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Norwegian Institute for Air Research

EMEP – Analytical intercomparison of heavy metals in precipitation 2013

Laboratory 3, Czech Hydrometeorological Institute, Praha (Czech Republic)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ¤
H1	As	9.298	9	8.801	0.757	0.656	S
H2		8.783	8.5	8.303	0.77	0.623	S
H3		0.915	0.9	0.869	0.108	0.425	S
H4		1.095	1.1	1.042	0.182	0.289	S
H1	Cd	0.77	0.7	0.683	0.058	1.515	S
H2		0.546	0.5	0.498	0.049	0.974	S
H3		0.065	0.06	0.058	0.013	0.54	S
H4		0.059	0.06	0.057	0.014	0.106	S
H1	Cr	6.078	6.5	6.583	2.824	-0.179	S
H2		6.979	7.5	7.191	1.144	-0.185	S
H3		0.723	0.8	0.78	0.169	-0.336	S
H4		0.635	0.7	0.696	0.219	-0.279	S
H1	Cu	11.965	12	11.652	0.877	0.357	S
H2		8.975	9	8.653	0.937	0.343	S
H3		0.939	0.9	0.943	0.333	-0.012	S
H4		1.002	1	0.985	0.286	0.06	S
H1	Ni	5.827	6	5.926	0.721	-0.137	S
H2		7.319	7.5	7.343	0.76	-0.031	S
H3		1.128	1.2	1.079	0.272	0.179	S
H4		0.843	0.9	0.862	0.155	-0.126	S
H1	Pb	18.913	19	18.598	1.561	0.202	S
H2		21.863	22	21.745	1.466	0.08	S
H3		0.967	1	0.944	0.235	0.099	S
H4		1.433	1.5	1.428	0.493	0.011	S
H1	Zn	128.8	110	111.292	7.435	2.355	Q
H2		123.35	105	105.729	8.562	2.058	Q
H3		11.063	9.5	10.004	3.407	0.311	S
H4		8.059	7	7.503	1.144	0.486	S

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, ½ DL is taken as the reported value in further calculations.

¤ EMEP quality norm; the letters in the column indicates:

S – Satisfactory: Your result deviates less than ±25% of the expected value for samples H1 and H2, and less than ±15% for samples H3 and H4

Q – Questionable: Your result deviates between ±25-50% of the expected value for samples H1 and H2, and between ±15-30% for samples H3 and H4

U – Unsatisfactory: Your result deviates more than ±50% of the expected value for samples H1 and H2, and more than ±30% for samples H3 and H4

B – Blank: You reported either no value or the detection limit

Please check the EMEP intercalibration website for Youden plots, updated expected values ect:
http://www.nilu.no/projects/ccc/intercomparison.html

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EMEP – Analytical intercomparison of heavy metals in precipitation 2013

Laboratory 4, Aarhus University, Department of Environmental Science (Denmark)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ¤
H1	As	9.4	9	8.801	0.757	0.791	S
H2		8.5	8.5	8.303	0.77	0.256	S
H3		< 1.500	0.9	0.869	0.108		B
H4		< 1.500	1.1	1.042	0.182		B
H1	Cd	0.65	0.7	0.683	0.058	-0.57	S
H2		0.61	0.5	0.498	0.049	2.281	S
H3		< 0.350	0.06	0.058	0.013		B
H4		< 0.350	0.06	0.057	0.014		B
H1	Cr	6	6.5	6.583	2.824	-0.207	S
H2		7.2	7.5	7.191	1.144	0.008	S
H3		< 2.000	0.8	0.78	0.169		B
H4		< 2.000	0.7	0.696	0.219		B
H1	Cu	11.4	12	11.652	0.877	-0.287	S
H2		8.4	9	8.653	0.937	-0.27	S
H3		< 2.500	0.9	0.943	0.333		B
H4		< 2.500	1	0.985	0.286		B
H1	Ni	5.5	6	5.926	0.721	-0.591	S
H2		7	7.5	7.343	0.76	-0.451	S
H3		< 3.000	1.2	1.079	0.272		B
H4		< 3.000	0.9	0.862	0.155		B
H1	Pb	17.6	19	18.598	1.561	-0.639	S
H2		20.2	22	21.745	1.466	-1.054	S
H3		< 3.000	1	0.944	0.235		B
H4		< 3.000	1.5	1.428	0.493		B
H1	Zn	-999	110	111.292	7.435		B
H2		-999	105	105.729	8.562		B
H3		-999	9.5	10.004	3.407		B
H4		-999	7	7.503	1.144		B

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EMEP – Analytical intercomparison of heavy metals in precipitation 2013

Laboratory 5, Finnish Meteorological Institute. Air Quality Department (Finland)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ¤
H1	As	9.3	9	8.801	0.757	0.659	S
H2		8.85	8.5	8.303	0.77	0.71	S
H3		0.95	0.9	0.869	0.108	0.749	S
H4		1.19	1.1	1.042	0.182	0.809	S
H1	Cd	0.751	0.7	0.683	0.058	1.185	S
H2		0.535	0.5	0.498	0.049	0.75	S
H3		0.066	0.06	0.058	0.013	0.617	S
H4		0.066	0.06	0.057	0.014	0.595	S
H1	Cr	6.66	6.5	6.583	2.824	0.027	S
H2		7.76	7.5	7.191	1.144	0.497	S
H3		0.85	0.8	0.78	0.169	0.418	S
H4		0.75	0.7	0.696	0.219	0.245	S
H1	Cu	12.52	12	11.652	0.877	0.99	S
H2		9.44	9	8.653	0.937	0.839	S
H3		0.98	0.9	0.943	0.333	0.111	S
H4		1.11	1	0.985	0.286	0.438	S
H1	Ni	6.21	6	5.926	0.721	0.394	S
H2		7.87	7.5	7.343	0.76	0.694	S
H3		1.29	1.2	1.079	0.272	0.775	S
H4		0.98	0.9	0.862	0.155	0.757	S
H1	Pb	20.592	19	18.598	1.561	1.278	S
H2		23.781	22	21.745	1.466	1.388	S
H3		1.088	1	0.944	0.235	0.613	S
H4		1.65	1.5	1.428	0.493	0.451	S
H1	Zn	116.7	110	111.292	7.435	0.727	S
H2		113.3	105	105.729	8.562	0.884	S
H3		10.3	9.5	10.004	3.407	0.087	S
H4		7.92	7	7.503	1.144	0.364	S

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, ½ DL is taken as the reported value in further calculations.

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Q – Questionable: Your result deviates between ±25-50% of the expected value for samples H1 and H2, and between ±15-30% for samples H3 and H4

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EMEP – Analytical intercomparison of heavy metals in precipitation 2013

Laboratory 6, SGS Multilab (France)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ¤
H1	As	9.55	9	8.801	0.757	0.989	S
H2		9.35	8.5	8.303	0.77	1.359	S
H3		0.88	0.9	0.869	0.108	0.101	S
H4		1.1	1.1	1.042	0.182	0.316	S
H1	Cd	0.7	0.7	0.683	0.058	0.299	S
H2		0.49	0.5	0.498	0.049	-0.169	S
H3		0.05	0.06	0.058	0.013	-0.611	S
H4		0.06	0.06	0.057	0.014	0.176	S
H1	Cr	6.28	6.5	6.583	2.824	-0.107	S
H2		7.28	7.5	7.191	1.144	0.078	S
H3		0.66	0.8	0.78	0.169	-0.71	S
H4		0.65	0.7	0.696	0.219	-0.211	S
H1	Cu	11.69	12	11.652	0.877	0.044	S
H2		8.7	9	8.653	0.937	0.05	S
H3		0.65	0.9	0.943	0.333	-0.881	Q
H4		0.65	1	0.985	0.286	-1.17	Q
H1	Ni	5.72	6	5.926	0.721	-0.286	S
H2		7.24	7.5	7.343	0.76	-0.135	S
H3		1.15	1.2	1.079	0.272	0.26	S
H4		0.75	0.9	0.862	0.155	-0.725	S
H1	Pb	18.5	19	18.598	1.561	-0.063	S
H2		21.4	22	21.745	1.466	-0.235	S
H3		0.76	1	0.944	0.235	-0.781	S
H4		1.25	1.5	1.428	0.493	-0.36	S
H1	Zn	116.8	110	111.292	7.435	0.741	S
H2		110.7	105	105.729	8.562	0.581	S
H3		12.3	9.5	10.004	3.407	0.674	Q
H4		9.28	7	7.503	1.144	1.553	Q

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U – Unsatisfactory: Your result deviates more than ±50% of the expected value for samples H1 and H2, and more than ±30% for samples H3 and H4

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EMEP – Analytical intercomparison of heavy metals in precipitation 2013

Laboratory 7, synlab Umweltinstitut GmbH, Niederlassung Leipzig (Germany)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ¤
H1	As	8.6	9	8.801	0.757	-0.266	S
H2		8.3	8.5	8.303	0.77	-0.003	S
H3		0.9	0.9	0.869	0.108	0.286	S
H4		0.95	1.1	1.042	0.182	-0.506	S
H1	Cd	0.7	0.7	0.683	0.058	0.299	S
H2		0.5	0.5	0.498	0.049	0.035	S
H3		0.06	0.06	0.058	0.013	0.156	S
H4		0.06	0.06	0.057	0.014	0.176	S
H1	Cr	8.2	6.5	6.583	2.824	0.572	Q
H2		9.4	7.5	7.191	1.144	1.931	Q
H3		1	0.8	0.78	0.169	1.308	S
H4		0.85	0.7	0.696	0.219	0.701	S
H1	Cu	14.5	12	11.652	0.877	3.247	Q
H2		10.9	9	8.653	0.937	2.397	Q
H3		1.15	0.9	0.943	0.333	0.622	Q
H4		1.25	1	0.985	0.286	0.927	S
H1	Ni	6	6	5.926	0.721	0.103	S
H2		7.8	7.5	7.343	0.76	0.602	S
H3		1.15	1.2	1.079	0.272	0.26	S
H4		0.9	0.9	0.862	0.155	0.242	S
H1	Pb	18	19	18.598	1.561	-0.383	S
H2		21	22	21.745	1.466	-0.508	S
H3		0.95	1	0.944	0.235	0.026	S
H4		1.45	1.5	1.428	0.493	0.045	S
H1	Zn	140	110	111.292	7.435	3.861	Q
H2		130	105	105.729	8.562	2.835	Q
H3		12.5	9.5	10.004	3.407	0.733	Q
H4		10.5	7	7.503	1.144	2.62	Q

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EMEP – Analytical intercomparison of heavy metals in precipitation 2013

Laboratory 8, Umweltbundesamt, Langen (Germany)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ¤
H1	As	8.81	9	8.801	0.757	0.012	S
H2		8.34	8.5	8.303	0.77	0.048	S
H3		0.877	0.9	0.869	0.108	0.074	S
H4		1.07	1.1	1.042	0.182	0.152	S
H1	Cd	0.645	0.7	0.683	0.058	-0.657	S
H2		0.463	0.5	0.498	0.049	-0.721	S
H3		0.058	0.06	0.058	0.013	0.003	S
H4		0.056	0.06	0.057	0.014	-0.104	S
H1	Cr	6.17	6.5	6.583	2.824	-0.146	S
H2		7.08	7.5	7.191	1.144	-0.097	S
H3		0.79	0.8	0.78	0.169	0.061	S
H4		0.69	0.7	0.696	0.219	-0.028	S
H1	Cu	11.3	12	11.652	0.877	-0.401	S
H2		8.47	9	8.653	0.937	-0.196	S
H3		0.89	0.9	0.943	0.333	-0.16	S
H4		0.98	1	0.985	0.286	-0.017	S
H1	Ni	5.53	6	5.926	0.721	-0.549	S
H2		6.93	7.5	7.343	0.76	-0.543	S
H3		1.11	1.2	1.079	0.272	0.113	S
H4		0.84	0.9	0.862	0.155	-0.145	S
H1	Pb	17.1	19	18.598	1.561	-0.959	S
H2		19.7	22	21.745	1.466	-1.395	S
H3		0.924	1	0.944	0.235	-0.084	S
H4		1.36	1.5	1.428	0.493	-0.137	S
H1	Zn	104.3	110	111.292	7.435	-0.94	S
H2		99.5	105	105.729	8.562	-0.727	S
H3		9.16	9.5	10.004	3.407	-0.248	S
H4		6.79	7	7.503	1.144	-0.623	S

