IAEA-TERC-2024-01 World Wide Open Proficiency Test Exercise, Pie-charts, S-Shapes and Reported Results with Scores

Terrestrial Environmental Radiochemistry Laboratory, International Atomic Energy Agency

October 17, 2024

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Abstract

The IAEA Terrestrial Environmental Radiochemistry Laboratory (TERC) provided a Proficiency Test (PT) on determination of anthropogenic and natural radionuclides in water, sediment, bauxite and simulated contaminated surface samples. This year's PT was designed to monitor and demonstrate the performance and analytical capability of the participating laboratories and to identify gaps and problem areas where further development is needed. The sample set was formulated to support these goals.

1 Description of Samples

- Sample 1: Water, Anthropogenic and natural radionuclides, gross alpha and beta (GAB), uranium (trace level)
- Sample 3: Sediment, naturally occurring gamma emitting radionuclides
- Sample 4: Bauxite, naturally occurring gamma emitting radionuclides
- Sample 5: Simulated contaminated surface sample, gamma and beta emitting radionuclides

1.1 Sample 1, Spiked Water

Matrix origin:

Drinking water sourced from Seibersdorf, Austria.

Sample preparation:

The raw water was gravimetrically spiked with a known amount of a standard solution, prepared from individual solutions with certified activity concentration of radionuclides. The batch of water was acidified to pH < 2 (0.05M HNO_3) for stabilization, and thoroughly mixed prior to bottling.

1.2 Sample 3, Sediment

Approximately 100 g of sediment has been provided for gamma spectrometry measurement. The bottled samples were sterilized (25 kGy gamma dose) and the related certificate is available on the PT website. It contains gamma-emitting radionuclides typically found in this type of environmental sample.

The determination of target values and associated uncertainties of the gamma emitting radionuclides has been carried-out using high precision semiconductor gamma-ray spectrometry measurements in compliance with ISO/IEC 17025. The sample was characterized for gamma emitting radionuclides only.

1.3 Sample 4, Bauxite

Approximately 200 g of bauxite has been provided for gamma spectrometry measurement. The bottled samples were sterilized (25 kGy gamma dose) and the related certificate is available on the PT website. It contains gamma-emitting radionuclides typically found in this type of material.

The determination of target values and associated uncertainties of the gamma emitting radionuclides has been carried-out using high precision semiconductor gamma-ray spectrometry measurements in compliance with ISO/IEC 17025. The samples are characterized for gamma emitting radionuclides only.

1.4 Samples 5, simulated contaminated surface samples

The simulated contaminated surface sample (purple) is printed with a combination of magenta ink (Sr-90) and blue ink (Cs-134) and activity of both radionuclides should be reported (Sample 05).

The simulated contaminated surface sample (blue) is a QC sample (Sample 06) and was spiked with known activity of Cs-134.

The simulated contaminated surface sample (magenta) is a QC sample (Sample 07) and was spiked with known activity of Sr-90.

1.5 Reference date for decay correction

The reference date 2024-01-01 should be used for decay correction in all samples.

2 Evaluation of results

Results reported by participants were evaluated using the following stepwise approach.

The evaluation follows the methodology applied for the annual IAEA proficiency testing schemes in the area of radionuclide measurements.

2.1 Relative bias (Samples 1, 3, 4 and 5)

The relative bias is the relative difference between the reported and the target value (the best estimate of the true value)

$$Bias_{relative} = \frac{Value_{reported} - Value_{target}}{Value_{target}} * 100\%$$

The relative bias is compared to the Maximum Acceptable Relative Bias (MARB) which has been determined for each property value, considering the analytical methods, the analyte level in the sample and the complexity of the analysis.

When $|Bias_{relative}| \leq MARB$, the result will be rated "Accepted (A)" for trueness.

2.2 Evaluation approach for radionuclide activity concentration values (Samples 1, 3 and 4) and activity values per sample (Samples 5)

Based on fit-for-purpose and good laboratory practice principles, the expanded relative uncertainty should cover the relative bias (as defined in 2.1):

The P value is calculated as follows:

$$P = \sqrt{\left(\frac{u_{target}}{A_{target}}\right)^2 + \left(\frac{u_{reported}}{A_{reported}}\right)^2} * 100\%$$

The relative bias is then compared to the P value, expanded by a coverage factor k:

$$|Bias_{relative}| \leq k * P$$

where k is the coverage factor: $k = 2.58$ for a level of confidence of 99%.

When the above criterion is fulfilled, the reported result is not significantly different from the target values considering the uncertainties associated with both values. The reported uncertainty of measurement is large enough to cover the bias of the method.

In addition, the P value is compared to the MARB.

$$P \leq MARB$$

When this criterion is fulfilled, the measurement uncertainty is not overestimated and fit-for-purpose in relation to the MARB criterion of this PT exercise. When both criteria related to the measurement uncertainty are fulfilled, the reported result is rated "accepted (A)" for precision (measurement uncertainty). The result is rated "Not Accepted (N)" for precision if either of the two conditions is not fulfilled.

The final score is assigned according to the detailed evaluation described above. The possible scores are listed below:

- "Accepted (A)" when both, trueness and precision were rated "Accepted"
- "Not Accepted (N)" when the trueness rating is "Not Accepted"
- "Warning (W)" when the trueness rating is “Accepted” but the precision rating is "Not Accepted"

2.3 Evaluation parameters calculated for intercomparison analyte values

2.3.1 Z-Score

The z score is calculated as follows

$$z = \frac{Value_{reported} - Value_{target}}{\sigma_{PT}}$$

Where $Value_{target}$ is the target value, calculated as the robust mean of all results reported by participating laboratories. $sigma_{PT}$ is the standard deviation for proficiency assessment, calculated as the robust standard deviation of all results reported by participating laboratories.

The following criteria apply for performance ratings based on obtained z scores

- $|z| \leq 2$ ... accepted (A)
- $2 < |z| < 3$ ... questionable (Q)
- $|z| \geq 3$ ... not accepted (N)

3 Data Evaluation

A total of 476 laboratories successfully reported data in the IAEA-TERC-2024-01 proficiency test exercise.

For each of the analytes evaluated, the target value, uncertainty ($k = 1$) and the MARB are listed. A pie chart showing the distribution of accepted, warning, not acceptable and not reported results, the graph showing all reported results, and a detailed table listing all evaluation results for the analyte (sorted by the laboratory code) are provided. The data points are coloured in blue, yellow and red, corresponding to the final score of "Accepted", "Warning", and "Not Accepted", respectively. The horizontal solid blue line indicates the target value. The dotted blue lines indicate the target value +/- its combined uncertainty. The horizontal solid red lines indicate the upper and lower limit of the accepted value range, defined by the target value +/- the maximum acceptable bias.

3.1 Evaluation of activity concentrations of radionuclides and mass fractions by ICP-MS

Eu-152 Determination in Sample 1 by Gamma-ray Spectrometry

TABLE 1. Target values

Parameter	Value
Activity concentration [Bq/kg]	14.8
Uncertainty [Bq/kg]	0.7
Maximum Acceptable Relative Bias [%]	20

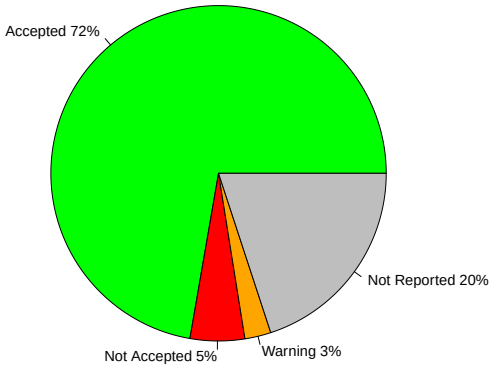

FIGURE 1. Percentage of Accepted vs. Warnings vs. Not Accepted vs. Not Reported results

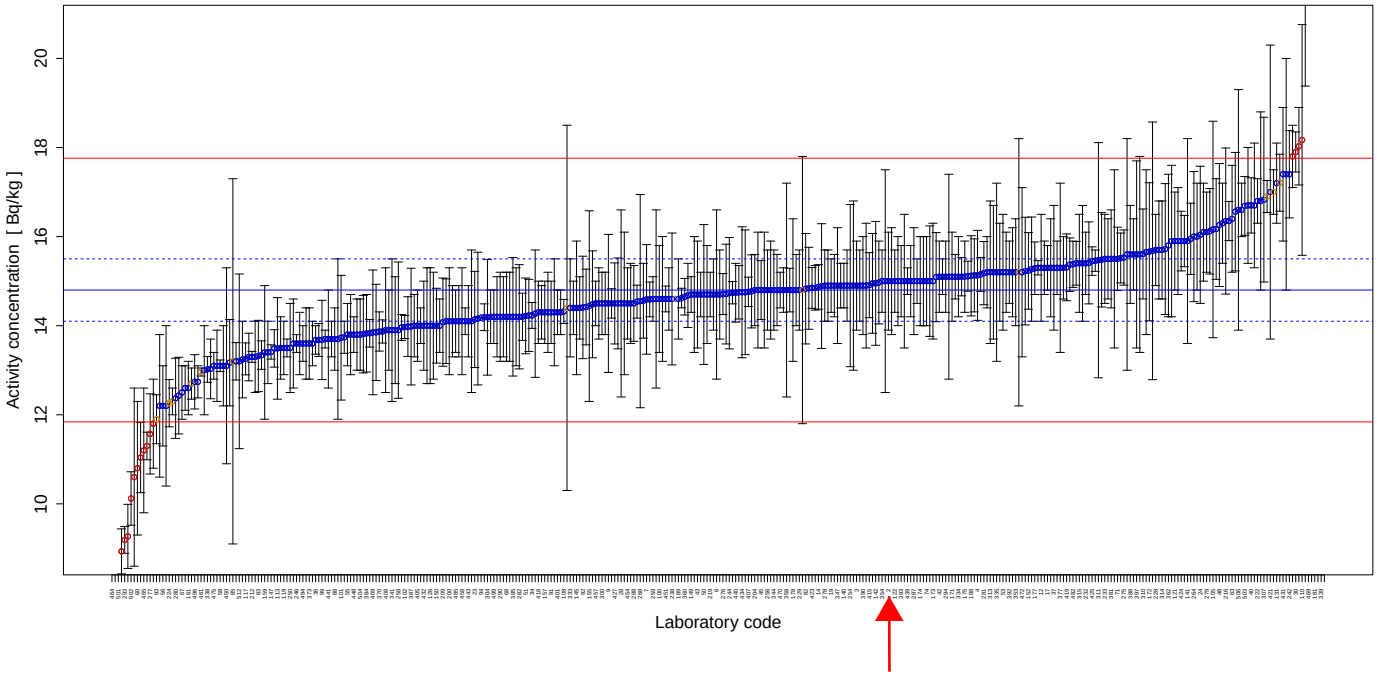

FIGURE 2. Reported results and evaluation parameters for Eu-152 by Gamma-ray Spectrometry. Blue points represent accepted scores, whereas yellow and red represent warning and not accepted scores, respectively.

TABLE 2. Evaluation Results for Eu-152 in Sample 1, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
2	15.0	1.1	1.35	8.73	A	A	A
3	14.9	1.0	0.68	8.21	A	A	A
4	15.13	1.01	2.23	8.18	A	A	A
5	15.0	1.5	1.35	11.06	A	A	A
6	14.7	1.9	-0.68	13.76	A	A	A
7	14.59	1.23	-1.42	9.67	A	A	A
8	15.27	1.17	3.18	9.00	A	A	A
9	14.5	1.55	-2.03	11.69	A	A	A
10	14.6	0.7	-1.35	6.73	A	A	A
11	15.0	0.8	1.35	7.13	A	A	A
12	15.3	1.2	3.38	9.16	A	A	A
13	14.0	1.2	-5.41	9.79	A	A	A
14	14.87	0.50	0.47	5.80	A	A	A
17	15.3	0.5	3.38	5.75	A	A	A
19	14.9	0.6	0.68	6.21	A	A	A
22	14.75	0.60	-0.34	6.24	A	A	A
23	14.14	1.08	-4.46	8.98	A	A	A
24	16.04	1.54	8.38	10.70	A	A	A
25	13.98	0.67	-5.54	6.73	A	A	A
27	14.5	0.7	-2.03	6.76	A	A	A
28	14.5	2.1	-2.03	15.24	A	A	A
29	14.0	0.4	-5.41	5.53	A	A	A
30	17.9	0.45	20.95	5.36	N	N	N
31	18.03	0.87	21.82	6.76	N	N	N
32	13.5	0.2	-8.78	4.96	A	A	A
34	14.23	0.29	-3.85	5.15	A	A	A
35	14.84	0.92	0.27	7.80	A	A	A
36	13.68	0.32	-7.57	5.28	A	A	A
37	15.3	1.4	3.38	10.30	A	A	A
38	13.7	1.8	-7.43	13.96	A	A	A
39	14.160	1.49	-4.32	11.54	A	A	A
40	16.70	0.62	12.84	6.01	A	A	A
41	15.0	1.2	1.35	9.29	A	A	A
42	15.1	0.8	2.03	7.10	A	A	A

TABLE 2. Evaluation Results for Eu-152 in Sample 1, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
43	14.7	1.2	-0.68	9.43	A	A	A
44	15.1	0.43	2.03	5.52	A	A	A
45	14.8	0.66	0.00	6.50	A	A	A
46	17.8	0.7	20.27	6.15	N	N	N
48	16.26	1.38	9.86	9.72	A	A	A
49	14.0	1.3	-5.41	10.42	A	A	A
50	14.7	1.57	-0.68	11.68	A	A	A
51	14.22	0.85	-3.92	7.62	A	A	A
52	15.40	0.49	4.05	5.70	A	A	A
53	15.2	1.3	2.70	9.77	A	A	A
55	13.8	0.7	-6.76	6.94	A	A	A
56	12.2	0.9	-17.57	8.76	A	A	A
58	13.10	0.13	-11.49	4.83	A	A	A
59	15.95	0.8	7.77	6.89	A	A	A
60	10.8	1.5	-27.03	14.67	N	A	N
62	14.0	0.7	-5.41	6.88	A	A	A
63	16.4	1.2	10.81	8.71	A	A	A
64	13.7	0.4	-7.43	5.56	A	A	A
67	12.5	0.6	-15.54	6.74	A	A	A
68	14.2	1.0	-4.05	8.48	A	A	A
69	14.8	1.3	0.00	9.98	A	A	A
70	15.20	1.5	2.70	10.94	A	A	A
71	15.5	0.711	4.73	6.59	A	A	A
72	12.2	1.8	-17.57	15.49	A	A	A
74	15.0	1.0	1.35	8.17	A	A	A
75	31.9	4.3	115.54	14.29	N	N	N
76	13.3	0.8	-10.14	7.65	A	A	A
77	13.49	0.42	-8.85	5.66	A	A	A
78	13.20	0.42	-10.81	5.70	A	A	A
79	15.0	2.5	1.35	17.32	A	A	A
80	13.87	0.26	-6.28	5.09	A	A	A
81	13.29653	0.5344283	-10.16	6.21	A	A	A
82	14.83	1.24	0.20	9.61	A	A	A
83	13.32	0.8	-10.00	7.64	A	A	A
84	14.62	0.22	-1.22	4.96	A	A	A
85	13.2	4.1	-10.81	31.42	A	N	W
88	13.7	0.7	-7.43	6.96	A	A	A
91	14.3	0.7	-3.38	6.81	A	A	A
92	14.41	1.15	-2.64	9.28	A	A	A
93	11.9	0.55	-19.59	6.61	A	N	W
94	14.18	0.004	-4.19	4.73	A	A	A
95	14.8	1.1	0.00	8.81	A	A	A
96	17.21	0.64	16.28	6.02	A	N	W
98	16.90	0.36	14.19	5.19	A	N	W
99	13.68	0.89	-7.57	8.04	A	A	A
100	14.6	1.2	-1.35	9.48	A	A	A
101	13.73	1.4	-7.23	11.24	A	A	A
102	13.97	0.26	-5.61	5.08	A	A	A
103	14.89	1.4	0.61	10.52	A	A	A
104	14.2	1	-4.05	8.48	A	A	A
105	16.16	2.43	9.19	15.76	A	A	A
106	14.7	0.5	-0.68	5.83	A	A	A
107	14.4	0.6	-2.70	6.30	A	A	A
108	14.32	0.27	-3.24	5.09	A	A	A
110	18.17	2.59	22.77	15.02	N	A	N
113	13.49	1.14	-8.85	9.68	A	A	A
114	14.77	0.82	-0.20	7.29	A	A	A
116	14.50	1.02	-2.03	8.48	A	A	A
117	13.255	0.359	-10.44	5.45	A	A	A
119	13.5	0.6	-8.78	6.49	A	A	A

TABLE 2. Evaluation Results for Eu-152 in Sample 1, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
120	14	0.6	-5.41	6.38	A	A	A
121	15.9	1.1	7.43	8.38	A	A	A
122	15.0	0.7	1.35	6.64	A	A	A
123	13.6	0.8	-8.11	7.55	A	A	A
124	13.8	0.8	-6.76	7.48	A	A	A
125	13.6	1.0	-8.11	8.74	A	A	A
126	14.0	1.3	-5.41	10.42	A	A	A
129	13	1	-12.16	9.03	A	A	A
131	17.2	0.9	16.22	7.05	A	A	A
133	15.2	1.1	2.70	8.65	A	A	A
137	14.4	4.1	-2.70	28.86	A	N	W
138	13.68	0.37	-7.57	5.45	A	A	A
140	14.9	0.5	0.68	5.80	A	A	A
141	15.9	2.3	7.43	15.22	A	A	A
142	14.95	1.39	1.01	10.43	A	A	A
143	14.7	1	-0.68	8.29	A	A	A
145	14.4	1.5	-2.70	11.44	A	A	A
146	10.6	2.0	-28.38	19.45	N	A	N
147	13.41	0.16	-9.39	4.88	A	A	A
148	13.74	0.36	-7.16	5.41	A	A	A
149	14.7	0.4	-0.68	5.46	A	A	A
150	14.00	0.84	-5.41	7.64	A	A	A
152	15.23	0.86	2.91	7.37	A	A	A
153	13.81	0.87	-6.69	7.88	A	A	A
155	14.44	2.14	-2.43	15.56	A	A	A
157	14.3	0.7	-3.38	6.81	A	A	A
159	13.4	1.5	-9.46	12.15	A	A	A
160	14.8	0.5	0.00	5.81	A	A	A
161	12.6	0.6	-14.86	6.71	A	A	A
162	12.2	1.6	-17.57	13.94	A	A	A
163	14.3	1.2	-3.38	9.63	A	A	A
164	15.1	0.4	2.03	5.42	A	A	A
167	14.80	0.49	0.00	5.77	A	A	A
168	14.6	2.0	-1.35	14.49	A	A	A
170	11.8	1.0	-20.27	9.71	N	A	N
171	15.1	1.0	2.03	8.14	A	A	A
172	15.66	1.55	5.81	10.97	A	A	A
173	15.0	1.3	1.35	9.87	A	A	A
174	15.0	1.0	1.35	8.17	A	A	A
175	15.1	0.8	2.03	7.10	A	A	A
176	14.1	0.8	-4.73	7.39	A	A	A
177	15.29	0.59	3.31	6.10	A	A	A
178	14.8	1.6	0.00	11.80	A	A	A
179	14.1	0.8	-4.73	7.39	A	A	A
181	29.6	1.8	100.00	7.70	N	N	N
184	15.3	0.6	3.38	6.14	A	A	A
185	15.226	1.208	2.88	9.24	A	A	A
186	14.3	0.5	-3.38	5.88	A	A	A
188	15.12	0.90	2.16	7.60	A	A	A
189	14.6	0.9	-1.35	7.77	A	A	A
191	14.90	1.4	0.68	10.52	A	A	A
192	14.9	0.7	0.68	6.67	A	A	A
195	15.5	0.9	4.73	7.49	A	A	A
196	14.70	1.30	-0.68	10.03	A	A	A
197	15.3	1.1	3.38	8.61	A	A	A
198	14.60		-1.35		A		
199	14.8	0.8	0.00	7.18	A	A	A
200	14.1	1.2	-4.73	9.74	A	A	A
201	13.6	0.7	-8.11	6.99	A	A	A
202	15.41	0.92	4.12	7.62	A	A	A

TABLE 2. Evaluation Results for Eu-152 in Sample 1, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
204	14.8	0.8	0.00	7.18	A	A	A
205	15.9	1.2	7.43	8.91	A	A	A
207	14.5	0.8	-2.03	7.27	A	A	A
208	15.52	0.56	4.86	5.95	A	A	A
209	14.08	0.99	-4.86	8.47	A	A	A
210	15.2	0.8	2.70	7.08	A	A	A
212	13.3	0.123	-10.14	4.82	A	A	A
213	14.2	0.53	-4.05	6.03	A	A	A
214	15.2	0.9	2.70	7.58	A	A	A
216	16.35	1.64	10.47	11.09	A	A	A
217	13.8	0.9	-6.76	8.06	A	A	A
218	14.4	0.7	-2.70	6.78	A	A	A
219	14.7	0.5	-0.68	5.83	A	A	A
222	16.8	0.5	13.51	5.59	A	A	A
223	13.7	0.2	-7.43	4.95	A	A	A
224	12.26	0.53	-17.16	6.41	A	N	W
225	13.83	0.31	-6.55	5.23	A	A	A
226	14.1	0.3	-4.73	5.19	A	A	A
228	15.7	0.8	6.08	6.95	A	A	A
229	14.8	0.9	0.00	7.70	A	A	A
230	15.3	0.16	3.38	4.84	A	A	A
232	15.4	0.7	4.05	6.56	A	A	A
233	15.5	1.0	4.73	8.00	A	A	A
234	15.48	1.06	4.59	8.32	A	A	A
236	15.9	0.576	7.43	5.96	A	A	A
238	14.6	1.48	-1.35	11.19	A	A	A
239	15.1	0.5	2.03	5.77	A	A	A
240	13.24	0.86	-10.54	8.04	A	A	A
242	17.4	0.98	17.57	7.35	A	A	A
243	14.71	1.12	-0.61	8.96	A	A	A
244	14.73	1.25	-0.47	9.72	A	A	A
245	15.2	1.0	2.70	8.10	A	A	A
246	13.6	0.2	-8.11	4.95	A	A	A
247	15.9	1.7	7.43	11.69	A	A	A
248	15.3	0.6	3.38	6.14	A	A	A
250	13.5	1.0	-8.78	8.79	A	A	A
251	14.56	0.84	-1.62	7.46	A	A	A
253	15.0	1.24	1.35	9.52	A	A	A
254	14.9	1.82	0.68	13.10	A	A	A
256	14.8	0.9	0.00	7.70	A	A	A
258	13.9	1.53	-6.08	11.98	A	A	A
259	14.6	0.5	-1.35	5.84	A	A	A
260	16.7	1.4	12.84	9.63	A	A	A
261	13.03	0.67	-11.96	6.99	A	A	A
263	14.2	0.9	-4.05	7.91	A	A	A
264	16.0	1.46	8.11	10.28	A	A	A
268	14.551	2.393	-1.68	17.11	A	A	A
269	17.0	0.5	14.86	5.57	A	N	W
271	14.1	1.6	-4.73	12.29	A	A	A
274	15.37	0.60	3.85	6.13	A	A	A
275	15.53	0.62	4.93	6.19	A	A	A
276	14.71	0.46	-0.61	5.67	A	A	A
277	11.57	0.90	-21.82	9.10	N	A	N
278	14.9	0.8	0.68	7.16	A	A	A
279	16.1	0.9	8.78	7.32	A	A	A
280	12.37	0.9	-16.42	8.68	A	A	A
281	15.18	0.71	2.57	6.65	A	A	A
282	14.2	1.17	-4.05	9.50	A	A	A
286	15.7	1.1	6.08	8.45	A	A	A
287	15.0	1.2	1.35	9.29	A	A	A

TABLE 2. Evaluation Results for Eu-152 in Sample 1, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
288	14.5	0.85	-2.03	7.53	A	A	A
290	14.20	1.00	-4.05	8.48	A	A	A
292	16.35	0.44	10.47	5.44	A	A	A
293	9.19	0.3	-37.91	5.75	N	N	N
294	15.1	0.8	2.03	7.10	A	A	A
295	14.75	1.4	-0.34	10.60	A	A	A
298	15.6	2.6	5.41	17.32	A	A	A
300	14.5	0.7	-2.03	6.76	A	A	A
301	16.0	1.2	8.11	8.87	A	A	A
302	13.85	1.08	-6.42	9.12	A	A	A
303	15.4	1.3	4.05	9.68	A	A	A
304	14.19	1.3	-4.12	10.31	A	A	A
305	16.12	0.96	8.92	7.61	A	A	A
306	12.7	0.35	-14.19	5.47	A	N	W
307	16.83	1.85	13.72	11.97	A	A	A
308	14.27	1.43	-3.58	11.08	A	A	A
310	15.61	1.01	5.47	8.01	A	A	A
311	15.47	2.64	4.53	17.71	A	A	A
312	14.2	0.6	-4.05	6.34	A	A	A
313	15.2	1.6	2.70	11.54	A	A	A
314	15.7	1.1	6.08	8.45	A	A	A
315	15.4	1.1	4.05	8.57	A	A	A
317	14.5	1.6	-2.03	12.01	A	A	A
318	14.7	1.1	-0.68	8.85	A	A	A
319	14.23	0.81	-3.85	7.40	A	A	A
320	14.7	0.8	-0.68	7.21	A	A	A
321	14.2	0.9	-4.05	7.91	A	A	A
322	14.42	0.85	-2.57	7.56	A	A	A
324	15.152	0.38	2.38	5.35	A	A	A
325	14.9	0.8	0.68	7.16	A	A	A
326	14.6	1.4	-1.35	10.69	A	A	A
328	13.9	0.9	-6.08	8.02	A	A	A
329	16.1	1.1	8.78	8.31	A	A	A
330	9.27	0.72	-37.36	9.09	N	N	N
331	14.54	0.37	-1.76	5.37	A	A	A
332	14.8	1.3	0.00	9.98	A	A	A
333	14.4	1.1	-2.70	8.98	A	A	A
334	15.1	0.9	2.03	7.61	A	A	A
335	15.2	2	2.70	13.98	A	A	A
336	14.85	0.50	0.34	5.81	A	A	A
337	13.17	0.97	-11.01	8.75	A	A	A
338	13.02	0.29	-12.03	5.23	A	A	A
339	39.01	2.46	163.58	7.88	N	N	N
340	15.0	0.5	1.35	5.79	A	A	A
341	13.9	1.6	-6.08	12.44	A	A	A
342	7.1	0.6	-52.03	9.68	N	N	N
343	14.5	0.9	-2.03	7.80	A	A	A
344	14.8	0.9	0.00	7.70	A	A	A
345	14.8	3.0	0.00	20.81	A	N	W
346	13.9	1.2	-6.08	9.84	A	A	A
347	14.9	1.3	0.68	9.92	A	A	A
348	15.0	1.0	1.35	8.17	A	A	A
350	16.56	1.33	11.89	9.32	A	A	A
351	14.59	0.39	-1.42	5.43	A	A	A
352	15.46	0.24	4.46	4.98	A	A	A
353	15.2	1.2	2.70	9.20	A	A	A
354	15.0	0.7	1.35	6.64	A	A	A
355	14.3	0.9	-3.38	7.87	A	A	A
357	16.8	2.0	13.51	12.81	A	A	A
358	14.8	2.4	0.00	16.89	A	A	A

TABLE 2. Evaluation Results for Eu-152 in Sample 1, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
360	14.65	0.41	-1.01	5.50	A	A	A
362	15.8	1.6	6.76	11.18	A	A	A
364	14.97	0.93	1.15	7.81	A	A	A
367	15.1	2.3	2.03	15.95	A	A	A
370	13.87	0.44	-6.28	5.70	A	A	A
371	14.9	0.8	0.68	7.16	A	A	A
373	13.6	0.8	-8.11	7.55	A	A	A
375	14.48	1.20	-2.16	9.54	A	A	A
377	15.3	1.9	3.38	13.29	A	A	A
378	15.72	1.47	6.22	10.48	A	A	A
380	13.34	0.32	-9.86	5.30	A	A	A
381	15.5	1.1	4.73	8.53	A	A	A
382	14.95	1.12	1.01	8.86	A	A	A
384	13.83	0.87	-6.55	7.87	A	A	A
385	14.2	1.33	-4.05	10.49	A	A	A
386	16.7	1.3	12.84	9.11	A	A	A
387	13.98	1.31	-5.54	10.50	A	A	A
388	15.6	1.10	5.41	8.49	A	A	A
390	14.9	1.1	0.68	8.77	A	A	A
391	14.9	0.5	0.68	5.80	A	A	A
392	15.2	0.7	2.70	6.60	A	A	A
393	15.0	0.8	1.35	7.13	A	A	A
395	12.6	0.5	-14.86	6.17	A	A	A
397	15.6	2.1	5.41	14.27	A	A	A
401	14.3	0.5	-3.38	5.88	A	A	A
402	15.6	2.2	5.41	14.87	A	A	A
404	13.4	0.7	-9.46	7.05	A	A	A
405	14.0	0.8	-5.41	7.42	A	A	A
407	14.76	0.33	-0.27	5.23	A	A	A
408	13.9	1.4	-6.08	11.13	A	A	A
409	13.85	1.40	-6.42	11.16	A	A	A
410	14.74	0.25	-0.41	5.02	A	A	A
412	14.10	0.95	-4.73	8.23	A	A	A
414	13.1	0.9	-11.49	8.34	A	A	A
415	14.91	0.73	0.74	6.81	A	A	A
416	15.09	1.00	1.96	8.14	A	A	A
418	14.3	0.7	-3.38	6.81	A	A	A
419	15.31	0.75	3.45	6.81	A	A	A
420	11.04	0.79	-25.41	8.58	N	N	N
421	17	3.3	14.86	19.98	A	A	A
423	14.849	0.459	0.33	5.65	A	A	A
424	15.9	0.67	7.43	6.33	A	A	A
425	15.45	0.32	4.39	5.16	A	A	A
426	15.68	2.892	5.95	19.04	A	A	A
427	14.50	0.91	-2.03	7.86	A	A	A
429	15.13	0.82	2.23	7.19	A	A	A
431	17.4	1.5	17.57	9.83	A	A	A
432	14	1	-5.41	8.57	A	A	A
434	14.75	1.47	-0.34	11.03	A	A	A
436	16.3	0.9	10.14	7.27	A	A	A
437	15.5	2.0	4.73	13.74	A	A	A
439	15.0	0.3	1.35	5.14	A	A	A
440	14.74	0.66	-0.41	6.51	A	A	A
441	13.7	1.1	-7.43	9.32	A	A	A
442	12.43	0.86	-16.01	8.38	A	A	A
443	14.1	0.8	-4.73	7.39	A	A	A
445	11.30	0.31	-23.65	5.47	N	N	N
446	14.68	0.72	-0.81	6.81	A	A	A
448	13.8	0.4	-6.76	5.55	A	A	A
449	14.5	0.33	-2.03	5.25	A	A	A

TABLE 2. Evaluation Results for Eu-152 in Sample 1, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
450	13.1	2.2	-11.49	17.45	A	A	A
451	14.60	0.29	-1.35	5.13	A	A	A
452	78.542	2.613	430.69	5.78	N	N	N
453	17.4	2.6	17.57	15.67	A	A	A
454	14.5	0.8	-2.03	7.27	A	A	A
455	15	1	1.35	8.17	A	A	A
457	14.5	0.5	-2.03	5.85	A	A	A
458	14.1	1.2	-4.73	9.74	A	A	A
461	12.96	0.09	-12.43	4.78	A	N	W
464	5.99	0.26	-59.53	6.42	N	N	N
465	11.2	1.4	-24.32	13.36	N	A	N
466	13.5	0.7	-8.78	7.02	A	A	A
469	26	0.6	75.68	5.26	N	N	N
470	14.8	0.4	0.00	5.45	A	A	A
471	14.19	0.30	-4.12	5.18	A	A	A
472	15.2	1.9	2.70	13.36	A	A	A
473	14.3	0.6	-3.38	6.32	A	A	A
474	14.2	1.1	-4.05	9.08	A	A	A
475	13.1	0.3	-11.49	5.25	A	A	A
476	14.9	0.8	0.68	7.16	A	A	A
478	27.47	1.05	85.61	6.08	N	N	N
479	13.1	0.8	-11.49	7.72	A	A	A
481	15.65	1.85	5.74	12.73	A	A	A
482	15.38	0.52	3.92	5.81	A	A	A
484	8.9331	0.5050	-39.64	7.37	N	N	N
485	14.1	0.7	-4.73	6.86	A	A	A
486	13.96	0.29	-5.68	5.17	A	A	A
487	14.8	0.8	0.00	7.18	A	A	A
489	16.60	0.60	12.16	5.95	A	A	A
490	15.11150	0.33643	2.10	5.23	A	A	A
491	21.5	2.12	45.27	10.94	N	N	N
492	12.3	0.3	-16.89	5.32	A	N	W
494	13.6	0.4	-8.11	5.57	A	A	A
496	12.74	0.61	-13.92	6.73	A	A	A
497	13.6	0.5	-8.11	5.99	A	A	A
499	14.2	0.6	-4.05	6.34	A	A	A
501	7.38	0.50	-50.14	8.26	N	N	N
502	10.12	0.6	-31.62	7.58	N	N	N
503	16.69	0.66	12.77	6.17	A	A	A
504	13.8	0.8	-6.76	7.48	A	A	A
505	12.74	0.36	-13.92	5.51	A	A	A
506	16.6	2.7	12.16	16.94	A	A	A
507	15.6	0.8	5.41	6.98	A	A	A
508	15.2	3	2.70	20.30	A	N	W
512	13.2	1.96	-10.81	15.58	A	A	A
513	15.3	0.7	3.38	6.58	A	A	A
515	16.17	1.13	9.26	8.44	A	A	A
516	14.9	1.9	0.68	13.60	A	A	A

Po-210 Determination in Sample 1 by Alpha Spectrometry

TABLE 3. Target values

Parameter	Value
Activity concentration [Bq/kg]	10.20
Uncertainty [Bq/kg]	0.90
Maximum Acceptable Relative Bias [%]	30

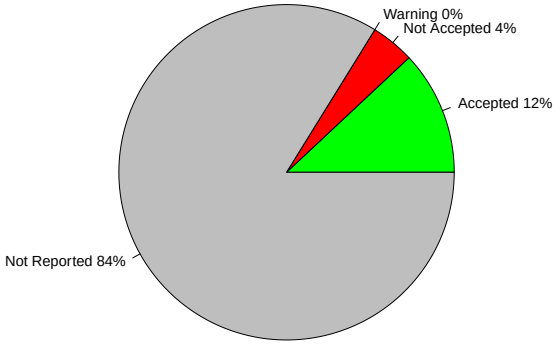

FIGURE 3. Percentage of Accepted vs. Warnings vs. Not Accepted vs. Not Reported results

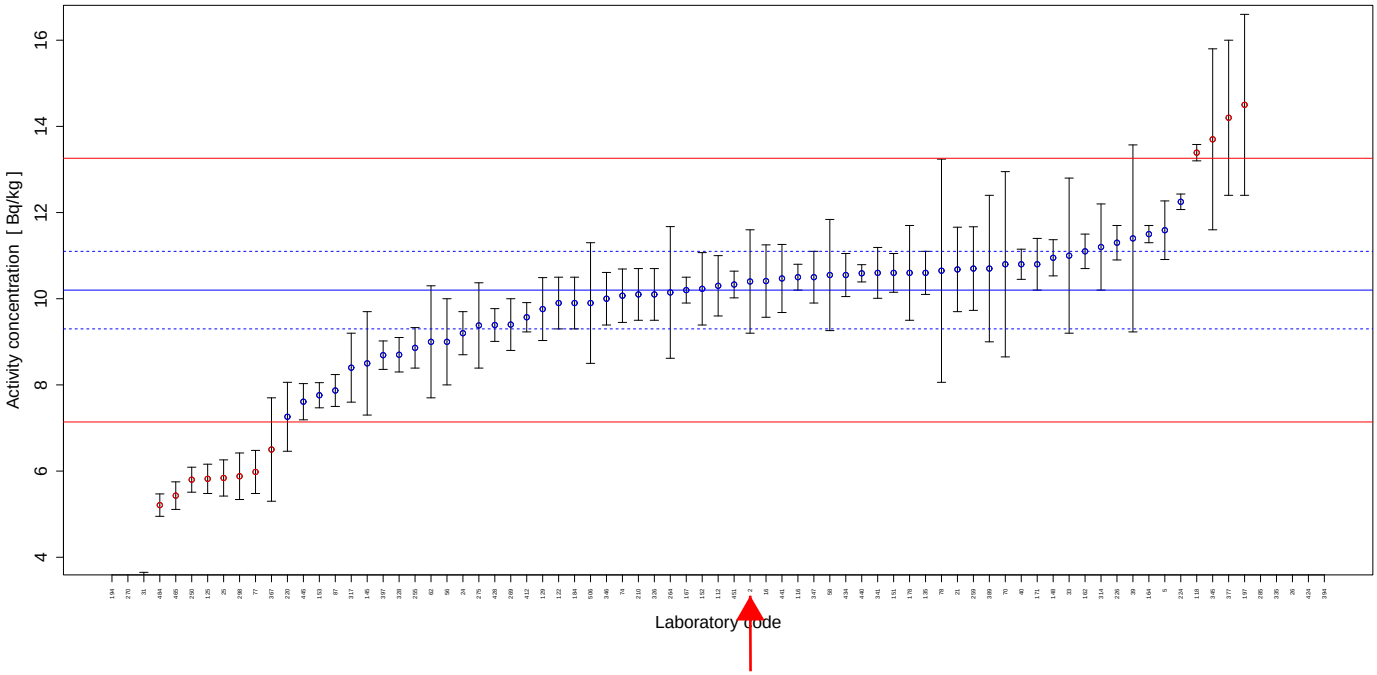

FIGURE 4. Reported results and evaluation parameters for Po-210 by Alpha Spectrometry. Blue points represent accepted scores, whereas yellow and red represent warning and not accepted scores, respectively.

TABLE 4. Evaluation Results for Po-210 in Sample 1, Rep. Value and Rep. Unc. in Bq/kg by Alpha spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
2	10.4	1.2	1.96	14.53	A	A	A
5	11.59	0.68	13.63	10.60	A	A	A
16	10.41	0.84	2.06	11.96	A	A	A
21	10.68	0.98	4.71	12.73	A	A	A
24	9.2	0.5	-9.80	10.36	A	A	A
25	5.84	0.42	-42.75	11.38	N	N	N
26	21.3	2.4	108.82	14.31	N	N	N
31	3.32	0.33	-67.45	13.29	N	N	N
33	11.0	1.8	7.84	18.59	A	A	A
39	11.40	2.17	11.76	20.98	A	A	A
40	10.80	0.35	5.88	9.40	A	A	A
56	9	1	-11.76	14.19	A	A	A
58	10.55	1.29	3.43	15.08	A	A	A
62	9.0	1.3	-11.76	16.93	A	A	A
70	10.80	2.15	5.88	21.78	A	A	A
74	10.07	0.62	-1.27	10.76	A	A	A
77	5.98	0.5	-41.37	12.16	N	N	N
78	10.65	2.59	4.41	25.87	A	A	A
87	7.87	0.37	-22.84	10.00	A	A	A
112	10.3	0.7	0.98	11.14	A	A	A
116	10.50	0.30	2.94	9.27	A	A	A
118	13.39	0.19	31.27	8.94	N	N	N
122	9.9	0.6	-2.94	10.70	A	A	A
125	5.82	0.34	-42.94	10.58	N	N	N
129	9.76	0.73	-4.31	11.57	A	A	A
135	10.6	0.5	3.92	10.01	A	A	A
145	8.5	1.2	-16.67	16.65	A	A	A
148	10.95	0.42	7.35	9.62	A	A	A
151	10.6	0.45	3.92	9.79	A	A	A
152	10.23	0.84	0.29	12.05	A	A	A
153	7.760	0.292	-23.92	9.59	A	A	A
162	11.1	0.4	8.82	9.53	A	A	A
164	11.5	0.2	12.75	8.99	A	A	A
167	10.2	0.3	0.00	9.30	A	A	A
171	10.8	0.6	5.88	10.43	A	A	A
178	10.6	1.1	3.92	13.62	A	A	A
184	9.9	0.6	-2.94	10.70	A	A	A
194	0.834	0.10	-91.82	14.89	N	N	N
197	14.5	2.1	42.16	16.96	N	A	N
210	10.1	0.6	-0.98	10.64	A	A	A
220	7.26	0.80	-28.82	14.12	A	A	A
224	12.25	0.18	20.10	8.95	A	A	A
226	11.3	0.4	10.78	9.51	A	A	A
250	5.80	0.29	-43.14	10.14	N	N	N
255	8.86	0.47	-13.14	10.30	A	A	A
259	10.7	0.97	4.90	12.65	A	A	A
264	10.146	1.528	-0.53	17.45	A	A	A
269	9.4	0.6	-7.84	10.89	A	A	A
270	2.18	0.24	-78.63	14.11	N	N	N
275	9.38	0.99	-8.04	13.76	A	A	A
285	18.9	1.8	85.29	12.98	N	N	N
298	5.88	0.54	-42.35	12.74	N	N	N
314	11.2	1.0	9.80	12.55	A	A	A
317	8.4	0.8	-17.65	12.98	A	A	A
326	10.1	0.6	-0.98	10.64	A	A	A
328	8.7	0.4	-14.71	9.95	A	A	A
335	19.8	1.3	94.12	11.00	N	N	N
341	10.60	0.59	3.92	10.43	A	A	A
345	13.7	2.1	34.31	17.69	N	A	N
346	10.0	0.61	-1.96	10.73	A	A	A

TABLE 4. Evaluation Results for Po-210 in Sample 1, Rep. Value and Rep. Unc. in Bq/kg by Alpha spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
347	10.5	0.60	2.94	10.51	A	A	A
367	6.5	1.2	-36.27	20.46	N	A	N
377	14.2	1.8	39.22	15.44	N	A	N
389	10.7	1.7	4.90	18.17	A	A	A
394	41.49	5.89	306.76	16.71	N	N	N
397	8.69	0.33	-14.80	9.61	A	A	A
412	9.57	0.34	-6.18	9.51	A	A	A
424	28.3	1.54	177.45	10.37	N	N	N
428	9.39	0.38	-7.94	9.71	A	A	A
434	10.55	0.50	3.43	10.02	A	A	A
440	10.59	0.20	3.82	9.02	A	A	A
441	10.47	0.79	2.65	11.61	A	A	A
445	7.61	0.42	-25.39	10.41	A	A	A
451	10.33	0.31	1.27	9.32	A	A	A
465	5.43	0.32	-46.76	10.61	N	N	N
484	5.21	0.26	-48.92	10.14	N	N	N
506	9.9	1.4	-2.94	16.67	A	A	A

Pb-210 Determination in Sample 1 by Gamma-ray Spectrometry

TABLE 5. Target values

Parameter	Value
Activity concentration [Bq/kg]	10.20
Uncertainty [Bq/kg]	0.90
Maximum Acceptable Relative Bias [%]	30

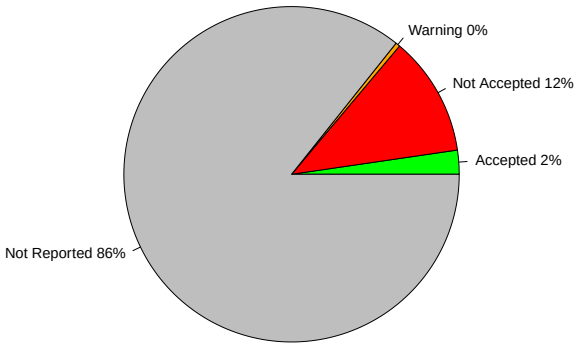

FIGURE 5. Percentage of Accepted vs. Warnings vs. Not Accepted vs. Not Reported results

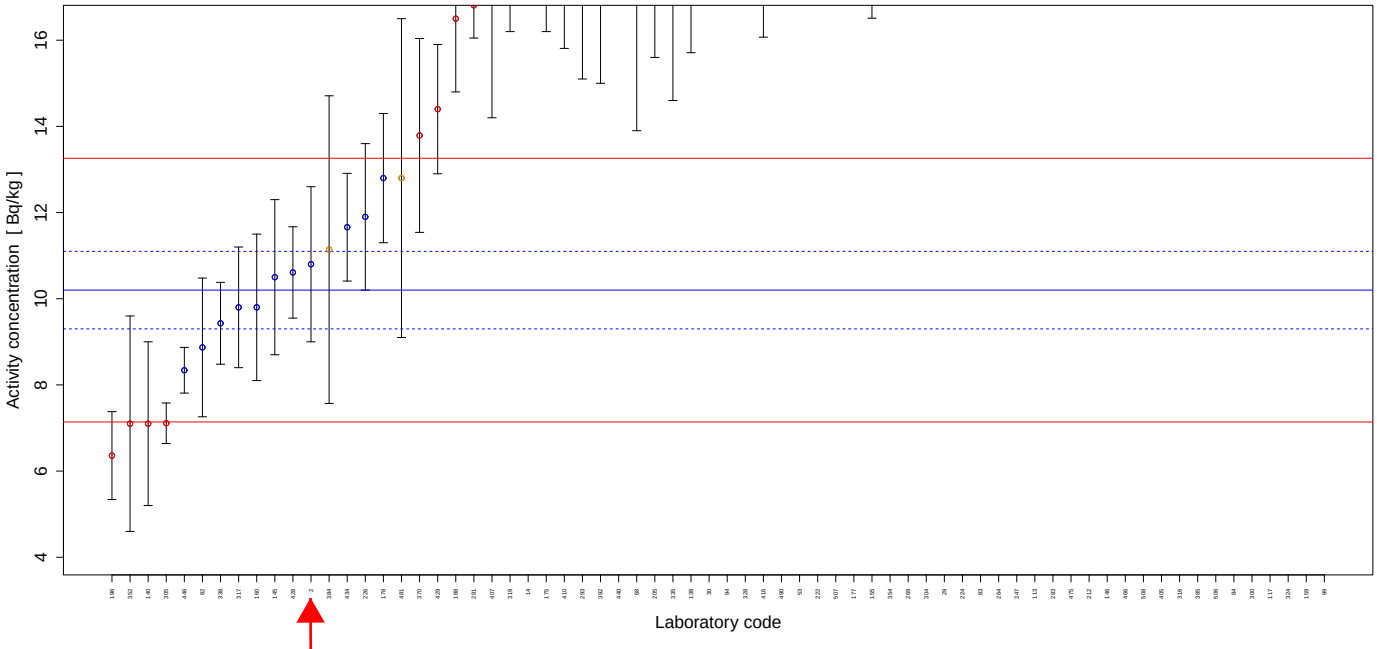

FIGURE 6. Reported results and evaluation parameters for Pb-210 by Gamma-ray Spectrometry. Blue points represent accepted scores, whereas yellow and red represent warning and not accepted scores, respectively.

TABLE 6. Evaluation Results for Pb-210 in Sample 1, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
2	10.8	1.8	5.88	18.86	A	A	A
14	17.69	0.67	73.43	9.60	N	N	N
29	21.5	3.1	110.78	16.90	N	N	N
30	18.9	0.82	85.29	9.83	N	N	N
53	19.9	2.7	95.10	16.18	N	N	N
68	18.2	4.3	78.43	25.22	N	N	N
82	8.87	1.61	-13.04	20.18	A	A	A
83	21.98	1.49	115.49	11.13	N	N	N
84	55	17	439.22	32.14	N	N	N
94	18.9	0.015	85.29	8.82	N	N	N
99	76.6	5.1	650.98	11.05	N	N	N
113	22.9	4.71	124.51	22.38	N	N	N
117	59.263	13.475	481.01	24.39	N	N	N
138	18.53	2.82	81.67	17.59	N	N	N
140	7.1	1.9	-30.39	28.18	N	A	N
145	10.5	1.8	2.94	19.28	A	A	A
146	23.8	4.8	133.33	22.01	N	N	N
155	20.99	4.48	105.78	23.10	N	N	N
159	60.7	10.4	495.10	19.27	N	N	N
160	9.8	1.7	-3.92	19.46	A	A	A
175	17.7	1.5	73.53	12.23	N	N	N
177	20.97	1.22	105.59	10.57	N	N	N
178	12.8	1.5	25.49	14.67	A	A	A
188	16.5	1.7	61.76	13.56	N	N	N
196	6.36	1.02	-37.65	18.30	N	A	N
205	18.5	2.9	81.37	17.99	N	N	N
212	23.44	1.66	129.80	11.31	N	N	N
222	20.5	1.2	100.98	10.59	N	N	N
224	21.64	1.41	112.16	10.97	N	N	N
226	11.9	1.7	16.67	16.79	A	A	A
247	22.7	2.5	122.55	14.11	N	N	N
264	22.3	4.46	118.63	21.86	N	N	N
269	21	1	105.88	10.03	N	N	N
281	16.81	0.76	64.80	9.91	N	N	N
283	22.90	3.20	124.51	16.53	N	N	N
293	17.8	2.7	74.51	17.55	N	N	N
300	55.6	2.8	445.10	10.16	N	N	N
304	21.1	3.3	106.86	17.96	N	N	N
305	7.11	0.47	-30.29	11.03	N	N	N
316	48.14	5.64	371.96	14.67	N	N	N
317	9.8	1.4	-3.92	16.79	A	A	A
319	17.35	1.15	70.10	11.04	N	N	N
324	59.400	2.77	482.35	9.98	N	N	N
328	19.1	1.3	87.25	11.14	N	N	N
335	18.5	3.9	81.37	22.85	N	N	N
338	9.43	0.95	-7.55	13.39	A	A	A
352	7.1	2.5	-30.39	36.30	N	N	N
354	21	3	105.88	16.79	N	N	N
370	13.79	2.25	35.20	18.55	N	A	N
384	11.14	3.57	9.22	33.24	A	N	W
385	50.86	2.79	398.63	10.39	N	N	N
392	18	3	76.47	18.86	N	N	N
405	41	2	301.96	10.08	N	N	N
407	17.1	2.9	67.65	19.12	N	N	N
410	17.78	1.97	74.31	14.16	N	N	N
416	19.13	3.06	87.55	18.27	N	N	N
428	10.61	1.06	4.02	13.33	A	A	A
429	14.4	1.5	41.18	13.65	N	N	N
434	11.66	1.25	14.31	13.88	A	A	A
440	18.0	1.0	76.47	10.43	N	N	N

TABLE 6. Evaluation Results for Pb-210 in Sample 1, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
446	8.34	0.53	-18.24	10.87	A	A	A
466	29.5	4.7	189.22	18.21	N	N	N
475	23.1	3.2	126.47	16.42	N	N	N
481	12.8	3.7	25.49	30.22	A	N	W
490	19.59189	2.08933	92.08	13.84	N	N	N
506	52	8.3	409.80	18.24	N	N	N
507	20.5	3.1	100.98	17.51	N	N	N
508	30.1	9	195.10	31.18	N	N	N

Pb-210 Determination in Sample 1 by Beta Counting

TABLE 7. Target values

Parameter	Value
Activity concentration [Bq/kg]	10.20
Uncertainty [Bq/kg]	0.90
Maximum Acceptable Relative Bias [%]	30

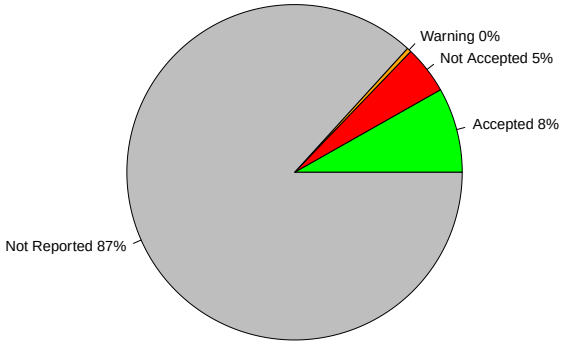

FIGURE 7. Percentage of Accepted vs. Warnings vs. Not Accepted vs. Not Reported results

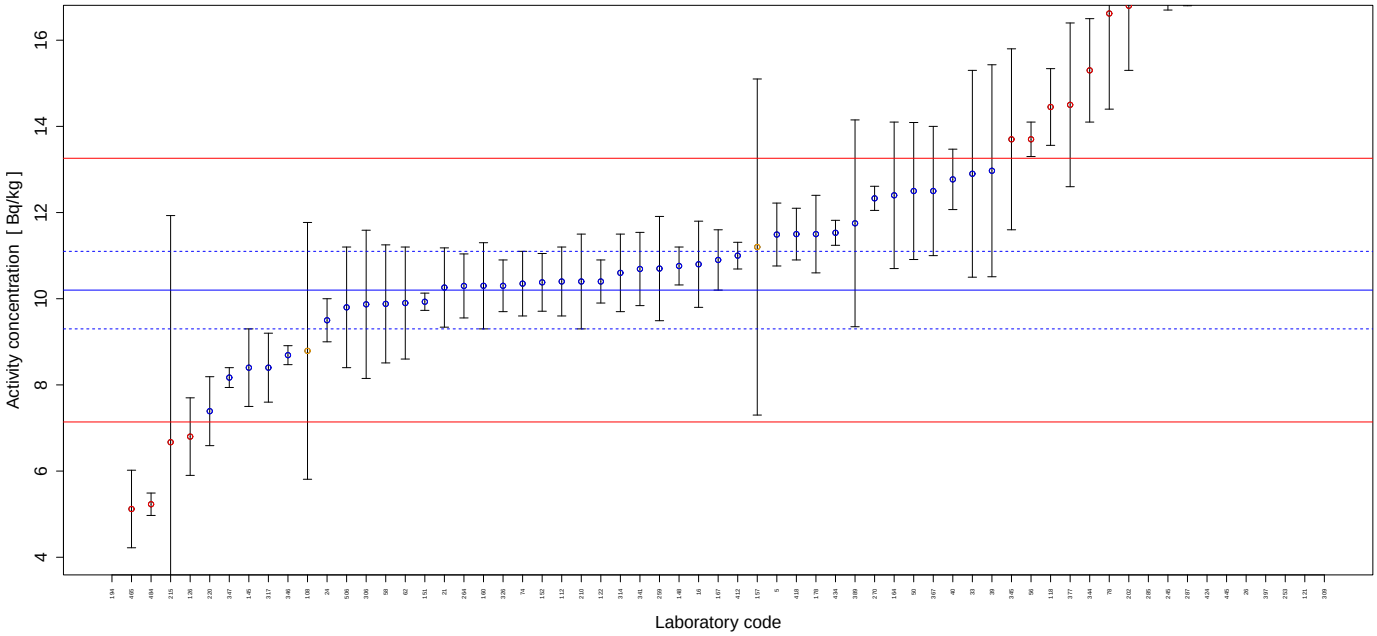

FIGURE 8. Reported results and evaluation parameters for Pb-210 by Beta Counting. Blue points represent accepted scores, whereas yellow and red represent warning and not accepted scores, respectively.

TABLE 8. Evaluation Results for Pb-210 in Sample 1, Rep. Value and Rep. Unc. in Bq/kg by Beta counting

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
5	11.49	0.73	12.65	10.87	A	A	A
16	10.8	1.0	5.88	12.79	A	A	A
21	10.26	0.92	0.59	12.58	A	A	A
24	9.5	0.5	-6.86	10.27	A	A	A
26	22.5	2.6	120.59	14.54	N	N	N
33	12.9	2.4	26.47	20.59	A	A	A
39	12.97	2.46	27.16	20.92	A	A	A
40	12.77	0.701	25.20	10.39	A	A	A
50	12.5	1.59	22.55	15.48	A	A	A
56	13.7	0.4	34.31	9.29	N	N	N
58	9.88	1.37	-3.14	16.44	A	A	A
62	9.9	1.3	-2.94	15.82	A	A	A
74	10.35	0.75	1.47	11.42	A	A	A
78	16.62	2.22	62.94	16.01	N	N	N
108	8.79	2.98	-13.82	35.03	A	N	W
112	10.4	0.8	1.96	11.71	A	A	A
118	14.45	0.89	41.67	10.76	N	N	N
121	85.7	25.7	740.20	31.26	N	N	N
122	10.4	0.5	1.96	10.05	A	A	A
126	6.8	0.9	-33.33	15.91	N	A	N
145	8.4	0.9	-17.65	13.88	A	A	A
148	10.76	0.44	5.49	9.73	A	A	A
151	9.93	0.20	-2.65	9.05	A	A	A
152	10.38	0.67	1.76	10.93	A	A	A
157	11.2	3.9	9.80	35.92	A	N	W
160	10.3	1.0	0.98	13.12	A	A	A
164	12.4	1.7	21.57	16.30	A	A	A
167	10.9	0.7	6.86	10.91	A	A	A
178	11.5	0.9	12.75	11.79	A	A	A
194	0.857	0.71	-91.60	83.32	N	N	N
202	16.8	1.5	64.71	12.55	N	N	N
210	10.4	1.1	1.96	13.77	A	A	A
215	6.67	5.26	-34.61	79.35	N	N	N
220	7.39	0.80	-27.55	13.97	A	A	A
245	18.10	1.40	77.45	11.73	N	N	N
253	58.0	3.14	468.63	10.35	N	N	N
259	10.7	1.21	4.90	14.34	A	A	A
264	10.297	0.743	0.95	11.40	A	A	A
270	12.33	0.28	20.88	9.11	A	A	A
285	18.0	0.68	76.47	9.60	N	N	N
287	18.5	1.7	81.37	12.74	N	N	N
306	9.87	1.72	-3.24	19.53	A	A	A
309	232	10	2174.51	9.82	N	N	N
314	10.6	0.9	3.92	12.25	A	A	A
317	8.4	0.8	-17.65	12.98	A	A	A
326	10.3	0.6	0.98	10.57	A	A	A
341	10.69	0.85	4.80	11.88	A	A	A
344	15.3	1.2	50.00	11.81	N	N	N
345	13.7	2.1	34.31	17.69	N	A	N
346	8.69	0.22	-14.80	9.18	A	A	A
347	8.17	0.23	-19.90	9.26	A	A	A
367	12.5	1.5	22.55	14.89	A	A	A
377	14.5	1.9	42.16	15.80	N	N	N
389	11.75	2.4	15.20	22.25	A	A	A
397	57.9	9.5	467.65	18.63	N	N	N
412	11.00	0.31	7.84	9.26	A	A	A
418	11.5	0.6	12.75	10.25	A	A	A
424	20.2	1.02	98.04	10.17	N	N	N
434	11.53	0.29	13.04	9.18	A	A	A
445	21.10	3.59	106.86	19.17	N	N	N

TABLE 8. Evaluation Results for Pb-210 in Sample 1, Rep. Value and Rep. Unc. in Bq/kg by Beta counting

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
465	5.12	0.90	-49.80	19.67	N	A	N
484	5.23	0.26	-48.73	10.13	N	N	N
506	9.8	1.4	-3.92	16.79	A	A	A

Total U Determination in Sample 1 by ICP-MS

TABLE 9. Target values

Parameter	Value
Mass fraction [ng/g]	2.251
Uncertainty [ng/g]	0.068
Maximum Acceptable Relative Bias [%]	30

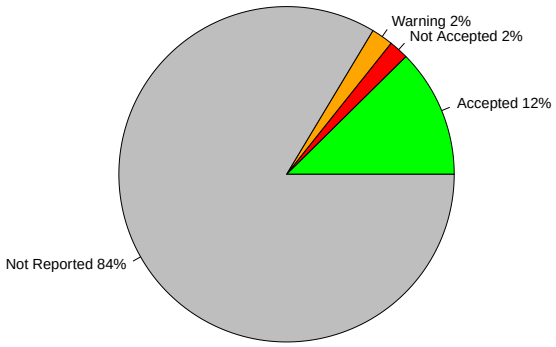

FIGURE 9. Percentage of Accepted vs. Warnings vs. Not Accepted vs. Not Reported results

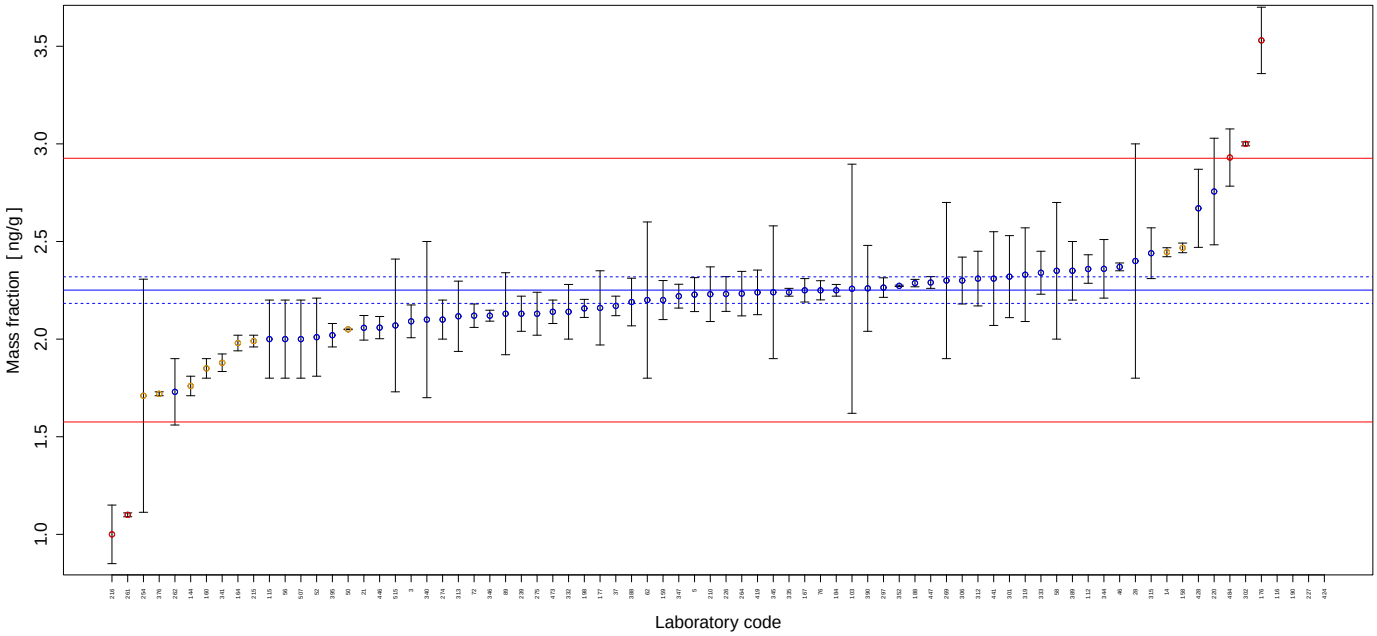

FIGURE 10. Reported results and evaluation parameters for Total U by ICP-MS. Blue points represent accepted scores, whereas yellow and red represent warning and not accepted scores, respectively.

TABLE 10. Evaluation Results for Total U in Sample 1, Rep. Value and Rep. Unc. in ng/g by ICP-MS

Labcode	Reported value [ng/g]	Reported uncertainty ($k = 1$) [ng/g]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
3	2.091	0.084	-7.11	5.03	A	A	A
5	2.228	0.087	-1.02	4.94	A	A	A
14	2.445	0.023	8.62	3.16	A	N	W
21	2.058	0.063	-8.57	4.30	A	A	A
28	2.4	0.6	6.62	25.18	A	A	A
37	2.17	0.05	-3.60	3.80	A	A	A
46	2.37	0.02	5.29	3.14	A	A	A
50	2.05	0.00162	-8.93	3.02	A	N	W
52	2.01	0.2	-10.71	10.40	A	A	A
56	2.0	0.2	-11.15	10.45	A	A	A
58	2.35	0.35	4.40	15.20	A	A	A
62	2.2	0.4	-2.27	18.43	A	A	A
72	2.12	0.06	-5.82	4.14	A	A	A
76	2.25	0.049	-0.04	3.72	A	A	A
89	2.13	0.21	-5.38	10.31	A	A	A
103	2.258	0.638	0.31	28.42	A	A	A
112	2.359	0.073	4.80	4.32	A	A	A
115	2.00	0.20	-11.15	10.45	A	A	A
116	5.088	0.091	126.03	3.51	N	N	N
144	1.76	0.05	-21.81	4.15	A	N	W
158	2.4672	0.0247	9.60	3.18	A	N	W
159	2.2	0.1	-2.27	5.46	A	A	A
160	1.85	0.05	-17.81	4.05	A	N	W
164	1.98	0.04	-12.04	3.63	A	N	W
167	2.25	0.06	-0.04	4.03	A	A	A
176	3.53	0.17	56.82	5.68	N	N	N
177	2.16	0.19	-4.04	9.30	A	A	A
184	2.25	0.03	-0.04	3.30	A	A	A
188	2.287	0.019	1.60	3.13	A	A	A
190	9.25	0.1	310.93	3.21	N	N	N
198	2.157384	0.046291	-4.16	3.71	A	A	A
210	2.23	0.14	-0.93	6.97	A	A	A
215	1.99	0.03	-11.59	3.38	A	N	W
216	1	0.15	-55.58	15.30	N	N	N
220	2.756	0.273	22.43	10.36	A	A	A
226	2.231	0.089	-0.89	5.00	A	A	A
227	9.52	0.1	322.92	3.20	N	N	N
239	2.13	0.09	-5.38	5.19	A	A	A
254	1.71	0.597	-24.03	35.04	A	N	W
261	1.10	0.01	-51.13	3.15	N	N	N
262	1.73	0.17	-23.15	10.28	A	A	A
264	2.233	0.114	-0.80	5.93	A	A	A
269	2.3	0.4	2.18	17.65	A	A	A
274	2.1	0.1	-6.71	5.64	A	A	A
275	2.13	0.11	-5.38	5.98	A	A	A
297	2.264	0.05	0.58	3.74	A	A	A
301	2.32	0.21	3.07	9.54	A	A	A
302	3.0	0.01	33.27	3.04	N	N	N
306	2.3	0.12	2.18	6.03	A	A	A
312	2.31	0.14	2.62	6.77	A	A	A
313	2.117	0.180	-5.95	9.02	A	A	A
315	2.44	0.13	8.40	6.12	A	A	A
319	2.33	0.24	3.51	10.73	A	A	A
332	2.14	0.14	-4.93	7.21	A	A	A
333	2.34	0.11	3.95	5.59	A	A	A
335	2.24	0.02	-0.49	3.15	A	A	A
340	2.1	0.4	-6.71	19.29	A	A	A
341	1.879	0.045	-16.53	3.86	A	N	W
344	2.36	0.15	4.84	7.04	A	A	A
345	2.24	0.34	-0.49	15.48	A	A	A

TABLE 10. Evaluation Results for Total U in Sample 1, Rep. Value and Rep. Unc. in ng/g by ICP-MS

Labcode	Reported value [ng/g]	Reported uncertainty ($k = 1$) [ng/g]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
346	2.12	0.028	-5.82	3.30	A	A	A
347	2.22	0.061	-1.38	4.08	A	A	A
352	2.2729	0.0035	0.97	3.02	A	A	A
376	1.72	0.01	-23.59	3.08	A	N	W
388	2.19	0.122	-2.71	6.34	A	A	A
389	2.35	0.15	4.40	7.06	A	A	A
390	2.26	0.22	0.40	10.19	A	A	A
395	2.02	0.06	-10.26	4.24	A	A	A
419	2.2394	0.1142	-0.52	5.93	A	A	A
424	16.5	0.82	633.01	5.82	N	N	N
428	2.67	0.2	18.61	8.08	A	A	A
441	2.31	0.24	2.62	10.82	A	A	A
446	2.059	0.057	-8.53	4.10	A	A	A
447	2.29	0.03	1.73	3.29	A	A	A
473	2.14	0.06	-4.93	4.12	A	A	A
484	2.9300	0.1465	30.16	5.84	N	N	N

U-235 Determination in Sample 1 by ICP-MS

TABLE 11. Target values

Parameter	Value
Mass fraction [ng/g]	0.0160
Uncertainty [ng/g]	0.0006
Maximum Acceptable Relative Bias [%]	30

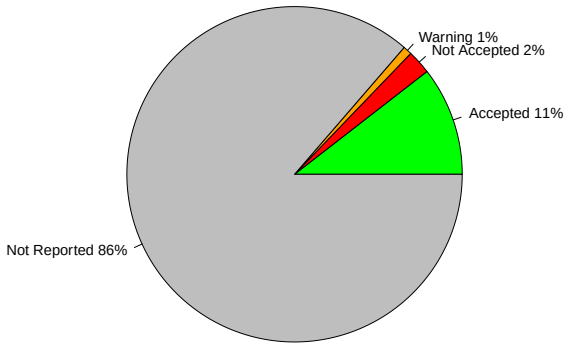

FIGURE 11. Percentage of Accepted vs. Warnings vs. Not Accepted vs. Not Reported results

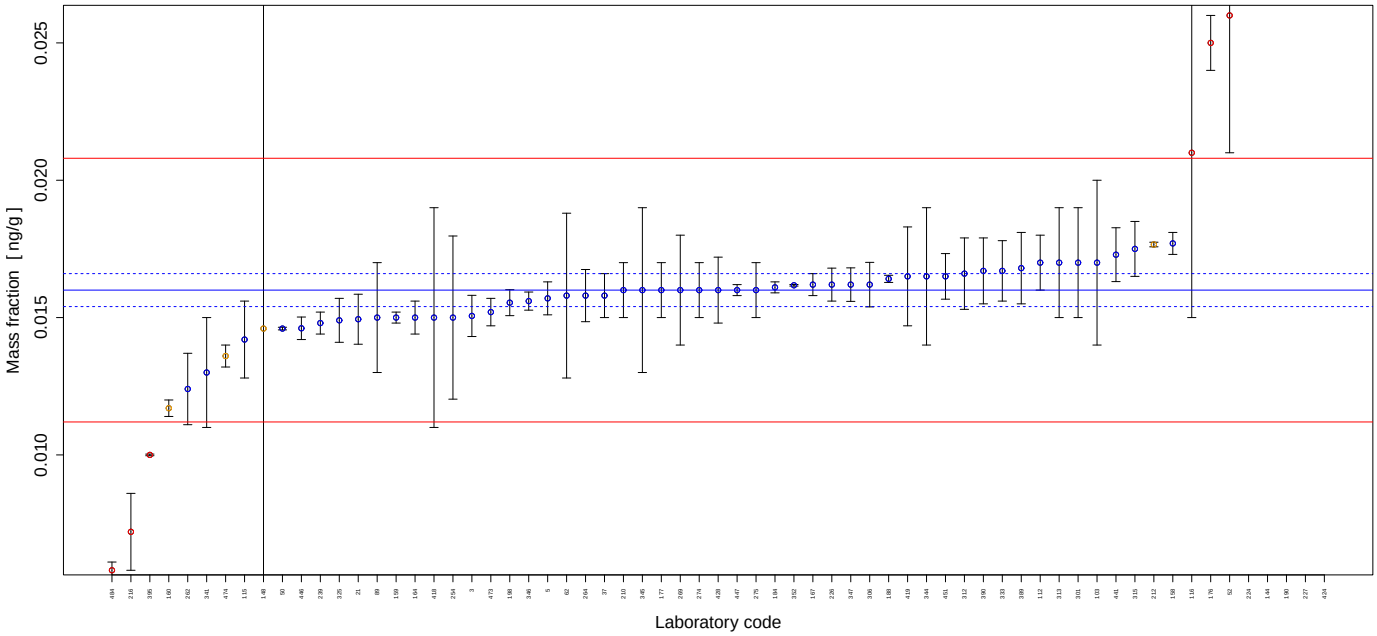

FIGURE 12. Reported results and evaluation parameters for U-235 by ICP-MS. Blue points represent accepted scores, whereas yellow and red represent warning and not accepted scores, respectively.

TABLE 12. Evaluation Results for U-235 in Sample 1, Rep. Value and Rep. Unc. in ng/g by ICP-MS

Labcode	Reported value [ng/g]	Reported uncertainty ($k = 1$) [ng/g]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
3	0.01506	0.00075	-5.87	6.23	A	A	A
5	0.0157	0.0006	-1.88	5.35	A	A	A
21	0.01494	0.00091	-6.62	7.15	A	A	A
37	0.0158	0.0008	-1.25	6.30	A	A	A
50	0.0146	0.000048	-8.75	3.76	A	A	A
52	0.026	0.005	62.50	19.59	N	N	N
62	0.0158	0.003	-1.25	19.35	A	A	A
89	0.015	0.002	-6.25	13.85	A	A	A
103	0.017	0.003	6.25	18.04	A	A	A
112	0.017	0.001	6.25	6.98	A	A	A
115	0.0142	0.0014	-11.25	10.55	A	A	A
116	0.021	0.006	31.25	28.82	N	A	N
144	1.75	0.05	10837.50	4.71	N	N	N
148	0.0146	0.02	-8.75	137.04	A	N	W
158	0.0177	0.0004	10.63	4.38	A	A	A
159	0.0150	0.0002	-6.25	3.98	A	A	A
160	0.0117	0.0003	-26.88	4.54	A	N	W
164	0.015	0.0006	-6.25	5.48	A	A	A
167	0.0162	0.0004	1.25	4.49	A	A	A
176	0.025	0.001	56.25	5.48	N	N	N
177	0.016	0.001	0.00	7.29	A	A	A
184	0.0161	0.0002	0.62	3.95	A	A	A
188	0.01641	0.00013	2.56	3.83	A	A	A
190	6.90	0.1	43025.00	4.02	N	N	N
198	0.015543	0.000473	-2.86	4.83	A	A	A
210	0.016	0.001	0.00	7.29	A	A	A
212	0.01766	0.000084	10.37	3.78	A	N	W
216	0.0072	0.0014	-55.00	19.80	N	N	N
224	0.075	0.03	368.75	40.18	N	N	N
226	0.0162	0.0006	1.25	5.27	A	A	A
227	7.18	0.1	44775.00	4.00	N	N	N
239	0.0148	0.0004	-7.50	4.62	A	A	A
254	0.0150	0.00297	-6.25	20.15	A	A	A
262	0.0124	0.0013	-22.50	11.13	A	A	A
264	0.0158	0.00095	-1.25	7.09	A	A	A
269	0.016	0.002	0.00	13.05	A	A	A
274	0.016	0.001	0.00	7.29	A	A	A
275	0.016	0.001	0.00	7.29	A	A	A
301	0.017	0.002	6.25	12.35	A	A	A
306	0.0162	0.00081	1.25	6.25	A	A	A
312	0.0166	0.0013	3.75	8.68	A	A	A
313	0.017	0.002	6.25	12.35	A	A	A
315	0.0175	0.0010	9.38	6.83	A	A	A
325	0.0149	0.0008	-6.88	6.55	A	A	A
333	0.0167	0.0011	4.37	7.58	A	A	A
341	0.013	0.002	-18.75	15.84	A	A	A
344	0.0165	0.0025	3.13	15.61	A	A	A
345	0.016	0.003	0.00	19.12	A	A	A
346	0.0156	0.00033	-2.50	4.31	A	A	A
347	0.0162	0.00061	1.25	5.31	A	A	A
352	0.016175	0.000028	1.09	3.75	A	A	A
389	0.0168	0.0013	5.00	8.60	A	A	A
390	0.0167	0.0012	4.37	8.11	A	A	A
395	0.01	0.00003	-37.50	3.76	N	N	N
418	0.015	0.004	-6.25	26.93	A	A	A
419	0.0165	0.0018	3.13	11.54	A	A	A
424	14.4	1.73	89900.00	12.59	N	N	N
428	0.016	0.0012	0.00	8.39	A	A	A
441	0.01729	0.00098	8.06	6.80	A	A	A
446	0.01461	0.00041	-8.69	4.68	A	A	A

TABLE 12. Evaluation Results for U-235 in Sample 1, Rep. Value and Rep. Unc. in ng/g by ICP-MS

Labcode	Reported value [ng/g]	Reported uncertainty ($k = 1$) [ng/g]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
447	0.016	0.0002	0.00	3.95	A	A	A
451	0.0165	0.00083	3.13	6.27	A	A	A
473	0.0152	0.0005	-5.00	4.99	A	A	A
474	0.0136	0.0004	-15.00	4.77	A	N	W
484	0.0058	0.0003	-63.75	6.39	N	N	N

U-238 Determination in Sample 1 by ICP-MS

TABLE 13. Target values

Parameter	Value
Mass fraction [ng/g]	2.235
Uncertainty [ng/g]	0.068
Maximum Acceptable Relative Bias [%]	30

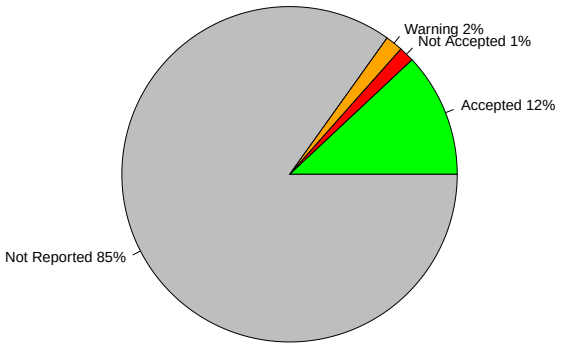

FIGURE 13. Percentage of Accepted vs. Warnings vs. Not Accepted vs. Not Reported results

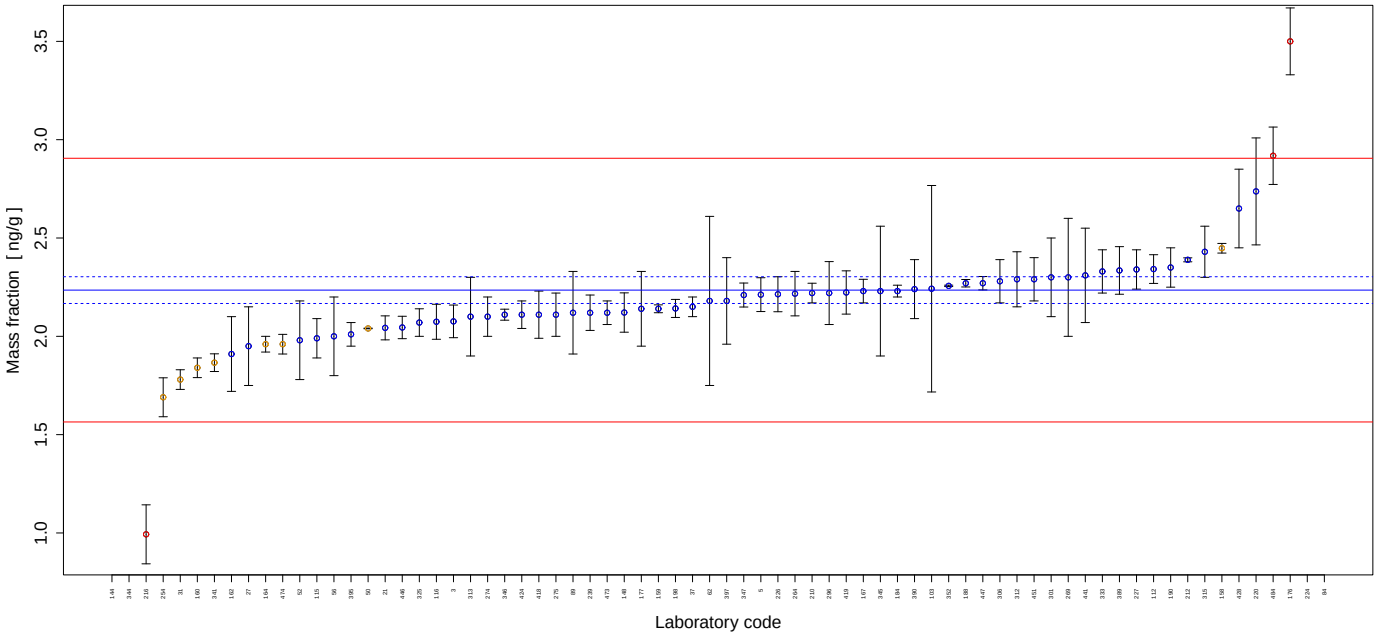

FIGURE 14. Reported results and evaluation parameters for U-238 by ICP-MS. Blue points represent accepted scores, whereas yellow and red represent warning and not accepted scores, respectively.

TABLE 14. Evaluation Results for U-238 in Sample 1, Rep. Value and Rep. Unc. in ng/g by ICP-MS

Labcode	Reported value [ng/g]	Reported uncertainty ($k = 1$) [ng/g]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
3	2.076	0.083	-7.11	5.02	A	A	A
5	2.212	0.086	-1.03	4.94	A	A	A
21	2.043	0.061	-8.59	4.26	A	A	A
27	1.95	0.20	-12.75	10.70	A	A	A
31	1.78	0.05	-20.36	4.14	A	N	W
37	2.15	0.05	-3.80	3.83	A	A	A
50	2.04	0.00157	-8.72	3.04	A	N	W
52	1.98	0.2	-11.41	10.55	A	A	A
56	2.0	0.2	-10.51	10.45	A	A	A
62	2.18	0.43	-2.46	19.96	A	A	A
84	3054	274	136544.30	9.47	N	N	N
89	2.12	0.21	-5.15	10.36	A	A	A
103	2.242	0.525	0.31	23.61	A	A	A
112	2.342	0.073	4.79	4.36	A	A	A
115	1.99	0.10	-10.96	5.87	A	A	A
116	2.074	0.089	-7.20	5.26	A	A	A
144	0.012	0.005	-99.46	41.78	N	N	N
148	2.121	0.10	-5.10	5.61	A	A	A
158	2.4479	0.0245	9.53	3.20	A	N	W
159	2.14	0.02	-4.25	3.18	A	A	A
160	1.84	0.05	-17.67	4.08	A	N	W
162	1.91	0.19	-14.54	10.40	A	A	A
164	1.96	0.04	-12.30	3.66	A	N	W
167	2.23	0.06	-0.22	4.06	A	A	A
176	3.50	0.17	56.60	5.73	N	N	N
177	2.14	0.19	-4.25	9.39	A	A	A
184	2.23	0.03	-0.22	3.33	A	A	A
188	2.270	0.019	1.57	3.16	A	A	A
190	2.35	0.1	5.15	5.23	A	A	A
198	2.141841	0.045876	-4.17	3.72	A	A	A
210	2.22	0.05	-0.67	3.79	A	A	A
212	2.389	0.0101	6.89	3.07	A	A	A
216	0.993	0.15	-55.57	15.41	N	N	N
220	2.737	0.272	22.46	10.39	A	A	A
224	10	4	347.43	40.12	N	N	N
226	2.214	0.089	-0.94	5.04	A	A	A
227	2.34	0.1	4.70	5.25	A	A	A
239	2.12	0.09	-5.15	5.22	A	A	A
254	1.69	0.0990	-24.38	6.60	A	N	W
264	2.217	0.113	-0.81	5.94	A	A	A
269	2.3	0.3	2.91	13.39	A	A	A
274	2.1	0.1	-6.04	5.65	A	A	A
275	2.11	0.11	-5.59	6.04	A	A	A
296	2.22	0.16	-0.67	7.82	A	A	A
301	2.3	0.2	2.91	9.21	A	A	A
306	2.28	0.11	2.01	5.70	A	A	A
312	2.29	0.14	2.46	6.83	A	A	A
313	2.1	0.2	-6.04	10.00	A	A	A
315	2.43	0.13	8.72	6.15	A	A	A
325	2.07	0.07	-7.38	4.55	A	A	A
333	2.33	0.11	4.25	5.62	A	A	A
341	1.866	0.045	-16.51	3.88	A	N	W
344	0.3652	0.0463	-83.66	13.04	N	N	N
345	2.23	0.33	-0.22	15.11	A	A	A
346	2.11	0.028	-5.59	3.32	A	A	A
347	2.21	0.061	-1.12	4.11	A	A	A
352	2.2566	0.0035	0.97	3.05	A	A	A
389	2.335	0.121	4.47	6.01	A	A	A
390	2.24	0.15	0.22	7.36	A	A	A
395	2.01	0.06	-10.07	4.26	A	A	A

TABLE 14. Evaluation Results for U-238 in Sample 1, Rep. Value and Rep. Unc. in ng/g by ICP-MS

Labcode	Reported value [ng/g]	Reported uncertainty ($k = 1$) [ng/g]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
397	2.18	0.22	-2.46	10.54	A	A	A
418	2.11	0.12	-5.59	6.45	A	A	A
419	2.2230	0.1100	-0.54	5.81	A	A	A
424	2.11	0.07	-5.59	4.50	A	A	A
428	2.65	0.20	18.57	8.14	A	A	A
441	2.31	0.24	3.36	10.83	A	A	A
446	2.045	0.057	-8.50	4.13	A	A	A
447	2.27	0.034	1.57	3.39	A	A	A
451	2.29	0.11	2.46	5.69	A	A	A
473	2.12	0.06	-5.15	4.16	A	A	A
474	1.96	0.05	-12.30	3.97	A	N	W
484	2.9183	0.1459	30.57	5.85	N	N	N

H-3 Determination in Sample 1 by Beta Counting

TABLE 15. Target values

Parameter	Value
Activity concentration [Bq/kg]	19.5
Uncertainty [Bq/kg]	1.0
Maximum Acceptable Relative Bias [%]	30

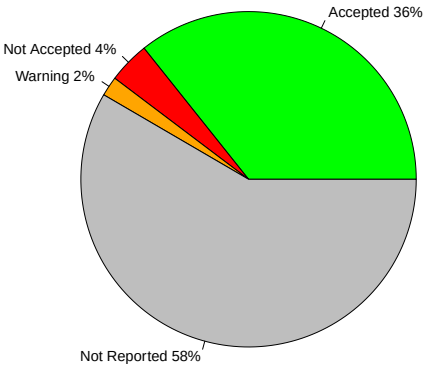

FIGURE 15. Percentage of Accepted vs. Warnings vs. Not Accepted vs. Not Reported results

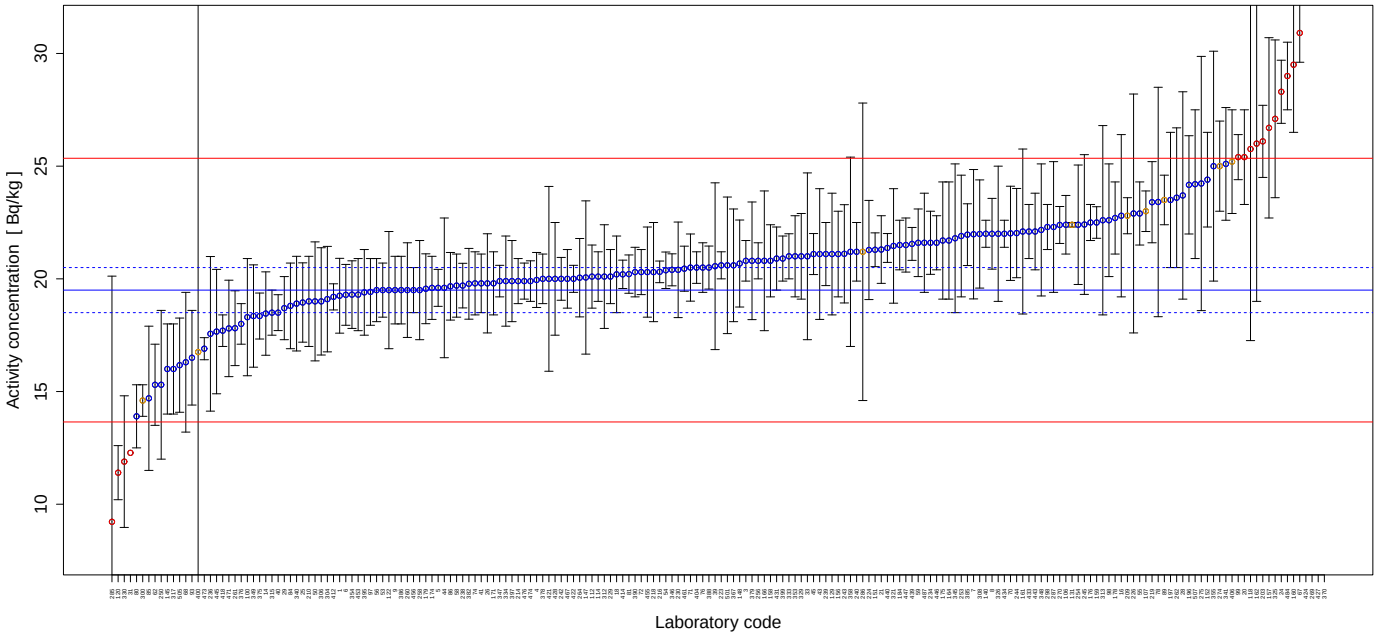

FIGURE 16. Reported results and evaluation parameters for H-3 by Beta Counting. Blue points represent accepted scores, whereas yellow and red represent warning and not accepted scores, respectively.

