LAKE CAPRI FISH SAMPLING REPORT
(September 2012 Sampling Event)

Multi Site G
Operation, Maintenance & Monitoring

Dzus Fasteners Site
West Islip, Suffolk County, NY
Site 1-52-033

Work Assignment No.
D007626-17

Prepared for:

SUPERFUND STANDBY PROGRAM
New York State
Department of Environmental Conservation
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1.0 INTRODUCTION

Past releases from the Dzus Fasteners facility in West Islip, New York (Site No. 1-52-033) resulted in the contamination of Willetts Creek and Lake Capri sediments downstream of the Dzus Facility. AECOM was tasked with collecting long term monitoring samples at five-quarterly intervals from selected monitoring wells, and surface water/sediment samples from Lake Capri as part of a long term monitoring plan. Also, as part of the monitoring, AECOM was tasked with performing annual fish sampling to determine levels of cadmium within fish species in Lake Capri.

AECOM is performing this work under the New York State Department of Environmental Conservation (NYSDEC) Superfund Standby Contract Work Assignment No. D007626-17. This report presents the results from the third round of fish sampling conducted in September of 2012. The last round of sampling was conducted in October 2010 and the results were presented in a report prepared by AECOM dated December 2010.

2.0 BACKGROUND INFORMATION

2.1 Site Location

The Dzus Fasteners Superfund (DFS) site is located at 425 Union Boulevard, West Islip, New York (Figure 1). The Site is bounded to the north by railroad tracks. To the southeast is Union Boulevard. On the southeast side of Union Boulevard is a shopping plaza and southeast of the shopping plaza is Willetts Creek. Willetts Creek, a north-south flowing, slow moving creek, about 5-7 meters wide and less than 20 centimeters in depth. Willetts Creek flows south past a junior high school and high school, and eventually discharges into Lake Capri approximately 4,500 ft south of the DFS Site.

Lake Capri (Figure 1) is located on the southern shore of Long Island. Lake Capri is approximately 150 meters (m) wide and 210 m long. The deepest point of the lake during the time of sampling was observed to be approximately 2.5 m in depth. At the shoreline, there is usually a vertical drop off approximately one meter in depth. The near vertical condition of the shoreline is likely a result of previous dredging activities. During the sampling event, thick growths of submerged aquatic vegetation were present throughout the lake in water depths less than 1.5 meters. The density of vegetation lessened in deeper waters. The lake is completely bordered by residential homes along the north, east, and west shorelines. The southern shoreline consists of a bulkhead structure that is adjacent to Route 25A (Montauk Highway). Within the bulkhead, a concrete weir and box culvert conveys water flow below Rt. 25A to Willetts Cove, a tidally influenced inlet.

2.2 Historic Sampling and Remediation Activities

In 1994, the NYSDEC performed sampling of fish within Lake Capri to determine levels of cadmium (Table 1) within the fish species of Lake Capri. Five species of fish were captured and analyzed: American eel, *Anguilla rostrata*; blue gill, *Lepomis macrochirus*; carp, family Cyprinidae; largemouth bass, *Micropterus salmoides*; and pumpkinseed, *Lepomis gibbosus*. After capture, the fish fillets and remaining carcasses were analyzed separately. Cadmium concentrations across the five species in the fish fillets and carcasses ranges from 0.18-1.40 and 0.07 to 1.90 mg/kg, respectively. Variation in the concentrations among species is attributable to fish lifespan, habits, and other factors.

Table 1

Fish Data 1994 – Cadmium Concentration in mg/kg of Fish Fillet and Carcass

Species	Fillet	Carcass
American eel	n/a	0.19 – 0.57
Blue gill	0.19	0.25
Carp	0.32-1.40	0.49-1.90
Largemouth bass	nd	0.07B - 0.19
Pumpkinseed	0.18	0.27
Source: NYSDEC, 1995		
Notes: nd = non detectable at recordable detectable levels; B = Value is less than the contract required detection limit but greater than the instrument detection limit.		

In 1999, as part of remedial activities fish were removed from Lake Capri and the lake sediments were dredged and removed. In 2000, after the completion of remedial activities, the lake was restocked with silversides, *Menidia* sp., bluegill, and largemouth bass.

3.0 FIELD ACTIVITIES

In 2012, the fish collection effort in Lake Capri occurred on September 17, 18, and 19. The air temperature varied from the high 60s at dawn to the mid 80s in the afternoon with partly cloudy to cloudy conditions on all days. A very light rain fell briefly on the morning of the 18th.

Sampling was conducted in accordance with the Sampling and Analysis Plan (SAP) prepared by AECOM, dated June 2007. The SAP is comprised of the Field Sampling Plan (FSP), the Quality Assurance Project Plan (QAPP) and the Health and Safety Plan (HASP). All field work was performed in Level D personal protection. The purpose of the sampling was to obtain edible-sized fish for cadmium analysis.

3.1 Fish Collection Methods

AECOM obtained fish samples using collection techniques that would not influence the cadmium analysis. These techniques included box and minnow fish traps, gill nets, and baited lines. In order to collect the fish, AECOM applied for and received a NYSDEC collection license (#1263).

3.1.1 Traps

Box and minnow traps (Photo 1) were used in the fish sampling efforts. Both traps were baited with frankfurters and cat food. Both baits have worked well in the past as they are high in lipids and/or give off a strong odor. Minnow traps were often placed under logs, ledges, and other overhangs that would attract small fish. Box traps, which are designed to catch larger fish, were placed in deeper locations where they could be submerged.

After the traps were baited, they were checked periodically. Traps were initially set just south of the mouth of Willetts Creek at N40º 41’ 52.8 and W73º 18’ 2.7 and near the weir N40º 41’ 44.6 and W73º 18’ 01.0; however, in order to capture as many fish as possible, the traps were then set all along the northern shoreline and the southern shoreline and throughout the lake.

USGS NY Bay Shore West Quadrangle

U.S.G.S. 1:24 000 SCALE TOPOGRAPHIC MAP

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Prepared by: AECOM

Prepared for: New York State Department of Environmental Conservation

Multi Site G
Operation, Maintenance & Monitoring

Site Location
Dzus Fasteners Site

Date:	Scale:	Figure No. :
January 2013	1 inch = 2,500 feet	1

3.1.2 Gill Nets

Multi-sized mesh gill nets were set in the lake on each of the sample days. The nets were retrieved and reset each morning and evening. The nets measured approximately 1.5 m in height and 25 m in length. The net was comprised of three, 25 ft -long panels of 1-, 2- and 3-inch size mesh. The net was set in approximately 1.5 m of water, in the southern one third of the lake where suitable depths occur. The net was waited at the bottom with a lead line and anchors and floated at the top with floats and a float line (Photo 2).

3.1.3 Baited Lines

In order to increase the potential to catch fish, lines with baited hooks were deployed. The lines were attached to vessels and poles and were periodically checked.

3.2 Fish Tissue Sample Collection

The initial plan called for the collection of 80, 100-gram samples from Lake Capri. Forty samples were to be obtained from the northern boundary of the lake (near the mouth of Willetts Creek), and 40 samples near the weir (southern portion of the lake). However, the desired amount of samples was not obtained. A total of 44 samples were collected. Also, due to varying lake depths, density of aquatic vegetation, and time constraints, the selection of gear could not be uniformly placed throughout the lake. Minnow traps had good success and suitable locations in the northern end of the lake. Gill nets could only be deployed in the southern portion of the lake. Larger fish traps could be deployed throughout the lake; however, these traps often became fouled with vegetation in the northern portion of the lake; thereby reducing their effectiveness. A similar experience was also encountered with baited lines.

3.3 Sample Preparation and Shipment

Captured fish were removed from the water alive. The fish were identified to species, measured for length, and then weighed. The fish were grouped together by species, given a sample identification number, and placed in a plastic bag. The bag was then labeled with the sample number, and immediately placed in a cooler with ice as per NYSDEC instructions. The samples were then shipped to Pace Laboratory, a NYSDEC-certified laboratory, for cadmium analysis.

4.0 SAMPLING RESULTS

4.1 Fish Tissue Samples

The target was for each sample to weigh at least 100 grams of fillet. For some samples this was not possible due to low recovery of fish. Some samples consisted of one individual fish and other samples consisted of numerous small fish (Table 3).

A total of five species comprising the 44 samples were obtained from Lake Capri. Table 2 identifies the fish captured during the September 2012, sampling event. In the column “Field ID”, samples with an N or S modifier correspond to fish captured in the northern or southern end of the lake, respectively. Also, Table 3 identifies the length, weight, and age of each fish sample. The age of the fish was based on visual observation and comparing the lengths of the fish to published reports for average length ratios of fish.

Four freshwater species and one catadromous species were captured during the sampling. The freshwater fish species included: blue gill, largemouth bass, pumpkinseed, and one red ear sunfish, *Lepomis microlophus*. The catadromous species was an American eel. All of these fish species are piscivorous, however, due to their size blue gills, pumpkinseeds, and red ear sunfish would only prey on very small fish no bigger than the size of small minnows (2 cm) in length. These species also prey upon a variety of insects, benthic invertebrates and other food sources. Eels and largemouth bass prey upon the sunfish and other fish species and aquatic fauna. Largemouth bass also have been known to feed on crustaceans (e.g., cray fish), small waterfowl, and small mammals.

The lengths of the captured fish ranged from 3.0 centimeters (cm) to 67 cm. The weight of each individual fish ranged from less than <1 gram (g) to 1,032 g. The total length and weight of each sample is provided in Table 3.

Table 2
Fish Samples Collected in Lake Capri

Field ID	Species	Field ID	Species
DF-N-AE-01	American Eel	DF-S-BG-15	Blue gill
DF-N-BG-01	Blue gill(46 individuals)	DF-S-BG-16	Blue gill
DF-N-BG-02	Blue gill (63 individuals)	DF-S-BG-17	Blue gill
DF-N-BG-03	Blue gill	DF-S-BG-18	Blue gill
DF-N-BG-04	Blue gill	DF-S-BG-19	Blue gill
DF-N-BG-05	Blue gill	DF-S-BG-20	Blue gill
DF-N-PS-01	Pumpkinseed	DF-S-LB-01	Largemouth Bass (7 individuals)
DF-N-SF-01	Sun Fish (mixed species) (50 individuals)	DF-S-LB-02	Largemouth Bass
DF-S-BG-01	Blue gill	DF-S-LB-03	Largemouth Bass
DF-S-BG-02	Blue gill	DF-S-PS-01	Pumpkinseed
DF-S-BG-03	Blue gill	DF-S-PS-02	Pumpkinseed
DF-S-BG-04	Blue gill	DF-S-PS-03	Pumpkinseed
DF-S-BG-05	Blue gill	DF-S-PS-04	Pumpkinseed
DF-S-BG-06	Blue gill	DF-S-PS-05	Pumpkinseed
DF-S-BG-07	Blue gill	DF-S-PS-06	Pumpkinseed
DF-S-BG-08	Blue gill	DF-S-PS-07	Pumpkinseed
DF-S-BG-09	Blue gill	DF-S-PS-08	Pumpkinseed
DF-S-BG-10	Blue gill	DF-S-PS-09	Pumpkinseed
DF-S-BG-11	Blue gill	DF-S-PS-10	Pumpkinseed
DF-S-BG-12	Blue gill	DF-S-PS-11	Pumpkinseed
DF-S-BG-13	Blue gill	DF-S-PS-12	Pumpkinseed
DF-S-BG-14	Blue gill	DF-S-RB-01	Red ear sunfish

4.2 Cadmium Analysis of Fish Samples

Cadmium analysis was performed by Pace Laboratories in Wisconsin. The samples were prepared in accordance with NYSDEC guidelines and cadmium was analyzed using the SW846 M3050 preparation method and the SW846 6020 analysis method. The Pace Analytical Laboratory data summary package is included in Appendix B. Table 3 provides the results of each sample. Cadmium concentrations in the samples varied from 0.0089 to 0.55 mg/kg.

Table 3

Fish Samples Collected in Lake Capri – Results of Cadmium Analysis

Field ID	Species	AGE (years)	Length (mm)	Weight (g)	Sample Type – Whole body or Fillet	Result	MDL	PQL
DF-N-AE-01	American Eel	3+	670	697	Fillet	0.39	0.0098	0.093
DF-N-BG-01	Blue gill	1	3-6	103 (0.5-7)	Whole Body (46 individuals)	0.14	0.0098	0.093
DF-N-BG-02	Blue gill	1	4-7	110 (1-5)	Whole Body (63 individuals)	0.22	0.0096	0.092
DF-N-BG-03	Blue gill	3-5	184	120	Whole Body	0.18	0.010	0.099
DF-N-BG-04	Blue gill	3-5	179	104	Whole Body	0.15	0.010	0.098
DF-N-BG-05	Blue gill	7+	210	235	Fillet	<0.0089	0.0089	0.085
DF-N-PS-01	Pumpkinseed	5-7	175	136	Whole Body	0.19	0.0099	0.094
DF-N-SF-01	Sun Fish (mixed species)	<1	4-7	93 (1-5)	Whole Body (50 individuals)	0.11	0.010	0.098
DF-S-BG-01	Blue gill	7+	203	196	Fillet	0.011J	0.0091	0.086
DF-S-BG-02	Blue gill	3-5	176	126	Whole Body	0.32	0.010	0.098
DF-S-BG-03	Blue gill	7+	215	199	Fillet	0.027J	0.0096	0.091
DF-S-BG-04	Blue gill	5-7	191	140	Whole Body	0.24	0.010	0.097
DF-S-BG-05	Blue gill	7+	214	209	Fillet	0.19	0.0098	0.094
DF-S-BG-06	Blue gill	3-5	179	108	Whole Body	0.17	0.010	0.095
DF-S-BG-07	Blue gill	7+	230	245	Fillet	0.017J	0.010	0.10
DF-S-BG-08	Blue gill	5-7	200	158	Whole Body	0.25	0.0095	0.091
DF-S-BG-09	Blue gill	7+	206	191	Fillet	0.015J	0.0088	0.083
DF-S-BG-10	Blue gill	7+	220	236	Fillet	0.10	0.010	0.097
DF-S-BG-11	Blue gill	7+	212	214	Fillet	0.012J	0.010	0.098
DF-S-BG-12	Blue gill	5-7	190	132	Whole Body	0.11	0.010	0.097
DF-S-BG-13	Blue gill	7-May	194	142	Whole Body	0.23	0.010	0.098
DF-S-BG-14	Blue gill	7+	220	231	Fillet	<0.010	0.010	0.096
DF-S-BG-15	Blue gill	3-5	180	131	Whole Body	0.21	0.010	0.096
DF-S-BG-16	Blue gill	3-5	161	150	Whole Body	0.24	0.0096	0.091
DF-S-BG-17	Blue gill	1-3	83	74	Whole Body	0.43	0.0094	0.090
DF-S-BG-18	Blue gill	7+	240	392	Fillet	0.027J	0.0096	0.091
DF-S-BG-19	Blue gill	7+	225	244	Fillet	<0.0097	0.0097	0.092
DF-S-BG-20	Blue gill	5-7	199	165	Whole Body	0.18	0.010	0.095
DF-S-LB-01	Largemouth Bass	yearlings	8.5-11.5	73 (7-14)	Whole Body (7 individuals)	0.083J	0.0094	0.089
DF-S-LB-02	Largemouth Bass	3+	441	1032	Fillet	<0.0090	0.0090	0.085
DF-S-LB-03	Largemouth Bass	1-2	205	103	Whole Body	0.17	0.0094	0.090
DF-S-PS-01	Pumpkinseed	5-7	167	113	Whole Body	0.26	0.010	0.099
DF-S-PS-02	Pumpkinseed	7+	186	152	Whole Body	0.27	0.010	0.097
DF-S-PS-03	Pumpkinseed	7+	183	136	Whole Body	0.48	0.010	0.099
DF-S-PS-04	Pumpkinseed	5-7	171	115	Whole Body	0.24	0.010	0.098
DF-S-PS-05	Pumpkinseed	7+	180	147	Whole Body	0.35	0.010	0.095
DF-S-PS-06	Pumpkinseed	7+	179	186	Whole Body	0.28	0.010	0.096
DF-S-PS-07	Pumpkinseed	2	112	81	Whole Body	0.22	0.0097	0.093

Field ID	Species	AGE (years)	Length (mm)	Weight (g)	Sample Type – Whole body or Fillet	Result	MDL	PQL
DF-S-PS-08	Pumpkinseed	7+	200	190	Fillet	0.041J	0.010	0.098
DF-S-PS-09	Pumpkinseed	7+	176	142	Whole Body	0.26	0.010	0.10
DF-S-PS-10	Pumpkinseed	7+	178	138	Whole Body	0.17	0.0098	0.094
DF-S-PS-11	Pumpkinseed	7+	180	117	Whole Body	0.31	0.0091	0.087
DF-S-PS-12	Pumpkinseed	7+	200	179	Whole Body	0.55	0.0096	0.092
DF-S-RB-01	Red ear sunfish	7+	210	227	Fillet	0.019J	0.0094	0.089

MDL – Method Detection Limit
PQL – Practical Quantitation Limit

Only one American eel was captured. Laboratory analysis determined that the cadmium concentration was 0.39 mg/kg. Eels are long-lived species that have been known to pass over the weir. Thus, it cannot be determined if the eel has spent its entire life in Lake Capri.

Only on red ear sunfish was captured. The sunfish was estimated at over 7 years of age due to its size. Laboratory analysis determined that cadmium concentrations in the fish were only 0.19 J mg/kg.

Three largemouth bass samples were collected. One sample comprised the whole body analyses of six yearlings (0.008 mg/kg), another sample comprised the whole body analysis of a 1-2 year old (0.17 mg/kg), and the third sample comprised the fillet of a 3+ year old 0.0090 mg/kg. Given the small sample size and difference in prey preferences between a yearling and the 1-2 year old, it is difficult to explain differences in the level of cadmium concentration, although the concentrations were similar to the 1994 concentrations (i.e., nd to 0.19 mg/kg).
For bluegills, Tables 4 and 5 identify the level of cadmium in samples that were analyzed for fillets and whole bodies. For blue gills, analysis of the fillet results in Table 4 identified that cadmium ranged from 0.0089 to 0.19 mg/kg. Two fish fillets had cadmium levels of 0.19 and 0.1 mg/kg. All other fish had cadmium levels less than 0.02 mg/kg, which is far below the results of the 1994 sampling of 0.19 mg/kg.

To further analyze the data, the average cadmium concentration was calculated among the fish by weight class. The three weight classes were the following: 190-215, 230-245, and 390 grams. The average cadmium concentrations are 0.051, 0.029, and 0.027 mg/kg, respectively. The variations are not significant and may be attributable to natural variation in the fish and the small sample size.

Table 4

Blue Gills Fillet Analysis

Field ID	Species	AGE	Length	Weight	Result	MDL	PQL
DF-S-BG-09	Blue gill	7+	206	191	0.015	0.0088	0.083
DF-S-BG-01	Blue gill	7+	203	196	0.011	0.0091	0.086
DF-S-BG-03	Blue gill	7+	215	199	0.027	0.0096	0.091
DF-S-BG-05	Blue gill	7+	214	209	0.19	0.0098	0.094
DF-S-BG-11	Blue gill	7+	212	214	0.012	0.01	0.098
DF-S-BG-14	Blue gill	7+		231	0.01	0.01	0.096
DF-N-BG-05	Blue gill	7+	210	235	0.0089	0.0089	0.085
DF-S-BG-10	Blue gill	7+	220	236	0.1	0.01	0.097
DF-S-BG-19	Blue gill	7+	225	244	0.0097	0.0097	0.092
DF-S-BG-07	Blue gill	7+	230	245	0.017	0.01	0.1
DF-S-BG-18	Blue gill	7+	240	392	0.027	0.0096	0.091

Table 5

Blue Gills Whole Body Analysis

Field ID	Species	AGE	Weight	Result	MDL	PQL
DF-N-BG-01	Blue gill	1	103 (0.5-7)	0.14	0.0098	0.093
DF-N-BG-02	Blue gill	1	110 (1-5)	0.22	0.0096	0.092
DF-S-BG-17	Blue gill	1 to 3	74	0.43	0.0094	0.09
DF-N-BG-04	Blue gill	3 to 5	104	0.15	0.01	0.098
DF-S-BG-06	Blue gill	3 to 5	108	0.17	0.01	0.095
DF-N-BG-03	Blue gill	3 to 5	120	0.18	0.01	0.099
DF-S-BG-02	Blue gill	3 to 5	126	0.32	0.01	0.098
DF-S-BG-15	Blue gill	3 to 5	131	0.21	0.01	0.096
DF-S-BG-12	Blue gill	5 to 7	132	0.11	0.01	0.097
DF-S-BG-04	Blue gill	5 to 7	140	0.24	0.01	0.097
DF-S-BG-13	Blue gill	5 to 7	142	0.23	0.01	0.098
DF-S-BG-16	Blue gill	3 to 5	150	0.24	0.0096	0.091
DF-S-BG-08	Blue gill	5 to 7	158	0.25	0.0095	0.091
DF-S-BG-20	Blue gill	5 to 7	165	0.18	0.01	0.095

Table 5 identifies the cadmium results for the whole body analysis of blue gills in Lake Capri. Cadmium concentrations varied between 0.11 and 0.43 mg/kg. In order to identify any trends among age class, the concentrations was averaged among age class of fish: 1, 1-3, 3-5, and 5-7. The results were 0.18, 0.42, 0.22, and 0.21 mg/kg suggesting little variation associated with age. There was limited recovery among fish of the younger age classes, so statistical comparison is difficult.

Pumpkinseeds were also analyzed for cadmium analysis. Only one pumpkinseed was big enough to be sampled for a fillet (Sample DF-S-PS-08). The concentration of cadmium in the fillet was 0.041J mg/kg, which is well below the fillet concentrations of 0.18 mg/kg found in 1994. For whole fish samples, the results of 12 samples ranged from 0.17 to 0.48 mg/kg, which is similar to the 1994 result of 0.27 mg/kg for carcasses. The whole body samples in Table 6 were grouped by weights 81-117, 136-152, and 179-186 grams. Analysis of the range of cadmium concentrations for each group was 0.22- 0.31, 0.17-0.48 and 0.28- 0.55, respectively. The large overlap of the range of cadmium concentrations indicates there is considerable similarity of cadmium concentrations amongst weight classes and ages.

Table 6

Pumpkinseed Whole Body Analysis

Field ID	Species	AGE	Length	Weight	WB or Fillet	Result	MDL	PQL
DF-S-PS-07	Pumpkinseed	2	112	81	Whole Body	0.22	0.0097	0.093
DF-S-PS-01	Pumpkinseed	5 to 7	167	113	Whole Body	0.26	0.01	0.099
DF-S-PS-04	Pumpkinseed	5 to 7	171	115	Whole Body	0.24	0.01	0.098
DF-N-PS-01	Pumpkinseed	5 to 7	175	136	Whole Body	0.19	0.0099	0.094
DF-S-PS-11	Pumpkinseed	7+	180	117	Whole Body	0.31	0.0091	0.087
DF-S-PS-03	Pumpkinseed	7+	183	136	Whole Body	0.48	0.01	0.099
DF-S-PS-10	Pumpkinseed	7+	178	138	Whole Body	0.17	0.0098	0.094
DF-S-PS-09	Pumpkinseed	7+	176	142	Whole Body	0.26	0.01	0.1
DF-S-PS-05	Pumpkinseed	7+	180	147	Whole Body	0.35	0.01	0.095
DF-S-PS-02	Pumpkinseed	7+	186	152	Whole Body	0.27	0.01	0.097
DF-S-PS-12	Pumpkinseed	7+	200	179	Whole Body	0.55	0.0096	0.092
DF-S-PS-06	Pumpkinseed	7+	179	186	Whole Body	0.28	0.01	0.096

5.0 SUMMARY AND RECOMMENDATIONS FOR FUTURE SITE REMEDIATION ACTIVITIES

5.1 Fish Tissue

The NYSDOH fish advisory (NYSDOH, 2012) for Lake Capri is that "women under 50 years of age and children under 15 years should not eat fish of any species" from the lake; and that adult males and women not of child bearing age may eat up to one meal a month of carp based on cadmium and one meal a month of American eel based on Chlordane. The cadmium is related to the Dzus site. The advisory for carp consumption is based on the NYSDOH fish advisory guideline for cadmium in fish of 1 mg/kg. As noted in Table 6, there were no carp caught during the September collection event. Fish tissue samples were analyzed for cadmium. Due to the small numbers of collected fish, it is not possible to perform in depth statistical analyses among age classes or fish captured in the northern and southern portions of the lake. The cadmium concentrations were generally at or lower than the levels identified in 1994 for the species collected. However, all of the sample results for any species collected (which included many fish of edible size) in 2012 were well below the 1 mg/kg advisory limit.

5.2 Recommendations

Based on the findings of this sampling event, another round of fish tissue sampling in Lake Capri is recommended. The next round of sampling should consist of additional sample time to collect the requisite number of fish. The sampling in this round captured only about half the required fish. If there were an additional 2-3 sample days, it is likely the requisite number of fish could have been captured from the north and south portions of the lake.

6.0 REFERENCES

New York State Department of Environmental Conservation. 1995. Record of Decision. Dzus Fastener Company. Operable Unit 01. Inactive Hazardous Waste Site. Site Number 152033

New York State Department of Health. 2012. Health Advice on eating Sportfish and Game. Accessed at http://www.health.ny.gov/environmental/outdoors/fish/health_advisories/docs/advisory_booklet.pdf

APPENDIX A

NYSDEC LICENSE TO COLLECT OR POSSESS

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
License to Collect or Possess: Scientific # 1263

LICENSE

Under the Environmental Conservation Law (ECL)

Licensee Information

License Issued To:
JOHN A ROLLINO
AECOM 200 LIBERTY ST 25TH FL
ONE WORLD FINANCIAL CENTER
NEW YORK, NY 10281

(212) 798-8607
COUNTY: NEW YORK
REGION: 2

DEC Contact Information

DIVISION OF FISH, WILDLIFE AND MARINE RESOURCES
SPECIAL LICENSES UNIT
625 BROADWAY, ALBANY, NEW YORK 12233-4752
PHONE: (518) 402-8985 FAX: (518) 402-8925
WEBSITE: www.dec.state.ny.us

License Authorizations

License to Collect or Possess: Scientific
License # 1263

New License Effective Date: 9/7/2012 Expiration Date: 9/6/2013

NYSDEC Approval

By acceptance of this license, the licensee agrees that the license is contingent upon strict compliance with the ECL, all applicable regulations, and all conditions included as part of this license.

License Regulations

Issued License **Page 1 of 4**

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
License to Collect or Possess: Scientific # 1263

6 NYCRR Part 175
ECL 11-0515 (1)
6 NYCRR Part 189

LICENSE TO COLLECT OR POSSESS: SCIENTIFIC - LICENSE CONDITIONS

1. Collection from the Wild: Authorized Species, Specific The licensee is authorized to collect and possess the following species: American eel (Anguilla rostrata), Bluegill sunfish (Lepomis macrochirus), Common carp (Cyprinus carpio), Largemouth bass (Micropterus salmoides)

2. Scientific Collection - Location The licensee is authorized to collect species from the following locations only:
Lake Capri-dzus fasteners, West Islip.

3. Scientific Collection - Authorized Activities The licensee is authorized to possess the collected species for the following activity(ies): Required sampling of Lake Capri superfund site. DEC assigned #D003281 site #152033. Total Samples required twenty 100 gram samples from 4 fish species.

4. Scientific Collection - Authorized Fish Collection Equipment The licensee shall only collect fish using
Electroshocking, gill nets, traps and angling.

5. Scientific Collection - Notification of Regional Fisheries Manager The licensee shall notify the regional fisheries manager at least 48 hours in advance of collection.

Regional Fisheries Manager
NYSDEC REGION 1 HEADQUARTERS
SUNY @ STONY BROOK|50 CIRCLE RD
STONY BROOK, NY11790 -3409

6. Scientific Collection - Freshwater Fisheries - Bio-safety Protocol The licensee shall conform with all guidelines contained in the NYS DEC Bureau of Fisheries Sampling, Survey, Boat and Equipment Protocol, attached to this license as Appendix I. Any questions regarding the protocols may be directed to the Regional Fisheries Manager at:

Regional Fisheries Manager
NYSDEC REGION 1 HEADQUARTERS
SUNY @ STONY BROOK|50 CIRCLE RD
STONY BROOK, NY11790 -3409

7. Scientific Collection - LCP - No Endangered or Threatened Species No endangered/threatened species may be collected or possessed pursuant to this license.

Issued License **Page 2 of 4**

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
License to Collect or Possess: Scientific # 1263

8. Scientific Collection - Authority to Designate Agents The licensee is authorized to designate agents to assist the licensee with the listed animals while conducting activities authorized pursuant to this license provided that:

a. the licensee submits a written request to the NYSDEC Special Licenses Unit at the address listed on the front of this license containing the:
i) name
ii) address
iii) age
iv) phone number of the person he or she is nominating as a designated agent, and;

b. the licensee receives an amended license from the Special Licenses Unit listing the designated agents he or she has nominated before that person can conduct activities authorized by this license.

9. Authorized Designated Agents The following Designated Agents are authorized: Lisa Montana and Staci Birnbaum.

10. Scientific Collection - Reporting Requirement - Prior to Expiration The licensee shall file a written annual report prior to the expiration date of this license. Such annual report shall contain: a) name of the licensee, b) license number, c) common name of the listed animals collected, d) location(s) of collection, e) date(s) of collection, f) biological data collected and g) final disposition of collected animals. The licensee shall send this report to the NYSDEC Special Licenses Unit 625 Broadway, Albany, NY 12233-4752.

GENERAL CONDITIONS - Apply to ALL Authorized Licenses

1. GC – Licensee Shall Read All Conditions The licensee shall read all license conditions prior to conducting any activities authorized pursuant to this license.

2. GC – License is Not Transferrable This license is not transferrable and is valid only for the person identified as the licensee.

3. GC – Licensee Responsible for Federal, State or Local Permits/Licenses The licensee is responsible for obtaining any and all necessary, corresponding Federal, State or local permits or licenses prior to conducting any activity authorized pursuant to this license.

4. GC – Reasons for Revocation This license may be revoked for any of the following reasons:

i. licensee provided materially false or inaccurate statements in his or her application, supporting documentation or on required reports;
ii. failure by the licensee to comply with any terms or conditions of this license;
iii. licensee exceeds the scope of the purpose or activities described in his or her application for this license;
iv. licensee fails to comply with any provisions of the NYS Environmental Conservation Law, any other State or Federal laws or regulations of the department directly related to the licensed activity;
v. licensee submits a check, money order or voucher for this license or application for this license that is subsequently returned to the department for insufficient funds or nonpayment after the license has been

Issued License **Page 3 of 4**

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
License to Collect or Possess: Scientific # 1263

issued.

5. GC – Licensee Shall Carry Copy of License The licensee shall carry a copy of this license or a document provided by the department, if relevant, when conducting activities pursuant to this license.

6. GC – Licensee Shall Notify of Change of Address The licensee shall notify the Special Licenses Unit in writing, by mail or email, within five (5) days of the official change of residence.

7. GC – Licensee is Liable for Designated Agents If designated agents are authorized pursuant to this license, the licensee shall be liable and responsible for any activities conducted by designated agents pursuant to this license or any actions by designated agents resulting from activities authorized by this license.

8. GC – Licensee Renewal The licensee shall submit a written request for the renewal of this license prior to the expiration date listed on the license. The licensee shall include accurate and complete copies of any required reports with their renewal request. This renewal paperwork shall be sent to:

NYSDEC
Special Licenses Unit
625 Broadway
Albany, NY 12233-4752.

This license is deemed expired on the date of expiration listed on the license.

NOTIFICATION OF OTHER LICENSEE OBLIGATIONS

MN– Licensee is Liable
The licensee shall be liable and responsible for any activities conducted under the authority of this license or any actions resulting from activities authorized by the license.

MN – Access by Law Enforcement
The licensee shall allow representatives of the NYS DEC Division of Law Enforcement to enter the licensed premises to inspect his or her operations and records for compliance with license conditions.

Trespassing Prohibited
This license is not a license to trespass. The licensee shall obtain permission from the appropriate landowner/land manager prior to conducting activities authorized pursuant to this license

APPENDIX B

PHOTOGRAPHS

Photo 1 Fish Traps

Photo 2 Deployed Gill Net. View of deployed net from surface. The net hangs vertically in the water column from the bottom to the surface.

APPENDIX C

DATA PACKAGE

Metals Data Package Cover Sheet

Client: AECOM, INC. - NY
Project: DZUS FASTENERS LAKE CAPRI FISH
SDG: 4067361

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

SAMPLE SUMMARY

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067361

Lab ID	Sample ID	Matrix	Date Collected	Date Received
4067361001	DF-S-PS-01	Tissue	09/16/12 00:00	09/20/12 10:10
4067361002	DF-S-PS-02	Tissue	09/16/12 00:00	09/20/12 10:10
4067361003	DF-S-PS-03	Tissue	09/16/12 00:00	09/20/12 10:10
4067361004	DF-S-PS-04	Tissue	09/16/12 00:00	09/20/12 10:10
4067361005	DF-S-PS-05	Tissue	09/17/12 00:00	09/20/12 10:10
4067361006	DF-S-PS-06	Tissue	09/17/12 00:00	09/20/12 10:10
4067361007	DF-S-PS-07	Tissue	09/17/12 00:00	09/20/12 10:10
4067361008	DF-S-PS-08	Tissue	09/17/12 00:00	09/20/12 10:10
4067361009	DF-S-PS-09	Tissue	09/17/12 00:00	09/20/12 10:10
4067361010	DF-S-PS-10	Tissue	09/17/12 00:00	09/20/12 10:10
4067361011	DF-S-PS-11	Tissue	09/18/12 00:00	09/20/12 10:10
4067361012	DF-S-PS-12	Tissue	09/18/12 00:00	09/20/12 10:10
4067361013	DF-N-PS-01	Tissue	09/17/12 00:00	09/20/12 10:10
4067361014	DF-S-BG-01	Tissue	09/16/12 00:00	09/20/12 10:10
4067361015	DF-S-BG-02	Tissue	09/16/12 00:00	09/20/12 10:10
4067361016	DF-S-BG-03	Tissue	09/16/12 00:00	09/20/12 10:10
4067361017	DF-S-BG-04	Tissue	09/16/12 00:00	09/20/12 10:10
4067361018	DF-S-BG-05	Tissue	09/17/12 00:00	09/20/12 10:10
4067361019	DF-S-BG-06	Tissue	09/17/12 00:00	09/20/12 10:10

REPORT OF LABORATORY ANALYSIS

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Pace Analytical®

CASE NARRATIVE - METALS ANALYSIS

Lab Report Number (SDG): 4067361
Client: AECOM, Inc.
Project Name: DZUS FASTENERS LAKE CAPRI FISH
Project Number: N/A

1. RECEIPT

The samples were received on ice at 4°C.

2. HOLDING TIMES

A. **Sample Preparation:** All recommended holding times were met.
B. **Sample Analysis:** All recommended holding times were met.

3. METHOD

A. **Preparation:** SW846 3050B
B. **Analysis:** SW846 6020

4. PREPARATION

Sample preparation proceeded normally.

5. ANALYSIS

A. **Calibration:**
   1. **Initial verification:** All method acceptance criteria were met.
   2. **Continuing verification:** All method acceptance criteria were met.
B. **Blanks:**
   1. **Initial calibration:** All method acceptance criteria were met.
   2. **Continuing calibration:** All method acceptance criteria were met.
   3. **Method:** All method acceptance criteria were met.
   4. **Chicken:** A chicken blank is prepared and analyzed with each sample batch to determine the background contamination levels of the chicken used for the laboratory control spike (LCS). The chicken blank is analyzed down to the laboratory MDL.
C. **Spikes:**
   1. **Lab Control Spike (LCS):** All in-house accuracy criteria were met.
   2. **SRM:** A Standard Reference Material was analyzed with this analytical batch. The in-house accuracy criteria were met.
   3. **Matrix Spike / Duplicate (MS/MSD):** Sample DF-S-PS-01 was designated as the parent sample for the MS/MSD for this SDG. All in-house accuracy and precision criteria were met.
D. **Sample Duplicates:** None required for this SDG.
E. **ICP-MS Interference Check Samples:** All method acceptance criteria were met.
F. **ICP-MS Serial Dilution:** All applicable method acceptance criteria were met.
G. **Samples:** Sample analyses proceeded normally.
H. **Dilutions:** None required for this SDG.
I. **Reanalysis:** None required for this SDG.
J. **Comments:** No additional comments are needed.

I certify that this data package is in compliance with the terms and conditions agreed to by **Pace Analytical Services, Inc.**, and by the client, both technically and for completeness, except for the conditions detailed above. The Laboratory Manager or his designee, as verified by the following signature, has authorized release of the data contained in this hard copy data package:

Signed: Leigh A Begalske Date: 10/11/12

Name: Leigh A. Begalske Position: Quality Assurance Auditor

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

SAMPLE ANALYTE COUNT

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067361

Lab ID	Sample ID	Method	Analysts	Analytes Reported
4067361001	DF-S-PS-01	EPA 6020	DS1	1
4067361002	DF-S-PS-02	EPA 6020	DS1	1
4067361003	DF-S-PS-03	EPA 6020	DS1	1
4067361004	DF-S-PS-04	EPA 6020	DS1	1
4067361005	DF-S-PS-05	EPA 6020	DS1	1
4067361006	DF-S-PS-06	EPA 6020	DS1	1
4067361007	DF-S-PS-07	EPA 6020	DS1	1
4067361008	DF-S-PS-08	EPA 6020	DS1	1
4067361009	DF-S-PS-09	EPA 6020	DS1	1
4067361010	DF-S-PS-10	EPA 6020	DS1	1
4067361011	DF-S-PS-11	EPA 6020	DS1	1
4067361012	DF-S-PS-12	EPA 6020	DS1	1
4067361013	DF-N-PS-01	EPA 6020	DS1	1
4067361014	DF-S-BG-01	EPA 6020	DS1	1
4067361015	DF-S-BG-02	EPA 6020	DS1	1
4067361016	DF-S-BG-03	EPA 6020	DS1	1
4067361017	DF-S-BG-04	EPA 6020	DS1	1
4067361018	DF-S-BG-05	EPA 6020	DS1	1
4067361019	DF-S-BG-06	EPA 6020	DS1	1

REPORT OF LABORATORY ANALYSIS

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Green Bay, WI 54302
(920)469-2436

QUALIFIERS

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067361

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PRL - Pace Reporting Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

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Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

CERTIFICATIONS

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067361

Green Bay Certification IDs
1241 Bellevue Street, Green Bay, WI 54302
Florida/NELAP Certification #: E87948
Illinois Certification #: 200050
Kentucky Certification #: 82
Louisiana Certification #: 04168
Minnesota Certification #: 055-999-334
New York Certification #: 11888
North Carolina Certification #: 503
North Dakota Certification #: R-150
South Carolina Certification #: 83006001
US Dept of Agriculture #: S-76505
Wisconsin Certification #: 405132750

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Appendix B. Sample Chain of Custody Form

4067361

CHAIN OF CUSTODY

I, John Rollino, of AECOM - 20 Exchange Pl N.Y. N.Y. have collected the following
(Print Name) (Print Address)

on SEPT 16, 2012 from SEPT 19 in the vicinity of LAKE CAPRI
(Date)

Town of W. Islip, Suffolk County.

Item(s): FISH Samples (SEE ATTACHED APPENDIX B)

I have assigned the identification number(s) SEE APPENDIX A to these samples, and have recorded pertinent data on the attached collection records. The samples were handled according to sampling protocols provided to me prior to collection. I placed the samples in the custody of FED EX (TO BE SHIPPED TO PACE LABS IN GREEN BAY, WI.
on SEPT 19, 2012.

I, Eric Heling, of Pace Green Bay have received the above mentioned sample(s) on the date specified for the purpose of _____. The sample(s) remained in my custody until subsequently transferred, prepared or shipped at times and dates as attested to below.

Signed Eric Heling Date 9/20/12

SECOND RECIPIENT (Print Name)	TIME & DATE	PURPOSE OF TRANSFER
SIGNATURE	AFFILIATION	
THIRD RECIPIENT (Print Name)	TIME & DATE	PURPOSE OF TRANSFER
SIGNATURE	AFFILIATION	
FOURTH RECIPIENT (Print Name)	TIME & DATE	PURPOSE OF TRANSFER
SIGNATURE	AFFILIATION	
RECEIVED IN LABORATORY BY (Print Name)	TIME & DATE	
SIGNATURE	AFFILIATION	

NOTICE OF WARRANTY

By signature to the chain of custody (reverse), the signator warrants that the information provided is truthful and accurate to the best of his/her ability.

4067361

Appendix A. Sample Collection Record

BIOTA COLLECTION RECORD

Project name, location and waterbody: DZUS FASTENERS, LAKE CAPRI WEST ISLIP, NY

Collections made by (names): J. Rollino, M. Smith, L. Montana

Preservation method: ☐ Freezing; ☐ Other (specify) ICE

Lab Use only Lab Number	Sample or Tag number	Species	Date Taken	Sampling Location	Method of Collection	Length (mm)	Weight (grams)	Remarks
001	S-PS-01	Pumpkinseed	9/17	South	Net/Trap	16.7	113	1-ziplock whole Body (WB)
002	S-PS-02					18.6	152	WB
003	S-PS-03					18.3	136	
004	S-PS-04					17.1	115	
005	S-PS-05		9/17			18.0	147	
006	S-PS-06					17.9	186	
007	S-PS-07					16.2	90	
008						15.3	72	
009	S-PS-08		9/			20.0	190	Fillet (F)
010	S-PS-09					17.6	142	WB
011	S-PS-10					17.8	138	WB
012	S-PS-11		9/18			18.0	117	
013	S-PS-12					20.0	179	
014	N-PS-01		9/17	North		17.5	136	WB

008 009 010 011 012 013

Email 9/20/12

NOTES

- All samples should be reported as "DF", then the identified sample # (i.e. DF-S-PS-01)
- S = FS1 // WB = whole Body Analysis
- N = FS2 // F = Analyze Fillet only

Rel: FedEx 9/20/12 1010 Rec: E Nelling PaceGB 9/20/12 1010 Temp: 4°C

Page 1 of 4

4067361

Appendix A. Sample Collection Record

BIOTA COLLECTION RECORD

Project name, location and waterbody: DZUS FASTENERS, WEST ISLIP, NY LAKE CAPRI

Collections made by (names): J. Rolling, M. Smith

Preservation method: ☐ Freezing; ☐ Other (specify) ICE

	Lab Use only Lab Number	Sample or Tag number	Species	Date Taken	Sampling Location	Method of Collection	Length (mm)	Weight (grams)	Remarks
014	015	S-BG-01	Bluegill	9/18	South	Net/Trap	20.3	196	F 1-ziplock
015	016	S-BG-02					17.6	126	WB
016	017	S-BG-03					21.5	199	F
017	018	S-BG-04					19.1	140	WB
018	019	S-BG-05		9/17			21.4	209	F
019	020	S-BG-06					17.9	108	WB
		S-BG-07					23.0	245	F
		S-BG-08					20.0	158	WB
		S-BG-09					20.6	191	F
		S-BG-10					22.0	236	F
		S-BG-11				Bait Line	21.2	214	F
		S-BG-12				Net Trap	19.0	132	W
		S-BG-13		9/18			19.4	142	W
		S-BG-14					21.8	236	F

Page 2 of 4

NOTES - SEE Pg 1

Rel: FedEx 9/20/12 1010

Rec: E Metting PaceGB 9/20/12 1010

Temp: 4°C

Pace Analytical Services, Inc.
1241 Bellevue Street, Suite 9
Green Bay, WI 54302

Pace Analytical

Sample Condition Upon Receipt

Client Name: AECOM Project # 4067361

Courier: ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other

Tracking #: 8007 1286 0322

Custody Seal on Cooler/Box Present: ☑ yes ☐ no Seals intact: ☑ yes ☐ no

Custody Seal on Samples Present: ☐ yes ☑ no Seals intact: ☐ yes ☐ no

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☑ None Other

Thermometer Used SR49 Type of Ice: (Wet) Blue Dry None ☑ Samples on ice, cooling process has begun.

Cooler Temperature 4°C Biological Tissue is Frozen: ☐ yes ☑ no

Temp Blank Present: ☐ yes ☑ no

Optional
Proj. Due Date:
Proj. Name:

Person examining contents:
Date: 9/20/12
Initials: EMH

Temp should be above freezing to 6°C for all sample except Biota.
Biota Samples should be received ≤ 0°C.

		Comments:
Chain of Custody Present:	☑Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☐Yes ☑No ☐N/A	2. No invoice, phone #, state, times EMH 9/20/12
Chain of Custody Relinquished:	☐Yes ☑No ☐N/A	3. Not present EMH 9/20/12
Sampler Name & Signature on COC:	EMH 9/20/12 (☑Yes) ☑No ☐N/A	4. No sig
Samples Arrived within Hold Time:	☑Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes ☑No ☐N/A	6.
Rush Turn Around Time Requested:	☐Yes ☑No ☐N/A	7.
Sufficient Volume:	☑Yes ☐No ☐N/A	8.
Correct Containers Used:	☑Yes ☐No ☐N/A	9.
-Pace Containers Used:	☐Yes ☑No ☐N/A	
Containers Intact:	☑Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☑N/A	11.
Sample Labels match COC: -Includes date/time/ID/Analysis Matrix: B	☑Yes ☐No ☐N/A	12.
All containers needing preservation have been checked.	☐Yes ☐No ☑N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☐Yes ☐No ☑N/A	Initial when completed / Lot # of added preservative
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	☐Yes ☐No	
Samples checked for dechlorination:	☐Yes ☐No ☑N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☑N/A	15.
Trip Blank Present:	☐Yes ☐No ☑N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☑N/A	
Pace Trip Blank Lot # (if purchased):		

Field Data Required? Y / N

Client Notification/ Resolution:
Person Contacted: Date/Time:
Comments/ Resolution:

Project Manager Review: CH For TN Date: 9/20/12

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

F-GB-C-031-Rev.00 (29Sept2011) SCUR Form

Metals Sample Data Cover Sheet

Client: AECOM, INC. - NY
Project: DZUS FASTENERS LAKE CAPRI FISH
SDG: 4067361

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067361

Matrix: Tissue
% Moisture:
Acode: 6020 MET ICPMS
Prep/Method: EPA 3050B / EPA 6020
Results reported on a "wet-weight" basis

Sample: DF-S-PS-01 NY
Lab ID: 4067361001
Collected: 09/16/12 00:00
Received: 09/20/12 10:10

CAS No.	Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Qual
7440-43-9	Cadmium	**0.26**	mg/kg	0.099	0.010	1	10/05/12 08:25	10/08/12 19:56	

Date: 10/11/2012 01:45 PM

REPORT OF LABORATORY ANALYSIS

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Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067361

Matrix: Tissue
% Moisture:
Acode: 6020 MET ICPMS
Prep/Method: EPA 3050B / EPA 6020

Sample: DF-S-PS-02 NY
Lab ID: 4067361002
Collected: 09/16/12 00:00
Received: 09/20/12 10:10

Results reported on a "wet-weight" basis

CAS No.	Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Qual
7440-43-9	Cadmium	**0.27**	mg/kg	0.097	0.010	1	10/05/12 08:25	10/08/12 20:18	

Date: 10/11/2012 01:45 PM

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067361

Matrix: Tissue
% Moisture:
Acode: 6020 MET ICPMS
Prep/Method: EPA 3050B / EPA 6020
Results reported on a "wet-weight" basis

Sample: DF-S-PS-03 NY
Lab ID: 4067361003
Collected: 09/16/12 00:00
Received: 09/20/12 10:10

CAS No.	Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Qual
7440-43-9	Cadmium	**0.48**	mg/kg	0.099	0.010	1	10/05/12 08:25	10/08/12 20:40	

Date: 10/11/2012 01:45 PM

REPORT OF LABORATORY ANALYSIS

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(920)469-2436

ANALYTICAL RESULTS

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067361

Matrix: Tissue
% Moisture:
Acode: 6020 MET ICPMS
Prep/Method: EPA 3050B / EPA 6020

Sample: DF-S-PS-04 NY
Lab ID: 4067361004
Collected: 09/16/12 00:00
Received: 09/20/12 10:10

Results reported on a "wet-weight" basis

CAS No.	Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Qual
7440-43-9	Cadmium	**0.24**	mg/kg	0.098	0.010	1	10/05/12 08:25	10/08/12 20:46	

Date: 10/11/2012 01:45 PM

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067361

Matrix: Tissue
% Moisture:
Acode: 6020 MET ICPMS
Prep/Method: EPA 3050B / EPA 6020
Results reported on a "wet-weight" basis

Sample: DF-S-PS-05 NY
Lab ID: 4067361005
Collected: 09/17/12 00:00
Received: 09/20/12 10:10

CAS No.	Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Qual
7440-43-9	Cadmium	**0.35**	mg/kg	0.095	0.010	1	10/05/12 08:25	10/08/12 20:51	

Date: 10/11/2012 01:45 PM

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ANALYTICAL RESULTS

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067361

Matrix: Tissue
% Moisture:
Acode: 6020 MET ICPMS
Prep/Method: EPA 3050B / EPA 6020

Sample: DF-S-PS-06 NY
Lab ID: 4067361006
Collected: 09/17/12 00:00
Received: 09/20/12 10:10

Results reported on a "wet-weight" basis

CAS No.	Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Qual
7440-43-9	Cadmium	**0.28**	mg/kg	0.096	0.010	1	10/05/12 08:25	10/08/12 20:57	

Date: 10/11/2012 01:45 PM

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ANALYTICAL RESULTS

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067361

Matrix: Tissue
% Moisture:
Acode: 6020 MET ICPMS
Prep/Method: EPA 3050B / EPA 6020
Results reported on a "wet-weight" basis

Sample: DF-S-PS-07 NY
Lab ID: 4067361007
Collected: 09/17/12 00:00
Received: 09/20/12 10:10

CAS No.	Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Qual
7440-43-9	Cadmium	**0.22**	mg/kg	0.093	0.0097	1	10/05/12 08:25	10/08/12 21:02	

Date: 10/11/2012 01:45 PM

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ANALYTICAL RESULTS

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067361

Matrix: Tissue
% Moisture:
Acode: 6020 MET ICPMS
Prep/Method: EPA 3050B / EPA 6020

Sample: DF-S-PS-08 NY
Lab ID: 4067361008
Collected: 09/17/12 00:00
Received: 09/20/12 10:10

Results reported on a "wet-weight" basis

CAS No.	Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Qual
7440-43-9	Cadmium	**0.041J**	mg/kg	0.098	0.010	1	10/05/12 08:25	10/08/12 21:08	

Date: 10/11/2012 01:45 PM

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ANALYTICAL RESULTS

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067361

Matrix: Tissue
% Moisture:
Acode: 6020 MET ICPMS
Prep/Method: EPA 3050B / EPA 6020
Results reported on a "wet-weight" basis

Sample: DF-S-PS-09 NY
Lab ID: 4067361009
Collected: 09/17/12 00:00
Received: 09/20/12 10:10

CAS No.	Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Qual
7440-43-9	Cadmium	**0.26**	mg/kg	0.10	0.010	1	10/05/12 08:25	10/08/12 21:13	

Date: 10/11/2012 01:45 PM

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ANALYTICAL RESULTS

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067361

Matrix: Tissue
% Moisture:
Acode: 6020 MET ICPMS
Prep/Method: EPA 3050B / EPA 6020
Results reported on a "wet-weight" basis

Sample: DF-S-PS-10 NY
Lab ID: 4067361010
Collected: 09/17/12 00:00
Received: 09/20/12 10:10

CAS No.	Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Qual
7440-43-9	Cadmium	**0.17**	mg/kg	0.094	0.0098	1	10/05/12 08:25	10/08/12 21:19	

Date: 10/11/2012 01:45 PM

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ANALYTICAL RESULTS

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067361

Matrix: Tissue
% Moisture:
Acode: 6020 MET ICPMS
Prep/Method: EPA 3050B / EPA 6020
Results reported on a "wet-weight" basis

Sample: DF-S-PS-11 NY
Lab ID: 4067361011
Collected: 09/18/12 00:00
Received: 09/20/12 10:10

CAS No.	Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Qual
7440-43-9	Cadmium	**0.31**	mg/kg	0.087	0.0091	1	10/05/12 08:25	10/08/12 21:25	

Date: 10/11/2012 01:45 PM

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ANALYTICAL RESULTS

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067361

Matrix: Tissue
% Moisture:
Acode: 6020 MET ICPMS
Prep/Method: EPA 3050B / EPA 6020
Results reported on a "wet-weight" basis

Sample: DF-S-PS-12 NY
Lab ID: 4067361012
Collected: 09/18/12 00:00
Received: 09/20/12 10:10

CAS No.	Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Qual
7440-43-9	Cadmium	**0.55**	mg/kg	0.092	0.0096	1	10/05/12 08:25	10/08/12 21:30	

Date: 10/11/2012 01:45 PM

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ANALYTICAL RESULTS

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067361

Matrix: Tissue
% Moisture:
Acode: 6020 MET ICPMS
Prep/Method: EPA 3050B / EPA 6020
Results reported on a "wet-weight" basis

Sample: DF-N-PS-01 NY
Lab ID: 4067361013
Collected: 09/17/12 00:00
Received: 09/20/12 10:10

CAS No.	Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Qual
7440-43-9	Cadmium	**0.19**	mg/kg	0.094	0.0099	1	10/05/12 08:25	10/08/12 21:47	

Date: 10/11/2012 01:45 PM

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ANALYTICAL RESULTS

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067361

Matrix: Tissue
% Moisture:
Acode: 6020 MET ICPMS
Prep/Method: EPA 3050B / EPA 6020
Results reported on a "wet-weight" basis

Sample: DF-S-BG-01 NY
Lab ID: 4067361014
Collected: 09/16/12 00:00
Received: 09/20/12 10:10

CAS No.	Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Qual
7440-43-9	Cadmium	**0.011J**	mg/kg	0.086	0.0091	1	10/05/12 08:25	10/08/12 21:52	

Date: 10/11/2012 01:45 PM

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ANALYTICAL RESULTS

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067361

Matrix: Tissue
% Moisture:
Acode: 6020 MET ICPMS
Prep/Method: EPA 3050B / EPA 6020
Results reported on a "wet-weight" basis

Sample: DF-S-BG-02 NY
Lab ID: 4067361015
Collected: 09/16/12 00:00
Received: 09/20/12 10:10

CAS No.	Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Qual
7440-43-9	Cadmium	**0.32**	mg/kg	0.098	0.010	1	10/05/12 08:25	10/08/12 21:58	

Date: 10/11/2012 01:45 PM

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ANALYTICAL RESULTS

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067361

Matrix: Tissue
% Moisture:
Acode: 6020 MET ICPMS
Prep/Method: EPA 3050B / EPA 6020
Results reported on a "wet-weight" basis

Sample: DF-S-BG-03 NY
Lab ID: 4067361016
Collected: 09/16/12 00:00
Received: 09/20/12 10:10

CAS No.	Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Qual
7440-43-9	Cadmium	**0.027J**	mg/kg	0.091	0.0096	1	10/05/12 08:25	10/08/12 22:04	

Date: 10/11/2012 01:45 PM

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ANALYTICAL RESULTS

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067361

Matrix: Tissue
% Moisture:
Acode: 6020 MET ICPMS
Prep/Method: EPA 3050B / EPA 6020
Results reported on a "wet-weight" basis

Sample: DF-S-BG-04 NY
Lab ID: 4067361017
Collected: 09/16/12 00:00
Received: 09/20/12 10:10

CAS No.	Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Qual
7440-43-9	Cadmium	**0.24**	mg/kg	0.097	0.010	1	10/05/12 08:25	10/08/12 22:09	

Date: 10/11/2012 01:45 PM

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ANALYTICAL RESULTS

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067361

Matrix: Tissue
% Moisture:
Acode: 6020 MET ICPMS
Prep/Method: EPA 3050B / EPA 6020

Sample: DF-S-BG-05 NY
Lab ID: 4067361018
Collected: 09/17/12 00:00
Received: 09/20/12 10:10

Results reported on a "wet-weight" basis

CAS No.	Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Qual
7440-43-9	Cadmium	**0.19**	mg/kg	0.094	0.0098	1	10/05/12 08:25	10/08/12 22:15	

Date: 10/11/2012 01:45 PM

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ANALYTICAL RESULTS

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067361

Matrix: Tissue
% Moisture:
Acode: 6020 MET ICPMS
Prep/Method: EPA 3050B / EPA 6020
Results reported on a "wet-weight" basis

Sample: DF-S-BG-06 NY
Lab ID: 4067361019
Collected: 09/17/12 00:00
Received: 09/20/12 10:10

CAS No.	Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Qual
7440-43-9	Cadmium	**0.17**	mg/kg	0.095	0.010	1	10/05/12 08:25	10/08/12 22:20	

Date: 10/11/2012 01:45 PM

REPORT OF LABORATORY ANALYSIS

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Metals QC Summary Cover Sheet

Client: AECOM, INC. - NY
Project: DZUS FASTENERS LAKE CAPRI FISH
SDG: 4067361

Pace Analytical Services

Metals Data Reporting Form

Initial Calibration Verification Standard **SDG:** 4067361

Instrument: 40ICM2 **Units:** ug/L

Chart Number 1008212A.csv **Acceptable Range:** 90% - 110%

Standard Source: Metals Secondary **Standard ID** 39693

Element	WL/ Mass	True Conc	ICV 10/8/2012 6:49 PM									
			Found	% Rec	Found	% Rec	Found	% Rec	Found	% Rec	Found	% Rec
Cadmium	111	110.0	111.20	**101.1**								

Pace Analytical Services

Metals Data Reporting Form

Continuing Calibration Verification **SDG:** 4067361

Instrument: 40ICM2 **Units:** ug/L

Chart Number: 1008212A.csv **Acceptable Range** 90% - 110%

Standard Source Metals Primary **Standard ID:** 40002

Element	WL/ Mass	True Conc	CCV1 10/8/2012 7:23 PM		CCV2 10/8/2012 8:29 PM		CCV3 10/8/2012 9:36 PM		CCV4 10/8/2012 10:42 PM			
			Found	% Rec	Found	% Rec	Found	% Rec	Found	% Rec	Found	% Rec
Cadmium	111	100.0	101.20	**101.2**	103.50	**103.5**	103.50	**103.5**	104.10	**104.1**		

Pace Analytical Services

Metals Data Reporting Form

Initial Calibration Blank Results **SDG:** 4067361

Instrument: 40ICM2 **Units:** ug/L

Chart Number: 1008212A.csv

Standard Source Calibration Blank **Standard ID:** 39996

Element	WL/ Mass	Report Limit	ICB 10/8/2012 6:55 PM Found	Q	Found	Q	Found	Q	Found	Q	Found	Q
Cadmium	111	1	**0.20**	**B**								

7.1

U Result is less than the IDL
B Result is between IDL and RL
S Detector saturated

Form 3 Equivalent

Pace Analytical Services

Metals Data Reporting Form

Continuing Calibration Blank Result **SDG:** 4067361

Instrument: 40ICM2 **Units:** ug/L

Chart Number: 1008212A.csv

Standard Source Calibration Blank **Standard ID:** 39996

Element	WL/ Mass	Report Limit	CCB1 10/8/2012 7:28 PM		CCB2 10/8/2012 8:35 PM		CCB3 10/8/2012 9:41 PM		CCB4 10/8/2012 10:48 PM			
			Found	Q	Found	Q	Found	Q	Found	Q	Found	Q
Cadmium	111	1	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U		

U Result is less than the IDL
B Result is between IDL and RL
S Detector saturated

Form 3 Equivalent

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METHOD BLANK RESULTS

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067361

QB Batch: MPRP/7572 **Prepared:** 10/05/12
Method(s): EPA 3050B / EPA 6020
Associated Lab Samples: 4067361001, 4067361002, 4067361003, 4067361004, 4067361005, 4067361006, 4067361007, 4067361008, 4067361009, 4067361010, 4067361011, 4067361012, 4067361013, 4067361014, 4067361015, 4067361016, 4067361017, 4067361018, 4067361019

CAS No.	Parameters	Results	Units	Reporting Limit	MDL	Analyzed	Qual
7440-43-9	Cadmium	<0.010	mg/kg	0.10	0.010	10/08/12	

Type	Sample	Matrix
BLANK	686242	Tissue

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Metals Data Reporting Form

Preparation Blank Results **SDG:** 4067361

Lab Sample ID: 686246 ①

Matrix: TISSUE **Units:** mg/kg **Prep Date:** 10/5/2012 **Prep Batch:** 3358

Weight: 0.5 **Volume:** 50 **Percent Moisture:** NA

Element	WL/ Mass	MDL	Report Limit	Conc	Q	DF	Instr	Anal Date	Anal Time
Cadmium	111	0.010	0.10	0.010	U	1	40ICM2	10/8/2012	19:39

① Chicken Blank
LAB 10/11/12

Comments:

U Result is less than the IDL
B Result is between IDL and RL

Pace Analytical Services

Metals Data Reporting Form

Interference Check Standard A **SDG:** 4067361

Instrument: 40ICM2 **Units:** ug/L

Chart Number: 1008212A.csv **Acceptable Range** 80% - 120%

Standard Source In House **Standard ID:** 39698

Element	WL/ Mass	Reporting Limit	True Conc	ICSA1 10/8/2012 7:11 PM Found	Found	Found	Found	Found
Aluminum	27		50000	50860				
Antimony	121	2		0				
Arsenic	75	2		0				
Barium	137	2		1				
Beryllium	9	2		0				
Boron	10	40		2				
Cadmium	111	2		0				
Calcium	43		50000	52910				
Chromium	52	2		1				
Cobalt	59	2		1				
Copper	63	2		1				
Iron	54		50000	50770				
Lead	208	2		0				
Lithium	7	2		0				
Magnesium	25		50000	49760				
Manganese	55	2		0				
Mercury	201	0.4		0				
Molybdenum	95		1000	1047				
Nickel	60	2		1				
Potassium	39		50000	53500				
Selenium	78	2		0				
Silver	107	1		0				
Sodium	23		50000	48970				
Strontium	88	2		0				
Thallium	205	2		0				
Tin	118	20		0				
Titanium	47		1000	1018				
Uranium	238	2		0				
Vanadium	51	2		0				
Zinc	66	20		2				

7.1

U Result is less than the IDL
B Result is between IDL and RL
S Detector saturated

Form 4 Equivalent

Pace Analytical Services

Metals Data Reporting Form

Interference Check Standard AB **SDG:** 4067361

Instrument: 40ICM2 **Units:** ug/L

Chart Number: 1008212A.csv **Acceptable Range** 80% - 120%

Standard Source In House **Standard ID:** 39699

Element	WL/ Mass	True Conc	ICSAB1 10/8/2012 7:17 PM Found	% Rec	Found	% Rec	Found	% Rec	Found	% Rec	Found	% Rec
Aluminum	27	50000	50260.0	**100.5**								
Antimony	121	100	102.6	**102.6**								
Arsenic	75	100	102.8	**102.8**								
Barium	137	100	102.6	**102.6**								
Beryllium	9	100	97.2	**97.2**								
Boron	10	100	98.1	**98.1**								
Cadmium	111	100	101.7	**101.7**								
Calcium	43	50000	52660.0	**105.3**								
Chromium	52	100	100.5	**100.5**								
Cobalt	59	100	97.8	**97.8**								
Copper	63	100	96.3	**96.3**								
Iron	54	50000	50240.0	**100.5**								
Lead	208	100	101.4	**101.4**								
Lithium	7	100	99.4	**99.4**								
Magnesium	25	50000	49110.0	**98.2**								
Manganese	55	100	99.7	**99.7**								
Mercury	201	5	5.3	**105.9**								
Molybdenum	95	1100	1152.0	**104.7**								
Nickel	60	100	97.7	**97.7**								
Potassium	39	50000	53140.0	**106.3**								
Selenium	78	100	101.4	**101.4**								
Silver	107	50	47.8	**95.7**								
Sodium	23	50000	48620.0	**97.2**								
Strontium	88	100	104.4	**104.4**								
Thallium	205	100	103.1	**103.1**								
Tin	118	100	100.5	**100.5**								
Titanium	47	1100	1105.0	**100.5**								
Uranium	238	100	104.8	**104.8**								
Vanadium	51	100	100.6	**100.6**								
Zinc	66	100	105.1	**105.1**								

7.1

U Result is less than the IDL
B Result is between IDL and RL
R Spike recovery failed
NC Percent recovery was not calculated
S Detector saturated

Form 4 Equivalent

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MATRIX SPIKE SAMPLE RESULTS

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067361

QB Batch: MPRP/7572
Method(s): EPA 3050B / EPA 6020

MS Prepared: 10/05/12
MSD Prepared: 10/05/12

Analyte	Units	Sample Conc	Spike Conc MS	Spike Conc MSD	Result MS	Result MSD	Dilution MS	Dilution MSD	% Recovery MS	% Recovery MSD	QC Limits %Recovery	RPD	Max RPD	Analyzed Date MS	Analyzed Date MSD	Qualifier(s) MS	Qualifier(s) MSD
Cadmium	mg/kg	0.26	20	19.9	20.8	20.9	1	1	103	104	75-125	1	20	10/08/12	10/08/12		

Type	Sample	Client Sample ID
MS	686248	DF-S-PS-01
MSD	686249	DF-S-PS-01

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Metals Data Reporting Form

Post Digest Spike Sample Result **SDG:** 4067361

Spike Sample ID: 688831

Original Sample ID: 4067361001 **Client ID:** PDS for HBN 111829 [ICPM/3358]

Matrix: TISSUE **Units:** ug/L **Prep Date:** 10/8/2012 **Prep Batch:** 3358

Weight: 10 **Volume:** 10 **Percent Moisture:** NA **Instrument:** 401CM2

Element	WL/ Mass	Parent			Post Spike			Spike Level	% Rec	Parent Analytical Date/Time	Post Spike Analytical Date/Time
		Dil	Conc	Q	Dil	Conc	Q				
Cadmium	111	1	2.7		1	204		200	100.8	10/8/2012 19:56	10/8/2012 20:12

Comments:

7.1

U Result is less than the IDL
B Result is between IDL and RL
R Spike recovery failed
NC Percent recovery was not calculated

Form 5B Equivalent

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LAB CONTROL SAMPLE RESULTS

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067361

QB Batch: MPRP/7572 **LCS Prepared:** 10/05/12
Method(s): EPA 3050B / EPA 6020 **LCSD Prepared:**

Analyte	LCS % Rec	LCSD % Rec	RPD	QC Limits % Rec	QC Limits RPD	Spike Conc	LCS Conc	LCSD Conc	Units	LCS Analyzed	LCSD Analyzed	LCS Qual	LCSD Qual
Cadmium	103			80-120		20	20.6		mg/kg	10/08/12			

Type	Sample
LCS	686243

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services

Metals Data Reporting Form

Laboratory Control Sample Results **SDG:** 4067361

Lab Sample ID: 686247 (1)

Matrix: TISSUE **Units:** mg/kg **Prep Date:** 10/5/2012 **Prep Batch:** 3358

Weight: 0.5 **Volume:** 50 **Percent Moisture:** NA

Element	WL/ Mass	Spike Level	Conc	Percent Recovery	Q	Range	DF	Instr	Anal Date	Anal Time
Cadmium	111	26.7	27.5	103.0		80-120	1	40ICM2	10/8/2012	19:50

(1) SRM TORT-2
#34855
LAB 10/11/12

Comments:

7.1

U Result is less than the IDL
B Result is between IDL and RL

Form 7 Equivalent

Pace Analytical Services

Metals Data Reporting Form

Serial Dilution Report **SDG:** 4067361

Serial Dilution Sample ID: 688832

Original Sample ID: 4067361002 **Client ID:** SD for HBN 111829 [ICPM/3358]

Matrix: TISSUE **Units:** ug/L **Prep Date:** 10/8/2012 **Prep Batch:** 3358

Element	WL/ Mass	Parent			Serial Dilution			Percent Diff	
		Dil	Conc	Q	Dil	Conc	Q		
Cadmium	111	1	2.8		5	2.8	B	2.6	

Comments:

7.1

U Result is less than the IDL
B Result is between IDL and RL
E Serial dilution percent difference not within limits

Form 9 Equivalent

Pace Analytical Services

Metals Data Reporting Form

Preparation Log **SDG:** 4067361

Preparation Batch: 3358 **Instrument:** 40ICM2 **Matrix:** TISSUE

Sample ID	Sample Type	Prep Date	Prep Method	Initial Weight (g)	Final Volume (ml)	% Moisture
4067361001	Sample	10/5/2012 8:25:00 AM	EPA 3050B	0.504	50	NA
4067361002	Sample	10/5/2012 8:25:00 AM	EPA 3050B	0.515	50	NA
4067361003	Sample	10/5/2012 8:25:00 AM	EPA 3050B	0.503	50	NA
4067361004	Sample	10/5/2012 8:25:00 AM	EPA 3050B	0.509	50	NA
4067361005	Sample	10/5/2012 8:25:00 AM	EPA 3050B	0.525	50	NA
4067361006	Sample	10/5/2012 8:25:00 AM	EPA 3050B	0.523	50	NA
4067361007	Sample	10/5/2012 8:25:00 AM	EPA 3050B	0.54	50	NA
4067361008	Sample	10/5/2012 8:25:00 AM	EPA 3050B	0.511	50	NA
4067361009	Sample	10/5/2012 8:25:00 AM	EPA 3050B	0.502	50	NA
4067361010	Sample	10/5/2012 8:25:00 AM	EPA 3050B	0.533	50	NA
4067361011	Sample	10/5/2012 8:25:00 AM	EPA 3050B	0.574	50	NA
4067361012	Sample	10/5/2012 8:25:00 AM	EPA 3050B	0.545	50	NA
4067361013	Sample	10/5/2012 8:25:00 AM	EPA 3050B	0.53	50	NA
4067361014	Sample	10/5/2012 8:25:00 AM	EPA 3050B	0.579	50	NA
4067361015	Sample	10/5/2012 8:25:00 AM	EPA 3050B	0.509	50	NA
4067361016	Sample	10/5/2012 8:25:00 AM	EPA 3050B	0.549	50	NA
4067361017	Sample	10/5/2012 8:25:00 AM	EPA 3050B	0.516	50	NA
4067361018	Sample	10/5/2012 8:25:00 AM	EPA 3050B	0.533	50	NA
4067361019	Sample	10/5/2012 8:25:00 AM	EPA 3050B	0.526	50	NA
686242	Preparation Blank	10/5/2012 8:25:00 AM	EPA 3050B	0.5	50	NA
686243	LCS	10/5/2012 8:25:00 AM	EPA 3050B	0.5	50	NA
686246	Sample	10/5/2012 8:25:00 AM	EPA 3050B	0.5	50	NA
686247	Sample	10/5/2012 8:25:00 AM	EPA 3050B	0.5	50	NA
686248	Matrix Spike	10/5/2012 8:25:00 AM	EPA 3050B	0.501	50	NA
686249	Matrix Spike Duplicate	10/5/2012 8:25:00 AM	EPA 3050B	0.503	50	NA

Pace Analytical Services

Metals Data Reporting Form

Instrument Runlo **SDG:** 4067361

Instrument: 40ICM2 **Chart Number:** 1008212A.csv

Lab Sample Name	Client Sample Name	Analytical Method	Date of Analysi	Time of Analysi
CAL0 39996	CAL0 39996		10/8/2012	18:16
CAL1 39997	CAL1 39997		10/8/2012	18:21
CAL2 39998	CAL2 39998		10/8/2012	18:27
CAL3 39999	CAL3 39999		10/8/2012	18:33
CAL4 40000	CAL4 40000		10/8/2012	18:38
CAL5 40001	CAL5 40001		10/8/2012	18:44
ICV 39693	ICV 39693		10/8/2012	18:49
ICB 39996	ICB 39996		10/8/2012	18:55
39997	39997		10/8/2012	19:00
ZZZZZZ			10/8/2012	19:06
ICSA1 39698	ICSA1 39698		10/8/2012	19:11
ICSAB1 39699	ICSAB1 39699		10/8/2012	19:17
CCV1 40002	CCV1 40002		10/8/2012	19:23
CCB1 39996	CCB1 39996		10/8/2012	19:28
686242	BLANK for HBN 111530 [	EPA 6020	10/8/2012	19:34
686246	SBLK for HBN 111530 [M	EPA 6020	10/8/2012	19:39
686243	LCS for HBN 111530 [MP	EPA 6020	10/8/2012	19:45
686247	SRM for HBN 111530 [M	EPA 6020	10/8/2012	19:50
4067361001	DF-S-PS-01	EPA 6020	10/8/2012	19:56
686248	DF-S-PS-01(676863MS)	EPA 6020	10/8/2012	20:01
686249	DF-S-PS-01(676863MSD)	EPA 6020	10/8/2012	20:07
688831	PDS for HBN 111829 [ICP	EPA 6020	10/8/2012	20:12
4067361002	DF-S-PS-02	EPA 6020	10/8/2012	20:18
688832	SD for HBN 111829 [ICP	EPA 6020	10/8/2012	20:24
CCV2 40002	CCV2 40002		10/8/2012	20:29
CCB2 39996	CCB2 39996		10/8/2012	20:35
4067361003	DF-S-PS-03	EPA 6020	10/8/2012	20:40
4067361004	DF-S-PS-04	EPA 6020	10/8/2012	20:46
4067361005	DF-S-PS-05	EPA 6020	10/8/2012	20:51
4067361006	DF-S-PS-06	EPA 6020	10/8/2012	20:57
4067361007	DF-S-PS-07	EPA 6020	10/8/2012	21:02
4067361008	DF-S-PS-08	EPA 6020	10/8/2012	21:08
4067361009	DF-S-PS-09	EPA 6020	10/8/2012	21:13
4067361010	DF-S-PS-10	EPA 6020	10/8/2012	21:19
4067361011	DF-S-PS-11	EPA 6020	10/8/2012	21:25
4067361012	DF-S-PS-12	EPA 6020	10/8/2012	21:30
CCV3 40002	CCV3 40002		10/8/2012	21:36
CCB3 39996	CCB3 39996		10/8/2012	21:41
4067361013	DF-N-PS-01	EPA 6020	10/8/2012	21:47

Pace Analytical Services

Metals Data Reporting Form

Instrument Runlo **SDG:** 4067361

Instrument: 40ICM2 **Chart Number:** 1008212A.csv

Lab Sample Name	Client Sample Name	Analytical Method	Date of Analysi	Time of Analysi
4067361014	DF-S-BG-01	EPA 6020	10/8/2012	21:52
4067361015	DF-S-BG-02	EPA 6020	10/8/2012	21:58
4067361016	DF-S-BG-03	EPA 6020	10/8/2012	22:04
4067361017	DF-S-BG-04	EPA 6020	10/8/2012	22:09
4067361018	DF-S-BG-05	EPA 6020	10/8/2012	22:15
4067361019	DF-S-BG-06	EPA 6020	10/8/2012	22:20
ZZZZZZ			10/8/2012	22:26
ZZZZZZ			10/8/2012	22:31
ZZZZZZ			10/8/2012	22:37
CCV4 40002	CCV4 40002		10/8/2012	22:42
CCB4 39996	CCB4 39996		10/8/2012	22:48

Pace Analytical Services

Metals Data Reporting Form

Instrument Runlo

Instrument: 40ICM2 **Chart Number:** 1008212A.csv

Start Date: 10/8/2012 **End Date:** 10/8/2012

Lab Sample ID	DF	Time of Analysi	Analytes																																
			Cd																																
CAL0 39996	1	6:16 PM	X																																
CAL1 39997	1	6:21 PM	X																																
CAL2 39998	1	6:27 PM	X																																
CAL3 39999	1	6:33 PM	X																																
CAL4 40000	1	6:38 PM	X																																
CAL5 40001	1	6:44 PM	X																																
ICV 39693	1	6:49 PM	X																																
ICB 39996	1	6:55 PM	X																																
39997	1	7:00 PM	X																																
ICSA1 39698	1	7:11 PM	X																																
ICSAB1 39699	1	7:17 PM	X																																
CCV1 40002	1	7:23 PM	X																																
CCB1 39996	1	7:28 PM	X																																
686242	1	7:34 PM	X																																
686246	1	7:39 PM	X																																
686243	1	7:45 PM	X																																
686247	1	7:50 PM	X																																
4067361001	1	7:56 PM	X																																
686248	1	8:01 PM	X																																
686249	1	8:07 PM	X																																
688831	1	8:12 PM	X																																
4067361002	1	8:18 PM	X																																
688832	5	8:24 PM	X																																
CCV2 40002	1	8:29 PM	X																																
CCB2 39996	1	8:35 PM	X																																
4067361003	1	8:40 PM	X																																
4067361004	1	8:46 PM	X																																
4067361005	1	8:51 PM	X																																
4067361006	1	8:57 PM	X																																
4067361007	1	9:02 PM	X																																
4067361008	1	9:08 PM	X																																

Form 14 Equivalent

Pace Analytical Services

Metals Data Reporting Form

Instrument Runlo

Instrument: 40ICM2 **Chart Number:** 1008212A.csv

Start Date: 10/8/2012 **End Date:** 10/8/2012

Lab Sample ID	DF	Time of Analysi	Analytes																																
			Cd																																
4067361009	1	9:13 PM	X																																
4067361010	1	9:19 PM	X																																
4067361011	1	9:25 PM	X																																
4067361012	1	9:30 PM	X																																
CCV3 40002	1	9:36 PM	X																																
CCB3 39996	1	9:41 PM	X																																
4067361013	1	9:47 PM	X																																
4067361014	1	9:52 PM	X																																
4067361015	1	9:58 PM	X																																
4067361016	1	10:04 PM	X																																
4067361017	1	10:09 PM	X																																
4067361018	1	10:15 PM	X																																
4067361019	1	10:20 PM	X																																
CCV4 40002	1	10:42 PM	X																																
CCB4 39996	1	10:48 PM	X																																

Form 14 Equivalent

Pace Analytical Services

INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY

Instrument Runlog **SDG:** 4067361

Instrument: 40ICM2 **Chart Number:** 1008212A.csv

Lab Sample Name	Client Sample Name	Date of Analysi	Time of Analysi	Bi	Q	Ge	Q	In	Q	Sc-CCT	Q	Sc-KED	Q	Tb	Q	Y	Q
CAL0 39996	CAL0 39996	10/8/2012	18:16	100		100		100		100		100		100		100	
CAL1 39997	CAL1 39997	10/8/2012	18:21	99.802		103.068		101.691		101.269		101.306		100.611		100.243	
CAL2 39998	CAL2 39998	10/8/2012	18:27	99.626		104.614		101.536		102.258		101.294		100.36		100.622	
CAL3 39999	CAL3 39999	10/8/2012	18:33	99.131		105.463		101.411		102.456		102.341		100.78		100.262	
CAL4 40000	CAL4 40000	10/8/2012	18:38	97.183		105.033		101.182		102.593		103.212		100.352		99.714	
CAL5 40001	CAL5 40001	10/8/2012	18:44	95.517		107.968		102.069		105.871		106.713		101.381		100.71	
ICV 39693	ICV 39693	10/8/2012	18:49	101.539		106.775		103.242		104.514		104.756		102.618		102.454	
ICB 39996	ICB 39996	10/8/2012	18:55	102.256		106.336		103.428		105.203		105.539		103.032		103.221	
39997	39997	10/8/2012	19:00	100.836		104.024		102.075		102.527		103.016		101.581		101.827	
ICSA1 39698	ICSA1 39698	10/8/2012	19:11	89.199		92.06		90.191		89.218		87.965		91.443		86.63	
ICSAB1 39699	ICSAB1 39699	10/8/2012	19:17	91.678		96.141		93.365		92.255		91.676		94.268		89.23	
CCV1 40002	CCV1 40002	10/8/2012	19:23	104.893		110.27		105.572		106.325		106.799		106.497		104.961	
CCB1 39996	CCB1 39996	10/8/2012	19:28	104.619		103.264		103.887		106.034		104.373		105.204		102.959	
686242	BLANK for HBN 111530	10/8/2012	19:34	105.503		107.981		104.424		104.706		104.114		105.279		103.193	
686246	SBLK for HBN 111530 [	10/8/2012	19:39	102.709		103.057		101.983		103.031		101.069		103.721		101.578	
686243	LCS for HBN 111530 [M	10/8/2012	19:45	96.788		98.918		96.922		100.1		97.384		99.683		96.357	
686247	SRM for HBN 111530 [M	10/8/2012	19:50	95.985		97.876		96.746		98.709		96.618		101.581		102.222	
4067361001	DF-S-PS-01	10/8/2012	19:56	98.076		95.166		97.626		99.932		93.231		101.621		95.406	
686248	DF-S-PS-01(676863MS)	10/8/2012	20:01	97.583		98.56		98.32		99.955		96.402		101.72		95.841	
686249	DF-S-PS-01(676863MS	10/8/2012	20:07	97.871		100.375		99.54		105.342		99.097		103.674		97.525	
688831	PDS for HBN 111829 [IC	10/8/2012	20:12	100.519		102.414		102.076		106.776		102.27		106.368		100.392	
4067361002	DF-S-PS-02	10/8/2012	20:18	101.043		100.168		100.622		107.775		99.33		106.296		99.077	
688832	SD for HBN 111829 [ICP	10/8/2012	20:24	107.811		105.581		103.835		109.052		101.69		108.821		102.168	
CCV2 40002	CCV2 40002	10/8/2012	20:29	108.441		111.276		106.382		115.101		109.425		111.428		105.641	
CCB2 39996	CCB2 39996	10/8/2012	20:35	110.127		106.943		105.172		115.504		106.935		110.56		105.772	
4067361003	DF-S-PS-03	10/8/2012	20:40	102.279		102.298		102.192		111.446		100.585		106.546		100.511	
4067361004	DF-S-PS-04	10/8/2012	20:46	101.443		100.407		100.695		107.942		99.844		106.273		99.448	
4067361005	DF-S-PS-05	10/8/2012	20:51	103.038		100.881		100.891		109.074		99.004		106.804		99.654	
4067361006	DF-S-PS-06	10/8/2012	20:57	103.592		102.24		102.905		110.991		101.239		108.789		101.149	
4067361007	DF-S-PS-07	10/8/2012	21:02	102.995		102.709		102.069		110.981		101.513		107.815		100.931	
4067361008	DF-S-PS-08	10/8/2012	21:08	108.413		107.466		105.421		114.438		104.826		110.966		104.471	
4067361009	DF-S-PS-09	10/8/2012	21:13	101.871		103.225		102.995		112.243		103.072		107.827		101.664	
4067361010	DF-S-PS-10	10/8/2012	21:19	104.164		102.639		102.579		112.322		102.803		108.701		101.221	

Form 15 Equivalent

Pace Analytical Services

INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY

Instrument Runlog **SDG:** 4067361

Instrument: 40ICM2 **Chart Number:** 1008212A.csv

Lab Sample Name	Client Sample Name	Date of Analysi	Time of Analysi	Bi	Q	Ge	Q	In	Q	Sc-CCT	Q	Sc-KED	Q	Tb	Q	Y	Q
4067361011	DF-S-PS-11	10/8/2012	21:25	104.447		104.244		102.893		113.068		102.76		108.53		102.052	
4067361012	DF-S-PS-12	10/8/2012	21:30	100.676		102.312		102.431		111.373		101.566		107.168		101.647	
CCV3 40002	CCV3 40002	10/8/2012	21:36	109.222		117.039		109.7		122.009		114.677		113.452		109.385	
CCB3 39996	CCB3 39996	10/8/2012	21:41	110.301		112.118		108.337		121.973		110.453		112.897		107.894	
4067361013	DF-N-PS-01	10/8/2012	21:47	102.777		103.412		103.038		116.012		102.64		107.893		102.027	
4067361014	DF-S-BG-01	10/8/2012	21:52	108.267		108.601		106.556		118.222		107.897		112.591		106.299	
4067361015	DF-S-BG-02	10/8/2012	21:58	104		105.382		103.604		114.826		103.197		108.35		102.868	
4067361016	DF-S-BG-03	10/8/2012	22:04	110.077		109.522		107.078		119.308		108.696		113.691		107.5	
4067361017	DF-S-BG-04	10/8/2012	22:09	103.862		105.607		103.852		115.059		103.774		108.563		102.004	
4067361018	DF-S-BG-05	10/8/2012	22:15	106.853		106.146		104.879		115.735		104.171		110.862		103.838	
4067361019	DF-S-BG-06	10/8/2012	22:20	103.911		105.356		104.044		116.531		104.983		109.399		102.919	
CCV4 40002	CCV4 40002	10/8/2012	22:42	108.651		114.197		108.106		122.055		112.71		111.872		107.658	
CCB4 39996	CCB4 39996	10/8/2012	22:48	110.817		110.799		107.746		121.956		111.861		113.298		109.172	

Form 15 Equivalent

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067361

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
4067361001	DF-S-PS-01	EPA 3050B	MPRP/7572	EPA 6020	ICPM/3358
4067361002	DF-S-PS-02	EPA 3050B	MPRP/7572	EPA 6020	ICPM/3358
4067361003	DF-S-PS-03	EPA 3050B	MPRP/7572	EPA 6020	ICPM/3358
4067361004	DF-S-PS-04	EPA 3050B	MPRP/7572	EPA 6020	ICPM/3358
4067361005	DF-S-PS-05	EPA 3050B	MPRP/7572	EPA 6020	ICPM/3358
4067361006	DF-S-PS-06	EPA 3050B	MPRP/7572	EPA 6020	ICPM/3358
4067361007	DF-S-PS-07	EPA 3050B	MPRP/7572	EPA 6020	ICPM/3358
4067361008	DF-S-PS-08	EPA 3050B	MPRP/7572	EPA 6020	ICPM/3358
4067361009	DF-S-PS-09	EPA 3050B	MPRP/7572	EPA 6020	ICPM/3358
4067361010	DF-S-PS-10	EPA 3050B	MPRP/7572	EPA 6020	ICPM/3358
4067361011	DF-S-PS-11	EPA 3050B	MPRP/7572	EPA 6020	ICPM/3358
4067361012	DF-S-PS-12	EPA 3050B	MPRP/7572	EPA 6020	ICPM/3358
4067361013	DF-N-PS-01	EPA 3050B	MPRP/7572	EPA 6020	ICPM/3358
4067361014	DF-S-BG-01	EPA 3050B	MPRP/7572	EPA 6020	ICPM/3358
4067361015	DF-S-BG-02	EPA 3050B	MPRP/7572	EPA 6020	ICPM/3358
4067361016	DF-S-BG-03	EPA 3050B	MPRP/7572	EPA 6020	ICPM/3358
4067361017	DF-S-BG-04	EPA 3050B	MPRP/7572	EPA 6020	ICPM/3358
4067361018	DF-S-BG-05	EPA 3050B	MPRP/7572	EPA 6020	ICPM/3358
4067361019	DF-S-BG-06	EPA 3050B	MPRP/7572	EPA 6020	ICPM/3358

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Metals Verification of Instrument Parameters Cover Sheet

Client: AECOM, INC. - NY
Project: DZUS FASTENERS LAKE CAPRI FISH
SDG: 4067361

Pace Analytical Services

Metals Data Reporting Form

Method Detection Limits **SDG:** 4067361

Instrument: 40ICM2 **Units:** ug/L

Element	Wavelength	Reporting Limit	MDL	Date of
Cadmium	111	1.0	0.10	8/18/2011

Pace Analytical Services

Metals Data Reporting Form

Linear Dynamic Range **SDG:** 4067361

Instrument: 40ICM2 **Units:** ppb

Element	Wavelength /Mass	Linear Range	Date of Linear Range
Cadmium	111	10000	12/14/2011

Metals Raw Data Cover Sheet

Client: AECOM, INC. - NY
Project: DZUS FASTENERS LAKE CAPRI FISH
SDG: 4067361

40ICM2 Run Log

Analytical Run: 1008212A.csv Method:

Date	Time	Sample ID	Dil	Notes:	Batch
10/08/12	18:16:22	CAL0 39996	1		3361
10/08/12	18:21:57	CAL1 39997	1		3361
10/08/12	18:27:29	CAL2 39998	1		3361
10/08/12	18:33:02	CAL3 39999	1		3361
10/08/12	18:38:35	CAL4 40000	1		3361
10/08/12	18:44:09	CAL5 40001	1		3361
10/08/12	18:49:43	ICV 39693	1		3361
10/08/12	18:55:17	ICB 39996	1		3361
10/08/12	19:00:51	CRDL 39997	1		3361
10/08/12	19:06:24	CRDL 39998	1		3361
10/08/12	19:11:56	ICSA1 39698	1		3361
10/08/12	19:17:28	ICSAB1 39699	1		3361
10/08/12	19:23:03	CCV1 40002	1		3361
10/08/12	19:28:36	CCB1 39996	1		3361
10/08/12	19:34:08	686242	1		3358
10/08/12	19:39:40	686246	1		3358
10/08/12	19:45:12	686243	1		3358
10/08/12	19:50:43	686247	1		3358
10/08/12	19:56:15	4067361001	1		3358
10/08/12	20:01:48	686248	1		3358
10/08/12	20:07:20	686249	1		3358
10/8/2012	20:12:54	688831	1		3358
10/8/2012	20:18:28	4067361002	1		3358
10/8/2012	20:24:02	688832	5		3358
10/8/2012	20:29:37	CCV2 40002	1		3361
10/8/2012	20:35:10	CCB2 39996	1		3361
10/8/2012	20:40:43	4067361003	1		3358
10/8/2012	20:46:18	4067361004	1		3358
10/8/2012	20:51:51	4067361005	1		3358
10/8/2012	20:57:23	4067361006	1		3358
10/8/2012	21:02:54	4067361007	1		3358
10/8/2012	21:08:27	4067361008	1		3358
10/8/2012	21:13:58	4067361009	1		3358
10/8/2012	21:19:31	4067361010	1		3358
10/8/2012	21:25:04	4067361011	1		3358
10/8/2012	21:30:38	4067361012	1		3358
10/8/2012	21:36:11	CCV3 40002	1		3361
10/8/2012	21:41:44	CCB3 39996	1		3361
10/8/2012	21:47:17	4067361013	1		3358
10/8/2012	21:52:51	4067361014	1		3358
10/8/2012	21:58:25	4067361015	1		3358
10/8/2012	22:04:00	4067361016	1		3358
10/8/2012	22:09:34	4067361017	1		3358
10/8/2012	22:15:06	4067361018	1		3358

40ICM2 Run Log

Analytical Run: 1008212A.csv Method:

Date	Time	Sample ID	Dil	Notes:	Batch
10/8/2012	22:20:39	4067361019	1		3358
10/8/2012	22:26:13	BLANK	1		
10/8/2012	22:31:47	686525	1		3359
10/8/2012	22:37:19	686527	1		3359
10/8/2012	22:42:53	CCV4 40002	1		3361
10/8/2012	22:48:27	CCB4 39996	1		3361
10/8/2012	22:53:59	686526	1		3359
10/8/2012	22:59:32	686528	1		3359
10/8/2012	23:05:05	4067362001	1		3359
10/8/2012	23:10:39	686529	1		3359
10/8/2012	23:16:12	686530	1		3359
10/8/2012	23:21:45	688843	1		3359
10/8/2012	23:27:19	4067362002	1		3359
10/8/2012	23:32:52	688844	5		3359
10/8/2012	23:38:26	4067362003	1		3359
10/8/2012	23:44:00	4067362004	1		3359
10/8/2012	23:49:35	CCV5 40002	1		3361
10/8/2012	23:55:09	CCB5 39996	1		3361
10/9/2012	0:00:41	4067362005	1		3359
10/9/2012	0:06:14	4067362006	1		3359
10/9/2012	0:11:47	4067362007	1		3359
10/9/2012	0:17:20	4067362008	1		3359
10/9/2012	0:22:53	4067362009	1		3359
10/9/2012	0:28:26	4067362010	1		3359
10/9/2012	0:34:00	4067362011	1		3359
10/9/2012	0:39:33	4067362012	1		3359
10/9/2012	0:45:06	4067362013	1		3359
10/9/2012	0:50:40	4067362014	1		3359
10/9/2012	0:56:15	CCV6 40002	1		3361
10/9/2012	1:01:48	CCB6 39996	1		3361
10/9/2012	1:07:21	4067362015	1		3359
10/9/2012	1:12:56	4067362016	1		3359
10/9/2012	1:18:30	4067362017	1		3359
10/9/2012	1:24:04	4067362018	1		3359
10/9/2012	1:29:39	BLANK	1		
10/9/2012	1:35:14	686605	1		3360
10/9/2012	1:40:48	686611	1		3360
10/9/2012	1:46:22	686606	1		3360
10/9/2012	1:51:55	686612	1		3360
10/9/2012	1:57:29	4067620001	1		3360
10/9/2012	2:03:03	CCV7 40002	1		3361
10/9/2012	2:08:37	CCB7 39996	1		3361
10/9/2012	2:14:09	686613	1		3360
10/9/2012	2:19:43	686614	1		3360
10/9/2012	2:25:16	688848	1		3360
10/9/2012	2:30:50	4067620002	1		3360

40ICM2 Run Log

Analytical Run: 1008212A.csv Method:

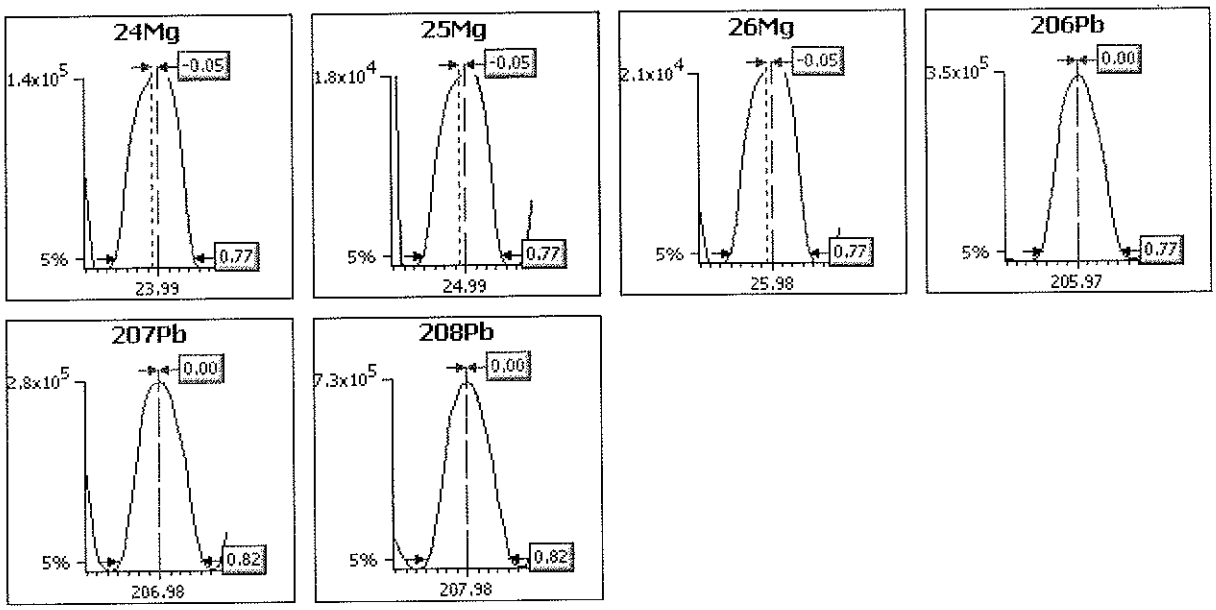
Date	Time	Sample ID	Dil	Notes:	Batch
10/9/2012	2:36:24	688849	5		3360
10/9/2012	2:41:59	4067620003	1		3360
10/9/2012	2:47:33	4067620004	1		3360
10/9/2012	2:53:07	4067620005	1		3360
10/9/2012	2:58:41	4067620006	1		3360
10/9/2012	3:04:14	4067620007	1		3360
10/9/2012	3:09:49	CCV8 40002	1		3361
10/9/2012	3:15:22	CCB8 39996	1		3361
10/9/2012	3:20:55	4067620008	1		3360
10/9/2012	3:26:30	4067620009	1		3360
10/9/2012	3:32:03	4067620010	1		3360
10/9/2012	3:37:36	4067365001	1		3360
10/9/2012	3:43:10	4067365002	1		3360
10/9/2012	3:48:45	4067365003	1		3360
10/9/2012	3:54:19	4067365004	1		3360
10/9/2012	3:59:53	4067365005	1		3360
10/9/2012	4:05:27	4067365006	1		3360
10/9/2012	4:11:01	4067365007	1		3360
10/9/2012	4:16:36	CCV9 40002	1		3361
10/9/2012	4:22:10	CCB9 39996	1		3361

Performance Report

Sample details
Acquired at : 10/8/2012 3:54:00 PM
Report name : EPA 40ICM2 SN 01301C [10/1/2012 3:16:50 PM]

Mass Calibration verification

Acquisition parameters
Sweeps : 10
Dwell : 10.0 mSecs
Point spacing : 0.05 amu
Peak width measured at 5% of the peak maximum



Analyte	Limits			Results	
	Max. width	Min. width	Max. error	Peak width	Peak error
24Mg	0.85	0.65	0.10	0.77	-0.05
25Mg	0.85	0.65	0.10	0.77	-0.05
26Mg	0.85	0.65	0.10	0.77	-0.05
206Pb	0.85	0.65	0.10	0.77	0.00
207Pb	0.85	0.65	0.10	0.82	0.00
208Pb	0.85	0.65	0.10	0.82	0.00

Sample details
Acquired at : 10/8/2012 3:54:00 PM
Report name : EPA 40ICM2 SN 01301C [10/1/2012 3:16:50 PM]

Tune conditions

Major	
Extraction	-98.0
Lens 1	-1098
Lens 2	-80.0
Focus	14.7
D1	-31.4
D2	-121
Pole Bias	0.1
Hexapole Bias	-3.5
Nebuliser	0.81

Minor	
Lens 3	-185.1
Forward power	1404
Horizontal	48
Vertical	282
DA	-37.6
Cool	13.0
Auxiliary	0.70
Sampling Depth	145

Global	
Standard resolution	145
High resolution	135
Analogue Detector	2375
PC Detector	3475

Add. Gases	
CCT-He	0.00
CCT-He	0.00

Sensitivity and stability results

Acquisition parameters
Sweeps : 35

Run	Time	5Bkg	7Li	24Mg	25Mg	26Mg	59Co	137Ba++	115In	137Ba
Dwell (mSecs)		500.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Limits	%RSD	-	2.0%	2.0%	2.0%	2.0%	2.0%	-	2.0%	-
	Countrate	<1	>60000	>10000	>10000	>10000	>150000	-	>400000	-
1	3:54:23 PM	0.229	100733.48	142079.14	19385.236	22557.858	234909.14	1525.835	709821.68	82253.169
2	3:55:09 PM	0.171	100652.64	143998.81	19439.631	23285.303	237737.39	1242.937	715171.39	84339.699
3	3:55:55 PM	0.343	100846.08	140678.78	19230.640	22377.437	234057.31	1337.236	714667.33	82722.887
4	3:56:41 PM	0.114	101411.98	143618.91	19388.098	22984.581	237459.21	1317.233	714439.90	83400.128
5	3:57:27 PM	0.229	99902.014	141061.46	19522.656	23368.362	234110.00	1394.387	712264.18	83302.142
x		0.217	100709.24	142287.42	19393.252	22914.708	235654.61	1363.526	713272.90	83203.605
σ		0.08	540.37	1486.25	106.57	437.04	1808.83	105.68	2227.05	786.36
%RSD		39.033	0.537	1.045	0.550	1.907	0.768	7.750	0.312	0.945

Run	Time	138Ba	140Ce	156Ce O	206Pb	207Pb	208Pb	220Bkg	238U
Dwell (mSecs)		10.0	10.0	10.0	10.0	10.0	10.0	500.0	10.0
Limits	%RSD	-	-	-	2.0%	2.0%	2.0%	-	2.0%
	Countrate	-	-	-	>10000	>10000	>10000	<1	>800000
1	3:54:23 PM	546323.08	719309.32	14453.712	344304.52	287959.70	718617.49	0.114	1607653.9
2	3:55:09 PM	548492.96	723144.43	13194.761	339456.64	284160.57	713229.06	0.000	1588250.9
3	3:55:55 PM	539417.69	716849.72	13744.102	337128.26	279886.49	701300.65	0.000	1587882.6
4	3:56:41 PM	542933.21	714839.45	14144.682	337657.79	283751.62	707861.97	0.057	1602995.1
5	3:57:27 PM	545727.80	723492.03	13869.996	338894.46	282601.33	705018.30	0.057	1566641.6
x		544578.95	719526.99	13881.451	339488.34	283671.94	709205.50	0.046	1590684.8
σ		3501.01	3807.74	470.99	2849.13	2920.01	6830.06	0.05	16057.26
%RSD		0.643	0.529	3.393	0.839	1.029	0.963	104.583	1.009

Ratio results

Run	Time	137Ba++/137Ba	156Ce O/140Ce
Ratio limits		<0.0300	<0.0200
1	3:54:23 PM	0.019	0.020
2	3:55:09 PM	0.015	0.018
3	3:55:55 PM	0.016	0.019
4	3:56:41 PM	0.016	0.020
5	3:57:27 PM	0.017	0.019
x		0.0164	0.0193
σ		0.00	0.00
%RSD		8.5848	3.6744

Result : The performance report passed.

Performance Report

Sample details
Acquired at : 10/8/2012 4:04:12 PM
Report name : Xt CCT 40ICM2 SN 01301C [10/1/2012 3:17:09 PM]

Tune conditions

Major	
Extraction	-98.0
Lens 1	-1098
Lens 2	-80.0
Focus	10.8
D1	-43.9
D2	-143
Pole Bias	-9.0
Hexapole Bias	-4.0
Nebuliser	0.81

Minor	
Lens 3	-195.3
Forward power	1404
Horizontal	48
Vertical	282
DA	-37.6
Cool	13.0
Auxiliary	0.70
Sampling Depth	145

Global	
Standard resolution	145
High resolution	135
Analogue Detector	2375
PC Detector	3475

Add. Gases	
CCT-He	0.00
CCT-He	0.51

Sensitivity and stability results

Acquisition parameters
Sweeps : 45

Run	Time	7Li	9Be	11B
Dwell (mSecs)		10.0	10.0	10.0
Limits	%RSD	2.0%	2.0%	2.0%
	Countrate	>10000	>2000	>2000
1	4:04:13 PM	16981.649	5159.161	5801.750
2	4:04:16 PM	17041.755	5079.119	5686.125
3	4:04:19 PM	17478.093	5088.012	5763.949
4	4:04:22 PM	17003.911	5012.417	5639.431
5	4:04:25 PM	16632.150	5005.747	5628.313
x		17027.512	5068.891	5703.914
σ		300.91	62.84	76.43
%RSD		1.767	1.240	1.340

Result : The performance report passed.

Performance Report

Sample details
Acquired at : 10/8/2012 4:11:56 PM
Report name : Xt CCT-KED 40ICM2 SN01301C [10/1/2012 3:17:23 PM]

Tune conditions

Major	
Extraction	-98.0
Lens 1	-1098
Lens 2	-80.0
Focus	-5.3
D1	-56.5
D2	-143
Pole Bias	-17.0
Hexapole Bias	-20.0
Nebuliser	0.81

Minor	
Lens 3	-195.3
Forward power	1404
Horizontal	48
Vertical	282
DA	-37.6
Cool	13.0
Auxiliary	0.70
Sampling Depth	145

Global	
Standard resolution	145
High resolution	135
Analogue Detector	2375
PC Detector	3475

Add. Gases	
CCT-He	0.00
CCT-He	3.80

Sensitivity and stability results

Acquisition parameters
Sweeps : 35

Run	Time	78Se	115In	140Ce	156Ce O
Dwell (mSecs)		100.0	10.0	10.0	50.0
Limits	%RSD	-	2.0%	-	-
	Countrate	<20	>100000	-	-
1	4:11:57 PM	8.000	300812.93	427717.45	5395.799
2	4:12:05 PM	4.286	303722.27	435306.91	5877.224
3	4:12:13 PM	4.571	299472.03	433349.99	5403.804
4	4:12:21 PM	6.286	303288.91	433968.40	5658.236
5	4:12:29 PM	6.000	299301.12	432014.73	5567.897
x		5.829	301319.45	432471.50	5580.592
σ		1.49	2085.40	2909.54	199.74
%RSD		25.612	0.692	0.673	3.579

Ratio results

Run	Time	156Ce O/140Ce
Ratio limits		<0.0200
1	4:11:57 PM	0.013
2	4:12:05 PM	0.014
3	4:12:13 PM	0.012
4	4:12:21 PM	0.013
5	4:12:29 PM	0.013
x		0.0129
σ		0.00
%RSD		3.1169

Result : The performance report passed.

Experiment Details

Description	PlasmaLab Template BlankExperiment
Template Filename	C:\Program Files\Thermo Fisher\PlasmaLab\Templates\6020 XSII SN 01301 C.tet
Created By User	metals
Analyte Database	Pace.tea
Creation Timestamp	7/10/2008 4:47:18 PM
Last Edited By	paceuser
Last Edit Timestamp	10/9/2012 8:12:25 AM
Instrument Detector	Simultaneous
Database Version	3,51
Acquisition Mode	Unknown

Numerical Results report key (text indicates meaning)

Blue text indicates that cell is a statistic.
Underlining indicates that a data warning flag is set.

Column headings	Result cells	Data warning flags
No flag	Internal Standard	I - Invalid calibration
Semi Quant	Excluded	T - Tripped
Standard Addition	QC Warning	F - Interference correction failed
Multi Element	QC Failure	M - Result over max
	Transient TRA only:	V - Valley integration failed
	Peak Not Found	D - Different method used
	Manually Edited	
	Merged Peak	

Setup

Survey Scan Setup

Sweeps	10
Dwell Time	600
Channels Per Mass	10
Acquisition Duration	13345

Main Run Setup

Main Run	Peak Jumping
Sweeps	45
Dwell Time	10000
Channels Per Mass	1
Acquisition Duration	31093
Channel Spacing	0.02

Survey Scan Regions

Start AMU	End AMU	Channels	Dwell ms	Resolution
4.59	11.50	69	600	
12.50	13.50	10	600	
22.59	28.41	58	600	
30.59	31.41	8	600	
33.59	35.50	19	600	
38.59	39.41	8	600	
42.59	45.50	29	600	
46.50	79.41	329	600	
80.59	245.50	1649	600	

Peak Jump Regions

Analyte	Channels	Dwell ms	Resolution
7Li	1	10000	Standard
9Be	1	10000	Standard
10B	1	10000	Standard
23Na	1	5000	
25Mg	1	10000	Standard
27Al	1	10000	Standard
28Si	1	10000	Standard
31P	1	10000	Standard
34S	1	10000	
35Cl	1	10000	
39K	1	10000	

43Ca	1	10000	Standard
45Sc-KED	1	10000	Standard
45Sc-CCT	1	10000	
47Ti	1	10000	Standard
51V	1	10000	Standard
52Cr	1	10000	Standard
53Cl O	1	10000	Standard
54Fe	1	10000	Standard
55Mn	1	10000	Standard
59Co	1	10000	Standard
60Ni	1	10000	Standard
63Cu	1	10000	Standard
66Zn	1	10000	Standard
72Ge	1	10000	Standard
73Ge	1	10000	Standard
75As	1	50000	Standard
78Se	1	50000	Standard
83Kr	1	50000	Standard
88Sr	1	10000	Standard
89Y	1	10000	Standard
90Zr	1	10000	Standard
95Mo	1	10000	Standard
107Ag	1	10000	Standard
111Cd	1	10000	Standard
115In	1	10000	Standard
118Sn	1	10000	Standard
121Sb	1	10000	Standard
137Ba	1	10000	Standard
159Tb	1	10000	Standard
184W	1	10000	Standard
201Hg	1	10000	Standard
205Tl	1	10000	Standard
206Pb	1	10000	Standard
207Pb	1	10000	Standard
208Pb	1	10000	Standard
209Bi	1	10000	Standard
238U	1	10000	Standard

Instrument Configuration

Sample/Analyte Settings

Label	Config	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
39996_3361_Cal0	5	7	7	7	8	8	8	8	8	8	8
39997_3361_Cal1	5	7	7	7	8	8	8	8	8	8	8
39998_3361_Cal2	5	7	7	7	8	8	8	8	8	8	8
39999_3361_Cal3	5	7	7	7	8	8	8	8	8	8	8
40000_3361_Cal4	5	7	7	7	8	8	8	8	8	8	8
40001_3361_Cal5	5	7	7	7	8	8	8	8	8	8	8
39693_3361_ICV	5	7	7	7	8	8	8	8	8	8	8
39996_3361_ICB	5	7	7	7	8	8	8	8	8	8	8
39997_3361_CRDL_A1	5	7	7	7	8	8	8	8	8	8	8
39998_3361_CRDL_B1	5	7	7	7	8	8	8	8	8	8	8
39698_3361_ICSA1	5	7	7	7	8	8	8	8	8	8	8
39699_3361_ICSAB1	5	7	7	7	8	8	8	8	8	8	8
40002_3361_CCV1	5	7	7	7	8	8	8	8	8	8	8
39996_3361_CCB1	5	7	7	7	8	8	8	8	8	8	8
686242_3358	5	7	7	7	8	8	8	8	8	8	8
686246_3358	5	7	7	7	8	8	8	8	8	8	8
686243_3358	5	7	7	7	8	8	8	8	8	8	8
686247_3358	5	7	7	7	8	8	8	8	8	8	8
4067361001_3358	5	7	7	7	8	8	8	8	8	8	8
686248_3358	5	7	7	7	8	8	8	8	8	8	8
686249_3358	5	7	7	7	8	8	8	8	8	8	8
688831_3358	5	7	7	7	8	8	8	8	8	8	8
4067361002_3358	5	7	7	7	8	8	8	8	8	8	8
688832_3358x5	5	7	7	7	8	8	8	8	8	8	8
40002_3361_CCV2	5	7	7	7	8	8	8	8	8	8	8
39996_3361_CCB2	5	7	7	7	8	8	8	8	8	8	8
4067361003_3358	5	7	7	7	8	8	8	8	8	8	8
4067361004_3358	5	7	7	7	8	8	8	8	8	8	8
4067361005_3358	5	7	7	7	8	8	8	8	8	8	8

4067361006_3358	5	7	7	7	8	8	8	8	8	8	8
4067361007_3358	5	7	7	7	8	8	8	8	8	8	8
4067361008_3358	5	7	7	7	8	8	8	8	8	8	8
4067361009_3358	5	7	7	7	8	8	8	8	8	8	8
4067361010_3358	5	7	7	7	8	8	8	8	8	8	8
4067361011_3358	5	7	7	7	8	8	8	8	8	8	8
4067361012_3358	5	7	7	7	8	8	8	8	8	8	8
40002_3361_CCV3	5	7	7	7	8	8	8	8	8	8	8
39996_3361_CCB3	5	7	7	7	8	8	8	8	8	8	8
4067361013_3358	5	7	7	7	8	8	8	8	8	8	8
4067361014_3358	5	7	7	7	8	8	8	8	8	8	8
4067361015_3358	5	7	7	7	8	8	8	8	8	8	8
4067361016_3358	5	7	7	7	8	8	8	8	8	8	8
4067361017_3358	5	7	7	7	8	8	8	8	8	8	8
4067361018_3358	5	7	7	7	8	8	8	8	8	8	8
4067361019_3358	5	7	7	7	8	8	8	8	8	8	8
Blank	5	7	7	7	8	8	8	8	8	8	8
686525_3359	5	7	7	7	8	8	8	8	8	8	8
686527_3359	5	7	7	7	8	8	8	8	8	8	8
40002_3361_CCV4	5	7	7	7	8	8	8	8	8	8	8
39996_3361_CCB4	5	7	7	7	8	8	8	8	8	8	8
686526_3359	5	7	7	7	8	8	8	8	8	8	8
686528_3359	5	7	7	7	8	8	8	8	8	8	8
4067362001_3359	5	7	7	7	8	8	8	8	8	8	8
686529_3359	5	7	7	7	8	8	8	8	8	8	8
686530_3359	5	7	7	7	8	8	8	8	8	8	8
688843_3359	5	7	7	7	8	8	8	8	8	8	8
4067362002_3359	5	7	7	7	8	8	8	8	8	8	8
688844_3359x5	5	7	7	7	8	8	8	8	8	8	8
4067362003_3359	5	7	7	7	8	8	8	8	8	8	8
4067362004_3359	5	7	7	7	8	8	8	8	8	8	8
40002_3361_CCV5	5	7	7	7	8	8	8	8	8	8	8
39996_3361_CCB5	5	7	7	7	8	8	8	8	8	8	8
4067362005_3359	5	7	7	7	8	8	8	8	8	8	8
4067362006_3359	5	7	7	7	8	8	8	8	8	8	8
4067362007_3359	5	7	7	7	8	8	8	8	8	8	8
4067362008_3359	5	7	7	7	8	8	8	8	8	8	8
4067362009_3359	5	7	7	7	8	8	8	8	8	8	8
4067362010_3359	5	7	7	7	8	8	8	8	8	8	8
4067362011_3359	5	7	7	7	8	8	8	8	8	8	8
4067362012_3359	5	7	7	7	8	8	8	8	8	8	8
4067362013_3359	5	7	7	7	8	8	8	8	8	8	8
4067362014_3359	5	7	7	7	8	8	8	8	8	8	8
40002_3361_CCV6	5	7	7	7	8	8	8	8	8	8	8
39996_3361_CCB6	5	7	7	7	8	8	8	8	8	8	8
4067362015_3359	5	7	7	7	8	8	8	8	8	8	8
4067362016_3359	5	7	7	7	8	8	8	8	8	8	8
4067362017_3359	5	7	7	7	8	8	8	8	8	8	8
4067362018_3359	5	7	7	7	8	8	8	8	8	8	8
Blank	5	7	7	7	8	8	8	8	8	8	8
686605_3360	5	7	7	7	8	8	8	8	8	8	8
686611_3360	5	7	7	7	8	8	8	8	8	8	8
686606_3360	5	7	7	7	8	8	8	8	8	8	8
686612_3360	5	7	7	7	8	8	8	8	8	8	8
4067620001_3360	5	7	7	7	8	8	8	8	8	8	8
40002_3361_CCV7	5	7	7	7	8	8	8	8	8	8	8
39996_3361_CCB7	5	7	7	7	8	8	8	8	8	8	8
686613_3360	5	7	7	7	8	8	8	8	8	8	8
686614_3360	5	7	7	7	8	8	8	8	8	8	8
688848_3360	5	7	7	7	8	8	8	8	8	8	8
4067620002_3360	5	7	7	7	8	8	8	8	8	8	8
688849_3360x5	5	7	7	7	8	8	8	8	8	8	8
4067620003_3360	5	7	7	7	8	8	8	8	8	8	8
4067620004_3360	5	7	7	7	8	8	8	8	8	8	8
4067620005_3360	5	7	7	7	8	8	8	8	8	8	8
4067620006_3360	5	7	7	7	8	8	8	8	8	8	8
4067620007_3360	5	7	7	7	8	8	8	8	8	8	8
40002_3361_CCV8	5	7	7	7	8	8	8	8	8	8	8
39996_3361_CCB8	5	7	7	7	8	8	8	8	8	8	8
4067620008_3360	5	7	7	7	8	8	8	8	8	8	8

4067620009_3360	5	7	7	7	8	8	8	8	8	8	8
4067620010_3360	5	7	7	7	8	8	8	8	8	8	8
4067365001_3360	5	7	7	7	8	8	8	8	8	8	8
4067365002_3360	5	7	7	7	8	8	8	8	8	8	8
4067365003_3360	5	7	7	7	8	8	8	8	8	8	8
4067365004_3360	5	7	7	7	8	8	8	8	8	8	8
4067365005_3360	5	7	7	7	8	8	8	8	8	8	8
4067365006_3360	5	7	7	7	8	8	8	8	8	8	8
4067365007_3360	5	7	7	7	8	8	8	8	8	8	8
40002_3361_CCV9	5	7	7	7	8	8	8	8	8	8	8
39996_3361_CCB9	5	7	7	7	8	8	8	8	8	8	8
Label	**Config**	**39K**	**43Ca**	**45Sc-KED**	**45Sc-CCT**	**47Ti**	**51V**	**52Cr**	**53Cl O**	**54Fe**	**55Mn**
39996_3361_Cal0	5	8	8	8	7	8	8	8	8	8	8
39997_3361_Cal1	5	8	8	8	7	8	8	8	8	8	8
39998_3361_Cal2	5	8	8	8	7	8	8	8	8	8	8
39999_3361_Cal3	5	8	8	8	7	8	8	8	8	8	8
40000_3361_Cal4	5	8	8	8	7	8	8	8	8	8	8
40001_3361_Cal5	5	8	8	8	7	8	8	8	8	8	8
39693_3361_ICV	5	8	8	8	7	8	8	8	8	8	8
39996_3361_ICB	5	8	8	8	7	8	8	8	8	8	8
39997_3361_CRDL_A1	5	8	8	8	7	8	8	8	8	8	8
39998_3361_CRDL_B1	5	8	8	8	7	8	8	8	8	8	8
39698_3361_ICSA1	5	8	8	8	7	8	8	8	8	8	8
39699_3361_ICSAB1	5	8	8	8	7	8	8	8	8	8	8
40002_3361_CCV1	5	8	8	8	7	8	8	8	8	8	8
39996_3361_CCB1	5	8	8	8	7	8	8	8	8	8	8
686242_3358	5	8	8	8	7	8	8	8	8	8	8
686246_3358	5	8	8	8	7	8	8	8	8	8	8
686243_3358	5	8	8	8	7	8	8	8	8	8	8
686247_3358	5	8	8	8	7	8	8	8	8	8	8
4067361001_3358	5	8	8	8	7	8	8	8	8	8	8
686248_3358	5	8	8	8	7	8	8	8	8	8	8
686249_3358	5	8	8	8	7	8	8	8	8	8	8
688831_3358	5	8	8	8	7	8	8	8	8	8	8
4067361002_3358	5	8	8	8	7	8	8	8	8	8	8
688832_3358x5	5	8	8	8	7	8	8	8	8	8	8
40002_3361_CCV2	5	8	8	8	7	8	8	8	8	8	8
39996_3361_CCB2	5	8	8	8	7	8	8	8	8	8	8
4067361003_3358	5	8	8	8	7	8	8	8	8	8	8
4067361004_3358	5	8	8	8	7	8	8	8	8	8	8
4067361005_3358	5	8	8	8	7	8	8	8	8	8	8
4067361006_3358	5	8	8	8	7	8	8	8	8	8	8
4067361007_3358	5	8	8	8	7	8	8	8	8	8	8
4067361008_3358	5	8	8	8	7	8	8	8	8	8	8
4067361009_3358	5	8	8	8	7	8	8	8	8	8	8
4067361010_3358	5	8	8	8	7	8	8	8	8	8	8
4067361011_3358	5	8	8	8	7	8	8	8	8	8	8
4067361012_3358	5	8	8	8	7	8	8	8	8	8	8
40002_3361_CCV3	5	8	8	8	7	8	8	8	8	8	8
39996_3361_CCB3	5	8	8	8	7	8	8	8	8	8	8
4067361013_3358	5	8	8	8	7	8	8	8	8	8	8
4067361014_3358	5	8	8	8	7	8	8	8	8	8	8
4067361015_3358	5	8	8	8	7	8	8	8	8	8	8
4067361016_3358	5	8	8	8	7	8	8	8	8	8	8
4067361017_3358	5	8	8	8	7	8	8	8	8	8	8
4067361018_3358	5	8	8	8	7	8	8	8	8	8	8
4067361019_3358	5	8	8	8	7	8	8	8	8	8	8
Blank	5	8	8	8	7	8	8	8	8	8	8
686525_3359	5	8	8	8	7	8	8	8	8	8	8
686527_3359	5	8	8	8	7	8	8	8	8	8	8
40002_3361_CCV4	5	8	8	8	7	8	8	8	8	8	8
39996_3361_CCB4	5	8	8	8	7	8	8	8	8	8	8
686526_3359	5	8	8	8	7	8	8	8	8	8	8
686528_3359	5	8	8	8	7	8	8	8	8	8	8
4067362001_3359	5	8	8	8	7	8	8	8	8	8	8
686529_3359	5	8	8	8	7	8	8	8	8	8	8
686530_3359	5	8	8	8	7	8	8	8	8	8	8
688843_3359	5	8	8	8	7	8	8	8	8	8	8
4067362002_3359	5	8	8	8	7	8	8	8	8	8	8
688844_3359x5	5	8	8	8	7	8	8	8	8	8	8

4067362003_3359	5	8	8	8	7	8	8	8	8	8	8
4067362004_3359	5	8	8	8	7	8	8	8	8	8	8
40002_3361_CCV5	5	8	8	8	7	8	8	8	8	8	8
39996_3361_CCB5	5	8	8	8	7	8	8	8	8	8	8
4067362005_3359	5	8	8	8	7	8	8	8	8	8	8
4067362006_3359	5	8	8	8	7	8	8	8	8	8	8
4067362007_3359	5	8	8	8	7	8	8	8	8	8	8
4067362008_3359	5	8	8	8	7	8	8	8	8	8	8
4067362009_3359	5	8	8	8	7	8	8	8	8	8	8
4067362010_3359	5	8	8	8	7	8	8	8	8	8	8
4067362011_3359	5	8	8	8	7	8	8	8	8	8	8
4067362012_3359	5	8	8	8	7	8	8	8	8	8	8
4067362013_3359	5	8	8	8	7	8	8	8	8	8	8
4067362014_3359	5	8	8	8	7	8	8	8	8	8	8
40002_3361_CCV6	5	8	8	8	7	8	8	8	8	8	8
39996_3361_CCB6	5	8	8	8	7	8	8	8	8	8	8
4067362015_3359	5	8	8	8	7	8	8	8	8	8	8
4067362016_3359	5	8	8	8	7	8	8	8	8	8	8
4067362017_3359	5	8	8	8	7	8	8	8	8	8	8
4067362018_3359	5	8	8	8	7	8	8	8	8	8	8
Blank	5	8	8	8	7	8	8	8	8	8	8
686605_3360	5	8	8	8	7	8	8	8	8	8	8
686611_3360	5	8	8	8	7	8	8	8	8	8	8
686606_3360	5	8	8	8	7	8	8	8	8	8	8
686612_3360	5	8	8	8	7	8	8	8	8	8	8
4067620001_3360	5	8	8	8	7	8	8	8	8	8	8
40002_3361_CCV7	5	8	8	8	7	8	8	8	8	8	8
39996_3361_CCB7	5	8	8	8	7	8	8	8	8	8	8
686613_3360	5	8	8	8	7	8	8	8	8	8	8
686614_3360	5	8	8	8	7	8	8	8	8	8	8
688848_3360	5	8	8	8	7	8	8	8	8	8	8
4067620002_3360	5	8	8	8	7	8	8	8	8	8	8
688849_3360x5	5	8	8	8	7	8	8	8	8	8	8
4067620003_3360	5	8	8	8	7	8	8	8	8	8	8
4067620004_3360	5	8	8	8	7	8	8	8	8	8	8
4067620005_3360	5	8	8	8	7	8	8	8	8	8	8
4067620006_3360	5	8	8	8	7	8	8	8	8	8	8
4067620007_3360	5	8	8	8	7	8	8	8	8	8	8
40002_3361_CCV8	5	8	8	8	7	8	8	8	8	8	8
39996_3361_CCB8	5	8	8	8	7	8	8	8	8	8	8
4067620008_3360	5	8	8	8	7	8	8	8	8	8	8
4067620009_3360	5	8	8	8	7	8	8	8	8	8	8
4067620010_3360	5	8	8	8	7	8	8	8	8	8	8
4067365001_3360	5	8	8	8	7	8	8	8	8	8	8
4067365002_3360	5	8	8	8	7	8	8	8	8	8	8
4067365003_3360	5	8	8	8	7	8	8	8	8	8	8
4067365004_3360	5	8	8	8	7	8	8	8	8	8	8
4067365005_3360	5	8	8	8	7	8	8	8	8	8	8
4067365006_3360	5	8	8	8	7	8	8	8	8	8	8
4067365007_3360	5	8	8	8	7	8	8	8	8	8	8
40002_3361_CCV9	5	8	8	8	7	8	8	8	8	8	8
39996_3361_CCB9	5	8	8	8	7	8	8	8	8	8	8
Label	**Config**	**59Co**	**60Ni**	**63Cu**	**66Zn**	**72Ge**	**73Ge**	**75As**	**78Se**	**83Kr**	**88Sr**
39996_3361_Cal0	5	8	8	8	8	8	8	8	8	8	8
39997_3361_Cal1	5	8	8	8	8	8	8	8	8	8	8
39998_3361_Cal2	5	8	8	8	8	8	8	8	8	8	8
39999_3361_Cal3	5	8	8	8	8	8	8	8	8	8	8
40000_3361_Cal4	5	8	8	8	8	8	8	8	8	8	8
40001_3361_Cal5	5	8	8	8	8	8	8	8	8	8	8
39693_3361_ICV	5	8	8	8	8	8	8	8	8	8	8
39996_3361_ICB	5	8	8	8	8	8	8	8	8	8	8
39997_3361_CRDL_A1	5	8	8	8	8	8	8	8	8	8	8
39998_3361_CRDL_B1	5	8	8	8	8	8	8	8	8	8	8
39698_3361_ICSA1	5	8	8	8	8	8	8	8	8	8	8
39699_3361_ICSAB1	5	8	8	8	8	8	8	8	8	8	8
40002_3361_CCV1	5	8	8	8	8	8	8	8	8	8	8
39996_3361_CCB1	5	8	8	8	8	8	8	8	8	8	8
686242_3358	5	8	8	8	8	8	8	8	8	8	8
686246_3358	5	8	8	8	8	8	8	8	8	8	8
686243_3358	5	8	8	8	8	8	8	8	8	8	8

686247_3358	5	8	8	8	8	8	8	8	8	8	8
4067361001_3358	5	8	8	8	8	8	8	8	8	8	8
686248_3358	5	8	8	8	8	8	8	8	8	8	8
686249_3358	5	8	8	8	8	8	8	8	8	8	8
688831_3358	5	8	8	8	8	8	8	8	8	8	8
4067361002_3358	5	8	8	8	8	8	8	8	8	8	8
688832_3358x5	5	8	8	8	8	8	8	8	8	8	8
40002_3361_CCV2	5	8	8	8	8	8	8	8	8	8	8
39996_3361_CCB2	5	8	8	8	8	8	8	8	8	8	8
4067361003_3358	5	8	8	8	8	8	8	8	8	8	8
4067361004_3358	5	8	8	8	8	8	8	8	8	8	8
4067361005_3358	5	8	8	8	8	8	8	8	8	8	8
4067361006_3358	5	8	8	8	8	8	8	8	8	8	8
4067361007_3358	5	8	8	8	8	8	8	8	8	8	8
4067361008_3358	5	8	8	8	8	8	8	8	8	8	8
4067361009_3358	5	8	8	8	8	8	8	8	8	8	8
4067361010_3358	5	8	8	8	8	8	8	8	8	8	8
4067361011_3358	5	8	8	8	8	8	8	8	8	8	8
4067361012_3358	5	8	8	8	8	8	8	8	8	8	8
40002_3361_CCV3	5	8	8	8	8	8	8	8	8	8	8
39996_3361_CCB3	5	8	8	8	8	8	8	8	8	8	8
4067361013_3358	5	8	8	8	8	8	8	8	8	8	8
4067361014_3358	5	8	8	8	8	8	8	8	8	8	8
4067361015_3358	5	8	8	8	8	8	8	8	8	8	8
4067361016_3358	5	8	8	8	8	8	8	8	8	8	8
4067361017_3358	5	8	8	8	8	8	8	8	8	8	8
4067361018_3358	5	8	8	8	8	8	8	8	8	8	8
4067361019_3358	5	8	8	8	8	8	8	8	8	8	8
Blank	5	8	8	8	8	8	8	8	8	8	8
686525_3359	5	8	8	8	8	8	8	8	8	8	8
686527_3359	5	8	8	8	8	8	8	8	8	8	8
40002_3361_CCV4	5	8	8	8	8	8	8	8	8	8	8
39996_3361_CCB4	5	8	8	8	8	8	8	8	8	8	8
686526_3359	5	8	8	8	8	8	8	8	8	8	8
686528_3359	5	8	8	8	8	8	8	8	8	8	8
4067362001_3359	5	8	8	8	8	8	8	8	8	8	8
686529_3359	5	8	8	8	8	8	8	8	8	8	8
686530_3359	5	8	8	8	8	8	8	8	8	8	8
688843_3359	5	8	8	8	8	8	8	8	8	8	8
4067362002_3359	5	8	8	8	8	8	8	8	8	8	8
688844_3359x5	5	8	8	8	8	8	8	8	8	8	8
4067362003_3359	5	8	8	8	8	8	8	8	8	8	8
4067362004_3359	5	8	8	8	8	8	8	8	8	8	8
40002_3361_CCV5	5	8	8	8	8	8	8	8	8	8	8
39996_3361_CCB5	5	8	8	8	8	8	8	8	8	8	8
4067362005_3359	5	8	8	8	8	8	8	8	8	8	8
4067362006_3359	5	8	8	8	8	8	8	8	8	8	8
4067362007_3359	5	8	8	8	8	8	8	8	8	8	8
4067362008_3359	5	8	8	8	8	8	8	8	8	8	8
4067362009_3359	5	8	8	8	8	8	8	8	8	8	8
4067362010_3359	5	8	8	8	8	8	8	8	8	8	8
4067362011_3359	5	8	8	8	8	8	8	8	8	8	8
4067362012_3359	5	8	8	8	8	8	8	8	8	8	8
4067362013_3359	5	8	8	8	8	8	8	8	8	8	8
4067362014_3359	5	8	8	8	8	8	8	8	8	8	8
40002_3361_CCV6	5	8	8	8	8	8	8	8	8	8	8
39996_3361_CCB6	5	8	8	8	8	8	8	8	8	8	8
4067362015_3359	5	8	8	8	8	8	8	8	8	8	8
4067362016_3359	5	8	8	8	8	8	8	8	8	8	8
4067362017_3359	5	8	8	8	8	8	8	8	8	8	8
4067362018_3359	5	8	8	8	8	8	8	8	8	8	8
Blank	5	8	8	8	8	8	8	8	8	8	8
686605_3360	5	8	8	8	8	8	8	8	8	8	8
686611_3360	5	8	8	8	8	8	8	8	8	8	8
686606_3360	5	8	8	8	8	8	8	8	8	8	8
686612_3360	5	8	8	8	8	8	8	8	8	8	8
4067620001_3360	5	8	8	8	8	8	8	8	8	8	8
40002_3361_CCV7	5	8	8	8	8	8	8	8	8	8	8
39996_3361_CCB7	5	8	8	8	8	8	8	8	8	8	8
686613_3360	5	8	8	8	8	8	8	8	8	8	8

686614_3360	5	8	8	8	8	8	8	8	8	8	8
688848_3360	5	8	8	8	8	8	8	8	8	8	8
4067620002_3360	5	8	8	8	8	8	8	8	8	8	8
688849_3360x5	5	8	8	8	8	8	8	8	8	8	8
4067620003_3360	5	8	8	8	8	8	8	8	8	8	8
4067620004_3360	5	8	8	8	8	8	8	8	8	8	8
4067620005_3360	5	8	8	8	8	8	8	8	8	8	8
4067620006_3360	5	8	8	8	8	8	8	8	8	8	8
4067620007_3360	5	8	8	8	8	8	8	8	8	8	8
40002_3361_CCV8	5	8	8	8	8	8	8	8	8	8	8
39996_3361_CCB8	5	8	8	8	8	8	8	8	8	8	8
4067620008_3360	5	8	8	8	8	8	8	8	8	8	8
4067620009_3360	5	8	8	8	8	8	8	8	8	8	8
4067620010_3360	5	8	8	8	8	8	8	8	8	8	8
4067365001_3360	5	8	8	8	8	8	8	8	8	8	8
4067365002_3360	5	8	8	8	8	8	8	8	8	8	8
4067365003_3360	5	8	8	8	8	8	8	8	8	8	8
4067365004_3360	5	8	8	8	8	8	8	8	8	8	8
4067365005_3360	5	8	8	8	8	8	8	8	8	8	8
4067365006_3360	5	8	8	8	8	8	8	8	8	8	8
4067365007_3360	5	8	8	8	8	8	8	8	8	8	8
40002_3361_CCV9	5	8	8	8	8	8	8	8	8	8	8
39996_3361_CCB9	5	8	8	8	8	8	8	8	8	8	8
Label	**Config**	**89Y**	**90Zr**	**95Mo**	**107Ag**	**111Cd**	**115In**	**118Sn**	**121Sb**	**137Ba**	**159Tb**
39996_3361_Cal0	5	8	8	8	8	8	8	8	8	8	8
39997_3361_Cal1	5	8	8	8	8	8	8	8	8	8	8
39998_3361_Cal2	5	8	8	8	8	8	8	8	8	8	8
39999_3361_Cal3	5	8	8	8	8	8	8	8	8	8	8
40000_3361_Cal4	5	8	8	8	8	8	8	8	8	8	8
40001_3361_Cal5	5	8	8	8	8	8	8	8	8	8	8
39693_3361_ICV	5	8	8	8	8	8	8	8	8	8	8
39996_3361_ICB	5	8	8	8	8	8	8	8	8	8	8
39997_3361_CRDL_A1	5	8	8	8	8	8	8	8	8	8	8
39998_3361_CRDL_B1	5	8	8	8	8	8	8	8	8	8	8
39698_3361_ICSA1	5	8	8	8	8	8	8	8	8	8	8
39699_3361_ICSAB1	5	8	8	8	8	8	8	8	8	8	8
40002_3361_CCV1	5	8	8	8	8	8	8	8	8	8	8
39996_3361_CCB1	5	8	8	8	8	8	8	8	8	8	8
686242_3358	5	8	8	8	8	8	8	8	8	8	8
686246_3358	5	8	8	8	8	8	8	8	8	8	8
686243_3358	5	8	8	8	8	8	8	8	8	8	8
686247_3358	5	8	8	8	8	8	8	8	8	8	8
4067361001_3358	5	8	8	8	8	8	8	8	8	8	8
686248_3358	5	8	8	8	8	8	8	8	8	8	8
686249_3358	5	8	8	8	8	8	8	8	8	8	8
688831_3358	5	8	8	8	8	8	8	8	8	8	8
4067361002_3358	5	8	8	8	8	8	8	8	8	8	8
688832_3358x5	5	8	8	8	8	8	8	8	8	8	8
40002_3361_CCV2	5	8	8	8	8	8	8	8	8	8	8
39996_3361_CCB2	5	8	8	8	8	8	8	8	8	8	8
4067361003_3358	5	8	8	8	8	8	8	8	8	8	8
4067361004_3358	5	8	8	8	8	8	8	8	8	8	8
4067361005_3358	5	8	8	8	8	8	8	8	8	8	8
4067361006_3358	5	8	8	8	8	8	8	8	8	8	8
4067361007_3358	5	8	8	8	8	8	8	8	8	8	8
4067361008_3358	5	8	8	8	8	8	8	8	8	8	8
4067361009_3358	5	8	8	8	8	8	8	8	8	8	8
4067361010_3358	5	8	8	8	8	8	8	8	8	8	8
4067361011_3358	5	8	8	8	8	8	8	8	8	8	8
4067361012_3358	5	8	8	8	8	8	8	8	8	8	8
40002_3361_CCV3	5	8	8	8	8	8	8	8	8	8	8
39996_3361_CCB3	5	8	8	8	8	8	8	8	8	8	8
4067361013_3358	5	8	8	8	8	8	8	8	8	8	8
4067361014_3358	5	8	8	8	8	8	8	8	8	8	8
4067361015_3358	5	8	8	8	8	8	8	8	8	8	8
4067361016_3358	5	8	8	8	8	8	8	8	8	8	8
4067361017_3358	5	8	8	8	8	8	8	8	8	8	8
4067361018_3358	5	8	8	8	8	8	8	8	8	8	8
4067361019_3358	5	8	8	8	8	8	8	8	8	8	8
Blank	5	8	8	8	8	8	8	8	8	8	8

686525_3359	5	8	8	8	8	8	8	8	8	8	8
686527_3359	5	8	8	8	8	8	8	8	8	8	8
40002_3361_CCV4	5	8	8	8	8	8	8	8	8	8	8
39996_3361_CCB4	5	8	8	8	8	8	8	8	8	8	8
686526_3359	5	8	8	8	8	8	8	8	8	8	8
686528_3359	5	8	8	8	8	8	8	8	8	8	8
4067362001_3359	5	8	8	8	8	8	8	8	8	8	8
686529_3359	5	8	8	8	8	8	8	8	8	8	8
686530_3359	5	8	8	8	8	8	8	8	8	8	8
688843_3359	5	8	8	8	8	8	8	8	8	8	8
4067362002_3359	5	8	8	8	8	8	8	8	8	8	8
688844_3359x5	5	8	8	8	8	8	8	8	8	8	8
4067362003_3359	5	8	8	8	8	8	8	8	8	8	8
4067362004_3359	5	8	8	8	8	8	8	8	8	8	8
40002_3361_CCV5	5	8	8	8	8	8	8	8	8	8	8
39996_3361_CCB5	5	8	8	8	8	8	8	8	8	8	8
4067362005_3359	5	8	8	8	8	8	8	8	8	8	8
4067362006_3359	5	8	8	8	8	8	8	8	8	8	8
4067362007_3359	5	8	8	8	8	8	8	8	8	8	8
4067362008_3359	5	8	8	8	8	8	8	8	8	8	8
4067362009_3359	5	8	8	8	8	8	8	8	8	8	8
4067362010_3359	5	8	8	8	8	8	8	8	8	8	8
4067362011_3359	5	8	8	8	8	8	8	8	8	8	8
4067362012_3359	5	8	8	8	8	8	8	8	8	8	8
4067362013_3359	5	8	8	8	8	8	8	8	8	8	8
4067362014_3359	5	8	8	8	8	8	8	8	8	8	8
40002_3361_CCV6	5	8	8	8	8	8	8	8	8	8	8
39996_3361_CCB6	5	8	8	8	8	8	8	8	8	8	8
4067362015_3359	5	8	8	8	8	8	8	8	8	8	8
4067362016_3359	5	8	8	8	8	8	8	8	8	8	8
4067362017_3359	5	8	8	8	8	8	8	8	8	8	8
4067362018_3359	5	8	8	8	8	8	8	8	8	8	8
Blank	5	8	8	8	8	8	8	8	8	8	8
686605_3360	5	8	8	8	8	8	8	8	8	8	8
686611_3360	5	8	8	8	8	8	8	8	8	8	8
686606_3360	5	8	8	8	8	8	8	8	8	8	8
686612_3360	5	8	8	8	8	8	8	8	8	8	8
4067620001_3360	5	8	8	8	8	8	8	8	8	8	8
40002_3361_CCV7	5	8	8	8	8	8	8	8	8	8	8
39996_3361_CCB7	5	8	8	8	8	8	8	8	8	8	8
686613_3360	5	8	8	8	8	8	8	8	8	8	8
686614_3360	5	8	8	8	8	8	8	8	8	8	8
688848_3360	5	8	8	8	8	8	8	8	8	8	8
4067620002_3360	5	8	8	8	8	8	8	8	8	8	8
688849_3360x5	5	8	8	8	8	8	8	8	8	8	8
4067620003_3360	5	8	8	8	8	8	8	8	8	8	8
4067620004_3360	5	8	8	8	8	8	8	8	8	8	8
4067620005_3360	5	8	8	8	8	8	8	8	8	8	8
4067620006_3360	5	8	8	8	8	8	8	8	8	8	8
4067620007_3360	5	8	8	8	8	8	8	8	8	8	8
40002_3361_CCV8	5	8	8	8	8	8	8	8	8	8	8
39996_3361_CCB8	5	8	8	8	8	8	8	8	8	8	8
4067620008_3360	5	8	8	8	8	8	8	8	8	8	8
4067620009_3360	5	8	8	8	8	8	8	8	8	8	8
4067620010_3360	5	8	8	8	8	8	8	8	8	8	8
4067365001_3360	5	8	8	8	8	8	8	8	8	8	8
4067365002_3360	5	8	8	8	8	8	8	8	8	8	8
4067365003_3360	5	8	8	8	8	8	8	8	8	8	8
4067365004_3360	5	8	8	8	8	8	8	8	8	8	8
4067365005_3360	5	8	8	8	8	8	8	8	8	8	8
4067365006_3360	5	8	8	8	8	8	8	8	8	8	8
4067365007_3360	5	8	8	8	8	8	8	8	8	8	8
40002_3361_CCV9	5	8	8	8	8	8	8	8	8	8	8
39996_3361_CCB9	5	8	8	8	8	8	8	8	8	8	8
Label	**Config**	**184W**	**201Hg**	**205Tl**	**206Pb**	**207Pb**	**208Pb**	**209Bi**	**238U**		
39996_3361_Cal0	5	8	8	8	8	8	8	8	8		
39997_3361_Cal1	5	8	8	8	8	8	8	8	8		
39998_3361_Cal2	5	8	8	8	8	8	8	8	8		
39999_3361_Cal3	5	8	8	8	8	8	8	8	8		
40000_3361_Cal4	5	8	8	8	8	8	8	8	8		

40001_3361_Cal5	5	8	8	8	8	8	8	8	8
39693_3361_ICV	5	8	8	8	8	8	8	8	8
39996_3361_ICB	5	8	8	8	8	8	8	8	8
39997_3361_CRDL_A1	5	8	8	8	8	8	8	8	8
39998_3361_CRDL_B1	5	8	8	8	8	8	8	8	8
39698_3361_ICSA1	5	8	8	8	8	8	8	8	8
39699_3361_ICSAB1	5	8	8	8	8	8	8	8	8
40002_3361_CCV1	5	8	8	8	8	8	8	8	8
39996_3361_CCB1	5	8	8	8	8	8	8	8	8
686242_3358	5	8	8	8	8	8	8	8	8
686246_3358	5	8	8	8	8	8	8	8	8
686243_3358	5	8	8	8	8	8	8	8	8
686247_3358	5	8	8	8	8	8	8	8	8
4067361001_3358	5	8	8	8	8	8	8	8	8
686248_3358	5	8	8	8	8	8	8	8	8
686249_3358	5	8	8	8	8	8	8	8	8
688831_3358	5	8	8	8	8	8	8	8	8
4067361002_3358	5	8	8	8	8	8	8	8	8
688832_3358x5	5	8	8	8	8	8	8	8	8
40002_3361_CCV2	5	8	8	8	8	8	8	8	8
39996_3361_CCB2	5	8	8	8	8	8	8	8	8
4067361003_3358	5	8	8	8	8	8	8	8	8
4067361004_3358	5	8	8	8	8	8	8	8	8
4067361005_3358	5	8	8	8	8	8	8	8	8
4067361006_3358	5	8	8	8	8	8	8	8	8
4067361007_3358	5	8	8	8	8	8	8	8	8
4067361008_3358	5	8	8	8	8	8	8	8	8
4067361009_3358	5	8	8	8	8	8	8	8	8
4067361010_3358	5	8	8	8	8	8	8	8	8
4067361011_3358	5	8	8	8	8	8	8	8	8
4067361012_3358	5	8	8	8	8	8	8	8	8
40002_3361_CCV3	5	8	8	8	8	8	8	8	8
39996_3361_CCB3	5	8	8	8	8	8	8	8	8
4067361013_3358	5	8	8	8	8	8	8	8	8
4067361014_3358	5	8	8	8	8	8	8	8	8
4067361015_3358	5	8	8	8	8	8	8	8	8
4067361016_3358	5	8	8	8	8	8	8	8	8
4067361017_3358	5	8	8	8	8	8	8	8	8
4067361018_3358	5	8	8	8	8	8	8	8	8
4067361019_3358	5	8	8	8	8	8	8	8	8
Blank	5	8	8	8	8	8	8	8	8
686525_3359	5	8	8	8	8	8	8	8	8
686527_3359	5	8	8	8	8	8	8	8	8
40002_3361_CCV4	5	8	8	8	8	8	8	8	8
39996_3361_CCB4	5	8	8	8	8	8	8	8	8
686526_3359	5	8	8	8	8	8	8	8	8
686528_3359	5	8	8	8	8	8	8	8	8
4067362001_3359	5	8	8	8	8	8	8	8	8
686529_3359	5	8	8	8	8	8	8	8	8
686530_3359	5	8	8	8	8	8	8	8	8
688843_3359	5	8	8	8	8	8	8	8	8
4067362002_3359	5	8	8	8	8	8	8	8	8
688844_3359x5	5	8	8	8	8	8	8	8	8
4067362003_3359	5	8	8	8	8	8	8	8	8
4067362004_3359	5	8	8	8	8	8	8	8	8
40002_3361_CCV5	5	8	8	8	8	8	8	8	8
39996_3361_CCB5	5	8	8	8	8	8	8	8	8
4067362005_3359	5	8	8	8	8	8	8	8	8
4067362006_3359	5	8	8	8	8	8	8	8	8
4067362007_3359	5	8	8	8	8	8	8	8	8
4067362008_3359	5	8	8	8	8	8	8	8	8
4067362009_3359	5	8	8	8	8	8	8	8	8
4067362010_3359	5	8	8	8	8	8	8	8	8
4067362011_3359	5	8	8	8	8	8	8	8	8
4067362012_3359	5	8	8	8	8	8	8	8	8
4067362013_3359	5	8	8	8	8	8	8	8	8
4067362014_3359	5	8	8	8	8	8	8	8	8
40002_3361_CCV6	5	8	8	8	8	8	8	8	8
39996_3361_CCB6	5	8	8	8	8	8	8	8	8
4067362015_3359	5	8	8	8	8	8	8	8	8

4067362016_3359	5	8	8	8	8	8	8	8	8
4067362017_3359	5	8	8	8	8	8	8	8	8
4067362018_3359	5	8	8	8	8	8	8	8	8
Blank	5	8	8	8	8	8	8	8	8
686605_3360	5	8	8	8	8	8	8	8	8
686611_3360	5	8	8	8	8	8	8	8	8
686606_3360	5	8	8	8	8	8	8	8	8
686612_3360	5	8	8	8	8	8	8	8	8
4067620001_3360	5	8	8	8	8	8	8	8	8
40002_3361_CCV7	5	8	8	8	8	8	8	8	8
39996_3361_CCB7	5	8	8	8	8	8	8	8	8
686613_3360	5	8	8	8	8	8	8	8	8
686614_3360	5	8	8	8	8	8	8	8	8
688848_3360	5	8	8	8	8	8	8	8	8
4067620002_3360	5	8	8	8	8	8	8	8	8
688849_3360x5	5	8	8	8	8	8	8	8	8
4067620003_3360	5	8	8	8	8	8	8	8	8
4067620004_3360	5	8	8	8	8	8	8	8	8
4067620005_3360	5	8	8	8	8	8	8	8	8
4067620006_3360	5	8	8	8	8	8	8	8	8
4067620007_3360	5	8	8	8	8	8	8	8	8
40002_3361_CCV8	5	8	8	8	8	8	8	8	8
39996_3361_CCB8	5	8	8	8	8	8	8	8	8
4067620008_3360	5	8	8	8	8	8	8	8	8
4067620009_3360	5	8	8	8	8	8	8	8	8
4067620010_3360	5	8	8	8	8	8	8	8	8
4067365001_3360	5	8	8	8	8	8	8	8	8
4067365002_3360	5	8	8	8	8	8	8	8	8
4067365003_3360	5	8	8	8	8	8	8	8	8
4067365004_3360	5	8	8	8	8	8	8	8	8
4067365005_3360	5	8	8	8	8	8	8	8	8
4067365006_3360	5	8	8	8	8	8	8	8	8
4067365007_3360	5	8	8	8	8	8	8	8	8
40002_3361_CCV9	5	8	8	8	8	8	8	8	8
39996_3361_CCB9	5	8	8	8	8	8	8	8	8

Configuration 5 - CCT 2

Minimum uptake 0
Maximum uptake 25
Minimum wash 0
Maximum wash 120

ACL Script

Title Fast uptake wash
Description Data acquisition using the peri pump at high speed for the washes and uptakes
Author Thermo Elemental Software
Version 131072

Settings sets

Id	Description	Extraction	Lens 1	Lens 2	Lens 3	Pole Bias	Sampling Depth	Horizontal	Vertical	Cool	Auxiliary
7	CCT Mode 10082012	-98.00	-1100.00	-80.00	-195.30	-9.00	145.00	48.00	282.00	13.00	0.70
8	CCTKED Mode 10082012	-98.00	-1100.00	-80.00	-195.30	-17.00	145.00	48.00	282.00	13.00	0.70

Id	Description	Nebuliser	Forward power	D1	Focus	CCT Gas 1	CCT Gas 2	D2	DA	Hexapole Bias
7	CCT Mode 10082012	0.81	1400.00	-43.90	10.80	0.00	0.50	-143.00	-37.60	-4.00
8	CCTKED Mode 10082012	0.81	1400.00	-56.50	-5.30	0.00	3.80	-143.00	-37.60	-20.00

Fully Quantitative Concentrations

Id	Label	Li	Be	B	Na	Mg	Al	Si	P	K	Ca
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	39996_3361_Cal0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	39997_3361_Cal1	1.000	1.000		250.000	250.000	250.000	50.000	50.000	250.000	250.000
3	39998_3361_Cal2	5.000	5.000	5.000	500.000	500.000	500.000	250.000	250.000	500.000	500.000

4	39999_3361_Cal3	50.000	50.000	50.000	2500.000	2500.000	2500.000	2500.000	2500.000	2500.000	2500.000
5	40000_3361_Cal4	250.000	250.000	250.000	12500.000	12500.000	12500.000	12500.000	12500.000	12500.000	12500.000
6	40001_3361_Cal5	500.000	500.000	500.000	25000.000	25000.000	25000.000	25000.000	25000.000	25000.000	25000.000
Id	Label	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	As
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	39996_3361_Cal0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	39997_3361_Cal1	1.000	1.000	1.000	1.000	250.000	1.000	1.000	1.000		1.000
3	39998_3361_Cal2	5.000	5.000	5.000	5.000	500.000	5.000	5.000	5.000	5.000	5.000
4	39999_3361_Cal3	50.000	50.000	50.000	50.000	2500.000	50.000	50.000	50.000	50.000	50.000
5	40000_3361_Cal4	250.000	250.000	250.000	250.000	12500.000	250.000	250.000	250.000	250.000	250.000
6	40001_3361_Cal5	500.000	500.000	500.000	500.000	25000.000	500.000	500.000	500.000	500.000	500.000
Id	Label	Se	Sr	Zr	Mo	Ag	Cd	Sn	Sb	Ba	Hg
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	39996_3361_Cal0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	39997_3361_Cal1	1.000	1.000	1.000	1.000	0.500	1.000	1.000	1.000	1.000	0.200
3	39998_3361_Cal2	5.000	5.000	5.000	5.000	2.500	5.000	5.000	5.000	5.000	0.500
4	39999_3361_Cal3	50.000	50.000	50.000	50.000	25.000	50.000	50.000	50.000	50.000	1.000
5	40000_3361_Cal4	250.000	250.000	250.000	250.000	125.000	250.000	250.000	250.000	250.000	10.000
6	40001_3361_Cal5	500.000	500.000	500.000	500.000	250.000	500.000	500.000	500.000	500.000	25.000
Id	Label	Tl	Pb	U							
		ppb	ppb	ppb							
1	39996_3361_Cal0	0.000	0.000	0.000							
2	39997_3361_Cal1	1.000	1.000	1.000							
3	39998_3361_Cal2	5.000	5.000	5.000							
4	39999_3361_Cal3	50.000	50.000	50.000							
5	40000_3361_Cal4	250.000	250.000	250.000							
6	40001_3361_Cal5	500.000	500.000	500.000							

Calibration Technique

Use External Drift Correction - No
Calibrate by - Isotope

Symbol	Interference Correction	RSF	Calibration Method	Line Fit	Weighting	Forcing	Use for Semi-Quant	Max Error	Minimum Correlation
7Li	Yes	0.36	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
9Be	Yes	0.07	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
10B	Yes	0.13	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
23Na	Yes	0.55	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
25Mg	Yes	0.49	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
27Al	Yes	0.45	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
28Si	Yes	0.20	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
31P	Yes	0.02	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
34S	Yes	0.04	Semi-Quantified				No		
35Cl	Yes	0.00	Semi-Quantified				No		
39K	Yes	0.38	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
43Ca	Yes	0.81	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
45Sc-KED	Yes	0.60	None				No		
47Ti	Yes	0.38	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
51V	Yes	0.39	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
52Cr	Yes	0.46	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
55Mn	Yes	0.70	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
54Fe	Yes	0.60	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
59Co	Yes	0.42	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
60Ni	Yes	0.33	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
63Cu	Yes	0.33	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
66Zn	Yes	0.35	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
72Ge	Yes	0.35	None				No		
73Ge	Yes	0.35	None				No		
75As	Yes	0.05	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
78Se	Yes	0.07	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
83Kr	Yes	0.00	None				No		
88Sr	Yes	0.66	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
89Y	Yes	0.74	None				No		
90Zr	Yes	0.61	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
95Mo	Yes	0.63	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
107Ag	Yes	0.45	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
111Cd	Yes	0.55	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
115In	Yes	0.77	None				No		
118Sn	Yes	0.69	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
121Sb	Yes	0.34	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
137Ba	Yes	0.53	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
159Tb	Yes	0.90	None				No		
184W	Yes	0.71	Semi-Quantified				No		

201Hg	Yes	0.06	Fully-Quantified	Linear	Absolute SD	None	Yes	0.998000
206Pb	Yes	0.55	Fully-Quantified	Linear	Absolute SD	None	Yes	0.998000
207Pb	Yes	0.55	Fully-Quantified	Linear	Absolute SD	None	Yes	0.998000
208Pb	Yes	0.55	Fully-Quantified	Linear	Absolute SD	None	Yes	0.998000
209Bi	Yes	0.45	None				No	
238U	Yes	0.65	Fully-Quantified	Linear	Absolute SD	None	Yes	0.998000
205Tl	Yes	0.58	Fully-Quantified	Linear	Absolute SD	None	Yes	0.998000
53Cl O	Yes		Semi-Quantified				No	
45Sc-CCT	Yes	0.60	None				No	

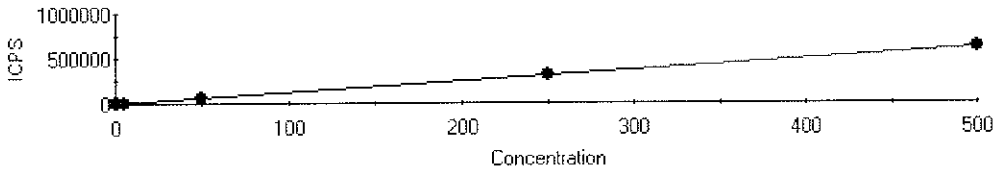
Sample List

No	Label	Type	Weight	Rack	Row	Col	Height
1	39996_3361_Cal0	Fully Quant Standard	1.000	0	1	8	144
2	39997_3361_Cal1	Fully Quant Standard	1.000	0	1	2	144
3	39998_3361_Cal2	Fully Quant Standard	1.000	0	1	3	144
4	39999_3361_Cal3	Fully Quant Standard	1.000	0	1	4	144
5	40000_3361_Cal4	Fully Quant Standard	1.000	0	1	5	144
6	40001_3361_Cal5	Fully Quant Standard	1.000	0	1	6	144
7	39693_3361_ICV	Unknown	1.000	1	1	1	144
8	39996_3361_ICB	Unknown	1.000	0	1	8	144
9	39997_3361_CRDL_A1	Unknown	1.000	0	1	2	144
10	39998_3361_CRDL_B1	Unknown	1.000	0	1	3	144
11	39698_3361_ICSA1	Unknown	1.000	1	1	2	144
12	39699_3361_ICSAB1	Unknown	1.000	1	1	3	144
13	40002_3361_CCV1	Unknown	1.000	0	1	7	144
14	39996_3361_CCB1	Unknown	1.000	0	1	1	144
15	686242_3358	Unknown	1.000	1	2	1	144
16	686246_3358	Unknown	1.000	1	2	2	144
17	686243_3358	Unknown	1.000	1	2	3	144
18	686247_3358	Unknown	1.000	1	2	4	144
19	4067361001_3358	Unknown	1.000	1	2	5	144
20	686248_3358	Unknown	1.000	1	2	6	144
21	686249_3358	Unknown	1.000	1	2	7	144
22	688831_3358	Unknown	1.000	1	2	8	144
23	4067361002_3358	Unknown	1.000	1	2	9	144
24	688832_3358x5	Unknown	1.000	1	2	10	144
25	40002_3361_CCV2	Unknown	1.000	0	1	7	144
26	39996_3361_CCB2	Unknown	1.000	0	1	1	144
27	4067361003_3358	Unknown	1.000	1	2	11	144
28	4067361004_3358	Unknown	1.000	1	2	12	144
29	4067361005_3358	Unknown	1.000	1	3	1	144
30	4067361006_3358	Unknown	1.000	1	3	2	144
31	4067361007_3358	Unknown	1.000	1	3	3	144
32	4067361008_3358	Unknown	1.000	1	3	4	144
33	4067361009_3358	Unknown	1.000	1	3	5	144
34	4067361010_3358	Unknown	1.000	1	3	6	144
35	4067361011_3358	Unknown	1.000	1	3	7	144
36	4067361012_3358	Unknown	1.000	1	3	8	144
37	40002_3361_CCV3	Unknown	1.000	0	1	7	144
38	39996_3361_CCB3	Unknown	1.000	0	1	1	144
39	4067361013_3358	Unknown	1.000	1	3	9	144
40	4067361014_3358	Unknown	1.000	1	3	10	144
41	4067361015_3358	Unknown	1.000	1	3	11	144
42	4067361016_3358	Unknown	1.000	1	3	12	144
43	4067361017_3358	Unknown	1.000	1	4	1	144
44	4067361018_3358	Unknown	1.000	1	4	2	144
45	4067361019_3358	Unknown	1.000	1	4	3	144
46	Blank	Unknown	1.000	0	1	8	144
47	686525_3359	Unknown	1.000	2	1	1	144
48	686527_3359	Unknown	1.000	2	1	2	144
49	40002_3361_CCV4	Unknown	1.000	0	1	7	144
50	39996_3361_CCB4	Unknown	1.000	0	1	1	144
51	686526_3359	Unknown	1.000	2	1	3	144
52	686528_3359	Unknown	1.000	2	1	4	144
53	4067362001_3359	Unknown	1.000	2	1	5	144
54	686529_3359	Unknown	1.000	2	1	6	144
55	686530_3359	Unknown	1.000	2	1	7	144
56	688843_3359	Unknown	1.000	2	1	8	144
57	4067362002_3359	Unknown	1.000	2	1	9	144
58	688844_3359x5	Unknown	1.000	2	1	10	144
59	4067362003_3359	Unknown	1.000	2	1	11	144
60	4067362004_3359	Unknown	1.000	2	1	12	144
61	40002_3361_CCV5	Unknown	1.000	0	1	7	144
62	39996_3361_CCB5	Unknown	1.000	0	1	1	144
63	4067362005_3359	Unknown	1.000	2	2	1	144
64	4067362006_3359	Unknown	1.000	2	2	2	144

65	4067362007_3359	Unknown	1.000	2	2	3	144
66	4067362008_3359	Unknown	1.000	2	2	4	144
67	4067362009_3359	Unknown	1.000	2	2	5	144
68	4067362010_3359	Unknown	1.000	2	2	6	144
69	4067362011_3359	Unknown	1.000	2	2	7	144
70	4067362012_3359	Unknown	1.000	2	2	8	144
71	4067362013_3359	Unknown	1.000	2	2	9	144
72	4067362014_3359	Unknown	1.000	2	2	10	144
73	40002_3361_CCV6	Unknown	1.000	0	1	7	144
74	39996_3361_CCB6	Unknown	1.000	0	1	1	144
75	4067362015_3359	Unknown	1.000	2	2	11	144
76	4067362016_3359	Unknown	1.000	2	2	12	144
77	4067362017_3359	Unknown	1.000	2	3	1	144
78	4067362018_3359	Unknown	1.000	2	3	2	144
79	Blank	Unknown	1.000	0	1	8	144
80	686605_3360	Unknown	1.000	2	3	12	144
81	686611_3360	Unknown	1.000	2	4	1	144
82	686606_3360	Unknown	1.000	2	4	2	144
83	686612_3360	Unknown	1.000	2	4	3	144
84	4067620001_3360	Unknown	1.000	2	4	4	144
85	40002_3361_CCV7	Unknown	1.000	0	1	7	144
86	39996_3361_CCB7	Unknown	1.000	0	1	1	144
87	686613_3360	Unknown	1.000	2	4	5	144
88	686614_3360	Unknown	1.000	2	4	6	144
89	688848_3360	Unknown	1.000	2	4	7	144
90	4067620002_3360	Unknown	1.000	2	4	8	144
91	688849_3360x5	Unknown	1.000	2	4	9	144
92	4067620003_3360	Unknown	1.000	2	4	10	144
93	4067620004_3360	Unknown	1.000	2	4	11	144
94	4067620005_3360	Unknown	1.000	2	4	12	144
95	4067620006_3360	Unknown	1.000	2	5	1	144
96	4067620007_3360	Unknown	1.000	2	5	2	144
97	40002_3361_CCV8	Unknown	1.000	0	1	7	144
98	39996_3361_CCB8	Unknown	1.000	0	1	1	144
99	4067620008_3360	Unknown	1.000	2	5	3	144
100	4067620009_3360	Unknown	1.000	2	5	4	144
101	4067620010_3360	Unknown	1.000	2	5	5	144
102	4067365001_3360	Unknown	1.000	2	5	6	144
103	4067365002_3360	Unknown	1.000	2	5	7	144
104	4067365003_3360	Unknown	1.000	2	5	8	144
105	4067365004_3360	Unknown	1.000	2	5	9	144
106	4067365005_3360	Unknown	1.000	2	5	10	144
107	4067365006_3360	Unknown	1.000	2	5	11	144
108	4067365007_3360	Unknown	1.000	2	5	12	144
109	40002_3361_CCV9	Unknown	1.000	0	1	7	144
110	39996_3361_CCB9	Unknown	1.000	0	1	1	144

Fully Quant Calibration

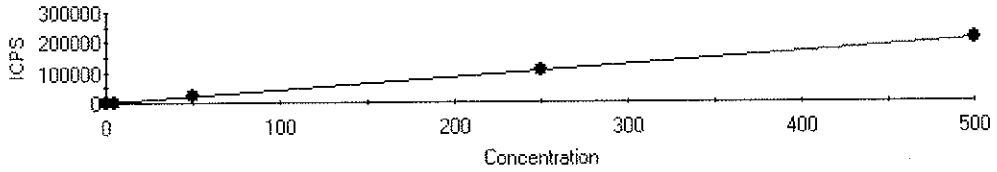
7Li FQ Block 1



Intercept CPS=34.132502 Intercept Conc=0.028168
Sensitivity=1211.728790 Correlation Coeff=0.999943

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	0.003	0.003	37.74	0.00
39997_3361_Cal1	1.000	0.938	0.062	1171.18	6.16
39998_3361_Cal2	5.000	4.972	0.028	6058.54	0.57
39999_3361_Cal3	50.000	50.528	0.528	61260.75	1.06
40000_3361_Cal4	250.000	250.054	0.054	303031.26	0.02
40001_3361_Cal5	500.000	511.575	11.575	619924.87	2.32

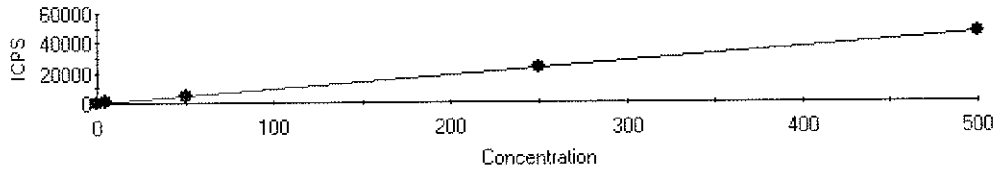
9Be FQ Block 1



Intercept CPS=13.904888 Intercept Conc=0.033062
Sensitivity=420.575076 Correlation Coeff=0.999973

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	0.000	0.000	14.06	0.00
39997_3361_Cal1	1.000	0.962	0.038	418.43	3.82
39998_3361_Cal2	5.000	5.112	0.112	2164.08	2.25
39999_3361_Cal3	50.000	51.096	1.096	21503.53	2.19
40000_3361_Cal4	250.000	249.471	0.529	104935.25	0.21
40001_3361_Cal5	500.000	491.771	8.229	206840.37	1.65

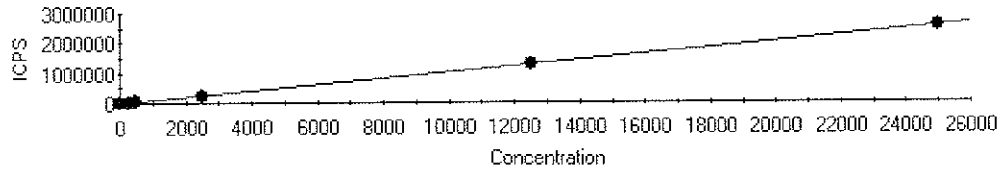
10B FQ Block 1



Intercept CPS=177.387133 Intercept Conc=1.935016
Sensitivity=91.672183 Correlation Coeff=0.999989

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	-0.361	0.361	144.34	0.00
39998_3361_Cal2	5.000	5.320	0.320	665.04	6.39
39999_3361_Cal3	50.000	50.405	0.405	4798.16	0.81
40000_3361_Cal4	250.000	247.498	2.502	22866.07	1.00
40001_3361_Cal5	500.000	499.128	0.872	45933.54	0.17

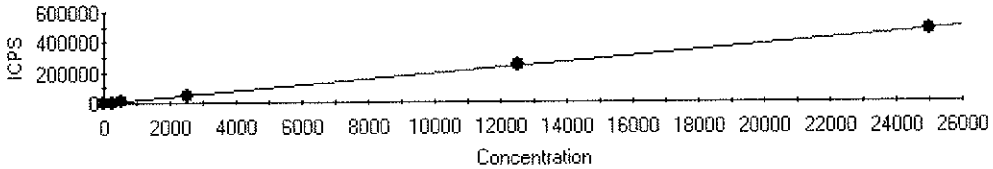
23Na FQ Block 1



Intercept CPS=2193.968525 Intercept Conc=21.457115
Sensitivity=102.248997 Correlation Coeff=0.999958

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	-0.068	0.068	2186.98	0.00
39997_3361_Cal1	250.000	251.579	1.579	27917.70	0.63
39998_3361_Cal2	500.000	503.702	3.702	53696.98	0.74
39999_3361_Cal3	2500.000	2446.953	53.047	252392.48	2.12
40000_3361_Cal4	12500.000	12140.761	359.239	1243574.62	2.87
40001_3361_Cal5	25000.000	24746.035	253.965	2532451.21	1.02

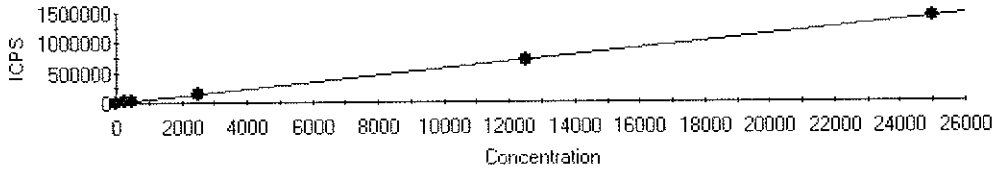
25Mg FQ Block 1



Intercept CPS=83.585294 Intercept Conc=4.360883
Sensitivity=19.167056 Correlation Coeff=0.999991

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	-1.578	1.578	53.34	0.00
39997_3361_Cal1	250.000	252.448	2.448	4922.27	0.98
39998_3361_Cal2	500.000	515.875	15.875	9971.38	3.17
39999_3361_Cal3	2500.000	2486.094	13.906	47734.69	0.56
40000_3361_Cal4	12500.000	12368.036	131.964	237142.43	1.06
40001_3361_Cal5	25000.000	24514.372	485.628	469951.93	1.94

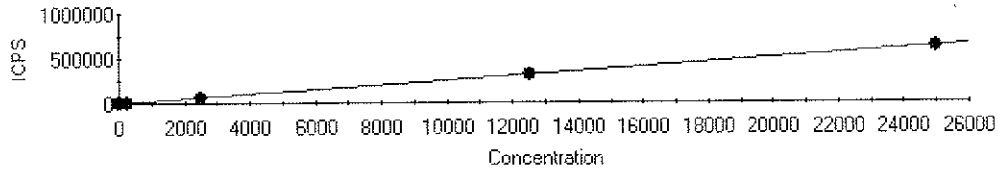
27Al FQ Block 1



Intercept CPS=334.481463 Intercept Conc=5.868350
Sensitivity=56.997534 Correlation Coeff=0.999999

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	-0.750	0.750	291.73	0.00
39997_3361_Cal1	250.000	248.388	1.612	14492.00	0.64
39998_3361_Cal2	500.000	510.859	10.859	29452.20	2.17
39999_3361_Cal3	2500.000	2473.724	26.276	141330.67	1.05
40000_3361_Cal4	12500.000	12310.493	189.507	702002.22	1.52
40001_3361_Cal5	25000.000	24693.071	306.929	1407778.66	1.23

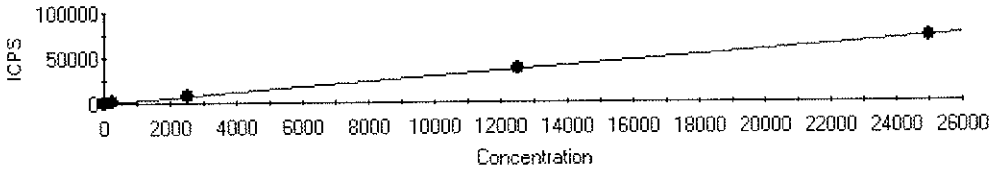
28Si FQ Block 1



Intercept CPS=441.569834 Intercept Conc=17.329169
Sensitivity=25.481305 Correlation Coeff=0.999834

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	-0.872	0.872	419.36	0.00
39997_3361_Cal1	50.000	105.785	55.785	3137.12	111.57
39998_3361_Cal2	250.000	267.565	17.565	7259.48	7.03
39999_3361_Cal3	2500.000	2556.853	56.853	65593.53	2.27
40000_3361_Cal4	12500.000	12345.224	154.776	315013.99	1.24
40001_3361_Cal5	25000.000	23955.519	1044.481	610859.45	4.18

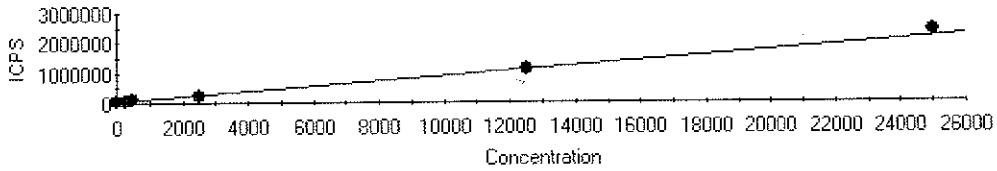
31P FQ Block 1



Intercept CPS=204.470330 Intercept Conc=71.570304
Sensitivity=2.856916 Correlation Coeff=0.999960

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	-3.615	3.615	194.14	0.00
39997_3361_Cal1	50.000	42.374	7.626	325.53	15.25
39998_3361_Cal2	250.000	271.808	21.808	981.00	8.72
39999_3361_Cal3	2500.000	2551.526	51.526	7493.97	2.06
40000_3361_Cal4	12500.000	12669.861	169.861	36401.20	1.36
40001_3361_Cal5	25000.000	24873.385	126.615	71265.64	0.51

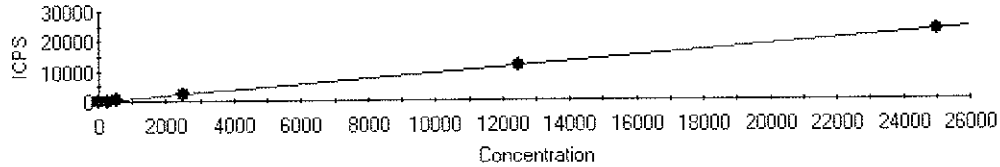
39K FQ Block 1



Intercept CPS=51175.827629 Intercept Conc=600.720187
Sensitivity=85.190790 Correlation Coeff=0.999385

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	8.787	8.787	51924.38	0.00
39997_3361_Cal1	250.000	259.214	9.214	73258.50	3.69
39998_3361_Cal2	500.000	487.773	12.227	92729.58	2.45
39999_3361_Cal3	2500.000	2410.164	89.836	256499.61	3.59
40000_3361_Cal4	12500.000	12473.893	26.107	1113836.64	0.21
40001_3361_Cal5	25000.000	26901.444	1901.444	2342931.13	7.61

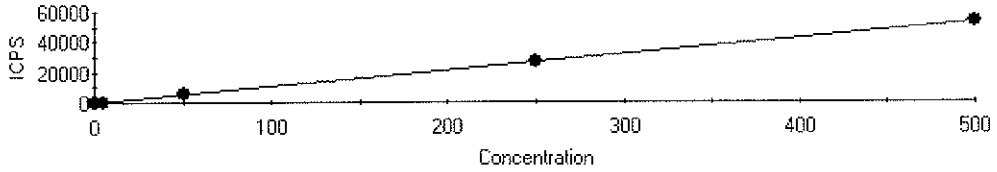
43Ca FQ Block 1



Intercept CPS=12.119015 Intercept Conc=12.971623
Sensitivity=0.934271 Correlation Coeff=0.999998

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	-0.734	0.734	11.43	0.00
39997_3361_Cal1	250.000	255.944	5.944	251.24	2.38
39998_3361_Cal2	500.000	511.778	11.778	490.26	2.36
39999_3361_Cal3	2500.000	2519.533	19.533	2366.05	0.78
40000_3361_Cal4	12500.000	12501.255	1.255	11691.68	0.01
40001_3361_Cal5	25000.000	24905.818	94.182	23280.91	0.38

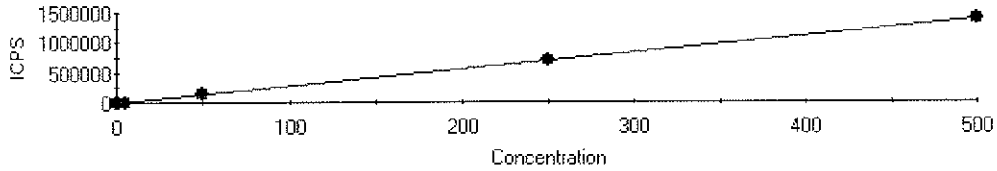
47Ti FQ Block 1



Intercept CPS=17.153420 Intercept Conc=0.161410
Sensitivity=106.272243 Correlation Coeff=0.999994

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	-0.008	0.008	16.28	0.00
39997_3361_Cal1	1.000	1.028	0.028	126.35	2.75
39998_3361_Cal2	5.000	5.100	0.100	559.17	2.01
39999_3361_Cal3	50.000	49.869	0.131	5316.89	0.26
40000_3361_Cal4	250.000	250.368	0.368	26624.32	0.15
40001_3361_Cal5	500.000	497.001	2.999	52834.56	0.60

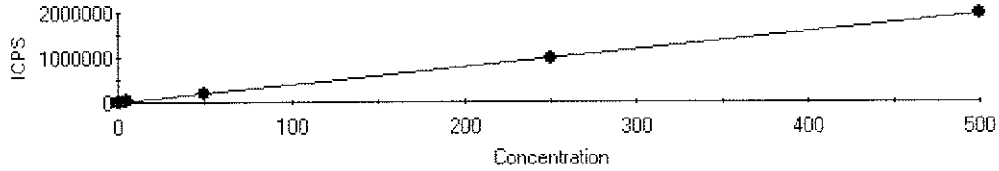
51V FQ Block 1



Intercept CPS=96.209194 Intercept Conc=0.034630
Sensitivity=2778.183686 Correlation Coeff=0.999995

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	0.126	0.126	446.74	0.00
39997_3361_Cal1	1.000	1.048	0.048	3007.18	4.78
39998_3361_Cal2	5.000	5.020	0.020	14043.03	0.40
39999_3361_Cal3	50.000	49.977	0.023	138942.43	0.05
40000_3361_Cal4	250.000	249.416	0.584	693019.22	0.23
40001_3361_Cal5	500.000	502.129	2.129	1395103.85	0.43

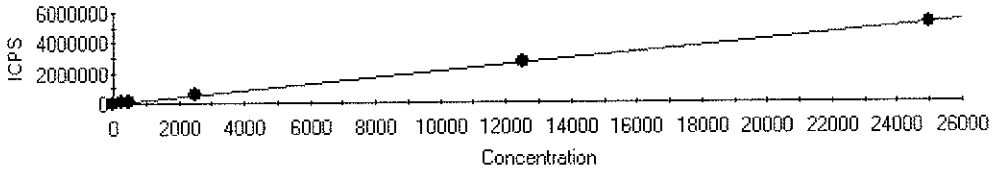
52Cr FQ Block 1



Intercept CPS=331.249442 Intercept Conc=0.084546
Sensitivity=3917.964779 Correlation Coeff=0.999998

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	-0.002	0.002	325.02	0.00
39997_3361_Cal1	1.000	1.035	0.035	4386.08	3.49
39998_3361_Cal2	5.000	4.954	0.046	19742.76	0.91
39999_3361_Cal3	50.000	49.841	0.159	195606.48	0.32
40000_3361_Cal4	250.000	249.884	0.116	979369.77	0.05
40001_3361_Cal5	500.000	501.737	1.737	1966120.48	0.35

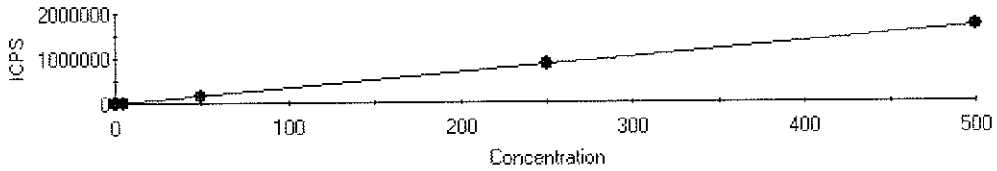
54Fe FQ Block 1



Intercept CPS=1871.895152 Intercept Conc=8.969731
Sensitivity=208.690221 Correlation Coeff=0.999904

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	-0.420	0.420	1784.24	0.00
39997_3361_Cal1	250.000	281.041	31.041	60522.40	12.42
39998_3361_Cal2	500.000	565.409	65.409	119867.13	13.08
39999_3361_Cal3	2500.000	2808.881	308.881	588057.92	12.36
40000_3361_Cal4	12500.000	12627.627	127.627	2637134.17	1.02
40001_3361_Cal5	25000.000	24777.460	222.540	5172685.48	0.89

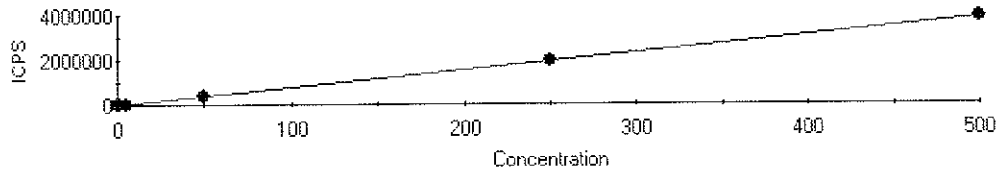
55Mn FQ Block 1



Intercept CPS=100.720819 Intercept Conc=0.029552
Sensitivity=3408.238989 Correlation Coeff=1.000000

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	0.000	0.000	100.73	0.00
39997_3361_Cal1	1.000	1.005	0.005	3525.77	0.49
39998_3361_Cal2	5.000	4.961	0.039	17009.42	0.78
39999_3361_Cal3	50.000	49.895	0.105	170153.26	0.21
40000_3361_Cal4	250.000	250.312	0.312	853224.54	0.12
40001_3361_Cal5	500.000	501.245	1.245	1708464.86	0.25

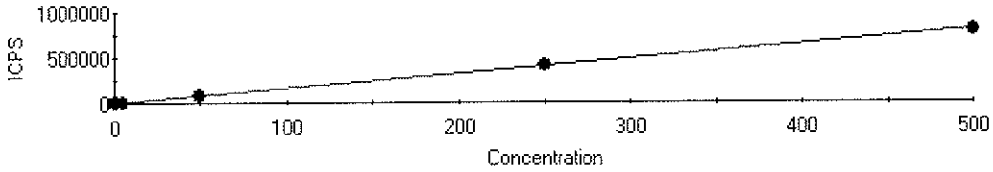
59Co FQ Block 1



Intercept CPS=94.032458 Intercept Conc=0.012347
Sensitivity=7616.000252 Correlation Coeff=0.999998

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	0.000	0.000	95.55	0.00
39997_3361_Cal1	1.000	0.990	0.010	7635.89	0.97
39998_3361_Cal2	5.000	4.937	0.063	37692.91	1.26
39999_3361_Cal3	50.000	49.598	0.402	377835.96	0.80
40000_3361_Cal4	250.000	250.931	0.931	1911181.91	0.37
40001_3361_Cal5	500.000	500.174	0.174	3809421.04	0.03

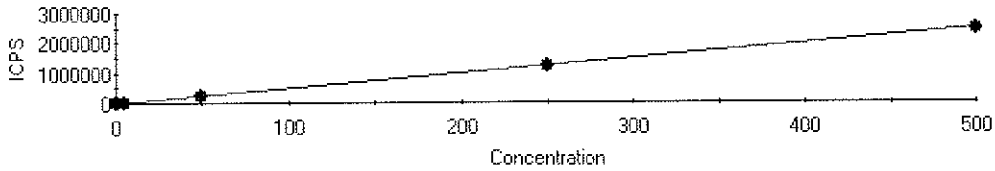
60Ni FQ Block 1



Intercept CPS=57.802665 Intercept Conc=0.035532
Sensitivity=1626.761231 Correlation Coeff=0.999928

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	-0.005	0.005	50.37	0.00
39997_3361_Cal1	1.000	1.015	0.015	1708.72	1.49
39998_3361_Cal2	5.000	5.125	0.125	8394.65	2.50
39999_3361_Cal3	50.000	50.847	0.847	82774.38	1.69
40000_3361_Cal4	250.000	249.771	0.229	406375.66	0.09
40001_3361_Cal5	500.000	487.373	12.627	792896.73	2.53

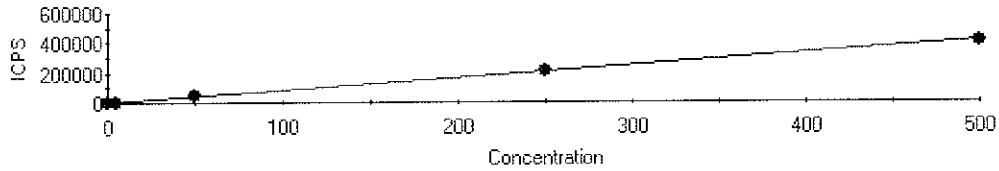
63Cu FQ Block 1



Intercept CPS=248.163764 Intercept Conc=0.050503
Sensitivity=4913.878278 Correlation Coeff=0.999963

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	-0.000	0.000	248.15	0.00
39997_3361_Cal1	1.000	0.981	0.019	5067.40	1.93
39998_3361_Cal2	5.000	5.061	0.061	25118.74	1.23
39999_3361_Cal3	50.000	50.589	0.589	248838.45	1.18
40000_3361_Cal4	250.000	250.049	0.049	1228959.61	0.02
40001_3361_Cal5	500.000	491.326	8.674	2414565.53	1.73

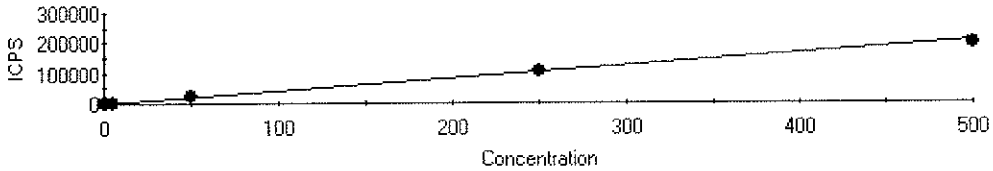
66Zn FQ Block 1



Intercept CPS=609.756256 Intercept Conc=0.736916
Sensitivity=827.442930 Correlation Coeff=0.999837

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	-0.016	0.016	596.28	0.00
39998_3361_Cal2	5.000	5.630	0.630	5268.14	12.60
39999_3361_Cal3	50.000	51.994	1.994	43631.54	3.99
40000_3361_Cal4	250.000	255.423	5.423	211958.09	2.17
40001_3361_Cal5	500.000	492.607	7.393	408213.79	1.48

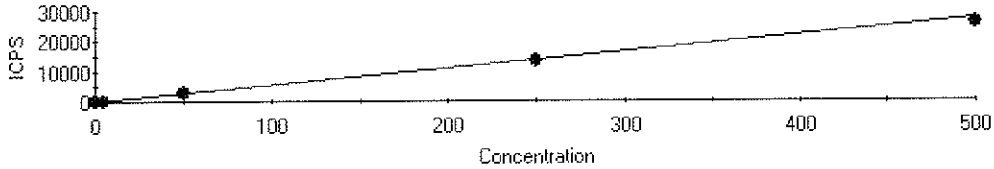
75As FQ Block 1



Intercept CPS=414.914149 Intercept Conc=1.011896
Sensitivity=410.036361 Correlation Coeff=0.999894

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	-0.005	0.005	412.76	0.00
39997_3361_Cal1	1.000	1.002	0.002	825.97	0.25
39998_3361_Cal2	5.000	5.005	0.005	2467.24	0.10
39999_3361_Cal3	50.000	50.709	0.709	21207.48	1.42
40000_3361_Cal4	250.000	248.743	1.257	102408.69	0.50
40001_3361_Cal5	500.000	482.824	17.176	198390.31	3.44

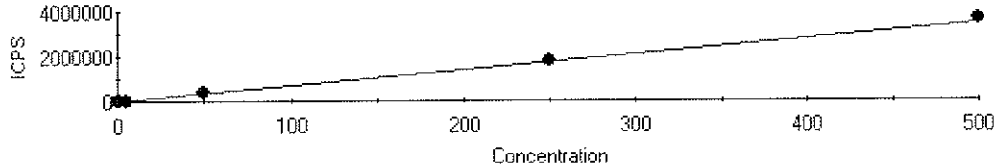
78Se FQ Block 1



Intercept CPS=25.040440 Intercept Conc=0.456917
Sensitivity=54.803010 Correlation Coeff=0.999845

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	-0.342	0.342	6.32	0.00
39997_3361_Cal1	1.000	0.723	0.277	64.65	27.73
39998_3361_Cal2	5.000	4.630	0.370	278.75	7.41
39999_3361_Cal3	50.000	50.008	0.008	2765.63	0.02
40000_3361_Cal4	250.000	245.083	4.917	13456.34	1.97
40001_3361_Cal5	500.000	473.152	26.848	25955.18	5.37

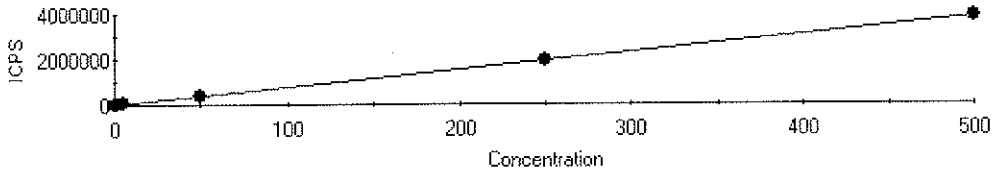
88Sr FQ Block 1



Intercept CPS=382.768662 Intercept Conc=0.054689
Sensitivity=6999.061131 Correlation Coeff=0.999984

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	0.007	0.007	432.51	0.00
39997_3361_Cal1	1.000	0.984	0.016	7269.03	1.61
39998_3361_Cal2	5.000	4.935	0.065	34921.94	1.30
39999_3361_Cal3	50.000	49.993	0.007	350284.19	0.01
40000_3361_Cal4	250.000	256.081	6.081	1792709.64	2.43
40001_3361_Cal5	500.000	517.744	17.744	3624101.83	3.55

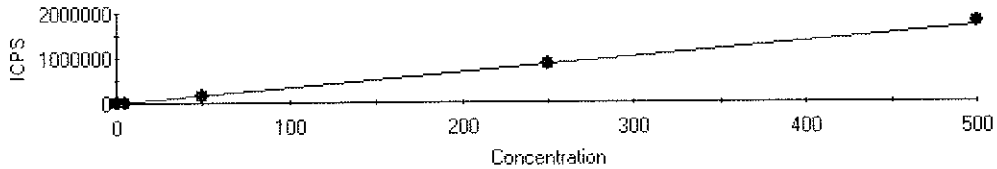
90Zr FQ Block 1



Intercept CPS=730.260816 Intercept Conc=0.094173
Sensitivity=7754.487265 Correlation Coeff=0.999994

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	0.000	0.000	734.13	0.00
39997_3361_Cal1	1.000	0.973	0.027	8277.34	2.67
39998_3361_Cal2	5.000	4.899	0.101	38722.33	2.01
39999_3361_Cal3	50.000	49.382	0.618	383664.79	1.24
40000_3361_Cal4	250.000	250.162	0.162	1940611.96	0.06
40001_3361_Cal5	500.000	496.801	3.199	3853168.39	0.64

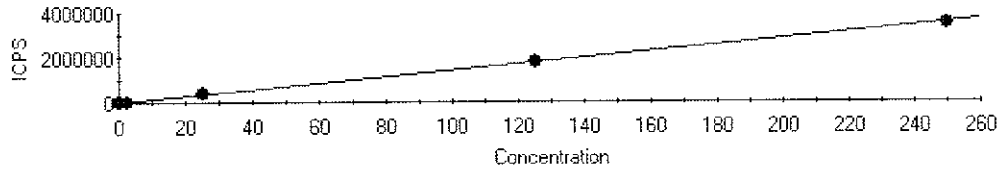
95Mo FQ Block 1



Intercept CPS=150.125148 Intercept Conc=0.044687
Sensitivity=3359.516872 Correlation Coeff=0.999949

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	0.001	0.001	151.85	0.00
39997_3361_Cal1	1.000	0.948	0.052	3335.11	5.20
39998_3361_Cal2	5.000	4.913	0.087	16654.70	1.74
39999_3361_Cal3	50.000	50.752	0.752	170653.79	1.50
40000_3361_Cal4	250.000	256.617	6.617	862258.74	2.65
40001_3361_Cal5	500.000	524.405	24.405	1761898.36	4.88

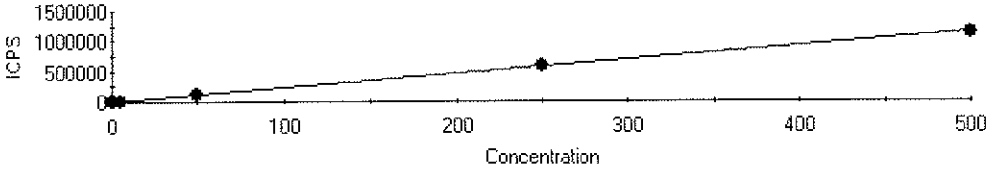
107Ag FQ Block 1



Intercept CPS=933.910866 Intercept Conc=0.065846
Sensitivity=14183.228455 Correlation Coeff=0.999932

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	-0.009	0.009	804.95	0.00
39997_3361_Cal1	0.500	0.490	0.010	7888.63	1.93
39998_3361_Cal2	2.500	2.509	0.009	36519.81	0.36
39999_3361_Cal3	25.000	25.154	0.154	357693.73	0.61
40000_3361_Cal4	125.000	125.027	0.027	1774213.54	0.02
40001_3361_Cal5	250.000	244.052	5.948	3462373.82	2.38

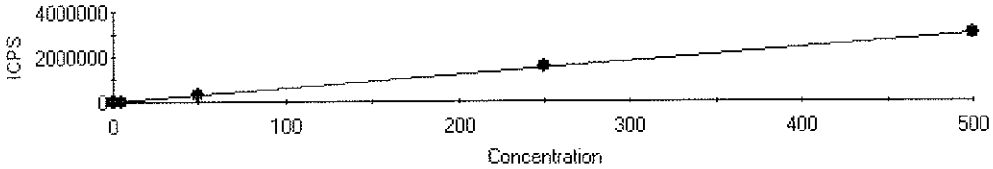
111Cd FQ Block 1



Intercept CPS=32.429976 Intercept Conc=0.014191
Sensitivity=2285.184797 Correlation Coeff=0.999982

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	-0.000	0.000	31.75	0.00
39997_3361_Cal1	1.000	0.982	0.018	2275.47	1.84
39998_3361_Cal2	5.000	5.060	0.060	11596.02	1.20
39999_3361_Cal3	50.000	50.755	0.755	116017.68	1.51
40000_3361_Cal4	250.000	249.890	0.110	571077.30	0.04
40001_3361_Cal5	500.000	493.860	6.140	1128592.76	1.23

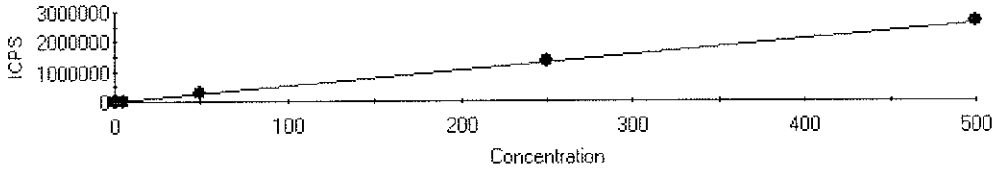
118Sn FQ Block 1



Intercept CPS=749.664867 Intercept Conc=0.126135
Sensitivity=5943.335986 Correlation Coeff=0.999998

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	0.001	0.001	756.31	0.00
39997_3361_Cal1	1.000	0.983	0.017	6594.19	1.66
39998_3361_Cal2	5.000	4.985	0.015	30374.47	0.31
39999_3361_Cal3	50.000	50.190	0.190	299047.49	0.38
40000_3361_Cal4	250.000	252.402	2.402	1500858.99	0.96
40001_3361_Cal5	500.000	506.628	6.628	3011807.73	1.33

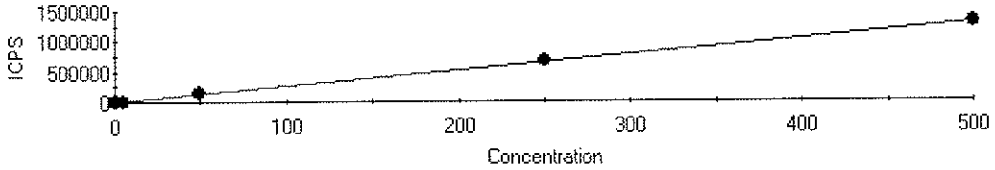
121Sb FQ Block 1



Intercept CPS=180.212588 Intercept Conc=0.034481
Sensitivity=5226.379024 Correlation Coeff=0.999995

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	-0.001	0.001	177.07	0.00
39997_3361_Cal1	1.000	0.983	0.017	5316.84	1.72
39998_3361_Cal2	5.000	5.076	0.076	26709.98	1.52
39999_3361_Cal3	50.000	50.312	0.312	263131.75	0.62
40000_3361_Cal4	250.000	249.984	0.016	1306693.39	0.01
40001_3361_Cal5	500.000	503.106	3.106	2629601.87	0.62

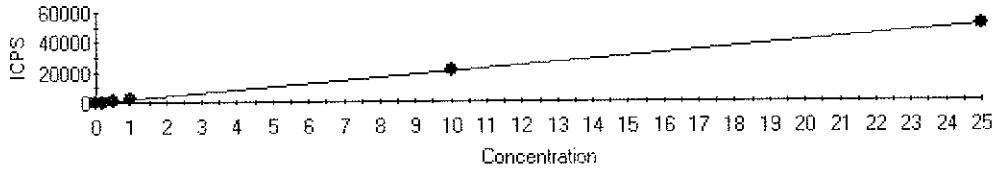
137Ba FQ Block 1



Intercept CPS=300.282461 Intercept Conc=0.115127
Sensitivity=2608.263136 Correlation Coeff=0.999942

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	0.001	0.001	303.71	0.00
39997_3361_Cal1	1.000	0.991	0.009	2884.49	0.92
39998_3361_Cal2	5.000	5.017	0.017	13384.82	0.33
39999_3361_Cal3	50.000	49.707	0.293	129948.65	0.59
40000_3361_Cal4	250.000	251.686	1.686	656764.56	0.67
40001_3361_Cal5	500.000	492.250	7.750	1284217.54	1.55

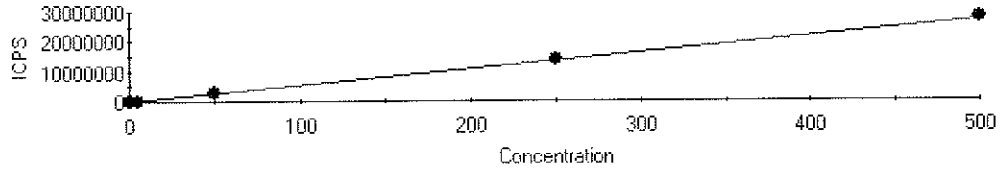
201Hg FQ Block 1



Intercept CPS=30.123532 Intercept Conc=0.014866
Sensitivity=2026.325481 Correlation Coeff=0.999991

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	-0.002	0.002	26.69	0.00
39997_3361_Cal1	0.200	0.204	0.004	444.03	2.13
39998_3361_Cal2	0.500	0.516	0.016	1075.41	3.17
39999_3361_Cal3	1.000	1.004	0.004	2064.99	0.42
40000_3361_Cal4	10.000	10.101	0.101	20498.57	1.01
40001_3361_Cal5	25.000	24.982	0.018	50652.75	0.07

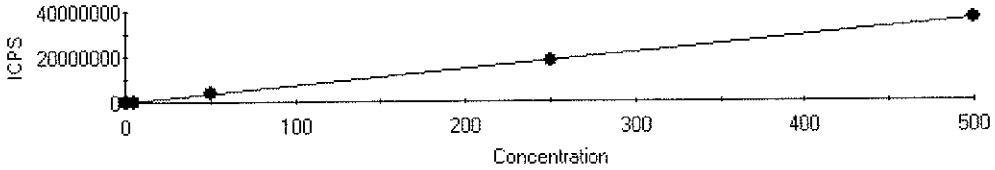
205Tl FQ Block 1



Intercept CPS=3147.201824 Intercept Conc=0.058048
Sensitivity=54216.789028 Correlation Coeff=0.999944

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	0.003	0.003	3317.12	0.00
39997_3361_Cal1	1.000	0.978	0.022	56148.48	2.24
39998_3361_Cal2	5.000	5.003	0.003	274374.76	0.05
39999_3361_Cal3	50.000	52.753	2.753	2863220.93	5.51
40000_3361_Cal4	250.000	250.999	0.999	13611505.29	0.40
40001_3361_Cal5	500.000	512.285	12.285	27777580.06	2.46

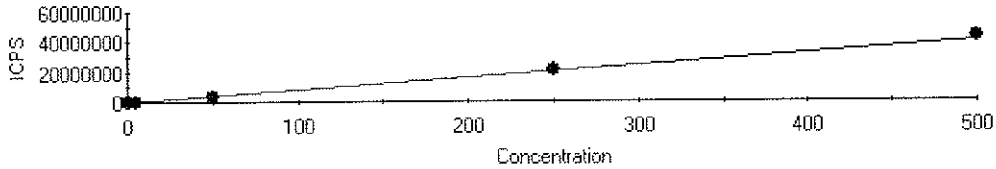
208Pb FQ Block 1



Intercept CPS=1281.983205 Intercept Conc=0.017756
Sensitivity=72200.992669 Correlation Coeff=0.999972

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	0.000	0.000	1297.19	0.00
39997_3361_Cal1	1.000	0.986	0.014	72443.28	1.44
39998_3361_Cal2	5.000	5.022	0.022	363847.77	0.43
39999_3361_Cal3	50.000	51.436	1.436	3715001.63	2.87
40000_3361_Cal4	250.000	247.632	2.368	17880574.90	0.95
40001_3361_Cal5	500.000	502.250	2.250	36264199.73	0.45

238U FQ Block 1



Intercept CPS=997.209106 Intercept Conc=0.012196
Sensitivity=81766.882737 Correlation Coeff=0.999920

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	0.000	0.000	997.76	0.00
39997_3361_Cal1	1.000	0.989	0.011	81835.40	1.14
39998_3361_Cal2	5.000	5.058	0.058	414548.15	1.15
39999_3361_Cal3	50.000	48.989	1.011	4006687.25	2.02
40000_3361_Cal4	250.000	252.930	2.930	20682326.11	1.17
40001_3361_Cal5	500.000	519.113	19.113	42447268.32	3.82

Dilution Corrected Concentrations

39996_3361_Cal0 10/8/2012 6:16:22 PM

User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:16:26	0.012	0.014	-0.009	0.639	-0.867	-1.247	0.367	1.877	163.800	τ 2261000.000
2	18:16:30	-0.004	-0.001	-0.497	-0.925	-2.505	-1.070	-1.097	-0.741	159.500	τ 2304000.000
3	18:16:34	0.001	-0.012	-0.576	0.081	-1.362	0.066	-1.885	-11.980	135.500	τ 2326000.000
x		0.003	0.000	-0.361	-0.068	-1.578	-0.750	-0.872	-3.615	152.900	τ 2297000.000
σ		0.008	0.013	0.307	0.793	0.840	0.713	1.143	7.363	15.240	τ 32960.000
%RSD		275.400	3615.000	85.120	1160.000	53.230	95.010	131.100	203.700	9.967	τ 1.435

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:16:26	-2.531	-1.420	99.551%	100.696%	-0.035	-0.003	-0.004	53.370	-0.646	-0.000
2	18:16:30	14.500	-3.904	99.936%	99.423%	-0.036	0.080	-0.009	54.680	-0.358	0.000
3	18:16:34	14.390	3.121	100.513%	99.881%	0.047	0.302	0.008	53.010	-0.256	-0.000
x		8.787	-0.734	100.000%	100.000%	-0.008	0.126	-0.002	53.690	-0.420	0.000
σ		9.801	3.562	0.484%	0.645%	0.048	0.158	0.009	0.881	0.202	0.000
%RSD		111.500	485.200	0.484	0.645	582.000	124.900	556.600	1.640	48.060	8964.000

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:16:26	-0.001	-0.011	-0.000	0.017	100.247%	-0.030	-0.394	0.001	99.463%	-0.003
2	18:16:30	0.002	-0.001	0.001	-0.014	100.356%	0.004	-0.285	0.009	100.470%	0.003
3	18:16:34	-0.000	-0.001	-0.001	-0.052	99.396%	0.010	-0.346	0.012	100.067%	0.001
x		0.000	-0.005	-0.000	-0.016	100.000%	-0.005	-0.342	0.007	100.000%	0.000
σ		0.002	0.006	0.001	0.035	0.526%	0.021	0.054	0.006	0.506%	0.003
%RSD		808.400	120.400	28060.000	213.400	0.526	408.600	15.890	80.240	0.506	550.300

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:16:26	-0.000	-0.014	-0.002	99.470%	0.002	-0.003	0.011	τ 99.030%	0.003	0.002
2	18:16:30	-0.001	-0.012	0.000	99.991%	-0.001	0.006	-0.014	τ 99.663%	-0.005	0.006
3	18:16:34	0.002	-0.001	0.000	100.539%	0.003	-0.005	0.006	τ 101.307%	-0.003	0.001
x		0.001	-0.009	-0.000	100.000%	0.001	-0.001	0.001	τ 100.000%	-0.002	0.003
σ		0.001	0.007	0.001	0.534%	0.002	0.006	0.013	τ 1.175%	0.004	0.002
%RSD		286.300	77.880	354.600	0.534	187.300	1011.000	995.800	τ 1.175	238.200	76.300

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	18:16:26	0.000	τ 99.299%	-0.000
2	18:16:30	0.001	τ 99.900%	0.000
3	18:16:34	-0.000	τ 100.800%	0.000
x		0.000	τ 100.000%	0.000
σ		0.001	τ 0.756%	0.000
%RSD		302.900	τ 0.756	3101.000

39997_3361_Cal1 10/8/2012 6:21:57 PM

User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:22:01	0.956	1.008	1.234	248.200	250.900	245.400	59.560	25.410	159.200	τ 2242000.000
2	18:22:05	0.879	0.982	1.983	247.100	253.800	250.000	56.160	70.140	126.600	τ 2317000.000
3	18:22:08	0.980	0.895	2.799	259.400	252.700	249.800	τ 201.600	31.570	173.300	τ 2286000.000
x		0.938	0.962	2.006	251.600	252.400	248.400	τ 105.800	42.370	153.000	τ 2282000.000
σ		0.052	0.060	0.783	6.827	1.452	2.547	τ 83.020	24.240	23.940	τ 37500.000
%RSD		5.593	6.199	39.030	2.714	0.575	1.025	τ 78.480	57.220	15.650	τ 1.643

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:22:01	247.500	267.000	101.861%	100.962%	0.966	1.064	1.022	52.640	278.700	0.947
2	18:22:05	261.800	245.800	100.996%	101.462%	0.976	0.927	1.010	54.210	281.400	0.993
3	18:22:08	268.300	255.000	101.061%	101.383%	1.140	1.153	1.072	54.000	283.000	1.075
x		259.200	255.900	101.306%	101.269%	1.028	1.048	1.035	53.620	281.000	1.005
σ		10.680	10.660	0.482%	0.269%	0.098	0.114	0.033	0.850	2.192	0.065
%RSD		4.118	4.164	0.475	0.266	9.520	10.850	3.193	1.586	0.780	6.423

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:22:01	0.983	1.001	0.950	1.347	104.142%	1.126	0.734	0.975	100.103%	0.949
2	18:22:05	0.983	1.025	1.023	1.323	102.077%	0.930	0.837	0.983	100.920%	0.972
3	18:22:08	1.004	1.019	0.969	1.447	102.986%	0.952	0.597	0.994	99.707%	0.999
x		0.990	1.015	0.981	1.372	103.068%	1.002	0.723	0.984	100.243%	0.973
σ		0.012	0.013	0.038	0.066	1.035%	0.107	0.120	0.009	0.619%	0.025
%RSD		1.222	1.270	3.868	4.809	1.004	10.690	16.660	0.945	0.617	2.596

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:22:01	0.921	0.500	0.914	101.307%	0.986	0.977	0.988	τ 100.298%	0.219	0.980
2	18:22:05	0.928	0.485	1.038	102.207%	0.990	0.955	0.964	τ 101.026%	0.186	0.970
3	18:22:08	0.995	0.486	0.992	101.558%	0.974	1.017	1.020	τ 100.510%	0.208	0.983
x		0.948	0.490	0.982	101.691%	0.983	0.983	0.991	τ 100.611%	0.204	0.978
σ		0.041	0.008	0.063	0.464%	0.008	0.032	0.028	τ 0.374%	0.017	0.006
%RSD		4.335	1.636	6.410	0.457	0.828	3.214	2.835	τ 0.372	8.273	0.650

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	18:22:01	0.986	τ 99.682%	0.992
2	18:22:05	0.990	τ 99.737%	0.980
3	18:22:08	0.981	τ 99.987%	0.995
x		0.986	τ 99.802%	0.989
σ		0.005	τ 0.162%	0.008
%RSD		0.460	τ 0.163	0.797

39998_3361_Cal2 10/8/2012 6:27:29 PM

User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:27:33	4.948	4.944	5.187	501.800	514.600	513.200	275.700	250.100	160.700	τ 2275000.000
2	18:27:37	4.956	5.345	5.948	498.200	512.900	508.400	258.300	291.700	143.600	τ 2246000.000
3	18:27:41	5.012	5.049	4.824	511.200	520.100	511.000	268.700	273.600	163.400	τ 2278000.000
x		4.972	5.112	5.320	503.700	515.900	510.900	267.600	271.800	155.900	τ 2267000.000
σ		0.035	0.208	0.574	6.709	3.750	2.414	8.720	20.840	10.690	τ 17810.000
%RSD		0.698	4.064	10.780	1.332	0.727	0.473	3.259	7.666	6.859	τ 0.786

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:27:33	491.400	572.900	100.343%	102.461%	5.471	5.427	4.939	51.220	571.200	4.919
2	18:27:37	477.800	452.700	102.568%	102.098%	4.663	4.876	5.029	53.000	563.400	4.978
3	18:27:41	494.100	509.700	100.969%	102.215%	5.167	4.758	4.896	54.190	561.600	4.987
x		487.800	511.800	101.294%	102.258%	5.100	5.020	4.954	52.800	565.400	4.961
σ		8.702	60.120	1.148%	0.185%	0.408	0.357	0.068	1.493	5.130	0.037
%RSD		1.784	11.750	1.133	0.181	7.998	7.115	1.371	2.828	0.907	0.749

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:27:33	5.032	5.155	5.142	5.982	104.202%	5.000	4.520	4.870	100.591%	4.838
2	18:27:37	4.884	5.147	5.032	5.381	104.731%	4.893	5.298	4.984	100.528%	4.862
3	18:27:41	4.894	5.072	5.010	5.527	104.910%	5.123	4.071	4.950	100.748%	4.999
x		4.937	5.125	5.061	5.630	104.614%	5.005	4.630	4.935	100.622%	4.899
σ		0.083	0.046	0.070	0.314	0.368%	0.115	0.621	0.059	0.113%	0.087
%RSD		1.674	0.894	1.391	5.568	0.352	2.298	13.410	1.185	0.113	1.774

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:27:33	4.921	2.503	5.049	101.155%	5.035	5.131	5.082	τ 100.059%	0.499	4.965
2	18:27:37	4.927	2.514	5.077	101.591%	4.963	5.047	5.011	τ 100.432%	0.528	4.996
3	18:27:41	4.890	2.511	5.054	101.863%	4.955	5.051	4.957	τ 100.589%	0.521	5.047
x		4.913	2.509	5.060	101.536%	4.985	5.076	5.017	τ 100.360%	0.516	5.003
σ		0.020	0.006	0.015	0.358%	0.044	0.048	0.062	τ 0.272%	0.015	0.042
%RSD		0.412	0.232	0.295	0.352	0.887	0.936	1.244	τ 0.271	2.890	0.831

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	18:27:33	5.024	τ 99.566%	5.035
2	18:27:37	5.009	τ 99.494%	5.034
3	18:27:41	5.032	τ 99.817%	5.105
x		5.022	τ 99.626%	5.058
σ		0.011	τ 0.169%	0.041
%RSD		0.223	τ 0.170	0.807

39999_3361_Cal3 10/8/2012 6:33:02 PM

User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:33:05	49.810	51.370	50.690	2406.000	2487.000	2464.000	2545.000	2501.000	152.600	↹2313000.000
2	18:33:09	50.730	50.630	50.500	2567.000	2523.000	2492.000	2559.000	2568.000	167.100	↹2188000.000
3	18:33:13	51.040	51.290	50.020	2368.000	2448.000	2465.000	2567.000	2585.000	147.500	↹2346000.000
x		50.530	51.100	50.410	2447.000	2486.000	2474.000	2557.000	2552.000	155.800	↹2283000.000
σ		0.641	0.402	0.345	105.500	37.760	15.520	10.810	44.360	10.150	↹83240.000
%RSD		1.268	0.787	0.683	4.310	1.519	0.627	0.423	1.739	6.517	↹3.647

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:33:05	2349.000	2463.000	101.984%	102.884%	48.780	50.070	49.540	44.590	2814.000	50.040
2	18:33:09	2499.000	2609.000	102.032%	102.284%	50.660	50.060	49.840	42.850	2793.000	49.790
3	18:33:13	2382.000	2486.000	103.007%	102.200%	50.170	49.800	50.140	42.950	2820.000	49.850
x		2410.000	2520.000	102.341%	102.456%	49.870	49.980	49.840	43.470	2809.000	49.890
σ		78.570	78.690	0.577%	0.373%	0.979	0.154	0.298	0.976	13.830	0.132
%RSD		3.260	3.123	0.564	0.364	1.962	0.308	0.599	2.246	0.492	0.265

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:33:05	49.680	51.050	50.630	52.160	105.511%	50.530	50.000	49.980	100.229%	49.450
2	18:33:09	49.100	50.250	50.880	51.400	105.324%	50.610	50.010	50.020	99.995%	49.160
3	18:33:13	50.020	51.240	50.260	52.420	105.554%	50.980	50.010	49.990	100.560%	49.540
x		49.600	50.850	50.590	51.990	105.463%	50.710	50.010	49.990	100.262%	49.380
σ		0.462	0.522	0.314	0.532	0.122%	0.242	0.007	0.022	0.284%	0.201
%RSD		0.932	1.027	0.621	1.024	0.116	0.476	0.015	0.044	0.283	0.407

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:33:05	51.130	25.210	51.090	100.824%	50.420	50.690	49.480	↹100.660%	1.026	52.320
2	18:33:09	50.300	25.130	50.230	101.664%	49.960	49.720	50.480	↹99.884%	1.012	53.630
3	18:33:13	50.830	25.130	50.950	101.745%	50.190	50.520	49.160	↹101.795%	0.974	52.310
x		50.750	25.150	50.760	101.411%	50.190	50.310	49.710	↹100.780%	1.004	52.750
σ		0.421	0.045	0.461	0.510%	0.231	0.520	0.690	↹0.961%	0.027	0.757
%RSD		0.830	0.179	0.909	0.503	0.460	1.033	1.387	↹0.954	2.668	1.435

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	18:33:05	51.130	↹98.481%	↹48.830
2	18:33:09	51.770	↹98.581%	↹49.430
3	18:33:13	51.410	↹100.330%	↹48.710
x		51.440	↹99.131%	↹48.990
σ		0.321	↹1.040%	↹0.383
%RSD		0.624	↹1.049	↹0.782

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:38:39	249.800	251.700	248.700	↹12220.000	12290.000	12260.000	12230.000	12660.000	163.900	↹2480000.000
2	18:38:43	249.200	248.500	244.700	↹11700.000	12380.000	12200.000	12370.000	12560.000	143.500	↹2545000.000
3	18:38:47	251.200	248.200	249.100	↹12490.000	12440.000	12470.000	12430.000	12790.000	168.600	↹2496000.000
x		250.100	249.500	247.500	↹12140.000	12370.000	12310.000	12350.000	12670.000	158.700	↹2507000.000
σ		1.050	1.943	2.449	↹402.200	77.410	138.200	103.200	115.800	13.370	↹33830.000
%RSD		0.420	0.779	0.990	↹3.313	0.626	1.122	0.836	0.914	8.427	↹1.349

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:38:39	12510.000	12320.000	102.354%	102.715%	249.400	249.600	250.400	-9.957	↹12680.000	250.400
2	18:38:43	12190.000	12670.000	103.984%	102.537%	250.800	249.300	249.400	-8.723	↹12640.000	249.700
3	18:38:47	12730.000	12510.000	103.296%	102.526%	250.900	249.300	249.900	-9.864	↹12570.000	250.800
x		12470.000	12500.000	103.212%	102.593%	250.400	249.400	249.900	-9.515	↹12630.000	250.300
σ		271.000	172.200	0.818%	0.106%	0.837	0.190	0.483	0.687	↹52.530	0.534
%RSD		2.173	1.377	0.793	0.103	0.334	0.076	0.193	7.219	↹0.416	0.214

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:38:39	250.400	250.300	248.100	253.300	105.076%	246.500	242.600	254.300	98.523%	250.200
2	18:38:43	252.600	248.800	251.500	256.800	104.247%	250.700	246.700	258.700	99.627%	250.000
3	18:38:47	249.800	250.200	250.600	256.100	105.775%	249.000	245.900	255.200	100.992%	250.300
x		250.900	249.800	250.000	255.400	105.033%	248.700	245.100	256.100	99.714%	250.200
σ		1.490	0.825	1.739	1.838	0.765%	2.109	2.195	2.296	1.237%	0.179
%RSD		0.594	0.330	0.696	0.720	0.728	0.848	0.896	0.897	1.240	0.072

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:38:39	258.500	125.400	247.600	101.082%	249.400	249.900	250.300	↹100.070%	10.090	↹251.300
2	18:38:43	257.400	124.700	251.700	100.882%	254.000	250.100	251.300	↹100.406%	10.040	↹249.100
3	18:38:47	254.000	124.900	250.400	101.583%	253.800	249.900	253.400	↹100.579%	10.170	↹252.500
x		256.600	125.000	249.900	101.182%	252.400	250.000	251.700	↹100.352%	10.100	↹251.000
σ		2.341	0.337	2.130	0.361%	2.639	0.090	1.575	↹0.259%	0.067	↹1.743
%RSD		0.912	0.270	0.852	0.357	1.045	0.036	0.626	↹0.258	0.661	↹0.695

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	18:38:39	↹247.900	↹96.134%	↹252.100
2	18:38:43	↹246.700	↹97.722%	↹250.900
3	18:38:47	↹248.300	↹97.693%	↹255.800
x		↹247.600	↹97.183%	↹252.900
σ		↹0.808	↹0.908%	↹2.537
%RSD		↹0.326	↹0.935	↹1.003

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:44:13	M 504.800	488.800	496.300	T 24770.000	24610.000	24600.000	23780.000	24860.000	196.700	T 2749000.000
2	18:44:17	TM 522.500	490.700	M 500.700	T 23940.000	24340.000	24640.000	24000.000	24760.000	160.600	T 2843000.000
3	18:44:20	M 507.400	495.900	M 500.400	TM 25540.000	24590.000	24840.000	24080.000	24990.000	168.300	T 2770000.000
x		TM 511.600	491.800	M 499.100	TM 24750.000	24510.000	24690.000	23960.000	24870.000	175.200	T 2787000.000
σ		TM 9.580	3.668	M 2.471	TM 800.100	147.900	127.400	154.600	115.900	19.000	T 49170.000
%RSD		TM 1.873	0.746	M 0.495	TM 3.233	0.603	0.516	0.645	0.466	10.840	T 1.764

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:44:13	TM 26870.000	24640.000	106.013%	106.068%	493.200	M 502.100	M 503.100	-95.700	T 24800.000	M 501.200
2	18:44:17	TM 26230.000	24820.000	107.340%	106.805%	498.200	M 501.600	499.500	-84.100	T 24750.000	499.300
3	18:44:20	TM 27600.000	M 25260.000	106.785%	104.739%	499.600	M 502.700	M 502.600	-87.750	T 24790.000	M 503.200
x		TM 26900.000	M 24910.000	106.713%	105.871%	497.000	M 502.100	M 501.700	-89.180	T 24780.000	M 501.200
σ		TM 684.900	M 319.100	0.666%	1.047%	3.390	M 0.511	M 1.941	5.931	T 27.290	M 1.921
%RSD		TM 2.546	M 1.281	0.624	0.989	0.682	M 0.102	M 0.387	6.651	T 0.110	M 0.383

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:44:13	TM 500.500	491.200	494.200	495.100	106.195%	486.800	471.700	TM 515.400	99.788%	T 496.900
2	18:44:17	TM 500.900	483.700	T 487.400	491.200	108.401%	482.800	474.400	TM 521.600	100.532%	T 498.800
3	18:44:20	T 499.100	487.200	492.300	491.600	109.306%	478.800	473.300	TM 516.300	101.811%	T 494.800
x		TM 500.200	487.400	T 491.300	492.600	107.968%	482.800	473.200	TM 517.700	100.710%	T 496.800
σ		TM 0.925	3.712	T 3.513	2.170	1.600%	3.991	1.356	TM 3.389	1.024%	T 2.015
%RSD		TM 0.185	0.762	T 0.715	0.441	1.482	0.827	0.287	TM 0.655	1.016	T 0.406

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:44:13	M 524.100	T 243.700	493.200	101.600%	M 513.300	M 500.800	T 492.100	T 99.960%	24.940	TM 510.300
2	18:44:17	M 529.100	T 243.500	495.500	102.166%	M 513.000	M 505.500	T 487.200	T 101.767%	24.990	TM 508.300
3	18:44:20	M 520.000	T 244.900	492.900	102.443%	T 493.600	M 503.000	T 497.400	T 102.415%	M 25.020	TM 518.200
x		M 524.400	T 244.100	493.900	102.069%	TM 506.600	M 503.100	T 492.200	T 101.381%	M 24.980	TM 512.300
σ		M 4.573	T 0.771	1.423	0.430%	TM 11.300	M 2.372	T 5.106	T 1.272%	M 0.040	TM 5.222
%RSD		M 0.872	T 0.316	0.288	0.421	TM 2.231	M 0.472	T 1.037	T 1.255	M 0.161	TM 1.019

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	18:44:13	T 498.800	T 94.748%	TM 517.000
2	18:44:17	T 500.000	T 96.296%	TM 514.100
3	18:44:20	TM 508.000	T 95.506%	TM 526.200
x		TM 502.200	T 95.517%	TM 519.100
σ		TM 4.983	T 0.774%	TM 6.305
%RSD		TM 0.992	T 0.810	TM 1.214

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:49:47	109.100	112.300	116.500	5670.000	5614.000	5481.000	5623.000	5618.000	143.000	τ2303000.000
2	18:49:50	110.200	112.000	114.800	5725.000	5542.000	5538.000	5582.000	5826.000	162.600	τ2286000.000
3	18:49:54	111.500	112.200	115.800	5552.000	5545.000	5467.000	5565.000	5797.000	132.300	τ2308000.000
x		110.300	112.200	115.700	5649.000	5567.000	5495.000	5590.000	5747.000	146.000	τ2299000.000
σ		1.205	0.118	0.819	88.130	40.930	37.710	29.440	112.500	15.320	τ11330.000
%RSD		1.092	0.106	0.708	1.560	0.735	0.686	0.527	1.957	10.500	τ0.493

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:49:47	5502.000	5672.000	103.647%	105.203%	109.700	108.900	110.500	29.180	6293.000	109.600
2	18:49:50	5556.000	5433.000	104.888%	104.235%	111.900	110.000	109.200	29.110	6275.000	109.200
3	18:49:54	5440.000	5517.000	105.734%	104.105%	109.000	108.800	108.900	28.150	6286.000	108.100
x		5499.000	5541.000	104.756%	104.514%	110.200	109.200	109.500	28.810	6284.000	108.900
σ		58.180	121.200	1.050%	0.600%	1.528	0.669	0.831	0.576	8.986	0.813
%RSD		1.058	2.187	1.002	0.574	1.387	0.613	0.759	1.999	0.143	0.747

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:49:47	109.600	112.900	112.100	117.100	105.565%	113.200	108.900	111.200	101.840%	107.800
2	18:49:50	107.200	110.700	110.100	118.100	107.634%	112.000	110.400	111.100	102.974%	107.200
3	18:49:54	107.800	111.700	109.500	117.600	107.126%	111.600	109.900	110.400	102.547%	107.300
x		108.200	111.700	110.600	117.600	106.775%	112.300	109.700	110.900	102.454%	107.400
σ		1.218	1.088	1.371	0.507	1.078%	0.817	0.756	0.409	0.573%	0.281
%RSD		1.126	0.974	1.240	0.431	1.010	0.728	0.689	0.369	0.559	0.262

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:49:47	112.300	55.070	111.600	102.907%	112.700	109.800	108.300	τ102.032%	4.241	τ106.700
2	18:49:50	111.900	54.830	110.800	103.375%	113.300	110.000	108.300	τ102.925%	4.241	τ106.300
3	18:49:54	112.200	54.530	111.300	103.443%	113.600	110.000	108.500	τ102.898%	4.070	τ105.600
x		112.100	54.810	111.200	103.242%	113.200	109.900	108.400	τ102.618%	4.184	τ106.200
σ		0.220	0.270	0.364	0.291%	0.471	0.086	0.136	τ0.508%	0.099	τ0.550
%RSD		0.197	0.493	0.328	0.282	0.416	0.078	0.125	τ0.495	2.365	τ0.518

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	18:49:47	τ108.500	τ100.788%	τ108.600
2	18:49:50	τ108.200	τ101.811%	τ108.800
3	18:49:54	τ108.000	τ102.017%	τ107.200
x		τ108.300	τ101.539%	τ108.200
σ		τ0.251	τ0.659%	τ0.865
%RSD		τ0.232	τ0.649	τ0.800

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:55:21	0.153	0.098	1.850	10.660	8.619	9.428	13.470	-10.540	141.900	τ 2317000.000
2	18:55:24	0.144	0.157	1.572	10.910	7.766	9.666	16.090	8.312	163.900	τ 2308000.000
3	18:55:28	0.173	0.093	1.626	8.136	6.263	6.381	10.720	4.071	169.800	τ 2283000.000
x		0.157	0.116	1.683	9.902	7.550	8.492	13.430	0.616	158.500	τ 2303000.000
σ		0.015	0.036	0.147	1.535	1.193	1.832	2.684	9.888	14.730	τ 17430.000
%RSD		9.582	30.710	8.750	15.500	15.800	21.570	19.990	1606.000	9.291	τ 0.757

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:55:21	25.880	12.310	104.505%	105.034%	0.138	0.572	0.305	64.160	11.820	0.246
2	18:55:24	20.180	0.781	105.164%	105.746%	0.196	0.140	0.275	66.260	11.410	0.247
3	18:55:28	-4.463	5.483	106.947%	104.829%	0.171	0.286	0.208	65.140	8.022	0.158
x		13.870	6.193	105.539%	105.203%	0.169	0.333	0.263	65.190	10.420	0.217
σ		16.130	5.800	1.263%	0.481%	0.029	0.220	0.050	1.051	2.085	0.051
%RSD		116.300	93.650	1.197	0.458	17.150	66.140	18.950	1.613	20.020	23.700

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:55:21	0.233	0.281	0.261	0.162	106.106%	0.428	-0.025	0.234	103.086%	0.214
2	18:55:24	0.216	0.214	0.223	0.107	107.052%	0.334	0.016	0.241	103.679%	0.209
3	18:55:28	0.154	0.156	0.168	0.055	105.851%	0.201	-0.084	0.173	102.899%	0.139
x		0.201	0.217	0.217	0.108	106.336%	0.321	-0.031	0.216	103.221%	0.187
σ		0.042	0.062	0.047	0.053	0.633%	0.114	0.051	0.037	0.407%	0.042
%RSD		20.810	28.810	21.410	49.350	0.595	35.590	163.400	17.310	0.395	22.400

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:55:21	0.260	0.125	0.230	103.387%	0.281	0.270	0.233	τ 102.917%	0.074	0.588
2	18:55:24	0.272	0.114	0.217	103.833%	0.298	0.246	0.231	τ 102.840%	0.091	0.545
3	18:55:28	0.149	0.068	0.160	103.065%	0.245	0.175	0.149	τ 103.339%	0.080	0.446
x		0.227	0.102	0.202	103.428%	0.275	0.231	0.204	τ 103.032%	0.082	0.526
σ		0.068	0.031	0.037	0.385%	0.027	0.049	0.048	τ 0.269%	0.009	0.073
%RSD		29.910	29.860	18.350	0.373	9.939	21.460	23.410	τ 0.261	10.490	13.830

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	18:55:21	0.266	τ 101.161%	0.226
2	18:55:24	0.237	τ 102.851%	0.221
3	18:55:28	0.164	τ 102.756%	0.152
x		0.223	τ 102.256%	0.200
σ		0.053	τ 0.949%	0.042
%RSD		23.680	τ 0.928	20.940

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:00:55	1.039	1.047	2.264	247.500	252.800	247.500	66.180	43.000	158.300	τ 2337000.000
2	19:00:58	1.023	0.984	2.753	247.600	262.200	249.900	59.730	47.620	145.600	τ 2300000.000
3	19:01:02	0.926	0.994	2.302	240.500	249.700	247.700	61.520	42.760	183.400	τ 2279000.000
x		0.996	1.008	2.439	245.200	254.900	248.400	62.470	44.460	162.400	τ 2305000.000
σ		0.061	0.034	0.272	4.033	6.522	1.350	3.331	2.735	19.230	τ 29350.000
%RSD		6.129	3.361	11.160	1.645	2.559	0.543	5.331	6.152	11.840	τ 1.273

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:00:55	254.900	332.200	101.835%	102.773%	0.884	1.164	1.087	65.030	286.500	1.013
2	19:00:58	245.200	217.000	103.117%	102.388%	1.014	0.836	1.120	66.170	288.900	0.992
3	19:01:02	243.300	240.400	104.094%	102.419%	1.184	0.930	1.028	65.150	282.800	1.042
x		247.800	263.200	103.016%	102.527%	1.028	0.977	1.078	65.450	286.100	1.016
σ		6.215	60.920	1.133%	0.213%	0.150	0.169	0.047	0.627	3.045	0.025
%RSD		2.508	23.140	1.100	0.208	14.620	17.330	4.314	0.958	1.065	2.455

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:00:55	1.004	1.068	1.067	1.304	103.738%	1.172	0.821	0.999	101.411%	0.987
2	19:00:58	1.044	1.077	1.060	1.214	103.622%	1.075	0.754	1.026	101.856%	0.985
3	19:01:02	1.022	1.063	1.074	1.259	104.713%	1.067	0.871	0.968	102.214%	1.030
x		1.023	1.069	1.067	1.259	104.024%	1.105	0.815	0.998	101.827%	1.001
σ		0.020	0.007	0.007	0.045	0.599%	0.059	0.059	0.029	0.402%	0.026
%RSD		1.966	0.651	0.653	3.558	0.576	5.297	7.185	2.907	0.395	2.561

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:00:55	1.035	0.510	1.026	101.524%	1.026	1.044	1.054	τ 101.279%	0.242	1.127
2	19:00:58	0.965	0.484	0.992	102.198%	1.041	1.042	1.010	τ 101.675%	0.270	1.123
3	19:01:02	1.048	0.498	1.056	102.502%	1.051	1.014	0.992	τ 101.790%	0.242	1.110
x		1.016	0.497	1.025	102.075%	1.039	1.033	1.019	τ 101.581%	0.251	1.120
σ		0.045	0.013	0.032	0.501%	0.012	0.017	0.032	τ 0.268%	0.017	0.009
%RSD		4.444	2.568	3.136	0.491	1.196	1.606	3.124	τ 0.264	6.604	0.763

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	19:00:55	1.018	τ 100.313%	1.016
2	19:00:58	1.012	τ 101.463%	1.012
3	19:01:02	1.021	τ 100.730%	1.003
x		1.017	τ 100.836%	1.010
σ		0.005	τ 0.582%	0.007
%RSD		0.463	τ 0.578	0.649

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:06:27	5.247	5.034	6.115	508.700	512.600	504.600	255.600	258.800	156.300	τ 2304000.000
2	19:06:31	4.975	4.951	5.742	504.100	532.300	506.600	253.500	265.900	159.900	τ 2333000.000
3	19:06:35	5.039	4.552	5.775	525.200	514.700	512.900	274.200	248.600	153.800	τ 2251000.000
x		5.087	4.846	5.877	512.700	519.800	508.000	261.100	257.800	156.700	τ 2296000.000
σ		0.142	0.258	0.207	11.110	10.840	4.314	11.400	8.702	3.058	τ 41340.000
%RSD		2.794	5.314	3.515	2.167	2.085	0.849	4.365	3.376	1.952	τ 1.800