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EMEP – Analytical intercomparison of heavy metals in precipitation 2013

Laboratory 10, Institute for Atmospheric Physics (Hungary)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ¤
H1	As	-999	9	8.801	0.757		B
H2		-999	8.5	8.303	0.77		B
H3		-999	0.9	0.869	0.108		B
H4		-999	1.1	1.042	0.182		B
H1	Cd	0.58	0.7	0.683	0.058	-1.786	Q
H2		0.403	0.5	0.498	0.049	-1.946	S
H3		0.035	0.06	0.058	0.013	-1.763	Q
H4		0.037	0.06	0.057	0.014	-1.431	Q
H1	Cr	-999	6.5	6.583	2.824		B
H2		-999	7.5	7.191	1.144		B
H3		-999	0.8	0.78	0.169		B
H4		-999	0.7	0.696	0.219		B
H1	Cu	-999	12	11.652	0.877		B
H2		-999	9	8.653	0.937		B
H3		-999	0.9	0.943	0.333		B
H4		-999	1	0.985	0.286		B
H1	Ni	-999	6	5.926	0.721		B
H2		-999	7.5	7.343	0.76		B
H3		-999	1.2	1.079	0.272		B
H4		-999	0.9	0.862	0.155		B
H1	Pb	20.864	19	18.598	1.561	1.452	S
H2		24.643	22	21.745	1.466	1.976	S
H3		1.389	1	0.944	0.235	1.892	Q
H4		2.01	1.5	1.428	0.493	1.181	Q
H1	Zn	-999	110	111.292	7.435		B
H2		-999	105	105.729	8.562		B
H3		-999	9.5	10.004	3.407		B
H4		-999	7	7.503	1.144		B

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, ½ DL is taken as the reported value in further calculations.

¤ EMEP quality norm; the letters in the column indicates:

S – Satisfactory: Your result deviates less than ±25% of the expected value for samples H1 and H2, and less than ±15% for samples H3 and H4

Q – Questionable: Your result deviates between ±25-50% of the expected value for samples H1 and H2, and between ±15-30% for samples H3 and H4

U – Unsatisfactory: Your result deviates more than ±50% of the expected value for samples H1 and H2, and more than ±30% for samples H3 and H4

B – Blank: You reported either no value or the detection limit

Please check the EMEP intercalibration website for Youden plots, updated expected values ect:
http://www.nilu.no/projects/ccc/intercomparison.html

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Norsk institutt for luftforskning
Norwegian Institute for Air Research

EMEP – Analytical intercomparison of heavy metals in precipitation 2013

Laboratory 15, Norwegian Institute for Air Research NILU (Norway)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ¤
H1	As	9.34	9	8.801	0.757	0.711	S
H2		8.76	8.5	8.303	0.77	0.594	S
H3		0.9	0.9	0.869	0.108	0.286	S
H4		1.04	1.1	1.042	0.182	-0.013	S
H1	Cd	0.7	0.7	0.683	0.058	0.299	S
H2		0.5	0.5	0.498	0.049	0.035	S
H3		0.06	0.06	0.058	0.013	0.156	S
H4		0.07	0.06	0.057	0.014	0.874	S
H1	Cr	6.35	6.5	6.583	2.824	-0.083	S
H2		7.4	7.5	7.191	1.144	0.183	S
H3		0.8	0.8	0.78	0.169	0.121	S
H4		0.7	0.7	0.696	0.219	0.017	S
H1	Cu	12.1	12	11.652	0.877	0.511	S
H2		8.8	9	8.653	0.937	0.156	S
H3		1.02	0.9	0.943	0.333	0.231	S
H4		1.04	1	0.985	0.286	0.193	S
H1	Ni	5.8	6	5.926	0.721	-0.175	S
H2		7.11	7.5	7.343	0.76	-0.306	S
H3		1.2	1.2	1.079	0.272	0.444	S
H4		0.94	0.9	0.862	0.155	0.499	S
H1	Pb	19.1	19	18.598	1.561	0.322	S
H2		21.5	22	21.745	1.466	-0.167	S
H3		1	1	0.944	0.235	0.239	S
H4		1.53	1.5	1.428	0.493	0.208	S
H1	Zn	115	110	111.292	7.435	0.499	S
H2		110	105	105.729	8.562	0.499	S
H3		9.86	9.5	10.004	3.407	-0.042	S
H4		7.51	7	7.503	1.144	0.006	S

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Norwegian Institute for Air Research

EMEP – Analytical intercomparison of heavy metals in precipitation 2013

Laboratory 16, Institute of Meteorology and Water Management, Warsaw (Poland)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ¤
H1	As	-999	9	8.801	0.757		B
H2		-999	8.5	8.303	0.77		B
H3		-999	0.9	0.869	0.108		B
H4		-999	1.1	1.042	0.182		B
H1	Cd	0.7	0.7	0.683	0.058	0.299	S
H2		0.5	0.5	0.498	0.049	0.035	S
H3		0.065	0.06	0.058	0.013	0.54	S
H4		0.06	0.06	0.057	0.014	0.176	S
H1	Cr	6.5	6.5	6.583	2.824	-0.029	S
H2		7.5	7.5	7.191	1.144	0.27	S
H3		0.8	0.8	0.78	0.169	0.121	S
H4		0.7	0.7	0.696	0.219	0.017	S
H1	Cu	11.5	12	11.652	0.877	-0.173	S
H2		8.5	9	8.653	0.937	-0.164	S
H3		0.9	0.9	0.943	0.333	-0.129	S
H4		1	1	0.985	0.286	0.053	S
H1	Ni	6.1	6	5.926	0.721	0.241	S
H2		7.6	7.5	7.343	0.76	0.339	S
H3		1.2	1.2	1.079	0.272	0.444	S
H4		0.9	0.9	0.862	0.155	0.242	S
H1	Pb	18	19	18.598	1.561	-0.383	S
H2		22	22	21.745	1.466	0.174	S
H3		1.05	1	0.944	0.235	0.451	S
H4		1.5	1.5	1.428	0.493	0.147	S
H1	Zn	105	110	111.292	7.435	-0.846	S
H2		100	105	105.729	8.562	-0.669	S
H3		8.5	9.5	10.004	3.407	-0.442	S
H4		6.5	7	7.503	1.144	-0.877	S

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, ½ DL is taken as the reported value in further calculations.

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EMEP – Analytical intercomparison of heavy metals in precipitation 2013

Laboratory 20, Swedish Environmental Research Institute IVL, Gothenburg (Sweden)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ¤
H1	As	9.1	9	8.801	0.757	0.395	S
H2		8.48	8.5	8.303	0.77	0.23	S
H3		0.851	0.9	0.869	0.108	-0.167	S
H4		1.09	1.1	1.042	0.182	0.261	S
H1	Cd	0.736	0.7	0.683	0.058	0.924	S
H2		0.512	0.5	0.498	0.049	0.28	S
H3		0.056	0.06	0.058	0.013	-0.151	S
H4		0.057	0.06	0.057	0.014	-0.034	S
H1	Cr	6.43	6.5	6.583	2.824	-0.054	S
H2		7.35	7.5	7.191	1.144	0.139	S
H3		0.779	0.8	0.78	0.169	-0.004	S
H4		0.709	0.7	0.696	0.219	0.058	S
H1	Cu	11.9	12	11.652	0.877	0.283	S
H2		8.8	9	8.653	0.937	0.156	S
H3		0.875	0.9	0.943	0.333	-0.205	S
H4		1.01	1	0.985	0.286	0.088	S
H1	Ni	5.95	6	5.926	0.721	0.033	S
H2		7.31	7.5	7.343	0.76	-0.043	S
H3		1.19	1.2	1.079	0.272	0.407	S
H4		0.934	0.9	0.862	0.155	0.461	S
H1	Pb	18.3	19	18.598	1.561	-0.191	S
H2		21.2	22	21.745	1.466	-0.372	S
H3		0.992	1	0.944	0.235	0.205	S
H4		1.51	1.5	1.428	0.493	0.167	S
H1	Zn	111	110	111.292	7.435	-0.039	S
H2		105	105	105.729	8.562	-0.085	S
H3		9.32	9.5	10.004	3.407	-0.201	S
H4		8.06	7	7.503	1.144	0.487	S

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EMEP – Analytical intercomparison of heavy metals in precipitation 2013

Laboratory 24, Serbian Environmental Protection Agency (Serbia)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ¤
H1	As	8.8	9	8.801	0.757	-0.002	S
H2		8.1	8.5	8.303	0.77	-0.263	S
H3		< 1.000	0.9	0.869	0.108		B
H4		1.45	1.1	1.042	0.182	2.234	U
H1	Cd	0.7	0.7	0.683	0.058	0.299	S
H2		0.49	0.5	0.498	0.049	-0.169	S
H3		0.04	0.06	0.058	0.013	-1.379	Q
H4		0.03	0.06	0.057	0.014	-1.92	Q
H1	Cr	5.55	6.5	6.583	2.824	-0.366	S
H2		6.25	7.5	7.191	1.144	-0.823	Q
H3		0.72	0.8	0.78	0.169	-0.354	S
H4		0.6	0.7	0.696	0.219	-0.439	S
H1	Cu	14	12	11.652	0.877	2.677	Q
H2		9.22	9	8.653	0.937	0.605	S
H3		2	0.9	0.943	0.333	3.177	U
H4		1.3	1	0.985	0.286	1.102	Q
H1	Ni	4.85	6	5.926	0.721	-1.492	Q
H2		5.9	7.5	7.343	0.76	-1.898	Q
H3		< 1.000	1.2	1.079	0.272	-2.131	U
H4		< 1.000	0.9	0.862	0.155		B
H1	Pb	15.1	19	18.598	1.561	-2.24	Q
H2		20.1	22	21.745	1.466	-1.122	S
H3		< 0.600	1	0.944	0.235	-2.736	U
H4		< 0.600	1.5	1.428	0.493	-2.287	U
H1	Zn	-999	110	111.292	7.435		B
H2		-999	105	105.729	8.562		B
H3		-999	9.5	10.004	3.407		B
H4		-999	7	7.503	1.144		B

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EMEP – Analytical intercomparison of heavy metals in precipitation 2013

Laboratory 31, Slovak Hydrometeorological Institute (Slovakia)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ¤
H1	As	8.61	9	8.801	0.757	-0.252	S
H2		8.12	8.5	8.303	0.77	-0.237	S
H3		0.862	0.9	0.869	0.108	-0.065	S
H4		1.054	1.1	1.042	0.182	0.064	S
H1	Cd	0.63	0.7	0.683	0.058	-0.917	S
H2		0.453	0.5	0.498	0.049	-0.925	S
H3		0.051	0.06	0.058	0.013	-0.535	S
H4		0.052	0.06	0.057	0.014	-0.383	S
H1	Cr	6.391	6.5	6.583	2.824	-0.068	S
H2		7.268	7.5	7.191	1.144	0.067	S
H3		0.776	0.8	0.78	0.169	-0.022	S
H4		0.687	0.7	0.696	0.219	-0.042	S
H1	Cu	11.1	12	11.652	0.877	-0.629	S
H2		8.306	9	8.653	0.937	-0.371	S
H3		0.821	0.9	0.943	0.333	-0.367	S
H4		0.994	1	0.985	0.286	0.032	S
H1	Ni	6.189	6	5.926	0.721	0.365	S
H2		7.729	7.5	7.343	0.76	0.508	S
H3		1.357	1.2	1.079	0.272	1.022	S
H4		0.953	0.9	0.862	0.155	0.583	S
H1	Pb	17.59	19	18.598	1.561	-0.645	S
H2		20.11	22	21.745	1.466	-1.115	S
H3		0.796	1	0.944	0.235	-0.628	S
H4		1.258	1.5	1.428	0.493	-0.344	S
H1	Zn	108	110	111.292	7.435	-0.443	S
H2		105	105	105.729	8.562	-0.085	S
H3		10	9.5	10.004	3.407	-0.001	S
H4		8	7	7.503	1.144	0.434	S