TABLE 16. Evaluation Results for H-3 in Sample 1, Rep. Value and Rep. Unc. in Bq/kg by Beta counting

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
1	19.25	1.66	-1.28	10.03	A	A	A
3	20.8	0.9	6.67	6.71	A	A	A
4	19.95	1.22	2.31	7.98	A	A	A
5	19.6	0.82	0.51	6.62	A	A	A
6	19.29	1.35	-1.08	8.68	A	A	A
7	21.98	2.87	12.72	14.03	A	A	A
8	22.0	1.57	12.82	8.79	A	A	A
9	19.5	1.50	0.00	9.25	A	A	A
14	18.46	1.85	-5.33	11.26	A	A	A
16	22.80	3.60	16.92	16.60	A	A	A
18	20.2	1.7	3.59	9.86	A	A	A
20	25.4	2.1	30.26	9.73	N	N	N
21	21.3	1.5	9.23	8.71	A	A	A
24	28.3	1.4	45.13	7.13	N	N	N
25	18.95	1.76	-2.82	10.61	A	A	A
26	19.8	2.2	1.54	12.24	A	A	A
28	23.7	4.6	21.54	20.08	A	A	A
29	18.7	1.4	-4.10	9.07	A	A	A
31	12.28		-37.03		N		N
33	21.0	3.7	7.69	18.35	A	A	A
39	20.56	3.70	5.44	18.71	A	A	A
40	18.5	0.796	-5.13	6.69	A	A	A
41	19.8	1.3	1.54	8.33	A	A	A
43	21.1	2.9	8.21	14.67	A	A	A
44	19.6	3.1	0.51	16.63	A	A	A
45	21.1	0.91	8.21	6.70	A	A	A
50	19.0	2.64	-2.56	14.81	A	A	A
53	19.5	1.2	0.00	8.01	A	A	A
54	20.38	0.81	4.51	6.49	A	A	A
55	22.9	1.4	17.44	7.98	A	A	A
56	19.5	1.4	0.00	8.82	A	A	A
58	19.7	1.4	1.03	8.76	A	A	A
59	21.6	1.5	10.77	8.63	A	A	A
62	15.3	1.8	-21.54	12.83	A	A	A
67	30.91	1.30	58.51	6.63	N	N	N
68	16.3	3.1	-16.41	19.70	A	A	A
70	22.02	2.09	12.92	10.79	A	A	A
71	20.5	1.49	5.13	8.90	A	A	A
72	20.3	1.0	4.10	7.11	A	A	A
74	19.8	1.4	1.54	8.73	A	A	A
76	20.5	1.1	5.13	7.42	A	A	A
78	23.41	5.09	20.05	22.34	A	A	A
80	13.9	1.4	-28.72	11.30	A	A	A
81	20.21	0.85	3.64	6.63	A	A	A
84	18.8	1.9	-3.59	11.33	A	A	A
85	14.7	3.2	-24.62	22.36	A	A	A
86	19.67	1.5	0.87	9.19	A	A	A
89	23.5	1.1	20.51	6.94	A	N	W
93	16.5	2.1	-15.38	13.72	A	A	A
97	19.42	1.48	-0.41	9.19	A	A	A
98	22.6	2.5	15.90	12.19	A	A	A
99	25.4	1.0	30.26	6.47	N	N	N
100	18.3	2.6	-6.15	15.10	A	A	A
106	22.4	1.3	14.87	7.74	A	A	A
107	23.0	0.9	17.95	6.45	A	N	W
112	20.1	1.4	3.08	8.65	A	A	A
114	20.1	1.1	3.08	7.50	A	A	A
118	25.76	8.5	32.10	33.39	N	N	N
120	11.4	1.2	-41.54	11.71	N	N	N
122	19.5	2.6	0.00	14.29	A	A	A

TABLE 16. Evaluation Results for H-3 in Sample 1, Rep. Value and Rep. Unc. in Bq/kg by Beta counting

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
129	21.1	2.7	8.21	13.79	A	A	A
131	22.4	0.1	14.87	5.15	A	N	W
140	22.0	0.6	12.82	5.81	A	A	A
145	16.0	2.0	-17.95	13.51	A	A	A
147	20.06	3.40	2.87	17.71	A	A	A
148	20.68	1.93	6.05	10.65	A	A	A
151	21.29	0.75	9.18	6.22	A	A	A
152	24.4	2.1	25.13	10.02	A	A	A
156	21.1	1.9	8.21	10.36	A	A	A
157	26.7	4	36.92	15.83	N	A	N
158	20.8	1.6	6.67	9.25	A	A	A
159	22.5	0.7	15.38	6.00	A	A	A
160	29.5	3.0	51.28	11.39	N	N	N
161	22.1	3.66	13.33	17.34	A	A	A
162	26	7	33.33	27.41	N	A	N
164	21.7	2.6	11.28	13.03	A	A	A
166	20.8	3.1	6.67	15.76	A	A	A
171	19.8	1.4	1.54	8.73	A	A	A
174	19.6	1.4	0.51	8.79	A	A	A
175	21.7	2.6	11.28	13.03	A	A	A
176	22.5	0.8	15.38	6.24	A	A	A
178	22.7	1.6	16.41	8.72	A	A	A
179	19.56	1.55	0.31	9.44	A	A	A
184	21.5	1.1	10.26	7.24	A	A	A
196	24.17	2.18	23.95	10.38	A	A	A
197	23.5	3.0	20.51	13.76	A	A	A
203	26.1	1.6	33.85	7.99	N	N	N
209	22.8	0.8	16.92	6.21	A	N	W
210	19.0	2.0	-2.56	11.71	A	A	A
214	19.9	1	2.05	7.18	A	A	A
216	20.31	0.48	4.15	5.65	A	A	A
218	20.3	2.2	4.10	11.99	A	A	A
219	23.4	1.8	20.00	9.25	A	A	A
223	20.6	0.6	5.64	5.90	A	A	A
224	21.28	2.2	9.13	11.54	A	A	A
226	22.9	5.3	17.44	23.71	A	A	A
229	20.1	1.2	3.08	7.87	A	A	A
230	20.4	2.12	4.62	11.59	A	A	A
234	21.6	1.4	10.77	8.26	A	A	A
236	17.56	3.43	-9.95	20.19	A	A	A
238	19.7	0.99	1.03	7.18	A	A	A
239	21.1	1.4	8.21	8.39	A	A	A
240	21.2	1.3	8.72	7.99	A	A	A
242	20.0	0.95	2.56	6.99	A	A	A
243	21.11	2.18	8.26	11.53	A	A	A
244	22.03	1.98	12.97	10.35	A	A	A
245	22.41	3.10	14.92	14.75	A	A	A
250	15.3	3.3	-21.54	22.17	A	A	A
253	21.9	2.7	12.31	13.35	A	A	A
254	22.4	2.65	14.87	12.89	A	A	A
256	20.8	0.8	6.67	6.41	A	A	A
258	19.5	2.2	0.00	12.39	A	A	A
260	19.5	2.1	0.00	11.93	A	A	A
261	17.81	1.66	-8.67	10.64	A	A	A
262	23.6	3.1	21.03	14.10	A	A	A
264	20.051	1.739	2.83	10.08	A	A	A
269	38	4	94.87	11.71	N	N	N
270	22.39	0.82	14.82	6.30	A	A	A
274	25	2	28.21	9.50	A	N	W
275	24.23	5.64	24.26	23.84	A	A	A

TABLE 16. Evaluation Results for H-3 in Sample 1, Rep. Value and Rep. Unc. in Bq/kg by Beta counting

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
285	9.22	10.9	-52.72	118.33	N	N	N
286	21.2	6.6	8.72	31.55	A	N	W
287	22.3	2.9	14.36	13.98	A	A	A
298	22.3	1.0	14.36	6.81	A	A	A
300	14.6	0.7	-25.13	7.02	A	N	W
304	19.1	2.34	-2.05	13.28	A	A	A
306	19	2.38	-2.56	13.54	A	A	A
308	21.99	2.40	12.77	12.06	A	A	A
312	20.1	2.3	3.08	12.54	A	A	A
313	22.6	4.2	15.90	19.28	A	A	A
315	18.5	1.0	-5.13	7.45	A	A	A
317	16.0	2.0	-17.95	13.51	A	A	A
321	21.46	2.54	10.05	12.90	A	A	A
325	27.1	3.5	38.97	13.90	N	N	N
326	22.0	3.0	12.82	14.57	A	A	A
329	21.0	1.9	7.69	10.40	A	A	A
330	11.89	2.92	-39.03	25.09	N	A	N
333	21.0	1.0	7.69	7.00	A	A	A
334	19.9	2.0	2.05	11.28	A	A	A
340	18.9	2.1	-3.08	12.24	A	A	A
341	25.1	2.5	28.72	11.20	A	A	A
345	21.8	3.3	11.79	15.98	A	A	A
346	20.4	0.71	4.62	6.20	A	A	A
347	19.9	0.70	2.05	6.22	A	A	A
348	22.17	2.93	13.69	14.18	A	A	A
349	18.35	2.27	-5.90	13.39	A	A	A
353	21.0	1.8	7.69	9.99	A	A	A
354	19.3	1.5	-1.03	9.31	A	A	A
355	25.0	5.1	28.21	21.03	A	A	A
358	21.2	4.2	8.72	20.46	A	A	A
367	20.6	2.5	5.64	13.17	A	A	A
370	46.73	2.31	139.64	7.12	N	N	N
375	18.35	1.02	-5.90	7.56	A	A	A
376	18	0.9	-7.69	7.16	A	A	A
378	20.0	1.1	2.56	7.52	A	A	A
379	20.8	2.61	6.67	13.56	A	A	A
382	19.78	1.57	1.44	9.45	A	A	A
385	21.96	1.37	12.62	8.08	A	A	A
386	19.5	1.5	0.00	9.25	A	A	A
388	20.5	0.955	5.13	6.93	A	A	A
390	20.3	1.1	4.10	7.46	A	A	A
395	19.4	1.9	-0.51	11.06	A	A	A
397	19.9	1.8	2.05	10.40	A	A	A
399	20.9	1.0	7.18	7.01	A	A	A
400	16.75	18.44	-14.10	110.21	A	N	W
404	20.5	0.7	5.13	6.16	A	A	A
406	25.2	2.3	29.23	10.47	A	N	W
412	19.20	0.58	-1.54	5.95	A	A	A
414	20.2	0.63	3.59	6.00	A	A	A
418	17.7	0.7	-9.23	6.48	A	A	A
421	20	4.1	2.56	21.13	A	A	A
422	20.0	0.6	2.56	5.94	A	A	A
424	34.7	1.82	77.95	7.34	N	N	N
427	39.0	1.45	100.00	6.33	N	N	N
428	20	2.5	2.56	13.51	A	A	A
431	20.9	1.4	7.18	8.44	A	A	A
433	22.1	1.2	13.33	7.47	A	A	A
434	22.0	0.6	12.82	5.81	A	A	A
439	21.55	0.73	10.51	6.15	A	A	A
440	21.37	0.64	9.59	5.94	A	A	A

TABLE 16. Evaluation Results for H-3 in Sample 1, Rep. Value and Rep. Unc. in Bq/kg by Beta counting

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
443	22.1	1.7	13.33	9.25	A	A	A
445	17.66	2.76	-9.44	16.45	A	A	A
446	21.6	1.2	10.77	7.56	A	A	A
447	21.5	1.20	10.26	7.58	A	A	A
453	19.3	1.6	-1.03	9.75	A	A	A
455	20.3	2.0	4.10	11.11	A	A	A
456	19.5	1.0	0.00	7.25	A	A	A
461	20.45	1.0	4.87	7.09	A	A	A
467	20.0	1.3	2.56	8.28	A	A	A
471	17.80	2.14	-8.72	13.07	A	A	A
473	16.9	0.49	-13.33	5.89	A	A	A
474	19.9	0.9	2.05	6.84	A	A	A
476	19.9	0.8	2.05	6.52	A	A	A
484	29.0	1.5	48.72	7.28	N	N	N
487	21.6	2.2	10.77	11.40	A	A	A
501	20.6	3.03	5.64	15.58	A	A	A
505	16.17	2.09	-17.08	13.91	A	A	A
507	24.2	3.3	24.10	14.57	A	A	A

Sr-90 Determination in Sample 1 by Beta Counting

TABLE 17. Target values

Parameter	Value
Activity concentration [Bq/kg]	23.6
Uncertainty [Bq/kg]	1.2
Maximum Acceptable Relative Bias [%]	30

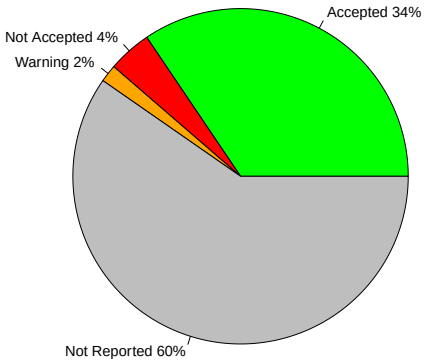

FIGURE 17. Percentage of Accepted vs. Warnings vs. Not Accepted vs. Not Reported results

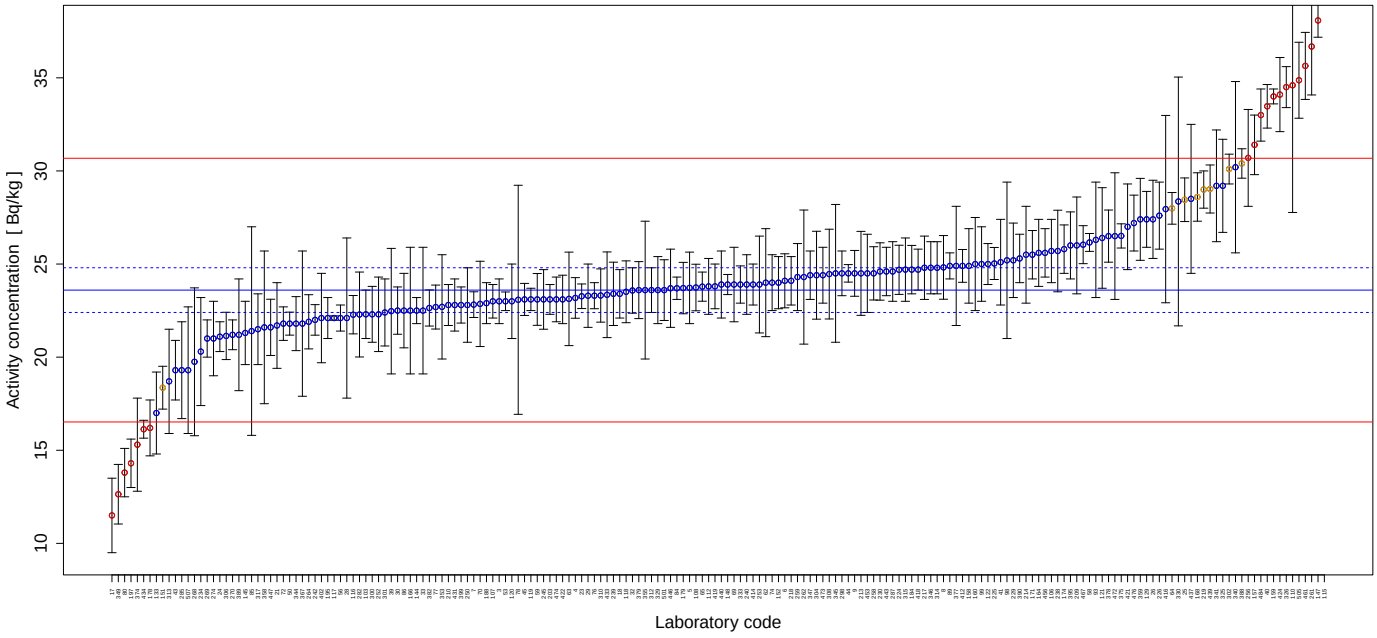

FIGURE 18. Reported results and evaluation parameters for Sr-90 by Beta Counting. Blue points represent accepted scores, whereas yellow and red represent warning and not accepted scores, respectively.

TABLE 18. Evaluation Results for Sr-90 in Sample 1, Rep. Value and Rep. Unc. in Bq/kg by Beta counting

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
3	23.0	1.2	-2.54	7.29	A	A	A
4	23.18	1.09	-1.78	6.93	A	A	A
5	23.72	1.92	0.51	9.56	A	A	A
6	24.1	1.45	2.12	7.88	A	A	A
7	22.82	0.69	-3.31	5.92	A	A	A
8	24.82	1.71	5.17	8.56	A	A	A
9	24.5	1.23	3.81	7.15	A	A	A
17	11.5	2.0	-51.27	18.12	N	N	N
18	23.4	1.3	-0.85	7.53	A	A	A
21	21.7	2.3	-8.05	11.76	A	A	A
23	23.27	0.66	-1.40	5.82	A	A	A
24	21.1	0.8	-10.59	6.34	A	A	A
25	28.452	1.171	20.56	6.54	A	N	W
26	27.4	2.1	16.10	9.20	A	A	A
28	22.1	4.3	-6.36	20.11	A	A	A
29	23.3	1.7	-1.27	8.89	A	A	A
30	22.5	1.27	-4.66	7.60	A	A	A
32	23.58	1.22	-0.08	7.25	A	A	A
33	22.5	3.4	-4.66	15.94	A	A	A
39	22.47	3.37	-4.79	15.84	A	A	A
40	33.47	1.17	41.82	6.17	N	N	N
41	25.1	2.3	6.36	10.48	A	A	A
43	19.3	1.6	-18.22	9.73	A	A	A
44	24.5	0.47	3.81	5.43	A	A	A
45	23.1	0.86	-2.12	6.30	A	A	A
50	21.8	0.617	-7.63	5.82	A	A	A
53	23.0	0.5	-2.54	5.53	A	A	A
56	22.1	0.7	-6.36	5.99	A	A	A
58	26.16	0.48	10.85	5.41	A	A	A
59	23.1	1.39	-2.12	7.88	A	A	A
62	24.0	2.9	1.69	13.11	A	A	A
63	23.13	2.51	-1.99	11.98	A	A	A
64	27.99	0.85	18.60	5.92	A	N	W
65	23.7861	0.7827	0.79	6.06	A	A	A
69	23.9	2.0	1.27	9.79	A	A	A
70	22.86	2.29	-3.14	11.23	A	A	A
72	21.8	0.9	-7.63	6.55	A	A	A
74	24.0	1.5	1.69	8.06	A	A	A
76	23.3	0.7	-1.27	5.91	A	A	A
77	22.69	1.18	-3.86	7.27	A	A	A
78	23.08	6.15	-2.20	27.13	A	A	A
80	13.8	1.3	-41.53	10.70	N	N	N
84	23.7	0.6	0.42	5.68	A	A	A
85	21.4	5.6	-9.32	26.66	A	A	A
86	22.5	2	-4.66	10.24	A	A	A
89	24.9	0.7	5.51	5.81	A	A	A
93	26.3	3.1	11.44	12.84	A	A	A
98	25.2	4.2	6.78	17.43	A	A	A
99	25	2	5.93	9.48	A	A	A
103	22.3	1.3	-5.51	7.74	A	A	A
106	25.7	1.7	8.90	8.34	A	A	A
107	23.0	0.9	-2.54	6.42	A	A	A
108	23.74	1.25	0.59	7.32	A	A	A
110	34.6	6.83	46.61	20.38	N	A	N
112	23.8	1.5	0.85	8.10	A	A	A
115	55	15	133.05	27.74	N	N	N
116	22.28	1.03	-5.59	6.87	A	A	A
117	22.10	0.12	-6.36	5.11	A	A	A
118	23.51	1.66	-0.38	8.70	A	A	A
119	23.1	0.6	-2.12	5.71	A	A	A

TABLE 18. Evaluation Results for Sr-90 in Sample 1, Rep. Value and Rep. Unc. in Bq/kg by Beta counting

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
120	23	2	-2.54	10.07	A	A	A
121	26.4	2.7	11.86	11.42	A	A	A
122	25.0	1.1	5.93	6.72	A	A	A
129	27.4	1.5	16.10	7.47	A	A	A
133	17.0	2.2	-27.97	13.90	A	A	A
144	22.5	0.7	-4.66	5.96	A	A	A
145	21.3	1.7	-9.75	9.46	A	A	A
147	38.08	0.90	61.36	5.61	N	N	N
148	23.90	0.54	1.27	5.56	A	A	A
151	18.36	1.15	-22.20	8.07	A	N	W
152	24.0	1.4	1.69	7.74	A	A	A
157	31.4	1.6	33.05	7.20	N	N	N
158	24.9	2.0	5.51	9.51	A	A	A
159	34.0	0.4	44.07	5.22	N	N	N
160	25.0	2.5	5.93	11.22	A	A	A
164	25.6	1.8	8.47	8.68	A	A	A
166	22.5	3.4	-4.66	15.94	A	A	A
168	28.6	1.3	21.19	6.82	A	N	W
171	25.5	1.3	8.05	7.20	A	A	A
174	25.8	1.3	9.32	7.16	A	A	A
178	16.2	1.5	-31.36	10.56	N	N	N
179	23.71	1.38	0.47	7.73	A	A	A
184	24.7	1.3	4.66	7.32	A	A	A
188	22.9	1.1	-2.97	6.99	A	A	A
195	22.1	1.1	-6.36	7.12	A	A	A
197	14.3	1.3	-39.41	10.42	N	N	N
203	23.1	0.8	-2.12	6.15	A	A	A
209	26.0	2.6	10.17	11.22	A	A	A
210	22.8	1.1	-3.39	7.01	A	A	A
213	24.5	2.254	3.81	10.51	A	A	A
214	25.5	2.6	8.05	11.39	A	A	A
217	24.8	1.7	5.08	8.53	A	A	A
218	24.1	1.3	2.12	7.41	A	A	A
219	29	1	22.88	6.14	A	N	W
224	24.69	1.32	4.62	7.38	A	A	A
225	25.03	0.86	6.06	6.14	A	A	A
226	27.6	1.8	16.95	8.27	A	A	A
229	25.2	2.0	6.78	9.43	A	A	A
230	24.6	1.54	4.24	8.07	A	A	A
234	20.3	2.9	-13.98	15.16	A	A	A
238	25.7	2.19	8.90	9.92	A	A	A
239	23.4	1.7	-0.85	8.87	A	A	A
240	23.9	1.6	1.27	8.41	A	A	A
242	22	0.82	-6.78	6.30	A	A	A
245	23.10	1.60	-2.12	8.59	A	A	A
250	22.8	2.0	-3.39	10.14	A	A	A
252	22.3	2	-5.51	10.31	A	A	A
253	23.9	2.6	1.27	12.01	A	A	A
256	30.7	2.6	30.08	9.88	N	N	N
258	24.5	1.43	3.81	7.74	A	A	A
259	24.3	1.8	2.97	8.98	A	A	A
261	36.68	2.60	55.42	8.72	N	N	N
262	24.3	3.6	2.97	15.66	A	A	A
264	21.898	1.455	-7.21	8.37	A	A	A
268	19.75	3.97	-16.31	20.73	A	A	A
269	21	1	-11.02	6.97	A	A	A
270	21.2	0.8	-10.17	6.33	A	A	A
274	21	2	-11.02	10.80	A	A	A
282	22.29	2.28	-5.55	11.42	A	A	A
285	19.3	2.6	-18.22	14.40	A	A	A

TABLE 18. Evaluation Results for Sr-90 in Sample 1, Rep. Value and Rep. Unc. in Bq/kg by Beta counting

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
287	24.6	1.6	4.24	8.26	A	A	A
298	24.5	1.2	3.81	7.06	A	A	A
300	22.3	1.5	-5.51	8.43	A	A	A
301	22.4	1.8	-5.08	9.51	A	A	A
302	30.1	0.8	27.54	5.74	A	N	W
304	24.4	2.36	3.39	10.93	A	A	A
306	21.14	1.27	-10.42	7.87	A	A	A
308	24.46	2.41	3.64	11.09	A	A	A
310	23.31	1.43	-1.23	7.97	A	A	A
312	23.6	1.2	0.00	7.19	A	A	A
313	18.7	2.8	-20.76	15.81	A	A	A
314	24.8	1.4	5.08	7.60	A	A	A
315	24.7	1.7	4.66	8.56	A	A	A
317	21.5	1.9	-8.90	10.20	A	A	A
325	29.2	2.5	23.73	9.96	A	A	A
326	34.5	1.1	46.19	6.00	N	N	N
329	23.6	1.8	0.00	9.17	A	A	A
330	28.36	6.68	20.17	24.10	A	A	A
333	23.9	1.0	1.27	6.58	A	A	A
340	30.2	4.6	27.97	16.06	A	A	A
341	29.2	3.0	23.73	11.46	A	A	A
344	21.8	1.45	-7.63	8.37	A	A	A
345	24.5	3.7	3.81	15.94	A	A	A
346	24.8	1.4	5.08	7.60	A	A	A
347	24.4	1.3	3.39	7.36	A	A	A
349	12.64	1.6	-46.44	13.64	N	N	N
353	22.7	2.8	-3.81	13.34	A	A	A
355	23.6	3.7	0.00	16.48	A	A	A
358	21.6	4.1	-8.47	19.65	A	A	A
359	27.4	2.2	16.10	9.50	A	A	A
367	21.8	3.9	-7.63	18.60	A	A	A
374	15.3	2.5	-35.17	17.11	N	A	N
375	26.51	0.65	12.33	5.65	A	A	A
377	24.9	3.2	5.51	13.82	A	A	A
378	26.5	1.4	12.29	7.33	A	A	A
379	23.6	1.53	0.00	8.24	A	A	A
382	22.64	0.97	-4.07	6.65	A	A	A
388	30.4	0.79	28.81	5.71	A	N	W
389	21.2	3.0	-10.17	15.04	A	A	A
390	25.3	1.3	7.20	7.23	A	A	A
395	26.0	1.8	10.17	8.59	A	A	A
399	22.8	0.97	-3.39	6.63	A	A	A
402	22.1	2.4	-6.36	11.99	A	A	A
412	24.90	0.88	5.51	6.19	A	A	A
414	23.9	1.1	1.27	6.86	A	A	A
416	27.95	5.03	18.43	18.70	A	A	A
418	24.7	1.1	4.66	6.76	A	A	A
419	23.80	1.20	0.85	7.16	A	A	A
421	27	2.3	14.41	9.92	A	A	A
422	23.1	1.3	-2.12	7.58	A	A	A
424	34.1	1.99	44.49	7.74	N	N	N
431	22.8	1.4	-3.39	7.97	A	A	A
433	23.35	2.3	-1.06	11.09	A	A	A
434	16.13	0.48	-31.65	5.89	N	N	N
437	28.5	4.0	20.76	14.93	A	A	A
439	29.03	1.29	23.01	6.75	A	N	W
440	23.9	1.8	1.27	9.09	A	A	A
443	24.6	1.3	4.24	7.33	A	A	A
446	23.7	2.1	0.42	10.22	A	A	A
447	21.6	1.51	-8.47	8.64	A	A	A

TABLE 18. Evaluation Results for Sr-90 in Sample 1, Rep. Value and Rep. Unc. in Bq/kg by Beta counting

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
453	24.5	2.1	3.81	9.97	A	A	A
456	25.6	1.3	8.47	7.19	A	A	A
461	35.64	1.8	51.02	7.17	N	N	N
467	26.04	1.02	10.34	6.42	A	A	A
472	26.5	3.4	12.29	13.80	A	A	A
473	24.4	1.5	3.39	7.98	A	A	A
474	23.1	1.2	-2.12	7.27	A	A	A
476	27.2	1.5	15.25	7.50	A	A	A
484	33.0	1.4	39.83	6.62	N	N	N
501	23.6	1.63	0.00	8.58	A	A	A
505	34.87	2.04	47.75	7.75	N	N	N
507	19.3	3.4	-18.22	18.34	A	A	A

Na-22 Determination in Sample 1 by Gamma-ray Spectrometry

TABLE 19. Target values

Parameter	Value
Activity concentration [Bq/kg]	19.1
Uncertainty [Bq/kg]	1.0
Maximum Acceptable Relative Bias [%]	20

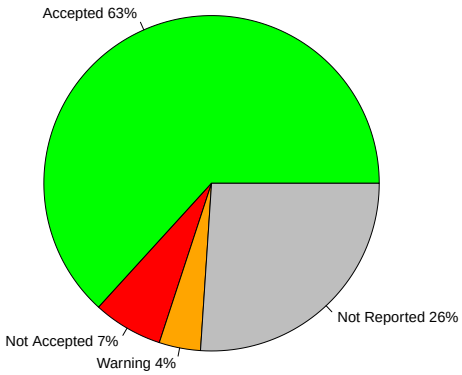

FIGURE 19. Percentage of Accepted vs. Warnings vs. Not Accepted vs. Not Reported results

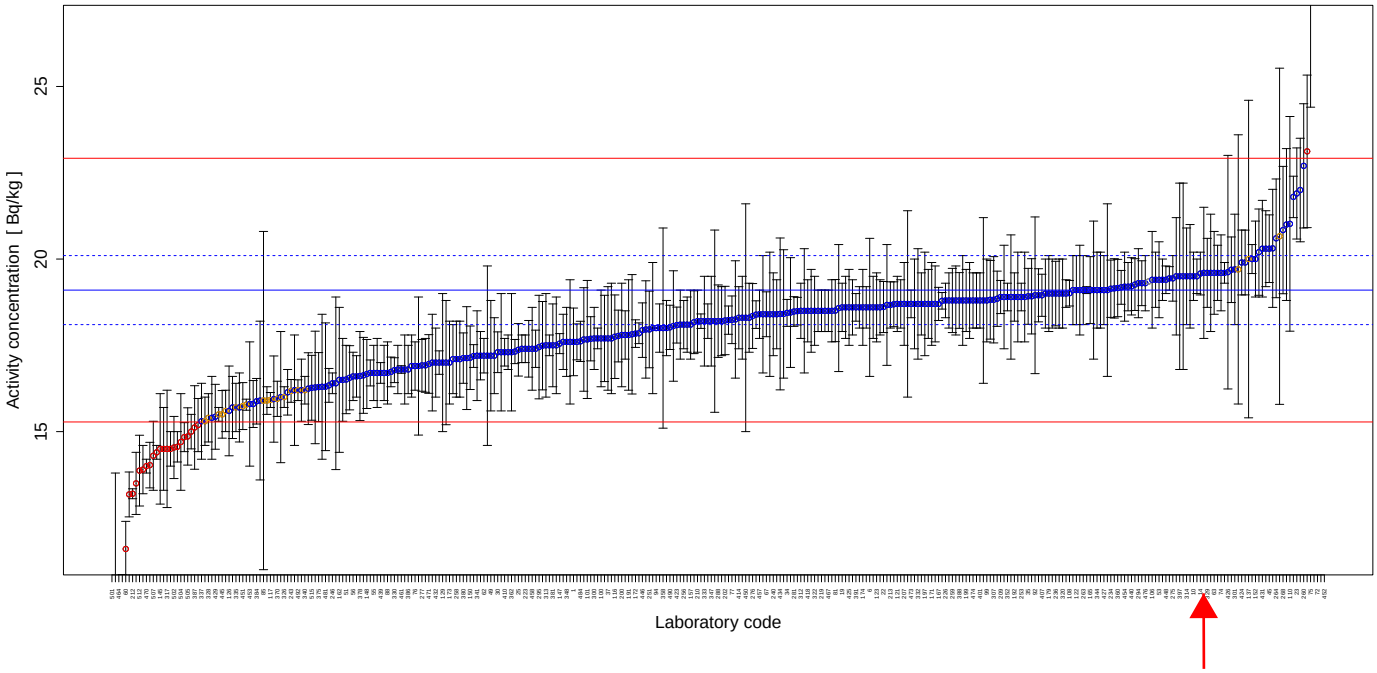

FIGURE 20. Reported results and evaluation parameters for Na-22 by Gamma-ray Spectrometry. Blue points represent accepted scores, whereas yellow and red represent warning and not accepted scores, respectively.

TABLE 20. Evaluation Results for Na-22 in Sample 1, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
1	17.6	0.98	-7.85	7.64	A	A	A
2	19.6	1.9	2.62	11.02	A	A	A
3	18.8	1.1	-1.57	7.85	A	A	A
4	18.82	1.14	-1.47	8.01	A	A	A
5	18.9	1.8	-1.05	10.87	A	A	A
6	18.6	2.0	-2.62	11.96	A	A	A
8	17.96	1.41	-5.97	9.44	A	A	A
9	17.7	1.25	-7.33	8.79	A	A	A
10	19.5	0.7	2.09	6.35	A	A	A
11	17.7	1.6	-7.33	10.45	A	A	A
12	19.6	1.7	2.62	10.13	A	A	A
14	19.58	0.62	2.51	6.12	A	A	A
17	19.6	0.8	2.62	6.64	A	A	A
19	18.6	0.7	-2.62	6.45	A	A	A
22	18.61	0.74	-2.57	6.57	A	A	A
23	21.9	1.32	14.66	7.98	A	A	A
24	23.12	2.21	21.05	10.90	N	A	N
25	17.37	0.76	-9.06	6.82	A	A	A
27	18.8	0.8	-1.57	6.75	A	A	A
28	18.2	2.64	-4.71	15.42	A	A	A
29	18.6	0.8	-2.62	6.78	A	A	A
30	17.3	0.59	-9.42	6.25	A	A	A
31	17.32	0.35	-9.32	5.61	A	A	A
32	19.6	0.3	2.62	5.45	A	A	A
34	18.44	0.39	-3.46	5.65	A	A	A
35	18.92	0.81	-0.94	6.76	A	A	A
36	18.23	0.41	-4.55	5.70	A	A	A
37	17.7	1.5	-7.33	9.96	A	A	A
39	18.0	1.9	-5.76	11.78	A	A	A
40	16.92	0.78	-11.41	6.98	A	A	A
41	18.5	1.2	-3.14	8.34	A	A	A
42	18.8	1.0	-1.57	7.46	A	A	A
43	21.0	2.2	9.95	11.71	A	A	A
44	17.6	0.52	-7.85	6.01	A	A	A
45	20.3	0.98	6.28	7.12	A	A	A
46	17.3	1.7	-9.42	11.13	A	A	A
49	17.2	1.6	-9.95	10.67	A	A	A
50	17.6	1.8	-7.85	11.49	A	A	A
51	16.51	0.99	-13.56	7.96	A	A	A
53	19.4	1.1	1.57	7.72	A	A	A
54	22	1.5	15.18	8.60	A	A	A
55	16.7	0.8	-12.57	7.10	A	A	A
56	16.6	0.7	-13.09	6.72	A	A	A
58	16.73	0.43	-12.41	5.83	A	A	A
59	20	0.42	4.71	5.64	A	A	A
60	11.6	0.8	-39.27	8.66	N	N	N
62	17.2	0.5	-9.95	5.99	A	A	A
63	19.6	1.2	2.62	8.06	A	A	A
64	14.4	0.2	-24.61	5.42	N	N	N
67	18.40	0.65	-3.66	6.32	A	A	A
68	18.3	1.2	-4.19	8.39	A	A	A
69	18.9	1.5	-1.05	9.51	A	A	A
70	17.67	1.50	-7.49	9.97	A	A	A
71	19.9	0.938	4.19	7.04	A	A	A
72	41.2	6.2	115.71	15.93	N	N	N
74	19.6	1.1	2.62	7.68	A	A	A
75	30.1	5.7	57.59	19.65	N	N	N
76	16.9	0.7	-11.52	6.68	A	A	A
77	18.24	0.69	-4.50	6.46	A	A	A
79	15.9	2.3	-16.75	15.38	A	A	A

TABLE 20. Evaluation Results for Na-22 in Sample 1, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
80	15.78	0.16	-17.38	5.33	A	N	W
81	18.50695	0.8999219	-3.10	7.15	A	A	A
82	18.45	1.59	-3.40	10.08	A	A	A
84	17.85	0.30	-6.54	5.50	A	A	A
85	15.9	4.9	-16.75	31.26	A	N	W
88	16.7	0.9	-12.57	7.51	A	A	A
91	19.2	0.7	0.52	6.38	A	A	A
92	18.95	2.27	-0.79	13.07	A	A	A
94	18.0	0.005	-5.76	5.24	A	A	A
95	19.1	2.0	0.00	11.71	A	A	A
98	19.44	0.34	1.78	5.52	A	A	A
99	18.8	1.2	-1.57	8.26	A	A	A
100	17.7	1.4	-7.33	9.49	A	A	A
101	17.67	1.71	-7.49	11.00	A	A	A
102	18.49	0.4	-3.19	5.66	A	A	A
105	17.13	1.49	-10.31	10.15	A	A	A
106	19.4	1.4	1.57	8.92	A	A	A
107	15.5	0.2	-18.85	5.39	A	N	W
108	19.01	0.37	-0.47	5.59	A	A	A
110	21.02	3.11	10.05	15.69	A	A	A
114	20.3	1.1	6.28	7.53	A	A	A
116	17.75	1.21	-7.07	8.60	A	A	A
117	15.916	0.217	-16.67	5.41	A	N	W
120	16.6	0.6	-13.09	6.36	A	A	A
121	18.7	0.8	-2.09	6.76	A	A	A
122	19.1	1.0	0.00	7.40	A	A	A
123	18.6	1.0	-2.62	7.50	A	A	A
124	18.4	1.0	-3.66	7.55	A	A	A
126	15.6	1.3	-18.32	9.84	A	A	A
129	17	2	-10.99	12.88	A	A	A
131	16.8	1.0	-12.04	7.93	A	A	A
133	17.77	0.75	-6.96	6.72	A	A	A
137	20.0	4.6	4.71	23.59	A	N	W
138	16.14	0.66	-15.50	6.64	A	A	A
140	18.6	0.6	-2.62	6.15	A	A	A
141	19.5	2.7	2.09	14.80	A	A	A
142	17.82	1.73	-6.70	11.03	A	A	A
143	18.5	0.9	-3.14	7.15	A	A	A
145	14.5	1.6	-24.08	12.21	N	A	N
146	8.2	5.6	-57.07	68.49	N	N	N
147	17.55	0.29	-8.12	5.49	A	A	A
148	16.67	1.00	-12.72	7.96	A	A	A
149	18.5	0.6	-3.14	6.16	A	A	A
150	17.14	0.92	-10.26	7.50	A	A	A
152	20.0	1.1	4.71	7.59	A	A	A
153	16.63	1.1	-12.93	8.44	A	A	A
157	18.1	1	-5.24	7.61	A	A	A
160	18.0	0.7	-5.76	6.52	A	A	A
161	13.5	0.9	-29.32	8.48	N	N	N
162	16.5	2.1	-13.61	13.76	A	A	A
165	19.1	0.97	0.00	7.29	A	A	A
166	17.2	2.6	-9.95	16.00	A	A	A
167	18.70	0.48	-2.09	5.83	A	A	A
168	18.1	0.8	-5.24	6.85	A	A	A
170	18.4	1.7	-3.66	10.62	A	A	A
171	18.7	1.2	-2.09	8.28	A	A	A
172	17.84	0.4	-6.60	5.70	A	A	A
173	17.0	1.2	-10.99	8.79	A	A	A
174	18.6	1.1	-2.62	7.90	A	A	A
175	18.3	1.0	-4.19	7.57	A	A	A

TABLE 20. Evaluation Results for Na-22 in Sample 1, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
176	17.5	0.3	-8.38	5.51	A	A	A
177	17.69	0.64	-7.38	6.36	A	A	A
178	18.4	1.8	-3.66	11.10	A	A	A
179	19.0	1.1	-0.52	7.81	A	A	A
181	15.3	0.7	-19.90	6.95	A	N	W
184	19.4	0.8	1.57	6.66	A	A	A
185	15.943	1.249	-16.53	9.42	A	A	A
186	17.8	0.7	-6.81	6.55	A	A	A
188	18.7	1.1	-2.09	7.87	A	A	A
189	18.2	1.0	-4.71	7.59	A	A	A
191	17.8	1.6	-6.81	10.40	A	A	A
192	18.9	0.7	-1.05	6.41	A	A	A
195	19.1	1.1	0.00	7.78	A	A	A
196	18.50	1.80	-3.14	11.05	A	A	A
197	18.7	1.5	-2.09	9.58	A	A	A
198	19.35		1.31		A		
199	18.8	0.9	-1.57	7.09	A	A	A
200	17.8	1.5	-6.81	9.92	A	A	A
201	17.7	0.3	-7.33	5.50	A	A	A
202	18.22	0.99	-4.61	7.55	A	A	A
204	18.7	0.7	-2.09	6.44	A	A	A
207	18.7	1.2	-2.09	8.28	A	A	A
208	18.69	0.65	-2.15	6.29	A	A	A
209	18.90	0.48	-1.05	5.82	A	A	A
210	18.2	0.9	-4.71	7.20	A	A	A
212	13.2	0.144	-30.89	5.35	N	N	N
213	18.67	0.67	-2.25	6.35	A	A	A
214	18.8	1.3	-1.57	8.67	A	A	A
218	18.6	0.6	-2.62	6.15	A	A	A
219	18.5	0.6	-3.14	6.16	A	A	A
222	21.8	0.6	14.14	5.91	A	A	A
223	17.4	0.4	-8.90	5.72	A	A	A
224	19.69	0.95	3.09	7.12	A	A	A
225	14.84	0.42	-22.30	5.95	N	N	N
226	18.8	0.5	-1.57	5.87	A	A	A
228	19	1	-0.52	7.42	A	A	A
230	18.2	0.21	-4.71	5.36	A	A	A
232	18.8	0.8	-1.57	6.75	A	A	A
233	18.7	1.3	-2.09	8.70	A	A	A
234	19.14	0.83	0.21	6.80	A	A	A
236	19.0	0.935	-0.52	7.19	A	A	A
239	19.4	0.6	1.57	6.08	A	A	A
240	18.4	1.2	-3.66	8.36	A	A	A
242	18.1	1.0	-5.24	7.61	A	A	A
243	16.18	0.33	-15.29	5.62	A	N	W
244	20.31	1.71	6.34	9.91	A	A	A
245	17.10	1.1	-10.47	8.29	A	A	A
246	16.4	0.3	-14.14	5.55	A	A	A
247	17.2	0.7	-9.95	6.63	A	A	A
248	17.4	0.54	-8.90	6.09	A	A	A
250	18.6	0.8	-2.62	6.78	A	A	A
251	17.96	1.11	-5.97	8.10	A	A	A
252	16.8	0.7	-12.04	6.69	A	A	A
253	18.9	0.4	-1.05	5.65	A	A	A
254	17.2	1.10	-9.95	8.27	A	A	A
256	18.1	0.7	-5.24	6.51	A	A	A
258	17.1	1.1	-10.47	8.29	A	A	A
259	18.8	0.93	-1.57	7.20	A	A	A
260	22.7	1.8	18.85	9.50	A	A	A
261	15.19	0.77	-20.47	7.29	N	N	N

TABLE 20. Evaluation Results for Na-22 in Sample 1, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
263	19.1	1.0	0.00	7.40	A	A	A
264	20.6	1.72	7.85	9.86	A	A	A
268	20.840	1.845	9.11	10.29	A	A	A
269	15.0	0.5	-21.47	6.21	N	N	N
271	14.5	0.5	-24.08	6.27	N	N	N
274	19.30	0.65	1.05	6.23	A	A	A
275	19.44	0.66	1.78	6.24	A	A	A
276	18.35	0.94	-3.93	7.32	A	A	A
277	16.92	0.75	-11.41	6.86	A	A	A
278	19.1	0.1	0.00	5.26	A	A	A
279	19.0	1.0	-0.52	7.42	A	A	A
280	16.245	1.04	-14.95	8.27	A	A	A
281	18.48	0.43	-3.25	5.73	A	A	A
282	18.41	1.86	-3.61	11.38	A	A	A
286	15.7	0.9	-17.80	7.76	A	A	A
287	17.5	1.4	-8.38	9.56	A	A	A
288	18.2	1.05	-4.71	7.79	A	A	A
290	19.18	0.49	0.42	5.83	A	A	A
292	17.19	0.33	-10.00	5.58	A	A	A
293	10.06	0.8	-47.33	9.52	N	N	N
294	19.3	1.0	1.05	7.37	A	A	A
295	17.45	1.5	-8.64	10.06	A	A	A
298	18.7	2.7	-2.09	15.36	A	A	A
300	17.7	0.9	-7.33	7.30	A	A	A
301	19.7	1.6	3.14	9.66	A	A	A
303	19.5	1.7	2.09	10.17	A	A	A
304	18.06	1.6	-5.45	10.29	A	A	A
305	19.26	0.75	0.84	6.52	A	A	A
306	18.7	0.9	-2.09	7.11	A	A	A
307	18.82	1.25	-1.47	8.46	A	A	A
308	16.28	1.63	-14.76	11.30	A	A	A
310	18.92	1.09	-0.94	7.78	A	A	A
311	18.25	1.7	-4.45	10.69	A	A	A
312	18.5	0.8	-3.14	6.79	A	A	A
313	17.5	1.5	-8.38	10.04	A	A	A
314	19.5	1.4	2.09	8.89	A	A	A
315	19.1	1.3	0.00	8.59	A	A	A
316	14.03	0.66	-26.54	7.04	N	N	N
317	14.5	1.7	-24.08	12.84	N	A	N
318	20.2	1.25	5.76	8.11	A	A	A
319	18.17	0.91	-4.87	7.25	A	A	A
320	19.0	1.0	-0.52	7.42	A	A	A
321	16.5	1.2	-13.61	8.96	A	A	A
322	18.5	1.0	-3.14	7.53	A	A	A
324	16.7	0.376	-12.57	5.70	A	A	A
325	17.6	0.8	-7.85	6.93	A	A	A
326	16.0	0.3	-16.23	5.56	A	N	W
328	15.4	0.7	-19.37	6.93	A	N	W
329	19.6	1.0	2.62	7.31	A	A	A
330	16.78	0.36	-12.15	5.66	A	A	A
331	18.79	0.24	-1.62	5.39	A	A	A
332	18.7	1.6	-2.09	10.03	A	A	A
333	18.2	1.3	-4.71	8.86	A	A	A
334	18.9	1.3	-1.05	8.64	A	A	A
335	15.7	0.7	-17.80	6.88	A	N	W
336	18.85	0.80	-1.31	6.74	A	A	A
337	15.3	1.1	-19.90	8.89	A	A	A
338	19.15	0.86	0.26	6.90	A	A	A
339	44.0	3.0	130.37	8.60	N	N	N
340	16.2	0.4	-15.18	5.79	A	N	W

TABLE 20. Evaluation Results for Na-22 in Sample 1, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
341	17.2	1.3	-9.95	9.19	A	A	A
342	13.9	0.7	-27.23	7.26	N	N	N
343	19.0	0.4	-0.52	5.64	A	A	A
344	19.1	1.1	0.00	7.78	A	A	A
345	19.7	3.9	3.14	20.48	A	N	W
346	18.9	1.3	-1.05	8.64	A	A	A
347	18.2	1.3	-4.71	8.86	A	A	A
348	17.6	1.0	-7.85	7.73	A	A	A
352	18.9	0.4	-1.05	5.65	A	A	A
353	15.7	1.0	-17.80	8.25	A	A	A
354	19.1	1.0	0.00	7.40	A	A	A
355	18.7	1.0	-2.09	7.48	A	A	A
357	17.0	1.8	-10.99	11.81	A	A	A
358	18.0	2.9	-5.76	16.94	A	A	A
360	19.16	0.83	0.31	6.80	A	A	A
362	17.3	1.7	-9.42	11.13	A	A	A
364	17.49	1.28	-8.43	9.00	A	A	A
367	16.0	1.9	-16.23	12.98	A	A	A
370	15.95	0.51	-16.49	6.13	A	N	W
371	18.6	0.9	-2.62	7.13	A	A	A
375	16.29	1.0	-14.71	8.07	A	A	A
377	19.1	2.5	0.00	14.10	A	A	A
378	16.61	1.29	-13.04	9.37	A	A	A
380	17.13	0.73	-10.31	6.75	A	A	A
381	17.5	1.2	-8.38	8.63	A	A	A
384	15.88	0.66	-16.86	6.68	A	A	A
385	16.34	0.49	-14.45	6.03	A	A	A
386	16.8	0.7	-12.04	6.69	A	A	A
387	15.12	1.21	-20.84	9.56	N	A	N
388	18.8	0.807	-1.57	6.77	A	A	A
390	15.4	1.2	-19.37	9.39	A	A	A
391	18.6	0.4	-2.62	5.66	A	A	A
392	18.0	0.8	-5.76	6.87	A	A	A
393	16.2	0.9	-15.18	7.63	A	A	A
395	15.9	0.4	-16.75	5.81	A	N	W
397	19.5	2.7	2.09	14.80	A	A	A
401	18.8	0.8	-1.57	6.75	A	A	A
402	16.3	2.1	-14.66	13.91	A	A	A
404	16.7	0.8	-12.57	7.10	A	A	A
407	18.95	0.61	-0.79	6.15	A	A	A
408	16.2	1.6	-15.18	11.18	A	A	A
409	18.67	1.75	-2.25	10.74	A	A	A
410	17.30	0.40	-9.42	5.72	A	A	A
414	18.3	0.9	-4.19	7.18	A	A	A
415	18.95	0.77	-0.79	6.63	A	A	A
416	18.58	1.84	-2.72	11.20	A	A	A
418	18.5	0.9	-3.14	7.15	A	A	A
419	15.80	0.68	-17.28	6.78	A	A	A
420	13.18	0.65	-30.99	7.19	N	N	N
421	17	1.4	-10.99	9.76	A	A	A
423	18.087	0.521	-5.30	5.98	A	A	A
424	19.9	0.94	4.19	7.05	A	A	A
425	18.6	1.1	-2.62	7.90	A	A	A
426	19.62	3.384	2.72	18.02	A	A	A
427	19.1	1.0	0.00	7.40	A	A	A
429	15.43	0.94	-19.21	8.03	A	A	A
431	20.3	1.4	6.28	8.66	A	A	A
432	17	1	-10.99	7.87	A	A	A
434	18.41	2.20	-3.61	13.05	A	A	A
436	17.1	1.0	-10.47	7.85	A	A	A

TABLE 20. Evaluation Results for Na-22 in Sample 1, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
437	16.9	2.0	-11.52	12.94	A	A	A
439	16.7	0.3	-12.57	5.54	A	A	A
440	19.21	0.83	0.58	6.79	A	A	A
442	14.56	0.44	-23.77	6.05	N	N	N
443	18.5	0.6	-3.14	6.16	A	A	A
445	15.50	0.69	-18.85	6.87	A	N	W
446	17.94	0.79	-6.07	6.84	A	A	A
448	19.4	0.4	1.57	5.63	A	A	A
449	17.0	0.34	-10.99	5.60	A	A	A
450	18.3	3.3	-4.19	18.78	A	A	A
451	15.74	0.68	-17.59	6.79	A	N	W
452	1169	54.65	6020.42	7.02	N	N	N
453	15.8	1.8	-17.28	12.54	A	A	A
454	19.2	1.0	0.52	7.39	A	A	A
455	19.5	1.5	2.09	9.31	A	A	A
457	18.4	0.7	-3.66	6.47	A	A	A
458	17.4	1.2	-8.90	8.66	A	A	A
461	16.8	0.11	-12.04	5.28	A	A	A
464	9.18	0.30	-51.94	6.17	N	N	N
465	14.5	1.2	-24.08	9.79	N	A	N
466	16.7	1.0	-12.57	7.95	A	A	A
467	18.5	0.6	-3.14	6.16	A	A	A
469	35.38	1.42	85.24	6.60	N	N	N
470	14.0	0.2	-26.70	5.43	N	N	N
471	16.96	0.85	-11.20	7.25	A	A	A
472	18.8	2.4	-1.57	13.80	A	A	A
473	18.7	0.4	-2.09	5.66	A	A	A
474	18.8	0.8	-1.57	6.75	A	A	A
475	17.4	0.4	-8.90	5.72	A	A	A
476	19.3	0.8	1.05	6.68	A	A	A
479	16.9	0.9	-11.52	7.47	A	A	A
481	16.3	1.85	-14.66	12.50	A	A	A
484	17.6148	0.5824	-7.78	6.19	A	A	A
485	18.6	0.9	-2.62	7.13	A	A	A
486	18.39	0.40	-3.72	5.67	A	A	A
487	19.0	1.0	-0.52	7.42	A	A	A
489	17.30	0.50	-9.42	5.98	A	A	A
490	18.02075	0.64142	-5.65	6.33	A	A	A
491	16.56	0.93	-13.30	7.68	A	A	A
492	16.2	0.3	-15.18	5.55	A	N	W
494	18.2	0.5	-4.71	5.91	A	A	A
496	17.40	0.82	-8.90	7.04	A	A	A
499	15.6	0.6	-18.32	6.50	A	N	W
501	8.02	0.22	-58.01	5.91	N	N	N
502	14.54	0.9	-23.87	8.11	N	N	N
503	20.66	4.87	8.17	24.15	A	N	W
504	14.7	1.4	-23.04	10.87	N	A	N
505	14.86	0.83	-22.20	7.66	N	N	N
507	14.3	1.0	-25.13	8.74	N	N	N
508	16.4	2.5	-14.14	16.12	A	A	A
512	13.87	1.025	-27.38	9.06	N	N	N
513	19.5	0.5	2.09	5.83	A	A	A
515	16.27	0.94	-14.82	7.80	A	A	A

Ra-226 Determination in Sample 1 by Alpha Spectrometry

TABLE 21. Target values

Parameter	Value
Activity concentration [Bq/kg]	13.0
Uncertainty [Bq/kg]	0.7
Maximum Acceptable Relative Bias [%]	30

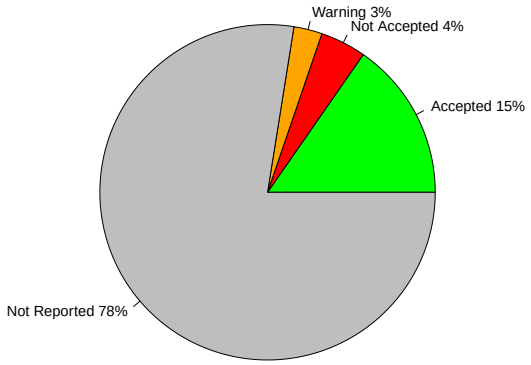

FIGURE 21. Percentage of Accepted vs. Warnings vs. Not Accepted vs. Not Reported results

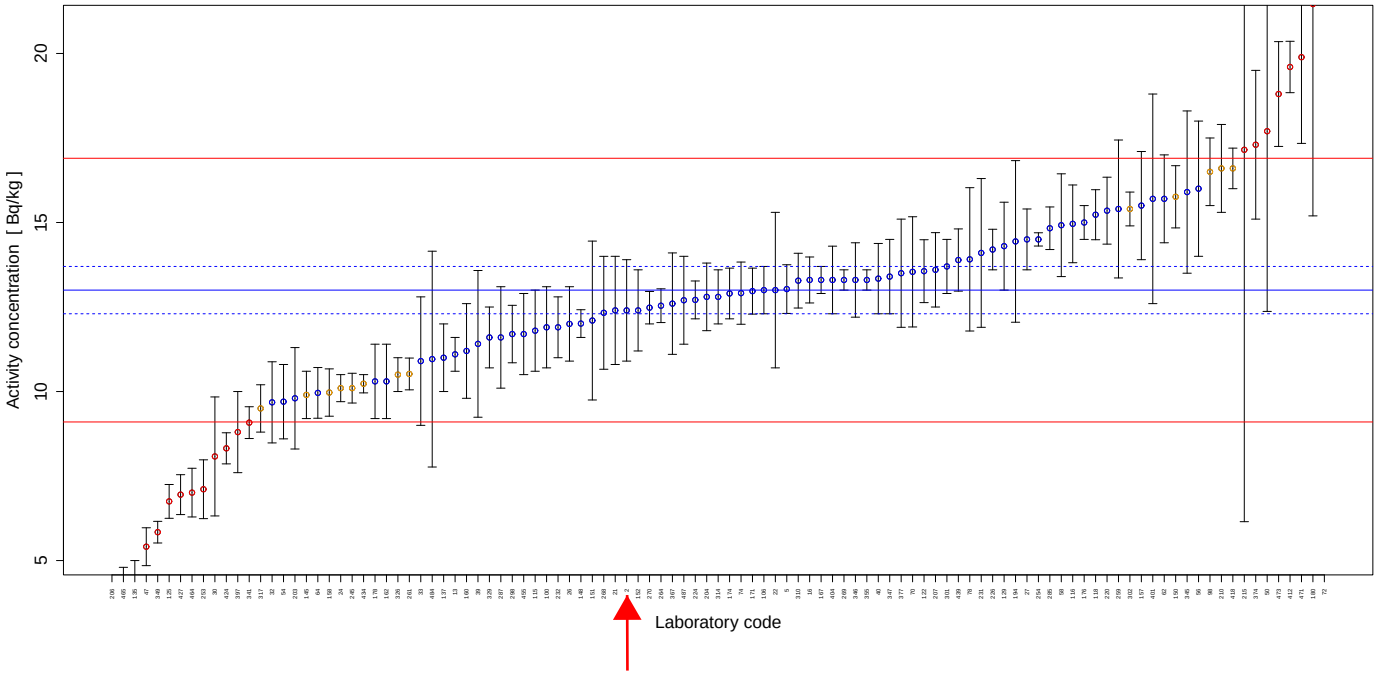

FIGURE 22. Reported results and evaluation parameters for Ra-226 by Alpha Spectrometry. Blue points represent accepted scores, whereas yellow and red represent warning and not accepted scores, respectively.

TABLE 22. Evaluation Results for Ra-226 in Sample 1, Rep. Value and Rep. Unc. in Bq/kg by Alpha spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
2	12.4	1.5	-4.62	13.24	A	A	A
5	13.03	0.72	0.23	7.72	A	A	A
13	11.1	0.5	-14.62	7.02	A	A	A
16	13.30	0.68	2.31	7.43	A	A	A
21	12.4	1.6	-4.62	13.98	A	A	A
22	13.0	2.3	0.00	18.49	A	A	A
24	10.1	0.4	-22.31	6.68	A	N	W
26	12.0	1.1	-7.69	10.63	A	A	A
27	14.5	0.9	11.54	8.22	A	A	A
30	8.08	1.76	-37.85	22.44	N	A	N
32	9.68	1.20	-25.54	13.52	A	A	A
33	10.9	1.9	-16.15	18.24	A	A	A
39	11.41	2.17	-12.23	19.77	A	A	A
40	13.34	1.04	2.62	9.47	A	A	A
47	5.41	0.56	-58.38	11.67	N	N	N
50	17.7	5.33	36.15	30.59	N	N	N
54	9.7	1.1	-25.38	12.55	A	A	A
56	16	2	23.08	13.61	A	A	A
58	14.92	1.52	14.77	11.52	A	A	A
62	15.7	1.3	20.77	9.88	A	A	A
64	9.96	0.75	-23.38	9.26	A	A	A
70	13.54	1.63	4.15	13.19	A	A	A
72	30.3	1.5	133.08	7.31	N	N	N
74	12.91	0.92	-0.69	8.93	A	A	A
78	13.91	2.12	7.00	16.16	A	A	A
98	16.5	1.0	26.92	8.11	A	N	W
100	11.9	1.2	-8.46	11.43	A	A	A
106	13.0	0.7	0.00	7.61	A	A	A
115	11.8	1.2	-9.23	11.51	A	A	A
116	14.96	1.15	15.08	9.39	A	A	A
118	15.23	0.74	17.15	7.25	A	A	A
122	13.56	0.93	4.31	8.72	A	A	A
125	6.75	0.50	-48.08	9.16	N	N	N
129	14.3	1.3	10.00	10.57	A	A	A
135	3.9	1.1	-70.00	28.71	N	A	N
137	11	1	-15.38	10.57	A	A	A
145	9.9	0.7	-23.85	8.89	A	N	W
148	12.01	0.41	-7.62	6.38	A	A	A
150	15.76	0.92	21.23	7.94	A	N	W
151	12.10	2.35	-6.92	20.15	A	A	A
152	12.4	1.2	-4.62	11.07	A	A	A
157	15.5	1.6	19.23	11.64	A	A	A
158	9.97	0.7	-23.31	8.85	A	N	W
160	11.2	1.4	-13.85	13.61	A	A	A
162	10.3	1.1	-20.77	11.96	A	A	A
167	13.3	0.4	2.31	6.17	A	A	A
171	12.97	0.68	-0.23	7.52	A	A	A
174	12.9	0.75	-0.77	7.92	A	A	A
176	15.0	0.5	15.38	6.33	A	A	A
178	10.3	1.1	-20.77	11.96	A	A	A
180	21.462	6.2662	65.09	29.69	N	A	N
194	14.44	2.39	11.08	17.41	A	A	A
203	9.8	1.5	-24.62	16.23	A	A	A
204	12.8	1.0	-1.54	9.49	A	A	A
206	1.67	0.45	-87.15	27.48	N	N	N
207	13.6	1.1	4.62	9.72	A	A	A
210	16.6	1.3	27.69	9.50	A	N	W
215	17.15	11.00	31.92	64.37	N	N	N
220	15.35	0.99	18.08	8.40	A	A	A
224	12.71	0.56	-2.23	6.96	A	A	A

TABLE 22. Evaluation Results for Ra-226 in Sample 1, Rep. Value and Rep. Unc. in Bq/kg by Alpha spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
226	14.2	0.6	9.23	6.84	A	A	A
231	14.1	2.2	8.46	16.51	A	A	A
232	11.9	0.9	-8.46	9.28	A	A	A
245	10.10	0.44	-22.31	6.93	A	N	W
253	7.11	0.87	-45.31	13.37	N	N	N
254	14.5	0.196	11.54	5.55	A	A	A
259	15.4	2.04	18.46	14.30	A	A	A
261	10.52	0.47	-19.08	7.00	A	N	W
264	12.539	0.499	-3.55	6.70	A	A	A
268	12.329	1.670	-5.16	14.58	A	A	A
269	13.3	0.3	2.31	5.84	A	A	A
270	12.48	0.48	-4.00	6.62	A	A	A
285	14.83	0.63	14.08	6.86	A	A	A
287	11.6	1.5	-10.77	14.01	A	A	A
298	11.7	0.85	-10.00	9.04	A	A	A
301	13.7	0.8	5.38	7.94	A	A	A
302	15.4	0.5	18.46	6.29	A	N	W
310	13.28	0.81	2.15	8.14	A	A	A
314	12.8	0.8	-1.54	8.25	A	A	A
317	9.5	0.7	-26.92	9.13	A	N	W
326	10.5	0.5	-19.23	7.19	A	N	W
329	11.6	0.9	-10.77	9.44	A	A	A
341	9.08	0.47	-30.15	7.47	N	N	N
345	15.9	2.4	22.31	16.03	A	A	A
346	13.3	1.1	2.31	9.87	A	A	A
347	13.4	1.1	3.08	9.82	A	A	A
349	5.84	0.32	-55.08	7.68	N	N	N
355	13.3	0.3	2.31	5.84	A	A	A
367	12.6	1.5	-3.08	13.07	A	A	A
374	17.3	2.2	33.08	13.81	N	A	N
377	13.5	1.6	3.85	13.02	A	A	A
397	8.8	1.2	-32.31	14.66	N	A	N
401	15.7	3.1	20.77	20.47	A	A	A
404	13.3	1.0	2.31	9.25	A	A	A
412	19.60	0.76	50.77	6.64	N	N	N
418	16.6	0.6	27.69	6.49	A	N	W
424	8.32	0.46	-36.00	7.72	N	N	N
427	6.95	0.59	-46.54	10.05	N	N	N
434	10.23	0.27	-21.31	6.00	A	N	W
439	13.89	0.92	6.85	8.54	A	A	A
455	11.7	1.2	-10.00	11.58	A	A	A
464	7.01	0.72	-46.08	11.60	N	N	N
465	3.9	0.9	-70.00	23.70	N	N	N
471	19.89	2.55	53.00	13.91	N	N	N
473	18.8	1.55	44.62	9.85	N	N	N
484	10.9590	3.1918	-15.70	29.62	A	A	A
487	12.7	1.3	-2.31	11.57	A	A	A

Ra-226 Determination in Sample 1 by Gamma-ray Spectrometry

TABLE 23. Target values

Parameter	Value
Activity concentration [Bq/kg]	13.0
Uncertainty [Bq/kg]	0.7
Maximum Acceptable Relative Bias [%]	20

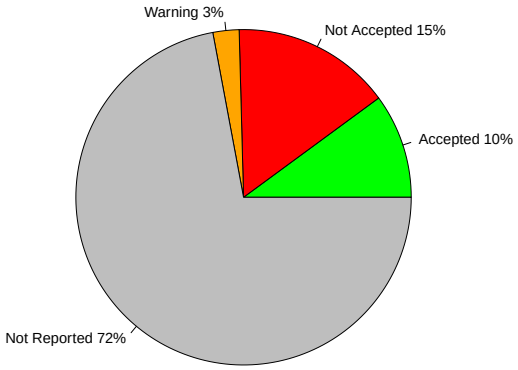

FIGURE 23. Percentage of Accepted vs. Warnings vs. Not Accepted vs. Not Reported results

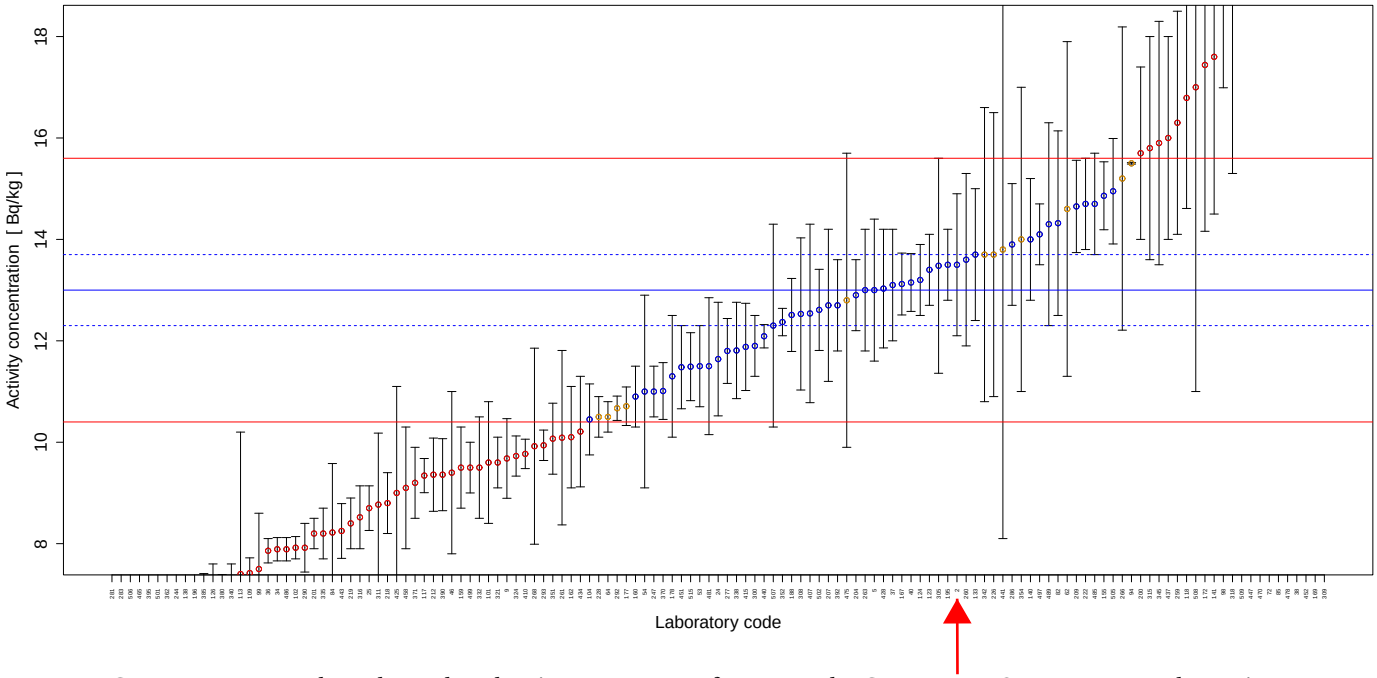

FIGURE 24. Reported results and evaluation parameters for Ra-226 by Gamma-ray Spectrometry. Blue points represent accepted scores, whereas yellow and red represent warning and not accepted scores, respectively.

TABLE 24. Evaluation Results for Ra-226 in Sample 1, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
2	13.5	1.4	3.85	11.68	A	A	A
5	13.0	1.4	0.00	12.04	A	A	A
9	9.68	0.785	-25.54	9.73	N	N	N
24	11.64	1.12	-10.46	11.03	A	A	A
25	8.7	0.44	-33.08	7.39	N	N	N
34	7.89	0.23	-39.31	6.12	N	N	N
36	7.86	0.24	-39.54	6.19	N	N	N
37	13.1	1.1	0.77	9.98	A	A	A
38	37.2	8.2	186.15	22.69	N	N	N
40	13.15	0.57	1.15	6.91	A	A	A
46	9.4	1.6	-27.69	17.85	N	A	N
53	11.5	0.8	-11.54	8.80	A	A	A
54	11	1.9	-15.38	18.09	A	A	A
62	14.6	3.3	12.31	23.24	A	N	W
64	10.5	0.3	-19.23	6.10	A	N	W
72	27.5	4.8	111.54	18.27	N	N	N
82	14.32	1.82	10.15	13.80	A	A	A
84	8.22	1.36	-36.77	17.40	N	A	N
85	28.1	8.7	116.15	31.43	N	N	N
94	15.5	0.014	19.23	5.39	A	N	W
98	19.05	2.06	46.54	12.08	N	N	N
99	7.5	1.1	-42.31	15.62	N	N	N
101	9.60	1.2	-26.15	13.61	N	A	N
102	7.92	0.22	-39.08	6.06	N	N	N
104	10.45	0.7	-19.62	8.59	A	A	A
109	7.42	0.3	-42.92	6.73	N	N	N
113	7.40	2.80	-43.08	38.22	N	N	N
117	9.342	0.337	-28.14	6.48	N	N	N
118	16.79	2.18	29.15	14.06	N	A	N
123	13.4	0.7	3.08	7.50	A	A	A
124	13.2	0.7	1.54	7.56	A	A	A
126	6.8	0.8	-47.69	12.94	N	N	N
133	13.7	1.3	5.38	10.91	A	A	A
138	6.09	0.50	-53.15	9.82	N	N	N
140	14	1.2	7.69	10.12	A	A	A
141	17.6	3.1	35.38	18.42	N	A	N
155	14.86	0.67	14.31	7.02	A	A	A
159	9.5	0.8	-26.92	10.00	N	N	N
160	10.9	0.6	-16.15	7.70	A	A	A
162	10.1	1.0	-22.31	11.27	N	A	N
167	13.12	0.61	0.92	7.11	A	A	A
169	80.971	17.998	522.85	22.87	N	N	N
172	17.44	3.28	34.15	19.56	N	A	N
177	10.71	0.38	-17.62	6.45	A	N	W
178	11.3	1.2	-13.08	11.91	A	A	A
188	12.51	0.72	-3.77	7.88	A	A	A
195	13.5	0.7	3.85	7.48	A	A	A
196	6.23	0.69	-52.08	12.32	N	N	N
200	15.7	1.7	20.77	12.09	N	A	N
201	8.2	0.3	-36.92	6.51	N	N	N
204	12.9	0.7	-0.77	7.64	A	A	A
207	12.7	1.5	-2.31	12.98	A	A	A
209	14.65	0.91	12.69	8.22	A	A	A
212	9.36	0.722	-28.00	9.41	N	N	N
218	8.8	0.6	-32.31	8.69	N	N	N
219	8.4	0.5	-35.38	8.03	N	N	N
222	14.7	0.9	13.08	8.15	A	A	A
226	13.7	2.8	5.38	21.14	A	N	W
228	10.5	0.4	-19.23	6.60	A	N	W
244	5.89	0.59	-54.69	11.37	N	N	N

TABLE 24. Evaluation Results for Ra-226 in Sample 1, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
247	11	0.5	-15.38	7.05	A	A	A
259	16.3	2.2	25.38	14.53	N	A	N
260	13.6	1.7	4.62	13.61	A	A	A
261	10.09	1.72	-22.38	17.88	N	A	N
263	13.0	1.2	0.00	10.69	A	A	A
266	15.2	2.99	16.92	20.39	A	N	W
268	9.922	1.933	-23.68	20.21	N	N	N
277	11.80	0.64	-9.23	7.64	A	A	A
281	2.33	0.13	-82.08	7.75	N	N	N
283	2.60	1.00	-80.00	38.84	N	N	N
286	13.9	1.2	6.92	10.17	A	A	A
290	7.92	0.48	-39.08	8.11	N	N	N
292	10.67	0.24	-17.92	5.84	A	N	W
293	9.94	0.3	-23.54	6.17	N	N	N
300	11.9	0.6	-8.46	7.38	A	A	A
305	13.48	2.12	3.69	16.62	A	A	A
308	12.53	1.50	-3.62	13.13	A	A	A
309	85	8.5	553.85	11.36	N	N	N
311	8.77	1.41	-32.54	16.96	N	A	N
315	15.8	2.2	21.54	14.93	N	A	N
316	8.52	0.62	-34.46	9.05	N	N	N
318	19.9	4.6	53.08	23.73	N	N	N
321	9.6	0.5	-26.15	7.49	N	N	N
324	9.728	0.396	-25.17	6.75	N	N	N
332	9.5	1.0	-26.92	11.82	N	A	N
335	8.2	0.5	-36.92	8.13	N	N	N
338	11.81	0.95	-9.15	9.68	A	A	A
340	7.3	0.3	-43.85	6.77	N	N	N
342	13.7	2.9	5.38	21.84	A	N	W
345	15.9	2.4	22.31	16.03	N	A	N
351	10.07	0.70	-22.54	8.79	N	A	N
352	12.37	0.27	-4.85	5.81	A	A	A
354	14	3	7.69	22.09	A	N	W
362	5.8	0.9	-55.38	16.42	N	N	N
370	11.01	0.56	-15.31	7.41	A	A	A
371	9.2	0.7	-29.23	9.32	N	N	N
380	7.04	0.35	-45.85	7.33	N	N	N
385	6.36	1.05	-51.08	17.37	N	N	N
390	9.36	0.71	-28.00	9.30	N	N	N
392	12.7	0.9	-2.31	8.90	A	A	A
395	4.50	0.23	-65.38	7.42	N	N	N
407	12.54	1.76	-3.54	15.03	A	A	A
410	9.77	0.29	-24.85	6.15	N	N	N
415	11.88	0.86	-8.62	9.02	A	A	A
425	9.0	2.1	-30.77	23.95	N	N	N
428	13.03	1.17	0.23	10.47	A	A	A
434	10.21	1.09	-21.46	11.96	N	A	N
437	16.0	2.0	23.08	13.61	N	A	N
440	12.09	0.23	-7.00	5.71	A	A	A
441	13.8	5.7	6.15	41.65	A	N	W
443	8.25	0.54	-36.54	8.48	N	N	N
447	22.2	3.46	70.77	16.49	N	N	N
451	11.48	0.82	-11.69	8.95	A	A	A
452	41.818	1.195	221.68	6.10	N	N	N
458	9.1	1.2	-30.00	14.24	N	A	N
465	3.9	0.9	-70.00	23.70	N	N	N
470	24.4	0.7	87.69	6.10	N	N	N
475	12.8	2.9	-1.54	23.29	A	N	W
478	33.65	2.71	158.85	9.69	N	N	N
481	11.5	1.35	-11.54	12.92	A	A	A

TABLE 24. Evaluation Results for Ra-226 in Sample 1, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
485	14.7	1	13.08	8.68	A	A	A
486	7.89	0.23	-39.31	6.12	N	N	N
489	14.3	2.0	10.00	14.99	A	A	A
497	14.1	0.6	8.46	6.86	A	A	A
499	9.5	0.5	-26.92	7.53	N	N	N
501	5.51	0.46	-57.62	9.93	N	N	N
502	12.61	0.8	-3.00	8.32	A	A	A
505	14.95	1.04	15.00	8.80	A	A	A
506	2.9	0.47	-77.69	17.08	N	N	N
507	12.3	2.0	-5.38	17.13	A	A	A
508	17	6	30.77	35.70	N	N	N
509	20.83	1.41	60.23	8.65	N	N	N
515	11.49	0.67	-11.62	7.94	A	A	A

Bi-212 Determination in Sample 3 by Gamma-ray Spectrometry

TABLE 25. Target values

Parameter	Value
Activity concentration [Bq/kg]	307
Uncertainty [Bq/kg]	12
Maximum Acceptable Relative Bias [%]	30

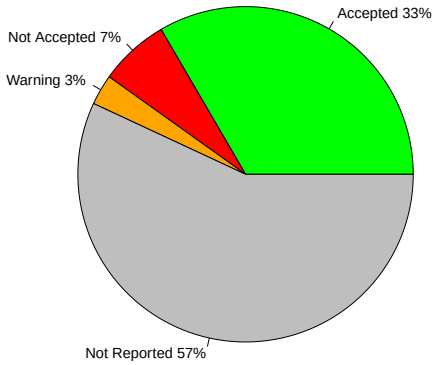

FIGURE 25. Percentage of Accepted vs. Warnings vs. Not Accepted vs. Not Reported results

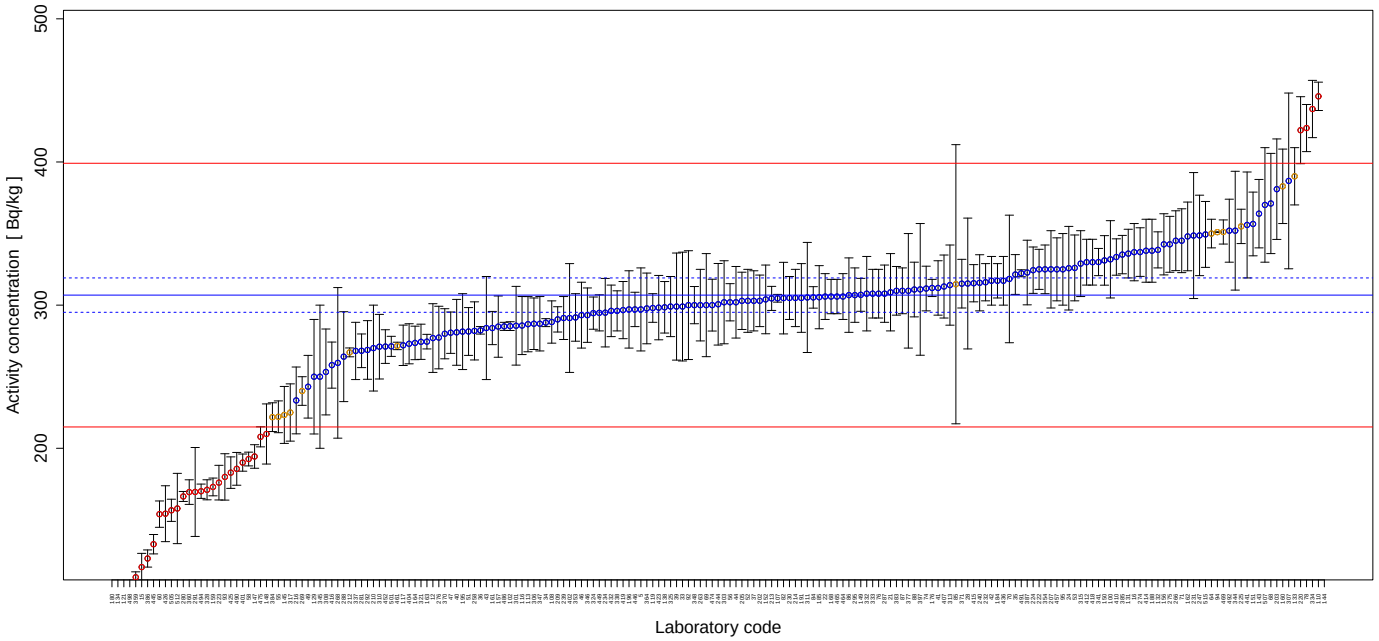

FIGURE 26. Reported results and evaluation parameters for Bi-212 by Gamma-ray Spectrometry. Blue points represent accepted scores, whereas yellow and red represent warning and not accepted scores, respectively.

