

EMEP – 29th intercomparison of analytical methods

Laboratory 2, 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 ^x
H1	As	0.544	0.55	0.482	0.204	0.303	S
H2	As	0.327	0.3	0.293	0.165	0.205	S
H3	As	7.932	7.5	7.142	0.884	0.893	S
H4	As	5.36	5	4.681	0.781	0.869	S
H1	Cd	0.032	0.04	0.032	0.013	0.034	S
H2	Cd	0.081	0.08	0.074	0.014	0.511	S
H3	Cd	0.744	0.7	0.649	0.088	1.08	S
H4	Cd	0.806	0.75	0.694	0.089	1.261	S
H1	Cr	0.75	0.8	0.835	0.279	-0.306	S
H2	Cr	0.836	0.85	0.877	0.275	-0.15	S
H3	Cr	6.466	6.4	6.327	0.779	0.179	S
H4	Cr	5.046	5	5.011	0.594	0.06	S
H1	Cu	1.189	1.1	0.994	0.264	0.738	S
H2	Cu	0.963	0.9	0.835	0.254	0.504	S
H3	Cu	8.447	8	7.515	1.027	0.908	S
H4	Cu	6.91	6.5	6.269	0.695	0.922	S
H1	Ni	0.745	0.75	0.879	0.159	-0.844	S
H2	Ni	0.526	0.5	0.589	0.213	-0.297	S
H3	Ni	10.32	9.9	9.69	1.138	0.554	S
H4	Ni	11.5	11	10.814	1.277	0.537	S
H1	Pb	1.379	1.5	1.422	0.362	-0.119	S
H2	Pb	1.049	1.1	1.173	0.578	-0.214	S
H3	Pb	20.28	21	20.64	2.05	-0.176	S
H4	Pb	23.96	24.5	23.398	1.81	0.31	S
H1	Zn	4.978	4.5	4.386	0.997	0.594	S
H2	Zn	9.108	8	7.315	1.91	0.939	S
H3	Zn	120.3	105	100.289	16.621	1.204	S
H4	Zn	115.1	100	94.667	15.007	1.362	Q

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

^x 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 – 29th intercomparison of analytical methods

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 ^x
H1	As	0.61	0.55	0.482	0.204	0.627	S
H2	As	0.335	0.3	0.293	0.165	0.254	S
H3	As	7.6	7.5	7.142	0.884	0.518	S
H4	As	5.11	5	4.681	0.781	0.549	S
H1	Cd	0.045	0.04	0.032	0.013	1.031	S
H2	Cd	0.093	0.08	0.074	0.014	1.394	S
H3	Cd	0.79	0.7	0.649	0.088	1.605	S
H4	Cd	0.8	0.75	0.694	0.089	1.193	S
H1	Cr	0.759	0.8	0.835	0.279	-0.274	S
H2	Cr	0.786	0.85	0.877	0.275	-0.332	S
H3	Cr	6.06	6.4	6.327	0.779	-0.342	S
H4	Cr	4.7	5	5.011	0.594	-0.522	S
H1	Cu	1.12	1.1	0.994	0.264	0.477	S
H2	Cu	0.919	0.9	0.835	0.254	0.331	S
H3	Cu	7.86	8	7.515	1.027	0.336	S
H4	Cu	6.4	6.5	6.269	0.695	0.189	S
H1	Ni	0.754	0.75	0.879	0.159	-0.787	S
H2	Ni	0.43	0.5	0.589	0.213	-0.748	S
H3	Ni	9.59	9.9	9.69	1.138	-0.088	S
H4	Ni	10.5	11	10.814	1.277	-0.246	S
H1	Pb	1.42	1.5	1.422	0.362	-0.006	S
H2	Pb	1.04	1.1	1.173	0.578	-0.23	S
H3	Pb	20.1	21	20.64	2.05	-0.264	S
H4	Pb	23.3	24.5	23.398	1.81	-0.054	S
H1	Zn	5.55	4.5	4.386	0.997	1.167	S
H2	Zn	9.7	8	7.315	1.91	1.249	S
H3	Zn	125	105	100.289	16.621	1.487	Q
H4	Zn	118	100	94.667	15.007	1.555	Q

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

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EMEP – 29th intercomparison of analytical methods

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 ^x
H1	As	< 1.500	0.55	0.482	0.204		B
H2	As	< 1.500	0.3	0.293	0.165		B
H3	As	7	7.5	7.142	0.884	-0.161	S
H4	As	4.8	5	4.681	0.781	0.152	S
H1	Cd	-999	0.04	0.032	0.013		B
H2	Cd	-999	0.08	0.074	0.014		B
H3	Cd	-999	0.7	0.649	0.088		B
H4	Cd	-999	0.75	0.694	0.089		B
H1	Cr	< 2.000	0.8	0.835	0.279		B
H2	Cr	< 2.000	0.85	0.877	0.275		B
H3	Cr	5.3	6.4	6.327	0.779	-1.317	Q
H4	Cr	4.2	5	5.011	0.594	-1.364	Q
H1	Cu	11.5	1.1	0.994	0.264	39.785	U
H2	Cu	< 2.500	0.9	0.835	0.254		B
H3	Cu	7	8	7.515	1.027	-0.501	S
H4	Cu	5.8	6.5	6.269	0.695	-0.674	S
H1	Ni	< 3.000	0.75	0.879	0.159		B
H2	Ni	14.6	0.5	0.589	0.213	65.738	U
H3	Ni	8.3	9.9	9.69	1.138	-1.222	Q
H4	Ni	9.6	11	10.814	1.277	-0.95	S
H1	Pb	< 3.000	1.5	1.422	0.362		B
H2	Pb	< 3.000	1.1	1.173	0.578		B
H3	Pb	19.7	21	20.64	2.05	-0.459	S
H4	Pb	23.3	24.5	23.398	1.81	-0.054	S
H1	Zn	-999	4.5	4.386	0.997		B
H2	Zn	-999	8	7.315	1.91		B
H3	Zn	-999	105	100.289	16.621		B
H4	Zn	-999	100	94.667	15.007		B

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

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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 ^x
H1	As	0.549	0.55	0.482	0.204	0.326	S
H2	As	0.294	0.3	0.293	0.165	0.003	S
H3	As	7.476	7.5	7.142	0.884	0.378	S
H4	As	4.924	5	4.681	0.781	0.311	S
H1	Cd	0.04	0.04	0.032	0.013	0.655	S
H2	Cd	0.081	0.08	0.074	0.014	0.474	S
H3	Cd	0.706	0.7	0.649	0.088	0.651	S
H4	Cd	0.736	0.75	0.694	0.089	0.471	S
H1	Cr	0.816	0.8	0.835	0.279	-0.071	S
H2	Cr	0.84	0.85	0.877	0.275	-0.136	S
H3	Cr	6.323	6.4	6.327	0.779	-0.005	S
H4	Cr	4.866	5	5.011	0.594	-0.242	S
H1	Cu	1.117	1.1	0.994	0.264	0.464	S
H2	Cu	0.917	0.9	0.835	0.254	0.323	S
H3	Cu	8.064	8	7.515	1.027	0.535	S
H4	Cu	6.41	6.5	6.269	0.695	0.203	S
H1	Ni	0.764	0.75	0.879	0.159	-0.723	S
H2	Ni	0.507	0.5	0.589	0.213	-0.384	S
H3	Ni	9.99	9.9	9.69	1.138	0.263	S
H4	Ni	10.909	11	10.814	1.277	0.074	S
H1	Pb	1.528	1.5	1.422	0.362	0.293	S
H2	Pb	1.103	1.1	1.173	0.578	-0.122	S
H3	Pb	21.229	21	20.64	2.05	0.287	S
H4	Pb	24.257	24.5	23.398	1.81	0.475	S
H1	Zn	4.627	4.5	4.386	0.997	0.242	S
H2	Zn	8.086	8	7.315	1.91	0.403	S
H3	Zn	106.823	105	100.289	16.621	0.393	S
H4	Zn	99.239	100	94.667	15.007	0.305	S

If your laboratory reported values as less than the detection limit, and your detection limit 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

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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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 ^x
H1	As	0	0.55	0.482	0.204	-2.367	U
H2	As	0.25	0.3	0.293	0.165	-0.262	S
H3	As	6.25	7.5	7.142	0.884	-1.009	Q
H4	As	4.05	5	4.681	0.781	-0.808	Q
H1	Cd	0	0.04	0.032	0.013	-2.42	U
H2	Cd	0.07	0.08	0.074	0.014	-0.298	S
H3	Cd	0.6	0.7	0.649	0.088	-0.563	S
H4	Cd	0.63	0.75	0.694	0.089	-0.724	Q
H1	Cr	0.87	0.8	0.835	0.279	0.124	S
H2	Cr	0.9	0.85	0.877	0.275	0.082	S
H3	Cr	6.25	6.4	6.327	0.779	-0.098	S
H4	Cr	4.85	5	5.011	0.594	-0.27	S
H1	Cu	1.15	1.1	0.994	0.264	0.59	S
H2	Cu	0.83	0.9	0.835	0.254	-0.019	S
H3	Cu	7.54	8	7.515	1.027	0.025	S
H4	Cu	6	6.5	6.269	0.695	-0.386	S
H1	Ni	0.95	0.75	0.879	0.159	0.443	Q
H2	Ni	0.6	0.5	0.589	0.213	0.05	S
H3	Ni	9.7	9.9	9.69	1.138	0.009	S
H4	Ni	10.72	11	10.814	1.277	-0.074	S
H1	Pb	1.6	1.5	1.422	0.362	0.492	S
H2	Pb	1.21	1.1	1.173	0.578	0.064	S
H3	Pb	21	21	20.64	2.05	0.176	S
H4	Pb	24	24.5	23.398	1.81	0.333	S
H1	Zn	4.78	4.5	4.386	0.997	0.395	S
H2	Zn	7.7	8	7.315	1.91	0.201	S
H3	Zn	100	105	100.289	16.621	-0.017	S
H4	Zn	95.15	100	94.667	15.007	0.032	S