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EMEP – Analytical intercomparison of heavy metals in precipitation 2013

Laboratory 32, Atmospheric Pollution Research Laboratory, Institute of Physics, Vilnius (Lithuania)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ¤
H1	As	10	9	8.801	0.757	1.583	S
H2		9	8.5	8.303	0.77	0.905	S
H3		0.9	0.9	0.869	0.108	0.286	S
H4		1.2	1.1	1.042	0.182	0.864	S
H1	Cd	0.7	0.7	0.683	0.058	0.299	S
H2		0.5	0.5	0.498	0.049	0.035	S
H3		0.06	0.06	0.058	0.013	0.156	S
H4		0.06	0.06	0.057	0.014	0.176	S
H1	Cr	5	6.5	6.583	2.824	-0.561	Q
H2		6	7.5	7.191	1.144	-1.041	Q
H3		0.7	0.8	0.78	0.169	-0.473	S
H4		0.6	0.7	0.696	0.219	-0.439	S
H1	Cu	10.5	12	11.652	0.877	-1.313	S
H2		9	9	8.653	0.937	0.37	S
H3		1	0.9	0.943	0.333	0.171	S
H4		1.4	1	0.985	0.286	1.451	Q
H1	Ni	6.5	6	5.926	0.721	0.796	S
H2		9	7.5	7.343	0.76	2.18	Q
H3		1.2	1.2	1.079	0.272	0.444	S
H4		0.8	0.9	0.862	0.155	-0.403	S
H1	Pb	15	19	18.598	1.561	-2.304	Q
H2		18	22	21.745	1.466	-2.554	Q
H3		0.8	1	0.944	0.235	-0.611	S
H4		1.2	1.5	1.428	0.493	-0.462	S
H1	Zn	125	110	111.292	7.435	1.844	S
H2		90	105	105.729	8.562	-1.837	S
H3		10	9.5	10.004	3.407	-0.001	S
H4		8	7	7.503	1.144	0.434	S

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, ½ DL is taken as the reported value in further calculations.

¤ EMEP quality norm; the letters in the column indicates:

S – Satisfactory: Your result deviates less than ±25% of the expected value for samples H1 and H2, and less than ±15% for samples H3 and H4

Q – Questionable: Your result deviates between ±25-50% of the expected value for samples H1 and H2, and between ±15-30% for samples H3 and H4

U – Unsatisfactory: Your result deviates more than ±50% of the expected value for samples H1 and H2, and more than ±30% for samples H3 and H4

B – Blank: You reported either no value or the detection limit

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EMEP – Analytical intercomparison of heavy metals in precipitation 2013

Laboratory 33, Environmental Pollution Observ. Centre (Latvia)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ¤
H1	As	13.5	9	8.801	0.757	6.204	U
H2		12	8.5	8.303	0.77	4.799	U
H3		0.65	0.9	0.869	0.108	-2.026	Q
H4		0.8	1.1	1.042	0.182	-1.328	Q
H1	Cd	0.65	0.7	0.683	0.058	-0.57	S
H2		0.5	0.5	0.498	0.049	0.035	S
H3		0.07	0.06	0.058	0.013	0.924	S
H4		0.06	0.06	0.057	0.014	0.176	S
H1	Cr	6.6	6.5	6.583	2.824	0.006	S
H2		7.7	7.5	7.191	1.144	0.445	S
H3		1	0.8	0.78	0.169	1.308	S
H4		0.9	0.7	0.696	0.219	0.929	Q
H1	Cu	11.5	12	11.652	0.877	-0.173	S
H2		9	9	8.653	0.937	0.37	S
H3		1.2	0.9	0.943	0.333	0.772	Q
H4		1	1	0.985	0.286	0.053	S
H1	Ni	9	6	5.926	0.721	4.263	U
H2		8	7.5	7.343	0.76	0.865	S
H3		0.7	1.2	1.079	0.272	-1.395	U
H4		0.7	0.9	0.862	0.155	-1.047	S
H1	Pb	20	19	18.598	1.561	0.898	S
H2		21.5	22	21.745	1.466	-0.167	S
H3		0.8	1	0.944	0.235	-0.611	S
H4		1	1.5	1.428	0.493	-0.867	Q
H1	Zn	108	110	111.292	7.435	-0.443	S
H2		105	105	105.729	8.562	-0.085	S
H3		9.5	9.5	10.004	3.407	-0.148	S
H4		8	7	7.503	1.144	0.434	S

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, ½ DL is taken as the reported value in further calculations.

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EMEP – Analytical intercomparison of heavy metals in precipitation 2013

Laboratory 34, Ministry of Environment and Urbanisation (Turkey)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ¤
H1	As	7.146	9	8.801	0.757	-2.185	Q
H2		6.825	8.5	8.303	0.77	-1.918	Q
H3		0.651	0.9	0.869	0.108	-2.017	Q
H4		0.835	1.1	1.042	0.182	-1.136	Q
H1	Cd	1	0.7	0.683	0.058	5.509	U
H2		< 1.000	0.5	0.498	0.049		B
H3		< 1.000	0.06	0.058	0.013		B
H4		< 1.000	0.06	0.057	0.014		B
H1	Cr	4.272	6.5	6.583	2.824	-0.818	U
H2		5.57	7.5	7.191	1.144	-1.417	Q
H3		0.539	0.8	0.78	0.169	-1.428	Q
H4		0.361	0.7	0.696	0.219	-1.528	Q
H1	Cu	10.242	12	11.652	0.877	-1.607	S
H2		7.566	9	8.653	0.937	-1.16	Q
H3		1.033	0.9	0.943	0.333	0.27	S
H4		0.964	1	0.985	0.286	-0.073	S
H1	Ni	4.854	6	5.926	0.721	-1.487	Q
H2		6.083	7.5	7.343	0.76	-1.657	Q
H3		0.923	1.2	1.079	0.272	-0.575	Q
H4		0.686	0.9	0.862	0.155	-1.137	S
H1	Pb	25	19	18.598	1.561	4.101	U
H2		28	22	21.745	1.466	4.266	Q
H3		5	1	0.944	0.235	17.238	U
H4		5	1.5	1.428	0.493	7.245	U
H1	Zn	96.903	110	111.292	7.435	-1.935	S
H2		90.936	105	105.729	8.562	-1.728	S
H3		10.059	9.5	10.004	3.407	0.016	S
H4		7.139	7	7.503	1.144	-0.318	S

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, ½ DL is taken as the reported value in further calculations.

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EMEP – Analytical intercomparison of heavy metals in precipitation 2013

Laboratory 36, Hydrometeorological Institute of Slovenia (Slovenia)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ¤
H1	As	9.01	9	8.801	0.757	0.276	S
H2		8.49	8.5	8.303	0.77	0.243	S
H3		0.87	0.9	0.869	0.108	0.009	S
H4		1.05	1.1	1.042	0.182	0.042	S
H1	Cd	0.699	0.7	0.683	0.058	0.281	S
H2		0.488	0.5	0.498	0.049	-0.21	S
H3		0.074	0.06	0.058	0.013	1.231	S
H4		0.089	0.06	0.057	0.014	2.201	Q
H1	Cr	6.32	6.5	6.583	2.824	-0.093	S
H2		7.23	7.5	7.191	1.144	0.034	S
H3		0.821	0.8	0.78	0.169	0.245	S
H4		0.769	0.7	0.696	0.219	0.332	S
H1	Cu	11.9	12	11.652	0.877	0.283	S
H2		10.5	9	8.653	0.937	1.97	Q
H3		0.991	0.9	0.943	0.333	0.144	S
H4		1.13	1	0.985	0.286	0.507	S
H1	Ni	5.77	6	5.926	0.721	-0.216	S
H2		7.21	7.5	7.343	0.76	-0.174	S
H3		1.14	1.2	1.079	0.272	0.224	S
H4		0.844	0.9	0.862	0.155	-0.119	S
H1	Pb	17.5	19	18.598	1.561	-0.703	S
H2		20.3	22	21.745	1.466	-0.986	S
H3		0.98	1	0.944	0.235	0.154	S
H4		1.57	1.5	1.428	0.493	0.289	S
H1	Zn	124	110	111.292	7.435	1.709	S
H2		116	105	105.729	8.562	1.2	S
H3		9.95	9.5	10.004	3.407	-0.016	S
H4		7.49	7	7.503	1.144	-0.011	S

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EMEP – Analytical intercomparison of heavy metals in precipitation 2013

Laboratory 38, Estonian Environmental Research Centre, Tallinn (Estonia)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ¤
H1	As	8.76	9	8.801	0.757	-0.054	S
H2		8.32	8.5	8.303	0.77	0.023	S
H3		1.05	0.9	0.869	0.108	1.674	S
H4		1.19	1.1	1.042	0.182	0.809	S
H1	Cd	0.68	0.7	0.683	0.058	-0.049	S
H2		0.48	0.5	0.498	0.049	-0.374	S
H3		0.05	0.06	0.058	0.013	-0.611	S
H4		0.06	0.06	0.057	0.014	0.176	S
H1	Cr	6.2	6.5	6.583	2.824	-0.136	S
H2		7.15	7.5	7.191	1.144	-0.036	S
H3		0.72	0.8	0.78	0.169	-0.354	S
H4		0.64	0.7	0.696	0.219	-0.256	S
H1	Cu	11.6	12	11.652	0.877	-0.059	S
H2		8.56	9	8.653	0.937	-0.1	S
H3		< 1.000	0.9	0.943	0.333		B
H4		< 1.000	1	0.985	0.286	-1.694	Q
H1	Ni	5.62	6	5.926	0.721	-0.424	S
H2		7.04	7.5	7.343	0.76	-0.398	S
H3		1.05	1.2	1.079	0.272	-0.108	S
H4		0.77	0.9	0.862	0.155	-0.596	S
H1	Pb	18.7	19	18.598	1.561	0.066	S
H2		21.8	22	21.745	1.466	0.037	S
H3		0.97	1	0.944	0.235	0.111	S
H4		1.62	1.5	1.428	0.493	0.39	S
H1	Zn	104	110	111.292	7.435	-0.981	S
H2		99	105	105.729	8.562	-0.786	S
H3		9.08	9.5	10.004	3.407	-0.271	S
H4		6.63	7	7.503	1.144	-0.763	S

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Norwegian Institute for Air Research

EMEP – Analytical intercomparison of heavy metals in precipitation 2013

Laboratory 48, Flemish Environment Agency (Belgium)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ¤
H1	As	8.94	9	8.801	0.757	0.183	S
H2		8.48	8.5	8.303	0.77	0.23	S
H3		0.92	0.9	0.869	0.108	0.471	S
H4		1.11	1.1	1.042	0.182	0.371	S
H1	Cd	0.69	0.7	0.683	0.058	0.125	S
H2		0.51	0.5	0.498	0.049	0.239	S
H3		< 0.150	0.06	0.058	0.013		B
H4		< 0.150	0.06	0.057	0.014		B
H1	Cr	6.29	6.5	6.583	2.824	-0.104	S
H2		7.31	7.5	7.191	1.144	0.104	S
H3		< 1.000	0.8	0.78	0.169		B
H4		< 1.000	0.7	0.696	0.219		B
H1	Cu	11.84	12	11.652	0.877	0.215	S
H2		8.86	9	8.653	0.937	0.22	S
H3		< 2.000	0.9	0.943	0.333		B
H4		< 2.000	1	0.985	0.286		B
H1	Ni	5.92	6	5.926	0.721	-0.008	S
H2		7.4	7.5	7.343	0.76	0.076	S
H3		< 2.000	1.2	1.079	0.272		B
H4		< 2.000	0.9	0.862	0.155		B
H1	Pb	19.1	19	18.598	1.561	0.322	S
H2		21.95	22	21.745	1.466	0.14	S
H3		1.03	1	0.944	0.235	0.366	S
H4		1.5	1.5	1.428	0.493	0.147	S
H1	Zn	112.63	110	111.292	7.435	0.18	S
H2		107.86	105	105.729	8.562	0.249	S
H3		12.96	9.5	10.004	3.407	0.868	Q
H4		10.54	7	7.503	1.144	2.655	U