TABLE 26. Evaluation Results for Bi-212 in Sample 3, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
5	297	29	-3.26	10.52	A	A	A
12	277	24	-9.77	9.51	A	A	A
15	117	9.6	-61.89	9.09	N	N	N
16	337	20	9.77	7.11	A	A	A
21	309	27	0.65	9.57	A	A	A
22	306	16	-0.33	6.53	A	A	A
24	325.8	29.2	6.12	9.78	A	A	A
28	315.1	45.7	2.64	15.02	A	A	A
33	299	38	-2.61	13.30	A	A	A
34	287.78	2.78	-6.26	4.03	A	A	A
35	321.4	13.9	4.69	5.83	A	A	A
36	282.40	2.62	-8.01	4.02	A	A	A
37	303	21	-1.30	7.96	A	A	A
39	299.0	37.4	-2.61	13.10	A	A	A
40	281	23	-8.47	9.07	A	A	A
41	312	19	1.63	7.24	A	A	A
42	317	17	3.26	6.64	A	A	A
43	284	36	-7.49	13.27	A	A	A
44	302	25	-1.63	9.15	A	A	A
46	293.0	23.0	-4.56	8.77	A	A	A
47	280.75	14.45	-8.55	6.46	A	A	A
49	243.0	21.9	-20.85	9.82	A	A	A
51	281.59	16.70	-8.28	7.10	A	A	A
52	303	22	-1.30	8.25	A	A	A
53	326	23	6.19	8.07	A	A	A
55	222	11.1	-27.69	6.35	A	N	W
56	302	13	-1.63	5.81	A	A	A
58	192.5	4.8	-37.30	4.64	N	N	N
60	154	9.2	-49.84	7.14	N	N	N
64	350	10	14.01	4.84	A	N	W
68	371	35	20.85	10.21	A	A	A
69	300	36	-2.28	12.62	A	A	A
70	318.29	44.56	3.68	14.54	A	A	A
71	345	22.3	12.38	7.55	A	A	A
74	311.6	15.6	1.50	6.35	A	A	A
76	308	17	0.33	6.76	A	A	A
78	423.7	16.46	38.01	5.51	N	N	N
82	304.9	25.0	-0.68	9.08	A	A	A
84	305.4	7.5	-0.52	4.62	A	A	A
85	314.6	97.5	2.48	31.24	A	N	W
86	307	26	0.00	9.33	A	A	A
87	310	16	0.98	6.47	A	A	A
88	310.9	19.10	1.27	7.28	A	A	A
92	300	38	-2.28	13.26	A	A	A
93	180	16.2	-41.37	9.81	N	N	N
94	351	0.16	14.33	3.91	A	N	W
95	325	25	5.86	8.63	A	A	A
100	332	27	8.14	9.02	A	A	A
102	285.34	3.06	-7.06	4.05	A	A	A
107	304.8	2.7	-0.72	4.01	A	A	A
108	288.21	14.77	-6.12	6.45	A	A	A
110	445.86	9.9	45.23	4.50	N	N	N
113	286.69	19.28	-6.62	7.78	A	A	A
116	285.74	20.27	-6.93	8.10	A	A	A
117	271.938	14.102	-11.42	6.49	A	A	A
119	298	10	-2.93	5.15	A	A	A
121	33.2	3.9	-89.19	12.38	N	N	N
129	250	40	-18.57	16.47	A	A	A
131	336	17	9.45	6.39	A	A	A
132	338.6	12.6	10.29	5.40	A	A	A

TABLE 26. Evaluation Results for Bi-212 in Sample 3, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
133	390	20	27.04	6.45	A	N	W
134	4.65	0.41	-98.49	9.64	N	N	N
138	298.49	17.99	-2.77	7.18	A	A	A
143	363.9	23.9	18.53	7.64	A	A	A
144	687	31	123.78	5.97	N	N	N
145	223.3	19.9	-27.26	9.73	A	N	W
147	194.28	8.22	-36.72	5.76	N	N	N
148	210	21	-31.60	10.74	N	N	N
149	307.2	11.5	0.07	5.41	A	A	A
150	331.24	17.30	7.90	6.52	A	A	A
151	356.7	22.25	16.19	7.36	A	A	A
152	304	24	-0.98	8.81	A	A	A
156	342.48	21.36	11.56	7.36	A	A	A
157	285	21.4	-7.17	8.47	A	A	A
159	173.0	6.2	-43.65	5.30	N	N	N
160	383	26	24.76	7.83	A	N	W
161	284	11.6	-7.49	5.65	A	A	A
162	348	24	13.36	7.93	A	A	A
163	274.5	5.1	-10.59	4.33	A	A	A
164	273.6	11.7	-10.88	5.79	A	A	A
168	306	12	-0.33	5.54	A	A	A
176	312	6	1.63	4.36	A	A	A
180	0.27123	0.0011167	-99.91	3.93	N	N	N
184	317	12	3.26	5.44	A	A	A
185	305.538	22.039	-0.48	8.20	A	A	A
188	338	22	10.10	7.59	A	A	A
191	305	24	-0.65	8.79	A	A	A
195	281.5	26.5	-8.31	10.19	A	A	A
196	297.00	27.00	-3.26	9.90	A	A	A
202	303	18	-1.30	7.11	A	A	A
203	381	35.1	24.10	10.01	A	A	A
205	303	20	-1.30	7.67	A	A	A
207	325	27	5.86	9.18	A	A	A
209	290.05	8.84	-5.52	4.96	A	A	A
210	270	30	-12.05	11.78	A	A	A
212	267	3.09	-13.03	4.08	A	N	W
213	304.7	8.4	-0.75	4.78	A	A	A
214	305	20	-0.65	7.63	A	A	A
216	233.43	23.34	-23.96	10.74	A	A	A
220	422.2	23.4	37.52	6.78	N	N	N
222	325	14	5.86	5.82	A	A	A
223	176.0	12.1	-42.67	7.91	N	N	N
224	324.41	16.2	5.67	6.34	A	A	A
225	355	12	15.64	5.17	A	N	W
230	305	15.0	-0.65	6.28	A	A	A
231	348.6	44.0	13.55	13.21	A	A	A
232	316	13	2.93	5.67	A	A	A
234	294.73	23.93	-4.00	9.01	A	A	A
239	291	15	-5.21	6.47	A	A	A
240	315.6	19.6	2.80	7.34	A	A	A
244	300.60	28.49	-2.08	10.25	A	A	A
247	348.7	28.1	13.58	8.96	A	A	A
258	282	20.3	-8.14	8.19	A	A	A
263	300	25	-2.28	9.20	A	A	A
266	345	20.9	12.38	7.21	A	A	A
268	259.670	52.598	-15.42	20.63	A	A	A
269	240	10	-21.82	5.71	A	N	W
274	337.06	16.98	9.79	6.38	A	A	A
275	342.49	19.53	11.56	6.91	A	A	A
276	277.36	21.86	-9.65	8.80	A	A	A

TABLE 26. Evaluation Results for Bi-212 in Sample 3, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
280	166.35	3.49	-45.81	4.44	N	N	N
281	268.11	11.75	-12.67	5.87	A	A	A
287	308	20	0.33	7.58	A	A	A
288	264	31.4	-14.01	12.52	A	A	A
291	169.484	31.066	-44.79	18.74	N	A	N
292	268.69	20.48	-12.48	8.57	A	A	A
295	307	19	0.00	7.32	A	A	A
301	285.6	27.5	-6.97	10.39	A	A	A
303	302	29	-1.63	10.37	A	A	A
306	287	18	-6.51	7.39	A	A	A
307	386.77	61.38	25.98	16.34	A	A	A
308	253.32	30.00	-17.49	12.47	A	A	A
310	270.97	22.56	-11.74	9.20	A	A	A
311	305.36	38.45	-0.53	13.18	A	A	A
313	314	28	2.28	9.74	A	A	A
315	329	23	7.17	8.01	A	A	A
317	225.0	20.0	-26.71	9.71	A	N	W
321	274.4	12.3	-10.62	5.95	A	A	A
324	294.42	11.25	-4.10	5.47	A	A	A
325	299	21	-2.61	8.04	A	A	A
328	171	7	-44.30	5.66	N	N	N
332	308	26	0.33	9.30	A	A	A
333	308	17	0.33	6.76	A	A	A
334	437	20	42.35	6.02	N	N	N
337	268	20	-12.70	8.42	A	A	A
338	296	14	-3.58	6.14	A	A	A
341	330.1	9.5	7.52	4.85	A	A	A
344	352	41.5	14.66	12.42	A	A	A
345	250	50	-18.57	20.38	A	A	A
346	293	19	-4.56	7.57	A	A	A
347	287	19	-6.51	7.69	A	A	A
348	300	13	-2.28	5.84	A	A	A
353	291.4	16.6	-5.08	6.91	A	A	A
354	325	17	5.86	6.53	A	A	A
359	109.9	3.8	-64.20	5.22	N	N	N
360	169.4	8.59	-44.82	6.40	N	N	N
364	297.7	24.7	-3.03	9.17	A	A	A
370	280.0	17.5	-8.79	7.37	A	A	A
371	315	17	2.61	6.66	A	A	A
377	310	40	0.98	13.48	A	A	A
383	310	17	0.98	6.73	A	A	A
384	221.74	10.04	-27.77	5.98	A	N	W
385	335.3	13.4	9.22	5.59	A	A	A
386	123	6	-59.93	6.25	N	N	N
387	322.78	22.57	5.14	8.01	A	A	A
397	311	46	1.30	15.30	A	A	A
401	190	6	-38.11	5.03	N	N	N
402	291	38	-5.21	13.63	A	A	A
404	273	14	-11.07	6.45	A	A	A
407	313	22	1.95	8.04	A	A	A
410	333.61	12.71	8.67	5.46	A	A	A
412	330	16	7.49	6.23	A	A	A
414	338	22	10.10	7.59	A	A	A
415	315.3	13.0	2.70	5.68	A	A	A
416	258.1	16.1	-15.93	7.36	A	A	A
418	330	16	7.49	6.23	A	A	A
419	296.53	19.97	-3.41	7.79	A	A	A
423	298.258	22.480	-2.85	8.49	A	A	A
425	183	11	-40.39	7.17	N	N	N
426	154.3	19.52	-49.74	13.24	N	N	N

TABLE 26. Evaluation Results for Bi-212 in Sample 3, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
432	296	18	-3.58	7.23	A	A	A
436	317	17	3.26	6.64	A	A	A
441	356	37	15.96	11.10	A	A	A
445	133.00	6.77	-56.68	6.42	N	N	N
446	297	12	-3.26	5.62	A	A	A
449	294.6	12.6	-4.04	5.79	A	A	A
452	271.054	11.756	-11.71	5.84	A	A	A
457	325	22	5.86	7.82	A	A	A
461	271.5	2.6	-11.56	4.02	A	N	W
464	306	16	-0.33	6.53	A	A	A
465	306.0	12.0	-0.33	5.54	A	A	A
469	351.09	8.43	14.36	4.59	A	N	W
474	300.0	18.1	-2.28	7.19	A	A	A
475	208	7	-32.25	5.16	N	N	N
486	285.17	2.82	-7.11	4.03	A	A	A
490	185.65008	11.44951	-39.53	7.30	N	N	N
491	322.27	2.43	4.97	3.98	A	A	A
492	352	22	14.66	7.37	A	A	A
494	170	5	-44.63	4.89	N	N	N
498	86.14	5.17	-71.94	7.16	N	N	N
501	271.2	7.01	-11.66	4.69	A	A	A
505	156.68	7.75	-48.96	6.30	N	N	N
507	370	40	20.52	11.50	A	A	A
512	157.9423	24.55	-48.55	16.03	N	N	N
515	349.40	23.02	13.81	7.66	A	A	A

Pb-212 Determination in Sample 3 by Gamma-ray Spectrometry

TABLE 27. Target values

Parameter	Value
Activity concentration [Bq/kg]	307
Uncertainty [Bq/kg]	12
Maximum Acceptable Relative Bias [%]	30

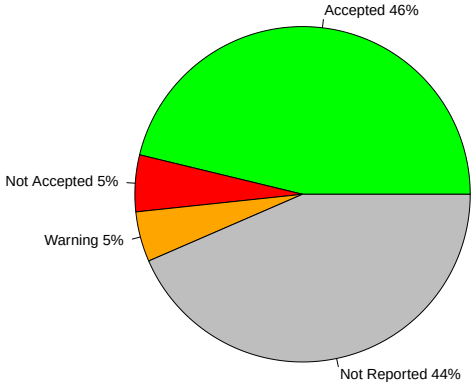

FIGURE 27. Percentage of Accepted vs. Warnings vs. Not Accepted vs. Not Reported results

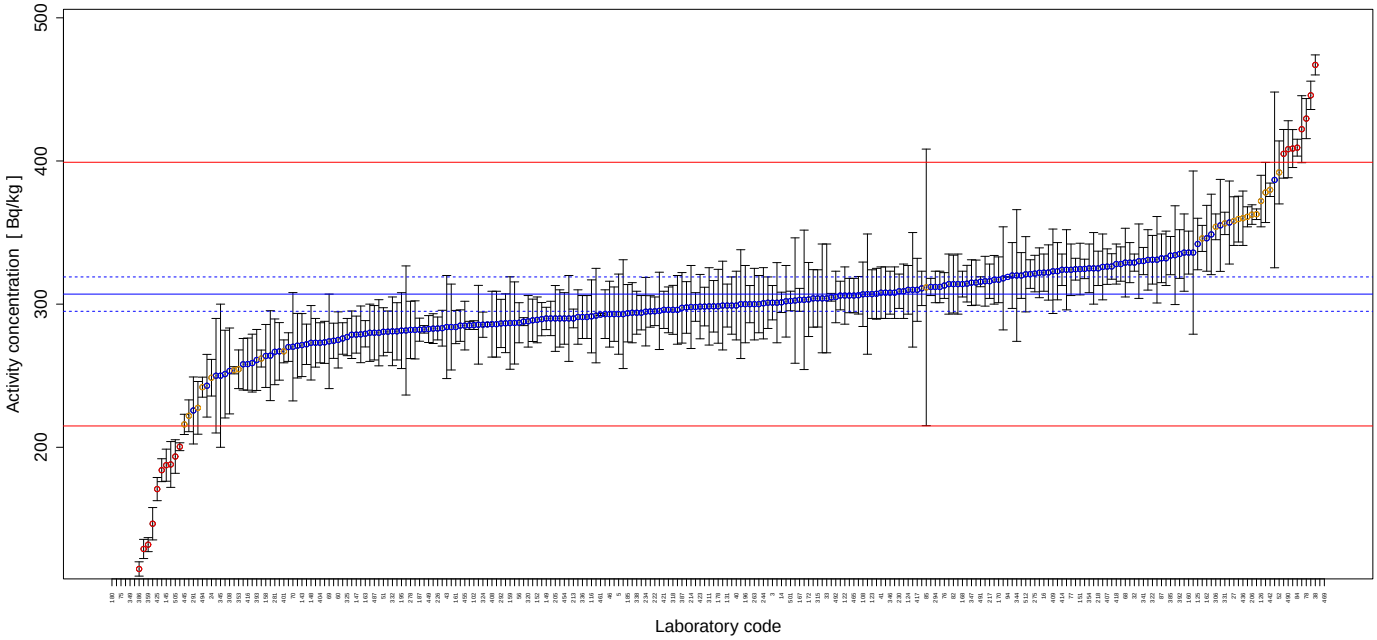

FIGURE 28. Reported results and evaluation parameters for Pb-212 by Gamma-ray Spectrometry. Blue points represent accepted scores, whereas yellow and red represent warning and not accepted scores, respectively.

TABLE 28. Evaluation Results for Pb-212 in Sample 3, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
3	301	12	-1.95	5.58	A	A	A
5	293	28	-4.56	10.32	A	A	A
12	291	19	-5.21	7.61	A	A	A
14	301.25	7.10	-1.87	4.56	A	A	A
15	94	3.5	-69.38	5.40	N	N	N
16	322	13	4.89	5.62	A	A	A
21	314	21	2.28	7.75	A	A	A
22	320	23	4.23	8.18	A	A	A
24	248.6	12.8	-19.02	6.46	A	N	W
27	358	17	16.61	6.15	A	N	W
28	302.5	43.8	-1.47	15.00	A	A	A
32	329	6	7.17	4.31	A	A	A
33	304	38	-0.98	13.10	A	A	A
34	287.78	2.78	-6.26	4.03	A	A	A
35	294.9	11.0	-3.94	5.40	A	A	A
36	282.40	2.62	-8.01	4.02	A	A	A
37	281	20	-8.47	8.12	A	A	A
38	467.1	7	52.15	4.19	N	N	N
39	304.0	38.0	-0.98	13.10	A	A	A
40	299	24	-2.61	8.93	A	A	A
41	308	18	0.33	7.03	A	A	A
42	317	17	3.26	6.64	A	A	A
43	284	36	-7.49	13.27	A	A	A
44	302	25	-1.63	9.15	A	A	A
46	293.0	23.0	-4.56	8.77	A	A	A
47	280.75	14.45	-8.55	6.46	A	A	A
49	243.0	21.9	-20.85	9.82	A	A	A
51	280.69	16.80	-8.57	7.15	A	A	A
52	392	22	27.69	6.84	A	N	W
53	326	23	6.19	8.07	A	A	A
55	222	11.1	-27.69	6.35	A	N	W
56	287	14	-6.51	6.25	A	A	A
58	362.8	3.7	18.18	4.04	A	N	W
59	286	23	-6.84	8.94	A	A	A
60	275	19.6	-10.42	8.13	A	A	A
62	306	10	-0.33	5.09	A	A	A
64	361	7	17.59	4.36	A	N	W
68	329	24	7.17	8.28	A	A	A
69	274	33	-10.75	12.66	A	A	A
70	270.23	37.83	-11.98	14.53	A	A	A
71	331	30.2	7.82	9.93	A	A	A
74	322.1	19.3	4.92	7.15	A	A	A
75	28.0	6.5	-90.88	23.54	N	N	N
76	313	9	1.95	4.85	A	A	A
77	324	18	5.54	6.79	A	A	A
78	429.6	14.0	39.93	5.09	N	N	N
82	314.0	20.2	2.28	7.53	A	A	A
84	409.3	5.9	33.32	4.17	N	N	N
85	311.7	96.6	1.53	31.24	A	N	W
86	303	48.7	-1.30	16.54	A	A	A
87	332	17	8.14	6.44	A	A	A
88	334.2	34.5	8.86	11.04	A	A	A
89	329	14	7.17	5.78	A	A	A
92	300	38	-2.28	13.26	A	A	A
93	304	20.1	-0.98	7.68	A	A	A
94	319	0.1	3.91	3.91	A	A	A
95	325	25	5.86	8.63	A	A	A
96	251.13	30.64	-18.20	12.81	A	A	A
100	330	26	7.49	8.80	A	A	A
101	284	30	-7.49	11.26	A	A	A

TABLE 28. Evaluation Results for Pb-212 in Sample 3, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
102	285.34	3.06	-7.06	4.05	A	A	A
107	304.8	2.7	-0.72	4.01	A	A	A
108	306.88	22.50	-0.04	8.31	A	A	A
110	445.86	9.9	45.23	4.50	N	N	N
113	286.65	20.54	-6.63	8.16	A	A	A
116	291.46	25.49	-5.06	9.58	A	A	A
117	271.938	14.102	-11.42	6.49	A	A	A
119	298	10	-2.93	5.15	A	A	A
121	32.7	2.2	-89.35	7.78	N	N	N
122	306	20	-0.33	7.62	A	A	A
123	307	17	0.00	6.78	A	A	A
124	310	17	0.98	6.73	A	A	A
125	342	18	11.40	6.56	A	A	A
126	372	18	21.17	6.22	A	N	W
129	250	40	-18.57	16.47	A	A	A
131	299	15	-2.61	6.36	A	A	A
132	283.2	12.5	-7.75	5.90	A	A	A
133	357	29	16.29	9.01	A	A	A
134	8.55	0.15	-97.21	4.28	N	N	N
138	298.49	17.99	-2.77	7.18	A	A	A
140	321	10	4.56	5.00	A	A	A
143	271.4	22	-11.60	9.00	A	A	A
144	651	33	112.05	6.40	N	N	N
145	187.5	11.2	-38.93	7.14	N	N	N
147	278.71	12.93	-9.21	6.07	A	A	A
148	273	26	-11.07	10.29	A	A	A
149	290.0	7.8	-5.54	4.74	A	A	A
150	359.40	16.00	17.07	5.92	A	N	W
151	324.5	18.03	5.70	6.79	A	A	A
152	289	16	-5.86	6.78	A	A	A
156	321.9	17.4	4.85	6.67	A	A	A
157	267	20.1	-13.03	8.48	A	A	A
158	263.8	22.0	-14.07	9.21	A	A	A
159	286.8	32.3	-6.58	11.92	A	A	A
160	336	15	9.45	5.93	A	A	A
161	284	11.6	-7.49	5.65	A	A	A
162	346	23	12.70	7.71	A	A	A
163	279.3	9.2	-9.02	5.11	A	A	A
167	303	8	-1.30	4.72	A	A	A
168	314	9	2.28	4.85	A	A	A
169	326.31	8.8992	6.29	4.77	A	A	A
170	317	16	3.26	6.38	A	A	A
172	303.24	25.86	-1.22	9.38	A	A	A
176	312	6	1.63	4.36	A	A	A
178	298.5	25.8	-2.77	9.49	A	A	A
180	0.32557	0.0024034	-99.89	3.98	N	N	N
184	301	18	-1.95	7.14	A	A	A
185	293.653	20.038	-4.35	7.86	A	A	A
187	282.15	8.06	-8.09	4.84	A	A	A
188	309	19	0.65	7.29	A	A	A
191	301	28	-1.95	10.09	A	A	A
192	308	18	0.33	7.03	A	A	A
195	281.5	26.5	-8.31	10.19	A	A	A
196	300.00	27.00	-2.28	9.81	A	A	A
197	280	20	-8.79	8.14	A	A	A
199	290	20	-5.54	7.93	A	A	A
202	258	18	-15.96	8.00	A	A	A
203	378	21.0	23.13	6.79	A	N	W
205	290	23	-5.54	8.84	A	A	A
206	362.56	6.83	18.10	4.34	A	N	W

TABLE 28. Evaluation Results for Pb-212 in Sample 3, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
207	336	27	9.45	8.94	A	A	A
210	299	31	-2.61	11.08	A	A	A
212	262	5.92	-14.66	4.51	A	N	W
213	290	6.54	-5.54	4.51	A	A	A
214	298	29	-2.93	10.49	A	A	A
216	286.85	28.69	-6.56	10.74	A	A	A
217	316	12	2.93	5.45	A	A	A
218	325	12	5.86	5.38	A	A	A
219	328	12	6.84	5.35	A	A	A
220	422.2	23.4	37.52	6.78	N	N	N
222	295	10	-3.91	5.17	A	A	A
223	273.3	14.7	-10.98	6.65	A	A	A
224	324.41	7.62	5.67	4.56	A	A	A
225	345.9	9.1	12.67	4.71	A	N	W
226	283	8	-7.82	4.82	A	A	A
230	309	12.0	0.65	5.51	A	A	A
231	285.8	1.4	-6.91	3.94	A	A	A
232	294	12	-4.23	5.65	A	A	A
234	294.73	23.93	-4.00	9.01	A	A	A
239	291	15	-5.21	6.47	A	A	A
244	300.60	24.89	-2.08	9.16	A	A	A
245	355.00	32.13	15.64	9.86	A	A	A
247	348.7	28.1	13.58	8.96	A	A	A
250	320	16	4.23	6.35	A	A	A
254	280	23.1	-8.79	9.13	A	A	A
258	282	20.3	-8.14	8.19	A	A	A
263	300	25	-2.28	9.20	A	A	A
266	316	17.4	2.93	6.75	A	A	A
268	306.187	13.123	-0.26	5.80	A	A	A
269	270	10	-12.05	5.38	A	A	A
270	296	16	-3.58	6.67	A	A	A
274	315.03	15.75	2.62	6.35	A	A	A
275	321.35	12.76	4.67	5.57	A	A	A
276	278.62	16.60	-9.24	7.13	A	A	A
278	282	20	-8.14	8.10	A	A	A
280	200.4	2.74	-34.72	4.14	N	N	N
281	266.69	22.96	-13.13	9.46	A	A	A
287	324	28	5.54	9.48	A	A	A
288	264	31.4	-14.01	12.52	A	A	A
291	225.717	23.405	-26.48	11.08	A	A	A
292	286.51	16.84	-6.67	7.06	A	A	A
294	312	11	1.63	5.26	A	A	A
295	292	33	-4.89	11.96	A	A	A
296	253.8	2.5	-17.33	4.03	A	N	W
298	330.9	21.1	7.79	7.48	A	A	A
301	285.6	27.5	-6.97	10.39	A	A	A
303	299	20	-2.61	7.75	A	A	A
306	354	9	15.31	4.66	A	N	W
307	386.77	61.38	25.98	16.34	A	A	A
308	253.32	30.00	-17.49	12.47	A	A	A
310	270.97	22.56	-11.74	9.20	A	A	A
311	298.43	27.02	-2.79	9.86	A	A	A
313	323	20	5.21	7.32	A	A	A
315	304	20	-0.98	7.65	A	A	A
317	188.0	16.0	-38.76	9.37	N	N	N
318	296	17.1	-3.58	6.98	A	A	A
320	288	18	-6.19	7.37	A	A	A
321	274.4	12.3	-10.62	5.95	A	A	A
322	331	17	7.82	6.45	A	A	A
324	285.64	8.81	-6.96	4.98	A	A	A

TABLE 28. Evaluation Results for Pb-212 in Sample 3, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
325	277	13	-9.77	6.11	A	A	A
328	290	12	-5.54	5.69	A	A	A
331	356.40	7.81	16.09	4.48	A	N	W
332	281	24	-8.47	9.39	A	A	A
333	293	17	-4.56	7.00	A	A	A
334	405	17	31.92	5.74	N	N	N
336	291	15	-5.21	6.47	A	A	A
337	294	21	-4.23	8.14	A	A	A
338	294	15	-4.23	6.43	A	A	A
341	330.1	9.5	7.52	4.85	A	A	A
343	306	12	-0.33	5.54	A	A	A
344	320	46	4.23	14.90	A	A	A
345	250	50	-18.57	20.38	A	A	A
346	308	15	0.33	6.24	A	A	A
347	315	16	2.61	6.41	A	A	A
348	300	13	-2.28	5.84	A	A	A
349	34.6	1.8	-88.73	6.51	N	N	N
353	254.5	13.5	-17.10	6.59	A	N	W
354	325	17	5.86	6.53	A	A	A
355	293	19	-4.56	7.57	A	A	A
358	281.6	45.1	-8.27	16.49	A	A	A
359	132	4.9	-57.00	5.39	N	N	N
360	146.6	11.3	-52.25	8.64	N	N	N
364	288.7	14.8	-5.96	6.45	A	A	A
370	278.9	19.8	-9.15	8.10	A	A	A
371	332	19	8.14	6.93	A	A	A
373	308	18	0.33	7.03	A	A	A
377	310	40	0.98	13.48	A	A	A
384	227.55	18.41	-25.88	8.99	A	N	W
385	333.9	13.35	8.76	5.59	A	A	A
386	115	5	-62.54	5.85	N	N	N
387	297.42	24.63	-3.12	9.16	A	A	A
391	285	11	-7.17	5.49	A	A	A
392	335	17	9.12	6.41	A	A	A
393	261	21.3	-14.98	9.05	A	A	A
397	307	42	0.00	14.23	A	A	A
401	267	8	-13.03	4.93	A	N	W
402	293	38	-4.56	13.55	A	A	A
404	273	14	-11.07	6.45	A	A	A
405	276	11	-10.10	5.58	A	A	A
407	326.2	12.4	6.25	5.45	A	A	A
408	286	23	-6.84	8.94	A	A	A
409	322.96	29.49	5.20	9.93	A	A	A
410	408.68	13.26	33.12	5.08	N	N	N
412	324.6	6.8	5.73	4.43	A	A	A
414	324	11	5.54	5.18	A	A	A
415	298.3	13.5	-2.83	5.98	A	A	A
416	258.1	18.2	-15.93	8.06	A	A	A
417	310	22	0.98	8.10	A	A	A
418	328	14	6.84	5.79	A	A	A
419	297.68	18.03	-3.04	7.21	A	A	A
421	296	13	-3.58	5.88	A	A	A
423	298.258	22.480	-2.85	8.49	A	A	A
425	170.8	8.1	-44.36	6.15	N	N	N
426	258.8	20.21	-15.70	8.73	A	A	A
432	273	17	-11.07	7.35	A	A	A
436	360	19	17.26	6.57	A	N	W
437	290	30	-5.54	11.06	A	A	A
441	318	36	3.58	11.98	A	A	A
442	379.87	4.69	23.74	4.10	A	N	W

TABLE 28. Evaluation Results for Pb-212 in Sample 3, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
443	312	11	1.63	5.26	A	A	A
445	216.00	7.07	-29.64	5.10	A	N	W
446	311	12	1.30	5.49	A	A	A
449	282.6	9.4	-7.95	5.13	A	A	A
454	290	18	-5.54	7.34	A	A	A
455	285	17	-7.17	7.13	A	A	A
457	314	21	2.28	7.75	A	A	A
458	295.3	27.0	-3.81	9.94	A	A	A
461	292.68	0.68	-4.66	3.92	A	A	A
463	336	57	9.45	17.41	A	A	A
464	296	24	-3.58	9.00	A	A	A
465	306.0	12.0	-0.33	5.54	A	A	A
469	1280.59	5.25	317.13	3.93	N	N	N
474	314.3	12.8	2.38	5.64	A	A	A
475	184	8	-40.07	5.85	N	N	N
478	282.90	10.39	-7.85	5.36	A	A	A
486	285.17	2.82	-7.11	4.03	A	A	A
487	280	19	-8.79	7.83	A	A	A
490	408.20193	19.90167	32.96	6.25	N	N	N
491	315.63	3.47	2.81	4.06	A	A	A
492	305	18	-0.65	7.08	A	A	A
494	242	7	-21.17	4.86	A	N	W
497	289.5	11.6	-5.70	5.60	A	A	A
498	128.98	6.70	-57.99	6.50	N	N	N
501	302.2	6.84	-1.56	4.52	A	A	A
505	193.55	11.73	-36.95	7.21	N	N	N
507	300	20	-2.28	7.73	A	A	A
512	320.8655	26.2838	4.52	9.08	A	A	A
515	307.24	17.75	0.08	6.98	A	A	A

Ac-228 Determination in Sample 3 by Gamma-ray Spectrometry

TABLE 29. Target values

Parameter	Value
Activity concentration [Bq/kg]	307
Uncertainty [Bq/kg]	17
Maximum Acceptable Relative Bias [%]	30

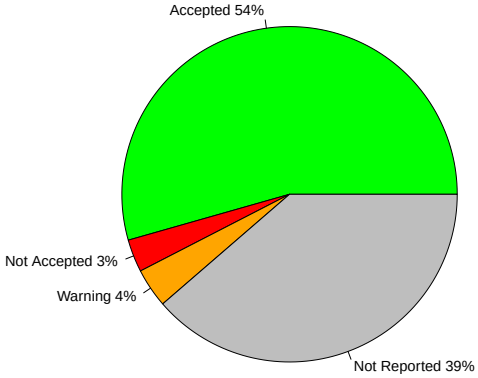

FIGURE 29. Percentage of Accepted vs. Warnings vs. Not Accepted vs. Not Reported results

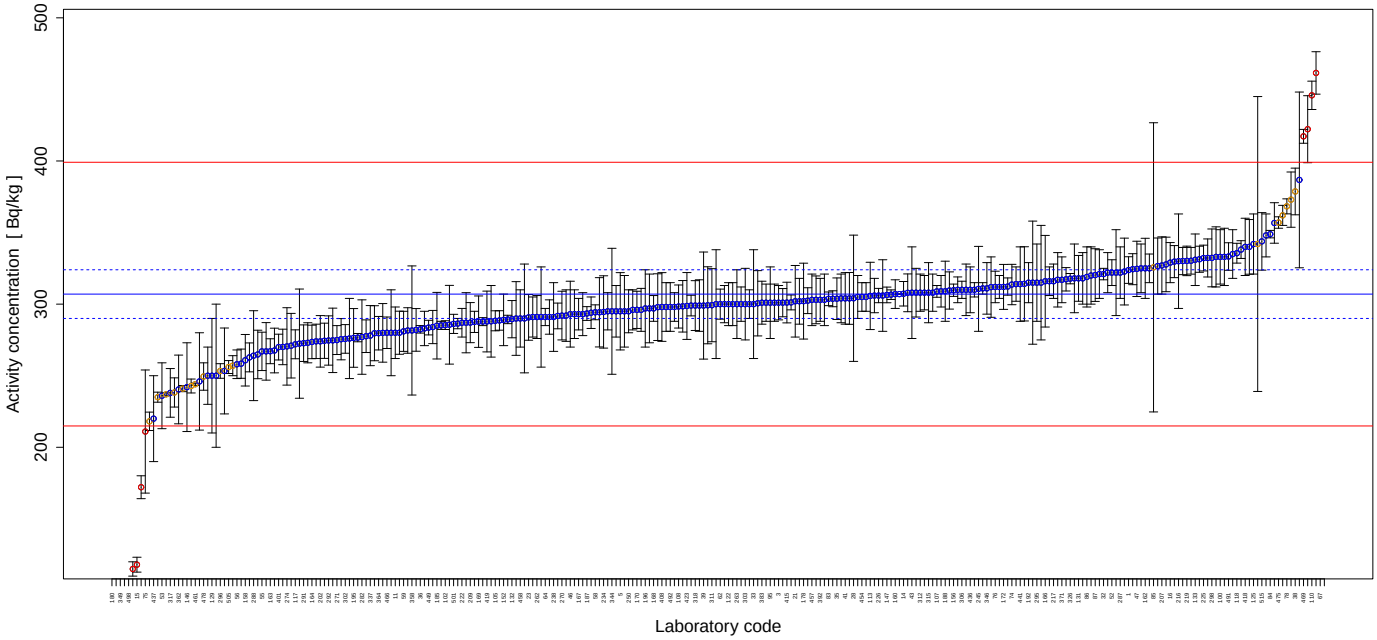

FIGURE 30. Reported results and evaluation parameters for Ac-228 by Gamma-ray Spectrometry. Blue points represent accepted scores, whereas yellow and red represent warning and not accepted scores, respectively.

TABLE 30. Evaluation Results for Ac-228 in Sample 3, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
1	323.8	9.3	5.47	6.24	A	A	A
3	301	12	-1.95	6.82	A	A	A
4	331.35	9.11	7.93	6.18	A	A	A
5	295	27	-3.91	10.70	A	A	A
11	280	18	-8.79	8.48	A	A	A
12	297	24	-3.26	9.80	A	A	A
14	307.25	8.56	0.08	6.20	A	A	A
15	118	5.2	-61.56	7.08	N	N	N
16	329	14	7.17	6.98	A	A	A
21	302	25	-1.63	9.96	A	A	A
22	300	15	-2.28	7.46	A	A	A
23	290.74	15.96	-5.30	7.80	A	A	A
24	326.6	19.6	6.38	8.17	A	A	A
27	335	17	9.12	7.51	A	A	A
28	304.1	44.1	-0.94	15.52	A	A	A
32	321	4	4.56	5.68	A	A	A
33	300	38	-2.28	13.82	A	A	A
34	287.78	2.78	-6.26	5.62	A	A	A
35	303.8	14.5	-1.04	7.31	A	A	A
36	282.40	2.62	-8.01	5.61	A	A	A
37	293	17	-4.56	8.02	A	A	A
38	378.7	16.3	23.36	7.01	A	N	W
39	299.0	37.4	-2.61	13.68	A	A	A
40	306	25	-0.33	9.87	A	A	A
41	304	18	-0.98	8.11	A	A	A
42	317	19	3.26	8.16	A	A	A
43	308	32	0.33	11.77	A	A	A
44	296	15	-3.58	7.51	A	A	A
45	304	18.1	-0.98	8.13	A	A	A
46	293.0	23.0	-4.56	9.61	A	A	A
47	324.63	19.31	5.74	8.13	A	A	A
49	299.2	26.9	-2.54	10.56	A	A	A
51	281.59	15.90	-8.28	7.91	A	A	A
52	322	9	4.89	6.20	A	A	A
53	236	23	-23.13	11.21	A	A	A
55	267	13.4	-13.03	7.47	A	A	A
56	258	10	-15.96	6.76	A	A	A
58	294.3	5.2	-4.14	5.81	A	A	A
59	281	14	-8.47	7.45	A	A	A
62	300	10.5	-2.28	6.55	A	A	A
64	291	6	-5.21	5.91	A	A	A
67	766.32	35.83	149.62	7.25	N	N	N
69	291	35	-5.21	13.24	A	A	A
70	272.40	38.14	-11.27	15.06	A	A	A
71	340	19.1	10.75	7.89	A	A	A
74	313.7	14.1	2.18	7.13	A	A	A
75	211	43	-31.27	21.12	N	A	N
76	312	11	1.63	6.56	A	A	A
77	322	14	4.89	7.04	A	A	A
78	368.3	5.24	19.97	5.72	A	N	W
80	310	5	0.98	5.77	A	A	A
82	297.9	23.3	-2.96	9.58	A	A	A
83	303.71	4.77	-1.07	5.76	A	A	A
84	348.9	2.6	13.65	5.59	A	A	A
85	325.7	101.0	6.09	31.50	A	N	W
86	319	21	3.91	8.60	A	A	A
87	320.3	18.4	4.33	7.98	A	A	A
88	311.9	21.1	1.60	8.74	A	A	A
89	362	7	17.92	5.87	A	N	W
92	300	38	-2.28	13.82	A	A	A

TABLE 30. Evaluation Results for Ac-228 in Sample 3, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
94	307	0.1	0.00	5.54	A	A	A
95	301	25	-1.95	9.98	A	A	A
96	242.81	4.86	-20.91	5.89	A	N	W
99	303	18	-1.30	8.12	A	A	A
100	333	19	8.47	7.95	A	A	A
101	280	30	-8.79	12.06	A	A	A
102	285.34	3.06	-7.06	5.64	A	A	A
105	288.36	6.99	-6.07	6.04	A	A	A
107	308.9	4.1	0.62	5.69	A	A	A
108	298.33	15.04	-2.82	7.49	A	A	A
110	445.86	9.9	45.23	5.97	N	N	N
113	305.74	23.5	-0.41	9.47	A	A	A
116	280.02	15.05	-8.79	7.72	A	A	A
117	271.938	10.102	-11.42	6.67	A	A	A
118	335.58	6.92	9.31	5.91	A	A	A
119	298	10	-2.93	6.47	A	A	A
121	32.9	2.3	-89.28	8.92	N	N	N
122	300	15	-2.28	7.46	A	A	A
125	342	21	11.40	8.27	A	A	A
126	333	20	8.47	8.17	A	A	A
129	250	40	-18.57	16.93	A	A	A
131	318	16	3.58	7.48	A	A	A
132	289.5	13.0	-5.70	7.13	A	A	A
133	331	18	7.82	7.76	A	A	A
134	4.64	0.41	-98.49	10.43	N	N	N
138	298.49	17.99	-2.77	8.18	A	A	A
143	277.6	11.4	-9.58	6.89	A	A	A
144	814	45	165.15	7.82	N	N	N
145	238.3	10.2	-22.38	7.00	A	N	W
146	242	31	-21.17	13.96	A	A	A
147	306.43	5.47	-0.19	5.82	A	A	A
148	246	34	-19.87	14.89	A	A	A
149	301.2	5.2	-1.89	5.80	A	A	A
150	330.29	9.32	7.59	6.21	A	A	A
152	289	18	-5.86	8.33	A	A	A
156	309.7	4.3	0.88	5.71	A	A	A
157	267	20.1	-13.03	9.35	A	A	A
158	260.8	18.0	-15.05	8.85	A	A	A
159	286.4	3.6	-6.71	5.68	A	A	A
160	307	10	0.00	6.42	A	A	A
161	284	11.6	-7.49	6.88	A	A	A
162	325	21	5.86	8.51	A	A	A
163	267.1	8.7	-13.00	6.42	A	A	A
164	273.6	11.7	-10.88	7.00	A	A	A
166	316	32	2.93	11.54	A	A	A
167	293	11	-4.56	6.69	A	A	A
168	297	9	-3.26	6.31	A	A	A
169	287.75	17.961	-6.27	8.34	A	A	A
170	296	13	-3.58	7.07	A	A	A
172	312.04	15.70	1.64	7.48	A	A	A
176	311	4	1.30	5.68	A	A	A
178	302.1	26.5	-1.60	10.37	A	A	A
180	0.29296	0.00519285	-99.90	5.81	N	N	N
184	310	9	0.98	6.25	A	A	A
185	284.943	23.255	-7.18	9.86	A	A	A
187	293.45	4.80	-4.41	5.77	A	A	A
188	309	21	0.65	8.77	A	A	A
192	315	14	2.61	7.10	A	A	A
195	276.4	20.5	-9.97	9.26	A	A	A
196	297.00	27.00	-3.26	10.64	A	A	A

TABLE 30. Evaluation Results for Ac-228 in Sample 3, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
197	305	15	-0.65	7.41	A	A	A
199	295	18	-3.91	8.24	A	A	A
202	274	18	-10.75	8.59	A	A	A
203	373	19.3	21.50	7.58	A	N	W
205	291	14	-5.21	7.34	A	A	A
206	312.28	6.03	1.72	5.86	A	A	A
207	327	20	6.51	8.25	A	A	A
208	327.73	19.05	6.75	8.03	A	A	A
209	287.08	14.00	-6.49	7.38	A	A	A
210	276	28	-10.10	11.56	A	A	A
212	237	1.04	-22.80	5.55	A	N	W
213	288.6	6.8	-5.99	6.02	A	A	A
214	310	18	0.98	8.02	A	A	A
216	329.99	33	7.49	11.43	A	A	A
217	316	12	2.93	6.71	A	A	A
218	316	10	2.93	6.38	A	A	A
219	330.2	10.3	7.56	6.36	A	A	A
220	422.2	23.4	37.52	7.83	N	N	N
222	287	10	-6.51	6.54	A	A	A
223	262.8	10.1	-14.40	6.74	A	A	A
224	324.41	10.83	5.67	6.47	A	A	A
225	332.2	9.0	8.21	6.16	A	A	A
226	306	5	-0.33	5.77	A	A	A
230	299	7.21	-2.61	6.04	A	A	A
231	276.6	2.9	-9.90	5.64	A	A	A
232	308	13	0.33	6.96	A	A	A
234	294.54	25.26	-4.06	10.21	A	A	A
238	291	24	-5.21	9.93	A	A	A
239	299	18	-2.61	8.18	A	A	A
240	307.9	13.2	0.29	7.00	A	A	A
243	338.11	6.2	10.13	5.83	A	A	A
244	300.60	22.80	-2.08	9.39	A	A	A
245	310.67	29.67	1.20	11.04	A	A	A
247	270.1	12.4	-12.02	7.19	A	A	A
250	295	15	-3.91	7.52	A	A	A
251	309.53	13.00	0.82	6.95	A	A	A
254	282	14.9	-8.14	7.65	A	A	A
258	303	16.7	-1.30	7.81	A	A	A
259	274	12	-10.75	7.06	A	A	A
262	291	15	-5.21	7.57	A	A	A
263	300	24	-2.28	9.73	A	A	A
268	322.763	23.340	5.13	9.11	A	A	A
269	250	20	-18.57	9.73	A	A	A
270	292	17	-4.89	8.03	A	A	A
271	274.9	10.1	-10.46	6.65	A	A	A
274	270.47	27.03	-11.90	11.43	A	A	A
275	301.02	9.86	-1.95	6.43	A	A	A
276	279.93	20.47	-8.82	9.17	A	A	A
278	300	12	-2.28	6.83	A	A	A
281	264.84	16.94	-13.73	8.46	A	A	A
282	277	26	-9.77	10.90	A	A	A
287	322	18	4.89	7.87	A	A	A
288	264	31.4	-14.01	13.12	A	A	A
291	272.727	12.775	-11.16	7.25	A	A	A
292	274.60	17.22	-10.55	8.37	A	A	A
294	314	12	2.28	6.73	A	A	A
295	315	27	2.61	10.20	A	A	A
296	253.3	5.1	-17.49	5.89	A	N	W
298	332.3	20.2	8.24	8.22	A	A	A
301	285.6	27.5	-6.97	11.11	A	A	A

TABLE 30. Evaluation Results for Ac-228 in Sample 3, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
302	275.7	10	-10.20	6.62	A	A	A
303	300	25	-2.28	10.01	A	A	A
306	310	6	0.98	5.87	A	A	A
307	386.77	61.38	25.98	16.81	A	A	A
308	253.32	30.00	-17.49	13.07	A	A	A
310	270.97	22.56	-11.74	10.00	A	A	A
311	299.25	25.53	-2.52	10.17	A	A	A
312	308	13	0.33	6.96	A	A	A
313	318	24	3.58	9.36	A	A	A
315	308	21	0.33	8.78	A	A	A
317	238.0	17.0	-22.48	9.04	A	A	A
318	299	17.4	-2.61	8.03	A	A	A
320	305	10	-0.65	6.44	A	A	A
321	274.4	12.3	-10.62	7.12	A	A	A
322	333	21	8.47	8.39	A	A	A
324	289.29	2.93	-5.77	5.63	A	A	A
325	296	14	-3.58	7.28	A	A	A
326	317.8	3.6	3.52	5.65	A	A	A
328	283	12	-7.82	6.97	A	A	A
330	241	2.15	-21.50	5.61	A	N	W
331	317.35	8.17	3.37	6.11	A	A	A
332	288	25	-6.19	10.30	A	A	A
333	298	17	-2.93	7.95	A	A	A
334	348	15	13.36	7.02	A	A	A
336	301	13	-1.95	7.02	A	A	A
337	278	21	-9.45	9.37	A	A	A
338	287.6	7.4	-6.32	6.11	A	A	A
341	330.1	9.5	7.52	6.24	A	A	A
343	312	8	1.63	6.10	A	A	A
344	295	44	-3.91	15.91	A	A	A
345	250	50	-18.57	20.75	A	A	A
346	311	18	1.30	8.01	A	A	A
347	318	18	3.58	7.92	A	A	A
348	301	13	-1.95	7.02	A	A	A
349	32.7	1.3	-89.35	6.82	N	N	N
353	275.5	14.4	-10.26	7.61	A	A	A
354	325	17	5.86	7.62	A	A	A
355	322	30	4.89	10.84	A	A	A
357	295	25	-3.91	10.12	A	A	A
358	281.6	45.1	-8.27	16.95	A	A	A
362	240.4	24.0	-21.69	11.42	A	A	A
364	279.7	11.7	-8.89	6.94	A	A	A
370	258.4	10.2	-15.83	6.80	A	A	A
371	317	16	3.26	7.49	A	A	A
375	356.7	14.15	16.19	6.81	A	A	A
377	315	40	2.61	13.85	A	A	A
382	303.75	5.57	-1.06	5.83	A	A	A
383	301	15	-1.95	7.45	A	A	A
384	218.14	6.43	-28.94	6.27	A	N	W
385	332.25	13.29	8.22	6.83	A	A	A
386	115	5	-62.54	7.04	N	N	N
387	289.97	25.74	-5.55	10.46	A	A	A
391	291	12	-5.21	6.90	A	A	A
392	303	15	-1.30	7.43	A	A	A
393	274.7	22.5	-10.52	9.89	A	A	A
397	315	43	2.61	14.73	A	A	A
401	270	9	-12.05	6.46	A	A	A
402	290	38	-5.54	14.23	A	A	A
404	273	14	-11.07	7.55	A	A	A
405	300	13	-2.28	7.03	A	A	A

TABLE 30. Evaluation Results for Ac-228 in Sample 3, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
407	329.7	11.2	7.39	6.50	A	A	A
408	298	24	-2.93	9.77	A	A	A
409	314.16	25.92	2.33	9.94	A	A	A
410	306.61	3.34	-0.13	5.64	A	A	A
412	309	11	0.65	6.58	A	A	A
414	294	11	-4.23	6.68	A	A	A
415	301.1	14.2	-1.92	7.27	A	A	A
416	267.6	15.6	-12.83	8.04	A	A	A
417	287	21	-6.51	9.18	A	A	A
418	340	20	10.75	8.08	A	A	A
419	287.86	21.23	-6.23	9.22	A	A	A
421	295	13	-3.91	7.08	A	A	A
423	298.707	23.346	-2.70	9.58	A	A	A
425	172.1	8.0	-43.94	7.23	N	N	N
427	294.3	24.2	-4.14	9.91	A	A	A
432	292	18	-4.89	8.29	A	A	A
436	310	16	0.98	7.57	A	A	A
437	220	30	-28.34	14.72	A	A	A
440	302	16	-1.63	7.66	A	A	A
441	314	26	2.28	9.96	A	A	A
442	461.50	14.82	50.33	6.40	N	N	N
443	325	10	5.86	6.33	A	A	A
445	235.00	3.51	-23.45	5.74	A	N	W
446	308	17	0.33	7.82	A	A	A
449	283.6	5.1	-7.62	5.82	A	A	A
452	302.418	9.028	-1.49	6.29	A	A	A
454	305	10	-0.65	6.44	A	A	A
455	300	10	-2.28	6.46	A	A	A
457	303	18	-1.30	8.12	A	A	A
458	290.0	20.0	-5.54	8.84	A	A	A
461	244.04	0.74	-20.51	5.55	A	N	W
463	342	103	11.40	30.62	A	N	W
464	321	17	4.56	7.66	A	A	A
465	306.0	12.0	-0.33	6.79	A	A	A
466	280	11	-8.79	6.79	A	A	A
469	417.22	4.84	35.90	5.66	N	N	N
475	357	4	16.29	5.65	A	N	W
478	249.43	9.57	-18.75	6.74	A	N	W
479	304	17	-0.98	7.87	A	A	A
486	285.17	2.82	-7.11	5.63	A	A	A
487	308	12	0.33	6.77	A	A	A
490	291.75364	8.97832	-4.97	6.34	A	A	A
491	333.26	9.62	8.55	6.24	A	A	A
492	298	17	-2.93	7.95	A	A	A
494	257	7	-16.29	6.17	A	N	W
498	78.16	2.90	-74.54	6.67	N	N	N
501	286.2	6.69	-6.78	6.01	A	A	A
505	256.06	4.52	-16.59	5.81	A	N	W
507	320	20	4.23	8.35	A	A	A
512	279.667	19.21379	-8.90	8.82	A	A	A
515	343.83	20.09	12.00	8.05	A	A	A
516	293	15	-4.56	7.54	A	A	A

Ra-228 Determination in Sample 3 by Gamma-ray Spectrometry

TABLE 31. Target values

Parameter	Value
Activity concentration [Bq/kg]	307
Uncertainty [Bq/kg]	17
Maximum Acceptable Relative Bias [%]	30

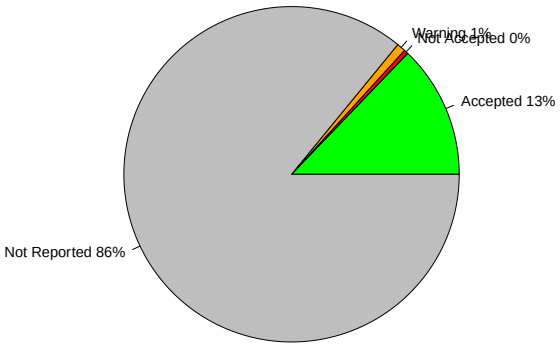

FIGURE 31. Percentage of Accepted vs. Warnings vs. Not Accepted vs. Not Reported results

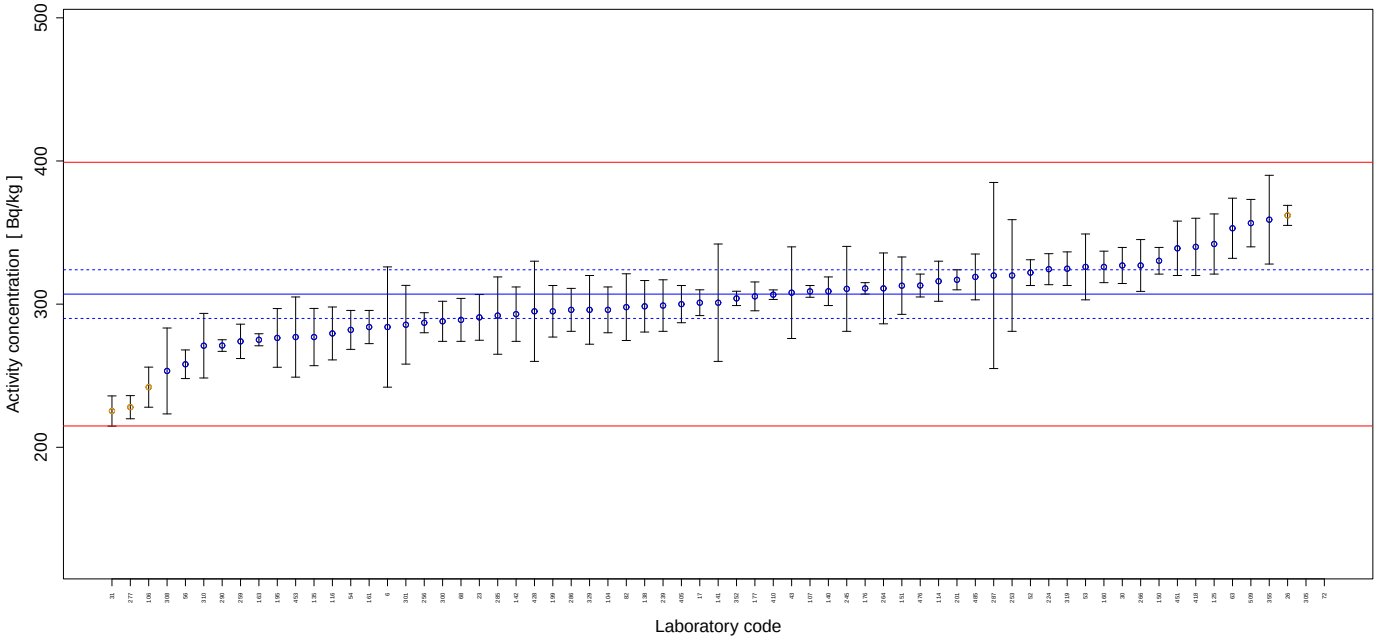

FIGURE 32. Reported results and evaluation parameters for Ra-228 by Gamma-ray Spectrometry. Blue points represent accepted scores, whereas yellow and red represent warning and not accepted scores, respectively.

TABLE 32. Evaluation Results for Ra-228 in Sample 3, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
6	284	42	-7.49	15.79	A	A	A
17	301	9	-1.95	6.29	A	A	A
23	290.74	15.96	-5.30	7.80	A	A	A
26	362	7	17.92	5.87	A	N	W
30	327	12.6	6.51	6.75	A	A	A
31	225.34	10.55	-26.60	7.25	A	N	W
43	308	32	0.33	11.77	A	A	A
52	322	9	4.89	6.20	A	A	A
53	326	23	6.19	8.97	A	A	A
54	282	13.6	-8.14	7.34	A	A	A
56	258	10	-15.96	6.76	A	A	A
63	353.0	21.0	14.98	8.13	A	A	A
68	289	15	-5.86	7.59	A	A	A
72	1580	45	414.66	6.23	N	N	N
82	297.9	23.3	-2.96	9.58	A	A	A
104	296	16	-3.58	7.74	A	A	A
106	242	14	-21.17	8.01	A	N	W
107	308.9	4.1	0.62	5.69	A	A	A
114	316	14	2.93	7.09	A	A	A
116	279.52	18.48	-8.95	8.62	A	A	A
125	342	21	11.40	8.27	A	A	A
135	277	20	-9.77	9.10	A	A	A
138	298.49	17.99	-2.77	8.18	A	A	A
140	309	10	0.65	6.41	A	A	A
141	301	41	-1.95	14.70	A	A	A
142	293	19	-4.56	8.53	A	A	A
150	330.29	9.32	7.59	6.21	A	A	A
151	312.9	20.04	1.92	8.47	A	A	A
160	326	11	6.19	6.48	A	A	A
161	284	11.6	-7.49	6.88	A	A	A
163	275.1	4.2	-10.39	5.74	A	A	A
176	311	4	1.30	5.68	A	A	A
177	305.42	10.07	-0.51	6.44	A	A	A
195	276.4	20.5	-9.97	9.26	A	A	A
199	295	18	-3.91	8.24	A	A	A
201	317	7	3.26	5.96	A	A	A
224	324.41	10.83	5.67	6.47	A	A	A
239	299	18	-2.61	8.18	A	A	A
245	310.67	29.67	1.20	11.04	A	A	A
253	320	39	4.23	13.39	A	A	A
256	287	7	-6.51	6.05	A	A	A
259	274	12	-10.75	7.06	A	A	A
264	311	24.75	1.30	9.70	A	A	A
266	327	18.1	6.51	7.83	A	A	A
277	228.00	8.08	-25.73	6.57	A	N	W
285	292	27	-4.89	10.78	A	A	A
286	296	15	-3.58	7.51	A	A	A
287	320	65	4.23	21.05	A	A	A
290	271.07	4.05	-11.70	5.74	A	A	A
300	288	14	-6.19	7.37	A	A	A
301	285.6	27.5	-6.97	11.11	A	A	A
305	581.4	21.45	89.38	6.65	N	N	N
308	253.32	30.00	-17.49	13.07	A	A	A
310	270.97	22.56	-11.74	10.00	A	A	A
319	324.75	11.74	5.78	6.61	A	A	A
329	296	24	-3.58	9.82	A	A	A
352	304	5	-0.98	5.78	A	A	A
355	359	31	16.94	10.26	A	A	A
405	300	13	-2.28	7.03	A	A	A
410	306.61	3.34	-0.13	5.64	A	A	A

TABLE 32. Evaluation Results for Ra-228 in Sample 3, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
418	340	20	10.75	8.08	A	A	A
428	295	35	-3.91	13.09	A	A	A
451	339	19	10.42	7.88	A	A	A
453	277	28	-9.77	11.53	A	A	A
476	313	8	1.95	6.10	A	A	A
485	319	16	3.91	7.47	A	A	A
509	356.58	16.56	16.15	7.23	A	A	A

Th-232 Determination in Sample 3 by Gamma-ray Spectrometry

TABLE 33. Target values

Parameter	Value
Activity concentration [Bq/kg]	307
Uncertainty [Bq/kg]	17
Maximum Acceptable Relative Bias [%]	30

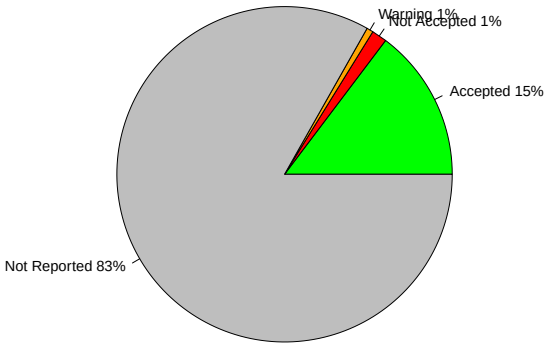

FIGURE 33. Percentage of Accepted vs. Warnings vs. Not Accepted vs. Not Reported results

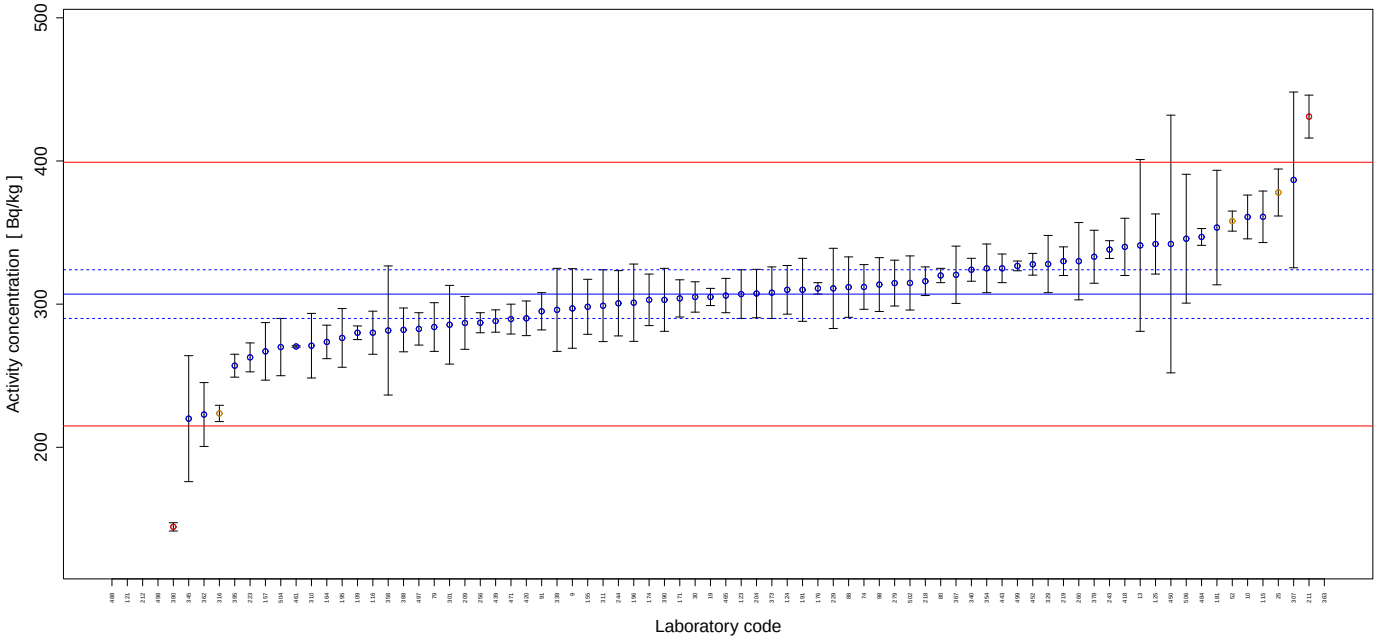

FIGURE 34. Reported results and evaluation parameters for Th-232 by Gamma-ray Spectrometry. Blue points represent accepted scores, whereas yellow and red represent warning and not accepted scores, respectively.

TABLE 34. Evaluation Results for Th-232 in Sample 3, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
9	297	27.8	-3.26	10.88	A	A	A
10	360.9	15.3	17.56	6.97	A	A	A
13	341	60	11.07	18.45	A	A	A
19	305	6	-0.65	5.88	A	A	A
25	377.97	16.40	23.12	7.03	A	N	W
30	305	10.6	-0.65	6.54	A	A	A
52	358	7	16.61	5.87	A	N	W
74	312.0	15.6	1.63	7.46	A	A	A
79	284	17	-7.49	8.15	A	A	A
80	320	5	4.23	5.75	A	A	A
88	311.9	21.1	1.60	8.74	A	A	A
91	295	13	-3.91	7.08	A	A	A
98	313.67	18.80	2.17	8.16	A	A	A
109	280	4.76	-8.79	5.79	A	A	A
115	361	18	17.59	7.45	A	A	A
116	280.02	15.05	-8.79	7.72	A	A	A
121	30.7	2.2	-90.00	9.06	N	N	N
123	307	17	0.00	7.83	A	A	A
124	310	17	0.98	7.79	A	A	A
125	342	21	11.40	8.27	A	A	A
155	298.14	19.21	-2.89	8.50	A	A	A
157	267	20.1	-13.03	9.35	A	A	A
164	273.6	11.7	-10.88	7.00	A	A	A
171	304	13	-0.98	7.00	A	A	A
174	303	18	-1.30	8.12	A	A	A
176	311	4	1.30	5.68	A	A	A
181	353.5	40	15.15	12.60	A	A	A
191	310	22	0.98	9.00	A	A	A
195	276.4	20.5	-9.97	9.26	A	A	A
196	301.00	27.00	-1.95	10.54	A	A	A
204	307.4	16.9	0.13	7.80	A	A	A
209	286.87	18.43	-6.56	8.48	A	A	A
211	431	15	40.39	6.54	N	N	N
212	66.3	1.96	-78.40	6.28	N	N	N
218	316	10	2.93	6.38	A	A	A
219	330	10	7.49	6.31	A	A	A
223	262.8	10.1	-14.40	6.74	A	A	A
229	311	28	1.30	10.57	A	A	A
243	338.11	6.2	10.13	5.83	A	A	A
244	300.60	22.80	-2.08	9.39	A	A	A
256	287	7	-6.51	6.05	A	A	A
260	330	27	7.49	9.88	A	A	A
279	314.7	16	2.51	7.52	A	A	A
301	285.6	27.5	-6.97	11.11	A	A	A
307	386.77	61.38	25.98	16.81	A	A	A
310	270.97	22.56	-11.74	10.00	A	A	A
311	298.91	25.07	-2.64	10.05	A	A	A
316	223.65	5.68	-27.15	6.09	A	N	W
329	328	20	6.84	8.24	A	A	A
339	296	29	-3.58	11.25	A	A	A
340	324	8	5.54	6.06	A	A	A
345	220	44	-28.34	20.75	A	A	A
354	325	17	5.86	7.62	A	A	A
358	281.6	45.1	-8.27	16.95	A	A	A
362	222.9	22.3	-27.39	11.43	A	A	A
363	5730	756	1766.45	14.31	N	N	N
367	320.5	20.0	4.40	8.34	A	A	A
373	308	18	0.33	8.05	A	A	A
378	333.1	18.5	8.50	7.84	A	A	A
380	144.4	2.9	-52.96	5.89	N	N	N

TABLE 34. Evaluation Results for Th-232 in Sample 3, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
388	282	15.3	-8.14	7.75	A	A	A
390	303	22	-1.30	9.13	A	A	A
395	257	8	-16.29	6.35	A	A	A
418	340	20	10.75	8.08	A	A	A
420	290.1	12.1	-5.50	6.93	A	A	A
439	288.2	7.8	-6.12	6.16	A	A	A
443	325	10	5.86	6.33	A	A	A
450	342	90	11.40	26.89	A	A	A
452	327.846	7.587	6.79	6.00	A	A	A
461	270.42	0.5	-11.92	5.54	A	A	A
465	306.0	12.0	-0.33	6.79	A	A	A
471	289.54	10.43	-5.69	6.61	A	A	A
484	346.93	5.8565	13.01	5.79	A	A	A
488	9.90	2.12	-96.78	22.12	N	N	N
497	282.7	11.3	-7.92	6.83	A	A	A
498	78.10	2.46	-74.56	6.37	N	N	N
499	326.7	3.4	6.42	5.63	A	A	A
502	314.78	18.9	2.53	8.17	A	A	A
504	270	20	-12.05	9.25	A	A	A
506	345.7	45	12.61	14.15	A	A	A

Tl-208 Determination in Sample 3 by Gamma-ray Spectrometry

TABLE 35. Target values

Parameter	Value
Activity concentration [Bq/kg]	110
Uncertainty [Bq/kg]	4
Maximum Acceptable Relative Bias [%]	30

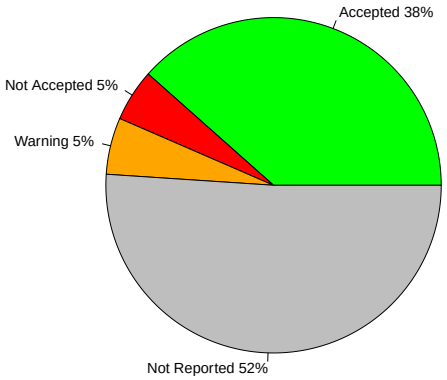

FIGURE 35. Percentage of Accepted vs. Warnings vs. Not Accepted vs. Not Reported results

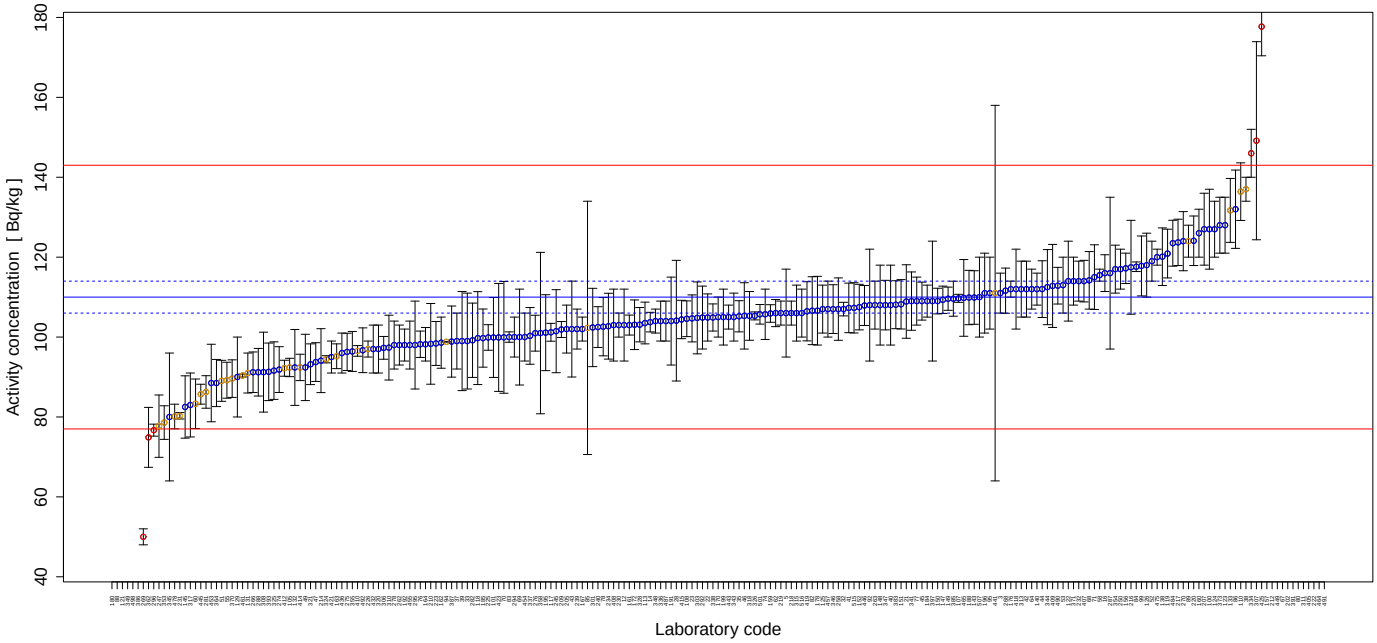

FIGURE 36. Reported results and evaluation parameters for Tl-208 by Gamma-ray Spectrometry. Blue points represent accepted scores, whereas yellow and red represent warning and not accepted scores, respectively.

TABLE 36. Evaluation Results for Tl-208 in Sample 3, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
3	111	5	0.91	5.79	A	A	A
5	106	11	-3.64	11.00	A	A	A
12	103	9	-6.36	9.46	A	A	A
14	103.74	2.45	-5.69	4.34	A	A	A
16	116.0	4.6	5.45	5.38	A	A	A
21	108.9	9.2	-1.00	9.20	A	A	A
22	104.9	5.9	-4.64	6.70	A	A	A
23	104.67	5.88	-4.85	6.69	A	A	A
28	104.1	15.1	-5.36	14.95	A	A	A
32	107	1.7	-2.73	3.97	A	A	A
33	99	12	-10.00	12.65	A	A	A
35	105.2	3.9	-4.36	5.19	A	A	A
37	99.0	7.0	-10.00	7.95	A	A	A
38	137	3	24.55	4.24	A	N	W
39	99.0	12.4	-10.00	13.04	A	A	A
40	108	10	-1.82	9.95	A	A	A
41	107.3	6.2	-2.45	6.83	A	A	A
42	112	7	1.82	7.23	A	A	A
43	102	12	-7.27	12.31	A	A	A
44	112	7.1	1.82	7.31	A	A	A
45	109	4.75	-0.91	5.68	A	A	A
46	105.3	8.3	-4.27	8.68	A	A	A
47	93.74	4.85	-14.78	6.32	A	A	A
49	92.4	8.3	-16.00	9.69	A	A	A
51	89.05	5.13	-19.05	6.81	A	N	W
52	119	5	8.18	5.56	A	A	A
53	113	7	2.73	7.18	A	A	A
55	89.2	4.5	-18.91	6.22	A	N	W
58	115.5	1.5	5.00	3.86	A	A	A
60	83.3	6.2	-24.27	8.28	A	N	W
62	106	3.39	-3.64	4.84	A	A	A
64	112	5	1.82	5.76	A	A	A
67	259.95	7.11	136.32	4.55	N	N	N
68	114.2	7.2	3.82	7.28	A	A	A
69	100	12	-9.09	12.54	A	A	A
70	99.93	13.99	-9.15	14.46	A	A	A
71	115	8.09	4.55	7.92	A	A	A
74	105.7	6.3	-3.91	6.98	A	A	A
76	98.2	3.3	-10.73	4.95	A	A	A
77	109	6	-0.91	6.60	A	A	A
78	102.6	7.3	-6.73	7.99	A	A	A
80	283	5	157.27	4.04	N	N	N
82	106.6	8.5	-3.09	8.76	A	A	A
83	100	1.3	-9.09	3.86	A	A	A
84	117.6	1.2	6.91	3.78	A	A	A
85	102.3	31.7	-7.00	31.20	A	N	W
86	132	9.8	20.00	8.27	A	A	A
88	10.7	8.8	-90.27	82.32	N	N	N
89	124	4	12.73	4.86	A	N	W
92	108	14	-1.82	13.46	A	A	A
94	98.8	0.03	-10.18	3.64	A	N	W
95	111	9	0.91	8.89	A	A	A
99	117.8	7.5	7.09	7.33	A	A	A
100	127	10	15.45	8.67	A	A	A
101	99.9	10	-9.18	10.65	A	A	A
105	92.39	2.30	-16.01	4.41	A	N	W
107	109.7	1.0	-0.27	3.75	A	A	A
108	104.58	4.47	-4.93	5.61	A	A	A
110	136.40	7.21	24.00	6.42	A	N	W
113	103.52	5.22	-5.89	6.22	A	A	A

TABLE 36. Evaluation Results for Tl-208 in Sample 3, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
117	101.197	2.234	-8.00	4.25	A	A	A
118	99.74	11.63	-9.33	12.21	A	A	A
119	120.9	6.1	9.91	6.22	A	A	A
121	10.8	0.6	-90.18	6.64	N	N	N
122	114	10	3.64	9.50	A	A	A
123	128	7	16.36	6.57	A	A	A
124	127	7	15.45	6.60	A	A	A
125	107	6	-2.73	6.68	A	A	A
126	118	8	7.27	7.69	A	A	A
129	90	10	-18.18	11.69	A	A	A
131	91	5	-17.27	6.59	A	N	W
132	92.4	9.5	-16.00	10.91	A	A	A
133	131.7	8.0	19.73	7.08	A	N	W
138	120.11	7.21	9.19	7.02	A	A	A
140	112	4	1.82	5.10	A	A	A
143	109.9	6.7	-0.09	7.10	A	A	A
145	82.5	7.8	-25.00	10.13	A	A	A
147	109.33	3.42	-0.61	4.80	A	A	A
148	108	10	-1.82	9.95	A	A	A
149	109.6	2.9	-0.36	4.50	A	A	A
150	109.01	3.21	-0.90	4.68	A	A	A
151	108.2	6.18	-1.64	6.77	A	A	A
152	107.5	5.7	-2.27	6.43	A	A	A
156	117.2	3.8	6.55	4.87	A	A	A
157	234	17.6	112.73	8.35	N	N	N
159	105.9	2.2	-3.73	4.19	A	A	A
160	126	6	14.55	5.99	A	A	A
161	103	2.5	-6.36	4.37	A	A	A
162	98.6	6.4	-10.36	7.44	A	A	A
163	95.2	3.1	-13.45	4.88	A	N	W
164	98.2	4.2	-10.73	5.61	A	A	A
167	102	3	-7.27	4.68	A	A	A
170	105	5	-4.55	5.99	A	A	A
172	103.08	6.21	-6.29	7.04	A	A	A
176	112	2	1.82	4.05	A	A	A
178	106.6	8.6	-3.09	8.85	A	A	A
180	0.25049	0.00899405	-99.77	5.11	N	N	N
184	109	4	-0.91	5.17	A	A	A
185	99.743	7.277	-9.32	8.15	A	A	A
188	109.9	6.8	-0.09	7.18	A	A	A
191	104	11	-5.45	11.18	A	A	A
192	98	4	-10.91	5.47	A	A	A
195	101.1	9.5	-8.09	10.08	A	A	A
196	111.00	10.00	0.91	9.72	A	A	A
199	105	7	-4.55	7.59	A	A	A
202	273	16	148.18	6.90	N	N	N
205	102	6	-7.27	6.92	A	A	A
207	127	9	15.45	7.97	A	A	A
209	101.9	2.0	-7.36	4.13	A	A	A
210	98.3	10.1	-10.64	10.90	A	A	A
212	239	3.49	117.27	3.92	N	N	N
214	94.1	8	-14.45	9.25	A	A	A
216	117.47	11.75	6.79	10.64	A	A	A
217	123.7	5.8	12.45	5.93	A	A	A
218	106	3	-3.64	4.61	A	A	A
219	106	3	-3.64	4.61	A	A	A
220	124.1	6.2	12.82	6.18	A	A	A
222	312	11	183.64	5.06	N	N	N
223	98.4	5.5	-10.55	6.67	A	A	A
225	99.9	3.2	-9.18	4.85	A	A	A

TABLE 36. Evaluation Results for Tl-208 in Sample 3, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
226	97	2	-11.82	4.18	A	N	W
230	103	3.01	-6.36	4.67	A	A	A
231	80.3	0.8	-27.00	3.77	A	N	W
232	114	5	3.64	5.70	A	A	A
234	102.72	8.24	-6.62	8.81	A	A	A
239	102	5	-7.27	6.10	A	A	A
240	102.5	5.1	-6.82	6.16	A	A	A
245	101.47	10.39	-7.75	10.87	A	A	A
247	77.7	7.8	-29.36	10.68	A	N	W
250	117	5	6.36	5.61	A	A	A
258	107	7.81	-2.73	8.15	A	A	A
262	98	5	-10.91	6.27	A	A	A
263	108	6	-1.82	6.64	A	A	A
266	91.2	5.07	-17.09	6.64	A	A	A
268	111.613	5.653	1.47	6.24	A	A	A
269	50	2	-54.55	5.41	N	N	N
270	124.0	7.4	12.73	6.99	A	A	A
274	91.86	5.73	-16.49	7.22	A	A	A
275	96.29	4.67	-12.46	6.06	A	A	A
276	100.97	4.49	-8.21	5.74	A	A	A
278	98	6	-10.91	7.12	A	A	A
281	86.26	4.07	-21.58	5.96	A	N	W
282	99.2	9.3	-9.82	10.06	A	A	A
287	116	19	5.45	16.78	A	A	A
288	91.2	5.96	-17.09	7.48	A	A	A
292	104.88	7.87	-4.65	8.34	A	A	A
294	100	5	-9.09	6.18	A	A	A
295	98	11	-10.91	11.80	A	A	A
296	76.7	1.5	-30.27	4.13	N	N	N
301	102.4	9.8	-6.91	10.24	A	A	A
303	104.8	9.0	-4.73	9.33	A	A	A
306	97.3	2.85	-11.55	4.67	A	A	A
307	149.14	24.79	35.58	17.02	N	A	N
308	91.22	10.00	-17.07	11.55	A	A	A
310	97.36	8.11	-11.49	9.09	A	A	A
311	301.37	24.77	173.97	8.99	N	N	N
313	112	7	1.82	7.23	A	A	A
315	106	7	-3.64	7.54	A	A	A
317	83.0	8.0	-24.55	10.30	A	A	A
318	105.3	6.1	-4.27	6.84	A	A	A
320	97	6	-11.82	7.18	A	A	A
321	93.2	5.1	-15.27	6.57	A	A	A
324	94.44	0.9	-14.15	3.76	A	N	W
325	91.6	7.2	-16.73	8.66	A	A	A
326	105.3	1.0	-4.27	3.76	A	A	A
328	103.1	4.3	-6.27	5.53	A	A	A
334	146	6	32.73	5.49	N	N	N
336	104	5	-5.45	6.03	A	A	A
337	100.3	7.1	-8.82	7.96	A	A	A
338	104.9	3.4	-4.64	4.87	A	A	A
341	109.0	7.3	-0.91	7.62	A	A	A
343	105	6	-4.55	6.77	A	A	A
344	112.5	9.4	2.27	9.11	A	A	A
345	80	16	-27.27	20.33	A	A	A
346	107	6.1	-2.73	6.76	A	A	A
347	108	6.2	-1.82	6.80	A	A	A
348	104	3	-5.45	4.64	A	A	A
349	13.34	1.0	-87.87	8.33	N	N	N
353	78.6	4.2	-28.55	6.46	A	N	W
354	117	6	6.36	6.29	A	A	A

TABLE 36. Evaluation Results for Tl-208 in Sample 3, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
355	96.4	5.0	-12.36	6.33	A	A	A
358	101.0	20.2	-8.18	20.33	A	A	A
362	74.9	7.5	-31.91	10.65	N	N	N
364	88.5	5.9	-19.55	7.59	A	A	A
370	89.6	4.7	-18.55	6.38	A	N	W
371	114	6	3.64	6.40	A	A	A
373	128	7	16.36	6.57	A	A	A
383	108.1	6.0	-1.73	6.64	A	A	A
385	109.6	4.38	-0.36	5.40	A	A	A
386	37.0	1.5	-66.36	5.45	N	N	N
387	98.87	8.90	-10.12	9.71	A	A	A
391	283	10	157.27	5.07	N	N	N
393	91.3	7.2	-17.00	8.68	A	A	A
397	109	15	-0.91	14.23	A	A	A
405	303	14	175.45	5.88	N	N	N
407	114.0	5.2	3.64	5.83	A	A	A
408	103	9	-6.36	9.46	A	A	A
409	112.80	10.39	2.55	9.90	A	A	A
410	96.53	1.33	-12.25	3.89	A	N	W
412	92.2	2.0	-16.18	4.23	A	N	W
414	92.4	3.3	-16.00	5.10	A	N	W
415	104.4	4.8	-5.09	5.86	A	A	A
418	112	10	1.82	9.64	A	A	A
419	106.45	7.40	-3.23	7.85	A	A	A
421	95	4.0	-13.64	5.56	A	A	A
423	99.910	13.510	-9.17	14.00	A	A	A
425	177.7	7.3	61.55	5.49	N	N	N
432	97	6	-11.82	7.18	A	A	A
436	96	5	-12.73	6.35	A	A	A
441	111	47	0.91	42.50	A	N	W
443	105	3	-4.55	4.62	A	A	A
445	85.70	2.49	-22.09	4.65	A	N	W
446	107.9	5.0	-1.91	5.89	A	A	A
449	242.4	6.7	120.36	4.57	N	N	N
453	88.5	9.7	-19.55	11.55	A	A	A
454	100	6	-9.09	7.02	A	A	A
455	98	6	-10.91	7.12	A	A	A
457	107	7	-2.73	7.48	A	A	A
461	90.37	0.37	-17.85	3.66	A	N	W
464	312	16	183.64	6.29	N	N	N
465	109.8	9.6	-0.18	9.47	A	A	A
475	120	2	9.09	4.00	A	A	A
478	80.12	3.08	-27.16	5.29	A	N	W
484	123.4906	5.7439	12.26	5.90	A	A	A
487	104	5	-5.45	6.03	A	A	A
490	112.85828	4.59192	2.60	5.46	A	A	A
491	315.04	9.69	186.40	4.76	N	N	N
492	96.7	5.6	-12.09	6.84	A	A	A
498	27.11	1.13	-75.35	5.53	N	N	N
501	105.7	2.45	-3.91	4.31	A	A	A
507	110	10	0.00	9.79	A	A	A
515	107.31	6.29	-2.45	6.90	A	A	A
516	106	6	-3.64	6.73	A	A	A

U-238 Determination in Sample 3 by Gamma-ray Spectrometry

TABLE 37. Target values

Parameter	Value
Activity concentration [Bq/kg]	246
Uncertainty [Bq/kg]	11
Maximum Acceptable Relative Bias [%]	30

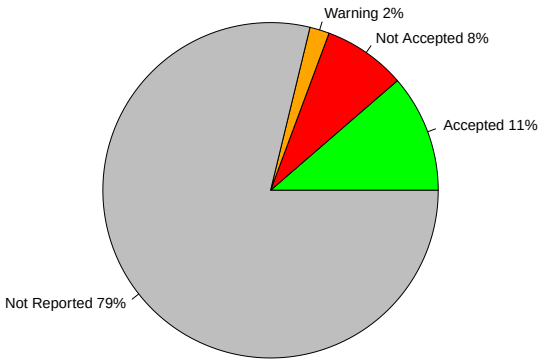

FIGURE 37. Percentage of Accepted vs. Warnings vs. Not Accepted vs. Not Reported results

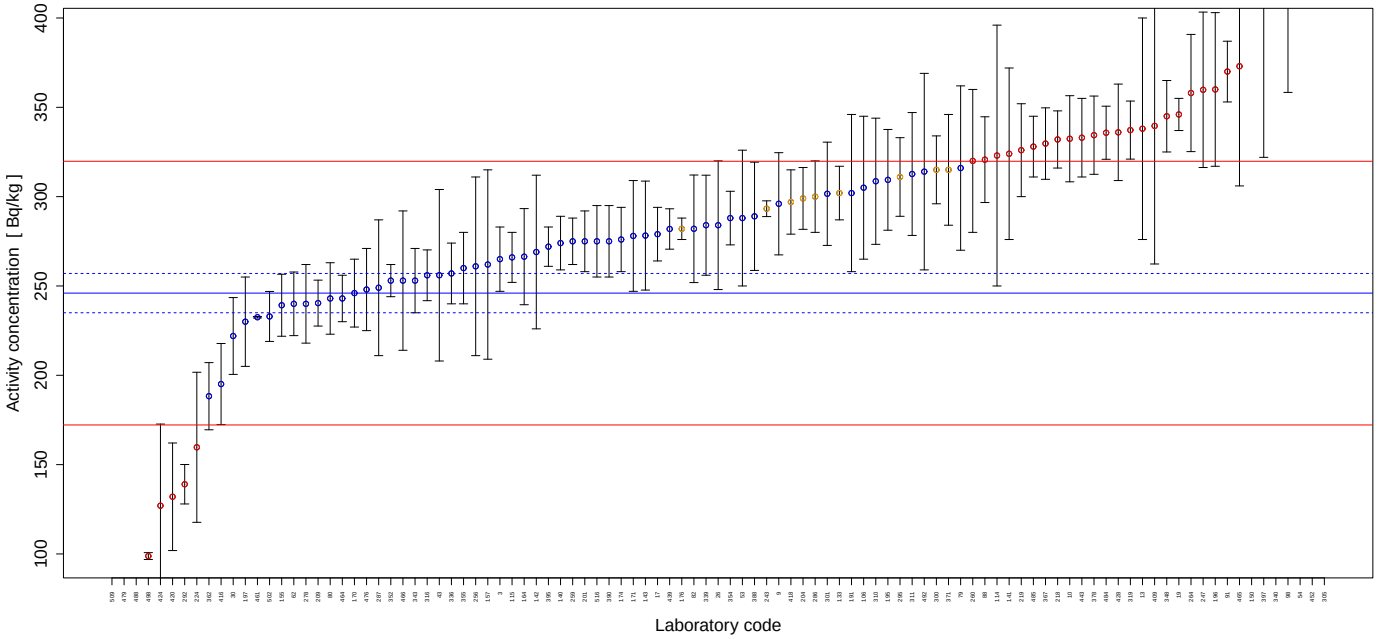

FIGURE 38. Reported results and evaluation parameters for U-238 by Gamma-ray Spectrometry. Blue points represent accepted scores, whereas yellow and red represent warning and not accepted scores, respectively.

TABLE 38. Evaluation Results for U-238 in Sample 3, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
3	265	18	7.72	8.13	A	A	A
9	296	28.6	20.33	10.65	A	A	A
10	332.4	24.1	35.12	8.52	N	N	N
13	338	62	37.40	18.88	N	A	N
17	279	15	13.41	6.99	A	A	A
19	346	9	40.65	5.17	N	N	N
26	284	36	15.45	13.44	A	A	A
30	222	21.5	-9.76	10.67	A	A	A
43	256	48	4.07	19.28	A	A	A
53	288	38	17.07	13.93	A	A	A
54	522.2	48.5	112.28	10.31	N	N	N
62	240	17.8	-2.44	8.66	A	A	A
79	316	46	28.46	15.23	A	A	A
80	243	20	-1.22	9.37	A	A	A
82	282.0	30.1	14.63	11.57	A	A	A
88	320.7	24.0	30.37	8.72	N	N	N
91	370	17	50.41	6.41	N	N	N
98	464.66	106.31	88.89	23.31	N	N	N
106	305	40	23.98	13.86	A	A	A
114	323	73	31.30	23.04	N	A	N
115	266	14	8.13	6.91	A	A	A
133	302	15	22.76	6.68	A	N	W
140	274	15	11.38	7.07	A	A	A
141	324	48	31.71	15.47	N	A	N
142	269	43	9.35	16.60	A	A	A
143	278.2	30.5	13.09	11.84	A	A	A
150	437.96	22.57	78.03	6.82	N	N	N
155	239.21	17.35	-2.76	8.52	A	A	A
157	262	53	6.50	20.72	A	A	A
164	266.4	26.9	8.29	11.04	A	A	A
170	246	19	0.00	8.92	A	A	A
171	278	31	13.01	12.01	A	A	A
174	276	18	12.20	7.91	A	A	A
176	282	6	14.63	4.95	A	N	W
191	302	44	22.76	15.24	A	A	A
195	309.4	28.2	25.77	10.15	A	A	A
196	360.00	43.00	46.34	12.75	N	N	N
197	230	25	-6.50	11.75	A	A	A
201	275	17	11.79	7.63	A	A	A
204	299.0	17.3	21.54	7.31	A	N	W
209	240.41	12.85	-2.27	6.97	A	A	A
218	332	16	34.96	6.57	N	N	N
219	326	26	32.52	9.14	N	N	N
224	159.7	42	-35.08	26.68	N	A	N
243	293.24	4.41	19.20	4.72	A	N	W
247	359.8	43.5	46.26	12.89	N	N	N
256	261	50	6.10	19.67	A	A	A
259	275	13	11.79	6.51	A	A	A
260	320	40	30.08	13.28	N	A	N
264	358	32.8	45.53	10.19	N	N	N
278	240	22	-2.44	10.20	A	A	A
286	300	20	21.95	8.03	A	N	W
287	249	38	1.22	15.90	A	A	A
292	139.02	11.04	-43.49	9.11	N	N	N
295	311	22	26.42	8.37	A	N	W
300	315	19	28.05	7.51	A	N	W
301	301.6	28.9	22.60	10.57	A	A	A
305	815.2	122.2	231.38	15.64	N	N	N
310	308.61	35.31	25.45	12.28	A	A	A
311	312.67	34.39	27.10	11.87	A	A	A

TABLE 38. Evaluation Results for U-238 in Sample 3, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
316	255.97	14.21	4.05	7.13	A	A	A
319	337.25	16.25	37.09	6.57	N	N	N
336	257	17	4.47	7.98	A	A	A
339	284	28	15.45	10.83	A	A	A
340	446	23	81.30	6.83	N	N	N
343	253	18	2.85	8.40	A	A	A
348	345	20	40.24	7.32	N	N	N
352	253	9	2.85	5.71	A	A	A
354	288	15	17.07	6.86	A	A	A
355	260	20	5.69	8.90	A	A	A
362	188.3	18.8	-23.46	10.94	A	A	A
367	329.7	20.0	34.02	7.54	N	N	N
371	315	31	28.05	10.81	A	N	W
378	334.4	21.9	35.93	7.93	N	N	N
388	289	30.3	17.48	11.40	A	A	A
390	275	20	11.79	8.54	A	A	A
395	272	11	10.57	6.03	A	A	A
397	440	118	78.86	27.19	N	N	N
409	339.59	77.29	38.04	23.19	N	A	N
416	195.1	22.7	-20.69	12.46	A	A	A
418	297	18	20.73	7.53	A	N	W
420	132.0	30.1	-46.34	23.24	N	A	N
424	127	45.7	-48.37	36.26	N	N	N
428	336	27	36.59	9.20	N	N	N
439	281.9	11.3	14.59	6.01	A	A	A
443	333	22	35.37	7.98	N	N	N
452	542	98.15	120.33	18.65	N	N	N
461	232.5	0.4	-5.49	4.47	A	A	A
464	243	13	-1.22	6.97	A	A	A
465	373.0	67.0	51.63	18.51	N	N	N
466	253	39	2.85	16.05	A	A	A
476	248	23	0.81	10.30	A	A	A
479	37.9	5.7	-84.59	15.69	N	N	N
484	335.7657	14.8549	36.49	6.29	N	N	N
485	328	17	33.33	6.85	N	N	N
488	38.03	8.95	-84.54	23.96	N	N	N
492	314	55	27.64	18.08	A	A	A
498	98.81	1.92	-59.83	4.88	N	N	N
502	232.94	13.98	-5.31	7.48	A	A	A
509	28.65	3.16	-88.35	11.90	N	N	N
516	275	20	11.79	8.54	A	A	A

Pb-210 Determination in Sample 3 by Gamma-ray Spectrometry

TABLE 39. Target values

Parameter	Value
Activity concentration [Bq/kg]	306
Uncertainty [Bq/kg]	17
Maximum Acceptable Relative Bias [%]	30

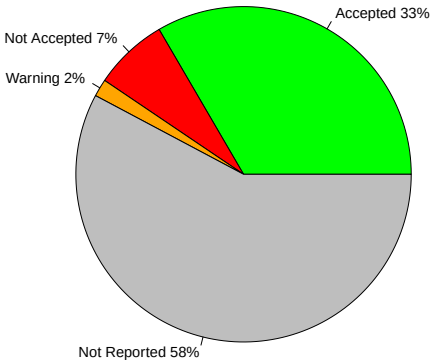

FIGURE 39. Percentage of Accepted vs. Warnings vs. Not Accepted vs. Not Reported results

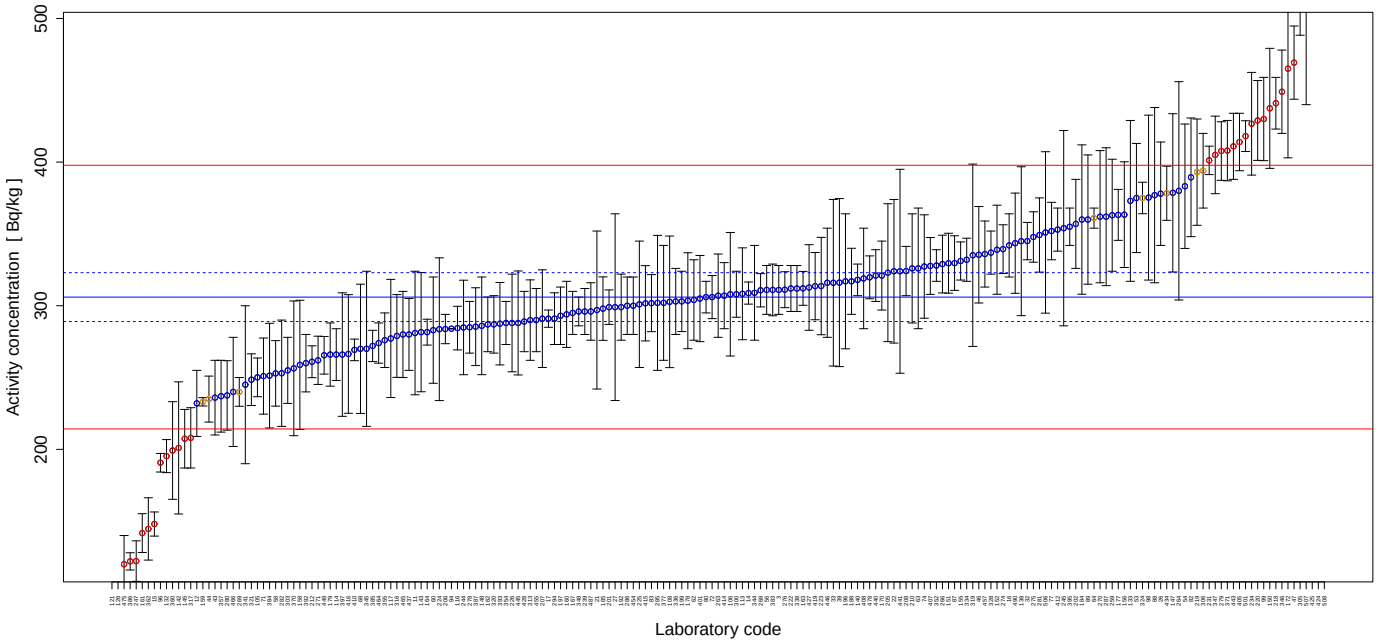

FIGURE 40. Reported results and evaluation parameters for Pb-210 by Gamma-ray Spectrometry. Blue points represent accepted scores, whereas yellow and red represent warning and not accepted scores, respectively.