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:06:27	503.100	460.200	101.947%	101.787%	5.143	4.836	5.086	61.580	570.800	5.047
2	19:06:31	515.500	503.700	102.565%	101.998%	5.194	5.271	5.082	62.330	569.100	5.012
3	19:06:35	543.300	529.300	103.009%	101.877%	5.151	5.516	5.195	58.570	569.700	4.995
x		520.600	497.700	102.507%	101.887%	5.162	5.208	5.121	60.830	569.900	5.018
σ		20.570	34.950	0.533%	0.106%	0.027	0.344	0.064	1.991	0.843	0.026
%RSD		3.951	7.022	0.520	0.104	0.529	6.608	1.248	3.273	0.148	0.528

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:06:27	4.906	5.263	5.207	5.436	104.228%	5.160	4.857	5.001	100.316%	4.891
2	19:06:31	4.971	5.329	5.224	5.877	104.448%	5.099	4.639	4.964	101.161%	4.960
3	19:06:35	4.990	5.211	5.078	5.564	104.658%	5.087	4.526	4.890	102.316%	4.928
x		4.956	5.268	5.169	5.626	104.445%	5.115	4.674	4.952	101.264%	4.926
σ		0.044	0.060	0.079	0.227	0.215%	0.039	0.169	0.056	1.004%	0.034
%RSD		0.891	1.132	1.538	4.036	0.206	0.763	3.609	1.138	0.991	0.694

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:06:27	5.104	2.513	5.144	101.536%	5.031	4.978	5.075	τ 101.338%	0.499	5.049
2	19:06:31	4.993	2.508	5.126	102.466%	4.993	5.066	4.940	τ 100.648%	0.507	5.071
3	19:06:35	4.927	2.487	5.019	102.718%	4.972	4.954	4.935	τ 102.534%	0.503	5.139
x		5.008	2.503	5.096	102.240%	4.999	5.000	4.983	τ 101.507%	0.503	5.086
σ		0.089	0.014	0.067	0.623%	0.030	0.059	0.079	τ 0.954%	0.004	0.047
%RSD		1.782	0.547	1.322	0.609	0.599	1.183	1.594	τ 0.940	0.764	0.922

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	19:06:27	5.002	τ 100.848%	5.049
2	19:06:31	4.999	τ 101.464%	5.116
3	19:06:35	5.024	τ 101.203%	5.098
x		5.008	τ 101.172%	5.088
σ		0.013	τ 0.309%	0.035
%RSD		0.265	τ 0.306	0.685

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:11:59	0.037	0.037	1.272	TM 48670.000	M 49280.000	TM 50460.000	16.390	M 52760.000	3187.000	T 2360000.000
2	19:12:03	0.056	0.014	2.182	TM 49080.000	M 50020.000	TM 50880.000	17.420	M 53030.000	3431.000	T 2416000.000
3	19:12:07	0.061	0.056	2.187	TM 49150.000	M 49990.000	TM 51250.000	17.310	M 53070.000	3540.000	T 2432000.000
x		0.051	0.036	1.880	TM 48970.000	M 49760.000	TM 50860.000	17.040	M 52950.000	3386.000	T 2403000.000
σ		0.013	0.021	0.527	TM 260.000	M 419.900	TM 398.200	0.565	M 165.800	180.300	T 37920.000
%RSD		24.440	57.960	28.010	TM 0.531	M 0.844	TM 0.783	3.315	M 0.313	5.325	T 1.578

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:11:59	TM 53190.000	M 52420.000	87.678%	89.943%	M 1016.000	0.462	0.612	32.900	TM 50880.000	0.060
2	19:12:03	TM 53500.000	M 53450.000	87.595%	88.902%	M 1021.000	0.230	0.555	33.550	TM 50540.000	-0.018
3	19:12:07	TM 53800.000	M 52850.000	88.622%	88.810%	M 1019.000	0.490	0.579	33.390	TM 50900.000	0.101
x		TM 53500.000	M 52910.000	87.965%	89.218%	M 1018.000	0.394	0.582	33.280	TM 50770.000	0.048
σ		TM 306.800	M 515.400	0.571%	0.630%	M 2.687	0.143	0.028	0.336	TM 201.400	0.060
%RSD		TM 0.573	M 0.974	0.649	0.706	M 0.264	36.250	4.894	1.010	TM 0.397	126.000

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:11:59	0.748	0.924	0.523	1.965	90.650%	0.517	-0.268	0.278	85.762%	0.344
2	19:12:03	0.741	0.960	0.517	1.927	92.594%	0.413	-0.297	0.271	86.739%	0.332
3	19:12:07	0.730	0.923	0.472	1.962	92.937%	0.519	-0.277	0.271	87.388%	0.309
x		0.740	0.936	0.504	1.952	92.060%	0.483	-0.281	0.273	86.630%	0.329
σ		0.009	0.021	0.028	0.021	1.234%	0.061	0.015	0.004	0.819%	0.018
%RSD		1.180	2.269	5.513	1.071	1.340	12.540	5.238	1.507	0.945	5.388

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:11:59	TM 1052.000	0.042	0.049	89.345%	0.101	0.380	1.161	T 90.602%	0.057	0.149
2	19:12:03	TM 1040.000	0.037	0.120	90.170%	0.123	0.357	1.152	T 91.621%	0.022	0.136
3	19:12:07	TM 1050.000	0.032	0.039	91.058%	0.102	0.326	1.211	T 92.104%	0.041	0.128
x		TM 1047.000	0.037	0.069	90.191%	0.109	0.354	1.175	T 91.443%	0.040	0.138
σ		TM 6.047	0.005	0.044	0.857%	0.012	0.027	0.032	T 0.767%	0.018	0.011
%RSD		TM 0.577	12.680	64.020	0.950	11.450	7.552	2.692	T 0.838	44.160	7.845

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	19:11:59	0.244	T 87.974%	0.030
2	19:12:03	0.230	T 88.971%	0.023
3	19:12:07	0.220	T 90.653%	0.015
x		0.231	T 89.199%	0.023
σ		0.012	T 1.355%	0.007
%RSD		5.194	T 1.519	32.660

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:17:32	99.030	96.860	97.740	TM 47990.000	M 49310.000	TM 50130.000	5130.000	M 57380.000	3183.000	T 2487000.000
2	19:17:37	99.970	97.500	97.050	TM 50070.000	M 48820.000	TM 50270.000	5168.000	M 57020.000	3305.000	T 2406000.000
3	19:17:40	99.260	97.180	99.490	TM 47810.000	M 49210.000	TM 50370.000	5178.000	M 57580.000	3241.000	T 2552000.000
x		99.420	97.180	98.090	TM 48620.000	M 49110.000	TM 50260.000	5159.000	M 57330.000	3243.000	T 2482000.000
σ		0.490	0.322	1.260	TM 1257.000	M 255.000	TM 118.300	24.870	M 281.300	61.080	T 72790.000
%RSD		0.493	0.331	1.284	TM 2.584	M 0.519	TM 0.236	0.482	M 0.491	1.883	T 2.933

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:17:32	TM 52410.000	M 52150.000	90.463%	92.092%	M 1105.000	100.800	101.300	14.500	TM 50670.000	100.200
2	19:17:37	TM 54390.000	M 53080.000	92.199%	92.833%	M 1109.000	100.500	100.200	15.720	TM 50070.000	100.200
3	19:17:40	TM 52620.000	M 52740.000	92.367%	91.841%	M 1102.000	100.700	100.200	13.700	TM 49990.000	98.820
x		TM 53140.000	M 52660.000	91.676%	92.255%	M 1105.000	100.600	100.500	14.640	TM 50240.000	99.710
σ		TM 1084.000	M 470.900	1.054%	0.516%	M 3.356	0.150	0.621	1.017	TM 369.400	0.771
%RSD		TM 2.039	M 0.894	1.150	0.559	M 0.304	0.149	0.617	6.945	TM 0.735	0.773

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:17:32	98.480	98.540	96.350	106.000	94.607%	103.000	102.500	105.200	87.858%	100.200
2	19:17:37	96.970	96.930	96.100	103.000	97.108%	102.200	101.200	103.700	89.414%	100.400
3	19:17:40	97.830	97.650	96.410	106.400	96.707%	103.300	100.400	104.400	90.417%	99.750
x		97.760	97.710	96.280	105.100	96.141%	102.800	101.400	104.400	89.230%	100.100
σ		0.756	0.808	0.164	1.862	1.343%	0.576	1.064	0.754	1.290%	0.336
%RSD		0.774	0.827	0.170	1.771	1.397	0.560	1.049	0.722	1.445	0.336

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:17:32	TM 1161.000	47.770	102.000	92.168%	100.400	102.000	102.600	T 93.632%	5.353	T 102.500
2	19:17:37	TM 1147.000	48.230	101.700	93.587%	100.600	102.800	104.000	T 93.952%	5.321	T 104.100
3	19:17:40	TM 1148.000	47.520	101.400	94.340%	100.400	102.800	101.100	T 95.220%	5.216	T 102.600
x		TM 1152.000	47.840	101.700	93.365%	100.500	102.600	102.600	T 94.268%	5.297	T 103.100
σ		TM 8.115	0.361	0.295	1.103%	0.079	0.436	1.458	T 0.840%	0.072	T 0.935
%RSD		TM 0.704	0.755	0.290	1.181	0.079	0.425	1.421	T 0.891	1.354	T 0.908

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	19:17:32	T 101.300	T 90.658%	T 104.100
2	19:17:37	T 102.000	T 91.483%	T 106.200
3	19:17:40	T 100.900	T 92.892%	T 104.000
x		T 101.400	T 91.678%	T 104.800
σ		T 0.548	T 1.130%	T 1.257
%RSD		T 0.540	T 1.232	T 1.200

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:23:06	96.990	95.700	94.970	5128.000	4923.000	4913.000	4978.000	5292.000	149.100	τ 2277000.000
2	19:23:11	98.890	98.850	97.290	4868.000	4958.000	4902.000	5022.000	5012.000	168.500	τ 2417000.000
3	19:23:14	98.530	97.650	98.680	5011.000	4915.000	4864.000	4963.000	4981.000	138.100	τ 2310000.000
x		98.130	97.400	96.980	5002.000	4932.000	4893.000	4988.000	5095.000	151.900	τ 2335000.000
σ		1.008	1.589	1.875	130.400	22.790	25.950	30.900	171.100	15.370	τ 73200.000
%RSD		1.027	1.632	1.934	2.606	0.462	0.530	0.620	3.359	10.120	τ 3.135

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:23:06	4926.000	4757.000	105.030%	107.173%	100.700	98.710	100.300	29.630	5690.000	100.500
2	19:23:11	4791.000	5024.000	106.697%	105.445%	100.800	100.100	101.000	28.660	5675.000	100.200
3	19:23:14	4893.000	5372.000	108.669%	106.355%	99.290	99.090	99.650	26.040	5582.000	99.040
x		4870.000	5051.000	106.799%	106.325%	100.300	99.290	100.300	28.110	5649.000	99.910
σ		70.700	308.200	1.822%	0.864%	0.867	0.705	0.655	1.854	58.280	0.760
%RSD		1.452	6.102	1.706	0.813	0.865	0.710	0.653	6.596	1.032	0.760

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:23:06	100.000	102.100	101.500	102.500	109.763%	100.500	99.220	99.260	104.481%	98.370
2	19:23:11	101.400	101.200	102.400	102.900	109.271%	101.300	98.590	99.960	104.705%	98.990
3	19:23:14	99.180	100.500	100.400	103.200	111.775%	100.100	99.600	99.150	105.697%	98.030
x		100.200	101.300	101.400	102.900	110.270%	100.600	99.140	99.460	104.961%	98.470
σ		1.120	0.831	1.022	0.369	1.326%	0.602	0.510	0.439	0.647%	0.485
%RSD		1.118	0.821	1.007	0.359	1.203	0.598	0.514	0.442	0.617	0.493

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:23:06	101.600	50.740	100.200	105.011%	100.300	99.830	99.880	τ 105.886%	5.115	τ 101.100
2	19:23:11	102.000	50.390	101.900	105.533%	101.100	100.600	98.110	τ 106.776%	4.940	τ 98.550
3	19:23:14	101.300	50.440	101.400	106.173%	100.300	100.400	99.120	τ 106.829%	5.037	τ 99.460
x		101.600	50.520	101.200	105.572%	100.600	100.300	99.040	τ 106.497%	5.031	τ 99.710
σ		0.373	0.191	0.917	0.582%	0.428	0.417	0.888	τ 0.530%	0.088	τ 1.304
%RSD		0.367	0.379	0.906	0.551	0.425	0.416	0.897	τ 0.498	1.749	τ 1.308

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	19:23:06	τ 100.600	τ 103.486%	τ 100.300
2	19:23:11	τ 99.480	τ 105.293%	τ 98.010
3	19:23:14	τ 99.350	τ 105.899%	τ 98.830
x		τ 99.830	τ 104.893%	τ 99.040
σ		τ 0.716	τ 1.255%	τ 1.157
%RSD		τ 0.717	τ 1.197	τ 1.168

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:28:40	0.024	0.007	0.344	1.308	-1.571	-0.539	1.057	-4.928	165.000	T 2311000.000
2	19:28:44	0.029	0.012	0.678	-2.214	-1.394	-1.249	-2.449	2.897	183.600	T 2262000.000
3	19:28:48	0.013	0.027	0.650	1.717	-0.114	1.085	-1.608	10.910	156.300	T 2296000.000
x		0.022	0.015	0.557	0.270	-1.026	-0.234	-1.000	2.960	168.300	T 2290000.000
σ		0.008	0.010	0.186	2.161	0.795	1.196	1.830	7.919	13.920	T 25010.000
%RSD		36.220	68.970	33.320	799.500	77.470	510.500	183.000	267.600	8.271	T 1.092

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:28:40	-0.929	2.682	103.880%	106.389%	-0.041	0.183	0.010	58.220	2.041	0.005
2	19:28:44	5.632	-6.538	105.499%	105.737%	-0.022	-0.020	-0.023	58.840	0.918	0.000
3	19:28:48	8.787	14.160	103.739%	105.974%	0.141	0.182	0.016	57.100	2.210	-0.001
x		4.497	3.436	104.373%	106.034%	0.026	0.115	0.001	58.050	1.723	0.002
σ		4.957	10.370	0.978%	0.330%	0.100	0.117	0.021	0.884	0.702	0.003
%RSD		110.200	301.800	0.937	0.311	384.700	101.800	2059.000	1.522	40.740	208.800

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:28:40	0.003	0.007	0.019	-0.126	103.042%	0.057	-0.318	-0.002	102.968%	0.002
2	19:28:44	0.003	-0.013	0.003	-0.179	103.644%	0.062	-0.349	-0.007	103.187%	-0.010
3	19:28:48	0.003	0.005	0.021	-0.154	103.107%	0.048	-0.341	-0.001	102.721%	-0.002
x		0.003	-0.000	0.014	-0.153	103.264%	0.056	-0.336	-0.003	102.959%	-0.004
σ		0.000	0.011	0.010	0.027	0.331%	0.007	0.016	0.003	0.233%	0.006
%RSD		13.860	2947.000	67.470	17.620	0.320	12.210	4.736	106.200	0.226	170.200

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:28:40	0.084	-0.011	0.003	103.544%	0.028	-0.002	-0.023	T 105.121%	0.039	0.155
2	19:28:44	0.061	-0.004	0.002	104.509%	0.006	0.005	-0.018	T 105.447%	0.045	0.128
3	19:28:48	0.085	-0.004	0.004	103.609%	0.048	0.008	0.003	T 105.042%	0.021	0.116
x		0.077	-0.006	0.003	103.887%	0.027	0.004	-0.012	T 105.204%	0.035	0.133
σ		0.013	0.004	0.001	0.540%	0.021	0.005	0.014	T 0.215%	0.013	0.020
%RSD		17.310	60.340	38.650	0.519	77.810	147.600	111.500	T 0.204	36.100	15.030

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	19:28:40	0.007	T 104.504%	-0.001
2	19:28:44	0.003	T 104.549%	-0.003
3	19:28:48	0.009	T 104.806%	0.002
x		0.006	T 104.619%	-0.001
σ		0.003	T 0.163%	0.002
%RSD		47.700	T 0.156	301.100

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:34:12	0.007	-0.008	0.751	20.960	18.110	16.350	12.540	47.840	165.400	τ 2140000.000
2	19:34:16	0.012	0.002	0.897	15.800	13.380	13.490	7.861	39.280	172.800	τ 2146000.000
3	19:34:20	0.023	0.002	0.440	12.840	14.780	11.230	8.274	60.630	145.900	τ 2178000.000
x		0.014	-0.001	0.696	16.540	15.430	13.690	9.559	49.250	161.300	τ 2155000.000
σ		0.008	0.006	0.234	4.111	2.428	2.569	2.592	10.750	13.920	τ 20570.000
%RSD		59.680	562.500	33.580	24.860	15.740	18.770	27.120	21.820	8.628	τ 0.955

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:34:12	6.825	81.770	104.230%	105.582%	0.399	0.085	0.377	53.640	15.540	0.172
2	19:34:16	5.722	47.420	104.558%	104.415%	0.198	0.148	0.379	53.130	11.990	0.178
3	19:34:20	-2.279	75.650	103.554%	104.122%	0.181	0.161	0.354	54.030	9.359	0.167
x		3.423	68.280	104.114%	104.706%	0.259	0.132	0.370	53.600	12.300	0.173
σ		4.969	18.320	0.512%	0.772%	0.122	0.041	0.014	0.453	3.100	0.006
%RSD		145.200	26.830	0.492	0.738	46.880	30.940	3.753	0.845	25.210	3.318

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:34:12	0.043	0.384	0.266	4.772	107.237%	-0.005	-0.312	0.103	102.881%	0.092
2	19:34:16	0.034	0.294	0.224	4.819	108.859%	-0.049	-0.243	0.091	103.196%	0.097
3	19:34:20	0.024	0.319	0.238	4.841	107.847%	-0.029	-0.321	0.080	103.500%	0.068
x		0.034	0.332	0.243	4.811	107.981%	-0.027	-0.292	0.091	103.193%	0.085
σ		0.010	0.046	0.022	0.036	0.819%	0.022	0.042	0.011	0.309%	0.016
%RSD		29.180	13.910	8.953	0.739	0.759	80.370	14.500	12.430	0.300	18.250

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:34:12	0.334	0.012	0.027	104.149%	41.210	0.054	0.102	τ 105.104%	0.036	0.095
2	19:34:16	0.217	0.004	0.027	104.751%	41.240	0.042	0.084	τ 105.667%	0.015	0.077
3	19:34:20	0.180	-0.008	0.026	104.373%	41.200	0.027	0.048	τ 105.066%	0.049	0.062
x		0.244	0.003	0.027	104.424%	41.220	0.041	0.078	τ 105.279%	0.034	0.078
σ		0.081	0.010	0.001	0.304%	0.021	0.014	0.027	τ 0.337%	0.017	0.017
%RSD		33.120	337.400	3.242	0.291	0.051	33.080	34.690	τ 0.320	51.030	21.470

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	19:34:12	0.066	τ 104.991%	0.031
2	19:34:16	0.048	τ 105.402%	0.018
3	19:34:20	0.039	τ 106.117%	0.010
x		0.051	τ 105.503%	0.020
σ		0.014	τ 0.570%	0.011
%RSD		27.680	τ 0.540	53.670

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:39:44	0.000	-0.013	1.655	4367.000	2875.000	12.440	28.210	22610.000	1457.000	T 1985000.000
2	19:39:48	0.016	0.013	1.828	4370.000	2879.000	10.740	26.510	22790.000	1468.000	T 2009000.000
3	19:39:51	0.027	0.003	2.621	4396.000	2860.000	11.140	27.560	22940.000	1542.000	T 1947000.000
x		0.015	0.001	2.034	4378.000	2871.000	11.440	27.430	22780.000	1489.000	T 1980000.000
σ		0.014	0.013	0.515	15.830	10.260	0.891	0.861	165.100	46.300	T 31600.000
%RSD		93.040	1134.000	25.320	0.362	0.357	7.792	3.140	0.725	3.109	T 1.596

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:39:44	TM 38430.000	509.800	100.925%	103.322%	2.671	0.560	0.359	47.440	47.840	1.070
2	19:39:48	TM 38190.000	434.100	100.476%	103.078%	2.479	-0.085	0.424	50.920	47.020	1.122
3	19:39:51	TM 38980.000	545.000	101.807%	102.693%	2.341	-0.020	0.370	50.030	43.660	1.099
x		TM 38530.000	496.300	101.069%	103.031%	2.497	0.152	0.384	49.460	46.170	1.097
σ		TM 406.000	56.680	0.677%	0.317%	0.166	0.355	0.035	1.805	2.218	0.026
%RSD		TM 1.054	11.420	0.670	0.308	6.635	234.300	9.057	3.650	4.804	2.372

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:39:44	0.035	0.383	2.691	76.750	103.872%	-0.044	0.936	0.331	101.288%	0.042
2	19:39:48	0.024	0.309	2.841	77.240	101.692%	-0.075	1.217	0.328	101.967%	0.034
3	19:39:51	0.018	0.374	2.829	75.270	103.607%	-0.033	1.388	0.341	101.479%	0.022
x		0.026	0.355	2.787	76.420	103.057%	-0.051	1.180	0.333	101.578%	0.032
σ		0.009	0.040	0.083	1.025	1.189%	0.022	0.228	0.007	0.350%	0.010
%RSD		34.470	11.360	2.986	1.341	1.154	42.860	19.340	2.050	0.345	32.030

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:39:44	0.460	-0.003	0.024	101.844%	40.930	0.041	0.148	T 103.294%	0.040	0.065
2	19:39:48	0.444	-0.006	0.003	101.938%	40.840	0.045	0.144	T 103.620%	0.031	0.054
3	19:39:51	0.382	-0.009	-0.000	102.168%	40.780	0.041	0.094	T 104.248%	0.020	0.049
x		0.429	-0.006	0.009	101.983%	40.850	0.042	0.129	T 103.721%	0.030	0.056
σ		0.041	0.003	0.013	0.167%	0.076	0.003	0.030	T 0.485%	0.010	0.008
%RSD		9.529	55.050	144.000	0.164	0.187	6.332	23.490	T 0.467	32.130	14.710

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	19:39:44	0.043	T 102.538%	0.014
2	19:39:48	0.035	T 102.584%	0.007
3	19:39:51	0.030	T 103.003%	0.004
x		0.036	T 102.709%	0.009
σ		0.006	T 0.256%	0.005
%RSD		17.120	T 0.250	57.570

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:45:16	192.100	201.200	191.800	T 14360.000	12840.000	9737.000	1013.000	M 45700.000	1544.000	T 2002000.000
2	19:45:20	193.200	198.400	190.900	T 14110.000	12740.000	9745.000	993.200	M 45680.000	1477.000	T 2009000.000
3	19:45:24	189.500	196.800	193.500	T 14460.000	12870.000	9722.000	1021.000	M 45840.000	1602.000	T 1995000.000
x		191.600	198.800	192.100	T 14310.000	12810.000	9735.000	1009.000	M 45740.000	1541.000	T 2002000.000
σ		1.887	2.220	1.346	T 179.400	67.450	11.980	14.430	M 88.310	62.940	T 7151.000
%RSD		0.985	1.116	0.701	T 1.253	0.526	0.123	1.430	M 0.193	4.084	T 0.357

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:45:16	TM 82080.000	10590.000	96.577%	100.252%	200.800	200.700	201.400	-13.410	T 10210.000	202.300
2	19:45:20	TM 82880.000	10540.000	98.289%	99.853%	203.900	198.500	199.900	-8.566	T 10240.000	200.400
3	19:45:24	TM 84020.000	10540.000	97.285%	100.195%	204.600	198.400	199.400	-9.605	11460.000	201.500
x		TM 82990.000	10560.000	97.384%	100.100%	203.100	199.200	200.300	-10.530	T 10640.000	201.400
σ		TM 973.700	30.340	0.860%	0.216%	2.057	1.273	1.059	2.552	T 714.300	0.930
%RSD		TM 1.173	0.287	0.884	0.215	1.013	0.639	0.529	24.240	T 6.714	0.462

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:45:16	196.200	201.800	203.600	297.900	98.558%	210.700	214.500	202.000	95.933%	89.750
2	19:45:20	195.500	202.100	203.800	296.900	98.666%	211.500	212.700	203.500	96.460%	89.790
3	19:45:24	195.700	202.000	203.400	298.000	99.530%	209.500	210.600	201.800	96.678%	89.530
x		195.800	202.000	203.600	297.600	98.918%	210.600	212.600	202.500	96.357%	89.690
σ		0.363	0.140	0.205	0.595	0.533%	0.984	1.983	0.900	0.383%	0.145
%RSD		0.186	0.069	0.100	0.200	0.539	0.467	0.933	0.444	0.398	0.162

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:45:16	205.500	91.900	206.000	96.297%	211.700	204.900	196.600	T 99.306%	5.144	T 193.400
2	19:45:20	205.300	91.240	206.400	97.285%	210.400	205.400	194.800	T 99.974%	5.039	T 194.200
3	19:45:24	205.300	91.770	205.500	97.184%	T 209.200	205.400	197.700	T 99.770%	5.018	T 195.400
x		205.400	91.630	205.900	96.922%	T 210.400	205.200	196.400	T 99.683%	5.067	T 194.300
σ		0.123	0.350	0.433	0.543%	T 1.249	0.315	1.437	T 0.342%	0.068	T 0.989
%RSD		0.060	0.382	0.210	0.561	T 0.594	0.153	0.732	T 0.344	1.333	T 0.509

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	19:45:16	T 195.700	T 96.302%	T 203.400
2	19:45:20	T 196.500	T 96.915%	T 204.600
3	19:45:24	T 196.000	T 97.147%	T 205.700
x		T 196.100	T 96.788%	T 204.600
σ		T 0.380	T 0.437%	T 1.176
%RSD		T 0.194	T 0.451	T 0.575

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:50:47	2.301	0.182	41.300	TM 120000.000	10390.000	118.400	269.200	M 105200.000	6431.000	T 1836000.000
2	19:50:50	2.372	0.139	40.710	TM 119500.000	10240.000	111.800	252.900	M 105200.000	6327.000	T 1838000.000
3	19:50:54	2.418	0.185	39.430	TM 118800.000	10230.000	109.100	265.000	M 104600.000	6469.000	T 1831000.000
x		2.364	0.169	40.480	TM 119400.000	10290.000	113.100	262.400	M 105000.000	6409.000	T 1835000.000
σ		0.059	0.026	0.959	TM 592.400	89.400	4.778	8.469	M 299.800	73.250	T 3635.000
%RSD		2.480	15.270	2.368	TM 0.496	0.869	4.224	3.227	M 0.286	1.143	T 0.198

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:50:47	TM 87100.000	M 35380.000	95.501%	98.415%	10.860	16.150	4.189	27.790	1032.000	121.300
2	19:50:50	TM 86520.000	M 35340.000	96.873%	98.353%	12.140	15.960	4.176	27.560	1020.000	120.500
3	19:50:54	TM 86830.000	M 35240.000	97.480%	99.358%	12.200	16.050	4.243	26.560	1022.000	120.100
x		TM 86820.000	M 35320.000	96.618%	98.709%	11.730	16.050	4.202	27.300	1025.000	120.600
σ		TM 292.300	M 73.020	1.014%	0.563%	0.759	0.094	0.035	0.654	6.422	0.581
%RSD		TM 0.337	M 0.207	1.049	0.570	6.464	0.588	0.840	2.397	0.627	0.482

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:50:47	4.907	21.260	TM 979.800	M 1956.000	97.400%	226.100	59.490	T 389.500	101.293%	0.382
2	19:50:50	4.765	21.020	TM 979.300	M 1964.000	97.341%	226.300	59.990	T 390.700	102.522%	0.357
3	19:50:54	4.761	20.680	TM 976.100	M 1953.000	98.887%	225.600	60.470	T 389.400	102.851%	0.327
x		4.811	20.990	TM 978.400	M 1958.000	97.876%	226.000	59.980	T 389.900	102.222%	0.355
σ		0.083	0.289	TM 2.008	M 5.879	0.876%	0.375	0.492	T 0.754	0.821%	0.028
%RSD		1.729	1.376	TM 0.205	M 0.300	0.895	0.166	0.821	T 0.194	0.804	7.864

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:50:47	9.344	60.280	274.200	95.831%	41.090	0.500	15.430	T 100.773%	2.173	0.508
2	19:50:50	9.212	60.100	275.900	96.823%	41.230	0.431	15.650	T 101.593%	2.212	0.421
3	19:50:54	9.134	59.970	274.800	97.586%	40.960	0.417	15.520	T 102.378%	2.055	0.365
x		9.230	60.120	275.000	96.746%	41.090	0.449	15.530	T 101.581%	2.147	0.431
σ		0.107	0.155	0.906	0.880%	0.136	0.044	0.108	T 0.803%	0.082	0.072
%RSD		1.154	0.258	0.330	0.909	0.331	9.864	0.697	T 0.790	3.800	16.700

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	19:50:47	3.012	T 95.056%	0.866
2	19:50:50	2.937	T 95.976%	0.809
3	19:50:54	2.882	T 96.923%	0.766
x		2.944	T 95.985%	0.814
σ		0.066	T 0.934%	0.050
%RSD		2.230	T 0.973	6.148

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:56:19	0.147	-0.007	0.883	11050.000	4613.000	46.150	137.800	M 100500.000	1629.000	T 1827000.000
2	19:56:23	0.128	0.004	1.389	11110.000	4712.000	48.940	153.400	M 103400.000	1554.000	T 1915000.000
3	19:56:26	0.157	0.046	0.486	10900.000	4529.000	47.920	139.900	M 100800.000	1616.000	T 1873000.000
x		0.144	0.014	0.920	11020.000	4618.000	47.670	143.700	M 101600.000	1600.000	T 1872000.000
σ		0.015	0.028	0.453	107.300	91.450	1.412	8.490	M 1563.000	39.940	T 44360.000
%RSD		10.210	192.300	49.220	0.974	1.980	2.963	5.909	M 1.539	2.497	T 2.370

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:56:19	TM 29960.000	M 181400.000	93.028%	99.772%	10.520	1.242	0.494	19.330	236.900	159.400
2	19:56:23	TM 30270.000	M 184700.000	92.062%	99.901%	9.608	1.033	0.453	21.170	240.100	160.500
3	19:56:26	TM 30190.000	M 180900.000	94.601%	100.122%	9.472	1.069	0.475	19.480	234.500	158.100
x		TM 30140.000	M 182300.000	93.231%	99.932%	9.866	1.114	0.474	19.990	237.200	159.300
σ		TM 161.800	M 2111.000	1.281%	0.177%	0.569	0.112	0.021	1.020	2.796	1.168
%RSD		TM 0.537	M 1.158	1.375	0.177	5.763	10.040	4.399	5.102	1.179	0.733

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:56:19	0.278	0.530	8.574	209.500	95.554%	0.943	2.915	201.400	95.093%	0.052
2	19:56:23	0.275	0.486	8.655	213.500	94.714%	1.100	2.901	201.800	95.456%	0.051
3	19:56:26	0.274	0.514	8.383	210.900	95.232%	1.046	2.914	200.900	95.670%	0.050
x		0.276	0.510	8.537	211.300	95.166%	1.030	2.910	201.400	95.406%	0.051
σ		0.002	0.022	0.140	2.027	0.424%	0.080	0.008	0.425	0.292%	0.001
%RSD		0.638	4.405	1.634	0.959	0.446	7.739	0.267	0.211	0.306	2.323

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:56:19	1.687	0.033	2.636	97.307%	41.360	0.055	14.230	T 101.294%	0.114	0.170
2	19:56:23	1.636	0.020	2.612	97.751%	41.140	0.046	14.030	T 101.331%	0.111	0.151
3	19:56:26	1.729	0.022	2.737	97.819%	41.300	0.044	14.200	T 102.237%	0.121	0.141
x		1.684	0.025	2.662	97.626%	41.270	0.048	14.150	T 101.621%	0.115	0.154
σ		0.047	0.007	0.067	0.278%	0.111	0.006	0.109	T 0.534%	0.005	0.015
%RSD		2.771	26.960	2.499	0.285	0.269	12.860	0.771	T 0.525	4.328	9.576

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	19:56:19	1.170	T 97.194%	0.025
2	19:56:23	1.140	T 98.443%	0.017
3	19:56:26	1.158	T 98.592%	0.015
x		1.156	T 98.076%	0.019
σ		0.015	T 0.768%	0.006
%RSD		1.325	T 0.783	29.360

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	20:01:51	182.400	182.000	180.800	T 20860.000	14010.000	9434.000	1117.000	M 108400.000	1661.000	T 2082000.000
2	20:01:55	181.200	182.700	186.400	T 21030.000	13920.000	9453.000	1145.000	M 109200.000	1683.000	T 2125000.000
3	20:01:59	182.600	181.500	179.700	T 21380.000	13760.000	9384.000	1135.000	M 107900.000	1733.000	T 2046000.000
x		182.100	182.000	182.300	T 21090.000	13900.000	9423.000	1132.000	M 108500.000	1693.000	T 2084000.000
σ		0.731	0.589	3.607	T 262.700	125.400	35.520	14.180	M 642.100	37.050	T 39710.000
%RSD		0.402	0.324	1.979	T 1.246	0.902	0.377	1.253	M 0.592	2.189	T 1.905

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	20:01:51	TM 74080.000	M 164500.000	94.895%	99.392%	208.400	202.700	203.300	-27.460	11690.000	354.500
2	20:01:55	TM 75330.000	M 164900.000	95.988%	100.274%	210.000	202.900	201.000	-24.630	T 10510.000	354.600
3	20:01:59	TM 76030.000	M 162400.000	98.322%	100.198%	210.400	200.000	200.400	-27.660	T 10410.000	352.600
x		TM 75150.000	M 163900.000	96.402%	99.955%	209.600	201.900	201.600	-26.580	T 10870.000	353.900
σ		TM 986.300	M 1361.000	1.751%	0.489%	1.059	1.605	1.512	1.697	T 714.500	1.164
%RSD		TM 1.313	M 0.830	1.816	0.489	0.505	0.795	0.750	6.382	T 6.572	0.329

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	20:01:51	198.100	200.900	206.300	422.600	96.895%	215.000	213.600	T 386.000	94.193%	T 73.090
2	20:01:55	197.300	200.100	206.100	422.700	98.856%	215.100	214.600	T 386.800	95.486%	T 71.780
3	20:01:59	196.000	198.100	205.400	419.300	99.929%	214.700	213.700	T 383.400	97.843%	69.830
x		197.100	199.700	205.900	421.500	98.560%	214.900	214.000	T 385.400	95.841%	T 71.570
σ		1.106	1.429	0.487	1.930	1.539%	0.244	0.591	T 1.788	1.851%	T 1.641
%RSD		0.561	0.715	0.237	0.458	1.561	0.114	0.276	T 0.464	1.931	T 2.294

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	20:01:51	211.200	91.140	208.900	96.816%	196.500	204.800	211.400	T 100.206%	5.277	T 200.500
2	20:01:55	211.400	90.340	208.400	98.033%	195.500	205.400	210.100	T 102.555%	5.441	T 197.300
3	20:01:59	208.900	90.060	206.600	100.113%	196.200	203.400	211.800	T 102.399%	5.350	T 202.300
x		210.500	90.510	208.000	98.320%	196.100	204.500	211.100	T 101.720%	5.356	T 200.000
σ		1.367	0.557	1.179	1.667%	0.511	1.042	0.850	T 1.314%	0.082	T 2.522
%RSD		0.649	0.616	0.567	1.696	0.261	0.509	0.403	T 1.291	1.534	T 1.261

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	20:01:51	T 200.500	T 96.106%	T 211.200
2	20:01:55	T 198.900	T 97.858%	T 211.300
3	20:01:59	T 200.100	T 98.784%	T 213.300
x		T 199.800	T 97.583%	T 211.900
σ		T 0.857	T 1.360%	T 1.170
%RSD		T 0.429	T 1.394	T 0.552

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	20:07:24	178.400	176.700	184.600	T 21750.000	14400.000	9381.000	1150.000	M 125900.000	1528.000	T 2173000.000
2	20:07:28	179.700	177.500	181.200	T 21110.000	14580.000	9460.000	1126.000	M 127000.000	1599.000	T 2255000.000
3	20:07:32	180.100	176.400	185.300	T 22720.000	14480.000	9563.000	1156.000	M 126900.000	1760.000	T 2174000.000
x		179.400	176.900	183.700	T 21860.000	14490.000	9468.000	1144.000	M 126600.000	1629.000	T 2201000.000
σ		0.879	0.570	2.155	T 810.500	90.920	91.040	15.940	M 581.100	118.900	T 47090.000
%RSD		0.490	0.322	1.173	T 3.708	0.628	0.962	1.393	M 0.459	7.300	T 2.140

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	20:07:24	TM 75840.000	M 203900.000	98.643%	105.552%	216.100	204.900	204.000	-26.750	T 10670.000	389.100
2	20:07:28	TM 74590.000	M 204900.000	99.432%	105.425%	210.400	206.000	204.700	-26.130	T 10710.000	387.900
3	20:07:32	TM 78730.000	M 206400.000	99.214%	105.051%	216.700	206.100	206.300	-32.610	T 10750.000	390.000
x		TM 76390.000	M 205100.000	99.097%	105.342%	214.400	205.700	205.000	-28.500	T 10710.000	389.000
σ		TM 2123.000	M 1268.000	0.407%	0.260%	3.494	0.681	1.173	3.576	T 37.070	1.047
%RSD		TM 2.779	M 0.618	0.411	0.247	1.630	0.331	0.572	12.550	T 0.346	0.269

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	20:07:24	200.100	201.300	206.700	436.400	100.345%	216.700	213.100	T 435.100	96.926%	T 78.190
2	20:07:28	201.500	202.200	208.700	442.900	99.748%	220.000	219.900	T 440.300	97.237%	75.530
3	20:07:32	201.000	202.500	207.900	439.200	101.031%	219.100	216.900	T 433.900	98.412%	75.800
x		200.900	202.000	207.800	439.500	100.375%	218.600	216.600	T 436.400	97.525%	T 76.500
σ		0.752	0.621	1.057	3.260	0.642%	1.692	3.398	T 3.390	0.784%	T 1.464
%RSD		0.375	0.307	0.509	0.742	0.639	0.774	1.569	T 0.777	0.804	T 1.913

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	20:07:24	216.000	91.650	210.500	98.548%	208.800	207.100	217.900	T 102.353%	5.541	T 204.000
2	20:07:28	216.700	91.370	212.600	99.312%	208.700	208.000	217.200	T 104.330%	5.582	T 203.300
3	20:07:32	214.300	91.730	208.900	100.759%	208.500	206.000	219.700	T 104.341%	5.505	T 205.200
x		215.700	91.580	210.600	99.540%	208.600	207.100	218.200	T 103.674%	5.543	T 204.200
σ		1.235	0.188	1.834	1.122%	0.162	1.024	1.281	T 1.145%	0.039	T 0.984
%RSD		0.573	0.205	0.871	1.128	0.077	0.495	0.587	T 1.104	0.698	T 0.482

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	20:07:24	T 204.800	T 96.450%	T 216.900
2	20:07:28	T 203.500	T 98.523%	T 215.100
3	20:07:32	T 204.900	T 98.638%	T 220.700
x		T 204.400	T 97.871%	T 217.600
σ		T 0.755	T 1.232%	T 2.846
%RSD		T 0.369	T 1.258	T 1.308

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	20:12:58	175.300	176.100	182.400	T 20020.000	13590.000	9012.000	1072.000	M 114800.000	1620.000	T 1809000.000
2	20:13:02	171.900	171.000	179.900	T 21110.000	13770.000	9111.000	1058.000	M 118400.000	1628.000	T 1815000.000
3	20:13:06	172.400	171.700	181.200	T 20010.000	13630.000	8957.000	1081.000	M 116300.000	1612.000	T 1864000.000
x		173.200	172.900	181.100	T 20380.000	13670.000	9027.000	1070.000	M 116500.000	1620.000	T 1829000.000
σ		1.867	2.800	1.249	T 634.300	94.650	77.790	11.790	M 1794.000	7.941	T 30220.000
%RSD		1.078	1.619	0.689	T 3.113	0.693	0.862	1.102	M 1.540	0.490	T 1.652

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	20:12:58	TM 70350.000	M 181100.000	102.367%	105.904%	203.300	193.800	194.300	-27.950	T 10100.000	344.900
2	20:13:02	TM 73220.000	M 184500.000	101.492%	107.479%	207.300	195.800	197.100	-28.400	T 10230.000	350.800
3	20:13:06	TM 71140.000	M 183400.000	102.951%	106.945%	208.100	195.000	194.500	-24.510	T 10220.000	347.400
x		TM 71570.000	M 183000.000	102.270%	106.776%	206.200	194.900	195.300	-26.950	T 10190.000	347.700
σ		TM 1484.000	M 1743.000	0.734%	0.801%	2.571	1.021	1.582	2.131	T 73.710	2.965
%RSD		TM 2.074	M 0.953	0.718	0.750	1.246	0.524	0.810	7.905	T 0.724	0.853

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	20:12:58	191.100	193.300	200.700	412.900	102.113%	213.500	213.200	T 401.900	99.580%	196.000
2	20:13:02	192.000	194.900	202.500	415.500	102.184%	214.100	213.800	T 398.200	100.745%	196.000
3	20:13:06	191.900	193.300	200.800	412.600	102.944%	213.900	216.600	T 403.000	100.851%	196.400
x		191.700	193.800	201.300	413.700	102.414%	213.800	214.500	T 401.100	100.392%	196.100
σ		0.456	0.916	1.023	1.606	0.461%	0.324	1.855	T 2.497	0.705%	0.212
%RSD		0.238	0.473	0.508	0.388	0.450	0.152	0.865	T 0.623	0.703	0.108

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	20:12:58	207.500	90.820	203.700	101.497%	241.000	201.000	207.400	T 105.605%	5.573	T 195.800
2	20:13:02	206.400	90.960	203.300	101.955%	242.300	201.700	208.800	T 106.249%	5.611	T 197.700
3	20:13:06	207.400	90.340	205.700	102.776%	240.100	203.400	206.900	T 107.251%	5.503	T 197.000
x		207.100	90.710	204.200	102.076%	241.200	202.000	207.700	T 106.368%	5.562	T 196.800
σ		0.573	0.327	1.270	0.648%	1.108	1.242	0.964	T 0.829%	0.055	T 0.976
%RSD		0.277	0.360	0.622	0.635	0.460	0.615	0.464	T 0.780	0.992	T 0.496

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	20:12:58	T 196.900	T 99.789%	T 206.200
2	20:13:02	T 197.200	T 100.246%	T 209.100
3	20:13:06	T 195.700	T 101.523%	T 208.300
x		T 196.600	T 100.519%	T 207.800
σ		T 0.804	T 0.899%	T 1.493
%RSD		T 0.409	T 0.894	T 0.718

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	20:18:32	0.256	0.118	2.286	T 12440.000	5090.000	83.580	286.600	M 113500.000	1624.000	T 1966000.000
2	20:18:35	0.273	0.080	2.201	12680.000	5123.000	75.050	287.100	M 115400.000	1536.000	T 2033000.000
3	20:18:39	0.267	0.095	1.853	12070.000	5014.000	75.400	290.200	M 113300.000	1601.000	T 2041000.000
x		0.265	0.098	2.113	T 12400.000	5076.000	78.010	287.900	M 114100.000	1587.000	T 2013000.000
σ		0.009	0.019	0.229	T 307.700	55.780	4.829	1.953	M 1196.000	45.480	T 41310.000
%RSD		3.273	19.430	10.850	T 2.481	1.099	6.190	0.678	M 1.049	2.866	T 2.052

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	20:18:32	TM 31810.000	M 198500.000	98.751%	108.548%	11.880	1.338	0.566	19.920	410.200	367.900
2	20:18:35	TM 32770.000	M 199500.000	98.945%	107.268%	13.290	1.348	0.565	19.960	415.300	369.400
3	20:18:39	TM 31690.000	M 198300.000	100.295%	107.508%	12.850	1.473	0.604	19.960	407.500	363.400
x		TM 32090.000	M 198700.000	99.330%	107.775%	12.670	1.386	0.578	19.950	411.000	366.900
σ		TM 588.900	M 656.700	0.841%	0.680%	0.725	0.076	0.023	0.023	3.980	3.093
%RSD		TM 1.835	M 0.330	0.847	0.631	5.719	5.454	3.893	0.115	0.969	0.843

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	20:18:32	0.439	0.708	6.946	235.700	100.073%	1.143	2.975	215.700	97.999%	0.118
2	20:18:35	0.471	0.772	7.054	238.000	99.713%	1.147	3.370	214.500	99.358%	0.100
3	20:18:39	0.480	0.738	7.075	237.000	100.718%	1.153	3.014	215.600	99.873%	0.135
x		0.463	0.739	7.025	236.900	100.168%	1.148	3.120	215.300	99.077%	0.118
σ		0.021	0.032	0.069	1.155	0.510%	0.005	0.218	0.700	0.968%	0.018
%RSD		4.564	4.325	0.980	0.488	0.509	0.460	6.986	0.325	0.977	15.050

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	20:18:32	1.708	0.040	2.723	99.799%	42.410	0.154	20.000	T 105.783%	0.161	0.404
2	20:18:35	1.753	0.050	2.689	101.443%	41.710	0.153	19.760	T 106.521%	0.144	0.396
3	20:18:39	1.860	0.052	2.847	100.624%	41.950	0.172	19.680	T 106.585%	0.183	0.394
x		1.773	0.048	2.753	100.622%	42.030	0.160	19.810	T 106.296%	0.163	0.398
σ		0.078	0.006	0.083	0.822%	0.356	0.011	0.166	T 0.446%	0.020	0.005
%RSD		4.420	13.200	3.015	0.817	0.848	6.721	0.836	T 0.419	12.120	1.340

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	20:18:32	1.877	T 100.056%	0.088
2	20:18:35	1.859	T 101.069%	0.092
3	20:18:39	1.871	T 102.004%	0.114
x		1.869	T 101.043%	0.098
σ		0.009	T 0.974%	0.014
%RSD		0.494	T 0.964	14.410

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	20:24:06	0.041	0.006	0.015	2484.000	1022.000	12.980	58.410	22280.000	406.000	T 2171000.000
2	20:24:10	0.044	0.011	0.224	2533.000	1019.000	11.710	60.690	22410.000	476.300	T 2159000.000
3	20:24:14	0.046	0.035	0.069	2497.000	1050.000	12.300	60.230	22430.000	459.900	T 2175000.000
x		0.044	0.017	0.103	2505.000	1030.000	12.330	59.780	22370.000	447.400	T 2168000.000
σ		0.003	0.016	0.109	25.470	16.890	0.639	1.209	79.970	36.790	T 8424.000
%RSD		6.303	92.050	105.500	1.017	1.639	5.185	2.022	0.357	8.223	T 0.389

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	20:24:06	5902.000	M 39410.000	101.343%	109.381%	2.514	0.075	0.018	22.890	78.040	72.130
2	20:24:10	6003.000	M 38870.000	101.169%	108.905%	2.435	0.138	0.003	23.270	79.810	72.520
3	20:24:14	5953.000	M 39580.000	102.557%	108.869%	1.649	0.062	-0.023	22.980	80.840	72.300
x		5953.000	M 39280.000	101.690%	109.052%	2.199	0.092	-0.001	23.050	79.560	72.320
σ		50.350	M 371.700	0.756%	0.286%	0.478	0.041	0.021	0.197	1.416	0.197
%RSD		0.846	M 0.946	0.743	0.262	21.750	44.220	3119.000	0.855	1.779	0.273

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	20:24:06	0.067	0.159	1.376	47.560	105.256%	0.070	0.186	41.660	101.447%	0.003
2	20:24:10	0.066	0.177	1.402	48.210	105.332%	0.151	0.274	41.440	102.090%	0.019
3	20:24:14	0.074	0.164	1.384	47.690	106.154%	0.153	0.240	41.520	102.968%	0.010
x		0.069	0.167	1.388	47.820	105.581%	0.125	0.233	41.540	102.168%	0.010
σ		0.004	0.009	0.014	0.346	0.498%	0.047	0.044	0.111	0.763%	0.008
%RSD		6.289	5.389	0.973	0.723	0.472	37.870	19.070	0.267	0.747	75.010

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	20:24:06	0.349	-0.010	0.565	103.686%	8.251	0.006	3.791	T 108.714%	0.037	0.086
2	20:24:10	0.353	-0.013	0.557	103.629%	8.466	0.006	3.830	T 108.802%	0.033	0.083
3	20:24:14	0.350	-0.005	0.573	104.189%	8.606	0.015	3.910	T 108.948%	0.043	0.079
x		0.351	-0.009	0.565	103.835%	8.441	0.009	3.844	T 108.821%	0.038	0.083
σ		0.002	0.004	0.008	0.308%	0.179	0.005	0.060	T 0.118%	0.005	0.004
%RSD		0.489	41.460	1.358	0.297	2.118	57.060	1.570	T 0.109	12.750	4.302

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	20:24:06	0.346	T 107.164%	-0.006
2	20:24:10	0.354	T 107.441%	-0.003
3	20:24:14	0.355	T 108.828%	-0.001
x		0.352	T 107.811%	-0.003
σ		0.005	T 0.892%	0.003
%RSD		1.460	T 0.827	83.090

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	20:29:41	89.530	85.570	89.640	4969.000	4911.000	4705.000	4678.000	5030.000	173.800	τ2321000.000
2	20:29:45	90.300	86.430	92.950	5179.000	5004.000	4807.000	4813.000	5024.000	169.600	τ2356000.000
3	20:29:48	90.260	86.530	91.120	5126.000	4957.000	4733.000	4814.000	5184.000	165.600	τ2336000.000
x		90.030	86.180	91.240	5091.000	4957.000	4748.000	4768.000	5079.000	169.700	τ2338000.000
σ		0.434	0.529	1.657	109.300	46.500	52.910	78.190	90.840	4.128	τ17770.000
%RSD		0.482	0.614	1.816	2.146	0.938	1.114	1.640	1.788	2.433	τ0.760

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	20:29:41	4950.000	5008.000	109.270%	114.521%	94.250	97.950	99.950	7.706	5614.000	99.990
2	20:29:45	5041.000	5019.000	108.205%	114.672%	101.000	99.600	101.300	9.984	5641.000	100.800
3	20:29:48	5043.000	5242.000	110.799%	116.111%	100.800	98.890	100.100	10.370	5642.000	100.500
x		5011.000	5090.000	109.425%	115.101%	98.680	98.810	100.500	9.353	5632.000	100.400
σ		52.930	132.100	1.304%	0.878%	3.837	0.826	0.704	1.439	16.040	0.428
%RSD		1.056	2.596	1.192	0.763	3.888	0.835	0.701	15.380	0.285	0.426

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	20:29:41	100.800	102.300	103.800	104.900	109.907%	100.600	98.440	100.400	104.263%	99.430
2	20:29:45	102.000	103.400	103.400	106.000	110.556%	102.200	99.550	100.600	105.515%	99.750
3	20:29:48	100.700	101.800	102.900	105.600	113.364%	101.500	96.510	99.740	107.145%	99.020
x		101.100	102.500	103.400	105.500	111.276%	101.400	98.170	100.200	105.641%	99.400
σ		0.713	0.804	0.458	0.571	1.837%	0.819	1.537	0.455	1.445%	0.367
%RSD		0.705	0.784	0.443	0.541	1.651	0.808	1.566	0.454	1.368	0.369

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	20:29:41	103.500	51.380	102.700	105.351%	100.700	101.500	96.770	τ110.553%	5.026	τ100.500
2	20:29:45	103.000	51.900	104.100	106.526%	101.400	101.100	98.580	τ111.218%	5.222	τ101.100
3	20:29:48	103.600	51.710	103.800	107.268%	102.100	102.000	98.090	τ112.513%	5.055	τ100.500
x		103.400	51.660	103.500	106.382%	101.400	101.500	97.810	τ111.428%	5.101	τ100.700
σ		0.319	0.264	0.716	0.967%	0.735	0.482	0.938	τ0.997%	0.106	τ0.328
%RSD		0.309	0.510	0.692	0.909	0.725	0.475	0.959	τ0.894	2.075	τ0.325

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	20:29:41	τ101.000	τ107.628%	τ100.800
2	20:29:45	τ101.600	τ107.947%	τ101.400
3	20:29:48	τ100.400	τ109.749%	τ100.800
x		τ101.000	τ108.441%	τ101.000
σ		τ0.560	τ1.144%	τ0.330
%RSD		τ0.554	τ1.055	τ0.327

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	20:35:14	0.026	0.003	0.632	4.956	-0.345	-0.758	-0.020	-8.217	157.900	r 2222000.000
2	20:35:18	0.024	-0.006	0.017	4.064	0.162	-0.182	45.050	0.683	161.800	r 2278000.000
3	20:35:22	0.005	0.013	0.597	3.728	-1.635	-0.332	-2.238	3.046	195.200	r 2226000.000
x		0.018	0.004	0.415	4.249	-0.606	-0.424	14.260	-1.496	171.600	r 2242000.000
σ		0.011	0.009	0.345	0.635	0.927	0.299	26.690	5.939	20.510	r 31420.000
%RSD		61.480	261.000	83.080	14.940	153.000	70.480	187.100	397.100	11.950	r 1.402

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	20:35:14	-8.164	-4.409	106.818%	116.145%	-0.083	0.119	-0.082	29.170	0.370	-0.000
2	20:35:18	-1.784	-0.110	107.655%	115.467%	-0.025	-0.050	-0.095	29.930	0.843	0.007
3	20:35:22	19.960	0.095	106.332%	114.901%	-0.063	0.232	-0.071	29.620	-0.194	0.009
x		3.337	-1.475	106.935%	115.504%	-0.057	0.100	-0.082	29.570	0.340	0.005
σ		14.740	2.544	0.670%	0.623%	0.029	0.142	0.012	0.381	0.519	0.005
%RSD		441.900	172.500	0.626	0.539	51.300	142.000	14.710	1.289	153.000	94.150

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	20:35:14	0.000	0.005	0.012	-0.077	107.181%	0.026	-0.274	-0.005	105.070%	-0.012
2	20:35:18	-0.003	0.018	0.011	-0.123	106.559%	-0.028	-0.310	0.001	106.301%	-0.005
3	20:35:22	0.002	0.016	0.026	-0.207	107.090%	-0.005	-0.267	-0.005	105.943%	-0.010
x		-0.000	0.013	0.016	-0.136	106.943%	-0.002	-0.284	-0.003	105.772%	-0.009
σ		0.003	0.007	0.008	0.066	0.336%	0.027	0.023	0.004	0.633%	0.004
%RSD		3840.000	52.070	52.190	48.330	0.314	1284.000	8.158	130.900	0.598	42.490

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	20:35:14	0.047	0.000	0.005	104.421%	-0.006	0.005	0.015	r 109.927%	0.033	0.150
2	20:35:18	0.048	-0.004	0.002	105.921%	-0.003	0.007	0.014	r 111.308%	0.024	0.128
3	20:35:22	0.046	-0.012	0.005	105.174%	-0.004	0.020	-0.010	r 110.444%	0.025	0.116
x		0.047	-0.006	0.004	105.172%	-0.004	0.010	0.006	r 110.560%	0.027	0.131
σ		0.001	0.006	0.002	0.750%	0.001	0.008	0.014	r 0.698%	0.005	0.018
%RSD		2.281	114.700	40.570	0.713	30.580	80.110	223.300	r 0.631	19.370	13.360

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	20:35:14	0.006	r 108.971%	-0.000
2	20:35:18	0.004	r 110.557%	0.001
3	20:35:22	0.003	r 110.851%	0.001
x		0.004	r 110.127%	0.000
σ		0.001	r 1.011%	0.001
%RSD		29.140	r 0.918	133.900

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	20:40:47	0.230	0.014	0.480	11110.000	4035.000	176.600	538.400	M 82920.000	1433.000	T 1912000.000
2	20:40:51	0.260	-0.005	1.047	11250.000	3973.000	168.800	536.700	M 82670.000	1458.000	T 1869000.000
3	20:40:55	0.270	0.005	0.583	11270.000	4077.000	168.100	546.700	M 83310.000	1571.000	T 1898000.000
x		0.253	0.005	0.703	11210.000	4028.000	171.100	540.600	M 82970.000	1487.000	T 1893000.000
σ		0.021	0.010	0.302	89.470	52.370	4.711	5.323	M 321.200	73.230	T 22090.000
%RSD		8.134	196.000	42.940	0.798	1.300	2.753	0.985	M 0.387	4.924	T 1.167

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	20:40:47	TM 29560.000	M 139400.000	99.895%	111.422%	13.690	1.714	0.894	21.220	763.800	M 527.400
2	20:40:51	TM 30180.000	M 138300.000	101.258%	112.196%	15.250	1.570	0.933	21.340	768.900	M 524.900
3	20:40:55	TM 30220.000	M 139400.000	100.601%	110.719%	13.420	1.658	0.950	21.280	774.400	M 529.500
x		TM 29980.000	M 139000.000	100.585%	111.446%	14.120	1.647	0.926	21.280	769.000	M 527.300
σ		TM 370.200	M 598.700	0.681%	0.739%	0.984	0.073	0.029	0.056	5.312	M 2.319
%RSD		TM 1.235	M 0.431	0.677	0.663	6.965	4.429	3.111	0.263	0.691	M 0.440

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	20:40:47	0.650	2.283	8.544	199.500	102.347%	0.975	2.271	156.200	99.820%	0.127
2	20:40:51	0.644	2.086	8.373	197.600	103.035%	1.117	2.329	155.100	101.178%	0.107
3	20:40:55	0.661	2.236	8.524	199.200	101.511%	1.049	2.768	156.000	100.534%	0.112
x		0.652	2.202	8.480	198.800	102.298%	1.047	2.456	155.800	100.511%	0.115
σ		0.009	0.103	0.094	1.038	0.763%	0.071	0.272	0.581	0.679%	0.011
%RSD		1.372	4.693	1.104	0.522	0.746	6.763	11.070	0.373	0.676	9.106

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	20:40:47	1.387	0.004	4.842	101.343%	40.510	0.065	23.050	T 106.229%	0.114	0.142
2	20:40:51	1.359	0.001	4.720	102.837%	39.950	0.065	23.280	T 106.880%	0.100	0.133
3	20:40:55	1.408	-0.001	4.869	102.397%	40.230	0.062	23.390	T 106.530%	0.109	0.130
x		1.385	0.001	4.810	102.192%	40.230	0.064	23.240	T 106.546%	0.108	0.135
σ		0.025	0.003	0.080	0.768%	0.283	0.002	0.176	T 0.326%	0.007	0.006
%RSD		1.774	180.400	1.655	0.752	0.704	2.838	0.758	T 0.306	6.410	4.552

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	20:40:47	3.970	T 101.666%	0.024
2	20:40:51	3.983	T 102.269%	0.026
3	20:40:55	4.051	T 102.903%	0.025
x		4.001	T 102.279%	0.025
σ		0.043	T 0.618%	0.001
%RSD		1.083	T 0.605	5.288

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	20:46:22	0.138	-0.009	0.739	10820.000	4622.000	63.240	265.300	M 100700.000	1629.000	T 1852000.000
2	20:46:25	0.122	0.035	0.298	10970.000	4695.000	64.530	282.000	M 101300.000	1625.000	T 1841000.000
3	20:46:29	0.126	-0.028	0.616	11030.000	4669.000	59.890	278.600	M 101000.000	1703.000	T 1856000.000
x		0.129	-0.001	0.551	10940.000	4662.000	62.550	275.300	M 101000.000	1653.000	T 1850000.000
σ		0.009	0.032	0.228	105.700	36.940	2.394	8.821	M 330.300	44.140	T 7729.000
%RSD		6.674	5935.000	41.330	0.966	0.792	3.828	3.204	M 0.327	2.671	T 0.418

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	20:46:22	TM 33360.000	M 167100.000	99.487%	107.871%	11.230	1.504	0.599	20.160	555.200	M 623.100
2	20:46:25	TM 34040.000	M 169800.000	99.823%	108.564%	11.080	1.489	0.624	20.860	550.300	M 624.000
3	20:46:29	TM 34250.000	M 168600.000	100.221%	107.392%	10.180	1.471	0.564	21.090	541.300	M 621.700
x		TM 33880.000	M 168500.000	99.844%	107.942%	10.830	1.488	0.596	20.700	549.000	M 622.900
σ		TM 462.400	M 1329.000	0.368%	0.589%	0.568	0.016	0.030	0.486	7.051	M 1.188
%RSD		TM 1.365	M 0.789	0.368	0.546	5.247	1.099	5.094	2.347	1.284	M 0.191

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	20:46:22	0.493	2.477	5.886	232.000	99.315%	0.800	2.764	182.300	99.032%	0.060
2	20:46:25	0.495	2.528	5.840	232.200	100.785%	0.727	2.933	184.800	99.609%	0.050
3	20:46:29	0.505	2.578	5.888	229.400	101.123%	0.907	3.183	183.600	99.703%	0.052
x		0.498	2.528	5.872	231.200	100.407%	0.811	2.960	183.600	99.448%	0.054
σ		0.007	0.050	0.028	1.561	0.961%	0.091	0.211	1.237	0.363%	0.005
%RSD		1.343	1.995	0.470	0.675	0.957	11.210	7.113	0.674	0.365	9.264

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	20:46:22	1.315	-0.005	2.488	99.771%	40.660	0.033	24.000	T 105.477%	0.082	0.103
2	20:46:25	1.349	-0.005	2.430	100.714%	40.700	0.047	24.670	T 106.117%	0.086	0.109
3	20:46:29	1.343	-0.009	2.379	101.601%	40.450	0.040	23.970	T 107.226%	0.095	0.099
x		1.336	-0.006	2.433	100.695%	40.600	0.040	24.210	T 106.273%	0.088	0.104
σ		0.018	0.002	0.054	0.915%	0.131	0.007	0.398	T 0.885%	0.006	0.005
%RSD		1.338	31.300	2.240	0.909	0.324	17.660	1.642	T 0.833	7.337	4.842

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	20:46:22	1.626	T 100.956%	0.005
2	20:46:25	1.649	T 101.161%	0.007
3	20:46:29	1.638	T 102.210%	0.005
x		1.638	T 101.443%	0.006
σ		0.012	T 0.672%	0.001
%RSD		0.709	T 0.663	18.990

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	20:51:55	0.082	-0.004	0.185	T 11880.000	3664.000	35.860	152.000	M 68100.000	1544.000	T 1869000.000
2	20:51:59	0.082	0.006	-0.327	T 11910.000	3672.000	35.260	148.300	M 68680.000	1532.000	T 1891000.000
3	20:52:03	0.078	-0.009	-0.041	T 11910.000	3662.000	35.850	150.000	M 69010.000	1688.000	T 1918000.000
x		0.081	-0.002	-0.061	T 11900.000	3666.000	35.660	150.100	M 68590.000	1588.000	T 1893000.000
σ		0.002	0.008	0.257	T 20.690	5.212	0.340	1.848	M 460.100	86.730	T 24690.000
%RSD		2.283	323.200	421.300	T 0.174	0.142	0.953	1.232	M 0.671	5.461	T 1.304

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	20:51:55	TM 30670.000	M 127300.000	98.776%	108.610%	7.282	0.544	0.756	21.070	343.000	TM 637.000
2	20:51:59	TM 31010.000	M 129300.000	99.347%	108.523%	7.537	0.795	0.754	19.670	339.500	M 614.900
3	20:52:03	TM 31600.000	M 130200.000	98.890%	110.090%	8.047	0.856	0.830	20.160	340.300	M 614.100
x		TM 31090.000	M 128900.000	99.004%	109.074%	7.622	0.732	0.780	20.300	340.900	TM 622.000
σ		TM 474.100	M 1496.000	0.302%	0.881%	0.390	0.165	0.043	0.710	1.826	TM 12.990
%RSD		TM 1.525	M 1.161	0.305	0.807	5.111	22.600	5.519	3.499	0.536	TM 2.088

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	20:51:55	0.300	0.545	13.950	206.600	100.441%	0.931	2.226	145.100	98.889%	0.022
2	20:51:59	0.329	0.576	14.020	209.500	100.320%	0.907	2.250	145.600	99.663%	0.048
3	20:52:03	0.318	0.546	13.770	208.900	101.882%	0.994	2.120	145.300	100.408%	0.023
x		0.316	0.556	13.910	208.300	100.881%	0.944	2.199	145.300	99.654%	0.031
σ		0.014	0.018	0.128	1.510	0.869%	0.045	0.069	0.264	0.759%	0.015
%RSD		4.520	3.182	0.920	0.725	0.862	4.730	3.143	0.182	0.762	49.200

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	20:51:55	1.596	0.006	3.735	100.205%	41.700	0.021	16.670	T 105.645%	0.115	0.092
2	20:51:59	1.659	0.016	3.712	100.271%	41.950	0.032	16.720	T 106.983%	0.078	0.088
3	20:52:03	1.662	0.006	3.510	102.197%	41.500	0.032	16.740	T 107.783%	0.118	0.087
x		1.639	0.009	3.652	100.891%	41.720	0.028	16.710	T 106.804%	0.104	0.089
σ		0.037	0.006	0.123	1.131%	0.221	0.007	0.036	T 1.080%	0.022	0.003
%RSD		2.261	63.180	3.378	1.121	0.531	23.100	0.216	T 1.011	21.610	3.055

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	20:51:55	1.303	T 101.783%	0.009
2	20:51:59	1.300	T 103.434%	0.007
3	20:52:03	1.305	T 103.897%	0.009
x		1.303	T 103.038%	0.008
σ		0.003	T 1.111%	0.001
%RSD		0.196	T 1.078	15.680

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	20:57:27	0.126	-0.024	0.369	T 12560.000	4836.000	37.400	121.300	M 97650.000	1644.000	T 1945000.000
2	20:57:31	0.104	-0.009	0.159	T 12390.000	4798.000	36.660	127.500	M 98630.000	1685.000	T 1937000.000
3	20:57:35	0.100	-0.005	0.110	T 12310.000	4788.000	35.080	123.000	M 98450.000	1553.000	T 1952000.000
x		0.110	-0.012	0.212	T 12420.000	4808.000	36.380	124.000	M 98240.000	1627.000	T 1945000.000
σ		0.014	0.010	0.138	T 126.200	25.420	1.187	3.196	M 519.900	67.830	T 7539.000
%RSD		12.950	79.960	64.750	T 1.017	0.529	3.262	2.578	M 0.529	4.168	T 0.388

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	20:57:27	TM 34130.000	M 168900.000	99.758%	111.543%	8.514	0.821	0.454	21.140	223.900	206.200
2	20:57:31	TM 34290.000	M 166100.000	101.588%	110.003%	10.550	0.968	0.430	20.450	223.300	204.500
3	20:57:35	TM 34490.000	M 171300.000	102.371%	111.428%	10.370	0.971	0.441	20.890	222.100	205.300
x		TM 34300.000	M 168800.000	101.239%	110.991%	9.812	0.920	0.442	20.820	223.100	205.400
σ		TM 182.500	M 2607.000	1.341%	0.858%	1.128	0.086	0.012	0.348	0.923	0.838
%RSD		TM 0.532	M 1.545	1.325	0.773	11.500	9.313	2.686	1.672	0.414	0.408

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	20:57:27	0.202	0.482	6.395	196.900	100.267%	0.827	2.388	186.600	99.889%	0.040
2	20:57:31	0.195	0.534	6.241	193.300	103.310%	0.808	2.487	186.000	101.428%	0.040
3	20:57:35	0.194	0.506	6.232	192.400	103.143%	0.750	2.407	186.900	102.130%	0.029
x		0.197	0.507	6.289	194.200	102.240%	0.795	2.427	186.500	101.149%	0.036
σ		0.004	0.026	0.092	2.382	1.711%	0.040	0.053	0.443	1.146%	0.006
%RSD		2.264	5.197	1.456	1.227	1.673	5.025	2.165	0.237	1.133	17.500

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	20:57:27	0.789	-0.008	3.043	101.620%	40.220	0.022	11.150	T 108.318%	0.120	0.084
2	20:57:31	0.815	-0.015	2.905	103.727%	39.950	0.021	11.040	T 108.647%	0.123	0.086
3	20:57:35	0.800	-0.011	2.947	103.368%	40.630	0.031	11.420	T 109.400%	0.124	0.083
x		0.801	-0.011	2.965	102.905%	40.270	0.025	11.200	T 108.789%	0.122	0.085
σ		0.013	0.004	0.071	1.128%	0.343	0.006	0.195	T 0.555%	0.002	0.002
%RSD		1.584	31.780	2.386	1.096	0.853	22.410	1.744	T 0.510	1.652	2.021

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	20:57:27	1.408	T 102.302%	-0.000
2	20:57:31	1.429	T 103.951%	-0.000
3	20:57:35	1.417	T 104.524%	0.000
x		1.418	T 103.592%	0.000
σ		0.011	T 1.153%	0.000
%RSD		0.742	T 1.113	532.400

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:02:58	0.065	-0.028	0.126	10620.000	4702.000	54.100	223.000	M 96460.000	1644.000	T 1968000.000
2	21:03:02	0.097	-0.005	0.451	10740.000	4744.000	52.310	195.000	M 97150.000	1622.000	T 1963000.000
3	21:03:06	0.103	0.005	0.081	T 10840.000	4791.000	53.390	198.600	M 98180.000	1631.000	T 2006000.000
x		0.088	-0.009	0.219	T 10740.000	4746.000	53.270	205.500	M 97260.000	1632.000	T 1979000.000
σ		0.020	0.017	0.202	T 108.800	44.390	0.900	15.220	M 867.200	11.200	T 23310.000
%RSD		23.190	185.200	92.160	T 1.014	0.935	1.690	7.406	M 0.892	0.686	T 1.178

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:02:58	TM 34440.000	M 165000.000	101.183%	110.555%	10.140	1.026	0.450	22.010	241.200	405.200
2	21:03:02	TM 34630.000	M 163200.000	102.347%	111.745%	9.581	1.168	0.465	20.740	239.200	401.900
3	21:03:06	TM 35450.000	M 167200.000	101.009%	110.644%	10.590	1.200	0.451	22.210	246.700	408.600
x		TM 34840.000	M 165200.000	101.513%	110.981%	10.100	1.131	0.456	21.650	242.400	405.200
σ		TM 537.500	M 2018.000	0.727%	0.662%	0.505	0.092	0.008	0.795	3.881	3.374
%RSD		TM 1.543	M 1.222	0.717	0.597	5.000	8.167	1.787	3.673	1.601	0.833

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:02:58	0.256	0.614	5.329	215.800	102.299%	0.929	2.757	208.600	100.599%	0.041
2	21:03:02	0.223	0.545	5.224	214.600	102.885%	0.983	3.031	208.900	101.043%	0.046
3	21:03:06	0.241	0.636	5.313	216.600	102.944%	0.943	2.789	208.600	101.152%	0.044
x		0.240	0.598	5.289	215.700	102.709%	0.952	2.859	208.700	100.931%	0.043
σ		0.017	0.048	0.057	1.034	0.357%	0.028	0.149	0.195	0.293%	0.003
%RSD		7.061	7.968	1.076	0.480	0.347	2.930	5.222	0.093	0.291	6.210

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:02:58	1.363	-0.008	2.425	101.431%	42.540	0.035	29.680	T 107.597%	0.076	0.105
2	21:03:02	1.326	-0.018	2.377	102.533%	41.980	0.020	29.730	T 108.107%	0.062	0.098
3	21:03:06	1.299	-0.014	2.435	102.243%	42.080	0.045	29.970	T 107.742%	0.073	0.095
x		1.330	-0.013	2.412	102.069%	42.200	0.033	29.790	T 107.815%	0.070	0.099
σ		0.032	0.005	0.031	0.572%	0.301	0.013	0.155	T 0.262%	0.007	0.005
%RSD		2.390	40.110	1.287	0.560	0.714	37.750	0.521	T 0.243	10.390	4.949

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	21:02:58	1.360	T 102.757%	0.001
2	21:03:02	1.369	T 103.063%	0.000
3	21:03:06	1.363	T 103.164%	0.000
x		1.364	T 102.995%	0.000
σ		0.005	T 0.212%	0.000
%RSD		0.342	T 0.206	41.950

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:08:31	0.028	-0.015	0.124	9019.000	3405.000	6.435	44.640	M 38250.000	1561.000	T 1708000.000
2	21:08:34	0.042	-0.001	0.048	8572.000	3350.000	4.503	43.220	M 38590.000	1524.000	T 1753000.000
3	21:08:38	0.033	-0.010	0.337	8948.000	3356.000	6.702	44.710	M 38470.000	1609.000	T 1724000.000
x		0.034	-0.008	0.169	8846.000	3370.000	5.880	44.190	M 38440.000	1564.000	T 1728000.000
σ		0.007	0.007	0.150	240.700	30.470	1.200	0.841	M 174.600	42.510	T 23000.000
%RSD		20.760	82.330	88.440	2.720	0.904	20.410	1.903	M 0.454	2.717	T 1.331

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:08:31	TM 37140.000	M 40970.000	103.310%	114.228%	3.998	0.171	0.252	21.180	32.320	37.340
2	21:08:34	TM 36790.000	M 40900.000	106.016%	114.915%	4.566	0.271	0.276	20.710	31.960	36.990
3	21:08:38	TM 37280.000	M 42100.000	105.152%	114.173%	3.789	0.227	0.310	21.010	32.580	37.070
x		TM 37070.000	M 41330.000	104.826%	114.438%	4.118	0.223	0.279	20.970	32.290	37.130
σ		TM 250.900	M 675.700	1.382%	0.414%	0.402	0.050	0.029	0.241	0.312	0.182
%RSD		TM 0.677	M 1.635	1.318	0.361	9.762	22.560	10.480	1.148	0.966	0.489

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:08:31	0.052	0.386	2.613	188.100	106.848%	0.313	2.102	46.240	103.651%	0.012
2	21:08:34	0.067	0.439	2.639	188.600	107.976%	0.314	2.070	46.420	105.481%	0.001
3	21:08:38	0.066	0.325	2.605	187.800	107.573%	0.323	2.068	46.760	104.280%	0.012
x		0.062	0.384	2.619	188.200	107.466%	0.317	2.080	46.470	104.471%	0.009
σ		0.009	0.057	0.018	0.414	0.571%	0.005	0.019	0.264	0.929%	0.006
%RSD		13.790	14.890	0.669	0.220	0.532	1.676	0.924	0.567	0.890	73.750

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:08:31	0.476	-0.007	0.400	104.323%	40.860	0.032	2.701	T 109.959%	0.251	0.041
2	21:08:34	0.459	-0.015	0.403	105.983%	40.670	0.037	2.517	T 111.944%	0.224	0.038
3	21:08:38	0.488	-0.013	0.453	105.955%	41.090	0.032	2.569	T 110.995%	0.253	0.037
x		0.474	-0.012	0.419	105.421%	40.870	0.034	2.596	T 110.966%	0.243	0.039
σ		0.015	0.004	0.030	0.950%	0.206	0.003	0.095	T 0.993%	0.016	0.002
%RSD		3.086	34.020	7.095	0.902	0.504	8.525	3.641	T 0.895	6.555	4.468

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	21:08:31	0.107	T 106.895%	-0.009
2	21:08:34	0.101	T 109.198%	-0.008
3	21:08:38	0.105	T 109.146%	-0.009
x		0.104	T 108.413%	-0.008
σ		0.003	T 1.315%	0.001
%RSD		3.087	T 1.213	6.291

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:14:02	0.125	-0.014	0.304	11460.000	4701.000	27.680	109.900	M 101100.000	1475.000	T 1882000.000
2	21:14:06	0.109	-0.028	0.283	T 11390.000	4648.000	30.890	103.200	M 100700.000	1650.000	T 1879000.000
3	21:14:10	0.096	-0.014	0.196	T 11840.000	4737.000	31.050	106.200	M 101000.000	1561.000	T 1845000.000
x		0.110	-0.019	0.261	T 11560.000	4695.000	29.870	106.400	M 101000.000	1562.000	T 1869000.000
σ		0.015	0.008	0.057	T 240.600	45.190	1.903	3.337	M 202.400	87.410	T 20560.000
%RSD		13.340	43.220	22.010	T 2.081	0.963	6.371	3.136	M 0.201	5.595	T 1.100

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:14:02	TM 30000.000	M 173300.000	103.338%	111.507%	9.639	1.100	0.337	20.630	232.900	201.800
2	21:14:06	TM 29690.000	M 174000.000	102.895%	112.590%	10.140	1.094	0.332	21.390	227.400	204.000
3	21:14:10	TM 30560.000	M 173100.000	102.982%	112.632%	10.290	1.212	0.365	21.480	231.400	203.800
x		TM 30080.000	M 173500.000	103.072%	112.243%	10.020	1.136	0.344	21.170	230.500	203.200
σ		TM 440.000	M 455.700	0.235%	0.638%	0.340	0.067	0.018	0.468	2.818	1.207
%RSD		TM 1.463	M 0.263	0.228	0.568	3.396	5.877	5.289	2.209	1.222	0.594

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:14:02	0.165	0.421	5.528	234.700	102.470%	0.887	2.855	197.700	101.410%	0.051
2	21:14:06	0.164	0.504	5.609	231.800	103.166%	0.952	2.939	200.200	101.244%	0.026
3	21:14:10	0.169	0.441	5.566	232.000	104.039%	0.849	2.794	196.800	102.339%	0.025
x		0.166	0.455	5.567	232.800	103.225%	0.896	2.862	198.200	101.664%	0.034
σ		0.002	0.043	0.041	1.630	0.786%	0.052	0.073	1.763	0.590%	0.014
%RSD		1.388	9.498	0.731	0.700	0.762	5.811	2.546	0.890	0.580	42.240

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:14:02	1.954	-0.009	2.600	102.938%	40.930	0.031	15.080	T 108.158%	0.076	0.042
2	21:14:06	2.020	-0.010	2.566	102.293%	41.670	0.042	15.010	T 107.447%	0.078	0.042
3	21:14:10	1.893	-0.011	2.598	103.753%	41.080	0.033	15.040	T 107.876%	0.084	0.035
x		1.956	-0.010	2.588	102.995%	41.230	0.036	15.040	T 107.827%	0.079	0.040
σ		0.063	0.001	0.019	0.731%	0.394	0.006	0.035	T 0.358%	0.004	0.004
%RSD		3.243	10.390	0.737	0.710	0.957	16.710	0.233	T 0.332	5.213	9.321

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	21:14:02	0.957	T 101.530%	-0.000
2	21:14:06	0.969	T 101.763%	-0.001
3	21:14:10	0.963	T 102.319%	-0.001
x		0.963	T 101.871%	-0.001
σ		0.006	T 0.405%	0.000
%RSD		0.633	T 0.398	30.020

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:19:35	0.103	0.000	0.368	T 11320.000	4430.000	25.460	117.300	M 89380.000	1679.000	T 1942000.000
2	21:19:39	0.083	-0.000	0.306	T 11250.000	4441.000	26.270	112.400	M 90480.000	1655.000	T 1968000.000
3	21:19:43	0.120	0.014	0.127	T 11390.000	4400.000	25.860	113.300	M 88560.000	1727.000	T 1914000.000
x		0.102	0.005	0.267	T 11320.000	4424.000	25.860	114.300	M 89470.000	1687.000	T 1941000.000
σ		0.019	0.008	0.125	T 66.170	21.050	0.403	2.580	M 962.500	36.350	T 26890.000
%RSD		18.210	175.200	46.920	T 0.585	0.476	1.557	2.257	M 1.076	2.155	T 1.385

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:19:35	TM 33240.000	M 147800.000	101.545%	111.579%	8.940	0.960	0.433	21.160	198.200	182.800
2	21:19:39	TM 33740.000	M 147300.000	102.520%	112.516%	8.466	1.072	0.378	21.200	200.900	179.400
3	21:19:43	TM 34000.000	M 145200.000	104.344%	112.870%	10.270	1.051	0.376	20.890	198.800	180.500
x		TM 33660.000	M 146700.000	102.803%	112.322%	9.224	1.028	0.396	21.080	199.300	180.900
σ		TM 385.500	M 1357.000	1.421%	0.667%	0.933	0.059	0.032	0.167	1.390	1.772
%RSD		TM 1.145	M 0.925	1.382	0.594	10.120	5.773	8.172	0.794	0.698	0.980

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:19:35	0.154	0.665	5.025	204.600	101.692%	0.835	2.920	164.300	100.083%	0.028
2	21:19:39	0.179	0.567	4.920	205.000	102.695%	0.804	2.878	163.800	101.317%	0.024
3	21:19:43	0.167	0.582	4.872	203.500	103.530%	0.944	3.002	163.100	102.263%	0.029
x		0.167	0.605	4.939	204.400	102.639%	0.861	2.933	163.700	101.221%	0.027
σ		0.013	0.053	0.078	0.778	0.920%	0.074	0.063	0.609	1.093%	0.002
%RSD		7.541	8.804	1.585	0.381	0.897	8.548	2.146	0.372	1.080	9.312

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:19:35	1.643	-0.010	1.771	101.412%	41.480	0.027	14.350	T 108.348%	0.091	0.032
2	21:19:39	1.688	-0.011	1.771	102.703%	41.100	0.032	14.400	T 108.867%	0.104	0.032
3	21:19:43	1.645	-0.012	1.770	103.622%	41.120	0.030	14.360	T 108.887%	0.081	0.031
x		1.658	-0.011	1.771	102.579%	41.240	0.030	14.370	T 108.701%	0.092	0.032
σ		0.025	0.001	0.000	1.110%	0.211	0.002	0.025	T 0.305%	0.011	0.001
%RSD		1.534	11.280	0.024	1.082	0.512	7.917	0.171	T 0.281	12.540	1.955

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	21:19:35	0.938	T 103.155%	-0.002
2	21:19:39	0.933	T 104.678%	-0.001
3	21:19:43	0.940	T 104.660%	-0.002
x		0.937	T 104.164%	-0.002
σ		0.004	T 0.874%	0.000
%RSD		0.400	T 0.839	15.470

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:25:08	0.182	-0.019	-0.066	T 11340.000	4331.000	113.600	393.300	M 83840.000	1744.000	T 1939000.000
2	21:25:12	0.166	-0.019	0.141	T 12130.000	4304.000	116.600	404.300	M 84480.000	1924.000	T 1856000.000
3	21:25:16	0.162	-0.014	-0.177	T 11800.000	4345.000	117.700	395.800	M 85200.000	1889.000	T 1906000.000
x		0.170	-0.017	-0.034	T 11760.000	4326.000	116.000	397.800	M 84500.000	1852.000	T 1901000.000
σ		0.010	0.003	0.161	T 394.600	20.920	2.131	5.742	M 679.100	95.400	T 41670.000
%RSD		6.151	15.420	471.800	T 3.356	0.484	1.838	1.444	M 0.804	5.151	T 2.192

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:25:08	TM 37540.000	M 134000.000	101.834%	112.836%	10.890	1.661	0.814	20.990	468.200	389.100
2	21:25:12	TM 39560.000	M 132400.000	102.871%	113.289%	12.470	1.458	0.843	21.810	462.600	394.000
3	21:25:16	TM 38950.000	M 132600.000	103.574%	113.077%	10.940	1.656	0.844	20.510	463.800	392.800
x		TM 38680.000	M 133000.000	102.760%	113.068%	11.430	1.592	0.834	21.100	464.800	392.000
σ		TM 1038.000	M 879.100	0.875%	0.226%	0.902	0.116	0.017	0.658	2.951	2.595
%RSD		TM 2.682	M 0.661	0.852	0.200	7.886	7.293	2.034	3.120	0.635	0.662

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:25:08	0.516	0.677	5.472	197.700	104.154%	0.800	3.482	152.500	100.706%	0.054
2	21:25:12	0.555	0.740	5.689	196.900	103.969%	0.871	3.337	150.600	102.721%	0.063
3	21:25:16	0.511	0.616	5.642	195.700	104.608%	0.840	3.145	152.400	102.729%	0.046
x		0.527	0.677	5.601	196.800	104.244%	0.837	3.321	151.800	102.052%	0.054
σ		0.024	0.062	0.114	1.043	0.329%	0.035	0.169	1.045	1.165%	0.008
%RSD		4.531	9.187	2.041	0.530	0.316	4.212	5.084	0.688	1.142	15.270

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:25:08	0.967	-0.018	3.585	102.121%	40.440	0.039	19.450	T 108.060%	0.075	0.038
2	21:25:12	0.978	-0.015	3.568	103.055%	40.540	0.039	19.720	T 107.805%	0.082	0.037
3	21:25:16	0.958	-0.012	3.622	103.505%	40.930	0.050	19.350	T 109.725%	0.072	0.034
x		0.968	-0.015	3.592	102.893%	40.640	0.043	19.500	T 108.530%	0.077	0.036
σ		0.010	0.003	0.027	0.706%	0.256	0.006	0.188	T 1.043%	0.005	0.002
%RSD		1.022	19.080	0.764	0.686	0.630	14.110	0.964	T 0.961	6.859	6.160

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	21:25:08	2.618	T 104.070%	0.006
2	21:25:12	2.639	T 104.246%	0.006
3	21:25:16	2.665	T 105.024%	0.005
x		2.641	T 104.447%	0.006
σ		0.023	T 0.508%	0.000
%RSD		0.889	T 0.486	7.545

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:30:42	0.227	-0.004	-0.055	T 15250.000	5763.000	128.800	400.200	M 145000.000	1797.000	T 1942000.000
2	21:30:45	0.276	-0.009	-0.233	T 15340.000	5808.000	129.900	428.300	M 145400.000	1773.000	T 1938000.000
3	21:30:49	0.271	-0.000	-0.336	T 15700.000	5818.000	121.200	390.600	M 146500.000	1836.000	T 1976000.000
x		0.258	-0.005	-0.208	T 15430.000	5796.000	126.600	406.300	M 145600.000	1802.000	T 1952000.000
σ		0.027	0.005	0.142	T 237.900	29.200	4.742	19.600	M 804.100	31.910	T 20840.000
%RSD		10.520	99.750	68.360	T 1.542	0.504	3.745	4.824	M 0.552	1.771	T 1.068

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:30:42	TM 33950.000	M 274400.000	100.911%	110.881%	17.440	1.987	0.870	20.660	381.600	345.600
2	21:30:45	TM 34160.000	M 272900.000	101.985%	111.084%	20.500	1.956	0.833	20.350	380.000	345.700
3	21:30:49	TM 34310.000	M 271200.000	101.803%	112.154%	18.210	1.749	0.873	21.540	376.700	345.800
x		TM 34140.000	M 272800.000	101.566%	111.373%	18.720	1.897	0.859	20.850	379.400	345.700
σ		TM 177.700	M 1596.000	0.575%	0.684%	1.590	0.129	0.022	0.620	2.483	0.124
%RSD		TM 0.521	M 0.585	0.566	0.614	8.494	6.818	2.614	2.972	0.654	0.036

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:30:42	0.380	1.029	8.207	308.700	101.662%	1.145	2.483	310.500	101.113%	0.047
2	21:30:45	0.400	0.936	8.237	308.600	102.534%	1.090	2.609	T 314.100	102.111%	0.048
3	21:30:49	0.397	1.004	8.084	307.200	102.740%	1.084	2.710	311.000	101.715%	0.054
x		0.393	0.990	8.176	308.200	102.312%	1.106	2.601	T 311.900	101.647%	0.050
σ		0.011	0.048	0.081	0.828	0.572%	0.034	0.114	T 1.960	0.503%	0.004
%RSD		2.717	4.862	0.994	0.269	0.559	3.036	4.370	T 0.628	0.495	7.959

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:30:42	1.779	-0.013	6.106	101.209%	41.390	0.046	20.060	T 105.842%	0.165	0.048
2	21:30:45	1.759	-0.004	5.997	102.917%	41.140	0.032	19.570	T 107.690%	0.141	0.043
3	21:30:49	1.835	-0.008	5.971	103.167%	41.250	0.033	20.040	T 107.973%	0.156	0.047
x		1.791	-0.009	6.025	102.431%	41.260	0.037	19.890	T 107.168%	0.154	0.046
σ		0.039	0.004	0.072	1.066%	0.127	0.008	0.280	T 1.158%	0.012	0.002
%RSD		2.191	49.900	1.191	1.041	0.307	21.130	1.406	T 1.080	7.994	4.833

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	21:30:42	3.356	T 99.452%	0.020
2	21:30:45	3.351	T 101.011%	0.020
3	21:30:49	3.346	T 101.564%	0.019
x		3.351	T 100.676%	0.019
σ		0.005	T 1.096%	0.000
%RSD		0.151	T 1.088	1.598

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:36:15	85.870	82.740	89.700	5034.000	4911.000	4625.000	4696.000	4999.000	161.600	↹2266000.000
2	21:36:19	85.860	82.540	86.090	5010.000	4949.000	4632.000	4733.000	4973.000	191.700	↹2310000.000
3	21:36:23	86.480	82.450	86.760	5170.000	4976.000	4666.000	4805.000	5138.000	162.900	↹2293000.000
x		86.070	82.570	87.520	5071.000	4945.000	4641.000	4745.000	5036.000	172.100	↹2290000.000
σ		0.353	0.152	1.920	86.480	32.940	21.570	55.580	88.870	16.970	↹22310.000
%RSD		0.410	0.184	2.194	1.705	0.666	0.465	1.171	1.765	9.861	↹0.974

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:36:15	4869.000	4777.000	113.514%	121.595%	97.870	98.850	99.780	6.705	5573.000	98.400
2	21:36:19	4914.000	4853.000	115.073%	122.059%	94.930	98.160	99.320	9.917	5539.000	98.650
3	21:36:23	4970.000	5088.000	115.446%	122.373%	96.020	98.040	99.570	12.140	5558.000	99.800
x		4917.000	4906.000	114.677%	122.009%	96.280	98.350	99.550	9.589	5557.000	98.950
σ		50.670	161.900	1.025%	0.392%	1.483	0.437	0.229	2.735	16.830	0.747
%RSD		1.030	3.301	0.894	0.321	1.540	0.444	0.230	28.520	0.303	0.755

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:36:15	100.600	102.600	103.600	104.600	115.798%	101.200	95.170	99.060	108.822%	99.200
2	21:36:19	100.000	101.600	102.500	104.100	117.194%	101.800	97.670	99.180	109.273%	99.520
3	21:36:23	99.960	102.200	103.200	103.800	118.124%	101.700	95.470	99.550	110.058%	99.650
x		100.200	102.100	103.100	104.200	117.039%	101.600	96.100	99.260	109.385%	99.460
σ		0.355	0.461	0.573	0.440	1.171%	0.351	1.367	0.252	0.625%	0.233
%RSD		0.355	0.452	0.556	0.422	1.001	0.345	1.422	0.254	0.572	0.234

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:36:15	103.500	51.600	103.600	109.160%	101.500	102.000	98.370	↹111.719%	5.130	↹100.400
2	21:36:19	103.400	51.860	103.100	109.524%	101.000	101.800	98.860	↹113.587%	5.068	↹102.200
3	21:36:23	103.900	51.580	104.000	110.418%	100.400	101.700	97.590	↹115.050%	5.043	↹100.600
x		103.600	51.680	103.500	109.700%	101.000	101.800	98.270	↹113.452%	5.080	↹101.100
σ		0.282	0.154	0.458	0.647%	0.546	0.166	0.642	↹1.670%	0.045	↹0.966
%RSD		0.273	0.299	0.443	0.590	0.541	0.163	0.653	↹1.472	0.879	↹0.956

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	21:36:15	↹101.100	↹108.167%	↹100.500
2	21:36:19	↹100.900	↹109.141%	↹100.500
3	21:36:23	↹100.800	↹110.357%	↹99.880
x		↹100.900	↹109.222%	↹100.300
σ		↹0.143	↹1.098%	↹0.368
%RSD		↹0.142	↹1.005	↹0.367

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:41:48	0.010	0.006	0.203	12.440	1.526	1.661	1.965	20.820	147.000	↹2167000.000
2	21:41:52	0.027	0.014	-0.021	11.880	3.520	1.058	4.092	27.840	157.900	↹2206000.000
3	21:41:56	0.011	-0.003	-0.024	12.110	4.120	2.863	2.596	19.750	181.600	↹2163000.000
x		0.016	0.006	0.053	12.140	3.055	1.861	2.885	22.800	162.200	↹2179000.000
σ		0.010	0.008	0.130	0.284	1.358	0.919	1.092	4.394	17.670	↹23590.000
%RSD		61.030	143.500	246.000	2.336	44.450	49.390	37.870	19.270	10.900	↹1.083

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:41:48	-8.867	46.320	110.291%	121.329%	0.123	0.214	-0.017	27.690	3.510	0.120
2	21:41:52	-1.214	43.980	110.332%	122.843%	0.142	-0.235	0.004	29.730	4.398	0.142
3	21:41:56	-7.670	63.170	110.736%	121.746%	0.065	0.046	-0.027	28.950	4.495	0.146
x		-5.917	51.160	110.453%	121.973%	0.110	0.008	-0.013	28.790	4.134	0.136
σ		4.117	10.470	0.246%	0.782%	0.040	0.227	0.015	1.031	0.543	0.014
%RSD		69.570	20.460	0.223	0.641	36.370	2718.000	115.300	3.581	13.130	10.190

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:41:48	0.060	0.077	0.098	-0.102	113.118%	0.040	-0.197	0.102	107.229%	0.050
2	21:41:52	0.083	0.071	0.089	0.043	111.121%	0.065	-0.186	0.125	108.219%	0.059
3	21:41:56	0.074	0.088	0.092	-0.031	112.114%	0.101	-0.177	0.116	108.234%	0.055
x		0.072	0.079	0.093	-0.030	112.118%	0.069	-0.187	0.114	107.894%	0.055
σ		0.012	0.009	0.005	0.072	0.999%	0.031	0.010	0.011	0.576%	0.005
%RSD		16.410	11.410	4.899	241.000	0.891	44.850	5.305	9.919	0.534	8.591

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:41:48	0.101	0.033	0.066	108.061%	0.068	0.058	0.035	↹112.895%	0.062	0.174
2	21:41:52	0.122	0.033	0.073	108.382%	0.072	0.081	0.088	↹112.489%	0.030	0.164
3	21:41:56	0.121	0.035	0.078	108.568%	0.105	0.087	0.072	↹113.306%	0.031	0.150
x		0.115	0.034	0.072	108.337%	0.082	0.075	0.065	↹112.897%	0.041	0.163
σ		0.012	0.001	0.006	0.257%	0.020	0.015	0.027	↹0.409%	0.018	0.012
%RSD		10.040	3.730	8.404	0.237	24.730	20.310	42.220	↹0.362	45.270	7.485

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	21:41:48	0.071	↹109.400%	0.056
2	21:41:52	0.082	↹110.698%	0.067
3	21:41:56	0.078	↹110.806%	0.068
x		0.077	↹110.301%	0.064
σ		0.006	↹0.782%	0.007
%RSD		7.228	↹0.709	10.370

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:47:21	0.101	-0.019	0.320	T 12280.000	4396.000	48.320	217.800	M 95010.000	1664.000	T 1926000.000
2	21:47:25	0.081	-0.019	-0.285	T 12190.000	4475.000	47.130	224.800	M 95180.000	1709.000	T 1966000.000
3	21:47:29	0.094	-0.001	0.325	T 12290.000	4349.000	46.780	220.400	M 95050.000	1775.000	T 1967000.000
x		0.092	-0.013	0.120	T 12250.000	4407.000	47.410	221.000	M 95080.000	1716.000	T 1953000.000
σ		0.010	0.011	0.351	T 59.480	63.600	0.805	3.573	M 86.370	55.670	T 23510.000
%RSD		11.280	79.220	292.800	T 0.485	1.443	1.698	1.617	M 0.091	3.244	T 1.204

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:47:21	TM 36160.000	M 157900.000	102.187%	116.102%	10.790	1.348	0.576	21.810	610.700	393.300
2	21:47:25	TM 36540.000	M 158100.000	102.342%	116.088%	9.482	1.220	0.589	22.000	615.400	395.800
3	21:47:29	TM 36980.000	M 159400.000	103.390%	115.848%	9.827	1.127	0.594	22.010	614.600	395.800
x		TM 36560.000	M 158500.000	102.640%	116.012%	10.030	1.232	0.586	21.940	613.600	395.000
σ		TM 408.000	M 810.500	0.654%	0.143%	0.680	0.111	0.009	0.111	2.500	1.466
%RSD		TM 1.116	M 0.511	0.637	0.123	6.778	9.007	1.550	0.506	0.408	0.371

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:47:21	0.445	1.014	8.532	221.800	103.910%	0.963	3.284	178.200	101.350%	0.059
2	21:47:25	0.426	0.977	8.763	228.200	102.486%	1.013	3.804	178.600	101.866%	0.040
3	21:47:29	0.450	0.976	8.694	228.300	103.841%	1.057	3.432	178.200	102.866%	0.053
x		0.441	0.989	8.663	226.100	103.412%	1.011	3.507	178.400	102.027%	0.051
σ		0.013	0.022	0.118	3.703	0.803%	0.047	0.268	0.241	0.771%	0.010
%RSD		2.928	2.196	1.367	1.638	0.776	4.656	7.637	0.135	0.755	18.840

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:47:21	1.681	0.003	2.015	102.494%	40.950	0.054	17.240	T 106.886%	0.099	0.121
2	21:47:25	1.684	-0.001	1.946	102.917%	41.000	0.046	17.480	T 108.073%	0.116	0.107
3	21:47:29	1.636	0.003	1.947	103.703%	40.760	0.034	17.480	T 108.720%	0.119	0.104
x		1.667	0.002	1.969	103.038%	40.900	0.044	17.400	T 107.893%	0.111	0.111
σ		0.027	0.002	0.040	0.613%	0.126	0.010	0.139	T 0.930%	0.011	0.009
%RSD		1.598	117.300	2.010	0.595	0.307	22.420	0.801	T 0.862	9.836	8.314

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	21:47:21	1.247	T 101.370%	0.020
2	21:47:25	1.235	T 102.730%	0.018
3	21:47:29	1.234	T 104.230%	0.013
x		1.239	T 102.777%	0.017
σ		0.007	T 1.430%	0.004
%RSD		0.603	T 1.392	20.950

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:52:55	0.019	-0.029	0.122	8989.000	3314.000	6.660	53.840	M 34990.000	1778.000	T 2024000.000
2	21:52:59	0.003	-0.011	-0.380	9160.000	3320.000	8.667	51.880	M 35010.000	1786.000	T 2024000.000
3	21:53:03	0.015	-0.011	0.051	9171.000	3330.000	6.413	51.840	M 34730.000	1858.000	T 2047000.000
x		0.012	-0.017	-0.069	9107.000	3321.000	7.247	52.520	M 34910.000	1807.000	T 2032000.000
σ		0.008	0.010	0.272	102.300	7.982	1.236	1.141	M 153.800	44.300	T 13230.000
%RSD		68.080	61.640	395.000	1.123	0.240	17.060	2.173	M 0.441	2.451	T 0.651

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:52:55	TM 42420.000	M 31220.000	106.746%	117.821%	3.928	0.238	0.308	24.430	38.900	155.600
2	21:52:59	TM 42400.000	M 31090.000	108.371%	118.441%	3.639	0.317	0.275	23.800	39.510	155.200
3	21:53:03	TM 42770.000	M 31350.000	108.574%	118.404%	5.308	0.065	0.280	24.880	40.410	155.400
x		TM 42530.000	M 31220.000	107.897%	118.222%	4.292	0.207	0.288	24.370	39.600	155.400
σ		TM 211.200	M 130.600	1.002%	0.348%	0.892	0.129	0.018	0.541	0.760	0.239
%RSD		TM 0.497	M 0.419	0.928	0.294	20.770	62.450	6.156	2.221	1.919	0.154

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:52:55	0.102	1.222	2.810	147.600	108.381%	0.303	2.979	38.690	105.837%	0.024
2	21:52:59	0.088	1.175	2.845	148.900	108.617%	0.354	3.323	38.530	106.776%	0.022
3	21:53:03	0.095	1.208	2.735	148.300	108.806%	0.309	3.117	39.250	106.285%	0.034
x		0.095	1.202	2.797	148.300	108.601%	0.322	3.140	38.820	106.299%	0.027
σ		0.007	0.024	0.056	0.668	0.213%	0.028	0.173	0.381	0.470%	0.006
%RSD		7.452	2.036	2.011	0.451	0.196	8.615	5.500	0.980	0.442	23.970

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:52:55	0.199	-0.010	0.140	106.016%	41.030	0.032	5.937	T 111.906%	0.103	0.048
2	21:52:59	0.213	-0.016	0.120	106.960%	40.940	0.028	5.949	T 113.403%	0.120	0.046
3	21:53:03	0.198	-0.015	0.131	106.692%	41.840	0.036	6.052	T 112.466%	0.100	0.048
x		0.203	-0.014	0.130	106.556%	41.270	0.032	5.979	T 112.591%	0.108	0.047
σ		0.008	0.003	0.010	0.486%	0.497	0.004	0.063	T 0.757%	0.011	0.001
%RSD		4.137	22.760	7.520	0.456	1.205	12.710	1.060	T 0.672	9.946	1.707

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	21:52:55	0.075	T 107.685%	-0.010
2	21:52:59	0.077	T 108.242%	-0.009
3	21:53:03	0.077	T 108.875%	-0.008
x		0.076	T 108.267%	-0.009
σ		0.001	T 0.596%	0.001
%RSD		1.274	T 0.550	10.460

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:58:29	0.139	-0.015	-0.151	T 10920.000	4312.000	83.500	306.500	M 90180.000	1614.000	T 1848000.000
2	21:58:33	0.121	-0.024	-0.389	11440.000	4404.000	84.870	303.800	M 92060.000	1603.000	T 1826000.000
3	21:58:37	0.122	-0.005	-0.242	T 11120.000	4294.000	79.820	295.700	M 90200.000	1591.000	T 1834000.000
x		0.127	-0.015	-0.261	T 11160.000	4337.000	82.730	302.000	M 90810.000	1603.000	T 1836000.000
σ		0.010	0.009	0.120	T 265.100	58.960	2.611	5.626	M 1080.000	11.260	T 10990.000
%RSD		7.738	62.940	46.210	T 2.376	1.359	3.156	1.863	M 1.189	0.703	T 0.599

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:58:29	TM 32880.000	M 148200.000	102.902%	115.474%	10.750	1.260	0.560	21.350	483.500	TM 674.900
2	21:58:33	TM 34220.000	M 148400.000	102.332%	114.475%	10.630	1.167	0.558	20.940	483.700	TM 677.100
3	21:58:37	TM 33520.000	M 145700.000	104.358%	114.528%	11.030	1.043	0.549	21.410	488.400	TM 673.200
x		TM 33540.000	M 147400.000	103.197%	114.826%	10.800	1.157	0.556	21.230	485.200	TM 675.100
σ		TM 667.600	M 1530.000	1.044%	0.562%	0.206	0.109	0.006	0.254	2.806	TM 1.960
%RSD		TM 1.991	M 1.038	1.012	0.489	1.904	9.398	1.012	1.196	0.578	TM 0.290

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:58:29	0.469	0.793	5.377	185.400	105.380%	0.847	3.022	179.800	101.893%	0.068
2	21:58:33	0.480	0.759	5.282	187.000	105.080%	0.832	3.121	178.800	102.714%	0.079
3	21:58:37	0.454	0.825	5.490	187.100	105.686%	0.747	2.999	179.600	103.996%	0.064
x		0.468	0.793	5.383	186.500	105.382%	0.809	3.047	179.400	102.868%	0.070
σ		0.013	0.033	0.104	0.954	0.303%	0.054	0.065	0.530	1.060%	0.008
%RSD		2.772	4.160	1.927	0.511	0.287	6.650	2.120	0.296	1.030	10.900

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:58:29	0.759	-0.008	3.131	101.964%	41.950	0.033	37.280	T 106.835%	0.072	0.077
2	21:58:33	0.756	-0.009	3.250	104.031%	41.210	0.037	37.390	T 108.572%	0.084	0.085
3	21:58:37	0.688	-0.011	3.324	104.816%	41.330	0.037	37.200	T 109.641%	0.065	0.083
x		0.734	-0.010	3.235	103.604%	41.500	0.036	37.290	T 108.350%	0.073	0.082
σ		0.040	0.001	0.097	1.473%	0.399	0.002	0.095	T 1.416%	0.010	0.004
%RSD		5.495	15.400	3.011	1.422	0.963	5.322	0.255	T 1.307	13.020	4.950

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	21:58:29	1.940	T 103.051%	0.002
2	21:58:33	1.931	T 103.735%	0.002
3	21:58:37	1.911	T 105.214%	0.002
x		1.927	T 104.000%	0.002
σ		0.015	T 1.105%	0.000
%RSD		0.760	T 1.063	20.020

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:04:04	0.029	-0.015	0.011	8913.000	3138.000	6.263	50.430	M 26170.000	1406.000	T 1864000.000
2	22:04:07	0.001	-0.002	-0.098	8780.000	3144.000	6.325	40.880	M 25630.000	1450.000	T 1830000.000
3	22:04:12	-0.001	-0.024	-0.271	9237.000	3123.000	7.681	45.930	M 26000.000	1517.000	T 1798000.000
x		0.010	-0.014	-0.120	8977.000	3135.000	6.756	45.750	M 25930.000	1458.000	T 1831000.000
σ		0.017	0.011	0.142	235.300	10.880	0.802	4.780	M 278.200	55.650	T 33020.000
%RSD		170.600	79.430	118.900	2.622	0.347	11.860	10.450	M 1.073	3.818	T 1.804

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:04:04	TM 37090.000	15850.000	107.346%	118.367%	2.913	-0.013	0.257	22.770	34.740	28.130
2	22:04:07	TM 36680.000	15800.000	109.681%	120.086%	3.060	-0.040	0.255	22.480	32.970	27.670
3	22:04:12	TM 38030.000	15980.000	109.060%	119.471%	2.656	0.268	0.261	22.180	33.830	27.840
x		TM 37270.000	15880.000	108.696%	119.308%	2.876	0.072	0.258	22.470	33.850	27.880
σ		TM 694.300	95.180	1.209%	0.871%	0.204	0.171	0.003	0.295	0.885	0.232
%RSD		TM 1.863	0.600	1.113	0.730	7.107	238.700	1.202	1.312	2.615	0.833

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:04:04	0.051	0.365	3.449	102.000	109.200%	0.268	2.749	16.800	107.149%	0.021
2	22:04:07	0.064	0.376	3.498	101.300	109.848%	0.250	2.710	16.640	107.608%	0.029
3	22:04:12	0.057	0.381	3.542	100.800	109.517%	0.146	2.404	16.770	107.744%	0.030
x		0.057	0.374	3.496	101.300	109.522%	0.221	2.621	16.740	107.500%	0.027
σ		0.007	0.008	0.046	0.609	0.324%	0.066	0.189	0.085	0.312%	0.005
%RSD		11.600	2.246	1.328	0.601	0.296	29.890	7.214	0.509	0.290	19.310

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:04:04	0.136	-0.015	0.319	106.524%	42.000	0.032	2.326	T 113.785%	0.230	0.027
2	22:04:07	0.152	-0.011	0.309	107.309%	42.310	0.022	2.278	T 114.023%	0.222	0.027
3	22:04:12	0.156	-0.010	0.264	107.400%	42.450	0.024	2.307	T 113.266%	0.245	0.029
x		0.148	-0.012	0.297	107.078%	42.260	0.026	2.304	T 113.691%	0.232	0.028
σ		0.010	0.003	0.029	0.482%	0.228	0.006	0.025	T 0.387%	0.011	0.001
%RSD		6.828	23.580	9.730	0.450	0.539	21.480	1.064	T 0.340	4.909	4.986

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	22:04:04	0.107	T 109.649%	-0.010
2	22:04:07	0.110	T 110.900%	-0.010
3	22:04:12	0.108	T 109.681%	-0.010
x		0.108	T 110.077%	-0.010
σ		0.001	T 0.713%	0.000
%RSD		1.105	T 0.648	1.984

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:09:38	0.037	0.013	-0.079	11070.000	4013.000	20.900	92.440	M 80090.000	1508.000	T 1842000.000
2	22:09:42	0.055	-0.006	0.151	11120.000	4065.000	22.430	88.440	M 80560.000	1499.000	T 1863000.000
3	22:09:45	0.029	-0.010	0.001	T 11160.000	4034.000	21.830	84.750	M 79360.000	1577.000	T 1846000.000
x		0.040	-0.001	0.024	T 11120.000	4037.000	21.720	88.540	M 80000.000	1528.000	T 1850000.000
σ		0.013	0.012	0.117	T 45.010	26.120	0.773	3.842	M 608.900	42.780	T 10980.000
%RSD		32.380	1340.000	480.500	T 0.405	0.647	3.559	4.339	M 0.761	2.800	T 0.593

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:09:38	TM 33290.000	M 127300.000	102.985%	114.956%	8.480	0.879	0.316	21.390	260.000	303.800
2	22:09:42	TM 33650.000	M 127400.000	103.327%	115.042%	7.632	0.640	0.353	21.890	258.700	302.000
3	22:09:45	TM 33420.000	M 127000.000	105.009%	115.179%	7.422	0.616	0.283	22.230	258.700	302.400
x		TM 33450.000	M 127200.000	103.774%	115.059%	7.845	0.711	0.317	21.840	259.100	302.700
σ		TM 180.100	M 214.000	1.084%	0.112%	0.560	0.146	0.035	0.421	0.792	0.899
%RSD		TM 0.538	M 0.168	1.044	0.098	7.136	20.450	11.120	1.926	0.306	0.297

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:09:38	0.288	0.519	4.353	203.900	104.466%	0.677	2.628	140.300	101.782%	0.037
2	22:09:42	0.273	0.467	4.448	198.400	106.669%	0.619	2.444	140.900	101.761%	0.038
3	22:09:45	0.293	0.466	4.339	201.300	105.686%	0.694	2.335	141.300	102.469%	0.040
x		0.284	0.484	4.380	201.200	105.607%	0.663	2.469	140.800	102.004%	0.038
σ		0.010	0.030	0.059	2.717	1.104%	0.039	0.148	0.484	0.403%	0.002
%RSD		3.634	6.206	1.355	1.351	1.045	5.954	6.002	0.343	0.395	4.952

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:09:38	0.495	-0.010	2.491	103.084%	40.970	0.030	17.270	T 108.036%	0.151	0.066
2	22:09:42	0.499	-0.019	2.566	103.869%	41.180	0.023	17.120	T 108.676%	0.141	0.066
3	22:09:45	0.520	-0.008	2.474	104.604%	41.150	0.032	17.090	T 108.979%	0.156	0.063
x		0.505	-0.013	2.510	103.852%	41.100	0.028	17.160	T 108.563%	0.149	0.065
σ		0.013	0.006	0.049	0.760%	0.111	0.005	0.098	T 0.481%	0.007	0.002
%RSD		2.672	45.800	1.949	0.732	0.271	17.130	0.574	T 0.443	4.937	2.571

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	22:09:38	0.647	T 102.927%	-0.004
2	22:09:42	0.655	T 103.889%	-0.005
3	22:09:45	0.656	T 104.769%	-0.005
x		0.653	T 103.862%	-0.005
σ		0.005	T 0.921%	0.000
%RSD		0.766	T 0.887	10.120

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:15:10	0.070	-0.010	0.019	9000.000	3258.000	59.820	228.300	M 42720.000	1386.000	T 1843000.000
2	22:15:14	0.057	-0.019	-0.160	9141.000	3252.000	64.780	211.400	M 42930.000	1411.000	T 1847000.000
3	22:15:18	0.072	-0.001	-0.155	8805.000	3221.000	62.540	226.900	M 42700.000	1435.000	T 1868000.000
x		0.066	-0.010	-0.099	8982.000	3244.000	62.380	222.200	M 42780.000	1411.000	T 1853000.000
σ		0.008	0.009	0.102	168.900	19.760	2.482	9.362	M 127.600	24.420	T 13710.000
%RSD		12.110	89.510	103.100	1.880	0.609	3.979	4.213	M 0.298	1.731	T 0.740

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:15:10	TM 36730.000	M 58310.000	103.353%	115.387%	6.809	0.443	0.576	21.930	346.100	255.800
2	22:15:14	TM 37100.000	M 58650.000	104.220%	116.089%	6.649	0.609	0.582	21.150	344.900	256.400
3	22:15:18	TM 37120.000	M 58670.000	104.939%	115.730%	5.891	0.521	0.596	21.720	347.200	255.900
x		TM 36990.000	M 58540.000	104.171%	115.735%	6.449	0.524	0.584	21.600	346.100	256.000
σ		TM 218.000	M 204.500	0.794%	0.351%	0.491	0.083	0.010	0.402	1.174	0.311
%RSD		TM 0.590	M 0.349	0.762	0.303	7.606	15.850	1.789	1.861	0.339	0.121

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:15:10	0.316	0.976	4.909	168.800	105.422%	0.556	2.601	69.500	103.169%	0.070
2	22:15:14	0.305	0.985	4.936	168.300	106.691%	0.552	2.437	70.190	103.755%	0.044
3	22:15:18	0.302	1.015	4.865	169.100	106.325%	0.557	2.324	70.060	104.590%	0.058
x		0.308	0.992	4.904	168.700	106.146%	0.555	2.454	69.920	103.838%	0.057
σ		0.007	0.020	0.036	0.425	0.653%	0.002	0.139	0.363	0.714%	0.013
%RSD		2.357	2.041	0.730	0.252	0.615	0.411	5.672	0.519	0.687	23.050

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:15:10	0.223	-0.006	2.100	104.344%	41.040	0.051	14.620	T 110.429%	0.141	0.037
2	22:15:14	0.227	-0.014	1.951	105.207%	41.080	0.022	14.390	T 110.791%	0.125	0.034
3	22:15:18	0.223	-0.016	2.101	105.085%	41.020	0.027	14.370	T 111.366%	0.129	0.034
x		0.224	-0.012	2.051	104.879%	41.050	0.033	14.460	T 110.862%	0.132	0.035
σ		0.002	0.005	0.086	0.467%	0.026	0.016	0.139	T 0.473%	0.008	0.002
%RSD		0.889	44.480	4.217	0.445	0.062	47.270	0.961	T 0.426	6.045	4.605

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	22:15:10	1.425	T 105.755%	-0.002
2	22:15:14	1.417	T 107.472%	-0.002
3	22:15:18	1.420	T 107.333%	-0.002
x		1.420	T 106.853%	-0.002
σ		0.004	T 0.953%	0.000
%RSD		0.284	T 0.892	21.380

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:20:43	0.033	-0.010	-0.225	T 10490.000	4093.000	9.496	73.570	M 73080.000	1726.000	T 2065000.000
2	22:20:47	0.053	-0.015	-0.298	10620.000	4083.000	9.038	59.210	M 73150.000	1707.000	T 2033000.000
3	22:20:51	0.033	-0.015	0.231	10720.000	4031.000	10.240	65.690	M 73260.000	1692.000	T 2041000.000
x		0.040	-0.013	-0.097	T 10610.000	4069.000	9.592	66.160	M 73160.000	1708.000	T 2046000.000
σ		0.012	0.003	0.286	T 116.000	33.360	0.608	7.193	M 93.460	17.050	T 16740.000
%RSD		28.940	19.880	294.600	T 1.093	0.820	6.338	10.870	M 0.128	0.998	T 0.818

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:20:43	TM 36220.000	M 153700.000	103.535%	116.231%	6.838	0.191	0.281	22.480	132.800	401.800
2	22:20:47	TM 36610.000	M 152300.000	105.413%	116.956%	6.825	0.247	0.277	22.450	131.200	402.000
3	22:20:51	TM 36870.000	M 152100.000	106.003%	116.405%	6.901	0.205	0.297	22.340	131.200	401.200
x		TM 36570.000	M 152700.000	104.983%	116.531%	6.855	0.214	0.285	22.420	131.700	401.700
σ		TM 326.600	M 872.300	1.289%	0.378%	0.041	0.029	0.011	0.077	0.907	0.384
%RSD		TM 0.893	M 0.571	1.228	0.325	0.591	13.500	3.818	0.342	0.688	0.095

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:20:43	0.215	0.484	4.250	208.700	105.452%	0.770	2.068	200.600	101.435%	0.026
2	22:20:47	0.231	0.445	4.331	210.400	104.612%	0.780	2.247	196.500	103.942%	0.024
3	22:20:51	0.230	0.459	4.304	208.000	106.003%	0.799	2.386	198.300	103.381%	0.027
x		0.225	0.463	4.295	209.000	105.356%	0.783	2.234	198.500	102.919%	0.026
σ		0.009	0.020	0.041	1.227	0.700%	0.015	0.160	2.054	1.316%	0.002
%RSD		4.011	4.223	0.952	0.587	0.665	1.913	7.139	1.035	1.278	7.091

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:20:43	0.363	-0.013	1.856	103.081%	41.470	0.020	25.050	T 108.415%	0.122	0.089
2	22:20:47	0.423	-0.020	1.766	104.306%	41.320	0.026	25.060	T 109.842%	0.119	0.091
3	22:20:51	0.372	-0.018	1.749	104.746%	41.340	0.019	24.910	T 109.941%	0.140	0.087
x		0.386	-0.017	1.790	104.044%	41.380	0.022	25.010	T 109.399%	0.127	0.089
σ		0.032	0.003	0.057	0.863%	0.085	0.004	0.083	T 0.854%	0.011	0.002
%RSD		8.403	20.120	3.211	0.829	0.206	16.280	0.330	T 0.780	9.005	2.647

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	22:20:43	0.252	T 103.352%	-0.006
2	22:20:47	0.259	T 103.860%	-0.006
3	22:20:51	0.255	T 104.521%	-0.006
x		0.255	T 103.911%	-0.006
σ		0.004	T 0.586%	0.000
%RSD		1.491	T 0.564	1.499

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:26:17	0.003	0.017	-0.438	4.557	-2.934	-1.143	-1.805	-14.860	165.800	τ 2206000.000
2	22:26:21	-0.003	0.007	-0.677	4.345	-0.980	-0.954	-0.595	13.300	147.300	τ 2195000.000
3	22:26:24	-0.002	0.003	-0.652	4.876	-1.223	-2.120	0.660	2.480	177.300	τ 2207000.000
x		-0.000	0.009	-0.589	4.593	-1.712	-1.406	-0.580	0.307	163.500	τ 2203000.000
σ		0.003	0.007	0.132	0.267	1.065	0.626	1.232	14.210	15.140	τ 6716.000
%RSD		696.900	77.620	22.360	5.817	62.190	44.520	212.500	4626.000	9.259	τ 0.305

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:26:17	-18.100	0.038	105.615%	116.549%	0.017	-0.158	-0.129	24.270	-0.935	0.016
2	22:26:21	-19.870	4.442	106.314%	117.525%	-0.024	-0.005	-0.103	24.480	-0.788	0.012
3	22:26:24	-7.666	46.050	107.144%	117.154%	-0.005	-0.000	-0.092	24.480	-1.147	0.134
x		-15.210	16.840	106.358%	117.076%	-0.004	-0.054	-0.108	24.410	-0.956	0.054
σ		6.595	25.390	0.765%	0.493%	0.020	0.090	0.019	0.123	0.180	0.069
%RSD		43.350	150.700	0.720	0.421	491.500	165.300	17.820	0.503	18.870	128.300

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:26:17	0.007	0.012	0.022	-0.043	106.226%	-0.098	-0.345	0.016	105.664%	-0.006
2	22:26:21	0.009	0.031	0.012	-0.038	107.561%	-0.123	-0.344	0.014	105.290%	-0.002
3	22:26:24	0.013	0.019	0.021	-0.013	106.854%	-0.024	-0.304	0.076	105.657%	0.008
x		0.010	0.021	0.019	-0.032	106.880%	-0.081	-0.331	0.035	105.537%	-0.000
σ		0.003	0.009	0.006	0.016	0.668%	0.051	0.023	0.035	0.214%	0.007
%RSD		30.740	45.310	31.000	50.410	0.625	63.070	6.924	100.100	0.203	5061.000

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:26:17	-0.006	-0.005	0.007	105.526%	-0.010	0.014	0.000	τ 111.381%	-0.003	-0.014
2	22:26:21	0.001	-0.005	0.014	105.290%	0.007	0.011	0.003	τ 110.420%	-0.003	-0.012
3	22:26:24	-0.000	-0.005	0.001	105.447%	0.009	0.006	0.010	τ 112.155%	0.001	-0.015
x		-0.002	-0.005	0.008	105.421%	0.002	0.010	0.004	τ 111.319%	-0.002	-0.014
σ		0.004	0.000	0.007	0.120%	0.010	0.004	0.005	τ 0.869%	0.002	0.001
%RSD		189.900	8.840	85.570	0.114	497.100	43.380	115.900	τ 0.781	134.900	9.229

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	22:26:17	0.005	τ 110.337%	0.009
2	22:26:21	0.008	τ 110.055%	0.011
3	22:26:24	0.006	τ 110.955%	0.009
x		0.006	τ 110.449%	0.010
σ		0.001	τ 0.460%	0.001
%RSD		17.710	τ 0.417	10.690

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:31:51	-0.011	0.008	0.046	12.440	5.500	6.180	6.736	40.160	142.700	τ 1909000.000
2	22:31:55	0.007	-0.019	0.094	8.186	3.938	6.433	4.026	36.120	149.200	τ 1927000.000
3	22:31:59	-0.002	-0.005	-0.045	9.482	7.099	6.464	7.464	29.480	188.400	τ 1920000.000
x		-0.002	-0.005	0.032	10.030	5.512	6.359	6.075	35.250	160.100	τ 1919000.000
σ		0.009	0.014	0.071	2.178	1.581	0.156	1.812	5.393	24.710	τ 9025.000
%RSD		401.800	253.200	224.200	21.710	28.680	2.452	29.820	15.300	15.430	τ 0.470

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:31:51	-54.560	33.100	105.823%	115.008%	0.075	0.116	0.189	20.730	3.443	0.148
2	22:31:55	-60.600	46.440	106.180%	115.892%	0.251	-0.122	0.223	22.130	3.522	0.143
3	22:31:59	-53.600	44.110	106.231%	114.177%	0.173	-0.184	0.240	22.930	3.633	0.135
x		-56.250	41.220	106.078%	115.026%	0.166	-0.063	0.217	21.930	3.533	0.142
σ		3.792	7.127	0.222%	0.857%	0.088	0.159	0.026	1.111	0.096	0.006
%RSD		6.741	17.290	0.209	0.745	53.050	250.200	12.060	5.065	2.710	4.551

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:31:51	-0.002	0.316	0.427	4.111	108.989%	-0.189	-0.338	0.105	105.082%	0.024
2	22:31:55	-0.001	0.218	0.409	4.191	108.806%	-0.140	-0.321	0.097	104.670%	0.036
3	22:31:59	-0.001	0.265	0.394	3.973	109.199%	-0.172	-0.346	0.106	104.933%	0.030
x		-0.001	0.266	0.410	4.092	108.998%	-0.167	-0.335	0.103	104.895%	0.030
σ		0.001	0.049	0.017	0.110	0.197%	0.025	0.013	0.005	0.209%	0.006
%RSD		50.690	18.390	4.083	2.686	0.180	14.850	3.899	4.500	0.199	19.870

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:31:51	0.034	-0.004	-0.009	105.987%	39.970	0.012	0.037	τ 110.530%	0.021	-0.035
2	22:31:55	0.033	-0.011	-0.012	106.102%	40.330	0.005	0.048	τ 111.181%	0.038	-0.038
3	22:31:59	0.019	-0.011	-0.011	105.797%	39.930	0.011	0.052	τ 110.639%	0.020	-0.034
x		0.029	-0.009	-0.010	105.962%	40.070	0.010	0.046	τ 110.783%	0.026	-0.036
σ		0.008	0.004	0.001	0.154%	0.222	0.004	0.008	τ 0.348%	0.010	0.002
%RSD		27.870	43.780	13.630	0.145	0.553	38.100	17.150	τ 0.314	38.000	5.750

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	22:31:51	0.000	τ 110.175%	-0.011
2	22:31:55	0.000	τ 110.757%	-0.011
3	22:31:59	0.001	τ 110.485%	-0.011
x		0.001	τ 110.472%	-0.011
σ		0.001	τ 0.292%	0.000
%RSD		102.400	τ 0.264	1.186

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:37:23	-0.001	-0.010	1.452	4266.000	2879.000	4.499	23.520	22660.000	1363.000	T 1780000.000
2	22:37:27	-0.009	-0.029	1.568	4306.000	2880.000	4.951	28.120	22250.000	1346.000	T 1803000.000
3	22:37:30	-0.011	-0.011	1.063	4351.000	2906.000	4.117	23.660	22520.000	1339.000	T 1794000.000
x		-0.007	-0.017	1.361	4308.000	2888.000	4.522	25.100	22480.000	1349.000	T 1793000.000
σ		0.005	0.010	0.265	42.510	15.690	0.418	2.616	209.800	12.290	T 11640.000
%RSD		70.240	63.250	19.440	0.987	0.543	9.234	10.420	0.934	0.911	T 0.649

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:37:23	TM 37940.000	513.300	105.679%	116.661%	2.803	0.129	0.224	21.290	38.630	1.000
2	22:37:27	TM 38480.000	510.400	106.309%	116.939%	2.607	0.196	0.241	21.370	41.110	1.026
3	22:37:30	TM 38970.000	450.800	106.599%	117.237%	2.873	-0.124	0.251	23.120	40.340	0.964
x		TM 38460.000	491.500	106.196%	116.946%	2.761	0.067	0.239	21.930	40.020	0.997
σ		TM 512.900	35.300	0.470%	0.288%	0.138	0.169	0.014	1.033	1.271	0.032
%RSD		TM 1.334	7.182	0.443	0.246	4.981	252.800	5.710	4.710	3.175	3.167

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:37:23	0.008	0.431	2.925	76.700	107.422%	-0.184	1.202	0.321	103.759%	0.006
2	22:37:27	0.002	0.377	2.889	75.200	108.765%	-0.145	1.304	0.293	105.651%	0.014
3	22:37:30	0.002	0.425	2.853	76.610	109.765%	-0.150	1.089	0.316	105.449%	0.015
x		0.004	0.411	2.889	76.170	108.651%	-0.160	1.198	0.310	104.953%	0.012
σ		0.003	0.030	0.036	0.839	1.176%	0.021	0.108	0.015	1.039%	0.005
%RSD		88.430	7.191	1.239	1.101	1.082	13.240	8.990	4.919	0.990	39.740

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:37:23	0.289	-0.011	-0.010	104.981%	40.910	0.019	0.115	T 109.861%	0.026	-0.029
2	22:37:27	0.280	-0.014	-0.013	106.124%	41.160	0.023	0.098	T 111.463%	0.026	-0.028
3	22:37:30	0.324	-0.017	-0.010	105.952%	41.210	0.026	0.096	T 111.326%	0.023	-0.029
x		0.298	-0.014	-0.011	105.685%	41.090	0.023	0.103	T 110.883%	0.025	-0.029
σ		0.023	0.003	0.002	0.616%	0.159	0.004	0.010	T 0.888%	0.002	0.000
%RSD		7.882	22.840	14.710	0.583	0.387	15.570	10.150	T 0.801	6.654	1.193

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	22:37:23	0.007	T 107.344%	-0.011
2	22:37:27	0.005	T 108.363%	-0.011
3	22:37:30	0.007	T 108.833%	-0.011
x		0.006	T 108.180%	-0.011
σ		0.001	T 0.761%	0.000
%RSD		21.470	T 0.704	0.799

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:42:57	85.820	80.940	83.660	4968.000	4916.000	4619.000	4668.000	5030.000	158.000	τ 2285000.000
2	22:43:01	87.030	82.110	87.500	5176.000	4997.000	4662.000	4683.000	5098.000	168.200	τ 2284000.000
3	22:43:05	85.790	81.940	87.650	5132.000	4964.000	4662.000	4724.000	5053.000	181.700	τ 2311000.000
x		86.210	81.660	86.270	5092.000	4959.000	4648.000	4692.000	5061.000	169.300	τ 2293000.000
σ		0.703	0.632	2.264	109.700	40.740	24.790	28.680	34.650	11.880	τ 15290.000
%RSD		0.816	0.774	2.624	2.155	0.822	0.533	0.611	0.685	7.021	τ 0.667

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:42:57	4744.000	5168.000	111.448%	122.298%	98.530	98.750	99.790	7.915	5550.000	99.090
2	22:43:01	4965.000	5004.000	112.937%	122.197%	98.170	98.220	100.300	9.698	5633.000	99.700
3	22:43:05	4925.000	5129.000	113.745%	121.669%	95.960	99.160	100.100	5.698	5571.000	99.570
x		4878.000	5100.000	112.710%	122.055%	97.550	98.710	100.100	7.770	5585.000	99.450
σ		117.500	85.880	1.165%	0.338%	1.394	0.470	0.273	2.004	43.530	0.324
%RSD		2.409	1.684	1.033	0.277	1.429	0.476	0.273	25.790	0.779	0.326

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:42:57	101.200	102.000	103.600	105.500	112.677%	102.100	95.370	99.970	106.330%	100.400
2	22:43:01	101.000	102.400	103.500	105.100	114.159%	101.900	96.860	99.510	108.034%	99.020
3	22:43:05	99.880	100.400	103.100	104.200	115.756%	100.700	96.420	99.550	108.612%	100.200
x		100.700	101.600	103.400	104.900	114.197%	101.600	96.220	99.680	107.658%	99.870
σ		0.712	1.049	0.269	0.679	1.540%	0.741	0.768	0.257	1.187%	0.756
%RSD		0.707	1.032	0.260	0.647	1.349	0.730	0.798	0.258	1.102	0.757

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:42:57	103.700	52.050	105.000	106.465%	102.100	101.600	96.740	τ 110.525%	5.069	τ 100.300
2	22:43:01	103.100	51.590	103.400	108.906%	101.100	101.100	97.640	τ 112.225%	5.041	τ 100.500
3	22:43:05	103.800	51.990	104.000	108.948%	102.100	101.000	97.520	τ 112.866%	5.040	τ 100.200
x		103.500	51.880	104.100	108.106%	101.800	101.200	97.300	τ 111.872%	5.050	τ 100.300
σ		0.403	0.253	0.802	1.421%	0.564	0.306	0.485	τ 1.210%	0.016	τ 0.165
%RSD		0.389	0.488	0.770	1.315	0.554	0.302	0.498	τ 1.081	0.319	τ 0.165

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	22:42:57	τ 101.100	τ 107.018%	τ 100.200
2	22:43:01	τ 100.900	τ 109.183%	τ 100.800
3	22:43:05	τ 100.400	τ 109.752%	τ 100.700
x		τ 100.800	τ 108.651%	τ 100.600
σ		τ 0.342	τ 1.443%	τ 0.357
%RSD		τ 0.339	τ 1.328	τ 0.355

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:48:31	0.029	0.019	-0.512	3.342	-0.214	-0.186	0.294	-11.060	193.000	τ 2229000.000
2	22:48:34	0.023	0.006	0.018	2.396	0.198	0.264	-3.846	-10.400	180.500	τ 2270000.000
3	22:48:38	0.018	0.023	-0.246	3.304	0.304	-0.291	-3.137	-11.760	171.500	τ 2247000.000
x		0.023	0.016	-0.247	3.014	0.096	-0.071	-2.230	-11.070	181.700	τ 2248000.000
σ		0.006	0.009	0.265	0.535	0.274	0.295	2.214	0.678	10.820	τ 20430.000
%RSD		23.730	57.540	107.200	17.770	285.500	415.300	99.300	6.122	5.953	τ 0.909

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:48:31	-2.763	-0.658	111.842%	120.942%	0.063	0.246	-0.092	28.540	0.846	0.020
2	22:48:34	-10.010	1.459	111.903%	122.903%	0.044	-0.095	-0.078	29.780	1.078	0.021
3	22:48:38	-2.346	5.630	111.838%	122.023%	-0.030	-0.032	-0.046	30.730	2.447	0.044
x		-5.039	2.144	111.861%	121.956%	0.026	0.040	-0.072	29.680	1.457	0.029
σ		4.308	3.199	0.036%	0.982%	0.049	0.182	0.024	1.097	0.865	0.013
%RSD		85.500	149.200	0.032	0.805	192.800	459.400	32.680	3.695	59.390	46.790

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:48:31	0.019	0.020	0.034	-0.108	111.396%	0.088	-0.328	0.010	108.080%	-0.007
2	22:48:34	0.018	0.020	0.039	-0.131	110.574%	0.068	-0.234	0.010	109.759%	0.002
3	22:48:38	0.027	0.027	0.049	-0.123	110.428%	0.068	-0.256	0.023	109.678%	0.014
x		0.021	0.022	0.041	-0.121	110.799%	0.075	-0.273	0.014	109.172%	0.003
σ		0.005	0.004	0.008	0.012	0.522%	0.011	0.049	0.007	0.947%	0.010
%RSD		23.020	19.640	18.930	9.696	0.471	15.290	18.030	52.430	0.867	352.000

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:48:31	0.062	-0.001	0.013	107.709%	0.009	0.013	0.007	τ 112.961%	0.029	0.104
2	22:48:34	0.056	0.003	0.011	108.098%	0.001	0.020	0.002	τ 113.631%	0.022	0.086
3	22:48:38	0.063	0.010	0.021	107.431%	0.014	0.031	0.038	τ 113.302%	0.014	0.091
x		0.060	0.004	0.015	107.746%	0.008	0.021	0.016	τ 113.298%	0.021	0.094
σ		0.003	0.005	0.005	0.335%	0.007	0.009	0.020	τ 0.335%	0.008	0.009
%RSD		5.700	127.500	35.950	0.311	83.480	41.210	125.700	τ 0.296	35.750	10.040

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	22:48:31	0.018	τ 110.147%	0.013
2	22:48:34	0.016	τ 110.564%	0.012
3	22:48:38	0.029	τ 111.739%	0.024
x		0.021	τ 110.817%	0.016
σ		0.007	τ 0.825%	0.007
%RSD		33.500	τ 0.745	41.150

Pace Analytical Prep Log Report

Batch Information: MPRP 7572

Template Version: F-GB-M-035-Rev.00 (25Apr2011)

Prep Method	EPA 3050B	Analysis Method	6020	Extracted By	MMZ	Solid Matrix Lot	N/A
Extracted By Date	10/05/2012 08:25:00	Balance ID	2301449	Block ID	40HB05	Block Temp (C)	92.3
Correction Factor (C)	+0.3	Corrected Temp. (C)	92.6	Acceptance Range	95+/-5 C	Thermometer ID	102090775
Digestion Vessel Lot	J147452-263	Metals Pipette 1	eppendorf 0.1-1.0mL 1638829	Metals Pipette 2	eppendorf 20-200uL 4443988	Metals Pipette 3	Finnpipette 50uL F87410
Batch Notes	HBN 111630	Reviewed By	DS1	Reviewed By Date	10/8/12		

Sample Information:

QC Rule	Sample Type	Lab Sample ID	Matrix	Initial Weight (g)	1:1 HNO3 (mL)	H2O2 (mL)	Conc. HCL (mL)	Final Volume (mL)	Due Date	Sample Notes	MDL / EQL	6000-SPKB (mL)	6000-SPKB2 (mL)	6000-SPKB3 (mL)
6020 T_P	BLANK	686242	Tissue	.5	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012		J			
6020 T_P	SBLK	686246	Tissue	.5	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012		J			
6020 T_P	LCS	686243	Tissue	.5	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012		J	39700 (1)	33986 (0)	36269 (1)
6020 T_P	SRM	686247	Tissue	.5	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012	34855	J			
6020 T_P	PS	4067361001	Tissue	0.504	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012	P / QC4	J			
6020 T_P	MS	686248	Tissue	0.501	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012		J	39700 (1)	33986 (0)	36269 (1)
6020 T_P	MSD	686249	Tissue	0.503	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012		J	39700 (1)	33986 (0)	36269 (1)
6020 T_P	PS	4067361002	Tissue	0.515	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012		J			
6020 T_P	PS	4067361003	Tissue	0.503	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012		J			
6020 T_P	PS	4067361004	Tissue	0.509	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012		J			
6020 T_P	PS	4067361005	Tissue	0.525	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012		J			
6020 T_P	PS	4067361006	Tissue	0.523	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012		J			
6020 T_P	PS	4067361007	Tissue	0.54	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012		J			
6020 T_P	PS	4067361008	Tissue	0.511	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012		J			
6020 T_P	PS	4067361009	Tissue	0.502	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012		J			
6020 T_P	PS	4067361010	Tissue	0.533	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012		J			
6020 T_P	PS	4067361011	Tissue	0.574	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012		J			
6020 T_P	PS	4067361012	Tissue	0.545	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012		J			
6020 T_P	PS	4067361013	Tissue	0.53	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012		J			
6020 T_P	PS	4067361014	Tissue	0.579	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012		J			
6020 T_P	PS	4067361015	Tissue	0.509	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012		J			
6020 T_P	PS	4067361016	Tissue	0.549	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012		J			

QC Rule	Sample Type	Lab Sample ID	Matrix	Initial Weight (g)	1:1 HNO3 (mL)	H2O2 (mL)	Conc. HCL (mL)	Final Volume (mL)	Due Date	Sample Notes	MDL / EQL	6000-SPKB (mL)	6000-SPKB2 (mL)	6000-SPKB3 (mL)
6020 T_P	PS	**4067361017**	Tissue	0.516	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012		J			
6020 T_P	PS	**4067361018**	Tissue	0.533	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012		J			
6020 T_P	PS	**4067361019**	Tissue	0.526	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012		J			

Standard Notes:

33986: Biota Spike 2 **36269: Biota Spike Silver** **39700: ICPMS Biota Spike** **Made 05/04/2012 MMZ**

Fri, 5 Oct 2012 14:36:45 -0500

SRM 34855
LAB 10/11/12

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #995, DI WATER

SOLVENT

Created By: CCR
Created: 04/23/2010 14:04
Expires: 01/01/2040

Volume of Standard: 1000000 mL
Manufacturer: DI WATER
Manufacturer Lot ID: NanoPure Water

Lot ID: NA
Part ID: N/A
Standard ID: NanoPure H20

Notes: DI WATER

Compound Name and Concentration for Standard #995

Compound Name	Concentration	Compound Name	Concentration
Water	mg/L		

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #1256, Barium Stock Standard - Rec'd 12/20/09,

STOCK STANDARD

Created By: CB
Created: 09/08/2000 15:25
Expires: 12/31/2015

Volume of Standard: 125 mL
Manufacturer: Ultra SCientific
Manufacturer Lot ID: 1209-4120-8

Lot ID: 40147
Part ID: ICP-056
Standard ID: Ba-STK

Notes: Barium Stock Standard - Rec'd 12/20/09, Open 12/29/09, DLB

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4000c/40147_COA.pdf

Compound Name and Concentration for Standard #1256

Compound Name	Concentration	Compound Name	Concentration
Barium	1000 ug/mL		

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Analytical Solutions

Certificate of Analysis

1209-4020-8

ULTRAgrade™ Solution
Barium ICP Standard
1000 µg/mL

Catalog Number: ICP-056
Lot Number: J01041
Job Number: J00009002
Lot Issue Date: 10/27/2008
Expiration Date: 12/31/2015

Starting Material:	Barium Nitrate
Starting Material Purity:	99.999%
Starting Material Lot No.:	NT04674
Matrix:	2% nitric acid in low TOC water (< 50 ppb)
Atomic Weight Ba:	137.36

Certified Value: 1002 ± 2 µg/mL

This Certified Reference Material (CRM) was manufactured and verified in accordance with ULTRA's ISO 9001:2000 registered quality system, and the analyte concentrations were verified by our ISO 17025 accredited laboratory. The certified value and uncertainty value, at the 95% confidence level, for each analyte determined gravimetrically.

Classical Wet Assay Method: Theoretical, based on gravimetric measurements

Confirmation by Inductively Coupled Plasma Spectroscopy (ICP / ICP-MS) vs. NIST SRM 3104a

ULTRA uses purified acids, 18 megohm double deionized water, calibrated Class A glassware & meticulously cleaned bottles in the manufacturing of ULTRAgrade standards. Balances used in the manufacturing of this standard are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001

Trace Metallic Impurities in Solution Standard in µg/mL:

*	Al	<0.005	ND	*	Ga	<0.005	ND	n	Nb			n	S		
*	Sb	<0.005	ND	n	Ge			n	Os			n	Ta		
*	As	<0.005	ND	n	Au			*	Pd	<0.005	ND	n	Te		
s	Ba			n	Hf			*	P	<0.005	ND	n	Tb		
*	Be	<0.005	ND	n	Ho			*	Pt	<0.005	ND	*	Tl	<0.005	ND
*	Bi	<0.005	ND	*	In	<0.005	ND	*	K	<0.005	ND	n	Th		
*	B	<0.005	ND	n	Ir			n	Pr			n	Tm		
*	Cd	<0.005	ND	*	Fe	<0.005	ND	n	Re			*	Sn	<0.005	ND
*	Ca	<0.005	ND	*	La	<0.005	ND	n	Rh			*	Ti	<0.005	ND
n	Ce			*	Pb	<0.005	ND	n	Rb			n	W		
n	Cs			*	Li	<0.005	ND	n	Ru			n	U		
*	Cr	<0.005	ND	n	Lu			n	Sm			*	V	<0.005	ND
*	Co	<0.005	ND	*	Mg	<0.005	ND	n	Sc			n	Yb		
*	Cu	<0.005	ND	*	Mn	<0.005	ND	*	Se	<0.005	ND	n	Y		
n	Dy			*	Hg	<0.005	ND	*	Si	<0.005	ND	*	Zn	<0.005	ND
*	Er	<0.005	ND	*	Mo	<0.005	ND	*	Ag	<0.005	ND	n	Zr		
*	Eu	<0.005	ND	n	Nd			*	Na	<0.005	ND				
*	Gd	<0.005	ND	*	Ni	<0.005	ND	*	Sr	<0.010	D				

* - element checked for
ND - not detected
i - spectral interference
D - detected
n - not checked for
s - solution standard element

100147
REC 09/08/10 BY CB
Exp. --/--/-- By --
Open --/--/-- By --

SHL #1236

Density of Solution (measured at 23.0°C ± 0.5°C): 1.007 g/mL

ACCREDITED

ISO 17025:2005
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A2LA
Cert. No. 0851.01

ISO 9001:2000
Registered
TÜV USA, Inc.
Cert. No. 09-1009

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www.ultrasci.com

See Reverse For Additional Information

William J. Leary
Quality Assurance Manager

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #1257, Boron Stock Standard - Rec'd 5/10/10, Op

Pace Analytical®
www.pacelabs.com

STOCK STANDARD

Created By: CB
Created: 09/08/2000 15:28
Expires: 09/30/2015

Volume of Standard: 125 mL
Manufacturer: Ultra SCientific
Manufacturer Lot ID: J00705

Lot ID: 40149
Part ID: ICP-005
Standard ID: B-STK

Notes: Boron Stock Standard - Rec'd 5/10/10, Open 06/02/10, DMS

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4000c/40149_COA.pdf

Compound Name and Concentration for Standard #1257

Compound Name	Concentration	Compound Name	Concentration
Boron	1000 ug/mL		

5-10-10

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

0510-4020-4

ULTRAgrade™ Solution
Boron ICP Standard
1000 µg/mL

Catalog Number: ICP-005
Lot Number: J00705
Job Number: J00008574
Lot Issue Date: 07/21/2008
Expiration Date: 09/30/2015

Starting Material:	Boric Acid
Starting Material Purity:	99.999%
Starting Material Lot No.:	BH00305
Matrix:	2% ammonium hydroxide in low TOC water (< 50 ppb)
Atomic Weight B:	10.82

Certified Value: 1002 ± 2 µg/mL

This Certified Reference Material (CRM) was manufactured and verified in accordance with ULTRA's ISO 9001:2000 registered quality system, and the analyte concentrations were verified by our ISO 17025 accredited laboratory. The certified value and uncertainty value, at the 95% confidence level, for each analyte determined gravimetrically.

Classical Wet Assay Method: Theoretical, based on gravimetric measurements

Confirmation by Inductively Coupled Plasma Spectroscopy (ICP / ICP-MS) vs. NIST SRM 3107

ULTRA uses purified acids, 18 megohm double deionized water, calibrated Class A glassware & meticulously cleaned bottles in the manufacturing of ULTRAgrade standards. Balances used in the manufacturing of this standard are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001

Trace Metallic Impurities in Solution Standard in µg/mL:

*	Al	<0.005	ND	*	Ga	<0.005	ND	n	Nb			n	S		
*	Sb	<0.005	ND	n	Ge			n	Os			n	Ta		
*	As	<0.005	ND	n	Au			*	Pd	<0.005	ND	n	Te		
*	Ba	<0.005	ND	n	Hf			*	P	<0.005	ND	n	Tb		
*	Be	<0.005	ND	n	Ho			*	Pt	<0.005	ND	*	Tl	<0.005	ND
*	Bi	<0.005	ND	*	In	<0.005	ND	*	K	<0.005	ND	n	Th		
s	B			n	Ir			n	Pr			n	Tm		
*	Cd	<0.005	ND	*	Fe	<0.005	ND	n	Re			*	Sn	<0.005	ND
*	Ca	<0.005	ND	*	La	<0.005	ND	n	Rh			*	Ti	<0.005	ND
n	Ce			*	Pb	<0.005	ND	n	Rb			n	W		
n	Cs			*	Li	<0.005	ND	n	Ru			n	U		
*	Cr	<0.005	ND	n	Lu			n	Sm			*	V	<0.005	ND
*	Co	<0.005	ND	*	Mg	<0.005	ND	n	Sc			n	Yb		
*	Cu	<0.005	ND	*	Mn	<0.005	ND	*	Se	<0.005	ND	n	Y		
n	Dy			*	Hg	<0.005	ND	*	Si	<0.005	ND	*	Zn	<0.005	ND
*	Er	<0.005	ND	*	Mo	<0.005	ND	*	Ag	<0.005	ND	n	Zr		
*	Eu	<0.005	ND	n	Nd			*	Na	<0.005	ND				
*	Gd	<0.005	ND	*	Ni	<0.005	ND	*	Sr	<0.005	ND				

* - element checked for
ND - not detected
i - spectral interference
D - detected
n - not checked for
s - solution standard element

100149
REC. 09/08/10 BY CB
Exp. --/--/-- By --
Open --/--/-- By --

STL #1257

Density of Solution (measured at 22.0°C ± 0.5°C): 0.998 g/mL

ACCREDITED

ISO 17025 Accredited A2LA Cert. No. 0851-01

ISO 9001:2000 Registered TUV USA, Inc. Cert. No. 09-1009

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William J. Leary
Quality Assurance Manager

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #1270, Cerium Stock Standard - Rec'd 8/18/09, O

STOCK STANDARD

Created By: CB
Created: 09/08/2000 15:47
Expires: 05/31/2016

Volume of Standard: 125 mL
Manufacturer: Ultra SCientific
Manufacturer Lot ID: K00331

Lot ID: 40155
Part ID: ICP-058
Standard ID: Ce-STK

Notes: Cerium Stock Standard - Rec'd 8/18/09, Open 09/29/09, DMS

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4000c/40155_COA.pdf

Compound Name and Concentration for Standard #1270

Compound Name	Concentration	Compound Name	Concentration
Cerium	1000 ug/mL		

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Analytical Solutions

Certificate of Analysis

0809-4020-5

ULTRAgrade™ Solution
Cerium ICP Standard
1000 µg/mL

Catalog Number: ICP-058
Lot Number: K00331
Job Number: J00009642
Lot Issue Date: 04/08/2009
Expiration Date: 05/31/2016

Starting Material:	Cerium Nitrate
Starting Material Purity:	99.995%
Starting Material Lot No.:	BH01247
Matrix:	1% nitric acid in low TOC water (< 50 ppb)
Atomic Weight Ce:	140.13

Certified Value: 1000 ± 2 µg/mL

This Certified Reference Material (CRM) was manufactured and verified in accordance with ULTRA's ISO 9001 registered quality system. The analyte concentrations were verified by our ISO 17025 accredited laboratory to be within ± 2.5%, when compared to calibration standards independently prepared using NIST SRM(s). The certified value and uncertainty value for each analyte is determined gravimetrically.

Classical Wet Assay Method: Theoretical, based on gravimetric measurements

Confirmation by Inductively Coupled Plasma Spectroscopy (ICP / ICP-MS) vs. NIST SRM 3110

ULTRA uses purified acids, 18 megohm double deionized water, calibrated Class A glassware & meticulously cleaned bottles in the manufacturing of ULTRAgrade standards. Balances used in the manufacturing of this standard are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001

Trace Metallic Impurities in Solution Standard in µg/mL:

*	Al	<0.005	ND	*	Ga	<0.005	ND	n	Nb			n	S		
*	Sb	<0.005	ND	n	Ge			n	Os			n	Ta		
*	As	<0.005	ND	n	Au			*	Pd	<0.005	ND	n	Te		
*	Ba	<0.005	ND	n	Hf			*	P	<0.005	ND	n	Tb		
*	Be	<0.005	ND	n	Ho			*	Pt	<0.005	ND	*	Tl	<0.005	ND
*	Bi	<0.005	ND	*	In	<0.005	ND	*	K	<0.005	ND	n	Th		
*	B	<0.005	ND	n	Ir			n	Pr			n	Tm		
*	Cd	<0.005	ND	*	Fe	<0.005	ND	n	Re			*	Sn	<0.005	ND
*	Ca	<0.010	D	*	La	<0.005	ND	n	Rh			*	Ti	<0.005	ND
s	Ce			*	Pb	<0.005	ND	n	Rb			n	W		
n	Cs			*	Li	<0.005	ND	n	Ru			n	U		
*	Cr	<0.005	ND	n	Lu			n	Sm			*	V	<0.005	ND
*	Co	<0.005	ND	*	Mg	<0.005	ND	n	Sc			n	Yb		
*	Cu	<0.005	ND	*	Mn	<0.005	ND	*	Se	<0.005	ND	n	Y		
n	Dy			*	Hg	<0.005	ND	*	Si	<0.005	ND	*	Zn	<0.005	ND
*	Er	<0.005	ND	*	Mo	<0.005	ND	*	Ag	<0.005	ND	n	Zr		
*	Eu	<0.005	ND	n	Nd			*	Na	<0.005	ND				
*	Gd	<0.005	ND	*	Ni	<0.005	ND	*	Sr	<0.005	ND				

* - element checked for
ND - not detected

i - spectral interference
D - detected

n - not checked for
s - solution standard element

100155
REC 09/08/10 BY CB
Exp. __/__/__ By __
Open __/__/__ By __

SYL # 1270

Density of Solution (measured at 23.5 ± 0.5°C): 1.006 g/mL

ACCREDITED

ISO 17025:2005
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Cert. No. 0851.01

ISO 9001:2000
Registered
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Cert. No. 06-1004

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See Reverse For Additional Information

William J. Leary
Quality Assurance Manager

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #1285, Lead Stock Standard - Rec'd 2/26/10, Ope

Pace Analytical®
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STOCK STANDARD

Created By: CB
Created: 09/08/2000 16:25
Expires: 08/31/2016

Volume of Standard: 125 mL
Manufacturer: Ultra Scientific
Manufacturer Lot ID: K00652

Lot ID: 40169
Part ID: ICP-082
Standard ID: Pb-STK

Notes: Lead Stock Standard - Rec'd 2/26/10, Open 03/31/10, MES

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4000c/40169_COA.pdf

Compound Name and Concentration for Standard #1285

Compound Name	Concentration	Compound Name	Concentration
Lead	1000 ug/mL		

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

0310-4020-1

ULTRAgrade™ Solution
Lead ICP Standard
1000 µg/mL

Catalog Number: ICP-082
Lot Number: K00652
Job Number: J00010047
Lot Issue Date: 07/05/2009
Expiration Date: 08/31/2016

Starting Material:	Lead (II) Nitrate
Starting Material Purity:	99.999%
Starting Material Lot No.:	NT02988
Matrix:	2% nitric acid in low TOC water (< 50 ppb)
Atomic Weight Pb:	207.21

Certified Value: 1001 ± 2 µg/mL

This Certified Reference Material (CRM) was manufactured and verified in accordance with ULTRA's ISO 9001 registered quality system. The analyte concentrations were verified by our ISO 17025 accredited laboratory to be within ± 2.5%, when compared to calibration standards independently prepared using NIST SRM(s). The certified value and uncertainty value for each analyte is determined gravimetrically.

Classical Wet Assay Method: Theoretical, based on gravimetric measurements

Confirmation by Inductively Coupled Plasma Spectroscopy (ICP / ICP-MS) vs. NIST SRM 3128

ULTRA uses purified acids, 18 megohm double deionized water, calibrated Class A glassware & meticulously cleaned bottles in the manufacturing of ULTRAgrade standards. Balances used in the manufacturing of this standard are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001.

Trace Metallic Impurities in Solution Standard in µg/mL:

*	Al	<0.005	ND	*	Ga	<0.005	ND	n	Nb			n	S		
*	Sb	<0.005	ND	n	Ge			n	Os			n	Ta		
*	As	<0.005	ND	n	Au			*	Pd	<0.005	ND	n	Te		
*	Ba	<0.005	ND	n	Hf			*	P	<0.005	ND	n	Tb		
*	Be	<0.005	ND	n	Ho			*	Pt	<0.005	ND	*	Tl	<0.005	ND
*	Bi	<0.005	ND	*	In	<0.005	ND	*	K	<0.005	ND	n	Th		
*	B	<0.005	ND	n	Ir			n	Pr			n	Tm		
*	Cd	<0.005	ND	*	Fe	<0.005	ND	n	Re			*	Sn	<0.005	ND
*	Ca	<0.005	D	*	La	<0.005	ND	n	Rh			*	Ti	<0.005	ND
n	Ce			s	Pb			n	Rb			n	W		
n	Cs			*	Li	<0.005	ND	n	Ru			n	U		
*	Cr	<0.005	ND	n	Lu			n	Sm			*	V	<0.005	ND
*	Co	<0.005	ND	*	Mg	<0.005	ND	n	Sc			n	Yb		
*	Cu	<0.005	D	*	Mn	<0.005	ND	*	Se	<0.005	ND	n	Y		
n	Dy			*	Hg	<0.005	ND	*	Si	<0.005	ND	*	Zn	<0.005	D
*	Er	<0.005	ND	*	Mo	<0.005	ND	*	Ag	<0.005	ND	n	Zr		
*	Eu	<0.005	ND	n	Nd			*	Na	<0.005	ND				
*	Gd	<0.005	ND	*	Ni	<0.005	ND	*	Sr	<0.005	ND				

* - element checked for
ND - not detected
i - spectral interference
D - detected
n - not checked for
s - solution standard element

100169
REC. 09/08/10 BY CB
Exp. --/--/-- By --
Open --/--/-- By --

Staff #1285

Density of Solution (measured at 22.0°C ± 0.5°C): 1.010 g/mL

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Cert. No. 0851.01

ISO 9001:2000
Registered
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Cert. No. 09-1009

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See Reverse For Additional Information

William J. Leary
Quality Assurance Manager

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #1287, Phosphorus Secondary Standard - Rec

STOCK STANDARD

Created By: CB
Created: 09/08/2000 16:31
Expires: 12/31/2015

Volume of Standard: 125 mL
Manufacturer: Ultra Scientific
Manufacturer Lot ID: J01102

Lot ID: 40171
Part ID: ICP-015
Standard ID: P-SPK

Notes: Phosphorus Secondary Standard - Rec 2/4/10, Open 04/22/10, DMS

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4000c/40171_COA.pdf

Compound Name and Concentration for Standard #1287

Compound Name	Concentration	Compound Name	Concentration
Phosphorus	1000 ug/mL		

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

Rec. 2/4/10

0210-4020-3

ULTRAgrade™ Solution
Phosphorus ICP Standard
1000 µg/mL

Catalog Number: ICP-015
Lot Number: J01102
Job Number: J00008998
Lot Issue Date: 11/17/2008
Expiration Date: 12/31/2015

Starting Material:	Ammonium Dihydrogen Phosphate
Starting Material Purity:	99.999%
Starting Material Lot No.:	BH00744
Matrix:	2% nitric acid in low TOC water (< 50 ppb)
Atomic Weight P:	30.98

Certified Value: 1001 ± 2 µg/mL

This Certified Reference Material (CRM) was manufactured and verified in accordance with ULTRA's ISO 9001:2000 registered quality system, and the analyte concentrations were verified by our ISO 17025 accredited laboratory. The certified value and uncertainty value, at the 95% confidence level, for each analyte determined gravimetrically.

Classical Wet Assay Method: Theoretical, based on gravimetric measurements

Confirmation by Inductively Coupled Plasma Spectroscopy (ICP / ICP-MS) vs. NIST SRM 3139a

ULTRA uses purified acids, 18 megohm double deionized water, calibrated Class A glassware & meticulously cleaned bottles in the manufacturing of ULTRAgrade standards. Balances used in the manufacturing of this standard are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001

Trace Metallic Impurities in Solution Standard in µg/mL:

*	Al	<0.005	D	*	Ga	<0.005	ND	n	Nb			n	S		
*	Sb	<0.005	ND	n	Ge			n	Os			n	Ta		
*	As	<0.005	ND	n	Au			*	Pd	<0.005	ND	n	Te		
*	Ba	<0.005	D	n	Hf			s	P			n	Tb		
*	Be	<0.005	ND	n	Ho			*	Pt	<0.005	ND	*	Tl	<0.005	ND
*	Bi	<0.005	ND	*	In	<0.005	ND	*	K	<0.005	ND	n	Th		
*	B	<0.005	ND	n	Ir			n	Pr			n	Tm		
*	Cd	<0.005	ND	*	Fe	<0.005	D	n	Re			*	Sn	<0.005	ND
*	Ca	<0.005	D	*	La	<0.005	ND	n	Rh			*	Ti	<0.005	D
n	Ce			*	Pb	<0.005	ND	n	Rb			n	W		
n	Cs			*	Li	<0.005	ND	n	Ru			n	U		
*	Cr	<0.010	D	n	Lu			n	Sm			*	V	<0.005	ND
*	Co	<0.005	ND	*	Mg	<0.005	D	n	Sc			n	Yb		
*	Cu	<0.005	D	*	Mn	<0.005	ND	*	Se	<0.005	ND	n	Y		
n	Dy			*	Hg	<0.005	ND	*	Si	<0.005	D	*	Zn	<0.005	ND
*	Er	<0.005	ND	*	Mo	<0.005	ND	*	Ag	<0.005	ND	n	Zr		
*	Eu	<0.005	ND	n	Nd			*	Na	<0.005	D				
*	Gd	<0.005	ND	*	Ni	<0.005	ND	*	Sr	<0.005	ND				

* - element checked for
ND - not detected

i - spectral interference
D - detected

n - not checked for
s - solution standard element

100171
REC.09/08/10 BY CB
Exp. __/__/__ By __
Open __/__/__ By __

SYL #1287

Density of Solution (measured at 22.5°C ± 0.5°C): 1.014 g/mL

ACCREDITED
ISO 17025:2005
Accredited
A2LA
Cert. No. 0851.01

ISO 9001:2000
Registered
TUV USA, Inc.
Cert. No. 06-1004

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www.ultrasci.com

See Reverse For Additional Information

William J. Leary
Quality Assurance Manager

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #1295, Silicon Secondary Stock Standard - Rec

STOCK STANDARD

Created By: CB
Created: 09/08/2000 16:46
Expires: 07/31/2016

Volume of Standard: 125 mL
Manufacturer: Ultra Scientific
Manufacturer Lot ID: K00574

Lot ID: 40178
Part ID: ICP-014
Standard ID: Si-SPK

Notes: Silicon Secondary Stock Standard - Rec 02/04/10, Open 04/22/10, DMS

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4000c/40178_COA.pdf

Compound Name and Concentration for Standard #1295

Compound Name	Concentration	Compound Name	Concentration
Silicon	1000 ug/mL		

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

Rec. 2/4/10

0210-4020-4

ULTRAgrade™ Solution
Silicon ICP Standard
1000 µg/mL

Catalog Number: ICP-014
Lot Number: K00574
Job Number: J00009811
Lot Issue Date: 06/15/2009
Expiration Date: 07/31/2016

Starting Material:	Ammonium Hexafluorosilicate
Starting Material Purity:	99.999%
Starting Material Lot No.:	BH00960
Matrix:	2% nitric acid, with trace HF, in low TOC water (< 50 ppb)
Atomic Weight Si:	28.09

Certified Value: 1001 ± 2 µg/mL

This Certified Reference Material (CRM) was manufactured and verified in accordance with ULTRA's ISO 9001 registered quality system. The analyte concentrations were verified by our ISO 17025 accredited laboratory to be within ± 2.5%, when compared to calibration standards independently prepared using NIST SRM(s). The certified value and uncertainty value for each analyte is determined gravimetrically.

Classical Wet Assay Method: Theoretical, based on gravimetric measurements

Confirmation by Inductively Coupled Plasma Spectroscopy (ICP / ICP-MS) vs. NIST SRM 3150

ULTRA uses purified acids, 18 megohm double deionized water, calibrated Class A glassware & meticulously cleaned bottles in the manufacturing of ULTRAgrade standards. Balances used in the manufacturing of this standard are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001.

Trace Metallic Impurities in Solution Standard in µg/mL:

*	Al	<0.005	D	*	Ga	<0.005	ND	n	Nb			n	S		
*	Sb	<0.005	ND	n	Ge			n	Os			n	Ta		
*	As	<0.005	ND	n	Au			*	Pd	<0.005	ND	n	Te		
*	Ba	<0.005	ND	n	Hf			*	P	<0.005	ND	n	Tb		
*	Be	<0.005	ND	n	Ho			*	Pt	<0.005	ND	*	Tl	<0.005	ND
*	Bi	<0.005	ND	*	In	<0.005	ND	*	K	<0.005	ND	n	Th		
*	B	<0.005	ND	n	Ir			n	Pr			n	Tm		
*	Cd	<0.005	ND	*	Fe	<0.005	D	n	Re			*	Sn	<0.005	ND
*	Ca	<0.005	D	*	La	<0.005	ND	n	Rh			*	Ti	<0.005	D
n	Ce			*	Pb	<0.005	ND	n	Rb			n	W		
n	Cs			*	Li	<0.005	ND	n	Ru			n	U		
*	Cr	<0.005	ND	n	Lu			n	Sm			*	V	<0.005	ND
*	Co	<0.005	ND	*	Mg	<0.005	D	n	Sc			n	Yb		
*	Cu	<0.005	ND	*	Mn	<0.005	ND	*	Se	<0.005	ND	n	Y		
n	Dy			*	Hg	<0.005	ND	s	Si			*	Zn	<0.005	ND
*	Er	<0.005	ND	*	Mo	<0.005	ND	*	Ag	<0.005	ND	n	Zr		
*	Eu	<0.005	ND	n	Nd			*	Na	<0.005	ND				
*	Gd	<0.005	ND	*	Ni	<0.005	ND	*	Sr	<0.005	ND				

* - element checked for
ND - not detected

i - spectral interference
D - detected

n - not checked for
s - solution standard element

100178
REC. 05/08/10 BY CB
Exp. __/__/__ By __
Open __/__/__ By __

STL #1295

Density of Solution (measured at 21.0°C ± 0.5°C): 1.010 g/mL

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ISO 9001:2000
Registered
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Cert. No. 06-1004

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See Reverse For Additional Information

William J. Leary
Quality Assurance Manager

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #4891, Nickel Stock Standard - Rec 09/10/10, Op

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www.pacelabs.com

STOCK STANDARD

Created By: CCR
Created: 03/08/2011 12:59
Expires: 09/30/2016

Volume of Standard: 125 mL
Manufacturer: ULTRA SCIENTIFIC
Manufacturer Lot ID: K00853

Lot ID: 40780
Part ID: ICP-028
Standard ID: Ni-STK

Notes: Nickel Stock Standard - Rec 09/10/10, Open 11/1/10, DMS

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4000c/40780_COA.pdf

Compound Name and Concentration for Standard #4891

Compound Name	Concentration	Compound Name	Concentration
Nickel	1000 ug/mL		

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ULTRAgrade™ Solution
Nickel ICP Standard
1000 µg/mL

Rec. 9/10/10

0910-4020-10

Catalog Number: ICP-028
Lot Number: K00853
Job Number: J00010203
Lot Issue Date: 08/17/2009
Expiration Date: 09/30/2016

40780
REC. 03/08/11 BY CCI
Exp. __/__/__ By __
Open __/__/__ By __

Starting Material:	Nickel (II) Nitrate Hexahydrate
Starting Material Purity:	99.999%
Starting Material Lot No.:	BH01230
Matrix:	2% nitric acid in low TOC water (< 50 ppb)
Atomic Weight Ni:	58.71

Certified Value: 1001 ± 2 µg/mL

This Certified Reference Material (CRM) was manufactured and verified in accordance with ULTRA's ISO 9001 registered quality system. The analyte concentrations were verified by our ISO 17025 accredited laboratory to be within ± 2.5%, when compared to calibration standards independently prepared using NIST SRM(s). The certified value and uncertainty value for each analyte is determined gravimetrically.

Classical Wet Assay Method: Theoretical, based on gravimetric measurements

Confirmation by Inductively Coupled Plasma Spectroscopy (ICP / ICP-MS) vs. NIST SRM 3136

ULTRA uses purified acids, 18 megohm double deionized water, calibrated Class A glassware & meticulously cleaned bottles in the manufacturing of ULTRAgrade standards. Balances used in the manufacturing of this standard are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001.

Trace Metallic Impurities in Solution Standard in µg/mL:

*	Al	<0.005	ND
*	Sb	<0.005	ND
*	As	<0.005	ND
*	Ba	<0.005	ND
*	Be	<0.005	ND
*	Bi	<0.005	ND
*	B	<0.005	ND
*	Cd	<0.005	ND
*	Ca	<0.005	ND
n	Ce		
n	Cs		
*	Cr	<0.005	ND
*	Co	<0.005	ND
*	Cu	<0.005	ND
n	Dy		
*	Er	<0.005	ND
*	Eu	<0.005	ND
*	Gd	<0.005	ND
*	Ga	<0.005	ND
n	Ge		
n	Au		
n	Hf		
n	Ho		
*	In	<0.005	ND
n	Ir		
*	Fe	<0.005	D
*	La	<0.005	ND
*	Pb	<0.005	ND
*	Li	<0.005	ND
n	Lu		
*	Mg	<0.005	D
*	Mn	<0.005	ND
*	Hg	<0.005	ND
*	Mo	<0.005	ND
n	Nd		
s	Ni		
n	Nb		
n	Os		
*	Pd	<0.005	ND
*	P	<0.005	ND
*	Pt	<0.005	ND
*	K	<0.005	ND
n	Pr		
n	Re		
n	Rh		
n	Rb		
n	Ru		
n	Sm		
n	Sc		
*	Se	<0.005	ND
*	Si	<0.005	ND
*	Ag	<0.005	ND
*	Na	<0.005	ND
*	Sr	<0.005	ND
n	S		
n	Ta		
n	Te		
n	Tb		
*	Tl	<0.005	ND
n	Th		
n	Tm		
*	Sn	<0.005	ND
*	Ti	<0.005	ND
n	W		
n	U		
*	V	<0.005	ND
n	Yb		
n	Y		
*	Zn	<0.005	ND
n	Zr		

* - element checked for
ND - not detected
i - spectral interference
D - detected
n - not checked for
s - solution standard element

Density of Solution (measured at 23.5°C ± 0.5°C): 1.014 g/mL

A2LA ACCREDITED
ISO 17025 Accredited A2LA Cert. No. 0851-01

ISO 9001:2000 Registered TUV USA, Inc. Cert. No. 09-1009

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www.ultrasci.com

William J. Leary
Quality Assurance Manager

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #4892, Beryllium Stock Standard - Rec 09/10/10,

Pace Analytical®
www.pacelabs.com

STOCK STANDARD

Created By: CCR
Created: 03/08/2011 13:02
Expires: 12/31/2015

Volume of Standard: 125 mL
Manufacturer: ULTRA SCIENTIFIC
Manufacturer Lot ID: J01074

Lot ID: 40781
Part ID: ICP-004
Standard ID: Be-STK

Notes: Beryllium Stock Standard - Rec 09/10/10, Open 11/1/10, DMS

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4000c/40781_COA.pdf

Compound Name and Concentration for Standard #4892

Compound Name	Concentration	Compound Name	Concentration
Beryllium	1000 ug/mL		

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ULTRAgrade™ Solution
Beryllium ICP Standard
1000 µg/mL

Rec. 9/10/10
0910-4020-7

Catalog Number: ICP-004
Lot Number: J01074
Job Number: J00008997
Lot Issue Date: 10/31/2008
Expiration Date: 12/31/2015

Starting Material:	Beryllium Acetate
Starting Material Purity:	99.999%
Starting Material Lot No.:	BH00331
Matrix:	2% nitric acid in low TOC water (< 50 ppb)
Atomic Weight: Be:	9.01

40781
REC.03/08/11 BY CC
Exp. __/__/__ By
Open __/__/__ By

Certified Value: 1001 ± 2 µg/mL
This Certified Reference Material (CRM) was manufactured and verified in accordance with ULTRA's ISO 9001:2000 registered quality system, and the analyte concentrations were verified by our ISO 17025 accredited laboratory. The certified value and uncertainty value, at the 95% confidence level, for each analyte determined gravimetrically.

Classical Wet Assay Method: Theoretical, based on gravimetric measurements

Confirmation by Inductively Coupled Plasma Spectroscopy (ICP / ICP-MS) vs. NIST SRM 3105a
ULTRA uses purified acids, 18 megohm double deionized water, calibrated Class A glassware & meticulously cleaned bottles in the manufacturing of ULTRAgrade standards. Balances used in the manufacturing of this standard are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001

Trace Metallic Impurities in Solution Standard in µg/mL:

*	Al	<0.005	D	*	Ga	<0.005	ND	n	Nb			n	S		
*	Sb	<0.005	ND	n	Ge			n	Os			n	Ta		
*	As	<0.005	ND	n	Au			*	Pd	<0.005	ND	n	Te		
*	Ba	<0.005	ND	n	Hf			*	P	<0.005	ND	n	Tb		
s	Be			n	Ho			*	Pt	<0.005	ND	*	Tl	<0.005	ND
*	Bi	<0.005	ND	*	In	<0.005	ND	*	K	<0.005	ND	n	Th		
*	B	<0.005	ND	n	Ir			n	Pr			n	Tm		
*	Cd	<0.005	ND	*	Fe	<0.005	D	n	Re			*	Sn	<0.005	ND
*	Ca	<0.005	ND	*	La	<0.005	ND	n	Rh			*	Ti	<0.005	ND
n	Ce			*	Pb	<0.005	ND	n	Rb			n	W		
n	Cs			*	Li	<0.005	ND	n	Ru			n	U		
*	Cr	<0.005	ND	n	Lu			n	Sm			*	V	<0.005	ND
*	Co	<0.005	ND	*	Mg	<0.005	ND	n	Sc			n	Yb		
*	Cu	<0.005	ND	*	Mn	<0.005	ND	*	Se	<0.005	ND	n	Y		
n	Dy			*	Hg	<0.005	ND	*	Si	<0.005	D	*	Zn	<0.005	ND
*	Er	<0.005	ND	*	Mo	<0.005	ND	*	Ag	<0.005	ND	n	Zr		
*	Eu	<0.005	ND	n	Nd			*	Na	<0.005	ND				
*	Gd	<0.005	ND	*	Ni	<0.005	D	*	Sr	<0.005	ND				

* - element checked for
ND - not detected
i - spectral interference
D - detected
n - not checked for
s - solution standard element

Density of Solution (measured at 22.5 °C ± 0.5°C): 1.008 g/mL

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William J. Leary
Quality Assurance Manager

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #5183, Cobalt Stock Standard, Rec

STOCK STANDARD

Created By: CCR
Created: 03/29/2011 10:19
Expires: 06/30/2016

Volume of Standard: 125 mL
Manufacturer: ULTRA SCIENTIFIC
Manufacturer Lot ID: K00433

Lot ID: 401017
Part ID: ICP-027
Standard ID: Co-STK

Notes: Cobalt Stock Standard, Rec 09/10/10,Open 11/01/10 DMS

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4001c/401017_COA.pdf

Compound Name and Concentration for Standard #5183

Compound Name	Concentration	Compound Name	Concentration
Cobalt	1000 ug/mL		

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ULTRAgrade™ Solution
Cobalt ICP Standard
1000 µg/mL

Rec. 9/10/10

0910-4020-8

Catalog Number: ICP-027
Lot Number: K00433
Job Number: J00009795
Lot Issue Date: 05/06/2009
Expiration Date: 06/30/2016

401017
REC.03/29/11 BY CCI
Exp. __/__/__ By __
Open __/__/__ By __

Starting Material:	Cobalt Nitrate Hexahydrate
Starting Material Purity:	99.999%
Starting Material Lot No.:	BH01158
Matrix:	2% nitric acid in low TOC water (< 50 ppb)
Atomic Weight Co:	58.94

Certified Value: 1000 ± 2 µg/mL

This Certified Reference Material (CRM) was manufactured and verified in accordance with ULTRA's ISO 9001 registered quality system. The analyte concentrations were verified by our ISO 17025 accredited laboratory to be within ± 2.5%, when compared to calibration standards independently prepared using NIST SRM(s). The certified value and uncertainty value for each analyte is determined gravimetrically.

Classical Wet Assay Method: Theoretical, based on gravimetric measurements

Confirmation by Inductively Coupled Plasma Spectroscopy (ICP / ICP-MS) vs. NIST SRM 3113

ULTRA uses purified acids, 18 megohm double deionized water, calibrated Class A glassware & meticulously cleaned bottles in the manufacturing of ULTRAgrade standards. Balances used in the manufacturing of this standard are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001.

Trace Metallic Impurities in Solution Standard in µg/mL:

*	Al	<0.005	ND	*	Ga	<0.005	ND	n	Nb			n	S		
*	Sb	<0.005	ND	n	Ge			n	Os			n	Ta		
*	As	<0.005	ND	n	Au			*	Pd	<0.005	ND	n	Te		
*	Ba	<0.005	ND	n	Hf			*	P	<0.005	ND	n	Tb		
*	Be	<0.005	ND	n	Ho			*	Pt	<0.005	ND	*	Tl	<0.005	ND
*	Bi	<0.005	ND	*	In	<0.005	ND	*	K	<0.005	ND	n	Th		
*	B	<0.005	ND	n	Ir			n	Pr			n	Tm		
*	Cd	<0.005	ND	*	Fe	<0.005	D	n	Re			*	Sn	<0.005	ND
*	Ca	<0.005	ND	*	La	<0.005	ND	n	Rh			*	Ti	<0.005	ND
n	Ce			*	Pb	<0.005	ND	n	Rb			n	W		
n	Cs			*	Li	<0.005	ND	n	Ru			n	U		
*	Cr	<0.005	ND	n	Lu			n	Sm			*	V	<0.005	ND
s	Co			*	Mg	<0.005	ND	n	Sc			n	Yb		
*	Cu	<0.005	ND	*	Mn	<0.005	ND	*	Se	<0.005	ND	n	Y		
n	Dy			*	Hg	<0.005	ND	*	Si	<0.005	ND	*	Zn	<0.005	ND
*	Er	<0.005	ND	*	Mo	<0.005	ND	*	Ag	<0.005	ND	n	Zr		
*	Eu	<0.005	ND	n	Nd			*	Na	<0.005	ND				
*	Gd	<0.005	ND	*	Ni	<0.005	D	*	Sr	<0.005	ND				

* - element checked for
ND - not detected
i - spectral interference
D - detected
n - not checked for
s - solution standard element

Density of Solution (measured at 22.5°C ± 0.5°C): 1.023 g/mL

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ISO 9001:2000 Registered TUV USA, Inc. Cert. No. 09-1009

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William J. Leary
Quality Assurance Manager

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #5659, Phosphorus Secondary Standard - Rec

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www.pacelabs.com

STOCK STANDARD

Created By: CCR
Created: 04/21/2011 16:13
Expires: 10/31/2017

Volume of Standard: 125 mL
Manufacturer: Ultra Scientific
Manufacturer Lot ID: L01132

Lot ID: 401164
Part ID: ICP-115
Standard ID: P-SPK

Notes: Phosphorus Secondary Standard - Rec 03/08/11, Open

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4001c/401164_COA.pdf

Compound Name and Concentration for Standard #5659

Compound Name	Concentration	Compound Name	Concentration
Phosphorus	10000 ug/mL		

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ULTRAgrade™ Solution
Phosphorus ICP Standard
10000 µg/mL
401164
REC.04/21/11 BY CCF
Exp. __/__/__ BY --
Open __/__/__ By --

Catalog Number: ICP-115 Rec. 3/8/11
Lot Number: L01132 0311-4020-5
Job Number: J00012124
Lot Issue Date: 09/29/2010
Expiration Date: 10/31/2017

Starting Material: Ammonium Dihydrogen Phosphate
Starting Material Purity: 99.999%
Starting Material Lot No.: BH01383
Matrix: 2% nitric acid in low TOC water (< 50 ppb)
Atomic Weight P: 30.98

Certified Value: 10002 ± 20 µg/mL
This Certified Reference Material (CRM) was manufactured and verified in accordance with ULTRA's ISO 9001 registered quality system. The analyte concentrations were verified by our ISO 17025 accredited laboratory to be within ± 2.5%, when compared to calibration standards independently prepared using NIST SRM(s). The certified value and uncertainty value for each analyte is determined gravimetrically.

Classical Wet Assay Method: Theoretical, based on gravimetric measurements

Confirmation by Inductively Coupled Plasma Spectroscopy (ICP / ICP-MS) vs. NIST SRM 3139a
ULTRA uses purified acids, 18 megohm double deionized water, calibrated Class A glassware & meticulously cleaned bottles in the manufacturing of ULTRAgrade standards. Balances used in the manufacturing of this standard are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001.

Trace Metallic Impurities in Solution Standard in µg/mL:

*	Al	<0.005	ND	*	Ga	<0.005	ND	n	Nb			n	S		
*	Sb	<0.005	ND	n	Ge			n	Os			n	Ta		
*	As	<0.005	ND	n	Au			*	Pd	<0.005	ND	n	Te		
*	Ba	<0.005	ND	n	Hf			s	P			n	Tb		
*	Be	<0.005	ND	n	Ho			*	Pt	<0.005	ND	*	Tl	<0.005	ND
*	Bi	<0.005	ND	*	In	<0.005	ND	*	K	<0.040	D	n	Th		
*	B	<0.005	ND	n	Ir			n	Pr			n	Tm		
*	Cd	<0.005	ND	*	Fe	<0.005	ND	n	Re			*	Sn	<0.005	ND
*	Ca	<0.010	D	*	La	<0.005	ND	n	Rh			*	Ti	<0.005	ND
n	Ce			*	Pb	<0.005	ND	n	Rb			n	W		
n	Cs			*	Li	<0.005	ND	n	Ru			n	U		
*	Cr	<0.005	ND	n	Lu			n	Sm			*	V	<0.005	ND
*	Co	<0.005	ND	*	Mg	<0.005	ND	n	Sc			n	Yb		
*	Cu	<0.005	ND	*	Mn	<0.005	ND	*	Se	<0.005	ND	n	Y		
n	Dy			*	Hg	<0.005	ND	*	Si	<0.005	ND	*	Zn	<0.005	ND
*	Er	<0.005	ND	*	Mo	<0.005	ND	*	Ag	<0.005	ND	n	Zr		
*	Eu	<0.005	ND	n	Nd			*	Na	<0.005	ND				
*	Gd	<0.005	ND	*	Ni	<0.005	ND	*	Sr	<0.005	ND				

* - element checked for
ND - not detected
i - spectral interference
D - detected
n - not checked for
s - solution standard element

Density of Solution (measured at 22°C ± 0.5°C): 1.027 g/mL

ACCREDITED

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www.ultrasci.com

William J. Leary
Quality Assurance Manager

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #7079, Phosphorus Primary Standard - Rec

STOCK STANDARD

Created By: DS1 **Volume of Standard:** 100 mL **Lot ID:** 401231

Created: 05/12/2011 13:06 **Manufacturer:** Fluka Analytical **Part ID:** 356433

Expires: 08/01/2013 **Manufacturer Lot ID:** MKBF1680 **Standard ID:** P-STK

Notes: Phosphorus Primary Standard - Rec 5/12/11, Open 5/12/11, DMS

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4001c/401231_COA.PDF

Compound Name and Concentration for Standard #7079

Compound Name	Concentration	Compound Name	Concentration
Phosphorus	10000 ug/mL		

Certificate of Analysis

401231
REC. 05/12/11 BY DS:
Exp. 8/1/13 BY

SIGMA-ALDRICH

Product Name	Phosphorus ICP/DCP standard solution, 10,000 µg/mL P in H_2O (Exact P concentration on label)
Product Number	356433
Product Brand	FLUKA

TEST	SPECIFICATION	LOT MKBF1680 RESULTS
Appearance (Clarity)	Clear	Clear
Appearance (Color)	Colorless	Colorless
Appearance (Form)	Liquid	Liquid
Phosphorus (P)	9800 - 10200 ppm by Titration with NaOH	10104 ppm
Trace Metal Analysis	≤10.0 ppm	< 10.0 ppm
Aluminum (Al)	ppm	< 0.1 ppm
Barium (Ba)	ppm	< 0.1 ppm
Calcium (Ca)	ppm	0.1 ppm
Chromium (Cr)	ppm	< 0.1 ppm
Copper (Cu)	ppm	< 0.1 ppm
Iron (Fe)	ppm	< 0.1 ppm
Magnesium (Mg)	ppm	< 0.1 ppm
Sodium (Na)	ppm	0.1 ppm
Antimony (Sb)	ppm	0.2 ppm
Titanium (Ti)	ppm	< 0.1 ppm
Zinc (Zn)	ppm	< 0.1 ppm
Expiration Date Period	---------- 3 Years	----------
Specification Date:		JUN 2010
Date of QC Release:		AUG 2010
Expiration Date:		AUG 2013
Print Date:		AUG 19 2010

Barbara Rajzer, Supervisor
Quality Control
Milwaukee, Wisconsin USA

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #18040, Uranium Secondary Standard - Rec

STOCK STANDARD

Created By: LMS
Created: 10/27/2011 09:17
Expires: 04/21/2013

Volume of Standard: 125 mL
Manufacturer: High Purity
Manufacturer Lot ID: 1120109

Lot ID: 401617
Part ID: 100064-1
Standard ID: U-SPK

Notes: Uranium Secondary Standard - Rec 10/26/2011 LMS

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4001c/401617_COA.PDF

Compound Name and Concentration for Standard #18040

Compound Name	Concentration	Compound Name	Concentration
Uranium	1000 ug/mL		

HIGH-PURITY STANDARDS
www.highpuritystandards.com

P.O. Box 41727
Charleston, SC 29423
Phone (843) 767-7900
Fax (843) 767-7906

Certificate of Analysis

401617
REC. 10/27/11 BY LMS
Exp. __/__/__ By __
Open __/__/__ By __

Product Description:

Name:	Uranium	Source Material:	Uranium Oxide
Part Number:	**100064-1**	Material Purity:	99.964%
Lot Number:	**1120109**	Matrix:	2% (v/v) HNO_3

Certified Value: 1000 µg/mL ± 3 µg/mL

The Certified value is based on gravimetric and volumetric preparation, and confirmed against SRM 3164 (lot number 080521) by inductively coupled plasma optical emission spectrometry (ICP-OES) using an internal laboratory-developed method. The uncertainty in the certified value is calculated for a 95% confidence interval and coverage factor *k* is about 2.

Density: 1.008 g/mL ± 0.002 g/mL @ 23.1°C

Uncertified Values:

Trace Metal Impurity Scan: The data reported are based upon a scan of this specific lot at 1000 µg/mL via ICP analysis. The values are reported in µg/L.

Ag	<	0.02	Cu	<	0.1	Li	<	9	Rb	<	0.02	Th	<	0.02
Al	<	1	Dy	<	0.02	Lu	<	0.02	Re	<	0.02	Ti	<	0.02
As	<	0.3	Er	<	0.02	Mg	<	0.5	Rh	<	0.02	Tl	<	0.02
Au	<	0.02	Eu	<	0.02	Mn	<	0.1	Ru	<	0.02	Tm	<	0.02
B	<	5	Fe	<	1	Mo	<	0.02	Sb	<	0.02	U		M
Ba	<	0.02	Ga	<	0.02	Na	<	3	Sc	<	0.02	V	<	0.05
Be	<	0.02	Gd	<	0.02	Nb	<	0.02	Se	<	0.1	W	<	0.02
Bi	<	0.02	Ge	<	0.02	Nd	<	0.02	Si	<	10	Y	<	2
Ca	<	0.5	Hf	<	0.02	Ni	<	0.02	Sm	<	0.02	Yb	<	0.02
Cd	<	0.02	Ho	<	0.02	Os	<	0.02	Sn	<	1	Zn	<	2
Ce	<	0.02	In	<	0.02	Pb	<	0.5	Sr	<	0.02	Zr	<	0.02
Co	<	0.05	Ir	<	0.02	Pd	<	0.02	Ta	<	0.02			
Cr	<	0.1	K	<	1	Pr	<	0.02	Tb	<	0.02			
Cs	<	0.02	La	<	0.02	Pt	<	0.02	Te	<	0.02			

Preparation Information:

The standard solution is prepared using high purity materials and assayed by analytical methods for conformity prior to use. This standard was prepared using the methods developed at NIST for SRM Spectrometric Standard Solutions under appropriate laboratory conditions.

Sub-boiling distilled high-purity acid has been used to place the materials in solution and to stabilize the standard. The matrix is as noted above in 18 megaohm deionized water.

Stability of this product is based upon rigorous short term and long term testing of the solution for the certified value. This testing includes, but is not limited to, the effect of temperature and packaging on the product.

Intended Use:

This Certified Reference Material (CRM) is intended for use as a calibration standard for the quantitative determination of uranium, calibration of instruments such as ICPOES, ICPMS, AAS and XRF, and validation of analytical methods. It also can be used in EPA, ASTM and other methods.

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Open / / Ru

Traceability Information:

The traceability of this standard is maintained through an unbroken chain of comparisons to appropriate standards with suitable procedure and measurement uncertainties. The maintenance of the base and derived units of International System of Units (SI) with traceability of measurement results (contemporary metrology) to SI ensures their comparability over time as follows.

a. **Standard Weight and Analytical Balance**
The standard weights (NBS weights Inventory No 20231A) are calibrated every two years by South Carolina Metrology Laboratory that is a participant in "NIST Weights and Measures Measurement Assurance Program" with a certificate of measurement traceability to NIST primary standards.
The balances are calibrated yearly by the ISO 17025 accredited metrology service, and are verified weekly by an in-house method using standard weights.

b. **Volumetric Device**
The calibration of volumetric vessels is checked annually using the NBS 602 method.

c. **Thermometer**
The standard thermometers are calibrated every year by the ISO 17025 accredited metrology service. The thermometers used in-house are verified against the standard thermometers yearly.

d. **Calibration Standards:**
The Calibration Standard is directly traceable to SRM 3100 Series Spectrometric Standard Solutions.

Packaging and Storage Conditions:

The standard is packaged in a pre-cleaned polyethylene bottle. To maintain the integrity of this product, the solution should be kept tightly capped and stored under normal laboratory conditions.

Refer to Material Safety Datasheet (MSDS) for hazardous information.

Expiration Information:

The expiry date is guaranteed to be valid for eighteen months from the shipping date provided. For this reason, standards from the same lot may have different expiration dates.

Preparation Date: **July 20, 2011**
Shipped Date: OCT 21 2011
Expiration Date: APR 21 2013
Certificate Issue Date: **July 29, 2011**

Quality Information:

ACLASS ACCREDITED TESTING
ISO/IEC 17025:2005 Accreditation
Certificate Number AT-1529

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER
ISO Guide 34:2009 (RMP) Accreditation
Certificate Number AR-1436

Vanny T. Yib,
Inorganic Laboratory Manager

Kim-Phuong Tran
Kim-Phuong Tran
Quality Manager

Theodore Rains, PhD
President

NOTICE: HPS products are intended for laboratory use only. All products should be handled and used by trained professional personnel. The responsibility for the safe handling and use of these products rests solely with the buyer and/or user. The data and information as stated was furnished by the manufacturer of the product. The information provided in this certificate pertains only to the lot number specified. None of the information provided in this certificate may be used, reproduced or transmitted in any form or by any means without written approval from High Purity Standards.

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #19251, Rec 11/15/11, Opened 11/17/11

STOCK STANDARD

Created By: CMS
Created: 11/17/2011 14:40
Expires: 12/01/2012

Volume of Standard: 125 mL
Manufacturer: Inorganic Ventures
Manufacturer Lot ID: E2-HG02091

Lot ID: 401650
Part ID: CGHG1-1
Standard ID: Hg-SPK

Notes: Rec 11/15/11, Opened 11/17/11

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4001c/401650_COA.pdf

Compound Name and Concentration for Standard #19251

Compound Name	Concentration	Compound Name	Concentration
Mercury	1000 ug/mL		

INORGANIC VENTURES™
300 Technology Drive
Christiansburg, VA 24073 • USA
inorganicventures.com
tel: 800.669.6799 • 540.585.3030
fax: 540.585.3012
info@inorganicventures.com

CERTIFICATE OF ANALYSIS

1.0 **INORGANIC VENTURES** is an ISO Guide 34 "General Requirements for the Competence of Reference Material Producers" and ISO 9001 registered manufacturer. Our manufacturing laboratory is accredited to ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories."

ACCREDITED Testing Laboratory Certificate 883.01 — ACCREDITED Reference Material Producer Certificate 883.02

2.0 **DESCRIPTION OF CRM** **1000 µg/mL Mercury in 5% v/v HNO3**

Catalog Number:	CGHG1-1, CGHG1-2, and CGHG1-5
Lot Number:	**E2-HG02091**
Starting Material:	Hg metal
Starting Material Purity (%):	100.0000
Starting Material Lot No:	R307HGA1
Matrix:	5% v/v HNO3

401660
REC.11/17/11 BY CMI
Exp. __/__/__ By __

3.0 **CERTIFIED VALUES AND UNCERTAINTIES**

Certified Concentration: 1000 ± 6 µg/mL - weighted mean

Certified Density: 1.025 g/mL (measured at 20 ± 1°C)

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Certified Value $(\bar{x}) = \frac{\Sigma x_i}{n}$

Uncertainty (±) $= \frac{2\,[(\Sigma s_i)^2]^{1/2}}{(n)^{1/2}}$

$(\bar{x})$ = mean
x_i = individual results
n = number of measurements
Σs_i = The summation of all significant estimated errors (Most common are the errors from instrumental measurement, weighing, dilution to volume and the fixed error reported on the NIST SRM certificate of analysis)

4.0 **TRACEABILITY TO NIST AND VALUES OBTAINED BY INDEPENDENT METHODS**

· "Property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties." (ISO VIM, 2nd ed., 1993, definition 6.10)

· This product is Traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRMs are available, the term 'in-house std.' is specified.

4.1 **Assay Method #1** **999 ± 4 µg/mL**
ICP Assay NIST SRM 3133 Lot Number: 061204

Assay Method #2 **1,000 ± 4 µg/mL**
EDTA NIST SRM 928 Lot Number: 928

4.2 **BALANCE CALIBRATION** - All analytical balances are calibrated yearly by an A2LA accredited calibration laboratory and are traceable to a class E 2 analytical weight set with NIST Traceability. All balances are checked daily using an in-house procedure. The weights used for testing are annually compared to master weights and are traceable to the National Institute of Standards and Technology (NIST).

4.3 **THERMOMETER CALIBRATION** - All thermometers are NIST traceable through thermometers that are calibrated by an A2LA accredited calibration laboratory.

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REC.11/17/11 BY CMS
Exp. __/__/__ By __

4.4 **GLASSWARE CALIBRATION** - An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM's.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP/MS AND ICP-OES IN µg/mL

CRM's solutions are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

O	Al	< 0.000090	M	Dy	< 0.012379	O	Li	< 0.000020	M	Pr	< 0.000619	M	Te	< 0.061896
M	Sb	< 0.001032	M	Er	< 0.010316	M	Lu	< 0.000825	M	Re	< 0.002063	M	Tb	< 0.000619
M	As	< 0.020632	M	Eu	< 0.006190	O	Mg	< 0.000030	M	Rh	< 0.002063	O	Tl	< 0.006000
M	Ba	< 0.020632	M	Gd	< 0.002063	M	Mn	< 0.008253	M	Rb	< 0.002063	M	Th	< 0.002063
M	Be	< 0.001032	M	Ga	< 0.002063	s	Hg		M	Ru	< 0.004126	M	Tm	< 0.000825
M	Bi	< 0.000825	O	Ge	< 0.018000	M	Mo	< 0.004126	M	Sm	< 0.002063	M	Sn	< 0.010316
M	B	< 0.144423	M	Au	< 0.006190	M	Nd	< 0.004126	M	Sc	< 0.020632	M	Ti	< 0.103159
O	Cd	< 0.004600	M	Hf	< 0.004126	O	Ni	< 0.001000	M	Se	< 0.016505	M	W	< 0.020632
O	Ca	0.000242	M	Ho	< 0.001032	M	Nb	< 0.001032	O	Si	< 0.003400	M	U	< 0.004126
M	Ce	< 0.010316	M	In	< 0.020632	n	Os		M	Ag	< 0.004126	M	V	< 0.004126
M	Cs	< 0.000619	M	Ir	< 0.010316	O	Pd	< 0.003800	O	Na	0.000218	M	Yb	< 0.002063
M	Cr	< 0.010316	O	Fe	< 0.001100	O	P	< 0.002600	M	Sr	< 0.001032	M	Y	< 0.082527
M	Co	< 0.006190	M	La	< 0.001032	M	Pt	< 0.004126	O	S	< 0.025000	M	Zn	< 0.041264
M	Cu	< 0.012379	M	Pb	< 0.006190	O	K	< 0.002000	M	Ta	< 0.014442	M	Zr	< 0.010316

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

For the calibration of analytical instruments including but not limited to the following:
HPLC, IC, TLC, ISE, IR, NMR, UV/VIS, MS, Capillary Eletrophoresis, Potentiometry, Wet Chemistry and Voltammetry
For the validation of analytical methods
For the preparation of "working reference samples"
For interference studies and the detemination of correction coefficients
For detection limit and linearity studies
For additional intended uses, contact Technical Staff

This CRM was manufactured using 18 megohm doubly deionized water that has been filtered through a 0.2 micron filter.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

Storage & Handling - Keep tightly sealed when not in use. Store and use at 20 ± 4°C. Do not pipet from container. Do not return portions removed for pipetting to container.

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 200.59; +2; 4 ; Hg(OH)(aq) 1+

Chemical Compatibility - Stable in HNO3. Avoid basic media forming insoluble carbonate. The sulfide, basic carbonate, oxalate, phosphate, arsenite, arsenate and iodide are insoluble in water. .

Stability - 2-100 ppb levels **not stable** in 1% HNO3 / LDPE container, ***stable*** in 10% HNO3 packaged in borosilicate glass. 1-100 ppm levels stable in 7% HNO3 packaged in borosilicate glass. 1000-10,000 ppm solutions are chemically stable for years in 5-10% HNO3 / LDPE container.

Hg Containing Samples (Preparation and Solution) - Metal (soluble in HNO3); Oxide (Soluble in HNO3); Ores and Organic based (The literature has more references to the preparation of Hg containing samples than any other element. Please consult the literature for your specific sample type, since such preparations are prone to error. Or e-mail our technical staff and we will contact you to discuss your particular sample preparation questions in further detail.).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	Estimated D.L.	Order	Type	Interferences (underlined indicates severe)
ICP-OES 184.950 nm	0.03 / 0.005 µg/mL	1	atom	
ICP-OES 194.227 nm	0.03 / 0.005 µg/mL	1	ion	V
ICP-OES 253.652 nm	0.1 / 0.03 µg/mL	1	atom	Ta, Co, Th ,Rh , Fe, U
ICP-MS 202 amu	9 ppt	n/a	M+	186W16O

401650
REC. 11/17/11 BY CH
EXP. __/__/__ BY

Uranium Note: If uranium is present in this standard, it is natural abundance unless specified in Section 3.0.

8.0 HAZARDOUS INFORMATION - Please refer to the enclosed Material Safety Data sheet for information regarding this CRM.

9.0 HOMOGENEITY - This solution was mixed according to an in house procedure and is guaranteed to be homogeneous.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration
- QMI Certificate Number 010105

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration"
- Chemical Testing - Accredited A2LA Certificate Number 883.01

10.3 ISO/IEC Guide 34 "General Requirements for the Competence of Reference Material Producers"
- Reference Materials Production - Accredited A2LA Certificate Number 883.02

10.4 10CFR50 Appendix B - Nuclear Regulatory Commission
- Domestic Licensing of Production and Utilization Facilities

10.5 10CFR21 - Nuclear Regulatory Commission
- Reporting Defects and Non-Compliance

11.0 DATE OF CERTIFICATION AND PERIOD OF VALIDITY

11.1 Shelf Life - The period of time during which the concentration of the analyte(s) in a properly packaged, unopened, and unused standard stored under environmentally controlled and monitored conditions will remain within the specified uncertainty range. Shelf life is limited primarily by transpiration (loss of water from the solution) and infrequently, by chemical instability.

11.2 Expiration Date - The date after which a CRM should not be used. Routine laboratory use of a CRM increases transpiration losses and the chance of contamination which affect the integrity of the CRM and limit its useful life. Manufacturer concurs with state and federal regulatory agencies' recommendations that solution standards be assigned a one-year expiration date.

11.3 Chemical Stability - Studies have been conducted on this or similar CRMs and it has been demonstrated that this CRM is chemically stable for a period of not less than two years provided the "Storage & Handling" conditions are followed that are described in section 7.0.

Certification Date: September 22, 2011
Expiration Date: EXPIRES 01 DEC 2012

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By:	Donna Senn, Product Documentation Technician	Donna Senn
Certificate Approved By:	Madeline Gozzi, Quality Control Supervisor	Madeline Gozzi
Certifying Officer:	Paul Gaines, PhD., Senior Technical Director	Paul R Gaines

401660

REC.11/17/11 BY CM
Exp. __/__/__ By __

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #22391, Conc. Nitric Acid - Rec 06/10/11

SOLVENT

Created By: DS1
Created: 01/13/2012 09:17
Expires: 01/13/2014

Volume of Standard: 2500 mL
Manufacturer: SCP SCIENCE
Manufacturer Lot ID: SCA1314782

Lot ID: 401741
Part ID: 250-037-171
Standard ID: RGNT373

Notes: Conc. Nitric Acid - Rec 06/10/11

Certificates of Analysis

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Compound Name and Concentration for Standard #22391

Compound Name	Concentration	Compound Name	Concentration
Nitric Acid			

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Certificate of Analysis

401741
REC.01/13/12 BY DS
Exp. __/__/__ By _

*Plasma*PURE

Nitric Acid (67 - 70% HNO_3)

Catalogue Number: 250-037-171 / 250-037-171 / 250-037-173 / 250-137-173 / 250-037-175 / 250-037-177

Lot Number: **SCA1314782**
Assay (HNO_3 w/w): **69%**
Colour (APHA): **< 10 (Specification: Max 10)**
Expiry Date: **November 2014**

Opened Bottle Expiry Information
15 months after opening, up to unopened expiration date

_____
Date bottle opened

Analyte	Maximum Specification	Actual Value (in ppb)	Analyte	Maximum Specification	Actual Value (in ppb)
Aluminum (Al)	1 ppb	< 0.5	Neodymium (Nd)	0.1 ppb	< 0.1
Antimony (Sb)	0.5 ppb	< 0.1	Nickel (Ni)	0.5 ppb	< 0.5
Arsenic (As)	0.5 ppb	< 0.1	Niobium (Nb)	0.1 ppb	< 0.1
Barium (Ba)	0.1 ppb	< 0.1	Palladium (Pd)	0.5 ppb	< 0.1
Beryllium (Be)	0.1 ppb	< 0.1	Platinum (Pt)	0.5 ppb	< 0.1
Bismuth (Bi)	0.1 ppb	< 0.1	Potassium (K)	1 ppb	< 0.2
Boron (B)	1 ppb	< 0.5	Praseodymium (Pr)	0.1 ppb	< 0.1
Cadmium (Cd)	0.5 ppb	< 0.1	Rhenium (Re)	0.1 ppb	< 0.1
Calcium (Ca)	1 ppb	< 0.5	Rhodium (Rh)	0.5 ppb	< 0.1
Cerium (Ce)	0.1 ppb	< 0.1	Rubidium (Rb)	0.1 ppb	< 0.1
Cesium (Cs)	0.1 ppb	< 0.1	Ruthenium (Ru)	0.5 ppb	< 0.1
Chromium (Cr)	1 ppb	< 0.5	Samarium (Sm)	0.1 ppb	< 0.1
Cobalt (Co)	0.5 ppb	< 0.1	Scandium (Sc)	0.1 ppb	< 0.1
Copper (Cu)	0.5 ppb	< 0.2	Selenium (Se)	1 ppb	< 0.1
Dysprosium (Dy)	0.1 ppb	< 0.1	Silver (Ag)	0.1 ppb	< 0.1
Erbium (Er)	0.1 ppb	< 0.1	Sodium (Na)	1 ppb	< 0.2
Europium (Eu)	0.1 ppb	< 0.1	Strontium (Sr)	0.1 ppb	< 0.1
Gadolinium (Gd)	0.1 ppb	< 0.1	Tantalum (Ta)	Information Only	< 0.1
Gallium (Ga)	0.1 ppb	< 0.1	Tellurium (Te)	0.1 ppb	< 0.1
Germanium (Ge)	0.1 ppb	< 0.1	Terbium (Tb)	0.1 ppb	< 0.1
Gold (Au)	0.1 ppb	< 0.1	Thallium (Tl)	0.1 ppb	< 0.1
Hafnium (Hf)	0.1 ppb	< 0.1	Thorium (Th)	0.1 ppb	< 0.1
Holmium (Ho)	0.1 ppb	< 0.1	Thulium (Tm)	0.1 ppb	< 0.1
Indium (In)	0.1 ppb	< 0.1	Tin (Sn)	0.5 ppb	< 0.1
Iron (Fe)	1 ppb	< 0.5	Titanium (Ti)	0.5 ppb	< 0.1
Lanthanum (La)	0.1 ppb	< 0.1	Tungsten (W)	0.1 ppb	< 0.1
Lead (Pb)	0.1 ppb	< 0.1	Uranium (U)	0.1 ppb	< 0.1
Lithium (Li)	0.1 ppb	< 0.1	Vanadium (V)	0.5 ppb	< 0.1
Lutetium (Lu)	0.1 ppb	< 0.1	Ytterbium (Yb)	0.1 ppb	< 0.1
Magnesium (Mg)	1 ppb	< 0.2	Yttrium (Y)	0.1 ppb	< 0.1
Manganese (Mn)	0.1 ppb	< 0.1	Zinc (Zn)	0.5 ppb	< 0.2
Mercury (Hg)	0.1 ppb	< 0.02	Zirconium (Zr)	0.1 ppb	< 0.1
Molybdenum (Mo)	0.1 ppb	< 0.1			

Analyte	Maximum Specification	Actual Value (in ppm)	Analyte	Maximum Specification	Actual Value (in ppm)
Chloride (Cl^-)	0.2 ppm	< 0.2	Total Sulphur (S)	0.3 ppm	< 0.3
Total Phosphorus (P)	0.01 ppm	< 0.01			

Certified by: Daniel Boisvert
Daniel Boisvert, Chemist

Certification Date: **November 2, 2011**

To maintain product integrity and reduce the risk of trace metal contamination: the inner pack of plastic bags and bottle should be opened under CLASS 100 particle conditions to maintain the integrity of the product. The use of safety apparel, as well as eye protection, plastic gloves, hair net and a clean room suit is also advised. The Material Safety Data Sheet and this Certificate of Analysis are available on our web site. **SCP SCIENCE** is ISO 9001:2008 registered and ISO 17025 accredited (Également disponible en français).

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Tel: +86 (10) 58032301
Fax: +86 (10) 58032302
Email: sales@scpscience.com
www.scpscience.com

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #22392, Conc. HCL - Rec 06/10/11

SOLVENT

Created By: DS1
Created: 01/13/2012 09:20
Expires: 01/13/2014

Volume of Standard: 2500 mL
Manufacturer: SCP SCIENCE
Manufacturer Lot ID: SCA1256754

Lot ID: 401742
Part ID: 250-037-151
Standard ID: RGNT153

Notes: Conc. HCL - Rec 06/10/11

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4001c/401742_COA.pdf

Compound Name and Concentration for Standard #22392

Compound Name	Concentration	Compound Name	Concentration
Hydrochloric Acid			

SCP SCIENCE

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Certificate of Analysis

401742

REC.01/13/12 BY DS
Exp: __/__/__ By _
Open __/__/__ By _

*Plasma*PURE Hydrochloric Acid (34 - 37% HCl)

Catalogue Number: 250-037-151 / 250-137-151 / 250-037-153 / 250-137-153 / 250-037-155 / 250-037-157 / 250-037-159
Lot Number: **SCA1256754**
Assay (HCl w/w): **35%**
Colour (APHA): **< 10 (Specification: Max 10)**
Expiry Date: **September 2014**

Opened Bottle Expiry Information
15 months after opening, up to unopened expiration date

Date bottle opened

Analyte	Maximum Specification	Actual Value (in ppb)	Analyte	Maximum Specification	Actual Value (in ppb)
Aluminum (Al)	1 ppb	< 0.5	Neodymium (Nd)	0.1 ppb	< 0.1
Antimony (Sb)	0.5 ppb	< 0.1	Nickel (Ni)	0.5 ppb	< 0.1
Arsenic (As)	0.5 ppb	< 0.1	Niobium (Nb)	0.1 ppb	< 0.1
Barium (Ba)	0.1 ppb	< 0.1	Palladium (Pd)	Information Only	< 0.5
Beryllium (Be)	0.1 ppb	< 0.1	Platinum (Pt)	Information Only	< 0.5
Bismuth (Bi)	0.1 ppb	< 0.1	Potassium (K)	1 ppb	< 0.1
Boron (B)	1 ppb	< 0.5	Praseodymium (Pr)	0.1 ppb	< 0.1
Cadmium (Cd)	0.1 ppb	< 0.1	Rhenium (Re)	0.1 ppb	< 0.1
Calcium (Ca)	1 ppb	< 0.5	Rhodium (Rh)	0.1 ppb	< 0.1
Cerium (Ce)	0.1 ppb	< 0.1	Rubidium (Rb)	0.1 ppb	< 0.1
Cesium (Cs)	0.1 ppb	< 0.1	Ruthenium (Ru)	0.1 ppb	< 0.1
Chromium (Cr)	0.5 ppb	< 0.1	Samarium (Sm)	0.1 ppb	< 0.1
Cobalt (Co)	0.1 ppb	< 0.1	Scandium (Sc)	0.1 ppb	< 0.1
Copper (Cu)	0.5 ppb	< 0.1	Selenium (Se)	1 ppb	< 0.1
Dysprosium (Dy)	0.1 ppb	< 0.1	Silver (Ag)	1 ppb	< 0.1
Erbium (Er)	0.1 ppb	< 0.1	Sodium (Na)	1 ppb	< 0.5
Europium (Eu)	0.1 ppb	< 0.1	Strontium (Sr)	0.1 ppb	< 0.1
Gadolinium (Gd)	0.1 ppb	< 0.1	Tantalum (Ta)	Information Only	< 1
Gallium (Ga)	0.1 ppb	< 0.1	Tellurium (Te)	0.1 ppb	< 0.1
Gold (Au)	0.5 ppb	< 0.1	Terbium (Tb)	0.1 ppb	< 0.1
Hafnium (Hf)	0.1 ppb	< 0.1	Thallium (Tl)	0.1 ppb	< 0.1
Holmium (Ho)	0.1 ppb	< 0.1	Thorium (Th)	0.1 ppb	< 0.1
Indium (In)	0.1 ppb	< 0.1	Thulium (Tm)	0.1 ppb	< 0.1
Iron (Fe)	1 ppb	< 0.5	Tin (Sn)	0.5 ppb	< 0.1
Lanthanum (La)	0.1 ppb	< 0.1	Titanium (Ti)	0.5 ppb	< 0.1
Lead (Pb)	0.1 ppb	< 0.1	Tungsten (W)	0.1 ppb	< 0.1
Lithium (Li)	0.1 ppb	< 0.1	Uranium (U)	0.1 ppb	< 0.1
Lutetium (Lu)	0.1 ppb	< 0.1	Vanadium (V)	0.5 ppb	< 0.1
Magnesium (Mg)	0.5 ppb	< 0.5	Ytterbium (Yb)	0.1 ppb	< 0.1
Manganese (Mn)	0.1 ppb	< 0.1	Yttrium (Y)	0.1 ppb	< 0.1
Mercury (Hg)	0.1 ppb	< 0.02	Zinc (Zn)	1 ppb	< 0.5
Molybdenum (Mo)	0.1 ppb	< 0.1	Zirconium (Zr)	0.1 ppb	< 0.1

Analyte	Maximum Specification	Actual Value (in ppm)	Analyte	Maximum Specification	Actual Value (in ppm)
Bromide (Br^-)	10 ppm	< 10	Total Sulphur (S)	0.3 ppm	< 0.3
Total Phosphorus (P)	0.01 ppm	< 0.01	Free Chlorine (Cl_2)	0.5 ppm	< 0.5

Certified by: Daniel Boisvert
Daniel Boisvert, Chemist

Certification Date: **September 15, 2011**

To maintain product integrity and reduce the risk of trace metal contamination: the inner pack of plastic bags and bottle should be opened under CLASS 100 particle conditions to maintain the integrity of the product. The use of safety apparel, as well as eye protection, plastic gloves, hair net and a clean room suit is also advised. The Material Safety Data Sheet and this Certificate of Analysis are available on our web site. **SCP SCIENCE** is ISO 9001:2008 registered and ISO 17025 accredited (Également disponible en français).

Canada / International
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Email: sales@scpscience.com
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www.scpscience.com

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #24681, Scandium Primary Standard - Rec

STOCK STANDARD

Created By: DS1
Created: 02/15/2012 14:00
Expires: 03/01/2013

Volume of Standard: 125 mL
Manufacturer: Inorganic Ventures
Manufacturer Lot ID: E2-SC02094

Lot ID: 401843
Part ID: MSSC-100PPM
Standard ID: Sc-STK

Notes: Scandium Primary Standard - Rec 03/16/11, Open

Certificates of Analysis

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Compound Name and Concentration for Standard #24681

Compound Name	Concentration	Compound Name	Concentration
Scandium	100 ug/mL		

INORGANIC VENTURES™
300 Technology Drive
Christiansburg, VA 24073 • USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

tel: 800.669.6799 • 540.585.3030
fax: 540.585.3012
info@inorganicventures.com

401843
REC. 02/15/12 BY DS
EXP. --/--/-- BY -
Open / / By

1.0 **INORGANIC VENTURES** is an ISO Guide 34 "General Requirements for the Competence of Reference Material Producers" and ISO 9001 registered manufacturer. Our manufacturing laboratory is accredited to ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories."

ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 **DESCRIPTION OF CRM** **100 µg/mL Scandium in 7% (v/v) HNO3**

Catalog Number:	MSSC-100PPM
Lot Number:	E2-SC02094
Starting Material:	Sc2O3
Starting Material Purity (%):	99.9960
Starting Material Lot No:	1630A
Matrix:	7% (v/v) HNO3

3.0 **CERTIFIED VALUES AND UNCERTAINTIES**

Certified Concentration: 100.32 ± 0.81 µg/mL

Certified Density: 1.031 g/mL (measured at 20 ± 1°C)

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Certified Value $(\bar{x}) = \frac{\sum x_i}{n}$

Uncertainty $(\pm) = \frac{2\,[(\sum s_i)^2]^{1/2}}{(n)^{1/2}}$

$(\bar{x})$ = mean
x_i = individual results
n = number of measurements
$\sum s_i$ = The summation of all significant estimated errors (Most common are the errors from instrumental measurement, weighing, dilution to volume and the fixed error reported on the NIST SRM certificate of analysis)

4.0 **TRACEABILITY TO NIST AND VALUES OBTAINED BY INDEPENDENT METHODS**

- "Property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties." (ISO VIM, 2nd ed., 1993, definition 6.10)
- This product is Traceable to NIST via an unbroken chain of comparisons to the following NIST SRMs:

4.1 ELEMENT	METHOD	NIST SRM#	SRM LOT#
Sc	ICP Assay	3148a	792111
Sc	EDTA	928	928

4.2 **BALANCE CALIBRATION** - All analytical balances are calibrated yearly by an A2LA accredited calibration laboratory and are traceable to a class E 2 analytical weight set with NIST Traceability. All balances are checked daily using an in-house procedure. The weights used for testing are annually compared to master weights and are traceable to the National Institute of Standards and Technology (NIST).

4.3 **THERMOMETER CALIBRATION** - All thermometers are NIST traceable through thermometers that are calibrated by an A2LA accredited calibration laboratory.

4.4 **GLASSWARE CALIBRATION** - An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM's.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP/MS AND ICP-OES IN µg/mL

Standard solutions are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag	< 0.0020060	O	Cu	0.0002480	M	La	< 0.0005010	M	Pr	< 0.0003010	M	Ta	< 0.0070200
O	Al	< 0.0010000	M	Dy	< 0.0060170	M	Li	< 0.0100290	M	Pt	< 0.0020060	M	Tb	< 0.0003010
M	As	< 0.0100290	M	Er	< 0.0050150	M	Lu	< 0.0004010	M	Rb	< 0.0010030	M	Te	< 0.0300870
M	Au	< 0.0030090	M	Eu	< 0.0030090	O	Mg	0.0000200	M	Re	< 0.0010030	M	Th	< 0.0010030
M	B	< 0.0702030	O	Fe	0.0000990	M	Mn	< 0.0040120	M	Rh	< 0.0010030	O	Ti	< 0.0010000
M	Ba	< 0.0100290	M	Ga	< 0.0010030	M	Mo	< 0.0020060	M	Ru	< 0.0020060	M	Tl	< 0.0010030
M	Be	< 0.0005010	M	Gd	< 0.0010030	O	Na	< 0.0900000	O	S	< 0.0250000	M	Tm	< 0.0004010
M	Bi	< 0.0004010	M	Ge	< 0.0060170	M	Nb	< 0.0005010	M	Sb	< 0.0005010	M	U	< 0.0020060
O	Ca	0.0026840	O	Hf	0.0004970	M	Nd	< 0.0020060	s	Sc		M	V	< 0.0020060
M	Cd	< 0.0030090	O	Hg	< 0.0100000	O	Ni	< 0.0009000	M	Se	< 0.0080230	O	W	< 0.0040000
M	Ce	< 0.0050150	M	Ho	< 0.0005010	n	Os		O	Si	0.0014910	O	Y	< 0.0010000
M	Co	< 0.0030090	M	In	< 0.0100290	n	P		M	Sm	< 0.0010030	M	Yb	< 0.0010030
O	Cr	< 0.0008000	M	Ir	< 0.0050150	M	Pb	< 0.0030090	M	Sn	< 0.0050150	O	Zn	0.0002780
M	Cs	< 0.0003010	O	K	< 0.1000000	M	Pd	< 0.0050150	M	Sr	< 0.0005010	O	Zr	0.0009940

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

For the calibration of analytical instruments including but not limited to the following:
HPLC, IC, TLC, ISE, IR, NMR, UV/VIS, MS, Capillary Electrophoresis, Potentiometry, Wet Chemistry and Voltammetry
For the validation of analytical methods
For the preparation of "working reference samples"
For interference studies and the determination of correction coefficients
For detection limit and linearity studies
For additional intended uses, contact Technical Staff

This CRM was manufactured using 18 megohm doubly deionized water that has been filtered through a 0.2 micron filter.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

Storage & Handling - Keep tightly sealed when not in use. Store and use at 20 ± 4°C. Do not pipet from container. Do not return portions removed for pipetting to container.
Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 44.95591; +3; 6; Sc(H2O)6+2
Chemical Compatibility - Soluble in HCl, H2SO4 and HNO3. Avoid HF, H3PO4 and neutral to basic media. Stable with most metals and inorganic anions forming an insoluble carbonate, oxide, oxalate, and fluoride. Avoid mixing with elements / solutions containing moderate amounts of fluoride. The fluoride is soluble in excess HF forming ScF63- (not recommended for standard preparations).
Stability - 2-100 ppb levels stable for months in 1% HNO3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 5-10% HNO3 / LDPE container. Small atomic radius increases hydrolysis requiring higher acid levels than other Rare Earths.
Sc Containing Samples (Preparation and Solution) - Metal (Soluble in acids); Oxide (Dissolve by heating in H2O / HNO3); Ores (Carbonate fusion in Pt0 followed by HCl dissolution); Organic Matrices (Dry ash and dissolve in 1:1 H2O / HCl or HNO3), (Aqua Regia or nitric / perchloric / sulfuric acid digestions can be used. **Exercise caution when using perchloric acid.)**
Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	Estimated D.L.	Order	Type	Interferences (underlined indicates severe)
ICP-OES 335.373 nm	0.004 / 0.00002 µg/mL	1	ion	
ICP-OES 337.215 nm	0.004 / 0.00002 µg/mL	1	ion	Ti, U, Ni, Rh
ICP-OES 424.683 nm	0.003 / 0.00002 µg/mL	1	ion	Ce
ICP-MS 45 amu	2.3 ppt	n/a	M+	16O212CH, 29Si16O, 90Zr+2

Uranium Note: If uranium is present in this standard, it is natural abundance unless specified in Section 3.0.

8.0 HAZARDOUS INFORMATION - Please refer to the enclosed Material Safety Data sheet for information regarding this CRM.

9.0 HOMOGENEITY - This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration
- QMI Certificate Number 010105

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration"
- Chemical Testing - Accredited A2LA Certificate Number 883.01

10.3 ISO/IEC Guide 34 "General Requirements for the Competence of Reference Material Producers"
- Reference Materials Production - Accredited A2LA Certificate Number 883.02

10.4 10CFR50 Appendix B - Nuclear Regulatory Commission
- Domestic Licensing of Production and Utilization Facilities

10.5 10CFR21 - Nuclear Regulatory Commission
- Reporting Defects and Non-Compliance

11.0 DATE OF CERTIFICATION AND PERIOD OF VALIDITY

11.1 Shelf Life - The period of time during which the concentration of the analyte(s) in a properly packaged, unopened, and unused standard stored under environmentally controlled and monitored conditions will remain within the specified uncertainty range. Shelf life is limited primarily by transpiration (loss of water from the solution) and infrequently, by chemical instability.

11.2 Expiration Date - The date after which a CRM should not be used. Routine laboratory use of a CRM increases transpiration losses and the chance of contamination which affect the integrity of the CRM and limit its useful life. Manufacturer concurs with state and federal regulatory agencies' recommendations that solution standards be assigned a one-year expiration date.

11.3 Chemical Stability - Studies have been conducted on this or similar CRMs and it has been demonstrated that this CRM is chemically stable for a period of not less than two years provided the "Storage & Handling" conditions are followed that are described in section 7.0.

Certification Date: **January 31, 2012**

Expiration Date: EXPIRES 01-2017

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By:	Danny Feeny, Product Documentation Technician	Danny R Feeny
Certificate Approved By:	Brian Alexander, PhD., Quality Control Supervisor	Brian Alexander
Certifying Officer:	Paul Gaines, PhD., Senior Technical Director	Paul R Gaines

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #24682, Scandium Primary Standard - Rec

STOCK STANDARD

Created By: DS1
Created: 02/15/2012 14:05
Expires: 03/01/2013

Volume of Standard: 125 mL
Manufacturer: Inorganic Ventures
Manufacturer Lot ID: E2-SC02094

Lot ID: 401843
Part ID: MSSC-100PPM
Standard ID: Sc-STK

Notes: Scandium Primary Standard - Rec 03/16/11, Open

Certificates of Analysis

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Compound Name and Concentration for Standard #24682

Compound Name	Concentration	Compound Name	Concentration
Scandium	100 ug/mL		

INORGANIC VENTURES™
300 Technology Drive
Christiansburg, VA 24073 • USA
inorganicventures.com
tel: 800.669.6799 • 540.585.3030
fax: 540.585.3012
info@inorganicventures.com

CERTIFICATE OF ANALYSIS

401843
REC. 02/15/12 BY DS
EXP. --/--/-- BY -
OPEN / / BY

1.0 **INORGANIC VENTURES** is an ISO Guide 34 "General Requirements for the Competence of Reference Material Producers" and ISO 9001 registered manufacturer. Our manufacturing laboratory is accredited to ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories."

ACCREDITED Testing Laboratory Certificate 883.01

ACCREDITED Reference Material Producer Certificate 883.02

2.0 **DESCRIPTION OF CRM** **100 µg/mL Scandium in 7% (v/v) HNO3**

Catalog Number:	MSSC-100PPM
Lot Number:	E2-SC02094
Starting Material:	Sc2O3
Starting Material Purity (%):	99.9960
Starting Material Lot No:	1630A
Matrix:	7% (v/v) HNO3

3.0 **CERTIFIED VALUES AND UNCERTAINTIES**

Certified Concentration: 100.32 ± 0.81 µg/mL

Certified Density: 1.031 g/mL (measured at 20 ± 1°C)

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Certified Value $(\overline{x}) = \frac{\Sigma x_i}{n}$

Uncertainty (±) $= \frac{2\,[(\Sigma s_i)^2]^{1/2}}{(n)^{1/2}}$

$(\overline{x})$ = mean
x_i = individual results
n = number of measurements
Σs_i = The summation of all significant estimated errors (Most common are the errors from instrumental measurement, weighing, dilution to volume and the fixed error reported on the NIST SRM certificate of analysis)

4.0 **TRACEABILITY TO NIST AND VALUES OBTAINED BY INDEPENDENT METHODS**

- "Property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties." (ISO VIM, 2nd ed., 1993, definition 6.10)
- This product is Traceable to NIST via an unbroken chain of comparisons to the following NIST SRMs:

4.1 ELEMENT	METHOD	NIST SRM#	SRM LOT#
Sc	ICP Assay	3148a	792111
Sc	EDTA	928	928

4.2 **BALANCE CALIBRATION** - All analytical balances are calibrated yearly by an A2LA accredited calibration laboratory and are traceable to a class E 2 analytical weight set with NIST Traceability. All balances are checked daily using an in-house procedure. The weights used for testing are annually compared to master weights and are traceable to the National Institute of Standards and Technology (NIST).

4.3 **THERMOMETER CALIBRATION** - All thermometers are NIST traceable through thermometers that are calibrated by an A2LA accredited calibration laboratory.

4.4 **GLASSWARE CALIBRATION** - An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM's.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP/MS AND ICP-OES IN µg/mL

Standard solutions are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag	< 0.0020060	O	Cu	0.0002480	M	La	< 0.0005010	M	Pr	< 0.0003010	M	Ta	< 0.0070200
O	Al	< 0.0010000	M	Dy	< 0.0060170	M	Li	< 0.0100290	M	Pt	< 0.0020060	M	Tb	< 0.0003010
M	As	< 0.0100290	M	Er	< 0.0050150	M	Lu	< 0.0004010	M	Rb	< 0.0010030	M	Te	< 0.0300870
M	Au	< 0.0030090	M	Eu	< 0.0030090	O	Mg	0.0000200	M	Re	< 0.0010030	M	Th	< 0.0010030
M	B	< 0.0702030	O	Fe	0.0000990	M	Mn	< 0.0040120	M	Rh	< 0.0010030	O	Ti	< 0.0010000
M	Ba	< 0.0100290	M	Ga	< 0.0010030	M	Mo	< 0.0020060	M	Ru	< 0.0020060	M	Tl	< 0.0010030
M	Be	< 0.0005010	M	Gd	< 0.0010030	O	Na	< 0.0900000	O	S	< 0.0250000	M	Tm	< 0.0004010
M	Bi	< 0.0004010	M	Ge	< 0.0060170	M	Nb	< 0.0005010	M	Sb	< 0.0005010	M	U	< 0.0020060
O	Ca	0.0026840	O	Hf	0.0004970	M	Nd	< 0.0020060	s	Sc		M	V	< 0.0020060
M	Cd	< 0.0030090	O	Hg	< 0.0100000	O	Ni	< 0.0009000	M	Se	< 0.0080230	O	W	< 0.0040000
M	Ce	< 0.0050150	M	Ho	< 0.0005010	n	Os		O	Si	0.0014910	O	Y	< 0.0010000
M	Co	< 0.0030090	M	In	< 0.0100290	n	P		M	Sm	< 0.0010030	M	Yb	< 0.0010030
O	Cr	< 0.0008000	M	Ir	< 0.0050150	M	Pb	< 0.0030090	M	Sn	< 0.0050150	O	Zn	0.0002780
M	Cs	< 0.0003010	O	K	< 0.1000000	M	Pd	< 0.0050150	M	Sr	< 0.0005010	O	Zr	0.0009940

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

For the calibration of analytical instruments including but not limited to the following:
HPLC, IC, TLC, ISE, IR, NMR, UV/VIS, MS, Capillary Electrophoresis, Potentiometry, Wet Chemistry and Voltammetry
For the validation of analytical methods
For the preparation of "working reference samples"
For interference studies and the determination of correction coefficients
For detection limit and linearity studies
For additional intended uses, contact Technical Staff

This CRM was manufactured using 18 megohm doubly deionized water that has been filtered through a 0.2 micron filter.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

Storage & Handling - Keep tightly sealed when not in use. Store and use at 20 ± 4°C. Do not pipet from container. Do not return portions removed for pipetting to container.
Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 44.95591; +3; 6; Sc(H2O)6+2
Chemical Compatibility - Soluble in HCl, H2SO4 and HNO3. Avoid HF, H3PO4 and neutral to basic media. Stable with most metals and inorganic anions forming an insoluble carbonate, oxide, oxalate, and fluoride. Avoid mixing with elements / solutions containing moderate amounts of fluoride. The fluoride is soluble in excess HF forming ScF63- (not recommended for standard preparations).
Stability - 2-100 ppb levels stable for months in 1% HNO3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 5-10% HNO3 / LDPE container. Small atomic radius increases hydrolysis requiring higher acid levels than other Rare Earths.
Sc Containing Samples (Preparation and Solution) - Metal (Soluble in acids); Oxide (Dissolve by heating in H2O / HNO3); Ores (Carbonate fusion in Pt0 followed by HCl dissolution); Organic Matrices (Dry ash and dissolve in 1:1 H2O / HCl or HNO3), (Aqua Regia or nitric / perchloric / sulfuric acid digestions can be used. **Exercise caution when using perchloric acid.)**
Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	Estimated D.L.	Order	Type	Interferences (underlined indicates severe)
ICP-OES 335.373 nm	0.004 / 0.00002 µg/mL	1	ion	
ICP-OES 337.215 nm	0.004 / 0.00002 µg/mL	1	ion	Ti, U, Ni, Rh
ICP-OES 424.683 nm	0.003 / 0.00002 µg/mL	1	ion	Ce
ICP-MS 45 amu	2.3 ppt	n/a	M+	16O212CH, 29Si16O, 90Zr+2

Uranium Note: If uranium is present in this standard, it is natural abundance unless specified in Section 3.0.

8.0 HAZARDOUS INFORMATION - Please refer to the enclosed Material Safety Data sheet for information regarding this CRM.

9.0 HOMOGENEITY - This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration
- QMI Certificate Number 010105

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration"
- Chemical Testing - Accredited A2LA Certificate Number 883.01

10.3 ISO/IEC Guide 34 "General Requirements for the Competence of Reference Material Producers"
- Reference Materials Production - Accredited A2LA Certificate Number 883.02

10.4 10CFR50 Appendix B - Nuclear Regulatory Commission
- Domestic Licensing of Production and Utilization Facilities

10.5 10CFR21 - Nuclear Regulatory Commission
- Reporting Defects and Non-Compliance

11.0 DATE OF CERTIFICATION AND PERIOD OF VALIDITY

11.1 Shelf Life - The period of time during which the concentration of the analyte(s) in a properly packaged, unopened, and unused standard stored under environmentally controlled and monitored conditions will remain within the specified uncertainty range. Shelf life is limited primarily by transpiration (loss of water from the solution) and infrequently, by chemical instability.

11.2 Expiration Date - The date after which a CRM should not be used. Routine laboratory use of a CRM increases transpiration losses and the chance of contamination which affect the integrity of the CRM and limit its useful life. Manufacturer concurs with state and federal regulatory agencies' recommendations that solution standards be assigned a one-year expiration date.

11.3 Chemical Stability - Studies have been conducted on this or similar CRMs and it has been demonstrated that this CRM is chemically stable for a period of not less than two years provided the "Storage & Handling" conditions are followed that are described in section 7.0.

Certification Date: **January 31, 2012**

Expiration Date: EXPIRES 01-2013

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By:	Danny Feeny, Product Documentation Technician	Danny R Feeny
Certificate Approved By:	Brian Alexander, PhD., Quality Control Supervisor	Brian Alexander
Certifying Officer:	Paul Gaines, PhD., Senior Technical Director	Paul R Gaines

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #24683, ICPMS Internal Standard Stock - Rec

STOCK STANDARD

Created By: DS1
Created: 02/15/2012 14:08
Expires: 03/01/2013

Volume of Standard: 125 mL
Manufacturer: Inorganic Ventures
Manufacturer Lot ID: F2-MEB410076

Lot ID: 401844
Part ID: PACEWI-CAL-4A-REV1
Standard ID: ICPM-istdSTK

Notes: ICPMS Internal Standard Stock - Rec 03/09/11, Open

Certificates of Analysis

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Compound Name and Concentration for Standard #24683

Compound Name	Concentration	Compound Name	Concentration
Bismuth	100 ug/mL	Terbium	100 ug/mL
Germanium	100 ug/mL	Yttrium	100 ug/mL
Indium	100 ug/mL		

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 • USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

tel: 800.669.6799 • 540.585.3030
fax: 540.585.3012
info@inorganicventures.com

1.0 **INORGANIC VENTURES** is an ISO Guide 34 "General Requirements for the Competence of Reference Material Producers" and ISO 9001 registered manufacturer. Our manufacturing laboratory is accredited to ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories."

