IAEA/AQ/7

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Worldwide Open Proficiency Test IAEA-CU-2007-09/A: Determination of Po-210 in Water

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International Atomic Energy Agency

Worldwide Open Proficiency Test
IAEA-CU-2007-09/A
Determination of Po-210 in Water

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FOREWORD

The IAEA helps the Member States' laboratories to maintain their readiness by coordination activities, by development of standardized methods for sample collection and analysis, and by conducting interlaboratory comparisons and proficiency tests as a tool for external quality control.

The Chemistry Unit of the Physics, Chemistry and Instrumentation Laboratory in the International Atomic Energy Agency's Seibersdorf Laboratories in Austria, has the programmatic responsibility to support global radionuclide measurement systems. To fulfil this obligation and ensure a reliable worldwide, rapid and consistent response, the Chemistry Unit organises interlaboratory studies and proficiency tests.

The Po-210 poisoning event which occurred in November 2006 brought into focus a number of issues, including the capacity of laboratories to rapidly and accurately determine this radionuclide in environmental samples. A number of requests were received from Member States to address this issue. Responding to these requests, the Chemistry Unit of the Physics, Chemistry and Instrumentation Laboratory in the Agency's Laboratories, conducted a world wide proficiency test on the determination of Po-210 in water. The aim was to gather information on the current state of practice for Po-210 measurements at various levels in aqueous samples. This report describes the methodology employed and the results obtained in this proficiency test.

The IAEA officer responsible for this publication is A. Shakhashiro of the Agency's Laboratories, Seibersdorf.

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1. INTRODUCTION

The Po-210 poisoning event which occurred in November 2006 [1] demonstrated the need for rapid and accurate determination of this radionuclide in environmental samples. Responding to many requests from Member States, it was decided to conduct a world wide proficiency test on the determination of Po-210 in water. The aim of this proficiency test was to gather information on the current state of practice for Po-210 measurements at various levels in aqueous samples and to assist the participating laboratories in improving the quality of the analytical results.

In the proficiency test described in this report, 635 test water samples were prepared and distributed to the participating laboratories during the last week of March 2007. Laboratories were sent five water samples containing known activities of Po-210 and were requested to return the results within one week of receipt of the samples.

The participating laboratories were requested to analyse the samples employing the methods used in their routine work, so that their performance on the test samples could be directly related to the real performance of the rapid reporting time.

114 laboratories from 127 initially registered laboratories, reported their results to the IAEA. The analytical results of the participating laboratories were compared with the reference values assigned to the reference materials, and a rating system was applied. The list of participants is reported in Appendix III.

The participants and laboratories who responded to this proficiency test and contributed their efforts to the present work are highly appreciated and acknowledged.

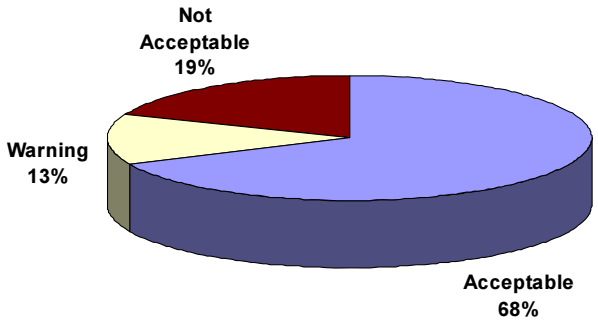


Fig.1. Summary evaluation of 570 measurement results of Po-210.

Although the matrix was pure acidified water and the activity concentrations were relatively high, 19% of the reported results failed to pass the proficiency test criteria. In few cases positive results were reported for the blank sample which suggests a possibility of false positive reporting.

The result of the overall summary evaluation of this proficiency test showed that 86 laboratories reported results which fit the purpose of rapid detection of Po-210 in water.

Figure 1 reports the summary of the analytical data evaluation of this proficiency test. 68% of all reported results were ‘acceptable’.

2. MATERIALS AND METHODS

2.1. Proficiency test objectives

Rapid measurement of spiked water, with an unknown (to the participants) amount of Po-210 was aimed at:

- checking the preparedness of Member States laboratories for rapid determination of Po-210 in liquid matrix,
- evaluating the probability of reporting false positive and false negative
- evaluating the repeatability of the reported results, and
- encouraging the participating laboratories to implement remedial actions where shortcomings in analytical performance are detected.

2.2. Participants

In this proficiency test 127 laboratories from 56 countries all over the world were registered on-line. 114 participants from 46 countries reported their results back to the IAEA via the designated on-line application. The list of participants can be found in Appendix III. The participating laboratories geographical distribution is shown in Figures 2 and 3.

2.3. Composition of the proficiency test materials

The set of the proficiency test materials consisted of 5 samples each 50 mL. The following proficiency test design was applied:

- two spiked demineralised water samples (sample codes 01, 03) ~50 g each containing ~2.5 Bq Po-210,
- two spiked demineralised water samples (sample codes 02, 04) ~50 g each containing ~5 Bq Po-210,
- one blank demineralised water (sample code 05). This is the same water which was used as raw material to spike the test materials,

Figure 4 shows a set of the packed PT samples.

Table 1 lists the target values and the associated combined standard uncertainty of the PT materials and the PT performance criteria LAP and MAB (see Section 3).

2.4.Preparation of the spiked samples

The spiked water samples were gravimetrically prepared in two batches: one batch for samples 01 and 03 and one batch for samples 02 and 04. To prepare each batch 20 kg of acidified demineralised water was spiked with a certified single Po-210 solution traceable to the international standard of radioactivity. Then a pump with multiple outlets was used to homogenise the bulk water sample in a 50 L tank. The first batch was divided in two samples: 01 and 03, the second batch in samples 02 and 04.

Sample 05 was prepared from the same bulk water used in preparation of the spiked samples 01 to 04. This sample (blank) was used to check for the false positive reporting.

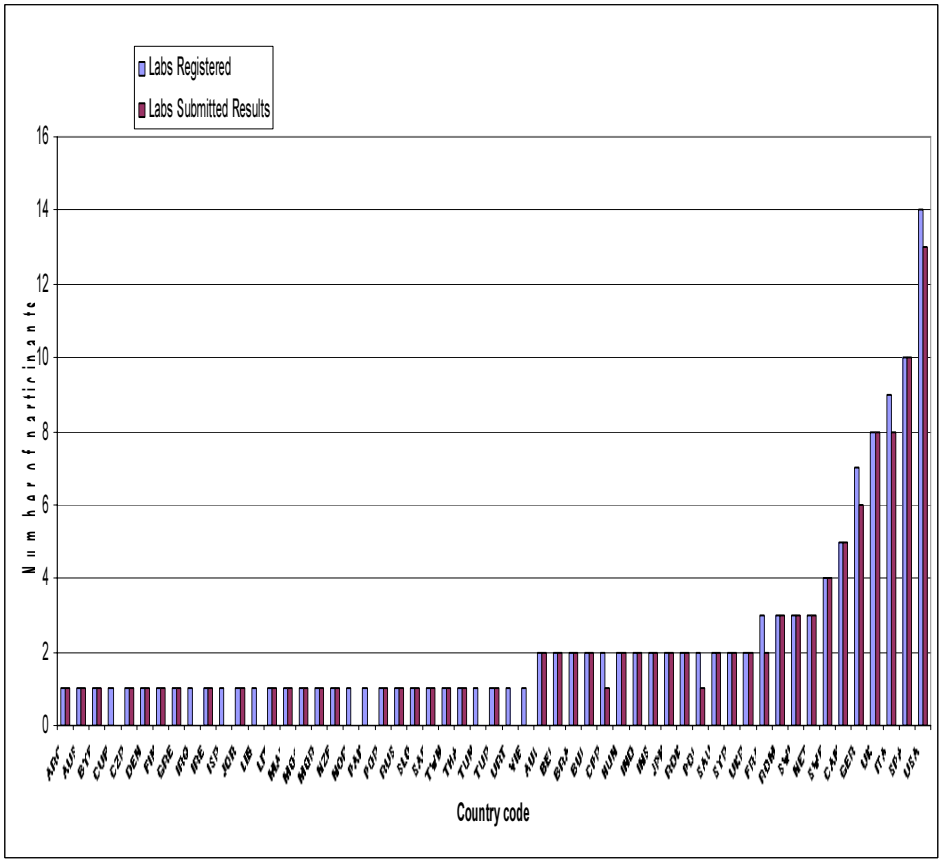


Fig.2. Participants' distribution by country.

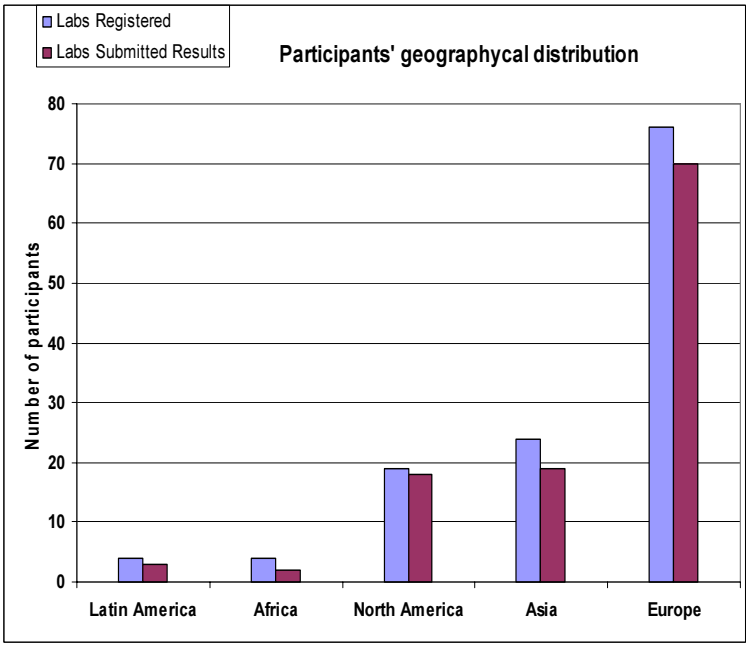


Fig. 3. Geographical distribution of the participants.

Fig. 4. The PT materials set.

TABLE 1. TARGET VALUES AND THE ASSOCIATED COMBINED STANDARD UNCERTAINTIES OF THE PT MATERIALS AND THE PT PERFORMANCE CRITERIA (SECTION 3)

Sample code	Samples 01 and 03	Samples 02 and 04	Sample 05
Activity [$Bq.kg^{-1}$]	52.8±1.4	101.6±2.8	<0.1
LAP [%]	15	15	-
MAB [%]	20	20	-

The final target activity concentration for Po-210 was calculated from the certified activity value assigned to the certified standard solution of Po-210, taking into account the successive dilution steps, the mass of spiking mixture and the amount of water being spiked as determined from weighing. The combined standard uncertainty includes two major components: uncertainty of the certified solution and weighing uncertainty. The initial activity concentration of the standard solution was 377±10 Bq.g-1.

The reference date for results reporting was set to the 1st of April 2007.

2.5. Homogeneity testing

Three bottles from each batch were measured using liquid scintillation counter in the Agency's Seibersdorf Laboratories to verify the homogeneity and stability of the PT materials. The three bottles were stored at ambient temperature and measured four times in the period from 19 March to 7 may 2007. Measurement results are presented in Figure 5.

The variations of the obtained measurement results are comparable to the method reproducibility and therefore it can be concluded that there was not any significant uncertainty arising from between bottles heterogeneity or material instability.

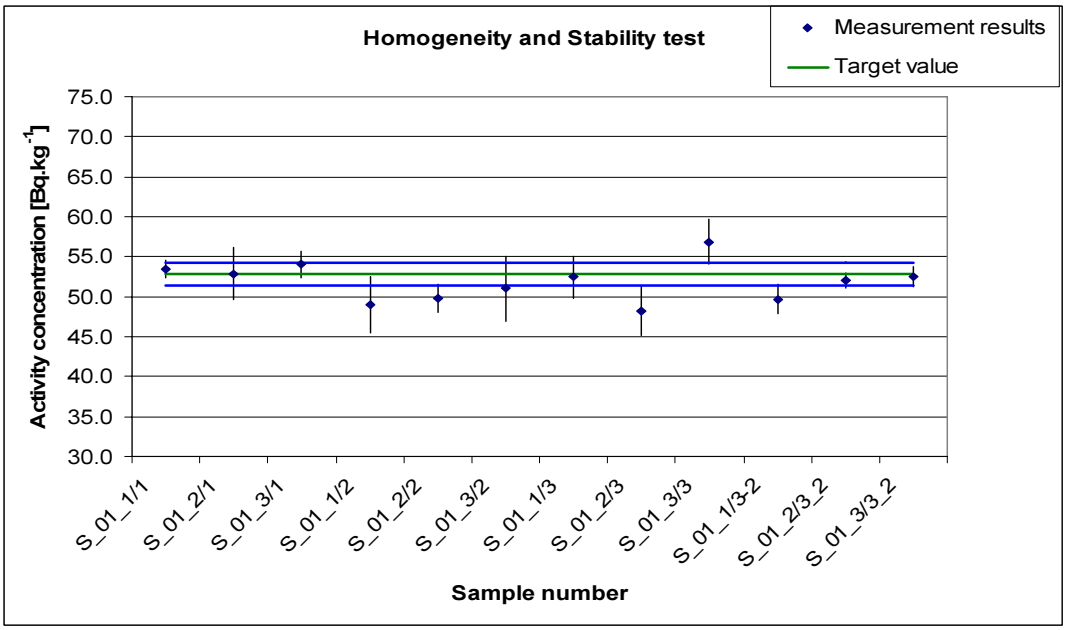


Fig. 5. Homogeneity and stability test results, four sets of measurements, and one set every two weeks. Reference date: 1st of April 2007.

3. PERFORMANCE CRITERIA

Currently most laboratories produce test results accompanied, at best, with an indication of their repeatability only and provide no indication of their analytical uncertainty. However, testing laboratories intending to follow international best practice will need to quantify and report their measurement uncertainty. In particular, this is a requirement under international standard ISO/IEC 17025:2005.

Several rating systems have been developed for determining a laboratory's performance and the meaning of the results of the different scoring systems are not always comparable. Among various statistics, z-scores and u-scores are most often used. The drawback of z-scores is that the uncertainty of the participant's measurement result is not taken into account in the evaluation of performance. In the case of u-scores, the evaluation includes uncertainties of the participant measurements and the uncertainty of the assigned value. Laboratories performing well in classical proficiency testing (z-scores) will not necessarily exhibit the same level of performance when their analytical uncertainties are considered in the evaluation.

The proficiency testing scoring system applied by the Chemistry Unit in the Agency's laboratories takes into consideration the trueness and the precision of the reported data and it includes in the evaluation both the combined standard uncertainty associated with the target value of proficiency testing samples and the combined standard uncertainty reported by the participating laboratories. According to the newly adopted approach, the reported results are evaluated against the acceptance criteria for accuracy and precision and assigned the status 'acceptable' or 'not acceptable' accordingly. A result must pass both criteria to be assigned the final status of 'acceptable'. The advantage of this approach is that it checks the credibility of the uncertainty statement given by the participating laboratories. Results are no longer compared against fixed criteria but participants establish their individual acceptance range on the basis of the uncertainties assigned to the values. Such an approach highlights not only methodological problems affecting the accuracy of the reported data but also identifies shortcomings in uncertainty estimation.

In addition, three other statistical parameters namely: relative bias, z-score and IAEA/Laboratory result ratio are calculated as complementary information for the participating laboratories.

3.1. Relative bias

The first stage in producing a score for a result $Value_{Analyst}$ (a single measurement of analyte concentration in a test material) is obtaining the estimate of the bias. To evaluate the bias of the reported results, the relative bias between the Analyst's value and the IAEA value is calculated and expressed as a percentage:

$$Relative \quad bias = \frac{Value_{Analyst} - Value_{IAEA}}{Value_{IAEA}} \times 100\%$$

3.2. PT evaluation criteria

The proficiency test results were evaluated against the acceptance criteria for trueness and precision and assigned the status 'acceptable', 'Warning' or 'not acceptable' accordingly [3].

3.2.1. Trueness

The participant result is assigned 'acceptable' status for trueness if:

$$A1 \leq A2$$

where:

$$\text{A1} = \left| Value_{IAEA} - Value_{Analyst} \right|$$

$$\text{A2} = 2.58 \times \sqrt{Unc_{IAEA}^2 + Unc_{Analyst}^2}$$

3.2.2. Precision

For evaluation of precision an estimator P is calculated for each participant, according to the following formula:

$$\text{P} = \sqrt{\left(\frac{Unc_{IAEA}}{Value_{IAEA}}\right)^2 + \left(\frac{Unc_{Analyst}}{Value_{Analyst}}\right)^2} \times 100\%$$

P directly depends on the measurement uncertainty claimed by the participant. The Limit of Acceptable Precision (LAP) for each analyte respectively is defined for the respective proficiency test in advance, including any adjustment due to the concentration or activity level of the analytes concerned and the complexity of the analytical problem. Participants' results are scored as 'acceptable' for precision when P ≤ LAP. The LAP value used in the evaluation of all radionuclides is listed in Table 1.

In the final evaluation, both scores for trueness and precision are combined. A result must obtain an 'acceptable' score in both criteria to be assigned the final score 'acceptable'. Obviously, if a score of 'not acceptable' was obtained for both trueness and precision, the final score will also be 'not acceptable'. In cases where either precision or trueness is 'not acceptable', a further check is applied. The reported result relative bias (R. Bias) is compared with the maximum acceptable bias (MAB). If R. Bias > MAB, the result will be 'not acceptable'. However, if R. Bias ≤ MAB, the final score will be 'warning'. A 'warning' will reflect mainly two situations. The first situation will be a result with small measurement uncertainty; however its bias is still within MAB. The second situation will appear when results close to the assigned property value are reported, but the associated uncertainty is large. The MAB value used in the evaluation of all radionuclides is listed in Table 1.

3.2.3. Blank evaluation

The results of the blank (sample 05) were evaluated to check if a false positive was reported using the following rule: if the reported result fulfils the following criteria it was considered acceptable:

$$|Value_{analyst} - Unc_{analyst}| < 0.1$$

Also if the laboratory reported the MDL as a result (a value with a sign <) it was considered acceptable. Otherwise, the reported value was not acceptable.

3.3. The z-score value

The z-score is calculated from the laboratory results, the assigned value and a standard deviation in accordance with the following equation:

$$z_{Score} = \frac{Value_{Analyst} - Value_{IAEA}}{\sigma}$$

On the basis of the 'fitness for purpose' principle, the target value for the standard deviation (σ) is:

$$0.10 \times Value_{IAEA}$$

The laboratory performance is evaluated as satisfactory if $| z_{Score} | \leq 2$; questionable for $2 < | z_{Score} | < 3$, and unsatisfactory for $| z_{Score} | \geq 3$.

3.4. The u-score value

The value of the u_{test} was calculated according to the following equation [4]

$$u_{test} = \frac{\left| Value_{IAEA} - Value_{Analyst} \right|}{\sqrt{Unc._{IAEA}^2 + Unc._{Analyst}^2}}$$

This value is compared with the critical value listed in the t-statistic tables to determine if the reported result differs significantly from the expected value at a given level of probability. The advantage of the u_{test} is that it takes into consideration the propagation of measurement uncertainties when defining the normalised error. This is especially useful when evaluating results, which uncertainty may overlap with the reference interval.

It should be noted that the choice of the significance level is subjective. For this proficiency test we have set the limiting value for the u-test parameter to 2.58 for a level of probability at 99% to determine if a result passes the test ($u < 2.58$).

If the evaluation approach and/or acceptance criteria applied in this PT are not appropriate for the types of analyses and application performed in one of the participating laboratories, it is suggested to apply a self- scoring evaluation system which could fit specific requirements.

4. RESULTS AND DISCUSSION

4.1. General

570 measurement results were reported to the IAEA in this PT from 114 laboratories. The participants' data along with the statistical performance evaluation were compiled and presented in two tables which constitute an integral part of this report. Appendix I shows the data evaluation tables sorted by sample code. Performance evaluation tables sorted by laboratory code are reported in Appendix II.

The overall evaluation showed that 68% of all reported results fulfilled the PT criteria for both trueness and precision. Despite the fact that the matrix was easy and there was not any interference effect, 19% of all reported results were not acceptable against the PT criteria.

4.2. Technical information provided by the participants

The summary of the technical information provided by the participants on the analytical procedures used in their own laboratories is compiled in Tables 4 and 5 The information is coded with the same laboratory code used in data evaluation. The participants can benefit from the information exchange without revealing the laboratories' identity. The provided technical information was compiled in the same format as it was received, without any modification or editing.

From the reported information on the applied analytical procedure, most of the participants did not use any separation method due to the nature of the matrix. For source preparation 88 laboratories used auto deposition method on silver or stainless steel disk, only 8 participants used electro-deposition, one laboratory (42) used co-precipitation.

Different measurement techniques were used by the participating laboratories as illustrated in Table 2.

From the technical details of the analytical procedure provided by the participants who had low performance score, it was not possible to find any indication of a methodological error or problem. There was no substantial difference in the described procedures to which the root cause of discrepancy could be attributed.

4.3. False positive reporting

In this PT the method detection limit (MDL) was an important performance indicator. The participants were asked to report the MDL estimated through method validation.

From the technical information provided by the laboratories, it can be observed that there is no harmonised method for MDL estimation amongst Member States laboratories which could lead to inappropriate comparison of MDL estimated in different laboratories. The summary of the reported MDL and the used procedure to derive the MDL is shown in Table 6.

It can be noticed that 21 laboratories (group C, Table 3) reported false positive for the blank sample 05, this might indicate that the MDL was not appropriately estimated, or the method validation for such a matrix was not yet performed.

TABLE 2. AVERAGE PERFORMANCE SCORE AGAINST THE USED MEASUREMENT TECHNIQUE

Measurement technique	Number of laboratories	Average score [%]
Alpha spectrometry	88	76
Liquid scintillation	11	69
Proportional counter	5	56
Gross alpha counter	2	75
ZnS counter	2	10
Not reported	6	-

TABLE 3. LABORATORIES GROUPING RELATED TO THE CATEGORY OF RECOMMENDATIONS

Group	Laboratory code
Group A	1, 2, 3, 4, 5, 7, 8, 9, 12, 14, 15, 16, 18, 19, 21, 24, 25, 26, 27, 28, 30, 31, 33, 34, 35, 38, 39, 40, 42, 43, 46, 47, 50,51, 55, 56, 57, 58, 59, 60, 63, 64, 65, 67, 69, 71, 72, 73, 74, 76, 78, 79, 81, 83, 84, 85, 87, 88, 89, 91, 92, 93, 94, 96, 97, 100, 102, 103, 104, 105, 106, 107, 108, 109, 110, 112, 114, 115, 117, 119, 121, 123, 124, 125, 126, 127.
Group B	2, 6, 17, 18, 19, 20, 23, 24, 26, 29, 37, 41, 44, 49, 51, 52, 56, 57, 62, 69, 70, 77, 82, 83, 86, 89, 90, 91, 93, 95, 98, 99, 101, 110, 125
Group C	3, 9, 13, 17, 20, 23, 30, 59, 62, 73, 80, 84, 85, 93, 95, 98, 99, 101, 110, 114, 118.
Group D	13, 20, 22, 23, 29, 36, 44, 49, 54, 70, 80, 82, 86, 95, 99, 101, 116.