TABLE 40. Evaluation Results for Pb-210 in Sample 3, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
3	311	17	1.63	7.79	A	A	A
11	281	43	-8.17	16.28	A	A	A
12	232	23	-24.18	11.36	A	A	A
14	308.81	7.70	0.92	6.09	A	A	A
15	148	8.4	-51.63	7.94	N	N	N
16	342	22	11.76	8.50	A	A	A
17	291	6	-4.90	5.93	A	A	A
21	297	55	-2.94	19.33	A	A	A
22	324	50	5.88	16.40	A	A	A
26	378	36	23.53	11.03	A	A	A
27	299	65	-2.29	22.44	A	A	A
32	345	13	12.75	6.71	A	A	A
33	316	58	3.27	19.18	A	A	A
39	316.1	58.5	3.30	19.32	A	A	A
43	236	26	-22.88	12.34	A	A	A
44	235	16	-23.20	8.79	A	N	W
46	335.5	33.6	9.64	11.45	A	A	A
47	469.27	25.48	53.36	7.77	N	N	N
53	375	38	22.55	11.56	A	A	A
54	383.2	43.3	25.23	12.59	A	A	A
56	311	17	1.63	7.79	A	A	A
58	252.9	22.8	-17.35	10.59	A	A	A
60	283	37	-7.52	14.21	A	A	A
62	304	28	-0.65	10.76	A	A	A
63	326.0	42.0	6.54	14.03	A	A	A
64	361	7	17.97	5.88	A	N	W
68	270	45	-11.76	17.57	A	A	A
71	251	26.5	-17.97	11.93	A	A	A
72	306	15	0.00	7.41	A	A	A
74	327.3	36.0	6.96	12.32	A	A	A
77	352	20	15.03	7.95	A	A	A
80	306	11	0.00	6.62	A	A	A
82	389.4	41.3	27.25	11.97	A	A	A
83	301.8	19.87	-1.37	8.61	A	A	A
87	329.7	19	7.75	8.00	A	A	A
88	377.0	61.0	23.20	17.11	A	A	A
89	360	45	17.65	13.68	A	A	A
94	284	0.16	-7.19	5.56	A	A	A
96	190.69	6.48	-37.68	6.51	N	N	N
98	375.28	57.41	22.64	16.28	A	A	A
99	430	29	40.52	8.74	N	N	N
105	250.13	13.48	-18.26	7.74	A	A	A
106	308	43	0.65	15.03	A	A	A
108	302.71	45.80	-1.08	16.12	A	A	A
113	308.31	31.98	0.75	11.77	A	A	A
114	266	18	-13.07	8.76	A	A	A
116	284.43	15.19	-7.05	7.71	A	A	A
117	277.217	41.135	-9.41	15.84	A	A	A
121	39.4	13.0	-87.12	33.46	N	N	N
126	75.1	7.5	-75.46	11.43	N	N	N
132	195.3	11.5	-36.18	8.10	N	N	N
133	373	56	21.90	16.01	A	A	A
138	344.93	51.84	12.72	16.02	A	A	A
140	318	11	3.92	6.54	A	A	A
142	201	46	-34.31	23.55	N	A	N
143	281.6	41.5	-7.97	15.75	A	A	A
145	207.4	20.4	-32.22	11.30	N	N	N
147	378.60	55.09	23.73	15.58	A	A	A
148	286	34	-6.54	13.12	A	A	A
150	437.43	41.78	42.95	11.05	N	N	N

TABLE 40. Evaluation Results for Pb-210 in Sample 3, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
151	329.6	20.85	7.71	8.42	A	A	A
152	339	31	10.78	10.70	A	A	A
155	331.16	13.27	8.22	6.85	A	A	A
156	363.4	36.8	18.76	11.55	A	A	A
158	258.8	45.0	-15.42	18.25	A	A	A
159	233.1	2.9	-23.82	5.69	A	N	W
160	294	23	-3.92	9.60	A	A	A
161	141.7	13.5	-53.69	11.03	N	N	N
162	287	19	-6.21	8.64	A	A	A
163	312.1	11.8	1.99	6.72	A	A	A
164	281.6	9.0	-7.97	6.41	A	A	A
167	295	15	-3.59	7.53	A	A	A
170	321	24	4.90	9.31	A	A	A
172	465.09	62.11	51.99	14.46	N	N	N
177	363.26	17.74	18.71	7.40	A	A	A
178	303.5	33.4	-0.82	12.33	A	A	A
179	266	22	-13.07	9.96	A	A	A
184	360	52	17.65	15.48	A	A	A
185	297.991	22.092	-2.62	9.26	A	A	A
188	317	23	3.59	9.14	A	A	A
192	299	23	-2.29	9.49	A	A	A
196	317.00	47.00	3.59	15.83	A	A	A
197	293	20	-4.25	8.80	A	A	A
199	303	21	-0.98	8.88	A	A	A
201	299	12	-2.29	6.85	A	A	A
202	357	31	16.67	10.31	A	A	A
205	323	48	5.56	15.87	A	A	A
206	283.77	10.20	-7.26	6.62	A	A	A
207	291	34	-4.90	12.94	A	A	A
208	324.15	17.16	5.93	7.67	A	A	A
210	326	38	6.54	12.91	A	A	A
212	261	11.1	-14.71	7.00	A	A	A
218	441	18	44.12	6.89	N	N	N
219	393	37	28.43	10.93	A	N	W
220	429.0	27.8	40.20	8.54	N	N	N
222	312	16	1.96	7.56	A	A	A
223	313.7	33.9	2.52	12.15	A	A	A
224	283.65	49.7	-7.30	18.38	A	A	A
225	301	44	-1.63	15.64	A	A	A
226	288	34	-5.88	13.05	A	A	A
231	401.2	9.9	31.11	6.08	N	N	N
234	426.70	35.76	39.44	10.05	N	N	N
239	296	16	-3.27	7.75	A	A	A
244	284.87	32.90	-6.91	12.82	A	A	A
245	354	68	15.69	20.00	A	A	A
247	122.2	14.1	-60.07	12.81	N	N	N
259	363	39	18.63	12.10	A	A	A
263	307	29	0.33	10.96	A	A	A
264	380	76	24.18	20.76	A	A	A
266	329	20.1	7.52	8.26	A	A	A
268	310.763	11.587	1.56	6.69	A	A	A
269	240	10	-21.57	6.94	A	N	W
270	362	46	18.30	13.87	A	A	A
271	262.0	16.8	-14.38	8.48	A	A	A
274	339.39	16.97	10.91	7.47	A	A	A
275	347.85	17.54	13.68	7.50	A	A	A
276	311.16	12.51	1.69	6.86	A	A	A
278	285	18	-6.86	8.41	A	A	A
279	407.7	20.4	33.24	7.48	N	N	N
280	237.55	24.18	-22.37	11.60	A	A	A

TABLE 40. Evaluation Results for Pb-210 in Sample 3, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
281	349.24	25.83	14.13	9.25	A	A	A
282	253	37	-17.32	15.64	A	A	A
285	302	47	-1.31	16.52	A	A	A
286	300	20	-1.96	8.68	A	A	A
287	362	48	18.30	14.38	A	A	A
294	291	18	-4.90	8.31	A	A	A
300	308	16	0.65	7.61	A	A	A
303	255	23	-16.67	10.59	A	A	A
305	513	24.66	67.65	7.35	N	N	N
306	394	26	28.76	8.63	A	N	W
313	290	28	-5.23	11.14	A	A	A
316	278.94	28.8	-8.84	11.72	A	A	A
317	208.0	21.0	-32.03	11.52	N	N	N
319	335.14	63.47	9.52	19.74	A	A	A
320	287	20	-6.21	8.91	A	A	A
321	248.5	18	-18.79	9.13	A	A	A
324	375.02	10.96	22.56	6.28	A	N	W
328	337	15	10.13	7.12	A	A	A
334	332	15	8.50	7.16	A	A	A
336	303	23	-0.98	9.41	A	A	A
338	312	16	1.96	7.56	A	A	A
341	245	55	-19.93	23.13	A	A	A
344	309	33	0.98	12.04	A	A	A
345	270	54	-11.76	20.76	A	A	A
346	449	29	46.73	8.52	N	N	N
347	405	27	32.35	8.68	N	N	N
348	296	10	-3.27	6.50	A	A	A
352	328	11	7.19	6.49	A	A	A
354	288	15	-5.88	7.62	A	A	A
355	276	19	-9.80	8.85	A	A	A
357	237	25	-22.55	11.92	A	A	A
360	199.2	33.99	-34.90	17.94	N	A	N
362	144.6	21.7	-52.75	16.00	N	N	N
370	256.4	46.9	-16.21	19.12	A	A	A
371	408	21	33.33	7.57	N	N	N
377	302	40	-1.31	14.36	A	A	A
383	311	18	1.63	8.02	A	A	A
384	251.32	36.43	-17.87	15.52	A	A	A
385	272	10.88	-11.11	6.85	A	A	A
386	122	6	-60.13	7.42	N	N	N
387	285.42	27.09	-6.73	11.00	A	A	A
392	260	20	-15.03	9.49	A	A	A
393	287.5	28.7	-6.05	11.42	A	A	A
395	355	13	16.01	6.65	A	A	A
397	266	43	-13.07	17.09	A	A	A
401	305	30	-0.33	11.30	A	A	A
405	414	20	35.29	7.36	N	N	N
407	327.7	19.8	7.09	8.21	A	A	A
408	319	35	4.25	12.30	A	A	A
410	269.26	7.51	-12.01	6.22	A	A	A
412	353	15	15.36	6.99	A	A	A
414	307	23	0.33	9.33	A	A	A
415	301.7	26.2	-1.41	10.31	A	A	A
416	266.4	41.3	-12.94	16.47	A	A	A
419	313.65	23.41	2.50	9.30	A	A	A
424	717	93.2	134.31	14.14	N	N	N
425	643	56	110.13	10.33	N	N	N
427	312.7	29.8	2.19	11.03	A	A	A
428	289	21	-5.56	9.15	A	A	A
434	378.31	18.83	23.63	7.46	A	N	W

TABLE 40. Evaluation Results for Pb-210 in Sample 3, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
437	280	25	-8.50	10.52	A	A	A
440	321	18	4.90	7.89	A	A	A
441	324	71	5.88	22.61	A	A	A
443	411	23	34.31	7.89	N	N	N
445	288.00	36.20	-5.88	13.74	A	A	A
446	316	38	3.27	13.25	A	A	A
449	265.5	13.1	-13.24	7.43	A	A	A
454	300	20	-1.96	8.68	A	A	A
455	290	22	-5.23	9.40	A	A	A
457	336	23	9.80	8.82	A	A	A
464	274	14	-10.46	7.55	A	A	A
465	280.0	30.0	-8.50	12.07	A	A	A
466	240	38	-21.57	16.78	A	A	A
475	120	20	-60.78	17.57	N	N	N
478	319.77	14.93	4.50	7.26	A	A	A
487	296	20	-3.27	8.75	A	A	A
490	343.54883	34.88214	12.27	11.57	A	A	A
501	418.1	10.7	36.63	6.12	N	N	N
506	351.03	56.2	14.72	16.95	A	A	A
507	590	150	92.81	26.02	N	N	N
508	2750	680	798.69	25.34	N	N	N

K-40 Determination in Sample 3 by Gamma-ray Spectrometry

TABLE 41. Target values

Parameter	Value
Activity concentration [Bq/kg]	873
Uncertainty [Bq/kg]	44
Maximum Acceptable Relative Bias [%]	30

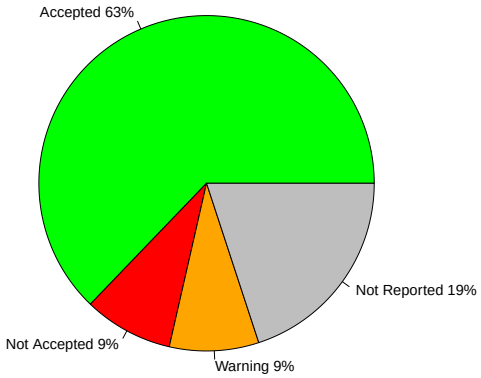

FIGURE 41. Percentage of Accepted vs. Warnings vs. Not Accepted vs. Not Reported results

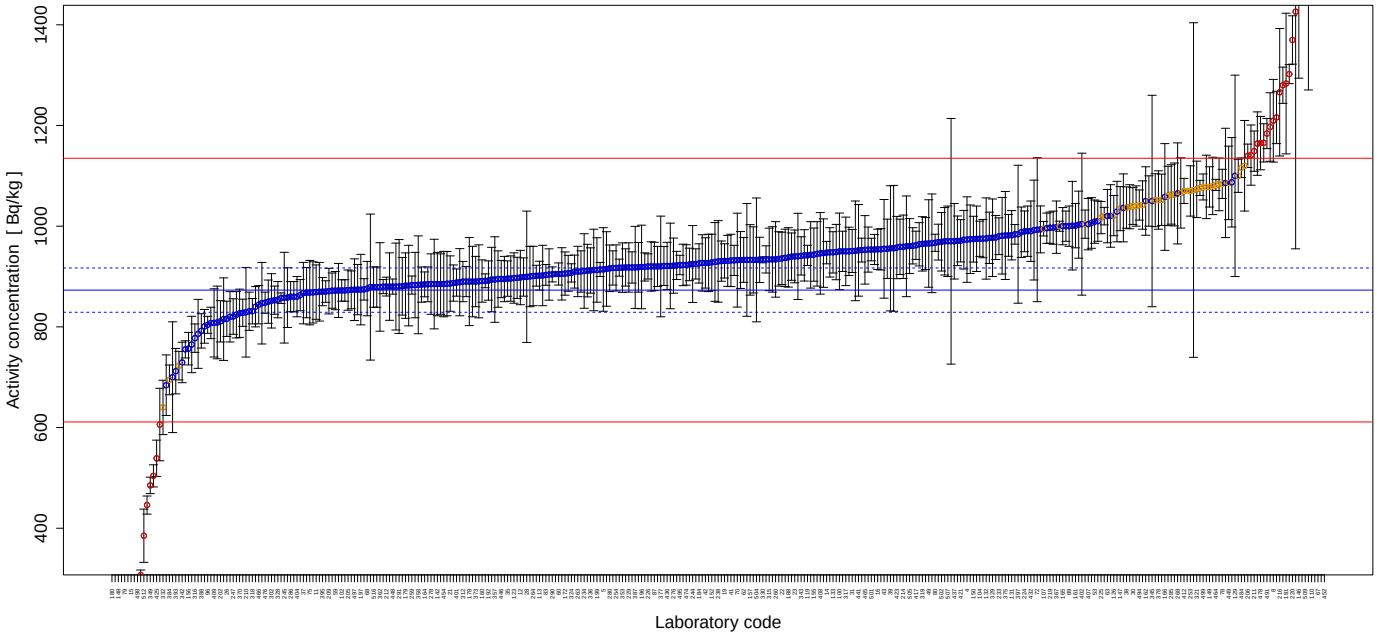

FIGURE 42. Reported results and evaluation parameters for K-40 by Gamma-ray Spectrometry. Blue points represent accepted scores, whereas yellow and red represent warning and not accepted scores, respectively.

TABLE 42. Evaluation Results for K-40 in Sample 3, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
1	973.1	58.2	11.47	7.82	A	A	A
3	879	40	0.69	6.79	A	A	A
4	973.39	84.88	11.50	10.07	A	A	A
5	914	83	4.70	10.39	A	A	A
6	934	65	6.99	8.59	A	A	A
8	1209.46	82.12	38.54	8.46	N	N	N
9	940	85.6	7.67	10.41	A	A	A
10	1083.0	52.3	24.05	6.98	A	N	W
11	869	54	-0.46	8.00	A	A	A
12	898	54	2.86	7.85	A	A	A
13	828	27	-5.15	6.00	A	A	A
14	947.48	22.26	8.53	5.56	A	A	A
15	129	7.74	-85.22	7.84	N	N	N
16	954	40	9.28	6.56	A	A	A
17	922	28	5.61	5.88	A	A	A
19	931	34	6.64	6.22	A	A	A
21	886	55	1.49	8.00	A	A	A
22	936	52	7.22	7.50	A	A	A
23	940	52.45	7.67	7.52	A	A	A
24	1141.2	59.8	30.72	7.27	N	N	N
25	1165.48	37.95	33.50	6.00	N	N	N
26	816	35	-6.53	6.62	A	A	A
27	948	49	8.59	7.22	A	A	A
28	899.5	130.4	3.04	15.35	A	A	A
30	1040	36.5	19.13	6.14	A	N	W
31	950.69	42.78	8.90	6.76	A	A	A
32	961	36	10.08	6.28	A	A	A
33	956	125	9.51	14.01	A	A	A
34	870.14	21.42	-0.33	5.61	A	A	A
35	895.9	35.1	2.62	6.38	A	A	A
36	874.43	21.22	0.16	5.59	A	A	A
37	867	61	-0.69	8.65	A	A	A
38	1037	41	18.79	6.41	A	N	W
39	956.0	124.3	9.51	13.94	A	A	A
40	884	35	1.26	6.41	A	A	A
41	932	52	6.76	7.52	A	A	A
42	927	50	6.19	7.38	A	A	A
43	955	98	9.39	11.43	A	A	A
44	951	99	8.93	11.57	A	A	A
45	923	41.2	5.73	6.73	A	A	A
46	1085.9	108.6	24.39	11.20	A	A	A
47	976.87	50.94	11.90	7.25	A	A	A
49	965.6	86.9	10.61	10.31	A	A	A
51	872.27	53.72	-0.08	7.96	A	A	A
53	1009	43	15.58	6.60	A	A	A
54	872	35	-0.11	6.44	A	A	A
55	924	32.3	5.84	6.13	A	A	A
56	964	43	10.42	6.73	A	A	A
58	952.5	23.7	9.11	5.62	A	A	A
59	872	38	-0.11	6.66	A	A	A
60	905	22	3.67	5.60	A	A	A
62	933	44.6	6.87	6.95	A	A	A
63	1020.0	53.0	16.84	7.24	A	A	A
64	1000	30	14.55	5.87	A	A	A
67	1902	56	117.87	5.84	N	N	N
68	876	54	0.34	7.96	A	A	A
69	933	112	6.87	13.02	A	A	A
70	932.56	93.26	6.82	11.20	A	A	A
71	974	68	11.57	8.61	A	A	A
72	993	143	13.75	15.26	A	A	A

TABLE 42. Evaluation Results for K-40 in Sample 3, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
74	1006.4	50.3	15.28	7.10	A	A	A
75	868	64	-0.57	8.93	A	A	A
76	913	81	4.58	10.20	A	A	A
77	970	67	11.11	8.55	A	A	A
78	1084	29	24.17	5.71	A	N	W
79	85	5	-90.26	7.75	N	N	N
80	967	17	10.77	5.34	A	A	A
82	932.8	56.5	6.85	7.88	A	A	A
83	903.18	20.55	3.46	5.53	A	A	A
84	1076	15	23.25	5.23	A	N	W
85	1071.8	332.3	22.77	31.41	A	N	W
86	929	78.2	6.41	9.81	A	A	A
87	920	48	5.38	7.25	A	A	A
88	965.4	51.7	10.58	7.35	A	A	A
89	1000	40	14.55	6.43	A	A	A
91	1042	48	19.36	6.83	A	N	W
92	960	100	9.97	11.57	A	A	A
93	981	76.1	12.37	9.25	A	A	A
94	1070	0.45	22.57	5.04	A	N	W
95	915	74	4.81	9.53	A	A	A
96	804.02	16.88	-7.90	5.46	A	A	A
98	948.58	54.97	8.66	7.68	A	A	A
99	966	98	10.65	11.33	A	A	A
100	950	76	8.82	9.46	A	A	A
101	882	80	1.03	10.38	A	A	A
102	872.29	21.32	-0.08	5.60	A	A	A
104	975	35	11.68	6.19	A	A	A
105	1063.0	62.4	21.76	7.74	A	N	W
106	1010	40	15.69	6.41	A	A	A
107	995.0	14.4	13.97	5.24	A	N	W
108	953.53	44.78	9.22	6.89	A	A	A
109	1020	17.4	16.84	5.32	A	N	W
110	1765.02	50	102.18	5.78	N	N	N
113	901.73	28.65	3.29	5.96	A	A	A
114	942	51	7.90	7.40	A	A	A
116	905.285	51.925	3.70	7.64	A	A	A
117	997.025	32.905	14.21	6.02	A	A	A
118	968.34	35.58	10.92	6.24	A	A	A
119	942	20	7.90	5.47	A	A	A
121	88.9	5.9	-89.82	8.33	N	N	N
122	874	50	0.11	7.62	A	A	A
123	897	50	2.75	7.51	A	A	A
124	904	51	3.55	7.57	A	A	A
125	1164	63	33.33	7.40	N	N	N
126	1021	40	16.95	6.38	A	N	W
129	1100	200	26.00	18.87	A	A	A
131	982	49	12.49	7.09	A	A	A
132	975.5	80.7	11.74	9.69	A	A	A
133	948	41	8.59	6.64	A	A	A
134	152.6	0.23	-82.52	5.04	N	N	N
135	885	60	1.37	8.45	A	A	A
138	801.01	33.47	-8.25	6.55	A	A	A
140	925	30	5.96	5.99	A	A	A
141	879	145	0.69	17.25	A	A	A
142	885	63	1.37	8.72	A	A	A
143	981.7	41.5	12.45	6.58	A	A	A
144	1080	57	23.71	7.30	A	N	W
145	946.5	68	8.42	8.78	A	A	A
146	1469	175	68.27	12.94	N	N	N
147	1034.89	43.82	18.54	6.58	A	N	W

TABLE 42. Evaluation Results for K-40 in Sample 3, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
148	39.5	2.0	-95.48	7.14	N	N	N
149	1078	40	23.48	6.26	A	N	W
150	974.20	45.45	11.59	6.87	A	A	A
151	911.8	52.25	4.44	7.63	A	A	A
152	928	56	6.30	7.86	A	A	A
155	943.53	52.83	8.08	7.53	A	A	A
156	756.7	32.3	-13.32	6.60	A	A	A
157	933	70	6.87	9.04	A	A	A
158	820.0	50.0	-6.07	7.91	A	A	A
159	953.7	29.9	9.24	5.94	A	A	A
160	891	42	2.06	6.90	A	A	A
161	1001	44	14.66	6.69	A	A	A
162	1050	68	20.27	8.21	A	A	A
163	755.3	17.1	-13.48	5.53	A	A	A
164	884.4	24.7	1.31	5.76	A	A	A
165	1000	37.0	14.55	6.25	A	A	A
166	1058	106	21.19	11.22	A	A	A
167	934	27	6.99	5.81	A	A	A
168	919	28	5.27	5.89	A	A	A
169	1066.0	69.775	22.11	8.26	A	N	W
170	765	56	-12.37	8.89	A	A	A
171	927	57	6.19	7.95	A	A	A
172	905.88	42.94	3.77	6.92	A	A	A
174	937	57	7.33	7.90	A	A	A
176	914	14	4.70	5.27	A	A	A
178	890.0	87.5	1.95	11.05	A	A	A
179	882	65	1.03	8.93	A	A	A
180	0.86068	0.017179	-99.90	5.42	N	N	N
181	1283.3	139.7	47.00	12.00	N	N	N
184	926	39	6.07	6.57	A	A	A
185	808.769	72.191	-7.36	10.25	A	A	A
186	307	10	-64.83	6.00	N	N	N
187	1100.02	32.90	26.00	5.86	A	N	W
188	938	59	7.45	8.06	A	A	A
191	918	31	5.15	6.07	A	A	A
192	892	39	2.18	6.67	A	A	A
195	885.8	63.8	1.47	8.79	A	A	A
196	919.00	83.00	5.27	10.34	A	A	A
197	874	70	0.11	9.46	A	A	A
199	913	64	4.58	8.63	A	A	A
201	1040	40	19.13	6.34	A	N	W
202	811	41	-7.10	7.14	A	A	A
204	970.9	49.3	11.21	7.15	A	A	A
205	873	40	0.00	6.81	A	A	A
206	1139.80	23.26	30.56	5.44	N	N	N
207	975	65	11.68	8.36	A	A	A
209	871.0	45.3	-0.23	7.24	A	A	A
210	829	89	-5.04	11.86	A	A	A
211	1149	40	31.62	6.13	N	N	N
212	880	18.7	0.80	5.47	A	A	A
213	901.6	20.69	3.28	5.54	A	A	A
214	959	63	9.85	8.28	A	A	A
216	1266.07	126.61	45.03	11.20	N	N	N
217	1004	28	15.01	5.76	A	N	W
218	932	30	6.76	5.98	A	A	A
219	997	31	14.20	5.92	A	A	A
220	1369.9	48.0	56.92	6.14	N	N	N
222	927	56	6.19	7.87	A	A	A
223	897.4	40.9	2.79	6.80	A	A	A
224	989.76	40.5	13.37	6.49	A	A	A

TABLE 42. Evaluation Results for K-40 in Sample 3, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
225	1017	32	16.49	5.94	A	N	W
226	920	25	5.38	5.73	A	A	A
229	918	49	5.15	7.34	A	A	A
230	1029	60.1	17.87	7.71	A	A	A
231	857.0	10.4	-1.83	5.18	A	A	A
232	918	37	5.15	6.45	A	A	A
233	980.0	36.5	12.26	6.27	A	A	A
234	910.97	74.00	4.35	9.56	A	A	A
238	930	81	6.53	10.06	A	A	A
240	910	41	4.24	6.76	A	A	A
242	895	56	2.52	8.03	A	A	A
243	1302.08	18.88	49.15	5.24	N	N	N
244	924.84	76.40	5.94	9.68	A	A	A
245	858.00	90.13	-1.72	11.65	A	A	A
247	820.5	35.3	-6.01	6.63	A	A	A
251	977.57	43.76	11.98	6.74	A	A	A
253	1070	50	22.57	6.87	A	N	W
254	917	45.8	5.04	7.10	A	A	A
256	863	31	-1.15	6.19	A	A	A
258	1003	66.6	14.89	8.34	A	A	A
259	883	18	1.15	5.44	A	A	A
260	934	75	6.99	9.48	A	A	A
261	918.34	49.37	5.19	7.37	A	A	A
262	1120	90	28.29	9.49	A	N	W
263	910	50	4.24	7.46	A	A	A
264	901	59	3.21	8.26	A	A	A
266	1060	59	21.42	7.51	A	N	W
268	1065.100	100.330	22.00	10.68	A	A	A
269	860	30	-1.49	6.13	A	A	A
270	606	72	-30.58	12.91	N	A	N
271	931.1	50.6	6.66	7.41	A	A	A
274	1051.53	52.58	20.45	7.10	A	N	W
275	1052.5	50.98	20.56	6.99	A	N	W
276	921.61	54.78	5.57	7.79	A	A	A
277	786.09	68.49	-9.96	10.07	A	A	A
278	885	60	1.37	8.45	A	A	A
279	939.5	47	7.62	7.10	A	A	A
280	916.3	46.31	4.96	7.14	A	A	A
281	807.76	31.20	-7.47	6.35	A	A	A
282	847	81	-2.98	10.81	A	A	A
285	1063	59	21.76	7.50	A	N	W
286	860	30	-1.49	6.13	A	A	A
287	921	85	5.50	10.52	A	A	A
290	904.20	14.93	3.57	5.30	A	A	A
291	880.173	93.247	0.82	11.73	A	A	A
292	884.48	34.56	1.32	6.38	A	A	A
294	902	60	3.32	8.35	A	A	A
295	933	45	6.87	6.98	A	A	A
296	999.9	10.0	14.54	5.14	A	N	W
298	1036.4	67.5	18.72	8.24	A	A	A
300	896	45	2.63	7.12	A	A	A
301	890.4	72.5	1.99	9.58	A	A	A
302	851.7	54	-2.44	8.10	A	A	A
303	955	59	9.39	7.97	A	A	A
305	1840	70	110.77	6.31	N	N	N
306	850	43	-2.63	7.14	A	A	A
307	1757.36	486.80	101.30	28.16	N	N	N
308	815.32	82.00	-6.61	11.25	A	A	A
310	869.76	58.23	-0.37	8.38	A	A	A
311	868.44	60.79	-0.52	8.63	A	A	A

TABLE 42. Evaluation Results for K-40 in Sample 3, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
312	890	40	1.95	6.75	A	A	A
313	1001	88	14.66	10.13	A	A	A
315	934	62	6.99	8.33	A	A	A
316	777.56	28.19	-10.93	6.21	A	A	A
317	950.0	68.0	8.82	8.75	A	A	A
318	831.1	25.2	-4.80	5.88	A	A	A
319	964.89	54.03	10.53	7.53	A	A	A
320	883	65	1.15	8.92	A	A	A
321	1073.1	56.1	22.92	7.26	A	N	W
324	907.19	18.14	3.92	5.42	A	A	A
325	831	38	-4.81	6.81	A	A	A
326	891.5	13.8	2.12	5.27	A	A	A
328	854	36	-2.18	6.57	A	A	A
329	977	77	11.91	9.36	A	A	A
330	933.21	5.93	6.90	5.08	A	A	A
332	640	54	-26.69	9.83	A	N	W
333	917	34	5.04	6.26	A	A	A
334	954	41	9.28	6.62	A	A	A
336	912	45	4.47	7.05	A	A	A
337	894	64	2.41	8.76	A	A	A
338	899	38	2.98	6.58	A	A	A
339	888.7	66.7	1.80	9.04	A	A	A
340	1280	36	46.62	5.77	N	N	N
341	700	110	-19.82	16.50	A	A	A
342	729.3	40.2	-16.46	7.47	A	A	A
343	941	38	7.79	6.46	A	A	A
344	1426	471	63.34	33.41	N	N	N
345	1050	210	20.27	20.63	A	A	A
346	959	55	9.85	7.64	A	A	A
347	935	54	7.10	7.67	A	A	A
348	868	50	-0.57	7.65	A	A	A
349	485.11	16.32	-44.43	6.06	N	N	N
351	920	39.90	5.38	6.65	A	A	A
352	880	14	0.80	5.29	A	A	A
353	917.7	49.1	5.12	7.35	A	A	A
354	900	60	3.09	8.36	A	A	A
355	895	45	2.52	7.12	A	A	A
357	894	85	2.41	10.76	A	A	A
358	883.5	97.2	1.20	12.10	A	A	A
359	446	18	-48.91	6.46	N	N	N
360	873.5	37.57	0.06	6.63	A	A	A
362	879.3	87.9	0.72	11.20	A	A	A
363	933	65.7	6.87	8.66	A	A	A
364	880.6	57.3	0.87	8.23	A	A	A
367	998	52	14.32	7.25	A	A	A
370	827.0	47.9	-5.27	7.68	A	A	A
371	950	48	8.82	7.14	A	A	A
373	890	50	1.95	7.55	A	A	A
375	981.5	87.4	12.43	10.23	A	A	A
377	920	100	5.38	11.98	A	A	A
378	1052	58	20.50	7.47	A	N	W
380	504	22	-42.27	6.67	N	N	N
382	993.60	46.57	13.81	6.88	A	A	A
383	950	40	8.82	6.57	A	A	A
384	694.67	29.57	-20.43	6.60	A	N	W
385	975.35	38.03	11.72	6.37	A	A	A
386	24.0	2.6	-97.25	11.95	N	N	N
387	918.1	81.47	5.17	10.21	A	A	A
388	792	34.1	-9.28	6.63	A	A	A
390	943	66	8.02	8.62	A	A	A

TABLE 42. Evaluation Results for K-40 in Sample 3, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
391	890	30	1.95	6.06	A	A	A
392	1050	50	20.27	6.93	A	N	W
393	712.0	45.1	-18.44	8.09	A	A	A
395	870	28	-0.34	5.98	A	A	A
397	984	137	12.71	14.81	A	A	A
401	888	27	1.72	5.89	A	A	A
402	1004	141	15.01	14.92	A	A	A
404	860	40	-1.49	6.86	A	A	A
405	840	40	-3.78	6.93	A	A	A
407	1004	51	15.01	7.16	A	A	A
408	946	81	8.36	9.94	A	A	A
409	807.85	67.76	-7.46	9.79	A	A	A
410	983.84	19.53	12.70	5.42	A	A	A
412	1070	25	22.57	5.56	A	N	W
414	887	36	1.60	6.47	A	A	A
415	930.6	40.0	6.60	6.62	A	A	A
416	880.1	86.3	0.81	11.03	A	A	A
417	962	28	10.19	5.82	A	A	A
418	990	50	13.40	7.14	A	A	A
419	906.41	35.70	3.83	6.40	A	A	A
420	858.1	59.3	-1.71	8.55	A	A	A
421	971	42	11.23	6.64	A	A	A
423	957.537	61.875	9.68	8.20	A	A	A
425	539	36	-38.26	8.37	N	N	N
426	684.1	60.18	-21.64	10.14	A	A	A
427	909.8	32.8	4.22	6.20	A	A	A
428	853	28	-2.29	6.01	A	A	A
432	990	60	13.40	7.88	A	A	A
434	1020.28	62.11	16.87	7.90	A	A	A
436	921	47	5.50	7.17	A	A	A
437	970	75	11.11	9.23	A	A	A
439	917.6	16.9	5.11	5.37	A	A	A
441	952	91	9.05	10.81	A	A	A
442	1665.82	26.39	90.82	5.28	N	N	N
443	996	30	14.09	5.87	A	A	A
445	723.00	28.40	-17.18	6.39	A	N	W
446	895	37	2.52	6.52	A	A	A
448	880	15	0.80	5.32	A	A	A
449	1086	73	24.40	8.40	A	N	W
450	970	244	11.11	25.65	A	A	A
451	824	46	-5.61	7.52	A	A	A
452	3093	81.03	254.30	5.68	N	N	N
453	885	89	1.37	11.25	A	A	A
454	885	65	1.37	8.91	A	A	A
455	880	67	0.80	9.13	A	A	A
457	945	64	8.25	8.44	A	A	A
458	920.0	49.0	5.38	7.33	A	A	A
461	904.98	3.66	3.66	5.06	A	A	A
464	1082	11	23.94	5.14	A	N	W
465	953.0	68.0	9.16	8.74	A	A	A
466	844	38	-3.32	6.76	A	A	A
471	1087.22	88.88	24.54	9.60	A	A	A
474	923.0	40.1	5.73	6.65	A	A	A
475	1216	52	39.29	6.61	N	N	N
476	848	21	-2.86	5.62	A	A	A
478	1165.00	53.00	33.45	6.79	N	N	N
479	1197	68	37.11	7.59	N	N	N
484	1116.05	19.5845	27.84	5.34	A	N	W
485	988	50	13.17	7.14	A	A	A
486	872.29	21.32	-0.08	5.60	A	A	A

TABLE 42. Evaluation Results for K-40 in Sample 3, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
487	890	70	1.95	9.34	A	A	A
488	73.73	37.49	-91.55	51.10	N	N	N
490	920.87673	38.68165	5.48	6.56	A	A	A
491	1184	29.98	35.62	5.64	N	N	N
492	1078	63	23.48	7.72	A	N	W
494	1042	30	19.36	5.80	A	N	W
495	922.9	19.3	5.72	5.46	A	A	A
497	873.9	61.2	0.10	8.63	A	A	A
498	206.65	11.25	-76.33	7.42	N	N	N
499	1077.9	25.8	23.47	5.58	A	N	W
501	953.6	22.4	9.23	5.56	A	A	A
502	969.02	58.1	11.00	7.83	A	A	A
504	933	123	6.87	14.11	A	A	A
505	960.48	54.48	10.02	7.59	A	A	A
506	992.3	99.2	13.67	11.20	A	A	A
507	970	70	11.11	8.80	A	A	A
508	2500	750	186.37	30.42	N	N	N
509	1674.93	69.99	91.86	6.55	N	N	N
512	385.09	52.8677	-55.89	14.62	N	N	N
515	1038.57	43.76	18.97	6.57	A	N	W
516	879	40	0.69	6.79	A	A	A

Pb-214 Determination in Sample 3 by Gamma-ray Spectrometry

TABLE 43. Target values

Parameter	Value
Activity concentration [Bq/kg]	340
Uncertainty [Bq/kg]	13
Maximum Acceptable Relative Bias [%]	30

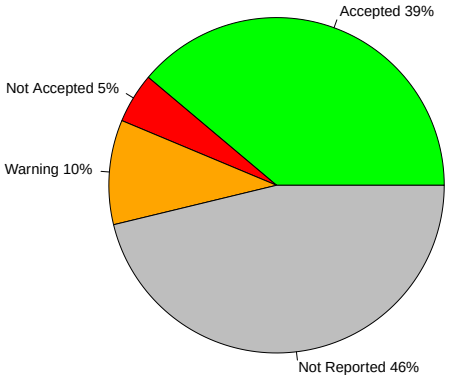

FIGURE 43. Percentage of Accepted vs. Warnings vs. Not Accepted vs. Not Reported results

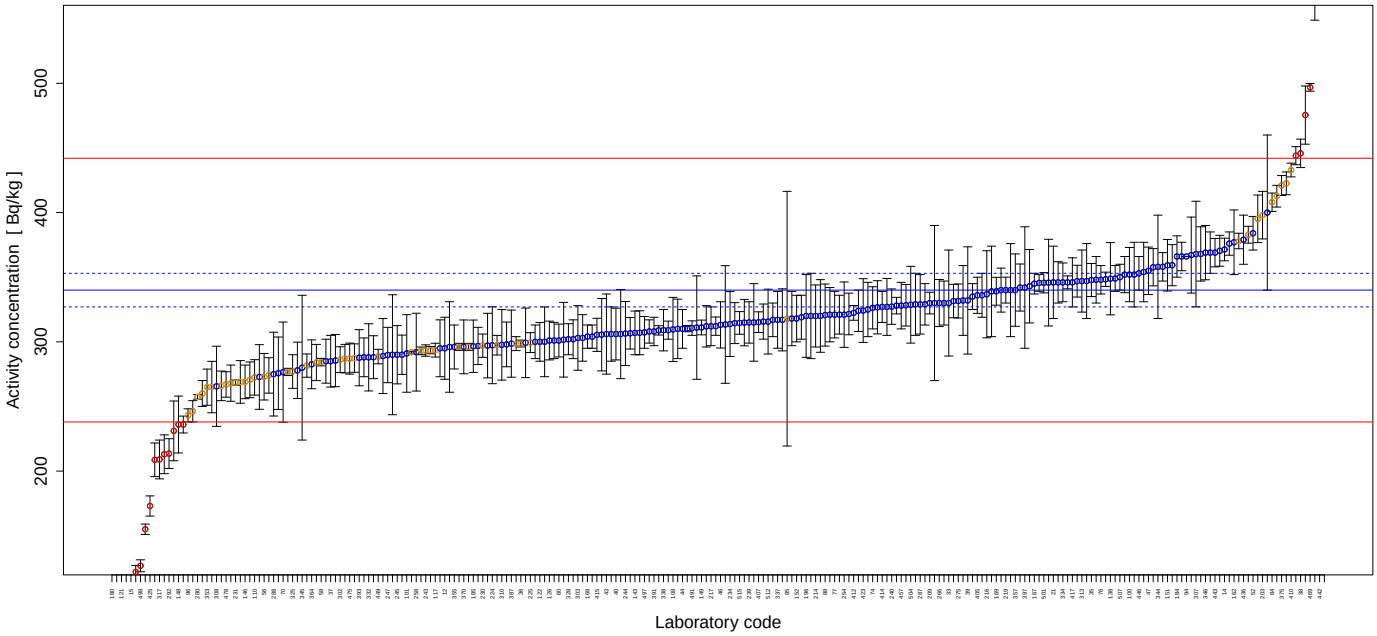

FIGURE 44. Reported results and evaluation parameters for Pb-214 by Gamma-ray Spectrometry. Blue points represent accepted scores, whereas yellow and red represent warning and not accepted scores, respectively.

TABLE 44. Evaluation Results for Pb-214 in Sample 3, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
3	336	17	-1.18	6.34	A	A	A
5	340	36	0.00	11.26	A	A	A
12	295	24	-13.24	8.99	A	A	A
14	371.43	8.74	9.24	4.49	A	A	A
15	112	5.2	-67.06	6.01	N	N	N
16	369	16	8.53	5.78	A	A	A
21	346	28	1.76	8.95	A	A	A
22	347	29	2.06	9.19	A	A	A
24	270.6	13.8	-20.41	6.37	A	N	W
27	340	17	0.00	6.29	A	A	A
28	313.4	45.5	-7.82	15.01	A	A	A
32	346	5	1.76	4.09	A	A	A
33	330	41	-2.94	13.00	A	A	A
34	293.54	2.80	-13.66	3.94	A	N	W
35	347.8	12.8	2.29	5.31	A	A	A
36	298.66	2.65	-12.16	3.93	A	N	W
37	285	20	-16.18	7.99	A	A	A
38	445.8	11	31.12	4.55	N	N	N
39	332.0	41.5	-2.35	13.07	A	A	A
40	306	20	-10.00	7.57	A	A	A
41	307	17	-9.71	6.73	A	A	A
42	319	17	-6.18	6.56	A	A	A
43	306	31	-10.00	10.83	A	A	A
44	310	15	-8.82	6.17	A	A	A
46	313.1	17.9	-7.91	6.88	A	A	A
47	354.92	18.37	4.39	6.43	A	A	A
49	299.2	26.9	-12.00	9.77	A	A	A
51	268.97	16.50	-20.89	7.23	A	N	W
52	384	13	12.94	5.11	A	A	A
53	352	25	3.53	8.07	A	A	A
55	274	13.7	-19.41	6.29	A	N	W
56	273	18	-19.71	7.62	A	N	W
58	284.3	2.9	-16.38	3.96	A	N	W
60	301	12.7	-11.47	5.69	A	A	A
64	378	6	11.18	4.14	A	N	W
67	572.82	24.0	68.48	5.67	N	N	N
68	327	22	-3.82	7.74	A	A	A
70	276.54	38.72	-18.66	14.51	A	A	A
74	326.3	16.3	-4.03	6.29	A	A	A
76	348	11	2.35	4.96	A	A	A
77	321	18	-5.59	6.79	A	A	A
78	422.6	8.8	24.29	4.35	A	N	W
80	444	7	30.59	4.14	N	N	N
82	367.1	29.4	7.97	8.87	A	A	A
84	408.0	7.1	20.00	4.20	A	N	W
85	317.9	98.5	-6.50	31.22	A	N	W
86	306	34.5	-10.00	11.91	A	A	A
87	329	24	-3.24	8.24	A	A	A
88	320.7	24.0	-5.68	8.40	A	A	A
92	330	60	-2.94	18.58	A	A	A
93	342	18.2	0.59	6.55	A	A	A
94	366	0.1	7.65	3.82	A	A	A
95	354	23	4.12	7.54	A	A	A
96	243.07	5.10	-28.51	4.36	A	N	W
100	352	21	3.53	7.09	A	A	A
101	291	30	-14.41	11.00	A	A	A
102	296.10	2.72	-12.91	3.93	A	N	W
108	309.57	24.81	-8.95	8.88	A	A	A
110	272.47	13.7	-19.86	6.32	A	N	W
113	328.30	16.08	-3.44	6.21	A	A	A

TABLE 44. Evaluation Results for Pb-214 in Sample 3, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
116	297.08	24.97	-12.62	9.23	A	A	A
117	293.548	5.338	-13.66	4.23	A	N	W
119	309	7	-9.12	4.44	A	A	A
121	29.8	1.2	-91.24	5.55	N	N	N
122	300	15	-11.76	6.29	A	A	A
125	348	18	2.35	6.43	A	A	A
126	301	15	-11.47	6.28	A	A	A
129	400	60	17.65	15.48	A	A	A
131	312	16	-8.24	6.40	A	A	A
132	296.8	14.4	-12.71	6.18	A	A	A
133	346	16	1.76	6.00	A	A	A
134	7.52	0.19	-97.79	4.58	N	N	N
138	348.82	27.95	2.59	8.88	A	A	A
140	366	11	7.65	4.86	A	A	A
143	306.9	16.9	-9.74	6.70	A	A	A
145	208.7	13.0	-38.62	7.31	N	N	N
146	269	13	-20.88	6.16	A	N	W
147	315.64	13.59	-7.16	5.76	A	A	A
148	236	22	-30.59	10.08	N	N	N
149	311.1	5.7	-8.50	4.24	A	A	A
150	370.42	11.94	8.95	5.00	A	A	A
151	359.2	19.93	5.65	6.74	A	A	A
152	318	18	-6.47	6.83	A	A	A
156	359.3	15.9	5.68	5.85	A	A	A
157	265	19.9	-22.06	8.43	A	N	W
158	272.8	25.0	-19.76	9.93	A	A	A
159	275.7	28	-18.91	10.85	A	A	A
160	335	10	-1.47	4.85	A	A	A
161	290	15.2	-14.71	6.49	A	A	A
162	377	25	10.88	7.65	A	A	A
163	298.6	5.4	-12.18	4.23	A	N	W
164	281.6	9.0	-17.18	4.98	A	N	W
167	345	8	1.47	4.47	A	A	A
168	304	9	-10.59	4.84	A	A	A
169	339.11	10.773	-0.26	4.97	A	A	A
170	300	27	-11.76	9.78	A	A	A
172	345.79	33.52	1.70	10.42	A	A	A
176	328	6.4	-3.53	4.29	A	A	A
178	320.0	28.1	-5.88	9.58	A	A	A
180	0.30026	0.0029025	-99.91	3.94	N	N	N
184	366	16	7.65	5.81	A	A	A
185	296.574	20.268	-12.77	7.83	A	A	A
187	297.38	7.59	-12.54	4.60	A	N	W
191	315	30	-7.35	10.26	A	A	A
195	305.5	28.0	-10.15	9.93	A	A	A
196	320.00	32.00	-5.88	10.71	A	A	A
199	324	16	-4.71	6.25	A	A	A
202	325	21	-4.41	7.51	A	A	A
203	398	18.4	17.06	6.00	A	N	W
205	295	22	-13.24	8.38	A	A	A
206	348.37	5.51	2.46	4.14	A	A	A
207	321	21	-5.59	7.58	A	A	A
209	329.98	8.36	-2.95	4.59	A	A	A
210	339	35	-0.29	11.01	A	A	A
212	293	2.95	-13.82	3.95	A	N	W
213	312.1	7.09	-8.21	4.45	A	A	A
214	320	24	-5.88	8.42	A	A	A
216	336.78	33.68	-0.95	10.71	A	A	A
217	312	15	-8.24	6.14	A	A	A
218	358	11	5.29	4.91	A	A	A

TABLE 44. Evaluation Results for Pb-214 in Sample 3, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
219	340	10	0.00	4.82	A	A	A
220	475.4	22.5	39.82	6.08	N	N	N
222	287	11	-15.59	5.41	A	N	W
223	288.1	16.6	-15.26	6.92	A	A	A
224	297.35	29.74	-12.54	10.71	A	A	A
225	299.4	7.7	-11.94	4.61	A	N	W
230	297	9.01	-12.65	4.88	A	N	W
231	268.4	2.0	-21.06	3.90	A	N	W
234	313.75	25.10	-7.72	8.87	A	A	A
239	315	16	-7.35	6.36	A	A	A
240	327.2	13.7	-3.76	5.67	A	A	A
243	293.24	4.41	-13.75	4.11	A	N	W
244	306.42	24.79	-9.88	8.95	A	A	A
245	290.00	22.53	-14.71	8.66	A	A	A
247	289.8	21.4	-14.76	8.32	A	A	A
251	314.86	17.95	-7.39	6.86	A	A	A
254	321	25.3	-5.59	8.76	A	A	A
258	292	30.1	-14.12	10.99	A	A	A
262	302	15	-11.18	6.27	A	A	A
263	310	23	-8.82	8.35	A	A	A
266	330	18.2	-2.94	6.71	A	A	A
268	346.907	12.283	2.03	5.21	A	A	A
269	260	10	-23.53	5.42	A	N	W
270	296	35	-12.94	12.43	A	A	A
271	287.4	11	-15.47	5.41	A	N	W
274	321.54	16.08	-5.43	6.30	A	A	A
275	331.58	13.17	-2.48	5.51	A	A	A
280	257.4	1.76	-24.29	3.88	A	N	W
281	246.25	8.21	-27.57	5.07	A	N	W
282	289	29	-15.00	10.74	A	A	A
287	329	23	-3.24	7.97	A	A	A
288	275	32.4	-19.12	12.39	A	A	A
291	277.923	21.820	-18.26	8.73	A	A	A
292	213.53	11.51	-37.20	6.61	N	N	N
295	317	24	-6.76	8.48	A	A	A
296	276.7	2.8	-18.62	3.96	A	N	W
298	326.7	20.6	-3.91	7.37	A	A	A
301	301.6	28.9	-11.29	10.32	A	A	A
302	286.2	10	-15.82	5.18	A	N	W
303	303	25	-10.88	9.09	A	A	A
305	669.14	31.11	96.81	6.02	N	N	N
306	376	9	10.59	4.51	A	A	A
307	367.89	40.84	8.20	11.74	A	A	A
308	265.58	31.00	-21.89	12.28	A	A	A
310	297.67	27.30	-12.45	9.94	A	A	A
311	343.03	28.42	0.89	9.12	A	A	A
312	317	13	-6.76	5.61	A	A	A
313	347	24	2.06	7.90	A	A	A
315	318	21	-6.47	7.63	A	A	A
317	209.0	15.0	-38.53	8.13	N	N	N
318	298	17.3	-12.35	6.95	A	A	A
321	306.6	12.2	-9.82	5.52	A	A	A
324	308.87	3.61	-9.16	4.00	A	A	A
325	277	13	-18.53	6.05	A	N	W
326	310.2	2.4	-8.76	3.90	A	A	A
328	302	12	-11.18	5.51	A	A	A
331	345.55	6.47	1.63	4.26	A	A	A
332	288	26	-15.29	9.80	A	A	A
334	346	15	1.76	5.78	A	A	A
336	308	9	-9.41	4.81	A	A	A

TABLE 44. Evaluation Results for Pb-214 in Sample 3, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
337	317	22	-6.76	7.92	A	A	A
338	309	16	-9.12	6.44	A	A	A
341	213	15	-37.35	8.01	N	N	N
344	358	40	5.29	11.81	A	A	A
345	280	56	-17.65	20.36	A	A	A
346	369	21	8.53	6.86	A	A	A
347	368	21	8.24	6.87	A	A	A
348	349	10	2.65	4.78	A	A	A
349	33.1	1.5	-90.26	5.93	N	N	N
353	264.9	14.0	-22.09	6.52	A	N	W
354	288	15	-15.29	6.46	A	A	A
355	296	17	-12.94	6.90	A	A	A
357	340	28	0.00	9.08	A	A	A
358	290.0	46.4	-14.71	16.45	A	A	A
359	155	4	-54.41	4.61	N	N	N
362	231.1	23.1	-32.03	10.70	N	N	N
364	282.6	18.9	-16.88	7.70	A	A	A
370	296.1	20.8	-12.91	8.00	A	A	A
371	330	17	-2.94	6.42	A	A	A
375	420.9	7.72	23.79	4.24	A	N	W
383	321	15	-5.59	6.04	A	A	A
384	265.92	11.43	-21.79	5.75	A	N	W
385	331.55	12.92	-2.49	5.46	A	A	A
386	122	5	-64.12	5.60	N	N	N
387	298.58	25.96	-12.18	9.50	A	A	A
391	308	11	-9.41	5.23	A	A	A
393	287.7	21.7	-15.38	8.46	A	A	A
397	342	47	0.59	14.26	A	A	A
402	311	40	-8.53	13.42	A	A	A
404	284	14	-16.47	6.24	A	N	W
405	336	14	-1.18	5.66	A	A	A
407	315.2	8.0	-7.29	4.59	A	A	A
408	332	27	-2.35	8.99	A	A	A
410	432.91	5.31	27.33	4.02	A	N	W
412	322.4	5.7	-5.18	4.21	A	A	A
414	327	12	-3.82	5.30	A	A	A
415	305.4	12.8	-10.18	5.67	A	A	A
416	285.5	20.2	-16.03	8.04	A	A	A
417	346	19	1.76	6.69	A	A	A
419	314.47	15.84	-7.51	6.32	A	A	A
421	300	13	-11.76	5.78	A	A	A
423	324.197	24.648	-4.65	8.51	A	A	A
425	173.0	7.8	-49.12	5.91	N	N	N
432	285	17	-16.18	7.09	A	A	A
436	379	19	11.47	6.30	A	A	A
440	352	14	3.53	5.52	A	A	A
441	320	33	-5.88	11.00	A	A	A
442	650.88	3.96	91.44	3.87	N	N	N
443	369	11	8.53	4.85	A	A	A
445	236.00	6.52	-30.59	4.72	N	N	N
446	353	13	3.82	5.31	A	A	A
449	288.6	5.6	-15.12	4.29	A	N	W
452	412.664	8.393	21.37	4.33	A	N	W
457	328	18	-3.53	6.69	A	A	A
458	306.0	21.0	-10.00	7.86	A	A	A
461	291.96	0.65	-14.13	3.83	A	N	W
464	329	16	-3.24	6.19	A	A	A
465	301.0	14.0	-11.47	6.02	A	A	A
469	496.88	2.98	46.14	3.87	N	N	N
474	357.7	14.4	5.21	5.55	A	A	A

TABLE 44. Evaluation Results for Pb-214 in Sample 3, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
475	287	12	-15.59	5.67	A	N	W
478	267.00	9.85	-21.47	5.31	A	N	W
479	268	14	-21.18	6.47	A	N	W
484	382.8569	6.4978	12.60	4.18	A	N	W
486	296.10	2.72	-12.91	3.93	A	N	W
490	395.1433	18.40253	16.22	6.03	A	N	W
491	310.6	5.6	-8.65	4.23	A	A	A
492	303	18	-10.88	7.06	A	A	A
494	304	9	-10.59	4.84	A	A	A
497	307.3	12.3	-9.62	5.54	A	A	A
498	126.73	4.62	-62.73	5.28	N	N	N
501	345.7	7.85	1.68	4.45	A	A	A
504	328.7	29.7	-3.32	9.81	A	A	A
507	350	10	2.94	4.77	A	A	A
512	315.6421	25.07214	-7.16	8.82	A	A	A
515	314.62	8.75	-7.46	4.73	A	A	A

Ra-226 Determination in Sample 3 by Gamma-ray Spectrometry

TABLE 45. Target values

Parameter	Value
Activity concentration [Bq/kg]	340
Uncertainty [Bq/kg]	13
Maximum Acceptable Relative Bias [%]	30

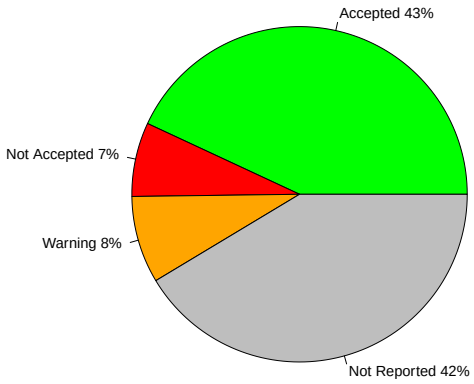

FIGURE 45. Percentage of Accepted vs. Warnings vs. Not Accepted vs. Not Reported results

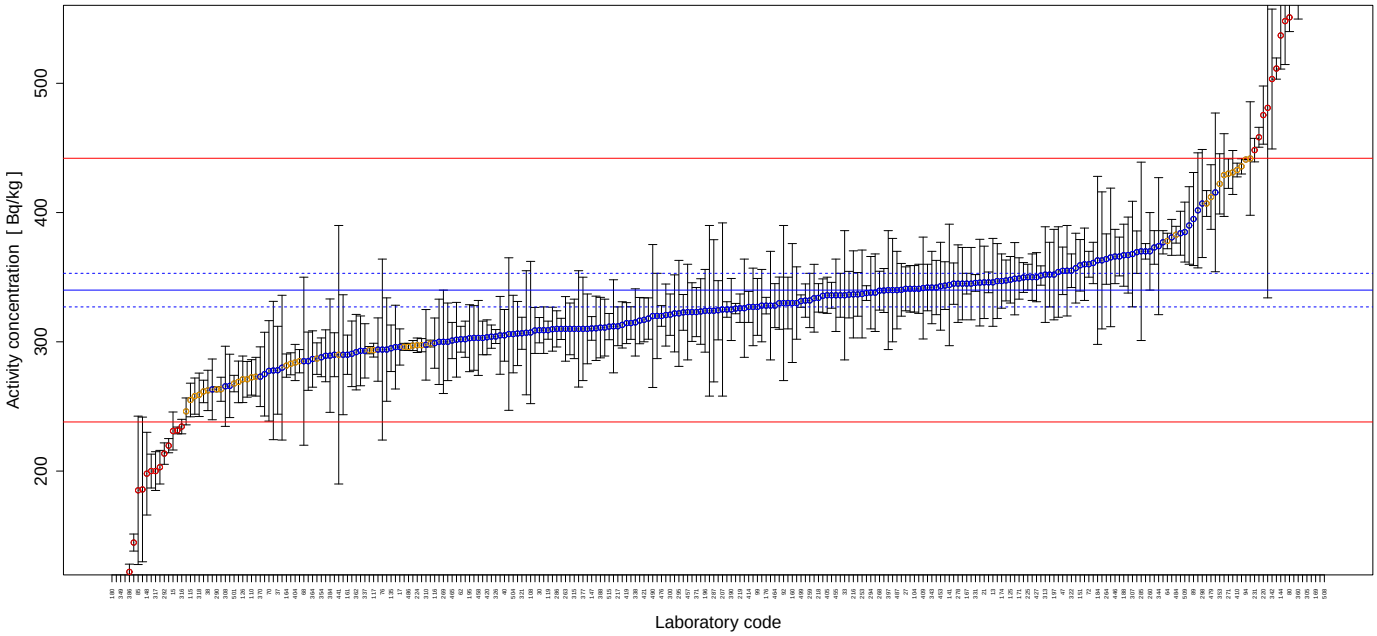

FIGURE 46. Reported results and evaluation parameters for Ra-226 by Gamma-ray Spectrometry. Blue points represent accepted scores, whereas yellow and red represent warning and not accepted scores, respectively.

TABLE 46. Evaluation Results for Ra-226 in Sample 3, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
3	336	17	-1.18	6.34	A	A	A
5	340	40	0.00	12.37	A	A	A
6	310	45	-8.82	15.01	A	A	A
8	329.89	20.20	-2.97	7.22	A	A	A
9	294	24.5	-13.53	9.17	A	A	A
11	293	27	-13.82	9.98	A	A	A
13	346	34	1.76	10.54	A	A	A
15	231	14.7	-32.06	7.42	N	N	N
16	366	15	7.65	5.60	A	A	A
17	296	14	-12.94	6.08	A	A	A
21	346	28	1.76	8.95	A	A	A
22	347	29	2.06	9.19	A	A	A
24	271.0	13.8	-20.29	6.37	A	N	W
25	380.80	13.89	12.00	5.28	A	A	A
26	431	17	26.76	5.49	A	N	W
27	341	17	0.29	6.28	A	A	A
30	309	9.8	-9.12	4.97	A	A	A
31	219.65	5.49	-35.40	4.57	N	N	N
33	336	50	-1.18	15.36	A	A	A
34	293.54	2.80	-13.66	3.94	A	N	W
36	298.66	2.65	-12.16	3.93	A	N	W
37	278	34	-18.24	12.81	A	A	A
38	262.4	15.6	-22.82	7.07	A	N	W
40	305	20	-10.29	7.59	A	A	A
43	306	59	-10.00	19.66	A	A	A
46	313.1	17.9	-7.91	6.88	A	A	A
47	354.92	18.37	4.39	6.43	A	A	A
51	265.90	24.5	-21.79	9.98	A	A	A
52	377	9	10.88	4.51	A	A	A
53	352	25	3.53	8.07	A	A	A
54	548.1	33.6	61.21	7.22	N	N	N
55	269	16.1	-20.88	7.10	A	N	W
56	258	14	-24.12	6.64	A	N	W
62	302	10	-11.18	5.06	A	A	A
63	342.0	18.0	0.59	6.51	A	A	A
64	378	6	11.18	4.14	A	N	W
68	285	65	-16.18	23.13	A	A	A
70	277.52	38.85	-18.38	14.51	A	A	A
72	360	10	5.88	4.73	A	A	A
74	314.5	12.6	-7.50	5.54	A	A	A
76	294	70	-13.53	24.11	A	A	A
78	415.6	61.4	22.24	15.26	A	A	A
79	307	48	-9.71	16.10	A	A	A
80	551	11	62.06	4.31	N	N	N
82	367.1	29.4	7.97	8.87	A	A	A
83	323.447	25.36	-4.87	8.72	A	A	A
85	185.1	57.4	-45.56	31.25	N	N	N
87	311	22	-8.53	8.04	A	A	A
88	320.7	24.0	-5.68	8.40	A	A	A
89	395	36	16.18	9.88	A	A	A
92	330	60	-2.94	18.58	A	A	A
94	441	0.17	29.71	3.82	A	N	W
99	327	22	-3.82	7.74	A	A	A
100	330	20	-2.94	7.17	A	A	A
101	294	40	-13.53	14.13	A	A	A
102	296.10	2.72	-12.91	3.93	A	N	W
104	341	18	0.29	6.52	A	A	A
106	373	13	9.71	5.17	A	A	A
108	307.20	55.03	-9.65	18.32	A	A	A
109	310	8.2	-8.82	4.65	A	A	A

TABLE 46. Evaluation Results for Ra-226 in Sample 3, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
110	272.47	13.7	-19.86	6.32	A	N	W
113	324.41	22.90	-4.59	8.03	A	A	A
114	341	18	0.29	6.52	A	A	A
115	255	13	-25.00	6.37	A	N	W
116	298.99	19.44	-12.06	7.54	A	A	A
117	293.548	5.338	-13.66	4.23	A	N	W
118	309.77	17	-8.89	6.69	A	A	A
119	309	7	-9.12	4.44	A	A	A
121	29.7	1.0	-91.26	5.09	N	N	N
122	302	14	-11.18	6.01	A	A	A
125	348	18	2.35	6.43	A	A	A
126	271	18	-20.29	7.66	A	N	W
133	337.7	5.7	-0.68	4.18	A	A	A
135	295	18	-13.24	7.20	A	A	A
138	348.82	27.95	2.59	8.88	A	A	A
140	361	16	6.18	5.85	A	A	A
141	344	47	1.18	14.19	A	A	A
142	360	28	5.88	8.67	A	A	A
144	537	26	57.94	6.17	N	N	N
145	200.0	13.1	-41.18	7.58	N	N	N
147	310.36	9.16	-8.72	4.83	A	A	A
148	198	32	-41.76	16.61	N	A	N
150	351.28	7.48	3.32	4.38	A	A	A
151	359.2	19.93	5.65	6.74	A	A	A
152	326	38	-4.12	12.27	A	A	A
155	347.45	15.82	2.19	5.95	A	A	A
156	365.3	53.6	7.44	15.16	A	A	A
158	263.2	23.5	-22.59	9.71	A	A	A
159	261.6	8.7	-23.06	5.07	A	N	W
160	330	46	-2.94	14.45	A	A	A
161	290	15.2	-14.71	6.49	A	A	A
162	345	16	1.47	6.01	A	A	A
163	297.4	5.1	-12.53	4.19	A	N	W
164	281.6	9.0	-17.18	4.98	A	N	W
167	345	8	1.47	4.47	A	A	A
169	690.31	52.794	103.03	8.55	N	N	N
170	300	33	-11.76	11.65	A	A	A
171	349	16	2.65	5.97	A	A	A
172	345.79	33.52	1.70	10.42	A	A	A
174	347	21	2.06	7.16	A	A	A
176	328	6.4	-3.53	4.29	A	A	A
177	349.76	11.55	2.87	5.05	A	A	A
178	322.0	29.8	-5.29	10.01	A	A	A
180	0.31406	0.04711	-99.91	15.48	N	N	N
181	295.9	32.4	-12.97	11.60	A	A	A
184	363	65	6.76	18.31	A	A	A
185	289.186	20.082	-14.95	7.93	A	A	A
187	185.79	55.96	-45.36	30.36	N	N	N
188	367	24	7.94	7.58	A	A	A
191	310	27	-8.82	9.51	A	A	A
192	338	30	-0.59	9.66	A	A	A
195	302.8	25.9	-10.94	9.37	A	A	A
196	324.00	32.00	-4.71	10.59	A	A	A
197	352	35	3.53	10.65	A	A	A
199	345	28	1.47	8.97	A	A	A
201	325	6	-4.41	4.25	A	A	A
203	628	53.2	84.71	9.29	N	N	N
204	308.8	17.8	-9.18	6.92	A	A	A
207	325	67	-4.41	20.97	A	A	A
208	369.35	16.42	8.63	5.86	A	A	A

TABLE 46. Evaluation Results for Ra-226 in Sample 3, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
209	322.76	13.84	-5.07	5.75	A	A	A
210	324	66	-4.71	20.73	A	A	A
211	407	10	19.71	4.54	A	N	W
216	336.69	33.69	-0.97	10.71	A	A	A
217	312	15	-8.24	6.14	A	A	A
218	334	11	-1.76	5.05	A	A	A
219	326	11	-4.12	5.10	A	A	A
220	475.4	22.5	39.82	6.08	N	N	N
222	429	32	26.18	8.38	A	N	W
224	297.35	5.61	-12.54	4.26	A	N	W
225	350	10	2.94	4.77	A	A	A
226	354	35	4.12	10.60	A	A	A
229	357	27	5.00	8.47	A	A	A
231	448.3	9.1	31.85	4.33	N	N	N
234	310.45	24.88	-8.69	8.88	A	A	A
244	306.42	24.80	-9.88	8.95	A	A	A
245	285.00	22.53	-16.18	8.78	A	A	A
247	287	12.2	-15.59	5.72	A	N	W
253	337	34	-0.88	10.79	A	A	A
256	304	9	-10.59	4.84	A	A	A
258	305	30.1	-10.29	10.58	A	A	A
259	332	21	-2.35	7.39	A	A	A
260	370	30	8.82	8.96	A	A	A
263	310	25	-8.82	8.93	A	A	A
264	364	19.5	7.06	6.58	A	A	A
268	339.560	15.030	-0.13	5.85	A	A	A
269	300	40	-11.76	13.87	A	A	A
270	312	36	-8.24	12.16	A	A	A
271	430.1	11.4	26.50	4.65	A	N	W
277	263.29	9.31	-22.56	5.21	A	N	W
278	345	30	1.47	9.50	A	A	A
279	339.7	17.0	-0.09	6.30	A	A	A
280	458.25	7.7	34.78	4.18	N	N	N
281	246.16	10.41	-27.60	5.70	A	N	W
285	370	69	8.82	19.04	A	A	A
286	310	14	-8.82	5.92	A	A	A
287	324	55	-4.71	17.40	A	A	A
288	275	32.4	-19.12	12.39	A	A	A
290	263.27	1.91	-22.57	3.89	A	N	W
292	213.52	8.29	-37.20	5.45	N	N	N
294	338	28	-0.59	9.12	A	A	A
295	322	41	-5.29	13.29	A	A	A
298	407.0	41.8	19.71	10.96	A	A	A
300	321	16	-5.59	6.28	A	A	A
301	301.6	28.9	-11.29	10.32	A	A	A
303	303	25	-10.88	9.09	A	A	A
305	668.45	20.18	96.60	4.87	N	N	N
306	363	53	6.76	15.09	A	A	A
307	367.89	40.84	8.20	11.74	A	A	A
308	265.58	31.00	-21.89	12.28	A	A	A
310	297.67	27.30	-12.45	9.94	A	A	A
313	352	37	3.53	11.19	A	A	A
315	310	23	-8.82	8.35	A	A	A
316	234.43	5.61	-31.05	4.51	N	N	N
317	200.0	15.0	-41.18	8.42	N	N	N
318	259	16.8	-23.82	7.53	A	N	W
320	330	28	-2.94	9.31	A	A	A
321	306.6	12.4	-9.82	5.57	A	A	A
322	355	13	4.41	5.29	A	A	A
324	297.11	3.89	-12.61	4.04	A	N	W

TABLE 46. Evaluation Results for Ra-226 in Sample 3, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
326	304.1	5.4	-10.56	4.22	A	A	A
329	328	28	-3.53	9.35	A	A	A
331	345.55	6.47	1.63	4.26	A	A	A
332	320	33	-5.88	11.00	A	A	A
334	384	17	12.94	5.85	A	A	A
336	350	18	2.94	6.41	A	A	A
337	293	21	-13.82	8.12	A	A	A
338	315	26	-7.35	9.10	A	A	A
340	346	8	1.76	4.47	A	A	A
341	273	15	-19.71	6.69	A	N	W
342	503.3	54.1	48.03	11.41	N	N	N
343	342	28	0.59	9.04	A	A	A
344	374	53	10.00	14.68	A	A	A
345	280	56	-17.65	20.36	A	A	A
348	355	35	4.41	10.57	A	A	A
349	32.3	1.07	-90.50	5.06	N	N	N
352	370	6	8.82	4.15	A	A	A
353	422.2	23.3	24.18	6.71	A	N	W
354	288	15	-15.29	6.46	A	A	A
358	290.0	46.4	-14.71	16.45	A	A	A
359	290	17	-14.71	7.00	A	A	A
360	602.7	53	77.26	9.59	N	N	N
362	292.0	29.2	-14.12	10.71	A	A	A
363	323	22.7	-5.00	8.00	A	A	A
364	286.7	21.8	-15.68	8.51	A	A	A
367	336.5	18.0	-1.03	6.58	A	A	A
370	273.0	23.1	-19.71	9.29	A	A	A
371	323	19	-5.00	7.02	A	A	A
377	310	40	-8.82	13.46	A	A	A
378	336.7	16.9	-0.97	6.31	A	A	A
380	144.7	6.6	-57.44	5.95	N	N	N
383	309	18	-9.12	6.97	A	A	A
384	289.29	43.86	-14.91	15.64	A	A	A
385	335.6	13.08	-1.29	5.46	A	A	A
386	122	6	-64.12	6.23	N	N	N
387	290.72	25.37	-14.49	9.53	A	A	A
388	311	23.4	-8.53	8.44	A	A	A
390	325	24	-4.41	8.32	A	A	A
391	303	13	-10.88	5.75	A	A	A
392	310	20	-8.82	7.50	A	A	A
395	285	9	-16.18	4.96	A	N	W
397	340	46	0.00	14.06	A	A	A
401	342	21	0.59	7.23	A	A	A
404	284	14	-16.47	6.24	A	N	W
405	336	14	-1.18	5.66	A	A	A
407	316.4	17.9	-6.94	6.83	A	A	A
409	341.60	39.41	0.47	12.15	A	A	A
410	432.91	5.31	27.33	4.02	A	N	W
414	327	12	-3.82	5.30	A	A	A
415	441.8	43.9	29.94	10.65	A	N	W
416	277.8	53.5	-18.29	19.63	A	A	A
418	390	30	14.71	8.59	A	A	A
419	314.47	15.84	-7.51	6.32	A	A	A
420	303.5	13.5	-10.74	5.87	A	A	A
421	317	17	-6.76	6.59	A	A	A
423	333.726	26.225	-1.85	8.74	A	A	A
424	283	8.52	-16.76	4.87	A	N	W
425	203	13	-40.29	7.46	N	N	N
427	350.0	19.0	2.94	6.64	A	A	A
428	328	42	-3.53	13.36	A	A	A

TABLE 46. Evaluation Results for Ra-226 in Sample 3, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
434	343.48	18.45	1.02	6.59	A	A	A
437	300	30	-11.76	10.71	A	A	A
439	325.7	4.0	-4.21	4.02	A	A	A
441	290	100	-14.71	34.69	A	N	W
443	336	10	-1.18	4.85	A	A	A
446	366	21	7.65	6.89	A	A	A
449	331.9	12.9	-2.38	5.45	A	A	A
450	481	147	41.47	30.80	N	N	N
451	341	19	0.29	6.76	A	A	A
452	435.722	5.898	28.15	4.06	A	N	W
453	343	34	0.88	10.62	A	A	A
454	345	28	1.47	8.97	A	A	A
455	336	28	-1.18	9.17	A	A	A
457	323	37	-5.00	12.08	A	A	A
458	303.0	29.0	-10.88	10.31	A	A	A
461	231.44	2.62	-31.93	3.99	N	N	N
464	328	17	-3.53	6.44	A	A	A
465	301.0	14.0	-11.47	6.02	A	A	A
466	327	30	-3.82	9.94	A	A	A
469	997.03	13.16	193.24	4.04	N	N	N
475	688	42	102.35	7.20	N	N	N
476	320	8	-5.88	4.57	A	A	A
478	596.21	25.30	75.36	5.71	N	N	N
479	412	25	21.18	7.17	A	N	W
484	382.8569	6.4978	12.60	4.18	A	N	W
485	318	16	-6.47	6.32	A	A	A
486	296.10	2.72	-12.91	3.93	A	N	W
487	340	30	0.00	9.62	A	A	A
490	319.96476	55.28420	-5.89	17.70	A	A	A
495	511.4	8.2	50.41	4.15	N	N	N
498	98.81	2.57	-70.94	4.62	N	N	N
499	331.5	4.8	-2.50	4.09	A	A	A
501	267.7	6.37	-21.26	4.50	A	N	W
502	340.23	20.4	0.07	7.11	A	A	A
504	306	30	-10.00	10.52	A	A	A
506	401.7	44.5	18.15	11.72	A	A	A
508	2410	650	608.82	27.24	N	N	N
509	384.89	23.18	13.20	7.13	A	A	A
515	311.77	10.15	-8.30	5.02	A	A	A

Th-234 Determination in Sample 3 by Gamma-ray Spectrometry

TABLE 47. Target values

Parameter	Value
Activity concentration [Bq/kg]	246
Uncertainty [Bq/kg]	11
Maximum Acceptable Relative Bias [%]	30

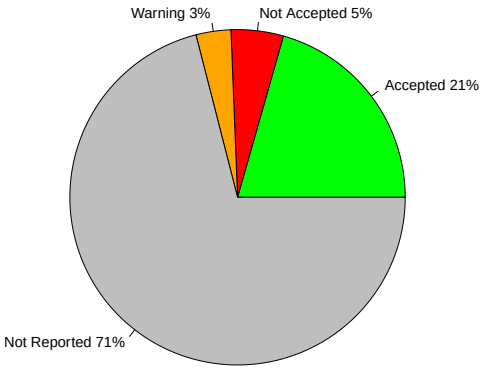

FIGURE 47. Percentage of Accepted vs. Warnings vs. Not Accepted vs. Not Reported results

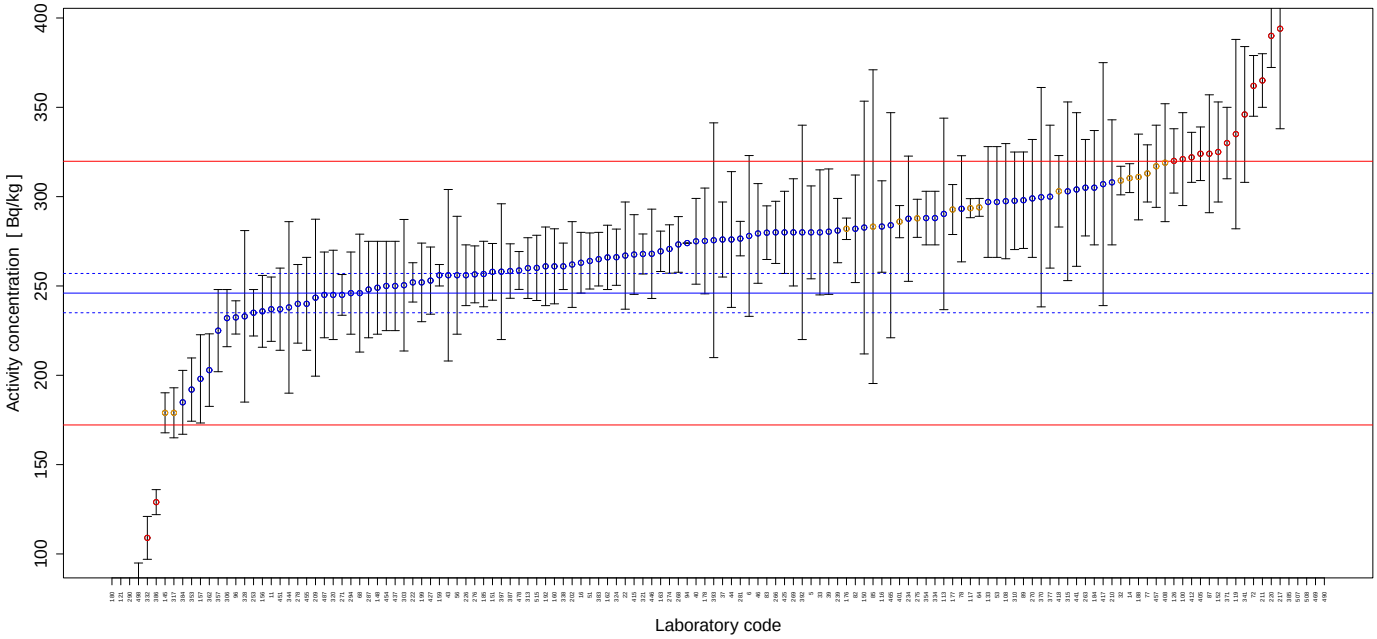

FIGURE 48. Reported results and evaluation parameters for Th-234 by Gamma-ray Spectrometry. Blue points represent accepted scores, whereas yellow and red represent warning and not accepted scores, respectively.

TABLE 48. Evaluation Results for Th-234 in Sample 3, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
5	280	26	13.82	10.31	A	A	A
6	278	45	13.01	16.79	A	A	A
11	237	18	-3.66	8.81	A	A	A
14	310.36	8.08	26.16	5.17	A	N	W
16	263	17	6.91	7.86	A	A	A
22	267	30	8.54	12.09	A	A	A
32	309	8	25.61	5.17	A	N	W
33	280	35	13.82	13.28	A	A	A
37	276	21	12.20	8.83	A	A	A
39	280.4	35.1	13.98	13.29	A	A	A
40	275	24	11.79	9.81	A	A	A
43	256	48	4.07	19.28	A	A	A
44	276	38	12.20	14.48	A	A	A
46	279.4	27.9	13.58	10.94	A	A	A
51	263.98	15.69	7.31	7.44	A	A	A
53	297	31	20.73	11.36	A	A	A
56	256	33	4.07	13.64	A	A	A
64	294	5	19.51	4.78	A	N	W
68	246	33	0.00	14.14	A	A	A
72	362	17	47.15	6.48	N	N	N
77	313	16	27.24	6.79	A	N	W
78	293.2	29.7	19.19	11.07	A	A	A
82	282.0	30.1	14.63	11.57	A	A	A
83	279.83	15.01	13.75	6.98	A	A	A
85	283.2	87.8	15.12	31.32	A	N	W
87	324	33	31.71	11.12	N	N	N
89	298	27	21.14	10.10	A	A	A
94	274	0.1	11.38	4.47	A	A	A
96	232.39	9.30	-5.53	6.00	A	A	A
100	321	26	30.49	9.25	N	N	N
108	297.46	32.23	20.92	11.72	A	A	A
113	290.33	53.6	18.02	19.00	A	A	A
116	283.27	25.59	15.15	10.08	A	A	A
117	293.548	5.338	19.33	4.83	A	N	W
119	335	53	36.18	16.44	N	A	N
121	19.9	5.4	-91.91	27.50	N	N	N
126	320	18	30.08	7.19	N	N	N
133	297	31	20.73	11.36	A	A	A
145	179.0	11.2	-27.24	7.69	A	N	W
148	249	26	1.22	11.36	A	A	A
150	282.70	70.74	14.92	25.42	A	A	A
151	257.9	15.88	4.84	7.61	A	A	A
152	325	28	32.11	9.71	N	N	N
156	235.8	20.1	-4.15	9.63	A	A	A
157	198	24.7	-19.51	13.25	A	A	A
159	256.0	6.0	4.07	5.05	A	A	A
160	261	21	6.10	9.21	A	A	A
162	266	18	8.13	8.11	A	A	A
163	269.4	11.3	9.51	6.13	A	A	A
176	282	6	14.63	4.95	A	N	W
177	292.78	13.98	19.02	6.54	A	N	W
178	275.2	29.6	11.87	11.65	A	A	A
180	0.22869	0.018493	-99.91	9.24	N	N	N
184	305	32	23.98	11.40	A	A	A
185	256.688	18.330	4.34	8.43	A	A	A
188	311	24	26.42	8.92	A	N	W
192	261	22	6.10	9.54	A	A	A
199	252	22	2.44	9.81	A	A	A
202	262	24	6.50	10.19	A	A	A
209	243.44	43.93	-1.04	18.59	A	A	A

TABLE 48. Evaluation Results for Th-234 in Sample 3, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
210	308	35	25.20	12.21	A	A	A
211	365	15	48.37	6.07	N	N	N
217	394	56	60.16	14.90	N	N	N
220	390.0	17.7	58.54	6.37	N	N	N
222	252	11	2.44	6.25	A	A	A
226	256	17	4.07	8.01	A	A	A
234	287.64	35.05	16.93	12.98	A	A	A
239	281	18	14.23	7.81	A	A	A
253	235	13	-4.47	7.11	A	A	A
263	305	27	23.98	9.92	A	A	A
266	280	17.4	13.82	7.66	A	A	A
268	273.247	15.580	11.08	7.25	A	A	A
269	280	30	13.82	11.61	A	A	A
270	299	33	21.54	11.91	A	A	A
271	245	11.4	-0.41	6.45	A	A	A
274	270.7	13.53	10.04	6.71	A	A	A
275	287.87	10.66	17.02	5.81	A	N	W
276	256.49	15.93	4.26	7.65	A	A	A
278	240	22	-2.44	10.20	A	A	A
281	276.51	9.65	12.40	5.67	A	A	A
287	248	27	0.81	11.77	A	A	A
290	57.24	5.46	-76.73	10.53	N	N	N
294	246	23	0.00	10.36	A	A	A
303	250.41	36.81	1.79	15.36	A	A	A
306	232	16	-5.69	8.22	A	A	A
310	297.67	27.30	21.00	10.20	A	A	A
313	260	17	5.69	7.92	A	A	A
315	303	50	23.17	17.10	A	A	A
317	179.0	14.0	-27.24	9.01	A	N	W
320	245	25	-0.41	11.14	A	A	A
321	267.9	11.2	8.90	6.12	A	A	A
324	266.10	15.74	8.17	7.42	A	A	A
328	233	48	-5.28	21.08	A	A	A
332	109	12	-55.69	11.88	N	N	N
334	288	15	17.07	6.86	A	A	A
338	261	13	6.10	6.69	A	A	A
341	346	38	40.65	11.86	N	N	N
344	238	48	-3.25	20.66	A	A	A
353	192.0	17.7	-21.95	10.25	A	A	A
354	288	15	17.07	6.86	A	A	A
357	225	23	-8.54	11.16	A	A	A
362	202.9	20.3	-17.52	10.96	A	A	A
370	299.7	61.4	21.83	20.97	A	A	A
371	330	20	34.15	7.53	N	N	N
377	300	40	21.95	14.06	A	A	A
383	265	15	7.72	7.21	A	A	A
384	184.87	17.88	-24.85	10.66	A	A	A
385	479.27	19.2	94.83	6.00	N	N	N
386	129	7	-47.56	7.03	N	N	N
387	258.35	15.24	5.02	7.40	A	A	A
392	280	60	13.82	21.89	A	A	A
393	275.6	65.7	12.03	24.25	A	A	A
397	258	38	4.88	15.39	A	A	A
401	286	9	16.26	5.47	A	N	W
405	324	15	31.71	6.44	N	N	N
408	319	33	29.67	11.27	A	N	W
412	322	14	30.89	6.24	N	N	N
415	267.6	22.3	8.78	9.46	A	A	A
417	307	68	24.80	22.60	A	A	A
418	303	20	23.17	7.97	A	N	W

TABLE 48. Evaluation Results for Th-234 in Sample 3, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
425	280	23	13.82	9.35	A	A	A
427	253.0	18.8	2.85	8.67	A	A	A
437	250	25	1.63	10.95	A	A	A
441	304	43	23.58	14.83	A	A	A
446	268	25	8.94	10.34	A	A	A
451	237	23	-3.66	10.69	A	A	A
454	250	25	1.63	10.95	A	A	A
455	240	26	-2.44	11.72	A	A	A
457	317	23	28.86	8.52	A	N	W
465	284.0	63.0	15.45	22.63	A	A	A
469	8859.72	291.48	3501.51	5.55	N	N	N
478	258.67	10.60	5.15	6.07	A	A	A
487	245	24	-0.41	10.77	A	A	A
490	86451.918	13453.562	35043.06	16.19	N	N	N
498	72.78	22.14	-70.41	30.75	N	N	N
507	480	70	95.12	15.25	N	N	N
508	1850	500	652.03	27.39	N	N	N
515	260.12	18.26	5.74	8.32	A	A	A

Pa-234m Determination in Sample 3 by Gamma-ray Spectrometry

TABLE 49. Target values

Parameter	Value
Activity concentration [Bq/kg]	246
Uncertainty [Bq/kg]	11
Maximum Acceptable Relative Bias [%]	30

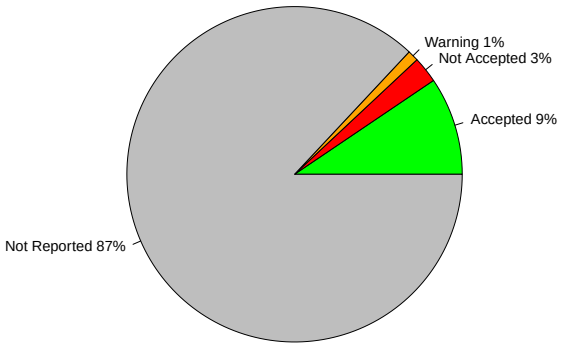

FIGURE 49. Percentage of Accepted vs. Warnings vs. Not Accepted vs. Not Reported results

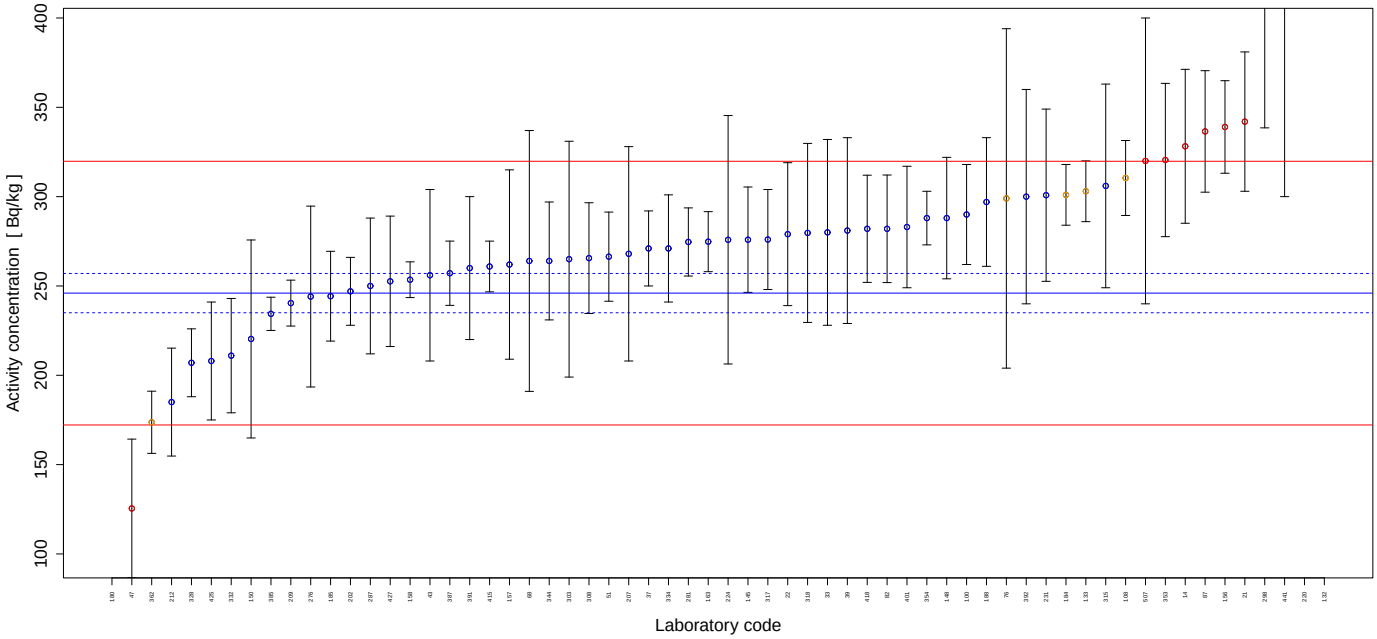

FIGURE 50. Reported results and evaluation parameters for Pa-234m by Gamma-ray Spectrometry. Blue points represent accepted scores, whereas yellow and red represent warning and not accepted scores, respectively.