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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 ^x
H1	As	0.45	0.55	0.482	0.204	-0.158	S
H2	As	0.24	0.3	0.293	0.165	-0.323	S
H3	As	4.98	7.5	7.142	0.884	-2.446	U
H4	As	3.43	5	4.681	0.781	-1.601	U
H1	Cd	0.03	0.04	0.032	0.013	-0.12	Q
H2	Cd	0.07	0.08	0.074	0.014	-0.298	S
H3	Cd	0.53	0.7	0.649	0.088	-1.362	Q
H4	Cd	0.55	0.75	0.694	0.089	-1.626	Q
H1	Cr	0.7	0.8	0.835	0.279	-0.486	S
H2	Cr	0.74	0.85	0.877	0.275	-0.499	S
H3	Cr	4.94	6.4	6.327	0.779	-1.779	Q
H4	Cr	4.03	5	5.011	0.594	-1.65	Q
H1	Cu	0.72	1.1	0.994	0.264	-1.038	Q
H2	Cu	0.59	0.9	0.835	0.254	-0.963	Q
H3	Cu	5.94	8	7.515	1.027	-1.534	Q
H4	Cu	4.96	6.5	6.269	0.695	-1.882	Q
H1	Ni	0.73	0.75	0.879	0.159	-0.938	S
H2	Ni	0.54	0.5	0.589	0.213	-0.232	S
H3	Ni	7.73	9.9	9.69	1.138	-1.723	Q
H4	Ni	8.82	11	10.814	1.277	-1.561	Q
H1	Pb	1.05	1.5	1.422	0.362	-1.029	Q
H2	Pb	0.95	1.1	1.173	0.578	-0.386	S
H3	Pb	15.32	21	20.64	2.05	-2.595	Q
H4	Pb	17.55	24.5	23.398	1.81	-3.232	Q
H1	Zn	2.6	4.5	4.386	0.997	-1.791	Q
H2	Zn	5.02	8	7.315	1.91	-1.202	Q
H3	Zn	57.16	105	100.289	16.621	-2.595	U
H4	Zn	52.88	100	94.667	15.007	-2.784	U

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EMEP – 29th intercomparison of analytical methods

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 ^x
H1	As	0.546	0.55	0.482	0.204	0.313	S
H2	As	0.302	0.3	0.293	0.165	0.053	S
H3	As	7.31	7.5	7.142	0.884	0.19	S
H4	As	4.85	5	4.681	0.781	0.216	S
H1	Cd	0.039	0.04	0.032	0.013	0.57	S
H2	Cd	0.079	0.08	0.074	0.014	0.364	S
H3	Cd	0.67	0.7	0.649	0.088	0.235	S
H4	Cd	0.711	0.75	0.694	0.089	0.189	S
H1	Cr	0.78	0.8	0.835	0.279	-0.199	S
H2	Cr	0.84	0.85	0.877	0.275	-0.136	S
H3	Cr	6.04	6.4	6.327	0.779	-0.368	S
H4	Cr	4.68	5	5.011	0.594	-0.556	S
H1	Cu	1.15	1.1	0.994	0.264	0.59	S
H2	Cu	0.9	0.9	0.835	0.254	0.256	S
H3	Cu	7.81	8	7.515	1.027	0.288	S
H4	Cu	6.3	6.5	6.269	0.695	0.045	S
H1	Ni	0.724	0.75	0.879	0.159	-0.976	S
H2	Ni	0.484	0.5	0.589	0.213	-0.494	S
H3	Ni	9.41	9.9	9.69	1.138	-0.246	S
H4	Ni	10.4	11	10.814	1.277	-0.324	S
H1	Pb	1.42	1.5	1.422	0.362	-0.006	S
H2	Pb	1.06	1.1	1.173	0.578	-0.195	S
H3	Pb	19.5	21	20.64	2.05	-0.556	S
H4	Pb	22.4	24.5	23.398	1.81	-0.552	S
H1	Zn	4.73	4.5	4.386	0.997	0.345	S
H2	Zn	8.39	8	7.315	1.91	0.563	S
H3	Zn	104	105	100.289	16.621	0.223	S
H4	Zn	98.2	100	94.667	15.007	0.235	S

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

^x 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 – 29th intercomparison of analytical methods

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 ^x
H1	As	-999	0.55	0.482	0.204		B
H2	As	-999	0.3	0.293	0.165		B
H3	As	-999	7.5	7.142	0.884		B
H4	As	-999	5	4.681	0.781		B
H1	Cd	0.01	0.04	0.032	0.013	-1.654	U
H2	Cd	0.051	0.08	0.074	0.014	-1.695	Q
H3	Cd	0.061	0.7	0.649	0.088	-6.713	U
H4	Cd	0.743	0.75	0.694	0.089	0.55	S
H1	Cr	-999	0.8	0.835	0.279		B
H2	Cr	-999	0.85	0.877	0.275		B
H3	Cr	-999	6.4	6.327	0.779		B
H4	Cr	-999	5	5.011	0.594		B
H1	Cu	-999	1.1	0.994	0.264		B
H2	Cu	-999	0.9	0.835	0.254		B
H3	Cu	-999	8	7.515	1.027		B
H4	Cu	-999	6.5	6.269	0.695		B
H1	Ni	-999	0.75	0.879	0.159		B
H2	Ni	-999	0.5	0.589	0.213		B
H3	Ni	-999	9.9	9.69	1.138		B
H4	Ni	-999	11	10.814	1.277		B
H1	Pb	2.217	1.5	1.422	0.362	2.198	U
H2	Pb	1.501	1.1	1.173	0.578	0.568	U
H3	Pb	20.78	21	20.64	2.05	0.068	S
H4	Pb	23.82	24.5	23.398	1.81	0.233	S
H1	Zn	-999	4.5	4.386	0.997		B
H2	Zn	-999	8	7.315	1.91		B
H3	Zn	-999	105	100.289	16.621		B
H4	Zn	-999	100	94.667	15.007		B

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

^x 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

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EMEP – 29th intercomparison of analytical methods

Laboratory 14, National Institute of Public Health and Environmental Protection RIVM (Netherlands)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
H1	As	0.54	0.55	0.482	0.204	0.284	S
H2	As	0.28	0.3	0.293	0.165	-0.08	S
H3	As	7.16	7.5	7.142	0.884	0.02	S
H4	As	4.7	5	4.681	0.781	0.024	S
H1	Cd	0.04	0.04	0.032	0.013	0.647	S
H2	Cd	0.07	0.08	0.074	0.014	-0.298	S
H3	Cd	0.65	0.7	0.649	0.088	0.007	S
H4	Cd	0.75	0.75	0.694	0.089	0.629	S
H1	Cr	0.9	0.8	0.835	0.279	0.231	S
H2	Cr	0.9	0.85	0.877	0.275	0.082	S
H3	Cr	6.5	6.4	6.327	0.779	0.222	S
H4	Cr	5.1	5	5.011	0.594	0.151	S
H1	Cu	1.1	1.1	0.994	0.264	0.401	S
H2	Cu	0.9	0.9	0.835	0.254	0.256	S
H3	Cu	7.9	8	7.515	1.027	0.375	S
H4	Cu	7.5	6.5	6.269	0.695	1.77	Q
H1	Ni	0.9	0.75	0.879	0.159	0.129	S
H2	Ni	0.7	0.5	0.589	0.213	0.519	Q
H3	Ni	10.1	9.9	9.69	1.138	0.36	S
H4	Ni	11.4	11	10.814	1.277	0.459	S
H1	Pb	1.6	1.5	1.422	0.362	0.492	S
H2	Pb	1.3	1.1	1.173	0.578	0.22	Q
H3	Pb	20.9	21	20.64	2.05	0.127	S
H4	Pb	24.4	24.5	23.398	1.81	0.554	S
H1	Zn	5	4.5	4.386	0.997	0.616	S
H2	Zn	9	8	7.315	1.91	0.882	S
H3	Zn	99	105	100.289	16.621	-0.078	S
H4	Zn	94	100	94.667	15.007	-0.044	S

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

^x 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

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EMEP – 29th intercomparison of analytical methods

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 ^α
H1	As	0.522	0.55	0.482	0.204	0.195	S
H2	As	0.283	0.3	0.293	0.165	-0.062	S
H3	As	8.25	7.5	7.142	0.884	1.253	S
H4	As	5.38	5	4.681	0.781	0.894	S
H1	Cd	0.04	0.04	0.032	0.013	0.647	S
H2	Cd	0.081	0.08	0.074	0.014	0.511	S
H3	Cd	0.693	0.7	0.649	0.088	0.498	S
H4	Cd	0.794	0.75	0.694	0.089	1.125	S
H1	Cr	0.813	0.8	0.835	0.279	-0.08	S
H2	Cr	0.857	0.85	0.877	0.275	-0.074	S
H3	Cr	6.52	6.4	6.327	0.779	0.248	S
H4	Cr	5.18	5	5.011	0.594	0.285	S
H1	Cu	1.138	1.1	0.994	0.264	0.545	S
H2	Cu	0.928	0.9	0.835	0.254	0.366	S
H3	Cu	8.14	8	7.515	1.027	0.609	S
H4	Cu	6.77	6.5	6.269	0.695	0.721	S
H1	Ni	0.765	0.75	0.879	0.159	-0.718	S
H2	Ni	0.5	0.5	0.589	0.213	-0.419	S
H3	Ni	10.15	9.9	9.69	1.138	0.404	S
H4	Ni	10.95	11	10.814	1.277	0.107	S
H1	Pb	1.5	1.5	1.422	0.362	0.215	S
H2	Pb	1.03	1.1	1.173	0.578	-0.247	S
H3	Pb	21.02	21	20.64	2.05	0.185	S
H4	Pb	24.61	24.5	23.398	1.81	0.67	S
H1	Zn	4.716	4.5	4.386	0.997	0.331	S
H2	Zn	8.37	8	7.315	1.91	0.552	S
H3	Zn	109.6	105	100.289	16.621	0.56	S
H4	Zn	102.7	100	94.667	15.007	0.535	S

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

^α 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 – 29th intercomparison of analytical methods