TABLE 4. SUMMARY INFORMATION ON THE ANALYTICAL PROCEDURE AS REPORTED BY THE PARTICIPANTS IS PRESENTED AGAINST THE AVERAGE SCORE, WHERE NUMBER OF 'A' WAS MULTIPLIED BY 20, 'W' BY 10. NR: NOT REPORTED

Lab.	Sample	Source preparation	Measurement technique	Average score
1	Evaporation	Auto deposition	Alpha spec.	100
2	Evaporation	Auto deposition	Alpha spec.	90
3	Evaporation	Auto deposition	Alpha spec.	80
4	Evaporation	Auto deposition	Alpha spec.	70
5	Evaporation	Auto deposition	Alpha spec.	100
6	Chelation	Electro deposition	ZnS counter	20
7	Evaporation	Auto deposition	Alpha spec.	100
8	Evaporation	Auto deposition	Alpha spec.	90
9	Evaporation	Auto deposition	Alpha spec.	80
12	Evaporation	Auto deposition	Alpha spec.	100
13	Evaporation	Auto deposition	ZnS counter	0
14	Evaporation	Auto deposition	Alpha spec.	70
15	Evaporation	Auto deposition	Alpha spec.	90
16	Evaporation	Auto deposition	Alpha spec.	90
17	Deposition	Deposition	Liquid scintillation counter	60
18	Evaporation	Auto deposition	Alpha spec.	80
19	Evaporation	Auto deposition	NR	90
20	Evaporation	Auto deposition	Alpha spec.	0
21	Evaporation	Auto deposition	Alpha spec.	80
22	Evaporation	Auto deposition	Alpha spec.	30
23	NR	NR	NR	0
24	Evaporation	Auto deposition	Alpha spec.	90

Lab.	Sample	Source preparation	Measurement technique	Average score
25	Evaporation	Auto deposition	Alpha spec.	100
26	Evaporation	Auto deposition	Alpha spec.	100
27	Evaporation	Auto deposition	Alpha spec.	100
28	NR	NR	Liquid scintillation counter	60
29	Evaporation	Auto deposition	Alpha spec.	30
30	Evaporation	Auto deposition	Alpha spec.	50
31	Evaporation	Auto deposition	Alpha spec.	60
33	Evaporation	Auto deposition	Alpha spec.	100
34	Evaporation	Auto deposition	Alpha spec.	100
35	Evaporation	Auto deposition	NR	90
36	NR	NR	Liquid scintillation counter	0
37	Evaporation	Auto deposition	Alpha spec.	60
38	Evaporation	Auto deposition	Alpha spec.	100
39	Evaporation	Auto deposition	Alpha spec.	100
40	Evaporation	Auto deposition	Alpha spec.	80
41	Chelation	Electro deposition	Proportional counter	50
42	Coprecipitation	Coprecipitation	Proportional counter	90
43	NR	NR	NR	100
44	Scintillation cocktail	Scintillation cocktail	Liquid scintillation counter	10
46	Evaporation	Auto deposition	Alpha spec.	100
47	NR	NR	Liquid scintillation counter	100
49	None	None	Alpha spec.	20
50	Evaporation	Auto deposition	Alpha spec.	100
51	Evaporation	Auto deposition	Alpha spec.	100
52	Evaporation	Auto deposition	Alpha spec.	50
54	Evaporation	Auto deposition	Alpha spec.	20

Lab.	Sample	Source preparation	Measurement technique	Average score
55	NR	NR	Liquid scintillation counter	90
56	Evaporation	Auto deposition	Alpha spec.	90
57	Evaporation	Auto deposition	Gross Alpha counting	70
58	NR	NR	NR	80
59	Evaporation	Auto deposition	Gross Alpha counting	80
60	NR	NR	Liquid scintillation counter	60
62	Evaporationn	Auto deposition	Alpha spec.	60
63	Evaporation	Auto deposition	Alpha spec.	70
64	Evaporation	Auto deposition	Alpha spec.	90
65	Evaporation	Auto deposition	Alpha spec.	100
67	Evaporation	Auto deposition	Alpha spec.	100
69	NR	NR	Alpha spec.	80
70	Evaporation	Auto deposition	Alpha spec.	20
71	Evaporation	Auto deposition	Alpha spec.	100
72	Evaporation	Auto deposition	Alpha spec.	90
73	Evaporation	Auto deposition	Alpha spec.	80
74	Evaporation	Auto deposition	Alpha spec.	100
76	Evaporation	Auto deposition	Alpha spec.	100
77	NR	NR	Alpha spec.	10
78	NR	NR	Liquid scintillation counter	100
79	Evaporation	Auto deposition	Alpha spec.	100
80	Chelation	Electro deposition	Alpha spec.	0
81	Evaporation	Auto deposition	Alpha spec.	100
82	Evaporation	Auto deposition	Alpha spec.	20
83	Evaporation	Auto deposition	Alpha spec.	100
84	Evaporation	Auto deposition	Alpha spec.	100

Lab.	Sample	Source preparation	Measurement technique	Average score
85	LSC	LSC	Liquid scintillation counter	100
86	Evaporation	Auto deposition	Proportional Counter	20
87	Evaporation	Auto deposition	Alpha spec.	60
88	Evaporation	Auto deposition	Alpha spec.	60
89	Evaporation	Auto deposition	Alpha spec.	90
90	NR	FALSE	Proportional Counter	40
91	Evaporation	Auto deposition	Alpha spec.	90
92	Evaporation	Auto deposition	Alpha spec.	100
93	Filtration	Filtration	Liquid scintillation counter	80
94	LSC	LSC	Liquid scintillation counter	100
95	Evaporation	Auto deposition	Alpha spec.	20
96	Evaporation	Auto deposition	Alpha spec.	100
97	Evaporation	Auto deposition	Alpha spec.	70
98	Evaporation	Auto deposition	Alpha spec.	60
99	Evaporation	Auto deposition	Alpha spec.	0
100	Chelation	Electro deposition	Alpha spec.	30
101	Evaporation	Auto deposition	Alpha spec.	40
102	Evaporation	Auto deposition	Alpha spec.	60
103	Evaporation	Auto deposition	Alpha spec.	100
104	Evaporation	Auto deposition	Alpha spec.	80
105	Evaporation	Auto deposition	Alpha spec.	100
106	Evaporation	Auto deposition	Alpha spec.	100
107	Chelation	Electro deposition	Alpha spec.	100
108	Evaporation	Auto deposition	Alpha spec.	100
109	Chelation	Electro deposition	Alpha spec.	100
110	Evaporation	Auto deposition	Alpha spec.	80

Lab.	Sample	Source preparation	Measurement technique	Average score
112	Evaporation	Auto deposition	Alpha spec.	100
114	Evaporation	Auto deposition	Proportional Counter	80
115	Chelation	Electro deposition	Alpha spec.	100
116	Evaporation	Auto deposition	Alpha spec.	40
117	Evaporation	Auto deposition	Alpha spec.	100
118	Evaporation	Auto deposition	Alpha spec.	40
119	Chelation	Electro deposition	Alpha spec.	100
120	Evaporation	Auto deposition	Alpha spec.	20
121	Evaporation	Auto deposition	Alpha spec.	90
123	Evaporation	Auto deposition	NR	100
124	NR	NR	Alpha spec.	80
125	Evaporation	Auto deposition	Alpha spec.	80
126	Deposition	Deposition	Alpha spec.	100
127	Evaporation	Auto deposition	Alpha spec.	80

TABLE 5. Po-210 ANALYTICAL PROCESS PARAMETERS AS REPORTED BY THE PARTICIPANTS. NR: NOT REPORTED

Lab code	Sample mass [g]	Counting time [s]	Gross counts	Counting efficiency [%]	Tracer added activity [Bq]	Unc. of added Tracer	Tracer recovery [%]
1	5.023	79711	6314	26	0.31	0.016	100
2	26.63	60000	16566	22.4	0.1738	0.0087	96.8
3	8.113	90000	4383	12.8	0.2	0.0009	87.3
4	74.3	81759	26519	9.6	0.0792	0.0034	93.1
5	30.35	11820	1618	18.8	1.48	0.01	45.8
6	60.15	7200	929	16	NR	NR	63
7	20.75	55402	10409	17.6	0.202	0.0051	98
8	10.1429	60000	6467	27.4	0.397	0.0012	78.6
9	1.0348	246228	2646	24	0.036	0.002	80
12	2	61000	1420	29	0.1	0.005	73
13	20.6448	30000	10760	52	0	0	93
14	25.95	60000	9044	16.58	0.6262	0.0188	69.25
15	15.347	60000	6448	25	0.96	0.01	60.9
16	5.0788	102477	6793	NR	0.193	0.0028	NR
17	26.77	7200	2553	50	NR	NR	NR
18	10	5000	683	0.32	NR	NR	NR
19	16.8	8000	1067	23	0.24	0.02	63
20	2.0526	64829	924	29.72	0.136	0.002	46
21	5.0812	30301	630	10.91	0.5717	0.0286	74.43
22	31.60977	10000	2994	25	0	0	0
23	3.1394	17220	355	28.63	0.134	0.002	45
24	2.725	92605	2618	19	0.039	0.001	95
25	57.5844	59653	40413	26	12.456	0.029	87

Lab code	Sample mass [g]	Counting time [s]	Gross counts	Counting efficiency [%]	Tracer added activity [Bq]	Unc. of added Tracer	Tracer recovery [%]
26	0.5041	84272	519	28.92	0.0105	0.00105	60.86
27	20	60000	NR	18.2	0.32	0.006	49.3
28	10	5400	NR	85	NR	NR	NR
29	21.0891	228910	40753		0.0353	0.00001	
30	19.68	15000	2191	34	1.858	0.013	36.5
31	10.392	50000	4811	21	0.861	0.0018	90.2
33	4.1578	200000		37.9	0.043	0.0004	
34	13.8	160000	11200	14.5	2.2	0.02	70.2
35	5.1858	86405	4914	27	0.08	0.001	83
36	5	6000	370	57	NR	NR	NR
37	3.089	24583	1715	36.67	0.0696	0.0003	83.31
38	4.1065	48540	2050	29.1	0.163	0.005	76.6
39	10.35	10800	1131	37.2	NR	NR	96
40	19.9193	10690	2044	19.89	NR	NR	95.15
41	55.41	20400	7625	36.6	0	0	73.7
42	29.74	216000	86962	31.33	0.0387	0.001	100
43	1.0459	398098	2191	20	0.089	0.0015	53
44	0.25	12000	4324	57	NR	NR	NR
46	3.0928	75161	2197	23.28	0.03149	0.00013	65.15
47	4.2	24900	5769	99.5	0	0	0
49	51.9497	1800	231	38.073	0	0	0
50	99.6218	13608	649	26.59	0.423	0.0145	95
51	10.381	107000		20.6	NR	NR	NR
52	26.64	8000	984	20	NR	NR	NR

Lab code	Sample mass [g]	Counting time [s]	Gross counts	Counting efficiency [%]	Tracer added activity [Bq]	Unc. of added Tracer	Tracer recovery [%]
53	50	78820	699	27.9	0.57	0.01	15.4
54	5.1885	21600	1190		0.4404	0.0048	54.8
55	15.5	28440	15642	71.1	NR	NR	NR
56	10	21200	2452	25	0.0511	0.00025	87
57	50.2562	500	494	32.94	0	NR	NR
58	15	74495	NR	NR	NR	NR	NR
59	10	400000	1195	17.3	NR	NR	NR
60	4	15000	3189	86.7	NR	NR	NR
62	20.07	80000	10382	17.52	6.03	0.12	76.1
63	21.06	55177	8813	25.42	3.66	0.05	75
64	53.3781	33000	10650	14	0.17	0.0017	83
65	47.1712	9154	5086	36.3	0.534	0.027	68.94
66	69.01	86404	12657	9	13.2865	0.0279	50.6
67	5.199	82800	3783	NR	7.39	0.22	91
69				NR			
70	20.09	84417	11730	19.4	0.065766	0.002	62.1
71	2.6095	252812	9338	29.95	0.050289	0.001106	99.9
72	5.17	85000	1735	14.8	0.523	1.7	54.2
73	2.07	200000	3692	23	0.02	0.0006	75.3
74	8.31	57600	5395	25.5	0.0542	0.0011	91
76	19.4066	334800	47474	25	0.923	0.02	61.5
77	0.005	323300	361	2.48	0		
78	8.1709	29344	13860	100			
79	22.7	60000	15360	23.6	0.0813	0.002	

Lab code	Sample mass [g]	Counting time [s]	Gross counts	Counting efficiency [%]	Tracer added activity [Bq]	Unc. of added Tracer	Tracer recovery [%]
80	10.4181	246612	11610	11.92	0.437	0.004	51.27
81	31.509	170000	30740	20.6	0.2002	0.0005	57
82	32.47	18327	3560	20	0.047	0.001	76
83	10.37	36000	5566	36.8	0.1935	0.0097	79
84	1	75600	838	38.9386	0.0774	0.0031	56.227
85	3.63	18000	7449	98	NR	NR	NR
86				NR			
87	25.036	150000	30022	13.9	0.163	0.003	124
88	20	81315	12787	29.83	0.160333		59.8
89	8.1675	23000	1595	16.3	0.2599	0.002	16.3
90	0.94	3600	90	0.503	0	0	0
91	19.85	120000	36696	31.17	0.08758	0.00036786	96.67
92	5	70000	2139		0.169	0.003	
93	10.48	2500	1319	85.1		NR	
94				NR			
95	20.6842	7200	2036	41	0.473	0.015	75
96	5.2108	200000	9497	25.7	0.229	0.0033	68.3
97	5.305	60000	2734	29.9	6.901	0.015	61.38
98	14.98	5800	426	36	0	0	43
99	5	70023	2284	40	0.074	0.004	21.5
100	2.01633	144693	3366	23.33	0.0525	0.0016	80.51
101	20	78994	6127	20.6	0.236	0.0127	16.156
102	70.44	20000	26901	47.2	0.1	0.0013	88.7
103	15.56	21650	835	6.27	0.556	0.011	82.5

Lab code	Sample mass [g]	Counting time [s]	Gross counts	Counting efficiency [%]	Tracer added activity [Bq]	Unc. of added Tracer	Tracer recovery [%]
104	60.8	86475	18932	11.1	0.156	0.019	68.2
105	25	200000	56412	25	1.07	0.05	51
106	25.0004	86400	14347	16.85	0.071	0.002	70.4
107	10.0104	82	5665	NR	0.035	0.000035	
108	19.71318	84370	5891	24	2.61329	0.0261329	29
109	10.328	80007	9814	26.3	0.1964	0.0023	88.2
110	21	79847	19773	15.65	0.5	0.035	68.6
112	14.7	43200	5005	25	0.89	NR	62
114	50	900	665	27		NR	
115	2.5622	252844	2656	NR	0.0816	0.0016	
116	2	242322	4842	23	0.077	0.002	95
117	0.982	80000	1749	45	0.123	0.00074	101
118	5.177	251004	4453	NR	0.1129	0.0063	
119	30.5346	149048	NR	8.66	7.2	0.3	8.66
120	2.062	55000	1114	26	0.124	0.012	102
121	57.3374	6000	4653	40.6	0.36	0.004	68.88
123	5.2	43200	1182	NR	0.403	0.002	10.7
124	8.214	151200	9179	17.2	0.261	0.8	17.2
125	2.58	60000	1608	28	0.09	0.00018	85
126	3.0314	183605	6730	25	0.1205	0.0025	98
127	25.022	38447	12296	26.9	2.0265	0.009727	86.386

TABLE 6. INFORMATION AS REPORTED BY THE PARTICIPANTS RELATED TO THE METHOD DETECTION LIMIT (MDL) OF PO-210

Lab code	Method validated	Reported procedure for Method Detection Limit estimation in the participants laboratories	Blank sample score
1	no	NR	**A**
2	yes	Minimum detection limit (MDL) = 0.06Bq/kg, Repeatability = 0.64 at 10.3Bq/kg	**A**
3	yes	Reproducibility : analysis on SRM (f.e. IAEA 134 + 368), one intercomparison test, Repeatability on spiked water samples (variation coefficient of 5.3% with uncertainty of 15%)	**N**
4	yes	Detection Limit (MDL) calculated according to ISO-11929 standard, MDL= 0.013 Bq/Kg (99%) (Confidence level)	**A**
5	no	For a 1000 minute count the MDL= 0.01Bq/kg	**A**
6	yes	Documents and records were first set to meet trackability and traceability requirements, where internal quality control mechanisms have been adopted. Methods stability was checked by means of Z-score control charts. Internal method validation parameters including method detection limits, repeatability limits, reproducibility limits, recovery coefficient and relative error were estimated. External method validation has been achieved by participating in national inter-laboratory exercises and international intercomparison exercises and proficiency tests.	**A**
7	no	detection limit: 0.01 - 0.06 Bq/kg	**A**
8	no	NR	**A**
9	yes	Minimum detection limit: ranges between 0.2-0.4 mBq depending on the camera used.	**N**
12	yes	All 5 samples analysed first based on 20 mL aliquots with DL's below 0.1 Bq/kg. Analyses of samples 1-4 repeated based on 2-3 mL aliquots to match spike amounts.	**A**
13	no	NR	**N**
14	yes	MDL: 0.04 Bq/kg (Po-210)	**A**
15	no	We do not routinely analyse for Po-210. We have performed limited cross-checking with other laboratories.	**A**

Lab code	Method validated	Reported procedure for Method Detection Limit estimation in the participants laboratories	Blank sample score
16	no	NR	**A**
17	no	NR	**N**
18	yes	MDL is 0.001 Bq/sample	**-**
19	yes	Minimum Detection Limit : 0.04 Bq/kg, Repeatability: 5%, Reproducibility: 8%	**A**
20	no	NR	**N**
21	no	NR	**-**
22	yes	a) Spectrometric system is checked by counting tracer (Pu-242) for MDL level concentration. b) Background count rate fro reproducibility	**A**
23		NR	**N**
24	yes	MDL is about 1 mBq for about 24 h counting time	**A**
25	yes	Method was validated against SRM4337 (Pb-210 standard that is equilibrium with Po-210 standard)	**A**
26	no	NR	**A**
27	no	NR	**A**
28	yes	ROI 40-400 keV, statistics of single measurement ±5%, statistics of 3 repetitive measurements for result	**A**
29	yes	NR	**A**
30	no	NR	**N**
31	yes	Minimum detection limit was calculated by L. A. Currie's equation. The MDL is 0.07 Bq/kg. Repeatability was not tested. Each sample was counted once by alpha spectrometer. Reproducibility was tested. The identical sample was measured three times. The RSD of results is less than 1.5%.	**A**

Lab code	Method validated	Reported procedure for Method Detection Limit estimation in the participants laboratories	Blank sample score
33	yes	MDL = < 0.05 Bq/kg	**A**
34	yes	MDL = < 0.05 Bq/kg	**A**
35	no	NR	**A**
36		MDL = 0.65 +/- 0.16 Bq/kg, Repeatability limit = 0.88 Bq/kg. No reproducibility limits are available at this time. Minimum detectable activity is determined by applying the average of eight replicate analysis of a blank sample to the Currie formula. Repeatability is determined using eight replicate analysis of a NIST traceable reference material. Similar reference materials are used to determine four point linearity.	**A**
37	yes	Minimum Detection Limit = 0.002 Bq/L, Standard deviation of the mean = 13%, Bias = 1,4 %	**A**
38	yes	MDL is dependant on sample mass. For low level work where 100g of sample is taken the MDL is 0.005Bq/kg.For these IAEA samples where the activity was very high 4 g of sample was used to achieve an MDL around 0.1Bq/kg, Repeatability at k=2 is 4.2%	**A**
39	yes	For this PT MDL=0.15Bq/kg, at Counting Time 25200s, sample Mass 10.4g, Counting Efficiency 37.2%, Recovery 96% (for low salinity waters)	**A**
40	no	Although we did not participate yet in a Po-210 intercomparison exercise, we have calculated our Minimum detection limit: for 20 grams of sample, 3 hours of measuring time, efficiency 0,4 and chemical yield 0,95= 0,08 Bq/Kg	-
41	yes	Minimum detection activity MDL: 0.0123 Bq on TENNELEC S5HP / Gas flow type proportional counter , 36000 sec. counting time ; Minimum detection activity: 0.0062 Bq on TENNELEC TC 257/IPA Silicon detector, SCA counting mode, 60000 sec Counting time .	**A**
42	no	NR	**A**
44	no	NR	**A**
46	yes	1-MDL=0.00481Bq/L, 2-Triplicate samples analysed, 3-Above 95%.	**A**
47	no	NR	**A**

Lab code	Method validated	Reported procedure for Method Detection Limit estimation in the participants laboratories	Blank sample score
49	yes	Minimum Detection Limit: 0.31 Bq/kg, Repeatability limit: 0.15%, Reproducibility limit: 0.25%	**A**
50	yes	Minimum detection limit: 0.1 Bq/kg	**A**
51	yes	Not especially for Po-210, Validation parameters.	**A**
52	no	NR	**A**
54	no	Method validation for polonium in solid, water and urine samples are in progress.	**A**
55	yes	Testing of reproducibility with certified standard	**A**
56	yes	The validation method was carried out for urine sample and is believed to be valid for water sample as well, Minimum detection limit: 1 mBq/L when 500 ml of urine is introduced in the analysis, repeatability: 10% at the 20 mBq/L level of activity.	**A**
57	yes	Minimum Detection Limit for Sample Code 1 to 4 - 0.2 Bq/Kg(3 sigma). Repeatability ±3%, Reproducibility ±4%	**A**
58	no	NR	**A**
59	no	NR	**N**
60	yes	The detection limit for Po-210 detection in water samples was calculated by the following formula: DL=3*sqrt(Cb)/(T*E*M) where DL is the detection limit, Cb is the background counts, T is the background counting time, E is the efficiency of detecting alpha particles and M is the sample mass. For Cb=3000 counts, T=300000sec, E=0.867 and M=4g the detection limit is DL=0.16 Bq/Kg. If a water sample of 7g is used the detection limit is reduced to 0.08 Bq/Kg. The repeatability limit was calculated by using the formula R=1.96*sqrt(2)*S where S is the standard deviation of activity A calculated by repeated measurements of each sample (4 measurements for each sample). Repeatability Limits in Bq/Kg were calculated for each sample and were found:sample#1: 3.5, sample#2: 5.4, sample#3: 8.0, sample#4: 8.8, sample#5:1.2.	**A**

Lab code	Method validated	Reported procedure for Method Detection Limit estimation in the participants laboratories	Blank sample score
62	yes	In order to determine any bias, the method validation procedure was carried out via the analysis of a standard Po-210 solution supplied in National Metrological Institute, with identical sample counting geometry and detector configuration. For the purposes of this exercise, the minimum detection limit achieved for this methodology was 0.34 mBq/kg (95% confidence level).The repeatability limit was 3%.	**N**
63	yes	NR	**A**
64	no	NR	**A**
65	yes	MDL=0.01 Bq/kg, repeatability = 6%	**A**
67	yes	MDC 0.1 Bq/kg for 5g sample and 23 hour counting time.	**A**
69	no	NR	**A**
70	no	NR	**A**
71	yes	Genie 2000 software validated by CANBERRA The method validation was performed by analysing IAEA-326 Soil and IAEA-315 Sediment. The obtained data were all in good agreement with the recommended values. The obtained precision (relative standard deviations) is < 10% and the accuracy (relative bias) is < 2%. The minimum detection limit for 5 kg of water sample is 0.016 mBq/kg and the corresponding value for 2.5 g of water 32 mBq/kg.	**A**
72	yes	I could give the validation parameters for these matrices. Furthermore, the minimum detection limit highly depends on the processed sample volume. Again there is no sense in giving a detection limit as such. A water sample is much simpler than a silicon-containing sample with a strongly oxidizing chemical treatment.	**A**
73	yes	The method validation was performed on urine samples of 500 ml. Considering a counting time of 200000s the validation parameters were: Minimum detection limit: 5 mBq/l; Repeatability limit : 5%; Reproducibility limit : 9%.	**N**
74	no	NR	**A**

Lab code	Method validated	Reported procedure for Method Detection Limit estimation in the participants laboratories	Blank sample score
76	yes	Detection limit (MDL): 0.005 bq/kg, Repeatability limit: 1.4 bq/kg for sample of 50 bq/kg radioactivity, at 95% confidence level. Reproducibility limit: No data	**A**
77	no	NR	**A**
78	no	NR	**A**
79	yes	MDL 0.1 Bq/kg, reproducibility limit 10%	**A**
80	yes	Validation was performed as emergency method; MDL: 0.16 Bq/kg.	**N**
81	no	NR	**A**
82	no	NR	**A**
83	no	NR	**A**
84	yes	1 pCi/L MDL, 20% precision limit, 25% bias limit	**N**
85	no	NR	**N**
86	no	NR	**A**
87	yes	Limit of detection (MDL) 0.05 Bq/kg, Repeatability 0.6%	**A**
88	yes	MDL = 6.225E-04 Bq/sample, LCS = Found-to-Added 98%	**A**
89	no	NR	**A**
90	no	MDL = 0.0089 Bq	**A**
91	yes	Water samples were spiked with a NIST traceable standard at 4.92, 11.5, 26.3, 42.6, 82.2, 392, and 755 mBq/L. The %recoveries ranged from 91% to 112%. The relative percent difference ranged from 3.5% to 12%. The typical MDL values for samples analyzed in this study ranged from 0.00477 to 0.09648 Bq/kg.	**A**

Lab code	Method validated	Reported procedure for Method Detection Limit estimation in the participants laboratories	Blank sample score
92	no	NR	**A**
93	yes	MDL 0.3 Bq/l	**N**
94	yes	NR	**A**
95	no	NR	**N**
96	no	The Currie detection limits ranged over 0.09 to 0.17Bq/kg for these particular samples	**A**
97	no	NR	**A**
98	yes	The MDL for our procedure is less than 0,05 Bq/Kg. The reproducibility parameter is 0,95.	**N**
99	yes	Minimum detection limit: 0.08 Bq/kg, Repeatability limit: smaller than 8%, Reproducibility limit: smaller then 10%	**N**
100	yes	MDL: 0.02. Use two different method to check reproductively.	**A**
101	no	NR	**N**
102	no	NR	**A**
103	yes	MDL: 0.05 Bq/kg	**A**
104	no	NR	**A**
105	yes	MDL is 0.05 Bq/kg	**A**
106	yes	MDL=0.04 Bq/kg where efficiency=0.2; yield=0.6; sample mass=25g, counting time=86400s. Accuracy: 15%. Precision: 10% (12 samples on day of analyses). Reproducibility: 13% (more than 50 test samples analysed over a year as test control samples)	**A**
107	no	NR	**A**

Lab code	Method validated	Reported procedure for Method Detection Limit estimation in the participants laboratories	Blank sample score
108	no	Based on peer reviewed publication	**A**
109	no	Minimum detection limit (MDL):12 counts/measuring sample	**A**
110	yes	Minim detection limit: 0.5Bq/sample in about 24hours (95% confidence level) Repeatability: 5%. Reproducibility: 7%	**N**
112	no	NR	**A**
114	no	MDL: 0.004 Bq/ml. Reproducibility: 0.95	**N**
115	no	NR	**A**
116	yes	Minimum detection limit, Repeatability limit, Reproducibility limit.	**A**
117	yes	NR	**A**
118	no	NR	**N**
119	no	NR	**A**
120	yes	Reagent blank (triplicates) was spiked with the same amount of tracer (Po-209). MDA was determined to be 0.084 Bq/Kg.	**A**
121	yes	The detection limit (MDL) for a 1 gram solid sample is 0.005Bq/g. Note, the detection limit will vary depending on the sample weight. Historically, the method has yielded a precision (relative standard deviation) of +/- 10%. The method has yielded an accuracy [Average Recovery (%) ± standard deviation (%)] of 99.0 ± 9.1	**A**
122	NR	NR	**A**
123	yes	MDL=0.007Bq/kg. Repeatability limit: r=2.8*S, #1: 2.7; #2: 7.6; #3: 3.9; #4: 8.0; #5: 0.093 Bq/kg, S was used as Standard deviation of 4 analyses.	**A**
124	no	NR	**A**

Lab code	Method validated	Reported procedure for Method Detection Limit estimation in the participants laboratories	Blank sample score
125	no	NR	**A**
126	yes	Repeated analysis on all samples. Note! reported values denote arithmetic means	**A**
127	yes	MDL: 3.00E-02 Bq/g. Accuracy : u=2.41. Precision: 6.41%	-

4.4. Measurement repeatability

The PT samples contained duplicate samples 01, 03 and 02, 04. The difference between the results of the duplicate samples was checked. 45 laboratories of 114 had a variation between the duplicate samples more than 5%, which might indicate the need for improving the method stability. The method statistical control and repeatability should be controlled and monitored to insure the method capability to detect low activity concentrations with high reliability.