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EMEP – Analytical intercomparison of heavy metals in precipitation 2013

Laboratory 110, Th□ringer Landesanstalt f□r Landwirtschaft TTL, Jena (Germany)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ¤
H1	As	8.72	9	8.801	0.757	-0.107	S
H2		8.26	8.5	8.303	0.77	-0.055	S
H3		0.88	0.9	0.869	0.108	0.101	S
H4		1.04	1.1	1.042	0.182	-0.013	S
H1	Cd	0.65	0.7	0.683	0.058	-0.57	S
H2		0.49	0.5	0.498	0.049	-0.169	S
H3		< 0.100	0.06	0.058	0.013		B
H4		< 0.100	0.06	0.057	0.014		B
H1	Cr	6.49	6.5	6.583	2.824	-0.033	S
H2		7.52	7.5	7.191	1.144	0.288	S
H3		0.81	0.8	0.78	0.169	0.18	S
H4		0.73	0.7	0.696	0.219	0.154	S
H1	Cu	11.9	12	11.652	0.877	0.283	S
H2		8.7	9	8.653	0.937	0.05	S
H3		0.81	0.9	0.943	0.333	-0.4	S
H4		0.98	1	0.985	0.286	-0.017	S
H1	Ni	5.94	6	5.926	0.721	0.019	S
H2		7.38	7.5	7.343	0.76	0.049	S
H3		1.2	1.2	1.079	0.272	0.444	S
H4		0.88	0.9	0.862	0.155	0.113	S
H1	Pb	19	19	18.598	1.561	0.258	S
H2		21.7	22	21.745	1.466	-0.031	S
H3		1	1	0.944	0.235	0.239	S
H4		1.52	1.5	1.428	0.493	0.187	S
H1	Zn	110	110	111.292	7.435	-0.174	S
H2		104	105	105.729	8.562	-0.202	S
H3		8.09	9.5	10.004	3.407	-0.562	S
H4		5.5	7	7.503	1.144	-1.751	S

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, ½ DL is taken as the reported value in further calculations.

¤ EMEP quality norm; the letters in the column indicates:

S – Satisfactory: Your result deviates less than ±25% of the expected value for samples H1 and H2, and less than ±15% for samples H3 and H4

Q – Questionable: Your result deviates between ±25-50% of the expected value for samples H1 and H2, and between ±15-30% for samples H3 and H4

U – Unsatisfactory: Your result deviates more than ±50% of the expected value for samples H1 and H2, and more than ±30% for samples H3 and H4

B – Blank: You reported either no value or the detection limit

Please check the EMEP intercalibration website for Youden plots, updated expected values ect:
http://www.nilu.no/projects/ccc/intercomparison.html

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Norsk institutt for luftforskning
Norwegian Institute for Air Research

EMEP – Analytical intercomparison of heavy metals in precipitation 2013

Laboratory 112, Nieders„chsische Forstliche Versuchsanstalt NVF (Germany)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ¤
H1	As	-999	9	8.801	0.757		B
H2		-999	8.5	8.303	0.77		B
H3		-999	0.9	0.869	0.108		B
H4		-999	1.1	1.042	0.182		B
H1	Cd	0.72	0.7	0.683	0.058	0.646	S
H2		0.51	0.5	0.498	0.049	0.239	S
H3		0.06	0.06	0.058	0.013	0.156	S
H4		0.063	0.06	0.057	0.014	0.385	S
H1	Cr	6.72	6.5	6.583	2.824	0.048	S
H2		7.73	7.5	7.191	1.144	0.471	S
H3		0.82	0.8	0.78	0.169	0.24	S
H4		0.73	0.7	0.696	0.219	0.154	S
H1	Cu	11.9	12	11.652	0.877	0.283	S
H2		8.91	9	8.653	0.937	0.274	S
H3		0.88	0.9	0.943	0.333	-0.19	S
H4		1	1	0.985	0.286	0.053	S
H1	Ni	6.21	6	5.926	0.721	0.394	S
H2		7.8	7.5	7.343	0.76	0.602	S
H3		1.18	1.2	1.079	0.272	0.371	S
H4		0.88	0.9	0.862	0.155	0.113	S
H1	Pb	19.61	19	18.598	1.561	0.648	S
H2		22.66	22	21.745	1.466	0.624	S
H3		1.05	1	0.944	0.235	0.451	S
H4		1.52	1.5	1.428	0.493	0.187	S
H1	Zn	112.4	110	111.292	7.435	0.149	S
H2		106.9	105	105.729	8.562	0.137	S
H3		9.75	9.5	10.004	3.407	-0.075	S
H4		7.21	7	7.503	1.144	-0.256	S

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Norwegian Institute for Air Research

EMEP – Analytical intercomparison of heavy metals in precipitation 2013

Laboratory 113, Fachhochschule Eberswalde (Germany)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ¤
H1	As	7.793	9	8.801	0.757	-1.331	S
H2		7.943	8.5	8.303	0.77	-0.466	S
H3		< 4.000	0.9	0.869	0.108		B
H4		< 4.000	1.1	1.042	0.182		B
H1	Cd	0.533	0.7	0.683	0.058	-2.607	Q
H2		0.425	0.5	0.498	0.049	-1.497	S
H3		< 0.400	0.06	0.058	0.013		B
H4		< 0.400	0.06	0.057	0.014		B
H1	Cr	6.183	6.5	6.583	2.824	-0.142	S
H2		7.12	7.5	7.191	1.144	-0.062	S
H3		0.869	0.8	0.78	0.169	0.53	S
H4		0.836	0.7	0.696	0.219	0.638	S
H1	Cu	8.45	12	11.652	0.877	-3.65	Q
H2		5.6	9	8.653	0.937	-3.257	U
H3		< 4.000	0.9	0.943	0.333		B
H4		< 4.000	1	0.985	0.286		B
H1	Ni	5.683	6	5.926	0.721	-0.337	S
H2		7.523	7.5	7.343	0.76	0.237	S
H3		< 2.000	1.2	1.079	0.272		B
H4		< 2.000	0.9	0.862	0.155		B
H1	Pb	17.133	19	18.598	1.561	-0.938	S
H2		20.9	22	21.745	1.466	-0.576	S
H3		< 4.000	1	0.944	0.235		B
H4		< 4.000	1.5	1.428	0.493		B
H1	Zn	105.333	110	111.292	7.435	-0.802	S
H2		101	105	105.729	8.562	-0.552	S
H3		< 7.000	9.5	10.004	3.407	-1.909	U
H4		< 7.000	7	7.503	1.144	-3.499	Q

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EMEP – Analytical intercomparison of heavy metals in precipitation 2013

Laboratory 114, C.N.R. Istituto Italiano di Idrobiologia (Italy)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ¤
H1	As	5.5	9	8.801	0.757	-4.359	U
H2		5	8.5	8.303	0.77	-4.287	U
H3		0.8	0.9	0.869	0.108	-0.639	S
H4		0.9	1.1	1.042	0.182	-0.78	Q
H1	Cd	0.6	0.7	0.683	0.058	-1.438	S
H2		0.5	0.5	0.498	0.049	0.035	S
H3		0.1	0.06	0.058	0.013	3.226	U
H4		0.1	0.06	0.057	0.014	2.97	U
H1	Cr	6.5	6.5	6.583	2.824	-0.029	S
H2		7.5	7.5	7.191	1.144	0.27	S
H3		0.8	0.8	0.78	0.169	0.121	S
H4		0.7	0.7	0.696	0.219	0.017	S
H1	Cu	8.5	12	11.652	0.877	-3.593	Q
H2		8	9	8.653	0.937	-0.697	S
H3		0.7	0.9	0.943	0.333	-0.731	S
H4		0.8	1	0.985	0.286	-0.646	S
H1	Ni	6	6	5.926	0.721	0.103	S
H2		7.4	7.5	7.343	0.76	0.076	S
H3		1.2	1.2	1.079	0.272	0.444	S
H4		1	0.9	0.862	0.155	0.886	S
H1	Pb	19	19	18.598	1.561	0.258	S
H2		22	22	21.745	1.466	0.174	S
H3		1	1	0.944	0.235	0.239	S
H4		1.5	1.5	1.428	0.493	0.147	S
H1	Zn	109.5	110	111.292	7.435	-0.241	S
H2		104.6	105	105.729	8.562	-0.132	S
H3		9.5	9.5	10.004	3.407	-0.148	S
H4		7	7	7.503	1.144	-0.44	S

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Norwegian Institute for Air Research

EMEP – Analytical intercomparison of heavy metals in precipitation 2013

Laboratory 115, Bayerische Landesanstalt f. Wald- und Forstwirtshaft (Germany)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ¤
H1	As	9.15	9	8.801	0.757	0.461	S
H2		8.57	8.5	8.303	0.77	0.347	S
H3		1.059	0.9	0.869	0.108	1.757	S
H4		1.22	1.1	1.042	0.182	0.974	S
H1	Cd	0.698	0.7	0.683	0.058	0.264	S
H2		0.503	0.5	0.498	0.049	0.096	S
H3		0.06	0.06	0.058	0.013	0.156	S
H4		0.062	0.06	0.057	0.014	0.316	S
H1	Cr	6.01	6.5	6.583	2.824	-0.203	S
H2		6.89	7.5	7.191	1.144	-0.263	S
H3		0.759	0.8	0.78	0.169	-0.122	S
H4		0.637	0.7	0.696	0.219	-0.27	S
H1	Cu	11.58	12	11.652	0.877	-0.082	S
H2		8.64	9	8.653	0.937	-0.014	S
H3		0.891	0.9	0.943	0.333	-0.157	S
H4		1.006	1	0.985	0.286	0.074	S
H1	Ni	5.58	6	5.926	0.721	-0.48	S
H2		6.88	7.5	7.343	0.76	-0.608	S
H3		1.109	1.2	1.079	0.272	0.11	S
H4		0.82	0.9	0.862	0.155	-0.274	S
H1	Pb	20.42	19	18.598	1.561	1.167	S
H2		25.03	22	21.745	1.466	2.24	S
H3		1.037	1	0.944	0.235	0.396	S
H4		1.622	1.5	1.428	0.493	0.394	S
H1	Zn	110.8	110	111.292	7.435	-0.066	S
H2		105.8	105	105.729	8.562	0.008	S
H3		9.81	9.5	10.004	3.407	-0.057	S
H4		7.25	7	7.503	1.144	-0.221	S

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EMEP – Analytical intercomparison of heavy metals in precipitation 2013

Laboratory 117, Standortserkundung/Bodenmonitoring Forsten, Graupa (Germany)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ¤
H1	As	-999	9	8.801	0.757		B
H2		-999	8.5	8.303	0.77		B
H3		-999	0.9	0.869	0.108		B
H4		-999	1.1	1.042	0.182		B
H1	Cd	0.79	0.7	0.683	0.058	1.862	S
H2		0.61	0.5	0.498	0.049	2.281	S
H3		0.06	0.06	0.058	0.013	0.156	S
H4		0.06	0.06	0.057	0.014	0.176	S
H1	Cr	6.53	6.5	6.583	2.824	-0.019	S
H2		8.08	7.5	7.191	1.144	0.777	S
H3		0.69	0.8	0.78	0.169	-0.532	S
H4		0.59	0.7	0.696	0.219	-0.484	S
H1	Cu	12.26	12	11.652	0.877	0.693	S
H2		9.05	9	8.653	0.937	0.423	S
H3		0.79	0.9	0.943	0.333	-0.46	S
H4		0.92	1	0.985	0.286	-0.226	S
H1	Ni	7.01	6	5.926	0.721	1.503	Q
H2		8.25	7.5	7.343	0.76	1.194	S
H3		1.2	1.2	1.079	0.272	0.444	S
H4		1.06	0.9	0.862	0.155	1.272	S
H1	Pb	18.98	19	18.598	1.561	0.245	S
H2		22.88	22	21.745	1.466	0.774	S
H3		0.89	1	0.944	0.235	-0.229	S
H4		1.43	1.5	1.428	0.493	0.005	S
H1	Zn	110	110	111.292	7.435	-0.174	S
H2		105	105	105.729	8.562	-0.085	S
H3		9	9.5	10.004	3.407	-0.295	S
H4		5.66	7	7.503	1.144	-1.611	S