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 ^x
H1	As	-999	0.55	0.482	0.204		B
H2	As	-999	0.3	0.293	0.165		B
H3	As	-999	7.5	7.142	0.884		B
H4	As	-999	5	4.681	0.781		B
H1	Cd	0.04	0.04	0.032	0.013	0.647	S
H2	Cd	0.08	0.08	0.074	0.014	0.438	S
H3	Cd	0.7	0.7	0.649	0.088	0.578	S
H4	Cd	0.75	0.75	0.694	0.089	0.629	S
H1	Cr	0.8	0.8	0.835	0.279	-0.127	S
H2	Cr	0.85	0.85	0.877	0.275	-0.1	S
H3	Cr	6.5	6.4	6.327	0.779	0.222	S
H4	Cr	5	5	5.011	0.594	-0.018	S
H1	Cu	1.1	1.1	0.994	0.264	0.401	S
H2	Cu	1	0.9	0.835	0.254	0.649	S
H3	Cu	7.5	8	7.515	1.027	-0.014	S
H4	Cu	6.5	6.5	6.269	0.695	0.333	S
H1	Ni	0.75	0.75	0.879	0.159	-0.812	S
H2	Ni	0.5	0.5	0.589	0.213	-0.419	S
H3	Ni	10	9.9	9.69	1.138	0.272	S
H4	Ni	10.5	11	10.814	1.277	-0.246	S
H1	Pb	1.4	1.5	1.422	0.362	-0.061	S
H2	Pb	1.1	1.1	1.173	0.578	-0.126	S
H3	Pb	22	21	20.64	2.05	0.663	S
H4	Pb	24	24.5	23.398	1.81	0.333	S
H1	Zn	4.5	4.5	4.386	0.997	0.114	S
H2	Zn	7	8	7.315	1.91	-0.165	S
H3	Zn	105	105	100.289	16.621	0.283	S
H4	Zn	100	100	94.667	15.007	0.355	S

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

^x EMEP quality norm; the letters in the column indicates:

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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

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 – 29th intercomparison of analytical methods

Laboratory 23, Ricardo-AEA Limited (United Kingdom)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
H1	As	0.497	0.55	0.482	0.204	0.073	S
H2	As	0.268	0.3	0.293	0.165	-0.153	S
H3	As	6.8	7.5	7.142	0.884	-0.387	S
H4	As	4.69	5	4.681	0.781	0.011	S
H1	Cd	< 0.050	0.04	0.032	0.013		B
H2	Cd	0.055	0.08	0.074	0.014	-1.372	Q
H3	Cd	0.635	0.7	0.649	0.088	-0.164	S
H4	Cd	0.612	0.75	0.694	0.089	-0.927	Q
H1	Cr	0.742	0.8	0.835	0.279	-0.335	S
H2	Cr	0.776	0.85	0.877	0.275	-0.368	S
H3	Cr	5.79	6.4	6.327	0.779	-0.689	S
H4	Cr	4.63	5	5.011	0.594	-0.64	S
H1	Cu	0.838	1.1	0.994	0.264	-0.591	S
H2	Cu	0.37	0.9	0.835	0.254	-1.829	U
H3	Cu	6.94	8	7.515	1.027	-0.56	S
H4	Cu	5.63	6.5	6.269	0.695	-0.918	S
H1	Ni	0.862	0.75	0.879	0.159	-0.109	S
H2	Ni	0.572	0.5	0.589	0.213	-0.081	S
H3	Ni	9.31	9.9	9.69	1.138	-0.334	S
H4	Ni	10.5	11	10.814	1.277	-0.246	S
H1	Pb	1.68	1.5	1.422	0.362	0.713	S
H2	Pb	1.28	1.1	1.173	0.578	0.185	Q
H3	Pb	22.6	21	20.64	2.05	0.956	S
H4	Pb	25.6	24.5	23.398	1.81	1.217	S
H1	Zn	2.59	4.5	4.386	0.997	-1.801	Q
H2	Zn	5.19	8	7.315	1.91	-1.113	Q
H3	Zn	94	105	100.289	16.621	-0.378	S
H4	Zn	86.5	100	94.667	15.007	-0.544	S

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

^x EMEP quality norm; the letters in the column indicates:

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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

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 – 29th intercomparison of analytical methods

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 ^α
H1	As	0.6	0.55	0.482	0.204	0.578	S
H2	As	0.3	0.3	0.293	0.165	0.041	S
H3	As	6	7.5	7.142	0.884	-1.292	Q
H4	As	3.8	5	4.681	0.781	-1.127	Q
H1	Cd	0.03	0.04	0.032	0.013	-0.12	Q
H2	Cd	0.05	0.08	0.074	0.014	-1.769	Q
H3	Cd	0.54	0.7	0.649	0.088	-1.248	Q
H4	Cd	0.57	0.75	0.694	0.089	-1.401	Q
H1	Cr	0.8	0.8	0.835	0.279	-0.127	S
H2	Cr	0.8	0.85	0.877	0.275	-0.281	S
H3	Cr	6	6.4	6.327	0.779	-0.419	S
H4	Cr	6.2	5	5.011	0.594	2.001	Q
H1	Cu	1.3	1.1	0.994	0.264	1.158	S
H2	Cu	1.6	0.9	0.835	0.254	3.01	U
H3	Cu	7.4	8	7.515	1.027	-0.112	S
H4	Cu	6.1	6.5	6.269	0.695	-0.242	S
H1	Ni	1.2	0.75	0.879	0.159	2.012	U
H2	Ni	0.9	0.5	0.589	0.213	1.458	U
H3	Ni	9.8	9.9	9.69	1.138	0.097	S
H4	Ni	10.8	11	10.814	1.277	-0.011	S
H1	Pb	1.4	1.5	1.422	0.362	-0.061	S
H2	Pb	1	1.1	1.173	0.578	-0.299	S
H3	Pb	20.2	21	20.64	2.05	-0.215	S
H4	Pb	22.5	24.5	23.398	1.81	-0.496	S
H1	Zn	4.1	4.5	4.386	0.997	-0.287	S
H2	Zn	7.7	8	7.315	1.91	0.201	S
H3	Zn	103.9	105	100.289	16.621	0.217	S
H4	Zn	96.8	100	94.667	15.007	0.142	S

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

^α 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 – 29th intercomparison of analytical methods

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 ^x
H1	As	0.5	0.55	0.482	0.204	0.087	S
H2	As	0.3	0.3	0.293	0.165	0.041	S
H3	As	7.4	7.5	7.142	0.884	0.291	S
H4	As	4.9	5	4.681	0.781	0.28	S
H1	Cd	0.04	0.04	0.032	0.013	0.647	S
H2	Cd	0.08	0.08	0.074	0.014	0.438	S
H3	Cd	0.69	0.7	0.649	0.088	0.464	S
H4	Cd	0.74	0.75	0.694	0.089	0.516	S
H1	Cr	0.9	0.8	0.835	0.279	0.231	S
H2	Cr	1	0.85	0.877	0.275	0.445	S
H3	Cr	6.8	6.4	6.327	0.779	0.607	S
H4	Cr	5.3	5	5.011	0.594	0.487	S
H1	Cu	0.9	1.1	0.994	0.264	-0.356	S
H2	Cu	0.7	0.9	0.835	0.254	-0.531	S
H3	Cu	7.6	8	7.515	1.027	0.083	S
H4	Cu	6.1	6.5	6.269	0.695	-0.242	S
H1	Ni	0.6	0.75	0.879	0.159	-1.754	S
H2	Ni	0.4	0.5	0.589	0.213	-0.888	S
H3	Ni	9.2	9.9	9.69	1.138	-0.431	S
H4	Ni	10.3	11	10.814	1.277	-0.402	S
H1	Pb	1.4	1.5	1.422	0.362	-0.061	S
H2	Pb	1.1	1.1	1.173	0.578	-0.126	S
H3	Pb	21.2	21	20.64	2.05	0.273	S
H4	Pb	24	24.5	23.398	1.81	0.333	S
H1	Zn	5	4.5	4.386	0.997	0.616	S
H2	Zn	9	8	7.315	1.91	0.882	S
H3	Zn	105	105	100.289	16.621	0.283	S
H4	Zn	100	100	94.667	15.007	0.355	S

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

^x 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 – 29th intercomparison of analytical methods

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 ^α
H1	As	0.4	0.55	0.482	0.204	-0.404	Q
H2	As	0.2	0.3	0.293	0.165	-0.565	Q
H3	As	6	7.5	7.142	0.884	-1.292	Q
H4	As	4.2	5	4.681	0.781	-0.616	Q
H1	Cd	< 0.060	0.04	0.032	0.013		B
H2	Cd	0.06	0.08	0.074	0.014	-1.033	Q
H3	Cd	0.6	0.7	0.649	0.088	-0.563	S
H4	Cd	0.65	0.75	0.694	0.089	-0.499	S
H1	Cr	0.92	0.8	0.835	0.279	0.303	S
H2	Cr	0.98	0.85	0.877	0.275	0.373	S
H3	Cr	6.9	6.4	6.327	0.779	0.736	S
H4	Cr	5.3	5	5.011	0.594	0.487	S
H1	Cu	1.1	1.1	0.994	0.264	0.401	S
H2	Cu	0.94	0.9	0.835	0.254	0.413	S
H3	Cu	7.6	8	7.515	1.027	0.083	S
H4	Cu	6.2	6.5	6.269	0.695	-0.099	S
H1	Ni	0.87	0.75	0.879	0.159	-0.059	S
H2	Ni	< 0.800	0.5	0.589	0.213		B
H3	Ni	10.1	9.9	9.69	1.138	0.36	S
H4	Ni	11.3	11	10.814	1.277	0.381	S
H1	Pb	1.5	1.5	1.422	0.362	0.215	S
H2	Pb	1.16	1.1	1.173	0.578	-0.022	S
H3	Pb	20.9	21	20.64	2.05	0.127	S
H4	Pb	25	24.5	23.398	1.81	0.885	S
H1	Zn	< 8.000	4.5	4.386	0.997		B
H2	Zn	< 8.000	8	7.315	1.91	-1.736	Q
H3	Zn	80	105	100.289	16.621	-1.221	Q
H4	Zn	76	100	94.667	15.007	-1.244	Q

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

^α 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 – 29th intercomparison of analytical methods

