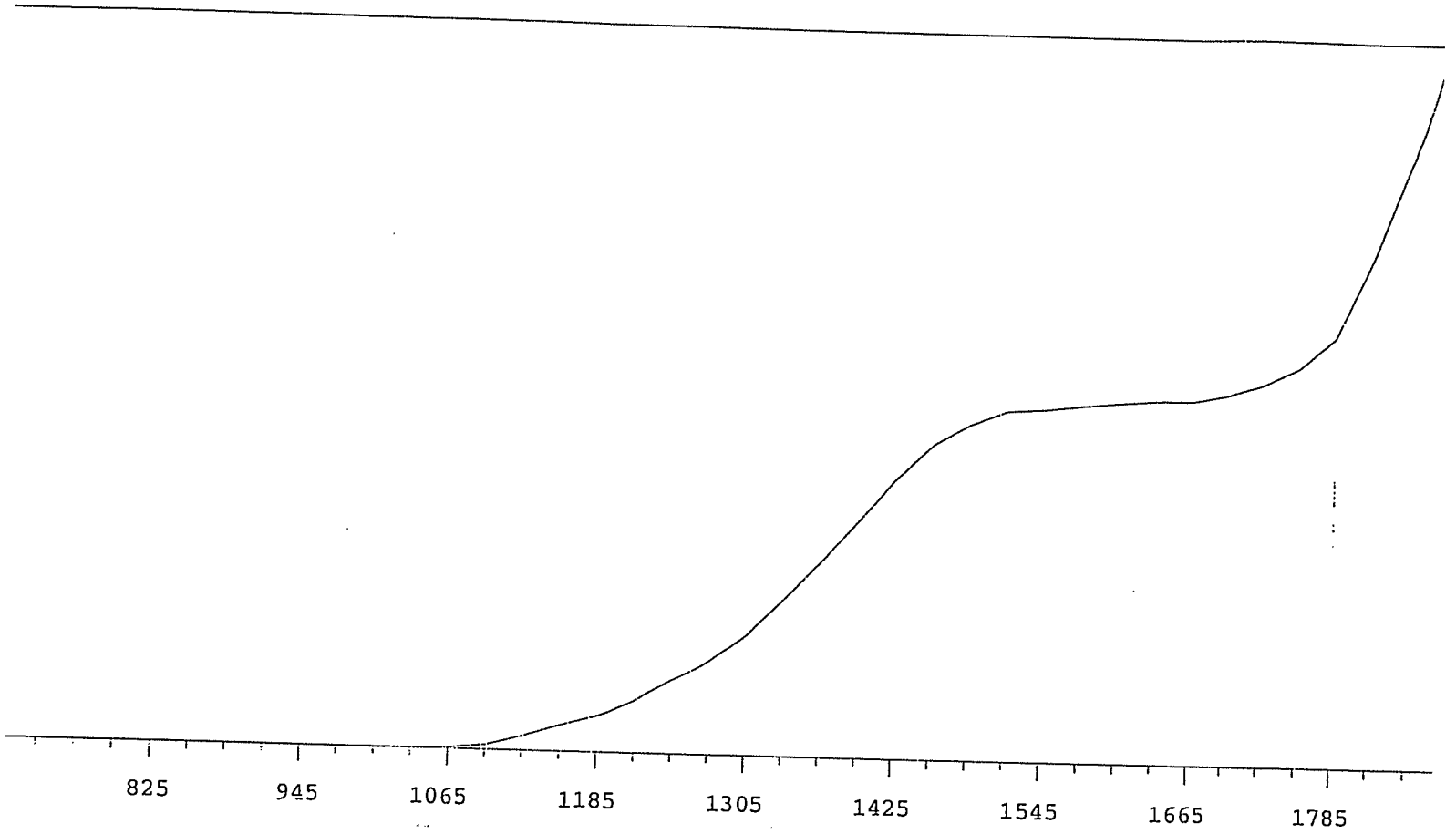
Plateau 7/1/09 Instrument 11 MPC 9604 Detector D 7/1/2009
Alpha Volts: 1515 Beta Volts: 1515



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	

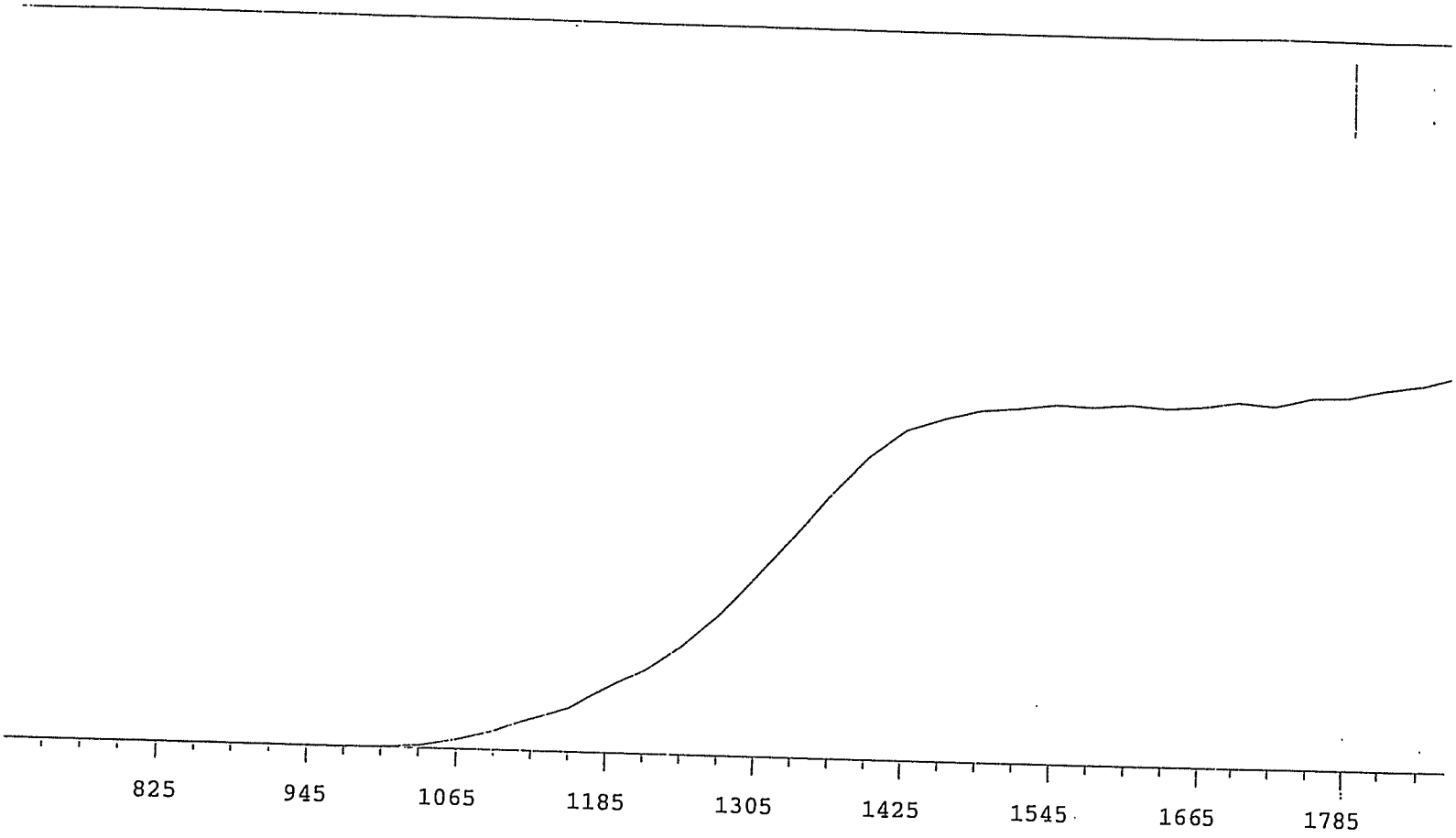
Plateau 7/1/09 Instrument 12 MPC 9604 Detector A 7/1/2009
Alpha Volts: 705 Beta Volts: 1515



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

VOLTS	COUNTS	%/100 Volts
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	

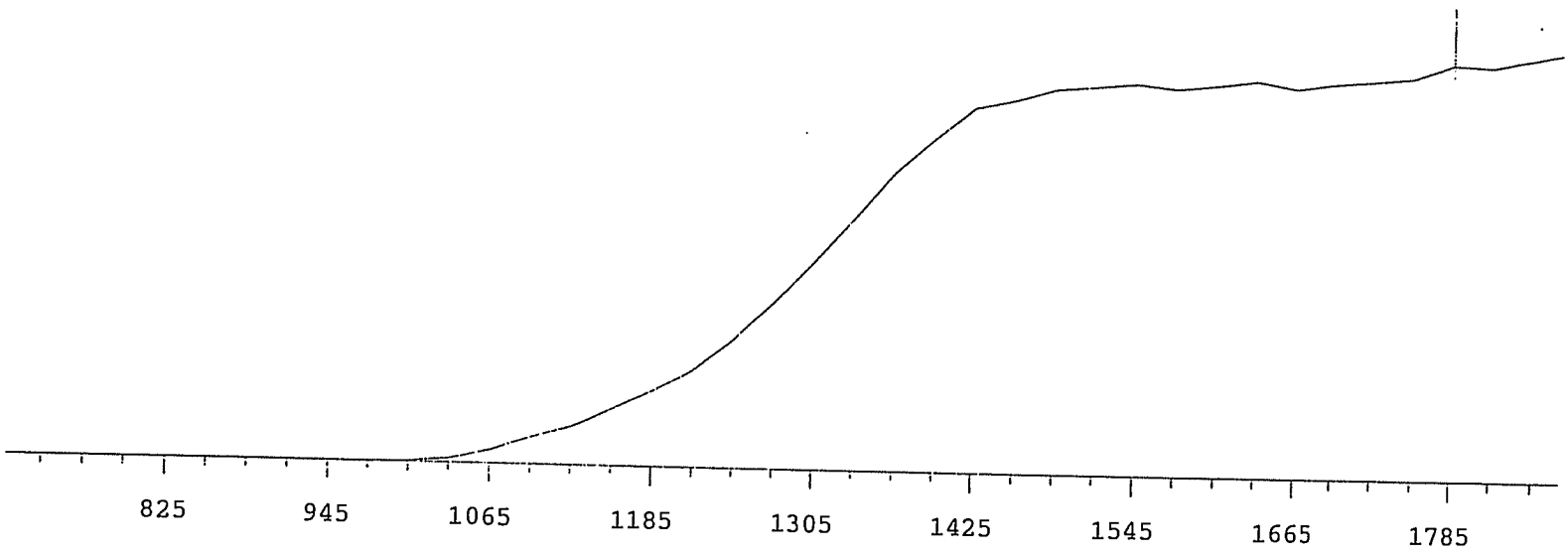
Plateau 7/1/09 Instrument 12 MPC 9604 Detector B 7/1/2009
Alpha Volts: 705 Beta Volts: 1515



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	

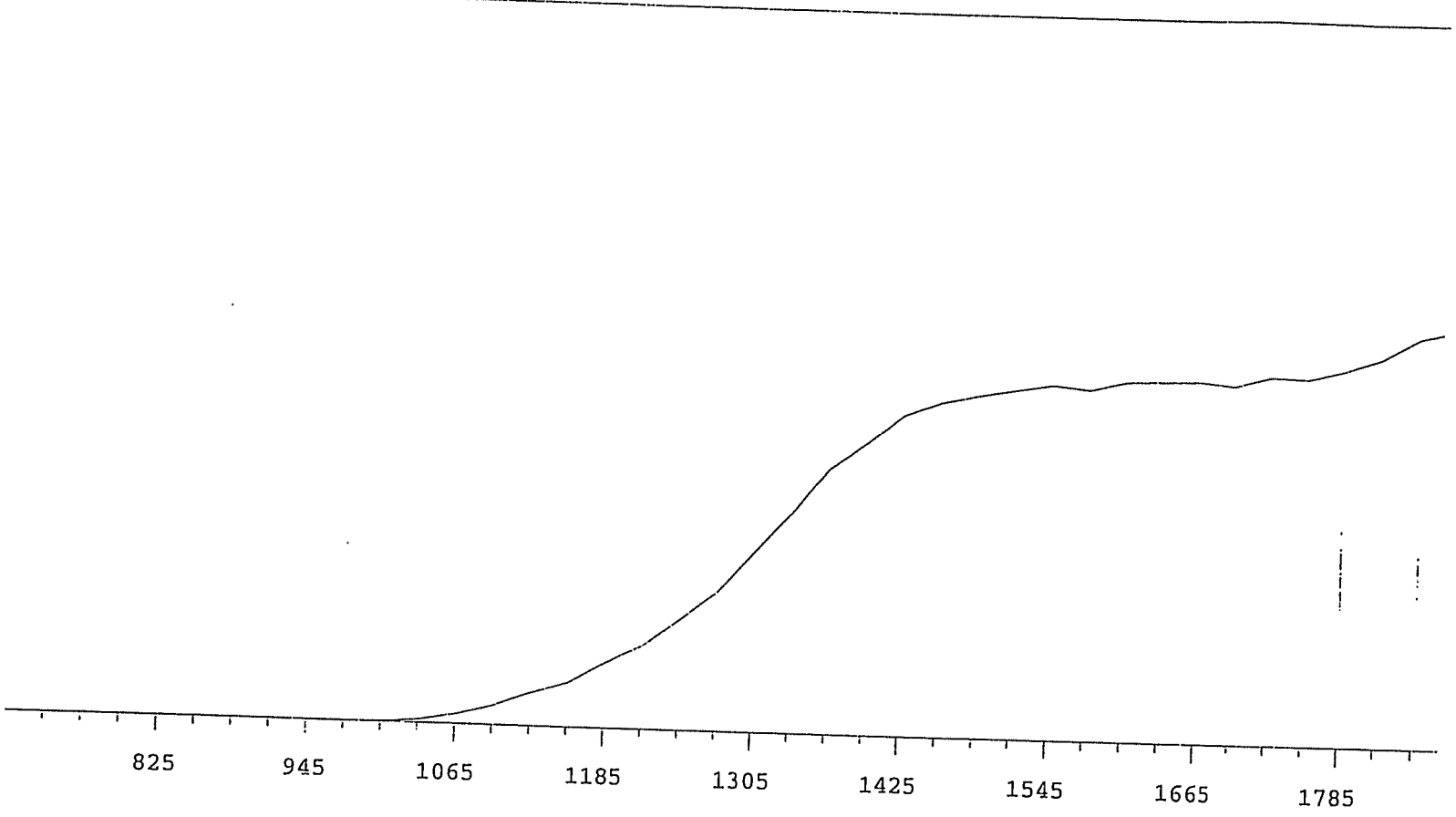
Plateau 7/1/09 Instrument 12 MPC 9604 Detector C 7/1/2009
Alpha Volts: 705 Beta Volts: 1515



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	

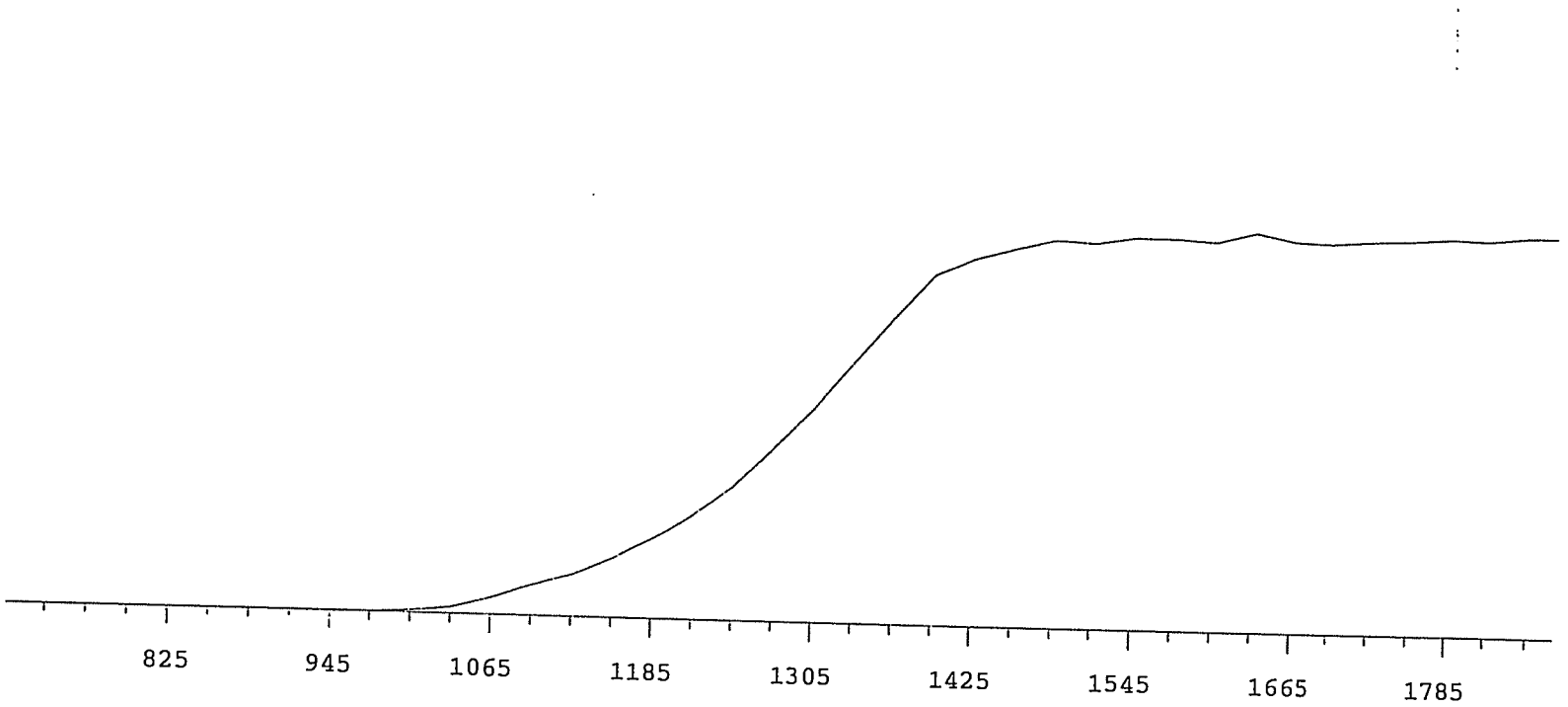
Plateau 7/1/09 Instrument 12 MPC 9604 Detector D 7/1/2009
Alpha Volts: 705 Beta Volts: 1515



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

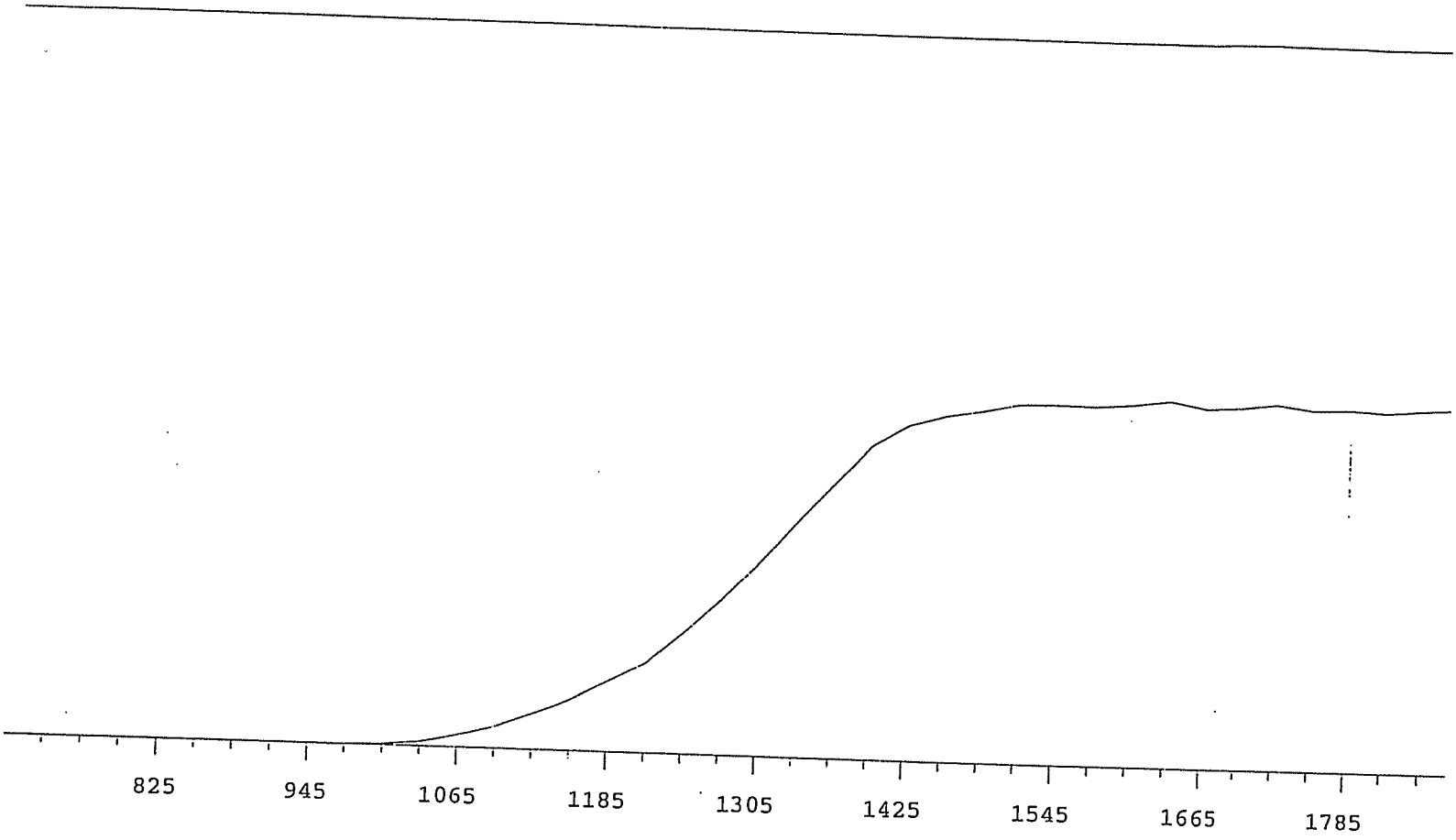
VOLTS	COUNTS	%/100 Volts
1305	9144	+69.92
1335	11120	+58.43
1365	13399	+45.40
1395	14711	+32.57
1425	16134	+20.69
1455	16805	+13.46
1485	17209	+7.90
1515	17500	+4.31
1545	17812	+3.48
1575	17629	+2.80
1605	18066	+2.23
1635	18122	+1.44
1665	18166	+1.20
1695	17967	+1.60
1725	18469	+3.41
1755	18409	+6.35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

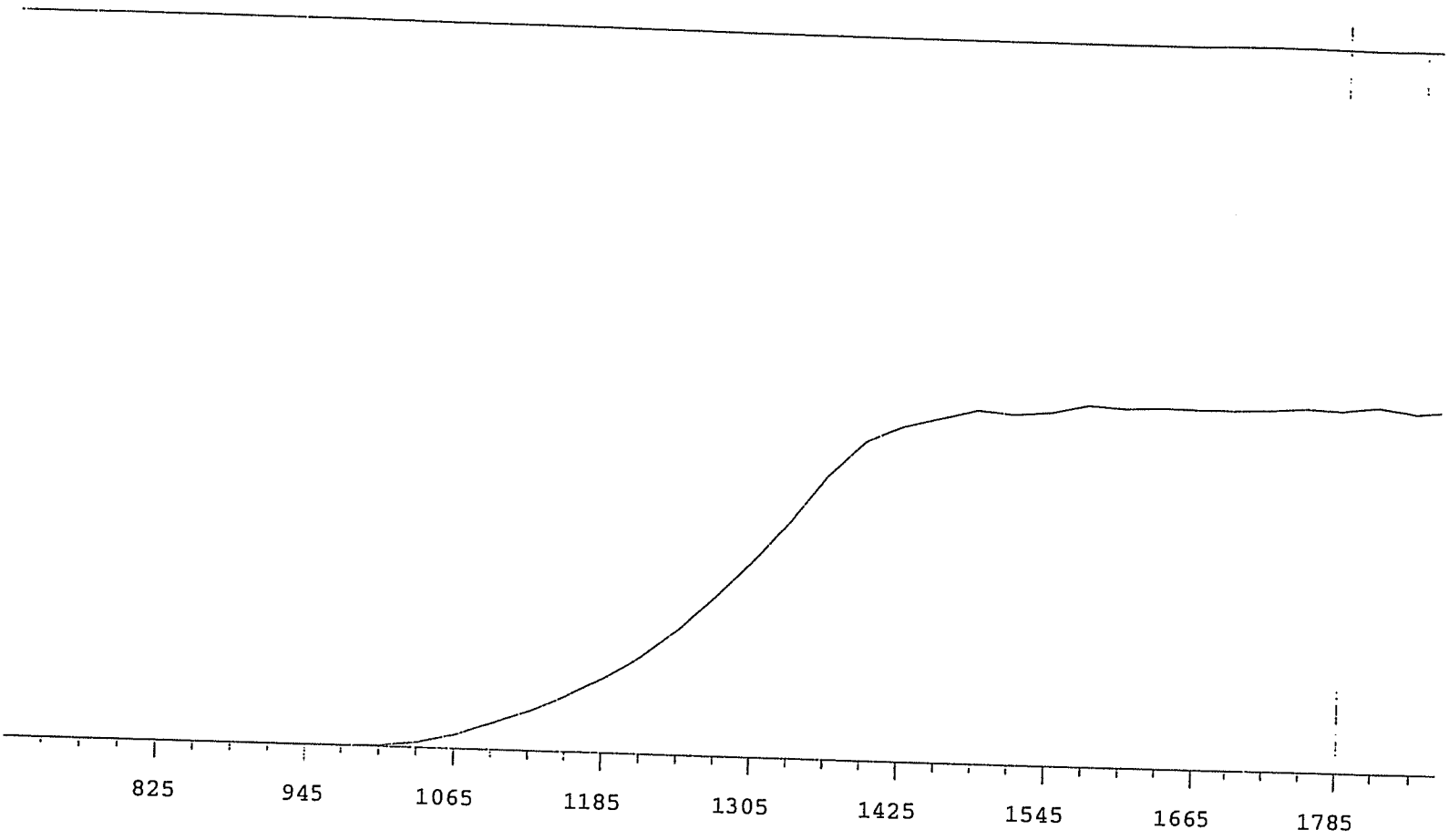
Plateau 7/1/09 Instrument 13 MPC 9604 Detector B 7/1/2009
Alpha Volts: 705 Beta Volts: 1515



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	

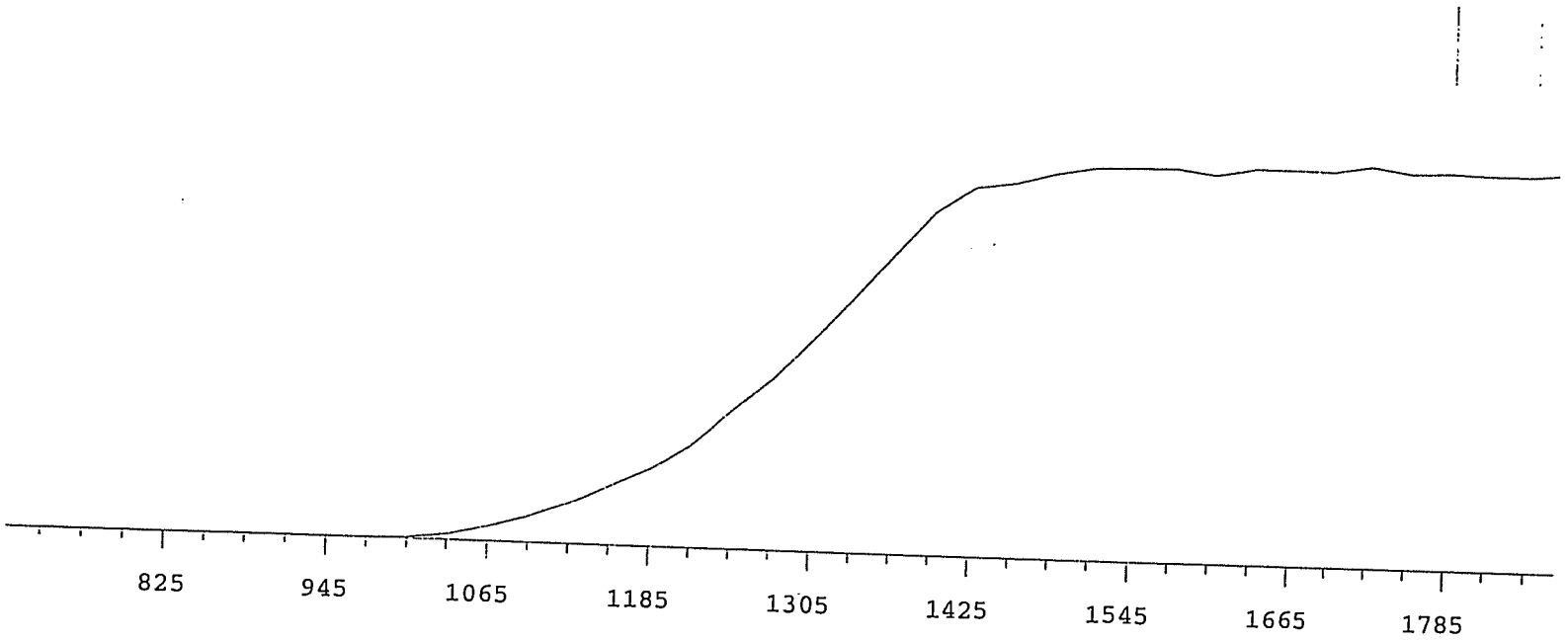
Plateau 7/1/09 Instrument 13 MPC 9604 Detector C 7/1/2009
Alpha Volts: 705 Beta Volts: 1515



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

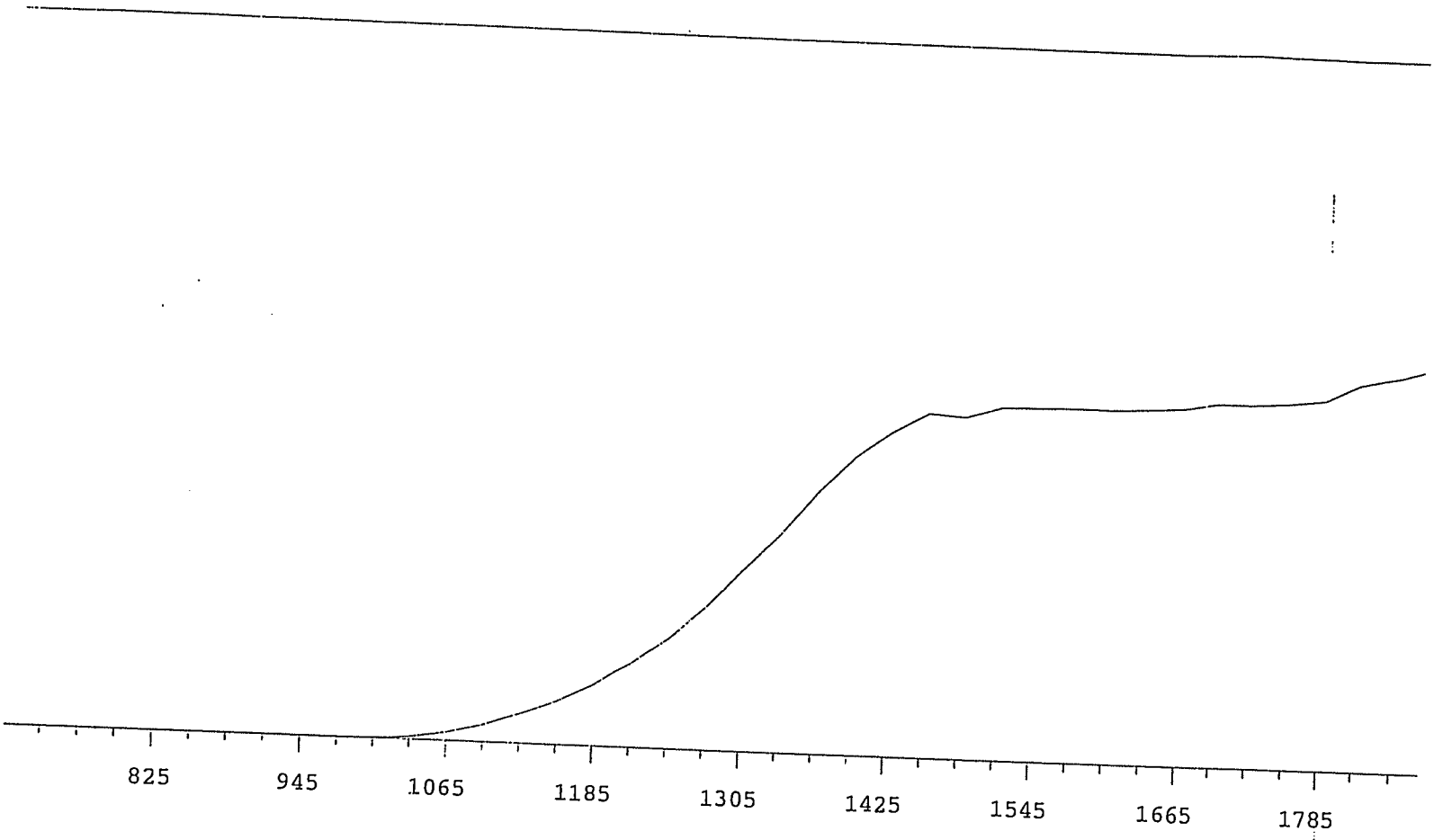


VOLTS	COUNTS	%/100 Volts
705	1	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	0	>100
975	9	>100
1005	58	>100
1035	228	>100
1065	544	>100
1095	936	>100
1125	1468	>100
1155	2110	>100
1185	2770	+94.71
1215	3670	+85.91
1245	4937	+79.46
1275	6066	+70.79

VOLTS	COUNTS	%/100 Volts
1305	7524	+61.93
1335	9002	+55.36
1365	10542	+44.70
1395	12064	+31.21
1425	12981	+19.20
1455	13192	+10.41
1485	13570	+5.93
1515	13820	+4.08
1545	13866	+0.75
1575	13880	+0.21
1605	13695	+0.59
1635	13950	+0.77
1665	13954	+1.92
1695	13911	+0.19
1725	14116	+0.02
1755	13908	-0.24
1785	13960	-0.81
1815	13939	+0.71
1845	13931	
1875	14071	

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

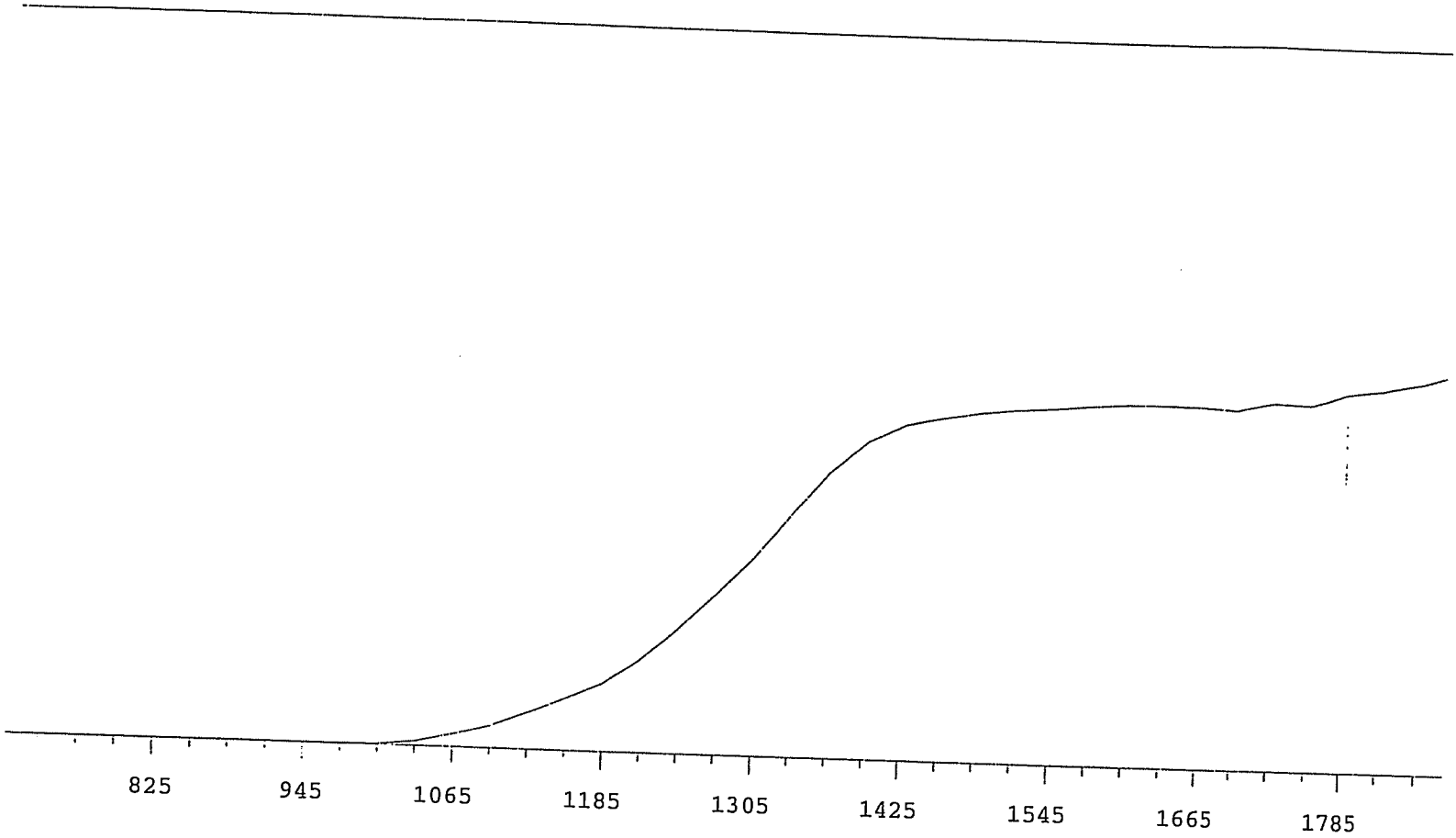
Alpha Volts: 705 Beta Volts: 1515



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	

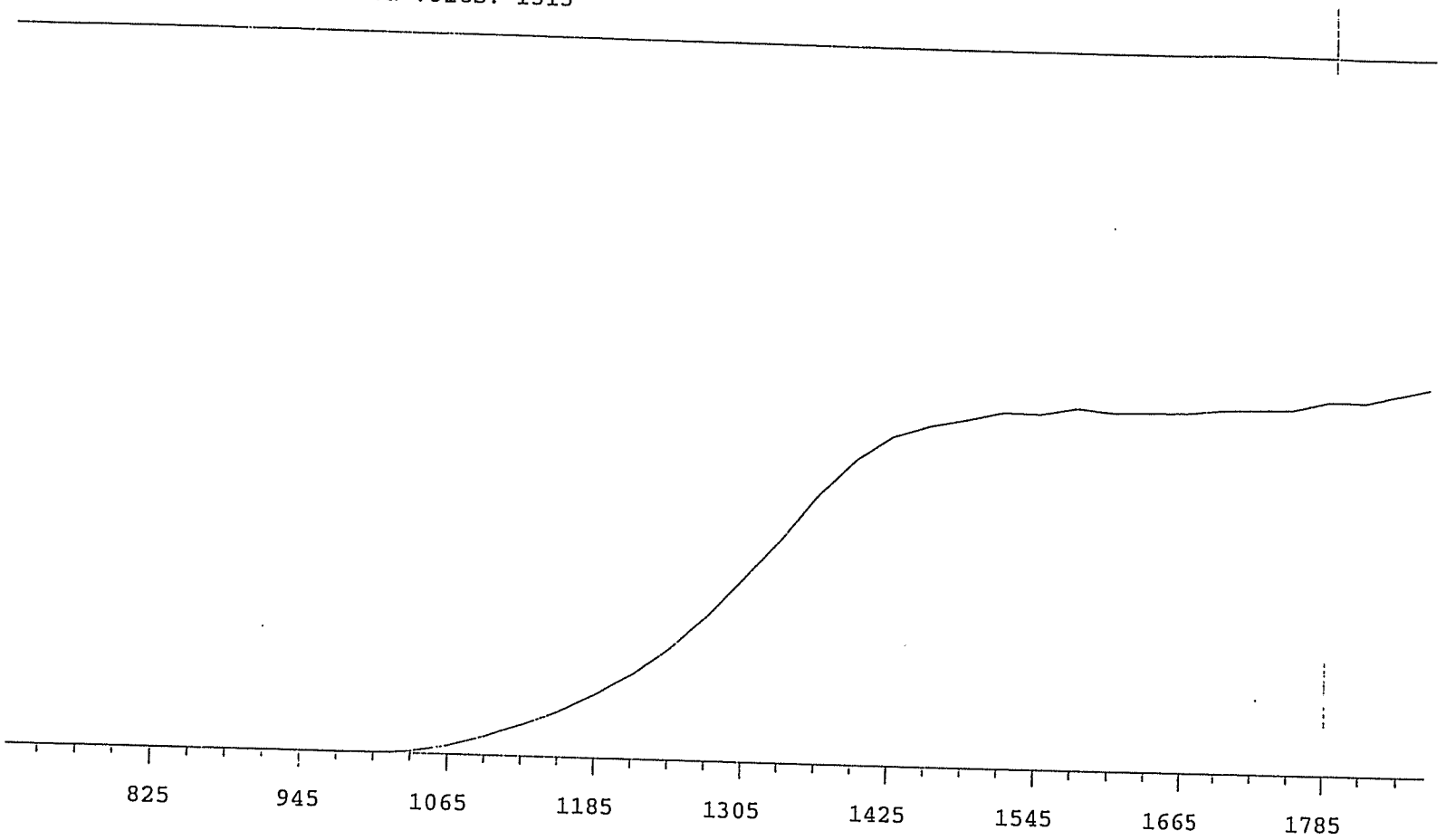
Plateau 7/1/09 Instrument 14 MPC 9604 Detector B 7/1/2009
Alpha Volts: 705 Beta Volts: 1515



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	

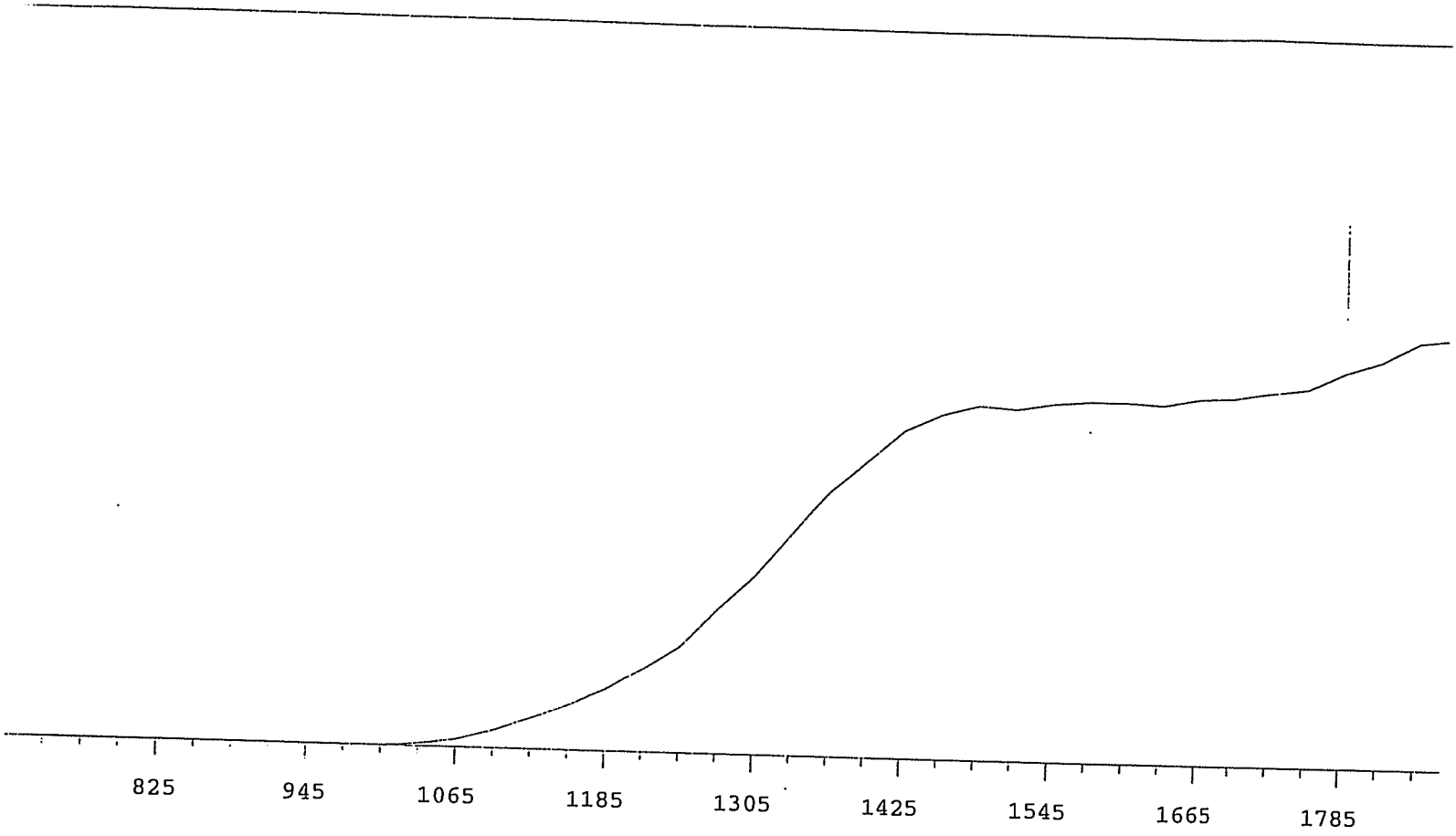
Plateau 7/1/09 Instrument 14 MPC 9604 Detector C 7/1/2009
Alpha Volts: 705 Beta Volts: 1515



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	

Eckert & Ziegler
Analytics

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION
Standard Radionuclide Source

1105

75251-278

Th-230 5 mL Liquid in Flame Sealed Vial

This standard radionuclide source was prepared gravimetrically from a calibrated master solution. The master solution was calibrated by liquid scintillation counting.