Figures 6 and 7 show the graphical presentation of the variations between the duplicate samples.

4.5. Recommendations to the laboratories

Based on the performance evaluation results the recommendations to the participants could be divided into four categories:

a) Eighty six laboratories (Table 3, group A) reported results with a quality which fits for the purpose of rapid responding in emergency situation to trigger an alarm for remediation or any other decision for an action to be taken. However more efforts should be invested on method validation to determine the method performance characteristics in the laboratory's local conditions and to demonstrate that the targeted quality criteria of the analytical procedure are attained.

b) Thirty five laboratories (Table 3, group B) should improve the repeatability and the reproducibility of their determinations and to find out the source of variations, is it from the plating or from inappropriate recovery correction or from other source. Replicate analysis of spiked samples should be used to optimise the method and to reduce the source of variations. Target repeatability and reproducibility standard deviations should be set up by the analyst and the analytical procedure should be optimised to attain these targets.

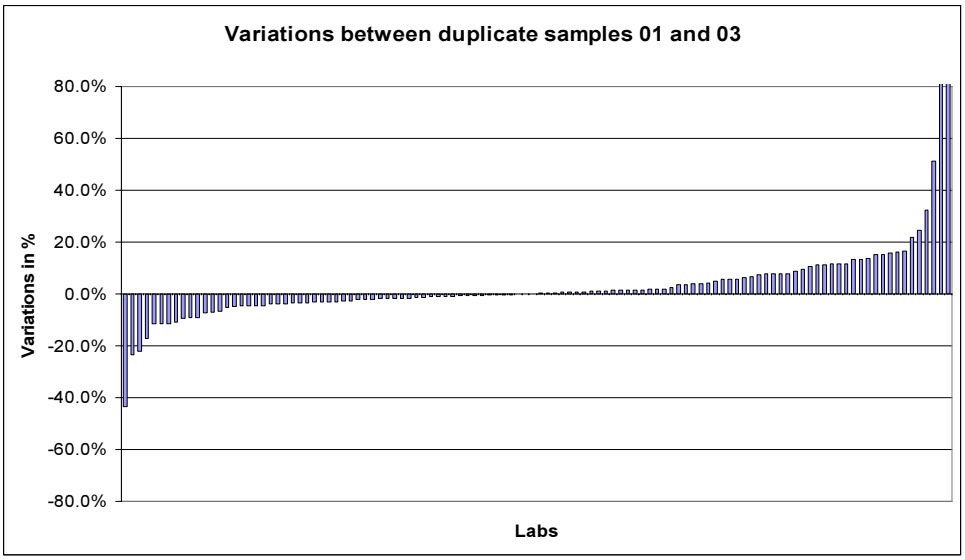
c) Twenty one laboratory (Table 3, group C) reported false positive or a value for the blank sample higher than the target value. These laboratories should evaluate the analytical procedure blank and to subtract it from the sample value. Eurachem Guide on method validation suggests some guidelines on MDL determination. Many participants reported in Table 6 the procedure they applied in the estimation of MDL.

d) Seventeen laboratories (Table 3, group D) could not report acceptable results due to either significant bias or in few cases due to unstable method. These laboratories should revise their method and look for the root cause of bias or instability and perform method validation to check the reliability of the reported results.

5. CONCLUSIONS

The IAEA-CU-2007-09 world wide proficiency test for the determination of Po-210 in water was successfully conducted, 127 participants received the PT samples, and 88% of the participants reported back their results to the IAEA which indicates a high rate of results reporting in this PT.

The PT results demonstrated that around 70% of the participants were able to report results which fit the purpose of rapid detection of Po-210 in water.



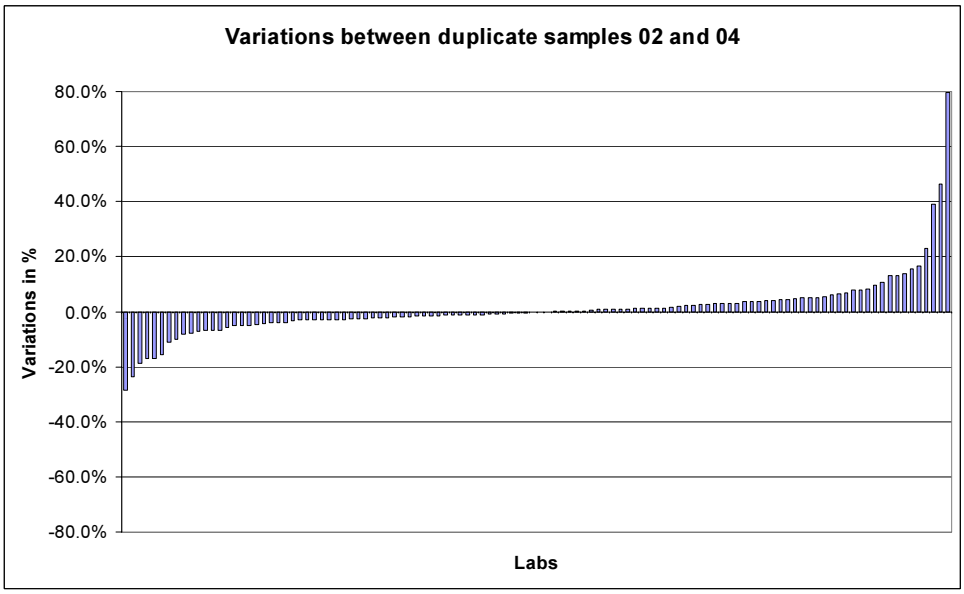


Fig. 6 and 7. Variations in % between the reported results for the duplicate samples 01, 03 and 02, 04.

However, although the matrix was a straightforward easy one and the activity concentrations were relatively high 19% of the reported results failed to pass the PT criteria. In few cases positive results were reported for the blank sample which suggests a possibility of false positive reporting.

The PT organiser proposed four categories of general recommendations to the participating laboratories to improve their analytical performance. However, if any participant needs any technical assistance to improve the analytical performance of Po-210 determination, Chemistry Unit at the Agency's Seibersdorf laboratories will be glad to respond to such requests.

The PT results revealed the need for a harmonised analytical procedure for Po-210 rapid determination in case of emergency for high and low levels of activities. The procedure should also contain a standardized quality control protocol to assist the analyst in the validation of the reported results.

APPENDIX I. DATA EVALUATION TABLES SORTED BY SAMPLE CODE

All results listed in this Appendix are expressed in Bq/kg units at a reference date set to 2007-April-01. The abbreviations and calculation formulas used in the individual evaluation tables are explained in Section 3 of this report.

The individual laboratory evaluation reports are presented in ascending order of the laboratory code.

On the S-shape charts the IAEA target value is represented by a red line, and the respective combined standard uncertainty [u] is represented by two green lines.

On the z score charts warning limits are represented by blue lines, action limits by red lines.

Data evaluation of sample 01

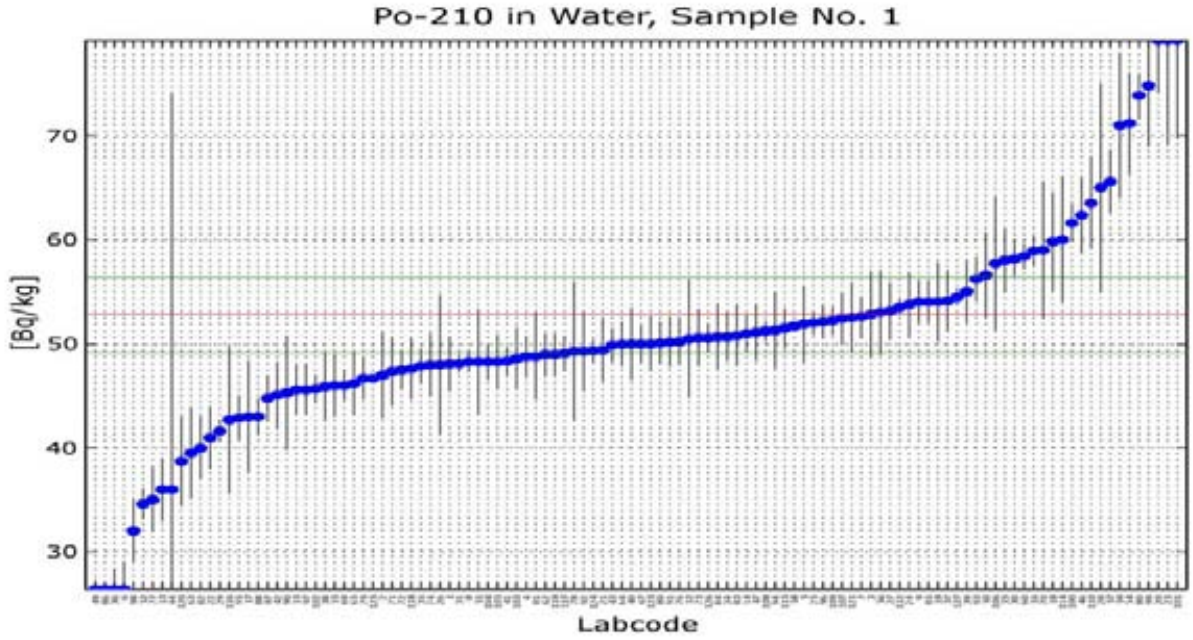


Fig. I-01: S-shape chart of sample 01

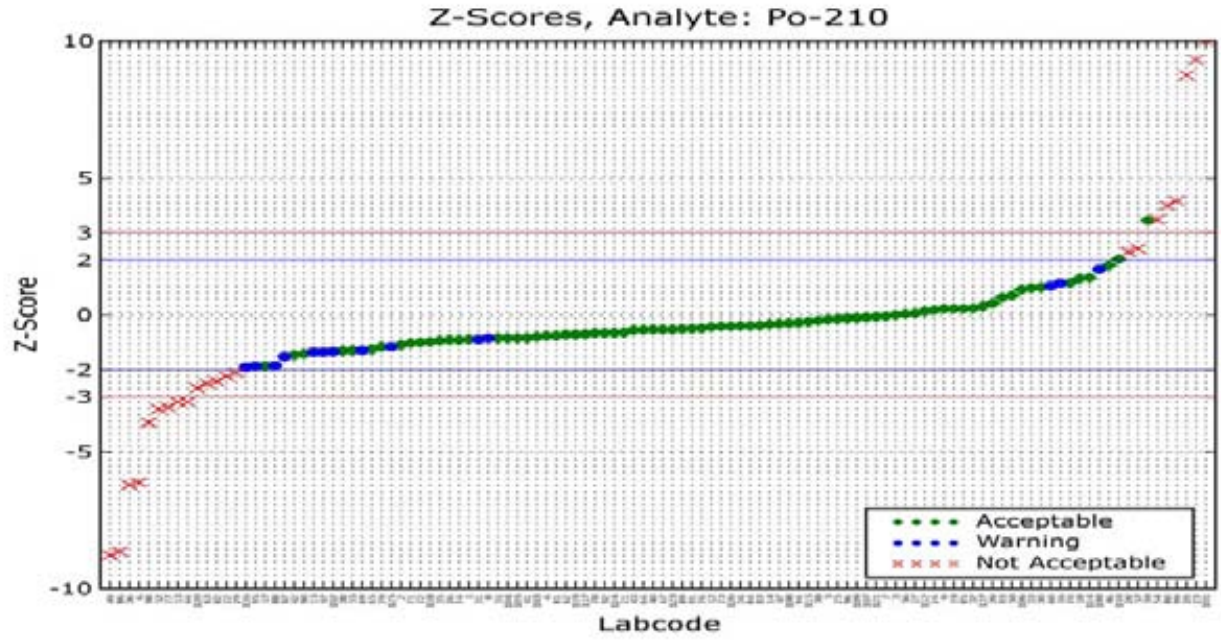


Fig. I -02: z-score chart of sample 01

Data evaluation of sample 01

Target Value: 52.8 ± 1.4 Bq/kg

TABLE I-01: DATA EVALUATION OF SAMPLE 01

Lab code	Rep. Value	Rep Unc.	Unc. [%]	A1	A2	Trueness	P	Precision	Final Score
1	48.10	2.60	5.41	4.70	7.62	A	6.02	A	**A**
2	47.00	4.10	8.72	5.80	11.18	A	9.12	A	**A**
3	52.80	4.10	7.77	0.00	11.18	A	8.21	A	**A**
4	48.80	2.00	4.10	4.00	6.30	A	4.88	A	**A**
5	51.90	3.60	6.94	0.90	9.97	A	7.43	A	**A**
6	20.50	2.50	12.20	32.30	7.39	N	12.48	A	**N**
7	52.60	1.90	3.61	0.20	6.09	A	4.48	A	**A**
8	48.30	1.00	2.07	4.50	4.44	N	3.36	A	**W**
9	54.00	2.00	3.70	1.20	6.30	A	4.55	A	**A**
12	50.50	5.60	11.09	2.30	14.89	A	11.40	A	**A**
13	36.00	3.00	8.33	16.80	8.54	N	8.74	A	**N**
14	51.00	1.80	3.53	1.80	5.88	A	4.41	A	**A**
15	45.60	2.35	5.15	7.20	7.06	N	5.80	A	**W**
16	58.92	1.42	2.41	6.12	5.14	N	3.58	A	**W**
17	43.00	5.40	12.56	9.80	14.39	A	12.84	A	**A**
18	59.80	4.70	7.86	7.00	12.65	A	8.29	A	**A**
19	54.02	3.76	6.96	1.22	10.35	A	7.45	A	**A**
20	99.00	5.00	5.05	46.20	13.40	N	5.70	A	**N**
21	49.41	3.01	6.09	3.39	8.56	A	6.64	A	**A**
22	40.98	2.98	7.27	11.82	8.49	N	7.74	A	**N**
23	102.00	10.00	9.80	49.20	26.05	N	10.16	A	**N**
24	53.76	3.09	5.75	0.96	8.75	A	6.33	A	**A**
25	52.00	1.10	2.12	0.80	4.59	A	3.39	A	**A**
26	48.02	6.66	13.87	4.78	17.56	A	14.12	A	**A**
27	53.10	2.70	5.08	0.30	7.85	A	5.73	A	**A**
28	65.00	10.00	15.38	12.20	26.05	A	15.61	N	**N**
29	41.64	1.03	2.47	11.16	4.48	N	3.63	A	**N**
30	58.15	1.65	2.84	5.35	5.58	A	3.88	A	**A**
31	48.12	0.88	1.83	4.68	4.27	N	3.22	A	**W**
33	58.00	3.00	5.17	5.20	8.54	A	5.81	A	**A**
34	50.70	2.30	4.54	2.10	6.95	A	5.25	A	**A**
35	47.90	1.70	3.55	4.90	5.68	A	4.43	A	**A**
36	20.00	2.00	10.00	32.80	6.30	N	10.35	A	**N**
37	54.10	2.90	5.36	1.30	8.31	A	5.98	A	**A**

Lab code	Rep. Value	Rep Unc.	Unc. [%]	A1	A2	Trueness	P	Precision	Final Score
38	45.90	3.20	6.97	6.90	9.01	A	7.46	A	**A**
39	55.00	3.00	5.45	2.20	8.54	A	6.06	A	**A**
40	50.00	3.40	6.80	2.80	9.49	A	7.30	A	**A**
41	48.36	1.33	2.75	4.44	4.98	A	3.82	A	**A**
42	45.10	3.20	7.10	7.70	9.01	A	7.57	A	**A**
43	49.90	1.60	3.21	2.90	5.49	A	4.16	A	**A**
44	36.00	38.00	105.56	16.80	98.11	A	105.5	N	**N**
46	62.35	3.57	5.73	9.55	9.90	A	6.31	A	**A**
47	51.10	2.70	5.28	1.70	7.85	A	5.91	A	**A**
49	6.43	0.86	13.32	46.37	4.24	N	13.58	A	**N**
50	56.57	4.08	7.21	3.77	11.13	A	7.68	A	**A**
51	48.30	5.02	10.39	4.50	13.45	A	10.73	A	**A**
52	34.60	1.42	4.10	18.20	5.14	N	4.89	A	**N**
54	71.20	4.90	6.88	18.40	13.15	N	7.38	A	**N**
55	46.00	3.00	6.52	6.80	8.54	A	7.04	A	**A**
56	53.00	4.00	7.55	0.20	10.93	A	8.00	A	**A**
57	65.60	3.00	4.57	12.80	8.54	N	5.29	A	**N**
58	51.70	0.40	0.77	1.10	3.76	A	2.76	A	**A**
59	71.00	7.00	9.86	18.20	18.42	A	10.21	A	**A**
60	58.40	1.20	2.05	5.60	4.76	N	3.35	A	**W**
62	49.00	2.00	4.08	3.80	6.30	A	4.87	A	**A**
63	39.50	4.42	11.19	13.30	11.96	N	11.50	A	**N**
64	49.97	2.12	4.24	2.83	6.55	A	5.00	A	**A**
65	46.20	3.00	6.49	6.60	8.54	A	7.01	A	**A**
67	50.00	1.70	3.40	2.80	5.68	A	4.31	A	**A**
69	46.00	1.40	3.04	6.80	5.11	N	4.04	A	**W**
70	59.00	6.60	11.19	6.20	17.41	A	11.50	A	**A**
71	47.37	3.32	7.01	5.43	9.30	A	7.49	A	**A**
72	47.50	1.90	4.00	5.30	6.09	A	4.80	A	**A**
73	50.60	2.70	5.34	2.20	7.85	A	5.96	A	**A**
74	48.00	3.00	6.25	4.80	8.54	A	6.79	A	**A**
76	50.23	2.26	4.50	2.57	6.86	A	5.22	A	**A**
77	35.00	3.10	8.86	17.80	8.78	N	9.25	A	**N**
78	49.30	6.60	13.39	3.50	17.41	A	13.65	A	**A**
79	46.70	2.00	4.28	6.10	6.30	A	5.04	A	**A**
80	73.88	2.17	2.94	21.08	6.66	N	3.96	A	**N**
81	48.81	4.14	8.48	3.99	11.28	A	8.89	A	**A**
82	40.00	3.00	7.50	12.80	8.54	N	7.95	A	**N**
83	50.80	2.90	5.71	2.00	8.31	A	6.29	A	**A**

Lab code	Rep. Value	Rep Unc.	Unc. [%]	A1	A2	Trueness	P	Precision	Final Score
84	50.69	3.13	6.17	2.11	8.85	A	6.72	A	**A**
85	54.00	2.00	3.70	1.20	6.30	A	4.55	A	**A**
86	7.12	0.17	2.39	45.68	3.64	N	3.57	A	**N**
87	44.80	2.20	4.91	8.00	6.73	N	5.58	A	**W**
88	43.03	1.71	3.97	9.77	5.70	N	4.78	A	**W**
89	50.09	2.00	4.00	2.71	6.30	A	4.80	A	**A**
90	45.31	5.51	12.16	7.49	14.67	A	12.45	A	**A**
91	50.18	2.36	4.70	2.62	7.07	A	5.39	A	**A**
92	49.30	3.80	7.71	3.50	10.45	A	8.15	A	**A**
93	56.20	2.10	3.74	3.40	6.51	A	4.58	A	**A**
94	51.30	3.60	7.02	1.50	9.97	A	7.50	A	**A**
95	42.90	2.10	4.90	9.90	6.51	N	5.57	A	**W**
96	52.10	1.50	2.88	0.70	5.29	A	3.91	A	**A**
97	45.60	2.40	5.26	7.20	7.17	N	5.89	A	**W**
98	32.00	3.00	9.38	20.80	8.54	N	9.74	A	**N**
99	74.82	5.80	7.75	22.02	15.39	N	8.19	A	**N**
100	61.60	1.80	2.92	8.80	5.88	N	3.95	A	**W**
101	115.42	9.54	8.26	62.62	24.87	N	8.68	A	**N**
102	45.70	1.35	2.95	7.10	5.02	N	3.97	A	**W**
103	48.60	2.92	6.01	4.20	8.35	A	6.57	A	**A**
104	48.30	1.70	3.52	4.50	5.68	A	4.41	A	**A**
105	48.30	2.60	5.38	4.50	7.62	A	6.00	A	**A**
106	57.70	6.40	11.09	4.90	16.90	A	11.40	A	**A**
107	52.40	2.39	4.56	0.40	7.15	A	5.28	A	**A**
108	51.23	0.94	1.83	1.57	4.35	A	3.22	A	**A**
109	52.20	1.30	2.49	0.60	4.93	A	3.64	A	**A**
110	63.50	4.40	6.93	10.70	11.91	A	7.42	A	**A**
112	53.50	0.70	1.31	0.70	4.04	A	2.96	A	**A**
114	60.00	6.00	10.00	7.20	15.90	A	10.35	A	**A**
115	51.50	1.90	3.69	1.30	6.09	A	4.54	A	**A**
116	42.70	7.10	16.63	10.10	18.67	A	16.84	N	**W**
117	49.10	1.70	3.46	3.70	5.68	A	4.36	A	**A**
118	47.62	2.94	6.17	5.18	8.40	A	6.72	A	**A**
119	49.00	2.00	4.08	3.80	6.30	A	4.87	A	**A**
120	38.70	4.30	11.11	14.10	11.67	N	11.42	A	**N**
121	52.50	3.30	6.29	0.30	9.25	A	6.82	A	**A**
123	50.00	2.60	5.20	2.80	7.62	A	5.84	A	**A**
124	49.36	1.05	2.13	3.44	4.52	A	3.40	A	**A**
125	46.70	0.20	0.43	6.10	3.65	N	2.69	A	**W**

Lab code	Rep. Value	Rep Unc.	Unc. [%]	A1	A2	Trueness	P	Precision	Final Score
126	50.60	1.30	2.57	2.20	4.93	A	3.69	A	**A**
127	54.48	0.79	1.44	1.68	4.14	A	3.02	A	**A**