TABLE 50. Evaluation Results for Pa-234m in Sample 3, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
14	328.18	43.08	33.41	13.87	N	A	N
21	342	39	39.02	12.25	N	N	N
22	279	40	13.41	15.02	A	A	A
33	280	52	13.82	19.10	A	A	A
37	271	21	10.16	8.95	A	A	A
39	281.0	52.0	14.23	19.04	A	A	A
43	256	48	4.07	19.28	A	A	A
47	125.48	38.8	-48.99	31.24	N	N	N
51	266.41	24.95	8.30	10.38	A	A	A
68	264	73	7.32	28.01	A	A	A
76	299	95	21.54	32.09	A	N	W
82	282.0	30.1	14.63	11.57	A	A	A
87	336.5	34	36.79	11.05	N	N	N
100	290	28	17.89	10.64	A	A	A
108	310.44	20.98	26.20	8.10	A	N	W
132	544.6	54.4	121.38	10.94	N	N	N
133	303	17	23.17	7.17	A	N	W
145	275.9	29.5	12.15	11.59	A	A	A
148	288	34	17.07	12.62	A	A	A
150	220.33	55.41	-10.43	25.54	A	A	A
156	339.0	25.9	37.80	8.85	N	N	N
157	262	53	6.50	20.72	A	A	A
158	253.5	10.0	3.05	5.96	A	A	A
163	274.8	16.8	11.71	7.57	A	A	A
180	0.41035	0.10202	-99.83	25.26	N	N	N
184	301	17	22.36	7.20	A	N	W
185	244.274	25.127	-0.70	11.22	A	A	A
188	297	36	20.73	12.92	A	A	A
202	247	19	0.41	8.90	A	A	A
207	268	60	8.94	22.83	A	A	A
209	240.41	12.85	-2.27	6.97	A	A	A
212	185	30.2	-24.80	16.93	A	A	A
220	492.1	30.1	100.04	7.58	N	N	N
224	275.86	69.53	12.14	25.60	A	A	A
231	300.8	48.2	22.28	16.64	A	A	A
276	244.07	50.62	-0.78	21.22	A	A	A
281	274.63	19.07	11.64	8.26	A	A	A
287	250	38	1.63	15.84	A	A	A
298	412.5	74.0	67.68	18.49	N	N	N
303	265	66	7.72	25.30	A	A	A
308	265.58	31.00	7.96	12.50	A	A	A
315	306	57	24.39	19.16	A	A	A
317	276.0	28.0	12.20	11.09	A	A	A
318	279.7	50.1	13.70	18.46	A	A	A
328	207	19	-15.85	10.21	A	A	A
332	211	32	-14.23	15.81	A	A	A
334	271	30	10.16	11.94	A	A	A
344	264	33	7.32	13.28	A	A	A
353	320.5	42.9	30.28	14.11	N	A	N
354	288	15	17.07	6.86	A	A	A
362	173.7	17.4	-29.39	10.97	A	N	W
385	234.4	9.3	-4.72	5.98	A	A	A
387	257.13	17.99	4.52	8.30	A	A	A
391	260	40	5.69	16.02	A	A	A
392	300	60	21.95	20.49	A	A	A
401	283	34	15.04	12.82	A	A	A
415	260.9	14.2	6.06	7.04	A	A	A
418	282	30	14.63	11.54	A	A	A
425	208	33	-15.45	16.48	A	A	A
427	252.6	36.5	2.68	15.13	A	A	A

TABLE 50. Evaluation Results for Pa-234m in Sample 3, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
441	420	120	70.73	28.92	N	A	N
507	320	80	30.08	25.40	N	A	N

U-235 Determination in Sample 3 by Gamma-ray Spectrometry

TABLE 51. Target values

Parameter	Value
Activity concentration [Bq/kg]	11.4
Uncertainty [Bq/kg]	1
Maximum Acceptable Relative Bias [%]	30

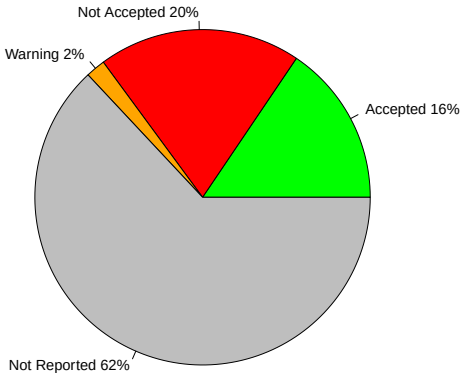

FIGURE 51. Percentage of Accepted vs. Warnings vs. Not Accepted vs. Not Reported results

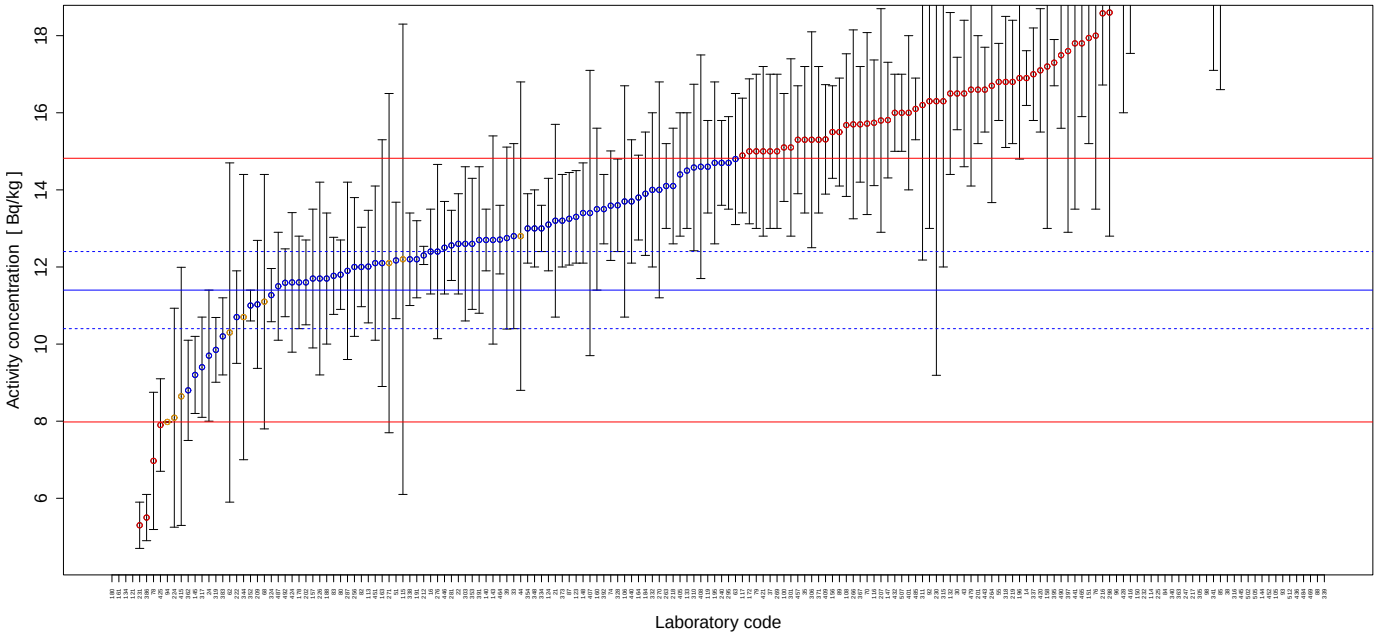

FIGURE 52. Reported results and evaluation parameters for U-235 by Gamma-ray Spectrometry. Blue points represent accepted scores, whereas yellow and red represent warning and not accepted scores, respectively.

TABLE 52. Evaluation Results for U-235 in Sample 3, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
14	16.90	0.71	48.25	9.73	N	N	N
16	12.4	1.1	8.77	12.48	A	A	A
21	13.2	2.5	15.79	20.87	A	A	A
22	12.6	1.3	10.53	13.54	A	A	A
24	9.7	1.7	-14.91	19.60	A	A	A
30	16.5	0.94	44.74	10.46	N	N	N
33	12.8	2.4	12.28	20.70	A	A	A
35	15.3	1.9	34.21	15.20	N	A	N
37	15	2	31.58	15.96	N	A	N
38	24.8	1.4	117.54	10.43	N	N	N
39	12.75	2.36	11.84	20.48	A	A	A
43	16.5	1.9	44.74	14.48	N	N	N
44	12.8	4	12.28	32.46	A	N	W
51	12.17	1.51	6.75	15.20	A	A	A
55	16.8	1.0	47.37	10.60	N	N	N
62	10.3	4.4	-9.65	43.61	A	N	W
63	14.8	1.7	29.82	14.45	A	A	A
68	11.1	3.3	-2.63	31.00	A	N	W
70	15.72	2.36	37.89	17.39	N	A	N
74	13.59	1.42	19.21	13.64	A	A	A
76	18.0	4.5	57.89	26.49	N	A	N
78	6.97	1.78	-38.86	27.00	N	A	N
79	15	2	31.58	15.96	N	A	N
80	11.8	0.9	3.51	11.62	A	A	A
82	12.0	1.03	5.26	12.27	A	A	A
83	11.77	1.0	3.25	12.21	A	A	A
84	21.8	0.7	91.23	9.34	N	N	N
85	24.0	7.4	110.53	32.06	N	N	N
87	13.25	1.2	16.23	12.61	A	A	A
88	147.8	25.4	1196.49	19.29	N	N	N
89	15.5	1.4	35.96	12.59	N	N	N
92	16.3	3.3	42.98	22.06	N	A	N
93	35.4	4.05	210.53	14.42	N	N	N
94	7.98	0.006	-30.00	8.77	A	N	W
96	19.57	0.39	71.67	9.00	N	N	N
98	23.55	2.79	106.58	14.74	N	N	N
100	15.1	1.4	32.46	12.76	N	A	N
105	34.36	1.45	201.40	9.73	N	N	N
106	13.7	3.0	20.18	23.59	A	A	A
108	15.68	1.85	37.54	14.70	N	A	N
113	12.01	1.46	5.35	14.99	A	A	A
114	21.4	1.3	87.72	10.67	N	N	N
115	12.2	6.1	7.02	50.76	A	N	W
116	15.74	1.63	38.07	13.57	N	N	N
117	14.891	1.488	30.62	13.30	N	A	N
119	14.6	1.2	28.07	12.02	A	A	A
121	1.8	0.3	-84.21	18.83	N	N	N
123	13.3	1.2	16.67	12.58	A	A	A
124	13.1	1.2	14.91	12.68	A	A	A
132	16.5	2.1	44.74	15.46	N	N	N
133	14.5	1.5	27.19	13.56	A	A	A
134	1.50	0.10	-86.84	11.02	N	N	N
140	12.7	0.8	11.40	10.80	A	A	A
143	12.7	2.7	11.40	23.00	A	A	A
144	31.5	2	176.32	10.83	N	N	N
145	9.2	1.0	-19.30	13.97	A	A	A
147	15.81	1.50	38.68	12.92	N	N	N
148	13.4	1.3	17.54	13.08	A	A	A
150	20.15	1.04	76.75	10.18	N	N	N
151	17.94	2.74	57.37	17.61	N	N	N

TABLE 52. Evaluation Results for U-235 in Sample 3, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
156	15.5	1.2	35.96	11.70	N	N	N
157	11.7	1.8	2.63	17.71	A	A	A
158	17.2	4.2	50.88	25.95	N	A	N
160	13.5	2.1	18.42	17.86	A	A	A
161	1.23	0.5	-89.21	41.59	N	N	N
163	12.1	3.2	6.14	27.86	A	A	A
164	13.8	1.1	21.05	11.85	A	A	A
172	15.00	1.88	31.58	15.30	N	A	N
178	11.6	1.2	1.75	13.56	A	A	A
180	0.020394	0.0029829	-99.82	17.06	N	N	N
184	13.9	1.6	21.93	14.47	A	A	A
188	11.7	1.7	2.63	16.97	A	A	A
191	12.2	1.0	7.02	12.01	A	A	A
195	14.7	2.1	28.95	16.76	A	A	A
196	16.90	2.10	48.25	15.21	N	N	N
201	16.6	1.4	45.61	12.17	N	N	N
202	11.6	1.1	1.75	12.92	A	A	A
207	15.8	2.9	38.60	20.34	N	A	N
209	11.03	1.66	-3.25	17.42	A	A	A
212	12.3	0.236	7.89	8.98	A	A	A
216	18.58	1.86	62.98	13.31	N	N	N
217	23.2	4.3	103.51	20.51	N	N	N
218	14.1	1.5	23.68	13.79	A	A	A
219	16.8	1.6	47.37	12.95	N	N	N
222	10.7	1.2	-6.14	14.24	A	A	A
224	8.09	2.84	-29.04	36.18	A	N	W
225	21.6	2.1	89.47	13.09	N	N	N
226	11.7	2.5	2.63	23.10	A	A	A
230	16.3	7.11	42.98	44.49	N	N	N
231	5.3	0.6	-53.51	14.32	N	N	N
232	21	2	84.21	12.95	N	N	N
240	14.7	1.1	28.95	11.53	A	A	A
247	23	2	101.75	12.35	N	N	N
256	12	1.8	5.26	17.38	A	A	A
263	14.1	1.1	23.68	11.74	A	A	A
264	16.7	3.03	46.49	20.15	N	A	N
266	15.7	2.45	37.72	17.90	N	A	N
269	15	2	31.58	15.96	N	A	N
270	14.0	2.8	22.81	21.84	A	A	A
271	12.1	4.4	6.14	37.41	A	N	W
276	12.40	2.26	8.77	20.23	A	A	A
281	12.56	0.91	10.18	11.38	A	A	A
287	11.9	2.3	4.39	21.23	A	A	A
295	14.7	1.2	28.95	11.98	A	A	A
298	18.6	5.8	63.16	32.39	N	N	N
301	15.1	2.3	32.46	17.58	N	A	N
303	12.6	2.0	10.53	18.14	A	A	A
305	23.26	1.03	104.04	9.83	N	N	N
306	15.3	2.8	34.21	20.29	N	A	N
310	14.58	2.16	27.89	17.22	A	A	A
311	16.20	4.02	42.11	26.32	N	A	N
315	16.3	4.3	42.98	27.80	N	A	N
316	25.25	2.03	121.49	11.90	N	N	N
317	9.4	1.3	-17.54	16.38	A	A	A
318	16.8	1.7	47.37	13.39	N	N	N
319	9.85	0.84	-13.60	12.23	A	A	A
324	11.27	0.69	-1.14	10.70	A	A	A
328	13.6	1.2	19.30	12.44	A	A	A
332	14	2	22.81	16.76	A	A	A
334	13.0	0.6	14.04	9.91	A	A	A

TABLE 52. Evaluation Results for U-235 in Sample 3, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
337	17.0	1.2	49.12	11.26	N	N	N
338	12.2	1.2	7.02	13.18	A	A	A
339	206	20	1707.02	13.08	N	N	N
340	21.9	1.1	92.11	10.11	N	N	N
341	23.9	6.8	109.65	29.77	N	N	N
344	10.7	3.7	-6.14	35.67	A	N	W
348	13	1	14.04	11.67	A	A	A
352	11.0	0.4	-3.51	9.50	A	A	A
353	12.6	1.7	10.53	16.09	A	A	A
354	13.0	0.9	14.04	11.17	A	A	A
362	8.8	1.3	-22.81	17.18	A	A	A
363	22.6	3.62	98.25	18.26	N	N	N
367	15.7	1.5	37.72	12.97	N	N	N
371	15.3	1.9	34.21	15.20	N	A	N
373	13.2	1.2	15.79	12.63	A	A	A
383	10.2	1.0	-10.53	13.16	A	A	A
386	5.5	0.6	-51.75	14.00	N	N	N
391	12.7	1.9	11.40	17.34	A	A	A
392	13.5	0.9	18.42	11.02	A	A	A
395	17.3	0.6	51.75	9.43	N	N	N
397	17.6	4.7	54.39	28.11	N	A	N
401	16	2	40.35	15.27	N	N	N
405	14.4	1.6	26.32	14.16	A	A	A
407	13.4	3.7	17.54	28.97	A	A	A
408	14.6	2.9	28.07	21.71	A	A	A
409	15.31	1.42	34.30	12.77	N	N	N
415	8.644	3.348	-24.18	39.71	A	N	W
416	20.06	2.52	75.96	15.32	N	N	N
420	17.1	1.6	50.00	12.83	N	N	N
421	15	2.2	31.58	17.09	N	A	N
424	11.6	1.81	1.75	17.90	A	A	A
425	7.9	1.2	-30.70	17.54	N	A	N
428	20	4	75.44	21.84	N	N	N
432	16	1	40.35	10.77	N	N	N
436	43	2	277.19	9.93	N	N	N
440	13.7	1.6	20.18	14.61	A	A	A
441	17.8	4.3	56.14	25.70	N	A	N
443	16.6	1.1	45.61	10.99	N	N	N
445	26.10	1.47	128.95	10.42	N	N	N
446	12.5	1.2	9.65	13.00	A	A	A
451	12.1	2.0	6.14	18.71	A	A	A
452	31.964	3.348	180.39	13.66	N	N	N
457	15.3	1.4	34.21	12.68	N	N	N
464	12.71	0.89	11.49	11.22	A	A	A
465	17.8	1.9	56.14	13.82	N	N	N
469	47.17	0.55	313.77	8.85	N	N	N
479	16.6	2.5	45.61	17.43	N	N	N
484	44.4982	1.0629	290.34	9.09	N	N	N
485	16.1	0.8	41.23	10.08	N	N	N
487	11.5	1.4	0.88	15.01	A	A	A
490	17.49219	1.89414	53.44	13.94	N	N	N
492	11.59	0.88	1.67	11.60	A	A	A
502	30.51	1.8	167.63	10.57	N	N	N
505	30.99	3.64	171.84	14.66	N	N	N
507	16	1	40.35	10.77	N	N	N
512	41.90849	5.173044	267.62	15.14	N	N	N

Bi-214 Determination in Sample 3 by Gamma-ray Spectrometry

TABLE 53. Target values

Parameter	Value
Activity concentration [Bq/kg]	340
Uncertainty [Bq/kg]	13
Maximum Acceptable Relative Bias [%]	30

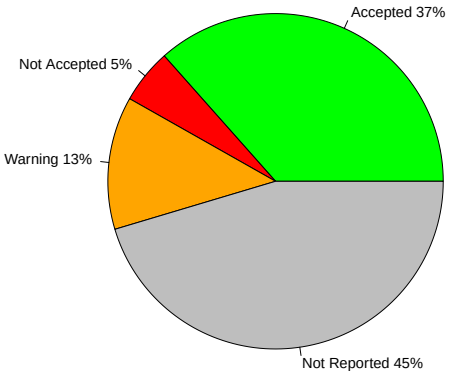

FIGURE 53. Percentage of Accepted vs. Warnings vs. Not Accepted vs. Not Reported results

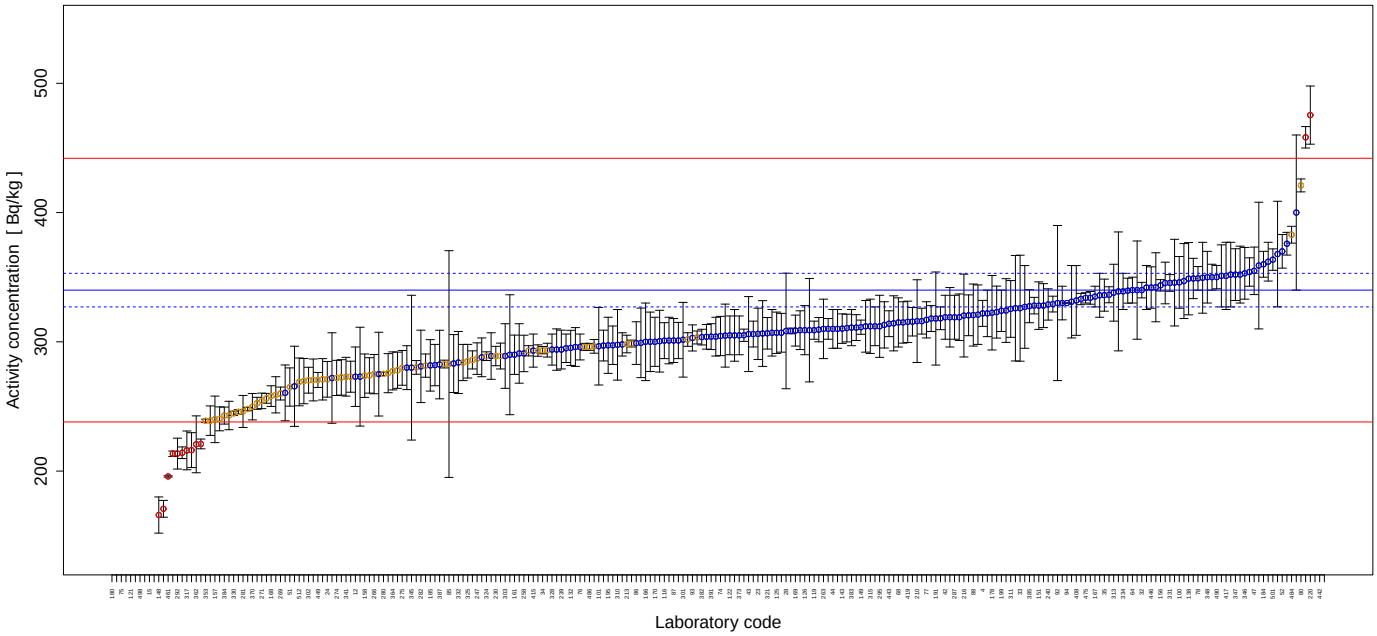

FIGURE 54. Reported results and evaluation parameters for Bi-214 by Gamma-ray Spectrometry. Blue points represent accepted scores, whereas yellow and red represent warning and not accepted scores, respectively.

TABLE 54. Evaluation Results for Bi-214 in Sample 3, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
1	318.2	8.8	-6.41	4.72	A	A	A
3	336	17	-1.18	6.34	A	A	A
4	322.00	10.05	-5.29	4.94	A	A	A
5	340	38	0.00	11.81	A	A	A
12	273	23	-19.71	9.25	A	A	A
14	375.90	8.80	10.56	4.48	A	A	A
15	115	4.3	-66.18	5.35	N	N	N
16	362	15	6.47	5.64	A	A	A
21	331	28	-2.65	9.28	A	A	A
22	347	29	2.06	9.19	A	A	A
23	306.17	19.87	-9.95	7.53	A	A	A
24	271.0	13.8	-20.29	6.37	A	N	W
27	342	17	0.59	6.27	A	A	A
28	308.4	44.7	-9.29	14.99	A	A	A
32	340	6	0.00	4.21	A	A	A
33	326	41	-4.12	13.15	A	A	A
34	293.54	2.80	-13.66	3.94	A	N	W
35	336.1	12.4	-1.15	5.31	A	A	A
36	298.66	2.65	-12.16	3.93	A	N	W
37	278	14	-18.24	6.32	A	N	W
38	345.5	16.1	1.62	6.03	A	A	A
39	326.0	40.8	-4.12	13.09	A	A	A
40	305	20	-10.29	7.59	A	A	A
41	294	16	-13.53	6.65	A	A	A
42	319	17	-6.18	6.56	A	A	A
43	306	29	-10.00	10.22	A	A	A
44	310	15	-8.82	6.17	A	A	A
45	334	4.91	-1.76	4.10	A	A	A
46	313.1	17.9	-7.91	6.88	A	A	A
47	354.92	18.37	4.39	6.43	A	A	A
49	299.2	26.9	-12.00	9.77	A	A	A
51	265.03	14.79	-22.05	6.76	A	N	W
52	370	13	8.82	5.19	A	A	A
53	352	25	3.53	8.07	A	A	A
55	274	13.7	-19.41	6.29	A	N	W
56	243	11	-28.53	5.93	A	N	W
58	282.8	3.0	-16.82	3.97	A	N	W
60	239	11.4	-29.71	6.11	A	N	W
64	340	10	0.00	4.82	A	A	A
68	315	19	-7.35	7.14	A	A	A
70	273.04	38.23	-19.69	14.51	A	A	A
74	304.5	15.2	-10.44	6.29	A	A	A
75	17.5	4.9	-94.85	28.26	N	N	N
76	296	10	-12.94	5.10	A	A	A
77	317	14	-6.76	5.84	A	A	A
78	349.1	9.12	2.68	4.63	A	A	A
80	421	5	23.82	4.00	A	N	W
82	342.2	26.7	0.65	8.69	A	A	A
84	329.2	6.1	-3.18	4.25	A	A	A
85	282.8	87.7	-16.82	31.25	A	N	W
86	299	16.5	-12.06	6.71	A	A	A
87	301	17	-11.47	6.82	A	A	A
88	320.7	24.0	-5.68	8.40	A	A	A
92	330	60	-2.94	18.58	A	A	A
93	303	10.1	-10.88	5.07	A	A	A
94	330	0.1	-2.94	3.82	A	A	A
95	319	23	-6.18	8.16	A	A	A
96	214.19	4.50	-37.00	4.36	N	N	N
100	346	20	1.76	6.93	A	A	A
101	296.6	30	-12.76	10.81	A	A	A

TABLE 54. Evaluation Results for Bi-214 in Sample 3, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
102	296.10	2.72	-12.91	3.93	A	N	W
108	301.77	5.24	-11.24	4.20	A	N	W
110	272.47	13.7	-19.86	6.32	A	N	W
113	320.52	15.78	-5.73	6.23	A	A	A
116	300.90	13.90	-11.50	6.00	A	A	A
117	293.548	5.338	-13.66	4.23	A	N	W
118	300.49	23.88	-11.62	8.82	A	A	A
119	309	7	-9.12	4.44	A	A	A
121	29.8	1.5	-91.24	6.32	N	N	N
122	305	15	-10.29	6.23	A	A	A
123	307	15	-9.71	6.20	A	A	A
124	304	15	-10.59	6.24	A	A	A
125	307	16	-9.71	6.46	A	A	A
126	309	19	-9.12	7.24	A	A	A
129	400	60	17.65	15.48	A	A	A
132	295.3	13.6	-13.15	5.99	A	A	A
133	336.4	6.2	-1.06	4.24	A	A	A
134	5.97	0.16	-98.24	4.67	N	N	N
138	348.82	27.95	2.59	8.88	A	A	A
140	354	11	4.12	4.93	A	A	A
142	352	22	3.53	7.33	A	A	A
143	310.2	11.4	-8.76	5.30	A	A	A
144	23.8	1.2	-93.00	6.33	N	N	N
145	216.2	13.5	-36.41	7.32	N	N	N
147	305.08	4.73	-10.27	4.13	A	A	A
148	166	14	-51.18	9.26	N	N	N
149	311.3	5.5	-8.44	4.21	A	A	A
150	339.57	9.64	-0.13	4.76	A	A	A
151	328	18.38	-3.53	6.78	A	A	A
152	319	18	-6.18	6.82	A	A	A
156	343.7	4.4	1.09	4.03	A	A	A
157	240	18	-29.41	8.42	A	N	W
158	273.8	16.8	-19.47	7.23	A	N	W
159	256.3	3.8	-24.62	4.10	A	N	W
160	310	8	-8.82	4.61	A	A	A
161	290	15.2	-14.71	6.49	A	A	A
162	312	20	-8.24	7.46	A	A	A
163	296.5	5.3	-12.79	4.22	A	N	W
164	281.6	9.0	-17.18	4.98	A	N	W
166	300	30	-11.76	10.71	A	A	A
167	335	8	-1.47	4.51	A	A	A
168	258	8	-24.12	4.92	A	N	W
169	308.68	11.973	-9.21	5.45	A	A	A
170	300	19	-11.76	7.40	A	A	A
172	345.79	33.52	1.70	10.42	A	A	A
176	328	6.4	-3.53	4.29	A	A	A
178	322.5	28.8	-5.15	9.71	A	A	A
180	0.25641	0.0030049	-99.92	4.00	N	N	N
184	360	10	5.88	4.73	A	A	A
185	281.779	19.896	-17.12	8.03	A	A	A
191	318	36	-6.47	11.95	A	A	A
195	297.3	21.7	-12.56	8.24	A	A	A
196	327.00	32.00	-3.82	10.51	A	A	A
199	324	16	-4.71	6.25	A	A	A
202	310	15	-8.82	6.17	A	A	A
203	349	15.6	2.65	5.88	A	A	A
205	289	18	-15.00	7.31	A	A	A
206	293.06	3.96	-13.81	4.06	A	N	W
207	307	18	-9.71	7.00	A	A	A
209	315.54	11.03	-7.19	5.18	A	A	A

TABLE 54. Evaluation Results for Bi-214 in Sample 3, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
210	316	32	-7.06	10.82	A	A	A
212	248	1.33	-27.06	3.86	A	N	W
213	298.3	6.81	-12.26	4.45	A	N	W
214	322	18	-5.29	6.77	A	A	A
216	320.31	32.03	-5.79	10.71	A	A	A
217	312	15	-8.24	6.14	A	A	A
218	318	10	-6.47	4.95	A	A	A
219	316	10	-7.06	4.96	A	A	A
220	475.4	22.5	39.82	6.08	N	N	N
222	295	11	-13.24	5.34	A	A	A
223	269.6	17.5	-20.71	7.53	A	N	W
224	297.35	14.87	-12.54	6.30	A	A	A
225	280.2	5.3	-17.59	4.27	A	N	W
230	289	7.51	-15.00	4.62	A	N	W
231	245.8	1.7	-27.71	3.89	A	N	W
234	304.80	24.37	-10.35	8.86	A	A	A
239	294	15	-13.53	6.38	A	A	A
240	328.9	12.1	-3.26	5.31	A	A	A
243	293.24	4.41	-13.75	4.11	A	N	W
244	306.42	25.43	-9.88	9.14	A	A	A
245	280.00	16.97	-17.65	7.17	A	A	A
247	287	12.2	-15.59	5.72	A	N	W
251	303.86	9.52	-10.63	4.94	A	A	A
254	323	20.1	-5.00	7.30	A	A	A
258	291	14.1	-14.41	6.17	A	A	A
262	296	15	-12.94	6.35	A	A	A
263	310	23	-8.82	8.35	A	A	A
266	275	15.2	-19.12	6.72	A	N	W
268	349.563	27.410	2.81	8.72	A	A	A
269	260	5	-23.53	4.28	A	N	W
270	272	35	-20.00	13.42	A	A	A
271	254.3	6.0	-25.21	4.49	A	N	W
274	272.08	13.6	-19.98	6.29	A	N	W
275	279.85	13.45	-17.69	6.14	A	N	W
280	275.2	1.31	-19.06	3.85	A	N	W
281	246.13	12.38	-27.61	6.32	A	N	W
282	281	28	-17.35	10.67	A	A	A
287	319	17	-6.18	6.56	A	A	A
288	275	32.4	-19.12	12.39	A	A	A
291	275.738	15.124	-18.90	6.69	A	N	W
292	213.51	11.94	-37.20	6.77	N	N	N
295	312	24	-8.24	8.59	A	A	A
296	213.4	2.1	-37.24	3.95	N	N	N
298	314.3	21.3	-7.56	7.78	A	A	A
301	301.6	28.9	-11.29	10.32	A	A	A
302	270.3	10	-20.50	5.32	A	N	W
303	289	25	-15.00	9.46	A	A	A
305	667.77	25.44	96.40	5.40	N	N	N
306	286	7	-15.88	4.54	A	N	W
307	367.89	40.84	8.20	11.74	A	A	A
308	265.58	31.00	-21.89	12.28	A	A	A
310	297.67	27.30	-12.45	9.94	A	A	A
311	325.44	21.95	-4.28	7.75	A	A	A
313	338	22	-0.59	7.55	A	A	A
315	312	21	-8.24	7.74	A	A	A
317	216.0	15.0	-36.47	7.93	N	N	N
321	306.6	12.2	-9.82	5.52	A	A	A
324	288.88	3.36	-15.04	4.00	A	N	W
325	285	13	-16.18	5.95	A	N	W
326	308.4	2.2	-9.29	3.89	A	A	A

TABLE 54. Evaluation Results for Bi-214 in Sample 3, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
328	294	12	-13.53	5.59	A	A	A
330	244.7	1.6	-28.03	3.88	A	N	W
331	345.55	6.47	1.63	4.26	A	A	A
332	284	24	-16.47	9.28	A	A	A
334	339	14	-0.29	5.63	A	A	A
336	311	10	-8.53	5.00	A	A	A
337	321	23	-5.59	8.12	A	A	A
338	306	10	-10.00	5.03	A	A	A
341	273	15	-19.71	6.69	A	N	W
344	359	49	5.59	14.17	A	A	A
345	280	56	-17.65	20.36	A	A	A
346	353	20	3.82	6.84	A	A	A
347	352	20	3.53	6.85	A	A	A
348	350	20	2.94	6.88	A	A	A
349	31.8	1.01	-90.65	4.97	N	N	N
353	238.9	1.27	-29.74	3.86	A	N	W
354	288	15	-15.29	6.46	A	A	A
357	351	24	3.24	7.83	A	A	A
358	290.0	46.4	-14.71	16.45	A	A	A
359	115.9	1.5	-65.91	4.04	N	N	N
362	220.7	22.0	-35.09	10.68	N	N	N
364	277.5	14.7	-18.38	6.53	A	N	W
370	249.8	10.2	-26.53	5.59	A	N	W
371	315	16	-7.35	6.36	A	A	A
373	305	15	-10.29	6.23	A	A	A
382	303.64	6.07	-10.69	4.31	A	A	A
383	311	14	-8.53	5.91	A	A	A
384	242.94	6.58	-28.55	4.69	A	N	W
385	327.55	12.77	-3.66	5.46	A	A	A
386	113	5	-66.76	5.85	N	N	N
387	282.42	26.54	-16.94	10.15	A	A	A
391	304	10	-10.59	5.04	A	A	A
393	260.5	21.6	-23.38	9.13	A	A	A
397	339	46	-0.29	14.10	A	A	A
402	309	40	-9.12	13.50	A	A	A
404	284	14	-16.47	6.24	A	N	W
405	330	13	-2.94	5.49	A	A	A
407	309.4	9.4	-9.00	4.88	A	A	A
408	332	27	-2.35	8.99	A	A	A
410	333.10	4.37	-2.03	4.04	A	A	A
414	289	10	-15.00	5.16	A	N	W
415	293.2	12.8	-13.76	5.80	A	A	A
416	270.5	16.2	-20.44	7.11	A	N	W
417	351	26	3.24	8.34	A	A	A
419	315.45	16.01	-7.22	6.35	A	A	A
421	273	12	-19.71	5.83	A	N	W
423	324.197	24.648	-4.65	8.51	A	A	A
425	170.8	6.5	-49.76	5.39	N	N	N
432	271	16	-20.29	7.03	A	N	W
436	301	18	-11.47	7.10	A	A	A
441	291	23	-14.41	8.78	A	A	A
442	635.65	6.10	86.96	3.94	N	N	N
443	314	10	-7.65	4.98	A	A	A
445	221.00	3.77	-35.00	4.19	N	N	N
446	342	16	0.59	6.04	A	A	A
449	270.5	5.8	-20.44	4.38	A	N	W
452	458.219	8.29	34.77	4.23	N	N	N
457	309	15	-9.12	6.18	A	A	A
458	300.0	23.0	-11.76	8.57	A	A	A
461	195.86	0.51	-42.39	3.83	N	N	N

TABLE 54. Evaluation Results for Bi-214 in Sample 3, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
464	328	17	-3.53	6.44	A	A	A
465	301.0	14.0	-11.47	6.02	A	A	A
469	590.19	4.31	73.59	3.89	N	N	N
475	334	4	-1.76	4.01	A	A	A
478	240.40	9.24	-29.29	5.42	A	N	W
479	259	14	-23.82	6.62	A	N	W
484	382.8569	6.4978	12.60	4.18	A	N	W
486	296.10	2.72	-12.91	3.93	A	N	W
490	350.05134	9.02764	2.96	4.61	A	A	A
491	303.37	5.01	-10.77	4.16	A	N	W
492	282	16	-17.06	6.84	A	A	A
494	298	9	-12.35	4.87	A	A	A
497	297.1	11.9	-12.62	5.54	A	A	A
498	70.88	2.27	-79.15	4.99	N	N	N
501	363.6	8.3	6.94	4.45	A	A	A
504	283.2	22.4	-16.71	8.79	A	A	A
505	252.44	4.64	-25.75	4.24	A	N	W
507	350	10	2.94	4.77	A	A	A
512	268.994	18.4925	-20.88	7.87	A	N	W
515	310.64	10.71	-8.64	5.15	A	A	A

Cs-137 Determination in Sample 4 by Gamma-ray Spectrometry

TABLE 55. Target values

Parameter	Value
Activity concentration [Bq/kg]	2.44
Uncertainty [Bq/kg]	0.26
Maximum Acceptable Relative Bias [%]	30

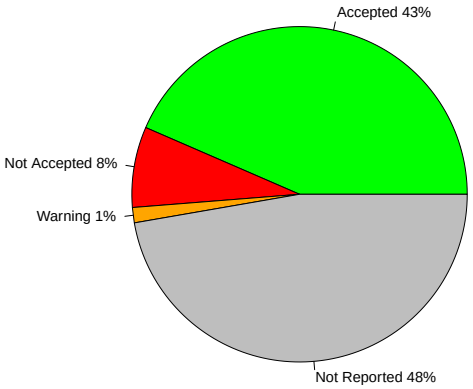

FIGURE 55. Percentage of Accepted vs. Warnings vs. Not Accepted vs. Not Reported results

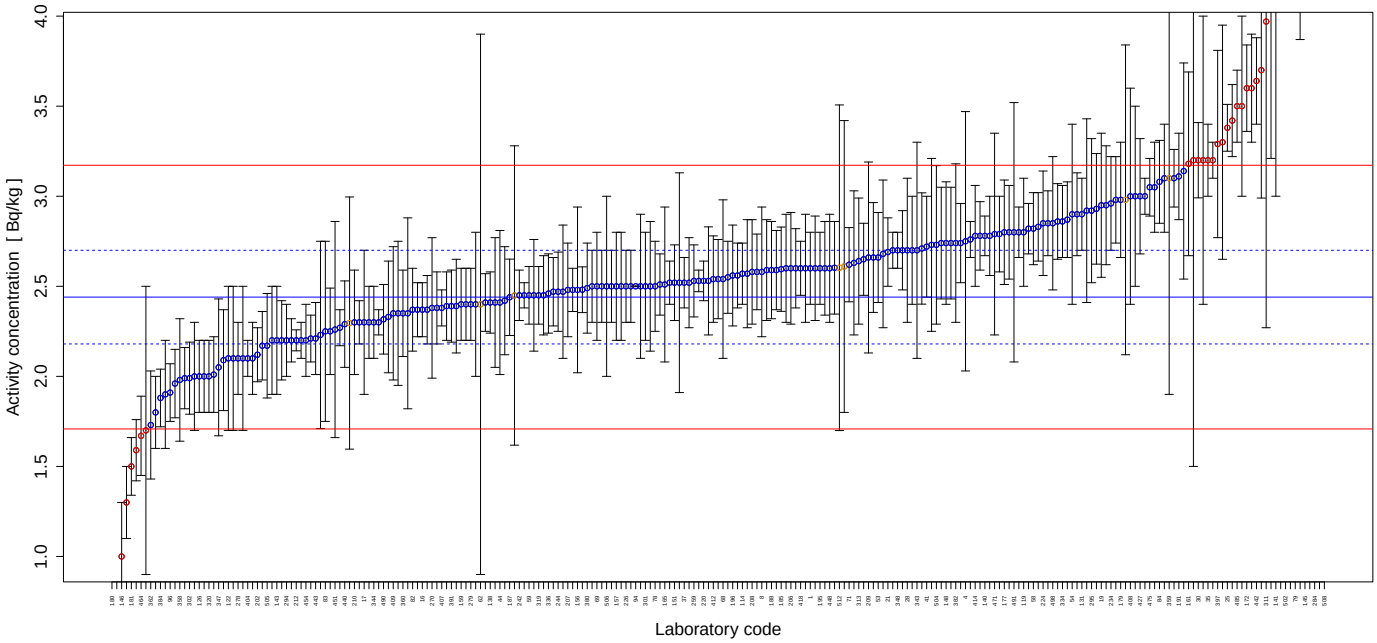

FIGURE 56. Reported results and evaluation parameters for Cs-137 by Gamma-ray Spectrometry. Blue points represent accepted scores, whereas yellow and red represent warning and not accepted scores, respectively.

TABLE 56. Evaluation Results for Cs-137 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
1	2.6	0.2	6.56	13.14	A	A	A
4	2.75	0.72	12.70	28.27	A	A	A
8	2.58	0.36	5.74	17.56	A	A	A
12	2.6	0.3	6.56	15.71	A	A	A
13	1.7	0.8	-30.33	48.25	N	N	N
16	2.37	0.15	-2.87	12.39	A	A	A
17	2.3	0.4	-5.74	20.40	A	A	A
19	2.95	0.40	20.90	17.25	A	A	A
21	2.69	0.19	10.25	12.78	A	A	A
22	2.47	0.19	1.23	13.14	A	A	A
23	2.45	0.31	0.41	16.54	A	A	A
24	5.83	1.96	138.93	35.27	N	N	N
25	3.38	0.13	38.52	11.33	N	N	N
26	2.92	0.51	19.67	20.46	A	A	A
28	2.7	0.4	10.66	18.25	A	A	A
30	3.20	0.209	31.15	12.50	N	A	N
33	2.4	0.4	-1.64	19.78	A	A	A
35	3.2	0.2	31.15	12.35	N	A	N
37	2.52	0.14	3.28	12.02	A	A	A
38	3.2	0.1	31.15	11.10	N	N	N
39	2.41	0.36	-1.23	18.35	A	A	A
41	2.72	0.28	11.48	14.82	A	A	A
43	2.63	0.40	7.79	18.57	A	A	A
44	2.41	0.4	-1.23	19.72	A	A	A
45	2.4	0.2	-1.64	13.53	A	A	A
47	2.60	0.22	6.56	13.61	A	A	A
53	2.66	0.25	9.02	14.21	A	A	A
54	2.9	0.5	18.85	20.27	A	A	A
55	2.48	0.12	1.64	11.70	A	A	A
58	2.82	0.20	15.57	12.80	A	A	A
59	2.45	0.16	0.41	12.50	A	A	A
62	2.4	1.5	-1.64	63.40	A	N	W
63	2.87	0.21	17.62	12.93	A	A	A
68	2.54	0.44	4.10	20.34	A	A	A
69	2.5	0.3	2.46	16.05	A	A	A
71	2.62	0.206	7.38	13.24	A	A	A
74	2.74	0.22	12.30	13.34	A	A	A
76	3.30	0.65	35.25	22.39	N	A	N
78	2.50	0.25	2.46	14.61	A	A	A
79	5.4	0.6	121.31	15.39	N	N	N
80	1.96	0.19	-19.67	14.41	A	A	A
82	2.37	0.23	-2.87	14.41	A	A	A
83	2.25	0.5	-7.79	24.64	A	A	A
84	3.08	0.23	26.23	13.01	A	A	A
85	2.61	0.81	6.97	32.81	A	N	W
88	3.6	0.3	47.54	13.53	N	N	N
89	2.47	0.37	1.23	18.38	A	A	A
92	2.59	0.28	6.15	15.18	A	A	A
93	3.2	0.8	31.15	27.18	N	A	N
94	2.5	0.002	2.46	10.66	A	A	A
96	1.91	0.16	-21.72	13.55	A	A	A
100	2.39	0.19	-2.05	13.29	A	A	A
108	2.58	0.21	5.74	13.41	A	A	A
109	3.1	0.16	27.05	11.84	A	A	A
113	2.30	0.12	-5.74	11.86	A	A	A
114	2.57	0.17	5.33	12.54	A	A	A
116	2.83	0.19	15.98	12.59	A	A	A
119	2.8	0.3	14.75	15.11	A	A	A
121	3.2	1.7	31.15	54.18	N	N	N
122	2.1	0.4	-13.93	21.83	A	A	A

TABLE 56. Evaluation Results for Cs-137 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
125	2.74	0.31	12.30	15.54	A	A	A
126	2.0	0.2	-18.03	14.61	A	A	A
129	2.5	0.3	2.46	16.05	A	A	A
131	2.9	0.2	18.85	12.69	A	A	A
132	2.42	0.30	-0.82	16.35	A	A	A
133	2.85	0.18	16.80	12.39	A	A	A
138	2.41	0.17	-1.23	12.78	A	A	A
140	2.78	0.11	13.93	11.37	A	A	A
141	4.4	1.4	80.33	33.56	N	N	N
143	2.2	0.3	-9.84	17.31	A	A	A
144	3.42	0.2	40.16	12.15	N	N	N
145	6.2	1.1	154.10	20.70	N	N	N
146	1.0	0.3	-59.02	31.84	N	N	N
147	2.70	0.22	10.66	13.41	A	A	A
148	2.74	0.34	12.30	16.36	A	A	A
149	1.8	0.2	-26.23	15.39	A	A	A
150	2.52	0.25	3.28	14.56	A	A	A
151	2.52	0.21	3.28	13.53	A	A	A
152	2.39	0.26	-2.05	15.23	A	A	A
156	2.48	0.46	1.64	21.39	A	A	A
157	2.5	0.3	2.46	16.05	A	A	A
158	3.0	0.5	22.95	19.78	A	A	A
159	2.4	0.2	-1.64	13.53	A	A	A
161	3.18	0.51	30.33	19.25	N	A	N
165	2.51	0.43	2.87	20.18	A	A	A
167	3.00	0.10	22.95	11.16	A	A	A
168	2.45	0.07	0.41	11.03	A	A	A
170	2.23	0.52	-8.61	25.64	A	A	A
172	3.6	0.24	47.54	12.57	N	N	N
177	2.80	0.29	14.75	14.86	A	A	A
178	2.7	0.3	10.66	15.39	A	A	A
179	2.98	0.32	22.13	15.13	A	A	A
180	0.0039106	0.00053644	-99.84	17.37	N	N	N
181	1.5	0.16	-38.52	15.08	N	A	N
184	2.5	0.2	2.46	13.32	A	A	A
185	2.595	0.234	6.35	13.96	A	A	A
186	0.5	0.05	-79.51	14.61	N	N	N
187	2.439	0.212	-0.04	13.75	A	A	A
188	2.59	0.27	6.15	14.91	A	A	A
189	2.76	0.10	13.11	11.25	A	A	A
191	3.11	0.24	27.46	13.16	A	A	A
192	2.2	0.12	-9.84	11.97	A	A	A
195	2.6	0.2	6.56	13.14	A	A	A
196	2.56	0.28	4.92	15.27	A	A	A
197	2.0	0.3	-18.03	18.40	A	A	A
199	2.45	0.22	0.41	13.93	A	A	A
201	2.80	0.26	14.75	14.13	A	A	A
202	2.12	0.15	-13.11	12.79	A	A	A
203	4.17	0.96	70.90	25.37	N	N	N
204	2.82	0.14	15.57	11.76	A	A	A
205	2.5	0.2	2.46	13.32	A	A	A
206	2.60	0.31	6.56	15.99	A	A	A
207	2.48	0.26	1.64	14.95	A	A	A
208	2.58	0.29	5.74	15.49	A	A	A
209	2.66	0.53	9.02	22.60	A	A	A
210	2.30	0.29	-5.74	16.51	A	A	A
212	2.20	0.0583	-9.84	10.98	A	A	A
213	2.37	0.19	-2.87	13.33	A	A	A
214	2.57	0.3	5.33	15.81	A	A	A
218	2.79	0.21	14.34	13.05	A	A	A

TABLE 56. Evaluation Results for Cs-137 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
219	2.5	0.2	2.46	13.32	A	A	A
220	2.53	0.11	3.69	11.51	A	A	A
222	2.98	0.24	22.13	13.36	A	A	A
223	1.9	0.3	-22.13	19.05	A	A	A
224	2.85	0.29	16.80	14.73	A	A	A
225	1.99	0.17	-18.44	13.66	A	A	A
226	2.5	0.2	2.46	13.32	A	A	A
230	3.14	0.60	28.69	21.88	A	A	A
232	2.80	0.14	14.75	11.77	A	A	A
233	2.1	0.4	-13.93	21.83	A	A	A
234	2.96	0.26	21.31	13.81	A	A	A
240	2.59	0.22	6.15	13.63	A	A	A
242	2.45	0.14	0.41	12.09	A	A	A
244	2.47	0.22	1.23	13.89	A	A	A
247	4.6	0.4	88.52	13.75	N	N	N
254	2.98	0.86	22.13	30.76	A	N	W
256	4.81	0.19	97.13	11.36	N	N	N
258	2.6	0.26	6.56	14.61	A	A	A
259	2.53	0.2	3.69	13.27	A	A	A
261	2.86	0.21	17.21	12.94	A	A	A
263	2.51	0.17	2.87	12.63	A	A	A
266	2.71	0.309	11.07	15.61	A	A	A
269	2.1	0.4	-13.93	21.83	A	A	A
270	2.38	0.39	-2.46	19.55	A	A	A
273	2.66	0.305	9.02	15.65	A	A	A
276	2.33	0.31	-4.51	17.05	A	A	A
278	2.1	0.2	-13.93	14.29	A	A	A
279	2.4	0.2	-1.64	13.53	A	A	A
281	2.52	0.61	3.28	26.45	A	A	A
284	7.43	0.27	204.51	11.26	N	N	N
291	2.449	0.831	0.37	35.57	A	N	W
294	2.2	0.2	-9.84	14.01	A	A	A
295	2.92	0.40	19.67	17.36	A	A	A
300	2.7	0.1	10.66	11.28	A	A	A
301	2.5	0.3	2.46	16.05	A	A	A
302	1.99	0.2	-18.44	14.65	A	A	A
303	2.17	0.19	-11.07	13.79	A	A	A
305	3.7	0.71	51.64	21.95	N	A	N
309	10	1	309.84	14.61	N	N	N
310	2.55	0.20	4.51	13.23	A	A	A
311	3.97	1.7	62.70	44.13	N	N	N
312	2.60	0.29	6.56	15.43	A	A	A
313	2.64	0.35	8.20	17.01	A	A	A
315	2.74	0.31	12.30	15.54	A	A	A
317	6.4	1.2	162.30	21.57	N	N	N
318	2.5	0.2	2.46	13.32	A	A	A
319	2.45	0.16	0.41	12.50	A	A	A
320	2.0	0.2	-18.03	14.61	A	A	A
324	2.27	0.10	-6.97	11.53	A	A	A
325	2.6	0.3	6.56	15.71	A	A	A
326	1.3	0.2	-46.72	18.71	N	A	N
328	2.21	0.13	-9.43	12.17	A	A	A
329	2.65	0.20	8.61	13.06	A	A	A
331	2.90	0.23	18.85	13.28	A	A	A
333	2.54	0.22	4.10	13.73	A	A	A
334	2.86	0.20	17.21	12.75	A	A	A
336	2.46	0.22	0.82	13.91	A	A	A
337	2.50	0.36	2.46	17.91	A	A	A
339	2.09	0.28	-14.34	17.12	A	A	A
343	2.7	0.6	10.66	24.64	A	A	A

TABLE 56. Evaluation Results for Cs-137 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
344	2.3	0.2	-5.74	13.75	A	A	A
346	2.68	0.41	9.84	18.64	A	A	A
347	2.05	0.38	-15.98	21.38	A	A	A
348	2.7	0.1	10.66	11.28	A	A	A
352	2.53	0.06	3.69	10.92	A	A	A
355	2.78	0.19	13.93	12.66	A	A	A
358	1.98	0.34	-18.85	20.21	A	A	A
359	3.1	1.2	27.05	40.15	A	N	W
360	2.35	0.24	-3.69	14.76	A	A	A
362	1.73	0.3	-29.10	20.35	A	A	A
363	2.93	0.307	20.08	14.94	A	A	A
370	2.3	0.2	-5.74	13.75	A	A	A
371	2.78	0.22	13.93	13.27	A	A	A
380	2.49	0.25	2.05	14.64	A	A	A
382	2.74	0.44	12.30	19.27	A	A	A
384	1.88	0.16	-22.95	13.64	A	A	A
387	2.38	0.20	-2.46	13.57	A	A	A
391	2.39	0.20	-2.05	13.55	A	A	A
392	2.5	0.4	2.46	19.22	A	A	A
393	2.35	0.4	-3.69	20.08	A	A	A
397	3.29	0.52	34.84	19.06	N	A	N
399	2.95	0.33	20.90	15.45	A	A	A
404	2.10	0.10	-13.93	11.67	A	A	A
405	2.2	0.3	-9.84	17.31	A	A	A
407	2.38	0.10	-2.46	11.45	A	A	A
408	3.0	0.6	22.95	22.66	A	A	A
409	2.35	0.37	-3.69	19.01	A	A	A
412	2.54	0.24	4.10	14.24	A	A	A
414	2.78	0.28	13.93	14.66	A	A	A
415	2.481	0.127	1.68	11.82	A	A	A
416	2.73	0.48	11.89	20.56	A	A	A
418	2.6	0.15	6.56	12.12	A	A	A
419	2.56	0.18	4.92	12.77	A	A	A
420	2.53	0.3	3.69	15.94	A	A	A
421	3.1	0.3	27.05	14.39	A	A	A
425	2.01	0.21	-17.62	14.92	A	A	A
426	2.296	0.7	-5.90	32.30	A	N	W
427	3.0	0.32	22.95	15.08	A	A	A
434	3.05	0.25	25.00	13.44	A	A	A
439	2.2	0.1	-9.84	11.58	A	A	A
440	2.29	0.24	-6.15	14.95	A	A	A
441	2.35	0.53	-3.69	24.94	A	A	A
442	3.64	0.24	49.18	12.53	N	N	N
443	2.21	0.20	-9.43	13.98	A	A	A
445	1.59	0.17	-34.84	15.10	N	A	N
446	2.41	0.16	-1.23	12.55	A	A	A
448	2.6	0.3	6.56	15.71	A	A	A
449	2.30	0.07	-5.74	11.08	A	A	A
451	2.26	0.60	-7.38	28.61	A	A	A
454	2.2	0.2	-9.84	14.01	A	A	A
455	2.0	0.2	-18.03	14.61	A	A	A
461	2.52	0.12	3.28	11.67	A	A	A
464	1.67	0.22	-31.56	16.94	N	A	N
466	2.25	0.24	-7.79	15.08	A	A	A
471	2.79	0.56	14.34	22.72	A	A	A
475	3.05	0.16	25.00	11.88	A	A	A
484	2.6028	0.2570	6.67	14.53	A	A	A
485	3.5	0.2	43.44	12.09	N	N	N
487	2.1	0.2	-13.93	14.29	A	A	A
490	2.31687	0.19326	-5.05	13.53	A	A	A

TABLE 56. Evaluation Results for Cs-137 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
491	2.80	0.72	14.75	27.83	A	A	A
492	2.37	0.15	-2.87	12.39	A	A	A
498	2.85	0.37	16.80	16.80	A	A	A
502	4.61	0.3	88.93	12.49	N	N	N
504	2.73	0.44	11.89	19.32	A	A	A
505	2.17	0.29	-11.07	17.09	A	A	A
506	2.5	0.5	2.46	22.66	A	A	A
507	3.5	0.5	43.44	17.82	N	A	N
508	11.56	2.1	373.77	21.06	N	N	N
509	2.20	0.22	-9.84	14.61	A	A	A
512	2.603	0.904	6.68	36.33	A	N	W

Th-232 Determination in Sample 4 by Gamma-ray Spectrometry

TABLE 57. Target values

Parameter	Value
Activity concentration [Bq/kg]	130
Uncertainty [Bq/kg]	8
Maximum Acceptable Relative Bias [%]	30

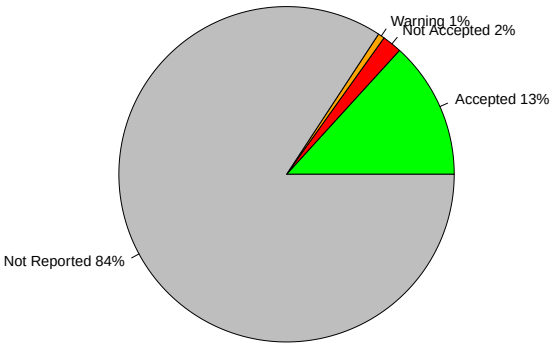

FIGURE 57. Percentage of Accepted vs. Warnings vs. Not Accepted vs. Not Reported results

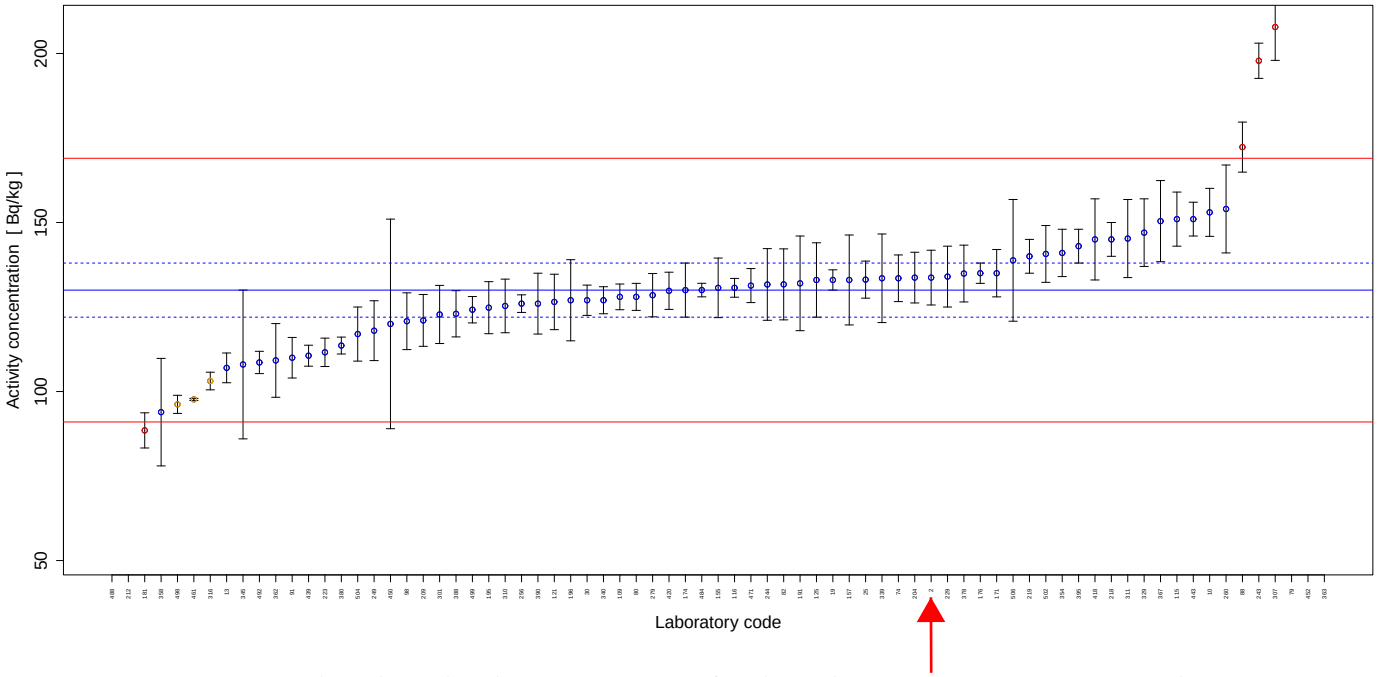

FIGURE 58. Reported results and evaluation parameters for Th-232 by Gamma-ray Spectrometry. Blue points represent accepted scores, whereas yellow and red represent warning and not accepted scores, respectively.

TABLE 58. Evaluation Results for Th-232 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
2	133.7	8.1	2.85	8.64	A	A	A
10	153.0	7.1	17.69	7.71	A	A	A
13	107.0	4.4	-17.69	7.40	A	A	A
19	133	3	2.31	6.55	A	A	A
25	133.10	5.48	2.38	7.40	A	A	A
30	127	4.48	-2.31	7.09	A	A	A
74	133.5	6.9	2.69	8.04	A	A	A
79	240	19	84.62	10.03	N	N	N
80	128	4	-1.54	6.90	A	A	A
82	131.7	10.5	1.31	10.07	A	A	A
88	172.3	7.4	32.54	7.50	N	N	N
91	110	6	-15.38	8.22	A	A	A
98	120.8	8.4	-7.08	9.29	A	A	A
109	128	3.8	-1.54	6.83	A	A	A
115	151	8	16.15	8.12	A	A	A
116	130.68	2.78	0.52	6.51	A	A	A
121	126.5	8.2	-2.69	8.94	A	A	A
125	133	11	2.31	10.31	A	A	A
155	130.67	8.81	0.52	9.13	A	A	A
157	133	13.3	2.31	11.74	A	A	A
171	135	7	3.85	8.05	A	A	A
174	130	8	0.00	8.70	A	A	A
176	135	3	3.85	6.54	A	A	A
181	88.5	5.2	-31.92	8.51	N	N	N
191	132	14	1.54	12.26	A	A	A
195	124.8	7.7	-4.00	8.71	A	A	A
196	127.00	12.00	-2.31	11.28	A	A	A
204	133.7	7.5	2.85	8.33	A	A	A
209	121.04	7.67	-6.89	8.83	A	A	A
212	34.5	1.51	-73.46	7.55	N	N	N
218	145	5	11.54	7.05	A	A	A
219	140	5	7.69	7.12	A	A	A
223	111.6	4.2	-14.15	7.21	A	A	A
229	134	9	3.08	9.11	A	A	A
243	197.84	5.21	52.18	6.69	N	N	N
244	131.67	10.60	1.28	10.13	A	A	A
249	118	8.85	-9.23	9.70	A	A	A
256	126	2.6	-3.08	6.49	A	A	A
260	154	13	18.46	10.45	A	A	A
279	128.5	6.4	-1.15	7.92	A	A	A
301	122.8	8.6	-5.54	9.32	A	A	A
307	207.82	9.86	59.86	7.77	N	N	N
310	125.32	7.93	-3.60	8.83	A	A	A
311	145.25	11.55	11.73	10.05	A	A	A
316	103.11	2.61	-20.68	6.65	A	N	W
329	147	10	13.08	9.17	A	A	A
339	133.5	13.1	2.69	11.58	A	A	A
340	127	4	-2.31	6.91	A	A	A
345	108	22	-16.92	21.28	A	A	A
354	141	7	8.46	7.91	A	A	A
358	93.9	15.9	-27.77	18.02	A	A	A
362	109.2	10.9	-16.00	11.73	A	A	A
363	2710	456	1984.62	17.92	N	N	N
367	150.4	12	15.69	10.08	A	A	A
378	134.9	8.4	3.77	8.75	A	A	A
380	113.6	2.5	-12.62	6.54	A	A	A
388	123	6.84	-5.38	8.29	A	A	A
390	126	9	-3.08	9.43	A	A	A
395	143	5	10.00	7.08	A	A	A
418	145	12	11.54	10.31	A	A	A

TABLE 58. Evaluation Results for Th-232 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
420	129.8	5.5	-0.15	7.47	A	A	A
439	110.6	3.1	-14.92	6.76	A	A	A
443	151	5	16.15	6.99	A	A	A
450	120	31	-7.69	26.56	A	A	A
452	347.52	6.242	167.32	6.41	N	N	N
461	97.68	0.3	-24.86	6.16	A	N	W
471	131.34	5.03	1.03	7.25	A	A	A
484	130.0161	2.0058	0.01	6.34	A	A	A
488	10.31	2.83	-92.07	28.13	N	N	N
492	108.6	3.3	-16.46	6.86	A	A	A
498	96.21	2.68	-25.99	6.75	A	N	W
499	124.2	3.9	-4.46	6.91	A	A	A
502	140.70	8.4	8.23	8.57	A	A	A
504	117	8	-10.00	9.20	A	A	A
506	138.8	18	6.77	14.35	A	A	A

Ra-228 Determination in Sample 4 by Gamma-ray Spectrometry

TABLE 59. Target values

Parameter	Value
Activity concentration [Bq/kg]	130
Uncertainty [Bq/kg]	8
Maximum Acceptable Relative Bias [%]	30

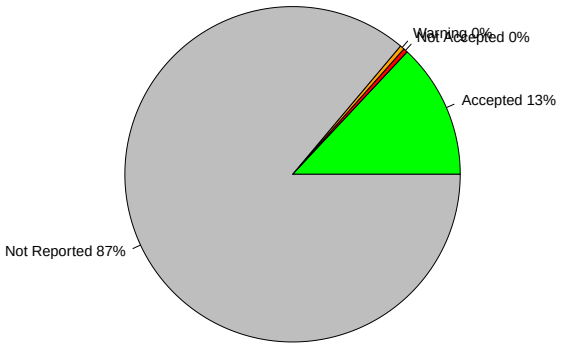

FIGURE 59. Percentage of Accepted vs. Warnings vs. Not Accepted vs. Not Reported results

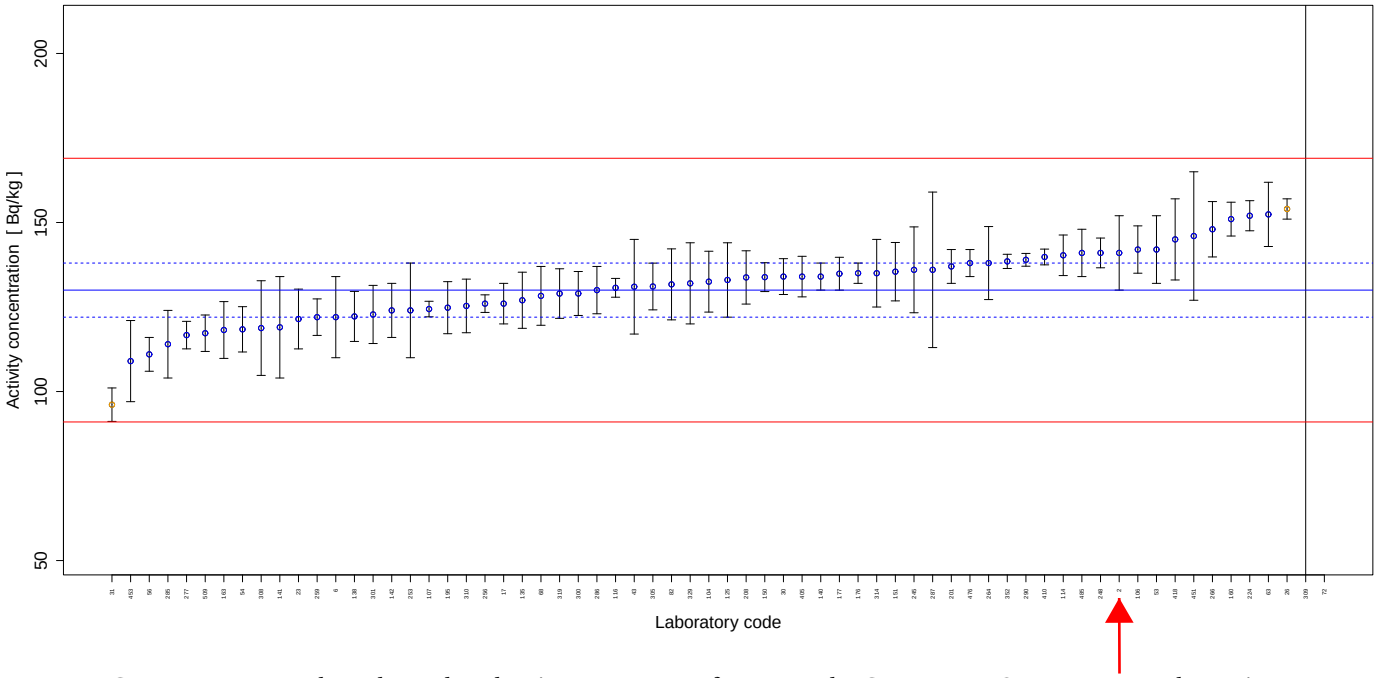

FIGURE 60. Reported results and evaluation parameters for Ra-228 by Gamma-ray Spectrometry. Blue points represent accepted scores, whereas yellow and red represent warning and not accepted scores, respectively.

TABLE 60. Evaluation Results for Ra-228 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
2	141	11	8.46	9.94	A	A	A
6	122	12	-6.15	11.60	A	A	A
17	126	6	-3.08	7.78	A	A	A
23	121.45	8.84	-6.58	9.53	A	A	A
26	154	3	18.46	6.45	A	N	W
30	134	5.3	3.08	7.32	A	A	A
31	96.11	4.95	-26.07	8.02	A	N	W
43	131	14	0.77	12.33	A	A	A
53	142	10	9.23	9.35	A	A	A
54	118.4	6.7	-8.92	8.36	A	A	A
56	111	5	-14.62	7.63	A	A	A
63	152.4	9.5	17.23	8.76	A	A	A
68	128.3	8.7	-1.31	9.16	A	A	A
72	658	18	406.15	6.73	N	N	N
82	131.7	10.5	1.31	10.07	A	A	A
104	132.5	9	1.92	9.17	A	A	A
106	142	7	9.23	7.88	A	A	A
107	124.4	2.3	-4.31	6.43	A	A	A
114	140.3	6.0	7.92	7.49	A	A	A
116	130.68	2.78	0.52	6.51	A	A	A
125	133	11	2.31	10.31	A	A	A
135	127	8.3	-2.31	8.98	A	A	A
138	122.22	7.40	-5.98	8.63	A	A	A
140	134	4	3.08	6.84	A	A	A
141	119	15	-8.46	14.03	A	A	A
142	124	8	-4.62	8.92	A	A	A
150	133.84	4.27	2.95	6.93	A	A	A
151	135.45	8.64	4.19	8.86	A	A	A
160	151	5	16.15	6.99	A	A	A
163	118.2	8.4	-9.08	9.40	A	A	A
176	135	3	3.85	6.54	A	A	A
177	134.85	4.86	3.73	7.13	A	A	A
195	124.8	7.7	-4.00	8.71	A	A	A
201	137	5	5.38	7.15	A	A	A
208	133.75	7.88	2.88	8.52	A	A	A
224	152	4.45	16.92	6.81	A	A	A
245	136.00	12.70	4.62	11.18	A	A	A
248	141	4.4	8.46	6.90	A	A	A
253	124	14	-4.62	12.86	A	A	A
256	126	2.6	-3.08	6.49	A	A	A
259	122	5.4	-6.15	7.58	A	A	A
264	138	10.8	6.15	9.96	A	A	A
266	148	8.19	13.85	8.28	A	A	A
277	116.69	4.07	-10.24	7.07	A	A	A
285	114	10	-12.31	10.72	A	A	A
286	130	7	0.00	8.18	A	A	A
287	136	23	4.62	18.00	A	A	A
290	138.96	1.89	6.89	6.30	A	A	A
300	129	6.5	-0.77	7.95	A	A	A
301	122.8	8.6	-5.54	9.32	A	A	A
305	131.07	6.91	0.82	8.10	A	A	A
308	118.77	14.00	-8.64	13.30	A	A	A
309	567	560	336.15	98.96	N	N	N
310	125.32	7.93	-3.60	8.83	A	A	A
314	135	10	3.85	9.63	A	A	A
319	128.98	7.33	-0.78	8.38	A	A	A
329	132	12	1.54	10.98	A	A	A
352	138.5	2.1	6.54	6.34	A	A	A
405	134	6	3.08	7.61	A	A	A
410	139.80	2.33	7.54	6.38	A	A	A

TABLE 60. Evaluation Results for Ra-228 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
418	145	12	11.54	10.31	A	A	A
451	146	19	12.31	14.40	A	A	A
453	109	12	-16.15	12.61	A	A	A
476	138	4	6.15	6.80	A	A	A
485	141	7	8.46	7.91	A	A	A
509	117.25	5.39	-9.81	7.68	A	A	A

Ac-228 Determination in Sample 4 by Gamma-ray Spectrometry

TABLE 61. Target values

Parameter	Value
Activity concentration [Bq/kg]	130
Uncertainty [Bq/kg]	8
Maximum Acceptable Relative Bias [%]	30

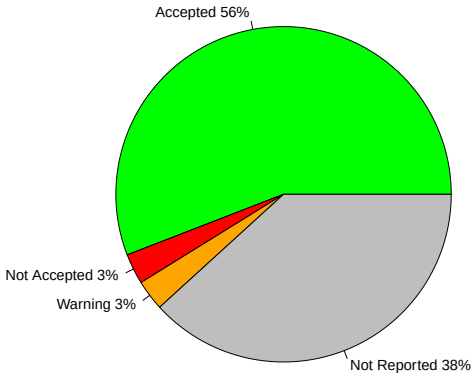

FIGURE 61. Percentage of Accepted vs. Warnings vs. Not Accepted vs. Not Reported results

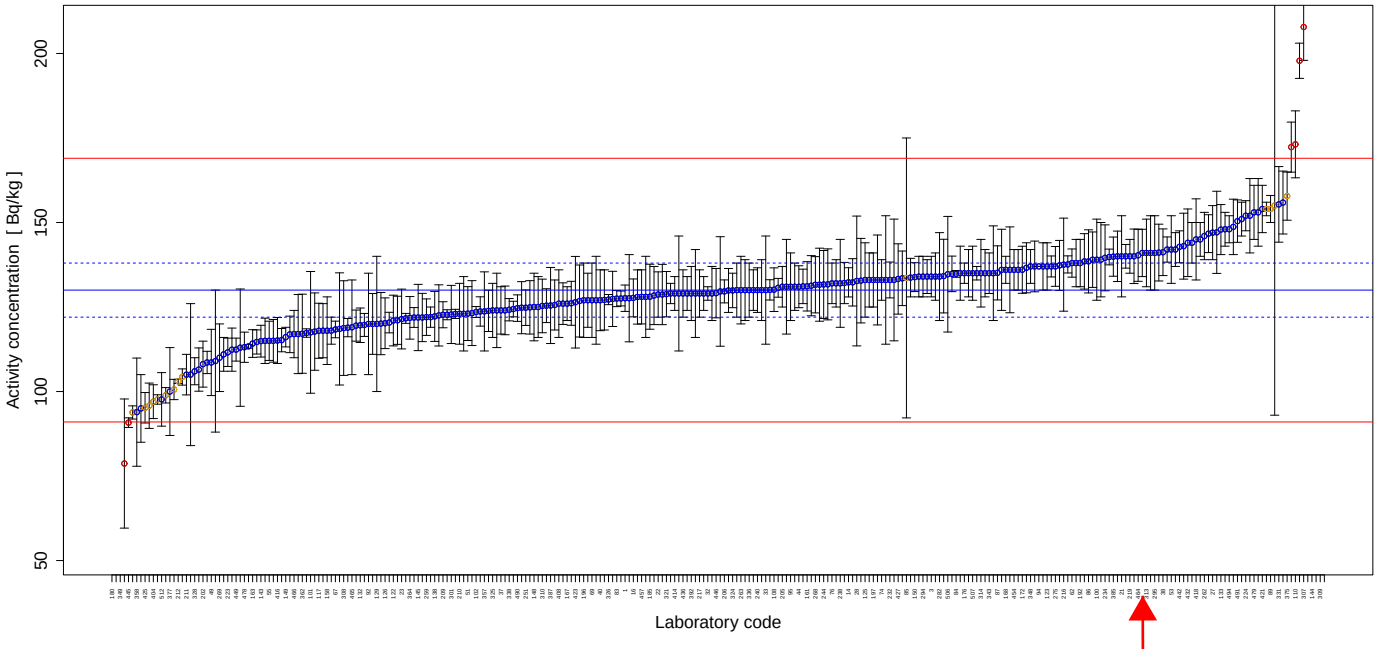

FIGURE 62. Reported results and evaluation parameters for Ac-228 by Gamma-ray Spectrometry. Blue points represent accepted scores, whereas yellow and red represent warning and not accepted scores, respectively.