Laboratory 47, Jelenia Gora (Poland)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
H1	As	< 0.012	0.55	0.482	0.204	-2.337	U
H2	As	< 0.012	0.3	0.293	0.165	-1.742	U
H3	As	< 0.012	7.5	7.142	0.884	-8.071	U
H4	As	< 0.012	5	4.681	0.781	-5.982	U
H1	Cd	< 0.001	0.04	0.032	0.013	-2.382	U
H2	Cd	< 0.001	0.08	0.074	0.014	-5.41	U
H3	Cd	0.001	0.7	0.649	0.088	-7.398	U
H4	Cd	0.001	0.75	0.694	0.089	-7.817	U
H1	Cr	< 0.002	0.8	0.835	0.279	-2.991	U
H2	Cr	< 0.002	0.85	0.877	0.275	-3.183	U
H3	Cr	0.007	6.4	6.327	0.779	-8.109	U
H4	Cr	0.005	5	5.011	0.594	-8.421	U
H1	Cu	< 0.002	1.1	0.994	0.264	-3.761	U
H2	Cu	< 0.002	0.9	0.835	0.254	-3.28	U
H3	Cu	0.008	8	7.515	1.027	-7.312	U
H4	Cu	0.007	6.5	6.269	0.695	-9.003	U
H1	Ni	< 0.003	0.75	0.879	0.159	-5.511	U
H2	Ni	< 0.003	0.5	0.589	0.213	-2.758	U
H3	Ni	0.011	9.9	9.69	1.138	-8.507	U
H4	Ni	0.012	11	10.814	1.277	-8.456	U
H1	Pb	< 0.007	1.5	1.422	0.362	-3.923	U
H2	Pb	< 0.007	1.1	1.173	0.578	-2.023	U
H3	Pb	0.021	21	20.64	2.05	-10.059	U
H4	Pb	0.026	24.5	23.398	1.81	-12.916	U
H1	Zn	0.005	4.5	4.386	0.997	-4.394	U
H2	Zn	0.009	8	7.315	1.91	-3.826	U
H3	Zn	0.102	105	100.289	16.621	-6.028	U
H4	Zn	0.096	100	94.667	15.007	-6.302	U

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

^x 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 – 29th intercomparison of analytical methods

Laboratory 39, Environmental Monitoring Laboratory, Institute of Environmental Protection (Poland)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
H1	As	-999	0.55	0.482	0.204		B
H2	As	-999	0.3	0.293	0.165		B
H3	As	-999	7.5	7.142	0.884		B
H4	As	-999	5	4.681	0.781		B
H1	Cd	-999	0.04	0.032	0.013		B
H2	Cd	-999	0.08	0.074	0.014		B
H3	Cd	-999	0.7	0.649	0.088		B
H4	Cd	-999	0.75	0.694	0.089		B
H1	Cr	-999	0.8	0.835	0.279		B
H2	Cr	-999	0.85	0.877	0.275		B
H3	Cr	-999	6.4	6.327	0.779		B
H4	Cr	-999	5	5.011	0.594		B
H1	Cu	-999	1.1	0.994	0.264		B
H2	Cu	-999	0.9	0.835	0.254		B
H3	Cu	-999	8	7.515	1.027		B
H4	Cu	-999	6.5	6.269	0.695		B
H1	Ni	-999	0.75	0.879	0.159		B
H2	Ni	-999	0.5	0.589	0.213		B
H3	Ni	-999	9.9	9.69	1.138		B
H4	Ni	-999	11	10.814	1.277		B
H1	Pb	-999	1.5	1.422	0.362		B
H2	Pb	-999	1.1	1.173	0.578		B
H3	Pb	-999	21	20.64	2.05		B
H4	Pb	-999	24.5	23.398	1.81		B
H1	Zn	-999	4.5	4.386	0.997		B
H2	Zn	-999	8	7.315	1.91		B
H3	Zn	-999	105	100.289	16.621		B
H4	Zn	-999	100	94.667	15.007		B

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

^x EMEP quality norm; the letters in the column indicates:

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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 – 29th intercomparison of analytical methods

Laboratory 110, Thüringer Landesanstalt für 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 ^α
H1	As	0.52	0.55	0.482	0.204	0.185	S
H2	As	0.28	0.3	0.293	0.165	-0.08	S
H3	As	6.8	7.5	7.142	0.884	-0.387	S
H4	As	4.57	5	4.681	0.781	-0.142	S
H1	Cd	< 0.050	0.04	0.032	0.013		B
H2	Cd	< 0.050	0.08	0.074	0.014	-3.608	U
H3	Cd	0.62	0.7	0.649	0.088	-0.335	S
H4	Cd	0.6	0.75	0.694	0.089	-1.063	Q
H1	Cr	0.65	0.8	0.835	0.279	-0.665	S
H2	Cr	0.67	0.85	0.877	0.275	-0.753	S
H3	Cr	8.91	6.4	6.327	0.779	3.315	U
H4	Cr	4.47	5	5.011	0.594	-0.909	S
H1	Cu	1.18	1.1	0.994	0.264	0.704	S
H2	Cu	0.94	0.9	0.835	0.254	0.413	S
H3	Cu	7.65	8	7.515	1.027	0.132	S
H4	Cu	6.31	6.5	6.269	0.695	0.059	S
H1	Ni	0.95	0.75	0.879	0.159	0.443	Q
H2	Ni	0.63	0.5	0.589	0.213	0.191	Q
H3	Ni	8.47	9.9	9.69	1.138	-1.072	S
H4	Ni	9.55	11	10.814	1.277	-0.989	S
H1	Pb	1.69	1.5	1.422	0.362	0.74	S
H2	Pb	1.26	1.1	1.173	0.578	0.151	S
H3	Pb	20.4	21	20.64	2.05	-0.117	S
H4	Pb	24.2	24.5	23.398	1.81	0.443	S
H1	Zn	3.11	4.5	4.386	0.997	-1.28	Q
H2	Zn	6.08	8	7.315	1.91	-0.647	S
H3	Zn	103	105	100.289	16.621	0.163	S
H4	Zn	94.5	100	94.667	15.007	-0.011	S

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

^α 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 – 29th intercomparison of analytical methods

Laboratory 112, Niedersächsische 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 ^x
H1	As	-999	0.55	0.482	0.204		B
H2	As	-999	0.3	0.293	0.165		B
H3	As	-999	7.5	7.142	0.884		B
H4	As	-999	5	4.681	0.781		B
H1	Cd	0.04	0.04	0.032	0.013	0.647	S
H2	Cd	0.08	0.08	0.074	0.014	0.438	S
H3	Cd	0.69	0.7	0.649	0.088	0.464	S
H4	Cd	0.74	0.75	0.694	0.089	0.516	S
H1	Cr	0.79	0.8	0.835	0.279	-0.163	S
H2	Cr	0.91	0.85	0.877	0.275	0.118	S
H3	Cr	6.64	6.4	6.327	0.779	0.402	S
H4	Cr	5.08	5	5.011	0.594	0.117	S
H1	Cu	0.64	1.1	0.994	0.264	-1.341	Q
H2	Cu	0.56	0.9	0.835	0.254	-1.081	Q
H3	Cu	7.02	8	7.515	1.027	-0.482	S
H4	Cu	5.54	6.5	6.269	0.695	-1.048	S
H1	Ni	0.87	0.75	0.879	0.159	-0.059	S
H2	Ni	0.64	0.5	0.589	0.213	0.238	Q
H3	Ni	10.03	9.9	9.69	1.138	0.299	S
H4	Ni	11.2	11	10.814	1.277	0.302	S
H1	Pb	1.48	1.5	1.422	0.362	0.16	S
H2	Pb	1.21	1.1	1.173	0.578	0.064	S
H3	Pb	20.38	21	20.64	2.05	-0.127	S
H4	Pb	23.79	24.5	23.398	1.81	0.217	S
H1	Zn	4.48	4.5	4.386	0.997	0.094	S
H2	Zn	10.35	8	7.315	1.91	1.589	Q
H3	Zn	101.83	105	100.289	16.621	0.093	S
H4	Zn	95.79	100	94.667	15.007	0.075	S

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

^x 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 – 29th intercomparison of analytical methods

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 ^x
H1	As	< 4.000	0.55	0.482	0.204		B
H2	As	< 4.000	0.3	0.293	0.165		B
H3	As	7.103	7.5	7.142	0.884	-0.045	S
H4	As	< 4.000	5	4.681	0.781	-3.431	U
H1	Cd	< 0.400	0.04	0.032	0.013		B
H2	Cd	< 0.400	0.08	0.074	0.014		B
H3	Cd	0.685	0.7	0.649	0.088	0.407	S
H4	Cd	0.639	0.75	0.694	0.089	-0.623	S
H1	Cr	2.845	0.8	0.835	0.279	7.203	U
H2	Cr	2.895	0.85	0.877	0.275	7.328	U
H3	Cr	7.16	6.4	6.327	0.779	1.069	S
H4	Cr	6.82	5	5.011	0.594	3.044	U
H1	Cu	< 4.000	1.1	0.994	0.264		B
H2	Cu	< 4.000	0.9	0.835	0.254		B
H3	Cu	5.635	8	7.515	1.027	-1.831	Q
H4	Cu	< 4.000	6.5	6.269	0.695	-6.138	U
H1	Ni	< 2.000	0.75	0.879	0.159		B
H2	Ni	< 2.000	0.5	0.589	0.213		B
H3	Ni	8.53	9.9	9.69	1.138	-1.02	S
H4	Ni	9.305	11	10.814	1.277	-1.181	Q
H1	Pb	< 4.000	1.5	1.422	0.362		B
H2	Pb	5.433	1.1	1.173	0.578	7.37	U
H3	Pb	23.575	21	20.64	2.05	1.432	S
H4	Pb	21.4	24.5	23.398	1.81	-1.104	S
H1	Zn	< 7.000	4.5	4.386	0.997		B
H2	Zn	< 7.000	8	7.315	1.91	-1.998	U
H3	Zn	95.35	105	100.289	16.621	-0.297	S
H4	Zn	89.825	100	94.667	15.007	-0.323	S

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

^x 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 – 29th intercomparison of analytical methods

