

EMEP – Analytical intercomparison of heavy metals in precipitation 2018

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 µg/l	< 0.088	0.1	0.105	0.027	-2.268	U
H2		0.149	0.15	0.192	0.173	-0.248	S
H3		0.209	0.2	0.231	0.157	-0.135	S
H4		0.306	0.3	0.303	0.053	0.056	S
H1	Cd µg/l	0.033	0.035	0.033	0.006	0.042	S
H2		0.045	0.045	0.044	0.007	0.188	S
H3		0.07	0.06	0.058	0.008	1.552	S
H4		0.077	0.07	0.071	0.007	1.074	S
H1	Cr µg/l	0.069	0.1	0.109	0.075	-0.534	Q
H2		0.117	0.15	0.163	0.082	-0.56	S
H3		0.254	0.3	0.306	0.07	-0.747	S
H4		0.344	0.4	0.411	0.14	-0.477	S
H1	Cu µg/l	0.664	0.7	0.669	0.087	-0.055	S
H2		0.863	0.9	0.856	0.084	0.083	S
H3		1.06	1.1	1.078	0.098	-0.18	S
H4		1.171	1.2	1.161	0.121	0.085	S
H1	Ni µg/l	0.369	0.4	0.371	0.057	-0.04	S
H2		0.461	0.5	0.447	0.086	0.154	S
H3		0.642	0.7	0.66	0.054	-0.334	S
H4		0.752	0.8	0.749	0.074	0.052	S
H1	Pb µg/l	0.399	0.45	0.439	0.031	-1.332	S
H2		0.49	0.55	0.532	0.045	-0.932	S
H3		0.712	0.8	0.768	0.045	-1.231	S
H4		0.804	0.9	0.885	0.082	-0.983	S
H1	Zn µg/l	7.159	6	6.091	0.614	1.738	S
H2		8.545	7	6.941	0.687	2.335	S
H3		9.965	8	8.017	0.84	2.318	S
H4		10.945	9	9.029	0.874	2.193	S

**Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001**

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, $\frac{1}{2}$ DL is taken as the reported value in further calculations.

* Z score in unitless

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

S – Satisfactory: Your results deviates less than $\pm 25\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and less than $\pm 15\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

Q – Questionable: Your result deviates between $\pm 25-50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and between $\pm 15-30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

U – Unsatisfactory: Your result deviates more than $\pm 50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and more than $\pm 30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

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

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

EMEP – Analytical intercomparison of heavy metals in precipitation 2018

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 $\mu\text{g/l}$	0.15	0.1	0.105	0.027	1.665	Q
H2		0.185	0.15	0.192	0.173	-0.04	S
H3		0.235	0.2	0.231	0.157	0.027	S
H4		0.35	0.3	0.303	0.053	0.888	S
H1	Cd $\mu\text{g/l}$	0.035	0.035	0.033	0.006	0.4	S
H2		0.05	0.045	0.044	0.007	0.9	S
H3		0.055	0.06	0.058	0.008	-0.317	S
H4		0.065	0.07	0.071	0.007	-0.849	S
H1	Cr $\mu\text{g/l}$	0.135	0.1	0.109	0.075	0.34	Q
H2		0.195	0.15	0.163	0.082	0.387	Q
H3		0.37	0.3	0.306	0.07	0.907	S
H4		0.485	0.4	0.411	0.14	0.526	S
H1	Cu $\mu\text{g/l}$	0.85	0.7	0.669	0.087	2.073	S
H2		1.074	0.9	0.856	0.084	2.593	S
H3		1.33	1.1	1.078	0.098	2.579	S
H4		1.405	1.2	1.161	0.121	2.015	S
H1	Ni $\mu\text{g/l}$	0.43	0.4	0.371	0.057	1.029	S
H2		0.545	0.5	0.447	0.086	1.142	S
H3		0.735	0.7	0.66	0.054	1.373	S
H4		0.845	0.8	0.749	0.074	1.297	S
H1	Pb $\mu\text{g/l}$	0.44	0.45	0.439	0.031	0.024	S
H2		0.54	0.55	0.532	0.045	0.178	S
H3		0.765	0.8	0.768	0.045	-0.062	S
H4		0.87	0.9	0.885	0.082	-0.183	S
H1	Zn $\mu\text{g/l}$	-999	6	6.091	0.614		B
H2		-999	7	6.941	0.687		B
H3		-999	8	8.017	0.84		B
H4		-999	9	9.029	0.874		B

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, $\frac{1}{2}$ DL is taken as the reported value in further calculations.