Data evaluation of sample 02

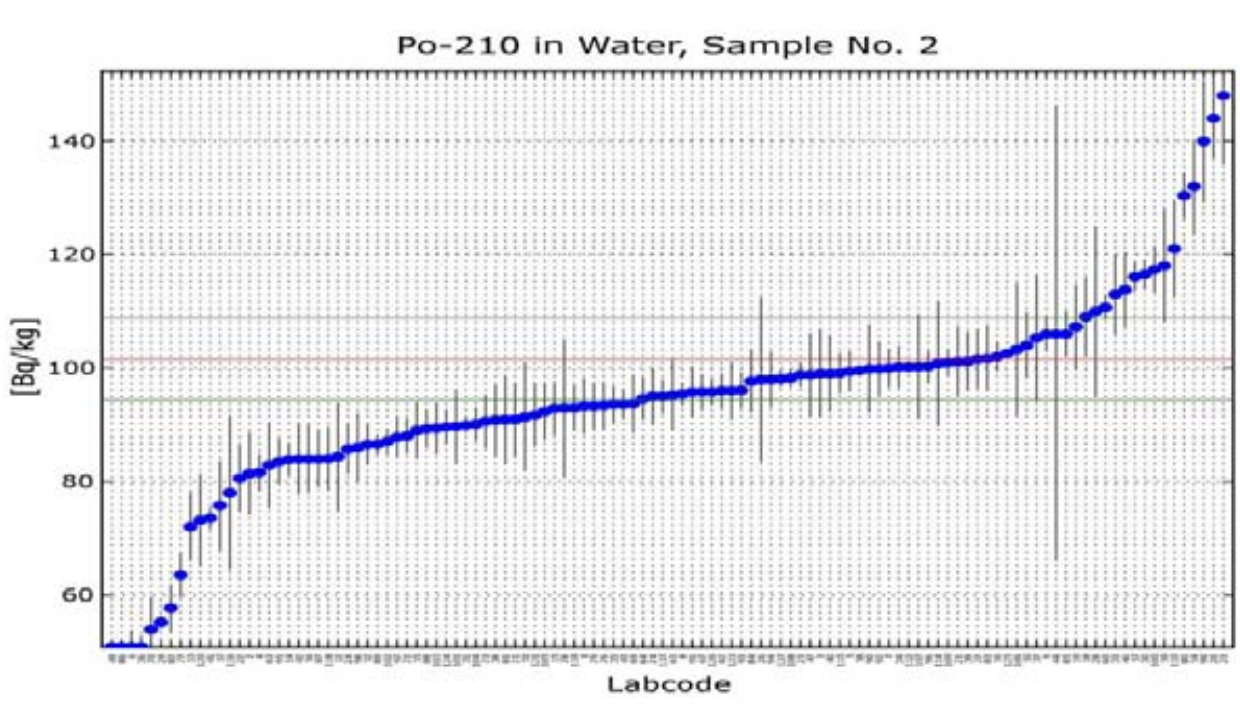


Fig. I -03: S-shape chart of sample 02

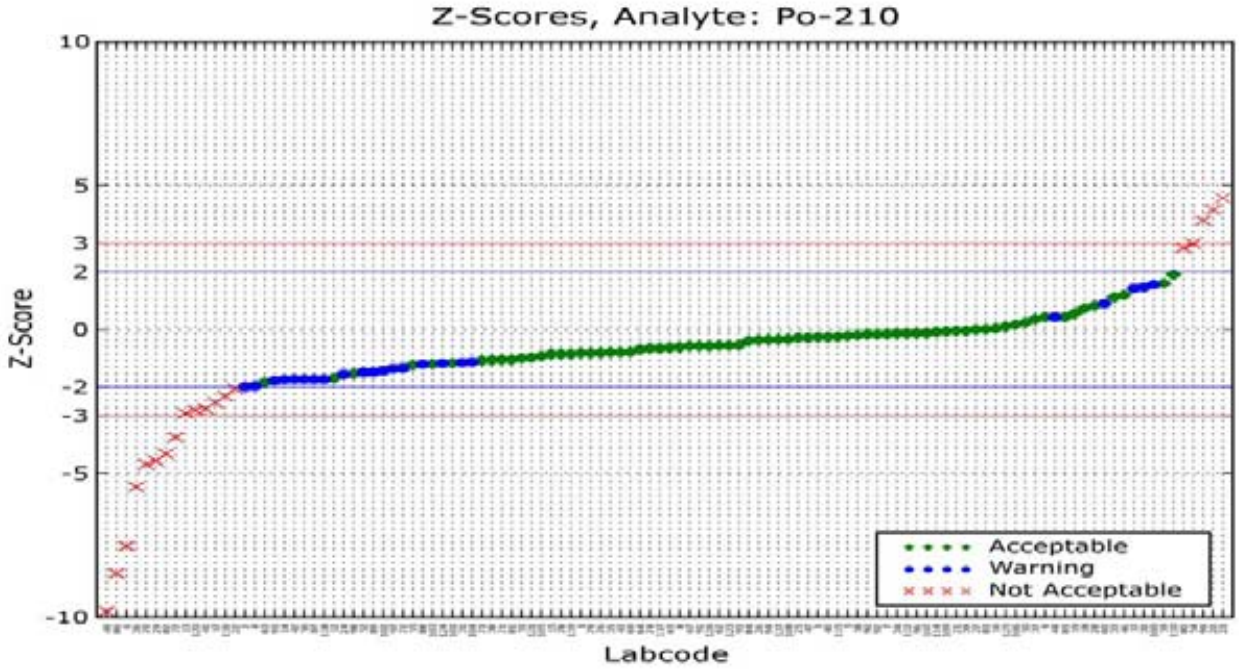


Fig. I -04: z-score chart of sample 02

Data evaluation of sample 02

Target Value: 101.6 ± 2.8 Bq/kg

TABLE I-02: DATA EVALUATION OF SAMPLE 02

Lab code	Rep. Value	Reported Unc.	Unc. [%]	A1	A2	Trueness	P	Precision	Final Score
1	93.30	4.80	5.14	8.30	14.34	A	5.84	A	**A**
2	81.40	7.20	8.85	20.2	19.93	N	9.26	A	**W**
3	99.00	7.70	7.78	2.60	21.14	A	8.25	A	**A**
4	81.60	3.30	4.04	20.0	11.17	N	4.89	A	**W**
5	99.40	3.50	3.52	2.20	11.56	A	4.47	A	**A**
6	25.10	3.00	11.95	76.5	10.59	N	12.2	A	**N**
7	100.00	3.35	3.35	1.60	11.26	A	4.34	A	**A**
8	95.40	2.00	2.10	6.20	8.88	A	3.46	A	**A**
9	106.00	3.00	2.83	4.40	10.59	A	3.95	A	**A**
12	84.40	9.40	11.14	17.2	25.31	A	11.4	A	**A**
13	72.00	6.00	8.33	29.6	17.08	N	8.78	A	**N**
14	83.90	2.80	3.34	17.7	10.22	N	4.33	A	**W**
15	92.93	4.68	5.04	8.67	14.07	A	5.74	A	**A**
16	102.01	2.56	2.51	0.41	9.79	A	3.73	A	**A**
17	75.80	7.90	10.42	25.8	210.6	N	10.7	A	**N**
18	109.00	7.00	6.42	7.40	19.45	A	6.99	A	**A**
19	107.28	7.35	6.85	5.68	20.29	A	7.38	A	**A**
20	144.00	7.00	4.86	42.40	19.45	N	5.59	A	**N**
21	101.15	6.16	6.09	0.45	17.46	A	6.68	A	**A**
22	80.55	5.78	7.18	21.0	16.57	N	7.69	A	**N**
23	148.00	12.00	8.11	46.4	31.79	N	8.56	A	**N**
24	85.75	4.34	5.06	15.85	13.33	N	5.76	A	**W**
25	98.80	2.10	2.13	2.80	9.03	A	3.48	A	**A**
26	97.98	14.44	14.74	3.62	37.95	A	14.99	A	**A**
27	101.60	5.10	5.02	0.00	15.01	A	5.73	A	**A**
28	110.00	15.00	13.64	8.40	39.37	A	13.91	A	**A**
29	55.19	1.11	2.01	46.4	7.77	N	3.41	A	**N**
30	116.50	2.66	2.28	14.9	9.96	N	3.58	A	**W**
31	89.92	1.32	1.47	11.6	7.99	N	3.12	A	**W**
33	113.00	7.00	6.19	11.4	19.45	A	6.78	A	**A**
34	100.20	3.60	3.59	1.40	11.77	A	4.53	A	**A**
35	93.60	3.20	3.42	8.00	10.97	A	4.39	A	**A**
36	46.00	2.00	4.35	55.6	8.88	N	5.15	A	**N**
37	105.30	11.00	10.45	3.70	29.28	A	10.80	A	**A**
38	90.80	6.20	6.83	10.8	17.55	A	7.36	A	**A**

Lab code	Rep. Value	Reported Unc.	Unc. [%]	A1	A2	Trueness	P	Precision	Final Score
39	101.20	5.20	5.14	0.40	15.24	A	5.83	A	**A**
40	99.00	6.60	6.67	2.60	18.50	A	7.21	A	**A**
41	73.54	1.95	2.65	28.0	8.80	N	3.82	A	**N**
42	84.00	6.10	7.26	17.6	17.32	N	7.77	A	**W**
43	93.60	2.60	2.78	8.00	9.86	A	3.91	A	**A**
44	106.00	40.00	37.74	4.40	103.45	A	37.84	N	**W**
46	113.80	6.49	5.70	12.2	18.23	A	6.33	A	**A**
47	98.80	7.30	7.39	2.80	20.17	A	7.89	A	**A**
49	2.04	0.34	16.46	99.5	7.28	N	16.69	N	**N**
50	103.99	5.77	5.55	2.39	16.55	A	6.20	A	**A**
51	91.40	9.52	10.42	10.2	25.60	A	10.77	A	**A**
52	86.50	3.50	4.05	15.1	11.56	N	4.90	A	**W**
54	132.00	8.30	6.29	30.4	22.60	N	6.87	A	**N**
55	89.00	5.00	5.62	12.6	14.78	A	6.26	A	**A**
56	84.00	6.00	7.14	17.6	17.08	N	7.66	A	**W**
57	116.10	2.50	2.15	14.5	9.68	N	3.50	A	**W**
58	99.60	0.50	0.50	2.00	7.34	A	2.80	A	**A**
59	118.00	10.00	8.47	16.4	26.79	A	8.91	A	**A**
60	110.70	2.10	1.90	9.10	9.03	N	3.35	A	**W**
62	96.00	3.00	3.13	5.60	10.59	A	4.17	A	**A**
63	82.90	7.53	9.08	18.7	20.73	A	9.49	A	**A**
64	94.59	3.69	3.90	7.01	11.95	A	4.78	A	**A**
65	95.20	6.20	6.51	6.40	17.55	A	7.07	A	**A**
67	95.80	3.10	3.24	5.80	10.78	A	4.25	A	**A**
69	93.70	5.10	5.44	7.90	15.01	A	6.10	A	**A**
70	53.90	5.82	10.80	47.70	16.66	N	11.14	A	**N**
71	90.93	6.37	7.01	10.6	17.95	A	7.53	A	**A**
72	88.00	3.00	3.41	13.60	10.59	N	4.38	A	**W**
73	90.60	4.70	5.19	11.00	14.11	A	5.87	A	**A**
74	95.00	5.00	5.26	6.60	14.78	A	5.94	A	**A**
76	93.40	4.18	4.48	8.20	12.98	A	5.26	A	**A**
77	63.50	3.80	5.98	38.10	12.18	N	6.59	A	**N**
78	93.00	12.00	12.90	8.60	31.79	A	13.19	A	**A**
79	93.30	4.00	4.29	8.30	12.60	A	5.10	A	**A**
80	130.40	4.00	3.07	28.80	12.60	N	4.12	A	**N**
81	90.89	7.72	8.49	10.71	21.19	A	8.93	A	**A**
82	57.70	4.20	7.28	43.90	13.02	N	7.78	A	**N**
83	101.70	5.70	5.60	0.10	16.38	A	6.25	A	**A**
84	97.68	5.44	5.57	3.92	15.79	A	6.21	A	**A**

Lab code	Rep. Value	Reported Unc.	Unc. [%]	A1	A2	Trueness	P	Precision	Final Score
85	106.00	4.00	3.77	4.40	12.60	A	4.67	A	**A**
86	15.53	0.29	1.87	86.07	7.26	N	3.33	A	**N**
87	84.00	5.00	5.95	17.60	14.78	N	6.56	A	**W**
88	89.31	3.28	3.67	12.29	11.13	N	4.59	A	**W**
89	86.53	1.73	2.00	15.07	8.49	N	3.40	A	**W**
90	99.87	7.67	7.68	1.73	21.07	A	8.16	A	**A**
91	95.77	4.41	4.60	5.83	13.48	A	5.37	A	**A**
92	99.90	4.70	4.70	1.70	14.11	A	5.45	A	**A**
93	96.10	3.10	3.23	5.50	10.78	A	4.24	A	**A**
94	98.00	4.90	5.00	3.60	14.56	A	5.71	A	**A**
95	83.50	4.00	4.79	18.10	12.60	N	5.53	A	**W**
96	100.30	2.70	2.69	1.30	10.04	A	3.85	A	**A**
97	87.80	3.50	3.99	13.80	11.56	N	4.85	A	**W**
98	86.00	6.00	6.98	15.60	17.08	A	7.50	A	**A**
99	140.00	10.62	7.59	38.40	28.34	N	8.07	A	**N**
100	117.40	4.00	3.41	15.80	12.60	N	4.38	A	**W**
101	89.70	6.38	7.11	11.89	17.96	A	7.62	A	**A**
102	87.10	2.26	2.59	14.50	9.28	N	3.79	A	**W**
103	89.40	4.47	5.00	12.20	13.61	A	5.71	A	**A**
104	90.10	2.90	3.22	11.50	10.40	N	4.24	A	**W**
105	92.30	4.90	5.31	9.30	14.56	A	5.98	A	**A**
106	103.30	11.60	11.23	1.70	30.79	A	11.56	A	**A**
107	100.24	9.24	9.22	1.36	24.91	A	9.62	A	**A**
108	98.27	1.58	1.61	3.33	8.29	A	3.19	A	**A**
109	101.00	2.30	2.28	0.60	9.35	A	3.58	A	**A**
110	121.00	8.50	7.02	19.40	23.09	A	7.55	A	**A**
112	100.20	1.00	1.00	1.40	7.67	A	2.93	A	**A**
114	100.80	11.00	10.91	0.80	29.28	A	11.26	A	**A**
115	99.10	3.50	3.53	2.50	11.56	A	4.48	A	**A**
116	78.00	13.50	17.31	23.60	35.57	A	17.53	N	**N**
117	95.00	2.90	3.05	6.60	10.40	A	4.11	A	**A**
118	84.07	5.56	6.61	17.53	16.06	N	7.16	A	**W**
119	93.00	4.00	4.30	8.60	12.60	A	5.11	A	**A**
120	73.20	8.10	11.07	28.40	22.11	N	11.40	A	**N**
121	91.70	5.50	6.00	9.90	15.92	A	6.60	A	**A**
123	96.00	5.10	5.31	5.60	15.01	A	5.98	A	**A**
124	89.62	2.82	3.15	11.98	10.25	N	4.18	A	**W**
125	102.60	0.60	0.58	1.00	7.39	A	2.82	A	**A**
126	95.80	2.30	2.40	5.80	9.35	A	3.65	A	**A**

Lab code	Rep. Value	Reported Unc.	Unc. [%]	A1	A2	Trueness	P	Precision	Final Score
127	98.13	1.37	1.40	3.47	8.04	A	3.09	A	**A**

Data evaluation of sample 03

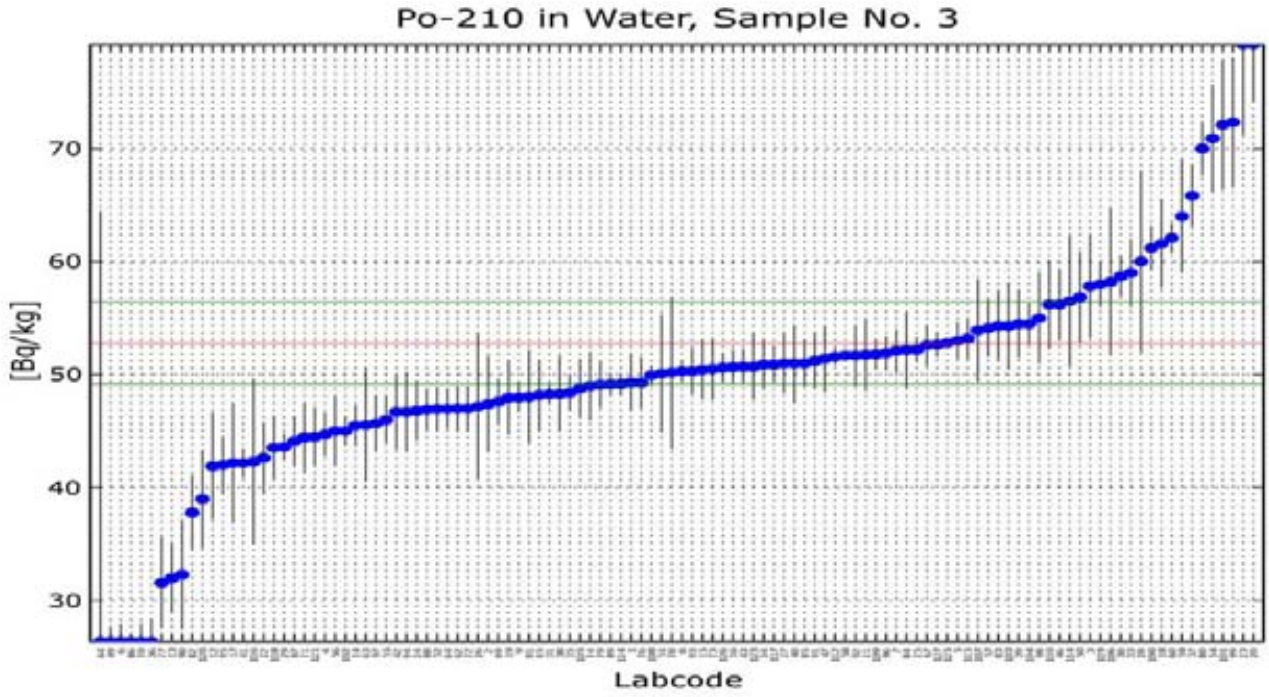


Fig. I -05: S-shape chart of sample 03.

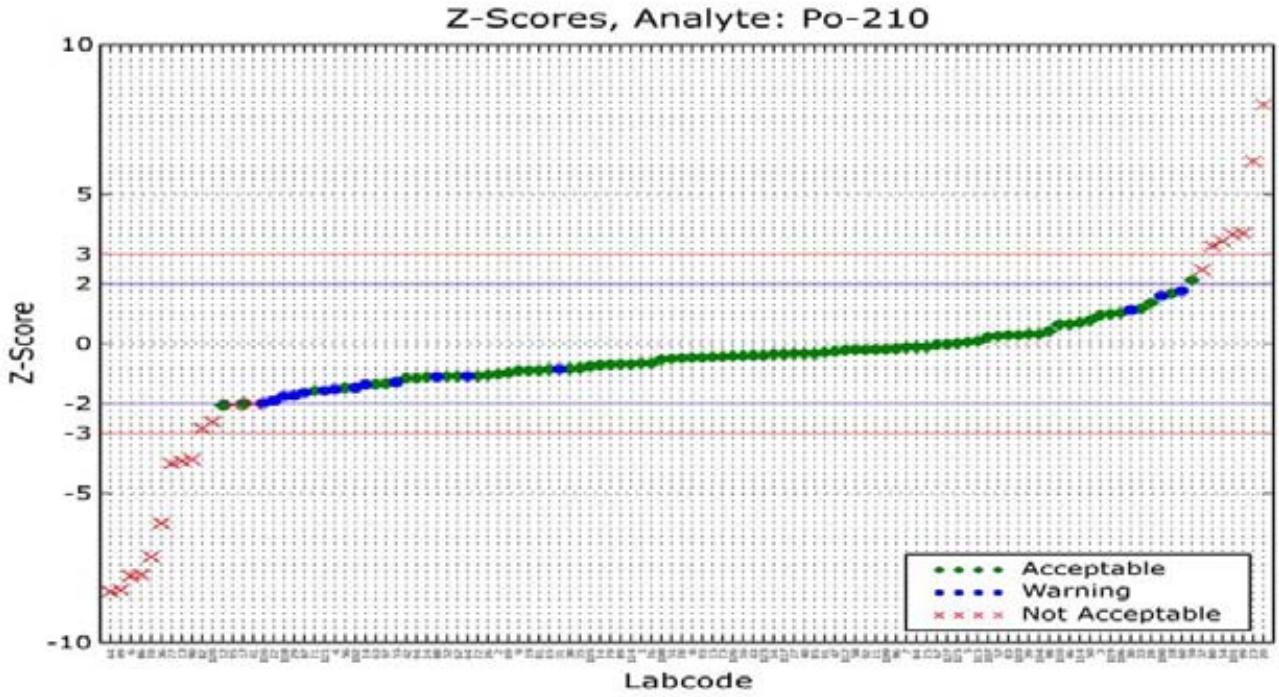


Fig. I -06: z-score chart of sample 03.

Data evaluation of sample 03

Target Value: 52.8 ± 1.4 Bq/kg

TABLE I-03: DATA EVALUATION OF SAMPLE 03.

Lab code	Rep. Value	Reported Unc.	Unc. [%]	A1	A2	Trueness	P	Precision	Final Score
1	49.30	2.50	5.07	3.50	7.39	A	5.72	A	**A**
2	47.40	4.20	8.86	5.40	11.42	A	9.25	A	**A**
3	57.80	4.50	7.79	5.00	12.16	A	8.22	A	**A**
4	44.70	1.90	4.25	8.10	6.09	N	5.01	A	**W**
5	53.00	1.60	3.02	0.20	5.49	A	4.02	A	**A**
6	11.80	1.50	12.71	41.00	5.29	N	12.99	A	**N**
7	52.10	1.92	3.69	0.70	6.13	A	4.54	A	**A**
8	50.30	1.00	1.99	2.50	4.44	A	3.31	A	**A**
9	48.00	1.30	2.71	4.80	4.93	A	3.79	A	**A**
12	41.90	4.70	11.22	10.90	12.65	A	11.53	A	**A**
13	32.00	3.00	9.38	20.80	8.54	N	9.74	A	**N**
14	45.50	1.80	3.96	7.30	5.88	N	4.76	A	**W**
15	50.43	2.60	5.16	2.37	7.62	A	5.80	A	**A**
16	50.66	1.49	2.94	2.14	5.27	A	3.96	A	**A**
17	42.20	5.30	12.56	10.60	14.14	A	12.84	A	**A**
18	61.60	3.90	6.33	8.80	10.69	A	6.86	A	**A**
19	47.97	3.23	6.73	4.83	9.08	A	7.24	A	**A**
20	95.00	5.00	5.26	42.20	13.40	N	5.89	A	**N**
21	51.75	3.15	6.09	1.05	8.89	A	6.64	A	**A**
22	42.64	3.11	7.29	10.16	8.80	N	7.76	A	**W**
23	85.00	8.00	9.41	32.20	20.95	N	9.78	A	**N**
24	46.81	2.63	5.62	5.99	7.69	A	6.21	A	**A**
25	52.20	1.10	2.11	0.60	4.59	A	3.39	A	**A**
26	47.19	6.38	13.52	5.61	16.85	A	13.78	A	**A**
27	51.00	2.60	5.10	1.80	7.62	A	5.75	A	**A**
28	60.00	8.00	13.33	7.20	20.95	A	13.59	A	**A**
29	43.60	1.16	2.66	9.20	4.69	N	3.76	A	**W**
30	58.70	1.73	2.95	5.90	5.74	N	3.96	A	**W**
31	48.27	0.88	1.82	4.53	4.27	N	3.22	A	**W**
33	59.00	3.00	5.08	6.20	8.54	A	5.73	A	**A**
34	50.90	2.20	4.32	1.90	6.73	A	5.07	A	**A**
35	48.40	1.60	3.31	4.40	5.49	A	4.24	A	**A**
36	21.00	2.00	9.52	31.80	6.30	N	9.89	A	**N**
37	65.80	2.70	4.10	13.00	7.85	N	4.89	A	**N**
38	48.30	3.30	6.83	4.50	9.25	A	7.33	A	**A**

Lab code	Rep. Value	Reported Unc.	Unc. [%]	A1	A2	Trueness	P	Precision	Final Score
39	54.50	3.00	5.50	1.70	8.54	A	6.11	A	**A**
40	51.00	3.40	6.67	1.80	9.49	A	7.17	A	**A**
41	42.20	1.25	2.96	10.60	4.84	N	3.98	A	**N**
42	46.70	3.30	7.07	6.10	9.25	A	7.55	A	**A**
43	50.70	1.50	2.96	2.10	5.29	A	3.97	A	**A**
44	9.00	38.00	422.22	43.80	98.11	A	422.2	N	**N**
46	56.21	3.14	5.59	3.41	8.87	A	6.19	A	**A**
47	51.40	2.90	5.64	1.40	8.31	A	6.23	A	**A**
49	9.27	1.18	12.76	43.53	4.73	N	13.03	A	**N**
50	56.86	3.99	7.02	4.06	10.91	A	7.50	A	**A**
51	50.10	5.20	10.38	2.70	13.89	A	10.71	A	**A**
52	46.96	1.93	4.11	5.84	6.15	A	4.89	A	**A**
54	70.90	4.70	6.63	18.10	12.65	N	7.14	A	**N**
55	46.00	2.00	4.35	6.80	6.30	N	5.09	A	**W**
56	45.00	3.00	6.67	7.80	8.54	A	7.17	A	**A**
57	54.10	2.50	4.62	1.30	7.39	A	5.33	A	**A**
58	51.70	0.40	0.77	1.10	3.76	A	2.76	A	**A**
59	64.00	5.00	7.81	11.20	13.40	A	8.25	A	**A**
60	62.10	1.30	2.09	9.30	4.93	N	3.38	A	**W**
62	47.00	2.00	4.26	5.80	6.30	A	5.01	A	**A**
63	45.55	4.97	10.91	7.25	13.32	A	11.23	A	**A**
64	46.97	1.69	3.60	5.83	5.66	N	4.47	A	**W**
65	48.20	3.10	6.43	4.60	8.78	A	6.96	A	**A**
67	52.60	1.80	3.42	0.20	5.88	A	4.33	A	**A**
69	47.60	2.00	4.20	5.20	6.30	A	4.97	A	**A**
70	15.11	1.56	10.34	37.69	5.41	N	10.68	A	**N**
71	44.45	3.11	7.00	8.35	8.80	A	7.48	A	**A**
72	47.00	2.00	4.26	5.80	6.30	A	5.01	A	**A**
73	50.50	2.70	5.35	2.30	7.85	A	5.97	A	**A**
74	49.00	3.00	6.12	3.80	8.54	A	6.67	A	**A**
76	49.30	2.23	4.52	3.50	6.79	A	5.24	A	**A**
77	31.60	4.00	12.66	21.20	10.93	N	12.93	A	**N**
78	50.20	6.70	13.35	2.60	17.66	A	13.61	A	**A**
79	49.10	2.00	4.07	3.70	6.30	A	4.86	A	**A**
80	70.00	2.35	3.36	17.20	7.06	N	4.28	A	**N**
81	48.05	4.08	8.49	4.75	11.13	A	8.90	A	**A**
82	37.80	3.30	8.73	15.00	9.25	N	9.12	A	**N**
83	54.30	3.00	5.52	1.50	8.54	A	6.13	A	**A**
84	52.17	3.29	6.31	0.63	9.22	A	6.84	A	**A**

Lab code	Rep. Value	Reported Unc.	Unc. [%]	A1	A2	Trueness	P	Precision	Final Score
85	51.00	2.00	3.92	1.80	6.30	A	4.73	A	**A**
86	11.94	0.24	2.01	40.86	3.66	N	3.33	A	**N**
87	44.10	2.20	4.99	8.70	6.73	N	5.65	A	**W**
88	46.91	1.77	3.77	5.89	5.82	N	4.61	A	**W**
89	49.14	0.98	2.00	3.66	4.41	A	3.32	A	**A**
90	32.32	4.81	14.88	20.48	12.92	N	15.12	N	**N**
91	51.20	2.38	4.65	1.60	7.12	A	5.35	A	**A**
92	51.70	2.70	5.22	1.10	7.85	A	5.86	A	**A**
93	50.30	2.00	3.98	2.50	6.30	A	4.78	A	**A**
94	46.70	3.50	7.49	6.10	9.73	A	7.95	A	**A**
95	42.00	2.50	5.95	10.80	7.39	N	6.52	A	**N**
96	51.90	1.50	2.89	0.90	5.29	A	3.92	A	**A**
97	45.70	2.40	5.25	7.10	7.17	A	5.88	A	**A**
98	55.00	4.00	7.27	2.20	10.93	A	7.74	A	**A**
99	72.31	5.75	7.95	19.51	15.27	N	8.38	A	**N**
100	61.20	1.90	3.10	8.40	6.09	N	4.08	A	**W**
101	72.09	5.67	7.87	19.29	15.08	N	8.30	A	**N**
102	45.00	1.28	2.84	7.80	4.89	N	3.89	A	**W**
103	54.30	3.80	7.00	1.50	10.45	A	7.48	A	**A**
104	54.50	1.80	3.30	1.70	5.88	A	4.24	A	**A**
105	48.80	2.60	5.33	4.00	7.62	A	5.95	A	**A**
106	58.20	6.50	11.17	5.40	17.15	A	11.48	A	**A**
107	53.93	4.48	8.31	1.13	12.11	A	8.72	A	**A**
108	49.95	0.87	1.74	2.85	4.25	A	3.17	A	**A**
109	51.80	1.30	2.51	1.00	4.93	A	3.65	A	**A**
110	56.20	3.90	6.94	3.40	10.69	A	7.43	A	**A**
112	51.60	0.70	1.36	1.20	4.04	A	2.98	A	**A**
114	56.50	5.70	10.09	3.70	15.14	A	10.43	A	**A**
115	53.20	1.80	3.38	0.40	5.88	A	4.30	A	**A**
116	42.30	7.30	17.26	10.50	19.18	A	17.46	N	**W**
117	50.90	1.60	3.14	1.90	5.49	A	4.11	A	**A**
118	43.53	2.82	6.48	9.27	8.12	N	7.00	A	**W**
119	58.00	2.00	3.45	5.20	6.30	A	4.35	A	**A**
120	39.00	4.30	11.03	13.80	11.67	N	11.34	A	**N**
121	44.50	2.60	5.84	8.30	7.62	N	6.42	A	**W**
123	50.70	2.90	5.72	2.10	8.31	A	6.30	A	**A**
124	49.16	0.92	1.87	3.64	4.32	A	3.25	A	**A**
125	52.80	0.20	0.38	0.00	3.65	A	2.68	A	**A**
126	50.60	1.30	2.57	2.20	4.93	A	3.69	A	**A**