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 ^α
H1	As	1.2	0.55	0.482	0.204	3.523	U
H2	As	2.5	0.3	0.293	0.165	13.384	U
H3	As	7.9	7.5	7.142	0.884	0.857	S
H4	As	5.9	5	4.681	0.781	1.56	Q
H1	Cd	0.1	0.04	0.032	0.013	5.248	U
H2	Cd	0.1	0.08	0.074	0.014	1.909	Q
H3	Cd	0.6	0.7	0.649	0.088	-0.563	S
H4	Cd	0.6	0.75	0.694	0.089	-1.063	Q
H1	Cr	0.8	0.8	0.835	0.279	-0.127	S
H2	Cr	0.8	0.85	0.877	0.275	-0.281	S
H3	Cr	5.4	6.4	6.327	0.779	-1.189	Q
H4	Cr	4.2	5	5.011	0.594	-1.364	Q
H1	Cu	1.1	1.1	0.994	0.264	0.401	S
H2	Cu	0.9	0.9	0.835	0.254	0.256	S
H3	Cu	6.8	8	7.515	1.027	-0.696	Q
H4	Cu	5.5	6.5	6.269	0.695	-1.105	Q
H1	Ni	0.9	0.75	0.879	0.159	0.129	S
H2	Ni	0.4	0.5	0.589	0.213	-0.888	S
H3	Ni	8.8	9.9	9.69	1.138	-0.782	S
H4	Ni	9.6	11	10.814	1.277	-0.95	S
H1	Pb	-999	1.5	1.422	0.362		B
H2	Pb	-999	1.1	1.173	0.578		B
H3	Pb	18.1	21	20.64	2.05	-1.239	S
H4	Pb	24.8	24.5	23.398	1.81	0.775	S
H1	Zn	4	4.5	4.386	0.997	-0.387	S
H2	Zn	7.5	8	7.315	1.91	0.097	S
H3	Zn	106	105	100.289	16.621	0.344	S
H4	Zn	102	100	94.667	15.007	0.489	S

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

^α 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

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

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EMEP – 29th intercomparison of analytical methods

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

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
H1	As	0.545	0.55	0.482	0.204	0.308	S
H2	As	0.329	0.3	0.293	0.165	0.217	S
H3	As	7.59	7.5	7.142	0.884	0.506	S
H4	As	5.03	5	4.681	0.781	0.447	S
H1	Cd	0.042	0.04	0.032	0.013	0.801	S
H2	Cd	0.081	0.08	0.074	0.014	0.511	S
H3	Cd	0.673	0.7	0.649	0.088	0.27	S
H4	Cd	0.725	0.75	0.694	0.089	0.347	S
H1	Cr	0.99	0.8	0.835	0.279	0.554	S
H2	Cr	1.04	0.85	0.877	0.275	0.591	S
H3	Cr	6.8	6.4	6.327	0.779	0.607	S
H4	Cr	5.27	5	5.011	0.594	0.437	S
H1	Cu	1.15	1.1	0.994	0.264	0.59	S
H2	Cu	0.944	0.9	0.835	0.254	0.429	S
H3	Cu	8.39	8	7.515	1.027	0.853	S
H4	Cu	6.77	6.5	6.269	0.695	0.721	S
H1	Ni	1.03	0.75	0.879	0.159	0.945	Q
H2	Ni	0.677	0.5	0.589	0.213	0.411	Q
H3	Ni	10.6	9.9	9.69	1.138	0.8	S
H4	Ni	11.8	11	10.814	1.277	0.772	S
H1	Pb	1.47	1.5	1.422	0.362	0.132	S
H2	Pb	1.13	1.1	1.173	0.578	-0.074	S
H3	Pb	18.7	21	20.64	2.05	-0.946	S
H4	Pb	22.2	24.5	23.398	1.81	-0.662	S
H1	Zn	4.8	4.5	4.386	0.997	0.415	S
H2	Zn	8.11	8	7.315	1.91	0.416	S
H3	Zn	103.6	105	100.289	16.621	0.199	S
H4	Zn	98	100	94.667	15.007	0.222	S

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

^x 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 – 29th intercomparison of analytical methods

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 ^x
H1	As	-999	0.55	0.482	0.204		B
H2	As	-999	0.3	0.293	0.165		B
H3	As	-999	7.5	7.142	0.884		B
H4	As	-999	5	4.681	0.781		B
H1	Cd	< 0.050	0.04	0.032	0.013		B
H2	Cd	0.085	0.08	0.074	0.014	0.805	S
H3	Cd	0.68	0.7	0.649	0.088	0.349	S
H4	Cd	0.71	0.75	0.694	0.089	0.178	S
H1	Cr	1.241	0.8	0.835	0.279	1.454	U
H2	Cr	1.28	0.85	0.877	0.275	1.462	U
H3	Cr	6.602	6.4	6.327	0.779	0.353	S
H4	Cr	5.42	5	5.011	0.594	0.689	S
H1	Cu	0.98	1.1	0.994	0.264	-0.053	S
H2	Cu	0.77	0.9	0.835	0.254	-0.255	S
H3	Cu	7.67	8	7.515	1.027	0.151	S
H4	Cu	6.05	6.5	6.269	0.695	-0.314	S
H1	Ni	1.48	0.75	0.879	0.159	3.77	U
H2	Ni	< 0.700	0.5	0.589	0.213		B
H3	Ni	9.84	9.9	9.69	1.138	0.132	S
H4	Ni	11.12	11	10.814	1.277	0.24	S
H1	Pb	1.83	1.5	1.422	0.362	1.128	Q
H2	Pb	1.38	1.1	1.173	0.578	0.358	Q
H3	Pb	18.68	21	20.64	2.05	-0.956	S
H4	Pb	21.95	24.5	23.398	1.81	-0.8	S
H1	Zn	5.25	4.5	4.386	0.997	0.866	S
H2	Zn	8.4	8	7.315	1.91	0.568	S
H3	Zn	99.4	105	100.289	16.621	-0.053	S
H4	Zn	94.1	100	94.667	15.007	-0.038	S

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

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

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EMEP – 29th intercomparison of analytical methods

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 ^x
H1	As	0.5	0.55	0.482	0.204	0.087	S
H2	As	0.4	0.3	0.293	0.165	0.648	Q
H3	As	6.5	7.5	7.142	0.884	-0.727	S
H4	As	4.5	5	4.681	0.781	-0.232	S
H1	Cd	0.01	0.04	0.032	0.013	-1.654	U
H2	Cd	0.05	0.08	0.074	0.014	-1.769	Q
H3	Cd	0.75	0.7	0.649	0.088	1.148	S
H4	Cd	0.83	0.75	0.694	0.089	1.531	S
H1	Cr	1.9	0.8	0.835	0.279	3.816	U
H2	Cr	1.9	0.85	0.877	0.275	3.714	U
H3	Cr	7.4	6.4	6.327	0.779	1.377	Q
H4	Cr	6	5	5.011	0.594	1.665	Q
H1	Cu	9.3	1.1	0.994	0.264	31.454	U
H2	Cu	9.5	0.9	0.835	0.254	34.086	U
H3	Cu	14.2	8	7.515	1.027	6.512	U
H4	Cu	12.8	6.5	6.269	0.695	9.391	U
H1	Ni	0.8	0.75	0.879	0.159	-0.499	S
H2	Ni	0.5	0.5	0.589	0.213	-0.419	S
H3	Ni	10.1	9.9	9.69	1.138	0.36	S
H4	Ni	11.3	11	10.814	1.277	0.381	S
H1	Pb	0.8	1.5	1.422	0.362	-1.72	U
H2	Pb	0.3	1.1	1.173	0.578	-1.51	U
H3	Pb	20.5	21	20.64	2.05	-0.068	S
H4	Pb	24.3	24.5	23.398	1.81	0.498	S
H1	Zn	4.6	4.5	4.386	0.997	0.214	S
H2	Zn	7.9	8	7.315	1.91	0.306	S
H3	Zn	104.4	105	100.289	16.621	0.247	S
H4	Zn	99.3	100	94.667	15.007	0.309	S

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

^x 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 – 29th intercomparison of analytical methods

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 ^α
H1	As	0.1	0.55	0.482	0.204	-1.876	U
H2	As	< 0.100	0.3	0.293	0.165	-1.475	U
H3	As	8.8	7.5	7.142	0.884	1.875	Q
H4	As	5.8	5	4.681	0.781	1.432	Q
H1	Cd	< 0.100	0.04	0.032	0.013		B
H2	Cd	0.1	0.08	0.074	0.014	1.909	Q
H3	Cd	0.7	0.7	0.649	0.088	0.578	S
H4	Cd	0.8	0.75	0.694	0.089	1.193	S
H1	Cr	0.8	0.8	0.835	0.279	-0.127	S
H2	Cr	0.9	0.85	0.877	0.275	0.082	S
H3	Cr	6.9	6.4	6.327	0.779	0.736	S
H4	Cr	5.6	5	5.011	0.594	0.992	S
H1	Cu	1.1	1.1	0.994	0.264	0.401	S
H2	Cu	1	0.9	0.835	0.254	0.649	S
H3	Cu	7.7	8	7.515	1.027	0.181	S
H4	Cu	6.3	6.5	6.269	0.695	0.045	S
H1	Ni	< 1.000	0.75	0.879	0.159		B
H2	Ni	< 1.000	0.5	0.589	0.213		B
H3	Ni	11	9.9	9.69	1.138	1.151	S
H4	Ni	12	11	10.814	1.277	0.928	S
H1	Pb	1	1.5	1.422	0.362	-1.167	U
H2	Pb	1	1.1	1.173	0.578	-0.299	S
H3	Pb	21	21	20.64	2.05	0.176	S
H4	Pb	24	24.5	23.398	1.81	0.333	S
H1	Zn	6	4.5	4.386	0.997	1.619	Q
H2	Zn	8.8	8	7.315	1.91	0.777	S
H3	Zn	100.8	105	100.289	16.621	0.031	S
H4	Zn	96.7	100	94.667	15.007	0.135	S

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

^α 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 – 29th intercomparison of analytical methods