Radionuclide purity and calibration were checked with germanium gamma-ray spectrometry and liquid scintillation counting. 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:	Th-230
ACTIVITY (Bq):	3.832 E4
HALF-LIFE:	7.538 E4 years
CALIBRATION DATE:	June 14, 2007 12:00 EST
RELATIVE EXPANDED UNCERTAINTY (k=2):	2.0%

Impurities: γ-impurities <0.1%, α-impurities <0.01%

5.09604 grams 0.5M HNO_3 solution.

P O NUMBER 2744RD, Item 3

SOURCE PREPARED BY: D Kressman for
M. D. Dimitrova, Radiochemist

Q A APPROVED:

RECEIVED 6/25/07

RC-S-045-146

Standard Traceability Log Rad

Source Material Info	
Parent Code:	1105
Prepared By:	Daniel Roy
Carrier Conc:	0.5M HNO3
Reference Date:	06/14/2007
Ampoule Mass (g):	5.09604 g
Uncertainty:	+/- 2 %
LogBook No:	RC-S-045-146

A Solution Material Info	
Isotope:	Thorium-230
Prepared By:	Daniel Roy
Prep Date:	07/23/2008
Verification Date:	01/09/2013
Expiration Date:	01/08/2014
Primary Code:	1105-A
Dilution(mL):	100 mL
Mass of Parent(g):	4.8933 g
Density(g/mL):	1.0137
Balance ID:	38080204

Calculations Converting parent activity to dpm/mL|dpm/g

(Mass of parent(g)) * (Parm Activity (Bq)) * (conversion dpm to Bq) / (Ampoule Mass(g) *(Dilution Vol)) = Parent Activity (dpm/mL)
(Mass of parent(g)) * (Parm Activity (Bq)) * (conversion dpm to Bq) / Density / (Ampoule Mass (g) * (Dilution Vol)) = Parent Activity (dpm/g)
(4.8933 g) * (38320 Bq) * (60 dpm/Bq) / (5.09604 g * 100 mL) = 22077.2901 dpm/mL
(4.8933 g) * (38320 Bq) * (60 dpm/Bq) / (1.0137 g/mL)/ (5.09604 g * 100 mL) = 21779.7999 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

Verification for Th-230 Standard 1105-A

v1.0.2

Instrument	Silver
Analyst	BF1
Verification Prep Date	1/8/2013

Standard Information	
Isotope	Th-230
Serial Number	1105-A
Isotope Halflife	7.5380E+04 Y
Reference Date	6/14/2007
Ref. Act. (DPM/mL)	22077.2901
Amount of Std. (mL)	0.1
Standard Prep Date	7/23/2008

Std #	Count Date	Quench Number	Gross cpm	Bkg cpm
1	1/9/2013	89.40	2285.68	46.20
2	1/9/2013	91.40	2290.23	46.20
3	1/9/2013	92.60	2305.98	46.20

Std #	Net cpm	Calculated Avg. Eff.	Standard dpm/mL	Measured dpm
1	2239.48	1.011815	22133.30	2213.33
2	2244.03	1.011815	22178.26	2217.83
3	2259.78	1.011815	22333.93	2233.39

	dpm/mL
Mean Value =	22215.16
Stdev =	105.2811441
Certificate Value* =	22076.2
Two sigma =	210.562
10 % of Mean =	2221.516
Rule A (Pass/Fail)	Pass
% Recovery	100.63%
Rule B (Pass/Fail)	Pass
Expiration Date	1/8/2014

Verification Rules

Rule A = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.

Rule B = The determined mean value shall be within 5% of the certificate value.

*** Certificate Value is decay corrected to Count Date.**

The analyst prepared three standard verification sources for Th-230 source 1105-A by transferring 0.1 mL portions of the standard into glass liquid scintillation vials. 10 mL of Ecoscint Ultra 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 10 mL of Ecoscint Ultra liquid scintillation cocktail. The standard verification vials and background source were dark adapted for at least two hours and counted on LSCSilver for Th-230 source standard verification. The Th-230 efficiency calibration which was used for verification calculations was performed on 1/9/2013 using Th-230 source 1242-A.

Standard results for each verification source was calculated as follows:

Source dpm/mL = (A - B)/(C)(D)

where:

A = Ver. source cpm,
B = BKG cpm,
C = System efficiency (cpm/dpm), and
D = volume used for standard verification.

RAD-M-001

1-11-13

Amanda L. Hehn
1/25/13

General Engineering Laboratories
GFC Calibration Source Preparation Sheet

Applicable SOP Number: GL-RAD-A-001

Isotope: Th-230

Date Standards Prepared: 8-29-11

Standard ID: 1105-A

Matrix of Planchett/Filter: 47 mm concentric ring SS planchette

Amount Used (g or (ml)): 2.0

Standard Activity (DPM/g or (mL)): 22077.2901

Residue/Carrier Agent: USGS Cal solution B

Reference Date: 6-14-07

Pipette ID Used: 10183301

Expiration Date: 6-22-13

Balance ID Used: 111302-1018

	Standard Number	Residue Volume(mL)	Initial Wt. (g)	Final Wt. (g)	Net Wt. (mg)
	T_1	0	7.5959	7.5969	1.0
	T_2	2.5	7.5548	7.5681	13.3
	T_3	5	7.5914	7.6154	24.0
	T_4	10	7.5645	7.6143	49.8
	T_5	12	7.5671	7.6140	46.9
	T_6	15	7.5697	7.6431	73.4
	T_7	20	7.5964	7.6813	84.9
	T_8	25	7.5722	7.6816	109.4
NL 11/27/12					

Prepared By: [signature] Date: 8-29-11

Reviewed By: [signature] Date: ~~10/4/12~~ NL 11/27/12

Nycomed Amersham plc
Amersham Laboratories

0133

NAMAS
CALIBRATION
No. 0146

ISSUED BY:	Nycomed Amersham plc Radiation & Radioactivity Calibration Laboratory Amersham Laboratories White Lion Road Amersham Buckinghamshire HP7 9LL	ISSUED FOR:	AEA Technology plc Isotrak Amersham Laboratories White Lion Road Amersham Buckinghamshire HP7 9LL

Description Principal radionuclide: Strontium-90

Product code: SIZ64
Solution number: S6/7/19

Measurement Reference time: 1200 GMT on 1 April 1996

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 by 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 W. F. Case

W F Case

Date of issue 11. May 1999

LC-S-023-0600

Nycomed Amersham

0133

UKAS ACCREDITED CALIBRATION LABORATORY No. 0146

Measurement

Reference time for solution number S6/7/19:	1200 GMT on 1 April 1996	
Radioactive concentration of strontium-90:	477.1	kilobecquerels per gram of solution
which is equivalent to:	12.89	microcuries per gram of solution
Mass of solution:	5.0669	grams
Total activity of strontium-90:	2.417	megabecquerels
which is equivalent to:	65.3	microcuries

Method of measurement used (see page 3 of the certificate): K

Calibration dates: 25 March 1996 to 27 March 1996

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.

Accuracy

Expanded uncertainty in the radioactive concentration quoted above: ± 0.80 %

Combined Type A uncertainty : ± 0.05 %

Combined Type B uncertainty : ± 0.40 %

Radionuclidic purity

The estimated activities of any radioactive impurities found by high-resolution gamma ray spectrometry, or in any other examination of the solution, are listed below expressed as percentages of the activity of the principal radionuclide at the reference time.

Other radionuclides 0.0005(3) %

Chemical composition

0.1 M HCl containing 100 micrograms of strontium and 100 micrograms of yttrium per ml.

Physical data

Recommended half life: 29.12 ± 0.24 years (1 year = 365.25 days)

Strontium-90: 100% beta particle emission.

Yttrium-90: 100% beta particle emission. Half life 64.1 ± 0.1 hours.

The activity of the yttrium-90 is equal to the activity of the strontium-90.

Remarks

This product meets the quality assurance requirements for achieving traceability to NIST as defined in ANSI N42.22-1995.

Tests made over a period of 2 years on standardised solutions of strontium-90 stored in glass ampoules have shown that loss of strontium-90 from solution is negligible other than by radioactive decay.

R(-5-073-000

UKAS ACCREDITED CALIBRATION LABORATORY No. 0146

Methods of measurement

The measurement techniques listed below are currently in use at Nycomed Amersham for the absolute standardisation of radioactive solutions. The methods used for this standardisation are indicated on page 2 of the certificate.

Using a gas flow proportional counter

A	4 pi beta counting
B	4 pi alpha counting
C	4 pi internal conversion electron counting
D	4 pi coincidence counting
E	4 pi anticoincidence counting
F	4 pi coincidence and anticoincidence counting

Using a liquid scintillation counter

G	4 pi coincidence counting
H	4 pi anticoincidence counting
J	4 pi coincidence and anticoincidence counting
K	4 pi efficiency tracing

SI unit of radioactivity

The S.I. unit of radioactivity is the becquerel

1 becquerel (Bq) = 1 nuclear transformation per second, therefore
1 curie (Ci) = 3.7×10^{10} becquerels exactly

Useful conversion factors are:

1 microcurie (μCi)	=	3.7×10^{4} Bq	=	37 kilobecquerels (kBq)
1 millicurie (mCi)	=	3.7×10^{7} Bq	=	37 megabecquerels (MBq)
1 kilobecquerel (kBq)	=	27.027 nanocuries (nCi)		
1 megabecquerel (MBq)	=	27.027 microcuries (μCi)		

RC-5-023-060B

Standard Traceability Log Rad

Source Material Info	
Parent Code:	0133
Prepared By:	Joe Davis
Carrier Conc:	0.1 M HCL
Reference Date:	04/01/1996
Ampoule Mass (g):	5.0669 g
Uncertainty:	+/- .8 %
LogBook No:	RC S 023 060

A Solution Material Info	
Isotope:	Strontium-90
Prepared By:	Aadli Abdul-Kareem
Prep Date:	09/25/1999
Verification Date:	08/13/2013
Expiration Date:	08/13/2014
Primary Code:	0133-A
Dilution(mL):	100 mL
Mass of Parent(g):	4.8374 g
Density(g/mL):	1.0041
Balance ID:	38080204

Calculations Converting parent activity to dpm/mL|dpm/g

(Mass of parent(g)) * (Parm Activity (uCi/g)) * (conversion dpm to uCi) / (Dilution Vol) = Parent Activity (dpm/mL)
(Mass of parent(g)) * (Parm Activity (uCi/g)) * (conversion dpm to uCi) / Density (g/mL)/ (Dilution Vol) = Parent Activity (dpm/g)
(4.8374 g) * (12.89 uCi/g) * (2220000 dpm/uCi) / (100 mL) = 1384260.7092 dpm/mL
(4.8374 g) * (12.89 uCi/g) * (2220000 dpm/uCi) / (1.0041 g/mL) / (100 mL) = 1378622.1492 dpm/g

Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
08/13/2013	Christina Kimball	.0050588	100	0133-BB	69.7424 dpm/mL	08/13/2013	08/13/2014
04/18/2003	Lonnie Morris	.3247	1000	0133-M	447.6386 dpm/mL	04/16/2004	04/16/2005
05/25/2004	Amanda Fehr	.361	1000	0133-N	497.6826 dpm/mL	05/24/2005	05/24/2006
07/22/2005	Brenda Burke	.098	500	0133-O	270.2099 dpm/mL	09/21/2006	09/21/2007
08/15/2005	Amanda Fehr	.1582	500	0133-P	436.196 dpm/mL	08/15/2005	08/15/2006
12/20/2005	Amanda Fehr	.3248	1000	0133-Q	447.78 dpm/mL	12/20/2005	12/20/2006
10/27/2006	Julie Strock	.000924958	100	0133-R	12.7516809 dpm/mL	10/27/2006	10/27/2007
11/17/2006	Amanda Fehr	.289	1000	0133-S	398.42 dpm/mL	11/17/2006	11/17/2007

11/17/2006	Angela Johnson	2.0079	100	0133-T	27681.35 dpm/mL	09/27/2012	09/27/2013
12/19/2006	Amanda Fehr	.35	1000	0133-U	482.52 dpm/mL	07/26/2007	12/19/2007
05/08/2007	Julie Strock	.010019421	100	0133-V	138.202 dpm/mL	04/29/2008	04/29/2009
07/11/2007	Daniel Roy	.3527	1000	0133-W	486.24 dpm/ml	07/11/2008	07/11/2009
04/29/2009	Tina Schoneman	.0100581	100	0133-X	138.666 dpm/mL	04/29/2010	04/29/2011
04/18/2011	Christina Kimball	.010141	100	0133-Y	139.8124 dpm/mL	04/11/2012	04/11/2013
07/31/2012	Christina Kimball	.01013	100	0133-Z	139.6486 dpm/mL	07/26/2013	07/26/2014

GEL Laboratories LLC
Version 1.0 9/18/2000

Verification for Sr-90 Standard 0133-T

v1.0.1

Instrument	Red
Analyst	BXF1
Verification Prep Date	9/27/2012

Standard Information	
Isotope	Sr-90
Serial Number	0133-T
Isotope Halflife	28.9000 Y
Reference Date	4/1/1996
Ref. Act. (DPM/mL)	27681.35
Amount of Std. (mL)	1.0
Standard Prep Date	9/27/2012

Std #	Count Date	Quench Number	Gross cpm	Bkg cpm
1	9/27/2012	97.90	38626.66	37.60
2	9/27/2012	97.70	38200.00	37.60
3	9/27/2012	97.80	38330.00	37.60

Std #	Net cpm	Calculated Avg. Eff.	Standard dpm/mL	Measured dpm
1	38589.06	2.042732	18890.91	18890.91
2	38162.40	2.042732	18682.04	18682.04
3	38292.40	2.042732	18745.68	18745.68

	dpm/mL
Mean Value =	18772.88
Stdev =	107.0564993
Certificate Value* =	18639.0
Two sigma =	214.113
10 % of Mean =	1877.288
Rule A (Pass/Fail)	Pass
% Recovery	100.72%
Rule B (Pass/Fail)	Pass
Expiration Date	9/27/2013

Verification Rules

Rule A = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.

Rule B = The determined mean value shall be within 5% of the certificate value.

*** Certificate Value is decay corrected to Count Date.**

The analyst prepared three standard verification sources for Sr-90 source 0133-T by transferring 1 mL portions of the standard into glass liquid scintillation vials. 10 mL of Ecoscint Ultra 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 10 mL of Ecoscint Ultra liquid scintillation cocktail. The standard verification vials and background source were dark adapted for at least two hours and counted on LSCRed for Sr-90 source standard verification. The Sr-90 efficiency calibration which was used for verification calculations was performed on 9/27/2012 using Sr-90 source 1243-A.

Standard results for each verification source was calculated as follows:

Source dpm/mL = (A - B)/(C)(D)

where:

A = Ver. source cpm,
B = BKG cpm,
C = System efficiency (cpm/dpm), and
D = volume used for standard verification.

RAD-M-001

Amanda L. Fehr 11/2/12

General Engineering Laboratories
GFC ~~Verification~~ Source Preparation Sheet
Calibration

Applicable SOP Number: GL-RAD-A-001

Isotope: Sr-90

Date Standards Prepared: 8-29-11

Standard ID: 0133-T

Matrix of Vial/Planchett: 47 mm Concentric Ring SS planchette

Amount Used (g or (ml)): 0.5

Standard Activity (DPM/g or (mL)): 27681.35

Residue/Carrier Agent: USGS Cal Solution B

Reference Date: 4-1-96

Pipette ID Used: 351921

Expiration Date: 9-27-13

Balance ID Used: 1113621018

	Standard Number	Residue Volume(mL)	Initial Wt. (g)	Final Wt. (g)	Net Wt. (mg)
	S_1	0.0	7.6097	7.6093	0
	S_2	2.5	7.5695	7.5823	12.8
	S_3	5	7.5778	7.6055	27.7
	S_4	10	7.5837	7.6345	50.8
	S_5	12	7.5925	7.6533	60.8
	S_6	15	7.5592	7.6324	73.2
	S_7	20	7.5925	7.6909	98.4
	S_8	25	7.5363	7.6521	115.8
NL 11/27/12					

Prepared By: [signature] Date: 8-29-11

Reviewed By: [signature] Date: ~~10/1/12~~ NL 11/27/12

*NL 9/27/13

Eckert & Ziegler
Isotope Products

24937 Avenue Tibbitts
Valencia, California 91355

Tel 661·309·1010
Fax 661·257·8303

1673

CERTIFICATE OF CALIBRATION
ALPHA STANDARD SOLUTION

Radionuclide: Po-210
Half-life: 138.376 ± 0.002 days
Catalog No.: 7310
Source No.: 1686-39

Customer: GENERAL ENGINEERING LABS.
P.O. No.: GEL1304374
Reference Date: 1-Aug-13 12:00 PST
Contained Radioactivity: 1.050 µCi 38.85 kBq

Physical Description:

A. Mass of solution: 5.19741 g in 5 mL flame-sealed ampoule
B. Chemical form: $PoCl_4$ in 2M HCl
C. Carrier content: None
D. Density: 1.033 g/mL @ 20°C

Radioimpurities:

None detected

Radionuclide Concentration: 0.2020 µCi/g, 7.474 kBq/g

Method of Calibration:

This source was prepared from a weighed aliquot of solution whose activity in µCi/g was determined using a liquid scintillation counter.

Uncertainty of Measurement:

A. Type A (random) uncertainty:	± 0.5 %
B. Type B (systematic) uncertainty:	± 3.0 %
C. Uncertainty in aliquot weighing:	± 0.0 %
D. Total uncertainty at the 99% confidence level:	± 3.0 %

Notes:

- See reverse side for leak test(s) performed on this source.
- EZIP participates in a NIST measurement assurance program to establish and maintain implicit traceability for a number of nuclides, based on the blind assay (and later NIST certification) of Standard Reference Materials (as in NRC Regulatory Guide 4.15).
- Nuclear data was taken from NCRP Report No. 58, 1985.
- This source has a working life of 9 months.

RECEIVED 7/16/13

Daniel James Van Dalsem
Quality Control

1-Jul-13
Date

EZIP Ref. No.: 1686-39

ISO 9001 CERTIFIED

RC-S-065-02

Standard Traceability Log Rad

Source Material Info	
Parent Code:	1673
Prepared By:	Gregory Ramsay
Carrier Conc:	2M HCl
Reference Date:	08/01/2013
Ampoule Mass (g):	5.19741 g
Uncertainty:	+/- 1.172 %
LogBook No:	RC-S-065-102

A Solution Material Info	
Isotope:	Polonium-210
Prepared By:	Tim Chandler
Prep Date:	07/29/2013
Verification Date:	08/26/2013
Expiration Date:	08/26/2014
Primary Code:	1673-A
Dilution(mL):	100 mL
Mass of Parent(g):	5.0441 g
Density(g/mL):	1.0315
Balance ID:	38080204

Calculations Converting parent activity to dpm/mL|dpm/g

(Mass of parent(g)) * (Parm Activity (kbq)) * (conversion dpm to kbq) / (Ampoule Mass(g) *(Dilution Vol)) = Parent Activity (dpm/mL)
(Mass of parent(g)) * (Parm Activity (kbq)) * (conversion dpm to kbq) / Density / (Ampoule Mass (g) * (Dilution Vol)) = Parent Activity (dpm/g)
(5.0441 g) * (38.85 kbq) * (60000 dpm/kbq) / (5.19741 g * 100 mL) = 22622.4160 dpm/mL
(5.0441 g) * (38.85 kbq) * (60000 dpm/kbq) / (1.0315 g/mL)/ (5.19741 g * 100 mL) = 21932.2093 dpm/g

Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
07/31/2013	Tim Chandler	2.8134	100	1673-B	617.040778 dpm/mL	08/07/2013	08/07/2014
08/21/2013	Christina Kimball	.3091	100	1673-C	67.79246 dpm/mL	08/26/2013	08/26/2014

GEL Laboratories LLC
Version 1.0 9/18/2000

Verification for Po-210 Standard 1673-A

v1.0

Analyst	TC1
Verification Prep Date	7/30/2013

Tracer Information	
Isotope	Po-209
Serial Number	1423-F
Amount of Std. (mL)	0.1
Expiration Date	8/2/2013

Standard Information	
Isotope	Po-210
Serial Number	1673-A
Isotope Halflife	138.3800 D
Reference Date	8/1/2013
Ref. Act. (dpm/mL)	22622.4159
Amount of Std. (mL)	0.0001
Standard Prep Date	7/29/2013

Std #	Count Date	Activity pCi	Standard dpm/mL
1	7/30/2013	1.040	23088.00
2	7/30/2013	1.120	24864.00
3	7/30/2013	1.020	22644.00
	Mean Value =	1.060	23532.000
	Stdev =	0.052915026	1174.713582

	pCi	dpm/mL
Certificate Value* =	1.0293	22850.1868
Two sigma =	0.1058	2349.4272
10 % of Mean =	0.1060	2353.2000
Rule A (Pass/Fail)	Pass	Pass
% Recovery	102.98%	102.98%
Rule B (Pass/Fail)	Pass	Pass
Expiration Date	7/30/2014	

Verification Rules

Rule A = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.

Rule B = The determined mean value shall be within 5% of the certificate value.

*** Certificate Value is decay corrected to Verification Prep Date.**

The analyst prepared three standard verification sources for Po-210 standard 1673-A using 0.0001 mL for each source. Each standard was combined with 0.1 mL of Po-209 standard 1423-F and was diluted in a plastic cup containing 2 grams of ascorbic acid and 75 mL of 1M HCl. The polonium was plated onto a nickel disc by spinning with a stir bar in the solution for 4 hours. The samples were prepared for counting following routine procedures for alpha spectroscopy source preparation. Each source was counted using routine alpha spec procedures. DPM values for Po-210 were calculated by comparison to Po-209 certified values.

7/31/13

7-31-13

Alpha Spectroscopy Software Version 3.3.16
effective date: 12-Jun-2013

GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

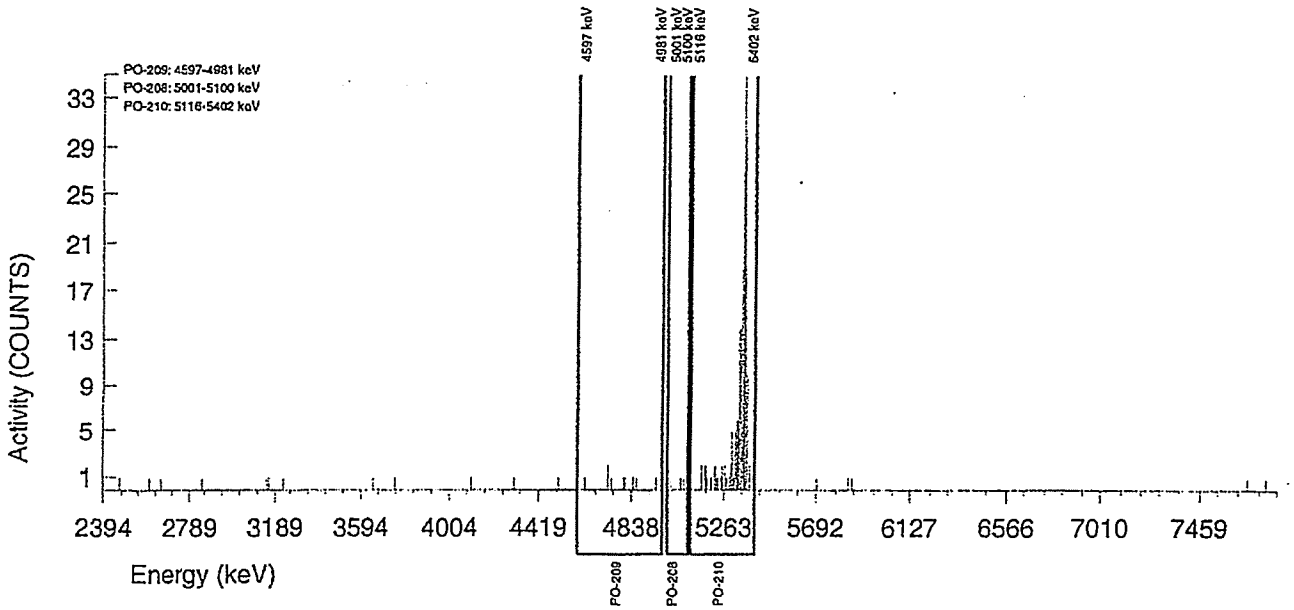
Instrument SOP: GL-RAD-I-009
Analytical SOP:

BATCH NUMBER : 1318659	CHAMBER : 069	LIB FILE : PO
SAMPLE ID : S1202918178_PO	DETECTOR S/N : 78795	BKG FILE : B069.CNF;1481
SAMPLE QTY : 1.000 L +/-0.500 %	AVERAGE %EFFICIENCY : 33.2166	BKG DATE : 27-Jul-2013
SAMPLE DATE : 30-Jul-2013 00:00:00	AVERAGE %EFF ERROR : 0.6386	BKG LIVE TIME(SEC) : 60000.00
ANALYST : TC1	COUNT DATE : 30-Jul-2013 17:47:46	EFF FILE : W069.CNF;410
% YIELD : 0.8 +/-48.240 %	ELAPSED LIVE TIME(SEC) : 30300.00	CAL DATE : 08-Jul-2013

TRACER
ID : 1423-F
NUCLIDE : PO-209
NOMINAL : 5.2508E+00 dpm
RESULTS : 4.1720E-02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/L	1.96-sigma TPU pCi/L	MDA pCi/L	Lc pCi/L	1.96-sigma cnt Unc pCi/L
PO-208	5080.00	5035.21	0.000	5.000	5.000	0.000	0.0000	100.000	1.69E+00	2.30E+00	1.01E+00	0.00E+00	1.66E+00
PO-209	4882.00	4792.13	4.908	9.000	6.980	2.020	1.4213	99.740	2.37E+00	3.16E+00	2.96E+00	9.72E-01	2.23E+00
PO-210	5304.38	5333.72	21.922	220.000	219.495	0.505	0.7106	100.000	7.45E+01	7.12E+01	1.99E+00	4.87E-01	9.90E+00



TDC
7-31-13

Alpha Spectroscopy Software Version 3.3.16
effective date: 12-Jun-2013

GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

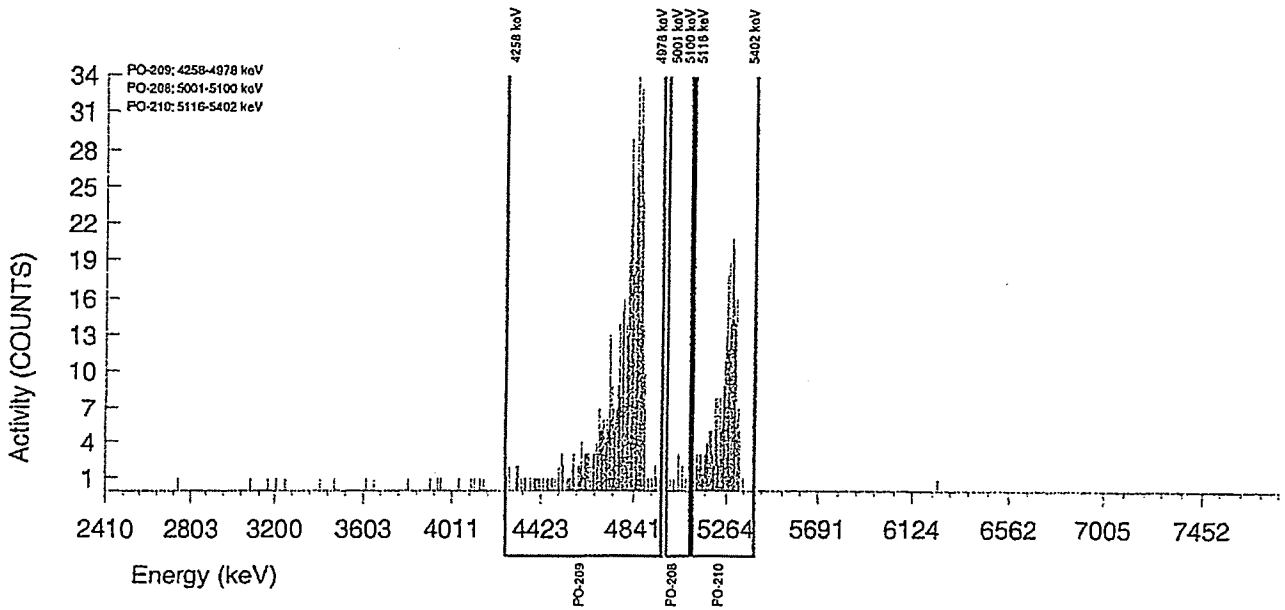
Instrument SOP: GL-RAD-I-009
Analytical SOP:

BATCH NUMBER : 1318659	CHAMBER : 070	LIB FILE : PO
SAMPLE ID : S1202918179_PO	DETECTOR S/N : 78262	BKG FILE : B070.CNF;1483
SAMPLE QTY : 1.000 L +/-0.500 %	AVERAGE %EFFICIENCY : 34.5949	BKG DATE : 27-Jul-2013
SAMPLE DATE : 30-Jul-2013 00:00:00	AVERAGE %EFF ERROR : 0.6645	BKG LIVE TIME(SEC) : 60000.00
ANALYST : TC1	COUNT DATE : 30-Jul-2013 17:47:46	EFF FILE : W070.CNF;400
% YIELD : 73.2 +/-5.273 %	ELAPSED LIVE TIME(SEC) : 30300.00	CAL DATE : 08-Jul-2013

TRACER	LCS
ID : 1423-F	ID
NUCLIDE : PO-209	NUCLIDE
NOMINAL : 5.2508E+00 dpm	NOMINAL (pCi/L)
RESULTS : 3.8451E+00 dpm	% RECOVERY

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/L	1.96-sigma TPU pCi/L	MDA pCi/L	Lc pCi/L	1.96-sigma cnt Unc pCi/L
PO-208	5080.00	5057.08	0.000	11.000	11.000	0.000	0.0000	100.000	3.88E-02	2.45E-02	1.06E-02	0.00E+00	2.42E-02
PO-209	4882.00	4787.03	63.543	671.000	669.990	1.010	1.0050	99.740	2.37E+00	3.17E-01	2.49E-02	7.16E-03	1.79E-01
PO-210	5304.38	5260.28	52.655	296.000	294.990	1.010	1.0050	100.000	1.04E+00	1.66E-01	2.50E-02	7.17E-03	1.20E-01



TC
7-31-13

Alpha Spectroscopy Software Version 3.3.16
effective date: 12-Jun-2013

GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

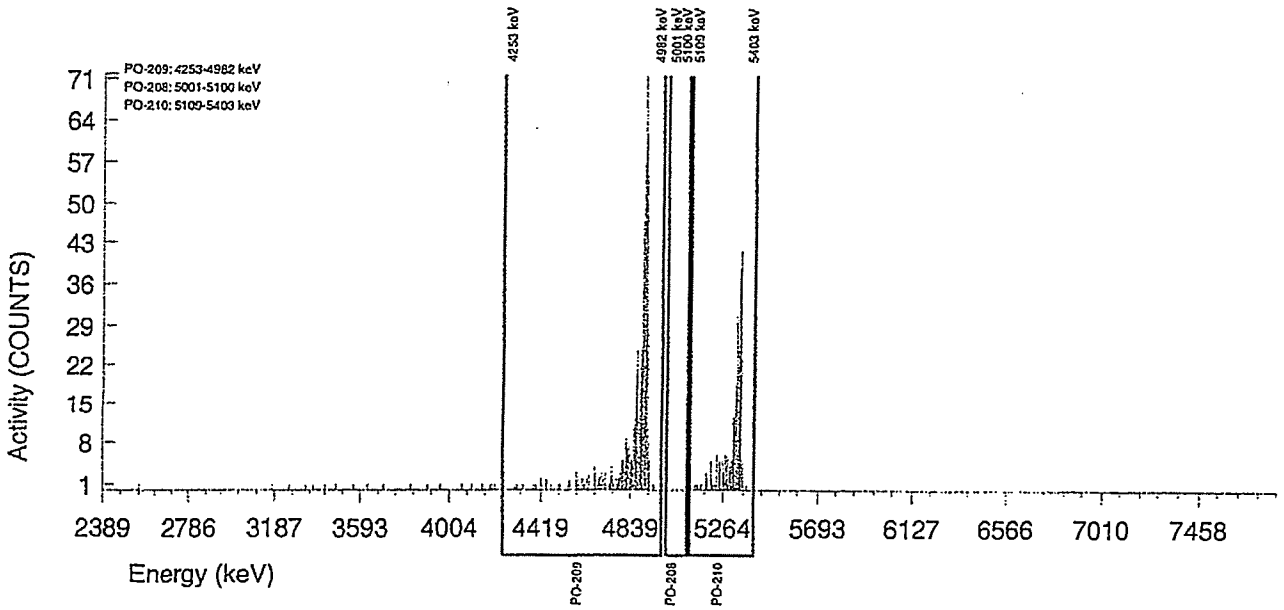
Instrument SOP: GL-RAD-I-009
Analytical SOP:

BATCH NUMBER : 1318659	CHAMBER : 071	LIB FILE : PO
SAMPLE ID : S1202918180_PO	DETECTOR S/N : 80020	BKG FILE : B071.CNF;1476
SAMPLE QTY : 1.000 L +/-0.500 %	AVERAGE %EFFICIENCY : 32.2871	BKG DATE : 27-Jul-2013
SAMPLE DATE : 30-Jul-2013 00:00:00	AVERAGE %EFF ERROR : 0.6210	BKG LIVE TIME(SEC) : 59999.99
ANALYST : TC1	COUNT DATE : 30-Jul-2013 17:47:47	EFF FILE : W071.CNF;382
% YIELD : 72.0 +/-5.403 %	ELAPSED LIVE TIME(SEC) : 30299.99	CAL DATE : 08-Jul-2013

TRACER	LCS
ID : 1423-F	ID
NUCLIDE : PO-209	NUCLIDE
NOMINAL : 5.2508E+00 dpm	NOMINAL (pCi/L)
RESULTS : 3.7786E+00 dpm	% RECOVERY

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/L	1.96-sigma TPU pCi/L	MDA pCi/L	Lc pCi/L	1.96-sigma cnt Unc pCi/L
PO-208	5080.00	5050.46	0.000	0.000	-0.505	0.505	0.7106	100.000	-1.94E-03	9.26E-03	2.25E-02	5.51E-03	9.25E-03
PO-209	4882.00	4849.53	25.915	616.000	614.485	1.515	1.2309	99.740	2.37E+00	3.26E-01	3.07E-02	9.56E-03	1.88E-01
PO-210	5304.38	5305.73	24.591	291.000	291.000	0.000	0.0000	100.000	1.12E+00	1.81E-01	1.16E-02	0.00E+00	1.29E-01



TDL
7-31-13

Alpha Spectroscopy Software Version 3.3.16
effective date: 12-Jun-2013

GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

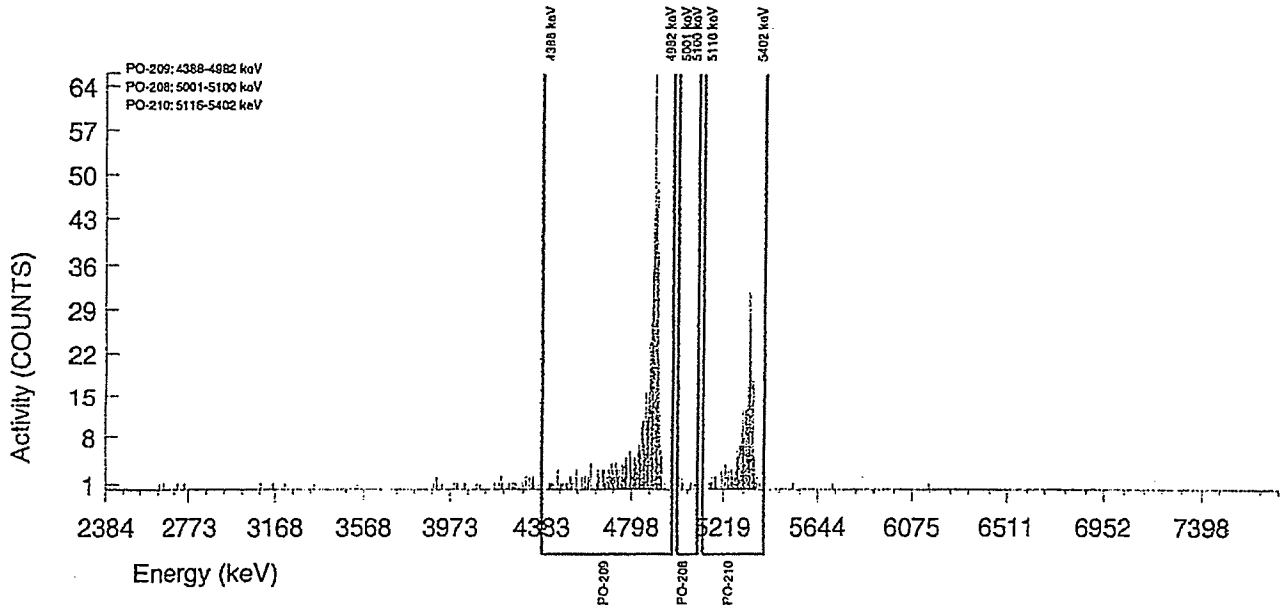
Instrument SOP: GL-RAD-I-009
Analytical SOP:

BATCH NUMBER : 1318659	CHAMBER : 072	LIB FILE : PO
SAMPLE ID : S1202918181_PO	DETECTOR S/N : 67584	BKG FILE : B072.CNF;1483
SAMPLE QTY : 1.000 L +/-0.500 %	AVERAGE %EFFICIENCY : 32.3134	BKG DATE : 27-Jul-2013
SAMPLE DATE : 30-Jul-2013 00:00:00	AVERAGE %EFF ERROR : 0.6215	BKG LIVE TIME(SEC) : 59999.99
ANALYST : TC1	COUNT DATE : 30-Jul-2013 17:47:47	EFF FILE : W072.CNF;388
% YIELD : 70.6 +/-5.438 %	ELAPSED LIVE TIME(SEC) : 30299.99	CAL DATE : 08-Jul-2013

TRACER	LCS
ID : 1423-F	ID
NUCLIDE : PO-209	NUCLIDE
NOMINAL : 5.2508E+00 dpm	NOMINAL (pCi/L)
RESULTS : 3.7078E+00 dpm	% RECOVERY

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/L	1.96-sigma TPU pCi/L	MDA pCi/L	Lc pCi/L	1.96-sigma cnt Unc pCi/L
PO-208	5080.00	5045.35	16.930	10.000	10.000	0.000	0.0000	100.000	3.91E-02	2.61E-02	1.17E-02	0.00E+00	2.57E-02
PO-209	4882.00	4846.67	26.817	607.000	603.465	3.535	1.8802	99.740	2.37E+00	3.29E-01	4.15E-02	1.49E-02	1.90E-01
PO-210	5304.38	5309.14	26.139	261.000	260.495	0.505	0.7106	100.000	1.02E+00	1.70E-01	2.30E-02	5.63E-03	1.25E-01



TDC
7-31-13

Standard Traceability Log Rad

Source Material Info	
Parent Code:	1673
Prepared By:	Gregory Ramsay
Carrier Conc:	2M HCl
Reference Date:	08/01/2013
Ampoule Mass (g):	5.19741 g
Uncertainty:	+/- 3 %
LogBook No:	RC-S-065-102

A Solution Material Info	
Isotope:	Polonium-210
Prepared By:	Tim Chandler
Prep Date:	07/29/2013
Verification Date:	07/30/2013
Expiration Date:	07/30/2014
Primary Code:	1673-A
Dilution(mL):	100 mL
Mass of Parent(g):	5.0441 g
Density(g/mL):	1.0315
Balance ID:	38080204

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)
(5.0441 g) * (7.47487691 kBq/g) * (60000 dpm/kBq) / (100 mL) = 22622.4160 dpm/mL
(5.0441 g) * (7.47487691 kBq/g) * (60000 dpm/kBq) / (1.0315 g/mL) / (100 mL) = 21932.2093 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

7/31/13

7-31-13

Polonium Queue Sheet

Verification of Po-210 1673-A

30-JUL-13

Batch #: 1318659 Analyst:TC1 First Client Due Date: Internal Due Date:16-AUG-13

Tracer Isotope: Po-209 Tracer Code: 1423-F Expiration Date: 8-2-13 Vol: 0.1

LCS Isotope: Po-210 LCS Code: 1673-A Expiration Date: ~~8-30-13~~ 11/30/14 Vol: 0.0001

Spike Isotope: Po-210 Spike Code: N/A Expiration Date: N/A Vol: N/A

Prep Date: 7-30-13 Initials: TDC Pipet ID: 1840022 Balance ID: 1113021618 Witness: N/A

Sample ID	Client Description	Type	Hazard Code	Min CRDL	Matrix	Client	Collection Date	Pos.	Label #	Wet/Dry Aliquot (g/l/f)	Po Det #
1202918178-1	MB for batch 1318659	MB		.05 pCi/L	WATER	QC ACCOUNT	25-JUL-13	1	1	1.0	69
1202918179-1	LCS for batch 1318659	LCS		.05 pCi/L	WATER	QC ACCOUNT	25-JUL-13	2	2	1.0	70
1202918180-1	LCS for batch 1318659	LCS		.05 pCi/L	WATER	QC ACCOUNT	25-JUL-13	3	3	1.0	71
1202918181-1	LCS for batch 1318659	LCS		.05 pCi/L	WATER	QC ACCOUNT	25-JUL-13	4	4	1.0	72

MB: spiked with Po-210 1673-A 0.1mL only

took 0.1ml diluted up to 100ml then took 0.1ml for aliquot = 0.0001mL

Solid Sample Dissolution by: LEACH or DIGESTION (Circle One) Data Reviewed By: 7-31-13

General Engineering Laboratories
GFC Calibration Source Preparation Sheet
Alpha Crosstalk

Applicable SOP Number: GL-RAD-A-001

Isotope: Po-210

Date Standards Prepared: 9/27/13

Standard ID: 1673-A

Matrix of Planchett/Filter: 47 mm concentric ring S.S. planchette

Amount Used (g or (ml)): 2.0

Standard Activity (DPM/g or (mL)): 22622.4159

Residue/Carrier Agent: tap water

Reference Date: 8/1/13

Pipette ID Used: 1608405

Expiration Date: 8/26/14

Balance ID Used: F30560

	Standard Number	Residue Volume(mL) (tapwater)	Initial Wt. (g)	Final Wt. (g)	Net Wt. (mg)	
	P1	Ø	7.6765	7.6765	0.0	
	P2	5	7.64846	7.6519	3.3	
	P3	10	7.64730	~~7.6480~~ AP 7/27/13	7.6495	6.5
	P4	15	7.7009	7.7173	16.4	
	P5	20	7.66602	7.6923	32.1	
	P6	25	7.6423	7.68999	47.6	
	P7	30	7.67666	7.7416	65.0	
	P8	35	7.6391	7.7186	79.5	wt ✓

AP 9/27/13

Prepared By: Amanda L. [illegible] Date: 9/27/13

Reviewed By: [illegible] Date: 10/1/13

Eckert & Ziegler
Analytics

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION
Standard Radionuclide Source

1242

78148-278

Th-230 5 mL Liquid in Flame Sealed Vial

Customer: General Engineerings Labs
P.O. No.: 7311RD, Item 1

This standard radionuclide source was prepared gravimetrically from a calibrated master solution. The master solution was calibrated by liquid scintillation counting.

Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry and liquid scintillation counting. 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:	Th-230
Activity (Bq):	4.021 E4
Half-Life:	7.538 E4 years
Calibration Date:	August 25, 2008 12:00 EST
Relative Expanded Uncertainty (k=2):	2.0%

Comments:
Impurities: γ-impurities <0.1%, α-impurities <0.04%
5.07467 grams 0.5M HNO3 solution.

Source Prepared By: M Taskaeva
M. I. Taskaeva, Radiochemist

QA Approved: DM Montgomery
D. M. Montgomery, QA Manager

Date: 9-4-08

End of Certificate

RECEIVED 9/17/08
RC-S-048-123

Eckert & Ziegler
Analytics

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404•352•8677
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www.analyticsinc.com

CERTIFICATE OF CALIBRATION
Standard Radionuclide Source

1243

78352-278

Sr-90 10 mL Liquid in Flame Sealed Vial

Customer: General Engineering Labs/Charleston, SC
P.O. No.: 7312 RD, Item 3

This standard radionuclide source was prepared gravimetrically from a calibrated master solution. The master solution was calibrated by liquid scintillation counting.

Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry and liquid scintillation counting. 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:	Sr-90
Activity (Bq):	3.856 E5
Half-Life:	28.79 years
Calibration Date:	October 1, 2008 12:00 EST
Relative Expanded Uncertainty (k=2):	1.7%

Comments:
Impurities: γ-impurities <0.1%
10.41484 grams 0.1M HCl solution with 30 μg/g Sr carrier.

NOTE: This source also contains Y-90 in secular equilibrium with Sr-90. The Y-90 activity is equal to the Sr-90 activity. Since Sr-90 and Y-90 both decay 100% by beta emission, the total beta emission rate for the source is twice the certified Sr-90 activity. The half-life for Y-90 is 64.08 hours.

Source Prepared By: _____
W. Mao, Radiochemist

QA Approved: _____ Date: 10/3/08
D. M. Montgomery, QA Manager

RECEIVED

Standard Traceability Log Rad

Source Material Info	
Parent Code:	1243
Prepared By:	Daniel Roy
Carrier Conc:	0.1M HCL
Reference Date:	10/01/2008
Ampoule Mass (g):	10.41484 g
Uncertainty:	+/- 1.7 %
LogBook No:	RC-S-048-124

A Solution Material Info	
Isotope:	Strontium-90
Prepared By:	Daniel Roy
Prep Date:	12/19/2008
Verification Date:	02/12/2013
Expiration Date:	02/12/2014
Primary Code:	1243-A
Dilution(mL):	100 mL
Mass of Parent(g):	10.2164 g
Density(g/mL):	0.9991
Balance ID:	38080204

Calculations Converting parent activity to dpm/mL|dpm/g

(Mass of parent(g)) * (Parm Activity (Bq)) * (conversion dpm to Bq) / (Ampoule Mass(g) *(Dilution Vol)) = Parent Activity (dpm/mL)
(Mass of parent(g)) * (Parm Activity (Bq)) * (conversion dpm to Bq) / Density / (Ampoule Mass (g) * (Dilution Vol)) = Parent Activity (dpm/g)
(10.2164 g) * (385600 Bq) * (60 dpm/Bq) / (10.41484 g * 100 mL) = 226951.7634 dpm/mL
(10.2164 g) * (385600 Bq) * (60 dpm/Bq) / (0.9991 g/mL)/ (10.41484 g * 100 mL) = 227146.2010 dpm/g

Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
01/21/2010	Bethany Fiem	2.2467	1000	1243-B	510.329369 dpm/mL	01/21/2010	01/21/2011
08/03/2010	Bethany Fiem	2.5604	1000	1243-C	581.5851 dpm/mL	08/03/2010	08/03/2011
01/12/2011	Bethany Fiem	2.4946	1000	1243-D	566.6389 dpm/mL	01/12/2011	01/12/2012
08/12/2011	Tim Chandler	3.3115	100	1243-G	18.7877 dpm/mL	08/11/2011	08/11/2012
08/17/2011	Tim Chandler	2.5541	100	1243-H	14.49064 dpm/mL	08/18/2011	08/16/2012
06/21/2011	Tim Chandler	.0235	100	1243-E	53.37936 dpm/mL	06/25/2012	06/20/2013
07/05/2011	Bethany Fiem	2.6072	1000	1243-F	592.2156 dpm/mL	07/05/2011	07/05/2012

01/31/2012	Gregory Ramsay	2.6792	1000	1243-I	608.5701 dpm/ml	01/31/2012	01/31/2013
08/29/2012	Bethany Fiem	2.6799	1000	1243-J	608.729104 dpm/mL	09/14/2012	09/11/2013
02/12/2013	Gregory Ramsay	2.6526	1000	1243-K	602.528 dpm/ml	02/12/2013	02/12/2014

GEL Laboratories LLC
Version 1.0 9/18/2000

Verification for Sr-90 Standard 1243-A

v1.0.2

Instrument	GOLD
Analyst	BF
Verification Prep Date	2/12/2013

Standard Information	
Isotope	Sr-90
Serial Number	1243-A
Isotope Halflife	28.9000 Y
Reference Date	10/1/2008
Ref. Act. (DPM/mL)	226951.7634
Amount of Std. (mL)	0.1
Standard Prep Date	12/19/2008

Std #	Count Date	Quench Number	Gross cpm	Bkg cpm
1	2/12/2013	55.70	41976.00	38.20
2	2/12/2013	56.10	41080.00	38.20
3	2/12/2013	56.00	42256.00	38.20

Std #	Net cpm	Calculated Avg. Eff.	Standard dpm/mL	Measured dpm
1	41937.80	1.986325	211132.62	21113.26
2	41041.80	1.986325	206621.78	20662.18
3	42217.80	1.986325	212542.26	21254.23

	dpm/mL
Mean Value =	210098.89
Stdev =	3092.649469
Certificate Value* =	204384.1
Two sigma =	6185.299
10 % of Mean =	21009.889
Rule A (Pass/Fail)	Pass
% Recovery	102.80%
Rule B (Pass/Fail)	Pass
Expiration Date	2/12/2014

Verification Rules

Rule A = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.

Rule B = The determined mean value shall be within 5% of the certificate value.

*** Certificate Value is decay corrected to Count Date.**

The analyst prepared three standard verification sources for Sr-90 source 1243-A by transferring 0.1 mL portions of the standard into glass liquid scintillation vials. 10 mL of Ecoscint Ultra 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 10 mL of Ecoscint Ultra liquid scintillation cocktail. The standard verification vials and background source were dark adapted for at least two hours and counted on LSCGOLD for Sr-90 source standard verification. The Sr-90 efficiency calibration which was used for verification calculations was performed on 2/12/2013 using Sr-90 source 1244-A.

Standard results for each verification source was calculated as follows:

Source dpm/mL = (A - B)/(C)(D)

where:

A = Ver. source cpm,
B = BKG cpm,
C = System efficiency (cpm/dpm), and
D = volume used for standard verification.

RAD-M-001

2-13-13

Amanda L. Fuchs

General Engineering Laboratories
GFC Verification Source Preparation Sheet

Applicable SOP Number: GL-RAD-A-001

Isotope: Th-230 / Sr-90

Date Standards Prepared: 8-29-11

Standard ID: 1242-A / 1243-A

Matrix of Vial/Planchett: 47mm concentric ring SS planchette

Amount Used (g or ml): 2.0 / 0.1

Standard Activity (DPM/g or mL): 23217.6149 / 226951.763

Residue/Carrier Agent: USGS cal solution B

Reference Date: 8-25-08 / 10-1-08

Pipette ID Used: 10183301 / 1795419

Expiration Date: ~~7-5-12~~ (MP) 10/1/12 / ~~7-5-12~~ (MP) 10/1/12
6/22/13 / 1/31/13

Balance ID Used: 1113021018

	Standard Number	Residue Volume(mL)	Initial Wt. (g)	Final Wt. (g)	Net Wt. (mg)
	V_1	0	7.5843	7.5840	0
	V_2	2.5	7.5812	7.5916	10.4
	V_3	5	7.5944	7.6182	23.8
	V_4	10	7.6239	7.6681	44.2
	V_5	12	7.5984	7.6531	54.7
	V_6	15	7.6059	7.6798	73.9
	V_7	20	7.6178	7.7130	95.2
	V_8	25	7.5955	7.6985	103

wt ✓

8/29/11

Prepared By: _____ Date: 8-29-11

Reviewed By: _____ Date: 9/15/11

Continuing Calibration Data

Gas Flow Proportional Counter Checks for 20-May-2015

Detectors LB4100 A1 through J4 and PIC 1A through 14D

Short Name	Status	Parmname	Run Time	Count Time	CPM or dec	Low Limit	High Limit	Stdev
LB4100B2	need 2nd	Beta XTalk	20-May 06:24	5	3.02E-4	1.52E-4	4.64E-4	-0.12
LB4100B3	Above	Alpha bkg	20-May 05:14	60	0.500	-1.10E-1	0.352	+4.92
LB4100B3	Below	Alpha eff	20-May 06:34	5	15558	15820	18920	-3.51
LB4100C1	Above	Alpha bkg	20-May 07:44	60	0.400	0.078	0.366	+3.71
LB4100C2	Above	Alpha bkg	20-May 07:44	60	0.400	-5.84E-2	0.297	+4.73
LB4100C2	Above	Beta bkg	20-May 07:44	60	127	0.218	2.179	+384.10
LB4100C4	Below	Alpha eff	20-May 07:31	5	7200	7639	9591	-4.35
LB4100C4	Above	Beta bkg	20-May 05:14	60	3.450	0.555	2.577	+5.59
LB4100C4	Below	Beta eff	20-May 07:03	5	21281	21730	25620	-3.69
LB4100D1	Above	Alpha XTalk	20-May 09:29	5	60.308	-1.59E+0	53.770	+3.71
LB4100D2	Above	Alpha bkg	20-May 06:35	60	0.333	0.100	0.528	+0.27
LB4100D3	Above	Alpha bkg	20-May 06:35	60	0.433	-1.55E-2	0.582	+1.51
LB4100D3	Above	Beta bkg	20-May 06:35	60	2.083	-1.53E+0	4.943	+0.35
LB4100E1	need 2nd	Beta bkg	20-May 05:17	60	1.867	1.123	2.358	+0.61
LB4100E2	need 2nd	Alpha eff	20-May 06:51	5	8636	8509	10570	-2.63
LB4100E2	Above	Beta bkg	20-May 05:17	60	2.800	0.632	2.040	+6.24
LB4100E4	Above	Beta bkg	20-May 05:17	60	2.117	0.777	1.787	+4.96
LB4100F1	Above	Alpha bkg	20-May 07:05	60	0.450	0.020	0.369	+4.39
LB4100F2	Above	Alpha bkg	20-May 05:18	60	0.450	0.042	0.348	+5.00
LB4100F2	Above	Beta bkg	20-May 05:18	60	2.667	0.642	2.248	+4.56
LB4100F2	Below	Beta eff	20-May 06:43	5	19713	20280	21300	-6.34
LB4100F3	Below	Alpha eff	20-May 06:51	5	17842	19270	21960	-6.19
LB4100F3	Above	Alpha XTalk	20-May 06:51	5	0.327	0.253	0.316	+4.13
LB4100F3	Above	Beta bkg	20-May 05:18	60	3.317	0.579	1.652	+12.31
LB4100F4	Above	Beta bkg	20-May 05:18	60	3.333	1.267	2.141	+11.19
LB4100I1	Above	Alpha bkg	20-May 05:15	60	0.333	-3.24E-2	0.336	+2.96
LB4100I1	Below	Beta eff	20-May 06:34	5	16322	16570	17550	-4.52
LB4100I2	Above	Alpha bkg	20-May 05:15	60	0.633	-5.96E-2	0.292	+8.82
LB4100I2	Above	Beta bkg	20-May 05:15	60	83.350	0.125	2.207	+236.83

LB4100I2	Below	Beta eff	20-May 06:34	5	18617	18740	19540	-3.92
LB4100I3	Above	Alpha bkg	20-May 05:15	60	0.500	0.008	0.352	+5.59
LB4100I3	Below	Alpha eff	20-May 06:24	5	11120	11170	11720	-3.55
LB4100I3	Below	Beta eff	20-May 06:34	5	17746	17910	18800	-4.10
LB4100I4	Above	Alpha bkg	20-May 05:15	60	0.600	-3.85E-2	0.288	+8.74
LB4100J1	Above	Alpha bkg	20-May 06:51	60	0.383	0.020	0.368	+3.27
LB4100J2	need 2nd	Alpha bkg	20-May 05:15	60	0.267	0.113	0.367	+0.64
LB4100J4	Above	Alpha bkg	20-May 05:15	60	0.433	-3.17E-2	0.292	+5.61
LB4100J4	Below	Alpha XTalk	20-May 06:24	5	0.150	0.158	0.202	-4.01
PIC3A	Above	Alpha bkg	20-May 05:31	60	1.183	-1.09E-1	0.333	+14.53
PIC3A	Above	Beta bkg	20-May 05:31	60	3.217	-1.30E-1	1.970	+6.56
PIC4A	Above	Alpha bkg	20-May 06:35	60	0.383	0.002	0.382	+3.01
PIC4A	Below	Beta eff	20-May 05:09	5	53916	54880	58930	-4.43
PIC5B	Above	Alpha bkg	20-May 07:54	60	0.317	-3.15E-2	0.362	+2.31
PIC7A	Below	Alpha eff	20-May 07:07	5	10462	10570	10980	-4.58
PIC7A	Above	Alpha XTalk	20-May 07:07	5	0.312	0.256	0.292	+6.34
PIC7A	Below	Beta eff	20-May 05:26	5	18189	20560	21500	-18.13
PIC8B	Above	Alpha bkg	20-May 05:41	60	0.517	-2.66E-2	0.278	+7.70
PIC8B	Below	Alpha eff	20-May 05:33	5	9628	9742	10090	-4.97
PIC8B	Above	Alpha XTalk	20-May 05:33	5	0.304	0.268	0.298	+4.25
PIC8B	Below	Beta eff	20-May 05:26	5	21699	22170	23130	-5.94
PIC11C	Above	Alpha bkg	20-May 07:20	60	0.467	-4.01E-2	0.339	+5.01
PIC11C	need 2nd	Beta bkg	20-May 07:20	60	1.500	0.077	2.533	+0.48
PIC14A	Above	Alpha bkg	20-May 06:03	60	0.417	-1.01E-1	0.362	+3.71
PIC14A	Above	Alpha eff	20-May 05:48	5	11338	9646	11250	+3.33

INSTRUMENTS NOT LISTED HAVE PASSED ALL QUALITY ASSURANCE PARAMETERS

The following detectors may not have properly transferred to the LIMS system

PIC6D	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
PIC13C	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk

Reviewed by _____

Date 5/26/15

GEL Laboratories LLC

Gas Flow Proportional Counter Checks for 21-May-2015

Detectors LB4100 A1 through J4 and PIC 1A through 14D

Short Name	Status	Parmname	Run Time	Count Time	CPM or dec	Low Limit	High Limit	Stdev
LB4100B3	Above	Alpha bkg	21-May 05:59	60	0.450	-1.10E-1	0.352	+4.27
LB4100B3	Below	Alpha eff	21-May 05:37	5	15290	15820	18920	-4.03
LB4100C1	Above	Alpha bkg	21-May 06:42	60	0.483	0.078	0.366	+5.45
LB4100C1	Below	Beta eff	21-May 05:59	5	16222	16810	19220	-4.46
LB4100C2	Above	Alpha bkg	21-May 06:42	60	0.550	-5.84E-2	0.297	+7.27
LB4100C2	Above	Beta bkg	21-May 06:42	60	124	0.218	2.179	+375.38
LB4100C4	need 2nd	Alpha eff	21-May 06:12	5	7708	7639	9591	-2.79
LB4100C4	Above	Beta bkg	21-May 06:42	60	3.317	0.555	2.577	+5.19
LB4100C4	Below	Beta eff	21-May 05:59	5	20282	21730	25620	-5.23
LB4100D1	need 2nd	Alpha XTalk	21-May 07:11	5	27.179	-1.59E+0	53.770	+0.12
LB4100D2	need 2nd	Alpha bkg	21-May 05:51	60	0.200	0.100	0.528	-1.59
LB4100D3	need 2nd	Alpha bkg	21-May 05:51	60	0.217	-1.55E-2	0.582	-0.67
LB4100D3	need 2nd	Beta bkg	21-May 05:51	60	1.633	-1.53E+0	4.943	-0.07
LB4100E1	Above	Beta bkg	21-May 06:01	60	2.100	1.123	2.358	+1.75
LB4100E2	Above	Alpha XTalk	21-May 05:53	5	0.426	0.298	0.424	+3.09
LB4100E2	Above	Beta bkg	21-May 06:01	60	2.567	0.632	2.040	+5.24
LB4100E4	Above	Beta bkg	21-May 06:01	60	2.000	0.777	1.787	+4.27
LB4100F1	Above	Beta bkg	21-May 07:07	60	2.067	1.105	2.188	+2.33
LB4100F2	Above	Alpha bkg	21-May 06:02	60	0.567	0.042	0.348	+7.29
LB4100F2	Above	Beta bkg	21-May 06:02	60	2.800	0.642	2.248	+5.06
LB4100F2	Below	Beta eff	21-May 05:46	5	19696	20280	21300	-6.43
LB4100F3	Below	Alpha eff	21-May 05:53	5	17852	19270	21960	-6.16
LB4100F3	Above	Alpha XTalk	21-May 05:53	5	0.326	0.253	0.316	+3.97
LB4100F3	Above	Beta bkg	21-May 06:02	60	3.067	0.579	1.652	+10.91
LB4100F4	Above	Alpha bkg	21-May 06:02	60	0.350	-3.52E-2	0.348	+3.04
LB4100F4	Above	Beta bkg	21-May 06:02	60	3.783	1.267	2.141	+14.27
LB4100G3	Above	Alpha bkg	21-May 07:24	60	0.300	-5.46E-2	0.245	+4.11
LB4100G3	need 2nd	Beta bkg	21-May 07:24	60	1.400	0.596	1.672	+1.48
LB4100I1	Above	Alpha bkg	21-May 05:47	60	0.367	-3.24E-2	0.336	+3.51
LB4100I1	Below	Beta eff	21-May 05:37	5	16378	16570	17550	-4.17

LB4100I2	Above	Alpha bkg	21-May 05:47	60	0.350	-5.96E-2	0.292	+3.99
LB4100I2	Above	Beta bkg	21-May 05:47	60	4.567	0.125	2.207	+9.80
LB4100I2	Below	Beta eff	21-May 05:37	5	18636	18740	19540	-3.78
LB4100I3	Above	Alpha bkg	21-May 05:47	60	0.333	0.008	0.352	+2.68
LB4100I3	Below	Alpha eff	21-May 05:24	5	11148	11170	11720	-3.24
LB4100I3	Below	Beta eff	21-May 05:37	5	17727	17910	18800	-4.23
LB4100I4	Above	Alpha bkg	21-May 05:47	60	0.583	-3.85E-2	0.288	+8.44
LB4100J1	Above	Alpha bkg	21-May 05:47	60	0.333	0.020	0.368	+2.41
LB4100J2	Above	Alpha bkg	21-May 05:47	60	0.550	0.113	0.367	+7.32
LB4100J4	Above	Alpha bkg	21-May 05:48	60	0.567	-3.17E-2	0.292	+8.08
LB4100J4	Below	Alpha XTalk	21-May 05:24	5	0.147	0.158	0.202	-4.47
PIC3A	Above	Alpha bkg	21-May 04:41	60	0.883	-1.09E-1	0.333	+10.46
PIC3A	Above	Beta bkg	21-May 04:41	60	3.283	-1.30E-1	1.970	+6.75
PIC4A	Above	Alpha bkg	21-May 05:43	60	0.350	0.002	0.382	+2.49
PIC4A	Below	Beta eff	21-May 04:24	5	54581	54880	58930	-3.44
PIC4D	Above	Beta bkg	21-May 05:43	60	2.100	1.165	2.200	+2.42
PIC5B	Above	Alpha bkg	21-May 04:56	60	0.367	-3.15E-2	0.362	+3.07
PIC6C	need 2nd	Alpha bkg	21-May 06:01	60	0.250	-3.02E-3	0.346	+1.35
PIC6C	Above	Beta bkg	21-May 06:01	60	2.017	0.640	2.136	+2.52
PIC8B	Above	Alpha bkg	21-May 04:57	60	0.650	-2.66E-2	0.278	+10.32
PIC8B	Below	Alpha eff	21-May 04:48	5	9656	9742	10090	-4.49
PIC8B	Above	Alpha XTalk	21-May 04:48	5	0.300	0.268	0.298	+3.38
PIC8B	Below	Beta eff	21-May 04:39	5	21546	22170	23130	-6.90
PIC8D	Above	Alpha bkg	21-May 06:03	60	0.333	-9.09E-3	0.323	+3.18
PIC8D	Above	Beta bkg	21-May 06:03	60	2.317	0.448	2.774	+1.82
PIC8D	Below	Beta eff	21-May 04:39	5	44096	44230	46930	-3.30
PIC10B	Above	Beta XTalk	21-May 06:45	5	6.37E-4	1.81E-4	5.42E-4	+4.59
PIC11C	Above	Alpha bkg	21-May 05:27	60	0.833	-4.01E-2	0.339	+10.81
PIC11C	Above	Beta bkg	21-May 05:27	60	3.100	0.077	2.533	+4.39
PIC14A	Above	Alpha bkg	21-May 05:27	60	0.350	-1.01E-1	0.362	+2.84
PIC14A	Above	Alpha eff	21-May 05:03	5	11431	9646	11250	+3.68
PIC14A	Above	Beta eff	21-May 05:18	5	59106	52750	58550	+3.58

INSTRUMENTS NOT LISTED HAVE PASSED ALL QUALITY ASSURANCE PARAMETERS

The following detectors may not have properly transferred to the LIMS system

PIC6D	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
PIC13C	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk

Reviewed by R. Brinkman

Date 5/21/15

GEL Laboratories LLC

Runlogs

Instrument Run Log

Instrument Type: GFPC **Batch ID: 1478361**

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
1203317702	LCS	KSD1	PIC8A	MAY-21-15 15:21:49	DONE	Tuffryn Filter	01-MAR-13 00:00
372020001	SAMPLE	KSD1	PIC7A	MAY-21-15 15:22:11	DONE	Tuffryn Filter	01-MAR-13 00:00
1203317701	MS	KSD1	PIC7D	MAY-21-15 15:22:13	DONE	Tuffryn Filter	01-MAR-13 00:00
1203317699	MB	KSD1	PIC7B	MAY-21-15 15:22:14	DONE	Tuffryn Filter	01-MAR-13 00:00
1203317700	DUP	KSD1	PIC7C	MAY-21-15 15:22:15	DONE	Tuffryn Filter	01-MAR-13 00:00

Instrument Run Log

Instrument Type: GFPC **Batch ID: 1479317**

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
1203320257	LCS	KXB2	LB4100B1	MAY-20-15 17:47:01	DONE	2 inch Planchett	01-OCT-13 00:00
1203320256	MSD	KXB2	LB4100A3	MAY-20-15 17:47:09	DONE	2 inch Planchett	01-OCT-13 00:00
1203320254	DUP	KXB2	PIC2A	MAY-20-15 19:20:50	DONE	2 inch Planchett	01-OCT-13 00:00
372020001	SAMPLE	KXB2	PIC1B	MAY-20-15 19:21:12	DONE	2 inch Planchett	01-OCT-13 00:00
1203320253	MB	KXB2	PIC1D	MAY-20-15 19:21:12	DONE	2 inch Planchett	01-OCT-13 00:00
1203320255	MS	KXB2	PIC1A	MAY-21-15 09:41:19	DONE	2 inch Planchett	01-OCT-13 00:00

Liquid Scintillation Raw Data

Radiochemistry Batch Checklist

26-May-2015

Batch# 1475759 Product: TC-99 Date: 5/20/15

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

Primary Review Performed By: [signature]

Secondary Review Performed By: [signature] OLSS 5/27/15

Technetium-99 Queue Sheet

30

05/01/2015

Batch #: 1475759 **Analyst:**MYM1 **First Client Due Date:**05/27/2015 **Internal Due Date:**05/16/2015

Spike Isotope: Technetium-99 **Spike Code:** 1621-B **Expiration Date:** 1/13/16 **Vol:** 0.1

LCS Isotope: Technetium-99 **LCS Code:** 1621-B **Expiration Date:** 1/13/16 **Vol:** 0.1

Tracer Isotope: Technetium-99m **Tracer Code:** TL0931-A **Reference Date:** 5/19/15 **Expiration Date:** 5/20/15 **Vol:** 1.0

Prep Date: 5/19/15 **Initials:** MYM **Pipet ID:** 2272418 4099802 **Balance ID:** 38110007 **Witness:** TLJ 5/19/15

Comments

Sample I	Client Description	Type	Hazard Code	Min CRDL	Matrix	Client	Collection Date	Pos. #	Wet/Dry Sample Mass (g/mL)	LSC Rack #
372020001-1	36-13B	SAMPLE	HZ	50 pCi/L	WATER	OLSS001	28-APR-15 10:00 AM	1	100	SO-2
1203310931-1	MB for batch 1475759	MB		50 pCi/L	WATER	QC ACCOUNT		2	100	SO-3
1203310932-1	36-13B(372020001DUP)	DUP		50 pCi/L	WATER	QC ACCOUNT	28-APR-15 10:00 AM	3	100	SO-4
1203310933-1	36-13B(372020001MS)	MS		50 pCi/L	WATER	QC ACCOUNT	28-APR-15 10:00 AM	4	100	SO-5
1203310934-1	LCS for batch 1475759	LCS		50 pCi/L	WATER	QC ACCOUNT		5	100	SO-6

Bkg Rack #: SO-1

Comments:

Data Reviewed By: 5/20/15

Choose SOP Used: GL-RAD-A-005 (TEVA) GL-RAD-B-016(Bioassay) GL-RAD-A-059 (AG)

Instrument Used: LS6000 (Red) 7065153, LS6500 (Blue) 7067083, LS6500 (Green) 7067404 Wallac (Yellow) 4140127, Wallac (Pink) 2200082, LS6000 (Brown) 7060655, LS6500 (Gold) 7070506, Wallac (White) 4140299, Purple 7069123, Silver 7060656, Orange DG06095168

Technetium-99 Liquid

Filename : TC99.XLS
File type : Excel
Version # : 1.2.16

Tracer S/N : TC1931-A
Tracer Exp Date : 5/20/2015
Tracer Volume Added: 1.00

Batch : 1475759
Analyst : MYM1
Prep Date : 5/19/2015
Tc-99 Method Uncertainty : 0.0556

Geometry:
15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin

Procedure Code : LSC99TCL
Parmname : Technetium-99
Required MDA : 50 pCi/L
Tc-99 Abundance : 1.00
Halflife of Tc-99 : 211100 years

Samp	Sample Characteristics				Tracer Calculations					
Pos.	Sample ID	Sample Aliquot L	Sample Aliquot StDev. L	Sample Date/Time	Tracer Ref. Activity (CPM)	Tracer Ref. Count Uncertainty (%)	Tracer Samp. Activity (CPM)	Tracer Samp. Count Uncertainty (%)	Tracer Aliquot (mL)	Tracer Aliquot StDev. (mL)
1	372020001.1	0.1000	1.1370E-05	4/28/2015 10:00	59555	0.88%	55119	0.92%	1.0	0.002000
2	1203310931.1	0.1000	1.1370E-05	5/19/2015 0:00	59555	0.88%	58075	0.90%	1.0	0.002000
3	1203310932.1	0.1000	1.1370E-05	4/28/2015 10:00	59555	0.88%	36992	0.93%	1.0	0.002000
4	1203310933.1	0.1000	1.1370E-05	4/28/2015 10:00	59555	0.88%	59256	0.89%	1.0	0.002000
5	1203310934.1	0.1000	1.1370E-05	5/19/2015 0:00	59555	0.88%	54466	0.89%	1.0	0.002000

Pipet, 0.1 ml Stdev : +/- 0.000200 ml
Pipet, 0.5 ml Stdev : +/- 0.001000 ml
Pipet, 1 ml Stdev : +/- 0.002000 ml

Analytical SOP: GL-RAD-A-059
Instrument SOP: GL-RAD-I-004

Count raw Data													Calibration Data						
Pos.	Rack Position #	Counting Time (min.)	Quench#	Gross cpm	Bkg cpm	Bkg Count Time (min.)	Bkg Quench#	Corrected Bkg cpm	Count Start Date/Time	Sample Decay	Calculated Sample Recovery %	Sample Recovery Error %	Counted on	Calibration Date	Calibration Due Date	Detector Efficiency (cpm/dpm)	Detector Efficiency Error (cpm/dpm)	Background Position #	Background Count Start Date/Time
1	50-2	60	243	17.85	16.77	60	159.9	17.7698	5/24/2015 15:55	1.000	92.6%	0.70%	LSCRED	7/1/2014	6/30/2015	0.4602	0.00792	50-1	5/24/2015 14:53
2	50-3	60	167	16.3	16.77	60	159.9	16.7372	5/24/2015 16:59	1.000	97.5%	0.69%	LSCRED	7/1/2014	6/30/2015	0.5735	0.00792	50-1	5/24/2015 14:53
3	50-4	60	188.5	17.28	16.77	60	159.9	16.8405	5/24/2015 18:02	1.000	62.1%	0.70%	LSCRED	7/1/2014	6/30/2015	0.5573	0.00792	50-1	5/24/2015 14:53
4	50-5	60	247.5	100.32	16.77	60	159.9	17.8461	5/24/2015 19:05	1.000	99.5%	0.69%	LSCRED	7/1/2014	6/30/2015	0.4494	0.00792	50-1	5/24/2015 14:53
5	50-6	60	164.1	116.05	16.77	60	159.9	16.7460	5/24/2015 20:10	1.000	91.5%	0.69%	LSCRED	7/1/2014	6/30/2015	0.5745	0.00792	50-1	5/24/2015 14:53

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

* - RPD changed to 0% due to sample & dup activity below MDA

Spike S/N : 1621-B
Spike Exp Date : 1/13/2016
Spike Activity (dpm/ml): 1911.38
Spike Volume Added: 0.10

LCS S/N : 1621-B
LCS Exp Date : 1/13/2016
LCS Activity (dpm/ml): 1911.38
LCS Volume Added (ml): 0.10

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 %	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	18.9650	13.3894	50	27.3076	**0.8478**	961.11%	0.0802	0.7705	15.9713	15.9716		SAMPLE				
2	14.0188	9.8974	50	20.1975	**-3.5219**	169.72%	-0.4372	0.7420	11.7154	11.7154		MB				
3	22.7170	16.0384	50	32.7274	**5.7194**	171.58%	0.4395	0.7541	19.2338	19.2443	372020001.1	DUP	* 0.0%			
4	18.1029	12.7808	50	26.0652	**830.8008**	2.00%	82.4739	1.4034	27.7081	96.2090	372020001.1	MS			860.9841	96.5%
5	14.9253	10.5374	50	21.5034	**851.4094**	1.83%	99.3040	1.4877	25.0003	97.6718		LCS			860.9839	98.9%

ASSAY 20-May-15 9:19:51

Protocol	id	12	TC99_REC
Time	limit	500	
Count	limit	10000	
Isotope	Tc-99m		
Protocol	date	23-Sep-13	14:21:59
Run	id.	80	

POS	RACK	BATCH	TIME	COUNTS	CPM	ERROR	% RECOVERY	COUNT TIME
1	36	1	13	12810	59554.7	0.88		09:19:58
2	36	2	13	11853	55118.6	0.92	92.55	09:20:23
3	36	3	13	12475	58074.5	0.9	97.51	09:20:48
4	36	4	19	11633	36991.7	0.93	62.11	09:21:13
5	36	5	13	12704	59256.2	0.89	99.50	09:21:44
6	51	6	14	12566	54466	0.89	91.46	09:22:25

END OF ASSAY

1475759

ID = TC-SP 24 MAY 2015 14:58
USER:17 COMMENT:RED
PRESET TIME : 60.00

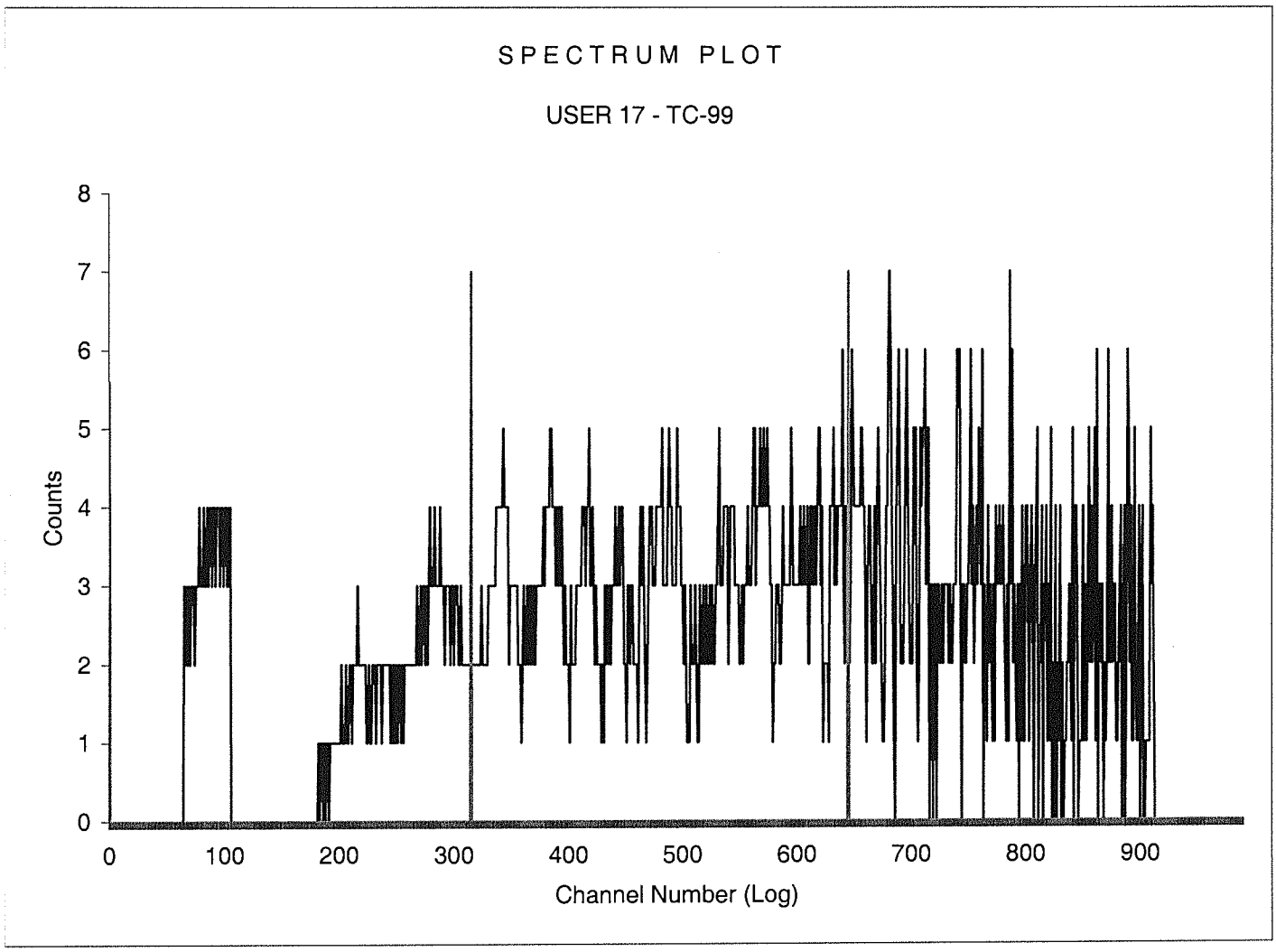
DATA CALC	: CPM	HW	:YES	SAMPLE REPEATS:	1	PRINTER	:EDIT
COUNT BLANK	: NO	ICR	: NO	REPLICATES :	1	RS232	:EDIT
TWO PHASE	: NO	ARC	: NO	CYCLE REPEATS :	1	DISK	: OFF
SCINTILLATOR	: LIQUID	LUMEX	:YES	LOW SAMPLE REJ:	0		
LOW LEVEL	: NO	HALF LIFE CORRECTION DATE:				none	

CHAN: 315.0 - 645.0 %ERROR: 0.00 FACTOR: 1.000000 BKG. SUB: 0
CHAN: 0.0 - 900.0 %ERROR: 0.00 FACTOR: 1.000000 BKG. SUB: 0

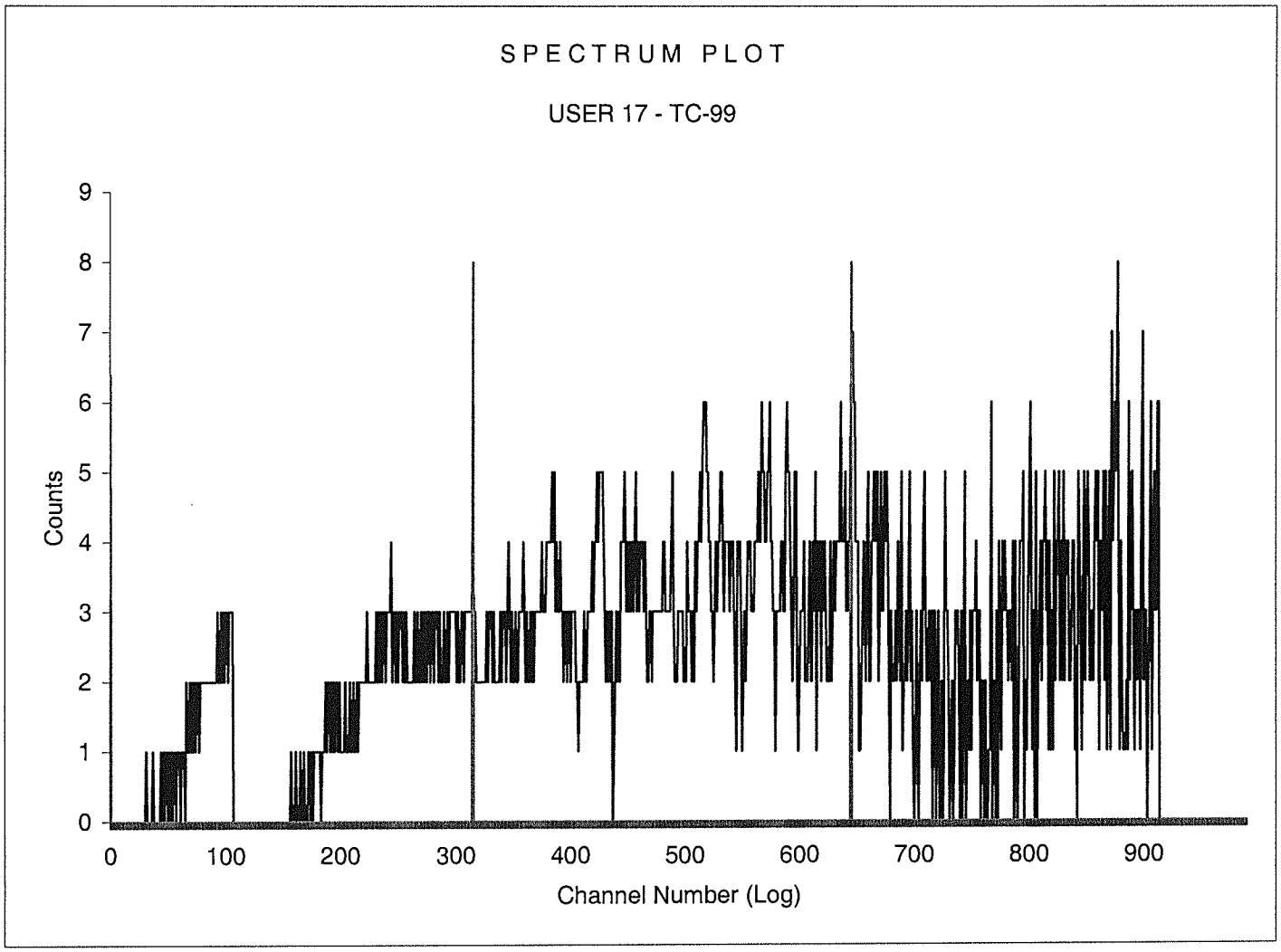
ALPHA-BETA DISCRIMINATION: NO

SAM NO	POS	TIME MIN	HR	WIND1 RAW CPM	WIND2 RAW CPM	WIND1 CPM	WIND1 %ERROR	WIND2 CPM	WIND2 %ERROR	LUMEX %	ELAPSED TIME
B 1	50-1	60.00	159.9	16.77	71.87	16.77	6.31	35.35	6.20	46.38	64.43
1 2	50-2	60.00	243.0	17.85	38.27	17.85	6.11	35.85	4.46	5.96	127.22
2 3	50-3	60.00	167.0	16.30	49.08	16.30	6.40	35.10	5.16	25.10	191.05
3 4	50-4	60.00	188.5	17.28	38.33	17.28	6.21	35.15	4.55	7.28	253.92
4 5	50-5	60.00	247.5	100.32	144.48	100.32	2.58	144.47	2.16	1.39	316.66
5 6	50-6	60.00	164.1	116.05	185.92	116.05	2.40	155.65	2.26	15.68	381.36