* Z score in unitless

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

S – Satisfactory: Your results deviates less than $\pm 25\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and less than $\pm 15\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

Q – Questionable: Your result deviates between $\pm 25-50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and between $\pm 15-30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

U – Unsatisfactory: Your result deviates more than $\pm 50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and more than $\pm 30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

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

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

EMEP – Analytical intercomparison of heavy metals in precipitation 2018

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 $\mu\text{g/l}$	0.1	0.1	0.105	0.027	-0.189	S
H2		0.154	0.15	0.192	0.173	-0.219	S
H3		0.203	0.2	0.231	0.157	-0.176	S
H4		0.302	0.3	0.303	0.053	-0.02	S
H1	Cd $\mu\text{g/l}$	0.035	0.035	0.033	0.006	0.4	S
H2		0.045	0.045	0.044	0.007	0.188	S
H3		0.061	0.06	0.058	0.008	0.43	S
H4		0.071	0.07	0.071	0.007	0.074	S
H1	Cr $\mu\text{g/l}$	0.096	0.1	0.109	0.075	-0.176	S
H2		0.145	0.15	0.163	0.082	-0.224	S
H3		0.3	0.3	0.306	0.07	-0.091	S
H4		0.399	0.4	0.411	0.14	-0.088	S
H1	Cu $\mu\text{g/l}$	0.704	0.7	0.669	0.087	0.398	S
H2		0.916	0.9	0.856	0.084	0.714	S
H3		1.106	1.1	1.078	0.098	0.286	S
H4		1.214	1.2	1.161	0.121	0.436	S
H1	Ni $\mu\text{g/l}$	0.393	0.4	0.371	0.057	0.381	S
H2		0.497	0.5	0.447	0.086	0.58	S
H3		0.712	0.7	0.66	0.054	0.951	S
H4		0.811	0.8	0.749	0.074	0.839	S
H1	Pb $\mu\text{g/l}$	0.448	0.45	0.439	0.031	0.286	S
H2		0.551	0.55	0.532	0.045	0.424	S
H3		0.796	0.8	0.768	0.045	0.621	S
H4		0.904	0.9	0.885	0.082	0.232	S
H1	Zn $\mu\text{g/l}$	6.105	6	6.091	0.614	0.022	S
H2		7.302	7	6.941	0.687	0.526	S
H3		8.245	8	8.017	0.84	0.271	S
H4		9.244	9	9.029	0.874	0.246	S

**Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001**

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, $\frac{1}{2}$ DL is taken as the reported value in further calculations.

* Z score in unitless

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

S – Satisfactory: Your results deviates less than $\pm 25\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and less than $\pm 15\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

Q – Questionable: Your result deviates between $\pm 25-50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and between $\pm 15-30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

U – Unsatisfactory: Your result deviates more than $\pm 50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and more than $\pm 30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