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EMEP – Analytical intercomparison of heavy metals in precipitation 2013

Laboratory 118, Forstliche Versuchs-und Forschungsanstalt (Germany)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ¤
H1	As	6.9	9	8.801	0.757	-2.51	Q
H2		6.4	8.5	8.303	0.77	-2.47	Q
H3		0.7	0.9	0.869	0.108	-1.564	S
H4		0.9	1.1	1.042	0.182	-0.78	Q
H1	Cd	0.69	0.7	0.683	0.058	0.125	S
H2		0.47	0.5	0.498	0.049	-0.578	S
H3		0.03	0.06	0.058	0.013	-2.146	Q
H4		0.03	0.06	0.057	0.014	-1.92	Q
H1	Cr	6.1	6.5	6.583	2.824	-0.171	S
H2		6.9	7.5	7.191	1.144	-0.254	S
H3		0.6	0.8	0.78	0.169	-1.066	Q
H4		0.5	0.7	0.696	0.219	-0.895	Q
H1	Cu	11.4	12	11.652	0.877	-0.287	S
H2		8.4	9	8.653	0.937	-0.27	S
H3		0.9	0.9	0.943	0.333	-0.129	S
H4		1.1	1	0.985	0.286	0.403	S
H1	Ni	5.6	6	5.926	0.721	-0.452	S
H2		7.2	7.5	7.343	0.76	-0.188	S
H3		1	1.2	1.079	0.272	-0.291	Q
H4		0.7	0.9	0.862	0.155	-1.047	S
H1	Pb	17.9	19	18.598	1.561	-0.447	S
H2		20.3	22	21.745	1.466	-0.986	S
H3		9.1	1	0.944	0.235	34.663	U
H4		7.7	1.5	1.428	0.493	12.721	U
H1	Zn	110	110	111.292	7.435	-0.174	S
H2		99.6	105	105.729	8.562	-0.716	S
H3		9.1	9.5	10.004	3.407	-0.265	S
H4		7.7	7	7.503	1.144	0.172	S

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, ½ DL is taken as the reported value in further calculations.

¤ EMEP quality norm; the letters in the column indicates:

S – Satisfactory: Your result deviates less than ±25% of the expected value for samples H1 and H2, and less than ±15% for samples H3 and H4

Q – Questionable: Your result deviates between ±25-50% of the expected value for samples H1 and H2, and between ±15-30% for samples H3 and H4

U – Unsatisfactory: Your result deviates more than ±50% of the expected value for samples H1 and H2, and more than ±30% for samples H3 and H4

B – Blank: You reported either no value or the detection limit

Please check the EMEP intercalibration website for Youden plots, updated expected values ect:
http://www.nilu.no/projects/ccc/intercomparison.html

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Norwegian Institute for Air Research

EMEP – Analytical intercomparison of heavy metals in precipitation 2013

Laboratory 120, Landwirtschaftliche Untersuchungs- und Forschungsanstalt LUFA (Germany)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ¤
H1	As	10	9	8.801	0.757	1.583	S
H2		9	8.5	8.303	0.77	0.905	S
H3		< 1.000	0.9	0.869	0.108		B
H4		< 1.000	1.1	1.042	0.182	-2.972	U
H1	Cd	0.6	0.7	0.683	0.058	-1.438	S
H2		0.4	0.5	0.498	0.049	-2.008	S
H3		< 0.100	0.06	0.058	0.013		B
H4		< 0.100	0.06	0.057	0.014		B
H1	Cr	7.1	6.5	6.583	2.824	0.183	S
H2		6.8	7.5	7.191	1.144	-0.342	S
H3		1	0.8	0.78	0.169	1.308	S
H4		0.8	0.7	0.696	0.219	0.473	S
H1	Cu	10.9	12	11.652	0.877	-0.857	S
H2		8.2	9	8.653	0.937	-0.484	S
H3		1.8	0.9	0.943	0.333	2.576	U
H4		1.8	1	0.985	0.286	2.849	U
H1	Ni	5	6	5.926	0.721	-1.284	Q
H2		8	7.5	7.343	0.76	0.865	S
H3		< 1.000	1.2	1.079	0.272	-2.131	U
H4		< 1.000	0.9	0.862	0.155		B
H1	Pb	16	19	18.598	1.561	-1.664	Q
H2		21	22	21.745	1.466	-0.508	S
H3		< 1.000	1	0.944	0.235	-1.886	Q
H4		< 1.000	1.5	1.428	0.493	-1.881	U
H1	Zn	110.7	110	111.292	7.435	-0.08	S
H2		106.7	105	105.729	8.562	0.113	S
H3		10.2	9.5	10.004	3.407	0.058	S
H4		7.7	7	7.503	1.144	0.172	S

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, ½ DL is taken as the reported value in further calculations.

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U – Unsatisfactory: Your result deviates more than ±50% of the expected value for samples H1 and H2, and more than ±30% for samples H3 and H4

B – Blank: You reported either no value or the detection limit

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EMEP – Analytical intercomparison of heavy metals in precipitation 2013

Laboratory 124, Laboratorium voor Bondemkunde, Gent (Belgium)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ¤
H1	As	< 15.000	9	8.801	0.757		B
H2		< 15.000	8.5	8.303	0.77		B
H3		< 15.000	0.9	0.869	0.108		B
H4		< 15.000	1.1	1.042	0.182		B
H1	Cd	< 2.000	0.7	0.683	0.058		B
H2		< 2.000	0.5	0.498	0.049		B
H3		< 2.000	0.06	0.058	0.013		B
H4		< 2.000	0.06	0.057	0.014		B
H1	Cr	7.1	6.5	6.583	2.824	0.183	S
H2		8.1	7.5	7.191	1.144	0.795	S
H3		< 2.000	0.8	0.78	0.169		B
H4		< 2.000	0.7	0.696	0.219		B
H1	Cu	12.8	12	11.652	0.877	1.309	S
H2		10.3	9	8.653	0.937	1.757	S
H3		< 2.000	0.9	0.943	0.333		B
H4		< 2.000	1	0.985	0.286		B
H1	Ni	5.9	6	5.926	0.721	-0.036	S
H2		7.1	7.5	7.343	0.76	-0.319	S
H3		< 2.000	1.2	1.079	0.272		B
H4		< 2.000	0.9	0.862	0.155		B
H1	Pb	18.1	19	18.598	1.561	-0.319	S
H2		23.5	22	21.745	1.466	1.197	S
H3		< 5.000	1	0.944	0.235		B
H4		< 5.000	1.5	1.428	0.493		B
H1	Zn	113.4	110	111.292	7.435	0.284	S
H2		108.6	105	105.729	8.562	0.335	S
H3		9.8	9.5	10.004	3.407	-0.06	S
H4		7.4	7	7.503	1.144	-0.09	S

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, ½ DL is taken as the reported value in further calculations.

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U – Unsatisfactory: Your result deviates more than ±50% of the expected value for samples H1 and H2, and more than ±30% for samples H3 and H4

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Norwegian Institute for Air Research

EMEP – Analytical intercomparison of heavy metals in precipitation 2013

Laboratory 125, Bayerisches Landesamt f⍰r Umweltschutz, Augsburg (Germany)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ¤
H1	As	9.83	9	8.801	0.757	1.358	S
H2		8.92	8.5	8.303	0.77	0.801	S
H3		0.938	0.9	0.869	0.108	0.638	S
H4		1.15	1.1	1.042	0.182	0.59	S
H1	Cd	0.715	0.7	0.683	0.058	0.559	S
H2		0.499	0.5	0.498	0.049	0.014	S
H3		0.059	0.06	0.058	0.013	0.079	S
H4		0.061	0.06	0.057	0.014	0.246	S
H1	Cr	6.59	6.5	6.583	2.824	0.002	S
H2		7.32	7.5	7.191	1.144	0.113	S
H3		0.792	0.8	0.78	0.169	0.073	S
H4		0.692	0.7	0.696	0.219	-0.019	S
H1	Cu	12.5	12	11.652	0.877	0.967	S
H2		9.02	9	8.653	0.937	0.391	S
H3		0.906	0.9	0.943	0.333	-0.111	S
H4		1.03	1	0.985	0.286	0.158	S
H1	Ni	6.37	6	5.926	0.721	0.616	S
H2		7.36	7.5	7.343	0.76	0.023	S
H3		1.26	1.2	1.079	0.272	0.665	S
H4		1.06	0.9	0.862	0.155	1.272	S
H1	Pb	20.2	19	18.598	1.561	1.026	S
H2		22.5	22	21.745	1.466	0.515	S
H3		1.03	1	0.944	0.235	0.366	S
H4		1.57	1.5	1.428	0.493	0.289	S
H1	Zn	125	110	111.292	7.435	1.844	S
H2		114	105	105.729	8.562	0.966	S
H3		10.4	9.5	10.004	3.407	0.116	S
H4		7.77	7	7.503	1.144	0.233	S

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, ½ DL is taken as the reported value in further calculations.

¤ EMEP quality norm; the letters in the column indicates:

S – Satisfactory: Your result deviates less than ±25% of the expected value for samples H1 and H2, and less than ±15% for samples H3 and H4

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U – Unsatisfactory: Your result deviates more than ±50% of the expected value for samples H1 and H2, and more than ±30% for samples H3 and H4

B – Blank: You reported either no value or the detection limit

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Norwegian Institute for Air Research

EMEP – Analytical intercomparison of heavy metals in precipitation 2013

Laboratory 129, Ecole Nationale d'ingenieurs de Sfax (Tunisia)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ¤
H1	As	-999	9	8.801	0.757		B
H2		-999	8.5	8.303	0.77		B
H3		-999	0.9	0.869	0.108		B
H4		-999	1.1	1.042	0.182		B
H1	Cd	< 5.000	0.7	0.683	0.058		B
H2		< 5.000	0.5	0.498	0.049		B
H3		< 5.000	0.06	0.058	0.013		B
H4		< 5.000	0.06	0.057	0.014		B
H1	Cr	160	6.5	6.583	2.824	54.319	U
H2		160	7.5	7.191	1.144	133.586	U
H3		140	0.8	0.78	0.169	826.146	U
H4		140	0.7	0.696	0.219	635.241	U
H1	Cu	< 50.000	12	11.652	0.877		B
H2		< 50.000	9	8.653	0.937		B
H3		< 50.000	0.9	0.943	0.333		B
H4		< 50.000	1	0.985	0.286		B
H1	Ni	< 10.000	6	5.926	0.721		B
H2		< 10.000	7.5	7.343	0.76		B
H3		< 10.000	1.2	1.079	0.272		B
H4		< 10.000	0.9	0.862	0.155		B
H1	Pb	< 50.000	19	18.598	1.561		B
H2		< 50.000	22	21.745	1.466		B
H3		< 50.000	1	0.944	0.235		B
H4		< 50.000	1.5	1.428	0.493		B
H1	Zn	100	110	111.292	7.435	-1.519	S
H2		1800	105	105.729	8.562	197.876	U
H3		350	9.5	10.004	3.407	99.805	U
H4		< 8.000	7	7.503	1.144		B

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, ½ DL is taken as the reported value in further calculations.