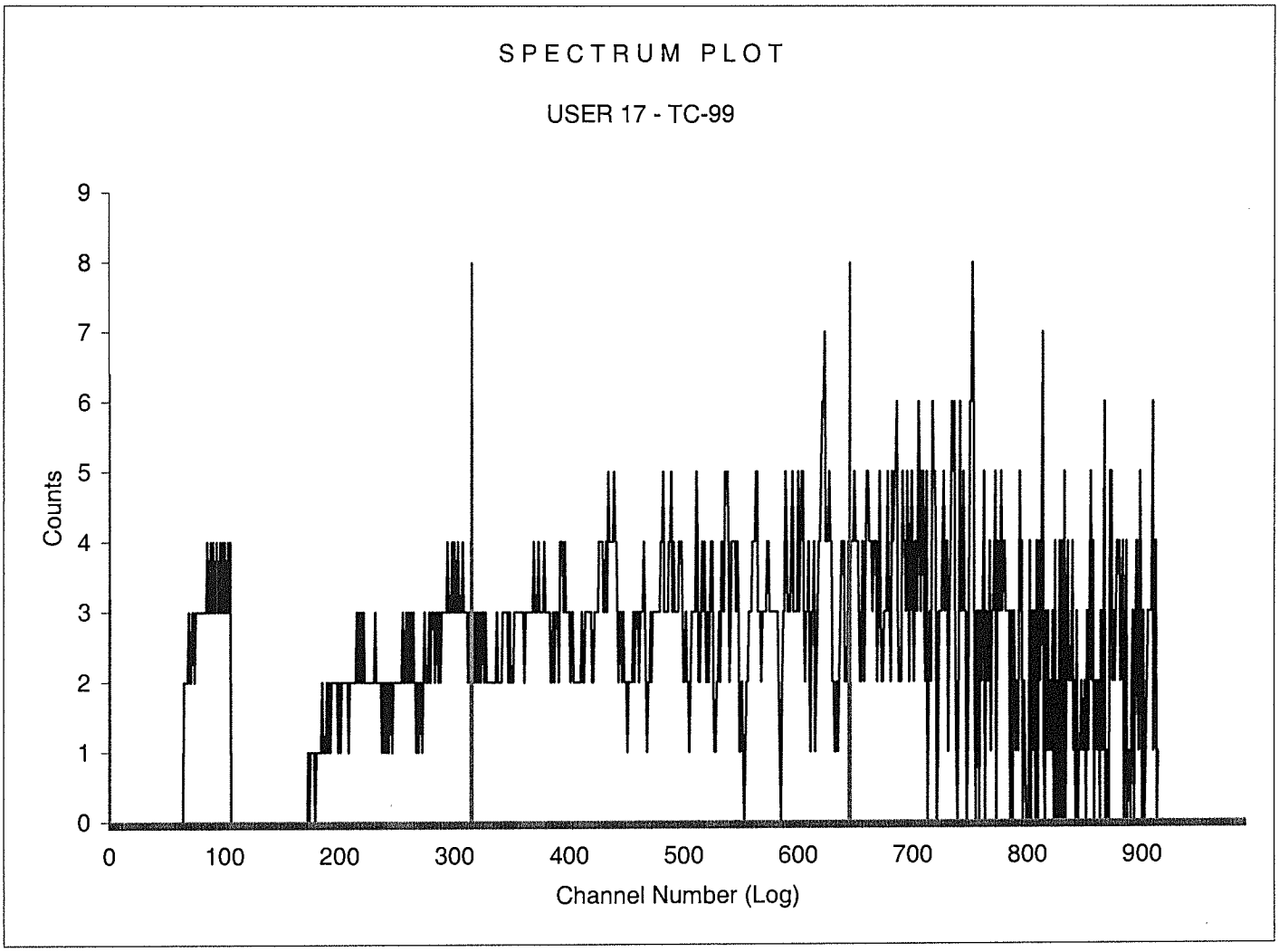
Sample Count Start Time:	24 May 2015 14:53:04		
Data Capture Date	24 May 2015 15:53:24		
User Filename	S17052450-1A.XLS		
	U17052450-1A.XLS		
Spectrum Type	Log Counts		
User Number	17		
User Id	TC-99		
User Comment	RED		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	1	50-1	60.00
H#, Total Counts:	159.9	2146	
Win1: Tc-99 - Start, End:	315	645	
Win2: - Start, End:	0	990	



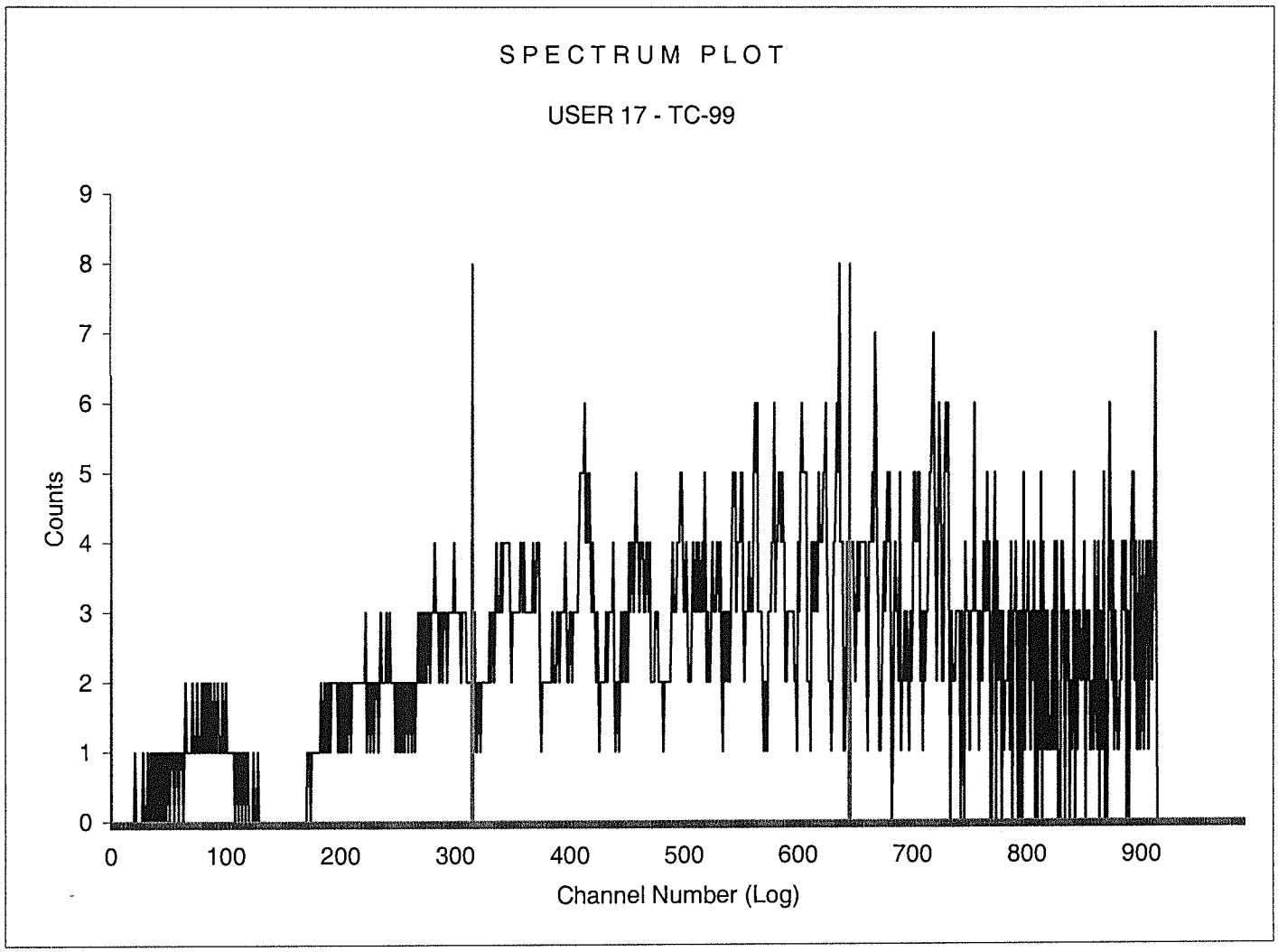
Sample Count Start Time:	24 May 2015 15:55:51		
Data Capture Date	24 May 2015 16:56:11		
User Filename	S17052450-2A.XLS		
	U17052450-1A.XLS		
Spectrum Type	Log Counts		
User Number	17		
User Id	TC-99		
User Comment	RED		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	2	50-2	60.00
H#, Total Counts:	243.0	2227	
Win1: Tc-99 - Start, End:	315	645	
Win2: - Start, End:	0	990	



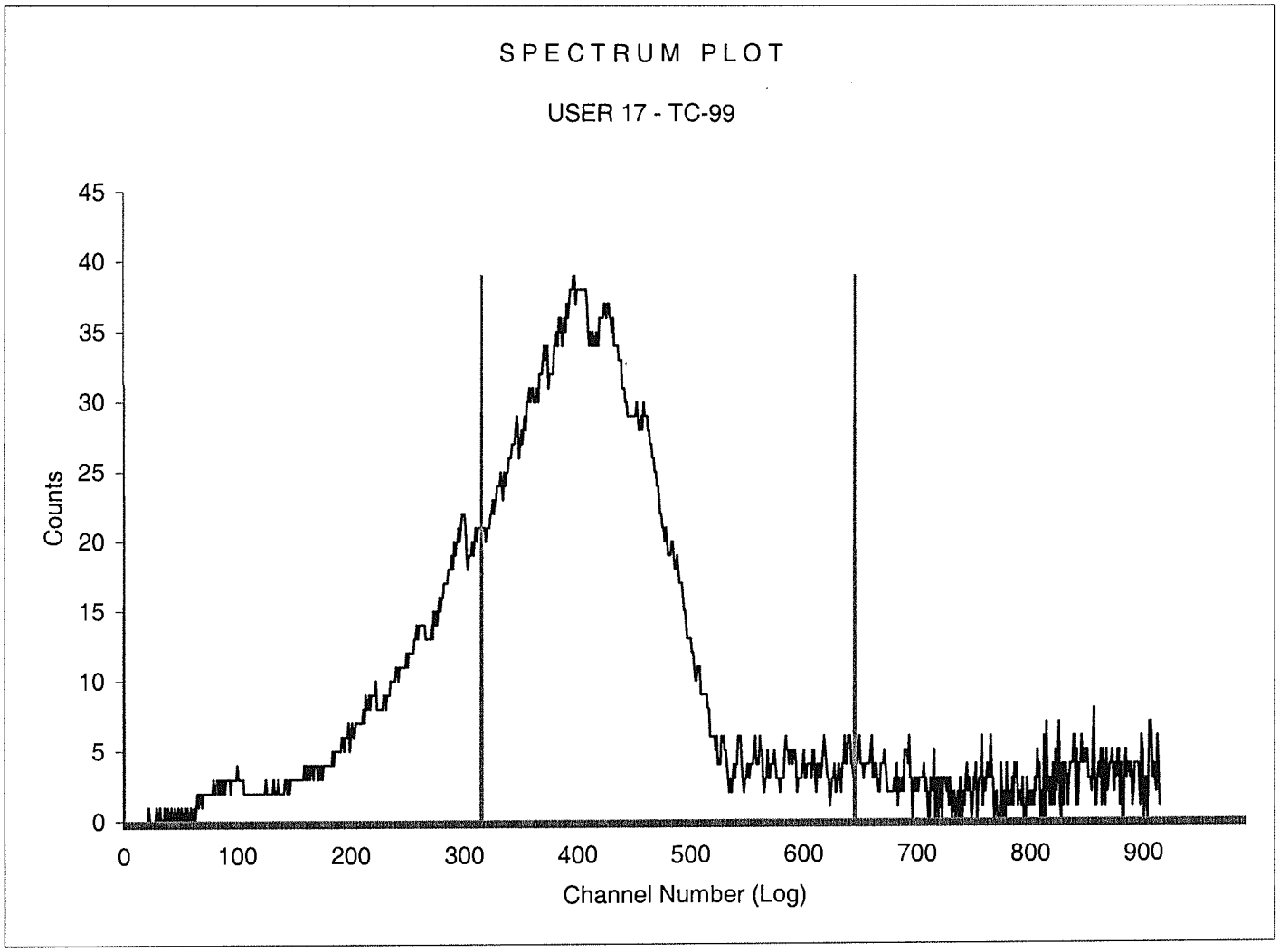
Sample Count Start Time:	24 May 2015 16:59:41		
Data Capture Date	24 May 2015 18:00:00		
User Filename	S17052450-3A.XLS		
	U17052450-1A.XLS		
Spectrum Type	Log Counts		
User Number	17		
User Id	TC-99		
User Comment	RED		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	3	50-3	60.00
H#, Total Counts:	167.0	2140	
Win1: Tc-99 - Start, End:	315	645	
Win2: - Start, End:	0	990	



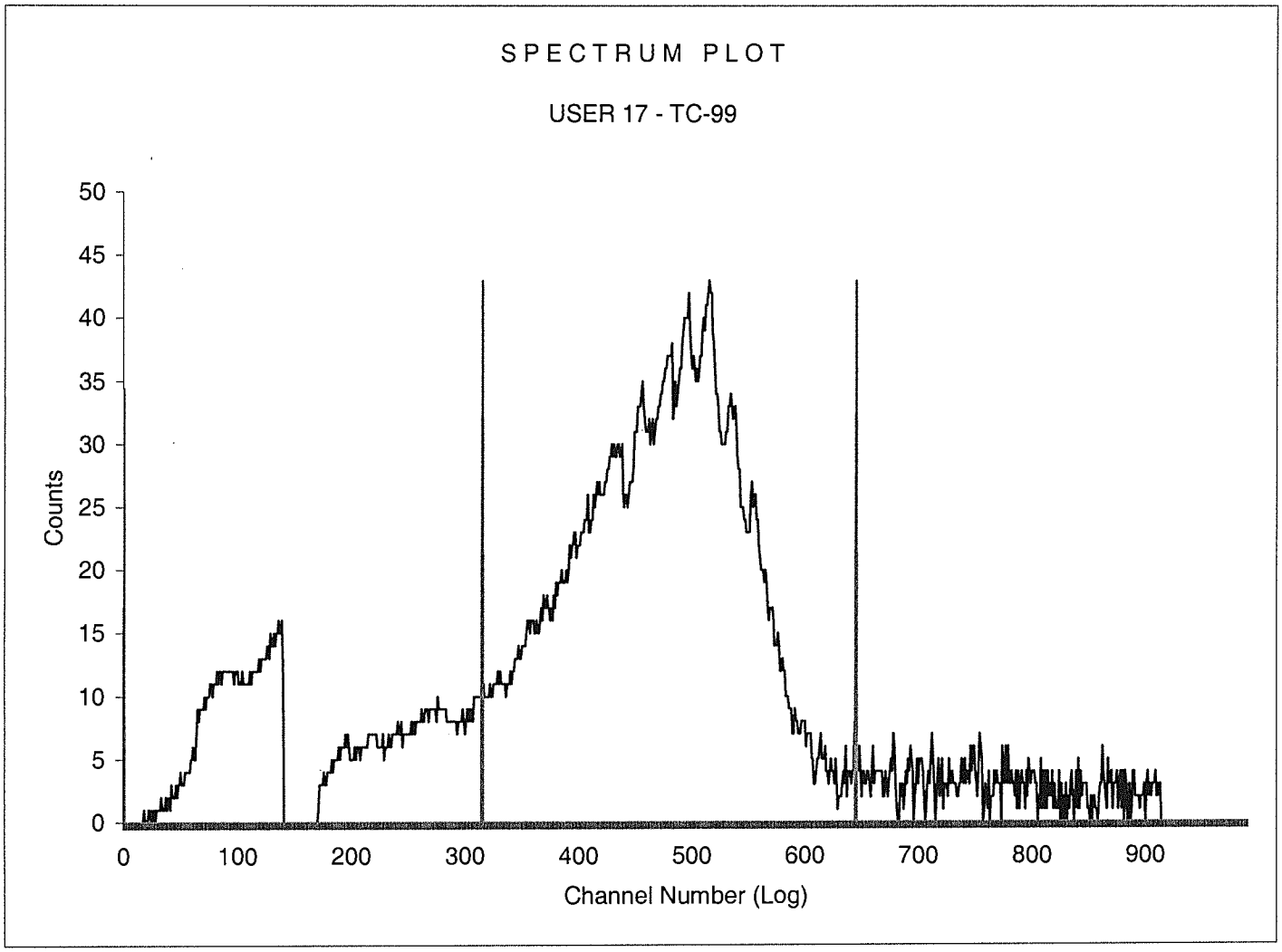
Sample Count Start Time:	24 May 2015 18:02:33		
Data Capture Date	24 May 2015 19:02:53		
User Filename	S17052450-4A.XLS		
	U17052450-1A.XLS		
Spectrum Type	Log Counts		
User Number	17		
User Id	TC-99		
User Comment	RED		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	4	50-4	60.00
H#, Total Counts:	188.5	2152	
Win1: Tc-99 - Start, End:	315	645	
Win2: - Start, End:	0	990	



Sample Count Start Time:	24 May 2015 19:05:18		
Data Capture Date	24 May 2015 20:05:37		
User Filename	S17052450-5A.XLS		
	U17052450-1A.XLS		
Spectrum Type	Log Counts		
User Number	17		
User Id	TC-99		
User Comment	RED		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	5	50-5	60.00
H#, Total Counts:	247.5	8719	
Win1: Tc-99 - Start, End:	315	645	
Win2: - Start, End:	0	990	



Sample Count Start Time:	24 May 2015 20:10:00		
Data Capture Date	24 May 2015 21:10:17		
User Filename	S17052450-6A.XLS		
	U17052450-1A.XLS		
Spectrum Type	Log Counts		
User Number	17		
User Id	TC-99		
User Comment	RED		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	6	50-6	60.00
H#, Total Counts:	164.1	9760	
Win1: Tc-99 - Start, End:	315	645	
Win2: - Start, End:	0	990	



Method Calibration Data

01-Jul-2014

GEL Laboratories
2040 Savage Road, Charleston, SC 29407
(843)556-8171

Liquid Scintillation Counter Calibration Package

Method: Tc-99

Instrument Color Code: Red

	Included/ Acceptable	Comments
Part 1: Efficiency determination		
1 Efficiency spreadsheet (eff pts, graph, trendline equation)	✓	
2 Verification Spreadsheet (recoveries 90%-110%)	✓	
3 Applicable portion of Machines.XLS	✓	
4 Raw Data and spectra	✓	
5 Window, Low Level and Lumex settings	✓	
Part 2. Documentation for Calibration Source		
1 Vendor Certificate	✓	
2 Standard Traceability Log (from LIMS)	✓	
3 Verification of Source	✓	
4 Source preparation sheet	✓	
5 Efficiency standard precision check	✓	
Part 3. Documentation for Verification Source		
1 Vendor Certificate	✓	
2 Standard Traceability Log (from LIMS)	✓	
3 Verification of Source	✓	
4 Source preparation sheet	✓	
Part 4. Enter into LIMS		
1 Alpha LIMS instrument calibration updated	✓	

Primary Review of Package

Secondary Review of Package

Effective Date: 7/1/14

Expiration Date: 6/30/15

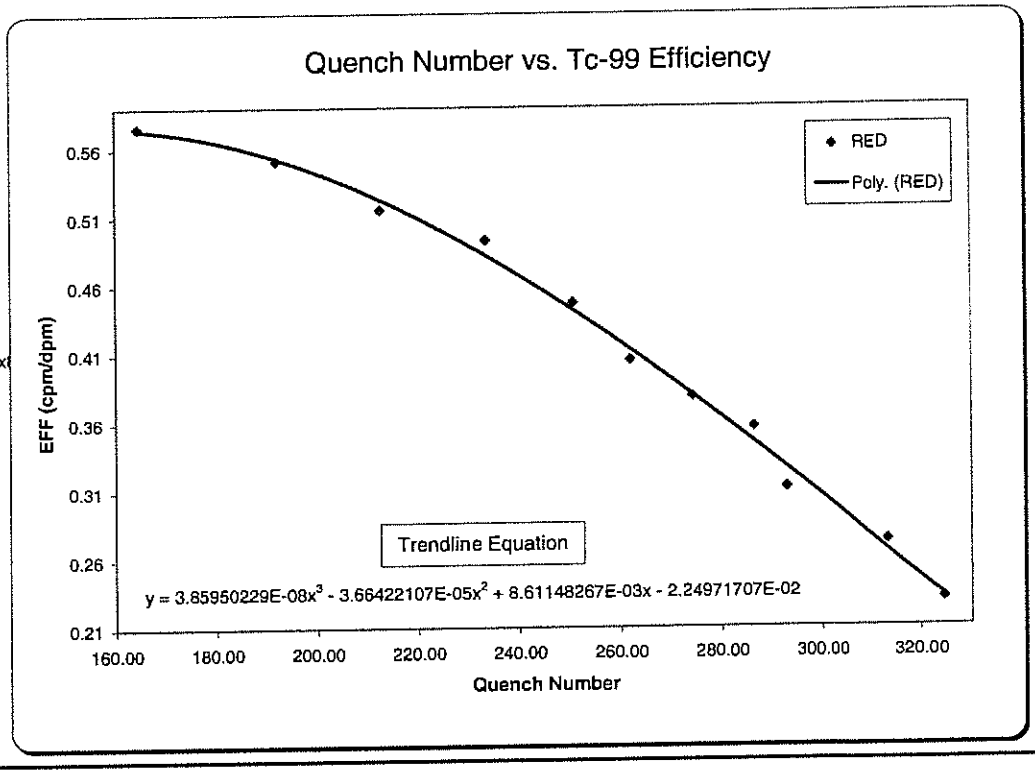
Tc-99 Calibration

Instrument	RED

Standard Information from prep sheet	
Isotope	Tc-99
Serial Number	1234-A
Isotope Halflife (days)	77798250
Reference Date	6/27/2008
Ref. Act. (DPM/mL)	21213.34
Amount of Std. (mL)	0.5

Std #	Start Count Time	Quench Number	RAW CPM	BKG	RAW CPM-BKG	Nominal DPM	EFF.
1	6/30/14 11:59	164.50	6125.80	17.93	6107.87	10606.46322	0.57586
2	6/30/14 12:15	192.10	5867.13	17.93	5849.20	10606.46322	0.55148
3	6/30/14 12:32	212.70	5483.13	17.93	5465.20	10606.46322	0.51527
4	6/30/14 12:49	233.50	5243.60	17.93	5225.67	10606.46322	0.49269
5	6/30/14 13:05	250.70	4756.93	17.93	4739.00	10606.46322	0.44680
6	6/30/14 13:21	261.90	4310.87	17.93	4292.94	10606.46322	0.40475
7	6/30/14 13:38	274.30	4026.53	17.93	4008.60	10606.46321	0.37794
8	6/30/14 13:54	286.40	3788.53	17.93	3770.60	10606.46321	0.35550
9	6/30/14 14:11	292.90	3321.53	17.93	3303.60	10606.46321	0.31147
10	6/30/14 14:27	313.40	2907.07	17.93	2889.14	10606.46321	0.27239
11	6/30/14 14:44	324.50	2460.20	17.93	2442.27	10606.46321	0.23026

Copy into Machines.xls	
Cal Date	07/01/14
Min H#	159.1
Max H#	326.6
A0	-2.24971707E-02
A1	8.61148267E-03
A2	-3.66422107E-05
A3	3.85950229E-08
A4	0
A5	0
Geometry	int GL/5mL DI H2O/AG 1x
Exp Date	06/30/15
Low Level	N
Eff Error	0.007920
Window1 LL	315
Window1 UL	645
Window2 LL	0
Window2 UL	900



Tc-99 Verification

Instrument	RED

Standard Information from prep sheet	
Isotope	Tc-99
Serial Number	1297-A
Isotope Halflife (days)	77798250
Reference Date	9/1/1996
Ref. Act. (DPM/mL)	95579.91
Amount of Std. (mL)	0.1

Std #	Start Count Time	Quench Number	Raw CPM	BKG	BKG Corrected CPM	Calculated EFF.	Standard DPM	Measured DPM	Recovery %
1	6/30/14 15:17	159.10	5667.40	17.80	5649.60	0.5755	9557.44	9816.77	102.71%
2	6/30/14 15:34	196.00	5331.93	17.80	5314.13	0.5483	9557.44	9691.85	101.41%
3	6/30/14 15:50	224.40	4761.87	17.80	4744.07	0.5009	9557.44	9471.06	99.10%
4	6/30/14 16:07	250.20	4450.93	17.80	4433.13	0.4428	9557.44	10011.86	104.75%
5	6/30/14 16:23	263.80	4053.53	17.80	4035.73	0.4078	9557.44	9896.58	103.55%
6	6/30/14 16:40	283.50	3561.40	17.80	3543.60	0.3532	9557.44	10031.44	104.96%
7	6/30/14 16:56	298.90	3145.67	17.80	3127.87	0.3085	9557.44	10140.26	106.10%
8	6/30/14 17:13	310.50	2862.40	17.80	2844.60	0.2740	9557.44	10380.23	108.61%
9	6/30/14 17:29	325.70	2406.27	17.80	2388.47	0.2287	9557.44	10443.08	109.27%
10	6/30/14 17:46	326.60	2173.40	17.80	2155.60	0.2260	9557.44	9536.50	99.78%

	Calibration Coeffs
a0	-2.24971707E-02
a1	8.61148267E-03
a2	-3.66422107E-05
a3	3.85950229E-08

Red	**Tc-99 AG**
Cal Date	07/01/2014
Min H#	159.10
Max H#	326.60
A0	-2.2497170700E-02
A1	8.6114826700E-03
A2	-3.6642210700E-05
A3	3.8595022900E-08
A4	0.00000000000000E+00
A5	0.00000000000000E+00
B0	3.70871804316776E+01
B1	-2.91045862403603E-01
B2	1.37249252828534E-03
B3	-2.02392654701130E-06
B4	0.00000000000000E+00
B5	0.00000000000000E+00
Geometry	15mL Ecoscint GL/5mL DI H2O/AG 1x8
Exp Date	06/30/2015
Low Level	N
Eff Error	0.007920
Window1 LL	315
Window1 UL	645
Window2 LL	0
Window2 UL	900

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Cals

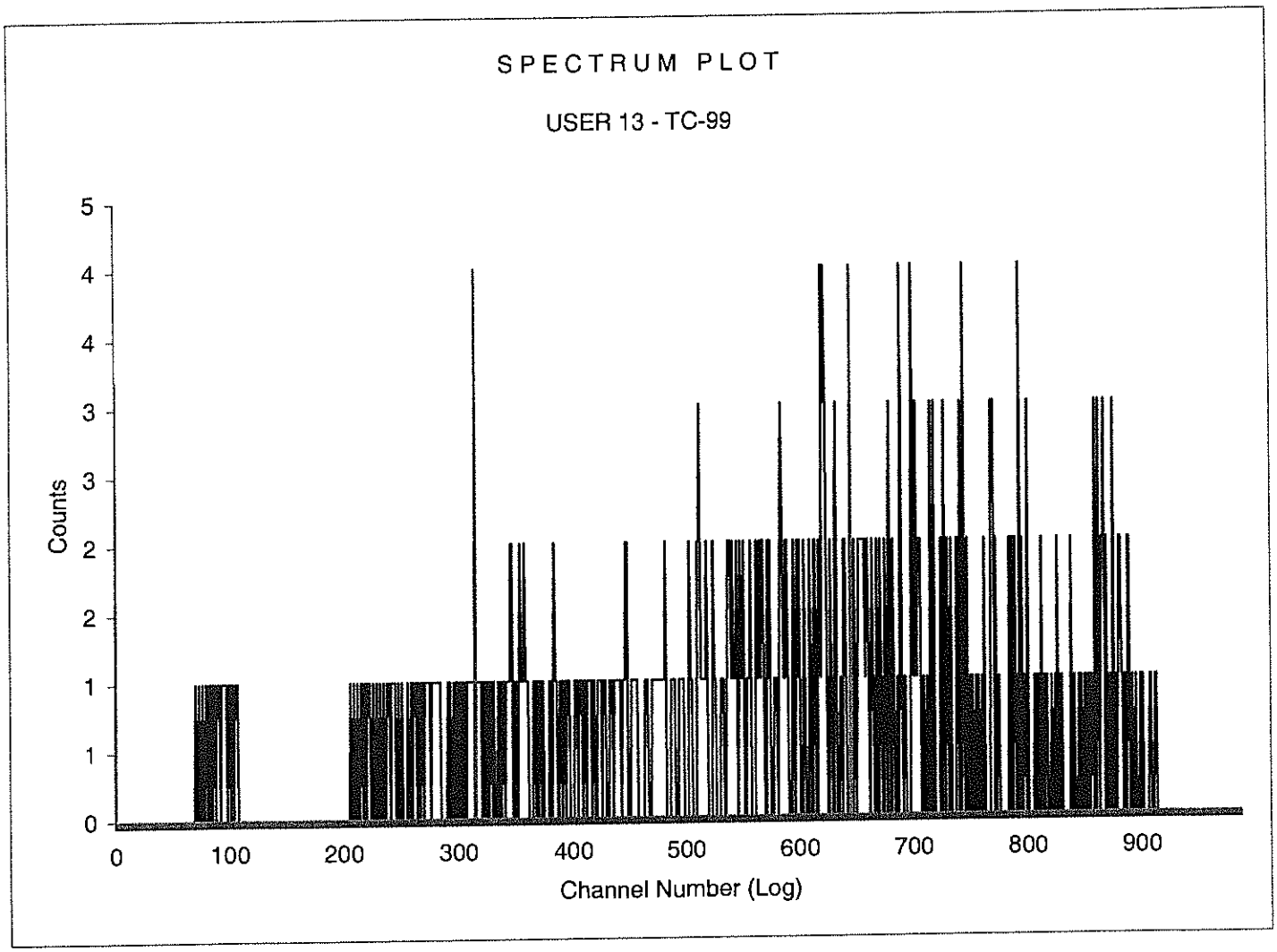
ID: TC-99 30 JUN 2014 11:46
USER:13 COMMENT:RED
PRESET TIME : 15.00
DATA CALC : CPM H# :YES SAMPLE REPEATS: 1 PRINTER :EDIT
COUNT BLANK : NO IC# : NO REPLICATES : 1 RS232 :EDIT
TWO PHASE : NO AQC : NO CYCLE REPEATS : 1 DISK : OFF
SCINTILLATOR: LIQUID LUMEX:YES LOW SAMPLE REJ: 0
LOW LEVEL : NO HALF LIFE CORRECTION DATE: none

CHAN: 315.0 - 645.0 %ERROR: 0.00 FACTOR: 1.000000 BKG. SUB: 0
CHAN: 0.0 - 900.0 %ERROR: 0.00 FACTOR: 1.000000 BKG. SUB: 0

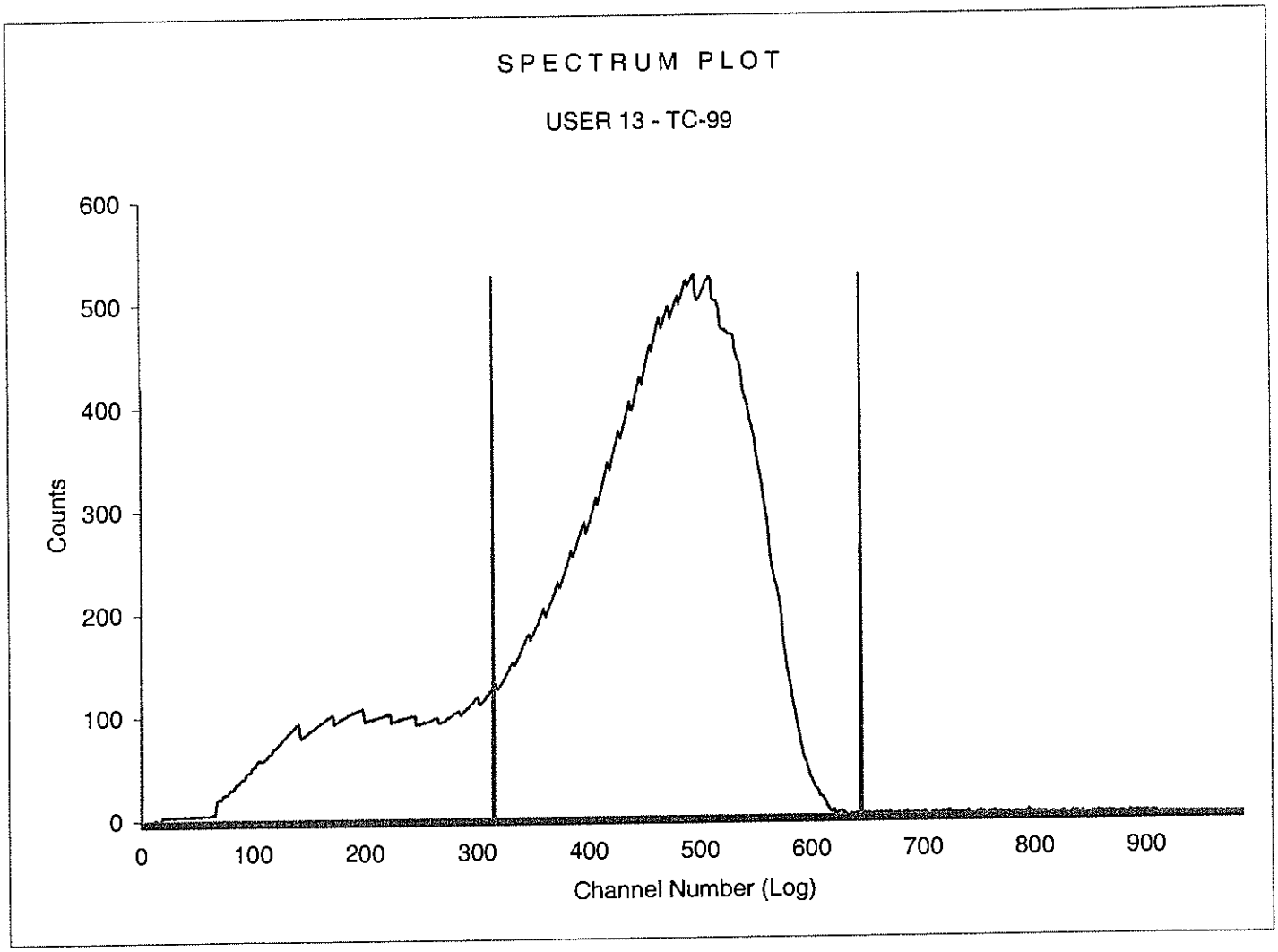
ALPHA-BETA DISCRIMINATION: NO

SAM NO	POS	TIME MIN	H#	WIND1 RAW CPM	WIND2 RAW CPM	WIND1 CPM	WIND1 %ERROR	WIND2 CPM	WIND2 %ERROR	LUMEX %	ELAPSED TIME
1	24-1	15.00	161.8	17.93	49.73	17.93	12.19	37.13	9.81	21.77	16.16
2	24-2	15.00	164.5	6125.80	7574.53	6125.80	0.66	7566.93	0.59	0.13	32.78
3	24-3	15.00	192.1	5867.13	7242.60	5867.13	0.67	7255.47	0.61	0.10	49.38
4	24-4	15.00	212.7	5483.13	6942.60	5483.13	0.70	6937.40	0.62	0.08	65.94
5	24-5	15.00	233.5	5243.60	6838.27	5243.60	0.71	6834.33	0.62	0.06	82.45
6	24-6	15.00	250.7	4756.93	6535.13	4756.93	0.75	6531.40	0.64	0.06	98.94
7	24-7	15.00	261.9	4310.87	6275.80	4310.87	0.79	6272.40	0.65	0.06	115.42
8	24-8	15.00	274.3	4026.53	6082.73	4026.53	0.81	6080.27	0.66	0.05	131.90
9	24-9	15.00	286.4	3788.53	5953.60	3788.53	0.84	5951.47	0.67	0.04	148.35
10	24-10	15.00	292.9	3321.53	5670.33	3321.53	0.90	5668.00	0.69	0.05	164.81
11	24-11	15.00	313.4	2907.07	5339.80	2907.07	0.96	5336.87	0.71	0.04	181.26
12	24-12	15.00	324.5	2460.20	5015.13	2460.20	1.04	5013.53	0.73	0.04	197.69

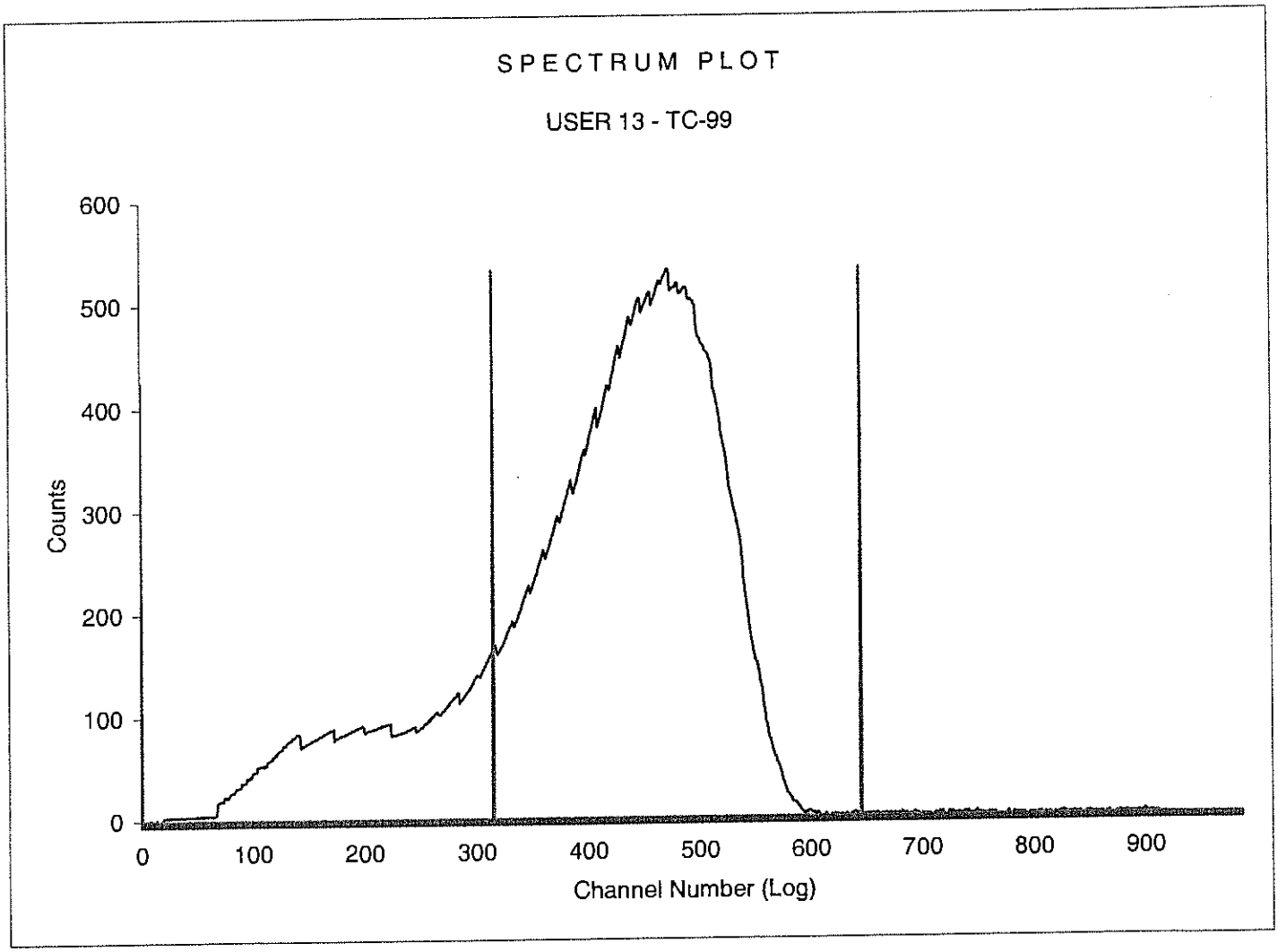
Sample Count Start Time:	30 Jun 2014 11:42:43		
Data Capture Date	30 Jun 2014 11:58:05		
User Filename	S13063024-1A.XLS		
	U13063024-1A.XLS		
Spectrum Type	Log Counts		
User Number	13		
User Id	TC-99		
User Comment	RED		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	1	24-1	15.00
H#, Total Counts:	161.8	562	
Win1: Tc-99 - Start, End, Counts:	315	645	268
Win2: - Start, End, Counts:	0	990	562