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

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

EMEP – Analytical intercomparison of heavy metals in precipitation 2018

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 $\mu\text{g/l}$	< 0.200	0.1	0.105	0.027		B
H2		< 0.200	0.15	0.192	0.173		B
H3		0.22	0.2	0.231	0.157	-0.068	S
H4		0.33	0.3	0.303	0.053	0.51	S
H1	Cd $\mu\text{g/l}$	0.037	0.035	0.033	0.006	0.758	S
H2		0.053	0.045	0.044	0.007	1.327	S
H3		0.068	0.06	0.058	0.008	1.303	S
H4		0.068	0.07	0.071	0.007	-0.388	S
H1	Cr $\mu\text{g/l}$	< 0.400	0.1	0.109	0.075		B
H2		< 0.400	0.15	0.163	0.082		B
H3		< 0.400	0.3	0.306	0.07		B
H4		< 0.400	0.4	0.411	0.14	-1.508	Q
H1	Cu $\mu\text{g/l}$	0.7	0.7	0.669	0.087	0.352	S
H2		0.88	0.9	0.856	0.084	0.285	S
H3		1.09	1.1	1.078	0.098	0.122	S
H4		1.18	1.2	1.161	0.121	0.155	S
H1	Ni $\mu\text{g/l}$	0.3	0.4	0.371	0.057	-1.248	Q
H2		0.38	0.5	0.447	0.086	-0.788	S
H3		0.58	0.7	0.66	0.054	-1.471	S
H4		0.68	0.8	0.749	0.074	-0.925	S
H1	Pb $\mu\text{g/l}$	0.38	0.45	0.439	0.031	-1.936	S
H2		0.47	0.55	0.532	0.045	-1.392	S
H3		0.72	0.8	0.768	0.045	-1.055	S
H4		0.83	0.9	0.885	0.082	-0.672	S
H1	Zn $\mu\text{g/l}$	8.8	6	6.091	0.614	4.41	Q
H2		9.87	7	6.941	0.687	4.263	Q
H3		11.44	8	8.017	0.84	4.073	Q
H4		12.73	9	9.029	0.874	4.237	Q

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, $\frac{1}{2}$ DL is taken as the reported value in further calculations.

* Z score in unitless

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

S – Satisfactory: Your results deviates less than $\pm 25\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and less than $\pm 15\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

Q – Questionable: Your result deviates between $\pm 25-50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and between $\pm 15-30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

U – Unsatisfactory: Your result deviates more than $\pm 50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and more than $\pm 30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

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

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

EMEP – Analytical intercomparison of heavy metals in precipitation 2018

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 µg/l	< 1.000	0.1	0.105	0.027		B
H2		< 1.000	0.15	0.192	0.173		B
H3		< 1.000	0.2	0.231	0.157		B
H4		< 1.000	0.3	0.303	0.053		B
H1	Cd µg/l	< 0.050	0.035	0.033	0.006		B
H2		0.05	0.045	0.044	0.007	0.9	S
H3		0.06	0.06	0.058	0.008	0.306	S
H4		0.07	0.07	0.071	0.007	-0.08	S
H1	Cr µg/l	< 0.500	0.1	0.109	0.075		B
H2		< 0.500	0.15	0.163	0.082		B
H3		< 0.500	0.3	0.306	0.07		B
H4		< 0.500	0.4	0.411	0.14		B
H1	Cu µg/l	0.67	0.7	0.669	0.087	0.008	S
H2		0.88	0.9	0.856	0.084	0.285	S
H3		1.07	1.1	1.078	0.098	-0.082	S
H4		1.16	1.2	1.161	0.121	-0.01	S
H1	Ni µg/l	< 0.560	0.4	0.371	0.057		B
H2		< 0.560	0.5	0.447	0.086		B
H3		0.68	0.7	0.66	0.054	0.364	S
H4		0.78	0.8	0.749	0.074	0.422	S
H1	Pb µg/l	< 0.570	0.45	0.439	0.031		B
H2		0.57	0.55	0.532	0.045	0.85	S
H3		0.81	0.8	0.768	0.045	0.93	S
H4		0.92	0.9	0.885	0.082	0.428	S
H1	Zn µg/l	6.35	6	6.091	0.614	0.421	S
H2		7.4	7	6.941	0.687	0.669	S
H3		8.58	8	8.017	0.84	0.669	S
H4		9.57	9	9.029	0.874	0.62	S

**Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001**

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, $\frac{1}{2}$ DL is taken as the reported value in further calculations.