Lab code	Rep. Value	Reported Unc.	Unc. [%]	A1	A2	Trueness	P	Precision	Final Score
127	52.65	1.09	2.08	0.15	4.58	A	3.37	A	**A**

Data evaluation of sample 04

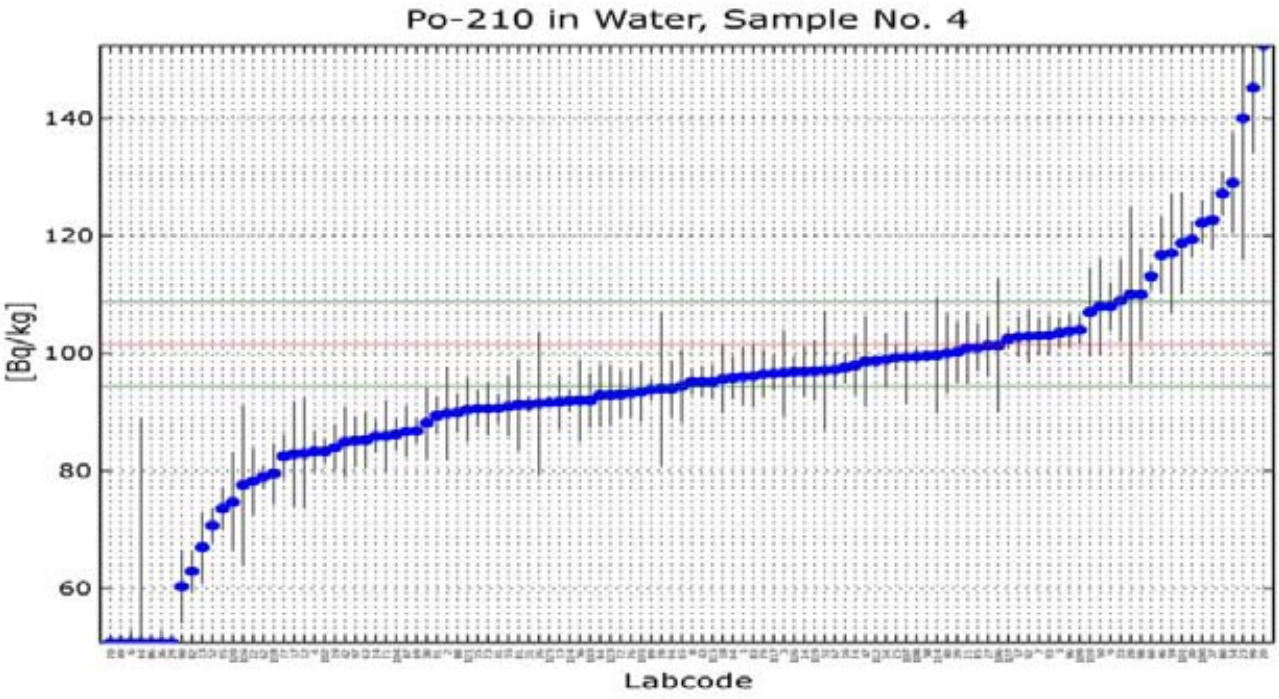


Fig. I -07: S-shape chart of sample 04.

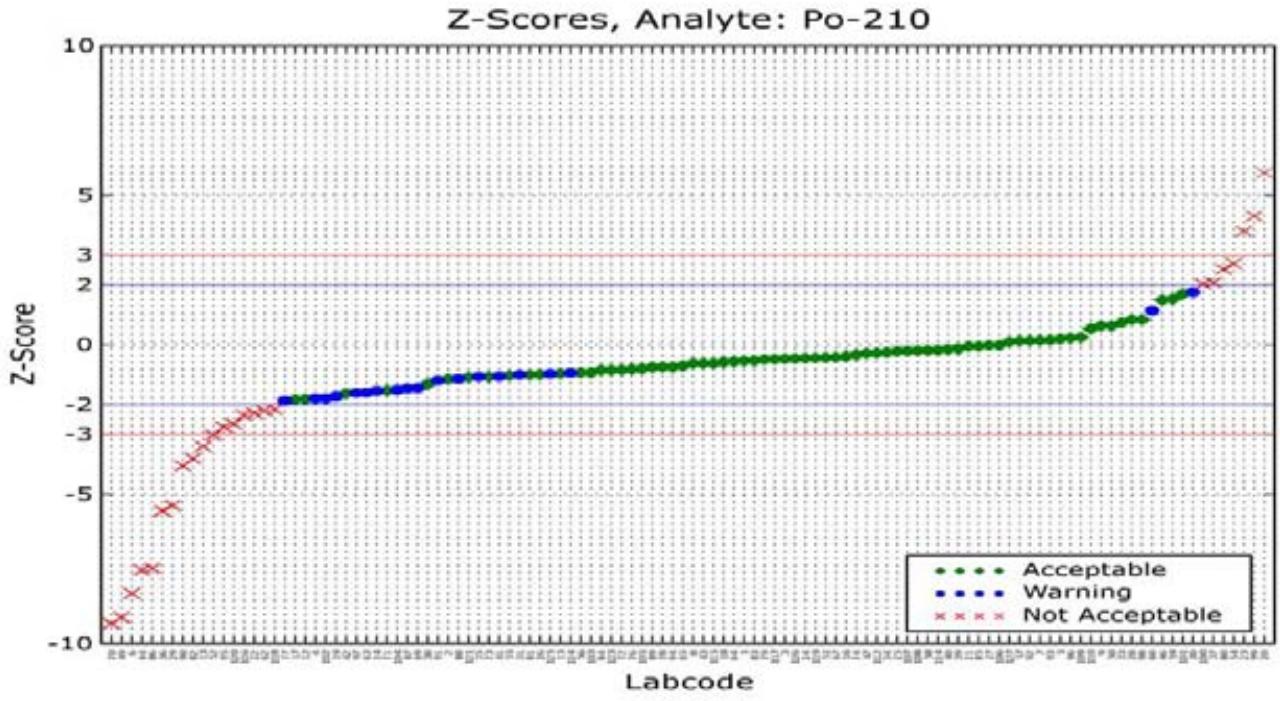


Fig. I -08: z-score chart of sample 04.

Data evaluation of sample 04

Target Value: 101.6 ± 2.8 Bq/kg

TABLE I-04: DATA EVALUATION OF SAMPLE 04

Lab code	Rep. Value	Reported Unc.	Unc. [%]	A1	A2	Trueness	P	Precision	Final Score
1	96.00	4.90	5.10	5.60	14.56	A	5.80	A	**A**
2	89.80	7.90	8.80	11.80	21.62	A	9.22	A	**A**
3	96.70	7.30	7.55	4.90	20.17	A	8.04	A	**A**
4	83.30	3.40	4.08	18.30	11.36	N	4.92	A	**W**
5	103.50	2.50	2.42	1.90	9.68	A	3.66	A	**A**
6	17.00	2.10	12.35	84.60	9.03	N	12.66	A	**N**
7	103.00	3.00	2.91	1.40	10.59	A	4.01	A	**A**
8	95.20	2.10	2.21	6.40	9.03	A	3.53	A	**A**
9	108.00	4.00	3.70	6.40	12.60	A	4.62	A	**A**
12	83.00	9.30	11.20	18.60	25.06	A	11.54	A	**A**
13	67.00	6.00	8.96	34.60	17.08	N	9.37	A	**N**
14	85.90	2.80	3.26	15.70	10.22	N	4.27	A	**W**
15	91.70	4.60	5.02	9.90	13.89	A	5.72	A	**A**
16	97.57	2.53	2.59	4.03	9.74	A	3.79	A	**A**
17	82.90	8.90	10.74	18.70	24.07	A	11.08	A	**A**
18	95.60	5.80	6.07	6.00	16.62	A	6.66	A	**A**
19	83.97	3.92	4.67	17.63	12.43	N	5.42	A	**W**
20	160.00	7.00	4.38	58.40	19.45	N	5.17	A	**N**
21	100.97	6.15	6.09	0.63	17.43	A	6.69	A	**A**
22	78.28	5.61	7.17	23.32	16.18	N	7.68	A	**N**
23	140.00	24.00	17.14	38.40	62.34	A	17.36	N	**N**
24	96.91	4.29	4.43	4.69	13.22	A	5.21	A	**A**
25	99.30	2.10	2.11	2.30	9.03	A	3.47	A	**A**
26	91.49	12.16	13.29	10.11	32.19	A	13.57	A	**A**
27	101.30	5.10	5.03	0.30	15.01	A	5.74	A	**A**
28	110.00	15.00	13.64	8.40	39.37	A	13.91	A	**A**
29	46.82	0.86	1.84	54.78	7.56	N	3.31	A	**N**
30	119.40	3.09	2.59	17.80	10.76	N	3.78	A	**W**
31	91.30	1.40	1.53	10.30	8.08	N	3.15	A	**W**
33	109.00	7.00	6.42	7.40	19.45	A	6.99	A	**A**
34	98.90	4.50	4.55	2.70	13.67	A	5.32	A	**A**
35	90.60	3.00	3.31	11.00	10.59	N	4.31	A	**W**
36	45.00	2.00	4.44	56.60	8.88	N	5.23	A	**N**
37	122.70	5.10	4.16	21.10	15.01	N	4.99	A	**N**
38	88.20	6.00	6.80	13.40	17.08	A	7.34	A	**A**

Lab code	Rep. Value	Reported Unc.	Unc. [%]	A1	A2	Trueness	P	Precision	Final Score
39	100.20	5.10	5.09	1.40	15.01	A	5.79	A	**A**
40	100.00	6.70	6.70	1.60	18.73	A	7.24	A	**A**
41	90.68	2.46	2.71	10.92	9.62	N	3.87	A	**W**
42	84.90	5.90	6.95	16.70	16.85	A	7.48	A	**A**
43	95.20	2.60	2.73	6.40	9.86	A	3.88	A	**A**
44	25.00	38.00	152.00	76.60	98.31	A	152.0	N	**N**
46	116.70	6.49	5.56	15.10	18.24	A	6.21	A	**A**
47	98.60	7.70	7.81	3.00	21.14	A	8.28	A	**A**
49	8.82	1.08	12.22	92.78	7.74	N	12.53	A	**N**
50	107.98	8.07	7.47	6.38	22.04	A	7.97	A	**A**
51	97.10	10.09	10.39	4.50	27.02	A	10.75	A	**A**
52	70.70	2.88	4.07	30.90	10.36	N	4.92	A	**N**
54	129.00	8.50	6.59	27.40	23.09	N	7.14	A	**N**
55	91.00	5.00	5.49	10.60	14.78	A	6.15	A	**A**
56	92.00	7.00	7.61	9.60	19.45	A	8.09	A	**A**
57	102.80	3.40	3.31	1.20	11.36	A	4.31	A	**A**
58	99.60	0.50	0.50	2.00	7.34	A	2.80	A	**A**
59	117.00	10.00	8.55	15.40	26.79	A	8.98	A	**A**
60	113.10	2.20	1.95	11.50	9.19	N	3.37	A	**W**
62	79.00	2.00	2.53	22.60	8.88	N	3.74	A	**N**
63	85.22	4.71	5.53	16.38	14.14	N	6.18	A	**W**
64	95.81	3.53	3.68	5.79	11.62	A	4.60	A	**A**
65	94.40	6.10	6.46	7.20	17.32	A	7.03	A	**A**
67	97.20	3.10	3.19	4.40	10.78	A	4.22	A	**A**
69	86.80	2.00	2.30	14.80	8.88	N	3.59	A	**W**
70	6.69	0.70	10.46	94.91	7.45	N	10.82	A	**N**
71	85.94	6.02	7.00	15.66	17.13	A	7.53	A	**A**
72	93.00	4.00	4.30	8.60	12.60	A	5.11	A	**A**
73	90.60	4.50	4.97	11.00	13.67	A	5.68	A	**A**
74	98.00	5.00	5.10	3.60	14.78	A	5.80	A	**A**
76	93.20	4.17	4.47	8.40	12.96	A	5.25	A	**A**
77	82.50	3.70	4.48	19.10	11.97	N	5.26	A	**W**
78	94.00	13.00	13.83	7.60	34.31	A	14.10	A	**A**
79	96.50	4.00	4.15	5.10	12.60	A	4.98	A	**A**
80	127.20	3.70	2.91	25.60	11.97	N	4.01	A	**N**
81	91.29	7.75	8.49	10.31	21.26	A	8.93	A	**A**
82	62.90	3.40	5.41	38.70	11.36	N	6.07	A	**N**
83	96.10	5.30	5.52	5.50	15.46	A	6.17	A	**A**
84	92.87	5.23	5.63	8.73	15.31	A	6.27	A	**A**

Lab code	Rep. Value	Reported Unc.	Unc. [%]	A1	A2	Trueness	P	Precision	Final Score
85	101.00	4.00	3.96	0.60	12.60	A	4.82	A	**A**
86	25.54	0.34	1.33	76.06	7.28	N	3.06	A	**N**
87	86.70	4.30	4.96	14.90	13.24	N	5.67	A	**W**
88	89.91	3.31	3.68	11.69	11.19	N	4.60	A	**W**
89	93.85	1.88	2.00	7.75	8.70	A	3.41	A	**A**
90	60.37	6.19	10.25	41.23	17.53	N	10.62	A	**N**
91	89.44	3.13	3.50	12.16	10.84	N	4.45	A	**W**
92	102.90	4.60	4.47	1.30	13.89	A	5.25	A	**A**
93	103.10	3.30	3.20	1.50	11.17	A	4.22	A	**A**
94	94.00	4.80	5.11	7.60	14.34	A	5.80	A	**A**
95	73.60	3.40	4.62	28.00	11.36	N	5.38	A	**N**
96	103.80	2.80	2.70	2.20	10.22	A	3.86	A	**A**
97	85.10	4.20	4.94	16.50	13.02	N	5.65	A	**W**
98	110.00	8.00	7.27	8.40	21.87	A	7.78	A	**A**
99	145.21	11.15	7.68	43.61	29.66	N	8.16	A	**N**
100	122.20	3.60	2.95	20.60	11.77	N	4.03	A	**N**
101	118.78	8.68	7.31	17.18	23.53	A	7.81	A	**A**
102	83.30	2.06	2.47	18.30	8.97	N	3.70	A	**W**
103	92.00	4.60	5.00	9.60	13.89	A	5.71	A	**A**
104	86.20	2.60	3.02	15.40	9.86	N	4.09	A	**W**
105	93.40	5.00	5.35	8.20	14.78	A	6.02	A	**A**
106	101.30	11.30	11.15	0.30	30.04	A	11.49	A	**A**
107	99.38	7.76	7.81	2.22	21.28	A	8.28	A	**A**
108	99.46	1.42	1.43	2.14	8.10	A	3.10	A	**A**
109	104.00	2.40	2.31	2.40	9.51	A	3.59	A	**A**
110	107.00	7.50	7.01	5.40	20.65	A	7.53	A	**A**
112	98.70	1.00	1.01	2.90	7.67	A	2.94	A	**A**
114	99.70	9.90	9.93	1.90	26.54	A	10.31	A	**A**
115	95.20	2.90	3.05	6.40	10.40	A	4.11	A	**A**
116	77.60	13.50	17.40	24.00	35.57	A	17.61	N	**N**
117	96.60	2.90	3.00	5.00	10.40	A	4.08	A	**A**
118	79.52	5.22	6.56	22.08	15.28	N	7.12	A	**N**
119	97.00	5.00	5.15	4.60	14.78	A	5.85	A	**A**
120	74.70	8.20	10.98	26.90	22.36	N	11.32	A	**N**
121	90.40	5.40	5.97	11.20	15.69	A	6.58	A	**A**
123	92.90	5.10	5.49	8.70	15.01	A	6.14	A	**A**
124	91.90	1.92	2.09	9.70	8.76	N	3.46	A	**W**
125	91.60	0.50	0.55	10.00	7.34	N	2.81	A	**W**
126	96.87	2.50	2.58	4.73	9.68	A	3.78	A	**A**

Lab code	Rep. Value	Reported Unc.	Unc. [%]	A1	A2	Trueness	P	Precision	Final Score
127	102.50	1.67	1.63	0.90	8.41	A	3.20	A	**A**

Data evaluation of sample 05, Blank

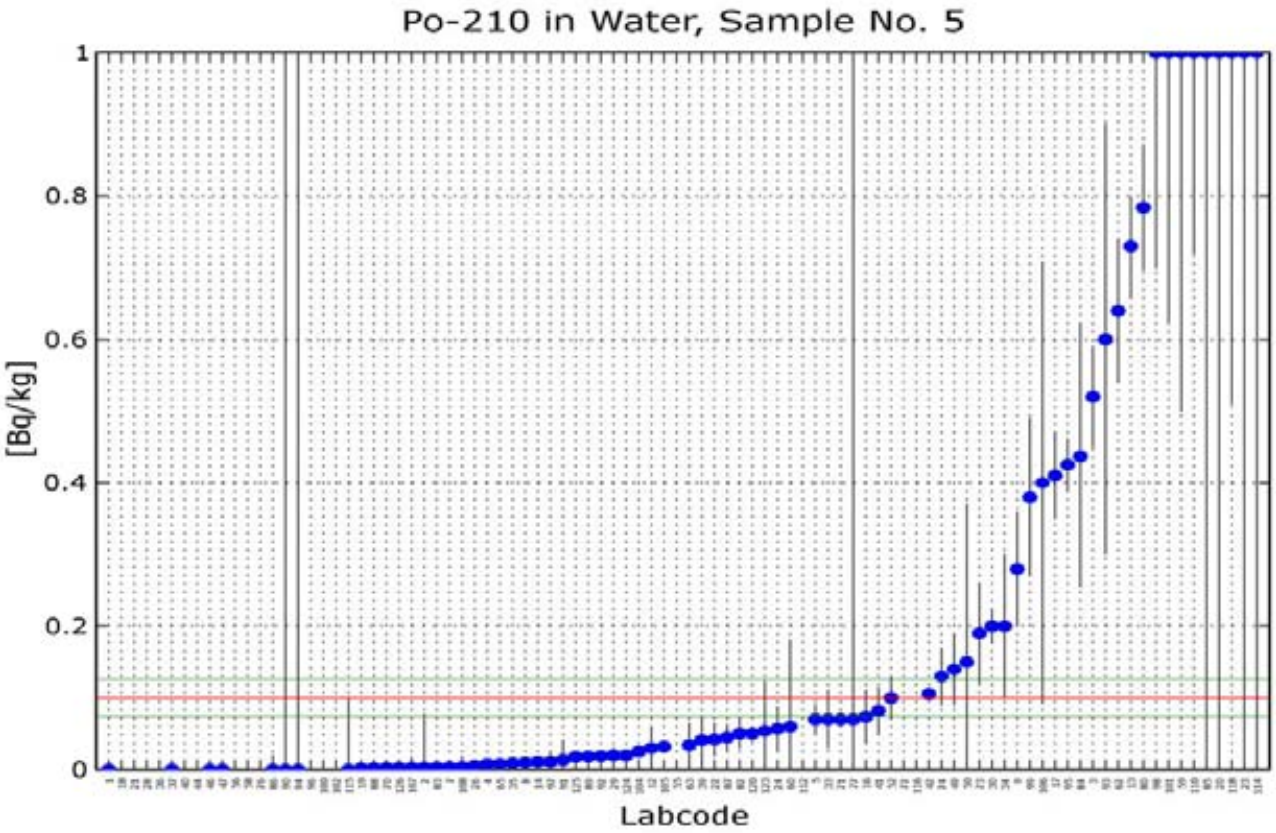


Fig. I -09: Graphical presentation of the 'Blank' sample results.

Data evaluation of sample 05, Blank

Target value: <0.1 Bq/kg

TABLE I-05: DATA EVALUATION OF THE 'BLANK' - SAMPLE 05

Lab code	Rep. Value	Reported Unc.	Final Score	Lab code	Rep. Value	Reported Unc.	Final Score
1	0.00	0.00	**A**	65	0.01	0.01	**A**
2	0.00	0.07	**A**	67	<0.073		**A**
3	0.52	0.07	**N**	69	<0.5		**A**
4	0.01	0.00	**A**	70	0.00	0.00	**A**
5	0.07	0.02	**A**	71	0.07	0.01	**A**
6	<0.55		**A**	72	0.10		**A**
7	0.00	0.01	**A**	73	0.19	0.07	**N**
8	0.01	0.00	**A**	74	0.13	0.04	**A**
9	0.28	0.08	**N**	76	0.00	0.04	**A**
12	0.03	0.03	**A**	77	0.07	1.60	**N**
13	0.73	0.07	**N**	78	<0.09		**A**
14	0.01	0.01	**A**	79	<0.1	0.03	**A**
15	<0.90		**A**	80	0.78	0.09	**N**
16	0.07	0.04	**A**	81	<0.12		**A**
17	0.41	0.06	**N**	82	0.05	0.02	**A**
18			**-**	83	0.00	0.00	**A**
19	0.00	0.00	**A**	84	0.44	0.18	**N**
20	4.00	1.00	**N**	85	3.70	2.00	**N**
21			**-**	86	0.00	0.02	**A**
22	0.04	0.02	**A**	87	0.04	0.02	**A**
23	27.00	5.00	**N**	88	0.00	0.00	**A**
24	0.06	0.03	**A**	89	0.02	0.00	**A**
25	<0.02		**A**	90	0.00	1.89	**A**
26	0.01	0.00	**A**	91	0.01	0.03	**A**
27	<0.16		**A**	92	0.02	0.00	**A**
28	0.00	20.00	**-**	93	0.60	0.30	**N**
29	0.02	0.01	**A**	94	0.00	1.10	**A**
30	0.20	0.02	**N**	95	0.42	0.04	**N**
31	<0.07		**A**	96	0.00	0.03	**A**
33	0.07	0.04	**A**	97	0.01	0.01	**A**
34	0.20	0.10	**A**	98	1.30	0.30	**N**
35	0.01	0.00	**A**	99	0.38	0.11	**N**
36	0.00	2.00	**-**	100	0.00	0.00	**-**
37	0.00	0.00	**A**	101	2.45	0.38	**N**
38	<0.04		**A**	102	0.00	0.00	**A**

Lab code	Rep. Value	Reported Unc.	Final Score	Lab code	Rep. Value	Reported Unc.	Final Score
39	0.04	0.03	**A**	103	<0.17		**A**
40	0.00			104	0.03	0.01	**A**
41	0.08	0.03	**A**	105	0.03	0.01	**A**
42	0.11	0.01	**A**	106	0.40	0.31	**A**
44	0.00	38.00	**N**	107	0.00	0.01	**A**
46	0.00	0.00	**A**	108	0.00	0.01	**A**
47	0.00	0.00	**A**	109	<0.1		**A**
49	0.14	0.05	**A**	110	3.28	0.28	**N**
50	0.15	0.22	**A**	112	0.06		**A**
51	<0.08		**A**	114	28.70	2.90	**N**
52	0.10	0.03	**A**	115	0.00	0.10	**A**
54	<0.2		**A**	116	0.10		**A**
55	0.03		**A**	117	<0.025		**A**
56	0.00	0.00	**A**	118	6.76	0.49	**N**
57	<0.15		**A**	119	<0.0045		**A**
58	0.00	1.00	**N**	120	0.05	0.01	**A**
59	3.20	0.50	**N**	121	<0.09		**A**
60	0.06	0.12	**A**	123	0.05	0.07	**A**
62	0.64	0.10	**N**	124	0.02	0.00	**A**
63	0.03	0.03	**A**	125	0.02	0.00	**A**
64	<0.01		**A**	126	0.00	0.00	**A**

APPENDIX II. DATA EVALUATION TABLES SORTED BY LABORATORY CODE

All results listed in this Appendix are expressed in Bq/kg units at a reference date set to 2007-April-01. The abbreviations and calculation formulas used in the individual evaluation tables are explained in Section 3 of this report.

The individual laboratory evaluation reports are presented in ascending order of the laboratory code.