¤ EMEP quality norm; the letters in the column indicates:

S – Satisfactory: Your result deviates less than ±25% of the expected value for samples H1 and H2, and less than ±15% for samples H3 and H4

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EMEP – Analytical intercomparison of heavy metals in precipitation 2013

Laboratory 132, Comision Chilena de Energia Nuclear (Chile)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ¤
H1	As	-999	9	8.801	0.757		B
H2		-999	8.5	8.303	0.77		B
H3		-999	0.9	0.869	0.108		B
H4		-999	1.1	1.042	0.182		B
H1	Cd	< 1.000	0.7	0.683	0.058		B
H2		< 1.000	0.5	0.498	0.049		B
H3		< 1.000	0.06	0.058	0.013		B
H4		< 1.000	0.06	0.057	0.014		B
H1	Cr	6.5	6.5	6.583	2.824	-0.029	S
H2		7.5	7.5	7.191	1.144	0.27	S
H3		< 5.000	0.8	0.78	0.169		B
H4		< 5.000	0.7	0.696	0.219		B
H1	Cu	10.7	12	11.652	0.877	-1.085	S
H2		8.2	9	8.653	0.937	-0.484	S
H3		< 5.000	0.9	0.943	0.333		B
H4		< 5.000	1	0.985	0.286		B
H1	Ni	6.8	6	5.926	0.721	1.212	S
H2		5.3	7.5	7.343	0.76	-2.687	Q
H3		< 5.000	1.2	1.079	0.272		B
H4		< 5.000	0.9	0.862	0.155		B
H1	Pb	18.5	19	18.598	1.561	-0.063	S
H2		21.6	22	21.745	1.466	-0.099	S
H3		< 5.000	1	0.944	0.235		B
H4		< 5.000	1.5	1.428	0.493		B
H1	Zn	106	110	111.292	7.435	-0.712	S
H2		99.7	105	105.729	8.562	-0.704	S
H3		6.1	9.5	10.004	3.407	-1.146	Q
H4		< 5.000	7	7.503	1.144	-4.374	U

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, ½ DL is taken as the reported value in further calculations.

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Norwegian Institute for Air Research

EMEP – Analytical intercomparison of heavy metals in precipitation 2013

Laboratory 141, Marine Division,Global Environment and Marine Department,Japan Meteorological Agency,Tokyo(Japan)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ¤
H1	As	-999	9	8.801	0.757		B
H2		-999	8.5	8.303	0.77		B
H3		-999	0.9	0.869	0.108		B
H4		-999	1.1	1.042	0.182		B
H1	Cd	0.703	0.7	0.683	0.058	0.351	S
H2		0.497	0.5	0.498	0.049	-0.026	S
H3		0.059	0.06	0.058	0.013	0.079	S
H4		0.055	0.06	0.057	0.014	-0.173	S
H1	Cr	-999	6.5	6.583	2.824		B
H2		-999	7.5	7.191	1.144		B
H3		-999	0.8	0.78	0.169		B
H4		-999	0.7	0.696	0.219		B
H1	Cu	-999	12	11.652	0.877		B
H2		-999	9	8.653	0.937		B
H3		-999	0.9	0.943	0.333		B
H4		-999	1	0.985	0.286		B
H1	Ni	-999	6	5.926	0.721		B
H2		-999	7.5	7.343	0.76		B
H3		-999	1.2	1.079	0.272		B
H4		-999	0.9	0.862	0.155		B
H1	Pb	-999	19	18.598	1.561		B
H2		-999	22	21.745	1.466		B
H3		-999	1	0.944	0.235		B
H4		-999	1.5	1.428	0.493		B
H1	Zn	-999	110	111.292	7.435		B
H2		-999	105	105.729	8.562		B
H3		-999	9.5	10.004	3.407		B
H4		-999	7	7.503	1.144		B

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, ½ DL is taken as the reported value in further calculations.

¤ EMEP quality norm; the letters in the column indicates:

S – Satisfactory: Your result deviates less than ±25% of the expected value for samples H1 and H2, and less than ±15% for samples H3 and H4

Q – Questionable: Your result deviates between ±25-50% of the expected value for samples H1 and H2, and between ±15-30% for samples H3 and H4

U – Unsatisfactory: Your result deviates more than ±50% of the expected value for samples H1 and H2, and more than ±30% for samples H3 and H4

B – Blank: You reported either no value or the detection limit

Please check the EMEP intercalibration website for Youden plots, updated expected values ect:
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EMEP – Analytical intercomparison of heavy metals in precipitation 2013

Laboratory 146, Cellule de Recherche en Environment et Biotechnologies Public Research Center-Gabriel Lippm (Luxembourg)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ¤
H1	As	9.064	9	8.801	0.757	0.347	S
H2		8.605	8.5	8.303	0.77	0.392	S
H3		0.956	0.9	0.869	0.108	0.804	S
H4		1.133	1.1	1.042	0.182	0.497	S
H1	Cd	0.706	0.7	0.683	0.058	0.403	S
H2		0.508	0.5	0.498	0.049	0.198	S
H3		0.064	0.06	0.058	0.013	0.463	S
H4		0.06	0.06	0.057	0.014	0.176	S
H1	Cr	6.24	6.5	6.583	2.824	-0.122	S
H2		7.328	7.5	7.191	1.144	0.12	S
H3		0.729	0.8	0.78	0.169	-0.3	S
H4		0.659	0.7	0.696	0.219	-0.17	S
H1	Cu	12.26	12	11.652	0.877	0.693	S
H2		9.129	9	8.653	0.937	0.507	S
H3		0.948	0.9	0.943	0.333	0.015	S
H4		1.011	1	0.985	0.286	0.092	S
H1	Ni	5.631	6	5.926	0.721	-0.409	S
H2		7.086	7.5	7.343	0.76	-0.338	S
H3		1.002	1.2	1.079	0.272	-0.284	Q
H4		0.73	0.9	0.862	0.155	-0.853	S
H1	Pb	18.76	19	18.598	1.561	0.104	S
H2		21.94	22	21.745	1.466	0.133	S
H3		0.98	1	0.944	0.235	0.154	S
H4		1.476	1.5	1.428	0.493	0.098	S
H1	Zn	120.3	110	111.292	7.435	1.212	S
H2		115.9	105	105.729	8.562	1.188	S
H3		10.27	9.5	10.004	3.407	0.078	S
H4		7.922	7	7.503	1.144	0.366	S

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S – Satisfactory: Your result deviates less than ±25% of the expected value for samples H1 and H2, and less than ±15% for samples H3 and H4

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U – Unsatisfactory: Your result deviates more than ±50% of the expected value for samples H1 and H2, and more than ±30% for samples H3 and H4

B – Blank: You reported either no value or the detection limit

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EMEP – Analytical intercomparison of heavy metals in precipitation 2013

Laboratory 165, Institute of Meteorology and Hydrology, Ha Noi city (Vietnam)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ¤
H1	As	7.5	9	8.801	0.757	-1.718	Q
H2		7.1	8.5	8.303	0.77	-1.561	Q
H3		0.66	0.9	0.869	0.108	-1.933	Q
H4		0.62	1.1	1.042	0.182	-2.315	U
H1	Cd	0.6	0.7	0.683	0.058	-1.438	S
H2		0.59	0.5	0.498	0.049	1.873	S
H3		0.07	0.06	0.058	0.013	0.924	S
H4		0.05	0.06	0.057	0.014	-0.523	S
H1	Cr	23.15	6.5	6.583	2.824	5.866	U
H2		10.51	7.5	7.191	1.144	2.901	U
H3		1.3	0.8	0.78	0.169	3.088	U
H4		1.7	0.7	0.696	0.219	4.578	U
H1	Cu	12.8	12	11.652	0.877	1.309	S
H2		15.8	9	8.653	0.937	7.624	U
H3		3.8	0.9	0.943	0.333	8.588	U
H4		2.8	1	0.985	0.286	6.344	U
H1	Ni	15.5	6	5.926	0.721	13.276	U
H2		13.5	7.5	7.343	0.76	8.099	U
H3		4	1.2	1.079	0.272	10.744	U
H4		2.9	0.9	0.862	0.155	13.123	U
H1	Pb	23.3	19	18.598	1.561	3.012	Q
H2		25.3	22	21.745	1.466	2.424	Q
H3		4.9	1	0.944	0.235	16.813	U
H4		2.8	1.5	1.428	0.493	2.783	U
H1	Zn	108.3	110	111.292	7.435	-0.402	S
H2		110.9	105	105.729	8.562	0.604	S
H3		27.3	9.5	10.004	3.407	5.077	U
H4		13	7	7.503	1.144	4.805	U

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S – Satisfactory: Your result deviates less than ±25% of the expected value for samples H1 and H2, and less than ±15% for samples H3 and H4

Q – Questionable: Your result deviates between ±25-50% of the expected value for samples H1 and H2, and between ±15-30% for samples H3 and H4

U – Unsatisfactory: Your result deviates more than ±50% of the expected value for samples H1 and H2, and more than ±30% for samples H3 and H4

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EMEP – Analytical intercomparison of heavy metals in precipitation 2013

Laboratory 166, Forest Research Institute, Laboratory of Forest Environment Chemistry (Poland)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ¤
H1	As	-999	9	8.801	0.757		B
H2		-999	8.5	8.303	0.77		B
H3		-999	0.9	0.869	0.108		B
H4		-999	1.1	1.042	0.182		B
H1	Cd	-999	0.7	0.683	0.058		B
H2		-999	0.5	0.498	0.049		B
H3		-999	0.06	0.058	0.013		B
H4		-999	0.06	0.057	0.014		B
H1	Cr	-999	6.5	6.583	2.824		B
H2		-999	7.5	7.191	1.144		B
H3		-999	0.8	0.78	0.169		B
H4		-999	0.7	0.696	0.219		B
H1	Cu	12.02	12	11.652	0.877	0.42	S
H2		9.06	9	8.653	0.937	0.434	S
H3		< 9.000	0.9	0.943	0.333		B
H4		< 9.000	1	0.985	0.286		B
H1	Ni	-999	6	5.926	0.721		B
H2		-999	7.5	7.343	0.76		B
H3		-999	1.2	1.079	0.272		B
H4		-999	0.9	0.862	0.155		B
H1	Pb	19.17	19	18.598	1.561	0.367	S
H2		22.46	22	21.745	1.466	0.488	S
H3		< 10.000	1	0.944	0.235		B
H4		< 10.000	1.5	1.428	0.493		B
H1	Zn	109.54	110	111.292	7.435	-0.236	S
H2		104.66	105	105.729	8.562	-0.125	S
H3		9.5	9.5	10.004	3.407	-0.148	S
H4		6.81	7	7.503	1.144	-0.606	S

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, ½ DL is taken as the reported value in further calculations.