* Z score in unitless

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

S – Satisfactory: Your results deviates less than $\pm 25\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and less than $\pm 15\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

Q – Questionable: Your result deviates between $\pm 25-50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and between $\pm 15-30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

U – Unsatisfactory: Your result deviates more than $\pm 50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and more than $\pm 30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

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

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

EMEP – Analytical intercomparison of heavy metals in precipitation 2018

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 µg/l	0.094	0.1	0.105	0.027	-0.422	S
H2		0.142	0.15	0.192	0.173	-0.286	S
H3		0.189	0.2	0.231	0.157	-0.263	S
H4		0.28	0.3	0.303	0.053	-0.435	S
H1	Cd µg/l	0.033	0.035	0.033	0.006	0.077	S
H2		0.044	0.045	0.044	0.007	-0.012	S
H3		0.058	0.06	0.058	0.008	0.044	S
H4		0.067	0.07	0.071	0.007	-0.557	S
H1	Cr µg/l	0.093	0.1	0.109	0.075	-0.216	S
H2		0.143	0.15	0.163	0.082	-0.248	S
H3		0.282	0.3	0.306	0.07	-0.347	S
H4		0.383	0.4	0.411	0.14	-0.202	S
H1	Cu µg/l	0.668	0.7	0.669	0.087	-0.015	S
H2		0.867	0.9	0.856	0.084	0.131	S
H3		1.06	1.1	1.078	0.098	-0.185	S
H4		1.173	1.2	1.161	0.121	0.097	S
H1	Ni µg/l	0.373	0.4	0.371	0.057	0.03	S
H2		0.476	0.5	0.447	0.086	0.335	S
H3		0.656	0.7	0.66	0.054	-0.077	S
H4		0.766	0.8	0.749	0.074	0.233	S
H1	Pb µg/l	0.439	0.45	0.439	0.031	-0.008	S
H2		0.537	0.55	0.532	0.045	0.11	S
H3		0.778	0.8	0.768	0.045	0.224	S
H4		0.881	0.9	0.885	0.082	-0.049	S
H1	Zn µg/l	5.94	6	6.091	0.614	-0.246	S
H2		6.99	7	6.941	0.687	0.072	S
H3		8	8	8.017	0.84	-0.021	S
H4		9.06	9	9.029	0.874	0.036	S

**Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001**

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, $\frac{1}{2}$ DL is taken as the reported value in further calculations.

* Z score in unitless

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

S – Satisfactory: Your results deviates less than $\pm 25\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and less than $\pm 15\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

Q – Questionable: Your result deviates between $\pm 25-50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and between $\pm 15-30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

U – Unsatisfactory: Your result deviates more than $\pm 50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and more than $\pm 30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

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

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

EMEP – Analytical intercomparison of heavy metals in precipitation 2018

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 <i>µg/l</i>	-999	0.1	0.105	0.027		B
H2		-999	0.15	0.192	0.173		B
H3		-999	0.2	0.231	0.157		B
H4		-999	0.3	0.303	0.053		B
H1	Cd <i>µg/l</i>	< 0.038	0.035	0.033	0.006		B
H2		< 0.038	0.045	0.044	0.007	-3.517	U
H3		0.04	0.06	0.058	0.008	-2.187	Q
H4		0.045	0.07	0.071	0.007	-3.926	Q
H1	Cr <i>µg/l</i>	-999	0.1	0.109	0.075		B
H2		-999	0.15	0.163	0.082		B
H3		-999	0.3	0.306	0.07		B
H4		-999	0.4	0.411	0.14		B
H1	Cu <i>µg/l</i>	-999	0.7	0.669	0.087		B
H2		-999	0.9	0.856	0.084		B
H3		-999	1.1	1.078	0.098		B
H4		-999	1.2	1.161	0.121		B
H1	Ni <i>µg/l</i>	-999	0.4	0.371	0.057		B
H2		-999	0.5	0.447	0.086		B
H3		-999	0.7	0.66	0.054		B
H4		-999	0.8	0.749	0.074		B
H1	Pb <i>µg/l</i>	0.455	0.45	0.439	0.031	0.514	S
H2		0.458	0.55	0.532	0.045	-1.661	S
H3		0.748	0.8	0.768	0.045	-0.437	S
H4		0.824	0.9	0.885	0.082	-0.745	S
H1	Zn <i>µg/l</i>	-999	6	6.091	0.614		B
H2		-999	7	6.941	0.687		B
H3		-999	8	8.017	0.84		B
H4		-999	9	9.029	0.874		B

**Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001**

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, $\frac{1}{2}$ DL is taken as the reported value in further calculations.