ACCREDITED Testing Laboratory Certificate 881-01

ACCREDITED Reference Material Producer Certificate 883-02

2.0 **DESCRIPTION OF CRM** Custom Solution

401844
REC. 02/16/12 BY DS
EXP. --/--/-- BY -

Catalog No.: PACEWI-CAL-4A-REV1

Lot Number: **F2-MEB410076**

Matrix: tr. HF, 7% HNO3(v/v)

100 µg/mL ea:
Bi, Ge, In, Tb, Y

3.0 **CERTIFIED VALUES AND UNCERTAINTIES**

ELEMENT	CERTIFIED VALUE	ELEMENT	CERTIFIED VALUE	ELEMENT	CERTIFIED VALUE
Bismuth, Bi	100.0 ± 0.6 µg/mL	Germanium, Ge	100.0 ± 0.7 µg/mL	Indium, In	100.0 ± 0.6 µg/mL
Terbium, Tb	100.0 ± 0.8 µg/mL	Yttrium, Y	100.0 ± 0.5 µg/mL		

Certified Density: 1.036 g/mL (measured at 20 ± 1° C)

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Certified Value $(\bar{x}) = \frac{\sum x_i}{n}$

Uncertainty $(\pm) = \frac{2\,[(\sum s_i)^2]^{1/2}}{(n)^{1/2}}$

$(\bar{x})$ = mean
x_i = individual results
n = number of measurements
$\sum s_i$ = The summation of all significant estimated errors (Most common are the errors from instrumental measurement, weighing, dilution to volume and the fixed error reported on the NIST SRM certificate of analysis)

4.0 **TRACEBILITY TO NIST AND VALUES OBTAINED BY INDEPENDENT METHODS**

· "Property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties." (ISO VIM, 2nd ed., 1993, definition 6.10)
· This product is Traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRMs are available, the term 'in-house std.' is specified.

4.1 ASSAY INFORMATION

ELEMENT	METHOD	NIST SRM#	SRM LOT#	ELEMENT	METHOD	NIST SRM#	SRM LOT#
Bi	Calculated		See Sec. 4.2	Bi	ICP Assay	3106	991212
Ge	Calculated		See Sec. 4.2	Ge	ICP Assay	3120a	080429
In	ICP Assay	3124a	991219	In	EDTA	928	928
Tb	ICP Assay	3157a	891603	Tb	EDTA	928	928
Y	ICP Assay	3167a	790412	Y	EDTA	928	928

4.2 **BALANCE CALIBRATION** - All analytical balances are calibrated yearly by an A2LA accredited calibration laboratory and are traceable to a class E 2 analytical weight set with NIST Traceability. All balances are checked daily using an in-house procedure. The weights used for testing are annually compared to master weights and are traceable to the National Institute of Standards and Technology (NIST).

4.3 **THERMOMETER CALIBRATION** - All thermometers are NIST traceable through thermometers that are calibrated by an A2LA accredited calibration laboratory.

4.4 **GLASSWARE CALIBRATION** - An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM's.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES IN µg/mL - N/A

6.0 INTENDED USE

For the calibration of analytical instruments including but not limited to the following:
HPLC, IC, TLC, ISE, IR, NMR, UV/VIS, MS, Capillary Electrophoresis, Potentiometry, Wet Chemistry and Voltammetry
For the validation of analytical methods
For the preparation of "working reference samples"
For interference studies and the determination of correction coefficients
For detection limit and linearity studies
For additional intended uses, contact Technical Staff

This CRM was manufactured using 18 megohm doubly deionized water that has been filtered through a 0.2 micron filter.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

Storage & Handling - Keep **Tightly** sealed when not in use. Store and use at 20 ± 4°C. **Do Not** pipette from the container. **Do Not** return portions removed from pipetting to container.

Element Specific Information - For specific information regarding any element: Contact technical staff.

Uranium Note: If uranium is present in this standard, it is natural abundance unless specified in Section 3.0.

HF Note: This standard should not be prepared or stored in glass.

8.0 HAZARDOUS INFORMATION - Please refer to the enclosed Material Safety Data sheet for information regarding this CRM.

9.0 HOMOGENEITY - This solution was mixed according to in-house procedure IV-MPM-004 and is guaranteed to be homogeneous.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 **ISO 9001 Quality Management System Registration**
- QMI Certificate Number 010105

10.2 **ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration"**
- Chemical Testing - Accredited A2LA Certificate Number 883.01

10.3 **ISO/IEC Guide 34 "General Requirements for the Competence of Reference Material Producers"**
- Reference Materials Production - Accredited A2LA Certificate Number 883.02

10.4 **10CFR50 Appendix B - Nuclear Regulatory Commission**
- Domestic Licensing of Production and Utilization Facilities

10.5 **10CFR21 - Nuclear Regulatory Commission**
- Reporting Defects and Non-Compliance

11.0 DATE OF CERTIFICATION AND PERIOD OF VALIDITY

11.1 Shelf Life - The period of time during which the concentration of the analyte(s) in a properly packaged, unopened, and unused standard stored under environmentally controlled and monitored conditions will remain within the specified uncertainty range. Shelf life is limited primarily by transpiration (loss of water from the solution) and infrequently, by chemical instability. Transpiration studies of chemically-stable solutions performed at the manufacturer's facility show a CRM shelf-life of twenty one months for solutions packaged in 125-mL low density polyethylene bottles. When stored under special conditions that minimize transpiration and instability, the shelf life can be extended past this limit.

11.2 Expiration Date - The date after which a CRM should not be used. Routine laboratory use of a CRM increases transpiration losses and the chance of contamination which affect the integrity of the CRM and limit its useful life. Manufacturer concurs with state and federal regulatory agencies' recommendations that solution standards be assigned a one-year expiration date.

11.3 Chemical Stability - Studies have been conducted on this or similar CRMs and it has been demonstrated that this CRM is chemically stable for a period of not less than two years provided the "Storage & Handling" conditions are followed that are described in section 7.0.

Certification Date: February 08, 2012

Expiration Date: EXPIRES 01 MAR-2013

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By: Christy Shortridge, Product Documentation — Christy Shortridge

Certificate Approved By: Brian Alexander, PhD., Quality Control Supervisor — Brian Alexander

Certifying Officer: Paul Gaines, PhD., Senior Technical Director — Paul R Gaines

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #24684, ICPMS Internal Standard Stock - Rec

STOCK STANDARD

Created By: DS1
Created: 02/15/2012 14:10
Expires: 03/01/2013

Volume of Standard: 125 mL
Manufacturer: Inorganic Ventures
Manufacturer Lot ID: F2-MEB410076

Lot ID: 401844
Part ID: PACEWI-CAL-4A-REV1
Standard ID: ICPM-istdSTK

Notes: ICPMS Internal Standard Stock - Rec 03/09/11, Open

Certificates of Analysis

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Compound Name and Concentration for Standard #24684

Compound Name	Concentration	Compound Name	Concentration
Bismuth	100 ug/mL	Terbium	100 ug/mL
Germanium	100 ug/mL	Yttrium	100 ug/mL
Indium	100 ug/mL		

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CERTIFICATE OF ANALYSIS

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ACCREDITED Testing Laboratory Certificate 883.01 — ACCREDITED Reference Material Producer Certificate 883.02

2.0 **DESCRIPTION OF CRM** Custom Solution

401044
REC.02/15/12 BY DS
Exp. --/--/-- By -

Catalog No.: PACEWI-CAL-4A-REV1

Lot Number: **F2-MEB410076**

Matrix: tr. HF, 7% HNO3(v/v)

100 µg/mL ea:
Bi, Ge, In, Tb, Y

3.0 **CERTIFIED VALUES AND UNCERTAINTIES**

ELEMENT	CERTIFIED VALUE	ELEMENT	CERTIFIED VALUE	ELEMENT	CERTIFIED VALUE
Bismuth, Bi	100.0 ± 0.6 µg/mL	Germanium, Ge	100.0 ± 0.7 µg/mL	Indium, In	100.0 ± 0.6 µg/mL
Terbium, Tb	100.0 ± 0.8 µg/mL	Yttrium, Y	100.0 ± 0.5 µg/mL		

Certified Density: 1.036 g/mL (measured at 20 ± 1° C)

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Certified Value $(\bar{x}) = \frac{\sum x_i}{n}$

Uncertainty $(\pm) = \frac{2\,[(\sum s_i)^2]^{1/2}}{(n)^{1/2}}$

$(\bar{x})$ = mean
x_i = individual results
n = number of measurements
$\sum s_i$ = The summation of all significant estimated errors (Most common are the errors from instrumental measurement, weighing, dilution to volume and the fixed error reported on the NIST SRM certificate of analysis)

4.0 **TRACEBILITY TO NIST AND VALUES OBTAINED BY INDEPENDENT METHODS**

- "Property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties." (ISO VIM, 2nd ed., 1993, definition 6.10)
- This product is Traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRMs are available, the term 'in-house std.' is specified.

4.1 ASSAY INFORMATION

ELEMENT	METHOD	NIST SRM#	SRM LOT#	ELEMENT	METHOD	NIST SRM#	SRM LOT#
Bi	Calculated		See Sec. 4.2	Bi	ICP Assay	3106	991212
Ge	Calculated		See Sec. 4.2	Ge	ICP Assay	3120a	080429
In	ICP Assay	3124a	991219	In	EDTA	928	928
Tb	ICP Assay	3157a	891603	Tb	EDTA	928	928
Y	ICP Assay	3167a	790412	Y	EDTA	928	928

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4.4 **GLASSWARE CALIBRATION** - An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM's.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES IN µg/mL - N/A

6.0 INTENDED USE

For the calibration of analytical instruments including but not limited to the following:
HPLC, IC, TLC, ISE, IR, NMR, UV/VIS, MS, Capillary Electrophoresis, Potentiometry, Wet Chemistry and Voltammetry
For the validation of analytical methods
For the preparation of "working reference samples"
For interference studies and the determination of correction coefficients
For detection limit and linearity studies
For additional intended uses, contact Technical Staff

This CRM was manufactured using 18 megohm doubly deionized water that has been filtered through a 0.2 micron filter.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

Storage & Handling - **Keep Tightly** sealed when not in use. Store and use at 20 ± 4°C. **Do Not** pipette from the container. **Do Not** return portions removed from pipetting to container.

Element Specific Information - For specific information regarding any element: Contact technical staff.

Uranium Note: If uranium is present in this standard, it is natural abundance unless specified in Section 3.0.

HF Note: This standard should not be prepared or stored in glass.

8.0 HAZARDOUS INFORMATION - Please refer to the enclosed Material Safety Data sheet for information regarding this CRM.

9.0 HOMOGENEITY - This solution was mixed according to in-house procedure IV-MPM-004 and is guaranteed to be homogeneous.

10.0 QUALITY STANDARD DOCUMENTATION

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- QMI Certificate Number 010105

10.2 **ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration"**
- Chemical Testing - Accredited A2LA Certificate Number 883.01

10.3 **ISO/IEC Guide 34 "General Requirements for the Competence of Reference Material Producers"**
- Reference Materials Production - Accredited A2LA Certificate Number 883.02

10.4 **10CFR50 Appendix B - Nuclear Regulatory Commission**
- Domestic Licensing of Production and Utilization Facilities

10.5 **10CFR21 - Nuclear Regulatory Commission**
- Reporting Defects and Non-Compliance

11.0 DATE OF CERTIFICATION AND PERIOD OF VALIDITY

11.1 Shelf Life - The period of time during which the concentration of the analyte(s) in a properly packaged, unopened, and unused standard stored under environmentally controlled and monitored conditions will remain within the specified uncertainty range. Shelf life is limited primarily by transpiration (loss of water from the solution) and infrequently, by chemical instability. Transpiration studies of chemically-stable solutions performed at the manufacturer's facility show a CRM shelf-life of twenty one months for solutions packaged in 125-mL low density polyethylene bottles. When stored under special conditions that minimize transpiration and instability, the shelf life can be extended past this limit.

11.2 Expiration Date - The date after which a CRM should not be used. Routine laboratory use of a CRM increases transpiration losses and the chance of contamination which affect the integrity of the CRM and limit its useful life. Manufacturer concurs with state and federal regulatory agencies' recommendations that solution standards be assigned a one-year expiration date.

11.3 Chemical Stability - Studies have been conducted on this or similar CRMs and it has been demonstrated that this CRM is chemically stable for a period of not less than two years provided the "Storage & Handling" conditions are followed that are described in section 7.0.

Certification Date: February 08, 2012

Expiration Date: EXPIRES 01 MAR-2013

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By: Christy Shortridge, Product Documentation

Christy Shortridge

Certificate Approved By: Brian Alexander, PhD., Quality Control Supervisor

Brian Alexander

Certifying Officer: Paul Gaines, PhD., Senior Technical Director

Paul R Gaines

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #24685, ICSA, ICSAB Stock Standard - Rec

STOCK STANDARD

Created By: DS1
Created: 02/15/2012 14:13
Expires: 08/08/2013

Volume of Standard: 250 mL
Manufacturer: CPI
Manufacturer Lot ID: 11J098

Lot ID: 401845
Part ID: 4400-061025MB01
Standard ID: ICS-STK

Notes: ICSA, ICSAB Stock Standard - Rec 08/04/11, Open 08/8/11,DS1

Certificates of Analysis

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Compound Name and Concentration for Standard #24685

Compound Name	Concentration	Compound Name	Concentration
Sodium	500 ug/mL	Molybdenum	10 ug/mL
Magnesium	500 ug/mL	Titanium	10 ug/mL
Aluminum	500 ug/mL	Phosphorus	500 ug/mL
Potassium	500 ug/mL	Sulfur	500 ug/mL
Calcium	500 ug/mL	Chloride	3600 ug/mL
Iron	500 ug/mL	Carbon	1000 ug/mL

USA
5580 Skylane Boulevard
Santa Rosa, CA 95403
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P: 800.878.7654
F: 707.545.7901

CPI INTERNATIONAL
Advanced Analytical, Semiconductor and Life Science Solutions

www.cpiinternational.com
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Europe
P.O. Box 2704
1000 CS Amsterdam
The Netherlands
P: +31 20 638 05 97
F: +31 20 420 28 36

Expiry: 8/8/2013

Certificate of Analysis

Part Number: 4400-061025MB01
Lot Number: 11J098
Shelf Life: 18 months

401846
REC.02/16/12 BY DS
Exp. __/__/__ By _

Pace
Custom Standard
2% HNO3 + tr HF

Concentrations in ug/mL ± 0.5%

Al	500
C	1000
Ca	500
Cl	3600
Fe	500
K	500
Mg	500
Mo	10
Na	500
P	500
S	500
Ti	10

This standard solution was prepared using high-purity starting materials, high-purity acid (if required) and 18-megaohm de-ionized water. The starting materials were weighed to five significant figures and diluted in volumetric glassware calibrated to five significant figures.

Starting materials were analyzed at 1000µg/mL by ICP-MS for trace impurities. The standard solution concentrations were certified instrumentally against the National Institute of Standards and Technology's SRM 3100 series, NIST approved second source and/or gravimetrically.

Accuracy and stability are guaranteed to within plus or minus 0.5% of the certified value for the stated shelf life from the date of shipment. The solution should be kept tightly capped and stored under normal laboratory conditions. See attached MSDS for proper handling information.

For questions or comments please call 1-800-878-7654 in the USA, +31 20 638 05 97 in Europe or visit our web-site at www.cpiinternational.com.

ISO 9001:2008 ACLASS ISO 17025

colitag™ PEAK PERFORMANCE™ CERTIFIED REFERENCE MATERIALS MOD BLOCK Accu•prep 7000™ Extraction Manifold Nu•Phase™ SPE Disks

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #26596, Lithium Stock Standard Rec'd 3/16/12

STOCK STANDARD

Created By: LMS
Created: 03/16/2012 15:08
Expires: 03/01/2013

Volume of Standard: 500 mL
Manufacturer: Inorganic Ventures
Manufacturer Lot ID: E2-LI02134

Lot ID: 401885
Part ID: CGLI10-5
Standard ID: Li-STK

Notes: Lithium Stock Standard Rec'd 3/16/12

Certificates of Analysis

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Compound Name and Concentration for Standard #26596

Compound Name	Concentration	Compound Name	Concentration
Lithium	10000 ug/mL		

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 • USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

tel: 800.669.6799 • 540.585.3030
fax: 540.585.3012
info@inorganicventures.com

1.0 **INORGANIC VENTURES** is an ISO Guide 34 "General Requirements for the Competence of Reference Material Producers" and ISO 9001 registered manufacturer. Our manufacturing laboratory is accredited to ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories."

ACCREDITED Testing Laboratory Certificate 663.01

ACCREDITED Reference Material Producer Certificate 663.02

401005
REC. 03/16/12 BY LH:
Exp. __/__/__ By _

2.0 **DESCRIPTION OF CRM** **10000 µg/mL Lithium in 2% (v/v) HNO3**

Catalog Number:	CGLI10-1, CGLI10-2, and CGLI10-5
Lot Number:	**E2-LI02134**
Starting Material:	Li2CO3
Starting Material Purity (%):	99.9989
Starting Material Lot No:	1312
Matrix:	2% (v/v) HNO3

3.0 **CERTIFIED VALUES AND UNCERTAINTIES**

Certified Concentration: 10,021 ± 53 µg/mL - weighted mean

Certified Density: 1.066 g/mL (measured at 20 ± 1°C)

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Certified Value $(\bar{x}) = \frac{\sum x_i}{n}$

Uncertainty (±) $= \frac{2\,[(\Sigma s_i)^2]^{1/2}}{(n)^{1/2}}$

$(\bar{x})$ = mean
x_i = individual results
n = number of measurements
Σs_i = The summation of all significant estimated errors (Most common are the errors from instrumental measurement, weighing, dilution to volume and the fixed error reported on the NIST SRM certificate of analysis)

4.0 **TRACEABILITY TO NIST AND VALUES OBTAINED BY INDEPENDENT METHODS**

· "Property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties." (ISO VIM, 2nd ed., 1993, definition 6.10)

· This product is Traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRMs are available, the term 'in-house std.' is specified.

4.1 **Assay Method #1** **10,019 ± 34 µg/mL**
ICP Assay NIST SRM 3129a Lot Number: 000505

Assay Method #2 **10,042 ± 11 µg/mL**
Gravimetric NIST SRM Lot Number: See Sec. 4.2

4.2 **BALANCE CALIBRATION** - All analytical balances are calibrated yearly by an A2LA accredited calibration laboratory and are traceable to a class E 2 analytical weight set with NIST Traceability. All balances are checked daily using an in-house procedure. The weights used for testing are annually compared to master weights and are traceable to the National Institute of Standards and Technology (NIST).

4.3 **THERMOMETER CALIBRATION** - All thermometers are NIST traceable through thermometers that are calibrated by an A2LA accredited calibration laboratory.

4.4 **GLASSWARE CALIBRATION** - An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM's.

401995
REC. 03/16/12 BY LM
Exp. __/__/__ By _
Open __/__/__ By

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP/MS AND ICP-OES IN µg/mL

CRM's solutions are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

O	Al	0.001366	M	Dy	< 0.012721	s	Li		M	Pr	< 0.000636	M	Te	< 0.063607
M	Sb	< 0.001060	M	Er	< 0.010601	M	Lu	< 0.000848	M	Re	< 0.002120	M	Tb	< 0.000636
M	As	< 0.021202	M	Eu	< 0.006361	O	Mg	0.047317	M	Rh	< 0.002120	M	Tl	< 0.002120
M	Ba	< 0.021202	M	Gd	< 0.002120	O	Mn	0.000146	M	Rb	0.027925	M	Th	< 0.002120
O	Be	< 0.000200	M	Ga	< 0.002120	O	Hg	< 0.015000	M	Ru	< 0.004240	M	Tm	< 0.000848
M	Bi	< 0.000848	M	Ge	< 0.012721	M	Mo	< 0.004240	M	Sm	< 0.002120	O	Sn	< 0.006000
O	B	< 0.000600	M	Au	< 0.006361	M	Nd	< 0.004240	M	Sc	< 0.021202	O	Ti	< 0.000700
M	Cd	< 0.006361	M	Hf	< 0.004240	O	Ni	< 0.002300	M	Se	< 0.016962	O	W	< 0.004000
O	Ca	0.204878	M	Ho	< 0.001060	M	Nb	< 0.001060	O	Si	0.204878	M	U	< 0.004240
M	Ce	< 0.010601	O	In	< 0.004000	n	Os		M	Ag	< 0.004240	O	V	< 0.000900
M	Cs	< 0.000636	M	Ir	< 0.010601	M	Pd	< 0.010601	O	Na	0.034146	M	Yb	< 0.002120
M	Cr	< 0.010601	O	Fe	0.010732	O	P	< 0.002500	O	Sr	0.001268	M	Y	< 0.084810
M	Co	< 0.006361	M	La	< 0.001060	M	Pt	< 0.004240	O	S	0.087805	O	Zn	0.011902
O	Cu	< 0.001400	M	Pb	< 0.006361	O	K	0.024390	M	Ta	< 0.014842	M	Zr	< 0.010601

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

For the calibration of analytical instruments including but not limited to the following:
HPLC, IC, TLC, ISE, IR, NMR, UV/VIS, MS, Capillary Eletrophoresis, Potentiometry, Wet Chemistry and Voltammetry
For the validation of analytical methods
For the preparation of "working reference samples"
For interference studies and the determination of correction coefficients
For detection limit and linearity studies
For additional intended uses, contact Technical Staff

This CRM was manufactured using 18 megohm doubly deionized water that has been filtered through a 0.2 micron filter.

401065

REC. 03/16/12 BY LM
EXP: --/--/-- BY --
ANAL --/--/-- BY --

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

Storage & Handling - Keep tightly sealed when not in use. Store and use at 20 ± 4°C. Do not pipet from container. Do not return portions removed for pipetting to container.

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 6.941; +1; (6); Li+(aq) large effective radius due to hydration sphere (Coordination Number in parentheses is assumed, not certain.)

Chemical Compatibility - Soluble in HCl, HNO3, H2SO4 and HF aqueous matrices. Stable with all metals and inorganic anions.

Stability - 2-100 ppb levels stable for months in 1% HNO3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1-5% HNO3 / LDPE container.

Li Containing Samples (Preparation and Solution) - Metal (Dissolves very rapidly in water); Ores (Sodium carbonate fusion in Pt0 followed by HCl dissolution-blank levels of Li in sodium carbonate critical); Organic Matrices (Sulfuric / peroxide digestion or nitric / sulfuric / perchloric acid decomposition).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	Estimated D.L.	Order	Type	Interferences (underlined indicates severe)
ICP-OES 670.784 nm	0.002 / 0.00002 µg/mL	1	atom	2nd order radiation from R.E.s on some optical designs
ICP-OES 460.286 nm	0.9 / 0.04 µg/mL	1	atom	Zr, Th
ICP-OES 323.261 nm	1.1 / 0.05 µg/mL	1	atom	Sb, Th, Ni
ICP-MS 7 amu	10 ppt	n/a	M+	

Uranium Note: If uranium is present in this standard, it is natural abundance unless specified in Section 3.0.

8.0 HAZARDOUS INFORMATION - Please refer to the enclosed Material Safety Data sheet for information regarding this CRM.

9.0 HOMOGENEITY - This solution was mixed according to an in house procedure and is guaranteed to be homogeneous.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration
- QMI Certificate Number 010105

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration"
- Chemical Testing - Accredited A2LA Certificate Number 883.01

10.3 ISO/IEC Guide 34 "General Requirements for the Competence of Reference Material Producers"
- Reference Materials Production - Accredited A2LA Certificate Number 883.02

10.4 10CFR50 Appendix B - Nuclear Regulatory Commission
- Domestic Licensing of Production and Utilization Facilities

10.5 10CFR21 - Nuclear Regulatory Commission
- Reporting Defects and Non-Compliance

11.0 DATE OF CERTIFICATION AND PERIOD OF VALIDITY

11.1 Shelf Life - The period of time during which the concentration of the analyte(s) in a properly packaged, unopened, and unused standard stored under environmentally controlled and monitored conditions will remain within the specified uncertainty range. Shelf life is limited primarily by transpiration (loss of water from the solution) and infrequently, by chemical instability.

11.2 Expiration Date - The date after which a CRM should not be used. Routine laboratory use of a CRM increases transpiration losses and the chance of contamination which affect the integrity of the CRM and limit its useful life. Manufacturer concurs with state and federal regulatory agencies' recommendations that solution standards be assigned a one-year expiration date.

11.3 Chemical Stability - Studies have been conducted on this or similar CRMs and it has been demonstrated that this CRM is chemically stable for a period of not less than two years provided the "Storage & Handling" conditions are followed that are described in section 7.0.

Certification Date: November 09, 2011

Expiration Date: EXPIRES 01 MAR 2013

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By:	Danny Feeny, Product Documentation Technician	Danny R Feeny
Certificate Approved By:	Brian Alexander, PhD., Quality Control Supervisor	Brian Alexander
Certifying Officer:	Paul Gaines, PhD., Senior Technical Director	Paul R Gaines

401695
REC. 03/16/12 BY LH
EXP. --/--/-- BY -

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #26665, Metals Trace Primary Standard - Rec'd

STOCK STANDARD

Created By: LMS
Created: 03/19/2012 11:15
Expires: 03/15/2013

Volume of Standard: 250 mL
Manufacturer: SPEX
Manufacturer Lot ID: 4-79YP

Lot ID: 401889
Part ID: XFSMN-26-250A
Standard ID: Metals STK1

Notes: Metals Trace Primary Standard - Rec'd 3/16/12

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4001c/401889_COA.pdf

Compound Name and Concentration for Standard #26665

Compound Name	Concentration	Compound Name	Concentration
Arsenic	100 ug/mL	Nickel	100 ug/mL
Barium	100 ug/mL	Phosphorus	100 ug/mL
Beryllium	100 ug/mL	Lead	100 ug/mL
Cadmium	100 ug/mL	Selenium	100 ug/mL
Cobalt	100 ug/mL	Strontium	100 ug/mL
Chromium	100 ug/mL	Thallium	100 ug/mL
Copper	100 ug/mL	Vanadium	100 ug/mL
Lithium	100 ug/mL	Zinc	100 ug/mL
Manganese	100 ug/mL		

SPEXertificate ®

Certificate of Reference Material

ACCREDITED

Reference Materials Producer
CERT #2495.01
Chemical Testing
CERT #2495.02

Catalog Number: **XFSMN-26-250A** **Lot No.:** 4-79YP
Description: Custom Assurance Standard
Matrix: 5% HNO3

401885
REC. 03/19/12 BY LM
Exp. __/__/__ By
Open __/__/__ By

This **ASSURANCE** ® Certified Reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for inorganic spectroscopic instrumentation such as ICPOES, DCP, AA, ICPMS, and XRF. It can be employed in USEPA, ASTM and other methods relevant to the certified properties listed below.

The CRM is prepared from high purity single element concentrates of individual elements using Class A laboratory ware to give precise concentrations and to comply with provisions of 10CFR part 21. Certificate must accompany shipment.

Instrumental Analysis by ICP Spectrometer:

Element	Labeled (mg/L)	Uncertainty (+/-mg/L)	Element	Labeled (mg/L)	Uncertainty (+/-mg/L)
As	100	0.5	Ni	100	0.5
Ba	100	0.5	P	100	0.5
Be	100	0.5	Pb	100	0.5
Cd	100	0.5	Se	100	0.5
Co	100	0.5	Sr	100	0.5
Cr	100	0.5	Tl	100	0.5
Cu	100	0.5	V	100	0.5
Li	100	0.5	Zn	100	0.5
Mn	100	0.5			

Spex Reference Multi: Lot #MULTI1LE

Following SRMs (as appropriate to the element analyzed) were used in establishing the above results:

El	SRM	El	SRM	El	SRM	El	SRM	El	SRM	El	SRM	El	SRM	El	SRM
Al	3101a*	Cc	3110*	Ga	3119a*	Li	3129a*	Pd	3138*	Sc	3148a*	Tb	3157a*	Yb	3166a*
Sb	3102a*	Cs	3111a*	Ge	3120a*	Lu	3130a*	P	3139a*	Se	3149*	Tl	3158*	Y	3167a*
As	3103a*	Cr	3112a*	Au	3121*	Mg	3131a*	Pt	3140*	Si	3150*	Th	3159*	Zn	3168a*
Ba	3104a*	Co	3113*	Hf	3122*	Mn	3132*	K	3141a*	Ag	3151*	Tm	3160a*	Zr	3169*
Be	3105a*	Cu	3114*	Ho	3123a*	Hg	3133*	Pr	3142a*	Na	3152a*	Sn	3161a*		
Bi	3106*	Dy	3115a*	In	3124a*	Mo	3134*	Re	3143*	Sr	3153a*	Ti	3162a*		
B	3107*	Er	3116a*	Fe	3126a*	Nd	3135a*	Rh	3144*	S	3154*	W	3163*		
Cd	3108*	Eu	3117a*	La	3127a*	Ni	3136*	Rb	3145a*	Ta	3155*	U	3164*		
Ca	3109a*	Gd	3118a*	Pb	3128*	Nb	3137*	Sm	3147a*	Te	3156*	V	3165*		

* - Indicates NIST SRM † - Indicates SPEX CertiPrep CRM (when NIST SRM is not available)

Balances are calibrated regularly with weight sets traceable to NIST#s 32856, 32867 and others. This CRM is guaranteed stable and accurate to +/- 0.5% on the average of all the labeled concentrations with no single element exceeding +/- 2%. This guarantee is valid for a period of one year from the date of certification only when the material is kept tightly capped and transported and stored under laboratory conditions.

Date of Certification: MAR 2012 Certifying Officer: Vanaja Sivakumar

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Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #26666, Metals Trace2 Primary Standard - Rec'd

Pace Analytical®
www.pacelabs.com

STOCK STANDARD

Created By: LMS
Created: 03/19/2012 11:20
Expires: 03/15/2013

Volume of Standard: 250 mL
Manufacturer: SPEX
Manufacturer Lot ID: 4-80YP

Lot ID: 401890
Part ID: XFSMN-27-250A
Standard ID: Metals STK2

Notes: Metals Trace2 Primary Standard - Rec'd 3/16/12

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4001c/401890_COA.pdf

Compound Name and Concentration for Standard #26666

Compound Name	Concentration	Compound Name	Concentration
Silicon	500 ug/mL	Tin	100 ug/mL
Boron	100 ug/mL	Zirconium	100 ug/mL
Molybdenum	100 ug/mL	Silver	50 ug/mL
Antimony	100 ug/mL	Titanium	100 ug/mL

SPEXertificate ®

Certificate of Reference Material

ACCREDITED

Reference Materials Producer
CERT #2495.01
Chemical Testing
CERT #2495.02

Catalog Number: XFSMN-27-250A **Lot No.: 4-80YP**
Description: Custom Assurance Standard
Matrix: 5% HNO3/Tr. Tart. Acid/Tr. HF

401090
REC.02/10/12 BY LM
Exp. --/--/-- By
Open / / By

This **ASSURANCE** ® Certified Reference Material, CRM, is intended primarily for use as a calibration standard or quality control standard for inorganic spectroscopic instrumentation such as ICPOES, DCP, AA, ICPMS, and XRF. It can be employed in USEPA, ASTM and other methods relevant to the certified properties listed below.

The CRM is prepared from high purity single element concentrates of individual elements using Class A laboratory ware to give precise concentrations and to comply with provisions of 10CFR part 21. Certificate must accompany shipment.

Instrumental Analysis by ICP Spectrometer:

Element	Labeled (mg/L)	Uncertainty (+/- mg/L)	Element	Labeled (mg/L)	Uncertainty (+/- mg/L)
Si	500	3	Sn	100	0.5
B	100	0.5	Ti	100	0.5
Mo	100	0.5	Zr	100	0.5
Sb	100	0.5	Ag	50	0.3

Spex Reference Multi: Lot #MULTI1LE

Following SRMs (as appropriate to the element analyzed) were used in establishing the above results:

El	SRM	El	SRM	El	SRM	El	SRM	El	SRM	El	SRM	El	SRM	El	SRM
Al	3101a*	Ce	3110*	Ga	3119a*	Li	3129a*	Pd	3138*	Sc	3148a*	Tb	3157a*	Yb	3166a*
Sb	3102a*	Cs	3111a*	Ge	3120a*	Lu	3130a*	P	3139a*	Se	3149*	Tl	3158*	Y	3167a*
As	3103a*	Cr	3112a*	Au	3121*	Mg	3131a*	Pt	3140*	Si	3150*	Th	3159*	Zn	3168a*
Ba	3104a*	Co	3113*	Hf	3122*	Mn	3132*	K	3141a*	Ag	3151*	Tm	3160a*	Zr	3169*
Be	3105a*	Cu	3114*	Ho	3123a*	Hg	3133*	Pr	3142a*	Na	3152a*	Sn	3161a*		
Bi	3106*	Dy	3115a*	In	3124a*	Mo	3134*	Re	3143*	Sr	3153a*	Ti	3162a*		
B	3107*	Er	3116a*	Fe	3126a*	Nd	3135a*	Rh	3144*	S	3154*	W	3163*		
Cd	3108*	Eu	3117a*	La	3127a*	Ni	3136*	Rb	3145a*	Ta	3155*	U	3164*		
Ca	3109a*	Gd	3118a*	Pb	3128*	Nb	3137*	Sm	3147a*	Te	3156*	V	3165*		

* - Indicates NIST SRM † - Indicates SPEX CertiPrep CRM (when NIST SRM is not available)

Balances are calibrated regularly with weight sets traceable to NIST#s 32856, 32867 and others. This CRM is guaranteed stable and accurate to +/- 0.5% on the average of all the labeled concentrations with no single element exceeding +/- 2%. This guarantee is valid for a period of one year from the date of certification only when the material is kept tightly capped and transported and stored under laboratory conditions.

Date of Certification: MAR 2012 Certifying Officer: Vanaja Sivakumar

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Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #26667, Metals Mineral Primary Standard, Rec

STOCK STANDARD

Created By: LMS
Created: 03/19/2012 11:22
Expires: 03/15/2013

Volume of Standard: 250 mL
Manufacturer: SPEX
Manufacturer Lot ID: 11-001CR

Lot ID: 401891
Part ID: XFSMN-28-250A
Standard ID: Metals STK3

Notes: Metals Mineral Primary Standard, Rec 03/16/12

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4001c/401891_COA.pdf

Compound Name and Concentration for Standard #26667

Compound Name	Concentration	Compound Name	Concentration
Aluminum	1000 ug/mL	Potassium	1000 ug/mL
Calcium	1000 ug/mL	Magnesium	1000 ug/mL
Iron	1000 ug/mL	Sodium	1000 ug/mL

ACCREDITED

Reference Materials Producer
CERT #2495.01
Chemical Testing
CERT #2495.02

SPEXertificate ®

Certificate of Reference Material

Catalog Number: **XFSMN-28-250A** **Lot No.: 11-001CR**
Description: Custom Assurance Standard
Matrix: 5% HNO3

401081
REC.03/12/12 BY LM
Exp. __/__/__ By _

This ASSURÅNCE ® Certified Reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for inorganic spectroscopic instrumentation such as ICPOES, DCP, AA, ICPMS, and XRF. It can be employed in USEPA, ASTM and other methods relevant to the certified properties listed below.

The CRM is prepared from high purity single element concentrates of individual elements using Class A laboratory ware to give precise concentrations and to comply with provisions of 10CFR part 21. Certificate must accompany shipment.

Instrumental Analysis by ICP Spectrometer:

Element	Labeled (mg/L)	Uncertainty (+/-mg/L)	Element	Labeled (mg/L)	Uncertainty (+/-mg/L)
Al	1000	5	K	1000	5
Ca	1000	5	Mg	1000	5
Fe	1000	5	Na	1000	5

SPEX CertiPrep Reference Multi: Lot #MULTI1LE

Following SRMs (as appropriate to the element analyzed) were used in establishing the above results:

El	SRM	El	SRM	El	SRM	El	SRM	El	SRM	El	SRM	El	SRM	El	SRM
Al	3101a*	Ce	3110*	Ga	3119a*	Li	3129a*	Pd	3138*	Sc	3148a*	Tb	3157a*	Yb	3166a*
Sb	3102a*	Cs	3111a*	Ge	3120a*	Lu	3130a*	P	3139a*	Se	3149*	Tl	3158*	Y	3167a*
As	3103a*	Cr	3112a*	Au	3121*	Mg	3131a*	Pt	3140*	Si	3150*	Th	3159*	Zn	3168a*
Ba	3104a*	Co	3113*	Hf	3122*	Mn	3132*	K	3141a*	Ag	3151*	Tm	3160a*	Zr	3169*
Be	3105a*	Cu	3114*	Ho	3123a*	Hg	3133*	Pr	3142a*	Na	3152a*	Sn	3161a*		
Bi	3106*	Dy	3115a*	In	3124a*	Mo	3134*	Re	3143*	Sr	3153a*	Ti	3162a*		
B	3107*	Er	3116a*	Fe	3126a*	Nd	3135a*	Rh	3144*	S	3154*	W	3163*		
Cd	3108*	Eu	3117a*	La	3127a*	Ni	3136*	Rb	3145a*	Ta	3155*	U	3164*		
Ca	3109a*	Gd	3118a*	Pb	3128*	Nb	3137*	Sm	3147a*	Te	3156*	V	3165*		

* - Indicates NIST SRM † - Indicates SPEX CertiPrep CRM (when NIST SRM is not available)

Balances are calibrated regularly with weight sets traceable to NIST#s 32856, 32867 and others. This CRM is guaranteed stable and accurate to +/- 0.5% on the average of all the labeled concentrations with no single element exceeding +/- 2%. This guarantee is valid for a period of one year from the date of certification only when the material is kept tightly capped and transported and stored under laboratory conditions.

Date of Certification: MAR 2012 Certifying Officer: Vanaja Sivakumar

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Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #29179, ICPMS X-Cal Stock Standard 1 - Rec'd

Pace Analytical®
www.pacelabs.com

STOCK STANDARD

Created By: DS1
Created: 04/27/2012 15:24
Expires: 04/24/2013

Volume of Standard: 125 mL
Manufacturer: High Purity
Manufacturer Lot ID: 1207515

Lot ID: 401965
Part ID: ICP-MS-68A
Standard ID: ICPM-XSTK1

Notes: ICPMS X-Cal Stock Standard 1 - Rec'd 4/27/12, Open 04/30/12

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4001c/401965_COA.pdf

Compound Name and Concentration for Standard #29179

Compound Name	Concentration	Compound Name	Concentration
Beryllium	10 mg/L	Selenium	10 mg/L
Boron	10 mg/L	Cadmium	10 mg/L
Sodium	10 mg/L	Barium	10 mg/L
Magnesium	10 mg/L	Thallium	10 mg/L
Aluminum	10 mg/L	Lead	10 mg/L
Potassium	10 mg/L	Bismuth	10 mg/L
Calcium	10 mg/L	Uranium	10 mg/L
Vanadium	10 mg/L	Cerium	10 mg/L
Chromium	10 mg/L	Cesium	10 mg/L
Iron	10 mg/L	Neodymium	10 mg/L
Manganese	10 mg/L	Lithium	10 mg/L
Lanthanum	10 mg/L	Strontium	10 mg/L
Cobalt	10 mg/L	Indium	10 mg/L
Nickel	10 mg/L	Rubidium	10 mg/L
Copper	10 mg/L	Scandium	10 mg/L
Zinc	10 mg/L	Yttrium	10 mg/L
Arsenic	10 mg/L		

HIGH-PURITY STANDARDS
www.highpuritystandards.com

P.O. Box 41727
Charleston, SC 29423
Phone (843) 767-7900
Fax (843) 767-7906

401965

Certificate of Analysis

401965
REC. 04/27/12 BY DS
EXP. __/__/__ BY _
Open __/__/__ By

H29179 ICPM-XSTK1 STOCK
24-APR-13
DESC: ICPMS X-Cal Stock Standard 1
LOT NUMBER: 401965
MANUFACTURER: High Purity
04/NOTES: ICPMS X-Cal Stock Standard 1 - Rec @ 4/27/12. Ope
CREATED: 27-APR-12 BY: DS1
EXPIRES: 24-APR-13 COMPOUND COUNT: 3

Product Description:

Part Number:	**ICP-MS-68A** Solution A
Lot Number:	**1207515**
Matrix:	2% HNO_3
Purity:	99.964% - 99.9999%

Certified Values:

Element	(mg/L)	SRM ID	SRM Lot#	Element	(mg/L)	SRM ID	SRM Lot#
Al	10.00 ± 0.05	3101a	60502	Lu	10.00 ± 0.05	3130a	100503
As	10.0 ± 0.1	3103a	100818	Mg	10.00 ± 0.05	3131a	050302
Ba	10.00 ± 0.06	3104a	70222	Mn	10.0 ± 0.1	3132	050429
Be	10.0 ± 0.1	3105a	90514	Nd	10.00 ± 0.06	3135a	992803
Bi	10.00 ± 0.05	3106	991212	Ni	10.00 ± 0.05	3136	000612
B	10.00 ± 0.05	3107	070514	P	10.00 ± 0.06	3139a	060717
Cd	10.00 ± 0.05	3108	060531	K	10.00 ± 0.05	3141a	051220
Ca	10.00 ± 0.05	3109a	050825	Pr	10.0 ± 0.1	3142a	990501
Ce	10.00 ± 0.05	3110	890602	Re	10.00 ± 0.06	3143	010816
Cs	10.00 ± 0.05	3111a	050614	Rb	10.0 ± 0.1	3145a	891203
Cr	10.00 ± 0.05	3122a	030730	Sm	10.00 ± 0.05	3147a	892911
Co	10.00 ± 0.05	3113	000630	Sc	10.00 ± 0.06	3148a	792111
Cu	10.00 ± 0.05	3114	011017	Se	10.0 ± 0.1	3149	100901
Dy	10.00 ± 0.05	3115a	990504	Na	10.00 ± 0.05	3152a	010728
Er	10.00 ± 0.05	3116a	000831	Sr	10.00 ± 0.05	3153a	990906
Eu	10.00 ± 0.05	3117a	991307	Tb	10.00 ± 0.05	3157a	891603
Gd	10.00 ± 0.05	3118a	992004	Tl	10.00 ± 0.05	3158	993012
Ga	10.00 ± 0.06	3119a	890709	Th	10.00 ± 0.06	*	
Ho	10.00 ± 0.05	3123a	790812	Tm	10.00 ± 0.06	3160a	790912
In	10.00 ± 0.05	3124a	991219	U	10.00 ± 0.05	3164	080521
Fe	10.00 ± 0.05	3126a	051031	V	10.00 ± 0.06	3165	992706
La	10.00 ± 0.05	3127a	890402	Yb	10.00 ± 0.05	3166a	790512
Pb	10.00 ± 0.06	3128	101026	Y	10.00 ± 0.05	3167a	790412
Li	10.00 ± 0.06	3129a	505	Zn	10.00 ± 0.05	3168a	080123

The Certified values are based on gravimetric and volumetric preparation, and verified against SRM 3100 series developed by National Institute of Standards and Technology (NIST) via inductively coupled plasma optical emission spectrometry (ICP-OES) using an internal laboratory developed method. The uncertainty in the certified value is calculated for a 95% confidence interval.

Preparation Information:

The highest purity source materials were purchased from qualified vendors per ISO 9001:2008 guidelines and assayed by ICP-OES for conformity prior to use. This standard was prepared using methods developed at NIST for the preparation of SRM Spectrometric Standard Solutions. Sub-boiling distilled high-purity acid has been used to place the materials in solution and to stabilize the standard. The matrix is as noted above in 18 megaohm deionized water.

Traceability Information:

The traceability of this standard is maintained through an unbroken chain of comparisons to appropriate standards with suitable procedure and measurement uncertainties.

a. **Analytical Balance Calibration**: All balances are calibrated weekly by an in-house method using NBS weights Inventory No 20231A. The balances are calibrated yearly and the calibration weights are checked biennially by a qualified metrology company with weights traceable to the primary standards developed by NIST.

b. **Volumetric Device Calibration**: The calibration of all volumetric vessels is checked using the NBS 602 method where all vessels are weighed to five significant figures.

c. **Calibration Standards**: The Calibration Standards are directly traceable to SRM 3100 Series Spectrometric Standard Solutions.

Packaging and Storage Conditions:

The standard is packaged in a pre-cleaned polyethylene bottle. To maintain the integrity of this product, the solution should be kept tightly capped and stored under normal laboratory conditions. The expiry date is guaranteed to be valid for twelve months from the shipping date provided. For this reason, standards from the same lot may have different expiration dates.

Expiration Information:

Preparation Date: March 15, 2012

Shipped Date: April 24, 2012

Expiration Date: April 24, 2013

Vanny T. Yib, Inorganic Laboratory Manager

Kim-Phuong Tran

Kim-Phuong Tran, Quality Manager

Theodore Rains, PhD, President

March 15, 2012

Certificate Issue Date

ISO/IEC 17025:2005 Accreditation
Certificate Number AT-1529

NOTICE: HPS products are intended for laboratory use only. All products should be handled and used by trained professional personnel. The responsibility for the safe handling and use of these products rests solely with the buyer and/or user. The data and information as stated was furnished by the manufacturer of the product. The information provided in this certificate pertains only to the lot number specified. None of the information provided in this certificate may be used, reproduced or transmitted in any form or by any means without written approval from High Purity Standards.

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #29180, ICPMS X-Cal Stock Standard 2 - Rec'd

STOCK STANDARD

Created By: DS1
Created: 04/27/2012 15:31
Expires: 04/24/2013

Volume of Standard: 125 mL
Manufacturer: High Purity
Manufacturer Lot ID: 1127913

Lot ID: 401966
Part ID: ICP-MS-68A-B
Standard ID: ICPM-XSTK2

Notes: ICPMS X-Cal Stock Standard 2 - Rec'd 4/27/12, Open 04/30/12

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4001c/401966_COA.pdf

Compound Name and Concentration for Standard #29180

Compound Name	Concentration	Compound Name	Concentration
Antimony	10 mg/L	Silver	10 mg/L
Germanium	10 mg/L	Tantalum	10 mg/L
Hafnium	10 mg/L	Tellurium	10 mg/L
Molybdenum	10 mg/L	Tin	10 mg/L
Niobium-94	10 mg/L	Titanium	10 mg/L
Silicon	10 mg/L	Zirconium	10 mg/L

HIGH-PURITY STANDARDS
www.highpuritystandards.com
P.O. Box 41727
Charleston, SC 29423
Phone: (843) 767-7900
Fax: (843) 767-7906

401966

Certificate of Analysis

401966
REC. 04/27/12 BY DS
Exp. __/__/__ By _

Product Description:

A29180 ICPM-XSTK2 STOCK
24-APR-13
DESC ICPMS X-cal Stock Standard 2
LOT NUMBER: 401966
MANUFACTURER: High Purity
04/00785 ICPMS X-cal Stock Standard 2 - Rec'd 4/27/12 Opq
CREATED: 27-APR-12 BY: DS1
EXPIRES: 24-APR-13 COMPOUND COUNT: 1

Part Number:	**ICP-MS-68A**
	Solution B
Lot Number:	**1127913**
Matrix:	2% HNO_3 + Tr HF
Purity:	99.3% - 99.9999%

Certified Values:

Element	(mg/L)	SRM ID	SRM Lot#	Element	(mg/L)	SRM ID	SRM Lot#
Sb	10.00 ± 0.06	3102a	061229	Ta	10.00 ± 0.06	3155	080502
Ge	10.00 ± 0.06	3120a	080429	Te	10.00 ± 0.06	3156	892901
Hf	10.00 ± 0.06	3122	080430	Sn	10.00 ± 0.06	3161a	070330
Mo	10.00 ± 0.06	3134	891307	Ti	10.00 ± 0.06	3162a	060808
Nb	10.0 ± 0.1	3137	080502	W	10.00 ± 0.06	3163	080331
Si	10.0 ± 0.1	3150	071204	Zr	10.00 ± 0.06	3169	071226
Ag	10.00 ± 0.05	3151	992212				

The Certified values are based on gravimetric and volumetric preparation, and verified against SRM 3100 series developed by National Institute of Standards and Technology (NIST) via inductively coupled plasma optical emission spectrometry (ICP-OES) using an internal laboratory developed method. The uncertainty in the certified value is calculated for a 95% confidence interval.

Preparation Information:

The highest purity source materials were purchased from qualified vendors per ISO 9001:2008 guidelines and assayed by ICP-OES for conformity prior to use. This standard was prepared using methods developed at NIST for the preparation of SRM Spectrometric Standard Solutions. Sub-boiling distilled high-purity acid has been used to place the materials in solution and to stabilize the standard. The matrix is as noted above in 18 megaohm deionized water.

Traceability Information:

The traceability of this standard is maintained through an unbroken chain of comparisons to appropriate standards with suitable procedure and measurement uncertainties.

a. **Analytical Balance Calibration:** All balances are calibrated weekly by an in-house method using NBS weights Inventory No 20231A. The balances are calibrated yearly and the calibration weights are checked

biennially by a qualified metrology company with weights traceable to the primary standards developed by NIST.

b. **Volumetric Device Calibration**: The calibration of all volumetric vessels is checked using the NBS 602 method where all vessels are weighed to five significant figures.

c. **Calibration Standards**: The Calibration Standards are directly traceable to SRM 3100 Series Spectrometric Standard Solutions.

Packaging and Storage Conditions:

The standard is packaged in a pre-cleaned polyethylene bottle. To maintain the integrity of this product, the solution should be kept tightly capped and stored under normal laboratory conditions. The expiry date is guaranteed to be valid for twelve months from the shipping date provided. For this reason, standards from the same lot may have different expiration dates.

Expiration Information:

Preparation Date: October 6, 2011

Shipped Date: April 24, 2012

Expiration Date: April 24, 2013

Vanny T. Yib, Inorganic Laboratory Manager

Kim-Phuong Tran

Kim-Phuong Tran, Quality Manager

Theodore Rains, PhD, President

October 7, 2011

Certificate Issue Date

ISO/IEC 17025:2005 Accreditation Certificate Number AT-1529

NOTICE: HPS products are intended for laboratory use only. All products should be handled and used by trained professional personnel. The responsibility for the safe handling and use of these products rests solely with the buyer and/or user. The data and information as stated was furnished by the manufacturer of the product. The information provided in this certificate pertains only to the lot number specified. None of the information provided in this certificate may be used, reproduced or transmitted in any form or by any means without written approval from High Purity Standards.

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #29588, Potassium Stock Standard - Rec

STOCK STANDARD

Created By: MMZ
Created: 01/21/2011 12:59
Expires: 02/28/2017

Volume of Standard: 125 mL
Manufacturer: ULTRA SCIENTIFIC
Manufacturer Lot ID: L00056

Lot ID: 401165
Part ID: ICP-119
Standard ID: K-STK

Notes: Potassium Stock Standard - Rec 01/21/11, Open 05/04/2012

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4001c/401165_COA.PDF

Compound Name and Concentration for Standard #29588

Compound Name	Concentration	Compound Name	Concentration
Potassium	10000 ug/mL		

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

401165

5662

ULTRAgrade™ Solution
Potassium ICP Standard
10000 µg/mL

Catalog Number: ICP-119
Lot Number: L00056
Job Number: J00010831
Lot Issue Date: 01/18/2010
Expiration Date: 02/28/2017

0111-4020-8

Starting Material:	Potassium Nitrate
Starting Material Purity:	99.999%
Starting Material Lot No.:	BH01316
Matrix:	2% nitric acid in low TOC water (< 50 ppb)
Atomic Weight K:	39.10

Certified Value: 10017 ± 20 µg/mL

This Certified Reference Material (CRM) was manufactured and verified in accordance with ULTRA's ISO 9001 registered quality system. The analyte concentrations were verified by our ISO 17025 accredited laboratory to be within ± 2.5%, when compared to calibration standards independently prepared using NIST SRM(s). The certified value and uncertainty value for each analyte is determined gravimetrically.

Classical Wet Assay Method: Theoretical, based on gravimetric measurements

Confirmation by Inductively Coupled Plasma Spectroscopy (ICP / ICP-MS) vs. NIST SRM 3141a

ULTRA uses purified acids, 18 megohm double deionized water, calibrated Class A glassware & meticulously cleaned bottles in the manufacturing of ULTRAgrade standards. Balances used in the manufacturing of this standard are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001.

Trace Metallic Impurities in Solution Standard in µg/mL:

*	Al	<0.005	ND	*	Ga	<0.005	ND	n	Nb			n	S		
*	Sb	<0.005	ND	n	Ge			n	Os			n	Ta		
*	As	<0.005	ND	n	Au			*	Pd	<0.005	ND	n	Te		
*	Ba	<0.005	ND	n	Hf			*	P	<0.005	ND	n	Tb		
*	Be	<0.005	ND	n	Ho			*	Pt	<0.005	ND	*	Tl	<0.005	ND
*	Bi	<0.005	ND	*	In	<0.005	ND	s	K			n	Th		
*	B	<0.005	ND	n	Ir			n	Pr			n	Tm		
*	Cd	<0.005	ND	*	Fe	<0.005	ND	n	Re			*	Sn	<0.005	ND
*	Ca	<0.005	ND	*	La	<0.005	ND	n	Rh			*	Ti	<0.005	ND
n	Ce			*	Pb	<0.005	ND	n	Rb			n	W		
n	Cs			*	Li	<0.005	ND	n	Ru			n	U		
*	Cr	<0.005	ND	n	Lu			n	Sm			*	V	<0.005	ND
*	Co	<0.005	ND	*	Mg	<0.010	D	n	Sc			n	Yb		
*	Cu	<0.005	ND	*	Mn	<0.010	D	*	Se	<0.005	ND	n	Y		
n	Dy			*	Hg	<0.005	ND	*	Si	<0.005	ND	*	Zn	<0.005	ND
*	Er	<0.005	ND	*	Mo	<0.005	ND	*	Ag	<0.005	ND	n	Zr		
*	Eu	<0.005	ND	n	Nd			*	Na	<0.050	D				
*	Gd	<0.005	ND	*	Ni	<0.005	ND	*	Sr	<0.005	ND				

* - element checked for
ND - not detected
i - spectral interference
D - detected
n - not checked for
s - solution standard element

Density of Solution (measured at 22.0°C ± 0.5°C): 1.039 g/mL

ACCREDITED

ISO 17025:2005 Accredited A2LA Cert. No. 0851-01

ISO 9001:2008 Registered TUV USA, Inc. Cert. No. 09-1009

250 Smith Street, North Kingstown, RI 02852 USA
401-294-9400 Fax: 295-2330
www.ultrasci.com

William J. Leary
Quality Assurance Manager

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #29998, Mercury ICV Int

WORKING STANDARD

Created By: DS1
Created: 05/10/2012 08:28
Expires: 11/10/2012

Volume of Standard: 100 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: Hg ICV Int

Notes: Mercury ICV Int

Compound Name and Concentration for Standard #29998

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Mercury	10000 ug/L
Nitric Acid	ug/L		

Composed of Information for Standard #29998

Composed of Standard Seq	Notes	Volume	Units
22391	Conc. Nitric Acid - Rec 06/10/11	3	mL
19251	Rec 11/15/11, Opened 11/17/11	1	mL
995	DI WATER	96	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #30948, Uranium Stock STandard - Rec'd

STOCK STANDARD

Created By: DS1 **Volume of Standard:** 125 mL **Lot ID:** 401997

Created: 05/25/2012 11:21 **Manufacturer:** Inorganic Ventures **Part ID:** AAU1-1

Expires: 06/01/2013 **Manufacturer Lot ID:** E2-U01094 **Standard ID:** U-STK

Notes: Uranium Stock STandard - Rec'd 5/25/12, Open 05/29/12, DMS

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4001c/401997_COA.pdf

Compound Name and Concentration for Standard #30948

Compound Name	Concentration	Compound Name	Concentration
Uranium	1000 ug/mL		

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 · USA
inorganicventures.com
tel: 800.669.6799 · 540.585.3030
fax: 540.585.3012
info@inorganicventures.com

CERTIFICATE OF ANALYSIS

ATOMIC ABSORPTION SOLUTION

1000 µg/mL Uranium

Catalog No: AAU1-1 and AAU1-5

401997

Lot Number: **E2-U01094**

401997

Matrix: 2% HNO_3 (v/v)

REC.05/25/12 BY DS:
Exp. --/--/-- By
Open / / Ru

Certified Value: **1,000 ± 10 µg/mL**

H30948 U-STK STOCK
01-JUN-13
DESC: Uranium Primary Standard
LOT NUMBER: 401997
MANUFACTURER: Inorganic Ventures
/12 NOTES: Uranium Stock Standard - Rec'd 5/25/12, Open 05/2
CREATED: 25-MAY-12 BY: DS1
EXPIRES: 01-JUN-13 COMPOUND COUNT: 2

The concentration of this solution standard has been verified by Inductively Coupled Plasma Spectroscopy (ICP) and is traceable to NIST SRM 3164.

The concentration of this standard was calculated based upon the manufacturing records and was manufactured by weight and volume using a certified aqueous concentrate traceable to NIST. The manufacturing accuracy is typically better than 0.5 % relative at the 95 % confidence level. This standard is certified for a period of 1 year from the date of shipment provided the bottle is kept tightly capped and stored under normal laboratory conditions (See expiration date below).

Observed Density of Solution: **1.010 g/mL**

GLASSWARE CALIBRATION

An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM's.

BALANCE CALIBRATION

All analytical balances are calibrated yearly by an A2LA accredited calibration laboratory and are traceable to a class E 2 analytical weight set with NIST Traceability No. All balances are checked daily using an in-house procedure. The weights used for testing are annually compared to master weights and are traceable to the National Institute of Standards and Technology (NIST).

THERMOMETER CALIBRATION

All thermometers are NIST traceable through thermometers that are calibrated by an A2LA accredited calibration laboratory.

Certification Date: December 28, 2011

Prepared By: Donna Senn

Expiration Date: EXPIRES 01 JUN 2013

Approved By: Brian Alexander

Certifying Officer: Paul R. Haines

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #30949, Silicon Primary Standard - Rec 05/25/12

Pace Analytical®
www.pacelabs.com

STOCK STANDARD

Created By: DS1 **Volume of Standard:** 100 mL **Lot ID:** 401998

Created: 05/25/2012 11:30 **Manufacturer:** Fluka Analytical **Part ID:** 08729

Expires: 07/01/2014 **Manufacturer Lot ID:** BCBC9940 **Standard ID:** Si-STK

Notes: Silicon Primary Standard - Rec 05/25/12

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4001c/401998_COA.pdf

Compound Name and Concentration for Standard #30949

Compound Name	Concentration	Compound Name	Concentration
Silicon	1000 mg/L		

401998

401998

REC.05/26/12 BY DS:
Exp. __/__/__ By _
Open __/__/__ By

H30949 Si-STK STOCK

01-JUL-14

DESC: Silicon Primary Standard
LOT NUMBER: 401998
MANUFACTURER: Fluka Analytical
NOTES: Silicon Primary Standard - Rec 05/25/12
CREATED: 25-MAY-12 BY: DS1
EXPIRES: 01-JUL-14 COMPOUND COUNT: 2

TraceCERT®

Traceable Certified Reference Materials

Fluka Analytical

Certificate

Produced in double accred laboratory fulfilling ISO/IEC 17025 ISO Guide 3

This certificate is designed in accordance with ISO Guide 31 [1].

Object of certification:	**Silicon standard for ICP**
Product no.:	**08729**
Lot no.:	**BCBC9940**
Composition:	Silicon semi-metal (high purity quality) in 2% HNO_3 and <0.5% HF (prepared from HNO *Trace*SELECT®, HF *Trace*SELECT® and water *Trace*SELECT® Ultra, 18.2 MΩ·cm, 0.22 filtered)
Intended use:	Calibration of ICP-spectrometry, AAS, spectrophotometry or any other analytical technic
Storing and handling:	This reference material shall be stored in the original closed bag between 5°C and 30°C After opening the bottle should be stored at reduced temperature to minimize transpirati rate. Before every use of the material the bottle must be shaken well and its temperatur has to be 20°C. We highly recommend using this reference material no longer than 15 months after the aluminum bag was opened.
Expiry date:	**JUL / 2014** (unopened bottle in aluminized bag)
Traceability [2]:	NIST SRM 3150, Silicon Standard Solution
Certificate issue date:	October 25, 2010

The certified values and uncertainties are according to ISO Guide 35 [3] and Eurachem/CITAC Guide [4].

Constituent	Certified values at 20°C and expanded uncertainties [$U = k \cdot u_c$; $k = 2$]
Silicon	**996 mg L^{-1} ± 4 mg L^{-1}** 986 mg kg^{-1} ± 4 mg kg^{-1}

Measurand	Certified value and expanded uncertainty [$U = k \cdot u_c$; $k = 2$]
Density at 20°C	**1.0103 g mL^{-1} ± 0.0005 g mL^{-1}**

CRM operations: J. Wüthrich

Certification body: K.-D. Schmidt, Ph.D.

SWISS CRM-PRODUCTION SRMS 001 ISO Guide 34

SWISS TESTING STS 490 ISO/IEC 17025

16368-0 ISO 900

Sigma-Aldrich Production GmbH, Industriestrasse 25, 9471 Buchs/ Switzerland

SIGMA-ALDRIC

1. Certification

Production and certification of this CRM are performed under double-accreditation in accordance with ISO/IEC 17025 [5] and also ISO Guide 34 [6]. Storage stability, leaching and homogeneity tests are considered for certification (see storing behavior, chapter 3).

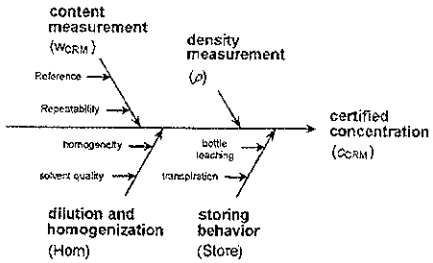
1.1 HP-ICP-OES Measurement

The certified value of the content (mg/kg) is determined using high-performance inductively coupled plasma optical emission spectrometry (HP-ICP-OES). To obtain performance comparable to isotope dilution and classical methods (titration and gravimetric analysis) the HP-ICP-OES measurement is performed using an internal standard and a drift correction procedure [7].
The mean value is based on 20 measurements (two samples and 10 measurements per sample). All measurements are traced gravimetrically to an internationally accepted reference material e.g. from NIST (USA), BAM (Germany) or EMPA – Material Science & Technology (Switzerland).

All uncertainties are calculated according to Eurachem/CITAC Guide [4] and reported as combined expanded uncertainties at the 95% confidence level. The main uncertainty contributions are illustrated by the following cause-effect diagram.

Typical relative contributions are:

$u(w_{CRM})$	0.1 - 0.3 %
u(Store)	< 0.1 %
$u(\rho)$	< 0.05 %
u(Hom)	< 0.03 %



The combined uncertainty u_c is calculated by combination of the squared contribution values.

The expanded uncertainty U is then calculated to a confidence level of 95%, by multiplying u_c with a confidence level factor of k=2.

1.2 Density Measurement

The density measurement is carried out according to ISO 15212-1 [8] and using the digital density meter DMA 4500M from Anton Paar with an oscillating U-tube installed. The measurement uncertainty is calculated according to Eurachem/CITAC Guide and reported as combined expanded uncertainty at the 95% confidence level.

2. Trace Impurities in Bottled Solution

Up to 75 trace impurities were determined with ICP-OES, ICP-MS and AAS. Some of the impurities are determined in the starting material and calculated for the solution (e.g. for rare earth elements contamination during the preparation is rendered impossible). Other elements are determined both in the starting material as well as in the bottled solution.

All values listed below are given in mg kg^{-1} (ppm), <X = below detection limit, m = matrix, n.a. = not analyzed:

Li	Be											B	C	N	O	F	Ne
<0.010	<0.005											<0.025	n.a.	n.a.	n.a.	n.a.	n.a.
Na	Mg											Al	Si	P	S	Cl	Ar
<0.02	<0.005											<0.050	m	<0.010	<0.005	n.a.	n.a.
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
<0.050	<0.020	<0.005	<0.010	<0.010	<0.010	<0.005	<0.010	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	<0.001	<0.001	n.a.	n.a.
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
<0.050	<0.005	<0.005	<0.010	<0.005	<0.010	n.a.	<0.010	<0.010	<0.005	<0.010	<0.010	<0.010	<0.025	<0.001	<0.010	n.a.	n.a.
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn
<0.050	<0.005	<0.005	<0.005	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.003	<0.005	<0.010	<0.001	n.a.	n.a.	n.a.
Fr	Ra	Ac															
n.a.	n.a.	n.a.															

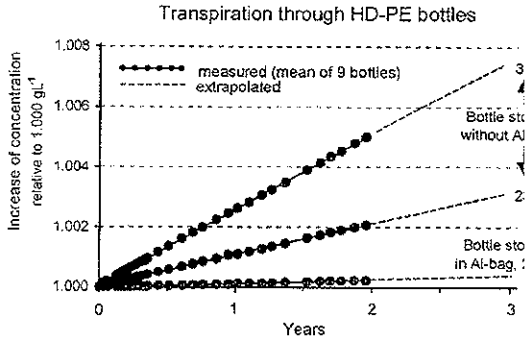
Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
<0.010	<0.010	<0.005	n.a.	<0.005	<0.005	<0.010	<0.005	<0.010	<0.005	<0.010	<0.005	<0.003	<0.005
Th	Pa	U											
<0.005	n.a.	<0.005											

3. Storing Behavior

The storage behavior of standard solutions is an important factor regarding the certified value. Therefore the t most important storing effects were investigated by in-depth studies in a cooperation with EMPA, St. Gallen:

1. The leach out of trace impurities from HD-PE bottles was determined with HR-ICP-MS after leaching the bottles with 2% nitric acid. Maximum contamination levels were found in the ng L^{-1} level for 12 elements.

2. To avoid significant loss of mass through transpiration the bottle is delivered in aluminum coated bags. After the bottle has been removed from the bag, transpiration will occur at an accelerated rate (see figure). We highly recommend not to open the bag until the solution is needed. Once the bottle is opened the solution should be stored at reduced temperature (4°C) to reduce transpiration.



References

[1] ISO Guide 31, 2nd Ed. (2000), "Reference materials - Contents of certificates and labels"
[2] Eurachem/CITAC Guide, 1st Ed. (2003), "Traceability in chemical measurement"
[3] ISO Guide 35, 3rd Ed. (2006), "Reference materials - General and statistical principles for certification"
[4] Eurachem/CITAC Guide, 2nd Ed. (2000), "Quantifying uncertainty in analytical measurement"
[5] ISO/IEC 17025, 2nd Ed. (2005), "General requirements for the competence of testing and calibration laboratories"
[6] ISO Guide 34, 3rd Ed. (2009), "General requirements for the competence of reference material producers"
[7] Marc L. Salit et al., Anal. Chem. 2001, 73, 4621-4629, "Single-Element Solution Comparisons with a High-Performance Inductively Coupled Plasma Optica Emission Spectrometric Method"
[8] DIN EN ISO 15212-1:1998, Oscillation-type density meters - Part 1: Laboratory instruments

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #31609, Hydrogen Peroxide - Rec'd 06/07/12

SOLVENT

Created By: MMZ
Created: 06/07/2012 15:20
Expires: 06/07/2014

Volume of Standard: 4000 mL
Manufacturer: Fisher Scientific
Manufacturer Lot ID: 121417

Lot ID: 402021
Part ID: H325-4
Standard ID: RGNT154

Notes: Hydrogen Peroxide - Rec'd 06/07/12 MMZ

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4002c/402021_COA.PDF

Compound Name and Concentration for Standard #31609

Compound Name	Concentration	Compound Name	Concentration
Hydrogen Peroxide			

Fisher Scientific

402021
REC. 06/07/12 BY MH:
Exp. __/__/__ By _

1 Reagent Lane
Fair Lawn, NJ 07410
201.796.7100 tel
201.796.1329 fax

Certificate of Analysis

Fisher Scientific's Quality System has been found to conform to Quality Management System Standard ISO9001:2008 standard by DNV Certificate number CERT-08052-2006-AQ-HOU-ANAB

This is to certify that units of the above mentioned lot number were tested and found to comply with the specifications of the grade listed. Certain data have been supplied by third parties. Fisher Scientific expressly disclaims all warranties, expressed or implied, including the implied warranties of merchantability and fitness for a particular purpose. Certain products (USP/FCC/NF/EP/BP/JP grades) are sold for use in food, drug, or medical device manufacturing. Fisher does not claim regulatory coverage under 21 CFR nor maintain DMF's with the FDA. The following are the actual analytical results obtained:

Catalog Number	H325	Mfg. Date	3/22/2012
Lot Number	121417		
Description	HYDROGEN PEROXIDE, A.C.S.		
Country of Origin	United States	Recommended Retest Date	Mar-2017
Chemical Origin	Synthetic		
BSE/TSE Comment	No animal products are used as starting raw material ingredients, or used in processing, including lubricants, processing aids, or any other material that might migrate to the finished product.		
Chemical Comment	This material is produced by a synthetic process. No animal, human, or plant materials are used in this systhesis.		

Result name	Units	Specifications	Test Value
APPEARANCE		REPORT	CLEAR, COLORLESS LIQUID
AMMONIUM (NH4)	ppm	<= 5	<5
ASSAY	%	Inclusive Between 30.0 32.0	31.4
CHLORIDE	ppm	<= 3	<3
COLOR	APHA	<= 10	5
COPPER (Cu)	ppm	<= 0.1	0.03
EVAPORATION RESIDUE	%	<= 0.002	0.0020
HEAVY METALS (as Pb)	ppm	<= 1	<1
IDENTIFICATION	PASS/FAIL	= PASS TEST	PASS TEST
IRON (Fe)	ppm	<= 0.5	<0.5
NICKEL (Ni)	ppm	<= 0.1	<0.01
NITRATE (NO3)	ppm	<= 2	<2
PHOSPHATE (PO4)	ppm	<= 2	<2
SULFATE (SO4)	ppm	<= 5	<5
TITRATABLE ACID	mEq/g	<= 0.0006	0.00010

CERTIFIED BY

Joel Boland

Lab Manager BPF

Note: The data listed is valid for all package sizes of this lot of this product, expressed as a extension of this catalog number listed above. If there are any questions with this certificate, please call Chemical Services at (800) 227-6701.

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #31733, Metals Trace Secondary - Rec'd 6/08/12

Pace Analytical®
www.pacelabs.com

STOCK STANDARD

Created By: DS1
Created: 06/11/2012 09:58
Expires: 07/01/2013

Volume of Standard: 250 mL
Manufacturer: Inorganic Ventures
Manufacturer Lot ID: F2-MEB410059

Lot ID: 402026
Part ID: PA-STD-1B
Standard ID: Metals SPK1

Notes: Metals Trace Secondary - Rec'd 6/08/12

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4002c/402026_COA.pdf

Compound Name and Concentration for Standard #31733

Compound Name	Concentration	Compound Name	Concentration
Arsenic	200 ug/mL	Nickel	200 ug/mL
Barium	200 ug/mL	Phosphorus	200 ug/mL
Beryllium	200 ug/mL	Lead	200 ug/mL
Cadmium	200 ug/mL	Selenium	200 ug/mL
Cobalt	200 ug/mL	Strontium	200 ug/mL
Chromium	200 ug/mL	Thallium	200 ug/mL
Copper	200 ug/mL	Vanadium	200 ug/mL
Lithium	200 ug/mL	Zinc	200 ug/mL
Manganese	200 ug/mL		

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 • USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

tel. 800.669.6499 • 540.585.3030
fax. 540.585.3012
info@inorganicventures.com

1.0 **INORGANIC VENTURES** is an ISO Guide 34 "General Requirements for the Competence of Reference Material Producers" and ISO 9001 registered manufacturer. Our manufacturing laboratory is accredited to ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories."

ACCREDITED Testing Laboratory Certificate 883.01 — ACCREDITED Reference Material Producer Certificate 883.02

2.0 **DESCRIPTION OF CRM** Custom Second Source Solution

Catalog No.: PA-STD-1B

Lot Number: **F2-MEB410059**

Matrix: 5% HNO3(v/v)

402026
REC.06/11/12 BY DS:
Exp. __/__/__ By

H31733 Metals SPK1 STOCK
01-JUL-13
DESC: Metals Trace Secondary
LOT NUMBER: 402026
MANUFACTURER: Inorganic Ventures
NOTES: Metals Trace Secondary - Rec'd 6/08/12
CREATED: 11-JUN-12 BY: DS1
EXPIRES: 01-JUL-13 COMPOUND COUNT: 15

Second Source: Whenever possible, this solution was manufactured from a second set of concentrates in our manufacturing facility.

200 mg/L ea:

As,	Ba,	Be,	Cd,	Co,	Cr3,	Cu,	Li,	Mn,
Ni,	P,	Pb,	Se,	Sr,	Tl,	V,	Zn	

3.0 **CERTIFIED VALUES AND UNCERTAINTIES**

ELEMENT	CERTIFIED VALUE	ELEMENT	CERTIFIED VALUE	ELEMENT	CERTIFIED VALUE
Arsenic, As	200.0 ± 1.3 mg/L	Barium, Ba	200.0 ± 1.7 mg/L	Beryllium, Be	200.0 ± 1.4 mg/L
Cadmium, Cd	200.0 ± 1.3 mg/L	Chromium+3, Cr3	200.0 ± 1.7 mg/L	Cobalt, Co	200.0 ± 1.3 mg/L
Copper, Cu	200.0 ± 1.4 mg/L	Lead, Pb	200.0 ± 1.5 mg/L	Lithium, Li	200.0 ± 0.8 mg/L
Manganese, Mn	200.0 ± 0.9 mg/L	Nickel, Ni	200.0 ± 0.9 mg/L	Phosphorus, P	200.0 ± 1.0 mg/L
Selenium, Se	200.0 ± 1.1 mg/L	Strontium, Sr	200.0 ± 1.1 mg/L	Thallium, Tl	200.0 ± 1.3 mg/L
Vanadium, V	200.0 ± 1.0 mg/L	Zinc, Zn	200.0 ± 1.2 mg/L		

Certified Density: 1.039 g/mL (measured at 20 ± 1° C)

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Certified Value $(\bar{x}) = \frac{\sum x_i}{n}$

Uncertainty $(\pm) = \frac{2\,[(\sum s_i)^2]^{1/2}}{(n)^{1/2}}$

$(\bar{x})$ = mean
x_i = individual results
n = number of measurements
$\sum s_i$ = The summation of all significant estimated errors (Most common are the errors from instrumental measurement, weighing, dilution to volume and the fixed error reported on the NIST SRM certificate of analysis)

4.0 TRACEBILITY TO NIST AND VALUES OBTAINED BY INDEPENDENT METHODS

· "Property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties." (ISO VIM, 2nd ed., 1993, definition 6.10)

· This product is Traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRMs are available, the term 'in-house std.' is specified.

4.1 ASSAY INFORMATION

ELEMENT	METHOD	NIST SRM#	SRM LOT#	ELEMENT	METHOD	NIST SRM#	SRM LOT#
As	Calculated		See Sec. 4.2	As	ICP Assay	3103a	010713
Ba	Gravimetric		See Sec. 4.2	Ba	ICP Assay	3104a	070222
Be	Calculated		See Sec. 4.2	Be	ICP Assay	3105a	892707
Cd	ICP Assay	3108	060531	Cd	EDTA	928	928
Co	ICP Assay	3113	00630	Co	EDTA	928	928
Cr3	Calculated		See Sec. 4.2	Cr3	ICP Assay	3112a	030730
Cu	ICP Assay	3114	011017	Cu	EDTA	928	928
Li	Gravimetric		See Sec. 4.2	Li	ICP Assay	3129a	000505
Mn	ICP Assay	3132	050429	Mn	EDTA	928	928
Ni	ICP Assay	3136	000612	Ni	EDTA	928	928
P	ICP Assay	3139a	060717	P	Acidimetric	84k	84k
Pb	ICP Assay	3128	030721	Pb	EDTA	928	928
Se	Calculated		See Sec. 4.2	Se	ICP Assay	3149	992106
Sr	ICP Assay	3153a	990906	Sr	EDTA	928	928
Tl	Calculated		See Sec. 4.2	Tl	ICP Assay	3158	993012
V	ICP Assay	3165	992706	V	EDTA	928	928
Zn	ICP Assay	3168a	001402	Zn	EDTA	928	928

4.2 **BALANCE CALIBRATION** - All analytical balances are calibrated yearly by an A2LA accredited calibration laboratory and are traceable to a class E 2 analytical weight set with NIST Traceability. All balances are checked daily using an in-house procedure. The weights used for testing are annually compared to master weights and are traceable to the National Institute of Standards and Technology (NIST).

4.3 **THERMOMETER CALIBRATION** - All thermometers are NIST traceable through thermometers that are calibrated by an A2LA accredited calibration laboratory.

4.4 **GLASSWARE CALIBRATION** - An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM's.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES IN µg/mL - N/A

6.0 INTENDED USE

For the calibration of analytical instruments including but not limited to the following:
HPLC, IC, TLC, ISE, IR, NMR, UV/VIS, MS, Capillary Electrophoresis, Potentiometry, Wet Chemistry and Voltammetry
For the validation of analytical methods
For the preparation of "working reference samples"
For interference studies and the determination of correction coefficients
For detection limit and linearity studies
For additional intended uses, contact Technical Staff

This CRM was manufactured using 18 megohm doubly deionized water that has been filtered through a 0.2 micron filter.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

Storage & Handling - Keep **Tightly** sealed when not in use. Store and use at 20 ± 4°C. **Do Not** pipette from the container. **Do Not** return portions removed from pipetting to container.

Element Specific Information - For specific information regarding any element: Contact technical staff.

Uranium Note: If uranium is present in this standard, it is natural abundance unless specified in Section 3.0.

8.0 HAZARDOUS INFORMATION - Please refer to the enclosed Material Safety Data sheet for information regarding this CRM.

9.0 HOMOGENEITY - This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration
- QMI File Number 010105

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration"
- Chemical Testing - Accredited A2LA Certificate Number 883.01

10.3 ISO/IEC Guide 34 "General Requirements for the Competence of Reference Material Producers"
- Reference Materials Production - Accredited A2LA Certificate Number 883.02

10.4 10CFR50 Appendix B - Nuclear Regulatory Commission
- Domestic Licensing of Production and Utilization Facilities

10.5 10CFR21 - Nuclear Regulatory Commission
- Reporting Defects and Non-Compliance

11.0 DATE OF CERTIFICATION AND PERIOD OF VALIDITY

11.1 Shelf Life - The period of time during which the concentration of the analyte(s) in a properly packaged, unopened, and unused standard stored under environmentally controlled and monitored conditions will remain within the specified uncertainty range. Shelf life is limited primarily by transpiration (loss of water from the solution) and infrequently, by chemical instability. Transpiration studies of chemically-stable solutions performed at the manufacturer's facility show a CRM shelf-life of twenty one months for solutions packaged in 125-mL low density polyethylene bottles. When stored under special conditions that minimize transpiration and instability, the shelf life can be extended past this limit.

11.2 Expiration Date - The date after which a CRM should not be used. Routine laboratory use of a CRM increases transpiration losses and the chance of contamination which affect the integrity of the CRM and limit its useful life. Manufacturer concurs with state and federal regulatory agencies' recommendations that solution standards be assigned a one-year expiration date.

11.3 Chemical Stability - Studies have been conducted on this or similar CRMs and it has been demonstrated that this CRM is chemically stable for a period of not less than two years provided the "Storage & Handling" conditions are followed that are described in section 7.0.

Certification Date: February 14, 2012

Expiration Date: EXPIRES 01 2013

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By: Brenda Francis
Product Documentation Technician

Certificate Approved By: Brian Alexander
PhD., Quality Control Supervisor

Certifying Officer: Paul Gaines
PhD., Senior Technical Director

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #31734, Metals Trace2 Secondary - Rec'd

STOCK STANDARD

Created By: DS1
Created: 06/11/2012 10:00
Expires: 07/01/2013

Volume of Standard: 250 mL
Manufacturer: Inorganic Ventures
Manufacturer Lot ID: F2-MEB4100060

Lot ID: 402027
Part ID: PA-STD-2B
Standard ID: Metals SPK2

Notes: Metals Trace2 Secondary - Rec'd 06/08/12

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4002c/402027_COA.pdf

Compound Name and Concentration for Standard #31734

Compound Name	Concentration	Compound Name	Concentration
Silicon	1000 ug/mL	Tin	200 ug/mL
Boron	200 ug/mL	Zirconium	200 ug/mL
Molybdenum	200 ug/mL	Silver	100 ug/mL
Antimony	200 ug/mL	Titanium	200 ug/mL

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 • USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

tel: 800.669.6799 • 540.585.3030
fax: 540.585.3013
info@inorganicventures.com

1.0 **INORGANIC VENTURES** is an ISO Guide 34 "General Requirements for the Competence of Reference Material Producers" and ISO 9001 registered manufacturer. Our manufacturing laboratory is accredited to ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories."

ACCREDITED Testing Laboratory Certificate 853.01

ACCREDITED Reference Material Producer Certificate 853.02

2.0 **DESCRIPTION OF CRM** Custom Second Source Solution

Catalog No.: PA-STD-2B

Lot Number: **F2-MEB410060**

Matrix: tr. HF, 3% HNO3(v/v)

402027
REC.06/11/12 BY DS:
Exp. __/__/__ By _

Second Source: Whenever possible, this solution was manufactured from a second set of concentrates in our manufacturing facility.

H31734 Metals SPK2 STOCK
01-JUL-13
DESC: Metals Trace2 Secondary
LOT NUMBER: 402027
MANUFACTURER: Inorganic Ventures
NOTES: Metals Trace2 Secondary - Rec'd 06/00/12
CREATED: 11-JUN-12 BY: DS1
EXPIRES: 01-JUL-13 COMPOUND COUNT: 9

1,000 mg/L ea:
Si,

200 mg/L ea:
B, Mo, Sb, Sn, Ti, Zr,

100 mg/L ea:
Ag

3.0 **CERTIFIED VALUES AND UNCERTAINTIES**

ELEMENT	CERTIFIED VALUE	ELEMENT	CERTIFIED VALUE	ELEMENT	CERTIFIED VALUE
Antimony, Sb	200.0 ± 1.6 mg/L	Boron, B	200.0 ± 1.1 mg/L	Molybdenum, Mo	200.0 ± 1.3 mg/L
Silicon, Si	1,000 ± 4 mg/L	Silver, Ag	100.0 ± 0.6 mg/L	Tin, Sn	200.0 ± 1.0 mg/L
Titanium, Ti	200.0 ± 1.3 mg/L	Zirconium, Zr	200.0 ± 1.3 mg/L		

Certified Density: 1.021 g/mL (measured at 20 ± 1° C)

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

$$\text{Certified Value } (\bar{x}) = \frac{\sum x_i}{n}$$

$$\text{Uncertainty } (\pm) = \frac{2\,[(\sum s_i)^2]^{1/2}}{(n)^{1/2}}$$

($\bar{x}$) = mean
x_i = individual results
n = number of measurements
$\sum s_i$ = The summation of all significant estimated errors (Most common are the errors from instrumental measurement, weighing, dilution to volume and the fixed error reported on the NIST SRM certificate of analysis)

4.0 TRACEBILITY TO NIST AND VALUES OBTAINED BY INDEPENDENT METHODS

· "Property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties." (ISO VIM, 2nd ed., 1993, definition 6.10)

· This product is Traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRMs are available, the term 'in-house std.' is specified.

4.1 ASSAY INFORMATION

ELEMENT	METHOD	NIST SRM#	SRM LOT#	ELEMENT	METHOD	NIST SRM#	SRM LOT#
Ag	Calculated		See Sec. 4.2	Ag	ICP Assay	3151	992212
B	ICP Assay	3107	070514	Mo	Calculated		See Sec. 4.2
Mo	ICP Assay	3134	891307	Sb	Calculated		See Sec. 4.2
Sb	ICP Assay	3102A	061229	Si	Calculated		See Sec. 4.2
Si	ICP Assay	3150	071204	Sn	Calculated		See Sec. 4.2
Sn	ICP Assay	3161a	993107	Ti	Calculated		See Sec. 4.2
Ti	ICP Assay	3162a	060808	Zr	Calculated		See Sec. 4.2
Zr	ICP Assay	3169	990109				

4.2 **BALANCE CALIBRATION** - All analytical balances are calibrated yearly by an A2LA accredited calibration laboratory and are traceable to a class E 2 analytical weight set with NIST Traceability. All balances are checked daily using an in-house procedure. The weights used for testing are annually compared to master weights and are traceable to the National Institute of Standards and Technology (NIST).

4.3 **THERMOMETER CALIBRATION** - All thermometers are NIST traceable through thermometers that are calibrated by an A2LA accredited calibration laboratory.

4.4 **GLASSWARE CALIBRATION** - An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM's.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES IN µg/mL - N/A

6.0 INTENDED USE

For the calibration of analytical instruments including but not limited to the following:
HPLC, IC, TLC, ISE, IR, NMR, UV/VIS, MS, Capillary Electrophoresis, Potentiometry, Wet Chemistry and Voltammetry
For the validation of analytical methods
For the preparation of "working reference samples"
For interference studies and the determination of correction coefficients
For detection limit and linearity studies
For additional intended uses, contact Technical Staff

This CRM was manufactured using 18 megohm doubly deionized water that has been filtered through a 0.2 micron filter.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

Storage & Handling - Keep **Tightly** sealed when not in use. Store and use at 20 ± 4°C. **Do Not** pipette from the container. **Do Not** return portions removed from pipetting to container.

Element Specific Information - For specific information regarding any element: Contact technical staff.

Uranium Note: If uranium is present in this standard, it is natural abundance unless specified in Section 3.0.

HF Note: This standard should not be prepared or stored in glass.

8.0 HAZARDOUS INFORMATION - Please refer to the enclosed Material Safety Data sheet for information regarding this CRM.

9.0 HOMOGENEITY - This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration
- QMI File Number 010105

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration"
- Chemical Testing - Accredited A2LA Certificate Number 883.01

10.3 ISO/IEC Guide 34 "General Requirements for the Competence of Reference Material Producers"
- Reference Materials Production - Accredited A2LA Certificate Number 883.02

10.4 10CFR50 Appendix B - Nuclear Regulatory Commission
- Domestic Licensing of Production and Utilization Facilities

10.5 10CFR21 - Nuclear Regulatory Commission
- Reporting Defects and Non-Compliance

11.0 DATE OF CERTIFICATION AND PERIOD OF VALIDITY

11.1 Shelf Life - The period of time during which the concentration of the analyte(s) in a properly packaged, unopened, and unused standard stored under environmentally controlled and monitored conditions will remain within the specified uncertainty range. Shelf life is limited primarily by transpiration (loss of water from the solution) and infrequently, by chemical instability. Transpiration studies of chemically-stable solutions performed at the manufacturer's facility show a CRM shelf-life of twenty one months for solutions packaged in 125-mL low density polyethylene bottles. When stored under special conditions that minimize transpiration and instability, the shelf life can be extended past this limit.

11.2 Expiration Date - The date after which a CRM should not be used. Routine laboratory use of a CRM increases transpiration losses and the chance of contamination which affect the integrity of the CRM and limit its useful life. Manufacturer concurs with state and federal regulatory agencies' recommendations that solution standards be assigned a one-year expiration date.

11.3 Chemical Stability - Studies have been conducted on this or similar CRMs and it has been demonstrated that this CRM is chemically stable for a period of not less than two years provided the "Storage & Handling" conditions are followed that are described in section 7.0.

Certification Date: February 14, 2012

Expiration Date: EXPIRES 01/2013

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By:	Brenda Francis Product Documentation Technician	
Certificate Approved By:	Brian Alexander PhD., Quality Control Supervisor	
Certifying Officer:	Paul Gaines PhD., Senior Technical Director	

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #31735, Metals Minerals Secondary - Rec'd

Pace Analytical®
www.pacelabs.com

STOCK STANDARD

Created By: DS1
Created: 06/11/2012 10:02
Expires: 07/01/2013

Volume of Standard: 250 mL
Manufacturer: Inorganic Ventures
Manufacturer Lot ID: F2-MEB410061

Lot ID: 402028
Part ID: PA-STD-3B
Standard ID: Metals SPK3

Notes: Metals Minerals Secondary - Rec'd 06/08/12

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4002c/402028_COA.pdf

Compound Name and Concentration for Standard #31735

Compound Name	Concentration	Compound Name	Concentration
Aluminum	2000 ug/mL	Potassium	2000 ug/mL
Calcium	2000 ug/mL	Magnesium	2000 ug/mL
Iron	2000 ug/mL	Sodium	2000 ug/mL

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 • USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

tel: 800.669.6799 • 540.585.3030
fax: 540.585.3012
info@inorganicventures.com

1.0 **INORGANIC VENTURES** is an ISO Guide 34 "General Requirements for the Competence of Reference Material Producers" and ISO 9001 registered manufacturer. Our manufacturing laboratory is accredited to ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories."

ACCREDITED Testing Laboratory Certificate 883.01

ACCREDITED Reference Material Producer Certificate 883.02

2.0 **DESCRIPTION OF CRM** Custom Second Source Solution

Catalog No.: PA-STD-3B

Lot Number: **F2-MEB410061**

Matrix: 3% HNO3(v/v)

402020
REC.06/11/12 BY DS:
Exp. --/--/-- By -

A31735 Metals SPK3 STOCK
01-JUL-13
DESC: Metals Minerals Secondary
LOT NUMBER: 402020
MANUFACTURER: Inorganic Ventures
NOTES: Metals Minerals Secondary - Rec'd 06/06/12
CREATED: 11-JUN-12 BY: DS1
EXPIRES: 01-JUL-13 COMPOUND COUNT: 7

Second Source: Whenever possible, this solution was manufactured from a second set of concentrates in our manufacturing facility.

2,000 mg/L ea:
Al, Ca, Fe, K, Mg, Na

3.0 **CERTIFIED VALUES AND UNCERTAINTIES**

ELEMENT	CERTIFIED VALUE	ELEMENT	CERTIFIED VALUE	ELEMENT	CERTIFIED VALUE
Aluminum, Al	2,000 ± 10 mg/L	Calcium, Ca	2,000 ± 13 mg/L	Iron, Fe	2,000 ± 9 mg/L
Magnesium, Mg	2,000 ± 16 mg/L	Potassium, K	2,000 ± 13 mg/L	Sodium, Na	2,000 ± 11 mg/L

Certified Density: 1.062 g/mL (measured at 20 ± 1° C)

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

$$\text{Certified Value } (\bar{x}) = \frac{\sum x_i}{n}$$

$$\text{Uncertainty } (\pm) = \frac{2\,[(\sum s_i)^2]^{1/2}}{(n)^{1/2}}$$

$(\bar{x})$ = mean
x_i = individual results
n = number of measurements
$\sum s_i$ = The summation of all significant estimated errors (Most common are the errors from instrumental measurement, weighing, dilution to volume and the fixed error reported on the NIST SRM certificate of analysis)

4.0 **TRACEBILITY TO NIST AND VALUES OBTAINED BY INDEPENDENT METHODS**

- "Property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties." (ISO VIM, 2nd ed., 1993, definition 6.10)
- This product is Traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRMs are available, the term 'in-house std.' is specified.

4.1 ASSAY INFORMATION

ELEMENT	METHOD	NIST SRM#	SRM LOT#	ELEMENT	METHOD	NIST SRM#	SRM LOT#
Al	ICP Assay	3101a	060502	Al	EDTA	928	928
Ca	ICP Assay	3109a	050825	Ca	EDTA	928	928
Fe	ICP Assay	3126a	051031	Fe	EDTA	928	928
K	Gravimetric		See Sec. 4.2	K	ICP Assay	3141a	051220
Mg	ICP Assay	3131a	050302	Mg	EDTA	928	928
Na	Gravimetric		See Sec. 4.2	Na	ICP Assay	3152a	010728

4.2 **BALANCE CALIBRATION** - All analytical balances are calibrated yearly by an A2LA accredited calibration laboratory and are traceable to a class E 2 analytical weight set with NIST Traceability. All balances are checked daily using an in-house procedure. The weights used for testing are annually compared to master weights and are traceable to the National Institute of Standards and Technology (NIST).

4.3 **THERMOMETER CALIBRATION** - All thermometers are NIST traceable through thermometers that are calibrated by an A2LA accredited calibration laboratory.

4.4 **GLASSWARE CALIBRATION** - An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM's.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES IN µg/mL - N/A

6.0 INTENDED USE

For the calibration of analytical instruments including but not limited to the following:
HPLC, IC, TLC, ISE, IR, NMR, UV/VIS, MS, Capillary Electrophoresis, Potentiometry, Wet Chemistry and Voltammetry
For the validation of analytical methods
For the preparation of "working reference samples"
For interference studies and the determination of correction coefficients
For detection limit and linearity studies
For additional intended uses, contact Technical Staff

This CRM was manufactured using 18 megohm doubly deionized water that has been filtered through a 0.2 micron filter.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

Storage & Handling - Keep **Tightly** sealed when not in use. Store and use at 20 ± 4°C. **Do Not** pipette from the container. **Do Not** return portions removed from pipetting to container.

Element Specific Information - For specific information regarding any element: Contact technical staff.

Uranium Note: If uranium is present in this standard, it is natural abundance unless specified in Section 3.0.

8.0 HAZARDOUS INFORMATION - Please refer to the enclosed Material Safety Data sheet for information regarding this CRM.

9.0 HOMOGENEITY - This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 **ISO 9001 Quality Management System Registration**
- QMI File Number 010105

10.2 **ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration"**
- Chemical Testing - Accredited A2LA Certificate Number 883.01

10.3 **ISO/IEC Guide 34 "General Requirements for the Competence of Reference Material Producers"**
- Reference Materials Production - Accredited A2LA Certificate Number 883.02

10.4 **10CFR50 Appendix B - Nuclear Regulatory Commission**
- Domestic Licensing of Production and Utilization Facilities

10.5 **10CFR21 - Nuclear Regulatory Commission**
- Reporting Defects and Non-Compliance

11.0 DATE OF CERTIFICATION AND PERIOD OF VALIDITY

11.1 Shelf Life - The period of time during which the concentration of the analyte(s) in a properly packaged, unopened, and unused standard stored under environmentally controlled and monitored conditions will remain within the specified uncertainty range. Shelf life is limited primarily by transpiration (loss of water from the solution) and infrequently, by chemical instability. Transpiration studies of chemically-stable solutions performed at the manufacturer's facility show a CRM shelf-life of twenty one months for solutions packaged in 125-mL low density polyethylene bottles. When stored under special conditions that minimize transpiration and instability, the shelf life can be extended past this limit.

11.2 Expiration Date - The date after which a CRM should not be used. Routine laboratory use of a CRM increases transpiration losses and the chance of contamination which affect the integrity of the CRM and limit its useful life. Manufacturer concurs with state and federal regulatory agencies' recommendations that solution standards be assigned a one-year expiration date.

11.3 Chemical Stability - Studies have been conducted on this or similar CRMs and it has been demonstrated that this CRM is chemically stable for a period of not less than two years provided the "Storage & Handling" conditions are followed that are described in section 7.0.

Certification Date: February 14, 2012

Expiration Date: EXPIRES 01 2013

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By: Brenda Francis
Product Documentation Technician

Certificate Approved By: Brian Alexander
PhD., Quality Control Supervisor

Certifying Officer: Paul Gaines
PhD., Senior Technical Director

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #32145, Magnesium Stock Standard - Rec'd

STOCK STANDARD

Created By: DS1
Created: 06/15/2012 12:58
Expires: 03/31/2018

Volume of Standard: 125 mL
Manufacturer: Ultra SCientific
Manufacturer Lot ID: M00166

Lot ID: 402040
Part ID: ICP-112
Standard ID: Mg-STK

Notes: Magnesium Stock Standard - Rec'd 06/15/12

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4002c/402040_COA.pdf

Compound Name and Concentration for Standard #32145

Compound Name	Concentration	Compound Name	Concentration
Magnesium	10000 ug/mL		

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ULTRAgrade™ Solution
Magnesium ICP Standard
10000 µg/mL

402040
REC.06/15/12 BY DS;
Exp. __/__/__ By _
Open __/__/__ By

Catalog Number: ICP-112
Lot Number: M00166
Job Number: J00012563
Lot Issue Date: 02/21/2011
Expiration Date: 03/31/2018

Starting Material:	Magnesium Nitrate Hexahydrate
Starting Material Purity:	99.999%
Starting Material Lot No.:	BH01553, BH01565, BH01769
Matrix:	2% nitric acid in low TOC water (< 50 ppb)
Atomic Weight Mg:	24.31

Certified Value: 10002 ± 20 µg/mL

This Certified Reference Material (CRM) was manufactured and verified in accordance with ULTRA's ISO 9001 registered quality system. The analyte concentrations were verified by our ISO 17025 accredited laboratory to be within ± 2.5%, when compared to calibration standards independently prepared using NIST SRM(s). The certified value and uncertainty value at the 95% confidence level for each analyte is determined gravimetrically.

Classical Wet Assay Method: Theoretical, based on gravimetric measurements

Confirmation by Inductively Coupled Plasma Spectroscopy (ICP / ICP-MS) vs. NIST SRM 3131a

ULTRA uses purified acids, 18 megohm double deionized water, calibrated Class A glassware & meticulously cleaned bottles in the manufacturing of ULTRAgrade standards. Balances used in the manufacturing of this standard are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001.

Trace Metallic Impurities in Solution Standard in µg/mL:

*	Al	<0.005	ND	*	Ga	<0.005	ND	n	Nb			n	S		
*	Sb	<0.005	ND	n	Ge			n	Os			n	Ta		
*	As	<0.005	ND	n	Au			*	Pd	<0.005	ND	n	Te		
*	Ba	<0.005	ND	n	Hf			*	P	<0.005	ND	n	Tb		
*	Be	<0.005	ND	n	Ho			*	Pt	<0.005	ND	*	Tl	<0.005	ND
*	Bi	<0.005	ND	*	In	<0.005	ND	*	K	<0.010	D	n	Th		
*	B	<0.005	ND	n	Ir			n	Pr			n	Tm		
*	Cd	<0.005	ND	*	Fe	<0.005	ND	n	Re			*	Sn	<0.005	ND
*	Ca	<0.070	D	*	La	<0.005	ND	n	Rh			*	Ti	<0.005	ND
n	Ce			*	Pb	<0.005	ND	n	Rb			n	W		
n	Cs			*	Li	<0.005	ND	n	Ru			n	U		
*	Cr	<0.005	ND	n	Lu			n	Sm			*	V	<0.005	ND
*	Co	<0.005	ND	s	Mg			n	Sc			n	Yb		
*	Cu	<0.005	ND	*	Mn	<0.005	ND	*	Se	<0.005	ND	n	Y		
n	Dy			*	Hg	<0.005	ND	*	Si	<0.005	ND	*	Zn	<0.005	ND
*	Er	<0.005	ND	*	Mo	<0.005	ND	*	Ag	<0.005	ND	n	Zr		
*	Eu	<0.005	ND	n	Nd			*	Na	<0.010	D				
*	Gd	<0.005	ND	*	Ni	<0.005	ND	*	Sr	<0.005	ND				

* - element checked for
ND - not detected
i - spectral interference
D - detected
n - not checked for
s - solution standard element

Density of Solution (measured at 20.0°C ± 0.5°C): 1.054 g/mL

H32145 Mg-STK STOCK
31-MAR-18
DESC: Magnesium Stock Standard
LOT NUMBER: 402040
MANUFACTURER: Ultra Scientific
NOTES: Magnesium Stock Standard - Rec'd 06/15/12
CREATED: 15-JUN-12 BY: DSI
EXPIRES: 31-MAR-18 COMPOUND COUNT: 1

ACCREDITED

ISO 17025 Accredited A2LA Cert. No. 0851-01

ISO 9001 Registered TUV USA, Inc. Cert. No. 09-1009

250 Smith Street, North Kingstown, RI 02852 USA
401-294-9400 Fax: 295-2330
www.ultrasci.com

William J. Leary
Quality Assurance Manager

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #33985, Mercury Stock Standard - Rec. 06/14/12,

STOCK STANDARD

Created By: CMS
Created: 07/13/2012 13:04
Expires: 12/08/2013

Volume of Standard: 125 mL
Manufacturer: High Purity
Manufacturer Lot ID: 1207328

Lot ID: 402090
Part ID: 100033-1
Standard ID: Hg-STK

Notes: Mercury Stock Standard - Rec. 06/14/12, Opened 07/13/12

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4002c/402090_COA.PDF

Compound Name and Concentration for Standard #33985

Compound Name	Concentration	Compound Name	Concentration
Mercury	1000 ug/mL		

HIGH-PURITY STANDARDS
www.highpuritystandards.com

P.O. Box 41727
Charleston, SC 29423
Phone (843) 767-7900
Fax (843) 767-7906

Certificate of Analysis

Product Description:

Name:	Mercury	Source Material:	Mercury Metal
Part Number:	**100033-1**	Material Purity:	99.9998%
Lot Number:	**1207328**	Matrix:	2% (v/v) HNO_3

Certified Value: 1000 µg/mL ± 6 µg/mL

The Certified value is based on gravimetric and volumetric preparation, and confirmed against SRM 3133 (lot number 061204) by inductively coupled plasma optical emission spectrometry (ICP-OES) using an internal laboratory-developed method. The uncertainty in the certified value is calculated for a 95% confidence interval and coverage factor *k* is about 2.

Density: 1.010 g/mL ± 0.002 g/mL @ 24.2°C

402090
REC. 07/13/12 BY CMS
Exp. --/--/-- By --

Uncertified Values:

Trace Metal Impurity Scan: The data reported are based upon a scan of this specific lot at 1000 µg/mL via ICP analysis. The values are reported in µg/L.

Ag		na	Cu	<	0.2	Li	<	0.02	Rb	<	0.02	Th	<	0.02
Al	<	0.1	Dy	<	0.02	Lu	<	0.02	Re	<	0.02	Ti	<	0.02
As	<	0.05	Er	<	0.02	Mg	<	0.5	Rh	<	0.02	Tl	<	0.02
Au	<	0.02	Eu	<	0.02	Mn	<	0.1	Ru	<	0.02	Tm	<	0.02
B	<	1	Fe	<	1	Mo	<	0.02	Sb	<	0.02	U	<	0.1
Ba	<	0.1	Ga	<	0.02	Na	<	3	Sc	<	0.02	V	<	0.05
Be	<	0.02	Gd	<	0.02	Nb	<	0.02	Se	<	0.1	W	<	0.02
Bi	<	0.02	Ge	<	0.02	Nd	<	0.02	Si	<	50	Y	<	0.02
Ca	<	1	Hf	<	0.02	Ni	<	0.02	Sm	<	0.02	Yb	<	0.02
Cd	<	0.02	Ho	<	0.02	Os	<	0.02	Sn	<	1	Zn	<	0.5
Ce	<	0.02	In	<	0.02	Pb	<	0.05	Sr	<	0.02	Zr	<	0.02
Co	<	0.2	Ir	<	0.02	Pd	<	0.02	Ta	<	0.02	Hg		M
Cr	<	0.1	K	<	1	Pr	<	0.02	Tb	<	0.02			
Cs		na	La	<	0.02	Pt	<	0.02	Te	<	0.1	na - not analyzed		

Preparation Information:

The standard solution is prepared using high purity materials and assayed by analytical methods for conformity prior to use. This standard was prepared using the methods developed at NIST for SRM Spectrometric Standard Solutions under appropriate laboratory conditions.

Sub-boiling distilled high-purity acid has been used to place the materials in solution and to stabilize the standard. The matrix is as noted above in 18 megaohm deionized water.

Stability of this product is based upon rigorous short term and long term testing of the solution for the certified value. This testing includes, but is not limited to, the effect of temperature and packaging on the product.

Intended Use:

This Certified Reference Material (CRM) is intended for use as a calibration standard for the quantitative determination of mercury, calibration of instruments such as ICPOES, ICPMS, AAS and XRF, and validation of analytical methods. It also can be used in EPA, ASTM and other methods.

Traceability Information:

The traceability of this standard is maintained through an unbroken chain of comparisons to appropriate standards with suitable procedure and measurement uncertainties. The maintenance of the base and derived units of International System of Units (SI) with traceability of measurement results (contemporary metrology) to SI ensures their comparability over time as follows.

a. **Standard Weight and Analytical Balance**
The standard weights (NBS weights Inventory No 20231A) are calibrated every two years by South Carolina Metrology Laboratory that is a participant in "NIST Weights and Measures Measurement Assurance Program" with a certificate of measurement traceability to NIST primary standards.
The balances are calibrated yearly by the ISO 17025 accredited metrology service, and are verified weekly by an in-house method using standard weights.

b. **Volumetric Device**
The calibration of volumetric vessels is checked annually using the NBS 602 method.

c. **Thermometer**
The standard thermometers are calibrated every year by the ISO 17025 accredited metrology service. The thermometers used in-house are verified against the standard thermometers yearly.

d. **Calibration Standards:**
The Calibration Standard is directly traceable to SRM 3100 Series Spectrometric Standard Solutions.

Packaging and Storage Conditions:

The standard is packaged in a pre-cleaned polyethylene bottle. To maintain the integrity of this product, the solution should be kept tightly capped and stored under normal laboratory conditions.

Refer to Material Safety Datasheet (MSDS) for hazardous information.

Expiration Information:

The expiry date is guaranteed to be valid for eighteen months from the shipping date provided. For this reason, standards from the same lot may have different expiration dates.

Preparation Date:	**March 13, 2012**
Shipped Date:	**June 8, 2012**
Expiration Date:	**December 8, 2013**
Certificate Issue Date:	**March 22, 2012**

Quality Information:

ISO/IEC 17025:2005 Accreditation
Certificate Number AT-1529

ISO Guide 34:2009 (RMP) Accreditation
Certificate Number AR-1436

Vanny T. Yib,	**Kim-Phuong Tran**	**Theodore Rains, PhD**
Inorganic Laboratory Manager	**Quality Manager**	**President**

NOTICE: HPS products are intended for laboratory use only. All products should be handled and used by trained professional personnel. The responsibility for the safe handling and use of these products rests solely with the buyer and/or user. The data and information as stated was furnished by the manufacturer of the product. The information provided in this certificate pertains only to the lot number specified. None of the information provided in this certificate may be used, reproduced or transmitted in any form or by any means without written approval from High Purity Standards.

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #34289, Conc. Nitric Acid - Rec 07/18/12 MMZ

SOLVENT

Created By: MMZ
Created: 07/18/2012 13:52
Expires: 07/18/2014

Volume of Standard: 2500 mL
Manufacturer: SCP SCIENCE
Manufacturer Lot ID: SCA2129885

Lot ID: 402098
Part ID: 250-037-171
Standard ID: RGNT373

Notes: Conc. Nitric Acid - Rec 07/18/12 MMZ

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4002c/402098_COA.PDF

Compound Name and Concentration for Standard #34289

Compound Name	Concentration	Compound Name	Concentration
Nitric Acid			

SCP SCIENCE 402098 REC.07/10/12 BY MM: Exp. --/--/-- By --

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Certificate of Analysis

*Plasma*PURE

Nitric Acid (67 - 70% HNO_3)

Catalogue Number: 250-038-171 / 250-138-175

Opened Bottle Expiry Information
15 months after opening, up to unopened expiration date
_____
Date bottle opened

Lot Number: **SCA2129885**
Assay (HNO_3 w/w): **69%**
Colour (APHA): **< 10 (Specification: Max 10)**
Expiry Date: **February 2014**

Analyte	Maximum Specification	Actual Value (in ppb)	Analyte	Maximum Specification	Actual Value (in ppb)
Aluminum (Al)	1 ppb	< 0.5	Neodymium (Nd)	0.1 ppb	< 0.1
Antimony (Sb)	0.5 ppb	< 0.1	Nickel (Ni)	0.5 ppb	< 0.5
Arsenic (As)	0.5 ppb	< 0.1	Niobium (Nb)	0.1 ppb	< 0.1
Barium (Ba)	0.1 ppb	< 0.1	Palladium (Pd)	0.5 ppb	< 0.1
Beryllium (Be)	0.1 ppb	< 0.1	Platinum (Pt)	0.5 ppb	< 0.1
Bismuth (Bi)	0.1 ppb	< 0.1	Potassium (K)	1 ppb	< 0.2
Boron (B)	1 ppb	< 0.5	Praseodymium (Pr)	0.1 ppb	< 0.1
Cadmium (Cd)	0.5 ppb	< 0.1	Rhenium (Re)	0.1 ppb	< 0.1
Calcium (Ca)	1 ppb	< 0.5	Rhodium (Rh)	0.5 ppb	< 0.1
Cerium (Ce)	0.1 ppb	< 0.1	Rubidium (Rb)	0.1 ppb	< 0.1
Cesium (Cs)	0.1 ppb	< 0.1	Ruthenium (Ru)	0.5 ppb	< 0.1
Chromium (Cr)	1 ppb	< 0.5	Samarium (Sm)	0.1 ppb	< 0.1
Cobalt (Co)	0.5 ppb	< 0.1	Scandium (Sc)	0.1 ppb	< 0.1
Copper (Cu)	0.5 ppb	< 0.2	Selenium (Se)	1 ppb	< 0.1
Dysprosium (Dy)	0.1 ppb	< 0.1	Silver (Ag)	0.1 ppb	< 0.1
Erbium (Er)	0.1 ppb	< 0.1	Sodium (Na)	1 ppb	< 0.5
Europium (Eu)	0.1 ppb	< 0.1	Strontium (Sr)	0.1 ppb	< 0.1
Gadolinium (Gd)	0.1 ppb	< 0.1	Tantalum (Ta)	Information Only	< 0.1
Gallium (Ga)	0.1 ppb	< 0.1	Tellurium (Te)	0.1 ppb	< 0.1
Germanium (Ge)	0.1 ppb	< 0.1	Terbium (Tb)	0.1 ppb	< 0.1
Gold (Au)	0.1 ppb	< 0.1	Thallium (Tl)	0.1 ppb	< 0.1
Hafnium (Hf)	0.1 ppb	< 0.1	Thorium (Th)	0.1 ppb	< 0.1
Holmium (Ho)	0.1 ppb	< 0.1	Thulium (Tm)	0.1 ppb	< 0.1
Indium (In)	0.1 ppb	< 0.1	Tin (Sn)	0.5 ppb	< 0.1
Iron (Fe)	1 ppb	< 0.5	Titanium (Ti)	0.5 ppb	< 0.1
Lanthanum (La)	0.1 ppb	< 0.1	Tungsten (W)	0.1 ppb	< 0.1
Lead (Pb)	0.1 ppb	< 0.1	Uranium (U)	0.1 ppb	< 0.1
Lithium (Li)	0.1 ppb	< 0.1	Vanadium (V)	0.5 ppb	< 0.1
Lutetium (Lu)	0.1 ppb	< 0.1	Ytterbium (Yb)	0.1 ppb	< 0.1
Magnesium (Mg)	1 ppb	< 0.2	Yttrium (Y)	0.1 ppb	< 0.1
Manganese (Mn)	0.1 ppb	< 0.1	Zinc (Zn)	0.5 ppb	< 0.2
Mercury (Hg)	0.1 ppb	< 0.02	Zirconium (Zr)	0.1 ppb	< 0.1
Molybdenum (Mo)	0.1 ppb	< 0.1			

Analyte	Maximum Specification	Actual Value (in ppm)	Analyte	Maximum Specification	Actual Value (in ppm)
Chloride (Cl^-)	0.2 ppm	< 0.2	Total Sulphur (S)	0.3 ppm	< 0.3
Total Phosphorus (P)	0.01 ppm	< 0.01			

Certified by: Daniel Boisvert
Daniel Boisvert, Chemist

Certification Date: **February 13, 2012**

To maintain product integrity and reduce the risk of trace metal contamination: the inner pack of plastic bags and bottle should be opened under CLASS 100 particle conditions to maintain the integrity of the product. The use of safety apparel, as well as eye protection, plastic gloves, hair net and a clean room suit is also advised. The Material Safety Data Sheet and this Certificate of Analysis are available on our web site. **SCP SCIENCE** is ISO 9001:2008 registered and ISO 17025 accredited (Également disponible en français).

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www.scpscience.com

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #34308, Conc. HCL - Rec 07/18/12 MMZ

SOLVENT

Created By: MMZ
Created: 07/18/2012 14:18
Expires: 07/18/2014

Volume of Standard: 2500 mL
Manufacturer: SCP SCIENCE
Manufacturer Lot ID: SCA2124881

Lot ID: 402100
Part ID: 250-038-151
Standard ID: RGNT153

Notes: Conc. HCL - Rec 07/18/12 MMZ

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4002c/402100_COA.PDF

Compound Name and Concentration for Standard #34308

Compound Name	Concentration	Compound Name	Concentration
Hydrochloric Acid			

SCP SCIENCE 402100 REC.07/10/12 BY MMZ Exp. __/__/__ By __

Providing Innovative Solutions to Analytical Chemis...

Certificate of Analysis

*Plasma*PURE — Hydrochloric Acid (34 - 37% HCl)

Catalogue Number: 250-038-151 / 250-038-155

Opened Bottle Expiry Information
15 months after opening, up to unopened expiration date
_____
Date bottle opened

Lot Number: **SCA2124881**
Assay (HCl w/w): 35%
Colour (APHA): < 10 (Specification: Max 10)
Expiry Date: **December 2014**

Analyte	Maximum Specification	Actual Value (in ppb)	Analyte	Maximum Specification	Actual Value (in ppb)
Aluminum (Al)	1 ppb	< 0.5	Neodymium (Nd)	0.1 ppb	< 0.1
Antimony (Sb)	0.5 ppb	< 0.1	Nickel (Ni)	0.5 ppb	< 0.1
Arsenic (As)	0.5 ppb	< 0.1	Niobium (Nb)	0.1 ppb	< 0.1
Barium (Ba)	0.1 ppb	< 0.1	Palladium (Pd)	Information Only	< 0.5
Beryllium (Be)	0.1 ppb	< 0.1	Platinum (Pt)	Information Only	< 0.5
Bismuth (Bi)	0.1 ppb	< 0.1	Potassium (K)	1 ppb	< 0.1
Boron (B)	1 ppb	< 0.5	Praseodymium (Pr)	0.1 ppb	< 0.1
Cadmium (Cd)	0.1 ppb	< 0.1	Rhenium (Re)	0.1 ppb	< 0.1
Calcium (Ca)	1 ppb	< 0.5	Rhodium (Rh)	0.1 ppb	< 0.1
Cerium (Ce)	0.1 ppb	< 0.1	Rubidium (Rb)	0.1 ppb	< 0.1
Cesium (Cs)	0.1 ppb	< 0.1	Ruthenium (Ru)	0.1 ppb	< 0.1
Chromium (Cr)	0.5 ppb	< 0.1	Samarium (Sm)	0.1 ppb	< 0.1
Cobalt (Co)	0.1 ppb	< 0.1	Scandium (Sc)	0.1 ppb	< 0.1
Copper (Cu)	0.5 ppb	< 0.1	Selenium (Se)	1 ppb	< 0.1
Dysprosium (Dy)	0.1 ppb	< 0.1	Silver (Ag)	1 ppb	< 0.1
Erbium (Er)	0.1 ppb	< 0.1	Sodium (Na)	1 ppb	< 0.5
Europium (Eu)	0.1 ppb	< 0.1	Strontium (Sr)	0.1 ppb	< 0.1
Gadolinium (Gd)	0.1 ppb	< 0.1	Tantalum (Ta)	Information Only	< 1
Gallium (Ga)	0.1 ppb	< 0.1	Tellurium (Te)	0.1 ppb	< 0.1
Gold (Au)	0.5 ppb	< 0.1	Terbium (Tb)	0.1 ppb	< 0.1
Hafnium (Hf)	0.1 ppb	< 0.1	Thallium (Tl)	0.1 ppb	< 0.1
Holmium (Ho)	0.1 ppb	< 0.1	Thorium (Th)	0.1 ppb	< 0.1
Indium (In)	0.1 ppb	< 0.1	Thulium (Tm)	0.1 ppb	< 0.1
Iron (Fe)	1 ppb	< 0.5	Tin (Sn)	0.5 ppb	< 0.1
Lanthanum (La)	0.1 ppb	< 0.1	Titanium (Ti)	0.5 ppb	< 0.1
Lead (Pb)	0.1 ppb	< 0.1	Tungsten (W)	0.1 ppb	< 0.1
Lithium (Li)	0.1 ppb	< 0.1	Uranium (U)	0.1 ppb	< 0.1
Lutetium (Lu)	0.1 ppb	< 0.1	Vanadium (V)	0.5 ppb	< 0.1
Magnesium (Mg)	0.5 ppb	< 0.5	Ytterbium (Yb)	0.1 ppb	< 0.1
Manganese (Mn)	0.1 ppb	< 0.1	Yttrium (Y)	0.1 ppb	< 0.1
Mercury (Hg)	0.1 ppb	< 0.02	Zinc (Zn)	1 ppb	< 0.5
Molybdenum (Mo)	0.1 ppb	< 0.1	Zirconium (Zr)	0.1 ppb	< 0.1

Analyte	Maximum Specification	Actual Value (in ppm)	Analyte	Maximum Specification	Actual Value (in ppm)
Bromide (Br^-)	10 ppm	< 10	Total Sulphur (S)	0.3 ppm	< 0.3
Total Phosphorus (P)	0.01 ppm	< 0.01	Free Chlorine (Cl_2)	0.5 ppm	< 0.5

Certified by: Daniel Boisvert
Daniel Boisvert, Chemist

Certification Date: **December 23, 2011**

To maintain product integrity and reduce the risk of trace metal contamination: the inner pack of plastic bags and bottle should be opened under CLASS 100 particle conditions to maintain the integrity of the product. The use of safety apparel, as well as eye protection, plastic gloves, hair net and a clean room suit is also advised. The Material Safety Data Sheet and this Certificate of Analysis are available on our web site. **SCP SCIENCE** is ISO 9001:2008 registered and ISO 17025 accredited (Également disponible en français).

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Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #34855, Metals SRM TORT-2 - Rec'd 07/25/12

STOCK STANDARD

Created By: MMZ
Created: 07/25/2012 09:37
Expires: 07/25/2014

Volume of Standard:
Manufacturer: NRC CNRC
Manufacturer Lot ID: TORT-2

Lot ID: 402129
Part ID: TORT-2
Standard ID: SRM TORT-2

Notes: Metals SRM TORT-2 - Rec'd 07/25/12

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4002c/402129_COA.PDF

Compound Name and Concentration for Standard #34855

Compound Name	Concentration	Compound Name	Concentration
Arsenic	21.6 mg/kg	Mercury	.27 mg/kg
Calcium	26.7 mg/kg	Molybdenum	.95 mg/kg
Chromium	.77 mg/kg	Nickel	2.5 mg/kg
Cobalt	.51 mg/kg	Selenium	5.63 mg/kg
Copper	106 mg/kg	Strontium	45.2 mg/kg
Iron	105 mg/kg	Vanadium	1.64 mg/kg
Lead	.35 mg/kg	Zinc	180 mg/kg
Manganese	13.6 mg/kg		

Certified Reference Material

National Research Council Canada | Conseil national de recherches Canada

402129
REC.07/25/12 BY NMZ
Exp. __/__/__ By __

TORT-2

Lobster Hepatopancreas Reference Material for Trace Metals

The following table lists those elements for which certified values have been established. Certified values and their uncertainties are reported as mass fractions (based on dry mass). The uncertainties represent 95% confidence limits for an individual subsample. That is, 95% of samples, 250 mg or greater, from any bottle would be expected to have concentrations within the specified range 95% of the time.

Trace Metal Mass Fractions (mg/kg)

Arsenic (g,h,m)	**21.6**	**±**	**1.8**
Cadmium (g,p)	**26.7**	**±**	**0.6**
Chromium (g,p)	**0.77**	**±**	**0.15**
Cobalt (g,m)	**0.51**	**±**	**0.09**
Copper (g,i,p)	**106**	**±**	**10**
Iron (g,i)	**105**	**±**	**13**
Lead (g,p)	**0.35**	**±**	**0.13**
Manganese (g,i,m)	**13.6**	**±**	**1.2**
Mercury (c,e)	**0.27**	**±**	**0.06**
Molybdenum (g,p)	**0.95**	**±**	**0.10**
Nickel (g,p)	**2.50**	**±**	**0.19**
Selenium (g,h,q)	**5.63**	**±**	**0.67**
Strontium (i,p)	**45.2**	**±**	**1.9**
Tin (p)	**(0.04)***		
Vanadium (g,i,m)	**1.64**	**±**	**0.19**
Zinc (g,i,p)	**180**	**±**	**6**
Methylmercury(as Hg) (e,t)	**0.152**	**±**	**0.013**

***information value only**

c - cold vapour atomic absorption spectrometry
e - cold vapour microwave induced plasma atomic emission spectrometry
g - graphite furnace atomicabsorption spectrometry (GFAAS)
h - hydride generation GFAAS
i - inductively coupled plasma atomic emission spectrometry
m- inductively coupled plasma mass spectrometry (ICPMS)
p - isotope dilution inductively coupled plasma mass spectrometry
q - isotope dilution hydride generation ICPMS
t - gas chromatography - electron capture detection

The coding refers only to the ultimate method of analyte determination. Methods of sample preparation or decomposition are available by request.

NRC · CNRC

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #36242, Hg Calibration Intermediate

WORKING STANDARD

Created By: DS1
Created: 08/14/2012 11:13
Expires: 02/14/2013

Volume of Standard: 100 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: Hg Cal Int

Notes: Hg Calibration Intermediate

Compound Name and Concentration for Standard #36242

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Nitric Acid	ug/L
Mercury	1000 ug/L		

Composed of Information for Standard #36242

Composed of Standard Seq	Notes	Volume	Units
33985	Mercury Stock Standard - Rec. 06/14/12,	0.1	mL
22391	Conc. Nitric Acid - Rec 06/10/11	3	mL
995	DI WATER	96.9	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #36269, Biota Spike Silver

WORKING STANDARD

Created By: DS1
Created: 08/14/2012 13:14
Expires: 01/01/2013

Volume of Standard: 100 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: 6000-SPKB3

Notes: Biota Spike Silver

Compound Name and Concentration for Standard #36269

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Tin	10000 ug/L
Silicon	50000 ug/L	Zirconium	10000 ug/L
Boron	10000 ug/L	Silver	5000 ug/L
Molybdenum	10000 ug/L	Titanium	10000 ug/L
Antimony	10000 ug/L	Nitric Acid	ug/L

Composed of Information for Standard #36269

Composed of Standard Seq	Notes	Volume	Units
22391	Conc. Nitric Acid - Rec 06/10/11	10	mL
20870	Metals Trace2 Secondary - Rec'd 12/03/11	5	mL
995	DI WATER	85	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #37662, ICPMS Magnesium Tune Intermediate

WORKING STANDARD

Created By: DS1
Created: 09/04/2012 08:41
Expires: 03/04/2013

Volume of Standard: 100 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: Mg Tune Int

Notes: ICPMS Magnesium Tune Intermediate

Compound Name and Concentration for Standard #37662

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Nitric Acid	ug/L
Magnesium	10000 ug/L		

Composed of Information for Standard #37662

Composed of Standard Seq	Notes	Volume	Units
34289	Conc. Nitric Acid - Rec 07/18/12 MMZ	3	mL
32145	Magnesium Stock Standard - Rec'd 06/15/1	0.1	mL
995	DI WATER	96.9	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #37663, ICPMS Tune Intermediate

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WORKING STANDARD

Created By: DS1
Created: 09/04/2012 08:44
Expires: 03/01/2013

Volume of Standard: 100 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: ICPM-TuneInt

Notes: ICPMS Tune Intermediate

Compound Name and Concentration for Standard #37663

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Uranium	1000 ug/L
Barium	1000 ug/L	Nitric Acid	ug/L
Boron	1000 ug/L	Scandium	1000 ug/L
Cerium	1000 ug/L	Bismuth	1000 ug/L
Lead	1000 ug/L	Germanium	1000 ug/L
Nickel	1000 ug/L	Indium	1000 ug/L
Beryllium	1000 ug/L	Terbium	1000 ug/L
Cobalt	1000 ug/L	Yttrium	1000 ug/L
Lithium	1000 ug/L	Magnesium	1000 ug/L

Composed of Information for Standard #37663

Composed of Standard Seq	Notes	Volume	Units
37662	ICPMS Magnesium Tune Intermediate	10	mL
34289	Conc. Nitric Acid - Rec 07/18/12 MMZ	2	mL
26596	Lithium Stock Standard Rec'd 3/16/12	0.01	mL
24683	ICPMS Internal Standard Stock - Rec 03/0	1	mL
24681	Scandium Primary Standard - Rec 03/16/11	1	mL
18040	Uranium Secondary Standard - Rec 10/26/2	0.1	mL
5183	Cobalt Stock Standard, Rec 09/10/10,Open	0.1	mL
4892	Beryllium Stock Standard - Rec 09/10/10,	0.1	mL
4891	Nickel Stock Standard - Rec 09/10/10, Op	0.1	mL
1285	Lead Stock Standard - Rec'd 2/26/10, Ope	0.1	mL
1270	Cerium Stock Standard - Rec'd 8/18/09, O	0.1	mL
1257	Boron Stock Standard - Rec'd 5/10/10, Op	0.1	mL
1256	Barium Stock Standard - Rec'd 12/20/09,	0.1	mL
995	DI WATER	85.19	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #37851, Gold Primary Standard - Rec 09/04/12

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STOCK STANDARD

Created By: DS1
Created: 09/05/2012 16:02
Expires: 10/01/2013

Volume of Standard: 500 mL
Manufacturer: Inorganic Ventures
Manufacturer Lot ID: F2-AU04014

Lot ID: 402219
Part ID: CGAU1-5
Standard ID: Au-STK

Notes: Gold Primary Standard - Rec 09/04/12

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4002c/402219_COA.PDF

Compound Name and Concentration for Standard #37851

Compound Name	Concentration	Compound Name	Concentration
Gold	1000 ug/mL		

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 • USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

tel: 800.669.6799 • 540.585.3030
fax: 540.585.3012
info@inorganicventures.com

402219

Rec. 9/4/12

402219
REC.09/05/12 BY DS
Exp. __/__/__ By -

1.0 **INORGANIC VENTURES** is an ISO Guide 34 "General Requirements for the Competence of Reference Material Producers" and ISO 9001 registered manufacturer. Our manufacturing laboratory is accredited to ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories."

ACCREDITED Testing Laboratory Certificate 883.01 — ACCREDITED Reference Material Producer Certificate 883.02

2.0 **DESCRIPTION OF CRM** **1000 µg/mL Gold in 10% (v/v) HCl**

Catalog Number:	CGAU1-1, CGAU1-2, and CGAU1-5
Lot Number:	**F2-AU04014**
Starting Material:	HAuCl4xH2O
Starting Material Purity (%):	99.9973
Starting Material Lot No:	1699
Matrix:	10% (v/v) HCl

H37851 Au-STK STOCK
01-OCT-13
DESC: Gold Primary Standard
LOT NUMBER: 402219
MANUFACTURER: Inorganic Ventures
NOTES: Gold Primary Standard - Rec 09/04/12
CREATED: 05-SEP-12 BY: DS1
EXPIRES: 01-OCT-13 COMPOUND COUNT: 1

3.0 **CERTIFIED VALUES AND UNCERTAINTIES**

Certified Concentration: 1,001 ± 5 µg/mL - weighted mean

Certified Density: 1.017 g/mL (measured at 20 ± 1°C)

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Certified Value $(\bar{x}) = \frac{\sum x_i}{n}$

$(\bar{x})$ = mean
x_i = individual results
n = number of measurements

Uncertainty (±) = $2\,[\,\Sigma(s_i)^2\,]^{1/2}$

2 = the coverage factor.
$[\,\Sigma(s_i)^2\,]^{1/2}$ = The square root of the sum of the squares of the most common errors (where 's' stands for the standard deviation) from instrumental measurement, density, NIST SRM uncertainty, weighing, dilution to volume, homogeneity, long term stability and short term stability.

4.0 **TRACEABILITY TO NIST AND VALUES OBTAINED BY INDEPENDENT METHODS**

· "Property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties." (ISO VIM, 2nd ed., 1993, definition 6.10)

· This product is Traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRMs are available, the term 'in-house std.' is specified.

4.1 **Assay Method #1** **1,002 ± 3 µg/mL**
ICP Assay NIST SRM 3121 Lot Number: 991806

Assay Method #2 **1,000 ± 3 µg/mL**
Calculated NIST SRM Lot Number: See Sec. 4.2

4.2 **BALANCE CALIBRATION -** All analytical balances are calibrated yearly by an A2LA accredited calibration laboratory and are traceable to a class E 2 analytical weight set with NIST Traceability. All balances are checked daily using an in-house procedure. The weights used for testing are annually compared to master weights and are traceable to the National Institute of Standards and Technology (NIST).

4.3 **THERMOMETER CALIBRATION -** All thermometers are NIST traceable through thermometers that are calibrated by an A2LA accredited calibration laboratory.

4.4 **GLASSWARE CALIBRATION -** An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM's.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP/MS AND ICP-OES IN µg/mL

CRM's solutions are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

O	Al	0.002073	M	Dy	< 0.046350	O	Li	< 0.000020	M	Pr	< 0.002318	M	Te	< 0.231751
M	Sb	< 0.003863	M	Er	< 0.038625	M	Lu	< 0.003090	M	Re	< 0.007725	M	Tb	< 0.002318
O	As	< 0.020000	M	Eu	< 0.023175	O	Mg	0.001037	M	Rh	0.000400	M	Tl	< 0.007725
M	Ba	0.000170	M	Gd	< 0.007725	O	Mn	0.000130	M	Rb	< 0.007725	M	Th	< 0.007725
M	Be	< 0.003863	M	Ga	< 0.007725	O	Hg	< 0.012000	M	Ru	< 0.015450	M	Tm	< 0.003090
M	Bi	0.000100	M	Ge	< 0.046350	M	Mo	< 0.015450	M	Sm	< 0.007725	M	Sn	0.000701
M	B	0.002403	s	Au		M	Nd	< 0.015450	M	Sc	< 0.077250	M	Ti	< 0.386251
M	Cd	0.000250	M	Hf	< 0.015450	O	Ni	0.000467	O	Se	< 0.050000	M	W	< 0.077250
O	Ca	0.006738	M	Ho	< 0.003863	M	Nb	< 0.003863	O	Si	0.004536	M	U	< 0.015450
M	Ce	< 0.038625	M	In	< 0.077250	n	Os		M	Ag	0.025026	O	V	< 0.001000
M	Cs	< 0.002318	M	Ir	< 0.038625	O	Pd	0.000907	O	Na	0.004536	M	Yb	< 0.007725
O	Cr	0.000518	O	Fe	0.004276	O	P	< 0.040000	M	Sr	< 0.003863	M	Y	< 0.309001
M	Co	< 0.023175	M	La	< 0.003863	O	Pt	0.001555	O	S	< 0.025000	O	Zn	0.001296
M	Cu	0.000200	O	Pb	< 0.006500	O	K	< 0.001800	M	Ta	< 0.054075	M	Zr	< 0.038625

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

For the calibration of analytical instruments including but not limited to the following:
HPLC, IC, TLC, ISE, IR, NMR, UV/VIS, MS, Capillary Eletrophoresis, Potentiometry, Wet Chemistry and Voltammetry
For the validation of analytical methods
For the preparation of "working reference samples"
For interference studies and the determination of correction coefficients
For detection limit and linearity studies
For additional intended uses, contact Technical Staff

This CRM was manufactured using 18 megohm doubly deionized water that has been filtered through a 0.2 micron filter.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

Storage & Handling - Keep tightly sealed when not in use. Store and use at 20 ± 4°C. Do not pipet from container. Do not return portions removed for pipetting to container.

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 196.9665; +3; 6; Au(Cl)63-

Chemical Compatibility - Stable in HCl, and HNO3, as the chloride complex. **Avoid** basic media. Stable with most metals and inorganic anions in acidic media.

Stability - 2-100 ppb levels. 2-10 ppb Au is stable for #1day maximum in 1% HNO3 / LDPE container. 100 ppb is stable for #2 days maximum in 1% HNO3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 10% HCl / LDPE container.

Au Containing Samples (Preparation and Solution) - Metal (Aqua Regia); Oxides (Soluble in HCl); Ores (Dissolve in HCl / HNO3).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	Estimated D.L.	Order	Type	Interferences (underlined indicates severe)
ICP-OES 242.795 nm	0.02 / 0.003 µg/mL	1	atom	Mn, Os, Th, Ta, Pt Co, F,
ICP-OES 267.595 nm	0.03 / 0.003 µg/mL	1	atom	Nb, Ta, U, Cr, Th, Rh, Ru
ICP-OES 208.209 nm	0.04 / 0.01 µg/mL	1	ion	Ir, Re
ICP-MS 197 amu	5 ppt	n/a	M+	181Ta16O

Uranium Note: If uranium is present in this standard, it is natural abundance unless specified in Section 3.0.

8.0 HAZARDOUS INFORMATION - Please refer to the enclosed Material Safety Data sheet for information regarding this CRM.

9.0 HOMOGENEITY - This solution was mixed according to an in house procedure and is guaranteed to be homogeneous. Inorganic Ventures homogeneity data indicate that the end user should take a minimum sample size of 0.2mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration
- QMI File Number 010105

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration"
- Chemical Testing - Accredited A2LA Certificate Number 883.01

10.3 ISO/IEC Guide 34 "General Requirements for the Competence of Reference Material Producers"
- Reference Materials Production - Accredited A2LA Certificate Number 883.02

10.4 10CFR50 Appendix B - Nuclear Regulatory Commission
- Domestic Licensing of Production and Utilization Facilities

10.5 10CFR21 - Nuclear Regulatory Commission
- Reporting Defects and Non-Compliance

11.0 DATE OF CERTIFICATION AND PERIOD OF VALIDITY

11.1 Shelf Life - The period of time during which the concentration of the analyte(s) in a properly packaged, unopened, and unused standard stored under environmentally controlled and monitored conditions will remain within the specified uncertainty range. Shelf life is limited primarily by transpiration (loss of water from the solution) and infrequently, by chemical instability.

11.2 Expiration Date - The date after which a CRM should not be used. Routine laboratory use of a CRM increases transpiration losses and the chance of contamination which affect the integrity of the CRM and limit its useful life. Manufacturer concurs with state and federal regulatory agencies' recommendations that solution standards be assigned a one-year expiration date.

11.3 Chemical Stability - Studies have been conducted on this or similar CRMs and it has been demonstrated that this CRM is chemically stable for a period of not less than two years provided the "Storage & Handling" conditions are followed that are described in section 7.0.

Certification Date: June 19, 2012

Expiration Date: EXPIRES 01/2013

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By:	Stephan Blaakman Product Documentation Technician	
Certificate Approved By:	Beth Day Quality Assurance Specialist	
Certifying Officer:	Paul Galnes PhD., Senior Technical Director	

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #39298, 1:1 HNO3

WORKING STANDARD

Created By: MMZ
Created: 09/26/2012 10:06
Expires: 03/26/2013

Volume of Standard: 2400 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: RGNT014

Notes: 1:1 HNO3

Compound Name and Concentration for Standard #39298

Compound Name	Concentration	Compound Name	Concentration
Water		Nitric Acid	

Composed of Information for Standard #39298

Composed of Standard Seq	Notes	Volume	Units
34289	Conc. Nitric Acid - Rec 07/18/12 MMZ	1200	mL
995	DI WATER	1200	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #39311, ICPMS Tune Solution

WORKING STANDARD

Created By: DS1
Created: 09/26/2012 10:59
Expires: 03/01/2013

Volume of Standard: 500 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: ICPM-Tune

Notes: ICPMS Tune Solution

Compound Name and Concentration for Standard #39311

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Lithium	10 ug/L
Nitric Acid	ug/L	Uranium	10 ug/L
Barium	10 ug/L	Scandium	10 ug/L
Boron	10 ug/L	Bismuth	10 ug/L
Cerium	10 ug/L	Germanium	10 ug/L
Lead	10 ug/L	Indium	10 ug/L
Nickel	10 ug/L	Terbium	10 ug/L
Beryllium	10 ug/L	Yttrium	10 ug/L
Cobalt	10 ug/L	Magnesium	10 ug/L

Composed of Information for Standard #39311

Composed of Standard Seq	Notes	Volume	Units
37663	ICPMS Tune Intermediate	5	mL
34289	Conc. Nitric Acid - Rec 07/18/12 MMZ	10	mL
995	DI WATER	485	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #39560, ICPMS Blank Water

WORKING STANDARD

Created By: DS1
Created: 10/01/2012 13:12
Expires: 04/01/2012

Volume of Standard: 1000 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: ICPM-BLKH2O

Notes: ICPMS Blank Water

Compound Name and Concentration for Standard #39560

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Hydrochloric Acid	ug/L
Nitric Acid	ug/L		

Composed of Information for Standard #39560

Composed of Standard Seq	Notes	Volume	Units
34289	Conc. Nitric Acid - Rec 07/18/12 MMZ	100	mL
22392	Conc. HCL - Rec 06/10/11	50	mL
995	DI WATER	850	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #39691, ICPMS X-Calibration Solution

WORKING STANDARD

Created By: DS1
Created: 10/03/2012 11:46
Expires: 04/03/2013

Volume of Standard: 100 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: ICPM-XCal

Notes: ICPMS X-Calibration Solution

Compound Name and Concentration for Standard #39691

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Uranium	50 ug/L
Beryllium	50 ug/L	Cerium	50 ug/L
Boron	50 ug/L	Cesium	50 ug/L
Sodium	50 ug/L	Neodymium	50 ug/L
Magnesium	50 ug/L	Lithium	50 ug/L
Aluminum	50 ug/L	Strontium	50 ug/L
Potassium	50 ug/L	Indium	50 ug/L
Calcium	50 ug/L	Rubidium	50 ug/L
Vanadium	50 ug/L	Scandium	50 ug/L
Chromium	50 ug/L	Yttrium	50 ug/L
Iron	50 ug/L	Antimony	50 ug/L
Manganese	50 ug/L	Germanium	50 ug/L
Lanthanum	50 ug/L	Hafnium	50 ug/L
Cobalt	50 ug/L	Molybdenum	50 ug/L
Nickel	50 ug/L	Niobium-94	50 ug/L
Copper	50 ug/L	Silicon	50 ug/L
Zinc	50 ug/L	Silver	50 ug/L
Arsenic	50 ug/L	Tantalum	50 ug/L
Selenium	50 ug/L	Tellurium	50 ug/L
Cadmium	50 ug/L	Tin	50 ug/L
Barium	50 ug/L	Titanium	50 ug/L
Thallium	50 ug/L	Zirconium	50 ug/L
Lead	50 ug/L	Nitric Acid	ug/L
Bismuth	50 ug/L	Hydrochloric Acid	ug/L

Composed of Information for Standard #39691

Composed of Standard Seq	Notes	Volume	Units
34308	Conc. HCL - Rec 07/18/12 MMZ	5	mL
34289	Conc. Nitric Acid - Rec 07/18/12 MMZ	10	mL
29180	ICPMS X-Cal Stock Standard 2 - Rec'd 4/2	0.5	mL
29179	ICPMS X-Cal Stock Standard 1 - Rec'd 4/2	0.5	mL
995	DI WATER	84	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #39693, ICPMS ICV

WORKING STANDARD

Created By: DS1
Created: 10/03/2012 12:45
Expires: 11/10/2012

Volume of Standard: 200 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: 6020-ICV

Notes: ICPMS ICV

Compound Name and Concentration for Standard #39693

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Manganese	110 ug/L
Phosphorus	5500 ug/L	Nickel	110 ug/L
Silicon	5500 ug/L	Lead	110 ug/L
Aluminum	5500 ug/L	Selenium	110 ug/L
Calcium	5500 ug/L	Strontium	110 ug/L
Iron	5500 ug/L	Thallium	110 ug/L
Potassium	5500 ug/L	Vanadium	110 ug/L
Magnesium	5500 ug/L	Zinc	110 ug/L
Sodium	5500 ug/L	Boron	110 ug/L
Uranium	110 ug/L	Molybdenum	110 ug/L
Arsenic	110 ug/L	Antimony	110 ug/L
Barium	110 ug/L	Tin	110 ug/L
Beryllium	110 ug/L	Zirconium	110 ug/L
Cadmium	110 ug/L	Silver	55 ug/L
Cobalt	110 ug/L	Titanium	110 ug/L
Chromium	110 ug/L	Hydrochloric Acid	ug/L
Copper	110 ug/L	Nitric Acid	ug/L
Lithium	110 ug/L	Mercury	4 ug/L

Composed of Information for Standard #39693

Composed of Standard Seq	Notes	Volume	Units
34308	Conc. HCL - Rec 07/18/12 MMZ	10	mL
34289	Conc. Nitric Acid - Rec 07/18/12 MMZ	20	mL
31735	Metals Minerals Secondary - Rec'd 06/08/	0.55	mL
31734	Metals Trace2 Secondary - Rec'd 06/08/12	0.11	mL
31733	Metals Trace Secondary - Rec'd 6/08/12	0.11	mL
29998	Mercury ICV Int	0.08	mL
18040	Uranium Secondary Standard - Rec 10/26/2	0.022	mL
1295	Silicon Secondary Stock Standard - Rec 0	0.99	mL
1287	Phosphorus Secondary Standard - Rec 2/4/	1.078	mL
995	DI WATER	166.994	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #39694, ICPMS Mineral Cal. Int

WORKING STANDARD

Created By: DS1
Created: 10/03/2012 13:05
Expires: 03/15/2013

Volume of Standard: 100 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: M Cal Int

Notes: ICPMS Mineral Cal. Int

Compound Name and Concentration for Standard #39694

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Iron	500000 ug/L
Nitric Acid	ug/L	Potassium	500000 ug/L
Aluminum	500000 ug/L	Magnesium	500000 ug/L
Calcium	500000 ug/L	Sodium	500000 ug/L

Composed of Information for Standard #39694

Composed of Standard Seq	Notes	Volume	Units
34289	Conc. Nitric Acid - Rec 07/18/12 MMZ	3	mL
26667	Metals Mineral Primary Standard, Rec 03/	50	mL
995	DI WATER	47	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #39695, ICPMS Trace Cal Int

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WORKING STANDARD

Created By: DS1
Created: 10/03/2012 13:12
Expires: 03/15/2013

Volume of Standard: 200 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: T Cal Int

Notes: ICPMS Trace Cal Int

Compound Name and Concentration for Standard #39695

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Strontium	1250 ug/L
Phosphorus	62500 ug/L	Thallium	1250 ug/L
Hydrochloric Acid	ug/L	Vanadium	1250 ug/L
Arsenic	1250 ug/L	Zinc	1250 ug/L
Barium	1250 ug/L	Silicon	62500 ug/L
Beryllium	1250 ug/L	Boron	1250 ug/L
Cadmium	1250 ug/L	Molybdenum	1250 ug/L
Cobalt	1250 ug/L	Antimony	1250 ug/L
Chromium	1250 ug/L	Tin	1250 ug/L
Copper	1250 ug/L	Zirconium	1250 ug/L
Lithium	1250 ug/L	Silver	625 ug/L
Manganese	1250 ug/L	Titanium	1250 ug/L
Nickel	1250 ug/L	Uranium	1250 ug/L
Lead	1250 ug/L	Nitric Acid	ug/L
Selenium	1250 ug/L		

Composed of Information for Standard #39695

Composed of Standard Seq	Notes	Volume	Units
34308	Conc. HCL - Rec 07/18/12 MMZ	10	mL
34289	Conc. Nitric Acid - Rec 07/18/12 MMZ	20	mL
30949	Silicon Primary Standard - Rec 05/25/12	11.25	mL
30948	Uranium Stock STandard - Rec'd 5/25/12,	0.25	mL
26666	Metals Trace2 Primary Standard - Rec'd 3	2.5	mL
26665	Metals Trace Primary Standard - Rec'd 3/	2.5	mL
7079	Phosphorus Primary Standard - Rec 5/12/1	1.225	mL
995	DI WATER	152.275	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #39698, 6020 ICSA

WORKING STANDARD

Created By: DS1
Created: 10/03/2012 13:33
Expires: 02/14/2013

Volume of Standard: 100 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: 6020-ICSA

Notes: 6020 ICSA

Compound Name and Concentration for Standard #39698

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Molybdenum	1000 ug/L
Hydrochloric Acid	ug/L	Titanium	1000 ug/L
Sodium	50000 ug/L	Phosphorus	50000 ug/L
Magnesium	50000 ug/L	Sulfur	50000 ug/L
Aluminum	50000 ug/L	Chloride	360000 ug/L
Potassium	50000 ug/L	Carbon	100000 ug/L
Calcium	50000 ug/L	Nitric Acid	ug/L
Iron	50000 ug/L		

Composed of Information for Standard #39698

Composed of Standard Seq	Notes	Volume	Units
34308	Conc. HCL - Rec 07/18/12 MMZ	5	mL
34289	Conc. Nitric Acid - Rec 07/18/12 MMZ	10	mL
24685	ICSA, ICSAB Stock Standard - Rec 08/04/1	10	mL
995	DI WATER	75	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #39699, 6020 ICSAB

WORKING STANDARD

Created By: DS1
Created: 10/03/2012 13:33
Expires: 02/14/2013

Volume of Standard: 100 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: 6020-ICSAB

Notes: 6020 ICSAB

Compound Name and Concentration for Standard #39699

Compound Name	Concentration	Compound Name	Concentration
Water	ug/mL	Cobalt	.1 ug/mL
Hydrochloric Acid	ug/mL	Chromium	.1 ug/mL
Sodium	50 ug/mL	Copper	.1 ug/mL
Magnesium	50 ug/mL	Lithium	.1 ug/mL
Aluminum	50 ug/mL	Manganese	.1 ug/mL
Potassium	50 ug/mL	Nickel	.1 ug/mL
Calcium	50 ug/mL	Lead	.1 ug/mL
Iron	50 ug/mL	Selenium	.1 ug/mL
Molybdenum	1.1 ug/mL	Strontium	.1 ug/mL
Titanium	1.1 ug/mL	Thallium	.1 ug/mL
Phosphorus	55 ug/mL	Vanadium	.1 ug/mL
Sulfur	50 ug/mL	Zinc	.1 ug/mL
Chloride	360 ug/mL	Silicon	5 ug/mL
Carbon	100 ug/mL	Boron	.1 ug/mL
Nitric Acid	ug/mL	Antimony	.1 ug/mL
Mercury	.005 ug/mL	Tin	.1 ug/mL
Arsenic	.1 ug/mL	Zirconium	.1 ug/mL
Barium	.1 ug/mL	Silver	.05 ug/mL
Beryllium	.1 ug/mL	Uranium	.1 ug/mL
Cadmium	.1 ug/mL		

Composed of Information for Standard #39699

Composed of Standard Seq	Notes	Volume	Units
39695	ICPMS Trace Cal Int	8	mL
36242	Hg Calibration Intermediate	0.5	mL
34308	Conc. HCL - Rec 07/18/12 MMZ	5	mL
34289	Conc. Nitric Acid - Rec 07/18/12 MMZ	10	mL
24685	ICSA, ICSAB Stock Standard - Rec 08/04/1	10	mL
995	DI WATER	66.5	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #39700, ICPMS Biota Spike **Made 05/04/2012**

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WORKING STANDARD

Created By: DS1
Created: 10/03/2012 13:44
Expires: 12/01/2012

Volume of Standard: 100 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: 6000-SPKB

Notes: ICPMS Biota Spike Made 05/04/2012 MMZ

Compound Name and Concentration for Standard #39700

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Cobalt	10000 ug/L
Phosphorus	1000000 ug/L	Chromium	10000 ug/L
Aluminum	500000 ug/L	Copper	10000 ug/L
Calcium	500000 ug/L	Lithium	10000 ug/L
Iron	500000 ug/L	Manganese	10000 ug/L
Potassium	2000000 ug/L	Nickel	10000 ug/L
Magnesium	500000 ug/L	Lead	10000 ug/L
Sodium	500000 ug/L	Selenium	10000 ug/L
Uranium	10000 ug/L	Strontium	10000 ug/L
Mercury	250 ug/L	Thallium	10000 ug/L
Arsenic	10000 ug/L	Vanadium	10000 ug/L
Barium	10000 ug/L	Zinc	10000 ug/L
Beryllium	10000 ug/L	Nitric Acid	ug/L
Cadmium	10000 ug/L		

Composed of Information for Standard #39700

Composed of Standard Seq	Notes	Volume	Units
31735	Metals Minerals Secondary - Rec'd 06/08/	25	mL
31733	Metals Trace Secondary - Rec'd 6/08/12	5	mL
29588	Potassium Stock Standard - Rec 01/21/11,	15	mL
22391	Conc. Nitric Acid - Rec 06/10/11	6	mL
19251	Rec 11/15/11, Opened 11/17/11	0.025	mL
18040	Uranium Secondary Standard - Rec 10/26/2	1	mL
5659	Phosphorus Secondary Standard - Rec 03/0	9.9	mL
995	DI WATER	38.075	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #39995, ICPMS Internal Standard Solution

WORKING STANDARD

Created By: DS1
Created: 10/08/2012 14:11
Expires: 03/01/2013

Volume of Standard: 2000 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: ICPM-IS

Notes: ICPMS Internal Standard Solution

Compound Name and Concentration for Standard #39995

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Indium	100 ug/L
Hydrochloric Acid	ug/L	Terbium	100 ug/L
Scandium	100 ug/L	Yttrium	100 ug/L
Bismuth	100 ug/L	Nitric Acid	ug/L
Germanium	100 ug/L	Gold	2000 ug/L

Composed of Information for Standard #39995

Composed of Standard Seq	Notes	Volume	Units
37851	Gold Primary Standard - Rec 09/04/12	4	mL
34308	Conc. HCL - Rec 07/18/12 MMZ	100	mL
34289	Conc. Nitric Acid - Rec 07/18/12 MMZ	200	mL
24684	ICPMS Internal Standard Stock - Rec 03/0	2	mL
24682	Scandium Primary Standard - Rec 03/16/11	2	mL
995	DI WATER	1692	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #39996, 6020-CAL0 ICPM

WORKING STANDARD

Created By: DS1
Created: 10/08/2012 14:11
Expires: 10/11/2012

Volume of Standard: 150 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: 6020-CAL0

Notes: 6020-CAL0 ICPM

Compound Name and Concentration for Standard #39996

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Lithium	0 ug/L
Mercury	0 ug/L	Manganese	0 ug/L
Nitric Acid	ug/L	Nickel	0 ug/L
Aluminum	0 ug/L	Lead	0 ug/L
Calcium	0 ug/L	Selenium	0 ug/L
Iron	0 ug/L	Strontium	0 ug/L
Potassium	0 ug/L	Thallium	0 ug/L
Magnesium	0 ug/L	Vanadium	0 ug/L
Sodium	0 ug/L	Zinc	0 ug/L
Phosphorus	0 ug/L	Silicon	0 ug/L
Hydrochloric Acid	ug/L	Boron	0 ug/L
Arsenic	0 ug/L	Molybdenum	0 ug/L
Barium	0 ug/L	Antimony	0 ug/L
Beryllium	0 ug/L	Tin	0 ug/L
Cadmium	0 ug/L	Zirconium	0 ug/L
Cobalt	0 ug/L	Silver	0 ug/L
Chromium	0 ug/L	Titanium	0 ug/L
Copper	0 ug/L	Uranium	0 ug/L

Composed of Information for Standard #39996

Composed of Standard Seq	Notes	Volume	Units
39695	ICPMS Trace Cal Int	0	mL
39694	ICPMS Mineral Cal. Int	0	mL
36242	Hg Calibration Intermediate	0	mL
34289	Conc. Nitric Acid - Rec 07/18/12 MMZ	15	mL
22392	Conc. HCL - Rec 06/10/11	7.5	mL
995	DI WATER	127.5	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #39997, 6020-CAL1 ICPM

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WORKING STANDARD

Created By: DS1
Created: 10/08/2012 14:11
Expires: 10/11/2012

Volume of Standard: 50 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: 6020-CAL1

Notes: 6020-CAL1 ICPM

Compound Name and Concentration for Standard #39997

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Lithium	1 ug/L
Mercury	.2 ug/L	Manganese	1 ug/L
Nitric Acid	ug/L	Nickel	1 ug/L
Aluminum	250 ug/L	Lead	1 ug/L
Calcium	250 ug/L	Selenium	1 ug/L
Iron	250 ug/L	Strontium	1 ug/L
Potassium	250 ug/L	Thallium	1 ug/L
Magnesium	250 ug/L	Vanadium	1 ug/L
Sodium	250 ug/L	Zinc	1 ug/L
Phosphorus	50 ug/L	Silicon	50 ug/L
Hydrochloric Acid	ug/L	Boron	1 ug/L
Arsenic	1 ug/L	Molybdenum	1 ug/L
Barium	1 ug/L	Antimony	1 ug/L
Beryllium	1 ug/L	Tin	1 ug/L
Cadmium	1 ug/L	Zirconium	1 ug/L
Cobalt	1 ug/L	Silver	.5 ug/L
Chromium	1 ug/L	Titanium	1 ug/L
Copper	1 ug/L	Uranium	1 ug/L

Composed of Information for Standard #39997

Composed of Standard Seq	Notes	Volume	Units
39695	ICPMS Trace Cal Int	0.04	mL
39694	ICPMS Mineral Cal. Int	0.025	mL
36242	Hg Calibration Intermediate	0.01	mL
34289	Conc. Nitric Acid - Rec 07/18/12 MMZ	5	mL
22392	Conc. HCL - Rec 06/10/11	2.5	mL
995	DI WATER	42.425	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #39998, 6020-CAL2 ICPM

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WORKING STANDARD

Created By: DS1
Created: 10/08/2012 14:11
Expires: 10/11/2012

Volume of Standard: 50 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: 6020-CAL2

Notes: 6020-CAL2 ICPM

Compound Name and Concentration for Standard #39998

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Lithium	5 ug/L
Mercury	.5 ug/L	Manganese	5 ug/L
Nitric Acid	ug/L	Nickel	5 ug/L
Aluminum	500 ug/L	Lead	5 ug/L
Calcium	500 ug/L	Selenium	5 ug/L
Iron	500 ug/L	Strontium	5 ug/L
Potassium	500 ug/L	Thallium	5 ug/L
Magnesium	500 ug/L	Vanadium	5 ug/L
Sodium	500 ug/L	Zinc	5 ug/L
Phosphorus	250 ug/L	Silicon	250 ug/L
Hydrochloric Acid	ug/L	Boron	5 ug/L
Arsenic	5 ug/L	Molybdenum	5 ug/L
Barium	5 ug/L	Antimony	5 ug/L
Beryllium	5 ug/L	Tin	5 ug/L
Cadmium	5 ug/L	Zirconium	5 ug/L
Cobalt	5 ug/L	Silver	2.5 ug/L
Chromium	5 ug/L	Titanium	5 ug/L
Copper	5 ug/L	Uranium	5 ug/L

Composed of Information for Standard #39998

Composed of Standard Seq	Notes	Volume	Units
39695	ICPMS Trace Cal Int	0.2	mL
39694	ICPMS Mineral Cal. Int	0.05	mL
36242	Hg Calibration Intermediate	0.025	mL
34289	Conc. Nitric Acid - Rec 07/18/12 MMZ	5	mL
22392	Conc. HCL - Rec 06/10/11	2.5	mL
995	DI WATER	42.225	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #39999, 6020-CAL3 ICPM

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WORKING STANDARD

Created By: DS1
Created: 10/08/2012 14:11
Expires: 10/11/2012

Volume of Standard: 50 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: 6020-CAL3

Notes: 6020-CAL3 ICPM

Compound Name and Concentration for Standard #39999

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Lithium	50 ug/L
Mercury	1 ug/L	Manganese	50 ug/L
Nitric Acid	ug/L	Nickel	50 ug/L
Aluminum	2500 ug/L	Lead	50 ug/L
Calcium	2500 ug/L	Selenium	50 ug/L
Iron	2500 ug/L	Strontium	50 ug/L
Potassium	2500 ug/L	Thallium	50 ug/L
Magnesium	2500 ug/L	Vanadium	50 ug/L
Sodium	2500 ug/L	Zinc	50 ug/L
Phosphorus	2500 ug/L	Silicon	2500 ug/L
Hydrochloric Acid	ug/L	Boron	50 ug/L
Arsenic	50 ug/L	Molybdenum	50 ug/L
Barium	50 ug/L	Antimony	50 ug/L
Beryllium	50 ug/L	Tin	50 ug/L
Cadmium	50 ug/L	Zirconium	50 ug/L
Cobalt	50 ug/L	Silver	25 ug/L
Chromium	50 ug/L	Titanium	50 ug/L
Copper	50 ug/L	Uranium	50 ug/L

Composed of Information for Standard #39999

Composed of Standard Seq	Notes	Volume	Units
39695	ICPMS Trace Cal Int	2	mL
39694	ICPMS Mineral Cal. Int	0.25	mL
36242	Hg Calibration Intermediate	0.05	mL
34289	Conc. Nitric Acid - Rec 07/18/12 MMZ	5	mL
22392	Conc. HCL - Rec 06/10/11	2.5	mL
995	DI WATER	40.2	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #40000, 6020-CAL4 ICPM

WORKING STANDARD

Created By: DS1 **Volume of Standard:** 50 mL **Lot ID:** NA

Created: 10/08/2012 14:11 **Manufacturer:** N/A **Part ID:** N/A

Expires: 10/11/2012 **Manufacturer Lot ID:** N/A **Standard ID:** 6020-CAL4

Notes: 6020-CAL4 ICPM

Compound Name and Concentration for Standard #40000

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Lithium	250 ug/L
Mercury	10 ug/L	Manganese	250 ug/L
Nitric Acid	ug/L	Nickel	250 ug/L
Aluminum	12500 ug/L	Lead	250 ug/L
Calcium	12500 ug/L	Selenium	250 ug/L
Iron	12500 ug/L	Strontium	250 ug/L
Potassium	12500 ug/L	Thallium	250 ug/L
Magnesium	12500 ug/L	Vanadium	250 ug/L
Sodium	12500 ug/L	Zinc	250 ug/L
Phosphorus	12500 ug/L	Silicon	12500 ug/L
Hydrochloric Acid	ug/L	Boron	250 ug/L
Arsenic	250 ug/L	Molybdenum	250 ug/L
Barium	250 ug/L	Antimony	250 ug/L
Beryllium	250 ug/L	Tin	250 ug/L
Cadmium	250 ug/L	Zirconium	250 ug/L
Cobalt	250 ug/L	Silver	125 ug/L
Chromium	250 ug/L	Titanium	250 ug/L
Copper	250 ug/L	Uranium	250 ug/L

Composed of Information for Standard #40000

Composed of Standard Seq	Notes	Volume	Units
39695	ICPMS Trace Cal Int	10	mL
39694	ICPMS Mineral Cal. Int	1.25	mL
36242	Hg Calibration Intermediate	0.5	mL
34289	Conc. Nitric Acid - Rec 07/18/12 MMZ	5	mL
22392	Conc. HCL - Rec 06/10/11	2.5	mL
995	DI WATER	30.75	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #40001, 6020-CAL5 ICPM

WORKING STANDARD

Created By: DS1
Created: 10/08/2012 14:11
Expires: 10/11/2012

Volume of Standard: 50 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: 6020-CAL5

Notes: 6020-CAL5 ICPM

Compound Name and Concentration for Standard #40001

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Lithium	500 ug/L
Mercury	25 ug/L	Manganese	500 ug/L
Nitric Acid	ug/L	Nickel	500 ug/L
Aluminum	25000 ug/L	Lead	500 ug/L
Calcium	25000 ug/L	Selenium	500 ug/L
Iron	25000 ug/L	Strontium	500 ug/L
Potassium	25000 ug/L	Thallium	500 ug/L
Magnesium	25000 ug/L	Vanadium	500 ug/L
Sodium	25000 ug/L	Zinc	500 ug/L
Phosphorus	25000 ug/L	Silicon	25000 ug/L
Hydrochloric Acid	ug/L	Boron	500 ug/L
Arsenic	500 ug/L	Molybdenum	500 ug/L
Barium	500 ug/L	Antimony	500 ug/L
Beryllium	500 ug/L	Tin	500 ug/L
Cadmium	500 ug/L	Zirconium	500 ug/L
Cobalt	500 ug/L	Silver	250 ug/L
Chromium	500 ug/L	Titanium	500 ug/L
Copper	500 ug/L	Uranium	500 ug/L

Composed of Information for Standard #40001

Composed of Standard Seq	Notes	Volume	Units
39695	ICPMS Trace Cal Int	20	mL
39694	ICPMS Mineral Cal. Int	2.5	mL
36242	Hg Calibration Intermediate	1.25	mL
34289	Conc. Nitric Acid - Rec 07/18/12 MMZ	5	mL
22392	Conc. HCL - Rec 06/10/11	2.5	mL
995	DI WATER	18.75	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #40002, 6020-CCV ICPM

WORKING STANDARD

Created By: DS1 **Volume of Standard:** 100 mL **Lot ID:** NA

Created: 10/08/2012 14:11 **Manufacturer:** N/A **Part ID:** N/A

Expires: 10/11/2012 **Manufacturer Lot ID:** N/A **Standard ID:** 6020-CCV

Notes: 6020-CCV ICPM

Compound Name and Concentration for Standard #40002

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Lithium	100 ug/L
Mercury	5 ug/L	Manganese	100 ug/L
Nitric Acid	ug/L	Nickel	100 ug/L
Aluminum	5000 ug/L	Lead	100 ug/L
Calcium	5000 ug/L	Selenium	100 ug/L
Iron	5000 ug/L	Strontium	100 ug/L
Potassium	5000 ug/L	Thallium	100 ug/L
Magnesium	5000 ug/L	Vanadium	100 ug/L
Sodium	5000 ug/L	Zinc	100 ug/L
Phosphorus	5000 ug/L	Silicon	5000 ug/L
Hydrochloric Acid	ug/L	Boron	100 ug/L
Arsenic	100 ug/L	Molybdenum	100 ug/L
Barium	100 ug/L	Antimony	100 ug/L
Beryllium	100 ug/L	Tin	100 ug/L
Cadmium	100 ug/L	Zirconium	100 ug/L
Cobalt	100 ug/L	Silver	50 ug/L
Chromium	100 ug/L	Titanium	100 ug/L
Copper	100 ug/L	Uranium	100 ug/L

Composed of Information for Standard #40002

Composed of Standard Seq	Notes	Volume	Units
39695	ICPMS Trace Cal Int	8	mL
39694	ICPMS Mineral Cal. Int	1	mL
36242	Hg Calibration Intermediate	0.5	mL
34289	Conc. Nitric Acid - Rec 07/18/12 MMZ	10	mL
22392	Conc. HCL - Rec 06/10/11	5	mL
995	DI WATER	75.5	mL

Metals Data Package Cover Sheet

Client: AECOM, INC. - NY
Project: DZUS FASTENERS LAKE CAPRI FISH
SDG: 4067362

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

SAMPLE SUMMARY

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067362

Lab ID	Sample ID	Matrix	Date Collected	Date Received
4067362001	DF-S-BG-07	Tissue	09/17/12 00:00	09/20/12 10:10
4067362002	DF-S-BG-08	Tissue	09/17/12 00:00	09/20/12 10:10
4067362003	DF-S-BG-09	Tissue	09/17/12 00:00	09/20/12 10:10
4067362004	DF-S-BG-10	Tissue	09/17/12 00:00	09/20/12 10:10
4067362005	DF-S-BG-11	Tissue	09/17/12 00:00	09/20/12 10:10
4067362006	DF-S-BG-12	Tissue	09/17/12 00:00	09/20/12 10:10
4067362007	DF-S-BG-13	Tissue	09/18/12 00:00	09/20/12 10:10
4067362008	DF-S-BG-14	Tissue	09/18/12 00:00	09/20/12 10:10
4067362009	DF-S-BG-15	Tissue	09/18/12 00:00	09/20/12 10:10
4067362010	DF-S-BG-16	Tissue	09/18/12 00:00	09/20/12 10:10
4067362011	DF-S-BG-17	Tissue	09/18/12 00:00	09/20/12 10:10
4067362012	DF-N-BG-01	Tissue	09/17/12 00:00	09/20/12 10:10
4067362013	DF-N-BG-02	Tissue	09/17/12 00:00	09/20/12 10:10
4067362014	DF-N-BG-03	Tissue	09/18/12 00:00	09/20/12 10:10
4067362015	DF-N-BG-04	Tissue	09/18/12 00:00	09/20/12 10:10
4067362016	DF-N-BG-05	Tissue	09/18/12 00:00	09/20/12 10:10
4067362017	DF-S-RB-01	Tissue	09/16/12 00:00	09/20/12 10:10
4067362018	DF-N-AE-01	Tissue	09/18/12 00:00	09/20/12 10:10

REPORT OF LABORATORY ANALYSIS

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CASE NARRATIVE - METALS ANALYSIS

Lab Report Number (SDG): 4067362
Client: AECOM, Inc.
Project Name: DZUS FASTENERS LAKE CAPRI FISH
Project Number: N/A

1. RECEIPT

The samples were received on ice at 4°C.

2. HOLDING TIMES

A. **Sample Preparation:** All recommended holding times were met.
B. **Sample Analysis:** All recommended holding times were met.

3. METHOD

A. **Preparation:** SW846 3050B
B. **Analysis:** SW846 6020

4. PREPARATION

Sample preparation proceeded normally.

5. ANALYSIS

A. **Calibration:**
   1. **Initial verification:** All method acceptance criteria were met.
   2. **Continuing verification:** All method acceptance criteria were met.
B. **Blanks:**
   1. **Initial calibration:** All method acceptance criteria were met.
   2. **Continuing calibration:** All method acceptance criteria were met.
   3. **Method:** All method acceptance criteria were met.
   4. **Chicken:** A chicken blank is prepared and analyzed with each sample batch to determine the background contamination levels of the chicken used for the laboratory control spike (LCS). The chicken blank is analyzed down to the laboratory MDL.
C. **Spikes:**
   1. **Lab Control Spike (LCS):** All in-house accuracy criteria were met.
   2. **SRM:** A Standard Reference Material was analyzed with this analytical batch. The in-house accuracy criteria were met.
   3. **Matrix Spike / Duplicate (MS/MSD):** Sample DF-S-BG-07 was designated as the parent sample for the MS/MSD for this SDG. All in-house accuracy and precision criteria were met.
D. **Sample Duplicates:** None required for this SDG.
E. **ICP-MS Interference Check Samples:** All method acceptance criteria were met.
F. **ICP-MS Serial Dilution:** All applicable method acceptance criteria were met.
G. **Samples:** Sample analyses proceeded normally.
H. **Dilutions:** None required for this SDG.
I. **Reanalysis:** None required for this SDG.
J. **Comments:** No additional comments are needed.

I certify that this data package is in compliance with the terms and conditions agreed to by **Pace Analytical Services, Inc.**, and by the client, both technically and for completeness, except for the conditions detailed above. The Laboratory Manager or his designee, as verified by the following signature, has authorized release of the data contained in this hard copy data package:

Signed: Leigh A Begalske Date: 10/11/12

Name: Leigh A. Begalske Position: Quality Assurance Auditor

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

SAMPLE ANALYTE COUNT

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067362

Lab ID	Sample ID	Method	Analysts	Analytes Reported
4067362001	DF-S-BG-07	EPA 6020	DS1	1
4067362002	DF-S-BG-08	EPA 6020	DS1	1
4067362003	DF-S-BG-09	EPA 6020	DS1	1
4067362004	DF-S-BG-10	EPA 6020	DS1	1
4067362005	DF-S-BG-11	EPA 6020	DS1	1
4067362006	DF-S-BG-12	EPA 6020	DS1	1
4067362007	DF-S-BG-13	EPA 6020	DS1	1
4067362008	DF-S-BG-14	EPA 6020	DS1	1
4067362009	DF-S-BG-15	EPA 6020	DS1	1
4067362010	DF-S-BG-16	EPA 6020	DS1	1
4067362011	DF-S-BG-17	EPA 6020	DS1	1
4067362012	DF-N-BG-01	EPA 6020	DS1	1
4067362013	DF-N-BG-02	EPA 6020	DS1	1
4067362014	DF-N-BG-03	EPA 6020	DS1	1
4067362015	DF-N-BG-04	EPA 6020	DS1	1
4067362016	DF-N-BG-05	EPA 6020	DS1	1
4067362017	DF-S-RB-01	EPA 6020	DS1	1
4067362018	DF-N-AE-01	EPA 6020	DS1	1

REPORT OF LABORATORY ANALYSIS

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Green Bay, Wi 54302
(920)469-2436

QUALIFIERS

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067362

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PRL - Pace Reporting Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

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Green Bay, WI 54302
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CERTIFICATIONS

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067362

Green Bay Certification IDs
1241 Bellevue Street, Green Bay, WI 54302
Florida/NELAP Certification #: E87948
Illinois Certification #: 200050
Kentucky Certification #: 82
Louisiana Certification #: 04168
Minnesota Certification #: 055-999-334
New York Certification #: 11888
North Carolina Certification #: 503
North Dakota Certification #: R-150
South Carolina Certification #: 83006001
US Dept of Agriculture #: S-76505
Wisconsin Certification #: 405132750

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Appendix B. Sample Chain of Custody Form

CHAIN OF CUSTODY

4067362

I, John Rollino (Print Name), of AECOM - 20 Exchange Pl N.Y N.Y (Print Address) have collected the following

on SEPT 16 (Date), 2012 from SEPT 19 in the vicinity of LAKE CAPRI

Town of W. Islip, Suffolk County.

Item(s): FISH Samples (SEE ATTACHED APPENDIX B)

I have assigned the identification number(s) SEE APPENDIX A to these samples, and have recorded pertinent data on the attached collection records. The samples were handled according to sampling protocols provided to me prior to collection. I placed the samples in the custody of FED EX (TO BE SHIPPED TO PACE LABS IN GREEN BAY, WI.

on SEPT 19, 2012.

I, Eric Heling, of Pace Green Bay have received the above mentioned sample(s) on the date specified for the purpose of _____. The sample(s) remained in my custody until subsequently transferred, prepared or shipped at times and dates as attested to below.

Signed Eric Heling Date 9/20/12

SECOND RECIPIENT (Print Name)	TIME & DATE	PURPOSE OF TRANSFER
SIGNATURE	AFFILIATION	
THIRD RECIPIENT (Print Name)	TIME & DATE	PURPOSE OF TRANSFER
SIGNATURE	AFFILIATION	
FOURTH RECIPIENT (Print Name)	TIME & DATE	PURPOSE OF TRANSFER
SIGNATURE	AFFILIATION	
RECEIVED IN LABORATORY BY (Print Name)	TIME & DATE	
SIGNATURE	AFFILIATION	

NOTICE OF WARRANTY

By signature to the chain of custody (reverse) , the signator warrants that the information provided is truthful and accurate to the best of his/her ability.

4067362

Appendix A. Sample Collection Record

BIOTA COLLECTION RECORD

Project name, location and waterbody: DZUS FASTENERS, WEST ISLIP, NY LAKE CAPRI

Collections made by (names): J. Rolling, M. Smith

Preservation method: ☐ Freezing; ☐ Other (specify) ICE

Lab Use only Lab Number	Sample or Tag number	Species	Date Taken	Sampling Location	Method of Collection	Length (mm)	Weight (grams)	Remarks
	S-BG-01	Bluegill	9/17	South	Net/Trap	20.3	196	F
	S-BG-02					17.6	126	WB
	S-BG-03					21.5	199	F
	S-BG-04					19.1	140	WB
	S-BG-05		9/17			21.4	209	F
	S-BG-06					17.9	108	WB
001	S-BG-07					23.0	245	F 1-ziplock
002	S-BG-08					20.0	158	WB
003	S-BG-09					20.6	191	F
004	S-BG-10					22.0	236	F
005	S-BG-11				Bait Line	21.2	214	F
006	S-BG-12				Net Trap	19.0	132	W
007	S-BG-13		9/18			19.4	142	W
008	S-BG-14					21.8	236	F

NOTES - SEE Pg 1

Rel: FedEx 9/20/12 1010

Rec: E Hetling PaceGB 9/20/12 1010

Temp: 4°C

4067362

Appendix A. Sample Collection Record

BIOTA COLLECTION RECORD

Project name, location and waterbody: DZUS FASTENERS, W. ISLIP NY

Collections made by (names): J. Rollino, M. Smith

Preservation method: ☐ Freezing; ☐ Other (specify) ICE

Lab Use only Lab Number	Sample or Tag number	Species	Date Taken	Sampling Location	Method of Collection	Length (mm)	Weight (grams)	Remarks
008	Blue gill	S-BG-14	9/18	South	NET/TRAP		231	F
009		S-BG-15					131	WB
010		S-BG-16					150	WB
011		S-BG-17					63	WB
012			9/19				85	WB
013								
014		N-BG-01	9/17	NORTH	TRAP	3.0-6	0.5-7	46 INDIVIDUALS WB
015		N-BG-02	9/17			5.0-7	61-5	63 INDIVIDUALS
016		N-BG-03	9/18		TRAP	18.4	120	WB
017		N-BG-04				17.9	104	WB
018		N-BG-05				21	235	F
019	RED BROWN SUNFISH	S-RB-01	9/16	SOUTH	BAIT LINE	21	227	F
020	AMERICAN EEL	N-AE-01	9/18	NORTH	TRAP	67	697	F
	LARGE MOUTH BASS	S-LB-01	9/17	SOUTH	NET	20.5	103	WB

012 → 013, 013 → 014, 014 → 015, 015 → 016, 016 → 017, 017 → 018, 018 → 019

NOTES - SEE Pg 2

Page 3 of 4

Rel: FedEx 9/20/12 1010, Rec: E Helbing PaceGB 9/20/12 1010

Temp: 4°C

Pace Analytical Services, Inc.
1241 Bellevue Street, Suite 9
Green Bay, WI 54302

Pace Analytical

Sample Condition Upon Receipt

Client Name: AECOM Project # 4067362

Courier: ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Tracking #: 8007 1286 0322

Custody Seal on Cooler/Box Present: ☑ yes ☐ no Seals intact: ☑ yes ☐ no

Custody Seal on Samples Present: ☐ yes ☑ no Seals intact: ☐ yes ☐ no

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☑ None Other

Thermometer Used SR49 Type of Ice: (Wet) Blue Dry None ☑ Samples on ice, cooling process has begun.

Cooler Temperature 4°C Biological Tissue is Frozen: ☐ yes ☑ no

Temp Blank Present: ☐ yes ☑ no

Optional:
Proj. Due Date:
Proj. Name:

Person examining contents:
Date: 9/20/12
Initials: EMH

Temp should be above freezing to 6°C for all sample except Biota.
Biota Samples should be received ≤ 0°C.

		Comments:
Chain of Custody Present:	☑Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☐Yes ☑No ☐N/A	2. No invoice, phone # state times EMH 9/20/12
Chain of Custody Relinquished:	☐Yes ☑No ☐N/A	3. Not present EMH 9/20/12
Sampler Name & Signature on COC:	☑Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☑Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes ☑No ☐N/A	6.
Rush Turn Around Time Requested:	☐Yes ☑No ☐N/A	7.
Sufficient Volume:	☑Yes ☐No ☐N/A	8.
Correct Containers Used:	☑Yes ☐No ☐N/A	9.
-Pace Containers Used:	☐Yes ☑No ☐N/A	
Containers Intact:	☑Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☑N/A	11.
Sample Labels match COC: -Includes date/time/ID/Analysis Matrix: B	☐Yes ☑No ☐N/A	12. 008 S-BG-14 listed on COC twice EMH 9/20/12
All containers needing preservation have been checked.	☐Yes ☐No ☑N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☐Yes ☐No ☑N/A	Initial when completed / Lot # of added preservative
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	☐Yes ☐No	
Samples checked for dechlorination:	☐Yes ☐No ☑N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☑N/A	15.
Trip Blank Present:	☐Yes ☐No ☑N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☑N/A	
Pace Trip Blank Lot # (if purchased):		

Field Data Required? Y / N

Client Notification/ Resolution:
Person Contacted: _____ Date/Time: _____
Comments/ Resolution: _____

Project Manager Review: CH for TN **Date:** 9/20/12

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

F-GB-C-031-Rev.00 (29Sept2011) SCUR Form

Metals Sample Data Cover Sheet

Client: AECOM, INC. - NY
Project: DZUS FASTENERS LAKE CAPRI FISH
SDG: 4067362

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067362

Matrix: Tissue
% Moisture:
Acode: 6020 MET ICPMS
Prep/Method: EPA 3050B / EPA 6020

Sample: DF-S-BG-07 NY
Lab ID: 4067362001
Collected: 09/17/12 00:00
Received: 09/20/12 10:10

Results reported on a "wet-weight" basis

CAS No.	Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Qual
7440-43-9	Cadmium	**0.017J**	mg/kg	0.10	0.010	1	10/05/12 08:30	10/08/12 23:05	

Date: 10/11/2012 03:39 PM

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ANALYTICAL RESULTS

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067362

Matrix: Tissue
% Moisture:
Acode: 6020 MET ICPMS
Prep/Method: EPA 3050B / EPA 6020

Sample: DF-S-BG-08 NY
Lab ID: 4067362002
Collected: 09/17/12 00:00
Received: 09/20/12 10:10

Results reported on a "wet-weight" basis

CAS No.	Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Qual
7440-43-9	Cadmium	**0.25**	mg/kg	0.091	0.0095	1	10/05/12 08:30	10/08/12 23:27	

Date: 10/11/2012 03:39 PM

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ANALYTICAL RESULTS

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067362

Matrix: Tissue
% Moisture:
Acode: 6020 MET ICPMS
Prep/Method: EPA 3050B / EPA 6020

Sample: DF-S-BG-09 NY
Lab ID: 4067362003
Collected: 09/17/12 00:00
Received: 09/20/12 10:10

Results reported on a "wet-weight" basis

CAS No.	Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Qual
7440-43-9	Cadmium	**0.015J**	mg/kg	0.083	0.0088	1	10/05/12 08:30	10/08/12 23:38	

Date: 10/11/2012 03:39 PM

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ANALYTICAL RESULTS

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067362

Matrix: Tissue
% Moisture:
Acode: 6020 MET ICPMS
Prep/Method: EPA 3050B / EPA 6020

Sample: DF-S-BG-10 NY
Lab ID: 4067362004
Collected: 09/17/12 00:00
Received: 09/20/12 10:10

Results reported on a "wet-weight" basis

CAS No.	Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Qual
7440-43-9	Cadmium	**0.10**	mg/kg	0.097	0.010	1	10/05/12 08:30	10/08/12 23:44	

Date: 10/11/2012 03:39 PM

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ANALYTICAL RESULTS

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067362

Matrix: Tissue
% Moisture:
Acode: 6020 MET ICPMS
Prep/Method: EPA 3050B / EPA 6020
Results reported on a "wet-weight" basis

Sample: DF-S-BG-11 NY
Lab ID: 4067362005
Collected: 09/17/12 00:00
Received: 09/20/12 10:10

CAS No.	Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Qual
7440-43-9	Cadmium	**0.012J**	mg/kg	0.098	0.010	1	10/05/12 08:30	10/09/12 00:00	

Date: 10/11/2012 03:39 PM

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ANALYTICAL RESULTS

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067362

Matrix: Tissue
% Moisture:
Acode: 6020 MET ICPMS
Prep/Method: EPA 3050B / EPA 6020
Results reported on a "wet-weight" basis

Sample: DF-S-BG-12 NY
Lab ID: 4067362006
Collected: 09/17/12 00:00
Received: 09/20/12 10:10

CAS No.	Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Qual
7440-43-9	Cadmium	**0.11**	mg/kg	0.097	0.010	1	10/05/12 08:30	10/09/12 00:06	

Date: 10/11/2012 03:39 PM

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ANALYTICAL RESULTS

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067362

Matrix: Tissue
% Moisture:
Acode: 6020 MET ICPMS
Prep/Method: EPA 3050B / EPA 6020
Results reported on a "wet-weight" basis

Sample: DF-S-BG-13 NY
Lab ID: 4067362007
Collected: 09/18/12 00:00
Received: 09/20/12 10:10

CAS No.	Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Qual
7440-43-9	Cadmium	**0.23**	mg/kg	0.098	0.010	1	10/05/12 08:30	10/09/12 00:11	

Date: 10/11/2012 03:39 PM

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ANALYTICAL RESULTS

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067362

Matrix: Tissue
% Moisture:
Acode: 6020 MET ICPMS
Prep/Method: EPA 3050B / EPA 6020

Sample: DF-S-BG-14 NY
Lab ID: 4067362008
Collected: 09/18/12 00:00
Received: 09/20/12 10:10

Results reported on a "wet-weight" basis

CAS No.	Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Qual
7440-43-9	Cadmium	**<0.010**	mg/kg	0.096	0.010	1	10/05/12 08:30	10/09/12 00:17	

Date: 10/11/2012 03:39 PM

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ANALYTICAL RESULTS

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067362

Matrix: Tissue
% Moisture:
Acode: 6020 MET ICPMS
Prep/Method: EPA 3050B / EPA 6020

Sample: DF-S-BG-15 NY
Lab ID: 4067362009
Collected: 09/18/12 00:00
Received: 09/20/12 10:10

Results reported on a "wet-weight" basis

CAS No.	Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Qual
7440-43-9	Cadmium	**0.21**	mg/kg	0.096	0.010	1	10/05/12 08:30	10/09/12 00:22	

Date: 10/11/2012 03:39 PM

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ANALYTICAL RESULTS

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067362

Matrix: Tissue
% Moisture:
Acode: 6020 MET ICPMS
Prep/Method: EPA 3050B / EPA 6020

Sample: DF-S-BG-16 NY
Lab ID: 4067362010
Collected: 09/18/12 00:00
Received: 09/20/12 10:10

Results reported on a "wet-weight" basis

CAS No.	Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Qual
7440-43-9	Cadmium	**0.24**	mg/kg	0.091	0.0096	1	10/05/12 08:30	10/09/12 00:28	

Date: 10/11/2012 03:39 PM

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ANALYTICAL RESULTS

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067362

Matrix: Tissue
% Moisture:
Acode: 6020 MET ICPMS
Prep/Method: EPA 3050B / EPA 6020

Sample: DF-S-BG-17 NY
Lab ID: 4067362011
Collected: 09/18/12 00:00
Received: 09/20/12 10:10

Results reported on a "wet-weight" basis

CAS No.	Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Qual
7440-43-9	Cadmium	**0.43**	mg/kg	0.090	0.0094	1	10/05/12 08:30	10/09/12 00:34	

Date: 10/11/2012 03:39 PM

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ANALYTICAL RESULTS

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067362

Matrix: Tissue
% Moisture:
Acode: 6020 MET ICPMS
Prep/Method: EPA 3050B / EPA 6020
Results reported on a "wet-weight" basis

Sample: DF-N-BG-01 NY
Lab ID: 4067362012
Collected: 09/17/12 00:00
Received: 09/20/12 10:10

CAS No.	Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Qual
7440-43-9	Cadmium	**0.14**	mg/kg	0.093	0.0098	1	10/05/12 08:30	10/09/12 00:39	

Date: 10/11/2012 03:39 PM

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ANALYTICAL RESULTS

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067362

Matrix: Tissue
% Moisture:
Acode: 6020 MET ICPMS
Prep/Method: EPA 3050B / EPA 6020

Sample: DF-N-BG-02 NY
Lab ID: 4067362013
Collected: 09/17/12 00:00
Received: 09/20/12 10:10

Results reported on a "wet-weight" basis

CAS No.	Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Qual
7440-43-9	Cadmium	**0.22**	mg/kg	0.092	0.0096	1	10/05/12 08:30	10/09/12 00:45	

Date: 10/11/2012 03:39 PM

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ANALYTICAL RESULTS

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067362

Matrix: Tissue
% Moisture:
Acode: 6020 MET ICPMS
Prep/Method: EPA 3050B / EPA 6020

Sample: DF-N-BG-03 NY
Lab ID: 4067362014
Collected: 09/18/12 00:00
Received: 09/20/12 10:10

Results reported on a "wet-weight" basis

CAS No.	Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Qual
7440-43-9	Cadmium	**0.18**	mg/kg	0.099	0.010	1	10/05/12 08:30	10/09/12 00:50	

Date: 10/11/2012 03:39 PM

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ANALYTICAL RESULTS

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067362

Matrix: Tissue
% Moisture:
Acode: 6020 MET ICPMS
Prep/Method: EPA 3050B / EPA 6020
Results reported on a "wet-weight" basis

Sample: DF-N-BG-04 NY
Lab ID: 4067362015
Collected: 09/18/12 00:00
Received: 09/20/12 10:10

CAS No.	Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Qual
7440-43-9	Cadmium	**0.15**	mg/kg	0.098	0.010	1	10/05/12 08:30	10/09/12 01:07	

Date: 10/11/2012 03:39 PM

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ANALYTICAL RESULTS

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067362

Matrix: Tissue
% Moisture:
Acode: 6020 MET ICPMS
Prep/Method: EPA 3050B / EPA 6020
Results reported on a "wet-weight" basis

Sample: DF-N-BG-05 NY
Lab ID: 4067362016
Collected: 09/18/12 00:00
Received: 09/20/12 10:10

CAS No.	Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Qual
7440-43-9	Cadmium	**<0.0089**	mg/kg	0.085	0.0089	1	10/05/12 08:30	10/09/12 01:12	

Date: 10/11/2012 03:39 PM

REPORT OF LABORATORY ANALYSIS

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1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067362

Matrix: Tissue
% Moisture:
Acode: 6020 MET ICPMS
Prep/Method: EPA 3050B / EPA 6020

Sample: DF-S-RB-01 NY
Lab ID: 4067362017
Collected: 09/16/12 00:00
Received: 09/20/12 10:10

Results reported on a "wet-weight" basis

CAS No.	Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Qual
7440-43-9	Cadmium	**0.019J**	mg/kg	0.089	0.0094	1	10/05/12 08:30	10/09/12 01:18	

Date: 10/11/2012 03:39 PM

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ANALYTICAL RESULTS

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067362

Matrix: Tissue
% Moisture:
Acode: 6020 MET ICPMS
Prep/Method: EPA 3050B / EPA 6020
Results reported on a "wet-weight" basis

Sample: DF-N-AE-01 NY
Lab ID: 4067362018
Collected: 09/18/12 00:00
Received: 09/20/12 10:10

CAS No.	Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Qual
7440-43-9	Cadmium	**0.39**	mg/kg	0.093	0.0098	1	10/05/12 08:30	10/09/12 01:24	

Date: 10/11/2012 03:39 PM

REPORT OF LABORATORY ANALYSIS

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Metals QC Summary Cover Sheet

Client: AECOM, INC. - NY
Project: DZUS FASTENERS LAKE CAPRI FISH
SDG: 4067362

Pace Analytical Services

Metals Data Reporting Form

Initial Calibration Verification Standard **SDG:** 4067362

Instrument: 40ICM2 **Units:** ug/L

Chart Number 1008212A.csv **Acceptable Range:** 90% - 110%

Standard Source: Metals Secondary **Standard ID** 39693

Element	WL/ Mass	True Conc	ICV 10/8/2012 6:49 PM Found	% Rec	Found	% Rec	Found	% Rec	Found	% Rec	Found	% Rec
Cadmium	111	110.0	111.20	**101.1**								

Pace Analytical Services

Metals Data Reporting Form

Continuing Calibration Verification **SDG:** 4067362

Instrument: 40ICM2 **Units:** ug/L

Chart Number: 1008212A.csv **Acceptable Range** 90% - 110%

Standard Source Metals Primary **Standard ID:** 40002

Element	WL/ Mass	True Conc	CCV1 10/8/2012 7:23 PM		CCV3 10/8/2012 9:36 PM		CCV4 10/8/2012 10:42 PM		CCV5 10/8/2012 11:49 PM		CCV6 10/9/2012 12:56 AM	
			Found	% Rec	Found	% Rec	Found	% Rec	Found	% Rec	Found	% Rec
Cadmium	111	100.0	101.20	**101.2**	103.50	**103.5**	104.10	**104.1**	104.50	**104.5**	104.30	**104.3**

Pace Analytical Services

Metals Data Reporting Form

Continuing Calibration Verification **SDG:** 4067362

Instrument: 40ICM2 **Units:** ug/L

Chart Number: 1008212A.csv **Acceptable Range** 90% - 110%

Standard Source Metals Primary **Standard ID:** 40002

Element	WL/ Mass	True Conc	CCV7 10/9/2012 2:03 AM									
			Found	% Rec	Found	% Rec	Found	% Rec	Found	% Rec	Found	% Rec
Cadmium	111	100.0	103.70	**103.7**								

Pace Analytical Services

Metals Data Reporting Form

Initial Calibration Blank Results **SDG:** 4067362

Instrument: 40ICM2 **Units:** ug/L

Chart Number: 1008212A.csv

Standard Source Calibration Blank **Standard ID:** 39996

Element	WL/ Mass	Report Limit	ICB 10/8/2012 6:55 PM Found	Q	Found	Q	Found	Q	Found	Q	Found	Q
Cadmium	111	1	**0.20**	**B**								

7.1

U Result is less than the IDL
B Result is between IDL and RL
S Detector saturated

Form 3 Equivalent

Pace Analytical Services

Metals Data Reporting Form

Continuing Calibration Blank Result **SDG:** 4067362

Instrument: 40ICM2 **Units:** ug/L

Chart Number: 1008212A.csv

Standard Source Calibration Blank **Standard ID:** 39996

Element	WL/ Mass	Report Limit	CCB1 10/8/2012 7:28 PM		CCB3 10/8/2012 9:41 PM		CCB4 10/8/2012 10:48 PM		CCB5 10/8/2012 11:55 PM		CCB6 10/9/2012 1:01 AM	
			Found	Q	Found	Q	Found	Q	Found	Q	Found	Q
Cadmium	111	1	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U

U Result is less than the IDL
B Result is between IDL and RL
S Detector saturated

Form 3 Equivalent

Pace Analytical Services

Metals Data Reporting Form

Continuing Calibration Blank Result **SDG:** 4067362

Instrument: 40ICM2 **Units:** ug/L

Chart Number: 1008212A.csv

Standard Source Calibration Blank **Standard ID:** 39996

Element	WL/ Mass	Report Limit	CCB7 10/9/2012 2:08 AM Found	Q	Found	Q	Found	Q	Found	Q	Found	Q
Cadmium	111	1	< 1.0	U								

U Result is less than the IDL
B Result is between IDL and RL
S Detector saturated

Form 3 Equivalent

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METHOD BLANK RESULTS

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067362

QB Batch: MPRP/7574 **Prepared:** 10/05/12
Method(s): EPA 3050B / EPA 6020
Associated Lab Samples: 4067362001, 4067362002, 4067362003, 4067362004, 4067362005, 4067362006, 4067362007, 4067362008, 4067362009, 4067362010, 4067362011, 4067362012, 4067362013, 4067362014, 4067362015, 4067362016, 4067362017, 4067362018

CAS No.	Parameters	Results	Units	Reporting Limit	MDL	Analyzed	Qual
7440-43-9	Cadmium	<0.010	mg/kg	0.10	0.010	10/08/12	

Type	Sample	Matrix
BLANK	686525	Tissue

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Metals Data Reporting Form

Preparation Blank Results **SDG:** 4067362

Lab Sample ID: 686527 ①

Matrix: TISSUE **Units:** mg/kg **Prep Date:** 10/5/2012 **Prep Batch:** 3359

Weight: 0.5 **Volume:** 50 **Percent Moisture:** NA

Element	WL/ Mass	MDL	Report Limit	Conc	Q	DF	Instr	Anal Date	Anal Time
Cadmium	111	0.010	0.10	0.010	U	1	40ICM2	10/8/2012	22:37

① Chicken Blank
LAB 10/11/12

Comments:

U Result is less than the IDL
B Result is between IDL and RL

Pace Analytical Services

Metals Data Reporting Form

Interference Check Standard A **SDG:** 4067362

Instrument: 40ICM2 **Units:** ug/L

Chart Number: 1008212A.csv **Acceptable Range** 80% - 120%

Standard Source In House **Standard ID:** 39698

Element	WL/ Mass	Reporting Limit	True Conc	ICSA1 10/8/2012 7:11 PM Found	Found	Found	Found	Found
Aluminum	27		50000	50860				
Antimony	121	2		0				
Arsenic	75	2		0				
Barium	137	2		1				
Beryllium	9	2		0				
Boron	10	40		2				
Cadmium	111	2		0				
Calcium	43		50000	52910				
Chromium	52	2		1				
Cobalt	59	2		1				
Copper	63	2		1				
Iron	54		50000	50770				
Lead	208	2		0				
Lithium	7	2		0				
Magnesium	25		50000	49760				
Manganese	55	2		0				
Mercury	201	0.4		0				
Molybdenum	95		1000	1047				
Nickel	60	2		1				
Potassium	39		50000	53500				
Selenium	78	2		0				
Silver	107	1		0				
Sodium	23		50000	48970				
Strontium	88	2		0				
Thallium	205	2		0				
Tin	118	20		0				
Titanium	47		1000	1018				
Uranium	238	2		0				
Vanadium	51	2		0				
Zinc	66	20		2				

7.1

U Result is less than the IDL
B Result is between IDL and RL
S Detector saturated

Form 4 Equivalent

Pace Analytical Services

Metals Data Reporting Form

Interference Check Standard AB **SDG:** 4067362

Instrument: 40ICM2 **Units:** ug/L

Chart Number: 1008212A.csv **Acceptable Range** 80% - 120%

Standard Source In House **Standard ID:** 39699

Element	WL/ Mass	True Conc	ICSAB1 10/8/2012 7:17 PM Found	% Rec	Found	% Rec	Found	% Rec	Found	% Rec	Found	% Rec
Aluminum	27	50000	50260.0	**100.5**								
Antimony	121	100	102.6	**102.6**								
Arsenic	75	100	102.8	**102.8**								
Barium	137	100	102.6	**102.6**								
Beryllium	9	100	97.2	**97.2**								
Boron	10	100	98.1	**98.1**								
Cadmium	111	100	101.7	**101.7**								
Calcium	43	50000	52660.0	**105.3**								
Chromium	52	100	100.5	**100.5**								
Cobalt	59	100	97.8	**97.8**								
Copper	63	100	96.3	**96.3**								
Iron	54	50000	50240.0	**100.5**								
Lead	208	100	101.4	**101.4**								
Lithium	7	100	99.4	**99.4**								
Magnesium	25	50000	49110.0	**98.2**								
Manganese	55	100	99.7	**99.7**								
Mercury	201	5	5.3	**105.9**								
Molybdenum	95	1100	1152.0	**104.7**								
Nickel	60	100	97.7	**97.7**								
Potassium	39	50000	53140.0	**106.3**								
Selenium	78	100	101.4	**101.4**								
Silver	107	50	47.8	**95.7**								
Sodium	23	50000	48620.0	**97.2**								
Strontium	88	100	104.4	**104.4**								
Thallium	205	100	103.1	**103.1**								
Tin	118	100	100.5	**100.5**								
Titanium	47	1100	1105.0	**100.5**								
Uranium	238	100	104.8	**104.8**								
Vanadium	51	100	100.6	**100.6**								
Zinc	66	100	105.1	**105.1**								

7.1

U Result is less than the IDL
B Result is between IDL and RL
R Spike recovery failed
NC Percent recovery was not calculated
S Detector saturated

Form 4 Equivalent

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MATRIX SPIKE SAMPLE RESULTS

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067362

QB Batch: MPRP/7574
Method(s): EPA 3050B / EPA 6020

MS Prepared: 10/05/12
MSD Prepared: 10/05/12

Analyte	Units	Sample Conc	Spike Conc MS	Spike Conc MSD	Result MS	Result MSD	Dilution MS	Dilution MSD	% Recovery MS	% Recovery MSD	QC Limits %Recovery	RPD	Max RPD	Analyzed Date MS	Analyzed Date MSD	Qualifier(s) MS	Qualifier(s) MSD
Cadmium	mg/kg	0.017J	19.9	20	21.3	20.8	1	1	107	104	75-125	2	20	10/08/12	10/08/12		

Type	Sample	Client Sample ID
MS	686529	DF-S-BG-07
MSD	686530	DF-S-BG-07

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Metals Data Reporting Form

Post Digest Spike Sample Result **SDG:** 4067362

Spike Sample ID: 688843

Original Sample ID: 4067362001 **Client ID:** PDS for HBN 111832 [ICPM/3359]

Matrix: TISSUE **Units:** ug/L **Prep Date:** 10/8/2012 **Prep Batch:** 3359

Weight: 10 **Volume:** 10 **Percent Moisture:** NA **Instrument:** 40ICM2

Element	WL/ Mass	Parent			Post Spike			Spike Level	% Rec	Parent Analytical Date/Time	Post Spike Analytical Date/Time
		Dil	Conc	Q	Dil	Conc	Q				
Cadmium	111	1	0.17	B	1	205		200	102.4	10/8/2012 23:05	10/8/2012 23:21

Comments:

7.1

U Result is less than the IDL
B Result is between IDL and RL
R Spike recovery failed
NC Percent recovery was not calculated

Form 5B Equivalent

Pace Analytical Services

Metals Data Reporting Form

Laboratory Control Sample Results **SDG:** 4067362

Lab Sample ID: 686528 ①

Matrix: TISSUE **Units:** mg/kg **Prep Date:** 10/5/2012 **Prep Batch:** 3359

Weight: 0.5 **Volume:** 50 **Percent Moisture:** NA

Element	WL/ Mass	Spike Level	Conc	Percent Recovery	Q	Range	DF	Instr	Anal Date	Anal Time
Cadmium	111	26.7	27.6	103.3		80-120	1	401CM2	10/8/2012	22:59

① SRM TORT-2 (#34855)
IAB 10/11/12

Comments:

7.1

U Result is less than the IDL
B Result is between IDL and RL

Form 7 Equivalent

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(920)469-2436

LAB CONTROL SAMPLE RESULTS

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067362

QB Batch: MPRP/7574 **LCS Prepared:** 10/05/12
Method(s): EPA 3050B / EPA 6020 **LCSD Prepared:**

Analyte	LCS % Rec	LCSD % Rec	RPD	QC Limits % Rec	QC Limits RPD	Spike Conc	LCS Conc	LCSD Conc	Units	LCS Analyzed	LCSD Analyzed	LCS Qual	LCSD Qual
Cadmium	105			80-120		20	21.0		mg/kg	10/08/12			

Type	Sample
LCS	686526

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Metals Data Reporting Form

Serial Dilution Report **SDG:** 4067362

Serial Dilution Sample ID: 688844

Original Sample ID: 4067362002 **Client ID:** SD for HBN 111832 [ICPM/3359]

Matrix: TISSUE **Units:** ug/L **Prep Date:** 10/8/2012 **Prep Batch:** 3359

Element	WL/ Mass	Parent			Serial Dilution			Percent Diff	
		Dil	Conc	Q	Dil	Conc	Q		
Cadmium	111	1	2.7		5	2.6	B	6.1	

Comments:

7.1

U Result is less than the IDL
B Result is between IDL and RL
E Serial dilution percent difference not within limits

Form 9 Equivalent

Pace Analytical Services

Metals Data Reporting Form

Preparation Log **SDG:** 4067362

Preparation Batch: 3359 **Instrument:** 40ICM2 **Matrix:** TISSUE

Sample ID	Sample Type	Prep Date	Prep Method	Initial Weight (g)	Final Volume (ml)	% Moisture
4067362001	Sample	10/5/2012 8:30:00 AM	EPA 3050B	0.501	50	NA
4067362002	Sample	10/5/2012 8:30:00 AM	EPA 3050B	0.55	50	NA
4067362003	Sample	10/5/2012 8:30:00 AM	EPA 3050B	0.599	50	NA
4067362004	Sample	10/5/2012 8:30:00 AM	EPA 3050B	0.514	50	NA
4067362005	Sample	10/5/2012 8:30:00 AM	EPA 3050B	0.508	50	NA
4067362006	Sample	10/5/2012 8:30:00 AM	EPA 3050B	0.513	50	NA
4067362007	Sample	10/5/2012 8:30:00 AM	EPA 3050B	0.508	50	NA
4067362008	Sample	10/5/2012 8:30:00 AM	EPA 3050B	0.519	50	NA
4067362009	Sample	10/5/2012 8:30:00 AM	EPA 3050B	0.519	50	NA
4067362010	Sample	10/5/2012 8:30:00 AM	EPA 3050B	0.548	50	NA
4067362011	Sample	10/5/2012 8:30:00 AM	EPA 3050B	0.557	50	NA
4067362012	Sample	10/5/2012 8:30:00 AM	EPA 3050B	0.536	50	NA
4067362013	Sample	10/5/2012 8:30:00 AM	EPA 3050B	0.546	50	NA
4067362014	Sample	10/5/2012 8:30:00 AM	EPA 3050B	0.506	50	NA
4067362015	Sample	10/5/2012 8:30:00 AM	EPA 3050B	0.511	50	NA
4067362016	Sample	10/5/2012 8:30:00 AM	EPA 3050B	0.587	50	NA
4067362017	Sample	10/5/2012 8:30:00 AM	EPA 3050B	0.561	50	NA
4067362018	Sample	10/5/2012 8:30:00 AM	EPA 3050B	0.535	50	NA
686525	Preparation Blank	10/5/2012 8:30:00 AM	EPA 3050B	0.5	50	NA
686526	LCS	10/5/2012 8:30:00 AM	EPA 3050B	0.5	50	NA
686527	Sample	10/5/2012 8:30:00 AM	EPA 3050B	0.5	50	NA
686528	Sample	10/5/2012 8:30:00 AM	EPA 3050B	0.5	50	NA
686529	Matrix Spike	10/5/2012 8:30:00 AM	EPA 3050B	0.503	50	NA
686530	Matrix Spike Duplicate	10/5/2012 8:30:00 AM	EPA 3050B	0.501	50	NA

Pace Analytical Services

Metals Data Reporting Form

Instrument Runlo **SDG:** 4067362

Instrument: 40ICM2 **Chart Number:** 1008212A.csv

Lab Sample Name	Client Sample Name	Analytical Method	Date of Analysi	Time of Analysi
CAL0 39996	CAL0 39996		10/8/2012	18:16
CAL1 39997	CAL1 39997		10/8/2012	18:21
CAL2 39998	CAL2 39998		10/8/2012	18:27
CAL3 39999	CAL3 39999		10/8/2012	18:33
CAL4 40000	CAL4 40000		10/8/2012	18:38
CAL5 40001	CAL5 40001		10/8/2012	18:44
ICV 39693	ICV 39693		10/8/2012	18:49
ICB 39996	ICB 39996		10/8/2012	18:55
39997	39997		10/8/2012	19:00
ZZZZZZ			10/8/2012	19:06
ICSA1 39698	ICSA1 39698		10/8/2012	19:11
ICSAB1 39699	ICSAB1 39699		10/8/2012	19:17
CCV1 40002	CCV1 40002		10/8/2012	19:23
CCB1 39996	CCB1 39996		10/8/2012	19:28
CCV3 40002	CCV3 40002		10/8/2012	21:36
CCB3 39996	CCB3 39996		10/8/2012	21:41
ZZZZZZ			10/8/2012	21:47
ZZZZZZ			10/8/2012	21:52
ZZZZZZ			10/8/2012	21:58
ZZZZZZ			10/8/2012	22:04
ZZZZZZ			10/8/2012	22:09
ZZZZZZ			10/8/2012	22:15
ZZZZZZ			10/8/2012	22:20
ZZZZZZ			10/8/2012	22:26
686525	BLANK for HBN 111568 [	EPA 6020	10/8/2012	22:31
686527	SBLK for HBN 111568 [M	EPA 6020	10/8/2012	22:37
CCV4 40002	CCV4 40002		10/8/2012	22:42
CCB4 39996	CCB4 39996		10/8/2012	22:48
686526	LCS for HBN 111568 [MP	EPA 6020	10/8/2012	22:53
686528	SRM for HBN 111568 [M	EPA 6020	10/8/2012	22:59
4067362001	DF-S-BG-07	EPA 6020	10/8/2012	23:05
686529	DF-S-BG-07(676902MS)	EPA 6020	10/8/2012	23:10
686530	DF-S-BG-07(676902MSD)	EPA 6020	10/8/2012	23:16
688843	PDS for HBN 111832 [ICP	EPA 6020	10/8/2012	23:21
4067362002	DF-S-BG-08	EPA 6020	10/8/2012	23:27
688844	SD for HBN 111832 [ICP	EPA 6020	10/8/2012	23:32
4067362003	DF-S-BG-09	EPA 6020	10/8/2012	23:38
4067362004	DF-S-BG-10	EPA 6020	10/8/2012	23:44
CCV5 40002	CCV5 40002		10/8/2012	23:49

Pace Analytical Services

Metals Data Reporting Form

Instrument Runlo **SDG:** 4067362

Instrument: 40ICM2 **Chart Number:** 1008212A.csv

Lab Sample Name	Client Sample Name	Analytical Method	Date of Analysi	Time of Analysi
CCB5 39996	CCB5 39996		10/8/2012	23:55
4067362005	DF-S-BG-11	EPA 6020	10/9/2012	0:00
4067362006	DF-S-BG-12	EPA 6020	10/9/2012	0:06
4067362007	DF-S-BG-13	EPA 6020	10/9/2012	0:11
4067362008	DF-S-BG-14	EPA 6020	10/9/2012	0:17
4067362009	DF-S-BG-15	EPA 6020	10/9/2012	0:22
4067362010	DF-S-BG-16	EPA 6020	10/9/2012	0:28
4067362011	DF-S-BG-17	EPA 6020	10/9/2012	0:34
4067362012	DF-N-BG-01	EPA 6020	10/9/2012	0:39
4067362013	DF-N-BG-02	EPA 6020	10/9/2012	0:45
4067362014	DF-N-BG-03	EPA 6020	10/9/2012	0:50
CCV6 40002	CCV6 40002		10/9/2012	0:56
CCB6 39996	CCB6 39996		10/9/2012	1:01
4067362015	DF-N-BG-04	EPA 6020	10/9/2012	1:07
4067362016	DF-N-BG-05	EPA 6020	10/9/2012	1:12
4067362017	DF-S-RB-01	EPA 6020	10/9/2012	1:18
4067362018	DF-N-AE-01	EPA 6020	10/9/2012	1:24
ZZZZZZ			10/9/2012	1:29
ZZZZZZ			10/9/2012	1:35
ZZZZZZ			10/9/2012	1:40
ZZZZZZ			10/9/2012	1:46
ZZZZZZ			10/9/2012	1:51
ZZZZZZ			10/9/2012	1:57
CCV7 40002	CCV7 40002		10/9/2012	2:03
CCB7 39996	CCB7 39996		10/9/2012	2:08

Pace Analytical Services

Metals Data Reporting Form

Instrument Runlo

Instrument: 40ICM2 **Chart Number:** 1008212A.csv

Start Date: 10/8/2012 **End Date:** 10/9/2012

Lab Sample ID	DF	Time of Analysi	Analytes																																
			Cd																																
CAL0 39996	1	6:16 PM	X																																
CAL1 39997	1	6:21 PM	X																																
CAL2 39998	1	6:27 PM	X																																
CAL3 39999	1	6:33 PM	X																																
CAL4 40000	1	6:38 PM	X																																
CAL5 40001	1	6:44 PM	X																																
ICV 39693	1	6:49 PM	X																																
ICB 39996	1	6:55 PM	X																																
39997	1	7:00 PM	X																																
ICSA1 39698	1	7:11 PM	X																																
ICSAB1 39699	1	7:17 PM	X																																
CCV1 40002	1	7:23 PM	X																																
CCB1 39996	1	7:28 PM	X																																
CCV3 40002	1	9:36 PM	X																																
CCB3 39996	1	9:41 PM	X																																
686525	1	10:31 PM	X																																
686527	1	10:37 PM	X																																
CCV4 40002	1	10:42 PM	X																																
CCB4 39996	1	10:48 PM	X																																
686526	1	10:53 PM	X																																
686528	1	10:59 PM	X																																
4067362001	1	11:05 PM	X																																
686529	1	11:10 PM	X																																
686530	1	11:16 PM	X																																
688843	1	11:21 PM	X																																
4067362002	1	11:27 PM	X																																
688844	5	11:32 PM	X																																
4067362003	1	11:38 PM	X																																
4067362004	1	11:44 PM	X																																
CCV5 40002	1	11:49 PM	X																																
CCB5 39996	1	11:55 PM	X																																

Form 14 Equivalent

Pace Analytical Services

Metals Data Reporting Form

Instrument Runlo

Instrument: 40ICM2 **Chart Number:** 1008212A.csv

Start Date: 10/8/2012 **End Date:** 10/9/2012

Lab Sample ID	DF	Time of Analysi	Analytes																															
			Cd																															
4067362005	1	12:00 AM	X																															
4067362006	1	12:06 AM	X																															
4067362007	1	12:11 AM	X																															
4067362008	1	12:17 AM	X																															
4067362009	1	12:22 AM	X																															
4067362010	1	12:28 AM	X																															
4067362011	1	12:34 AM	X																															
4067362012	1	12:39 AM	X																															
4067362013	1	12:45 AM	X																															
4067362014	1	12:50 AM	X																															
CCV6 40002	1	12:56 AM	X																															
CCB6 39996	1	1:01 AM	X																															
4067362015	1	1:07 AM	X																															
4067362016	1	1:12 AM	X																															
4067362017	1	1:18 AM	X																															
4067362018	1	1:24 AM	X																															
CCV7 40002	1	2:03 AM	X																															
CCB7 39996	1	2:08 AM	X																															

Form 14 Equivalent

Pace Analytical Services

INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY

Instrument Runlog **SDG:** 4067362

Instrument: 40ICM2 **Chart Number:** 1008212A.csv

Lab Sample Name	Client Sample Name	Date of Analysi	Time of Analysi	Bi	Q	Ge	Q	In	Q	Sc-CCT	Q	Sc-KED	Q	Tb	Q	Y	Q
CAL0 39996	CAL0 39996	10/8/2012	18:16	100		100		100		100		100		100		100	
CAL1 39997	CAL1 39997	10/8/2012	18:21	99.802		103.068		101.691		101.269		101.306		100.611		100.243	
CAL2 39998	CAL2 39998	10/8/2012	18:27	99.626		104.614		101.536		102.258		101.294		100.36		100.622	
CAL3 39999	CAL3 39999	10/8/2012	18:33	99.131		105.463		101.411		102.456		102.341		100.78		100.262	
CAL4 40000	CAL4 40000	10/8/2012	18:38	97.183		105.033		101.182		102.593		103.212		100.352		99.714	
CAL5 40001	CAL5 40001	10/8/2012	18:44	95.517		107.968		102.069		105.871		106.713		101.381		100.71	
ICV 39693	ICV 39693	10/8/2012	18:49	101.539		106.775		103.242		104.514		104.756		102.618		102.454	
ICB 39996	ICB 39996	10/8/2012	18:55	102.256		106.336		103.428		105.203		105.539		103.032		103.221	
39997	39997	10/8/2012	19:00	100.836		104.024		102.075		102.527		103.016		101.581		101.827	
ICSA1 39698	ICSA1 39698	10/8/2012	19:11	89.199		92.06		90.191		89.218		87.965		91.443		86.63	
ICSAB1 39699	ICSAB1 39699	10/8/2012	19:17	91.678		96.141		93.365		92.255		91.676		94.268		89.23	
CCV1 40002	CCV1 40002	10/8/2012	19:23	104.893		110.27		105.572		106.325		106.799		106.497		104.961	
CCB1 39996	CCB1 39996	10/8/2012	19:28	104.619		103.264		103.887		106.034		104.373		105.204		102.959	
CCV3 40002	CCV3 40002	10/8/2012	21:36	109.222		117.039		109.7		122.009		114.677		113.452		109.385	
CCB3 39996	CCB3 39996	10/8/2012	21:41	110.301		112.118		108.337		121.973		110.453		112.897		107.894	
686525	BLANK for HBN 111568	10/8/2012	22:31	110.472		108.998		105.962		115.026		106.078		110.783		104.895	
686527	SBLK for HBN 111568 [	10/8/2012	22:37	108.18		108.651		105.685		116.946		106.196		110.883		104.953	
CCV4 40002	CCV4 40002	10/8/2012	22:42	108.651		114.197		108.106		122.055		112.71		111.872		107.658	
CCB4 39996	CCB4 39996	10/8/2012	22:48	110.817		110.799		107.746		121.956		111.861		113.298		109.172	
686526	LCS for HBN 111568 [M	10/8/2012	22:53	103.508		110.884		104.752		122.066		110.603		110.074		105.475	
686528	SRM for HBN 111568 [M	10/8/2012	22:59	100.187		108.674		103.415		121.322		110.343		109.198		111.368	
4067362001	DF-S-BG-07	10/8/2012	23:05	109.583		110.915		107.925		123.497		110.406		114.371		108.394	
686529	DF-S-BG-07(676902MS	10/8/2012	23:10	103.301		108.736		104.085		119.977		109.471		110.073		104.433	
686530	DF-S-BG-07(676902MS	10/8/2012	23:16	104.785		110.786		105.12		121.566		111.173		111.527		105.864	
688843	PDS for HBN 111832 [IC	10/8/2012	23:21	105.214		110.174		105.267		121.06		111.699		112.155		106.628	
4067362002	DF-S-BG-08	10/8/2012	23:27	103.167		105.141		103.113		117.713		104.794		109.29		102.369	
688844	SD for HBN 111832 [ICP	10/8/2012	23:32	108.747		108.701		104.792		117.225		106.027		110.92		104.142	
4067362003	DF-S-BG-09	10/8/2012	23:38	109.299		107.225		104.474		117.063		105.93		112.221		104.074	
4067362004	DF-S-BG-10	10/8/2012	23:44	108.158		106.946		104.359		117.516		105.932		111.078		103.83	
CCV5 40002	CCV5 40002	10/8/2012	23:49	107.132		113.837		105.896		122.026		111.012		111.253		106.01	
CCB5 39996	CCB5 39996	10/8/2012	23:55	108.807		110.37		105.959		120.276		109.595		111.099		106.756	
4067362005	DF-S-BG-11	10/9/2012	0:00	107.235		107.535		104.077		118.941		106.258		110.672		104.128	
4067362006	DF-S-BG-12	10/9/2012	0:06	102.811		101.592		101.457		114.927		102.167		108.443		99.849	

Form 15 Equivalent

Pace Analytical Services

INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY

Instrument Runlog **SDG:** 4067362

Instrument: 40ICM2 **Chart Number:** 1008212A.csv

Lab Sample Name	Client Sample Name	Date of Analysi	Time of Analysi	Bi	Q	Ge	Q	In	Q	Sc-CCT	Q	Sc-KED	Q	Tb	Q	Y	Q
4067362007	DF-S-BG-13	10/9/2012	0:11	103.005		102.495		101.351		112.896		101.565		107.584		99.984	
4067362008	DF-S-BG-14	10/9/2012	0:17	109.21		106.463		104.433		115.521		105.325		112.391		104.407	
4067362009	DF-S-BG-15	10/9/2012	0:22	102.292		102.049		100.181		111.765		100.844		106.641		99.313	
4067362010	DF-S-BG-16	10/9/2012	0:28	101.287		100.588		99.344		111.434		100.029		106.818		98.716	
4067362011	DF-S-BG-17	10/9/2012	0:34	98.564		97.105		97.669		108.649		97.898		104.95		97.181	
4067362012	DF-N-BG-01	10/9/2012	0:39	103.814		101.582		100.667		112.123		100.987		108.221		99.733	
4067362013	DF-N-BG-02	10/9/2012	0:45	102.383		101.944		100.67		113.004		100.072		106.997		99.326	
4067362014	DF-N-BG-03	10/9/2012	0:50	102.802		102.466		100.702		112.167		100.503		107.264		99.557	
CCV6 40002	CCV6 40002	10/9/2012	0:56	106.7		110.995		104.828		116.795		109.251		110.54		104.607	
CCB6 39996	CCB6 39996	10/9/2012	1:01	108.887		105.679		102.846		116.031		105.557		110.231		103.124	
4067362015	DF-N-BG-04	10/9/2012	1:07	101.848		101.39		99.694		113.609		100.904		106.338		98.474	
4067362016	DF-N-BG-05	10/9/2012	1:12	107.542		105.71		102.673		114.71		103.19		109.744		101.859	
4067362017	DF-S-RB-01	10/9/2012	1:18	106.458		104.635		101.694		113.883		102.761		109.428		101.553	
4067362018	DF-N-AE-01	10/9/2012	1:24	104.676		103.269		101.552		112.056		101.321		107.972		100.224	
CCV7 40002	CCV7 40002	10/9/2012	2:03	106.057		110.594		103.842		118.608		108.776		109.671		104.236	
CCB7 39996	CCB7 39996	10/9/2012	2:08	106.898		107.226		103.016		116.758		106.31		109.225		103.732	

Pace Analytical Services, Inc.
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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067362

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
4067362001	DF-S-BG-07	EPA 3050B	MPRP/7574	EPA 6020	ICPM/3359
4067362002	DF-S-BG-08	EPA 3050B	MPRP/7574	EPA 6020	ICPM/3359
4067362003	DF-S-BG-09	EPA 3050B	MPRP/7574	EPA 6020	ICPM/3359
4067362004	DF-S-BG-10	EPA 3050B	MPRP/7574	EPA 6020	ICPM/3359
4067362005	DF-S-BG-11	EPA 3050B	MPRP/7574	EPA 6020	ICPM/3359
4067362006	DF-S-BG-12	EPA 3050B	MPRP/7574	EPA 6020	ICPM/3359
4067362007	DF-S-BG-13	EPA 3050B	MPRP/7574	EPA 6020	ICPM/3359
4067362008	DF-S-BG-14	EPA 3050B	MPRP/7574	EPA 6020	ICPM/3359
4067362009	DF-S-BG-15	EPA 3050B	MPRP/7574	EPA 6020	ICPM/3359
4067362010	DF-S-BG-16	EPA 3050B	MPRP/7574	EPA 6020	ICPM/3359
4067362011	DF-S-BG-17	EPA 3050B	MPRP/7574	EPA 6020	ICPM/3359
4067362012	DF-N-BG-01	EPA 3050B	MPRP/7574	EPA 6020	ICPM/3359
4067362013	DF-N-BG-02	EPA 3050B	MPRP/7574	EPA 6020	ICPM/3359
4067362014	DF-N-BG-03	EPA 3050B	MPRP/7574	EPA 6020	ICPM/3359
4067362015	DF-N-BG-04	EPA 3050B	MPRP/7574	EPA 6020	ICPM/3359
4067362016	DF-N-BG-05	EPA 3050B	MPRP/7574	EPA 6020	ICPM/3359
4067362017	DF-S-RB-01	EPA 3050B	MPRP/7574	EPA 6020	ICPM/3359
4067362018	DF-N-AE-01	EPA 3050B	MPRP/7574	EPA 6020	ICPM/3359

REPORT OF LABORATORY ANALYSIS

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Metals Verification of Instrument Parameters Cover Sheet

Client: AECOM, INC. - NY
Project: DZUS FASTENERS LAKE CAPRI FISH
SDG: 4067362

Pace Analytical Services

Metals Data Reporting Form

Method Detection Limits **SDG:** 4067362

Instrument: 40ICM2 **Units:** ug/L

Element	Wavelength	Reporting Limit	MDL	Date of
Cadmium	111	1.0	0.10	8/18/2011

Pace Analytical Services

Metals Data Reporting Form

Linear Dynamic Range **SDG:** 4067362

Instrument: 40ICM2 **Units:** ppb

Element	Wavelength /Mass	Linear Range	Date of Linear Range
Cadmium	111	10000	12/14/2011

Metals Raw Data Cover Sheet

Client: AECOM, INC. - NY
Project: DZUS FASTENERS LAKE CAPRI FISH
SDG: 4067362

40ICM2 Run Log

Analytical Run: 1008212A.csv Method:

Date	Time	Sample ID	Dil	Notes:	Batch
10/08/12	18:16:22	CAL0 39996	1		3361
10/08/12	18:21:57	CAL1 39997	1		3361
10/08/12	18:27:29	CAL2 39998	1		3361
10/08/12	18:33:02	CAL3 39999	1		3361
10/08/12	18:38:35	CAL4 40000	1		3361
10/08/12	18:44:09	CAL5 40001	1		3361
10/08/12	18:49:43	ICV 39693	1		3361
10/08/12	18:55:17	ICB 39996	1		3361
10/08/12	19:00:51	CRDL 39997	1		3361
10/08/12	19:06:24	CRDL 39998	1		3361
10/08/12	19:11:56	ICSA1 39698	1		3361
10/08/12	19:17:28	ICSAB1 39699	1		3361
10/08/12	19:23:03	CCV1 40002	1		3361
10/08/12	19:28:36	CCB1 39996	1		3361
10/08/12	19:34:08	686242	1		3358
10/08/12	19:39:40	686246	1		3358
10/08/12	19:45:12	686243	1		3358
10/08/12	19:50:43	686247	1		3358
10/08/12	19:56:15	4067361001	1		3358
10/08/12	20:01:48	686248	1		3358
10/08/12	20:07:20	686249	1		3358
10/8/2012	20:12:54	688831	1		3358
10/8/2012	20:18:28	4067361002	1		3358
10/8/2012	20:24:02	688832	5		3358
10/8/2012	20:29:37	CCV2 40002	1		3361
10/8/2012	20:35:10	CCB2 39996	1		3361
10/8/2012	20:40:43	4067361003	1		3358
10/8/2012	20:46:18	4067361004	1		3358
10/8/2012	20:51:51	4067361005	1		3358
10/8/2012	20:57:23	4067361006	1		3358
10/8/2012	21:02:54	4067361007	1		3358
10/8/2012	21:08:27	4067361008	1		3358
10/8/2012	21:13:58	4067361009	1		3358
10/8/2012	21:19:31	4067361010	1		3358
10/8/2012	21:25:04	4067361011	1		3358
10/8/2012	21:30:38	4067361012	1		3358
10/8/2012	21:36:11	CCV3 40002	1		3361
10/8/2012	21:41:44	CCB3 39996	1		3361
10/8/2012	21:47:17	4067361013	1		3358
10/8/2012	21:52:51	4067361014	1		3358
10/8/2012	21:58:25	4067361015	1		3358
10/8/2012	22:04:00	4067361016	1		3358
10/8/2012	22:09:34	4067361017	1		3358
10/8/2012	22:15:06	4067361018	1		3358

40ICM2 Run Log

Analytical Run: 1008212A.csv Method:

Date	Time	Sample ID	Dil	Notes:	Batch
10/8/2012	22:20:39	4067361019	1		3358
10/8/2012	22:26:13	BLANK	1		
10/8/2012	22:31:47	686525	1		3359
10/8/2012	22:37:19	686527	1		3359
10/8/2012	22:42:53	CCV4 40002	1		3361
10/8/2012	22:48:27	CCB4 39996	1		3361
10/8/2012	22:53:59	686526	1		3359
10/8/2012	22:59:32	686528	1		3359
10/8/2012	23:05:05	4067362001	1		3359
10/8/2012	23:10:39	686529	1		3359
10/8/2012	23:16:12	686530	1		3359
10/8/2012	23:21:45	688843	1		3359
10/8/2012	23:27:19	4067362002	1		3359
10/8/2012	23:32:52	688844	5		3359
10/8/2012	23:38:26	4067362003	1		3359
10/8/2012	23:44:00	4067362004	1		3359
10/8/2012	23:49:35	CCV5 40002	1		3361
10/8/2012	23:55:09	CCB5 39996	1		3361
10/9/2012	0:00:41	4067362005	1		3359
10/9/2012	0:06:14	4067362006	1		3359
10/9/2012	0:11:47	4067362007	1		3359
10/9/2012	0:17:20	4067362008	1		3359
10/9/2012	0:22:53	4067362009	1		3359
10/9/2012	0:28:26	4067362010	1		3359
10/9/2012	0:34:00	4067362011	1		3359
10/9/2012	0:39:33	4067362012	1		3359
10/9/2012	0:45:06	4067362013	1		3359
10/9/2012	0:50:40	4067362014	1		3359
10/9/2012	0:56:15	CCV6 40002	1		3361
10/9/2012	1:01:48	CCB6 39996	1		3361
10/9/2012	1:07:21	4067362015	1		3359
10/9/2012	1:12:56	4067362016	1		3359
10/9/2012	1:18:30	4067362017	1		3359
10/9/2012	1:24:04	4067362018	1		3359
10/9/2012	1:29:39	BLANK	1		
10/9/2012	1:35:14	686605	1		3360
10/9/2012	1:40:48	686611	1		3360
10/9/2012	1:46:22	686606	1		3360
10/9/2012	1:51:55	686612	1		3360
10/9/2012	1:57:29	4067620001	1		3360
10/9/2012	2:03:03	CCV7 40002	1		3361
10/9/2012	2:08:37	CCB7 39996	1		3361
10/9/2012	2:14:09	686613	1		3360
10/9/2012	2:19:43	686614	1		3360
10/9/2012	2:25:16	688848	1		3360
10/9/2012	2:30:50	4067620002	1		3360

40ICM2 Run Log

Analytical Run: 1008212A.csv Method:

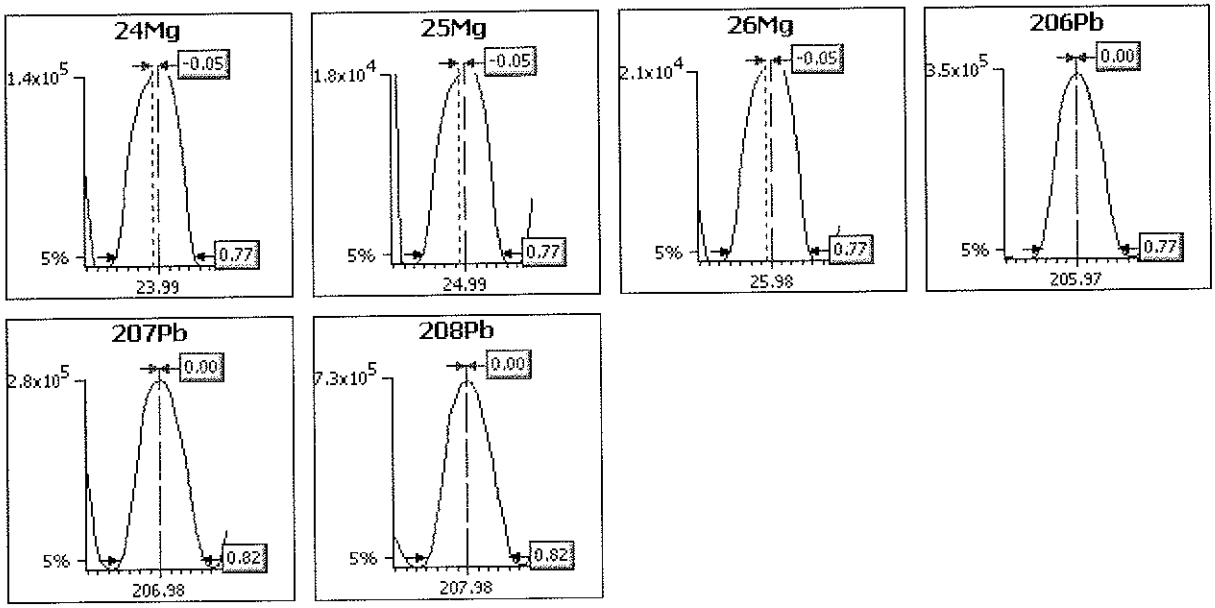
Date	Time	Sample ID	Dil	Notes:	Batch
10/9/2012	2:36:24	688849	5		3360
10/9/2012	2:41:59	4067620003	1		3360
10/9/2012	2:47:33	4067620004	1		3360
10/9/2012	2:53:07	4067620005	1		3360
10/9/2012	2:58:41	4067620006	1		3360
10/9/2012	3:04:14	4067620007	1		3360
10/9/2012	3:09:49	CCV8 40002	1		3361
10/9/2012	3:15:22	CCB8 39996	1		3361
10/9/2012	3:20:55	4067620008	1		3360
10/9/2012	3:26:30	4067620009	1		3360
10/9/2012	3:32:03	4067620010	1		3360
10/9/2012	3:37:36	4067365001	1		3360
10/9/2012	3:43:10	4067365002	1		3360
10/9/2012	3:48:45	4067365003	1		3360
10/9/2012	3:54:19	4067365004	1		3360
10/9/2012	3:59:53	4067365005	1		3360
10/9/2012	4:05:27	4067365006	1		3360
10/9/2012	4:11:01	4067365007	1		3360
10/9/2012	4:16:36	CCV9 40002	1		3361
10/9/2012	4:22:10	CCB9 39996	1		3361

Performance Report

Sample details
Acquired at : 10/8/2012 3:54:00 PM
Report name : EPA 40ICM2 SN 01301C [10/1/2012 3:16:50 PM]

Mass Calibration verification

Acquisition parameters
Sweeps : 10
Dwell : 10.0 mSecs
Point spacing : 0.05 amu
Peak width measured at 5% of the peak maximum



Analyte	Limits			Results	
	Max. width	Min. width	Max. error	Peak width	Peak error
24Mg	0.85	0.65	0.10	0.77	-0.05
25Mg	0.85	0.65	0.10	0.77	-0.05
26Mg	0.85	0.65	0.10	0.77	-0.05
206Pb	0.85	0.65	0.10	0.77	0.00
207Pb	0.85	0.65	0.10	0.82	0.00
208Pb	0.85	0.65	0.10	0.82	0.00

Sample details
Acquired at : 10/8/2012 3:54:00 PM
Report name : EPA 40ICM2 SN 01301C [10/1/2012 3:16:50 PM]

Tune conditions

Major	
Extraction	-98.0
Lens 1	-1098
Lens 2	-80.0
Focus	14.7
D1	-31.4
D2	-121
Pole Bias	0.1
Hexapole Bias	-3.5
Nebuliser	0.81

Minor	
Lens 3	-185.1
Forward power	1404
Horizontal	48
Vertical	282
DA	-37.6
Cool	13.0
Auxiliary	0.70
Sampling Depth	145

Global	
Standard resolution	145
High resolution	135
Analogue Detector	2375
PC Detector	3475

Add. Gases	
CCT-He	0.00
CCT-He	0.00

Sensitivity and stability results

Acquisition parameters
Sweeps : 35

Run	Time	5Bkg	7Li	24Mg	25Mg	26Mg	59Co	137Ba++	115In	137Ba
Dwell (mSecs)		500.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Limits	%RSD	-	2.0%	2.0%	2.0%	2.0%	2.0%	-	2.0%	-
	Countrate	<1	>60000	>10000	>10000	>10000	>150000	-	>400000	-
1	3:54:23 PM	0.229	100733.48	142079.14	19385.236	22557.858	234909.14	1525.835	709821.68	82253.169
2	3:55:09 PM	0.171	100652.64	143998.81	19439.631	23285.303	237737.39	1242.937	715171.39	84339.699
3	3:55:55 PM	0.343	100846.08	140678.78	19230.640	22377.437	234057.31	1337.236	714667.33	82722.887
4	3:56:41 PM	0.114	101411.98	143618.91	19388.098	22984.581	237459.21	1317.233	714439.90	83400.128
5	3:57:27 PM	0.229	99902.014	141061.46	19522.656	23368.362	234110.00	1394.387	712264.18	83302.142
x		0.217	100709.24	142287.42	19393.252	22914.708	235654.61	1363.526	713272.90	83203.605
σ		0.08	540.37	1486.25	106.57	437.04	1808.83	105.68	2227.05	786.36
%RSD		39.033	0.537	1.045	0.550	1.907	0.768	7.750	0.312	0.945

Run	Time	138Ba	140Ce	156Ce O	206Pb	207Pb	208Pb	220Bkg	238U
Dwell (mSecs)		10.0	10.0	10.0	10.0	10.0	10.0	500.0	10.0
Limits	%RSD	-	-	-	2.0%	2.0%	2.0%	-	2.0%
	Countrate	-	-	-	>10000	>10000	>10000	<1	>800000
1	3:54:23 PM	546323.08	719309.32	14453.712	344304.52	287959.70	718617.49	0.114	1607653.9
2	3:55:09 PM	548492.96	723144.43	13194.761	339456.64	284160.57	713229.06	0.000	1588250.9
3	3:55:55 PM	539417.69	716849.72	13744.102	337128.26	279886.49	701300.65	0.000	1587882.6
4	3:56:41 PM	542933.21	714839.45	14144.682	337657.79	283751.62	707861.97	0.057	1602995.1
5	3:57:27 PM	545727.80	723492.03	13869.996	338894.46	282601.33	705018.30	0.057	1566641.6
x		544578.95	719526.99	13881.451	339488.34	283671.94	709205.50	0.046	1590684.8
σ		3501.01	3807.74	470.99	2849.13	2920.01	6830.06	0.05	16057.26
%RSD		0.643	0.529	3.393	0.839	1.029	0.963	104.583	1.009

Ratio results

Run	Time	137Ba++/137Ba	156Ce O/140Ce
Ratio limits		<0.0300	<0.0200
1	3:54:23 PM	0.019	0.020
2	3:55:09 PM	0.015	0.018
3	3:55:55 PM	0.016	0.019
4	3:56:41 PM	0.016	0.020
5	3:57:27 PM	0.017	0.019
x		0.0164	0.0193
σ		0.00	0.00
%RSD		8.5848	3.6744

Result : The performance report passed.