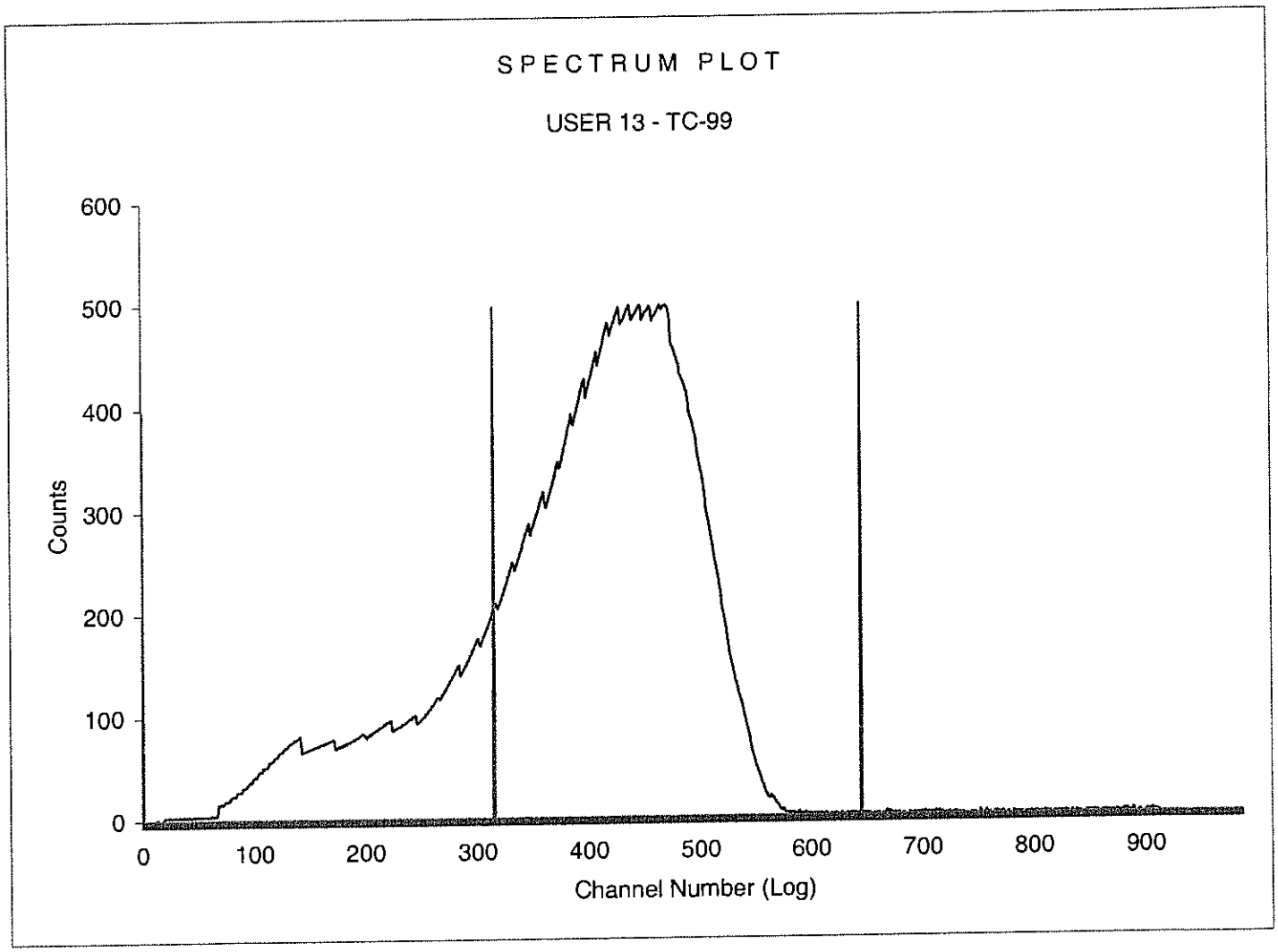
Sample Count Start Time:	30 Jun 2014 11:59:20		
Data Capture Date	30 Jun 2014 12:14:44		
User Filename	S13063024-2A.XLS		
	U13063024-1A.XLS		
Spectrum Type	Log Counts		
User Number	13		
User Id	TC-99		
User Comment	RED		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	2	24-2	15.00
H#, Total Counts:	164.5	113509	
Win1: Tc-99 - Start, End, Counts:	315	645	91760
Win2: - Start, End, Counts:	0	990	113444



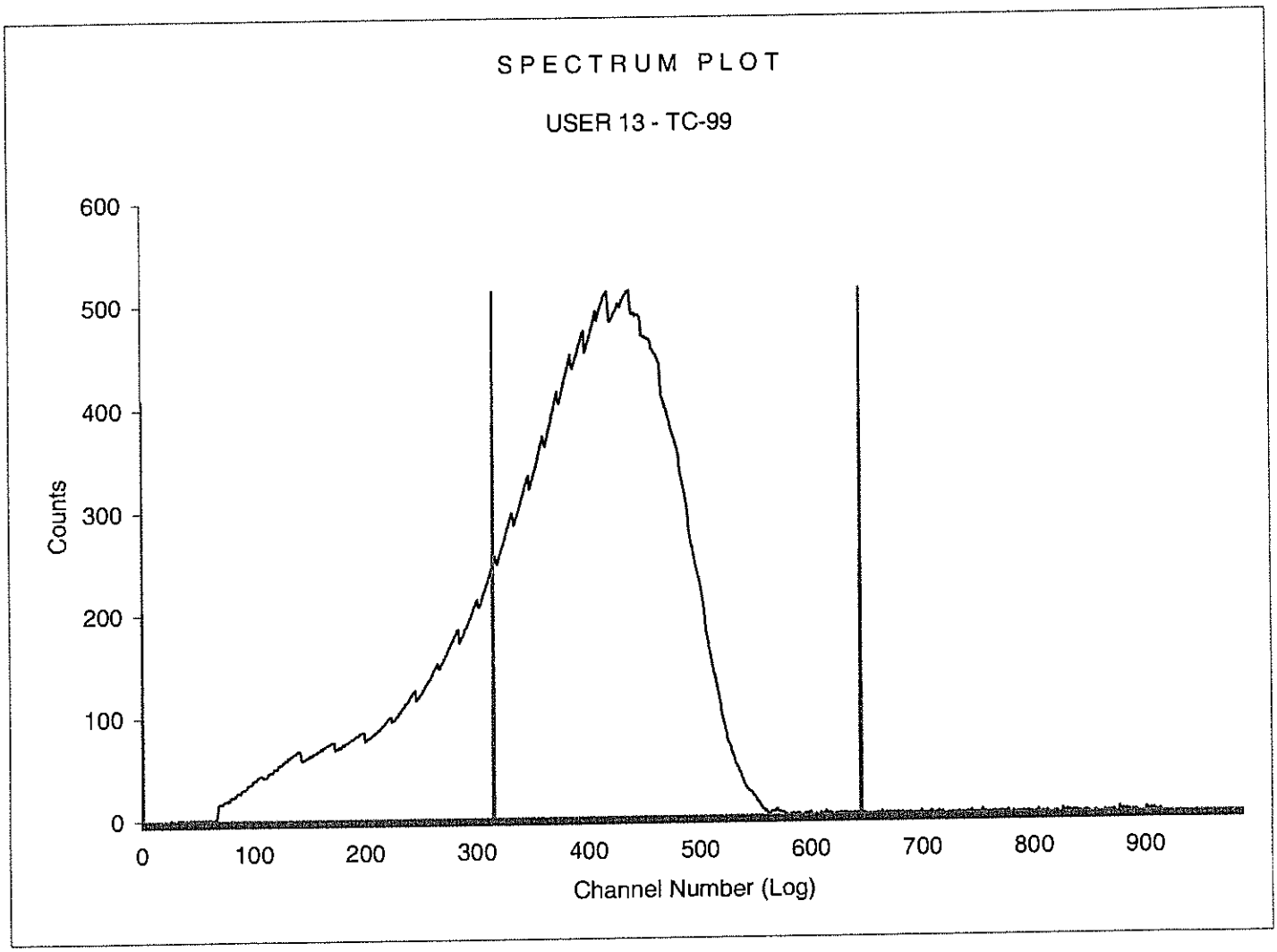
Sample Count Start Time:	30 Jun 2014 12:15:56		
Data Capture Date	30 Jun 2014 12:31:20		
User Filename	S13063024-3A.XLS		
	U13063024-1A.XLS		
Spectrum Type	Log Counts		
User Number	13		
User Id	TC-99		
User Comment	RED		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	3	24-3	15.00
H#, Total Counts:	192.1	108841	
Win1: Tc-99 - Start, End, Counts:	315	645	87843
Win2: - Start, End, Counts:	0	990	108780



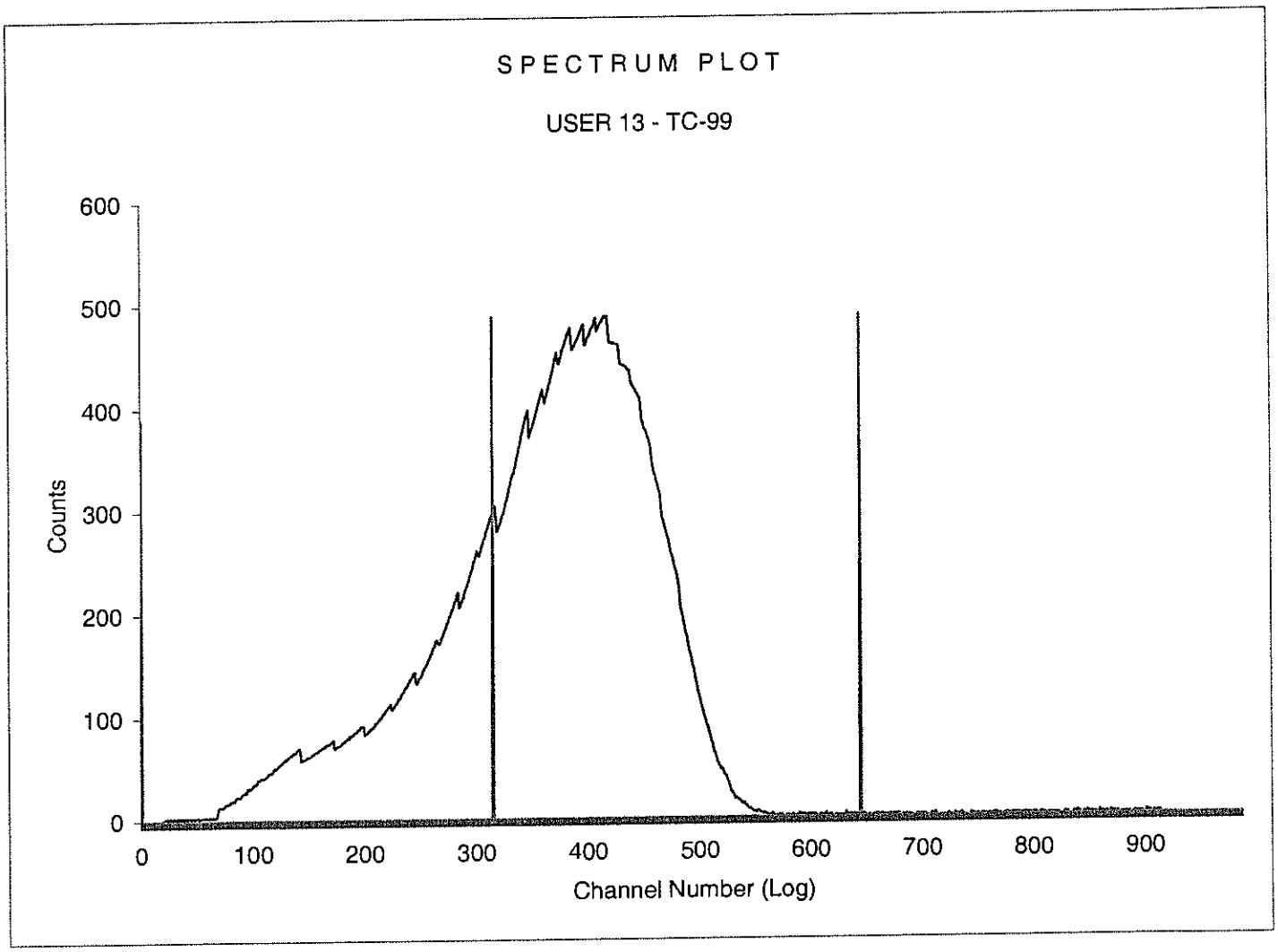
Sample Count Start Time:	30 Jun 2014 12:32:29		
Data Capture Date	30 Jun 2014 12:47:53		
User Filename	S13063024-4A.XLS		
	U13063024-1A.XLS		
Spectrum Type	Log Counts		
User Number	13		
User Id	TC-99		
User Comment	RED		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	4	24-4	15.00
H#, Total Counts:	212.7	104076	
Win1: Tc-99 - Start, End, Counts:	315	645	82044
Win2: - Start, End, Counts:	0	990	104040



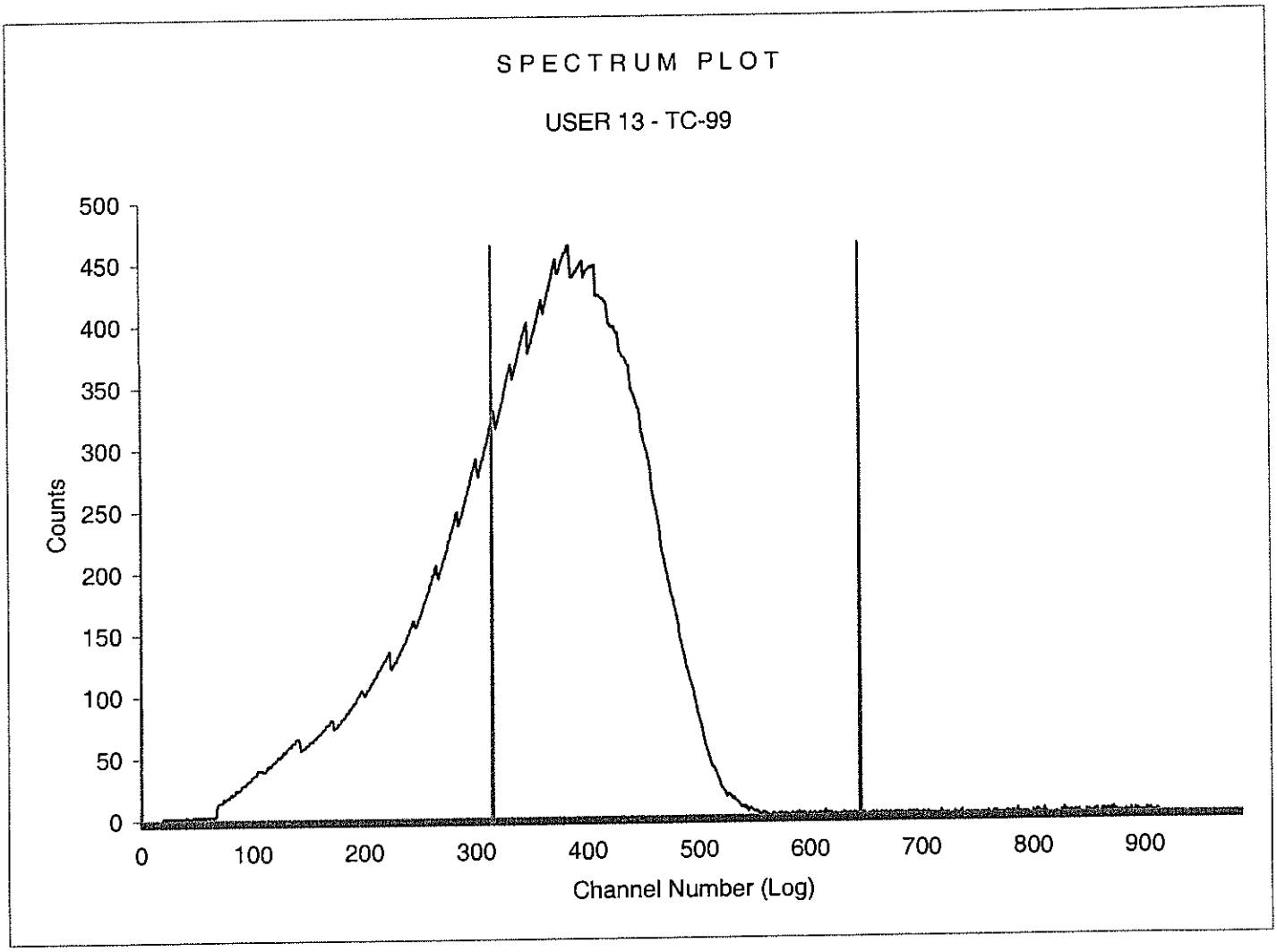
Sample Count Start Time:	30 Jun 2014 12:49:00		
Data Capture Date	30 Jun 2014 13:04:23		
User Filename	S13063024-5A.XLS		
	U13063024-1A.XLS		
Spectrum Type	Log Counts		
User Number	13		
User Id	TC-99		
User Comment	RED		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	5	24-5	15.00
H#, Total Counts:	233.5	102372	
Win1: Tc-99 - Start, End, Counts:	315	645	78406
Win2: - Start, End, Counts:	0	990	102344



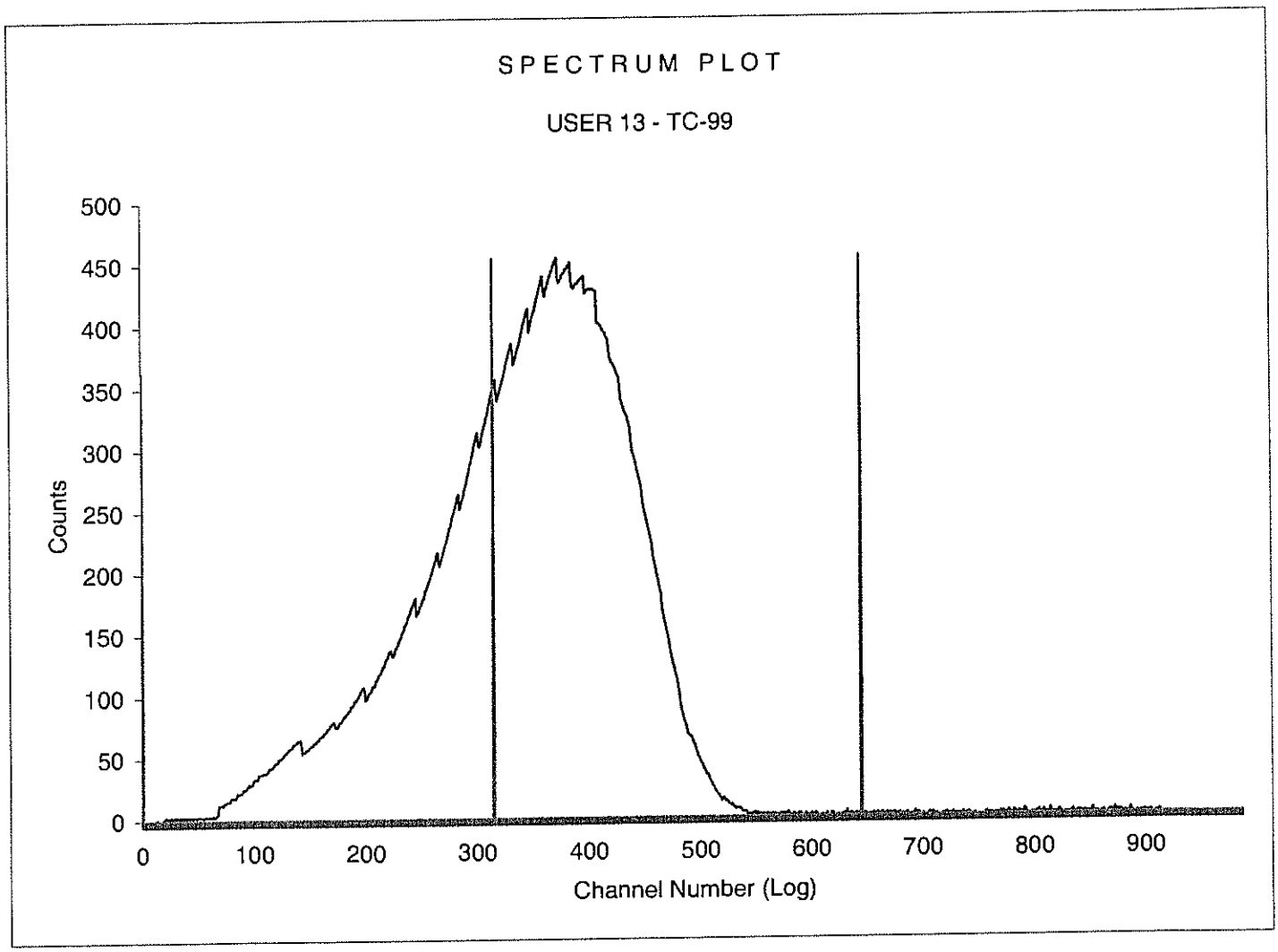
Sample Count Start Time:	30 Jun 2014 13:05:29		
Data Capture Date	30 Jun 2014 13:20:53		
User Filename	S13063024-6A.XLS		
	U13063024-1A.XLS		
Spectrum Type	Log Counts		
User Number	13		
User Id	TC-99		
User Comment	RED		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	6	24-6	15.00
H#, Total Counts:	250.7	97988	
Win1: Tc-99 - Start, End, Counts:	315	645	71056
Win2: - Start, End, Counts:	0	990	97953



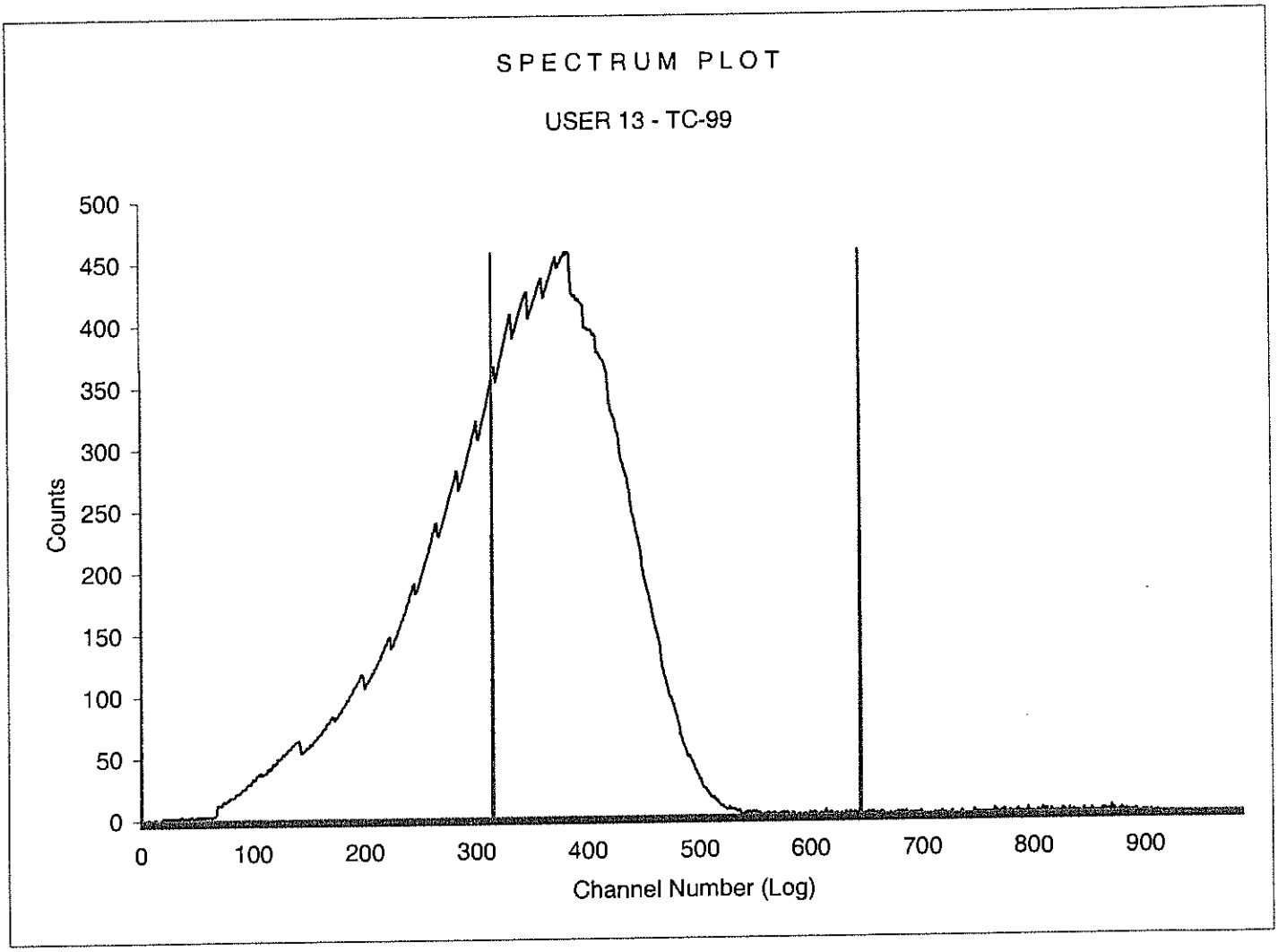
Sample Count Start Time:	30 Jun 2014 13:21:58		
Data Capture Date	30 Jun 2014 13:37:22		
User Filename	S13063024-7A.XLS		
	U13063024-1A.XLS		
Spectrum Type	Log Counts		
User Number	13		
User Id	TC-99		
User Comment	RED		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	7	24-7	15.00
H#, Total Counts:	261.9	94099	
Win1: Tc-99 - Start, End, Counts:	315	645	64343
Win2: - Start, End, Counts:	0	990	94077



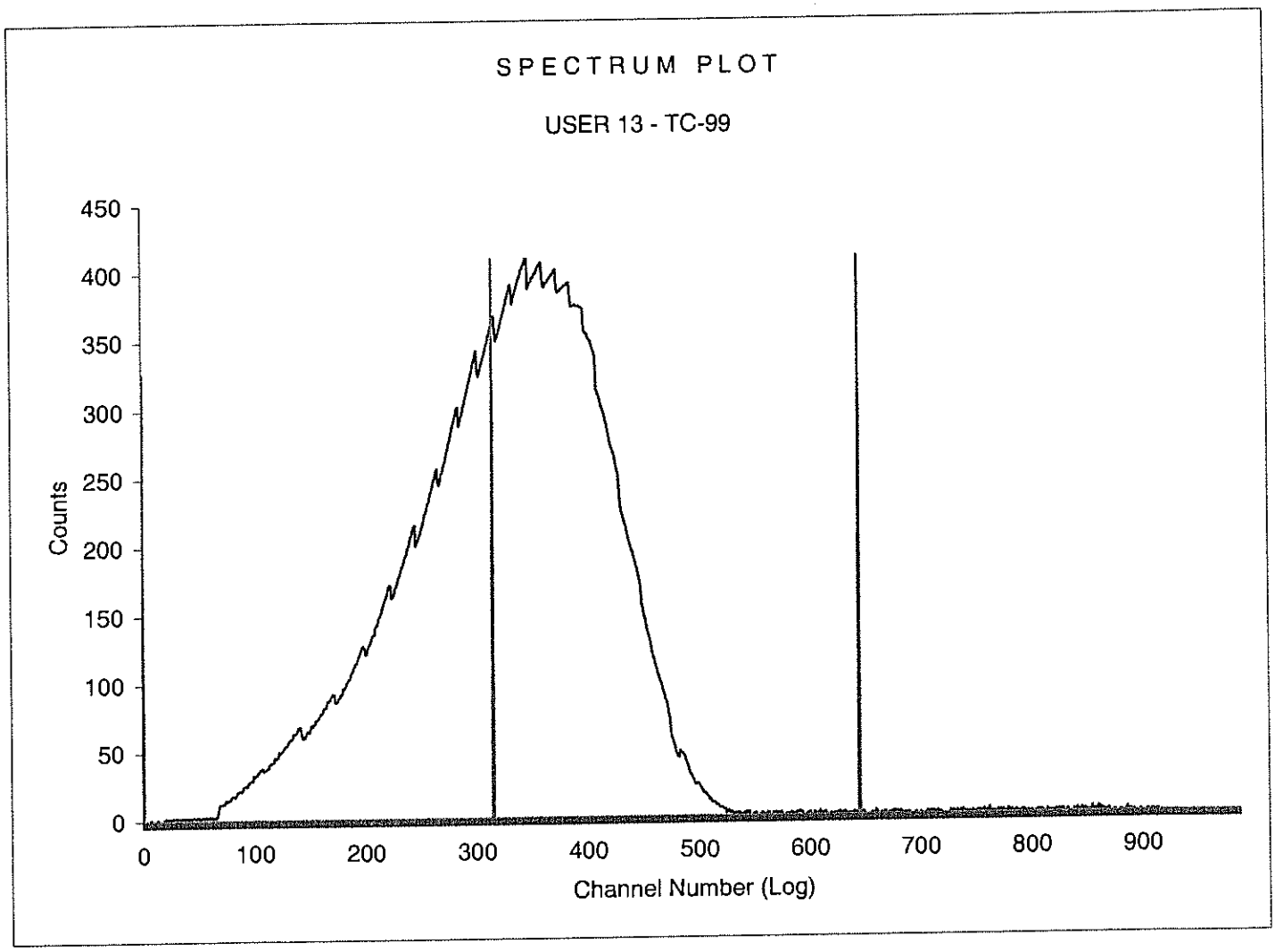
Sample Count Start Time:	30 Jun 2014 13:38:27		
Data Capture Date	30 Jun 2014 13:53:50		
User Filename	S13063024-8A.XLS		
	U13063024-1A.XLS		
Spectrum Type	Log Counts		
User Number	13		
User Id	TC-99		
User Comment	RED		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	8	24-8	15.00
H#, Total Counts:	274.3	91211	
Win1: Tc-99 - Start, End, Counts:	315	645	60050
Win2: - Start, End, Counts:	0	990	91188



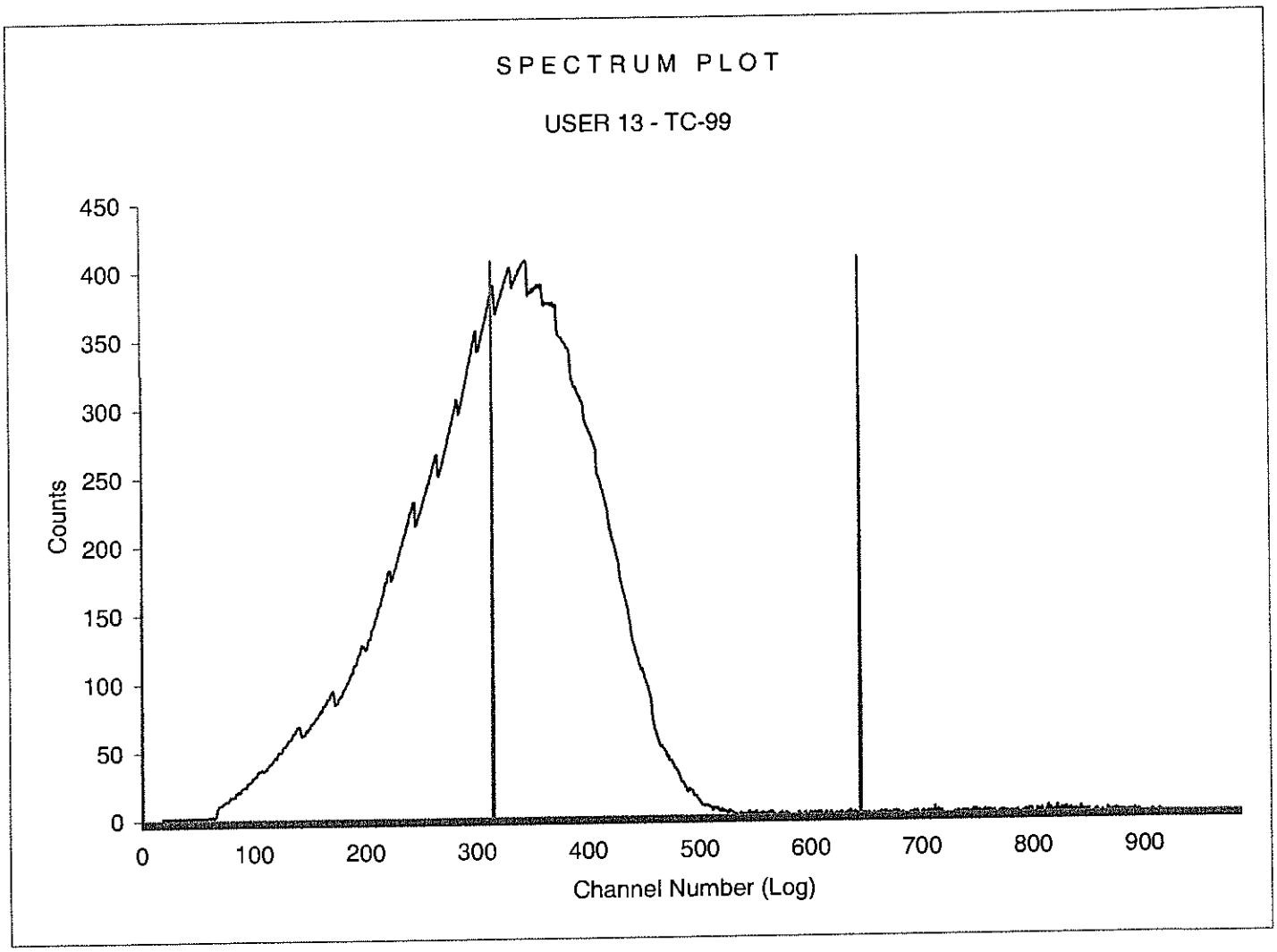
Sample Count Start Time:	30 Jun 2014 13:54:54		
Data Capture Date	30 Jun 2014 14:10:18		
User Filename	S13063024-9A.XLS		
	U13063024-1A.XLS		
Spectrum Type	Log Counts		
User Number	13		
User Id	TC-99		
User Comment	RED		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	9	24-9	15.00
H#, Total Counts:	286.4	89275	
Win1: Tc-99 - Start, End, Counts:	315	645	56472
Win2: - Start, End, Counts:	0	990	89255



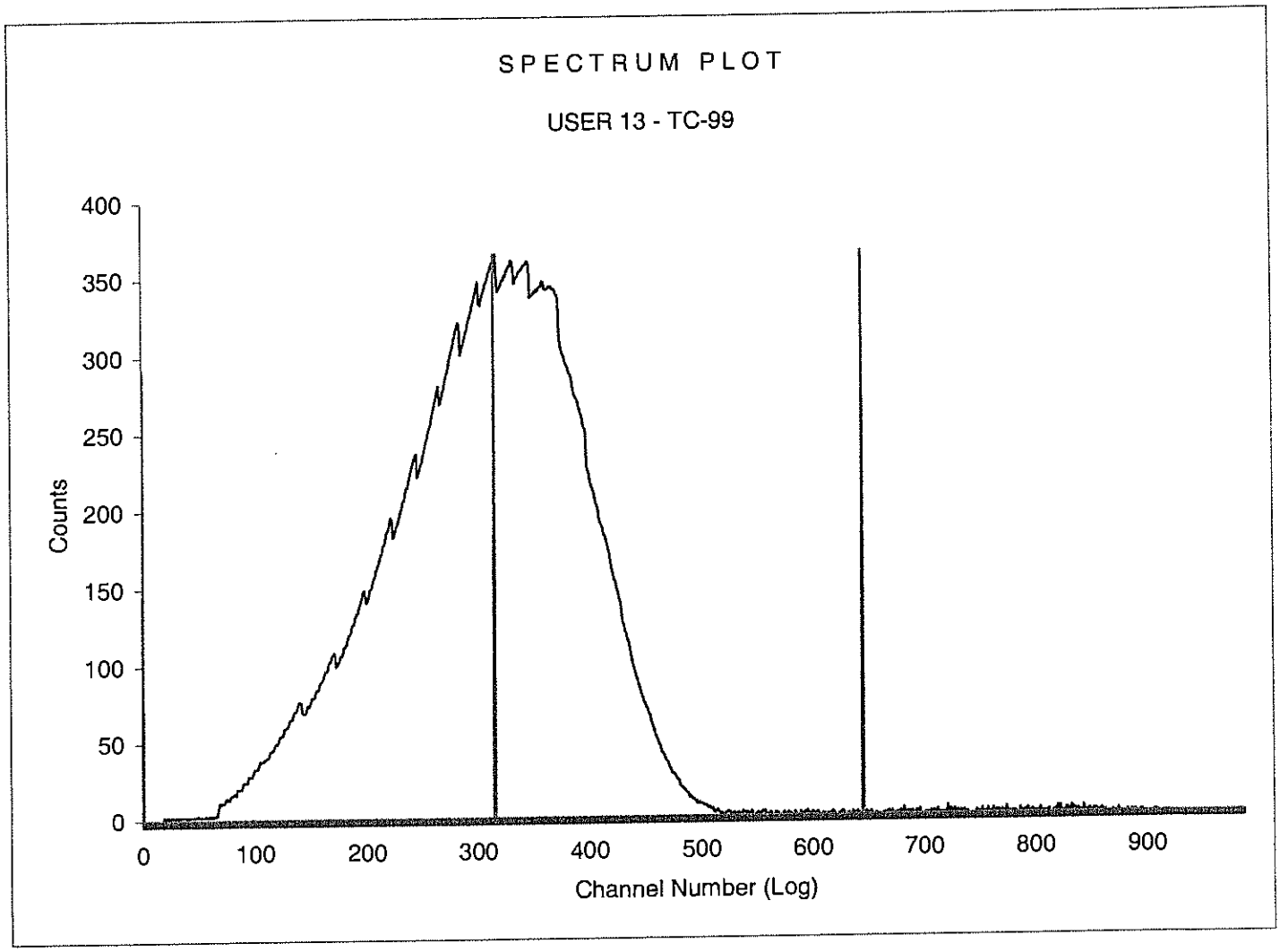
Sample Count Start Time:	30 Jun 2014 14:11:22		
Data Capture Date	30 Jun 2014 14:26:46		
User Filename	S13063024-10A.XLS		
	U13063024-1A.XLS		
Spectrum Type	Log Counts		
User Number	13		
User Id	TC-99		
User Comment	RED		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	10	24-10	15.00
H#, Total Counts:	292.9	85025	
Win1: Tc-99 - Start, End, Counts:	315	645	49462
Win2: - Start, End, Counts:	0	990	85006



Sample Count Start Time:	30 Jun 2014 14:27:49		
Data Capture Date	30 Jun 2014 14:43:12		
User Filename	S13063024-11A.XLS		
	U13063024-1A.XLS		
Spectrum Type	Log Counts		
User Number	13		
User Id	TC-99		
User Comment	RED		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	11	24-11	15.00
H#, Total Counts:	313.4	80055	
Win1: Tc-99 - Start, End, Counts:	315	645	43224
Win2: - Start, End, Counts:	0	990	80047



Sample Count Start Time:	30 Jun 2014 14:44:14		
Data Capture Date	30 Jun 2014 14:59:37		
User Filename	S13063024-12A.XLS		
	U13063024-1A.XLS		
Spectrum Type	Log Counts		
User Number	13		
User Id	TC-99		
User Comment	RED		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	12	24-12	15.00
H#, Total Counts:	324.5	75204	
Win1: Tc-99 - Start, End, Counts:	315	645	36542
Win2: - Start, End, Counts:	0	990	75191



Vers

ID = TC-SP 30 JUN 2014 15:05
USER:13 COMMENT:RED
PRESET TIME : 15.00
DATA CALC : CPM H# :YES SAMPLE REPEATS: 1 PRINTER :EDIT
COUNT BLANK : NO IC# : NO REPLICATES : 1 RS232 :EDIT
TWO PHASE : NO AGC : NO CYCLE REPEATS : 1 DISK : OFF
SCINTILLATOR: LIQUID LUMEX:YES LOW SAMPLE REJ: 0
LOW LEVEL : NO HALF LIFE CORRECTION DATE: none

CHAN: 315.0 - 645.0 %ERROR: 0.00 FACTOR: 1.000000 BKG. SUB: 0
CHAN: 0.0 - 900.0 %ERROR: 0.00 FACTOR: 1.000000 BKG. SUB: 0

ALPHA-BETA DISCRIMINATION: NO

SAM NO	POS	TIME MIN	H#	WIND1 RAW CPM	WIND2 RAW CPM	WIND1 CPM	WIND1 %ERROR	WIND2 CPM	WIND2 %ERROR	LUMEX %	ELAPSED TIME
1	3-1	15.00	151.9	17.80	46.47	17.80	12.24	37.27	9.45	17.47	16.11
2	3-2	15.00	159.1	5667.40	6949.07	5667.40	0.69	6938.67	0.62	0.16	32.76
3	3-3	15.00	196.0	5331.93	6642.60	5331.93	0.71	6635.00	0.63	0.12	49.36
4	3-4	15.00	224.4	4761.87	6213.27	4761.87	0.75	6208.80	0.66	0.08	65.90
5	3-5	15.00	250.2	4450.93	6027.40	4450.93	0.77	6022.93	0.67	0.08	82.42
6	3-6	15.00	263.8	4053.53	5796.93	4053.53	0.81	5793.73	0.68	0.06	98.92
7	3-7	15.00	283.5	3561.40	5478.20	3561.40	0.87	5475.20	0.70	0.06	115.38
8	3-8	15.00	298.9	3145.67	5254.87	3145.67	0.92	5252.13	0.71	0.06	131.85
9	3-9	15.00	310.5	2862.40	5042.27	2862.40	0.97	5039.73	0.73	0.06	148.32
10	3-10	15.00	325.7	2406.27	4699.27	2406.27	1.05	4697.33	0.75	0.05	164.76
11	3-11	15.00	326.6	2173.40	4511.33	2173.40	1.11	4509.47	0.77	0.05	181.19
~~12~~	~~3-12~~	~~15.00~~	~~339.9~~	~~2003.00~~	~~4341.07~~	~~2003.00~~	~~1.15~~	~~4339.60~~	~~0.78~~	~~0.04~~	~~197.61~~