TABLE 62. Evaluation Results for Ac-228 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
1	127.6	3.9	-1.85	6.87	A	A	A
2	141	11	8.46	9.94	A	A	A
3	134	6	3.08	7.61	A	A	A
4	123.68	4.34	-4.86	7.08	A	A	A
5	129	13	-0.77	11.81	A	A	A
11	117	11.7	-10.00	11.74	A	A	A
12	136	12	4.62	10.76	A	A	A
14	132.30	4.32	1.77	6.97	A	A	A
16	127.7	5.6	-1.77	7.56	A	A	A
21	140	12	7.69	10.55	A	A	A
22	128.7	6.7	-1.00	8.06	A	A	A
23	121.45	8.84	-6.58	9.53	A	A	A
24	155.9	9.3	19.92	8.57	A	A	A
27	147	8	13.08	8.22	A	A	A
28	132.7	19.2	2.08	15.72	A	A	A
32	129	2	-0.77	6.35	A	A	A
33	130	16	0.00	13.76	A	A	A
34	121.64	1.47	-6.43	6.27	A	A	A
35	129.9	6.5	-0.08	7.93	A	A	A
36	122.96	1.36	-5.42	6.25	A	A	A
37	124	7	-4.62	8.35	A	A	A
38	141.2	6.9	8.62	7.86	A	A	A
39	129.6	16.2	-0.31	13.93	A	A	A
40	127	9	-2.31	9.39	A	A	A
41	137.3	7.4	5.62	8.18	A	A	A
42	130	8	0.00	8.70	A	A	A
43	131	14	0.77	12.33	A	A	A
44	131	6.2	0.77	7.76	A	A	A
45	140	7.46	7.69	8.14	A	A	A
46	131.6	10.8	1.23	10.26	A	A	A
47	133.49	8.07	2.68	8.63	A	A	A
49	108.6	9.8	-16.46	10.92	A	A	A
50	115	6.70	-11.54	8.47	A	A	A
51	123.06	7.97	-5.34	8.93	A	A	A
53	142	10	9.23	9.35	A	A	A
55	115	5.8	-11.54	7.96	A	A	A
56	111	5	-14.62	7.63	A	A	A
59	126.1	6.5	-3.00	8.03	A	A	A
60	95.8	6.7	-26.31	9.32	A	N	W
62	138	4.17	6.15	6.86	A	A	A
64	134	5	3.08	7.20	A	A	A
67	118.36	2.46	-8.95	6.50	A	A	A
69	127	11	-2.31	10.62	A	A	A
70	118.52	16.59	-8.83	15.29	A	A	A
71	140	8.06	7.69	8.43	A	A	A
74	133.0	6.0	2.31	7.63	A	A	A
75	109	21	-16.15	20.23	A	A	A
76	132	6	1.54	7.65	A	A	A
77	127	8	-2.31	8.81	A	A	A
78	146.7	5.6	12.85	7.24	A	A	A
80	122	3	-6.15	6.63	A	A	A
82	131.7	10.5	1.31	10.07	A	A	A
83	127.5	2.39	-1.92	6.43	A	A	A
84	134.8	1.0	3.69	6.20	A	A	A
85	133.6	41.4	2.77	31.59	A	N	W
86	138.5	9.34	6.54	9.13	A	A	A
87	135.1	8	3.92	8.54	A	A	A
88	172.3	7.4	32.54	7.50	N	N	N
89	154	4	18.46	6.68	A	N	W
92	120	15	-7.69	13.93	A	A	A

TABLE 62. Evaluation Results for Ac-228 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
94	137	0.04	5.38	6.15	A	A	A
95	131	10	0.77	9.81	A	A	A
96	104.30	2.40	-19.77	6.57	A	N	W
99	124.0	7.2	-4.62	8.46	A	A	A
100	139	12	6.92	10.60	A	A	A
101	117.5	18	-9.62	16.51	A	A	A
102	123.52	1.61	-4.98	6.29	A	A	A
105	98.89	2.28	-23.93	6.57	A	N	W
107	124.4	2.3	-4.31	6.43	A	A	A
108	130.13	6.45	0.10	7.90	A	A	A
110	173.12	9.9	33.17	8.40	N	N	N
113	127.97	8.02	-1.56	8.78	A	A	A
116	130.68	2.78	0.52	6.51	A	A	A
117	117.979	8.140	-9.25	9.25	A	A	A
118	112.98	17.35	-13.09	16.54	A	A	A
119	129	5	-0.77	7.27	A	A	A
121	141.1	8.4	8.54	8.56	A	A	A
122	121.0	7.5	-6.92	8.73	A	A	A
123	137	7	5.38	8.00	A	A	A
124	134	7	3.08	8.07	A	A	A
125	133	11	2.31	10.31	A	A	A
126	120.2	7.5	-7.54	8.76	A	A	A
129	120	20	-7.69	17.77	A	A	A
131	138	7	6.15	7.97	A	A	A
132	119.6	5.1	-8.00	7.49	A	A	A
133	147.9	7.4	13.77	7.93	A	A	A
134	4.65	0.16	-96.42	7.05	N	N	N
138	122.22	7.40	-5.98	8.63	A	A	A
143	114.9	4.7	-11.62	7.39	A	A	A
144	318	16	144.62	7.95	N	N	N
145	121.9	9.8	-6.23	10.12	A	A	A
146	106.5	6.4	-18.08	8.60	A	A	A
147	137.60	2.53	5.85	6.42	A	A	A
148	125	10	-3.85	10.09	A	A	A
149	116.1	2.9	-10.69	6.64	A	A	A
150	133.84	4.27	2.95	6.93	A	A	A
152	128.4	8.6	-1.23	9.10	A	A	A
156	117.3	1.25	-9.77	6.25	A	A	A
157	133	13.3	2.31	11.74	A	A	A
158	118.0	10.0	-9.23	10.47	A	A	A
159	118.9	2.7	-8.54	6.56	A	A	A
160	142	5	9.23	7.09	A	A	A
161	131.12	7.3	0.86	8.30	A	A	A
162	152	11	16.92	9.50	A	A	A
163	114.2	4.1	-12.15	7.12	A	A	A
164	114.66	3.57	-11.80	6.90	A	A	A
166	127	13	-2.31	11.94	A	A	A
167	126	5	-3.08	7.32	A	A	A
168	136	4	4.62	6.82	A	A	A
169	134.15	10.894	3.19	10.19	A	A	A
170	125	9	-3.85	9.47	A	A	A
172	136.02	6.96	4.63	8.00	A	A	A
176	135	3	3.85	6.54	A	A	A
178	127.6	12.9	-1.85	11.84	A	A	A
180	0.13039	0.00406905	-99.90	6.90	N	N	N
184	129	3	-0.77	6.58	A	A	A
185	128.044	9.614	-1.50	9.71	A	A	A
187	127.53	2.20	-1.90	6.39	A	A	A
188	127.1	8.9	-2.23	9.32	A	A	A
192	138	7	6.15	7.97	A	A	A

TABLE 62. Evaluation Results for Ac-228 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
195	124.8	7.7	-4.00	8.71	A	A	A
196	127.00	11.00	-2.31	10.62	A	A	A
197	133	8	2.31	8.61	A	A	A
199	128	12	-1.54	11.21	A	A	A
202	108.1	6.8	-16.85	8.80	A	A	A
203	143	9.75	10.00	9.18	A	A	A
205	131	6	0.77	7.67	A	A	A
206	129.62	3.40	-0.29	6.69	A	A	A
207	133	8	2.31	8.61	A	A	A
209	122.71	3.85	-5.61	6.91	A	A	A
210	123	9	-5.38	9.56	A	A	A
211	105	6	-19.23	8.40	A	A	A
212	103	0.618	-20.77	6.18	A	N	W
213	120.4	3.04	-7.38	6.65	A	A	A
214	137	7.5	5.38	8.24	A	A	A
216	137.53	13.76	5.79	11.75	A	A	A
217	129	7	-0.77	8.20	A	A	A
218	145	5	11.54	7.05	A	A	A
219	140	5	7.69	7.12	A	A	A
220	148.7	8.2	14.38	8.26	A	A	A
222	148	5	13.85	7.02	A	A	A
223	111.6	4.2	-14.15	7.21	A	A	A
224	152	4.45	16.92	6.81	A	A	A
225	119.7	3.4	-7.92	6.78	A	A	A
226	135	2	3.85	6.33	A	A	A
230	142	3.73	9.23	6.69	A	A	A
232	133	5.3	2.31	7.33	A	A	A
234	139.55	9.75	7.35	9.31	A	A	A
238	132	13	1.54	11.61	A	A	A
239	131	7	0.77	8.15	A	A	A
240	130.0	6.6	0.00	7.98	A	A	A
243	197.84	5.21	52.18	6.69	N	N	N
244	131.67	10.05	1.28	9.80	A	A	A
245	136.00	12.70	4.62	11.18	A	A	A
247	116.9	5.4	-10.08	7.69	A	A	A
250	129	8	-0.77	8.74	A	A	A
251	124.80	5.25	-4.00	7.45	A	A	A
254	115	6.32	-11.54	8.25	A	A	A
258	126	6.15	-3.08	7.85	A	A	A
259	122	5.4	-6.15	7.58	A	A	A
262	146	7	12.31	7.80	A	A	A
263	130	10	0.00	9.85	A	A	A
268	131.583	8.323	1.22	8.82	A	A	A
269	110	10	-15.38	10.98	A	A	A
270	124.9	7.9	-3.92	8.82	A	A	A
271	78.7	19.1	-39.46	25.04	N	A	N
274	117.73	11.44	-9.44	11.50	A	A	A
275	137.01	5.89	5.39	7.51	A	A	A
276	128.70	8.92	-1.00	9.27	A	A	A
278	135	7	3.85	8.05	A	A	A
281	112.39	6.38	-13.55	8.37	A	A	A
282	134	13	3.08	11.49	A	A	A
287	139	11	6.92	10.02	A	A	A
291	123.866	6.107	-4.72	7.89	A	A	A
292	121.90	7.14	-6.23	8.50	A	A	A
294	134	6	3.08	7.61	A	A	A
295	141	11	8.46	9.94	A	A	A
296	100.6	3.0	-22.62	6.84	A	N	W
298	132.8	12.5	2.15	11.25	A	A	A
301	122.8	8.6	-5.54	9.32	A	A	A

TABLE 62. Evaluation Results for Ac-228 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
302	131.3	8.9	1.00	9.16	A	A	A
303	124	11	-4.62	10.80	A	A	A
306	140	3.5	7.69	6.64	A	A	A
307	207.82	9.86	59.86	7.77	N	N	N
308	118.77	14.00	-8.64	13.30	A	A	A
309	567	56.7	336.15	11.74	N	N	N
310	125.32	7.93	-3.60	8.83	A	A	A
311	147.09	12.15	13.15	10.30	A	A	A
312	133.7	5.7	2.85	7.49	A	A	A
313	141	10	8.46	9.39	A	A	A
314	135	10	3.85	9.63	A	A	A
315	130	9	0.00	9.26	A	A	A
317	123.0	11.0	-5.38	10.86	A	A	A
318	125.6	7.4	-3.38	8.52	A	A	A
320	136	6	4.62	7.57	A	A	A
321	128.8	6.7	-0.92	8.06	A	A	A
322	153	10	17.69	8.98	A	A	A
324	129.9	5.1	-0.08	7.30	A	A	A
325	124	8	-4.62	8.92	A	A	A
326	127.2	1.5	-2.15	6.27	A	A	A
328	106	4	-18.46	7.22	A	A	A
330	97.65	1.39	-24.88	6.32	A	N	W
331	155.36	11.18	19.51	9.47	A	A	A
332	118	8	-9.23	9.16	A	A	A
333	130	9	0.00	9.26	A	A	A
334	144	6	10.77	7.43	A	A	A
336	130	8	0.00	8.70	A	A	A
337	123.2	9.6	-5.23	9.93	A	A	A
338	124.2	3.3	-4.46	6.70	A	A	A
341	138.5	8.2	6.54	8.54	A	A	A
343	135	6	3.85	7.59	A	A	A
344	120	9	-7.69	9.70	A	A	A
345	105	21	-19.23	20.93	A	A	A
346	139	8.2	6.92	8.52	A	A	A
347	135	8.0	3.85	8.54	A	A	A
348	137	5	5.38	7.15	A	A	A
349	35.54	1.9	-72.66	8.15	N	N	N
354	141	7	8.46	7.91	A	A	A
357	123.7	11.7	-4.85	11.28	A	A	A
358	93.9	16.0	-27.77	18.12	A	A	A
362	117.1	11.7	-9.92	11.73	A	A	A
364	121.8	6.3	-6.31	8.04	A	A	A
370	119.5	4.6	-8.08	7.26	A	A	A
371	137	7	5.38	8.00	A	A	A
373	132	7	1.54	8.12	A	A	A
375	157.8	7.12	21.38	7.63	A	N	W
377	100	13	-23.08	14.38	A	A	A
382	130.07	3.00	0.05	6.57	A	A	A
383	132.3	7.0	1.77	8.12	A	A	A
384	115.20	3.44	-11.38	6.84	A	A	A
385	139.9	5.8	7.62	7.42	A	A	A
386	253	11	94.62	7.53	N	N	N
387	125.45	11.25	-3.50	10.88	A	A	A
391	129	5	-0.77	7.27	A	A	A
392	129	8	-0.77	8.74	A	A	A
393	127.4	8.16	-2.00	8.88	A	A	A
397	129	17	-0.77	14.54	A	A	A
401	118	4	-9.23	7.03	A	A	A
402	133	19	2.31	15.55	A	A	A
404	97	5	-25.38	8.03	A	N	W

TABLE 62. Evaluation Results for Ac-228 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
405	134	6	3.08	7.61	A	A	A
407	137.0	3.1	5.38	6.56	A	A	A
408	126	10	-3.08	10.04	A	A	A
409	126.78	10.65	-2.48	10.41	A	A	A
410	139.80	2.33	7.54	6.38	A	A	A
412	131.1	5.1	0.85	7.28	A	A	A
414	129	5	-0.77	7.27	A	A	A
415	132.1	6.1	1.62	7.69	A	A	A
416	115.1	6.8	-11.46	8.53	A	A	A
417	133	18	2.31	14.87	A	A	A
418	145	12	11.54	10.31	A	A	A
419	122.52	9.05	-5.75	9.61	A	A	A
421	154	7	18.46	7.65	A	A	A
423	126.415	13.550	-2.76	12.36	A	A	A
425	95.2	4.5	-26.77	7.76	A	N	W
427	133.3	10.4	2.54	9.94	A	A	A
432	144	10	10.77	9.28	A	A	A
436	129	7	-0.77	8.20	A	A	A
437	95	10	-26.92	12.19	A	A	A
440	136.6	7.4	5.08	8.20	A	A	A
441	719.0	6.5	453.08	6.22	N	N	N
442	142.81	4.72	9.85	6.99	A	A	A
443	151	5	16.15	6.99	A	A	A
445	90.80	1.42	-30.15	6.35	N	N	N
446	129.1	7.3	-0.69	8.36	A	A	A
449	112.4	3.4	-13.54	6.86	A	A	A
452	366.011	7.585	181.55	6.49	N	N	N
454	136	6	4.62	7.57	A	A	A
455	130	6	0.00	7.69	A	A	A
457	128	8	-1.54	8.77	A	A	A
458	120.1	9.2	-7.62	9.83	A	A	A
461	113.36	0.54	-12.80	6.17	A	A	A
463	155	62	19.23	40.47	A	N	W
464	140.3	7.7	7.92	8.25	A	A	A
465	119.0	14.0	-8.46	13.28	A	A	A
466	117	7	-10.00	8.58	A	A	A
475	154	2	18.46	6.29	A	N	W
478	113.10	4.47	-13.00	7.31	A	A	A
479	153	8	17.69	8.08	A	A	A
486	122.71	1.48	-5.61	6.27	A	A	A
487	135	7	3.85	8.05	A	A	A
490	124.67161	3.92280	-4.10	6.91	A	A	A
491	150.41	6.27	15.70	7.43	A	A	A
492	108.6	3.3	-16.46	6.86	A	A	A
494	148	4	13.85	6.72	A	A	A
497	125.4	5.0	-3.54	7.33	A	A	A
498	134.80	5.26	3.69	7.29	A	A	A
501	121.9	2.93	-6.23	6.61	A	A	A
505	93.81	1.95	-27.84	6.50	A	N	W
506	134.7	17.1	3.62	14.11	A	A	A
507	135	8	3.85	8.54	A	A	A
512	97.676	7.918	-24.86	10.18	A	A	A
515	121.07	7.12	-6.87	8.51	A	A	A
516	135	14	3.85	12.06	A	A	A

Pb-212 Determination in Sample 4 by Gamma-ray Spectrometry

TABLE 63. Target values

Parameter	Value
Activity concentration [Bq/kg]	130
Uncertainty [Bq/kg]	6
Maximum Acceptable Relative Bias [%]	30

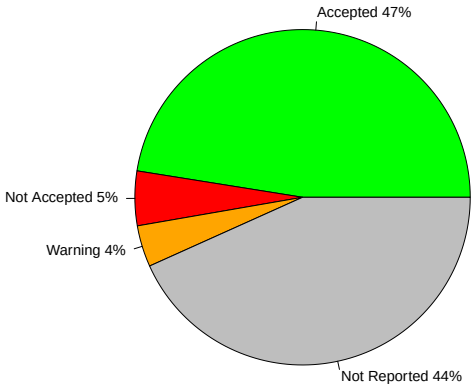

FIGURE 63. Percentage of Accepted vs. Warnings vs. Not Accepted vs. Not Reported results

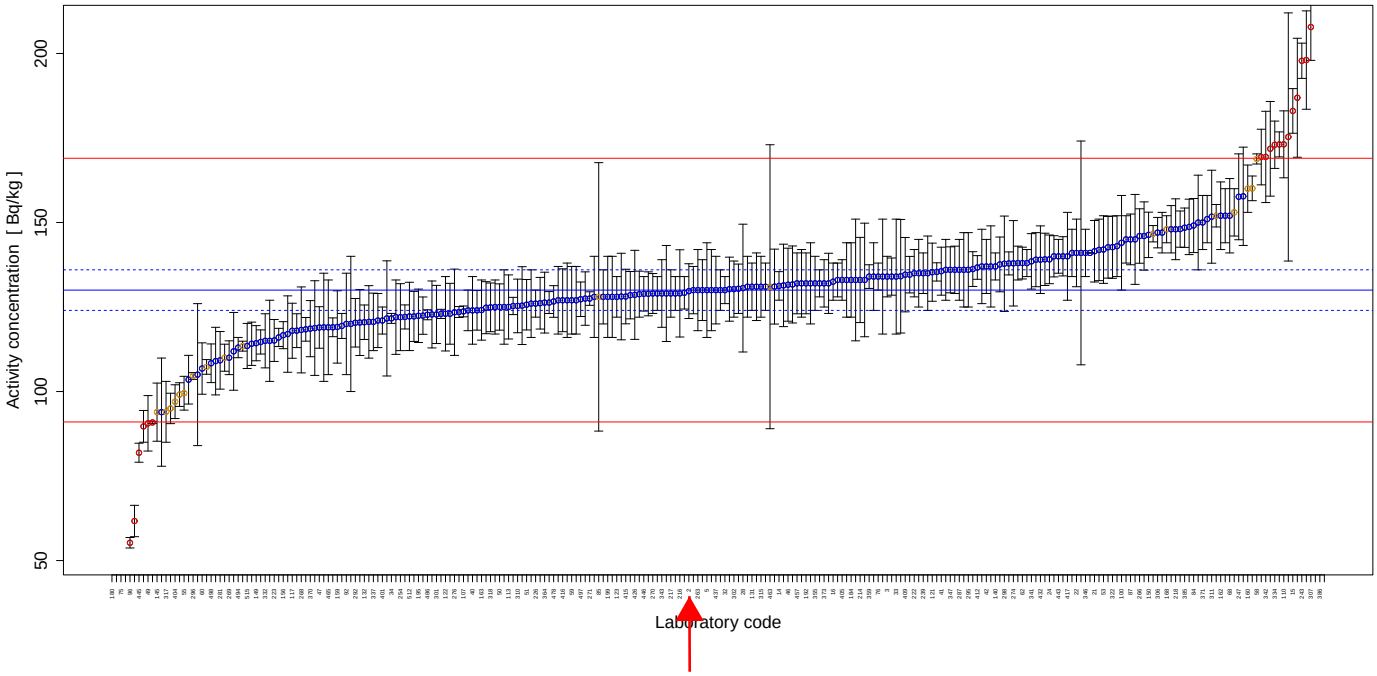

FIGURE 64. Reported results and evaluation parameters for Pb-212 by Gamma-ray Spectrometry. Blue points represent accepted scores, whereas yellow and red represent warning and not accepted scores, respectively.

TABLE 64. Evaluation Results for Pb-212 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
2	129.7	8.1	-0.23	7.77	A	A	A
3	134	6	3.08	6.43	A	A	A
5	130	14	0.00	11.72	A	A	A
12	131	9	0.77	8.28	A	A	A
14	131.24	4.22	0.95	5.63	A	A	A
15	183	6.6	40.77	5.86	N	N	N
16	132.5	5.5	1.92	6.21	A	A	A
21	141.5	9.1	8.85	7.92	A	A	A
22	141	10	8.46	8.46	A	A	A
24	139.1	7.2	7.00	6.93	A	A	A
27	153	7	17.69	6.50	A	N	W
28	130.6	18.9	0.46	15.19	A	A	A
32	130	4	0.00	5.55	A	A	A
33	134	17	3.08	13.50	A	A	A
34	121.64	1.47	-6.43	4.77	A	A	A
35	129.2	4.8	-0.62	5.92	A	A	A
36	122.96	1.36	-5.42	4.75	A	A	A
37	121	8	-6.92	8.06	A	A	A
38	173.1	3.7	33.15	5.09	N	N	N
39	134.1	16.8	3.15	13.35	A	A	A
40	124	10	-4.62	9.29	A	A	A
41	135.6	7.1	4.31	6.98	A	A	A
42	137	8	5.38	7.44	A	A	A
43	119	16	-8.46	14.22	A	A	A
44	132	8.9	1.54	8.17	A	A	A
46	131.6	10.8	1.23	9.42	A	A	A
47	118.95	6.14	-8.50	6.92	A	A	A
49	90.6	8.2	-30.31	10.16	N	N	N
50	125	6.85	-3.85	7.16	A	A	A
51	125.68	7.47	-3.32	7.53	A	A	A
53	142	10	9.23	8.42	A	A	A
55	99.5	5.0	-23.46	6.82	A	N	W
56	124	6	-4.62	6.69	A	A	A
58	168.8	1.5	29.85	4.70	A	N	W
59	127	10	-2.31	9.13	A	A	A
60	106.8	7.6	-17.85	8.48	A	A	A
62	138	4.70	6.15	5.74	A	A	A
68	152	11	16.92	8.58	A	A	A
69	122	11	-6.15	10.13	A	A	A
70	121.63	17.03	-6.44	14.74	A	A	A
71	145	13.3	11.54	10.27	A	A	A
74	137.6	8.1	5.85	7.48	A	A	A
75	14.6	3.5	-88.77	24.41	N	N	N
76	134	4	3.08	5.50	A	A	A
77	132	10	1.54	8.87	A	A	A
78	175.3	36.7	34.85	21.44	N	A	N
82	141.9	9.1	9.15	7.90	A	A	A
84	149.1	8.0	14.69	7.08	A	A	A
85	128.0	39.7	-1.54	31.36	A	N	W
86	129	14.2	-0.77	11.94	A	A	A
87	145	7.5	11.54	6.93	A	A	A
88	186.9	17.6	43.77	10.49	N	N	N
89	148	7	13.85	6.61	A	A	A
92	120	15	-7.69	13.32	A	A	A
93	146	10.1	12.31	8.32	A	A	A
94	141	0.05	8.46	4.62	A	A	A
95	134	10	3.08	8.77	A	A	A
96	55.27	1.55	-57.48	5.40	N	N	N
100	144	14	10.77	10.76	A	A	A
101	115	12	-11.54	11.41	A	A	A

TABLE 64. Evaluation Results for Pb-212 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
102	123.52	1.61	-4.98	4.80	A	A	A
107	123.7	1.6	-4.85	4.79	A	A	A
108	130.28	9.47	0.22	8.61	A	A	A
110	173.12	9.9	33.17	7.35	N	N	N
113	125.02	9.48	-3.83	8.88	A	A	A
116	125.31	2.55	-3.61	5.04	A	A	A
117	117.979	8.140	-9.25	8.30	A	A	A
119	129	5	-0.77	6.03	A	A	A
121	135.3	8.6	4.08	7.86	A	A	A
122	123.0	11.0	-5.38	10.06	A	A	A
123	128	6	-1.54	6.58	A	A	A
124	130	6	0.00	6.53	A	A	A
125	139	8	6.92	7.38	A	A	A
126	128.5	7.0	-1.15	7.14	A	A	A
129	120	20	-7.69	17.29	A	A	A
131	131	7	0.77	7.06	A	A	A
132	120.5	5.1	-7.31	6.26	A	A	A
133	171.8	14.0	32.15	9.37	N	N	N
134	4.08	0.06	-96.86	4.84	N	N	N
138	122.22	7.40	-5.98	7.61	A	A	A
140	137	4	5.38	5.46	A	A	A
144	247	14	90.00	7.31	N	N	N
145	93.9	8.6	-27.77	10.26	A	N	W
147	124.02	5.86	-4.60	6.61	A	A	A
148	150	14	15.38	10.41	A	A	A
149	114.3	5.2	-12.08	6.48	A	A	A
150	146.34	6.71	12.57	6.51	A	A	A
151	139.1	7.73	7.00	7.22	A	A	A
152	130.4	7.3	0.31	7.26	A	A	A
156	116.67	4.0	-10.25	5.75	A	A	A
158	122.8	9.9	-5.54	9.29	A	A	A
159	119.1	10.7	-8.38	10.10	A	A	A
160	160	7	23.08	6.36	A	N	W
161	114.13	6.4	-12.21	7.26	A	A	A
162	152	10	16.92	8.04	A	A	A
163	124.1	8.9	-4.54	8.53	A	A	A
164	114.66	3.57	-11.80	5.57	A	A	A
167	132	4	1.54	5.52	A	A	A
168	148	4	13.85	5.35	A	N	W
169	136.22	5.1397	4.78	5.96	A	A	A
170	136	9	4.62	8.07	A	A	A
172	131.04	11.08	0.80	9.63	A	A	A
176	133	5	2.31	5.95	A	A	A
178	128.1	12.8	-1.46	11.01	A	A	A
180	0.14449	0.0017828	-99.89	4.78	N	N	N
184	133	11	2.31	9.47	A	A	A
185	131.391	12.193	1.07	10.36	A	A	A
187	122.06	3.56	-6.11	5.46	A	A	A
188	127.5	7.9	-1.92	7.73	A	A	A
192	132	9	1.54	8.23	A	A	A
195	122.4	7.9	-5.85	7.93	A	A	A
196	128.00	12.00	-1.54	10.45	A	A	A
197	132	12	1.54	10.20	A	A	A
199	128	12	-1.54	10.45	A	A	A
202	103.5	7.2	-20.38	8.35	A	A	A
203	141	33.1	8.46	23.92	A	A	A
205	133	11	2.31	9.47	A	A	A
206	135.38	2.70	4.14	5.03	A	A	A
207	137	11	5.38	9.26	A	A	A
210	135	10	3.85	8.73	A	A	A

TABLE 64. Evaluation Results for Pb-212 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
211	109	10	-16.15	10.27	A	A	A
212	116	2.69	-10.77	5.17	A	A	A
213	119	2.78	-8.46	5.17	A	A	A
214	133	12.6	2.31	10.54	A	A	A
216	129.03	12.90	-0.75	11.01	A	A	A
217	129	7	-0.77	7.12	A	A	A
218	148	9	13.85	7.63	A	A	A
219	147	6	13.08	6.16	A	A	A
220	148.7	8.2	14.38	7.19	A	A	A
222	135	7	3.85	6.94	A	A	A
223	115.1	6.2	-11.46	7.09	A	A	A
224	152	3.32	16.92	5.11	A	N	W
225	99.1	3.5	-23.77	5.81	A	N	W
226	126	4	-3.08	5.60	A	A	A
230	140	6.09	7.69	6.34	A	A	A
232	134	5.5	3.08	6.18	A	A	A
234	142.67	9.12	9.75	7.88	A	A	A
239	135	6	3.85	6.41	A	A	A
243	197.84	5.21	52.18	5.31	N	N	N
244	131.67	11.39	1.28	9.80	A	A	A
245	157.75	14.54	21.35	10.31	A	A	A
247	157.6	12.7	21.23	9.29	A	A	A
250	131	7	0.77	7.06	A	A	A
254	122	9.9	-6.15	9.34	A	A	A
258	133	16.8	2.31	13.45	A	A	A
263	130	12	0.00	10.32	A	A	A
266	146	8.05	12.31	7.19	A	A	A
268	118.227	12.710	-9.06	11.70	A	A	A
269	110	5	-15.38	6.48	A	A	A
270	129.0	5.9	-0.77	6.50	A	A	A
271	127.5	2.0	-1.92	4.87	A	A	A
274	137.93	12.63	6.10	10.25	A	A	A
275	148.05	5.36	13.88	5.87	A	A	A
276	123.45	12.76	-5.04	11.32	A	A	A
278	127	11	-2.31	9.81	A	A	A
280	107.28	2.17	-17.48	5.04	A	N	W
281	109.23	8.52	-15.98	9.06	A	A	A
282	136	11	4.62	9.31	A	A	A
287	136	9	4.62	8.07	A	A	A
291	111.887	11.500	-13.93	11.27	A	A	A
292	120.34	7.18	-7.43	7.54	A	A	A
294	131	10	0.77	8.92	A	A	A
295	136	11	4.62	9.31	A	A	A
296	104.6	1.0	-19.54	4.71	A	N	W
298	137.8	14.1	6.00	11.22	A	A	A
301	122.8	8.6	-5.54	8.39	A	A	A
302	130.3	8.3	0.23	7.87	A	A	A
303	124.8	7.7	-4.00	7.71	A	A	A
306	147	4.5	13.08	5.54	A	A	A
307	207.82	9.86	59.86	6.62	N	N	N
308	118.77	14.00	-8.64	12.66	A	A	A
309	459	45	253.08	10.84	N	N	N
310	125.32	7.93	-3.60	7.83	A	A	A
311	151.71	13.75	16.70	10.17	A	A	A
313	143	9	10.00	7.80	A	A	A
314	135	11	3.85	9.36	A	A	A
315	131	9	0.77	8.28	A	A	A
317	94.0	9.0	-27.69	10.63	A	N	W
318	124.9	7.2	-3.92	7.38	A	A	A
320	128	12	-1.54	10.45	A	A	A

TABLE 64. Evaluation Results for Pb-212 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
321	128.8	6.8	-0.92	7.01	A	A	A
322	142.7	9.2	9.77	7.93	A	A	A
324	126.32	3.24	-2.83	5.28	A	A	A
325	125	8	-3.85	7.89	A	A	A
328	118	5	-9.23	6.27	A	A	A
331	198.05	14.55	52.35	8.68	N	N	N
332	115	8	-11.54	8.35	A	A	A
333	130	9	0.00	8.32	A	A	A
334	173	7	33.08	6.14	N	N	N
336	128	8	-1.54	7.77	A	A	A
337	120.6	8.5	-7.23	8.42	A	A	A
338	128.9	6.5	-0.85	6.84	A	A	A
341	138.5	8.2	6.54	7.51	A	A	A
342	169.4	13.5	30.31	9.21	N	N	N
343	129	10	-0.77	9.02	A	A	A
344	123	9	-5.38	8.65	A	A	A
345	105	21	-19.23	20.53	A	A	A
346	141	7.0	8.46	6.78	A	A	A
347	136	6.8	4.62	6.80	A	A	A
348	138	4	6.15	5.45	A	A	A
349	38.81	2.03	-70.15	6.98	N	N	N
354	141	7	8.46	6.78	A	A	A
355	132	8	1.54	7.62	A	A	A
358	93.9	16.0	-27.77	17.65	A	A	A
359	134	3.5	3.08	5.30	A	A	A
360	89.7	4.7	-31.00	6.98	N	N	N
364	126.3	9.0	-2.85	8.49	A	A	A
370	118.6	8.3	-8.77	8.38	A	A	A
371	150	8	15.38	7.05	A	A	A
373	132	7	1.54	7.03	A	A	A
384	120.41	9.75	-7.38	9.32	A	A	A
385	148.46	5.82	14.20	6.06	A	A	A
386	256	12	96.92	6.58	N	N	N
387	122.45	5.52	-5.81	6.45	A	A	A
391	129	5	-0.77	6.03	A	A	A
392	136	7	4.62	6.91	A	A	A
393	120.6	10.72	-7.23	10.02	A	A	A
397	133	18	2.31	14.30	A	A	A
401	121	4	-6.92	5.68	A	A	A
402	134	17	3.08	13.50	A	A	A
404	97	5	-25.38	6.92	A	N	W
405	133	6	2.31	6.45	A	A	A
407	137.9	3.4	6.08	5.23	A	A	A
408	126	10	-3.08	9.18	A	A	A
409	134.57	11.00	3.52	9.39	A	A	A
410	134.57	5.40	3.52	6.12	A	A	A
412	136.7	3.5	5.15	5.28	A	A	A
414	138	5	6.15	5.87	A	A	A
415	128.1	8.07	-1.46	7.81	A	A	A
416	127.0	9.3	-2.31	8.66	A	A	A
417	140	13	7.69	10.37	A	A	A
418	145	7	11.54	6.68	A	A	A
419	126.12	7.64	-2.98	7.62	A	A	A
421	151	7	16.15	6.54	A	A	A
423	125.415	11.510	-3.53	10.27	A	A	A
425	95.0	4.5	-26.92	6.61	A	N	W
426	128.6	13.17	-1.08	11.23	A	A	A
432	139	10	6.92	8.55	A	A	A
436	152	8	16.92	7.00	A	A	A
437	130	10	0.00	8.97	A	A	A

TABLE 64. Evaluation Results for Pb-212 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
441	137	12	5.38	9.90	A	A	A
442	113.42	1.47	-12.75	4.79	A	N	W
443	140	5	7.69	5.84	A	A	A
445	81.90	2.81	-37.00	5.75	N	N	N
446	128.9	5.1	-0.85	6.08	A	A	A
449	118.4	3.5	-8.92	5.48	A	A	A
454	130	12	0.00	10.32	A	A	A
455	125	11	-3.85	9.94	A	A	A
457	132	9	1.54	8.23	A	A	A
458	117.0	11.3	-10.00	10.70	A	A	A
461	90.85	0.34	-30.12	4.63	N	N	N
463	131	42	0.77	32.39	A	N	W
464	127	10	-2.31	9.13	A	A	A
465	119.0	14.0	-8.46	12.64	A	A	A
474	140.0	5.8	7.69	6.20	A	A	A
475	110	4	-15.38	5.88	A	N	W
478	126.64	4.68	-2.58	5.91	A	A	A
486	122.71	1.48	-5.61	4.77	A	A	A
487	127	10	-2.31	9.13	A	A	A
490	169.36331	8.22538	30.28	6.70	N	N	N
491	146.68	2.41	12.83	4.90	A	N	W
492	119.4	3.7	-8.15	5.56	A	A	A
494	113	3	-13.08	5.32	A	A	A
497	127.3	5.1	-2.08	6.11	A	A	A
498	108.36	5.72	-16.65	7.01	A	A	A
501	160.1	3.65	23.15	5.15	A	N	W
505	61.70	4.64	-52.54	8.82	N	N	N
507	130	7	0.00	7.09	A	A	A
512	122.2173	10.103	-5.99	9.47	A	A	A
515	113.48	6.67	-12.71	7.47	A	A	A

Tl-208 Determination in Sample 4 by Gamma-ray Spectrometry

TABLE 65. Target values

Parameter	Value
Activity concentration [Bq/kg]	46.7
Uncertainty [Bq/kg]	1.8
Maximum Acceptable Relative Bias [%]	30

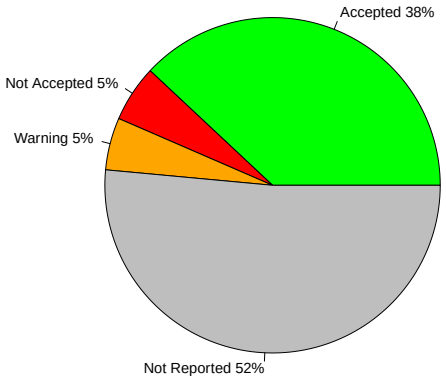

FIGURE 65. Percentage of Accepted vs. Warnings vs. Not Accepted vs. Not Reported results

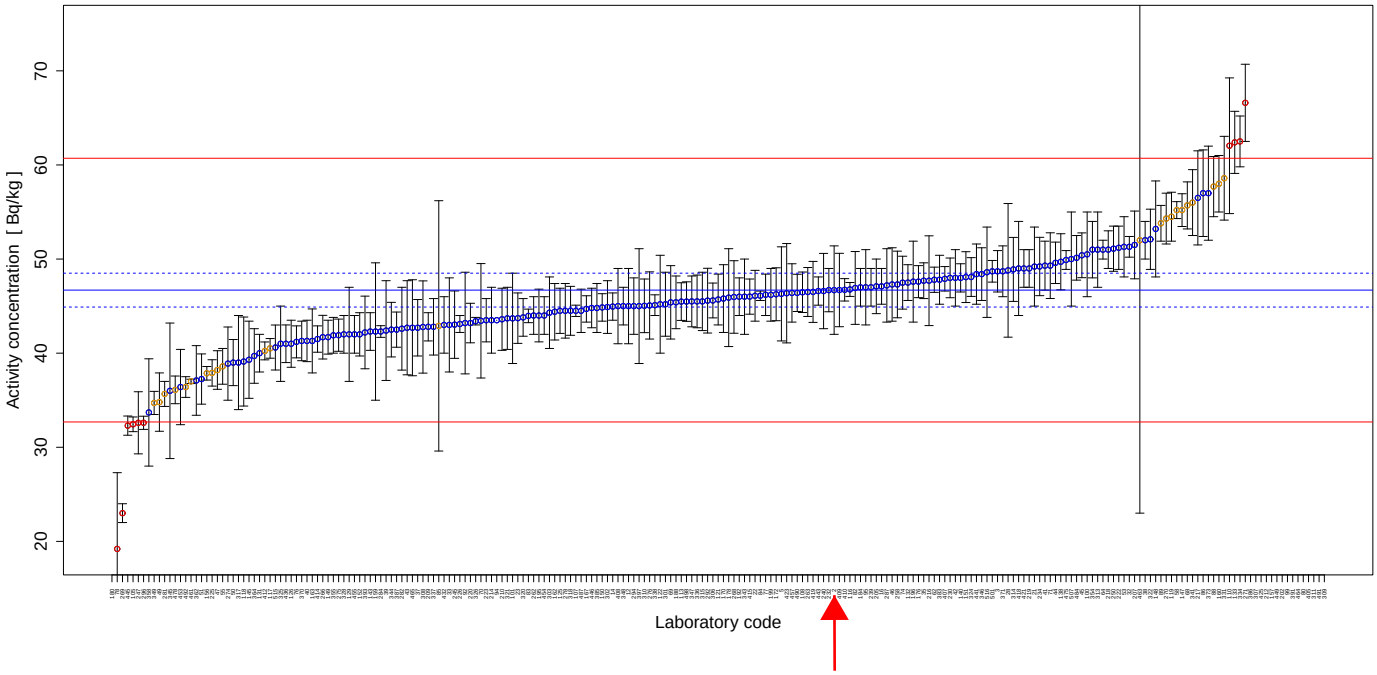

FIGURE 66. Reported results and evaluation parameters for Tl-208 by Gamma-ray Spectrometry. Blue points represent accepted scores, whereas yellow and red represent warning and not accepted scores, respectively.

TABLE 66. Evaluation Results for Tl-208 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
2	46.7	4.7	0.00	10.78	A	A	A
3	48.7	2.2	4.28	5.94	A	A	A
5	46.3	5.0	-0.86	11.47	A	A	A
12	45	4	-3.64	9.69	A	A	A
14	44.95	1.45	-3.75	5.03	A	A	A
16	47.1	1.9	0.86	5.58	A	A	A
21	49.2	4.2	5.35	9.37	A	A	A
22	46.1	2.7	-1.28	7.01	A	A	A
23	43.72	2.68	-6.38	7.24	A	A	A
28	48.8	7.1	4.50	15.05	A	A	A
32	51.3	1.1	9.85	4.41	A	A	A
33	43	5	-7.92	12.25	A	A	A
35	47.7	1.9	2.14	5.54	A	A	A
37	42.7	3.0	-8.57	8.01	A	A	A
38	52	2	11.35	5.45	A	A	A
39	42.4	5.3	-9.21	13.08	A	A	A
40	41.3	2.2	-11.56	6.58	A	A	A
41	49.3	2.6	5.57	6.53	A	A	A
42	48	3	2.78	7.34	A	A	A
43	42.7	5.0	-8.57	12.33	A	A	A
44	49.6	2.2	6.21	5.88	A	A	A
45	50.4	2.38	7.92	6.10	A	A	A
46	47.3	3.9	1.28	9.10	A	A	A
47	38.21	2.05	-18.18	6.61	A	N	W
49	34.8	3.1	-25.48	9.71	A	N	W
50	39.0	2.45	-16.49	7.37	A	A	A
51	37.25	2.67	-20.24	8.14	A	A	A
53	51.3	3.2	9.85	7.33	A	A	A
55	38.6	1.9	-17.34	6.25	A	N	W
58	55.2	0.9	18.20	4.19	A	N	W
62	47.8	1.34	2.36	4.77	A	A	A
64	51	1	9.21	4.32	A	A	A
68	55.7	2.5	19.27	5.92	A	N	W
69	45.4	3.9	-2.78	9.42	A	A	A
70	43.44	6.08	-6.98	14.52	A	A	A
71	49.3	3.49	5.57	8.06	A	A	A
74	47.49	2.81	1.69	7.06	A	A	A
76	41.2	1.7	-11.78	5.65	A	A	A
77	46.2	2.2	-1.07	6.13	A	A	A
78	19.2	8.1	-58.89	42.36	N	N	N
80	134	3	186.94	4.46	N	N	N
82	46.93	3.87	0.49	9.10	A	A	A
83	43.96	0.72	-5.87	4.19	A	A	A
84	46.1	0.5	-1.28	4.00	A	A	A
85	42.9	13.3	-8.14	31.24	A	N	W
86	57	4.6	22.06	8.94	A	A	A
88	57.7	3.2	23.55	6.75	A	N	W
89	53.8	1.9	15.20	5.23	A	N	W
92	43.2	5.4	-7.49	13.08	A	A	A
94	43.5	0.001	-6.85	3.85	A	A	A
95	47	4	0.64	9.34	A	A	A
99	126.7	7.8	171.31	7.26	N	N	N
100	50.5	4.5	8.14	9.71	A	A	A
101	43.7	4.8	-6.42	11.64	A	A	A
105	32.44	0.78	-30.54	4.54	N	N	N
107	44.5	0.6	-4.71	4.08	A	A	A
108	46.47	2.15	-0.49	6.02	A	A	A
110	62.04	7.21	32.85	12.24	N	N	N
113	45.48	2	-2.61	5.85	A	A	A
116	46.77	0.74	0.15	4.17	A	A	A

TABLE 66. Evaluation Results for Tl-208 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
117	40.509	1.045	-13.26	4.64	A	N	W
118	39.11	4.73	-16.25	12.69	A	A	A
119	54.5	2.6	16.70	6.13	A	N	W
121	45.7	2.7	-2.14	7.05	A	A	A
122	45.2	5.2	-3.21	12.13	A	A	A
125	44.5	2.4	-4.71	6.63	A	A	A
126	41.0	2.5	-12.21	7.21	A	A	A
129	42	5	-10.06	12.51	A	A	A
131	40	2	-14.35	6.31	A	A	A
132	47.5	1.9	1.71	5.55	A	A	A
133	62.4	3.3	33.62	6.54	N	N	N
138	49.71	2.98	6.45	7.13	A	A	A
140	48	1.5	2.78	4.96	A	A	A
143	42.3	2	-9.42	6.10	A	A	A
145	39.3	4.1	-15.85	11.12	A	A	A
147	55.20	1.74	18.20	4.98	A	N	W
148	53.2	5.1	13.92	10.33	A	A	A
149	41.7	1.8	-10.71	5.79	A	A	A
150	44.86	1.46	-3.94	5.04	A	A	A
151	48.08	2.70	2.96	6.81	A	A	A
152	42.0	2.3	-10.06	6.70	A	A	A
156	37.86	0.72	-18.93	4.30	A	N	W
157	101	10.1	116.27	10.72	N	N	N
159	42.3	7.3	-9.42	17.68	A	A	A
160	58	3	24.20	6.45	A	N	W
162	44.4	3.0	-4.93	7.78	A	A	A
163	41.3	3.4	-11.56	9.09	A	A	A
167	44.7	1.4	-4.28	4.97	A	A	A
170	45.8	3.6	-1.93	8.75	A	A	A
172	46.26	2.81	-0.94	7.19	A	A	A
176	47.6	1.7	1.93	5.25	A	A	A
178	45.9	5.2	-1.71	11.97	A	A	A
180	0.11362	0.00814105	-99.76	8.14	N	N	N
184	47	2	0.64	5.74	A	A	A
188	45.4	2.8	-2.78	7.27	A	A	A
192	46	2	-1.50	5.81	A	A	A
195	44.0	2.8	-5.78	7.44	A	A	A
196	47.60	4.30	1.93	9.82	A	A	A
199	46.2	2.8	-1.07	7.18	A	A	A
202	108.6	6.4	132.55	7.04	N	N	N
205	47.1	2.9	0.86	7.26	A	A	A
207	51.5	3.6	10.28	7.98	A	A	A
209	42.8	1.5	-8.35	5.21	A	A	A
210	43.6	3.3	-6.64	8.49	A	A	A
212	101	1.76	116.27	4.23	N	N	N
214	43.5	3.5	-6.85	8.92	A	A	A
216	47.70	4.77	2.14	10.72	A	A	A
217	56.5	5.0	20.99	9.65	A	A	A
218	51	2	9.21	5.50	A	A	A
219	49	2	4.93	5.61	A	A	A
220	43.2	2.1	-7.49	6.20	A	A	A
222	51.2	2.3	9.64	5.92	A	A	A
223	43.5	2.3	-6.85	6.54	A	A	A
225	37.9	1.4	-18.84	5.34	A	N	W
226	43.1	0.9	-7.71	4.38	A	A	A
230	48.0	2.11	2.78	5.85	A	A	A
232	46.7	2.3	0.00	6.25	A	A	A
234	49.21	3.10	5.37	7.39	A	A	A
239	47	2	0.64	5.74	A	A	A
240	46.6	4.0	-0.21	9.41	A	A	A

TABLE 66. Evaluation Results for Tl-208 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
245	43.03	3.58	-7.86	9.17	A	A	A
247	32.6	3.3	-30.19	10.83	N	N	N
250	51.1	2.4	9.42	6.08	A	A	A
258	47.3	3.54	1.28	8.42	A	A	A
262	44	2	-5.78	5.96	A	A	A
263	46.5	2.6	-0.43	6.79	A	A	A
266	41.7	2.32	-10.71	6.77	A	A	A
268	45.970	3.853	-1.56	9.23	A	A	A
269	23	1	-50.75	5.81	N	N	N
270	54.3	2.7	16.27	6.29	A	N	W
271	66.6	4.1	42.61	7.26	N	N	N
274	38.89	3.89	-16.72	10.72	A	A	A
275	41.91	1.71	-10.26	5.61	A	A	A
276	45.07	3.57	-3.49	8.81	A	A	A
278	44.5	2.9	-4.71	7.57	A	A	A
281	35.67	1.33	-23.62	5.36	A	N	W
282	42.6	4.4	-8.78	11.02	A	A	A
284	42.30	0.62	-9.42	4.12	A	A	A
287	47.2	3.9	1.07	9.12	A	A	A
292	45.58	3.44	-2.40	8.47	A	A	A
294	45	3	-3.64	7.70	A	A	A
296	32.6	0.7	-30.19	4.41	N	N	N
301	45.2	3.4	-3.21	8.45	A	A	A
302	44.9	2.8	-3.85	7.33	A	A	A
303	44.3	3.8	-5.14	9.40	A	A	A
306	45.6	1.85	-2.36	5.60	A	A	A
307	86.76	3.85	85.78	5.88	N	N	N
308	42.78	4.90	-8.39	12.09	A	A	A
309	224	23	379.66	10.97	N	N	N
310	45.03	2.85	-3.58	7.41	A	A	A
311	138.82	12.5	197.26	9.79	N	N	N
313	51	4	9.21	8.74	A	A	A
314	48.9	3.4	4.71	7.95	A	A	A
315	45.5	3.1	-2.57	7.83	A	A	A
317	39.0	5.0	-16.49	13.39	A	A	A
318	44.5	2.6	-4.71	7.00	A	A	A
320	43.8	2.0	-6.21	5.98	A	A	A
321	43.7	3.3	-6.42	8.48	A	A	A
322	52.1	3.2	11.56	7.25	A	A	A
324	48.09	2.06	2.98	5.76	A	A	A
325	41	4	-12.21	10.49	A	A	A
326	43.4	0.4	-7.07	3.96	A	A	A
328	42	2	-10.06	6.13	A	A	A
331	58.59	4.45	25.46	8.52	A	N	W
334	62.5	2.7	33.83	5.79	N	N	N
336	45.5	2.8	-2.57	7.26	A	A	A
337	42.8	3.0	-8.35	8.00	A	A	A
338	45.1	1.1	-3.43	4.56	A	A	A
341	56.0	3.5	19.91	7.34	A	N	W
343	46	4	-1.50	9.51	A	A	A
344	42.5	2.9	-8.99	7.84	A	A	A
345	36	7.2	-22.91	20.37	A	A	A
346	48.4	2.8	3.64	6.95	A	A	A
347	45.5	2.7	-2.57	7.08	A	A	A
348	45	2	-3.64	5.88	A	A	A
349	34.71	1.23	-25.67	5.24	A	N	W
354	51	3	9.21	7.03	A	A	A
355	41.9	1.9	-10.28	5.95	A	A	A
358	33.7	5.7	-27.84	17.35	A	A	A
362	37.1	3.7	-20.56	10.69	A	A	A

TABLE 66. Evaluation Results for Tl-208 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
364	39.7	2.9	-14.99	8.26	A	A	A
370	41.3	2.1	-11.56	6.38	A	A	A
371	48.7	2.7	4.28	6.75	A	A	A
373	57	5	22.06	9.58	A	A	A
383	47.8	2.6	2.36	6.67	A	A	A
385	44.8	2.6	-4.07	6.97	A	A	A
386	83	3	77.73	5.28	N	N	N
387	42.5	1.87	-8.99	5.85	A	A	A
391	127	4	171.95	4.98	N	N	N
393	42.2	3.86	-9.64	9.93	A	A	A
397	45.0	6.1	-3.64	14.09	A	A	A
405	138	7	195.50	6.37	N	N	N
407	47.9	1.3	2.57	4.71	A	A	A
408	45	4	-3.64	9.69	A	A	A
409	46.71	3.90	0.02	9.20	A	A	A
410	46.73	1.19	0.06	4.62	A	A	A
412	40.24	0.95	-13.83	4.52	A	N	W
414	41.5	1.4	-11.13	5.12	A	A	A
415	46.01	1.87	-1.48	5.60	A	A	A
418	49	5	4.93	10.91	A	A	A
419	46.51	3.24	-0.41	7.96	A	A	A
421	49	2	4.93	5.61	A	A	A
423	46.37	5.278	-0.71	12.02	A	A	A
425	99.0	4.1	111.99	5.66	N	N	N
432	43	3	-7.92	7.97	A	A	A
436	41	2	-12.21	6.22	A	A	A
441	48.4	3.2	3.64	7.65	A	A	A
443	46.6	1.5	-0.21	5.02	A	A	A
445	32.30	1.02	-30.84	4.98	N	N	N
446	44.8	2.1	-4.07	6.07	A	A	A
449	102.3	3.1	119.06	4.90	N	N	N
453	36.4	4.0	-22.06	11.65	A	A	A
454	44	2	-5.78	5.96	A	A	A
455	42	2	-10.06	6.13	A	A	A
457	46.4	3.1	-0.64	7.71	A	A	A
461	37.0	0.23	-20.77	3.90	A	N	W
463	52	29	11.35	55.90	A	N	W
464	133.3	7.2	185.44	6.64	N	N	N
465	42.7	5.1	-8.57	12.55	A	A	A
475	49.9	1.0	6.85	4.34	A	A	A
478	36.10	1.47	-22.70	5.61	A	N	W
484	50.1300	2.3694	7.34	6.10	A	A	A
487	44.5	2.3	-4.71	6.45	A	A	A
490	46.40586	1.97821	-0.63	5.75	A	A	A
491	162.05	7.04	247.00	5.81	N	N	N
492	36.4	1.1	-22.06	4.90	A	N	W
498	45.48	2.10	-2.61	6.01	A	A	A
501	48.7	1.15	4.28	4.52	A	A	A
507	50	5	7.07	10.72	A	A	A
515	40.60	2.39	-13.06	7.04	A	A	A
516	48.6	4.8	4.07	10.60	A	A	A

U-238 Determination in Sample 4 by Gamma-ray Spectrometry

TABLE 67. Target values

Parameter	Value
Activity concentration [Bq/kg]	143
Uncertainty [Bq/kg]	7
Maximum Acceptable Relative Bias [%]	30

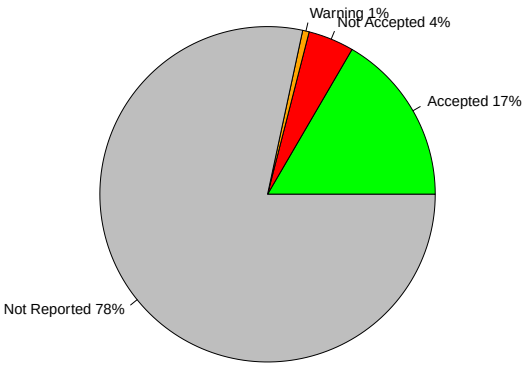

FIGURE 67. Percentage of Accepted vs. Warnings vs. Not Accepted vs. Not Reported results

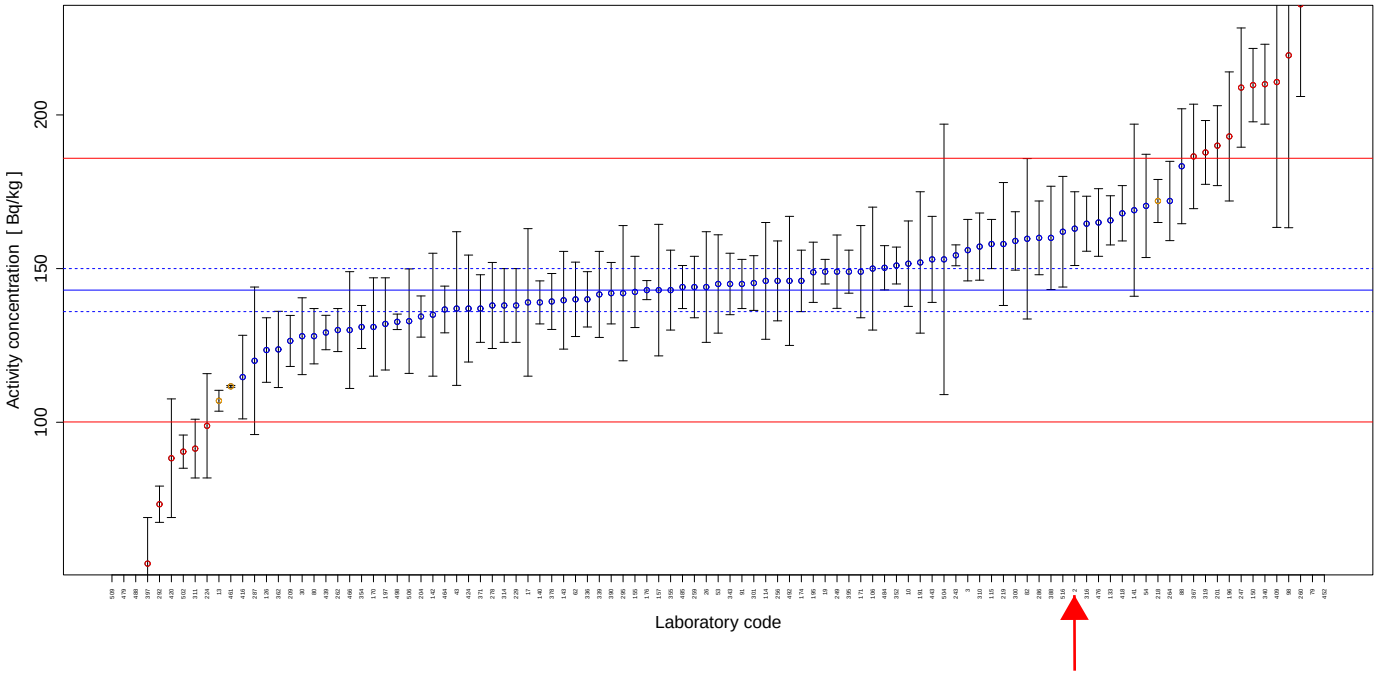

FIGURE 68. Reported results and evaluation parameters for U-238 by Gamma-ray Spectrometry. Blue points represent accepted scores, whereas yellow and red represent warning and not accepted scores, respectively.

TABLE 68. Evaluation Results for U-238 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
2	163	12	13.99	8.84	A	A	A
3	156	10	9.09	8.07	A	A	A
10	151.6	13.9	6.01	10.39	A	A	A
13	107.0	3.4	-25.17	5.84	A	N	W
17	139	24	-2.80	17.95	A	A	A
19	149	4	4.20	5.58	A	A	A
26	144	18	0.70	13.42	A	A	A
30	128	12.5	-10.49	10.92	A	A	A
43	137	25	-4.20	18.89	A	A	A
53	145	16	1.40	12.07	A	A	A
54	170.4	16.8	19.16	11.01	A	A	A
62	140	12.1	-2.10	9.93	A	A	A
79	403	61	181.82	15.91	N	N	N
80	128	9	-10.49	8.57	A	A	A
82	159.7	26.1	11.68	17.06	A	A	A
88	183.3	18.7	28.18	11.32	A	A	A
91	145	8	1.40	7.38	A	A	A
98	219.4	56.1	53.43	26.03	N	A	N
106	150	20	4.90	14.20	A	A	A
114	146	19	2.10	13.90	A	A	A
115	158	8	10.49	7.04	A	A	A
126	123.5	10.5	-13.64	9.81	A	A	A
133	165.7	8.0	15.87	6.88	A	A	A
140	139	7	-2.80	7.02	A	A	A
141	169	28	18.18	17.28	A	A	A
142	135	20	-5.59	15.60	A	A	A
143	139.7	15.9	-2.31	12.39	A	A	A
150	209.70	11.94	46.64	7.51	N	N	N
155	142.41	11.59	-0.41	9.50	A	A	A
157	143	21.4	0.00	15.75	A	A	A
170	131	16	-8.39	13.16	A	A	A
171	149	15	4.20	11.19	A	A	A
174	146	10	2.10	8.42	A	A	A
176	143	3.1	0.00	5.35	A	A	A
191	152	23	6.29	15.90	A	A	A
195	148.8	9.8	4.06	8.21	A	A	A
196	193.00	21.00	34.97	11.93	N	N	N
197	132	15	-7.69	12.37	A	A	A
201	190	13	32.87	8.41	N	N	N
204	134.4	6.7	-6.01	6.99	A	A	A
209	126.46	8.30	-11.57	8.19	A	A	A
218	172	7	20.28	6.37	A	N	W
219	158	20	10.49	13.57	A	A	A
224	98.85	16.97	-30.87	17.85	N	A	N
229	138	12	-3.50	9.98	A	A	A
243	154.32	3.4	7.92	5.37	A	A	A
247	208.9	19.4	46.08	10.50	N	N	N
249	149	11.93	4.20	9.38	A	A	A
256	146	13	2.10	10.16	A	A	A
259	144	10	0.70	8.50	A	A	A
260	236	30	65.03	13.62	N	N	N
262	130	7	-9.09	7.28	A	A	A
264	172	12.9	20.28	8.96	A	A	A
278	138	14	-3.50	11.26	A	A	A
286	160	12	11.89	8.96	A	A	A
287	120	24	-16.08	20.59	A	A	A
292	73.33	5.90	-48.72	9.42	N	N	N
295	142	22	-0.70	16.25	A	A	A
300	159	9.5	11.19	7.72	A	A	A
301	145.3	8.9	1.61	7.84	A	A	A

TABLE 68. Evaluation Results for U-238 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
310	157.16	10.93	9.90	8.50	A	A	A
311	91.43	9.56	-36.06	11.55	N	N	N
314	138	12	-3.50	9.98	A	A	A
316	164.6	8.95	15.10	7.32	A	A	A
319	187.80	10.38	31.33	7.38	N	N	N
336	140	9	-2.10	8.08	A	A	A
339	141.6	14	-0.98	11.03	A	A	A
340	210	13	46.85	7.89	N	N	N
343	145	10	1.40	8.46	A	A	A
352	151	6	5.59	6.30	A	A	A
354	131	7	-8.39	7.25	A	A	A
355	143	13	0.00	10.33	A	A	A
362	123.7	12.4	-13.50	11.16	A	A	A
367	186.5	17.0	30.42	10.35	N	N	N
371	137	11	-4.20	9.40	A	A	A
378	139.3	9.1	-2.59	8.16	A	A	A
388	160	16.8	11.89	11.58	A	A	A
390	142	10	-0.70	8.58	A	A	A
395	149	7	4.20	6.78	A	A	A
397	54	15	-62.24	28.21	N	A	N
409	210.70	47.30	47.34	22.98	N	A	N
416	114.7	13.6	-19.79	12.83	A	A	A
418	168	9	17.48	7.26	A	A	A
420	88.3	19.3	-38.25	22.40	N	A	N
424	137	17.4	-4.20	13.61	A	A	A
439	129.2	5.6	-9.65	6.54	A	A	A
443	153	14	6.99	10.38	A	A	A
452	646.7	94.24	352.24	15.37	N	N	N
461	111.68	0.3	-21.90	4.90	A	N	W
464	136.7	7.6	-4.41	7.41	A	A	A
466	130	19	-9.09	15.41	A	A	A
476	165	11	15.38	8.27	A	A	A
479	24.4	3.6	-82.94	15.54	N	N	N
484	150.2639	7.1994	5.08	6.85	A	A	A
485	144	7	0.70	6.90	A	A	A
488	35.13	3.71	-75.43	11.64	N	N	N
492	146	21	2.10	15.19	A	A	A
498	132.68	2.52	-7.22	5.25	A	A	A
502	90.44	5.4	-36.76	7.72	N	N	N
504	153	44	6.99	29.17	A	A	A
506	132.9	17	-7.06	13.70	A	A	A
509	6.50	1.80	-95.45	28.12	N	N	N
516	162	18	13.29	12.14	A	A	A

Pb-210 Determination in Sample 4 by Gamma-ray Spectrometry

TABLE 69. Target values

Parameter	Value
Activity concentration [Bq/kg]	140
Uncertainty [Bq/kg]	6
Maximum Acceptable Relative Bias [%]	30

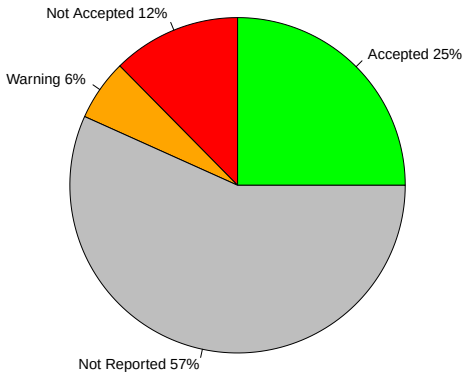

FIGURE 69. Percentage of Accepted vs. Warnings vs. Not Accepted vs. Not Reported results

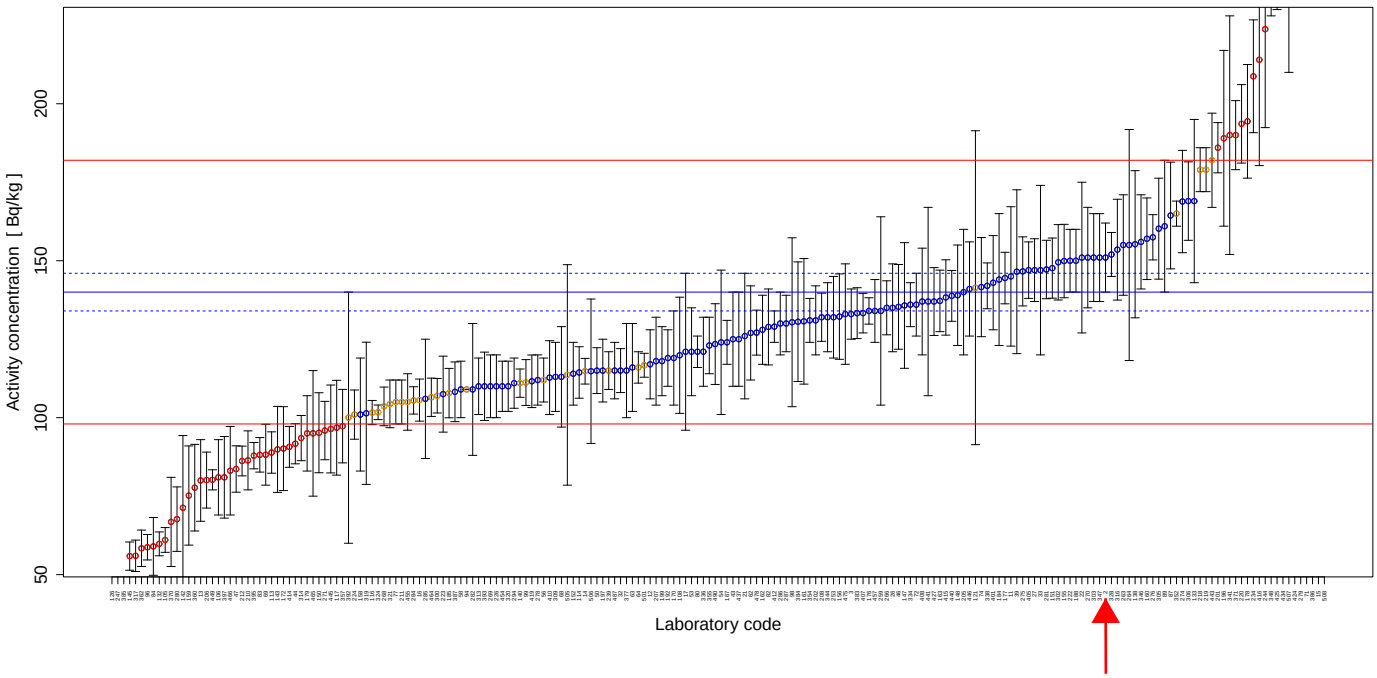

FIGURE 70. Reported results and evaluation parameters for Pb-210 by Gamma-ray Spectrometry. Blue points represent accepted scores, whereas yellow and red represent warning and not accepted scores, respectively.

TABLE 70. Evaluation Results for Pb-210 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
2	151	11	7.86	8.45	A	A	A
3	133	8	-5.00	7.39	A	A	A
11	145	22.2	3.57	15.90	A	A	A
12	117	11	-16.43	10.33	A	A	A
13	80.0	13.0	-42.86	16.81	N	A	N
14	114.80	4.09	-18.00	5.57	A	N	W
15	533	23	280.71	6.08	N	N	N
16	105.6	6.7	-24.57	7.66	A	N	W
17	121	25	-13.57	21.10	A	A	A
21	126	20	-10.00	16.44	A	A	A
22	151	24	7.86	16.46	A	A	A
26	135	14	-3.57	11.22	A	A	A
27	147	10	5.00	8.04	A	A	A
32	115	7	-17.86	7.44	A	A	A
33	147	27	5.00	18.86	A	A	A
39	146.5	26.1	4.64	18.32	A	A	A
43	125	15	-10.71	12.74	A	A	A
44	91.7	6.4	-34.50	8.19	N	N	N
46	135.3	13.5	-3.36	10.86	A	A	A
47	83.65	7.39	-40.25	9.82	N	N	N
50	115	7.29	-17.86	7.65	A	A	A
53	121	14	-13.57	12.34	A	A	A
54	124	23	-11.43	19.04	A	A	A
56	112	7	-20.00	7.58	A	N	W
58	109.0	9.0	-22.14	9.30	A	A	A
62	127	15	-9.29	12.56	A	A	A
63	116.0	14.0	-17.14	12.81	A	A	A
64	116	5	-17.14	6.08	A	N	W
68	113	16	-19.29	14.79	A	A	A
69	88.2	9.7	-37.00	11.80	N	N	N
71	290	30.7	107.14	11.42	N	N	N
72	136	10	-2.86	8.51	A	A	A
74	141.6	15.8	1.14	11.95	A	A	A
77	105	7	-25.00	7.93	A	N	W
80	121	5	-13.57	5.95	A	A	A
82	128.9	12.1	-7.93	10.32	A	A	A
83	88.168	5.5	-37.02	7.57	N	N	N
84	59.0	9.2	-57.86	16.17	N	N	N
87	164.4	17	17.43	11.19	A	A	A
89	161	21	15.00	13.73	A	A	A
94	109	0.05	-22.14	4.29	A	N	W
96	58.73	4.05	-58.05	8.12	N	N	N
98	130.4	26.9	-6.86	21.07	A	A	A
99	111.2	7.3	-20.57	7.84	A	N	W
105	61.05	3.94	-56.39	7.75	N	N	N
106	81	12	-42.14	15.42	N	N	N
108	119.88	18.50	-14.37	16.02	A	A	A
113	88.90	6.59	-36.50	8.56	N	N	N
114	114.4	8.2	-18.29	8.35	A	A	A
116	101.63	3.86	-27.41	5.73	A	N	W
117	96.802	15.099	-30.86	16.18	N	A	N
121	141.4	50.0	1.00	35.62	A	N	W
126	4.7	0.5	-96.64	11.47	N	N	N
132	59.8	3.8	-57.29	7.66	N	N	N
133	169	26	20.71	15.97	A	A	A
138	155.25	23.44	10.89	15.69	A	A	A
140	111	4.5	-20.71	5.90	A	N	W
142	71.3	23.0	-49.07	32.54	N	N	N
143	89.9	13.7	-35.79	15.83	N	A	N
145	55.9	4.5	-60.07	9.12	N	N	N

TABLE 70. Evaluation Results for Pb-210 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
147	135.74	20.01	-3.04	15.35	A	A	A
148	139	16	-0.71	12.28	A	A	A
150	95.20	12.74	-32.00	14.05	N	A	N
151	147.65	9.58	5.46	7.78	A	A	A
152	114	10	-18.57	9.76	A	A	A
155	149.90	11.69	7.07	8.90	A	A	A
156	132.2	13.6	-5.57	11.14	A	A	A
158	101.0	18.0	-27.86	18.33	A	A	A
159	75.2	15.8	-46.29	21.44	N	A	N
160	157	13	12.14	9.32	A	A	A
161	130.69	20	-6.65	15.89	A	A	A
162	128	11	-8.57	9.60	A	A	A
163	137.2	9.8	-2.00	8.33	A	A	A
167	124	7	-11.43	7.09	A	A	A
170	119	15	-15.00	13.31	A	A	A
172	90.15	13.36	-35.61	15.43	N	A	N
176	134	4.2	-4.29	5.31	A	A	A
177	144.48	8.21	3.20	7.12	A	A	A
178	194.4	18.1	38.86	10.25	N	N	N
179	95	12	-32.14	13.34	N	A	N
184	144	21	2.86	15.20	A	A	A
185	107.831	7.867	-22.98	8.46	A	N	W
188	150	10	7.14	7.93	A	A	A
192	119	9	-15.00	8.69	A	A	A
196	189.00	28.00	35.00	15.42	N	A	N
197	115	10	-17.86	9.69	A	A	A
199	118	11	-15.71	10.26	A	A	A
201	186	8	32.86	6.07	N	N	N
202	131	11	-6.43	9.43	A	A	A
205	140	20	0.00	14.91	A	A	A
206	80.12	8.92	-42.77	11.93	N	N	N
207	118	14	-15.71	12.61	A	A	A
208	131.99	7.67	-5.72	7.22	A	A	A
210	86.4	9.4	-38.29	11.69	N	N	N
211	105	7	-25.00	7.93	A	N	W
212	86.2	4.74	-38.43	6.97	N	N	N
218	179	7	27.86	5.80	A	N	W
219	179	7	27.86	5.80	A	N	W
220	193.6	12.5	38.29	7.75	N	N	N
222	150	10	7.14	7.93	A	A	A
223	107.5	12.1	-23.21	12.04	A	A	A
224	100.98	7.84	-27.87	8.87	A	N	W
226	110	10	-21.43	10.05	A	A	A
234	208.75	17.97	49.11	9.62	N	N	N
239	115	6	-17.86	6.75	A	N	W
244	223.76	31.36	59.83	14.66	N	N	N
247	36.7	5.6	-73.79	15.85	N	N	N
253	132	13	-5.71	10.74	A	A	A
259	134	30	-4.29	22.79	A	A	A
263	155	16	10.71	11.18	A	A	A
264	155	36.8	10.71	24.13	A	A	A
266	135	8.6	-3.57	7.68	A	A	A
268	103.593	6.160	-26.00	7.33	A	N	W
269	110	10	-21.43	10.05	A	A	A
270	151	16	7.86	11.43	A	A	A
271	95.9	9.3	-31.50	10.60	N	N	N
274	168.85	16.3	20.61	10.56	A	A	A
275	146.6	11	4.71	8.64	A	A	A
276	157.46	7.21	12.47	6.27	A	A	A
278	112	8	-20.00	8.33	A	A	A

TABLE 70. Evaluation Results for Pb-210 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
279	284.2	14.2	103.00	6.58	N	N	N
280	67.68	10.27	-51.66	15.77	N	N	N
281	147.20	9.31	5.14	7.64	A	A	A
282	109	21	-22.14	19.74	A	A	A
284	105.5	4.35	-24.64	5.95	A	N	W
285	106	19	-24.29	18.43	A	A	A
286	130	10	-7.14	8.81	A	A	A
287	130	9	-7.14	8.14	A	A	A
294	111	8	-20.71	8.39	A	A	A
300	107	5.5	-23.57	6.69	A	N	W
302	149.5	12	6.79	9.10	A	A	A
303	151	14	7.86	10.21	A	A	A
305	160.21	16.08	14.44	10.91	A	A	A
306	169	12.5	20.71	8.55	A	A	A
309	113	11	-19.29	10.64	A	A	A
313	110	9	-21.43	9.24	A	A	A
314	93.5	7.2	-33.21	8.81	N	N	N
316	153.52	16.06	9.66	11.31	A	A	A
317	56.0	5.0	-60.00	9.90	N	N	N
319	101.40	22.65	-27.57	22.74	A	A	A
320	110	8	-21.43	8.44	A	A	A
321	104.4	7.6	-25.43	8.45	A	N	W
324	101.71	2.32	-27.35	4.85	A	N	W
328	152	7	8.57	6.29	A	A	A
334	136	7	-2.86	6.70	A	A	A
336	121	11	-13.57	10.05	A	A	A
338	142.0	7.3	1.43	6.69	A	A	A
341	190	38	35.71	20.45	N	A	N
344	132	11	-5.71	9.37	A	A	A
346	156	15	11.43	10.53	A	A	A
347	151	14	7.86	10.21	A	A	A
348	238	10	70.00	6.00	N	N	N
352	165	4	17.86	4.92	A	N	W
354	131	7	-6.43	6.85	A	A	A
355	123	9	-12.14	8.48	A	A	A
357	97.3	11.7	-30.50	12.77	N	A	N
360	77.7	13.8	-44.50	18.27	N	A	N
362	58.4	5.8	-58.29	10.82	N	N	N
370	66.8	14.2	-52.29	21.69	N	A	N
371	190	11	35.71	7.20	N	N	N
377	115	15	-17.86	13.73	A	A	A
383	133.3	8.1	-4.79	7.44	A	A	A
384	130.57	19.06	-6.74	15.21	A	A	A
385	37.57	1.91	-73.16	6.65	N	N	N
386	300	13	114.29	6.09	N	N	N
387	108.24	9.51	-22.69	9.78	A	A	A
392	100	40	-28.57	40.23	A	N	W
393	110.0	10.88	-21.43	10.78	A	A	A
395	87.9	4.2	-37.21	6.42	N	N	N
397	81	13	-42.14	16.61	N	A	N
401	143	15	2.14	11.33	A	A	A
405	147	9	5.00	7.47	A	A	A
407	133.3	6.3	-4.79	6.38	A	A	A
408	137	17	-2.14	13.13	A	A	A
410	112.76	11.76	-19.46	11.28	A	A	A
412	129.0	5.0	-7.86	5.78	A	A	A
414	90.7	6.5	-35.21	8.35	N	N	N
415	138.3	12.0	-1.21	9.68	A	A	A
416	214.0	33.7	52.86	16.32	N	N	N
419	111.59	8.37	-20.29	8.64	A	A	A

TABLE 70. Evaluation Results for Pb-210 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
424	281	36.5	100.71	13.68	N	N	N
425	251	21	79.29	9.40	N	N	N
427	137.0	10.8	-2.14	8.97	A	A	A
434	276.79	19.85	97.71	8.35	N	N	N
437	125	15	-10.71	12.74	A	A	A
440	138.8	8.1	-0.86	7.24	A	A	A
441	137	30	-2.14	22.31	A	A	A
443	182	15	30.00	9.29	A	N	W
445	96.40	14.00	-31.14	15.14	N	A	N
446	141	15	0.71	11.47	A	A	A
449	80.2	3.2	-42.71	5.86	N	N	N
454	110	8	-21.43	8.44	A	A	A
455	105	9	-25.00	9.58	A	N	W
457	134	10	-4.29	8.61	A	A	A
464	106.5	6.1	-23.93	7.15	A	N	W
465	95.0	20.0	-32.14	21.48	N	A	N
466	83.1	14.1	-40.64	17.50	N	A	N
475	133	16	-5.00	12.77	A	A	A
478	127.10	7.16	-9.21	7.08	A	A	A
487	115	9	-17.86	8.92	A	A	A
490	123.44263	12.85512	-11.83	11.26	A	A	A
501	116.7	3.81	-16.64	5.39	A	N	W
505	113.62	35.12	-18.84	31.21	A	N	W
506	114.8	23	-18.00	20.49	A	A	A
507	280	70	100.00	25.36	N	N	N
508	1468	250	948.57	17.56	N	N	N

Bi-214 Determination in Sample 4 by Gamma-ray Spectrometry

TABLE 71. Target values

Parameter	Value
Activity concentration [Bq/kg]	144
Uncertainty [Bq/kg]	5
Maximum Acceptable Relative Bias [%]	30

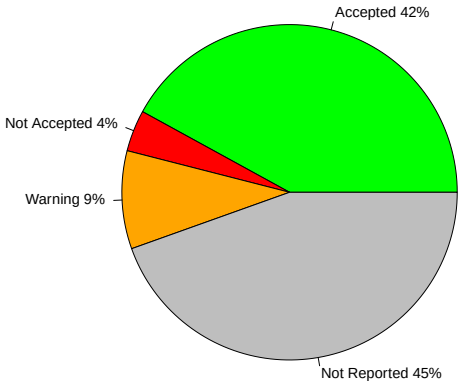

FIGURE 71. Percentage of Accepted vs. Warnings vs. Not Accepted vs. Not Reported results

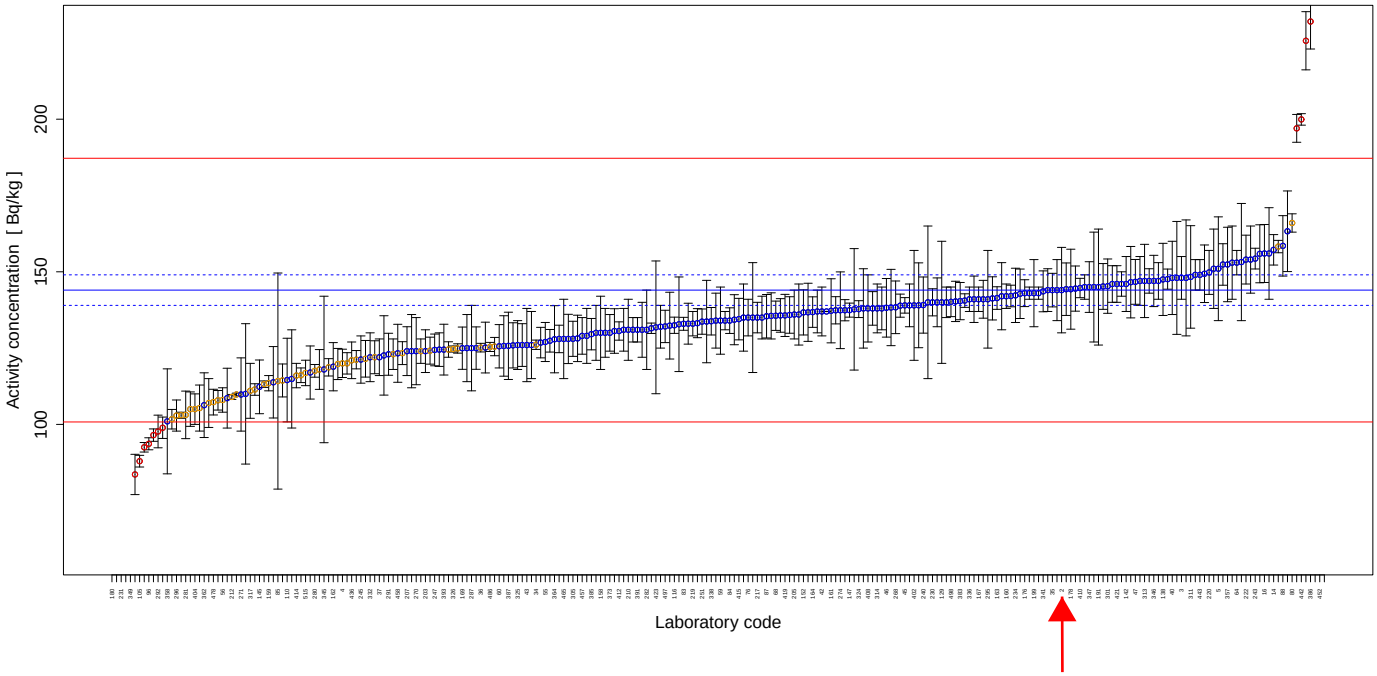

FIGURE 72. Reported results and evaluation parameters for Bi-214 by Gamma-ray Spectrometry. Blue points represent accepted scores, whereas yellow and red represent warning and not accepted scores, respectively.

TABLE 72. Evaluation Results for Bi-214 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
1	120	3.5	-16.67	4.53	A	N	W
2	144	14	0.00	10.32	A	A	A
3	148	7	2.78	5.87	A	A	A
4	120.00	4.64	-16.67	5.20	A	N	W
5	151	17	4.86	11.78	A	A	A
12	126	11	-12.50	9.40	A	A	A
14	157.20	4.99	9.17	4.70	A	A	A
15	322	11	123.61	4.87	N	N	N
16	156.0	9.5	8.33	7.01	A	A	A
21	151	13	4.86	9.28	A	A	A
22	153	12	6.25	8.58	A	A	A
23	136.73	9.52	-5.05	7.78	A	A	A
24	144.5	7.4	0.35	6.19	A	A	A
27	137	7	-4.86	6.18	A	A	A
28	137.7	19.9	-4.38	14.86	A	A	A
32	143	2	-0.69	3.74	A	A	A
33	148	19	2.78	13.30	A	A	A
34	126.10	1.53	-12.43	3.68	A	N	W
35	144.0	5.5	0.00	5.16	A	A	A
36	125.15	1.41	-13.09	3.65	A	N	W
37	122	6	-15.28	6.02	A	A	A
38	133.7	13.5	-7.15	10.68	A	A	A
39	148.0	18.5	2.78	12.97	A	A	A
40	148	12	2.78	8.82	A	A	A
41	133.0	6.7	-7.64	6.12	A	A	A
42	137	8	-4.86	6.79	A	A	A
43	126	12	-12.50	10.14	A	A	A
44	141	6.2	-2.08	5.60	A	A	A
45	139	2.54	-3.47	3.92	A	A	A
46	138.2	9.6	-4.03	7.77	A	A	A
47	146.7	7.34	1.87	6.09	A	A	A
49	108.6	9.8	-24.58	9.67	A	A	A
50	105	5.64	-27.08	6.40	A	N	W
51	128.18	7.6	-10.99	6.87	A	A	A
53	154	11	6.94	7.94	A	A	A
55	127	6.4	-11.81	6.12	A	A	A
56	108	4	-25.00	5.08	A	N	W
58	131.5	1.7	-8.68	3.71	A	A	A
59	134	11	-6.94	8.91	A	A	A
60	125.6	7.1	-12.78	6.63	A	A	A
64	153	4	6.25	4.35	A	A	A
67	158.27	2.03	9.91	3.70	A	N	W
68	135.6	4.8	-5.83	4.96	A	A	A
70	114.90	16.09	-20.21	14.43	A	A	A
74	145.2	7.5	0.83	6.22	A	A	A
75	110	23	-23.61	21.20	A	A	A
76	135	6	-6.25	5.64	A	A	A
77	144	7	0.00	5.97	A	A	A
78	135.7	5.5	-5.76	5.34	A	A	A
80	166	3	15.28	3.91	A	N	W
82	146.6	11.7	1.81	8.70	A	A	A
83	132.96	2.12	-7.67	3.82	A	A	A
84	134.0	4.2	-6.94	4.68	A	A	A
85	114.2	35.4	-20.69	31.19	A	N	W
86	125	6.95	-13.19	6.56	A	A	A
87	135.44	7.12	-5.94	6.30	A	A	A
88	158.5	9.9	10.07	7.15	A	A	A
92	140	25	-2.78	18.19	A	A	A
93	138	5.5	-4.17	5.29	A	A	A
94	137	0.04	-4.86	3.47	A	A	A

TABLE 72. Evaluation Results for Bi-214 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
95	134	9	-6.94	7.56	A	A	A
96	93.65	1.97	-34.97	4.06	N	N	N
100	142	11	-1.39	8.49	A	A	A
101	122.6	13	-14.86	11.16	A	A	A
102	124.88	1.53	-13.28	3.68	A	N	W
105	87.95	1.91	-38.92	4.10	N	N	N
108	137.41	3.47	-4.58	4.29	A	A	A
110	114.53	13.7	-20.47	12.46	A	A	A
113	135.85	5.98	-5.66	5.61	A	A	A
116	132.48	2.66	-8.00	4.01	A	A	A
117	124.536	2.534	-13.52	4.02	A	N	W
118	123.35	3.75	-14.34	4.62	A	N	W
119	134	3	-6.94	4.13	A	A	A
121	130.6	7.3	-9.31	6.58	A	A	A
122	130.0	9.0	-9.72	7.75	A	A	A
123	132	7	-8.33	6.34	A	A	A
124	135	7	-6.25	6.24	A	A	A
125	126	7	-12.50	6.55	A	A	A
126	117	8.7	-18.75	8.21	A	A	A
129	140	20	-2.78	14.70	A	A	A
132	124.5	5.5	-13.54	5.62	A	A	A
133	155.9	9.5	8.26	7.01	A	A	A
134	2.92	0.07	-97.97	4.22	N	N	N
138	147.51	11.82	2.44	8.73	A	A	A
140	149	5	3.47	4.83	A	A	A
142	146	9	1.39	7.08	A	A	A
143	127.4	3.7	-11.53	4.53	A	A	A
144	8.86	0.5	-93.85	6.63	N	N	N
145	112.3	8.8	-22.01	8.57	A	A	A
147	137.44	2.30	-4.56	3.85	A	A	A
148	83.6	6.6	-41.94	8.62	N	N	N
149	121.2	3.0	-15.83	4.26	A	N	W
150	137.39	4.46	-4.59	4.75	A	A	A
151	135.55	7.56	-5.87	6.57	A	A	A
152	136.7	7.4	-5.07	6.43	A	A	A
156	140.57	2.22	-2.38	3.81	A	A	A
157	107	8	-25.69	8.24	A	N	W
158	130.0	12.0	-9.72	9.86	A	A	A
159	113.5	2.5	-21.18	4.11	A	N	W
160	142	4	-1.39	4.47	A	A	A
161	137.22	10.5	-4.71	8.40	A	A	A
162	118.9	7.9	-17.43	7.50	A	A	A
163	141.4	3.7	-1.81	4.35	A	A	A
164	136.8	5.0	-5.00	5.04	A	A	A
166	124	12	-13.89	10.28	A	A	A
167	141	4	-2.08	4.48	A	A	A
168	124	4	-13.89	4.74	A	N	W
169	124.97	6.9244	-13.22	6.54	A	A	A
170	130	8	-9.72	7.07	A	A	A
172	153.19	19.2	6.38	13.01	A	A	A
176	143	4.4	-0.69	4.64	A	A	A
178	144.3	13.1	0.21	9.72	A	A	A
180	0.11584	0.0023031	-99.92	4.00	N	N	N
184	146	4	1.39	4.42	A	A	A
185	125.176	8.315	-13.07	7.50	A	A	A
191	145	19	0.69	13.56	A	A	A
195	144.3	8.6	0.21	6.90	A	A	A
196	138.00	13.00	-4.17	10.04	A	A	A
199	143	11	-0.69	8.44	A	A	A
202	121.5	6.0	-15.62	6.04	A	N	W

TABLE 72. Evaluation Results for Bi-214 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
203	124	7.0	-13.89	6.63	A	A	A
205	136	8	-5.56	6.83	A	A	A
206	111.43	1.89	-22.62	3.86	A	N	W
207	124	8	-13.89	7.33	A	A	A
209	133.17	4.76	-7.52	4.98	A	A	A
210	131	10	-9.03	8.39	A	A	A
212	109	0.808	-24.31	3.55	A	N	W
213	125.5	3	-12.85	4.22	A	N	W
214	141	7.6	-2.08	6.41	A	A	A
216	139.03	13.90	-3.45	10.58	A	A	A
217	135	5	-6.25	5.08	A	A	A
218	140	5	-2.78	4.98	A	A	A
219	133	4	-7.64	4.59	A	A	A
220	149.8	7.2	4.03	5.93	A	A	A
222	154	8	6.94	6.25	A	A	A
223	116.1	2.4	-19.38	4.04	A	N	W
224	141.29	7.07	-1.88	6.09	A	A	A
225	101.7	3.2	-29.37	4.69	A	N	W
230	140	4.44	-2.78	4.70	A	A	A
231	5.0	1.0	-96.53	20.30	N	N	N
234	142.28	8.89	-1.19	7.15	A	A	A
240	139.1	9.2	-3.40	7.47	A	A	A
243	154.32	3.4	7.17	4.11	A	A	A
244	132.36	10.94	-8.08	8.97	A	A	A
245	121.25	7.74	-15.80	7.27	A	A	A
247	124.4	5.2	-13.61	5.43	A	A	A
251	133.68	4.14	-7.17	4.65	A	A	A
254	128	8.07	-11.11	7.20	A	A	A
262	139	7	-3.47	6.12	A	A	A
263	135	11	-6.25	8.86	A	A	A
266	118	6.52	-18.06	6.53	A	N	W
268	138.367	8.623	-3.91	7.13	A	A	A
269	131	4	-9.03	4.62	A	A	A
270	124	11	-13.89	9.53	A	A	A
271	109.8	12.0	-23.75	11.47	A	A	A
274	137.4	12.57	-4.58	9.79	A	A	A
275	119.79	5.1	-16.81	5.49	A	N	W
280	117.55	2.08	-18.37	3.90	A	N	W
281	103.12	7.79	-28.39	8.31	A	N	W
282	131	13	-9.03	10.51	A	A	A
287	125	14	-13.19	11.73	A	A	A
291	122.980	6.877	-14.60	6.58	A	A	A
292	97.68	5.35	-32.17	6.48	N	N	N
295	141	16	-2.08	11.87	A	A	A
296	102.9	5.1	-28.54	6.05	A	N	W
298	138.3	12.5	-3.96	9.68	A	A	A
301	145.3	8.9	0.90	7.04	A	A	A
302	125.9	7.4	-12.57	6.83	A	A	A
303	125	11	-13.19	9.46	A	A	A
305	128.04	5.75	-11.08	5.68	A	A	A
306	128	4.5	-11.11	4.94	A	A	A
307	225.70	9.53	56.74	5.47	N	N	N
308	132.81	15.50	-7.77	12.18	A	A	A
309	857	85.7	495.14	10.59	N	N	N
310	149.36	9.43	3.72	7.21	A	A	A
311	148.32	16.79	3.00	11.84	A	A	A
313	147	12	2.08	8.87	A	A	A
314	138	8	-4.17	6.76	A	A	A
315	129	9	-10.42	7.79	A	A	A
317	111.0	9.0	-22.92	8.82	A	N	W

TABLE 72. Evaluation Results for Bi-214 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
318	113.8	11.7	-20.97	10.85	A	A	A
321	152.4	6.8	5.83	5.65	A	A	A
324	137.77	2.76	-4.33	4.01	A	A	A
325	126	8	-12.50	7.24	A	A	A
326	124.7	1.0	-13.40	3.56	A	N	W
328	123	5	-14.58	5.35	A	N	W
330	113.18	1.06	-21.40	3.60	A	N	W
331	163.28	13.21	13.39	8.80	A	A	A
332	122	8	-15.28	7.42	A	A	A
334	147	6	2.08	5.36	A	A	A
336	141	4	-2.08	4.48	A	A	A
337	144	10	0.00	7.76	A	A	A
338	133.8	4.5	-7.08	4.83	A	A	A
341	143.6	6.7	-0.28	5.82	A	A	A
344	131	9	-9.03	7.70	A	A	A
345	118	24	-18.06	20.63	A	A	A
346	147	8.4	2.08	6.69	A	A	A
347	145	8.3	0.69	6.69	A	A	A
348	145	4	0.69	4.43	A	A	A
349	41.10	2.2	-71.46	6.38	N	N	N
354	131	7	-9.03	6.37	A	A	A
357	152.4	12.2	5.83	8.73	A	A	A
358	101.0	17.2	-29.86	17.38	A	A	A
359	103	1	-28.47	3.61	A	N	W
362	106.3	10.6	-26.18	10.56	A	A	A
364	127.9	11.0	-11.18	9.27	A	A	A
370	126.8	5.0	-11.94	5.25	A	A	A
371	138	7	-4.17	6.15	A	A	A
373	130	6	-9.72	5.78	A	A	A
377	145	18	0.69	12.89	A	A	A
382	118.70	2.84	-17.57	4.22	A	N	W
383	140.4	6.1	-2.50	5.56	A	A	A
384	124.16	4.42	-13.78	4.97	A	N	W
385	129.57	5.14	-10.02	5.27	A	A	A
386	232	9	61.11	5.21	N	N	N
387	125.74	11.02	-12.68	9.43	A	A	A
391	131	4	-9.03	4.62	A	A	A
393	124.5	8.32	-13.54	7.53	A	A	A
397	135	18	-6.25	13.78	A	A	A
402	139	18	-3.47	13.41	A	A	A
404	105	5	-27.08	5.89	A	N	W
405	146	6	1.39	5.38	A	A	A
407	147.6	3.3	2.50	4.13	A	A	A
408	138	11	-4.17	8.69	A	A	A
410	144.69	3.17	0.48	4.11	A	A	A
412	130.6	3.0	-9.31	4.16	A	A	A
414	116	4	-19.44	4.89	A	N	W
415	134.5	6.8	-6.60	6.13	A	A	A
416	134.3	8.2	-6.74	7.02	A	A	A
417	156	15	8.33	10.22	A	A	A
419	135.71	6.90	-5.76	6.16	A	A	A
421	146	6	1.39	5.38	A	A	A
423	131.801	21.750	-8.47	16.86	A	A	A
425	98.9	3.5	-31.32	4.96	N	N	N
432	136	10	-5.56	8.13	A	A	A
436	121	6	-15.97	6.05	A	N	W
441	122.0	5.4	-15.28	5.63	A	N	W
442	199.93	1.88	38.84	3.60	N	N	N
443	149	5	3.47	4.83	A	A	A
445	92.50	1.56	-35.76	3.86	N	N	N

TABLE 72. Evaluation Results for Bi-214 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
446	140.3	6.6	-2.57	5.85	A	A	A
449	114.4	5.4	-20.56	5.86	A	N	W
452	386.49	9.602	168.40	4.27	N	N	N
457	129	6	-10.42	5.80	A	A	A
458	123.3	9.5	-14.38	8.45	A	A	A
461	109.8	0.44	-23.75	3.50	A	N	W
464	142.8	8.1	-0.83	6.65	A	A	A
465	128.0	13.0	-11.11	10.73	A	A	A
475	143	2	-0.69	3.74	A	A	A
478	107.30	4.21	-25.49	5.24	A	N	W
479	147	8	2.08	6.46	A	A	A
486	125.38	1.49	-12.93	3.67	A	N	W
490	138.90527	3.78254	-3.54	4.41	A	A	A
491	142.07	3.54	-1.34	4.27	A	A	A
492	107.9	3.2	-25.07	4.57	A	N	W
494	147	4	2.08	4.41	A	A	A
497	132.1	5.3	-8.26	5.31	A	A	A
498	140.16	4.85	-2.67	4.90	A	A	A
501	197.0	4.56	36.81	4.17	N	N	N
504	125.7	9.9	-12.71	8.61	A	A	A
505	96.49	2.03	-32.99	4.06	N	N	N
507	140	8	-2.78	6.69	A	A	A
512	105.353	7.543	-26.84	7.96	A	N	W
515	116.86	4.17	-18.85	4.98	A	N	W

Pb-214 Determination in Sample 4 by Gamma-ray Spectrometry

TABLE 73. Target values

Parameter	Value
Activity concentration [Bq/kg]	144
Uncertainty [Bq/kg]	5
Maximum Acceptable Relative Bias [%]	30

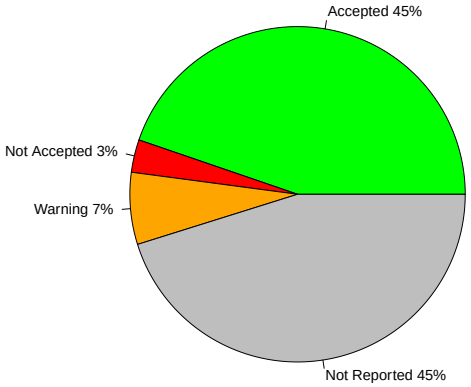

FIGURE 73. Percentage of Accepted vs. Warnings vs. Not Accepted vs. Not Reported results

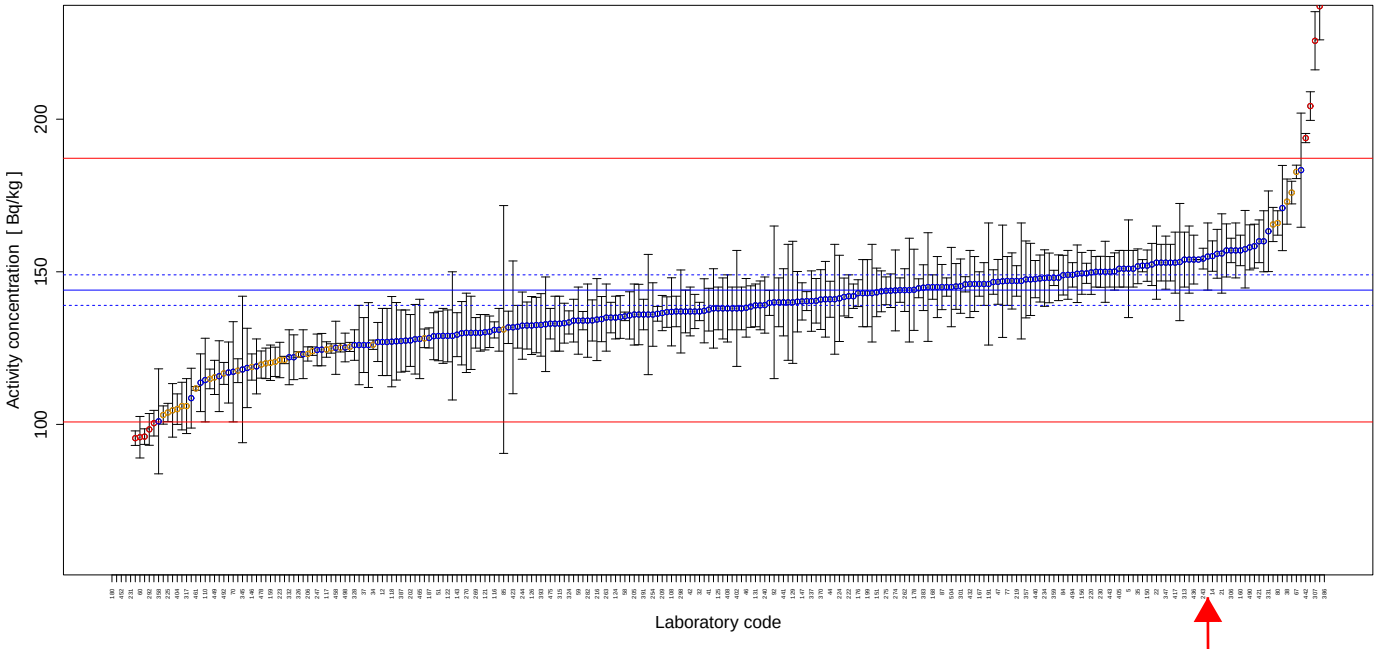

FIGURE 74. Reported results and evaluation parameters for Pb-214 by Gamma-ray Spectrometry. Blue points represent accepted scores, whereas yellow and red represent warning and not accepted scores, respectively.