Performance Report

Sample details
Acquired at : 10/8/2012 4:04:12 PM
Report name : Xt CCT 40ICM2 SN 01301C [10/1/2012 3:17:09 PM]

Tune conditions

Major	
Extraction	-98.0
Lens 1	-1098
Lens 2	-80.0
Focus	10.8
D1	-43.9
D2	-143
Pole Bias	-9.0
Hexapole Bias	-4.0
Nebuliser	0.81

Minor	
Lens 3	-195.3
Forward power	1404
Horizontal	48
Vertical	282
DA	-37.6
Cool	13.0
Auxiliary	0.70
Sampling Depth	145

Global	
Standard resolution	145
High resolution	135
Analogue Detector	2375
PC Detector	3475

Add. Gases	
CCT-He	0.00
CCT-He	0.51

Sensitivity and stability results

Acquisition parameters
Sweeps : 45

Run	Time	7Li	9Be	11B
Dwell (mSecs)		10.0	10.0	10.0
Limits	%RSD	2.0%	2.0%	2.0%
	Countrate	>10000	>2000	>2000
1	4:04:13 PM	16981.649	5159.161	5801.750
2	4:04:16 PM	17041.755	5079.119	5686.125
3	4:04:19 PM	17478.093	5088.012	5763.949
4	4:04:22 PM	17003.911	5012.417	5639.431
5	4:04:25 PM	16632.150	5005.747	5628.313
x		17027.512	5068.891	5703.914
σ		300.91	62.84	76.43
%RSD		1.767	1.240	1.340

Result : The performance report passed.

Performance Report

Sample details
Acquired at : 10/8/2012 4:11:56 PM
Report name : Xt CCT-KED 40ICM2 SN01301C [10/1/2012 3:17:23 PM]

Tune conditions

Major	
Extraction	-98.0
Lens 1	-1098
Lens 2	-80.0
Focus	-5.3
D1	-56.5
D2	-143
Pole Bias	-17.0
Hexapole Bias	-20.0
Nebuliser	0.81

Minor	
Lens 3	-195.3
Forward power	1404
Horizontal	48
Vertical	282
DA	-37.6
Cool	13.0
Auxiliary	0.70
Sampling Depth	145

Global	
Standard resolution	145
High resolution	135
Analogue Detector	2375
PC Detector	3475

Add. Gases	
CCT-He	0.00
CCT-He	3.80

Sensitivity and stability results

Acquisition parameters
Sweeps : 35

Run	Time	78Se	115In	140Ce	156Ce O
Dwell (mSecs)		100.0	10.0	10.0	50.0
Limits	%RSD	-	2.0%	-	-
	Countrate	<20	>100000	-	-
1	4:11:57 PM	8.000	300812.93	427717.45	5395.799
2	4:12:05 PM	4.286	303722.27	435306.91	5877.224
3	4:12:13 PM	4.571	299472.03	433349.99	5403.804
4	4:12:21 PM	6.286	303288.91	433968.40	5658.236
5	4:12:29 PM	6.000	299301.12	432014.73	5567.897
x		5.829	301319.45	432471.50	5580.592
σ		1.49	2085.40	2909.54	199.74
%RSD		25.612	0.692	0.673	3.579

Ratio results

Run	Time	156Ce O/140Ce
Ratio limits		<0.0200
1	4:11:57 PM	0.013
2	4:12:05 PM	0.014
3	4:12:13 PM	0.012
4	4:12:21 PM	0.013
5	4:12:29 PM	0.013
x		0.0129
σ		0.00
%RSD		3.1169

Result : The performance report passed.

Experiment Details

Description	PlasmaLab Template BlankExperiment
Template Filename	C:\Program Files\Thermo Fisher\PlasmaLab\Templates\6020 XSII SN 01301 C.tet
Created By User	metals
Analyte Database	Pace.tea
Creation Timestamp	7/10/2008 4:47:18 PM
Last Edited By	paceuser
Last Edit Timestamp	10/9/2012 8:12:25 AM
Instrument Detector	Simultaneous
Database Version	3,51
Acquisition Mode	Unknown

Numerical Results report key (text indicates meaning)

Blue text indicates that cell is a statistic.
Underlining indicates that a data warning flag is set.

Column headings	Result cells	Data warning flags
No flag	Internal Standard	I - Invalid calibration
Semi Quant	Excluded	T - Tripped
Standard Addition	QC Warning	F - Interference correction failed
Multi Element	QC Failure	M - Result over max
	Transient TRA only:	V - Valley integration failed
	Peak Not Found	D - Different method used
	Manually Edited	
	Merged Peak	

Setup

Survey Scan Setup

Sweeps	10
Dwell Time	600
Channels Per Mass	10
Acquisition Duration	13345

Main Run Setup

Main Run	Peak Jumping
Sweeps	45
Dwell Time	10000
Channels Per Mass	1
Acquisition Duration	31093
Channel Spacing	0.02

Survey Scan Regions

Start AMU	End AMU	Channels	Dwell ms	Resolution
4.59	11.50	69	600	
12.50	13.50	10	600	
22.59	28.41	58	600	
30.59	31.41	8	600	
33.59	35.50	19	600	
38.59	39.41	8	600	
42.59	45.50	29	600	
46.50	79.41	329	600	
80.59	245.50	1649	600	

Peak Jump Regions

Analyte	Channels	Dwell ms	Resolution
7Li	1	10000	Standard
9Be	1	10000	Standard
10B	1	10000	Standard
23Na	1	5000	
25Mg	1	10000	Standard
27Al	1	10000	Standard
28Si	1	10000	Standard
31P	1	10000	Standard
34S	1	10000	
35Cl	1	10000	
39K	1	10000	

43Ca	1	10000	Standard
45Sc-KED	1	10000	Standard
45Sc-CCT	1	10000	
47Ti	1	10000	Standard
51V	1	10000	Standard
52Cr	1	10000	Standard
53Cl O	1	10000	Standard
54Fe	1	10000	Standard
55Mn	1	10000	Standard
59Co	1	10000	Standard
60Ni	1	10000	Standard
63Cu	1	10000	Standard
66Zn	1	10000	Standard
72Ge	1	10000	Standard
73Ge	1	10000	Standard
75As	1	50000	Standard
78Se	1	50000	Standard
83Kr	1	50000	Standard
88Sr	1	10000	Standard
89Y	1	10000	Standard
90Zr	1	10000	Standard
95Mo	1	10000	Standard
107Ag	1	10000	Standard
111Cd	1	10000	Standard
115In	1	10000	Standard
118Sn	1	10000	Standard
121Sb	1	10000	Standard
137Ba	1	10000	Standard
159Tb	1	10000	Standard
184W	1	10000	Standard
201Hg	1	10000	Standard
205Tl	1	10000	Standard
206Pb	1	10000	Standard
207Pb	1	10000	Standard
208Pb	1	10000	Standard
209Bi	1	10000	Standard
238U	1	10000	Standard

Instrument Configuration

Sample/Analyte Settings

Label	Config	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
39996_3361_Cal0	5	7	7	7	8	8	8	8	8	8	8
39997_3361_Cal1	5	7	7	7	8	8	8	8	8	8	8
39998_3361_Cal2	5	7	7	7	8	8	8	8	8	8	8
39999_3361_Cal3	5	7	7	7	8	8	8	8	8	8	8
40000_3361_Cal4	5	7	7	7	8	8	8	8	8	8	8
40001_3361_Cal5	5	7	7	7	8	8	8	8	8	8	8
39693_3361_ICV	5	7	7	7	8	8	8	8	8	8	8
39996_3361_ICB	5	7	7	7	8	8	8	8	8	8	8
39997_3361_CRDL_A1	5	7	7	7	8	8	8	8	8	8	8
39998_3361_CRDL_B1	5	7	7	7	8	8	8	8	8	8	8
39698_3361_ICSA1	5	7	7	7	8	8	8	8	8	8	8
39699_3361_ICSAB1	5	7	7	7	8	8	8	8	8	8	8
40002_3361_CCV1	5	7	7	7	8	8	8	8	8	8	8
39996_3361_CCB1	5	7	7	7	8	8	8	8	8	8	8
686242_3358	5	7	7	7	8	8	8	8	8	8	8
686246_3358	5	7	7	7	8	8	8	8	8	8	8
686243_3358	5	7	7	7	8	8	8	8	8	8	8
686247_3358	5	7	7	7	8	8	8	8	8	8	8
4067361001_3358	5	7	7	7	8	8	8	8	8	8	8
686248_3358	5	7	7	7	8	8	8	8	8	8	8
686249_3358	5	7	7	7	8	8	8	8	8	8	8
688831_3358	5	7	7	7	8	8	8	8	8	8	8
4067361002_3358	5	7	7	7	8	8	8	8	8	8	8
688832_3358x5	5	7	7	7	8	8	8	8	8	8	8
40002_3361_CCV2	5	7	7	7	8	8	8	8	8	8	8
39996_3361_CCB2	5	7	7	7	8	8	8	8	8	8	8
4067361003_3358	5	7	7	7	8	8	8	8	8	8	8
4067361004_3358	5	7	7	7	8	8	8	8	8	8	8
4067361005_3358	5	7	7	7	8	8	8	8	8	8	8

4067361006_3358	5	7	7	7	8	8	8	8	8	8	8
4067361007_3358	5	7	7	7	8	8	8	8	8	8	8
4067361008_3358	5	7	7	7	8	8	8	8	8	8	8
4067361009_3358	5	7	7	7	8	8	8	8	8	8	8
4067361010_3358	5	7	7	7	8	8	8	8	8	8	8
4067361011_3358	5	7	7	7	8	8	8	8	8	8	8
4067361012_3358	5	7	7	7	8	8	8	8	8	8	8
40002_3361_CCV3	5	7	7	7	8	8	8	8	8	8	8
39996_3361_CCB3	5	7	7	7	8	8	8	8	8	8	8
4067361013_3358	5	7	7	7	8	8	8	8	8	8	8
4067361014_3358	5	7	7	7	8	8	8	8	8	8	8
4067361015_3358	5	7	7	7	8	8	8	8	8	8	8
4067361016_3358	5	7	7	7	8	8	8	8	8	8	8
4067361017_3358	5	7	7	7	8	8	8	8	8	8	8
4067361018_3358	5	7	7	7	8	8	8	8	8	8	8
4067361019_3358	5	7	7	7	8	8	8	8	8	8	8
Blank	5	7	7	7	8	8	8	8	8	8	8
686525_3359	5	7	7	7	8	8	8	8	8	8	8
686527_3359	5	7	7	7	8	8	8	8	8	8	8
40002_3361_CCV4	5	7	7	7	8	8	8	8	8	8	8
39996_3361_CCB4	5	7	7	7	8	8	8	8	8	8	8
686526_3359	5	7	7	7	8	8	8	8	8	8	8
686528_3359	5	7	7	7	8	8	8	8	8	8	8
4067362001_3359	5	7	7	7	8	8	8	8	8	8	8
686529_3359	5	7	7	7	8	8	8	8	8	8	8
686530_3359	5	7	7	7	8	8	8	8	8	8	8
688843_3359	5	7	7	7	8	8	8	8	8	8	8
4067362002_3359	5	7	7	7	8	8	8	8	8	8	8
688844_3359x5	5	7	7	7	8	8	8	8	8	8	8
4067362003_3359	5	7	7	7	8	8	8	8	8	8	8
4067362004_3359	5	7	7	7	8	8	8	8	8	8	8
40002_3361_CCV5	5	7	7	7	8	8	8	8	8	8	8
39996_3361_CCB5	5	7	7	7	8	8	8	8	8	8	8
4067362005_3359	5	7	7	7	8	8	8	8	8	8	8
4067362006_3359	5	7	7	7	8	8	8	8	8	8	8
4067362007_3359	5	7	7	7	8	8	8	8	8	8	8
4067362008_3359	5	7	7	7	8	8	8	8	8	8	8
4067362009_3359	5	7	7	7	8	8	8	8	8	8	8
4067362010_3359	5	7	7	7	8	8	8	8	8	8	8
4067362011_3359	5	7	7	7	8	8	8	8	8	8	8
4067362012_3359	5	7	7	7	8	8	8	8	8	8	8
4067362013_3359	5	7	7	7	8	8	8	8	8	8	8
4067362014_3359	5	7	7	7	8	8	8	8	8	8	8
40002_3361_CCV6	5	7	7	7	8	8	8	8	8	8	8
39996_3361_CCB6	5	7	7	7	8	8	8	8	8	8	8
4067362015_3359	5	7	7	7	8	8	8	8	8	8	8
4067362016_3359	5	7	7	7	8	8	8	8	8	8	8
4067362017_3359	5	7	7	7	8	8	8	8	8	8	8
4067362018_3359	5	7	7	7	8	8	8	8	8	8	8
Blank	5	7	7	7	8	8	8	8	8	8	8
686605_3360	5	7	7	7	8	8	8	8	8	8	8
686611_3360	5	7	7	7	8	8	8	8	8	8	8
686606_3360	5	7	7	7	8	8	8	8	8	8	8
686612_3360	5	7	7	7	8	8	8	8	8	8	8
4067620001_3360	5	7	7	7	8	8	8	8	8	8	8
40002_3361_CCV7	5	7	7	7	8	8	8	8	8	8	8
39996_3361_CCB7	5	7	7	7	8	8	8	8	8	8	8
686613_3360	5	7	7	7	8	8	8	8	8	8	8
686614_3360	5	7	7	7	8	8	8	8	8	8	8
688848_3360	5	7	7	7	8	8	8	8	8	8	8
4067620002_3360	5	7	7	7	8	8	8	8	8	8	8
688849_3360x5	5	7	7	7	8	8	8	8	8	8	8
4067620003_3360	5	7	7	7	8	8	8	8	8	8	8
4067620004_3360	5	7	7	7	8	8	8	8	8	8	8
4067620005_3360	5	7	7	7	8	8	8	8	8	8	8
4067620006_3360	5	7	7	7	8	8	8	8	8	8	8
4067620007_3360	5	7	7	7	8	8	8	8	8	8	8
40002_3361_CCV8	5	7	7	7	8	8	8	8	8	8	8
39996_3361_CCB8	5	7	7	7	8	8	8	8	8	8	8
4067620008_3360	5	7	7	7	8	8	8	8	8	8	8

4067620009_3360	5	7	7	7	8	8	8	8	8	8	8
4067620010_3360	5	7	7	7	8	8	8	8	8	8	8
4067365001_3360	5	7	7	7	8	8	8	8	8	8	8
4067365002_3360	5	7	7	7	8	8	8	8	8	8	8
4067365003_3360	5	7	7	7	8	8	8	8	8	8	8
4067365004_3360	5	7	7	7	8	8	8	8	8	8	8
4067365005_3360	5	7	7	7	8	8	8	8	8	8	8
4067365006_3360	5	7	7	7	8	8	8	8	8	8	8
4067365007_3360	5	7	7	7	8	8	8	8	8	8	8
40002_3361_CCV9	5	7	7	7	8	8	8	8	8	8	8
39996_3361_CCB9	5	7	7	7	8	8	8	8	8	8	8
Label	**Config**	**39K**	**43Ca**	**45Sc-KED**	**45Sc-CCT**	**47Ti**	**51V**	**52Cr**	**53Cl O**	**54Fe**	**55Mn**
39996_3361_Cal0	5	8	8	8	7	8	8	8	8	8	8
39997_3361_Cal1	5	8	8	8	7	8	8	8	8	8	8
39998_3361_Cal2	5	8	8	8	7	8	8	8	8	8	8
39999_3361_Cal3	5	8	8	8	7	8	8	8	8	8	8
40000_3361_Cal4	5	8	8	8	7	8	8	8	8	8	8
40001_3361_Cal5	5	8	8	8	7	8	8	8	8	8	8
39693_3361_ICV	5	8	8	8	7	8	8	8	8	8	8
39996_3361_ICB	5	8	8	8	7	8	8	8	8	8	8
39997_3361_CRDL_A1	5	8	8	8	7	8	8	8	8	8	8
39998_3361_CRDL_B1	5	8	8	8	7	8	8	8	8	8	8
39698_3361_ICSA1	5	8	8	8	7	8	8	8	8	8	8
39699_3361_ICSAB1	5	8	8	8	7	8	8	8	8	8	8
40002_3361_CCV1	5	8	8	8	7	8	8	8	8	8	8
39996_3361_CCB1	5	8	8	8	7	8	8	8	8	8	8
686242_3358	5	8	8	8	7	8	8	8	8	8	8
686246_3358	5	8	8	8	7	8	8	8	8	8	8
686243_3358	5	8	8	8	7	8	8	8	8	8	8
686247_3358	5	8	8	8	7	8	8	8	8	8	8
4067361001_3358	5	8	8	8	7	8	8	8	8	8	8
686248_3358	5	8	8	8	7	8	8	8	8	8	8
686249_3358	5	8	8	8	7	8	8	8	8	8	8
688831_3358	5	8	8	8	7	8	8	8	8	8	8
4067361002_3358	5	8	8	8	7	8	8	8	8	8	8
688832_3358x5	5	8	8	8	7	8	8	8	8	8	8
40002_3361_CCV2	5	8	8	8	7	8	8	8	8	8	8
39996_3361_CCB2	5	8	8	8	7	8	8	8	8	8	8
4067361003_3358	5	8	8	8	7	8	8	8	8	8	8
4067361004_3358	5	8	8	8	7	8	8	8	8	8	8
4067361005_3358	5	8	8	8	7	8	8	8	8	8	8
4067361006_3358	5	8	8	8	7	8	8	8	8	8	8
4067361007_3358	5	8	8	8	7	8	8	8	8	8	8
4067361008_3358	5	8	8	8	7	8	8	8	8	8	8
4067361009_3358	5	8	8	8	7	8	8	8	8	8	8
4067361010_3358	5	8	8	8	7	8	8	8	8	8	8
4067361011_3358	5	8	8	8	7	8	8	8	8	8	8
4067361012_3358	5	8	8	8	7	8	8	8	8	8	8
40002_3361_CCV3	5	8	8	8	7	8	8	8	8	8	8
39996_3361_CCB3	5	8	8	8	7	8	8	8	8	8	8
4067361013_3358	5	8	8	8	7	8	8	8	8	8	8
4067361014_3358	5	8	8	8	7	8	8	8	8	8	8
4067361015_3358	5	8	8	8	7	8	8	8	8	8	8
4067361016_3358	5	8	8	8	7	8	8	8	8	8	8
4067361017_3358	5	8	8	8	7	8	8	8	8	8	8
4067361018_3358	5	8	8	8	7	8	8	8	8	8	8
4067361019_3358	5	8	8	8	7	8	8	8	8	8	8
Blank	5	8	8	8	7	8	8	8	8	8	8
686525_3359	5	8	8	8	7	8	8	8	8	8	8
686527_3359	5	8	8	8	7	8	8	8	8	8	8
40002_3361_CCV4	5	8	8	8	7	8	8	8	8	8	8
39996_3361_CCB4	5	8	8	8	7	8	8	8	8	8	8
686526_3359	5	8	8	8	7	8	8	8	8	8	8
686528_3359	5	8	8	8	7	8	8	8	8	8	8
4067362001_3359	5	8	8	8	7	8	8	8	8	8	8
686529_3359	5	8	8	8	7	8	8	8	8	8	8
686530_3359	5	8	8	8	7	8	8	8	8	8	8
688843_3359	5	8	8	8	7	8	8	8	8	8	8
4067362002_3359	5	8	8	8	7	8	8	8	8	8	8
688844_3359x5	5	8	8	8	7	8	8	8	8	8	8

4067362003_3359	5	8	8	8	7	8	8	8	8	8	8
4067362004_3359	5	8	8	8	7	8	8	8	8	8	8
40002_3361_CCV5	5	8	8	8	7	8	8	8	8	8	8
39996_3361_CCB5	5	8	8	8	7	8	8	8	8	8	8
4067362005_3359	5	8	8	8	7	8	8	8	8	8	8
4067362006_3359	5	8	8	8	7	8	8	8	8	8	8
4067362007_3359	5	8	8	8	7	8	8	8	8	8	8
4067362008_3359	5	8	8	8	7	8	8	8	8	8	8
4067362009_3359	5	8	8	8	7	8	8	8	8	8	8
4067362010_3359	5	8	8	8	7	8	8	8	8	8	8
4067362011_3359	5	8	8	8	7	8	8	8	8	8	8
4067362012_3359	5	8	8	8	7	8	8	8	8	8	8
4067362013_3359	5	8	8	8	7	8	8	8	8	8	8
4067362014_3359	5	8	8	8	7	8	8	8	8	8	8
40002_3361_CCV6	5	8	8	8	7	8	8	8	8	8	8
39996_3361_CCB6	5	8	8	8	7	8	8	8	8	8	8
4067362015_3359	5	8	8	8	7	8	8	8	8	8	8
4067362016_3359	5	8	8	8	7	8	8	8	8	8	8
4067362017_3359	5	8	8	8	7	8	8	8	8	8	8
4067362018_3359	5	8	8	8	7	8	8	8	8	8	8
Blank	5	8	8	8	7	8	8	8	8	8	8
686605_3360	5	8	8	8	7	8	8	8	8	8	8
686611_3360	5	8	8	8	7	8	8	8	8	8	8
686606_3360	5	8	8	8	7	8	8	8	8	8	8
686612_3360	5	8	8	8	7	8	8	8	8	8	8
4067620001_3360	5	8	8	8	7	8	8	8	8	8	8
40002_3361_CCV7	5	8	8	8	7	8	8	8	8	8	8
39996_3361_CCB7	5	8	8	8	7	8	8	8	8	8	8
686613_3360	5	8	8	8	7	8	8	8	8	8	8
686614_3360	5	8	8	8	7	8	8	8	8	8	8
688848_3360	5	8	8	8	7	8	8	8	8	8	8
4067620002_3360	5	8	8	8	7	8	8	8	8	8	8
688849_3360x5	5	8	8	8	7	8	8	8	8	8	8
4067620003_3360	5	8	8	8	7	8	8	8	8	8	8
4067620004_3360	5	8	8	8	7	8	8	8	8	8	8
4067620005_3360	5	8	8	8	7	8	8	8	8	8	8
4067620006_3360	5	8	8	8	7	8	8	8	8	8	8
4067620007_3360	5	8	8	8	7	8	8	8	8	8	8
40002_3361_CCV8	5	8	8	8	7	8	8	8	8	8	8
39996_3361_CCB8	5	8	8	8	7	8	8	8	8	8	8
4067620008_3360	5	8	8	8	7	8	8	8	8	8	8
4067620009_3360	5	8	8	8	7	8	8	8	8	8	8
4067620010_3360	5	8	8	8	7	8	8	8	8	8	8
4067365001_3360	5	8	8	8	7	8	8	8	8	8	8
4067365002_3360	5	8	8	8	7	8	8	8	8	8	8
4067365003_3360	5	8	8	8	7	8	8	8	8	8	8
4067365004_3360	5	8	8	8	7	8	8	8	8	8	8
4067365005_3360	5	8	8	8	7	8	8	8	8	8	8
4067365006_3360	5	8	8	8	7	8	8	8	8	8	8
4067365007_3360	5	8	8	8	7	8	8	8	8	8	8
40002_3361_CCV9	5	8	8	8	7	8	8	8	8	8	8
39996_3361_CCB9	5	8	8	8	7	8	8	8	8	8	8
Label	**Config**	**59Co**	**60Ni**	**63Cu**	**66Zn**	**72Ge**	**73Ge**	**75As**	**78Se**	**83Kr**	**88Sr**
39996_3361_Cal0	5	8	8	8	8	8	8	8	8	8	8
39997_3361_Cal1	5	8	8	8	8	8	8	8	8	8	8
39998_3361_Cal2	5	8	8	8	8	8	8	8	8	8	8
39999_3361_Cal3	5	8	8	8	8	8	8	8	8	8	8
40000_3361_Cal4	5	8	8	8	8	8	8	8	8	8	8
40001_3361_Cal5	5	8	8	8	8	8	8	8	8	8	8
39693_3361_ICV	5	8	8	8	8	8	8	8	8	8	8
39996_3361_ICB	5	8	8	8	8	8	8	8	8	8	8
39997_3361_CRDL_A1	5	8	8	8	8	8	8	8	8	8	8
39998_3361_CRDL_B1	5	8	8	8	8	8	8	8	8	8	8
39698_3361_ICSA1	5	8	8	8	8	8	8	8	8	8	8
39699_3361_ICSAB1	5	8	8	8	8	8	8	8	8	8	8
40002_3361_CCV1	5	8	8	8	8	8	8	8	8	8	8
39996_3361_CCB1	5	8	8	8	8	8	8	8	8	8	8
686242_3358	5	8	8	8	8	8	8	8	8	8	8
686246_3358	5	8	8	8	8	8	8	8	8	8	8
686243_3358	5	8	8	8	8	8	8	8	8	8	8

686247_3358	5	8	8	8	8	8	8	8	8	8	8
4067361001_3358	5	8	8	8	8	8	8	8	8	8	8
686248_3358	5	8	8	8	8	8	8	8	8	8	8
686249_3358	5	8	8	8	8	8	8	8	8	8	8
688831_3358	5	8	8	8	8	8	8	8	8	8	8
4067361002_3358	5	8	8	8	8	8	8	8	8	8	8
688832_3358x5	5	8	8	8	8	8	8	8	8	8	8
40002_3361_CCV2	5	8	8	8	8	8	8	8	8	8	8
39996_3361_CCB2	5	8	8	8	8	8	8	8	8	8	8
4067361003_3358	5	8	8	8	8	8	8	8	8	8	8
4067361004_3358	5	8	8	8	8	8	8	8	8	8	8
4067361005_3358	5	8	8	8	8	8	8	8	8	8	8
4067361006_3358	5	8	8	8	8	8	8	8	8	8	8
4067361007_3358	5	8	8	8	8	8	8	8	8	8	8
4067361008_3358	5	8	8	8	8	8	8	8	8	8	8
4067361009_3358	5	8	8	8	8	8	8	8	8	8	8
4067361010_3358	5	8	8	8	8	8	8	8	8	8	8
4067361011_3358	5	8	8	8	8	8	8	8	8	8	8
4067361012_3358	5	8	8	8	8	8	8	8	8	8	8
40002_3361_CCV3	5	8	8	8	8	8	8	8	8	8	8
39996_3361_CCB3	5	8	8	8	8	8	8	8	8	8	8
4067361013_3358	5	8	8	8	8	8	8	8	8	8	8
4067361014_3358	5	8	8	8	8	8	8	8	8	8	8
4067361015_3358	5	8	8	8	8	8	8	8	8	8	8
4067361016_3358	5	8	8	8	8	8	8	8	8	8	8
4067361017_3358	5	8	8	8	8	8	8	8	8	8	8
4067361018_3358	5	8	8	8	8	8	8	8	8	8	8
4067361019_3358	5	8	8	8	8	8	8	8	8	8	8
Blank	5	8	8	8	8	8	8	8	8	8	8
686525_3359	5	8	8	8	8	8	8	8	8	8	8
686527_3359	5	8	8	8	8	8	8	8	8	8	8
40002_3361_CCV4	5	8	8	8	8	8	8	8	8	8	8
39996_3361_CCB4	5	8	8	8	8	8	8	8	8	8	8
686526_3359	5	8	8	8	8	8	8	8	8	8	8
686528_3359	5	8	8	8	8	8	8	8	8	8	8
4067362001_3359	5	8	8	8	8	8	8	8	8	8	8
686529_3359	5	8	8	8	8	8	8	8	8	8	8
686530_3359	5	8	8	8	8	8	8	8	8	8	8
688843_3359	5	8	8	8	8	8	8	8	8	8	8
4067362002_3359	5	8	8	8	8	8	8	8	8	8	8
688844_3359x5	5	8	8	8	8	8	8	8	8	8	8
4067362003_3359	5	8	8	8	8	8	8	8	8	8	8
4067362004_3359	5	8	8	8	8	8	8	8	8	8	8
40002_3361_CCV5	5	8	8	8	8	8	8	8	8	8	8
39996_3361_CCB5	5	8	8	8	8	8	8	8	8	8	8
4067362005_3359	5	8	8	8	8	8	8	8	8	8	8
4067362006_3359	5	8	8	8	8	8	8	8	8	8	8
4067362007_3359	5	8	8	8	8	8	8	8	8	8	8
4067362008_3359	5	8	8	8	8	8	8	8	8	8	8
4067362009_3359	5	8	8	8	8	8	8	8	8	8	8
4067362010_3359	5	8	8	8	8	8	8	8	8	8	8
4067362011_3359	5	8	8	8	8	8	8	8	8	8	8
4067362012_3359	5	8	8	8	8	8	8	8	8	8	8
4067362013_3359	5	8	8	8	8	8	8	8	8	8	8
4067362014_3359	5	8	8	8	8	8	8	8	8	8	8
40002_3361_CCV6	5	8	8	8	8	8	8	8	8	8	8
39996_3361_CCB6	5	8	8	8	8	8	8	8	8	8	8
4067362015_3359	5	8	8	8	8	8	8	8	8	8	8
4067362016_3359	5	8	8	8	8	8	8	8	8	8	8
4067362017_3359	5	8	8	8	8	8	8	8	8	8	8
4067362018_3359	5	8	8	8	8	8	8	8	8	8	8
Blank	5	8	8	8	8	8	8	8	8	8	8
686605_3360	5	8	8	8	8	8	8	8	8	8	8
686611_3360	5	8	8	8	8	8	8	8	8	8	8
686606_3360	5	8	8	8	8	8	8	8	8	8	8
686612_3360	5	8	8	8	8	8	8	8	8	8	8
4067620001_3360	5	8	8	8	8	8	8	8	8	8	8
40002_3361_CCV7	5	8	8	8	8	8	8	8	8	8	8
39996_3361_CCB7	5	8	8	8	8	8	8	8	8	8	8
686613_3360	5	8	8	8	8	8	8	8	8	8	8

686614_3360	5	8	8	8	8	8	8	8	8	8	8
688848_3360	5	8	8	8	8	8	8	8	8	8	8
4067620002_3360	5	8	8	8	8	8	8	8	8	8	8
688849_3360x5	5	8	8	8	8	8	8	8	8	8	8
4067620003_3360	5	8	8	8	8	8	8	8	8	8	8
4067620004_3360	5	8	8	8	8	8	8	8	8	8	8
4067620005_3360	5	8	8	8	8	8	8	8	8	8	8
4067620006_3360	5	8	8	8	8	8	8	8	8	8	8
4067620007_3360	5	8	8	8	8	8	8	8	8	8	8
40002_3361_CCV8	5	8	8	8	8	8	8	8	8	8	8
39996_3361_CCB8	5	8	8	8	8	8	8	8	8	8	8
4067620008_3360	5	8	8	8	8	8	8	8	8	8	8
4067620009_3360	5	8	8	8	8	8	8	8	8	8	8
4067620010_3360	5	8	8	8	8	8	8	8	8	8	8
4067365001_3360	5	8	8	8	8	8	8	8	8	8	8
4067365002_3360	5	8	8	8	8	8	8	8	8	8	8
4067365003_3360	5	8	8	8	8	8	8	8	8	8	8
4067365004_3360	5	8	8	8	8	8	8	8	8	8	8
4067365005_3360	5	8	8	8	8	8	8	8	8	8	8
4067365006_3360	5	8	8	8	8	8	8	8	8	8	8
4067365007_3360	5	8	8	8	8	8	8	8	8	8	8
40002_3361_CCV9	5	8	8	8	8	8	8	8	8	8	8
39996_3361_CCB9	5	8	8	8	8	8	8	8	8	8	8
Label	**Config**	**89Y**	**90Zr**	**95Mo**	**107Ag**	**111Cd**	**115In**	**118Sn**	**121Sb**	**137Ba**	**159Tb**
39996_3361_Cal0	5	8	8	8	8	8	8	8	8	8	8
39997_3361_Cal1	5	8	8	8	8	8	8	8	8	8	8
39998_3361_Cal2	5	8	8	8	8	8	8	8	8	8	8
39999_3361_Cal3	5	8	8	8	8	8	8	8	8	8	8
40000_3361_Cal4	5	8	8	8	8	8	8	8	8	8	8
40001_3361_Cal5	5	8	8	8	8	8	8	8	8	8	8
39693_3361_ICV	5	8	8	8	8	8	8	8	8	8	8
39996_3361_ICB	5	8	8	8	8	8	8	8	8	8	8
39997_3361_CRDL_A1	5	8	8	8	8	8	8	8	8	8	8
39998_3361_CRDL_B1	5	8	8	8	8	8	8	8	8	8	8
39698_3361_ICSA1	5	8	8	8	8	8	8	8	8	8	8
39699_3361_ICSAB1	5	8	8	8	8	8	8	8	8	8	8
40002_3361_CCV1	5	8	8	8	8	8	8	8	8	8	8
39996_3361_CCB1	5	8	8	8	8	8	8	8	8	8	8
686242_3358	5	8	8	8	8	8	8	8	8	8	8
686246_3358	5	8	8	8	8	8	8	8	8	8	8
686243_3358	5	8	8	8	8	8	8	8	8	8	8
686247_3358	5	8	8	8	8	8	8	8	8	8	8
4067361001_3358	5	8	8	8	8	8	8	8	8	8	8
686248_3358	5	8	8	8	8	8	8	8	8	8	8
686249_3358	5	8	8	8	8	8	8	8	8	8	8
688831_3358	5	8	8	8	8	8	8	8	8	8	8
4067361002_3358	5	8	8	8	8	8	8	8	8	8	8
688832_3358x5	5	8	8	8	8	8	8	8	8	8	8
40002_3361_CCV2	5	8	8	8	8	8	8	8	8	8	8
39996_3361_CCB2	5	8	8	8	8	8	8	8	8	8	8
4067361003_3358	5	8	8	8	8	8	8	8	8	8	8
4067361004_3358	5	8	8	8	8	8	8	8	8	8	8
4067361005_3358	5	8	8	8	8	8	8	8	8	8	8
4067361006_3358	5	8	8	8	8	8	8	8	8	8	8
4067361007_3358	5	8	8	8	8	8	8	8	8	8	8
4067361008_3358	5	8	8	8	8	8	8	8	8	8	8
4067361009_3358	5	8	8	8	8	8	8	8	8	8	8
4067361010_3358	5	8	8	8	8	8	8	8	8	8	8
4067361011_3358	5	8	8	8	8	8	8	8	8	8	8
4067361012_3358	5	8	8	8	8	8	8	8	8	8	8
40002_3361_CCV3	5	8	8	8	8	8	8	8	8	8	8
39996_3361_CCB3	5	8	8	8	8	8	8	8	8	8	8
4067361013_3358	5	8	8	8	8	8	8	8	8	8	8
4067361014_3358	5	8	8	8	8	8	8	8	8	8	8
4067361015_3358	5	8	8	8	8	8	8	8	8	8	8
4067361016_3358	5	8	8	8	8	8	8	8	8	8	8
4067361017_3358	5	8	8	8	8	8	8	8	8	8	8
4067361018_3358	5	8	8	8	8	8	8	8	8	8	8
4067361019_3358	5	8	8	8	8	8	8	8	8	8	8
Blank	5	8	8	8	8	8	8	8	8	8	8

686525_3359	5	8	8	8	8	8	8	8	8	8	8
686527_3359	5	8	8	8	8	8	8	8	8	8	8
40002_3361_CCV4	5	8	8	8	8	8	8	8	8	8	8
39996_3361_CCB4	5	8	8	8	8	8	8	8	8	8	8
686526_3359	5	8	8	8	8	8	8	8	8	8	8
686528_3359	5	8	8	8	8	8	8	8	8	8	8
4067362001_3359	5	8	8	8	8	8	8	8	8	8	8
686529_3359	5	8	8	8	8	8	8	8	8	8	8
686530_3359	5	8	8	8	8	8	8	8	8	8	8
688843_3359	5	8	8	8	8	8	8	8	8	8	8
4067362002_3359	5	8	8	8	8	8	8	8	8	8	8
688844_3359x5	5	8	8	8	8	8	8	8	8	8	8
4067362003_3359	5	8	8	8	8	8	8	8	8	8	8
4067362004_3359	5	8	8	8	8	8	8	8	8	8	8
40002_3361_CCV5	5	8	8	8	8	8	8	8	8	8	8
39996_3361_CCB5	5	8	8	8	8	8	8	8	8	8	8
4067362005_3359	5	8	8	8	8	8	8	8	8	8	8
4067362006_3359	5	8	8	8	8	8	8	8	8	8	8
4067362007_3359	5	8	8	8	8	8	8	8	8	8	8
4067362008_3359	5	8	8	8	8	8	8	8	8	8	8
4067362009_3359	5	8	8	8	8	8	8	8	8	8	8
4067362010_3359	5	8	8	8	8	8	8	8	8	8	8
4067362011_3359	5	8	8	8	8	8	8	8	8	8	8
4067362012_3359	5	8	8	8	8	8	8	8	8	8	8
4067362013_3359	5	8	8	8	8	8	8	8	8	8	8
4067362014_3359	5	8	8	8	8	8	8	8	8	8	8
40002_3361_CCV6	5	8	8	8	8	8	8	8	8	8	8
39996_3361_CCB6	5	8	8	8	8	8	8	8	8	8	8
4067362015_3359	5	8	8	8	8	8	8	8	8	8	8
4067362016_3359	5	8	8	8	8	8	8	8	8	8	8
4067362017_3359	5	8	8	8	8	8	8	8	8	8	8
4067362018_3359	5	8	8	8	8	8	8	8	8	8	8
Blank	5	8	8	8	8	8	8	8	8	8	8
686605_3360	5	8	8	8	8	8	8	8	8	8	8
686611_3360	5	8	8	8	8	8	8	8	8	8	8
686606_3360	5	8	8	8	8	8	8	8	8	8	8
686612_3360	5	8	8	8	8	8	8	8	8	8	8
4067620001_3360	5	8	8	8	8	8	8	8	8	8	8
40002_3361_CCV7	5	8	8	8	8	8	8	8	8	8	8
39996_3361_CCB7	5	8	8	8	8	8	8	8	8	8	8
686613_3360	5	8	8	8	8	8	8	8	8	8	8
686614_3360	5	8	8	8	8	8	8	8	8	8	8
688848_3360	5	8	8	8	8	8	8	8	8	8	8
4067620002_3360	5	8	8	8	8	8	8	8	8	8	8
688849_3360x5	5	8	8	8	8	8	8	8	8	8	8
4067620003_3360	5	8	8	8	8	8	8	8	8	8	8
4067620004_3360	5	8	8	8	8	8	8	8	8	8	8
4067620005_3360	5	8	8	8	8	8	8	8	8	8	8
4067620006_3360	5	8	8	8	8	8	8	8	8	8	8
4067620007_3360	5	8	8	8	8	8	8	8	8	8	8
40002_3361_CCV8	5	8	8	8	8	8	8	8	8	8	8
39996_3361_CCB8	5	8	8	8	8	8	8	8	8	8	8
4067620008_3360	5	8	8	8	8	8	8	8	8	8	8
4067620009_3360	5	8	8	8	8	8	8	8	8	8	8
4067620010_3360	5	8	8	8	8	8	8	8	8	8	8
4067365001_3360	5	8	8	8	8	8	8	8	8	8	8
4067365002_3360	5	8	8	8	8	8	8	8	8	8	8
4067365003_3360	5	8	8	8	8	8	8	8	8	8	8
4067365004_3360	5	8	8	8	8	8	8	8	8	8	8
4067365005_3360	5	8	8	8	8	8	8	8	8	8	8
4067365006_3360	5	8	8	8	8	8	8	8	8	8	8
4067365007_3360	5	8	8	8	8	8	8	8	8	8	8
40002_3361_CCV9	5	8	8	8	8	8	8	8	8	8	8
39996_3361_CCB9	5	8	8	8	8	8	8	8	8	8	8
Label	**Config**	**184W**	**201Hg**	**205Tl**	**206Pb**	**207Pb**	**208Pb**	**209Bi**	**238U**		
39996_3361_Cal0	5	8	8	8	8	8	8	8	8		
39997_3361_Cal1	5	8	8	8	8	8	8	8	8		
39998_3361_Cal2	5	8	8	8	8	8	8	8	8		
39999_3361_Cal3	5	8	8	8	8	8	8	8	8		
40000_3361_Cal4	5	8	8	8	8	8	8	8	8		

40001_3361_Cal5	5	8	8	8	8	8	8	8	8
39693_3361_ICV	5	8	8	8	8	8	8	8	8
39996_3361_ICB	5	8	8	8	8	8	8	8	8
39997_3361_CRDL_A1	5	8	8	8	8	8	8	8	8
39998_3361_CRDL_B1	5	8	8	8	8	8	8	8	8
39698_3361_ICSA1	5	8	8	8	8	8	8	8	8
39699_3361_ICSAB1	5	8	8	8	8	8	8	8	8
40002_3361_CCV1	5	8	8	8	8	8	8	8	8
39996_3361_CCB1	5	8	8	8	8	8	8	8	8
686242_3358	5	8	8	8	8	8	8	8	8
686246_3358	5	8	8	8	8	8	8	8	8
686243_3358	5	8	8	8	8	8	8	8	8
686247_3358	5	8	8	8	8	8	8	8	8
4067361001_3358	5	8	8	8	8	8	8	8	8
686248_3358	5	8	8	8	8	8	8	8	8
686249_3358	5	8	8	8	8	8	8	8	8
688831_3358	5	8	8	8	8	8	8	8	8
4067361002_3358	5	8	8	8	8	8	8	8	8
688832_3358x5	5	8	8	8	8	8	8	8	8
40002_3361_CCV2	5	8	8	8	8	8	8	8	8
39996_3361_CCB2	5	8	8	8	8	8	8	8	8
4067361003_3358	5	8	8	8	8	8	8	8	8
4067361004_3358	5	8	8	8	8	8	8	8	8
4067361005_3358	5	8	8	8	8	8	8	8	8
4067361006_3358	5	8	8	8	8	8	8	8	8
4067361007_3358	5	8	8	8	8	8	8	8	8
4067361008_3358	5	8	8	8	8	8	8	8	8
4067361009_3358	5	8	8	8	8	8	8	8	8
4067361010_3358	5	8	8	8	8	8	8	8	8
4067361011_3358	5	8	8	8	8	8	8	8	8
4067361012_3358	5	8	8	8	8	8	8	8	8
40002_3361_CCV3	5	8	8	8	8	8	8	8	8
39996_3361_CCB3	5	8	8	8	8	8	8	8	8
4067361013_3358	5	8	8	8	8	8	8	8	8
4067361014_3358	5	8	8	8	8	8	8	8	8
4067361015_3358	5	8	8	8	8	8	8	8	8
4067361016_3358	5	8	8	8	8	8	8	8	8
4067361017_3358	5	8	8	8	8	8	8	8	8
4067361018_3358	5	8	8	8	8	8	8	8	8
4067361019_3358	5	8	8	8	8	8	8	8	8
Blank	5	8	8	8	8	8	8	8	8
686525_3359	5	8	8	8	8	8	8	8	8
686527_3359	5	8	8	8	8	8	8	8	8
40002_3361_CCV4	5	8	8	8	8	8	8	8	8
39996_3361_CCB4	5	8	8	8	8	8	8	8	8
686526_3359	5	8	8	8	8	8	8	8	8
686528_3359	5	8	8	8	8	8	8	8	8
4067362001_3359	5	8	8	8	8	8	8	8	8
686529_3359	5	8	8	8	8	8	8	8	8
686530_3359	5	8	8	8	8	8	8	8	8
688843_3359	5	8	8	8	8	8	8	8	8
4067362002_3359	5	8	8	8	8	8	8	8	8
688844_3359x5	5	8	8	8	8	8	8	8	8
4067362003_3359	5	8	8	8	8	8	8	8	8
4067362004_3359	5	8	8	8	8	8	8	8	8
40002_3361_CCV5	5	8	8	8	8	8	8	8	8
39996_3361_CCB5	5	8	8	8	8	8	8	8	8
4067362005_3359	5	8	8	8	8	8	8	8	8
4067362006_3359	5	8	8	8	8	8	8	8	8
4067362007_3359	5	8	8	8	8	8	8	8	8
4067362008_3359	5	8	8	8	8	8	8	8	8
4067362009_3359	5	8	8	8	8	8	8	8	8
4067362010_3359	5	8	8	8	8	8	8	8	8
4067362011_3359	5	8	8	8	8	8	8	8	8
4067362012_3359	5	8	8	8	8	8	8	8	8
4067362013_3359	5	8	8	8	8	8	8	8	8
4067362014_3359	5	8	8	8	8	8	8	8	8
40002_3361_CCV6	5	8	8	8	8	8	8	8	8
39996_3361_CCB6	5	8	8	8	8	8	8	8	8
4067362015_3359	5	8	8	8	8	8	8	8	8

4067362016_3359	5	8	8	8	8	8	8	8	8
4067362017_3359	5	8	8	8	8	8	8	8	8
4067362018_3359	5	8	8	8	8	8	8	8	8
Blank	5	8	8	8	8	8	8	8	8
686605_3360	5	8	8	8	8	8	8	8	8
686611_3360	5	8	8	8	8	8	8	8	8
686606_3360	5	8	8	8	8	8	8	8	8
686612_3360	5	8	8	8	8	8	8	8	8
4067620001_3360	5	8	8	8	8	8	8	8	8
40002_3361_CCV7	5	8	8	8	8	8	8	8	8
39996_3361_CCB7	5	8	8	8	8	8	8	8	8
686613_3360	5	8	8	8	8	8	8	8	8
686614_3360	5	8	8	8	8	8	8	8	8
688848_3360	5	8	8	8	8	8	8	8	8
4067620002_3360	5	8	8	8	8	8	8	8	8
688849_3360x5	5	8	8	8	8	8	8	8	8
4067620003_3360	5	8	8	8	8	8	8	8	8
4067620004_3360	5	8	8	8	8	8	8	8	8
4067620005_3360	5	8	8	8	8	8	8	8	8
4067620006_3360	5	8	8	8	8	8	8	8	8
4067620007_3360	5	8	8	8	8	8	8	8	8
40002_3361_CCV8	5	8	8	8	8	8	8	8	8
39996_3361_CCB8	5	8	8	8	8	8	8	8	8
4067620008_3360	5	8	8	8	8	8	8	8	8
4067620009_3360	5	8	8	8	8	8	8	8	8
4067620010_3360	5	8	8	8	8	8	8	8	8
4067365001_3360	5	8	8	8	8	8	8	8	8
4067365002_3360	5	8	8	8	8	8	8	8	8
4067365003_3360	5	8	8	8	8	8	8	8	8
4067365004_3360	5	8	8	8	8	8	8	8	8
4067365005_3360	5	8	8	8	8	8	8	8	8
4067365006_3360	5	8	8	8	8	8	8	8	8
4067365007_3360	5	8	8	8	8	8	8	8	8
40002_3361_CCV9	5	8	8	8	8	8	8	8	8
39996_3361_CCB9	5	8	8	8	8	8	8	8	8

Configuration 5 - CCT 2

Minimum uptake 0
Maximum uptake 25
Minimum wash 0
Maximum wash 120

ACL Script

Title Fast uptake wash
Description Data acquisition using the peri pump at high speed for the washes and uptakes
Author Thermo Elemental Software
Version 131072

Settings sets

Id	Description	Extraction	Lens 1	Lens 2	Lens 3	Pole Bias	Sampling Depth	Horizontal	Vertical	Cool	Auxiliary
7	CCT Mode 10082012	-98.00	-1100.00	-80.00	-195.30	-9.00	145.00	48.00	282.00	13.00	0.70
8	CCTKED Mode 10082012	-98.00	-1100.00	-80.00	-195.30	-17.00	145.00	48.00	282.00	13.00	0.70

Id	Description	Nebuliser	Forward power	D1	Focus	CCT Gas 1	CCT Gas 2	D2	DA	Hexapole Bias
7	CCT Mode 10082012	0.81	1400.00	-43.90	10.80	0.00	0.50	-143.00	-37.60	-4.00
8	CCTKED Mode 10082012	0.81	1400.00	-56.50	-5.30	0.00	3.80	-143.00	-37.60	-20.00

Fully Quantitative Concentrations

Id	Label	Li	Be	B	Na	Mg	Al	Si	P	K	Ca
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	39996_3361_Cal0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	39997_3361_Cal1	1.000	1.000		250.000	250.000	250.000	50.000	50.000	250.000	250.000
3	39998_3361_Cal2	5.000	5.000	5.000	500.000	500.000	500.000	250.000	250.000	500.000	500.000

4	39999_3361_Cal3	50.000	50.000	50.000	2500.000	2500.000	2500.000	2500.000	2500.000	2500.000	2500.000
5	40000_3361_Cal4	250.000	250.000	250.000	12500.000	12500.000	12500.000	12500.000	12500.000	12500.000	12500.000
6	40001_3361_Cal5	500.000	500.000	500.000	25000.000	25000.000	25000.000	25000.000	25000.000	25000.000	25000.000
Id	Label	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	As
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	39996_3361_Cal0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	39997_3361_Cal1	1.000	1.000	1.000	1.000	250.000	1.000	1.000	1.000		1.000
3	39998_3361_Cal2	5.000	5.000	5.000	5.000	500.000	5.000	5.000	5.000	5.000	5.000
4	39999_3361_Cal3	50.000	50.000	50.000	50.000	2500.000	50.000	50.000	50.000	50.000	50.000
5	40000_3361_Cal4	250.000	250.000	250.000	250.000	12500.000	250.000	250.000	250.000	250.000	250.000
6	40001_3361_Cal5	500.000	500.000	500.000	500.000	25000.000	500.000	500.000	500.000	500.000	500.000
Id	Label	Se	Sr	Zr	Mo	Ag	Cd	Sn	Sb	Ba	Hg
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	39996_3361_Cal0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	39997_3361_Cal1	1.000	1.000	1.000	1.000	0.500	1.000	1.000	1.000	1.000	0.200
3	39998_3361_Cal2	5.000	5.000	5.000	5.000	2.500	5.000	5.000	5.000	5.000	0.500
4	39999_3361_Cal3	50.000	50.000	50.000	50.000	25.000	50.000	50.000	50.000	50.000	1.000
5	40000_3361_Cal4	250.000	250.000	250.000	250.000	125.000	250.000	250.000	250.000	250.000	10.000
6	40001_3361_Cal5	500.000	500.000	500.000	500.000	250.000	500.000	500.000	500.000	500.000	25.000
Id	Label	Tl	Pb	U							
		ppb	ppb	ppb							
1	39996_3361_Cal0	0.000	0.000	0.000							
2	39997_3361_Cal1	1.000	1.000	1.000							
3	39998_3361_Cal2	5.000	5.000	5.000							
4	39999_3361_Cal3	50.000	50.000	50.000							
5	40000_3361_Cal4	250.000	250.000	250.000							
6	40001_3361_Cal5	500.000	500.000	500.000							

Calibration Technique

Use External Drift Correction - No
Calibrate by - Isotope

Symbol	Interference Correction	RSF	Calibration Method	Line Fit	Weighting	Forcing	Use for Semi-Quant	Max Error	Minimum Correlation
7Li	Yes	0.36	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
9Be	Yes	0.07	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
10B	Yes	0.13	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
23Na	Yes	0.55	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
25Mg	Yes	0.49	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
27Al	Yes	0.45	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
28Si	Yes	0.20	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
31P	Yes	0.02	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
34S	Yes	0.04	Semi-Quantified				No		
35Cl	Yes	0.00	Semi-Quantified				No		
39K	Yes	0.38	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
43Ca	Yes	0.81	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
45Sc-KED	Yes	0.60	None				No		
47Ti	Yes	0.38	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
51V	Yes	0.39	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
52Cr	Yes	0.46	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
55Mn	Yes	0.70	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
54Fe	Yes	0.60	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
59Co	Yes	0.42	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
60Ni	Yes	0.33	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
63Cu	Yes	0.33	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
66Zn	Yes	0.35	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
72Ge	Yes	0.35	None				No		
73Ge	Yes	0.35	None				No		
75As	Yes	0.05	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
78Se	Yes	0.07	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
83Kr	Yes	0.00	None				No		
88Sr	Yes	0.66	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
89Y	Yes	0.74	None				No		
90Zr	Yes	0.61	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
95Mo	Yes	0.63	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
107Ag	Yes	0.45	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
111Cd	Yes	0.55	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
115In	Yes	0.77	None				No		
118Sn	Yes	0.69	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
121Sb	Yes	0.34	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
137Ba	Yes	0.53	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
159Tb	Yes	0.90	None				No		
184W	Yes	0.71	Semi-Quantified				No		

201Hg	Yes	0.06	Fully-Quantified	Linear	Absolute SD	None	Yes	0.998000
206Pb	Yes	0.55	Fully-Quantified	Linear	Absolute SD	None	Yes	0.998000
207Pb	Yes	0.55	Fully-Quantified	Linear	Absolute SD	None	Yes	0.998000
208Pb	Yes	0.55	Fully-Quantified	Linear	Absolute SD	None	Yes	0.998000
209Bi	Yes	0.45	None				No	
238U	Yes	0.65	Fully-Quantified	Linear	Absolute SD	None	Yes	0.998000
205Tl	Yes	0.58	Fully-Quantified	Linear	Absolute SD	None	Yes	0.998000
53Cl O	Yes		Semi-Quantified				No	
45Sc-CCT	Yes	0.60	None				No	

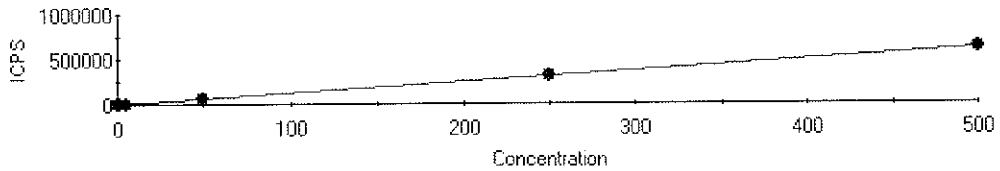
Sample List

No	Label	Type	Weight	Rack	Row	Col	Height
1	39996_3361_Cal0	Fully Quant Standard	1.000	0	1	8	144
2	39997_3361_Cal1	Fully Quant Standard	1.000	0	1	2	144
3	39998_3361_Cal2	Fully Quant Standard	1.000	0	1	3	144
4	39999_3361_Cal3	Fully Quant Standard	1.000	0	1	4	144
5	40000_3361_Cal4	Fully Quant Standard	1.000	0	1	5	144
6	40001_3361_Cal5	Fully Quant Standard	1.000	0	1	6	144
7	39693_3361_ICV	Unknown	1.000	1	1	1	144
8	39996_3361_ICB	Unknown	1.000	0	1	8	144
9	39997_3361_CRDL_A1	Unknown	1.000	0	1	2	144
10	39998_3361_CRDL_B1	Unknown	1.000	0	1	3	144
11	39698_3361_ICSA1	Unknown	1.000	1	1	2	144
12	39699_3361_ICSAB1	Unknown	1.000	1	1	3	144
13	40002_3361_CCV1	Unknown	1.000	0	1	7	144
14	39996_3361_CCB1	Unknown	1.000	0	1	1	144
15	686242_3358	Unknown	1.000	1	2	1	144
16	686246_3358	Unknown	1.000	1	2	2	144
17	686243_3358	Unknown	1.000	1	2	3	144
18	686247_3358	Unknown	1.000	1	2	4	144
19	4067361001_3358	Unknown	1.000	1	2	5	144
20	686248_3358	Unknown	1.000	1	2	6	144
21	686249_3358	Unknown	1.000	1	2	7	144
22	688831_3358	Unknown	1.000	1	2	8	144
23	4067361002_3358	Unknown	1.000	1	2	9	144
24	688832_3358x5	Unknown	1.000	1	2	10	144
25	40002_3361_CCV2	Unknown	1.000	0	1	7	144
26	39996_3361_CCB2	Unknown	1.000	0	1	1	144
27	4067361003_3358	Unknown	1.000	1	2	11	144
28	4067361004_3358	Unknown	1.000	1	2	12	144
29	4067361005_3358	Unknown	1.000	1	3	1	144
30	4067361006_3358	Unknown	1.000	1	3	2	144
31	4067361007_3358	Unknown	1.000	1	3	3	144
32	4067361008_3358	Unknown	1.000	1	3	4	144
33	4067361009_3358	Unknown	1.000	1	3	5	144
34	4067361010_3358	Unknown	1.000	1	3	6	144
35	4067361011_3358	Unknown	1.000	1	3	7	144
36	4067361012_3358	Unknown	1.000	1	3	8	144
37	40002_3361_CCV3	Unknown	1.000	0	1	7	144
38	39996_3361_CCB3	Unknown	1.000	0	1	1	144
39	4067361013_3358	Unknown	1.000	1	3	9	144
40	4067361014_3358	Unknown	1.000	1	3	10	144
41	4067361015_3358	Unknown	1.000	1	3	11	144
42	4067361016_3358	Unknown	1.000	1	3	12	144
43	4067361017_3358	Unknown	1.000	1	4	1	144
44	4067361018_3358	Unknown	1.000	1	4	2	144
45	4067361019_3358	Unknown	1.000	1	4	3	144
46	Blank	Unknown	1.000	0	1	8	144
47	686525_3359	Unknown	1.000	2	1	1	144
48	686527_3359	Unknown	1.000	2	1	2	144
49	40002_3361_CCV4	Unknown	1.000	0	1	7	144
50	39996_3361_CCB4	Unknown	1.000	0	1	1	144
51	686526_3359	Unknown	1.000	2	1	3	144
52	686528_3359	Unknown	1.000	2	1	4	144
53	4067362001_3359	Unknown	1.000	2	1	5	144
54	686529_3359	Unknown	1.000	2	1	6	144
55	686530_3359	Unknown	1.000	2	1	7	144
56	688843_3359	Unknown	1.000	2	1	8	144
57	4067362002_3359	Unknown	1.000	2	1	9	144
58	688844_3359x5	Unknown	1.000	2	1	10	144
59	4067362003_3359	Unknown	1.000	2	1	11	144
60	4067362004_3359	Unknown	1.000	2	1	12	144
61	40002_3361_CCV5	Unknown	1.000	0	1	7	144
62	39996_3361_CCB5	Unknown	1.000	0	1	1	144
63	4067362005_3359	Unknown	1.000	2	2	1	144
64	4067362006_3359	Unknown	1.000	2	2	2	144

65	4067362007_3359	Unknown	1.000	2	2	3	144
66	4067362008_3359	Unknown	1.000	2	2	4	144
67	4067362009_3359	Unknown	1.000	2	2	5	144
68	4067362010_3359	Unknown	1.000	2	2	6	144
69	4067362011_3359	Unknown	1.000	2	2	7	144
70	4067362012_3359	Unknown	1.000	2	2	8	144
71	4067362013_3359	Unknown	1.000	2	2	9	144
72	4067362014_3359	Unknown	1.000	2	2	10	144
73	40002_3361_CCV6	Unknown	1.000	0	1	7	144
74	39996_3361_CCB6	Unknown	1.000	0	1	1	144
75	4067362015_3359	Unknown	1.000	2	2	11	144
76	4067362016_3359	Unknown	1.000	2	2	12	144
77	4067362017_3359	Unknown	1.000	2	3	1	144
78	4067362018_3359	Unknown	1.000	2	3	2	144
79	Blank	Unknown	1.000	0	1	8	144
80	686605_3360	Unknown	1.000	2	3	12	144
81	686611_3360	Unknown	1.000	2	4	1	144
82	686606_3360	Unknown	1.000	2	4	2	144
83	686612_3360	Unknown	1.000	2	4	3	144
84	4067620001_3360	Unknown	1.000	2	4	4	144
85	40002_3361_CCV7	Unknown	1.000	0	1	7	144
86	39996_3361_CCB7	Unknown	1.000	0	1	1	144
87	686613_3360	Unknown	1.000	2	4	5	144
88	686614_3360	Unknown	1.000	2	4	6	144
89	688848_3360	Unknown	1.000	2	4	7	144
90	4067620002_3360	Unknown	1.000	2	4	8	144
91	688849_3360x5	Unknown	1.000	2	4	9	144
92	4067620003_3360	Unknown	1.000	2	4	10	144
93	4067620004_3360	Unknown	1.000	2	4	11	144
94	4067620005_3360	Unknown	1.000	2	4	12	144
95	4067620006_3360	Unknown	1.000	2	5	1	144
96	4067620007_3360	Unknown	1.000	2	5	2	144
97	40002_3361_CCV8	Unknown	1.000	0	1	7	144
98	39996_3361_CCB8	Unknown	1.000	0	1	1	144
99	4067620008_3360	Unknown	1.000	2	5	3	144
100	4067620009_3360	Unknown	1.000	2	5	4	144
101	4067620010_3360	Unknown	1.000	2	5	5	144
102	4067365001_3360	Unknown	1.000	2	5	6	144
103	4067365002_3360	Unknown	1.000	2	5	7	144
104	4067365003_3360	Unknown	1.000	2	5	8	144
105	4067365004_3360	Unknown	1.000	2	5	9	144
106	4067365005_3360	Unknown	1.000	2	5	10	144
107	4067365006_3360	Unknown	1.000	2	5	11	144
108	4067365007_3360	Unknown	1.000	2	5	12	144
109	40002_3361_CCV9	Unknown	1.000	0	1	7	144
110	39996_3361_CCB9	Unknown	1.000	0	1	1	144

Fully Quant Calibration

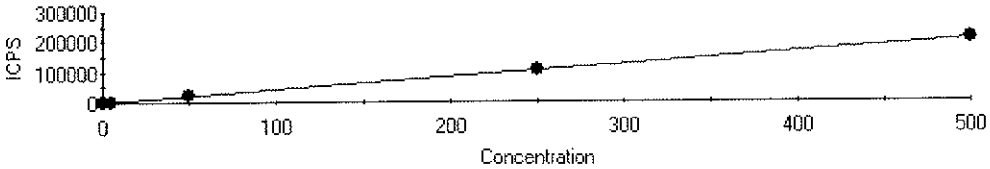
7Li FQ Block 1



Intercept CPS=34.132502 Intercept Conc=0.028168
Sensitivity=1211.728790 Correlation Coeff=0.999943

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	0.003	0.003	37.74	0.00
39997_3361_Cal1	1.000	0.938	0.062	1171.18	6.16
39998_3361_Cal2	5.000	4.972	0.028	6058.54	0.57
39999_3361_Cal3	50.000	50.528	0.528	61260.75	1.06
40000_3361_Cal4	250.000	250.054	0.054	303031.26	0.02
40001_3361_Cal5	500.000	511.575	11.575	619924.87	2.32

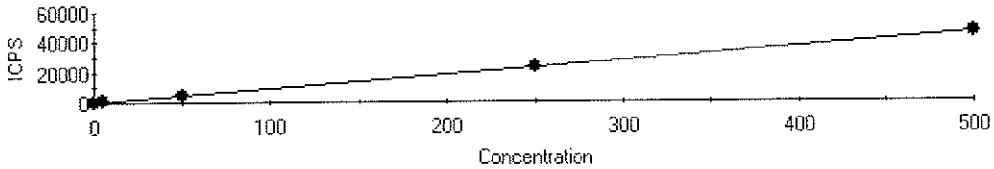
9Be FQ Block 1



Intercept CPS=13.904888 Intercept Conc=0.033062
Sensitivity=420.575076 Correlation Coeff=0.999973

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	0.000	0.000	14.06	0.00
39997_3361_Cal1	1.000	0.962	0.038	418.43	3.82
39998_3361_Cal2	5.000	5.112	0.112	2164.08	2.25
39999_3361_Cal3	50.000	51.096	1.096	21503.53	2.19
40000_3361_Cal4	250.000	249.471	0.529	104935.25	0.21
40001_3361_Cal5	500.000	491.771	8.229	206840.37	1.65

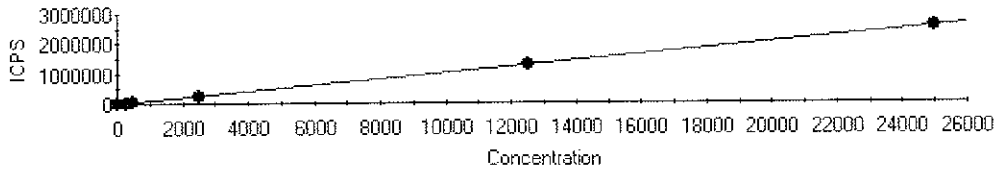
10B FQ Block 1



Intercept CPS=177.387133 Intercept Conc=1.935016
Sensitivity=91.672183 Correlation Coeff=0.999989

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	-0.361	0.361	144.34	0.00
39998_3361_Cal2	5.000	5.320	0.320	665.04	6.39
39999_3361_Cal3	50.000	50.405	0.405	4798.16	0.81
40000_3361_Cal4	250.000	247.498	2.502	22866.07	1.00
40001_3361_Cal5	500.000	499.128	0.872	45933.54	0.17

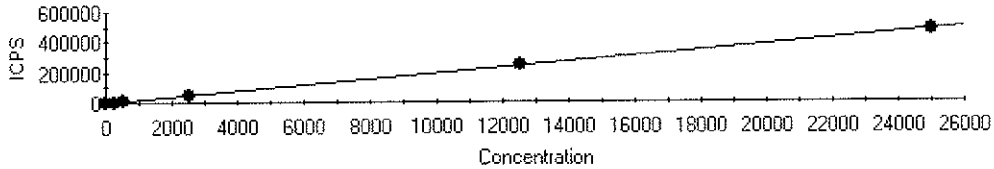
23Na FQ Block 1



Intercept CPS=2193.968525 Intercept Conc=21.457115
Sensitivity=102.248997 Correlation Coeff=0.999958

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	-0.068	0.068	2186.98	0.00
39997_3361_Cal1	250.000	251.579	1.579	27917.70	0.63
39998_3361_Cal2	500.000	503.702	3.702	53696.98	0.74
39999_3361_Cal3	2500.000	2446.953	53.047	252392.48	2.12
40000_3361_Cal4	12500.000	12140.761	359.239	1243574.62	2.87
40001_3361_Cal5	25000.000	24746.035	253.965	2532451.21	1.02

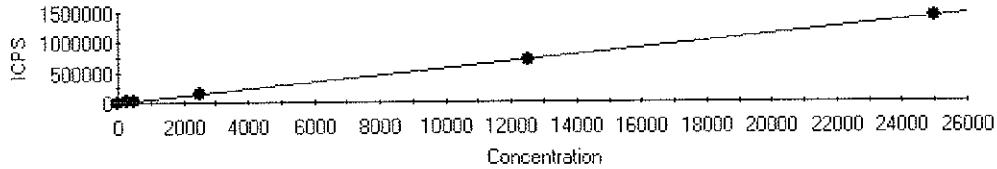
25Mg FQ Block 1



Intercept CPS=83.585294 Intercept Conc=4.360883
Sensitivity=19.167056 Correlation Coeff=0.999991

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	-1.578	1.578	53.34	0.00
39997_3361_Cal1	250.000	252.448	2.448	4922.27	0.98
39998_3361_Cal2	500.000	515.875	15.875	9971.38	3.17
39999_3361_Cal3	2500.000	2486.094	13.906	47734.69	0.56
40000_3361_Cal4	12500.000	12368.036	131.964	237142.43	1.06
40001_3361_Cal5	25000.000	24514.372	485.628	469951.93	1.94

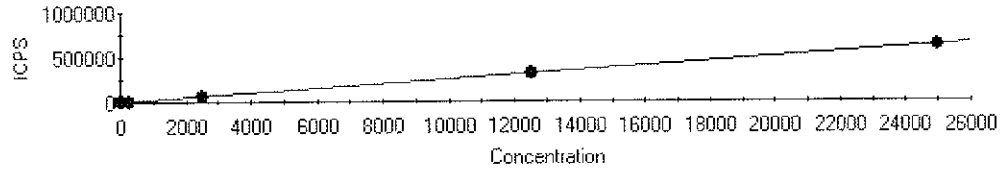
27Al FQ Block 1



Intercept CPS=334.481463 Intercept Conc=5.868350
Sensitivity=56.997534 Correlation Coeff=0.999999

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	-0.750	0.750	291.73	0.00
39997_3361_Cal1	250.000	248.388	1.612	14492.00	0.64
39998_3361_Cal2	500.000	510.859	10.859	29452.20	2.17
39999_3361_Cal3	2500.000	2473.724	26.276	141330.67	1.05
40000_3361_Cal4	12500.000	12310.493	189.507	702002.22	1.52
40001_3361_Cal5	25000.000	24693.071	306.929	1407778.66	1.23

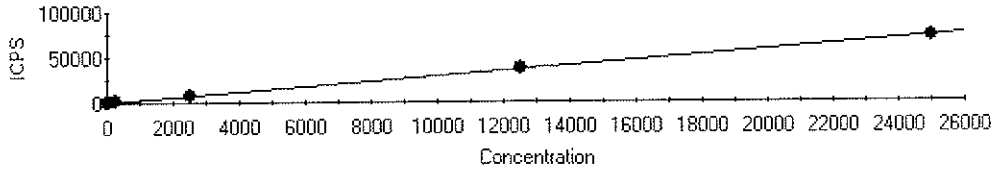
28Si FQ Block 1



Intercept CPS=441.569834 Intercept Conc=17.329169
Sensitivity=25.481305 Correlation Coeff=0.999894

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	-0.872	0.872	419.36	0.00
39997_3361_Cal1	50.000	105.785	55.785	3137.12	111.57
39998_3361_Cal2	250.000	267.565	17.565	7259.48	7.03
39999_3361_Cal3	2500.000	2556.853	56.853	65593.53	2.27
40000_3361_Cal4	12500.000	12345.224	154.776	315013.99	1.24
40001_3361_Cal5	25000.000	23955.519	1044.481	610859.45	4.18

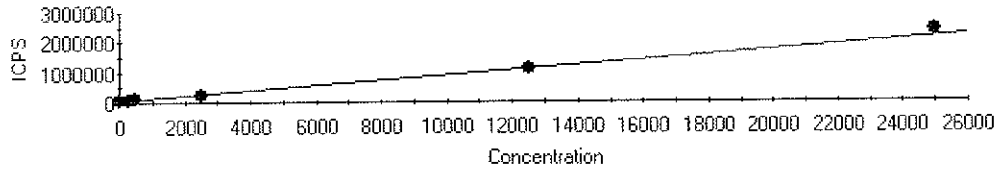
31P FQ Block 1



Intercept CPS=204.470330 Intercept Conc=71.570304
Sensitivity=2.856916 Correlation Coeff=0.999960

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	-3.615	3.615	194.14	0.00
39997_3361_Cal1	50.000	42.374	7.626	325.53	15.25
39998_3361_Cal2	250.000	271.808	21.808	981.00	8.72
39999_3361_Cal3	2500.000	2551.526	51.526	7493.97	2.06
40000_3361_Cal4	12500.000	12669.861	169.861	36401.20	1.36
40001_3361_Cal5	25000.000	24873.385	126.615	71265.64	0.51

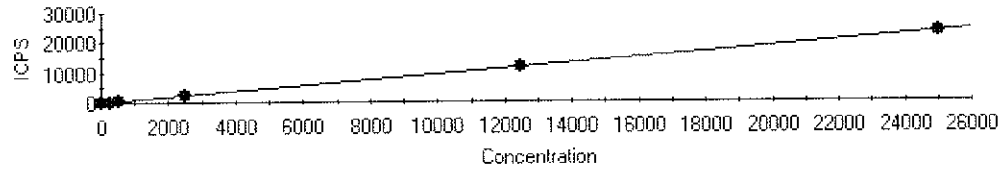
39K FQ Block 1



Intercept CPS=51175.827629 Intercept Conc=600.720187
Sensitivity=85.190790 Correlation Coeff=0.999385

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	8.787	8.787	51924.38	0.00
39997_3361_Cal1	250.000	259.214	9.214	73258.50	3.69
39998_3361_Cal2	500.000	487.773	12.227	92729.58	2.45
39999_3361_Cal3	2500.000	2410.164	89.836	256499.61	3.59
40000_3361_Cal4	12500.000	12473.893	26.107	1113836.64	0.21
40001_3361_Cal5	25000.000	26901.444	1901.444	2342931.13	7.61

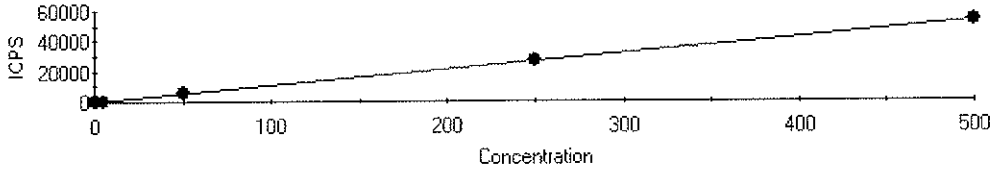
43Ca FQ Block 1



Intercept CPS=12.119015 Intercept Conc=12.971623
Sensitivity=0.934271 Correlation Coeff=0.999998

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	-0.734	0.734	11.43	0.00
39997_3361_Cal1	250.000	255.944	5.944	251.24	2.38
39998_3361_Cal2	500.000	511.778	11.778	490.26	2.36
39999_3361_Cal3	2500.000	2519.533	19.533	2366.05	0.78
40000_3361_Cal4	12500.000	12501.255	1.255	11691.68	0.01
40001_3361_Cal5	25000.000	24905.818	94.182	23280.91	0.38

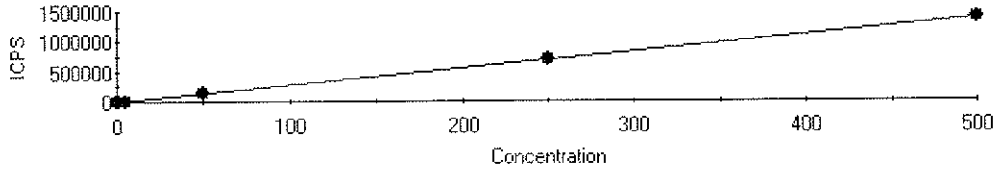
47Ti FQ Block 1



Intercept CPS=17.153420 Intercept Conc=0.161410
Sensitivity=106.272243 Correlation Coeff=0.999994

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	-0.008	0.008	16.28	0.00
39997_3361_Cal1	1.000	1.028	0.028	126.35	2.75
39998_3361_Cal2	5.000	5.100	0.100	559.17	2.01
39999_3361_Cal3	50.000	49.869	0.131	5316.89	0.26
40000_3361_Cal4	250.000	250.368	0.368	26624.32	0.15
40001_3361_Cal5	500.000	497.001	2.999	52834.56	0.60

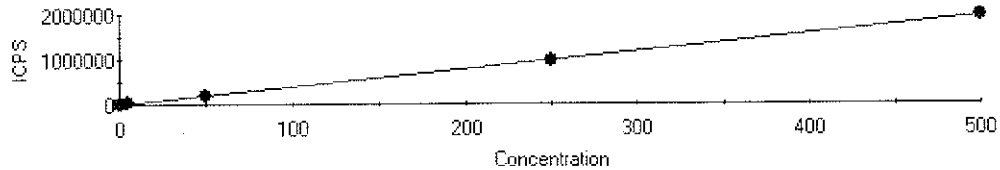
51V FQ Block 1



Intercept CPS=96.209194 Intercept Conc=0.034630
Sensitivity=2778.183686 Correlation Coeff=0.999995

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	0.126	0.126	446.74	0.00
39997_3361_Cal1	1.000	1.048	0.048	3007.18	4.78
39998_3361_Cal2	5.000	5.020	0.020	14043.03	0.40
39999_3361_Cal3	50.000	49.977	0.023	138942.43	0.05
40000_3361_Cal4	250.000	249.416	0.584	693019.22	0.23
40001_3361_Cal5	500.000	502.129	2.129	1395103.85	0.43

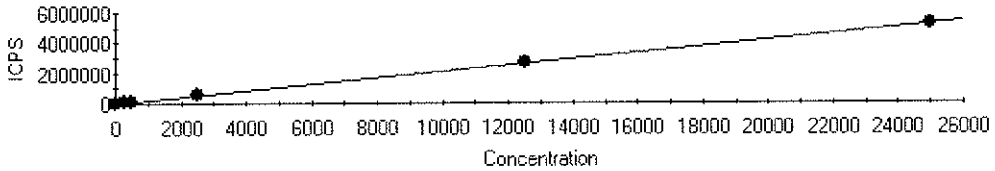
52Cr FQ Block 1



Intercept CPS=331.249442 Intercept Conc=0.084546
Sensitivity=3917.964779 Correlation Coeff=0.999998

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	-0.002	0.002	325.02	0.00
39997_3361_Cal1	1.000	1.035	0.035	4386.08	3.49
39998_3361_Cal2	5.000	4.954	0.046	19742.76	0.91
39999_3361_Cal3	50.000	49.841	0.159	195606.48	0.32
40000_3361_Cal4	250.000	249.884	0.116	979369.77	0.05
40001_3361_Cal5	500.000	501.737	1.737	1966120.48	0.35

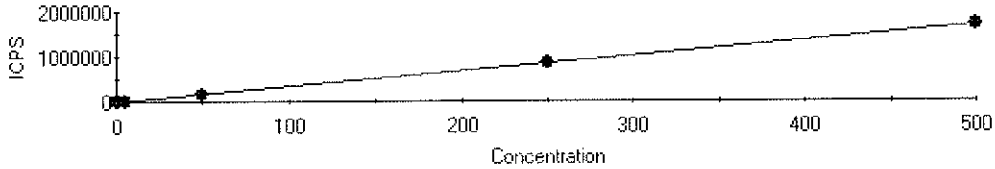
54Fe FQ Block 1



Intercept CPS=1871.895152 Intercept Conc=8.969731
Sensitivity=208.690221 Correlation Coeff=0.999904

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	-0.420	0.420	1784.24	0.00
39997_3361_Cal1	250.000	281.041	31.041	60522.40	12.42
39998_3361_Cal2	500.000	565.409	65.409	119867.13	13.08
39999_3361_Cal3	2500.000	2808.881	308.881	588057.92	12.36
40000_3361_Cal4	12500.000	12627.627	127.627	2637134.17	1.02
40001_3361_Cal5	25000.000	24777.460	222.540	5172685.48	0.89

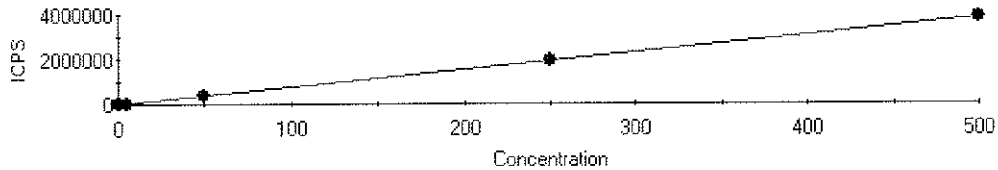
55Mn FQ Block 1



Intercept CPS=100.720819 Intercept Conc=0.029552
Sensitivity=3408.238989 Correlation Coeff=1.000000

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	0.000	0.000	100.73	0.00
39997_3361_Cal1	1.000	1.005	0.005	3525.77	0.49
39998_3361_Cal2	5.000	4.961	0.039	17009.42	0.78
39999_3361_Cal3	50.000	49.895	0.105	170153.26	0.21
40000_3361_Cal4	250.000	250.312	0.312	853224.54	0.12
40001_3361_Cal5	500.000	501.245	1.245	1708464.86	0.25

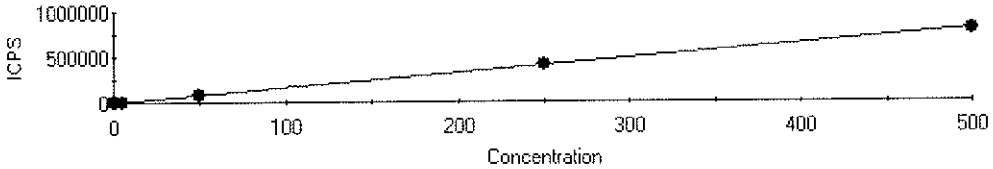
59Co FQ Block 1



Intercept CPS=94.032458 Intercept Conc=0.012347
Sensitivity=7616.000252 Correlation Coeff=0.999998

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	0.000	0.000	95.55	0.00
39997_3361_Cal1	1.000	0.990	0.010	7635.89	0.97
39998_3361_Cal2	5.000	4.937	0.063	37692.91	1.26
39999_3361_Cal3	50.000	49.598	0.402	377835.96	0.80
40000_3361_Cal4	250.000	250.931	0.931	1911181.91	0.37
40001_3361_Cal5	500.000	500.174	0.174	3809421.04	0.03

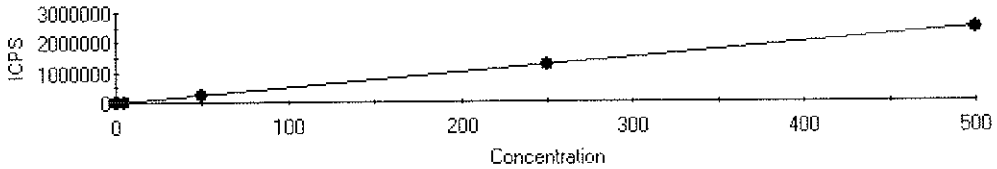
60Ni FQ Block 1



Intercept CPS=57.802665 Intercept Conc=0.035532
Sensitivity=1626.761231 Correlation Coeff=0.999928

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	-0.005	0.005	50.37	0.00
39997_3361_Cal1	1.000	1.015	0.015	1708.72	1.49
39998_3361_Cal2	5.000	5.125	0.125	8394.65	2.50
39999_3361_Cal3	50.000	50.847	0.847	82774.38	1.69
40000_3361_Cal4	250.000	249.771	0.229	406375.66	0.09
40001_3361_Cal5	500.000	487.373	12.627	792896.73	2.53

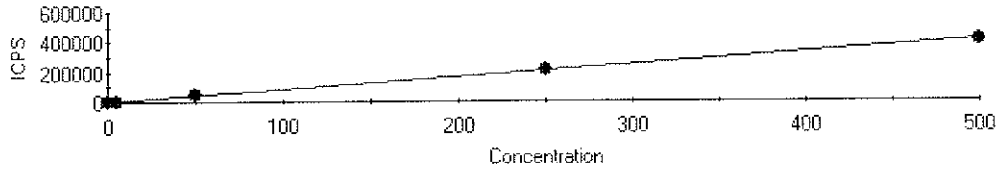
63Cu FQ Block 1



Intercept CPS=248.163764 Intercept Conc=0.050503
Sensitivity=4913.878278 Correlation Coeff=0.999963

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	-0.000	0.000	248.15	0.00
39997_3361_Cal1	1.000	0.981	0.019	5067.40	1.93
39998_3361_Cal2	5.000	5.061	0.061	25118.74	1.23
39999_3361_Cal3	50.000	50.589	0.589	248838.45	1.18
40000_3361_Cal4	250.000	250.049	0.049	1228959.61	0.02
40001_3361_Cal5	500.000	491.326	8.674	2414565.53	1.73

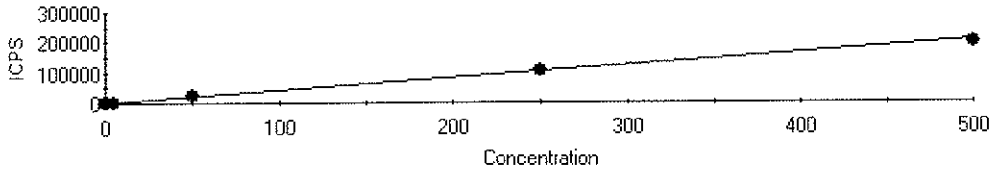
66Zn FQ Block 1



Intercept CPS=609.756256 Intercept Conc=0.736916
Sensitivity=827.442930 Correlation Coeff=0.999837

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	-0.016	0.016	596.28	0.00
39998_3361_Cal2	5.000	5.630	0.630	5268.14	12.60
39999_3361_Cal3	50.000	51.994	1.994	43631.54	3.99
40000_3361_Cal4	250.000	255.423	5.423	211958.09	2.17
40001_3361_Cal5	500.000	492.607	7.393	408213.79	1.48

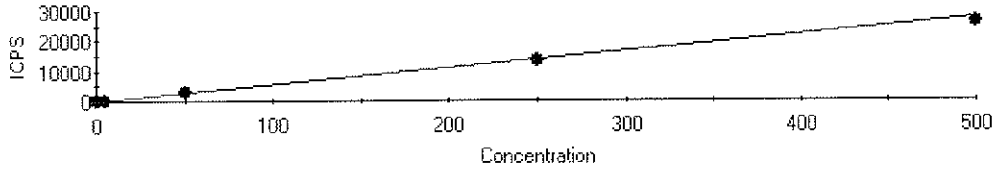
75As FQ Block 1



Intercept CPS=414.914149 Intercept Conc=1.011896
Sensitivity=410.036361 Correlation Coeff=0.999894

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	-0.005	0.005	412.76	0.00
39997_3361_Cal1	1.000	1.002	0.002	825.97	0.25
39998_3361_Cal2	5.000	5.005	0.005	2467.24	0.10
39999_3361_Cal3	50.000	50.709	0.709	21207.48	1.42
40000_3361_Cal4	250.000	248.743	1.257	102408.69	0.50
40001_3361_Cal5	500.000	482.824	17.176	198390.31	3.44

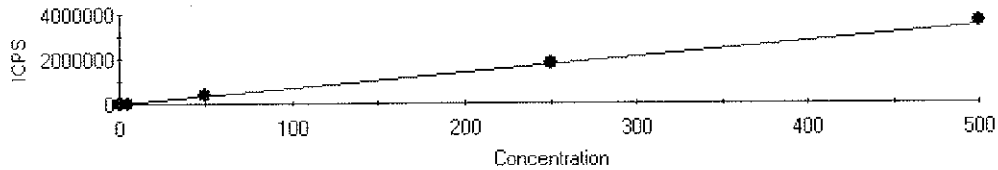
78Se FQ Block 1



Intercept CPS=25.040440 Intercept Conc=0.456917
Sensitivity=54.803010 Correlation Coeff=0.999845

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	-0.342	0.342	6.32	0.00
39997_3361_Cal1	1.000	0.723	0.277	64.65	27.73
39998_3361_Cal2	5.000	4.630	0.370	278.75	7.41
39999_3361_Cal3	50.000	50.008	0.008	2765.63	0.02
40000_3361_Cal4	250.000	245.083	4.917	13456.34	1.97
40001_3361_Cal5	500.000	473.152	26.848	25955.18	5.37

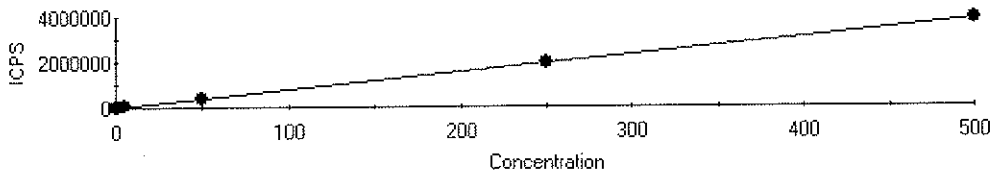
88Sr FQ Block 1



Intercept CPS=382.768662 Intercept Conc=0.054689
Sensitivity=6999.061131 Correlation Coeff=0.999984

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	0.007	0.007	432.51	0.00
39997_3361_Cal1	1.000	0.984	0.016	7269.03	1.61
39998_3361_Cal2	5.000	4.935	0.065	34921.94	1.30
39999_3361_Cal3	50.000	49.993	0.007	350284.19	0.01
40000_3361_Cal4	250.000	256.081	6.081	1792709.64	2.43
40001_3361_Cal5	500.000	517.744	17.744	3624101.83	3.55

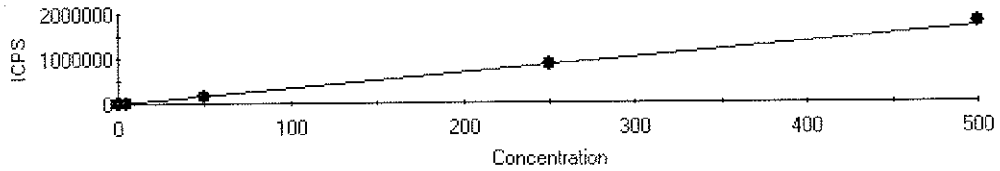
90Zr FQ Block 1



Intercept CPS=730.260816 Intercept Conc=0.094173
Sensitivity=7754.487265 Correlation Coeff=0.999994

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	0.000	0.000	734.13	0.00
39997_3361_Cal1	1.000	0.973	0.027	8277.34	2.67
39998_3361_Cal2	5.000	4.899	0.101	38722.33	2.01
39999_3361_Cal3	50.000	49.382	0.618	383664.79	1.24
40000_3361_Cal4	250.000	250.162	0.162	1940611.96	0.06
40001_3361_Cal5	500.000	496.801	3.199	3853168.39	0.64

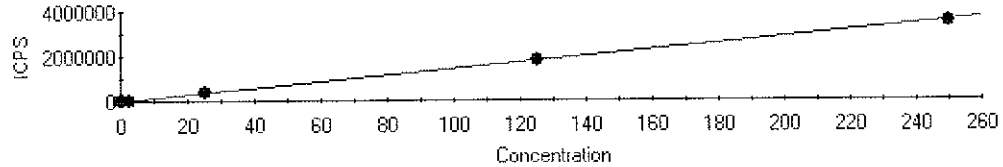
95Mo FQ Block 1



Intercept CPS=150.125148 Intercept Conc=0.044687
Sensitivity=3359.518872 Correlation Coeff=0.999949

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	0.001	0.001	151.85	0.00
39997_3361_Cal1	1.000	0.948	0.052	3335.11	5.20
39998_3361_Cal2	5.000	4.913	0.087	16654.70	1.74
39999_3361_Cal3	50.000	50.752	0.752	170653.79	1.50
40000_3361_Cal4	250.000	256.617	6.617	862258.74	2.65
40001_3361_Cal5	500.000	524.405	24.405	1761898.36	4.88

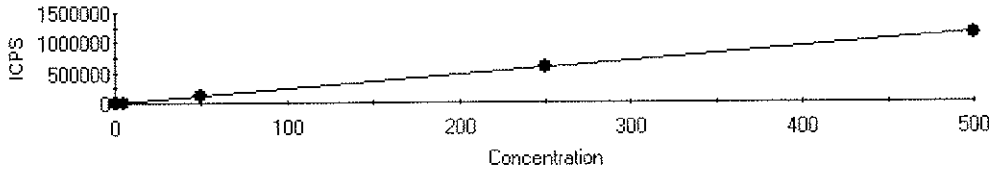
107Ag FQ Block 1



Intercept CPS=933.910866 Intercept Conc=0.065846
Sensitivity=14183.228455 Correlation Coeff=0.999932

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	-0.009	0.009	804.95	0.00
39997_3361_Cal1	0.500	0.490	0.010	7888.63	1.93
39998_3361_Cal2	2.500	2.509	0.009	36519.81	0.36
39999_3361_Cal3	25.000	25.154	0.154	357693.73	0.61
40000_3361_Cal4	125.000	125.027	0.027	1774213.54	0.02
40001_3361_Cal5	250.000	244.052	5.948	3462373.82	2.38

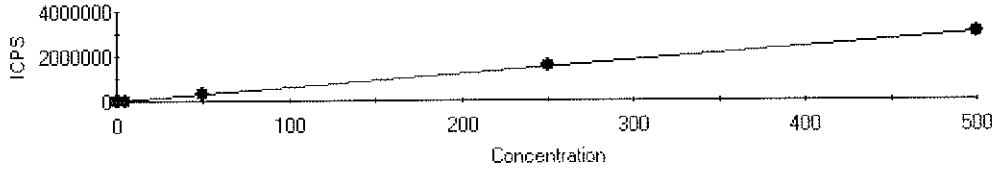
111Cd FQ Block 1



Intercept CPS=32.429976 Intercept Conc=0.014191
Sensitivity=2285.184797 Correlation Coeff=0.999982

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	-0.000	0.000	31.75	0.00
39997_3361_Cal1	1.000	0.982	0.018	2275.47	1.84
39998_3361_Cal2	5.000	5.060	0.060	11596.02	1.20
39999_3361_Cal3	50.000	50.755	0.755	116017.68	1.51
40000_3361_Cal4	250.000	249.890	0.110	571077.30	0.04
40001_3361_Cal5	500.000	493.860	6.140	1128592.76	1.23

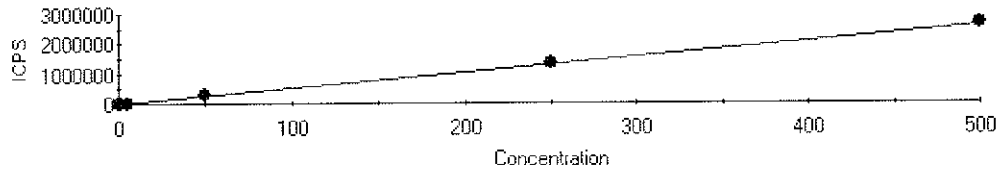
118Sn FQ Block 1



Intercept CPS=749.664867 Intercept Conc=0.126135
Sensitivity=5943.335986 Correlation Coeff=0.999998

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	0.001	0.001	756.31	0.00
39997_3361_Cal1	1.000	0.983	0.017	6594.19	1.66
39998_3361_Cal2	5.000	4.985	0.015	30374.47	0.31
39999_3361_Cal3	50.000	50.190	0.190	299047.49	0.38
40000_3361_Cal4	250.000	252.402	2.402	1500858.99	0.96
40001_3361_Cal5	500.000	506.628	6.628	3011807.73	1.33

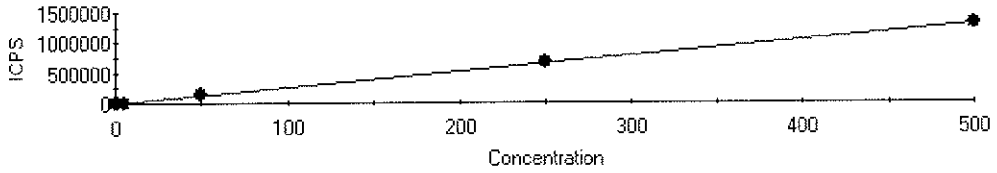
121Sb FQ Block 1



Intercept CPS=180.212588 Intercept Conc=0.034481
Sensitivity=5226.379024 Correlation Coeff=0.999995

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	-0.001	0.001	177.07	0.00
39997_3361_Cal1	1.000	0.983	0.017	5316.84	1.72
39998_3361_Cal2	5.000	5.076	0.076	26709.98	1.52
39999_3361_Cal3	50.000	50.312	0.312	263131.75	0.62
40000_3361_Cal4	250.000	249.984	0.016	1306693.39	0.01
40001_3361_Cal5	500.000	503.106	3.106	2629601.87	0.62

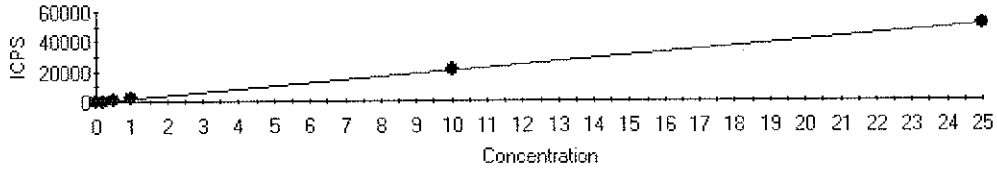
137Ba FQ Block 1



Intercept CPS=300.282461 Intercept Conc=0.115127
Sensitivity=2608.263136 Correlation Coeff=0.999942

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	0.001	0.001	303.71	0.00
39997_3361_Cal1	1.000	0.991	0.009	2884.49	0.92
39998_3361_Cal2	5.000	5.017	0.017	13384.82	0.33
39999_3361_Cal3	50.000	49.707	0.293	129948.65	0.59
40000_3361_Cal4	250.000	251.686	1.686	656764.56	0.67
40001_3361_Cal5	500.000	492.250	7.750	1284217.54	1.55

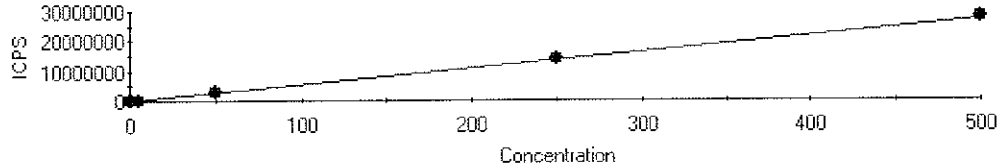
201Hg FQ Block 1



Intercept CPS=30.123532 Intercept Conc=0.014866
Sensitivity=2026.325481 Correlation Coeff=0.999991

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	-0.002	0.002	26.69	0.00
39997_3361_Cal1	0.200	0.204	0.004	444.03	2.13
39998_3361_Cal2	0.500	0.516	0.016	1075.41	3.17
39999_3361_Cal3	1.000	1.004	0.004	2064.99	0.42
40000_3361_Cal4	10.000	10.101	0.101	20498.57	1.01
40001_3361_Cal5	25.000	24.982	0.018	50652.75	0.07

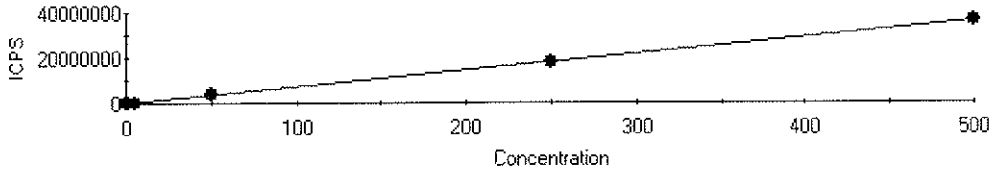
205Tl FQ Block 1



Intercept CPS=3147.201824 Intercept Conc=0.058048
Sensitivity=54216.789028 Correlation Coeff=0.999944

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	0.003	0.003	3317.12	0.00
39997_3361_Cal1	1.000	0.978	0.022	56148.48	2.24
39998_3361_Cal2	5.000	5.003	0.003	274374.76	0.05
39999_3361_Cal3	50.000	52.753	2.753	2863220.93	5.51
40000_3361_Cal4	250.000	250.999	0.999	13611505.29	0.40
40001_3361_Cal5	500.000	512.285	12.285	27777580.06	2.46

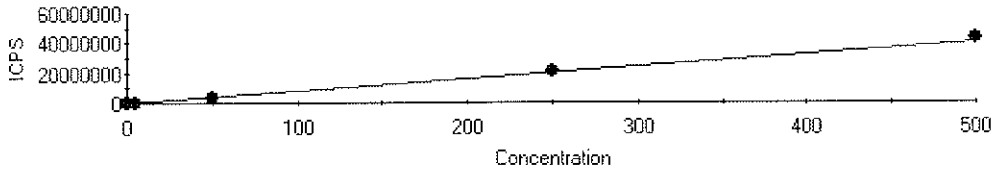
208Pb FQ Block 1



Intercept CPS=1281.983205 Intercept Conc=0.017756
Sensitivity=72200.992669 Correlation Coeff=0.999972

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	0.000	0.000	1297.19	0.00
39997_3361_Cal1	1.000	0.986	0.014	72443.28	1.44
39998_3361_Cal2	5.000	5.022	0.022	363847.77	0.43
39999_3361_Cal3	50.000	51.436	1.436	3715001.63	2.87
40000_3361_Cal4	250.000	247.632	2.368	17880574.90	0.95
40001_3361_Cal5	500.000	502.250	2.250	36264199.73	0.45

238U FQ Block 1



Intercept CPS=997.209106 Intercept Conc=0.012196
Sensitivity=81766.882737 Correlation Coeff=0.999920

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	0.000	0.000	997.76	0.00
39997_3361_Cal1	1.000	0.989	0.011	81835.40	1.14
39998_3361_Cal2	5.000	5.058	0.058	414548.15	1.15
39999_3361_Cal3	50.000	48.989	1.011	4006687.25	2.02
40000_3361_Cal4	250.000	252.930	2.930	20682326.11	1.17
40001_3361_Cal5	500.000	519.113	19.113	42447268.32	3.82

Dilution Corrected Concentrations

39996_3361_Cal0 10/8/2012 6:16:22 PM

User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:16:26	0.012	0.014	-0.009	0.639	-0.867	-1.247	0.367	1.877	163.800	↹2261000.000
2	18:16:30	-0.004	-0.001	-0.497	-0.925	-2.505	-1.070	-1.097	-0.741	159.500	↹2304000.000
3	18:16:34	0.001	-0.012	-0.576	0.081	-1.362	0.066	-1.885	-11.980	135.500	↹2326000.000
x		0.003	0.000	-0.361	-0.068	-1.578	-0.750	-0.872	-3.615	152.900	↹2297000.000
σ		0.008	0.013	0.307	0.793	0.840	0.713	1.143	7.363	15.240	↹32960.000
%RSD		275.400	3615.000	85.120	1160.000	53.230	95.010	131.100	203.700	9.967	↹1.435

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:16:26	-2.531	-1.420	99.551%	100.696%	-0.035	-0.003	-0.004	53.370	-0.646	-0.000
2	18:16:30	14.500	-3.904	99.936%	99.423%	-0.036	0.080	-0.009	54.680	-0.358	0.000
3	18:16:34	14.390	3.121	100.513%	99.881%	0.047	0.302	0.008	53.010	-0.256	-0.000
x		8.787	-0.734	100.000%	100.000%	-0.008	0.126	-0.002	53.690	-0.420	0.000
σ		9.801	3.562	0.484%	0.645%	0.048	0.158	0.009	0.881	0.202	0.000
%RSD		111.500	485.200	0.484	0.645	582.000	124.900	556.600	1.640	48.060	8964.000

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:16:26	-0.001	-0.011	-0.000	0.017	100.247%	-0.030	-0.394	0.001	99.463%	-0.003
2	18:16:30	0.002	-0.001	0.001	-0.014	100.356%	0.004	-0.285	0.009	100.470%	0.003
3	18:16:34	-0.000	-0.001	-0.001	-0.052	99.396%	0.010	-0.346	0.012	100.067%	0.001
x		0.000	-0.005	-0.000	-0.016	100.000%	-0.005	-0.342	0.007	100.000%	0.000
σ		0.002	0.006	0.001	0.035	0.526%	0.021	0.054	0.006	0.506%	0.003
%RSD		808.400	120.400	28060.000	213.400	0.526	408.600	15.890	80.240	0.506	550.300

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:16:26	-0.000	-0.014	-0.002	99.470%	0.002	-0.003	0.011	↹99.030%	0.003	0.002
2	18:16:30	-0.001	-0.012	0.000	99.991%	-0.001	0.006	-0.014	↹99.663%	-0.005	0.006
3	18:16:34	0.002	-0.001	0.000	100.539%	0.003	-0.005	0.006	↹101.307%	-0.003	0.001
x		0.001	-0.009	-0.000	100.000%	0.001	-0.001	0.001	↹100.000%	-0.002	0.003
σ		0.001	0.007	0.001	0.534%	0.002	0.006	0.013	↹1.175%	0.004	0.002
%RSD		286.300	77.880	354.600	0.534	187.300	1011.000	995.800	↹1.175	238.200	76.300

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	18:16:26	0.000	↹99.299%	-0.000
2	18:16:30	0.001	↹99.900%	0.000
3	18:16:34	-0.000	↹100.800%	0.000
x		0.000	↹100.000%	0.000
σ		0.001	↹0.756%	0.000
%RSD		302.900	↹0.756	3101.000

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:22:01	0.956	1.008	1.234	248.200	250.900	245.400	59.560	25.410	159.200	↹2242000.000
2	18:22:05	0.879	0.982	1.983	247.100	253.800	250.000	56.160	70.140	126.600	↹2317000.000
3	18:22:08	0.980	0.895	2.799	259.400	252.700	249.800	↹201.600	31.570	173.300	↹2286000.000
x		0.938	0.962	2.006	251.600	252.400	248.400	↹105.800	42.370	153.000	↹2282000.000
σ		0.052	0.060	0.783	6.827	1.452	2.547	↹83.020	24.240	23.940	↹37500.000
%RSD		5.593	6.199	39.030	2.714	0.575	1.025	↹78.480	57.220	15.650	↹1.643

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:22:01	247.500	267.000	101.861%	100.962%	0.966	1.064	1.022	52.640	278.700	0.947
2	18:22:05	261.800	245.800	100.996%	101.462%	0.976	0.927	1.010	54.210	281.400	0.993
3	18:22:08	268.300	255.000	101.061%	101.383%	1.140	1.153	1.072	54.000	283.000	1.075
x		259.200	255.900	101.306%	101.269%	1.028	1.048	1.035	53.620	281.000	1.005
σ		10.680	10.660	0.482%	0.269%	0.098	0.114	0.033	0.850	2.192	0.065
%RSD		4.118	4.164	0.475	0.266	9.520	10.850	3.193	1.586	0.780	6.423

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:22:01	0.983	1.001	0.950	1.347	104.142%	1.126	0.734	0.975	100.103%	0.949
2	18:22:05	0.983	1.025	1.023	1.323	102.077%	0.930	0.837	0.983	100.920%	0.972
3	18:22:08	1.004	1.019	0.969	1.447	102.986%	0.952	0.597	0.994	99.707%	0.999
x		0.990	1.015	0.981	1.372	103.068%	1.002	0.723	0.984	100.243%	0.973
σ		0.012	0.013	0.038	0.066	1.035%	0.107	0.120	0.009	0.619%	0.025
%RSD		1.222	1.270	3.868	4.809	1.004	10.690	16.660	0.945	0.617	2.596

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:22:01	0.921	0.500	0.914	101.307%	0.986	0.977	0.988	↹100.298%	0.219	0.980
2	18:22:05	0.928	0.485	1.038	102.207%	0.990	0.955	0.964	↹101.026%	0.186	0.970
3	18:22:08	0.995	0.486	0.992	101.558%	0.974	1.017	1.020	↹100.510%	0.208	0.983
x		0.948	0.490	0.982	101.691%	0.983	0.983	0.991	↹100.611%	0.204	0.978
σ		0.041	0.008	0.063	0.464%	0.008	0.032	0.028	↹0.374%	0.017	0.006
%RSD		4.335	1.636	6.410	0.457	0.828	3.214	2.835	↹0.372	8.273	0.650

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	18:22:01	0.986	↹99.682%	0.992
2	18:22:05	0.990	↹99.737%	0.980
3	18:22:08	0.981	↹99.987%	0.995
x		0.986	↹99.802%	0.989
σ		0.005	↹0.162%	0.008
%RSD		0.460	↹0.163	0.797

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:27:33	4.948	4.944	5.187	501.800	514.600	513.200	275.700	250.100	160.700	τ 2275000.000
2	18:27:37	4.956	5.345	5.948	498.200	512.900	508.400	258.300	291.700	143.600	τ 2246000.000
3	18:27:41	5.012	5.049	4.824	511.200	520.100	511.000	268.700	273.600	163.400	τ 2278000.000
x		4.972	5.112	5.320	503.700	515.900	510.900	267.600	271.800	155.900	τ 2267000.000
σ		0.035	0.208	0.574	6.709	3.750	2.414	8.720	20.840	10.690	τ 17810.000
%RSD		0.698	4.064	10.780	1.332	0.727	0.473	3.259	7.666	6.859	τ 0.786

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:27:33	491.400	572.900	100.343%	102.461%	5.471	5.427	4.939	51.220	571.200	4.919
2	18:27:37	477.800	452.700	102.568%	102.098%	4.663	4.876	5.029	53.000	563.400	4.978
3	18:27:41	494.100	509.700	100.969%	102.215%	5.167	4.758	4.896	54.190	561.600	4.987
x		487.800	511.800	101.294%	102.258%	5.100	5.020	4.954	52.800	565.400	4.961
σ		8.702	60.120	1.148%	0.185%	0.408	0.357	0.068	1.493	5.130	0.037
%RSD		1.784	11.750	1.133	0.181	7.998	7.115	1.371	2.828	0.907	0.749

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:27:33	5.032	5.155	5.142	5.982	104.202%	5.000	4.520	4.870	100.591%	4.838
2	18:27:37	4.884	5.147	5.032	5.381	104.731%	4.893	5.298	4.984	100.528%	4.862
3	18:27:41	4.894	5.072	5.010	5.527	104.910%	5.123	4.071	4.950	100.748%	4.999
x		4.937	5.125	5.061	5.630	104.614%	5.005	4.630	4.935	100.622%	4.899
σ		0.083	0.046	0.070	0.314	0.368%	0.115	0.621	0.059	0.113%	0.087
%RSD		1.674	0.894	1.391	5.568	0.352	2.298	13.410	1.185	0.113	1.774

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:27:33	4.921	2.503	5.049	101.155%	5.035	5.131	5.082	τ 100.059%	0.499	4.965
2	18:27:37	4.927	2.514	5.077	101.591%	4.963	5.047	5.011	τ 100.432%	0.528	4.996
3	18:27:41	4.890	2.511	5.054	101.863%	4.955	5.051	4.957	τ 100.589%	0.521	5.047
x		4.913	2.509	5.060	101.536%	4.985	5.076	5.017	τ 100.360%	0.516	5.003
σ		0.020	0.006	0.015	0.358%	0.044	0.048	0.062	τ 0.272%	0.015	0.042
%RSD		0.412	0.232	0.295	0.352	0.887	0.936	1.244	τ 0.271	2.890	0.831

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	18:27:33	5.024	τ 99.566%	5.035
2	18:27:37	5.009	τ 99.494%	5.034
3	18:27:41	5.032	τ 99.817%	5.105
x		5.022	τ 99.626%	5.058
σ		0.011	τ 0.169%	0.041
%RSD		0.223	τ 0.170	0.807

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:33:05	49.810	51.370	50.690	2406.000	2487.000	2464.000	2545.000	2501.000	152.600	↹2313000.000
2	18:33:09	50.730	50.630	50.500	2567.000	2523.000	2492.000	2559.000	2568.000	167.100	↹2188000.000
3	18:33:13	51.040	51.290	50.020	2368.000	2448.000	2465.000	2567.000	2585.000	147.500	↹2346000.000
x		50.530	51.100	50.410	2447.000	2486.000	2474.000	2557.000	2552.000	155.800	↹2283000.000
σ		0.641	0.402	0.345	105.500	37.760	15.520	10.810	44.360	10.150	↹83240.000
%RSD		1.268	0.787	0.683	4.310	1.519	0.627	0.423	1.739	6.517	↹3.647

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:33:05	2349.000	2463.000	101.984%	102.884%	48.780	50.070	49.540	44.590	2814.000	50.040
2	18:33:09	2499.000	2609.000	102.032%	102.284%	50.660	50.060	49.840	42.850	2793.000	49.790
3	18:33:13	2382.000	2486.000	103.007%	102.200%	50.170	49.800	50.140	42.950	2820.000	49.850
x		2410.000	2520.000	102.341%	102.456%	49.870	49.980	49.840	43.470	2809.000	49.890
σ		78.570	78.690	0.577%	0.373%	0.979	0.154	0.298	0.976	13.830	0.132
%RSD		3.260	3.123	0.564	0.364	1.962	0.308	0.599	2.246	0.492	0.265

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:33:05	49.680	51.050	50.630	52.160	105.511%	50.530	50.000	49.980	100.229%	49.450
2	18:33:09	49.100	50.250	50.880	51.400	105.324%	50.610	50.010	50.020	99.995%	49.160
3	18:33:13	50.020	51.240	50.260	52.420	105.554%	50.980	50.010	49.990	100.560%	49.540
x		49.600	50.850	50.590	51.990	105.463%	50.710	50.010	49.990	100.262%	49.380
σ		0.462	0.522	0.314	0.532	0.122%	0.242	0.007	0.022	0.284%	0.201
%RSD		0.932	1.027	0.621	1.024	0.116	0.476	0.015	0.044	0.283	0.407

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:33:05	51.130	25.210	51.090	100.824%	50.420	50.690	49.480	↹100.660%	1.026	52.320
2	18:33:09	50.300	25.130	50.230	101.664%	49.960	49.720	50.480	↹99.884%	1.012	53.630
3	18:33:13	50.830	25.130	50.950	101.745%	50.190	50.520	49.160	↹101.795%	0.974	52.310
x		50.750	25.150	50.760	101.411%	50.190	50.310	49.710	↹100.780%	1.004	52.750
σ		0.421	0.045	0.461	0.510%	0.231	0.520	0.690	↹0.961%	0.027	0.757
%RSD		0.830	0.179	0.909	0.503	0.460	1.033	1.387	↹0.954	2.668	1.435

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	18:33:05	51.130	↹98.481%	↹48.830
2	18:33:09	51.770	↹98.581%	↹49.430
3	18:33:13	51.410	↹100.330%	↹48.710
x		51.440	↹99.131%	↹48.990
σ		0.321	↹1.040%	↹0.383
%RSD		0.624	↹1.049	↹0.782

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:38:39	249.800	251.700	248.700	↹12220.000	12290.000	12260.000	12230.000	12660.000	163.900	↹2480000.000
2	18:38:43	249.200	248.500	244.700	↹11700.000	12380.000	12200.000	12370.000	12560.000	143.500	↹2545000.000
3	18:38:47	251.200	248.200	249.100	↹12490.000	12440.000	12470.000	12430.000	12790.000	168.600	↹2496000.000
x		250.100	249.500	247.500	↹12140.000	12370.000	12310.000	12350.000	12670.000	158.700	↹2507000.000
σ		1.050	1.943	2.449	↹402.200	77.410	138.200	103.200	115.800	13.370	↹33830.000
%RSD		0.420	0.779	0.990	↹3.313	0.626	1.122	0.836	0.914	8.427	↹1.349

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:38:39	12510.000	12320.000	102.354%	102.715%	249.400	249.600	250.400	-9.957	↹12680.000	250.400
2	18:38:43	12190.000	12670.000	103.984%	102.537%	250.800	249.300	249.400	-8.723	↹12640.000	249.700
3	18:38:47	12730.000	12510.000	103.296%	102.526%	250.900	249.300	249.900	-9.864	↹12570.000	250.800
x		12470.000	12500.000	103.212%	102.593%	250.400	249.400	249.900	-9.515	↹12630.000	250.300
σ		271.000	172.200	0.818%	0.106%	0.837	0.190	0.483	0.687	↹52.530	0.534
%RSD		2.173	1.377	0.793	0.103	0.334	0.076	0.193	7.219	↹0.416	0.214

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:38:39	250.400	250.300	248.100	253.300	105.076%	246.500	242.600	254.300	98.523%	250.200
2	18:38:43	252.600	248.800	251.500	256.800	104.247%	250.700	246.700	258.700	99.627%	250.000
3	18:38:47	249.800	250.200	250.600	256.100	105.775%	249.000	245.900	255.200	100.992%	250.300
x		250.900	249.800	250.000	255.400	105.033%	248.700	245.100	256.100	99.714%	250.200
σ		1.490	0.825	1.739	1.838	0.765%	2.109	2.195	2.296	1.237%	0.179
%RSD		0.594	0.330	0.696	0.720	0.728	0.848	0.896	0.897	1.240	0.072

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:38:39	258.500	125.400	247.600	101.082%	249.400	249.900	250.300	↹100.070%	10.090	↹251.300
2	18:38:43	257.400	124.700	251.700	100.882%	254.000	250.100	251.300	↹100.406%	10.040	↹249.100
3	18:38:47	254.000	124.900	250.400	101.583%	253.800	249.900	253.400	↹100.579%	10.170	↹252.500
x		256.600	125.000	249.900	101.182%	252.400	250.000	251.700	↹100.352%	10.100	↹251.000
σ		2.341	0.337	2.130	0.361%	2.639	0.090	1.575	↹0.259%	0.067	↹1.743
%RSD		0.912	0.270	0.852	0.357	1.045	0.036	0.626	↹0.258	0.661	↹0.695

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	18:38:39	↹247.900	↹96.134%	↹252.100
2	18:38:43	↹246.700	↹97.722%	↹250.900
3	18:38:47	↹248.300	↹97.693%	↹255.800
x		↹247.600	↹97.183%	↹252.900
σ		↹0.808	↹0.908%	↹2.537
%RSD		↹0.326	↹0.935	↹1.003

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:44:13	M 504.800	488.800	496.300	T 24770.000	24610.000	24600.000	23780.000	24860.000	196.700	T 2749000.000
2	18:44:17	TM 522.500	490.700	M 500.700	T 23940.000	24340.000	24640.000	24000.000	24760.000	160.600	T 2843000.000
3	18:44:20	M 507.400	495.900	M 500.400	TM 25540.000	24590.000	24840.000	24080.000	24990.000	168.300	T 2770000.000
x		TM 511.600	491.800	M 499.100	TM 24750.000	24510.000	24690.000	23960.000	24870.000	175.200	T 2787000.000
σ		TM 9.580	3.668	M 2.471	TM 800.100	147.900	127.400	154.600	115.900	19.000	T 49170.000
%RSD		TM 1.873	0.746	M 0.495	TM 3.233	0.603	0.516	0.645	0.466	10.840	T 1.764

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:44:13	TM 26870.000	24640.000	106.013%	106.068%	493.200	M 502.100	M 503.100	-95.700	T 24800.000	M 501.200
2	18:44:17	TM 26230.000	24820.000	107.340%	106.805%	498.200	M 501.600	499.500	-84.100	T 24750.000	499.300
3	18:44:20	TM 27600.000	M 25260.000	106.785%	104.739%	499.600	M 502.700	M 502.600	-87.750	T 24790.000	M 503.200
x		TM 26900.000	M 24910.000	106.713%	105.871%	497.000	M 502.100	M 501.700	-89.180	T 24780.000	M 501.200
σ		TM 684.900	M 319.100	0.666%	1.047%	3.390	M 0.511	M 1.941	5.931	T 27.290	M 1.921
%RSD		TM 2.546	M 1.281	0.624	0.989	0.682	M 0.102	M 0.387	6.651	T 0.110	M 0.383

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:44:13	TM 500.500	491.200	494.200	495.100	106.195%	486.800	471.700	TM 515.400	99.788%	T 496.900
2	18:44:17	TM 500.900	483.700	T 487.400	491.200	108.401%	482.800	474.400	TM 521.600	100.532%	T 498.800
3	18:44:20	T 499.100	487.200	492.300	491.600	109.306%	478.800	473.300	TM 516.300	101.811%	T 494.800
x		TM 500.200	487.400	T 491.300	492.600	107.968%	482.800	473.200	TM 517.700	100.710%	T 496.800
σ		TM 0.925	3.712	T 3.513	2.170	1.600%	3.991	1.356	TM 3.389	1.024%	T 2.015
%RSD		TM 0.185	0.762	T 0.715	0.441	1.482	0.827	0.287	TM 0.655	1.016	T 0.406

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:44:13	M 524.100	T 243.700	493.200	101.600%	M 513.300	M 500.800	T 492.100	T 99.960%	24.940	TM 510.300
2	18:44:17	M 529.100	T 243.500	495.500	102.166%	M 513.000	M 505.500	T 487.200	T 101.767%	24.990	TM 508.300
3	18:44:20	M 520.000	T 244.900	492.900	102.443%	T 493.600	M 503.000	T 497.400	T 102.415%	M 25.020	TM 518.200
x		M 524.400	T 244.100	493.900	102.069%	TM 506.600	M 503.100	T 492.200	T 101.381%	M 24.980	TM 512.300
σ		M 4.573	T 0.771	1.423	0.430%	TM 11.300	M 2.372	T 5.106	T 1.272%	M 0.040	TM 5.222
%RSD		M 0.872	T 0.316	0.288	0.421	TM 2.231	M 0.472	T 1.037	T 1.255	M 0.161	TM 1.019

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	18:44:13	T 498.800	T 94.748%	TM 517.000
2	18:44:17	T 500.000	T 96.296%	TM 514.100
3	18:44:20	TM 508.000	T 95.506%	TM 526.200
x		TM 502.200	T 95.517%	TM 519.100
σ		TM 4.983	T 0.774%	TM 6.305
%RSD		TM 0.992	T 0.810	TM 1.214

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:49:47	109.100	112.300	116.500	5670.000	5614.000	5481.000	5623.000	5618.000	143.000	τ 2303000.000
2	18:49:50	110.200	112.000	114.800	5725.000	5542.000	5538.000	5582.000	5826.000	162.600	τ 2286000.000
3	18:49:54	111.500	112.200	115.800	5552.000	5545.000	5467.000	5565.000	5797.000	132.300	τ 2308000.000
x		110.300	112.200	115.700	5649.000	5567.000	5495.000	5590.000	5747.000	146.000	τ 2299000.000
σ		1.205	0.118	0.819	88.130	40.930	37.710	29.440	112.500	15.320	τ 11330.000
%RSD		1.092	0.106	0.708	1.560	0.735	0.686	0.527	1.957	10.500	τ 0.493

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:49:47	5502.000	5672.000	103.647%	105.203%	109.700	108.900	110.500	29.180	6293.000	109.600
2	18:49:50	5556.000	5433.000	104.888%	104.235%	111.900	110.000	109.200	29.110	6275.000	109.200
3	18:49:54	5440.000	5517.000	105.734%	104.105%	109.000	108.800	108.900	28.150	6286.000	108.100
x		5499.000	5541.000	104.756%	104.514%	110.200	109.200	109.500	28.810	6284.000	108.900
σ		58.180	121.200	1.050%	0.600%	1.528	0.669	0.831	0.576	8.986	0.813
%RSD		1.058	2.187	1.002	0.574	1.387	0.613	0.759	1.999	0.143	0.747

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:49:47	109.600	112.900	112.100	117.100	105.565%	113.200	108.900	111.200	101.840%	107.800
2	18:49:50	107.200	110.700	110.100	118.100	107.634%	112.000	110.400	111.100	102.974%	107.200
3	18:49:54	107.800	111.700	109.500	117.600	107.126%	111.600	109.900	110.400	102.547%	107.300
x		108.200	111.700	110.600	117.600	106.775%	112.300	109.700	110.900	102.454%	107.400
σ		1.218	1.088	1.371	0.507	1.078%	0.817	0.756	0.409	0.573%	0.281
%RSD		1.126	0.974	1.240	0.431	1.010	0.728	0.689	0.369	0.559	0.262

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:49:47	112.300	55.070	111.600	102.907%	112.700	109.800	108.300	τ 102.032%	4.241	τ 106.700
2	18:49:50	111.900	54.830	110.800	103.375%	113.300	110.000	108.300	τ 102.925%	4.241	τ 106.300
3	18:49:54	112.200	54.530	111.300	103.443%	113.600	110.000	108.500	τ 102.898%	4.070	τ 105.600
x		112.100	54.810	111.200	103.242%	113.200	109.900	108.400	τ 102.618%	4.184	τ 106.200
σ		0.220	0.270	0.364	0.291%	0.471	0.086	0.136	τ 0.508%	0.099	τ 0.550
%RSD		0.197	0.493	0.328	0.282	0.416	0.078	0.125	τ 0.495	2.365	τ 0.518

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	18:49:47	τ 108.500	τ 100.788%	τ 108.600
2	18:49:50	τ 108.200	τ 101.811%	τ 108.800
3	18:49:54	τ 108.000	τ 102.017%	τ 107.200
x		τ 108.300	τ 101.539%	τ 108.200
σ		τ 0.251	τ 0.659%	τ 0.865
%RSD		τ 0.232	τ 0.649	τ 0.800

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:55:21	0.153	0.098	1.850	10.660	8.619	9.428	13.470	-10.540	141.900	τ 2317000.000
2	18:55:24	0.144	0.157	1.572	10.910	7.766	9.666	16.090	8.312	163.900	τ 2308000.000
3	18:55:28	0.173	0.093	1.626	8.136	6.263	6.381	10.720	4.071	169.800	τ 2283000.000
x		0.157	0.116	1.683	9.902	7.550	8.492	13.430	0.616	158.500	τ 2303000.000
σ		0.015	0.036	0.147	1.535	1.193	1.832	2.684	9.888	14.730	τ 17430.000
%RSD		9.582	30.710	8.750	15.500	15.800	21.570	19.990	1606.000	9.291	τ 0.757

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:55:21	25.880	12.310	104.505%	105.034%	0.138	0.572	0.305	64.160	11.820	0.246
2	18:55:24	20.180	0.781	105.164%	105.746%	0.196	0.140	0.275	66.260	11.410	0.247
3	18:55:28	-4.463	5.483	106.947%	104.829%	0.171	0.286	0.208	65.140	8.022	0.158
x		13.870	6.193	105.539%	105.203%	0.169	0.333	0.263	65.190	10.420	0.217
σ		16.130	5.800	1.263%	0.481%	0.029	0.220	0.050	1.051	2.085	0.051
%RSD		116.300	93.650	1.197	0.458	17.150	66.140	18.950	1.613	20.020	23.700

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:55:21	0.233	0.281	0.261	0.162	106.106%	0.428	-0.025	0.234	103.086%	0.214
2	18:55:24	0.216	0.214	0.223	0.107	107.052%	0.334	0.016	0.241	103.679%	0.209
3	18:55:28	0.154	0.156	0.168	0.055	105.851%	0.201	-0.084	0.173	102.899%	0.139
x		0.201	0.217	0.217	0.108	106.336%	0.321	-0.031	0.216	103.221%	0.187
σ		0.042	0.062	0.047	0.053	0.633%	0.114	0.051	0.037	0.407%	0.042
%RSD		20.810	28.810	21.410	49.350	0.595	35.590	163.400	17.310	0.395	22.400

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:55:21	0.260	0.125	0.230	103.387%	0.281	0.270	0.233	τ 102.917%	0.074	0.588
2	18:55:24	0.272	0.114	0.217	103.833%	0.298	0.246	0.231	τ 102.840%	0.091	0.545
3	18:55:28	0.149	0.068	0.160	103.065%	0.245	0.175	0.149	τ 103.339%	0.080	0.446
x		0.227	0.102	0.202	103.428%	0.275	0.231	0.204	τ 103.032%	0.082	0.526
σ		0.068	0.031	0.037	0.385%	0.027	0.049	0.048	τ 0.269%	0.009	0.073
%RSD		29.910	29.860	18.350	0.373	9.939	21.460	23.410	τ 0.261	10.490	13.830

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	18:55:21	0.266	τ 101.161%	0.226
2	18:55:24	0.237	τ 102.851%	0.221
3	18:55:28	0.164	τ 102.756%	0.152
x		0.223	τ 102.256%	0.200
σ		0.053	τ 0.949%	0.042
%RSD		23.680	τ 0.928	20.940

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:00:55	1.039	1.047	2.264	247.500	252.800	247.500	66.180	43.000	158.300	↹2337000.000
2	19:00:58	1.023	0.984	2.753	247.600	262.200	249.900	59.730	47.620	145.600	↹2300000.000
3	19:01:02	0.926	0.994	2.302	240.500	249.700	247.700	61.520	42.760	183.400	↹2279000.000
x		0.996	1.008	2.439	245.200	254.900	248.400	62.470	44.460	162.400	↹2305000.000
σ		0.061	0.034	0.272	4.033	6.522	1.350	3.331	2.735	19.230	↹29350.000
%RSD		6.129	3.361	11.160	1.645	2.559	0.543	5.331	6.152	11.840	↹1.273

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:00:55	254.900	332.200	101.835%	102.773%	0.884	1.164	1.087	65.030	286.500	1.013
2	19:00:58	245.200	217.000	103.117%	102.388%	1.014	0.836	1.120	66.170	288.900	0.992
3	19:01:02	243.300	240.400	104.094%	102.419%	1.184	0.930	1.028	65.150	282.800	1.042
x		247.800	263.200	103.016%	102.527%	1.028	0.977	1.078	65.450	286.100	1.016
σ		6.215	60.920	1.133%	0.213%	0.150	0.169	0.047	0.627	3.045	0.025
%RSD		2.508	23.140	1.100	0.208	14.620	17.330	4.314	0.958	1.065	2.455

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:00:55	1.004	1.068	1.067	1.304	103.738%	1.172	0.821	0.999	101.411%	0.987
2	19:00:58	1.044	1.077	1.060	1.214	103.622%	1.075	0.754	1.026	101.856%	0.985
3	19:01:02	1.022	1.063	1.074	1.259	104.713%	1.067	0.871	0.968	102.214%	1.030
x		1.023	1.069	1.067	1.259	104.024%	1.105	0.815	0.998	101.827%	1.001
σ		0.020	0.007	0.007	0.045	0.599%	0.059	0.059	0.029	0.402%	0.026
%RSD		1.966	0.651	0.653	3.558	0.576	5.297	7.185	2.907	0.395	2.561

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:00:55	1.035	0.510	1.026	101.524%	1.026	1.044	1.054	↹101.279%	0.242	1.127
2	19:00:58	0.965	0.484	0.992	102.198%	1.041	1.042	1.010	↹101.675%	0.270	1.123
3	19:01:02	1.048	0.498	1.056	102.502%	1.051	1.014	0.992	↹101.790%	0.242	1.110
x		1.016	0.497	1.025	102.075%	1.039	1.033	1.019	↹101.581%	0.251	1.120
σ		0.045	0.013	0.032	0.501%	0.012	0.017	0.032	↹0.268%	0.017	0.009
%RSD		4.444	2.568	3.136	0.491	1.196	1.606	3.124	↹0.264	6.604	0.763

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	19:00:55	1.018	↹100.313%	1.016
2	19:00:58	1.012	↹101.463%	1.012
3	19:01:02	1.021	↹100.730%	1.003
x		1.017	↹100.836%	1.010
σ		0.005	↹0.582%	0.007
%RSD		0.463	↹0.578	0.649

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:06:27	5.247	5.034	6.115	508.700	512.600	504.600	255.600	258.800	156.300	r 2304000.000
2	19:06:31	4.975	4.951	5.742	504.100	532.300	506.600	253.500	265.900	159.900	r 2333000.000
3	19:06:35	5.039	4.552	5.775	525.200	514.700	512.900	274.200	248.600	153.800	r 2251000.000
x		5.087	4.846	5.877	512.700	519.800	508.000	261.100	257.800	156.700	r 2296000.000
σ		0.142	0.258	0.207	11.110	10.840	4.314	11.400	8.702	3.058	r 41340.000
%RSD		2.794	5.314	3.515	2.167	2.085	0.849	4.365	3.376	1.952	r 1.800

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:06:27	503.100	460.200	101.947%	101.787%	5.143	4.836	5.086	61.580	570.800	5.047
2	19:06:31	515.500	503.700	102.565%	101.998%	5.194	5.271	5.082	62.330	569.100	5.012
3	19:06:35	543.300	529.300	103.009%	101.877%	5.151	5.516	5.195	58.570	569.700	4.995
x		520.600	497.700	102.507%	101.887%	5.162	5.208	5.121	60.830	569.900	5.018
σ		20.570	34.950	0.533%	0.106%	0.027	0.344	0.064	1.991	0.843	0.026
%RSD		3.951	7.022	0.520	0.104	0.529	6.608	1.248	3.273	0.148	0.528

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:06:27	4.906	5.263	5.207	5.436	104.228%	5.160	4.857	5.001	100.316%	4.891
2	19:06:31	4.971	5.329	5.224	5.877	104.448%	5.099	4.639	4.964	101.161%	4.960
3	19:06:35	4.990	5.211	5.078	5.564	104.658%	5.087	4.526	4.890	102.316%	4.928
x		4.956	5.268	5.169	5.626	104.445%	5.115	4.674	4.952	101.264%	4.926
σ		0.044	0.060	0.079	0.227	0.215%	0.039	0.169	0.056	1.004%	0.034
%RSD		0.891	1.132	1.538	4.036	0.206	0.763	3.609	1.138	0.991	0.694

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:06:27	5.104	2.513	5.144	101.536%	5.031	4.978	5.075	r 101.338%	0.499	5.049
2	19:06:31	4.993	2.508	5.126	102.466%	4.993	5.066	4.940	r 100.648%	0.507	5.071
3	19:06:35	4.927	2.487	5.019	102.718%	4.972	4.954	4.935	r 102.534%	0.503	5.139
x		5.008	2.503	5.096	102.240%	4.999	5.000	4.983	r 101.507%	0.503	5.086
σ		0.089	0.014	0.067	0.623%	0.030	0.059	0.079	r 0.954%	0.004	0.047
%RSD		1.782	0.547	1.322	0.609	0.599	1.183	1.594	r 0.940	0.764	0.922

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	19:06:27	5.002	r 100.848%	5.049
2	19:06:31	4.999	r 101.464%	5.116
3	19:06:35	5.024	r 101.203%	5.098
x		5.008	r 101.172%	5.088
σ		0.013	r 0.309%	0.035
%RSD		0.265	r 0.306	0.685

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:11:59	0.037	0.037	1.272	TM 48670.000	M 49280.000	TM 50460.000	16.390	M 52760.000	3187.000	T 2360000.000
2	19:12:03	0.056	0.014	2.182	TM 49080.000	M 50020.000	TM 50880.000	17.420	M 53030.000	3431.000	T 2416000.000
3	19:12:07	0.061	0.056	2.187	TM 49150.000	M 49990.000	TM 51250.000	17.310	M 53070.000	3540.000	T 2432000.000
x		0.051	0.036	1.880	TM 48970.000	M 49760.000	TM 50860.000	17.040	M 52950.000	3386.000	T 2403000.000
σ		0.013	0.021	0.527	TM 260.000	M 419.900	TM 398.200	0.565	M 165.800	180.300	T 37920.000
%RSD		24.440	57.960	28.010	TM 0.531	M 0.844	TM 0.783	3.315	M 0.313	5.325	T 1.578

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:11:59	TM 53190.000	M 52420.000	87.678%	89.943%	M 1016.000	0.462	0.612	32.900	TM 50880.000	0.060
2	19:12:03	TM 53500.000	M 53450.000	87.595%	88.902%	M 1021.000	0.230	0.555	33.550	TM 50540.000	-0.018
3	19:12:07	TM 53800.000	M 52850.000	88.622%	88.810%	M 1019.000	0.490	0.579	33.390	TM 50900.000	0.101
x		TM 53500.000	M 52910.000	87.965%	89.218%	M 1018.000	0.394	0.582	33.280	TM 50770.000	0.048
σ		TM 306.800	M 515.400	0.571%	0.630%	M 2.687	0.143	0.028	0.336	TM 201.400	0.060
%RSD		TM 0.573	M 0.974	0.649	0.706	M 0.264	36.250	4.894	1.010	TM 0.397	126.000

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:11:59	0.748	0.924	0.523	1.965	90.650%	0.517	-0.268	0.278	85.762%	0.344
2	19:12:03	0.741	0.960	0.517	1.927	92.594%	0.413	-0.297	0.271	86.739%	0.332
3	19:12:07	0.730	0.923	0.472	1.962	92.937%	0.519	-0.277	0.271	87.388%	0.309
x		0.740	0.936	0.504	1.952	92.060%	0.483	-0.281	0.273	86.630%	0.329
σ		0.009	0.021	0.028	0.021	1.234%	0.061	0.015	0.004	0.819%	0.018
%RSD		1.180	2.269	5.513	1.071	1.340	12.540	5.238	1.507	0.945	5.388

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:11:59	TM 1052.000	0.042	0.049	89.345%	0.101	0.380	1.161	T 90.602%	0.057	0.149
2	19:12:03	TM 1040.000	0.037	0.120	90.170%	0.123	0.357	1.152	T 91.621%	0.022	0.136
3	19:12:07	TM 1050.000	0.032	0.039	91.058%	0.102	0.326	1.211	T 92.104%	0.041	0.128
x		TM 1047.000	0.037	0.069	90.191%	0.109	0.354	1.175	T 91.443%	0.040	0.138
σ		TM 6.047	0.005	0.044	0.857%	0.012	0.027	0.032	T 0.767%	0.018	0.011
%RSD		TM 0.577	12.680	64.020	0.950	11.450	7.552	2.692	T 0.838	44.160	7.845

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	19:11:59	0.244	T 87.974%	0.030
2	19:12:03	0.230	T 88.971%	0.023
3	19:12:07	0.220	T 90.653%	0.015
x		0.231	T 89.199%	0.023
σ		0.012	T 1.355%	0.007
%RSD		5.194	T 1.519	32.660

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:17:32	99.030	96.860	97.740	TM 47990.000	M 49310.000	TM 50130.000	5130.000	M 57380.000	3183.000	T 2487000.000
2	19:17:37	99.970	97.500	97.050	TM 50070.000	M 48820.000	TM 50270.000	5168.000	M 57020.000	3305.000	T 2406000.000
3	19:17:40	99.260	97.180	99.490	TM 47810.000	M 49210.000	TM 50370.000	5178.000	M 57580.000	3241.000	T 2552000.000
x		99.420	97.180	98.090	TM 48620.000	M 49110.000	TM 50260.000	5159.000	M 57330.000	3243.000	T 2482000.000
σ		0.490	0.322	1.260	TM 1257.000	M 255.000	TM 118.300	24.870	M 281.300	61.080	T 72790.000
%RSD		0.493	0.331	1.284	TM 2.584	M 0.519	TM 0.236	0.482	M 0.491	1.883	T 2.933

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:17:32	TM 52410.000	M 52150.000	90.463%	92.092%	M 1105.000	100.800	101.300	14.500	TM 50670.000	100.200
2	19:17:37	TM 54390.000	M 53080.000	92.199%	92.833%	M 1109.000	100.500	100.200	15.720	TM 50070.000	100.200
3	19:17:40	TM 52620.000	M 52740.000	92.367%	91.841%	M 1102.000	100.700	100.200	13.700	TM 49990.000	98.820
x		TM 53140.000	M 52660.000	91.676%	92.255%	M 1105.000	100.600	100.500	14.640	TM 50240.000	99.710
σ		TM 1084.000	M 470.900	1.054%	0.516%	M 3.356	0.150	0.621	1.017	TM 369.400	0.771
%RSD		TM 2.039	M 0.894	1.150	0.559	M 0.304	0.149	0.617	6.945	TM 0.735	0.773

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:17:32	98.480	98.540	96.350	106.000	94.607%	103.000	102.500	105.200	87.858%	100.200
2	19:17:37	96.970	96.930	96.100	103.000	97.108%	102.200	101.200	103.700	89.414%	100.400
3	19:17:40	97.830	97.650	96.410	106.400	96.707%	103.300	100.400	104.400	90.417%	99.750
x		97.760	97.710	96.280	105.100	96.141%	102.800	101.400	104.400	89.230%	100.100
σ		0.756	0.808	0.164	1.862	1.343%	0.576	1.064	0.754	1.290%	0.336
%RSD		0.774	0.827	0.170	1.771	1.397	0.560	1.049	0.722	1.445	0.336

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:17:32	TM 1161.000	47.770	102.000	92.168%	100.400	102.000	102.600	T 93.632%	5.353	T 102.500
2	19:17:37	TM 1147.000	48.230	101.700	93.587%	100.600	102.800	104.000	T 93.952%	5.321	T 104.100
3	19:17:40	TM 1148.000	47.520	101.400	94.340%	100.400	102.800	101.100	T 95.220%	5.216	T 102.600
x		TM 1152.000	47.840	101.700	93.365%	100.500	102.600	102.600	T 94.268%	5.297	T 103.100
σ		TM 8.115	0.361	0.295	1.103%	0.079	0.436	1.458	T 0.840%	0.072	T 0.935
%RSD		TM 0.704	0.755	0.290	1.181	0.079	0.425	1.421	T 0.891	1.354	T 0.908

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	19:17:32	T 101.300	T 90.658%	T 104.100
2	19:17:37	T 102.000	T 91.483%	T 106.200
3	19:17:40	T 100.900	T 92.892%	T 104.000
x		T 101.400	T 91.678%	T 104.800
σ		T 0.548	T 1.130%	T 1.257
%RSD		T 0.540	T 1.232	T 1.200

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:23:06	96.990	95.700	94.970	5128.000	4923.000	4913.000	4978.000	5292.000	149.100	↹2277000.000
2	19:23:11	98.890	98.850	97.290	4868.000	4958.000	4902.000	5022.000	5012.000	168.500	↹2417000.000
3	19:23:14	98.530	97.650	98.680	5011.000	4915.000	4864.000	4963.000	4981.000	138.100	↹2310000.000
x		98.130	97.400	96.980	5002.000	4932.000	4893.000	4988.000	5095.000	151.900	↹2335000.000
σ		1.008	1.589	1.875	130.400	22.790	25.950	30.900	171.100	15.370	↹73200.000
%RSD		1.027	1.632	1.934	2.606	0.462	0.530	0.620	3.359	10.120	↹3.135

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:23:06	4926.000	4757.000	105.030%	107.173%	100.700	98.710	100.300	29.630	5690.000	100.500
2	19:23:11	4791.000	5024.000	106.697%	105.445%	100.800	100.100	101.000	28.660	5675.000	100.200
3	19:23:14	4893.000	5372.000	108.669%	106.355%	99.290	99.090	99.650	26.040	5582.000	99.040
x		4870.000	5051.000	106.799%	106.325%	100.300	99.290	100.300	28.110	5649.000	99.910
σ		70.700	308.200	1.822%	0.864%	0.867	0.705	0.655	1.854	58.280	0.760
%RSD		1.452	6.102	1.706	0.813	0.865	0.710	0.653	6.596	1.032	0.760

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:23:06	100.000	102.100	101.500	102.500	109.763%	100.500	99.220	99.260	104.481%	98.370
2	19:23:11	101.400	101.200	102.400	102.900	109.271%	101.300	98.590	99.960	104.705%	98.990
3	19:23:14	99.180	100.500	100.400	103.200	111.775%	100.100	99.600	99.150	105.697%	98.030
x		100.200	101.300	101.400	102.900	110.270%	100.600	99.140	99.460	104.961%	98.470
σ		1.120	0.831	1.022	0.369	1.326%	0.602	0.510	0.439	0.647%	0.485
%RSD		1.118	0.821	1.007	0.359	1.203	0.598	0.514	0.442	0.617	0.493

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:23:06	101.600	50.740	100.200	105.011%	100.300	99.830	99.880	↹105.886%	5.115	↹101.100
2	19:23:11	102.000	50.390	101.900	105.533%	101.100	100.600	98.110	↹106.776%	4.940	↹98.550
3	19:23:14	101.300	50.440	101.400	106.173%	100.300	100.400	99.120	↹106.829%	5.037	↹99.460
x		101.600	50.520	101.200	105.572%	100.600	100.300	99.040	↹106.497%	5.031	↹99.710
σ		0.373	0.191	0.917	0.582%	0.428	0.417	0.888	↹0.530%	0.088	↹1.304
%RSD		0.367	0.379	0.906	0.551	0.425	0.416	0.897	↹0.498	1.749	↹1.308

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	19:23:06	↹100.600	↹103.486%	↹100.300
2	19:23:11	↹99.480	↹105.293%	↹98.010
3	19:23:14	↹99.350	↹105.899%	↹98.830
x		↹99.830	↹104.893%	↹99.040
σ		↹0.716	↹1.255%	↹1.157
%RSD		↹0.717	↹1.197	↹1.168

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:28:40	0.024	0.007	0.344	1.308	-1.571	-0.539	1.057	-4.928	165.000	↑2311000.000
2	19:28:44	0.029	0.012	0.678	-2.214	-1.394	-1.249	-2.449	2.897	183.600	↑2262000.000
3	19:28:48	0.013	0.027	0.650	1.717	-0.114	1.085	-1.608	10.910	156.300	↑2296000.000
x		0.022	0.015	0.557	0.270	-1.026	-0.234	-1.000	2.960	168.300	↑2290000.000
σ		0.008	0.010	0.186	2.161	0.795	1.196	1.830	7.919	13.920	↑25010.000
%RSD		36.220	68.970	33.320	799.500	77.470	510.500	183.000	267.600	8.271	↑1.092

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:28:40	-0.929	2.682	103.880%	106.389%	-0.041	0.183	0.010	58.220	2.041	0.005
2	19:28:44	5.632	-6.538	105.499%	105.737%	-0.022	-0.020	-0.023	58.840	0.918	0.000
3	19:28:48	8.787	14.160	103.739%	105.974%	0.141	0.182	0.016	57.100	2.210	-0.001
x		4.497	3.436	104.373%	106.034%	0.026	0.115	0.001	58.050	1.723	0.002
σ		4.957	10.370	0.978%	0.330%	0.100	0.117	0.021	0.884	0.702	0.003
%RSD		110.200	301.800	0.937	0.311	384.700	101.800	2059.000	1.522	40.740	208.800

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:28:40	0.003	0.007	0.019	-0.126	103.042%	0.057	-0.318	-0.002	102.968%	0.002
2	19:28:44	0.003	-0.013	0.003	-0.179	103.644%	0.062	-0.349	-0.007	103.187%	-0.010
3	19:28:48	0.003	0.005	0.021	-0.154	103.107%	0.048	-0.341	-0.001	102.721%	-0.002
x		0.003	-0.000	0.014	-0.153	103.264%	0.056	-0.336	-0.003	102.959%	-0.004
σ		0.000	0.011	0.010	0.027	0.331%	0.007	0.016	0.003	0.233%	0.006
%RSD		13.860	2947.000	67.470	17.620	0.320	12.210	4.736	106.200	0.226	170.200

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:28:40	0.084	-0.011	0.003	103.544%	0.028	-0.002	-0.023	↑105.121%	0.039	0.155
2	19:28:44	0.061	-0.004	0.002	104.509%	0.006	0.005	-0.018	↑105.447%	0.045	0.128
3	19:28:48	0.085	-0.004	0.004	103.609%	0.048	0.008	0.003	↑105.042%	0.021	0.116
x		0.077	-0.006	0.003	103.887%	0.027	0.004	-0.012	↑105.204%	0.035	0.133
σ		0.013	0.004	0.001	0.540%	0.021	0.005	0.014	↑0.215%	0.013	0.020
%RSD		17.310	60.340	38.650	0.519	77.810	147.600	111.500	↑0.204	36.100	15.030

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	19:28:40	0.007	↑104.504%	-0.001
2	19:28:44	0.003	↑104.549%	-0.003
3	19:28:48	0.009	↑104.806%	0.002
x		0.006	↑104.619%	-0.001
σ		0.003	↑0.163%	0.002
%RSD		47.700	↑0.156	301.100

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:36:15	85.870	82.740	89.700	5034.000	4911.000	4625.000	4696.000	4999.000	161.600	↹2266000.000
2	21:36:19	85.860	82.540	86.090	5010.000	4949.000	4632.000	4733.000	4973.000	191.700	↹2310000.000
3	21:36:23	86.480	82.450	86.760	5170.000	4976.000	4666.000	4805.000	5138.000	162.900	↹2293000.000
x		86.070	82.570	87.520	5071.000	4945.000	4641.000	4745.000	5036.000	172.100	↹2290000.000
σ		0.353	0.152	1.920	86.480	32.940	21.570	55.580	88.870	16.970	↹22310.000
%RSD		0.410	0.184	2.194	1.705	0.666	0.465	1.171	1.765	9.861	↹0.974

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:36:15	4869.000	4777.000	113.514%	121.595%	97.870	98.850	99.780	6.705	5573.000	98.400
2	21:36:19	4914.000	4853.000	115.073%	122.059%	94.930	98.160	99.320	9.917	5539.000	98.650
3	21:36:23	4970.000	5088.000	115.446%	122.373%	96.020	98.040	99.570	12.140	5558.000	99.800
x		4917.000	4906.000	114.677%	122.009%	96.280	98.350	99.550	9.589	5557.000	98.950
σ		50.670	161.900	1.025%	0.392%	1.483	0.437	0.229	2.735	16.830	0.747
%RSD		1.030	3.301	0.894	0.321	1.540	0.444	0.230	28.520	0.303	0.755

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:36:15	100.600	102.600	103.600	104.600	115.798%	101.200	95.170	99.060	108.822%	99.200
2	21:36:19	100.000	101.600	102.500	104.100	117.194%	101.800	97.670	99.180	109.273%	99.520
3	21:36:23	99.960	102.200	103.200	103.800	118.124%	101.700	95.470	99.550	110.058%	99.650
x		100.200	102.100	103.100	104.200	117.039%	101.600	96.100	99.260	109.385%	99.460
σ		0.355	0.461	0.573	0.440	1.171%	0.351	1.367	0.252	0.625%	0.233
%RSD		0.355	0.452	0.556	0.422	1.001	0.345	1.422	0.254	0.572	0.234

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:36:15	103.500	51.600	103.600	109.160%	101.500	102.000	98.370	↹111.719%	5.130	↹100.400
2	21:36:19	103.400	51.860	103.100	109.524%	101.000	101.800	98.860	↹113.587%	5.068	↹102.200
3	21:36:23	103.900	51.580	104.000	110.418%	100.400	101.700	97.590	↹115.050%	5.043	↹100.600
x		103.600	51.680	103.500	109.700%	101.000	101.800	98.270	↹113.452%	5.080	↹101.100
σ		0.282	0.154	0.458	0.647%	0.546	0.166	0.642	↹1.670%	0.045	↹0.966
%RSD		0.273	0.299	0.443	0.590	0.541	0.163	0.653	↹1.472	0.879	↹0.956

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	21:36:15	↹101.100	↹108.167%	↹100.500
2	21:36:19	↹100.900	↹109.141%	↹100.500
3	21:36:23	↹100.800	↹110.357%	↹99.880
x		↹100.900	↹109.222%	↹100.300
σ		↹0.143	↹1.098%	↹0.368
%RSD		↹0.142	↹1.005	↹0.367

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:41:48	0.010	0.006	0.203	12.440	1.526	1.661	1.965	20.820	147.000	↹2167000.000
2	21:41:52	0.027	0.014	-0.021	11.880	3.520	1.058	4.092	27.840	157.900	↹2206000.000
3	21:41:56	0.011	-0.003	-0.024	12.110	4.120	2.863	2.596	19.750	181.600	↹2163000.000
x		0.016	0.006	0.053	12.140	3.055	1.861	2.885	22.800	162.200	↹2179000.000
σ		0.010	0.008	0.130	0.284	1.358	0.919	1.092	4.394	17.670	↹23590.000
%RSD		61.030	143.500	246.000	2.336	44.450	49.390	37.870	19.270	10.900	↹1.083

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:41:48	-8.867	46.320	110.291%	121.329%	0.123	0.214	-0.017	27.690	3.510	0.120
2	21:41:52	-1.214	43.980	110.332%	122.843%	0.142	-0.235	0.004	29.730	4.398	0.142
3	21:41:56	-7.670	63.170	110.736%	121.746%	0.065	0.046	-0.027	28.950	4.495	0.146
x		-5.917	51.160	110.453%	121.973%	0.110	0.008	-0.013	28.790	4.134	0.136
σ		4.117	10.470	0.246%	0.782%	0.040	0.227	0.015	1.031	0.543	0.014
%RSD		69.570	20.460	0.223	0.641	36.370	2718.000	115.300	3.581	13.130	10.190

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:41:48	0.060	0.077	0.098	-0.102	113.118%	0.040	-0.197	0.102	107.229%	0.050
2	21:41:52	0.083	0.071	0.089	0.043	111.121%	0.065	-0.186	0.125	108.219%	0.059
3	21:41:56	0.074	0.088	0.092	-0.031	112.114%	0.101	-0.177	0.116	108.234%	0.055
x		0.072	0.079	0.093	-0.030	112.118%	0.069	-0.187	0.114	107.894%	0.055
σ		0.012	0.009	0.005	0.072	0.999%	0.031	0.010	0.011	0.576%	0.005
%RSD		16.410	11.410	4.899	241.000	0.891	44.850	5.305	9.919	0.534	8.591

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:41:48	0.101	0.033	0.066	108.061%	0.068	0.058	0.035	↹112.895%	0.062	0.174
2	21:41:52	0.122	0.033	0.073	108.382%	0.072	0.081	0.088	↹112.489%	0.030	0.164
3	21:41:56	0.121	0.035	0.078	108.568%	0.105	0.087	0.072	↹113.306%	0.031	0.150
x		0.115	0.034	0.072	108.337%	0.082	0.075	0.065	↹112.897%	0.041	0.163
σ		0.012	0.001	0.006	0.257%	0.020	0.015	0.027	↹0.409%	0.018	0.012
%RSD		10.040	3.730	8.404	0.237	24.730	20.310	42.220	↹0.362	45.270	7.485

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	21:41:48	0.071	↹109.400%	0.056
2	21:41:52	0.082	↹110.698%	0.067
3	21:41:56	0.078	↹110.806%	0.068
x		0.077	↹110.301%	0.064
σ		0.006	↹0.782%	0.007
%RSD		7.228	↹0.709	10.370

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:47:21	0.101	-0.019	0.320	T 12280.000	4396.000	48.320	217.800	M 95010.000	1664.000	T 1926000.000
2	21:47:25	0.081	-0.019	-0.285	T 12190.000	4475.000	47.130	224.800	M 95180.000	1709.000	T 1966000.000
3	21:47:29	0.094	-0.001	0.325	T 12290.000	4349.000	46.780	220.400	M 95050.000	1775.000	T 1967000.000
x		0.092	-0.013	0.120	T 12250.000	4407.000	47.410	221.000	M 95080.000	1716.000	T 1953000.000
σ		0.010	0.011	0.351	T 59.480	63.600	0.805	3.573	M 86.370	55.670	T 23510.000
%RSD		11.280	79.220	292.800	T 0.485	1.443	1.698	1.617	M 0.091	3.244	T 1.204

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:47:21	TM 36160.000	M 157900.000	102.187%	116.102%	10.790	1.348	0.576	21.810	610.700	393.300
2	21:47:25	TM 36540.000	M 158100.000	102.342%	116.088%	9.482	1.220	0.589	22.000	615.400	395.800
3	21:47:29	TM 36980.000	M 159400.000	103.390%	115.848%	9.827	1.127	0.594	22.010	614.600	395.800
x		TM 36560.000	M 158500.000	102.640%	116.012%	10.030	1.232	0.586	21.940	613.600	395.000
σ		TM 408.000	M 810.500	0.654%	0.143%	0.680	0.111	0.009	0.111	2.500	1.466
%RSD		TM 1.116	M 0.511	0.637	0.123	6.778	9.007	1.550	0.506	0.408	0.371

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:47:21	0.445	1.014	8.532	221.800	103.910%	0.963	3.284	178.200	101.350%	0.059
2	21:47:25	0.426	0.977	8.763	228.200	102.486%	1.013	3.804	178.600	101.866%	0.040
3	21:47:29	0.450	0.976	8.694	228.300	103.841%	1.057	3.432	178.200	102.866%	0.053
x		0.441	0.989	8.663	226.100	103.412%	1.011	3.507	178.400	102.027%	0.051
σ		0.013	0.022	0.118	3.703	0.803%	0.047	0.268	0.241	0.771%	0.010
%RSD		2.928	2.196	1.367	1.638	0.776	4.656	7.637	0.135	0.755	18.840

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:47:21	1.681	0.003	2.015	102.494%	40.950	0.054	17.240	T 106.886%	0.099	0.121
2	21:47:25	1.684	-0.001	1.946	102.917%	41.000	0.046	17.480	T 108.073%	0.116	0.107
3	21:47:29	1.636	0.003	1.947	103.703%	40.760	0.034	17.480	T 108.720%	0.119	0.104
x		1.667	0.002	1.969	103.038%	40.900	0.044	17.400	T 107.893%	0.111	0.111
σ		0.027	0.002	0.040	0.613%	0.126	0.010	0.139	T 0.930%	0.011	0.009
%RSD		1.598	117.300	2.010	0.595	0.307	22.420	0.801	T 0.862	9.836	8.314

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	21:47:21	1.247	T 101.370%	0.020
2	21:47:25	1.235	T 102.730%	0.018
3	21:47:29	1.234	T 104.230%	0.013
x		1.239	T 102.777%	0.017
σ		0.007	T 1.430%	0.004
%RSD		0.603	T 1.392	20.950

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:52:55	0.019	-0.029	0.122	8989.000	3314.000	6.660	53.840	M 34990.000	1778.000	T 2024000.000
2	21:52:59	0.003	-0.011	-0.380	9160.000	3320.000	8.667	51.880	M 35010.000	1786.000	T 2024000.000
3	21:53:03	0.015	-0.011	0.051	9171.000	3330.000	6.413	51.840	M 34730.000	1858.000	T 2047000.000
x		0.012	-0.017	-0.069	9107.000	3321.000	7.247	52.520	M 34910.000	1807.000	T 2032000.000
σ		0.008	0.010	0.272	102.300	7.982	1.236	1.141	M 153.800	44.300	T 13230.000
%RSD		68.080	61.640	395.000	1.123	0.240	17.060	2.173	M 0.441	2.451	T 0.651

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:52:55	TM 42420.000	M 31220.000	106.746%	117.821%	3.928	0.238	0.308	24.430	38.900	155.600
2	21:52:59	TM 42400.000	M 31090.000	108.371%	118.441%	3.639	0.317	0.275	23.800	39.510	155.200
3	21:53:03	TM 42770.000	M 31350.000	108.574%	118.404%	5.308	0.065	0.280	24.880	40.410	155.400
x		TM 42530.000	M 31220.000	107.897%	118.222%	4.292	0.207	0.288	24.370	39.600	155.400
σ		TM 211.200	M 130.600	1.002%	0.348%	0.892	0.129	0.018	0.541	0.760	0.239
%RSD		TM 0.497	M 0.419	0.928	0.294	20.770	62.450	6.156	2.221	1.919	0.154

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:52:55	0.102	1.222	2.810	147.600	108.381%	0.303	2.979	38.690	105.837%	0.024
2	21:52:59	0.088	1.175	2.845	148.900	108.617%	0.354	3.323	38.530	106.776%	0.022
3	21:53:03	0.095	1.208	2.735	148.300	108.806%	0.309	3.117	39.250	106.285%	0.034
x		0.095	1.202	2.797	148.300	108.601%	0.322	3.140	38.820	106.299%	0.027
σ		0.007	0.024	0.056	0.668	0.213%	0.028	0.173	0.381	0.470%	0.006
%RSD		7.452	2.036	2.011	0.451	0.196	8.615	5.500	0.980	0.442	23.970

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:52:55	0.199	-0.010	0.140	106.016%	41.030	0.032	5.937	T 111.906%	0.103	0.048
2	21:52:59	0.213	-0.016	0.120	106.960%	40.940	0.028	5.949	T 113.403%	0.120	0.046
3	21:53:03	0.198	-0.015	0.131	106.692%	41.840	0.036	6.052	T 112.466%	0.100	0.048
x		0.203	-0.014	0.130	106.556%	41.270	0.032	5.979	T 112.591%	0.108	0.047
σ		0.008	0.003	0.010	0.486%	0.497	0.004	0.063	T 0.757%	0.011	0.001
%RSD		4.137	22.760	7.520	0.456	1.205	12.710	1.060	T 0.672	9.946	1.707

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	21:52:55	0.075	T 107.685%	-0.010
2	21:52:59	0.077	T 108.242%	-0.009
3	21:53:03	0.077	T 108.875%	-0.008
x		0.076	T 108.267%	-0.009
σ		0.001	T 0.596%	0.001
%RSD		1.274	T 0.550	10.460

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:58:29	0.139	-0.015	-0.151	T 10920.000	4312.000	83.500	306.500	M 90180.000	1614.000	T 1848000.000
2	21:58:33	0.121	-0.024	-0.389	11440.000	4404.000	84.870	303.800	M 92060.000	1603.000	T 1826000.000
3	21:58:37	0.122	-0.005	-0.242	T 11120.000	4294.000	79.820	295.700	M 90200.000	1591.000	T 1834000.000
x		0.127	-0.015	-0.261	T 11160.000	4337.000	82.730	302.000	M 90810.000	1603.000	T 1836000.000
σ		0.010	0.009	0.120	T 265.100	58.960	2.611	5.626	M 1080.000	11.260	T 10990.000
%RSD		7.738	62.940	46.210	T 2.376	1.359	3.156	1.863	M 1.189	0.703	T 0.599

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:58:29	TM 32880.000	M 148200.000	102.902%	115.474%	10.750	1.260	0.560	21.350	483.500	TM 674.900
2	21:58:33	TM 34220.000	M 148400.000	102.332%	114.475%	10.630	1.167	0.558	20.940	483.700	TM 677.100
3	21:58:37	TM 33520.000	M 145700.000	104.358%	114.528%	11.030	1.043	0.549	21.410	488.400	TM 673.200
x		TM 33540.000	M 147400.000	103.197%	114.826%	10.800	1.157	0.556	21.230	485.200	TM 675.100
σ		TM 667.600	M 1530.000	1.044%	0.562%	0.206	0.109	0.006	0.254	2.806	TM 1.960
%RSD		TM 1.991	M 1.038	1.012	0.489	1.904	9.398	1.012	1.196	0.578	TM 0.290

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:58:29	0.469	0.793	5.377	185.400	105.380%	0.847	3.022	179.800	101.893%	0.068
2	21:58:33	0.480	0.759	5.282	187.000	105.080%	0.832	3.121	178.800	102.714%	0.079
3	21:58:37	0.454	0.825	5.490	187.100	105.686%	0.747	2.999	179.600	103.996%	0.064
x		0.468	0.793	5.383	186.500	105.382%	0.809	3.047	179.400	102.868%	0.070
σ		0.013	0.033	0.104	0.954	0.303%	0.054	0.065	0.530	1.060%	0.008
%RSD		2.772	4.160	1.927	0.511	0.287	6.650	2.120	0.296	1.030	10.900

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	21:58:29	0.759	-0.008	3.131	101.964%	41.950	0.033	37.280	T 106.835%	0.072	0.077
2	21:58:33	0.756	-0.009	3.250	104.031%	41.210	0.037	37.390	T 108.572%	0.084	0.085
3	21:58:37	0.688	-0.011	3.324	104.816%	41.330	0.037	37.200	T 109.641%	0.065	0.083
x		0.734	-0.010	3.235	103.604%	41.500	0.036	37.290	T 108.350%	0.073	0.082
σ		0.040	0.001	0.097	1.473%	0.399	0.002	0.095	T 1.416%	0.010	0.004
%RSD		5.495	15.400	3.011	1.422	0.963	5.322	0.255	T 1.307	13.020	4.950

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	21:58:29	1.940	T 103.051%	0.002
2	21:58:33	1.931	T 103.735%	0.002
3	21:58:37	1.911	T 105.214%	0.002
x		1.927	T 104.000%	0.002
σ		0.015	T 1.105%	0.000
%RSD		0.760	T 1.063	20.020

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:04:04	0.029	-0.015	0.011	8913.000	3138.000	6.263	50.430	M 26170.000	1406.000	T 1864000.000
2	22:04:07	0.001	-0.002	-0.098	8780.000	3144.000	6.325	40.880	M 25630.000	1450.000	T 1830000.000
3	22:04:12	-0.001	-0.024	-0.271	9237.000	3123.000	7.681	45.930	M 26000.000	1517.000	T 1798000.000
x		0.010	-0.014	-0.120	8977.000	3135.000	6.756	45.750	M 25930.000	1458.000	T 1831000.000
σ		0.017	0.011	0.142	235.300	10.880	0.802	4.780	M 278.200	55.650	T 33020.000
%RSD		170.600	79.430	118.900	2.622	0.347	11.860	10.450	M 1.073	3.818	T 1.804

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:04:04	TM 37090.000	15850.000	107.346%	118.367%	2.913	-0.013	0.257	22.770	34.740	28.130
2	22:04:07	TM 36680.000	15800.000	109.681%	120.086%	3.060	-0.040	0.255	22.480	32.970	27.670
3	22:04:12	TM 38030.000	15980.000	109.060%	119.471%	2.656	0.268	0.261	22.180	33.830	27.840
x		TM 37270.000	15880.000	108.696%	119.308%	2.876	0.072	0.258	22.470	33.850	27.880
σ		TM 694.300	95.180	1.209%	0.871%	0.204	0.171	0.003	0.295	0.885	0.232
%RSD		TM 1.863	0.600	1.113	0.730	7.107	238.700	1.202	1.312	2.615	0.833

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:04:04	0.051	0.365	3.449	102.000	109.200%	0.268	2.749	16.800	107.149%	0.021
2	22:04:07	0.064	0.376	3.498	101.300	109.848%	0.250	2.710	16.640	107.608%	0.029
3	22:04:12	0.057	0.381	3.542	100.800	109.517%	0.146	2.404	16.770	107.744%	0.030
x		0.057	0.374	3.496	101.300	109.522%	0.221	2.621	16.740	107.500%	0.027
σ		0.007	0.008	0.046	0.609	0.324%	0.066	0.189	0.085	0.312%	0.005
%RSD		11.600	2.246	1.328	0.601	0.296	29.890	7.214	0.509	0.290	19.310

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:04:04	0.136	-0.015	0.319	106.524%	42.000	0.032	2.326	T 113.785%	0.230	0.027
2	22:04:07	0.152	-0.011	0.309	107.309%	42.310	0.022	2.278	T 114.023%	0.222	0.027
3	22:04:12	0.156	-0.010	0.264	107.400%	42.450	0.024	2.307	T 113.266%	0.245	0.029
x		0.148	-0.012	0.297	107.078%	42.260	0.026	2.304	T 113.691%	0.232	0.028
σ		0.010	0.003	0.029	0.482%	0.228	0.006	0.025	T 0.387%	0.011	0.001
%RSD		6.828	23.580	9.730	0.450	0.539	21.480	1.064	T 0.340	4.909	4.986

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	22:04:04	0.107	T 109.649%	-0.010
2	22:04:07	0.110	T 110.900%	-0.010
3	22:04:12	0.108	T 109.681%	-0.010
x		0.108	T 110.077%	-0.010
σ		0.001	T 0.713%	0.000
%RSD		1.105	T 0.648	1.984

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:09:38	0.037	0.013	-0.079	11070.000	4013.000	20.900	92.440	M 80090.000	1508.000	T 1842000.000
2	22:09:42	0.055	-0.006	0.151	11120.000	4065.000	22.430	88.440	M 80560.000	1499.000	T 1863000.000
3	22:09:45	0.029	-0.010	0.001	T 11160.000	4034.000	21.830	84.750	M 79360.000	1577.000	T 1846000.000
x		0.040	-0.001	0.024	T 11120.000	4037.000	21.720	88.540	M 80000.000	1528.000	T 1850000.000
σ		0.013	0.012	0.117	T 45.010	26.120	0.773	3.842	M 608.900	42.780	T 10980.000
%RSD		32.380	1340.000	480.500	T 0.405	0.647	3.559	4.339	M 0.761	2.800	T 0.593

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:09:38	TM 33290.000	M 127300.000	102.985%	114.956%	8.480	0.879	0.316	21.390	260.000	303.800
2	22:09:42	TM 33650.000	M 127400.000	103.327%	115.042%	7.632	0.640	0.353	21.890	258.700	302.000
3	22:09:45	TM 33420.000	M 127000.000	105.009%	115.179%	7.422	0.616	0.283	22.230	258.700	302.400
x		TM 33450.000	M 127200.000	103.774%	115.059%	7.845	0.711	0.317	21.840	259.100	302.700
σ		TM 180.100	M 214.000	1.084%	0.112%	0.560	0.146	0.035	0.421	0.792	0.899
%RSD		TM 0.538	M 0.168	1.044	0.098	7.136	20.450	11.120	1.926	0.306	0.297

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:09:38	0.288	0.519	4.353	203.900	104.466%	0.677	2.628	140.300	101.782%	0.037
2	22:09:42	0.273	0.467	4.448	198.400	106.669%	0.619	2.444	140.900	101.761%	0.038
3	22:09:45	0.293	0.466	4.339	201.300	105.686%	0.694	2.335	141.300	102.469%	0.040
x		0.284	0.484	4.380	201.200	105.607%	0.663	2.469	140.800	102.004%	0.038
σ		0.010	0.030	0.059	2.717	1.104%	0.039	0.148	0.484	0.403%	0.002
%RSD		3.634	6.206	1.355	1.351	1.045	5.954	6.002	0.343	0.395	4.952

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:09:38	0.495	-0.010	2.491	103.084%	40.970	0.030	17.270	T 108.036%	0.151	0.066
2	22:09:42	0.499	-0.019	2.566	103.869%	41.180	0.023	17.120	T 108.676%	0.141	0.066
3	22:09:45	0.520	-0.008	2.474	104.604%	41.150	0.032	17.090	T 108.979%	0.156	0.063
x		0.505	-0.013	2.510	103.852%	41.100	0.028	17.160	T 108.563%	0.149	0.065
σ		0.013	0.006	0.049	0.760%	0.111	0.005	0.098	T 0.481%	0.007	0.002
%RSD		2.672	45.800	1.949	0.732	0.271	17.130	0.574	T 0.443	4.937	2.571

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	22:09:38	0.647	T 102.927%	-0.004
2	22:09:42	0.655	T 103.889%	-0.005
3	22:09:45	0.656	T 104.769%	-0.005
x		0.653	T 103.862%	-0.005
σ		0.005	T 0.921%	0.000
%RSD		0.766	T 0.887	10.120

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:15:10	0.070	-0.010	0.019	9000.000	3258.000	59.820	228.300	M 42720.000	1386.000	T 1843000.000
2	22:15:14	0.057	-0.019	-0.160	9141.000	3252.000	64.780	211.400	M 42930.000	1411.000	T 1847000.000
3	22:15:18	0.072	-0.001	-0.155	8805.000	3221.000	62.540	226.900	M 42700.000	1435.000	T 1868000.000
x		0.066	-0.010	-0.099	8982.000	3244.000	62.380	222.200	M 42780.000	1411.000	T 1853000.000
σ		0.008	0.009	0.102	168.900	19.760	2.482	9.362	M 127.600	24.420	T 13710.000
%RSD		12.110	89.510	103.100	1.880	0.609	3.979	4.213	M 0.298	1.731	T 0.740

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:15:10	TM 36730.000	M 58310.000	103.353%	115.387%	6.809	0.443	0.576	21.930	346.100	255.800
2	22:15:14	TM 37100.000	M 58650.000	104.220%	116.089%	6.649	0.609	0.582	21.150	344.900	256.400
3	22:15:18	TM 37120.000	M 58670.000	104.939%	115.730%	5.891	0.521	0.596	21.720	347.200	255.900
x		TM 36990.000	M 58540.000	104.171%	115.735%	6.449	0.524	0.584	21.600	346.100	256.000
σ		TM 218.000	M 204.500	0.794%	0.351%	0.491	0.083	0.010	0.402	1.174	0.311
%RSD		TM 0.590	M 0.349	0.762	0.303	7.606	15.850	1.789	1.861	0.339	0.121

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:15:10	0.316	0.976	4.909	168.800	105.422%	0.556	2.601	69.500	103.169%	0.070
2	22:15:14	0.305	0.985	4.936	168.300	106.691%	0.552	2.437	70.190	103.755%	0.044
3	22:15:18	0.302	1.015	4.865	169.100	106.325%	0.557	2.324	70.060	104.590%	0.058
x		0.308	0.992	4.904	168.700	106.146%	0.555	2.454	69.920	103.838%	0.057
σ		0.007	0.020	0.036	0.425	0.653%	0.002	0.139	0.363	0.714%	0.013
%RSD		2.357	2.041	0.730	0.252	0.615	0.411	5.672	0.519	0.687	23.050

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:15:10	0.223	-0.006	2.100	104.344%	41.040	0.051	14.620	T 110.429%	0.141	0.037
2	22:15:14	0.227	-0.014	1.951	105.207%	41.080	0.022	14.390	T 110.791%	0.125	0.034
3	22:15:18	0.223	-0.016	2.101	105.085%	41.020	0.027	14.370	T 111.366%	0.129	0.034
x		0.224	-0.012	2.051	104.879%	41.050	0.033	14.460	T 110.862%	0.132	0.035
σ		0.002	0.005	0.086	0.467%	0.026	0.016	0.139	T 0.473%	0.008	0.002
%RSD		0.889	44.480	4.217	0.445	0.062	47.270	0.961	T 0.426	6.045	4.605

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	22:15:10	1.425	T 105.755%	-0.002
2	22:15:14	1.417	T 107.472%	-0.002
3	22:15:18	1.420	T 107.333%	-0.002
x		1.420	T 106.853%	-0.002
σ		0.004	T 0.953%	0.000
%RSD		0.284	T 0.892	21.380

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:20:43	0.033	-0.010	-0.225	T 10490.000	4093.000	9.496	73.570	M 73080.000	1726.000	T 2065000.000
2	22:20:47	0.053	-0.015	-0.298	10620.000	4083.000	9.038	59.210	M 73150.000	1707.000	T 2033000.000
3	22:20:51	0.033	-0.015	0.231	10720.000	4031.000	10.240	65.690	M 73260.000	1692.000	T 2041000.000
x		0.040	-0.013	-0.097	T 10610.000	4069.000	9.592	66.160	M 73160.000	1708.000	T 2046000.000
σ		0.012	0.003	0.286	T 116.000	33.360	0.608	7.193	M 93.460	17.050	T 16740.000
%RSD		28.940	19.880	294.600	T 1.093	0.820	6.338	10.870	M 0.128	0.998	T 0.818

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:20:43	TM 36220.000	M 153700.000	103.535%	116.231%	6.838	0.191	0.281	22.480	132.800	401.800
2	22:20:47	TM 36610.000	M 152300.000	105.413%	116.956%	6.825	0.247	0.277	22.450	131.200	402.000
3	22:20:51	TM 36870.000	M 152100.000	106.003%	116.405%	6.901	0.205	0.297	22.340	131.200	401.200
x		TM 36570.000	M 152700.000	104.983%	116.531%	6.855	0.214	0.285	22.420	131.700	401.700
σ		TM 326.600	M 872.300	1.289%	0.378%	0.041	0.029	0.011	0.077	0.907	0.384
%RSD		TM 0.893	M 0.571	1.228	0.325	0.591	13.500	3.818	0.342	0.688	0.095

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:20:43	0.215	0.484	4.250	208.700	105.452%	0.770	2.068	200.600	101.435%	0.026
2	22:20:47	0.231	0.445	4.331	210.400	104.612%	0.780	2.247	196.500	103.942%	0.024
3	22:20:51	0.230	0.459	4.304	208.000	106.003%	0.799	2.386	198.300	103.381%	0.027
x		0.225	0.463	4.295	209.000	105.356%	0.783	2.234	198.500	102.919%	0.026
σ		0.009	0.020	0.041	1.227	0.700%	0.015	0.160	2.054	1.316%	0.002
%RSD		4.011	4.223	0.952	0.587	0.665	1.913	7.139	1.035	1.278	7.091

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:20:43	0.363	-0.013	1.856	103.081%	41.470	0.020	25.050	T 108.415%	0.122	0.089
2	22:20:47	0.423	-0.020	1.766	104.306%	41.320	0.026	25.060	T 109.842%	0.119	0.091
3	22:20:51	0.372	-0.018	1.749	104.746%	41.340	0.019	24.910	T 109.941%	0.140	0.087
x		0.386	-0.017	1.790	104.044%	41.380	0.022	25.010	T 109.399%	0.127	0.089
σ		0.032	0.003	0.057	0.863%	0.085	0.004	0.083	T 0.854%	0.011	0.002
%RSD		8.403	20.120	3.211	0.829	0.206	16.280	0.330	T 0.780	9.005	2.647

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	22:20:43	0.252	T 103.352%	-0.006
2	22:20:47	0.259	T 103.860%	-0.006
3	22:20:51	0.255	T 104.521%	-0.006
x		0.255	T 103.911%	-0.006
σ		0.004	T 0.586%	0.000
%RSD		1.491	T 0.564	1.499

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:26:17	0.003	0.017	-0.438	4.557	-2.934	-1.143	-1.805	-14.860	165.800	↹2206000.000
2	22:26:21	-0.003	0.007	-0.677	4.345	-0.980	-0.954	-0.595	13.300	147.300	↹2195000.000
3	22:26:24	-0.002	0.003	-0.652	4.876	-1.223	-2.120	0.660	2.480	177.300	↹2207000.000
x		-0.000	0.009	-0.589	4.593	-1.712	-1.406	-0.580	0.307	163.500	↹2203000.000
σ		0.003	0.007	0.132	0.267	1.065	0.626	1.232	14.210	15.140	↹6716.000
%RSD		696.900	77.620	22.360	5.817	62.190	44.520	212.500	4626.000	9.259	↹0.305

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:26:17	-18.100	0.038	105.615%	116.549%	0.017	-0.158	-0.129	24.270	-0.935	0.016
2	22:26:21	-19.870	4.442	106.314%	117.525%	-0.024	-0.005	-0.103	24.480	-0.788	0.012
3	22:26:24	-7.666	46.050	107.144%	117.154%	-0.005	-0.000	-0.092	24.480	-1.147	0.134
x		-15.210	16.840	106.358%	117.076%	-0.004	-0.054	-0.108	24.410	-0.956	0.054
σ		6.595	25.390	0.765%	0.493%	0.020	0.090	0.019	0.123	0.180	0.069
%RSD		43.350	150.700	0.720	0.421	491.500	165.300	17.820	0.503	18.870	128.300

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:26:17	0.007	0.012	0.022	-0.043	106.226%	-0.098	-0.345	0.016	105.664%	-0.006
2	22:26:21	0.009	0.031	0.012	-0.038	107.561%	-0.123	-0.344	0.014	105.290%	-0.002
3	22:26:24	0.013	0.019	0.021	-0.013	106.854%	-0.024	-0.304	0.076	105.657%	0.008
x		0.010	0.021	0.019	-0.032	106.880%	-0.081	-0.331	0.035	105.537%	-0.000
σ		0.003	0.009	0.006	0.016	0.668%	0.051	0.023	0.035	0.214%	0.007
%RSD		30.740	45.310	31.000	50.410	0.625	63.070	6.924	100.100	0.203	5061.000

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:26:17	-0.006	-0.005	0.007	105.526%	-0.010	0.014	0.000	↹111.381%	-0.003	-0.014
2	22:26:21	0.001	-0.005	0.014	105.290%	0.007	0.011	0.003	↹110.420%	-0.003	-0.012
3	22:26:24	-0.000	-0.005	0.001	105.447%	0.009	0.006	0.010	↹112.155%	0.001	-0.015
x		-0.002	-0.005	0.008	105.421%	0.002	0.010	0.004	↹111.319%	-0.002	-0.014
σ		0.004	0.000	0.007	0.120%	0.010	0.004	0.005	↹0.869%	0.002	0.001
%RSD		189.900	8.840	85.570	0.114	497.100	43.380	115.900	↹0.781	134.900	9.229

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	22:26:17	0.005	↹110.337%	0.009
2	22:26:21	0.008	↹110.055%	0.011
3	22:26:24	0.006	↹110.955%	0.009
x		0.006	↹110.449%	0.010
σ		0.001	↹0.460%	0.001
%RSD		17.710	↹0.417	10.690

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:31:51	-0.011	0.008	0.046	12.440	5.500	6.180	6.736	40.160	142.700	τ 1909000.000
2	22:31:55	0.007	-0.019	0.094	8.186	3.938	6.433	4.026	36.120	149.200	τ 1927000.000
3	22:31:59	-0.002	-0.005	-0.045	9.482	7.099	6.464	7.464	29.480	188.400	τ 1920000.000
x		-0.002	-0.005	0.032	10.030	5.512	6.359	6.075	35.250	160.100	τ 1919000.000
σ		0.009	0.014	0.071	2.178	1.581	0.156	1.812	5.393	24.710	τ 9025.000
%RSD		401.800	253.200	224.200	21.710	28.680	2.452	29.820	15.300	15.430	τ 0.470

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:31:51	-54.560	33.100	105.823%	115.008%	0.075	0.116	0.189	20.730	3.443	0.148
2	22:31:55	-60.600	46.440	106.180%	115.892%	0.251	-0.122	0.223	22.130	3.522	0.143
3	22:31:59	-53.600	44.110	106.231%	114.177%	0.173	-0.184	0.240	22.930	3.633	0.135
x		-56.250	41.220	106.078%	115.026%	0.166	-0.063	0.217	21.930	3.533	0.142
σ		3.792	7.127	0.222%	0.857%	0.088	0.159	0.026	1.111	0.096	0.006
%RSD		6.741	17.290	0.209	0.745	53.050	250.200	12.060	5.065	2.710	4.551

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:31:51	-0.002	0.316	0.427	4.111	108.989%	-0.189	-0.338	0.105	105.082%	0.024
2	22:31:55	-0.001	0.218	0.409	4.191	108.806%	-0.140	-0.321	0.097	104.670%	0.036
3	22:31:59	-0.001	0.265	0.394	3.973	109.199%	-0.172	-0.346	0.106	104.933%	0.030
x		-0.001	0.266	0.410	4.092	108.998%	-0.167	-0.335	0.103	104.895%	0.030
σ		0.001	0.049	0.017	0.110	0.197%	0.025	0.013	0.005	0.209%	0.006
%RSD		50.690	18.390	4.083	2.686	0.180	14.850	3.899	4.500	0.199	19.870

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:31:51	0.034	-0.004	-0.009	105.987%	39.970	0.012	0.037	τ 110.530%	0.021	-0.035
2	22:31:55	0.033	-0.011	-0.012	106.102%	40.330	0.005	0.048	τ 111.181%	0.038	-0.038
3	22:31:59	0.019	-0.011	-0.011	105.797%	39.930	0.011	0.052	τ 110.639%	0.020	-0.034
x		0.029	-0.009	-0.010	105.962%	40.070	0.010	0.046	τ 110.783%	0.026	-0.036
σ		0.008	0.004	0.001	0.154%	0.222	0.004	0.008	τ 0.348%	0.010	0.002
%RSD		27.870	43.780	13.630	0.145	0.553	38.100	17.150	τ 0.314	38.000	5.750

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	22:31:51	0.000	τ 110.175%	-0.011
2	22:31:55	0.000	τ 110.757%	-0.011
3	22:31:59	0.001	τ 110.485%	-0.011
x		0.001	τ 110.472%	-0.011
σ		0.001	τ 0.292%	0.000
%RSD		102.400	τ 0.264	1.186

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:37:23	-0.001	-0.010	1.452	4266.000	2879.000	4.499	23.520	22660.000	1363.000	T 1780000.000
2	22:37:27	-0.009	-0.029	1.568	4306.000	2880.000	4.951	28.120	22250.000	1346.000	T 1803000.000
3	22:37:30	-0.011	-0.011	1.063	4351.000	2906.000	4.117	23.660	22520.000	1339.000	T 1794000.000
x		-0.007	-0.017	1.361	4308.000	2888.000	4.522	25.100	22480.000	1349.000	T 1793000.000
σ		0.005	0.010	0.265	42.510	15.690	0.418	2.616	209.800	12.290	T 11640.000
%RSD		70.240	63.250	19.440	0.987	0.543	9.234	10.420	0.934	0.911	T 0.649

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl Q	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:37:23	TM 37940.000	513.300	105.679%	116.661%	2.803	0.129	0.224	21.290	38.630	1.000
2	22:37:27	TM 38480.000	510.400	106.309%	116.939%	2.607	0.196	0.241	21.370	41.110	1.026
3	22:37:30	TM 38970.000	450.800	106.599%	117.237%	2.873	-0.124	0.251	23.120	40.340	0.964
x		TM 38460.000	491.500	106.196%	116.946%	2.761	0.067	0.239	21.930	40.020	0.997
σ		TM 512.900	35.300	0.470%	0.288%	0.138	0.169	0.014	1.033	1.271	0.032
%RSD		TM 1.334	7.182	0.443	0.246	4.981	252.800	5.710	4.710	3.175	3.167

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:37:23	0.008	0.431	2.925	76.700	107.422%	-0.184	1.202	0.321	103.759%	0.006
2	22:37:27	0.002	0.377	2.889	75.200	108.765%	-0.145	1.304	0.293	105.651%	0.014
3	22:37:30	0.002	0.425	2.853	76.610	109.765%	-0.150	1.089	0.316	105.449%	0.015
x		0.004	0.411	2.889	76.170	108.651%	-0.160	1.198	0.310	104.953%	0.012
σ		0.003	0.030	0.036	0.839	1.176%	0.021	0.108	0.015	1.039%	0.005
%RSD		88.430	7.191	1.239	1.101	1.082	13.240	8.990	4.919	0.990	39.740

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:37:23	0.289	-0.011	-0.010	104.981%	40.910	0.019	0.115	T 109.861%	0.026	-0.029
2	22:37:27	0.280	-0.014	-0.013	106.124%	41.160	0.023	0.098	T 111.463%	0.026	-0.028
3	22:37:30	0.324	-0.017	-0.010	105.952%	41.210	0.026	0.096	T 111.326%	0.023	-0.029
x		0.298	-0.014	-0.011	105.685%	41.090	0.023	0.103	T 110.883%	0.025	-0.029
σ		0.023	0.003	0.002	0.616%	0.159	0.004	0.010	T 0.888%	0.002	0.000
%RSD		7.882	22.840	14.710	0.583	0.387	15.570	10.150	T 0.801	6.654	1.193

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	22:37:23	0.007	T 107.344%	-0.011
2	22:37:27	0.005	T 108.363%	-0.011
3	22:37:30	0.007	T 108.833%	-0.011
x		0.006	T 108.180%	-0.011
σ		0.001	T 0.761%	0.000
%RSD		21.470	T 0.704	0.799

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:42:57	85.820	80.940	83.660	4968.000	4916.000	4619.000	4668.000	5030.000	158.000	τ 2285000.000
2	22:43:01	87.030	82.110	87.500	5176.000	4997.000	4662.000	4683.000	5098.000	168.200	τ 2284000.000
3	22:43:05	85.790	81.940	87.650	5132.000	4964.000	4662.000	4724.000	5053.000	181.700	τ 2311000.000
x		86.210	81.660	86.270	5092.000	4959.000	4648.000	4692.000	5061.000	169.300	τ 2293000.000
σ		0.703	0.632	2.264	109.700	40.740	24.790	28.680	34.650	11.880	τ 15290.000
%RSD		0.816	0.774	2.624	2.155	0.822	0.533	0.611	0.685	7.021	τ 0.667

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:42:57	4744.000	5168.000	111.448%	122.298%	98.530	98.750	99.790	7.915	5550.000	99.090
2	22:43:01	4965.000	5004.000	112.937%	122.197%	98.170	98.220	100.300	9.698	5633.000	99.700
3	22:43:05	4925.000	5129.000	113.745%	121.669%	95.960	99.160	100.100	5.698	5571.000	99.570
x		4878.000	5100.000	112.710%	122.055%	97.550	98.710	100.100	7.770	5585.000	99.450
σ		117.500	85.880	1.165%	0.338%	1.394	0.470	0.273	2.004	43.530	0.324
%RSD		2.409	1.684	1.033	0.277	1.429	0.476	0.273	25.790	0.779	0.326

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:42:57	101.200	102.000	103.600	105.500	112.677%	102.100	95.370	99.970	106.330%	100.400
2	22:43:01	101.000	102.400	103.500	105.100	114.159%	101.900	96.860	99.510	108.034%	99.020
3	22:43:05	99.880	100.400	103.100	104.200	115.756%	100.700	96.420	99.550	108.612%	100.200
x		100.700	101.600	103.400	104.900	114.197%	101.600	96.220	99.680	107.658%	99.870
σ		0.712	1.049	0.269	0.679	1.540%	0.741	0.768	0.257	1.187%	0.756
%RSD		0.707	1.032	0.260	0.647	1.349	0.730	0.798	0.258	1.102	0.757

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:42:57	103.700	52.050	105.000	106.465%	102.100	101.600	96.740	τ 110.525%	5.069	τ 100.300
2	22:43:01	103.100	51.590	103.400	108.906%	101.100	101.100	97.640	τ 112.225%	5.041	τ 100.500
3	22:43:05	103.800	51.990	104.000	108.948%	102.100	101.000	97.520	τ 112.866%	5.040	τ 100.200
x		103.500	51.880	104.100	108.106%	101.800	101.200	97.300	τ 111.872%	5.050	τ 100.300
σ		0.403	0.253	0.802	1.421%	0.564	0.306	0.485	τ 1.210%	0.016	τ 0.165
%RSD		0.389	0.488	0.770	1.315	0.554	0.302	0.498	τ 1.081	0.319	τ 0.165

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	22:42:57	τ 101.100	τ 107.018%	τ 100.200
2	22:43:01	τ 100.900	τ 109.183%	τ 100.800
3	22:43:05	τ 100.400	τ 109.752%	τ 100.700
x		τ 100.800	τ 108.651%	τ 100.600
σ		τ 0.342	τ 1.443%	τ 0.357
%RSD		τ 0.339	τ 1.328	τ 0.355

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:48:31	0.029	0.019	-0.512	3.342	-0.214	-0.186	0.294	-11.060	193.000	↹2229000.000
2	22:48:34	0.023	0.006	0.018	2.396	0.198	0.264	-3.846	-10.400	180.500	↹2270000.000
3	22:48:38	0.018	0.023	-0.246	3.304	0.304	-0.291	-3.137	-11.760	171.500	↹2247000.000
x		0.023	0.016	-0.247	3.014	0.096	-0.071	-2.230	-11.070	181.700	↹2248000.000
σ		0.006	0.009	0.265	0.535	0.274	0.295	2.214	0.678	10.820	↹20430.000
%RSD		23.730	57.540	107.200	17.770	285.500	415.300	99.300	6.122	5.953	↹0.909

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:48:31	-2.763	-0.658	111.842%	120.942%	0.063	0.246	-0.092	28.540	0.846	0.020
2	22:48:34	-10.010	1.459	111.903%	122.903%	0.044	-0.095	-0.078	29.780	1.078	0.021
3	22:48:38	-2.346	5.630	111.838%	122.023%	-0.030	-0.032	-0.046	30.730	2.447	0.044
x		-5.039	2.144	111.861%	121.956%	0.026	0.040	-0.072	29.680	1.457	0.029
σ		4.308	3.199	0.036%	0.982%	0.049	0.182	0.024	1.097	0.865	0.013
%RSD		85.500	149.200	0.032	0.805	192.800	459.400	32.680	3.695	59.390	46.790

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:48:31	0.019	0.020	0.034	-0.108	111.396%	0.088	-0.328	0.010	108.080%	-0.007
2	22:48:34	0.018	0.020	0.039	-0.131	110.574%	0.068	-0.234	0.010	109.759%	0.002
3	22:48:38	0.027	0.027	0.049	-0.123	110.428%	0.068	-0.256	0.023	109.678%	0.014
x		0.021	0.022	0.041	-0.121	110.799%	0.075	-0.273	0.014	109.172%	0.003
σ		0.005	0.004	0.008	0.012	0.522%	0.011	0.049	0.007	0.947%	0.010
%RSD		23.020	19.640	18.930	9.696	0.471	15.290	18.030	52.430	0.867	352.000

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:48:31	0.062	-0.001	0.013	107.709%	0.009	0.013	0.007	↹112.961%	0.029	0.104
2	22:48:34	0.056	0.003	0.011	108.098%	0.001	0.020	0.002	↹113.631%	0.022	0.086
3	22:48:38	0.063	0.010	0.021	107.431%	0.014	0.031	0.038	↹113.302%	0.014	0.091
x		0.060	0.004	0.015	107.746%	0.008	0.021	0.016	↹113.298%	0.021	0.094
σ		0.003	0.005	0.005	0.335%	0.007	0.009	0.020	↹0.335%	0.008	0.009
%RSD		5.700	127.500	35.950	0.311	83.480	41.210	125.700	↹0.296	35.750	10.040

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	22:48:31	0.018	↹110.147%	0.013
2	22:48:34	0.016	↹110.564%	0.012
3	22:48:38	0.029	↹111.739%	0.024
x		0.021	↹110.817%	0.016
σ		0.007	↹0.825%	0.007
%RSD		33.500	↹0.745	41.150

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:54:03	176.300	174.700	177.800	T 14910.000	12730.000	9423.000	965.900	M 43180.000	1426.000	T 1876000.000
2	22:54:07	175.100	170.900	177.000	T 15020.000	12880.000	9508.000	979.300	M 43530.000	1430.000	T 1940000.000
3	22:54:11	173.800	172.000	176.900	T 14490.000	12630.000	9347.000	947.500	M 43210.000	1408.000	T 1974000.000
x		175.100	172.600	177.300	T 14800.000	12750.000	9426.000	964.200	M 43310.000	1421.000	T 1930000.000
σ		1.218	1.955	0.507	T 277.800	124.200	80.550	15.940	M 196.300	11.730	T 49700.000
%RSD		0.696	1.133	0.286	T 1.876	0.974	0.855	1.653	M 0.453	0.825	T 2.575

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:54:03	TM 81320.000	10710.000	110.404%	121.177%	198.000	199.000	201.000	-19.410	T 10310.000	199.100
2	22:54:07	TM 82600.000	10670.000	110.409%	122.304%	197.600	199.900	201.500	-22.030	T 10360.000	198.700
3	22:54:11	TM 81240.000	10260.000	110.996%	122.717%	202.300	199.900	200.500	-21.320	T 10400.000	200.100
x		TM 81720.000	10550.000	110.603%	122.066%	199.300	199.600	201.000	-20.920	T 10350.000	199.300
σ		TM 765.000	248.300	0.341%	0.797%	2.631	0.529	0.503	1.353	T 46.360	0.720
%RSD		TM 0.936	2.355	0.308	0.653	1.320	0.265	0.250	6.466	T 0.448	0.361

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:54:03	200.200	205.800	210.500	294.900	109.571%	212.900	206.500	203.900	104.464%	96.590
2	22:54:07	199.500	204.000	206.800	293.200	111.733%	210.400	204.200	201.700	106.243%	95.050
3	22:54:11	200.900	204.100	208.600	297.300	111.349%	211.200	210.100	204.300	105.718%	96.370
x		200.200	204.600	208.600	295.100	110.884%	211.500	206.900	203.300	105.475%	96.000
σ		0.704	0.999	1.846	2.095	1.153%	1.271	2.960	1.407	0.914%	0.835
%RSD		0.352	0.488	0.885	0.710	1.040	0.601	1.430	0.692	0.866	0.870

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:54:03	212.200	95.510	210.000	104.205%	218.800	206.200	195.100	T 108.866%	5.275	T 198.200
2	22:54:07	210.300	94.330	209.700	104.725%	217.200	207.300	194.600	T 110.093%	5.430	T 198.000
3	22:54:11	212.200	94.900	211.300	105.325%	218.600	207.800	195.200	T 111.264%	5.126	T 196.600
x		211.600	94.920	210.300	104.752%	218.200	207.100	195.000	T 110.074%	5.277	T 197.600
σ		1.087	0.591	0.847	0.560%	0.838	0.780	0.346	T 1.199%	0.152	T 0.860
%RSD		0.514	0.622	0.403	0.535	0.384	0.377	0.178	T 1.089	2.883	T 0.435

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	22:54:03	T 201.200	T 101.783%	T 207.600
2	22:54:07	T 199.800	T 103.840%	T 205.600
3	22:54:11	T 199.300	T 104.901%	T 205.200
x		T 200.100	T 103.508%	T 206.100
σ		T 0.981	T 1.585%	T 1.257
%RSD		T 0.491	T 1.531	T 0.610

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:59:36	2.199	0.093	39.960	TM 125300.000	10600.000	107.000	265.100	M 103300.000	6057.000	T 1950000.000
2	22:59:40	2.218	0.071	38.300	TM 125700.000	10620.000	108.600	264.100	M 104100.000	6146.000	T 1974000.000
3	22:59:44	2.058	0.089	40.230	TM 125800.000	10610.000	106.100	261.400	M 103600.000	5995.000	T 1963000.000
x		2.158	0.085	39.500	TM 125600.000	10610.000	107.200	263.600	M 103700.000	6066.000	T 1962000.000
σ		0.087	0.012	1.045	TM 309.000	9.673	1.274	1.900	M 371.700	75.960	T 11990.000
%RSD		4.041	13.650	2.646	TM 0.246	0.091	1.188	0.721	M 0.359	1.252	T 0.611

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:59:36	TM 88290.000	M 40240.000	109.695%	121.654%	12.400	15.740	4.567	28.780	1011.000	122.400
2	22:59:40	TM 89300.000	M 39500.000	110.352%	121.431%	13.390	16.280	4.608	28.040	1007.000	123.400
3	22:59:44	TM 89970.000	M 39360.000	110.982%	120.880%	12.640	15.810	4.646	28.550	1016.000	122.500
x		TM 89190.000	M 39700.000	110.343%	121.322%	12.810	15.940	4.607	28.450	1011.000	122.800
σ		TM 841.900	M 471.700	0.643%	0.398%	0.514	0.290	0.040	0.379	4.716	0.592
%RSD		TM 0.944	M 1.188	0.583	0.328	4.014	1.821	0.860	1.332	0.466	0.483

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:59:36	4.872	21.500	TM 1004.000	M 1937.000	107.608%	225.700	60.520	T 440.600	109.775%	0.258
2	22:59:40	4.943	21.650	TM 998.900	M 1944.000	108.431%	226.200	59.070	T 442.400	111.935%	0.259
3	22:59:44	4.779	21.430	TM 993.600	M 1935.000	109.981%	225.200	58.990	T 444.200	112.395%	0.255
x		4.865	21.530	TM 999.000	M 1939.000	108.674%	225.700	59.530	T 442.400	111.368%	0.257
σ		0.082	0.109	TM 5.389	M 4.680	1.205%	0.494	0.861	T 1.800	1.399%	0.002
%RSD		1.693	0.507	TM 0.539	M 0.241	1.109	0.219	1.446	T 0.407	1.256	0.891

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	22:59:36	9.626	62.170	275.300	102.825%	41.920	0.519	15.680	T 108.057%	2.203	0.553
2	22:59:40	9.462	62.300	277.000	102.851%	42.230	0.529	15.800	T 109.086%	2.243	0.503
3	22:59:44	9.455	61.740	275.000	104.569%	41.800	0.517	15.890	T 110.452%	2.218	0.443
x		9.514	62.070	275.800	103.415%	41.990	0.521	15.790	T 109.198%	2.221	0.500
σ		0.096	0.297	1.078	0.999%	0.222	0.006	0.107	T 1.201%	0.020	0.055
%RSD		1.014	0.479	0.391	0.966	0.528	1.241	0.679	T 1.100	0.912	11.010

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	22:59:36	2.950	T 99.295%	0.872
2	22:59:40	2.972	T 99.766%	0.889
3	22:59:44	2.887	T 101.499%	0.845
x		2.936	T 100.187%	0.869
σ		0.044	T 1.160%	0.022
%RSD		1.500	T 1.158	2.568

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	23:05:09	0.025	-0.007	0.622	7403.000	3025.000	4.950	31.070	M 35350.000	1304.000	T 1855000.000
2	23:05:13	0.048	-0.016	0.559	7521.000	3053.000	4.838	27.010	M 35620.000	1356.000	T 1818000.000
3	23:05:17	0.027	-0.003	0.219	7090.000	3052.000	5.900	28.580	M 35340.000	1247.000	T 1883000.000
x		0.033	-0.009	0.467	7338.000	3043.000	5.230	28.890	M 35440.000	1302.000	T 1852000.000
σ		0.012	0.007	0.217	222.900	15.860	0.584	2.046	M 160.500	54.270	T 32750.000
%RSD		37.550	73.740	46.510	3.038	0.521	11.160	7.081	M 0.453	4.167	T 1.768

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	23:05:09	TM 36050.000	M 38450.000	109.561%	123.233%	3.748	0.036	0.240	24.290	20.460	71.020
2	23:05:13	TM 36850.000	M 38560.000	110.340%	123.447%	3.815	0.180	0.278	24.390	20.380	71.670
3	23:05:17	TM 36020.000	M 37600.000	111.317%	123.811%	3.673	-0.005	0.225	24.290	19.590	70.020
x		TM 36310.000	M 38200.000	110.406%	123.497%	3.745	0.070	0.248	24.320	20.140	70.910
σ		TM 471.500	M 524.300	0.880%	0.292%	0.071	0.097	0.027	0.059	0.481	0.834
%RSD		TM 1.299	M 1.372	0.797	0.237	1.893	138.000	10.980	0.241	2.388	1.177

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	23:05:09	0.068	0.660	2.510	130.600	110.924%	0.342	2.152	44.030	108.083%	0.015
2	23:05:13	0.071	0.712	2.498	127.500	111.558%	0.297	1.980	44.670	108.383%	0.023
3	23:05:17	0.065	0.626	2.558	130.000	110.261%	0.304	1.953	44.560	108.717%	0.012
x		0.068	0.666	2.522	129.400	110.915%	0.314	2.029	44.420	108.394%	0.017
σ		0.003	0.043	0.032	1.649	0.648%	0.024	0.108	0.341	0.317%	0.006
%RSD		4.727	6.478	1.265	1.275	0.585	7.723	5.329	0.768	0.292	35.930

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	23:05:09	0.189	0.014	0.166	107.482%	40.620	0.026	4.221	T 114.214%	0.390	0.115
2	23:05:13	0.182	0.001	0.176	108.396%	41.350	0.036	4.261	T 114.118%	0.430	0.117
3	23:05:17	0.185	0.017	0.162	107.897%	40.770	0.038	4.241	T 114.780%	0.355	0.105
x		0.185	0.011	0.168	107.925%	40.910	0.033	4.241	T 114.371%	0.392	0.112
σ		0.003	0.009	0.007	0.458%	0.382	0.007	0.020	T 0.357%	0.037	0.006
%RSD		1.744	82.600	4.266	0.424	0.933	19.590	0.468	T 0.312	9.554	5.682

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	23:05:09	0.084	T 109.055%	-0.003
2	23:05:13	0.085	T 108.903%	0.000
3	23:05:17	0.085	T 110.790%	-0.001
x		0.084	T 109.583%	-0.001
σ		0.000	T 1.048%	0.002
%RSD		0.354	T 0.957	138.500

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	23:10:42	176.500	170.300	176.400	T 17580.000	12940.000	9598.000	964.300	M 47080.000	1418.000	T 1993000.000
2	23:10:47	173.700	169.300	180.600	T 18370.000	13090.000	9655.000	998.700	M 47660.000	1446.000	T 2017000.000
3	23:10:50	173.900	170.600	176.000	T 18410.000	12930.000	9576.000	970.800	M 46980.000	1501.000	T 2006000.000
x		174.700	170.100	177.700	T 18120.000	12990.000	9609.000	977.900	M 47240.000	1455.000	T 2005000.000
σ		1.551	0.703	2.567	T 472.800	89.090	40.850	18.250	M 370.400	42.020	T 11690.000
%RSD		0.888	0.414	1.445	T 2.609	0.686	0.425	1.867	M 0.784	2.888	T 0.583

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	23:10:42	TM 83150.000	M 28630.000	108.496%	120.132%	202.300	203.500	205.100	-24.520	T 10580.000	231.300
2	23:10:47	TM 85550.000	M 29100.000	109.112%	119.713%	208.900	203.500	205.700	-26.510	T 10610.000	231.500
3	23:10:50	TM 84480.000	M 28380.000	110.805%	120.087%	203.500	200.400	203.700	-20.970	T 10610.000	232.000
x		TM 84390.000	M 28710.000	109.471%	119.977%	204.900	202.500	204.900	-24.000	T 10600.000	231.600
σ		TM 1201.000	M 366.700	1.195%	0.230%	3.534	1.805	1.049	2.808	T 15.530	0.357
%RSD		TM 1.423	M 1.278	1.092	0.192	1.725	0.892	0.512	11.700	T 0.147	0.154

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	23:10:42	205.300	208.200	210.600	341.700	107.637%	216.500	210.400	230.400	103.290%	128.400
2	23:10:47	202.900	207.100	211.000	337.800	109.054%	215.600	212.600	229.300	104.787%	128.000
3	23:10:50	203.300	205.800	208.400	336.000	109.516%	215.900	212.200	229.600	105.220%	129.000
x		203.900	207.000	210.000	338.500	108.736%	216.000	211.700	229.800	104.433%	128.500
σ		1.288	1.225	1.401	2.893	0.979%	0.448	1.154	0.590	1.013%	0.500
%RSD		0.632	0.592	0.667	0.855	0.900	0.208	0.545	0.257	0.970	0.389

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	23:10:42	216.900	96.540	215.000	102.543%	236.200	211.100	200.000	T 108.552%	5.944	T 203.600
2	23:10:47	214.500	96.000	212.300	105.039%	234.600	208.600	201.000	T 110.512%	5.887	T 204.000
3	23:10:50	215.300	96.810	214.200	104.673%	236.600	210.700	202.700	T 111.157%	5.938	T 204.500
x		215.500	96.450	213.800	104.085%	235.800	210.100	201.200	T 110.073%	5.923	T 204.000
σ		1.193	0.413	1.358	1.348%	1.029	1.357	1.363	T 1.357%	0.031	T 0.459
%RSD		0.553	0.428	0.635	1.295	0.436	0.646	0.677	T 1.233	0.528	T 0.225

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	23:10:42	T 203.700	T 102.084%	T 212.300
2	23:10:47	T 204.900	T 103.483%	T 213.500
3	23:10:50	T 205.100	T 104.336%	T 215.900
x		T 204.500	T 103.301%	T 213.900
σ		T 0.728	T 1.137%	T 1.822
%RSD		T 0.356	T 1.100	T 0.852

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	23:16:16	174.300	170.900	177.900	T 16970.000	12510.000	9292.000	970.700	M 45190.000	1391.000	T 1988000.000
2	23:16:19	172.900	168.300	175.600	T 18480.000	12500.000	9492.000	972.500	M 45980.000	1462.000	T 1903000.000
3	23:16:23	174.300	168.700	175.200	T 17970.000	12440.000	9326.000	942.900	M 45660.000	1443.000	T 1953000.000
x		173.800	169.300	176.200	T 17810.000	12480.000	9370.000	962.100	M 45610.000	1432.000	T 1948000.000
σ		0.815	1.403	1.473	T 769.700	39.610	106.700	16.580	M 396.900	36.930	T 42870.000
%RSD		0.469	0.829	0.836	T 4.323	0.317	1.139	1.723	M 0.870	2.579	T 2.201

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	23:16:16	TM 79820.000	M 26350.000	109.817%	121.141%	200.500	199.600	200.500	-17.240	T 10520.000	228.400
2	23:16:19	TM 83850.000	M 26380.000	111.244%	121.848%	201.900	199.100	200.200	-25.130	T 10430.000	229.000
3	23:16:23	TM 82960.000	M 25820.000	112.457%	121.708%	199.000	197.100	199.600	-21.760	T 10380.000	227.600
x		TM 82210.000	M 26180.000	111.173%	121.566%	200.500	198.600	200.100	-21.380	T 10440.000	228.300
σ		TM 2116.000	M 312.000	1.321%	0.374%	1.447	1.352	0.428	3.955	T 69.690	0.690
%RSD		TM 2.574	M 1.191	1.188	0.308	0.722	0.681	0.214	18.500	T 0.667	0.302

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	23:16:16	200.600	204.300	207.400	345.400	109.034%	210.800	207.100	224.200	105.434%	115.300
2	23:16:19	198.400	203.000	205.000	341.100	111.449%	209.000	207.300	221.200	105.888%	115.700
3	23:16:23	197.000	201.300	203.700	339.200	111.874%	209.600	206.000	221.100	106.271%	115.000
x		198.700	202.800	205.400	341.900	110.786%	209.800	206.800	222.200	105.864%	115.300
σ		1.824	1.496	1.873	3.194	1.532%	0.890	0.734	1.730	0.419%	0.363
%RSD		0.918	0.738	0.912	0.934	1.383	0.424	0.355	0.779	0.396	0.315

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	23:16:16	211.400	94.890	212.000	103.755%	225.700	208.500	195.700	T 111.116%	5.769	T 198.400
2	23:16:19	209.600	94.160	206.500	105.210%	224.100	206.300	197.600	T 110.931%	5.871	T 201.400
3	23:16:23	211.000	93.500	207.900	106.396%	223.500	206.400	197.100	T 112.535%	5.775	T 197.900
x		210.700	94.180	208.800	105.120%	224.400	207.100	196.800	T 111.527%	5.805	T 199.200
σ		0.932	0.692	2.888	1.323%	1.131	1.276	0.986	T 0.877%	0.057	T 1.911
%RSD		0.442	0.735	1.383	1.258	0.504	0.616	0.501	T 0.787	0.985	T 0.959

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	23:16:16	T 199.700	T 104.096%	T 206.000
2	23:16:19	T 202.400	T 104.121%	T 210.300
3	23:16:23	T 199.700	T 106.138%	T 207.500
x		T 200.600	T 104.785%	T 207.900
σ		T 1.553	T 1.172%	T 2.180
%RSD		T 0.774	T 1.118	T 1.048

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	23:21:49	171.600	166.500	176.100	T 17180.000	12350.000	9104.000	911.200	M 53160.000	1368.000	T 1792000.000
2	23:21:52	170.300	166.400	176.100	T 17510.000	12420.000	9090.000	918.000	M 53770.000	1387.000	T 1843000.000
3	23:21:56	168.800	164.200	170.400	T 17570.000	12560.000	9235.000	929.400	M 53990.000	1427.000	T 1836000.000
x		170.200	165.700	174.200	T 17420.000	12440.000	9143.000	919.500	M 53640.000	1394.000	T 1824000.000
σ		1.396	1.282	3.257	T 205.300	107.600	79.920	9.180	M 430.700	29.860	T 27620.000
%RSD		0.820	0.774	1.870	T 1.179	0.865	0.874	0.998	M 0.803	2.142	T 1.515

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	23:21:49	TM 77030.000	M 45880.000	111.616%	120.392%	195.200	191.200	194.600	-20.710	T 10120.000	260.300
2	23:21:52	TM 78710.000	M 46120.000	111.752%	120.611%	195.400	195.500	197.200	-28.340	T 10160.000	259.400
3	23:21:56	TM 78640.000	M 46480.000	111.728%	122.176%	198.900	194.500	195.800	-23.990	T 10170.000	262.400
x		TM 78130.000	M 46160.000	111.699%	121.060%	196.500	193.700	195.900	-24.350	T 10150.000	260.700
σ		TM 948.900	M 301.500	0.073%	0.973%	2.057	2.272	1.298	3.827	T 22.800	1.511
%RSD		TM 1.215	M 0.653	0.065	0.804	1.047	1.172	0.663	15.720	T 0.225	0.580

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	23:21:49	193.300	198.000	200.400	336.000	109.854%	209.700	205.400	241.400	105.645%	195.900
2	23:21:52	193.600	197.100	200.300	337.600	110.249%	209.500	206.200	243.100	106.847%	196.200
3	23:21:56	194.200	196.900	202.100	337.200	110.419%	210.900	207.800	244.500	107.392%	197.800
x		193.700	197.300	200.900	336.900	110.174%	210.000	206.500	243.000	106.628%	196.600
σ		0.454	0.542	0.996	0.826	0.290%	0.744	1.239	1.521	0.894%	0.992
%RSD		0.235	0.275	0.496	0.245	0.263	0.354	0.600	0.626	0.838	0.505

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	23:21:49	204.900	95.330	205.700	104.134%	244.300	203.600	196.500	T 111.257%	5.783	T 195.800
2	23:21:52	204.900	94.850	204.600	105.634%	242.200	203.200	193.700	T 112.332%	5.675	T 195.700
3	23:21:56	205.000	94.370	204.900	106.034%	245.300	202.000	194.800	T 112.875%	5.798	T 195.900
x		204.900	94.850	205.000	105.267%	243.900	202.900	195.000	T 112.155%	5.752	T 195.800
σ		0.083	0.479	0.565	1.002%	1.613	0.817	1.448	T 0.824%	0.067	T 0.127
%RSD		0.041	0.505	0.276	0.951	0.661	0.403	0.743	T 0.734	1.164	T 0.065

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	23:21:49	T 196.500	T 104.014%	T 205.600
2	23:21:52	T 196.200	T 105.565%	T 203.400
3	23:21:56	T 196.700	T 106.063%	T 206.300
x		T 196.500	T 105.214%	T 205.100
σ		T 0.219	T 1.069%	T 1.482
%RSD		T 0.111	T 1.016	T 0.723

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	23:27:22	0.201	0.025	4.003	T 13290.000	4224.000	41.050	124.400	M 93260.000	1543.000	T 1858000.000
2	23:27:26	0.226	0.025	1.321	T 13410.000	4256.000	38.870	122.400	M 94130.000	1615.000	T 1823000.000
3	23:27:30	0.213	-0.011	1.726	T 13250.000	4246.000	36.870	120.700	M 93000.000	1615.000	T 1864000.000
x		0.213	0.013	2.350	T 13320.000	4242.000	38.930	122.500	M 93460.000	1591.000	T 1848000.000
σ		0.012	0.021	1.446	T 84.170	16.620	2.086	1.833	M 593.100	41.770	T 22020.000
%RSD		5.823	155.300	61.510	T 0.632	0.392	5.358	1.496	M 0.635	2.625	T 1.191

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	23:27:22	TM 32570.000	M 158400.000	105.062%	117.577%	10.070	1.046	0.532	21.080	191.900	M 522.400
2	23:27:26	TM 32650.000	M 158400.000	104.318%	118.359%	9.555	0.585	0.516	23.100	190.600	M 520.900
3	23:27:30	TM 32600.000	M 160800.000	105.004%	117.203%	10.340	0.930	0.500	20.620	188.600	M 526.200
x		TM 32610.000	M 159200.000	104.794%	117.713%	9.986	0.854	0.516	21.600	190.400	M 523.200
σ		TM 40.140	M 1412.000	0.414%	0.590%	0.397	0.240	0.016	1.318	1.642	M 2.730
%RSD		TM 0.123	M 0.887	0.395	0.501	3.973	28.050	3.049	6.102	0.862	M 0.522

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	23:27:22	0.367	0.717	5.671	169.000	105.612%	1.125	2.612	197.100	102.546%	0.171
2	23:27:26	0.389	0.671	5.548	168.400	105.162%	1.069	2.448	197.500	102.250%	0.181
3	23:27:30	0.382	0.694	5.567	167.700	104.648%	0.938	2.605	197.700	102.311%	0.168
x		0.379	0.694	5.595	168.400	105.141%	1.044	2.555	197.400	102.369%	0.174
σ		0.011	0.023	0.066	0.676	0.483%	0.096	0.093	0.275	0.156%	0.006
%RSD		2.874	3.259	1.183	0.402	0.459	9.188	3.634	0.139	0.153	3.720

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	23:27:22	0.660	0.085	2.810	103.602%	41.680	0.201	36.650	T 109.632%	0.157	0.541
2	23:27:26	0.737	0.081	2.734	102.719%	41.930	0.202	36.440	T 108.748%	0.152	0.507
3	23:27:30	0.653	0.059	2.668	103.017%	42.280	0.174	36.820	T 109.490%	0.158	0.435
x		0.683	0.075	2.737	103.113%	41.960	0.192	36.640	T 109.290%	0.155	0.495
σ		0.047	0.014	0.071	0.449%	0.303	0.016	0.190	T 0.475%	0.003	0.054
%RSD		6.818	18.370	2.603	0.436	0.722	8.432	0.519	T 0.434	2.172	10.990

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	23:27:22	0.889	T 102.412%	0.157
2	23:27:26	0.871	T 103.242%	0.162
3	23:27:30	0.843	T 103.846%	0.133
x		0.868	T 103.167%	0.150
σ		0.024	T 0.720%	0.015
%RSD		2.716	T 0.698	10.260

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	23:32:56	0.047	0.003	0.014	2637.000	868.300	5.593	28.160	18560.000	437.600	T 2101000.000
2	23:33:01	0.063	0.003	0.607	2644.000	865.400	5.449	22.530	18480.000	417.400	T 2095000.000
3	23:33:04	0.039	0.007	0.025	2613.000	874.500	5.113	25.090	18350.000	471.500	T 2140000.000
x		0.050	0.004	0.216	2631.000	869.400	5.385	25.260	18460.000	442.200	T 2112000.000
σ		0.012	0.003	0.339	16.000	4.675	0.246	2.816	105.400	27.340	T 24460.000
%RSD		24.170	56.100	157.500	0.608	0.538	4.572	11.150	0.571	6.183	T 1.158

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	23:32:56	5691.000	M 31160.000	105.457%	116.893%	1.461	0.113	0.003	24.180	34.570	102.400
2	23:33:01	5863.000	M 31620.000	106.110%	117.278%	2.101	0.166	0.028	24.030	34.720	102.800
3	23:33:04	5799.000	M 31010.000	106.514%	117.504%	1.798	0.358	0.009	23.230	35.490	102.600
x		5784.000	M 31260.000	106.027%	117.225%	1.787	0.212	0.014	23.810	34.930	102.600
σ		87.040	M 317.700	0.533%	0.309%	0.320	0.129	0.013	0.512	0.492	0.237
%RSD		1.505	M 1.016	0.503	0.264	17.910	60.690	95.570	2.148	1.408	0.231

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	23:32:56	0.050	0.137	1.068	34.350	108.231%	0.156	0.258	38.510	104.160%	-0.007
2	23:33:01	0.045	0.126	1.108	33.750	108.354%	0.167	0.204	38.380	104.815%	-0.002
3	23:33:04	0.047	0.157	1.150	33.750	109.519%	0.209	0.292	39.070	103.452%	-0.001
x		0.047	0.140	1.109	33.950	108.701%	0.177	0.251	38.660	104.142%	-0.003
σ		0.002	0.015	0.041	0.347	0.711%	0.028	0.044	0.366	0.682%	0.003
%RSD		4.870	11.000	3.708	1.021	0.654	15.900	17.610	0.948	0.655	101.700

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	23:32:56	0.101	-0.009	0.486	104.669%	8.461	0.004	7.185	T 111.125%	0.049	0.094
2	23:33:01	0.093	-0.007	0.516	105.218%	8.461	0.012	7.222	T 110.492%	0.048	0.086
3	23:33:04	0.099	-0.015	0.540	104.488%	8.468	0.014	7.356	T 111.142%	0.031	0.090
x		0.098	-0.010	0.514	104.792%	8.464	0.010	7.254	T 110.920%	0.043	0.090
σ		0.004	0.004	0.027	0.380%	0.004	0.005	0.090	T 0.371%	0.010	0.004
%RSD		3.954	40.060	5.300	0.363	0.045	53.740	1.241	T 0.334	23.400	4.447

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	23:32:56	0.134	T 108.276%	-0.008
2	23:33:01	0.134	T 108.842%	-0.007
3	23:33:04	0.139	T 109.123%	-0.004
x		0.136	T 108.747%	-0.006
σ		0.003	T 0.431%	0.002
%RSD		2.289	T 0.397	39.480

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	23:38:30	0.002	0.008	0.300	7608.000	3202.000	4.315	40.700	24670.000	1652.000	T 1857000.000
2	23:38:34	0.009	0.012	0.264	7774.000	3173.000	4.958	42.060	M 25120.000	1672.000	T 1815000.000
3	23:38:37	0.009	0.012	0.030	7800.000	3174.000	4.225	44.290	24780.000	1705.000	T 1801000.000
x		0.007	0.011	0.198	7727.000	3183.000	4.499	42.350	M 24860.000	1676.000	T 1824000.000
σ		0.005	0.003	0.147	103.900	16.400	0.400	1.813	M 236.300	26.520	T 29450.000
%RSD		66.600	24.910	74.010	1.344	0.515	8.881	4.280	M 0.951	1.582	T 1.614

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	23:38:30	TM 43070.000	8804.000	104.905%	117.148%	2.447	-0.081	0.247	23.000	22.450	15.650
2	23:38:34	TM 44270.000	8993.000	105.882%	116.848%	3.174	0.137	0.301	23.150	23.190	16.040
3	23:38:37	TM 44820.000	8666.000	107.003%	117.193%	2.806	-0.007	0.290	23.370	22.380	15.880
x		TM 44060.000	8821.000	105.930%	117.063%	2.809	0.016	0.279	23.180	22.670	15.860
σ		TM 894.300	164.300	1.050%	0.188%	0.363	0.111	0.028	0.188	0.449	0.197
%RSD		TM 2.030	1.862	0.991	0.160	12.940	685.500	10.120	0.811	1.978	1.243

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	23:38:30	0.054	0.439	2.681	93.060	106.263%	0.485	2.810	9.684	103.147%	0.023
2	23:38:34	0.060	0.414	2.644	93.050	106.779%	0.505	2.585	9.760	104.452%	0.033
3	23:38:37	0.063	0.353	2.698	91.730	108.633%	0.460	2.416	9.637	104.622%	0.016
x		0.059	0.402	2.674	92.610	107.225%	0.483	2.604	9.693	104.074%	0.024
σ		0.005	0.044	0.028	0.763	1.247%	0.022	0.198	0.062	0.807%	0.008
%RSD		7.837	10.970	1.029	0.823	1.163	4.648	7.592	0.639	0.775	34.250

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	23:38:30	0.196	-0.004	0.161	103.057%	41.270	0.040	1.273	T 111.728%	0.113	0.085
2	23:38:34	0.205	-0.014	0.184	105.052%	41.160	0.040	1.196	T 112.662%	0.103	0.088
3	23:38:37	0.203	-0.007	0.207	105.314%	41.140	0.040	1.231	T 112.272%	0.126	0.076
x		0.201	-0.008	0.184	104.474%	41.190	0.040	1.233	T 112.221%	0.114	0.083
σ		0.005	0.005	0.023	1.234%	0.072	0.000	0.038	T 0.469%	0.011	0.006
%RSD		2.342	62.400	12.360	1.181	0.174	0.905	3.104	T 0.418	9.932	7.654

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	23:38:30	0.031	T 108.892%	0.002
2	23:38:34	0.033	T 109.244%	0.000
3	23:38:37	0.032	T 109.762%	0.001
x		0.032	T 109.299%	0.001
σ		0.001	T 0.438%	0.001
%RSD		3.469	T 0.401	100.800

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	23:44:04	0.044	-0.011	0.398	7983.000	2839.000	24.970	90.750	M 25590.000	1349.000	T 1770000.000
2	23:44:09	0.016	-0.024	0.293	7723.000	2829.000	24.310	99.320	M 25500.000	1256.000	T 1830000.000
3	23:44:12	0.039	-0.002	0.209	8196.000	2779.000	24.480	88.620	M 25150.000	1368.000	T 1724000.000
x		0.033	-0.012	0.300	7968.000	2816.000	24.590	92.900	M 25410.000	1324.000	T 1775000.000
σ		0.015	0.011	0.095	236.900	32.020	0.343	5.664	M 233.600	59.810	T 52870.000
%RSD		46.060	93.590	31.550	2.973	1.137	1.397	6.097	M 0.919	4.516	T 2.979

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	23:44:04	TM 37540.000	21140.000	105.071%	117.434%	3.634	0.230	0.386	22.440	126.600	248.200
2	23:44:09	TM 37150.000	20670.000	105.952%	117.517%	3.191	0.213	0.364	23.100	125.800	249.300
3	23:44:12	TM 37880.000	20670.000	106.772%	117.597%	3.620	0.161	0.355	23.760	126.900	248.500
x		TM 37520.000	20830.000	105.932%	117.516%	3.482	0.201	0.368	23.100	126.400	248.700
σ		TM 370.000	271.700	0.851%	0.081%	0.252	0.036	0.016	0.663	0.566	0.567
%RSD		TM 0.986	1.305	0.803	0.069	7.241	17.690	4.278	2.869	0.448	0.228

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	23:44:04	0.150	0.487	3.717	113.300	107.186%	0.616	2.123	24.020	102.907%	0.011
2	23:44:09	0.145	0.495	3.748	113.100	107.357%	0.678	1.947	24.250	104.235%	0.023
3	23:44:12	0.152	0.518	3.677	113.900	106.293%	0.560	2.056	23.830	104.349%	0.027
x		0.149	0.500	3.714	113.400	106.946%	0.618	2.042	24.030	103.830%	0.020
σ		0.004	0.016	0.036	0.424	0.571%	0.059	0.089	0.208	0.802%	0.008
%RSD		2.352	3.198	0.964	0.374	0.534	9.590	4.354	0.864	0.772	41.200

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	23:44:04	0.168	-0.002	1.054	103.391%	41.520	0.040	7.836	T 110.305%	0.111	0.074
2	23:44:09	0.170	-0.009	1.017	104.551%	41.090	0.024	7.844	T 111.480%	0.111	0.076
3	23:44:12	0.179	-0.013	1.004	105.135%	40.870	0.031	8.057	T 111.447%	0.117	0.070
x		0.172	-0.008	1.025	104.359%	41.160	0.032	7.912	T 111.078%	0.113	0.073
σ		0.006	0.005	0.026	0.888%	0.331	0.008	0.125	T 0.669%	0.004	0.003
%RSD		3.583	65.660	2.523	0.851	0.803	25.740	1.585	T 0.602	3.130	4.211

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	23:44:04	0.385	T 107.794%	-0.006
2	23:44:09	0.379	T 108.297%	-0.006
3	23:44:12	0.382	T 108.383%	-0.005
x		0.382	T 108.158%	-0.006
σ		0.003	T 0.318%	0.000
%RSD		0.780	T 0.294	6.315

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	23:49:39	87.960	83.530	88.800	5195.000	5002.000	4729.000	4783.000	5184.000	198.300	↹2232000.000
2	23:49:43	88.430	82.920	86.280	4924.000	5019.000	4671.000	4788.000	5021.000	141.200	↹2384000.000
3	23:49:47	88.190	82.270	86.800	5174.000	4954.000	4725.000	4711.000	5014.000	160.300	↹2289000.000
x		88.200	82.900	87.290	5098.000	4992.000	4708.000	4761.000	5073.000	166.600	↹2302000.000
σ		0.236	0.630	1.328	150.700	34.180	32.360	42.910	96.110	29.060	↹76830.000
%RSD		0.268	0.760	1.521	2.957	0.685	0.687	0.901	1.895	17.440	↹3.338

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	23:49:39	4904.000	5094.000	109.338%	122.135%	98.620	98.860	100.400	9.410	5610.000	100.000
2	23:49:43	4778.000	4962.000	111.539%	121.820%	98.000	98.310	99.810	13.370	5611.000	98.260
3	23:49:47	4961.000	5063.000	112.159%	122.122%	96.610	98.270	100.000	13.380	5626.000	99.550
x		4881.000	5040.000	111.012%	122.026%	97.740	98.480	100.100	12.050	5616.000	99.270
σ		93.830	68.870	1.482%	0.178%	1.027	0.332	0.321	2.290	9.229	0.906
%RSD		1.922	1.367	1.335	0.146	1.051	0.337	0.320	18.990	0.164	0.913

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	23:49:39	101.300	102.000	104.000	105.400	112.294%	101.800	95.930	99.780	104.766%	100.700
2	23:49:43	100.700	100.900	102.800	104.700	113.930%	101.500	97.800	99.790	106.255%	99.410
3	23:49:47	100.400	102.000	103.400	104.100	115.289%	101.400	97.510	99.200	107.009%	100.200
x		100.800	101.600	103.400	104.700	113.837%	101.600	97.080	99.590	106.010%	100.100
σ		0.433	0.648	0.578	0.630	1.500%	0.241	1.006	0.336	1.142%	0.674
%RSD		0.430	0.637	0.559	0.602	1.318	0.237	1.036	0.338	1.077	0.673

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	23:49:39	103.900	52.960	104.800	104.439%	103.100	101.900	97.810	↹109.477%	4.999	↹102.700
2	23:49:43	104.000	52.300	104.800	105.898%	101.100	102.200	96.470	↹111.854%	5.132	↹99.500
3	23:49:47	103.300	52.370	104.000	107.350%	100.800	101.400	97.210	↹112.429%	4.948	↹102.200
x		103.700	52.540	104.500	105.896%	101.600	101.800	97.160	↹111.253%	5.026	↹101.500
σ		0.396	0.365	0.434	1.456%	1.262	0.404	0.672	↹1.565%	0.095	↹1.721
%RSD		0.382	0.694	0.415	1.375	1.242	0.396	0.691	↹1.406	1.890	↹1.696

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	23:49:39	↹102.100	↹105.754%	↹101.200
2	23:49:43	↹100.300	↹108.231%	↹98.560
3	23:49:47	↹102.200	↹107.411%	↹100.800
x		↹101.500	↹107.132%	↹100.200
σ		↹1.040	↹1.262%	↹1.442
%RSD		↹1.024	↹1.178	↹1.439

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	23:55:13	0.036	0.020	0.054	5.004	1.697	1.673	1.618	6.151	180.100	↹2212000.000
2	23:55:16	0.031	0.002	0.225	9.190	3.195	4.009	5.166	9.111	168.400	↹2166000.000
3	23:55:20	0.031	0.019	0.344	6.413	4.119	2.757	5.507	1.472	133.000	↹2187000.000
x		0.033	0.014	0.207	6.869	3.004	2.813	4.097	5.578	160.500	↹2188000.000
σ		0.003	0.010	0.146	2.130	1.222	1.169	2.154	3.851	24.500	↹22640.000
%RSD		9.216	73.260	70.290	31.010	40.690	41.570	52.570	69.040	15.260	↹1.035

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	23:55:13	-17.020	1.504	109.089%	119.452%	-0.008	-0.113	-0.010	32.280	3.618	0.101
2	23:55:16	13.290	14.490	108.943%	120.103%	0.126	0.229	0.044	31.200	4.606	0.107
3	23:55:20	-11.780	18.300	110.752%	121.273%	-0.048	0.163	0.012	30.890	5.442	0.144
x		-5.169	11.430	109.595%	120.276%	0.023	0.093	0.015	31.460	4.555	0.117
σ		16.200	8.806	1.005%	0.922%	0.091	0.181	0.027	0.729	0.913	0.023
%RSD		313.400	77.040	0.917	0.767	391.700	194.400	177.000	2.317	20.040	19.730

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	23:55:13	0.061	0.066	0.072	-0.167	109.483%	0.090	-0.304	0.059	105.845%	0.041
2	23:55:16	0.086	0.107	0.116	-0.067	110.656%	0.163	-0.220	0.078	106.559%	0.048
3	23:55:20	0.076	0.122	0.100	-0.122	110.971%	0.193	-0.275	0.081	107.866%	0.064
x		0.074	0.098	0.096	-0.119	110.370%	0.148	-0.266	0.073	106.756%	0.051
σ		0.012	0.029	0.022	0.050	0.784%	0.053	0.043	0.012	1.025%	0.012
%RSD		16.700	29.760	22.940	42.240	0.710	35.680	16.040	16.240	0.960	23.440