Laboratory No. 1

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec	Final Score
Sample 01	52.80	1.40	48.10	2.60	5.41	-8.90	-0.89	-1.59	0.91	4.70	7.62	A	6.02	A	**A**
Sample 02	101.60	2.80	93.30	4.80	5.14	-8.17	-0.82	-1.49	0.92	8.30	14.34	A	5.84	A	**A**
Sample 03	52.80	1.40	49.30	2.50	5.07	-6.63	-0.66	-1.22	0.93	3.50	7.39	A	5.72	A	**A**
Sample 04	101.60	2.80	96.00	4.90	5.10	-5.51	-0.55	-0.99	0.94	5.60	14.56	A	5.80	A	**A**
Sample 05	0.10	0.01	0.00	0.00											**A**

Laboratory No. 2

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	47.00	4.10	8.72	-10.98	-1.1	-1.34	0.89	5.80	11.18	A	9.12	A	**A**
Sample 02	101.60	2.80	81.40	7.20	8.85	-19.88	-1.99	-2.61	0.8	20.20	19.93	N	9.26	A	**W**
Sample 03	52.80	1.40	47.40	4.20	8.86	-10.23	-1.02	-1.22	0.9	5.40	11.42	A	9.25	A	**A**
Sample 04	101.60	2.80	89.80	7.90	8.80	-11.61	-1.16	-1.41	0.88	11.80	21.62	A	9.22	A	**A**
Sample 05	0.10	0.01	0.00	0.07											**A**

Laboratory No. 3

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec	Final Score
Sample 01	52.80	1.40	52.80	4.10	7.77	0.00	0.0	0.0	1.0	0.00	11.18	A	8.21	A	**A**
Sample 02	101.60	2.80	99.00	7.70	7.78	-2.56	-0.26	-0.32	0.97	2.60	21.14	A	8.25	A	**A**
Sample 03	52.80	1.40	57.80	4.50	7.79	9.47	0.95	1.06	1.09	5.00	12.16	A	8.22	A	**A**
Sample 04	101.60	2.80	96.70	7.30	7.55	-4.82	-0.48	-0.63	0.95	4.90	20.17	A	8.04	A	**A**
Sample 05	0.10	0.01	0.52	0.07											**N**

Laboratory No. 4

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec	Final Score
Sample 01	52.80	1.40	48.80	2.00	4.10	-7.58	-0.76	-1.64	0.92	4.00	6.30	A	4.88	A	**A**
Sample 02	101.60	2.80	81.60	3.30	4.04	-19.69	-1.97	-4.62	0.8	20.00	11.17	N	4.89	A	**W**
Sample 03	52.80	1.40	44.70	1.90	4.25	-15.34	-1.53	-3.43	0.85	8.10	6.09	N	5.01	A	**W**
Sample 04	101.60	2.80	83.30	3.40	4.08	-18.01	-1.8	-4.15	0.82	18.30	11.36	N	4.92	A	**W**
Sample 05	0.10	0.01	0.01	0.00											**A**

Laboratory No. 5

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec	Final Score
Sample 01	52.80	1.40	51.90	3.60	6.94	-1.70	-0.17	-0.23	0.98	0.90	9.97	A	7.43	A	**A**
Sample 02	101.60	2.80	99.40	3.50	3.52	-2.17	-0.22	-0.49	0.98	2.20	11.56	A	4.47	A	**A**
Sample 03	52.80	1.40	53.00	1.60	3.02	0.38	0.04	0.09	1.0	0.20	5.49	A	4.02	A	**A**
Sample 04	101.60	2.80	103.50	2.50	2.42	1.87	0.19	0.51	1.02	1.90	9.68	A	3.66	A	**A**
Sample 05	0.10	0.01	0.07	0.02											**A**

Laboratory No. 6

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec	Final Score
Sample 01	52.80	1.40	20.50	2.50	12.20	-61.17	-6.12	-11.27	0.39	32.30	7.39	N	12.48	A	**N**
Sample 02	101.60	2.80	25.10	3.00	11.95	-75.30	-7.53	-18.64	0.25	76.50	10.59	N	12.27	A	**N**
Sample 03	52.80	1.40	11.80	1.50	12.71	-77.65	-7.77	-19.98	0.22	41.00	5.29	N	12.99	A	**N**
Sample 04	101.60	2.80	17.00	2.10	12.35	-83.27	-8.33	-24.17	0.17	84.60	9.03	N	12.66	A	**N**
Sample 05	0.10	0.01	<0.55												**A**

Laboratory No. 7

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec	Final Score
Sample 01	52.80	1.40	52.60	1.90	3.61	-0.38	-0.04	-0.08	1.0	0.20	6.09	A	4.48	A	**A**
Sample 02	101.60	2.80	100.00	3.35	3.35	-1.57	-0.16	-0.37	0.98	1.60	11.26	A	4.34	A	**A**
Sample 03	52.80	1.40	52.10	1.92	3.69	-1.33	-0.13	-0.29	0.99	0.70	6.13	A	4.54	A	**A**
Sample 04	101.60	2.80	103.00	3.00	2.91	1.38	0.14	0.34	1.01	1.40	10.59	A	4.01	A	**A**
Sample 05	0.10	0.01	0.00	0.01											**A**

Laboratory No. 8

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec	Final Score
Sample 01	52.80	1.40	48.30	1.00	2.07	-8.52	-0.85	-2.62	0.91	4.50	4.44	N	3.36	A	**W**
Sample 02	101.60	2.80	95.40	2.00	2.10	-6.10	-0.61	-1.8	0.94	6.20	8.88	A	3.46	A	**A**
Sample 03	52.80	1.40	50.30	1.00	1.99	-4.73	-0.47	-1.45	0.95	2.50	4.44	A	3.31	A	**A**
Sample 04	101.60	2.80	95.20	2.10	2.21	-6.30	-0.63	-1.83	0.94	6.40	9.03	A	3.53	A	**A**
Sample 05	0.10	0.01	0.01	0.00											**A**

Laboratory No. 9

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec	Final Score
Sample 01	52.80	1.40	54.00	2.00	3.70	2.27	0.23	0.49	1.02	1.20	6.30	A	4.55	A	**A**
Sample 02	101.60	2.80	106.00	3.00	2.83	4.33	0.43	1.07	1.04	4.40	10.59	A	3.95	A	**A**
Sample 03	52.80	1.40	48.00	1.30	2.71	-9.09	-0.91	-2.51	0.91	4.80	4.93	A	3.79	A	**A**
Sample 04	101.60	2.80	108.00	4.00	3.70	6.30	0.63	1.31	1.06	6.40	12.60	A	4.62	A	**A**
Sample 05	0.10	0.01	0.28	0.08											**N**

Laboratory No. 12

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	50.50	5.60	11.09	-4.36	-0.44	-0.4	0.96	2.30	14.89	A	11.40	A	**A**
Sample 02	101.60	2.80	84.40	9.40	11.14	-16.93	-1.69	-1.75	0.83	17.20	25.31	A	11.47	A	**A**
Sample 03	52.80	1.40	41.90	4.70	11.22	-20.64	-2.06	-2.22	0.79	10.90	12.65	A	11.53	A	**A**
Sample 04	101.60	2.80	83.00	9.30	11.20	-18.31	-1.83	-1.92	0.82	18.60	25.06	A	11.54	A	**A**
Sample 05	0.10	0.01	0.03	0.03											**A**

Laboratory No. 13

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec	Final Score
Sample 01	52.80	1.40	36.00	3.00	8.33	-31.82	-3.18	-5.07	0.68	16.80	8.54	N	8.74	A	**N**
Sample 02	101.60	2.80	72.00	6.00	8.33	-29.13	-2.91	-4.47	0.71	29.60	17.08	N	8.78	A	**N**
Sample 03	52.80	1.40	32.00	3.00	9.38	-39.39	-3.94	-6.28	0.61	20.80	8.54	N	9.74	A	**N**
Sample 04	101.60	2.80	67.00	6.00	8.96	-34.06	-3.41	-5.23	0.66	34.60	17.08	N	9.37	A	**N**
Sample 05	0.10	0.01	0.73	0.07											**N**

Laboratory No. 14

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	51.00	1.80	3.53	-3.41	-0.34	-0.79	0.97	1.80	5.88	A	4.41	A	**A**
Sample 02	101.60	2.80	83.90	2.80	3.34	-17.42	-1.74	-4.47	0.83	17.70	10.22	N	4.33	A	**W**
Sample 03	52.80	1.40	45.50	1.80	3.96	-13.83	-1.38	-3.2	0.86	7.30	5.88	N	4.76	A	**W**
Sample 04	101.60	2.80	85.90	2.80	3.26	-15.45	-1.55	-3.96	0.85	15.70	10.22	N	4.27	A	**W**
Sample 05	0.10	0.01	0.01	0.01											**A**

Laboratory No. 15

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	45.60	2.35	5.15	-13.64	-1.36	-2.63	0.86	7.20	7.06	N	5.80	A	**W**
Sample 02	101.60	2.80	92.93	4.68	5.04	-8.53	-0.85	-1.59	0.91	8.67	14.07	A	5.74	A	**A**
Sample 03	52.80	1.40	50.43	2.60	5.16	-4.49	-0.45	-0.8	0.96	2.37	7.62	A	5.80	A	**A**
Sample 04	101.60	2.80	91.70	4.60	5.02	-9.74	-0.97	-1.84	0.9	9.90	13.89	A	5.72	A	**A**
Sample 05	0.10	0.01	<0.90												**A**

Laboratory No. 16

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	58.92	1.42	2.41	11.59	1.16	3.07	1.12	6.12	5.14	N	3.58	A	**W**
Sample 02	101.60	2.80	102.01	2.56	2.51	0.41	0.04	0.11	1.0	0.41	9.79	A	3.73	A	**A**
Sample 03	52.80	1.40	50.66	1.49	2.94	-4.06	-0.41	-1.05	0.96	2.14	5.27	A	3.96	A	**A**
Sample 04	101.60	2.80	97.57	2.53	2.59	-3.97	-0.4	-1.07	0.96	4.03	9.74	A	3.79	A	**A**
Sample 05	0.10	0.01	0.07	0.04											**A**

Laboratory No. 17

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	43.00	5.40	12.56	-18.56	-1.86	-1.76	0.81	9.80	14.39	A	12.84	A	**A**
Sample 02	101.60	2.80	75.80	7.90	10.42	-25.39	-2.54	-3.08	0.75	25.80	21.62	N	10.78	A	**N**
Sample 03	52.80	1.40	42.20	5.30	12.56	-20.08	-2.01	-1.93	0.8	10.60	14.14	A	12.84	A	**A**
Sample 04	101.60	2.80	82.90	8.90	10.74	-18.41	-1.84	-2.0	0.82	18.70	24.07	A	11.08	A	**A**
Sample 05	0.10	0.01	0.41	0.06											**N**

Laboratory No. 18

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	59.80	4.70	7.86	13.26	1.33	1.43	1.13	7.00	12.65	A	8.29	A	**A**
Sample 02	101.60	2.80	109.00	7.00	6.42	7.28	0.73	0.98	1.07	7.40	19.45	A	6.99	A	**A**
Sample 03	52.80	1.40	61.60	3.90	6.33	16.67	1.67	2.12	1.17	8.80	10.69	A	6.86	A	**A**
Sample 04	101.60	2.80	95.60	5.80	6.07	-5.91	-0.59	-0.93	0.94	6.00	16.62	A	6.66	A	**A**
Sample 05	0.10	0.01													**-**

Laboratory No. 19

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	54.02	3.76	6.96	2.31	0.23	0.3	1.02	1.22	10.35	A	7.45	A	**A**
Sample 02	101.60	2.80	107.28	7.35	6.85	5.59	0.56	0.72	1.06	5.68	20.29	A	7.38	A	**A**
Sample 03	52.80	1.40	47.97	3.23	6.73	-9.15	-0.91	-1.37	0.91	4.83	9.08	A	7.24	A	**A**
Sample 04	101.60	2.80	83.97	3.92	4.67	-17.35	-1.74	-3.66	0.83	17.63	12.43	N	5.42	A	**W**
Sample 05	0.10	0.01	0.00	0.00											**A**

Laboratory No. 20

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	99.00	5.00	5.05	87.50	8.75	8.9	1.88	46.20	13.40	N	5.70	A	**N**
Sample 02	101.60	2.80	144.00	7.00	4.86	41.73	4.17	5.62	1.42	42.40	19.45	N	5.59	A	**N**
Sample 03	52.80	1.40	95.00	5.00	5.26	79.92	7.99	8.13	1.8	42.20	13.40	N	5.89	A	**N**
Sample 04	101.60	2.80	160.00	7.00	4.38	57.48	5.75	7.75	1.57	58.40	19.45	N	5.17	A	**N**
Sample 05	0.10	0.01	4.00	1.00											**N**

Laboratory No. 21

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	49.41	3.01	6.09	-6.42	-0.64	-1.02	0.94	3.39	8.56	A	6.64	A	**A**
Sample 02	101.60	2.80	101.15	6.16	6.09	-0.44	-0.04	-0.07	1.0	0.45	17.46	A	6.68	A	**A**
Sample 03	52.80	1.40	51.75	3.15	6.09	-1.99	-0.2	-0.3	0.98	1.05	8.89	A	6.64	A	**A**
Sample 04	101.60	2.80	100.97	6.15	6.09	-0.62	-0.06	-0.09	0.99	0.63	17.43	A	6.69	A	**A**
Sample 05	0.10	0.01													**-**

Laboratory No. 22

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	40.98	2.98	7.27	-22.39	-2.24	-3.59	0.78	11.82	8.49	N	7.74	A	**N**
Sample 02	101.60	2.80	80.55	5.78	7.18	-20.72	-2.07	-3.28	0.79	21.05	16.57	N	7.69	A	**N**
Sample 03	52.80	1.40	42.64	3.11	7.29	-19.24	-1.92	-2.98	0.81	10.16	8.80	N	7.76	A	**W**
Sample 04	101.60	2.80	78.28	5.61	7.17	-22.95	-2.3	-3.72	0.77	23.32	16.18	N	7.68	A	**N**
Sample 05	0.10	0.01	0.04	0.02											**A**

Laboratory No. 23

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	102.00	10.00	9.80	93.18	9.32	4.87	1.93	49.20	26.05	N	10.16	A	**N**
Sample 02	101.60	2.80	148.00	12.00	8.11	45.67	4.57	3.77	1.46	46.40	31.79	N	8.56	A	**N**
Sample 03	52.80	1.40	85.00	8.00	9.41	60.98	6.1	3.96	1.61	32.20	20.95	N	9.78	A	**N**
Sample 04	101.60	2.80	140.00	24.00	17.14	37.80	3.78	1.59	1.38	38.40	62.34	A	17.36	N	**N**
Sample 05	0.10	0.01	27.00	5.00											**N**

Laboratory No. 24

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	53.76	3.09	5.75	1.82	0.18	0.28	1.02	0.96	8.75	A	6.33	A	**A**
Sample 02	101.60	2.80	85.75	4.34	5.06	-15.60	-1.56	-3.07	0.84	15.85	13.33	N	5.76	A	**W**
Sample 03	52.80	1.40	46.81	2.63	5.62	-11.34	-1.13	-2.01	0.89	5.99	7.69	A	6.21	A	**A**
Sample 04	101.60	2.80	96.91	4.29	4.43	-4.62	-0.46	-0.92	0.95	4.69	13.22	A	5.21	A	**A**
Sample 05	0.10	0.01	0.06	0.03											**A**

Laboratory No. 25

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	52.00	1.10	2.12	-1.52	-0.15	-0.45	0.98	0.80	4.59	A	3.39	A	**A**
Sample 02	101.60	2.80	98.80	2.10	2.13	-2.76	-0.28	-0.8	0.97	2.80	9.03	A	3.48	A	**A**
Sample 03	52.80	1.40	52.20	1.10	2.11	-1.14	-0.11	-0.34	0.99	0.60	4.59	A	3.39	A	**A**
Sample 04	101.60	2.80	99.30	2.10	2.11	-2.26	-0.23	-0.66	0.98	2.30	9.03	A	3.47	A	**A**
Sample 05	0.10	0.01	<0.02												**A**

Laboratory No. 26

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	48.02	6.66	13.87	-9.05	-0.91	-0.7	0.91	4.78	17.56	A	14.12	A	**A**
Sample 02	101.60	2.80	97.98	14.44	14.74	-3.56	-0.36	-0.25	0.96	3.62	37.95	A	14.99	A	**A**
Sample 03	52.80	1.40	47.19	6.38	13.52	-10.63	-1.06	-0.86	0.89	5.61	16.85	A	13.78	A	**A**
Sample 04	101.60	2.80	91.49	12.16	13.29	-9.95	-1.0	-0.81	0.9	10.11	32.19	A	13.57	A	**A**
Sample 05	0.10	0.01	0.01	0.00											**A**

Laboratory No. 27

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	53.10	2.70	5.08	0.57	0.06	0.1	1.01	0.30	7.85	A	5.73	A	**A**
Sample 02	101.60	2.80	101.60	5.10	5.02	0.00	0.0	0.0	1.0	0.00	15.01	A	5.73	A	**A**
Sample 03	52.80	1.40	51.00	2.60	5.10	-3.41	-0.34	-0.61	0.97	1.80	7.62	A	5.75	A	**A**
Sample 04	101.60	2.80	101.30	5.10	5.03	-0.30	-0.03	-0.05	1.0	0.30	15.01	A	5.74	A	**A**
Sample 05	0.10	0.01	<0.16												**A**

Laboratory No. 28

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	65.00	10.00	15.38	23.11	2.31	1.21	1.23	12.20	26.05	A	15.61	N	**N**
Sample 02	101.60	2.80	110.00	15.00	13.64	8.27	0.83	0.55	1.08	8.40	39.37	A	13.91	A	**A**
Sample 03	52.80	1.40	60.00	8.00	13.33	13.64	1.36	0.89	1.14	7.20	20.95	A	13.59	A	**A**
Sample 04	101.60	2.80	110.00	15.00	13.64	8.27	0.83	0.55	1.08	8.40	39.37	A	13.91	A	**A**
Sample 05	0.10	0.01	0.00	20.00											**-**

Laboratory No. 29

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	41.64	1.03	2.47	-21.14	-2.11	-6.42	0.79	11.16	4.48	N	3.63	A	**N**
Sample 02	101.60	2.80	55.19	1.11	2.01	-45.68	-4.57	-15.41	0.54	46.41	7.77	N	3.41	A	**N**
Sample 03	52.80	1.40	43.60	1.16	2.66	-17.42	-1.74	-5.06	0.83	9.20	4.69	N	3.76	A	**W**
Sample 04	101.60	2.80	46.82	0.86	1.84	-53.92	-5.39	-18.7	0.46	54.78	7.56	N	3.31	A	**N**
Sample 05	0.10	0.01	0.02	0.01											**A**

Laboratory No. 30

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	58.15	1.65	2.84	10.13	1.01	2.47	1.1	5.35	5.58	A	3.88	A	**A**
Sample 02	101.60	2.80	116.50	2.66	2.28	14.67	1.47	3.86	1.15	14.90	9.96	N	3.58	A	**W**
Sample 03	52.80	1.40	58.70	1.73	2.95	11.17	1.12	2.65	1.11	5.90	5.74	N	3.96	A	**W**
Sample 04	101.60	2.80	119.40	3.09	2.59	17.52	1.75	4.27	1.18	17.80	10.76	N	3.78	A	**W**
Sample 05	0.10	0.01	0.20	0.02											**N**

Laboratory No. 31

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	48.12	0.88	1.83	-8.86	-0.89	-2.83	0.91	4.68	4.27	N	3.22	A	**W**
Sample 02	101.60	2.80	89.92	1.32	1.47	-11.50	-1.15	-3.77	0.89	11.68	7.99	N	3.12	A	**W**
Sample 03	52.80	1.40	48.27	0.88	1.82	-8.58	-0.86	-2.74	0.91	4.53	4.27	N	3.22	A	**W**
Sample 04	101.60	2.80	91.30	1.40	1.53	-10.14	-1.01	-3.29	0.9	10.30	8.08	N	3.15	A	**W**
Sample 05	0.10	0.01	<0.07												**A**

Laboratory No. 33

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	58.00	3.00	5.17	9.85	0.98	1.57	1.1	5.20	8.54	A	5.81	A	**A**
Sample 02	101.60	2.80	113.00	7.00	6.19	11.22	1.12	1.51	1.11	11.40	19.45	A	6.78	A	**A**
Sample 03	52.80	1.40	59.00	3.00	5.08	11.74	1.17	1.87	1.12	6.20	8.54	A	5.73	A	**A**
Sample 04	101.60	2.80	109.00	7.00	6.42	7.28	0.73	0.98	1.07	7.40	19.45	A	6.99	A	**A**
Sample 05	0.10	0.01	0.07	0.04											**A**

Laboratory No. 34

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	50.70	2.30	4.54	-3.98	-0.4	-0.78	0.96	2.10	6.95	A	5.25	A	**A**
Sample 02	101.60	2.80	100.20	3.60	3.59	-1.38	-0.14	-0.31	0.99	1.40	11.77	A	4.53	A	**A**
Sample 03	52.80	1.40	50.90	2.20	4.32	-3.60	-0.36	-0.73	0.96	1.90	6.73	A	5.07	A	**A**
Sample 04	101.60	2.80	98.90	4.50	4.55	-2.66	-0.27	-0.51	0.97	2.70	13.67	A	5.32	A	**A**
Sample 05	0.10	0.01	0.20	0.10											**A**

Laboratory No. 35

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	47.90	1.70	3.55	-9.28	-0.93	-2.22	0.91	4.90	5.68	A	4.43	A	**A**
Sample 02	101.60	2.80	93.60	3.20	3.42	-7.87	-0.79	-1.88	0.92	8.00	10.97	A	4.39	A	**A**
Sample 03	52.80	1.40	48.40	1.60	3.31	-8.33	-0.83	-2.07	0.92	4.40	5.49	A	4.24	A	**A**
Sample 04	101.60	2.80	90.60	3.00	3.31	-10.83	-1.08	-2.68	0.89	11.00	10.59	N	4.31	A	**W**
Sample 05	0.10	0.01	0.01	0.00											**A**

Laboratory No. 36

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	20.00	2.00	10.00	-62.12	-6.21	-13.44	0.38	32.80	6.30	N	10.35	A	**N**
Sample 02	101.60	2.80	46.00	2.00	4.35	-54.72	-5.47	-16.16	0.45	55.60	8.88	N	5.15	A	**N**
Sample 03	52.80	1.40	21.00	2.00	9.52	-60.23	-6.02	-13.03	0.4	31.80	6.30	N	9.89	A	**N**
Sample 04	101.60	2.80	45.00	2.00	4.44	-55.71	-5.57	-16.45	0.44	56.60	8.88	N	5.23	A	**N**
Sample 05	0.10	0.01	0.00	2.00											**-**

Laboratory No. 37

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	54.10	2.90	5.36	2.46	0.25	0.4	1.02	1.30	8.31	A	5.98	A	**A**
Sample 02	101.60	2.80	105.30	11.00	10.45	3.64	0.36	0.33	1.04	3.70	29.28	A	10.80	A	**A**
Sample 03	52.80	1.40	65.80	2.70	4.10	24.62	2.46	4.27	1.25	13.00	7.85	N	4.89	A	**N**
Sample 04	101.60	2.80	122.70	5.10	4.16	20.77	2.08	3.63	1.21	21.10	15.01	N	4.99	A	**N**
Sample 05	0.10	0.01	0.00	0.00											**A**

Laboratory No. 38

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	45.90	3.20	6.97	-13.07	-1.31	-1.98	0.87	6.90	9.01	A	7.46	A	**A**
Sample 02	101.60	2.80	90.80	6.20	6.83	-10.63	-1.06	-1.59	0.89	10.80	17.55	A	7.36	A	**A**
Sample 03	52.80	1.40	48.30	3.30	6.83	-8.52	-0.85	-1.26	0.91	4.50	9.25	A	7.33	A	**A**
Sample 04	101.60	2.80	88.20	6.00	6.80	-13.19	-1.32	-2.02	0.87	13.40	17.08	A	7.34	A	**A**
Sample 05	0.10	0.01	<0.0453												**A**

Laboratory No. 39

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	55.00	3.00	5.45	4.17	0.42	0.66	1.04	2.20	8.54	A	6.06	A	**A**
Sample 02	101.60	2.80	101.20	5.20	5.14	-0.39	-0.04	-0.07	1.0	0.40	15.24	A	5.83	A	**A**
Sample 03	52.80	1.40	54.50	3.00	5.50	3.22	0.32	0.51	1.03	1.70	8.54	A	6.11	A	**A**
Sample 04	101.60	2.80	100.20	5.10	5.09	-1.38	-0.14	-0.24	0.99	1.40	15.01	A	5.79	A	**A**
Sample 05	0.10	0.01	0.04	0.03											**A**

Laboratory No. 40

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	50.00	3.40	6.80	-5.30	-0.53	-0.76	0.95	2.80	9.49	A	7.30	A	**A**
Sample 02	101.60	2.80	99.00	6.60	6.67	-2.56	-0.26	-0.36	0.97	2.60	18.50	A	7.21	A	**A**
Sample 03	52.80	1.40	51.00	3.40	6.67	-3.41	-0.34	-0.49	0.97	1.80	9.49	A	7.17	A	**A**
Sample 04	101.60	2.80	100.00	6.70	6.70	-1.57	-0.16	-0.22	0.98	1.60	18.73	A	7.24	A	**A**
Sample 05	0.10	0.01	0.00											-	**-**

Laboratory No. 41

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	48.36	1.33	2.75	-8.41	-0.84	-2.3	0.92	4.44	4.98	A	3.82	A	**A**
Sample 02	101.60	2.80	73.54	1.95	2.65	-27.62	-2.76	-8.22	0.72	28.06	8.80	N	3.82	A	**N**
Sample 03	52.80	1.40	42.20	1.25	2.96	-20.08	-2.01	-5.65	0.8	10.60	4.84	N	3.98	A	**N**
Sample 04	101.60	2.80	90.68	2.46	2.71	-10.75	-1.07	-2.93	0.89	10.92	9.62	N	3.87	A	**W**
Sample 05	0.10	0.01	0.08	0.03											**A**