TABLE 74. Evaluation Results for Pb-214 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
2	155	11	7.64	7.90	A	A	A
3	146	7	1.39	5.92	A	A	A
5	151	16	4.86	11.15	A	A	A
12	127	11	-11.81	9.33	A	A	A
14	155.15	4.98	7.74	4.73	A	A	A
15	237	11	64.58	5.80	N	N	N
16	160	10	11.11	7.15	A	A	A
21	156	13	8.33	9.03	A	A	A
22	153	12	6.25	8.58	A	A	A
24	155.9	8.0	8.26	6.20	A	A	A
27	137	7	-4.86	6.18	A	A	A
28	136	19.7	-5.56	14.90	A	A	A
32	137	3	-4.86	4.11	A	A	A
33	147	19	2.08	13.38	A	A	A
34	126.10	1.53	-12.43	3.68	A	N	W
35	151.8	5.7	5.42	5.11	A	A	A
36	125.15	1.41	-13.09	3.65	A	N	W
37	126	9	-12.50	7.94	A	A	A
38	173	7.4	20.14	5.51	A	N	W
39	146.9	18.4	2.01	13.00	A	A	A
40	150	10	4.17	7.52	A	A	A
41	137.6	7	-4.44	6.16	A	A	A
42	137	8	-4.86	6.79	A	A	A
43	126	13	-12.50	10.89	A	A	A
44	141	5.9	-2.08	5.44	A	A	A
46	138.2	9.6	-4.03	7.77	A	A	A
47	146.7	7.34	1.87	6.09	A	A	A
49	108.6	9.8	-24.58	9.67	A	A	A
50	122	7.34	-15.28	6.95	A	A	A
51	128.97	8.11	-10.44	7.18	A	A	A
53	154	11	6.94	7.94	A	A	A
55	127	6.4	-11.81	6.12	A	A	A
56	120	5	-16.67	5.42	A	N	W
58	135.4	1.4	-5.97	3.62	A	A	A
59	134	11	-6.94	8.91	A	A	A
60	95.8	6.8	-33.47	7.90	N	N	N
64	152	2	5.56	3.71	A	A	A
67	182.74	2.20	26.90	3.68	A	N	W
68	145.2	7.5	0.83	6.22	A	A	A
70	117.24	16.41	-18.58	14.42	A	A	A
74	147.8	7.7	2.64	6.26	A	A	A
75	129	21	-10.42	16.65	A	A	A
76	151	6	4.86	5.28	A	A	A
77	147	8	2.08	6.46	A	A	A
78	165.5	5.6	14.93	4.85	A	N	W
80	166	4	15.28	4.23	A	N	W
82	157.4	12.7	9.31	8.78	A	A	A
83	136.24	2.42	-5.39	3.90	A	A	A
84	148.9	6.5	3.40	5.58	A	A	A
85	131.1	40.6	-8.96	31.16	A	N	W
86	126	13.9	-12.50	11.57	A	A	A
87	145	7.4	0.69	6.17	A	A	A
88	183.3	18.7	27.29	10.78	A	A	A
92	140	25	-2.78	18.19	A	A	A
93	157	8.7	9.03	6.54	A	A	A
94	154	0.04	6.94	3.47	A	A	A
95	146	9	1.39	7.08	A	A	A
96	103.07	2.99	-28.42	4.52	A	N	W
100	143	11	-0.69	8.44	A	A	A
101	118.5	13	-17.71	11.51	A	A	A

TABLE 74. Evaluation Results for Pb-214 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
102	124.88	1.53	-13.28	3.68	A	N	W
105	95.49	2.38	-33.69	4.27	N	N	N
108	136.88	11.16	-4.94	8.86	A	A	A
110	114.53	13.7	-20.47	12.46	A	A	A
113	135.19	7	-6.12	6.23	A	A	A
116	130.96	2.64	-9.06	4.01	A	A	A
117	124.536	2.534	-13.52	4.02	A	N	W
118	127.11	14.79	-11.73	12.14	A	A	A
119	134	3	-6.94	4.13	A	A	A
121	130.2	5.8	-9.58	5.65	A	A	A
122	129.0	8.5	-10.42	7.45	A	A	A
123	132	7	-8.33	6.34	A	A	A
124	135	7	-6.25	6.24	A	A	A
125	138	7	-4.17	6.15	A	A	A
126	132.4	9.5	-8.06	7.97	A	A	A
129	140	20	-2.78	14.70	A	A	A
131	139	7	-3.47	6.12	A	A	A
132	124.5	5.3	-13.54	5.49	A	A	A
133	158.4	7.2	10.00	5.72	A	A	A
134	3.72	0.08	-97.42	4.08	N	N	N
138	147.51	11.82	2.44	8.73	A	A	A
140	153	6	6.25	5.24	A	A	A
143	129.4	7.2	-10.14	6.56	A	A	A
145	106.0	7.8	-26.39	8.14	A	N	W
146	118.8	4.3	-17.50	5.02	A	N	W
147	140.30	6.10	-2.57	5.56	A	A	A
148	117	10	-18.75	9.23	A	A	A
149	117.6	3.9	-18.33	4.80	A	N	W
150	152.01	5.13	5.56	4.84	A	A	A
151	143.25	7.96	-0.52	6.55	A	A	A
152	134.5	7.4	-6.60	6.51	A	A	A
156	149.49	6.86	3.81	5.75	A	A	A
157	119	9	-17.36	8.32	A	A	A
158	127.9	11.4	-11.18	9.57	A	A	A
159	120.2	5.8	-16.53	5.94	A	N	W
160	157	5	9.03	4.71	A	A	A
161	137.22	10.5	-4.71	8.40	A	A	A
162	145	10	0.69	7.72	A	A	A
163	144.6	3.1	0.42	4.08	A	A	A
164	136.8	5.0	-5.00	5.04	A	A	A
167	146	4	1.39	4.42	A	A	A
168	145	4	0.69	4.43	A	A	A
169	133.17	6.5338	-7.52	6.01	A	A	A
170	130	12	-9.72	9.86	A	A	A
172	153.19	19.2	6.38	13.01	A	A	A
176	143	4.4	-0.69	4.64	A	A	A
178	144.1	13.3	0.07	9.86	A	A	A
180	0.1365	0.0023171	-99.91	3.86	N	N	N
184	153	6	6.25	5.24	A	A	A
185	129.873	10.380	-9.81	8.71	A	A	A
187	128.33	3.29	-10.88	4.32	A	A	A
191	146	20	1.39	14.13	A	A	A
195	147.0	9.2	2.08	7.16	A	A	A
196	138.00	13.00	-4.17	10.04	A	A	A
199	143	11	-0.69	8.44	A	A	A
202	127.5	8.5	-11.46	7.52	A	A	A
203	145	17.8	0.69	12.76	A	A	A
205	136	10	-5.56	8.13	A	A	A
206	123.08	2.33	-14.53	3.95	A	N	W
207	129	9	-10.42	7.79	A	A	A

TABLE 74. Evaluation Results for Pb-214 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
209	136.48	5.77	-5.22	5.47	A	A	A
210	138	10	-4.17	8.04	A	A	A
212	124	1.38	-13.89	3.65	A	N	W
213	128.2	3.05	-10.97	4.21	A	N	W
214	136	9.9	-5.56	8.07	A	A	A
216	134.34	13.43	-6.71	10.58	A	A	A
217	135	5	-6.25	5.08	A	A	A
218	150	5	4.17	4.81	A	A	A
219	147	5	2.08	4.86	A	A	A
220	149.8	7.2	4.03	5.93	A	A	A
222	142	7	-1.39	6.03	A	A	A
223	121.1	5.8	-15.90	5.92	A	N	W
224	141.29	14.13	-1.88	10.59	A	A	A
225	103.9	3.0	-27.85	4.52	A	N	W
230	150	5.08	4.17	4.85	A	A	A
231	42.3	0.4	-70.62	3.60	N	N	N
234	147.95	9.26	2.74	7.16	A	A	A
240	139.1	9.2	-3.40	7.47	A	A	A
243	154.32	3.4	7.17	4.11	A	A	A
244	132.36	11.01	-8.08	9.01	A	A	A
245	132.55	9.08	-7.95	7.68	A	A	A
247	124.4	5.2	-13.61	5.43	A	A	A
251	135.71	7.74	-5.76	6.68	A	A	A
254	136	10.4	-5.56	8.40	A	A	A
258	141	12.4	-2.08	9.45	A	A	A
262	144	7	0.00	5.97	A	A	A
263	135	11	-6.25	8.86	A	A	A
266	148	8.14	2.78	6.50	A	A	A
268	139.820	4.110	-2.90	4.55	A	A	A
269	130	5	-9.72	5.18	A	A	A
270	130	13	-9.72	10.59	A	A	A
271	120.5	4.8	-16.32	5.28	A	N	W
274	143.9	13.25	-0.07	9.84	A	A	A
275	143.77	4.56	-0.16	4.70	A	A	A
281	104.60	8.77	-27.36	9.07	A	N	W
282	134	12	-6.94	9.60	A	A	A
287	144	17	0.00	12.31	A	A	A
291	127.445	10.045	-11.50	8.61	A	A	A
292	98.36	5.20	-31.69	6.32	N	N	N
295	143	16	-0.69	11.72	A	A	A
296	121.1	1.2	-15.90	3.61	A	N	W
298	137.0	13.6	-4.86	10.52	A	A	A
301	145.3	8.9	0.90	7.04	A	A	A
302	128.9	7.7	-10.49	6.91	A	A	A
303	127	11	-11.81	9.33	A	A	A
305	148.05	7.49	2.81	6.14	A	A	A
306	157	4	9.03	4.31	A	A	A
307	225.70	9.53	56.74	5.47	N	N	N
308	132.81	15.50	-7.77	12.18	A	A	A
310	149.36	9.43	3.72	7.21	A	A	A
311	170.89	13.96	18.67	8.88	A	A	A
312	137	5.6	-4.86	5.36	A	A	A
313	154	9	6.94	6.80	A	A	A
314	138	7	-4.17	6.15	A	A	A
315	133	9	-7.64	7.61	A	A	A
317	106.0	9.0	-26.39	9.17	A	N	W
318	132.4	7.7	-8.06	6.77	A	A	A
321	152.4	6.9	5.83	5.71	A	A	A
324	133.41	3.79	-7.35	4.49	A	A	A
325	123	8	-14.58	7.37	A	A	A

TABLE 74. Evaluation Results for Pb-214 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
326	122.9	0.9	-14.65	3.55	A	N	W
328	126	5	-12.50	5.27	A	A	A
331	163.28	13.21	13.39	8.80	A	A	A
332	122	9	-15.28	8.15	A	A	A
334	151	6	4.86	5.28	A	A	A
336	142	4	-1.39	4.47	A	A	A
337	140.4	9.9	-2.50	7.86	A	A	A
338	138.0	7.0	-4.17	6.15	A	A	A
341	143.6	6.7	-0.28	5.82	A	A	A
344	133	9	-7.64	7.61	A	A	A
345	118	24	-18.06	20.63	A	A	A
346	157	9.0	9.03	6.70	A	A	A
347	153	8.7	6.25	6.66	A	A	A
348	144	4	0.00	4.45	A	A	A
349	35.60	1.4	-75.28	5.25	N	N	N
354	131	7	-9.03	6.37	A	A	A
355	139	8	-3.47	6.72	A	A	A
357	147.5	12.6	2.43	9.22	A	A	A
358	101.0	17.2	-29.86	17.38	A	A	A
359	148	2.5	2.78	3.86	A	A	A
362	115.8	11.6	-19.58	10.60	A	A	A
364	127.23	12.7	-11.65	10.57	A	A	A
370	140.9	9.8	-2.15	7.77	A	A	A
371	145	3	0.69	4.04	A	A	A
373	130	6	-9.72	5.78	A	A	A
375	175.96	3.71	22.19	4.06	A	N	W
377	141	18	-2.08	13.23	A	A	A
383	144.8	7.5	0.56	6.24	A	A	A
384	141.74	6.21	-1.57	5.59	A	A	A
385	130.35	5.16	-9.48	5.27	A	A	A
386	249	10	72.92	5.31	N	N	N
387	127.31	10.18	-11.59	8.72	A	A	A
391	136	5	-5.56	5.06	A	A	A
393	132.6	10.24	-7.92	8.47	A	A	A
397	140	19	-2.78	14.01	A	A	A
402	138	19	-4.17	14.20	A	A	A
404	105	5	-27.08	5.89	A	N	W
405	151	6	4.86	5.28	A	A	A
407	149.5	3.3	3.82	4.11	A	A	A
408	138	11	-4.17	8.69	A	A	A
410	145.90	2.49	1.32	3.87	A	A	A
412	140.4	3.1	-2.50	4.11	A	A	A
414	137	5	-4.86	5.04	A	A	A
415	138.6	6.8	-3.75	6.01	A	A	A
416	140.2	9.9	-2.64	7.87	A	A	A
417	153	10	6.25	7.40	A	A	A
419	134.06	6.74	-6.90	6.11	A	A	A
421	160	7	11.11	5.59	A	A	A
423	131.801	21.750	-8.47	16.86	A	A	A
425	100.4	4.2	-30.28	5.44	N	N	N
432	146	11	1.39	8.30	A	A	A
436	154	8	6.94	6.25	A	A	A
440	147.6	6.1	2.50	5.40	A	A	A
441	140	11	-2.78	8.59	A	A	A
442	193.82	1.51	34.60	3.56	N	N	N
443	150	5	4.17	4.81	A	A	A
445	96.00	2.55	-33.33	4.37	N	N	N
446	143.8	5.5	-0.14	5.17	A	A	A
449	115.4	5.6	-19.86	5.97	A	N	W
452	32.723	6.837	-77.28	21.18	N	N	N

TABLE 74. Evaluation Results for Pb-214 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
457	134	7	-6.94	6.27	A	A	A
458	125.1	8.7	-13.13	7.77	A	A	A
461	111.78	0.6	-22.38	3.51	A	N	W
464	140.5	7.3	-2.43	6.25	A	A	A
465	128.0	13.0	-11.11	10.73	A	A	A
474	150.1	6.1	4.24	5.35	A	A	A
475	133	5	-7.64	5.12	A	A	A
478	119.61	4.45	-16.94	5.09	A	N	W
479	149	8	3.47	6.39	A	A	A
486	125.38	1.49	-12.93	3.67	A	N	W
490	158.00649	7.38150	9.73	5.82	A	A	A
491	146.65	4.01	1.84	4.42	A	A	A
492	116.7	3.6	-18.96	4.64	A	N	W
494	149	4	3.47	4.39	A	A	A
497	131.8	5.3	-8.47	5.31	A	A	A
498	125.20	4.70	-13.06	5.11	A	A	A
501	204.3	4.69	41.88	4.16	N	N	N
504	145	13	0.69	9.61	A	A	A
507	140	8	-2.78	6.69	A	A	A
512	113.655	9.458	-21.07	9.02	A	A	A
515	114.90	3.22	-20.21	4.46	A	N	W

Ra-226 Determination in Sample 4 by Gamma-ray Spectrometry

TABLE 75. Target values

Parameter	Value
Activity concentration [Bq/kg]	144
Uncertainty [Bq/kg]	5
Maximum Acceptable Relative Bias [%]	30

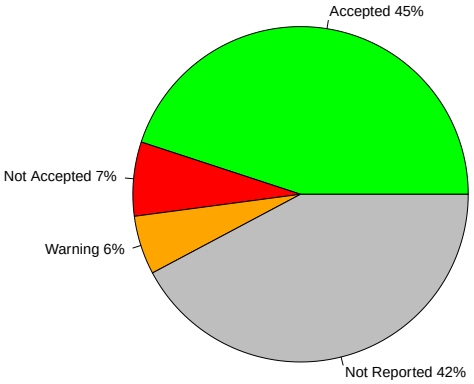

FIGURE 75. Percentage of Accepted vs. Warnings vs. Not Accepted vs. Not Reported results

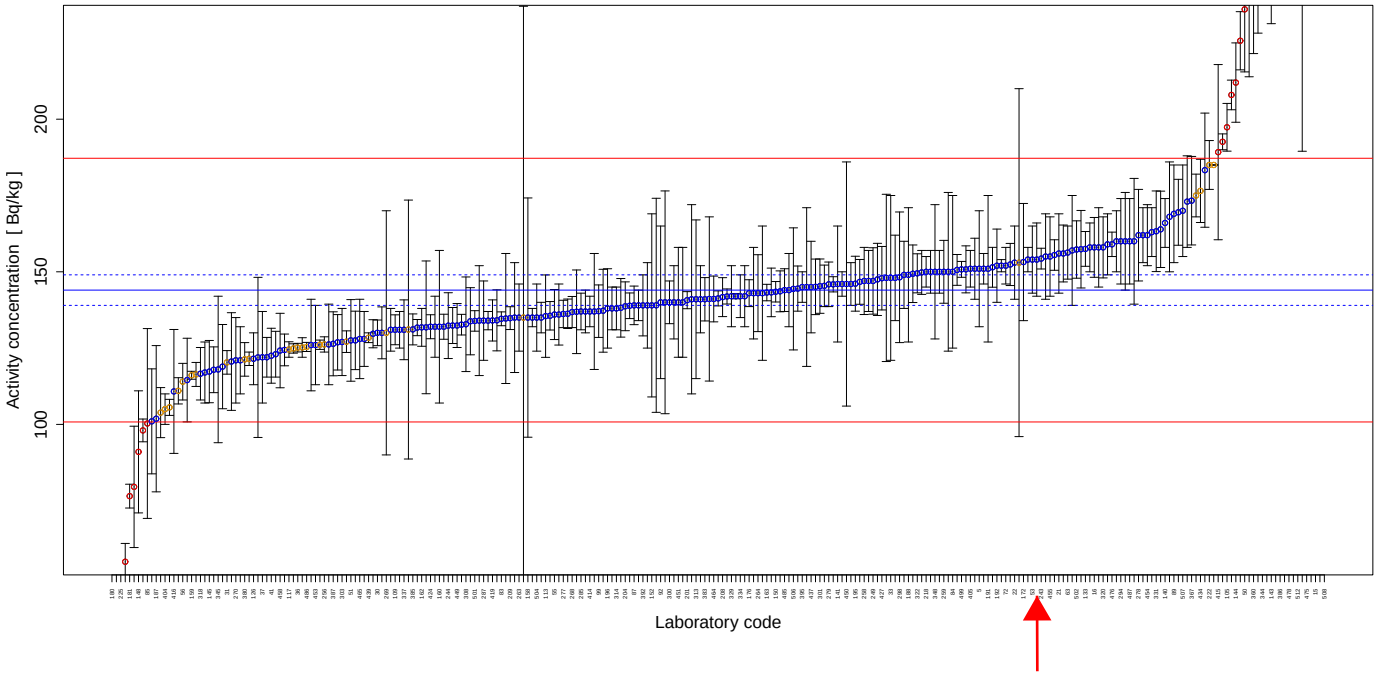

FIGURE 76. Reported results and evaluation parameters for Ra-226 by Gamma-ray Spectrometry. Blue points represent accepted scores, whereas yellow and red represent warning and not accepted scores, respectively.

TABLE 76. Evaluation Results for Ra-226 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
2	154	12	6.94	8.53	A	A	A
3	146	7	1.39	5.92	A	A	A
5	151	19	4.86	13.05	A	A	A
6	144	12	0.00	9.03	A	A	A
11	134	18	-6.94	13.87	A	A	A
13	111.0	4.3	-22.92	5.20	A	N	W
15	512	27	255.56	6.31	N	N	N
16	158.0	9.8	9.72	7.11	A	A	A
17	131	6	-9.03	5.75	A	A	A
21	156	13	8.33	9.03	A	A	A
22	153	12	6.25	8.58	A	A	A
24	144.5	7.4	0.35	6.19	A	A	A
25	136.25	4.82	-5.38	4.96	A	A	A
26	175	7	21.53	5.30	A	N	W
27	137	7	-4.86	6.18	A	A	A
30	130	4.2	-9.72	4.74	A	A	A
31	120.32	3.86	-16.44	4.73	A	N	W
33	148	27	2.78	18.57	A	A	A
34	126.10	1.53	-12.43	3.68	A	N	W
36	125.15	1.41	-13.09	3.65	A	N	W
37	122	15	-15.28	12.78	A	A	A
38	169.5	10.8	17.71	7.26	A	A	A
39	148.0	27.4	2.78	18.84	A	A	A
40	147	10	2.08	7.64	A	A	A
41	122.5	9.0	-14.93	8.13	A	A	A
43	126	15	-12.50	12.40	A	A	A
46	138.2	9.6	-4.03	7.77	A	A	A
47	146.70	7.34	1.87	6.09	A	A	A
50	236	20.5	63.89	9.35	N	N	N
51	127.52	13.37	-11.44	11.04	A	A	A
53	154	11	6.94	7.94	A	A	A
54	245.2	17	70.28	7.75	N	N	N
55	136	8.2	-5.56	6.96	A	A	A
56	114	6	-20.83	6.31	A	N	W
62	140	36.5	-2.78	26.30	A	A	A
63	156.3	8.7	8.54	6.56	A	A	A
64	152	2	5.56	3.71	A	A	A
67	192.59	2.60	33.74	3.73	N	N	N
68	145	26	0.69	18.26	A	A	A
70	79.53	19.88	-44.77	25.24	N	A	N
72	152	6	5.56	5.26	A	A	A
74	145.4	6.8	0.97	5.82	A	A	A
78	134.7	21.3	-6.46	16.19	A	A	A
79	408	70	183.33	17.50	N	N	N
80	251	9	74.31	4.99	N	N	N
82	157.4	12.7	9.31	8.78	A	A	A
83	134.6	2.27	-6.53	3.86	A	A	A
84	150	25	4.17	17.02	A	A	A
85	100.3	31.1	-30.35	31.20	N	N	N
87	139	6.32	-3.47	5.72	A	A	A
88	183.3	18.7	27.29	10.78	A	A	A
89	169	16	17.36	10.08	A	A	A
92	140	25	-2.78	18.19	A	A	A
94	185	0.07	28.47	3.47	A	N	W
99	137.1	8.6	-4.79	7.17	A	A	A
100	140	12	-2.78	9.25	A	A	A
101	120.6	16	-16.25	13.71	A	A	A
102	124.88	1.53	-13.28	3.68	A	N	W
104	134.1	10	-6.88	8.23	A	A	A
105	197.35	7.82	37.05	5.27	N	N	N

TABLE 76. Evaluation Results for Ra-226 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
106	150	7	4.17	5.82	A	A	A
108	131.08	42.42	-8.97	32.55	A	N	W
109	131	4.9	-9.03	5.10	A	A	A
110	114.53	13.7	-20.47	12.46	A	A	A
113	135.47	13.50	-5.92	10.55	A	A	A
114	150.8	7.7	4.72	6.17	A	A	A
115	55	6	-61.81	11.45	N	N	N
116	131.72	2.65	-8.53	4.01	A	A	A
117	124.536	2.534	-13.52	4.02	A	N	W
118	127.11	3.54	-11.73	4.45	A	N	W
119	134	3	-6.94	4.13	A	A	A
121	129.7	4.6	-9.93	4.96	A	A	A
122	130.0	8.5	-9.72	7.40	A	A	A
125	138	7	-4.17	6.15	A	A	A
126	121.5	8.5	-15.62	7.81	A	A	A
133	157.5	5.7	9.38	5.02	A	A	A
135	122	6.5	-15.28	6.36	A	A	A
138	147.51	11.82	2.44	8.73	A	A	A
140	166	8	15.28	5.94	A	A	A
141	146	19	1.39	13.47	A	A	A
142	149	11	3.47	8.16	A	A	A
143	254.3	23	76.60	9.69	N	N	N
144	212	13	47.22	7.05	N	N	N
145	117.3	10.2	-18.54	9.36	A	A	A
147	138.87	4.20	-3.56	4.60	A	A	A
148	91	20	-36.81	22.25	N	A	N
150	143.46	3.35	-0.37	4.18	A	A	A
151	143.25	7.96	-0.52	6.55	A	A	A
152	139	30	-3.47	21.86	A	A	A
155	151.48	6.53	5.19	5.54	A	A	A
156	141.1	26.9	-2.01	19.38	A	A	A
158	135.0	39.2	-6.25	29.24	A	A	A
159	116.1	1.3	-19.38	3.65	A	N	W
160	132	25	-8.33	19.26	A	A	A
162	131.8	6.2	-8.47	5.85	A	A	A
163	143.2	2.7	-0.56	3.95	A	A	A
167	146	4	1.39	4.42	A	A	A
169	256.40	3.3278	78.06	3.71	N	N	N
171	162	9	12.50	6.55	A	A	A
172	153.19	19.2	6.38	13.01	A	A	A
174	159	10	10.42	7.18	A	A	A
176	143	4.4	-0.69	4.64	A	A	A
177	150.62	5.05	4.60	4.83	A	A	A
180	0.14841	0.038107	-99.90	25.91	N	N	N
181	76.5	3.9	-46.88	6.17	N	N	N
184	150	26	4.17	17.68	A	A	A
185	127.524	9.573	-11.44	8.27	A	A	A
187	101.86	23.96	-29.26	23.78	A	A	A
188	149	22	3.47	15.17	A	A	A
191	151	24	4.86	16.27	A	A	A
192	152	12	5.56	8.62	A	A	A
195	146.1	9.0	1.46	7.07	A	A	A
196	138.00	13.00	-4.17	10.04	A	A	A
197	168	18	16.67	11.26	A	A	A
199	155	14	7.64	9.68	A	A	A
201	140.7	2.8	-2.29	4.00	A	A	A
203	289	99.5	100.69	34.60	N	N	N
204	138.7	8.0	-3.68	6.73	A	A	A
207	141	31	-2.08	22.26	A	A	A
208	141.70	6.38	-1.60	5.69	A	A	A

TABLE 76. Evaluation Results for Ra-226 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
209	134.82	3.74	-6.38	4.44	A	A	A
217	135	5	-6.25	5.08	A	A	A
218	150	5	4.17	4.81	A	A	A
219	139	5	-3.47	5.00	A	A	A
220	149.8	7.2	4.03	5.93	A	A	A
222	185	8	28.47	5.55	A	N	W
224	141.29	2.46	-1.88	3.88	A	A	A
225	44.9	2.2	-68.82	6.01	N	N	N
226	160	16	11.11	10.59	A	A	A
229	148	14	2.78	10.08	A	A	A
234	145.07	9.10	0.74	7.17	A	A	A
243	154.32	3.4	7.17	4.11	A	A	A
244	132.36	10.78	-8.08	8.85	A	A	A
245	126.90	9.08	-11.87	7.95	A	A	A
247	124.4	5.2	-13.61	5.43	A	A	A
248	132	4.1	-8.33	4.66	A	A	A
249	147	10.88	2.08	8.18	A	A	A
253	121	11	-15.97	9.73	A	A	A
256	126.2	2.5	-12.36	4.00	A	N	W
258	147	11	2.08	8.25	A	A	A
259	150	10.3	4.17	7.69	A	A	A
260	173	15	20.14	9.34	A	A	A
263	135	11	-6.25	8.86	A	A	A
264	143	12.6	-0.69	9.47	A	A	A
268	136.817	5.100	-4.99	5.09	A	A	A
269	130	40	-9.72	30.96	A	N	W
270	121	14	-15.97	12.08	A	A	A
271	160	20.6	11.11	13.33	A	A	A
277	136.19	4.48	-5.42	4.78	A	A	A
278	162	15	12.50	9.89	A	A	A
279	145.9	7.3	1.32	6.09	A	A	A
281	103.86	8.20	-27.88	8.63	A	N	W
284	276	7.38	91.67	4.38	N	N	N
285	137	6	-4.86	5.59	A	A	A
286	150	7	4.17	5.82	A	A	A
287	134	13	-6.94	10.30	A	A	A
290	142.00	0.85	-1.39	3.52	A	A	A
292	98.03	3.73	-31.92	5.15	N	N	N
294	160	14	11.11	9.41	A	A	A
295	143	22	-0.69	15.77	A	A	A
298	148.2	21.4	2.92	14.85	A	A	A
300	140	7	-2.78	6.09	A	A	A
301	145.3	8.9	0.90	7.04	A	A	A
302	121.5	2.2	-15.62	3.92	A	N	W
303	127	11	-11.81	9.33	A	A	A
305	137.24	13.58	-4.69	10.49	A	A	A
307	225.70	9.53	56.74	5.47	N	N	N
308	132.81	15.50	-7.77	12.18	A	A	A
309	857	85	495.14	10.51	N	N	N
310	149.36	9.43	3.72	7.21	A	A	A
311	163.92	12.51	13.83	8.38	A	A	A
313	141	26	-2.08	18.76	A	A	A
314	138	7	-4.17	6.15	A	A	A
316	105.58	2.63	-26.68	4.27	A	N	W
317	117.0	10.0	-18.75	9.23	A	A	A
318	116.6	8.6	-19.03	8.15	A	A	A
320	158	10	9.72	7.22	A	A	A
321	152.4	6.9	5.83	5.71	A	A	A
322	149.5	6.4	3.82	5.51	A	A	A
324	135.59	4.66	-5.84	4.89	A	A	A

TABLE 76. Evaluation Results for Ra-226 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
326	125.2	3.2	-13.06	4.31	A	N	W
329	142	10	-1.39	7.85	A	A	A
331	163.28	13.21	13.39	8.80	A	A	A
332	132	10	-8.33	8.33	A	A	A
334	142	7	-1.39	6.03	A	A	A
336	163	8	13.19	6.01	A	A	A
337	131.0	9.8	-9.03	8.25	A	A	A
338	139	14	-3.47	10.65	A	A	A
340	135	3	-6.25	4.12	A	A	A
341	143.6	6.7	-0.28	5.82	A	A	A
342	242.0	28.1	68.06	12.12	N	N	N
343	157	18	9.03	11.98	A	A	A
344	249	9	72.92	5.01	N	N	N
345	118	24	-18.06	20.63	A	A	A
348	150	22	4.17	15.07	A	A	A
349	17.41	0.91	-87.91	6.28	N	N	N
352	154	4	6.94	4.34	A	A	A
354	131	7	-9.03	6.37	A	A	A
355	158	13	9.72	8.93	A	A	A
358	101.0	17.2	-29.86	17.38	A	A	A
360	243	21.5	68.75	9.50	N	N	N
362	136.9	13.7	-4.93	10.59	A	A	A
363	156	9.32	8.33	6.91	A	A	A
364	126.2	13.2	-12.36	11.02	A	A	A
367	173.3	14.5	20.35	9.06	A	A	A
370	133.8	11.0	-7.08	8.92	A	A	A
371	142	10	-1.39	7.85	A	A	A
377	140	18	-2.78	13.32	A	A	A
380	121.3	5.5	-15.76	5.71	A	N	W
383	141.0	7.1	-2.08	6.12	A	A	A
384	139.02	35.07	-3.46	25.46	A	A	A
385	131.13	5.07	-8.94	5.20	A	A	A
386	263	12	82.64	5.73	N	N	N
387	126.41	10.48	-12.22	8.99	A	A	A
388	135	102	-6.25	75.64	A	N	W
390	136	10	-5.56	8.13	A	A	A
392	139	10	-3.47	7.99	A	A	A
395	145	5	0.69	4.89	A	A	A
397	137	19	-4.86	14.30	A	A	A
401	128	9	-11.11	7.84	A	A	A
404	105	5	-27.08	5.89	A	N	W
405	151	6	4.86	5.28	A	A	A
407	155.5	5.0	7.99	4.73	A	A	A
409	118.93	13.80	-17.41	12.11	A	A	A
410	145.90	2.49	1.32	3.87	A	A	A
414	137	5	-4.86	5.04	A	A	A
415	189.2	28.7	31.39	15.56	N	A	N
416	110.8	20.3	-23.06	18.65	A	A	A
418	160	10	11.11	7.15	A	A	A
419	134.06	6.74	-6.90	6.11	A	A	A
420	132.4	5.9	-8.06	5.65	A	A	A
421	151	10	4.86	7.48	A	A	A
423	131.801	21.750	-8.47	16.86	A	A	A
424	132	3.93	-8.33	4.57	A	A	A
425	117.9	7.5	-18.12	7.25	A	A	A
427	147.9	10.4	2.71	7.84	A	A	A
434	176.51	10.36	22.58	6.82	A	N	W
437	145	15	0.69	10.91	A	A	A
439	128.4	1.6	-10.83	3.69	A	N	W
441	153	57	6.25	37.42	A	N	W

TABLE 76. Evaluation Results for Ra-226 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
443	151	5	4.86	4.80	A	A	A
446	141	11	-2.08	8.54	A	A	A
449	132.4	7.2	-8.06	6.45	A	A	A
450	146	40	1.39	27.62	A	A	A
451	140	18	-2.78	13.32	A	A	A
452	207.949	4.857	44.41	4.18	N	N	N
453	126	13	-12.50	10.89	A	A	A
454	162	10	12.50	7.08	A	A	A
455	155	13	7.64	9.08	A	A	A
457	135	18	-6.25	13.78	A	A	A
458	124.2	12.2	-13.75	10.42	A	A	A
464	141.1	7.5	-2.01	6.35	A	A	A
465	128.0	13.0	-11.11	10.73	A	A	A
466	143	15	-0.69	11.05	A	A	A
475	320	20	122.22	7.15	N	N	N
476	159	4	10.42	4.29	A	A	A
478	277.73	12.71	92.87	5.74	N	N	N
479	158	8	9.72	6.14	A	A	A
484	141.9108	2.4677	-1.45	3.88	A	A	A
485	144	7	0.00	5.97	A	A	A
486	125.38	1.49	-12.93	3.67	A	N	W
487	160	14	11.11	9.41	A	A	A
490	121.95286	26.23143	-15.31	21.79	A	A	A
494	283	8	96.53	4.48	N	N	N
498	132.68	3.38	-7.86	4.31	A	A	A
499	150.8	2.6	4.72	3.88	A	A	A
501	133.9	3.36	-7.01	4.28	A	A	A
502	157.30	9.4	9.24	6.91	A	A	A
504	135	11	-6.25	8.86	A	A	A
506	144.4	20	0.28	14.28	A	A	A
507	170	15	18.06	9.48	A	A	A
508	1460	430	913.89	29.66	N	N	N
509	123.00	7.50	-14.58	7.02	A	A	A
512	287.2837	27.1701	99.50	10.07	N	N	N
515	116.37	3.93	-19.19	4.84	A	N	W

Th-234 Determination in Sample 4 by Gamma-ray Spectrometry

TABLE 77. Target values

Parameter	Value
Activity concentration [Bq/kg]	143
Uncertainty [Bq/kg]	7
Maximum Acceptable Relative Bias [%]	30

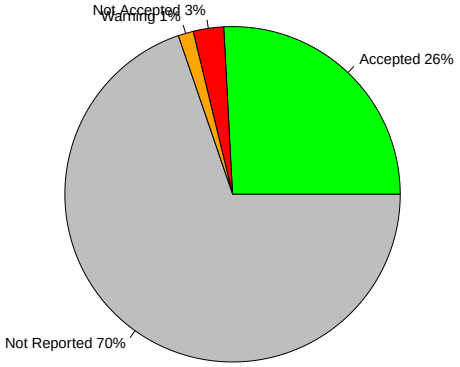

FIGURE 77. Percentage of Accepted vs. Warnings vs. Not Accepted vs. Not Reported results

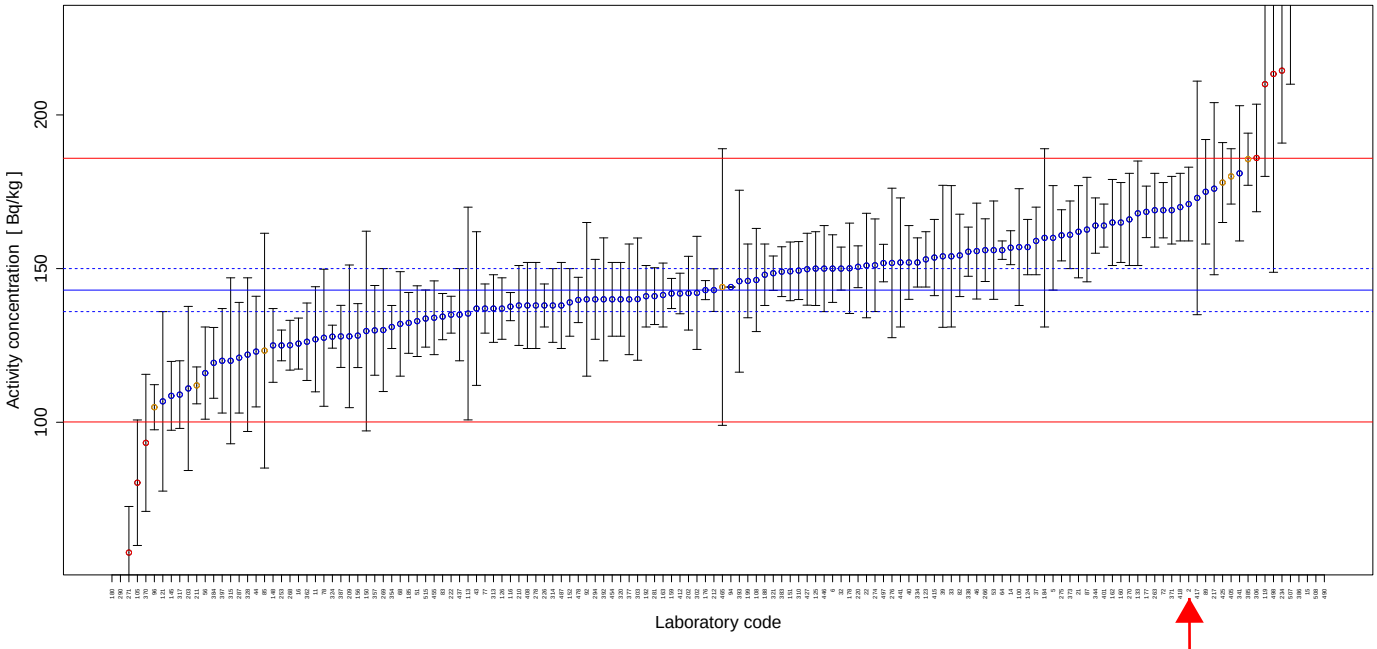

FIGURE 78. Reported results and evaluation parameters for Th-234 by Gamma-ray Spectrometry. Blue points represent accepted scores, whereas yellow and red represent warning and not accepted scores, respectively.

TABLE 78. Evaluation Results for Th-234 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
2	171	12	19.58	8.56	A	A	A
5	160	17	11.89	11.70	A	A	A
6	150	11	4.90	8.82	A	A	A
11	127	17.1	-11.19	14.33	A	A	A
14	156.80	5.52	9.65	6.03	A	A	A
15	336	14	134.97	6.43	N	N	N
16	125.6	8.3	-12.17	8.22	A	A	A
21	162	15	13.29	10.47	A	A	A
22	151	17	5.59	12.28	A	A	A
32	150	7	4.90	6.76	A	A	A
33	154	23	7.69	15.72	A	A	A
37	159	11	11.19	8.47	A	A	A
39	154.0	23.1	7.69	15.78	A	A	A
40	152	12	6.29	9.29	A	A	A
43	137	25	-4.20	18.89	A	A	A
44	123	18	-13.99	15.43	A	A	A
46	155.7	15.6	8.88	11.15	A	A	A
51	132.90	11.50	-7.06	9.94	A	A	A
53	156	16	9.09	11.36	A	A	A
56	116	15	-18.88	13.83	A	A	A
64	156	3	9.09	5.26	A	A	A
68	132	17	-7.69	13.78	A	A	A
72	169	9	18.18	7.23	A	A	A
77	137	8	-4.20	7.62	A	A	A
78	127.5	22.3	-10.84	18.16	A	A	A
82	154.3	13.4	7.90	9.97	A	A	A
83	134.38	7.52	-6.03	7.43	A	A	A
85	123.3	38.2	-13.78	31.37	A	N	W
87	162.7	17	13.78	11.54	A	A	A
89	175	17	22.38	10.88	A	A	A
92	140	25	-2.10	18.52	A	A	A
94	144	0.06	0.70	4.90	A	A	A
96	104.89	7.34	-26.65	8.54	A	N	W
100	157	19	9.79	13.05	A	A	A
105	80.33	20.42	-43.83	25.89	N	A	N
108	146.29	16.78	2.30	12.47	A	A	A
113	135.38	34.61	-5.33	26.03	A	A	A
116	137.63	4.58	-3.76	5.92	A	A	A
119	210	30	46.85	15.10	N	N	N
121	106.8	29.2	-25.31	27.78	A	A	A
123	153	9	6.99	7.65	A	A	A
124	157	9	9.79	7.54	A	A	A
125	150	12	4.90	9.38	A	A	A
126	137	10	-4.20	8.79	A	A	A
133	168	17	17.48	11.24	A	A	A
145	108.6	11.2	-24.06	11.42	A	A	A
148	125	12	-12.59	10.78	A	A	A
150	129.68	32.49	-9.31	25.53	A	A	A
151	149.1	9.55	4.27	8.06	A	A	A
152	139	11	-2.80	9.31	A	A	A
156	128.2	10.4	-10.35	9.47	A	A	A
159	141.9	4.9	-0.77	5.99	A	A	A
160	165	13	15.38	9.28	A	A	A
162	165	14	15.38	9.80	A	A	A
163	141.4	10.4	-1.12	8.84	A	A	A
176	143	3.1	0.00	5.35	A	A	A
177	168.46	8.38	17.80	6.98	A	A	A
178	150.1	14.7	4.97	10.95	A	A	A
180	0.15077	0.01557	-99.89	11.43	N	N	N
184	160	29	11.89	18.77	A	A	A

TABLE 78. Evaluation Results for Th-234 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
185	132.333	9.897	-7.46	8.94	A	A	A
188	148	10	3.50	8.34	A	A	A
192	141	10	-1.40	8.62	A	A	A
199	146	12	2.10	9.57	A	A	A
202	142	12	-0.70	9.77	A	A	A
203	111	26.7	-22.38	24.55	A	A	A
209	127.96	23.21	-10.52	18.79	A	A	A
210	138	13	-3.50	10.62	A	A	A
211	112	6	-21.68	7.26	A	N	W
212	143	6.94	0.00	6.89	A	A	A
217	176	28	23.08	16.65	A	A	A
220	150.6	6.8	5.31	6.66	A	A	A
222	135	6	-5.59	6.61	A	A	A
226	138	7	-3.50	7.05	A	A	A
234	214.42	23.58	49.94	12.04	N	N	N
253	125	5	-12.59	6.32	A	A	A
263	169	12	18.18	8.62	A	A	A
266	156	10.2	9.09	8.17	A	A	A
268	125.065	8.100	-12.54	8.12	A	A	A
269	130	20	-9.09	16.14	A	A	A
270	166	15	16.08	10.28	A	A	A
271	57.6	15.0	-59.72	26.50	N	A	N
274	151.09	15.07	5.66	11.11	A	A	A
275	160.83	8.32	12.47	7.12	A	A	A
276	151.84	24.32	6.18	16.75	A	A	A
278	138	14	-3.50	11.26	A	A	A
281	141.04	9.24	-1.37	8.18	A	A	A
287	121	18	-15.38	15.66	A	A	A
290	41.30	2.53	-71.12	7.84	N	N	N
294	140	13	-2.10	10.50	A	A	A
302	142.1	18.4	-0.63	13.84	A	A	A
303	140.07	19.89	-2.05	15.02	A	A	A
306	186	17.5	30.07	10.61	N	N	N
310	149.36	9.43	4.45	7.99	A	A	A
313	137	11	-4.20	9.40	A	A	A
314	138	12	-3.50	9.98	A	A	A
315	120	27	-16.08	23.03	A	A	A
317	109.0	11.0	-23.78	11.22	A	A	A
320	140	12	-2.10	9.87	A	A	A
321	148.5	5.6	3.85	6.18	A	A	A
324	127.85	3.74	-10.59	5.70	A	A	A
328	122	25	-14.69	21.07	A	A	A
334	152	8	6.29	7.19	A	A	A
338	155.5	8.0	8.74	7.10	A	A	A
341	181	22	26.57	13.10	A	A	A
344	164	9	14.69	7.35	A	A	A
354	131	7	-8.39	7.25	A	A	A
357	129.9	14.6	-9.16	12.26	A	A	A
362	126.2	12.6	-11.75	11.12	A	A	A
370	93.3	22.3	-34.76	24.40	N	A	N
371	169	11	18.18	8.14	A	A	A
373	161	11	12.59	8.40	A	A	A
377	140	18	-2.10	13.76	A	A	A
383	149.0	8.1	4.20	7.32	A	A	A
384	119.33	11.52	-16.55	10.82	A	A	A
385	185.59	8.48	29.78	6.70	A	N	W
386	268	13	87.41	6.89	N	N	N
387	127.94	10.10	-10.53	9.29	A	A	A
392	140	20	-2.10	15.10	A	A	A
393	145.9	29.6	2.03	20.87	A	A	A

TABLE 78. Evaluation Results for Th-234 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
397	120	17	-16.08	14.99	A	A	A
401	164	7	14.69	6.49	A	A	A
405	180	9	25.87	7.00	A	N	W
408	138	14	-3.50	11.26	A	A	A
412	141.9	6.6	-0.77	6.75	A	A	A
415	153.6	12.4	7.41	9.44	A	A	A
417	173	38	20.98	22.50	A	A	A
418	170	11	18.88	8.11	A	A	A
425	178	13	24.48	8.79	A	N	W
427	149.8	11.7	4.76	9.22	A	A	A
437	135	15	-5.59	12.14	A	A	A
441	152	21	6.29	14.66	A	A	A
446	150	14	4.90	10.54	A	A	A
454	140	12	-2.10	9.87	A	A	A
455	134	12	-6.29	10.21	A	A	A
465	144	45	0.70	31.63	A	N	W
478	139.80	7.37	-2.24	7.19	A	A	A
487	138	14	-3.50	11.26	A	A	A
490	54187.164	8329.0786	37793.12	16.13	N	N	N
497	151.8	6.1	6.15	6.33	A	A	A
498	213.33	64.53	49.18	30.64	N	N	N
507	240	30	67.83	13.42	N	N	N
508	1330	260	830.07	20.15	N	N	N
515	133.74	9.29	-6.48	8.50	A	A	A

Pa-234m Determination in Sample 4 by Gamma-ray Spectrometry

TABLE 79. Target values

Parameter	Value
Activity concentration [Bq/kg]	143
Uncertainty [Bq/kg]	7
Maximum Acceptable Relative Bias [%]	30

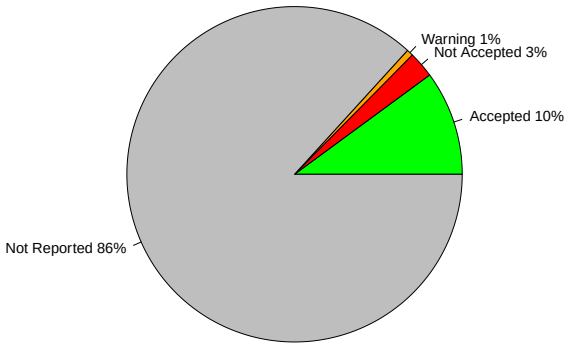

FIGURE 79. Percentage of Accepted vs. Warnings vs. Not Accepted vs. Not Reported results

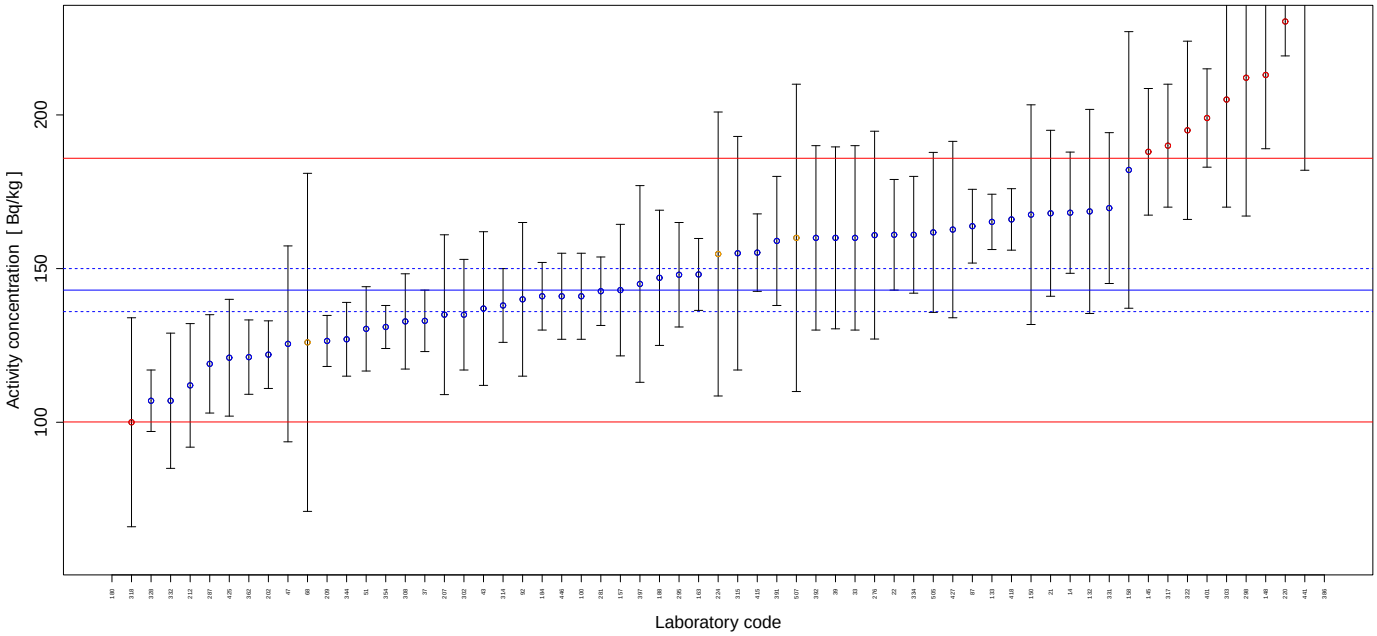

FIGURE 80. Reported results and evaluation parameters for Pa-234m by Gamma-ray Spectrometry. Blue points represent accepted scores, whereas yellow and red represent warning and not accepted scores, respectively.

TABLE 80. Evaluation Results for Pa-234m in Sample 4, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
14	168.19	19.72	17.62	12.71	A	A	A
21	168	27	17.48	16.80	A	A	A
22	161	18	12.59	12.20	A	A	A
33	160	30	11.89	19.38	A	A	A
37	133	10	-6.99	8.97	A	A	A
39	160.0	29.6	11.89	19.14	A	A	A
43	137	25	-4.20	18.89	A	A	A
47	125.51	31.87	-12.23	25.86	A	A	A
51	130.39	13.72	-8.82	11.61	A	A	A
68	126	55	-11.89	43.92	A	N	W
87	163.8	12	14.55	8.81	A	A	A
92	140	25	-2.10	18.52	A	A	A
100	141	14	-1.40	11.07	A	A	A
132	168.6	33.2	17.90	20.29	A	A	A
133	165.2	9.0	15.52	7.32	A	A	A
145	188.0	20.6	31.47	12.00	N	N	N
148	213	24	48.95	12.28	N	N	N
150	167.55	35.74	17.17	21.89	A	A	A
157	143	21.4	0.00	15.75	A	A	A
158	182.1	45.0	27.34	25.19	A	A	A
163	148.1	11.7	3.57	9.29	A	A	A
180	0.46412	0.10622	-99.68	23.40	N	N	N
184	141	11	-1.40	9.21	A	A	A
188	147	22	2.80	15.75	A	A	A
202	122	11	-14.69	10.26	A	A	A
207	135	26	-5.59	19.87	A	A	A
209	126.46	8.30	-11.57	8.19	A	A	A
212	112	20.1	-21.68	18.60	A	A	A
220	230.4	11.2	61.12	6.90	N	N	N
224	154.75	46.2	8.22	30.25	A	N	W
276	160.89	33.81	12.51	21.58	A	A	A
281	142.64	11.14	-0.25	9.22	A	A	A
287	119	16	-16.78	14.31	A	A	A
295	148	17	3.50	12.49	A	A	A
298	212.1	45.0	48.32	21.77	N	A	N
302	135.0	18	-5.59	14.20	A	A	A
303	205	35	43.36	17.76	N	A	N
308	132.81	15.50	-7.13	12.66	A	A	A
314	138	12	-3.50	9.98	A	A	A
315	155	38	8.39	25.00	A	A	A
317	190.0	20.0	32.87	11.61	N	N	N
318	100.0	34.0	-30.07	34.35	N	N	N
322	195	29	36.36	15.66	N	A	N
328	107	10	-25.17	10.55	A	A	A
331	169.69	24.54	18.66	15.27	A	A	A
332	107	22	-25.17	21.14	A	A	A
334	161	19	12.59	12.78	A	A	A
344	127	12	-11.19	10.64	A	A	A
354	131	7	-8.39	7.25	A	A	A
362	121.2	12.1	-15.24	11.12	A	A	A
386	292	38	104.20	13.90	N	N	N
391	159	21	11.19	14.09	A	A	A
392	160	30	11.89	19.38	A	A	A
397	145	32	1.40	22.61	A	A	A
401	199	16	39.16	9.41	N	N	N
415	155.2	12.6	8.53	9.48	A	A	A
418	166	10	16.08	7.76	A	A	A
425	121	19	-15.38	16.45	A	A	A
427	162.7	28.7	13.78	18.31	A	A	A
441	262	80	83.22	30.92	N	N	N

TABLE 80. Evaluation Results for Pa-234m in Sample 4, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
446	141	14	-1.40	11.07	A	A	A
505	161.78	26.03	13.13	16.82	A	A	A
507	160	50	11.89	31.63	A	N	W

U-235 Determination in Sample 4 by Gamma-ray Spectrometry

TABLE 81. Target values

Parameter	Value
Activity concentration [Bq/kg]	6.66
Uncertainty [Bq/kg]	0.58
Maximum Acceptable Relative Bias [%]	30

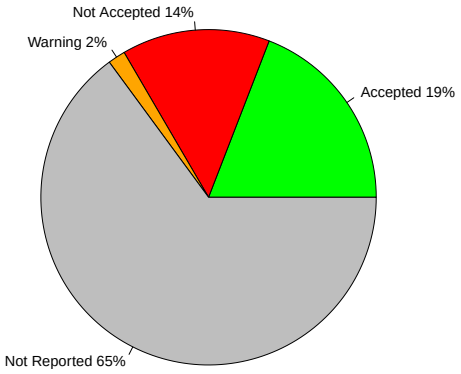

FIGURE 81. Percentage of Accepted vs. Warnings vs. Not Accepted vs. Not Reported results

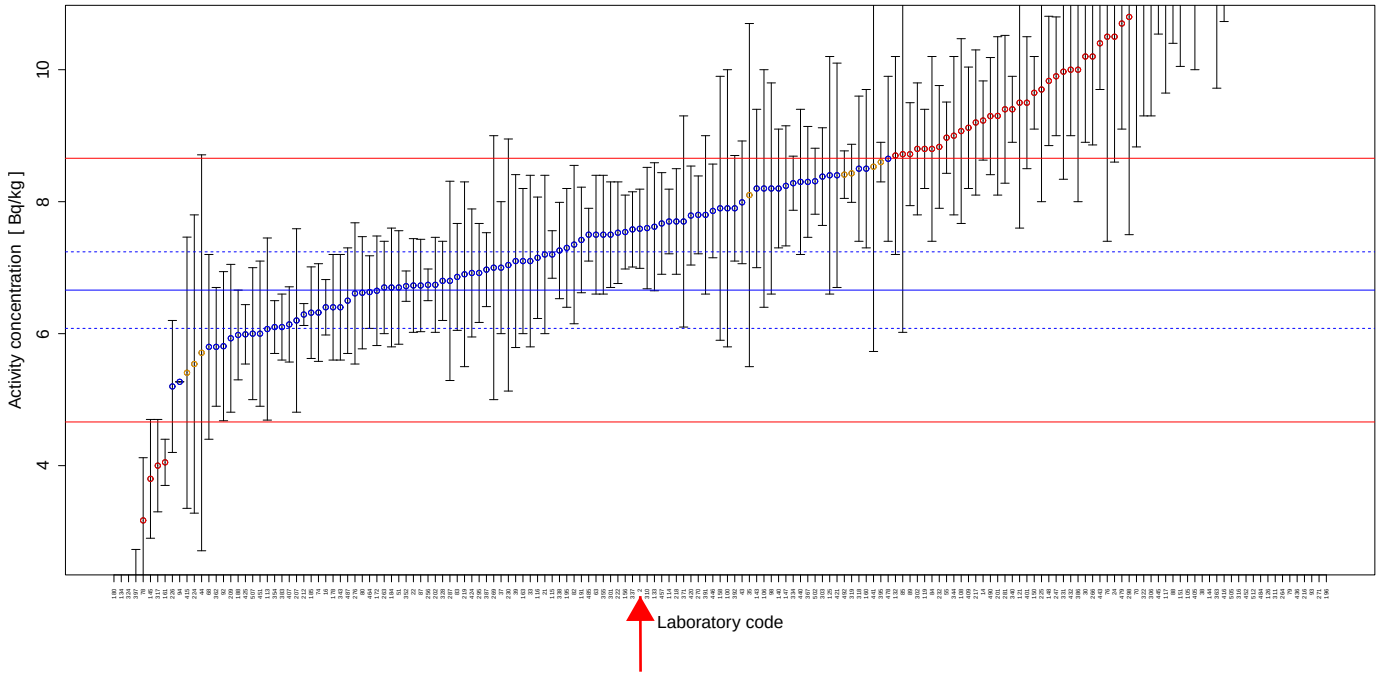

FIGURE 82. Reported results and evaluation parameters for U-235 by Gamma-ray Spectrometry. Blue points represent accepted scores, whereas yellow and red represent warning and not accepted scores, respectively.

TABLE 82. Evaluation Results for U-235 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
2	7.59	0.60	13.96	11.76	A	A	A
14	9.23	0.60	38.59	10.87	N	N	N
16	6.40	0.42	-3.90	10.90	A	A	A
21	7.2	1.2	8.11	18.80	A	A	A
22	6.73	0.71	1.05	13.68	A	A	A
24	10.5	1.9	57.66	20.08	N	N	N
30	10.2	1.3	53.15	15.44	N	N	N
33	7.1	1.3	6.61	20.28	A	A	A
35	8.1	2.6	21.62	33.26	A	N	W
37	7	1	5.11	16.73	A	A	A
38	12.3	0.7	84.68	10.40	N	N	N
39	7.10	1.31	6.61	20.40	A	A	A
43	7.99	0.93	19.97	14.54	A	A	A
44	5.71	3.0	-14.26	53.26	A	N	W
51	6.70	0.86	0.60	15.51	A	A	A
55	8.97	0.54	34.68	10.59	N	N	N
63	7.50	0.90	12.61	14.83	A	A	A
68	5.8	1.4	-12.91	25.66	A	A	A
70	11.03	2.20	65.62	21.76	N	N	N
74	6.32	0.74	-5.11	14.59	A	A	A
76	10.5	3.1	57.66	30.78	N	N	N
78	3.17	0.95	-52.40	31.21	N	N	N
79	19	3	185.29	18.03	N	N	N
80	6.62	0.85	-0.60	15.51	A	A	A
82	7.35	1.20	10.36	18.50	A	A	A
83	6.86	0.81	3.00	14.67	A	A	A
84	8.8	1.4	32.13	18.14	N	A	N
85	8.72	2.70	30.93	32.16	N	N	N
87	6.73	0.7	1.05	13.57	A	A	A
88	11.4	1.0	71.17	12.36	N	N	N
89	8.72	0.78	30.93	12.48	N	A	N
92	5.81	1.13	-12.76	21.31	A	A	A
93	21.6	2.7	224.32	15.23	N	N	N
94	5.27	0.002	-20.87	8.71	A	A	A
98	8.2	1.6	23.12	21.37	A	A	A
100	7.9	2.1	18.62	27.97	A	A	A
105	11.99	0.52	80.03	9.73	N	N	N
106	8.2	1.8	23.12	23.62	A	A	A
108	9.07	1.40	36.19	17.72	N	A	N
113	6.07	1.38	-8.86	24.35	A	A	A
114	7.70	0.49	15.62	10.79	A	A	A
115	7.20	0.36	8.11	10.04	A	A	A
116	7.15	0.92	7.36	15.54	A	A	A
117	11.351	1.705	70.44	17.36	N	N	N
119	8.8	0.6	32.13	11.06	N	N	N
121	9.5	1.9	42.64	21.81	N	A	N
125	8.4	1.8	26.13	23.13	A	A	A
126	17.7	1.4	165.77	11.76	N	N	N
132	8.7	1.5	30.63	19.32	N	A	N
133	7.62	0.97	14.41	15.42	A	A	A
134	0.76	0.05	-88.59	10.91	N	N	N
140	8.2	0.9	23.12	14.01	A	A	A
143	8.2	1.2	23.12	17.03	A	A	A
144	12.4	0.8	86.19	10.84	N	N	N
145	3.8	0.9	-42.94	25.23	N	A	N
147	8.24	0.91	23.72	14.06	A	A	A
148	9.83	0.98	47.60	13.24	N	N	N
150	9.65	0.55	44.89	10.41	N	N	N
151	11.62	1.57	74.47	16.07	N	N	N
156	7.54	0.56	13.21	11.45	A	A	A

TABLE 82. Evaluation Results for U-235 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
158	7.9	2.0	18.62	26.77	A	A	A
160	8.5	1.2	27.63	16.59	A	A	A
161	4.05	0.35	-39.19	12.27	N	N	N
163	7.1	1.1	6.61	17.77	A	A	A
172	6.65	0.83	-0.15	15.22	A	A	A
178	6.4	0.8	-3.90	15.23	A	A	A
180	0.0098791	0.0024723	-99.85	26.50	N	N	N
184	6.7	0.9	0.60	16.01	A	A	A
185	6.318	0.694	-5.14	14.02	A	A	A
188	5.98	0.68	-10.21	14.32	A	A	A
191	7.42	0.80	11.41	13.86	A	A	A
195	7.3	0.9	9.61	15.09	A	A	A
196	193.00	21.00	2797.90	13.94	N	N	N
201	9.3	1.2	39.64	15.57	N	A	N
202	6.74	0.72	1.20	13.78	A	A	A
207	6.20	1.39	-6.91	24.05	A	A	A
209	5.93	1.12	-10.96	20.80	A	A	A
212	6.29	0.166	-5.56	9.10	A	A	A
216	20.63	2.06	209.76	13.25	N	N	N
217	9.2	1.1	38.14	14.79	N	A	N
218	7.7	0.8	15.62	13.56	A	A	A
219	6.9	1.4	3.60	22.08	A	A	A
222	7.53	0.77	13.06	13.43	A	A	A
224	5.54	2.26	-16.82	41.71	A	N	W
225	9.7	1.7	45.65	19.57	N	A	N
226	5.2	1.0	-21.92	21.11	A	A	A
230	7.04	1.91	5.71	28.49	A	A	A
232	8.83	0.93	32.58	13.67	N	A	N
247	9.9	0.9	48.65	12.59	N	N	N
256	6.74	0.24	1.20	9.41	A	A	A
263	6.7	0.7	0.60	13.60	A	A	A
264	18.2	1.16	173.27	10.79	N	N	N
266	10.2	1.34	53.15	15.76	N	N	N
269	7	2	5.11	29.87	A	A	A
270	7.80	0.59	17.12	11.54	A	A	A
271	27.0	2.6	305.41	12.98	N	N	N
276	6.61	1.07	-0.75	18.38	A	A	A
281	9.40	1.12	41.14	14.76	N	N	N
287	6.80	1.51	2.10	23.85	A	A	A
295	6.92	0.75	3.90	13.90	A	A	A
298	10.8	3.3	62.16	31.77	N	N	N
301	7.5	0.8	12.61	13.77	A	A	A
302	8.8	1.0	32.13	14.32	N	A	N
303	8.38	0.74	25.83	12.40	A	A	A
306	11.2	1.9	68.17	19.07	N	N	N
310	7.60	0.92	14.11	14.91	A	A	A
311	17.8	4.22	167.27	25.26	N	N	N
316	14.70	1.08	120.72	11.39	N	N	N
317	4.0	0.7	-39.94	19.55	N	A	N
318	8.5	1.1	27.63	15.60	A	A	A
319	8.43	0.44	26.58	10.15	A	N	W
322	11.1	1.8	66.67	18.41	N	N	N
324	1.41	0.46	-78.83	33.77	N	N	N
328	6.8	0.6	2.10	12.40	A	A	A
331	9.97	1.63	49.70	18.52	N	N	N
334	8.28	0.41	24.32	10.02	A	A	A
337	7.58	0.57	13.81	11.51	A	A	A
338	7.26	0.73	9.01	13.30	A	A	A
340	9.4	0.5	41.14	10.20	N	N	N
343	6.4	0.8	-3.90	15.23	A	A	A

TABLE 82. Evaluation Results for U-235 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
344	9	1.2	35.14	15.93	N	A	N
352	6.72	0.23	0.90	9.36	A	A	A
354	6.1	0.4	-8.41	10.90	A	A	A
355	7.5	0.9	12.61	14.83	A	A	A
362	5.8	0.9	-12.91	17.79	A	A	A
363	12.6	2.88	89.19	24.46	N	N	N
367	8.3	0.84	24.62	13.35	A	A	A
371	7.7	1.6	15.62	22.53	A	A	A
383	6.1	0.5	-8.41	11.96	A	A	A
386	10	2	50.15	21.81	N	A	N
387	6.97	0.56	4.65	11.85	A	A	A
391	7.8	1.2	17.12	17.68	A	A	A
392	7.9	0.8	18.62	13.36	A	A	A
395	8.6	0.3	29.13	9.38	A	N	W
397	2.15	0.58	-67.72	28.35	N	A	N
401	9.5	1	42.64	13.66	N	N	N
405	12	2	80.18	18.80	N	N	N
407	6.14	0.57	-7.81	12.73	A	A	A
409	9.12	0.92	36.94	13.33	N	N	N
415	5.408	2.055	-18.80	38.98	A	N	W
416	12.69	1.96	90.54	17.73	N	N	N
420	7.79	0.75	16.97	12.98	A	A	A
421	8.4	1.7	26.13	22.03	A	A	A
424	6.92	0.97	3.90	16.50	A	A	A
425	5.99	0.45	-10.06	11.50	A	A	A
432	10	1	50.15	13.26	N	N	N
436	19.5	1.1	192.79	10.38	N	N	N
440	8.3	1.1	24.62	15.86	A	A	A
441	8.53	2.8	28.08	33.96	A	N	W
443	10.4	0.7	56.16	11.01	N	N	N
445	11.20	0.66	68.17	10.52	N	N	N
446	7.86	0.71	18.02	12.55	A	A	A
451	6.0	1.1	-9.91	20.30	A	A	A
452	15.955	1.549	139.56	13.04	N	N	N
457	7.67	0.77	15.17	13.29	A	A	A
464	6.63	0.55	-0.45	12.03	A	A	A
478	8.65	1.25	29.88	16.87	A	A	A
479	10.7	1.6	60.66	17.30	N	N	N
484	17.2026	0.5121	158.30	9.20	N	N	N
485	7.5	0.4	12.61	10.21	A	A	A
487	6.5	0.8	-2.40	15.08	A	A	A
490	9.29685	0.88770	39.59	12.92	N	N	N
492	8.41	0.36	26.28	9.70	A	N	W
502	8.31	0.5	24.77	10.59	A	A	A
505	14.11	1.30	111.86	12.68	N	N	N
507	6.0	1.0	-9.91	18.80	A	A	A
512	16.8081	2.5492	152.37	17.49	N	N	N

Bi-212 Determination in Sample 4 by Gamma-ray Spectrometry

TABLE 83. Target values

Parameter	Value
Activity concentration [Bq/kg]	130
Uncertainty [Bq/kg]	7
Maximum Acceptable Relative Bias [%]	30

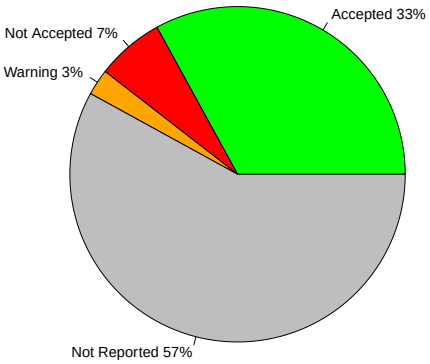

FIGURE 83. Percentage of Accepted vs. Warnings vs. Not Accepted vs. Not Reported results

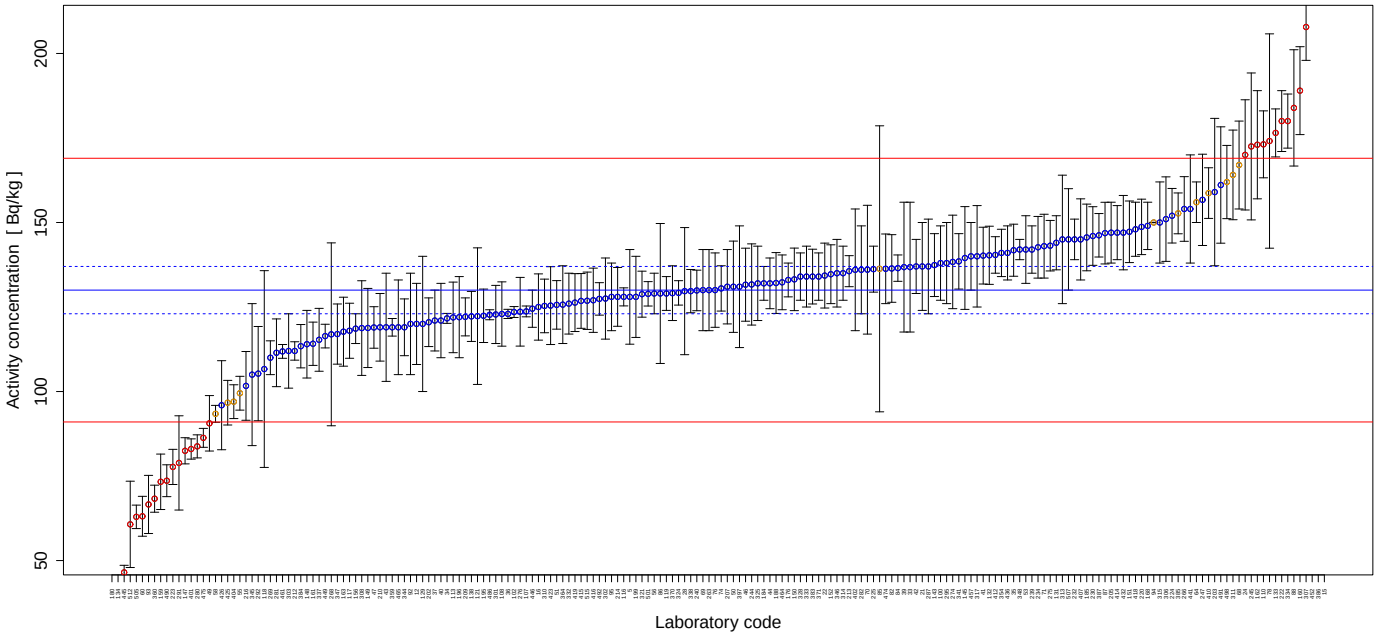

FIGURE 84. Reported results and evaluation parameters for Bi-212 by Gamma-ray Spectrometry. Blue points represent accepted scores, whereas yellow and red represent warning and not accepted scores, respectively.

TABLE 84. Evaluation Results for Bi-212 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
5	128	14	-1.54	12.19	A	A	A
12	120	12	-7.69	11.36	A	A	A
15	416	26	220.00	8.25	N	N	N
16	125.0	9.8	-3.85	9.51	A	A	A
21	137	13	5.38	10.91	A	A	A
22	134.3	9.6	3.31	8.95	A	A	A
24	170.0	16.3	30.77	11.00	N	N	N
28	129.7	18.8	-0.23	15.46	A	A	A
33	136.8	19.2	5.23	15.03	A	A	A
34	121.64	1.47	-6.43	5.52	A	A	A
35	141.8	7.7	9.08	7.65	A	A	A
36	122.96	1.36	-5.42	5.50	A	A	A
37	121	9	-6.92	9.18	A	A	A
39	136.8	19.2	5.23	15.03	A	A	A
40	121	11	-6.92	10.57	A	A	A
41	140.2	8.4	7.85	8.06	A	A	A
42	137	8	5.38	7.94	A	A	A
43	119	16	-8.46	14.48	A	A	A
44	132	7.5	1.54	7.83	A	A	A
46	131.6	10.8	1.23	9.82	A	A	A
47	118.95	6.14	-8.50	7.46	A	A	A
49	90.6	8.2	-30.31	10.53	N	N	N
50	131	13.5	0.77	11.63	A	A	A
51	125.63	7.18	-3.36	7.85	A	A	A
53	142	10	9.23	8.86	A	A	A
55	99.5	5.0	-23.46	7.37	A	N	W
56	129	6	-0.77	7.12	A	A	A
58	93.4	2.5	-28.15	6.01	A	N	W
60	63.1	5.9	-51.46	10.79	N	N	N
64	156	6	20.00	6.62	A	N	W
68	167	13	28.46	9.47	A	N	W
69	130	12	0.00	10.69	A	A	A
70	136.04	19.05	4.65	15.00	A	A	A
71	143	9.44	10.00	8.52	A	A	A
74	130.5	6.7	0.38	7.44	A	A	A
76	130	11	0.00	10.03	A	A	A
78	174.1	31.7	33.92	18.99	N	A	N
82	136.4	10.0	4.92	9.10	A	A	A
84	136.5	3.9	5.00	6.10	A	A	A
85	136.3	42.3	4.85	31.50	A	N	W
86	129	20.7	-0.77	16.93	A	A	A
87	146.86	9.12	12.97	8.22	A	A	A
88	183.9	17.2	41.46	10.79	N	N	N
92	120	15	-7.69	13.61	A	A	A
93	66.6	8.6	-48.77	13.99	N	N	N
94	150	0.06	15.38	5.38	A	N	W
95	128	10	-1.54	9.49	A	A	A
100	138	11	6.15	9.62	A	A	A
102	123.52	1.61	-4.98	5.54	A	A	A
107	123.7	1.6	-4.85	5.54	A	A	A
108	122.93	9.51	-5.44	9.43	A	A	A
110	173.12	9.9	33.17	7.85	N	N	N
113	121.93	10.44	-6.21	10.11	A	A	A
116	128.00	2.67	-1.54	5.77	A	A	A
117	117.979	8.140	-9.25	8.75	A	A	A
118	106.65	29.1	-17.96	27.81	A	A	A
119	129	5	-0.77	6.63	A	A	A
121	122.3	20.2	-5.92	17.37	A	A	A
129	120	20	-7.69	17.51	A	A	A
131	144	8	10.77	7.74	A	A	A

TABLE 84. Evaluation Results for Bi-212 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
132	140.3	8.6	7.92	8.16	A	A	A
133	176.5	7.1	35.77	6.72	N	N	N
134	2.64	0.20	-97.97	9.29	N	N	N
138	122.22	7.40	-5.98	8.10	A	A	A
143	137.4	9.3	5.69	8.65	A	A	A
145	139.5	15.2	7.31	12.15	A	A	A
147	82.47	3.87	-36.56	7.14	N	N	N
148	114	10	-12.31	10.29	A	A	A
149	118.8	11.7	-8.62	11.22	A	A	A
150	133.18	9.25	2.45	8.79	A	A	A
151	147.25	9.11	13.27	8.20	A	A	A
152	134.7	8.7	3.62	8.41	A	A	A
156	118.6	4.4	-8.77	6.54	A	A	A
159	73.3	8.2	-43.62	12.42	N	N	N
160	189	13	45.38	8.74	N	N	N
161	114.13	6.4	-12.21	7.77	A	A	A
162	173	16	33.08	10.70	N	N	N
163	117.7	10.2	-9.46	10.20	A	A	A
168	149	7	14.62	7.15	A	A	A
176	133	5	2.31	6.57	A	A	A
180	0.12699	0.0089666	-99.90	8.88	N	N	N
184	132	5	1.54	6.58	A	A	A
185	145.577	9.861	11.98	8.65	A	A	A
188	132.1	9.0	1.62	8.68	A	A	A
195	122.4	7.9	-5.85	8.41	A	A	A
196	122.00	12.00	-6.15	11.21	A	A	A
199	128	12	-1.54	10.81	A	A	A
202	120.5	7.2	-7.31	8.04	A	A	A
203	159	21.8	22.31	14.73	A	A	A
205	147	9	13.08	8.15	A	A	A
207	131	11	0.77	9.98	A	A	A
209	122.08	5.62	-6.09	7.08	A	A	A
210	119	10	-8.46	9.98	A	A	A
212	112	2.72	-13.85	5.91	A	A	A
213	135.6	4.59	4.31	6.36	A	A	A
214	128	8.7	-1.54	8.67	A	A	A
216	101.67	10.17	-21.79	11.36	A	A	A
220	148.7	8.2	14.38	7.71	A	A	A
222	180	9	38.46	7.35	N	N	N
223	77.7	5.2	-40.23	8.59	N	N	N
224	152	8.07	16.92	7.56	A	A	A
225	136.2	6.8	4.77	7.34	A	A	A
230	146	8.67	12.31	8.02	A	A	A
232	145	6.0	11.54	6.79	A	A	A
234	142.67	9.12	9.75	8.36	A	A	A
239	142	7	9.23	7.30	A	A	A
240	129.9	6.0	-0.08	7.09	A	A	A
244	131.67	12.01	1.28	10.59	A	A	A
245	172.50	21.73	32.69	13.70	N	A	N
247	156.7	13.5	20.54	10.16	A	A	A
263	130	12	0.00	10.69	A	A	A
266	154	9.56	18.46	8.22	A	A	A
268	116.923	27.049	-10.06	23.75	A	A	A
269	110	5	-15.38	7.05	A	A	A
274	138.34	13.83	6.42	11.36	A	A	A
275	143.14	7.47	10.11	7.50	A	A	A
276	123.60	10.16	-4.92	9.83	A	A	A
280	83.78	3.41	-35.55	6.75	N	N	N
281	111.46	10.02	-14.26	10.48	A	A	A
282	136	13	4.62	10.97	A	A	A

TABLE 84. Evaluation Results for Bi-212 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
287	137	14	5.38	11.55	A	A	A
291	78.884	13.939	-39.32	18.47	N	A	N
292	105.30	13.94	-19.00	14.29	A	A	A
295	138	12	6.15	10.23	A	A	A
301	122.8	8.6	-5.54	8.83	A	A	A
302	127.5	12	-1.92	10.84	A	A	A
303	112	11	-13.85	11.20	A	A	A
306	151	12.5	16.15	9.88	A	A	A
307	207.82	9.86	59.86	7.18	N	N	N
308	118.77	14.00	-8.64	12.96	A	A	A
310	125.32	7.93	-3.60	8.31	A	A	A
311	164.08	13.26	26.22	9.71	A	N	W
313	145	19	11.54	14.17	A	A	A
314	135	8	3.85	8.01	A	A	A
315	150	12	15.38	9.64	A	A	A
317	140.0	15.0	7.69	11.99	A	A	A
321	128.8	6.8	-0.92	7.54	A	A	A
324	129.18	3.61	-0.63	6.07	A	A	A
325	132	11	1.54	9.92	A	A	A
328	134	7	3.08	7.50	A	A	A
332	126	9	-3.08	8.95	A	A	A
333	134	9	3.08	8.61	A	A	A
334	180	8	38.46	6.98	N	N	N
337	115.3	9.3	-11.31	9.70	A	A	A
338	129.7	6.4	-0.23	7.30	A	A	A
341	138.5	8.2	6.54	8.00	A	A	A
344	119	8.4	-8.46	8.88	A	A	A
345	105	21	-19.23	20.71	A	A	A
346	135	10	3.85	9.16	A	A	A
347	117	8.9	-10.00	9.32	A	A	A
348	142	3	9.23	5.78	A	A	A
354	141	7	8.46	7.32	A	A	A
359	119	2.6	-8.46	5.81	A	A	A
360	68.3	4	-47.46	7.96	N	N	N
364	125.7	11.5	-3.31	10.62	A	A	A
370	129.1	8.1	-0.69	8.27	A	A	A
371	134	7	3.08	7.50	A	A	A
383	134.0	8.1	3.08	8.10	A	A	A
384	113.41	6.41	-12.76	7.81	A	A	A
385	152.7	6.04	17.46	6.68	A	N	W
386	250	12	92.31	7.21	N	N	N
387	146.22	6.43	12.48	6.95	A	A	A
397	131	18	0.77	14.76	A	A	A
401	83	3	-36.15	6.49	N	N	N
402	136	18	4.62	14.29	A	A	A
404	97	5	-25.38	7.45	A	N	W
407	145	12	11.54	9.87	A	A	A
410	158.70	7.49	22.08	7.16	A	N	W
412	140.4	5.4	8.00	6.62	A	A	A
414	147	8	13.08	7.66	A	A	A
415	126.8	8.1	-2.46	8.35	A	A	A
416	127.0	9.5	-2.31	9.22	A	A	A
418	148	8	13.85	7.63	A	A	A
419	126.31	8.56	-2.84	8.66	A	A	A
423	125.415	11.510	-3.53	10.64	A	A	A
425	96.7	6.6	-25.62	8.69	A	N	W
426	95.95	13.17	-26.19	14.74	A	A	A
432	147	11	13.08	9.22	A	A	A
436	141	8	8.46	7.82	A	A	A
441	154	16	18.46	11.70	A	A	A

TABLE 84. Evaluation Results for Bi-212 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg by Gamma ray spectrometry

Labcode	Reported value [Bq/kg]	Reported uncertainty ($k = 1$) [Bq/kg]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
445	46.50	2.10	-64.23	7.03	N	N	N
446	124.5	5.5	-4.23	6.96	A	A	A
449	116.4	3.5	-10.46	6.17	A	A	A
452	244.433	10.543	88.03	6.90	N	N	N
457	140	10	7.69	8.95	A	A	A
461	111.87	2.04	-13.95	5.69	A	A	A
464	132.3	8.1	1.77	8.15	A	A	A
465	119.0	14.0	-8.46	12.94	A	A	A
474	136.3	10.3	4.85	9.28	A	A	A
475	86.3	2.8	-33.62	6.29	N	N	N
486	122.71	1.48	-5.61	5.52	A	A	A
490	73.61664	4.71070	-43.37	8.36	N	N	N
491	161.09	17.21	23.92	11.96	A	A	A
492	127.4	4.8	-2.00	6.57	A	A	A
498	161.97	10.83	24.59	8.59	A	N	W
501	128.9	3.61	-0.85	6.07	A	A	A
505	62.93	3.47	-51.59	7.71	N	N	N
507	145	15	11.54	11.66	A	A	A
512	60.71167	12.76525	-53.30	21.70	N	A	N
515	126.85	8.48	-2.42	8.58	A	A	A

Cs-134 Determination in Sample 5 by Gamma-ray Spectrometry

TABLE 85. Target values

Parameter	Value
Massic activity [Bq/sample]	7.71
Uncertainty [Bq/sample]	0.39
Maximum Acceptable Relative Bias [%]	30

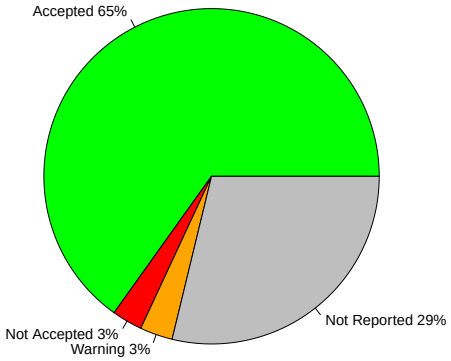

FIGURE 85. Percentage of Accepted vs. Warnings vs. Not Accepted vs. Not Reported results

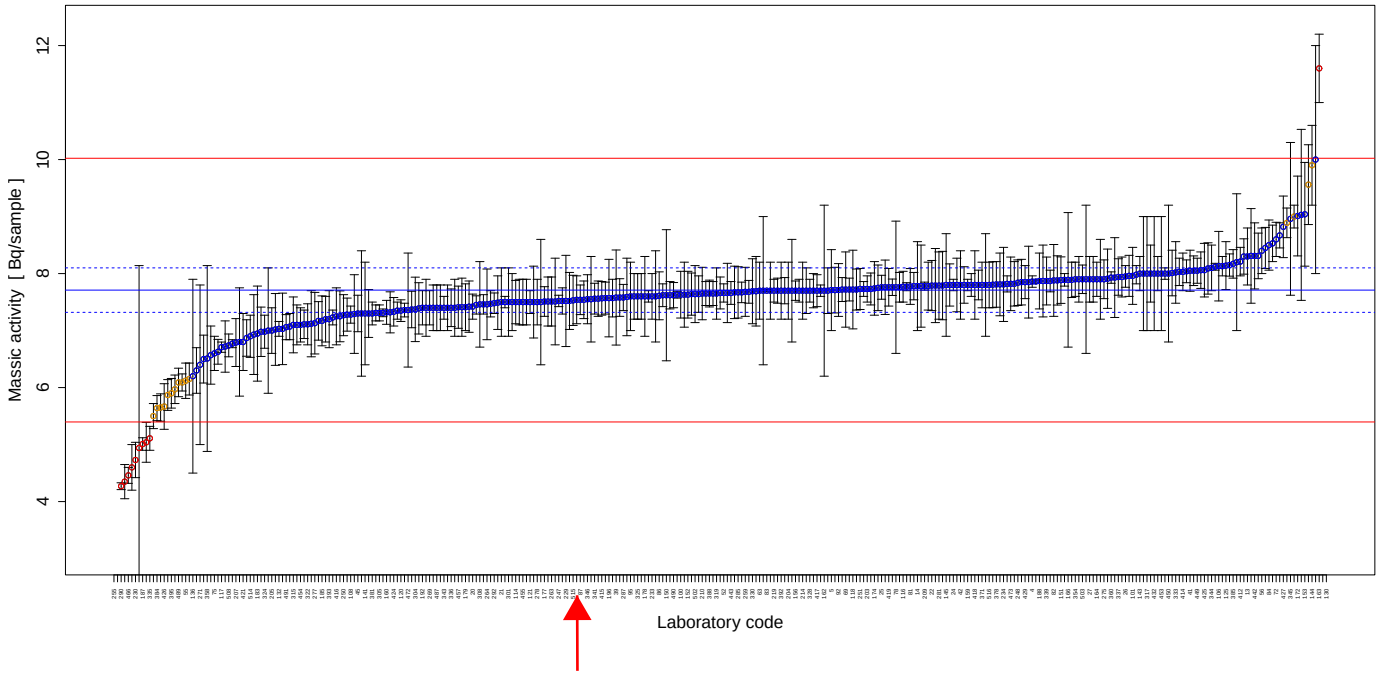

FIGURE 86. Reported results and evaluation parameters for Cs-134 by Gamma-ray Spectrometry. Blue points represent accepted scores, whereas yellow and red represent warning and not accepted scores, respectively.