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	23:55:13	0.126	0.026	0.077	105.043%	0.041	0.062	0.075	↹110.304%	0.051	0.185
2	23:55:16	0.121	0.043	0.068	105.715%	0.084	0.089	0.067	↹111.150%	0.038	0.203
3	23:55:20	0.139	0.040	0.075	107.120%	0.084	0.108	0.107	↹111.845%	0.023	0.192
x		0.129	0.037	0.073	105.959%	0.070	0.086	0.083	↹111.099%	0.037	0.193
σ		0.009	0.009	0.005	1.059%	0.025	0.023	0.021	↹0.772%	0.014	0.009
%RSD		7.056	24.590	6.187	1.000	36.030	27.210	25.240	↹0.695	37.810	4.692

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	23:55:13	0.061	↹107.957%	0.051
2	23:55:16	0.086	↹108.311%	0.074
3	23:55:20	0.086	↹110.154%	0.079
x		0.077	↹108.807%	0.068
σ		0.014	↹1.180%	0.015
%RSD		18.640	↹1.085	21.550

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	00:00:45	0.018	-0.006	0.625	7219.000	3210.000	5.694	43.850	M 32130.000	1515.000	T 1762000.000
2	00:00:48	0.026	-0.011	0.020	7406.000	3200.000	5.707	42.320	M 32630.000	1653.000	T 1735000.000
3	00:00:52	0.027	-0.011	0.115	7350.000	3173.000	7.017	46.750	M 32300.000	1531.000	T 1751000.000
x		0.024	-0.009	0.253	7325.000	3194.000	6.139	44.310	M 32350.000	1567.000	T 1749000.000
σ		0.005	0.003	0.326	96.070	19.080	0.760	2.249	M 250.700	75.620	T 13320.000
%RSD		19.950	28.560	128.500	1.311	0.597	12.380	5.077	M 0.775	4.827	T 0.761

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	00:00:45	TM 37090.000	M 29020.000	105.212%	118.352%	3.708	0.136	0.312	24.960	25.620	107.600
2	00:00:48	TM 37770.000	M 28790.000	106.443%	119.057%	3.332	0.083	0.266	24.990	25.370	107.300
3	00:00:52	TM 38190.000	M 28560.000	107.118%	119.416%	3.196	0.159	0.247	24.510	25.220	106.800
x		TM 37680.000	M 28790.000	106.258%	118.941%	3.412	0.126	0.275	24.820	25.400	107.200
σ		TM 553.700	M 230.800	0.967%	0.541%	0.265	0.039	0.034	0.271	0.203	0.368
%RSD		TM 1.469	M 0.802	0.910	0.455	7.769	30.930	12.210	1.093	0.800	0.343

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	00:00:45	0.065	0.673	3.746	108.200	107.600%	0.297	2.125	32.830	102.947%	0.020
2	00:00:48	0.060	0.694	3.707	108.900	107.773%	0.345	2.121	32.510	104.575%	0.025
3	00:00:52	0.060	0.680	3.761	109.800	107.232%	0.263	2.029	32.970	104.862%	0.013
x		0.062	0.682	3.738	108.900	107.535%	0.302	2.092	32.770	104.128%	0.019
σ		0.003	0.011	0.028	0.838	0.276%	0.041	0.054	0.237	1.033%	0.006
%RSD		4.180	1.579	0.739	0.769	0.257	13.710	2.590	0.723	0.992	29.120

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	00:00:45	0.172	-0.010	0.130	103.107%	42.580	0.049	5.695	T 109.915%	0.166	0.087
2	00:00:48	0.188	-0.007	0.132	104.299%	41.960	0.039	5.882	T 110.379%	0.145	0.081
3	00:00:52	0.168	-0.008	0.116	104.826%	42.230	0.030	5.746	T 111.722%	0.132	0.074
x		0.176	-0.008	0.126	104.077%	42.260	0.039	5.775	T 110.672%	0.148	0.081
σ		0.010	0.002	0.008	0.881%	0.307	0.009	0.097	T 0.939%	0.017	0.007
%RSD		5.861	18.760	6.696	0.847	0.726	23.210	1.674	T 0.848	11.660	8.326

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	00:00:45	0.196	T 105.966%	0.007
2	00:00:48	0.193	T 107.355%	0.002
3	00:00:52	0.191	T 108.384%	-0.002
x		0.193	T 107.235%	0.002
σ		0.003	T 1.213%	0.004
%RSD		1.398	T 1.131	207.100

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	00:06:17	0.064	-0.015	0.191	10080.000	4033.000	5.464	41.470	M 81770.000	1598.000	T 1902000.000
2	00:06:22	0.041	-0.019	-0.048	10210.000	3942.000	6.173	46.260	M 82140.000	1579.000	T 1903000.000
3	00:06:25	0.066	-0.019	0.461	10170.000	3953.000	6.620	43.620	M 81070.000	1582.000	T 1895000.000
x		0.057	-0.018	0.202	10160.000	3976.000	6.086	43.790	M 81660.000	1586.000	T 1900000.000
σ		0.014	0.003	0.255	66.210	49.510	0.583	2.398	M 544.100	10.150	T 4331.000
%RSD		24.510	14.810	126.300	0.652	1.245	9.580	5.478	M 0.666	0.640	T 0.228

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	00:06:17	TM 34240.000	M 131700.000	101.154%	115.144%	8.047	0.337	0.242	22.690	108.900	TM 715.500
2	00:06:22	TM 34750.000	M 132600.000	102.316%	114.320%	6.974	0.669	0.245	21.590	109.200	TM 711.800
3	00:06:25	TM 34620.000	M 133000.000	103.031%	115.318%	7.252	0.382	0.288	21.920	109.500	TM 715.600
x		TM 34540.000	M 132400.000	102.167%	114.927%	7.424	0.463	0.258	22.070	109.200	TM 714.300
σ		TM 268.000	M 637.700	0.947%	0.533%	0.557	0.180	0.026	0.560	0.267	TM 2.210
%RSD		TM 0.776	M 0.482	0.927	0.464	7.502	38.840	9.973	2.539	0.244	TM 0.309

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	00:06:17	0.150	0.378	3.237	180.000	100.911%	0.638	2.305	152.400	99.190%	0.021
2	00:06:22	0.145	0.358	3.159	178.300	101.834%	0.620	2.388	152.700	100.077%	0.026
3	00:06:25	0.137	0.413	3.190	178.500	102.030%	0.593	2.152	152.800	100.279%	0.023
x		0.144	0.383	3.195	178.900	101.592%	0.617	2.282	152.700	99.849%	0.024
σ		0.006	0.028	0.039	0.949	0.597%	0.022	0.119	0.211	0.580%	0.003
%RSD		4.321	7.337	1.223	0.530	0.588	3.645	5.235	0.138	0.581	12.360

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	00:06:17	0.420	-0.015	1.140	100.269%	41.540	0.025	27.530	T 107.274%	0.115	0.072
2	00:06:22	0.417	-0.012	1.067	101.756%	41.700	0.013	27.390	T 108.537%	0.106	0.074
3	00:06:25	0.448	-0.014	1.039	102.347%	41.960	0.015	27.120	T 109.519%	0.118	0.074
x		0.429	-0.014	1.082	101.457%	41.730	0.018	27.350	T 108.443%	0.113	0.073
σ		0.017	0.001	0.052	1.071%	0.212	0.007	0.206	T 1.125%	0.006	0.001
%RSD		4.034	8.703	4.808	1.055	0.509	37.400	0.752	T 1.038	5.392	1.496

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	00:06:17	0.249	T 101.874%	-0.006
2	00:06:22	0.256	T 102.323%	-0.006
3	00:06:25	0.249	T 104.235%	-0.007
x		0.251	T 102.811%	-0.006
σ		0.004	T 1.254%	0.001
%RSD		1.728	T 1.219	9.170

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	00:11:50	0.052	0.009	0.336	10090.000	4236.000	24.520	109.200	M 88030.000	1418.000	T 1914000.000
2	00:11:55	0.068	0.009	-0.014	10110.000	4160.000	25.320	118.600	M 87460.000	1518.000	T 1884000.000
3	00:11:59	0.055	-0.010	0.038	10270.000	4192.000	24.760	120.400	M 88510.000	1482.000	T 1903000.000
x		0.058	0.003	0.120	10160.000	4196.000	24.870	116.100	M 88000.000	1472.000	T 1900000.000
σ		0.009	0.011	0.189	100.300	38.090	0.412	6.036	M 526.300	50.730	T 15420.000
%RSD		14.590	383.700	157.800	0.988	0.908	1.658	5.200	M 0.598	3.445	T 0.811

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	00:11:50	TM 30740.000	M 148500.000	100.731%	112.084%	8.593	0.965	0.367	20.950	185.000	TM 644.300
2	00:11:55	TM 31020.000	M 149900.000	102.509%	112.336%	8.973	0.753	0.332	21.120	185.600	TM 637.600
3	00:11:59	TM 30930.000	M 148300.000	101.455%	114.268%	9.580	0.855	0.314	20.570	189.700	M 611.500
x		TM 30890.000	M 148900.000	101.565%	112.896%	9.049	0.857	0.338	20.880	186.800	TM 631.100
σ		TM 142.400	M 864.600	0.894%	1.195%	0.497	0.106	0.027	0.282	2.555	TM 17.330
%RSD		TM 0.461	M 0.581	0.880	1.058	5.497	12.360	7.898	1.351	1.368	TM 2.746

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	00:11:50	0.195	0.459	4.513	180.100	101.654%	0.733	2.044	183.500	99.508%	0.028
2	00:11:55	0.189	0.543	4.480	177.700	103.176%	0.805	1.985	183.300	99.834%	0.029
3	00:11:59	0.207	0.539	4.522	177.200	102.655%	0.715	1.786	183.700	100.609%	0.035
x		0.197	0.514	4.505	178.300	102.495%	0.751	1.938	183.500	99.984%	0.030
σ		0.009	0.048	0.022	1.496	0.773%	0.047	0.135	0.239	0.566%	0.004
%RSD		4.634	9.259	0.494	0.839	0.754	6.305	6.981	0.130	0.566	12.220

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	00:11:50	0.592	-0.009	2.346	100.405%	41.550	0.027	37.250	T 106.700%	0.086	0.075
2	00:11:55	0.591	-0.008	2.298	101.748%	41.490	0.024	37.750	T 107.676%	0.085	0.085
3	00:11:59	0.572	-0.008	2.220	101.900%	41.690	0.030	37.490	T 108.376%	0.087	0.072
x		0.585	-0.009	2.288	101.351%	41.580	0.027	37.490	T 107.584%	0.086	0.078
σ		0.011	0.001	0.063	0.823%	0.101	0.003	0.248	T 0.842%	0.001	0.007
%RSD		1.965	6.438	2.759	0.812	0.242	10.490	0.662	T 0.783	1.369	8.709

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	00:11:50	0.574	T 102.655%	-0.006
2	00:11:55	0.582	T 102.748%	-0.006
3	00:11:59	0.571	T 103.612%	-0.005
x		0.575	T 103.005%	-0.006
σ		0.005	T 0.528%	0.001
%RSD		0.937	T 0.512	10.850

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	00:17:24	0.008	-0.010	0.190	6836.000	2724.000	4.746	42.820	21600.000	1540.000	τ 1769000.000
2	00:17:28	0.007	-0.010	-0.175	6712.000	2800.000	5.066	43.530	21680.000	1507.000	τ 1801000.000
3	00:17:32	0.002	-0.019	-0.531	6875.000	2721.000	5.120	44.240	22070.000	1437.000	τ 1752000.000
x		0.006	-0.013	-0.172	6808.000	2749.000	4.977	43.530	21780.000	1495.000	τ 1774000.000
σ		0.003	0.005	0.361	85.070	44.570	0.202	0.711	251.600	52.740	τ 24920.000
%RSD		58.890	40.030	209.800	1.250	1.622	4.062	1.634	1.155	3.529	τ 1.405

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	00:17:24	TM 37240.000	8218.000	104.690%	115.193%	2.732	-0.017	0.302	21.080	21.940	22.810
2	00:17:28	TM 37850.000	8008.000	105.188%	115.708%	2.897	-0.204	0.297	23.580	22.060	23.150
3	00:17:32	TM 37810.000	7932.000	106.096%	115.661%	2.557	0.177	0.285	21.160	22.170	22.900
x		TM 37640.000	8053.000	105.325%	115.521%	2.729	-0.015	0.295	21.940	22.060	22.950
σ		TM 339.000	148.300	0.713%	0.284%	0.170	0.190	0.009	1.419	0.118	0.179
%RSD		TM 0.901	1.842	0.677	0.246	6.227	1293.000	2.966	6.469	0.534	0.779

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	00:17:24	0.050	0.375	2.683	96.120	106.179%	0.088	2.179	8.493	103.652%	0.007
2	00:17:28	0.047	0.318	2.702	96.850	106.530%	0.095	2.508	8.420	104.239%	0.004
3	00:17:32	0.046	0.311	2.816	96.910	106.681%	0.049	2.196	8.329	105.330%	0.009
x		0.048	0.335	2.734	96.630	106.463%	0.078	2.294	8.414	104.407%	0.006
σ		0.002	0.035	0.072	0.437	0.258%	0.025	0.185	0.082	0.851%	0.002
%RSD		4.562	10.470	2.630	0.452	0.242	31.980	8.082	0.978	0.815	38.510

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	00:17:24	0.141	-0.014	0.063	103.372%	40.720	0.018	1.516	τ 111.934%	0.104	0.025
2	00:17:28	0.122	-0.015	0.078	104.574%	40.610	0.017	1.523	τ 112.554%	0.120	0.025
3	00:17:32	0.130	-0.010	0.082	105.353%	40.300	0.020	1.491	τ 112.686%	0.096	0.024
x		0.131	-0.013	0.074	104.433%	40.540	0.018	1.510	τ 112.391%	0.106	0.025
σ		0.010	0.003	0.010	0.998%	0.219	0.002	0.017	τ 0.402%	0.012	0.001
%RSD		7.550	20.340	13.480	0.956	0.540	10.430	1.122	τ 0.357	11.530	3.600

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	00:17:24	0.039	τ 108.721%	-0.011
2	00:17:28	0.040	τ 109.410%	-0.011
3	00:17:32	0.038	τ 109.499%	-0.011
x		0.039	τ 109.210%	-0.011
σ		0.001	τ 0.426%	0.000
%RSD		2.903	τ 0.390	1.502

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	00:22:57	0.094	-0.019	-0.255	10870.000	3980.000	39.050	169.300	M 82170.000	1597.000	T 1746000.000
2	00:23:01	0.083	-0.019	-0.332	10670.000	3936.000	40.960	152.900	M 82860.000	1523.000	T 1743000.000
3	00:23:04	0.080	-0.014	-0.100	11080.000	3964.000	41.330	154.500	M 83290.000	1524.000	T 1725000.000
x		0.086	-0.017	-0.229	10870.000	3960.000	40.450	158.900	M 82770.000	1548.000	T 1738000.000
σ		0.007	0.003	0.118	201.700	22.400	1.221	9.065	M 566.000	42.150	T 11580.000
%RSD		8.697	15.370	51.590	1.855	0.566	3.018	5.706	M 0.684	2.723	T 0.666

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	00:22:57	TM 31880.000	M 135900.000	99.649%	111.121%	9.159	0.658	0.398	20.640	217.600	402.300
2	00:23:01	TM 32420.000	M 136800.000	101.843%	111.891%	8.612	0.543	0.395	20.630	216.100	400.700
3	00:23:04	TM 33270.000	M 136900.000	101.042%	112.284%	9.594	0.624	0.390	19.790	218.800	399.700
x		TM 32520.000	M 136600.000	100.844%	111.765%	9.122	0.608	0.394	20.360	217.500	400.900
σ		TM 699.400	M 552.800	1.110%	0.592%	0.492	0.059	0.004	0.487	1.326	1.328
%RSD		TM 2.151	M 0.405	1.101	0.530	5.398	9.749	0.909	2.391	0.610	0.331

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	00:22:57	0.221	0.598	5.564	181.200	102.305%	0.590	2.654	161.300	97.986%	0.042
2	00:23:01	0.216	0.547	5.581	182.800	100.981%	0.567	2.870	160.800	99.770%	0.063
3	00:23:04	0.215	0.578	5.720	182.200	102.860%	0.468	2.735	159.500	100.184%	0.032
x		0.217	0.574	5.622	182.100	102.049%	0.542	2.753	160.500	99.313%	0.046
σ		0.004	0.026	0.086	0.806	0.966%	0.065	0.110	0.895	1.168%	0.016
%RSD		1.612	4.440	1.524	0.443	0.946	11.930	3.979	0.558	1.176	33.940

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	00:22:57	0.525	-0.014	2.325	98.897%	42.000	0.032	25.020	T 105.616%	0.103	0.072
2	00:23:01	0.511	-0.010	2.162	100.363%	41.730	0.031	25.070	T 106.805%	0.097	0.068
3	00:23:04	0.503	-0.014	2.185	101.283%	41.970	0.032	25.130	T 107.501%	0.099	0.066
x		0.513	-0.013	2.224	100.181%	41.900	0.031	25.080	T 106.641%	0.100	0.069
σ		0.011	0.002	0.088	1.203%	0.145	0.001	0.057	T 0.953%	0.003	0.003
%RSD		2.172	16.090	3.950	1.201	0.346	2.294	0.226	T 0.894	3.235	4.191

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	00:22:57	0.948	T 101.547%	-0.004
2	00:23:01	0.935	T 102.488%	-0.004
3	00:23:04	0.948	T 102.840%	-0.006
x		0.944	T 102.292%	-0.005
σ		0.008	T 0.668%	0.001
%RSD		0.799	T 0.653	17.460

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	00:28:30	0.095	-0.009	0.217	9622.000	4146.000	60.180	189.000	M 80520.000	1482.000	T 1932000.000
2	00:28:34	0.123	-0.019	0.172	10020.000	4204.000	58.760	206.200	M 81110.000	1499.000	T 1933000.000
3	00:28:38	0.122	-0.014	0.136	9640.000	4193.000	56.960	201.800	M 80550.000	1562.000	T 1959000.000
x		0.113	-0.014	0.175	9762.000	4181.000	58.630	199.000	M 80730.000	1514.000	T 1942000.000
σ		0.016	0.005	0.041	226.200	30.910	1.616	8.956	M 332.200	42.070	T 15250.000
%RSD		13.890	33.680	23.240	2.317	0.739	2.755	4.500	M 0.412	2.778	T 0.785

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	00:28:30	TM 32630.000	M 130300.000	99.658%	111.496%	8.698	1.197	0.508	21.660	334.400	461.200
2	00:28:34	TM 33490.000	M 133200.000	99.383%	111.622%	9.539	0.970	0.485	23.170	333.400	459.400
3	00:28:38	TM 32430.000	M 130100.000	101.047%	111.182%	9.280	0.846	0.433	22.780	335.700	459.400
x		TM 32850.000	M 131200.000	100.029%	111.434%	9.172	1.004	0.475	22.540	334.500	460.000
σ		TM 559.900	M 1762.000	0.892%	0.226%	0.430	0.178	0.038	0.787	1.130	1.067
%RSD		TM 1.704	M 1.343	0.892	0.203	4.692	17.710	8.073	3.492	0.338	0.232

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	00:28:30	0.455	0.536	4.638	196.400	98.925%	0.728	2.758	153.400	98.218%	0.038
2	00:28:34	0.440	0.561	4.549	192.100	102.368%	0.683	2.394	154.200	98.568%	0.036
3	00:28:38	0.460	0.549	4.620	195.700	100.470%	0.686	2.707	154.900	99.361%	0.033
x		0.452	0.548	4.602	194.700	100.588%	0.699	2.620	154.200	98.716%	0.036
σ		0.010	0.012	0.047	2.311	1.725%	0.025	0.197	0.772	0.586%	0.002
%RSD		2.244	2.268	1.027	1.187	1.715	3.589	7.524	0.501	0.593	6.700

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	00:28:30	0.445	-0.014	2.611	98.655%	41.900	0.033	31.560	T 106.529%	0.096	0.061
2	00:28:34	0.422	-0.016	2.602	99.398%	41.640	0.024	32.130	T 106.206%	0.127	0.059
3	00:28:38	0.460	-0.007	2.640	99.977%	41.940	0.019	32.070	T 107.717%	0.126	0.056
x		0.442	-0.013	2.618	99.344%	41.830	0.025	31.920	T 106.818%	0.116	0.059
σ		0.019	0.005	0.020	0.663%	0.164	0.007	0.313	T 0.796%	0.018	0.003
%RSD		4.371	37.710	0.768	0.667	0.393	29.210	0.980	T 0.745	15.420	4.570

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	00:28:30	1.447	T 100.220%	-0.003
2	00:28:34	1.464	T 100.888%	-0.002
3	00:28:38	1.449	T 102.754%	-0.003
x		1.453	T 101.287%	-0.003
σ		0.009	T 1.313%	0.001
%RSD		0.612	T 1.297	30.110

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	00:34:04	0.223	0.001	-0.377	T 13180.000	5859.000	137.500	436.700	M 146500.000	1756.000	T 1833000.000
2	00:34:07	0.230	-0.004	0.180	T 12710.000	5875.000	136.600	411.800	M 146300.000	1771.000	T 1872000.000
3	00:34:11	0.218	-0.018	0.082	T 13260.000	5926.000	141.900	425.000	M 148000.000	1810.000	T 1853000.000
x		0.223	-0.007	-0.038	T 13050.000	5887.000	138.700	424.500	M 146900.000	1779.000	T 1853000.000
σ		0.006	0.010	0.297	T 301.900	35.250	2.834	12.480	M 918.800	27.870	T 19280.000
%RSD		2.637	140.400	776.600	T 2.314	0.599	2.043	2.940	M 0.625	1.566	T 1.041

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	00:34:04	TM 35680.000	M 263100.000	96.934%	108.896%	16.530	2.328	0.873	18.870	472.100	M 555.200
2	00:34:07	TM 35050.000	M 261000.000	98.622%	108.908%	18.300	2.287	0.869	18.450	469.600	M 552.200
3	00:34:11	TM 35760.000	M 264500.000	98.139%	108.141%	20.110	2.239	0.890	18.750	470.100	M 554.200
x		TM 35500.000	M 262900.000	97.898%	108.649%	18.310	2.285	0.877	18.690	470.600	M 553.800
σ		TM 391.500	M 1779.000	0.869%	0.439%	1.792	0.045	0.011	0.220	1.330	M 1.561
%RSD		TM 1.103	M 0.677	0.888	0.404	9.785	1.960	1.295	1.174	0.283	M 0.282

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	00:34:04	0.371	0.688	9.794	260.600	95.943%	1.392	2.982	309.400	95.990%	0.102
2	00:34:07	0.373	0.656	9.815	260.500	97.743%	1.482	2.777	311.600	97.405%	0.090
3	00:34:11	0.370	0.656	9.833	261.300	97.630%	1.400	2.849	313.800	98.147%	0.107
x		0.371	0.666	9.814	260.800	97.105%	1.424	2.870	311.600	97.181%	0.099
σ		0.002	0.019	0.020	0.429	1.008%	0.050	0.104	2.189	1.096%	0.008
%RSD		0.411	2.818	0.199	0.165	1.038	3.483	3.623	0.703	1.128	8.523

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	00:34:04	1.911	-0.011	4.790	96.819%	40.960	0.026	34.330	T 104.403%	0.129	0.121
2	00:34:07	1.883	-0.000	4.825	97.811%	41.090	0.039	34.250	T 104.833%	0.130	0.124
3	00:34:11	1.788	-0.001	4.750	98.378%	40.920	0.034	35.400	T 105.613%	0.113	0.118
x		1.861	-0.004	4.788	97.669%	40.990	0.033	34.660	T 104.950%	0.124	0.121
σ		0.064	0.006	0.037	0.789%	0.088	0.006	0.643	T 0.613%	0.009	0.003
%RSD		3.457	147.700	0.780	0.808	0.214	18.850	1.856	T 0.584	7.587	2.810

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	00:34:04	3.516	T 97.306%	0.015
2	00:34:07	3.488	T 99.136%	0.014
3	00:34:11	3.504	T 99.250%	0.013
x		3.503	T 98.564%	0.014
σ		0.014	T 1.091%	0.001
%RSD		0.406	T 1.107	6.128

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	00:39:37	0.092	0.005	-0.088	9302.000	4312.000	23.380	75.560	M 83790.000	1697.000	T 1963000.000
2	00:39:41	0.052	-0.010	0.333	9017.000	4280.000	19.410	60.410	M 83230.000	1695.000	T 1990000.000
3	00:39:44	0.089	-0.028	-0.342	9004.000	4277.000	21.970	62.150	M 83250.000	1608.000	T 1987000.000
x		0.078	-0.011	-0.032	9108.000	4290.000	21.590	66.040	M 83420.000	1667.000	T 1980000.000
σ		0.022	0.017	0.341	168.100	19.230	2.011	8.293	M 315.500	51.160	T 14720.000
%RSD		28.730	151.100	1060.000	1.846	0.448	9.316	12.560	M 0.378	3.069	T 0.743

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	00:39:37	TM 35110.000	M 138600.000	99.714%	111.550%	8.223	0.437	0.915	20.850	248.600	397.800
2	00:39:41	TM 34530.000	M 136900.000	100.863%	112.211%	7.941	0.462	0.904	20.830	249.800	394.800
3	00:39:44	TM 34920.000	M 136400.000	102.384%	112.609%	7.537	0.248	0.927	20.920	247.600	394.700
x		TM 34860.000	M 137300.000	100.987%	112.123%	7.900	0.382	0.916	20.870	248.700	395.800
σ		TM 296.300	M 1148.000	1.339%	0.535%	0.345	0.117	0.012	0.045	1.103	1.775
%RSD		TM 0.850	M 0.836	1.326	0.477	4.367	30.570	1.291	0.214	0.444	0.449

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	00:39:37	0.212	0.451	6.014	369.300	100.396%	0.786	2.677	173.700	98.916%	0.018
2	00:39:41	0.187	0.464	5.999	365.600	101.580%	0.740	2.284	175.100	99.513%	0.027
3	00:39:44	0.205	0.415	5.820	364.500	102.771%	0.828	2.676	173.100	100.769%	0.018
x		0.201	0.443	5.944	366.500	101.582%	0.785	2.546	174.000	99.733%	0.021
σ		0.013	0.026	0.108	2.517	1.187%	0.044	0.227	0.996	0.946%	0.005
%RSD		6.499	5.755	1.816	0.687	1.169	5.571	8.897	0.573	0.949	22.850

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	00:39:37	0.701	-0.007	1.547	100.092%	40.400	0.024	12.180	T 107.623%	0.122	0.139
2	00:39:41	0.728	-0.010	1.458	100.307%	40.440	0.025	12.190	T 107.471%	0.117	0.142
3	00:39:44	0.729	-0.014	1.398	101.603%	40.220	0.032	12.440	T 109.569%	0.120	0.149
x		0.719	-0.010	1.467	100.667%	40.350	0.027	12.270	T 108.221%	0.119	0.143
σ		0.016	0.003	0.075	0.817%	0.116	0.004	0.147	T 1.170%	0.003	0.005
%RSD		2.203	31.570	5.099	0.812	0.288	15.610	1.199	T 1.081	2.182	3.476

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	00:39:37	0.431	T 102.934%	-0.008
2	00:39:41	0.419	T 103.717%	-0.007
3	00:39:44	0.422	T 104.792%	-0.007
x		0.424	T 103.814%	-0.007
σ		0.006	T 0.933%	0.000
%RSD		1.504	T 0.898	5.851

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	00:45:10	0.111	-0.014	0.014	9697.000	4534.000	48.610	117.600	M 87300.000	1608.000	T 1948000.000
2	00:45:14	0.102	-0.010	-0.318	9950.000	4532.000	54.280	126.500	M 87720.000	1717.000	T 1940000.000
3	00:45:18	0.116	-0.024	-0.414	9564.000	4501.000	52.430	109.500	M 87920.000	1636.000	T 2023000.000
x		0.110	-0.016	-0.239	9737.000	4522.000	51.770	117.800	M 87640.000	1654.000	T 1970000.000
σ		0.007	0.007	0.225	196.300	18.810	2.892	8.528	M 319.100	56.630	T 45650.000
%RSD		6.422	44.490	93.960	2.016	0.416	5.586	7.237	M 0.364	3.424	T 2.317

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	00:45:10	TM 34850.000	M 149600.000	99.708%	111.916%	9.367	0.551	0.716	20.090	389.000	M 533.000
2	00:45:14	TM 35310.000	M 149900.000	99.580%	113.960%	9.877	0.539	0.722	21.100	384.500	M 535.100
3	00:45:18	TM 35100.000	M 149000.000	100.929%	113.135%	10.210	0.582	0.679	21.000	385.900	M 527.700
x		TM 35090.000	M 149500.000	100.072%	113.004%	9.819	0.557	0.705	20.730	386.500	M 532.000
σ		TM 231.800	M 494.000	0.745%	1.028%	0.427	0.023	0.023	0.560	2.281	M 3.822
%RSD		TM 0.661	M 0.330	0.744	0.910	4.344	4.043	3.297	2.699	0.590	M 0.719

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	00:45:10	0.332	0.454	8.999	373.800	101.826%	1.069	2.589	188.100	98.769%	0.023
2	00:45:14	0.309	0.542	8.825	372.600	102.398%	1.022	2.466	188.700	99.131%	0.028
3	00:45:18	0.340	0.475	8.820	377.900	101.608%	1.083	2.781	186.700	100.076%	0.020
x		0.327	0.490	8.881	374.700	101.944%	1.058	2.612	187.800	99.326%	0.024
σ		0.016	0.046	0.102	2.762	0.408%	0.032	0.159	1.063	0.675%	0.004
%RSD		4.990	9.378	1.146	0.737	0.400	3.015	6.076	0.566	0.679	17.670

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	00:45:10	0.832	0.006	2.394	99.950%	39.510	0.042	15.920	T 105.957%	0.141	0.167
2	00:45:14	0.856	-0.000	2.387	100.924%	39.480	0.033	16.090	T 106.557%	0.115	0.161
3	00:45:18	0.840	-0.002	2.416	101.138%	39.240	0.023	16.010	T 108.478%	0.128	0.161
x		0.843	0.001	2.399	100.670%	39.410	0.032	16.010	T 106.997%	0.128	0.163
σ		0.012	0.004	0.015	0.633%	0.149	0.009	0.084	T 1.317%	0.013	0.004
%RSD		1.419	402.900	0.645	0.629	0.378	29.310	0.525	T 1.231	10.130	2.387

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	00:45:10	0.619	T 101.752%	-0.001
2	00:45:14	0.624	T 101.918%	-0.003
3	00:45:18	0.617	T 103.480%	-0.002
x		0.620	T 102.383%	-0.002
σ		0.004	T 0.954%	0.001
%RSD		0.576	T 0.932	34.020

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	00:50:44	0.070	-0.024	0.031	10260.000	3766.000	30.080	122.000	M 75390.000	1370.000	T 1870000.000
2	00:50:48	0.037	-0.019	-0.315	10140.000	3701.000	27.430	120.600	M 75980.000	1430.000	T 1894000.000
3	00:50:52	0.098	-0.009	0.141	10060.000	3804.000	29.290	121.800	M 76310.000	1438.000	T 1941000.000
x		0.068	-0.017	-0.048	10150.000	3757.000	28.940	121.500	M 75890.000	1413.000	T 1901000.000
σ		0.030	0.007	0.238	97.720	52.290	1.361	0.774	M 468.900	37.240	T 35980.000
%RSD		44.420	41.530	500.900	0.963	1.392	4.704	0.637	M 0.618	2.636	T 1.892

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	00:50:44	TM 30140.000	M 125900.000	100.322%	112.211%	8.144	0.548	0.428	22.250	240.500	M 507.200
2	00:50:48	TM 30210.000	M 124700.000	100.933%	112.217%	7.270	0.939	0.456	19.650	241.000	M 500.700
3	00:50:52	TM 30080.000	M 126000.000	100.253%	112.075%	8.166	0.637	0.420	21.450	241.500	M 509.600
x		TM 30140.000	M 125600.000	100.503%	112.167%	7.860	0.708	0.434	21.120	241.000	M 505.900
σ		TM 67.690	M 713.900	0.374%	0.080%	0.511	0.205	0.019	1.335	0.491	M 4.583
%RSD		TM 0.225	M 0.569	0.372	0.072	6.502	29.010	4.347	6.321	0.204	M 0.906

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	00:50:44	0.194	0.858	5.034	183.700	102.303%	0.577	2.112	151.100	98.782%	0.016
2	00:50:48	0.204	0.873	4.966	184.000	102.161%	0.628	2.206	150.900	100.121%	0.008
3	00:50:52	0.209	0.835	5.082	184.000	102.934%	0.585	2.512	152.100	99.769%	0.020
x		0.202	0.855	5.027	183.900	102.466%	0.597	2.277	151.400	99.557%	0.015
σ		0.007	0.019	0.058	0.142	0.412%	0.027	0.209	0.674	0.694%	0.006
%RSD		3.617	2.201	1.157	0.077	0.402	4.608	9.185	0.445	0.697	38.580

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	00:50:44	0.457	-0.012	1.781	100.889%	40.060	0.023	29.270	T 106.795%	0.061	0.035
2	00:50:48	0.458	-0.008	1.768	100.652%	40.270	0.034	28.980	T 107.153%	0.082	0.034
3	00:50:52	0.433	-0.012	1.885	100.566%	40.560	0.015	29.450	T 107.845%	0.076	0.034
x		0.449	-0.011	1.811	100.702%	40.300	0.024	29.230	T 107.264%	0.073	0.034
σ		0.014	0.003	0.065	0.167%	0.248	0.009	0.233	T 0.534%	0.011	0.001
%RSD		3.067	24.930	3.561	0.166	0.616	38.650	0.797	T 0.498	14.760	1.458

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	00:50:44	0.700	T 101.644%	-0.006
2	00:50:48	0.690	T 103.411%	-0.007
3	00:50:52	0.688	T 103.350%	-0.007
x		0.693	T 102.802%	-0.007
σ		0.006	T 1.003%	0.001
%RSD		0.884	T 0.976	9.701

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	00:56:18	87.450	83.530	88.730	5051.000	4924.000	4649.000	4680.000	4959.000	122.300	↹2228000.000
2	00:56:23	87.200	82.790	90.640	5066.000	4846.000	4608.000	4609.000	5005.000	169.100	↹2195000.000
3	00:56:26	87.600	83.630	91.150	5147.000	5020.000	4730.000	4733.000	4991.000	173.600	↹2260000.000
x		87.420	83.310	90.170	5088.000	4930.000	4663.000	4674.000	4985.000	155.000	↹2228000.000
σ		0.205	0.458	1.274	51.700	87.150	62.150	62.340	23.790	28.400	↹32680.000
%RSD		0.234	0.549	1.413	1.016	1.768	1.333	1.334	0.477	18.330	↹1.467

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	00:56:18	4760.000	5079.000	107.601%	116.336%	99.650	98.210	100.300	9.314	5609.000	99.610
2	00:56:23	4798.000	4914.000	111.236%	117.578%	97.190	96.740	98.750	10.000	5581.000	98.310
3	00:56:26	4719.000	5145.000	108.917%	116.471%	100.200	98.980	101.100	11.520	5603.000	100.300
x		4759.000	5046.000	109.251%	116.795%	99.010	97.980	100.100	10.280	5598.000	99.410
σ		39.590	119.200	1.841%	0.682%	1.607	1.139	1.194	1.129	14.570	1.011
%RSD		0.832	2.362	1.685	0.584	1.623	1.162	1.193	10.980	0.260	1.017

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	00:56:18	101.100	102.600	104.200	104.100	109.906%	101.500	97.090	100.300	102.977%	99.990
2	00:56:23	99.640	100.900	103.100	104.800	111.133%	101.400	96.380	98.810	105.796%	98.620
3	00:56:26	101.300	101.900	104.100	105.900	111.946%	101.300	96.890	99.810	105.049%	100.400
x		100.700	101.800	103.800	104.900	110.995%	101.400	96.790	99.620	104.607%	99.680
σ		0.912	0.845	0.609	0.909	1.027%	0.071	0.368	0.737	1.460%	0.936
%RSD		0.906	0.829	0.587	0.867	0.925	0.070	0.380	0.740	1.396	0.939

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	00:56:18	103.200	52.240	105.300	103.081%	102.300	102.000	97.390	↹109.671%	5.130	↹101.300
2	00:56:23	102.700	51.510	102.600	106.174%	100.200	100.200	95.880	↹111.433%	5.065	↹101.100
3	00:56:26	103.600	52.210	105.100	105.228%	102.400	101.000	98.660	↹110.516%	5.136	↹100.500
x		103.100	51.990	104.300	104.828%	101.600	101.000	97.310	↹110.540%	5.111	↹100.900
σ		0.417	0.412	1.467	1.585%	1.206	0.875	1.390	↹0.881%	0.039	↹0.409
%RSD		0.404	0.793	1.406	1.512	1.186	0.866	1.428	↹0.797	0.770	↹0.405

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	00:56:18	↹101.300	↹105.221%	↹100.800
2	00:56:23	↹100.500	↹107.241%	↹99.780
3	00:56:26	↹101.400	↹107.639%	↹101.100
x		↹101.100	↹106.700%	↹100.600
σ		↹0.468	↹1.297%	↹0.691
%RSD		↹0.463	↹1.216	↹0.687

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:01:52	0.037	0.022	1.570	2.575	1.425	1.728	0.583	0.096	154.700	↹2206000.000
2	01:01:56	0.041	0.017	0.073	4.500	1.353	2.963	3.748	11.000	140.500	↹2200000.000
3	01:02:00	0.033	0.017	-0.294	5.652	2.576	2.880	1.098	25.150	171.500	↹2197000.000
x		0.037	0.019	0.450	4.242	1.785	2.524	1.810	12.080	155.600	↹2201000.000
σ		0.004	0.003	0.987	1.555	0.686	0.691	1.699	12.560	15.530	↹4808.000
%RSD		11.220	15.320	219.600	36.650	38.460	27.360	93.860	104.000	9.979	↹0.218

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:01:52	-23.340	11.480	104.196%	115.505%	0.059	-0.060	-0.050	27.690	2.388	0.055
2	01:01:56	-24.750	17.580	105.513%	115.898%	0.076	0.039	-0.040	27.920	4.170	0.135
3	01:02:00	-30.170	19.200	106.962%	116.692%	0.132	0.078	-0.018	27.580	4.502	0.177
x		-26.090	16.080	105.557%	116.031%	0.089	0.019	-0.036	27.730	3.687	0.122
σ		3.609	4.069	1.383%	0.605%	0.038	0.071	0.016	0.177	1.137	0.062
%RSD		13.840	25.300	1.310	0.521	42.650	371.500	45.120	0.637	30.830	50.480

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:01:52	0.036	0.033	0.044	-0.135	104.457%	0.149	-0.159	0.039	102.765%	0.020
2	01:01:56	0.065	0.070	0.099	-0.016	106.454%	0.082	-0.211	0.090	103.174%	0.063
3	01:02:00	0.088	0.090	0.099	-0.014	106.125%	0.118	-0.247	0.118	103.433%	0.063
x		0.063	0.064	0.081	-0.055	105.679%	0.116	-0.205	0.082	103.124%	0.048
σ		0.026	0.029	0.032	0.069	1.071%	0.034	0.045	0.040	0.337%	0.025
%RSD		41.460	45.510	39.350	124.900	1.013	29.190	21.660	48.460	0.327	51.440

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:01:52	0.087	0.006	0.027	102.363%	0.017	0.045	0.031	↹109.690%	0.022	0.126
2	01:01:56	0.096	0.028	0.093	102.777%	0.045	0.075	0.070	↹110.345%	0.030	0.137
3	01:02:00	0.122	0.037	0.119	103.398%	0.083	0.090	0.077	↹110.659%	0.027	0.148
x		0.102	0.024	0.079	102.846%	0.048	0.070	0.059	↹110.231%	0.026	0.137
σ		0.018	0.016	0.048	0.521%	0.033	0.023	0.025	↹0.495%	0.004	0.011
%RSD		18.150	66.670	60.090	0.507	68.800	32.880	41.370	↹0.449	16.710	8.353

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	01:01:52	0.036	↹107.932%	0.031
2	01:01:56	0.066	↹108.979%	0.061
3	01:02:00	0.083	↹109.750%	0.081
x		0.062	↹108.887%	0.058
σ		0.024	↹0.912%	0.025
%RSD		38.250	↹0.838	43.440

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:07:25	0.045	-0.010	-0.286	9523.000	4154.000	9.136	73.920	M 86650.000	1493.000	T 1921000.000
2	01:07:29	0.070	-0.010	0.005	10110.000	4120.000	7.230	75.590	M 86030.000	1667.000	T 1845000.000
3	01:07:33	0.048	-0.005	0.236	9953.000	4160.000	6.935	82.100	M 85880.000	1571.000	T 1865000.000
x		0.054	-0.008	-0.015	9863.000	4145.000	7.767	77.210	M 86190.000	1577.000	T 1877000.000
σ		0.014	0.003	0.262	304.900	21.910	1.195	4.323	M 408.200	87.400	T 39860.000
%RSD		25.790	31.870	1727.000	3.091	0.529	15.380	5.600	M 0.474	5.543	T 2.124

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:07:25	TM 32780.000	M 140000.000	99.788%	113.217%	7.989	0.609	0.280	21.550	138.000	445.400
2	01:07:29	TM 33460.000	M 139500.000	100.909%	113.736%	8.388	0.552	0.307	22.010	137.000	446.300
3	01:07:33	TM 32930.000	M 140700.000	102.017%	113.874%	7.999	0.569	0.243	21.760	134.000	445.200
x		TM 33050.000	M 140100.000	100.904%	113.609%	8.125	0.577	0.277	21.770	136.300	445.600
σ		TM 357.300	M 571.200	1.115%	0.346%	0.228	0.029	0.032	0.229	2.052	0.594
%RSD		TM 1.081	M 0.408	1.105	0.305	2.802	5.089	11.480	1.053	1.505	0.133

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:07:25	0.157	0.472	3.649	199.800	100.113%	0.698	2.378	157.700	98.416%	0.037
2	01:07:29	0.164	0.408	3.637	194.700	102.410%	0.739	2.298	160.100	98.195%	0.039
3	01:07:33	0.162	0.430	3.534	196.900	101.649%	0.657	2.471	159.700	98.812%	0.035
x		0.161	0.437	3.607	197.200	101.390%	0.698	2.382	159.200	98.474%	0.037
σ		0.003	0.033	0.064	2.567	1.170%	0.041	0.087	1.268	0.313%	0.002
%RSD		2.161	7.445	1.764	1.302	1.154	5.904	3.644	0.796	0.318	5.191

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:07:25	0.723	-0.003	1.530	99.079%	41.670	0.039	32.900	T 106.656%	0.102	0.147
2	01:07:29	0.723	-0.012	1.528	99.860%	42.200	0.038	33.360	T 105.315%	0.095	0.146
3	01:07:33	0.688	-0.008	1.600	100.142%	42.430	0.017	33.340	T 107.044%	0.105	0.140
x		0.712	-0.007	1.553	99.694%	42.100	0.031	33.200	T 106.338%	0.101	0.144
σ		0.020	0.005	0.041	0.551%	0.392	0.013	0.258	T 0.907%	0.005	0.004
%RSD		2.834	61.520	2.635	0.552	0.930	40.080	0.777	T 0.853	5.224	2.735

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	01:07:25	0.204	T 101.857%	0.009
2	01:07:29	0.202	T 101.254%	0.007
3	01:07:33	0.197	T 102.434%	0.005
x		0.201	T 101.848%	0.007
σ		0.004	T 0.590%	0.002
%RSD		1.843	T 0.579	23.560

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:13:00	-0.006	-0.010	0.021	8535.000	3144.000	4.471	36.440	22820.000	1530.000	T 1824000.000
2	01:13:04	-0.009	-0.024	-0.060	8748.000	3097.000	4.358	36.240	22900.000	1644.000	T 1842000.000
3	01:13:08	-0.009	-0.019	-0.313	8545.000	3130.000	3.797	36.850	22700.000	1626.000	T 1871000.000
x		-0.008	-0.018	-0.117	8609.000	3123.000	4.209	36.510	22810.000	1600.000	T 1845000.000
σ		0.002	0.007	0.174	120.200	23.960	0.361	0.310	97.780	61.520	T 23700.000
%RSD		24.750	40.310	148.800	1.396	0.767	8.571	0.850	0.429	3.845	T 1.284

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:13:00	TM 41300.000	6419.000	102.196%	114.016%	3.064	0.102	0.239	21.440	28.840	12.250
2	01:13:04	TM 41560.000	6734.000	103.705%	115.036%	2.415	0.083	0.256	21.990	27.060	12.190
3	01:13:08	TM 40700.000	6212.000	103.670%	115.079%	3.203	0.109	0.261	22.780	27.690	12.300
x		TM 41190.000	6455.000	103.190%	114.710%	2.894	0.098	0.252	22.070	27.860	12.240
σ		TM 441.100	262.600	0.861%	0.602%	0.421	0.014	0.012	0.673	0.906	0.056
%RSD		TM 1.071	4.069	0.835	0.524	14.530	14.170	4.692	3.050	3.253	0.459

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:13:00	0.049	0.372	3.459	109.600	105.474%	0.156	2.513	7.062	101.013%	0.024
2	01:13:04	0.049	0.402	3.402	108.300	106.248%	0.180	2.493	6.955	102.085%	0.024
3	01:13:08	0.046	0.384	3.459	108.600	105.409%	0.149	2.426	6.983	102.480%	0.019
x		0.048	0.386	3.440	108.800	105.710%	0.162	2.477	7.000	101.859%	0.022
σ		0.001	0.015	0.033	0.714	0.467%	0.016	0.046	0.055	0.759%	0.003
%RSD		2.788	3.836	0.954	0.656	0.442	10.100	1.846	0.791	0.745	14.820

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:13:00	0.197	-0.008	0.075	102.389%	40.480	0.025	0.889	T 108.992%	0.199	0.052
2	01:13:04	0.192	-0.015	0.062	102.878%	41.220	0.019	0.879	T 110.205%	0.200	0.047
3	01:13:08	0.178	-0.009	0.071	102.751%	41.380	0.026	0.829	T 110.034%	0.184	0.045
x		0.189	-0.011	0.069	102.673%	41.030	0.023	0.866	T 109.744%	0.194	0.048
σ		0.010	0.004	0.007	0.254%	0.480	0.004	0.032	T 0.657%	0.009	0.003
%RSD		5.226	37.580	9.404	0.247	1.170	16.810	3.738	T 0.598	4.717	6.987

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	01:13:00	0.026	T 106.340%	-0.008
2	01:13:04	0.022	T 107.708%	-0.008
3	01:13:08	0.024	T 108.579%	-0.009
x		0.024	T 107.542%	-0.008
σ		0.002	T 1.128%	0.001
%RSD		8.133	T 1.049	9.109

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:18:34	0.014	-0.010	0.074	8345.000	3154.000	9.682	67.750	M 27090.000	1679.000	T 1770000.000
2	01:18:38	0.017	-0.005	0.331	8208.000	3188.000	10.650	63.030	M 27430.000	1504.000	T 1804000.000
3	01:18:42	0.012	-0.014	-0.102	8220.000	3084.000	13.020	54.420	M 27670.000	1559.000	T 1763000.000
x		0.014	-0.010	0.101	8258.000	3142.000	11.120	61.730	M 27400.000	1580.000	T 1779000.000
σ		0.002	0.005	0.218	76.020	52.690	1.720	6.757	M 288.000	89.500	T 21930.000
%RSD		16.110	46.140	215.800	0.921	1.677	15.470	10.950	M 1.051	5.663	T 1.233

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:18:34	TM 39770.000	18090.000	101.799%	113.413%	3.693	0.048	0.295	22.620	41.300	57.060
2	01:18:38	TM 40100.000	17540.000	102.676%	114.490%	3.073	0.140	0.271	21.820	41.790	57.220
3	01:18:42	TM 40280.000	17490.000	103.809%	113.745%	3.039	0.056	0.302	22.100	41.770	56.860
x		TM 40050.000	17700.000	102.761%	113.883%	3.268	0.081	0.290	22.180	41.620	57.050
σ		TM 261.200	333.100	1.007%	0.551%	0.368	0.051	0.016	0.406	0.281	0.177
%RSD		TM 0.652	1.881	0.980	0.484	11.270	62.270	5.604	1.828	0.675	0.310

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:18:34	0.075	0.406	2.846	110.200	104.441%	0.335	2.482	19.530	100.891%	0.022
2	01:18:38	0.073	0.400	2.891	110.500	104.389%	0.278	2.860	19.470	101.781%	0.007
3	01:18:42	0.079	0.410	2.870	109.900	105.076%	0.259	2.526	19.420	101.987%	0.017
x		0.076	0.405	2.869	110.200	104.635%	0.291	2.623	19.470	101.553%	0.015
σ		0.003	0.005	0.022	0.316	0.383%	0.040	0.207	0.052	0.582%	0.008
%RSD		3.840	1.160	0.776	0.287	0.366	13.700	7.879	0.267	0.573	50.970

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:18:34	0.102	-0.005	0.208	100.335%	41.570	0.022	2.683	T 108.480%	0.217	0.038
2	01:18:38	0.096	-0.012	0.206	102.101%	40.410	0.022	2.734	T 109.769%	0.191	0.039
3	01:18:42	0.102	-0.012	0.214	102.646%	40.750	0.023	2.650	T 110.035%	0.181	0.040
x		0.100	-0.010	0.210	101.694%	40.910	0.022	2.689	T 109.428%	0.196	0.039
σ		0.004	0.004	0.004	1.208%	0.598	0.001	0.042	T 0.832%	0.019	0.001
%RSD		3.727	45.810	2.058	1.188	1.460	2.948	1.564	T 0.760	9.620	2.942

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	01:18:34	0.154	T 105.356%	-0.009
2	01:18:38	0.154	T 106.815%	-0.009
3	01:18:42	0.153	T 107.203%	-0.010
x		0.153	T 106.458%	-0.010
σ		0.001	T 0.974%	0.000
%RSD		0.335	T 0.915	3.722

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:24:08	0.013	-0.005	0.197	8088.000	2661.000	5.348	19.920	M 36650.000	1335.000	T 1660000.000
2	01:24:11	0.021	-0.005	-0.219	8143.000	2713.000	5.826	27.330	M 37070.000	1350.000	T 1657000.000
3	01:24:15	0.008	-0.005	-0.070	7591.000	2680.000	5.850	23.230	M 36500.000	1288.000	T 1703000.000
x		0.014	-0.005	-0.030	7941.000	2685.000	5.675	23.490	M 36740.000	1324.000	T 1673000.000
σ		0.006	0.000	0.211	304.400	26.260	0.283	3.714	M 291.400	31.980	T 25360.000
%RSD		45.910	4.344	694.000	3.833	0.978	4.983	15.810	M 0.793	2.415	T 1.516

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:24:08	TM 38130.000	M 31690.000	100.457%	111.406%	3.411	0.024	0.232	21.380	63.850	86.690
2	01:24:11	TM 38790.000	M 31820.000	101.359%	112.981%	3.381	0.073	0.258	21.110	64.240	86.680
3	01:24:15	TM 37460.000	M 31500.000	102.147%	111.781%	3.768	-0.170	0.228	22.300	67.900	85.800
x		TM 38130.000	M 31670.000	101.321%	112.056%	3.520	-0.024	0.239	21.600	65.330	86.390
σ		TM 667.400	M 157.300	0.846%	0.823%	0.216	0.128	0.017	0.623	2.232	0.510
%RSD		TM 1.750	M 0.497	0.835	0.735	6.127	533.800	6.910	2.883	3.416	0.590

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:24:08	0.143	0.452	3.104	226.400	103.472%	0.724	2.379	29.710	99.650%	0.019
2	01:24:11	0.147	0.450	3.196	224.500	103.957%	0.780	2.467	29.410	100.658%	0.025
3	01:24:15	0.150	0.374	3.191	226.400	102.377%	0.717	2.379	29.760	100.362%	0.018
x		0.147	0.425	3.163	225.800	103.269%	0.741	2.408	29.630	100.224%	0.021
σ		0.004	0.045	0.052	1.049	0.809%	0.035	0.051	0.192	0.518%	0.003
%RSD		2.411	10.510	1.642	0.465	0.784	4.696	2.097	0.648	0.517	16.080

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:24:08	0.043	-0.011	4.119	101.247%	41.080	0.018	3.399	T 107.526%	0.309	-0.006
2	01:24:11	0.048	-0.005	3.966	102.150%	41.250	0.032	3.462	T 107.432%	0.295	-0.007
3	01:24:15	0.041	-0.018	4.316	101.259%	41.050	0.024	3.240	T 108.956%	0.313	-0.004
x		0.044	-0.011	4.134	101.552%	41.130	0.025	3.367	T 107.972%	0.305	-0.005
σ		0.004	0.007	0.176	0.518%	0.107	0.007	0.115	T 0.854%	0.010	0.002
%RSD		8.300	58.380	4.245	0.510	0.261	27.550	3.407	T 0.791	3.116	30.130

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	01:24:08	0.578	T 103.781%	-0.010
2	01:24:11	0.594	T 104.348%	-0.010
3	01:24:15	0.588	T 105.898%	-0.010
x		0.587	T 104.676%	-0.010
σ		0.008	T 1.096%	0.000
%RSD		1.352	T 1.047	1.524

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:29:43	0.005	-0.004	-0.330	-1.112	-2.153	-2.391	-0.898	2.483	153.200	τ 2106000.000
2	01:29:47	0.016	0.010	-0.887	-0.656	-1.002	-1.350	-0.341	10.020	154.600	τ 2239000.000
3	01:29:51	0.006	0.014	-0.823	0.057	-0.846	-1.140	0.839	7.551	162.200	τ 2086000.000
x		0.009	0.007	-0.680	-0.571	-1.334	-1.627	-0.133	6.684	156.700	τ 2144000.000
σ		0.006	0.010	0.305	0.590	0.714	0.670	0.887	3.841	4.855	τ 82920.000
%RSD		66.310	146.900	44.850	103.300	53.540	41.170	666.000	57.470	3.099	τ 3.868

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:29:43	-41.520	26.890	99.787%	110.232%	-0.078	-0.104	-0.093	25.980	-1.258	0.051
2	01:29:47	-46.520	12.510	100.106%	110.991%	-0.015	0.121	-0.102	25.090	-0.618	0.056
3	01:29:51	-11.510	21.350	102.243%	111.207%	0.023	-0.100	-0.098	25.730	-0.654	0.052
x		-33.180	20.250	100.712%	110.810%	-0.023	-0.028	-0.098	25.600	-0.844	0.053
σ		18.930	7.254	1.336%	0.512%	0.051	0.129	0.004	0.457	0.360	0.002
%RSD		57.060	35.820	1.326	0.462	216.000	467.700	4.572	1.783	42.630	4.642

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:29:43	0.009	0.015	0.025	0.028	100.973%	-0.088	-0.332	0.038	99.803%	-0.002
2	01:29:47	0.015	0.010	0.024	-0.010	101.977%	-0.074	-0.302	0.039	98.839%	0.006
3	01:29:51	0.014	0.021	0.029	-0.050	101.987%	-0.027	-0.191	0.027	100.227%	-0.003
x		0.013	0.015	0.026	-0.010	101.646%	-0.063	-0.275	0.035	99.623%	0.000
σ		0.003	0.005	0.003	0.039	0.582%	0.032	0.075	0.006	0.711%	0.005
%RSD		25.340	33.720	9.712	377.900	0.573	50.900	27.120	18.500	0.714	1381.000

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:29:43	-0.002	-0.001	0.007	99.329%	-0.004	0.012	0.012	τ 106.866%	0.001	-0.012
2	01:29:47	-0.004	-0.002	0.006	99.255%	0.002	0.014	0.001	τ 107.426%	-0.002	-0.011
3	01:29:51	0.001	-0.005	0.010	100.678%	0.006	0.009	0.013	τ 107.686%	0.003	-0.011
x		-0.002	-0.003	0.008	99.754%	0.002	0.012	0.009	τ 107.326%	0.001	-0.011
σ		0.002	0.002	0.002	0.801%	0.005	0.002	0.007	τ 0.419%	0.002	0.000
%RSD		151.700	80.240	23.570	0.803	319.900	20.820	74.300	τ 0.390	363.100	1.781

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	01:29:43	0.006	τ 105.043%	0.008
2	01:29:47	0.004	τ 107.188%	0.009
3	01:29:51	0.006	τ 107.199%	0.009
x		0.006	τ 106.477%	0.009
σ		0.001	τ 1.241%	0.001
%RSD		17.350	τ 1.166	6.626

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:35:18	-0.008	-0.033	-0.297	9.700	8.971	3.910	4.975	34.060	182.800	τ 2023000.000
2	01:35:22	-0.005	-0.019	-0.251	8.685	8.754	5.044	3.932	24.000	147.300	τ 1991000.000
3	01:35:26	-0.002	-0.028	0.014	7.062	7.745	6.460	6.037	42.590	167.000	τ 2075000.000
x		-0.005	-0.027	-0.178	8.482	8.490	5.138	4.981	33.550	165.700	τ 2030000.000
σ		0.003	0.007	0.168	1.330	0.654	1.278	1.052	9.304	17.790	τ 42440.000
%RSD		66.840	27.280	94.480	15.690	7.708	24.870	21.120	27.730	10.730	τ 2.091

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:35:18	-62.610	146.500	100.883%	110.968%	0.128	0.192	2.085	23.190	27.720	0.249
2	01:35:22	-46.600	160.000	102.547%	110.811%	0.226	0.311	2.104	22.420	27.090	0.280
3	01:35:26	-56.430	161.800	101.523%	110.677%	0.249	0.240	2.050	22.820	29.340	0.264
x		-55.210	156.100	101.651%	110.819%	0.201	0.248	2.080	22.810	28.050	0.264
σ		8.075	8.379	0.839%	0.146%	0.064	0.060	0.027	0.388	1.162	0.015
%RSD		14.630	5.368	0.826	0.131	31.960	24.330	1.320	1.701	4.141	5.796

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:35:18	0.005	0.273	0.203	10.400	104.012%	-0.135	-0.305	0.069	99.365%	0.025
2	01:35:22	0.003	0.326	0.239	10.220	103.469%	-0.065	-0.348	0.083	100.198%	0.039
3	01:35:26	0.007	0.283	0.206	10.690	105.598%	-0.119	-0.365	0.078	101.253%	0.041
x		0.005	0.294	0.216	10.440	104.360%	-0.106	-0.339	0.076	100.272%	0.035
σ		0.002	0.028	0.020	0.237	1.106%	0.037	0.031	0.007	0.946%	0.009
%RSD		44.950	9.581	9.157	2.269	1.060	34.600	9.150	9.022	0.943	25.270

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:35:18	0.198	-0.011	-0.012	100.795%	40.380	0.018	0.032	τ 108.009%	0.014	-0.036
2	01:35:22	0.178	-0.011	-0.009	100.688%	40.930	0.026	0.023	τ 107.191%	0.009	-0.038
3	01:35:26	0.195	-0.008	-0.008	101.565%	40.540	0.012	0.014	τ 108.613%	0.014	-0.039
x		0.190	-0.010	-0.009	101.016%	40.620	0.019	0.023	τ 107.938%	0.012	-0.038
σ		0.011	0.002	0.002	0.479%	0.282	0.007	0.009	τ 0.714%	0.003	0.002
%RSD		5.829	17.160	21.460	0.474	0.694	37.100	39.400	τ 0.661	26.120	4.098

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	01:35:18	0.010	τ 106.976%	-0.011
2	01:35:22	0.011	τ 107.646%	-0.011
3	01:35:26	0.010	τ 108.678%	-0.011
x		0.011	τ 107.767%	-0.011
σ		0.000	τ 0.858%	0.000
%RSD		2.725	τ 0.796	2.879

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:40:52	-0.015	-0.014	0.723	4299.000	2866.000	8.318	22.250	22220.000	1379.000	τ 1648000.000
2	01:40:56	-0.010	-0.028	1.008	4476.000	2898.000	8.512	20.820	22750.000	1334.000	τ 1649000.000
3	01:40:59	-0.010	-0.019	1.157	4417.000	2920.000	7.070	22.290	22890.000	1493.000	τ 1651000.000
x		-0.012	-0.020	0.963	4397.000	2895.000	7.966	21.790	22620.000	1402.000	τ 1649000.000
σ		0.003	0.007	0.220	90.180	27.230	0.783	0.839	354.300	81.830	τ 1252.000
%RSD		23.210	35.590	22.890	2.051	0.941	9.825	3.849	1.566	5.837	τ 0.076

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:40:52	TM 37940.000	433.200	101.140%	111.248%	2.501	-0.204	0.316	22.130	41.470	1.096
2	01:40:56	TM 39340.000	521.100	100.592%	112.831%	2.683	0.076	0.294	22.100	42.280	1.119
3	01:40:59	TM 38950.000	524.600	101.256%	112.108%	2.724	-0.113	0.304	22.900	43.520	1.141
x		TM 38740.000	493.000	100.996%	112.062%	2.636	-0.080	0.305	22.380	42.420	1.119
σ		TM 721.600	51.770	0.355%	0.792%	0.119	0.142	0.011	0.456	1.034	0.023
%RSD		TM 1.863	10.500	0.351	0.707	4.503	177.300	3.635	2.037	2.438	2.035

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:40:52	0.014	0.531	2.824	82.620	103.509%	-0.162	0.898	0.368	100.062%	0.020
2	01:40:56	0.012	0.647	2.811	84.960	102.464%	-0.187	1.010	0.323	100.908%	0.011
3	01:40:59	0.016	0.630	2.847	84.020	103.852%	-0.099	1.205	0.330	100.895%	0.024
x		0.014	0.603	2.827	83.870	103.275%	-0.149	1.038	0.340	100.622%	0.018
σ		0.002	0.063	0.018	1.175	0.723%	0.045	0.156	0.025	0.485%	0.007
%RSD		17.530	10.380	0.639	1.401	0.700	30.210	14.980	7.229	0.482	36.470

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:40:52	0.312	-0.013	-0.012	100.286%	41.390	0.015	0.139	τ 107.532%	0.027	-0.029
2	01:40:56	0.315	-0.010	-0.013	101.468%	41.040	0.020	0.167	τ 106.808%	0.032	-0.028
3	01:40:59	0.304	-0.011	-0.015	101.631%	41.210	0.019	0.140	τ 108.016%	0.040	-0.031
x		0.310	-0.012	-0.013	101.128%	41.210	0.018	0.148	τ 107.452%	0.033	-0.029
σ		0.006	0.001	0.001	0.734%	0.178	0.003	0.016	τ 0.608%	0.006	0.001
%RSD		1.834	11.770	11.410	0.726	0.432	15.950	10.710	τ 0.565	19.050	4.055

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	01:40:52	0.035	τ 105.968%	-0.011
2	01:40:56	0.032	τ 106.496%	-0.011
3	01:40:59	0.035	τ 107.739%	-0.011
x		0.034	τ 106.734%	-0.011
σ		0.002	τ 0.909%	0.000
%RSD		4.823	τ 0.852	0.635

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:46:25	175.300	171.500	182.100	T 15230.000	12530.000	9343.000	959.200	M 43020.000	1372.000	T 1768000.000
2	01:46:29	176.200	171.300	180.100	T 15220.000	12790.000	9466.000	949.100	M 43650.000	1451.000	T 1827000.000
3	01:46:33	175.500	172.600	176.600	T 14890.000	12900.000	9426.000	952.500	M 44120.000	1385.000	T 1858000.000
x		175.700	171.800	179.600	T 15120.000	12740.000	9412.000	953.600	M 43600.000	1403.000	T 1818000.000
σ		0.448	0.696	2.755	T 193.200	192.200	62.780	5.142	M 554.900	42.550	T 45920.000
%RSD		0.255	0.405	1.534	T 1.278	1.509	0.667	0.539	M 1.273	3.033	T 2.526

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:46:25	TM 82250.000	10540.000	103.750%	113.469%	196.000	195.500	200.000	-15.280	T 10350.000	198.300
2	01:46:29	TM 83160.000	10220.000	104.337%	114.043%	201.600	196.900	200.400	-21.180	T 10400.000	198.700
3	01:46:33	TM 82370.000	10610.000	105.182%	112.824%	199.200	198.500	200.200	-24.340	T 10370.000	197.900
x		TM 82590.000	10460.000	104.423%	113.446%	199.000	197.000	200.200	-20.270	T 10370.000	198.300
σ		TM 490.400	209.800	0.720%	0.610%	2.809	1.537	0.163	4.596	T 25.450	0.391
%RSD		TM 0.594	2.006	0.689	0.538	1.412	0.780	0.081	22.680	T 0.245	0.197

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:46:25	196.000	201.500	205.900	291.900	104.559%	207.600	202.900	199.000	98.733%	83.860
2	01:46:29	197.400	201.900	206.100	295.500	105.723%	208.100	203.600	199.600	101.484%	82.650
3	01:46:33	197.300	202.800	204.700	296.500	107.119%	206.700	203.100	200.500	102.101%	82.910
x		196.900	202.100	205.600	294.600	105.800%	207.500	203.200	199.700	100.773%	83.140
σ		0.785	0.661	0.761	2.446	1.282%	0.669	0.329	0.735	1.793%	0.637
%RSD		0.399	0.327	0.370	0.830	1.211	0.323	0.162	0.368	1.780	0.767

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:46:25	208.000	95.040	211.300	98.418%	212.100	206.100	195.900	T 103.992%	5.184	T 200.200
2	01:46:29	208.300	94.650	209.700	100.443%	210.900	205.200	194.000	T 106.580%	5.093	T 196.500
3	01:46:33	208.200	94.660	210.900	100.247%	211.700	209.200	193.700	T 107.469%	5.171	T 195.600
x		208.100	94.790	210.600	99.703%	211.600	206.800	194.500	T 106.014%	5.149	T 197.400
σ		0.161	0.223	0.821	1.116%	0.584	2.113	1.177	T 1.806%	0.049	T 2.387
%RSD		0.078	0.236	0.390	1.120	0.276	1.021	0.605	T 1.704	0.958	T 1.209

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	01:46:25	T 200.800	T 97.965%	T 208.700
2	01:46:29	T 199.400	T 100.571%	T 206.100
3	01:46:33	T 198.600	T 101.627%	T 203.600
x		T 199.600	T 100.054%	T 206.100
σ		T 1.090	T 1.885%	T 2.549
%RSD		T 0.546	T 1.884	T 1.237

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:51:59	2.305	0.110	39.300	TM 120800.000	10120.000	124.800	259.100	M 102200.000	5814.000	T 1675000.000
2	01:52:03	2.313	0.110	37.220	TM 123800.000	10260.000	120.900	257.500	M 103200.000	5987.000	T 1651000.000
3	01:52:06	2.175	0.118	37.720	TM 124300.000	10150.000	119.900	250.700	M 103900.000	5977.000	T 1649000.000
x		2.264	0.113	38.080	TM 123000.000	10180.000	121.900	255.800	M 103100.000	5926.000	T 1658000.000
σ		0.078	0.004	1.081	TM 1916.000	71.720	2.597	4.453	M 860.400	96.940	T 14170.000
%RSD		3.437	3.787	2.840	TM 1.558	0.705	2.131	1.741	M 0.834	1.636	T 0.855

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:51:59	TM 85290.000	M 33080.000	103.460%	114.380%	13.580	16.110	4.428	25.190	1008.000	116.800
2	01:52:03	TM 86730.000	M 32040.000	103.954%	114.297%	14.070	16.020	4.554	24.460	1005.000	117.000
3	01:52:06	TM 86830.000	M 32770.000	104.674%	115.746%	13.180	16.210	4.368	24.310	1008.000	116.400
x		TM 86280.000	M 32630.000	104.029%	114.808%	13.610	16.110	4.450	24.650	1007.000	116.800
σ		TM 857.800	M 535.700	0.611%	0.813%	0.448	0.091	0.095	0.475	1.897	0.299
%RSD		TM 0.994	M 1.642	0.587	0.709	3.293	0.567	2.133	1.926	0.188	0.256

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:51:59	4.891	21.660	TM 1004.000	M 1996.000	102.009%	226.300	59.080	T 364.400	104.529%	0.510
2	01:52:03	4.811	21.320	TM 995.200	M 1964.000	104.624%	223.600	59.520	T 367.200	105.919%	0.483
3	01:52:06	4.863	21.240	TM 1003.000	M 1996.000	103.012%	227.800	59.760	T 366.800	105.982%	0.531
x		4.855	21.400	TM 1001.000	M 1985.000	103.215%	225.900	59.450	T 366.100	105.477%	0.508
σ		0.041	0.226	TM 4.854	M 18.340	1.319%	2.145	0.345	T 1.495	0.821%	0.024
%RSD		0.840	1.054	TM 0.485	M 0.924	1.278	0.949	0.580	T 0.408	0.779	4.809

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:51:59	9.348	62.410	282.900	97.146%	42.200	0.527	14.820	T 104.592%	2.256	0.516
2	01:52:03	9.458	61.930	280.500	98.607%	41.900	0.495	14.730	T 105.782%	2.151	0.443
3	01:52:06	9.353	61.860	280.700	99.527%	41.820	0.452	14.650	T 106.886%	2.097	0.367
x		9.387	62.070	281.400	98.427%	41.970	0.492	14.730	T 105.753%	2.168	0.442
σ		0.062	0.303	1.313	1.201%	0.198	0.038	0.088	T 1.148%	0.081	0.075
%RSD		0.662	0.488	0.467	1.220	0.471	7.662	0.598	T 1.085	3.734	16.930

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	01:51:59	2.954	T 97.400%	0.888
2	01:52:03	2.886	T 98.562%	0.854
3	01:52:06	2.823	T 99.259%	0.799
x		2.888	T 98.407%	0.847
σ		0.065	T 0.939%	0.045
%RSD		2.261	T 0.954	5.273

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:57:33	-0.001	-0.015	0.827	3713.000	2780.000	8.154	50.260	19960.000	1405.000	τ 1793000.000
2	01:57:37	0.004	0.007	0.909	3865.000	2759.000	6.398	47.570	19990.000	1417.000	τ 1698000.000
3	01:57:40	-0.003	-0.015	1.029	3911.000	2780.000	8.450	46.170	19940.000	1493.000	τ 1738000.000
x		-0.000	-0.008	0.921	3830.000	2773.000	7.667	48.000	19960.000	1438.000	τ 1743000.000
σ		0.004	0.013	0.102	103.900	12.150	1.109	2.079	24.190	48.070	τ 47690.000
%RSD		2164.000	166.000	11.050	2.714	0.438	14.470	4.332	0.121	3.342	τ 2.736

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:57:33	TM 36880.000	1777.000	107.883%	116.751%	2.510	0.026	0.335	26.590	28.750	1.499
2	01:57:37	TM 37560.000	1891.000	109.663%	118.499%	2.278	0.075	0.297	26.980	29.360	1.477
3	01:57:40	TM 37950.000	1865.000	108.104%	118.596%	2.409	0.009	0.361	27.520	28.670	1.522
x		TM 37460.000	1844.000	108.550%	117.949%	2.399	0.037	0.331	27.030	28.930	1.499
σ		TM 536.600	59.820	0.970%	1.038%	0.116	0.034	0.032	0.468	0.377	0.023
%RSD		TM 1.432	3.243	0.894	0.880	4.841	93.170	9.778	1.730	1.302	1.527

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:57:33	0.023	0.351	2.971	98.210	109.705%	1.361	4.674	1.304	105.373%	0.038
2	01:57:37	0.020	0.276	2.988	96.780	110.201%	1.251	4.904	1.299	105.827%	0.033
3	01:57:40	0.026	0.334	3.029	97.610	109.573%	1.443	5.072	1.386	106.185%	0.033
x		0.023	0.320	2.996	97.530	109.826%	1.352	4.884	1.330	105.795%	0.035
σ		0.003	0.039	0.030	0.720	0.331%	0.096	0.200	0.049	0.407%	0.003
%RSD		14.700	12.240	0.995	0.738	0.301	7.135	4.091	3.667	0.384	8.504

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:57:33	0.106	0.007	0.034	105.247%	41.460	0.042	0.277	τ 112.065%	0.528	0.044
2	01:57:37	0.099	0.016	0.069	107.051%	41.320	0.033	0.291	τ 111.938%	0.543	0.042
3	01:57:40	0.111	0.017	0.091	105.577%	41.730	0.063	0.313	τ 112.764%	0.493	0.039
x		0.105	0.013	0.065	105.959%	41.500	0.046	0.294	τ 112.255%	0.521	0.042
σ		0.006	0.006	0.029	0.961%	0.213	0.015	0.018	τ 0.445%	0.026	0.002
%RSD		5.726	42.710	44.520	0.907	0.513	32.760	6.148	τ 0.396	4.938	5.958

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	01:57:33	0.101	τ 108.485%	-0.007
2	01:57:37	0.105	τ 108.829%	-0.004
3	01:57:40	0.108	τ 109.423%	-0.001
x		0.105	τ 108.912%	-0.004
σ		0.003	τ 0.474%	0.003
%RSD		3.079	τ 0.436	66.480

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	02:03:07	88.780	83.200	88.030	5319.000	4959.000	4696.000	4663.000	5063.000	161.600	↹2173000.000
2	02:03:11	88.550	85.350	93.380	5032.000	5032.000	4670.000	4642.000	5108.000	132.100	↹2275000.000
3	02:03:15	88.990	85.640	93.100	4945.000	5033.000	4731.000	4690.000	4940.000	142.900	↹2336000.000
x		88.770	84.730	91.500	5099.000	5008.000	4699.000	4665.000	5037.000	145.500	↹2261000.000
σ		0.223	1.333	3.014	196.200	42.180	30.620	24.190	86.910	14.930	↹82700.000
%RSD		0.252	1.573	3.294	3.847	0.842	0.652	0.519	1.726	10.260	↹3.657

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	02:03:07	4927.000	5348.000	106.656%	118.650%	98.740	99.250	101.400	9.605	5589.000	100.400
2	02:03:11	4827.000	5015.000	109.441%	118.854%	95.540	99.020	100.700	11.850	5662.000	98.600
3	02:03:15	4855.000	5147.000	110.233%	118.320%	97.950	99.330	100.200	11.860	5627.000	100.000
x		4870.000	5170.000	108.776%	118.608%	97.410	99.200	100.800	11.100	5626.000	99.680
σ		51.940	167.700	1.879%	0.269%	1.670	0.161	0.620	1.298	36.480	0.954
%RSD		1.067	3.244	1.727	0.227	1.714	0.162	0.615	11.690	0.649	0.957

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	02:03:07	100.300	102.800	103.900	104.500	111.198%	99.850	94.270	99.420	103.005%	100.900
2	02:03:11	101.500	102.700	104.500	105.800	110.099%	101.600	96.590	99.440	104.592%	98.300
3	02:03:15	101.300	102.300	104.000	106.400	110.486%	102.200	97.450	99.720	105.111%	99.090
x		101.000	102.600	104.100	105.600	110.594%	101.200	96.100	99.530	104.236%	99.420
σ		0.632	0.264	0.336	0.952	0.557%	1.223	1.648	0.166	1.097%	1.312
%RSD		0.625	0.258	0.323	0.902	0.504	1.208	1.714	0.167	1.053	1.320

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	02:03:07	104.000	52.500	103.500	103.395%	102.200	100.800	97.900	↹108.429%	5.114	↹102.900
2	02:03:11	103.500	52.320	103.900	103.701%	100.900	102.400	96.610	↹110.033%	5.079	↹99.520
3	02:03:15	104.600	51.960	103.800	104.430%	101.700	102.000	96.290	↹110.552%	5.186	↹99.970
x		104.000	52.260	103.700	103.842%	101.600	101.700	96.930	↹109.671%	5.126	↹100.800
σ		0.550	0.272	0.207	0.532%	0.649	0.853	0.849	↹1.106%	0.054	↹1.806
%RSD		0.529	0.520	0.200	0.512	0.639	0.839	0.876	↹1.009	1.063	↹1.792

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	02:03:07	↹101.700	↹104.624%	↹101.800
2	02:03:11	↹99.500	↹106.878%	↹99.580
3	02:03:15	↹100.200	↹106.670%	↹99.110
x		↹100.500	↹106.057%	↹100.200
σ		↹1.104	↹1.246%	↹1.443
%RSD		↹1.099	↹1.175	↹1.440

39996_3361_CCB7 10/9/2012 2:08:37 AM

User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	02:08:41	0.051	0.008	-0.129	6.751	4.319	3.151	2.677	5.330	208.100	↹2152000.000
2	02:08:44	0.049	0.021	0.196	4.155	3.624	2.551	4.262	4.446	151.800	↹2153000.000
3	02:08:48	0.042	0.021	-0.308	2.771	1.582	2.271	-0.098	1.646	142.500	↹2164000.000
x		0.047	0.017	-0.080	4.559	3.175	2.657	2.280	3.808	167.500	↹2156000.000
σ		0.005	0.007	0.256	2.021	1.423	0.450	2.207	1.923	35.520	↹6640.000
%RSD		10.120	44.370	318.900	44.320	44.810	16.920	96.790	50.510	21.210	↹0.308

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	02:08:41	-10.560	15.790	104.184%	115.447%	0.079	0.034	0.008	31.230	3.854	0.092
2	02:08:44	-24.230	30.470	107.443%	117.144%	0.189	0.036	0.034	30.630	4.062	0.072
3	02:08:48	-17.760	-9.317	107.302%	117.683%	0.034	0.062	0.012	30.900	3.533	0.067
x		-17.520	12.320	106.310%	116.758%	0.100	0.044	0.018	30.920	3.816	0.077
σ		6.840	20.120	1.842%	1.167%	0.080	0.016	0.014	0.300	0.267	0.013
%RSD		39.050	163.400	1.733	0.999	79.540	35.900	77.430	0.971	6.985	17.250

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	02:08:41	0.068	0.071	0.102	-0.032	107.407%	0.150	-0.263	0.075	103.001%	0.053
2	02:08:44	0.057	0.065	0.093	0.011	107.433%	0.037	-0.106	0.066	104.080%	0.043
3	02:08:48	0.059	0.084	0.090	0.001	106.837%	0.101	-0.156	0.058	104.117%	0.052
x		0.061	0.074	0.095	-0.007	107.226%	0.096	-0.175	0.066	103.732%	0.049
σ		0.006	0.010	0.006	0.022	0.337%	0.057	0.080	0.009	0.634%	0.005
%RSD		10.360	13.490	6.848	336.300	0.314	58.890	45.780	12.940	0.611	11.160

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	02:08:41	0.109	0.034	0.062	102.543%	0.054	0.071	0.081	↹108.351%	0.024	0.179
2	02:08:44	0.103	0.028	0.081	103.074%	0.047	0.077	0.046	↹109.712%	0.020	0.163
3	02:08:48	0.083	0.023	0.063	103.430%	0.067	0.068	0.059	↹109.611%	0.020	0.144
x		0.098	0.028	0.069	103.016%	0.056	0.072	0.062	↹109.225%	0.021	0.162
σ		0.014	0.006	0.011	0.446%	0.010	0.004	0.018	↹0.759%	0.003	0.018
%RSD		13.710	20.740	15.350	0.433	18.400	6.038	28.690	↹0.694	12.550	10.830

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	02:08:41	0.069	↹105.861%	0.062
2	02:08:44	0.060	↹107.365%	0.057
3	02:08:48	0.057	↹107.468%	0.060
x		0.062	↹106.898%	0.059
σ		0.006	↹0.900%	0.003
%RSD		9.762	↹0.842	4.226

Pace Analytical® Prep Log Report

Batch Information: MPRP 7574

Template Version: F-GB-M-035-Rev.00 (25Apr2011)

Prep Method	EPA 3050B
Extracted By Date	10/05/2012 08:30:00
Correction Factor (C)	+0.3
Digestion Vessel Lot	J147452-263
Batch Notes	HBN 117566

Analysis Method	6020
Balance ID	2301449
Corrected Temp. (C)	93.6
Metals Pipette 1	eppendorf 0.1-1.0mL 1638829
Reviewed By	DSI

Extracted By	MMZ
Block ID	40HB07
Acceptance Range	95+/-5 C
Metals Pipette 2	eppendorf 20-200uL 4443988
Reviewed By Date	10/8/12

Solid Matrix Lot	N/A
Block Temp (C)	93.3
Thermometer ID	102090775
Metals Pipette 3	Finnpipette 50uL F87410

Sample Information:

QC Rule	Sample Type	Lab Sample ID	Matrix	Initial Weight (g)	1:1 HNO3 (mL)	H2O2 (mL)	Conc. HCL (mL)	Final Volume (mL)	Due Date	Sample Notes	MDL / EQL	6000-SPKB (mL)	6000-SPKB2 (mL)	6000-SPKB3 (mL)
6020 T_P	BLANK	686525	Tissue	.5	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012		J			
6020 T_P	SBLK	686527	Tissue	.5	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012		J			
6020 T_P	LCS	686526	Tissue	.5	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012		J	39700 (1)	33986 (0)	36269 (1)
6020 T_P	SRM	686528	Tissue	.5	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012	34855	J			
6020 T_P	PS	4067362001	Tissue	0.501	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012	P / QC4	J			
6020 T_P	MS	686529	Tissue	0.503	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012		J	39700 (1)	33986 (0)	36269 (1)
6020 T_P	MSD	686530	Tissue	0.501	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012		J	39700 (1)	33986 (0)	36269 (1)
6020 T_P	PS	4067362002	Tissue	0.55	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012		J			
6020 T_P	PS	4067362003	Tissue	0.599	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012		J			
6020 T_P	PS	4067362004	Tissue	0.514	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012		J			
6020 T_P	PS	4067362005	Tissue	0.508	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012		J			
6020 T_P	PS	4067362006	Tissue	0.513	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012		J			
6020 T_P	PS	4067362007	Tissue	0.508	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012		J			
6020 T_P	PS	4067362008	Tissue	0.519	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012		J			
6020 T_P	PS	4067362009	Tissue	0.519	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012		J			
6020 T_P	PS	4067362010	Tissue	0.548	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012		J			
6020 T_P	PS	4067362011	Tissue	0.557	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012		J			
6020 T_P	PS	4067362012	Tissue	0.536	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012		J			
6020 T_P	PS	4067362013	Tissue	0.546	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012		J			
6020 T_P	PS	4067362014	Tissue	0.506	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012		J			
6020 T_P	PS	4067362015	Tissue	0.511	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012		J			
6020 T_P	PS	4067362016	Tissue	0.587	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012		J			

QC Rule	Sample Type	Lab Sample ID	Matrix	Initial Weight (g)	1:1 HNO3 (mL)	H2O2 (mL)	Conc. HCL (mL)	Final Volume (mL)	Due Date	Sample Notes	MDL / EQL	6000-SPKB (mL)	6000-SPKB2 (mL)	6000-SPKB3 (mL)
6020 T_P	PS	**4067362017**	Tissue	0.561	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012		J			
6020 T_P	PS	**4067362018**	Tissue	0.535	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012		J			

Standard Notes:

33986: Biota Spike 2 36269: Biota Spike Silver 39700: ICPMS Biota Spike Made 05/04/2012 MMZ

Fri, 5 Oct 2012 14:39:05 -0500

SRM Std # 34855
LAB 10/11/12

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #995, DI WATER

SOLVENT

Created By:	CCR	**Volume of Standard:**	1000000 mL	**Lot ID:**	NA
Created:	04/23/2010 14:04	**Manufacturer:**	DI WATER	**Part ID:**	N/A
Expires:	01/01/2040	**Manufacturer Lot ID:**	NanoPure Water	**Standard ID:**	NanoPure H20

Notes: DI WATER

Compound Name and Concentration for Standard #995

Compound Name	Concentration	Compound Name	Concentration
Water	mg/L		

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #1256, Barium Stock Standard - Rec'd 12/20/09,

STOCK STANDARD

Created By: CB
Created: 09/08/2000 15:25
Expires: 12/31/2015

Volume of Standard: 125 mL
Manufacturer: Ultra SCientific
Manufacturer Lot ID: 1209-4120-8

Lot ID: 40147
Part ID: ICP-056
Standard ID: Ba-STK

Notes: Barium Stock Standard - Rec'd 12/20/09, Open 12/29/09, DLB

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4000c/40147_COA.pdf

Compound Name and Concentration for Standard #1256

Compound Name	Concentration	Compound Name	Concentration
Barium	1000 ug/mL		

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

1209-4020-8

ULTRAgrade™ Solution
Barium ICP Standard
1000 µg/mL

Catalog Number: ICP-056
Lot Number: J01041
Job Number: J00009002
Lot Issue Date: 10/27/2008
Expiration Date: 12/31/2015

Starting Material:	Barium Nitrate
Starting Material Purity:	99.999%
Starting Material Lot No.:	NT04674
Matrix:	2% nitric acid in low TOC water (< 50 ppb)
Atomic Weight Ba:	137.36

Certified Value: 1002 ± 2 µg/mL

This Certified Reference Material (CRM) was manufactured and verified in accordance with ULTRA's ISO 9001:2000 registered quality system, and the analyte concentrations were verified by our ISO 17025 accredited laboratory. The certified value and uncertainty value, at the 95% confidence level, for each analyte determined gravimetrically.

Classical Wet Assay Method: Theoretical, based on gravimetric measurements

Confirmation by Inductively Coupled Plasma Spectroscopy (ICP / ICP-MS) vs. NIST SRM 3104a

ULTRA uses purified acids, 18 megohm double deionized water, calibrated Class A glassware & meticulously cleaned bottles in the manufacturing of ULTRAgrade standards. Balances used in the manufacturing of this standard are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001

Trace Metallic Impurities in Solution Standard in µg/mL:

100147
REC. 09/08/10 BY CB
Exp. --/--/-- By --
Open --/--/-- By --

SHL #1290

*	Al	<0.005	ND	*	Ga	<0.005	ND	n	Nb			n	S		
*	Sb	<0.005	ND	n	Ge			n	Os			n	Ta		
*	As	<0.005	ND	n	Au			*	Pd	<0.005	ND	n	Te		
s	Ba			n	Hf			*	P	<0.005	ND	n	Tb		
*	Be	<0.005	ND	n	Ho			*	Pt	<0.005	ND	*	Tl	<0.005	ND
*	Bi	<0.005	ND	*	In	<0.005	ND	*	K	<0.005	ND	n	Th		
*	B	<0.005	ND	n	Ir			n	Pr			n	Tm		
*	Cd	<0.005	ND	*	Fe	<0.005	ND	n	Re			*	Sn	<0.005	ND
*	Ca	<0.005	ND	*	La	<0.005	ND	n	Rh			*	Ti	<0.005	ND
n	Ce			*	Pb	<0.005	ND	n	Rb			n	W		
n	Cs			*	Li	<0.005	ND	n	Ru			n	U		
*	Cr	<0.005	ND	n	Lu			n	Sm			*	V	<0.005	ND
*	Co	<0.005	ND	*	Mg	<0.005	ND	n	Sc			n	Yb		
*	Cu	<0.005	ND	*	Mn	<0.005	ND	*	Se	<0.005	ND	n	Y		
n	Dy			*	Hg	<0.005	ND	*	Si	<0.005	ND	*	Zn	<0.005	ND
*	Er	<0.005	ND	*	Mo	<0.005	ND	*	Ag	<0.005	ND	n	Zr		
*	Eu	<0.005	ND	n	Nd			*	Na	<0.005	ND				
*	Gd	<0.005	ND	*	Ni	<0.005	ND	*	Sr	<0.010	D				

* - element checked for
ND - not detected
i - spectral interference
D - detected
n - not checked for
s - solution standard element

Density of Solution (measured at 23.0°C ± 0.5°C): 1.007 g/mL

ACCREDITED

ISO 17025:2005
Accredited
A2LA
Cert. No. 0851.01

ISO 9001:2000
Registered
TUV USA, Inc.
Cert. No. 09-1009

250 Smith Street, North Kingstown, RI 02852 USA
401-294-9400 Fax: 401-295-2330
www.ultrasci.com

See Reverse For Additional Information

William J. Leary
Quality Assurance Manager

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #1257, Boron Stock Standard - Rec'd 5/10/10, Op

Pace Analytical®
www.pacelabs.com

STOCK STANDARD

Created By: CB
Created: 09/08/2000 15:28
Expires: 09/30/2015

Volume of Standard: 125 mL
Manufacturer: Ultra SCientific
Manufacturer Lot ID: J00705

Lot ID: 40149
Part ID: ICP-005
Standard ID: B-STK

Notes: Boron Stock Standard - Rec'd 5/10/10, Open 06/02/10, DMS

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4000c/40149_COA.pdf

Compound Name and Concentration for Standard #1257

Compound Name	Concentration	Compound Name	Concentration
Boron	1000 ug/mL		

5-10-10

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

0510-4020-4

ULTRAgrade™ Solution
Boron ICP Standard
1000 µg/mL

Catalog Number: ICP-005
Lot Number: J00705
Job Number: J00008574
Lot Issue Date: 07/21/2008
Expiration Date: 09/30/2015

Starting Material:	Boric Acid
Starting Material Purity:	99.999%
Starting Material Lot No.:	BH00305
Matrix:	2% ammonium hydroxide in low TOC water (< 50 ppb)
Atomic Weight B:	10.82

Certified Value: 1002 ± 2 µg/mL

This Certified Reference Material (CRM) was manufactured and verified in accordance with ULTRA's ISO 9001:2000 registered quality system, and the analyte concentrations were verified by our ISO 17025 accredited laboratory. The certified value and uncertainty value, at the 95% confidence level, for each analyte determined gravimetrically.

Classical Wet Assay Method: Theoretical, based on gravimetric measurements

Confirmation by Inductively Coupled Plasma Spectroscopy (ICP / ICP-MS) vs. NIST SRM 3107

ULTRA uses purified acids, 18 megohm double deionized water, calibrated Class A glassware & meticulously cleaned bottles in the manufacturing of ULTRAgrade standards. Balances used in the manufacturing of this standard are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001

Trace Metallic Impurities in Solution Standard in µg/mL:

*	Al	<0.005	ND	*	Ga	<0.005	ND	n	Nb			n	S		
*	Sb	<0.005	ND	n	Ge			n	Os			n	Ta		
*	As	<0.005	ND	n	Au			*	Pd	<0.005	ND	n	Te		
*	Ba	<0.005	ND	n	Hf			*	P	<0.005	ND	n	Tb		
*	Be	<0.005	ND	n	Ho			*	Pt	<0.005	ND	*	Tl	<0.005	ND
*	Bi	<0.005	ND	*	In	<0.005	ND	*	K	<0.005	ND	n	Th		
s	B			n	Ir			n	Pr			n	Tm		
*	Cd	<0.005	ND	*	Fe	<0.005	ND	n	Re			*	Sn	<0.005	ND
*	Ca	<0.005	ND	*	La	<0.005	ND	n	Rh			*	Ti	<0.005	ND
n	Ce			*	Pb	<0.005	ND	n	Rb			n	W		
n	Cs			*	Li	<0.005	ND	n	Ru			n	U		
*	Cr	<0.005	ND	n	Lu			n	Sm			*	V	<0.005	ND
*	Co	<0.005	ND	*	Mg	<0.005	ND	n	Sc			n	Yb		
*	Cu	<0.005	ND	*	Mn	<0.005	ND	*	Se	<0.005	ND	n	Y		
n	Dy			*	Hg	<0.005	ND	*	Si	<0.005	ND	*	Zn	<0.005	ND
*	Er	<0.005	ND	*	Mo	<0.005	ND	*	Ag	<0.005	ND	n	Zr		
*	Eu	<0.005	ND	n	Nd			*	Na	<0.005	ND				
*	Gd	<0.005	ND	*	Ni	<0.005	ND	*	Sr	<0.005	ND				

100149
REC. 09/08/15 BY CB
Exp. --/--/-- By --
Open --/--/-- By --

STK #1257

* - element checked for
ND - not detected
i - spectral interference
D - detected
n - not checked for
s - solution standard element

Density of Solution (measured at 22.0°C ± 0.5°C): 0.998 g/mL

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William J. Leary
Quality Assurance Manager

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #1270, Cerium Stock Standard - Rec'd 8/18/09, O

STOCK STANDARD

Created By: CB
Created: 09/08/2000 15:47
Expires: 05/31/2016

Volume of Standard: 125 mL
Manufacturer: Ultra SCientific
Manufacturer Lot ID: K00331

Lot ID: 40155
Part ID: ICP-058
Standard ID: Ce-STK

Notes: Cerium Stock Standard - Rec'd 8/18/09, Open 09/29/09, DMS

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4000c/40155_COA.pdf

Compound Name and Concentration for Standard #1270

Compound Name	Concentration	Compound Name	Concentration
Cerium	1000 ug/mL		

ULTRA SCIENTIFIC
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Certificate of Analysis

0809-4020-5

ULTRAgrade™ Solution
Cerium ICP Standard
1000 µg/mL

Catalog Number: ICP-058
Lot Number: K00331
Job Number: J00009642
Lot Issue Date: 04/08/2009
Expiration Date: 05/31/2016

Starting Material:	Cerium Nitrate
Starting Material Purity:	99.995%
Starting Material Lot No.:	BH01247
Matrix:	1% nitric acid in low TOC water (< 50 ppb)
Atomic Weight Ce:	140.13

Certified Value: 1000 ± 2 µg/mL

This Certified Reference Material (CRM) was manufactured and verified in accordance with ULTRA's ISO 9001 registered quality system. The analyte concentrations were verified by our ISO 17025 accredited laboratory to be within ± 2.5%, when compared to calibration standards independently prepared using NIST SRM(s). The certified value and uncertainty value for each analyte is determined gravimetrically.

Classical Wet Assay Method: Theoretical, based on gravimetric measurements

Confirmation by Inductively Coupled Plasma Spectroscopy (ICP / ICP-MS) vs. NIST SRM 3110

ULTRA uses purified acids, 18 megohm double deionized water, calibrated Class A glassware & meticulously cleaned bottles in the manufacturing of ULTRAgrade standards. Balances used in the manufacturing of this standard are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001

Trace Metallic Impurities in Solution Standard in µg/mL:

*	Al	<0.005	ND	*	Ga	<0.005	ND	n	Nb			n	S		
*	Sb	<0.005	ND	n	Ge			n	Os			n	Ta		
*	As	<0.005	ND	n	Au			*	Pd	<0.005	ND	n	Te		
*	Ba	<0.005	ND	n	Hf			*	P	<0.005	ND	n	Tb		
*	Be	<0.005	ND	n	Ho			*	Pt	<0.005	ND	*	Tl	<0.005	ND
*	Bi	<0.005	ND	*	In	<0.005	ND	*	K	<0.005	ND	n	Th		
*	B	<0.005	ND	n	Ir			n	Pr			n	Tm		
*	Cd	<0.005	ND	*	Fe	<0.005	ND	n	Re			*	Sn	<0.005	ND
*	Ca	<0.010	D	*	La	<0.005	ND	n	Rh			*	Ti	<0.005	ND
s	Ce			*	Pb	<0.005	ND	n	Rb			n	W		
n	Cs			*	Li	<0.005	ND	n	Ru			n	U		
*	Cr	<0.005	ND	n	Lu			n	Sm			*	V	<0.005	ND
*	Co	<0.005	ND	*	Mg	<0.005	ND	n	Sc			n	Yb		
*	Cu	<0.005	ND	*	Mn	<0.005	ND	*	Se	<0.005	ND	n	Y		
n	Dy			*	Hg	<0.005	ND	*	Si	<0.005	ND	*	Zn	<0.005	ND
*	Er	<0.005	ND	*	Mo	<0.005	ND	*	Ag	<0.005	ND	n	Zr		
*	Eu	<0.005	ND	n	Nd			*	Na	<0.005	ND				
*	Gd	<0.005	ND	*	Ni	<0.005	ND	*	Sr	<0.005	ND				

* - element checked for
ND - not detected

i - spectral interference
D - detected

n - not checked for
s - solution standard element

100155
REC. 09/08/10 BY CB
Exp. __/__/__ By --
Open __/__/__ By --

SAL # 1270

Density of Solution (measured at 23.5 ± 0.5°C): 1.006 g/mL

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See Reverse For Additional Information

William J. Leary
Quality Assurance Manager

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #1285, Lead Stock Standard - Rec'd 2/26/10, Ope

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STOCK STANDARD

Created By: CB
Created: 09/08/2000 16:25
Expires: 08/31/2016

Volume of Standard: 125 mL
Manufacturer: Ultra Scientific
Manufacturer Lot ID: K00652

Lot ID: 40169
Part ID: ICP-082
Standard ID: Pb-STK

Notes: Lead Stock Standard - Rec'd 2/26/10, Open 03/31/10, MES

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4000c/40169_COA.pdf

Compound Name and Concentration for Standard #1285

Compound Name	Concentration	Compound Name	Concentration
Lead	1000 ug/mL		

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Certificate of Analysis

0310-4020-1

ULTRAgrade™ Solution
Lead ICP Standard
1000 µg/mL

Catalog Number: ICP-082
Lot Number: K00652
Job Number: J00010047
Lot Issue Date: 07/05/2009
Expiration Date: 08/31/2016

Starting Material:	Lead (II) Nitrate
Starting Material Purity:	99.999%
Starting Material Lot No.:	NT02988
Matrix:	2% nitric acid in low TOC water (< 50 ppb)
Atomic Weight Pb:	207.21

Certified Value: 1001 ± 2 µg/mL

This Certified Reference Material (CRM) was manufactured and verified in accordance with ULTRA's ISO 9001 registered quality system. The analyte concentrations were verified by our ISO 17025 accredited laboratory to be within ± 2.5%, when compared to calibration standards independently prepared using NIST SRM(s). The certified value and uncertainty value for each analyte is determined gravimetrically.

Classical Wet Assay Method: Theoretical, based on gravimetric measurements

Confirmation by Inductively Coupled Plasma Spectroscopy (ICP / ICP-MS) vs. NIST SRM 3128

ULTRA uses purified acids, 18 megohm double deionized water, calibrated Class A glassware & meticulously cleaned bottles in the manufacturing of ULTRAgrade standards. Balances used in the manufacturing of this standard are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001.

Trace Metallic Impurities in Solution Standard in µg/mL:

*	Al	<0.005	ND	*	Ga	<0.005	ND	n	Nb			n	S				
*	Sb	<0.005	ND	n	Ge			n	Os			n	Ta				
*	As	<0.005	ND	n	Au			*	Pd	<0.005	ND	n	Te				
*	Ba	<0.005	ND	n	Hf			*	P	<0.005	ND	n	Tb				
*	Be	<0.005	ND	n	Ho			*	Pt	<0.005	ND	*	Tl	<0.005	ND		
*	Bi	<0.005	ND	*	In	<0.005	ND	*	K	<0.005	ND	n	Th				
*	B	<0.005	ND	n	Ir			n	Pr			n	Tm				
*	Cd	<0.005	ND	*	Fe	<0.005	ND	n	Re			*	Sn	<0.005	ND		
*	Ca	<0.005	D	*	La	<0.005	ND	n	Rh			*	Ti	<0.005	ND		
n	Ce			s	Pb			n	Rb			n	W				
n	Cs			*	Li	<0.005	ND	n	Ru			n	U				
*	Cr	<0.005	ND	n	Lu			n	Sm			*	V	<0.005	ND		
*	Co	<0.005	ND	*	Mg	<0.005	ND	n	Sc			n	Yb				
*	Cu	<0.005	D	*	Mn	<0.005	ND	*	Se	<0.005	ND	n	Y				
n	Dy			*	Hg	<0.005	ND	*	Si	<0.005	ND	*	Zn	<0.005	D		
*	Er	<0.005	ND	*	Mo	<0.005	ND	*	Ag	<0.005	ND	n	Zr				
*	Eu	<0.005	ND	n	Nd			*	Na	<0.005	ND						
*	Gd	<0.005	ND	*	Ni	<0.005	ND	*	Sr	<0.005	ND						

* - element checked for
ND - not detected
i - spectral interference
D - detected
n - not checked for
s - solution standard element

100169
REC. 09/08/10 BY CB
Exp --/--/-- By --
Open --/--/-- By --

Stir #1283

Density of Solution (measured at 22.0°C ± 0.5°C): 1.010 g/mL

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See Reverse For Additional Information

William J. Leary
Quality Assurance Manager

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #1287, Phosphorus Secondary Standard - Rec

STOCK STANDARD

Created By: CB
Created: 09/08/2000 16:31
Expires: 12/31/2015

Volume of Standard: 125 mL
Manufacturer: Ultra Scientific
Manufacturer Lot ID: J01102

Lot ID: 40171
Part ID: ICP-015
Standard ID: P-SPK

Notes: Phosphorus Secondary Standard - Rec 2/4/10, Open 04/22/10, DMS

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4000c/40171_COA.pdf

Compound Name and Concentration for Standard #1287

Compound Name	Concentration	Compound Name	Concentration
Phosphorus	1000 ug/mL		

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Certificate of Analysis

Rec. 2/4/10

0210-4020-3

ULTRAgrade™ Solution
Phosphorus ICP Standard
1000 µg/mL

Catalog Number: ICP-015
Lot Number: J01102
Job Number: J00008998
Lot Issue Date: 11/17/2008
Expiration Date: 12/31/2015

Starting Material:	Ammonium Dihydrogen Phosphate
Starting Material Purity:	99.999%
Starting Material Lot No.:	BH00744
Matrix:	2% nitric acid in low TOC water (< 50 ppb)
Atomic Weight P:	30.98

Certified Value: 1001 ± 2 µg/mL

This Certified Reference Material (CRM) was manufactured and verified in accordance with ULTRA's ISO 9001:2000 registered quality system, and the analyte concentrations were verified by our ISO 17025 accredited laboratory. The certified value and uncertainty value, at the 95% confidence level, for each analyte determined gravimetrically.

Classical Wet Assay Method: Theoretical, based on gravimetric measurements

Confirmation by Inductively Coupled Plasma Spectroscopy (ICP / ICP-MS) vs. NIST SRM 3139a

ULTRA uses purified acids, 18 megohm double deionized water, calibrated Class A glassware & meticulously cleaned bottles in the manufacturing of ULTRAgrade standards. Balances used in the manufacturing of this standard are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001

Trace Metallic Impurities in Solution Standard in µg/mL:

*	Al	<0.005	D	*	Ga	<0.005	ND	n	Nb			n	S		
*	Sb	<0.005	ND	n	Ge			n	Os			n	Ta		
*	As	<0.005	ND	n	Au			*	Pd	<0.005	ND	n	Te		
*	Ba	<0.005	D	n	Hf			s	P			n	Tb		
*	Be	<0.005	ND	n	Ho			*	Pt	<0.005	ND	*	Tl	<0.005	ND
*	Bi	<0.005	ND	*	In	<0.005	ND	*	K	<0.005	ND	n	Th		
*	B	<0.005	ND	n	Ir			n	Pr			n	Tm		
*	Cd	<0.005	ND	*	Fe	<0.005	D	n	Re			*	Sn	<0.005	ND
*	Ca	<0.005	D	*	La	<0.005	ND	n	Rh			*	Ti	<0.005	D
n	Ce			*	Pb	<0.005	ND	n	Rb			n	W		
n	Cs			*	Li	<0.005	ND	n	Ru			n	U		
*	Cr	<0.010	D	n	Lu			n	Sm			*	V	<0.005	ND
*	Co	<0.005	ND	*	Mg	<0.005	D	n	Sc			n	Yb		
*	Cu	<0.005	D	*	Mn	<0.005	ND	*	Se	<0.005	ND	n	Y		
n	Dy			*	Hg	<0.005	ND	*	Si	<0.005	D	*	Zn	<0.005	ND
*	Er	<0.005	ND	*	Mo	<0.005	ND	*	Ag	<0.005	ND	n	Zr		
*	Eu	<0.005	ND	n	Nd			*	Na	<0.005	D				
*	Gd	<0.005	ND	*	Ni	<0.005	ND	*	Sr	<0.005	ND				

* - element checked for
ND - not detected

i - spectral interference
D - detected

n - not checked for
s - solution standard element

100171
REC.09/08/10 BY CB
Exp. --/--/-- By --
Open --/--/-- By --

Density of Solution (measured at 22.5°C ± 0.5°C): 1.014 g/mL

STK #1287

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See Reverse For Additional Information

William J. Leary
Quality Assurance Manager

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #1295, Silicon Secondary Stock Standard - Rec

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STOCK STANDARD

Created By: CB
Created: 09/08/2000 16:46
Expires: 07/31/2016

Volume of Standard: 125 mL
Manufacturer: Ultra Scientific
Manufacturer Lot ID: K00574

Lot ID: 40178
Part ID: ICP-014
Standard ID: Si-SPK

Notes: Silicon Secondary Stock Standard - Rec 02/04/10, Open 04/22/10, DMS

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4000c/40178_COA.pdf

Compound Name and Concentration for Standard #1295

Compound Name	Concentration	Compound Name	Concentration
Silicon	1000 ug/mL		

ULTRA SCIENTIFIC
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Certificate of Analysis

Rec. 2/4/10

0210-4020-4

ULTRAgrade™ Solution
Silicon ICP Standard
1000 µg/mL

Catalog Number: ICP-014
Lot Number: K00574
Job Number: J00009811
Lot Issue Date: 06/15/2009
Expiration Date: 07/31/2016

Starting Material:	Ammonium Hexafluorosilicate
Starting Material Purity:	99.999%
Starting Material Lot No.:	BH00960
Matrix:	2% nitric acid, with trace HF, in low TOC water (< 50 ppb)
Atomic Weight Si:	28.09

Certified Value: 1001 ± 2 µg/mL

This Certified Reference Material (CRM) was manufactured and verified in accordance with ULTRA's ISO 9001 registered quality system. The analyte concentrations were verified by our ISO 17025 accredited laboratory to be within ± 2.5%, when compared to calibration standards independently prepared using NIST SRM(s). The certified value and uncertainty value for each analyte is determined gravimetrically.

Classical Wet Assay Method: Theoretical, based on gravimetric measurements

Confirmation by Inductively Coupled Plasma Spectroscopy (ICP / ICP-MS) vs. NIST SRM 3150

ULTRA uses purified acids, 18 megohm double deionized water, calibrated Class A glassware & meticulously cleaned bottles in the manufacturing of ULTRAgrade standards. Balances used in the manufacturing of this standard are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001.

Trace Metallic Impurities in Solution Standard in µg/mL:

*	Al	<0.005	D	*	Ga	<0.005	ND	n	Nb			n	S		
*	Sb	<0.005	ND	n	Ge			n	Os			n	Ta		
*	As	<0.005	ND	n	Au			*	Pd	<0.005	ND	n	Te		
*	Ba	<0.005	ND	n	Hf			*	P	<0.005	ND	n	Tb		
*	Be	<0.005	ND	n	Ho			*	Pt	<0.005	ND	*	Tl	<0.005	ND
*	Bi	<0.005	ND	*	In	<0.005	ND	*	K	<0.005	ND	n	Th		
*	B	<0.005	ND	n	Ir			n	Pr			n	Tm		
*	Cd	<0.005	ND	*	Fe	<0.005	D	n	Re			*	Sn	<0.005	ND
*	Ca	<0.005	D	*	La	<0.005	ND	n	Rh			*	Ti	<0.005	D
n	Ce			*	Pb	<0.005	ND	n	Rb			n	W		
n	Cs			*	Li	<0.005	ND	n	Ru			n	U		
*	Cr	<0.005	ND	n	Lu			n	Sm			*	V	<0.005	ND
*	Co	<0.005	ND	*	Mg	<0.005	D	n	Sc			n	Yb		
*	Cu	<0.005	ND	*	Mn	<0.005	ND	*	Se	<0.005	ND	n	Y		
n	Dy			*	Hg	<0.005	ND	s	Si			*	Zn	<0.005	ND
*	Er	<0.005	ND	*	Mo	<0.005	ND	*	Ag	<0.005	ND	n	Zr		
*	Eu	<0.005	ND	n	Nd			*	Na	<0.005	ND				
*	Gd	<0.005	ND	*	Ni	<0.005	ND	*	Sr	<0.005	ND				

* - element checked for
ND - not detected

i - spectral interference
D - detected

n - not checked for
s - solution standard element

100178
REC. 09/08/10 BY CB
Exp. __/__/__ By __
Open __/__/__ By __

Density of Solution (measured at 21.0°C ± 0.5°C): 1.010 g/mL

STK #1295

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See Reverse For Additional Information

William J. Leary
Quality Assurance Manager

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #4891, Nickel Stock Standard - Rec 09/10/10, Op

STOCK STANDARD

Created By: CCR
Created: 03/08/2011 12:59
Expires: 09/30/2016

Volume of Standard: 125 mL
Manufacturer: ULTRA SCIENTIFIC
Manufacturer Lot ID: K00853

Lot ID: 40780
Part ID: ICP-028
Standard ID: Ni-STK

Notes: Nickel Stock Standard - Rec 09/10/10, Open 11/1/10, DMS

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4000c/40780_COA.pdf

Compound Name and Concentration for Standard #4891

Compound Name	Concentration	Compound Name	Concentration
Nickel	1000 ug/mL		

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ULTRAgrade™ Solution
Nickel ICP Standard
1000 µg/mL

Rec. 9/10/10

0910-4020-10

Catalog Number: ICP-028
Lot Number: K00853
Job Number: J00010203
Lot Issue Date: 08/17/2009
Expiration Date: 09/30/2016

40780
REC. 03/08/11 BY CCI
Exp. __/__/__ By __
Open __/__/__ By __

Starting Material:	Nickel (II) Nitrate Hexahydrate
Starting Material Purity:	99.999%
Starting Material Lot No.:	BH01230
Matrix:	2% nitric acid in low TOC water (< 50 ppb)
Atomic Weight Ni:	58.71

Certified Value: 1001 ± 2 µg/mL

This Certified Reference Material (CRM) was manufactured and verified in accordance with ULTRA's ISO 9001 registered quality system. The analyte concentrations were verified by our ISO 17025 accredited laboratory to be within ± 2.5%, when compared to calibration standards independently prepared using NIST SRM(s). The certified value and uncertainty value for each analyte is determined gravimetrically.

Classical Wet Assay Method: Theoretical, based on gravimetric measurements

Confirmation by Inductively Coupled Plasma Spectroscopy (ICP / ICP-MS) vs. NIST SRM 3136

ULTRA uses purified acids, 18 megohm double deionized water, calibrated Class A glassware & meticulously cleaned bottles in the manufacturing of ULTRAgrade standards. Balances used in the manufacturing of this standard are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001.

Trace Metallic Impurities in Solution Standard in µg/mL:

*	Al	<0.005	ND
*	Sb	<0.005	ND
*	As	<0.005	ND
*	Ba	<0.005	ND
*	Be	<0.005	ND
*	Bi	<0.005	ND
*	B	<0.005	ND
*	Cd	<0.005	ND
*	Ca	<0.005	ND
n	Ce		
n	Cs		
*	Cr	<0.005	ND
*	Co	<0.005	ND
*	Cu	<0.005	ND
n	Dy		
*	Er	<0.005	ND
*	Eu	<0.005	ND
*	Gd	<0.005	ND
*	Ga	<0.005	ND
n	Ge		
n	Au		
n	Hf		
n	Ho		
*	In	<0.005	ND
n	Ir		
*	Fe	<0.005	D
*	La	<0.005	ND
*	Pb	<0.005	ND
*	Li	<0.005	ND
n	Lu		
*	Mg	<0.005	D
*	Mn	<0.005	ND
*	Hg	<0.005	ND
*	Mo	<0.005	ND
n	Nd		
s	Ni		
n	Nb		
n	Os		
*	Pd	<0.005	ND
*	P	<0.005	ND
*	Pt	<0.005	ND
*	K	<0.005	ND
n	Pr		
n	Re		
n	Rh		
n	Rb		
n	Ru		
n	Sm		
n	Sc		
*	Se	<0.005	ND
*	Si	<0.005	ND
*	Ag	<0.005	ND
*	Na	<0.005	ND
*	Sr	<0.005	ND
n	S		
n	Ta		
n	Te		
n	Tb		
*	Tl	<0.005	ND
n	Th		
n	Tm		
*	Sn	<0.005	ND
*	Ti	<0.005	ND
n	W		
n	U		
*	V	<0.005	ND
n	Yb		
n	Y		
*	Zn	<0.005	ND
n	Zr		

* - element checked for
ND - not detected
i - spectral interference
D - detected
n - not checked for
s - solution standard element

Density of Solution (measured at 23.5°C ± 0.5°C): 1.014 g/mL

ACCREDITED

ISO 17025 Accredited A2LA Cert. No. 0851-01

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William J. Leary
Quality Assurance Manager

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #4892, Beryllium Stock Standard - Rec 09/10/10,

Pace Analytical®
www.pacelabs.com

STOCK STANDARD

Created By: CCR
Created: 03/08/2011 13:02
Expires: 12/31/2015

Volume of Standard: 125 mL
Manufacturer: ULTRA SCIENTIFIC
Manufacturer Lot ID: J01074

Lot ID: 40781
Part ID: ICP-004
Standard ID: Be-STK

Notes: Beryllium Stock Standard - Rec 09/10/10, Open 11/1/10, DMS

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4000c/40781_COA.pdf

Compound Name and Concentration for Standard #4892

Compound Name	Concentration	Compound Name	Concentration
Beryllium	1000 ug/mL		

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ULTRAgrade™ Solution
Beryllium ICP Standard
1000 µg/mL

Rec. 9/10/10
0910-4020-7

Catalog Number: ICP-004
Lot Number: J01074
Job Number: J00008997
Lot Issue Date: 10/31/2008
Expiration Date: 12/31/2015

Starting Material:	Beryllium Acetate
Starting Material Purity:	99.999%
Starting Material Lot No.:	BH00331
Matrix:	2% nitric acid in low TOC water (< 50 ppb)
Atomic Weight: Be:	9.01

40781
REC.01/08/11 BY CC
Exp. __/__/__ By
Open __/__/__ By

Certified Value: 1001 ± 2 µg/mL
This Certified Reference Material (CRM) was manufactured and verified in accordance with ULTRA's ISO 9001:2000 registered quality system, and the analyte concentrations were verified by our ISO 17025 accredited laboratory. The certified value and uncertainty value, at the 95% confidence level, for each analyte determined gravimetrically.

Classical Wet Assay Method: Theoretical, based on gravimetric measurements

Confirmation by Inductively Coupled Plasma Spectroscopy (ICP / ICP-MS) vs. NIST SRM 3105a
ULTRA uses purified acids, 18 megohm double deionized water, calibrated Class A glassware & meticulously cleaned bottles in the manufacturing of ULTRAgrade standards. Balances used in the manufacturing of this standard are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001

Trace Metallic Impurities in Solution Standard in µg/mL:

*	Al	<0.005	D	*	Ga	<0.005	ND	n	Nb			n	S		
*	Sb	<0.005	ND	n	Ge			n	Os			n	Ta		
*	As	<0.005	ND	n	Au			*	Pd	<0.005	ND	n	Te		
*	Ba	<0.005	ND	n	Hf			*	P	<0.005	ND	n	Tb		
s	Be			n	Ho			*	Pt	<0.005	ND	*	Tl	<0.005	ND
*	Bi	<0.005	ND	*	In	<0.005	ND	*	K	<0.005	ND	n	Th		
*	B	<0.005	ND	n	Ir			n	Pr			n	Tm		
*	Cd	<0.005	ND	*	Fe	<0.005	D	n	Re			*	Sn	<0.005	ND
*	Ca	<0.005	ND	*	La	<0.005	ND	n	Rh			*	Ti	<0.005	ND
n	Ce			*	Pb	<0.005	ND	n	Rb			n	W		
n	Cs			*	Li	<0.005	ND	n	Ru			n	U		
*	Cr	<0.005	ND	n	Lu			n	Sm			*	V	<0.005	ND
*	Co	<0.005	ND	*	Mg	<0.005	ND	n	Sc			n	Yb		
*	Cu	<0.005	ND	*	Mn	<0.005	ND	*	Se	<0.005	ND	n	Y		
n	Dy			*	Hg	<0.005	ND	*	Si	<0.005	D	*	Zn	<0.005	ND
*	Er	<0.005	ND	*	Mo	<0.005	ND	*	Ag	<0.005	ND	n	Zr		
*	Eu	<0.005	ND	n	Nd			*	Na	<0.005	ND				
*	Gd	<0.005	ND	*	Ni	<0.005	D	*	Sr	<0.005	ND				

* - element checked for
ND - not detected
i - spectral interference
D - detected
n - not checked for
s - solution standard element

Density of Solution (measured at 22.5 °C ± 0.5°C): 1.008 g/mL

ACCREDITED
ISO 17025 Accredited A2LA Cert. No. 0851-01
ISO 9001:2000 Registered TUV USA, Inc. Cert. No. 09-1009

250 Smith Street, North Kingstown, RI 02852 USA
401-294-9400 Fax: 295-2330
www.ultrasci.com

William J. Leary
Quality Assurance Manager

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #5183, Cobalt Stock Standard, Rec

STOCK STANDARD

Created By: CCR
Created: 03/29/2011 10:19
Expires: 06/30/2016

Volume of Standard: 125 mL
Manufacturer: ULTRA SCIENTIFIC
Manufacturer Lot ID: K00433

Lot ID: 401017
Part ID: ICP-027
Standard ID: Co-STK

Notes: Cobalt Stock Standard, Rec 09/10/10,Open 11/01/10 DMS

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4001c/401017_COA.pdf

Compound Name and Concentration for Standard #5183

Compound Name	Concentration	Compound Name	Concentration
Cobalt	1000 ug/mL		

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ULTRAgrade™ Solution
Cobalt ICP Standard
1000 µg/mL

Rec. 9/10/10
0910-4020-8

Catalog Number: ICP-027
Lot Number: K00433
Job Number: J00009795
Lot Issue Date: 05/06/2009
Expiration Date: 06/30/2016

401017
REC. 03/29/11 BY CCI
Exp. __/__/__ By __
Open __/__/__ By __

Starting Material:	Cobalt Nitrate Hexahydrate
Starting Material Purity:	99.999%
Starting Material Lot No.:	BH01158
Matrix:	2% nitric acid in low TOC water (< 50 ppb)
Atomic Weight Co:	58.94

Certified Value: 1000 ± 2 µg/mL

This Certified Reference Material (CRM) was manufactured and verified in accordance with ULTRA's ISO 9001 registered quality system. The analyte concentrations were verified by our ISO 17025 accredited laboratory to be within ± 2.5%, when compared to calibration standards independently prepared using NIST SRM(s). The certified value and uncertainty value for each analyte is determined gravimetrically.

Classical Wet Assay Method: Theoretical, based on gravimetric measurements

Confirmation by Inductively Coupled Plasma Spectroscopy (ICP / ICP-MS) vs. NIST SRM 3113

ULTRA uses purified acids, 18 megohm double deionized water, calibrated Class A glassware & meticulously cleaned bottles in the manufacturing of ULTRAgrade standards. Balances used in the manufacturing of this standard are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001.

Trace Metallic Impurities in Solution Standard in µg/mL:

*	Al	<0.005	ND	*	Ga	<0.005	ND	n	Nb			n	S		
*	Sb	<0.005	ND	n	Ge			n	Os			n	Ta		
*	As	<0.005	ND	n	Au			*	Pd	<0.005	ND	n	Te		
*	Ba	<0.005	ND	n	Hf			*	P	<0.005	ND	n	Tb		
*	Be	<0.005	ND	n	Ho			*	Pt	<0.005	ND	*	Tl	<0.005	ND
*	Bi	<0.005	ND	*	In	<0.005	ND	*	K	<0.005	ND	n	Th		
*	B	<0.005	ND	n	Ir			n	Pr			n	Tm		
*	Cd	<0.005	ND	*	Fe	<0.005	D	n	Re			*	Sn	<0.005	ND
*	Ca	<0.005	ND	*	La	<0.005	ND	n	Rh			*	Ti	<0.005	ND
n	Ce			*	Pb	<0.005	ND	n	Rb			n	W		
n	Cs			*	Li	<0.005	ND	n	Ru			n	U		
*	Cr	<0.005	ND	n	Lu			n	Sm			*	V	<0.005	ND
s	Co			*	Mg	<0.005	ND	n	Sc			n	Yb		
*	Cu	<0.005	ND	*	Mn	<0.005	ND	*	Se	<0.005	ND	n	Y		
n	Dy			*	Hg	<0.005	ND	*	Si	<0.005	ND	*	Zn	<0.005	ND
*	Er	<0.005	ND	*	Mo	<0.005	ND	*	Ag	<0.005	ND	n	Zr		
*	Eu	<0.005	ND	n	Nd			*	Na	<0.005	ND				
*	Gd	<0.005	ND	*	Ni	<0.005	D	*	Sr	<0.005	ND				

* - element checked for
ND - not detected
i - spectral interference
D - detected
n - not checked for
s - solution standard element

Density of Solution (measured at 22.5°C ± 0.5°C): 1.023 g/mL

A2LA ACCREDITED

ISO 17025 Accredited A2LA Cert. No. 0851-01

ISO 9001:2000 Registered TUV USA, Inc. Cert. No. 09-1009

250 Smith Street, North Kingstown, RI 02852 USA
401-294-9400 Fax: 295-2330
www.ultrasci.com

William J. Leary
Quality Assurance Manager

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #5659, Phosphorus Secondary Standard - Rec

STOCK STANDARD

Created By: CCR
Created: 04/21/2011 16:13
Expires: 10/31/2017

Volume of Standard: 125 mL
Manufacturer: Ultra Scientific
Manufacturer Lot ID: L01132

Lot ID: 401164
Part ID: ICP-115
Standard ID: P-SPK

Notes: Phosphorus Secondary Standard - Rec 03/08/11, Open

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4001c/401164_COA.pdf

Compound Name and Concentration for Standard #5659

Compound Name	Concentration	Compound Name	Concentration
Phosphorus	10000 ug/mL		

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ULTRAgrade™ Solution
Phosphorus ICP Standard
10000 µg/mL
401164
REC.04/21/11 BY CCF
Exp. __/__/__ BY --
Open __/__/__ BY --

Catalog Number: ICP-115 Rec. 3/8/11
Lot Number: L01132 0311-4020-5
Job Number: J00012124
Lot Issue Date: 09/29/2010
Expiration Date: 10/31/2017

Starting Material: Ammonium Dihydrogen Phosphate
Starting Material Purity: 99.999%
Starting Material Lot No.: BH01383
Matrix: 2% nitric acid in low TOC water (< 50 ppb)
Atomic Weight P: 30.98

Certified Value: 10002 ± 20 µg/mL

This Certified Reference Material (CRM) was manufactured and verified in accordance with ULTRA's ISO 9001 registered quality system. The analyte concentrations were verified by our ISO 17025 accredited laboratory to be within ± 2.5%, when compared to calibration standards independently prepared using NIST SRM(s). The certified value and uncertainty value for each analyte is determined gravimetrically.

Classical Wet Assay Method: Theoretical, based on gravimetric measurements

Confirmation by Inductively Coupled Plasma Spectroscopy (ICP / ICP-MS) vs. NIST SRM 3139a

ULTRA uses purified acids, 18 megohm double deionized water, calibrated Class A glassware & meticulously cleaned bottles in the manufacturing of ULTRAgrade standards. Balances used in the manufacturing of this standard are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001.

Trace Metallic Impurities in Solution Standard in µg/mL:

*	Al	<0.005	ND	*	Ga	<0.005	ND	n	Nb			n	S		
*	Sb	<0.005	ND	n	Ge			n	Os			n	Ta		
*	As	<0.005	ND	n	Au			*	Pd	<0.005	ND	n	Te		
*	Ba	<0.005	ND	n	Hf			s	P			n	Tb		
*	Be	<0.005	ND	n	Ho			*	Pt	<0.005	ND	*	Tl	<0.005	ND
*	Bi	<0.005	ND	*	In	<0.005	ND	*	K	<0.040	D	n	Th		
*	B	<0.005	ND	n	Ir			n	Pr			n	Tm		
*	Cd	<0.005	ND	*	Fe	<0.005	ND	n	Re			*	Sn	<0.005	ND
*	Ca	<0.010	D	*	La	<0.005	ND	n	Rh			*	Ti	<0.005	ND
n	Ce			*	Pb	<0.005	ND	n	Rb			n	W		
n	Cs			*	Li	<0.005	ND	n	Ru			n	U		
*	Cr	<0.005	ND	n	Lu			n	Sm			*	V	<0.005	ND
*	Co	<0.005	ND	*	Mg	<0.005	ND	n	Sc			n	Yb		
*	Cu	<0.005	ND	*	Mn	<0.005	ND	*	Se	<0.005	ND	n	Y		
n	Dy			*	Hg	<0.005	ND	*	Si	<0.005	ND	*	Zn	<0.005	ND
*	Er	<0.005	ND	*	Mo	<0.005	ND	*	Ag	<0.005	ND	n	Zr		
*	Eu	<0.005	ND	n	Nd			*	Na	<0.005	ND				
*	Gd	<0.005	ND	*	Ni	<0.005	ND	*	Sr	<0.005	ND				

* - element checked for
ND - not detected
i - spectral interference
D - detected
n - not checked for
s - solution standard element

Density of Solution (measured at 22°C ± 0.5°C): 1.027 g/mL

ACCREDITED

ISO 17025:2005 Accredited A2LA Cert. No. 0851-01

ISO 9001:2008 Registered TUV USA, Inc. Cert. No. 09-1009

250 Smith Street, North Kingstown, RI 02852 USA
401-294-9400 Fax: 295-2330
www.ultrasci.com

William J. Leary
Quality Assurance Manager

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #7079, Phosphorus Primary Standard - Rec

STOCK STANDARD

Created By: DS1 **Volume of Standard:** 100 mL **Lot ID:** 401231

Created: 05/12/2011 13:06 **Manufacturer:** Fluka Analytical **Part ID:** 356433

Expires: 08/01/2013 **Manufacturer Lot ID:** MKBF1680 **Standard ID:** P-STK

Notes: Phosphorus Primary Standard - Rec 5/12/11, Open 5/12/11, DMS

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4001c/401231_COA.PDF

Compound Name and Concentration for Standard #7079

Compound Name	Concentration	Compound Name	Concentration
Phosphorus	10000 ug/mL		

Certificate of Analysis

401231
REC. 05/12/11 BY DS:
EXP. 8/1/13 BY

SIGMA-ALDRICH

Product Name	Phosphorus ICP/DCP standard solution, 10,000 µg/mL P in H_2O (Exact P concentration on label)
Product Number	356433
Product Brand	FLUKA

TEST	SPECIFICATION	LOT MKBF1680 RESULTS
Appearance (Clarity)	Clear	Clear
Appearance (Color)	Colorless	Colorless
Appearance (Form)	Liquid	Liquid
Phosphorus (P)	9800 - 10200 ppm by Titration with NaOH	10104 ppm
Trace Metal Analysis	≤10.0 ppm	< 10.0 ppm
Aluminum (Al)	ppm	< 0.1 ppm
Barium (Ba)	ppm	< 0.1 ppm
Calcium (Ca)	ppm	0.1 ppm
Chromium (Cr)	ppm	< 0.1 ppm
Copper (Cu)	ppm	< 0.1 ppm
Iron (Fe)	ppm	< 0.1 ppm
Magnesium (Mg)	ppm	< 0.1 ppm
Sodium (Na)	ppm	0.1 ppm
Antimony (Sb)	ppm	0.2 ppm
Titanium (Ti)	ppm	< 0.1 ppm
Zinc (Zn)	ppm	< 0.1 ppm
Expiration Date Period	3 Years	

Specification Date:	JUN 2010
Date of QC Release:	AUG 2010
Expiration Date:	AUG 2013
Print Date:	AUG 19 2010

Barbara Rajzer, Supervisor
Quality Control
Milwaukee, Wisconsin USA

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #18040, Uranium Secondary Standard - Rec

Pace Analytical®
www.pacelabs.com

STOCK STANDARD

Created By: LMS
Created: 10/27/2011 09:17
Expires: 04/21/2013

Volume of Standard: 125 mL
Manufacturer: High Purity
Manufacturer Lot ID: 1120109

Lot ID: 401617
Part ID: 100064-1
Standard ID: U-SPK

Notes: Uranium Secondary Standard - Rec 10/26/2011 LMS

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4001c/401617_COA.PDF

Compound Name and Concentration for Standard #18040

Compound Name	Concentration	Compound Name	Concentration
Uranium	1000 ug/mL		

HIGH-PURITY STANDARDS
www.highpuritystandards.com

P.O. Box 41727
Charleston, SC 29423
Phone (843) 767-7900
Fax (843) 767-7906

Certificate of Analysis

401617
REC. 10/27/11 BY LMI
Exp. __/__/__ By __
Open __/__/__ By __

Product Description:

Name:	Uranium	Source Material:	Uranium Oxide
Part Number:	**100064-1**	Material Purity:	99.964%
Lot Number:	**1120109**	Matrix:	2% (v/v) HNO_3

Certified Value: 1000 µg/mL ± 3 µg/mL

The Certified value is based on gravimetric and volumetric preparation, and confirmed against SRM 3164 (lot number 080521) by inductively coupled plasma optical emission spectrometry (ICP-OES) using an internal laboratory-developed method. The uncertainty in the certified value is calculated for a 95% confidence interval and coverage factor *k* is about 2.

Density: 1.008 g/mL ± 0.002 g/mL @ 23.1°C

Uncertified Values:

Trace Metal Impurity Scan: The data reported are based upon a scan of this specific lot at 1000 µg/mL via ICP analysis. The values are reported in µg/L.

Ag	<	0.02	Cu	<	0.1	Li	<	9	Rb	<	0.02	Th	<	0.02
Al	<	1	Dy	<	0.02	Lu	<	0.02	Re	<	0.02	Ti	<	0.02
As	<	0.3	Er	<	0.02	Mg	<	0.5	Rh	<	0.02	Tl	<	0.02
Au	<	0.02	Eu	<	0.02	Mn	<	0.1	Ru	<	0.02	Tm	<	0.02
B	<	5	Fe	<	1	Mo	<	0.02	Sb	<	0.02	U		M
Ba	<	0.02	Ga	<	0.02	Na	<	3	Sc	<	0.02	V	<	0.05
Be	<	0.02	Gd	<	0.02	Nb	<	0.02	Se	<	0.1	W	<	0.02
Bi	<	0.02	Ge	<	0.02	Nd	<	0.02	Si	<	10	Y	<	2
Ca	<	0.5	Hf	<	0.02	Ni	<	0.02	Sm	<	0.02	Yb	<	0.02
Cd	<	0.02	Ho	<	0.02	Os	<	0.02	Sn	<	1	Zn	<	2
Ce	<	0.02	In	<	0.02	Pb	<	0.5	Sr	<	0.02	Zr	<	0.02
Co	<	0.05	Ir	<	0.02	Pd	<	0.02	Ta	<	0.02			
Cr	<	0.1	K	<	1	Pr	<	0.02	Tb	<	0.02			
Cs	<	0.02	La	<	0.02	Pt	<	0.02	Te	<	0.02			

Preparation Information:

The standard solution is prepared using high purity materials and assayed by analytical methods for conformity prior to use. This standard was prepared using the methods developed at NIST for SRM Spectrometric Standard Solutions under appropriate laboratory conditions.

Sub-boiling distilled high-purity acid has been used to place the materials in solution and to stabilize the standard. The matrix is as noted above in 18 megaohm deionized water.

Stability of this product is based upon rigorous short term and long term testing of the solution for the certified value. This testing includes, but is not limited to, the effect of temperature and packaging on the product.

Intended Use:

This Certified Reference Material (CRM) is intended for use as a calibration standard for the quantitative determination of uranium, calibration of instruments such as ICPOES, ICPMS, AAS and XRF, and validation of analytical methods. It also can be used in EPA, ASTM and other methods.

401617
REC.10/27/11 BY LMI
Exp. __/__/__ By __
Open / / By

Traceability Information:

The traceability of this standard is maintained through an unbroken chain of comparisons to appropriate standards with suitable procedure and measurement uncertainties. The maintenance of the base and derived units of International System of Units (SI) with traceability of measurement results (contemporary metrology) to SI ensures their comparability over time as follows.

a. **Standard Weight and Analytical Balance**
The standard weights (NBS weights Inventory No 20231A) are calibrated every two years by South Carolina Metrology Laboratory that is a participant in "NIST Weights and Measures Measurement Assurance Program" with a certificate of measurement traceability to NIST primary standards.
The balances are calibrated yearly by the ISO 17025 accredited metrology service, and are verified weekly by an in-house method using standard weights.

b. **Volumetric Device**
The calibration of volumetric vessels is checked annually using the NBS 602 method.

c. **Thermometer**
The standard thermometers are calibrated every year by the ISO 17025 accredited metrology service. The thermometers used in-house are verified against the standard thermometers yearly.

d. **Calibration Standards:**
The Calibration Standard is directly traceable to SRM 3100 Series Spectrometric Standard Solutions.

Packaging and Storage Conditions:

The standard is packaged in a pre-cleaned polyethylene bottle. To maintain the integrity of this product, the solution should be kept tightly capped and stored under normal laboratory conditions.

Refer to Material Safety Datasheet (MSDS) for hazardous information.

Expiration Information:

The expiry date is guaranteed to be valid for eighteen months from the shipping date provided. For this reason, standards from the same lot may have different expiration dates.

Preparation Date: **July 20, 2011**

Shipped Date: OCT 2 1 2011

Expiration Date: APR 2 1 2013

Certificate Issue Date: **July 29, 2011**

Quality Information:

ACLASS ACCREDITED TESTING
ISO/IEC 17025:2005 Accreditation
Certificate Number AT-1529

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER
ISO Guide 34:2009 (RMP) Accreditation
Certificate Number AR-1436

Vanny T. Yib, **Inorganic Laboratory Manager**	**Kim-Phuong Tran** **Quality Manager**	**Theodore Rains, PhD** **President**

NOTICE: HPS products are intended for laboratory use only. All products should be handled and used by trained professional personnel. The responsibility for the safe handling and use of these products rests solely with the buyer and/or user. The data and information as stated was furnished by the manufacturer of the product. The information provided in this certificate pertains only to the lot number specified. None of the information provided in this certificate may be used, reproduced or transmitted in any form or by any means without written approval from High Purity Standards.

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #19251, Rec 11/15/11, Opened 11/17/11

Pace Analytical®
www.pacelabs.com

STOCK STANDARD

Created By: CMS
Created: 11/17/2011 14:40
Expires: 12/01/2012

Volume of Standard: 125 mL
Manufacturer: Inorganic Ventures
Manufacturer Lot ID: E2-HG02091

Lot ID: 401650
Part ID: CGHG1-1
Standard ID: Hg-SPK

Notes: Rec 11/15/11, Opened 11/17/11

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4001c/401650_COA.pdf

Compound Name and Concentration for Standard #19251

Compound Name	Concentration	Compound Name	Concentration
Mercury	1000 ug/mL		

INORGANIC VENTURES™
300 Technology Drive
Christiansburg, VA 24073 • USA
inorganicventures.com
tel: 800.669.6799 • 540.585.3030
fax: 540.585.3012
info@inorganicventures.com

CERTIFICATE OF ANALYSIS

1.0 **INORGANIC VENTURES** is an ISO Guide 34 "General Requirements for the Competence of Reference Material Producers" and ISO 9001 registered manufacturer. Our manufacturing laboratory is accredited to ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories."

ACCREDITED Testing Laboratory Certificate 883.01 — ACCREDITED Reference Material Producer Certificate 883.02

2.0 **DESCRIPTION OF CRM** **1000 µg/mL Mercury in 5% v/v HNO3**

Catalog Number:	CGHG1-1, CGHG1-2, and CGHG1-5
Lot Number:	**E2-HG02091**
Starting Material:	Hg metal
Starting Material Purity (%):	100.0000
Starting Material Lot No:	R307HGA1
Matrix:	5% v/v HNO3

401660
REC.11/17/11 BY CM1
Exp: __/__/__ By __

3.0 **CERTIFIED VALUES AND UNCERTAINTIES**

Certified Concentration: 1000 ± 6 µg/mL - weighted mean

Certified Density: 1.025 g/mL (measured at 20 ± 1°C)

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Certified Value $(\bar{x}) = \frac{\sum x_i}{n}$

Uncertainty (±) $= \frac{2\,[(\sum s_i)^2]^{1/2}}{(n)^{1/2}}$

$(\bar{x})$ = mean
x_i = individual results
n = number of measurements
$\sum s_i$ = The summation of all significant estimated errors (Most common are the errors from instrumental measurement, weighing, dilution to volume and the fixed error reported on the NIST SRM certificate of analysis)

4.0 **TRACEABILITY TO NIST AND VALUES OBTAINED BY INDEPENDENT METHODS**

· "Property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties." (ISO VIM, 2nd ed., 1993, definition 6.10)

· This product is Traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRMs are available, the term 'in-house std.' is specified.

4.1 **Assay Method #1** **999 ± 4 µg/mL**
ICP Assay NIST SRM 3133 Lot Number: 061204

Assay Method #2 **1,000 ± 4 µg/mL**
EDTA NIST SRM 928 Lot Number: 928

4.2 **BALANCE CALIBRATION** - All analytical balances are calibrated yearly by an A2LA accredited calibration laboratory and are traceable to a class E 2 analytical weight set with NIST Traceability. All balances are checked daily using an in-house procedure. The weights used for testing are annually compared to master weights and are traceable to the National Institute of Standards and Technology (NIST).

4.3 **THERMOMETER CALIBRATION** - All thermometers are NIST traceable through thermometers that are calibrated by an A2LA accredited calibration laboratory.

401650
REC. 11/17/11 BY CMS
Exp. --/--/-- By --

4.4 **GLASSWARE CALIBRATION** - An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM's.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP/MS AND ICP-OES IN µg/mL

CRM's solutions are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

O	Al	< 0.000090	M	Dy	< 0.012379	O	Li	< 0.000020	M	Pr	< 0.000619	M	Te	< 0.061896
M	Sb	< 0.001032	M	Er	< 0.010316	M	Lu	< 0.000825	M	Re	< 0.002063	M	Tb	< 0.000619
M	As	< 0.020632	M	Eu	< 0.006190	O	Mg	< 0.000030	M	Rh	< 0.002063	O	Tl	< 0.006000
M	Ba	< 0.020632	M	Gd	< 0.002063	M	Mn	< 0.008253	M	Rb	< 0.002063	M	Th	< 0.002063
M	Be	< 0.001032	M	Ga	< 0.002063	s	Hg		M	Ru	< 0.004126	M	Tm	< 0.000825
M	Bi	< 0.000825	O	Ge	< 0.018000	M	Mo	< 0.004126	M	Sm	< 0.002063	M	Sn	< 0.010316
M	B	< 0.144423	M	Au	< 0.006190	M	Nd	< 0.004126	M	Sc	< 0.020632	M	Ti	< 0.103159
O	Cd	< 0.004600	M	Hf	< 0.004126	O	Ni	< 0.001000	M	Se	< 0.016505	M	W	< 0.020632
O	Ca	0.000242	M	Ho	< 0.001032	M	Nb	< 0.001032	O	Si	< 0.003400	M	U	< 0.004126
M	Ce	< 0.010316	M	In	< 0.020632	n	Os		M	Ag	< 0.004126	M	V	< 0.004126
M	Cs	< 0.000619	M	Ir	< 0.010316	O	Pd	< 0.003800	O	Na	0.000218	M	Yb	< 0.002063
M	Cr	< 0.010316	O	Fe	< 0.001100	O	P	< 0.002600	M	Sr	< 0.001032	M	Y	< 0.082527
M	Co	< 0.006190	M	La	< 0.001032	M	Pt	< 0.004126	O	S	< 0.025000	M	Zn	< 0.041264
M	Cu	< 0.012379	M	Pb	< 0.006190	O	K	< 0.002000	M	Ta	< 0.014442	M	Zr	< 0.010316

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

For the calibration of analytical instruments including but not limited to the following:
HPLC, IC, TLC, ISE, IR, NMR, UV/VIS, MS, Capillary Eletrophoresis, Potentiometry, Wet Chemistry and Voltammetry
For the validation of analytical methods
For the preparation of "working reference samples"
For interference studies and the determination of correction coefficients
For detection limit and linearity studies
For additional intended uses, contact Technical Staff

This CRM was manufactured using 18 megohm doubly deionized water that has been filtered through a 0.2 micron filter.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

Storage & Handling - Keep tightly sealed when not in use. Store and use at 20 ± 4°C. Do not pipet from container. Do not return portions removed for pipetting to container.

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 200.59; +2; 4 ; Hg(OH)(aq) 1+

Chemical Compatibility - Stable in HNO3. Avoid basic media forming insoluble carbonate. The sulfide, basic carbonate, oxalate, phosphate, arsenite, arsenate and iodide are insoluble in water. .

Stability - 2-100 ppb levels **not stable** in 1% HNO3 / LDPE container, ***stable*** in 10% HNO3 packaged in borosilicate glass. 1-100 ppm levels stable in 7% HNO3 packaged in borosilicate glass. 1000-10,000 ppm solutions are chemically stable for years in 5-10% HNO3 / LDPE container.

Hg Containing Samples (Preparation and Solution) - Metal (soluble in HNO3); Oxide (Soluble in HNO3); Ores and Organic based (The literature has more references to the preparation of Hg containing samples than any other element. Please consult the literature for your specific sample type, since such preparations are prone to error. Or e-mail our technical staff and we will contact you to discuss your particular sample preparation questions in further detail.).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	Estimated D.L.	Order	Type	Interferences (underlined indicates severe)
ICP-OES 184.950 nm	0.03 / 0.005 µg/mL	1	atom	
ICP-OES 194.227 nm	0.03 / 0.005 µg/mL	1	ion	V
ICP-OES 253.652 nm	0.1 / 0.03 µg/mL	1	atom	Ta, Co, Th ,Rh , Fe, U
ICP-MS 202 amu	9 ppt	n/a	M+	186W16O

401650
REC. 11/17/11 BY CMI
EXP. __/__/__ BY __

Uranium Note: If uranium is present in this standard, it is natural abundance unless specified in Section 3.0.

8.0 HAZARDOUS INFORMATION - Please refer to the enclosed Material Safety Data sheet for information regarding this CRM.

9.0 HOMOGENEITY - This solution was mixed according to an in house procedure and is guaranteed to be homogeneous.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 **ISO 9001 Quality Management System Registration**
- QMI Certificate Number 010105

10.2 **ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration"**
- Chemical Testing - Accredited A2LA Certificate Number 883.01

10.3 **ISO/IEC Guide 34 "General Requirements for the Competence of Reference Material Producers"**
- Reference Materials Production - Accredited A2LA Certificate Number 883.02

10.4 **10CFR50 Appendix B - Nuclear Regulatory Commission**
- Domestic Licensing of Production and Utilization Facilities

10.5 **10CFR21 - Nuclear Regulatory Commission**
- Reporting Defects and Non-Compliance

11.0 DATE OF CERTIFICATION AND PERIOD OF VALIDITY

11.1 **Shelf Life** - The period of time during which the concentration of the analyte(s) in a properly packaged, unopened, and unused standard stored under environmentally controlled and monitored conditions will remain within the specified uncertainty range. Shelf life is limited primarily by transpiration (loss of water from the solution) and infrequently, by chemical instability.

11.2 **Expiration Date** - The date after which a CRM should not be used. Routine laboratory use of a CRM increases transpiration losses and the chance of contamination which affect the integrity of the CRM and limit its useful life. Manufacturer concurs with state and federal regulatory agencies' recommendations that solution standards be assigned a one-year expiration date.

11.3 **Chemical Stability** - Studies have been conducted on this or similar CRMs and it has been demonstrated that this CRM is chemically stable for a period of not less than two years provided the "Storage & Handling" conditions are followed that are described in section 7.0.

Certification Date: September 22, 2011
Expiration Date: EXPIRES 01 SEP 2012

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By:	Donna Senn, Product Documentation Technician	Donna Senn
Certificate Approved By:	Madeline Gozzi, Quality Control Supervisor	Madeline Gozzi
Certifying Officer:	Paul Gaines, PhD., Senior Technical Director	Paul R Gaines

401660

REC.11/17/11 BY CMI
Exp. __/__/__ By __
Appr __/__/__ By __

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #22391, Conc. Nitric Acid - Rec 06/10/11

SOLVENT

Created By: DS1
Created: 01/13/2012 09:17
Expires: 01/13/2014

Volume of Standard: 2500 mL
Manufacturer: SCP SCIENCE
Manufacturer Lot ID: SCA1314782

Lot ID: 401741
Part ID: 250-037-171
Standard ID: RGNT373

Notes: Conc. Nitric Acid - Rec 06/10/11

Certificates of Analysis

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Compound Name and Concentration for Standard #22391

Compound Name	Concentration	Compound Name	Concentration
Nitric Acid			

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Certificate of Analysis

*Plasma*PURE

401741
REC.01/13/12 BY DS
Exp. __/__/__ By __

Nitric Acid (67 - 70% HNO_3)

Catalogue Number: 250-037-171 / 250-137-171 / 250-037-173 / 250-137-173 / 250-037-175 / 250-037-177

Lot Number: SCA1314782
Assay (HNO_3 w/w): 69%
Colour (APHA): < 10 (Specification: Max 10)
Expiry Date: November 2014

Opened Bottle Expiry Information
15 months after opening, up to unopened expiration date

_____
Date bottle opened

Analyte	Maximum Specification	Actual Value (in ppb)	Analyte	Maximum Specification	Actual Value (in ppb)
Aluminum (Al)	1 ppb	< 0.5	Neodymium (Nd)	0.1 ppb	< 0.1
Antimony (Sb)	0.5 ppb	< 0.1	Nickel (Ni)	0.5 ppb	< 0.5
Arsenic (As)	0.5 ppb	< 0.1	Niobium (Nb)	0.1 ppb	< 0.1
Barium (Ba)	0.1 ppb	< 0.1	Palladium (Pd)	0.5 ppb	< 0.1
Beryllium (Be)	0.1 ppb	< 0.1	Platinum (Pt)	0.5 ppb	< 0.1
Bismuth (Bi)	0.1 ppb	< 0.1	Potassium (K)	1 ppb	< 0.2
Boron (B)	1 ppb	< 0.5	Praseodymium (Pr)	0.1 ppb	< 0.1
Cadmium (Cd)	0.5 ppb	< 0.1	Rhenium (Re)	0.1 ppb	< 0.1
Calcium (Ca)	1 ppb	< 0.5	Rhodium (Rh)	0.5 ppb	< 0.1
Cerium (Ce)	0.1 ppb	< 0.1	Rubidium (Rb)	0.1 ppb	< 0.1
Cesium (Cs)	0.1 ppb	< 0.1	Ruthenium (Ru)	0.5 ppb	< 0.1
Chromium (Cr)	1 ppb	< 0.5	Samarium (Sm)	0.1 ppb	< 0.1
Cobalt (Co)	0.5 ppb	< 0.1	Scandium (Sc)	0.1 ppb	< 0.1
Copper (Cu)	0.5 ppb	< 0.2	Selenium (Se)	1 ppb	< 0.1
Dysprosium (Dy)	0.1 ppb	< 0.1	Silver (Ag)	0.1 ppb	< 0.1
Erbium (Er)	0.1 ppb	< 0.1	Sodium (Na)	1 ppb	< 0.2
Europium (Eu)	0.1 ppb	< 0.1	Strontium (Sr)	0.1 ppb	< 0.1
Gadolinium (Gd)	0.1 ppb	< 0.1	Tantalum (Ta)	Information Only	< 0.1
Gallium (Ga)	0.1 ppb	< 0.1	Tellurium (Te)	0.1 ppb	< 0.1
Germanium (Ge)	0.1 ppb	< 0.1	Terbium (Tb)	0.1 ppb	< 0.1
Gold (Au)	0.1 ppb	< 0.1	Thallium (Tl)	0.1 ppb	< 0.1
Hafnium (Hf)	0.1 ppb	< 0.1	Thorium (Th)	0.1 ppb	< 0.1
Holmium (Ho)	0.1 ppb	< 0.1	Thulium (Tm)	0.1 ppb	< 0.1
Indium (In)	0.1 ppb	< 0.1	Tin (Sn)	0.5 ppb	< 0.1
Iron (Fe)	1 ppb	< 0.5	Titanium (Ti)	0.5 ppb	< 0.1
Lanthanum (La)	0.1 ppb	< 0.1	Tungsten (W)	0.1 ppb	< 0.1
Lead (Pb)	0.1 ppb	< 0.1	Uranium (U)	0.1 ppb	< 0.1
Lithium (Li)	0.1 ppb	< 0.1	Vanadium (V)	0.5 ppb	< 0.1
Lutetium (Lu)	0.1 ppb	< 0.1	Ytterbium (Yb)	0.1 ppb	< 0.1
Magnesium (Mg)	1 ppb	< 0.2	Yttrium (Y)	0.1 ppb	< 0.1
Manganese (Mn)	0.1 ppb	< 0.1	Zinc (Zn)	0.5 ppb	< 0.2
Mercury (Hg)	0.1 ppb	< 0.02	Zirconium (Zr)	0.1 ppb	< 0.1
Molybdenum (Mo)	0.1 ppb	< 0.1			

Analyte	Maximum Specification	Actual Value (in ppm)	Analyte	Maximum Specification	Actual Value (in ppm)
Chloride (Cl^-)	0.2 ppm	< 0.2	Total Sulphur (S)	0.3 ppm	< 0.3
Total Phosphorus (P)	0.01 ppm	< 0.01			

Certified by: Daniel Boisvert
Daniel Boisvert, Chemist

Certification Date: November 2, 2011

To maintain product integrity and reduce the risk of trace metal contamination: the inner pack of plastic bags and bottle should be opened under CLASS 100 particle conditions to maintain the integrity of the product. The use of safety apparel, as well as eye protection, plastic gloves, hair net and a clean room suit is also advised. The Material Safety Data Sheet and this Certificate of Analysis are available on our web site. SCP SCIENCE is ISO 9001:2008 registered and ISO 17025 accredited (Également disponible en français).

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Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #22392, Conc. HCL - Rec 06/10/11

SOLVENT

Created By: DS1
Created: 01/13/2012 09:20
Expires: 01/13/2014

Volume of Standard: 2500 mL
Manufacturer: SCP SCIENCE
Manufacturer Lot ID: SCA1256754

Lot ID: 401742
Part ID: 250-037-151
Standard ID: RGNT153

Notes: Conc. HCL - Rec 06/10/11

Certificates of Analysis

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Compound Name and Concentration for Standard #22392

Compound Name	Concentration	Compound Name	Concentration
Hydrochloric Acid			

SCP SCIENCE

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Certificate of Analysis

401742

REC.01/13/12 BY DS
Exp. __/__/__ By _
Open __/__/__ By _

*Plasma*PURE Hydrochloric Acid (34 - 37% HCl)

Catalogue Number: 250-037-151 / 250-137-151 / 250-037-153 / 250-137-153 / 250-037-155 / 250-037-157 / 250-037-159
Lot Number: **SCA1256754**
Assay (HCl w/w): **35%**
Colour (APHA): **< 10 (Specification: Max 10)**
Expiry Date: **September 2014**

Opened Bottle Expiry Information
15 months after opening, up to unopened expiration date

_____
Date bottle opened

Analyte	Maximum Specification	Actual Value (in ppb)	Analyte	Maximum Specification	Actual Value (in ppb)
Aluminum (Al)	1 ppb	< 0.5	Neodymium (Nd)	0.1 ppb	< 0.1
Antimony (Sb)	0.5 ppb	< 0.1	Nickel (Ni)	0.5 ppb	< 0.1
Arsenic (As)	0.5 ppb	< 0.1	Niobium (Nb)	0.1 ppb	< 0.1
Barium (Ba)	0.1 ppb	< 0.1	Palladium (Pd)	Information Only	< 0.5
Beryllium (Be)	0.1 ppb	< 0.1	Platinum (Pt)	Information Only	< 0.5
Bismuth (Bi)	0.1 ppb	< 0.1	Potassium (K)	1 ppb	< 0.1
Boron (B)	1 ppb	< 0.5	Praseodymium (Pr)	0.1 ppb	< 0.1
Cadmium (Cd)	0.1 ppb	< 0.1	Rhenium (Re)	0.1 ppb	< 0.1
Calcium (Ca)	1 ppb	< 0.5	Rhodium (Rh)	0.1 ppb	< 0.1
Cerium (Ce)	0.1 ppb	< 0.1	Rubidium (Rb)	0.1 ppb	< 0.1
Cesium (Cs)	0.1 ppb	< 0.1	Ruthenium (Ru)	0.1 ppb	< 0.1
Chromium (Cr)	0.5 ppb	< 0.1	Samarium (Sm)	0.1 ppb	< 0.1
Cobalt (Co)	0.1 ppb	< 0.1	Scandium (Sc)	0.1 ppb	< 0.1
Copper (Cu)	0.5 ppb	< 0.1	Selenium (Se)	1 ppb	< 0.1
Dysprosium (Dy)	0.1 ppb	< 0.1	Silver (Ag)	1 ppb	< 0.1
Erbium (Er)	0.1 ppb	< 0.1	Sodium (Na)	1 ppb	< 0.5
Europium (Eu)	0.1 ppb	< 0.1	Strontium (Sr)	0.1 ppb	< 0.1
Gadolinium (Gd)	0.1 ppb	< 0.1	Tantalum (Ta)	Information Only	< 1
Gallium (Ga)	0.1 ppb	< 0.1	Tellurium (Te)	0.1 ppb	< 0.1
Gold (Au)	0.5 ppb	< 0.1	Terbium (Tb)	0.1 ppb	< 0.1
Hafnium (Hf)	0.1 ppb	< 0.1	Thallium (Tl)	0.1 ppb	< 0.1
Holmium (Ho)	0.1 ppb	< 0.1	Thorium (Th)	0.1 ppb	< 0.1
Indium (In)	0.1 ppb	< 0.1	Thulium (Tm)	0.1 ppb	< 0.1
Iron (Fe)	1 ppb	< 0.5	Tin (Sn)	0.5 ppb	< 0.1
Lanthanum (La)	0.1 ppb	< 0.1	Titanium (Ti)	0.5 ppb	< 0.1
Lead (Pb)	0.1 ppb	< 0.1	Tungsten (W)	0.1 ppb	< 0.1
Lithium (Li)	0.1 ppb	< 0.1	Uranium (U)	0.1 ppb	< 0.1
Lutetium (Lu)	0.1 ppb	< 0.1	Vanadium (V)	0.5 ppb	< 0.1
Magnesium (Mg)	0.5 ppb	< 0.5	Ytterbium (Yb)	0.1 ppb	< 0.1
Manganese (Mn)	0.1 ppb	< 0.1	Yttrium (Y)	0.1 ppb	< 0.1
Mercury (Hg)	0.1 ppb	< 0.02	Zinc (Zn)	1 ppb	< 0.5
Molybdenum (Mo)	0.1 ppb	< 0.1	Zirconium (Zr)	0.1 ppb	< 0.1

Analyte	Maximum Specification	Actual Value (in ppm)	Analyte	Maximum Specification	Actual Value (in ppm)
Bromide (Br^-)	10 ppm	< 10	Total Sulphur (S)	0.3 ppm	< 0.3
Total Phosphorus (P)	0.01 ppm	< 0.01	Free Chlorine (Cl_2)	0.5 ppm	< 0.5

Certified by: Daniel Boisvert
Daniel Boisvert, Chemist

Certification Date: **September 15, 2011**

To maintain product integrity and reduce the risk of trace metal contamination: the inner pack of plastic bags and bottle should be opened under CLASS 100 particle conditions to maintain the integrity of the product. The use of safety apparel, as well as eye protection, plastic gloves, hair net and a clean room suit is also advised. The Material Safety Data Sheet and this Certificate of Analysis are available on our web site. **SCP SCIENCE** is ISO 9001:2008 registered and ISO 17025 accredited (Également disponible en français).

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Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #24681, Scandium Primary Standard - Rec

STOCK STANDARD

Created By: DS1
Created: 02/15/2012 14:00
Expires: 03/01/2013

Volume of Standard: 125 mL
Manufacturer: Inorganic Ventures
Manufacturer Lot ID: E2-SC02094

Lot ID: 401843
Part ID: MSSC-100PPM
Standard ID: Sc-STK

Notes: Scandium Primary Standard - Rec 03/16/11, Open

Certificates of Analysis

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Compound Name and Concentration for Standard #24681

Compound Name	Concentration	Compound Name	Concentration
Scandium	100 ug/mL		

INORGANIC VENTURES™
300 Technology Drive
Christiansburg, VA 24073 • USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

tel: 800.669.6799 • 540.585.3030
fax: 540.585.3012
info@inorganicventures.com

401843
REC. 02/16/12 BY DS
Exp. --/--/-- BY -
Gmth / / Qu

1.0 **INORGANIC VENTURES** is an ISO Guide 34 "General Requirements for the Competence of Reference Material Producers" and ISO 9001 registered manufacturer. Our manufacturing laboratory is accredited to ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories."

ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 DESCRIPTION OF CRM — 100 µg/mL Scandium in 7% (v/v) HNO3

Catalog Number:	MSSC-100PPM
Lot Number:	E2-SC02094
Starting Material:	Sc2O3
Starting Material Purity (%):	99.9960
Starting Material Lot No:	1630A
Matrix:	7% (v/v) HNO3

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Concentration: 100.32 ± 0.81 µg/mL

Certified Density: 1.031 g/mL (measured at 20 ± 1°C)

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Certified Value $(\bar{x}) = \frac{\Sigma x_i}{n}$

Uncertainty $(\pm) = \frac{2\,[(\Sigma s_i)^2]^{1/2}}{(n)^{1/2}}$

$(\bar{x})$ = mean
x_i = individual results
n = number of measurements
Σs_i = The summation of all significant estimated errors (Most common are the errors from instrumental measurement, weighing, dilution to volume and the fixed error reported on the NIST SRM certificate of analysis)

4.0 TRACEABILITY TO NIST AND VALUES OBTAINED BY INDEPENDENT METHODS

- "Property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties." (ISO VIM, 2nd ed., 1993, definition 6.10)
- This product is Traceable to NIST via an unbroken chain of comparisons to the following NIST SRMs:

4.1 ELEMENT	METHOD	NIST SRM#	SRM LOT#
Sc	ICP Assay	3148a	792111
Sc	EDTA	928	928

4.2 **BALANCE CALIBRATION** - All analytical balances are calibrated yearly by an A2LA accredited calibration laboratory and are traceable to a class E 2 analytical weight set with NIST Traceability. All balances are checked daily using an in-house procedure. The weights used for testing are annually compared to master weights and are traceable to the National Institute of Standards and Technology (NIST).

4.3 **THERMOMETER CALIBRATION** - All thermometers are NIST traceable through thermometers that are calibrated by an A2LA accredited calibration laboratory.

4.4 **GLASSWARE CALIBRATION** - An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM's.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP/MS AND ICP-OES IN µg/mL

Standard solutions are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag	< 0.0020060	O	Cu	0.0002480	M	La	< 0.0005010	M	Pr	< 0.0003010	M	Ta	< 0.0070200
O	Al	< 0.0010000	M	Dy	< 0.0060170	M	Li	< 0.0100290	M	Pt	< 0.0020060	M	Tb	< 0.0003010
M	As	< 0.0100290	M	Er	< 0.0050150	M	Lu	< 0.0004010	M	Rb	< 0.0010030	M	Te	< 0.0300870
M	Au	< 0.0030090	M	Eu	< 0.0030090	O	Mg	0.0000200	M	Re	< 0.0010030	M	Th	< 0.0010030
M	B	< 0.0702030	O	Fe	0.0000990	M	Mn	< 0.0040120	M	Rh	< 0.0010030	O	Ti	< 0.0010000
M	Ba	< 0.0100290	M	Ga	< 0.0010030	M	Mo	< 0.0020060	M	Ru	< 0.0020060	M	Tl	< 0.0010030
M	Be	< 0.0005010	M	Gd	< 0.0010030	O	Na	< 0.0900000	O	S	< 0.0250000	M	Tm	< 0.0004010
M	Bi	< 0.0004010	M	Ge	< 0.0060170	M	Nb	< 0.0005010	M	Sb	< 0.0005010	M	U	< 0.0020060
O	Ca	0.0026840	O	Hf	0.0004970	M	Nd	< 0.0020060	s	Sc		M	V	< 0.0020060
M	Cd	< 0.0030090	O	Hg	< 0.0100000	O	Ni	< 0.0009000	M	Se	< 0.0080230	O	W	< 0.0040000
M	Ce	< 0.0050150	M	Ho	< 0.0005010	n	Os		O	Si	0.0014910	O	Y	< 0.0010000
M	Co	< 0.0030090	M	In	< 0.0100290	n	P		M	Sm	< 0.0010030	M	Yb	< 0.0010030
O	Cr	< 0.0008000	M	Ir	< 0.0050150	M	Pb	< 0.0030090	M	Sn	< 0.0050150	O	Zn	0.0002780
M	Cs	< 0.0003010	O	K	< 0.1000000	M	Pd	< 0.0050150	M	Sr	< 0.0005010	O	Zr	0.0009940

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

For the calibration of analytical instruments including but not limited to the following:
HPLC, IC, TLC, ISE, IR, NMR, UV/VIS, MS, Capillary Electrophoresis, Potentiometry, Wet Chemistry and Voltammetry
For the validation of analytical methods
For the preparation of "working reference samples"
For interference studies and the determination of correction coefficients
For detection limit and linearity studies
For additional intended uses, contact Technical Staff

This CRM was manufactured using 18 megohm doubly deionized water that has been filtered through a 0.2 micron filter.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

Storage & Handling - Keep tightly sealed when not in use. Store and use at 20 ± 4°C. Do not pipet from container. Do not return portions removed for pipetting to container.
Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 44.95591; +3; 6; Sc(H2O)6+2
Chemical Compatibility - Soluble in HCl, H2SO4 and HNO3. Avoid HF, H3PO4 and neutral to basic media. Stable with most metals and inorganic anions forming an insoluble carbonate, oxide, oxalate, and fluoride. Avoid mixing with elements / solutions containing moderate amounts of fluoride. The fluoride is soluble in excess HF forming ScF63- (not recommended for standard preparations).
Stability - 2-100 ppb levels stable for months in 1% HNO3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 5-10% HNO3 / LDPE container. Small atomic radius increases hydrolysis requiring higher acid levels than other Rare Earths.
Sc Containing Samples (Preparation and Solution) - Metal (Soluble in acids); Oxide (Dissolve by heating in H2O / HNO3); Ores (Carbonate fusion in Pt0 followed by HCl dissolution); Organic Matrices (Dry ash and dissolve in 1:1 H2O / HCl or HNO3), (Aqua Regia or nitric / perchloric / sulfuric acid digestions can be used. **Exercise caution when using perchloric acid.)**
Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	Estimated D.L.	Order	Type	Interferences (underlined indicates severe)
ICP-OES 335.373 nm	0.004 / 0.00002 µg/mL	1	ion	
ICP-OES 337.215 nm	0.004 / 0.00002 µg/mL	1	ion	Ti, U, Ni, Rh
ICP-OES 424.683 nm	0.003 / 0.00002 µg/mL	1	ion	Ce
ICP-MS 45 amu	2.3 ppt	n/a	M+	16O212CH, 29Si16O, 90Zr+2

Uranium Note: If uranium is present in this standard, it is natural abundance unless specified in Section 3.0.

8.0 HAZARDOUS INFORMATION - Please refer to the enclosed Material Safety Data sheet for information regarding this CRM.

9.0 HOMOGENEITY - This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration
- QMI Certificate Number 010105

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration"
- Chemical Testing - Accredited A2LA Certificate Number 883.01

10.3 ISO/IEC Guide 34 "General Requirements for the Competence of Reference Material Producers"
- Reference Materials Production - Accredited A2LA Certificate Number 883.02

10.4 10CFR50 Appendix B - Nuclear Regulatory Commission
- Domestic Licensing of Production and Utilization Facilities

10.5 10CFR21 - Nuclear Regulatory Commission
- Reporting Defects and Non-Compliance

11.0 DATE OF CERTIFICATION AND PERIOD OF VALIDITY

11.1 Shelf Life - The period of time during which the concentration of the analyte(s) in a properly packaged, unopened, and unused standard stored under environmentally controlled and monitored conditions will remain within the specified uncertainty range. Shelf life is limited primarily by transpiration (loss of water from the solution) and infrequently, by chemical instability.

11.2 Expiration Date - The date after which a CRM should not be used. Routine laboratory use of a CRM increases transpiration losses and the chance of contamination which affect the integrity of the CRM and limit its useful life. Manufacturer concurs with state and federal regulatory agencies' recommendations that solution standards be assigned a one-year expiration date.

11.3 Chemical Stability - Studies have been conducted on this or similar CRMs and it has been demonstrated that this CRM is chemically stable for a period of not less than two years provided the "Storage & Handling" conditions are followed that are described in section 7.0.

Certification Date: **January 31, 2012**

Expiration Date: EXPIRES 01-2017

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By:	Danny Feeny, Product Documentation Technician	Danny R Feeny
Certificate Approved By:	Brian Alexander, PhD., Quality Control Supervisor	Brian Alexander
Certifying Officer:	Paul Gaines, PhD., Senior Technical Director	Paul R Gaines

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #24682, Scandium Primary Standard - Rec

Pace Analytical®
www.pacelabs.com

STOCK STANDARD

Created By: DS1
Created: 02/15/2012 14:05
Expires: 03/01/2013

Volume of Standard: 125 mL
Manufacturer: Inorganic Ventures
Manufacturer Lot ID: E2-SC02094

Lot ID: 401843
Part ID: MSSC-100PPM
Standard ID: Sc-STK

Notes: Scandium Primary Standard - Rec 03/16/11, Open

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4001c/401843_COA.PDF

Compound Name and Concentration for Standard #24682

Compound Name	Concentration	Compound Name	Concentration
Scandium	100 ug/mL		

INORGANIC VENTURES™
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tel: 800.669.6799 • 540.585.3030
fax: 540.585.3012
info@inorganicventures.com

CERTIFICATE OF ANALYSIS

401043
REC. 02/16/12 BY DS
Exp. --/--/-- By --
Oppn / / By

1.0 **INORGANIC VENTURES** is an ISO Guide 34 "General Requirements for the Competence of Reference Material Producers" and ISO 9001 registered manufacturer. Our manufacturing laboratory is accredited to ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories."

ACCREDITED Testing Laboratory Certificate 583.01

ACCREDITED Reference Material Producer Certificate 583.02

2.0 **DESCRIPTION OF CRM** **100 µg/mL Scandium in 7% (v/v) HNO3**

Catalog Number:	MSSC-100PPM
Lot Number:	E2-SC02094
Starting Material:	Sc2O3
Starting Material Purity (%):	99.9960
Starting Material Lot No:	1630A
Matrix:	7% (v/v) HNO3

3.0 **CERTIFIED VALUES AND UNCERTAINTIES**

Certified Concentration: 100.32 ± 0.81 µg/mL

Certified Density: 1.031 g/mL (measured at 20 ± 1°C)

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Certified Value $(\bar{x}) = \frac{\sum x_i}{n}$

Uncertainty (±) $= \frac{2\,[(\Sigma s_i)^2]^{1/2}}{(n)^{1/2}}$

($\bar{x}$) = mean
x_i = individual results
n = number of measurements
Σs_i = The summation of all significant estimated errors (Most common are the errors from instrumental measurement, weighing, dilution to volume and the fixed error reported on the NIST SRM certificate of analysis)

4.0 **TRACEABILITY TO NIST AND VALUES OBTAINED BY INDEPENDENT METHODS**

- "Property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties." (ISO VIM, 2nd ed., 1993, definition 6.10)
- This product is Traceable to NIST via an unbroken chain of comparisons to the following NIST SRMs:

4.1 ELEMENT	METHOD	NIST SRM#	SRM LOT#
Sc	ICP Assay	3148a	792111
Sc	EDTA	928	928

4.2 **BALANCE CALIBRATION** - All analytical balances are calibrated yearly by an A2LA accredited calibration laboratory and are traceable to a class E 2 analytical weight set with NIST Traceability. All balances are checked daily using an in-house procedure. The weights used for testing are annually compared to master weights and are traceable to the National Institute of Standards and Technology (NIST).

4.3 **THERMOMETER CALIBRATION** - All thermometers are NIST traceable through thermometers that are calibrated by an A2LA accredited calibration laboratory.

4.4 **GLASSWARE CALIBRATION** - An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM's.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP/MS AND ICP-OES IN µg/mL

Standard solutions are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag	< 0.0020060	O	Cu	0.0002480	M	La	< 0.0005010	M	Pr	< 0.0003010	M	Ta	< 0.0070200
O	Al	< 0.0010000	M	Dy	< 0.0060170	M	Li	< 0.0100290	M	Pt	< 0.0020060	M	Tb	< 0.0003010
M	As	< 0.0100290	M	Er	< 0.0050150	M	Lu	< 0.0004010	M	Rb	< 0.0010030	M	Te	< 0.0300870
M	Au	< 0.0030090	M	Eu	< 0.0030090	O	Mg	0.0000200	M	Re	< 0.0010030	M	Th	< 0.0010030
M	B	< 0.0702030	O	Fe	0.0000990	M	Mn	< 0.0040120	M	Rh	< 0.0010030	O	Ti	< 0.0010000
M	Ba	< 0.0100290	M	Ga	< 0.0010030	M	Mo	< 0.0020060	M	Ru	< 0.0020060	M	Tl	< 0.0010030
M	Be	< 0.0005010	M	Gd	< 0.0010030	O	Na	< 0.0900000	O	S	< 0.0250000	M	Tm	< 0.0004010
M	Bi	< 0.0004010	M	Ge	< 0.0060170	M	Nb	< 0.0005010	M	Sb	< 0.0005010	M	U	< 0.0020060
O	Ca	0.0026840	O	Hf	0.0004970	M	Nd	< 0.0020060	s	Sc		M	V	< 0.0020060
M	Cd	< 0.0030090	O	Hg	< 0.0100000	O	Ni	< 0.0009000	M	Se	< 0.0080230	O	W	< 0.0040000
M	Ce	< 0.0050150	M	Ho	< 0.0005010	n	Os		O	Si	0.0014910	O	Y	< 0.0010000
M	Co	< 0.0030090	M	In	< 0.0100290	n	P		M	Sm	< 0.0010030	M	Yb	< 0.0010030
O	Cr	< 0.0008000	M	Ir	< 0.0050150	M	Pb	< 0.0030090	M	Sn	< 0.0050150	O	Zn	0.0002780
M	Cs	< 0.0003010	O	K	< 0.1000000	M	Pd	< 0.0050150	M	Sr	< 0.0005010	O	Zr	0.0009940

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

For the calibration of analytical instruments including but not limited to the following:
HPLC, IC, TLC, ISE, IR, NMR, UV/VIS, MS, Capillary Electrophoresis, Potentiometry, Wet Chemistry and Voltammetry
For the validation of analytical methods
For the preparation of "working reference samples"
For interference studies and the determination of correction coefficients
For detection limit and linearity studies
For additional intended uses, contact Technical Staff

This CRM was manufactured using 18 megohm doubly deionized water that has been filtered through a 0.2 micron filter.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

Storage & Handling - Keep tightly sealed when not in use. Store and use at 20 ± 4°C. Do not pipet from container. Do not return portions removed for pipetting to container.
Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 44.95591; +3; 6; Sc(H2O)6+2
Chemical Compatibility - Soluble in HCl, H2SO4 and HNO3. Avoid HF, H3PO4 and neutral to basic media. Stable with most metals and inorganic anions forming an insoluble carbonate, oxide, oxalate, and fluoride. Avoid mixing with elements / solutions containing moderate amounts of fluoride. The fluoride is soluble in excess HF forming ScF63- (not recommended for standard preparations).
Stability - 2-100 ppb levels stable for months in 1% HNO3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 5-10% HNO3 / LDPE container. Small atomic radius increases hydrolysis requiring higher acid levels than other Rare Earths.
Sc Containing Samples (Preparation and Solution) - Metal (Soluble in acids); Oxide (Dissolve by heating in H2O / HNO3); Ores (Carbonate fusion in Pt0 followed by HCl dissolution); Organic Matrices (Dry ash and dissolve in 1:1 H2O / HCl or HNO3), (Aqua Regia or nitric / perchloric / sulfuric acid digestions can be used. **Exercise caution when using perchloric acid.)**
Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	Estimated D.L.	Order	Type	Interferences (underlined indicates severe)
ICP-OES 335.373 nm	0.004 / 0.00002 µg/mL	1	ion	
ICP-OES 337.215 nm	0.004 / 0.00002 µg/mL	1	ion	Ti, U, Ni, Rh
ICP-OES 424.683 nm	0.003 / 0.00002 µg/mL	1	ion	Ce
ICP-MS 45 amu	2.3 ppt	n/a	M+	16O212CH, 29Si16O, 90Zr+2

Uranium Note: If uranium is present in this standard, it is natural abundance unless specified in Section 3.0.

8.0 HAZARDOUS INFORMATION - Please refer to the enclosed Material Safety Data sheet for information regarding this CRM.

9.0 HOMOGENEITY - This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 **ISO 9001 Quality Management System Registration**
- QMI Certificate Number 010105

10.2 **ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration"**
- Chemical Testing - Accredited A2LA Certificate Number 883.01

10.3 **ISO/IEC Guide 34 "General Requirements for the Competence of Reference Material Producers"**
- Reference Materials Production - Accredited A2LA Certificate Number 883.02

10.4 **10CFR50 Appendix B - Nuclear Regulatory Commission**
- Domestic Licensing of Production and Utilization Facilities

10.5 **10CFR21 - Nuclear Regulatory Commission**
- Reporting Defects and Non-Compliance

11.0 DATE OF CERTIFICATION AND PERIOD OF VALIDITY

11.1 Shelf Life - The period of time during which the concentration of the analyte(s) in a properly packaged, unopened, and unused standard stored under environmentally controlled and monitored conditions will remain within the specified uncertainty range. Shelf life is limited primarily by transpiration (loss of water from the solution) and infrequently, by chemical instability.

11.2 Expiration Date - The date after which a CRM should not be used. Routine laboratory use of a CRM increases transpiration losses and the chance of contamination which affect the integrity of the CRM and limit its useful life. Manufacturer concurs with state and federal regulatory agencies' recommendations that solution standards be assigned a one-year expiration date.

11.3 Chemical Stability - Studies have been conducted on this or similar CRMs and it has been demonstrated that this CRM is chemically stable for a period of not less than two years provided the "Storage & Handling" conditions are followed that are described in section 7.0.

Certification Date: **January 31, 2012**

Expiration Date: EXPIRES 01-2017

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By:	Danny Feeny, Product Documentation Technician	Danny R Feeny
Certificate Approved By:	Brian Alexander, PhD., Quality Control Supervisor	Brian Alexander
Certifying Officer:	Paul Gaines, PhD., Senior Technical Director	Paul R Gaines

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #24683, ICPMS Internal Standard Stock - Rec

Pace Analytical®
www.pacelabs.com

STOCK STANDARD

Created By: DS1 **Volume of Standard:** 125 mL **Lot ID:** 401844

Created: 02/15/2012 14:08 **Manufacturer:** Inorganic Ventures **Part ID:** PACEWI-CAL-4A-REV1

Expires: 03/01/2013 **Manufacturer Lot ID:** F2-MEB410076 **Standard ID:** ICPM-istdSTK

Notes: ICPMS Internal Standard Stock - Rec 03/09/11, Open

Certificates of Analysis

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Compound Name and Concentration for Standard #24683

Compound Name	Concentration	Compound Name	Concentration
Bismuth	100 ug/mL	Terbium	100 ug/mL
Germanium	100 ug/mL	Yttrium	100 ug/mL
Indium	100 ug/mL		

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inorganicventures.com
tel: 800.669.6799 • 540.585.3030
fax: 540.585.3012
info@inorganicventures.com

CERTIFICATE OF ANALYSIS

1.0 **INORGANIC VENTURES** is an ISO Guide 34 "General Requirements for the Competence of Reference Material Producers" and ISO 9001 registered manufacturer. Our manufacturing laboratory is accredited to ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories."

ACCREDITED Testing Laboratory Certificate 881.01

ACCREDITED Reference Material Producer Certificate 881.02

2.0 **DESCRIPTION OF CRM** Custom Solution

401844
REC. 02/16/12 BY DS
Exp. __/__/__ By _

Catalog No.: PACEWI-CAL-4A-REV1

Lot Number: **F2-MEB410076**

Matrix: tr. HF, 7% HNO3(v/v)

100 µg/mL ea:
Bi, Ge, In, Tb, Y

3.0 **CERTIFIED VALUES AND UNCERTAINTIES**

ELEMENT	CERTIFIED VALUE	ELEMENT	CERTIFIED VALUE	ELEMENT	CERTIFIED VALUE
Bismuth, Bi	100.0 ± 0.6 µg/mL	Germanium, Ge	100.0 ± 0.7 µg/mL	Indium, In	100.0 ± 0.6 µg/mL
Terbium, Tb	100.0 ± 0.8 µg/mL	Yttrium, Y	100.0 ± 0.5 µg/mL		

Certified Density: 1.036 g/mL (measured at 20 ± 1° C)

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Certified Value $(\bar{x}) = \frac{\sum x_i}{n}$

$(\bar{x})$ = mean
x_i = individual results
n = number of measurements

Uncertainty (±) $= \frac{2\,[(\Sigma s_i)^2]^{1/2}}{(n)^{1/2}}$

Σs_i = The summation of all significant estimated errors (Most common are the errors from instrumental measurement, weighing, dilution to volume and the fixed error reported on the NIST SRM certificate of analysis)

4.0 **TRACEBILITY TO NIST AND VALUES OBTAINED BY INDEPENDENT METHODS**

- "Property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties." (ISO VIM, 2nd ed., 1993, definition 6.10)
- This product is Traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRMs are available, the term 'in-house std.' is specified.

4.1 ASSAY INFORMATION

ELEMENT	METHOD	NIST SRM#	SRM LOT#	ELEMENT	METHOD	NIST SRM#	SRM LOT#
Bi	Calculated		See Sec. 4.2	Bi	ICP Assay	3106	991212
Ge	Calculated		See Sec. 4.2	Ge	ICP Assay	3120a	080429
In	ICP Assay	3124a	991219	In	EDTA	928	928
Tb	ICP Assay	3157a	891603	Tb	EDTA	928	928
Y	ICP Assay	3167a	790412	Y	EDTA	928	928

4.2 **BALANCE CALIBRATION** - All analytical balances are calibrated yearly by an A2LA accredited calibration laboratory and are traceable to a class E 2 analytical weight set with NIST Traceability. All balances are checked daily using an in-house procedure. The weights used for testing are annually compared to master weights and are traceable to the National Institute of Standards and Technology (NIST).

4.3 **THERMOMETER CALIBRATION** - All thermometers are NIST traceable through thermometers that are calibrated by an A2LA accredited calibration laboratory.

4.4 **GLASSWARE CALIBRATION** - An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM's.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES IN µg/mL - N/A

6.0 INTENDED USE

For the calibration of analytical instruments including but not limited to the following:
HPLC, IC, TLC, ISE, IR, NMR, UV/VIS, MS, Capillary Electrophoresis, Potentiometry, Wet Chemistry and Voltammetry
For the validation of analytical methods
For the preparation of "working reference samples"
For interference studies and the determination of correction coefficients
For detection limit and linearity studies
For additional intended uses, contact Technical Staff

This CRM was manufactured using 18 megohm doubly deionized water that has been filtered through a 0.2 micron filter.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

Storage & Handling - Keep Tightly sealed when not in use. Store and use at 20 ± 4°C. **Do Not** pipette from the container. **Do Not** return portions removed from pipetting to container.

Element Specific Information - For specific information regarding any element: Contact technical staff.

Uranium Note: If uranium is present in this standard, it is natural abundance unless specified in Section 3.0.

HF Note: This standard should not be prepared or stored in glass.

8.0 HAZARDOUS INFORMATION - Please refer to the enclosed Material Safety Data sheet for information regarding this CRM.

9.0 HOMOGENEITY - This solution was mixed according to in-house procedure IV-MPM-004 and is guaranteed to be homogeneous.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 **ISO 9001 Quality Management System Registration**
- QMI Certificate Number 010105

10.2 **ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration"**
- Chemical Testing - Accredited A2LA Certificate Number 883.01

10.3 **ISO/IEC Guide 34 "General Requirements for the Competence of Reference Material Producers"**
- Reference Materials Production - Accredited A2LA Certificate Number 883.02

10.4 **10CFR50 Appendix B - Nuclear Regulatory Commission**
- Domestic Licensing of Production and Utilization Facilities

10.5 **10CFR21 - Nuclear Regulatory Commission**
- Reporting Defects and Non-Compliance

11.0 DATE OF CERTIFICATION AND PERIOD OF VALIDITY

11.1 Shelf Life - The period of time during which the concentration of the analyte(s) in a properly packaged, unopened, and unused standard stored under environmentally controlled and monitored conditions will remain within the specified uncertainty range. Shelf life is limited primarily by transpiration (loss of water from the solution) and infrequently, by chemical instability. Transpiration studies of chemically-stable solutions performed at the manufacturer's facility show a CRM shelf-life of twenty one months for solutions packaged in 125-mL low density polyethylene bottles. When stored under special conditions that minimize transpiration and instability, the shelf life can be extended past this limit.

11.2 Expiration Date - The date after which a CRM should not be used. Routine laboratory use of a CRM increases transpiration losses and the chance of contamination which affect the integrity of the CRM and limit its useful life. Manufacturer concurs with state and federal regulatory agencies' recommendations that solution standards be assigned a one-year expiration date.

11.3 Chemical Stability - Studies have been conducted on this or similar CRMs and it has been demonstrated that this CRM is chemically stable for a period of not less than two years provided the "Storage & Handling" conditions are followed that are described in section 7.0.

Certification Date: February 08, 2012

Expiration Date: EXPIRES 01-MAR-2013

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By: Christy Shortridge, Product Documentation

Christy Shortridge

Certificate Approved By: Brian Alexander, PhD., Quality Control Supervisor

Brian Alexander

Certifying Officer: Paul Gaines, PhD., Senior Technical Director

Paul R Gaines

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #24684, ICPMS Internal Standard Stock - Rec

Pace Analytical®
www.pacelabs.com

STOCK STANDARD

Created By: DS1
Created: 02/15/2012 14:10
Expires: 03/01/2013

Volume of Standard: 125 mL
Manufacturer: Inorganic Ventures
Manufacturer Lot ID: F2-MEB410076

Lot ID: 401844
Part ID: PACEWI-CAL-4A-REV1
Standard ID: ICPM-istdSTK

Notes: ICPMS Internal Standard Stock - Rec 03/09/11, Open

Certificates of Analysis

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Compound Name and Concentration for Standard #24684

Compound Name	Concentration	Compound Name	Concentration
Bismuth	100 ug/mL	Terbium	100 ug/mL
Germanium	100 ug/mL	Yttrium	100 ug/mL
Indium	100 ug/mL		

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fax: 540.585.3012
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CERTIFICATE OF ANALYSIS

1.0 **INORGANIC VENTURES** is an ISO Guide 34 "General Requirements for the Competence of Reference Material Producers" and ISO 9001 registered manufacturer. Our manufacturing laboratory is accredited to ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories."

ACCREDITED Testing Laboratory Certificate 881.01 — ACCREDITED Reference Material Producer Certificate 883.02

2.0 **DESCRIPTION OF CRM** Custom Solution

401044
REC. 02/16/12 BY DS
Exp. --/--/-- By -

Catalog No.: PACEWI-CAL-4A-REV1

Lot Number: **F2-MEB410076**

Matrix: tr. HF, 7% HNO3(v/v)

100 µg/mL ea:
Bi, Ge, In, Tb, Y

3.0 **CERTIFIED VALUES AND UNCERTAINTIES**

ELEMENT	CERTIFIED VALUE	ELEMENT	CERTIFIED VALUE	ELEMENT	CERTIFIED VALUE
Bismuth, Bi	100.0 ± 0.6 µg/mL	Germanium, Ge	100.0 ± 0.7 µg/mL	Indium, In	100.0 ± 0.6 µg/mL
Terbium, Tb	100.0 ± 0.8 µg/mL	Yttrium, Y	100.0 ± 0.5 µg/mL		

Certified Density: 1.036 g/mL (measured at 20 ± 1° C)

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Certified Value $(\bar{x}) = \frac{\sum x_i}{n}$

Uncertainty $(\pm) = \frac{2\,[(\sum s_i)^2]^{1/2}}{(n)^{1/2}}$

$(\bar{x})$ = mean
x_i = individual results
n = number of measurements
$\sum s_i$ = The summation of all significant estimated errors (Most common are the errors from instrumental measurement, weighing, dilution to volume and the fixed error reported on the NIST SRM certificate of analysis)

4.0 **TRACEBILITY TO NIST AND VALUES OBTAINED BY INDEPENDENT METHODS**

· "Property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties." (ISO VIM, 2nd ed., 1993, definition 6.10)

· This product is Traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRMs are available, the term 'in-house std.' is specified.

4.1 ASSAY INFORMATION

ELEMENT	METHOD	NIST SRM#	SRM LOT#	ELEMENT	METHOD	NIST SRM#	SRM LOT#
Bi	Calculated		See Sec. 4.2	Bi	ICP Assay	3106	991212
Ge	Calculated		See Sec. 4.2	Ge	ICP Assay	3120a	080429
In	ICP Assay	3124a	991219	In	EDTA	928	928
Tb	ICP Assay	3157a	891603	Tb	EDTA	928	928
Y	ICP Assay	3167a	790412	Y	EDTA	928	928

4.2 **BALANCE CALIBRATION** - All analytical balances are calibrated yearly by an A2LA accredited calibration laboratory and are traceable to a class E 2 analytical weight set with NIST Traceability. All balances are checked daily using an in-house procedure. The weights used for testing are annually compared to master weights and are traceable to the National Institute of Standards and Technology (NIST).

4.3 **THERMOMETER CALIBRATION** - All thermometers are NIST traceable through thermometers that are calibrated by an A2LA accredited calibration laboratory.

4.4 **GLASSWARE CALIBRATION** - An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM's.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES IN µg/mL - N/A

6.0 INTENDED USE

For the calibration of analytical instruments including but not limited to the following:
HPLC, IC, TLC, ISE, IR, NMR, UV/VIS, MS, Capillary Electrophoresis, Potentiometry, Wet Chemistry and Voltammetry
For the validation of analytical methods
For the preparation of "working reference samples"
For interference studies and the determination of correction coefficients
For detection limit and linearity studies
For additional intended uses, contact Technical Staff

This CRM was manufactured using 18 megohm doubly deionized water that has been filtered through a 0.2 micron filter.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

Storage & Handling - Keep **Tightly** sealed when not in use. Store and use at 20 ± 4°C. **Do Not** pipette from the container. **Do Not** return portions removed from pipetting to container.

Element Specific Information - For specific information regarding any element: Contact technical staff.

Uranium Note: If uranium is present in this standard, it is natural abundance unless specified in Section 3.0.

HF Note: This standard should not be prepared or stored in glass.

8.0 HAZARDOUS INFORMATION - Please refer to the enclosed Material Safety Data sheet for information regarding this CRM.

9.0 HOMOGENEITY - This solution was mixed according to in-house procedure IV-MPM-004 and is guaranteed to be homogeneous.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 **ISO 9001 Quality Management System Registration**
- QMI Certificate Number 010105

10.2 **ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration"**
- Chemical Testing - Accredited A2LA Certificate Number 883.01

10.3 **ISO/IEC Guide 34 "General Requirements for the Competence of Reference Material Producers"**
- Reference Materials Production - Accredited A2LA Certificate Number 883.02

10.4 **10CFR50 Appendix B - Nuclear Regulatory Commission**
- Domestic Licensing of Production and Utilization Facilities

10.5 **10CFR21 - Nuclear Regulatory Commission**
- Reporting Defects and Non-Compliance

11.0 DATE OF CERTIFICATION AND PERIOD OF VALIDITY

11.1 Shelf Life - The period of time during which the concentration of the analyte(s) in a properly packaged, unopened, and unused standard stored under environmentally controlled and monitored conditions will remain within the specified uncertainty range. Shelf life is limited primarily by transpiration (loss of water from the solution) and infrequently, by chemical instability. Transpiration studies of chemically-stable solutions performed at the manufacturer's facility show a CRM shelf-life of twenty one months for solutions packaged in 125-mL low density polyethylene bottles. When stored under special conditions that minimize transpiration and instability, the shelf life can be extended past this limit.

11.2 Expiration Date - The date after which a CRM should not be used. Routine laboratory use of a CRM increases transpiration losses and the chance of contamination which affect the integrity of the CRM and limit its useful life. Manufacturer concurs with state and federal regulatory agencies' recommendations that solution standards be assigned a one-year expiration date.

11.3 Chemical Stability - Studies have been conducted on this or similar CRMs and it has been demonstrated that this CRM is chemically stable for a period of not less than two years provided the "Storage & Handling" conditions are followed that are described in section 7.0.

Certification Date: February 08, 2012

Expiration Date: EXPIRES 01 MAR-2013

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By: Christy Shortridge, Product Documentation

Christy Shortridge

Certificate Approved By: Brian Alexander, PhD., Quality Control Supervisor

Brian Alexander

Certifying Officer: Paul Gaines, PhD., Senior Technical Director

Paul R Gaines

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #24685, ICSA, ICSAB Stock Standard - Rec

STOCK STANDARD

Created By: DS1
Created: 02/15/2012 14:13
Expires: 08/08/2013

Volume of Standard: 250 mL
Manufacturer: CPI
Manufacturer Lot ID: 11J098

Lot ID: 401845
Part ID: 4400-061025MB01
Standard ID: ICS-STK

Notes: ICSA, ICSAB Stock Standard - Rec 08/04/11, Open 08/8/11,DS1

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4001c/401845_COA.pdf

Compound Name and Concentration for Standard #24685

Compound Name	Concentration	Compound Name	Concentration
Sodium	500 ug/mL	Molybdenum	10 ug/mL
Magnesium	500 ug/mL	Titanium	10 ug/mL
Aluminum	500 ug/mL	Phosphorus	500 ug/mL
Potassium	500 ug/mL	Sulfur	500 ug/mL
Calcium	500 ug/mL	Chloride	3600 ug/mL
Iron	500 ug/mL	Carbon	1000 ug/mL

USA
5580 Skylane Boulevard P: 707.525.5788
Santa Rosa, CA 95403 P: 800.878.7654
F: 707.545.7901

CPI INTERNATIONAL
Advanced Analytical, Semiconductor and Life Science Solutions

Europe
P.O. Box 2704 P: +31 20 638 05 97
1000 CS Amsterdam F: +31 20 420 28 36
The Netherlands

www.cpiinternational.com
www.colitag.com

Expiry: 8/8/2013

Certificate of Analysis

Part Number: 4400-061025MB01
Lot Number: 11J098
Shelf Life: 18 months

401846
REC.02/16/12 BY DS
Exp: __/__/__ By _

Pace
Custom Standard
2% HNO3 + tr HF

Concentrations in ug/mL ± 0.5%

Al	500
C	1000
Ca	500
Cl	3600
Fe	500
K	500
Mg	500
Mo	10
Na	500
P	500
S	500
Ti	10

This standard solution was prepared using high-purity starting materials, high-purity acid (if required) and 18-megaohm de-ionized water. The starting materials were weighed to five significant figures and diluted in volumetric glassware calibrated to five significant figures.

Starting materials were analyzed at 1000µg/mL by ICP-MS for trace impurities. The standard solution concentrations were certified instrumentally against the National Institute of Standards and Technology's SRM 3100 series, NIST approved second source and/or gravimetrically.

Accuracy and stability are guaranteed to within plus or minus 0.5% of the certified value for the stated shelf life from the date of shipment. The solution should be kept tightly capped and stored under normal laboratory conditions. See attached MSDS for proper handling information.

For questions or comments please call 1-800-878-7654 in the USA, +31 20 638 05 97 in Europe or visit our web-site at www.cpiinternational.com.

ISO 9001:2008 ACLASS ISO 17025

colitag PEAK PERFORMANCE CERTIFIED REFERENCE MATERIALS MOD BLOCK Accu•prep 7000™ Extraction Manifold Nu•Phase™ SPE Disks

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #26596, Lithium Stock Standard Rec'd 3/16/12

Pace Analytical®
www.pacelabs.com

STOCK STANDARD

Created By: LMS
Created: 03/16/2012 15:08
Expires: 03/01/2013

Volume of Standard: 500 mL
Manufacturer: Inorganic Ventures
Manufacturer Lot ID: E2-LI02134

Lot ID: 401885
Part ID: CGLI10-5
Standard ID: Li-STK

Notes: Lithium Stock Standard Rec'd 3/16/12

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4001c/401885_COA.pdf

Compound Name and Concentration for Standard #26596

Compound Name	Concentration	Compound Name	Concentration
Lithium	10000 ug/mL		

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 • USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

tel: 800.669.6799 • 540.585.3030
fax: 540.585.3012
info@inorganicventures.com

1.0 **INORGANIC VENTURES** is an ISO Guide 34 "General Requirements for the Competence of Reference Material Producers" and ISO 9001 registered manufacturer. Our manufacturing laboratory is accredited to ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories."

ACCREDITED Testing Laboratory Certificate 583.01

ACCREDITED Reference Material Producer Certificate 583.02

401005
REC. 03/16/12 BY LH
Exp. __/__/__ By _

2.0 **DESCRIPTION OF CRM** **10000 µg/mL Lithium in 2% (v/v) HNO3**

Catalog Number:	CGLI10-1, CGLI10-2, and CGLI10-5
Lot Number:	**E2-LI02134**
Starting Material:	Li2CO3
Starting Material Purity (%):	99.9989
Starting Material Lot No:	1312
Matrix:	2% (v/v) HNO3

3.0 **CERTIFIED VALUES AND UNCERTAINTIES**

Certified Concentration: 10,021 ± 53 µg/mL - weighted mean

Certified Density: 1.066 g/mL (measured at 20 ± 1°C)

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Certified Value $(\bar{x}) = \frac{\sum x_i}{n}$

Uncertainty $(\pm) = \frac{2\,[(\Sigma s_i)^2]^{1/2}}{(n)^{1/2}}$

$(\bar{x})$ = mean
x_i = individual results
n = number of measurements
Σs_i = The summation of all significant estimated errors (Most common are the errors from instrumental measurement, weighing, dilution to volume and the fixed error reported on the NIST SRM certificate of analysis)

4.0 **TRACEABILITY TO NIST AND VALUES OBTAINED BY INDEPENDENT METHODS**

· "Property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties." (ISO VIM, 2nd ed., 1993, definition 6.10)

· This product is Traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRMs are available, the term 'in-house std.' is specified.

4.1 **Assay Method #1** **10,019 ± 34 µg/mL**
ICP Assay NIST SRM 3129a Lot Number: 000505

Assay Method #2 **10,042 ± 11 µg/mL**
Gravimetric NIST SRM Lot Number: See Sec. 4.2

4.2 **BALANCE CALIBRATION** - All analytical balances are calibrated yearly by an A2LA accredited calibration laboratory and are traceable to a class E 2 analytical weight set with NIST Traceability. All balances are checked daily using an in-house procedure. The weights used for testing are annually compared to master weights and are traceable to the National Institute of Standards and Technology (NIST).

4.3 **THERMOMETER CALIBRATION** - All thermometers are NIST traceable through thermometers that are calibrated by an A2LA accredited calibration laboratory.

4.4 **GLASSWARE CALIBRATION** - An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM's.

401006
REC.03/16/12 BY LM
Exp. __/__/__ By
Rcan / / By

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP/MS AND ICP-OES IN µg/mL

CRM's solutions are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

O	Al	0.001366	M	Dy	< 0.012721	s	Li		M	Pr	< 0.000636	M	Te	< 0.063607
M	Sb	< 0.001060	M	Er	< 0.010601	M	Lu	< 0.000848	M	Re	< 0.002120	M	Tb	< 0.000636
M	As	< 0.021202	M	Eu	< 0.006361	O	Mg	0.047317	M	Rh	< 0.002120	M	Tl	< 0.002120
M	Ba	< 0.021202	M	Gd	< 0.002120	O	Mn	0.000146	M	Rb	0.027925	M	Th	< 0.002120
O	Be	< 0.000200	M	Ga	< 0.002120	O	Hg	< 0.015000	M	Ru	< 0.004240	M	Tm	< 0.000848
M	Bi	< 0.000848	M	Ge	< 0.012721	M	Mo	< 0.004240	M	Sm	< 0.002120	O	Sn	< 0.006000
O	B	< 0.000600	M	Au	< 0.006361	M	Nd	< 0.004240	M	Sc	< 0.021202	O	Ti	< 0.000700
M	Cd	< 0.006361	M	Hf	< 0.004240	O	Ni	< 0.002300	M	Se	< 0.016962	O	W	< 0.004000
O	Ca	0.204878	M	Ho	< 0.001060	M	Nb	< 0.001060	O	Si	0.204878	M	U	< 0.004240
M	Ce	< 0.010601	O	In	< 0.004000	n	Os		M	Ag	< 0.004240	O	V	< 0.000900
M	Cs	< 0.000636	M	Ir	< 0.010601	M	Pd	< 0.010601	O	Na	0.034146	M	Yb	< 0.002120
M	Cr	< 0.010601	O	Fe	0.010732	O	P	< 0.002500	O	Sr	0.001268	M	Y	< 0.084810
M	Co	< 0.006361	M	La	< 0.001060	M	Pt	< 0.004240	O	S	0.087805	O	Zn	0.011902
O	Cu	< 0.001400	M	Pb	< 0.006361	O	K	0.024390	M	Ta	< 0.014842	M	Zr	< 0.010601

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

For the calibration of analytical instruments including but not limited to the following:
HPLC, IC, TLC, ISE, IR, NMR, UV/VIS, MS, Capillary Eletrophoresis, Potentiometry, Wet Chemistry and Voltammetry
For the validation of analytical methods
For the preparation of "working reference samples"
For interference studies and the determination of correction coefficients
For detection limit and linearity studies
For additional intended uses, contact Technical Staff

This CRM was manufactured using 18 megohm doubly deionized water that has been filtered through a 0.2 micron filter.

401005
REC.03/16/12 BY LM
EXP: --/--/-- BY --

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

Storage & Handling - Keep tightly sealed when not in use. Store and use at 20 ± 4°C. Do not pipet from container. Do not return portions removed for pipetting to container.

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 6.941; +1; (6); Li+(aq) large effective radius due to hydration sphere (Coordination Number in parentheses is assumed, not certain.)

Chemical Compatibility - Soluble in HCl, HNO3, H2SO4 and HF aqueous matrices. Stable with all metals and inorganic anions.

Stability - 2-100 ppb levels stable for months in 1% HNO3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1-5% HNO3 / LDPE container.

Li Containing Samples (Preparation and Solution) - Metal (Dissolves very rapidly in water); Ores (Sodium carbonate fusion in Pt0 followed by HCl dissolution-blank levels of Li in sodium carbonate critical); Organic Matrices (Sulfuric / peroxide digestion or nitric / sulfuric / perchloric acid decomposition).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	Estimated D.L.	Order	Type	Interferences (underlined indicates severe)
ICP-OES 670.784 nm	0.002 / 0.00002 µg/mL	1	atom	2nd order radiation from R.E.s on some optical designs
ICP-OES 460.286 nm	0.9 / 0.04 µg/mL	1	atom	Zr, Th
ICP-OES 323.261 nm	1.1 / 0.05 µg/mL	1	atom	Sb, Th, Ni
ICP-MS 7 amu	10 ppt	n/a	M+	

Uranium Note: If uranium is present in this standard, it is natural abundance unless specified in Section 3.0.

8.0 HAZARDOUS INFORMATION

- Please refer to the enclosed Material Safety Data sheet for information regarding this CRM.

9.0 HOMOGENEITY

- This solution was mixed according to an in house procedure and is guaranteed to be homogeneous.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration
- QMI Certificate Number 010105

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration"
- Chemical Testing - Accredited A2LA Certificate Number 883.01

10.3 ISO/IEC Guide 34 "General Requirements for the Competence of Reference Material Producers"
- Reference Materials Production - Accredited A2LA Certificate Number 883.02

10.4 10CFR50 Appendix B - Nuclear Regulatory Commission
- Domestic Licensing of Production and Utilization Facilities

10.5 10CFR21 - Nuclear Regulatory Commission
- Reporting Defects and Non-Compliance

11.0 DATE OF CERTIFICATION AND PERIOD OF VALIDITY

11.1 Shelf Life - The period of time during which the concentration of the analyte(s) in a properly packaged, unopened, and unused standard stored under environmentally controlled and monitored conditions will remain within the specified uncertainty range. Shelf life is limited primarily by transpiration (loss of water from the solution) and infrequently, by chemical instability.

11.2 Expiration Date - The date after which a CRM should not be used. Routine laboratory use of a CRM increases transpiration losses and the chance of contamination which affect the integrity of the CRM and limit its useful life. Manufacturer concurs with state and federal regulatory agencies' recommendations that solution standards be assigned a one-year expiration date.

11.3 Chemical Stability - Studies have been conducted on this or similar CRMs and it has been demonstrated that this CRM is chemically stable for a period of not less than two years provided the "Storage & Handling" conditions are followed that are described in section 7.0.

Certification Date: November 09, 2011

Expiration Date: EXPIRES 01 MAR 2013

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By:	Danny Feeny, Product Documentation Technician	
Certificate Approved By:	Brian Alexander, PhD., Quality Control Supervisor	
Certifying Officer:	Paul Gaines, PhD., Senior Technical Director	

401696
REC.03/16/12 BY LH
EXP. __/__/__ BY -

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #26665, Metals Trace Primary Standard - Rec'd

STOCK STANDARD

Created By: LMS
Created: 03/19/2012 11:15
Expires: 03/15/2013

Volume of Standard: 250 mL
Manufacturer: SPEX
Manufacturer Lot ID: 4-79YP

Lot ID: 401889
Part ID: XFSMN-26-250A
Standard ID: Metals STK1

Notes: Metals Trace Primary Standard - Rec'd 3/16/12

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4001c/401889_COA.pdf

Compound Name and Concentration for Standard #26665

Compound Name	Concentration	Compound Name	Concentration
Arsenic	100 ug/mL	Nickel	100 ug/mL
Barium	100 ug/mL	Phosphorus	100 ug/mL
Beryllium	100 ug/mL	Lead	100 ug/mL
Cadmium	100 ug/mL	Selenium	100 ug/mL
Cobalt	100 ug/mL	Strontium	100 ug/mL
Chromium	100 ug/mL	Thallium	100 ug/mL
Copper	100 ug/mL	Vanadium	100 ug/mL
Lithium	100 ug/mL	Zinc	100 ug/mL
Manganese	100 ug/mL		

SPEXertificate ®

Certificate of Reference Material

ACCREDITED

Reference Materials Producer
CERT #2495.01
Chemical Testing
CERT #2495.02

Catalog Number: **XFSMN-26-250A** **Lot No.: 4-79YP**
Description: Custom Assurance Standard
Matrix: 5% HNO3

401885
REC. 03/19/12 BY LM
Exp. __/__/__ By __
Open __/__/__ By __

This **ASSURANCE** ® Certified Reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for inorganic spectroscopic instrumentation such as ICPOES, DCP, AA, ICPMS, and XRF. It can be employed in USEPA, ASTM and other methods relevant to the certified properties listed below.

The CRM is prepared from high purity single element concentrates of individual elements using Class A laboratory ware to give precise concentrations and to comply with provisions of 10CFR part 21. Certificate must accompany shipment.

Instrumental Analysis by ICP Spectrometer:

Element	Labeled (mg/L)	Uncertainty (+/-mg/L)	Element	Labeled (mg/L)	Uncertainty (+/-mg/L)
As	100	0.5	Ni	100	0.5
Ba	100	0.5	P	100	0.5
Be	100	0.5	Pb	100	0.5
Cd	100	0.5	Se	100	0.5
Co	100	0.5	Sr	100	0.5
Cr	100	0.5	Tl	100	0.5
Cu	100	0.5	V	100	0.5
Li	100	0.5	Zn	100	0.5
Mn	100	0.5			

Spex Reference Multi: Lot #MULTI1LE

Following SRMs (as appropriate to the element analyzed) were used in establishing the above results:

El	SRM	El	SRM	El	SRM	El	SRM	El	SRM	El	SRM	El	SRM	El	SRM
Al	3101a*	Ce	3110*	Ga	3119a*	Li	3129a*	Pd	3138*	Sc	3148a*	Tb	3157a*	Yb	3166a*
Sb	3102a*	Cs	3111a*	Ge	3120a*	Lu	3130a*	P	3139a*	Se	3149*	Tl	3158*	Y	3167a*
As	3103a*	Cr	3112a*	Au	3121*	Mg	3131a*	Pt	3140*	Si	3150*	Th	3159*	Zn	3168a*
Ba	3104a*	Co	3113*	Hf	3122*	Mn	3132*	K	3141a*	Ag	3151*	Tm	3160a*	Zr	3169*
Be	3105a*	Cu	3114*	Ho	3123a*	Hg	3133*	Pr	3142a*	Na	3152a*	Sn	3161a*		
Bi	3106*	Dy	3115a*	In	3124a*	Mo	3134*	Re	3143*	Sr	3153a*	Ti	3162a*		
B	3107*	Er	3116a*	Fe	3126a*	Nd	3135a*	Rh	3144*	S	3154*	W	3163*		
Cd	3108*	Eu	3117a*	La	3127a*	Ni	3136*	Rb	3145a*	Ta	3155*	U	3164*		
Ca	3109a*	Gd	3118a*	Pb	3128*	Nb	3137*	Sm	3147a*	Te	3156*	V	3165*		

* - Indicates NIST SRM † - Indicates SPEX CertiPrep CRM (when NIST SRM is not available)

Balances are calibrated regularly with weight sets traceable to NIST#s 32856, 32867 and others. This CRM is guaranteed stable and accurate to +/- 0.5% on the average of all the labeled concentrations with no single element exceeding +/- 2%. This guarantee is valid for a period of one year from the date of certification only when the material is kept tightly capped and transported and stored under laboratory conditions.

Date of Certification: MAR 2012 Certifying Officer: Vanaja Sivakumar

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Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #26666, Metals Trace2 Primary Standard - Rec'd

Pace Analytical®
www.pacelabs.com

STOCK STANDARD

Created By: LMS
Created: 03/19/2012 11:20
Expires: 03/15/2013

Volume of Standard: 250 mL
Manufacturer: SPEX
Manufacturer Lot ID: 4-80YP

Lot ID: 401890
Part ID: XFSMN-27-250A
Standard ID: Metals STK2

Notes: Metals Trace2 Primary Standard - Rec'd 3/16/12

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4001c/401890_COA.pdf

Compound Name and Concentration for Standard #26666

Compound Name	Concentration	Compound Name	Concentration
Silicon	500 ug/mL	Tin	100 ug/mL
Boron	100 ug/mL	Zirconium	100 ug/mL
Molybdenum	100 ug/mL	Silver	50 ug/mL
Antimony	100 ug/mL	Titanium	100 ug/mL

SPEXertificate ®

Certificate of Reference Material

ACCREDITED

Reference Materials Producer
CERT #2495.01
Chemical Testing
CERT #2495.02

Catalog Number: XFSMN-27-250A **Lot No.: 4-80YP**
Description: Custom Assurance Standard
Matrix: 5% HNO3/Tr. Tart. Acid/Tr. HF

401890
REC. 03/19/12 BY LM
Exp. --/--/-- By --
Open / / By

This ASSURÅNCE ® Certified Reference Material, CRM, is intended primarily for use as a calibration standard or quality control standard for inorganic spectroscopic instrumentation such as ICPOES, DCP, AA, ICPMS, and XRF. It can be employed in USEPA, ASTM and other methods relevant to the certified properties listed below.

The CRM is prepared from high purity single element concentrates of individual elements using Class A laboratory ware to give precise concentrations and to comply with provisions of 10CFR part 21. Certificate must accompany shipment.

Instrumental Analysis by ICP Spectrometer:

Element	Labeled (mg/L)	Uncertainty (+/- mg/L)	Element	Labeled (mg/L)	Uncertainty (+/- mg/L)
Si	500	3	Sn	100	0.5
B	100	0.5	Ti	100	0.5
Mo	100	0.5	Zr	100	0.5
Sb	100	0.5	Ag	50	0.3

Spex Reference Multi: Lot #MULTI1LE

Following SRMs (as appropriate to the element analyzed) were used in establishing the above results:

El	SRM	El	SRM	El	SRM	El	SRM	El	SRM	El	SRM	El	SRM	El	SRM
Al	3101a*	Ce	3110*	Ga	3119a*	Li	3129a*	Pd	3138*	Sc	3148a*	Tb	3157a*	Yb	3166a*
Sb	3102a*	Cs	3111a*	Ge	3120a*	Lu	3130a*	P	3139a*	Se	3149*	Tl	3158*	Y	3167a*
As	3103a*	Cr	3112a*	Au	3121*	Mg	3131a*	Pt	3140*	Si	3150*	Th	3159*	Zn	3168a*
Ba	3104a*	Co	3113*	Hf	3122*	Mn	3132*	K	3141a*	Ag	3151*	Tm	3160a*	Zr	3169*
Be	3105a*	Cu	3114*	Ho	3123a*	Hg	3133*	Pr	3142a*	Na	3152a*	Sn	3161a*		
Bi	3106*	Dy	3115a*	In	3124a*	Mo	3134*	Re	3143*	Sr	3153a*	Ti	3162a*		
B	3107*	Er	3116a*	Fe	3126a*	Nd	3135a*	Rh	3144*	S	3154*	W	3163*		
Cd	3108*	Eu	3117a*	La	3127a*	Ni	3136*	Rb	3145a*	Ta	3155*	U	3164*		
Ca	3109a*	Gd	3118a*	Pb	3128*	Nb	3137*	Sm	3147a*	Te	3156*	V	3165*		

* - Indicates NIST SRM † - Indicates SPEX CertiPrep CRM (when NIST SRM is not available)

Balances are calibrated regularly with weight sets traceable to NIST#s 32856, 32867 and others. This CRM is guaranteed stable and accurate to +/- 0.5% on the average of all the labeled concentrations with no single element exceeding +/- 2%. This guarantee is valid for a period of one year from the date of certification only when the material is kept tightly capped and transported and stored under laboratory conditions.

Date of Certification: MAR 2012 Certifying Officer: Vanaja Sivakumar

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Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #26667, Metals Mineral Primary Standard, Rec

STOCK STANDARD

Created By: LMS
Created: 03/19/2012 11:22
Expires: 03/15/2013

Volume of Standard: 250 mL
Manufacturer: SPEX
Manufacturer Lot ID: 11-001CR

Lot ID: 401891
Part ID: XFSMN-28-250A
Standard ID: Metals STK3

Notes: Metals Mineral Primary Standard, Rec 03/16/12

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4001c/401891_COA.pdf

Compound Name and Concentration for Standard #26667

Compound Name	Concentration	Compound Name	Concentration
Aluminum	1000 ug/mL	Potassium	1000 ug/mL
Calcium	1000 ug/mL	Magnesium	1000 ug/mL
Iron	1000 ug/mL	Sodium	1000 ug/mL

ACCREDITED

Reference Materials Producer
CERT #2495.01
Chemical Testing
CERT #2495.02

SPEXertificate ®

Certificate of Reference Material

Catalog Number: **XFSMN-28-250A** **Lot No.: 11-001CR**
Description: Custom Assurance Standard
Matrix: 5% HNO3

401081
REC.03/19/12 BY LM
Exp. __/__/__ By _

This **ASSURÅNCE** ® Certified Reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for inorganic spectroscopic instrumentation such as ICPOES, DCP, AA, ICPMS, and XRF. It can be employed in USEPA, ASTM and other methods relevant to the certified properties listed below.

The CRM is prepared from high purity single element concentrates of individual elements using Class A laboratory ware to give precise concentrations and to comply with provisions of 10CFR part 21. Certificate must accompany shipment.

Instrumental Analysis by ICP Spectrometer:

Element	Labeled (mg/L)	Uncertainty (+/-mg/L)	Element	Labeled (mg/L)	Uncertainty (+/-mg/L)
Al	1000	5	K	1000	5
Ca	1000	5	Mg	1000	5
Fe	1000	5	Na	1000	5

SPEX CertiPrep Reference Multi: Lot #MULTI1LE

Following SRMs (as appropriate to the element analyzed) were used in establishing the above results:

El	SRM	El	SRM	El	SRM	El	SRM	El	SRM	El	SRM	El	SRM	El	SRM
Al	3101a*	Ce	3110*	Ga	3119a*	Li	3129a*	Pd	3138*	Sc	3148a*	Tb	3157a*	Yb	3166a*
Sb	3102a*	Cs	3111a*	Ge	3120a*	Lu	3130a*	P	3139a*	Se	3149*	Ti	3158*	Y	3167a*
As	3103a*	Cr	3112a*	Au	3121*	Mg	3131a*	Pt	3140*	Si	3150*	Th	3159*	Zn	3168a*
Ba	3104a*	Co	3113*	Hf	3122*	Mn	3132*	K	3141a*	Ag	3151*	Tm	3160a*	Zr	3169*
Be	3105a*	Cu	3114*	Ho	3123a*	Hg	3133*	Pr	3142a*	Na	3152a*	Sn	3161a*		
Bi	3106*	Dy	3115a*	In	3124a*	Mo	3134*	Re	3143*	Sr	3153a*	Ti	3162a*		
B	3107*	Er	3116a*	Fe	3126a*	Nd	3135a*	Rh	3144*	S	3154*	W	3163*		
Cd	3108*	Eu	3117a*	La	3127a*	Ni	3136*	Rb	3145a*	Ta	3155*	U	3164*		
Ca	3109a*	Gd	3118a*	Pb	3128*	Nb	3137*	Sm	3147a*	Te	3156*	V	3165*		

* - Indicates NIST SRM † - Indicates SPEX CertiPrep CRM (when NIST SRM is not available)

Balances are calibrated regularly with weight sets traceable to NIST#s 32856, 32867 and others. This CRM is guaranteed stable and accurate to +/- 0.5% on the average of all the labeled concentrations with no single element exceeding +/- 2%. This guarantee is valid for a period of one year from the date of certification only when the material is kept tightly capped and transported and stored under laboratory conditions.

Date of Certification: MAR 2012 Certifying Officer: Vanaja Sivakumar

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Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #29179, ICPMS X-Cal Stock Standard 1 - Rec'd

Pace Analytical®
www.pacelabs.com

STOCK STANDARD

Created By: DS1
Created: 04/27/2012 15:24
Expires: 04/24/2013

Volume of Standard: 125 mL
Manufacturer: High Purity
Manufacturer Lot ID: 1207515

Lot ID: 401965
Part ID: ICP-MS-68A
Standard ID: ICPM-XSTK1

Notes: ICPMS X-Cal Stock Standard 1 - Rec'd 4/27/12, Open 04/30/12

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4001c/401965_COA.pdf

Compound Name and Concentration for Standard #29179

Compound Name	Concentration	Compound Name	Concentration
Beryllium	10 mg/L	Selenium	10 mg/L
Boron	10 mg/L	Cadmium	10 mg/L
Sodium	10 mg/L	Barium	10 mg/L
Magnesium	10 mg/L	Thallium	10 mg/L
Aluminum	10 mg/L	Lead	10 mg/L
Potassium	10 mg/L	Bismuth	10 mg/L
Calcium	10 mg/L	Uranium	10 mg/L
Vanadium	10 mg/L	Cerium	10 mg/L
Chromium	10 mg/L	Cesium	10 mg/L
Iron	10 mg/L	Neodymium	10 mg/L
Manganese	10 mg/L	Lithium	10 mg/L
Lanthanum	10 mg/L	Strontium	10 mg/L
Cobalt	10 mg/L	Indium	10 mg/L
Nickel	10 mg/L	Rubidium	10 mg/L
Copper	10 mg/L	Scandium	10 mg/L
Zinc	10 mg/L	Yttrium	10 mg/L
Arsenic	10 mg/L		

HIGH-PURITY STANDARDS
www.highpuritystandards.com
P.O. Box 41727
Charleston, SC 29423
Phone (843) 767-7900
Fax (843) 767-7906

401965

Certificate of Analysis

401965
REC. 04/27/12 BY DS
Exp. __/__/__ BY -
Open __/__/__ By

A29179 ICPM-XSTK1 STOCK
24-APR-13
DESC: ICPMS X-Cal Stock Standard
LOT NUMBER: 401965
MANUFACTURER: High Purity
04/00712: ICPMS X-Cal Stock Standard 1 - Rec'd 4/27/12 Opd
CREATED: 27-APR-12 BY: DS1
EXPIRES: 24-APR-13 COMPOUND COUNT: 3

Product Description:

Part Number:	**ICP-MS-68A** Solution A
Lot Number:	**1207515**
Matrix:	2% HNO_3
Purity:	99.964% - 99.9999%

Certified Values:

Element	(mg/L)	SRM ID	SRM Lot#
Al	10.00 ± 0.05	3101a	60502
As	10.0 ± 0.1	3103a	100818
Ba	10.00 ± 0.06	3104a	70222
Be	10.0 ± 0.1	3105a	90514
Bi	10.00 ± 0.05	3106	991212
B	10.00 ± 0.05	3107	070514
Cd	10.00 ± 0.05	3108	060531
Ca	10.00 ± 0.05	3109a	050825
Ce	10.00 ± 0.05	3110	890602
Cs	10.00 ± 0.05	3111a	050614
Cr	10.00 ± 0.05	3122a	030730
Co	10.00 ± 0.05	3113	000630
Cu	10.00 ± 0.05	3114	011017
Dy	10.00 ± 0.05	3115a	990504
Er	10.00 ± 0.05	3116a	000831
Eu	10.00 ± 0.05	3117a	991307
Gd	10.00 ± 0.05	3118a	992004
Ga	10.00 ± 0.06	3119a	890709
Ho	10.00 ± 0.05	3123a	790812
In	10.00 ± 0.05	3124a	991219
Fe	10.00 ± 0.05	3126a	051031
La	10.00 ± 0.05	3127a	890402
Pb	10.00 ± 0.06	3128	101026
Li	10.00 ± 0.06	3129a	505

Element	(mg/L)	SRM ID	SRM Lot#
Lu	10.00 ± 0.05	3130a	100503
Mg	10.00 ± 0.05	3131a	050302
Mn	10.0 ± 0.1	3132	050429
Nd	10.00 ± 0.06	3135a	992803
Ni	10.00 ± 0.05	3136	000612
P	10.00 ± 0.06	3139a	060717
K	10.00 ± 0.05	3141a	051220
Pr	10.0 ± 0.1	3142a	990501
Re	10.00 ± 0.06	3143	010816
Rb	10.0 ± 0.1	3145a	891203
Sm	10.00 ± 0.05	3147a	892911
Sc	10.00 ± 0.06	3148a	792111
Se	10.0 ± 0.1	3149	100901
Na	10.00 ± 0.05	3152a	010728
Sr	10.00 ± 0.05	3153a	990906
Tb	10.00 ± 0.05	3157a	891603
Tl	10.00 ± 0.05	3158	993012
Th	10.00 ± 0.06	*	
Tm	10.00 ± 0.06	3160a	790912
U	10.00 ± 0.05	3164	080521
V	10.00 ± 0.06	3165	992706
Yb	10.00 ± 0.05	3166a	790512
Y	10.00 ± 0.05	3167a	790412
Zn	10.00 ± 0.05	3168a	080123

The Certified values are based on gravimetric and volumetric preparation, and verified against SRM 3100 series developed by National Institute of Standards and Technology (NIST) via inductively coupled plasma optical emission spectrometry (ICP-OES) using an internal laboratory developed method. The uncertainty in the certified value is calculated for a 95% confidence interval.

Preparation Information:

The highest purity source materials were purchased from qualified vendors per ISO 9001:2008 guidelines and assayed by ICP-OES for conformity prior to use. This standard was prepared using methods developed at NIST for the preparation of SRM Spectrometric Standard Solutions. Sub-boiling distilled high-purity acid has been used to place the materials in solution and to stabilize the standard. The matrix is as noted above in 18 megaohm deionized water.

Traceability Information:

The traceability of this standard is maintained through an unbroken chain of comparisons to appropriate standards with suitable procedure and measurement uncertainties.

a. **Analytical Balance Calibration**: All balances are calibrated weekly by an in-house method using NBS weights Inventory No 20231A. The balances are calibrated yearly and the calibration weights are checked biennially by a qualified metrology company with weights traceable to the primary standards developed by NIST.

b. **Volumetric Device Calibration**: The calibration of all volumetric vessels is checked using the NBS 602 method where all vessels are weighed to five significant figures.

c. **Calibration Standards**: The Calibration Standards are directly traceable to SRM 3100 Series Spectrometric Standard Solutions.

Packaging and Storage Conditions:

The standard is packaged in a pre-cleaned polyethylene bottle. To maintain the integrity of this product, the solution should be kept tightly capped and stored under normal laboratory conditions. The expiry date is guaranteed to be valid for twelve months from the shipping date provided. For this reason, standards from the same lot may have different expiration dates.

Expiration Information:

Preparation Date: March 15, 2012

Shipped Date: April 24, 2012

Expiration Date: April 24, 2013

Vanny T. Yib, Inorganic Laboratory Manager

Kim-Phuong Tran

Kim-Phuong Tran, Quality Manager

Theodore Rains, PhD, President

March 15, 2012

Certificate Issue Date

ISO/IEC 17025:2005 Accreditation
Certificate Number AT-1529

NOTICE: HPS products are intended for laboratory use only. All products should be handled and used by trained professional personnel. The responsibility for the safe handling and use of these products rests solely with the buyer and/or user. The data and information as stated was furnished by the manufacturer of the product. The information provided in this certificate pertains only to the lot number specified. None of the information provided in this certificate may be used, reproduced or transmitted in any form or by any means without written approval from High Purity Standards.

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #29180, ICPMS X-Cal Stock Standard 2 - Rec'd

Pace Analytical®
www.pacelabs.com

STOCK STANDARD

Created By: DS1
Created: 04/27/2012 15:31
Expires: 04/24/2013

Volume of Standard: 125 mL
Manufacturer: High Purity
Manufacturer Lot ID: 1127913

Lot ID: 401966
Part ID: ICP-MS-68A-B
Standard ID: ICPM-XSTK2

Notes: ICPMS X-Cal Stock Standard 2 - Rec'd 4/27/12, Open 04/30/12

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4001c/401966_COA.pdf

Compound Name and Concentration for Standard #29180

Compound Name	Concentration	Compound Name	Concentration
Antimony	10 mg/L	Silver	10 mg/L
Germanium	10 mg/L	Tantalum	10 mg/L
Hafnium	10 mg/L	Tellurium	10 mg/L
Molybdenum	10 mg/L	Tin	10 mg/L
Niobium-94	10 mg/L	Titanium	10 mg/L
Silicon	10 mg/L	Zirconium	10 mg/L

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www.highpuritystandards.com
P.O. Box 41727
Charleston, SC 29423
Phone (843) 767-7900
Fax (843) 767-7906

401966

Certificate of Analysis

401966
REC. 04/27/12 BY DS
EXP: __/__/__ BY

H29180 ICPM-XSTK2 STOCK
24-APR-13
DESC: ICPMS X-Cal Stock Standard 2
LOT NUMBER 401966
MANUFACTURER High Purity
04/MAY/12 ICPMS X-Cal Stock Standard 2 - Rec'd 4/27/12 Opa
CREATED 27-APR-12 BY DS1
EXPIRES 24-APR-13 COMPOUND COUNT 1

Product Description:

Part Number:	**ICP-MS-68A**
	Solution B
Lot Number:	**1127913**
Matrix:	2% HNO_3 + Tr HF
Purity:	99.3% - 99.9999%

Certified Values:

Element	(mg/L)	SRM ID	SRM Lot#	Element	(mg/L)	SRM ID	SRM Lot#
Sb	10.00 ± 0.06	3102a	061229	Ta	10.00 ± 0.06	3155	080502
Ge	10.00 ± 0.06	3120a	080429	Te	10.00 ± 0.06	3156	892901
Hf	10.00 ± 0.06	3122	080430	Sn	10.00 ± 0.06	3161a	070330
Mo	10.00 ± 0.06	3134	891307	Ti	10.00 ± 0.06	3162a	060808
Nb	10.0 ± 0.1	3137	080502	W	10.00 ± 0.06	3163	080331
Si	10.0 ± 0.1	3150	071204	Zr	10.00 ± 0.06	3169	071226
Ag	10.00 ± 0.05	3151	992212				

The Certified values are based on gravimetric and volumetric preparation, and verified against SRM 3100 series developed by National Institute of Standards and Technology (NIST) via inductively coupled plasma optical emission spectrometry (ICP-OES) using an internal laboratory developed method. The uncertainty in the certified value is calculated for a 95% confidence interval.

Preparation Information:

The highest purity source materials were purchased from qualified vendors per ISO 9001:2008 guidelines and assayed by ICP-OES for conformity prior to use. This standard was prepared using methods developed at NIST for the preparation of SRM Spectrometric Standard Solutions. Sub-boiling distilled high-purity acid has been used to place the materials in solution and to stabilize the standard. The matrix is as noted above in 18 megaohm deionized water.

Traceability Information:

The traceability of this standard is maintained through an unbroken chain of comparisons to appropriate standards with suitable procedure and measurement uncertainties.

a. **Analytical Balance Calibration:** All balances are calibrated weekly by an in-house method using NBS weights Inventory No 20231A. The balances are calibrated yearly and the calibration weights are checked

biennially by a qualified metrology company with weights traceable to the primary standards developed by NIST.

b. **Volumetric Device Calibration:** The calibration of all volumetric vessels is checked using the NBS 602 method where all vessels are weighed to five significant figures.

c. **Calibration Standards:** The Calibration Standards are directly traceable to SRM 3100 Series Spectrometric Standard Solutions.

Packaging and Storage Conditions:

The standard is packaged in a pre-cleaned polyethylene bottle. To maintain the integrity of this product, the solution should be kept tightly capped and stored under normal laboratory conditions. The expiry date is guaranteed to be valid for twelve months from the shipping date provided. For this reason, standards from the same lot may have different expiration dates.

Expiration Information:

Preparation Date: October 6, 2011

Shipped Date: April 24, 2012

Expiration Date: April 24, 2013

Vanny T. Yib

Vanny T. Yib, Inorganic Laboratory Manager

Kim-Phuong Tran

Kim-Phuong Tran, Quality Manager

Theodore C Rains

Theodore Rains, PhD, President

October 7, 2011

Certificate Issue Date

ACLASS ACCREDITED TESTING

ISO/IEC 17025:2005 Accreditation Certificate Number AT-1529

NOTICE: HPS products are intended for laboratory use only. All products should be handled and used by trained professional personnel. The responsibility for the safe handling and use of these products rests solely with the buyer and/or user. The data and information as stated was furnished by the manufacturer of the product. The information provided in this certificate pertains only to the lot number specified. None of the information provided in this certificate may be used, reproduced or transmitted in any form or by any means without written approval from High Purity Standards.

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #29588, Potassium Stock Standard - Rec

STOCK STANDARD

Created By: MMZ
Created: 01/21/2011 12:59
Expires: 02/28/2017

Volume of Standard: 125 mL
Manufacturer: ULTRA SCIENTIFIC
Manufacturer Lot ID: L00056

Lot ID: 401165
Part ID: ICP-119
Standard ID: K-STK

Notes: Potassium Stock Standard - Rec 01/21/11, Open 05/04/2012

Certificates of Analysis

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Compound Name and Concentration for Standard #29588

Compound Name	Concentration	Compound Name	Concentration
Potassium	10000 ug/mL		

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

401165

5662

ULTRAgrade™ Solution
Potassium ICP Standard
10000 µg/mL

Catalog Number: ICP-119
Lot Number: L00056
Job Number: J00010831
Lot Issue Date: 01/18/2010
Expiration Date: 02/28/2017

0111-4020-8

Starting Material:	Potassium Nitrate
Starting Material Purity:	99.999%
Starting Material Lot No.:	BH01316
Matrix:	2% nitric acid in low TOC water (< 50 ppb)
Atomic Weight K:	39.10

Certified Value: 10017 ± 20 µg/mL

This Certified Reference Material (CRM) was manufactured and verified in accordance with ULTRA's ISO 9001 registered quality system. The analyte concentrations were verified by our ISO 17025 accredited laboratory to be within ± 2.5%, when compared to calibration standards independently prepared using NIST SRM(s). The certified value and uncertainty value for each analyte is determined gravimetrically.

Classical Wet Assay Method: Theoretical, based on gravimetric measurements

Confirmation by Inductively Coupled Plasma Spectroscopy (ICP / ICP-MS) vs. NIST SRM 3141a

ULTRA uses purified acids, 18 megohm double deionized water, calibrated Class A glassware & meticulously cleaned bottles in the manufacturing of ULTRAgrade standards. Balances used in the manufacturing of this standard are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001.