* Z score in unitless

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

S – Satisfactory: Your results deviates less than $\pm 25\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and less than $\pm 15\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

Q – Questionable: Your result deviates between $\pm 25-50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and between $\pm 15-30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

U – Unsatisfactory: Your result deviates more than $\pm 50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and more than $\pm 30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

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

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

EMEP – Analytical intercomparison of heavy metals in precipitation 2018

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 µg/l	0.1	0.1	0.105	0.027	-0.189	S
H2		0.15	0.15	0.192	0.173	-0.242	S
H3		0.2	0.2	0.231	0.157	-0.195	S
H4		0.29	0.3	0.303	0.053	-0.246	S
H1	Cd µg/l	0.04	0.035	0.033	0.006	1.295	S
H2		0.05	0.045	0.044	0.007	0.9	S
H3		0.06	0.06	0.058	0.008	0.306	S
H4		0.07	0.07	0.071	0.007	-0.08	S
H1	Cr µg/l	0.1	0.1	0.109	0.075	-0.123	S
H2		0.15	0.15	0.163	0.082	-0.163	S
H3		0.3	0.3	0.306	0.07	-0.091	S
H4		0.4	0.4	0.411	0.14	-0.081	S
H1	Cu µg/l	0.7	0.7	0.669	0.087	0.352	S
H2		0.9	0.9	0.856	0.084	0.523	S
H3		1.1	1.1	1.078	0.098	0.225	S
H4		1.2	1.2	1.161	0.121	0.321	S
H1	Ni µg/l	0.4	0.4	0.371	0.057	0.503	S
H2		0.5	0.5	0.447	0.086	0.615	S
H3		0.7	0.7	0.66	0.054	0.731	S
H4		0.8	0.8	0.749	0.074	0.691	S
H1	Pb µg/l	0.45	0.45	0.439	0.031	0.351	S
H2		0.55	0.55	0.532	0.045	0.402	S
H3		0.8	0.8	0.768	0.045	0.709	S
H4		0.9	0.9	0.885	0.082	0.183	S
H1	Zn µg/l	6	6	6.091	0.614	-0.149	S
H2		7.4	7	6.941	0.687	0.669	S
H3		8.2	8	8.017	0.84	0.217	S
H4		9.4	9	9.029	0.874	0.425	S

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, $\frac{1}{2}$ DL is taken as the reported value in further calculations.

* Z score in unitless

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

S – Satisfactory: Your results deviates less than $\pm 25\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and less than $\pm 15\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

Q – Questionable: Your result deviates between $\pm 25-50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and between $\pm 15-30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

U – Unsatisfactory: Your result deviates more than $\pm 50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and more than $\pm 30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

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

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

EMEP – Analytical intercomparison of heavy metals in precipitation 2018

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 µg/l	-999	0.1	0.105	0.027		B
H2		-999	0.15	0.192	0.173		B
H3		-999	0.2	0.231	0.157		B
H4		-999	0.3	0.303	0.053		B
H1	Cd µg/l	0.035	0.035	0.033	0.006	0.4	S
H2		0.045	0.045	0.044	0.007	0.188	S
H3		0.06	0.06	0.058	0.008	0.306	S
H4		0.07	0.07	0.071	0.007	-0.08	S
H1	Cr µg/l	0.088	0.1	0.109	0.075	-0.282	S
H2		0.14	0.15	0.163	0.082	-0.285	S
H3		0.28	0.3	0.306	0.07	-0.376	S
H4		0.38	0.4	0.411	0.14	-0.223	S
H1	Cu µg/l	0.63	0.7	0.669	0.087	-0.451	S
H2		0.88	0.9	0.856	0.084	0.285	S
H3		1	1.1	1.078	0.098	-0.799	S
H4		1.05	1.2	1.161	0.121	-0.919	S
H1	Ni µg/l	0.34	0.4	0.371	0.057	-0.547	S
H2		0.43	0.5	0.447	0.086	-0.203	S
H3		0.6	0.7	0.66	0.054	-1.104	S
H4		0.73	0.8	0.749	0.074	-0.251	S
H1	Pb µg/l	0.44	0.45	0.439	0.031	0.024	S
H2		0.55	0.55	0.532	0.045	0.402	S
H3		0.8	0.8	0.768	0.045	0.709	S
H4		0.9	0.9	0.885	0.082	0.183	S
H1	Zn µg/l	6	6	6.091	0.614	-0.149	S
H2		7	7	6.941	0.687	0.087	S
H3		8	8	8.017	0.84	-0.021	S
H4		9	9	9.029	0.874	-0.033	S

**Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001**

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, $\frac{1}{2}$ DL is taken as the reported value in further calculations.

* Z score in unitless

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

S – Satisfactory: Your results deviates less than $\pm 25\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and less than $\pm 15\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

Q – Questionable: Your result deviates between $\pm 25-50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and between $\pm 15-30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

U – Unsatisfactory: Your result deviates more than $\pm 50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and more than $\pm 30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

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

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

EMEP – Analytical intercomparison of heavy metals in precipitation 2018

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 µg/l	0.12	0.1	0.105	0.027	0.553	S
H2		0.163	0.15	0.192	0.173	-0.167	S
H3		0.215	0.2	0.231	0.157	-0.1	S
H4		0.315	0.3	0.303	0.053	0.226	S
H1	Cd µg/l	0.036	0.035	0.033	0.006	0.579	S
H2		0.046	0.045	0.044	0.007	0.33	S
H3		0.061	0.06	0.058	0.008	0.43	S
H4		0.07	0.07	0.071	0.007	-0.08	S
H1	Cr µg/l	0.102	0.1	0.109	0.075	-0.097	S
H2		0.153	0.15	0.163	0.082	-0.126	S
H3		0.305	0.3	0.306	0.07	-0.019	S
H4		0.406	0.4	0.411	0.14	-0.038	S
H1	Cu µg/l	0.727	0.7	0.669	0.087	0.662	S
H2		0.923	0.9	0.856	0.084	0.797	S
H3		1.133	1.1	1.078	0.098	0.562	S
H4		1.236	1.2	1.161	0.121	0.618	S
H1	Ni µg/l	0.392	0.4	0.371	0.057	0.363	S
H2		0.489	0.5	0.447	0.086	0.487	S
H3		0.697	0.7	0.66	0.054	0.676	S
H4		0.787	0.8	0.749	0.074	0.516	S
H1	Pb µg/l	0.457	0.45	0.439	0.031	0.58	S
H2		0.555	0.55	0.532	0.045	0.514	S
H3		0.797	0.8	0.768	0.045	0.643	S
H4		0.906	0.9	0.885	0.082	0.257	S
H1	Zn µg/l	6.053	6	6.091	0.614	-0.062	S
H2		6.989	7	6.941	0.687	0.071	S
H3		8.027	8	8.017	0.84	0.011	S
H4		9.36	9	9.029	0.874	0.379	S

**Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001**

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, $\frac{1}{2}$ DL is taken as the reported value in further calculations.

* Z score in unitless

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

S – Satisfactory: Your results deviates less than $\pm 25\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and less than $\pm 15\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

Q – Questionable: Your result deviates between $\pm 25-50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and between $\pm 15-30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

U – Unsatisfactory: Your result deviates more than $\pm 50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and more than $\pm 30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