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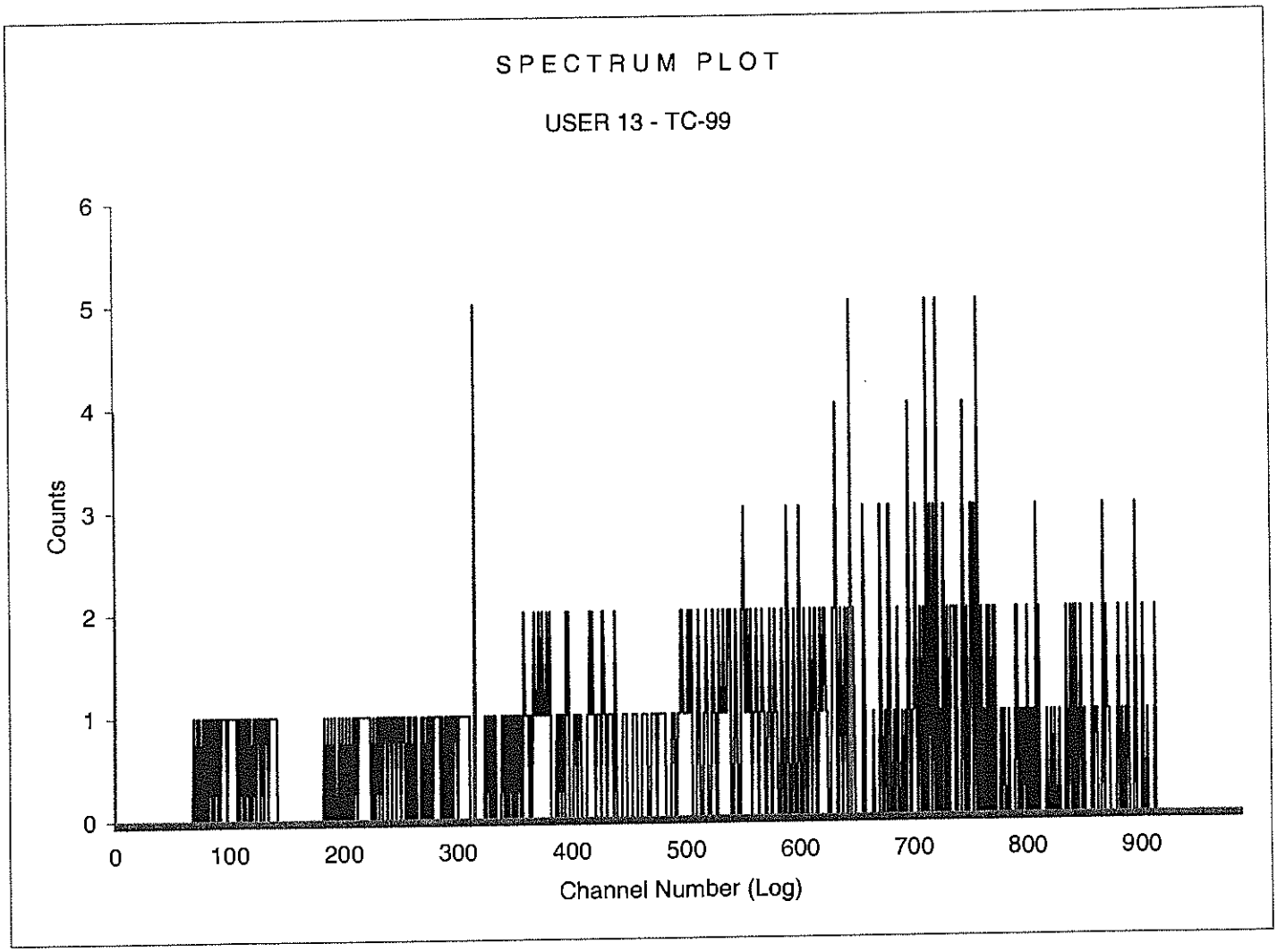
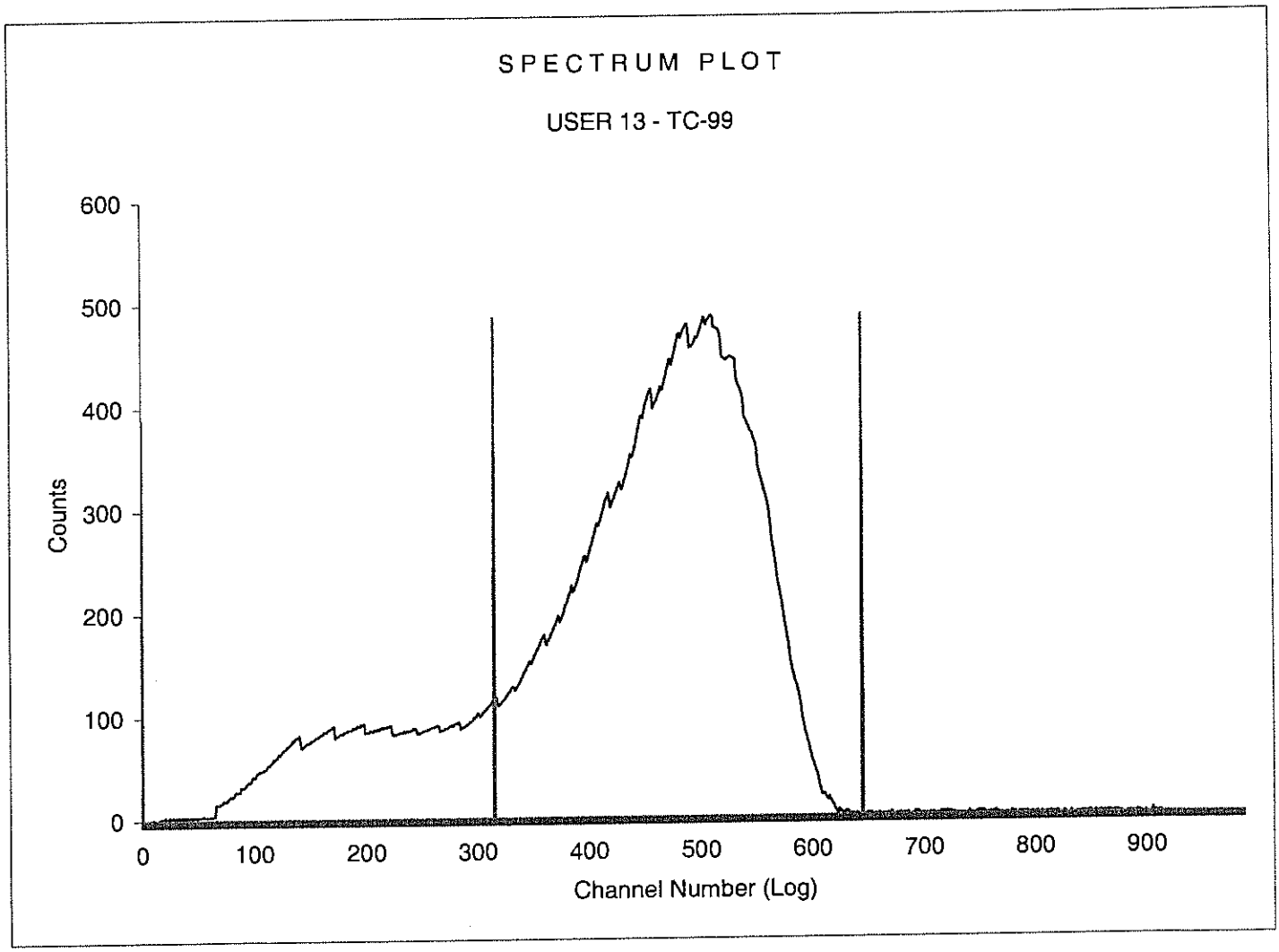
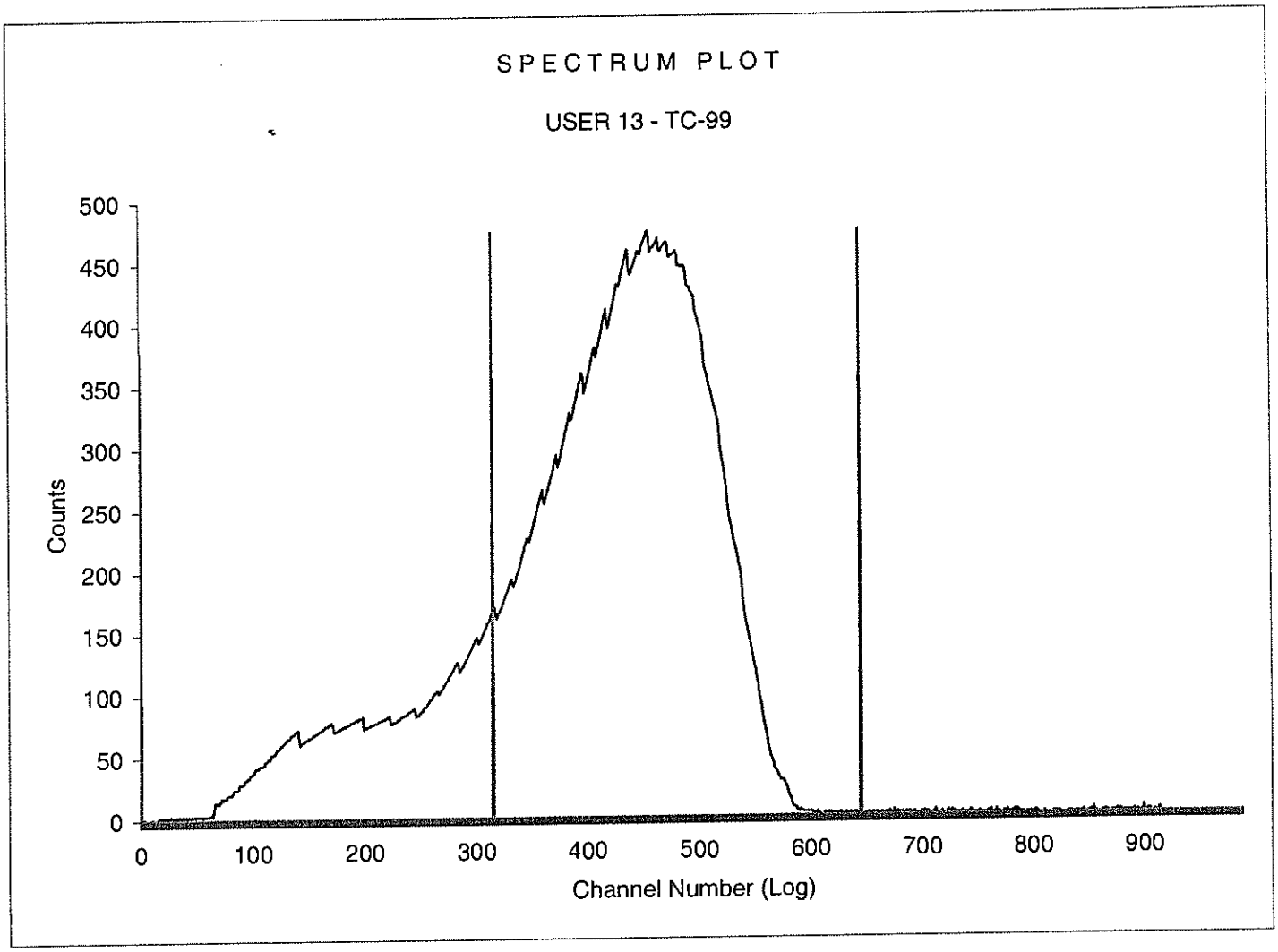
Sample Count Start Time:	30 Jun 2014 15:01:10		
Data Capture Date	30 Jun 2014 15:16:22		
User Filename	S13063003-1A.XLS		
	U13063003-1A.XLS		
Spectrum Type	Log Counts		
User Number	13		
User Id	TC-99		
User Comment	RED		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	1	3-1	15.00
H#, Total Counts:	151.9	580	
Win1: Tc-99 - Start, End, Counts:	315	645	268
Win2: - Start, End, Counts:	0	990	580



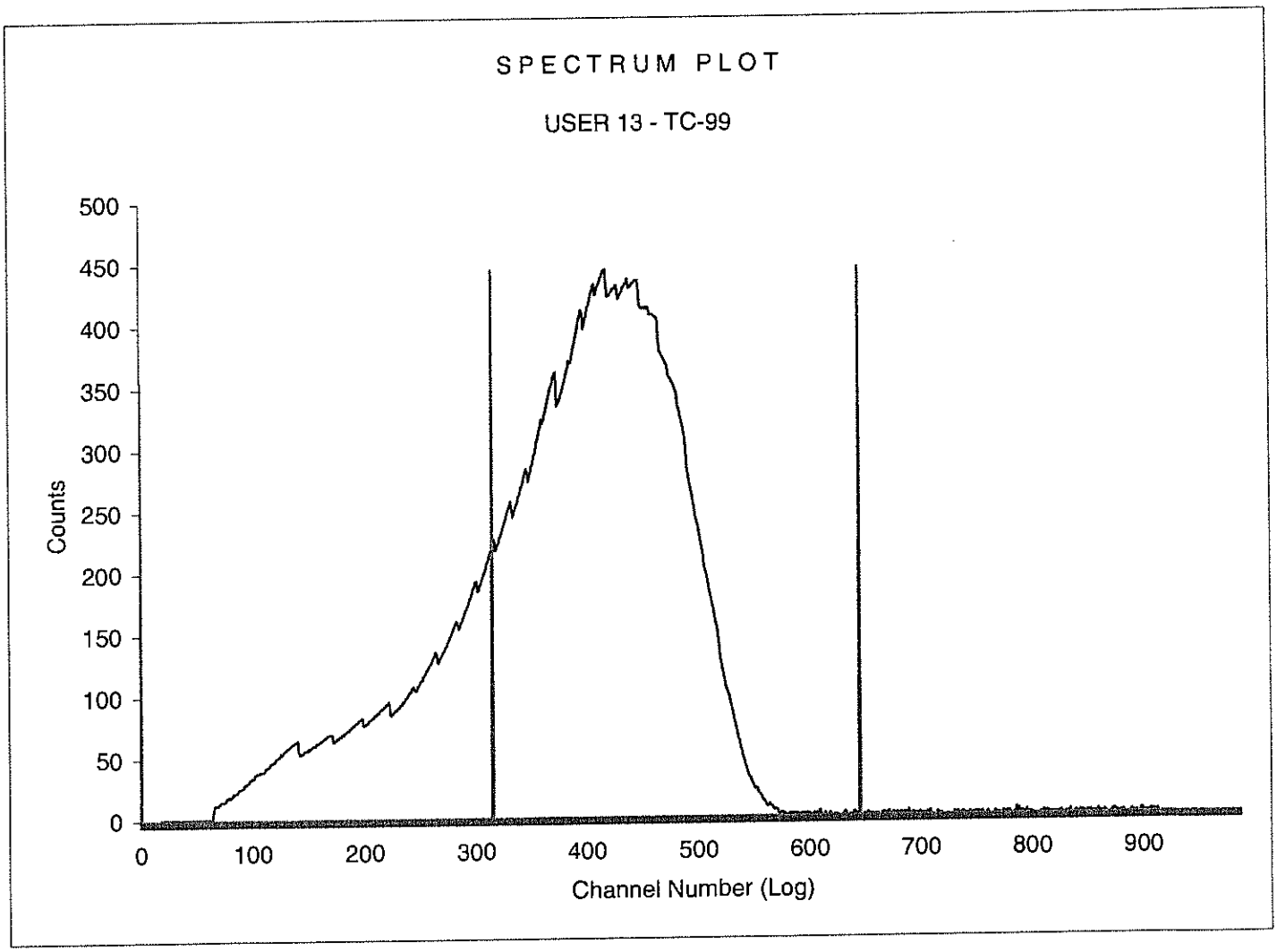
Sample Count Start Time:	30 Jun 2014 15:17:49		
Data Capture Date	30 Jun 2014 15:33:02		
User Filename	S13063003-2A.XLS		
	U13063003-1A.XLS		
Spectrum Type	Log Counts		
User Number	13		
User Id	TC-99		
User Comment	RED		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	2	3-2	15.00
H#, Total Counts:	159.1	104087	
Win1: Tc-99 - Start, End, Counts:	315	645	84896
Win2: - Start, End, Counts:	0	990	104022



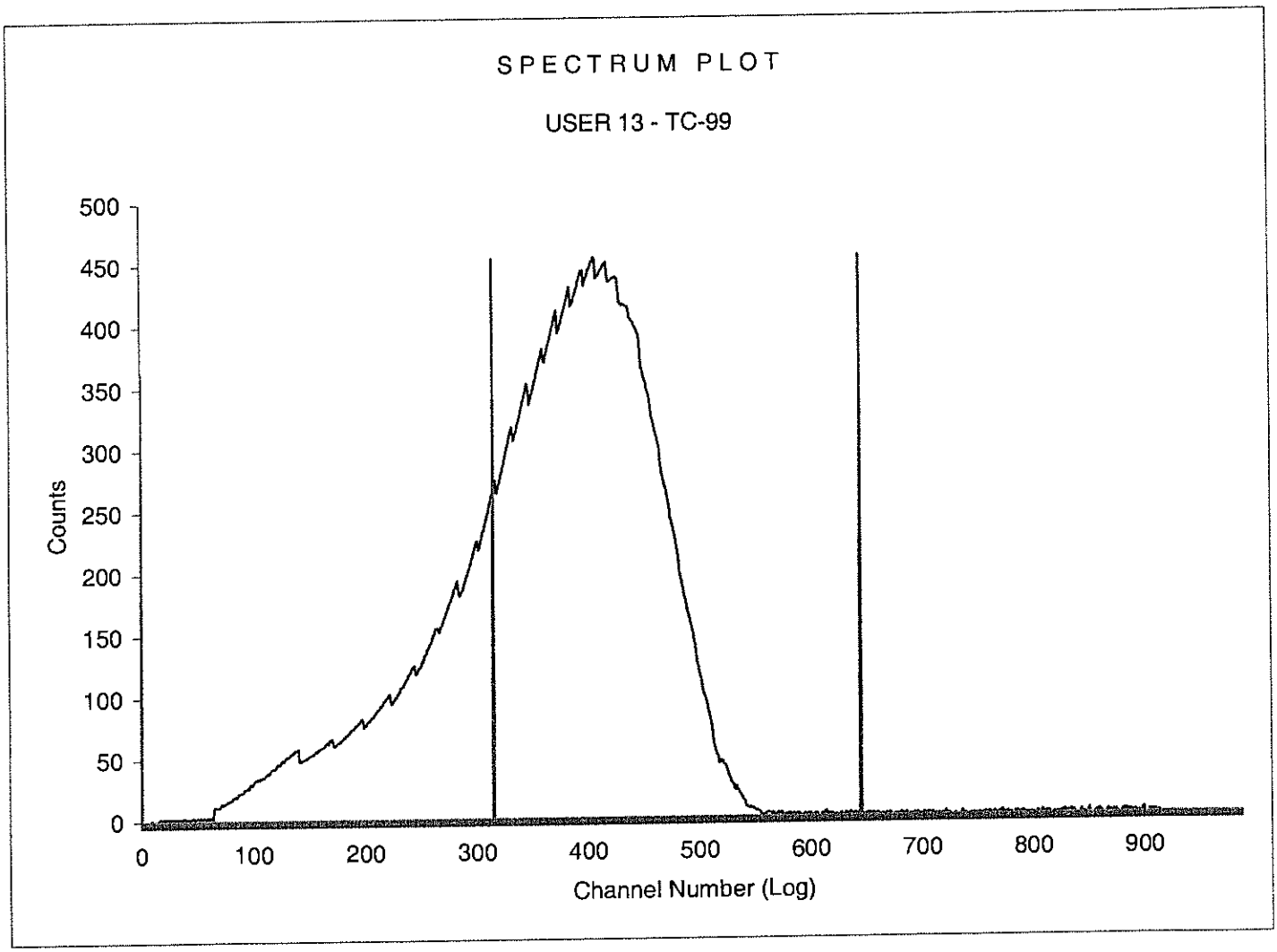
Sample Count Start Time:	30 Jun 2014 15:34:25		
Data Capture Date	30 Jun 2014 15:49:38		
User Filename	S13063003-3A.XLS		
	U13063003-1A.XLS		
Spectrum Type	Log Counts		
User Number	13		
User Id	TC-99		
User Comment	RED		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	3	3-3	15.00
H#, Total Counts:	196.0	99535	
Win1: Tc-99 - Start, End, Counts:	315	645	79812
Win2: - Start, End, Counts:	0	990	99477



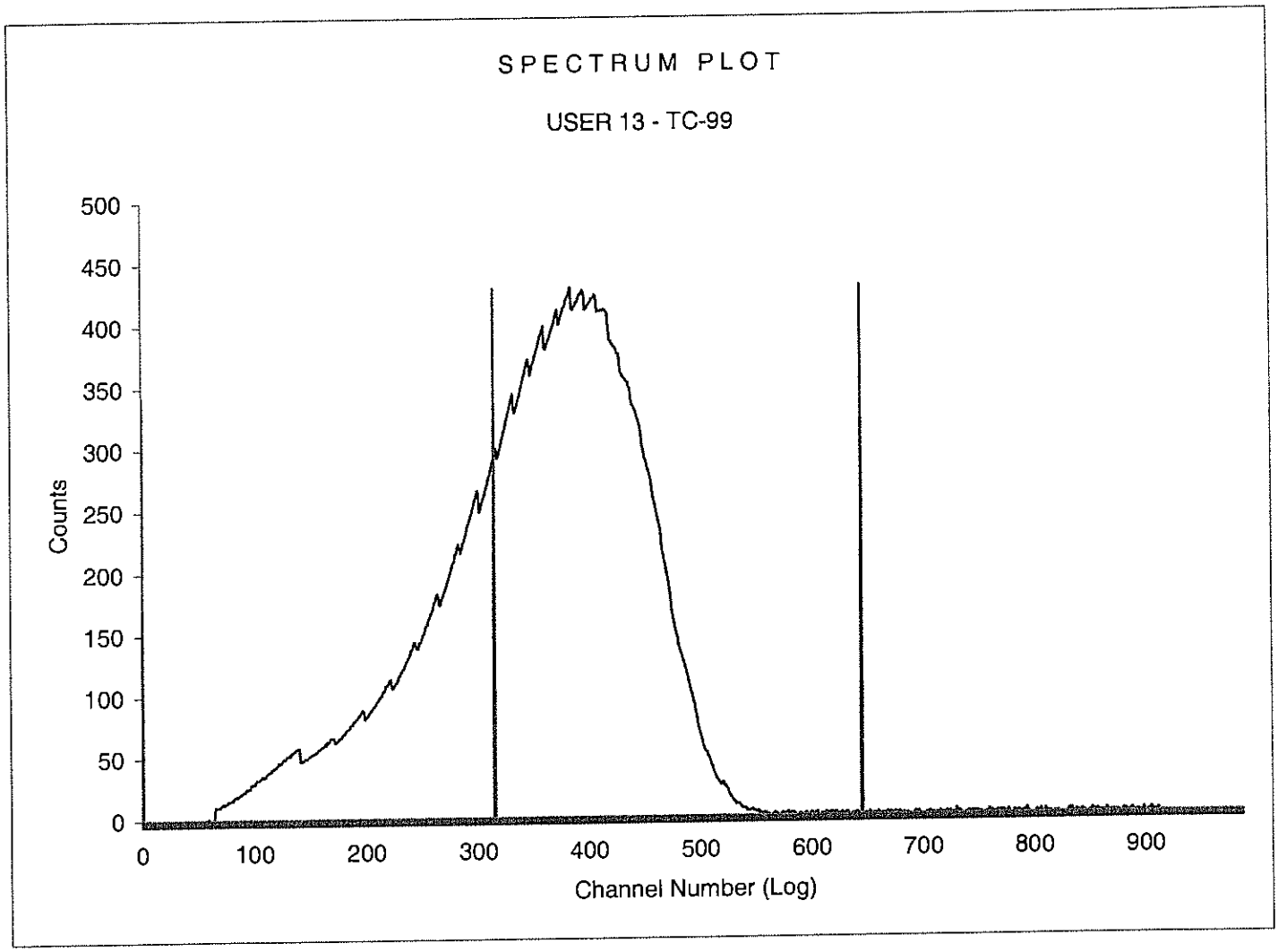
Sample Count Start Time:	30 Jun 2014 15:50:57		
Data Capture Date	30 Jun 2014 16:06:09		
User Filename	S13063003-4A.XLS		
	U13063003-1A.XLS		
Spectrum Type	Log Counts		
User Number	13		
User Id	TC-99		
User Comment	RED		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	4	3-4	15.00
H#, Total Counts:	224.4	93082	
Win1: Tc-99 - Start, End, Counts:	315	645	71209
Win2: - Start, End, Counts:	0	990	93048



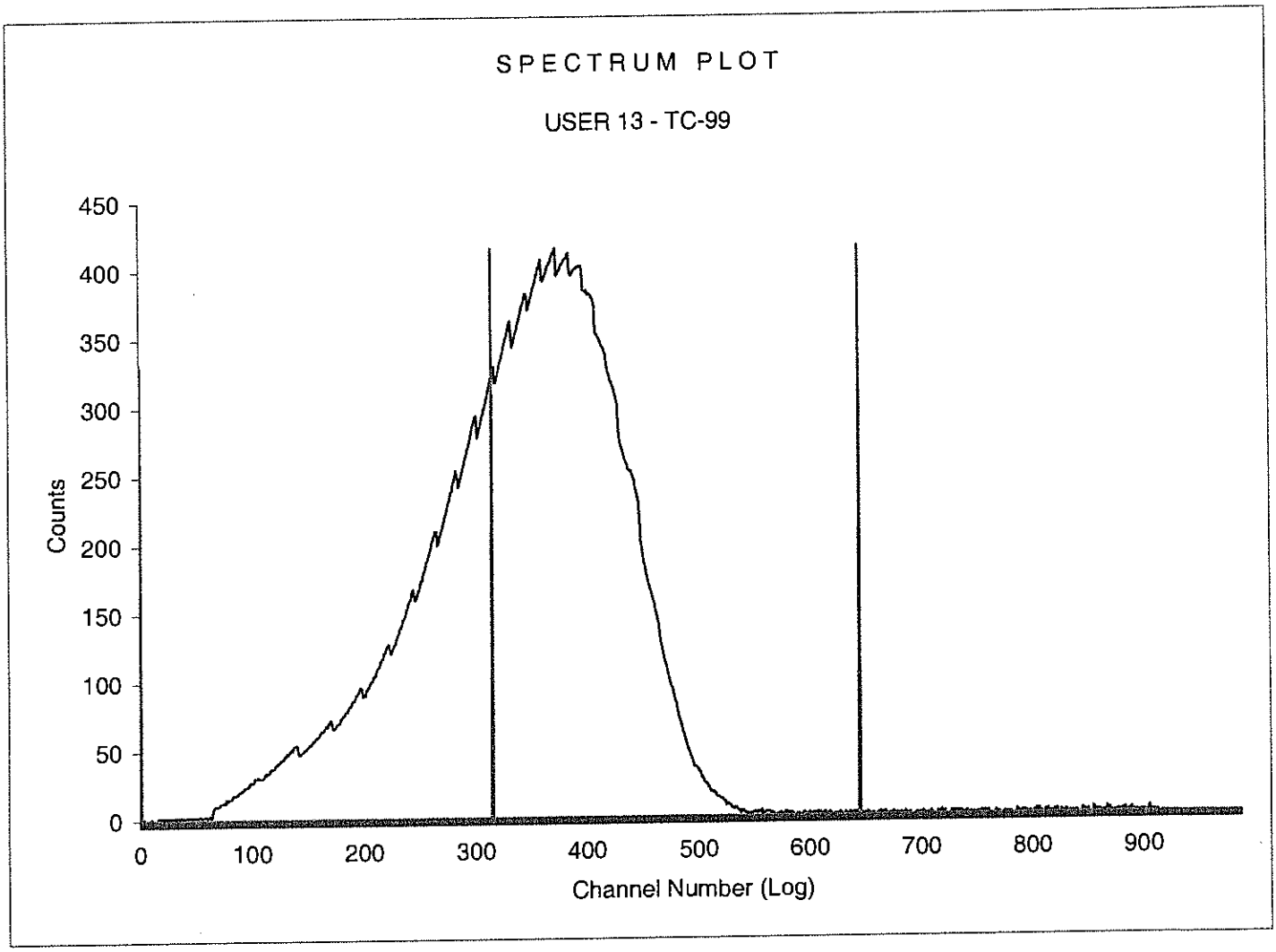
Sample Count Start Time:	30 Jun 2014 16:07:28		
Data Capture Date	30 Jun 2014 16:22:41		
User Filename	S13063003-5A.XLS		
	U13063003-1A.XLS		
Spectrum Type	Log Counts		
User Number	13		
User Id	TC-99		
User Comment	RED		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	5	3-5	15.00
H#, Total Counts:	250.2	90355	
Win1: Tc-99 - Start, End, Counts:	315	645	66499
Win2: - Start, End, Counts:	0	990	90324



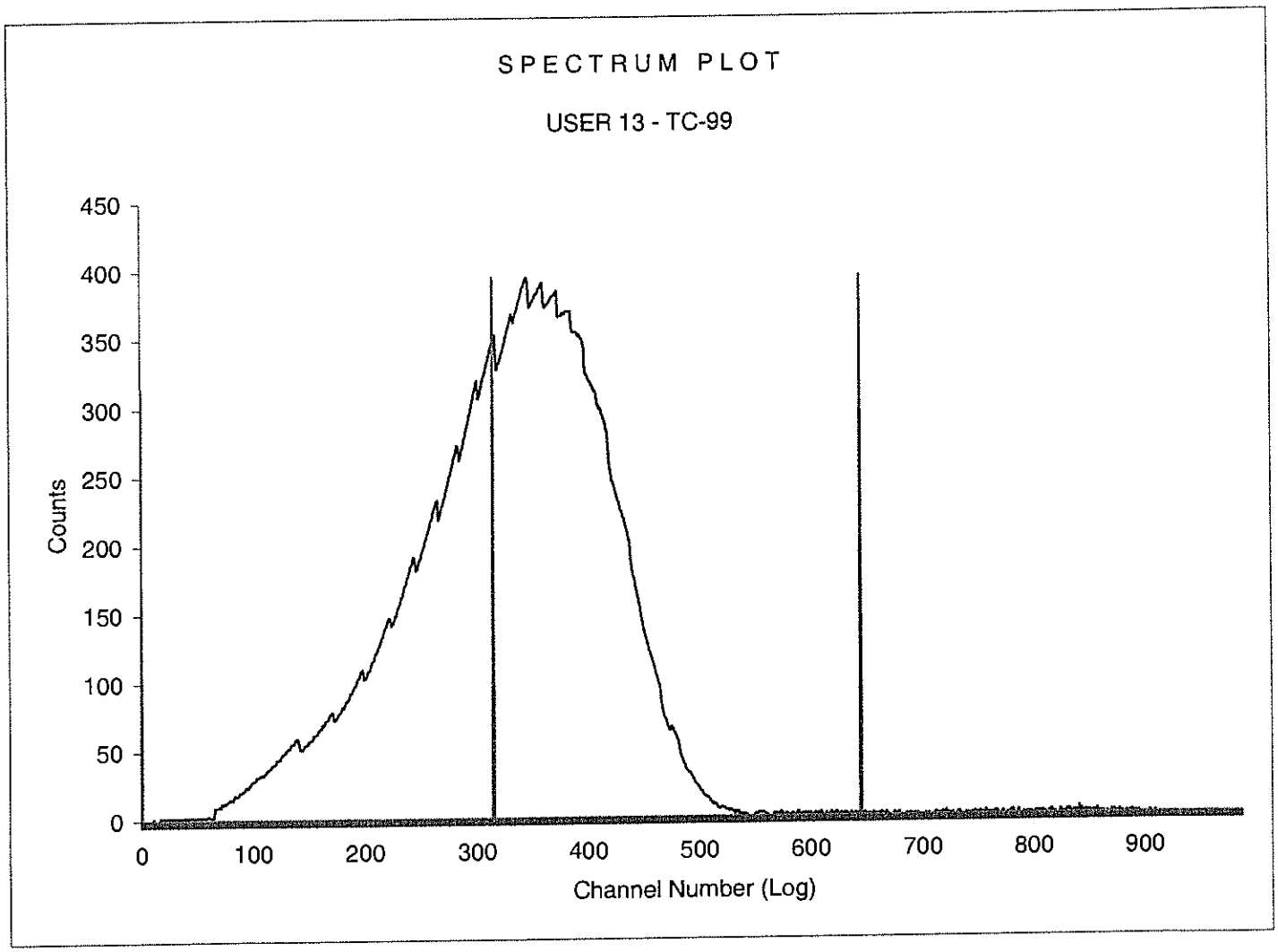
Sample Count Start Time:	30 Jun 2014 16:23:58		
Data Capture Date	30 Jun 2014 16:39:11		
User Filename	S13063003-6A.XLS		
	U13063003-1A.XLS		
Spectrum Type	Log Counts		
User Number	13		
User Id	TC-99		
User Comment	RED		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	6	3-6	15.00
H#, Total Counts:	263.8	86824	
Win1: Tc-99 - Start, End, Counts:	315	645	60512
Win2: - Start, End, Counts:	0	990	86798



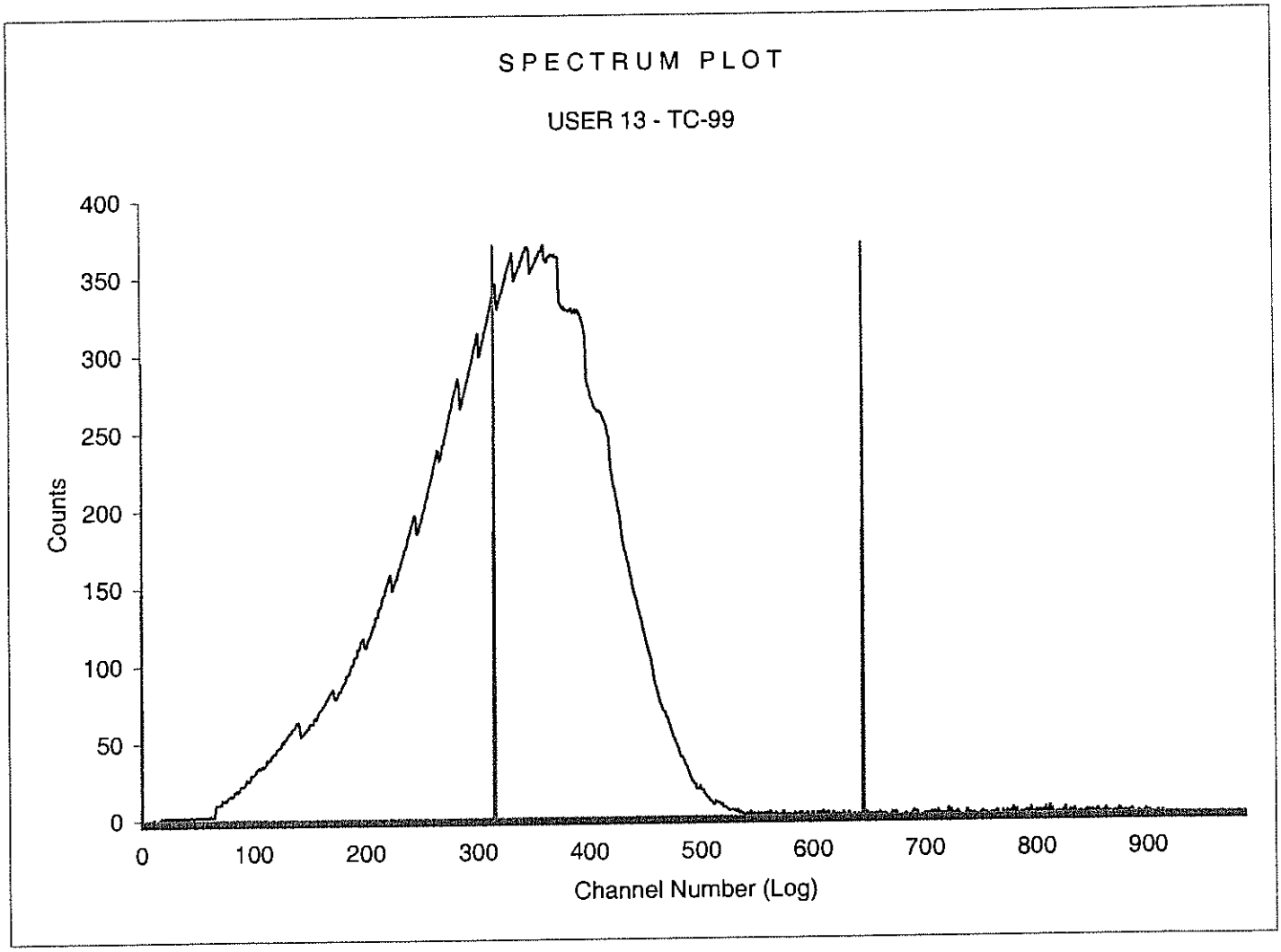
Sample Count Start Time:	30 Jun 2014 16:40:26		
Data Capture Date	30 Jun 2014 16:55:39		
User Filename	S13063003-7A.XLS		
	U13063003-1A.XLS		
Spectrum Type	Log Counts		
User Number	13		
User Id	TC-99		
User Comment	RED		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	7	3-7	15.00
H#, Total Counts:	283.5	82137	
Win1: Tc-99 - Start, End, Counts:	315	645	53099
Win2: - Start, End, Counts:	0	990	82110



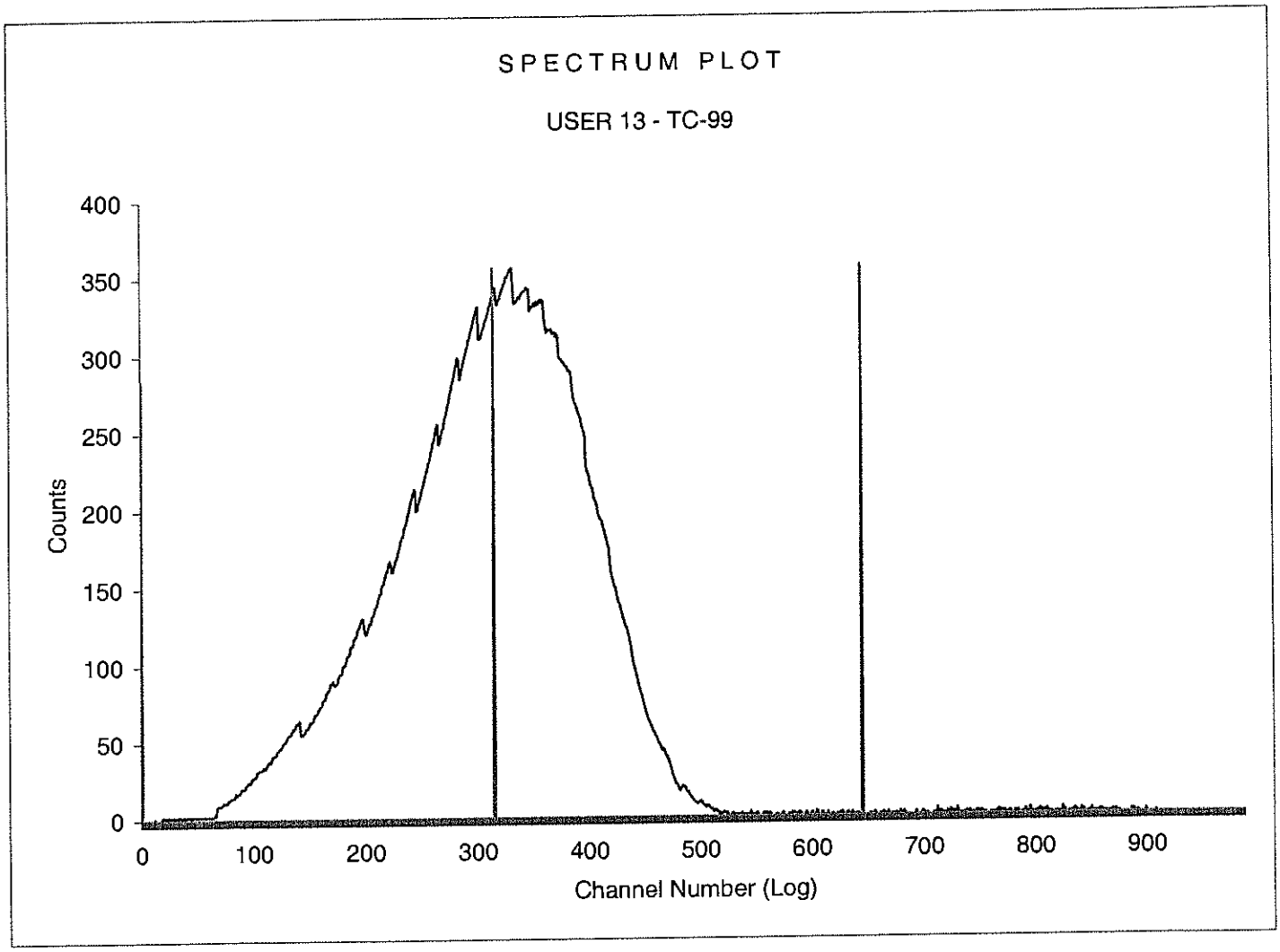
Sample Count Start Time:	30 Jun 2014 16:56:54		
Data Capture Date	30 Jun 2014 17:12:06		
User Filename	S13063003-8A.XLS		
	U13063003-1A.XLS		
Spectrum Type	Log Counts		
User Number	13		
User Id	TC-99		
User Comment	RED		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	8	3-8	15.00
H#, Total Counts:	298.9	78784	
Win1: Tc-99 - Start, End, Counts:	315	645	46838
Win2: - Start, End, Counts:	0	990	78763



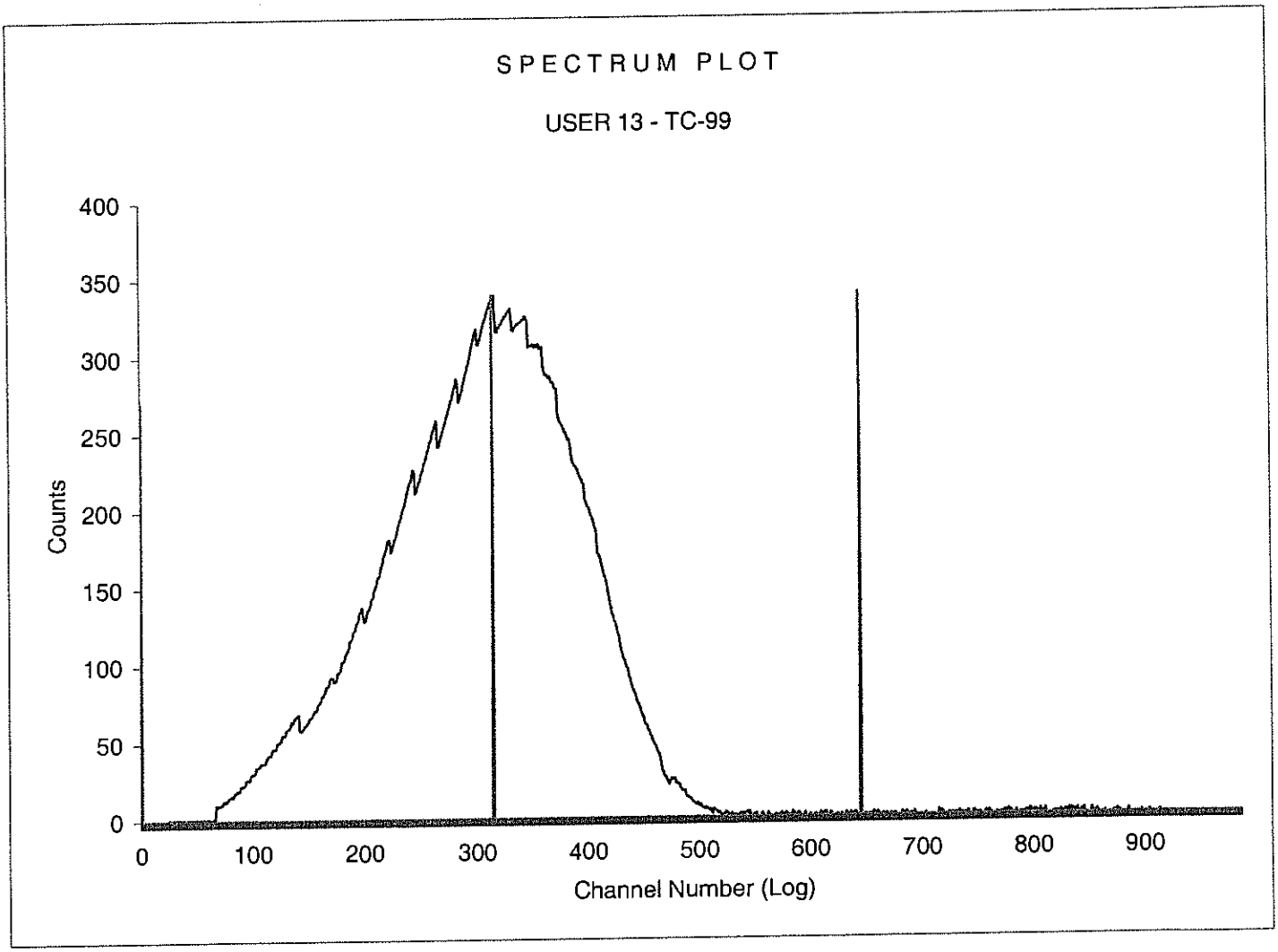
Sample Count Start Time:	30 Jun 2014 17:13:22		
Data Capture Date	30 Jun 2014 17:28:34		
User Filename	S13063003-9A.XLS		
	U13063003-1A.XLS		
Spectrum Type	Log Counts		
User Number	13		
User Id	TC-99		
User Comment	RED		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	9	3-9	15.00
H#, Total Counts:	310.5	75599	
Win1: Tc-99 - Start, End, Counts:	315	645	42598
Win2: - Start, End, Counts:	0	990	75583



Sample Count Start Time:	30 Jun 2014 17:29:49		
Data Capture Date	30 Jun 2014 17:45:00		
User Filename	S13063003-10A.XLS		
	U13063003-1A.XLS		
Spectrum Type	Log Counts		
User Number	13		
User Id	TC-99		
User Comment	RED		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	10	3-10	15.00
H#, Total Counts:	325.7	70461	
Win1: Tc-99 - Start, End, Counts:	315	645	35756
Win2: - Start, End, Counts:	0	990	70448



Sample Count Start Time:	30 Jun 2014 17:46:14		
Data Capture Date	30 Jun 2014 18:01:26		
User Filename	S13063003-11A.XLS		
	U13063003-1A.XLS		
Spectrum Type	Log Counts		
User Number	13		
User Id	TC-99		
User Comment	RED		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	11	3-11	15.00
H#, Total Counts:	326.6	67580	
Win1: Tc-99 - Start, End, Counts:	315	645	32265
Win2: - Start, End, Counts:	0	990	67571



Eckert & Ziegler
Analytics

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404•352•8677
Fax 404•352•2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION
Standard Radionuclide Source

1234

77768-278

Tc-99 5 mL Liquid in Flame Sealed Vial

Customer: General Engineering Labs
P. O. No.: 7310 RD, Item 1

This standard radionuclide source was prepared gravimetrically from a calibrated master solution. The master solution was calibrated by liquid scintillation counting. The calibration was checked by liquid scintillation counting after source preparation.