Trace Metallic Impurities in Solution Standard in µg/mL:

*	Al	<0.005	ND	*	Ga	<0.005	ND	n	Nb			n	S				
*	Sb	<0.005	ND	n	Ge			n	Os			n	Ta				
*	As	<0.005	ND	n	Au			*	Pd	<0.005	ND	n	Te				
*	Ba	<0.005	ND	n	Hf			*	P	<0.005	ND	n	Tb				
*	Be	<0.005	ND	n	Ho			*	Pt	<0.005	ND	*	Tl	<0.005	ND		
*	Bi	<0.005	ND	*	In	<0.005	ND	s	K			n	Th				
*	B	<0.005	ND	n	Ir			n	Pr			n	Tm				
*	Cd	<0.005	ND	*	Fe	<0.005	ND	n	Re			*	Sn	<0.005	ND		
*	Ca	<0.005	ND	*	La	<0.005	ND	n	Rh			*	Ti	<0.005	ND		
n	Ce			*	Pb	<0.005	ND	n	Rb			n	W				
n	Cs			*	Li	<0.005	ND	n	Ru			n	U				
*	Cr	<0.005	ND	n	Lu			n	Sm			*	V	<0.005	ND		
*	Co	<0.005	ND	*	Mg	<0.010	D	n	Sc			n	Yb				
*	Cu	<0.005	ND	*	Mn	<0.010	D	*	Se	<0.005	ND	n	Y				
n	Dy			*	Hg	<0.005	ND	*	Si	<0.005	ND	*	Zn	<0.005	ND		
*	Er	<0.005	ND	*	Mo	<0.005	ND	*	Ag	<0.005	ND	n	Zr				
*	Eu	<0.005	ND	n	Nd			*	Na	<0.050	D						
*	Gd	<0.005	ND	*	Ni	<0.005	ND	*	Sr	<0.005	ND						

* - element checked for
ND - not detected

i - spectral interference
D - detected

n - not checked for
s - solution standard element

Density of Solution (measured at 22.0°C ± 0.5°C): 1.039 g/mL

ACCREDITED

ISO 17025:2005
Accredited
A2LA
Cert. No. 0851-01

ISO 9001:2008
Registered
TUV USA, Inc.
Cert. No. 09-1009

250 Smith Street, North Kingstown, RI 02852 USA
401-294-9400 Fax: 295-2330
www.ultrasci.com

William J. Leary
Quality Assurance Manager

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #29998, Mercury ICV Int

Pace Analytical®
www.pacelabs.com

WORKING STANDARD

Created By: DS1
Created: 05/10/2012 08:28
Expires: 11/10/2012

Volume of Standard: 100 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: Hg ICV Int

Notes: Mercury ICV Int

Compound Name and Concentration for Standard #29998

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Mercury	10000 ug/L
Nitric Acid	ug/L		

Composed of Information for Standard #29998

Composed of Standard Seq	Notes	Volume	Units
22391	Conc. Nitric Acid - Rec 06/10/11	3	mL
19251	Rec 11/15/11, Opened 11/17/11	1	mL
995	DI WATER	96	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #30948, Uranium Stock STandard - Rec'd

STOCK STANDARD

Created By: DS1 **Volume of Standard:** 125 mL **Lot ID:** 401997

Created: 05/25/2012 11:21 **Manufacturer:** Inorganic Ventures **Part ID:** AAU1-1

Expires: 06/01/2013 **Manufacturer Lot ID:** E2-U01094 **Standard ID:** U-STK

Notes: Uranium Stock STandard - Rec'd 5/25/12, Open 05/29/12, DMS

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4001c/401997_COA.pdf

Compound Name and Concentration for Standard #30948

Compound Name	Concentration	Compound Name	Concentration
Uranium	1000 ug/mL		

INORGANIC VENTURES™
300 Technology Drive
Christiansburg, VA 24073 · USA
inorganicventures.com
tel: 800.669.6799 · 540.585.3030
fax: 540.585.3012
info@inorganicventures.com

CERTIFICATE OF ANALYSIS

ATOMIC ABSORPTION SOLUTION

1000 µg/mL Uranium

Catalog No: AAU1-1 and AAU1-5

401997

Lot Number: **E2-U01094**

401997

Matrix: 2% HNO_3 (v/v)

1 REC.05/25/12 BY DS:
Exp. __/__/__ By
Open / / By

Certified Value: **1,000 ± 10 µg/mL**

H30948 U-STK STOCK
01-JUN-13
DESC: Uranium Primary Standard
LOT NUMBER: 401997
MANUFACTURER: Inorganic Ventures
NOTES: Uranium Stock Standard - Rec'd 5/25/12, Open 05/2
CREATED: 25-MAY-12 BY: DS1
EXPIRES: 01-JUN-13 COMPOUND COUNT: 2

The concentration of this solution standard has been verified by Inductively Coupled Plasma Spectroscopy (ICP) and is traceable to NIST SRM 3164.

The concentration of this standard was calculated based upon the manufacturing records and was manufactured by weight and volume using a certified aqueous concentrate traceable to NIST. The manufacturing accuracy is typically better than 0.5 % relative at the 95 % confidence level. This standard is certified for a period of 1 year from the date of shipment provided the bottle is kept tightly capped and stored under normal laboratory conditions (See expiration date below).

Observed Density of Solution: **1.010 g/mL**

GLASSWARE CALIBRATION

An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM's.

BALANCE CALIBRATION

All analytical balances are calibrated yearly by an A2LA accredited calibration laboratory and are traceable to a class E 2 analytical weight set with NIST Traceability No. All balances are checked daily using an in-house procedure. The weights used for testing are annually compared to master weights and are traceable to the National Institute of Standards and Technology (NIST).

THERMOMETER CALIBRATION

All thermometers are NIST traceable through thermometers that are calibrated by an A2LA accredited calibration laboratory.

Certification Date: December 28, 2011

Prepared By: Donna Sera

Expiration Date: EXPIRES 01 JUN 2013

Approved By: Brian Alexander

Certifying Officer: Paul R. Haines

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #30949, Silicon Primary Standard - Rec 05/25/12

STOCK STANDARD

Created By: DS1 **Volume of Standard:** 100 mL **Lot ID:** 401998

Created: 05/25/2012 11:30 **Manufacturer:** Fluka Analytical **Part ID:** 08729

Expires: 07/01/2014 **Manufacturer Lot ID:** BCBC9940 **Standard ID:** Si-STK

Notes: Silicon Primary Standard - Rec 05/25/12

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4001c/401998_COA.pdf

Compound Name and Concentration for Standard #30949

Compound Name	Concentration	Compound Name	Concentration
Silicon	1000 mg/L		

401998

401998

REC.06/26/12 BY DS:
Exp. __/__/__ By __
Open __/__/__ By __

H30949 Si-STK STOCK

01-JUL-14

DESC: Silicon Primary Standard
LOT NUMBER: 401998
MANUFACTURER: Fluka Analytical
NOTES: Silicon Primary Standard - Rec 05/25/12
CREATED: 25-MAY-12 BY: DS1
EXPIRES: 01-JUL-14 COMPOUND COUNT: 2

TraceCERT®
Traceable Certified Reference Materials

Fluka Analytical

Certificate

Produced in double accredited laboratory fulfilling ISO/IEC 17025 ISO Guide 34

This certificate is designed in accordance with ISO Guide 31 [1].

Object of certification:	**Silicon standard for ICP**
Product no.:	**08729**
Lot no.:	**BCBC9940**
Composition:	Silicon semi-metal (high purity quality) in 2% HNO_3 and <0.5% HF (prepared from HNO *Trace*SELECT®, HF *Trace*SELECT® and water *Trace*SELECT® Ultra, 18.2 MΩ·cm, 0.22 filtered)
Intended use:	Calibration of ICP-spectrometry, AAS, spectrophotometry or any other analytical technic
Storing and handling:	This reference material shall be stored in the original closed bag between 5°C and 30°C After opening the bottle should be stored at reduced temperature to minimize transpirati rate. Before every use of the material the bottle must be shaken well and its temperatur has to be 20°C. We highly recommend using this reference material no longer than 15 months after the aluminum bag was opened.
Expiry date:	**JUL / 2014** (unopened bottle in aluminized bag)
Traceability [2]:	NIST SRM 3150, Silicon Standard Solution
Certificate issue date:	October 25, 2010

The certified values and uncertainties are according to ISO Guide 35 [3] and Eurachem/CITAC Guide [4].

Constituent	Certified values at 20°C and expanded uncertainties [$U = k \cdot u_c$; $k = 2$]
Silicon	**996 mg L^{-1} ± 4 mg L^{-1}** 986 mg kg^{-1} ± 4 mg kg^{-1}

Measurand	Certified value and expanded uncertainty [$U = k \cdot u_c$; $k = 2$]
Density at 20°C	**1.0103 g mL^{-1} ± 0.0005 g mL^{-1}**

CRM operations: J. Wüthrich

Certification body: K.-D. Schmidt, Ph.D.

SWISS CRM PRODUCTION — SRMS 001 ISO Guide 34

SWISS TESTING — STS 490 ISO/IEC 17025

16368-C ISO 90

Sigma-Aldrich Production GmbH, Industriestrasse 25, 9471 Buchs/ Switzerland

SIGMA-ALDRIC

1. Certification

Production and certification of this CRM are performed under double-accreditation in accordance with ISO/IEC 17025 [5] and also ISO Guide 34 [6]. Storage stability, leaching and homogeneity tests are considered for certification (see storing behavior, chapter 3).

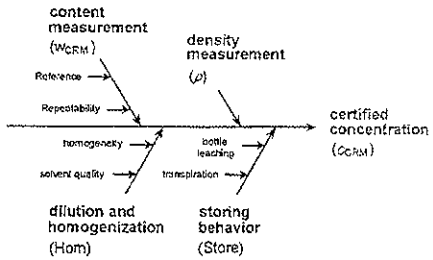
1.1 HP-ICP-OES Measurement

The certified value of the content (mg/kg) is determined using high-performance inductively coupled plasma optical emission spectrometry (HP-ICP-OES). To obtain performance comparable to isotope dilution and classical methods (titration and gravimetric analysis) the HP-ICP-OES measurement is performed using an internal standard and a drift correction procedure [7].
The mean value is based on 20 measurements (two samples and 10 measurements per sample). All measurements are traced gravimetrically to an internationally accepted reference material e.g. from NIST (USA), BAM (Germany) or EMPA – Material Science & Technology (Switzerland).

All uncertainties are calculated according to Eurachem/CITAC Guide [4] and reported as combined expanded uncertainties at the 95% confidence level. The main uncertainty contributions are illustrated by the following cause-effect diagram.

Typical relative contributions are:

$u(w_{CRM})$	0.1 - 0.3 %
u(Store)	< 0.1 %
$u(\rho)$	< 0.05 %
u(Hom)	< 0.03 %



The combined uncertainty u_c is calculated by combination of the squared contribution values.

The expanded uncertainty U is then calculated to a confidence level of 95%, by multiplying u_c with a confidence level factor of k=2.

1.2 Density Measurement

The density measurement is carried out according to ISO 15212-1 [8] and using the digital density meter DMA 4500M from Anton Paar with an oscillating U-tube installed. The measurement uncertainty is calculated according to Eurachem/CITAC Guide and reported as combined expanded uncertainty at the 95% confidence level.

2. Trace Impurities in Bottled Solution

Up to 75 trace impurities were determined with ICP-OES, ICP-MS and AAS. Some of the impurities are determined in the starting material and calculated for the solution (e.g. for rare earth elements contamination during the preparation is rendered impossible). Other elements are determined both in the starting material as well as in the bottled solution.

All values listed below are given in mg kg^{-1} (ppm), <X = below detection limit, m = matrix, n.a. = not analyzed:

Li	Be											B	C	N	O	F	Ne
<0.010	<0.005											<0.025	n.a.	n.a.	n.a.	n.a.	n.a.
Na	Mg											Al	Si	P	S	Cl	Ar
<0.02	<0.005											<0.050	m	<0.010	<0.005	n.a.	n.a.
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
<0.050	<0.020	<0.005	<0.010	<0.010	<0.010	<0.005	<0.010	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	<0.001	<0.001	n.a.	n.a.
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
<0.050	<0.005	<0.003	<0.010	<0.005	<0.010	n.a.	<0.010	<0.010	<0.005	<0.010	<0.010	<0.010	<0.025	<0.001	<0.010	n.a.	n.a.
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn
<0.050	<0.005	<0.005	<0.005	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.003	<0.005	<0.010	<0.001	n.a.	n.a.	n.a.
Fr	Ra	Ac															
n.a.	n.a.	n.a.															

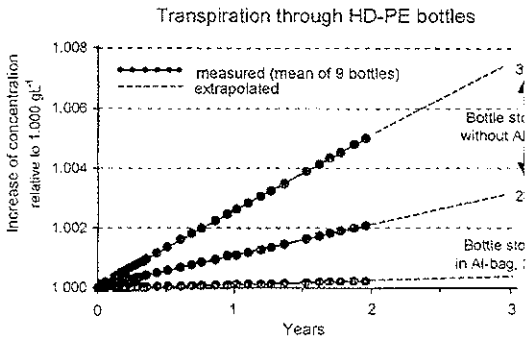
Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
<0.010	<0.010	<0.005	n.a.	<0.005	<0.005	<0.010	<0.005	<0.010	<0.005	<0.010	<0.005	<0.003	<0.005
Th	Pa	U											
<0.005	n.a.	<0.005											

3. Storing Behavior

The storage behavior of standard solutions is an important factor regarding the certified value. Therefore the t most important storing effects were investigated by in-depth studies in a cooperation with EMPA, St. Gallen:

1. The leach out of trace impurities from HD-PE bottles was determined with HR-ICP-MS after leaching the bottles with 2% nitric acid. Maximum contamination levels were found in the ng L^{-1} level for 12 elements.

2. To avoid significant loss of mass through transpiration the bottle is delivered in aluminum coated bags. After the bottle has been removed from the bag, transpiration will occur at an accelerated rate (see figure). We highly recommend not to open the bag until the solution is needed. Once the bottle is opened the solution should be stored at reduced temperature (4 °C) to reduce transpiration.



References

[1] ISO Guide 31, 2nd Ed. (2000), "Reference materials - Contents of certificates and labels"
[2] Eurachem/CITAC Guide, 1st Ed. (2003), "Traceability in chemical measurement"
[3] ISO Guide 35, 3rd Ed. (2006), "Reference materials - General and statistical principles for certification"
[4] Eurachem/CITAC Guide, 2nd Ed. (2000), "Quantifying uncertainty in analytical measurement"
[5] ISO/IEC 17025, 2nd Ed. (2005), "General requirements for the competence of testing and calibration laboratories"
[6] ISO Guide 34, 3rd Ed. (2009), "General requirements for the competence of reference material producers"
[7] Marc L. Salit et al., Anal. Chem. 2001, 73, 4621-4629, "Single-Element Solution Comparisons with a High-Performance Inductively Coupled Plasma Optica Emission Spectrometric Method"
[8] DIN EN ISO 15212-1:1998, Oscillation-type density meters - Part 1: Laboratory instruments

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #31609, Hydrogen Peroxide - Rec'd 06/07/12

SOLVENT

Created By: MMZ
Created: 06/07/2012 15:20
Expires: 06/07/2014

Volume of Standard: 4000 mL
Manufacturer: Fisher Scientific
Manufacturer Lot ID: 121417

Lot ID: 402021
Part ID: H325-4
Standard ID: RGNT154

Notes: Hydrogen Peroxide - Rec'd 06/07/12 MMZ

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4002c/402021_COA.PDF

Compound Name and Concentration for Standard #31609

Compound Name	Concentration	Compound Name	Concentration
Hydrogen Peroxide			

Fisher Scientific

402021

REC. 06/07/12 BY MM
EXP. __/__/__ BY

1 Reagent Lane
Fair Lawn, NJ 07410
201.796.7100 tel
201.796.1329 fax

Certificate of Analysis

Fisher Scientific's Quality System has been found to conform to Quality Management System Standard ISO9001:2008 standard by DNV Certificate number CERT-08052-2006-AQ-HOU-ANAB

This is to certify that units of the above mentioned lot number were tested and found to comply with the specifications of the grade listed. Certain data have been supplied by third parties. Fisher Scientific expressly disclaims all warranties, expressed or implied, including the implied warranties of merchantability and fitness for a particular purpose. Certain products (USP/FCC/NF/EP/BP/JP grades) are sold for use in food, drug, or medical device manufacturing. Fisher does not claim regulatory coverage under 21 CFR nor maintain DMF's with the FDA. The following are the actual analytical results obtained:

Catalog Number	H325	Mfg. Date	3/22/2012
Lot Number	121417		
Description	HYDROGEN PEROXIDE, A.C.S.		
Country of Origin	United States	Recommended Retest Date	Mar-2017
Chemical Origin	Synthetic		
BSE/TSE Comment	No animal products are used as starting raw material ingredients, or used in processing, including lubricants, processing aids, or any other material that might migrate to the finished product.		
Chemical Comment	This material is produced by a synthetic process. No animal, human, or plant materials are used in this systhesis.		

Result name	Units	Specifications	Test Value
APPEARANCE		REPORT	CLEAR, COLORLESS LIQUID
AMMONIUM (NH4)	ppm	<= 5	<5
ASSAY	%	Inclusive Between 30.0 32.0	31.4
CHLORIDE	ppm	<= 3	<3
COLOR	APHA	<= 10	5
COPPER (Cu)	ppm	<= 0.1	0.03
EVAPORATION RESIDUE	%	<= 0.002	0.0020
HEAVY METALS (as Pb)	ppm	<= 1	<1
IDENTIFICATION	PASS/FAIL	= PASS TEST	PASS TEST
IRON (Fe)	ppm	<= 0.5	<0.5
NICKEL (Ni)	ppm	<= 0.1	<0.01
NITRATE (NO3)	ppm	<= 2	<2
PHOSPHATE (PO4)	ppm	<= 2	<2
SULFATE (SO4)	ppm	<= 5	<5
TITRATABLE ACID	mEq/g	<= 0.0006	0.00010

CERTIFIED BY

Joel Boland

Lab Manager BPF

Note: The data listed is valid for all package sizes of this lot of this product, expressed as a extension of this catalog number listed above. If there are any questions with this certificate, please call Chemical Services at (800) 227-6701.

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #31733, Metals Trace Secondary - Rec'd 6/08/12

Pace Analytical®
www.pacelabs.com

STOCK STANDARD

Created By: DS1
Created: 06/11/2012 09:58
Expires: 07/01/2013

Volume of Standard: 250 mL
Manufacturer: Inorganic Ventures
Manufacturer Lot ID: F2-MEB410059

Lot ID: 402026
Part ID: PA-STD-1B
Standard ID: Metals SPK1

Notes: Metals Trace Secondary - Rec'd 6/08/12

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4002c/402026_COA.pdf

Compound Name and Concentration for Standard #31733

Compound Name	Concentration	Compound Name	Concentration
Arsenic	200 ug/mL	Nickel	200 ug/mL
Barium	200 ug/mL	Phosphorus	200 ug/mL
Beryllium	200 ug/mL	Lead	200 ug/mL
Cadmium	200 ug/mL	Selenium	200 ug/mL
Cobalt	200 ug/mL	Strontium	200 ug/mL
Chromium	200 ug/mL	Thallium	200 ug/mL
Copper	200 ug/mL	Vanadium	200 ug/mL
Lithium	200 ug/mL	Zinc	200 ug/mL
Manganese	200 ug/mL		

INORGANIC VENTURES™
300 Technology Drive
Christiansburg, VA 24073 • USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

tel. 800 669 6799 • 540.585.3030
fax. 540 585.3012
info@inorganicventures.com

1.0 **INORGANIC VENTURES** is an ISO Guide 34 "General Requirements for the Competence of Reference Material Producers" and ISO 9001 registered manufacturer. Our manufacturing laboratory is accredited to ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories."

ACCREDITED Testing Laboratory Certificate 883.01

ACCREDITED Reference Material Producer Certificate 883.02

2.0 **DESCRIPTION OF CRM** Custom Second Source Solution

Catalog No.: PA-STD-1B

Lot Number: **F2-MEB410059**

Matrix: 5% HNO3(v/v)

402026
REC.06/11/12 BY OS:
Exp. __/__/__ By

H31733 Metals SPK1 STOCK
01-JUL-13
DESC. Metals Trace Secondary
LOT NUMBER 402026
MANUFACTURER Inorganic Ventures
NOTES: Metals Trace Secondary - Rec'd 6/08/12
CREATED: 11-JUN-12 BY: OS1
EXPIRES: 01-JUL-13 COMPOUND COUNT: 1

Second Source: Whenever possible, this solution was manufactured from a second set of concentrates in our manufacturing facility.

200 mg/L ea:

As,	Ba,	Be,	Cd,	Co,	Cr3,	Cu,	Li,	Mn,
Ni,	P,	Pb,	Se,	Sr,	Tl,	V,	Zn	

3.0 **CERTIFIED VALUES AND UNCERTAINTIES**

ELEMENT	CERTIFIED VALUE	ELEMENT	CERTIFIED VALUE	ELEMENT	CERTIFIED VALUE
Arsenic, As	200.0 ± 1.3 mg/L	Barium, Ba	200.0 ± 1.7 mg/L	Beryllium, Be	200.0 ± 1.4 mg/L
Cadmium, Cd	200.0 ± 1.3 mg/L	Chromium+3, Cr3	200.0 ± 1.7 mg/L	Cobalt, Co	200.0 ± 1.3 mg/L
Copper, Cu	200.0 ± 1.4 mg/L	Lead, Pb	200.0 ± 1.5 mg/L	Lithium, Li	200.0 ± 0.8 mg/L
Manganese, Mn	200.0 ± 0.9 mg/L	Nickel, Ni	200.0 ± 0.9 mg/L	Phosphorus, P	200.0 ± 1.0 mg/L
Selenium, Se	200.0 ± 1.1 mg/L	Strontium, Sr	200.0 ± 1.1 mg/L	Thallium, Tl	200.0 ± 1.3 mg/L
Vanadium, V	200.0 ± 1.0 mg/L	Zinc, Zn	200.0 ± 1.2 mg/L		

Certified Density: 1.039 g/mL (measured at 20 ± 1° C)

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Certified Value $(\bar{x}) = \frac{\sum x_i}{n}$

Uncertainty $(\pm) = \frac{2\,[(\sum s_i)^2]^{1/2}}{(n)^{1/2}}$

$(\bar{x})$ = mean
x_i = individual results
n = number of measurements
$\sum s_i$ = The summation of all significant estimated errors (Most common are the errors from instrumental measurement, weighing, dilution to volume and the fixed error reported on the NIST SRM certificate of analysis)

4.0 TRACEBILITY TO NIST AND VALUES OBTAINED BY INDEPENDENT METHODS

- "Property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties." (ISO VIM, 2nd ed., 1993, definition 6.10)
- This product is Traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRMs are available, the term 'in-house std.' is specified.

4.1 ASSAY INFORMATION

ELEMENT	METHOD	NIST SRM#	SRM LOT#	ELEMENT	METHOD	NIST SRM#	SRM LOT#
As	Calculated		See Sec. 4.2	As	ICP Assay	3103a	010713
Ba	Gravimetric		See Sec. 4.2	Ba	ICP Assay	3104a	070222
Be	Calculated		See Sec. 4.2	Be	ICP Assay	3105a	892707
Cd	ICP Assay	3108	060531	Cd	EDTA	928	928
Co	ICP Assay	3113	00630	Co	EDTA	928	928
Cr3	Calculated		See Sec. 4.2	Cr3	ICP Assay	3112a	030730
Cu	ICP Assay	3114	011017	Cu	EDTA	928	928
Li	Gravimetric		See Sec. 4.2	Li	ICP Assay	3129a	000505
Mn	ICP Assay	3132	050429	Mn	EDTA	928	928
Ni	ICP Assay	3136	000612	Ni	EDTA	928	928
P	ICP Assay	3139a	060717	P	Acidimetric	84k	84k
Pb	ICP Assay	3128	030721	Pb	EDTA	928	928
Se	Calculated		See Sec. 4.2	Se	ICP Assay	3149	992106
Sr	ICP Assay	3153a	990906	Sr	EDTA	928	928
Tl	Calculated		See Sec. 4.2	Tl	ICP Assay	3158	993012
V	ICP Assay	3165	992706	V	EDTA	928	928
Zn	ICP Assay	3168a	001402	Zn	EDTA	928	928

4.2 BALANCE CALIBRATION - All analytical balances are calibrated yearly by an A2LA accredited calibration laboratory and are traceable to a class E 2 analytical weight set with NIST Traceability. All balances are checked daily using an in-house procedure. The weights used for testing are annually compared to master weights and are traceable to the National Institute of Standards and Technology (NIST).

4.3 THERMOMETER CALIBRATION - All thermometers are NIST traceable through thermometers that are calibrated by an A2LA accredited calibration laboratory.

4.4 GLASSWARE CALIBRATION - An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM's.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES IN µg/mL - N/A

6.0 INTENDED USE

For the calibration of analytical instruments including but not limited to the following:
HPLC, IC, TLC, ISE, IR, NMR, UV/VIS, MS, Capillary Electrophoresis, Potentiometry, Wet Chemistry and Voltammetry
For the validation of analytical methods
For the preparation of "working reference samples"
For interference studies and the determination of correction coefficients
For detection limit and linearity studies
For additional intended uses, contact Technical Staff

This CRM was manufactured using 18 megohm doubly deionized water that has been filtered through a 0.2 micron filter.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

Storage & Handling - Keep Tightly sealed when not in use. Store and use at 20 ± 4°C. **Do Not** pipette from the container. **Do Not** return portions removed from pipetting to container.

Element Specific Information - For specific information regarding any element: Contact technical staff.

Uranium Note: If uranium is present in this standard, it is natural abundance unless specified in Section 3.0.

8.0 HAZARDOUS INFORMATION - Please refer to the enclosed Material Safety Data sheet for information regarding this CRM.

9.0 HOMOGENEITY - This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 **ISO 9001 Quality Management System Registration**
- QMI File Number 010105

10.2 **ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration"**
- Chemical Testing - Accredited A2LA Certificate Number 883.01

10.3 **ISO/IEC Guide 34 "General Requirements for the Competence of Reference Material Producers"**
- Reference Materials Production - Accredited A2LA Certificate Number 883.02

10.4 **10CFR50 Appendix B - Nuclear Regulatory Commission**
- Domestic Licensing of Production and Utilization Facilities

10.5 **10CFR21 - Nuclear Regulatory Commission**
- Reporting Defects and Non-Compliance

11.0 DATE OF CERTIFICATION AND PERIOD OF VALIDITY

11.1 **Shelf Life** - The period of time during which the concentration of the analyte(s) in a properly packaged, unopened, and unused standard stored under environmentally controlled and monitored conditions will remain within the specified uncertainty range. Shelf life is limited primarily by transpiration (loss of water from the solution) and infrequently, by chemical instability. Transpiration studies of chemically-stable solutions performed at the manufacturer's facility show a CRM shelf-life of twenty one months for solutions packaged in 125-mL low density polyethylene bottles. When stored under special conditions that minimize transpiration and instability, the shelf life can be extended past this limit.

11.2 **Expiration Date** - The date after which a CRM should not be used. Routine laboratory use of a CRM increases transpiration losses and the chance of contamination which affect the integrity of the CRM and limit its useful life. Manufacturer concurs with state and federal regulatory agencies' recommendations that solution standards be assigned a one-year expiration date.

11.3 **Chemical Stability** - Studies have been conducted on this or similar CRMs and it has been demonstrated that this CRM is chemically stable for a period of not less than two years provided the "Storage & Handling" conditions are followed that are described in section 7.0.

Certification Date: February 14, 2012

Expiration Date: EXPIRES 01/2013

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By: Brenda Francis
Product Documentation Technician

Certificate Approved By: Brian Alexander
PhD., Quality Control Supervisor

Certifying Officer: Paul Gaines
PhD., Senior Technical Director

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #31734, Metals Trace2 Secondary - Rec'd

STOCK STANDARD

Created By: DS1
Created: 06/11/2012 10:00
Expires: 07/01/2013

Volume of Standard: 250 mL
Manufacturer: Inorganic Ventures
Manufacturer Lot ID: F2-MEB4100060

Lot ID: 402027
Part ID: PA-STD-2B
Standard ID: Metals SPK2

Notes: Metals Trace2 Secondary - Rec'd 06/08/12

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4002c/402027_COA.pdf

Compound Name and Concentration for Standard #31734

Compound Name	Concentration	Compound Name	Concentration
Silicon	1000 ug/mL	Tin	200 ug/mL
Boron	200 ug/mL	Zirconium	200 ug/mL
Molybdenum	200 ug/mL	Silver	100 ug/mL
Antimony	200 ug/mL	Titanium	200 ug/mL

INORGANIC VENTURES™
300 Technology Drive
Christiansburg, VA 24073 • USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

tel: 800.669.6799 • 540.585.3030
fax: 540.585.3019
info@inorganicventures.com

1.0 **INORGANIC VENTURES** is an ISO Guide 34 "General Requirements for the Competence of Reference Material Producers" and ISO 9001 registered manufacturer. Our manufacturing laboratory is accredited to ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories."

ACCREDITED Testing Laboratory Certificate 953.01 — ACCREDITED Reference Material Producer Certificate 953.02

2.0 **DESCRIPTION OF CRM** Custom Second Source Solution

Catalog No.: PA-STD-2B

Lot Number: **F2-MEB410060**

Matrix: tr. HF, 3% HNO3(v/v)

402027
REC.06/11/12 BY DS:
Exp. __/__/__ By

Second Source: Whenever possible, this solution was manufactured from a second set of concentrates in our manufacturing facility.

H31734 Metals SPK2 STOCK
01-JUL-13
DESC: Metals Trace2 Secondary
LOT NUMBER: 402027
MANUFACTURER: Inorganic Ventures
NOTES: Metals Trace2 Secondary - Rec'd 06/06/12
CREATED: 11-JUN-12 BY DS1
EXPIRES: 01-JUL-13 COMPOUND COUNT: 9

1,000 mg/L ea:
Si,

200 mg/L ea:
B, Mo, Sb, Sn, Ti, Zr,

100 mg/L ea:
Ag

3.0 **CERTIFIED VALUES AND UNCERTAINTIES**

ELEMENT	CERTIFIED VALUE	ELEMENT	CERTIFIED VALUE	ELEMENT	CERTIFIED VALUE
Antimony, Sb	200.0 ± 1.6 mg/L	Boron, B	200.0 ± 1.1 mg/L	Molybdenum, Mo	200.0 ± 1.3 mg/L
Silicon, Si	1,000 ± 4 mg/L	Silver, Ag	100.0 ± 0.6 mg/L	Tin, Sn	200.0 ± 1.0 mg/L
Titanium, Ti	200.0 ± 1.3 mg/L	Zirconium, Zr	200.0 ± 1.3 mg/L		

Certified Density: 1.021 g/mL (measured at 20 ± 1° C)

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Certified Value $(\bar{x}) = \frac{\sum x_i}{n}$

Uncertainty $(\pm) = \frac{2\,[(\sum s_i)^2]^{1/2}}{(n)^{1/2}}$

$(\bar{x})$ = mean
x_i = individual results
n = number of measurements
$\sum s_i$ = The summation of all significant estimated errors (Most common are the errors from instrumental measurement, weighing, dilution to volume and the fixed error reported on the NIST SRM certificate of analysis)

4.0 TRACEBILITY TO NIST AND VALUES OBTAINED BY INDEPENDENT METHODS

· "Property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties." (ISO VIM, 2nd ed., 1993, definition 6.10)
· This product is Traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRMs are available, the term 'in-house std.' is specified.

4.1 ASSAY INFORMATION

ELEMENT	METHOD	NIST SRM#	SRM LOT#	ELEMENT	METHOD	NIST SRM#	SRM LOT#
Ag	Calculated		See Sec. 4.2	Ag	ICP Assay	3151	992212
B	ICP Assay	3107	070514	Mo	Calculated		See Sec. 4.2
Mo	ICP Assay	3134	891307	Sb	Calculated		See Sec. 4.2
Sb	ICP Assay	3102A	061229	Si	Calculated		See Sec. 4.2
Si	ICP Assay	3150	071204	Sn	Calculated		See Sec. 4.2
Sn	ICP Assay	3161a	993107	Ti	Calculated		See Sec. 4.2
Ti	ICP Assay	3162a	060808	Zr	Calculated		See Sec. 4.2
Zr	ICP Assay	3169	990109				

4.2 **BALANCE CALIBRATION** - All analytical balances are calibrated yearly by an A2LA accredited calibration laboratory and are traceable to a class E 2 analytical weight set with NIST Traceability. All balances are checked daily using an in-house procedure. The weights used for testing are annually compared to master weights and are traceable to the National Institute of Standards and Technology (NIST).

4.3 **THERMOMETER CALIBRATION** - All thermometers are NIST traceable through thermometers that are calibrated by an A2LA accredited calibration laboratory.

4.4 **GLASSWARE CALIBRATION** - An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM's.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES IN µg/mL - N/A

6.0 INTENDED USE

For the calibration of analytical instruments including but not limited to the following:
HPLC, IC, TLC, ISE, IR, NMR, UV/VIS, MS, Capillary Electrophoresis, Potentiometry, Wet Chemistry and Voltammetry
For the validation of analytical methods
For the preparation of "working reference samples"
For interference studies and the determination of correction coefficients
For detection limit and linearity studies
For additional intended uses, contact Technical Staff

This CRM was manufactured using 18 megohm doubly deionized water that has been filtered through a 0.2 micron filter.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

Storage & Handling - Keep **Tightly** sealed when not in use. Store and use at 20 ± 4°C. **Do Not** pipette from the container. **Do Not** return portions removed from pipetting to container.

Element Specific Information - For specific information regarding any element: Contact technical staff.

Uranium Note: If uranium is present in this standard, it is natural abundance unless specified in Section 3.0.

HF Note: This standard should not be prepared or stored in glass.

8.0 HAZARDOUS INFORMATION - Please refer to the enclosed Material Safety Data sheet for information regarding this CRM.

9.0 HOMOGENEITY - This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration
- QMI File Number 010105

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration"
- Chemical Testing - Accredited A2LA Certificate Number 883.01

10.3 ISO/IEC Guide 34 "General Requirements for the Competence of Reference Material Producers"
- Reference Materials Production - Accredited A2LA Certificate Number 883.02

10.4 10CFR50 Appendix B - Nuclear Regulatory Commission
- Domestic Licensing of Production and Utilization Facilities

10.5 10CFR21 - Nuclear Regulatory Commission
- Reporting Defects and Non-Compliance

11.0 DATE OF CERTIFICATION AND PERIOD OF VALIDITY

11.1 Shelf Life - The period of time during which the concentration of the analyte(s) in a properly packaged, unopened, and unused standard stored under environmentally controlled and monitored conditions will remain within the specified uncertainty range. Shelf life is limited primarily by transpiration (loss of water from the solution) and infrequently, by chemical instability. Transpiration studies of chemically-stable solutions performed at the manufacturer's facility show a CRM shelf-life of twenty one months for solutions packaged in 125-mL low density polyethylene bottles. When stored under special conditions that minimize transpiration and instability, the shelf life can be extended past this limit.

11.2 Expiration Date - The date after which a CRM should not be used. Routine laboratory use of a CRM increases transpiration losses and the chance of contamination which affect the integrity of the CRM and limit its useful life. Manufacturer concurs with state and federal regulatory agencies' recommendations that solution standards be assigned a one-year expiration date.

11.3 Chemical Stability - Studies have been conducted on this or similar CRMs and it has been demonstrated that this CRM is chemically stable for a period of not less than two years provided the "Storage & Handling" conditions are followed that are described in section 7.0.

Certification Date: February 14, 2012

Expiration Date: EXPIRES 01/2013

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By:	Brenda Francis Product Documentation Technician	
Certificate Approved By:	Brian Alexander PhD., Quality Control Supervisor	
Certifying Officer:	Paul Gaines PhD., Senior Technical Director	

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #31735, Metals Minerals Secondary - Rec'd

STOCK STANDARD

Created By: DS1 **Volume of Standard:** 250 mL **Lot ID:** 402028

Created: 06/11/2012 10:02 **Manufacturer:** Inorganic Ventures **Part ID:** PA-STD-3B

Expires: 07/01/2013 **Manufacturer Lot ID:** F2-MEB410061 **Standard ID:** Metals SPK3

Notes: Metals Minerals Secondary - Rec'd 06/08/12

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4002c/402028_COA.pdf

Compound Name and Concentration for Standard #31735

Compound Name	Concentration	Compound Name	Concentration
Aluminum	2000 ug/mL	Potassium	2000 ug/mL
Calcium	2000 ug/mL	Magnesium	2000 ug/mL
Iron	2000 ug/mL	Sodium	2000 ug/mL

INORGANIC™ VENTURES
300 Technology Drive
Christiansburg, VA 24073 • USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

tel: 800.669.6799 • 540.585.3030
fax: 540.585.3012
info@inorganicventures.com

1.0 **INORGANIC VENTURES** is an ISO Guide 34 "General Requirements for the Competence of Reference Material Producers" and ISO 9001 registered manufacturer. Our manufacturing laboratory is accredited to ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories."

ACCREDITED Testing Laboratory Certificate 883.01

ACCREDITED Reference Material Producer Certificate 883.02

2.0 **DESCRIPTION OF CRM** Custom Second Source Solution

Catalog No.: PA-STD-3B

Lot Number: **F2-MEB410061**

Matrix: 3% HNO3(v/v)

402028
REC.06/11/12 BY DS:
Exp. --/--/-- By -

H31735 Metals SPK3 STOCK
01-JUL-13
DESC: Metals Minerals Secondary
LOT NUMBER: 402028
MANUFACTURER: Inorganic Ventures
NOTES: Metals Minerals Secondary --Rec'd 06/06/12
CREATED: 11-JUN-12 BY: DS1
EXPIRES: 01-JUL-13 COMPOUND COUNT: 7

Second Source: Whenever possible, this solution was manufactured from a second set of concentrates in our manufacturing facility.

2,000 mg/L ea:

Al, Ca, Fe, K, Mg, Na

3.0 **CERTIFIED VALUES AND UNCERTAINTIES**

ELEMENT	CERTIFIED VALUE	ELEMENT	CERTIFIED VALUE	ELEMENT	CERTIFIED VALUE
Aluminum, Al	2,000 ± 10 mg/L	Calcium, Ca	2,000 ± 13 mg/L	Iron, Fe	2,000 ± 9 mg/L
Magnesium, Mg	2,000 ± 16 mg/L	Potassium, K	2,000 ± 13 mg/L	Sodium, Na	2,000 ± 11 mg/L

Certified Density: 1.062 g/mL (measured at 20 ± 1° C)

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

$$\text{Certified Value } (\bar{x}) = \frac{\sum x_i}{n}$$

$$\text{Uncertainty } (\pm) = \frac{2\,[(\sum s_i)^2]^{1/2}}{(n)^{1/2}}$$

($\bar{x}$) = mean
x_i = individual results
n = number of measurements
$\sum s_i$ = The summation of all significant estimated errors (Most common are the errors from instrumental measurement, weighing, dilution to volume and the fixed error reported on the NIST SRM certificate of analysis)

4.0 **TRACEBILITY TO NIST AND VALUES OBTAINED BY INDEPENDENT METHODS**

· "Property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties." (ISO VIM, 2nd ed., 1993, definition 6.10)

· This product is Traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRMs are available, the term 'in-house std.' is specified.

4.1 ASSAY INFORMATION

ELEMENT	METHOD	NIST SRM#	SRM LOT#	ELEMENT	METHOD	NIST SRM#	SRM LOT#
Al	ICP Assay	3101a	060502	Al	EDTA	928	928
Ca	ICP Assay	3109a	050825	Ca	EDTA	928	928
Fe	ICP Assay	3126a	051031	Fe	EDTA	928	928
K	Gravimetric		See Sec. 4.2	K	ICP Assay	3141a	051220
Mg	ICP Assay	3131a	050302	Mg	EDTA	928	928
Na	Gravimetric		See Sec. 4.2	Na	ICP Assay	3152a	010728

4.2 **BALANCE CALIBRATION** - All analytical balances are calibrated yearly by an A2LA accredited calibration laboratory and are traceable to a class E 2 analytical weight set with NIST Traceability. All balances are checked daily using an in-house procedure. The weights used for testing are annually compared to master weights and are traceable to the National Institute of Standards and Technology (NIST).

4.3 **THERMOMETER CALIBRATION** - All thermometers are NIST traceable through thermometers that are calibrated by an A2LA accredited calibration laboratory.

4.4 **GLASSWARE CALIBRATION** - An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM's.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES IN µg/mL - N/A

6.0 INTENDED USE

For the calibration of analytical instruments including but not limited to the following:
HPLC, IC, TLC, ISE, IR, NMR, UV/VIS, MS, Capillary Electrophoresis, Potentiometry, Wet Chemistry and Voltammetry
For the validation of analytical methods
For the preparation of "working reference samples"
For interference studies and the determination of correction coefficients
For detection limit and linearity studies
For additional intended uses, contact Technical Staff

This CRM was manufactured using 18 megohm doubly deionized water that has been filtered through a 0.2 micron filter.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

Storage & Handling - Keep **Tightly** sealed when not in use. Store and use at 20 ± 4°C. **Do Not** pipette from the container. **Do Not** return portions removed from pipetting to container.

Element Specific Information - For specific information regarding any element: Contact technical staff.

Uranium Note: If uranium is present in this standard, it is natural abundance unless specified in Section 3.0.

8.0 HAZARDOUS INFORMATION - Please refer to the enclosed Material Safety Data sheet for information regarding this CRM.

9.0 HOMOGENEITY - This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration
- QMI File Number 010105

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration"
- Chemical Testing - Accredited A2LA Certificate Number 883.01

10.3 ISO/IEC Guide 34 "General Requirements for the Competence of Reference Material Producers"
- Reference Materials Production - Accredited A2LA Certificate Number 883.02

10.4 10CFR50 Appendix B - Nuclear Regulatory Commission
- Domestic Licensing of Production and Utilization Facilities

10.5 10CFR21 - Nuclear Regulatory Commission
- Reporting Defects and Non-Compliance

11.0 DATE OF CERTIFICATION AND PERIOD OF VALIDITY

11.1 Shelf Life - The period of time during which the concentration of the analyte(s) in a properly packaged, unopened, and unused standard stored under environmentally controlled and monitored conditions will remain within the specified uncertainty range. Shelf life is limited primarily by transpiration (loss of water from the solution) and infrequently, by chemical instability. Transpiration studies of chemically-stable solutions performed at the manufacturer's facility show a CRM shelf-life of twenty one months for solutions packaged in 125-mL low density polyethylene bottles. When stored under special conditions that minimize transpiration and instability, the shelf life can be extended past this limit.

11.2 Expiration Date - The date after which a CRM should not be used. Routine laboratory use of a CRM increases transpiration losses and the chance of contamination which affect the integrity of the CRM and limit its useful life. Manufacturer concurs with state and federal regulatory agencies' recommendations that solution standards be assigned a one-year expiration date.

11.3 Chemical Stability - Studies have been conducted on this or similar CRMs and it has been demonstrated that this CRM is chemically stable for a period of not less than two years provided the "Storage & Handling" conditions are followed that are described in section 7.0.

Certification Date: February 14, 2012

Expiration Date: EXPIRES 01/2013

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By:	Brenda Francis Product Documentation Technician	
Certificate Approved By:	Brian Alexander PhD., Quality Control Supervisor	
Certifying Officer:	Paul Gaines PhD., Senior Technical Director	

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #32145, Magnesium Stock Standard - Rec'd

STOCK STANDARD

Created By: DS1
Created: 06/15/2012 12:58
Expires: 03/31/2018

Volume of Standard: 125 mL
Manufacturer: Ultra SCientific
Manufacturer Lot ID: M00166

Lot ID: 402040
Part ID: ICP-112
Standard ID: Mg-STK

Notes: Magnesium Stock Standard - Rec'd 06/15/12

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4002c/402040_COA.pdf

Compound Name and Concentration for Standard #32145

Compound Name	Concentration	Compound Name	Concentration
Magnesium	10000 ug/mL		

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ULTRAgrade™ Solution
Magnesium ICP Standard
10000 µg/mL

Catalog Number: ICP-112
Lot Number: M00166
Job Number: J00012563
Lot Issue Date: 02/21/2011
Expiration Date: 03/31/2018

402040
REC.06/15/12 BY DS:
Exp. __/__/__ By _
Open __/__/__ By _

Starting Material:	Magnesium Nitrate Hexahydrate
Starting Material Purity:	99.999%
Starting Material Lot No.:	BH01553, BH01565, BH01769
Matrix:	2% nitric acid in low TOC water (< 50 ppb)
Atomic Weight Mg:	24.31

Certified Value: 10002 ± 20 µg/mL

This Certified Reference Material (CRM) was manufactured and verified in accordance with ULTRA's ISO 9001 registered quality system. The analyte concentrations were verified by our ISO 17025 accredited laboratory to be within ± 2.5%, when compared to calibration standards independently prepared using NIST SRM(s). The certified value and uncertainty value at the 95% confidence level for each analyte is determined gravimetrically.

Classical Wet Assay Method: Theoretical, based on gravimetric measurements

Confirmation by Inductively Coupled Plasma Spectroscopy (ICP / ICP-MS) vs. NIST SRM 3131a

ULTRA uses purified acids, 18 megohm double deionized water, calibrated Class A glassware & meticulously cleaned bottles in the manufacturing of ULTRAgrade standards. Balances used in the manufacturing of this standard are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001.

Trace Metallic Impurities in Solution Standard in µg/mL:

*	Al	<0.005	ND	*	Ga	<0.005	ND	n	Nb			n	S		
*	Sb	<0.005	ND	n	Ge			n	Os			n	Ta		
*	As	<0.005	ND	n	Au			*	Pd	<0.005	ND	n	Te		
*	Ba	<0.005	ND	n	Hf			*	P	<0.005	ND	n	Tb		
*	Be	<0.005	ND	n	Ho			*	Pt	<0.005	ND	*	Tl	<0.005	ND
*	Bi	<0.005	ND	*	In	<0.005	ND	*	K	<0.010	D	n	Th		
*	B	<0.005	ND	n	Ir			n	Pr			n	Tm		
*	Cd	<0.005	ND	*	Fe	<0.005	ND	n	Re			*	Sn	<0.005	ND
*	Ca	<0.070	D	*	La	<0.005	ND	n	Rh			*	Ti	<0.005	ND
n	Ce			*	Pb	<0.005	ND	n	Rb			n	W		
n	Cs			*	Li	<0.005	ND	n	Ru			n	U		
*	Cr	<0.005	ND	n	Lu			n	Sm			*	V	<0.005	ND
*	Co	<0.005	ND	s	Mg			n	Sc			n	Yb		
*	Cu	<0.005	ND	*	Mn	<0.005	ND	*	Se	<0.005	ND	n	Y		
n	Dy			*	Hg	<0.005	ND	*	Si	<0.005	ND	*	Zn	<0.005	ND
*	Er	<0.005	ND	*	Mo	<0.005	ND	*	Ag	<0.005	ND	n	Zr		
*	Eu	<0.005	ND	n	Nd			*	Na	<0.010	D				
*	Gd	<0.005	ND	*	Ni	<0.005	ND	*	Sr	<0.005	ND				

* - element checked for
ND - not detected
i - spectral interference
D - detected
n - not checked for
s - solution standard element

Density of Solution (measured at 20.0°C ± 0.5°C): 1.054 g/mL

#32145 Mg-STK STOCK
31-MAR-18
DESC: Magnesium Stock Standard
LOT NUMBER: 402040
MANUFACTURER: Ultra Scientific
NOTES: Magnesium Stock Standard - Rec'd 06/15/12
CREATED: 15-JUN-12 BY: DS1
EXPIRES: 31-MAR-18 COMPOUND COUNT: 1

ACCREDITED

ISO 17025 Accredited A2LA Cert. No. 0851-01
ISO 9001 Registered TÜV USA, Inc. Cert. No. 09-1009

250 Smith Street, North Kingstown, RI 02852 USA
401-294-9400 Fax: 295-2330
www.ultrasci.com

William J. Leary
Quality Assurance Manager

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #33985, Mercury Stock Standard - Rec. 06/14/12,

STOCK STANDARD

Created By: CMS
Created: 07/13/2012 13:04
Expires: 12/08/2013

Volume of Standard: 125 mL
Manufacturer: High Purity
Manufacturer Lot ID: 1207328

Lot ID: 402090
Part ID: 100033-1
Standard ID: Hg-STK

Notes: Mercury Stock Standard - Rec. 06/14/12, Opened 07/13/12

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4002c/402090_COA.PDF

Compound Name and Concentration for Standard #33985

Compound Name	Concentration	Compound Name	Concentration
Mercury	1000 ug/mL		

HIGH-PURITY STANDARDS
www.highpuritystandards.com

P.O. Box 41727
Charleston, SC 29423
Phone: (843) 767-7900
Fax: (843) 767-7906

Certificate of Analysis

Product Description:

Name:	Mercury	Source Material:	Mercury Metal
Part Number:	**100033-1**	Material Purity:	99.9998%
Lot Number:	**1207328**	Matrix:	2% (v/v) HNO_3

Certified Value: 1000 µg/mL ± 6 µg/mL

The Certified value is based on gravimetric and volumetric preparation, and confirmed against SRM 3133 (lot number 061204) by inductively coupled plasma optical emission spectrometry (ICP-OES) using an internal laboratory-developed method. The uncertainty in the certified value is calculated for a 95% confidence interval and coverage factor *k* is about 2.

Density: 1.010 g/mL ± 0.002 g/mL @ 24.2°C

402080
REC. 07/13/12 BY CMS
Exp. --/--/-- BY --

Uncertified Values:

Trace Metal Impurity Scan: The data reported are based upon a scan of this specific lot at 1000 µg/mL via ICP analysis. The values are reported in µg/L.

Ag		na	Cu	<	0.2	Li	<	0.02	Rb	<	0.02	Th	<	0.02
Al	<	0.1	Dy	<	0.02	Lu	<	0.02	Re	<	0.02	Ti	<	0.02
As	<	0.05	Er	<	0.02	Mg	<	0.5	Rh	<	0.02	Tl	<	0.02
Au	<	0.02	Eu	<	0.02	Mn	<	0.1	Ru	<	0.02	Tm	<	0.02
B	<	1	Fe	<	1	Mo	<	0.02	Sb	<	0.02	U	<	0.1
Ba	<	0.1	Ga	<	0.02	Na	<	3	Sc	<	0.02	V	<	0.05
Be	<	0.02	Gd	<	0.02	Nb	<	0.02	Se	<	0.1	W	<	0.02
Bi	<	0.02	Ge	<	0.02	Nd	<	0.02	Si	<	50	Y	<	0.02
Ca	<	1	Hf	<	0.02	Ni	<	0.02	Sm	<	0.02	Yb	<	0.02
Cd	<	0.02	Ho	<	0.02	Os	<	0.02	Sn	<	1	Zn	<	0.5
Ce	<	0.02	In	<	0.02	Pb	<	0.05	Sr	<	0.02	Zr	<	0.02
Co	<	0.2	Ir	<	0.02	Pd	<	0.02	Ta	<	0.02	Hg		M
Cr	<	0.1	K	<	1	Pr	<	0.02	Tb	<	0.02			
Cs		na	La	<	0.02	Pt	<	0.02	Te	<	0.1	na - not analyzed		

Preparation Information:

The standard solution is prepared using high purity materials and assayed by analytical methods for conformity prior to use. This standard was prepared using the methods developed at NIST for SRM Spectrometric Standard Solutions under appropriate laboratory conditions.

Sub-boiling distilled high-purity acid has been used to place the materials in solution and to stabilize the standard. The matrix is as noted above in 18 megaohm deionized water.

Stability of this product is based upon rigorous short term and long term testing of the solution for the certified value. This testing includes, but is not limited to, the effect of temperature and packaging on the product.

Intended Use:

This Certified Reference Material (CRM) is intended for use as a calibration standard for the quantitative determination of mercury, calibration of instruments such as ICPOES, ICPMS, AAS and XRF, and validation of analytical methods. It also can be used in EPA, ASTM and other methods.

Traceability Information:

The traceability of this standard is maintained through an unbroken chain of comparisons to appropriate standards with suitable procedure and measurement uncertainties. The maintenance of the base and derived units of International System of Units (SI) with traceability of measurement results (contemporary metrology) to SI ensures their comparability over time as follows.

a. **Standard Weight and Analytical Balance**
The standard weights (NBS weights Inventory No 20231A) are calibrated every two years by South Carolina Metrology Laboratory that is a participant in "NIST Weights and Measures Measurement Assurance Program" with a certificate of measurement traceability to NIST primary standards.
The balances are calibrated yearly by the ISO 17025 accredited metrology service, and are verified weekly by an in-house method using standard weights.

b. **Volumetric Device**
The calibration of volumetric vessels is checked annually using the NBS 602 method.

c. **Thermometer**
The standard thermometers are calibrated every year by the ISO 17025 accredited metrology service. The thermometers used in-house are verified against the standard thermometers yearly.

d. **Calibration Standards:**
The Calibration Standard is directly traceable to SRM 3100 Series Spectrometric Standard Solutions.

Packaging and Storage Conditions:

The standard is packaged in a pre-cleaned polyethylene bottle. To maintain the integrity of this product, the solution should be kept tightly capped and stored under normal laboratory conditions.

Refer to Material Safety Datasheet (MSDS) for hazardous information.

Expiration Information:

The expiry date is guaranteed to be valid for eighteen months from the shipping date provided. For this reason, standards from the same lot may have different expiration dates.

Preparation Date:	**March 13, 2012**
Shipped Date:	**June 8, 2012**
Expiration Date:	**December 8, 2013**
Certificate Issue Date:	**March 22, 2012**

Quality Information:

ISO/IEC 17025:2005 Accreditation
Certificate Number AT-1529

ISO Guide 34:2009 (RMP) Accreditation
Certificate Number AR-1436

Vanny T. Yib,	**Kim-Phuong Tran**	**Theodore Rains, PhD**
Inorganic Laboratory Manager	**Quality Manager**	**President**

NOTICE: HPS products are intended for laboratory use only. All products should be handled and used by trained professional personnel. The responsibility for the safe handling and use of these products rests solely with the buyer and/or user. The data and information as stated was furnished by the manufacturer of the product. The information provided in this certificate pertains only to the lot number specified. None of the information provided in this certificate may be used, reproduced or transmitted in any form or by any means without written approval from High Purity Standards.

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #34289, Conc. Nitric Acid - Rec 07/18/12 MMZ

SOLVENT

Created By:	MMZ	**Volume of Standard:**	2500 mL	**Lot ID:**	402098
Created:	07/18/2012 13:52	**Manufacturer:**	SCP SCIENCE	**Part ID:**	250-037-171
Expires:	07/18/2014	**Manufacturer Lot ID:**	SCA2129885	**Standard ID:**	RGNT373

Notes: Conc. Nitric Acid - Rec 07/18/12 MMZ

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4002c/402098_COA.PDF

Compound Name and Concentration for Standard #34289

Compound Name	Concentration	Compound Name	Concentration
Nitric Acid			

SCP SCIENCE 402098 REC.07/18/12 BY MM: Exp. --/--/-- By --

Providing Innovative Solutions to Analytical Chemists

Certificate of Analysis

*Plasma*PURE

Nitric Acid (67 - 70% HNO_3)

Catalogue Number: 250-038-171 / 250-138-175

Lot Number: **SCA2129885**
Assay (HNO_3 w/w): **69%**
Colour (APHA): **< 10 (Specification: Max 10)**
Expiry Date: **February 2014**

Opened Bottle Expiry Information
15 months after opening, up to unopened expiration date

Date bottle opened

Analyte	Maximum Specification	Actual Value (in ppb)	Analyte	Maximum Specification	Actual Value (in ppb)
Aluminum (Al)	1 ppb	< 0.5	Neodymium (Nd)	0.1 ppb	< 0.1
Antimony (Sb)	0.5 ppb	< 0.1	Nickel (Ni)	0.5 ppb	< 0.5
Arsenic (As)	0.5 ppb	< 0.1	Niobium (Nb)	0.1 ppb	< 0.1
Barium (Ba)	0.1 ppb	< 0.1	Palladium (Pd)	0.5 ppb	< 0.1
Beryllium (Be)	0.1 ppb	< 0.1	Platinum (Pt)	0.5 ppb	< 0.1
Bismuth (Bi)	0.1 ppb	< 0.1	Potassium (K)	1 ppb	< 0.2
Boron (B)	1 ppb	< 0.5	Praseodymium (Pr)	0.1 ppb	< 0.1
Cadmium (Cd)	0.5 ppb	< 0.1	Rhenium (Re)	0.1 ppb	< 0.1
Calcium (Ca)	1 ppb	< 0.5	Rhodium (Rh)	0.5 ppb	< 0.1
Cerium (Ce)	0.1 ppb	< 0.1	Rubidium (Rb)	0.1 ppb	< 0.1
Cesium (Cs)	0.1 ppb	< 0.1	Ruthenium (Ru)	0.5 ppb	< 0.1
Chromium (Cr)	1 ppb	< 0.5	Samarium (Sm)	0.1 ppb	< 0.1
Cobalt (Co)	0.5 ppb	< 0.1	Scandium (Sc)	0.1 ppb	< 0.1
Copper (Cu)	0.5 ppb	< 0.2	Selenium (Se)	1 ppb	< 0.1
Dysprosium (Dy)	0.1 ppb	< 0.1	Silver (Ag)	0.1 ppb	< 0.1
Erbium (Er)	0.1 ppb	< 0.1	Sodium (Na)	1 ppb	< 0.5
Europium (Eu)	0.1 ppb	< 0.1	Strontium (Sr)	0.1 ppb	< 0.1
Gadolinium (Gd)	0.1 ppb	< 0.1	Tantalum (Ta)	Information Only	< 0.1
Gallium (Ga)	0.1 ppb	< 0.1	Tellurium (Te)	0.1 ppb	< 0.1
Germanium (Ge)	0.1 ppb	< 0.1	Terbium (Tb)	0.1 ppb	< 0.1
Gold (Au)	0.1 ppb	< 0.1	Thallium (Tl)	0.1 ppb	< 0.1
Hafnium (Hf)	0.1 ppb	< 0.1	Thorium (Th)	0.1 ppb	< 0.1
Holmium (Ho)	0.1 ppb	< 0.1	Thulium (Tm)	0.1 ppb	< 0.1
Indium (In)	0.1 ppb	< 0.1	Tin (Sn)	0.5 ppb	< 0.1
Iron (Fe)	1 ppb	< 0.5	Titanium (Ti)	0.5 ppb	< 0.1
Lanthanum (La)	0.1 ppb	< 0.1	Tungsten (W)	0.1 ppb	< 0.1
Lead (Pb)	0.1 ppb	< 0.1	Uranium (U)	0.1 ppb	< 0.1
Lithium (Li)	0.1 ppb	< 0.1	Vanadium (V)	0.5 ppb	< 0.1
Lutetium (Lu)	0.1 ppb	< 0.1	Ytterbium (Yb)	0.1 ppb	< 0.1
Magnesium (Mg)	1 ppb	< 0.2	Yttrium (Y)	0.1 ppb	< 0.1
Manganese (Mn)	0.1 ppb	< 0.1	Zinc (Zn)	0.5 ppb	< 0.2
Mercury (Hg)	0.1 ppb	< 0.02	Zirconium (Zr)	0.1 ppb	< 0.1
Molybdenum (Mo)	0.1 ppb	< 0.1			

Analyte	Maximum Specification	Actual Value (in ppm)	Analyte	Maximum Specification	Actual Value (in ppm)
Chloride (Cl⁻)	0.2 ppm	< 0.2	Total Sulphur (S)	0.3 ppm	< 0.3
Total Phosphorus (P)	0.01 ppm	< 0.01			

Certified by: Daniel Boisvert
Daniel Boisvert, Chemist

Certification Date: **February 13, 2012**

To maintain product integrity and reduce the risk of trace metal contamination: the inner pack of plastic bags and bottle should be opened under CLASS 100 particle conditions to maintain the integrity of the product. The use of safety apparel, as well as eye protection, plastic gloves, hair net and a clean room suit is also advised. The Material Safety Data Sheet and this Certificate of Analysis are available on our web site. **SCP SCIENCE** is ISO 9001:2008 registered and ISO 17025 accredited (Également disponible en français).

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Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #34308, Conc. HCL - Rec 07/18/12 MMZ

SOLVENT

Created By:	MMZ	**Volume of Standard:**	2500 mL	**Lot ID:**	402100
Created:	07/18/2012 14:18	**Manufacturer:**	SCP SCIENCE	**Part ID:**	250-038-151
Expires:	07/18/2014	**Manufacturer Lot ID:**	SCA2124881	**Standard ID:**	RGNT153

Notes: Conc. HCL - Rec 07/18/12 MMZ

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4002c/402100_COA.PDF

Compound Name and Concentration for Standard #34308

Compound Name	Concentration	Compound Name	Concentration
Hydrochloric Acid			

SCP SCIENCE 402100 REC.07/18/12 BY MMZ Exp. __/__/__ By __

Providing Innovative Solutions to Analytical Chemis...

Certificate of Analysis

*Plasma*PURE — Hydrochloric Acid (34 - 37% HCl)

Catalogue Number: 250-038-151 / 250-038-155

Opened Bottle Expiry Information
15 months after opening, up to unopened expiration date

_____
Date bottle opened

Lot Number: **SCA2124881**
Assay (HCl w/w): 35%
Colour (APHA): **< 10 (Specification: Max 10)**
Expiry Date: **December 2014**

Analyte	Maximum Specification	Actual Value (in ppb)	Analyte	Maximum Specification	Actual Value (in ppb)
Aluminum (Al)	1 ppb	< 0.5	Neodymium (Nd)	0.1 ppb	< 0.1
Antimony (Sb)	0.5 ppb	< 0.1	Nickel (Ni)	0.5 ppb	< 0.1
Arsenic (As)	0.5 ppb	< 0.1	Niobium (Nb)	0.1 ppb	< 0.1
Barium (Ba)	0.1 ppb	< 0.1	Palladium (Pd)	Information Only	< 0.5
Beryllium (Be)	0.1 ppb	< 0.1	Platinum (Pt)	Information Only	< 0.5
Bismuth (Bi)	0.1 ppb	< 0.1	Potassium (K)	1 ppb	< 0.1
Boron (B)	1 ppb	< 0.5	Praseodymium (Pr)	0.1 ppb	< 0.1
Cadmium (Cd)	0.1 ppb	< 0.1	Rhenium (Re)	0.1 ppb	< 0.1
Calcium (Ca)	1 ppb	< 0.5	Rhodium (Rh)	0.1 ppb	< 0.1
Cerium (Ce)	0.1 ppb	< 0.1	Rubidium (Rb)	0.1 ppb	< 0.1
Cesium (Cs)	0.1 ppb	< 0.1	Ruthenium (Ru)	0.1 ppb	< 0.1
Chromium (Cr)	0.5 ppb	< 0.1	Samarium (Sm)	0.1 ppb	< 0.1
Cobalt (Co)	0.1 ppb	< 0.1	Scandium (Sc)	0.1 ppb	< 0.1
Copper (Cu)	0.5 ppb	< 0.1	Selenium (Se)	1 ppb	< 0.1
Dysprosium (Dy)	0.1 ppb	< 0.1	Silver (Ag)	1 ppb	< 0.1
Erbium (Er)	0.1 ppb	< 0.1	Sodium (Na)	1 ppb	< 0.5
Europium (Eu)	0.1 ppb	< 0.1	Strontium (Sr)	0.1 ppb	< 0.1
Gadolinium (Gd)	0.1 ppb	< 0.1	Tantalum (Ta)	Information Only	< 1
Gallium (Ga)	0.1 ppb	< 0.1	Tellurium (Te)	0.1 ppb	< 0.1
Gold (Au)	0.5 ppb	< 0.1	Terbium (Tb)	0.1 ppb	< 0.1
Hafnium (Hf)	0.1 ppb	< 0.1	Thallium (Tl)	0.1 ppb	< 0.1
Holmium (Ho)	0.1 ppb	< 0.1	Thorium (Th)	0.1 ppb	< 0.1
Indium (In)	0.1 ppb	< 0.1	Thulium (Tm)	0.1 ppb	< 0.1
Iron (Fe)	1 ppb	< 0.5	Tin (Sn)	0.5 ppb	< 0.1
Lanthanum (La)	0.1 ppb	< 0.1	Titanium (Ti)	0.5 ppb	< 0.1
Lead (Pb)	0.1 ppb	< 0.1	Tungsten (W)	0.1 ppb	< 0.1
Lithium (Li)	0.1 ppb	< 0.1	Uranium (U)	0.1 ppb	< 0.1
Lutetium (Lu)	0.1 ppb	< 0.1	Vanadium (V)	0.5 ppb	< 0.1
Magnesium (Mg)	0.5 ppb	< 0.5	Ytterbium (Yb)	0.1 ppb	< 0.1
Manganese (Mn)	0.1 ppb	< 0.1	Yttrium (Y)	0.1 ppb	< 0.1
Mercury (Hg)	0.1 ppb	< 0.02	Zinc (Zn)	1 ppb	< 0.5
Molybdenum (Mo)	0.1 ppb	< 0.1	Zirconium (Zr)	0.1 ppb	< 0.1

Analyte	Maximum Specification	Actual Value (in ppm)	Analyte	Maximum Specification	Actual Value (in ppm)
Bromide (Br^-)	10 ppm	< 10	Total Sulphur (S)	0.3 ppm	< 0.3
Total Phosphorus (P)	0.01 ppm	< 0.01	Free Chlorine (Cl_2)	0.5 ppm	< 0.5

Certified by: Daniel Boisvert
Daniel Boisvert, Chemist

Certification Date: **December 23, 2011**

To maintain product integrity and reduce the risk of trace metal contamination: the inner pack of plastic bags and bottle should be opened under CLASS 100 particle conditions to maintain the integrity of the product. The use of safety apparel, as well as eye protection, plastic gloves, hair net and a clean room suit is also advised. The Material Safety Data Sheet and this Certificate of Analysis are available on our web site. SCP SCIENCE is ISO 9001:2008 registered and ISO 17025 accredited (Également disponible en français).

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Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #34855, Metals SRM TORT-2 - Rec'd 07/25/12

Pace Analytical®
www.pacelabs.com

STOCK STANDARD

Created By: MMZ
Created: 07/25/2012 09:37
Expires: 07/25/2014

Volume of Standard:
Manufacturer: NRC CNRC
Manufacturer Lot ID: TORT-2

Lot ID: 402129
Part ID: TORT-2
Standard ID: SRM TORT-2

Notes: Metals SRM TORT-2 - Rec'd 07/25/12

Certificates of Analysis

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Compound Name and Concentration for Standard #34855

Compound Name	Concentration	Compound Name	Concentration
Arsenic	21.6 mg/kg	Mercury	.27 mg/kg
Calcium	26.7 mg/kg	Molybdenum	.95 mg/kg
Chromium	.77 mg/kg	Nickel	2.5 mg/kg
Cobalt	.51 mg/kg	Selenium	5.63 mg/kg
Copper	106 mg/kg	Strontium	45.2 mg/kg
Iron	105 mg/kg	Vanadium	1.64 mg/kg
Lead	.35 mg/kg	Zinc	180 mg/kg
Manganese	13.6 mg/kg		

Certified Reference Material

National Research Council Canada | Conseil national de recherches Canada

402129
REC.07/25/12 BY MHZ
EXP. __/__/__ BY __

TORT-2

Lobster Hepatopancreas Reference Material for Trace Metals

The following table lists those elements for which certified values have been established. Certified values and their uncertainties are reported as mass fractions (based on dry mass). The uncertainties represent 95% confidence limits for an individual subsample. That is, 95% of samples, 250 mg or greater, from any bottle would be expected to have concentrations within the specified range 95% of the time.

Trace Metal Mass Fractions (mg/kg)

Arsenic (g,h,m)	**21.6**	**±**	**1.8**
Cadmium (g,p)	**26.7**	**±**	**0.6**
Chromium (g,p)	**0.77**	**±**	**0.15**
Cobalt (g,m)	**0.51**	**±**	**0.09**
Copper (g,i,p)	**106**	**±**	**10**
Iron (g,i)	**105**	**±**	**13**
Lead (g,p)	**0.35**	**±**	**0.13**
Manganese (g,i,m)	**13.6**	**±**	**1.2**
Mercury (c,e)	**0.27**	**±**	**0.06**
Molybdenum (g,p)	**0.95**	**±**	**0.10**
Nickel (g,p)	**2.50**	**±**	**0.19**
Selenium (g,h,q)	**5.63**	**±**	**0.67**
Strontium (i,p)	**45.2**	**±**	**1.9**
Tin (p)	**(0.04)***		
Vanadium (g,i,m)	**1.64**	**±**	**0.19**
Zinc (g,i,p)	**180**	**±**	**6**
Methylmercury(as Hg) (e,t)	**0.152**	**±**	**0.013**

***information value only**

c - cold vapour atomic absorption spectrometry
e - cold vapour microwave induced plasma atomic emission spectrometry
g - graphite furnace atomicabsorption spectrometry (GFAAS)
h - hydride generation GFAAS
i - inductively coupled plasma atomic emission spectrometry
m- inductively coupled plasma mass spectrometry (ICPMS)
p - isotope dilution inductively coupled plasma mass spectrometry
q - isotope dilution hydride generation ICPMS
t - gas chromatography - electron capture detection

The coding refers only to the ultimate method of analyte determination. Methods of sample preparation or decomposition are available by request.

NRC · CNRC

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #36242, Hg Calibration Intermediate

WORKING STANDARD

Created By: DS1
Created: 08/14/2012 11:13
Expires: 02/14/2013

Volume of Standard: 100 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: Hg Cal Int

Notes: Hg Calibration Intermediate

Compound Name and Concentration for Standard #36242

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Nitric Acid	ug/L
Mercury	1000 ug/L		

Composed of Information for Standard #36242

Composed of Standard Seq	Notes	Volume	Units
33985	Mercury Stock Standard - Rec. 06/14/12,	0.1	mL
22391	Conc. Nitric Acid - Rec 06/10/11	3	mL
995	DI WATER	96.9	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #36269, Biota Spike Silver

WORKING STANDARD

Created By: DS1
Created: 08/14/2012 13:14
Expires: 01/01/2013

Volume of Standard: 100 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: 6000-SPKB3

Notes: Biota Spike Silver

Compound Name and Concentration for Standard #36269

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Tin	10000 ug/L
Silicon	50000 ug/L	Zirconium	10000 ug/L
Boron	10000 ug/L	Silver	5000 ug/L
Molybdenum	10000 ug/L	Titanium	10000 ug/L
Antimony	10000 ug/L	Nitric Acid	ug/L

Composed of Information for Standard #36269

Composed of Standard Seq	Notes	Volume	Units
22391	Conc. Nitric Acid - Rec 06/10/11	10	mL
20870	Metals Trace2 Secondary - Rec'd 12/03/11	5	mL
995	DI WATER	85	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #37662, ICPMS Magnesium Tune Intermediate

Pace Analytical®
www.pacelabs.com

WORKING STANDARD

Created By: DS1
Created: 09/04/2012 08:41
Expires: 03/04/2013

Volume of Standard: 100 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: Mg Tune Int

Notes: ICPMS Magnesium Tune Intermediate

Compound Name and Concentration for Standard #37662

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Nitric Acid	ug/L
Magnesium	10000 ug/L		

Composed of Information for Standard #37662

Composed of Standard Seq	Notes	Volume	Units
34289	Conc. Nitric Acid - Rec 07/18/12 MMZ	3	mL
32145	Magnesium Stock Standard - Rec'd 06/15/1	0.1	mL
995	DI WATER	96.9	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #37663, ICPMS Tune Intermediate

WORKING STANDARD

Created By: DS1
Created: 09/04/2012 08:44
Expires: 03/01/2013

Volume of Standard: 100 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: ICPM-TuneInt

Notes: ICPMS Tune Intermediate

Compound Name and Concentration for Standard #37663

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Uranium	1000 ug/L
Barium	1000 ug/L	Nitric Acid	ug/L
Boron	1000 ug/L	Scandium	1000 ug/L
Cerium	1000 ug/L	Bismuth	1000 ug/L
Lead	1000 ug/L	Germanium	1000 ug/L
Nickel	1000 ug/L	Indium	1000 ug/L
Beryllium	1000 ug/L	Terbium	1000 ug/L
Cobalt	1000 ug/L	Yttrium	1000 ug/L
Lithium	1000 ug/L	Magnesium	1000 ug/L

Composed of Information for Standard #37663

Composed of Standard Seq	Notes	Volume	Units
37662	ICPMS Magnesium Tune Intermediate	10	mL
34289	Conc. Nitric Acid - Rec 07/18/12 MMZ	2	mL
26596	Lithium Stock Standard Rec'd 3/16/12	0.01	mL
24683	ICPMS Internal Standard Stock - Rec 03/0	1	mL
24681	Scandium Primary Standard - Rec 03/16/11	1	mL
18040	Uranium Secondary Standard - Rec 10/26/2	0.1	mL
5183	Cobalt Stock Standard, Rec 09/10/10,Open	0.1	mL
4892	Beryllium Stock Standard - Rec 09/10/10,	0.1	mL
4891	Nickel Stock Standard - Rec 09/10/10, Op	0.1	mL
1285	Lead Stock Standard - Rec'd 2/26/10, Ope	0.1	mL
1270	Cerium Stock Standard - Rec'd 8/18/09, O	0.1	mL
1257	Boron Stock Standard - Rec'd 5/10/10, Op	0.1	mL
1256	Barium Stock Standard - Rec'd 12/20/09,	0.1	mL
995	DI WATER	85.19	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #37851, Gold Primary Standard - Rec 09/04/12

STOCK STANDARD

Created By:	DS1	**Volume of Standard:**	500 mL	**Lot ID:**	402219
Created:	09/05/2012 16:02	**Manufacturer:**	Inorganic Ventures	**Part ID:**	CGAU1-5
Expires:	10/01/2013	**Manufacturer Lot ID:**	F2-AU04014	**Standard ID:**	Au-STK

Notes: Gold Primary Standard - Rec 09/04/12

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4002c/402219_COA.PDF

Compound Name and Concentration for Standard #37851

Compound Name	Concentration	Compound Name	Concentration
Gold	1000 ug/mL		

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 • USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

tel: 800.669.6799 • 540.585.3030
fax: 540.585.3012
info@inorganicventures.com

402219

Rec. 9/4/12

402219
REC.09/05/12 BY DS
Exp: __/__/__ By -

1.0 **INORGANIC VENTURES** is an ISO Guide 34 "General Requirements for the Competence of Reference Material Producers" and ISO 9001 registered manufacturer. Our manufacturing laboratory is accredited to ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories."

ACCREDITED Testing Laboratory Certificate 583.01 — ACCREDITED Reference Material Producer Certificate 583.02

2.0 DESCRIPTION OF CRM

DESCRIPTION OF CRM	**1000 µg/mL Gold in 10% (v/v) HCl**
Catalog Number:	CGAU1-1, CGAU1-2, and CGAU1-5
Lot Number:	**F2-AU04014**
Starting Material:	HAuCl4xH2O
Starting Material Purity (%):	99.9973
Starting Material Lot No:	1699
Matrix:	10% (v/v) HCl

H37851 Au-STK STOCK
01-OCT-13
DESC: Gold Primary Standard
LOT NUMBER: 402219
MANUFACTURER: Inorganic Ventures
NOTES: Gold Primary Standard - Rec 09/04/12
CREATED: 05-SEP-12 BY: DS1
EXPIRES: 01-OCT-13 COMPOUND COUNT: 1

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Concentration: 1,001 ± 5 µg/mL - weighted mean

Certified Density: 1.017 g/mL (measured at 20 ± 1°C)

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Certified Value $(\bar{x}) = \frac{\sum x_i}{n}$

$(\bar{x})$ = mean
x_i = individual results
n = number of measurements

Uncertainty (±) = $2\,[\,\Sigma(s_i)^2\,]^{1/2}$

2 = the coverage factor.
$[\,\Sigma(s_i)^2\,]^{1/2}$ = The square root of the sum of the squares of the most common errors (where 's' stands for the standard deviation) from instrumental measurement, density, NIST SRM uncertainty, weighing, dilution to volume, homogeneity, long term stability and short term stability.

4.0 TRACEABILITY TO NIST AND VALUES OBTAINED BY INDEPENDENT METHODS

· "Property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties." (ISO VIM, 2nd ed., 1993, definition 6.10)

· This product is Traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRMs are available, the term 'in-house std.' is specified.

4.1 Assay Method #1 **1,002 ± 3 µg/mL**
ICP Assay NIST SRM 3121 Lot Number: 991806

Assay Method #2 **1,000 ± 3 µg/mL**
Calculated NIST SRM Lot Number: See Sec. 4.2

4.2 **BALANCE CALIBRATION -** All analytical balances are calibrated yearly by an A2LA accredited calibration laboratory and are traceable to a class E 2 analytical weight set with NIST Traceability. All balances are checked daily using an in-house procedure. The weights used for testing are annually compared to master weights and are traceable to the National Institute of Standards and Technology (NIST).

4.3 **THERMOMETER CALIBRATION -** All thermometers are NIST traceable through thermometers that are calibrated by an A2LA accredited calibration laboratory.

4.4 **GLASSWARE CALIBRATION -** An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM's.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP/MS AND ICP-OES IN µg/mL

CRM's solutions are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

O	Al		0.002073	M	Dy	<	0.046350	O	Li	<	0.000020	M	Pr	<	0.002318	M	Te	<	0.231751
M	Sb	<	0.003863	M	Er	<	0.038625	M	Lu	<	0.003090	M	Re	<	0.007725	M	Tb	<	0.002318
O	As	<	0.020000	M	Eu	<	0.023175	O	Mg		0.001037	M	Rh		0.000400	M	Tl	<	0.007725
M	Ba		0.000170	M	Gd	<	0.007725	O	Mn		0.000130	M	Rb	<	0.007725	M	Th	<	0.007725
M	Be	<	0.003863	M	Ga	<	0.007725	O	Hg	<	0.012000	M	Ru	<	0.015450	M	Tm	<	0.003090
M	Bi		0.000100	M	Ge	<	0.046350	M	Mo	<	0.015450	M	Sm	<	0.007725	M	Sn		0.000701
M	B		0.002403	s	Au			M	Nd	<	0.015450	M	Sc	<	0.077250	M	Ti	<	0.386251
M	Cd		0.000250	M	Hf	<	0.015450	O	Ni		0.000467	O	Se	<	0.050000	M	W	<	0.077250
O	Ca		0.006738	M	Ho	<	0.003863	M	Nb	<	0.003863	O	Si		0.004536	M	U	<	0.015450
M	Ce	<	0.038625	M	In	<	0.077250	n	Os			M	Ag		0.025026	O	V	<	0.001000
M	Cs	<	0.002318	M	Ir	<	0.038625	O	Pd		0.000907	O	Na		0.004536	M	Yb	<	0.007725
O	Cr		0.000518	O	Fe		0.004276	O	P	<	0.040000	M	Sr	<	0.003863	M	Y	<	0.309001
M	Co	<	0.023175	M	La	<	0.003863	O	Pt		0.001555	O	S	<	0.025000	O	Zn		0.001296
M	Cu		0.000200	O	Pb	<	0.006500	O	K	<	0.001800	M	Ta	<	0.054075	M	Zr	<	0.038625

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

For the calibration of analytical instruments including but not limited to the following:
HPLC, IC, TLC, ISE, IR, NMR, UV/VIS, MS, Capillary Eletrophoresis, Potentiometry, Wet Chemistry and Voltammetry
For the validation of analytical methods
For the preparation of "working reference samples"
For interference studies and the determination of correction coefficients
For detection limit and linearity studies
For additional intended uses, contact Technical Staff

This CRM was manufactured using 18 megohm doubly deionized water that has been filtered through a 0.2 micron filter.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

Storage & Handling - Keep tightly sealed when not in use. Store and use at 20 ± 4°C. Do not pipet from container. Do not return portions removed for pipetting to container.

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 196.9665; +3; 6; Au(Cl)63-

Chemical Compatibility - Stable in HCl, and HNO3, as the chloride complex. **Avoid** basic media. Stable with most metals and inorganic anions in acidic media.

Stability - 2-100 ppb levels. 2-10 ppb Au is stable for #1day maximum in 1% HNO3 / LDPE container. 100 ppb is stable for #2 days maximum in 1% HNO3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 10% HCl / LDPE container.

Au Containing Samples (Preparation and Solution) - Metal (Aqua Regia); Oxides (Soluble in HCl); Ores (Dissolve in HCl / HNO3).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	Estimated D.L.	Order	Type	Interferences (underlined indicates severe)
ICP-OES 242.795 nm	0.02 / 0.003 µg/mL	1	atom	Mn, Os, Th, Ta, Pt Co, F.
ICP-OES 267.595 nm	0.03 / 0.003 µg/mL	1	atom	Nb, Ta, U, Cr, Th, Rh, Ru
ICP-OES 208.209 nm	0.04 / 0.01 µg/mL	1	ion	Ir, Re
ICP-MS 197 amu	5 ppt	n/a	M+	181Ta16O

Uranium Note: If uranium is present in this standard, it is natural abundance unless specified in Section 3.0.

8.0 HAZARDOUS INFORMATION - Please refer to the enclosed Material Safety Data sheet for information regarding this CRM.

9.0 HOMOGENEITY - This solution was mixed according to an in house procedure and is guaranteed to be homogeneous. Inorganic Ventures homogeneity data indicate that the end user should take a minimum sample size of 0.2mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration
- QMI File Number 010105

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration"
- Chemical Testing - Accredited A2LA Certificate Number 883.01

10.3 ISO/IEC Guide 34 "General Requirements for the Competence of Reference Material Producers"
- Reference Materials Production - Accredited A2LA Certificate Number 883.02

10.4 10CFR50 Appendix B - Nuclear Regulatory Commission
- Domestic Licensing of Production and Utilization Facilities

10.5 10CFR21 - Nuclear Regulatory Commission
- Reporting Defects and Non-Compliance

11.0 DATE OF CERTIFICATION AND PERIOD OF VALIDITY

11.1 Shelf Life - The period of time during which the concentration of the analyte(s) in a properly packaged, unopened, and unused standard stored under environmentally controlled and monitored conditions will remain within the specified uncertainty range. Shelf life is limited primarily by transpiration (loss of water from the solution) and infrequently, by chemical instability.

11.2 Expiration Date - The date after which a CRM should not be used. Routine laboratory use of a CRM increases transpiration losses and the chance of contamination which affect the integrity of the CRM and limit its useful life. Manufacturer concurs with state and federal regulatory agencies' recommendations that solution standards be assigned a one-year expiration date.

11.3 Chemical Stability - Studies have been conducted on this or similar CRMs and it has been demonstrated that this CRM is chemically stable for a period of not less than two years provided the "Storage & Handling" conditions are followed that are described in section 7.0.

Certification Date: June 19, 2012

Expiration Date: EXPIRES 01/2013

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By:	Stephan Blaakman Product Documentation Technician	
Certificate Approved By:	Beth Day Quality Assurance Specialist	
Certifying Officer:	Paul Gaines PhD., Senior Technical Director	

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #39298, 1:1 HNO3

WORKING STANDARD

Created By: MMZ
Created: 09/26/2012 10:06
Expires: 03/26/2013

Volume of Standard: 2400 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: RGNT014

Notes: 1:1 HNO3

Compound Name and Concentration for Standard #39298

Compound Name	Concentration	Compound Name	Concentration
Water		Nitric Acid	

Composed of Information for Standard #39298

Composed of Standard Seq	Notes	Volume	Units
34289	Conc. Nitric Acid - Rec 07/18/12 MMZ	1200	mL
995	DI WATER	1200	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #39311, ICPMS Tune Solution

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WORKING STANDARD

Created By: DS1
Created: 09/26/2012 10:59
Expires: 03/01/2013

Volume of Standard: 500 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: ICPM-Tune

Notes: ICPMS Tune Solution

Compound Name and Concentration for Standard #39311

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Lithium	10 ug/L
Nitric Acid	ug/L	Uranium	10 ug/L
Barium	10 ug/L	Scandium	10 ug/L
Boron	10 ug/L	Bismuth	10 ug/L
Cerium	10 ug/L	Germanium	10 ug/L
Lead	10 ug/L	Indium	10 ug/L
Nickel	10 ug/L	Terbium	10 ug/L
Beryllium	10 ug/L	Yttrium	10 ug/L
Cobalt	10 ug/L	Magnesium	10 ug/L

Composed of Information for Standard #39311

Composed of Standard Seq	Notes	Volume	Units
37663	ICPMS Tune Intermediate	5	mL
34289	Conc. Nitric Acid - Rec 07/18/12 MMZ	10	mL
995	DI WATER	485	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #39560, ICPMS Blank Water

WORKING STANDARD

Created By: DS1
Created: 10/01/2012 13:12
Expires: 04/01/2012

Volume of Standard: 1000 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: ICPM-BLKH2O

Notes: ICPMS Blank Water

Compound Name and Concentration for Standard #39560

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Hydrochloric Acid	ug/L
Nitric Acid	ug/L		

Composed of Information for Standard #39560

Composed of Standard Seq	Notes	Volume	Units
34289	Conc. Nitric Acid - Rec 07/18/12 MMZ	100	mL
22392	Conc. HCL - Rec 06/10/11	50	mL
995	DI WATER	850	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #39691, ICPMS X-Calibration Solution

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WORKING STANDARD

Created By: DS1
Created: 10/03/2012 11:46
Expires: 04/03/2013

Volume of Standard: 100 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: ICPM-XCal

Notes: ICPMS X-Calibration Solution

Compound Name and Concentration for Standard #39691

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Uranium	50 ug/L
Beryllium	50 ug/L	Cerium	50 ug/L
Boron	50 ug/L	Cesium	50 ug/L
Sodium	50 ug/L	Neodymium	50 ug/L
Magnesium	50 ug/L	Lithium	50 ug/L
Aluminum	50 ug/L	Strontium	50 ug/L
Potassium	50 ug/L	Indium	50 ug/L
Calcium	50 ug/L	Rubidium	50 ug/L
Vanadium	50 ug/L	Scandium	50 ug/L
Chromium	50 ug/L	Yttrium	50 ug/L
Iron	50 ug/L	Antimony	50 ug/L
Manganese	50 ug/L	Germanium	50 ug/L
Lanthanum	50 ug/L	Hafnium	50 ug/L
Cobalt	50 ug/L	Molybdenum	50 ug/L
Nickel	50 ug/L	Niobium-94	50 ug/L
Copper	50 ug/L	Silicon	50 ug/L
Zinc	50 ug/L	Silver	50 ug/L
Arsenic	50 ug/L	Tantalum	50 ug/L
Selenium	50 ug/L	Tellurium	50 ug/L
Cadmium	50 ug/L	Tin	50 ug/L
Barium	50 ug/L	Titanium	50 ug/L
Thallium	50 ug/L	Zirconium	50 ug/L
Lead	50 ug/L	Nitric Acid	ug/L
Bismuth	50 ug/L	Hydrochloric Acid	ug/L

Composed of Information for Standard #39691

Composed of Standard Seq	Notes	Volume	Units
34308	Conc. HCL - Rec 07/18/12 MMZ	5	mL
34289	Conc. Nitric Acid - Rec 07/18/12 MMZ	10	mL
29180	ICPMS X-Cal Stock Standard 2 - Rec'd 4/2	0.5	mL
29179	ICPMS X-Cal Stock Standard 1 - Rec'd 4/2	0.5	mL
995	DI WATER	84	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #39693, ICPMS ICV

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WORKING STANDARD

Created By: DS1
Created: 10/03/2012 12:45
Expires: 11/10/2012

Volume of Standard: 200 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: 6020-ICV

Notes: ICPMS ICV

Compound Name and Concentration for Standard #39693

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Manganese	110 ug/L
Phosphorus	5500 ug/L	Nickel	110 ug/L
Silicon	5500 ug/L	Lead	110 ug/L
Aluminum	5500 ug/L	Selenium	110 ug/L
Calcium	5500 ug/L	Strontium	110 ug/L
Iron	5500 ug/L	Thallium	110 ug/L
Potassium	5500 ug/L	Vanadium	110 ug/L
Magnesium	5500 ug/L	Zinc	110 ug/L
Sodium	5500 ug/L	Boron	110 ug/L
Uranium	110 ug/L	Molybdenum	110 ug/L
Arsenic	110 ug/L	Antimony	110 ug/L
Barium	110 ug/L	Tin	110 ug/L
Beryllium	110 ug/L	Zirconium	110 ug/L
Cadmium	110 ug/L	Silver	55 ug/L
Cobalt	110 ug/L	Titanium	110 ug/L
Chromium	110 ug/L	Hydrochloric Acid	ug/L
Copper	110 ug/L	Nitric Acid	ug/L
Lithium	110 ug/L	Mercury	4 ug/L

Composed of Information for Standard #39693

Composed of Standard Seq	Notes	Volume	Units
34308	Conc. HCL - Rec 07/18/12 MMZ	10	mL
34289	Conc. Nitric Acid - Rec 07/18/12 MMZ	20	mL
31735	Metals Minerals Secondary - Rec'd 06/08/	0.55	mL
31734	Metals Trace2 Secondary - Rec'd 06/08/12	0.11	mL
31733	Metals Trace Secondary - Rec'd 6/08/12	0.11	mL
29998	Mercury ICV Int	0.08	mL
18040	Uranium Secondary Standard - Rec 10/26/2	0.022	mL
1295	Silicon Secondary Stock Standard - Rec 0	0.99	mL
1287	Phosphorus Secondary Standard - Rec 2/4/	1.078	mL
995	DI WATER	166.994	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #39694, ICPMS Mineral Cal. Int

WORKING STANDARD

Created By: DS1
Created: 10/03/2012 13:05
Expires: 03/15/2013

Volume of Standard: 100 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: M Cal Int

Notes: ICPMS Mineral Cal. Int

Compound Name and Concentration for Standard #39694

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Iron	500000 ug/L
Nitric Acid	ug/L	Potassium	500000 ug/L
Aluminum	500000 ug/L	Magnesium	500000 ug/L
Calcium	500000 ug/L	Sodium	500000 ug/L

Composed of Information for Standard #39694

Composed of Standard Seq	Notes	Volume	Units
34289	Conc. Nitric Acid - Rec 07/18/12 MMZ	3	mL
26667	Metals Mineral Primary Standard, Rec 03/	50	mL
995	DI WATER	47	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #39695, ICPMS Trace Cal Int

WORKING STANDARD

Created By: DS1
Created: 10/03/2012 13:12
Expires: 03/15/2013

Volume of Standard: 200 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: T Cal Int

Notes: ICPMS Trace Cal Int

Compound Name and Concentration for Standard #39695

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Strontium	1250 ug/L
Phosphorus	62500 ug/L	Thallium	1250 ug/L
Hydrochloric Acid	ug/L	Vanadium	1250 ug/L
Arsenic	1250 ug/L	Zinc	1250 ug/L
Barium	1250 ug/L	Silicon	62500 ug/L
Beryllium	1250 ug/L	Boron	1250 ug/L
Cadmium	1250 ug/L	Molybdenum	1250 ug/L
Cobalt	1250 ug/L	Antimony	1250 ug/L
Chromium	1250 ug/L	Tin	1250 ug/L
Copper	1250 ug/L	Zirconium	1250 ug/L
Lithium	1250 ug/L	Silver	625 ug/L
Manganese	1250 ug/L	Titanium	1250 ug/L
Nickel	1250 ug/L	Uranium	1250 ug/L
Lead	1250 ug/L	Nitric Acid	ug/L
Selenium	1250 ug/L		

Composed of Information for Standard #39695

Composed of Standard Seq	Notes	Volume	Units
34308	Conc. HCL - Rec 07/18/12 MMZ	10	mL
34289	Conc. Nitric Acid - Rec 07/18/12 MMZ	20	mL
30949	Silicon Primary Standard - Rec 05/25/12	11.25	mL
30948	Uranium Stock STandard - Rec'd 5/25/12,	0.25	mL
26666	Metals Trace2 Primary Standard - Rec'd 3	2.5	mL
26665	Metals Trace Primary Standard - Rec'd 3/	2.5	mL
7079	Phosphorus Primary Standard - Rec 5/12/1	1.225	mL
995	DI WATER	152.275	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #39698, 6020 ICSA

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WORKING STANDARD

Created By: DS1
Created: 10/03/2012 13:33
Expires: 02/14/2013

Volume of Standard: 100 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: 6020-ICSA

Notes: 6020 ICSA

Compound Name and Concentration for Standard #39698

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Molybdenum	1000 ug/L
Hydrochloric Acid	ug/L	Titanium	1000 ug/L
Sodium	50000 ug/L	Phosphorus	50000 ug/L
Magnesium	50000 ug/L	Sulfur	50000 ug/L
Aluminum	50000 ug/L	Chloride	360000 ug/L
Potassium	50000 ug/L	Carbon	100000 ug/L
Calcium	50000 ug/L	Nitric Acid	ug/L
Iron	50000 ug/L		

Composed of Information for Standard #39698

Composed of Standard Seq	Notes	Volume	Units
34308	Conc. HCL - Rec 07/18/12 MMZ	5	mL
34289	Conc. Nitric Acid - Rec 07/18/12 MMZ	10	mL
24685	ICSA, ICSAB Stock Standard - Rec 08/04/1	10	mL
995	DI WATER	75	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #39699, 6020 ICSAB

Pace Analytical®
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WORKING STANDARD

Created By: DS1
Created: 10/03/2012 13:33
Expires: 02/14/2013

Volume of Standard: 100 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: 6020-ICSAB

Notes: 6020 ICSAB

Compound Name and Concentration for Standard #39699

Compound Name	Concentration	Compound Name	Concentration
Water	ug/mL	Cobalt	.1 ug/mL
Hydrochloric Acid	ug/mL	Chromium	.1 ug/mL
Sodium	50 ug/mL	Copper	.1 ug/mL
Magnesium	50 ug/mL	Lithium	.1 ug/mL
Aluminum	50 ug/mL	Manganese	.1 ug/mL
Potassium	50 ug/mL	Nickel	.1 ug/mL
Calcium	50 ug/mL	Lead	.1 ug/mL
Iron	50 ug/mL	Selenium	.1 ug/mL
Molybdenum	1.1 ug/mL	Strontium	.1 ug/mL
Titanium	1.1 ug/mL	Thallium	.1 ug/mL
Phosphorus	55 ug/mL	Vanadium	.1 ug/mL
Sulfur	50 ug/mL	Zinc	.1 ug/mL
Chloride	360 ug/mL	Silicon	5 ug/mL
Carbon	100 ug/mL	Boron	.1 ug/mL
Nitric Acid	ug/mL	Antimony	.1 ug/mL
Mercury	.005 ug/mL	Tin	.1 ug/mL
Arsenic	.1 ug/mL	Zirconium	.1 ug/mL
Barium	.1 ug/mL	Silver	.05 ug/mL
Beryllium	.1 ug/mL	Uranium	.1 ug/mL
Cadmium	.1 ug/mL		

Composed of Information for Standard #39699

Composed of Standard Seq	Notes	Volume	Units
39695	ICPMS Trace Cal Int	8	mL
36242	Hg Calibration Intermediate	0.5	mL
34308	Conc. HCL - Rec 07/18/12 MMZ	5	mL
34289	Conc. Nitric Acid - Rec 07/18/12 MMZ	10	mL
24685	ICSA, ICSAB Stock Standard - Rec 08/04/1	10	mL
995	DI WATER	66.5	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #39700, ICPMS Biota Spike **Made 05/04/2012**

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WORKING STANDARD

Created By: DS1 **Volume of Standard:** 100 mL **Lot ID:** NA

Created: 10/03/2012 13:44 **Manufacturer:** N/A **Part ID:** N/A

Expires: 12/01/2012 **Manufacturer Lot ID:** N/A **Standard ID:** 6000-SPKB

Notes: ICPMS Biota Spike Made 05/04/2012 MMZ

Compound Name and Concentration for Standard #39700

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Cobalt	10000 ug/L
Phosphorus	1000000 ug/L	Chromium	10000 ug/L
Aluminum	500000 ug/L	Copper	10000 ug/L
Calcium	500000 ug/L	Lithium	10000 ug/L
Iron	500000 ug/L	Manganese	10000 ug/L
Potassium	2000000 ug/L	Nickel	10000 ug/L
Magnesium	500000 ug/L	Lead	10000 ug/L
Sodium	500000 ug/L	Selenium	10000 ug/L
Uranium	10000 ug/L	Strontium	10000 ug/L
Mercury	250 ug/L	Thallium	10000 ug/L
Arsenic	10000 ug/L	Vanadium	10000 ug/L
Barium	10000 ug/L	Zinc	10000 ug/L
Beryllium	10000 ug/L	Nitric Acid	ug/L
Cadmium	10000 ug/L		

Composed of Information for Standard #39700

Composed of Standard Seq	Notes	Volume	Units
31735	Metals Minerals Secondary - Rec'd 06/08/	25	mL
31733	Metals Trace Secondary - Rec'd 6/08/12	5	mL
29588	Potassium Stock Standard - Rec 01/21/11,	15	mL
22391	Conc. Nitric Acid - Rec 06/10/11	6	mL
19251	Rec 11/15/11, Opened 11/17/11	0.025	mL
18040	Uranium Secondary Standard - Rec 10/26/2	1	mL
5659	Phosphorus Secondary Standard - Rec 03/0	9.9	mL
995	DI WATER	38.075	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #39995, ICPMS Internal Standard Solution

Pace Analytical®
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WORKING STANDARD

Created By: DS1
Created: 10/08/2012 14:11
Expires: 03/01/2013

Volume of Standard: 2000 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: ICPM-IS

Notes: ICPMS Internal Standard Solution

Compound Name and Concentration for Standard #39995

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Indium	100 ug/L
Hydrochloric Acid	ug/L	Terbium	100 ug/L
Scandium	100 ug/L	Yttrium	100 ug/L
Bismuth	100 ug/L	Nitric Acid	ug/L
Germanium	100 ug/L	Gold	2000 ug/L

Composed of Information for Standard #39995

Composed of Standard Seq	Notes	Volume	Units
37851	Gold Primary Standard - Rec 09/04/12	4	mL
34308	Conc. HCL - Rec 07/18/12 MMZ	100	mL
34289	Conc. Nitric Acid - Rec 07/18/12 MMZ	200	mL
24684	ICPMS Internal Standard Stock - Rec 03/0	2	mL
24682	Scandium Primary Standard - Rec 03/16/11	2	mL
995	DI WATER	1692	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #39996, 6020-CAL0 ICPM

Pace Analytical®
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WORKING STANDARD

Created By: DS1
Created: 10/08/2012 14:11
Expires: 10/11/2012

Volume of Standard: 150 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: 6020-CAL0

Notes: 6020-CAL0 ICPM

Compound Name and Concentration for Standard #39996

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Lithium	0 ug/L
Mercury	0 ug/L	Manganese	0 ug/L
Nitric Acid	ug/L	Nickel	0 ug/L
Aluminum	0 ug/L	Lead	0 ug/L
Calcium	0 ug/L	Selenium	0 ug/L
Iron	0 ug/L	Strontium	0 ug/L
Potassium	0 ug/L	Thallium	0 ug/L
Magnesium	0 ug/L	Vanadium	0 ug/L
Sodium	0 ug/L	Zinc	0 ug/L
Phosphorus	0 ug/L	Silicon	0 ug/L
Hydrochloric Acid	ug/L	Boron	0 ug/L
Arsenic	0 ug/L	Molybdenum	0 ug/L
Barium	0 ug/L	Antimony	0 ug/L
Beryllium	0 ug/L	Tin	0 ug/L
Cadmium	0 ug/L	Zirconium	0 ug/L
Cobalt	0 ug/L	Silver	0 ug/L
Chromium	0 ug/L	Titanium	0 ug/L
Copper	0 ug/L	Uranium	0 ug/L

Composed of Information for Standard #39996

Composed of Standard Seq	Notes	Volume	Units
39695	ICPMS Trace Cal Int	0	mL
39694	ICPMS Mineral Cal. Int	0	mL
36242	Hg Calibration Intermediate	0	mL
34289	Conc. Nitric Acid - Rec 07/18/12 MMZ	15	mL
22392	Conc. HCL - Rec 06/10/11	7.5	mL
995	DI WATER	127.5	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #39997, 6020-CAL1 ICPM

Pace Analytical®
www.pacelabs.com

WORKING STANDARD

Created By: DS1
Created: 10/08/2012 14:11
Expires: 10/11/2012

Volume of Standard: 50 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: 6020-CAL1

Notes: 6020-CAL1 ICPM

Compound Name and Concentration for Standard #39997

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Lithium	1 ug/L
Mercury	.2 ug/L	Manganese	1 ug/L
Nitric Acid	ug/L	Nickel	1 ug/L
Aluminum	250 ug/L	Lead	1 ug/L
Calcium	250 ug/L	Selenium	1 ug/L
Iron	250 ug/L	Strontium	1 ug/L
Potassium	250 ug/L	Thallium	1 ug/L
Magnesium	250 ug/L	Vanadium	1 ug/L
Sodium	250 ug/L	Zinc	1 ug/L
Phosphorus	50 ug/L	Silicon	50 ug/L
Hydrochloric Acid	ug/L	Boron	1 ug/L
Arsenic	1 ug/L	Molybdenum	1 ug/L
Barium	1 ug/L	Antimony	1 ug/L
Beryllium	1 ug/L	Tin	1 ug/L
Cadmium	1 ug/L	Zirconium	1 ug/L
Cobalt	1 ug/L	Silver	.5 ug/L
Chromium	1 ug/L	Titanium	1 ug/L
Copper	1 ug/L	Uranium	1 ug/L

Composed of Information for Standard #39997

Composed of Standard Seq	Notes	Volume	Units
39695	ICPMS Trace Cal Int	0.04	mL
39694	ICPMS Mineral Cal. Int	0.025	mL
36242	Hg Calibration Intermediate	0.01	mL
34289	Conc. Nitric Acid - Rec 07/18/12 MMZ	5	mL
22392	Conc. HCL - Rec 06/10/11	2.5	mL
995	DI WATER	42.425	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #39998, 6020-CAL2 ICPM

WORKING STANDARD

Created By: DS1
Created: 10/08/2012 14:11
Expires: 10/11/2012

Volume of Standard: 50 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: 6020-CAL2

Notes: 6020-CAL2 ICPM

Compound Name and Concentration for Standard #39998

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Lithium	5 ug/L
Mercury	.5 ug/L	Manganese	5 ug/L
Nitric Acid	ug/L	Nickel	5 ug/L
Aluminum	500 ug/L	Lead	5 ug/L
Calcium	500 ug/L	Selenium	5 ug/L
Iron	500 ug/L	Strontium	5 ug/L
Potassium	500 ug/L	Thallium	5 ug/L
Magnesium	500 ug/L	Vanadium	5 ug/L
Sodium	500 ug/L	Zinc	5 ug/L
Phosphorus	250 ug/L	Silicon	250 ug/L
Hydrochloric Acid	ug/L	Boron	5 ug/L
Arsenic	5 ug/L	Molybdenum	5 ug/L
Barium	5 ug/L	Antimony	5 ug/L
Beryllium	5 ug/L	Tin	5 ug/L
Cadmium	5 ug/L	Zirconium	5 ug/L
Cobalt	5 ug/L	Silver	2.5 ug/L
Chromium	5 ug/L	Titanium	5 ug/L
Copper	5 ug/L	Uranium	5 ug/L

Composed of Information for Standard #39998

Composed of Standard Seq	Notes	Volume	Units
39695	ICPMS Trace Cal Int	0.2	mL
39694	ICPMS Mineral Cal. Int	0.05	mL
36242	Hg Calibration Intermediate	0.025	mL
34289	Conc. Nitric Acid - Rec 07/18/12 MMZ	5	mL
22392	Conc. HCL - Rec 06/10/11	2.5	mL
995	DI WATER	42.225	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #39999, 6020-CAL3 ICPM

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www.pacelabs.com

WORKING STANDARD

Created By: DS1
Created: 10/08/2012 14:11
Expires: 10/11/2012

Volume of Standard: 50 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: 6020-CAL3

Notes: 6020-CAL3 ICPM

Compound Name and Concentration for Standard #39999

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Lithium	50 ug/L
Mercury	1 ug/L	Manganese	50 ug/L
Nitric Acid	ug/L	Nickel	50 ug/L
Aluminum	2500 ug/L	Lead	50 ug/L
Calcium	2500 ug/L	Selenium	50 ug/L
Iron	2500 ug/L	Strontium	50 ug/L
Potassium	2500 ug/L	Thallium	50 ug/L
Magnesium	2500 ug/L	Vanadium	50 ug/L
Sodium	2500 ug/L	Zinc	50 ug/L
Phosphorus	2500 ug/L	Silicon	2500 ug/L
Hydrochloric Acid	ug/L	Boron	50 ug/L
Arsenic	50 ug/L	Molybdenum	50 ug/L
Barium	50 ug/L	Antimony	50 ug/L
Beryllium	50 ug/L	Tin	50 ug/L
Cadmium	50 ug/L	Zirconium	50 ug/L
Cobalt	50 ug/L	Silver	25 ug/L
Chromium	50 ug/L	Titanium	50 ug/L
Copper	50 ug/L	Uranium	50 ug/L

Composed of Information for Standard #39999

Composed of Standard Seq	Notes	Volume	Units
39695	ICPMS Trace Cal Int	2	mL
39694	ICPMS Mineral Cal. Int	0.25	mL
36242	Hg Calibration Intermediate	0.05	mL
34289	Conc. Nitric Acid - Rec 07/18/12 MMZ	5	mL
22392	Conc. HCL - Rec 06/10/11	2.5	mL
995	DI WATER	40.2	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #40000, 6020-CAL4 ICPM

Pace Analytical®
www.pacelabs.com

WORKING STANDARD

Created By: DS1
Created: 10/08/2012 14:11
Expires: 10/11/2012

Volume of Standard: 50 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: 6020-CAL4

Notes: 6020-CAL4 ICPM

Compound Name and Concentration for Standard #40000

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Lithium	250 ug/L
Mercury	10 ug/L	Manganese	250 ug/L
Nitric Acid	ug/L	Nickel	250 ug/L
Aluminum	12500 ug/L	Lead	250 ug/L
Calcium	12500 ug/L	Selenium	250 ug/L
Iron	12500 ug/L	Strontium	250 ug/L
Potassium	12500 ug/L	Thallium	250 ug/L
Magnesium	12500 ug/L	Vanadium	250 ug/L
Sodium	12500 ug/L	Zinc	250 ug/L
Phosphorus	12500 ug/L	Silicon	12500 ug/L
Hydrochloric Acid	ug/L	Boron	250 ug/L
Arsenic	250 ug/L	Molybdenum	250 ug/L
Barium	250 ug/L	Antimony	250 ug/L
Beryllium	250 ug/L	Tin	250 ug/L
Cadmium	250 ug/L	Zirconium	250 ug/L
Cobalt	250 ug/L	Silver	125 ug/L
Chromium	250 ug/L	Titanium	250 ug/L
Copper	250 ug/L	Uranium	250 ug/L

Composed of Information for Standard #40000

Composed of Standard Seq	Notes	Volume	Units
39695	ICPMS Trace Cal Int	10	mL
39694	ICPMS Mineral Cal. Int	1.25	mL
36242	Hg Calibration Intermediate	0.5	mL
34289	Conc. Nitric Acid - Rec 07/18/12 MMZ	5	mL
22392	Conc. HCL - Rec 06/10/11	2.5	mL
995	DI WATER	30.75	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #40001, 6020-CAL5 ICPM

WORKING STANDARD

Created By: DS1
Created: 10/08/2012 14:11
Expires: 10/11/2012

Volume of Standard: 50 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: 6020-CAL5

Notes: 6020-CAL5 ICPM

Compound Name and Concentration for Standard #40001

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Lithium	500 ug/L
Mercury	25 ug/L	Manganese	500 ug/L
Nitric Acid	ug/L	Nickel	500 ug/L
Aluminum	25000 ug/L	Lead	500 ug/L
Calcium	25000 ug/L	Selenium	500 ug/L
Iron	25000 ug/L	Strontium	500 ug/L
Potassium	25000 ug/L	Thallium	500 ug/L
Magnesium	25000 ug/L	Vanadium	500 ug/L
Sodium	25000 ug/L	Zinc	500 ug/L
Phosphorus	25000 ug/L	Silicon	25000 ug/L
Hydrochloric Acid	ug/L	Boron	500 ug/L
Arsenic	500 ug/L	Molybdenum	500 ug/L
Barium	500 ug/L	Antimony	500 ug/L
Beryllium	500 ug/L	Tin	500 ug/L
Cadmium	500 ug/L	Zirconium	500 ug/L
Cobalt	500 ug/L	Silver	250 ug/L
Chromium	500 ug/L	Titanium	500 ug/L
Copper	500 ug/L	Uranium	500 ug/L

Composed of Information for Standard #40001

Composed of Standard Seq	Notes	Volume	Units
39695	ICPMS Trace Cal Int	20	mL
39694	ICPMS Mineral Cal. Int	2.5	mL
36242	Hg Calibration Intermediate	1.25	mL
34289	Conc. Nitric Acid - Rec 07/18/12 MMZ	5	mL
22392	Conc. HCL - Rec 06/10/11	2.5	mL
995	DI WATER	18.75	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #40002, 6020-CCV ICPM

WORKING STANDARD

Created By: DS1
Created: 10/08/2012 14:11
Expires: 10/11/2012

Volume of Standard: 100 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: 6020-CCV

Notes: 6020-CCV ICPM

Compound Name and Concentration for Standard #40002

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Lithium	100 ug/L
Mercury	5 ug/L	Manganese	100 ug/L
Nitric Acid	ug/L	Nickel	100 ug/L
Aluminum	5000 ug/L	Lead	100 ug/L
Calcium	5000 ug/L	Selenium	100 ug/L
Iron	5000 ug/L	Strontium	100 ug/L
Potassium	5000 ug/L	Thallium	100 ug/L
Magnesium	5000 ug/L	Vanadium	100 ug/L
Sodium	5000 ug/L	Zinc	100 ug/L
Phosphorus	5000 ug/L	Silicon	5000 ug/L
Hydrochloric Acid	ug/L	Boron	100 ug/L
Arsenic	100 ug/L	Molybdenum	100 ug/L
Barium	100 ug/L	Antimony	100 ug/L
Beryllium	100 ug/L	Tin	100 ug/L
Cadmium	100 ug/L	Zirconium	100 ug/L
Cobalt	100 ug/L	Silver	50 ug/L
Chromium	100 ug/L	Titanium	100 ug/L
Copper	100 ug/L	Uranium	100 ug/L

Composed of Information for Standard #40002

Composed of Standard Seq	Notes	Volume	Units
39695	ICPMS Trace Cal Int	8	mL
39694	ICPMS Mineral Cal. Int	1	mL
36242	Hg Calibration Intermediate	0.5	mL
34289	Conc. Nitric Acid - Rec 07/18/12 MMZ	10	mL
22392	Conc. HCL - Rec 06/10/11	5	mL
995	DI WATER	75.5	mL

Metals Data Package Cover Sheet

Client: AECOM, INC. - NY
Project: DZUS FASTENERS LAKE CAPRI FISH
SDG: 4067365

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1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

SAMPLE SUMMARY

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067365

Lab ID	Sample ID	Matrix	Date Collected	Date Received
4067365001	**DF-S-LB-01**	Tissue	09/17/12 00:00	09/20/12 10:10
4067365002	**DF-S-LB-02**	Tissue	09/18/12 00:00	09/20/12 10:10
4067365003	**DF-S-LB-03**	Tissue	09/18/12 00:00	09/20/12 10:10
4067365004	**DF-N-SF-01**	Tissue	09/18/12 00:00	09/20/12 10:10
4067365005	**DF-S-BG-18**	Tissue	09/19/12 00:00	09/20/12 10:10
4067365006	**DF-S-BG-19**	Tissue	09/19/12 00:00	09/20/12 10:10
4067365007	**DF-S-BG-20**	Tissue	09/19/12 00:00	09/20/12 10:10

REPORT OF LABORATORY ANALYSIS

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CASE NARRATIVE - METALS ANALYSIS

Lab Report Number (SDG): 4067365
Client: AECOM, Inc.
Project Name: DZUS FASTENERS LAKE CAPRI FISH
Project Number: N/A

1. RECEIPT

The samples were received on ice at 4°C.

2. HOLDING TIMES

A. **Sample Preparation:** All recommended holding times were met.
B. **Sample Analysis:** All recommended holding times were met.

3. METHOD

A. **Preparation:** SW846 3050B
B. **Analysis:** SW846 6020

4. PREPARATION

Sample preparation proceeded normally.

5. ANALYSIS

A. **Calibration:**
   1. **Initial verification:** All method acceptance criteria were met.
   2. **Continuing verification:** All method acceptance criteria were met.
B. **Blanks:**
   1. **Initial calibration:** All method acceptance criteria were met.
   2. **Continuing calibration:** All method acceptance criteria were met.
   3. **Method:** All method acceptance criteria were met.
   4. **Chicken:** A chicken blank is prepared and analyzed with each sample batch to determine the background contamination levels of the chicken used for the laboratory control spike (LCS). The chicken blank is analyzed down to the laboratory MDL.
C. **Spikes:**
   1. **Lab Control Spike (LCS):** All in-house accuracy criteria were met.
   2. **SRM:** A Standard Reference Material was analyzed with this analytical batch. The in-house accuracy criteria were met.
   3. **Matrix Spike / Duplicate (MS/MSD):** A batch MS/MSD (4067620001) was analyzed with this SDG. The in-house accuracy and precision criteria were met.
D. **Sample Duplicates:** None required for this SDG.
E. **ICP-MS Interference Check Samples:** All method acceptance criteria were met.
F. **ICP-MS Serial Dilution:** None required for this SDG.
G. **Samples:** Sample analyses proceeded normally.
H. **Dilutions:** None required for this SDG.
I. **Reanalysis:** None required for this SDG.
J. **Comments:** No additional comments are needed.

I certify that this data package is in compliance with the terms and conditions agreed to by **Pace Analytical Services, Inc.**, and by the client, both technically and for completeness, except for the conditions detailed above. The Laboratory Manager or his designee, as verified by the following signature, has authorized release of the data contained in this hard copy data package:

Signed: Leigh A Begalske Date: 10/11/12

Name: Leigh A. Begalske Position: Quality Assurance Auditor

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SAMPLE ANALYTE COUNT

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067365

Lab ID	Sample ID	Method	Analysts	Analytes Reported
4067365001	DF-S-LB-01	EPA 6020	DS1	1
4067365002	DF-S-LB-02	EPA 6020	DS1	1
4067365003	DF-S-LB-03	EPA 6020	DS1	1
4067365004	DF-N-SF-01	EPA 6020	DS1	1
4067365005	DF-S-BG-18	EPA 6020	DS1	1
4067365006	DF-S-BG-19	EPA 6020	DS1	1
4067365007	DF-S-BG-20	EPA 6020	DS1	1

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067365

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PRL - Pace Reporting Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

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CERTIFICATIONS

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067365

Green Bay Certification IDs
1241 Bellevue Street, Green Bay, WI 54302
Florida/NELAP Certification #: E87948
Illinois Certification #: 200050
Kentucky Certification #: 82
Louisiana Certification #: 04168
Minnesota Certification #: 055-999-334
New York Certification #: 11888
North Carolina Certification #: 503
North Dakota Certification #: R-150
South Carolina Certification #: 83006001
US Dept of Agriculture #: S-76505
Wisconsin Certification #: 405132750

REPORT OF LABORATORY ANALYSIS

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Appendix B. Sample Chain of Custody Form

CHAIN OF CUSTODY

4067365

I, John Rolling, of AECOM - 20 Exchange Pl N.Y N.Y have collected the following
(Print Name) (Print Address)

on SEPT 16, 2012 from SEPT 19 in the vicinity of LAKE CAPRI
(Date)

Town of W. Islip, Suffolk County.

Item(s): FISH Samples (SEE ATTACHED APPENDIX B)

I have assigned the identification number(s) SEE APPENDIX A to these samples, and have recorded pertinent data on the attached collection records. The samples were handled according to sampling protocols provided to me prior to collection. I placed the samples in the custody of FED EX (TO BE SHIPPED TO PACE LABS IN GREEN BAY, WI. on SEPT 19, 2012.

I, Eric Heling, of Pace Green Bay have received the above mentioned sample(s) on the date specified for the purpose of _____. The sample(s) remained in my custody until subsequently transferred, prepared or shipped at times and dates as attested to below.

Signed Eric Heling Date 9/20/12

SECOND RECIPIENT (Print Name)	TIME & DATE	PURPOSE OF TRANSFER
SIGNATURE	AFFILIATION	
THIRD RECIPIENT (Print Name)	TIME & DATE	PURPOSE OF TRANSFER
SIGNATURE	AFFILIATION	
FOURTH RECIPIENT (Print Name)	TIME & DATE	PURPOSE OF TRANSFER
SIGNATURE	AFFILIATION	
RECEIVED IN LABORATORY BY (Print Name)	TIME & DATE	
SIGNATURE	AFFILIATION	

NOTICE OF WARRANTY

By signature to the chain of custody (reverse), the signator warrants that the information provided is truthful and accurate to the best of his/her ability.

4067365

Appendix A. Sample Collection Record

BIOTA COLLECTION RECORD

Project name, location and waterbody: DZUS FASTENERS, W. ISLIP NY

Collections made by (names): J. Rollino, M. Smith

Preservation method: ☐ Freezing; ☐ Other (specify) ICE

Lab Use only Lab Number	Sample or Tag number	Species	Date Taken	Sampling Location	Method of Collection	Length (mm)	Weight (grams)	Remarks
	Blue gill	S-BG-14	9/18	South	NET/TRAP		231	F
		S-BG-15					131	WB
		S-BG-16					150	WB
		S-BG-17					63	WB
			9/19				85	WB
		N-BG-01	9/17	NORTH	TRAP	3.0-6	0.5-7	46 INDIVIDUALS WB
		N-BG-02	9/17			5.0-7	61-5	63 INDIVIDUALS
		N-BG-03	9/18		TRAP	18.4	120	WB
		N-BG-04				17.9	104	WB
		N-BG-05				21	235	F
	RED BROAD SUNFISH	S-RB-01	9/16	SOUTH	BAIT LINE	21	227	F
	AMERICAN EEL	N-AE-01	9/18	NORTH	TRAP	67	697	F
001	LARGEMOUTH BASS	S-LB-01	9/17	South	NET	20.5	103	WB

NOTES - SEE Pg 2

Page 3 of 4

Rel: FedEx 9/20/12 1010 , Rec: E Hetrny PaceGB 9/20/12 1010

Temp: 4°C

4067365

Appendix A. Sample Collection Record

BIOTA COLLECTION RECORD

Project name, location and waterbody: DZUS FASTNERS, WEST ISLIP, NY LAKE CAPRI

Collections made by (names): J. Rollino, M. Smith

Preservation method: ☐ Freezing; ☐ Other (specify) ICE

Lab Use only Lab Number	Sample or Tag number	Species	Date Taken	Sampling Location	Method of Collection	Length (mm)	Weight (grams)	Remarks
002	S-LB-02	LARGEMOUTH BASS	9/18	SOUTH	NET	44.1	1,032	F
003	S-LB-03	↓	9/16-9/18	↓	NET	18.4	14	WB
	↓	↓	↓	↓	↓	10.0	11	↓
						9.9	11	
						9.9	11	
						9.0	10	
						8.5	7	
004	N-SF-01	Bluegill, P. sun, Sunfish	9/17-9/20	NORTH	TRAP	4.0-7.0	<1-5	50 INDIVIDUALS WB
003	S-LB-03	LARGEMOUTH BASS	9/17	SOUTH	TRAP	9.5	9	WB
005	S-BG-18	Bluegill	9/19			24	392	F
006	S-BG-19	↓	↓	↓	↓	22.5	244	F
007	S-BG-20					19.9	165	WB

NOTES - SEE Pg 1

Page 4 of 9

Rel: FedEx 9/20/12 1010 , Rec: E Nelling PaceGB 9/20/12 1010

Temp: 4°C

Pace Analytical Services, Inc.
1241 Bellevue Street, Suite 9
Green Bay, WI 54302

Pace Analytical

Sample Condition Upon Receipt

Client Name: AECOM Project # 4067365

Courier: ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Tracking #: 8007 1286 0322

Custody Seal on Cooler/Box Present: ☑ yes ☐ no Seals intact: ☑ yes ☐ no

Custody Seal on Samples Present: ☐ yes ☑ no Seals intact: ☐ yes ☐ no

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☑ None Other

Thermometer Used SR49 **Type of Ice:** (Wet) Blue Dry None ☑ Samples on ice, cooling process has begun.

Cooler Temperature 4°C **Biological Tissue is Frozen:** ☐ yes ☑ no

Temp Blank Present: ☐ yes ☑ no

Optional
Proj. Due Date:
Proj. Name:

Person examining contents:
Date: 9/20/12
Initials: EMH

Temp should be above freezing to 6°C for all sample except Biota.
Biota Samples should be received ≤ 0°C.

		Comments:
Chain of Custody Present:	☑Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☐Yes ☑No ☐N/A	2. No invoice, phone#, State, times EMH 9/20/12
Chain of Custody Relinquished:	☐Yes ☑No ☐N/A	3. Not present EMH 9/20/12
Sampler Name & Signature on COC:	☑Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☑Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes ☑No ☐N/A	6.
Rush Turn Around Time Requested:	☐Yes ☑No ☐N/A	7.
Sufficient Volume:	☑Yes ☐No ☐N/A	8.
Correct Containers Used:	☑Yes ☐No ☐N/A	9.
-Pace Containers Used:	☐Yes ☑No ☐N/A	
Containers Intact:	☑Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☑N/A	11.
Sample Labels match COC: -Includes date/time/ID/Analysis Matrix: B	☐Yes ☑No ☐N/A	12. 003 S-LB-03 listed on COC twice EMH 9/20/12
All containers needing preservation have been checked.	☐Yes ☐No ☑N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☐Yes ☐No ☑N/A	Initial when completed / Lot # of added preservative
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	☐Yes ☐No	
Samples checked for dechlorination:	☐Yes ☐No ☑N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☑N/A	15.
Trip Blank Present:	☐Yes ☐No ☑N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☑N/A	
Pace Trip Blank Lot # (if purchased):		

Field Data Required? Y / N

Client Notification/ Resolution:
Person Contacted: _____ Date/Time: _____
Comments/ Resolution: _____

Project Manager Review: CH for TL **Date:** 9/20/12

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

F-GB-C-031-Rev.00 (29Sept2011) SCUR Form

Metals Sample Data Cover Sheet

Client: AECOM, INC. - NY
Project: DZUS FASTENERS LAKE CAPRI FISH
SDG: 4067365

Pace Analytical Services, Inc.
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Green Bay, WI 54302
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ANALYTICAL RESULTS

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067365

Matrix: Tissue
% Moisture:
Acode: 6020 MET ICPMS
Prep/Method: EPA 3050B / EPA 6020

Sample: DF-S-LB-01 NY
Lab ID: 4067365001
Collected: 09/17/12 00:00
Received: 09/20/12 10:10

Results reported on a "wet-weight" basis

CAS No.	Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Qual
7440-43-9	Cadmium	**0.083J**	mg/kg	0.089	0.0094	1	10/05/12 08:00	10/09/12 03:37	

Date: 10/11/2012 03:53 PM

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ANALYTICAL RESULTS

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067365

Matrix: Tissue
% Moisture:
Acode: 6020 MET ICPMS
Prep/Method: EPA 3050B / EPA 6020

Sample: DF-S-LB-02 NY
Lab ID: 4067365002
Collected: 09/18/12 00:00
Received: 09/20/12 10:10

Results reported on a "wet-weight" basis

CAS No.	Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Qual
7440-43-9	Cadmium	**<0.0090**	mg/kg	0.085	0.0090	1	10/05/12 08:00	10/09/12 03:43	

Date: 10/11/2012 03:53 PM

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ANALYTICAL RESULTS

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067365

Matrix: Tissue
% Moisture:
Acode: 6020 MET ICPMS
Prep/Method: EPA 3050B / EPA 6020
Results reported on a "wet-weight" basis

Sample: DF-S-LB-03 NY
Lab ID: 4067365003
Collected: 09/18/12 00:00
Received: 09/20/12 10:10

CAS No.	Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Qual
7440-43-9	Cadmium	**0.17**	mg/kg	0.090	0.0094	1	10/05/12 08:00	10/09/12 03:48	

Date: 10/11/2012 03:53 PM

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ANALYTICAL RESULTS

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067365

Matrix: Tissue
% Moisture:
Acode: 6020 MET ICPMS
Prep/Method: EPA 3050B / EPA 6020

Sample: DF-N-SF-01 NY
Lab ID: 4067365004
Collected: 09/18/12 00:00
Received: 09/20/12 10:10

Results reported on a "wet-weight" basis

CAS No.	Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Qual
7440-43-9	Cadmium	**0.11**	mg/kg	0.098	0.010	1	10/05/12 08:00	10/09/12 03:54	

Date: 10/11/2012 03:53 PM

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ANALYTICAL RESULTS

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067365

Matrix: Tissue
% Moisture:
Acode: 6020 MET ICPMS
Prep/Method: EPA 3050B / EPA 6020
Results reported on a "wet-weight" basis

Sample: DF-S-BG-18 NY
Lab ID: 4067365005
Collected: 09/19/12 00:00
Received: 09/20/12 10:10

CAS No.	Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Qual
7440-43-9	Cadmium	**0.027J**	mg/kg	0.091	0.0096	1	10/05/12 08:00	10/09/12 03:59	

Date: 10/11/2012 03:53 PM

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ANALYTICAL RESULTS

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067365

Matrix: Tissue
% Moisture:
Acode: 6020 MET ICPMS
Prep/Method: EPA 3050B / EPA 6020
Results reported on a "wet-weight" basis

Sample: DF-S-BG-19 NY
Lab ID: 4067365006
Collected: 09/19/12 00:00
Received: 09/20/12 10:10

CAS No.	Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Qual
7440-43-9	Cadmium	**<0.0097**	mg/kg	0.092	0.0097	1	10/05/12 08:00	10/09/12 04:05	

Date: 10/11/2012 03:53 PM

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ANALYTICAL RESULTS

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067365

Matrix: Tissue
% Moisture:
Acode: 6020 MET ICPMS
Prep/Method: EPA 3050B / EPA 6020

Sample: DF-S-BG-20 NY
Lab ID: 4067365007
Collected: 09/19/12 00:00
Received: 09/20/12 10:10

Results reported on a "wet-weight" basis

CAS No.	Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Qual
7440-43-9	Cadmium	**0.18**	mg/kg	0.095	0.010	1	10/05/12 08:00	10/09/12 04:11	

Date: 10/11/2012 03:53 PM

REPORT OF LABORATORY ANALYSIS

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Metals QC Summary Cover Sheet

Client: AECOM, INC. - NY
Project: DZUS FASTENERS LAKE CAPRI FISH
SDG: 4067365

Pace Analytical Services

Metals Data Reporting Form

Initial Calibration Verification Standard **SDG:** 4067365

Instrument: 40ICM2 **Units:** ug/L

Chart Number 1008212A.csv **Acceptable Range:** 90% - 110%

Standard Source: Metals Secondary **Standard ID** 39693

Element	WL/ Mass	True Conc	ICV 10/8/2012 6:49 PM									
			Found	% Rec	Found	% Rec	Found	% Rec	Found	% Rec	Found	% Rec
Cadmium	111	110.0	111.20	**101.1**								

Pace Analytical Services

Metals Data Reporting Form

Continuing Calibration Verification **SDG:** 4067365

Instrument: 40ICM2 **Units:** ug/L

Chart Number: 1008212A.csv **Acceptable Range** 90% - 110%

Standard Source Metals Primary **Standard ID:** 40002

Element	WL/ Mass	True Conc	CCV1 10/8/2012 7:23 PM		CCV6 10/9/2012 12:56 AM		CCV7 10/9/2012 2:03 AM		CCV8 10/9/2012 3:09 AM		CCV9 10/9/2012 4:16 AM	
			Found	% Rec	Found	% Rec	Found	% Rec	Found	% Rec	Found	% Rec
Cadmium	111	100.0	101.20	**101.2**	104.30	**104.3**	103.70	**103.7**	103.20	**103.2**	104.50	**104.5**

Pace Analytical Services

Metals Data Reporting Form

Initial Calibration Blank Results **SDG:** 4067365

Instrument: 40ICM2 **Units:** ug/L

Chart Number: 1008212A.csv

Standard Source Calibration Blank **Standard ID:** 39996

Element	WL/ Mass	Report Limit	ICB 10/8/2012 6:55 PM									
			Found	Q	Found	Q	Found	Q	Found	Q	Found	Q
Cadmium	111	1	**0.20**	**B**								

7.1

U Result is less than the IDL
B Result is between IDL and RL
S Detector saturated

Form 3 Equivalent

Pace Analytical Services

Metals Data Reporting Form

Continuing Calibration Blank Result **SDG:** 4067365

Instrument: 40ICM2 **Units:** ug/L

Chart Number: 1008212A.csv

Standard Source Calibration Blank **Standard ID:** 39996

Element	WL/ Mass	Report Limit	CCB1 10/8/2012 7:28 PM		CCB6 10/9/2012 1:01 AM		CCB7 10/9/2012 2:08 AM		CCB8 10/9/2012 3:15 AM		CCB9 10/9/2012 4:22 AM	
			Found	Q	Found	Q	Found	Q	Found	Q	Found	Q
Cadmium	111	1	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U

U Result is less than the IDL
B Result is between IDL and RL
S Detector saturated

Form 3 Equivalent

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METHOD BLANK RESULTS

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067365

QB Batch: MPRP/7575 **Prepared:** 10/05/12
Method(s): EPA 3050B / EPA 6020
Associated Lab Samples: 4067365001, 4067365002, 4067365003, 4067365004, 4067365005, 4067365006, 4067365007

CAS No.	Parameters	Results	Units	Reporting Limit	MDL	Analyzed	Qual
7440-43-9	Cadmium	<0.010	mg/kg	0.10	0.010	10/09/12	

Type	Sample	Matrix
BLANK	686605	Tissue

REPORT OF LABORATORY ANALYSIS

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Metals Data Reporting Form

Preparation Blank Results **SDG:** 4067365

Lab Sample ID: 686611 ①

Matrix: TISSUE **Units:** mg/kg **Prep Date:** 10/5/2012 **Prep Batch:** 3360

Weight: 0.5 **Volume:** 50 **Percent Moisture:** NA

Element	WL/ Mass	MDL	Report Limit	Conc	Q	DF	Instr	Anal Date	Anal Time
Cadmium	111	0.010	0.10	0.010	U	1	40ICM2	10/9/2012	1:40

① Chicken Blank
LAB 10/11/12

Comments:

7.1

U Result is less than the IDL
B Result is between IDL and RL

Form 3 Equivalent

Pace Analytical Services

Metals Data Reporting Form

Interference Check Standard A **SDG:** 4067365

Instrument: 40ICM2 **Units:** ug/L

Chart Number: 1008212A.csv **Acceptable Range** 80% - 120%

Standard Source In House **Standard ID:** 39698

Element	WL/ Mass	Reporting Limit	True Conc	ICSA1 10/8/2012 7:11 PM Found	Found	Found	Found	Found
Aluminum	27		50000	50860				
Antimony	121	2		0				
Arsenic	75	2		0				
Barium	137	2		1				
Beryllium	9	2		0				
Boron	10	40		2				
Cadmium	111	2		0				
Calcium	43		50000	52910				
Chromium	52	2		1				
Cobalt	59	2		1				
Copper	63	2		1				
Iron	54		50000	50770				
Lead	208	2		0				
Lithium	7	2		0				
Magnesium	25		50000	49760				
Manganese	55	2		0				
Mercury	201	0.4		0				
Molybdenum	95		1000	1047				
Nickel	60	2		1				
Potassium	39		50000	53500				
Selenium	78	2		0				
Silver	107	1		0				
Sodium	23		50000	48970				
Strontium	88	2		0				
Thallium	205	2		0				
Tin	118	20		0				
Titanium	47		1000	1018				
Uranium	238	2		0				
Vanadium	51	2		0				
Zinc	66	20		2				

7.1

U Result is less than the IDL
B Result is between IDL and RL
S Detector saturated

Form 4 Equivalent

Pace Analytical Services

Metals Data Reporting Form

Interference Check Standard AB **SDG:** 4067365

Instrument: 40ICM2 **Units:** ug/L

Chart Number: 1008212A.csv **Acceptable Range** 80% - 120%

Standard Source In House **Standard ID:** 39699

Element	WL/ Mass	True Conc	ICSAB1 10/8/2012 7:17 PM Found	% Rec	Found	% Rec	Found	% Rec	Found	% Rec	Found	% Rec
Aluminum	27	50000	50260.0	**100.5**								
Antimony	121	100	102.6	**102.6**								
Arsenic	75	100	102.8	**102.8**								
Barium	137	100	102.6	**102.6**								
Beryllium	9	100	97.2	**97.2**								
Boron	10	100	98.1	**98.1**								
Cadmium	111	100	101.7	**101.7**								
Calcium	43	50000	52660.0	**105.3**								
Chromium	52	100	100.5	**100.5**								
Cobalt	59	100	97.8	**97.8**								
Copper	63	100	96.3	**96.3**								
Iron	54	50000	50240.0	**100.5**								
Lead	208	100	101.4	**101.4**								
Lithium	7	100	99.4	**99.4**								
Magnesium	25	50000	49110.0	**98.2**								
Manganese	55	100	99.7	**99.7**								
Mercury	201	5	5.3	**105.9**								
Molybdenum	95	1100	1152.0	**104.7**								
Nickel	60	100	97.7	**97.7**								
Potassium	39	50000	53140.0	**106.3**								
Selenium	78	100	101.4	**101.4**								
Silver	107	50	47.8	**95.7**								
Sodium	23	50000	48620.0	**97.2**								
Strontium	88	100	104.4	**104.4**								
Thallium	205	100	103.1	**103.1**								
Tin	118	100	100.5	**100.5**								
Titanium	47	1100	1105.0	**100.5**								
Uranium	238	100	104.8	**104.8**								
Vanadium	51	100	100.6	**100.6**								
Zinc	66	100	105.1	**105.1**								

7.1

U Result is less than the IDL
B Result is between IDL and RL
R Spike recovery failed
NC Percent recovery was not calculated
S Detector saturated

Form 4 Equivalent

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MATRIX SPIKE SAMPLE RESULTS

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067365

QB Batch: MPRP/7575
Method(s): EPA 3050B / EPA 6020

MS Prepared: 10/05/12
MSD Prepared: 10/05/12

Analyte	Units	Sample Conc	Spike Conc MS	Spike Conc MSD	Result MS	Result MSD	Dilution MS	Dilution MSD	% Recovery MS	% Recovery MSD	QC Limits %Recovery	RPD	Max RPD	Analyzed Date MS	Analyzed Date MSD	Qualifier(s) MS	Qualifier(s) MSD
Cadmium	mg/kg	<0.010	19.8	20	21.1	21.2	1	1	106	106	75-125	0	20	10/09/12	10/09/12		

Type	Sample	Client Sample ID
MS	686613	4067620001
MSD	686614	4067620001

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LAB CONTROL SAMPLE RESULTS

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067365

QB Batch: MPRP/7575 **LCS Prepared:** 10/05/12
Method(s): EPA 3050B / EPA 6020 **LCSD Prepared:**

Analyte	LCS % Rec	LCSD % Rec	RPD	QC Limits % Rec	QC Limits RPD	Spike Conc	LCS Conc	LCSD Conc	Units	LCS Analyzed	LCSD Analyzed	LCS Qual	LCSD Qual
Cadmium	105			80-120		20	21.1		mg/kg	10/09/12			

Type	Sample
LCS	686606

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Metals Data Reporting Form

Laboratory Control Sample Results **SDG:** 4067365

Lab Sample ID: 686612 ①

Matrix: TISSUE **Units:** mg/kg **Prep Date:** 10/5/2012 **Prep Batch:** 3360

Weight: 0.5 **Volume:** 50 **Percent Moisture:** NA

Element	WL/ Mass	Spike Level	Conc	Percent Recovery	Q	Range	DF	Instr	Anal Date	Anal Time
Cadmium	111	26.7	28.1	105.4		80-120	1	40ICM2	10/9/2012	1:51

① SRM TORT-2 (#34855)
LAB 10/11/12

Comments:

7.1

U Result is less than the IDL
B Result is between IDL and RL

Form 7 Equivalent

Pace Analytical Services

Metals Data Reporting Form

Preparation Log **SDG:** 4067365

Preparation Batch: 3360 **Instrument:** 40ICM2 **Matrix:** TISSUE

Sample ID	Sample Type	Prep Date	Prep Method	Initial Weight (g)	Final Volume (ml)	% Moisture
4067365001	Sample	10/5/2012 8:00:00 AM	EPA 3050B	0.559	50	NA
4067365002	Sample	10/5/2012 8:00:00 AM	EPA 3050B	0.586	50	NA
4067365003	Sample	10/5/2012 8:00:00 AM	EPA 3050B	0.556	50	NA
4067365004	Sample	10/5/2012 8:00:00 AM	EPA 3050B	0.512	50	NA
4067365005	Sample	10/5/2012 8:00:00 AM	EPA 3050B	0.547	50	NA
4067365006	Sample	10/5/2012 8:00:00 AM	EPA 3050B	0.542	50	NA
4067365007	Sample	10/5/2012 8:00:00 AM	EPA 3050B	0.527	50	NA
686605	Preparation Blank	10/5/2012 8:00:00 AM	EPA 3050B	0.5	50	NA
686606	LCS	10/5/2012 8:00:00 AM	EPA 3050B	0.5	50	NA
686611	Sample	10/5/2012 8:00:00 AM	EPA 3050B	0.5	50	NA
686612	Sample	10/5/2012 8:00:00 AM	EPA 3050B	0.5	50	NA

Pace Analytical Services

Metals Data Reporting Form

Instrument Runlo **SDG:** 4067365

Instrument: 40ICM2 **Chart Number:** 1008212A.csv

Lab Sample Name	Client Sample Name	Analytical Method	Date of Analysi	Time of Analysi
CAL0 39996	CAL0 39996		10/8/2012	18:16
CAL1 39997	CAL1 39997		10/8/2012	18:21
CAL2 39998	CAL2 39998		10/8/2012	18:27
CAL3 39999	CAL3 39999		10/8/2012	18:33
CAL4 40000	CAL4 40000		10/8/2012	18:38
CAL5 40001	CAL5 40001		10/8/2012	18:44
ICV 39693	ICV 39693		10/8/2012	18:49
ICB 39996	ICB 39996		10/8/2012	18:55
39997	39997		10/8/2012	19:00
ZZZZZZ			10/8/2012	19:06
ICSA1 39698	ICSA1 39698		10/8/2012	19:11
ICSAB1 39699	ICSAB1 39699		10/8/2012	19:17
CCV1 40002	CCV1 40002		10/8/2012	19:23
CCB1 39996	CCB1 39996		10/8/2012	19:28
CCV6 40002	CCV6 40002		10/9/2012	0:56
CCB6 39996	CCB6 39996		10/9/2012	1:01
ZZZZZZ			10/9/2012	1:07
ZZZZZZ			10/9/2012	1:12
ZZZZZZ			10/9/2012	1:18
ZZZZZZ			10/9/2012	1:24
ZZZZZZ			10/9/2012	1:29
686605	BLANK for HBN 111580 [	EPA 6020	10/9/2012	1:35
686611	SBLK for HBN 111580 [M	EPA 6020	10/9/2012	1:40
686606	LCS for HBN 111580 [MP	EPA 6020	10/9/2012	1:46
686612	SRM for HBN 111580 [M	EPA 6020	10/9/2012	1:51
ZZZZZZ			10/9/2012	1:57
CCV7 40002	CCV7 40002		10/9/2012	2:03
CCB7 39996	CCB7 39996		10/9/2012	2:08
ZZZZZZ			10/9/2012	2:14
ZZZZZZ			10/9/2012	2:19
ZZZZZZ			10/9/2012	2:25
ZZZZZZ			10/9/2012	2:30
ZZZZZZ			10/9/2012	2:36
ZZZZZZ			10/9/2012	2:41
ZZZZZZ			10/9/2012	2:47
ZZZZZZ			10/9/2012	2:53
ZZZZZZ			10/9/2012	2:58
ZZZZZZ			10/9/2012	3:04
CCV8 40002	CCV8 40002		10/9/2012	3:09

Pace Analytical Services

Metals Data Reporting Form

Instrument Runlo **SDG:** 4067365

Instrument: 40ICM2 **Chart Number:** 1008212A.csv

Lab Sample Name	Client Sample Name	Analytical Method	Date of Analysi	Time of Analysi
CCB8 39996	CCB8 39996		10/9/2012	3:15
ZZZZZZ			10/9/2012	3:20
ZZZZZZ			10/9/2012	3:26
ZZZZZZ			10/9/2012	3:32
4067365001	DF-S-LB-01	EPA 6020	10/9/2012	3:37
4067365002	DF-S-LB-02	EPA 6020	10/9/2012	3:43
4067365003	DF-S-LB-03	EPA 6020	10/9/2012	3:48
4067365004	DF-N-SF-01	EPA 6020	10/9/2012	3:54
4067365005	DF-S-BG-18	EPA 6020	10/9/2012	3:59
4067365006	DF-S-BG-19	EPA 6020	10/9/2012	4:05
4067365007	DF-S-BG-20	EPA 6020	10/9/2012	4:11
CCV9 40002	CCV9 40002		10/9/2012	4:16
CCB9 39996	CCB9 39996		10/9/2012	4:22

Pace Analytical Services

Metals Data Reporting Form

Instrument Runlo

Instrument: 40ICM2 **Chart Number:** 1008212A.csv

Start Date: 10/8/2012 **End Date:** 10/9/2012

Lab Sample ID	DF	Time of Analysi	Analytes																																
			Cd																																
CAL0 39996	1	6:16 PM	X																																
CAL1 39997	1	6:21 PM	X																																
CAL2 39998	1	6:27 PM	X																																
CAL3 39999	1	6:33 PM	X																																
CAL4 40000	1	6:38 PM	X																																
CAL5 40001	1	6:44 PM	X																																
ICV 39693	1	6:49 PM	X																																
ICB 39996	1	6:55 PM	X																																
39997	1	7:00 PM	X																																
ICSA1 39698	1	7:11 PM	X																																
ICSAB1 39699	1	7:17 PM	X																																
CCV1 40002	1	7:23 PM	X																																
CCB1 39996	1	7:28 PM	X																																
CCV6 40002	1	12:56 AM	X																																
CCB6 39996	1	1:01 AM	X																																
686605	1	1:35 AM	X																																
686611	1	1:40 AM	X																																
686606	1	1:46 AM	X																																
686612	1	1:51 AM	X																																
CCV7 40002	1	2:03 AM	X																																
CCB7 39996	1	2:08 AM	X																																
CCV8 40002	1	3:09 AM	X																																
CCB8 39996	1	3:15 AM	X																																
4067365001	1	3:37 AM	X																																
4067365002	1	3:43 AM	X																																
4067365003	1	3:48 AM	X																																
4067365004	1	3:54 AM	X																																
4067365005	1	3:59 AM	X																																
4067365006	1	4:05 AM	X																																
4067365007	1	4:11 AM	X																																
CCV9 40002	1	4:16 AM	X																																

Form 14 Equivalent

Pace Analytical Services

Metals Data Reporting Form

Instrument Runlo

Instrument: 40ICM2 **Chart Number:** 1008212A.csv

Start Date: 10/8/2012 **End Date:** 10/9/2012

Lab Sample ID	DF	Time of Analysi	Analytes																															
			Cd																															
CCB9 39996	1	4:22 AM	X																															

Form 14 Equivalent

Pace Analytical Services

INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY

Instrument Runlog **SDG:** 4067365

Instrument: 40ICM2 **Chart Number:** 1008212A.csv

Lab Sample Name	Client Sample Name	Date of Analysi	Time of Analysi	Bi	Q	Ge	Q	In	Q	Sc-CCT	Q	Sc-KED	Q	Tb	Q	Y	Q
CAL0 39996	CAL0 39996	10/8/2012	18:16	100		100		100		100		100		100		100	
CAL1 39997	CAL1 39997	10/8/2012	18:21	99.802		103.068		101.691		101.269		101.306		100.611		100.243	
CAL2 39998	CAL2 39998	10/8/2012	18:27	99.626		104.614		101.536		102.258		101.294		100.36		100.622	
CAL3 39999	CAL3 39999	10/8/2012	18:33	99.131		105.463		101.411		102.456		102.341		100.78		100.262	
CAL4 40000	CAL4 40000	10/8/2012	18:38	97.183		105.033		101.182		102.593		103.212		100.352		99.714	
CAL5 40001	CAL5 40001	10/8/2012	18:44	95.517		107.968		102.069		105.871		106.713		101.381		100.71	
ICV 39693	ICV 39693	10/8/2012	18:49	101.539		106.775		103.242		104.514		104.756		102.618		102.454	
ICB 39996	ICB 39996	10/8/2012	18:55	102.256		106.336		103.428		105.203		105.539		103.032		103.221	
39997	39997	10/8/2012	19:00	100.836		104.024		102.075		102.527		103.016		101.581		101.827	
ICSA1 39698	ICSA1 39698	10/8/2012	19:11	89.199		92.06		90.191		89.218		87.965		91.443		86.63	
ICSAB1 39699	ICSAB1 39699	10/8/2012	19:17	91.678		96.141		93.365		92.255		91.676		94.268		89.23	
CCV1 40002	CCV1 40002	10/8/2012	19:23	104.893		110.27		105.572		106.325		106.799		106.497		104.961	
CCB1 39996	CCB1 39996	10/8/2012	19:28	104.619		103.264		103.887		106.034		104.373		105.204		102.959	
CCV6 40002	CCV6 40002	10/9/2012	0:56	106.7		110.995		104.828		116.795		109.251		110.54		104.607	
CCB6 39996	CCB6 39996	10/9/2012	1:01	108.887		105.679		102.846		116.031		105.557		110.231		103.124	
686605	BLANK for HBN 111580	10/9/2012	1:35	107.767		104.36		101.016		110.819		101.651		107.938		100.272	
686611	SBLK for HBN 111580 [	10/9/2012	1:40	106.734		103.275		101.128		112.062		100.996		107.452		100.622	
686606	LCS for HBN 111580 [M	10/9/2012	1:46	100.054		105.8		99.703		113.446		104.423		106.014		100.773	
686612	SRM for HBN 111580 [M	10/9/2012	1:51	98.407		103.215		98.427		114.808		104.029		105.753		105.477	
CCV7 40002	CCV7 40002	10/9/2012	2:03	106.057		110.594		103.842		118.608		108.776		109.671		104.236	
CCB7 39996	CCB7 39996	10/9/2012	2:08	106.898		107.226		103.016		116.758		106.31		109.225		103.732	
CCV8 40002	CCV8 40002	10/9/2012	3:09	103.833		110.509		103.575		118.151		109.74		109.048		104.213	
CCB8 39996	CCB8 39996	10/9/2012	3:15	106.502		107.336		101.958		116.036		107.515		109.341		103.749	
4067365001	DF-S-LB-01	10/9/2012	3:37	100.418		98.557		96.848		109.094		97.262		104.745		96.065	
4067365002	DF-S-LB-02	10/9/2012	3:43	103.7		103.73		99.11		111.114		101.066		107.137		99.627	
4067365003	DF-S-LB-03	10/9/2012	3:48	98.017		97.272		95.214		107.366		96.775		102.706		95.373	
4067365004	DF-N-SF-01	10/9/2012	3:54	98.147		97.174		95.207		106.386		96.46		103.06		94.652	
4067365005	DF-S-BG-18	10/9/2012	3:59	99.645		98.943		96.431		107.163		97.94		103.969		96.072	
4067365006	DF-S-BG-19	10/9/2012	4:05	102.078		98.286		96.505		106.729		97.556		105.551		96.25	
4067365007	DF-S-BG-20	10/9/2012	4:11	96.742		95.175		94.126		105.279		95.12		101.88		93.199	
CCV9 40002	CCV9 40002	10/9/2012	4:16	102.28		105.648		99.161		110.693		104.503		106.145		99.391	
CCB9 39996	CCB9 39996	10/9/2012	4:22	103.632		104.431		98.597		111.322		103.116		105.724		100.044	

Form 15 Equivalent

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: DZUS FASTENERS LAKE CAPRI FISH
Pace Project No.: 4067365

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
4067365001	**DF-S-LB-01**	EPA 3050B	MPRP/7575	EPA 6020	ICPM/3360
4067365002	**DF-S-LB-02**	EPA 3050B	MPRP/7575	EPA 6020	ICPM/3360
4067365003	**DF-S-LB-03**	EPA 3050B	MPRP/7575	EPA 6020	ICPM/3360
4067365004	**DF-N-SF-01**	EPA 3050B	MPRP/7575	EPA 6020	ICPM/3360
4067365005	**DF-S-BG-18**	EPA 3050B	MPRP/7575	EPA 6020	ICPM/3360
4067365006	**DF-S-BG-19**	EPA 3050B	MPRP/7575	EPA 6020	ICPM/3360
4067365007	**DF-S-BG-20**	EPA 3050B	MPRP/7575	EPA 6020	ICPM/3360

Date: 10/11/2012 03:53 PM

REPORT OF LABORATORY ANALYSIS

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Metals Verification of Instrument Parameters Cover Sheet

Client: AECOM, INC. - NY
Project: DZUS FASTENERS LAKE CAPRI FISH
SDG: 4067365

Pace Analytical Services

Metals Data Reporting Form

Method Detection Limits **SDG:** 4067365

Instrument: 40ICM2 **Units:** ug/L

Element	Wavelength	Reporting Limit	MDL	Date of
Cadmium	111	1.0	0.10	8/18/2011

Pace Analytical Services

Metals Data Reporting Form

Linear Dynamic Range **SDG:** 4067365

Instrument: 40ICM2 **Units:** ppb

Element	Wavelength /Mass	Linear Range	Date of Linear Range
Cadmium	111	10000	12/14/2011

Metals Raw Data Cover Sheet

Client: AECOM, INC. - NY
Project: DZUS FASTENERS LAKE CAPRI FISH
SDG: 4067365

40ICM2 Run Log

Analytical Run: 1008212A.csv Method:

Date	Time	Sample ID	Dil	Notes:	Batch
10/08/12	18:16:22	CAL0 39996	1		3361
10/08/12	18:21:57	CAL1 39997	1		3361
10/08/12	18:27:29	CAL2 39998	1		3361
10/08/12	18:33:02	CAL3 39999	1		3361
10/08/12	18:38:35	CAL4 40000	1		3361
10/08/12	18:44:09	CAL5 40001	1		3361
10/08/12	18:49:43	ICV 39693	1		3361
10/08/12	18:55:17	ICB 39996	1		3361
10/08/12	19:00:51	CRDL 39997	1		3361
10/08/12	19:06:24	CRDL 39998	1		3361
10/08/12	19:11:56	ICSA1 39698	1		3361
10/08/12	19:17:28	ICSAB1 39699	1		3361
10/08/12	19:23:03	CCV1 40002	1		3361
10/08/12	19:28:36	CCB1 39996	1		3361
10/08/12	19:34:08	686242	1		3358
10/08/12	19:39:40	686246	1		3358
10/08/12	19:45:12	686243	1		3358
10/08/12	19:50:43	686247	1		3358
10/08/12	19:56:15	4067361001	1		3358
10/08/12	20:01:48	686248	1		3358
10/08/12	20:07:20	686249	1		3358
10/8/2012	20:12:54	688831	1		3358
10/8/2012	20:18:28	4067361002	1		3358
10/8/2012	20:24:02	688832	5		3358
10/8/2012	20:29:37	CCV2 40002	1		3361
10/8/2012	20:35:10	CCB2 39996	1		3361
10/8/2012	20:40:43	4067361003	1		3358
10/8/2012	20:46:18	4067361004	1		3358
10/8/2012	20:51:51	4067361005	1		3358
10/8/2012	20:57:23	4067361006	1		3358
10/8/2012	21:02:54	4067361007	1		3358
10/8/2012	21:08:27	4067361008	1		3358
10/8/2012	21:13:58	4067361009	1		3358
10/8/2012	21:19:31	4067361010	1		3358
10/8/2012	21:25:04	4067361011	1		3358
10/8/2012	21:30:38	4067361012	1		3358
10/8/2012	21:36:11	CCV3 40002	1		3361
10/8/2012	21:41:44	CCB3 39996	1		3361
10/8/2012	21:47:17	4067361013	1		3358
10/8/2012	21:52:51	4067361014	1		3358
10/8/2012	21:58:25	4067361015	1		3358
10/8/2012	22:04:00	4067361016	1		3358
10/8/2012	22:09:34	4067361017	1		3358
10/8/2012	22:15:06	4067361018	1		3358

40ICM2 Run Log

Analytical Run: 1008212A.csv Method:

Date	Time	Sample ID	Dil	Notes:	Batch
10/8/2012	22:20:39	4067361019	1		3358
10/8/2012	22:26:13	BLANK	1		
10/8/2012	22:31:47	686525	1		3359
10/8/2012	22:37:19	686527	1		3359
10/8/2012	22:42:53	CCV4 40002	1		3361
10/8/2012	22:48:27	CCB4 39996	1		3361
10/8/2012	22:53:59	686526	1		3359
10/8/2012	22:59:32	686528	1		3359
10/8/2012	23:05:05	4067362001	1		3359
10/8/2012	23:10:39	686529	1		3359
10/8/2012	23:16:12	686530	1		3359
10/8/2012	23:21:45	688843	1		3359
10/8/2012	23:27:19	4067362002	1		3359
10/8/2012	23:32:52	688844	5		3359
10/8/2012	23:38:26	4067362003	1		3359
10/8/2012	23:44:00	4067362004	1		3359
10/8/2012	23:49:35	CCV5 40002	1		3361
10/8/2012	23:55:09	CCB5 39996	1		3361
10/9/2012	0:00:41	4067362005	1		3359
10/9/2012	0:06:14	4067362006	1		3359
10/9/2012	0:11:47	4067362007	1		3359
10/9/2012	0:17:20	4067362008	1		3359
10/9/2012	0:22:53	4067362009	1		3359
10/9/2012	0:28:26	4067362010	1		3359
10/9/2012	0:34:00	4067362011	1		3359
10/9/2012	0:39:33	4067362012	1		3359
10/9/2012	0:45:06	4067362013	1		3359
10/9/2012	0:50:40	4067362014	1		3359
10/9/2012	0:56:15	CCV6 40002	1		3361
10/9/2012	1:01:48	CCB6 39996	1		3361
10/9/2012	1:07:21	4067362015	1		3359
10/9/2012	1:12:56	4067362016	1		3359
10/9/2012	1:18:30	4067362017	1		3359
10/9/2012	1:24:04	4067362018	1		3359
10/9/2012	1:29:39	BLANK	1		
10/9/2012	1:35:14	686605	1		3360
10/9/2012	1:40:48	686611	1		3360
10/9/2012	1:46:22	686606	1		3360
10/9/2012	1:51:55	686612	1		3360
10/9/2012	1:57:29	4067620001	1		3360
10/9/2012	2:03:03	CCV7 40002	1		3361
10/9/2012	2:08:37	CCB7 39996	1		3361
10/9/2012	2:14:09	686613	1		3360
10/9/2012	2:19:43	686614	1		3360
10/9/2012	2:25:16	688848	1		3360
10/9/2012	2:30:50	4067620002	1		3360

40ICM2 Run Log

Analytical Run: 1008212A.csv Method:

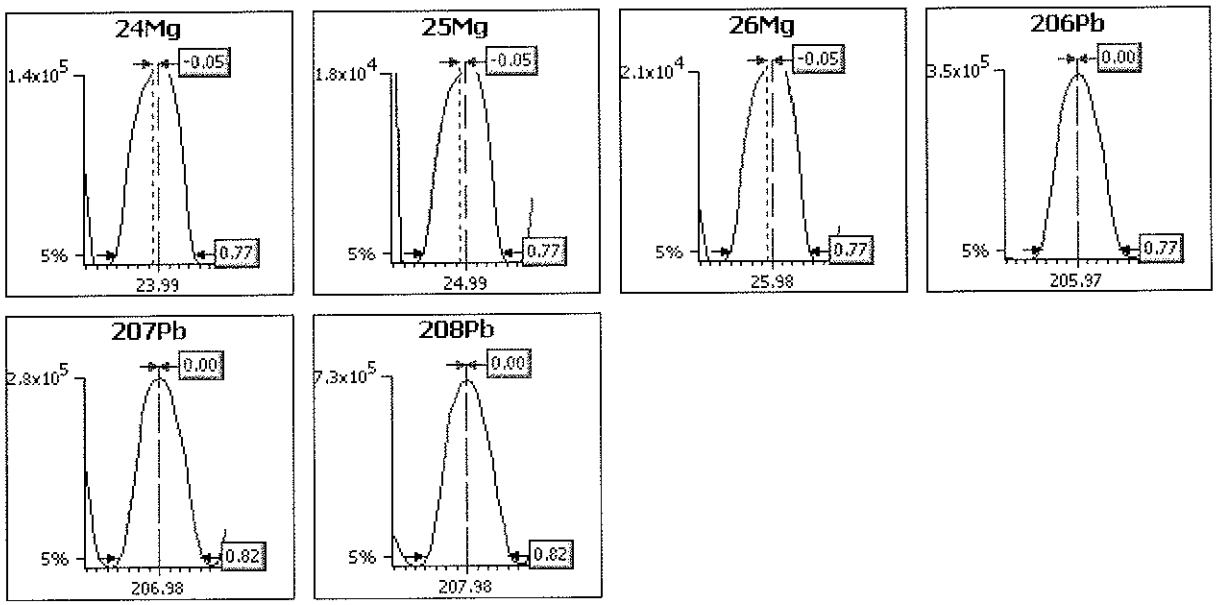
Date	Time	Sample ID	Dil	Notes:	Batch
10/9/2012	2:36:24	688849	5		3360
10/9/2012	2:41:59	4067620003	1		3360
10/9/2012	2:47:33	4067620004	1		3360
10/9/2012	2:53:07	4067620005	1		3360
10/9/2012	2:58:41	4067620006	1		3360
10/9/2012	3:04:14	4067620007	1		3360
10/9/2012	3:09:49	CCV8 40002	1		3361
10/9/2012	3:15:22	CCB8 39996	1		3361
10/9/2012	3:20:55	4067620008	1		3360
10/9/2012	3:26:30	4067620009	1		3360
10/9/2012	3:32:03	4067620010	1		3360
10/9/2012	3:37:36	4067365001	1		3360
10/9/2012	3:43:10	4067365002	1		3360
10/9/2012	3:48:45	4067365003	1		3360
10/9/2012	3:54:19	4067365004	1		3360
10/9/2012	3:59:53	4067365005	1		3360
10/9/2012	4:05:27	4067365006	1		3360
10/9/2012	4:11:01	4067365007	1		3360
10/9/2012	4:16:36	CCV9 40002	1		3361
10/9/2012	4:22:10	CCB9 39996	1		3361

Performance Report

Sample details
Acquired at : 10/8/2012 3:54:00 PM
Report name : EPA 40ICM2 SN 01301C [10/1/2012 3:16:50 PM]

Mass Calibration verification

Acquisition parameters
Sweeps : 10
Dwell : 10.0 mSecs
Point spacing : 0.05 amu
Peak width measured at 5% of the peak maximum



Analyte	Limits			Results	
	Max. width	Min. width	Max. error	Peak width	Peak error
24Mg	0.85	0.65	0.10	0.77	-0.05
25Mg	0.85	0.65	0.10	0.77	-0.05
26Mg	0.85	0.65	0.10	0.77	-0.05
206Pb	0.85	0.65	0.10	0.77	0.00
207Pb	0.85	0.65	0.10	0.82	0.00
208Pb	0.85	0.65	0.10	0.82	0.00

Sample details
Acquired at : 10/8/2012 3:54:00 PM
Report name : EPA 40ICM2 SN 01301C [10/1/2012 3:16:50 PM]

Tune conditions

Major	
Extraction	-98.0
Lens 1	-1098
Lens 2	-80.0
Focus	14.7
D1	-31.4
D2	-121
Pole Bias	0.1
Hexapole Bias	-3.5
Nebuliser	0.81

Minor	
Lens 3	-185.1
Forward power	1404
Horizontal	48
Vertical	282
DA	-37.6
Cool	13.0
Auxiliary	0.70
Sampling Depth	145

Global	
Standard resolution	145
High resolution	135
Analogue Detector	2375
PC Detector	3475

Add. Gases	
CCT-He	0.00
CCT-He	0.00

Sensitivity and stability results

Acquisition parameters
Sweeps : 35

Run	Time	5Bkg	7Li	24Mg	25Mg	26Mg	59Co	137Ba++	115In	137Ba
Dwell (mSecs)		500.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Limits	%RSD	-	2.0%	2.0%	2.0%	2.0%	2.0%	-	2.0%	-
	Countrate	<1	>60000	>10000	>10000	>10000	>150000	-	>400000	-
1	3:54:23 PM	0.229	100733.48	142079.14	19385.236	22557.858	234909.14	1525.835	709821.68	82253.169
2	3:55:09 PM	0.171	100652.64	143998.81	19439.631	23285.303	237737.39	1242.937	715171.39	84339.699
3	3:55:55 PM	0.343	100846.08	140678.78	19230.640	22377.437	234057.31	1337.236	714667.33	82722.887
4	3:56:41 PM	0.114	101411.98	143618.91	19388.098	22984.581	237459.21	1317.233	714439.90	83400.128
5	3:57:27 PM	0.229	99902.014	141061.46	19522.656	23368.362	234110.00	1394.387	712264.18	83302.142
x		0.217	100709.24	142287.42	19393.252	22914.708	235654.61	1363.526	713272.90	83203.605
σ		0.08	540.37	1486.25	106.57	437.04	1808.83	105.68	2227.05	786.36
%RSD		39.033	0.537	1.045	0.550	1.907	0.768	7.750	0.312	0.945

Run	Time	138Ba	140Ce	156Ce O	206Pb	207Pb	208Pb	220Bkg	238U
Dwell (mSecs)		10.0	10.0	10.0	10.0	10.0	10.0	500.0	10.0
Limits	%RSD	-	-	-	2.0%	2.0%	2.0%	-	2.0%
	Countrate	-	-	-	>10000	>10000	>10000	<1	>800000
1	3:54:23 PM	546323.08	719309.32	14453.712	344304.52	287959.70	718617.49	0.114	1607653.9
2	3:55:09 PM	548492.96	723144.43	13194.761	339456.64	284160.57	713229.06	0.000	1588250.9
3	3:55:55 PM	539417.69	716849.72	13744.102	337128.26	279886.49	701300.65	0.000	1587882.6
4	3:56:41 PM	542933.21	714839.45	14144.682	337657.79	283751.62	707861.97	0.057	1602995.1
5	3:57:27 PM	545727.80	723492.03	13869.996	338894.46	282601.33	705018.30	0.057	1566641.6
x		544578.95	719526.99	13881.451	339488.34	283671.94	709205.50	0.046	1590684.8
σ		3501.01	3807.74	470.99	2849.13	2920.01	6830.06	0.05	16057.26
%RSD		0.643	0.529	3.393	0.839	1.029	0.963	104.583	1.009

Ratio results

Run	Time	137Ba++/137Ba	156Ce O/140Ce
Ratio limits		<0.0300	<0.0200
1	3:54:23 PM	0.019	0.020
2	3:55:09 PM	0.015	0.018
3	3:55:55 PM	0.016	0.019
4	3:56:41 PM	0.016	0.020
5	3:57:27 PM	0.017	0.019
x		0.0164	0.0193
σ		0.00	0.00
%RSD		8.5848	3.6744

Result : The performance report passed.

Performance Report

Sample details
Acquired at : 10/8/2012 4:04:12 PM
Report name : Xt CCT 40ICM2 SN 01301C [10/1/2012 3:17:09 PM]

Tune conditions

Major	
Extraction	-98.0
Lens 1	-1098
Lens 2	-80.0
Focus	10.8
D1	-43.9
D2	-143
Pole Bias	-9.0
Hexapole Bias	-4.0
Nebuliser	0.81

Minor	
Lens 3	-195.3
Forward power	1404
Horizontal	48
Vertical	282
DA	-37.6
Cool	13.0
Auxiliary	0.70
Sampling Depth	145

Global	
Standard resolution	145
High resolution	135
Analogue Detector	2375
PC Detector	3475

Add. Gases	
CCT-He	0.00
CCT-He	0.51

Sensitivity and stability results

Acquisition parameters
Sweeps : 45

Run	Time	7Li	9Be	11B
Dwell (mSecs)		10.0	10.0	10.0
Limits	%RSD	2.0%	2.0%	2.0%
	Countrate	>10000	>2000	>2000
1	4:04:13 PM	16981.649	5159.161	5801.750
2	4:04:16 PM	17041.755	5079.119	5686.125
3	4:04:19 PM	17478.093	5088.012	5763.949
4	4:04:22 PM	17003.911	5012.417	5639.431
5	4:04:25 PM	16632.150	5005.747	5628.313
x		17027.512	5068.891	5703.914
σ		300.91	62.84	76.43
%RSD		1.767	1.240	1.340

Result : The performance report passed.

Performance Report

Sample details
Acquired at : 10/8/2012 4:11:56 PM
Report name : Xt CCT-KED 40ICM2 SN01301C [10/1/2012 3:17:23 PM]

Tune conditions

Major	
Extraction	-98.0
Lens 1	-1098
Lens 2	-80.0
Focus	-5.3
D1	-56.5
D2	-143
Pole Bias	-17.0
Hexapole Bias	-20.0
Nebuliser	0.81

Minor	
Lens 3	-195.3
Forward power	1404
Horizontal	48
Vertical	282
DA	-37.6
Cool	13.0
Auxiliary	0.70
Sampling Depth	145

Global	
Standard resolution	145
High resolution	135
Analogue Detector	2375
PC Detector	3475

Add. Gases	
CCT-He	0.00
CCT-He	3.80

Sensitivity and stability results

Acquisition parameters
Sweeps : 35

Run	Time	78Se	115In	140Ce	156Ce O
Dwell (mSecs)		100.0	10.0	10.0	50.0
Limits	%RSD	-	2.0%	-	-
	Countrate	<20	>100000	-	-
1	4:11:57 PM	8.000	300812.93	427717.45	5395.799
2	4:12:05 PM	4.286	303722.27	435306.91	5877.224
3	4:12:13 PM	4.571	299472.03	433349.99	5403.804
4	4:12:21 PM	6.286	303288.91	433968.40	5658.236
5	4:12:29 PM	6.000	299301.12	432014.73	5567.897
x		5.829	301319.45	432471.50	5580.592
σ		1.49	2085.40	2909.54	199.74
%RSD		25.612	0.692	0.673	3.579

Ratio results

Run	Time	156Ce O/140Ce
Ratio limits		<0.0200
1	4:11:57 PM	0.013
2	4:12:05 PM	0.014
3	4:12:13 PM	0.012
4	4:12:21 PM	0.013
5	4:12:29 PM	0.013
x		0.0129
σ		0.00
%RSD		3.1169

Result : The performance report passed.

Experiment Details

Description	PlasmaLab Template BlankExperiment
Template Filename	C:\Program Files\Thermo Fisher\PlasmaLab\Templates\6020 XSII SN 01301 C.tet
Created By User	metals
Analyte Database	Pace.tea
Creation Timestamp	7/10/2008 4:47:18 PM
Last Edited By	paceuser
Last Edit Timestamp	10/9/2012 8:12:25 AM
Instrument Detector	Simultaneous
Database Version	3,51
Acquisition Mode	Unknown

Numerical Results report key (text indicates meaning)

Blue text indicates that cell is a statistic.
Underlining indicates that a data warning flag is set.

Column headings	Result cells	Data warning flags
No flag	Internal Standard	I - Invalid calibration
Semi Quant	Excluded	T - Tripped
Standard Addition	QC Warning	F - Interference correction failed
Multi Element	QC Failure	M - Result over max
	Transient TRA only:	V - Valley integration failed
	Peak Not Found	D - Different method used
	Manually Edited	
	Merged Peak	

Setup

Survey Scan Setup

Sweeps	10
Dwell Time	600
Channels Per Mass	10
Acquisition Duration	13345

Main Run Setup

Main Run	Peak Jumping
Sweeps	45
Dwell Time	10000
Channels Per Mass	1
Acquisition Duration	31093
Channel Spacing	0.02

Survey Scan Regions

Start AMU	End AMU	Channels	Dwell ms	Resolution
4.59	11.50	69	600	
12.50	13.50	10	600	
22.59	28.41	58	600	
30.59	31.41	8	600	
33.59	35.50	19	600	
38.59	39.41	8	600	
42.59	45.50	29	600	
46.50	79.41	329	600	
80.59	245.50	1649	600	

Peak Jump Regions

Analyte	Channels	Dwell ms	Resolution
7Li	1	10000	Standard
9Be	1	10000	Standard
10B	1	10000	Standard
23Na	1	5000	
25Mg	1	10000	Standard
27Al	1	10000	Standard
28Si	1	10000	Standard
31P	1	10000	Standard
34S	1	10000	
35Cl	1	10000	
39K	1	10000	

43Ca	1	10000	Standard
45Sc-KED	1	10000	Standard
45Sc-CCT	1	10000	
47Ti	1	10000	Standard
51V	1	10000	Standard
52Cr	1	10000	Standard
53Cl O	1	10000	Standard
54Fe	1	10000	Standard
55Mn	1	10000	Standard
59Co	1	10000	Standard
60Ni	1	10000	Standard
63Cu	1	10000	Standard
66Zn	1	10000	Standard
72Ge	1	10000	Standard
73Ge	1	10000	Standard
75As	1	50000	Standard
78Se	1	50000	Standard
83Kr	1	50000	Standard
88Sr	1	10000	Standard
89Y	1	10000	Standard
90Zr	1	10000	Standard
95Mo	1	10000	Standard
107Ag	1	10000	Standard
111Cd	1	10000	Standard
115In	1	10000	Standard
118Sn	1	10000	Standard
121Sb	1	10000	Standard
137Ba	1	10000	Standard
159Tb	1	10000	Standard
184W	1	10000	Standard
201Hg	1	10000	Standard
205Tl	1	10000	Standard
206Pb	1	10000	Standard
207Pb	1	10000	Standard
208Pb	1	10000	Standard
209Bi	1	10000	Standard
238U	1	10000	Standard

Instrument Configuration

Sample/Analyte Settings

Label	Config	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
39996_3361_Cal0	5	7	7	7	8	8	8	8	8	8	8
39997_3361_Cal1	5	7	7	7	8	8	8	8	8	8	8
39998_3361_Cal2	5	7	7	7	8	8	8	8	8	8	8
39999_3361_Cal3	5	7	7	7	8	8	8	8	8	8	8
40000_3361_Cal4	5	7	7	7	8	8	8	8	8	8	8
40001_3361_Cal5	5	7	7	7	8	8	8	8	8	8	8
39693_3361_ICV	5	7	7	7	8	8	8	8	8	8	8
39996_3361_ICB	5	7	7	7	8	8	8	8	8	8	8
39997_3361_CRDL_A1	5	7	7	7	8	8	8	8	8	8	8
39998_3361_CRDL_B1	5	7	7	7	8	8	8	8	8	8	8
39698_3361_ICSA1	5	7	7	7	8	8	8	8	8	8	8
39699_3361_ICSAB1	5	7	7	7	8	8	8	8	8	8	8
40002_3361_CCV1	5	7	7	7	8	8	8	8	8	8	8
39996_3361_CCB1	5	7	7	7	8	8	8	8	8	8	8
686242_3358	5	7	7	7	8	8	8	8	8	8	8
686246_3358	5	7	7	7	8	8	8	8	8	8	8
686243_3358	5	7	7	7	8	8	8	8	8	8	8
686247_3358	5	7	7	7	8	8	8	8	8	8	8
4067361001_3358	5	7	7	7	8	8	8	8	8	8	8
686248_3358	5	7	7	7	8	8	8	8	8	8	8
686249_3358	5	7	7	7	8	8	8	8	8	8	8
688831_3358	5	7	7	7	8	8	8	8	8	8	8
4067361002_3358	5	7	7	7	8	8	8	8	8	8	8
688832_3358x5	5	7	7	7	8	8	8	8	8	8	8
40002_3361_CCV2	5	7	7	7	8	8	8	8	8	8	8
39996_3361_CCB2	5	7	7	7	8	8	8	8	8	8	8
4067361003_3358	5	7	7	7	8	8	8	8	8	8	8
4067361004_3358	5	7	7	7	8	8	8	8	8	8	8
4067361005_3358	5	7	7	7	8	8	8	8	8	8	8

4067361006_3358	5	7	7	7	8	8	8	8	8	8	8
4067361007_3358	5	7	7	7	8	8	8	8	8	8	8
4067361008_3358	5	7	7	7	8	8	8	8	8	8	8
4067361009_3358	5	7	7	7	8	8	8	8	8	8	8
4067361010_3358	5	7	7	7	8	8	8	8	8	8	8
4067361011_3358	5	7	7	7	8	8	8	8	8	8	8
4067361012_3358	5	7	7	7	8	8	8	8	8	8	8
40002_3361_CCV3	5	7	7	7	8	8	8	8	8	8	8
39996_3361_CCB3	5	7	7	7	8	8	8	8	8	8	8
4067361013_3358	5	7	7	7	8	8	8	8	8	8	8
4067361014_3358	5	7	7	7	8	8	8	8	8	8	8
4067361015_3358	5	7	7	7	8	8	8	8	8	8	8
4067361016_3358	5	7	7	7	8	8	8	8	8	8	8
4067361017_3358	5	7	7	7	8	8	8	8	8	8	8
4067361018_3358	5	7	7	7	8	8	8	8	8	8	8
4067361019_3358	5	7	7	7	8	8	8	8	8	8	8
Blank	5	7	7	7	8	8	8	8	8	8	8
686525_3359	5	7	7	7	8	8	8	8	8	8	8
686527_3359	5	7	7	7	8	8	8	8	8	8	8
40002_3361_CCV4	5	7	7	7	8	8	8	8	8	8	8
39996_3361_CCB4	5	7	7	7	8	8	8	8	8	8	8
686526_3359	5	7	7	7	8	8	8	8	8	8	8
686528_3359	5	7	7	7	8	8	8	8	8	8	8
4067362001_3359	5	7	7	7	8	8	8	8	8	8	8
686529_3359	5	7	7	7	8	8	8	8	8	8	8
686530_3359	5	7	7	7	8	8	8	8	8	8	8
688843_3359	5	7	7	7	8	8	8	8	8	8	8
4067362002_3359	5	7	7	7	8	8	8	8	8	8	8
688844_3359x5	5	7	7	7	8	8	8	8	8	8	8
4067362003_3359	5	7	7	7	8	8	8	8	8	8	8
4067362004_3359	5	7	7	7	8	8	8	8	8	8	8
40002_3361_CCV5	5	7	7	7	8	8	8	8	8	8	8
39996_3361_CCB5	5	7	7	7	8	8	8	8	8	8	8
4067362005_3359	5	7	7	7	8	8	8	8	8	8	8
4067362006_3359	5	7	7	7	8	8	8	8	8	8	8
4067362007_3359	5	7	7	7	8	8	8	8	8	8	8
4067362008_3359	5	7	7	7	8	8	8	8	8	8	8
4067362009_3359	5	7	7	7	8	8	8	8	8	8	8
4067362010_3359	5	7	7	7	8	8	8	8	8	8	8
4067362011_3359	5	7	7	7	8	8	8	8	8	8	8
4067362012_3359	5	7	7	7	8	8	8	8	8	8	8
4067362013_3359	5	7	7	7	8	8	8	8	8	8	8
4067362014_3359	5	7	7	7	8	8	8	8	8	8	8
40002_3361_CCV6	5	7	7	7	8	8	8	8	8	8	8
39996_3361_CCB6	5	7	7	7	8	8	8	8	8	8	8
4067362015_3359	5	7	7	7	8	8	8	8	8	8	8
4067362016_3359	5	7	7	7	8	8	8	8	8	8	8
4067362017_3359	5	7	7	7	8	8	8	8	8	8	8
4067362018_3359	5	7	7	7	8	8	8	8	8	8	8
Blank	5	7	7	7	8	8	8	8	8	8	8
686605_3360	5	7	7	7	8	8	8	8	8	8	8
686611_3360	5	7	7	7	8	8	8	8	8	8	8
686606_3360	5	7	7	7	8	8	8	8	8	8	8
686612_3360	5	7	7	7	8	8	8	8	8	8	8
4067620001_3360	5	7	7	7	8	8	8	8	8	8	8
40002_3361_CCV7	5	7	7	7	8	8	8	8	8	8	8
39996_3361_CCB7	5	7	7	7	8	8	8	8	8	8	8
686613_3360	5	7	7	7	8	8	8	8	8	8	8
686614_3360	5	7	7	7	8	8	8	8	8	8	8
688848_3360	5	7	7	7	8	8	8	8	8	8	8
4067620002_3360	5	7	7	7	8	8	8	8	8	8	8
688849_3360x5	5	7	7	7	8	8	8	8	8	8	8
4067620003_3360	5	7	7	7	8	8	8	8	8	8	8
4067620004_3360	5	7	7	7	8	8	8	8	8	8	8
4067620005_3360	5	7	7	7	8	8	8	8	8	8	8
4067620006_3360	5	7	7	7	8	8	8	8	8	8	8
4067620007_3360	5	7	7	7	8	8	8	8	8	8	8
40002_3361_CCV8	5	7	7	7	8	8	8	8	8	8	8
39996_3361_CCB8	5	7	7	7	8	8	8	8	8	8	8
4067620008_3360	5	7	7	7	8	8	8	8	8	8	8

4067620009_3360	5	7	7	7	8	8	8	8	8	8	8
4067620010_3360	5	7	7	7	8	8	8	8	8	8	8
4067365001_3360	5	7	7	7	8	8	8	8	8	8	8
4067365002_3360	5	7	7	7	8	8	8	8	8	8	8
4067365003_3360	5	7	7	7	8	8	8	8	8	8	8
4067365004_3360	5	7	7	7	8	8	8	8	8	8	8
4067365005_3360	5	7	7	7	8	8	8	8	8	8	8
4067365006_3360	5	7	7	7	8	8	8	8	8	8	8
4067365007_3360	5	7	7	7	8	8	8	8	8	8	8
40002_3361_CCV9	5	7	7	7	8	8	8	8	8	8	8
39996_3361_CCB9	5	7	7	7	8	8	8	8	8	8	8
Label	**Config**	**39K**	**43Ca**	**45Sc-KED**	**45Sc-CCT**	**47Ti**	**51V**	**52Cr**	**53Cl O**	**54Fe**	**55Mn**
39996_3361_Cal0	5	8	8	8	7	8	8	8	8	8	8
39997_3361_Cal1	5	8	8	8	7	8	8	8	8	8	8
39998_3361_Cal2	5	8	8	8	7	8	8	8	8	8	8
39999_3361_Cal3	5	8	8	8	7	8	8	8	8	8	8
40000_3361_Cal4	5	8	8	8	7	8	8	8	8	8	8
40001_3361_Cal5	5	8	8	8	7	8	8	8	8	8	8
39693_3361_ICV	5	8	8	8	7	8	8	8	8	8	8
39996_3361_ICB	5	8	8	8	7	8	8	8	8	8	8
39997_3361_CRDL_A1	5	8	8	8	7	8	8	8	8	8	8
39998_3361_CRDL_B1	5	8	8	8	7	8	8	8	8	8	8
39698_3361_ICSA1	5	8	8	8	7	8	8	8	8	8	8
39699_3361_ICSAB1	5	8	8	8	7	8	8	8	8	8	8
40002_3361_CCV1	5	8	8	8	7	8	8	8	8	8	8
39996_3361_CCB1	5	8	8	8	7	8	8	8	8	8	8
686242_3358	5	8	8	8	7	8	8	8	8	8	8
686246_3358	5	8	8	8	7	8	8	8	8	8	8
686243_3358	5	8	8	8	7	8	8	8	8	8	8
686247_3358	5	8	8	8	7	8	8	8	8	8	8
4067361001_3358	5	8	8	8	7	8	8	8	8	8	8
686248_3358	5	8	8	8	7	8	8	8	8	8	8
686249_3358	5	8	8	8	7	8	8	8	8	8	8
688831_3358	5	8	8	8	7	8	8	8	8	8	8
4067361002_3358	5	8	8	8	7	8	8	8	8	8	8
688832_3358x5	5	8	8	8	7	8	8	8	8	8	8
40002_3361_CCV2	5	8	8	8	7	8	8	8	8	8	8
39996_3361_CCB2	5	8	8	8	7	8	8	8	8	8	8
4067361003_3358	5	8	8	8	7	8	8	8	8	8	8
4067361004_3358	5	8	8	8	7	8	8	8	8	8	8
4067361005_3358	5	8	8	8	7	8	8	8	8	8	8
4067361006_3358	5	8	8	8	7	8	8	8	8	8	8
4067361007_3358	5	8	8	8	7	8	8	8	8	8	8
4067361008_3358	5	8	8	8	7	8	8	8	8	8	8
4067361009_3358	5	8	8	8	7	8	8	8	8	8	8
4067361010_3358	5	8	8	8	7	8	8	8	8	8	8
4067361011_3358	5	8	8	8	7	8	8	8	8	8	8
4067361012_3358	5	8	8	8	7	8	8	8	8	8	8
40002_3361_CCV3	5	8	8	8	7	8	8	8	8	8	8
39996_3361_CCB3	5	8	8	8	7	8	8	8	8	8	8
4067361013_3358	5	8	8	8	7	8	8	8	8	8	8
4067361014_3358	5	8	8	8	7	8	8	8	8	8	8
4067361015_3358	5	8	8	8	7	8	8	8	8	8	8
4067361016_3358	5	8	8	8	7	8	8	8	8	8	8
4067361017_3358	5	8	8	8	7	8	8	8	8	8	8
4067361018_3358	5	8	8	8	7	8	8	8	8	8	8
4067361019_3358	5	8	8	8	7	8	8	8	8	8	8
Blank	5	8	8	8	7	8	8	8	8	8	8
686525_3359	5	8	8	8	7	8	8	8	8	8	8
686527_3359	5	8	8	8	7	8	8	8	8	8	8
40002_3361_CCV4	5	8	8	8	7	8	8	8	8	8	8
39996_3361_CCB4	5	8	8	8	7	8	8	8	8	8	8
686526_3359	5	8	8	8	7	8	8	8	8	8	8
686528_3359	5	8	8	8	7	8	8	8	8	8	8
4067362001_3359	5	8	8	8	7	8	8	8	8	8	8
686529_3359	5	8	8	8	7	8	8	8	8	8	8
686530_3359	5	8	8	8	7	8	8	8	8	8	8
688843_3359	5	8	8	8	7	8	8	8	8	8	8
4067362002_3359	5	8	8	8	7	8	8	8	8	8	8
688844_3359x5	5	8	8	8	7	8	8	8	8	8	8

4067362003_3359	5	8	8	8	7	8	8	8	8	8	8
4067362004_3359	5	8	8	8	7	8	8	8	8	8	8
40002_3361_CCV5	5	8	8	8	7	8	8	8	8	8	8
39996_3361_CCB5	5	8	8	8	7	8	8	8	8	8	8
4067362005_3359	5	8	8	8	7	8	8	8	8	8	8
4067362006_3359	5	8	8	8	7	8	8	8	8	8	8
4067362007_3359	5	8	8	8	7	8	8	8	8	8	8
4067362008_3359	5	8	8	8	7	8	8	8	8	8	8
4067362009_3359	5	8	8	8	7	8	8	8	8	8	8
4067362010_3359	5	8	8	8	7	8	8	8	8	8	8
4067362011_3359	5	8	8	8	7	8	8	8	8	8	8
4067362012_3359	5	8	8	8	7	8	8	8	8	8	8
4067362013_3359	5	8	8	8	7	8	8	8	8	8	8
4067362014_3359	5	8	8	8	7	8	8	8	8	8	8
40002_3361_CCV6	5	8	8	8	7	8	8	8	8	8	8
39996_3361_CCB6	5	8	8	8	7	8	8	8	8	8	8
4067362015_3359	5	8	8	8	7	8	8	8	8	8	8
4067362016_3359	5	8	8	8	7	8	8	8	8	8	8
4067362017_3359	5	8	8	8	7	8	8	8	8	8	8
4067362018_3359	5	8	8	8	7	8	8	8	8	8	8
Blank	5	8	8	8	7	8	8	8	8	8	8
686605_3360	5	8	8	8	7	8	8	8	8	8	8
686611_3360	5	8	8	8	7	8	8	8	8	8	8
686606_3360	5	8	8	8	7	8	8	8	8	8	8
686612_3360	5	8	8	8	7	8	8	8	8	8	8
4067620001_3360	5	8	8	8	7	8	8	8	8	8	8
40002_3361_CCV7	5	8	8	8	7	8	8	8	8	8	8
39996_3361_CCB7	5	8	8	8	7	8	8	8	8	8	8
686613_3360	5	8	8	8	7	8	8	8	8	8	8
686614_3360	5	8	8	8	7	8	8	8	8	8	8
688848_3360	5	8	8	8	7	8	8	8	8	8	8
4067620002_3360	5	8	8	8	7	8	8	8	8	8	8
688849_3360x5	5	8	8	8	7	8	8	8	8	8	8
4067620003_3360	5	8	8	8	7	8	8	8	8	8	8
4067620004_3360	5	8	8	8	7	8	8	8	8	8	8
4067620005_3360	5	8	8	8	7	8	8	8	8	8	8
4067620006_3360	5	8	8	8	7	8	8	8	8	8	8
4067620007_3360	5	8	8	8	7	8	8	8	8	8	8
40002_3361_CCV8	5	8	8	8	7	8	8	8	8	8	8
39996_3361_CCB8	5	8	8	8	7	8	8	8	8	8	8
4067620008_3360	5	8	8	8	7	8	8	8	8	8	8
4067620009_3360	5	8	8	8	7	8	8	8	8	8	8
4067620010_3360	5	8	8	8	7	8	8	8	8	8	8
4067365001_3360	5	8	8	8	7	8	8	8	8	8	8
4067365002_3360	5	8	8	8	7	8	8	8	8	8	8
4067365003_3360	5	8	8	8	7	8	8	8	8	8	8
4067365004_3360	5	8	8	8	7	8	8	8	8	8	8
4067365005_3360	5	8	8	8	7	8	8	8	8	8	8
4067365006_3360	5	8	8	8	7	8	8	8	8	8	8
4067365007_3360	5	8	8	8	7	8	8	8	8	8	8
40002_3361_CCV9	5	8	8	8	7	8	8	8	8	8	8
39996_3361_CCB9	5	8	8	8	7	8	8	8	8	8	8
Label	**Config**	**59Co**	**60Ni**	**63Cu**	**66Zn**	**72Ge**	**73Ge**	**75As**	**78Se**	**83Kr**	**88Sr**
39996_3361_Cal0	5	8	8	8	8	8	8	8	8	8	8
39997_3361_Cal1	5	8	8	8	8	8	8	8	8	8	8
39998_3361_Cal2	5	8	8	8	8	8	8	8	8	8	8
39999_3361_Cal3	5	8	8	8	8	8	8	8	8	8	8
40000_3361_Cal4	5	8	8	8	8	8	8	8	8	8	8
40001_3361_Cal5	5	8	8	8	8	8	8	8	8	8	8
39693_3361_ICV	5	8	8	8	8	8	8	8	8	8	8
39996_3361_ICB	5	8	8	8	8	8	8	8	8	8	8
39997_3361_CRDL_A1	5	8	8	8	8	8	8	8	8	8	8
39998_3361_CRDL_B1	5	8	8	8	8	8	8	8	8	8	8
39698_3361_ICSA1	5	8	8	8	8	8	8	8	8	8	8
39699_3361_ICSAB1	5	8	8	8	8	8	8	8	8	8	8
40002_3361_CCV1	5	8	8	8	8	8	8	8	8	8	8
39996_3361_CCB1	5	8	8	8	8	8	8	8	8	8	8
686242_3358	5	8	8	8	8	8	8	8	8	8	8
686246_3358	5	8	8	8	8	8	8	8	8	8	8
686243_3358	5	8	8	8	8	8	8	8	8	8	8

686247_3358	5	8	8	8	8	8	8	8	8	8	8
4067361001_3358	5	8	8	8	8	8	8	8	8	8	8
686248_3358	5	8	8	8	8	8	8	8	8	8	8
686249_3358	5	8	8	8	8	8	8	8	8	8	8
688831_3358	5	8	8	8	8	8	8	8	8	8	8
4067361002_3358	5	8	8	8	8	8	8	8	8	8	8
688832_3358x5	5	8	8	8	8	8	8	8	8	8	8
40002_3361_CCV2	5	8	8	8	8	8	8	8	8	8	8
39996_3361_CCB2	5	8	8	8	8	8	8	8	8	8	8
4067361003_3358	5	8	8	8	8	8	8	8	8	8	8
4067361004_3358	5	8	8	8	8	8	8	8	8	8	8
4067361005_3358	5	8	8	8	8	8	8	8	8	8	8
4067361006_3358	5	8	8	8	8	8	8	8	8	8	8
4067361007_3358	5	8	8	8	8	8	8	8	8	8	8
4067361008_3358	5	8	8	8	8	8	8	8	8	8	8
4067361009_3358	5	8	8	8	8	8	8	8	8	8	8
4067361010_3358	5	8	8	8	8	8	8	8	8	8	8
4067361011_3358	5	8	8	8	8	8	8	8	8	8	8
4067361012_3358	5	8	8	8	8	8	8	8	8	8	8
40002_3361_CCV3	5	8	8	8	8	8	8	8	8	8	8
39996_3361_CCB3	5	8	8	8	8	8	8	8	8	8	8
4067361013_3358	5	8	8	8	8	8	8	8	8	8	8
4067361014_3358	5	8	8	8	8	8	8	8	8	8	8
4067361015_3358	5	8	8	8	8	8	8	8	8	8	8
4067361016_3358	5	8	8	8	8	8	8	8	8	8	8
4067361017_3358	5	8	8	8	8	8	8	8	8	8	8
4067361018_3358	5	8	8	8	8	8	8	8	8	8	8
4067361019_3358	5	8	8	8	8	8	8	8	8	8	8
Blank	5	8	8	8	8	8	8	8	8	8	8
686525_3359	5	8	8	8	8	8	8	8	8	8	8
686527_3359	5	8	8	8	8	8	8	8	8	8	8
40002_3361_CCV4	5	8	8	8	8	8	8	8	8	8	8
39996_3361_CCB4	5	8	8	8	8	8	8	8	8	8	8
686526_3359	5	8	8	8	8	8	8	8	8	8	8
686528_3359	5	8	8	8	8	8	8	8	8	8	8
4067362001_3359	5	8	8	8	8	8	8	8	8	8	8
686529_3359	5	8	8	8	8	8	8	8	8	8	8
686530_3359	5	8	8	8	8	8	8	8	8	8	8
688843_3359	5	8	8	8	8	8	8	8	8	8	8
4067362002_3359	5	8	8	8	8	8	8	8	8	8	8
688844_3359x5	5	8	8	8	8	8	8	8	8	8	8
4067362003_3359	5	8	8	8	8	8	8	8	8	8	8
4067362004_3359	5	8	8	8	8	8	8	8	8	8	8
40002_3361_CCV5	5	8	8	8	8	8	8	8	8	8	8
39996_3361_CCB5	5	8	8	8	8	8	8	8	8	8	8
4067362005_3359	5	8	8	8	8	8	8	8	8	8	8
4067362006_3359	5	8	8	8	8	8	8	8	8	8	8
4067362007_3359	5	8	8	8	8	8	8	8	8	8	8
4067362008_3359	5	8	8	8	8	8	8	8	8	8	8
4067362009_3359	5	8	8	8	8	8	8	8	8	8	8
4067362010_3359	5	8	8	8	8	8	8	8	8	8	8
4067362011_3359	5	8	8	8	8	8	8	8	8	8	8
4067362012_3359	5	8	8	8	8	8	8	8	8	8	8
4067362013_3359	5	8	8	8	8	8	8	8	8	8	8
4067362014_3359	5	8	8	8	8	8	8	8	8	8	8
40002_3361_CCV6	5	8	8	8	8	8	8	8	8	8	8
39996_3361_CCB6	5	8	8	8	8	8	8	8	8	8	8
4067362015_3359	5	8	8	8	8	8	8	8	8	8	8
4067362016_3359	5	8	8	8	8	8	8	8	8	8	8
4067362017_3359	5	8	8	8	8	8	8	8	8	8	8
4067362018_3359	5	8	8	8	8	8	8	8	8	8	8
Blank	5	8	8	8	8	8	8	8	8	8	8
686605_3360	5	8	8	8	8	8	8	8	8	8	8
686611_3360	5	8	8	8	8	8	8	8	8	8	8
686606_3360	5	8	8	8	8	8	8	8	8	8	8
686612_3360	5	8	8	8	8	8	8	8	8	8	8
4067620001_3360	5	8	8	8	8	8	8	8	8	8	8
40002_3361_CCV7	5	8	8	8	8	8	8	8	8	8	8
39996_3361_CCB7	5	8	8	8	8	8	8	8	8	8	8
686613_3360	5	8	8	8	8	8	8	8	8	8	8

686614_3360	5	8	8	8	8	8	8	8	8	8	8
688848_3360	5	8	8	8	8	8	8	8	8	8	8
4067620002_3360	5	8	8	8	8	8	8	8	8	8	8
688849_3360x5	5	8	8	8	8	8	8	8	8	8	8
4067620003_3360	5	8	8	8	8	8	8	8	8	8	8
4067620004_3360	5	8	8	8	8	8	8	8	8	8	8
4067620005_3360	5	8	8	8	8	8	8	8	8	8	8
4067620006_3360	5	8	8	8	8	8	8	8	8	8	8
4067620007_3360	5	8	8	8	8	8	8	8	8	8	8
40002_3361_CCV8	5	8	8	8	8	8	8	8	8	8	8
39996_3361_CCB8	5	8	8	8	8	8	8	8	8	8	8
4067620008_3360	5	8	8	8	8	8	8	8	8	8	8
4067620009_3360	5	8	8	8	8	8	8	8	8	8	8
4067620010_3360	5	8	8	8	8	8	8	8	8	8	8
4067365001_3360	5	8	8	8	8	8	8	8	8	8	8
4067365002_3360	5	8	8	8	8	8	8	8	8	8	8
4067365003_3360	5	8	8	8	8	8	8	8	8	8	8
4067365004_3360	5	8	8	8	8	8	8	8	8	8	8
4067365005_3360	5	8	8	8	8	8	8	8	8	8	8
4067365006_3360	5	8	8	8	8	8	8	8	8	8	8
4067365007_3360	5	8	8	8	8	8	8	8	8	8	8
40002_3361_CCV9	5	8	8	8	8	8	8	8	8	8	8
39996_3361_CCB9	5	8	8	8	8	8	8	8	8	8	8
Label	**Config**	**89Y**	**90Zr**	**95Mo**	**107Ag**	**111Cd**	**115In**	**118Sn**	**121Sb**	**137Ba**	**159Tb**
39996_3361_Cal0	5	8	8	8	8	8	8	8	8	8	8
39997_3361_Cal1	5	8	8	8	8	8	8	8	8	8	8
39998_3361_Cal2	5	8	8	8	8	8	8	8	8	8	8
39999_3361_Cal3	5	8	8	8	8	8	8	8	8	8	8
40000_3361_Cal4	5	8	8	8	8	8	8	8	8	8	8
40001_3361_Cal5	5	8	8	8	8	8	8	8	8	8	8
39693_3361_ICV	5	8	8	8	8	8	8	8	8	8	8
39996_3361_ICB	5	8	8	8	8	8	8	8	8	8	8
39997_3361_CRDL_A1	5	8	8	8	8	8	8	8	8	8	8
39998_3361_CRDL_B1	5	8	8	8	8	8	8	8	8	8	8
39698_3361_ICSA1	5	8	8	8	8	8	8	8	8	8	8
39699_3361_ICSAB1	5	8	8	8	8	8	8	8	8	8	8
40002_3361_CCV1	5	8	8	8	8	8	8	8	8	8	8
39996_3361_CCB1	5	8	8	8	8	8	8	8	8	8	8
686242_3358	5	8	8	8	8	8	8	8	8	8	8
686246_3358	5	8	8	8	8	8	8	8	8	8	8
686243_3358	5	8	8	8	8	8	8	8	8	8	8
686247_3358	5	8	8	8	8	8	8	8	8	8	8
4067361001_3358	5	8	8	8	8	8	8	8	8	8	8
686248_3358	5	8	8	8	8	8	8	8	8	8	8
686249_3358	5	8	8	8	8	8	8	8	8	8	8
688831_3358	5	8	8	8	8	8	8	8	8	8	8
4067361002_3358	5	8	8	8	8	8	8	8	8	8	8
688832_3358x5	5	8	8	8	8	8	8	8	8	8	8
40002_3361_CCV2	5	8	8	8	8	8	8	8	8	8	8
39996_3361_CCB2	5	8	8	8	8	8	8	8	8	8	8
4067361003_3358	5	8	8	8	8	8	8	8	8	8	8
4067361004_3358	5	8	8	8	8	8	8	8	8	8	8
4067361005_3358	5	8	8	8	8	8	8	8	8	8	8
4067361006_3358	5	8	8	8	8	8	8	8	8	8	8
4067361007_3358	5	8	8	8	8	8	8	8	8	8	8
4067361008_3358	5	8	8	8	8	8	8	8	8	8	8
4067361009_3358	5	8	8	8	8	8	8	8	8	8	8
4067361010_3358	5	8	8	8	8	8	8	8	8	8	8
4067361011_3358	5	8	8	8	8	8	8	8	8	8	8
4067361012_3358	5	8	8	8	8	8	8	8	8	8	8
40002_3361_CCV3	5	8	8	8	8	8	8	8	8	8	8
39996_3361_CCB3	5	8	8	8	8	8	8	8	8	8	8
4067361013_3358	5	8	8	8	8	8	8	8	8	8	8
4067361014_3358	5	8	8	8	8	8	8	8	8	8	8
4067361015_3358	5	8	8	8	8	8	8	8	8	8	8
4067361016_3358	5	8	8	8	8	8	8	8	8	8	8
4067361017_3358	5	8	8	8	8	8	8	8	8	8	8
4067361018_3358	5	8	8	8	8	8	8	8	8	8	8
4067361019_3358	5	8	8	8	8	8	8	8	8	8	8
Blank	5	8	8	8	8	8	8	8	8	8	8

686525_3359	5	8	8	8	8	8	8	8	8	8	8
686527_3359	5	8	8	8	8	8	8	8	8	8	8
40002_3361_CCV4	5	8	8	8	8	8	8	8	8	8	8
39996_3361_CCB4	5	8	8	8	8	8	8	8	8	8	8
686526_3359	5	8	8	8	8	8	8	8	8	8	8
686528_3359	5	8	8	8	8	8	8	8	8	8	8
4067362001_3359	5	8	8	8	8	8	8	8	8	8	8
686529_3359	5	8	8	8	8	8	8	8	8	8	8
686530_3359	5	8	8	8	8	8	8	8	8	8	8
688843_3359	5	8	8	8	8	8	8	8	8	8	8
4067362002_3359	5	8	8	8	8	8	8	8	8	8	8
688844_3359x5	5	8	8	8	8	8	8	8	8	8	8
4067362003_3359	5	8	8	8	8	8	8	8	8	8	8
4067362004_3359	5	8	8	8	8	8	8	8	8	8	8
40002_3361_CCV5	5	8	8	8	8	8	8	8	8	8	8
39996_3361_CCB5	5	8	8	8	8	8	8	8	8	8	8
4067362005_3359	5	8	8	8	8	8	8	8	8	8	8
4067362006_3359	5	8	8	8	8	8	8	8	8	8	8
4067362007_3359	5	8	8	8	8	8	8	8	8	8	8
4067362008_3359	5	8	8	8	8	8	8	8	8	8	8
4067362009_3359	5	8	8	8	8	8	8	8	8	8	8
4067362010_3359	5	8	8	8	8	8	8	8	8	8	8
4067362011_3359	5	8	8	8	8	8	8	8	8	8	8
4067362012_3359	5	8	8	8	8	8	8	8	8	8	8
4067362013_3359	5	8	8	8	8	8	8	8	8	8	8
4067362014_3359	5	8	8	8	8	8	8	8	8	8	8
40002_3361_CCV6	5	8	8	8	8	8	8	8	8	8	8
39996_3361_CCB6	5	8	8	8	8	8	8	8	8	8	8
4067362015_3359	5	8	8	8	8	8	8	8	8	8	8
4067362016_3359	5	8	8	8	8	8	8	8	8	8	8
4067362017_3359	5	8	8	8	8	8	8	8	8	8	8
4067362018_3359	5	8	8	8	8	8	8	8	8	8	8
Blank	5	8	8	8	8	8	8	8	8	8	8
686605_3360	5	8	8	8	8	8	8	8	8	8	8
686611_3360	5	8	8	8	8	8	8	8	8	8	8
686606_3360	5	8	8	8	8	8	8	8	8	8	8
686612_3360	5	8	8	8	8	8	8	8	8	8	8
4067620001_3360	5	8	8	8	8	8	8	8	8	8	8
40002_3361_CCV7	5	8	8	8	8	8	8	8	8	8	8
39996_3361_CCB7	5	8	8	8	8	8	8	8	8	8	8
686613_3360	5	8	8	8	8	8	8	8	8	8	8
686614_3360	5	8	8	8	8	8	8	8	8	8	8
688848_3360	5	8	8	8	8	8	8	8	8	8	8
4067620002_3360	5	8	8	8	8	8	8	8	8	8	8
688849_3360x5	5	8	8	8	8	8	8	8	8	8	8
4067620003_3360	5	8	8	8	8	8	8	8	8	8	8
4067620004_3360	5	8	8	8	8	8	8	8	8	8	8
4067620005_3360	5	8	8	8	8	8	8	8	8	8	8
4067620006_3360	5	8	8	8	8	8	8	8	8	8	8
4067620007_3360	5	8	8	8	8	8	8	8	8	8	8
40002_3361_CCV8	5	8	8	8	8	8	8	8	8	8	8
39996_3361_CCB8	5	8	8	8	8	8	8	8	8	8	8
4067620008_3360	5	8	8	8	8	8	8	8	8	8	8
4067620009_3360	5	8	8	8	8	8	8	8	8	8	8
4067620010_3360	5	8	8	8	8	8	8	8	8	8	8
4067365001_3360	5	8	8	8	8	8	8	8	8	8	8
4067365002_3360	5	8	8	8	8	8	8	8	8	8	8
4067365003_3360	5	8	8	8	8	8	8	8	8	8	8
4067365004_3360	5	8	8	8	8	8	8	8	8	8	8
4067365005_3360	5	8	8	8	8	8	8	8	8	8	8
4067365006_3360	5	8	8	8	8	8	8	8	8	8	8
4067365007_3360	5	8	8	8	8	8	8	8	8	8	8
40002_3361_CCV9	5	8	8	8	8	8	8	8	8	8	8
39996_3361_CCB9	5	8	8	8	8	8	8	8	8	8	8
Label	**Config**	**184W**	**201Hg**	**205Tl**	**206Pb**	**207Pb**	**208Pb**	**209Bi**	**238U**		
39996_3361_Cal0	5	8	8	8	8	8	8	8	8		
39997_3361_Cal1	5	8	8	8	8	8	8	8	8		
39998_3361_Cal2	5	8	8	8	8	8	8	8	8		
39999_3361_Cal3	5	8	8	8	8	8	8	8	8		
40000_3361_Cal4	5	8	8	8	8	8	8	8	8		

40001_3361_Cal5	5	8	8	8	8	8	8	8	8
39693_3361_ICV	5	8	8	8	8	8	8	8	8
39996_3361_ICB	5	8	8	8	8	8	8	8	8
39997_3361_CRDL_A1	5	8	8	8	8	8	8	8	8
39998_3361_CRDL_B1	5	8	8	8	8	8	8	8	8
39698_3361_ICSA1	5	8	8	8	8	8	8	8	8
39699_3361_ICSAB1	5	8	8	8	8	8	8	8	8
40002_3361_CCV1	5	8	8	8	8	8	8	8	8
39996_3361_CCB1	5	8	8	8	8	8	8	8	8
686242_3358	5	8	8	8	8	8	8	8	8
686246_3358	5	8	8	8	8	8	8	8	8
686243_3358	5	8	8	8	8	8	8	8	8
686247_3358	5	8	8	8	8	8	8	8	8
4067361001_3358	5	8	8	8	8	8	8	8	8
686248_3358	5	8	8	8	8	8	8	8	8
686249_3358	5	8	8	8	8	8	8	8	8
688831_3358	5	8	8	8	8	8	8	8	8
4067361002_3358	5	8	8	8	8	8	8	8	8
688832_3358x5	5	8	8	8	8	8	8	8	8
40002_3361_CCV2	5	8	8	8	8	8	8	8	8
39996_3361_CCB2	5	8	8	8	8	8	8	8	8
4067361003_3358	5	8	8	8	8	8	8	8	8
4067361004_3358	5	8	8	8	8	8	8	8	8
4067361005_3358	5	8	8	8	8	8	8	8	8
4067361006_3358	5	8	8	8	8	8	8	8	8
4067361007_3358	5	8	8	8	8	8	8	8	8
4067361008_3358	5	8	8	8	8	8	8	8	8
4067361009_3358	5	8	8	8	8	8	8	8	8
4067361010_3358	5	8	8	8	8	8	8	8	8
4067361011_3358	5	8	8	8	8	8	8	8	8
4067361012_3358	5	8	8	8	8	8	8	8	8
40002_3361_CCV3	5	8	8	8	8	8	8	8	8
39996_3361_CCB3	5	8	8	8	8	8	8	8	8
4067361013_3358	5	8	8	8	8	8	8	8	8
4067361014_3358	5	8	8	8	8	8	8	8	8
4067361015_3358	5	8	8	8	8	8	8	8	8
4067361016_3358	5	8	8	8	8	8	8	8	8
4067361017_3358	5	8	8	8	8	8	8	8	8
4067361018_3358	5	8	8	8	8	8	8	8	8
4067361019_3358	5	8	8	8	8	8	8	8	8
Blank	5	8	8	8	8	8	8	8	8
686525_3359	5	8	8	8	8	8	8	8	8
686527_3359	5	8	8	8	8	8	8	8	8
40002_3361_CCV4	5	8	8	8	8	8	8	8	8
39996_3361_CCB4	5	8	8	8	8	8	8	8	8
686526_3359	5	8	8	8	8	8	8	8	8
686528_3359	5	8	8	8	8	8	8	8	8
4067362001_3359	5	8	8	8	8	8	8	8	8
686529_3359	5	8	8	8	8	8	8	8	8
686530_3359	5	8	8	8	8	8	8	8	8
688843_3359	5	8	8	8	8	8	8	8	8
4067362002_3359	5	8	8	8	8	8	8	8	8
688844_3359x5	5	8	8	8	8	8	8	8	8
4067362003_3359	5	8	8	8	8	8	8	8	8
4067362004_3359	5	8	8	8	8	8	8	8	8
40002_3361_CCV5	5	8	8	8	8	8	8	8	8
39996_3361_CCB5	5	8	8	8	8	8	8	8	8
4067362005_3359	5	8	8	8	8	8	8	8	8
4067362006_3359	5	8	8	8	8	8	8	8	8
4067362007_3359	5	8	8	8	8	8	8	8	8
4067362008_3359	5	8	8	8	8	8	8	8	8
4067362009_3359	5	8	8	8	8	8	8	8	8
4067362010_3359	5	8	8	8	8	8	8	8	8
4067362011_3359	5	8	8	8	8	8	8	8	8
4067362012_3359	5	8	8	8	8	8	8	8	8
4067362013_3359	5	8	8	8	8	8	8	8	8
4067362014_3359	5	8	8	8	8	8	8	8	8
40002_3361_CCV6	5	8	8	8	8	8	8	8	8
39996_3361_CCB6	5	8	8	8	8	8	8	8	8
4067362015_3359	5	8	8	8	8	8	8	8	8

4067362016_3359	5	8	8	8	8	8	8	8	8
4067362017_3359	5	8	8	8	8	8	8	8	8
4067362018_3359	5	8	8	8	8	8	8	8	8
Blank	5	8	8	8	8	8	8	8	8
686605_3360	5	8	8	8	8	8	8	8	8
686611_3360	5	8	8	8	8	8	8	8	8
686606_3360	5	8	8	8	8	8	8	8	8
686612_3360	5	8	8	8	8	8	8	8	8
4067620001_3360	5	8	8	8	8	8	8	8	8
40002_3361_CCV7	5	8	8	8	8	8	8	8	8
39996_3361_CCB7	5	8	8	8	8	8	8	8	8
686613_3360	5	8	8	8	8	8	8	8	8
686614_3360	5	8	8	8	8	8	8	8	8
688848_3360	5	8	8	8	8	8	8	8	8
4067620002_3360	5	8	8	8	8	8	8	8	8
688849_3360x5	5	8	8	8	8	8	8	8	8
4067620003_3360	5	8	8	8	8	8	8	8	8
4067620004_3360	5	8	8	8	8	8	8	8	8
4067620005_3360	5	8	8	8	8	8	8	8	8
4067620006_3360	5	8	8	8	8	8	8	8	8
4067620007_3360	5	8	8	8	8	8	8	8	8
40002_3361_CCV8	5	8	8	8	8	8	8	8	8
39996_3361_CCB8	5	8	8	8	8	8	8	8	8
4067620008_3360	5	8	8	8	8	8	8	8	8
4067620009_3360	5	8	8	8	8	8	8	8	8
4067620010_3360	5	8	8	8	8	8	8	8	8
4067365001_3360	5	8	8	8	8	8	8	8	8
4067365002_3360	5	8	8	8	8	8	8	8	8
4067365003_3360	5	8	8	8	8	8	8	8	8
4067365004_3360	5	8	8	8	8	8	8	8	8
4067365005_3360	5	8	8	8	8	8	8	8	8
4067365006_3360	5	8	8	8	8	8	8	8	8
4067365007_3360	5	8	8	8	8	8	8	8	8
40002_3361_CCV9	5	8	8	8	8	8	8	8	8
39996_3361_CCB9	5	8	8	8	8	8	8	8	8

Configuration 5 - CCT 2

Minimum uptake 0
Maximum uptake 25
Minimum wash 0
Maximum wash 120

ACL Script

Title Fast uptake wash
Description Data acquisition using the peri pump at high speed for the washes and uptakes
Author Thermo Elemental Software
Version 131072

Settings sets

Id	Description	Extraction	Lens 1	Lens 2	Lens 3	Pole Bias	Sampling Depth	Horizontal	Vertical	Cool	Auxiliary
7	CCT Mode 10082012	-98.00	-1100.00	-80.00	-195.30	-9.00	145.00	48.00	282.00	13.00	0.70
8	CCTKED Mode 10082012	-98.00	-1100.00	-80.00	-195.30	-17.00	145.00	48.00	282.00	13.00	0.70

Id	Description	Nebuliser	Forward power	D1	Focus	CCT Gas 1	CCT Gas 2	D2	DA	Hexapole Bias
7	CCT Mode 10082012	0.81	1400.00	-43.90	10.80	0.00	0.50	-143.00	-37.60	-4.00
8	CCTKED Mode 10082012	0.81	1400.00	-56.50	-5.30	0.00	3.80	-143.00	-37.60	-20.00

Fully Quantitative Concentrations

Id	Label	Li	Be	B	Na	Mg	Al	Si	P	K	Ca
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	39996_3361_Cal0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	39997_3361_Cal1	1.000	1.000		250.000	250.000	250.000	50.000	50.000	250.000	250.000
3	39998_3361_Cal2	5.000	5.000	5.000	500.000	500.000	500.000	250.000	250.000	500.000	500.000

4	39999_3361_Cal3	50.000	50.000	50.000	2500.000	2500.000	2500.000	2500.000	2500.000	2500.000	2500.000
5	40000_3361_Cal4	250.000	250.000	250.000	12500.000	12500.000	12500.000	12500.000	12500.000	12500.000	12500.000
6	40001_3361_Cal5	500.000	500.000	500.000	25000.000	25000.000	25000.000	25000.000	25000.000	25000.000	25000.000
Id	Label	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	As
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	39996_3361_Cal0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	39997_3361_Cal1	1.000	1.000	1.000	1.000	250.000	1.000	1.000	1.000		1.000
3	39998_3361_Cal2	5.000	5.000	5.000	5.000	500.000	5.000	5.000	5.000	5.000	5.000
4	39999_3361_Cal3	50.000	50.000	50.000	50.000	2500.000	50.000	50.000	50.000	50.000	50.000
5	40000_3361_Cal4	250.000	250.000	250.000	250.000	12500.000	250.000	250.000	250.000	250.000	250.000
6	40001_3361_Cal5	500.000	500.000	500.000	500.000	25000.000	500.000	500.000	500.000	500.000	500.000
Id	Label	Se	Sr	Zr	Mo	Ag	Cd	Sn	Sb	Ba	Hg
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	39996_3361_Cal0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	39997_3361_Cal1	1.000	1.000	1.000	1.000	0.500	1.000	1.000	1.000	1.000	0.200
3	39998_3361_Cal2	5.000	5.000	5.000	5.000	2.500	5.000	5.000	5.000	5.000	0.500
4	39999_3361_Cal3	50.000	50.000	50.000	50.000	25.000	50.000	50.000	50.000	50.000	1.000
5	40000_3361_Cal4	250.000	250.000	250.000	250.000	125.000	250.000	250.000	250.000	250.000	10.000
6	40001_3361_Cal5	500.000	500.000	500.000	500.000	250.000	500.000	500.000	500.000	500.000	25.000
Id	Label	Tl	Pb	U							
		ppb	ppb	ppb							
1	39996_3361_Cal0	0.000	0.000	0.000							
2	39997_3361_Cal1	1.000	1.000	1.000							
3	39998_3361_Cal2	5.000	5.000	5.000							
4	39999_3361_Cal3	50.000	50.000	50.000							
5	40000_3361_Cal4	250.000	250.000	250.000							
6	40001_3361_Cal5	500.000	500.000	500.000							

Calibration Technique

Use External Drift Correction - No
Calibrate by - Isotope

Symbol	Interference Correction	RSF	Calibration Method	Line Fit	Weighting	Forcing	Use for Semi-Quant	Max Error	Minimum Correlation
7Li	Yes	0.36	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
9Be	Yes	0.07	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
10B	Yes	0.13	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
23Na	Yes	0.55	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
25Mg	Yes	0.49	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
27Al	Yes	0.45	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
28Si	Yes	0.20	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
31P	Yes	0.02	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
34S	Yes	0.04	Semi-Quantified				No		
35Cl	Yes	0.00	Semi-Quantified				No		
39K	Yes	0.38	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
43Ca	Yes	0.81	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
45Sc-KED	Yes	0.60	None				No		
47Ti	Yes	0.38	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
51V	Yes	0.39	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
52Cr	Yes	0.46	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
55Mn	Yes	0.70	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
54Fe	Yes	0.60	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
59Co	Yes	0.42	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
60Ni	Yes	0.33	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
63Cu	Yes	0.33	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
66Zn	Yes	0.35	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
72Ge	Yes	0.35	None				No		
73Ge	Yes	0.35	None				No		
75As	Yes	0.05	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
78Se	Yes	0.07	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
83Kr	Yes	0.00	None				No		
88Sr	Yes	0.66	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
89Y	Yes	0.74	None				No		
90Zr	Yes	0.61	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
95Mo	Yes	0.63	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
107Ag	Yes	0.45	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
111Cd	Yes	0.55	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
115In	Yes	0.77	None				No		
118Sn	Yes	0.69	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
121Sb	Yes	0.34	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
137Ba	Yes	0.53	Fully-Quantified	Linear	Absolute SD	None	Yes		0.998000
159Tb	Yes	0.90	None				No		
184W	Yes	0.71	Semi-Quantified				No		

201Hg	Yes	0.06	Fully-Quantified	Linear	Absolute SD	None	Yes	0.998000
206Pb	Yes	0.55	Fully-Quantified	Linear	Absolute SD	None	Yes	0.998000
207Pb	Yes	0.55	Fully-Quantified	Linear	Absolute SD	None	Yes	0.998000
208Pb	Yes	0.55	Fully-Quantified	Linear	Absolute SD	None	Yes	0.998000
209Bi	Yes	0.45	None				No	
238U	Yes	0.65	Fully-Quantified	Linear	Absolute SD	None	Yes	0.998000
205Tl	Yes	0.58	Fully-Quantified	Linear	Absolute SD	None	Yes	0.998000
53Cl O	Yes		Semi-Quantified				No	
45Sc-CCT	Yes	0.60	None				No	

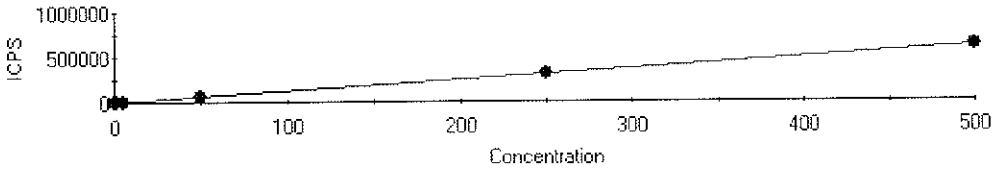
Sample List

No	Label	Type	Weight	Rack	Row	Col	Height
1	39996_3361_Cal0	Fully Quant Standard	1.000	0	1	8	144
2	39997_3361_Cal1	Fully Quant Standard	1.000	0	1	2	144
3	39998_3361_Cal2	Fully Quant Standard	1.000	0	1	3	144
4	39999_3361_Cal3	Fully Quant Standard	1.000	0	1	4	144
5	40000_3361_Cal4	Fully Quant Standard	1.000	0	1	5	144
6	40001_3361_Cal5	Fully Quant Standard	1.000	0	1	6	144
7	39693_3361_ICV	Unknown	1.000	1	1	1	144
8	39996_3361_ICB	Unknown	1.000	0	1	8	144
9	39997_3361_CRDL_A1	Unknown	1.000	0	1	2	144
10	39998_3361_CRDL_B1	Unknown	1.000	0	1	3	144
11	39698_3361_ICSA1	Unknown	1.000	1	1	2	144
12	39699_3361_ICSAB1	Unknown	1.000	1	1	3	144
13	40002_3361_CCV1	Unknown	1.000	0	1	7	144
14	39996_3361_CCB1	Unknown	1.000	0	1	1	144
15	686242_3358	Unknown	1.000	1	2	1	144
16	686246_3358	Unknown	1.000	1	2	2	144
17	686243_3358	Unknown	1.000	1	2	3	144
18	686247_3358	Unknown	1.000	1	2	4	144
19	4067361001_3358	Unknown	1.000	1	2	5	144
20	686248_3358	Unknown	1.000	1	2	6	144
21	686249_3358	Unknown	1.000	1	2	7	144
22	688831_3358	Unknown	1.000	1	2	8	144
23	4067361002_3358	Unknown	1.000	1	2	9	144
24	688832_3358x5	Unknown	1.000	1	2	10	144
25	40002_3361_CCV2	Unknown	1.000	0	1	7	144
26	39996_3361_CCB2	Unknown	1.000	0	1	1	144
27	4067361003_3358	Unknown	1.000	1	2	11	144
28	4067361004_3358	Unknown	1.000	1	2	12	144
29	4067361005_3358	Unknown	1.000	1	3	1	144
30	4067361006_3358	Unknown	1.000	1	3	2	144
31	4067361007_3358	Unknown	1.000	1	3	3	144
32	4067361008_3358	Unknown	1.000	1	3	4	144
33	4067361009_3358	Unknown	1.000	1	3	5	144
34	4067361010_3358	Unknown	1.000	1	3	6	144
35	4067361011_3358	Unknown	1.000	1	3	7	144
36	4067361012_3358	Unknown	1.000	1	3	8	144
37	40002_3361_CCV3	Unknown	1.000	0	1	7	144
38	39996_3361_CCB3	Unknown	1.000	0	1	1	144
39	4067361013_3358	Unknown	1.000	1	3	9	144
40	4067361014_3358	Unknown	1.000	1	3	10	144
41	4067361015_3358	Unknown	1.000	1	3	11	144
42	4067361016_3358	Unknown	1.000	1	3	12	144
43	4067361017_3358	Unknown	1.000	1	4	1	144
44	4067361018_3358	Unknown	1.000	1	4	2	144
45	4067361019_3358	Unknown	1.000	1	4	3	144
46	Blank	Unknown	1.000	0	1	8	144
47	686525_3359	Unknown	1.000	2	1	1	144
48	686527_3359	Unknown	1.000	2	1	2	144
49	40002_3361_CCV4	Unknown	1.000	0	1	7	144
50	39996_3361_CCB4	Unknown	1.000	0	1	1	144
51	686526_3359	Unknown	1.000	2	1	3	144
52	686528_3359	Unknown	1.000	2	1	4	144
53	4067362001_3359	Unknown	1.000	2	1	5	144
54	686529_3359	Unknown	1.000	2	1	6	144
55	686530_3359	Unknown	1.000	2	1	7	144
56	688843_3359	Unknown	1.000	2	1	8	144
57	4067362002_3359	Unknown	1.000	2	1	9	144
58	688844_3359x5	Unknown	1.000	2	1	10	144
59	4067362003_3359	Unknown	1.000	2	1	11	144
60	4067362004_3359	Unknown	1.000	2	1	12	144
61	40002_3361_CCV5	Unknown	1.000	0	1	7	144
62	39996_3361_CCB5	Unknown	1.000	0	1	1	144
63	4067362005_3359	Unknown	1.000	2	2	1	144
64	4067362006_3359	Unknown	1.000	2	2	2	144

65	4067362007_3359	Unknown	1.000	2	2	3	144
66	4067362008_3359	Unknown	1.000	2	2	4	144
67	4067362009_3359	Unknown	1.000	2	2	5	144
68	4067362010_3359	Unknown	1.000	2	2	6	144
69	4067362011_3359	Unknown	1.000	2	2	7	144
70	4067362012_3359	Unknown	1.000	2	2	8	144
71	4067362013_3359	Unknown	1.000	2	2	9	144
72	4067362014_3359	Unknown	1.000	2	2	10	144
73	40002_3361_CCV6	Unknown	1.000	0	1	7	144
74	39996_3361_CCB6	Unknown	1.000	0	1	1	144
75	4067362015_3359	Unknown	1.000	2	2	11	144
76	4067362016_3359	Unknown	1.000	2	2	12	144
77	4067362017_3359	Unknown	1.000	2	3	1	144
78	4067362018_3359	Unknown	1.000	2	3	2	144
79	Blank	Unknown	1.000	0	1	8	144
80	686605_3360	Unknown	1.000	2	3	12	144
81	686611_3360	Unknown	1.000	2	4	1	144
82	686606_3360	Unknown	1.000	2	4	2	144
83	686612_3360	Unknown	1.000	2	4	3	144
84	4067620001_3360	Unknown	1.000	2	4	4	144
85	40002_3361_CCV7	Unknown	1.000	0	1	7	144
86	39996_3361_CCB7	Unknown	1.000	0	1	1	144
87	686613_3360	Unknown	1.000	2	4	5	144
88	686614_3360	Unknown	1.000	2	4	6	144
89	688848_3360	Unknown	1.000	2	4	7	144
90	4067620002_3360	Unknown	1.000	2	4	8	144
91	688849_3360x5	Unknown	1.000	2	4	9	144
92	4067620003_3360	Unknown	1.000	2	4	10	144
93	4067620004_3360	Unknown	1.000	2	4	11	144
94	4067620005_3360	Unknown	1.000	2	4	12	144
95	4067620006_3360	Unknown	1.000	2	5	1	144
96	4067620007_3360	Unknown	1.000	2	5	2	144
97	40002_3361_CCV8	Unknown	1.000	0	1	7	144
98	39996_3361_CCB8	Unknown	1.000	0	1	1	144
99	4067620008_3360	Unknown	1.000	2	5	3	144
100	4067620009_3360	Unknown	1.000	2	5	4	144
101	4067620010_3360	Unknown	1.000	2	5	5	144
102	4067365001_3360	Unknown	1.000	2	5	6	144
103	4067365002_3360	Unknown	1.000	2	5	7	144
104	4067365003_3360	Unknown	1.000	2	5	8	144
105	4067365004_3360	Unknown	1.000	2	5	9	144
106	4067365005_3360	Unknown	1.000	2	5	10	144
107	4067365006_3360	Unknown	1.000	2	5	11	144
108	4067365007_3360	Unknown	1.000	2	5	12	144
109	40002_3361_CCV9	Unknown	1.000	0	1	7	144
110	39996_3361_CCB9	Unknown	1.000	0	1	1	144

Fully Quant Calibration

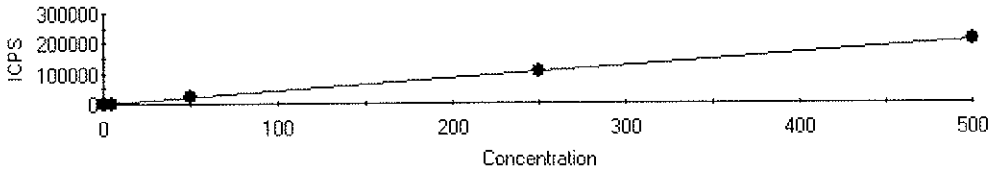
7Li FQ Block 1



Intercept CPS=34.132502 Intercept Conc=0.028168
Sensitivity=1211.728790 Correlation Coeff=0.999943

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	0.003	0.003	37.74	0.00
39997_3361_Cal1	1.000	0.938	0.062	1171.18	6.16
39998_3361_Cal2	5.000	4.972	0.028	6058.54	0.57
39999_3361_Cal3	50.000	50.528	0.528	61260.75	1.06
40000_3361_Cal4	250.000	250.054	0.054	303031.26	0.02
40001_3361_Cal5	500.000	511.575	11.575	619924.87	2.32

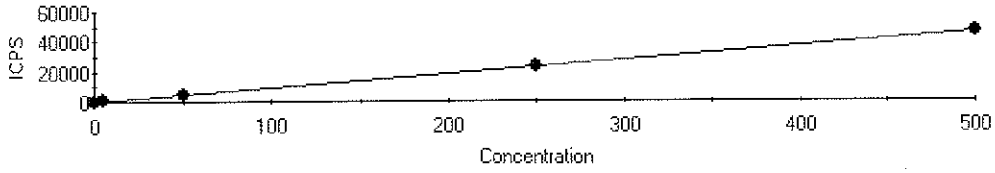
9Be FQ Block 1



Intercept CPS=13.904888 Intercept Conc=0.033062
Sensitivity=420.575076 Correlation Coeff=0.999973

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	0.000	0.000	14.06	0.00
39997_3361_Cal1	1.000	0.962	0.038	418.43	3.82
39998_3361_Cal2	5.000	5.112	0.112	2164.08	2.25
39999_3361_Cal3	50.000	51.096	1.096	21503.53	2.19
40000_3361_Cal4	250.000	249.471	0.529	104935.25	0.21
40001_3361_Cal5	500.000	491.771	8.229	206840.37	1.65

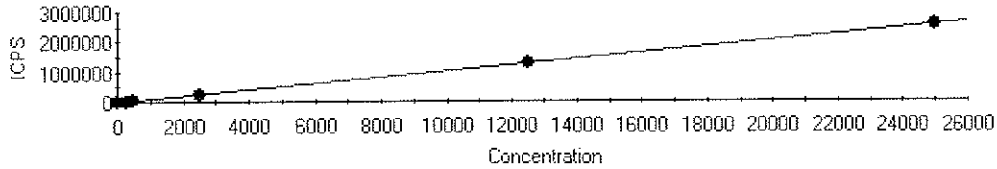
10B FQ Block 1



Intercept CPS=177.387133 Intercept Conc=1.935016
Sensitivity=91.672183 Correlation Coeff=0.999989

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	-0.361	0.361	144.34	0.00
39998_3361_Cal2	5.000	5.320	0.320	665.04	6.39
39999_3361_Cal3	50.000	50.405	0.405	4798.16	0.81
40000_3361_Cal4	250.000	247.498	2.502	22866.07	1.00
40001_3361_Cal5	500.000	499.128	0.872	45933.54	0.17

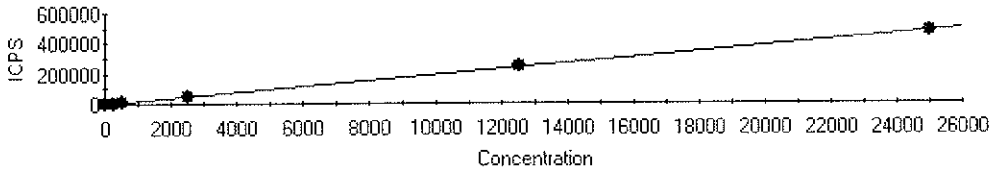
23Na FQ Block 1



Intercept CPS=2193.968525 Intercept Conc=21.457115
Sensitivity=102.248997 Correlation Coeff=0.999958

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	-0.068	0.068	2186.98	0.00
39997_3361_Cal1	250.000	251.579	1.579	27917.70	0.63
39998_3361_Cal2	500.000	503.702	3.702	53696.98	0.74
39999_3361_Cal3	2500.000	2446.953	53.047	252392.48	2.12
40000_3361_Cal4	12500.000	12140.761	359.239	1243574.62	2.87
40001_3361_Cal5	25000.000	24746.035	253.965	2532451.21	1.02

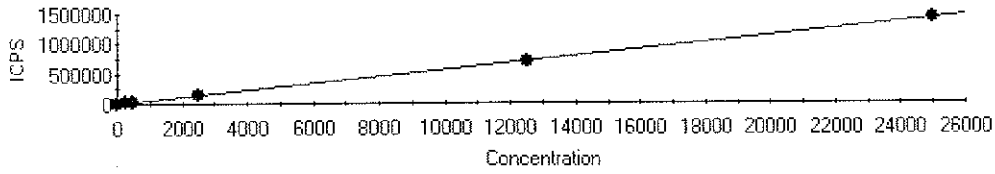
25Mg FQ Block 1



Intercept CPS=83.585294 Intercept Conc=4.360883
Sensitivity=19.167056 Correlation Coeff=0.999991

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	-1.578	1.578	53.34	0.00
39997_3361_Cal1	250.000	252.448	2.448	4922.27	0.98
39998_3361_Cal2	500.000	515.875	15.875	9971.38	3.17
39999_3361_Cal3	2500.000	2486.094	13.906	47734.69	0.56
40000_3361_Cal4	12500.000	12368.036	131.964	237142.43	1.06
40001_3361_Cal5	25000.000	24514.372	485.628	469951.93	1.94

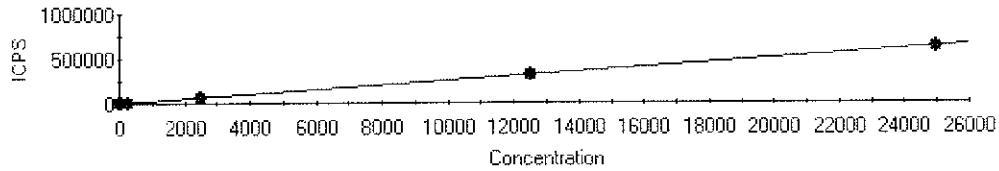
27Al FQ Block 1



Intercept CPS=334.481463 Intercept Conc=5.868350
Sensitivity=56.997534 Correlation Coeff=0.999999

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	-0.750	0.750	291.73	0.00
39997_3361_Cal1	250.000	248.388	1.612	14492.00	0.64
39998_3361_Cal2	500.000	510.859	10.859	29452.20	2.17
39999_3361_Cal3	2500.000	2473.724	26.276	141330.67	1.05
40000_3361_Cal4	12500.000	12310.493	189.507	702002.22	1.52
40001_3361_Cal5	25000.000	24693.071	306.929	1407778.66	1.23

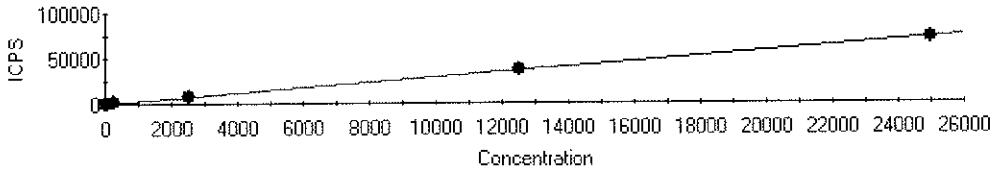
28Si FQ Block 1



Intercept CPS=441.569834 Intercept Conc=17.329169
Sensitivity=25.481305 Correlation Coeff=0.999894

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	-0.872	0.872	419.36	0.00
39997_3361_Cal1	50.000	105.785	55.785	3137.12	111.57
39998_3361_Cal2	250.000	267.565	17.565	7259.48	7.03
39999_3361_Cal3	2500.000	2556.853	56.853	65593.53	2.27
40000_3361_Cal4	12500.000	12345.224	154.776	315013.99	1.24
40001_3361_Cal5	25000.000	23955.519	1044.481	610859.45	4.18