Laboratory No. 42

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	45.10	3.20	7.10	-14.58	-1.46	-2.2	0.85	7.70	9.01	A	7.57	A	**A**
Sample 02	101.60	2.80	84.00	6.10	7.26	-17.32	-1.73	-2.62	0.83	17.60	17.32	N	7.77	A	**W**
Sample 03	52.80	1.40	46.70	3.30	7.07	-11.55	-1.16	-1.7	0.88	6.10	9.25	A	7.55	A	**A**
Sample 04	101.60	2.80	84.90	5.90	6.95	-16.44	-1.64	-2.56	0.84	16.70	16.85	A	7.48	A	**A**
Sample 05	0.10	0.01	0.11	0.01											**A**

Laboratory No. 43

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	49.90	1.60	3.21	-5.49	-0.55	-1.36	0.95	2.90	5.49	A	4.16	A	**A**
Sample 02	101.60	2.80	93.60	2.60	2.78	-7.87	-0.79	-2.09	0.92	8.00	9.86	A	3.91	A	**A**
Sample 03	52.80	1.40	50.70	1.50	2.96	-3.98	-0.4	-1.02	0.96	2.10	5.29	A	3.97	A	**A**
Sample 04	101.60	2.80	95.20	2.60	2.73	-6.30	-0.63	-1.67	0.94	6.40	9.86	A	3.88	A	**A**
Sample 05	0.10	0.01													**-**

Laboratory No. 44

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	36.00	38.00	105.56	-31.82	-3.18	-0.44	0.68	16.80	98.11	A	105.59	N	**N**
Sample 02	101.60	2.80	106.00	40.00	37.74	4.33	0.43	0.11	1.04	4.40	103.45	A	37.84	N	**W**
Sample 03	52.80	1.40	9.00	38.00	422.22	-82.95	-8.3	-1.15	0.17	43.80	98.11	A	422.2	N	**N**
Sample 04	101.60	2.80	25.00	38.00	152.00	-75.39	-7.54	-2.01	0.25	76.60	98.31	A	152.0	N	**N**
Sample 05	0.10	0.01	0.00	38.00											**N**

Laboratory No. 46

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	62.35	3.57	5.73	18.08	1.81	2.49	1.18	9.55	9.90	A	6.31	A	**A**
Sample 02	101.60	2.80	113.80	6.49	5.70	12.00	1.2	1.73	1.12	12.20	18.23	A	6.33	A	**A**
Sample 03	52.80	1.40	56.21	3.14	5.59	6.45	0.65	0.99	1.06	3.41	8.87	A	6.19	A	**A**
Sample 04	101.60	2.80	116.70	6.49	5.56	14.86	1.49	2.14	1.15	15.10	18.24	A	6.21	A	**A**
Sample 05	0.10	0.01	0.00	0.00										A	**A**

Laboratory No. 47

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	51.10	2.70	5.28	-3.22	-0.32	-0.56	0.97	1.70	7.85	A	5.91	A	**A**
Sample 02	101.60	2.80	98.80	7.30	7.39	-2.76	-0.28	-0.36	0.97	2.80	20.17	A	7.89	A	**A**
Sample 03	52.80	1.40	51.40	2.90	5.64	-2.65	-0.27	-0.43	0.97	1.40	8.31	A	6.23	A	**A**
Sample 04	101.60	2.80	98.60	7.70	7.81	-2.95	-0.3	-0.37	0.97	3.00	21.14	A	8.28	A	**A**
Sample 05	0.10	0.01	0.00	0.00											**A**

Laboratory No. 49

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	6.43	0.86	13.32	-87.81	-8.78	-28.25	0.12	46.37	4.24	N	13.58	A	**N**
Sample 02	101.60	2.80	2.04	0.34	16.46	-98.00	-9.8	-35.31	0.02	99.56	7.28	N	16.69	N	**N**
Sample 03	52.80	1.40	9.27	1.18	12.76	-82.44	-8.24	-23.75	0.18	43.53	4.73	N	13.03	A	**N**
Sample 04	101.60	2.80	8.82	1.08	12.22	-91.32	-9.13	-30.92	0.09	92.78	7.74	N	12.53	A	**N**
Sample 05	0.10	0.01	0.14	0.05											**A**

Laboratory No. 50

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	56.57	4.08	7.21	7.14	0.71	0.87	1.07	3.77	11.13	A	7.68	A	**A**
Sample 02	101.60	2.80	103.99	5.77	5.55	2.35	0.24	0.37	1.02	2.39	16.55	A	6.20	A	**A**
Sample 03	52.80	1.40	56.86	3.99	7.02	7.69	0.77	0.96	1.08	4.06	10.91	A	7.50	A	**A**
Sample 04	101.60	2.80	107.98	8.07	7.47	6.28	0.63	0.75	1.06	6.38	22.04	A	7.97	A	**A**
Sample 05	0.10	0.01	0.15	0.22											**A**

Laboratory No. 51

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	48.30	5.02	10.39	-8.52	-0.85	-0.86	0.91	4.50	13.45	A	10.73	A	**A**
Sample 02	101.60	2.80	91.40	9.52	10.42	-10.04	-1.0	-1.03	0.9	10.20	25.60	A	10.77	A	**A**
Sample 03	52.80	1.40	50.10	5.20	10.38	-5.11	-0.51	-0.5	0.95	2.70	13.89	A	10.71	A	**A**
Sample 04	101.60	2.80	97.10	10.09	10.39	-4.43	-0.44	-0.43	0.96	4.50	27.02	A	10.75	A	**A**
Sample 05	0.10	0.01	<0.08												**A**

Laboratory No. 52

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	34.60	1.42	4.10	-34.47	-3.45	-9.13	0.66	18.20	5.14	N	4.89	A	**N**
Sample 02	101.60	2.80	86.50	3.50	4.05	-14.86	-1.49	-3.37	0.85	15.10	11.56	N	4.90	A	**W**
Sample 03	52.80	1.40	46.96	1.93	4.11	-11.06	-1.11	-2.45	0.89	5.84	6.15	A	4.89	A	**A**
Sample 04	101.60	2.80	70.70	2.88	4.07	-30.41	-3.04	-7.69	0.7	30.90	10.36	N	4.92	A	**N**
Sample 05	0.10	0.01	0.10	0.03											**A**

Laboratory No. 54

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	71.20	4.90	6.88	34.85	3.48	3.61	1.35	18.40	13.15	N	7.38	A	**N**
Sample 02	101.60	2.80	132.00	8.30	6.29	29.92	2.99	3.47	1.3	30.40	22.60	N	6.87	A	**N**
Sample 03	52.80	1.40	70.90	4.70	6.63	34.28	3.43	3.69	1.34	18.10	12.65	N	7.14	A	**N**
Sample 04	101.60	2.80	129.00	8.50	6.59	26.97	2.7	3.06	1.27	27.40	23.09	N	7.14	A	**N**
Sample 05	0.10	0.01	<0.2												**A**

Laboratory No. 55

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	46.00	3.00	6.52	-12.88	-1.29	-2.05	0.87	6.80	8.54	A	7.04	A	**A**
Sample 02	101.60	2.80	89.00	5.00	5.62	-12.40	-1.24	-2.2	0.88	12.60	14.78	A	6.26	A	**A**
Sample 03	52.80	1.40	46.00	2.00	4.35	-12.88	-1.29	-2.79	0.87	6.80	6.30	N	5.09	A	**W**
Sample 04	101.60	2.80	91.00	5.00	5.49	-10.43	-1.04	-1.85	0.9	10.60	14.78	A	6.15	A	**A**
Sample 05	0.10	0.01	0.03												**A**

Laboratory No. 56

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	53.00	4.00	7.55	0.38	0.04	0.05	1.0	0.20	10.93	A	8.00	A	**A**
Sample 02	101.60	2.80	84.00	6.00	7.14	-17.32	-1.73	-2.66	0.83	17.60	17.08	N	7.66	A	**W**
Sample 03	52.80	1.40	45.00	3.00	6.67	-14.77	-1.48	-2.36	0.85	7.80	8.54	A	7.17	A	**A**
Sample 04	101.60	2.80	92.00	7.00	7.61	-9.45	-0.94	-1.27	0.91	9.60	19.45	A	8.09	A	**A**
Sample 05	0.10	0.01	0.00	0.00											**A**

Laboratory No. 57

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	65.60	3.00	4.57	24.24	2.42	3.87	1.24	12.80	8.54	N	5.29	A	**N**
Sample 02	101.60	2.80	116.10	2.50	2.15	14.27	1.43	3.86	1.14	14.50	9.68	N	3.50	A	**W**
Sample 03	52.80	1.40	54.10	2.50	4.62	2.46	0.25	0.45	1.02	1.30	7.39	A	5.33	A	**A**
Sample 04	101.60	2.80	102.80	3.40	3.31	1.18	0.12	0.27	1.01	1.20	11.36	A	4.31	A	**A**
Sample 05	0.10	0.01	<0.15												**A**

Laboratory No. 58

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	51.70	0.40	0.77	-2.08	-0.21	-0.76	0.98	1.10	3.76	A	2.76	A	**A**
Sample 02	101.60	2.80	99.60	0.50	0.50	-1.97	-0.2	-0.7	0.98	2.00	7.34	A	2.80	A	**A**
Sample 03	52.80	1.40	51.70	0.40	0.77	-2.08	-0.21	-0.76	0.98	1.10	3.76	A	2.76	A	**A**
Sample 04	101.60	2.80	99.60	0.50	0.50	-1.97	-0.2	-0.7	0.98	2.00	7.34	A	2.80	A	**A**
Sample 05	0.10	0.01	0.00	1.00											**N**

Laboratory No. 59

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	71.00	7.00	9.86	34.47	3.45	2.55	1.34	18.20	18.42	A	10.21	A	**A**
Sample 02	101.60	2.80	118.00	10.00	8.47	16.14	1.61	1.58	1.16	16.40	26.79	A	8.91	A	**A**
Sample 03	52.80	1.40	64.00	5.00	7.81	21.21	2.12	2.16	1.21	11.20	13.40	A	8.25	A	**A**
Sample 04	101.60	2.80	117.00	10.00	8.55	15.16	1.52	1.48	1.15	15.40	26.79	A	8.98	A	**A**
Sample 05	0.10	0.01	3.20	0.50											**N**

Laboratory No. 60

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	58.40	1.20	2.05	10.61	1.06	3.04	1.11	5.60	4.76	N	3.35	A	**W**
Sample 02	101.60	2.80	110.70	2.10	1.90	8.96	0.9	2.6	1.09	9.10	9.03	N	3.35	A	**W**
Sample 03	52.80	1.40	62.10	1.30	2.09	17.61	1.76	4.87	1.18	9.30	4.93	N	3.38	A	**W**
Sample 04	101.60	2.80	113.10	2.20	1.95	11.32	1.13	3.23	1.11	11.50	9.19	N	3.37	A	**W**
Sample 05	0.10	0.01	0.06	0.12											**A**

Laboratory No. 62

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	49.00	2.00	4.08	-7.20	-0.72	-1.56	0.93	3.80	6.30	A	4.87	A	**A**
Sample 02	101.60	2.80	96.00	3.00	3.13	-5.51	-0.55	-1.36	0.94	5.60	10.59	A	4.17	A	**A**
Sample 03	52.80	1.40	47.00	2.00	4.26	-10.98	-1.1	-2.38	0.89	5.80	6.30	A	5.01	A	**A**
Sample 04	101.60	2.80	79.00	2.00	2.53	-22.24	-2.22	-6.57	0.78	22.60	8.88	N	3.74	A	**N**
Sample 05	0.10	0.01	0.64	0.10											**N**

Laboratory No. 63

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	39.50	4.42	11.19	-25.19	-2.52	-2.87	0.75	13.30	11.96	N	11.50	A	**N**
Sample 02	101.60	2.80	82.90	7.53	9.08	-18.41	-1.84	-2.33	0.82	18.70	20.73	A	9.49	A	**A**
Sample 03	52.80	1.40	45.55	4.97	10.91	-13.73	-1.37	-1.4	0.86	7.25	13.32	A	11.23	A	**A**
Sample 04	101.60	2.80	85.22	4.71	5.53	-16.12	-1.61	-2.99	0.84	16.38	14.14	N	6.18	A	**W**
Sample 05	0.10	0.01	0.03	0.03											**A**

Laboratory No. 64

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	49.97	2.12	4.24	-5.36	-0.54	-1.11	0.95	2.83	6.55	A	5.00	A	**A**
Sample 02	101.60	2.80	94.59	3.69	3.90	-6.90	-0.69	-1.51	0.93	7.01	11.95	A	4.78	A	**A**
Sample 03	52.80	1.40	46.97	1.69	3.60	-11.04	-1.1	-2.66	0.89	5.83	5.66	N	4.47	A	**W**
Sample 04	101.60	2.80	95.81	3.53	3.68	-5.70	-0.57	-1.29	0.94	5.79	11.62	A	4.60	A	**A**
Sample 05	0.10	0.01	<0.01												**A**

Laboratory No. 65

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	46.20	3.00	6.49	-12.50	-1.25	-1.99	0.88	6.60	8.54	A	7.01	A	**A**
Sample 02	101.60	2.80	95.20	6.20	6.51	-6.30	-0.63	-0.94	0.94	6.40	17.55	A	7.07	A	**A**
Sample 03	52.80	1.40	48.20	3.10	6.43	-8.71	-0.87	-1.35	0.91	4.60	8.78	A	6.96	A	**A**
Sample 04	101.60	2.80	94.40	6.10	6.46	-7.09	-0.71	-1.07	0.93	7.20	17.32	A	7.03	A	**A**
Sample 05	0.10	0.01	0.01	0.01											**A**

Laboratory No. 67

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	50.00	1.70	3.40	-5.30	-0.53	-1.27	0.95	2.80	5.68	A	4.31	A	**A**
Sample 02	101.60	2.80	95.80	3.10	3.24	-5.71	-0.57	-1.39	0.94	5.80	10.78	A	4.25	A	**A**
Sample 03	52.80	1.40	52.60	1.80	3.42	-0.38	-0.04	-0.09	1.0	0.20	5.88	A	4.33	A	**A**
Sample 04	101.60	2.80	97.20	3.10	3.19	-4.33	-0.43	-1.05	0.96	4.40	10.78	A	4.22	A	**A**
Sample 05	0.10	0.01	<0.073												**A**

Laboratory No. 69

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	46.00	1.40	3.04	-12.88	-1.29	-3.43	0.87	6.80	5.11	N	4.04	A	**W**
Sample 02	101.60	2.80	93.70	5.10	5.44	-7.78	-0.78	-1.36	0.92	7.90	15.01	A	6.10	A	**A**
Sample 03	52.80	1.40	47.60	2.00	4.20	-9.85	-0.98	-2.13	0.9	5.20	6.30	A	4.97	A	**A**
Sample 04	101.60	2.80	86.80	2.00	2.30	-14.57	-1.46	-4.3	0.85	14.80	8.88	N	3.59	A	**W**
Sample 05	0.10	0.01	<0.5												**A**

Laboratory No. 70

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	59.00	6.60	11.19	11.74	1.17	0.92	1.12	6.20	17.41	A	11.50	A	**A**
Sample 02	101.60	2.80	53.90	5.82	10.80	-46.95	-4.69	-7.39	0.53	47.70	16.66	N	11.14	A	**N**
Sample 03	52.80	1.40	15.11	1.56	10.34	-71.38	-7.14	-17.96	0.29	37.69	5.41	N	10.68	A	**N**
Sample 04	101.60	2.80	6.69	0.70	10.46	-93.42	-9.34	-32.88	0.07	94.91	7.45	N	10.82	A	**N**
Sample 05	0.10	0.01	0.00	0.00											**A**

Laboratory No. 71

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	47.37	3.32	7.01	-10.28	-1.03	-1.51	0.9	5.43	9.30	A	7.49	A	**A**
Sample 02	101.60	2.80	90.93	6.37	7.01	-10.50	-1.05	-1.53	0.89	10.67	17.95	A	7.53	A	**A**
Sample 03	52.80	1.40	44.45	3.11	7.00	-15.81	-1.58	-2.45	0.84	8.35	8.80	A	7.48	A	**A**
Sample 04	101.60	2.80	85.94	6.02	7.00	-15.41	-1.54	-2.36	0.85	15.66	17.13	A	7.53	A	**A**
Sample 05	0.10	0.01	0.07	0.01											**A**

Laboratory No. 72

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	47.50	1.90	4.00	-10.04	-1.0	-2.25	0.9	5.30	6.09	A	4.80	A	**A**
Sample 02	101.60	2.80	88.00	3.00	3.41	-13.39	-1.34	-3.31	0.87	13.60	10.59	N	4.38	A	**W**
Sample 03	52.80	1.40	47.00	2.00	4.26	-10.98	-1.1	-2.38	0.89	5.80	6.30	A	5.01	A	**A**
Sample 04	101.60	2.80	93.00	4.00	4.30	-8.46	-0.85	-1.76	0.92	8.60	12.60	A	5.11	A	**A**
Sample 05	0.10	0.01	0.10												**A**

Laboratory No. 73

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	50.60	2.70	5.34	-4.17	-0.42	-0.72	0.96	2.20	7.85	A	5.96	A	**A**
Sample 02	101.60	2.80	90.60	4.70	5.19	-10.83	-1.08	-2.01	0.89	11.00	14.11	A	5.87	A	**A**
Sample 03	52.80	1.40	50.50	2.70	5.35	-4.36	-0.44	-0.76	0.96	2.30	7.85	A	5.97	A	**A**
Sample 04	101.60	2.80	90.60	4.50	4.97	-10.83	-1.08	-2.08	0.89	11.00	13.67	A	5.68	A	**A**
Sample 05	0.10	0.01	0.19	0.07											**N**

Laboratory No. 74

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	48.00	3.00	6.25	-9.09	-0.91	-1.45	0.91	4.80	8.54	A	6.79	A	**A**
Sample 02	101.60	2.80	95.00	5.00	5.26	-6.50	-0.65	-1.15	0.94	6.60	14.78	A	5.94	A	**A**
Sample 03	52.80	1.40	49.00	3.00	6.12	-7.20	-0.72	-1.15	0.93	3.80	8.54	A	6.67	A	**A**
Sample 04	101.60	2.80	98.00	5.00	5.10	-3.54	-0.35	-0.63	0.96	3.60	14.78	A	5.80	A	**A**
Sample 05	0.10	0.01	0.13	0.04											**A**

Laboratory No. 76

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	50.23	2.26	4.50	-4.87	-0.49	-0.97	0.95	2.57	6.86	A	5.22	A	**A**
Sample 02	101.60	2.80	93.40	4.18	4.48	-8.07	-0.81	-1.63	0.92	8.20	12.98	A	5.26	A	**A**
Sample 03	52.80	1.40	49.30	2.23	4.52	-6.63	-0.66	-1.33	0.93	3.50	6.79	A	5.24	A	**A**
Sample 04	101.60	2.80	93.20	4.17	4.47	-8.27	-0.83	-1.67	0.92	8.40	12.96	A	5.25	A	**A**
Sample 05	0.10	0.01	0.00	0.04											**A**

Laboratory No. 77

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	35.00	3.10	8.86	-33.71	-3.37	-5.23	0.66	17.80	8.78	N	9.25	A	**N**
Sample 02	101.60	2.80	63.50	3.80	5.98	-37.50	-3.75	-8.07	0.63	38.10	12.18	N	6.59	A	**N**
Sample 03	52.80	1.40	31.60	4.00	12.66	-40.15	-4.02	-5.0	0.6	21.20	10.93	N	12.93	A	**N**
Sample 04	101.60	2.80	82.50	3.70	4.48	-18.80	-1.88	-4.12	0.81	19.10	11.97	N	5.26	A	**W**
Sample 05	0.10	0.01	0.07	1.60											**N**

Laboratory No. 78

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	49.30	6.60	13.39	-6.63	-0.66	-0.52	0.93	3.50	17.41	A	13.65	A	**A**
Sample 02	101.60	2.80	93.00	12.00	12.90	-8.46	-0.85	-0.7	0.92	8.60	31.79	A	13.19	A	**A**
Sample 03	52.80	1.40	50.20	6.70	13.35	-4.92	-0.49	-0.38	0.95	2.60	17.66	A	13.61	A	**A**
Sample 04	101.60	2.80	94.00	13.00	13.83	-7.48	-0.75	-0.57	0.93	7.60	34.31	A	14.10	A	**A**
Sample 05	0.10	0.01	<0.09												**A**

Laboratory No. 79

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	46.70	2.00	4.28	-11.55	-1.16	-2.5	0.88	6.10	6.30	A	5.04	A	**A**
Sample 02	101.60	2.80	93.30	4.00	4.29	-8.17	-0.82	-1.7	0.92	8.30	12.60	A	5.10	A	**A**
Sample 03	52.80	1.40	49.10	2.00	4.07	-7.01	-0.7	-1.52	0.93	3.70	6.30	A	4.86	A	**A**
Sample 04	101.60	2.80	96.50	4.00	4.15	-5.02	-0.5	-1.04	0.95	5.10	12.60	A	4.98	A	**A**
Sample 05	0.10	0.01	<0.1	0.03											**A**

Laboratory No. 80

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	73.88	2.17	2.94	39.92	3.99	8.16	1.4	21.08	6.66	N	3.96	A	**N**
Sample 02	101.60	2.80	130.40	4.00	3.07	28.35	2.83	5.9	1.28	28.80	12.60	N	4.12	A	**N**
Sample 03	52.80	1.40	70.00	2.35	3.36	32.58	3.26	6.29	1.33	17.20	7.06	N	4.28	A	**N**
Sample 04	101.60	2.80	127.20	3.70	2.91	25.20	2.52	5.52	1.25	25.60	11.97	N	4.01	A	**N**
Sample 05	0.10	0.01	0.78	0.09											**N**

Laboratory No. 81

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	48.81	4.14	8.48	-7.56	-0.76	-0.91	0.92	3.99	11.28	A	8.89	A	**A**
Sample 02	101.60	2.80	90.89	7.72	8.49	-10.54	-1.05	-1.3	0.89	10.71	21.19	A	8.93	A	**A**
Sample 03	52.80	1.40	48.05	4.08	8.49	-9.00	-0.9	-1.1	0.91	4.75	11.13	A	8.90	A	**A**
Sample 04	101.60	2.80	91.29	7.75	8.49	-10.15	-1.01	-1.25	0.9	10.31	21.26	A	8.93	A	**A**
Sample 05	0.10	0.01	<0.12												**A**

Laboratory No. 82

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	40.00	3.00	7.50	-24.24	-2.42	-3.87	0.76	12.80	8.54	N	7.95	A	**N**
Sample 02	101.60	2.80	57.70	4.20	7.28	-43.21	-4.32	-8.7	0.57	43.90	13.02	N	7.78	A	**N**
Sample 03	52.80	1.40	37.80	3.30	8.73	-28.41	-2.84	-4.18	0.72	15.00	9.25	N	9.12	A	**N**
Sample 04	101.60	2.80	62.90	3.40	5.41	-38.09	-3.81	-8.79	0.62	38.70	11.36	N	6.07	A	**N**
Sample 05	0.10	0.01	0.05	0.02											**A**

Laboratory No. 83

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	50.80	2.90	5.71	-3.79	-0.38	-0.62	0.96	2.00	8.31	A	6.29	A	**A**
Sample 02	101.60	2.80	101.70	5.70	5.60	0.10	0.01	0.02	1.0	0.10	16.38	A	6.25	A	**A**
Sample 03	52.80	1.40	54.30	3.00	5.52	2.84	0.28	0.45	1.03	1.50	8.54	A	6.13	A	**A**
Sample 04	101.60	2.80	96.10	5.30	5.52	-5.41	-0.54	-0.92	0.95	5.50	15.46	A	6.17	A	**A**
Sample 05	0.10	0.01	0.00	0.00											**A**

Laboratory No. 84

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	50.69	3.13	6.17	-4.00	-0.4	-0.62	0.96	2.11	8.85	A	6.72	A	**A**
Sample 02	101.60	2.80	97.68	5.44	5.57	-3.86	-0.39	-0.64	0.96	3.92	15.79	A	6.21	A	**A**
Sample 03	52.80	1.40	52.17	3.29	6.31	-1.19	-0.12	-0.18	0.99	0.63	9.22	A	6.84	A	**A**
Sample 04	101.60	2.80	92.87	5.23	5.63	-8.59	-0.86	-1.47	0.91	8.73	15.31	A	6.27	A	**A**
Sample 05	0.10	0.01	0.44	0.18											**N**

Laboratory No. 85

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	54.00	2.00	3.70	2.27	0.23	0.49	1.02	1.20	6.30	A	4.55	A	**A**
Sample 02	101.60	2.80	106.00	4.00	3.77	4.33	0.43	0.9	1.04	4.40	12.60	A	4.67	A	**A**
Sample 03	52.80	1.40	51.00	2.00	3.92	-3.41	-0.34	-0.74	0.97	1.80	6.30	A	4.73	A	**A**
Sample 04	101.60	2.80	101.00	4.00	3.96	-0.59	-0.06	-0.12	0.99	0.60	12.60	A	4.82	A	**A**
Sample 05	0.10	0.01	3.70	2.00											**N**

Laboratory No. 86

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	7.12	0.17	2.39	-86.52	-8.65	-32.39	0.13	45.68	3.64	N	3.57	A	**N**
Sample 02	101.60	2.80	15.53	0.29	1.87	-84.71	-8.47	-30.58	0.15	86.07	7.26	N	3.33	A	**N**
Sample 03	52.80	1.40	11.94	0.24	2.01	-77.39	-7.74	-28.77	0.23	40.86	3.66	N	3.33	A	**N**
Sample 04	101.60	2.80	25.54	0.34	1.33	-74.86	-7.49	-26.97	0.25	76.06	7.28	N	3.06	A	**N**
Sample 05	0.10	0.01	0.00	0.02											**A**