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S – Satisfactory: Your result deviates less than ±25% of the expected value for samples H1 and H2, and less than ±15% for samples H3 and H4

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U – Unsatisfactory: Your result deviates more than ±50% of the expected value for samples H1 and H2, and more than ±30% for samples H3 and H4

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Norwegian Institute for Air Research

EMEP – Analytical intercomparison of heavy metals in precipitation 2013

Laboratory 171, Ecole de Mines de Douai, Department Chimie et Environment (France)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ¤
H1	As	9.214	9	8.801	0.757	0.545	S
H2		9.166	8.5	8.303	0.77	1.121	S
H3		0.946	0.9	0.869	0.108	0.712	S
H4		1.154	1.1	1.042	0.182	0.612	S
H1	Cd	0.721	0.7	0.683	0.058	0.663	S
H2		0.528	0.5	0.498	0.049	0.607	S
H3		0.063	0.06	0.058	0.013	0.386	S
H4		0.062	0.06	0.057	0.014	0.316	S
H1	Cr	6.023	6.5	6.583	2.824	-0.198	S
H2		7.417	7.5	7.191	1.144	0.198	S
H3		0.828	0.8	0.78	0.169	0.287	S
H4		0.721	0.7	0.696	0.219	0.113	S
H1	Cu	12.27	12	11.652	0.877	0.705	S
H2		9.528	9	8.653	0.937	0.933	S
H3		0.993	0.9	0.943	0.333	0.15	S
H4		1.067	1	0.985	0.286	0.287	S
H1	Ni	6.142	6	5.926	0.721	0.3	S
H2		7.963	7.5	7.343	0.76	0.816	S
H3		1.278	1.2	1.079	0.272	0.731	S
H4		0.96	0.9	0.862	0.155	0.628	S
H1	Pb	17.817	19	18.598	1.561	-0.5	S
H2		21.038	22	21.745	1.466	-0.482	S
H3		0.934	1	0.944	0.235	-0.042	S
H4		1.407	1.5	1.428	0.493	-0.042	S
H1	Zn	121.837	110	111.292	7.435	1.418	S
H2		121.987	105	105.729	8.562	1.899	Q
H3		10.883	9.5	10.004	3.407	0.258	S
H4		7.991	7	7.503	1.144	0.427	S

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EMEP – Analytical intercomparison of heavy metals in precipitation 2013

Laboratory 174, Background Monitoring Department, Institute of Global Climate and Ecology (IGCE), Moscow (Russian Federation)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ¤
H1	As	-999	9	8.801	0.757		B
H2		-999	8.5	8.303	0.77		B
H3		-999	0.9	0.869	0.108		B
H4		-999	1.1	1.042	0.182		B
H1	Cd	0.61	0.7	0.683	0.058	-1.264	S
H2		0.42	0.5	0.498	0.049	-1.599	S
H3		0.053	0.06	0.058	0.013	-0.381	S
H4		0.05	0.06	0.057	0.014	-0.523	S
H1	Cr	-999	6.5	6.583	2.824		B
H2		-999	7.5	7.191	1.144		B
H3		-999	0.8	0.78	0.169		B
H4		-999	0.7	0.696	0.219		B
H1	Cu	9.3	12	11.652	0.877	-2.681	Q
H2		7.2	9	8.653	0.937	-1.551	Q
H3		0.79	0.9	0.943	0.333	-0.46	S
H4		0.97	1	0.985	0.286	-0.052	S
H1	Ni	-999	6	5.926	0.721		B
H2		-999	7.5	7.343	0.76		B
H3		-999	1.2	1.079	0.272		B
H4		-999	0.9	0.862	0.155		B
H1	Pb	27.5	19	18.598	1.561	5.702	U
H2		33	22	21.745	1.466	7.675	U
H3		1.6	1	0.944	0.235	2.789	U
H4		2.6	1.5	1.428	0.493	2.378	U
H1	Zn	-999	110	111.292	7.435		B
H2		-999	105	105.729	8.562		B
H3		-999	9.5	10.004	3.407		B
H4		-999	7	7.503	1.144		B

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, ½ DL is taken as the reported value in further calculations.

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EMEP – Analytical intercomparison of heavy metals in precipitation 2013

Laboratory 178, Environmental Chemistry and EANET Monitoring Laboratory,Limnological Institute RAS/SB, Irkutsk (Russian Federation)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ¤
H1	As	9.14	9	8.801	0.757	0.447	S
H2		8.8	8.5	8.303	0.77	0.646	S
H3		0.92	0.9	0.869	0.108	0.471	S
H4		1.16	1.1	1.042	0.182	0.645	S
H1	Cd	0.7	0.7	0.683	0.058	0.299	S
H2		0.5	0.5	0.498	0.049	0.035	S
H3		0.05	0.06	0.058	0.013	-0.611	S
H4		0.05	0.06	0.057	0.014	-0.523	S
H1	Cr	5.62	6.5	6.583	2.824	-0.341	S
H2		6.62	7.5	7.191	1.144	-0.499	S
H3		0.65	0.8	0.78	0.169	-0.769	S
H4		0.6	0.7	0.696	0.219	-0.439	S
H1	Cu	11.07	12	11.652	0.877	-0.663	S
H2		8.43	9	8.653	0.937	-0.238	S
H3		0.74	0.9	0.943	0.333	-0.61	S
H4		0.89	1	0.985	0.286	-0.331	S
H1	Ni	5.46	6	5.926	0.721	-0.646	S
H2		6.43	7.5	7.343	0.76	-1.2	S
H3		1.1	1.2	1.079	0.272	0.076	S
H4		0.82	0.9	0.862	0.155	-0.274	S
H1	Pb	17.6	19	18.598	1.561	-0.639	S
H2		20.76	22	21.745	1.466	-0.672	S
H3		0.91	1	0.944	0.235	-0.144	S
H4		1.41	1.5	1.428	0.493	-0.036	S
H1	Zn	99.34	110	111.292	7.435	-1.608	S
H2		97.11	105	105.729	8.562	-1.007	S
H3		7.87	9.5	10.004	3.407	-0.626	S
H4		5.78	7	7.503	1.144	-1.506	S

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, ½ DL is taken as the reported value in further calculations.

¤ EMEP quality norm; the letters in the column indicates:

S – Satisfactory: Your result deviates less than ±25% of the expected value for samples H1 and H2, and less than ±15% for samples H3 and H4

Q – Questionable: Your result deviates between ±25-50% of the expected value for samples H1 and H2, and between ±15-30% for samples H3 and H4

U – Unsatisfactory: Your result deviates more than ±50% of the expected value for samples H1 and H2, and more than ±30% for samples H3 and H4

B – Blank: You reported either no value or the detection limit

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EMEP – Analytical intercomparison of heavy metals in precipitation 2013

Laboratory 179, Murmansk Environmental Monitoring Center, Murmansk (Russian Federation)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ¤
H1	As	8.28	9	8.801	0.757	-0.688	S
H2		7.6	8.5	8.303	0.77	-0.912	S
H3		0.538	0.9	0.869	0.108	-3.062	Q
H4		0.719	1.1	1.042	0.182	-1.772	U
H1	Cd	0.632	0.7	0.683	0.058	-0.882	S
H2		0.409	0.5	0.498	0.049	-1.824	S
H3		0.043	0.06	0.058	0.013	-1.149	Q
H4		0.038	0.06	0.057	0.014	-1.361	Q
H1	Cr	6.27	6.5	6.583	2.824	-0.111	S
H2		6.51	7.5	7.191	1.144	-0.595	S
H3		0.89	0.8	0.78	0.169	0.655	S
H4		0.63	0.7	0.696	0.219	-0.302	S
H1	Cu	11.19	12	11.652	0.877	-0.526	S
H2		7.56	9	8.653	0.937	-1.166	Q
H3		1.22	0.9	0.943	0.333	0.832	Q
H4		0.95	1	0.985	0.286	-0.122	S
H1	Ni	6.42	6	5.926	0.721	0.685	S
H2		8.15	7.5	7.343	0.76	1.062	S
H3		1.69	1.2	1.079	0.272	2.247	U
H4		0.83	0.9	0.862	0.155	-0.209	S
H1	Pb	11.6	19	18.598	1.561	-4.482	U
H2		15.33	22	21.745	1.466	-4.375	U
H3		1.13	1	0.944	0.235	0.791	S
H4		1.66	1.5	1.428	0.493	0.471	S
H1	Zn	115.41	110	111.292	7.435	0.554	S
H2		108.72	105	105.729	8.562	0.349	S
H3		8.72	9.5	10.004	3.407	-0.377	S
H4		6.1	7	7.503	1.144	-1.227	S

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, ½ DL is taken as the reported value in further calculations.

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U – Unsatisfactory: Your result deviates more than ±50% of the expected value for samples H1 and H2, and more than ±30% for samples H3 and H4

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EMEP – Analytical intercomparison of heavy metals in precipitation 2013

Laboratory 181, TNO innovation for life (The Netherlands)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ¤
H1	As	8.98	9	8.801	0.757	0.236	S
H2		8.37	8.5	8.303	0.77	0.087	S
H3		0.88	0.9	0.869	0.108	0.101	S
H4		1.06	1.1	1.042	0.182	0.097	S
H1	Cd	0.71	0.7	0.683	0.058	0.472	S
H2		0.49	0.5	0.498	0.049	-0.169	S
H3		0.05	0.06	0.058	0.013	-0.611	S
H4		0.05	0.06	0.057	0.014	-0.523	S
H1	Cr	6.4	6.5	6.583	2.824	-0.065	S
H2		7.6	7.5	7.191	1.144	0.357	S
H3		0.8	0.8	0.78	0.169	0.121	S
H4		0.7	0.7	0.696	0.219	0.017	S
H1	Cu	12.1	12	11.652	0.877	0.511	S
H2		9.1	9	8.653	0.937	0.477	S
H3		0.9	0.9	0.943	0.333	-0.129	S
H4		1.1	1	0.985	0.286	0.403	S
H1	Ni	6	6	5.926	0.721	0.103	S
H2		7.7	7.5	7.343	0.76	0.47	S
H3		1.2	1.2	1.079	0.272	0.444	S
H4		1	0.9	0.862	0.155	0.886	S
H1	Pb	19	19	18.598	1.561	0.258	S
H2		22	22	21.745	1.466	0.174	S
H3		1	1	0.944	0.235	0.239	S
H4		1.5	1.5	1.428	0.493	0.147	S
H1	Zn	112	110	111.292	7.435	0.095	S
H2		106	105	105.729	8.562	0.032	S
H3		9	9.5	10.004	3.407	-0.295	S
H4		8	7	7.503	1.144	0.434	S

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, ½ DL is taken as the reported value in further calculations.

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U – Unsatisfactory: Your result deviates more than ±50% of the expected value for samples H1 and H2, and more than ±30% for samples H3 and H4

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EMEP – Analytical intercomparison of heavy metals in precipitation 2013

Laboratory 184, Institute for Public Health Pozarevac (Republic of Serbia)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ¤
H1	As	8.09	9	8.801	0.757	-0.939	S
H2		7.66	8.5	8.303	0.77	-0.834	S
H3		< 2.000	0.9	0.869	0.108		B
H4		< 2.000	1.1	1.042	0.182		B
H1	Cd	0.725	0.7	0.683	0.058	0.733	S
H2		0.518	0.5	0.498	0.049	0.402	S
H3		< 0.100	0.06	0.058	0.013		B
H4		< 0.100	0.06	0.057	0.014		B
H1	Cr	6.18	6.5	6.583	2.824	-0.143	S
H2		7.26	7.5	7.191	1.144	0.06	S
H3		< 1.000	0.8	0.78	0.169		B
H4		< 1.000	0.7	0.696	0.219		B
H1	Cu	-999	12	11.652	0.877		B
H2		-999	9	8.653	0.937		B
H3		-999	0.9	0.943	0.333		B
H4		-999	1	0.985	0.286		B
H1	Ni	-999	6	5.926	0.721		B
H2		-999	7.5	7.343	0.76		B
H3		-999	1.2	1.079	0.272		B
H4		-999	0.9	0.862	0.155		B
H1	Pb	19.16	19	18.598	1.561	0.36	S
H2		21.23	22	21.745	1.466	-0.351	S
H3		< 2.000	1	0.944	0.235		B
H4		< 2.000	1.5	1.428	0.493		B
H1	Zn	112	110	111.292	7.435	0.095	S
H2		106	105	105.729	8.562	0.032	S
H3		< 10.000	9.5	10.004	3.407		B
H4		< 10.000	7	7.503	1.144		B

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, ½ DL is taken as the reported value in further calculations.