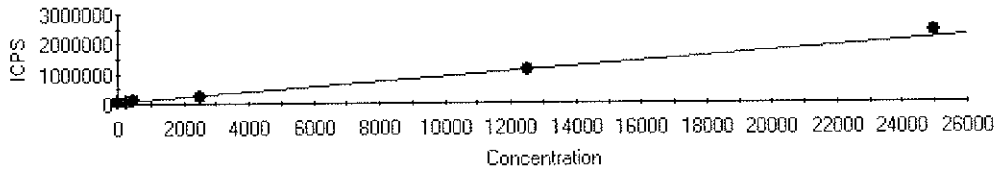
31P FQ Block 1



Intercept CPS=204.470330 Intercept Conc=71.570304
Sensitivity=2.856916 Correlation Coeff=0.999960

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	-3.615	3.615	194.14	0.00
39997_3361_Cal1	50.000	42.374	7.626	325.53	15.25
39998_3361_Cal2	250.000	271.808	21.808	981.00	8.72
39999_3361_Cal3	2500.000	2551.526	51.526	7493.97	2.06
40000_3361_Cal4	12500.000	12669.861	169.861	36401.20	1.36
40001_3361_Cal5	25000.000	24873.385	126.615	71265.64	0.51

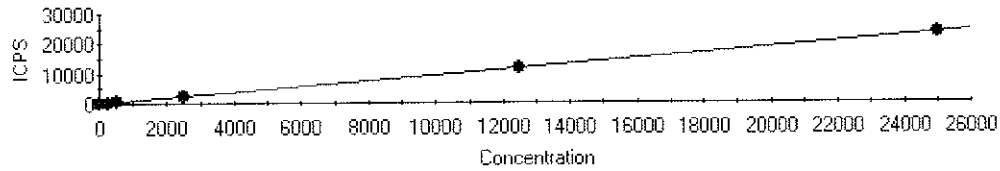
39K FQ Block 1



Intercept CPS=51175.827629 Intercept Conc=600.720187
Sensitivity=85.190790 Correlation Coeff=0.999385

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	8.787	8.787	51924.38	0.00
39997_3361_Cal1	250.000	259.214	9.214	73258.50	3.69
39998_3361_Cal2	500.000	487.773	12.227	92729.58	2.45
39999_3361_Cal3	2500.000	2410.164	89.836	256499.61	3.59
40000_3361_Cal4	12500.000	12473.893	26.107	1113836.64	0.21
40001_3361_Cal5	25000.000	26901.444	1901.444	2342931.13	7.61

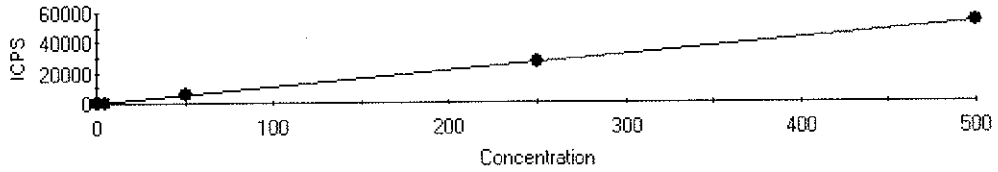
43Ca FQ Block 1



Intercept CPS=12.119015 Intercept Conc=12.971623
Sensitivity=0.934271 Correlation Coeff=0.999998

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	-0.734	0.734	11.43	0.00
39997_3361_Cal1	250.000	255.944	5.944	251.24	2.38
39998_3361_Cal2	500.000	511.778	11.778	490.26	2.36
39999_3361_Cal3	2500.000	2519.533	19.533	2366.05	0.78
40000_3361_Cal4	12500.000	12501.255	1.255	11691.68	0.01
40001_3361_Cal5	25000.000	24905.818	94.182	23280.91	0.38

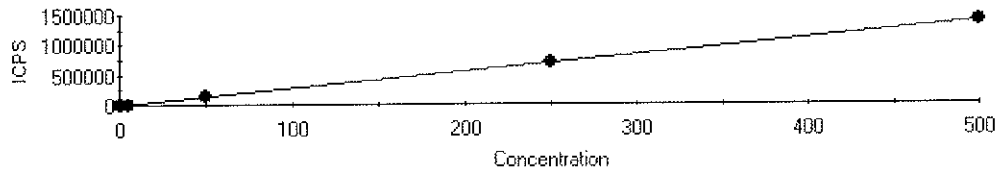
47Ti FQ Block 1



Intercept CPS=17.153420 Intercept Conc=0.161410
Sensitivity=106.272243 Correlation Coeff=0.999994

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	-0.008	0.008	16.28	0.00
39997_3361_Cal1	1.000	1.028	0.028	126.35	2.75
39998_3361_Cal2	5.000	5.100	0.100	559.17	2.01
39999_3361_Cal3	50.000	49.869	0.131	5316.89	0.26
40000_3361_Cal4	250.000	250.368	0.368	26624.32	0.15
40001_3361_Cal5	500.000	497.001	2.999	52834.56	0.60

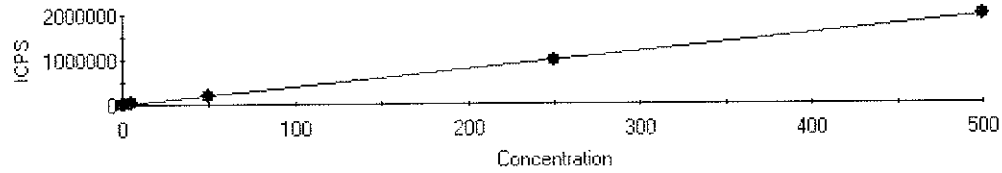
51V FQ Block 1



Intercept CPS=96.209194 Intercept Conc=0.034630
Sensitivity=2778.183686 Correlation Coeff=0.999995

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	0.126	0.126	446.74	0.00
39997_3361_Cal1	1.000	1.048	0.048	3007.18	4.78
39998_3361_Cal2	5.000	5.020	0.020	14043.03	0.40
39999_3361_Cal3	50.000	49.977	0.023	138942.43	0.05
40000_3361_Cal4	250.000	249.416	0.584	693019.22	0.23
40001_3361_Cal5	500.000	502.129	2.129	1395103.85	0.43

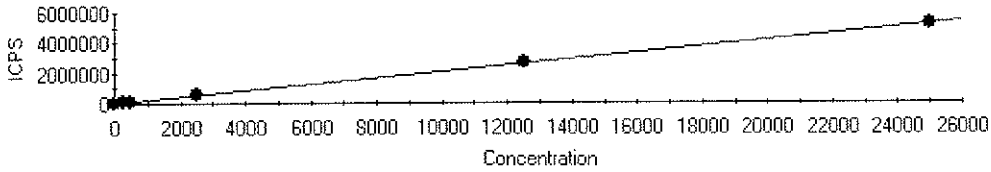
52Cr FQ Block 1



Intercept CPS=331.249442 Intercept Conc=0.084546
Sensitivity=3917.964779 Correlation Coeff=0.999998

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	-0.002	0.002	325.02	0.00
39997_3361_Cal1	1.000	1.035	0.035	4386.08	3.49
39998_3361_Cal2	5.000	4.954	0.046	19742.76	0.91
39999_3361_Cal3	50.000	49.841	0.159	195606.48	0.32
40000_3361_Cal4	250.000	249.884	0.116	979369.77	0.05
40001_3361_Cal5	500.000	501.737	1.737	1966120.48	0.35

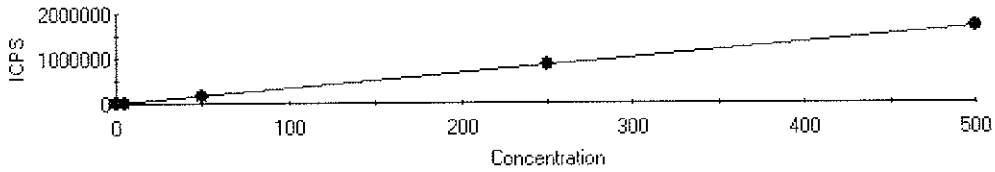
54Fe FQ Block 1



Intercept CPS=1871.895152 Intercept Conc=8.969731
Sensitivity=208.690221 Correlation Coeff=0.999904

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	-0.420	0.420	1784.24	0.00
39997_3361_Cal1	250.000	281.041	31.041	60522.40	12.42
39998_3361_Cal2	500.000	565.409	65.409	119867.13	13.08
39999_3361_Cal3	2500.000	2808.881	308.881	588057.92	12.36
40000_3361_Cal4	12500.000	12627.627	127.627	2637134.17	1.02
40001_3361_Cal5	25000.000	24777.460	222.540	5172685.48	0.89

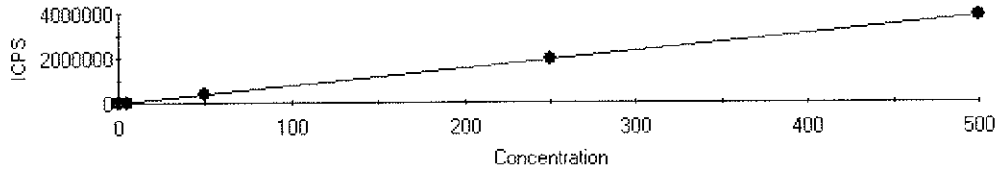
55Mn FQ Block 1



Intercept CPS=100.720819 Intercept Conc=0.029552
Sensitivity=3408.239989 Correlation Coeff=1.000000

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	0.000	0.000	100.73	0.00
39997_3361_Cal1	1.000	1.005	0.005	3525.77	0.49
39998_3361_Cal2	5.000	4.961	0.039	17009.42	0.78
39999_3361_Cal3	50.000	49.895	0.105	170153.26	0.21
40000_3361_Cal4	250.000	250.312	0.312	853224.54	0.12
40001_3361_Cal5	500.000	501.245	1.245	1708464.86	0.25

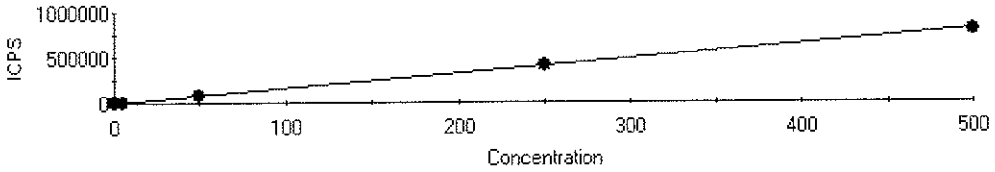
59Co FQ Block 1



Intercept CPS=94.032458 Intercept Conc=0.012347
Sensitivity=7616.000252 Correlation Coeff=0.999998

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	0.000	0.000	95.55	0.00
39997_3361_Cal1	1.000	0.990	0.010	7635.89	0.97
39998_3361_Cal2	5.000	4.937	0.063	37692.91	1.26
39999_3361_Cal3	50.000	49.598	0.402	377835.96	0.80
40000_3361_Cal4	250.000	250.931	0.931	1911181.91	0.37
40001_3361_Cal5	500.000	500.174	0.174	3809421.04	0.03

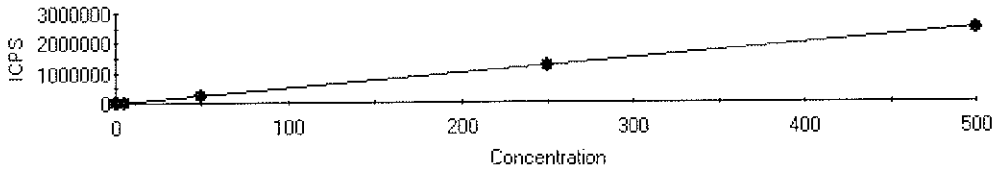
60Ni FQ Block 1



Intercept CPS=57.802665 Intercept Conc=0.035532
Sensitivity=1626.761231 Correlation Coeff=0.999928

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	-0.005	0.005	50.37	0.00
39997_3361_Cal1	1.000	1.015	0.015	1708.72	1.49
39998_3361_Cal2	5.000	5.125	0.125	8394.65	2.50
39999_3361_Cal3	50.000	50.847	0.847	82774.38	1.69
40000_3361_Cal4	250.000	249.771	0.229	406375.66	0.09
40001_3361_Cal5	500.000	487.373	12.627	792896.73	2.53

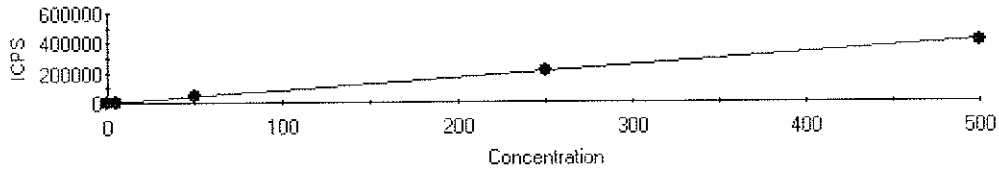
63Cu FQ Block 1



Intercept CPS=248.163764 Intercept Conc=0.050503
Sensitivity=4913.878278 Correlation Coeff=0.999963

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	-0.000	0.000	248.15	0.00
39997_3361_Cal1	1.000	0.981	0.019	5067.40	1.93
39998_3361_Cal2	5.000	5.061	0.061	25118.74	1.23
39999_3361_Cal3	50.000	50.589	0.589	248838.45	1.18
40000_3361_Cal4	250.000	250.049	0.049	1228959.61	0.02
40001_3361_Cal5	500.000	491.326	8.674	2414565.53	1.73

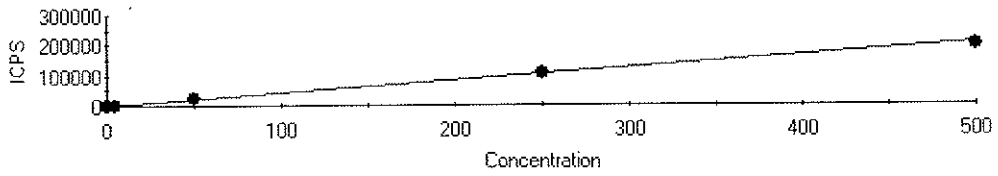
66Zn FQ Block 1



Intercept CPS=609.756256 Intercept Conc=0.736918
Sensitivity=827.442930 Correlation Coeff=0.999837

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	-0.016	0.016	596.28	0.00
39998_3361_Cal2	5.000	5.630	0.630	5268.14	12.60
39999_3361_Cal3	50.000	51.994	1.994	43631.54	3.99
40000_3361_Cal4	250.000	255.423	5.423	211958.09	2.17
40001_3361_Cal5	500.000	492.607	7.393	408213.79	1.48

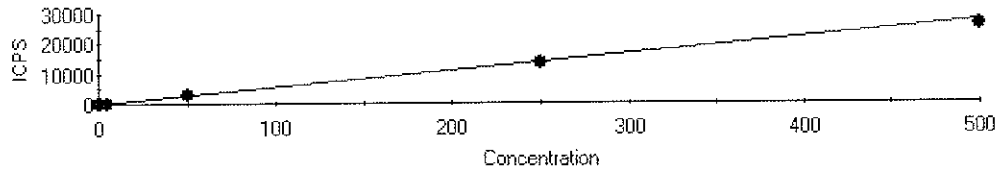
75As FQ Block 1



Intercept CPS=414.914149 Intercept Conc=1.011896
Sensitivity=410.036361 Correlation Coeff=0.999894

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	-0.005	0.005	412.76	0.00
39997_3361_Cal1	1.000	1.002	0.002	825.97	0.25
39998_3361_Cal2	5.000	5.005	0.005	2467.24	0.10
39999_3361_Cal3	50.000	50.709	0.709	21207.48	1.42
40000_3361_Cal4	250.000	248.743	1.257	102408.69	0.50
40001_3361_Cal5	500.000	482.824	17.176	198390.31	3.44

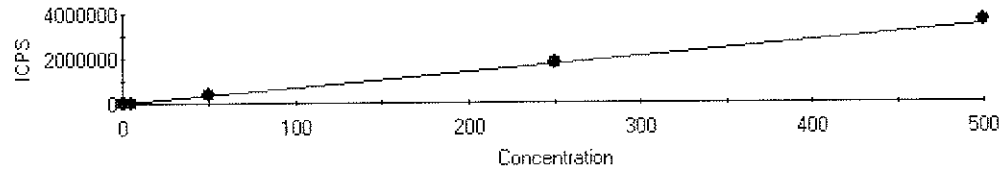
78Se FQ Block 1



Intercept CPS=25.040440 Intercept Conc=0.456917
Sensitivity=54.803010 Correlation Coeff=0.999845

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	-0.342	0.342	6.32	0.00
39997_3361_Cal1	1.000	0.723	0.277	64.65	27.73
39998_3361_Cal2	5.000	4.630	0.370	278.75	7.41
39999_3361_Cal3	50.000	50.008	0.008	2765.63	0.02
40000_3361_Cal4	250.000	245.083	4.917	13456.34	1.97
40001_3361_Cal5	500.000	473.152	26.848	25955.18	5.37

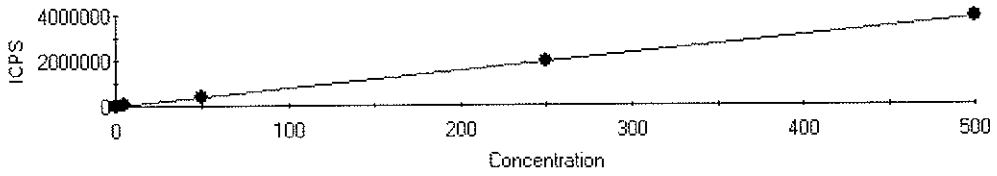
88Sr FQ Block 1



Intercept CPS=382.768662 Intercept Conc=0.054689
Sensitivity=6999.061131 Correlation Coeff=0.999984

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	0.007	0.007	432.51	0.00
39997_3361_Cal1	1.000	0.984	0.016	7269.03	1.61
39998_3361_Cal2	5.000	4.935	0.065	34921.94	1.30
39999_3361_Cal3	50.000	49.993	0.007	350284.19	0.01
40000_3361_Cal4	250.000	256.081	6.081	1792709.64	2.43
40001_3361_Cal5	500.000	517.744	17.744	3624101.83	3.55

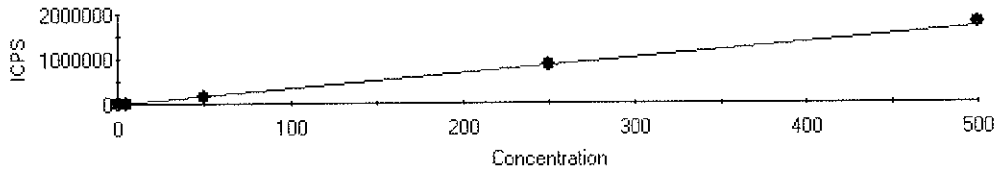
90Zr FQ Block 1



Intercept CPS=730.260816 Intercept Conc=0.094173
Sensitivity=7754.487265 Correlation Coeff=0.999994

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	0.000	0.000	734.13	0.00
39997_3361_Cal1	1.000	0.973	0.027	8277.34	2.67
39998_3361_Cal2	5.000	4.899	0.101	38722.33	2.01
39999_3361_Cal3	50.000	49.382	0.618	383664.79	1.24
40000_3361_Cal4	250.000	250.162	0.162	1940611.96	0.06
40001_3361_Cal5	500.000	496.801	3.199	3853168.39	0.64

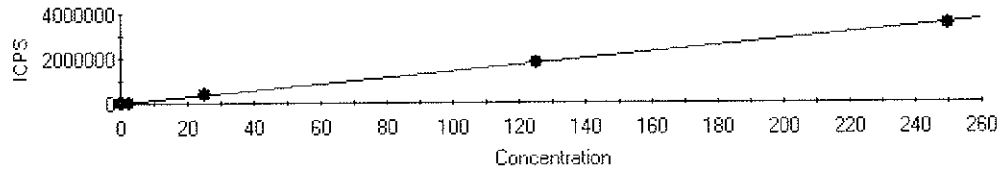
95Mo FQ Block 1



Intercept CPS=150.125148 Intercept Conc=0.044687
Sensitivity=3359.516872 Correlation Coeff=0.999949

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	0.001	0.001	151.85	0.00
39997_3361_Cal1	1.000	0.948	0.052	3335.11	5.20
39998_3361_Cal2	5.000	4.913	0.087	16654.70	1.74
39999_3361_Cal3	50.000	50.752	0.752	170653.79	1.50
40000_3361_Cal4	250.000	256.617	6.617	862258.74	2.65
40001_3361_Cal5	500.000	524.405	24.405	1761898.36	4.88

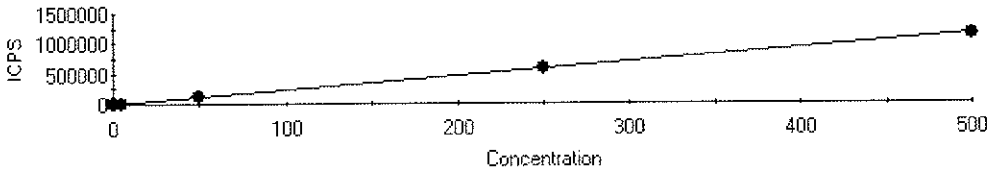
107Ag FQ Block 1



Intercept CPS=933.910866 Intercept Conc=0.065846
Sensitivity=14183.228455 Correlation Coeff=0.999932

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	-0.009	0.009	804.95	0.00
39997_3361_Cal1	0.500	0.490	0.010	7888.63	1.93
39998_3361_Cal2	2.500	2.509	0.009	36519.81	0.36
39999_3361_Cal3	25.000	25.154	0.154	357693.73	0.61
40000_3361_Cal4	125.000	125.027	0.027	1774213.54	0.02
40001_3361_Cal5	250.000	244.052	5.948	3462373.82	2.38

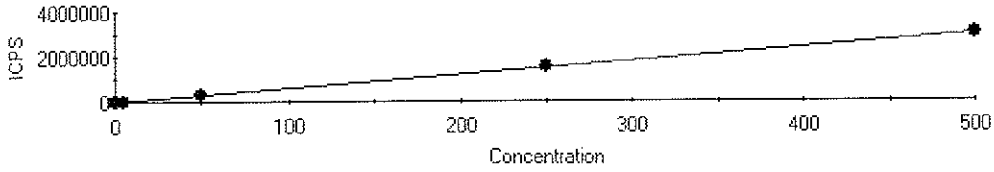
111Cd FQ Block 1



Intercept CPS=32.429976 Intercept Conc=0.014191
Sensitivity=2285.184797 Correlation Coeff=0.999982

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	-0.000	0.000	31.75	0.00
39997_3361_Cal1	1.000	0.982	0.018	2275.47	1.84
39998_3361_Cal2	5.000	5.060	0.060	11596.02	1.20
39999_3361_Cal3	50.000	50.755	0.755	116017.68	1.51
40000_3361_Cal4	250.000	249.890	0.110	571077.30	0.04
40001_3361_Cal5	500.000	493.860	6.140	1128592.76	1.23

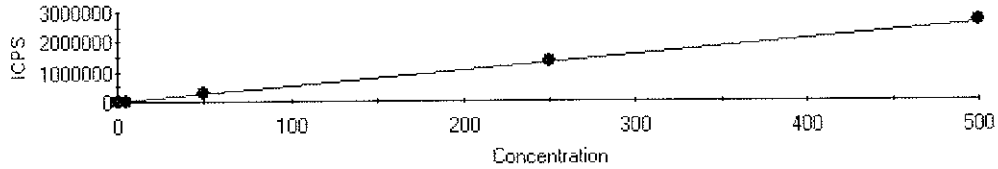
118Sn FQ Block 1



Intercept CPS=749.664867 Intercept Conc=0.126135
Sensitivity=5943.335986 Correlation Coeff=0.999998

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	0.001	0.001	756.31	0.00
39997_3361_Cal1	1.000	0.983	0.017	6594.19	1.66
39998_3361_Cal2	5.000	4.985	0.015	30374.47	0.31
39999_3361_Cal3	50.000	50.190	0.190	299047.49	0.38
40000_3361_Cal4	250.000	252.402	2.402	1500858.99	0.96
40001_3361_Cal5	500.000	506.628	6.628	3011807.73	1.33

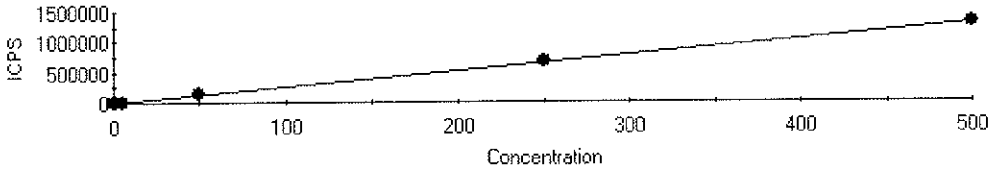
121Sb FQ Block 1



Intercept CPS=180.212588 Intercept Conc=0.034481
Sensitivity=5226.379024 Correlation Coeff=0.999995

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	-0.001	0.001	177.07	0.00
39997_3361_Cal1	1.000	0.983	0.017	5316.84	1.72
39998_3361_Cal2	5.000	5.076	0.076	26709.98	1.52
39999_3361_Cal3	50.000	50.312	0.312	263131.75	0.62
40000_3361_Cal4	250.000	249.984	0.016	1306693.39	0.01
40001_3361_Cal5	500.000	503.106	3.106	2629601.87	0.62

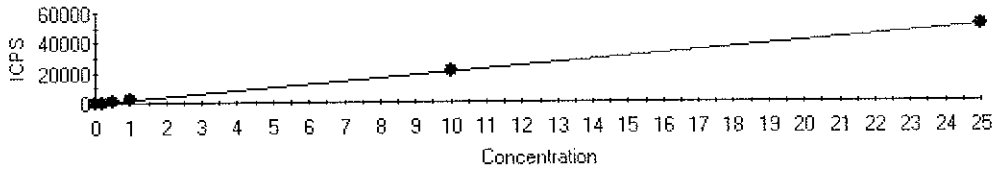
137Ba FQ Block 1



Intercept CPS=300.282461 Intercept Conc=0.115127
Sensitivity=2608.263136 Correlation Coeff=0.999942

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	0.001	0.001	303.71	0.00
39997_3361_Cal1	1.000	0.991	0.009	2884.49	0.92
39998_3361_Cal2	5.000	5.017	0.017	13384.82	0.33
39999_3361_Cal3	50.000	49.707	0.293	129948.65	0.59
40000_3361_Cal4	250.000	251.686	1.686	656764.56	0.67
40001_3361_Cal5	500.000	492.250	7.750	1284217.54	1.55

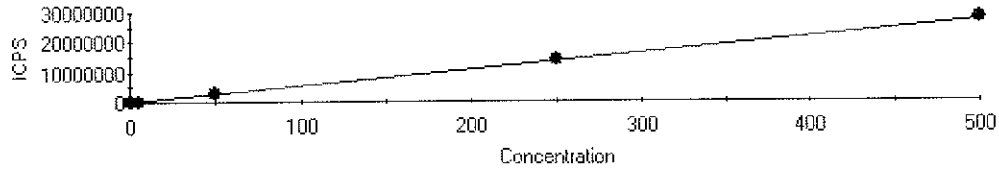
201Hg FQ Block 1



Intercept CPS=30.123532 Intercept Conc=0.014866
Sensitivity=2026.325481 Correlation Coeff=0.999991

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	-0.002	0.002	26.69	0.00
39997_3361_Cal1	0.200	0.204	0.004	444.03	2.13
39998_3361_Cal2	0.500	0.516	0.016	1075.41	3.17
39999_3361_Cal3	1.000	1.004	0.004	2064.99	0.42
40000_3361_Cal4	10.000	10.101	0.101	20498.57	1.01
40001_3361_Cal5	25.000	24.982	0.018	50652.75	0.07

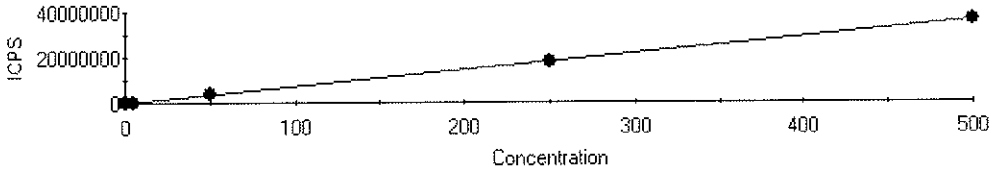
205Tl FQ Block 1



Intercept CPS=3147.201824 Intercept Conc=0.058048
Sensitivity=54216.789028 Correlation Coeff=0.999944

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	0.003	0.003	3317.12	0.00
39997_3361_Cal1	1.000	0.978	0.022	56148.48	2.24
39998_3361_Cal2	5.000	5.003	0.003	274374.76	0.05
39999_3361_Cal3	50.000	52.753	2.753	2863220.93	5.51
40000_3361_Cal4	250.000	250.999	0.999	13611505.29	0.40
40001_3361_Cal5	500.000	512.285	12.285	27777580.06	2.46

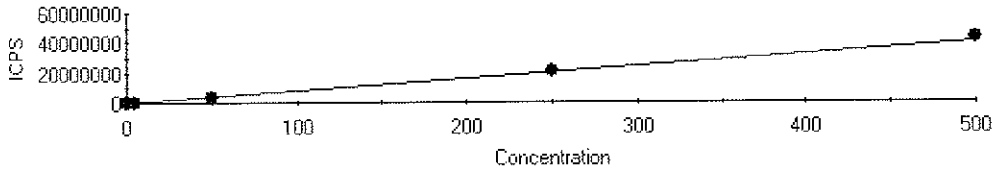
208Pb FQ Block 1



Intercept CPS=1281.983205 Intercept Conc=0.017756
Sensitivity=72200.992669 Correlation Coeff=0.999972

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	0.000	0.000	1297.19	0.00
39997_3361_Cal1	1.000	0.986	0.014	72443.28	1.44
39998_3361_Cal2	5.000	5.022	0.022	363847.77	0.43
39999_3361_Cal3	50.000	51.436	1.436	3715001.63	2.87
40000_3361_Cal4	250.000	247.632	2.368	17880574.90	0.95
40001_3361_Cal5	500.000	502.250	2.250	36264199.73	0.45

238U FQ Block 1



Intercept CPS=997.209106 Intercept Conc=0.012196
Sensitivity=81766.882737 Correlation Coeff=0.999920

Label	Defined	Measured	Error	Mean CPS	% Error
39996_3361_Cal0	0.000	0.000	0.000	997.76	0.00
39997_3361_Cal1	1.000	0.989	0.011	81835.40	1.14
39998_3361_Cal2	5.000	5.058	0.058	414548.15	1.15
39999_3361_Cal3	50.000	48.989	1.011	4006687.25	2.02
40000_3361_Cal4	250.000	252.930	2.930	20682326.11	1.17
40001_3361_Cal5	500.000	519.113	19.113	42447268.32	3.82

Dilution Corrected Concentrations

39996_3361_Cal0 10/8/2012 6:16:22 PM

User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:16:26	0.012	0.014	-0.009	0.639	-0.867	-1.247	0.367	1.877	163.800	τ 2261000.000
2	18:16:30	-0.004	-0.001	-0.497	-0.925	-2.505	-1.070	-1.097	-0.741	159.500	τ 2304000.000
3	18:16:34	0.001	-0.012	-0.576	0.081	-1.362	0.066	-1.885	-11.980	135.500	τ 2326000.000
x		0.003	0.000	-0.361	-0.068	-1.578	-0.750	-0.872	-3.615	152.900	τ 2297000.000
σ		0.008	0.013	0.307	0.793	0.840	0.713	1.143	7.363	15.240	τ 32960.000
%RSD		275.400	3615.000	85.120	1160.000	53.230	95.010	131.100	203.700	9.967	τ 1.435

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:16:26	-2.531	-1.420	99.551%	100.696%	-0.035	-0.003	-0.004	53.370	-0.646	-0.000
2	18:16:30	14.500	-3.904	99.936%	99.423%	-0.036	0.080	-0.009	54.680	-0.358	0.000
3	18:16:34	14.390	3.121	100.513%	99.881%	0.047	0.302	0.008	53.010	-0.256	-0.000
x		8.787	-0.734	100.000%	100.000%	-0.008	0.126	-0.002	53.690	-0.420	0.000
σ		9.801	3.562	0.484%	0.645%	0.048	0.158	0.009	0.881	0.202	0.000
%RSD		111.500	485.200	0.484	0.645	582.000	124.900	556.600	1.640	48.060	8964.000

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:16:26	-0.001	-0.011	-0.000	0.017	100.247%	-0.030	-0.394	0.001	99.463%	-0.003
2	18:16:30	0.002	-0.001	0.001	-0.014	100.356%	0.004	-0.285	0.009	100.470%	0.003
3	18:16:34	-0.000	-0.001	-0.001	-0.052	99.396%	0.010	-0.346	0.012	100.067%	0.001
x		0.000	-0.005	-0.000	-0.016	100.000%	-0.005	-0.342	0.007	100.000%	0.000
σ		0.002	0.006	0.001	0.035	0.526%	0.021	0.054	0.006	0.506%	0.003
%RSD		808.400	120.400	28060.000	213.400	0.526	408.600	15.890	80.240	0.506	550.300

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:16:26	-0.000	-0.014	-0.002	99.470%	0.002	-0.003	0.011	τ 99.030%	0.003	0.002
2	18:16:30	-0.001	-0.012	0.000	99.991%	-0.001	0.006	-0.014	τ 99.663%	-0.005	0.006
3	18:16:34	0.002	-0.001	0.000	100.539%	0.003	-0.005	0.006	τ 101.307%	-0.003	0.001
x		0.001	-0.009	-0.000	100.000%	0.001	-0.001	0.001	τ 100.000%	-0.002	0.003
σ		0.001	0.007	0.001	0.534%	0.002	0.006	0.013	τ 1.175%	0.004	0.002
%RSD		286.300	77.880	354.600	0.534	187.300	1011.000	995.800	τ 1.175	238.200	76.300

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	18:16:26	0.000	τ 99.299%	-0.000
2	18:16:30	0.001	τ 99.900%	0.000
3	18:16:34	-0.000	τ 100.800%	0.000
x		0.000	τ 100.000%	0.000
σ		0.001	τ 0.756%	0.000
%RSD		302.900	τ 0.756	3101.000

39997_3361_Cal1 10/8/2012 6:21:57 PM

User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:22:01	0.956	1.008	1.234	248.200	250.900	245.400	59.560	25.410	159.200	↹2242000.000
2	18:22:05	0.879	0.982	1.983	247.100	253.800	250.000	56.160	70.140	126.600	↹2317000.000
3	18:22:08	0.980	0.895	2.799	259.400	252.700	249.800	↹201.600	31.570	173.300	↹2286000.000
x		0.938	0.962	2.006	251.600	252.400	248.400	↹105.800	42.370	153.000	↹2282000.000
σ		0.052	0.060	0.783	6.827	1.452	2.547	↹83.020	24.240	23.940	↹37500.000
%RSD		5.593	6.199	39.030	2.714	0.575	1.025	↹78.480	57.220	15.650	↹1.643

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:22:01	247.500	267.000	101.861%	100.962%	0.966	1.064	1.022	52.640	278.700	0.947
2	18:22:05	261.800	245.800	100.996%	101.462%	0.976	0.927	1.010	54.210	281.400	0.993
3	18:22:08	268.300	255.000	101.061%	101.383%	1.140	1.153	1.072	54.000	283.000	1.075
x		259.200	255.900	101.306%	101.269%	1.028	1.048	1.035	53.620	281.000	1.005
σ		10.680	10.660	0.482%	0.269%	0.098	0.114	0.033	0.850	2.192	0.065
%RSD		4.118	4.164	0.475	0.266	9.520	10.850	3.193	1.586	0.780	6.423

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:22:01	0.983	1.001	0.950	1.347	104.142%	1.126	0.734	0.975	100.103%	0.949
2	18:22:05	0.983	1.025	1.023	1.323	102.077%	0.930	0.837	0.983	100.920%	0.972
3	18:22:08	1.004	1.019	0.969	1.447	102.986%	0.952	0.597	0.994	99.707%	0.999
x		0.990	1.015	0.981	1.372	103.068%	1.002	0.723	0.984	100.243%	0.973
σ		0.012	0.013	0.038	0.066	1.035%	0.107	0.120	0.009	0.619%	0.025
%RSD		1.222	1.270	3.868	4.809	1.004	10.690	16.660	0.945	0.617	2.596

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:22:01	0.921	0.500	0.914	101.307%	0.986	0.977	0.988	↹100.298%	0.219	0.980
2	18:22:05	0.928	0.485	1.038	102.207%	0.990	0.955	0.964	↹101.026%	0.186	0.970
3	18:22:08	0.995	0.486	0.992	101.558%	0.974	1.017	1.020	↹100.510%	0.208	0.983
x		0.948	0.490	0.982	101.691%	0.983	0.983	0.991	↹100.611%	0.204	0.978
σ		0.041	0.008	0.063	0.464%	0.008	0.032	0.028	↹0.374%	0.017	0.006
%RSD		4.335	1.636	6.410	0.457	0.828	3.214	2.835	↹0.372	8.273	0.650

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	18:22:01	0.986	↹99.682%	0.992
2	18:22:05	0.990	↹99.737%	0.980
3	18:22:08	0.981	↹99.987%	0.995
x		0.986	↹99.802%	0.989
σ		0.005	↹0.162%	0.008
%RSD		0.460	↹0.163	0.797

39998_3361_Cal2 10/8/2012 6:27:29 PM

User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:27:33	4.948	4.944	5.187	501.800	514.600	513.200	275.700	250.100	160.700	τ2275000.000
2	18:27:37	4.956	5.345	5.948	498.200	512.900	508.400	258.300	291.700	143.600	τ2246000.000
3	18:27:41	5.012	5.049	4.824	511.200	520.100	511.000	268.700	273.600	163.400	τ2278000.000
x		4.972	5.112	5.320	503.700	515.900	510.900	267.600	271.800	155.900	τ2267000.000
σ		0.035	0.208	0.574	6.709	3.750	2.414	8.720	20.840	10.690	τ17810.000
%RSD		0.698	4.064	10.780	1.332	0.727	0.473	3.259	7.666	6.859	τ0.786

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:27:33	491.400	572.900	100.343%	102.461%	5.471	5.427	4.939	51.220	571.200	4.919
2	18:27:37	477.800	452.700	102.568%	102.098%	4.663	4.876	5.029	53.000	563.400	4.978
3	18:27:41	494.100	509.700	100.969%	102.215%	5.167	4.758	4.896	54.190	561.600	4.987
x		487.800	511.800	101.294%	102.258%	5.100	5.020	4.954	52.800	565.400	4.961
σ		8.702	60.120	1.148%	0.185%	0.408	0.357	0.068	1.493	5.130	0.037
%RSD		1.784	11.750	1.133	0.181	7.998	7.115	1.371	2.828	0.907	0.749

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:27:33	5.032	5.155	5.142	5.982	104.202%	5.000	4.520	4.870	100.591%	4.838
2	18:27:37	4.884	5.147	5.032	5.381	104.731%	4.893	5.298	4.984	100.528%	4.862
3	18:27:41	4.894	5.072	5.010	5.527	104.910%	5.123	4.071	4.950	100.748%	4.999
x		4.937	5.125	5.061	5.630	104.614%	5.005	4.630	4.935	100.622%	4.899
σ		0.083	0.046	0.070	0.314	0.368%	0.115	0.621	0.059	0.113%	0.087
%RSD		1.674	0.894	1.391	5.568	0.352	2.298	13.410	1.185	0.113	1.774

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:27:33	4.921	2.503	5.049	101.155%	5.035	5.131	5.082	τ100.059%	0.499	4.965
2	18:27:37	4.927	2.514	5.077	101.591%	4.963	5.047	5.011	τ100.432%	0.528	4.996
3	18:27:41	4.890	2.511	5.054	101.863%	4.955	5.051	4.957	τ100.589%	0.521	5.047
x		4.913	2.509	5.060	101.536%	4.985	5.076	5.017	τ100.360%	0.516	5.003
σ		0.020	0.006	0.015	0.358%	0.044	0.048	0.062	τ0.272%	0.015	0.042
%RSD		0.412	0.232	0.295	0.352	0.887	0.936	1.244	τ0.271	2.890	0.831

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	18:27:33	5.024	τ99.566%	5.035
2	18:27:37	5.009	τ99.494%	5.034
3	18:27:41	5.032	τ99.817%	5.105
x		5.022	τ99.626%	5.058
σ		0.011	τ0.169%	0.041
%RSD		0.223	τ0.170	0.807

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:33:05	49.810	51.370	50.690	2406.000	2487.000	2464.000	2545.000	2501.000	152.600	↹2313000.000
2	18:33:09	50.730	50.630	50.500	2567.000	2523.000	2492.000	2559.000	2568.000	167.100	↹2188000.000
3	18:33:13	51.040	51.290	50.020	2368.000	2448.000	2465.000	2567.000	2585.000	147.500	↹2346000.000
x		50.530	51.100	50.410	2447.000	2486.000	2474.000	2557.000	2552.000	155.800	↹2283000.000
σ		0.641	0.402	0.345	105.500	37.760	15.520	10.810	44.360	10.150	↹83240.000
%RSD		1.268	0.787	0.683	4.310	1.519	0.627	0.423	1.739	6.517	↹3.647

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:33:05	2349.000	2463.000	101.984%	102.884%	48.780	50.070	49.540	44.590	2814.000	50.040
2	18:33:09	2499.000	2609.000	102.032%	102.284%	50.660	50.060	49.840	42.850	2793.000	49.790
3	18:33:13	2382.000	2486.000	103.007%	102.200%	50.170	49.800	50.140	42.950	2820.000	49.850
x		2410.000	2520.000	102.341%	102.456%	49.870	49.980	49.840	43.470	2809.000	49.890
σ		78.570	78.690	0.577%	0.373%	0.979	0.154	0.298	0.976	13.830	0.132
%RSD		3.260	3.123	0.564	0.364	1.962	0.308	0.599	2.246	0.492	0.265

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:33:05	49.680	51.050	50.630	52.160	105.511%	50.530	50.000	49.980	100.229%	49.450
2	18:33:09	49.100	50.250	50.880	51.400	105.324%	50.610	50.010	50.020	99.995%	49.160
3	18:33:13	50.020	51.240	50.260	52.420	105.554%	50.980	50.010	49.990	100.560%	49.540
x		49.600	50.850	50.590	51.990	105.463%	50.710	50.010	49.990	100.262%	49.380
σ		0.462	0.522	0.314	0.532	0.122%	0.242	0.007	0.022	0.284%	0.201
%RSD		0.932	1.027	0.621	1.024	0.116	0.476	0.015	0.044	0.283	0.407

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:33:05	51.130	25.210	51.090	100.824%	50.420	50.690	49.480	↹100.660%	1.026	52.320
2	18:33:09	50.300	25.130	50.230	101.664%	49.960	49.720	50.480	↹99.884%	1.012	53.630
3	18:33:13	50.830	25.130	50.950	101.745%	50.190	50.520	49.160	↹101.795%	0.974	52.310
x		50.750	25.150	50.760	101.411%	50.190	50.310	49.710	↹100.780%	1.004	52.750
σ		0.421	0.045	0.461	0.510%	0.231	0.520	0.690	↹0.961%	0.027	0.757
%RSD		0.830	0.179	0.909	0.503	0.460	1.033	1.387	↹0.954	2.668	1.435

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	18:33:05	51.130	↹98.481%	↹48.830
2	18:33:09	51.770	↹98.581%	↹49.430
3	18:33:13	51.410	↹100.330%	↹48.710
x		51.440	↹99.131%	↹48.990
σ		0.321	↹1.040%	↹0.383
%RSD		0.624	↹1.049	↹0.782

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:38:39	249.800	251.700	248.700	↹12220.000	12290.000	12260.000	12230.000	12660.000	163.900	↹2480000.000
2	18:38:43	249.200	248.500	244.700	↹11700.000	12380.000	12200.000	12370.000	12560.000	143.500	↹2545000.000
3	18:38:47	251.200	248.200	249.100	↹12490.000	12440.000	12470.000	12430.000	12790.000	168.600	↹2496000.000
x		250.100	249.500	247.500	↹12140.000	12370.000	12310.000	12350.000	12670.000	158.700	↹2507000.000
σ		1.050	1.943	2.449	↹402.200	77.410	138.200	103.200	115.800	13.370	↹33830.000
%RSD		0.420	0.779	0.990	↹3.313	0.626	1.122	0.836	0.914	8.427	↹1.349

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:38:39	12510.000	12320.000	102.354%	102.715%	249.400	249.600	250.400	-9.957	↹12680.000	250.400
2	18:38:43	12190.000	12670.000	103.984%	102.537%	250.800	249.300	249.400	-8.723	↹12640.000	249.700
3	18:38:47	12730.000	12510.000	103.296%	102.526%	250.900	249.300	249.900	-9.864	↹12570.000	250.800
x		12470.000	12500.000	103.212%	102.593%	250.400	249.400	249.900	-9.515	↹12630.000	250.300
σ		271.000	172.200	0.818%	0.106%	0.837	0.190	0.483	0.687	↹52.530	0.534
%RSD		2.173	1.377	0.793	0.103	0.334	0.076	0.193	7.219	↹0.416	0.214

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:38:39	250.400	250.300	248.100	253.300	105.076%	246.500	242.600	254.300	98.523%	250.200
2	18:38:43	252.600	248.800	251.500	256.800	104.247%	250.700	246.700	258.700	99.627%	250.000
3	18:38:47	249.800	250.200	250.600	256.100	105.775%	249.000	245.900	255.200	100.992%	250.300
x		250.900	249.800	250.000	255.400	105.033%	248.700	245.100	256.100	99.714%	250.200
σ		1.490	0.825	1.739	1.838	0.765%	2.109	2.195	2.296	1.237%	0.179
%RSD		0.594	0.330	0.696	0.720	0.728	0.848	0.896	0.897	1.240	0.072

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:38:39	258.500	125.400	247.600	101.082%	249.400	249.900	250.300	↹100.070%	10.090	↹251.300
2	18:38:43	257.400	124.700	251.700	100.882%	254.000	250.100	251.300	↹100.406%	10.040	↹249.100
3	18:38:47	254.000	124.900	250.400	101.583%	253.800	249.900	253.400	↹100.579%	10.170	↹252.500
x		256.600	125.000	249.900	101.182%	252.400	250.000	251.700	↹100.352%	10.100	↹251.000
σ		2.341	0.337	2.130	0.361%	2.639	0.090	1.575	↹0.259%	0.067	↹1.743
%RSD		0.912	0.270	0.852	0.357	1.045	0.036	0.626	↹0.258	0.661	↹0.695

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	18:38:39	↹247.900	↹96.134%	↹252.100
2	18:38:43	↹246.700	↹97.722%	↹250.900
3	18:38:47	↹248.300	↹97.693%	↹255.800
x		↹247.600	↹97.183%	↹252.900
σ		↹0.808	↹0.908%	↹2.537
%RSD		↹0.326	↹0.935	↹1.003

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:44:13	M 504.800	488.800	496.300	T 24770.000	24610.000	24600.000	23780.000	24860.000	196.700	T 2749000.000
2	18:44:17	TM 522.500	490.700	M 500.700	T 23940.000	24340.000	24640.000	24000.000	24760.000	160.600	T 2843000.000
3	18:44:20	M 507.400	495.900	M 500.400	TM 25540.000	24590.000	24840.000	24080.000	24990.000	168.300	T 2770000.000
x		TM 511.600	491.800	M 499.100	TM 24750.000	24510.000	24690.000	23960.000	24870.000	175.200	T 2787000.000
σ		TM 9.580	3.668	M 2.471	TM 800.100	147.900	127.400	154.600	115.900	19.000	T 49170.000
%RSD		TM 1.873	0.746	M 0.495	TM 3.233	0.603	0.516	0.645	0.466	10.840	T 1.764

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:44:13	TM 26870.000	24640.000	106.013%	106.068%	493.200	M 502.100	M 503.100	-95.700	T 24800.000	M 501.200
2	18:44:17	TM 26230.000	24820.000	107.340%	106.805%	498.200	M 501.600	499.500	-84.100	T 24750.000	499.300
3	18:44:20	TM 27600.000	M 25260.000	106.785%	104.739%	499.600	M 502.700	M 502.600	-87.750	T 24790.000	M 503.200
x		TM 26900.000	M 24910.000	106.713%	105.871%	497.000	M 502.100	M 501.700	-89.180	T 24780.000	M 501.200
σ		TM 684.900	M 319.100	0.666%	1.047%	3.390	M 0.511	M 1.941	5.931	T 27.290	M 1.921
%RSD		TM 2.546	M 1.281	0.624	0.989	0.682	M 0.102	M 0.387	6.651	T 0.110	M 0.383

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:44:13	TM 500.500	491.200	494.200	495.100	106.195%	486.800	471.700	TM 515.400	99.788%	T 496.900
2	18:44:17	TM 500.900	483.700	T 487.400	491.200	108.401%	482.800	474.400	TM 521.600	100.532%	T 498.800
3	18:44:20	T 499.100	487.200	492.300	491.600	109.306%	478.800	473.300	TM 516.300	101.811%	T 494.800
x		TM 500.200	487.400	T 491.300	492.600	107.968%	482.800	473.200	TM 517.700	100.710%	T 496.800
σ		TM 0.925	3.712	T 3.513	2.170	1.600%	3.991	1.356	TM 3.389	1.024%	T 2.015
%RSD		TM 0.185	0.762	T 0.715	0.441	1.482	0.827	0.287	TM 0.655	1.016	T 0.406

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:44:13	M 524.100	T 243.700	493.200	101.600%	M 513.300	M 500.800	T 492.100	T 99.960%	24.940	TM 510.300
2	18:44:17	M 529.100	T 243.500	495.500	102.166%	M 513.000	M 505.500	T 487.200	T 101.767%	24.990	TM 508.300
3	18:44:20	M 520.000	T 244.900	492.900	102.443%	T 493.600	M 503.000	T 497.400	T 102.415%	M 25.020	TM 518.200
x		M 524.400	T 244.100	493.900	102.069%	TM 506.600	M 503.100	T 492.200	T 101.381%	M 24.980	TM 512.300
σ		M 4.573	T 0.771	1.423	0.430%	TM 11.300	M 2.372	T 5.106	T 1.272%	M 0.040	TM 5.222
%RSD		M 0.872	T 0.316	0.288	0.421	TM 2.231	M 0.472	T 1.037	T 1.255	M 0.161	TM 1.019

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	18:44:13	T 498.800	T 94.748%	TM 517.000
2	18:44:17	T 500.000	T 96.296%	TM 514.100
3	18:44:20	TM 508.000	T 95.506%	TM 526.200
x		TM 502.200	T 95.517%	TM 519.100
σ		TM 4.983	T 0.774%	TM 6.305
%RSD		TM 0.992	T 0.810	TM 1.214

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:49:47	109.100	112.300	116.500	5670.000	5614.000	5481.000	5623.000	5618.000	143.000	↹2303000.000
2	18:49:50	110.200	112.000	114.800	5725.000	5542.000	5538.000	5582.000	5826.000	162.600	↹2286000.000
3	18:49:54	111.500	112.200	115.800	5552.000	5545.000	5467.000	5565.000	5797.000	132.300	↹2308000.000
x		110.300	112.200	115.700	5649.000	5567.000	5495.000	5590.000	5747.000	146.000	↹2299000.000
σ		1.205	0.118	0.819	88.130	40.930	37.710	29.440	112.500	15.320	↹11330.000
%RSD		1.092	0.106	0.708	1.560	0.735	0.686	0.527	1.957	10.500	↹0.493

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:49:47	5502.000	5672.000	103.647%	105.203%	109.700	108.900	110.500	29.180	6293.000	109.600
2	18:49:50	5556.000	5433.000	104.888%	104.235%	111.900	110.000	109.200	29.110	6275.000	109.200
3	18:49:54	5440.000	5517.000	105.734%	104.105%	109.000	108.800	108.900	28.150	6286.000	108.100
x		5499.000	5541.000	104.756%	104.514%	110.200	109.200	109.500	28.810	6284.000	108.900
σ		58.180	121.200	1.050%	0.600%	1.528	0.669	0.831	0.576	8.986	0.813
%RSD		1.058	2.187	1.002	0.574	1.387	0.613	0.759	1.999	0.143	0.747

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:49:47	109.600	112.900	112.100	117.100	105.565%	113.200	108.900	111.200	101.840%	107.800
2	18:49:50	107.200	110.700	110.100	118.100	107.634%	112.000	110.400	111.100	102.974%	107.200
3	18:49:54	107.800	111.700	109.500	117.600	107.126%	111.600	109.900	110.400	102.547%	107.300
x		108.200	111.700	110.600	117.600	106.775%	112.300	109.700	110.900	102.454%	107.400
σ		1.218	1.088	1.371	0.507	1.078%	0.817	0.756	0.409	0.573%	0.281
%RSD		1.126	0.974	1.240	0.431	1.010	0.728	0.689	0.369	0.559	0.262

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:49:47	112.300	55.070	111.600	102.907%	112.700	109.800	108.300	↹102.032%	4.241	↹106.700
2	18:49:50	111.900	54.830	110.800	103.375%	113.300	110.000	108.300	↹102.925%	4.241	↹106.300
3	18:49:54	112.200	54.530	111.300	103.443%	113.600	110.000	108.500	↹102.898%	4.070	↹105.600
x		112.100	54.810	111.200	103.242%	113.200	109.900	108.400	↹102.618%	4.184	↹106.200
σ		0.220	0.270	0.364	0.291%	0.471	0.086	0.136	↹0.508%	0.099	↹0.550
%RSD		0.197	0.493	0.328	0.282	0.416	0.078	0.125	↹0.495	2.365	↹0.518

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	18:49:47	↹108.500	↹100.788%	↹108.600
2	18:49:50	↹108.200	↹101.811%	↹108.800
3	18:49:54	↹108.000	↹102.017%	↹107.200
x		↹108.300	↹101.539%	↹108.200
σ		↹0.251	↹0.659%	↹0.865
%RSD		↹0.232	↹0.649	↹0.800

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:55:21	0.153	0.098	1.850	10.660	8.619	9.428	13.470	-10.540	141.900	↹2317000.000
2	18:55:24	0.144	0.157	1.572	10.910	7.766	9.666	16.090	8.312	163.900	↹2308000.000
3	18:55:28	0.173	0.093	1.626	8.136	6.263	6.381	10.720	4.071	169.800	↹2283000.000
x		0.157	0.116	1.683	9.902	7.550	8.492	13.430	0.616	158.500	↹2303000.000
σ		0.015	0.036	0.147	1.535	1.193	1.832	2.684	9.888	14.730	↹17430.000
%RSD		9.582	30.710	8.750	15.500	15.800	21.570	19.990	1606.000	9.291	↹0.757

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:55:21	25.880	12.310	104.505%	105.034%	0.138	0.572	0.305	64.160	11.820	0.246
2	18:55:24	20.180	0.781	105.164%	105.746%	0.196	0.140	0.275	66.260	11.410	0.247
3	18:55:28	-4.463	5.483	106.947%	104.829%	0.171	0.286	0.208	65.140	8.022	0.158
x		13.870	6.193	105.539%	105.203%	0.169	0.333	0.263	65.190	10.420	0.217
σ		16.130	5.800	1.263%	0.481%	0.029	0.220	0.050	1.051	2.085	0.051
%RSD		116.300	93.650	1.197	0.458	17.150	66.140	18.950	1.613	20.020	23.700

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:55:21	0.233	0.281	0.261	0.162	106.106%	0.428	-0.025	0.234	103.086%	0.214
2	18:55:24	0.216	0.214	0.223	0.107	107.052%	0.334	0.016	0.241	103.679%	0.209
3	18:55:28	0.154	0.156	0.168	0.055	105.851%	0.201	-0.084	0.173	102.899%	0.139
x		0.201	0.217	0.217	0.108	106.336%	0.321	-0.031	0.216	103.221%	0.187
σ		0.042	0.062	0.047	0.053	0.633%	0.114	0.051	0.037	0.407%	0.042
%RSD		20.810	28.810	21.410	49.350	0.595	35.590	163.400	17.310	0.395	22.400

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	18:55:21	0.260	0.125	0.230	103.387%	0.281	0.270	0.233	↹102.917%	0.074	0.588
2	18:55:24	0.272	0.114	0.217	103.833%	0.298	0.246	0.231	↹102.840%	0.091	0.545
3	18:55:28	0.149	0.068	0.160	103.065%	0.245	0.175	0.149	↹103.339%	0.080	0.446
x		0.227	0.102	0.202	103.428%	0.275	0.231	0.204	↹103.032%	0.082	0.526
σ		0.068	0.031	0.037	0.385%	0.027	0.049	0.048	↹0.269%	0.009	0.073
%RSD		29.910	29.860	18.350	0.373	9.939	21.460	23.410	↹0.261	10.490	13.830

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	18:55:21	0.266	↹101.161%	0.226
2	18:55:24	0.237	↹102.851%	0.221
3	18:55:28	0.164	↹102.756%	0.152
x		0.223	↹102.256%	0.200
σ		0.053	↹0.949%	0.042
%RSD		23.680	↹0.928	20.940

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:00:55	1.039	1.047	2.264	247.500	252.800	247.500	66.180	43.000	158.300	↹2337000.000
2	19:00:58	1.023	0.984	2.753	247.600	262.200	249.900	59.730	47.620	145.600	↹2300000.000
3	19:01:02	0.926	0.994	2.302	240.500	249.700	247.700	61.520	42.760	183.400	↹2279000.000
x		0.996	1.008	2.439	245.200	254.900	248.400	62.470	44.460	162.400	↹2305000.000
σ		0.061	0.034	0.272	4.033	6.522	1.350	3.331	2.735	19.230	↹29350.000
%RSD		6.129	3.361	11.160	1.645	2.559	0.543	5.331	6.152	11.840	↹1.273

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:00:55	254.900	332.200	101.835%	102.773%	0.884	1.164	1.087	65.030	286.500	1.013
2	19:00:58	245.200	217.000	103.117%	102.388%	1.014	0.836	1.120	66.170	288.900	0.992
3	19:01:02	243.300	240.400	104.094%	102.419%	1.184	0.930	1.028	65.150	282.800	1.042
x		247.800	263.200	103.016%	102.527%	1.028	0.977	1.078	65.450	286.100	1.016
σ		6.215	60.920	1.133%	0.213%	0.150	0.169	0.047	0.627	3.045	0.025
%RSD		2.508	23.140	1.100	0.208	14.620	17.330	4.314	0.958	1.065	2.455

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:00:55	1.004	1.068	1.067	1.304	103.738%	1.172	0.821	0.999	101.411%	0.987
2	19:00:58	1.044	1.077	1.060	1.214	103.622%	1.075	0.754	1.026	101.856%	0.985
3	19:01:02	1.022	1.063	1.074	1.259	104.713%	1.067	0.871	0.968	102.214%	1.030
x		1.023	1.069	1.067	1.259	104.024%	1.105	0.815	0.998	101.827%	1.001
σ		0.020	0.007	0.007	0.045	0.599%	0.059	0.059	0.029	0.402%	0.026
%RSD		1.966	0.651	0.653	3.558	0.576	5.297	7.185	2.907	0.395	2.561

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:00:55	1.035	0.510	1.026	101.524%	1.026	1.044	1.054	↹101.279%	0.242	1.127
2	19:00:58	0.965	0.484	0.992	102.198%	1.041	1.042	1.010	↹101.675%	0.270	1.123
3	19:01:02	1.048	0.498	1.056	102.502%	1.051	1.014	0.992	↹101.790%	0.242	1.110
x		1.016	0.497	1.025	102.075%	1.039	1.033	1.019	↹101.581%	0.251	1.120
σ		0.045	0.013	0.032	0.501%	0.012	0.017	0.032	↹0.268%	0.017	0.009
%RSD		4.444	2.568	3.136	0.491	1.196	1.606	3.124	↹0.264	6.604	0.763

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	19:00:55	1.018	↹100.313%	1.016
2	19:00:58	1.012	↹101.463%	1.012
3	19:01:02	1.021	↹100.730%	1.003
x		1.017	↹100.836%	1.010
σ		0.005	↹0.582%	0.007
%RSD		0.463	↹0.578	0.649

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:06:27	5.247	5.034	6.115	508.700	512.600	504.600	255.600	258.800	156.300	τ 2304000.000
2	19:06:31	4.975	4.951	5.742	504.100	532.300	506.600	253.500	265.900	159.900	τ 2333000.000
3	19:06:35	5.039	4.552	5.775	525.200	514.700	512.900	274.200	248.600	153.800	τ 2251000.000
x		5.087	4.846	5.877	512.700	519.800	508.000	261.100	257.800	156.700	τ 2296000.000
σ		0.142	0.258	0.207	11.110	10.840	4.314	11.400	8.702	3.058	τ 41340.000
%RSD		2.794	5.314	3.515	2.167	2.085	0.849	4.365	3.376	1.952	τ 1.800

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:06:27	503.100	460.200	101.947%	101.787%	5.143	4.836	5.086	61.580	570.800	5.047
2	19:06:31	515.500	503.700	102.565%	101.998%	5.194	5.271	5.082	62.330	569.100	5.012
3	19:06:35	543.300	529.300	103.009%	101.877%	5.151	5.516	5.195	58.570	569.700	4.995
x		520.600	497.700	102.507%	101.887%	5.162	5.208	5.121	60.830	569.900	5.018
σ		20.570	34.950	0.533%	0.106%	0.027	0.344	0.064	1.991	0.843	0.026
%RSD		3.951	7.022	0.520	0.104	0.529	6.608	1.248	3.273	0.148	0.528

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:06:27	4.906	5.263	5.207	5.436	104.228%	5.160	4.857	5.001	100.316%	4.891
2	19:06:31	4.971	5.329	5.224	5.877	104.448%	5.099	4.639	4.964	101.161%	4.960
3	19:06:35	4.990	5.211	5.078	5.564	104.658%	5.087	4.526	4.890	102.316%	4.928
x		4.956	5.268	5.169	5.626	104.445%	5.115	4.674	4.952	101.264%	4.926
σ		0.044	0.060	0.079	0.227	0.215%	0.039	0.169	0.056	1.004%	0.034
%RSD		0.891	1.132	1.538	4.036	0.206	0.763	3.609	1.138	0.991	0.694

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:06:27	5.104	2.513	5.144	101.536%	5.031	4.978	5.075	τ 101.338%	0.499	5.049
2	19:06:31	4.993	2.508	5.126	102.466%	4.993	5.066	4.940	τ 100.648%	0.507	5.071
3	19:06:35	4.927	2.487	5.019	102.718%	4.972	4.954	4.935	τ 102.534%	0.503	5.139
x		5.008	2.503	5.096	102.240%	4.999	5.000	4.983	τ 101.507%	0.503	5.086
σ		0.089	0.014	0.067	0.623%	0.030	0.059	0.079	τ 0.954%	0.004	0.047
%RSD		1.782	0.547	1.322	0.609	0.599	1.183	1.594	τ 0.940	0.764	0.922

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	19:06:27	5.002	τ 100.848%	5.049
2	19:06:31	4.999	τ 101.464%	5.116
3	19:06:35	5.024	τ 101.203%	5.098
x		5.008	τ 101.172%	5.088
σ		0.013	τ 0.309%	0.035
%RSD		0.265	τ 0.306	0.685

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:11:59	0.037	0.037	1.272	TM 48670.000	M 49280.000	TM 50460.000	16.390	M 52760.000	3187.000	T 2360000.000
2	19:12:03	0.056	0.014	2.182	TM 49080.000	M 50020.000	TM 50880.000	17.420	M 53030.000	3431.000	T 2416000.000
3	19:12:07	0.061	0.056	2.187	TM 49150.000	M 49990.000	TM 51250.000	17.310	M 53070.000	3540.000	T 2432000.000
x		0.051	0.036	1.880	TM 48970.000	M 49760.000	TM 50860.000	17.040	M 52950.000	3386.000	T 2403000.000
σ		0.013	0.021	0.527	TM 260.000	M 419.900	TM 398.200	0.565	M 165.800	180.300	T 37920.000
%RSD		24.440	57.960	28.010	TM 0.531	M 0.844	TM 0.783	3.315	M 0.313	5.325	T 1.578

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:11:59	TM 53190.000	M 52420.000	87.678%	89.943%	M 1016.000	0.462	0.612	32.900	TM 50880.000	0.060
2	19:12:03	TM 53500.000	M 53450.000	87.595%	88.902%	M 1021.000	0.230	0.555	33.550	TM 50540.000	-0.018
3	19:12:07	TM 53800.000	M 52850.000	88.622%	88.810%	M 1019.000	0.490	0.579	33.390	TM 50900.000	0.101
x		TM 53500.000	M 52910.000	87.965%	89.218%	M 1018.000	0.394	0.582	33.280	TM 50770.000	0.048
σ		TM 306.800	M 515.400	0.571%	0.630%	M 2.687	0.143	0.028	0.336	TM 201.400	0.060
%RSD		TM 0.573	M 0.974	0.649	0.706	M 0.264	36.250	4.894	1.010	TM 0.397	126.000

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:11:59	0.748	0.924	0.523	1.965	90.650%	0.517	-0.268	0.278	85.762%	0.344
2	19:12:03	0.741	0.960	0.517	1.927	92.594%	0.413	-0.297	0.271	86.739%	0.332
3	19:12:07	0.730	0.923	0.472	1.962	92.937%	0.519	-0.277	0.271	87.388%	0.309
x		0.740	0.936	0.504	1.952	92.060%	0.483	-0.281	0.273	86.630%	0.329
σ		0.009	0.021	0.028	0.021	1.234%	0.061	0.015	0.004	0.819%	0.018
%RSD		1.180	2.269	5.513	1.071	1.340	12.540	5.238	1.507	0.945	5.388

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:11:59	TM 1052.000	0.042	0.049	89.345%	0.101	0.380	1.161	T 90.602%	0.057	0.149
2	19:12:03	TM 1040.000	0.037	0.120	90.170%	0.123	0.357	1.152	T 91.621%	0.022	0.136
3	19:12:07	TM 1050.000	0.032	0.039	91.058%	0.102	0.326	1.211	T 92.104%	0.041	0.128
x		TM 1047.000	0.037	0.069	90.191%	0.109	0.354	1.175	T 91.443%	0.040	0.138
σ		TM 6.047	0.005	0.044	0.857%	0.012	0.027	0.032	T 0.767%	0.018	0.011
%RSD		TM 0.577	12.680	64.020	0.950	11.450	7.552	2.692	T 0.838	44.160	7.845

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	19:11:59	0.244	T 87.974%	0.030
2	19:12:03	0.230	T 88.971%	0.023
3	19:12:07	0.220	T 90.653%	0.015
x		0.231	T 89.199%	0.023
σ		0.012	T 1.355%	0.007
%RSD		5.194	T 1.519	32.660

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:17:32	99.030	96.860	97.740	TM 47990.000	M 49310.000	TM 50130.000	5130.000	M 57380.000	3183.000	T 2487000.000
2	19:17:37	99.970	97.500	97.050	TM 50070.000	M 48820.000	TM 50270.000	5168.000	M 57020.000	3305.000	T 2406000.000
3	19:17:40	99.260	97.180	99.490	TM 47810.000	M 49210.000	TM 50370.000	5178.000	M 57580.000	3241.000	T 2552000.000
x		99.420	97.180	98.090	TM 48620.000	M 49110.000	TM 50260.000	5159.000	M 57330.000	3243.000	T 2482000.000
σ		0.490	0.322	1.260	TM 1257.000	M 255.000	TM 118.300	24.870	M 281.300	61.080	T 72790.000
%RSD		0.493	0.331	1.284	TM 2.584	M 0.519	TM 0.236	0.482	M 0.491	1.883	T 2.933

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:17:32	TM 52410.000	M 52150.000	90.463%	92.092%	M 1105.000	100.800	101.300	14.500	TM 50670.000	100.200
2	19:17:37	TM 54390.000	M 53080.000	92.199%	92.833%	M 1109.000	100.500	100.200	15.720	TM 50070.000	100.200
3	19:17:40	TM 52620.000	M 52740.000	92.367%	91.841%	M 1102.000	100.700	100.200	13.700	TM 49990.000	98.820
x		TM 53140.000	M 52660.000	91.676%	92.255%	M 1105.000	100.600	100.500	14.640	TM 50240.000	99.710
σ		TM 1084.000	M 470.900	1.054%	0.516%	M 3.356	0.150	0.621	1.017	TM 369.400	0.771
%RSD		TM 2.039	M 0.894	1.150	0.559	M 0.304	0.149	0.617	6.945	TM 0.735	0.773

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:17:32	98.480	98.540	96.350	106.000	94.607%	103.000	102.500	105.200	87.858%	100.200
2	19:17:37	96.970	96.930	96.100	103.000	97.108%	102.200	101.200	103.700	89.414%	100.400
3	19:17:40	97.830	97.650	96.410	106.400	96.707%	103.300	100.400	104.400	90.417%	99.750
x		97.760	97.710	96.280	105.100	96.141%	102.800	101.400	104.400	89.230%	100.100
σ		0.756	0.808	0.164	1.862	1.343%	0.576	1.064	0.754	1.290%	0.336
%RSD		0.774	0.827	0.170	1.771	1.397	0.560	1.049	0.722	1.445	0.336

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:17:32	TM 1161.000	47.770	102.000	92.168%	100.400	102.000	102.600	T 93.632%	5.353	T 102.500
2	19:17:37	TM 1147.000	48.230	101.700	93.587%	100.600	102.800	104.000	T 93.952%	5.321	T 104.100
3	19:17:40	TM 1148.000	47.520	101.400	94.340%	100.400	102.800	101.100	T 95.220%	5.216	T 102.600
x		TM 1152.000	47.840	101.700	93.365%	100.500	102.600	102.600	T 94.268%	5.297	T 103.100
σ		TM 8.115	0.361	0.295	1.103%	0.079	0.436	1.458	T 0.840%	0.072	T 0.935
%RSD		TM 0.704	0.755	0.290	1.181	0.079	0.425	1.421	T 0.891	1.354	T 0.908

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	19:17:32	T 101.300	T 90.658%	T 104.100
2	19:17:37	T 102.000	T 91.483%	T 106.200
3	19:17:40	T 100.900	T 92.892%	T 104.000
x		T 101.400	T 91.678%	T 104.800
σ		T 0.548	T 1.130%	T 1.257
%RSD		T 0.540	T 1.232	T 1.200

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:23:06	96.990	95.700	94.970	5128.000	4923.000	4913.000	4978.000	5292.000	149.100	τ 2277000.000
2	19:23:11	98.890	98.850	97.290	4868.000	4958.000	4902.000	5022.000	5012.000	168.500	τ 2417000.000
3	19:23:14	98.530	97.650	98.680	5011.000	4915.000	4864.000	4963.000	4981.000	138.100	τ 2310000.000
x		98.130	97.400	96.980	5002.000	4932.000	4893.000	4988.000	5095.000	151.900	τ 2335000.000
σ		1.008	1.589	1.875	130.400	22.790	25.950	30.900	171.100	15.370	τ 73200.000
%RSD		1.027	1.632	1.934	2.606	0.462	0.530	0.620	3.359	10.120	τ 3.135

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:23:06	4926.000	4757.000	105.030%	107.173%	100.700	98.710	100.300	29.630	5690.000	100.500
2	19:23:11	4791.000	5024.000	106.697%	105.445%	100.800	100.100	101.000	28.660	5675.000	100.200
3	19:23:14	4893.000	5372.000	108.669%	106.355%	99.290	99.090	99.650	26.040	5582.000	99.040
x		4870.000	5051.000	106.799%	106.325%	100.300	99.290	100.300	28.110	5649.000	99.910
σ		70.700	308.200	1.822%	0.864%	0.867	0.705	0.655	1.854	58.280	0.760
%RSD		1.452	6.102	1.706	0.813	0.865	0.710	0.653	6.596	1.032	0.760

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:23:06	100.000	102.100	101.500	102.500	109.763%	100.500	99.220	99.260	104.481%	98.370
2	19:23:11	101.400	101.200	102.400	102.900	109.271%	101.300	98.590	99.960	104.705%	98.990
3	19:23:14	99.180	100.500	100.400	103.200	111.775%	100.100	99.600	99.150	105.697%	98.030
x		100.200	101.300	101.400	102.900	110.270%	100.600	99.140	99.460	104.961%	98.470
σ		1.120	0.831	1.022	0.369	1.326%	0.602	0.510	0.439	0.647%	0.485
%RSD		1.118	0.821	1.007	0.359	1.203	0.598	0.514	0.442	0.617	0.493

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:23:06	101.600	50.740	100.200	105.011%	100.300	99.830	99.880	τ 105.886%	5.115	τ 101.100
2	19:23:11	102.000	50.390	101.900	105.533%	101.100	100.600	98.110	τ 106.776%	4.940	τ 98.550
3	19:23:14	101.300	50.440	101.400	106.173%	100.300	100.400	99.120	τ 106.829%	5.037	τ 99.460
x		101.600	50.520	101.200	105.572%	100.600	100.300	99.040	τ 106.497%	5.031	τ 99.710
σ		0.373	0.191	0.917	0.582%	0.428	0.417	0.888	τ 0.530%	0.088	τ 1.304
%RSD		0.367	0.379	0.906	0.551	0.425	0.416	0.897	τ 0.498	1.749	τ 1.308

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	19:23:06	τ 100.600	τ 103.486%	τ 100.300
2	19:23:11	τ 99.480	τ 105.293%	τ 98.010
3	19:23:14	τ 99.350	τ 105.899%	τ 98.830
x		τ 99.830	τ 104.893%	τ 99.040
σ		τ 0.716	τ 1.255%	τ 1.157
%RSD		τ 0.717	τ 1.197	τ 1.168

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:28:40	0.024	0.007	0.344	1.308	-1.571	-0.539	1.057	-4.928	165.000	↹2311000.000
2	19:28:44	0.029	0.012	0.678	-2.214	-1.394	-1.249	-2.449	2.897	183.600	↹2262000.000
3	19:28:48	0.013	0.027	0.650	1.717	-0.114	1.085	-1.608	10.910	156.300	↹2296000.000
x		0.022	0.015	0.557	0.270	-1.026	-0.234	-1.000	2.960	168.300	↹2290000.000
σ		0.008	0.010	0.186	2.161	0.795	1.196	1.830	7.919	13.920	↹25010.000
%RSD		36.220	68.970	33.320	799.500	77.470	510.500	183.000	267.600	8.271	↹1.092

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:28:40	-0.929	2.682	103.880%	106.389%	-0.041	0.183	0.010	58.220	2.041	0.005
2	19:28:44	5.632	-6.538	105.499%	105.737%	-0.022	-0.020	-0.023	58.840	0.918	0.000
3	19:28:48	8.787	14.160	103.739%	105.974%	0.141	0.182	0.016	57.100	2.210	-0.001
x		4.497	3.436	104.373%	106.034%	0.026	0.115	0.001	58.050	1.723	0.002
σ		4.957	10.370	0.978%	0.330%	0.100	0.117	0.021	0.884	0.702	0.003
%RSD		110.200	301.800	0.937	0.311	384.700	101.800	2059.000	1.522	40.740	208.800

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:28:40	0.003	0.007	0.019	-0.126	103.042%	0.057	-0.318	-0.002	102.968%	0.002
2	19:28:44	0.003	-0.013	0.003	-0.179	103.644%	0.062	-0.349	-0.007	103.187%	-0.010
3	19:28:48	0.003	0.005	0.021	-0.154	103.107%	0.048	-0.341	-0.001	102.721%	-0.002
x		0.003	-0.000	0.014	-0.153	103.264%	0.056	-0.336	-0.003	102.959%	-0.004
σ		0.000	0.011	0.010	0.027	0.331%	0.007	0.016	0.003	0.233%	0.006
%RSD		13.860	2947.000	67.470	17.620	0.320	12.210	4.736	106.200	0.226	170.200

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	19:28:40	0.084	-0.011	0.003	103.544%	0.028	-0.002	-0.023	↹105.121%	0.039	0.155
2	19:28:44	0.061	-0.004	0.002	104.509%	0.006	0.005	-0.018	↹105.447%	0.045	0.128
3	19:28:48	0.085	-0.004	0.004	103.609%	0.048	0.008	0.003	↹105.042%	0.021	0.116
x		0.077	-0.006	0.003	103.887%	0.027	0.004	-0.012	↹105.204%	0.035	0.133
σ		0.013	0.004	0.001	0.540%	0.021	0.005	0.014	↹0.215%	0.013	0.020
%RSD		17.310	60.340	38.650	0.519	77.810	147.600	111.500	↹0.204	36.100	15.030

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	19:28:40	0.007	↹104.504%	-0.001
2	19:28:44	0.003	↹104.549%	-0.003
3	19:28:48	0.009	↹104.806%	0.002
x		0.006	↹104.619%	-0.001
σ		0.003	↹0.163%	0.002
%RSD		47.700	↹0.156	301.100

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	00:56:18	87.450	83.530	88.730	5051.000	4924.000	4649.000	4680.000	4959.000	122.300	↹2228000.000
2	00:56:23	87.200	82.790	90.640	5066.000	4846.000	4608.000	4609.000	5005.000	169.100	↹2195000.000
3	00:56:26	87.600	83.630	91.150	5147.000	5020.000	4730.000	4733.000	4991.000	173.600	↹2260000.000
x		87.420	83.310	90.170	5088.000	4930.000	4663.000	4674.000	4985.000	155.000	↹2228000.000
σ		0.205	0.458	1.274	51.700	87.150	62.150	62.340	23.790	28.400	↹32680.000
%RSD		0.234	0.549	1.413	1.016	1.768	1.333	1.334	0.477	18.330	↹1.467

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	00:56:18	4760.000	5079.000	107.601%	116.336%	99.650	98.210	100.300	9.314	5609.000	99.610
2	00:56:23	4798.000	4914.000	111.236%	117.578%	97.190	96.740	98.750	10.000	5581.000	98.310
3	00:56:26	4719.000	5145.000	108.917%	116.471%	100.200	98.980	101.100	11.520	5603.000	100.300
x		4759.000	5046.000	109.251%	116.795%	99.010	97.980	100.100	10.280	5598.000	99.410
σ		39.590	119.200	1.841%	0.682%	1.607	1.139	1.194	1.129	14.570	1.011
%RSD		0.832	2.362	1.685	0.584	1.623	1.162	1.193	10.980	0.260	1.017

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	00:56:18	101.100	102.600	104.200	104.100	109.906%	101.500	97.090	100.300	102.977%	99.990
2	00:56:23	99.640	100.900	103.100	104.800	111.133%	101.400	96.380	98.810	105.796%	98.620
3	00:56:26	101.300	101.900	104.100	105.900	111.946%	101.300	96.890	99.810	105.049%	100.400
x		100.700	101.800	103.800	104.900	110.995%	101.400	96.790	99.620	104.607%	99.680
σ		0.912	0.845	0.609	0.909	1.027%	0.071	0.368	0.737	1.460%	0.936
%RSD		0.906	0.829	0.587	0.867	0.925	0.070	0.380	0.740	1.396	0.939

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	00:56:18	103.200	52.240	105.300	103.081%	102.300	102.000	97.390	↹109.671%	5.130	↹101.300
2	00:56:23	102.700	51.510	102.600	106.174%	100.200	100.200	95.880	↹111.433%	5.065	↹101.100
3	00:56:26	103.600	52.210	105.100	105.228%	102.400	101.000	98.660	↹110.516%	5.136	↹100.500
x		103.100	51.990	104.300	104.828%	101.600	101.000	97.310	↹110.540%	5.111	↹100.900
σ		0.417	0.412	1.467	1.585%	1.206	0.875	1.390	↹0.881%	0.039	↹0.409
%RSD		0.404	0.793	1.406	1.512	1.186	0.866	1.428	↹0.797	0.770	↹0.405

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	00:56:18	↹101.300	↹105.221%	↹100.800
2	00:56:23	↹100.500	↹107.241%	↹99.780
3	00:56:26	↹101.400	↹107.639%	↹101.100
x		↹101.100	↹106.700%	↹100.600
σ		↹0.468	↹1.297%	↹0.691
%RSD		↹0.463	↹1.216	↹0.687

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:01:52	0.037	0.022	1.570	2.575	1.425	1.728	0.583	0.096	154.700	↹2206000.000
2	01:01:56	0.041	0.017	0.073	4.500	1.353	2.963	3.748	11.000	140.500	↹2200000.000
3	01:02:00	0.033	0.017	-0.294	5.652	2.576	2.880	1.098	25.150	171.500	↹2197000.000
x		0.037	0.019	0.450	4.242	1.785	2.524	1.810	12.080	155.600	↹2201000.000
σ		0.004	0.003	0.987	1.555	0.686	0.691	1.699	12.560	15.530	↹4808.000
%RSD		11.220	15.320	219.600	36.650	38.460	27.360	93.860	104.000	9.979	↹0.218

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:01:52	-23.340	11.480	104.196%	115.505%	0.059	-0.060	-0.050	27.690	2.388	0.055
2	01:01:56	-24.750	17.580	105.513%	115.898%	0.076	0.039	-0.040	27.920	4.170	0.135
3	01:02:00	-30.170	19.200	106.962%	116.692%	0.132	0.078	-0.018	27.580	4.502	0.177
x		-26.090	16.080	105.557%	116.031%	0.089	0.019	-0.036	27.730	3.687	0.122
σ		3.609	4.069	1.383%	0.605%	0.038	0.071	0.016	0.177	1.137	0.062
%RSD		13.840	25.300	1.310	0.521	42.650	371.500	45.120	0.637	30.830	50.480

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:01:52	0.036	0.033	0.044	-0.135	104.457%	0.149	-0.159	0.039	102.765%	0.020
2	01:01:56	0.065	0.070	0.099	-0.016	106.454%	0.082	-0.211	0.090	103.174%	0.063
3	01:02:00	0.088	0.090	0.099	-0.014	106.125%	0.118	-0.247	0.118	103.433%	0.063
x		0.063	0.064	0.081	-0.055	105.679%	0.116	-0.205	0.082	103.124%	0.048
σ		0.026	0.029	0.032	0.069	1.071%	0.034	0.045	0.040	0.337%	0.025
%RSD		41.460	45.510	39.350	124.900	1.013	29.190	21.660	48.460	0.327	51.440

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:01:52	0.087	0.006	0.027	102.363%	0.017	0.045	0.031	↹109.690%	0.022	0.126
2	01:01:56	0.096	0.028	0.093	102.777%	0.045	0.075	0.070	↹110.345%	0.030	0.137
3	01:02:00	0.122	0.037	0.119	103.398%	0.083	0.090	0.077	↹110.659%	0.027	0.148
x		0.102	0.024	0.079	102.846%	0.048	0.070	0.059	↹110.231%	0.026	0.137
σ		0.018	0.016	0.048	0.521%	0.033	0.023	0.025	↹0.495%	0.004	0.011
%RSD		18.150	66.670	60.090	0.507	68.800	32.880	41.370	↹0.449	16.710	8.353

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	01:01:52	0.036	↹107.932%	0.031
2	01:01:56	0.066	↹108.979%	0.061
3	01:02:00	0.083	↹109.750%	0.081
x		0.062	↹108.887%	0.058
σ		0.024	↹0.912%	0.025
%RSD		38.250	↹0.838	43.440

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:07:25	0.045	-0.010	-0.286	9523.000	4154.000	9.136	73.920	M 86650.000	1493.000	T 1921000.000
2	01:07:29	0.070	-0.010	0.005	10110.000	4120.000	7.230	75.590	M 86030.000	1667.000	T 1845000.000
3	01:07:33	0.048	-0.005	0.236	9953.000	4160.000	6.935	82.100	M 85880.000	1571.000	T 1865000.000
x		0.054	-0.008	-0.015	9863.000	4145.000	7.767	77.210	M 86190.000	1577.000	T 1877000.000
σ		0.014	0.003	0.262	304.900	21.910	1.195	4.323	M 408.200	87.400	T 39860.000
%RSD		25.790	31.870	1727.000	3.091	0.529	15.380	5.600	M 0.474	5.543	T 2.124

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:07:25	TM 32780.000	M 140000.000	99.788%	113.217%	7.989	0.609	0.280	21.550	138.000	445.400
2	01:07:29	TM 33460.000	M 139500.000	100.909%	113.736%	8.388	0.552	0.307	22.010	137.000	446.300
3	01:07:33	TM 32930.000	M 140700.000	102.017%	113.874%	7.999	0.569	0.243	21.760	134.000	445.200
x		TM 33050.000	M 140100.000	100.904%	113.609%	8.125	0.577	0.277	21.770	136.300	445.600
σ		TM 357.300	M 571.200	1.115%	0.346%	0.228	0.029	0.032	0.229	2.052	0.594
%RSD		TM 1.081	M 0.408	1.105	0.305	2.802	5.089	11.480	1.053	1.505	0.133

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:07:25	0.157	0.472	3.649	199.800	100.113%	0.698	2.378	157.700	98.416%	0.037
2	01:07:29	0.164	0.408	3.637	194.700	102.410%	0.739	2.298	160.100	98.195%	0.039
3	01:07:33	0.162	0.430	3.534	196.900	101.649%	0.657	2.471	159.700	98.812%	0.035
x		0.161	0.437	3.607	197.200	101.390%	0.698	2.382	159.200	98.474%	0.037
σ		0.003	0.033	0.064	2.567	1.170%	0.041	0.087	1.268	0.313%	0.002
%RSD		2.161	7.445	1.764	1.302	1.154	5.904	3.644	0.796	0.318	5.191

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:07:25	0.723	-0.003	1.530	99.079%	41.670	0.039	32.900	T 106.656%	0.102	0.147
2	01:07:29	0.723	-0.012	1.528	99.860%	42.200	0.038	33.360	T 105.315%	0.095	0.146
3	01:07:33	0.688	-0.008	1.600	100.142%	42.430	0.017	33.340	T 107.044%	0.105	0.140
x		0.712	-0.007	1.553	99.694%	42.100	0.031	33.200	T 106.338%	0.101	0.144
σ		0.020	0.005	0.041	0.551%	0.392	0.013	0.258	T 0.907%	0.005	0.004
%RSD		2.834	61.520	2.635	0.552	0.930	40.080	0.777	T 0.853	5.224	2.735

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	01:07:25	0.204	T 101.857%	0.009
2	01:07:29	0.202	T 101.254%	0.007
3	01:07:33	0.197	T 102.434%	0.005
x		0.201	T 101.848%	0.007
σ		0.004	T 0.590%	0.002
%RSD		1.843	T 0.579	23.560

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:13:00	-0.006	-0.010	0.021	8535.000	3144.000	4.471	36.440	22820.000	1530.000	τ 1824000.000
2	01:13:04	-0.009	-0.024	-0.060	8748.000	3097.000	4.358	36.240	22900.000	1644.000	τ 1842000.000
3	01:13:08	-0.009	-0.019	-0.313	8545.000	3130.000	3.797	36.850	22700.000	1626.000	τ 1871000.000
x		-0.008	-0.018	-0.117	8609.000	3123.000	4.209	36.510	22810.000	1600.000	τ 1845000.000
σ		0.002	0.007	0.174	120.200	23.960	0.361	0.310	97.780	61.520	τ 23700.000
%RSD		24.750	40.310	148.800	1.396	0.767	8.571	0.850	0.429	3.845	τ 1.284

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:13:00	TM 41300.000	6419.000	102.196%	114.016%	3.064	0.102	0.239	21.440	28.840	12.250
2	01:13:04	TM 41560.000	6734.000	103.705%	115.036%	2.415	0.083	0.256	21.990	27.060	12.190
3	01:13:08	TM 40700.000	6212.000	103.670%	115.079%	3.203	0.109	0.261	22.780	27.690	12.300
x		TM 41190.000	6455.000	103.190%	114.710%	2.894	0.098	0.252	22.070	27.860	12.240
σ		TM 441.100	262.600	0.861%	0.602%	0.421	0.014	0.012	0.673	0.906	0.056
%RSD		TM 1.071	4.069	0.835	0.524	14.530	14.170	4.692	3.050	3.253	0.459

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:13:00	0.049	0.372	3.459	109.600	105.474%	0.156	2.513	7.062	101.013%	0.024
2	01:13:04	0.049	0.402	3.402	108.300	106.248%	0.180	2.493	6.955	102.085%	0.024
3	01:13:08	0.046	0.384	3.459	108.600	105.409%	0.149	2.426	6.983	102.480%	0.019
x		0.048	0.386	3.440	108.800	105.710%	0.162	2.477	7.000	101.859%	0.022
σ		0.001	0.015	0.033	0.714	0.467%	0.016	0.046	0.055	0.759%	0.003
%RSD		2.788	3.836	0.954	0.656	0.442	10.100	1.846	0.791	0.745	14.820

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:13:00	0.197	-0.008	0.075	102.389%	40.480	0.025	0.889	τ 108.992%	0.199	0.052
2	01:13:04	0.192	-0.015	0.062	102.878%	41.220	0.019	0.879	τ 110.205%	0.200	0.047
3	01:13:08	0.178	-0.009	0.071	102.751%	41.380	0.026	0.829	τ 110.034%	0.184	0.045
x		0.189	-0.011	0.069	102.673%	41.030	0.023	0.866	τ 109.744%	0.194	0.048
σ		0.010	0.004	0.007	0.254%	0.480	0.004	0.032	τ 0.657%	0.009	0.003
%RSD		5.226	37.580	9.404	0.247	1.170	16.810	3.738	τ 0.598	4.717	6.987

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	01:13:00	0.026	τ 106.340%	-0.008
2	01:13:04	0.022	τ 107.708%	-0.008
3	01:13:08	0.024	τ 108.579%	-0.009
x		0.024	τ 107.542%	-0.008
σ		0.002	τ 1.128%	0.001
%RSD		8.133	τ 1.049	9.109

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:18:34	0.014	-0.010	0.074	8345.000	3154.000	9.682	67.750	M 27090.000	1679.000	T 1770000.000
2	01:18:38	0.017	-0.005	0.331	8208.000	3188.000	10.650	63.030	M 27430.000	1504.000	T 1804000.000
3	01:18:42	0.012	-0.014	-0.102	8220.000	3084.000	13.020	54.420	M 27670.000	1559.000	T 1763000.000
x		0.014	-0.010	0.101	8258.000	3142.000	11.120	61.730	M 27400.000	1580.000	T 1779000.000
σ		0.002	0.005	0.218	76.020	52.690	1.720	6.757	M 288.000	89.500	T 21930.000
%RSD		16.110	46.140	215.800	0.921	1.677	15.470	10.950	M 1.051	5.663	T 1.233

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:18:34	TM 39770.000	18090.000	101.799%	113.413%	3.693	0.048	0.295	22.620	41.300	57.060
2	01:18:38	TM 40100.000	17540.000	102.676%	114.490%	3.073	0.140	0.271	21.820	41.790	57.220
3	01:18:42	TM 40280.000	17490.000	103.809%	113.745%	3.039	0.056	0.302	22.100	41.770	56.860
x		TM 40050.000	17700.000	102.761%	113.883%	3.268	0.081	0.290	22.180	41.620	57.050
σ		TM 261.200	333.100	1.007%	0.551%	0.368	0.051	0.016	0.406	0.281	0.177
%RSD		TM 0.652	1.881	0.980	0.484	11.270	62.270	5.604	1.828	0.675	0.310

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:18:34	0.075	0.406	2.846	110.200	104.441%	0.335	2.482	19.530	100.891%	0.022
2	01:18:38	0.073	0.400	2.891	110.500	104.389%	0.278	2.860	19.470	101.781%	0.007
3	01:18:42	0.079	0.410	2.870	109.900	105.076%	0.259	2.526	19.420	101.987%	0.017
x		0.076	0.405	2.869	110.200	104.635%	0.291	2.623	19.470	101.553%	0.015
σ		0.003	0.005	0.022	0.316	0.383%	0.040	0.207	0.052	0.582%	0.008
%RSD		3.840	1.160	0.776	0.287	0.366	13.700	7.879	0.267	0.573	50.970

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:18:34	0.102	-0.005	0.208	100.335%	41.570	0.022	2.683	T 108.480%	0.217	0.038
2	01:18:38	0.096	-0.012	0.206	102.101%	40.410	0.022	2.734	T 109.769%	0.191	0.039
3	01:18:42	0.102	-0.012	0.214	102.646%	40.750	0.023	2.650	T 110.035%	0.181	0.040
x		0.100	-0.010	0.210	101.694%	40.910	0.022	2.689	T 109.428%	0.196	0.039
σ		0.004	0.004	0.004	1.208%	0.598	0.001	0.042	T 0.832%	0.019	0.001
%RSD		3.727	45.810	2.058	1.188	1.460	2.948	1.564	T 0.760	9.620	2.942

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	01:18:34	0.154	T 105.356%	-0.009
2	01:18:38	0.154	T 106.815%	-0.009
3	01:18:42	0.153	T 107.203%	-0.010
x		0.153	T 106.458%	-0.010
σ		0.001	T 0.974%	0.000
%RSD		0.335	T 0.915	3.722

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:24:08	0.013	-0.005	0.197	8088.000	2661.000	5.348	19.920	M 36650.000	1335.000	T 1660000.000
2	01:24:11	0.021	-0.005	-0.219	8143.000	2713.000	5.826	27.330	M 37070.000	1350.000	T 1657000.000
3	01:24:15	0.008	-0.005	-0.070	7591.000	2680.000	5.850	23.230	M 36500.000	1288.000	T 1703000.000
x		0.014	-0.005	-0.030	7941.000	2685.000	5.675	23.490	M 36740.000	1324.000	T 1673000.000
σ		0.006	0.000	0.211	304.400	26.260	0.283	3.714	M 291.400	31.980	T 25360.000
%RSD		45.910	4.344	694.000	3.833	0.978	4.983	15.810	M 0.793	2.415	T 1.516

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:24:08	TM 38130.000	M 31690.000	100.457%	111.406%	3.411	0.024	0.232	21.380	63.850	86.690
2	01:24:11	TM 38790.000	M 31820.000	101.359%	112.981%	3.381	0.073	0.258	21.110	64.240	86.680
3	01:24:15	TM 37460.000	M 31500.000	102.147%	111.781%	3.768	-0.170	0.228	22.300	67.900	85.800
x		TM 38130.000	M 31670.000	101.321%	112.056%	3.520	-0.024	0.239	21.600	65.330	86.390
σ		TM 667.400	M 157.300	0.846%	0.823%	0.216	0.128	0.017	0.623	2.232	0.510
%RSD		TM 1.750	M 0.497	0.835	0.735	6.127	533.800	6.910	2.883	3.416	0.590

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:24:08	0.143	0.452	3.104	226.400	103.472%	0.724	2.379	29.710	99.650%	0.019
2	01:24:11	0.147	0.450	3.196	224.500	103.957%	0.780	2.467	29.410	100.658%	0.025
3	01:24:15	0.150	0.374	3.191	226.400	102.377%	0.717	2.379	29.760	100.362%	0.018
x		0.147	0.425	3.163	225.800	103.269%	0.741	2.408	29.630	100.224%	0.021
σ		0.004	0.045	0.052	1.049	0.809%	0.035	0.051	0.192	0.518%	0.003
%RSD		2.411	10.510	1.642	0.465	0.784	4.696	2.097	0.648	0.517	16.080

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:24:08	0.043	-0.011	4.119	101.247%	41.080	0.018	3.399	T 107.526%	0.309	-0.006
2	01:24:11	0.048	-0.005	3.966	102.150%	41.250	0.032	3.462	T 107.432%	0.295	-0.007
3	01:24:15	0.041	-0.018	4.316	101.259%	41.050	0.024	3.240	T 108.956%	0.313	-0.004
x		0.044	-0.011	4.134	101.552%	41.130	0.025	3.367	T 107.972%	0.305	-0.005
σ		0.004	0.007	0.176	0.518%	0.107	0.007	0.115	T 0.854%	0.010	0.002
%RSD		8.300	58.380	4.245	0.510	0.261	27.550	3.407	T 0.791	3.116	30.130

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	01:24:08	0.578	T 103.781%	-0.010
2	01:24:11	0.594	T 104.348%	-0.010
3	01:24:15	0.588	T 105.898%	-0.010
x		0.587	T 104.676%	-0.010
σ		0.008	T 1.096%	0.000
%RSD		1.352	T 1.047	1.524

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:29:43	0.005	-0.004	-0.330	-1.112	-2.153	-2.391	-0.898	2.483	153.200	↹2106000.000
2	01:29:47	0.016	0.010	-0.887	-0.656	-1.002	-1.350	-0.341	10.020	154.600	↹2239000.000
3	01:29:51	0.006	0.014	-0.823	0.057	-0.846	-1.140	0.839	7.551	162.200	↹2086000.000
x		0.009	0.007	-0.680	-0.571	-1.334	-1.627	-0.133	6.684	156.700	↹2144000.000
σ		0.006	0.010	0.305	0.590	0.714	0.670	0.887	3.841	4.855	↹82920.000
%RSD		66.310	146.900	44.850	103.300	53.540	41.170	666.000	57.470	3.099	↹3.868

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:29:43	-41.520	26.890	99.787%	110.232%	-0.078	-0.104	-0.093	25.980	-1.258	0.051
2	01:29:47	-46.520	12.510	100.106%	110.991%	-0.015	0.121	-0.102	25.090	-0.618	0.056
3	01:29:51	-11.510	21.350	102.243%	111.207%	0.023	-0.100	-0.098	25.730	-0.654	0.052
x		-33.180	20.250	100.712%	110.810%	-0.023	-0.028	-0.098	25.600	-0.844	0.053
σ		18.930	7.254	1.336%	0.512%	0.051	0.129	0.004	0.457	0.360	0.002
%RSD		57.060	35.820	1.326	0.462	216.000	467.700	4.572	1.783	42.630	4.642

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:29:43	0.009	0.015	0.025	0.028	100.973%	-0.088	-0.332	0.038	99.803%	-0.002
2	01:29:47	0.015	0.010	0.024	-0.010	101.977%	-0.074	-0.302	0.039	98.839%	0.006
3	01:29:51	0.014	0.021	0.029	-0.050	101.987%	-0.027	-0.191	0.027	100.227%	-0.003
x		0.013	0.015	0.026	-0.010	101.646%	-0.063	-0.275	0.035	99.623%	0.000
σ		0.003	0.005	0.003	0.039	0.582%	0.032	0.075	0.006	0.711%	0.005
%RSD		25.340	33.720	9.712	377.900	0.573	50.900	27.120	18.500	0.714	1381.000

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:29:43	-0.002	-0.001	0.007	99.329%	-0.004	0.012	0.012	↹106.866%	0.001	-0.012
2	01:29:47	-0.004	-0.002	0.006	99.255%	0.002	0.014	0.001	↹107.426%	-0.002	-0.011
3	01:29:51	0.001	-0.005	0.010	100.678%	0.006	0.009	0.013	↹107.686%	0.003	-0.011
x		-0.002	-0.003	0.008	99.754%	0.002	0.012	0.009	↹107.326%	0.001	-0.011
σ		0.002	0.002	0.002	0.801%	0.005	0.002	0.007	↹0.419%	0.002	0.000
%RSD		151.700	80.240	23.570	0.803	319.900	20.820	74.300	↹0.390	363.100	1.781

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	01:29:43	0.006	↹105.043%	0.008
2	01:29:47	0.004	↹107.188%	0.009
3	01:29:51	0.006	↹107.199%	0.009
x		0.006	↹106.477%	0.009
σ		0.001	↹1.241%	0.001
%RSD		17.350	↹1.166	6.626

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:35:18	-0.008	-0.033	-0.297	9.700	8.971	3.910	4.975	34.060	182.800	τ 2023000.000
2	01:35:22	-0.005	-0.019	-0.251	8.685	8.754	5.044	3.932	24.000	147.300	τ 1991000.000
3	01:35:26	-0.002	-0.028	0.014	7.062	7.745	6.460	6.037	42.590	167.000	τ 2075000.000
x		-0.005	-0.027	-0.178	8.482	8.490	5.138	4.981	33.550	165.700	τ 2030000.000
σ		0.003	0.007	0.168	1.330	0.654	1.278	1.052	9.304	17.790	τ 42440.000
%RSD		66.840	27.280	94.480	15.690	7.708	24.870	21.120	27.730	10.730	τ 2.091

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:35:18	-62.610	146.500	100.883%	110.968%	0.128	0.192	2.085	23.190	27.720	0.249
2	01:35:22	-46.600	160.000	102.547%	110.811%	0.226	0.311	2.104	22.420	27.090	0.280
3	01:35:26	-56.430	161.800	101.523%	110.677%	0.249	0.240	2.050	22.820	29.340	0.264
x		-55.210	156.100	101.651%	110.819%	0.201	0.248	2.080	22.810	28.050	0.264
σ		8.075	8.379	0.839%	0.146%	0.064	0.060	0.027	0.388	1.162	0.015
%RSD		14.630	5.368	0.826	0.131	31.960	24.330	1.320	1.701	4.141	5.796

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:35:18	0.005	0.273	0.203	10.400	104.012%	-0.135	-0.305	0.069	99.365%	0.025
2	01:35:22	0.003	0.326	0.239	10.220	103.469%	-0.065	-0.348	0.083	100.198%	0.039
3	01:35:26	0.007	0.283	0.206	10.690	105.598%	-0.119	-0.365	0.078	101.253%	0.041
x		0.005	0.294	0.216	10.440	104.360%	-0.106	-0.339	0.076	100.272%	0.035
σ		0.002	0.028	0.020	0.237	1.106%	0.037	0.031	0.007	0.946%	0.009
%RSD		44.950	9.581	9.157	2.269	1.060	34.600	9.150	9.022	0.943	25.270

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:35:18	0.198	-0.011	-0.012	100.795%	40.380	0.018	0.032	τ 108.009%	0.014	-0.036
2	01:35:22	0.178	-0.011	-0.009	100.688%	40.930	0.026	0.023	τ 107.191%	0.009	-0.038
3	01:35:26	0.195	-0.008	-0.008	101.565%	40.540	0.012	0.014	τ 108.613%	0.014	-0.039
x		0.190	-0.010	-0.009	101.016%	40.620	0.019	0.023	τ 107.938%	0.012	-0.038
σ		0.011	0.002	0.002	0.479%	0.282	0.007	0.009	τ 0.714%	0.003	0.002
%RSD		5.829	17.160	21.460	0.474	0.694	37.100	39.400	τ 0.661	26.120	4.098

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	01:35:18	0.010	τ 106.976%	-0.011
2	01:35:22	0.011	τ 107.646%	-0.011
3	01:35:26	0.010	τ 108.678%	-0.011
x		0.011	τ 107.767%	-0.011
σ		0.000	τ 0.858%	0.000
%RSD		2.725	τ 0.796	2.879

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:40:52	-0.015	-0.014	0.723	4299.000	2866.000	8.318	22.250	22220.000	1379.000	T 1648000.000
2	01:40:56	-0.010	-0.028	1.008	4476.000	2898.000	8.512	20.820	22750.000	1334.000	T 1649000.000
3	01:40:59	-0.010	-0.019	1.157	4417.000	2920.000	7.070	22.290	22890.000	1493.000	T 1651000.000
x		-0.012	-0.020	0.963	4397.000	2895.000	7.966	21.790	22620.000	1402.000	T 1649000.000
σ		0.003	0.007	0.220	90.180	27.230	0.783	0.839	354.300	81.830	T 1252.000
%RSD		23.210	35.590	22.890	2.051	0.941	9.825	3.849	1.566	5.837	T 0.076

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:40:52	TM 37940.000	433.200	101.140%	111.248%	2.501	-0.204	0.316	22.130	41.470	1.096
2	01:40:56	TM 39340.000	521.100	100.592%	112.831%	2.683	0.076	0.294	22.100	42.280	1.119
3	01:40:59	TM 38950.000	524.600	101.256%	112.108%	2.724	-0.113	0.304	22.900	43.520	1.141
x		TM 38740.000	493.000	100.996%	112.062%	2.636	-0.080	0.305	22.380	42.420	1.119
σ		TM 721.600	51.770	0.355%	0.792%	0.119	0.142	0.011	0.456	1.034	0.023
%RSD		TM 1.863	10.500	0.351	0.707	4.503	177.300	3.635	2.037	2.438	2.035

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:40:52	0.014	0.531	2.824	82.620	103.509%	-0.162	0.898	0.368	100.062%	0.020
2	01:40:56	0.012	0.647	2.811	84.960	102.464%	-0.187	1.010	0.323	100.908%	0.011
3	01:40:59	0.016	0.630	2.847	84.020	103.852%	-0.099	1.205	0.330	100.895%	0.024
x		0.014	0.603	2.827	83.870	103.275%	-0.149	1.038	0.340	100.622%	0.018
σ		0.002	0.063	0.018	1.175	0.723%	0.045	0.156	0.025	0.485%	0.007
%RSD		17.530	10.380	0.639	1.401	0.700	30.210	14.980	7.229	0.482	36.470

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:40:52	0.312	-0.013	-0.012	100.286%	41.390	0.015	0.139	T 107.532%	0.027	-0.029
2	01:40:56	0.315	-0.010	-0.013	101.468%	41.040	0.020	0.167	T 106.808%	0.032	-0.028
3	01:40:59	0.304	-0.011	-0.015	101.631%	41.210	0.019	0.140	T 108.016%	0.040	-0.031
x		0.310	-0.012	-0.013	101.128%	41.210	0.018	0.148	T 107.452%	0.033	-0.029
σ		0.006	0.001	0.001	0.734%	0.178	0.003	0.016	T 0.608%	0.006	0.001
%RSD		1.834	11.770	11.410	0.726	0.432	15.950	10.710	T 0.565	19.050	4.055

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	01:40:52	0.035	T 105.968%	-0.011
2	01:40:56	0.032	T 106.496%	-0.011
3	01:40:59	0.035	T 107.739%	-0.011
x		0.034	T 106.734%	-0.011
σ		0.002	T 0.909%	0.000
%RSD		4.823	T 0.852	0.635

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:46:25	175.300	171.500	182.100	T 15230.000	12530.000	9343.000	959.200	M 43020.000	1372.000	T 1768000.000
2	01:46:29	176.200	171.300	180.100	T 15220.000	12790.000	9466.000	949.100	M 43650.000	1451.000	T 1827000.000
3	01:46:33	175.500	172.600	176.600	T 14890.000	12900.000	9426.000	952.500	M 44120.000	1385.000	T 1858000.000
x		175.700	171.800	179.600	T 15120.000	12740.000	9412.000	953.600	M 43600.000	1403.000	T 1818000.000
σ		0.448	0.696	2.755	T 193.200	192.200	62.780	5.142	M 554.900	42.550	T 45920.000
%RSD		0.255	0.405	1.534	T 1.278	1.509	0.667	0.539	M 1.273	3.033	T 2.526

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:46:25	TM 82250.000	10540.000	103.750%	113.469%	196.000	195.500	200.000	-15.280	T 10350.000	198.300
2	01:46:29	TM 83160.000	10220.000	104.337%	114.043%	201.600	196.900	200.400	-21.180	T 10400.000	198.700
3	01:46:33	TM 82370.000	10610.000	105.182%	112.824%	199.200	198.500	200.200	-24.340	T 10370.000	197.900
x		TM 82590.000	10460.000	104.423%	113.446%	199.000	197.000	200.200	-20.270	T 10370.000	198.300
σ		TM 490.400	209.800	0.720%	0.610%	2.809	1.537	0.163	4.596	T 25.450	0.391
%RSD		TM 0.594	2.006	0.689	0.538	1.412	0.780	0.081	22.680	T 0.245	0.197

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:46:25	196.000	201.500	205.900	291.900	104.559%	207.600	202.900	199.000	98.733%	83.860
2	01:46:29	197.400	201.900	206.100	295.500	105.723%	208.100	203.600	199.600	101.484%	82.650
3	01:46:33	197.300	202.800	204.700	296.500	107.119%	206.700	203.100	200.500	102.101%	82.910
x		196.900	202.100	205.600	294.600	105.800%	207.500	203.200	199.700	100.773%	83.140
σ		0.785	0.661	0.761	2.446	1.282%	0.669	0.329	0.735	1.793%	0.637
%RSD		0.399	0.327	0.370	0.830	1.211	0.323	0.162	0.368	1.780	0.767

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:46:25	208.000	95.040	211.300	98.418%	212.100	206.100	195.900	T 103.992%	5.184	T 200.200
2	01:46:29	208.300	94.650	209.700	100.443%	210.900	205.200	194.000	T 106.580%	5.093	T 196.500
3	01:46:33	208.200	94.660	210.900	100.247%	211.700	209.200	193.700	T 107.469%	5.171	T 195.600
x		208.100	94.790	210.600	99.703%	211.600	206.800	194.500	T 106.014%	5.149	T 197.400
σ		0.161	0.223	0.821	1.116%	0.584	2.113	1.177	T 1.806%	0.049	T 2.387
%RSD		0.078	0.236	0.390	1.120	0.276	1.021	0.605	T 1.704	0.958	T 1.209

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	01:46:25	T 200.800	T 97.965%	T 208.700
2	01:46:29	T 199.400	T 100.571%	T 206.100
3	01:46:33	T 198.600	T 101.627%	T 203.600
x		T 199.600	T 100.054%	T 206.100
σ		T 1.090	T 1.885%	T 2.549
%RSD		T 0.546	T 1.884	T 1.237

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:51:59	2.305	0.110	39.300	TM 120800.000	10120.000	124.800	259.100	M 102200.000	5814.000	T 1675000.000
2	01:52:03	2.313	0.110	37.220	TM 123800.000	10260.000	120.900	257.500	M 103200.000	5987.000	T 1651000.000
3	01:52:06	2.175	0.118	37.720	TM 124300.000	10150.000	119.900	250.700	M 103900.000	5977.000	T 1649000.000
x		2.264	0.113	38.080	TM 123000.000	10180.000	121.900	255.800	M 103100.000	5926.000	T 1658000.000
σ		0.078	0.004	1.081	TM 1916.000	71.720	2.597	4.453	M 860.400	96.940	T 14170.000
%RSD		3.437	3.787	2.840	TM 1.558	0.705	2.131	1.741	M 0.834	1.636	T 0.855

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:51:59	TM 85290.000	M 33080.000	103.460%	114.380%	13.580	16.110	4.428	25.190	1008.000	116.800
2	01:52:03	TM 86730.000	M 32040.000	103.954%	114.297%	14.070	16.020	4.554	24.460	1005.000	117.000
3	01:52:06	TM 86830.000	M 32770.000	104.674%	115.746%	13.180	16.210	4.368	24.310	1008.000	116.400
x		TM 86280.000	M 32630.000	104.029%	114.808%	13.610	16.110	4.450	24.650	1007.000	116.800
σ		TM 857.800	M 535.700	0.611%	0.813%	0.448	0.091	0.095	0.475	1.897	0.299
%RSD		TM 0.994	M 1.642	0.587	0.709	3.293	0.567	2.133	1.926	0.188	0.256

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:51:59	4.891	21.660	TM 1004.000	M 1996.000	102.009%	226.300	59.080	T 364.400	104.529%	0.510
2	01:52:03	4.811	21.320	TM 995.200	M 1964.000	104.624%	223.600	59.520	T 367.200	105.919%	0.483
3	01:52:06	4.863	21.240	TM 1003.000	M 1996.000	103.012%	227.800	59.760	T 366.800	105.982%	0.531
x		4.855	21.400	TM 1001.000	M 1985.000	103.215%	225.900	59.450	T 366.100	105.477%	0.508
σ		0.041	0.226	TM 4.854	M 18.340	1.319%	2.145	0.345	T 1.495	0.821%	0.024
%RSD		0.840	1.054	TM 0.485	M 0.924	1.278	0.949	0.580	T 0.408	0.779	4.809

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:51:59	9.348	62.410	282.900	97.146%	42.200	0.527	14.820	T 104.592%	2.256	0.516
2	01:52:03	9.458	61.930	280.500	98.607%	41.900	0.495	14.730	T 105.782%	2.151	0.443
3	01:52:06	9.353	61.860	280.700	99.527%	41.820	0.452	14.650	T 106.886%	2.097	0.367
x		9.387	62.070	281.400	98.427%	41.970	0.492	14.730	T 105.753%	2.168	0.442
σ		0.062	0.303	1.313	1.201%	0.198	0.038	0.088	T 1.148%	0.081	0.075
%RSD		0.662	0.488	0.467	1.220	0.471	7.662	0.598	T 1.085	3.734	16.930

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	01:51:59	2.954	T 97.400%	0.888
2	01:52:03	2.886	T 98.562%	0.854
3	01:52:06	2.823	T 99.259%	0.799
x		2.888	T 98.407%	0.847
σ		0.065	T 0.939%	0.045
%RSD		2.261	T 0.954	5.273

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:57:33	-0.001	-0.015	0.827	3713.000	2780.000	8.154	50.260	19960.000	1405.000	T 1793000.000
2	01:57:37	0.004	0.007	0.909	3865.000	2759.000	6.398	47.570	19990.000	1417.000	T 1698000.000
3	01:57:40	-0.003	-0.015	1.029	3911.000	2780.000	8.450	46.170	19940.000	1493.000	T 1738000.000
x		-0.000	-0.008	0.921	3830.000	2773.000	7.667	48.000	19960.000	1438.000	T 1743000.000
σ		0.004	0.013	0.102	103.900	12.150	1.109	2.079	24.190	48.070	T 47690.000
%RSD		2164.000	166.000	11.050	2.714	0.438	14.470	4.332	0.121	3.342	T 2.736

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:57:33	TM 36880.000	1777.000	107.883%	116.751%	2.510	0.026	0.335	26.590	28.750	1.499
2	01:57:37	TM 37560.000	1891.000	109.663%	118.499%	2.278	0.075	0.297	26.980	29.360	1.477
3	01:57:40	TM 37950.000	1865.000	108.104%	118.596%	2.409	0.009	0.361	27.520	28.670	1.522
x		TM 37460.000	1844.000	108.550%	117.949%	2.399	0.037	0.331	27.030	28.930	1.499
σ		TM 536.600	59.820	0.970%	1.038%	0.116	0.034	0.032	0.468	0.377	0.023
%RSD		TM 1.432	3.243	0.894	0.880	4.841	93.170	9.778	1.730	1.302	1.527

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:57:33	0.023	0.351	2.971	98.210	109.705%	1.361	4.674	1.304	105.373%	0.038
2	01:57:37	0.020	0.276	2.988	96.780	110.201%	1.251	4.904	1.299	105.827%	0.033
3	01:57:40	0.026	0.334	3.029	97.610	109.573%	1.443	5.072	1.386	106.185%	0.033
x		0.023	0.320	2.996	97.530	109.826%	1.352	4.884	1.330	105.795%	0.035
σ		0.003	0.039	0.030	0.720	0.331%	0.096	0.200	0.049	0.407%	0.003
%RSD		14.700	12.240	0.995	0.738	0.301	7.135	4.091	3.667	0.384	8.504

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	01:57:33	0.106	0.007	0.034	105.247%	41.460	0.042	0.277	T 112.065%	0.528	0.044
2	01:57:37	0.099	0.016	0.069	107.051%	41.320	0.033	0.291	T 111.938%	0.543	0.042
3	01:57:40	0.111	0.017	0.091	105.577%	41.730	0.063	0.313	T 112.764%	0.493	0.039
x		0.105	0.013	0.065	105.959%	41.500	0.046	0.294	T 112.255%	0.521	0.042
σ		0.006	0.006	0.029	0.961%	0.213	0.015	0.018	T 0.445%	0.026	0.002
%RSD		5.726	42.710	44.520	0.907	0.513	32.760	6.148	T 0.396	4.938	5.958

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	01:57:33	0.101	T 108.485%	-0.007
2	01:57:37	0.105	T 108.829%	-0.004
3	01:57:40	0.108	T 109.423%	-0.001
x		0.105	T 108.912%	-0.004
σ		0.003	T 0.474%	0.003
%RSD		3.079	T 0.436	66.480

40002_3361_CCV7 10/9/2012 2:03:03 AM

User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	02:03:07	88.780	83.200	88.030	5319.000	4959.000	4696.000	4663.000	5063.000	161.600	↹2173000.000
2	02:03:11	88.550	85.350	93.380	5032.000	5032.000	4670.000	4642.000	5108.000	132.100	↹2275000.000
3	02:03:15	88.990	85.640	93.100	4945.000	5033.000	4731.000	4690.000	4940.000	142.900	↹2336000.000
x		88.770	84.730	91.500	5099.000	5008.000	4699.000	4665.000	5037.000	145.500	↹2261000.000
σ		0.223	1.333	3.014	196.200	42.180	30.620	24.190	86.910	14.930	↹82700.000
%RSD		0.252	1.573	3.294	3.847	0.842	0.652	0.519	1.726	10.260	↹3.657

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	02:03:07	4927.000	5348.000	106.656%	118.650%	98.740	99.250	101.400	9.605	5589.000	100.400
2	02:03:11	4827.000	5015.000	109.441%	118.854%	95.540	99.020	100.700	11.850	5662.000	98.600
3	02:03:15	4855.000	5147.000	110.233%	118.320%	97.950	99.330	100.200	11.860	5627.000	100.000
x		4870.000	5170.000	108.776%	118.608%	97.410	99.200	100.800	11.100	5626.000	99.680
σ		51.940	167.700	1.879%	0.269%	1.670	0.161	0.620	1.298	36.480	0.954
%RSD		1.067	3.244	1.727	0.227	1.714	0.162	0.615	11.690	0.649	0.957

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	02:03:07	100.300	102.800	103.900	104.500	111.198%	99.850	94.270	99.420	103.005%	100.900
2	02:03:11	101.500	102.700	104.500	105.800	110.099%	101.600	96.590	99.440	104.592%	98.300
3	02:03:15	101.300	102.300	104.000	106.400	110.486%	102.200	97.450	99.720	105.111%	99.090
x		101.000	102.600	104.100	105.600	110.594%	101.200	96.100	99.530	104.236%	99.420
σ		0.632	0.264	0.336	0.952	0.557%	1.223	1.648	0.166	1.097%	1.312
%RSD		0.625	0.258	0.323	0.902	0.504	1.208	1.714	0.167	1.053	1.320

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	02:03:07	104.000	52.500	103.500	103.395%	102.200	100.800	97.900	↹108.429%	5.114	↹102.900
2	02:03:11	103.500	52.320	103.900	103.701%	100.900	102.400	96.610	↹110.033%	5.079	↹99.520
3	02:03:15	104.600	51.960	103.800	104.430%	101.700	102.000	96.290	↹110.552%	5.186	↹99.970
x		104.000	52.260	103.700	103.842%	101.600	101.700	96.930	↹109.671%	5.126	↹100.800
σ		0.550	0.272	0.207	0.532%	0.649	0.853	0.849	↹1.106%	0.054	↹1.806
%RSD		0.529	0.520	0.200	0.512	0.639	0.839	0.876	↹1.009	1.063	↹1.792

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	02:03:07	↹101.700	↹104.624%	↹101.800
2	02:03:11	↹99.500	↹106.878%	↹99.580
3	02:03:15	↹100.200	↹106.670%	↹99.110
x		↹100.500	↹106.057%	↹100.200
σ		↹1.104	↹1.246%	↹1.443
%RSD		↹1.099	↹1.175	↹1.440

39996_3361_CCB7 10/9/2012 2:08:37 AM

User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	02:08:41	0.051	0.008	-0.129	6.751	4.319	3.151	2.677	5.330	208.100	r 2152000.000
2	02:08:44	0.049	0.021	0.196	4.155	3.624	2.551	4.262	4.446	151.800	r 2153000.000
3	02:08:48	0.042	0.021	-0.308	2.771	1.582	2.271	-0.098	1.646	142.500	r 2164000.000
x		0.047	0.017	-0.080	4.559	3.175	2.657	2.280	3.808	167.500	r 2156000.000
σ		0.005	0.007	0.256	2.021	1.423	0.450	2.207	1.923	35.520	r 6640.000
%RSD		10.120	44.370	318.900	44.320	44.810	16.920	96.790	50.510	21.210	r 0.308

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	02:08:41	-10.560	15.790	104.184%	115.447%	0.079	0.034	0.008	31.230	3.854	0.092
2	02:08:44	-24.230	30.470	107.443%	117.144%	0.189	0.036	0.034	30.630	4.062	0.072
3	02:08:48	-17.760	-9.317	107.302%	117.683%	0.034	0.062	0.012	30.900	3.533	0.067
x		-17.520	12.320	106.310%	116.758%	0.100	0.044	0.018	30.920	3.816	0.077
σ		6.840	20.120	1.842%	1.167%	0.080	0.016	0.014	0.300	0.267	0.013
%RSD		39.050	163.400	1.733	0.999	79.540	35.900	77.430	0.971	6.985	17.250

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	02:08:41	0.068	0.071	0.102	-0.032	107.407%	0.150	-0.263	0.075	103.001%	0.053
2	02:08:44	0.057	0.065	0.093	0.011	107.433%	0.037	-0.106	0.066	104.080%	0.043
3	02:08:48	0.059	0.084	0.090	0.001	106.837%	0.101	-0.156	0.058	104.117%	0.052
x		0.061	0.074	0.095	-0.007	107.226%	0.096	-0.175	0.066	103.732%	0.049
σ		0.006	0.010	0.006	0.022	0.337%	0.057	0.080	0.009	0.634%	0.005
%RSD		10.360	13.490	6.848	336.300	0.314	58.890	45.780	12.940	0.611	11.160

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	02:08:41	0.109	0.034	0.062	102.543%	0.054	0.071	0.081	r 108.351%	0.024	0.179
2	02:08:44	0.103	0.028	0.081	103.074%	0.047	0.077	0.046	r 109.712%	0.020	0.163
3	02:08:48	0.083	0.023	0.063	103.430%	0.067	0.068	0.059	r 109.611%	0.020	0.144
x		0.098	0.028	0.069	103.016%	0.056	0.072	0.062	r 109.225%	0.021	0.162
σ		0.014	0.006	0.011	0.446%	0.010	0.004	0.018	r 0.759%	0.003	0.018
%RSD		13.710	20.740	15.350	0.433	18.400	6.038	28.690	r 0.694	12.550	10.830

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	02:08:41	0.069	r 105.861%	0.062
2	02:08:44	0.060	r 107.365%	0.057
3	02:08:48	0.057	r 107.468%	0.060
x		0.062	r 106.898%	0.059
σ		0.006	r 0.900%	0.003
%RSD		9.762	r 0.842	4.226

686613_3360 10/9/2012 2:14:09 AM

User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	02:14:13	177.400	174.500	180.100	T 14540.000	12780.000	9472.000	975.300	M 40950.000	1647.000	T 1859000.000
2	02:14:17	177.700	172.400	174.600	T 14350.000	12680.000	9362.000	985.400	M 41030.000	1646.000	T 1837000.000
3	02:14:21	176.900	173.800	178.400	T 14380.000	12860.000	9503.000	981.300	M 41180.000	1526.000	T 1879000.000
x		177.300	173.600	177.700	T 14420.000	12780.000	9445.000	980.700	M 41050.000	1606.000	T 1858000.000
σ		0.371	1.059	2.818	T 102.600	91.010	74.020	5.111	M 121.100	69.680	T 21080.000
%RSD		0.209	0.610	1.586	T 0.711	0.712	0.784	0.521	M 0.295	4.337	T 1.134

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	02:14:13	TM 81210.000	11700.000	104.327%	115.418%	202.600	200.500	203.300	-18.360	T 10500.000	200.000
2	02:14:17	TM 80280.000	11700.000	106.906%	116.540%	198.000	196.300	199.200	-15.610	T 10420.000	200.300
3	02:14:21	TM 82350.000	11650.000	106.649%	116.240%	204.300	199.900	201.500	-21.460	T 10530.000	201.900
x		TM 81280.000	11680.000	105.961%	116.066%	201.600	198.900	201.300	-18.470	T 10480.000	200.700
σ		TM 1036.000	29.620	1.421%	0.581%	3.269	2.278	2.088	2.926	T 56.250	1.023
%RSD		TM 1.274	0.254	1.341	0.501	1.621	1.145	1.037	15.840	T 0.537	0.510

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	02:14:13	199.900	203.100	267.100	359.400	106.667%	208.900	207.000	203.800	100.738%	86.110
2	02:14:17	198.900	201.400	264.200	357.400	107.219%	211.400	209.400	203.800	101.129%	86.650
3	02:14:21	200.000	203.500	263.800	362.200	106.473%	212.100	209.600	202.700	103.395%	84.880
x		199.600	202.600	265.000	359.700	106.787%	210.800	208.600	203.400	101.754%	85.880
σ		0.618	1.093	1.755	2.368	0.387%	1.681	1.469	0.632	1.434%	0.907
%RSD		0.309	0.539	0.662	0.659	0.362	0.797	0.704	0.311	1.410	1.056

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	02:14:13	211.100	96.370	214.600	98.823%	220.800	208.900	197.100	T 105.258%	5.899	T 200.200
2	02:14:17	210.400	95.690	212.600	100.187%	220.900	208.500	198.000	T 105.340%	5.883	T 199.800
3	02:14:21	209.600	94.380	211.500	101.599%	216.700	208.100	194.000	T 108.306%	5.910	T 197.700
x		210.400	95.480	212.900	100.203%	219.400	208.500	196.400	T 106.301%	5.897	T 199.200
σ		0.733	1.015	1.584	1.388%	2.405	0.434	2.084	T 1.737%	0.014	T 1.373
%RSD		0.348	1.063	0.744	1.385	1.096	0.208	1.061	T 1.634	0.238	T 0.689

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	02:14:13	T 204.000	T 99.239%	T 210.300
2	02:14:17	T 203.400	T 101.067%	T 209.800
3	02:14:21	T 201.700	T 102.427%	T 204.800
x		T 203.000	T 100.911%	T 208.300
σ		T 1.190	T 1.600%	T 3.085
%RSD		T 0.586	T 1.585	T 1.481

686614_3360 10/9/2012 2:19:43 AM

User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	02:19:47	180.200	175.600	183.200	T 14240.000	12680.000	9400.000	971.600	M 40520.000	1486.000	T 1869000.000
2	02:19:50	178.300	176.300	180.800	T 14230.000	12650.000	9416.000	973.900	M 40310.000	1465.000	T 1915000.000
3	02:19:54	178.900	175.300	179.600	T 14460.000	12850.000	9632.000	986.600	M 41320.000	1517.000	T 1909000.000
x		179.100	175.800	181.200	T 14310.000	12720.000	9482.000	977.400	M 40710.000	1490.000	T 1898000.000
σ		0.950	0.513	1.846	T 129.400	106.800	129.600	8.070	M 533.200	26.040	T 24900.000
%RSD		0.530	0.292	1.019	T 0.904	0.839	1.367	0.826	M 1.310	1.748	T 1.312

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	02:19:47	TM 80050.000	11420.000	106.452%	115.891%	200.900	199.800	202.900	-22.640	T 10560.000	200.100
2	02:19:50	TM 79450.000	11530.000	107.892%	115.411%	202.600	198.500	200.400	-12.680	T 10530.000	200.300
3	02:19:54	TM 81170.000	11280.000	106.167%	114.828%	196.600	200.800	203.000	-21.310	T 10620.000	201.700
x		TM 80230.000	11410.000	106.837%	115.377%	200.000	199.700	202.100	-18.880	T 10570.000	200.700
σ		TM 874.700	124.700	0.924%	0.533%	3.110	1.155	1.499	5.409	T 44.290	0.868
%RSD		TM 1.090	1.093	0.865	0.462	1.555	0.578	0.742	28.660	T 0.419	0.433

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	02:19:47	198.800	204.100	208.200	351.400	106.318%	211.700	209.400	204.600	100.107%	90.770
2	02:19:50	199.200	203.300	206.800	351.100	107.511%	209.900	208.500	205.000	101.749%	90.160
3	02:19:54	199.200	204.500	207.400	352.200	107.458%	211.800	207.800	204.900	102.353%	90.230
x		199.100	204.000	207.500	351.600	107.096%	211.100	208.600	204.800	101.403%	90.390
σ		0.183	0.643	0.657	0.586	0.674%	1.075	0.774	0.201	1.162%	0.335
%RSD		0.092	0.315	0.317	0.167	0.630	0.509	0.371	0.098	1.146	0.370

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	02:19:47	213.500	96.690	211.700	100.114%	220.800	207.200	196.500	T 106.516%	5.720	T 201.000
2	02:19:50	212.500	96.060	212.800	100.614%	220.600	210.000	196.800	T 107.647%	5.912	T 199.000
3	02:19:54	211.700	95.640	211.600	100.952%	221.000	209.700	195.000	T 108.678%	5.764	T 199.800
x		212.600	96.130	212.000	100.560%	220.800	209.000	196.100	T 107.614%	5.799	T 199.900
σ		0.912	0.529	0.666	0.422%	0.179	1.518	0.976	T 1.081%	0.100	T 1.012
%RSD		0.429	0.550	0.314	0.419	0.081	0.727	0.498	T 1.005	1.730	T 0.506

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	02:19:47	T 201.400	T 100.020%	T 208.400
2	02:19:50	T 201.100	T 101.754%	T 207.200
3	02:19:54	T 201.700	T 102.075%	T 209.300
x		T 201.400	T 101.283%	T 208.300
σ		T 0.257	T 1.106%	T 1.032
%RSD		T 0.128	T 1.092	T 0.495

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	02:25:20	172.900	169.100	183.200	T 13320.000	12310.000	9077.000	946.100	M 38980.000	1397.000	T 1762000.000
2	02:25:24	172.000	166.700	179.600	T 13640.000	12110.000	9119.000	945.600	M 38870.000	1405.000	T 1713000.000
3	02:25:28	171.800	169.400	183.000	T 13820.000	12220.000	9160.000	930.300	M 39260.000	1434.000	T 1720000.000
x		172.200	168.400	182.000	T 13590.000	12220.000	9119.000	940.700	M 39040.000	1412.000	T 1732000.000
σ		0.557	1.512	2.003	T 249.200	101.600	41.110	8.994	M 202.700	19.580	T 26030.000
%RSD		0.323	0.898	1.101	T 1.834	0.832	0.451	0.956	M 0.519	1.387	T 1.503

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	02:25:20	TM 74030.000	11690.000	106.036%	115.654%	195.300	193.100	194.800	-15.180	T 10190.000	193.700
2	02:25:24	TM 75630.000	11700.000	107.692%	116.968%	193.400	192.100	194.000	-17.240	T 10130.000	193.800
3	02:25:28	TM 76500.000	11830.000	106.631%	115.620%	196.100	192.700	193.400	-18.550	T 10090.000	195.600
x		TM 75390.000	11740.000	106.786%	116.081%	194.900	192.600	194.100	-16.990	T 10140.000	194.400
σ		TM 1252.000	76.550	0.839%	0.769%	1.382	0.512	0.699	1.702	T 51.740	1.078
%RSD		TM 1.661	0.652	0.785	0.662	0.709	0.266	0.360	10.020	T 0.510	0.555

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	02:25:20	194.600	197.200	203.200	307.700	105.788%	209.100	207.100	198.500	101.512%	198.000
2	02:25:24	192.800	197.400	201.200	307.700	106.345%	208.900	208.500	197.100	103.418%	196.200
3	02:25:28	193.700	199.100	201.300	304.100	107.115%	208.900	208.600	199.400	103.176%	197.800
x		193.700	197.900	201.900	306.500	106.416%	209.000	208.100	198.400	102.702%	197.300
σ		0.919	1.004	1.148	2.108	0.667%	0.129	0.839	1.155	1.038%	1.007
%RSD		0.474	0.507	0.569	0.688	0.626	0.062	0.403	0.582	1.011	0.511

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	02:25:20	207.700	96.310	209.000	99.762%	247.300	204.500	188.300	T 108.025%	5.841	T 191.200
2	02:25:24	205.100	96.040	206.600	101.128%	245.000	204.200	188.300	T 109.273%	5.814	T 193.800
3	02:25:28	204.900	95.380	205.200	102.369%	244.600	202.200	188.000	T 109.138%	5.876	T 194.800
x		205.900	95.910	206.900	101.086%	245.600	203.600	188.200	T 108.812%	5.844	T 193.300
σ		1.546	0.477	1.926	1.304%	1.462	1.240	0.153	T 0.685%	0.031	T 1.854
%RSD		0.751	0.497	0.931	1.290	0.595	0.609	0.081	T 0.629	0.539	T 0.959

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	02:25:20	T 193.700	T 101.778%	T 198.600
2	02:25:24	T 195.100	T 102.025%	T 201.300
3	02:25:28	T 195.900	T 103.006%	T 202.400
x		T 194.900	T 102.270%	T 200.800
σ		T 1.100	T 0.649%	T 1.950
%RSD		T 0.565	T 0.635	T 0.971

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	02:30:54	0.063	0.057	2.401	3936.000	2885.000	13.680	39.260	21490.000	1430.000	T 1719000.000
2	02:30:58	0.080	0.026	2.003	4094.000	2979.000	13.370	52.760	22000.000	1447.000	T 1746000.000
3	02:31:01	0.083	0.068	1.551	4117.000	2923.000	13.330	50.910	22030.000	1541.000	T 1734000.000
x		0.075	0.050	1.985	4049.000	2929.000	13.460	47.640	21840.000	1473.000	T 1733000.000
σ		0.011	0.022	0.426	98.510	47.300	0.189	7.320	302.000	59.990	T 13520.000
%RSD		14.350	42.690	21.440	2.433	1.615	1.406	15.360	1.383	4.073	T 0.780

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	02:30:54	TM 37080.000	6118.000	107.116%	116.835%	2.415	0.201	0.389	27.410	39.530	1.981
2	02:30:58	TM 38670.000	6345.000	106.389%	115.738%	3.370	0.267	0.385	27.610	37.610	1.957
3	02:31:01	TM 38760.000	6126.000	107.623%	115.441%	3.043	0.263	0.401	27.650	35.590	1.936
x		TM 38170.000	6197.000	107.043%	116.005%	2.942	0.244	0.392	27.560	37.570	1.958
σ		TM 945.400	128.800	0.620%	0.734%	0.486	0.037	0.008	0.128	1.970	0.023
%RSD		TM 2.477	2.079	0.580	0.633	16.500	15.030	2.140	0.463	5.242	1.159

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	02:30:54	0.166	0.523	2.653	146.200	107.650%	0.511	4.228	5.016	103.439%	0.155
2	02:30:58	0.157	0.474	2.660	147.300	109.220%	0.499	3.647	5.061	104.220%	0.152
3	02:31:01	0.129	0.454	2.614	146.900	108.403%	0.457	4.066	5.013	105.787%	0.129
x		0.151	0.484	2.643	146.800	108.425%	0.489	3.980	5.030	104.482%	0.146
σ		0.019	0.036	0.025	0.575	0.785%	0.028	0.300	0.027	1.196%	0.014
%RSD		12.650	7.361	0.929	0.392	0.724	5.794	7.536	0.537	1.144	9.637

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	02:30:54	0.383	0.097	0.207	104.139%	41.130	0.219	1.562	T 110.338%	0.969	0.421
2	02:30:58	0.372	0.071	0.164	104.339%	41.220	0.197	1.474	T 111.913%	1.015	0.361
3	02:31:01	0.348	0.044	0.169	105.538%	40.830	0.154	1.576	T 112.333%	0.995	0.310
x		0.367	0.070	0.180	104.672%	41.060	0.190	1.537	T 111.528%	0.993	0.364
σ		0.018	0.026	0.023	0.756%	0.203	0.033	0.055	T 1.052%	0.023	0.056
%RSD		4.879	37.390	13.010	0.723	0.495	17.320	3.584	T 0.943	2.308	15.360

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	02:30:54	0.254	T 107.534%	0.157
2	02:30:58	0.219	T 108.632%	0.136
3	02:31:01	0.184	T 109.050%	0.107
x		0.219	T 108.405%	0.133
σ		0.035	T 0.783%	0.025
%RSD		15.910	T 0.722	18.720

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	02:36:28	0.008	-0.006	0.404	829.100	572.600	0.568	10.810	4250.000	400.300	↹2071000.000
2	02:36:32	0.034	-0.011	-0.283	815.100	593.500	0.263	9.528	4269.000	438.000	↹2091000.000
3	02:36:36	0.027	-0.011	0.132	828.200	567.000	-0.793	12.790	4194.000	421.800	↹2079000.000
x		0.023	-0.009	0.084	824.100	577.700	0.013	11.040	4238.000	420.000	↹2081000.000
σ		0.013	0.003	0.346	7.834	14.010	0.714	1.641	39.350	18.890	↹10100.000
%RSD		58.350	30.930	411.300	0.951	2.425	5710.000	14.870	0.929	4.498	↹0.485

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	02:36:28	7020.000	1349.000	106.011%	116.089%	0.607	0.133	-0.009	29.770	4.951	0.391
2	02:36:32	7124.000	1309.000	106.838%	117.408%	0.483	-0.068	0.028	31.580	4.043	0.371
3	02:36:36	7141.000	1269.000	108.313%	117.282%	0.398	-0.020	-0.026	32.270	4.182	0.368
x		7095.000	1309.000	107.054%	116.926%	0.496	0.015	-0.003	31.210	4.392	0.377
σ		65.370	39.800	1.166%	0.728%	0.105	0.105	0.028	1.291	0.489	0.012
%RSD		0.921	3.040	1.089	0.623	21.140	709.900	1068.000	4.136	11.140	3.273

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	02:36:28	-0.003	0.078	0.508	29.320	108.170%	0.052	0.389	0.979	102.818%	-0.010
2	02:36:32	0.001	0.072	0.479	28.820	109.230%	0.095	0.301	0.971	104.612%	0.005
3	02:36:36	0.001	0.072	0.491	29.360	109.125%	0.116	0.337	0.983	104.499%	0.007
x		-0.001	0.074	0.493	29.170	108.842%	0.088	0.342	0.978	103.976%	0.001
σ		0.002	0.003	0.014	0.303	0.584%	0.033	0.044	0.006	1.005%	0.009
%RSD		308.200	4.489	2.938	1.039	0.537	37.340	12.960	0.581	0.966	1333.000

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	02:36:28	0.036	-0.009	-0.000	103.257%	8.141	-0.001	0.242	↹109.684%	0.191	0.073
2	02:36:32	0.036	-0.010	0.001	104.135%	8.248	-0.004	0.236	↹110.140%	0.210	0.074
3	02:36:36	0.047	-0.009	0.007	103.947%	8.171	0.011	0.261	↹111.404%	0.184	0.076
x		0.040	-0.009	0.003	103.780%	8.187	0.002	0.246	↹110.409%	0.195	0.074
σ		0.006	0.001	0.004	0.462%	0.055	0.008	0.013	↹0.891%	0.013	0.001
%RSD		14.910	8.723	156.200	0.445	0.676	463.200	5.356	↹0.807	6.852	1.980

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	02:36:28	0.007	↹107.806%	-0.008
2	02:36:32	0.010	↹108.741%	-0.008
3	02:36:36	0.013	↹108.343%	-0.004
x		0.010	↹108.297%	-0.007
σ		0.003	↹0.469%	0.002
%RSD		30.100	↹0.433	30.470

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	02:42:02	0.019	-0.029	0.426	3598.000	2988.000	7.072	40.640	23770.000	1403.000	T 1667000.000
2	02:42:06	0.015	-0.015	0.557	3558.000	3082.000	7.831	41.290	23930.000	1509.000	T 1739000.000
3	02:42:10	0.025	-0.001	0.409	3445.000	3026.000	7.314	41.330	23570.000	1446.000	T 1782000.000
x		0.020	-0.015	0.464	3534.000	3032.000	7.405	41.090	23760.000	1452.000	T 1729000.000
σ		0.005	0.014	0.081	79.550	47.130	0.388	0.384	182.300	53.380	T 57840.000
%RSD		26.930	90.890	17.490	2.251	1.554	5.236	0.935	0.767	3.675	T 3.345

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	02:42:02	TM 43080.000	4707.000	108.170%	116.015%	3.030	0.005	0.268	28.880	47.910	7.998
2	02:42:06	TM 42060.000	4797.000	107.869%	115.738%	2.781	0.001	0.293	30.140	48.330	8.203
3	02:42:10	TM 42230.000	5305.000	109.142%	116.859%	2.714	-0.153	0.290	32.090	49.050	7.967
x		TM 42460.000	4936.000	108.394%	116.204%	2.842	-0.049	0.284	30.370	48.430	8.056
σ		TM 546.900	322.700	0.666%	0.584%	0.167	0.090	0.014	1.617	0.573	0.128
%RSD		TM 1.288	6.537	0.614	0.502	5.867	184.300	4.937	5.323	1.183	1.591

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	02:42:02	0.037	0.822	3.799	125.600	107.299%	0.843	2.197	2.553	103.898%	0.035
2	02:42:06	0.042	0.816	3.883	123.400	109.983%	0.896	2.185	2.596	104.620%	0.049
3	02:42:10	0.040	0.799	3.836	126.400	108.503%	0.916	2.243	2.620	104.440%	0.052
x		0.040	0.812	3.839	125.100	108.595%	0.885	2.208	2.590	104.320%	0.045
σ		0.002	0.012	0.042	1.570	1.344%	0.038	0.031	0.034	0.376%	0.009
%RSD		5.862	1.447	1.101	1.255	1.238	4.245	1.387	1.295	0.360	19.670

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	02:42:02	0.069	-0.007	0.016	104.396%	40.920	0.019	2.592	T 108.936%	0.939	0.056
2	02:42:06	0.066	-0.007	0.023	103.480%	42.330	0.039	2.638	T 110.860%	0.857	0.051
3	02:42:10	0.052	-0.012	0.010	103.912%	41.410	0.032	2.523	T 111.632%	0.927	0.045
x		0.062	-0.009	0.016	103.930%	41.550	0.030	2.584	T 110.476%	0.908	0.050
σ		0.009	0.003	0.007	0.458%	0.713	0.010	0.057	T 1.388%	0.044	0.005
%RSD		14.220	33.060	40.770	0.441	1.716	34.570	2.222	T 1.257	4.863	10.500

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	02:42:02	0.047	T 104.999%	0.001
2	02:42:06	0.045	T 106.949%	-0.001
3	02:42:10	0.043	T 108.496%	-0.003
x		0.045	T 106.815%	-0.001
σ		0.002	T 1.752%	0.002
%RSD		4.277	T 1.641	206.100

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	02:47:37	0.011	-0.011	0.063	3486.000	2722.000	7.007	34.400	19990.000	1709.000	T 1810000.000
2	02:47:40	-0.003	-0.002	0.002	3530.000	2743.000	6.901	32.580	20300.000	1659.000	T 1783000.000
3	02:47:44	0.004	-0.015	0.219	3525.000	2724.000	7.991	33.110	20130.000	1618.000	T 1801000.000
x		0.004	-0.009	0.095	3514.000	2730.000	7.300	33.360	20140.000	1662.000	T 1798000.000
σ		0.007	0.007	0.112	24.190	11.530	0.601	0.939	154.300	45.600	T 13770.000
%RSD		187.800	73.020	118.100	0.688	0.423	8.237	2.814	0.766	2.744	T 0.766

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	02:47:37	TM 39860.000	1332.000	109.922%	117.681%	2.464	0.038	0.254	31.950	14.880	1.144
2	02:47:40	TM 40440.000	1209.000	111.146%	118.887%	3.038	-0.147	0.271	33.980	15.090	1.153
3	02:47:44	TM 40810.000	1261.000	110.839%	119.311%	2.612	0.007	0.286	32.790	13.090	1.191
x		TM 40370.000	1267.000	110.636%	118.627%	2.705	-0.034	0.270	32.910	14.350	1.162
σ		TN 481.900	62.150	0.637%	0.846%	0.298	0.099	0.016	1.023	1.100	0.025
%RSD		TM 1.194	4.904	0.576	0.713	11.020	291.400	5.875	3.109	7.668	2.139

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	02:47:37	0.007	0.279	2.042	66.120	109.867%	0.380	3.027	0.355	106.032%	0.027
2	02:47:40	0.013	0.309	2.097	65.590	110.709%	0.392	2.965	0.331	106.324%	0.028
3	02:47:44	0.020	0.329	2.072	65.640	110.744%	0.461	3.154	0.360	106.865%	0.033
x		0.013	0.306	2.070	65.780	110.440%	0.411	3.049	0.349	106.407%	0.029
σ		0.007	0.025	0.027	0.291	0.496%	0.044	0.096	0.015	0.423%	0.004
%RSD		50.480	8.313	1.316	0.442	0.450	10.620	3.156	4.441	0.397	12.080

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	02:47:37	0.043	-0.015	-0.004	104.977%	41.870	0.014	0.110	T 111.478%	0.798	0.041
2	02:47:40	0.049	-0.015	-0.008	105.560%	41.540	0.014	0.130	T 112.410%	0.851	0.038
3	02:47:44	0.036	-0.010	-0.008	106.443%	41.600	0.017	0.106	T 112.873%	0.772	0.042
x		0.043	-0.013	-0.007	105.660%	41.670	0.015	0.115	T 112.254%	0.807	0.040
σ		0.006	0.003	0.002	0.738%	0.176	0.002	0.013	T 0.711%	0.041	0.002
%RSD		14.390	22.290	32.830	0.698	0.421	11.180	11.110	T 0.633	5.031	4.787

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	02:47:37	0.017	T 106.740%	-0.010
2	02:47:40	0.018	T 107.202%	-0.009
3	02:47:44	0.017	T 108.695%	-0.009
x		0.017	T 107.546%	-0.009
σ		0.001	T 1.021%	0.001
%RSD		5.029	T 0.950	6.421

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	02:53:11	-0.005	-0.006	-0.058	3101.000	2654.000	7.787	27.620	19960.000	1605.000	T 1723000.000
2	02:53:15	0.006	-0.002	0.248	3035.000	2648.000	7.822	29.590	20170.000	1560.000	T 1768000.000
3	02:53:19	-0.004	-0.007	0.030	3022.000	2616.000	7.211	26.600	19870.000	1591.000	T 1734000.000
x		-0.001	-0.005	0.073	3053.000	2639.000	7.607	27.930	20000.000	1585.000	T 1742000.000
σ		0.006	0.003	0.158	42.300	20.730	0.343	1.522	155.400	23.030	T 23580.000
%RSD		662.100	52.450	215.700	1.386	0.786	4.509	5.450	0.777	1.452	T 1.353

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	02:53:11	TM 40690.000	1102.000	110.214%	117.544%	3.084	0.144	0.316	33.060	22.760	1.157
2	02:53:15	TM 40500.000	1188.000	110.786%	118.814%	2.819	0.034	0.313	33.960	21.350	1.065
3	02:53:19	TM 40560.000	1176.000	112.383%	119.685%	2.575	-0.147	0.298	34.830	21.740	1.079
x		TM 40580.000	1155.000	111.128%	118.681%	2.826	0.010	0.309	33.950	21.950	1.100
σ		TM 96.390	46.670	1.124%	1.077%	0.255	0.147	0.009	0.884	0.728	0.050
%RSD		TM 0.238	4.039	1.011	0.907	9.020	1441.000	3.031	2.603	3.318	4.513

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	02:53:11	0.053	0.556	2.492	68.640	109.652%	1.764	2.220	0.384	105.813%	0.028
2	02:53:15	0.037	0.545	2.415	68.390	111.743%	1.592	2.669	0.400	106.762%	0.007
3	02:53:19	0.039	0.576	2.418	68.370	111.959%	1.733	2.315	0.383	107.282%	0.028
x		0.043	0.559	2.442	68.470	111.118%	1.696	2.401	0.389	106.619%	0.021
σ		0.009	0.016	0.043	0.148	1.274%	0.092	0.237	0.010	0.745%	0.012
%RSD		20.020	2.811	1.777	0.216	1.147	5.408	9.858	2.470	0.698	57.950

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	02:53:11	0.042	-0.012	-0.007	104.437%	42.460	0.016	0.110	T 109.745%	0.884	0.031
2	02:53:15	0.035	-0.016	-0.006	106.402%	41.870	0.023	0.107	T 111.271%	0.885	0.029
3	02:53:19	0.057	-0.014	-0.006	106.763%	41.710	0.026	0.136	T 112.165%	0.842	0.027
x		0.045	-0.014	-0.006	105.867%	42.010	0.021	0.118	T 111.060%	0.871	0.029
σ		0.011	0.002	0.000	1.252%	0.398	0.005	0.016	T 1.224%	0.025	0.002
%RSD		24.140	15.010	7.030	1.183	0.947	24.160	13.260	T 1.102	2.846	7.557

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	02:53:11	0.056	T 106.016%	-0.010
2	02:53:15	0.052	T 107.322%	-0.010
3	02:53:19	0.055	T 108.028%	-0.011
x		0.055	T 107.122%	-0.010
σ		0.002	T 1.020%	0.000
%RSD		3.965	T 0.953	2.384

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	02:58:45	0.001	-0.024	0.302	3432.000	3115.000	5.533	50.140	M 26270.000	1343.000	T 1908000.000
2	02:58:49	0.012	0.003	0.691	3456.000	3115.000	5.780	42.240	M 26420.000	1278.000	T 1941000.000
3	02:58:52	0.005	-0.020	0.062	3418.000	3098.000	6.264	51.280	M 26360.000	1265.000	T 1961000.000
x		0.006	-0.014	0.352	3435.000	3110.000	5.859	47.890	M 26350.000	1295.000	T 1937000.000
σ		0.006	0.014	0.317	19.300	9.718	0.372	4.923	M 72.550	41.810	T 26470.000
%RSD		95.900	105.100	90.280	0.562	0.313	6.348	10.280	M 0.275	3.228	T 1.367

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	02:58:45	TM 42800.000	10050.000	108.066%	119.172%	2.620	-0.015	0.368	33.740	98.060	12.870
2	02:58:49	TM 43200.000	10220.000	108.780%	118.177%	2.913	-0.034	0.437	34.220	97.000	13.080
3	02:58:52	TM 42840.000	9872.000	108.943%	117.772%	2.679	-0.119	0.435	34.690	99.060	13.070
x		TM 42950.000	10050.000	108.596%	118.374%	2.737	-0.056	0.413	34.210	98.040	13.000
σ		TM 220.300	175.500	0.467%	0.720%	0.155	0.055	0.039	0.475	1.026	0.118
%RSD		TM 0.513	1.746	0.430	0.609	5.652	98.540	9.461	1.387	1.047	0.906

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	02:58:45	0.044	0.333	3.058	115.800	110.632%	0.981	2.103	5.436	104.294%	0.047
2	02:58:49	0.051	0.286	3.015	116.300	109.607%	0.958	1.907	5.403	105.054%	0.031
3	02:58:52	0.048	0.297	3.023	116.600	109.292%	1.059	2.004	5.591	104.779%	0.031
x		0.048	0.305	3.032	116.200	109.844%	0.999	2.005	5.477	104.709%	0.037
σ		0.003	0.024	0.023	0.427	0.701%	0.053	0.098	0.101	0.385%	0.009
%RSD		6.810	7.971	0.745	0.367	0.638	5.282	4.900	1.839	0.367	25.600

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	02:58:45	0.129	-0.010	0.003	102.814%	42.040	0.017	4.596	T 108.389%	1.281	0.014
2	02:58:49	0.133	-0.012	0.010	104.268%	42.140	0.019	4.558	T 110.559%	1.318	0.011
3	02:58:52	0.133	-0.017	0.002	103.758%	42.350	0.022	4.499	T 110.303%	1.294	0.008
x		0.132	-0.013	0.005	103.613%	42.180	0.019	4.551	T 109.750%	1.298	0.011
σ		0.002	0.003	0.005	0.738%	0.161	0.003	0.049	T 1.185%	0.019	0.003
%RSD		1.680	26.890	96.600	0.712	0.382	14.850	1.072	T 1.080	1.430	28.570

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	02:58:45	0.145	T 103.242%	-0.009
2	02:58:49	0.147	T 104.435%	-0.009
3	02:58:52	0.145	T 105.798%	-0.009
x		0.146	T 104.492%	-0.009
σ		0.001	T 1.279%	0.000
%RSD		0.929	T 1.224	0.663

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	03:04:18	0.005	-0.029	-0.095	3209.000	3057.000	9.105	35.070	M 26850.000	1334.000	T 1779000.000
2	03:04:22	0.005	-0.015	0.306	3236.000	3071.000	10.270	37.490	M 27460.000	1423.000	T 1841000.000
3	03:04:26	0.009	-0.015	0.256	3385.000	3107.000	11.540	40.090	M 27420.000	1463.000	T 1790000.000
x		0.006	-0.019	0.156	3277.000	3078.000	10.310	37.550	M 27250.000	1407.000	T 1804000.000
σ		0.003	0.008	0.219	94.490	25.540	1.218	2.513	M 341.400	65.800	T 33000.000
%RSD		40.570	40.450	140.500	2.884	0.830	11.820	6.691	M 1.253	4.677	T 1.830

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	03:04:18	TM 41870.000	11270.000	107.024%	117.270%	2.848	-0.046	0.322	29.240	55.780	10.650
2	03:04:22	TM 42820.000	11880.000	105.792%	115.722%	2.644	0.086	0.275	28.760	57.320	10.690
3	03:04:26	TM 43630.000	11560.000	106.166%	117.282%	3.279	0.104	0.305	28.910	55.690	10.830
x		TM 42770.000	11570.000	106.327%	116.758%	2.924	0.048	0.301	28.970	56.260	10.720
σ		TM 877.600	303.800	0.632%	0.897%	0.325	0.082	0.023	0.243	0.919	0.095
%RSD		TM 2.052	2.626	0.594	0.768	11.100	171.500	7.774	0.840	1.634	0.888

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	03:04:18	0.043	0.347	3.081	147.000	106.846%	1.346	1.847	5.742	102.615%	0.033
2	03:04:22	0.051	0.351	3.116	148.400	106.753%	1.256	1.886	5.545	103.690%	0.028
3	03:04:26	0.046	0.325	3.114	146.500	108.772%	1.165	1.910	5.655	103.638%	0.035
x		0.047	0.341	3.104	147.300	107.457%	1.255	1.881	5.647	103.315%	0.032
σ		0.004	0.014	0.020	0.969	1.140%	0.091	0.032	0.099	0.606%	0.004
%RSD		8.625	4.088	0.629	0.658	1.061	7.214	1.686	1.745	0.587	12.170

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	03:04:18	0.053	-0.004	0.062	102.858%	41.330	0.018	3.617	T 109.341%	1.719	-0.013
2	03:04:22	0.073	-0.014	0.056	103.808%	41.130	0.024	3.642	T 110.642%	1.711	-0.013
3	03:04:26	0.064	-0.015	0.035	103.939%	41.910	0.015	3.734	T 110.369%	1.743	-0.015
x		0.063	-0.011	0.051	103.535%	41.460	0.019	3.664	T 110.117%	1.725	-0.014
σ		0.010	0.006	0.014	0.590%	0.404	0.005	0.062	T 0.686%	0.017	0.002
%RSD		16.370	54.190	27.580	0.570	0.974	25.770	1.681	T 0.623	0.973	10.970

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	03:04:18	0.176	T 105.773%	-0.008
2	03:04:22	0.174	T 106.425%	-0.008
3	03:04:26	0.181	T 106.660%	-0.007
x		0.177	T 106.286%	-0.008
σ		0.003	T 0.460%	0.000
%RSD		1.860	T 0.432	5.861

40002_3361_CCV8 10/9/2012 3:09:49 AM

User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	03:09:53	90.620	85.590	92.480	5133.000	5005.000	4688.000	4682.000	5041.000	158.100	↹2216000.000
2	03:09:57	90.560	86.290	93.560	5298.000	4942.000	4725.000	4693.000	5136.000	149.700	↹2165000.000
3	03:10:01	89.410	85.970	89.200	5238.000	4923.000	4650.000	4633.000	4921.000	136.700	↹2170000.000
x		90.200	85.950	91.750	5223.000	4956.000	4688.000	4669.000	5033.000	148.200	↹2184000.000
σ		0.678	0.349	2.269	83.260	42.920	37.330	31.950	108.100	10.780	↹28210.000
%RSD		0.751	0.406	2.473	1.594	0.866	0.796	0.684	2.148	7.274	↹1.292

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	03:09:53	4794.000	5018.000	108.432%	117.984%	99.080	98.380	100.300	11.800	5622.000	99.740
2	03:09:57	4994.000	5349.000	108.945%	118.102%	96.910	98.100	100.600	14.510	5610.000	99.700
3	03:10:01	4916.000	5234.000	111.842%	118.368%	96.860	98.150	100.200	12.380	5596.000	99.720
x		4901.000	5200.000	109.740%	118.151%	97.610	98.210	100.400	12.900	5609.000	99.720
σ		100.700	167.800	1.839%	0.197%	1.265	0.147	0.212	1.423	12.720	0.021
%RSD		2.055	3.227	1.675	0.166	1.296	0.149	0.211	11.040	0.227	0.022

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	03:09:53	100.600	102.800	103.900	106.000	108.759%	100.800	96.540	98.540	103.109%	99.070
2	03:09:57	100.400	102.200	103.300	105.600	111.863%	100.200	95.740	99.160	104.337%	100.000
3	03:10:01	100.500	101.300	103.300	105.100	110.905%	101.800	96.080	99.000	105.194%	98.910
x		100.500	102.100	103.500	105.600	110.509%	100.900	96.120	98.900	104.213%	99.330
σ		0.125	0.773	0.347	0.488	1.590%	0.787	0.403	0.320	1.048%	0.598
%RSD		0.124	0.757	0.336	0.462	1.438	0.780	0.419	0.323	1.006	0.602

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	03:09:53	103.700	52.110	103.900	102.177%	100.800	101.300	96.830	↹108.207%	5.063	↹101.400
2	03:09:57	102.800	52.470	102.700	103.590%	101.800	100.700	98.150	↹109.190%	5.076	↹103.500
3	03:10:01	102.300	51.950	103.000	104.958%	100.900	100.500	97.760	↹109.748%	5.061	↹101.800
x		102.900	52.180	103.200	103.575%	101.200	100.900	97.580	↹109.048%	5.067	↹102.200
σ		0.706	0.268	0.637	1.390%	0.557	0.430	0.675	↹0.780%	0.008	↹1.117
%RSD		0.686	0.513	0.617	1.342	0.550	0.427	0.692	↹0.715	0.162	↹1.093

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	03:09:53	↹101.600	↹102.876%	↹100.100
2	03:09:57	↹102.800	↹103.464%	↹101.200
3	03:10:01	↹101.600	↹105.158%	↹101.800
x		↹102.000	↹103.833%	↹101.100
σ		↹0.669	↹1.185%	↹0.845
%RSD		↹0.656	↹1.141	↹0.836

39996_3361_CCB8 10/9/2012 3:15:22 AM

User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	03:15:26	0.069	-0.001	-0.211	3.409	1.796	2.086	2.089	10.310	151.100	↹2132000.000
2	03:15:30	0.070	0.031	-0.343	4.894	4.059	4.841	10.930	3.028	150.100	↹2225000.000
3	03:15:34	0.062	0.045	-0.029	3.586	2.415	2.016	0.874	7.081	162.500	↹2211000.000
x		0.067	0.025	-0.194	3.963	2.757	2.981	4.631	6.807	154.600	↹2189000.000
σ		0.004	0.024	0.157	0.811	1.170	1.611	5.489	3.650	6.868	↹49750.000
%RSD		6.531	95.470	81.020	20.460	42.440	54.040	118.500	53.630	4.444	↹2.272

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	03:15:26	-26.730	8.420	107.344%	116.671%	0.150	0.001	0.019	34.530	3.516	0.086
2	03:15:30	-42.860	12.590	107.400%	115.684%	0.072	-0.027	0.031	35.540	6.041	0.125
3	03:15:34	-55.970	36.950	107.800%	115.753%	-0.064	0.338	0.023	35.430	3.610	0.081
x		-41.850	19.320	107.515%	116.036%	0.053	0.104	0.024	35.170	4.389	0.097
σ		14.640	15.410	0.248%	0.551%	0.109	0.203	0.006	0.554	1.432	0.024
%RSD		34.990	79.760	0.231	0.475	206.200	195.200	25.940	1.575	32.620	24.590

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	03:15:26	0.063	0.096	0.083	-0.069	106.831%	0.102	-0.232	0.057	103.774%	0.038
2	03:15:30	0.111	0.130	0.123	-0.069	107.411%	0.229	-0.255	0.093	103.979%	0.071
3	03:15:34	0.065	0.067	0.088	-0.054	107.767%	0.103	-0.201	0.067	103.493%	0.053
x		0.080	0.098	0.098	-0.064	107.336%	0.144	-0.230	0.072	103.749%	0.054
σ		0.027	0.031	0.022	0.009	0.473%	0.073	0.027	0.019	0.244%	0.017
%RSD		33.540	32.150	22.480	13.500	0.440	50.520	11.820	25.990	0.235	31.460

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	03:15:26	0.122	0.026	0.079	102.530%	0.053	0.066	0.089	↹109.214%	0.030	0.170
2	03:15:30	0.136	0.049	0.089	101.812%	0.095	0.094	0.112	↹109.850%	0.040	0.188
3	03:15:34	0.122	0.029	0.076	101.532%	0.066	0.074	0.057	↹108.959%	0.025	0.148
x		0.126	0.035	0.082	101.958%	0.071	0.078	0.086	↹109.341%	0.032	0.169
σ		0.008	0.012	0.007	0.514%	0.022	0.014	0.028	↹0.459%	0.008	0.020
%RSD		6.705	35.790	8.357	0.505	30.360	18.430	32.450	↹0.420	24.160	11.750

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	03:15:26	0.066	↹105.314%	0.057
2	03:15:30	0.097	↹107.577%	0.091
3	03:15:34	0.066	↹106.615%	0.064
x		0.077	↹106.502%	0.071
σ		0.018	↹1.135%	0.018
%RSD		23.460	↹1.066	25.720

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	03:20:59	0.013	-0.010	0.050	3816.000	2932.000	7.664	41.910	23620.000	1428.000	T 1729000.000
2	03:21:03	0.010	-0.001	0.390	3965.000	2988.000	6.818	36.820	23810.000	1561.000	T 1746000.000
3	03:21:07	0.007	-0.019	0.004	3820.000	2979.000	6.817	39.420	23920.000	1392.000	T 1788000.000
x		0.010	-0.010	0.148	3867.000	2966.000	7.099	39.390	23780.000	1461.000	T 1754000.000
σ		0.003	0.009	0.211	85.050	30.210	0.489	2.544	151.300	89.210	T 30770.000
%RSD		32.480	91.410	142.600	2.199	1.019	6.887	6.458	0.636	6.108	T 1.754

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	03:20:59	TM 39030.000	8479.000	107.181%	116.023%	2.238	-0.003	0.299	28.220	23.650	1.226
2	03:21:03	TM 39960.000	8189.000	107.262%	114.713%	2.548	0.133	0.337	29.350	22.890	1.185
3	03:21:07	TM 39230.000	8157.000	108.808%	116.277%	2.762	-0.029	0.296	29.230	22.510	1.188
x		TM 39410.000	8275.000	107.751%	115.671%	2.516	0.034	0.311	28.930	23.020	1.200
σ		TM 487.500	177.400	0.917%	0.840%	0.264	0.087	0.023	0.623	0.578	0.023
%RSD		TM 1.237	2.144	0.851	0.726	10.470	257.900	7.391	2.153	2.511	1.919

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	03:20:59	0.039	0.327	2.476	112.300	107.141%	0.569	4.208	3.897	102.357%	0.042
2	03:21:03	0.032	0.347	2.453	112.400	107.695%	0.513	3.922	3.848	103.282%	0.039
3	03:21:07	0.023	0.337	2.474	114.000	107.456%	0.631	3.672	3.814	105.119%	0.035
x		0.031	0.337	2.468	112.900	107.431%	0.571	3.934	3.853	103.586%	0.039
σ		0.008	0.010	0.013	0.936	0.278%	0.059	0.268	0.042	1.406%	0.003
%RSD		24.870	3.041	0.525	0.829	0.258	10.280	6.817	1.078	1.357	8.874

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	03:20:59	0.087	-0.001	0.024	102.019%	41.340	0.047	0.339	T 108.204%	1.602	0.045
2	03:21:03	0.087	-0.008	0.024	102.687%	41.490	0.051	0.331	T 110.214%	1.508	0.035
3	03:21:07	0.071	-0.006	0.023	103.668%	41.700	0.044	0.336	T 110.574%	1.548	0.030
x		0.082	-0.005	0.024	102.791%	41.510	0.047	0.336	T 109.664%	1.553	0.037
σ		0.009	0.004	0.001	0.830%	0.178	0.003	0.004	T 1.277%	0.047	0.008
%RSD		10.970	73.720	2.808	0.807	0.429	7.253	1.199	T 1.164	3.036	21.600

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	03:20:59	0.399	T 104.606%	0.008
2	03:21:03	0.381	T 105.699%	0.003
3	03:21:07	0.378	T 107.675%	0.000
x		0.386	T 105.993%	0.004
σ		0.012	T 1.556%	0.004
%RSD		2.987	T 1.468	103.200

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	03:26:34	0.024	0.003	0.261	4064.000	2965.000	6.444	27.750	M 27280.000	1276.000	T 1728000.000
2	03:26:37	0.003	-0.029	0.002	4024.000	2960.000	5.603	25.000	M 26980.000	1352.000	T 1730000.000
3	03:26:41	0.013	-0.015	0.204	4019.000	2960.000	5.696	28.140	M 26990.000	1285.000	T 1722000.000
x		0.013	-0.013	0.155	4035.000	2962.000	5.914	26.960	M 27080.000	1305.000	T 1726000.000
σ		0.010	0.016	0.136	24.640	3.266	0.461	1.710	M 168.100	41.460	T 4349.000
%RSD		77.650	119.900	87.690	0.611	0.110	7.797	6.342	M 0.621	3.178	T 0.252

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	03:26:34	TM 40610.000	13160.000	105.449%	115.932%	2.988	0.006	0.357	28.120	38.230	6.558
2	03:26:37	TM 39910.000	13430.000	106.721%	116.416%	3.204	-0.216	0.303	29.100	39.080	6.449
3	03:26:41	TM 40550.000	13650.000	107.216%	116.749%	2.784	-0.083	0.343	28.690	39.470	6.436
x		TM 40360.000	13410.000	106.462%	116.365%	2.992	-0.098	0.334	28.640	38.930	6.481
σ		TM 389.100	242.900	0.912%	0.411%	0.210	0.112	0.028	0.490	0.633	0.067
%RSD		TM 0.964	1.811	0.856	0.353	7.030	114.300	8.468	1.712	1.626	1.036

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	03:26:34	0.025	2.972	10.090	120.100	107.006%	0.774	2.970	4.154	102.460%	0.026
2	03:26:37	0.019	3.041	10.080	119.200	108.718%	0.781	2.945	4.195	103.431%	0.018
3	03:26:41	0.019	3.056	10.260	120.200	107.238%	0.733	2.822	4.085	103.133%	0.028
x		0.021	3.023	10.140	119.800	107.654%	0.762	2.912	4.144	103.008%	0.024
σ		0.003	0.045	0.100	0.557	0.929%	0.026	0.080	0.056	0.498%	0.005
%RSD		15.960	1.481	0.987	0.465	0.863	3.402	2.733	1.344	0.483	22.340

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	03:26:34	0.035	-0.006	0.004	101.956%	41.100	0.028	0.818	T 107.934%	1.220	0.014
2	03:26:37	0.065	-0.014	0.006	102.887%	41.640	0.024	0.847	T 108.144%	1.177	0.008
3	03:26:41	0.046	-0.010	0.003	103.663%	41.290	0.030	0.781	T 109.207%	1.285	0.005
x		0.049	-0.010	0.004	102.835%	41.340	0.027	0.815	T 108.429%	1.227	0.009
σ		0.016	0.004	0.001	0.855%	0.274	0.003	0.033	T 0.682%	0.054	0.004
%RSD		31.940	43.200	36.590	0.831	0.662	10.530	4.057	T 0.629	4.439	45.970

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	03:26:34	0.273	T 103.406%	-0.007
2	03:26:37	0.281	T 104.872%	-0.007
3	03:26:41	0.270	T 104.788%	-0.008
x		0.275	T 104.356%	-0.007
σ		0.005	T 0.823%	0.001
%RSD		1.994	T 0.789	7.180

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	03:32:07	0.007	-0.024	-0.086	3837.000	2776.000	9.538	23.780	23250.000	1344.000	τ 1796000.000
2	03:32:11	0.000	-0.019	-0.106	3931.000	2833.000	7.089	22.660	24050.000	1367.000	τ 1808000.000
3	03:32:14	0.003	-0.001	0.468	3739.000	2776.000	5.136	20.970	23730.000	1313.000	τ 1866000.000
x		0.004	-0.015	0.092	3836.000	2795.000	7.254	22.470	23680.000	1341.000	τ 1824000.000
σ		0.003	0.012	0.326	96.130	33.100	2.206	1.414	401.700	27.210	τ 37460.000
%RSD		91.280	81.130	354.100	2.506	1.184	30.410	6.294	1.697	2.028	τ 2.054

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	03:32:07	τM 38050.000	1180.000	106.293%	114.054%	2.844	-0.192	0.726	35.690	100.500	0.927
2	03:32:11	τM 39320.000	1233.000	106.218%	115.318%	2.747	-0.007	0.761	34.960	101.100	0.949
3	03:32:14	τM 38490.000	1065.000	107.713%	116.002%	2.361	-0.110	0.687	36.300	100.700	0.914
x		τM 38620.000	1159.000	106.741%	115.125%	2.651	-0.103	0.725	35.650	100.800	0.930
σ		τM 645.900	85.690	0.842%	0.988%	0.256	0.092	0.037	0.673	0.315	0.018
%RSD		τM 1.672	7.391	0.789	0.858	9.638	89.760	5.081	1.888	0.313	1.900

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	03:32:07	0.023	0.774	4.939	52.260	108.664%	1.165	3.702	0.518	103.318%	0.030
2	03:32:11	0.027	0.809	4.898	53.450	108.862%	1.024	3.822	0.515	104.240%	0.040
3	03:32:14	0.025	0.790	5.002	53.410	108.576%	1.220	3.521	0.516	104.615%	0.027
x		0.025	0.791	4.946	53.040	108.701%	1.137	3.682	0.516	104.058%	0.033
σ		0.002	0.018	0.052	0.677	0.146%	0.101	0.151	0.002	0.667%	0.007
%RSD		8.187	2.213	1.054	1.276	0.135	8.898	4.113	0.322	0.641	21.580

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	03:32:07	0.105	-0.014	-0.004	102.905%	41.950	0.020	0.117	τ 110.030%	0.638	0.035
2	03:32:11	0.119	-0.016	-0.003	103.510%	41.910	0.019	0.136	τ 109.641%	0.677	0.035
3	03:32:14	0.114	-0.010	-0.005	103.805%	42.460	0.022	0.122	τ 111.041%	0.640	0.028
x		0.113	-0.013	-0.004	103.407%	42.110	0.020	0.125	τ 110.237%	0.652	0.032
σ		0.007	0.003	0.001	0.459%	0.306	0.001	0.010	τ 0.723%	0.022	0.004
%RSD		6.264	23.580	23.740	0.443	0.726	6.545	7.812	τ 0.655	3.366	12.740

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	03:32:07	0.076	τ 104.385%	-0.009
2	03:32:11	0.075	τ 105.245%	-0.009
3	03:32:14	0.075	τ 107.008%	-0.010
x		0.075	τ 105.546%	-0.009
σ		0.001	τ 1.337%	0.000
%RSD		0.774	τ 1.267	3.215

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	03:37:40	0.031	-0.018	-0.145	8312.000	4086.000	9.970	33.540	M 68760.000	1593.000	T 1921000.000
2	03:37:44	0.048	-0.023	0.140	8395.000	3981.000	9.430	29.680	M 68430.000	1525.000	T 1815000.000
3	03:37:48	0.023	-0.023	-0.045	8688.000	4090.000	8.860	28.130	M 69210.000	1703.000	T 1881000.000
x		0.034	-0.022	-0.017	8465.000	4052.000	9.420	30.450	M 68800.000	1607.000	T 1872000.000
σ		0.012	0.003	0.144	197.600	61.920	0.555	2.788	M 390.100	89.740	T 53500.000
%RSD		36.620	13.230	867.600	2.335	1.528	5.891	9.155	M 0.567	5.585	T 2.857

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	03:37:40	TM 32590.000	M 101600.000	96.009%	108.311%	7.277	0.008	0.416	22.330	114.000	238.700
2	03:37:44	TM 33430.000	M 99180.000	98.888%	108.654%	6.711	0.017	0.413	22.100	111.700	236.700
3	03:37:48	TM 34370.000	M 101400.000	96.889%	110.317%	7.036	-0.035	0.430	22.870	114.900	238.900
x		TM 33460.000	M 100700.000	97.262%	109.094%	7.008	-0.003	0.420	22.440	113.600	238.100
σ		TM 889.100	M 1350.000	1.475%	1.073%	0.284	0.028	0.009	0.396	1.635	1.193
%RSD		TM 2.657	M 1.340	1.517	0.983	4.051	863.400	2.239	1.765	1.440	0.501

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	03:37:40	0.146	0.443	5.211	187.500	97.856%	0.739	1.571	112.100	95.102%	0.034
2	03:37:44	0.130	0.463	5.106	185.400	98.851%	0.829	1.934	111.700	96.522%	0.007
3	03:37:48	0.147	0.474	5.211	185.400	98.962%	0.769	1.755	111.000	96.572%	0.025
x		0.141	0.460	5.176	186.100	98.557%	0.779	1.753	111.600	96.065%	0.022
σ		0.010	0.016	0.061	1.223	0.609%	0.046	0.181	0.549	0.835%	0.014
%RSD		6.943	3.442	1.175	0.657	0.618	5.879	10.350	0.492	0.869	61.380

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	03:37:40	0.203	-0.009	0.928	96.085%	42.020	0.017	6.039	T 104.572%	0.143	0.061
2	03:37:44	0.178	-0.007	0.937	97.140%	41.460	0.018	6.082	T 104.903%	0.194	0.060
3	03:37:48	0.193	-0.011	0.920	97.319%	41.950	0.014	6.101	T 104.760%	0.148	0.055
x		0.191	-0.009	0.928	96.848%	41.810	0.016	6.074	T 104.745%	0.162	0.059
σ		0.013	0.002	0.008	0.667%	0.309	0.002	0.032	T 0.166%	0.028	0.003
%RSD		6.675	22.490	0.893	0.689	0.738	14.470	0.525	T 0.159	17.220	5.433

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	03:37:40	0.248	T 100.507%	-0.010
2	03:37:44	0.255	T 100.256%	-0.010
3	03:37:48	0.258	T 100.491%	-0.010
x		0.254	T 100.418%	-0.010
σ		0.005	T 0.140%	0.000
%RSD		1.899	T 0.140	1.390

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	03:43:14	0.002	-0.004	-0.185	6520.000	2991.000	2.811	29.250	22320.000	1697.000	T 1863000.000
2	03:43:18	-0.000	-0.019	-0.165	6718.000	2962.000	6.078	29.440	21950.000	1735.000	T 1760000.000
3	03:43:22	-0.002	-0.014	-0.024	6536.000	3009.000	4.573	27.400	21900.000	1729.000	T 1857000.000
x		-0.000	-0.012	-0.125	6591.000	2987.000	4.487	28.700	22060.000	1720.000	T 1827000.000
σ		0.002	0.007	0.088	109.700	23.670	1.635	1.126	230.100	20.540	T 57650.000
%RSD		1652.000	58.670	70.580	1.664	0.793	36.450	3.923	1.043	1.194	T 3.156

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	03:43:14	TM 41280.000	2991.000	100.177%	110.814%	2.401	-0.006	0.235	25.670	26.840	2.653
2	03:43:18	TM 42970.000	2947.000	101.824%	110.918%	2.545	0.056	0.277	25.050	25.140	2.670
3	03:43:22	TM 42110.000	3242.000	101.197%	111.611%	2.993	-0.105	0.254	27.820	26.240	2.619
x		TM 42120.000	3060.000	101.066%	111.114%	2.646	-0.018	0.255	26.180	26.070	2.647
σ		TN 840.800	159.500	0.831%	0.433%	0.308	0.081	0.021	1.450	0.864	0.026
%RSD		TM 1.996	5.213	0.823	0.390	11.650	450.200	8.287	5.538	3.315	0.969

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	03:43:14	0.026	0.326	1.857	85.020	102.708%	0.085	1.441	2.674	98.971%	0.023
2	03:43:18	0.021	0.320	1.839	84.830	103.922%	0.008	1.416	2.672	99.775%	0.009
3	03:43:22	0.025	0.337	1.830	85.040	104.561%	0.036	1.541	2.674	100.136%	0.017
x		0.024	0.327	1.842	84.960	103.730%	0.043	1.466	2.673	99.627%	0.016
σ		0.003	0.009	0.014	0.116	0.941%	0.039	0.066	0.001	0.596%	0.007
%RSD		10.870	2.625	0.737	0.137	0.907	89.810	4.523	0.048	0.598	42.350

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	03:43:14	0.052	-0.013	0.068	98.196%	41.290	0.019	0.185	T 107.286%	0.630	0.025
2	03:43:18	0.057	-0.007	0.102	99.437%	40.920	0.021	0.190	T 106.487%	0.721	0.025
3	03:43:22	0.047	-0.022	0.068	99.698%	41.190	0.017	0.227	T 107.637%	0.661	0.027
x		0.052	-0.014	0.079	99.110%	41.140	0.019	0.201	T 107.137%	0.671	0.026
σ		0.005	0.008	0.020	0.803%	0.191	0.002	0.023	T 0.589%	0.046	0.002
%RSD		10.530	56.930	25.040	0.810	0.465	10.760	11.570	T 0.550	6.879	6.225

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	03:43:14	0.015	T 103.724%	-0.011
2	03:43:18	0.013	T 102.924%	-0.011
3	03:43:22	0.015	T 104.451%	-0.011
x		0.014	T 103.700%	-0.011
σ		0.001	T 0.764%	0.000
%RSD		4.361	T 0.736	0.649

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	03:48:49	0.097	-0.033	0.283	8224.000	4326.000	54.430	161.700	M 82560.000	1567.000	T 1795000.000
2	03:48:52	0.079	-0.013	-0.201	8269.000	4159.000	51.690	140.700	M 81010.000	1550.000	T 1767000.000
3	03:48:56	0.095	-0.018	0.413	8093.000	4317.000	54.130	151.400	M 82420.000	1605.000	T 1867000.000
x		0.090	-0.022	0.165	8195.000	4267.000	53.420	151.200	M 81990.000	1574.000	T 1810000.000
σ		0.010	0.010	0.324	91.380	93.820	1.503	10.520	M 857.500	27.850	T 51530.000
%RSD		10.710	47.350	196.000	1.115	2.199	2.813	6.957	M 1.046	1.769	T 2.848

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	03:48:49	TM 35280.000	M 124200.000	95.251%	107.102%	8.675	0.494	0.426	22.200	454.700	M 653.900
2	03:48:52	TM 35810.000	M 123900.000	98.163%	107.639%	8.724	0.458	0.442	22.480	449.700	TM 685.900
3	03:48:56	TM 35610.000	M 125600.000	96.910%	107.359%	9.073	0.388	0.382	23.350	445.600	TM 688.100
x		TM 35570.000	M 124600.000	96.775%	107.366%	8.824	0.447	0.416	22.680	450.000	TM 676.000
σ		TM 268.600	M 919.000	1.461%	0.268%	0.217	0.054	0.031	0.600	4.577	TM 19.170
%RSD		TM 0.755	M 0.738	1.510	0.250	2.460	12.050	7.493	2.646	1.017	TM 2.836

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	03:48:49	0.254	0.628	6.595	250.900	96.935%	0.974	2.709	162.200	94.417%	0.073
2	03:48:52	0.232	0.628	6.564	252.800	97.804%	0.945	2.684	159.700	96.048%	0.129
3	03:48:56	0.275	0.675	6.699	256.000	97.077%	0.867	2.361	163.200	95.653%	0.072
x		0.254	0.644	6.619	253.200	97.272%	0.929	2.585	161.700	95.373%	0.091
σ		0.022	0.027	0.071	2.550	0.466%	0.056	0.194	1.791	0.851%	0.033
%RSD		8.496	4.255	1.070	1.007	0.479	5.998	7.506	1.108	0.892	35.960

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	03:48:49	0.462	-0.008	1.923	94.006%	42.130	0.046	13.150	T 101.892%	0.118	0.112
2	03:48:52	0.481	-0.010	1.881	95.612%	41.840	0.034	13.190	T 102.552%	0.099	0.114
3	03:48:56	0.482	-0.009	1.826	96.024%	41.780	0.041	13.160	T 103.674%	0.125	0.112
x		0.475	-0.009	1.877	95.214%	41.920	0.040	13.170	T 102.706%	0.114	0.112
σ		0.012	0.001	0.049	1.067%	0.185	0.006	0.022	T 0.901%	0.014	0.001
%RSD		2.422	8.411	2.597	1.120	0.442	15.290	0.167	T 0.877	12.080	1.091

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	03:48:49	1.089	T 96.604%	-0.005
2	03:48:52	1.074	T 97.870%	-0.005
3	03:48:56	1.079	T 99.578%	-0.005
x		1.080	T 98.017%	-0.005
σ		0.008	T 1.492%	0.000
%RSD		0.703	T 1.522	6.511

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	03:54:23	0.032	-0.028	0.170	8522.000	3667.000	21.470	42.260	M 65630.000	1425.000	T 1745000.000
2	03:54:26	0.034	-0.018	0.075	8439.000	3620.000	18.920	37.500	M 65100.000	1359.000	T 1729000.000
3	03:54:30	0.047	-0.013	-0.373	8305.000	3564.000	18.530	43.750	M 64590.000	1413.000	T 1725000.000
x		0.038	-0.020	-0.043	8422.000	3617.000	19.640	41.170	M 65110.000	1399.000	T 1733000.000
σ		0.008	0.008	0.290	109.600	51.290	1.595	3.265	M 520.100	35.340	T 10350.000
%RSD		21.350	37.900	681.300	1.301	1.418	8.121	7.931	M 0.799	2.526	T 0.598

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	03:54:23	TM 28910.000	M 108900.000	94.703%	105.928%	6.585	0.307	0.365	21.400	253.500	286.900
2	03:54:26	TM 28580.000	M 107100.000	96.719%	106.125%	6.363	0.153	0.349	21.980	252.100	281.800
3	03:54:30	TM 28170.000	M 106200.000	97.958%	107.104%	5.712	0.320	0.324	21.520	249.000	282.900
x		TM 28550.000	M 107400.000	96.460%	106.386%	6.220	0.260	0.346	21.640	251.500	283.900
σ		TM 369.800	M 1370.000	1.643%	0.630%	0.454	0.093	0.021	0.308	2.294	2.670
%RSD		TM 1.295	M 1.276	1.703	0.592	7.292	35.810	6.067	1.423	0.912	0.941

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	03:54:23	0.185	0.371	5.233	342.100	96.664%	0.688	1.884	134.800	93.743%	0.040
2	03:54:26	0.168	0.346	5.118	342.100	97.669%	0.692	2.023	135.100	94.579%	0.034
3	03:54:30	0.155	0.314	5.074	338.600	97.190%	0.703	2.131	134.800	95.634%	0.033
x		0.169	0.344	5.142	340.900	97.174%	0.694	2.012	134.900	94.652%	0.036
σ		0.015	0.029	0.082	2.004	0.503%	0.008	0.124	0.147	0.947%	0.004
%RSD		9.079	8.432	1.591	0.588	0.517	1.088	6.156	0.109	1.001	11.200

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	03:54:23	0.714	-0.011	1.114	94.569%	42.960	0.018	9.982	T 102.715%	0.080	0.099
2	03:54:26	0.672	-0.013	1.122	95.412%	42.590	0.018	10.010	T 102.867%	0.088	0.100
3	03:54:30	0.705	-0.010	1.068	95.640%	43.230	0.021	10.020	T 103.597%	0.098	0.100
x		0.697	-0.011	1.101	95.207%	42.930	0.019	10.000	T 103.060%	0.089	0.100
σ		0.022	0.002	0.029	0.564%	0.323	0.002	0.019	T 0.471%	0.009	0.000
%RSD		3.133	16.410	2.643	0.593	0.752	10.470	0.186	T 0.457	10.220	0.411

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	03:54:23	0.654	T 97.182%	-0.008
2	03:54:26	0.651	T 98.198%	-0.009
3	03:54:30	0.649	T 99.062%	-0.009
x		0.652	T 98.147%	-0.009
σ		0.003	T 0.941%	0.000
%RSD		0.394	T 0.959	2.380

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	03:59:57	0.020	0.001	0.119	10110.000	3493.000	4.736	28.310	M 41190.000	1213.000	T 1782000.000
2	04:00:01	0.011	-0.008	-0.443	9840.000	3477.000	4.627	25.740	M 40780.000	1234.000	T 1761000.000
3	04:00:05	0.013	-0.023	-0.393	9975.000	3492.000	5.476	32.360	M 41120.000	1234.000	T 1787000.000
x		0.015	-0.010	-0.239	9976.000	3487.000	4.946	28.800	M 41030.000	1227.000	T 1777000.000
σ		0.004	0.012	0.311	136.200	9.154	0.462	3.336	M 219.400	12.060	T 14170.000
%RSD		30.540	122.700	130.300	1.365	0.263	9.338	11.580	M 0.535	0.982	T 0.797

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	03:59:57	TM 37240.000	M 46050.000	96.702%	107.378%	3.899	0.185	0.249	22.510	47.250	70.170
2	04:00:01	TM 36760.000	M 45570.000	98.818%	107.221%	4.788	0.051	0.266	23.060	45.910	70.100
3	04:00:05	TM 37240.000	M 45530.000	98.299%	106.889%	4.176	-0.003	0.294	23.260	46.760	70.220
x		TM 37080.000	M 45720.000	97.940%	107.163%	4.288	0.078	0.270	22.950	46.640	70.170
σ		TM 276.600	M 289.900	1.103%	0.250%	0.455	0.097	0.023	0.386	0.680	0.062
%RSD		TM 0.746	M 0.634	1.126	0.233	10.610	124.100	8.420	1.683	1.458	0.088

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	03:59:57	0.044	0.362	2.767	114.800	98.315%	0.328	2.430	53.610	95.769%	0.010
2	04:00:01	0.050	0.393	2.728	114.300	99.458%	0.401	2.186	54.420	95.982%	0.012
3	04:00:05	0.050	0.332	2.812	115.000	99.057%	0.405	1.983	54.140	96.466%	0.006
x		0.048	0.362	2.769	114.700	98.943%	0.378	2.200	54.050	96.072%	0.010
σ		0.003	0.031	0.042	0.372	0.580%	0.043	0.224	0.412	0.357%	0.003
%RSD		6.688	8.508	1.509	0.324	0.586	11.410	10.190	0.762	0.372	32.110

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	03:59:57	0.129	-0.015	0.314	95.587%	41.860	0.018	4.169	T 103.049%	0.260	0.044
2	04:00:01	0.098	-0.020	0.286	96.492%	42.010	0.023	4.118	T 104.110%	0.260	0.037
3	04:00:05	0.123	-0.013	0.289	97.214%	41.540	0.017	3.957	T 104.750%	0.307	0.041
x		0.117	-0.016	0.297	96.431%	41.800	0.019	4.081	T 103.969%	0.276	0.041
σ		0.016	0.003	0.015	0.815%	0.240	0.003	0.111	T 0.859%	0.027	0.003
%RSD		14.130	21.110	5.177	0.845	0.575	15.710	2.709	T 0.826	9.907	8.515

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	03:59:57	0.187	T 98.877%	-0.010
2	04:00:01	0.183	T 99.916%	-0.010
3	04:00:05	0.187	T 100.144%	-0.010
x		0.186	T 99.645%	-0.010
σ		0.002	T 0.676%	0.000
%RSD		1.191	T 0.678	0.722

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	04:05:31	0.006	-0.018	-0.171	7214.000	2951.000	4.430	33.390	M 25400.000	1327.000	T 1829000.000
2	04:05:35	0.010	-0.023	-0.147	7441.000	2998.000	4.505	33.720	M 25730.000	1455.000	T 1821000.000
3	04:05:38	0.024	-0.023	-0.081	7992.000	2983.000	5.957	34.500	M 25880.000	1522.000	T 1741000.000
x		0.013	-0.022	-0.133	7549.000	2977.000	4.964	33.870	M 25670.000	1435.000	T 1797000.000
σ		0.009	0.003	0.046	399.900	24.110	0.861	0.570	M 244.200	98.700	T 49060.000
%RSD		71.630	13.070	34.810	5.297	0.810	17.340	1.684	M 0.951	6.880	T 2.730

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	04:05:31	TM 36400.000	12780.000	97.676%	107.169%	3.630	0.022	0.286	22.940	35.880	20.940
2	04:05:35	TM 37690.000	13070.000	97.726%	107.093%	3.387	0.202	0.270	22.220	35.830	21.710
3	04:05:38	TM 39640.000	13060.000	97.266%	105.925%	2.415	0.000	0.286	23.230	35.370	21.390
x		TM 37910.000	12970.000	97.556%	106.729%	3.144	0.075	0.281	22.800	35.690	21.350
σ		TM 1634.000	162.000	0.253%	0.697%	0.643	0.111	0.009	0.521	0.279	0.387
%RSD		TM 4.311	1.249	0.259	0.653	20.440	148.200	3.382	2.285	0.783	1.814

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	04:05:31	0.116	0.377	3.182	154.900	97.109%	0.185	3.329	14.090	95.590%	0.003
2	04:05:35	0.130	0.292	3.144	153.800	98.908%	0.161	3.307	14.250	95.734%	0.005
3	04:05:38	0.120	0.337	3.177	155.100	98.842%	0.215	2.926	13.880	97.426%	0.013
x		0.122	0.336	3.168	154.600	98.286%	0.187	3.187	14.070	96.250%	0.007
σ		0.007	0.042	0.021	0.683	1.020%	0.027	0.227	0.187	1.021%	0.005
%RSD		6.090	12.660	0.653	0.442	1.038	14.510	7.107	1.331	1.061	74.400

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	04:05:31	0.132	-0.016	0.083	96.101%	41.890	0.018	1.499	T 105.519%	0.127	0.005
2	04:05:35	0.140	-0.012	0.107	95.896%	42.140	0.021	1.419	T 105.914%	0.132	0.008
3	04:05:38	0.122	-0.010	0.087	97.517%	41.620	0.025	1.454	T 105.219%	0.138	0.008
x		0.131	-0.013	0.093	96.505%	41.880	0.021	1.457	T 105.551%	0.133	0.007
σ		0.009	0.003	0.013	0.882%	0.263	0.003	0.040	T 0.348%	0.005	0.002
%RSD		6.646	26.620	14.080	0.914	0.629	15.900	2.745	T 0.330	3.982	24.090

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	04:05:31	0.028	T 101.941%	-0.011
2	04:05:35	0.031	T 102.185%	-0.011
3	04:05:38	0.030	T 102.109%	-0.011
x		0.030	T 102.078%	-0.011
σ		0.001	T 0.125%	0.000
%RSD		5.060	T 0.122	2.084

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User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	04:11:05	0.085	-0.028	0.233	10240.000	4157.000	20.850	97.220	M 71490.000	1447.000	T 1907000.000
2	04:11:09	0.059	-0.018	0.088	9955.000	4171.000	23.530	89.880	M 71280.000	1370.000	T 1987000.000
3	04:11:12	0.057	-0.023	0.114	10230.000	4164.000	22.190	102.700	M 71960.000	1463.000	T 1914000.000
x		0.067	-0.023	0.145	10140.000	4164.000	22.190	96.580	M 71580.000	1427.000	T 1936000.000
σ		0.016	0.005	0.077	161.500	7.019	1.341	6.415	M 348.500	49.400	T 44630.000
%RSD		23.500	21.720	53.340	1.593	0.169	6.043	6.641	M 0.487	3.463	T 2.305

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	04:11:05	TM 34930.000	M 115800.000	94.270%	105.100%	8.243	0.276	0.448	23.190	160.200	285.900
2	04:11:09	TM 34770.000	M 115000.000	95.352%	105.455%	6.485	0.302	0.477	22.300	160.700	282.900
3	04:11:12	TM 35050.000	M 114000.000	95.736%	105.282%	7.221	0.344	0.490	22.450	161.800	284.400
x		TM 34920.000	M 114900.000	95.120%	105.279%	7.316	0.307	0.471	22.650	160.900	284.400
σ		TM 139.500	M 938.900	0.760%	0.177%	0.883	0.034	0.022	0.480	0.833	1.469
%RSD		TM 0.400	M 0.817	0.799	0.169	12.070	11.200	4.576	2.120	0.518	0.517

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	04:11:05	0.107	0.551	5.788	155.100	94.661%	0.908	2.397	138.300	92.578%	0.093
2	04:11:09	0.110	0.491	5.728	156.400	95.037%	0.893	2.477	138.200	93.127%	0.091
3	04:11:12	0.098	0.463	5.703	155.500	95.828%	0.922	2.530	137.300	93.893%	0.080
x		0.105	0.502	5.739	155.600	95.175%	0.908	2.468	137.900	93.199%	0.088
σ		0.006	0.045	0.044	0.718	0.596%	0.014	0.067	0.566	0.661%	0.007
%RSD		6.034	8.951	0.760	0.461	0.626	1.576	2.703	0.411	0.709	8.138

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	04:11:05	0.510	-0.005	1.945	93.446%	42.340	0.021	22.770	T 101.113%	0.140	0.074
2	04:11:09	0.475	-0.004	1.917	94.008%	42.220	0.016	22.820	T 102.428%	0.105	0.078
3	04:11:12	0.544	-0.004	1.878	94.922%	42.320	0.016	23.110	T 102.100%	0.124	0.071
x		0.510	-0.005	1.913	94.126%	42.300	0.018	22.900	T 101.880%	0.123	0.074
σ		0.034	0.001	0.034	0.745%	0.065	0.003	0.185	T 0.685%	0.017	0.003
%RSD		6.741	12.850	1.758	0.791	0.154	18.030	0.808	T 0.672	14.240	4.310

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	04:11:05	0.458	T 95.618%	-0.006
2	04:11:09	0.457	T 97.231%	-0.006
3	04:11:12	0.459	T 97.377%	-0.006
x		0.458	T 96.742%	-0.006
σ		0.001	T 0.976%	0.000
%RSD		0.178	T 1.009	1.886

40002_3361_CCV9 10/9/2012 4:16:36 AM

User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	04:16:40	88.560	85.280	89.390	5104.000	4984.000	4704.000	4686.000	5043.000	139.900	τ 2197000.000
2	04:16:44	89.080	84.810	92.090	5086.000	4933.000	4630.000	4662.000	4901.000	150.900	τ 2200000.000
3	04:16:47	89.530	85.350	93.900	5091.000	4974.000	4742.000	4731.000	4997.000	153.200	τ 2251000.000
x		89.060	85.150	91.790	5094.000	4964.000	4692.000	4693.000	4980.000	148.000	τ 2216000.000
σ		0.485	0.293	2.268	9.140	27.010	57.150	34.850	72.360	7.141	τ 30440.000
%RSD		0.544	0.344	2.471	0.179	0.544	1.218	0.743	1.453	4.825	τ 1.374

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	04:16:40	4675.000	5131.000	102.683%	111.160%	98.180	98.320	100.500	10.300	5607.000	99.210
2	04:16:44	4681.000	4995.000	105.614%	110.507%	97.160	96.380	99.490	13.020	5569.000	98.800
3	04:16:47	4750.000	4910.000	105.213%	110.413%	97.020	97.740	99.960	9.456	5631.000	100.400
x		4702.000	5012.000	104.503%	110.693%	97.450	97.480	99.990	10.930	5603.000	99.450
σ		41.620	111.100	1.589%	0.407%	0.632	0.994	0.517	1.864	31.070	0.810
%RSD		0.885	2.217	1.521	0.368	0.649	1.020	0.517	17.060	0.555	0.814

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	04:16:40	100.600	101.600	103.300	105.700	104.302%	101.400	95.560	99.250	98.378%	99.650
2	04:16:44	100.300	101.500	103.200	104.800	106.305%	99.800	96.180	99.340	99.546%	99.500
3	04:16:47	100.600	102.300	103.800	104.800	106.338%	101.800	96.890	99.950	100.249%	99.400
x		100.500	101.800	103.400	105.100	105.648%	101.000	96.210	99.510	99.391%	99.510
σ		0.173	0.475	0.348	0.516	1.166%	1.045	0.664	0.380	0.945%	0.124
%RSD		0.173	0.467	0.336	0.491	1.104	1.034	0.690	0.382	0.951	0.125

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	04:16:40	103.700	52.240	104.600	98.344%	101.600	101.800	96.620	τ 105.108%	5.049	τ 101.400
2	04:16:44	103.500	52.340	104.200	99.003%	102.700	101.800	98.230	τ 106.008%	5.109	τ 102.200
3	04:16:47	103.900	52.020	104.600	100.136%	102.200	102.000	96.740	τ 107.318%	4.988	τ 100.500
x		103.700	52.200	104.500	99.161%	102.200	101.800	97.200	τ 106.145%	5.049	τ 101.400
σ		0.202	0.165	0.190	0.906%	0.548	0.109	0.897	τ 1.111%	0.061	τ 0.884
%RSD		0.195	0.317	0.182	0.914	0.536	0.107	0.922	τ 1.047	1.203	τ 0.872

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	04:16:40	τ 101.200	τ 101.031%	τ 100.400
2	04:16:44	τ 101.500	τ 102.198%	τ 100.700
3	04:16:47	τ 100.400	τ 103.611%	τ 99.330
x		τ 101.000	τ 102.280%	τ 100.100
σ		τ 0.555	τ 1.292%	τ 0.710
%RSD		τ 0.549	τ 1.263	τ 0.709

39996_3361_CCB9 10/9/2012 4:22:10 AM

User Pre-dilution: 1.000

Run	Time	7Li	9Be	10B	23Na	25Mg	27Al	28Si	31P	34S	35Cl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	04:22:14	0.059	0.076	-0.170	5.020	3.953	3.707	4.175	-8.913	185.700	↹2089000.000
2	04:22:18	0.053	0.029	-0.063	5.322	5.333	5.222	5.635	0.938	155.800	↹2094000.000
3	04:22:22	0.062	0.057	-0.041	7.108	5.722	4.944	5.255	6.597	151.300	↹2128000.000
x		0.058	0.054	-0.091	5.817	5.003	4.624	5.022	-0.459	164.300	↹2104000.000
σ		0.005	0.024	0.069	1.128	0.929	0.807	0.758	7.849	18.680	↹21070.000
%RSD		8.718	44.370	75.450	19.390	18.570	17.440	15.090	1709.000	11.370	↹1.001

Run	Time	39K	43Ca	45Sc-KED	45Sc-CCT	47Ti	51V	52Cr	53Cl O	54Fe	55Mn
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	04:22:14	-30.800	7.103	101.797%	111.241%	0.126	-0.029	0.019	30.110	4.440	0.117
2	04:22:18	-39.960	17.470	104.059%	111.388%	0.220	0.147	0.100	29.670	8.222	0.210
3	04:22:22	-40.410	36.280	103.491%	111.338%	0.323	0.125	0.068	29.480	6.835	0.175
x		-37.060	20.280	103.116%	111.322%	0.223	0.081	0.062	29.750	6.499	0.167
σ		5.424	14.790	1.177%	0.075%	0.099	0.096	0.041	0.325	1.913	0.047
%RSD		14.640	72.900	1.141	0.067	44.310	117.900	65.400	1.093	29.440	28.220

Run	Time	59Co	60Ni	63Cu	66Zn	72Ge	75As	78Se	88Sr	89Y	90Zr
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	04:22:14	0.093	0.094	0.103	0.007	104.201%	0.185	-0.210	0.083	99.087%	0.086
2	04:22:18	0.149	0.162	0.176	0.132	104.933%	0.254	-0.186	0.172	100.083%	0.114
3	04:22:22	0.131	0.171	0.145	0.102	104.158%	0.168	-0.176	0.134	100.961%	0.095
x		0.124	0.142	0.141	0.080	104.431%	0.202	-0.191	0.130	100.044%	0.098
σ		0.029	0.042	0.037	0.066	0.436%	0.046	0.018	0.045	0.938%	0.014
%RSD		22.990	29.410	26.090	81.560	0.417	22.630	9.258	34.530	0.937	14.520

Run	Time	95Mo	107Ag	111Cd	115In	118Sn	121Sb	137Ba	159Tb	201Hg	205Tl
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
1	04:22:14	0.137	0.038	0.087	97.976%	0.068	0.079	0.082	↹104.909%	0.027	0.189
2	04:22:18	0.178	0.075	0.145	99.117%	0.138	0.153	0.147	↹106.302%	0.018	0.245
3	04:22:22	0.161	0.069	0.134	98.697%	0.148	0.150	0.140	↹105.962%	0.023	0.205
x		0.159	0.061	0.122	98.597%	0.118	0.128	0.123	↹105.724%	0.022	0.213
σ		0.021	0.020	0.031	0.577%	0.044	0.042	0.036	↹0.726%	0.004	0.029
%RSD		13.060	33.120	25.470	0.585	37.120	32.610	28.810	↹0.687	19.640	13.550

Run	Time	208Pb	209Bi	238U
		ppb	ppb	ppb
1	04:22:14	0.085	↹102.741%	0.078
2	04:22:18	0.151	↹103.492%	0.144
3	04:22:22	0.129	↹104.662%	0.121
x		0.122	↹103.632%	0.114
σ		0.034	↹0.968%	0.034
%RSD		27.940	↹0.934	29.410

Prep Log Report

Batch Information: MPRP 7575

Template Version: F-GB-M-035-Rev.00 (25Apr2011)

Prep Method	EPA 3050B	Analysis Method	6020	Extracted By	MMZ	Solid Matrix Lot	N/A
Extracted By Date	10/05/2012 08:00:00	Balance ID	2301449	Block ID	40HB04	Block Temp (C)	94.8
Correction Factor (C)	+0.3	Corrected Temp. (C)	95.1	Acceptance Range:	95+/-5 C	Thermometer ID	102090775
Digestion Vessel Lot	J147452-263	Metals Pipette 1	eppendorf 0.1-1.0mL 1638829	Metals Pipette 2	eppendorf 20-200uL 4443988	Metals Pipette 3	Finnpipette 50uL F87410
Batch Notes	HBN 111580	Reviewed By	DJI	Reviewed By Date	10/8/12		

Sample Information:

QC Rule	Sample Type	Lab Sample ID	Matrix	Initial Weight (g)	1:1 HNO3 (mL)	H2O2 (mL)	Conc. HCL (mL)	Final Volume (mL)	Due Date	Sample Notes	MDL / EQL	6000-SPKB (mL)	6000-SPKB2 (mL)	6000-SPKB3 (mL)
6020 T_P	BLANK	**686605**	Tissue	.5	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012		J			
6020 T_P	SBLK	**686611**	Tissue	.5	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012		J			
6020 T_P	LCS	**686606**	Tissue	.5	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012		J	39700 (1)	33986 (0)	36269 (1)
6020 T_P	SRM	**686612**	Tissue	.5	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012	34855	J			
6020 T_P	PS	**4067620001**	Tissue	0.501	39298 (10)	31609 (5)	34308 (2.5)	50	10/16/2012	P / QC4	J			
6020 T_P	MS	**686613**	Tissue	0.504	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012		J	39700 (1)	33986 (0)	36269 (1)
6020 T_P	MSD	**686614**	Tissue	0.5	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012		J	39700 (1)	33986 (0)	36269 (1)
6020 T_P	PS	**4067620002**	Tissue	0.526	39298 (10)	31609 (5)	34308 (2.5)	50	10/16/2012		J			
6020 T_P	PS	**4067620003**	Tissue	0.548	39298 (10)	31609 (5)	34308 (2.5)	50	10/16/2012		J			
6020 T_P	PS	**4067620004**	Tissue	0.51	39298 (10)	31609 (5)	34308 (2.5)	50	10/16/2012		J			
6020 T_P	PS	**4067620005**	Tissue	0.524	39298 (10)	31609 (5)	34308 (2.5)	50	10/16/2012		J			
6020 T_P	PS	**4067620006**	Tissue	0.537	39298 (10)	31609 (5)	34308 (2.5)	50	10/16/2012		J			
6020 T_P	PS	**4067620007**	Tissue	0.537	39298 (10)	31609 (5)	34308 (2.5)	50	10/16/2012		J			
6020 T_P	PS	**4067620008**	Tissue	0.525	39298 (10)	31609 (5)	34308 (2.5)	50	10/16/2012		J			
6020 T_P	PS	**4067620009**	Tissue	0.541	39298 (10)	31609 (5)	34308 (2.5)	50	10/16/2012		J			
6020 T_P	PS	**4067620010**	Tissue	0.513	39298 (10)	31609 (5)	34308 (2.5)	50	10/16/2012		J			
6020 T_P	PS	**4067365001**	Tissue	0.559	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012	QC4	J			
6020 T_P	PS	**4067365002**	Tissue	0.586	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012		J			
6020 T_P	PS	**4067365003**	Tissue	0.556	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012		J			
6020 T_P	PS	**4067365004**	Tissue	0.512	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012		J			
6020 T_P	PS	**4067365005**	Tissue	0.547	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012		J			
6020 T_P	PS	**4067365006**	Tissue	0.542	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012		J			

QC Rule	Sample Type	Lab Sample ID	Matrix	Initial Weight (g)	1:1 HNO3 (mL)	H2O2 (mL)	Conc. HCL (mL)	Final Volume (mL)	Due Date	Sample Notes	MDL / EQL	6000-SPKB (mL)	6000-SPKB2 (mL)	6000-SPKB3 (mL)
6020 T_P	PS	**4067365007**	Tissue	0.527	39298 (10)	31609 (5)	34308 (2.5)	50	10/11/2012		J			

Standard Notes:

33986: Biota Spike 2 36269: Biota Spike Silver 39700: ICPMS Biota Spike Made 05/04/2012 MMZ

Fri, 5 Oct 2012 14:33:41 -0500

SRM Std # 34855
LAB 10/11/12

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #995, DI WATER

SOLVENT

Created By:	CCR	**Volume of Standard:**	1000000 mL	**Lot ID:**	NA
Created:	04/23/2010 14:04	**Manufacturer:**	DI WATER	**Part ID:**	N/A
Expires:	01/01/2040	**Manufacturer Lot ID:**	NanoPure Water	**Standard ID:**	NanoPure H20

Notes: DI WATER

Compound Name and Concentration for Standard #995

Compound Name	Concentration	Compound Name	Concentration
Water	mg/L		

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #1256, Barium Stock Standard - Rec'd 12/20/09,

Pace Analytical®
www.pacelabs.com

STOCK STANDARD

Created By: CB
Created: 09/08/2000 15:25
Expires: 12/31/2015

Volume of Standard: 125 mL
Manufacturer: Ultra SCientific
Manufacturer Lot ID: 1209-4120-8

Lot ID: 40147
Part ID: ICP-056
Standard ID: Ba-STK

Notes: Barium Stock Standard - Rec'd 12/20/09, Open 12/29/09, DLB

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4000c/40147_COA.pdf

Compound Name and Concentration for Standard #1256

Compound Name	Concentration	Compound Name	Concentration
Barium	1000 ug/mL		

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

1209-4020-8

ULTRAgrade™ Solution
Barium ICP Standard
1000 µg/mL

Catalog Number: ICP-056
Lot Number: J01041
Job Number: J00009002
Lot Issue Date: 10/27/2008
Expiration Date: 12/31/2015

Starting Material:	Barium Nitrate
Starting Material Purity:	99.999%
Starting Material Lot No.:	NT04674
Matrix:	2% nitric acid in low TOC water (< 50 ppb)
Atomic Weight Ba:	137.36

Certified Value: 1002 ± 2 µg/mL

This Certified Reference Material (CRM) was manufactured and verified in accordance with ULTRA's ISO 9001:2000 registered quality system, and the analyte concentrations were verified by our ISO 17025 accredited laboratory. The certified value and uncertainty value, at the 95% confidence level, for each analyte determined gravimetrically.

Classical Wet Assay Method: Theoretical, based on gravimetric measurements

Confirmation by Inductively Coupled Plasma Spectroscopy (ICP / ICP-MS) vs. NIST SRM 3104a

ULTRA uses purified acids, 18 megohm double deionized water, calibrated Class A glassware & meticulously cleaned bottles in the manufacturing of ULTRAgrade standards. Balances used in the manufacturing of this standard are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001

Trace Metallic Impurities in Solution Standard in µg/mL:

*	Al	<0.005	ND	*	Ga	<0.005	ND	n	Nb			n	S		
*	Sb	<0.005	ND	n	Ge			n	Os			n	Ta		
*	As	<0.005	ND	n	Au			*	Pd	<0.005	ND	n	Te		
s	Ba			n	Hf			*	P	<0.005	ND	n	Tb		
*	Be	<0.005	ND	n	Ho			*	Pt	<0.005	ND	*	Tl	<0.005	ND
*	Bi	<0.005	ND	*	In	<0.005	ND	*	K	<0.005	ND	n	Th		
*	B	<0.005	ND	n	Ir			n	Pr			n	Tm		
*	Cd	<0.005	ND	*	Fe	<0.005	ND	n	Re			*	Sn	<0.005	ND
*	Ca	<0.005	ND	*	La	<0.005	ND	n	Rh			*	Ti	<0.005	ND
n	Ce			*	Pb	<0.005	ND	n	Rb			n	W		
n	Cs			*	Li	<0.005	ND	n	Ru			n	U		
*	Cr	<0.005	ND	n	Lu			n	Sm			*	V	<0.005	ND
*	Co	<0.005	ND	*	Mg	<0.005	ND	n	Sc			n	Yb		
*	Cu	<0.005	ND	*	Mn	<0.005	ND	*	Se	<0.005	ND	n	Y		
n	Dy			*	Hg	<0.005	ND	*	Si	<0.005	ND	*	Zn	<0.005	ND
*	Er	<0.005	ND	*	Mo	<0.005	ND	*	Ag	<0.005	ND	n	Zr		
*	Eu	<0.005	ND	n	Nd			*	Na	<0.005	ND				
*	Gd	<0.005	ND	*	Ni	<0.005	ND	*	Sr	<0.010	D				

* - element checked for
ND - not detected
i - spectral interference
D - detected
n - not checked for
s - solution standard element

100147
REC. 09/08/10 BY CB
Exp. --/--/-- By --
Open --/--/-- By --

STK #1236

Density of Solution (measured at 23.0°C ± 0.5°C): 1.007 g/mL

ACCREDITED

ISO 17025:2005
Accredited
A2LA
Cert. No. 0851.01

ISO 9001:2000
Registered
TUV USA, Inc.
Cert. No. 09-1009

250 Smith Street, North Kingstown, RI 02852 USA
401-294-9400 Fax: 401-295-2330
www.ultrasci.com

See Reverse For Additional Information

William J. Leary
Quality Assurance Manager

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #1257, Boron Stock Standard - Rec'd 5/10/10, Op

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STOCK STANDARD

Created By: CB
Created: 09/08/2000 15:28
Expires: 09/30/2015

Volume of Standard: 125 mL
Manufacturer: Ultra SCientific
Manufacturer Lot ID: J00705

Lot ID: 40149
Part ID: ICP-005
Standard ID: B-STK

Notes: Boron Stock Standard - Rec'd 5/10/10, Open 06/02/10, DMS

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4000c/40149_COA.pdf

Compound Name and Concentration for Standard #1257

Compound Name	Concentration	Compound Name	Concentration
Boron	1000 ug/mL		

5-10-10

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

0510-4020-4

ULTRAgrade™ Solution
Boron ICP Standard
1000 µg/mL

Catalog Number: ICP-005
Lot Number: J00705
Job Number: J00008574
Lot Issue Date: 07/21/2008
Expiration Date: 09/30/2015

Starting Material:	Boric Acid
Starting Material Purity:	99.999%
Starting Material Lot No.:	BH00305
Matrix:	2% ammonium hydroxide in low TOC water (< 50 ppb)
Atomic Weight B:	10.82

Certified Value: 1002 ± 2 µg/mL

This Certified Reference Material (CRM) was manufactured and verified in accordance with ULTRA's ISO 9001:2000 registered quality system, and the analyte concentrations were verified by our ISO 17025 accredited laboratory. The certified value and uncertainty value, at the 95% confidence level, for each analyte determined gravimetrically.

Classical Wet Assay Method: Theoretical, based on gravimetric measurements

Confirmation by Inductively Coupled Plasma Spectroscopy (ICP / ICP-MS) vs. NIST SRM 3107

ULTRA uses purified acids, 18 megohm double deionized water, calibrated Class A glassware & meticulously cleaned bottles in the manufacturing of ULTRAgrade standards. Balances used in the manufacturing of this standard are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001

Trace Metallic Impurities in Solution Standard in µg/mL:

*	Al	<0.005	ND	*	Ga	<0.005	ND	n	Nb			n	S		
*	Sb	<0.005	ND	n	Ge			n	Os			n	Ta		
*	As	<0.005	ND	n	Au			*	Pd	<0.005	ND	n	Te		
*	Ba	<0.005	ND	n	Hf			*	P	<0.005	ND	n	Tb		
*	Be	<0.005	ND	n	Ho			*	Pt	<0.005	ND	*	Tl	<0.005	ND
*	Bi	<0.005	ND	*	In	<0.005	ND	*	K	<0.005	ND	n	Th		
s	B			n	Ir			n	Pr			n	Tm		
*	Cd	<0.005	ND	*	Fe	<0.005	ND	n	Re			*	Sn	<0.005	ND
*	Ca	<0.005	ND	*	La	<0.005	ND	n	Rh			*	Ti	<0.005	ND
n	Ce			*	Pb	<0.005	ND	n	Rb			n	W		
n	Cs			*	Li	<0.005	ND	n	Ru			n	U		
*	Cr	<0.005	ND	n	Lu			n	Sm			*	V	<0.005	ND
*	Co	<0.005	ND	*	Mg	<0.005	ND	n	Sc			n	Yb		
*	Cu	<0.005	ND	*	Mn	<0.005	ND	*	Se	<0.005	ND	n	Y		
n	Dy			*	Hg	<0.005	ND	*	Si	<0.005	ND	*	Zn	<0.005	ND
*	Er	<0.005	ND	*	Mo	<0.005	ND	*	Ag	<0.005	ND	n	Zr		
*	Eu	<0.005	ND	n	Nd			*	Na	<0.005	ND				
*	Gd	<0.005	ND	*	Ni	<0.005	ND	*	Sr	<0.005	ND				

* - element checked for
ND - not detected
i - spectral interference
D - detected
n - not checked for
s - solution standard element

100149
REC. 09/06/10 BY CB
EXP. --/--/-- BY --
Open --/--/-- BY --

STL #1257

Density of Solution (measured at 22.0°C ± 0.5°C): 0.998 g/mL

ACCREDITED

ISO 17025 Accredited A2LA Cert. No. 0851-01

ISO 9001:2000 Registered TUV USA, Inc. Cert. No. 09-1009

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www.ultrasci.com

William J. Leary
Quality Assurance Manager

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #1270, Cerium Stock Standard - Rec'd 8/18/09, O

STOCK STANDARD

Created By: CB
Created: 09/08/2000 15:47
Expires: 05/31/2016

Volume of Standard: 125 mL
Manufacturer: Ultra SCientific
Manufacturer Lot ID: K00331

Lot ID: 40155
Part ID: ICP-058
Standard ID: Ce-STK

Notes: Cerium Stock Standard - Rec'd 8/18/09, Open 09/29/09, DMS

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4000c/40155_COA.pdf

Compound Name and Concentration for Standard #1270

Compound Name	Concentration	Compound Name	Concentration
Cerium	1000 ug/mL		

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Certificate of Analysis

0809-4020-5

ULTRAgrade™ Solution
Cerium ICP Standard
1000 µg/mL

Catalog Number: ICP-058
Lot Number: K00331
Job Number: J00009642
Lot Issue Date: 04/08/2009
Expiration Date: 05/31/2016

Starting Material:	Cerium Nitrate
Starting Material Purity:	99.995%
Starting Material Lot No.:	BH01247
Matrix:	1% nitric acid in low TOC water (< 50 ppb)
Atomic Weight Ce:	140.13

Certified Value: 1000 ± 2 µg/mL

This Certified Reference Material (CRM) was manufactured and verified in accordance with ULTRA's ISO 9001 registered quality system. The analyte concentrations were verified by our ISO 17025 accredited laboratory to be within ± 2.5%, when compared to calibration standards independently prepared using NIST SRM(s). The certified value and uncertainty value for each analyte is determined gravimetrically.

Classical Wet Assay Method: Theoretical, based on gravimetric measurements

Confirmation by Inductively Coupled Plasma Spectroscopy (ICP / ICP-MS) vs. NIST SRM 3110

ULTRA uses purified acids, 18 megohm double deionized water, calibrated Class A glassware & meticulously cleaned bottles in the manufacturing of ULTRAgrade standards. Balances used in the manufacturing of this standard are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001

Trace Metallic Impurities in Solution Standard in µg/mL:

*	Al	<0.005	ND	*	Ga	<0.005	ND	n	Nb			n	S		
*	Sb	<0.005	ND	n	Ge			n	Os			n	Ta		
*	As	<0.005	ND	n	Au			*	Pd	<0.005	ND	n	Te		
*	Ba	<0.005	ND	n	Hf			*	P	<0.005	ND	n	Tb		
*	Be	<0.005	ND	n	Ho			*	Pt	<0.005	ND	*	Tl	<0.005	ND
*	Bi	<0.005	ND	*	In	<0.005	ND	*	K	<0.005	ND	n	Th		
*	B	<0.005	ND	n	Ir			n	Pr			n	Tm		
*	Cd	<0.005	ND	*	Fe	<0.005	ND	n	Re			*	Sn	<0.005	ND
*	Ca	<0.010	D	*	La	<0.005	ND	n	Rh			*	Ti	<0.005	ND
s	Ce			*	Pb	<0.005	ND	n	Rb			n	W		
n	Cs			*	Li	<0.005	ND	n	Ru			n	U		
*	Cr	<0.005	ND	n	Lu			n	Sm			*	V	<0.005	ND
*	Co	<0.005	ND	*	Mg	<0.005	ND	n	Sc			n	Yb		
*	Cu	<0.005	ND	*	Mn	<0.005	ND	*	Se	<0.005	ND	n	Y		
n	Dy			*	Hg	<0.005	ND	*	Si	<0.005	ND	*	Zn	<0.005	ND
*	Er	<0.005	ND	*	Mo	<0.005	ND	*	Ag	<0.005	ND	n	Zr		
*	Eu	<0.005	ND	n	Nd			*	Na	<0.005	ND				
*	Gd	<0.005	ND	*	Ni	<0.005	ND	*	Sr	<0.005	ND				

* - element checked for
ND - not detected

i - spectral interference
D - detected

n - not checked for
s - solution standard element

100155
REC. 09/08/10 BY CB
Exp. __/__/__ By __
Open __/__/__ By __

SFL # 1270

Density of Solution (measured at 23.5 ± 0.5°C): 1.006 g/mL

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See Reverse For Additional Information

William J. Leary
Quality Assurance Manager

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #1285, Lead Stock Standard - Rec'd 2/26/10, Ope

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STOCK STANDARD

Created By: CB
Created: 09/08/2000 16:25
Expires: 08/31/2016

Volume of Standard: 125 mL
Manufacturer: Ultra Scientific
Manufacturer Lot ID: K00652

Lot ID: 40169
Part ID: ICP-082
Standard ID: Pb-STK

Notes: Lead Stock Standard - Rec'd 2/26/10, Open 03/31/10, MES

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4000c/40169_COA.pdf

Compound Name and Concentration for Standard #1285

Compound Name	Concentration	Compound Name	Concentration
Lead	1000 ug/mL		

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

0310-4020-1

ULTRAgrade™ Solution
Lead ICP Standard
1000 µg/mL

Catalog Number: ICP-082
Lot Number: K00652
Job Number: J00010047
Lot Issue Date: 07/05/2009
Expiration Date: 08/31/2016

Starting Material:	Lead (II) Nitrate
Starting Material Purity:	99.999%
Starting Material Lot No.:	NT02988
Matrix:	2% nitric acid in low TOC water (< 50 ppb)
Atomic Weight Pb:	207.21

Certified Value: 1001 ± 2 µg/mL

This Certified Reference Material (CRM) was manufactured and verified in accordance with ULTRA's ISO 9001 registered quality system. The analyte concentrations were verified by our ISO 17025 accredited laboratory to be within ± 2.5%, when compared to calibration standards independently prepared using NIST SRM(s). The certified value and uncertainty value for each analyte is determined gravimetrically.

Classical Wet Assay Method: Theoretical, based on gravimetric measurements

Confirmation by Inductively Coupled Plasma Spectroscopy (ICP / ICP-MS) vs. NIST SRM 3128

ULTRA uses purified acids, 18 megohm double deionized water, calibrated Class A glassware & meticulously cleaned bottles in the manufacturing of ULTRAgrade standards. Balances used in the manufacturing of this standard are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001.

Trace Metallic Impurities in Solution Standard in µg/mL:

*	Al	<0.005	ND	*	Ga	<0.005	ND	n	Nb			n	S		
*	Sb	<0.005	ND	n	Ge			n	Os			n	Ta		
*	As	<0.005	ND	n	Au			*	Pd	<0.005	ND	n	Te		
*	Ba	<0.005	ND	n	Hf			*	P	<0.005	ND	n	Tb		
*	Be	<0.005	ND	n	Ho			*	Pt	<0.005	ND	*	Tl	<0.005	ND
*	Bi	<0.005	ND	*	In	<0.005	ND	*	K	<0.005	ND	n	Th		
*	B	<0.005	ND	n	Ir			n	Pr			n	Tm		
*	Cd	<0.005	ND	*	Fe	<0.005	ND	n	Re			*	Sn	<0.005	ND
*	Ca	<0.005	D	*	La	<0.005	ND	n	Rh			*	Ti	<0.005	ND
n	Ce			s	Pb			n	Rb			n	W		
n	Cs			*	Li	<0.005	ND	n	Ru			n	U		
*	Cr	<0.005	ND	n	Lu			n	Sm			*	V	<0.005	ND
*	Co	<0.005	ND	*	Mg	<0.005	ND	n	Sc			n	Yb		
*	Cu	<0.005	D	*	Mn	<0.005	ND	*	Se	<0.005	ND	n	Y		
n	Dy			*	Hg	<0.005	ND	*	Si	<0.005	ND	*	Zn	<0.005	D
*	Er	<0.005	ND	*	Mo	<0.005	ND	*	Ag	<0.005	ND	n	Zr		
*	Eu	<0.005	ND	n	Nd			*	Na	<0.005	ND				
*	Gd	<0.005	ND	*	Ni	<0.005	ND	*	Sr	<0.005	ND				

* - element checked for
ND - not detected
i - spectral interference
D - detected
n - not checked for
s - solution standard element

100169
REC. 09/08/10 BY CB
Exp. --/--/-- By --
Open --/--/-- By --

Stk #1285

Density of Solution (measured at 22.0°C ± 0.5°C): 1.010 g/mL

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See Reverse For Additional Information

William J. Leary
Quality Assurance Manager

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #1287, Phosphorus Secondary Standard - Rec

STOCK STANDARD

Created By: CB
Created: 09/08/2000 16:31
Expires: 12/31/2015

Volume of Standard: 125 mL
Manufacturer: Ultra Scientific
Manufacturer Lot ID: J01102

Lot ID: 40171
Part ID: ICP-015
Standard ID: P-SPK

Notes: Phosphorus Secondary Standard - Rec 2/4/10, Open 04/22/10, DMS

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4000c/40171_COA.pdf

Compound Name and Concentration for Standard #1287

Compound Name	Concentration	Compound Name	Concentration
Phosphorus	1000 ug/mL		

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

Rec. 2/4/10

0210-4020-3

ULTRAgrade™ Solution
Phosphorus ICP Standard
1000 µg/mL

Catalog Number: ICP-015
Lot Number: J01102
Job Number: J00008998
Lot Issue Date: 11/17/2008
Expiration Date: 12/31/2015

Starting Material:	Ammonium Dihydrogen Phosphate
Starting Material Purity:	99.999%
Starting Material Lot No.:	BH00744
Matrix:	2% nitric acid in low TOC water (< 50 ppb)
Atomic Weight P:	30.98

Certified Value: 1001 ± 2 µg/mL

This Certified Reference Material (CRM) was manufactured and verified in accordance with ULTRA's ISO 9001:2000 registered quality system, and the analyte concentrations were verified by our ISO 17025 accredited laboratory. The certified value and uncertainty value, at the 95% confidence level, for each analyte determined gravimetrically.

Classical Wet Assay Method: Theoretical, based on gravimetric measurements

Confirmation by Inductively Coupled Plasma Spectroscopy (ICP / ICP-MS) vs. NIST SRM 3139a

ULTRA uses purified acids, 18 megohm double deionized water, calibrated Class A glassware & meticulously cleaned bottles in the manufacturing of ULTRAgrade standards. Balances used in the manufacturing of this standard are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001

Trace Metallic Impurities in Solution Standard in µg/mL:

*	Al	<0.005	D	*	Ga	<0.005	ND	n	Nb			n	S		
*	Sb	<0.005	ND	n	Ge			n	Os			n	Ta		
*	As	<0.005	ND	n	Au			*	Pd	<0.005	ND	n	Te		
*	Ba	<0.005	D	n	Hf			s	P			n	Tb		
*	Be	<0.005	ND	n	Ho			*	Pt	<0.005	ND	*	Ti	<0.005	ND
*	Bi	<0.005	ND	*	In	<0.005	ND	*	K	<0.005	ND	n	Th		
*	B	<0.005	ND	n	Ir			n	Pr			n	Tm		
*	Cd	<0.005	ND	*	Fe	<0.005	D	n	Re			*	Sn	<0.005	ND
*	Ca	<0.005	D	*	La	<0.005	ND	n	Rh			*	Ti	<0.005	D
n	Ce			*	Pb	<0.005	ND	n	Rb			n	W		
n	Cs			*	Li	<0.005	ND	n	Ru			n	U		
*	Cr	<0.010	D	n	Lu			n	Sm			*	V	<0.005	ND
*	Co	<0.005	ND	*	Mg	<0.005	D	n	Sc			n	Yb		
*	Cu	<0.005	D	*	Mn	<0.005	ND	*	Se	<0.005	ND	n	Y		
n	Dy			*	Hg	<0.005	ND	*	Si	<0.005	D	*	Zn	<0.005	ND
*	Er	<0.005	ND	*	Mo	<0.005	ND	*	Ag	<0.005	ND	n	Zr		
*	Eu	<0.005	ND	n	Nd			*	Na	<0.005	D				
*	Gd	<0.005	ND	*	Ni	<0.005	ND	*	Sr	<0.005	ND				

* - element checked for
ND - not detected

i - spectral interference
D - detected

n - not checked for
s - solution standard element

100171
REC. 03/08/10 BY CB
Exp. __/__/__ By __
Open __/__/__ By __

Density of Solution (measured at 22.5°C ± 0.5°C): 1.014 g/mL

STK #1287

ACCREDITED

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Accredited
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ISO 9001:2000
Registered
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Cert. No. 06-1004

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See Reverse For Additional Information

William J. Leary
Quality Assurance Manager

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #1295, Silicon Secondary Stock Standard - Rec

STOCK STANDARD

Created By: CB
Created: 09/08/2000 16:46
Expires: 07/31/2016

Volume of Standard: 125 mL
Manufacturer: Ultra Scientific
Manufacturer Lot ID: K00574

Lot ID: 40178
Part ID: ICP-014
Standard ID: Si-SPK

Notes: Silicon Secondary Stock Standard - Rec 02/04/10, Open 04/22/10, DMS

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4000c/40178_COA.pdf

Compound Name and Concentration for Standard #1295

Compound Name	Concentration	Compound Name	Concentration
Silicon	1000 ug/mL		

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

Rec. 2/4/10

0210-4020-4

ULTRAgrade™ Solution
Silicon ICP Standard
1000 µg/mL

Catalog Number: ICP-014
Lot Number: K00574
Job Number: J00009811
Lot Issue Date: 06/15/2009
Expiration Date: 07/31/2016

Starting Material:	Ammonium Hexafluorosilicate
Starting Material Purity:	99.999%
Starting Material Lot No.:	BH00960
Matrix:	2% nitric acid, with trace HF, in low TOC water (< 50 ppb)
Atomic Weight Si:	28.09

Certified Value: 1001 ± 2 µg/mL

This Certified Reference Material (CRM) was manufactured and verified in accordance with ULTRA's ISO 9001 registered quality system. The analyte concentrations were verified by our ISO 17025 accredited laboratory to be within ± 2.5%, when compared to calibration standards independently prepared using NIST SRM(s). The certified value and uncertainty value for each analyte is determined gravimetrically.

Classical Wet Assay Method: Theoretical, based on gravimetric measurements

Confirmation by Inductively Coupled Plasma Spectroscopy (ICP / ICP-MS) vs. NIST SRM 3150

ULTRA uses purified acids, 18 megohm double deionized water, calibrated Class A glassware & meticulously cleaned bottles in the manufacturing of ULTRAgrade standards. Balances used in the manufacturing of this standard are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001.

Trace Metallic Impurities in Solution Standard in µg/mL:

*	Al	<0.005	D	*	Ga	<0.005	ND	n	Nb			n	S		
*	Sb	<0.005	ND	n	Ge			n	Os			n	Ta		
*	As	<0.005	ND	n	Au			*	Pd	<0.005	ND	n	Te		
*	Ba	<0.005	ND	n	Hf			*	P	<0.005	ND	n	Tb		
*	Be	<0.005	ND	n	Ho			*	Pt	<0.005	ND	*	Tl	<0.005	ND
*	Bi	<0.005	ND	*	In	<0.005	ND	*	K	<0.005	ND	n	Th		
*	B	<0.005	ND	n	Ir			n	Pr			n	Tm		
*	Cd	<0.005	ND	*	Fe	<0.005	D	n	Re			*	Sn	<0.005	ND
*	Ca	<0.005	D	*	La	<0.005	ND	n	Rh			*	Ti	<0.005	D
n	Ce			*	Pb	<0.005	ND	n	Rb			n	W		
n	Cs			*	Li	<0.005	ND	n	Ru			n	U		
*	Cr	<0.005	ND	n	Lu			n	Sm			*	V	<0.005	ND
*	Co	<0.005	ND	*	Mg	<0.005	D	n	Sc			n	Yb		
*	Cu	<0.005	ND	*	Mn	<0.005	ND	*	Se	<0.005	ND	n	Y		
n	Dy			*	Hg	<0.005	ND	s	Si			*	Zn	<0.005	ND
*	Er	<0.005	ND	*	Mo	<0.005	ND	*	Ag	<0.005	ND	n	Zr		
*	Eu	<0.005	ND	n	Nd			*	Na	<0.005	ND				
*	Gd	<0.005	ND	*	Ni	<0.005	ND	*	Sr	<0.005	ND				

* - element checked for
ND - not detected

i - spectral interference
D - detected

n - not checked for
s - solution standard element

100178
REC. 09/08/10 BY CB
Exp. __/__/__ By __
Open __/__/__ By __

SHL #1295

Density of Solution (measured at 21.0°C ± 0.5°C): 1.010 g/mL

ACCREDITED

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ISO 9001:2000
Registered
TUV USA, Inc.
Cert. No. 06-1004

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See Reverse For Additional Information

William J. Leary
Quality Assurance Manager

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #4891, Nickel Stock Standard - Rec 09/10/10, Op

STOCK STANDARD

Created By: CCR
Created: 03/08/2011 12:59
Expires: 09/30/2016

Volume of Standard: 125 mL
Manufacturer: ULTRA SCIENTIFIC
Manufacturer Lot ID: K00853

Lot ID: 40780
Part ID: ICP-028
Standard ID: Ni-STK

Notes: Nickel Stock Standard - Rec 09/10/10, Open 11/1/10, DMS

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4000c/40780_COA.pdf

Compound Name and Concentration for Standard #4891

Compound Name	Concentration	Compound Name	Concentration
Nickel	1000 ug/mL		

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ULTRAgrade™ Solution
Nickel ICP Standard
1000 µg/mL

Rec. 9/10/10

0910-4020-10

Catalog Number: ICP-028
Lot Number: K00853
Job Number: J00010203
Lot Issue Date: 08/17/2009
Expiration Date: 09/30/2016

40780
REC. 03/08/11 BY CCI
Exp. __/__/__ By __
Open __/__/__ By __

Starting Material:	Nickel (II) Nitrate Hexahydrate
Starting Material Purity:	99.999%
Starting Material Lot No.:	BH01230
Matrix:	2% nitric acid in low TOC water (< 50 ppb)
Atomic Weight Ni:	58.71

Certified Value: 1001 ± 2 µg/mL

This Certified Reference Material (CRM) was manufactured and verified in accordance with ULTRA's ISO 9001 registered quality system. The analyte concentrations were verified by our ISO 17025 accredited laboratory to be within ± 2.5%, when compared to calibration standards independently prepared using NIST SRM(s). The certified value and uncertainty value for each analyte is determined gravimetrically.