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:	Tc-99
ACTIVITY (Bq):	3.662 E4
HALF-LIFE:	2.111 E5 years
CALIBRATION DATE:	June 27, 2008 12:00 EST
RELATIVE EXPANDED UNCERTAINTY (k=2):	2.5%

Comments:
Impurities: γ-impurities <0.1%

5.01268 grams 0.3M NH_4OH with 225 µg/g $TcO_4(-I)$.

Source Prepared By: M. I. Taskaeva
M. I. Taskaeva, Radiochemist

QA Approved: D. M. Montgomery, QA Manager Date: 6-30-08

End of Certificate

RECEIVED 6/25/08

RC-S-048-115

Standard Traceability Log Rad

Source Material Info	
Parent Code:	1234
Prepared By:	Daniel Roy
Carrier Conc:	.3M NH4OH
Reference Date:	06/27/2008
Ampoule Mass (g):	5.01268 g
Uncertainty:	+/- 2.5 %
LogBook No:	RC-S-048-115

A Solution Material Info	
Isotope:	Technetium-99
Prepared By:	Gregory Ramsay
Prep Date:	03/23/2011
Verification Date:	01/31/2014
Expiration Date:	01/31/2015
Primary Code:	1234-A
Dilution(mL):	100 mL
Mass of Parent(g):	4.8396 g
Density(g/mL):	0.9939
Balance ID:	38080204

Calculations Converting parent activity to dpm/mL|dpm/g

(Mass of parent(g)) * (Parm Activity (Bq)) * (conversion dpm to Bq) / (Ampoule Mass(g) *(Dilution Vol)) = Parent Activity (dpm/mL)
(Mass of parent(g)) * (Parm Activity (Bq)) * (conversion dpm to Bq) / Density / (Ampoule Mass (g) * (Dilution Vol)) = Parent Activity (dpm/g)
(4.8396 g) * (36620 Bq) * (60 dpm/Bq) / (5.01268 g * 100 mL) = 21213.3412 dpm/mL
(4.8396 g) * (36620 Bq) * (60 dpm/Bq) / (0.9939 g/mL)/ (5.01268 g * 100 mL) = 21343.4079 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

Verification for Tc-99 Standard 1234-A

v1.1

Analyst	JAS1
Verification Prep Date	1/31/2014

Calibration Information	
Isotope	Tc-99
Serial Number	1621-A
Amount of Std. (mL)	0.01
Expiration Date	6/6/2014

Standard Information	
Serial Number	1234-A
Reference Date	6/27/2008
Standard Prep Date	3/23/2011

Nuclide Information	
Isotope	Tc-99
Isotope Halflife	2.1110E+05 Y
Ref. Act. (ug/L)	557.826

Std #	Count Date	Activity ug/L
1	1/31/2014	0.56329800
2	1/31/2014	0.57724600
3	1/31/2014	0.56112400

Mean Value = 0.56722267
Stdev = 0.008748256

Certificate Value* =	**0.55781575**
Two sigma =	0.01749651
10 % of Mean =	0.05672227
Rule A (Pass/Fail)	Pass
% Recovery	101.69%
Rule B (Pass/Fail)	Pass
Expiration Date	**1/31/2015**

Verification Rules

Rule A = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.
Rule B = The determined mean value shall be within 5% of the certificate value.

*** Certificate Value is decay corrected to Verification Count Date.**

The analyst performed three analyses of a dilution of standard 1234-A on the ICPMS for Tc-99. 0.05 mL of 1234-A was diluted to 50 mL with 2% Nitric Acid. The ICPMS was calibrated using dilutions of Tc-99 standard 1621-A.

Reference SOP RAD M-001

2/3/14

General Engineering Laboratories
Calibration Source Preparation Sheet

Applicable SOP Number	GL-RAD-A-059	Isotope	Tc99
Date Standards Prepared	6/17/14	Cocktail Type Used	Ecoscint GL
Standard ID	1234-A	Matrix of Vial/Planchett	5mL DI Water 15mL Ecoscint GL 1 column AG Resin
Amount Used (g or ml)	0.5		
Standard Activity (DPM/g or mL)	21213.3412	Type of Scintillation Vial	Plastic
Reference Date	6/27/08	Pipette ID Used	3158763
Expiration Date	1/31/15	Balance ID Used	NA
Residue/Carrier Agent	NA	Quenching Agent	Conc. Brown Colorant

Standard Number	Quenching Vol (uL)/
1	0
2	30
3	60
4	90
5	120
6	150
7	180
8	210
9	240
10	270
11	300

Prepared By: _____ Date: 6/17/14

Reviewed By: _____ Date: 6/29/14

CAL or VER
Date: 6/18/14

Efficiency Standard Precision Check

Rack	Time (min.)	CPM Iso1	Within -/+ 5% mean
49-2	1	7149.00	YES
49-3	1	7302.00	YES
49-4	1	7110.00	YES
49-5	1	7170.00	YES
49-6	1	7248.00	YES
49-7	1	7181.00	YES
49-8	1	7275.00	YES
49-9	1	7258.00	YES
49-10	1	7192.00	YES
49-11	1	7146.00	YES
49-12	1	7113.00	YES

-5% Mean	Mean	+5% Mean
6835.16	7194.91	7554.65

TC-99 Cals

PAGE: 1

ID=TOTAL ACTIVITY 18 JUN 2014 06:14

USER:11 COMMENT:SILVER

PRESET TIME :	1.00						
DATA CALC :	CPM	H# :YES	SAMPLE REPEATS:	1	PRINTER	:EDIT	
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 LUMEX NO %	POS ELAPSED TIME	TIME MIN	H#	WIND1 RAW CPM	WIND2 RAW CPM	WIND1 CPM	WIND1 %ERROR	WIND2 CPM	WIND2 %ERROR
1 45.87	49-1	1.00 1.51	154.6	104.00	106.00	59.00	34.62	61.00	33.80
2 0.57	49-2	1.00 3.47	156.3	7187.00	7189.00	7149.00	2.37	7151.00	2.37
3 0.58	49-3	1.00 5.47	153.4	7342.00	7348.00	7302.00	2.35	7308.00	2.35
4 0.57	49-4	1.00 7.48	152.5	7149.00	7154.00	7110.00	2.38	7115.00	2.38
5 0.52	49-5	1.00 9.46	151.4	7205.00	7206.00	7170.00	2.37	7171.00	2.37
6 0.55	49-6	1.00 11.48	158.8	7286.00	7287.00	7248.00	2.36	7249.00	2.36
7 0.55	49-7	1.00 13.48	161.6	7219.00	7224.00	7181.00	2.37	7186.00	2.37
8 0.54	49-8	1.00 15.49	155.7	7311.00	7312.00	7275.00	2.35	7276.00	2.35
9 0.52	49-9	1.00 17.49	154.2	7293.00	7297.00	7258.00	2.35	7262.00	2.35
10 0.57	49-10	1.00 19.51	162.7	7231.00	7233.00	7192.00	2.36	7194.00	2.36
11 0.60	49-11	1.00 21.50	157.8	7186.00	7186.00	7146.00	2.37	7146.00	2.37
12 0.58	49-12	1.00 23.53	157.0	7152.00	7155.00	7113.00	2.38	7116.00	2.38

QPQP

1297

National Institute of Standards & Technology

Certificate

Standard Reference Material 4288A
Technetium-99 Radioactivity Standard

This Standard Reference Material (SRM) consists of radioactive technetium-99, as potassium pertechnetate, and potassium hydroxide 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 beta-particle counting instruments and for the monitoring of radiochemical procedures.

Radiological Hazard

The SRM ampoule contains technetium-99 with a total activity of approximately 160 kBq. Technetium-99 decays by beta-particle emission. None of the beta particles escape from the SRM ampoule. During the decay process no photons are emitted. Approximate unshielded dose rates at several distances (as of the reference time) are given in note [a]* There is no detectable external radiation. The SRM should be used only by persons qualified to handle radioactive material.

Chemical Hazard

The SRM ampoule contains potassium hydroxide (KOH) with a concentration of 0.001 moles per liter of water. The solution is mildly corrosive and could represent 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.

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 September 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) because of the radioactivity.

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
October 1996

Thomas E. Gills, Chief
Standard Reference Materials Program

*Notes and references are on pages 5 and 6.

DCS-051-011

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.

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

PROPERTIES OF SRM 4288A
(Certified values are shown in bold type)

Source identification number	NIST SRM 4288A		
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	(0.998 ± 0.002) $g \cdot mL^{-1}$ at 21 °C [b]*		
Solution mass	(4.998 ± 0.002) g [b]		
Chemical Properties:			
Solution composition	Chemical Formula	Concentration ($mol \cdot L^{-1}$)	Mass Fraction ($g \cdot g^{-1}$)
	H_2O KOH $K^{99}TcO_4$	55 0.001 0.0005	1.00 0.00006 0.0001
Radiological Properties:			
Radionuclide	**Technetium-99**		
Reference time	**1200 EST, 1 September 1996**		
Massic activity of the solution [c]	**32.61 $kBq \cdot g^{-1}$**		
Relative expanded uncertainty ($k=2$)	**1.14%** [d] [e]		
Photon-emitting impurities	None detected [f]		
Half lives used in the decay corrections	Cobalt-60: (5.2714 ± 0.0005) a [g] Technetium-99: (2.111 ± 0.012) × 10^5 a [g]		
Measuring instrument	NIST $4\pi\beta(LS)$-γ-anticoincidence counting system using cobalt-60 as the efficiency-tracing radionuclide. The efficiency was varied electronically from 50 to 93 percent.		

*Notes and references are on pages 5 and 6

EVALUATION OF THE UNCERTAINTY OF THE MASSIC ACTIVITY [d]*

Input Quantity x_i, the source of uncertainty (and individual uncertainty components where appropriate)	Method Used To Evaluate $u(x_i)$, the standard uncertainty of x_i (A) denotes evaluation by statistical methods (B) denotes evaluation by other methods	Relative Uncertainty Of Input Quantity, $u(x_i)/x_i$, (%) [h]	Relative Sensitivity Factor, $\lvert \partial y/\partial x_i \rvert \cdot (x_i/y)$ [i]	Relative Uncertainty Of Output Quantity, $u_i(y)/y$, (%) [j]
Extrapolated massic liquid-scintillation count rate of the Tc-99 solution, corrected for background, cobalt-60 tracer count rate, and decay.	Standard deviation of the mean for 4 sets of repeated measurements on each of 3 samples (A)	0.10	1.0	0.10
Decay corrections		[k]	[m]	
for cobalt-60	Standard uncertainty of the half life (A)	0.01	0.01	0.0001
for technetium-99	Standard uncertainty of the half life (A)	0.6	0.000005	0.000003
Decay scheme data	Standard uncertainty of the probability of decay by beta-particle emission (A)	0.01	1.0	0.01
Extrapolation of the beta-particle-count-rate versus anticoincidence-gamma-ray-count-rate to zero anticoincidence-gamma-ray-count-rate	Estimated (B)	0.40	1.0	0.40
Calibration of the cobalt-60 tracer solution using the $4\pi\beta$(LS)-γ-anticoincidence counting system	Standard uncertainty of the extrapolated massic count rate (B)	0.25	1.0	0.25
Gravimetric measurements	Estimated (B)	0.20	1.0	0.20
Live-time measurements [n]	Estimated (B)	0.10	1.0	0.10
Variability between ampoules	Estimated (B)	0.20	1.0	0.20
Photon-emitting impurities	Limit of detection (B) [p]	100.	0.00004	0.004
Relative Combined Standard Uncertainty of the Output Quantity, $u_c(y)/y$, (%)				0.57
Coverage Factor, k				x 2
Relative Expanded Uncertainty of the Output Quantity, Uy, (%)				1.14

*Notes and references are on pages 5 and 6.

NOTES

[a] The Sievert is the SI unit for dose equivalent. See reference [1]. One μSv is equal to 0.1 mrem.

Distance from Ampoule (cm):	1	30	100
Approximate Dose Rate (μSv/h):	<0.1 (Not detectable)		

[b] The stated uncertainty is two times the standard uncertainty.

[c] **Massic activity** is the preferred name for the quantity activity divided by the total mass of the sample. See reference [1].

[d] The reported value, y, of massic activity (activity per unit mass) at the reference time was not measured directly but was derived from measurements and calculations of other quantities. This can be expressed as $y = f(x_1, x_2, x_3, \ldots x_n)$, where f is a mathematical function derived from the assumed model of the measurement process.

The value, x_i, used for each input quantity i has a **standard uncertainty**, $u(x_i)$, that generates a corresponding uncertainty in y, $u_i(y) \equiv |\partial y/\partial x_i| \cdot u(x_i)$, called a **component of combined standard uncertainty** of y.

The **combined standard uncertainty** of y, $u_c(y)$, is the positive square root of the sum of the squares of the components of combined standard uncertainty.

The combined standard uncertainty is multiplied by a **coverage factor** of $k = 2$ to obtain U, the **expanded uncertainty** of y.

Since it can be assumed that the possible estimated values of the massic activity are approximately normally distributed with approximate standard deviation $u_c(y)$, the unknown value of the massic activity is believed to lie in the interval $y \pm U$ with a level of confidence of approximately 95 percent.

For further information on the expression of uncertainties, see references [2] and [3].

[e] The value of each standard uncertainty component, and hence the value of the expanded uncertainty itself, is a best estimate based upon all available information, but is only approximately known. That is to say, the "uncertainty of the uncertainty" is large and not well known. This is true for uncertainties evaluated by statistical methods (e.g., the relative standard deviation of the standard deviation of the mean for the liquid-scintillation counting is approximately 50%) and for uncertainties evaluated by other methods (which could easily be over estimated or under estimated by substantial amounts). The unknown value of the expanded uncertainty is believed to lie in the interval $U/2$ to $2U$ (i.e., within a factor of 2 of the estimated value).

[f] Estimated limits of detection for photon-emitting impurities are:
2×10^{-4} $\gamma \cdot s^{-1} \cdot g^{-1}$ for energies between 20 and 85 keV,
2×10^{-5} $\gamma \cdot s^{-1} \cdot g^{-1}$ for energies between 93 and 503 keV,
1×10^{-5} $\gamma \cdot s^{-1} \cdot g^{-1}$ for energies between 519 and 1457 keV, and
5×10^{-6} $\gamma \cdot s^{-1} \cdot g^{-1}$ for energies between 1465 and 3250 keV.

[g] The stated uncertainty is the standard uncertainty. See reference [5].

[h] Relative standard uncertainty of the input quantity x_i

[i] 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.

[j] 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.

[k] 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.

[m] $|\partial y/\partial x_i| \cdot (x_i/y) = |\lambda \cdot t|$, multiplied by other sensitivity factors where appropriate.

[n] The live time is determined by counting the pulses from a gated crystal-controlled oscillator.

[p] 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 Tc-99)$\} \cdot \{$(Bq of impurity)/(Bq of Tc-99)$\}$. 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), September 1996.

RC-S-051-f

Standard Traceability Log Rad

Source Material Info	
Parent Code:	1297
Prepared By:	Amanda Fehr
Carrier Conc:	DI Water
Reference Date:	09/01/1996
Ampoule Mass (g):	4.998 g
Uncertainty:	+/- 1.14 %
LogBook No:	RC-S-051-016

A Solution Material Info	
Isotope:	Technetium-99
Prepared By:	Gregory Ramsay
Prep Date:	02/16/2009
Verification Date:	01/31/2014
Expiration Date:	01/31/2015
Primary Code:	1297-A
Dilution(mL):	100 mL
Mass of Parent(g):	4.885 g
Density(g/mL):	0.9968
Balance ID:	38080204

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)
(4.885 g) * (32.61 kBq/g) * (60000 dpm/kBq) / (100 mL) = 95579.9100 dpm/mL
(4.885 g) * (32.61 kBq/g) * (60000 dpm/kBq) / (0.9968 g/mL) / (100 mL) = 95883.4800 dpm/g

Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
04/27/2009	Julie Strock	.02	10	1297-090427-1	5.0636 ug/L	05/04/2008	05/04/2009
04/30/2009	Julie Strock	.01	10	1005-090430-1	5.0373 ug/L	05/04/2008	05/04/2009
04/30/2009	Julie Strock	.02	10	1005-090430-2	5.0373 ug/L	05/04/2008	05/04/2009
04/30/2009	Julie Strock	.2	10	1005-090430-3	5.0373 ug/L	05/04/2008	05/04/2009
04/27/2009	Julie Strock	.2	20	1297-090427-2	5.0636 ug/L	05/04/2008	05/04/2009
04/30/2009	Julie Strock	.2	10	1297-090430-1	5.0636 ug/L	05/04/2008	05/04/2009
04/27/2009	Julie Strock	.1	25	13321297-090427	5.0636 ug/L	05/04/2008	05/04/2009
05/05/2009	Julie Strock	.02	10	1297-090505-1	5.0636 ug/L	05/12/2008	05/12/2009
05/05/2009	Julie Strock	.01	10	1005-090505-4	.0050373 ug/L	05/12/2008	05/12/2009
05/05/2009	Julie Strock	.2	20	1297-090505-2	5.0636 ug/L	05/12/2008	05/12/2009
05/05/2009	Julie Strock	.1	25	13321297-090505-1		05/12/2008	05/12/2009
06/18/2009	James Schoneman	.02	10	1297-090618-1	5.04782 ug/L	06/25/2008	06/25/2009
06/18/2009	James Schoneman	.2	20	1297-090618-2	5.04782 ug/L	06/25/2008	06/25/2009
06/24/2009	James Schoneman	.2	20	1297-090624-1	5.04782 ug/L	06/25/2008	06/25/2009
06/18/2009	James Schoneman	.1	25	13451297-090618-1	5.04782 ug/L	06/25/2008	06/25/2009

06/24/2009	James Schoneman	.1	25	13451297-090624-1	5.04782 ug/L	06/25/2008	06/25/2009
08/10/2009	James Schoneman	.02	10	1297-090810-1	5.0478 ug/L	08/17/2008	08/17/2009
08/10/2009	James Schoneman	.04	20	1297-090810-2		08/17/2008	08/17/2009
08/10/2009	James Schoneman	.4	20	1297-090810-3		08/17/2008	08/17/2009
08/10/2009	James Schoneman	.02	20	1297-090810-4		08/17/2008	08/17/2009
08/11/2009	James Schoneman	4	20	1297-090811-1	5.0478 ug/L	08/17/2008	08/17/2009
08/10/2009	James Schoneman	.1	25	12971345-090810-1		08/17/2008	08/17/2009
09/29/2009	James Schoneman	.02	10	1297-090929-1	95575.8 dpm/mL	10/06/2008	10/06/2009
09/29/2009	James Schoneman	.04	20	1297-090929-2	5.0478 ug/L	10/06/2008	10/06/2009
09/29/2009	James Schoneman	.4	20	1297-090929-3	5.0478 ug/L	10/06/2008	10/06/2009
09/29/2009	James Schoneman	4	20	1297-090929-4	5.0478 ug/L	10/06/2008	10/06/2009
09/29/2009	James Schoneman	.02	20	1297-090929-5	5.0478 ug/L	10/06/2008	10/06/2009
09/29/2009	James Schoneman	.1	25	12971332-090929-1	95575.8 dpm/mL	10/06/2008	10/06/2009
10/30/2009	James Schoneman	.02	10	1297-091030-1	95575.8 dpm/mL	11/06/2008	11/06/2009
10/30/2009	James Schoneman	.04	20	1297-091030-2	5.0478 ug/L	11/06/2008	11/06/2009
10/30/2009	James Schoneman	.4	20	1297-091030-3	5.0478 ug/L	11/06/2008	11/06/2009
10/30/2009	James Schoneman	4	20	1297-091030-4	5.0478 ug/L	11/06/2008	11/06/2009
10/30/2009	James Schoneman	.02	20	1297-091030-5	5.0478 ug/L	11/06/2008	11/06/2009
11/03/2009	James Schoneman	.02	20	1297-091103-1	5.0478 ug/L	11/06/2008	11/06/2009
10/30/2009	James Schoneman	.1	25	12971332-091030-1		11/06/2008	11/06/2009
11/06/2009	James Schoneman	.02	10	1297-091106-1	95575.8 dpm/mL	11/13/2008	11/13/2009
11/06/2009	James Schoneman	.04	20	1297-091106-2	5.0478 ug/L	11/13/2008	11/13/2009
11/06/2009	James Schoneman	.4	20	1297-091106-3	5.0478 ug/L	11/13/2008	11/13/2009
11/06/2009	James Schoneman	4	20	1297-091106-4	5.0478 ug/L	11/13/2008	11/13/2009

11/06/2009	James Schoneman	.02	20	1297-091106-5	5.0478 ug/L	11/13/2008	11/13/2009
11/06/2009	James Schoneman	.1	25	12971332-091106-1		11/13/2008	11/13/2009
11/16/2009	James Schoneman	.02	10	1297-091116-1	95575.8 dpm/mL	11/23/2008	11/23/2009
11/16/2009	James Schoneman	.04	20	1247-091116-2	5.0478 ug/L	11/23/2008	11/23/2009
11/16/2009	James Schoneman	.4	20	1297-091116-3	5.0478 ug/L	11/23/2008	11/23/2009
11/16/2009	James Schoneman	4	20	1297-091116-4	5.0478 ug/L	11/23/2008	11/23/2009
11/16/2009	James Schoneman	.02	20	1297-091116-5	5.0478 ug/L	11/23/2008	11/23/2009
11/19/2009	Julie Strock	.04	20	1297-091119-01	95575.8 dpm/mL	11/26/2008	11/26/2009
11/16/2009	James Schoneman	.1	25	12971332-091116-1		11/23/2008	11/23/2009
11/19/2009	Julie Strock	.02	10	1297-091119-2	95575.8 dpm/mL	11/26/2008	11/26/2009
11/19/2009	Julie Strock	.04	20	1297-091119-3	95575.8 dpm/mL	11/23/2008	11/23/2009
11/19/2009	Julie Strock	.4	20	1297-091119-4	5.0478 ug/L	11/26/2008	11/26/2009
11/19/2009	Julie Strock	4	20	1297-091119-5	5.0478 ug/L	11/26/2008	11/26/2009
11/23/2009	James Schoneman	.02	10	1297-091123-1	95575.8 dpm/mL	11/30/2008	11/30/2009
11/23/2009	James Schoneman	.04	20	1297-091123-2	5.0478 ug/L	11/30/2008	11/30/2009
11/23/2009	James Schoneman	.4	20	1297-091123-3	5.0478 ug/L	11/30/2008	11/30/2009
11/23/2009	James Schoneman	.1	25	12971332-091123-1		11/30/2008	11/30/2009
12/15/2009	James Schoneman	.02	10	1297-091215-1	95575.8 dpm/mL	12/22/2008	12/22/2009
12/15/2009	James Schoneman	.04	20	1297-091215-2	5.0478 ug/L	12/22/2008	12/22/2009
12/15/2009	James Schoneman	.4	20	1297-091215-3	5.0478 ug/L	12/22/2008	12/22/2009
12/15/2009	James Schoneman	4	20	1297-091215-4	5.0478 ug/L	12/22/2008	12/22/2009
12/15/2009	James Schoneman	.02	20	1297-091215-5	5.0478 ug/L	12/22/2008	12/22/2009
12/15/2009	James Schoneman	.1	25	12971333-091215-1		12/22/2008	12/22/2009
02/17/2009	Mary Aders	10.5308	500	1297-B	2019.4595 dpm/ml	02/17/2009	02/17/2010

12/07/2009	Bethany Fiem	10.2418	500	1297-C	1964.0388 dpm/mL	11/29/2010	11/29/2011
04/05/2011	Gregory Ramsay	10.3169	500	1297-D	1978.44055 dpm/mL	03/29/2012	03/29/2012
09/05/2012	Gregory Ramsay	10.0582	500	1297-E	1928.83044 dpm/mL	08/15/2013	08/15/2014

GEL Laboratories LLC
Version 1.0 9/18/2000

Verification for Tc-99 Standard 1297-A

v1.1

Analyst	JAS1
Verification Prep Date	1/31/2014

Calibration Information	
Isotope	Tc-99
Serial Number	1621-A
Amount of Std. (mL)	0.01
Expiration Date	6/6/2014

Standard Information	
Serial Number	1297-A
Reference Date	9/1/1996
Standard Prep Date	2/16/2009

Nuclide Information	
Isotope	Tc-99
Isotope Halflife	2.1110E+05 Y
Ref. Act. (ug/L)	2513.369

Std #	Count Date	Activity ug/L
1	1/31/2014	0.53054300
2	1/31/2014	0.51057500
3	1/31/2014	0.52208600

Mean Value = 0.52106800
Stdev = 0.010022849

Certificate Value* =	**0.50264506**
Two sigma =	0.02004570
10 % of Mean =	0.05210680
Rule A (Pass/Fail)	**Pass**
% Recovery	103.67%
Rule B (Pass/Fail)	**Pass**
Expiration Date	**1/31/2015**

Verification Rules

Rule A = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.
Rule B = The determined mean value shall be within 5% of the certificate value.

*** Certificate Value is decay corrected to Verification Count Date.**

The analyst performed three analyses of a dilution of standard 1297-A on the ICPMS for Tc-99. 0.01 mL of 1297-A was diluted to 50 mL with 2% Nitric Acid. The ICPMS was calibrated using dilutions of Tc-99 standard 1621-A.

Reference SOP RAD M-001

2/3/14

General Engineering Laboratories
Verification Source Preparation Sheet

Applicable SOP Number	GL-RAD-A-059	Isotope	Tc99
Date Standards Prepared	6/17/14	Cocktail Type Used	Ecoscint GL
Standard ID	1297-A	Matrix of Vial/Planchett	5mL DI water 15mL Ecoscint GL 1 column AG Resin
Amount Used (g or (ml))	0.1		
Standard Activity (DPM/g or (mL))	9557.91	Type of Scintillation Vial	Plastic
Reference Date	9/1/96	Pipette ID Used	2272418
Expiration Date	1/31/15	Balance ID Used	NA
Residue/Carrier Agent	NA	Quenching Agent	Conc. Brown Colorant

Standard Number	Quenching Vol (uL)/
1	0
2	30
3	60
4	90
5	120
6	150
7	180
8	210
9	240
10	270
11	300

Prepared By: _____ Date: 6/17/14

Reviewed By: _____ Date: 6/29/14

CAL or ~~VER~~
Date: 10/18/14

Efficiency Standard Precision Check

Rack	Time (min.)	CPM Iso1	Within -/+ 5% mean
3-2	1	7220.00	YES
3-3	1	7132.00	YES
3-4	1	6630.00	YES
3-5	1	7009.00	YES
3-6	1	6710.00	YES
3-7	1	6670.00	YES
3-8	1	6945.00	YES
3-9	1	6891.00	YES
3-10	1	6815.00	YES
3-11	1	7019.00	YES
3-12	1	6773.00	YES

-5% Mean	Mean	+5% Mean
6547.57	6892.18	7236.79

TC-99 Vers

ID:TOTAL ACTIVITY 18 JUN 2014 05:50

USER:11 COMMENT:SILVER

PRESET TIME :	1.00						
DATA CALC :	CPM	H# :YES	SAMPLE REPEATS:	1	PRINTER	:EDIT	
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 LUMEX NO %	POS TIME	TIME ELAPSED MIN	H#	WIND1 RAW CPM	WIND2 RAW CPM	WIND1 CPM	WIND1 %ERROR	WIND2 CPM	WIND2 %ERROR
1 45.96	3-1	1.00 1.51	145.6	95.00	97.00	54.00	36.15	56.00	35.22
2 0.63	3-2	1.00 3.47	151.4	7264.00	7265.00	7220.00	2.36	7221.00	2.36
3 0.62	3-3	1.00 5.47	152.3	7174.00	7177.00	7132.00	2.38	7135.00	2.37
4 0.68	3-4	1.00 7.49	149.0	6673.00	6678.00	6630.00	2.46	6635.00	2.46
5 0.64	3-5	1.00 9.48	155.2	7052.00	7053.00	7009.00	2.40	7010.00	2.40
6 0.67	3-6	1.00 11.61	150.2	6751.00	6756.00	6710.00	2.45	6715.00	2.45
7 0.64	3-7	1.00 13.60	156.8	6710.00	6713.00	6670.00	2.46	6673.00	2.46
8 0.76	3-8	1.00 15.64	157.1	6995.00	6998.00	6945.00	2.41	6948.00	2.41
9 0.61	3-9	1.00 17.63	160.4	6931.00	6935.00	6891.00	2.42	6895.00	2.42
10 0.59	3-10	1.00 19.66	155.6	6852.00	6856.00	6815.00	2.43	6819.00	2.43
11 0.56	3-11	1.00 21.66	160.2	7056.00	7059.00	7019.00	2.39	7022.00	2.39
12 0.67	3-12	1.00 23.87	150.2	6816.00	6819.00	6773.00	2.44	6776.00	2.44

QPQ`

Continuing Calibration Data

Liquid Scintillation Counter Checks for 24-MAY-2015

Short Name	Parmname	Run Time	Count Time	Counts	CPM	Stdev	Status	Comments
LSCBLUE	Carbon-14	05:58	1.4		115442	1.93		
	Carbon-14	05:59	1.4		115316	1.48		
	Tritium	06:01	1.2		163703	-0.46		
	Tritium	06:03	1.2		163646	-0.59		
	BKG	06:05	30		24	-1.8		
	BKG	06:35	30		28	2.57		
LSCGOLD	Carbon-14	05:40	1.3		125854	0.16		
	Carbon-14	05:42	1.3		125927	0.39		
	Tritium	05:44	1.25		156739	1.36		
	Tritium	05:45	1.25		155881	-0.47		
	BKG	05:47	30		24	0.98		
	BKG	06:18	30		24	0.88		
LSCGREEN	Carbon-14	05:50	1.4		114565	0.28		
	Carbon-14	05:52	1.4		114486	-0.06		
	Tritium	05:54	1.25		159278	0.34		
	Tritium	05:56	1.25		159523	0.81		
	BKG	05:58	30		25	-0.1		
	BKG	06:28	30		25	-0.02		
LSCORANGE	Carbon-14	06:53	1.012433		130178	-0.93		
	Tritium	06:56	1.012433		168200	-1.7		
	BKG	07:29	30.01243		12	0.73		
	Carbon-14	07:30	1.012433		131483	2.84		
	Tritium	07:32	1.012333		168284	-1.5		
	BKG	08:02	30.01243		11	-0.52		
LSCPINK	Carbon-14	06:31	1.01245		118840	-0.44		
	Tritium	06:34	1.012433		138125	-0.16		
	BKG	07:07	30.01243		9.82	2.07		
	Carbon-14	07:08	1.012433		119077	0.21		
	Tritium	07:10	1.012433		138976	1.68		
	BKG	07:40	30.01243		8.03	-0.95		

LSCRED	Carbon-14	05:58	1.4	114953	-0.16
	Carbon-14	05:59	1.4	115274	0.92
	Tritium	06:01	1.2	166213	0.03
	Tritium	06:03	1.2	166844	1.32
	BKG	06:05	30	26	-0.18
	BKG	06:36	30	27	1.01
LSCSILVER	Carbon-14	05:40	1.35	120601	0.68
	Carbon-14	05:42	1.35	120258	-0.48
	Tritium	05:44	1.25	157246	-1.5
	Tritium	05:45	1.25	157702	-0.45
	BKG	05:47	30	24	-0.15
	BKG	06:18	30	24	0.11
LSCTEAL	Carbon-14	06:21	1.3	130449	1.59
	Carbon-14	06:23	1.333	129945	0.13
	Tritium	06:25	1.5	141821	0.69
	Tritium	06:27	1.5	141944	0.95
	BKG	06:30	30	13	-1.5
	BKG	07:01	30	15	1.21
LSCYELLOW	Carbon-14	05:48	1.483	114473	-0.1
	Carbon-14	05:50	1.483	114373	-0.44
	Tritium	05:53	1.367	151379	-0.93
	Tritium	05:55	1.367	151482	-0.63
	BKG	05:57	30	16	1.43
	BKG	06:28	30	16	0.97

Reviewed by:  **Date:** 24-MAY-15

Lyndsey Pace

GEL Laboratories LLC

Runlogs

Instrument Run Log

Instrument Type: LSC **Batch ID: 1475759**

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
372020001	SAMPLE	MYM1	LSCRED	MAY-24-15 15:55:51	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	01-JUL-14 00:00
1203310931	MB	MYM1	LSCRED	MAY-24-15 16:59:41	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	01-JUL-14 00:00
1203310932	DUP	MYM1	LSCRED	MAY-24-15 18:02:33	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	01-JUL-14 00:00
1203310933	MS	MYM1	LSCRED	MAY-24-15 19:05:18	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	01-JUL-14 00:00
1203310934	LCS	MYM1	LSCRED	MAY-24-15 20:10:00	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	01-JUL-14 00:00

APPENDIX C
DIANE SHORT & ASSOCIATES
DATA VERIFICATION
AND VALIDATION REPORTS

DIANE SHORT & ASSOCIATES, INC.
1978 S. Garrison St. # 114
Lakewood CO 80227
303:271-9642
dsa7cbc@eazy.net

RADIOCHEMISTRY DATA QUALITY REVIEW REPORT
Gas Flow Proportional Counting (GFPC) and Liquid Scintillation (LSC)
Tritium Analysis in Gas by Combustion followed by LSC
Carbon-14 Analysis in Gas by Combustion followed by LSC

SDG: GEL: 372020 ISOTECH: 28838, 28847

PROJECT: Caerus Oil & Gas Battlement Mesa, Olsson Project # 015-0982

LABORATORY: GEL Laboratories, LLC, Charleston, South Carolina; IsoTech Laboratories , Champaign, Illinois for Tritium in water

SAMPLE MATRIX: Water and gas SAMPLING DATE (Mo/Yr): 4/28/2015

NO.SAMPLES: 1

ANALYSES REQUESTED: GEL: GFPC for Cl-36, gross alpha/beta, and Sr-90; LSC for Tc-99; IsoTech: LCS for tritium and C14 in water and gas

SAMPLE NUMBERS: 36-13B

DATA REVIEWER: John Huntington

QA REVIEWER: Diane Short & Associates, Inc. INITIALS/DATE: DLS 9/8/15

Telephone Logs included Yes____ No __X___

Contractual Violations Yes____ No __X___

The project Quality Assurance Project Plan (QAPP), the EPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, 2004, the laboratory Standard Operating Procedure (SOP), and the EPA Radiochemistry Methods (current updates) have been referenced by the reviewer to perform this data validation review. The review includes evaluation of calibration, holding times and QC for all samples and a 10% review of the calculation algorithms. General comments regarding the data/ analytical quality are part of the review when raw data are submitted. The EPA qualifiers have been expanded to include a descriptor code and value to define QC violations and their values, per the approval of the project Manager.

I. DELIVERABLES

1. All deliverables were present as specified in the Statement of Work (SOW) or in the project contract.
Yes ____ No__X_
The following is noted:
Data were submitted for GEL: GFPC for Cl-36, gross alpha/beta, and Sr-90; LSC for Tc-99; IsoTech: LCS for tritium and C14 in water and gas.
Deliverables from GEL Laboratories are complete and as required for validation.

The original submittal of tritium and C-14 results from Isotech laboratories did not include any QC or calibration data.

On 8/10/2015, we received the missing data from Isotech and Beta Analytic, and this is a revised report that includes such validation as could be performed for tritium and C-14. This includes the COC documentation missing in the first submittal. On September 4, we received some additional documentation of certifications from Beta Analytic. At this point the documentation is as complete as it has been historically for the two laboratories.

The documentation provided by Isotech for tritium analysis is sufficient for most validation purposes. Some detailed raw results, such as quench curves, are not present but these are not strictly required per the validation guidance.

The Beta Analytic documentation for C-14 includes a signed COC and general QA information, including certification documents and acceptable results for reference standards dated May 11, 2015. Count data, run dates, blank results, and other specific QC are not available from Beta. This only impacts C-14 analysis.

II. ANALYTICAL REPORT FORMS

1. The Analytical Report or Data Sheets are present and complete for all requested analyses.
Yes _X___ No____
Note that analysis dates and uncertainties are not provided by Isotech or Beta Analytic in their reports. The submittal from Isotech on 8/10 includes the missing analysis dates and uncertainties for the results, and the count data are provided.

2. Holding Times
A. The contract holding times were met for all analyses.
Yes __X__ No____

B. Samples were properly preserved, or applicable preservative was used.
Yes _X___ No____

3. Chains of Custody (COC)
A. Chains of Custody (COC) were reviewed and all fields were complete, signatures were present and cross outs were clean and initialed.

Yes __X__ No ____
With the final submittal of the beta Analytic COC the chain of custody documentation is complete.

III. CALIBRATION AND STANDARDIZATION

1. Daily counting efficiency (Base Efficiency) for all methods was achieved.
Yes __X___ No____ NA____

2. The calibration data include a plot of the counting efficiency obtained versus the various weights of salts spiked with a known DPM of the standard; The "best fit" curve or a computer fit equation with the estimated standard deviation meet the method calibration criteria. At least one complete self-absorption curve exists for one detector per array and the efficiency for the standard curve of $\geq$ 3 standards agree within 95% confidence level.
Yes __X___ No_____ NA ____

3. Reliability of the daily QC check standards are within a 2 to 3 sigma control limit of the mean count of long term counting
Yes __X__ No_____ NA____

4. The most recent background count duration is at least as long as the sample duration and this background total is within 99% confidence level or 2 to 3 sigma of the average of the last ten background checks on that detector.
Yes __X___ No_____ NA____

5. The attenuation was with the (beta x r2) limits as appropriate to the method.
Yes __X___ No ____ NA__

6. There is documentation to verify that the standards are NIST traceable or the equivalent.
Yes _X____ No_____ NA____

7. Quench factors were reported and noted as acceptable.
Yes __X__ No____ NA__ __
For the GEL data.

IV. DETECTION AND REPORTING LIMITS

1. Minimal detection concentrations (MDC) with efficiencies were established for all analytes every six months or whenever a significant background or instrument response is expected (e.g., detector change).
Yes ___X___ No _____ NA_____

2. The laboratory reported the results with uncertainties that included all uncertainties associated with the preparation and analytical procedures.
Yes ___ No__X__
These are provided for all results except for the C-14 analyses.

Samples where uncertainties are greater than the result or the result has been reported as

estimated "J" may have unrealistically low MDC values. The uncertainties are multiplied by 1.65. If the result is greater than the reported MDC, the isotope has been qualified UJQ for an unrealistically low MDC. If the value calculated is less than the reported MDC, the activity result is qualified JQ estimated below the MDC.

No such instances are observed and no qualifiers are applied.

Gross Alpha and Beta: There were no detections observed for gross alpha, but there was a detection observed for gross beta. The reporting limit is elevated due to matrix effects. The samples contain high TDS and the total weight must be kept to a level within the calibration range. This limits the sample size and therefore the reporting limit.

Tritium: These results for water and gas are reported by Isotech Laboratories. Uncertainties are not included in the report. All results are reported as non-detects. The raw count data provided subsequently provide the uncertainties for each standard, blank, and sample.

C-14: Uncertainties are not provided.

V. MATRIX SPIKE

1. Matrix spike (MS) was analyzed for every analysis performed and for every 20 samples or for every matrix whichever is more frequent.
Yes _X__ No ____
The following MS/MSDs were conducted. For the gross alpha/beta analysis, an MS/MSD was conducted. For the other methods, a matrix spike was conducted plus a sample duplicate.

SDG	Method	Client Sample ID	Lab Sample ID
372020	EPA 905.0 Modified (Sr-90)	36-13B	372020001
372020	E EML HASL-300, Tc-02-RC Modified	36-13B	372020001
372020	EPA 900.0/SW846 9310	36-13B	372020001

IsoTech has not provided matrix spike results for tritium or C-14 analysis.

2. The MS percent recoveries were within the limits defined in the contract or a guidance limit of 75-125%.
Yes ____ No __X__
All MS recoveries are in control except for Sr-90, which was low (34%R), and the parent sample is qualified as JMS34. Data could be biased low proportional to the spike recovery or false non-detected data reported .

Method	QC Sample	Analyte	Recovery	Qualifier
EPA 905.0 Modified (Sr-90)	36-13B	Strontium-90	34.1	UJMS34

3. The samples used for qualification are client samples.
Yes __X_ No___

VI. MATRIX DUPLICATE

1. The matrix spike duplicate relative percent difference of the percent recoveries were within the limits defined in the contract or the CLP 20% for water and 35% for soil, or ± RL for results < 5 x RL (± 2x RL for soils).