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U – Unsatisfactory: Your result deviates more than ±50% of the expected value for samples H1 and H2, and more than ±30% for samples H3 and H4

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EMEP – Analytical intercomparison of heavy metals in precipitation 2013

Laboratory 186, Public Health Institute - Kralevo (Republic of Serbia)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ¤
H1	As	8.503	9	8.801	0.757	-0.394	S
H2		7.105	8.5	8.303	0.77	-1.555	Q
H3		0.811	0.9	0.869	0.108	-0.537	S
H4		0.705	1.1	1.042	0.182	-1.849	U
H1	Cd	-999	0.7	0.683	0.058		B
H2		-999	0.5	0.498	0.049		B
H3		-999	0.06	0.058	0.013		B
H4		-999	0.06	0.057	0.014		B
H1	Cr	6.113	6.5	6.583	2.824	-0.166	S
H2		6.901	7.5	7.191	1.144	-0.254	S
H3		0.608	0.8	0.78	0.169	-1.019	S
H4		0.703	0.7	0.696	0.219	0.031	S
H1	Cu	-999	12	11.652	0.877		B
H2		-999	9	8.653	0.937		B
H3		-999	0.9	0.943	0.333		B
H4		-999	1	0.985	0.286		B
H1	Ni	-999	6	5.926	0.721		B
H2		-999	7.5	7.343	0.76		B
H3		-999	1.2	1.079	0.272		B
H4		-999	0.9	0.862	0.155		B
H1	Pb	-999	19	18.598	1.561		B
H2		-999	22	21.745	1.466		B
H3		-999	1	0.944	0.235		B
H4		-999	1.5	1.428	0.493		B
H1	Zn	-999	110	111.292	7.435		B
H2		-999	105	105.729	8.562		B
H3		-999	9.5	10.004	3.407		B
H4		-999	7	7.503	1.144		B

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Norwegian Institute for Air Research

EMEP – Analytical intercomparison of heavy metals in precipitation 2013

Laboratory 187, Public Health Institute - Nis, Department for Sanitary Chemistry (Republic of Serbia)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ¤
H1	As	8.5	9	8.801	0.757	-0.398	S
H2		7.1	8.5	8.303	0.77	-1.561	Q
H3		1.2	0.9	0.869	0.108	3.061	Q
H4		1.2	1.1	1.042	0.182	0.864	S
H1	Cd	0.8	0.7	0.683	0.058	2.036	S
H2		0.55	0.5	0.498	0.049	1.056	S
H3		0.2	0.06	0.058	0.013	10.902	U
H4		0.2	0.06	0.057	0.014	9.954	U
H1	Cr	7	6.5	6.583	2.824	0.148	S
H2		8.4	7.5	7.191	1.144	1.057	S
H3		0.85	0.8	0.78	0.169	0.418	S
H4		0.55	0.7	0.696	0.219	-0.667	S
H1	Cu	8	12	11.652	0.877	-4.163	U
H2		7.7	9	8.653	0.937	-1.017	S
H3		< 0.500	0.9	0.943	0.333	-2.083	U
H4		< 0.500	1	0.985	0.286	-2.568	U
H1	Ni	9.9	6	5.926	0.721	5.511	U
H2		11	7.5	7.343	0.76	4.811	U
H3		0.8	1.2	1.079	0.272	-1.027	U
H4		1.2	0.9	0.862	0.155	2.174	Q
H1	Pb	20.83	19	18.598	1.561	1.43	S
H2		23.29	22	21.745	1.466	1.054	S
H3		0.9	1	0.944	0.235	-0.186	S
H4		1.3	1.5	1.428	0.493	-0.259	S
H1	Zn	109	110	111.292	7.435	-0.308	S
H2		100	105	105.729	8.562	-0.669	S
H3		7	9.5	10.004	3.407	-0.882	Q
H4		6	7	7.503	1.144	-1.314	S

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EMEP – Analytical intercomparison of heavy metals in precipitation 2013

Laboratory 189, Institute of Public Health - Kikinda (Republic of Serbia)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ¤
H1	As	8.4	9	8.801	0.757	-0.53	S
H2		9.4	8.5	8.303	0.77	1.424	S
H3		< 1.000	0.9	0.869	0.108		B
H4		< 1.000	1.1	1.042	0.182	-2.972	U
H1	Cd	-999	0.7	0.683	0.058		B
H2		-999	0.5	0.498	0.049		B
H3		-999	0.06	0.058	0.013		B
H4		-999	0.06	0.057	0.014		B
H1	Cr	6	6.5	6.583	2.824	-0.207	S
H2		7	7.5	7.191	1.144	-0.167	S
H3		< 1.000	0.8	0.78	0.169		B
H4		< 1.000	0.7	0.696	0.219		B
H1	Cu	-999	12	11.652	0.877		B
H2		-999	9	8.653	0.937		B
H3		-999	0.9	0.943	0.333		B
H4		-999	1	0.985	0.286		B
H1	Ni	5.4	6	5.926	0.721	-0.729	S
H2		7.1	7.5	7.343	0.76	-0.319	S
H3		< 2.000	1.2	1.079	0.272		B
H4		< 2.000	0.9	0.862	0.155		B
H1	Pb	18.3	19	18.598	1.561	-0.191	S
H2		21.2	22	21.745	1.466	-0.372	S
H3		< 1.000	1	0.944	0.235	-1.886	Q
H4		< 1.000	1.5	1.428	0.493	-1.881	U
H1	Zn	118.2	110	111.292	7.435	0.929	S
H2		108.3	105	105.729	8.562	0.3	S
H3		< 10.000	9.5	10.004	3.407		B
H4		< 10.000	7	7.503	1.144		B

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EMEP – Analytical intercomparison of heavy metals in precipitation 2013

Laboratory 194, Institute of Public Health - Zrenjanin (Republic of Serbia)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ¤
H1	As	9.8	9	8.801	0.757	1.319	S
H2		9.6	8.5	8.303	0.77	1.684	S
H3		< 2.000	0.9	0.869	0.108		B
H4		< 2.000	1.1	1.042	0.182		B
H1	Cd	< 20.000	0.7	0.683	0.058		B
H2		< 20.000	0.5	0.498	0.049		B
H3		< 20.000	0.06	0.058	0.013		B
H4		< 20.000	0.06	0.057	0.014		B
H1	Cr	< 40.000	6.5	6.583	2.824		B
H2		< 40.000	7.5	7.191	1.144		B
H3		< 40.000	0.8	0.78	0.169		B
H4		< 40.000	0.7	0.696	0.219		B
H1	Cu	< 40.000	12	11.652	0.877		B
H2		< 40.000	9	8.653	0.937		B
H3		< 40.000	0.9	0.943	0.333		B
H4		< 40.000	1	0.985	0.286		B
H1	Ni	< 50.000	6	5.926	0.721		B
H2		< 50.000	7.5	7.343	0.76		B
H3		< 50.000	1.2	1.079	0.272		B
H4		< 50.000	0.9	0.862	0.155		B
H1	Pb	< 100.000	19	18.598	1.561		B
H2		< 100.000	22	21.745	1.466		B
H3		< 100.000	1	0.944	0.235		B
H4		< 100.000	1.5	1.428	0.493		B
H1	Zn	108	110	111.292	7.435	-0.443	S
H2		103	105	105.729	8.562	-0.319	S
H3		< 20.000	9.5	10.004	3.407		B
H4		< 20.000	7	7.503	1.144		B

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EMEP – Analytical intercomparison of heavy metals in precipitation 2013

Laboratory 195, Institute of Public Health - Suobtica (Republic of Serbia)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ¤
H1	As	7.91	9	8.801	0.757	-1.177	S
H2		7.69	8.5	8.303	0.77	-0.795	S
H3		< 1.400	0.9	0.869	0.108		B
H4		< 1.400	1.1	1.042	0.182		B
H1	Cd	0.68	0.7	0.683	0.058	-0.049	S
H2		0.54	0.5	0.498	0.049	0.852	S
H3		< 0.480	0.06	0.058	0.013		B
H4		< 0.480	0.06	0.057	0.014		B
H1	Cr	4.72	6.5	6.583	2.824	-0.66	Q
H2		5.71	7.5	7.191	1.144	-1.295	Q
H3		< 0.510	0.8	0.78	0.169	-3.113	U
H4		< 0.510	0.7	0.696	0.219	-2.012	U
H1	Cu	10.15	12	11.652	0.877	-1.712	Q
H2		7.45	9	8.653	0.937	-1.284	Q
H3		< 0.650	0.9	0.943	0.333	-1.858	U
H4		< 0.650	1	0.985	0.286	-2.306	U
H1	Ni	4.85	6	5.926	0.721	-1.492	Q
H2		6.17	7.5	7.343	0.76	-1.542	Q
H3		< 0.740	1.2	1.079	0.272	-2.609	U
H4		< 0.740	0.9	0.862	0.155	-3.172	U
H1	Pb	17.97	19	18.598	1.561	-0.402	S
H2		21.98	22	21.745	1.466	0.16	S
H3		< 1.310	1	0.944	0.235		B
H4		< 1.310	1.5	1.428	0.493	-1.567	U
H1	Zn	98.2	110	111.292	7.435	-1.761	S
H2		94.03	105	105.729	8.562	-1.366	S
H3		9.8	9.5	10.004	3.407	-0.06	S
H4		7.39	7	7.503	1.144	-0.099	S

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EMEP – Analytical intercomparison of heavy metals in precipitation 2013

Laboratory 197, Institute of Occupational Health - Novi Sad (Republic of Serbia)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ¤
H1	As	-999	9	8.801	0.757		B
H2		-999	8.5	8.303	0.77		B
H3		-999	0.9	0.869	0.108		B
H4		-999	1.1	1.042	0.182		B
H1	Cd	0.47	0.7	0.683	0.058	-3.696	U
H2		0.26	0.5	0.498	0.049	-4.867	Q
H3		-999	0.06	0.058	0.013		B
H4		-999	0.06	0.057	0.014		B
H1	Cr	-999	6.5	6.583	2.824		B
H2		-999	7.5	7.191	1.144		B
H3		-999	0.8	0.78	0.169		B
H4		-999	0.7	0.696	0.219		B
H1	Cu	8	12	11.652	0.877	-4.163	U
H2		4	9	8.653	0.937	-4.964	U
H3		-999	0.9	0.943	0.333		B
H4		-999	1	0.985	0.286		B
H1	Ni	-999	6	5.926	0.721		B
H2		-999	7.5	7.343	0.76		B
H3		-999	1.2	1.079	0.272		B
H4		-999	0.9	0.862	0.155		B
H1	Pb	13	19	18.598	1.561	-3.586	U
H2		16	22	21.745	1.466	-3.918	Q
H3		-999	1	0.944	0.235		B
H4		-999	1.5	1.428	0.493		B
H1	Zn	92	110	111.292	7.435	-2.595	Q
H2		88	105	105.729	8.562	-2.071	Q
H3		-999	9.5	10.004	3.407		B
H4		-999	7	7.503	1.144		B

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EMEP – Analytical intercomparison of heavy metals in precipitation 2013

Laboratory 198, Institute for public health - Sremska Mitrovica (Republic of Serbia)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ¤
H1	As	-999	9	8.801	0.757		B
H2		-999	8.5	8.303	0.77		B
H3		-999	0.9	0.869	0.108		B
H4		-999	1.1	1.042	0.182		B
H1	Cd	< 1.000	0.7	0.683	0.058		B
H2		< 1.000	0.5	0.498	0.049		B
H3		< 1.000	0.06	0.058	0.013		B
H4		< 1.000	0.06	0.057	0.014		B
H1	Cr	< 5.000	6.5	6.583	2.824	-1.446	U
H2		< 5.000	7.5	7.191	1.144	-4.101	U
H3		< 5.000	0.8	0.78	0.169		B
H4		< 5.000	0.7	0.696	0.219		B
H1	Cu	-999	12	11.652	0.877		B
H2		-999	9	8.653	0.937		B
H3		-999	0.9	0.943	0.333		B
H4		-999	1	0.985	0.286		B
H1	Ni	6	6	5.926	0.721	0.103	S
H2		9	7.5	7.343	0.76	2.18	Q
H3		< 4.000	1.2	1.079	0.272		B
H4		< 4.000	0.9	0.862	0.155		B
H1	Pb	< 28.000	19	18.598	1.561		B
H2		< 28.000	22	21.745	1.466		B
H3		< 28.000	1	0.944	0.235		B
H4		< 28.000	1.5	1.428	0.493		B
H1	Zn	109	110	111.292	7.435	-0.308	S
H2		103	105	105.729	8.562	-0.319	S
H3		10	9.5	10.004	3.407	-0.001	S
H4		8	7	7.503	1.144	0.434	S

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