Laboratory 121, Landeslabor Schleswig-Holsteinmwelt (Germany)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
H1	As	0.59	0.55	0.482	0.204	0.529	S
H2	As	0.36	0.3	0.293	0.165	0.405	S
H3	As	7.6	7.5	7.142	0.884	0.518	S
H4	As	5	5	4.681	0.781	0.408	S
H1	Cd	0.03	0.04	0.032	0.013	-0.12	Q
H2	Cd	0.08	0.08	0.074	0.014	0.438	S
H3	Cd	0.75	0.7	0.649	0.088	1.148	S
H4	Cd	0.79	0.75	0.694	0.089	1.08	S
H1	Cr	0.76	0.8	0.835	0.279	-0.27	S
H2	Cr	0.78	0.85	0.877	0.275	-0.354	S
H3	Cr	6.4	6.4	6.327	0.779	0.094	S
H4	Cr	5.1	5	5.011	0.594	0.151	S
H1	Cu	0.89	1.1	0.994	0.264	-0.394	S
H2	Cu	0.71	0.9	0.835	0.254	-0.491	S
H3	Cu	7.6	8	7.515	1.027	0.083	S
H4	Cu	6.2	6.5	6.269	0.695	-0.099	S
H1	Ni	0.74	0.75	0.879	0.159	-0.875	S
H2	Ni	0.35	0.5	0.589	0.213	-1.123	Q
H3	Ni	10.2	9.9	9.69	1.138	0.448	S
H4	Ni	11.8	11	10.814	1.277	0.772	S
H1	Pb	1.5	1.5	1.422	0.362	0.215	S
H2	Pb	1	1.1	1.173	0.578	-0.299	S
H3	Pb	22.4	21	20.64	2.05	0.858	S
H4	Pb	26.5	24.5	23.398	1.81	1.714	S
H1	Zn	4.7	4.5	4.386	0.997	0.315	S
H2	Zn	7.9	8	7.315	1.91	0.306	S
H3	Zn	120	105	100.289	16.621	1.186	S
H4	Zn	113	100	94.667	15.007	1.222	S

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

^x 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 – 29th intercomparison of analytical methods

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 ^x
H1	As	< 15.000	0.55	0.482	0.204		B
H2	As	< 15.000	0.3	0.293	0.165		B
H3	As	< 15.000	7.5	7.142	0.884		B
H4	As	< 15.000	5	4.681	0.781		B
H1	Cd	< 2.000	0.04	0.032	0.013		B
H2	Cd	< 2.000	0.08	0.074	0.014		B
H3	Cd	< 2.000	0.7	0.649	0.088		B
H4	Cd	< 2.000	0.75	0.694	0.089		B
H1	Cr	< 2.000	0.8	0.835	0.279		B
H2	Cr	< 2.000	0.85	0.877	0.275		B
H3	Cr	6.4	6.4	6.327	0.779	0.094	S
H4	Cr	5.35	5	5.011	0.594	0.571	S
H1	Cu	< 2.000	1.1	0.994	0.264		B
H2	Cu	< 2.000	0.9	0.835	0.254		B
H3	Cu	7.57	8	7.515	1.027	0.054	S
H4	Cu	6.77	6.5	6.269	0.695	0.721	S
H1	Ni	< 5.000	0.75	0.879	0.159		B
H2	Ni	< 5.000	0.5	0.589	0.213		B
H3	Ni	9.49	9.9	9.69	1.138	-0.176	S
H4	Ni	10.56	11	10.814	1.277	-0.199	S
H1	Pb	< 5.000	1.5	1.422	0.362		B
H2	Pb	< 5.000	1.1	1.173	0.578		B
H3	Pb	21.3	21	20.64	2.05	0.322	S
H4	Pb	22.7	24.5	23.398	1.81	-0.386	S
H1	Zn	< 10.000	4.5	4.386	0.997		B
H2	Zn	< 10.000	8	7.315	1.91		B
H3	Zn	96.07	105	100.289	16.621	-0.254	S
H4	Zn	91.64	100	94.667	15.007	-0.202	S

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

^x 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 – 29th intercomparison of analytical methods

Laboratory 125, Bayerisches Landesamt für 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 ^α
H1	As	0.514	0.55	0.482	0.204	0.156	S
H2	As	0.284	0.3	0.293	0.165	-0.056	S
H3	As	6.43	7.5	7.142	0.884	-0.806	S
H4	As	4.59	5	4.681	0.781	-0.117	S
H1	Cd	0.038	0.04	0.032	0.013	0.494	S
H2	Cd	0.076	0.08	0.074	0.014	0.143	S
H3	Cd	0.645	0.7	0.649	0.088	-0.05	S
H4	Cd	0.681	0.75	0.694	0.089	-0.149	S
H1	Cr	0.869	0.8	0.835	0.279	0.12	S
H2	Cr	0.882	0.85	0.877	0.275	0.017	S
H3	Cr	6.41	6.4	6.327	0.779	0.107	S
H4	Cr	5.05	5	5.011	0.594	0.066	S
H1	Cu	1.18	1.1	0.994	0.264	0.704	S
H2	Cu	0.934	0.9	0.835	0.254	0.39	S
H3	Cu	8.01	8	7.515	1.027	0.483	S
H4	Cu	6.56	6.5	6.269	0.695	0.419	S
H1	Ni	0.993	0.75	0.879	0.159	0.713	Q
H2	Ni	0.654	0.5	0.589	0.213	0.303	Q
H3	Ni	10	9.9	9.69	1.138	0.272	S
H4	Ni	11.4	11	10.814	1.277	0.459	S
H1	Pb	1.65	1.5	1.422	0.362	0.63	S
H2	Pb	1.26	1.1	1.173	0.578	0.151	S
H3	Pb	20.9	21	20.64	2.05	0.127	S
H4	Pb	24.5	24.5	23.398	1.81	0.609	S
H1	Zn	3.92	4.5	4.386	0.997	-0.468	S
H2	Zn	6.89	8	7.315	1.91	-0.223	S
H3	Zn	88.8	105	100.289	16.621	-0.691	Q
H4	Zn	85	100	94.667	15.007	-0.644	S

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

^α 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 – 29th intercomparison of analytical methods

Laboratory 127, Dept. of Chemistry Malaysia, Environmental Health Division (Malaysia)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
H1	As	1.4	0.55	0.482	0.204	4.504	U
H2	As	0.5	0.3	0.293	0.165	1.254	U
H3	As	7.1	7.5	7.142	0.884	-0.048	S
H4	As	4.6	5	4.681	0.781	-0.104	S
H1	Cd	< 0.200	0.04	0.032	0.013		B
H2	Cd	< 0.200	0.08	0.074	0.014		B
H3	Cd	0.6	0.7	0.649	0.088	-0.563	S
H4	Cd	0.7	0.75	0.694	0.089	0.065	S
H1	Cr	0.8	0.8	0.835	0.279	-0.127	S
H2	Cr	1.1	0.85	0.877	0.275	0.808	Q
H3	Cr	6.4	6.4	6.327	0.779	0.094	S
H4	Cr	4.7	5	5.011	0.594	-0.522	S
H1	Cu	0.8	1.1	0.994	0.264	-0.735	Q
H2	Cu	0.9	0.9	0.835	0.254	0.256	S
H3	Cu	7.6	8	7.515	1.027	0.083	S
H4	Cu	6	6.5	6.269	0.695	-0.386	S
H1	Ni	< 2.000	0.75	0.879	0.159		B
H2	Ni	< 2.000	0.5	0.589	0.213		B
H3	Ni	9.7	9.9	9.69	1.138	0.009	S
H4	Ni	10.7	11	10.814	1.277	-0.089	S
H1	Pb	1.3	1.5	1.422	0.362	-0.338	S
H2	Pb	1.2	1.1	1.173	0.578	0.047	S
H3	Pb	20.4	21	20.64	2.05	-0.117	S
H4	Pb	23.5	24.5	23.398	1.81	0.056	S
H1	Zn	2.8	4.5	4.386	0.997	-1.591	Q
H2	Zn	6	8	7.315	1.91	-0.689	S
H3	Zn	93.9	105	100.289	16.621	-0.384	S
H4	Zn	90.3	100	94.667	15.007	-0.291	S

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

^x 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 – 29th intercomparison of analytical methods

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 ^x
H1	As	-999	0.55	0.482	0.204		B
H2	As	-999	0.3	0.293	0.165		B
H3	As	-999	7.5	7.142	0.884		B
H4	As	-999	5	4.681	0.781		B
H1	Cd	< 5.000	0.04	0.032	0.013		B
H2	Cd	< 5.000	0.08	0.074	0.014		B
H3	Cd	< 5.000	0.7	0.649	0.088		B
H4	Cd	< 5.000	0.75	0.694	0.089		B
H1	Cr	< 5.000	0.8	0.835	0.279		B
H2	Cr	< 5.000	0.85	0.877	0.275		B
H3	Cr	5.9	6.4	6.327	0.779	-0.548	S
H4	Cr	4.9	5	5.011	0.594	-0.186	S
H1	Cu	10.1	1.1	0.994	0.264	34.483	U
H2	Cu	5.5	0.9	0.835	0.254	18.351	U
H3	Cu	9.66	8	7.515	1.027	2.09	Q
H4	Cu	7.5	6.5	6.269	0.695	1.77	Q
H1	Ni	< 5.000	0.75	0.879	0.159		B
H2	Ni	< 5.000	0.5	0.589	0.213		B
H3	Ni	9.98	9.9	9.69	1.138	0.255	S
H4	Ni	< 5.000	11	10.814	1.277	-6.508	U
H1	Pb	8.2	1.5	1.422	0.362	18.74	U
H2	Pb	7.6	1.1	1.173	0.578	11.119	U
H3	Pb	26.88	21	20.64	2.05	3.044	Q
H4	Pb	20.1	24.5	23.398	1.81	-1.823	Q
H1	Zn	< 5.000	4.5	4.386	0.997		B
H2	Zn	6.9	8	7.315	1.91	-0.217	S
H3	Zn	94.97	105	100.289	16.621	-0.32	S
H4	Zn	90.85	100	94.667	15.007	-0.254	S

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

^x 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 – 29th intercomparison of analytical methods