Yes __X__ No _____ NA_____

Except for gross alpha and beta, matrix duplicates, not matrix spike duplicates, were analyzed using the same samples as were used for the matrix spikes. All are in control.

In the case of gross alpha and beta, a matrix spike duplicate was analyzed. Recoveries are in control, but the RPD was out of limits for gross alpha (23.3%). Since the recoveries are in control no qualifier is required.

The QC data submitted by Isotech for tritium has duplicate results, and these are in control.

B. Or met the Duplicate Error Ratio (DER) criteria calculations which account for the 2 sigma efficiency values. DER limit is 1.

Yes ____ No ____ NA ___X_

VII. LABORATORY CONTROL SAMPLE

1. Laboratory Control Sample (LCS) was analyzed for every analysis performed and for every 20 samples or for every matrix, whichever is more frequent

Yes __X__ No____

For the GEL results LCS results are reported and are in control.

For the IsoTech tritium analyses, NIST standard results and blank results are reported, and raw count data are provided. The QC reports provided by Isotech shows that the standards run with the samples are in control.

For the C-14 analyses, Beta Analytic provides a report showing the recovery results for three standards, showing them to be within the acceptable limits. The report of these results is dated May 11, 2015. Although the laboratory states that standards were analyzed "quasi-simultaneously" with unknowns, the actual count dates for these standards and for the samples are not provided.

2. The LCS %R for each analyte (background corrected) met the established control limits or the method limits of 75-125%.

Yes __X__ No ____

3. The LCSD %R for each analyte (background corrected) met the established control limits or the method limits of 75-125%.

Yes ____ No ____ NA__X__

LCSDs are not reported.

4. The duplicate relative percent difference of the percent recoveries were within the limits.

Yes ____ No _____ NA__X__

VIII. BLANKS

1. Low-level activities of isotopes were reported for laboratory preparation blanks and met the MDC or background CPM criteria
Yes _X__ No_____
For LSC methods, the MDC of the prep blank shall be less than the calibration MDC or the sample MDC whichever is reported. If all sample results in a batch are reported as detected, then the prep blank MDC must be less than the activity of the lowest MDC in the batch.

For the GFPC methods, if a sample activity is < 5 x MDC, the activity of the prep blank shall be equivalent to zero when the measurement uncertainty is considered or shall be less than the MDC. If the sample activity is > 5 x MDC, the activity of the prep blank shall be equivalent to zero when the measurement uncertainty is considered. This is determined from the Normalized Absolute Difference (NAD).

The impact of the blank contamination may be evaluated where appropriate by calculating the Normalized Absolute Difference (NAD) for the Method Blank and subsequent evaluation criteria as defined in the Army Corp. guidance section III and elsewhere. When the NAD is found to be greater than 1.96 but less than 2.58, the sample results are qualified JMB# where # represents the isotopes blank activity. Such results are considered to be estimated and possibly undetected values due to the presence of blank contamination.

GEL, gross alpha/beta: The raw data provides all of the necessary information to evaluate the method blanks. The measurement uncertainty is less than the MDC and the sample results are all < 5x MDC. No qualifiers are required.
GEL, Sr-90: Sample results are all non-detects and the method blank raw results are less than MDC. No qualifications are required.
GEL, Tc-99: Sample results are all non-detects and the method blank raw results are less than MDC. No qualifications are required.

IsoTech, for tritium: Blank results are provided and are acceptable.

Beta Analytic, for C-14: No blank results are provided.

2. The cross talk summary was acceptable and indicated no interferences
Yes _X__ No_____ NA____
These are provided only for samples submitted to Gel Laboratories.
This is not applicable to the tritium analysis.

IX. CHEMICAL YIELD SUMMARY
Chemical Yield (Tracer) Summary was analyzed to monitor the accuracy of percent samples recoveries and the percent recoveries were within the control limits.
Yes __X__ No ____ NA ____
GEL: Chemical yield recoveries are reported Sr-90 and Tc-99. The recoveries reported are within limits.

X. FIELD QC

A. If Field duplicates or Performance Check Compounds were identified, they met the RPD or % recovery criteria for the project. Guidelines of 35% RPD for water were used unless the reported results are < 5 x Reporting Limit (RL) in which case 2 x RL difference is acceptable.
Yes ___ No____ NA __X__
No field duplicates were present.

B. For low level data, the following DER calculations can be applied.
The Normalized Absolute Difference for isotopes with activities $\leq$ 5X the MDC is considered for data validation rather than the Relative Percent Difference (RPD). If the NAD calculated is 1.96 < x > 3.29 the results for all samples have been qualified JD# where # represents the NAD calculated. If the NAD calculated were greater than 3.29 the results would be rejected. If the results are less than 1.96 no qualification has been made. Where results are greater than 5X the MDC the RPD is considered for data validation.
Yes___ No___ NA__X_

XI. CALCULATIONS

The calculation algorithm has been checked for 10% of the submitted data packages and accuracy of the reported results is verified.
Yes __X___ No _____ NA____
For the GEL reports.

XII. OVERALL ASSESSMENT OF THE CASE

The data are considered fully useable for project purposes with consideration of the qualifications or comments.

Deliverables
The following is noted:
Data were submitted for GEL: GFPC for Cl-36, gross alpha/beta, and Sr-90; LSC for Tc-99; IsoTech: LCS for tritium and C14 in water and gas.
Deliverables from GEL Laboratories are complete and as required for validation.

The original submittal of tritium and C-14 results from Isotech laboratories did not include any QC or calibration data.

On 8/10/2015, we received the missing data from Isotech and Beta Analytic, and this is a revised report that includes such validation as could be performed for tritium and C-14. This includes the COC documentation missing in the first submittal. On September 4, we received some additional documentation of certifications from Beta Analytic. At this point the documentation is as complete as it has been historically for the two laboratories.

The documentation provided by Isotech for tritium analysis is sufficient for most validation purposes. Some detailed raw results, such as quench curves, are not present but these are not specifically required in the validation guidance.

The Beta Analytic documentation for C-14 includes a signed COC and general QA information, including certification documents and acceptable results for reference standards dated May 11, 2015. Count data, run dates, blank results, and other specific QC are not available from Beta. This deficiency only impacts C-14 analysis.

Analytical Report Forms

Note that analysis dates and uncertainties are not provided by Isotech or Beta Analytic in their reports. The submittal from Isotech on 8/10 includes the missing analysis dates and uncertainties for the results, and the count data are provided.

Uncertainties

These are provided for all results except for the C-14 analyses.

Samples where uncertainties are greater than the result or the result has been reported as estimated "J" may have unrealistically low MDC values. The uncertainties are multiplied by 1.65. If the result is greater than the reported MDC, the isotope has been qualified UJQ for an unrealistically low MDC. If the value calculated is less than the reported MDA, the activity result is qualified JQ estimated below the MDC.

No such instances are observed and no qualifiers are applied.

Gross Alpha and Beta: There were no detections observed for gross alpha, but there was a detection observed for gross beta. The reporting limit is elevated due to matrix effects. The samples contain high TDS and the total weight must be kept to a level within the calibration range. This limits the sample size and therefore the reporting limit.

Tritium and C-14: These results for water and gas are reported by Isotech Laboratories. Uncertainties are not included in the report. All results are reported as non-detects.

Laboratory Control Spikes

For the GEL results LCS results are reported and are in control.
For the IsoTech tritium analyses, NIST standard results and blank results are reported, and raw count data are provided. The QC reports provided by Isotech shows that the standards run with the samples are in control.

For the C-14 analyses, Beta Analytic provides a report showing the recovery results for three standards, showing them to be within the acceptable limits. The report of these results is dated May 11, 2015. Although the laboratory states that standards were analyzed "quasi-simultaneously" with unknowns, the actual count dates for these standards and for the samples are not provided.

Matrix Spikes

The following MS/MSDs were conducted. For the gross alpha/beta analysis, an MS/MSD was conducted. For the other methods, a matrix spike was conducted plus a sample duplicate.

SDG	Method	Client Sample ID	Lab Sample ID
372020	EPA 905.0 Modified (Sr-90)	36-13B	372020001
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372020	EPA 900.0/SW846 9310	36-13B	372020001

IsoTech has not provided matrix spike results for tritium or C-14 analysis.
All MS recoveries are in control except for Sr-90, which was low (34%R), and the parent sample is qualified as JMS34. Data could be biased low proportional to the spike recovery or false non-detected data reported .

Matrix Duplicates
Except for gross alpha and beta, matrix duplicates, not matrix spike duplicates, were analyzed using the same samples as were used for the matrix spikes. All are in control.

In the case of gross alpha and beta, a matrix spike duplicate was analyzed. Recoveries are in control, but the RPD was out of limits for gross alpha (23.3%). Since the recoveries are in control no qualifier is required.

The QC data submitted by Isotech for tritium has duplicate results, and these are in control.

Method Blanks
GEL, gross alpha/beta: The raw data provides all of the necessary information to evaluate the method blanks. The measurement uncertainty is less than the MDC and the sample results are all < 5x MDC. No qualifiers are required.
GEL, Sr-90: Sample results are all non-detects and the method blank raw results are less than MDC. No qualifications are required.
GEL, Tc-99: Sample results are all non-detects and the method blank raw results are less than MDC. No qualifications are required.

IsoTech: Blank results are provided and are acceptable.
Beta Analytic: No blank results are provided.

Summary of Qualifiers:

SDG ID	Lab Sample ID	Method	Analyte	Conc	RL	Lab Flag	DSA Qual
372020	372020001	EPA 905.0 Modified	Sr-90	-0.238	1.87	U	UJMS34
372020	1203317700	EPA 905.0 Modified	Sr-90	-0.533	1.39	U	UJMS34

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RADIOCHEMISTRY QUALITY REVIEW REPORT
GAMMA SPECTROMETRY

SDG: 372020

PROJECT: Piceance Energy, a subsidiary of Laramie Energy II , Olsson Project #: 012-1919

LABORATORY: GEL Laboratories, LLC, Charleston, South Carolina

SAMPLE MATRIX: Water

SAMPLING DATE (Mo/Yr): 4/28/2015

ANALYSES REQUESTED: Ac-228, Ag-110m, Am-241, Ba-133, Ba-140, Be-7, Bi-212, Bi-214, Ce-139, Ce-141, Ce-144, Co-56, Co-57, Co-58, Co-60, Cr-51, Cs-134, Cs-136, Cs-137, Eu-152, Eu-154, Eu-155, Fe-59, Hg-203, Ir-192, K-40, Mn-54, Na-22, Nb-94, Nb-95, Nd-117, Np-239, Pb-210, Pb-212, Pb-214, Pm-144, Pm-146, Ra-228, Ru-106, Sb-124, Sb-125, Sn-113, Th-234, Tl-208, U-235, U-238, Y-88, Zn-65, Zr-95

SAMPLE NUMBERS: 36-13B

DATA REVIEWER: John Huntington

QA REVIEWER Diane Short & Associates, Inc. Initials/ Date DLS 07/28/15

Telephone Logs included Yes____ No _X___

Contractual Violations Yes____ No __X__

The project Quality Assurance Project Plan (QAPP), the EPA Laboratory Data Validation Functional Guidelines for Evaluating Inorganic Analyses, (SOP), the EPA method 901.1 and the Paragon Standard Operating Procedure SOPS noted in the report have been used by the reviewer to perform this data validation review. Only a limited number of the Data Validation QC items apply to radiochemical analyses. The remaining QC items have been taken from the Paragon Method QC. The EPA qualifiers have been expanded to include a descriptor code and value to define QC violations and their values, per the approval of EPA. All chains of custody, calibrations, QC Forms have been validated and qualifiers added from the QC data on the Forms and an overview of the raw data.

I. DELIVERABLES

A. All deliverables were present as specified in the Statement of Work (SOW) or in the project contract.

Yes _X___ No ___

The following is noted:

The GEL Laboratories data package included raw data, and at client request a level IV review was conducted. The method used is EPA 901.1.

B. The Analytical Report or Data Sheets are present and complete for all requested analyses.

Yes _X___ No____

II. INSTRUMENTATION

A. The detector range is appropriate for the samples being analyzed.

Yes _X__ No___ NA __

B. The system resolution peak is within the 1332 KeV range for Co-60.

Yes _X__ No___ NA __

C. The resolution is within the 3 KeV range for Co-60.

Yes _X__ No___ NA __

III. STANDARDS

A. Standards were NIST traceable or equivalent.

Yes _X__ No___ NA __

Certificates were provided for all standards used, as well as calibration logs and raw data.

B. Standards for efficiency checks are counted at least once a month for each detector.

Yes _X__ No___ NA __

C. The check source standard has not shifted more than 2 channels from the centroid position.

Yes _X__ No___ NA __

This is documented in the calibration portion of the data package.

D. Samples are counted for a duration long enough to achieve the RDL.

Yes _X__ No___ NA __

E. Background counts for the same duration as the sample runs are submitted and acceptable.

Yes __X_ No___ NA __

This is provided for each sample in the raw data section.

F. Each standard is measured for peak resolution as full-width at half-maximum height (FWHM) and absolute counting efficiency and all center column readings (bounds test) "Pass".

Yes _X__ No___ NA __

G. The MDA was checked for 10% of the samples and is $\leq$ RDL.

Yes _X__ No____

IV. BLANKS

A. The method blank was analyzed at the required frequency.

Yes _X___ No____

B. And the results were within the required control limits. When average blanks or instrument background is subtracted to determine net counts, the net blank must be < 2 sigma uncertainty.
Yes __X__ No ____NA___
GEL: All results are reported as ND. No blank corrections are required.

B. Field Blanks are identified and results are below the detection limit or < 2 x IDL.
Yes ____ No ____ NA __X__
No field blank is identified.

V. SPIKE SAMPLE RECOVERY
A. A matrix (pre-digestion) spike sample was analyzed for each digestion group and/ or matrix or as required in the SOW.
Yes _X___No ____
No MS was prepared. The laboratory has not commented about the reason.
The spiking of the large sample size (~500g) required for these analyses usually prohibits the spiking of radioactive compounds. The acceptable QC sample for accuracy for this analysis is the Laboratory Control Sample (LCS).

And the Matrix spike percent recoveries were within the required control limits of 75 – 125%
Yes ____No____ NA__X___

VI. DUPLICATES
A. Matrix (pre-digestion) duplicate samples were analyzed at the required frequency.
Yes __X__ No ____

B. And met the Duplicate Error Ratio (DER) criteria calculations which account for the 2 sigma efficiency values. DER limit is 1.0 (the DOE limit is 1.42)
Yes ____ No __X__
The laboratory uses relative percent difference (RPD) to compare duplicate results. The duplicate error ratio (DER) is not provided in the report. The DER is, however, provided in the Excel file submitted by GEL. The RPD is provided in the report, but not in the Excel file. RPD is also used to evaluate precision for duplicates, but the criteria are different. The laboratory also refers to data exception reports as "DER. It is important to understand that this is a different usage of the acronym from the duplicate error ratio.

There are 17 DER outliers relative to the DER limit of 1.0. Using the RPD, Bi-214 is at 28.9% RPD and has a DER value of 1.36. Pb-212 has an RPD of 52.8 and a DER of 2.4. Pb-214 has an RPD of 57.9 and a DER of 2.0. This reflects the fact that these two analytes are detections in the sample and non-detects in the duplicate.

These are the only cases where both the DER and RPD are out of limits. The laboratory shows limits for the RPD of 0-100%, presumably because the results are low-level. P-212 and Pb-214 are qualified as JMD#, where # is the RPD observed, since they represent detections in the sample.

The analytes having DER values outside of limits are shown in the table below. Since all of these except for Pb-212 and Pb-214 are cases where the analyte is not detected in the sample,

and since the RPD is not out of limits, no qualifiers are added to the sample results except for those already mentioned.

Parameter	Conc	RL	Counting error	Units	QAQC Flag	EPA Qual	DER
Ag-110m	1.35	5.04	2.47	pCi/L	U		1.79849
Ba-140	19.6	30.2	14.5	pCi/L	U		1.90574
Be-7	-21.6	39.1	24.8	pCi/L	U		1.25904
Bi-212	9.17	77	39.1	pCi/L	U		1.36623
Bi-214	18.8	9.63	8.54	pCi/L			1.35598
Ce-144	18.6	38.2	20.9	pCi/L	U		2.71903
Co-56	1.8	5.1	2.36	pCi/L	U		2.35568
Cs-137	-0.246	5.56	2.95	pCi/L	U		1.37044
Eu-155	7.34	22.7	12.7	pCi/L	U		1.12843
Fe-59	-3.44	9.89	6.83	pCi/L	U		1.63271
Np-239	10.7	53.8	30.5	pCi/L	U		1.45142
Pb-212	0	14.2	10.2	pCi/L	UI	UJMD52.8	2.39726
Pb-214	11.1	16.4	11.4	pCi/L	U	UJMD57.9	2.00519
Sn-113	2.09	6.71	3.47	pCi/L	U		1.42058
Tl-208	6.22	4.82	4.09	pCi/L			1.22463
Y-88	-0.942	5.8	3.06	pCi/L	U		1.09874
Zn-65	4.46	7.14	4.7	pCi/L	U		1.31106

C. If suspected "hot particles" were found, were samples re-analyzed.
Yes____ No ___ NA_X__
No hot particles found, sample results low or BDL.

VII. LABORATORY CONTROL SAMPLE
A. An LCS was analyzed at the required frequency.
Yes __X__ No____
The laboratory used a subset of the nuclide target list in the LCS. Am-241, Co-60, and Cs-137 were spiked.

B. The LCS was within a control limit of 80-120% for water and 70 – 130% for soil.
Yes _X___ No____

C. The LCS uncertainty calculation verifies that the observed value of the LCS is within 3 sigma control limits of the expected LCS value and the relative percent error does not exceed 5 %.
Yes _X___ No____

VIII. DETECTION LIMITS and SAMPLE IDENTIFICATION
A. Detection limits met the method limits.

Yes __X__ No____
The instrument detection limit was within an isotope-specific limit for the calibration standards and QC samples.

B. The energy of the identified peaks are within 2 KeV of the library energy of the radionuclide.
Yes__X__ No____ NA____

C. Decay-corrected results have been reported appropriately for the short half-life results
Yes__X__ No____ NA___

D. Sample Identifications are accurate.
Yes____ No__X__

In the sample, there are five detections reported, as shown in the table below. As also shown in the second table, there are five detections observed in the duplicate. Ac-228, K-40, and Ra-228 are detected in both samples and duplicate, but the others are not detected in both. All are at low levels, near the reporting limit.

Detected results in sample:

Parameter	CAS_ NO	Conc	RL	Counting error	Units
Ac-228	14331-83-0	30.7	28.9	29.2	pCi/L
K-40	13966-00-2	174	69.3	75.7	pCi/L
Pb-212	15092-94-1	24.4	11.4	14.5	pCi/L
Pb-214	15067-28-4	29.8	15.8	12.9	pCi/L
Ra-228	15262-20-1	30.7	28.9	29.2	pCi/L

Detected results in Laboratory duplicate:

Parameter	CAS_ NO	Conc	RL	Counting error	Units
Ac-228	14331-83-0	33	27.7	23.4	pCi/L
Bi-214	14733-03-0	18.8	9.63	8.54	pCi/L
K-40	13966-00-2	147	58.9	56.3	pCi/L
Ra-228	15262-20-1	33	27.7	23.4	pCi/L
Tl-208	14913-50-9	6.22	4.82	4.09	pCi/L

K-40 is expected to be present at low levels if potassium is present.

The laboratory has indicated that they reject certain data due to high counting uncertainty of low abundance. All these are associated with non-detected data. Results are qualified as RQ, rejected per laboratory assessment. Such results appear to suffer from a low bias and may be false negatives.

Parameter	RL	Counting Error	Units	QAQC Flag	Comments
Bi-214	25.1	14.6	pCi/L	UI	Data rejected due to low abundance.
Tl-208	6.79	9.03	pCi/L	UI	Data rejected due to high counting uncertainty.
Cs-134	2.58	4.26	pCi/L	UI	Data rejected due to high counting uncertainty.
Pb-212	14.2	10.2	pCi/L	UI	Data rejected due to low abundance.

We recommend using the result from either the sample or the duplicate which is not rejected by the laboratory, as shown below.

Sample	Parameter	Conc	RL	Lab Flag	DSA Qual	Count error	Comment
Sample	Bi-214	0	25.1	UI	URQ	14.6	
Dup	Bi-214	18.8	9.63			8.54	Use
Sample	Cs-134	-0.281	8.14	**U**		4.59	Use
Dup	Cs-134	0	2.58	UI	URQ	4.26	
Sample	Pb-212	24.4	11.4		JMD52.8	14.5	Use
Dup	Pb-212	0	14.2	UI	URQMD52.8	10.2	
Sample	Tl-208	0	6.79	UI	URQ	9.03	
Dup	Tl-208	6.22	4.82			4.09	Use

E. Tentatively Identified Radionuclides (TIR)
TIRs were reported and correctly identified from the library search.
Yes____ No_____ NA__X_
No TIRs are reported or requested.

IX. PREPARATION AND ANALYSIS LOGS

A. All samples were prepared or analyzed within the required holding times referencing the SOW (time of sample receipt to preparation/distillation).
Yes _X___ No____

B. All samples were analyzed within the EPA Method recommended holding times (time of sample collection to date of analysis).
Yes __X__ No____
No 40 CFR limits exist for radchem, so method limits were referenced. All samples were analyzed within 90 days of collection.

X. CHAINS OF CUSTODY

A. All chains of custody were complete with initials, dates, times and any changes are crossed out with one line and initialed.
Yes __X_ No ___

B. Samples arrived intact, at the proper pH (< 2) and temperature.
Yes _X__ No____
Although not noted in the log-in documentation, an email from the Laboratory Project Manager to the client indicates that the sample required additional preservation because it was received at a pH of 4. This is acceptable for radiochemical analysis and no qualifiers are required.

XI. FIELD QC

Field QC samples were identified and have met a guidance limit of CLP 30% for water and 50% for soil, or ± 2 x RL (water) or 3.5 x RL (soil) for results < 5 x RL. Or for radiochemistry, the results relative to the 2 sigma counting error (uncertainty) may be used. The difference between the 2 results is compared against the uncertainty for each sample result. DER of > 1 is to be discussed. No qualifiers are applied.

Yes ____ No____ NA __X__

No field duplicates are identified.

XII. OVERALL ASSESSMENT OF THE CASE

The data are considered fully useable for project purposes with consideration of the qualifications or comments.

Duplicates

The laboratory uses relative percent difference (RPD) to compare duplicate results. The duplicate error ratio (DER) is not provided in the report. The DER is, however, provided in the Excel file submitted by GEL. The RPD is provided in the report, but not in the Excel file. RPD is also used to evaluate precision for duplicates, but the criteria are different. The laboratory also refers to data exception reports as "DER. It is important to understand that this is a different usage of the acronym from the duplicate error ratio.

There are 17 DER outliers relative to the DER limit of 1.0. Using the RPD, Bi-214 is at 28.9% RPD and has a DER value of 1.36. Pb-212 has an RPD of 52.8 and a DER of 2.4. Pb-214 has an RPD of 57.9 and a DER of 2.0. This reflects the fact that these two analytes are detections in the sample and non-detects in the duplicate.

These are the only cases where both the DER and RPD are out of limits. The laboratory shows limits for the RPD of 0-100%, presumably because the results are low-level. P-212 and Pb-214 are qualified as JMD#, where # is the RPD observed, since they represent detections in the sample.

The analytes having DER values outside of limits are shown in the table below. Since all of these except for Pb-212 and Pb-214 are cases where the analyte is not detected in the sample, and since the RPD is not out of limits, no qualifiers are added to the sample results except for those already mentioned.

Detection Limits and Sample Identification

In the sample, there are five detections reported, as shown in the table within this report. As also shown in the second table, there are five detections observed. Ac-228, K-40, and Ra-228 are detected in both samples and duplicate, but the others are not detected in both. All are at low levels, near the reporting limit.

K-40 is expected to be present at low levels if potassium is present.

The laboratory has indicated that they reject certain data due to high counting uncertainty of low abundance. All these are associated with non-detected data. Results are qualified as UJQ.

QUALIFIER TABLE

SDG ID	Lab Sample ID	Method	Parameter	Conc	RL	Lab Flag	DSA Qual
372020	372020001	EPA 901.1	Bi-214		25.1	UI	URQ
372020	372020001	EPA 901.1	Pb-212	24.4	11.4		JMD52.8
372020	372020001	EPA 901.1	Pb-214	29.8	15.8		JMD57.9
372020	372020001	EPA 901.1	Tl-208		6.79	UI	URQ
372020	1203310163	EPA 901.1	Cs-134		2.58	UI	URQ
372020	1203310163	EPA 901.1	Pb-212		14.2	UI	URQMD52.8
372020	1203310163	EPA 901.1	Pb-214	11.1	16.4	U	UJMD57.9

SDG ID	Lab_ID	Samp_Date	Medium_type	Method_Type
372020	372020001	42122.41667	WG	RADCHEM
372020	1203310163	42122.41667	WG	RADCHEM
372020	372020001	42122.41667	WG	RADCHEM
372020	1203310163	42122.41667	WG	RADCHEM
372020	372020001	42122.41667	WG	RADCHEM
372020	1203310163	42122.41667	WG	RADCHEM
372020	372020001	42122.41667	WG	RADCHEM
372020	1203310163	42122.41667	WG	RADCHEM
372020	372020001	42122.41667	WG	RADCHEM
372020	1203310163	42122.41667	WG	RADCHEM
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372020	1203310163	42122.41667	WG	RADCHEM
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372020	1203310163	42122.41667	WG	RADCHEM
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372020	1203310163	42122.41667	WG	RADCHEM

372020	372020001	42122.41667	WG	RADCHEM
372020	1203310163	42122.41667	WG	RADCHEM
372020	372020001	42122.41667	WG	RADCHEM
372020	1203310163	42122.41667	WG	RADCHEM
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372020	1203310163	42122.41667	WG	RADCHEM
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372020	1203320254	42122.41667	WG	RADCHEM
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372020	1203320254	42122.41667	WG	RADCHEM
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372020	372020001	42122.41667	WG	RADCHEM

372020	1203310163	42122.41667	WG	RADCHEM
372020	372020001	42122.41667	WG	RADCHEM
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372020	1203317700	42122.41667	WG	RADCHEM
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372020	1203310932	42122.41667	WG	RADCHEM
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372020	1203310933	42122.41667	WG	RADCHEM
372020	1203310163	42122.41667	WG	RADCHEM
372020	1203317701	42122.41667	WG	RADCHEM
372020	372020001	42122.41667	WG	RADCHEM
372020	1203310163	42122.41667	WG	RADCHEM
372020	1203320255	42122.41667	WG	RADCHEM
372020	1203320255	42122.41667	WG	RADCHEM
372020	1203320256	42122.41667	WG	RADCHEM
372020	1203320256	42122.41667	WG	RADCHEM

Method_ID	RunNo	Samp_Fraction	IS_FIELD_QC
EPA 901.1	1	Total	No
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EPA 901.1	1	Total	No
EPA 901.1	1	Total	Yes
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EPA 901.1	1	Total	Yes
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EPA 900.0/SW846 9310	1	Total	No
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EPA 901.1	1	Total	Yes
EPA 905.0 Modified	1	Total	No
EPA 905.0 Modified	1	Total	Yes
DOE EML HASL-300, Tc-02-RC Modified	1	Total	No
DOE EML HASL-300, Tc-02-RC Modified	1	Total	Yes
EPA 901.1	1	Total	No
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EPA 905.0 Modified	1	Total	Yes
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EPA 900.0/SW846 9310	1	Total	Yes
EPA 900.0/SW846 9310	1	Total	Yes
EPA 900.0/SW846 9310	1	Total	Yes
EPA 900.0/SW846 9310	1	Total	Yes

Field_QC_ID	Parameter	CAS_ NO	Conc	RL	IDL
SA	Ac-228	14331-83-0	30.7	28.9	
LD	Ac-228	14331-83-0	33	27.7	
SA	Ag-110m	378784-24-8	-3.4	7	
LD	Ag-110m	378784-24-8	1.35	5.04	
SA	Am-241	14596-10-2	-4.17	13	
LD	Am-241	14596-10-2	-21.1	50.7	
SA	Ba-133	13981-41-4	0.214	7.97	
LD	Ba-133	13981-41-4	0.266	7.13	
SA	Ba-140	14798-08-4	-8.94	34.6	
LD	Ba-140	14798-08-4	19.6	30.2	
SA	Be-7	13966-02-4	5.51	60.7	
LD	Be-7	13966-02-4	-21.6	39.1	
SA	Bi-212	14913-49-6	78.1	124	
LD	Bi-212	14913-49-6	9.17	77	
SA	Bi-214	14733-03-0	0	25.1	
LD	Bi-214	14733-03-0	18.8	9.63	
SA	Ce-139	13982-30-4	0.701	6.38	
LD	Ce-139	13982-30-4	-0.173	4.94	
SA	Ce-141	13967-74-3	2.79	11.4	
LD	Ce-141	13967-74-3	-1.82	9.81	
SA	Ce-144	14762-78-8	-39.3	40.9	
LD	Ce-144	14762-78-8	18.6	38.2	
SA	Co-56	14093-03-9	-3.9	5.86	
LD	Co-56	14093-03-9	1.8	5.1	
SA	Co-57	13981-50-5	-0.881	5.07	
LD	Co-57	13981-50-5	-0.366	4.83	
SA	Co-58	13981-38-9	-2.47	7.38	
LD	Co-58	13981-38-9	-1.34	4.38	
SA	Co-60	10198-40-0	-0.274	7.62	
LD	Co-60	10198-40-0	0.148	4.95	
SA	Cr-51	14392-02-0	-22.7	60.8	
LD	Cr-51	14392-02-0	-13.5	49.3	
SA	Cs-134	13967-70-9	-0.281	8.14	
LD	Cs-134	13967-70-9	0	2.58	
SA	Cs-136	14234-29-8	2.07	13.9	
LD	Cs-136	14234-29-8	-0.81	7.42	
SA	Cs-137	10045-97-3	3.66	8.77	
LD	Cs-137	10045-97-3	-0.246	5.56	

SA	Eu-152	14683-23-9	-11.4	20	
LD	Eu-152	14683-23-9	-3.05	15.8	
SA	Eu-154	15585-10-1	2.39	20.7	
LD	Eu-154	15585-10-1	6.29	17.6	
SA	Eu-155	14391-16-3	-3.12	21.6	
LD	Eu-155	14391-16-3	7.34	22.7	
SA	Fe-59	14596-12-4	5.15	17.1	
LD	Fe-59	14596-12-4	-3.44	9.89	
SA	GROSS ALPHA	12587-46-1	72.9	94.1	
LD	GROSS ALPHA	12587-46-1	-86.1	149	
SA	GROSS BETA	12587-47-2	181	65.2	
LD	GROSS BETA	12587-47-2	203	69.5	
SA	Hg-203	13982-78-0	-0.926	6.84	
LD	Hg-203	13982-78-0	-3.45	6.58	
SA	Ir-192	14694-69-0	-1.74	6.5	
LD	Ir-192	14694-69-0	-0.493	5.32	
SA	K-40	13966-00-2	174	69.3	
LD	K-40	13966-00-2	147	58.9	
SA	Mn-54	13966-31-9	3.23	7.46	
LD	Mn-54	13966-31-9	2.72	6.05	
SA	Na-22	13966-32-0	0.838	7.27	
LD	Na-22	13966-32-0	2.24	6.22	
SA	Nb-94	14681-63-1	1.36	7.27	
LD	Nb-94	14681-63-1	-0.619	4.73	
SA	Nb-95	13967-76-5	-0.186	8.49	
LD	Nb-95	13967-76-5	-0.0355	4.78	
SA	Nd-117	14269-74-0	-22.3	70.3	
LD	Nd-117	14269-74-0	1.95	49.6	
SA	Np-239	13968-59-7	-23.6	55.4	
LD	Np-239	13968-59-7	10.7	53.8	
SA	Pb-210	14255-04-0	21.6	125	
LD	Pb-210	14255-04-0	280	2100	
SA	Pb-212	15092-94-1	24.4	11.4	
LD	Pb-212	15092-94-1	0	14.2	
SA	Pb-214	15067-28-4	29.8	15.8	
LD	Pb-214	15067-28-4	11.1	16.4	
SA	Pm-144	14834-73-2	1.16	7.35	
LD	Pm-144	14834-73-2	-0.586	4.3	
SA	Pm-146	14834-74-3	-0.477	8.45	

LD	Pm-146	14834-74-3	-1.03	6.23	
SA	Ra-228	15262-20-1	30.7	28.9	
LD	Ra-228	15262-20-1	33	27.7	
SA	Ru-106	13967-48-1	7.37	65.1	
LD	Ru-106	13967-48-1	8.4	44.1	
SA	Sb-124	14683-10-4	-2.43	17.1	
LD	Sb-124	14683-10-4	2.15	14.7	
SA	Sb-125	14234-35-6	0.408	18.9	
LD	Sb-125	14234-35-6	5.97	14.4	
SA	Sn-113	13966-06-8	-2.36	8.48	
LD	Sn-113	13966-06-8	2.09	6.71	
SA	Sr-90	10098-97-2	-0.238	1.87	
LD	Sr-90	10098-97-2	-0.533	1.39	
SA	Tc-99	14133-76-7	0.848	27.3	
LD	Tc-99	14133-76-7	5.72	32.7	
SA	Th-234	15065-10-8	14.7	132	
LD	Th-234	15065-10-8	87.1	400	
SA	Tl-208	14913-50-9	0	6.79	
LD	Tl-208	14913-50-9	6.22	4.82	
SA	U-235	15117-96-1	-10.9	42.6	
LD	U-235	15117-96-1	-10.4	36.4	
SA	U-238	7440-61-1	14.7	132	
LD	U-238	7440-61-1	87.1	400	
SA	Y-88	13982-36-0	1.73	8.27	
LD	Y-88	13982-36-0	-0.942	5.8	
SA	Zn-65	13982-39-3	-3.35	15.9	
MS	Tc-99	14133-76-7	831	26.1	
LD	Zn-65	13982-39-3	4.46	7.14	
MS	Sr-90	10098-97-2	24.9	1.68	
SA	Zr-95	13967-71-0	9.02	14	
LD	Zr-95	13967-71-0	3.24	9.67	
MS	GROSS ALPHA	12587-46-1	11600	528	
MS	GROSS BETA	12587-47-2	50600	385	
MSD	GROSS ALPHA	12587-46-1	14600	712	
MSD	GROSS BETA	12587-47-2	48500	561	

Countig_error	Units	Dilution_Factor	QAQC_Flag	EPAQual	IS_DETECT
29.2	pCi/L	1			Y
23.4	pCi/L	1			Y
4.24	pCi/L	1	U		N
2.47	pCi/L	1	U		N
8.72	pCi/L	1	U		N
31	pCi/L	1	U		N
5.01	pCi/L	1	U		N
4.45	pCi/L	1	U		N
23.5	pCi/L	1	U		N
14.5	pCi/L	1	U		N
32.6	pCi/L	1	U		N
24.8	pCi/L	1	U		N
83.3	pCi/L	1	U		N
39.1	pCi/L	1	U		N
14.6	pCi/L	1	UI	URQ	N
8.54	pCi/L	1			Y
3.62	pCi/L	1	U		N
2.9	pCi/L	1	U		N
10.6	pCi/L	1	U		N
6.63	pCi/L	1	U		N
30	pCi/L	1	U		N
20.9	pCi/L	1	U		N
3.61	pCi/L	1	U		N
2.36	pCi/L	1	U		N
2.94	pCi/L	1	U		N
2.83	pCi/L	1	U		N
5.21	pCi/L	1	U		N
2.46	pCi/L	1	U		N
3.97	pCi/L	1	U		N
2.47	pCi/L	1	U		N
35.1	pCi/L	1	U		N
28.3	pCi/L	1	U		N
4.59	pCi/L	1	U		N
4.26	pCi/L	1	UI	URQ	N
6.95	pCi/L	1	U		N
3.89	pCi/L	1	U		N
4.43	pCi/L	1	U		N
2.95	pCi/L	1	U		N

15.9	pCi/L	1	U		N
10.2	pCi/L	1	U		N
10.1	pCi/L	1	U		N
8.03	pCi/L	1	U		N
12.5	pCi/L	1	U		N
12.7	pCi/L	1	U		N
7.13	pCi/L	1	U		N
6.83	pCi/L	1	U		N
58.6	pCi/L	1	U		N
76.5	pCi/L	1	U		N
44.1	pCi/L	1			Y
47.6	pCi/L	1			Y
3.81	pCi/L	1	U		N
3.87	pCi/L	1	U		N
3.69	pCi/L	1	U		N
2.97	pCi/L	1	U		N
75.7	pCi/L	1			Y
56.3	pCi/L	1			Y
2.81	pCi/L	1	U		N
2.89	pCi/L	1	U		N
3.53	pCi/L	1	U		N
2.83	pCi/L	1	U		N
3.84	pCi/L	1	U		N
2.56	pCi/L	1	U		N
5.35	pCi/L	1	U		N
2.48	pCi/L	1	U		N
40.9	pCi/L	1	U		N
27	pCi/L	1	U		N
32.8	pCi/L	1	U		N
30.5	pCi/L	1	U		N
70.6	pCi/L	1	U		N
1160	pCi/L	1	U		N
14.5	pCi/L	1		JMD52.8	Y
10.2	pCi/L	1	UI	URQMD52.8	N
12.9	pCi/L	1		JMD57.9	Y
11.4	pCi/L	1	U	UJMD57.9	N
3.91	pCi/L	1	U		N
2.3	pCi/L	1	U		N
4.65	pCi/L	1	U		N

3.54	pCi/L	1	U		N
29.2	pCi/L	1			Y
23.4	pCi/L	1			Y
34.6	pCi/L	1	U		N
22.9	pCi/L	1	U		N
8.89	pCi/L	1	U		N
6.88	pCi/L	1	U		N
10.3	pCi/L	1	U		N
7.26	pCi/L	1	U		N
4.85	pCi/L	1	U		N
3.47	pCi/L	1	U		N
0.951	pCi/L	1	U	UJMS34	N
0.589	pCi/L	1	U	UJMS34	N
16	pCi/L	1	U		N
19.2	pCi/L	1	U		N
105	pCi/L	1	U		N
242	pCi/L	1	U		N
9.03	pCi/L	1	UI	URQ	N
4.09	pCi/L	1			Y
30.8	pCi/L	1	U		N
25.3	pCi/L	1	U		N
105	pCi/L	1	U		N
242	pCi/L	1	U		N
3.55	pCi/L	1	U		N
3.06	pCi/L	1	U		N
10.6	pCi/L	1	U		N
27.7	pCi/L	1			Y
4.7	pCi/L	1	U		N
2.79	pCi/L	1		JMS34	Y
10.2	pCi/L	1	U		N
7.13	pCi/L	1	U		N
1510	pCi/L	1			Y
1850	pCi/L	1			Y
1800	pCi/L	1			Y
1820	pCi/L	1			Y

TPU	DER	MDC	Matrix	StdDev
29.4		28.9	Water	
23.7	0.11999	27.7	Water	
4.51		7	Water	
2.55	1.79849	5.04	Water	
8.93		13	Water	
32.7	0.97799	50.7	Water	
5.01		7.97	Water	
4.46	0.01503	7.13	Water	
23.8		34.6	Water	
17.1	1.90574	30.2	Water	
32.7		60.7	Water	
26.7	1.25904	39.1	Water	
90.7		124	Water	
39.3	1.36623	77	Water	
25.7		25.1	Water	
8.74	1.35598	9.63	Water	
3.64		6.38	Water	
2.9	0.368	4.94	Water	
10.7		11.4	Water	
6.68	0.71695	9.81	Water	
35.1		40.9	Water	
22.6	2.71903	38.2	Water	
4.02		5.86	Water	
2.5	2.35568	5.1	Water	
2.96		5.07	Water	
2.83	0.24637	4.83	Water	
5.33		7.38	Water	
2.54	0.37313	4.38	Water	
3.97		7.62	Water	
2.47	0.17676	4.95	Water	
36.7		60.8	Water	
29	0.38609	49.3	Water	
4.59		8.14	Water	
4.29	0.08778	2.58	Water	
7.01		13.9	Water	
3.91	0.70168	7.42	Water	
4.74		8.77	Water	
2.95	1.37044	5.56	Water	

16.7		20	Water	
10.3	0.83273	15.8	Water	
10.1		20.7	Water	
8.53	0.57886	17.6	Water	
12.6		21.6	Water	
13.1	1.12843	22.7	Water	
7.54		17.1	Water	
7.03	1.63271	9.89	Water	
59.9		94.1	Water	
76.5		149	Water	
53.4		65.2	Water	
59.2		69.5	Water	
3.84		6.84	Water	
4.19	0.86902	6.58	Water	
3.78		6.5	Water	
2.98	0.50805	5.32	Water	
77.1		69.3	Water	
57.9	0.54085	58.9	Water	
2.83		7.46	Water	
3.15	0.23427	6.05	Water	
3.56		7.27	Water	
3.01	0.59034	6.22	Water	
3.89		7.27	Water	
2.57	0.82999	4.73	Water	
5.35		8.49	Water	
2.48	0.05008	4.78	Water	
42.1		70.3	Water	
27	0.94925	49.6	Water	
34.6		55.4	Water	
30.9	1.45142	53.8	Water	
71.3		125	Water	
1160	0.43507	2100	Water	
14.9		11.4	Water	
13.3	2.39726	14.2	Water	
13.3		15.8	Water	
12.5	2.00519	16.4	Water	
3.94		7.35	Water	
2.32	0.74986	4.3	Water	
4.66		8.45	Water	

3.57	0.18318	6.23	Water	
29.4		28.9	Water	
23.7	0.11999	27.7	Water	
34.8		65.1	Water	
23.3	0.04812	44.1	Water	
8.96		17.1	Water	
6.95	0.79187	14.7	Water	
10.3		18.9	Water	
7.76	0.84475	14.4	Water	
4.97		8.48	Water	
3.59	1.42058	6.71	Water	
0.952		1.87	Water	
0.589		1.39	Water	
16		27.3	Water	
19.2		32.7	Water	
105		132	Water	
246	0.53059	400	Water	
9.05		6.79	Water	
4.13	1.22463	4.82	Water	
31.2		42.6	Water	
25.7	0.02471	36.4	Water	
105		132	Water	
246	0.53059	400	Water	
3.63		8.27	Water	
3.09	1.09874	5.8	Water	
10.7		15.9	Water	
96.2		26.1	Water	
4.75	1.31106	7.14	Water	
4.81		1.68	Water	
11		14	Water	
7.29	0.85916	9.67	Water	
2440		528	Water	
8470		385	Water	
3100		712	Water	
8220		561	Water	

Comments
Result not detected above the detection limit
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Result not detected above the detection limit
Data rejected due to low abundance.
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Data rejected due to high counting uncertainty.
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Data rejected due to low abundance.
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