Laboratory No. 87

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	44.80	2.20	4.91	-15.15	-1.52	-3.07	0.85	8.00	6.73	N	5.58	A	**W**
Sample 02	101.60	2.80	84.00	5.00	5.95	-17.32	-1.73	-3.07	0.83	17.60	14.78	N	6.56	A	**W**
Sample 03	52.80	1.40	44.10	2.20	4.99	-16.48	-1.65	-3.34	0.84	8.70	6.73	N	5.65	A	**W**
Sample 04	101.60	2.80	86.70	4.30	4.96	-14.67	-1.47	-2.9	0.85	14.90	13.24	N	5.67	A	**W**
Sample 05	0.10	0.01	0.04	0.02											**A**

Laboratory No. 88

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	43.03	1.71	3.97	-18.50	-1.85	-4.42	0.81	9.77	5.70	N	4.78	A	**W**
Sample 02	101.60	2.80	89.31	3.28	3.67	-12.10	-1.21	-2.85	0.88	12.29	11.13	N	4.59	A	**W**
Sample 03	52.80	1.40	46.91	1.77	3.77	-11.16	-1.12	-2.61	0.89	5.89	5.82	N	4.61	A	**W**
Sample 04	101.60	2.80	89.91	3.31	3.68	-11.51	-1.15	-2.7	0.88	11.69	11.19	N	4.60	A	**W**
Sample 05	0.10	0.01	0.00	0.00											**A**

Laboratory No. 89

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	50.09	2.00	4.00	-5.14	-0.51	-1.11	0.95	2.71	6.30	A	4.80	A	**A**
Sample 02	101.60	2.80	86.53	1.73	2.00	-14.83	-1.48	-4.58	0.85	15.07	8.49	N	3.40	A	**W**
Sample 03	52.80	1.40	49.14	0.98	2.00	-6.93	-0.69	-2.14	0.93	3.66	4.41	A	3.32	A	**A**
Sample 04	101.60	2.80	93.85	1.88	2.00	-7.63	-0.76	-2.3	0.92	7.75	8.70	A	3.41	A	**A**
Sample 05	0.10	0.01	0.02	0.00											**A**

Laboratory No. 90

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	45.31	5.51	12.16	-14.19	-1.42	-1.32	0.86	7.49	14.67	A	12.45	A	**A**
Sample 02	101.60	2.80	99.87	7.67	7.68	-1.70	-0.17	-0.21	0.98	1.73	21.07	A	8.16	A	**A**
Sample 03	52.80	1.40	32.32	4.81	14.88	-38.79	-3.88	-4.09	0.61	20.48	12.92	N	15.12	N	**N**
Sample 04	101.60	2.80	60.37	6.19	10.25	-40.58	-4.06	-6.07	0.59	41.23	17.53	N	10.62	A	**N**
Sample 05	0.10	0.01	0.00	1.89											**A**

Laboratory No. 91

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	50.18	2.36	4.70	-4.96	-0.5	-0.96	0.95	2.62	7.07	A	5.39	A	**A**
Sample 02	101.60	2.80	95.77	4.41	4.60	-5.74	-0.57	-1.12	0.94	5.83	13.48	A	5.37	A	**A**
Sample 03	52.80	1.40	51.20	2.38	4.65	-3.03	-0.3	-0.58	0.97	1.60	7.12	A	5.35	A	**A**
Sample 04	101.60	2.80	89.44	3.13	3.50	-11.97	-1.2	-2.9	0.88	12.16	10.84	N	4.45	A	**W**
Sample 05	0.10	0.01	0.01	0.03											**A**

Laboratory No. 92

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	49.30	3.80	7.71	-6.63	-0.66	-0.86	0.93	3.50	10.45	A	8.15	A	**A**
Sample 02	101.60	2.80	99.90	4.70	4.70	-1.67	-0.17	-0.31	0.98	1.70	14.11	A	5.45	A	**A**
Sample 03	52.80	1.40	51.70	2.70	5.22	-2.08	-0.21	-0.36	0.98	1.10	7.85	A	5.86	A	**A**
Sample 04	101.60	2.80	102.90	4.60	4.47	1.28	0.13	0.24	1.01	1.30	13.89	A	5.25	A	**A**
Sample 05	0.10	0.01	0.02	0.00											**A**

Laboratory No. 93

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	56.20	2.10	3.74	6.44	0.64	1.35	1.06	3.40	6.51	A	4.58	A	**A**
Sample 02	101.60	2.80	96.10	3.10	3.23	-5.41	-0.54	-1.32	0.95	5.50	10.78	A	4.24	A	**A**
Sample 03	52.80	1.40	50.30	2.00	3.98	-4.73	-0.47	-1.02	0.95	2.50	6.30	A	4.78	A	**A**
Sample 04	101.60	2.80	103.10	3.30	3.20	1.48	0.15	0.35	1.01	1.50	11.17	A	4.22	A	**A**
Sample 05	0.10	0.01	0.60	0.30											**N**

Laboratory No. 94

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	51.30	3.60	7.02	-2.84	-0.28	-0.39	0.97	1.50	9.97	A	7.50	A	**A**
Sample 02	101.60	2.80	98.00	4.90	5.00	-3.54	-0.35	-0.64	0.96	3.60	14.56	A	5.71	A	**A**
Sample 03	52.80	1.40	46.70	3.50	7.49	-11.55	-1.16	-1.62	0.88	6.10	9.73	A	7.95	A	**A**
Sample 04	101.60	2.80	94.00	4.80	5.11	-7.48	-0.75	-1.37	0.93	7.60	14.34	A	5.80	A	**A**
Sample 05	0.10	0.01	0.00	1.10											**A**

Laboratory No. 95

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	42.90	2.10	4.90	-18.75	-1.87	-3.92	0.81	9.90	6.51	N	5.57	A	**W**
Sample 02	101.60	2.80	83.50	4.00	4.79	-17.81	-1.78	-3.71	0.82	18.10	12.60	N	5.53	A	**W**
Sample 03	52.80	1.40	42.00	2.50	5.95	-20.45	-2.05	-3.77	0.8	10.80	7.39	N	6.52	A	**N**
Sample 04	101.60	2.80	73.60	3.40	4.62	-27.56	-2.76	-6.36	0.72	28.00	11.36	N	5.38	A	**N**
Sample 05	0.10	0.01	0.42	0.04											**N**

Laboratory No. 96

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	52.10	1.50	2.88	-1.33	-0.13	-0.34	0.99	0.70	5.29	A	3.91	A	**A**
Sample 02	101.60	2.80	100.30	2.70	2.69	-1.28	-0.13	-0.33	0.99	1.30	10.04	A	3.85	A	**A**
Sample 03	52.80	1.40	51.90	1.50	2.89	-1.70	-0.17	-0.44	0.98	0.90	5.29	A	3.92	A	**A**
Sample 04	101.60	2.80	103.80	2.80	2.70	2.17	0.22	0.56	1.02	2.20	10.22	A	3.86	A	**A**
Sample 05	0.10	0.01	0.00	0.03											**A**

Laboratory No. 97

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	45.60	2.40	5.26	-13.64	-1.36	-2.59	0.86	7.20	7.17	N	5.89	A	**W**
Sample 02	101.60	2.80	87.80	3.50	3.99	-13.58	-1.36	-3.08	0.86	13.80	11.56	N	4.85	A	**W**
Sample 03	52.80	1.40	45.70	2.40	5.25	-13.45	-1.34	-2.56	0.87	7.10	7.17	A	5.88	A	**A**
Sample 04	101.60	2.80	85.10	4.20	4.94	-16.24	-1.62	-3.27	0.84	16.50	13.02	N	5.65	A	**W**
Sample 05	0.10	0.01	0.01	0.01											**A**

Laboratory No. 98

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	32.00	3.00	9.38	-39.39	-3.94	-6.28	0.61	20.80	8.54	N	9.74	A	**N**
Sample 02	101.60	2.80	86.00	6.00	6.98	-15.35	-1.54	-2.36	0.85	15.60	17.08	A	7.50	A	**A**
Sample 03	52.80	1.40	55.00	4.00	7.27	4.17	0.42	0.52	1.04	2.20	10.93	A	7.74	A	**A**
Sample 04	101.60	2.80	110.00	8.00	7.27	8.27	0.83	0.99	1.08	8.40	21.87	A	7.78	A	**A**
Sample 05	0.10	0.01	1.30	0.30											**N**

Laboratory No. 99

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	74.82	5.80	7.75	41.70	4.17	3.69	1.42	22.02	15.39	N	8.19	A	**N**
Sample 02	101.60	2.80	140.00	10.62	7.59	37.80	3.78	3.5	1.38	38.40	28.34	N	8.07	A	**N**
Sample 03	52.80	1.40	72.31	5.75	7.95	36.95	3.7	3.3	1.37	19.51	15.27	N	8.38	A	**N**
Sample 04	101.60	2.80	145.21	11.15	7.68	42.92	4.29	3.79	1.43	43.61	29.66	N	8.16	A	**N**
Sample 05	0.10	0.01	0.38	0.11											**N**

Laboratory No. 100

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	61.60	1.80	2.92	16.67	1.67	3.86	1.17	8.80	5.88	N	3.95	A	**W**
Sample 02	101.60	2.80	117.40	4.00	3.41	15.55	1.56	3.24	1.16	15.80	12.60	N	4.38	A	**W**
Sample 03	52.80	1.40	61.20	1.90	3.10	15.91	1.59	3.56	1.16	8.40	6.09	N	4.08	A	**W**
Sample 04	101.60	2.80	122.20	3.60	2.95	20.28	2.03	4.52	1.2	20.60	11.77	N	4.03	A	**N**
Sample 05	0.10	0.01	0.00	0.00											**-**

Laboratory No. 101

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	115.42	9.54	8.26	118.60	11.86	6.5	2.19	62.62	24.87	N	8.68	A	**N**
Sample 02	101.60	2.80	89.70	6.38	7.11	-11.71	-1.17	-1.71	0.88	11.89	17.96	A	7.62	A	**A**
Sample 03	52.80	1.40	72.09	5.67	7.87	36.53	3.65	3.3	1.37	19.29	15.08	N	8.30	A	**N**
Sample 04	101.60	2.80	118.78	8.68	7.31	16.91	1.69	1.88	1.17	17.18	23.53	A	7.81	A	**A**
Sample 05	0.10	0.01	2.45	0.38											**N**

Laboratory No. 102

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	45.70	1.35	2.95	-13.45	-1.34	-3.65	0.87	7.10	5.02	N	3.97	A	**W**
Sample 02	101.60	2.80	87.10	2.26	2.59	-14.27	-1.43	-4.03	0.86	14.50	9.28	N	3.79	A	**W**
Sample 03	52.80	1.40	45.00	1.28	2.84	-14.77	-1.48	-4.11	0.85	7.80	4.89	N	3.89	A	**W**
Sample 04	101.60	2.80	83.30	2.06	2.47	-18.01	-1.8	-5.26	0.82	18.30	8.97	N	3.70	A	**W**
Sample 05	0.10	0.01	0.00	0.00											**A**

Laboratory No. 103

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	48.60	2.92	6.01	-7.95	-0.8	-1.3	0.92	4.20	8.35	A	6.57	A	**A**
Sample 02	101.60	2.80	89.40	4.47	5.00	-12.01	-1.2	-2.31	0.88	12.20	13.61	A	5.71	A	**A**
Sample 03	52.80	1.40	54.30	3.80	7.00	2.84	0.28	0.37	1.03	1.50	10.45	A	7.48	A	**A**
Sample 04	101.60	2.80	92.00	4.60	5.00	-9.45	-0.94	-1.78	0.91	9.60	13.89	A	5.71	A	**A**
Sample 05	0.10	0.01	<0.17												**A**

Laboratory No. 104

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	48.30	1.70	3.52	-8.52	-0.85	-2.04	0.91	4.50	5.68	A	4.41	A	**A**
Sample 02	101.60	2.80	90.10	2.90	3.22	-11.32	-1.13	-2.85	0.89	11.50	10.40	N	4.24	A	**W**
Sample 03	52.80	1.40	54.50	1.80	3.30	3.22	0.32	0.75	1.03	1.70	5.88	A	4.24	A	**A**
Sample 04	101.60	2.80	86.20	2.60	3.02	-15.16	-1.52	-4.03	0.85	15.40	9.86	N	4.09	A	**W**
Sample 05	0.10	0.01	0.03	0.01											**A**

Laboratory No. 105

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	48.30	2.60	5.38	-8.52	-0.85	-1.52	0.91	4.50	7.62	A	6.00	A	**A**
Sample 02	101.60	2.80	92.30	4.90	5.31	-9.15	-0.92	-1.65	0.91	9.30	14.56	A	5.98	A	**A**
Sample 03	52.80	1.40	48.80	2.60	5.33	-7.58	-0.76	-1.35	0.92	4.00	7.62	A	5.95	A	**A**
Sample 04	101.60	2.80	93.40	5.00	5.35	-8.07	-0.81	-1.43	0.92	8.20	14.78	A	6.02	A	**A**
Sample 05	0.10	0.01	0.03	0.01											**A**

Laboratory No. 106

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	57.70	6.40	11.09	9.28	0.93	0.75	1.09	4.90	16.90	A	11.40	A	**A**
Sample 02	101.60	2.80	103.30	11.60	11.23	1.67	0.17	0.14	1.02	1.70	30.79	A	11.56	A	**A**
Sample 03	52.80	1.40	58.20	6.50	11.17	10.23	1.02	0.81	1.1	5.40	17.15	A	11.48	A	**A**
Sample 04	101.60	2.80	101.30	11.30	11.15	-0.30	-0.03	-0.03	1.0	0.30	30.04	A	11.49	A	**A**
Sample 05	0.10	0.01	0.40	0.31											**A**

Laboratory No. 107

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	52.40	2.39	4.56	-0.76	-0.08	-0.14	0.99	0.40	7.15	A	5.28	A	**A**
Sample 02	101.60	2.80	100.24	9.24	9.22	-1.34	-0.13	-0.14	0.99	1.36	24.91	A	9.62	A	**A**
Sample 03	52.80	1.40	53.93	4.48	8.31	2.14	0.21	0.24	1.02	1.13	12.11	A	8.72	A	**A**
Sample 04	101.60	2.80	99.38	7.76	7.81	-2.19	-0.22	-0.27	0.98	2.22	21.28	A	8.28	A	**A**
Sample 05	0.10	0.01	0.00	0.01											**A**

Laboratory No. 108

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	51.23	0.94	1.83	-2.97	-0.3	-0.93	0.97	1.57	4.35	A	3.22	A	**A**
Sample 02	101.60	2.80	98.27	1.58	1.61	-3.28	-0.33	-1.04	0.97	3.33	8.29	A	3.19	A	**A**
Sample 03	52.80	1.40	49.95	0.87	1.74	-5.40	-0.54	-1.73	0.95	2.85	4.25	A	3.17	A	**A**
Sample 04	101.60	2.80	99.46	1.42	1.43	-2.11	-0.21	-0.68	0.98	2.14	8.10	A	3.10	A	**A**
Sample 05	0.10	0.01	0.00	0.01											**A**

Laboratory No. 109

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	52.20	1.30	2.49	-1.14	-0.11	-0.31	0.99	0.60	4.93	A	3.64	A	**A**
Sample 02	101.60	2.80	101.00	2.30	2.28	-0.59	-0.06	-0.17	0.99	0.60	9.35	A	3.58	A	**A**
Sample 03	52.80	1.40	51.80	1.30	2.51	-1.89	-0.19	-0.52	0.98	1.00	4.93	A	3.65	A	**A**
Sample 04	101.60	2.80	104.00	2.40	2.31	2.36	0.24	0.65	1.02	2.40	9.51	A	3.59	A	**A**
Sample 05	0.10	0.01	<0.1												**A**

Laboratory No. 110

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	63.50	4.40	6.93	20.27	2.03	2.32	1.2	10.70	11.91	A	7.42	A	**A**
Sample 02	101.60	2.80	121.00	8.50	7.02	19.09	1.91	2.17	1.19	19.40	23.09	A	7.55	A	**A**
Sample 03	52.80	1.40	56.20	3.90	6.94	6.44	0.64	0.82	1.06	3.40	10.69	A	7.43	A	**A**
Sample 04	101.60	2.80	107.00	7.50	7.01	5.31	0.53	0.67	1.05	5.40	20.65	A	7.53	A	**A**
Sample 05	0.10	0.01	3.28	0.28											**N**

Laboratory No. 112

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	53.50	0.70	1.31	1.33	0.13	0.45	1.01	0.70	4.04	A	2.96	A	**A**
Sample 02	101.60	2.80	100.20	1.00	1.00	-1.38	-0.14	-0.47	0.99	1.40	7.67	A	2.93	A	**A**
Sample 03	52.80	1.40	51.60	0.70	1.36	-2.27	-0.23	-0.77	0.98	1.20	4.04	A	2.98	A	**A**
Sample 04	101.60	2.80	98.70	1.00	1.01	-2.85	-0.29	-0.98	0.97	2.90	7.67	A	2.94	A	**A**
Sample 05	0.10	0.01	0.06												**A**

Laboratory No. 114

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	60.00	6.00	10.00	13.64	1.36	1.17	1.14	7.20	15.90	A	10.35	A	**A**
Sample 02	101.60	2.80	100.80	11.00	10.91	-0.79	-0.08	-0.07	0.99	0.80	29.28	A	11.26	A	**A**
Sample 03	52.80	1.40	56.50	5.70	10.09	7.01	0.7	0.63	1.07	3.70	15.14	A	10.43	A	**A**
Sample 04	101.60	2.80	99.70	9.90	9.93	-1.87	-0.19	-0.18	0.98	1.90	26.54	A	10.31	A	**A**
Sample 05	0.10	0.01	28.70	2.90											**N**

Laboratory No. 115

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	51.50	1.90	3.69	-2.46	-0.25	-0.55	0.98	1.30	6.09	A	4.54	A	**A**
Sample 02	101.60	2.80	99.10	3.50	3.53	-2.46	-0.25	-0.56	0.98	2.50	11.56	A	4.48	A	**A**
Sample 03	52.80	1.40	53.20	1.80	3.38	0.76	0.08	0.18	1.01	0.40	5.88	A	4.30	A	**A**
Sample 04	101.60	2.80	95.20	2.90	3.05	-6.30	-0.63	-1.59	0.94	6.40	10.40	A	4.11	A	**A**
Sample 05	0.10	0.01	0.00	0.10											**A**

Laboratory No. 116

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	42.70	7.10	16.63	-19.13	-1.91	-1.4	0.81	10.10	18.67	A	16.84	N	**W**
Sample 02	101.60	2.80	78.00	13.50	17.31	-23.23	-2.32	-1.71	0.77	23.60	35.57	A	17.53	N	**N**
Sample 03	52.80	1.40	42.30	7.30	17.26	-19.89	-1.99	-1.41	0.8	10.50	19.18	A	17.46	N	**W**
Sample 04	101.60	2.80	77.60	13.50	17.40	-23.62	-2.36	-1.74	0.76	24.00	35.57	A	17.61	N	**N**
Sample 05	0.10	0.01	0.10												**A**

Laboratory No. 117

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	49.10	1.70	3.46	-7.01	-0.7	-1.68	0.93	3.70	5.68	A	4.36	A	**A**
Sample 02	101.60	2.80	95.00	2.90	3.05	-6.50	-0.65	-1.64	0.94	6.60	10.40	A	4.11	A	**A**
Sample 03	52.80	1.40	50.90	1.60	3.14	-3.60	-0.36	-0.89	0.96	1.90	5.49	A	4.11	A	**A**
Sample 04	101.60	2.80	96.60	2.90	3.00	-4.92	-0.49	-1.24	0.95	5.00	10.40	A	4.08	A	**A**
Sample 05	0.10	0.01	<0.025												**A**

Laboratory No. 118

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	47.62	2.94	6.17	-9.81	-0.98	-1.59	0.9	5.18	8.40	A	6.72	A	**A**
Sample 02	101.60	2.80	84.07	5.56	6.61	-17.25	-1.73	-2.82	0.83	17.53	16.06	N	7.16	A	**W**
Sample 03	52.80	1.40	43.53	2.82	6.48	-17.56	-1.76	-2.94	0.82	9.27	8.12	N	7.00	A	**W**
Sample 04	101.60	2.80	79.52	5.22	6.56	-21.73	-2.17	-3.73	0.78	22.08	15.28	N	7.12	A	**N**
Sample 05	0.10	0.01	6.76	0.49											**N**

Laboratory No. 119

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	49.00	2.00	4.08	-7.20	-0.72	-1.56	0.93	3.80	6.30	A	4.87	A	**A**
Sample 02	101.60	2.80	93.00	4.00	4.30	-8.46	-0.85	-1.76	0.92	8.60	12.60	A	5.11	A	**A**
Sample 03	52.80	1.40	58.00	2.00	3.45	9.85	0.98	2.13	1.1	5.20	6.30	A	4.35	A	**A**
Sample 04	101.60	2.80	97.00	5.00	5.15	-4.53	-0.45	-0.8	0.95	4.60	14.78	A	5.85	A	**A**
Sample 05	0.10	0.01	<0.0045												**A**

Laboratory No. 120

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	38.70	4.30	11.11	-26.70	-2.67	-3.12	0.73	14.10	11.67	N	11.42	A	**N**
Sample 02	101.60	2.80	73.20	8.10	11.07	-27.95	-2.8	-3.31	0.72	28.40	22.11	N	11.40	A	**N**
Sample 03	52.80	1.40	39.00	4.30	11.03	-26.14	-2.61	-3.05	0.74	13.80	11.67	N	11.34	A	**N**
Sample 04	101.60	2.80	74.70	8.20	10.98	-26.48	-2.65	-3.1	0.74	26.90	22.36	N	11.32	A	**N**
Sample 05	0.10	0.01	0.05	0.01											**A**

Laboratory No. 121

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	52.50	3.30	6.29	-0.57	-0.06	-0.08	0.99	0.30	9.25	A	6.82	A	**A**
Sample 02	101.60	2.80	91.70	5.50	6.00	-9.74	-0.97	-1.6	0.9	9.90	15.92	A	6.60	A	**A**
Sample 03	52.80	1.40	44.50	2.60	5.84	-15.72	-1.57	-2.81	0.84	8.30	7.62	N	6.42	A	**W**
Sample 04	101.60	2.80	90.40	5.40	5.97	-11.02	-1.1	-1.84	0.89	11.20	15.69	A	6.58	A	**A**
Sample 05	0.10	0.01	<0.09												**A**

Laboratory No. 123

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	50.00	2.60	5.20	-5.30	-0.53	-0.95	0.95	2.80	7.62	A	5.84	A	**A**
Sample 02	101.60	2.80	96.00	5.10	5.31	-5.51	-0.55	-0.96	0.94	5.60	15.01	A	5.98	A	**A**
Sample 03	52.80	1.40	50.70	2.90	5.72	-3.98	-0.4	-0.65	0.96	2.10	8.31	A	6.30	A	**A**
Sample 04	101.60	2.80	92.90	5.10	5.49	-8.56	-0.86	-1.5	0.91	8.70	15.01	A	6.14	A	**A**
Sample 05	0.10	0.01	0.05	0.07											**A**

Laboratory No. 124

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	49.36	1.05	2.13	-6.52	-0.65	-1.97	0.93	3.44	4.52	A	3.40	A	**A**
Sample 02	101.60	2.80	89.62	2.82	3.15	-11.79	-1.18	-3.01	0.88	11.98	10.25	N	4.18	A	**W**
Sample 03	52.80	1.40	49.16	0.92	1.87	-6.89	-0.69	-2.17	0.93	3.64	4.32	A	3.25	A	**A**
Sample 04	101.60	2.80	91.90	1.92	2.09	-9.55	-0.95	-2.86	0.9	9.70	8.76	N	3.46	A	**W**
Sample 05	0.10	0.01	0.02	0.00											**A**

Laboratory No. 125

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	46.70	0.20	0.43	-11.55	-1.16	-4.31	0.88	6.10	3.65	N	2.69	A	**W**
Sample 02	101.60	2.80	102.60	0.60	0.58	0.98	0.1	0.35	1.01	1.00	7.39	A	2.82	A	**A**
Sample 03	52.80	1.40	52.80	0.20	0.38	0.00	0.0	0.0	1.0	0.00	3.65	A	2.68	A	**A**
Sample 04	101.60	2.80	91.60	0.50	0.55	-9.84	-0.98	-3.52	0.9	10.00	7.34	N	2.81	A	**W**
Sample 05	0.10	0.01	0.02	0.00											**A**

Laboratory No. 126

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	50.60	1.30	2.57	-4.17	-0.42	-1.15	0.96	2.20	4.93	A	3.69	A	**A**
Sample 02	101.60	2.80	95.80	2.30	2.40	-5.71	-0.57	-1.6	0.94	5.80	9.35	A	3.65	A	**A**
Sample 03	52.80	1.40	50.60	1.30	2.57	-4.17	-0.42	-1.15	0.96	2.20	4.93	A	3.69	A	**A**
Sample 04	101.60	2.80	96.87	2.50	2.58	-4.66	-0.47	-1.26	0.95	4.73	9.68	A	3.78	A	**A**
Sample 05	0.10	0.01	0.00	0.00											**A**

Laboratory No. 127

Sample code	Target Value	Unc	Lab. Value	Lab. Unc.	Unc. [%]	Rel. Bias	Z-Score	U-Test	Ratio	A1	A2	True	P	Prec.	Final Score
Sample 01	52.80	1.40	54.48	0.79	1.44	3.18	0.32	1.05	1.03	1.68	4.14	A	3.02	A	**A**
Sample 02	101.60	2.80	98.13	1.37	1.40	-3.42	-0.34	-1.11	0.97	3.47	8.04	A	3.09	A	**A**
Sample 03	52.80	1.40	52.65	1.09	2.08	-0.29	-0.03	-0.09	1.0	0.15	4.58	A	3.37	A	**A**
Sample 04	101.60	2.80	102.50	1.67	1.63	0.89	0.09	0.28	1.01	0.90	8.41	A	3.20	A	**A**
Sample 05	0.10	0.01													**-**

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