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 ^x
H1	As	-999	0.55	0.482	0.204		B
H2	As	-999	0.3	0.293	0.165		B
H3	As	-999	7.5	7.142	0.884		B
H4	As	-999	5	4.681	0.781		B
H1	Cd	0.031	0.04	0.032	0.013	-0.043	S
H2	Cd	0.068	0.08	0.074	0.014	-0.445	S
H3	Cd	0.667	0.7	0.649	0.088	0.201	S
H4	Cd	0.696	0.75	0.694	0.089	0.02	S
H1	Cr	-999	0.8	0.835	0.279		B
H2	Cr	-999	0.85	0.877	0.275		B
H3	Cr	-999	6.4	6.327	0.779		B
H4	Cr	-999	5	5.011	0.594		B
H1	Cu	-999	1.1	0.994	0.264		B
H2	Cu	-999	0.9	0.835	0.254		B
H3	Cu	-999	8	7.515	1.027		B
H4	Cu	-999	6.5	6.269	0.695		B
H1	Ni	-999	0.75	0.879	0.159		B
H2	Ni	-999	0.5	0.589	0.213		B
H3	Ni	-999	9.9	9.69	1.138		B
H4	Ni	-999	11	10.814	1.277		B
H1	Pb	-999	1.5	1.422	0.362		B
H2	Pb	-999	1.1	1.173	0.578		B
H3	Pb	-999	21	20.64	2.05		B
H4	Pb	-999	24.5	23.398	1.81		B
H1	Zn	-999	4.5	4.386	0.997		B
H2	Zn	-999	8	7.315	1.91		B
H3	Zn	-999	105	100.289	16.621		B
H4	Zn	-999	100	94.667	15.007		B

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

^x 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 – 29th intercomparison of analytical methods

Laboratory 146, Luxembourg Institute of Science and Technology (LIST) (Luxembourg)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
H1	As	< 1.000	0.55	0.482	0.204		B
H2	As	< 1.000	0.3	0.293	0.165		B
H3	As	7.076	7.5	7.142	0.884	-0.075	S
H4	As	4.73	5	4.681	0.781	0.063	S
H1	Cd	0.043	0.04	0.032	0.013	0.877	S
H2	Cd	0.078	0.08	0.074	0.014	0.291	S
H3	Cd	0.625	0.7	0.649	0.088	-0.278	S
H4	Cd	0.674	0.75	0.694	0.089	-0.228	S
H1	Cr	0.842	0.8	0.835	0.279	0.023	S
H2	Cr	0.918	0.85	0.877	0.275	0.147	S
H3	Cr	6.489	6.4	6.327	0.779	0.208	S
H4	Cr	5.242	5	5.011	0.594	0.389	S
H1	Cu	1.091	1.1	0.994	0.264	0.367	S
H2	Cu	0.956	0.9	0.835	0.254	0.476	S
H3	Cu	7.95	8	7.515	1.027	0.424	S
H4	Cu	6.431	6.5	6.269	0.695	0.233	S
H1	Ni	1.045	0.75	0.879	0.159	1.039	Q
H2	Ni	0.741	0.5	0.589	0.213	0.712	Q
H3	Ni	10.968	9.9	9.69	1.138	1.123	S
H4	Ni	12.316	11	10.814	1.277	1.176	S
H1	Pb	1.611	1.5	1.422	0.362	0.522	S
H2	Pb	1.229	1.1	1.173	0.578	0.097	S
H3	Pb	21.083	21	20.64	2.05	0.216	S
H4	Pb	24.546	24.5	23.398	1.81	0.634	S
H1	Zn	3.935	4.5	4.386	0.997	-0.452	S
H2	Zn	6.831	8	7.315	1.91	-0.254	S
H3	Zn	89.723	105	100.289	16.621	-0.636	S
H4	Zn	84.537	100	94.667	15.007	-0.675	Q

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

^x 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 – 29th intercomparison of analytical methods

Laboratory 159, CARSO, Lyon (France)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
H1	As	0.48	0.55	0.482	0.204	-0.011	S
H2	As	0.24	0.3	0.293	0.165	-0.323	S
H3	As	7.4	7.5	7.142	0.884	0.291	S
H4	As	4.9	5	4.681	0.781	0.28	S
H1	Cd	< 0.100	0.04	0.032	0.013		B
H2	Cd	< 0.100	0.08	0.074	0.014		B
H3	Cd	0.6	0.7	0.649	0.088	-0.563	S
H4	Cd	0.69	0.75	0.694	0.089	-0.048	S
H1	Cr	0.63	0.8	0.835	0.279	-0.736	S
H2	Cr	0.65	0.85	0.877	0.275	-0.826	S
H3	Cr	6.1	6.4	6.327	0.779	-0.291	S
H4	Cr	4.8	5	5.011	0.594	-0.354	S
H1	Cu	1	1.1	0.994	0.264	0.022	S
H2	Cu	< 1.000	0.9	0.835	0.254		B
H3	Cu	7.7	8	7.515	1.027	0.181	S
H4	Cu	6.3	6.5	6.269	0.695	0.045	S
H1	Ni	0.89	0.75	0.879	0.159	0.066	S
H2	Ni	0.49	0.5	0.589	0.213	-0.466	S
H3	Ni	10	9.9	9.69	1.138	0.272	S
H4	Ni	11	11	10.814	1.277	0.146	S
H1	Pb	1.5	1.5	1.422	0.362	0.215	S
H2	Pb	1.1	1.1	1.173	0.578	-0.126	S
H3	Pb	21	21	20.64	2.05	0.176	S
H4	Pb	24	24.5	23.398	1.81	0.333	S
H1	Zn	< 10.000	4.5	4.386	0.997		B
H2	Zn	< 10.000	8	7.315	1.91		B
H3	Zn	103	105	100.289	16.621	0.163	S
H4	Zn	103	100	94.667	15.007	0.555	S

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

^x 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 – 29th intercomparison of analytical methods

Laboratory 160, Coillte, Wicklow (Ireland)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
H1	As	0.515	0.55	0.482	0.204	0.161	S
H2	As	< 0.170	0.3	0.293	0.165	-1.263	U
H3	As	8.894	7.5	7.142	0.884	1.981	Q
H4	As	5.562	5	4.681	0.781	1.127	S
H1	Cd	0.029	0.04	0.032	0.013	-0.196	Q
H2	Cd	0.067	0.08	0.074	0.014	-0.519	S
H3	Cd	0.824	0.7	0.649	0.088	1.993	Q
H4	Cd	0.79	0.75	0.694	0.089	1.08	S
H1	Cr	2.567	0.8	0.835	0.279	6.207	U
H2	Cr	2.546	0.85	0.877	0.275	6.06	U
H3	Cr	9.258	6.4	6.327	0.779	3.761	U
H4	Cr	7.604	5	5.011	0.594	4.363	U
H1	Cu	1.383	1.1	0.994	0.264	1.473	Q
H2	Cu	0.955	0.9	0.835	0.254	0.472	S
H3	Cu	10.17	8	7.515	1.027	2.586	Q
H4	Cu	8.093	6.5	6.269	0.695	2.623	Q
H1	Ni	1.203	0.75	0.879	0.159	2.031	U
H2	Ni	0.906	0.5	0.589	0.213	1.486	U
H3	Ni	13.15	9.9	9.69	1.138	3.041	U
H4	Ni	15.07	11	10.814	1.277	3.332	U
H1	Pb	1.451	1.5	1.422	0.362	0.08	S
H2	Pb	1.145	1.1	1.173	0.578	-0.048	S
H3	Pb	18.72	21	20.64	2.05	-0.937	S
H4	Pb	20.95	24.5	23.398	1.81	-1.353	S
H1	Zn	6.288	4.5	4.386	0.997	1.907	Q
H2	Zn	10.43	8	7.315	1.91	1.631	Q
H3	Zn	120.2	105	100.289	16.621	1.198	S
H4	Zn	111.1	100	94.667	15.007	1.095	S

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

^x 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 – 29th intercomparison of analytical methods

Laboratory 168, Universite de Bretagne Occidentale (France)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
H1	As	1.03	0.55	0.482	0.204	2.689	U
H2	As	0.93	0.3	0.293	0.165	3.862	U
H3	As	13.1	7.5	7.142	0.884	6.738	U
H4	As	9.2	5	4.681	0.781	5.782	U
H1	Cd	0.02	0.04	0.032	0.013	-0.887	Q
H2	Cd	0.05	0.08	0.074	0.014	-1.769	Q
H3	Cd	0.38	0.7	0.649	0.088	-3.074	U
H4	Cd	0.42	0.75	0.694	0.089	-3.092	U
H1	Cr	0.65	0.8	0.835	0.279	-0.665	S
H2	Cr	0.82	0.85	0.877	0.275	-0.209	S
H3	Cr	4.3	6.4	6.327	0.779	-2.601	U
H4	Cr	3.8	5	5.011	0.594	-2.037	Q
H1	Cu	0.98	1.1	0.994	0.264	-0.053	S
H2	Cu	0.75	0.9	0.835	0.254	-0.334	S
H3	Cu	6	8	7.515	1.027	-1.475	Q
H4	Cu	4.9	6.5	6.269	0.695	-1.968	Q
H1	Ni	1.21	0.75	0.879	0.159	2.075	U
H2	Ni	1.07	0.5	0.589	0.213	2.255	U
H3	Ni	9.2	9.9	9.69	1.138	-0.431	S
H4	Ni	10.8	11	10.814	1.277	-0.011	S
H1	Pb	1.43	1.5	1.422	0.362	0.022	S
H2	Pb	1.21	1.1	1.173	0.578	0.064	S
H3	Pb	11.4	21	20.64	2.05	-4.508	U
H4	Pb	13.5	24.5	23.398	1.81	-5.47	U
H1	Zn	3.2	4.5	4.386	0.997	-1.19	Q
H2	Zn	5.3	8	7.315	1.91	-1.055	Q
H3	Zn	143.7	105	100.289	16.621	2.612	U
H4	Zn	123.1	100	94.667	15.007	1.895	Q

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

^x EMEP quality norm; the letters in the column indicates:

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

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EMEP – 29th intercomparison of analytical methods