TABLE 86. Evaluation Results for Cs-134 in Sample 5, Rep. Value and Rep. Unc. in Bq/sample by Gamma ray spectrometry

Labcode	Reported value [Bq/sample]	Reported uncertainty ($k = 1$) [Bq/sample]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
2	7.54	0.42	-2.20	7.52	A	A	A
3	7.41	0.51	-3.89	8.54	A	A	A
4	7.86	0.1	1.95	5.22	A	A	A
5	7.71	0.71	0.00	10.51	A	A	A
6	7.78	0.72	0.91	10.55	A	A	A
8	8.01	0.4	3.89	7.11	A	A	A
10	5.87	0.27	-23.87	6.84	A	N	W
11	7.5	0.4	-2.72	7.35	A	A	A
12	7.87	0.63	2.08	9.47	A	A	A
13	8.3	0.5	7.65	7.87	A	A	A
14	7.78	0.78	0.91	11.23	A	A	A
16	7.28	0.29	-5.58	6.44	A	A	A
17	7.7	0.2	-0.13	5.69	A	A	A
19	7.66	0.28	-0.65	6.24	A	A	A
20	7.42	0.22	-3.76	5.86	A	A	A
21	7.5	0.6	-2.72	9.47	A	A	A
22	7.79	0.44	1.04	7.58	A	A	A
23	7.64	0.37	-0.91	7.00	A	A	A
24	7.8	0.1	1.17	5.22	A	A	A
25	7.76	0.21	0.65	5.74	A	A	A
26	7.95	0.19	3.11	5.59	A	A	A
27	7.9	0.4	2.46	7.16	A	A	A
28	7.5	1.1	-2.72	15.51	A	A	A
30	6.57	0.51	-14.79	9.27	A	A	A
31	7.63	0.06	-1.04	5.12	A	A	A
32	7.49	0.47	-2.85	8.06	A	A	A
33	7.6	0.8	-1.43	11.68	A	A	A
35	7.57	0.28	-1.82	6.27	A	A	A
37	7.82	0.39	1.43	7.10	A	A	A
38	8.2	1.2	6.36	15.48	A	A	A
39	7.580	0.834	-1.69	12.11	A	A	A
40	7.67	0.46	-0.52	7.85	A	A	A
41	8.05	0.36	4.41	6.75	A	A	A
42	7.8	0.6	1.17	9.21	A	A	A
43	8.31	0.83	7.78	11.20	A	A	A
44	8.03	0.24	4.15	5.88	A	A	A
45	7.3	0.32	-5.32	6.69	A	A	A
47	7.51	0.76	-2.59	11.31	A	A	A
50	7.03	0.627	-8.82	10.25	A	A	A
52	7.66	0.16	-0.65	5.47	A	A	A
53	7.30	0.42	-5.32	7.66	A	A	A
54	7.7	0.1	-0.13	5.22	A	A	A
55	6.12	0.31	-20.62	7.16	A	N	W
56	8.4	0.4	8.95	6.95	A	A	A
59	7.8	0.47	1.17	7.87	A	A	A
60	7.7	0.9	-0.13	12.74	A	A	A
62	7.62	0.2	-1.17	5.70	A	A	A
63	7.7	0.5	-0.13	8.23	A	A	A
65	7.805	0.403	1.23	7.23	A	A	A
67	5.5	0.22	-28.66	6.45	A	N	W
68	6.72	0.45	-12.84	8.39	A	A	A
69	7.72	0.66	0.13	9.93	A	A	A
70	7.29	0.69	-5.45	10.73	A	A	A
71	7.17	0.338	-7.00	6.91	A	A	A
72	8.6	0.3	11.54	6.14	A	A	A
74	7.80	0.37	1.17	6.93	A	A	A
75	6.6	0.3	-14.40	6.80	A	A	A
78	7.76	1.16	0.65	15.78	A	A	A
80	5.04	0.35	-34.63	8.59	N	N	N
81	7.774	0.3142337	0.83	6.48	A	A	A

TABLE 86. Evaluation Results for Cs-134 in Sample 5, Rep. Value and Rep. Unc. in Bq/sample by Gamma ray spectrometry

Labcode	Reported value [Bq/sample]	Reported uncertainty ($k = 1$) [Bq/sample]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
82	7.88	0.63	2.20	9.46	A	A	A
83	7.7	0.02	-0.13	5.07	A	A	A
84	8.50	0.44	10.25	7.24	A	A	A
86	7.61	0.42	-1.30	7.49	A	A	A
87	7.54	0.26	-2.20	6.12	A	A	A
89	8.67	0.22	12.45	5.66	A	A	A
92	7.712	0.463	0.03	7.85	A	A	A
95	7.6	0.6	-1.43	9.38	A	A	A
96	6.09	0.15	-21.01	5.63	A	N	W
98	8.53	0.32	10.64	6.30	A	A	A
99	7.94	0.35	2.98	6.71	A	A	A
100	7.63	0.41	-1.04	7.38	A	A	A
101	7.96	0.50	3.24	8.06	A	A	A
103	7.89	0.31	2.33	6.41	A	A	A
104	7.39	0.45	-4.15	7.92	A	A	A
106	8.13	0.61	5.45	9.05	A	A	A
107	6.77	0.07	-12.19	5.16	A	A	A
108	7.28	0.15	-5.58	5.46	A	A	A
110	8.05	0.26	4.41	6.00	A	A	A
113	7.66	0.52	-0.65	8.47	A	A	A
114	7.50	0.38	-2.72	7.16	A	A	A
116	7.77	0.27	0.78	6.14	A	A	A
117	6.709	0.090	-12.98	5.23	A	A	A
118	7.72	0.69	0.13	10.27	A	A	A
120	7.35	0.19	-4.67	5.68	A	A	A
121	7.5	0.2	-2.72	5.72	A	A	A
122	7.5	0.4	-2.72	7.35	A	A	A
125	8.14	0.42	5.58	7.23	A	A	A
127	7.86	0.03	1.95	5.07	A	A	A
129	7.5	0.5	-2.72	8.37	A	A	A
130	44.64	3.32	478.99	8.99	N	N	N
132	7.03	0.13	-8.82	5.39	A	A	A
135	7.4	0.5	-4.02	8.44	A	A	A
136	6.2	1.7	-19.58	27.88	A	A	A
138	7.70	0.22	-0.13	5.81	A	A	A
140	7.52	0.23	-2.46	5.91	A	A	A
141	7.3	0.9	-5.32	13.33	A	A	A
142	7.7	0.5	-0.13	8.23	A	A	A
143	8	0.3	3.76	6.30	A	A	A
144	9.9	0.7	28.40	8.69	A	N	W
145	7.8	0.9	1.17	12.60	A	A	A
147	7.46	0.17	-3.24	5.55	A	A	A
148	8.30	0.31	7.65	6.29	A	A	A
149	7.7	0.4	-0.13	7.25	A	A	A
150	7.62	1.15	-1.17	15.92	A	A	A
151	7.885	0.408	2.27	7.24	A	A	A
152	7.63	0.41	-1.04	7.38	A	A	A
153	9.04	0.91	17.25	11.27	A	A	A
156	7.70	0.17	-0.13	5.52	A	A	A
158	8.45	0.36	9.60	6.61	A	A	A
159	7.8	0.1	1.17	5.22	A	A	A
160	7.32	0.21	-5.06	5.82	A	A	A
161	7.7	0.23	-0.13	5.87	A	A	A
162	7.7	1.5	-0.13	20.13	A	A	A
163	11.6	0.6	50.45	7.23	N	N	N
164	7.9	0.3	2.46	6.33	A	A	A
166	7.89	1.18	2.33	15.79	A	A	A
167	7.31	0.14	-5.19	5.41	A	A	A
168	7.64	0.32	-0.91	6.57	A	A	A
171	7.76	0.26	0.65	6.07	A	A	A

TABLE 86. Evaluation Results for Cs-134 in Sample 5, Rep. Value and Rep. Unc. in Bq/sample by Gamma ray spectrometry

Labcode	Reported value [Bq/sample]	Reported uncertainty ($k = 1$) [Bq/sample]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
172	9.01	0.7	16.86	9.27	A	A	A
173	8.0	0.5	3.76	8.04	A	A	A
174	7.74	0.47	0.39	7.90	A	A	A
176	7.98	0.16	3.50	5.44	A	A	A
177	7.51	0.26	-2.59	6.13	A	A	A
178	7.6	0.7	-1.43	10.51	A	A	A
179	7.41	0.41	-3.89	7.50	A	A	A
180	7.31110833	0.06754002	-5.17	5.14	A	A	A
183	6.947	0.834	-9.90	13.03	A	A	A
184	7.8	0.2	1.17	5.67	A	A	A
185	7.171	0.438	-6.99	7.93	A	A	A
186	4.35	0.3	-43.58	8.55	N	N	N
187	5.01	0.11	-35.02	5.51	N	N	N
188	7.87	0.49	2.08	8.02	A	A	A
189	7.35	0.15	-4.67	5.45	A	A	A
192	7.4	0.3	-4.02	6.48	A	A	A
195	7.4	0.5	-4.02	8.44	A	A	A
196	7.57	0.68	-1.82	10.31	A	A	A
199	7.42	0.45	-3.76	7.90	A	A	A
200	7.9	1.3	2.46	17.22	A	A	A
201	7.45	0.16	-3.37	5.50	A	A	A
203	7.73	0.23	0.26	5.87	A	A	A
204	7.7	0.5	-0.13	8.23	A	A	A
205	7	0.4	-9.21	7.63	A	A	A
207	6.79	0.42	-11.93	7.99	A	A	A
209	7.78	0.07	0.91	5.14	A	A	A
210	7.65	0.46	-0.78	7.86	A	A	A
214	7.7	0.5	-0.13	8.23	A	A	A
216	7.36	0.12	-4.54	5.31	A	A	A
218	7.68	0.20	-0.39	5.69	A	A	A
219	7.70	0.20	-0.13	5.69	A	A	A
220	7.73	0.28	0.26	6.22	A	A	A
223	9.0	0.2	16.73	5.52	A	N	W
224	7.73	0.13	0.26	5.33	A	A	A
225	8.04	0.20	4.28	5.64	A	A	A
226	7.11	0.25	-7.78	6.16	A	A	A
229	7.52	0.8	-2.46	11.78	A	A	A
230	4.73	0.31	-38.65	8.28	N	N	N
232	8.0	0.3	3.76	6.30	A	A	A
233	7.6	0.4	-1.43	7.30	A	A	A
234	7.81	0.65	1.30	9.74	A	A	A
236	8.15	0.195	5.71	5.60	A	A	A
238	7.59	0.68	-1.56	10.29	A	A	A
239	7.78	0.24	0.91	5.92	A	A	A
243	8.09	0.45	4.93	7.52	A	A	A
245	7.07	0.23	-8.30	6.01	A	A	A
247	7.52	0.1	-2.46	5.23	A	A	A
248	7.84	0.4	1.69	7.18	A	A	A
250	7.27	0.36	-5.71	7.08	A	A	A
251	7.73	0.36	0.26	6.88	A	A	A
253	7.77	0.07	0.78	5.14	A	A	A
254	7.25	0.446	-5.97	7.96	A	A	A
255	0.12	0.02	-98.44	17.42	N	N	N
256	7.65	0.21	-0.78	5.76	A	A	A
258	7.37	0.32	-4.41	6.67	A	A	A
259	7.68	0.43	-0.39	7.55	A	A	A
260	7.79	0.65	1.04	9.76	A	A	A
262	7.55	0.75	-2.08	11.15	A	A	A
263	7.51	0.43	-2.59	7.64	A	A	A
264	7.46	0.62	-3.24	9.73	A	A	A

TABLE 86. Evaluation Results for Cs-134 in Sample 5, Rep. Value and Rep. Unc. in Bq/sample by Gamma ray spectrometry

Labcode	Reported value [Bq/sample]	Reported uncertainty ($k = 1$) [Bq/sample]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
266	7.88	0.432	2.20	7.46	A	A	A
268	7.760	0.144	0.65	5.39	A	A	A
269	7.4	0.3	-4.02	6.48	A	A	A
270	7.10	0.35	-7.91	7.06	A	A	A
271	6.4	1.4	-16.99	22.45	A	A	A
274	8.06	0.32	4.54	6.43	A	A	A
275	7.9	0.34	2.46	6.64	A	A	A
277	7.13	0.54	-7.52	9.11	A	A	A
278	7.5	0.4	-2.72	7.35	A	A	A
279	7.75	0.4	0.52	7.23	A	A	A
281	7.79	0.59	1.04	9.11	A	A	A
283	7.50	0.10	-2.72	5.23	A	A	A
285	7.67	0.45	-0.52	7.75	A	A	A
287	7.58	0.23	-1.69	5.90	A	A	A
290	4.27	0.06	-44.62	5.25	N	N	N
291	6.979	0.433	-9.48	8.01	A	A	A
292	7.48	0.18	-2.98	5.60	A	A	A
294	7.7	0.4	-0.13	7.25	A	A	A
296	7.47	0.23	-3.11	5.92	A	A	A
297	7.32	0.36	-5.06	7.06	A	A	A
298	7.7	1.3	-0.13	17.62	A	A	A
301	7.5	0.6	-2.72	9.47	A	A	A
302	5.97	0.25	-22.57	6.57	A	N	W
303	7.12	0.58	-7.65	9.59	A	A	A
304	7.372	0.5653	-4.38	9.19	A	A	A
305	7.31	0.14	-5.19	5.41	A	A	A
306	7.62	0.24	-1.17	5.96	A	A	A
307	9.56	0.7	23.99	8.90	A	N	W
308	7.46	0.75	-3.24	11.25	A	A	A
309	6.93	0.7	-10.12	11.30	A	A	A
310	7.69	0.61	-0.26	9.41	A	A	A
311	7.63	0.57	-1.04	9.02	A	A	A
312	7.8	0.32	1.17	6.51	A	A	A
313	7.91	0.52	2.59	8.29	A	A	A
314	7.78	0.42	0.91	7.40	A	A	A
315	7.10	0.49	-7.91	8.56	A	A	A
316	7.72	0.2	0.13	5.68	A	A	A
317	8.0	1.0	3.76	13.48	A	A	A
318	7.2	0.4	-6.61	7.51	A	A	A
319	7.65	0.45	-0.78	7.76	A	A	A
320	7.4	0.4	-4.02	7.40	A	A	A
321	6.15	0.28	-20.23	6.81	A	N	W
322	7.11	0.36	-7.78	7.16	A	A	A
324	6.98	0.29	-9.47	6.55	A	A	A
325	7.6	0.4	-1.43	7.30	A	A	A
326	8.0	0.1	3.76	5.21	A	A	A
328	7.7	0.2	-0.13	5.69	A	A	A
329	7.4	0.4	-4.02	7.40	A	A	A
330	7.69	0.57	-0.26	8.97	A	A	A
331	8.31	0.40	7.78	6.98	A	A	A
332	7.7	0.3	-0.13	6.38	A	A	A
333	8.02	0.54	4.02	8.42	A	A	A
334	7.9	0.4	2.46	7.16	A	A	A
335	5.11	0.21	-33.72	6.52	N	N	N
336	7.40	0.33	-4.02	6.74	A	A	A
337	7.94	0.32	2.98	6.47	A	A	A
338	7.72	0.21	0.13	5.74	A	A	A
339	7.87	0.42	2.08	7.35	A	A	A
341	7.56	0.27	-1.95	6.19	A	A	A
342	10	2	29.70	20.63	A	A	A

TABLE 86. Evaluation Results for Cs-134 in Sample 5, Rep. Value and Rep. Unc. in Bq/sample by Gamma ray spectrometry

Labcode	Reported value [Bq/sample]	Reported uncertainty ($k = 1$) [Bq/sample]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
343	7.4	0.2	-4.02	5.74	A	A	A
344	8.1	0.4	5.06	7.07	A	A	A
345	8.96	1.34	16.21	15.79	A	A	A
346	7.55	0.43	-2.08	7.62	A	A	A
347	7.51	0.43	-2.59	7.64	A	A	A
348	7.57	0.33	-1.82	6.68	A	A	A
349	2.52	0.11	-67.32	6.68	N	N	N
354	7.9	0.3	2.46	6.33	A	A	A
355	7.6	0.4	-1.43	7.30	A	A	A
358	6.51	1.63	-15.56	25.54	A	A	A
359	7.85	0.4	1.82	7.18	A	A	A
360	7.93	0.1	2.85	5.21	A	A	A
362	4.6	0.4	-40.34	10.06	N	N	N
364	7.6	0.4	-1.43	7.30	A	A	A
365	17.509	1.055	127.09	7.87	N	N	N
367	7.5	0.63	-2.72	9.81	A	A	A
370	5.65	0.24	-26.72	6.61	A	N	W
371	7.8	0.4	1.17	7.20	A	A	A
375	7.52	0.5	-2.46	8.35	A	A	A
377	7.3	1.1	-5.32	15.89	A	A	A
378	7.81	0.40	1.30	7.20	A	A	A
379	7.76	0.477	0.65	7.96	A	A	A
380	7.87	0.19	2.08	5.60	A	A	A
381	7.3	0.2	-5.32	5.75	A	A	A
382	7.65	0.21	-0.78	5.76	A	A	A
384	5.64	0.22	-26.85	6.39	A	N	W
385	8.17	0.25	5.97	5.91	A	A	A
387	7.02	0.63	-8.95	10.30	A	A	A
388	7.65	0.235	-0.78	5.92	A	A	A
392	7.7	0.5	-0.13	8.23	A	A	A
393	7.2	0.5	-6.61	8.59	A	A	A
395	5.90	0.26	-23.48	6.71	A	N	W
397	6.87	0.32	-10.89	6.88	A	A	A
402	8.0	1.0	3.76	13.48	A	A	A
408	7.9	0.7	2.46	10.20	A	A	A
409	7.81	0.55	1.30	8.67	A	A	A
410	7.71	0.40	0.00	7.25	A	A	A
412	8.21	0.25	6.49	5.90	A	A	A
414	8.03	0.33	4.15	6.52	A	A	A
415	7.566	0.295	-1.87	6.39	A	A	A
416	7.25	0.50	-5.97	8.55	A	A	A
417	7.70	0.28	-0.13	6.23	A	A	A
418	7.8	0.6	1.17	9.21	A	A	A
419	7.76	0.33	0.65	6.61	A	A	A
420	7.85	0.63	1.82	9.49	A	A	A
421	6.8	0.5	-11.80	8.92	A	A	A
423	7.56	0.31	-1.95	6.51	A	A	A
424	7.33	0.25	-4.93	6.10	A	A	A
425	8.06	0.47	4.54	7.72	A	A	A
426	5.668	0.4	-26.49	8.68	A	N	W
427	8.82	0.54	14.40	7.94	A	A	A
429	7.85	0.29	1.82	6.26	A	A	A
432	8	1	3.76	13.48	A	A	A
433	6.3	0.4	-18.29	8.12	A	A	A
434	7.79	0.60	1.04	9.21	A	A	A
436	7.9	0.4	2.46	7.16	A	A	A
437	7.0	1.1	-9.21	16.51	A	A	A
439	7.819	0.141	1.41	5.37	A	A	A
442	8.31	0.58	7.78	8.62	A	A	A
443	7.66	0.2	-0.65	5.69	A	A	A

TABLE 86. Evaluation Results for Cs-134 in Sample 5, Rep. Value and Rep. Unc. in Bq/sample by Gamma ray spectrometry

Labcode	Reported value [Bq/sample]	Reported uncertainty ($k = 1$) [Bq/sample]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
445	7.23	0.13	-6.23	5.37	A	A	A
449	8.05	0.22	4.41	5.75	A	A	A
450	8.0	1.2	3.76	15.83	A	A	A
451	8.13	0.17	5.45	5.47	A	A	A
453	8.0	1.0	3.76	13.48	A	A	A
454	7.1	0.3	-7.91	6.59	A	A	A
455	7.5	0.4	-2.72	7.35	A	A	A
457	7.41	0.37	-3.89	7.11	A	A	A
458	7.93	0.70	2.85	10.17	A	A	A
461	8.12	0.06	5.32	5.11	A	A	A
464	6.50	0.42	-15.69	8.21	A	A	A
465	6.80	0.95	-11.80	14.86	A	A	A
466	4.46	0.14	-42.15	5.95	N	N	N
472	7.36	1.0	-4.54	14.50	A	A	A
473	7.82	0.47	1.43	7.86	A	A	A
474	7.58	0.33	-1.69	6.67	A	A	A
475	7.89	0.11	2.33	5.25	A	A	A
476	7.72	0.36	0.13	6.88	A	A	A
478	7.96	0.36	3.24	6.79	A	A	A
484	6.6282	0.2176	-14.03	6.03	A	A	A
485	7.4	0.4	-4.02	7.40	A	A	A
487	7.4	0.4	-4.02	7.40	A	A	A
489	6.09	0.25	-21.01	6.51	A	N	W
490	7.62178	0.22126	-1.14	5.83	A	A	A
491	7.06	0.22	-8.43	5.94	A	A	A
492	7.54	0.33	-2.20	6.69	A	A	A
494	8.89	0.26	15.30	5.84	A	N	W
501	7.8	0.26	1.17	6.06	A	A	A
502	7.64	0.5	-0.91	8.27	A	A	A
503	7.9	0.25	2.46	5.97	A	A	A
505	7.67	0.18	-0.52	5.58	A	A	A
506	9.03	1.5	17.12	17.36	A	A	A
507	7.8	0.9	1.17	12.60	A	A	A
508	6.74	0.2	-12.58	5.86	A	A	A
512	4.94	3.2	-35.93	64.97	N	N	N
513	7.6	0.1	-1.43	5.23	A	A	A
514	6.9	0.37	-10.51	7.37	A	A	A
515	7.53	0.44	-2.33	7.73	A	A	A
516	7.8	0.4	1.17	7.20	A	A	A

Sr-90 Determination in Sample 5 by Beta Counting

TABLE 87. Target values

Parameter	Value
Massic activity [Bq/sample]	3.28
Uncertainty [Bq/sample]	0.16
Maximum Acceptable Relative Bias [%]	30

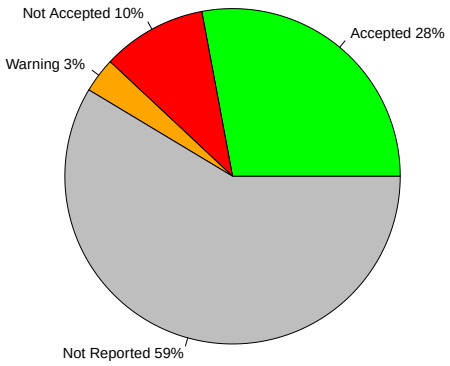

FIGURE 87. Percentage of Accepted vs. Warnings vs. Not Accepted vs. Not Reported results

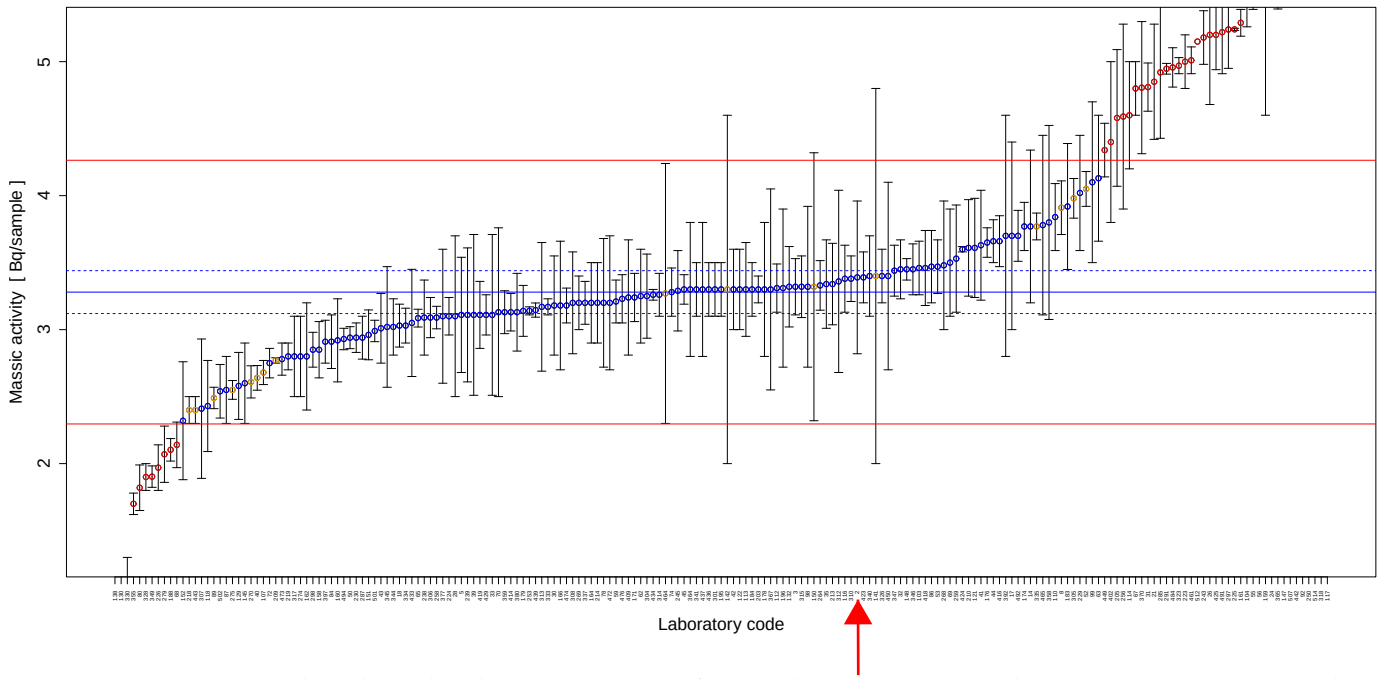

FIGURE 88. Reported results and evaluation parameters for Sr-90 by Beta Counting. Blue points represent accepted scores, whereas yellow and red represent warning and not accepted scores, respectively.

TABLE 88. Evaluation Results for Sr-90 in Sample 5, Rep. Value and Rep. Unc. in Bq/sample by Beta counting

Labcode	Reported value [Bq/sample]	Reported uncertainty ($k = 1$) [Bq/sample]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
2	3.39	0.57	3.35	17.51	A	A	A
3	3.32	0.21	1.22	7.99	A	A	A
5	3.11	0.43	-5.18	14.66	A	A	A
8	3.91	0.2	19.21	7.07	A	N	W
14	3.77	0.57	14.94	15.89	A	A	A
17	3.7	0.7	12.80	19.54	A	A	A
18	3.03	0.16	-7.62	7.19	A	A	A
21	4.85	0.43	47.87	10.12	N	N	N
24	5.85	0.18	78.35	5.77	N	N	N
26	5.20	0.52	58.54	11.13	N	N	N
28	3.1	0.6	-5.49	19.96	A	A	A
30	3.18	0.37	-3.05	12.62	A	A	A
31	4.81	0.18	46.65	6.15	N	N	N
32	3.45	0.22	5.18	8.03	A	A	A
33	3.11	0.60	-5.18	19.90	A	A	A
35	3.34	0.33	1.83	11.02	A	A	A
39	3.11	0.60	-5.18	19.90	A	A	A
40	2.64	0.092	-19.51	5.99	A	N	W
41	3.63	0.41	10.67	12.30	A	A	A
42	3.3	0.3	0.61	10.32	A	A	A
43	3.01	0.26	-8.23	9.92	A	A	A
44	3.66	0.16	11.59	6.55	A	A	A
45	3.3	0.11	0.61	5.91	A	A	A
50	2.94	0.082	-10.37	5.62	A	A	A
52	4.05	0.13	23.48	5.84	A	N	W
53	3.47	0.20	5.79	7.55	A	A	A
55	5.67	0.28	72.87	6.94	N	N	N
56	5.8	0.2	76.83	5.97	N	N	N
59	3.21	0.16	-2.13	6.97	A	A	A
62	3.25	0.35	-0.91	11.82	A	A	A
63	4.13	0.47	25.91	12.38	A	A	A
65	3.0858	0.0663	-5.92	5.33	A	A	A
67	4.8	0.2	46.34	6.42	N	N	N
68	2.14	0.17	-34.76	9.32	N	N	N
69	3.5	0.4	6.71	12.43	A	A	A
70	3.13	0.63	-4.57	20.71	A	A	A
72	2.75	0.11	-16.16	6.31	A	A	A
74	3.28	0.18	0.00	7.34	A	A	A
78	3.20	0.48	-2.44	15.77	A	A	A
80	1.82	0.17	-44.51	10.54	N	N	N
84	2.91	0.20	-11.28	8.43	A	A	A
86	3.47	0.27	5.79	9.18	A	A	A
87	2.55	0.25	-22.26	10.95	A	A	A
89	2.49	0.08	-24.09	5.84	A	N	W
92	6.68	0.8	103.66	12.93	N	N	N
98	3.32	0.6	1.22	18.72	A	A	A
99	4.1	0.6	25.00	15.43	A	A	A
103	3.46	0.20	5.49	7.56	A	A	A
104	5.66	0.4	72.56	8.59	N	N	N
107	2.68	0.09	-18.29	5.92	A	N	W
110	3.84	0.25	17.07	8.14	A	A	A
112	3.31	0.18	0.91	7.31	A	A	A
113	3.3	0.35	0.61	11.67	A	A	A
114	4.6	0.4	40.24	9.97	N	N	N
116	3.38	0.25	3.05	8.86	A	A	A
117	10.7801	0.0012	228.66	4.88	N	N	N
118	2.43	0.34	-25.91	14.82	A	A	A
121	3.61	0.37	10.06	11.35	A	A	A
122	3.3	0.3	0.61	10.32	A	A	A
129	2.58	0.25	-21.34	10.85	A	A	A

TABLE 88. Evaluation Results for Sr-90 in Sample 5, Rep. Value and Rep. Unc. in Bq/sample by Beta counting

Labcode	Reported value [Bq/sample]	Reported uncertainty ($k = 1$) [Bq/sample]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
130	0.6	0.05	-81.71	9.66	N	N	N
132	3.32	0.3	1.22	10.27	A	A	A
138	0.29	0.03	-91.16	11.44	N	N	N
141	3.4	1.4	3.66	41.46	A	N	W
142	3.3	1.3	0.61	39.69	A	N	W
145	2.6	0.3	-20.73	12.53	A	A	A
147	6.06	0.07	84.76	5.01	N	N	N
148	3.45	0.08	5.18	5.40	A	A	A
150	3.32	1.00	1.22	30.51	A	N	W
151	2.961	0.186	-9.73	7.95	A	A	A
152	2.32	0.44	-29.27	19.58	A	A	A
158	2.85	0.21	-13.11	8.84	A	A	A
159	5.8	1.2	76.83	21.26	N	N	N
160	2.92	0.31	-10.98	11.68	A	A	A
161	5.29	0.1	61.28	5.23	N	N	N
162	2.8	0.4	-14.63	15.10	A	A	A
164	3.2	0.3	-2.44	10.57	A	A	A
166	3.18	0.48	-3.05	15.86	A	A	A
171	3.24	0.18	-1.22	7.39	A	A	A
174	3.77	0.18	14.94	6.83	A	A	A
176	3.65	0.11	11.28	5.73	A	A	A
178	3.3	0.5	0.61	15.92	A	A	A
179	3.14	0.19	-4.27	7.77	A	A	A
183	3.919	0.470	19.48	12.95	A	A	A
184	3.3	0.2	0.61	7.78	A	A	A
188	2.103	0.084	-35.88	6.30	N	N	N
195	3.3	0.2	0.61	7.78	A	A	A
196	3.31	0.59	0.91	18.48	A	A	A
203	3.3	0.1	0.61	5.74	A	A	A
205	4.58	0.51	39.63	12.16	N	N	N
209	2.77	0.02	-15.55	4.93	A	N	W
210	3.61	0.36	10.06	11.10	A	A	A
213	3.34	0.304	1.83	10.33	A	A	A
214	3.2	0.3	-2.44	10.57	A	A	A
218	2.4	0.1	-26.83	6.42	A	N	W
219	2.8	0.1	-14.63	6.05	A	A	A
223	5.0	0.2	52.44	6.31	N	N	N
224	3.1	0.14	-5.49	6.65	A	A	A
225	5.241	0.008	59.79	4.88	N	N	N
226	1.97	0.17	-39.94	9.91	N	N	N
229	4.02	0.43	22.56	11.76	A	A	A
230	2.94	0.11	-10.37	6.15	A	A	A
238	3.09	0.28	-5.79	10.29	A	A	A
239	3.11	0.5	-5.18	16.80	A	A	A
243	5.18	0.20	57.93	6.22	N	N	N
245	3.29	0.30	0.30	10.34	A	A	A
250	6.82	0.22	107.93	5.85	N	N	N
253	3.14	0.03	-4.27	4.97	A	A	A
256	4.59	0.69	39.94	15.80	N	A	N
258	3.09	0.084	-5.79	5.58	A	A	A
259	3.53	0.40	7.62	12.34	A	A	A
264	3.33	0.185	1.52	7.39	A	A	A
268	3.48	0.48	6.10	14.63	A	A	A
269	3.2	0.2	-2.44	7.93	A	A	A
270	2.61	0.12	-20.43	6.70	A	N	W
274	2.8	0.3	-14.63	11.77	A	A	A
275	2.55	0.07	-22.26	5.60	A	N	W
279	2.07	0.21	-36.89	11.26	N	N	N
285	4.92	0.492	50.00	11.13	N	N	N
287	2.94	0.16	-10.37	7.31	A	A	A

TABLE 88. Evaluation Results for Sr-90 in Sample 5, Rep. Value and Rep. Unc. in Bq/sample by Beta counting

Labcode	Reported value [Bq/sample]	Reported uncertainty ($k = 1$) [Bq/sample]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
291	4.947	0.040	50.82	4.94	N	N	N
297	5.24	0.29	59.76	7.38	N	N	N
298	2.85	0.13	-13.11	6.68	A	A	A
301	3.3	0.2	0.61	7.78	A	A	A
304	3.25	0.314	-0.91	10.82	A	A	A
305	3.98	0.148	21.34	6.13	A	N	W
306	3.09	0.15	-5.79	6.88	A	A	A
307	2.41	0.52	-26.52	22.12	A	A	A
308	3.20	0.38	-2.44	12.84	A	A	A
310	3.38	0.17	3.05	7.01	A	A	A
312	3.36	0.68	2.44	20.82	A	A	A
313	3.17	0.48	-3.35	15.91	A	A	A
314	3.26	0.16	-0.61	6.92	A	A	A
315	3.32	0.23	1.22	8.47	A	A	A
317	2.8	0.3	-14.63	11.77	A	A	A
318	8.9	0.6	171.34	8.32	N	N	N
323	4.97	0.06	51.52	5.03	N	N	N
326	3.4	0.2	3.66	7.64	A	A	A
328	1.9	0.1	-42.07	7.18	N	N	N
330	1.09	0.21	-66.77	19.87	N	N	N
333	3.17	0.06	-3.35	5.23	A	A	A
334	3.03	0.13	-7.62	6.50	A	A	A
335	3.77	0.10	14.94	5.55	A	N	W
337	3.20	0.16	-2.44	6.99	A	A	A
340	3.4	0.3	3.66	10.08	A	A	A
341	3.3	0.2	0.61	7.78	A	A	A
344	3.02	0.21	-7.93	8.49	A	A	A
345	3.02	0.45	-7.93	15.68	A	A	A
346	3.45	0.19	5.18	7.36	A	A	A
347	3.44	0.19	4.88	7.37	A	A	A
349	1.903	0.08	-41.98	6.44	N	N	N
355	1.7	0.08	-48.17	6.78	N	N	N
358	3.8	0.724	15.85	19.67	A	A	A
359	3.13	0.16	-4.57	7.07	A	A	A
364	3.3	0.5	0.61	15.92	A	A	A
365	5.986	0.593	82.50	11.04	N	N	N
367	3.3	0.75	0.61	23.24	A	A	A
370	4.806	0.493	46.52	11.36	N	N	N
377	3.1	0.5	-5.49	16.85	A	A	A
380	3.13	0.29	-4.57	10.47	A	A	A
392	3.7	0.9	12.80	24.81	A	A	A
397	2.91	0.16	-11.28	7.35	A	A	A
402	4.4	0.6	34.15	14.48	N	A	N
409	3.24	0.43	-1.22	14.14	A	A	A
414	3.13	0.14	-4.57	6.62	A	A	A
416	3.66	0.19	11.59	7.12	A	A	A
418	3.46	0.28	5.49	9.45	A	A	A
419	3.11	0.25	-5.18	9.40	A	A	A
423	3.39	0.19	3.35	7.43	A	A	A
424	3.60	0.02	9.76	4.91	A	A	A
425	5.20	0.26	58.54	6.99	N	N	N
429	3.11	0.15	-5.18	6.86	A	A	A
433	3.05	0.4	-7.01	13.99	A	A	A
434	3.26	0.04	-0.61	5.03	A	A	A
436	3.3	0.2	0.61	7.78	A	A	A
437	3.3	0.5	0.61	15.92	A	A	A
439	3.146	0.053	-4.09	5.16	A	A	A
442	6.63	0.15	102.13	5.38	N	N	N
443	2.4	0.1	-26.83	6.42	A	N	W
449	4.34	0.2	32.32	6.71	N	N	N

TABLE 88. Evaluation Results for Sr-90 in Sample 5, Rep. Value and Rep. Unc. in Bq/sample by Beta counting

Labcode	Reported value [Bq/sample]	Reported uncertainty ($k = 1$) [Bq/sample]	Relative bias [%]	P-Test [%]	Trueness evaluation	Precision evaluation	Final Score
450	3.4	0.7	3.66	21.16	A	A	A
461	5.01	0.1	52.74	5.27	N	N	N
464	3.27	0.97	-0.30	30.06	A	N	W
465	3.78	0.67	15.24	18.38	A	A	A
472	3.2	0.5	-2.44	16.37	A	A	A
473	2.78	0.12	-15.24	6.51	A	A	A
474	3.18	0.13	-3.05	6.36	A	A	A
476	3.23	0.18	-1.52	7.41	A	A	A
484	4.9570	0.1468	51.13	5.71	N	N	N
491	5.22	0.31	59.15	7.69	N	N	N
492	3.70	0.19	12.80	7.08	A	A	A
494	2.93	0.08	-10.67	5.59	A	A	A
501	2.99	0.08	-8.84	5.56	A	A	A
502	2.54	0.2	-22.56	9.26	A	A	A
507	6.6	0.8	101.22	13.07	N	N	N
512	5.15		57.01		N		N
514	8.48	0.42	158.54	6.95	N	N	N

3.2 Display of intercomparison values

Reported Results for Gross Alpha Determination in Sample 1

TABLE 89. Target values

Parameter	Value
Robust Mean, Bq/kg	24.1
Robust SD, Bq/kg	9.6

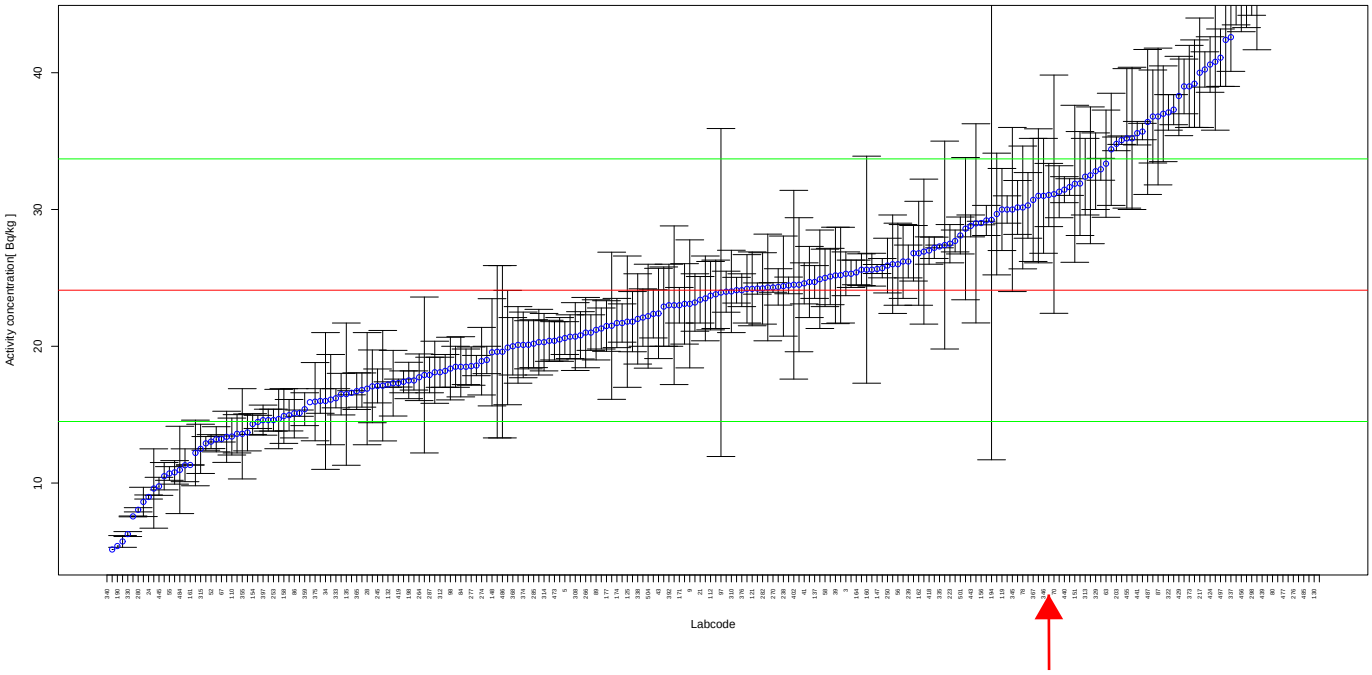

FIGURE 89. Reported results and evaluation parameters for Gross Alpha in Sample 1.

TABLE 90. IC Evaluation Results for Gross Alpha in Sample 1, Rep. Value and Rep. Unc. in Bq/kg

Labcode	Rep. Value	Rep. Unc.	Z-Score	Z-Score Evaluation
2	31.0	4.9	0.72	A
3	25.3	1.6	0.12	A
5	20.6	1.2	-0.36	A
9	23.1	4.68	-0.10	A
10	24.9	3.6	0.08	A
11	9.6	2.9	-1.51	A
14	29.67	4.45	0.58	A
16	24.10	0.94	0.00	A
21	23.4	1.7	-0.07	A
22	29.2	1.1	0.53	A
24	8.98	0.15	-1.58	A
25	10.78	0.86	-1.39	A
26	24.3	3.9	0.02	A
27	21.7	1.4	-0.25	A
28	16.9	4.1	-0.75	A
29	34.4	4.1	1.07	A
30	20.8	1.73	-0.34	A
31	13.20	0.92	-1.14	A
33	25.2	3.5	0.11	A
34	16	5	-0.84	A
36	17.9	5.7	-0.65	A
39	25.18	3.525	0.11	A
40	23.99	1.5	-0.01	A
41	24.6	1.5	0.05	A
43	22.4	3.3	-0.18	A

TABLE 90. IC Evaluation Results for Gross Alpha in Sample 1, Rep. Value and Rep. Unc. in Bq/kg

Labcode	Rep. Value	Rep. Unc.	Z-Score	Z-Score Evaluation
44	27.4	7.6	0.34	A
50	13.7	1.35	-1.08	A
52	13.03	0.51	-1.15	A
53	20.5	1.6	-0.38	A
54	10.5	1	-1.42	A
55	10.7	0.5	-1.40	A
56	26	3	0.20	A
58	25.0	2.1	0.09	A
62	37.3	1.1	1.37	A
63	33.35	3.92	0.96	A
65	25.7102	0.7063	0.17	A
67	13.22	0.22	-1.13	A
69	22.1	2.1	-0.21	A
70	31.12	8.71	0.73	A
71	25.6	1.16	0.16	A
72	54.6	1.4	3.18	N
74	24.2	2.5	0.01	A
76	5.73	0.43	-1.91	A
77	24.45	0.61	0.04	A
78	30.15	4.49	0.63	A
80	50.4	2.1	2.74	Q
84	18.5	2.2	-0.58	A
85	13.6	1.4	-1.09	A
86	15.10	1.80	-0.94	A
87	36.8	5	1.32	A
89	21.2	2.2	-0.30	A
97	23.93	11.99	-0.02	A
98	18.37	2.29	-0.60	A
102	19.6	6.3	-0.47	A
103	18.1	2.27	-0.62	A
104	23.8	2.5	-0.03	A
106	19	1	-0.53	A
107	17.4	0.8	-0.70	A
108	16.5	1.52	-0.79	A
110	13.4	1.35	-1.11	A
112	23.7	2.5	-0.04	A
116	14.96	1.15	-0.95	A
117	16.60	0.15	-0.78	A
118	30.15	1.97	0.63	A
119	30.0	3.0	0.61	A
120	16.1	3.3	-0.83	A
121	24.2	2.7	0.01	A
122	23.2	2.1	-0.09	A
125	21.8	4.8	-0.24	A
129	26.2	2.7	0.22	A
130	67.62	5.82	4.53	N
132	17.2	0.2	-0.72	A
135	16.5	5.2	-0.79	A
137	24.7	1.2	0.06	A
140	53.0	2.4	3.01	N
145	36.8	3.4	1.32	A
147	25.65	0.33	0.16	A
148	19.56	3.92	-0.47	A
150	22.37	1.76	-0.18	A
151	31.88	5.74	0.81	A
152	25.10	2.06	0.10	A
154	14.3136	0.76	-1.02	A
156	29.01	0.13	0.51	A
158	14.9	2.0	-0.96	A
159	39.2	3.2	1.57	A
160	25.6	8.3	0.16	A

TABLE 90. IC Evaluation Results for Gross Alpha in Sample 1, Rep. Value and Rep. Unc. in Bq/kg

Labcode	Rep. Value	Rep. Unc.	Z-Score	Z-Score Evaluation
161	11.32	0.012	-1.33	A
162	26.8	3.8	0.28	A
164	25.4	0.9	0.14	A
171	23.0	1.3	-0.11	A
172	17.07	2.66	-0.73	A
173	35.07	0.31	1.14	A
174	21.7	1.8	-0.25	A
176	25.3	1.0	0.12	A
177	21.48	1.85	-0.27	A
178	18.5	1.3	-0.58	A
184	76	3	5.41	N
186	12.9	0.5	-1.17	A
190	5.395	0.000045	-1.95	A
194	29.24	17.54	0.54	A
195	22.9	2.9	-0.13	A
197	32.5	5.0	0.87	A
198	17.50	1.33	-0.69	A
200	25.6	1.2	0.16	A
203	34.8	0.5	1.11	A
204	20.7	1.6	-0.35	A
206	40.24	1.29	1.68	A
209	17.3	2.4	-0.71	A
210	20.11	1.76	-0.42	A
213	17.118	4.038	-0.73	A
217	40.0	4.0	1.66	A
218	27.7	0.8	0.37	A
219	30	1	0.61	A
220	65.10	4.90	4.27	N
223	27.5	1.4	0.35	A
224	24.34	1.33	0.02	A
225	14.47	0.48	-1.00	A
226	35.7	0.6	1.21	A
227	5.141	0.000045	-1.97	A
229	21.3	1.5	-0.29	A
231	24.7	2.6	0.06	A
234	16.00	0.90	-0.84	A
238	24.4	3.66	0.03	A
239	26.2	1.2	0.22	A
243	7.56	0.03	-1.72	A
245	17.10	1.24	-0.73	A
250	25.9	2.0	0.19	A
253	14.6	0.8	-0.99	A
256	57.8	2.6	3.51	N
258	32.94	0.8	0.92	A
260	20.1	2.8	-0.42	A
261	31.06	2.31	0.72	A
264	17.734	1.705	-0.66	A
266	21.0	2.57	-0.32	A
268	19.905	4.180	-0.44	A
269	39	2	1.55	A
270	24.3	0.35	0.02	A
274	18.91	2.47	-0.54	A
275	14.68	2.17	-0.98	A
276	55.57	5.53	3.28	N
277	18.55	1.40	-0.58	A
280	8.045	0.155	-1.67	A
282	24.23	2.61	0.01	A
283	20.30	2.40	-0.40	A
285	20.19	1.75	-0.41	A
286	28.988	7.281	0.51	A
287	17.9	1.3	-0.65	A

TABLE 90. IC Evaluation Results for Gross Alpha in Sample 1, Rep. Value and Rep. Unc. in Bq/kg

Labcode	Rep. Value	Rep. Unc.	Z-Score	Z-Score Evaluation
298	47.2	3.0	2.41	Q
301	23.5	3.1	-0.06	A
306	49.03	7.35	2.60	Q
308	20.71	2.48	-0.35	A
310	24.01	3.01	-0.01	A
312	18.1	1.1	-0.62	A
313	32.4	2.8	0.86	A
314	20.3	2.1	-0.40	A
315	12.5	1.8	-1.21	A
317	37.0	3.5	1.34	A
320	35.2	5.2	1.16	A
321	24.22	0.41	0.01	A
322	37.1	1.3	1.35	A
325	18.2	1.2	-0.61	A
326	11.3	1.2	-1.33	A
328	17.5	0.7	-0.69	A
329	32.8	2.8	0.91	A
330	6.27	0.18	-1.86	A
332	14.6	0.8	-0.99	A
333	16.2	0.7	-0.82	A
334	21.0	1.3	-0.32	A
335	27.3	0.1	0.33	A
337	42.6	2.5	1.93	A
338	22.0	3.3	-0.22	A
340	1.1	0.1	-2.40	Q
341	45.9	2.4	2.27	Q
344	16.8	1.25	-0.76	A
345	30	6	0.61	A
346	31.0	4.2	0.72	A
347	26.0	3.6	0.20	A
348	31.64	0.61	0.79	A
349	13.38	1.87	-1.12	A
353	30.3	2.4	0.65	A
354	31.3	1.9	0.75	A
355	13.6	3.3	-1.09	A
358	21.50	5.38	-0.27	A
359	15.4	1.2	-0.91	A
365	16.718	1.337	-0.77	A
367	30.7	4.5	0.69	A
368	20.0	2.1	-0.43	A
370	49.765	3.384	2.67	Q
373	39	3	1.55	A
374	20.1	2.4	-0.42	A
375	15.95	2.86	-0.85	A
376	24.1	1.2	0.00	A
377	28.6	5.2	0.47	A
378	42.4	3.4	1.91	A
388	23.1	2.94	-0.10	A
389	24.5	4.9	0.04	A
390	20.4	1.5	-0.39	A
392	23	3	-0.11	A
395	31.9	3.8	0.81	A
397	14.6	1.1	-0.99	A
402	24.5	6.9	0.04	A
404	18.5	1.5	-0.58	A
412	27.20	0.78	0.32	A
418	27	1	0.30	A
419	17.31	0.29	-0.71	A
423	26.921	5.300	0.29	A
424	40.6	2.03	1.72	A
428	21.8	2.2	-0.24	A

TABLE 90. IC Evaluation Results for Gross Alpha in Sample 1, Rep. Value and Rep. Unc. in Bq/kg

Labcode	Rep. Value	Rep. Unc.	Z-Score	Z-Score Evaluation
429	38.3	2.9	1.48	A
433	40.8	5	1.74	A
434	18.59	0.74	-0.57	A
439	49.2	1.9	2.61	Q
440	31.45	0.95	0.77	A
441	35.58	0.86	1.20	A
443	28.8	0.8	0.49	A
445	9.76	0.66	-1.49	A
447	26.8	2.03	0.28	A
455	35.2	5.1	1.16	A
456	46	3	2.28	Q
460	15.11	0.23	-0.94	A
461	8.62	1.07	-1.61	A
464	47.1	3.8	2.40	Q
465	23.0	5.8	-0.11	A
473	20.4	1.4	-0.39	A
477	53.98	5.4	3.11	N
484	10.9590	3.1918	-1.37	A
485	62	3	3.95	N
486	19.6	6.3	-0.47	A
487	36.4	5.3	1.28	A
497	41.1	2.1	1.77	A
501	28.1	1.35	0.42	A
504	22.2	3.8	-0.20	A
507	12.2	2.4	-1.24	A
512	15.91		-0.85	A

Reported Results for Gross Beta Determination in Sample 1

TABLE 91. Target values

Parameter	Value
Robust Mean, Bq/kg	80.1
Robust SD, Bq/kg	14.7

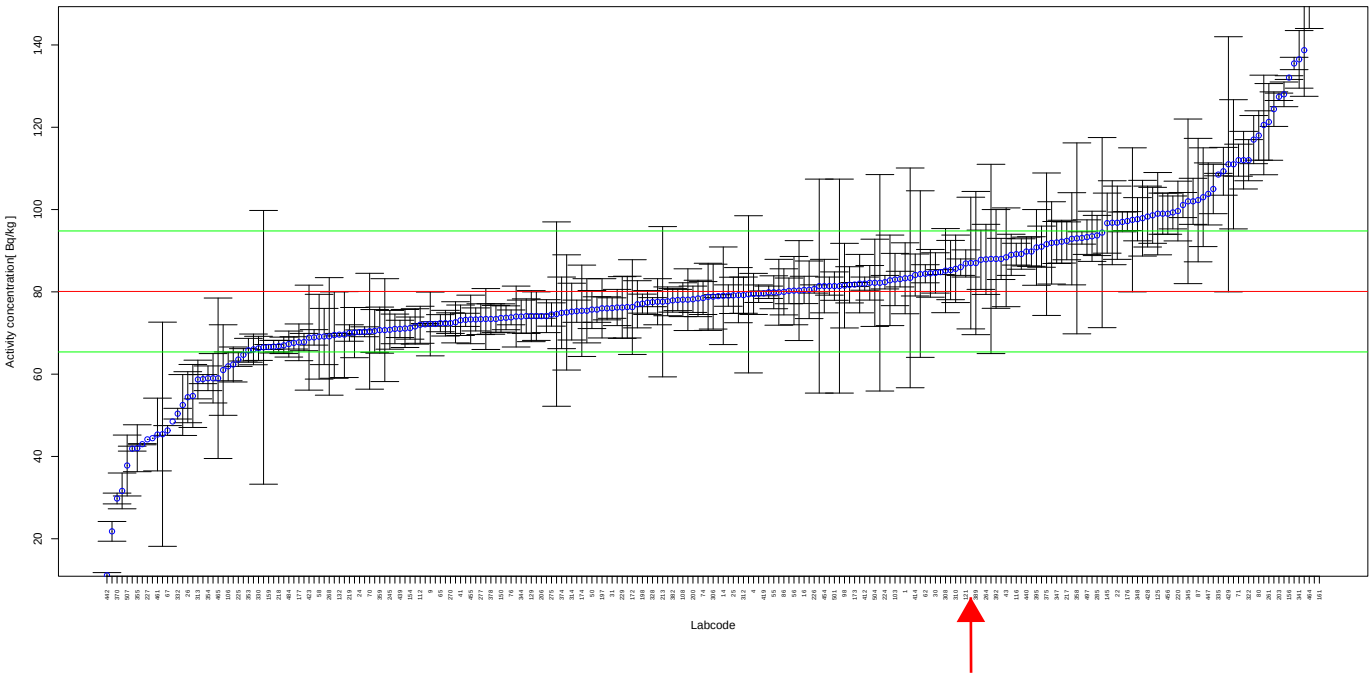

FIGURE 90. Reported results and evaluation parameters for Gross Beta in Sample 1.

TABLE 92. IC Evaluation Results for Gross Beta in Sample 1, Rep. Value and Rep. Unc. in Bq/kg

Labcode	Rep. Value	Rep. Unc.	Z-Score	Z-Score Evaluation
1	83.3	8.62	0.22	A
2	87	16	0.47	A
3	74.1	4.2	-0.41	A
4	79.50	4.99	-0.04	A
5	73.7	2.9	-0.44	A
9	72.2	7.75	-0.54	A
10	75.4	7.8	-0.32	A
11	74.6	22.4	-0.37	A
14	79.05	11.86	-0.07	A
16	80.47	3.32	0.03	A
21	77.6	5.6	-0.17	A
22	96.8	8.9	1.14	A
23	68.94	1.88	-0.76	A
24	70.22	0.53	-0.67	A
25	79.15	4.41	-0.06	A
26	54.4	6.2	-1.75	A
27	80.5	7.0	0.03	A
28	94.4	23.1	0.97	A
29	83.1	1.9	0.20	A
30	84.6	4.9	0.31	A
31	76.06	2.49	-0.27	A
33	69.5	10.5	-0.72	A
34	82.2	26.3	0.14	A
36	83.4	26.7	0.22	A
39	69.62	10.44	-0.71	A
40	81.71	4.4	0.11	A

TABLE 92. IC Evaluation Results for Gross Beta in Sample 1, Rep. Value and Rep. Unc. in Bq/kg

Labcode	Rep. Value	Rep. Unc.	Z-Score	Z-Score Evaluation
41	73.1	3.7	-0.48	A
43	88.4	12	0.56	A
44	87.8	7.2	0.52	A
45	67.8	2.1	-0.84	A
48	167.33	7.06	5.93	N
50	75.7	4.62	-0.30	A
52	78.02	2.58	-0.14	A
53	64.7	1.5	-1.05	A
54	99.3	4	1.31	A
55	79.9	4.0	-0.01	A
56	80.3	8.3	0.01	A
58	69.1	10.3	-0.75	A
62	84.4	2.2	0.29	A
63	62.35	4.25	-1.21	A
65	72.3863	2.0805	-0.52	A
67	46.32	1.18	-2.30	Q
69	79.2	6.7	-0.06	A
70	70.43	14.08	-0.66	A
71	112	3.89	2.17	Q
72	93.1	1.5	0.88	A
74	78.5	4.0	-0.11	A
76	73.8	1.8	-0.43	A
77	80.31	12.14	0.01	A
78	109.30	5.81	1.99	A
80	118	6	2.58	Q
84	89.2	3.7	0.62	A
86	80	5.6	-0.01	A
87	102.3	15	1.51	A
89	73.4	7.4	-0.46	A
97	66.52	33.26	-0.92	A
98	81.51	10.28	0.10	A
102	81.4	26.0	0.09	A
103	83.0	6.35	0.20	A
104	91.9	10	0.80	A
106	61.9	3.5	-1.24	A
107	79.1	2.6	-0.07	A
108	78.1	4.11	-0.14	A
110	69.15	6.83	-0.74	A
112	72.0	4.5	-0.55	A
116	89.16	2.65	0.62	A
117	72.11	0.20	-0.54	A
118	66.02	3.73	-0.96	A
119	97.0	2.4	1.15	A
121	86.9	3.3	0.46	A
122	84.5	5.8	0.30	A
125	99	10	1.29	A
129	74.1	6.2	-0.41	A
130	138.73	11.21	3.99	N
132	69.6	0.3	-0.71	A
135	82.8	11	0.18	A
137	41.9	0.6	-2.60	Q
140	105	6	1.69	A
145	96.7	7.3	1.13	A
147	78.96	0.36	-0.08	A
148	84.32	20.24	0.29	A
150	73.65	3.44	-0.44	A
151	79.55	2.13	-0.04	A
152	74.1	4.0	-0.41	A
154	71.1949	2.69	-0.61	A
156	132.07	0.45	3.54	N
158	59.0	6.0	-1.44	A

TABLE 92. IC Evaluation Results for Gross Beta in Sample 1, Rep. Value and Rep. Unc. in Bq/kg

Labcode	Rep. Value	Rep. Unc.	Z-Score	Z-Score Evaluation
159	66.6	0.6	-0.92	A
160	75	14	-0.35	A
161	286.591	0.128	14.05	N
162	61	11	-1.30	A
164	89.8	3.6	0.66	A
171	75.7	3.1	-0.30	A
172	76.3	11.51	-0.26	A
173	81.78	0.49	0.11	A
174	75.4	11.1	-0.32	A
176	97.2	2.3	1.16	A
177	67.74	4.46	-0.84	A
178	72.6	5.0	-0.51	A
184	86	2	0.40	A
190	44.436	0.00139	-2.43	Q
194	45.40	27.24	-2.36	Q
195	82.0	7.1	0.13	A
197	76.0	7.2	-0.28	A
198	77.14	2.31	-0.20	A
200	78.2	3.2	-0.13	A
203	127.4	0.9	3.22	N
204	70.5	5.2	-0.65	A
206	74.10	0.51	-0.41	A
209	111.0	15.7	2.10	Q
210	80.24	3.12	0.01	A
213	77.6	18.26	-0.17	A
217	92.4	4.6	0.84	A
218	66.8	1.4	-0.90	A
219	70	2	-0.69	A
220	99.64	7.26	1.33	A
223	76.2	4.4	-0.27	A
224	82.35	1.64	0.15	A
225	63.55	1.66	-1.13	A
226	80.7	1.0	0.04	A
227	44.155	0.00139	-2.45	Q
229	76.2	7.5	-0.27	A
230	72.2	0.55	-0.54	A
231	97.9	9.2	1.21	A
234	70.3	1.2	-0.67	A
238	74.0	7.4	-0.41	A
239	128	3	3.26	N
240	79.9	8.0	-0.01	A
243	67.6	1.5	-0.85	A
245	70.78	4.71	-0.63	A
250	93.5	6.1	0.91	A
253	77.7	3.5	-0.16	A
256	135.5	1.5	3.77	N
258	84.8	0.599	0.32	A
260	79.4	19.1	-0.05	A
261	121.3	9.32	2.80	Q
264	87.896	8.516	0.53	A
266	78.4	4.42	-0.12	A
268	69.176	14.284	-0.74	A
269	99	5	1.29	A
270	72.4	2.5	-0.52	A
274	77.41	2.90	-0.18	A
275	74.50	2.83	-0.38	A
276	101.10	3.05	1.43	A
277	73.36	3.74	-0.46	A
282	78.79	8.16	-0.09	A
283	75.30	2.70	-0.33	A
285	93.7	4.88	0.93	A

TABLE 92. IC Evaluation Results for Gross Beta in Sample 1, Rep. Value and Rep. Unc. in Bq/kg

Labcode	Rep. Value	Rep. Unc.	Z-Score	Z-Score Evaluation
286	76.98	5.73	-0.21	A
287	71.6	4.3	-0.58	A
298	103	12	1.56	A
301	85.3	7.2	0.35	A
306	78.84	7.884	-0.09	A
308	85.16	10.22	0.34	A
310	85.60	8.20	0.37	A
312	79.2	4.4	-0.06	A
313	58.7	4.7	-1.46	A
314	75.2	6.9	-0.33	A
315	52.5	7.4	-1.88	A
317	96.8	10.2	1.14	A
320	70.1	6.1	-0.68	A
321	90.98	5.00	0.74	A
322	112	5.0	2.17	Q
325	78.1	7.5	-0.14	A
326	58.8	1.1	-1.45	A
328	77.5	1.1	-0.18	A
329	92.2	5.2	0.82	A
330	66.27	2.93	-0.94	A
332	50.4	1.3	-2.02	Q
333	73.2	1.6	-0.47	A
334	73.4	3.3	-0.46	A
335	108.5	0.3	1.93	A
337	79.9	1.5	-0.01	A
338	71.0	3.6	-0.62	A
340	21.8	2.4	-3.97	N
341	136.5	7.0	3.84	N
342	70.7	12.5	-0.64	A
344	74	4	-0.41	A
345	102	20	1.49	A
346	102	5.6	1.49	A
347	92.0	5.1	0.81	A
348	97.65	5.25	1.19	A
349	31.63	4.35	-3.30	N
353	65.8	2.9	-0.97	A
354	59	3	-1.44	A
355	42.0	5.7	-2.59	Q
358	93.0	23.2	0.88	A
359	70.7	5.6	-0.64	A
365	54.698	7.656	-1.73	A
367	92.9	11.2	0.87	A
370	29.784	1.311	-3.42	N
373	89	5	0.61	A
374	74.9	8.7	-0.35	A
375	91.58	17.31	0.78	A
376	82.2	4.2	0.14	A
377	97.5	17.5	1.18	A
378	73.4	3.7	-0.46	A
382	77.93	2.86	-0.15	A
388	71.1	4.62	-0.61	A
389	87	17.4	0.47	A
390	76.3	7.5	-0.26	A
392	88	12	0.54	A
395	90.8	9.2	0.73	A
397	73.3	2.8	-0.46	A
402	88	23	0.54	A
404	112	7	2.17	Q
412	82.0	1.6	0.13	A
414	84.1	5.1	0.27	A
418	81.4	2.2	0.09	A

TABLE 92. IC Evaluation Results for Gross Beta in Sample 1, Rep. Value and Rep. Unc. in Bq/kg

Labcode	Rep. Value	Rep. Unc.	Z-Score	Z-Score Evaluation
419	79.63	0.58	-0.03	A
423	68.874	12.757	-0.76	A
424	117	5.85	2.51	Q
428	98.3	7.4	1.24	A
429	111	31	2.10	Q
433	98.6	6.8	1.26	A
434	72.39	3.12	-0.52	A
439	71.0	2.1	-0.62	A
440	89.8	3.5	0.66	A
441	124.4	4.2	3.01	N
442	11.12	0.66	-4.69	N
443	67	2	-0.89	A
445	66.68	1.53	-0.91	A
447	103.8	7.54	1.61	A
454	81.4	6.5	0.09	A
455	73.3	5.9	-0.46	A
456	99	5	1.29	A
460	42.98	0.14	-2.53	Q
461	45.33	8.84	-2.37	Q
464	151.3	7.3	4.84	N
465	59.0	19.5	-1.44	A
473	76.0	2.8	-0.28	A
477	120.56	12.1	2.75	Q
484	67.3159	3.1600	-0.87	A
485	88	5	0.54	A
486	81.4	26.0	0.09	A
487	74.1	5.9	-0.41	A
497	93.3	4.2	0.90	A
501	81.4	3.45	0.09	A
504	82.2	10.6	0.14	A
507	37.8	7.4	-2.88	Q
512	48.5		-2.15	Q

Reported Results for K-40 Determination in Sample 4

TABLE 93. Target values

Parameter	Value
Robust Mean, Bq/kg	35.1
Robust SD, Bq/kg	8.5

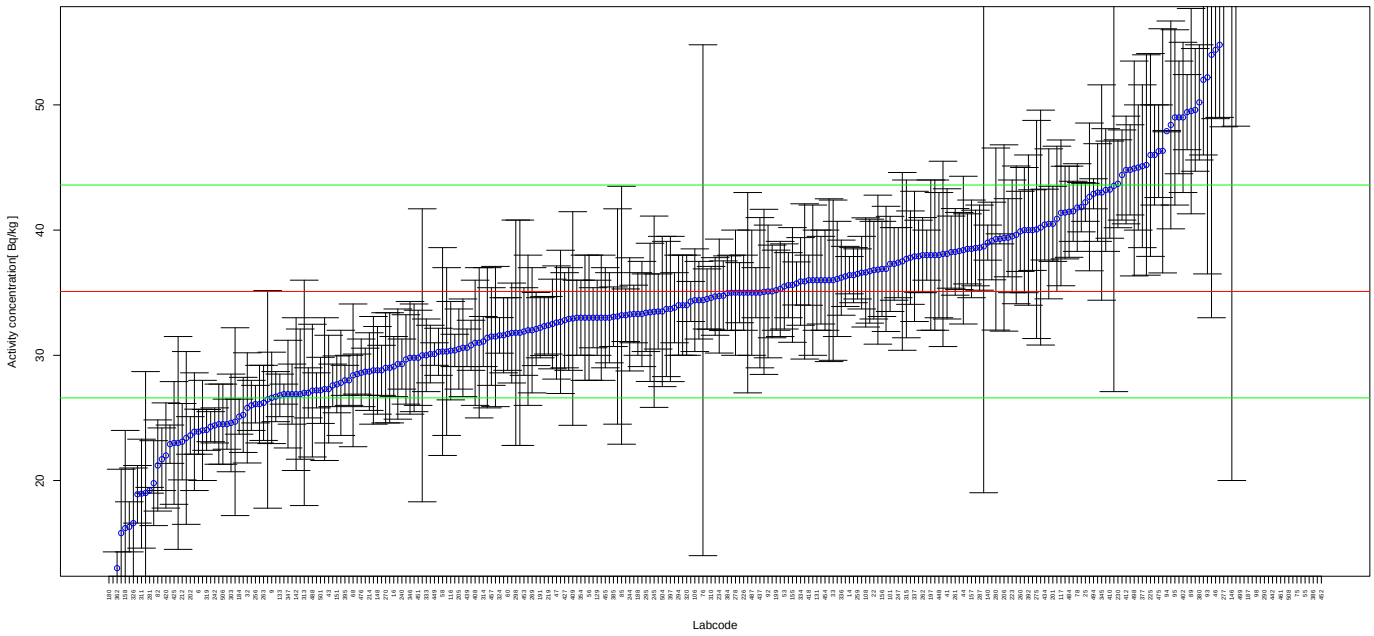

FIGURE 91. Reported results and evaluation parameters for K-40 in Sample 4.

TABLE 94. IC Evaluation Results for K-40 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg

Labcode	Rep. Value	Rep. Unc.	Z-Score	Z-Score Evaluation
3	34.7	3.1	-0.05	A
6	23.9	1.8	-1.32	A
9	26.6	3.65	-1.00	A
11	29	4.4	-0.72	A
13	23.0	8.5	-1.42	A
14	36.40	1.49	0.15	A
15	1106	42	125.99	N
16	29.1	2.4	-0.71	A
17	31	6	-0.48	A
19	33	5	-0.25	A
21	28.8	4.3	-0.74	A
22	36.8	3.9	0.20	A
24	43.2	4.9	0.95	A
25	42.22	1.52	0.84	A
26	24.7	7.5	-1.22	A
27	31.8	9	-0.39	A
28	29.8	4.3	-0.62	A
30	30.0	11.7	-0.60	A
31	43.53	16.43	0.99	A
32	25.8	4.4	-1.09	A
33	36.0	6.4	0.11	A
34	39.13	3.10	0.47	A
36	38.33	3.08	0.38	A
37	33.0	2.4	-0.25	A
39	36.0	6.5	0.11	A
41	38.1	5.2	0.35	A

TABLE 94. IC Evaluation Results for K-40 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg

Labcode	Rep. Value	Rep. Unc.	Z-Score	Z-Score Evaluation
42	36	6	0.11	A
43	27.3	4.3	-0.92	A
44	38.4	5.9	0.39	A
46	54.4	5.5	2.27	Q
47	32.62	4.52	-0.29	A
49	26.9	2.4	-0.96	A
51	37.91	2.88	0.33	A
53	35.5	3.4	0.05	A
55	309	10.8	32.22	N
56	33	5	-0.25	A
58	30.3	8.3	-0.56	A
59	24.5	3.2	-1.25	A
60	31.7	2.9	-0.40	A
63	38.5	2.8	0.40	A
64	38	2	0.34	A
68	28.4	5.7	-0.79	A
71	32.5	3.58	-0.31	A
72	33.1	8.6	-0.24	A
74	29.67	3.57	-0.64	A
75	257	12	26.11	N
76	34.4	20.4	-0.08	A
77	31.4	5.6	-0.44	A
78	41.8	3.5	0.79	A
79	54	21	2.22	Q
80	36.4	2.2	0.15	A
82	21.20	3.64	-1.64	A
83	33.5	3.0	-0.19	A
84	35.3	3.8	0.02	A
85	33.2	10.3	-0.22	A
87	25.24	3	-1.16	A
89	49.5	8.2	1.69	A
92	35.1	5.3	0.00	A
93	52.2	15.7	2.01	Q
94	47.9	0.05	1.51	A
95	49	7	1.64	A
96	41.83	1.97	0.79	A
98	88.8	7.7	6.32	N
99	33.8	2.8	-0.15	A
100	35.1	3.7	0.00	A
101	37.3	3.8	0.26	A
102	38.24	2.88	0.37	A
104	33	5	-0.25	A
106	34.4	4.1	-0.08	A
107	27.3	5.7	-0.92	A
108	36.62	4.36	0.18	A
110	253.47	22.1	25.69	N
113	40.50	5.99	0.64	A
114	44.4	3.6	1.09	A
116	30.37	3.93	-0.56	A
117	41.376	5.820	0.74	A
119	34.5	2.4	-0.07	A
122	40.0	5.0	0.58	A
123	27	2	-0.95	A
124	26	2	-1.07	A
126	24.5	2.0	-1.25	A
129	33	3	-0.25	A
131	36	4	0.11	A
132	23.4	6.9	-1.38	A
133	26.8	1.7	-0.98	A
134	76.1	4.62	4.82	N
135	26.9	5.2	-0.96	A

TABLE 94. IC Evaluation Results for K-40 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg

Labcode	Rep. Value	Rep. Unc.	Z-Score	Z-Score Evaluation
138	28.69	1.88	-0.75	A
140	39	1.4	0.46	A
142	26.9	6.1	-0.96	A
143	33	3.6	-0.25	A
145	49.0	4.5	1.64	A
146	63	43	3.28	N
147	39.39	3.12	0.50	A
148	28.8	3.5	-0.74	A
149	48.4	8.3	1.56	A
150	79.28	8.44	5.20	N
151	27.68	2.27	-0.87	A
152	36.1	4.6	0.12	A
155	35.62	4.58	0.06	A
156	36.9	3.8	0.21	A
157	38.5	3.9	0.40	A
158	16.2	7.8	-2.22	Q
159	33.7	5.4	-0.16	A
160	35	8	-0.01	A
161	39.62	5.5	0.53	A
165	32.67	5.72	-0.29	A
170	30.3	6.7	-0.56	A
172	19.79	3.39	-1.80	A
178	18.9	2.3	-1.91	A
179	31.5	5.6	-0.42	A
180	0.037349	0.0085085	-4.13	N
181	142.9	7.8	12.68	N
184	25.1	1.4	-1.18	A
186	9.34	1.7	-3.03	N
187	76.32	8.47	4.85	N
188	33.3	3.3	-0.21	A
191	32.2	2.4	-0.34	A
192	36	3.5	0.11	A
195	35.6	2.6	0.06	A
196	29.30	4.40	-0.68	A
197	38	6	0.34	A
199	35.2	3.2	0.01	A
201	40.5	3.0	0.64	A
202	23.6	1.5	-1.35	A
204	38.1	7.4	0.35	A
205	30.5	3.2	-0.54	A
206	39.37	7.44	0.50	A
209	16.3	2.0	-2.21	Q
212	23.1	3.05	-1.41	A
213	34.76	2.78	-0.04	A
214	28.7	3.1	-0.75	A
217	32.9	4.1	-0.26	A
218	43.0	3.9	0.93	A
219	32.4	2.3	-0.32	A
220	34.3	1.6	-0.09	A
222	41.4	3.7	0.74	A
223	39.5	4.5	0.52	A
224	42.65	5.9	0.89	A
225	46.0	8.1	1.28	A
226	35	3	-0.01	A
230	43.7	3.51	1.01	A
232	30.8	2.0	-0.51	A
234	34.73	4.55	-0.04	A
240	29.3	2.0	-0.68	A
242	24.4	1.4	-1.26	A
243	89.92	14.86	6.45	N
244	33.27	4.52	-0.22	A

TABLE 94. IC Evaluation Results for K-40 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg

Labcode	Rep. Value	Rep. Unc.	Z-Score	Z-Score Evaluation
245	33.48	7.64	-0.19	A
247	37.4	2.8	0.27	A
249	22.9	1.53	-1.44	A
251	31.78	3.99	-0.39	A
253	49.6	4.9	1.71	A
254	45.2	8.8	1.19	A
256	26.1	1.5	-1.06	A
258	40.2	9.38	0.60	A
259	36.5	2.0	0.16	A
260	39.9	3.2	0.56	A
261	38.26	3.46	0.37	A
262	38	3	0.34	A
263	26.2	3	-1.05	A
266	37.8	3.73	0.32	A
268	35.067	6.593	-0.00	A
269	32	5	-0.36	A
270	29.0	4.4	-0.72	A
274	36.84	5.95	0.20	A
275	40.05	8.71	0.58	A
276	36.72	4.15	0.19	A
277	59.07	10.82	2.82	Q
278	35	5	-0.01	A
279	27.2	1.4	-0.93	A
280	39.285	7.27	0.49	A
281	19.22	0.23	-1.87	A
286	33	3	-0.25	A
287	38.6	3.4	0.41	A
290	95.45	4.78	7.10	N
291	38.691	19.668	0.42	A
292	40.00	3.22	0.58	A
294	34	4	-0.13	A
295	33.4	3.1	-0.20	A
296	39.3	0.4	0.49	A
298	31.8	9.0	-0.39	A
301	37.3	2.9	0.26	A
302	36.9	5.0	0.21	A
303	24.6	3.9	-1.24	A
307	60.15	1.40	2.95	Q
309	625	62	69.40	N
310	34.59	2.51	-0.06	A
311	18.95	4.35	-1.90	A
312	23.9	4.7	-1.32	A
313	27	9	-0.95	A
314	31.1	2.0	-0.47	A
315	37.7	6.3	0.31	A
316	33.43	5.52	-0.20	A
317	52.0	6.0	1.99	A
319	24.04	1.63	-1.30	A
320	34	4	-0.13	A
321	41.5	2.4	0.75	A
324	31.59	1.42	-0.41	A
325	32	6	-0.36	A
326	16.6	4.4	-2.18	Q
328	27.6	1.7	-0.88	A
329	35	3	-0.01	A
333	30.0	2.9	-0.60	A
334	35.9	3.5	0.09	A
336	36.2	3.0	0.13	A
337	37.9	5.2	0.33	A
338	30.1	2.3	-0.59	A
343	35	2	-0.01	A

TABLE 94. IC Evaluation Results for K-40 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg

Labcode	Rep. Value	Rep. Unc.	Z-Score	Z-Score Evaluation
345	43	8.6	0.93	A
346	29.8	4.5	-0.62	A
347	26.9	4.3	-0.96	A
349	132.46	11.1	11.45	N
352	26.9	0.8	-0.96	A
354	33	3	-0.25	A
355	38	6	0.34	A
358	27.8	4.2	-0.86	A
362	13	1.3	-2.60	Q
364	37.5	7.1	0.28	A
367	40.9	5.8	0.68	A
370	35.0	2.4	-0.01	A
371	28.5	1.6	-0.78	A
373	28	2	-0.84	A
377	45.1	6.5	1.18	A
378	34.4	3.1	-0.08	A
380	50.2	4.6	1.78	A
383	33.2	2.1	-0.22	A
384	34.96	2.98	-0.02	A
385	33.08	2.38	-0.24	A
386	800	32	89.99	N
388	32.1	2.92	-0.35	A
390	26.7	2.0	-0.99	A
392	40	6	0.58	A
395	28.0	1.2	-0.84	A
397	33.7	5.8	-0.16	A
401	24	4	-1.31	A
402	49	6.0	1.64	A
407	33.3	4.2	-0.21	A
408	31	5	-0.48	A
409	32.94	8.53	-0.25	A
410	43.23	3.88	0.96	A
412	44.8	4.3	1.14	A
414	30.6	3.9	-0.53	A
415	30.28	1.88	-0.57	A
416	26.48	8.69	-1.01	A
418	36	2	0.11	A
419	35.74	1.72	0.08	A
420	22.0	4.2	-1.54	A
421	45	5	1.16	A
425	23.0	4.9	-1.42	A
427	32.8	3.8	-0.27	A
432	46	4	1.28	A
434	40.44	2.83	0.63	A
436	34	4	-0.13	A
437	35	6	-0.01	A
439	30.6	1.5	-0.53	A
441	19.0	9.7	-1.89	A
442	107.72	5.41	8.54	N
443	36.3	2.4	0.14	A
446	33.3	2.3	-0.21	A
448	38	5	0.34	A
449	30.1	0.9	-0.59	A
451	29.8	3.8	-0.62	A
452	15510	49.76	1820.58	N
453	31.9	3.5	-0.38	A
454	36	4	0.11	A
455	33	4	-0.25	A
457	31.5	3.9	-0.42	A
458	36.6	2.9	0.18	A
461	142.66	1.44	12.65	N

TABLE 94. IC Evaluation Results for K-40 in Sample 4, Rep. Value and Rep. Unc. in Bq/kg

Labcode	Rep. Value	Rep. Unc.	Z-Score	Z-Score Evaluation
464	35.9	6.2	0.09	A
465	15.8	5.1	-2.27	Q
466	26.1	3.1	-1.06	A
471	46.33	9.75	1.32	A
475	46.3	3.7	1.32	A
476	28.6	2.7	-0.76	A
479	54.8	5.8	2.32	Q
484	41.4671	3.6403	0.75	A
485	24.3	1.2	-1.27	A
486	38.57	3.02	0.41	A
487	35	5	-0.01	A
488	63.20	14.90	3.31	N
488	27.18	5.30	-0.93	A
490	32.32830	2.34906	-0.33	A
491	106.97	15.93	8.46	N
492	21.7	2.5	-1.58	A
494	42.9	1.2	0.92	A
497	28.8	2.0	-0.74	A
498	44.92	8.58	1.16	A
499	72.0	10.0	4.34	N
501	27.2	2.64	-0.93	A
502	49.42	3.0	1.68	A
504	33.5	6	-0.19	A
505	44.81	3.60	1.14	A
506	24.5	3.2	-1.25	A
508	185	40	17.64	N
509	299.57	13.46	31.11	N
515	30.39	1.29	-0.55	A
516	31.6	3.0	-0.41	A

4 References

References

[1] International Organization for Standardization (ISO). Conformity assessment - General requirements for the competence of proficiency test providers, ISO/IEC 17043:2023. Geneva: Switzerland.

[2] International Organization for Standardization (ISO). Statistical methods for use in proficiency testing by interlaboratory comparison, ISO 13528:2022. Geneva: Switzerland.

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