Classical Wet Assay Method: Theoretical, based on gravimetric measurements

Confirmation by Inductively Coupled Plasma Spectroscopy (ICP / ICP-MS) vs. NIST SRM 3136

ULTRA uses purified acids, 18 megohm double deionized water, calibrated Class A glassware & meticulously cleaned bottles in the manufacturing of ULTRAgrade standards. Balances used in the manufacturing of this standard are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001.

Trace Metallic Impurities in Solution Standard in µg/mL:

*	Al	<0.005	ND	*	Ga	<0.005	ND	n	Nb			n	S				
*	Sb	<0.005	ND	n	Ge			n	Os			n	Ta				
*	As	<0.005	ND	n	Au			*	Pd	<0.005	ND	n	Te				
*	Ba	<0.005	ND	n	Hf			*	P	<0.005	ND	n	Tb				
*	Be	<0.005	ND	n	Ho			*	Pt	<0.005	ND	*	Tl	<0.005	ND		
*	Bi	<0.005	ND	*	In	<0.005	ND	*	K	<0.005	ND	n	Th				
*	B	<0.005	ND	n	Ir			n	Pr			n	Tm				
*	Cd	<0.005	ND	*	Fe	<0.005	D	n	Re			*	Sn	<0.005	ND		
*	Ca	<0.005	ND	*	La	<0.005	ND	n	Rh			*	Ti	<0.005	ND		
n	Ce			*	Pb	<0.005	ND	n	Rb			n	W				
n	Cs			*	Li	<0.005	ND	n	Ru			n	U				
*	Cr	<0.005	ND	n	Lu			n	Sm			*	V	<0.005	ND		
*	Co	<0.005	ND	*	Mg	<0.005	D	n	Sc			n	Yb				
*	Cu	<0.005	ND	*	Mn	<0.005	ND	*	Se	<0.005	ND	n	Y				
n	Dy			*	Hg	<0.005	ND	*	Si	<0.005	ND	*	Zn	<0.005	ND		
*	Er	<0.005	ND	*	Mo	<0.005	ND	*	Ag	<0.005	ND	n	Zr				
*	Eu	<0.005	ND	n	Nd			*	Na	<0.005	ND						
*	Gd	<0.005	ND	s	Ni			*	Sr	<0.005	ND						

* - element checked for
ND - not detected

i - spectral interference
D - detected

n - not checked for
s - solution standard element

Density of Solution (measured at 23.5°C ± 0.5°C): 1.014 g/mL

ACCREDITED

ISO 17025 Accredited A2LA Cert. No. 0851-01

ISO 9001:2000 Registered TUV USA, Inc. Cert. No. 09-1009

250 Smith Street, North Kingstown, RI 02852 USA
401-294-9400 Fax: 295-2330
www.ultrasci.com

William J. Leary
Quality Assurance Manager

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #4892, Beryllium Stock Standard - Rec 09/10/10,

Pace Analytical®
www.pacelabs.com

STOCK STANDARD

Created By: CCR
Created: 03/08/2011 13:02
Expires: 12/31/2015

Volume of Standard: 125 mL
Manufacturer: ULTRA SCIENTIFIC
Manufacturer Lot ID: J01074

Lot ID: 40781
Part ID: ICP-004
Standard ID: Be-STK

Notes: Beryllium Stock Standard - Rec 09/10/10, Open 11/1/10, DMS

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4000c/40781_COA.pdf

Compound Name and Concentration for Standard #4892

Compound Name	Concentration	Compound Name	Concentration
Beryllium	1000 ug/mL		

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ULTRAgrade™ Solution
Beryllium ICP Standard
1000 µg/mL

Rec. 9/10/10
0910-4020-7

Catalog Number: ICP-004
Lot Number: J01074
Job Number: J00008997
Lot Issue Date: 10/31/2008
Expiration Date: 12/31/2015

Starting Material:	Beryllium Acetate
Starting Material Purity:	99.999%
Starting Material Lot No.:	BH00331
Matrix:	2% nitric acid in low TOC water (< 50 ppb)
Atomic Weight: Be:	9.01

40781
REC.01/08/11 BY CC
Exp. __/__/__ By
Open __/__/__ By

Certified Value: 1001 ± 2 µg/mL
This Certified Reference Material (CRM) was manufactured and verified in accordance with ULTRA's ISO 9001:2000 registered quality system, and the analyte concentrations were verified by our ISO 17025 accredited laboratory. The certified value and uncertainty value, at the 95% confidence level, for each analyte determined gravimetrically.

Classical Wet Assay Method: Theoretical, based on gravimetric measurements

Confirmation by Inductively Coupled Plasma Spectroscopy (ICP / ICP-MS) vs. NIST SRM 3105a
ULTRA uses purified acids, 18 megohm double-deionized water, calibrated Class A glassware & meticulously cleaned bottles in the manufacturing of ULTRAgrade standards. Balances used in the manufacturing of this standard are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001

Trace Metallic Impurities in Solution Standard in µg/mL:

*	Al	<0.005	D	*	Ga	<0.005	ND	n	Nb			n	S		
*	Sb	<0.005	ND	n	Ge			n	Os			n	Ta		
*	As	<0.005	ND	n	Au			*	Pd	<0.005	ND	n	Te		
*	Ba	<0.005	ND	n	Hf			*	P	<0.005	ND	n	Tb		
s	Be			n	Ho			*	Pt	<0.005	ND	*	Tl	<0.005	ND
*	Bi	<0.005	ND	*	In	<0.005	ND	*	K	<0.005	ND	n	Th		
*	B	<0.005	ND	n	Ir			n	Pr			n	Tm		
*	Cd	<0.005	ND	*	Fe	<0.005	D	n	Re			*	Sn	<0.005	ND
*	Ca	<0.005	ND	*	La	<0.005	ND	n	Rh			*	Ti	<0.005	ND
n	Ce			*	Pb	<0.005	ND	n	Rb			n	W		
n	Cs			*	Li	<0.005	ND	n	Ru			n	U		
*	Cr	<0.005	ND	n	Lu			n	Sm			*	V	<0.005	ND
*	Co	<0.005	ND	*	Mg	<0.005	ND	n	Sc			n	Yb		
*	Cu	<0.005	ND	*	Mn	<0.005	ND	*	Se	<0.005	ND	n	Y		
n	Dy			*	Hg	<0.005	ND	*	Si	<0.005	D	*	Zn	<0.005	ND
*	Er	<0.005	ND	*	Mo	<0.005	ND	*	Ag	<0.005	ND	n	Zr		
*	Eu	<0.005	ND	n	Nd			*	Na	<0.005	ND				
*	Gd	<0.005	ND	*	Ni	<0.005	D	*	Sr	<0.005	ND				

* - element checked for
ND - not detected
i - spectral interference
D - detected
n - not checked for
s - solution standard element

Density of Solution (measured at 22.5 °C ± 0.5°C): 1.008 g/mL

ACCREDITED
ISO 17025 Accredited A2LA Cert. No. 0851-01
ISO 9001:2000 Registered TÜV USA, Inc. Cert. No. 09-1009

250 Smith Street, North Kingstown, RI 02852 USA
401-294-9400 Fax: 295-2330
www.ultrasci.com

William J. Leary
Quality Assurance Manager

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #5183, Cobalt Stock Standard, Rec

STOCK STANDARD

Created By: CCR
Created: 03/29/2011 10:19
Expires: 06/30/2016

Volume of Standard: 125 mL
Manufacturer: ULTRA SCIENTIFIC
Manufacturer Lot ID: K00433

Lot ID: 401017
Part ID: ICP-027
Standard ID: Co-STK

Notes: Cobalt Stock Standard, Rec 09/10/10,Open 11/01/10 DMS

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4001c/401017_COA.pdf

Compound Name and Concentration for Standard #5183

Compound Name	Concentration	Compound Name	Concentration
Cobalt	1000 ug/mL		

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ULTRAgrade™ Solution
Cobalt ICP Standard
1000 µg/mL

Rec. 9/10/10
0910-4020-8

Catalog Number: ICP-027
Lot Number: K00433
Job Number: J00009795
Lot Issue Date: 05/06/2009
Expiration Date: 06/30/2016

401017
REC. 03/29/11 BY CC
Exp. __/__/__ By --
Open __/__/__ By --

Starting Material:	Cobalt Nitrate Hexahydrate
Starting Material Purity:	99.999%
Starting Material Lot No.:	BH01158
Matrix:	2% nitric acid in low TOC water (< 50 ppb)
Atomic Weight Co:	58.94

Certified Value: 1000 ± 2 µg/mL

This Certified Reference Material (CRM) was manufactured and verified in accordance with ULTRA's ISO 9001 registered quality system. The analyte concentrations were verified by our ISO 17025 accredited laboratory to be within ± 2.5%, when compared to calibration standards independently prepared using NIST SRM(s). The certified value and uncertainty value for each analyte is determined gravimetrically.

Classical Wet Assay Method: Theoretical, based on gravimetric measurements

Confirmation by Inductively Coupled Plasma Spectroscopy (ICP / ICP-MS) vs. NIST SRM 3113

ULTRA uses purified acids, 18 megohm double deionized water, calibrated Class A glassware & meticulously cleaned bottles in the manufacturing of ULTRAgrade standards. Balances used in the manufacturing of this standard are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001.

Trace Metallic Impurities in Solution Standard in µg/mL:

*	Al	<0.005	ND	*	Ga	<0.005	ND	n	Nb			n	S		
*	Sb	<0.005	ND	n	Ge			n	Os			n	Ta		
*	As	<0.005	ND	n	Au			*	Pd	<0.005	ND	n	Te		
*	Ba	<0.005	ND	n	Hf			*	P	<0.005	ND	n	Tb		
*	Be	<0.005	ND	n	Ho			*	Pt	<0.005	ND	*	Tl	<0.005	ND
*	Bi	<0.005	ND	*	In	<0.005	ND	*	K	<0.005	ND	n	Th		
*	B	<0.005	ND	n	Ir			n	Pr			n	Tm		
*	Cd	<0.005	ND	*	Fe	<0.005	D	n	Re			*	Sn	<0.005	ND
*	Ca	<0.005	ND	*	La	<0.005	ND	n	Rh			*	Ti	<0.005	ND
n	Ce			*	Pb	<0.005	ND	n	Rb			n	W		
n	Cs			*	Li	<0.005	ND	n	Ru			n	U		
*	Cr	<0.005	ND	n	Lu			n	Sm			*	V	<0.005	ND
s	Co			*	Mg	<0.005	ND	n	Sc			n	Yb		
*	Cu	<0.005	ND	*	Mn	<0.005	ND	*	Se	<0.005	ND	n	Y		
n	Dy			*	Hg	<0.005	ND	*	Si	<0.005	ND	*	Zn	<0.005	ND
*	Er	<0.005	ND	*	Mo	<0.005	ND	*	Ag	<0.005	ND	n	Zr		
*	Eu	<0.005	ND	n	Nd			*	Na	<0.005	ND				
*	Gd	<0.005	ND	*	Ni	<0.005	D	*	Sr	<0.005	ND				

* - element checked for
ND - not detected
i - spectral interference
D - detected
n - not checked for
s - solution standard element

Density of Solution (measured at 22.5°C ± 0.5°C): 1.023 g/mL

ACCREDITED

ISO 17025 Accredited A2LA Cert. No. 0851-01
ISO 9001:2000 Registered TÜV USA, Inc. Cert. No. 09-1009

250 Smith Street, North Kingstown, RI 02852 USA
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www.ultrasci.com

William J. Leary
Quality Assurance Manager

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #5659, Phosphorus Secondary Standard - Rec

STOCK STANDARD

Created By: CCR
Created: 04/21/2011 16:13
Expires: 10/31/2017

Volume of Standard: 125 mL
Manufacturer: Ultra Scientific
Manufacturer Lot ID: L01132

Lot ID: 401164
Part ID: ICP-115
Standard ID: P-SPK

Notes: Phosphorus Secondary Standard - Rec 03/08/11, Open

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4001c/401164_COA.pdf

Compound Name and Concentration for Standard #5659

Compound Name	Concentration	Compound Name	Concentration
Phosphorus	10000 ug/mL		

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ULTRAgrade™ Solution
Phosphorus ICP Standard
10000 µg/mL

401164

REC.04/21/11 BY CCF
Exp. __/__/__ By --
Open __/__/__ By --

Catalog Number: ICP-115 Rec. 3/8/11
Lot Number: L01132 0311-4020-5
Job Number: J00012124
Lot Issue Date: 09/29/2010
Expiration Date: 10/31/2017

Starting Material: Ammonium Dihydrogen Phosphate
Starting Material Purity: 99.999%
Starting Material Lot No.: BH01383
Matrix: 2% nitric acid in low TOC water (< 50 ppb)
Atomic Weight P: 30.98

Certified Value: 10002 ± 20 µg/mL

This Certified Reference Material (CRM) was manufactured and verified in accordance with ULTRA's ISO 9001 registered quality system. The analyte concentrations were verified by our ISO 17025 accredited laboratory to be within ± 2.5%, when compared to calibration standards independently prepared using NIST SRM(s). The certified value and uncertainty value for each analyte is determined gravimetrically.

Classical Wet Assay Method: Theoretical, based on gravimetric measurements

Confirmation by Inductively Coupled Plasma Spectroscopy (ICP / ICP-MS) vs. NIST SRM 3139a

ULTRA uses purified acids, 18 megohm double deionized water, calibrated Class A glassware & meticulously cleaned bottles in the manufacturing of ULTRAgrade standards. Balances used in the manufacturing of this standard are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001.

Trace Metallic Impurities in Solution Standard in µg/mL:

*	Al	<0.005	ND	*	Ga	<0.005	ND	n	Nb			n	S		
*	Sb	<0.005	ND	n	Ge			n	Os			n	Ta		
*	As	<0.005	ND	n	Au			*	Pd	<0.005	ND	n	Te		
*	Ba	<0.005	ND	n	Hf			s	P			n	Tb		
*	Be	<0.005	ND	n	Ho			*	Pt	<0.005	ND	*	Tl	<0.005	ND
*	Bi	<0.005	ND	*	In	<0.005	ND	*	K	<0.040	D	n	Th		
*	B	<0.005	ND	n	Ir			n	Pr			n	Tm		
*	Cd	<0.005	ND	*	Fe	<0.005	ND	n	Re			*	Sn	<0.005	ND
*	Ca	<0.010	D	*	La	<0.005	ND	n	Rh			*	Ti	<0.005	ND
n	Ce			*	Pb	<0.005	ND	n	Rb			n	W		
n	Cs			*	Li	<0.005	ND	n	Ru			n	U		
*	Cr	<0.005	ND	n	Lu			n	Sm			*	V	<0.005	ND
*	Co	<0.005	ND	*	Mg	<0.005	ND	n	Sc			n	Yb		
*	Cu	<0.005	ND	*	Mn	<0.005	ND	*	Se	<0.005	ND	n	Y		
n	Dy			*	Hg	<0.005	ND	*	Si	<0.005	ND	*	Zn	<0.005	ND
*	Er	<0.005	ND	*	Mo	<0.005	ND	*	Ag	<0.005	ND	n	Zr		
*	Eu	<0.005	ND	n	Nd			*	Na	<0.005	ND				
*	Gd	<0.005	ND	*	Ni	<0.005	ND	*	Sr	<0.005	ND				

* - element checked for
ND - not detected
i - spectral interference
D - detected
n - not checked for
s - solution standard element

Density of Solution (measured at 22°C ± 0.5°C): 1.027 g/mL

ACCREDITED

ISO 17025:2005 Accredited A2LA Cert. No. 0851-01

ISO 9001:2008 Registered TUV USA, Inc. Cert. No. 09-1009

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www.ultrasci.com

William J. Leary
Quality Assurance Manager

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #7079, Phosphorus Primary Standard - Rec

STOCK STANDARD

Created By: DS1 **Volume of Standard:** 100 mL **Lot ID:** 401231

Created: 05/12/2011 13:06 **Manufacturer:** Fluka Analytical **Part ID:** 356433

Expires: 08/01/2013 **Manufacturer Lot ID:** MKBF1680 **Standard ID:** P-STK

Notes: Phosphorus Primary Standard - Rec 5/12/11, Open 5/12/11, DMS

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4001c/401231_COA.PDF

Compound Name and Concentration for Standard #7079

Compound Name	Concentration	Compound Name	Concentration
Phosphorus	10000 ug/mL		

Certificate of Analysis

401231
REC. 05/12/11 BY DS:
EXP. 8/1/13 BY

SIGMA-ALDRICH

Product Name	Phosphorus ICP/DCP standard solution, 10,000 µg/mL P in H_2O (Exact P concentration on label)
Product Number	356433
Product Brand	FLUKA

TEST	SPECIFICATION	LOT MKBF1680 RESULTS
Appearance (Clarity)	Clear	Clear
Appearance (Color)	Colorless	Colorless
Appearance (Form)	Liquid	Liquid
Phosphorus (P)	9800 - 10200 ppm by Titration with NaOH	10104 ppm
Trace Metal Analysis	≤10.0 ppm	< 10.0 ppm
Aluminum (Al)	ppm	< 0.1 ppm
Barium (Ba)	ppm	< 0.1 ppm
Calcium (Ca)	ppm	0.1 ppm
Chromium (Cr)	ppm	< 0.1 ppm
Copper (Cu)	ppm	< 0.1 ppm
Iron (Fe)	ppm	< 0.1 ppm
Magnesium (Mg)	ppm	< 0.1 ppm
Sodium (Na)	ppm	0.1 ppm
Antimony (Sb)	ppm	0.2 ppm
Titanium (Ti)	ppm	< 0.1 ppm
Zinc (Zn)	ppm	< 0.1 ppm
Expiration Date Period	3 Years	
Specification Date:		JUN 2010
Date of QC Release:		AUG 2010
Expiration Date:		AUG 2013
Print Date:		AUG 19 2010

Barbara Rajzer, Supervisor
Quality Control
Milwaukee, Wisconsin USA

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #18040, Uranium Secondary Standard - Rec

Pace Analytical®
www.pacelabs.com

STOCK STANDARD

Created By: LMS
Created: 10/27/2011 09:17
Expires: 04/21/2013

Volume of Standard: 125 mL
Manufacturer: High Purity
Manufacturer Lot ID: 1120109

Lot ID: 401617
Part ID: 100064-1
Standard ID: U-SPK

Notes: Uranium Secondary Standard - Rec 10/26/2011 LMS

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4001c/401617_COA.PDF

Compound Name and Concentration for Standard #18040

Compound Name	Concentration	Compound Name	Concentration
Uranium	1000 ug/mL		

HIGH-PURITY STANDARDS
www.highpuritystandards.com

P.O. Box 41727
Charleston, SC 29423
Phone (843) 767-7900
Fax (843) 767-7906

Certificate of Analysis

401617
REC. 10/27/11 BY LMI
Exp. --/--/-- By --
Open / / By

Product Description:

Name:	Uranium	Source Material:	Uranium Oxide
Part Number:	**100064-1**	Material Purity:	99.964%
Lot Number:	**1120109**	Matrix:	2% (v/v) HNO_3

Certified Value: 1000 µg/mL ± 3 µg/mL

The Certified value is based on gravimetric and volumetric preparation, and confirmed against SRM 3164 (lot number 080521) by inductively coupled plasma optical emission spectrometry (ICP-OES) using an internal laboratory-developed method. The uncertainty in the certified value is calculated for a 95% confidence interval and coverage factor *k* is about 2.

Density: 1.008 g/mL ± 0.002 g/mL @ 23.1°C

Uncertified Values:

Trace Metal Impurity Scan: The data reported are based upon a scan of this specific lot at 1000 µg/mL via ICP analysis. The values are reported in µg/L.

Ag	<	0.02	Cu	<	0.1	Li	<	9	Rb	<	0.02	Th	<	0.02
Al	<	1	Dy	<	0.02	Lu	<	0.02	Re	<	0.02	Ti	<	0.02
As	<	0.3	Er	<	0.02	Mg	<	0.5	Rh	<	0.02	Tl	<	0.02
Au	<	0.02	Eu	<	0.02	Mn	<	0.1	Ru	<	0.02	Tm	<	0.02
B	<	5	Fe	<	1	Mo	<	0.02	Sb	<	0.02	U		M
Ba	<	0.02	Ga	<	0.02	Na	<	3	Sc	<	0.02	V	<	0.05
Be	<	0.02	Gd	<	0.02	Nb	<	0.02	Se	<	0.1	W	<	0.02
Bi	<	0.02	Ge	<	0.02	Nd	<	0.02	Si	<	10	Y	<	2
Ca	<	0.5	Hf	<	0.02	Ni	<	0.02	Sm	<	0.02	Yb	<	0.02
Cd	<	0.02	Ho	<	0.02	Os	<	0.02	Sn	<	1	Zn	<	2
Ce	<	0.02	In	<	0.02	Pb	<	0.5	Sr	<	0.02	Zr	<	0.02
Co	<	0.05	Ir	<	0.02	Pd	<	0.02	Ta	<	0.02			
Cr	<	0.1	K	<	1	Pr	<	0.02	Tb	<	0.02			
Cs	<	0.02	La	<	0.02	Pt	<	0.02	Te	<	0.02			

Preparation Information:

The standard solution is prepared using high purity materials and assayed by analytical methods for conformity prior to use. This standard was prepared using the methods developed at NIST for SRM Spectrometric Standard Solutions under appropriate laboratory conditions.

Sub-boiling distilled high-purity acid has been used to place the materials in solution and to stabilize the standard. The matrix is as noted above in 18 megaohm deionized water.

Stability of this product is based upon rigorous short term and long term testing of the solution for the certified value. This testing includes, but is not limited to, the effect of temperature and packaging on the product.

Intended Use:

This Certified Reference Material (CRM) is intended for use as a calibration standard for the quantitative determination of uranium, calibration of instruments such as ICPOES, ICPMS, AAS and XRF, and validation of analytical methods. It also can be used in EPA, ASTM and other methods.

401617
REC.10/27/11 BY LMI
Exp. __/__/__ By __
Open / / Ru

Traceability Information:

The traceability of this standard is maintained through an unbroken chain of comparisons to appropriate standards with suitable procedure and measurement uncertainties. The maintenance of the base and derived units of International System of Units (SI) with traceability of measurement results (contemporary metrology) to SI ensures their comparability over time as follows.

a. **Standard Weight and Analytical Balance**
The standard weights (NBS weights Inventory No 20231A) are calibrated every two years by South Carolina Metrology Laboratory that is a participant in "NIST Weights and Measures Measurement Assurance Program" with a certificate of measurement traceability to NIST primary standards.
The balances are calibrated yearly by the ISO 17025 accredited metrology service, and are verified weekly by an in-house method using standard weights.

b. **Volumetric Device**
The calibration of volumetric vessels is checked annually using the NBS 602 method.

c. **Thermometer**
The standard thermometers are calibrated every year by the ISO 17025 accredited metrology service. The thermometers used in-house are verified against the standard thermometers yearly.

d. **Calibration Standards:**
The Calibration Standard is directly traceable to SRM 3100 Series Spectrometric Standard Solutions.

Packaging and Storage Conditions:

The standard is packaged in a pre-cleaned polyethylene bottle. To maintain the integrity of this product, the solution should be kept tightly capped and stored under normal laboratory conditions.

Refer to Material Safety Datasheet (MSDS) for hazardous information.

Expiration Information:

The expiry date is guaranteed to be valid for eighteen months from the shipping date provided. For this reason, standards from the same lot may have different expiration dates.

Preparation Date: **July 20, 2011**

Shipped Date: OCT 2 1 2011

Expiration Date: APR 2 1 2013

Certificate Issue Date: **July 29, 2011**

Quality Information:

ISO/IEC 17025:2005 Accreditation
Certificate Number AT-1529

ISO Guide 34:2009 (RMP) Accreditation
Certificate Number AR-1436

Vanny T. Yib,
Inorganic Laboratory Manager

Kim-Phuong Tran

Kim-Phuong Tran
Quality Manager

Theodore Rains, PhD
President

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Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #19251, Rec 11/15/11, Opened 11/17/11

STOCK STANDARD

Created By: CMS
Created: 11/17/2011 14:40
Expires: 12/01/2012

Volume of Standard: 125 mL
Manufacturer: Inorganic Ventures
Manufacturer Lot ID: E2-HG02091

Lot ID: 401650
Part ID: CGHG1-1
Standard ID: Hg-SPK

Notes: Rec 11/15/11, Opened 11/17/11

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4001c/401650_COA.pdf

Compound Name and Concentration for Standard #19251

Compound Name	Concentration	Compound Name	Concentration
Mercury	1000 ug/mL		

INORGANIC VENTURES™
300 Technology Drive
Christiansburg, VA 24073 • USA
inorganicventures.com
tel: 800.669.6799 • 540.585.3030
fax: 540.585.3012
info@inorganicventures.com

CERTIFICATE OF ANALYSIS

1.0 **INORGANIC VENTURES** is an ISO Guide 34 "General Requirements for the Competence of Reference Material Producers" and ISO 9001 registered manufacturer. Our manufacturing laboratory is accredited to ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories."

ACCREDITED Testing Laboratory Certificate 883.01 — ACCREDITED Reference Material Producer Certificate 883.02

2.0 **DESCRIPTION OF CRM** **1000 µg/mL Mercury in 5% v/v HNO3**

Catalog Number:	CGHG1-1, CGHG1-2, and CGHG1-5
Lot Number:	**E2-HG02091**
Starting Material:	Hg metal
Starting Material Purity (%):	100.0000
Starting Material Lot No:	R307HGA1
Matrix:	5% v/v HNO3

401660
REC.11/17/11 BY CMI
Exp. __/__/__ By __

3.0 **CERTIFIED VALUES AND UNCERTAINTIES**

Certified Concentration: 1000 ± 6 µg/mL - weighted mean

Certified Density: 1.025 g/mL (measured at 20 ± 1°C)

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Certified Value $(\bar{x}) = \frac{\sum x_i}{n}$

$(\bar{x})$ = mean
x_i = individual results
n = number of measurements

Uncertainty (±) $= \frac{2\,[(\sum s_i)^2]^{1/2}}{(n)^{1/2}}$

$\sum s_i$ = The summation of all significant estimated errors (Most common are the errors from instrumental measurement, weighing, dilution to volume and the fixed error reported on the NIST SRM certificate of analysis)

4.0 **TRACEABILITY TO NIST AND VALUES OBTAINED BY INDEPENDENT METHODS**

- "Property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties." (ISO VIM, 2nd ed., 1993, definition 6.10)
- This product is Traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRMs are available, the term 'in-house std.' is specified.

4.1 **Assay Method #1** **999 ± 4 µg/mL**
ICP Assay NIST SRM 3133 Lot Number: 061204

Assay Method #2 **1,000 ± 4 µg/mL**
EDTA NIST SRM 928 Lot Number: 928

4.2 **BALANCE CALIBRATION** - All analytical balances are calibrated yearly by an A2LA accredited calibration laboratory and are traceable to a class E 2 analytical weight set with NIST Traceability. All balances are checked daily using an in-house procedure. The weights used for testing are annually compared to master weights and are traceable to the National Institute of Standards and Technology (NIST).

4.3 **THERMOMETER CALIBRATION** - All thermometers are NIST traceable through thermometers that are calibrated by an A2LA accredited calibration laboratory.

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REC.11/17/11 BY CMI
Exp. __/__/__ By __

4.4 **GLASSWARE CALIBRATION** - An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM's.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP/MS AND ICP-OES IN µg/mL

CRM's solutions are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

O	Al	< 0.000090	M	Dy	< 0.012379	O	Li	< 0.000020	M	Pr	< 0.000619	M	Te	< 0.061896
M	Sb	< 0.001032	M	Er	< 0.010316	M	Lu	< 0.000825	M	Re	< 0.002063	M	Tb	< 0.000619
M	As	< 0.020632	M	Eu	< 0.006190	O	Mg	< 0.000030	M	Rh	< 0.002063	O	Tl	< 0.006000
M	Ba	< 0.020632	M	Gd	< 0.002063	M	Mn	< 0.008253	M	Rb	< 0.002063	M	Th	< 0.002063
M	Be	< 0.001032	M	Ga	< 0.002063	s	Hg		M	Ru	< 0.004126	M	Tm	< 0.000825
M	Bi	< 0.000825	O	Ge	< 0.018000	M	Mo	< 0.004126	M	Sm	< 0.002063	M	Sn	< 0.010316
M	B	< 0.144423	M	Au	< 0.006190	M	Nd	< 0.004126	M	Sc	< 0.020632	M	Ti	< 0.103159
O	Cd	< 0.004600	M	Hf	< 0.004126	O	Ni	< 0.001000	M	Se	< 0.016505	M	W	< 0.020632
O	Ca	0.000242	M	Ho	< 0.001032	M	Nb	< 0.001032	O	Si	< 0.003400	M	U	< 0.004126
M	Ce	< 0.010316	M	In	< 0.020632	n	Os		M	Ag	< 0.004126	M	V	< 0.004126
M	Cs	< 0.000619	M	Ir	< 0.010316	O	Pd	< 0.003800	O	Na	0.000218	M	Yb	< 0.002063
M	Cr	< 0.010316	O	Fe	< 0.001100	O	P	< 0.002600	M	Sr	< 0.001032	M	Y	< 0.082527
M	Co	< 0.006190	M	La	< 0.001032	M	Pt	< 0.004126	O	S	< 0.025000	M	Zn	< 0.041264
M	Cu	< 0.012379	M	Pb	< 0.006190	O	K	< 0.002000	M	Ta	< 0.014442	M	Zr	< 0.010316

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

For the calibration of analytical instruments including but not limited to the following:
HPLC, IC, TLC, ISE, IR, NMR, UV/VIS, MS, Capillary Eletrophoresis, Potentiometry, Wet Chemistry and Voltammetry
For the validation of analytical methods
For the preparation of "working reference samples"
For interference studies and the determination of correction coefficients
For detection limit and linearity studies
For additional intended uses, contact Technical Staff

This CRM was manufactured using 18 megohm doubly deionized water that has been filtered through a 0.2 micron filter.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

Storage & Handling - Keep tightly sealed when not in use. Store and use at 20 ± 4°C. Do not pipet from container. Do not return portions removed for pipetting to container.

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 200.59; +2; 4 ; Hg(OH)(aq) 1+

Chemical Compatibility - Stable in HNO3. Avoid basic media forming insoluble carbonate. The sulfide, basic carbonate, oxalate, phosphate, arsenite, arsenate and iodide are insoluble in water. .

Stability - 2-100 ppb levels not stable in 1% HNO3 / LDPE container, ***stable*** in 10% HNO3 packaged in borosilicate glass. 1-100 ppm levels stable in 7% HNO3 packaged in borosilicate glass. 1000-10,000 ppm solutions are chemically stable for years in 5-10% HNO3 / LDPE container.

Hg Containing Samples (Preparation and Solution) - Metal (soluble in HNO3); Oxide (Soluble in HNO3); Ores and Organic based (The literature has more references to the preparation of Hg containing samples than any other element. Please consult the literature for your specific sample type, since such preparations are prone to error. Or e-mail our technical staff and we will contact you to discuss your particular sample preparation questions in further detail.).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	Estimated D.L.	Order	Type	Interferences (underlined indicates severe)
ICP-OES 184.950 nm	0.03 / 0.005 µg/mL	1	atom	
ICP-OES 194.227 nm	0.03 / 0.005 µg/mL	1	ion	V
ICP-OES 253.652 nm	0.1 / 0.03 µg/mL	1	atom	Ta, Co, Th ,Rh , Fe, U
ICP-MS 202 amu	9 ppt	n/a	M+	186W16O

401650
REC.11/17/11 BY CMS
Exp. --/--/-- BY --

Uranium Note: If uranium is present in this standard, it is natural abundance unless specified in Section 3.0.

8.0 HAZARDOUS INFORMATION - Please refer to the enclosed Material Safety Data sheet for information regarding this CRM.

9.0 HOMOGENEITY - This solution was mixed according to an in house procedure and is guaranteed to be homogeneous.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration
- QMI Certificate Number 010105

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration"
- Chemical Testing - Accredited A2LA Certificate Number 883.01

10.3 ISO/IEC Guide 34 "General Requirements for the Competence of Reference Material Producers"
- Reference Materials Production - Accredited A2LA Certificate Number 883.02

10.4 10CFR50 Appendix B - Nuclear Regulatory Commission
- Domestic Licensing of Production and Utilization Facilities

10.5 10CFR21 - Nuclear Regulatory Commission
- Reporting Defects and Non-Compliance

11.0 DATE OF CERTIFICATION AND PERIOD OF VALIDITY

11.1 Shelf Life - The period of time during which the concentration of the analyte(s) in a properly packaged, unopened, and unused standard stored under environmentally controlled and monitored conditions will remain within the specified uncertainty range. Shelf life is limited primarily by transpiration (loss of water from the solution) and infrequently, by chemical instability.

11.2 Expiration Date - The date after which a CRM should not be used. Routine laboratory use of a CRM increases transpiration losses and the chance of contamination which affect the integrity of the CRM and limit its useful life. Manufacturer concurs with state and federal regulatory agencies' recommendations that solution standards be assigned a one-year expiration date.

11.3 Chemical Stability - Studies have been conducted on this or similar CRMs and it has been demonstrated that this CRM is chemically stable for a period of not less than two years provided the "Storage & Handling" conditions are followed that are described in section 7.0.

Certification Date: September 22, 2011

Expiration Date: EXPIRES 01 DEC 2012

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By:	Donna Senn, Product Documentation Technician	Donna Senn
Certificate Approved By:	Madeline Gozzi, Quality Control Supervisor	Madeline Gozzi
Certifying Officer:	Paul Gaines, PhD., Senior Technical Director	Paul R Gaines

401650
REC.11/17/11 BY CMI
Exp. __/__/__ By __

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #22391, Conc. Nitric Acid - Rec 06/10/11

Pace Analytical®
www.pacelabs.com

SOLVENT

Created By: DS1
Created: 01/13/2012 09:17
Expires: 01/13/2014

Volume of Standard: 2500 mL
Manufacturer: SCP SCIENCE
Manufacturer Lot ID: SCA1314782

Lot ID: 401741
Part ID: 250-037-171
Standard ID: RGNT373

Notes: Conc. Nitric Acid - Rec 06/10/11

Certificates of Analysis

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Compound Name and Concentration for Standard #22391

Compound Name	Concentration	Compound Name	Concentration
Nitric Acid			

SCP SCIENCE

Providing Innovative Solutions to Analytical Chemists

Certificate of Analysis

*Plasma***PURE**

401741
REC.01/13/12 BY DS
Exp. __/__/__ By _

Nitric Acid (67 - 70% HNO_3)

Catalogue Number: 250-037-171 / 250-137-171 / 250-037-173 / 250-137-173 / 250-037-175 / 250-037-177

Lot Number: SCA1314782
Assay (HNO_3 w/w): 69%
Colour (APHA): < 10 (Specification: Max 10)
Expiry Date: November 2014

Opened Bottle Expiry Information
15 months after opening, up to unopened expiration date

_____
Date bottle opened

Analyte	Maximum Specification	Actual Value (in ppb)
Aluminum (Al)	1 ppb	< 0.5
Antimony (Sb)	0.5 ppb	< 0.1
Arsenic (As)	0.5 ppb	< 0.1
Barium (Ba)	0.1 ppb	< 0.1
Beryllium (Be)	0.1 ppb	< 0.1
Bismuth (Bi)	0.1 ppb	< 0.1
Boron (B)	1 ppb	< 0.5
Cadmium (Cd)	0.5 ppb	< 0.1
Calcium (Ca)	1 ppb	< 0.5
Cerium (Ce)	0.1 ppb	< 0.1
Cesium (Cs)	0.1 ppb	< 0.1
Chromium (Cr)	1 ppb	< 0.5
Cobalt (Co)	0.5 ppb	< 0.1
Copper (Cu)	0.5 ppb	< 0.2
Dysprosium (Dy)	0.1 ppb	< 0.1
Erbium (Er)	0.1 ppb	< 0.1
Europium (Eu)	0.1 ppb	< 0.1
Gadolinium (Gd)	0.1 ppb	< 0.1
Gallium (Ga)	0.1 ppb	< 0.1
Germanium (Ge)	0.1 ppb	< 0.1
Gold (Au)	0.1 ppb	< 0.1
Hafnium (Hf)	0.1 ppb	< 0.1
Holmium (Ho)	0.1 ppb	< 0.1
Indium (In)	0.1 ppb	< 0.1
Iron (Fe)	1 ppb	< 0.5
Lanthanum (La)	0.1 ppb	< 0.1
Lead (Pb)	0.1 ppb	< 0.1
Lithium (Li)	0.1 ppb	< 0.1
Lutetium (Lu)	0.1 ppb	< 0.1
Magnesium (Mg)	1 ppb	< 0.2
Manganese (Mn)	0.1 ppb	< 0.1
Mercury (Hg)	0.1 ppb	< 0.02
Molybdenum (Mo)	0.1 ppb	< 0.1

Analyte	Maximum Specification	Actual Value (in ppb)
Neodymium (Nd)	0.1 ppb	< 0.1
Nickel (Ni)	0.5 ppb	< 0.5
Niobium (Nb)	0.1 ppb	< 0.1
Palladium (Pd)	0.5 ppb	< 0.1
Platinum (Pt)	0.5 ppb	< 0.1
Potassium (K)	1 ppb	< 0.2
Praseodymium (Pr)	0.1 ppb	< 0.1
Rhenium (Re)	0.1 ppb	< 0.1
Rhodium (Rh)	0.5 ppb	< 0.1
Rubidium (Rb)	0.1 ppb	< 0.1
Ruthenium (Ru)	0.5 ppb	< 0.1
Samarium (Sm)	0.1 ppb	< 0.1
Scandium (Sc)	0.1 ppb	< 0.1
Selenium (Se)	1 ppb	< 0.1
Silver (Ag)	0.1 ppb	< 0.1
Sodium (Na)	1 ppb	< 0.2
Strontium (Sr)	0.1 ppb	< 0.1
Tantalum (Ta)	Information Only	< 0.1
Tellurium (Te)	0.1 ppb	< 0.1
Terbium (Tb)	0.1 ppb	< 0.1
Thallium (Tl)	0.1 ppb	< 0.1
Thorium (Th)	0.1 ppb	< 0.1
Thulium (Tm)	0.1 ppb	< 0.1
Tin (Sn)	0.5 ppb	< 0.1
Titanium (Ti)	0.5 ppb	< 0.1
Tungsten (W)	0.1 ppb	< 0.1
Uranium (U)	0.1 ppb	< 0.1
Vanadium (V)	0.5 ppb	< 0.1
Ytterbium (Yb)	0.1 ppb	< 0.1
Yttrium (Y)	0.1 ppb	< 0.1
Zinc (Zn)	0.5 ppb	< 0.2
Zirconium (Zr)	0.1 ppb	< 0.1

Analyte	Maximum Specification	Actual Value (in ppm)
Chloride (Cl^-)	0.2 ppm	< 0.2
Total Phosphorus (P)	0.01 ppm	< 0.01

Analyte	Maximum Specification	Actual Value (in ppm)
Total Sulphur (S)	0.3 ppm	< 0.3

Certified by: Daniel Boisvert
Daniel Boisvert, Chemist

Certification Date: November 2, 2011

To maintain product integrity and reduce the risk of trace metal contamination: the inner pack of plastic bags and bottle should be opened under CLASS 100 particle conditions to maintain the integrity of the product. The use of safety apparel, as well as eye protection, plastic gloves, hair net and a clean room suit is also advised. The Material Safety Data Sheet and this Certificate of Analysis are available on our web site. SCP SCIENCE is ISO 9001:2008 registered and ISO 17025 accredited (Également disponible en français).

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Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #22392, Conc. HCL - Rec 06/10/11

Pace Analytical®
www.pacelabs.com

SOLVENT

Created By: DS1
Created: 01/13/2012 09:20
Expires: 01/13/2014

Volume of Standard: 2500 mL
Manufacturer: SCP SCIENCE
Manufacturer Lot ID: SCA1256754

Lot ID: 401742
Part ID: 250-037-151
Standard ID: RGNT153

Notes: Conc. HCL - Rec 06/10/11

Certificates of Analysis

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Compound Name and Concentration for Standard #22392

Compound Name	Concentration	Compound Name	Concentration
Hydrochloric Acid			

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Certificate of Analysis

401742

REC.01/13/12 BY DS
Exp. __/__/__ By _
Open __/__/__ By _

*Plasma*PURE Hydrochloric Acid (34 - 37% HCl)

Catalogue Number: 250-037-151 / 250-137-151 / 250-037-153 / 250-137-153 / 250-037-155 / 250-037-157 / 250-037-159
Lot Number: **SCA1256754**
Assay (HCl w/w): **35%**
Colour (APHA): **< 10 (Specification: Max 10)**
Expiry Date: **September 2014**

Opened Bottle Expiry Information
15 months after opening, up to unopened expiration date

_____
Date bottle opened

Analyte	Maximum Specification	Actual Value (in ppb)	Analyte	Maximum Specification	Actual Value (in ppb)
Aluminum (Al)	1 ppb	< 0.5	Neodymium (Nd)	0.1 ppb	< 0.1
Antimony (Sb)	0.5 ppb	< 0.1	Nickel (Ni)	0.5 ppb	< 0.1
Arsenic (As)	0.5 ppb	< 0.1	Niobium (Nb)	0.1 ppb	< 0.1
Barium (Ba)	0.1 ppb	< 0.1	Palladium (Pd)	Information Only	< 0.5
Beryllium (Be)	0.1 ppb	< 0.1	Platinum (Pt)	Information Only	< 0.5
Bismuth (Bi)	0.1 ppb	< 0.1	Potassium (K)	1 ppb	< 0.1
Boron (B)	1 ppb	< 0.5	Praseodymium (Pr)	0.1 ppb	< 0.1
Cadmium (Cd)	0.1 ppb	< 0.1	Rhenium (Re)	0.1 ppb	< 0.1
Calcium (Ca)	1 ppb	< 0.5	Rhodium (Rh)	0.1 ppb	< 0.1
Cerium (Ce)	0.1 ppb	< 0.1	Rubidium (Rb)	0.1 ppb	< 0.1
Cesium (Cs)	0.1 ppb	< 0.1	Ruthenium (Ru)	0.1 ppb	< 0.1
Chromium (Cr)	0.5 ppb	< 0.1	Samarium (Sm)	0.1 ppb	< 0.1
Cobalt (Co)	0.1 ppb	< 0.1	Scandium (Sc)	0.1 ppb	< 0.1
Copper (Cu)	0.5 ppb	< 0.1	Selenium (Se)	1 ppb	< 0.1
Dysprosium (Dy)	0.1 ppb	< 0.1	Silver (Ag)	1 ppb	< 0.1
Erbium (Er)	0.1 ppb	< 0.1	Sodium (Na)	1 ppb	< 0.5
Europium (Eu)	0.1 ppb	< 0.1	Strontium (Sr)	0.1 ppb	< 0.1
Gadolinium (Gd)	0.1 ppb	< 0.1	Tantalum (Ta)	Information Only	< 1
Gallium (Ga)	0.1 ppb	< 0.1	Tellurium (Te)	0.1 ppb	< 0.1
Gold (Au)	0.5 ppb	< 0.1	Terbium (Tb)	0.1 ppb	< 0.1
Hafnium (Hf)	0.1 ppb	< 0.1	Thallium (Tl)	0.1 ppb	< 0.1
Holmium (Ho)	0.1 ppb	< 0.1	Thorium (Th)	0.1 ppb	< 0.1
Indium (In)	0.1 ppb	< 0.1	Thulium (Tm)	0.1 ppb	< 0.1
Iron (Fe)	1 ppb	< 0.5	Tin (Sn)	0.5 ppb	< 0.1
Lanthanum (La)	0.1 ppb	< 0.1	Titanium (Ti)	0.5 ppb	< 0.1
Lead (Pb)	0.1 ppb	< 0.1	Tungsten (W)	0.1 ppb	< 0.1
Lithium (Li)	0.1 ppb	< 0.1	Uranium (U)	0.1 ppb	< 0.1
Lutetium (Lu)	0.1 ppb	< 0.1	Vanadium (V)	0.5 ppb	< 0.1
Magnesium (Mg)	0.5 ppb	< 0.5	Ytterbium (Yb)	0.1 ppb	< 0.1
Manganese (Mn)	0.1 ppb	< 0.1	Yttrium (Y)	0.1 ppb	< 0.1
Mercury (Hg)	0.1 ppb	< 0.02	Zinc (Zn)	1 ppb	< 0.5
Molybdenum (Mo)	0.1 ppb	< 0.1	Zirconium (Zr)	0.1 ppb	< 0.1

Analyte	Maximum Specification	Actual Value (in ppm)	Analyte	Maximum Specification	Actual Value (in ppm)
Bromide (Br^-)	10 ppm	< 10	Total Sulphur (S)	0.3 ppm	< 0.3
Total Phosphorus (P)	0.01 ppm	< 0.01	Free Chlorine (Cl_2)	0.5 ppm	< 0.5

Certified by: Daniel Boisvert
Daniel Boisvert, Chemist

Certification Date: **September 15, 2011**

To maintain product integrity and reduce the risk of trace metal contamination: the inner pack of plastic bags and bottle should be opened under CLASS 100 particle conditions to maintain the integrity of the product. The use of safety apparel, as well as eye protection, plastic gloves, hair net and a clean room suit is also advised. The Material Safety Data Sheet and this Certificate of Analysis are available on our web site. **SCP SCIENCE** is ISO 9001:2008 registered and ISO 17025 accredited (Également disponible en français).

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Fax: +86 (10) 58032302
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www.scpscience.com

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #24681, Scandium Primary Standard - Rec

STOCK STANDARD

Created By: DS1
Created: 02/15/2012 14:00
Expires: 03/01/2013

Volume of Standard: 125 mL
Manufacturer: Inorganic Ventures
Manufacturer Lot ID: E2-SC02094

Lot ID: 401843
Part ID: MSSC-100PPM
Standard ID: Sc-STK

Notes: Scandium Primary Standard - Rec 03/16/11, Open

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4001c/401843_COA.PDF

Compound Name and Concentration for Standard #24681

Compound Name	Concentration	Compound Name	Concentration
Scandium	100 ug/mL		

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 • USA
inorganicventures.com
tel: 800.669.6799 • 540.585.3030
fax: 540.585.3012
info@inorganicventures.com

CERTIFICATE OF ANALYSIS

401843
REC.02/16/12 BY DS
Exp. --/--/-- BY -
Open / / By

1.0 **INORGANIC VENTURES** is an ISO Guide 34 "General Requirements for the Competence of Reference Material Producers" and ISO 9001 registered manufacturer. Our manufacturing laboratory is accredited to ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories."

ACCREDITED Testing Laboratory Certificate 583.01
ACCREDITED Reference Material Producer Certificate 583.02

2.0 **DESCRIPTION OF CRM** **100 µg/mL Scandium in 7% (v/v) HNO3**

Catalog Number:	MSSC-100PPM
Lot Number:	E2-SC02094
Starting Material:	Sc2O3
Starting Material Purity (%):	99.9960
Starting Material Lot No:	1630A
Matrix:	7% (v/v) HNO3

3.0 **CERTIFIED VALUES AND UNCERTAINTIES**

Certified Concentration: 100.32 ± 0.81 µg/mL

Certified Density: 1.031 g/mL (measured at 20 ± 1°C)

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Certified Value $(\bar{x}) = \frac{\sum x_i}{n}$

Uncertainty $(\pm) = \frac{2\,[(\sum s_i)^2]^{1/2}}{(n)^{1/2}}$

$(\bar{x})$ = mean
x_i = individual results
n = number of measurements
$\sum s_i$ = The summation of all significant estimated errors (Most common are the errors from instrumental measurement, weighing, dilution to volume and the fixed error reported on the NIST SRM certificate of analysis)

4.0 **TRACEABILITY TO NIST AND VALUES OBTAINED BY INDEPENDENT METHODS**

- "Property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties." (ISO VIM, 2nd ed., 1993, definition 6.10)
- This product is Traceable to NIST via an unbroken chain of comparisons to the following NIST SRMs:

4.1 ELEMENT	METHOD	NIST SRM#	SRM LOT#
Sc	ICP Assay	3148a	792111
Sc	EDTA	928	928

4.2 **BALANCE CALIBRATION** - All analytical balances are calibrated yearly by an A2LA accredited calibration laboratory and are traceable to a class E 2 analytical weight set with NIST Traceability. All balances are checked daily using an in-house procedure. The weights used for testing are annually compared to master weights and are traceable to the National Institute of Standards and Technology (NIST).

4.3 **THERMOMETER CALIBRATION** - All thermometers are NIST traceable through thermometers that are calibrated by an A2LA accredited calibration laboratory.

4.4 **GLASSWARE CALIBRATION** - An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM's.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP/MS AND ICP-OES IN µg/mL

Standard solutions are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag	< 0.0020060	O	Cu	0.0002480	M	La	< 0.0005010	M	Pr	< 0.0003010	M	Ta	< 0.0070200
O	Al	< 0.0010000	M	Dy	< 0.0060170	M	Li	< 0.0100290	M	Pt	< 0.0020060	M	Tb	< 0.0003010
M	As	< 0.0100290	M	Er	< 0.0050150	M	Lu	< 0.0004010	M	Rb	< 0.0010030	M	Te	< 0.0300870
M	Au	< 0.0030090	M	Eu	< 0.0030090	O	Mg	0.0000200	M	Re	< 0.0010030	M	Th	< 0.0010030
M	B	< 0.0702030	O	Fe	0.0000990	M	Mn	< 0.0040120	M	Rh	< 0.0010030	O	Ti	< 0.0010000
M	Ba	< 0.0100290	M	Ga	< 0.0010030	M	Mo	< 0.0020060	M	Ru	< 0.0020060	M	Tl	< 0.0010030
M	Be	< 0.0005010	M	Gd	< 0.0010030	O	Na	< 0.0900000	O	S	< 0.0250000	M	Tm	< 0.0004010
M	Bi	< 0.0004010	M	Ge	< 0.0060170	M	Nb	< 0.0005010	M	Sb	< 0.0005010	M	U	< 0.0020060
O	Ca	0.0026840	O	Hf	0.0004970	M	Nd	< 0.0020060	s	Sc		M	V	< 0.0020060
M	Cd	< 0.0030090	O	Hg	< 0.0100000	O	Ni	< 0.0009000	M	Se	< 0.0080230	O	W	< 0.0040000
M	Ce	< 0.0050150	M	Ho	< 0.0005010	n	Os		O	Si	0.0014910	O	Y	< 0.0010000
M	Co	< 0.0030090	M	In	< 0.0100290	n	P		M	Sm	< 0.0010030	M	Yb	< 0.0010030
O	Cr	< 0.0008000	M	Ir	< 0.0050150	M	Pb	< 0.0030090	M	Sn	< 0.0050150	O	Zn	0.0002780
M	Cs	< 0.0003010	O	K	< 0.1000000	M	Pd	< 0.0050150	M	Sr	< 0.0005010	O	Zr	0.0009940

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

For the calibration of analytical instruments including but not limited to the following:
HPLC, IC, TLC, ISE, IR, NMR, UV/VIS, MS, Capillary Electrophoresis, Potentiometry, Wet Chemistry and Voltammetry
For the validation of analytical methods
For the preparation of "working reference samples"
For interference studies and the determination of correction coefficients
For detection limit and linearity studies
For additional intended uses, contact Technical Staff

This CRM was manufactured using 18 megohm doubly deionized water that has been filtered through a 0.2 micron filter.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

Storage & Handling - Keep tightly sealed when not in use. Store and use at 20 ± 4°C. Do not pipet from container. Do not return portions removed for pipetting to container.
Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 44.95591; +3; 6; Sc(H2O)6+2
Chemical Compatibility - Soluble in HCl, H2SO4 and HNO3. Avoid HF, H3PO4 and neutral to basic media. Stable with most metals and inorganic anions forming an insoluble carbonate, oxide, oxalate, and fluoride. Avoid mixing with elements / solutions containing moderate amounts of fluoride. The fluoride is soluble in excess HF forming ScF63- (not recommended for standard preparations).
Stability - 2-100 ppb levels stable for months in 1% HNO3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 5-10% HNO3 / LDPE container. Small atomic radius increases hydrolysis requiring higher acid levels than other Rare Earths.
Sc Containing Samples (Preparation and Solution) - Metal (Soluble in acids); Oxide (Dissolve by heating in H2O / HNO3); Ores (Carbonate fusion in Pt0 followed by HCl dissolution); Organic Matrices (Dry ash and dissolve in 1:1 H2O / HCl or HNO3), (Aqua Regia or nitric / perchloric / sulfuric acid digestions can be used. **Exercise caution when using perchloric acid.**)
Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	Estimated D.L.	Order	Type	Interferences (underlined indicates severe)
ICP-OES 335.373 nm	0.004 / 0.00002 µg/mL	1	ion	
ICP-OES 337.215 nm	0.004 / 0.00002 µg/mL	1	ion	Ti, U, Ni, Rh
ICP-OES 424.683 nm	0.003 / 0.00002 µg/mL	1	ion	Ce
ICP-MS 45 amu	2.3 ppt	n/a	M+	16O212CH, 29Si16O, 90Zr+2

Uranium Note: If uranium is present in this standard, it is natural abundance unless specified in Section 3.0.

8.0 HAZARDOUS INFORMATION - Please refer to the enclosed Material Safety Data sheet for information regarding this CRM.

9.0 HOMOGENEITY - This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 **ISO 9001 Quality Management System Registration**
- QMI Certificate Number 010105

10.2 **ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration"**
- Chemical Testing - Accredited A2LA Certificate Number 883.01

10.3 **ISO/IEC Guide 34 "General Requirements for the Competence of Reference Material Producers"**
- Reference Materials Production - Accredited A2LA Certificate Number 883.02

10.4 **10CFR50 Appendix B - Nuclear Regulatory Commission**
- Domestic Licensing of Production and Utilization Facilities

10.5 **10CFR21 - Nuclear Regulatory Commission**
- Reporting Defects and Non-Compliance

11.0 DATE OF CERTIFICATION AND PERIOD OF VALIDITY

11.1 Shelf Life - The period of time during which the concentration of the analyte(s) in a properly packaged, unopened, and unused standard stored under environmentally controlled and monitored conditions will remain within the specified uncertainty range. Shelf life is limited primarily by transpiration (loss of water from the solution) and infrequently, by chemical instability.

11.2 Expiration Date - The date after which a CRM should not be used. Routine laboratory use of a CRM increases transpiration losses and the chance of contamination which affect the integrity of the CRM and limit its useful life. Manufacturer concurs with state and federal regulatory agencies' recommendations that solution standards be assigned a one-year expiration date.

11.3 Chemical Stability - Studies have been conducted on this or similar CRMs and it has been demonstrated that this CRM is chemically stable for a period of not less than two years provided the "Storage & Handling" conditions are followed that are described in section 7.0.

Certification Date: **January 31, 2012**

Expiration Date: EXPIRES 01-2017

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By:	Danny Feeny, Product Documentation Technician	Danny R Feeny
Certificate Approved By:	Brian Alexander, PhD., Quality Control Supervisor	Brian Alexander
Certifying Officer:	Paul Gaines, PhD., Senior Technical Director	Paul R Gaines

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #24682, Scandium Primary Standard - Rec

STOCK STANDARD

Created By: DS1
Created: 02/15/2012 14:05
Expires: 03/01/2013

Volume of Standard: 125 mL
Manufacturer: Inorganic Ventures
Manufacturer Lot ID: E2-SC02094

Lot ID: 401843
Part ID: MSSC-100PPM
Standard ID: Sc-STK

Notes: Scandium Primary Standard - Rec 03/16/11, Open

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4001c/401843_COA.PDF

Compound Name and Concentration for Standard #24682

Compound Name	Concentration	Compound Name	Concentration
Scandium	100 ug/mL		

INORGANIC VENTURES™
300 Technology Drive
Christiansburg, VA 24073 • USA
inorganicventures.com
tel: 800.669.6799 • 540.585.3030
fax: 540.585.3012
info@inorganicventures.com

CERTIFICATE OF ANALYSIS

401843
REC.02/16/12 BY DS
EXP. --/--/-- BY -
OPEN / / BY

1.0 **INORGANIC VENTURES** is an ISO Guide 34 "General Requirements for the Competence of Reference Material Producers" and ISO 9001 registered manufacturer. Our manufacturing laboratory is accredited to ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories."

ACCREDITED Testing Laboratory Certificate 853.01
ACCREDITED Reference Material Producer Certificate 853.02

2.0 DESCRIPTION OF CRM — 100 µg/mL Scandium in 7% (v/v) HNO3

Catalog Number:	MSSC-100PPM
Lot Number:	E2-SC02094
Starting Material:	Sc2O3
Starting Material Purity (%):	99.9960
Starting Material Lot No:	1630A
Matrix:	7% (v/v) HNO3

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Concentration: 100.32 ± 0.81 µg/mL

Certified Density: 1.031 g/mL (measured at 20 ± 1°C)

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Certified Value $(\bar{x}) = \frac{\sum x_i}{n}$

Uncertainty $(\pm) = \frac{2\,[(\sum s_i)^2]^{1/2}}{(n)^{1/2}}$

$(\bar{x})$ = mean
x_i = individual results
n = number of measurements
$\sum s_i$ = The summation of all significant estimated errors (Most common are the errors from instrumental measurement, weighing, dilution to volume and the fixed error reported on the NIST SRM certificate of analysis)

4.0 TRACEABILITY TO NIST AND VALUES OBTAINED BY INDEPENDENT METHODS

- "Property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties." (ISO VIM, 2nd ed., 1993, definition 6.10)
- This product is Traceable to NIST via an unbroken chain of comparisons to the following NIST SRMs:

4.1 ELEMENT	METHOD	NIST SRM#	SRM LOT#
Sc	ICP Assay	3148a	792111
Sc	EDTA	928	928

4.2 **BALANCE CALIBRATION** - All analytical balances are calibrated yearly by an A2LA accredited calibration laboratory and are traceable to a class E 2 analytical weight set with NIST Traceability. All balances are checked daily using an in-house procedure. The weights used for testing are annually compared to master weights and are traceable to the National Institute of Standards and Technology (NIST).

4.3 **THERMOMETER CALIBRATION** - All thermometers are NIST traceable through thermometers that are calibrated by an A2LA accredited calibration laboratory.

4.4 **GLASSWARE CALIBRATION** - An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM's.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP/MS AND ICP-OES IN µg/mL

Standard solutions are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag	< 0.0020060	O	Cu	0.0002480	M	La	< 0.0005010	M	Pr	< 0.0003010	M	Ta	< 0.0070200
O	Al	< 0.0010000	M	Dy	< 0.0060170	M	Li	< 0.0100290	M	Pt	< 0.0020060	M	Tb	< 0.0003010
M	As	< 0.0100290	M	Er	< 0.0050150	M	Lu	< 0.0004010	M	Rb	< 0.0010030	M	Te	< 0.0300870
M	Au	< 0.0030090	M	Eu	< 0.0030090	O	Mg	0.0000200	M	Re	< 0.0010030	M	Th	< 0.0010030
M	B	< 0.0702030	O	Fe	0.0000990	M	Mn	< 0.0040120	M	Rh	< 0.0010030	O	Ti	< 0.0010000
M	Ba	< 0.0100290	M	Ga	< 0.0010030	M	Mo	< 0.0020060	M	Ru	< 0.0020060	M	Tl	< 0.0010030
M	Be	< 0.0005010	M	Gd	< 0.0010030	O	Na	< 0.0900000	O	S	< 0.0250000	M	Tm	< 0.0004010
M	Bi	< 0.0004010	M	Ge	< 0.0060170	M	Nb	< 0.0005010	M	Sb	< 0.0005010	M	U	< 0.0020060
O	Ca	0.0026840	O	Hf	0.0004970	M	Nd	< 0.0020060	s	Sc		M	V	< 0.0020060
M	Cd	< 0.0030090	O	Hg	< 0.0100000	O	Ni	< 0.0009000	M	Se	< 0.0080230	O	W	< 0.0040000
M	Ce	< 0.0050150	M	Ho	< 0.0005010	n	Os		O	Si	0.0014910	O	Y	< 0.0010000
M	Co	< 0.0030090	M	In	< 0.0100290	n	P		M	Sm	< 0.0010030	M	Yb	< 0.0010030
O	Cr	< 0.0008000	M	Ir	< 0.0050150	M	Pb	< 0.0030090	M	Sn	< 0.0050150	O	Zn	0.0002780
M	Cs	< 0.0003010	O	K	< 0.1000000	M	Pd	< 0.0050150	M	Sr	< 0.0005010	O	Zr	0.0009940

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

For the calibration of analytical instruments including but not limited to the following:
HPLC, IC, TLC, ISE, IR, NMR, UV/VIS, MS, Capillary Electrophoresis, Potentiometry, Wet Chemistry and Voltammetry
For the validation of analytical methods
For the preparation of "working reference samples"
For interference studies and the determination of correction coefficients
For detection limit and linearity studies
For additional intended uses, contact Technical Staff

This CRM was manufactured using 18 megohm doubly deionized water that has been filtered through a 0.2 micron filter.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

Storage & Handling - Keep tightly sealed when not in use. Store and use at 20 ± 4°C. Do not pipet from container. Do not return portions removed for pipetting to container.
Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 44.95591; +3; 6; Sc(H2O)6+2
Chemical Compatibility - Soluble in HCl, H2SO4 and HNO3. Avoid HF, H3PO4 and neutral to basic media. Stable with most metals and inorganic anions forming an insoluble carbonate, oxide, oxalate, and fluoride. Avoid mixing with elements / solutions containing moderate amounts of fluoride. The fluoride is soluble in excess HF forming ScF63- (not recommended for standard preparations).
Stability - 2-100 ppb levels stable for months in 1% HNO3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 5-10% HNO3 / LDPE container. Small atomic radius increases hydrolysis requiring higher acid levels than other Rare Earths.
Sc Containing Samples (Preparation and Solution) - Metal (Soluble in acids); Oxide (Dissolve by heating in H2O / HNO3); Ores (Carbonate fusion in Pt0 followed by HCl dissolution); Organic Matrices (Dry ash and dissolve in 1:1 H2O / HCl or HNO3), (Aqua Regia or nitric / perchloric / sulfuric acid digestions can be used. **Exercise caution when using perchloric acid.)**
Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	Estimated D.L.	Order	Type	Interferences (underlined indicates severe)
ICP-OES 335.373 nm	0.004 / 0.00002 µg/mL	1	ion	
ICP-OES 337.215 nm	0.004 / 0.00002 µg/mL	1	ion	Ti, U, Ni, Rh
ICP-OES 424.683 nm	0.003 / 0.00002 µg/mL	1	ion	Ce
ICP-MS 45 amu	2.3 ppt	n/a	M+	16O212CH, 29Si16O, 90Zr+2

Uranium Note: If uranium is present in this standard, it is natural abundance unless specified in Section 3.0.

8.0 HAZARDOUS INFORMATION - Please refer to the enclosed Material Safety Data sheet for information regarding this CRM.

9.0 HOMOGENEITY - This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration
- QMI Certificate Number 010105

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration"
- Chemical Testing - Accredited A2LA Certificate Number 883.01

10.3 ISO/IEC Guide 34 "General Requirements for the Competence of Reference Material Producers"
- Reference Materials Production - Accredited A2LA Certificate Number 883.02

10.4 10CFR50 Appendix B - Nuclear Regulatory Commission
- Domestic Licensing of Production and Utilization Facilities

10.5 10CFR21 - Nuclear Regulatory Commission
- Reporting Defects and Non-Compliance

11.0 DATE OF CERTIFICATION AND PERIOD OF VALIDITY

11.1 Shelf Life - The period of time during which the concentration of the analyte(s) in a properly packaged, unopened, and unused standard stored under environmentally controlled and monitored conditions will remain within the specified uncertainty range. Shelf life is limited primarily by transpiration (loss of water from the solution) and infrequently, by chemical instability.

11.2 Expiration Date - The date after which a CRM should not be used. Routine laboratory use of a CRM increases transpiration losses and the chance of contamination which affect the integrity of the CRM and limit its useful life. Manufacturer concurs with state and federal regulatory agencies' recommendations that solution standards be assigned a one-year expiration date.

11.3 Chemical Stability - Studies have been conducted on this or similar CRMs and it has been demonstrated that this CRM is chemically stable for a period of not less than two years provided the "Storage & Handling" conditions are followed that are described in section 7.0.

Certification Date: January 31, 2012

Expiration Date: EXPIRES 01-2013

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By:	Danny Feeny, Product Documentation Technician	Danny R Feeny
Certificate Approved By:	Brian Alexander, PhD., Quality Control Supervisor	Brian Alexander
Certifying Officer:	Paul Gaines, PhD., Senior Technical Director	Paul R Gaines

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #24683, ICPMS Internal Standard Stock - Rec

Pace Analytical®
www.pacelabs.com

STOCK STANDARD

Created By: DS1 **Volume of Standard:** 125 mL **Lot ID:** 401844

Created: 02/15/2012 14:08 **Manufacturer:** Inorganic Ventures **Part ID:** PACEWI-CAL-4A-REV1

Expires: 03/01/2013 **Manufacturer Lot ID:** F2-MEB410076 **Standard ID:** ICPM-istdSTK

Notes: ICPMS Internal Standard Stock - Rec 03/09/11, Open

Certificates of Analysis

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Compound Name and Concentration for Standard #24683

Compound Name	Concentration	Compound Name	Concentration
Bismuth	100 ug/mL	Terbium	100 ug/mL
Germanium	100 ug/mL	Yttrium	100 ug/mL
Indium	100 ug/mL		

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 • USA
inorganicventures.com
tel: 800.669.6799 • 540.585.3030
fax: 540.585.3012
info@inorganicventures.com

CERTIFICATE OF ANALYSIS

1.0 **INORGANIC VENTURES** is an ISO Guide 34 "General Requirements for the Competence of Reference Material Producers" and ISO 9001 registered manufacturer. Our manufacturing laboratory is accredited to ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories."

ACCREDITED Testing Laboratory Certificate 88301

ACCREDITED Reference Material Producer Certificate 885 07

2.0 **DESCRIPTION OF CRM** Custom Solution

401044
REC.02/15/12 BY DS
Exp. __/__/__ By _

Catalog No.: PACEWI-CAL-4A-REV1

Lot Number: **F2-MEB410076**

Matrix: tr. HF, 7% HNO3(v/v)

100 µg/mL ea:
Bi, Ge, In, Tb, Y

3.0 **CERTIFIED VALUES AND UNCERTAINTIES**

ELEMENT	CERTIFIED VALUE	ELEMENT	CERTIFIED VALUE	ELEMENT	CERTIFIED VALUE
Bismuth, Bi	100.0 ± 0.6 µg/mL	Germanium, Ge	100.0 ± 0.7 µg/mL	Indium, In	100.0 ± 0.6 µg/mL
Terbium, Tb	100.0 ± 0.8 µg/mL	Yttrium, Y	100.0 ± 0.5 µg/mL		

Certified Density: 1.036 g/mL (measured at 20 ± 1° C)

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Certified Value $(\bar{x}) = \frac{\sum x_i}{n}$

$(\bar{x})$ = mean
x_i = individual results
n = number of measurements

Uncertainty (±) $= \frac{2\,[(\Sigma s_i)^2]^{1/2}}{(n)^{1/2}}$

Σs_i = The summation of all significant estimated errors (Most common are the errors from instrumental measurement, weighing, dilution to volume and the fixed error reported on the NIST SRM certificate of analysis)

4.0 **TRACEBILITY TO NIST AND VALUES OBTAINED BY INDEPENDENT METHODS**

- "Property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties." (ISO VIM, 2nd ed., 1993, definition 6.10)
- This product is Traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRMs are available, the term 'in-house std.' is specified.

4.1 ASSAY INFORMATION

ELEMENT	METHOD	NIST SRM#	SRM LOT#	ELEMENT	METHOD	NIST SRM#	SRM LOT#
Bi	Calculated		See Sec. 4.2	Bi	ICP Assay	3106	991212
Ge	Calculated		See Sec. 4.2	Ge	ICP Assay	3120a	080429
In	ICP Assay	3124a	991219	In	EDTA	928	928
Tb	ICP Assay	3157a	891603	Tb	EDTA	928	928
Y	ICP Assay	3167a	790412	Y	EDTA	928	928

4.2 **BALANCE CALIBRATION** - All analytical balances are calibrated yearly by an A2LA accredited calibration laboratory and are traceable to a class E 2 analytical weight set with NIST Traceability. All balances are checked daily using an in-house procedure. The weights used for testing are annually compared to master weights and are traceable to the National Institute of Standards and Technology (NIST).

4.3 **THERMOMETER CALIBRATION** - All thermometers are NIST traceable through thermometers that are calibrated by an A2LA accredited calibration laboratory.

4.4 **GLASSWARE CALIBRATION** - An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM's.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES IN µg/mL - N/A

6.0 INTENDED USE

For the calibration of analytical instruments including but not limited to the following:
HPLC, IC, TLC, ISE, IR, NMR, UV/VIS, MS, Capillary Electrophoresis, Potentiometry, Wet Chemistry and Voltammetry
For the validation of analytical methods
For the preparation of "working reference samples"
For interference studies and the determination of correction coefficients
For detection limit and linearity studies
For additional intended uses, contact Technical Staff

This CRM was manufactured using 18 megohm doubly deionized water that has been filtered through a 0.2 micron filter.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

Storage & Handling - Keep **Tightly** sealed when not in use. Store and use at 20 ± 4°C. **Do Not** pipette from the container. **Do Not** return portions removed from pipetting to container.

Element Specific Information - For specific information regarding any element: Contact technical staff.

Uranium Note: If uranium is present in this standard, it is natural abundance unless specified in Section 3.0.

HF Note: This standard should not be prepared or stored in glass.

8.0 HAZARDOUS INFORMATION - Please refer to the enclosed Material Safety Data sheet for information regarding this CRM.

9.0 HOMOGENEITY - This solution was mixed according to in-house procedure IV-MPM-004 and is guaranteed to be homogeneous.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 **ISO 9001 Quality Management System Registration**
- QMI Certificate Number 010105

10.2 **ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration"**
- Chemical Testing - Accredited A2LA Certificate Number 883.01

10.3 **ISO/IEC Guide 34 "General Requirements for the Competence of Reference Material Producers"**
- Reference Materials Production - Accredited A2LA Certificate Number 883.02

10.4 **10CFR50 Appendix B - Nuclear Regulatory Commission**
- Domestic Licensing of Production and Utilization Facilities

10.5 **10CFR21 - Nuclear Regulatory Commission**
- Reporting Defects and Non-Compliance

11.0 DATE OF CERTIFICATION AND PERIOD OF VALIDITY

11.1 Shelf Life - The period of time during which the concentration of the analyte(s) in a properly packaged, unopened, and unused standard stored under environmentally controlled and monitored conditions will remain within the specified uncertainty range. Shelf life is limited primarily by transpiration (loss of water from the solution) and infrequently, by chemical instability. Transpiration studies of chemically-stable solutions performed at the manufacturer's facility show a CRM shelf-life of twenty one months for solutions packaged in 125-mL low density polyethylene bottles. When stored under special conditions that minimize transpiration and instability, the shelf life can be extended past this limit.

11.2 Expiration Date - The date after which a CRM should not be used. Routine laboratory use of a CRM increases transpiration losses and the chance of contamination which affect the integrity of the CRM and limit its useful life. Manufacturer concurs with state and federal regulatory agencies' recommendations that solution standards be assigned a one-year expiration date.

11.3 Chemical Stability - Studies have been conducted on this or similar CRMs and it has been demonstrated that this CRM is chemically stable for a period of not less than two years provided the "Storage & Handling" conditions are followed that are described in section 7.0.

Certification Date: February 08, 2012

Expiration Date: EXPIRES 01 MAR 2013

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By: Christy Shortridge, Product Documentation — Christy Shortridge

Certificate Approved By: Brian Alexander, PhD., Quality Control Supervisor — Brian Alexander

Certifying Officer: Paul Gaines, PhD., Senior Technical Director — Paul R Gaines

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #24684, ICPMS Internal Standard Stock - Rec

STOCK STANDARD

Created By: DS1
Created: 02/15/2012 14:10
Expires: 03/01/2013

Volume of Standard: 125 mL
Manufacturer: Inorganic Ventures
Manufacturer Lot ID: F2-MEB410076

Lot ID: 401844
Part ID: PACEWI-CAL-4A-REV1
Standard ID: ICPM-istdSTK

Notes: ICPMS Internal Standard Stock - Rec 03/09/11, Open

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4001c/401844_COA.PDF

Compound Name and Concentration for Standard #24684

Compound Name	Concentration	Compound Name	Concentration
Bismuth	100 ug/mL	Terbium	100 ug/mL
Germanium	100 ug/mL	Yttrium	100 ug/mL
Indium	100 ug/mL		

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Christiansburg, VA 24073 • USA
inorganicventures.com
tel: 800.669.6799 • 540.585.3030
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info@inorganicventures.com

CERTIFICATE OF ANALYSIS

1.0 **INORGANIC VENTURES** is an ISO Guide 34 "General Requirements for the Competence of Reference Material Producers" and ISO 9001 registered manufacturer. Our manufacturing laboratory is accredited to ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories."

ACCREDITED Testing Laboratory Certificate 881.01 — ACCREDITED Reference Material Producer Certificate 883.02

2.0 **DESCRIPTION OF CRM** Custom Solution

401844
REC.02/15/12 BY DS
Exp: --/--/-- By -

Catalog No.: PACEWI-CAL-4A-REV1

Lot Number: **F2-MEB410076**

Matrix: tr. HF, 7% HNO3(v/v)

100 µg/mL ea:
Bi, Ge, In, Tb, Y

3.0 **CERTIFIED VALUES AND UNCERTAINTIES**

ELEMENT	CERTIFIED VALUE	ELEMENT	CERTIFIED VALUE	ELEMENT	CERTIFIED VALUE
Bismuth, Bi	100.0 ± 0.6 µg/mL	Germanium, Ge	100.0 ± 0.7 µg/mL	Indium, In	100.0 ± 0.6 µg/mL
Terbium, Tb	100.0 ± 0.8 µg/mL	Yttrium, Y	100.0 ± 0.5 µg/mL		

Certified Density: 1.036 g/mL (measured at 20 ± 1° C)

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Certified Value $(\bar{x}) = \frac{\Sigma x_i}{n}$

Uncertainty (±) $= \frac{2\,[(\Sigma s_i)^2]^{1/2}}{(n)^{1/2}}$

($\bar{x}$) = mean
x_i = individual results
n = number of measurements
Σs_i = The summation of all significant estimated errors (Most common are the errors from instrumental measurement, weighing, dilution to volume and the fixed error reported on the NIST SRM certificate of analysis)

4.0 **TRACEBILITY TO NIST AND VALUES OBTAINED BY INDEPENDENT METHODS**

· "Property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties." (ISO VIM, 2nd ed., 1993, definition 6.10)

· This product is Traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRMs are available, the term 'in-house std.' is specified.

4.1 ASSAY INFORMATION

ELEMENT	METHOD	NIST SRM#	SRM LOT#	ELEMENT	METHOD	NIST SRM#	SRM LOT#
Bi	Calculated		See Sec. 4.2	Bi	ICP Assay	3106	991212
Ge	Calculated		See Sec. 4.2	Ge	ICP Assay	3120a	080429
In	ICP Assay	3124a	991219	In	EDTA	928	928
Tb	ICP Assay	3157a	891603	Tb	EDTA	928	928
Y	ICP Assay	3167a	790412	Y	EDTA	928	928

4.2 **BALANCE CALIBRATION** - All analytical balances are calibrated yearly by an A2LA accredited calibration laboratory and are traceable to a class E 2 analytical weight set with NIST Traceability. All balances are checked daily using an in-house procedure. The weights used for testing are annually compared to master weights and are traceable to the National Institute of Standards and Technology (NIST).

4.3 **THERMOMETER CALIBRATION** - All thermometers are NIST traceable through thermometers that are calibrated by an A2LA accredited calibration laboratory.

4.4 **GLASSWARE CALIBRATION** - An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM's.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES IN µg/mL - N/A

6.0 INTENDED USE

For the calibration of analytical instruments including but not limited to the following:
HPLC, IC, TLC, ISE, IR, NMR, UV/VIS, MS, Capillary Electrophoresis, Potentiometry, Wet Chemistry and Voltammetry
For the validation of analytical methods
For the preparation of "working reference samples"
For interference studies and the determination of correction coefficients
For detection limit and linearity studies
For additional intended uses, contact Technical Staff

This CRM was manufactured using 18 megohm doubly deionized water that has been filtered through a 0.2 micron filter.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

Storage & Handling - Keep **Tightly** sealed when not in use. Store and use at 20 ± 4°C. **Do Not** pipette from the container. **Do Not** return portions removed from pipetting to container.

Element Specific Information - For specific information regarding any element: Contact technical staff.

Uranium Note: If uranium is present in this standard, it is natural abundance unless specified in Section 3.0.

HF Note: This standard should not be prepared or stored in glass.

8.0 HAZARDOUS INFORMATION - Please refer to the enclosed Material Safety Data sheet for information regarding this CRM.

9.0 HOMOGENEITY - This solution was mixed according to in-house procedure IV-MPM-004 and is guaranteed to be homogeneous.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 **ISO 9001 Quality Management System Registration**
- QMI Certificate Number 010105

10.2 **ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration"**
- Chemical Testing - Accredited A2LA Certificate Number 883.01

10.3 **ISO/IEC Guide 34 "General Requirements for the Competence of Reference Material Producers"**
- Reference Materials Production - Accredited A2LA Certificate Number 883.02

10.4 **10CFR50 Appendix B - Nuclear Regulatory Commission**
- Domestic Licensing of Production and Utilization Facilities

10.5 **10CFR21 - Nuclear Regulatory Commission**
- Reporting Defects and Non-Compliance

11.0 DATE OF CERTIFICATION AND PERIOD OF VALIDITY

11.1 Shelf Life - The period of time during which the concentration of the analyte(s) in a properly packaged, unopened, and unused standard stored under environmentally controlled and monitored conditions will remain within the specified uncertainty range. Shelf life is limited primarily by transpiration (loss of water from the solution) and infrequently, by chemical instability. Transpiration studies of chemically-stable solutions performed at the manufacturer's facility show a CRM shelf-life of twenty one months for solutions packaged in 125-mL low density polyethylene bottles. When stored under special conditions that minimize transpiration and instability, the shelf life can be extended past this limit.

11.2 Expiration Date - The date after which a CRM should not be used. Routine laboratory use of a CRM increases transpiration losses and the chance of contamination which affect the integrity of the CRM and limit its useful life. Manufacturer concurs with state and federal regulatory agencies' recommendations that solution standards be assigned a one-year expiration date.

11.3 Chemical Stability - Studies have been conducted on this or similar CRMs and it has been demonstrated that this CRM is chemically stable for a period of not less than two years provided the "Storage & Handling" conditions are followed that are described in section 7.0.

Certification Date: February 08, 2012

Expiration Date: EXPIRES 01-MAR-2013

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By: Christy Shortridge, Product Documentation

Certificate Approved By: Brian Alexander, PhD., Quality Control Supervisor

Certifying Officer: Paul Gaines, PhD., Senior Technical Director

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #24685, ICSA, ICSAB Stock Standard - Rec

STOCK STANDARD

Created By: DS1
Created: 02/15/2012 14:13
Expires: 08/08/2013

Volume of Standard: 250 mL
Manufacturer: CPI
Manufacturer Lot ID: 11J098

Lot ID: 401845
Part ID: 4400-061025MB01
Standard ID: ICS-STK

Notes: ICSA, ICSAB Stock Standard - Rec 08/04/11, Open 08/8/11,DS1

Certificates of Analysis

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Compound Name and Concentration for Standard #24685

Compound Name	Concentration	Compound Name	Concentration
Sodium	500 ug/mL	Molybdenum	10 ug/mL
Magnesium	500 ug/mL	Titanium	10 ug/mL
Aluminum	500 ug/mL	Phosphorus	500 ug/mL
Potassium	500 ug/mL	Sulfur	500 ug/mL
Calcium	500 ug/mL	Chloride	3600 ug/mL
Iron	500 ug/mL	Carbon	1000 ug/mL

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The Netherlands

www.cpiinternational.com
www.colitag.com

Expiry: 8/8/2013

Certificate of Analysis

Part Number: 4400-061025MB01
Lot Number: 11J098
Shelf Life: 18 months

401846
REC.02/15/12 BY DS
Exp. __/__/__ By _

Pace
Custom Standard
2% HNO3 + tr HF

Concentrations in ug/mL ± 0.5%

Al	500
C	1000
Ca	500
Cl	3600
Fe	500
K	500
Mg	500
Mo	10
Na	500
P	500
S	500
Ti	10

This standard solution was prepared using high-purity starting materials, high-purity acid (if required) and 18-megaohm de-ionized water. The starting materials were weighed to five significant figures and diluted in volumetric glassware calibrated to five significant figures.

Starting materials were analyzed at 1000µg/mL by ICP-MS for trace impurities. The standard solution concentrations were certified instrumentally against the National Institute of Standards and Technology's SRM 3100 series, NIST approved second source and/or gravimetrically.

Accuracy and stability are guaranteed to within plus or minus 0.5% of the certified value for the stated shelf life from the date of shipment. The solution should be kept tightly capped and stored under normal laboratory conditions. See attached MSDS for proper handling information.

For questions or comments please call 1-800-878-7654 in the USA, +31 20 638 05 97 in Europe or visit our web-site at www.cpiinternational.com.

ISO 9001:2008 ACLASS ISO 17025

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Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #26596, Lithium Stock Standard Rec'd 3/16/12

STOCK STANDARD

Created By: LMS
Created: 03/16/2012 15:08
Expires: 03/01/2013

Volume of Standard: 500 mL
Manufacturer: Inorganic Ventures
Manufacturer Lot ID: E2-LI02134

Lot ID: 401885
Part ID: CGLI10-5
Standard ID: Li-STK

Notes: Lithium Stock Standard Rec'd 3/16/12

Certificates of Analysis

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Compound Name and Concentration for Standard #26596

Compound Name	Concentration	Compound Name	Concentration
Lithium	10000 ug/mL		

INORGANIC VENTURES
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CERTIFICATE OF ANALYSIS

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1.0 **INORGANIC VENTURES** is an ISO Guide 34 "General Requirements for the Competence of Reference Material Producers" and ISO 9001 registered manufacturer. Our manufacturing laboratory is accredited to ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories."

ACCREDITED Testing Laboratory Certificate 88301

ACCREDITED Reference Material Producer Certificate 88302

401005
REC.03/16/12 BY LH:
Exp. __/__/__ By __

2.0 **DESCRIPTION OF CRM** **10000 µg/mL Lithium in 2% (v/v) HNO3**

Catalog Number:	CGLI10-1, CGLI10-2, and CGLI10-5
Lot Number:	**E2-LI02134**
Starting Material:	Li2CO3
Starting Material Purity (%):	99.9989
Starting Material Lot No:	1312
Matrix:	2% (v/v) HNO3

3.0 **CERTIFIED VALUES AND UNCERTAINTIES**

Certified Concentration: 10,021 ± 53 µg/mL - weighted mean

Certified Density: 1.066 g/mL (measured at 20 ± 1°C)

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Certified Value $(\bar{x}) = \frac{\sum x_i}{n}$

Uncertainty (±) $= \frac{2\,[(\Sigma s_i)^2]^{1/2}}{(n)^{1/2}}$

$(\bar{x})$ = mean
x_i = individual results
n = number of measurements
Σs_i = The summation of all significant estimated errors (Most common are the errors from instrumental measurement, weighing, dilution to volume and the fixed error reported on the NIST SRM certificate of analysis)

4.0 **TRACEABILITY TO NIST AND VALUES OBTAINED BY INDEPENDENT METHODS**

· "Property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties." (ISO VIM, 2nd ed., 1993, definition 6.10)

· This product is Traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRMs are available, the term 'in-house std.' is specified.

4.1 **Assay Method #1** **10,019 ± 34 µg/mL**
ICP Assay NIST SRM 3129a Lot Number: 000505

Assay Method #2 **10,042 ± 11 µg/mL**
Gravimetric NIST SRM Lot Number: See Sec. 4.2

4.2 **BALANCE CALIBRATION** - All analytical balances are calibrated yearly by an A2LA accredited calibration laboratory and are traceable to a class E 2 analytical weight set with NIST Traceability. All balances are checked daily using an in-house procedure. The weights used for testing are annually compared to master weights and are traceable to the National Institute of Standards and Technology (NIST).

4.3 **THERMOMETER CALIBRATION** - All thermometers are NIST traceable through thermometers that are calibrated by an A2LA accredited calibration laboratory.

4.4 **GLASSWARE CALIBRATION** - An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM's.

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5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP/MS AND ICP-OES IN µg/mL

CRM's solutions are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

O	Al	0.001366	M	Dy	< 0.012721	s	Li		M	Pr	< 0.000636	M	Te	< 0.063607
M	Sb	< 0.001060	M	Er	< 0.010601	M	Lu	< 0.000848	M	Re	< 0.002120	M	Tb	< 0.000636
M	As	< 0.021202	M	Eu	< 0.006361	O	Mg	0.047317	M	Rh	< 0.002120	M	Tl	< 0.002120
M	Ba	< 0.021202	M	Gd	< 0.002120	O	Mn	0.000146	M	Rb	0.027925	M	Th	< 0.002120
O	Be	< 0.000200	M	Ga	< 0.002120	O	Hg	< 0.015000	M	Ru	< 0.004240	M	Tm	< 0.000848
M	Bi	< 0.000848	M	Ge	< 0.012721	M	Mo	< 0.004240	M	Sm	< 0.002120	O	Sn	< 0.006000
O	B	< 0.000600	M	Au	< 0.006361	M	Nd	< 0.004240	M	Sc	< 0.021202	O	Ti	< 0.000700
M	Cd	< 0.006361	M	Hf	< 0.004240	O	Ni	< 0.002300	M	Se	< 0.016962	O	W	< 0.004000
O	Ca	0.204878	M	Ho	< 0.001060	M	Nb	< 0.001060	O	Si	0.204878	M	U	< 0.004240
M	Ce	< 0.010601	O	In	< 0.004000	n	Os		M	Ag	< 0.004240	O	V	< 0.000900
M	Cs	< 0.000636	M	Ir	< 0.010601	M	Pd	< 0.010601	O	Na	0.034146	M	Yb	< 0.002120
M	Cr	< 0.010601	O	Fe	0.010732	O	P	< 0.002500	O	Sr	0.001268	M	Y	< 0.084810
M	Co	< 0.006361	M	La	< 0.001060	M	Pt	< 0.004240	O	S	0.087805	O	Zn	0.011902
O	Cu	< 0.001400	M	Pb	< 0.006361	O	K	0.024390	M	Ta	< 0.014842	M	Zr	< 0.010601

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

For the calibration of analytical instruments including but not limited to the following:
HPLC, IC, TLC, ISE, IR, NMR, UV/VIS, MS, Capillary Eletrophoresis, Potentiometry, Wet Chemistry and Voltammetry
For the validation of analytical methods
For the preparation of "working reference samples"
For interference studies and the determination of correction coefficients
For detection limit and linearity studies
For additional intended uses, contact Technical Staff

This CRM was manufactured using 18 megohm doubly deionized water that has been filtered through a 0.2 micron filter.

401005
REC. 03/16/12 BY LM
EXP: --/--/-- BY --

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

Storage & Handling - Keep tightly sealed when not in use. Store and use at 20 ± 4°C. Do not pipet from container. Do not return portions removed for pipetting to container.

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 6.941; +1; (6); Li+(aq) large effective radius due to hydration sphere (Coordination Number in parentheses is assumed, not certain.)

Chemical Compatibility - Soluble in HCl, HNO3, H2SO4 and HF aqueous matrices. Stable with all metals and inorganic anions.

Stability - 2-100 ppb levels stable for months in 1% HNO3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1-5% HNO3 / LDPE container.

Li Containing Samples (Preparation and Solution) - Metal (Dissolves very rapidly in water); Ores (Sodium carbonate fusion in Pt0 followed by HCl dissolution-blank levels of Li in sodium carbonate critical); Organic Matrices (Sulfuric / peroxide digestion or nitric / sulfuric / perchloric acid decomposition).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	Estimated D.L.	Order	Type	Interferences (underlined indicates severe)
ICP-OES 670.784 nm	0.002 / 0.00002 µg/mL	1	atom	2nd order radiation from R.E.s on some optical designs
ICP-OES 460.286 nm	0.9 / 0.04 µg/mL	1	atom	Zr, Th
ICP-OES 323.261 nm	1.1 / 0.05 µg/mL	1	atom	Sb, Th, Ni
ICP-MS 7 amu	10 ppt	n/a	M+	

Uranium Note: If uranium is present in this standard, it is natural abundance unless specified in Section 3.0.

8.0 HAZARDOUS INFORMATION - Please refer to the enclosed Material Safety Data sheet for information regarding this CRM.

9.0 HOMOGENEITY - This solution was mixed according to an in house procedure and is guaranteed to be homogeneous.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration
- QMI Certificate Number 010105

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration"
- Chemical Testing - Accredited A2LA Certificate Number 883.01

10.3 ISO/IEC Guide 34 "General Requirements for the Competence of Reference Material Producers"
- Reference Materials Production - Accredited A2LA Certificate Number 883.02

10.4 10CFR50 Appendix B - Nuclear Regulatory Commission
- Domestic Licensing of Production and Utilization Facilities

10.5 10CFR21 - Nuclear Regulatory Commission
- Reporting Defects and Non-Compliance

11.0 DATE OF CERTIFICATION AND PERIOD OF VALIDITY

11.1 Shelf Life - The period of time during which the concentration of the analyte(s) in a properly packaged, unopened, and unused standard stored under environmentally controlled and monitored conditions will remain within the specified uncertainty range. Shelf life is limited primarily by transpiration (loss of water from the solution) and infrequently, by chemical instability.

11.2 Expiration Date - The date after which a CRM should not be used. Routine laboratory use of a CRM increases transpiration losses and the chance of contamination which affect the integrity of the CRM and limit its useful life. Manufacturer concurs with state and federal regulatory agencies' recommendations that solution standards be assigned a one-year expiration date.

11.3 Chemical Stability - Studies have been conducted on this or similar CRMs and it has been demonstrated that this CRM is chemically stable for a period of not less than two years provided the "Storage & Handling" conditions are followed that are described in section 7.0.

Certification Date: November 09, 2011

Expiration Date: EXPIRES 01 MAR 2013

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By:	Danny Feeny, Product Documentation Technician	
Certificate Approved By:	Brian Alexander, PhD., Quality Control Supervisor	
Certifying Officer:	Paul Gaines, PhD., Senior Technical Director	

401895
REC. 03/16/12 BY LH
Exp. --/--/-- BY -

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #26665, Metals Trace Primary Standard - Rec'd

STOCK STANDARD

Created By: LMS
Created: 03/19/2012 11:15
Expires: 03/15/2013

Volume of Standard: 250 mL
Manufacturer: SPEX
Manufacturer Lot ID: 4-79YP

Lot ID: 401889
Part ID: XFSMN-26-250A
Standard ID: Metals STK1

Notes: Metals Trace Primary Standard - Rec'd 3/16/12

Certificates of Analysis

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Compound Name and Concentration for Standard #26665

Compound Name	Concentration	Compound Name	Concentration
Arsenic	100 ug/mL	Nickel	100 ug/mL
Barium	100 ug/mL	Phosphorus	100 ug/mL
Beryllium	100 ug/mL	Lead	100 ug/mL
Cadmium	100 ug/mL	Selenium	100 ug/mL
Cobalt	100 ug/mL	Strontium	100 ug/mL
Chromium	100 ug/mL	Thallium	100 ug/mL
Copper	100 ug/mL	Vanadium	100 ug/mL
Lithium	100 ug/mL	Zinc	100 ug/mL
Manganese	100 ug/mL		

SPEXertificate ®

Certificate of Reference Material

ACCREDITED

Reference Materials Producer
CERT #2495.01
Chemical Testing
CERT #2495.02

Catalog Number: **XFSMN-26-250A** **Lot No.: 4-79YP**
Description: Custom Assurance Standard
Matrix: 5% HNO3

401085
REC. 03/19/12 BY LM
Exp. __/__/__ By __
Open __/__/__ By __

This ASSURÅNCE ® Certified Reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for inorganic spectroscopic instrumentation such as ICPOES, DCP, AA, ICPMS, and XRF. It can be employed in USEPA, ASTM and other methods relevant to the certified properties listed below.

The CRM is prepared from high purity single element concentrates of individual elements using Class A laboratory ware to give precise concentrations and to comply with provisions of 10CFR part 21. Certificate must accompany shipment.

Instrumental Analysis by ICP Spectrometer:

Element	Labeled (mg/L)	Uncertainty (+/-mg/L)	Element	Labeled (mg/L)	Uncertainty (+/-mg/L)
As	100	0.5	Ni	100	0.5
Ba	100	0.5	P	100	0.5
Be	100	0.5	Pb	100	0.5
Cd	100	0.5	Se	100	0.5
Co	100	0.5	Sr	100	0.5
Cr	100	0.5	Tl	100	0.5
Cu	100	0.5	V	100	0.5
Li	100	0.5	Zn	100	0.5
Mn	100	0.5			

Spex Reference Multi: Lot #MULTI1LE

Following SRMs (as appropriate to the element analyzed) were used in establishing the above results:

El	SRM	El	SRM	El	SRM	El	SRM	El	SRM	El	SRM	El	SRM	El	SRM
Al	3101a*	Ce	3110*	Ga	3119a*	Li	3129a*	Pd	3138*	Sc	3148a*	Tb	3157a*	Yb	3166a*
Sb	3102a*	Cs	3111a*	Ge	3120a*	Lu	3130a*	P	3139a*	Se	3149*	Tl	3158*	Y	3167a*
As	3103a*	Cr	3112a*	Au	3121*	Mg	3131a*	Pt	3140*	Si	3150*	Th	3159*	Zn	3168a*
Ba	3104a*	Co	3113*	Hf	3122*	Mn	3132*	K	3141a*	Ag	3151*	Tm	3160a*	Zr	3169*
Be	3105a*	Cu	3114*	Ho	3123a*	Hg	3133*	Pr	3142a*	Na	3152a*	Sn	3161a*		
Bi	3106*	Dy	3115a*	In	3124a*	Mo	3134*	Re	3143*	Sr	3153a*	Ti	3162a*		
B	3107*	Er	3116a*	Fe	3126a*	Nd	3135a*	Rh	3144*	S	3154*	W	3163*		
Cd	3108*	Eu	3117a*	La	3127a*	Ni	3136*	Rb	3145a*	Ta	3155*	U	3164*		
Ca	3109a*	Gd	3118a*	Pb	3128*	Nb	3137*	Sm	3147a*	Te	3156*	V	3165*		

* - Indicates NIST SRM † - Indicates SPEX CertiPrep CRM (when NIST SRM is not available)

Balances are calibrated regularly with weight sets traceable to NIST#s 32856, 32867 and others. This CRM is guaranteed stable and accurate to +/- 0.5% on the average of all the labeled concentrations with no single element exceeding +/- 2%. This guarantee is valid for a period of one year from the date of certification only when the material is kept tightly capped and transported and stored under laboratory conditions.

Date of Certification: MAR 2012 Certifying Officer: Vanaja Sivakumar

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Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #26666, Metals Trace2 Primary Standard - Rec'd

Pace Analytical®
www.pacelabs.com

STOCK STANDARD

Created By: LMS
Created: 03/19/2012 11:20
Expires: 03/15/2013

Volume of Standard: 250 mL
Manufacturer: SPEX
Manufacturer Lot ID: 4-80YP

Lot ID: 401890
Part ID: XFSMN-27-250A
Standard ID: Metals STK2

Notes: Metals Trace2 Primary Standard - Rec'd 3/16/12

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4001c/401890_COA.pdf

Compound Name and Concentration for Standard #26666

Compound Name	Concentration	Compound Name	Concentration
Silicon	500 ug/mL	Tin	100 ug/mL
Boron	100 ug/mL	Zirconium	100 ug/mL
Molybdenum	100 ug/mL	Silver	50 ug/mL
Antimony	100 ug/mL	Titanium	100 ug/mL

SPEXertificate ®

Certificate of Reference Material

ACCREDITED

Reference Materials Producer
CERT #2495.01
Chemical Testing
CERT #2495.02

Catalog Number: XFSMN-27-250A **Lot No.: 4-80YP**
Description: Custom Assurance Standard
Matrix: 5% HNO3/Tr. Tart. Acid/Tr. HF

401890
REC. 03/19/12 BY LM
Exp. --/--/-- By -
Open / / By

This ASSURANCE ® Certified Reference Material, CRM, is intended primarily for use as a calibration standard or quality control standard for inorganic spectroscopic instrumentation such as ICPOES, DCP, AA, ICPMS, and XRF. It can be employed in USEPA, ASTM and other methods relevant to the certified properties listed below.

The CRM is prepared from high purity single element concentrates of individual elements using Class A laboratory ware to give precise concentrations and to comply with provisions of 10CFR part 21. Certificate must accompany shipment.

Instrumental Analysis by ICP Spectrometer:

Element	Labeled (mg/L)	Uncertainty (+/- mg/L)	Element	Labeled (mg/L)	Uncertainty (+/- mg/L)
Si	500	3	Sn	100	0.5
B	100	0.5	Ti	100	0.5
Mo	100	0.5	Zr	100	0.5
Sb	100	0.5	Ag	50	0.3

Spex Reference Multi: Lot #MULTI1LE

Following SRMs (as appropriate to the element analyzed) were used in establishing the above results:

El	SRM	El	SRM	El	SRM	El	SRM	El	SRM	El	SRM	El	SRM	El	SRM
Al	3101a*	Ce	3110*	Ga	3119a*	Li	3129a*	Pd	3138*	Sc	3148a*	Tb	3157a*	Yb	3166a*
Sb	3102a*	Cs	3111a*	Ge	3120a*	Lu	3130a*	P	3139a*	Se	3149*	Tl	3158*	Y	3167a*
As	3103a*	Cr	3112a*	Au	3121*	Mg	3131a*	Pt	3140*	Si	3150*	Th	3159*	Zn	3168a*
Ba	3104a*	Co	3113*	Hf	3122*	Mn	3132*	K	3141a*	Ag	3151*	Tm	3160a*	Zr	3169*
Be	3105a*	Cu	3114*	Ho	3123a*	Hg	3133*	Pr	3142a*	Na	3152a*	Sn	3161a*		
Bi	3106*	Dy	3115a*	In	3124a*	Mo	3134*	Re	3143*	Sr	3153a*	Ti	3162a*		
B	3107*	Er	3116a*	Fe	3126a*	Nd	3135a*	Rh	3144*	S	3154*	W	3163*		
Cd	3108*	Eu	3117a*	La	3127a*	Ni	3136*	Rb	3145a*	Ta	3155*	U	3164*		
Ca	3109a*	Gd	3118a*	Pb	3128*	Nb	3137*	Sm	3147a*	Te	3156*	V	3165*		

* - Indicates NIST SRM † - Indicates SPEX CertiPrep CRM (when NIST SRM is not available)

Balances are calibrated regularly with weight sets traceable to NIST#s 32856, 32867 and others. This CRM is guaranteed stable and accurate to +/- 0.5% on the average of all the labeled concentrations with no single element exceeding +/- 2%. This guarantee is valid for a period of one year from the date of certification only when the material is kept tightly capped and transported and stored under laboratory conditions.

Date of Certification: MAR 2012 Certifying Officer: Vanaja Sivakumar

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Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #26667, Metals Mineral Primary Standard, Rec

Pace Analytical®
www.pacelabs.com

STOCK STANDARD

Created By: LMS
Created: 03/19/2012 11:22
Expires: 03/15/2013

Volume of Standard: 250 mL
Manufacturer: SPEX
Manufacturer Lot ID: 11-001CR

Lot ID: 401891
Part ID: XFSMN-28-250A
Standard ID: Metals STK3

Notes: Metals Mineral Primary Standard, Rec 03/16/12

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4001c/401891_COA.pdf

Compound Name and Concentration for Standard #26667

Compound Name	Concentration	Compound Name	Concentration
Aluminum	1000 ug/mL	Potassium	1000 ug/mL
Calcium	1000 ug/mL	Magnesium	1000 ug/mL
Iron	1000 ug/mL	Sodium	1000 ug/mL

ACCREDITED

Reference Materials Producer
CERT #2495.01
Chemical Testing
CERT #2495.02

SPEXertificate ®

Certificate of Reference Material

Catalog Number: XFSMN-28-250A **Lot No.: 11-001CR**
Description: Custom Assurance Standard
Matrix: 5% HNO3

401081
REC.03/16/12 BY LH
Exp. __/__/__ By _

This ASSURANCE ® Certified Reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for inorganic spectroscopic instrumentation such as ICPOES, DCP, AA, ICPMS, and XRF. It can be employed in USEPA, ASTM and other methods relevant to the certified properties listed below.

The CRM is prepared from high purity single element concentrates of individual elements using Class A laboratory ware to give precise concentrations and to comply with provisions of 10CFR part 21. Certificate must accompany shipment.

Instrumental Analysis by ICP Spectrometer:

Element	Labeled (mg/L)	Uncertainty (+/-mg/L)	Element	Labeled (mg/L)	Uncertainty (+/-mg/L)
Al	1000	5	K	1000	5
Ca	1000	5	Mg	1000	5
Fe	1000	5	Na	1000	5

SPEX CertiPrep Reference Multi: Lot #MULTI1LE

Following SRMs (as appropriate to the element analyzed) were used in establishing the above results:

El	SRM	El	SRM	El	SRM	El	SRM	El	SRM	El	SRM	El	SRM	El	SRM
Al	3101a*	Ce	3110*	Ga	3119a*	Li	3129a*	Pd	3138*	Sc	3148a*	Tb	3157a*	Yb	3166a*
Sb	3102a*	Cs	3111a*	Ge	3120a*	Lu	3130a*	P	3139a*	Se	3149*	Tl	3158*	Y	3167a*
As	3103a*	Cr	3112a*	Au	3121*	Mg	3131a*	Pt	3140*	Si	3150*	Th	3159*	Zn	3168a*
Ba	3104a*	Co	3113*	Hf	3122*	Mn	3132*	K	3141a*	Ag	3151*	Tm	3160a*	Zr	3169*
Be	3105a*	Cu	3114*	Ho	3123a*	Hg	3133*	Pr	3142a*	Na	3152a*	Sn	3161a*		
Bi	3106*	Dy	3115a*	In	3124a*	Mo	3134*	Re	3143*	Sr	3153a*	Ti	3162a*		
B	3107*	Er	3116a*	Fe	3126a*	Nd	3135a*	Rh	3144*	S	3154*	W	3163*		
Cd	3108*	Eu	3117a*	La	3127a*	Ni	3136*	Rb	3145a*	Ta	3155*	U	3164*		
Ca	3109a*	Gd	3118a*	Pb	3128*	Nb	3137*	Sm	3147a*	Te	3156*	V	3165*		

* - Indicates NIST SRM † - Indicates SPEX CertiPrep CRM (when NIST SRM is not available)

Balances are calibrated regularly with weight sets traceable to NIST#s 32856, 32867 and others. This CRM is guaranteed stable and accurate to +/- 0.5% on the average of all the labeled concentrations with no single element exceeding +/- 2%. This guarantee is valid for a period of one year from the date of certification only when the material is kept tightly capped and transported and stored under laboratory conditions.

Date of Certification: MAR 2012 Certifying Officer: Vanaja Sivakumar

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Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #29179, ICPMS X-Cal Stock Standard 1 - Rec'd

Pace Analytical®
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STOCK STANDARD

Created By: DS1
Created: 04/27/2012 15:24
Expires: 04/24/2013

Volume of Standard: 125 mL
Manufacturer: High Purity
Manufacturer Lot ID: 1207515

Lot ID: 401965
Part ID: ICP-MS-68A
Standard ID: ICPM-XSTK1

Notes: ICPMS X-Cal Stock Standard 1 - Rec'd 4/27/12, Open 04/30/12

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4001c/401965_COA.pdf

Compound Name and Concentration for Standard #29179

Compound Name	Concentration	Compound Name	Concentration
Beryllium	10 mg/L	Selenium	10 mg/L
Boron	10 mg/L	Cadmium	10 mg/L
Sodium	10 mg/L	Barium	10 mg/L
Magnesium	10 mg/L	Thallium	10 mg/L
Aluminum	10 mg/L	Lead	10 mg/L
Potassium	10 mg/L	Bismuth	10 mg/L
Calcium	10 mg/L	Uranium	10 mg/L
Vanadium	10 mg/L	Cerium	10 mg/L
Chromium	10 mg/L	Cesium	10 mg/L
Iron	10 mg/L	Neodymium	10 mg/L
Manganese	10 mg/L	Lithium	10 mg/L
Lanthanum	10 mg/L	Strontium	10 mg/L
Cobalt	10 mg/L	Indium	10 mg/L
Nickel	10 mg/L	Rubidium	10 mg/L
Copper	10 mg/L	Scandium	10 mg/L
Zinc	10 mg/L	Yttrium	10 mg/L
Arsenic	10 mg/L		

HIGH-PURITY STANDARDS
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P.O. Box 41727
Charleston, SC 29423
Phone: (843) 767-2900
Fax: (843) 767-2906

401965

Certificate of Analysis

401965
REC.04/27/12 BY DS
Exp. __/__/__ By -
Open __/__/__ By

H29179 ICPM-XSTK1 STOCK
24-APR-13
DESC: ICPMS X-Cal Stock Standard 1
LOT NUMBER: 401965
MANUFACTURER: High Purity
04/00782: ICPMS X-Cal Stock Standard 1 - Rec'd 4/27/12, Opd
CREATED: 27-APR-12 BY: DS1
EXPIRES: 24-APR-13 COMPOUND COUNT: 3

Product Description:

Part Number:	**ICP-MS-68A** Solution A
Lot Number:	**1207515**
Matrix:	2% HNO_3
Purity:	99.964% - 99.9999%

Certified Values:

Element	(mg/L)	SRM ID	SRM Lot#
Al	10.00 ± 0.05	3101a	60502
As	10.0 ± 0.1	3103a	100818
Ba	10.00 ± 0.06	3104a	70222
Be	10.0 ± 0.1	3105a	90514
Bi	10.00 ± 0.05	3106	991212
B	10.00 ± 0.05	3107	070514
Cd	10.00 ± 0.05	3108	060531
Ca	10.00 ± 0.05	3109a	050825
Ce	10.00 ± 0.05	3110	890602
Cs	10.00 ± 0.05	3111a	050614
Cr	10.00 ± 0.05	3122a	030730
Co	10.00 ± 0.05	3113	000630
Cu	10.00 ± 0.05	3114	011017
Dy	10.00 ± 0.05	3115a	990504
Er	10.00 ± 0.05	3116a	000831
Eu	10.00 ± 0.05	3117a	991307
Gd	10.00 ± 0.05	3118a	992004
Ga	10.00 ± 0.06	3119a	890709
Ho	10.00 ± 0.05	3123a	790812
In	10.00 ± 0.05	3124a	991219
Fe	10.00 ± 0.05	3126a	051031
La	10.00 ± 0.05	3127a	890402
Pb	10.00 ± 0.06	3128	101026
Li	10.00 ± 0.06	3129a	505

Element	(mg/L)	SRM ID	SRM Lot#
Lu	10.00 ± 0.05	3130a	100503
Mg	10.00 ± 0.05	3131a	050302
Mn	10.0 ± 0.1	3132	050429
Nd	10.00 ± 0.06	3135a	992803
Ni	10.00 ± 0.05	3136	000612
P	10.00 ± 0.06	3139a	060717
K	10.00 ± 0.05	3141a	051220
Pr	10.0 ± 0.1	3142a	990501
Re	10.00 ± 0.06	3143	010816
Rb	10.0 ± 0.1	3145a	891203
Sm	10.00 ± 0.05	3147a	892911
Sc	10.00 ± 0.06	3148a	792111
Se	10.0 ± 0.1	3149	100901
Na	10.00 ± 0.05	3152a	010728
Sr	10.00 ± 0.05	3153a	990906
Tb	10.00 ± 0.05	3157a	891603
Tl	10.00 ± 0.05	3158	993012
Th	10.00 ± 0.06	*	
Tm	10.00 ± 0.06	3160a	790912
U	10.00 ± 0.05	3164	080521
V	10.00 ± 0.06	3165	992706
Yb	10.00 ± 0.05	3166a	790512
Y	10.00 ± 0.05	3167a	790412
Zn	10.00 ± 0.05	3168a	080123

The Certified values are based on gravimetric and volumetric preparation, and verified against SRM 3100 series developed by National Institute of Standards and Technology (NIST) via inductively coupled plasma optical emission spectrometry (ICP-OES) using an internal laboratory developed method. The uncertainty in the certified value is calculated for a 95% confidence interval.

Preparation Information:

The highest purity source materials were purchased from qualified vendors per ISO 9001:2008 guidelines and assayed by ICP-OES for conformity prior to use. This standard was prepared using methods developed at NIST for the preparation of SRM Spectrometric Standard Solutions. Sub-boiling distilled high-purity acid has been used to place the materials in solution and to stabilize the standard. The matrix is as noted above in 18 megaohm deionized water.

Traceability Information:

The traceability of this standard is maintained through an unbroken chain of comparisons to appropriate standards with suitable procedure and measurement uncertainties.

a. **Analytical Balance Calibration**: All balances are calibrated weekly by an in-house method using NBS weights Inventory No 20231A. The balances are calibrated yearly and the calibration weights are checked biennially by a qualified metrology company with weights traceable to the primary standards developed by NIST.

b. **Volumetric Device Calibration**: The calibration of all volumetric vessels is checked using the NBS 602 method where all vessels are weighed to five significant figures.

c. **Calibration Standards**: The Calibration Standards are directly traceable to SRM 3100 Series Spectrometric Standard Solutions.

Packaging and Storage Conditions:

The standard is packaged in a pre-cleaned polyethylene bottle. To maintain the integrity of this product, the solution should be kept tightly capped and stored under normal laboratory conditions. The expiry date is guaranteed to be valid for twelve months from the shipping date provided. For this reason, standards from the same lot may have different expiration dates.

Expiration Information:

Preparation Date:	March 15, 2012
Shipped Date:	April 24, 2012
Expiration Date:	April 24, 2013

Vanny T. Yib

Vanny T. Yib, Inorganic Laboratory Manager

Kim-Phuong Tran

Kim-Phuong Tran, Quality Manager

Theodore C Rains

Theodore Rains, PhD, President

March 15, 2012

Certificate Issue Date

ACLASS ACCREDITED TESTING

ISO/IEC 17025:2005 Accreditation Certificate Number AT-1529

NOTICE: HPS products are intended for laboratory use only. All products should be handled and used by trained professional personnel. The responsibility for the safe handling and use of these products rests solely with the buyer and/or user. The data and information as stated was furnished by the manufacturer of the product. The information provided in this certificate pertains only to the lot number specified. None of the information provided in this certificate may be used, reproduced or transmitted in any form or by any means without written approval from High Purity Standards.

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #29180, ICPMS X-Cal Stock Standard 2 - Rec'd

STOCK STANDARD

Created By: DS1
Created: 04/27/2012 15:31
Expires: 04/24/2013

Volume of Standard: 125 mL
Manufacturer: High Purity
Manufacturer Lot ID: 1127913

Lot ID: 401966
Part ID: ICP-MS-68A-B
Standard ID: ICPM-XSTK2

Notes: ICPMS X-Cal Stock Standard 2 - Rec'd 4/27/12, Open 04/30/12

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4001c/401966_COA.pdf

Compound Name and Concentration for Standard #29180

Compound Name	Concentration	Compound Name	Concentration
Antimony	10 mg/L	Silver	10 mg/L
Germanium	10 mg/L	Tantalum	10 mg/L
Hafnium	10 mg/L	Tellurium	10 mg/L
Molybdenum	10 mg/L	Tin	10 mg/L
Niobium-94	10 mg/L	Titanium	10 mg/L
Silicon	10 mg/L	Zirconium	10 mg/L

HIGH-PURITY STANDARDS
www.highpuritystandards.com
P.O. Box 41727
Charleston, SC 29423
Phone: (843) 767-7900
Fax: (843) 767-7906

401966

Certificate of Analysis

401966
REC. 04/27/12 BY DS
Exp. __/__/__ BY -

#29180 ICPM-XSTK2 STOCK
24-APR-13
DESC ICPMS Cal Stock Standard 2
LOT NUMBER 401966
MANUFACTURER High Purity
04/27/12 ICPMS X cal Stock Standard 2 - Rec'd 4/27/12 Opn
CREATED 27-APR-12 BY DS1
EXPIRES 24-APR-13 COMPOUND COUNT 1

Product Description:

Part Number:	**ICP-MS-68A**
	Solution B
Lot Number:	**1127913**
Matrix:	2% HNO_3 + Tr HF
Purity:	99.3% - 99.9999%

Certified Values:

Element	(mg/L)	SRM ID	SRM Lot#	Element	(mg/L)	SRM ID	SRM Lot#
Sb	10.00 ± 0.06	3102a	061229	Ta	10.00 ± 0.06	3155	080502
Ge	10.00 ± 0.06	3120a	080429	Te	10.00 ± 0.06	3156	892901
Hf	10.00 ± 0.06	3122	080430	Sn	10.00 ± 0.06	3161a	070330
Mo	10.00 ± 0.06	3134	891307	Ti	10.00 ± 0.06	3162a	060808
Nb	10.0 ± 0.1	3137	080502	W	10.00 ± 0.06	3163	080331
Si	10.0 ± 0.1	3150	071204	Zr	10.00 ± 0.06	3169	071226
Ag	10.00 ± 0.05	3151	992212				

The Certified values are based on gravimetric and volumetric preparation, and verified against SRM 3100 series developed by National Institute of Standards and Technology (NIST) via inductively coupled plasma optical emission spectrometry (ICP-OES) using an internal laboratory developed method. The uncertainty in the certified value is calculated for a 95% confidence interval.

Preparation Information:

The highest purity source materials were purchased from qualified vendors per ISO 9001:2008 guidelines and assayed by ICP-OES for conformity prior to use. This standard was prepared using methods developed at NIST for the preparation of SRM Spectrometric Standard Solutions. Sub-boiling distilled high-purity acid has been used to place the materials in solution and to stabilize the standard. The matrix is as noted above in 18 megaohm deionized water.

Traceability Information:

The traceability of this standard is maintained through an unbroken chain of comparisons to appropriate standards with suitable procedure and measurement uncertainties.

a. **Analytical Balance Calibration**: All balances are calibrated weekly by an in-house method using NBS weights Inventory No 20231A. The balances are calibrated yearly and the calibration weights are checked

biennially by a qualified metrology company with weights traceable to the primary standards developed by NIST.

b. **Volumetric Device Calibration:** The calibration of all volumetric vessels is checked using the NBS 602 method where all vessels are weighed to five significant figures.

c. **Calibration Standards:** The Calibration Standards are directly traceable to SRM 3100 Series Spectrometric Standard Solutions.

Packaging and Storage Conditions:

The standard is packaged in a pre-cleaned polyethylene bottle. To maintain the integrity of this product, the solution should be kept tightly capped and stored under normal laboratory conditions. The expiry date is guaranteed to be valid for twelve months from the shipping date provided. For this reason, standards from the same lot may have different expiration dates.

Expiration Information:

Preparation Date: October 6, 2011

Shipped Date: April 24, 2012

Expiration Date: April 24, 2013

Vanny T. Yib

Vanny T. Yib, Inorganic Laboratory Manager

Kim-Phuong Tran

Kim-Phuong Tran, Quality Manager

Theodore C Rains

Theodore Rains, PhD, President

October 7, 2011

Certificate Issue Date

ACLASS ACCREDITED TESTING

ISO/IEC 17025:2005 Accreditation Certificate Number AT-1529

NOTICE: HPS products are intended for laboratory use only. All products should be handled and used by trained professional personnel. The responsibility for the safe handling and use of these products rests solely with the buyer and/or user. The data and information as stated was furnished by the manufacturer of the product. The information provided in this certificate pertains only to the lot number specified. None of the information provided in this certificate may be used, reproduced or transmitted in any form or by any means without written approval from High Purity Standards.

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #29588, Potassium Stock Standard - Rec

STOCK STANDARD

Created By: MMZ
Created: 01/21/2011 12:59
Expires: 02/28/2017

Volume of Standard: 125 mL
Manufacturer: ULTRA SCIENTIFIC
Manufacturer Lot ID: L00056

Lot ID: 401165
Part ID: ICP-119
Standard ID: K-STK

Notes: Potassium Stock Standard - Rec 01/21/11, Open 05/04/2012

Certificates of Analysis

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Compound Name and Concentration for Standard #29588

Compound Name	Concentration	Compound Name	Concentration
Potassium	10000 ug/mL		

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

401165

5662

ULTRAgrade™ Solution
Potassium ICP Standard
10000 µg/mL

Catalog Number: ICP-119
Lot Number: L00056
Job Number: J00010831
Lot Issue Date: 01/18/2010
Expiration Date: 02/28/2017

0111-4020-8

Starting Material:	Potassium Nitrate
Starting Material Purity:	99.999%
Starting Material Lot No.:	BH01316
Matrix:	2% nitric acid in low TOC water (< 50 ppb)
Atomic Weight K:	39.10

Certified Value: 10017 ± 20 µg/mL

This Certified Reference Material (CRM) was manufactured and verified in accordance with ULTRA's ISO 9001 registered quality system. The analyte concentrations were verified by our ISO 17025 accredited laboratory to be within ± 2.5%, when compared to calibration standards independently prepared using NIST SRM(s). The certified value and uncertainty value for each analyte is determined gravimetrically.

Classical Wet Assay Method: Theoretical, based on gravimetric measurements

Confirmation by Inductively Coupled Plasma Spectroscopy (ICP / ICP-MS) vs. NIST SRM 3141a

ULTRA uses purified acids, 18 megohm double deionized water, calibrated Class A glassware & meticulously cleaned bottles in the manufacturing of ULTRAgrade standards. Balances used in the manufacturing of this standard are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001.

Trace Metallic Impurities in Solution Standard in µg/mL:

*	Al	<0.005	ND	*	Ga	<0.005	ND	n	Nb			n	S		
*	Sb	<0.005	ND	n	Ge			n	Os			n	Ta		
*	As	<0.005	ND	n	Au			*	Pd	<0.005	ND	n	Te		
*	Ba	<0.005	ND	n	Hf			*	P	<0.005	ND	n	Tb		
*	Be	<0.005	ND	n	Ho			*	Pt	<0.005	ND	*	Tl	<0.005	ND
*	Bi	<0.005	ND	*	In	<0.005	ND	s	K			n	Th		
*	B	<0.005	ND	n	Ir			n	Pr			n	Tm		
*	Cd	<0.005	ND	*	Fe	<0.005	ND	n	Re			*	Sn	<0.005	ND
*	Ca	<0.005	ND	*	La	<0.005	ND	n	Rh			*	Ti	<0.005	ND
n	Ce			*	Pb	<0.005	ND	n	Rb			n	W		
n	Cs			*	Li	<0.005	ND	n	Ru			n	U		
*	Cr	<0.005	ND	n	Lu			n	Sm			*	V	<0.005	ND
*	Co	<0.005	ND	*	Mg	<0.010	D	n	Sc			n	Yb		
*	Cu	<0.005	ND	*	Mn	<0.010	D	*	Se	<0.005	ND	n	Y		
n	Dy			*	Hg	<0.005	ND	*	Si	<0.005	ND	*	Zn	<0.005	ND
*	Er	<0.005	ND	*	Mo	<0.005	ND	*	Ag	<0.005	ND	n	Zr		
*	Eu	<0.005	ND	n	Nd			*	Na	<0.050	D				
*	Gd	<0.005	ND	*	Ni	<0.005	ND	*	Sr	<0.005	ND				

* - element checked for
ND - not detected

i - spectral interference
D - detected

n - not checked for
s - solution standard element

Density of Solution (measured at 22.0°C ± 0.5°C): 1.039 g/mL

ACCREDITED

ISO 17025:2005 Accredited A2LA Cert. No. 0851-01

ISO 9001:2008 Registered TUV USA, Inc. Cert. No. 09-1009

250 Smith Street, North Kingstown, RI 02852 USA
401-294-9400 Fax: 295-2330
www.ultrasci.com

William J. Leary
Quality Assurance Manager

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #29998, Mercury ICV Int

Pace Analytical®
www.pacelabs.com

WORKING STANDARD

Created By: DS1
Created: 05/10/2012 08:28
Expires: 11/10/2012

Volume of Standard: 100 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: Hg ICV Int

Notes: Mercury ICV Int

Compound Name and Concentration for Standard #29998

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Mercury	10000 ug/L
Nitric Acid	ug/L		

Composed of Information for Standard #29998

Composed of Standard Seq	Notes	Volume	Units
22391	Conc. Nitric Acid - Rec 06/10/11	3	mL
19251	Rec 11/15/11, Opened 11/17/11	1	mL
995	DI WATER	96	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #30948, Uranium Stock STandard - Rec'd

STOCK STANDARD

Created By: DS1 **Volume of Standard:** 125 mL **Lot ID:** 401997

Created: 05/25/2012 11:21 **Manufacturer:** Inorganic Ventures **Part ID:** AAU1-1

Expires: 06/01/2013 **Manufacturer Lot ID:** E2-U01094 **Standard ID:** U-STK

Notes: Uranium Stock STandard - Rec'd 5/25/12, Open 05/29/12, DMS

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4001c/401997_COA.pdf

Compound Name and Concentration for Standard #30948

Compound Name	Concentration	Compound Name	Concentration
Uranium	1000 ug/mL		

INORGANIC VENTURES™
300 Technology Drive
Christiansburg, VA 24073 : USA
inorganicventures.com
tel: 800.669.6799 · 540.585.3030
fax: 540.585.3012
info@inorganicventures.com

CERTIFICATE OF ANALYSIS

ATOMIC ABSORPTION SOLUTION

1000 µg/mL Uranium

Catalog No: AAU1-1 and AAU1-5

401997

Lot Number: **E2-U01094**

Matrix: 2% HNO_3 (v/v)

401997
REC.05/25/12 BY DS:
Exp. __/__/__ By
Open / / By

Certified Value: **1,000 ± 10 µg/mL**

H30948 U-STK STOCK
01-JUN-13
DESC: Uranium Primary Standard
LOT NUMBER: 401997
MANUFACTURER: Inorganic Ventures
NOTES: Uranium Stock Standard - Rec'd 5/25/12. Opnd 05/2
CREATED 25-MAY-12 BY DS1
EXPIRES: 01-JUN-13 COMPOUND COUNT: 2

The concentration of this solution standard has been verified by Inductively Coupled Plasma Spectroscopy (ICP) and is traceable to NIST SRM 3164.

The concentration of this standard was calculated based upon the manufacturing records and was manufactured by weight and volume using a certified aqueous concentrate traceable to NIST. The manufacturing accuracy is typically better than 0.5 % relative at the 95 % confidence level. This standard is certified for a period of 1 year from the date of shipment provided the bottle is kept tightly capped and stored under normal laboratory conditions (See expiration date below).

Observed Density of Solution: **1.010 g/mL**

GLASSWARE CALIBRATION

An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM's.

BALANCE CALIBRATION

All analytical balances are calibrated yearly by an A2LA accredited calibration laboratory and are traceable to a class E 2 analytical weight set with NIST Traceability No. All balances are checked daily using an in-house procedure. The weights used for testing are annually compared to master weights and are traceable to the National Institute of Standards and Technology (NIST).

THERMOMETER CALIBRATION

All thermometers are NIST traceable through thermometers that are calibrated by an A2LA accredited calibration laboratory.

Certification Date: December 28, 2011

Prepared By: Donna Sera

Expiration Date: EXPIRES 01 JUN 2013

Approved By: Brian Alexander

Certifying Officer: Paul R. Haines

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #30949, Silicon Primary Standard - Rec 05/25/12

STOCK STANDARD

Created By: DS1
Created: 05/25/2012 11:30
Expires: 07/01/2014

Volume of Standard: 100 mL
Manufacturer: Fluka Analytical
Manufacturer Lot ID: BCBC9940

Lot ID: 401998
Part ID: 08729
Standard ID: Si-STK

Notes: Silicon Primary Standard - Rec 05/25/12

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4001c/401998_COA.pdf

Compound Name and Concentration for Standard #30949

Compound Name	Concentration	Compound Name	Concentration
Silicon	1000 mg/L		

401998

401998

REC.05/25/12 BY DS:
Exp: __/__/__ By __
Open __/__/__ By __

H30949 Si-STK STOCK

01-JUL-14

DESC: Silicon Primary Standard
LOT NUMBER: 401998
MANUFACTURER: Fluka Analytical
NOTES: Silicon Primary Standard - Rec 05/25/12
CREATED: 25-MAY-12 BY: DS
EXPIRES: 01-JUL-14 COMPOUND COUNT: 2

TraceCERT®

Traceable Certified Reference Materials

Fluka Analytical

Certificate

Produced in double-accred laboratory fulfilling ISO/IEC 17025 ISO Guide 3

This certificate is designed in accordance with ISO Guide 31 [1].

Object of certification:	**Silicon standard for ICP**
Product no.:	**08729**
Lot no.:	**BCBC9940**
Composition:	Silicon semi-metal (high punty quality) in 2% HNO_3 and <0.5% HF (prepared from HNO *Trace*SELECT®, HF *Trace*SELECT® and water *Trace*SELECT® Ultra, 18.2 MΩ·cm, 0.22 filtered)
Intended use:	Calibration of ICP-spectrometry, AAS, spectrophotometry or any other analytical technic
Storing and handling:	This reference material shall be stored in the original closed bag between 5 °C and 30 °C After opening the bottle should be stored at reduced temperature to minimize transpirati rate. Before every use of the material the bottle must be shaken well and its temperatur has to be 20°C. We highly recommend using this reference material no longer than 15 months after the aluminum bag was opened.
Expiry date:	**JUL / 2014** (unopened bottle in aluminized bag)
Traceability [2]:	NIST SRM 3150, Silicon Standard Solution
Certificate issue date:	October 25, 2010

The certified values and uncertainties are according to ISO Guide 35 [3] and Eurachem/CITAC Guide [4].

Constituent	Certified values at 20°C and expanded uncertainties [$U = k \cdot u_c$; $k = 2$]
Silicon	**996 mg L^{-1} ± 4 mg L^{-1}** 986 mg kg^{-1} ± 4 mg kg^{-1}

Measurand	Certified value and expanded uncertainty [$U = k \cdot u_c$; $k = 2$]
Density at 20°C	**1.0103 g mL^{-1} ± 0.0005 g mL^{-1}**

CRM operations: J. Wüthrich

Certification body: K.-D. Schmidt, Ph.D.

SWISS CRM PRODUCTION — SRMS 001 ISO Guide 34

SWISS TESTING — STS 490 ISO/IEC 17025

16368-C ISO 90

Sigma-Aldrich Production GmbH, Industriestrasse 25, 9471 Buchs/ Switzerland

SIGMA-ALDRIC

1. Certification

Production and certification of this CRM are performed under double-accreditation in accordance with ISO/IEC 17025 [5] and also ISO Guide 34 [6]. Storage stability, leaching and homogeneity tests are considered for certification (see storing behavior, chapter 3).

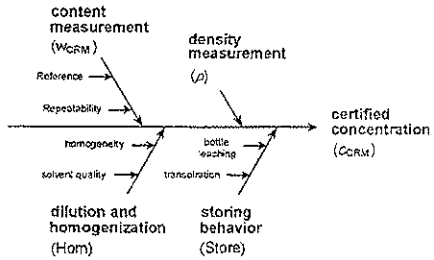
1.1 HP-ICP-OES Measurement

The certified value of the content (mg/kg) is determined using high-performance inductively coupled plasma optical emission spectrometry (HP-ICP-OES). To obtain performance comparable to isotope dilution and classical methods (titration and gravimetric analysis) the HP-ICP-OES measurement is performed using an internal standard and a drift correction procedure [7].
The mean value is based on 20 measurements (two samples and 10 measurements per sample). All measurements are traced gravimetrically to an internationally accepted reference material e.g. from NIST (USA), BAM (Germany) or EMPA – Material Science & Technology (Switzerland).

All uncertainties are calculated according to Eurachem/CITAC Guide [5] and reported as combined expanded uncertainties at the 95% confidence level. The main uncertainty contributions are illustrated by the following cause-effect diagram.

Typical relative contributions are:

$u(w_{CRM})$	0.1 - 0.3 %
u(Store)	< 0.1 %
$u(\rho)$	< 0.05 %
u(Hom)	< 0.03 %



The combined uncertainty u_c is calculated by combination of the squared contribution values.

The expanded uncertainty U is then calculated to a confidence level of 95%, by multiplying u_c with a confidence level factor of k=2.

1.2 Density Measurement

The density measurement is carried out according to ISO 15212-1 [8] and using the digital density meter DMA 4500M from Anton Paar with an oscillating U-tube installed. The measurement uncertainty is calculated according to Eurachem/CITAC Guide and reported as combined expanded uncertainty at the 95% confidence level.

2. Trace Impurities in Bottled Solution

Up to 75 trace impurities were determined with ICP-OES, ICP-MS and AAS. Some of the impurities are determined in the starting material and calculated for the solution (e.g. for rare earth elements contamination during the preparation is rendered impossible). Other elements are determined both in the starting material as well as in the bottled solution.

All values listed below are given in mg kg^{-1} (ppm), <X = below detection limit, m = matrix, n.a. = not analyzed:

Li	Be												B	C	N	O	F	Ne
<0.010	<0.005												<0.025	n.a.	n.a.	n.a.	n.a.	n.a.
Na	Mg												Al	Si	P	S	Cl	Ar
<0.02	<0.005												<0.050	m	<0.010	<0.005	n.a.	n.a.
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn		Ga	Ge	As	Se	Br	Kr
<0.050	<0.020	<0.005	<0.010	<0.010	<0.010	<0.005	<0.010	<0.010	<0.010	<0.010	<0.010		<0.005	<0.005	<0.001	<0.001	n.a.	n.a.
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd		In	Sn	Sb	Te	I	Xe
<0.050	<0.005	<0.003	<0.010	<0.005	<0.010	n.a.	<0.010	<0.010	<0.005	<0.010	<0.010		<0.010	<0.025	<0.001	<0.010	n.a.	n.a.
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg		Tl	Pb	Bi	Po	At	Rn
<0.050	<0.005	<0.005	<0.005	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.003		<0.005	<0.010	<0.001	n.a.	n.a.	n.a.
Fr	Ra	Ac																
n.a.	n.a.	n.a.																

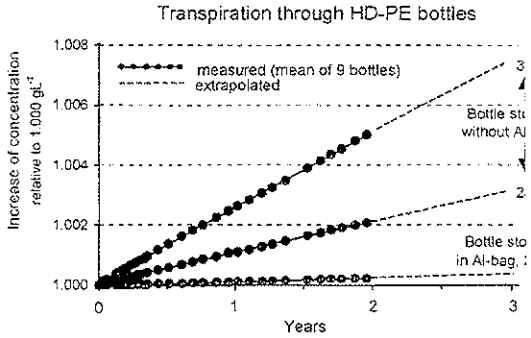
Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
<0.010	<0.010	<0.005	n.a.	<0.005	<0.005	<0.010	<0.005	<0.010	<0.005	<0.010	<0.005	<0.003	<0.005
Th	Pa	U											
<0.005	n.a.	<0.005											

3. Storing Behavior

The storage behavior of standard solutions is an important factor regarding the certified value. Therefore the t most important storing effects were investigated by in-depth studies in a cooperation with EMPA, St. Gallen:

1. The leach out of trace impurities from HD-PE bottles was determined with HR-ICP-MS after leaching the bottles with 2% nitric acid. Maximum contamination levels were found in the ng L^{-1} level for 12 elements.

2. To avoid significant loss of mass through transpiration the bottle is delivered in aluminum coated bags. After the bottle has been removed from the bag, transpiration will occur at an accelerated rate (see figure). We highly recommend not to open the bag until the solution is needed. Once the bottle is opened the solution should be stored at reduced temperature (4°C) to reduce transpiration.



References
[1] ISO Guide 31, 2nd Ed. (2000), "Reference materials - Contents of certificates and labels"
[2] Eurachem/CITAC Guide, 1st Ed. (2003), "Traceability in chemical measurement"
[3] ISO Guide 35, 3rd Ed. (2006), "Reference materials - General and statistical principles for certification"
[4] Eurachem/CITAC Guide, 2nd Ed. (2000), "Quantifying uncertainty in analytical measurement"
[5] ISO/IEC 17025, 2nd Ed. (2005), "General requirements for the competence of testing and calibration laboratories"
[6] ISO Guide 34, 3rd Ed. (2009), "General requirements for the competence of reference material producers"
[7] Marc L. Salit et al., Anal. Chem. 2001, 73, 4821-4829, "Single-Element Solution Comparisons with a High-Performance Inductively Coupled Plasma Optica Emission Spectrometric Method"
[8] DIN EN ISO 15212-1:1998, Oscillation-type density meters - Part 1: Laboratory instruments

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #31609, Hydrogen Peroxide - Rec'd 06/07/12

Pace Analytical®
www.pacelabs.com

SOLVENT

Created By: MMZ
Created: 06/07/2012 15:20
Expires: 06/07/2014

Volume of Standard: 4000 mL
Manufacturer: Fisher Scientific
Manufacturer Lot ID: 121417

Lot ID: 402021
Part ID: H325-4
Standard ID: RGNT154

Notes: Hydrogen Peroxide - Rec'd 06/07/12 MMZ

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4002c/402021_COA.PDF

Compound Name and Concentration for Standard #31609

Compound Name	Concentration	Compound Name	Concentration
Hydrogen Peroxide			

402021

REC. 06/07/12 BY MM
Exp. __/__/__ By _

Fisher Scientific

1 Reagent Lane
Fair Lawn, NJ 07410
201.796.7100 tel
201.796.1329 fax

Certificate of Analysis

Fisher Scientific's Quality System has been found to conform to Quality Management System Standard ISO9001:2008 standard by DNV Certificate number CERT-08052-2006-AQ-HOU-ANAB

This is to certify that units of the above mentioned lot number were tested and found to comply with the specifications of the grade listed. Certain data have been supplied by third parties. Fisher Scientific expressly disclaims all warranties, expressed or implied, including the implied warranties of merchantability and fitness for a particular purpose. Certain products (USP/FCC/NF/EP/BP/JP grades) are sold for use in food, drug, or medical device manufacturing. Fisher does not claim regulatory coverage under 21 CFR nor maintain DMF's with the FDA. The following are the actual analytical results obtained:

Catalog Number	H325	Mfg. Date	3/22/2012
Lot Number	121417		
Description	HYDROGEN PEROXIDE, A.C.S.		
Country of Origin	United States	Recommended Retest Date	Mar-2017
Chemical Origin	Synthetic		
BSE/TSE Comment	No animal products are used as starting raw material ingredients, or used in processing, including lubricants, processing aids, or any other material that might migrate to the finished product.		
Chemical Comment	This material is produced by a synthetic process. No animal, human, or plant materials are used in this systhesis.		

Result name	Units	Specifications	Test Value
APPEARANCE		REPORT	CLEAR, COLORLESS LIQUID
AMMONIUM (NH4)	ppm	<= 5	<5
ASSAY	%	Inclusive Between 30.0 32.0	31.4
CHLORIDE	ppm	<= 3	<3
COLOR	APHA	<= 10	5
COPPER (Cu)	ppm	<= 0.1	0.03
EVAPORATION RESIDUE	%	<= 0.002	0.0020
HEAVY METALS (as Pb)	ppm	<= 1	<1
IDENTIFICATION	PASS/FAIL	= PASS TEST	PASS TEST
IRON (Fe)	ppm	<= 0.5	<0.5
NICKEL (Ni)	ppm	<= 0.1	<0.01
NITRATE (NO3)	ppm	<= 2	<2
PHOSPHATE (PO4)	ppm	<= 2	<2
SULFATE (SO4)	ppm	<= 5	<5
TITRATABLE ACID	mEq/g	<= 0.0006	0.00010

CERTIFIED BY

Joel Boland

Lab Manager BPF

Note: The data listed is valid for all package sizes of this lot of this product, expressed as a extension of this catalog number listed above. If there are any questions with this certificate, please call Chemical Services at (800) 227-6701.

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #31733, Metals Trace Secondary - Rec'd 6/08/12

Pace Analytical®
www.pacelabs.com

STOCK STANDARD

Created By: DS1
Created: 06/11/2012 09:58
Expires: 07/01/2013

Volume of Standard: 250 mL
Manufacturer: Inorganic Ventures
Manufacturer Lot ID: F2-MEB410059

Lot ID: 402026
Part ID: PA-STD-1B
Standard ID: Metals SPK1

Notes: Metals Trace Secondary - Rec'd 6/08/12

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4002c/402026_COA.pdf

Compound Name and Concentration for Standard #31733

Compound Name	Concentration	Compound Name	Concentration
Arsenic	200 ug/mL	Nickel	200 ug/mL
Barium	200 ug/mL	Phosphorus	200 ug/mL
Beryllium	200 ug/mL	Lead	200 ug/mL
Cadmium	200 ug/mL	Selenium	200 ug/mL
Cobalt	200 ug/mL	Strontium	200 ug/mL
Chromium	200 ug/mL	Thallium	200 ug/mL
Copper	200 ug/mL	Vanadium	200 ug/mL
Lithium	200 ug/mL	Zinc	200 ug/mL
Manganese	200 ug/mL		

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 • USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

tel. 800.669.6799 • 540.585.3030
fax. 540.585.3012
info@inorganicventures.com

1.0 **INORGANIC VENTURES** is an ISO Guide 34 "General Requirements for the Competence of Reference Material Producers" and ISO 9001 registered manufacturer. Our manufacturing laboratory is accredited to ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories."

ACCREDITED Testing Laboratory Certificate 883.01

ACCREDITED Reference Material Producer Certificate 883.02

2.0 **DESCRIPTION OF CRM** Custom Second Source Solution

Catalog No.: PA-STD-1B

Lot Number: **F2-MEB410059**

Matrix: 5% HNO3(v/v)

402026
REC.06/11/12 BY DS:
Exp. __/__/__ By

H31733 Metals SPK1 STOCK
01-JUL-13
DESC: Metals Trace Secondary
LOT NUMBER: 402026
MANUFACTURER: Inorganic Ventures
NOTES: Metals Trace Secondary - Rec'd 6/08/12
CREATED: 11-JUN-12 BY: DS1
EXPIRES: 01-JUL-13 COMPOUND COUNT: 15

Second Source: Whenever possible, this solution was manufactured from a second set of concentrates in our manufacturing facility.

200 mg/L ea:

As,	Ba,	Be,	Cd,	Co,	Cr3,	Cu,	Li,	Mn,
Ni,	P,	Pb,	Se,	Sr,	Tl,	V,	Zn	

3.0 **CERTIFIED VALUES AND UNCERTAINTIES**

ELEMENT	CERTIFIED VALUE	ELEMENT	CERTIFIED VALUE	ELEMENT	CERTIFIED VALUE
Arsenic, As	200.0 ± 1.3 mg/L	Barium, Ba	200.0 ± 1.7 mg/L	Beryllium, Be	200.0 ± 1.4 mg/L
Cadmium, Cd	200.0 ± 1.3 mg/L	Chromium+3, Cr3	200.0 ± 1.7 mg/L	Cobalt, Co	200.0 ± 1.3 mg/L
Copper, Cu	200.0 ± 1.4 mg/L	Lead, Pb	200.0 ± 1.5 mg/L	Lithium, Li	200.0 ± 0.8 mg/L
Manganese, Mn	200.0 ± 0.9 mg/L	Nickel, Ni	200.0 ± 0.9 mg/L	Phosphorus, P	200.0 ± 1.0 mg/L
Selenium, Se	200.0 ± 1.1 mg/L	Strontium, Sr	200.0 ± 1.1 mg/L	Thallium, Tl	200.0 ± 1.3 mg/L
Vanadium, V	200.0 ± 1.0 mg/L	Zinc, Zn	200.0 ± 1.2 mg/L		

Certified Density: 1.039 g/mL (measured at 20 ± 1° C)

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Certified Value $(\bar{x}) = \frac{\sum x_i}{n}$

$(\bar{x})$ = mean
x_i = individual results
n = number of measurements

Uncertainty (±) $= \frac{2\,[(\sum s_i)^2]^{1/2}}{(n)^{1/2}}$

$\sum s_i$ = The summation of all significant estimated errors (Most common are the errors from instrumental measurement, weighing, dilution to volume and the fixed error reported on the NIST SRM certificate of analysis)

4.0 TRACEBILITY TO NIST AND VALUES OBTAINED BY INDEPENDENT METHODS

· "Property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties." (ISO VIM, 2nd ed., 1993, definition 6.10)

· This product is Traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRMs are available, the term 'in-house std.' is specified.

4.1 ASSAY INFORMATION

ELEMENT	METHOD	NIST SRM#	SRM LOT#	ELEMENT	METHOD	NIST SRM#	SRM LOT#
As	Calculated		See Sec. 4.2	As	ICP Assay	3103a	010713
Ba	Gravimetric		See Sec. 4.2	Ba	ICP Assay	3104a	070222
Be	Calculated		See Sec. 4.2	Be	ICP Assay	3105a	892707
Cd	ICP Assay	3108	060531	Cd	EDTA	928	928
Co	ICP Assay	3113	00630	Co	EDTA	928	928
Cr3	Calculated		See Sec. 4.2	Cr3	ICP Assay	3112a	030730
Cu	ICP Assay	3114	011017	Cu	EDTA	928	928
Li	Gravimetric		See Sec. 4.2	Li	ICP Assay	3129a	000505
Mn	ICP Assay	3132	050429	Mn	EDTA	928	928
Ni	ICP Assay	3136	000612	Ni	EDTA	928	928
P	ICP Assay	3139a	060717	P	Acidimetric	84k	84k
Pb	ICP Assay	3128	030721	Pb	EDTA	928	928
Se	Calculated		See Sec. 4.2	Se	ICP Assay	3149	992106
Sr	ICP Assay	3153a	990906	Sr	EDTA	928	928
Tl	Calculated		See Sec. 4.2	Tl	ICP Assay	3158	993012
V	ICP Assay	3165	992706	V	EDTA	928	928
Zn	ICP Assay	3168a	001402	Zn	EDTA	928	928

4.2 **BALANCE CALIBRATION** - All analytical balances are calibrated yearly by an A2LA accredited calibration laboratory and are traceable to a class E 2 analytical weight set with NIST Traceability. All balances are checked daily using an in-house procedure. The weights used for testing are annually compared to master weights and are traceable to the National Institute of Standards and Technology (NIST).

4.3 **THERMOMETER CALIBRATION** - All thermometers are NIST traceable through thermometers that are calibrated by an A2LA accredited calibration laboratory.

4.4 **GLASSWARE CALIBRATION** - An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM's.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES IN µg/mL - N/A

6.0 INTENDED USE

For the calibration of analytical instruments including but not limited to the following:
HPLC, IC, TLC, ISE, IR, NMR, UV/VIS, MS, Capillary Electrophoresis, Potentiometry, Wet Chemistry and Voltammetry
For the validation of analytical methods
For the preparation of "working reference samples"
For interference studies and the determination of correction coefficients
For detection limit and linearity studies
For additional intended uses, contact Technical Staff

This CRM was manufactured using 18 megohm doubly deionized water that has been filtered through a 0.2 micron filter.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

Storage & Handling - Keep **Tightly** sealed when not in use. Store and use at 20 ± 4°C. **Do Not** pipette from the container. **Do Not** return portions removed from pipetting to container.

Element Specific Information - For specific information regarding any element: Contact technical staff.

Uranium Note: If uranium is present in this standard, it is natural abundance unless specified in Section 3.0.

8.0 HAZARDOUS INFORMATION - Please refer to the enclosed Material Safety Data sheet for information regarding this CRM.

9.0 HOMOGENEITY - This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 **ISO 9001 Quality Management System Registration**
- QMI File Number 010105

10.2 **ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration"**
- Chemical Testing - Accredited A2LA Certificate Number 883.01

10.3 **ISO/IEC Guide 34 "General Requirements for the Competence of Reference Material Producers"**
- Reference Materials Production - Accredited A2LA Certificate Number 883.02

10.4 **10CFR50 Appendix B - Nuclear Regulatory Commission**
- Domestic Licensing of Production and Utilization Facilities

10.5 **10CFR21 - Nuclear Regulatory Commission**
- Reporting Defects and Non-Compliance

11.0 DATE OF CERTIFICATION AND PERIOD OF VALIDITY

11.1 Shelf Life - The period of time during which the concentration of the analyte(s) in a properly packaged, unopened, and unused standard stored under environmentally controlled and monitored conditions will remain within the specified uncertainty range. Shelf life is limited primarily by transpiration (loss of water from the solution) and infrequently, by chemical instability. Transpiration studies of chemically-stable solutions performed at the manufacturer's facility show a CRM shelf-life of twenty one months for solutions packaged in 125-mL low density polyethylene bottles. When stored under special conditions that minimize transpiration and instability, the shelf life can be extended past this limit.

11.2 Expiration Date - The date after which a CRM should not be used. Routine laboratory use of a CRM increases transpiration losses and the chance of contamination which affect the integrity of the CRM and limit its useful life. Manufacturer concurs with state and federal regulatory agencies' recommendations that solution standards be assigned a one-year expiration date.

11.3 Chemical Stability - Studies have been conducted on this or similar CRMs and it has been demonstrated that this CRM is chemically stable for a period of not less than two years provided the "Storage & Handling" conditions are followed that are described in section 7.0.

Certification Date: February 14, 2012

Expiration Date: EXPIRES 01/2013

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By: Brenda Francis
Product Documentation Technician

Certificate Approved By: Brian Alexander
PhD., Quality Control Supervisor

Certifying Officer: Paul Gaines
PhD., Senior Technical Director

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #31734, Metals Trace2 Secondary - Rec'd

Pace Analytical®
www.pacelabs.com

STOCK STANDARD

Created By: DS1
Created: 06/11/2012 10:00
Expires: 07/01/2013

Volume of Standard: 250 mL
Manufacturer: Inorganic Ventures
Manufacturer Lot ID: F2-MEB4100060

Lot ID: 402027
Part ID: PA-STD-2B
Standard ID: Metals SPK2

Notes: Metals Trace2 Secondary - Rec'd 06/08/12

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4002c/402027_COA.pdf

Compound Name and Concentration for Standard #31734

Compound Name	Concentration	Compound Name	Concentration
Silicon	1000 ug/mL	Tin	200 ug/mL
Boron	200 ug/mL	Zirconium	200 ug/mL
Molybdenum	200 ug/mL	Silver	100 ug/mL
Antimony	200 ug/mL	Titanium	200 ug/mL

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 • USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

tel: 800.669.6799 • 540.585.3030
fax: 540.585.3012
e-mail: inorganicventures@inorganicventures.com

1.0 **INORGANIC VENTURES** is an ISO Guide 34 "General Requirements for the Competence of Reference Material Producers" and ISO 9001 registered manufacturer. Our manufacturing laboratory is accredited to ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories."

ACCREDITED Testing Laboratory Certificate 853.01 — ACCREDITED Reference Material Producer Certificate 853.02

2.0 **DESCRIPTION OF CRM** Custom Second Source Solution

Catalog No.: PA-STD-2B

Lot Number: **F2-MEB410060**

Matrix: tr. HF, 3% HNO3(v/v)

402027
REC.06/11/12 BY DS:
Exp: __/__/__ By __

Second Source: Whenever possible, this solution was manufactured from a second set of concentrates in our manufacturing facility.

H31734 Metals SPK2 STOCK
01-JUL-13
DESC: Metals Trace2 Secondary
LOT NUMBER: 402027
MANUFACTURER: Inorganic Ventures
NOTES: Metals Trace2 Secondary - Rec'd 06/06/12
CREATED: 11-JUN-12 BY: DS1
EXPIRES: 01-JUL-13 COMPOUND COUNT: 9

1,000 mg/L ea:
Si,

200 mg/L ea:
B, Mo, Sb, Sn, Ti, Zr,

100 mg/L ea:
Ag

3.0 CERTIFIED VALUES AND UNCERTAINTIES

ELEMENT	CERTIFIED VALUE	ELEMENT	CERTIFIED VALUE	ELEMENT	CERTIFIED VALUE
Antimony, Sb	200.0 ± 1.6 mg/L	Boron, B	200.0 ± 1.1 mg/L	Molybdenum, Mo	200.0 ± 1.3 mg/L
Silicon, Si	1,000 ± 4 mg/L	Silver, Ag	100.0 ± 0.6 mg/L	Tin, Sn	200.0 ± 1.0 mg/L
Titanium, Ti	200.0 ± 1.3 mg/L	Zirconium, Zr	200.0 ± 1.3 mg/L		

Certified Density: 1.021 g/mL (measured at 20 ± 1° C)

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

$$\text{Certified Value } (\bar{x}) = \frac{\Sigma x_i}{n}$$

$$\text{Uncertainty } (\pm) = \frac{2\,[(\Sigma s_i)^2]^{1/2}}{(n)^{1/2}}$$

$(\bar{x})$ = mean
x_i = individual results
n = number of measurements
Σs_i = The summation of all significant estimated errors (Most common are the errors from instrumental measurement, weighing, dilution to volume and the fixed error reported on the NIST SRM certificate of analysis)

4.0 TRACEBILITY TO NIST AND VALUES OBTAINED BY INDEPENDENT METHODS

· "Property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties." (ISO VIM, 2nd ed., 1993, definition 6.10)
· This product is Traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRMs are available, the term 'in-house std.' is specified.

4.1 ASSAY INFORMATION

ELEMENT	METHOD	NIST SRM#	SRM LOT#	ELEMENT	METHOD	NIST SRM#	SRM LOT#
Ag	Calculated		See Sec. 4.2	Ag	ICP Assay	3151	992212
B	ICP Assay	3107	070514	Mo	Calculated		See Sec. 4.2
Mo	ICP Assay	3134	891307	Sb	Calculated		See Sec. 4.2
Sb	ICP Assay	3102A	061229	Si	Calculated		See Sec. 4.2
Si	ICP Assay	3150	071204	Sn	Calculated		See Sec. 4.2
Sn	ICP Assay	3161a	993107	Ti	Calculated		See Sec. 4.2
Ti	ICP Assay	3162a	060808	Zr	Calculated		See Sec. 4.2
Zr	ICP Assay	3169	990109				

4.2 **BALANCE CALIBRATION** - All analytical balances are calibrated yearly by an A2LA accredited calibration laboratory and are traceable to a class E 2 analytical weight set with NIST Traceability. All balances are checked daily using an in-house procedure. The weights used for testing are annually compared to master weights and are traceable to the National Institute of Standards and Technology (NIST).

4.3 **THERMOMETER CALIBRATION** - All thermometers are NIST traceable through thermometers that are calibrated by an A2LA accredited calibration laboratory.

4.4 **GLASSWARE CALIBRATION** - An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM's.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES IN µg/mL - N/A

6.0 INTENDED USE

For the calibration of analytical instruments including but not limited to the following:
HPLC, IC, TLC, ISE, IR, NMR, UV/VIS, MS, Capillary Electrophoresis, Potentiometry, Wet Chemistry and Voltammetry
For the validation of analytical methods
For the preparation of "working reference samples"
For interference studies and the determination of correction coefficients
For detection limit and linearity studies
For additional intended uses, contact Technical Staff

This CRM was manufactured using 18 megohm doubly deionized water that has been filtered through a 0.2 micron filter.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

Storage & Handling - Keep **Tightly** sealed when not in use. Store and use at 20 ± 4°C. **Do Not** pipette from the container. **Do Not** return portions removed from pipetting to container.

Element Specific Information - For specific information regarding any element: Contact technical staff.

Uranium Note: If uranium is present in this standard, it is natural abundance unless specified in Section 3.0.

HF Note: This standard should not be prepared or stored in glass.

8.0 HAZARDOUS INFORMATION - Please refer to the enclosed Material Safety Data sheet for information regarding this CRM.

9.0 HOMOGENEITY - This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration
- QMI File Number 010105

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration"
- Chemical Testing - Accredited A2LA Certificate Number 883.01

10.3 ISO/IEC Guide 34 "General Requirements for the Competence of Reference Material Producers"
- Reference Materials Production - Accredited A2LA Certificate Number 883.02

10.4 10CFR50 Appendix B - Nuclear Regulatory Commission
- Domestic Licensing of Production and Utilization Facilities

10.5 10CFR21 - Nuclear Regulatory Commission
- Reporting Defects and Non-Compliance

11.0 DATE OF CERTIFICATION AND PERIOD OF VALIDITY

11.1 Shelf Life - The period of time during which the concentration of the analyte(s) in a properly packaged, unopened, and unused standard stored under environmentally controlled and monitored conditions will remain within the specified uncertainty range. Shelf life is limited primarily by transpiration (loss of water from the solution) and infrequently, by chemical instability. Transpiration studies of chemically-stable solutions performed at the manufacturer's facility show a CRM shelf-life of twenty one months for solutions packaged in 125-mL low density polyethylene bottles. When stored under special conditions that minimize transpiration and instability, the shelf life can be extended past this limit.

11.2 Expiration Date - The date after which a CRM should not be used. Routine laboratory use of a CRM increases transpiration losses and the chance of contamination which affect the integrity of the CRM and limit its useful life. Manufacturer concurs with state and federal regulatory agencies' recommendations that solution standards be assigned a one-year expiration date.

11.3 Chemical Stability - Studies have been conducted on this or similar CRMs and it has been demonstrated that this CRM is chemically stable for a period of not less than two years provided the "Storage & Handling" conditions are followed that are described in section 7.0.

Certification Date: February 14, 2012

Expiration Date: EXPIRES 01 2013

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By:	Brenda Francis Product Documentation Technician	
Certificate Approved By:	Brian Alexander PhD., Quality Control Supervisor	
Certifying Officer:	Paul Gaines PhD., Senior Technical Director	

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #31735, Metals Minerals Secondary - Rec'd

STOCK STANDARD

Created By: DS1
Created: 06/11/2012 10:02
Expires: 07/01/2013

Volume of Standard: 250 mL
Manufacturer: Inorganic Ventures
Manufacturer Lot ID: F2-MEB410061

Lot ID: 402028
Part ID: PA-STD-3B
Standard ID: Metals SPK3

Notes: Metals Minerals Secondary - Rec'd 06/08/12

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4002c/402028_COA.pdf

Compound Name and Concentration for Standard #31735

Compound Name	Concentration	Compound Name	Concentration
Aluminum	2000 ug/mL	Potassium	2000 ug/mL
Calcium	2000 ug/mL	Magnesium	2000 ug/mL
Iron	2000 ug/mL	Sodium	2000 ug/mL

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 • USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

tel: 800.669.6799 • 540.585.3030
fax: 540.585.3012
info@inorganicventures.com

1.0 **INORGANIC VENTURES** is an ISO Guide 34 "General Requirements for the Competence of Reference Material Producers" and ISO 9001 registered manufacturer. Our manufacturing laboratory is accredited to ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories."

ACCREDITED Testing Laboratory Certificate 853.01 — ACCREDITED Reference Material Producer Certificate 853.02

2.0 **DESCRIPTION OF CRM** Custom Second Source Solution

Catalog No.: PA-STD-3B

Lot Number: **F2-MEB410061**

Matrix: 3% HNO3(v/v)

402020
REC.06/11/12 BY DS:
Exp. --/--/-- By _

H31735 Metals SPK3 STOCK
01-JUL-13
DESC: Metals Minerals Secondary
LOT NUMBER: 402020
MANUFACTURER: Inorganic Ventures
NOTES: Metals Minerals Secondary - Rec'd 06/08/12
CREATED: 11-JUN-12 BY: DS1
EXPIRES: 01-JUL-13 COMPOUND COUNT: 7

Second Source: Whenever possible, this solution was manufactured from a second set of concentrates in our manufacturing facility.

2,000 mg/L ea:
Al, Ca, Fe, K, Mg, Na

3.0 **CERTIFIED VALUES AND UNCERTAINTIES**

ELEMENT	CERTIFIED VALUE	ELEMENT	CERTIFIED VALUE	ELEMENT	CERTIFIED VALUE
Aluminum, Al	2,000 ± 10 mg/L	Calcium, Ca	2,000 ± 13 mg/L	Iron, Fe	2,000 ± 9 mg/L
Magnesium, Mg	2,000 ± 16 mg/L	Potassium, K	2,000 ± 13 mg/L	Sodium, Na	2,000 ± 11 mg/L

Certified Density: 1.062 g/mL (measured at 20 ± 1° C)

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

$$\text{Certified Value } (\bar{x}) = \frac{\sum x_i}{n}$$

$$\text{Uncertainty } (\pm) = \frac{2\,[(\sum s_i)^2]^{1/2}}{(n)^{1/2}}$$

$(\bar{x})$ = mean
x_i = individual results
n = number of measurements
$\sum s_i$ = The summation of all significant estimated errors (Most common are the errors from instrumental measurement, weighing, dilution to volume and the fixed error reported on the NIST SRM certificate of analysis)

4.0 **TRACEBILITY TO NIST AND VALUES OBTAINED BY INDEPENDENT METHODS**

- "Property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties." (ISO VIM, 2nd ed., 1993, definition 6.10)
- This product is Traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRMs are available, the term 'in-house std.' is specified.

4.1 ASSAY INFORMATION

ELEMENT	METHOD	NIST SRM#	SRM LOT#	ELEMENT	METHOD	NIST SRM#	SRM LOT#
Al	ICP Assay	3101a	060502	Al	EDTA	928	928
Ca	ICP Assay	3109a	050825	Ca	EDTA	928	928
Fe	ICP Assay	3126a	051031	Fe	EDTA	928	928
K	Gravimetric		See Sec. 4.2	K	ICP Assay	3141a	051220
Mg	ICP Assay	3131a	050302	Mg	EDTA	928	928
Na	Gravimetric		See Sec. 4.2	Na	ICP Assay	3152a	010728

4.2 **BALANCE CALIBRATION** - All analytical balances are calibrated yearly by an A2LA accredited calibration laboratory and are traceable to a class E 2 analytical weight set with NIST Traceability. All balances are checked daily using an in-house procedure. The weights used for testing are annually compared to master weights and are traceable to the National Institute of Standards and Technology (NIST).

4.3 **THERMOMETER CALIBRATION** - All thermometers are NIST traceable through thermometers that are calibrated by an A2LA accredited calibration laboratory.

4.4 **GLASSWARE CALIBRATION** - An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM's.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES IN µg/mL - N/A

6.0 INTENDED USE

For the calibration of analytical instruments including but not limited to the following:
HPLC, IC, TLC, ISE, IR, NMR, UV/VIS, MS, Capillary Electrophoresis, Potentiometry, Wet Chemistry and Voltammetry
For the validation of analytical methods
For the preparation of "working reference samples"
For interference studies and the determination of correction coefficients
For detection limit and linearity studies
For additional intended uses, contact Technical Staff

This CRM was manufactured using 18 megohm doubly deionized water that has been filtered through a 0.2 micron filter.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

Storage & Handling - Keep **Tightly** sealed when not in use. Store and use at 20 ± 4°C. **Do Not** pipette from the container. **Do Not** return portions removed from pipetting to container.

Element Specific Information - For specific information regarding any element: Contact technical staff.

Uranium Note: If uranium is present in this standard, it is natural abundance unless specified in Section 3.0.

8.0 HAZARDOUS INFORMATION - Please refer to the enclosed Material Safety Data sheet for information regarding this CRM.

9.0 HOMOGENEITY - This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration
- QMI File Number 010105

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration"
- Chemical Testing - Accredited A2LA Certificate Number 883.01

10.3 ISO/IEC Guide 34 "General Requirements for the Competence of Reference Material Producers"
- Reference Materials Production - Accredited A2LA Certificate Number 883.02

10.4 10CFR50 Appendix B - Nuclear Regulatory Commission
- Domestic Licensing of Production and Utilization Facilities

10.5 10CFR21 - Nuclear Regulatory Commission
- Reporting Defects and Non-Compliance

11.0 DATE OF CERTIFICATION AND PERIOD OF VALIDITY

11.1 Shelf Life - The period of time during which the concentration of the analyte(s) in a properly packaged, unopened, and unused standard stored under environmentally controlled and monitored conditions will remain within the specified uncertainty range. Shelf life is limited primarily by transpiration (loss of water from the solution) and infrequently, by chemical instability. Transpiration studies of chemically-stable solutions performed at the manufacturer's facility show a CRM shelf-life of twenty one months for solutions packaged in 125-mL low density polyethylene bottles. When stored under special conditions that minimize transpiration and instability, the shelf life can be extended past this limit.

11.2 Expiration Date - The date after which a CRM should not be used. Routine laboratory use of a CRM increases transpiration losses and the chance of contamination which affect the integrity of the CRM and limit its useful life. Manufacturer concurs with state and federal regulatory agencies' recommendations that solution standards be assigned a one-year expiration date.

11.3 Chemical Stability - Studies have been conducted on this or similar CRMs and it has been demonstrated that this CRM is chemically stable for a period of not less than two years provided the "Storage & Handling" conditions are followed that are described in section 7.0.

Certification Date: February 14, 2012

Expiration Date: EXPIRES 01 2013

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By:	Brenda Francis Product Documentation Technician	
Certificate Approved By:	Brian Alexander PhD., Quality Control Supervisor	
Certifying Officer:	Paul Gaines PhD., Senior Technical Director	

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #32145, Magnesium Stock Standard - Rec'd

STOCK STANDARD

Created By: DS1
Created: 06/15/2012 12:58
Expires: 03/31/2018

Volume of Standard: 125 mL
Manufacturer: Ultra SCientific
Manufacturer Lot ID: M00166

Lot ID: 402040
Part ID: ICP-112
Standard ID: Mg-STK

Notes: Magnesium Stock Standard - Rec'd 06/15/12

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4002c/402040_COA.pdf

Compound Name and Concentration for Standard #32145

Compound Name	Concentration	Compound Name	Concentration
Magnesium	10000 ug/mL		

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ULTRAgrade™ Solution
Magnesium ICP Standard
10000 µg/mL

402040
REC.06/16/12 BY DS.
Exp. __/__/__ By -
Open / / By

Catalog Number: ICP-112
Lot Number: M00166
Job Number: J00012563
Lot Issue Date: 02/21/2011
Expiration Date: 03/31/2018

Starting Material:	Magnesium Nitrate Hexahydrate
Starting Material Purity:	99.999%
Starting Material Lot No.:	BH01553, BH01565, BH01769
Matrix:	2% nitric acid in low TOC water (< 50 ppb)
Atomic Weight Mg:	24.31

Certified Value: 10002 ± 20 µg/mL

This Certified Reference Material (CRM) was manufactured and verified in accordance with ULTRA's ISO 9001 registered quality system. The analyte concentrations were verified by our ISO 17025 accredited laboratory to be within ± 2.5%, when compared to calibration standards independently prepared using NIST SRM(s). The certified value and uncertainty value at the 95% confidence level for each analyte is determined gravimetrically.

Classical Wet Assay Method: Theoretical, based on gravimetric measurements

Confirmation by Inductively Coupled Plasma Spectroscopy (ICP / ICP-MS) vs. NIST SRM 3131a

ULTRA uses purified acids, 18 megohm double deionized water, calibrated Class A glassware & meticulously cleaned bottles in the manufacturing of ULTRAgrade standards. Balances used in the manufacturing of this standard are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001.

Trace Metallic Impurities in Solution Standard in µg/mL:

*	Al	<0.005	ND	*	Ga	<0.005	ND	n	Nb			n	S		
*	Sb	<0.005	ND	n	Ge			n	Os			n	Ta		
*	As	<0.005	ND	n	Au			*	Pd	<0.005	ND	n	Te		
*	Ba	<0.005	ND	n	Hf			*	P	<0.005	ND	n	Tb		
*	Be	<0.005	ND	n	Ho			*	Pt	<0.005	ND	*	Tl	<0.005	ND
*	Bi	<0.005	ND	*	In	<0.005	ND	*	K	<0.010	D	n	Th		
*	B	<0.005	ND	n	Ir			n	Pr			n	Tm		
*	Cd	<0.005	ND	*	Fe	<0.005	ND	n	Re			*	Sn	<0.005	ND
*	Ca	<0.070	D	*	La	<0.005	ND	n	Rh			*	Ti	<0.005	ND
n	Ce			*	Pb	<0.005	ND	n	Rb			n	W		
n	Cs			*	Li	<0.005	ND	n	Ru			n	U		
*	Cr	<0.005	ND	n	Lu			n	Sm			*	V	<0.005	ND
*	Co	<0.005	ND	s	Mg			n	Sc			n	Yb		
*	Cu	<0.005	ND	*	Mn	<0.005	ND	*	Se	<0.005	ND	n	Y		
n	Dy			*	Hg	<0.005	ND	*	Si	<0.005	ND	*	Zn	<0.005	ND
*	Er	<0.005	ND	*	Mo	<0.005	ND	*	Ag	<0.005	ND	n	Zr		
*	Eu	<0.005	ND	n	Nd			*	Na	<0.010	D				
*	Gd	<0.005	ND	*	Ni	<0.005	ND	*	Sr	<0.005	ND				

* - element checked for
ND - not detected
i - spectral interference
D - detected
n - not checked for
s - solution standard element

Density of Solution (measured at 20.0°C ± 0.5°C): 1.054 g/mL

M32145 Mg-STK STOCK
31-MAR-18
DESC: Magnesium Stock Standard
LOT NUMBER: 402040
MANUFACTURER: Ultra Scientific
NOTES: Magnesium Stock Standard - Rec'd 06/15/12
CREATED: 15-JUN-12 BY: DS1
EXPIRES: 31-MAR-18 COMPOUND COUNT: 1

ACCREDITED

ISO 17025 Accredited A2LA Cert. No. 0851-01

ISO 9001 Registered TÜV USA, Inc. Cert. No. 09-1009

250 Smith Street, North Kingstown, RI 02852 USA
401-294-9400 Fax: 295-2330
www.ultrasci.com

William J. Leary
Quality Assurance Manager

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #33985, Mercury Stock Standard - Rec. 06/14/12,

STOCK STANDARD

Created By: CMS
Created: 07/13/2012 13:04
Expires: 12/08/2013

Volume of Standard: 125 mL
Manufacturer: High Purity
Manufacturer Lot ID: 1207328

Lot ID: 402090
Part ID: 100033-1
Standard ID: Hg-STK

Notes: Mercury Stock Standard - Rec. 06/14/12, Opened 07/13/12

Certificates of Analysis

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Compound Name and Concentration for Standard #33985

Compound Name	Concentration	Compound Name	Concentration
Mercury	1000 ug/mL		

HIGH-PURITY STANDARDS
www.highpuritystandards.com
P.O. Box 41727
Charleston, SC 29423
Phone: (843) 767-7900
Fax: (843) 767-7906

Certificate of Analysis

Product Description:

Name:	Mercury	Source Material:	Mercury Metal
Part Number:	**100033-1**	Material Purity:	99.9998%
Lot Number:	**1207328**	Matrix:	2% (v/v) HNO_3

Certified Value: 1000 µg/mL ± 6 µg/mL

The Certified value is based on gravimetric and volumetric preparation, and confirmed against SRM 3133 (lot number 061204) by inductively coupled plasma optical emission spectrometry (ICP-OES) using an internal laboratory-developed method. The uncertainty in the certified value is calculated for a 95% confidence interval and coverage factor *k* is about 2.

Density: 1.010 g/mL ± 0.002 g/mL @ 24.2°C

402090
REC. 07/13/12 BY CMS
EXP: --/--/-- BY --

Uncertified Values:

Trace Metal Impurity Scan: The data reported are based upon a scan of this specific lot at 1000 µg/mL via ICP analysis. The values are reported in µg/L.

Ag		na	Cu	<	0.2	Li	<	0.02	Rb	<	0.02	Th	<	0.02
Al	<	0.1	Dy	<	0.02	Lu	<	0.02	Re	<	0.02	Ti	<	0.02
As	<	0.05	Er	<	0.02	Mg	<	0.5	Rh	<	0.02	Tl	<	0.02
Au	<	0.02	Eu	<	0.02	Mn	<	0.1	Ru	<	0.02	Tm	<	0.02
B	<	1	Fe	<	1	Mo	<	0.02	Sb	<	0.02	U	<	0.1
Ba	<	0.1	Ga	<	0.02	Na	<	3	Sc	<	0.02	V	<	0.05
Be	<	0.02	Gd	<	0.02	Nb	<	0.02	Se	<	0.1	W	<	0.02
Bi	<	0.02	Ge	<	0.02	Nd	<	0.02	Si	<	50	Y	<	0.02
Ca	<	1	Hf	<	0.02	Ni	<	0.02	Sm	<	0.02	Yb	<	0.02
Cd	<	0.02	Ho	<	0.02	Os	<	0.02	Sn	<	1	Zn	<	0.5
Ce	<	0.02	In	<	0.02	Pb	<	0.05	Sr	<	0.02	Zr	<	0.02
Co	<	0.2	Ir	<	0.02	Pd	<	0.02	Ta	<	0.02	Hg		M
Cr	<	0.1	K	<	1	Pr	<	0.02	Tb	<	0.02			
Cs		na	La	<	0.02	Pt	<	0.02	Te	<	0.1	na - not analyzed		

Preparation Information:

The standard solution is prepared using high purity materials and assayed by analytical methods for conformity prior to use. This standard was prepared using the methods developed at NIST for SRM Spectrometric Standard Solutions under appropriate laboratory conditions.

Sub-boiling distilled high-purity acid has been used to place the materials in solution and to stabilize the standard. The matrix is as noted above in 18 megaohm deionized water.

Stability of this product is based upon rigorous short term and long term testing of the solution for the certified value. This testing includes, but is not limited to, the effect of temperature and packaging on the product.

Intended Use:

This Certified Reference Material (CRM) is intended for use as a calibration standard for the quantitative determination of mercury, calibration of instruments such as ICPOES, ICPMS, AAS and XRF, and validation of analytical methods. It also can be used in EPA, ASTM and other methods.

Traceability Information:

The traceability of this standard is maintained through an unbroken chain of comparisons to appropriate standards with suitable procedure and measurement uncertainties. The maintenance of the base and derived units of International System of Units (SI) with traceability of measurement results (contemporary metrology) to SI ensures their comparability over time as follows.

a. **Standard Weight and Analytical Balance**
The standard weights (NBS weights Inventory No 20231A) are calibrated every two years by South Carolina Metrology Laboratory that is a participant in "NIST Weights and Measures Measurement Assurance Program" with a certificate of measurement traceability to NIST primary standards.
The balances are calibrated yearly by the ISO 17025 accredited metrology service, and are verified weekly by an in-house method using standard weights.

b. **Volumetric Device**
The calibration of volumetric vessels is checked annually using the NBS 602 method.

c. **Thermometer**
The standard thermometers are calibrated every year by the ISO 17025 accredited metrology service. The thermometers used in-house are verified against the standard thermometers yearly.

d. **Calibration Standards:**
The Calibration Standard is directly traceable to SRM 3100 Series Spectrometric Standard Solutions.

Packaging and Storage Conditions:

The standard is packaged in a pre-cleaned polyethylene bottle. To maintain the integrity of this product, the solution should be kept tightly capped and stored under normal laboratory conditions.

Refer to Material Safety Datasheet (MSDS) for hazardous information.

Expiration Information:

The expiry date is guaranteed to be valid for eighteen months from the shipping date provided. For this reason, standards from the same lot may have different expiration dates.

Preparation Date:	**March 13, 2012**
Shipped Date:	**June 8, 2012**
Expiration Date:	**December 8, 2013**
Certificate Issue Date:	**March 22, 2012**

Quality Information:

ISO/IEC 17025:2005 Accreditation
Certificate Number AT-1529

ISO Guide 34:2009 (RMP) Accreditation
Certificate Number AR-1436

Vanny T. Yib,	**Kim-Phuong Tran**	**Theodore Rains, PhD**
Inorganic Laboratory Manager	**Quality Manager**	**President**

NOTICE: HPS products are intended for laboratory use only. All products should be handled and used by trained professional personnel. The responsibility for the safe handling and use of these products rests solely with the buyer and/or user. The data and information as stated was furnished by the manufacturer of the product. The information provided in this certificate pertains only to the lot number specified. None of the information provided in this certificate may be used, reproduced or transmitted in any form or by any means without written approval from High Purity Standards.

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #34289, Conc. Nitric Acid - Rec 07/18/12 MMZ

SOLVENT

Created By:	MMZ	**Volume of Standard:**	2500 mL	**Lot ID:**	402098
Created:	07/18/2012 13:52	**Manufacturer:**	SCP SCIENCE	**Part ID:**	250-037-171
Expires:	07/18/2014	**Manufacturer Lot ID:**	SCA2129885	**Standard ID:**	RGNT373

Notes: Conc. Nitric Acid - Rec 07/18/12 MMZ

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4002c/402098_COA.PDF

Compound Name and Concentration for Standard #34289

Compound Name	Concentration	Compound Name	Concentration
Nitric Acid			

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402098
REC. 07/10/12 BY MM
Exp. --/--/--

Certificate of Analysis

*Plasma*PURE

Nitric Acid (67 - 70% HNO_3)

Catalogue Number: 250-038-171 / 250-138-175

Lot Number: **SCA2129885**
Assay (HNO_3 w/w): **69%**
Colour (APHA): **< 10 (Specification: Max 10)**
Expiry Date: **February 2014**

Opened Bottle Expiry Information
15 months after opening, up to unopened expiration date

Date bottle opened

Analyte	Maximum Specification	Actual Value (in ppb)	Analyte	Maximum Specification	Actual Value (in ppb)
Aluminum (Al)	1 ppb	< 0.5	Neodymium (Nd)	0.1 ppb	< 0.1
Antimony (Sb)	0.5 ppb	< 0.1	Nickel (Ni)	0.5 ppb	< 0.5
Arsenic (As)	0.5 ppb	< 0.1	Niobium (Nb)	0.1 ppb	< 0.1
Barium (Ba)	0.1 ppb	< 0.1	Palladium (Pd)	0.5 ppb	< 0.1
Beryllium (Be)	0.1 ppb	< 0.1	Platinum (Pt)	0.5 ppb	< 0.1
Bismuth (Bi)	0.1 ppb	< 0.1	Potassium (K)	1 ppb	< 0.2
Boron (B)	1 ppb	< 0.5	Praseodymium (Pr)	0.1 ppb	< 0.1
Cadmium (Cd)	0.5 ppb	< 0.1	Rhenium (Re)	0.1 ppb	< 0.1
Calcium (Ca)	1 ppb	< 0.5	Rhodium (Rh)	0.5 ppb	< 0.1
Cerium (Ce)	0.1 ppb	< 0.1	Rubidium (Rb)	0.1 ppb	< 0.1
Cesium (Cs)	0.1 ppb	< 0.1	Ruthenium (Ru)	0.5 ppb	< 0.1
Chromium (Cr)	1 ppb	< 0.5	Samarium (Sm)	0.1 ppb	< 0.1
Cobalt (Co)	0.5 ppb	< 0.1	Scandium (Sc)	0.1 ppb	< 0.1
Copper (Cu)	0.5 ppb	< 0.2	Selenium (Se)	1 ppb	< 0.1
Dysprosium (Dy)	0.1 ppb	< 0.1	Silver (Ag)	0.1 ppb	< 0.1
Erbium (Er)	0.1 ppb	< 0.1	Sodium (Na)	1 ppb	< 0.5
Europium (Eu)	0.1 ppb	< 0.1	Strontium (Sr)	0.1 ppb	< 0.1
Gadolinium (Gd)	0.1 ppb	< 0.1	Tantalum (Ta)	Information Only	< 0.1
Gallium (Ga)	0.1 ppb	< 0.1	Tellurium (Te)	0.1 ppb	< 0.1
Germanium (Ge)	0.1 ppb	< 0.1	Terbium (Tb)	0.1 ppb	< 0.1
Gold (Au)	0.1 ppb	< 0.1	Thallium (Tl)	0.1 ppb	< 0.1
Hafnium (Hf)	0.1 ppb	< 0.1	Thorium (Th)	0.1 ppb	< 0.1
Holmium (Ho)	0.1 ppb	< 0.1	Thulium (Tm)	0.1 ppb	< 0.1
Indium (In)	0.1 ppb	< 0.1	Tin (Sn)	0.5 ppb	< 0.1
Iron (Fe)	1 ppb	< 0.5	Titanium (Ti)	0.5 ppb	< 0.1
Lanthanum (La)	0.1 ppb	< 0.1	Tungsten (W)	0.1 ppb	< 0.1
Lead (Pb)	0.1 ppb	< 0.1	Uranium (U)	0.1 ppb	< 0.1
Lithium (Li)	0.1 ppb	< 0.1	Vanadium (V)	0.5 ppb	< 0.1
Lutetium (Lu)	0.1 ppb	< 0.1	Ytterbium (Yb)	0.1 ppb	< 0.1
Magnesium (Mg)	1 ppb	< 0.2	Yttrium (Y)	0.1 ppb	< 0.1
Manganese (Mn)	0.1 ppb	< 0.1	Zinc (Zn)	0.5 ppb	< 0.2
Mercury (Hg)	0.1 ppb	< 0.02	Zirconium (Zr)	0.1 ppb	< 0.1
Molybdenum (Mo)	0.1 ppb	< 0.1			

Analyte	Maximum Specification	Actual Value (in ppm)	Analyte	Maximum Specification	Actual Value (in ppm)
Chloride (Cl^-)	0.2 ppm	< 0.2	Total Sulphur (S)	0.3 ppm	< 0.3
Total Phosphorus (P)	0.01 ppm	< 0.01			

Certified by: Daniel Boisvert
Daniel Boisvert, Chemist

Certification Date: **February 13, 2012**

To maintain product integrity and reduce the risk of trace metal contamination: the inner pack of plastic bags and bottle should be opened under CLASS 100 particle conditions to maintain the integrity of the product. The use of safety apparel, as well as eye protection, plastic gloves, hair net and a clean room suit is also advised. The Material Safety Data Sheet and this Certificate of Analysis are available on our web site. SCP SCIENCE is ISO 9001:2008 registered and ISO 17025 accredited (Également disponible en français).

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www.scpscience.com

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #34308, Conc. HCL - Rec 07/18/12 MMZ

SOLVENT

Created By: MMZ
Created: 07/18/2012 14:18
Expires: 07/18/2014

Volume of Standard: 2500 mL
Manufacturer: SCP SCIENCE
Manufacturer Lot ID: SCA2124881

Lot ID: 402100
Part ID: 250-038-151
Standard ID: RGNT153

Notes: Conc. HCL - Rec 07/18/12 MMZ

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4002c/402100_COA.PDF

Compound Name and Concentration for Standard #34308

Compound Name	Concentration	Compound Name	Concentration
Hydrochloric Acid			

SCP SCIENCE

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402100
REC.07/10/12 BY MMZ
Exp. __/__/__ By __

Certificate of Analysis

*Plasma*PURE — Hydrochloric Acid (34 - 37% HCl)

Catalogue Number: 250-038-151 / 250-038-155

Lot Number: **SCA2124881**
Assay (HCl w/w): 35%
Colour (APHA): **< 10 (Specification: Max 10)**
Expiry Date: **December 2014**

Opened Bottle Expiry Information
15 months after opening, up to unopened expiration date

_____
Date bottle opened

Analyte	Maximum Specification	Actual Value (in ppb)	Analyte	Maximum Specification	Actual Value (in ppb)
Aluminum (Al)	1 ppb	< 0.5	Neodymium (Nd)	0.1 ppb	< 0.1
Antimony (Sb)	0.5 ppb	< 0.1	Nickel (Ni)	0.5 ppb	< 0.1
Arsenic (As)	0.5 ppb	< 0.1	Niobium (Nb)	0.1 ppb	< 0.1
Barium (Ba)	0.1 ppb	< 0.1	Palladium (Pd)	Information Only	< 0.5
Beryllium (Be)	0.1 ppb	< 0.1	Platinum (Pt)	Information Only	< 0.5
Bismuth (Bi)	0.1 ppb	< 0.1	Potassium (K)	1 ppb	< 0.1
Boron (B)	1 ppb	< 0.5	Praseodymium (Pr)	0.1 ppb	< 0.1
Cadmium (Cd)	0.1 ppb	< 0.1	Rhenium (Re)	0.1 ppb	< 0.1
Calcium (Ca)	1 ppb	< 0.5	Rhodium (Rh)	0.1 ppb	< 0.1
Cerium (Ce)	0.1 ppb	< 0.1	Rubidium (Rb)	0.1 ppb	< 0.1
Cesium (Cs)	0.1 ppb	< 0.1	Ruthenium (Ru)	0.1 ppb	< 0.1
Chromium (Cr)	0.5 ppb	< 0.1	Samarium (Sm)	0.1 ppb	< 0.1
Cobalt (Co)	0.1 ppb	< 0.1	Scandium (Sc)	0.1 ppb	< 0.1
Copper (Cu)	0.5 ppb	< 0.1	Selenium (Se)	1 ppb	< 0.1
Dysprosium (Dy)	0.1 ppb	< 0.1	Silver (Ag)	1 ppb	< 0.1
Erbium (Er)	0.1 ppb	< 0.1	Sodium (Na)	1 ppb	< 0.5
Europium (Eu)	0.1 ppb	< 0.1	Strontium (Sr)	0.1 ppb	< 0.1
Gadolinium (Gd)	0.1 ppb	< 0.1	Tantalum (Ta)	Information Only	< 1
Gallium (Ga)	0.1 ppb	< 0.1	Tellurium (Te)	0.1 ppb	< 0.1
Gold (Au)	0.5 ppb	< 0.1	Terbium (Tb)	0.1 ppb	< 0.1
Hafnium (Hf)	0.1 ppb	< 0.1	Thallium (Tl)	0.1 ppb	< 0.1
Holmium (Ho)	0.1 ppb	< 0.1	Thorium (Th)	0.1 ppb	< 0.1
Indium (In)	0.1 ppb	< 0.1	Thulium (Tm)	0.1 ppb	< 0.1
Iron (Fe)	1 ppb	< 0.5	Tin (Sn)	0.5 ppb	< 0.1
Lanthanum (La)	0.1 ppb	< 0.1	Titanium (Ti)	0.5 ppb	< 0.1
Lead (Pb)	0.1 ppb	< 0.1	Tungsten (W)	0.1 ppb	< 0.1
Lithium (Li)	0.1 ppb	< 0.1	Uranium (U)	0.1 ppb	< 0.1
Lutetium (Lu)	0.1 ppb	< 0.1	Vanadium (V)	0.5 ppb	< 0.1
Magnesium (Mg)	0.5 ppb	< 0.5	Ytterbium (Yb)	0.1 ppb	< 0.1
Manganese (Mn)	0.1 ppb	< 0.1	Yttrium (Y)	0.1 ppb	< 0.1
Mercury (Hg)	0.1 ppb	< 0.02	Zinc (Zn)	1 ppb	< 0.5
Molybdenum (Mo)	0.1 ppb	< 0.1	Zirconium (Zr)	0.1 ppb	< 0.1

Analyte	Maximum Specification	Actual Value (in ppm)	Analyte	Maximum Specification	Actual Value (in ppm)
Bromide (Br^-)	10 ppm	< 10	Total Sulphur (S)	0.3 ppm	< 0.3
Total Phosphorus (P)	0.01 ppm	< 0.01	Free Chlorine (Cl_2)	0.5 ppm	< 0.5

Certified by: Daniel Boisvert
Daniel Boisvert, Chemist

Certification Date: **December 23, 2011**

To maintain product integrity and reduce the risk of trace metal contamination: the inner pack of plastic bags and bottle should be opened under CLASS 100 particle conditions to maintain the integrity of the product. The use of safety apparel, as well as eye protection, plastic gloves, hair net and a clean room suit is also advised. The Material Safety Data Sheet and this Certificate of Analysis are available on our web site. SCP SCIENCE is ISO 9001:2008 registered and ISO 17025 accredited (Également disponible en français).

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Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #34855, Metals SRM TORT-2 - Rec'd 07/25/12

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STOCK STANDARD

Created By: MMZ
Created: 07/25/2012 09:37
Expires: 07/25/2014

Volume of Standard:
Manufacturer: NRC CNRC
Manufacturer Lot ID: TORT-2

Lot ID: 402129
Part ID: TORT-2
Standard ID: SRM TORT-2

Notes: Metals SRM TORT-2 - Rec'd 07/25/12

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4002c/402129_COA.PDF

Compound Name and Concentration for Standard #34855

Compound Name	Concentration	Compound Name	Concentration
Arsenic	21.6 mg/kg	Mercury	.27 mg/kg
Calcium	26.7 mg/kg	Molybdenum	.95 mg/kg
Chromium	.77 mg/kg	Nickel	2.5 mg/kg
Cobalt	.51 mg/kg	Selenium	5.63 mg/kg
Copper	106 mg/kg	Strontium	45.2 mg/kg
Iron	105 mg/kg	Vanadium	1.64 mg/kg
Lead	.35 mg/kg	Zinc	180 mg/kg
Manganese	13.6 mg/kg		

National Research Council Canada | Conseil national de recherches Canada

402129
REC.07/25/12 BY NHZ
EXP. __/__/__ BY __

Certified Reference Material

TORT-2

Lobster Hepatopancreas Reference Material for Trace Metals

The following table lists those elements for which certified values have been established. Certified values and their uncertainties are reported as mass fractions (based on dry mass). The uncertainties represent 95% confidence limits for an individual subsample. That is, 95% of samples, 250 mg or greater, from any bottle would be expected to have concentrations within the specified range 95% of the time.

Trace Metal Mass Fractions (mg/kg)

Arsenic (g,h,m)	**21.6**	**±**	**1.8**
Cadmium (g,p)	**26.7**	**±**	**0.6**
Chromium (g,p)	**0.77**	**±**	**0.15**
Cobalt (g,m)	**0.51**	**±**	**0.09**
Copper (g,i,p)	**106**	**±**	**10**
Iron (g,i)	**105**	**±**	**13**
Lead (g,p)	**0.35**	**±**	**0.13**
Manganese (g,i,m)	**13.6**	**±**	**1.2**
Mercury (c,e)	**0.27**	**±**	**0.06**
Molybdenum (g,p)	**0.95**	**±**	**0.10**
Nickel (g,p)	**2.50**	**±**	**0.19**
Selenium (g,h,q)	**5.63**	**±**	**0.67**
Strontium (i,p)	**45.2**	**±**	**1.9**
Tin (p)	**(0.04)***		
Vanadium (g,i,m)	**1.64**	**±**	**0.19**
Zinc (g,i,p)	**180**	**±**	**6**
Methylmercury(as Hg) (e,t)	**0.152**	**±**	**0.013**

***information value only**

c - cold vapour atomic absorption spectrometry
e - cold vapour microwave induced plasma atomic emission spectrometry
g - graphite furnace atomicabsorption spectrometry (GFAAS)
h - hydride generation GFAAS
i - inductively coupled plasma atomic emission spectrometry
m- inductively coupled plasma mass spectrometry (ICPMS)
p - isotope dilution inductively coupled plasma mass spectrometry
q - isotope dilution hydride generation ICPMS
t - gas chromatography - electron capture detection

The coding refers only to the ultimate method of analyte determination. Methods of sample preparation or decomposition are available by request.

NRC · CNRC

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #36242, Hg Calibration Intermediate

WORKING STANDARD

Created By: DS1
Created: 08/14/2012 11:13
Expires: 02/14/2013

Volume of Standard: 100 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: Hg Cal Int

Notes: Hg Calibration Intermediate

Compound Name and Concentration for Standard #36242

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Nitric Acid	ug/L
Mercury	1000 ug/L		

Composed of Information for Standard #36242

Composed of Standard Seq	Notes	Volume	Units
33985	Mercury Stock Standard - Rec. 06/14/12,	0.1	mL
22391	Conc. Nitric Acid - Rec 06/10/11	3	mL
995	DI WATER	96.9	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #36269, Biota Spike Silver

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WORKING STANDARD

Created By: DS1
Created: 08/14/2012 13:14
Expires: 01/01/2013

Volume of Standard: 100 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: 6000-SPKB3

Notes: Biota Spike Silver

Compound Name and Concentration for Standard #36269

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Tin	10000 ug/L
Silicon	50000 ug/L	Zirconium	10000 ug/L
Boron	10000 ug/L	Silver	5000 ug/L
Molybdenum	10000 ug/L	Titanium	10000 ug/L
Antimony	10000 ug/L	Nitric Acid	ug/L

Composed of Information for Standard #36269

Composed of Standard Seq	Notes	Volume	Units
22391	Conc. Nitric Acid - Rec 06/10/11	10	mL
20870	Metals Trace2 Secondary - Rec'd 12/03/11	5	mL
995	DI WATER	85	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #37662, ICPMS Magnesium Tune Intermediate

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WORKING STANDARD

Created By: DS1
Created: 09/04/2012 08:41
Expires: 03/04/2013

Volume of Standard: 100 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: Mg Tune Int

Notes: ICPMS Magnesium Tune Intermediate

Compound Name and Concentration for Standard #37662

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Nitric Acid	ug/L
Magnesium	10000 ug/L		

Composed of Information for Standard #37662

Composed of Standard Seq	Notes	Volume	Units
34289	Conc. Nitric Acid - Rec 07/18/12 MMZ	3	mL
32145	Magnesium Stock Standard - Rec'd 06/15/1	0.1	mL
995	DI WATER	96.9	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #37663, ICPMS Tune Intermediate

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WORKING STANDARD

Created By: DS1
Created: 09/04/2012 08:44
Expires: 03/01/2013

Volume of Standard: 100 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: ICPM-TuneInt

Notes: ICPMS Tune Intermediate

Compound Name and Concentration for Standard #37663

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Uranium	1000 ug/L
Barium	1000 ug/L	Nitric Acid	ug/L
Boron	1000 ug/L	Scandium	1000 ug/L
Cerium	1000 ug/L	Bismuth	1000 ug/L
Lead	1000 ug/L	Germanium	1000 ug/L
Nickel	1000 ug/L	Indium	1000 ug/L
Beryllium	1000 ug/L	Terbium	1000 ug/L
Cobalt	1000 ug/L	Yttrium	1000 ug/L
Lithium	1000 ug/L	Magnesium	1000 ug/L

Composed of Information for Standard #37663

Composed of Standard Seq	Notes	Volume	Units
37662	ICPMS Magnesium Tune Intermediate	10	mL
34289	Conc. Nitric Acid - Rec 07/18/12 MMZ	2	mL
26596	Lithium Stock Standard Rec'd 3/16/12	0.01	mL
24683	ICPMS Internal Standard Stock - Rec 03/0	1	mL
24681	Scandium Primary Standard - Rec 03/16/11	1	mL
18040	Uranium Secondary Standard - Rec 10/26/2	0.1	mL
5183	Cobalt Stock Standard, Rec 09/10/10,Open	0.1	mL
4892	Beryllium Stock Standard - Rec 09/10/10,	0.1	mL
4891	Nickel Stock Standard - Rec 09/10/10, Op	0.1	mL
1285	Lead Stock Standard - Rec'd 2/26/10, Ope	0.1	mL
1270	Cerium Stock Standard - Rec'd 8/18/09, O	0.1	mL
1257	Boron Stock Standard - Rec'd 5/10/10, Op	0.1	mL
1256	Barium Stock Standard - Rec'd 12/20/09,	0.1	mL
995	DI WATER	85.19	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #37851, Gold Primary Standard - Rec 09/04/12

Pace Analytical®
www.pacelabs.com

STOCK STANDARD

Created By: DS1 **Volume of Standard:** 500 mL **Lot ID:** 402219

Created: 09/05/2012 16:02 **Manufacturer:** Inorganic Ventures **Part ID:** CGAU1-5

Expires: 10/01/2013 **Manufacturer Lot ID:** F2-AU04014 **Standard ID:** Au-STK

Notes: Gold Primary Standard - Rec 09/04/12

Certificates of Analysis

//Pace_tree/S40FILESERVER1_NFS.WISCONSIN.PACE/ereports/COA/4002c/402219_COA.PDF

Compound Name and Concentration for Standard #37851

Compound Name	Concentration	Compound Name	Concentration
Gold	1000 ug/mL		

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inorganicventures.com

CERTIFICATE OF ANALYSIS

tel: 800.669.6799 • 540.585.3030
fax: 540.585.3012
info@inorganicventures.com

402219

Rec. 9/4/12

402219
REC.09/05/12 BY DS
EXP: __/__/__ BY -

1.0 **INORGANIC VENTURES** is an ISO Guide 34 "General Requirements for the Competence of Reference Material Producers" and ISO 9001 registered manufacturer. Our manufacturing laboratory is accredited to ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories."

ACCREDITED Testing Laboratory Certificate 883.01

ACCREDITED Reference Material Producer Certificate 883.02

2.0 **DESCRIPTION OF CRM** **1000 µg/mL Gold in 10% (v/v) HCl**

Catalog Number:	CGAU1-1, CGAU1-2, and CGAU1-5
Lot Number:	**F2-AU04014**
Starting Material:	HAuCl4xH2O
Starting Material Purity (%):	99.9973
Starting Material Lot No:	1699
Matrix:	10% (v/v) HCl

H37851 Au-STK STOCK
01-OCT-13
DESC: Gold Primary Standard
LOT NUMBER: 402219
MANUFACTURER: Inorganic Ventures
NOTES: Gold Primary Standard Rec 09/04/12
CREATED: 05-SEP-12 BY: DS1
EXPIRES: 01-OCT-13 COMPOUND COUNT: 1

3.0 **CERTIFIED VALUES AND UNCERTAINTIES**

Certified Concentration: 1,001 ± 5 µg/mL - weighted mean

Certified Density: 1.017 g/mL (measured at 20 ± 1°C)

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Certified Value $(\bar{x}) = \frac{\sum x_i}{n}$

$(\bar{x})$ = mean
x_i = individual results
n = number of measurements

Uncertainty (±) $= 2\,[\,\Sigma(s_i)^2\,]^{1/2}$

2 = the coverage factor.
$[\,\Sigma(s_i)^2\,]^{1/2}$ = The square root of the sum of the squares of the most common errors (where 's' stands for the standard deviation) from instrumental measurement, density, NIST SRM uncertainty, weighing, dilution to volume, homogeneity, long term stability and short term stability.

4.0 **TRACEABILITY TO NIST AND VALUES OBTAINED BY INDEPENDENT METHODS**

· "Property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties." (ISO VIM, 2nd ed., 1993, definition 6.10)

· This product is Traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRMs are available, the term 'in-house std.' is specified.

4.1 Assay Method #1 **1,002 ± 3 µg/mL**
ICP Assay NIST SRM 3121 Lot Number: 991806

Assay Method #2 **1,000 ± 3 µg/mL**
Calculated NIST SRM Lot Number: See Sec. 4.2

4.2 **BALANCE CALIBRATION** - All analytical balances are calibrated yearly by an A2LA accredited calibration laboratory and are traceable to a class E 2 analytical weight set with NIST Traceability. All balances are checked daily using an in-house procedure. The weights used for testing are annually compared to master weights and are traceable to the National Institute of Standards and Technology (NIST).

4.3 **THERMOMETER CALIBRATION** - All thermometers are NIST traceable through thermometers that are calibrated by an A2LA accredited calibration laboratory.

4.4 **GLASSWARE CALIBRATION** - An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM's.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP/MS AND ICP-OES IN µg/mL

CRM's solutions are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

O	Al	0.002073	M	Dy	< 0.046350	O	Li	< 0.000020	M	Pr	< 0.002318	M	Te	< 0.231751
M	Sb	< 0.003863	M	Er	< 0.038625	M	Lu	< 0.003090	M	Re	< 0.007725	M	Tb	< 0.002318
O	As	< 0.020000	M	Eu	< 0.023175	O	Mg	0.001037	M	Rh	0.000400	M	Tl	< 0.007725
M	Ba	0.000170	M	Gd	< 0.007725	O	Mn	0.000130	M	Rb	< 0.007725	M	Th	< 0.007725
M	Be	< 0.003863	M	Ga	< 0.007725	O	Hg	< 0.012000	M	Ru	< 0.015450	M	Tm	< 0.003090
M	Bi	0.000100	M	Ge	< 0.046350	M	Mo	< 0.015450	M	Sm	< 0.007725	M	Sn	0.000701
M	B	0.002403	s	Au		M	Nd	< 0.015450	M	Sc	< 0.077250	M	Ti	< 0.386251
M	Cd	0.000250	M	Hf	< 0.015450	O	Ni	0.000467	O	Se	< 0.050000	M	W	< 0.077250
O	Ca	0.006738	M	Ho	< 0.003863	M	Nb	< 0.003863	O	Si	0.004536	M	U	< 0.015450
M	Ce	< 0.038625	M	In	< 0.077250	n	Os		M	Ag	0.025026	O	V	< 0.001000
M	Cs	< 0.002318	M	Ir	< 0.038625	O	Pd	0.000907	O	Na	0.004536	M	Yb	< 0.007725
O	Cr	0.000518	O	Fe	0.004276	O	P	< 0.040000	M	Sr	< 0.003863	M	Y	< 0.309001
M	Co	< 0.023175	M	La	< 0.003863	O	Pt	0.001555	O	S	< 0.025000	O	Zn	0.001296
M	Cu	0.000200	O	Pb	< 0.006500	O	K	< 0.001800	M	Ta	< 0.054075	M	Zr	< 0.038625

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

For the calibration of analytical instruments including but not limited to the following:
HPLC, IC, TLC, ISE, IR, NMR, UV/VIS, MS, Capillary Eletrophoresis, Potentiometry, Wet Chemistry and Voltammetry
For the validation of analytical methods
For the preparation of "working reference samples"
For interference studies and the determination of correction coefficients
For detection limit and linearity studies
For additional intended uses, contact Technical Staff

This CRM was manufactured using 18 megohm doubly deionized water that has been filtered through a 0.2 micron filter.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

Storage & Handling - Keep tightly sealed when not in use. Store and use at 20 ± 4°C. Do not pipet from container. Do not return portions removed for pipetting to container.

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 196.9665; +3; 6; Au(Cl)63-

Chemical Compatibility - Stable in HCl, and HNO3, as the chloride complex. **Avoid** basic media. Stable with most metals and inorganic anions in acidic media.

Stability - 2-100 ppb levels. 2-10 ppb Au is stable for #1day maximum in 1% HNO3 / LDPE container. 100 ppb is stable for #2 days maximum in 1% HNO3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 10% HCl / LDPE container.

Au Containing Samples (Preparation and Solution) - Metal (Aqua Regia); Oxides (Soluble in HCl); Ores (Dissolve in HCl / HNO3).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	Estimated D.L.	Order	Type	Interferences (underlined indicates severe)
ICP-OES 242.795 nm	0.02 / 0.003 µg/mL	1	atom	Mn, Os, Th, Ta, Pt Co, F,
ICP-OES 267.595 nm	0.03 / 0.003 µg/mL	1	atom	Nb, Ta, U, Cr, Th, Rh, Ru
ICP-OES 208.209 nm	0.04 / 0.01 µg/mL	1	ion	Ir, Re
ICP-MS 197 amu	5 ppt	n/a	M+	181Ta16O

Uranium Note: If uranium is present in this standard, it is natural abundance unless specified in Section 3.0.

8.0 HAZARDOUS INFORMATION - Please refer to the enclosed Material Safety Data sheet for information regarding this CRM.

9.0 HOMOGENEITY - This solution was mixed according to an in house procedure and is guaranteed to be homogeneous. Inorganic Ventures homogeneity data indicate that the end user should take a minimum sample size of 0.2mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration
- QMI File Number 010105

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration"
- Chemical Testing - Accredited A2LA Certificate Number 883.01

10.3 ISO/IEC Guide 34 "General Requirements for the Competence of Reference Material Producers"
- Reference Materials Production - Accredited A2LA Certificate Number 883.02

10.4 10CFR50 Appendix B - Nuclear Regulatory Commission
- Domestic Licensing of Production and Utilization Facilities

10.5 10CFR21 - Nuclear Regulatory Commission
- Reporting Defects and Non-Compliance

11.0 DATE OF CERTIFICATION AND PERIOD OF VALIDITY

11.1 Shelf Life - The period of time during which the concentration of the analyte(s) in a properly packaged, unopened, and unused standard stored under environmentally controlled and monitored conditions will remain within the specified uncertainty range. Shelf life is limited primarily by transpiration (loss of water from the solution) and infrequently, by chemical instability.

11.2 Expiration Date - The date after which a CRM should not be used. Routine laboratory use of a CRM increases transpiration losses and the chance of contamination which affect the integrity of the CRM and limit its useful life. Manufacturer concurs with state and federal regulatory agencies' recommendations that solution standards be assigned a one-year expiration date.

11.3 Chemical Stability - Studies have been conducted on this or similar CRMs and it has been demonstrated that this CRM is chemically stable for a period of not less than two years provided the "Storage & Handling" conditions are followed that are described in section 7.0.

Certification Date: June 19, 2012

Expiration Date: EXPIRES 01/2013

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By:	Stephan Blaakman Product Documentation Technician	
Certificate Approved By:	Beth Day Quality Assurance Specialist	
Certifying Officer:	Paul Gaines PhD., Senior Technical Director	

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #39298, 1:1 HNO3

WORKING STANDARD

Created By: MMZ
Created: 09/26/2012 10:06
Expires: 03/26/2013

Volume of Standard: 2400 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: RGNT014

Notes: 1:1 HNO3

Compound Name and Concentration for Standard #39298

Compound Name	Concentration	Compound Name	Concentration
Water		Nitric Acid	

Composed of Information for Standard #39298

Composed of Standard Seq	Notes	Volume	Units
34289	Conc. Nitric Acid - Rec 07/18/12 MMZ	1200	mL
995	DI WATER	1200	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #39311, ICPMS Tune Solution

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WORKING STANDARD

Created By: DS1
Created: 09/26/2012 10:59
Expires: 03/01/2013

Volume of Standard: 500 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: ICPM-Tune

Notes: ICPMS Tune Solution

Compound Name and Concentration for Standard #39311

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Lithium	10 ug/L
Nitric Acid	ug/L	Uranium	10 ug/L
Barium	10 ug/L	Scandium	10 ug/L
Boron	10 ug/L	Bismuth	10 ug/L
Cerium	10 ug/L	Germanium	10 ug/L
Lead	10 ug/L	Indium	10 ug/L
Nickel	10 ug/L	Terbium	10 ug/L
Beryllium	10 ug/L	Yttrium	10 ug/L
Cobalt	10 ug/L	Magnesium	10 ug/L

Composed of Information for Standard #39311

Composed of Standard Seq	Notes	Volume	Units
37663	ICPMS Tune Intermediate	5	mL
34289	Conc. Nitric Acid - Rec 07/18/12 MMZ	10	mL
995	DI WATER	485	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #39560, ICPMS Blank Water

WORKING STANDARD

Created By: DS1
Created: 10/01/2012 13:12
Expires: 04/01/2012

Volume of Standard: 1000 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: ICPM-BLKH2O

Notes: ICPMS Blank Water

Compound Name and Concentration for Standard #39560

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Hydrochloric Acid	ug/L
Nitric Acid	ug/L		

Composed of Information for Standard #39560

Composed of Standard Seq	Notes	Volume	Units
34289	Conc. Nitric Acid - Rec 07/18/12 MMZ	100	mL
22392	Conc. HCL - Rec 06/10/11	50	mL
995	DI WATER	850	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #39691, ICPMS X-Calibration Solution

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WORKING STANDARD

Created By: DS1
Created: 10/03/2012 11:46
Expires: 04/03/2013

Volume of Standard: 100 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: ICPM-XCal

Notes: ICPMS X-Calibration Solution

Compound Name and Concentration for Standard #39691

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Uranium	50 ug/L
Beryllium	50 ug/L	Cerium	50 ug/L
Boron	50 ug/L	Cesium	50 ug/L
Sodium	50 ug/L	Neodymium	50 ug/L
Magnesium	50 ug/L	Lithium	50 ug/L
Aluminum	50 ug/L	Strontium	50 ug/L
Potassium	50 ug/L	Indium	50 ug/L
Calcium	50 ug/L	Rubidium	50 ug/L
Vanadium	50 ug/L	Scandium	50 ug/L
Chromium	50 ug/L	Yttrium	50 ug/L
Iron	50 ug/L	Antimony	50 ug/L
Manganese	50 ug/L	Germanium	50 ug/L
Lanthanum	50 ug/L	Hafnium	50 ug/L
Cobalt	50 ug/L	Molybdenum	50 ug/L
Nickel	50 ug/L	Niobium-94	50 ug/L
Copper	50 ug/L	Silicon	50 ug/L
Zinc	50 ug/L	Silver	50 ug/L
Arsenic	50 ug/L	Tantalum	50 ug/L
Selenium	50 ug/L	Tellurium	50 ug/L
Cadmium	50 ug/L	Tin	50 ug/L
Barium	50 ug/L	Titanium	50 ug/L
Thallium	50 ug/L	Zirconium	50 ug/L
Lead	50 ug/L	Nitric Acid	ug/L
Bismuth	50 ug/L	Hydrochloric Acid	ug/L

Composed of Information for Standard #39691

Composed of Standard Seq	Notes	Volume	Units
34308	Conc. HCL - Rec 07/18/12 MMZ	5	mL
34289	Conc. Nitric Acid - Rec 07/18/12 MMZ	10	mL
29180	ICPMS X-Cal Stock Standard 2 - Rec'd 4/2	0.5	mL
29179	ICPMS X-Cal Stock Standard 1 - Rec'd 4/2	0.5	mL
995	DI WATER	84	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #39693, ICPMS ICV

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WORKING STANDARD

Created By: DS1
Created: 10/03/2012 12:45
Expires: 11/10/2012

Volume of Standard: 200 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: 6020-ICV

Notes: ICPMS ICV

Compound Name and Concentration for Standard #39693

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Manganese	110 ug/L
Phosphorus	5500 ug/L	Nickel	110 ug/L
Silicon	5500 ug/L	Lead	110 ug/L
Aluminum	5500 ug/L	Selenium	110 ug/L
Calcium	5500 ug/L	Strontium	110 ug/L
Iron	5500 ug/L	Thallium	110 ug/L
Potassium	5500 ug/L	Vanadium	110 ug/L
Magnesium	5500 ug/L	Zinc	110 ug/L
Sodium	5500 ug/L	Boron	110 ug/L
Uranium	110 ug/L	Molybdenum	110 ug/L
Arsenic	110 ug/L	Antimony	110 ug/L
Barium	110 ug/L	Tin	110 ug/L
Beryllium	110 ug/L	Zirconium	110 ug/L
Cadmium	110 ug/L	Silver	55 ug/L
Cobalt	110 ug/L	Titanium	110 ug/L
Chromium	110 ug/L	Hydrochloric Acid	ug/L
Copper	110 ug/L	Nitric Acid	ug/L
Lithium	110 ug/L	Mercury	4 ug/L

Composed of Information for Standard #39693

Composed of Standard Seq	Notes	Volume	Units
34308	Conc. HCL - Rec 07/18/12 MMZ	10	mL
34289	Conc. Nitric Acid - Rec 07/18/12 MMZ	20	mL
31735	Metals Minerals Secondary - Rec'd 06/08/	0.55	mL
31734	Metals Trace2 Secondary - Rec'd 06/08/12	0.11	mL
31733	Metals Trace Secondary - Rec'd 6/08/12	0.11	mL
29998	Mercury ICV Int	0.08	mL
18040	Uranium Secondary Standard - Rec 10/26/2	0.022	mL
1295	Silicon Secondary Stock Standard - Rec 0	0.99	mL
1287	Phosphorus Secondary Standard - Rec 2/4/	1.078	mL
995	DI WATER	166.994	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #39694, ICPMS Mineral Cal. Int

WORKING STANDARD

Created By: DS1
Created: 10/03/2012 13:05
Expires: 03/15/2013

Volume of Standard: 100 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: M Cal Int

Notes: ICPMS Mineral Cal. Int

Compound Name and Concentration for Standard #39694

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Iron	500000 ug/L
Nitric Acid	ug/L	Potassium	500000 ug/L
Aluminum	500000 ug/L	Magnesium	500000 ug/L
Calcium	500000 ug/L	Sodium	500000 ug/L

Composed of Information for Standard #39694

Composed of Standard Seq	Notes	Volume	Units
34289	Conc. Nitric Acid - Rec 07/18/12 MMZ	3	mL
26667	Metals Mineral Primary Standard, Rec 03/	50	mL
995	DI WATER	47	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #39695, ICPMS Trace Cal Int

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WORKING STANDARD

Created By: DS1
Created: 10/03/2012 13:12
Expires: 03/15/2013

Volume of Standard: 200 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: T Cal Int

Notes: ICPMS Trace Cal Int

Compound Name and Concentration for Standard #39695

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Strontium	1250 ug/L
Phosphorus	62500 ug/L	Thallium	1250 ug/L
Hydrochloric Acid	ug/L	Vanadium	1250 ug/L
Arsenic	1250 ug/L	Zinc	1250 ug/L
Barium	1250 ug/L	Silicon	62500 ug/L
Beryllium	1250 ug/L	Boron	1250 ug/L
Cadmium	1250 ug/L	Molybdenum	1250 ug/L
Cobalt	1250 ug/L	Antimony	1250 ug/L
Chromium	1250 ug/L	Tin	1250 ug/L
Copper	1250 ug/L	Zirconium	1250 ug/L
Lithium	1250 ug/L	Silver	625 ug/L
Manganese	1250 ug/L	Titanium	1250 ug/L
Nickel	1250 ug/L	Uranium	1250 ug/L
Lead	1250 ug/L	Nitric Acid	ug/L
Selenium	1250 ug/L		

Composed of Information for Standard #39695

Composed of Standard Seq	Notes	Volume	Units
34308	Conc. HCL - Rec 07/18/12 MMZ	10	mL
34289	Conc. Nitric Acid - Rec 07/18/12 MMZ	20	mL
30949	Silicon Primary Standard - Rec 05/25/12	11.25	mL
30948	Uranium Stock STandard - Rec'd 5/25/12,	0.25	mL
26666	Metals Trace2 Primary Standard - Rec'd 3	2.5	mL
26665	Metals Trace Primary Standard - Rec'd 3/	2.5	mL
7079	Phosphorus Primary Standard - Rec 5/12/1	1.225	mL
995	DI WATER	152.275	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #39698, 6020 ICSA

WORKING STANDARD

Created By: DS1
Created: 10/03/2012 13:33
Expires: 02/14/2013

Volume of Standard: 100 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: 6020-ICSA

Notes: 6020 ICSA

Compound Name and Concentration for Standard #39698

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Molybdenum	1000 ug/L
Hydrochloric Acid	ug/L	Titanium	1000 ug/L
Sodium	50000 ug/L	Phosphorus	50000 ug/L
Magnesium	50000 ug/L	Sulfur	50000 ug/L
Aluminum	50000 ug/L	Chloride	360000 ug/L
Potassium	50000 ug/L	Carbon	100000 ug/L
Calcium	50000 ug/L	Nitric Acid	ug/L
Iron	50000 ug/L		

Composed of Information for Standard #39698

Composed of Standard Seq	Notes	Volume	Units
34308	Conc. HCL - Rec 07/18/12 MMZ	5	mL
34289	Conc. Nitric Acid - Rec 07/18/12 MMZ	10	mL
24685	ICSA, ICSAB Stock Standard - Rec 08/04/1	10	mL
995	DI WATER	75	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #39699, 6020 ICSAB

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WORKING STANDARD

Created By: DS1
Created: 10/03/2012 13:33
Expires: 02/14/2013

Volume of Standard: 100 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: 6020-ICSAB

Notes: 6020 ICSAB

Compound Name and Concentration for Standard #39699

Compound Name	Concentration	Compound Name	Concentration
Water	ug/mL	Cobalt	.1 ug/mL
Hydrochloric Acid	ug/mL	Chromium	.1 ug/mL
Sodium	50 ug/mL	Copper	.1 ug/mL
Magnesium	50 ug/mL	Lithium	.1 ug/mL
Aluminum	50 ug/mL	Manganese	.1 ug/mL
Potassium	50 ug/mL	Nickel	.1 ug/mL
Calcium	50 ug/mL	Lead	.1 ug/mL
Iron	50 ug/mL	Selenium	.1 ug/mL
Molybdenum	1.1 ug/mL	Strontium	.1 ug/mL
Titanium	1.1 ug/mL	Thallium	.1 ug/mL
Phosphorus	55 ug/mL	Vanadium	.1 ug/mL
Sulfur	50 ug/mL	Zinc	.1 ug/mL
Chloride	360 ug/mL	Silicon	5 ug/mL
Carbon	100 ug/mL	Boron	.1 ug/mL
Nitric Acid	ug/mL	Antimony	.1 ug/mL
Mercury	.005 ug/mL	Tin	.1 ug/mL
Arsenic	.1 ug/mL	Zirconium	.1 ug/mL
Barium	.1 ug/mL	Silver	.05 ug/mL
Beryllium	.1 ug/mL	Uranium	.1 ug/mL
Cadmium	.1 ug/mL		

Composed of Information for Standard #39699

Composed of Standard Seq	Notes	Volume	Units
39695	ICPMS Trace Cal Int	8	mL
36242	Hg Calibration Intermediate	0.5	mL
34308	Conc. HCL - Rec 07/18/12 MMZ	5	mL
34289	Conc. Nitric Acid - Rec 07/18/12 MMZ	10	mL
24685	ICSA, ICSAB Stock Standard - Rec 08/04/1	10	mL
995	DI WATER	66.5	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #39700, ICPMS Biota Spike **Made 05/04/2012**

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WORKING STANDARD

Created By: DS1 **Volume of Standard:** 100 mL **Lot ID:** NA

Created: 10/03/2012 13:44 **Manufacturer:** N/A **Part ID:** N/A

Expires: 12/01/2012 **Manufacturer Lot ID:** N/A **Standard ID:** 6000-SPKB

Notes: ICPMS Biota Spike Made 05/04/2012 MMZ

Compound Name and Concentration for Standard #39700

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Cobalt	10000 ug/L
Phosphorus	1000000 ug/L	Chromium	10000 ug/L
Aluminum	500000 ug/L	Copper	10000 ug/L
Calcium	500000 ug/L	Lithium	10000 ug/L
Iron	500000 ug/L	Manganese	10000 ug/L
Potassium	2000000 ug/L	Nickel	10000 ug/L
Magnesium	500000 ug/L	Lead	10000 ug/L
Sodium	500000 ug/L	Selenium	10000 ug/L
Uranium	10000 ug/L	Strontium	10000 ug/L
Mercury	250 ug/L	Thallium	10000 ug/L
Arsenic	10000 ug/L	Vanadium	10000 ug/L
Barium	10000 ug/L	Zinc	10000 ug/L
Beryllium	10000 ug/L	Nitric Acid	ug/L
Cadmium	10000 ug/L		

Composed of Information for Standard #39700

Composed of Standard Seq	Notes	Volume	Units
31735	Metals Minerals Secondary - Rec'd 06/08/	25	mL
31733	Metals Trace Secondary - Rec'd 6/08/12	5	mL
29588	Potassium Stock Standard - Rec 01/21/11,	15	mL
22391	Conc. Nitric Acid - Rec 06/10/11	6	mL
19251	Rec 11/15/11, Opened 11/17/11	0.025	mL
18040	Uranium Secondary Standard - Rec 10/26/2	1	mL
5659	Phosphorus Secondary Standard - Rec 03/0	9.9	mL
995	DI WATER	38.075	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #39995, ICPMS Internal Standard Solution

WORKING STANDARD

Created By: DS1
Created: 10/08/2012 14:11
Expires: 03/01/2013

Volume of Standard: 2000 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: ICPM-IS

Notes: ICPMS Internal Standard Solution

Compound Name and Concentration for Standard #39995

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Indium	100 ug/L
Hydrochloric Acid	ug/L	Terbium	100 ug/L
Scandium	100 ug/L	Yttrium	100 ug/L
Bismuth	100 ug/L	Nitric Acid	ug/L
Germanium	100 ug/L	Gold	2000 ug/L

Composed of Information for Standard #39995

Composed of Standard Seq	Notes	Volume	Units
37851	Gold Primary Standard - Rec 09/04/12	4	mL
34308	Conc. HCL - Rec 07/18/12 MMZ	100	mL
34289	Conc. Nitric Acid - Rec 07/18/12 MMZ	200	mL
24684	ICPMS Internal Standard Stock - Rec 03/0	2	mL
24682	Scandium Primary Standard - Rec 03/16/11	2	mL
995	DI WATER	1692	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #39996, 6020-CAL0 ICPM

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WORKING STANDARD

Created By: DS1
Created: 10/08/2012 14:11
Expires: 10/11/2012

Volume of Standard: 150 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: 6020-CAL0

Notes: 6020-CAL0 ICPM

Compound Name and Concentration for Standard #39996

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Lithium	0 ug/L
Mercury	0 ug/L	Manganese	0 ug/L
Nitric Acid	ug/L	Nickel	0 ug/L
Aluminum	0 ug/L	Lead	0 ug/L
Calcium	0 ug/L	Selenium	0 ug/L
Iron	0 ug/L	Strontium	0 ug/L
Potassium	0 ug/L	Thallium	0 ug/L
Magnesium	0 ug/L	Vanadium	0 ug/L
Sodium	0 ug/L	Zinc	0 ug/L
Phosphorus	0 ug/L	Silicon	0 ug/L
Hydrochloric Acid	ug/L	Boron	0 ug/L
Arsenic	0 ug/L	Molybdenum	0 ug/L
Barium	0 ug/L	Antimony	0 ug/L
Beryllium	0 ug/L	Tin	0 ug/L
Cadmium	0 ug/L	Zirconium	0 ug/L
Cobalt	0 ug/L	Silver	0 ug/L
Chromium	0 ug/L	Titanium	0 ug/L
Copper	0 ug/L	Uranium	0 ug/L

Composed of Information for Standard #39996

Composed of Standard Seq	Notes	Volume	Units
39695	ICPMS Trace Cal Int	0	mL
39694	ICPMS Mineral Cal. Int	0	mL
36242	Hg Calibration Intermediate	0	mL
34289	Conc. Nitric Acid - Rec 07/18/12 MMZ	15	mL
22392	Conc. HCL - Rec 06/10/11	7.5	mL
995	DI WATER	127.5	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #39997, 6020-CAL1 ICPM

WORKING STANDARD

Created By: DS1
Created: 10/08/2012 14:11
Expires: 10/11/2012

Volume of Standard: 50 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: 6020-CAL1

Notes: 6020-CAL1 ICPM

Compound Name and Concentration for Standard #39997

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Lithium	1 ug/L
Mercury	.2 ug/L	Manganese	1 ug/L
Nitric Acid	ug/L	Nickel	1 ug/L
Aluminum	250 ug/L	Lead	1 ug/L
Calcium	250 ug/L	Selenium	1 ug/L
Iron	250 ug/L	Strontium	1 ug/L
Potassium	250 ug/L	Thallium	1 ug/L
Magnesium	250 ug/L	Vanadium	1 ug/L
Sodium	250 ug/L	Zinc	1 ug/L
Phosphorus	50 ug/L	Silicon	50 ug/L
Hydrochloric Acid	ug/L	Boron	1 ug/L
Arsenic	1 ug/L	Molybdenum	1 ug/L
Barium	1 ug/L	Antimony	1 ug/L
Beryllium	1 ug/L	Tin	1 ug/L
Cadmium	1 ug/L	Zirconium	1 ug/L
Cobalt	1 ug/L	Silver	.5 ug/L
Chromium	1 ug/L	Titanium	1 ug/L
Copper	1 ug/L	Uranium	1 ug/L

Composed of Information for Standard #39997

Composed of Standard Seq	Notes	Volume	Units
39695	ICPMS Trace Cal Int	0.04	mL
39694	ICPMS Mineral Cal. Int	0.025	mL
36242	Hg Calibration Intermediate	0.01	mL
34289	Conc. Nitric Acid - Rec 07/18/12 MMZ	5	mL
22392	Conc. HCL - Rec 06/10/11	2.5	mL
995	DI WATER	42.425	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #39998, 6020-CAL2 ICPM

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WORKING STANDARD

Created By: DS1
Created: 10/08/2012 14:11
Expires: 10/11/2012

Volume of Standard: 50 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: 6020-CAL2

Notes: 6020-CAL2 ICPM

Compound Name and Concentration for Standard #39998

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Lithium	5 ug/L
Mercury	.5 ug/L	Manganese	5 ug/L
Nitric Acid	ug/L	Nickel	5 ug/L
Aluminum	500 ug/L	Lead	5 ug/L
Calcium	500 ug/L	Selenium	5 ug/L
Iron	500 ug/L	Strontium	5 ug/L
Potassium	500 ug/L	Thallium	5 ug/L
Magnesium	500 ug/L	Vanadium	5 ug/L
Sodium	500 ug/L	Zinc	5 ug/L
Phosphorus	250 ug/L	Silicon	250 ug/L
Hydrochloric Acid	ug/L	Boron	5 ug/L
Arsenic	5 ug/L	Molybdenum	5 ug/L
Barium	5 ug/L	Antimony	5 ug/L
Beryllium	5 ug/L	Tin	5 ug/L
Cadmium	5 ug/L	Zirconium	5 ug/L
Cobalt	5 ug/L	Silver	2.5 ug/L
Chromium	5 ug/L	Titanium	5 ug/L
Copper	5 ug/L	Uranium	5 ug/L

Composed of Information for Standard #39998

Composed of Standard Seq	Notes	Volume	Units
39695	ICPMS Trace Cal Int	0.2	mL
39694	ICPMS Mineral Cal. Int	0.05	mL
36242	Hg Calibration Intermediate	0.025	mL
34289	Conc. Nitric Acid - Rec 07/18/12 MMZ	5	mL
22392	Conc. HCL - Rec 06/10/11	2.5	mL
995	DI WATER	42.225	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #39999, 6020-CAL3 ICPM

WORKING STANDARD

Created By: DS1
Created: 10/08/2012 14:11
Expires: 10/11/2012

Volume of Standard: 50 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: 6020-CAL3

Notes: 6020-CAL3 ICPM

Compound Name and Concentration for Standard #39999

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Lithium	50 ug/L
Mercury	1 ug/L	Manganese	50 ug/L
Nitric Acid	ug/L	Nickel	50 ug/L
Aluminum	2500 ug/L	Lead	50 ug/L
Calcium	2500 ug/L	Selenium	50 ug/L
Iron	2500 ug/L	Strontium	50 ug/L
Potassium	2500 ug/L	Thallium	50 ug/L
Magnesium	2500 ug/L	Vanadium	50 ug/L
Sodium	2500 ug/L	Zinc	50 ug/L
Phosphorus	2500 ug/L	Silicon	2500 ug/L
Hydrochloric Acid	ug/L	Boron	50 ug/L
Arsenic	50 ug/L	Molybdenum	50 ug/L
Barium	50 ug/L	Antimony	50 ug/L
Beryllium	50 ug/L	Tin	50 ug/L
Cadmium	50 ug/L	Zirconium	50 ug/L
Cobalt	50 ug/L	Silver	25 ug/L
Chromium	50 ug/L	Titanium	50 ug/L
Copper	50 ug/L	Uranium	50 ug/L

Composed of Information for Standard #39999

Composed of Standard Seq	Notes	Volume	Units
39695	ICPMS Trace Cal Int	2	mL
39694	ICPMS Mineral Cal. Int	0.25	mL
36242	Hg Calibration Intermediate	0.05	mL
34289	Conc. Nitric Acid - Rec 07/18/12 MMZ	5	mL
22392	Conc. HCL - Rec 06/10/11	2.5	mL
995	DI WATER	40.2	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #40000, 6020-CAL4 ICPM

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WORKING STANDARD

Created By: DS1
Created: 10/08/2012 14:11
Expires: 10/11/2012

Volume of Standard: 50 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: 6020-CAL4

Notes: 6020-CAL4 ICPM

Compound Name and Concentration for Standard #40000

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Lithium	250 ug/L
Mercury	10 ug/L	Manganese	250 ug/L
Nitric Acid	ug/L	Nickel	250 ug/L
Aluminum	12500 ug/L	Lead	250 ug/L
Calcium	12500 ug/L	Selenium	250 ug/L
Iron	12500 ug/L	Strontium	250 ug/L
Potassium	12500 ug/L	Thallium	250 ug/L
Magnesium	12500 ug/L	Vanadium	250 ug/L
Sodium	12500 ug/L	Zinc	250 ug/L
Phosphorus	12500 ug/L	Silicon	12500 ug/L
Hydrochloric Acid	ug/L	Boron	250 ug/L
Arsenic	250 ug/L	Molybdenum	250 ug/L
Barium	250 ug/L	Antimony	250 ug/L
Beryllium	250 ug/L	Tin	250 ug/L
Cadmium	250 ug/L	Zirconium	250 ug/L
Cobalt	250 ug/L	Silver	125 ug/L
Chromium	250 ug/L	Titanium	250 ug/L
Copper	250 ug/L	Uranium	250 ug/L

Composed of Information for Standard #40000

Composed of Standard Seq	Notes	Volume	Units
39695	ICPMS Trace Cal Int	10	mL
39694	ICPMS Mineral Cal. Int	1.25	mL
36242	Hg Calibration Intermediate	0.5	mL
34289	Conc. Nitric Acid - Rec 07/18/12 MMZ	5	mL
22392	Conc. HCL - Rec 06/10/11	2.5	mL
995	DI WATER	30.75	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #40001, 6020-CAL5 ICPM

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WORKING STANDARD

Created By: DS1
Created: 10/08/2012 14:11
Expires: 10/11/2012

Volume of Standard: 50 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: 6020-CAL5

Notes: 6020-CAL5 ICPM

Compound Name and Concentration for Standard #40001

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Lithium	500 ug/L
Mercury	25 ug/L	Manganese	500 ug/L
Nitric Acid	ug/L	Nickel	500 ug/L
Aluminum	25000 ug/L	Lead	500 ug/L
Calcium	25000 ug/L	Selenium	500 ug/L
Iron	25000 ug/L	Strontium	500 ug/L
Potassium	25000 ug/L	Thallium	500 ug/L
Magnesium	25000 ug/L	Vanadium	500 ug/L
Sodium	25000 ug/L	Zinc	500 ug/L
Phosphorus	25000 ug/L	Silicon	25000 ug/L
Hydrochloric Acid	ug/L	Boron	500 ug/L
Arsenic	500 ug/L	Molybdenum	500 ug/L
Barium	500 ug/L	Antimony	500 ug/L
Beryllium	500 ug/L	Tin	500 ug/L
Cadmium	500 ug/L	Zirconium	500 ug/L
Cobalt	500 ug/L	Silver	250 ug/L
Chromium	500 ug/L	Titanium	500 ug/L
Copper	500 ug/L	Uranium	500 ug/L

Composed of Information for Standard #40001

Composed of Standard Seq	Notes	Volume	Units
39695	ICPMS Trace Cal Int	20	mL
39694	ICPMS Mineral Cal. Int	2.5	mL
36242	Hg Calibration Intermediate	1.25	mL
34289	Conc. Nitric Acid - Rec 07/18/12 MMZ	5	mL
22392	Conc. HCL - Rec 06/10/11	2.5	mL
995	DI WATER	18.75	mL

Standard Log

PASI Green Bay Laboratory

Standards Log Information for Standard #40002, 6020-CCV ICPM

WORKING STANDARD

Created By: DS1
Created: 10/08/2012 14:11
Expires: 10/11/2012

Volume of Standard: 100 mL
Manufacturer: N/A
Manufacturer Lot ID: N/A

Lot ID: NA
Part ID: N/A
Standard ID: 6020-CCV

Notes: 6020-CCV ICPM

Compound Name and Concentration for Standard #40002

Compound Name	Concentration	Compound Name	Concentration
Water	ug/L	Lithium	100 ug/L
Mercury	5 ug/L	Manganese	100 ug/L
Nitric Acid	ug/L	Nickel	100 ug/L
Aluminum	5000 ug/L	Lead	100 ug/L
Calcium	5000 ug/L	Selenium	100 ug/L
Iron	5000 ug/L	Strontium	100 ug/L
Potassium	5000 ug/L	Thallium	100 ug/L
Magnesium	5000 ug/L	Vanadium	100 ug/L
Sodium	5000 ug/L	Zinc	100 ug/L
Phosphorus	5000 ug/L	Silicon	5000 ug/L
Hydrochloric Acid	ug/L	Boron	100 ug/L
Arsenic	100 ug/L	Molybdenum	100 ug/L
Barium	100 ug/L	Antimony	100 ug/L
Beryllium	100 ug/L	Tin	100 ug/L
Cadmium	100 ug/L	Zirconium	100 ug/L
Cobalt	100 ug/L	Silver	50 ug/L
Chromium	100 ug/L	Titanium	100 ug/L
Copper	100 ug/L	Uranium	100 ug/L

Composed of Information for Standard #40002

Composed of Standard Seq	Notes	Volume	Units
39695	ICPMS Trace Cal Int	8	mL
39694	ICPMS Mineral Cal. Int	1	mL
36242	Hg Calibration Intermediate	0.5	mL
34289	Conc. Nitric Acid - Rec 07/18/12 MMZ	10	mL
22392	Conc. HCL - Rec 06/10/11	5	mL
995	DI WATER	75.5	mL