Laboratory 169, Lancaster Environment Centre, Centre for Ecology and Hydrology (United Kingdom)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
H1	As	0.546	0.55	0.482	0.204	0.313	S
H2	As	0.283	0.3	0.293	0.165	-0.062	S
H3	As	7.36	7.5	7.142	0.884	0.246	S
H4	As	4.86	5	4.681	0.781	0.229	S
H1	Cd	0.041	0.04	0.032	0.013	0.724	S
H2	Cd	0.079	0.08	0.074	0.014	0.364	S
H3	Cd	0.714	0.7	0.649	0.088	0.737	S
H4	Cd	0.757	0.75	0.694	0.089	0.708	S
H1	Cr	0.827	0.8	0.835	0.279	-0.03	S
H2	Cr	0.868	0.85	0.877	0.275	-0.034	S
H3	Cr	6.44	6.4	6.327	0.779	0.145	S
H4	Cr	5.01	5	5.011	0.594	-0.001	S
H1	Cu	1.14	1.1	0.994	0.264	0.553	S
H2	Cu	0.908	0.9	0.835	0.254	0.288	S
H3	Cu	7.76	8	7.515	1.027	0.239	S
H4	Cu	6.33	6.5	6.269	0.695	0.088	S
H1	Ni	0.759	0.75	0.879	0.159	-0.756	S
H2	Ni	0.491	0.5	0.589	0.213	-0.461	S
H3	Ni	9.66	9.9	9.69	1.138	-0.026	S
H4	Ni	10.67	11	10.814	1.277	-0.113	S
H1	Pb	1.5	1.5	1.422	0.362	0.215	S
H2	Pb	1.11	1.1	1.173	0.578	-0.109	S
H3	Pb	20.8	21	20.64	2.05	0.078	S
H4	Pb	24.1	24.5	23.398	1.81	0.388	S
H1	Zn	5.23	4.5	4.386	0.997	0.846	S
H2	Zn	8.3	8	7.315	1.91	0.516	S
H3	Zn	104	105	100.289	16.621	0.223	S
H4	Zn	100	100	94.667	15.007	0.355	S

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

^x EMEP quality norm; the letters in the column indicates:

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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 – 29th intercomparison of analytical methods

Laboratory 171, Mines Douai, Departement Sciences de l'Atmosphere et Genie de l'Environnement (France)

Heavy metals in precipitation (H-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
H1	As	0.552	0.55	0.482	0.204	0.342	S
H2	As	0.297	0.3	0.293	0.165	0.024	S
H3	As	7.675	7.5	7.142	0.884	0.602	S
H4	As	5.134	5	4.681	0.781	0.579	S
H1	Cd	0.044	0.04	0.032	0.013	0.954	S
H2	Cd	0.087	0.08	0.074	0.014	0.923	S
H3	Cd	0.697	0.7	0.649	0.088	0.546	S
H4	Cd	0.754	0.75	0.694	0.089	0.672	S
H1	Cr	0.879	0.8	0.835	0.279	0.157	S
H2	Cr	0.926	0.85	0.877	0.275	0.175	S
H3	Cr	6.709	6.4	6.327	0.779	0.49	S
H4	Cr	5.273	5	5.011	0.594	0.441	S
H1	Cu	1.125	1.1	0.994	0.264	0.494	S
H2	Cu	0.937	0.9	0.835	0.254	0.401	S
H3	Cu	8.166	8	7.515	1.027	0.634	S
H4	Cu	6.802	6.5	6.269	0.695	0.767	S
H1	Ni	1.02	0.75	0.879	0.159	0.882	Q
H2	Ni	0.692	0.5	0.589	0.213	0.48	Q
H3	Ni	10.434	9.9	9.69	1.138	0.654	S
H4	Ni	11.883	11	10.814	1.277	0.837	S
H1	Pb	1.641	1.5	1.422	0.362	0.605	S
H2	Pb	1.268	1.1	1.173	0.578	0.164	Q
H3	Pb	20.6	21	20.64	2.05	-0.019	S
H4	Pb	24.101	24.5	23.398	1.81	0.389	S
H1	Zn	4.729	4.5	4.386	0.997	0.344	S
H2	Zn	8.567	8	7.315	1.91	0.655	S
H3	Zn	106.072	105	100.289	16.621	0.348	S
H4	Zn	105.045	100	94.667	15.007	0.692	S

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

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Please check the EMEP intercalibration website for Youden plots, updated expected values ect:

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EMEP – 29th intercomparison of analytical methods

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 ^x
H1	As	-999	0.55	0.482	0.204		B
H2	As	-999	0.3	0.293	0.165		B
H3	As	-999	7.5	7.142	0.884		B
H4	As	-999	5	4.681	0.781		B
H1	Cd	0.036	0.04	0.032	0.013	0.34	S
H2	Cd	0.07	0.08	0.074	0.014	-0.298	S
H3	Cd	0.5	0.7	0.649	0.088	-1.704	Q
H4	Cd	0.62	0.75	0.694	0.089	-0.837	Q
H1	Cr	-999	0.8	0.835	0.279		B
H2	Cr	-999	0.85	0.877	0.275		B
H3	Cr	-999	6.4	6.327	0.779		B
H4	Cr	-999	5	5.011	0.594		B
H1	Cu	0.5	1.1	0.994	0.264	-1.871	U
H2	Cu	0.6	0.9	0.835	0.254	-0.924	Q
H3	Cu	4.5	8	7.515	1.027	-2.936	U
H4	Cu	2	6.5	6.269	0.695	-6.138	U
H1	Ni	0.7	0.75	0.879	0.159	-1.126	S
H2	Ni	1	0.5	0.589	0.213	1.927	U
H3	Ni	5.8	9.9	9.69	1.138	-3.419	U
H4	Ni	6.9	11	10.814	1.277	-3.064	U
H1	Pb	5	1.5	1.422	0.362	9.892	U
H2	Pb	4	1.1	1.173	0.578	4.891	U
H3	Pb	25	21	20.64	2.05	2.127	Q
H4	Pb	26	24.5	23.398	1.81	1.438	S
H1	Zn	< 1.670	4.5	4.386	0.997	-3.562	U
H2	Zn	< 1.670	8	7.315	1.91	-3.393	U
H3	Zn	52	105	100.289	16.621	-2.905	U
H4	Zn	50	100	94.667	15.007	-2.976	U

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

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EMEP – 29th intercomparison of analytical methods

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 ^x
H1	As	0.4	0.55	0.482	0.204	-0.404	Q
H2	As	0.2	0.3	0.293	0.165	-0.565	Q
H3	As	5.6	7.5	7.142	0.884	-1.744	Q
H4	As	3.7	5	4.681	0.781	-1.255	Q
H1	Cd	0.03	0.04	0.032	0.013	-0.12	Q
H2	Cd	0.07	0.08	0.074	0.014	-0.298	S
H3	Cd	0.59	0.7	0.649	0.088	-0.677	Q
H4	Cd	0.62	0.75	0.694	0.089	-0.837	Q
H1	Cr	0.74	0.8	0.835	0.279	-0.342	S
H2	Cr	0.72	0.85	0.877	0.275	-0.572	S
H3	Cr	6.1	6.4	6.327	0.779	-0.291	S
H4	Cr	4.7	5	5.011	0.594	-0.522	S
H1	Cu	0.9	1.1	0.994	0.264	-0.356	S
H2	Cu	0.8	0.9	0.835	0.254	-0.137	S
H3	Cu	7.5	8	7.515	1.027	-0.014	S
H4	Cu	6	6.5	6.269	0.695	-0.386	S
H1	Ni	0.9	0.75	0.879	0.159	0.129	S
H2	Ni	0.6	0.5	0.589	0.213	0.05	S
H3	Ni	9.5	9.9	9.69	1.138	-0.167	S
H4	Ni	10.5	11	10.814	1.277	-0.246	S
H1	Pb	1.5	1.5	1.422	0.362	0.215	S
H2	Pb	1.2	1.1	1.173	0.578	0.047	S
H3	Pb	19.7	21	20.64	2.05	-0.459	S
H4	Pb	22.7	24.5	23.398	1.81	-0.386	S
H1	Zn	2.6	4.5	4.386	0.997	-1.791	Q
H2	Zn	5.5	8	7.315	1.91	-0.951	Q
H3	Zn	83.6	105	100.289	16.621	-1.004	Q
H4	Zn	79.3	100	94.667	15.007	-1.024	Q

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

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EMEP – 29th intercomparison of analytical methods

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 ^x
H1	As	-999	0.55	0.482	0.204		B
H2	As	-999	0.3	0.293	0.165		B
H3	As	-999	7.5	7.142	0.884		B
H4	As	-999	5	4.681	0.781		B
H1	Cd	0.1	0.04	0.032	0.013	5.248	U
H2	Cd	0.14	0.08	0.074	0.014	4.851	U
H3	Cd	0.54	0.7	0.649	0.088	-1.248	Q
H4	Cd	0.62	0.75	0.694	0.089	-0.837	Q
H1	Cr	1.18	0.8	0.835	0.279	1.235	Q
H2	Cr	0.93	0.85	0.877	0.275	0.191	S
H3	Cr	5.26	6.4	6.327	0.779	-1.369	Q
H4	Cr	4.49	5	5.011	0.594	-0.876	S
H1	Cu	0.75	1.1	0.994	0.264	-0.924	Q
H2	Cu	0.76	0.9	0.835	0.254	-0.295	S
H3	Cu	6.22	8	7.515	1.027	-1.261	Q
H4	Cu	4.93	6.5	6.269	0.695	-1.925	Q
H1	Ni	-999	0.75	0.879	0.159		B
H2	Ni	-999	0.5	0.589	0.213		B
H3	Ni	-999	9.9	9.69	1.138		B
H4	Ni	-999	11	10.814	1.277		B
H1	Pb	1.06	1.5	1.422	0.362	-1.001	Q
H2	Pb	0.82	1.1	1.173	0.578	-0.611	Q
H3	Pb	16.2	21	20.64	2.05	-2.166	Q
H4	Pb	19.3	24.5	23.398	1.81	-2.265	Q
H1	Zn	-999	4.5	4.386	0.997		B
H2	Zn	2.57	8	7.315	1.91	-2.485	U
H3	Zn	89.9	105	100.289	16.621	-0.625	S
H4	Zn	81.7	100	94.667	15.007	-0.864	Q

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