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

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

EMEP – Analytical intercomparison of heavy metals in precipitation 2018

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 ^x
H1	As <i>µg/l</i>	< 0.500	0.1	0.105	0.027		B
H2		< 0.500	0.15	0.192	0.173		B
H3		< 0.500	0.2	0.231	0.157		B
H4		< 0.500	0.3	0.303	0.053		B
H1	Cd <i>µg/l</i>	< 0.300	0.035	0.033	0.006		B
H2		< 0.300	0.045	0.044	0.007		B
H3		< 0.300	0.06	0.058	0.008		B
H4		0.07	0.07	0.071	0.007	-0.08	S
H1	Cr <i>µg/l</i>	< 0.600	0.1	0.109	0.075		B
H2		< 0.600	0.15	0.163	0.082		B
H3		< 0.600	0.3	0.306	0.07		B
H4		< 0.600	0.4	0.411	0.14		B
H1	Cu <i>µg/l</i>	-999	0.7	0.669	0.087		B
H2		-999	0.9	0.856	0.084		B
H3		-999	1.1	1.078	0.098		B
H4		-999	1.2	1.161	0.121		B
H1	Ni <i>µg/l</i>	< 1.000	0.4	0.371	0.057		B
H2		< 1.000	0.5	0.447	0.086		B
H3		< 1.000	0.7	0.66	0.054		B
H4		< 1.000	0.8	0.749	0.074		B
H1	Pb <i>µg/l</i>	< 1.000	0.45	0.439	0.031		B
H2		< 1.000	0.55	0.532	0.045		B
H3		< 1.000	0.8	0.768	0.045		B
H4		< 1.000	0.9	0.885	0.082		B
H1	Zn <i>µg/l</i>	< 10.000	6	6.091	0.614		B
H2		< 10.000	7	6.941	0.687		B
H3		< 10.000	8	8.017	0.84		B
H4		< 10.000	9	9.029	0.874		B

**Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001**

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, $\frac{1}{2}$ DL is taken as the reported value in further calculations.

* Z score in unitless

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

S – Satisfactory: Your results deviates less than $\pm 25\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and less than $\pm 15\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

Q – Questionable: Your result deviates between $\pm 25-50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and between $\pm 15-30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

U – Unsatisfactory: Your result deviates more than $\pm 50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and more than $\pm 30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

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

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

EMEP – Analytical intercomparison of heavy metals in precipitation 2018

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 $\mu\text{g/l}$	0.09	0.1	0.105	0.027	-0.559	S
H2		0.144	0.15	0.192	0.173	-0.277	S
H3		0.205	0.2	0.231	0.157	-0.164	S
H4		0.292	0.3	0.303	0.053	-0.209	S
H1	Cd $\mu\text{g/l}$	0.008	0.035	0.033	0.006	-4.434	U
H2		0.022	0.045	0.044	0.007	-3.09	U
H3		0.037	0.06	0.058	0.008	-2.561	Q
H4		0.046	0.07	0.071	0.007	-3.772	Q
H1	Cr $\mu\text{g/l}$	0	0.1	0.109	0.075	-1.449	U
H2		0.131	0.15	0.163	0.082	-0.395	S
H3		0.276	0.3	0.306	0.07	-0.433	S
H4		0.359	0.4	0.411	0.14	-0.373	S
H1	Cu $\mu\text{g/l}$	0.446	0.7	0.669	0.087	-2.562	Q
H2		0.729	0.9	0.856	0.084	-1.511	S
H3		0.894	1.1	1.078	0.098	-1.884	S
H4		1.008	1.2	1.161	0.121	-1.267	S
H1	Ni $\mu\text{g/l}$	0.231	0.4	0.371	0.057	-2.457	Q
H2		0.404	0.5	0.447	0.086	-0.507	S
H3		0.584	0.7	0.66	0.054	-1.398	S
H4		0.658	0.8	0.749	0.074	-1.221	S
H1	Pb $\mu\text{g/l}$	0.323	0.45	0.439	0.031	-3.799	Q
H2		0.504	0.55	0.532	0.045	-0.629	S
H3		0.718	0.8	0.768	0.045	-1.099	S
H4		0.821	0.9	0.885	0.082	-0.782	S
H1	Zn $\mu\text{g/l}$	3.888	6	6.091	0.614	-3.587	Q
H2		5.809	7	6.941	0.687	-1.647	S
H3		6.844	8	8.017	0.84	-1.396	S
H4		7.974	9	9.029	0.874	-1.207	S

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, $\frac{1}{2}$ DL is taken as the reported value in further calculations.

* Z score in unitless

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

S – Satisfactory: Your results deviates less than $\pm 25\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and less than $\pm 15\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

Q – Questionable: Your result deviates between $\pm 25-50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and between $\pm 15-30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

U – Unsatisfactory: Your result deviates more than $\pm 50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and more than $\pm 30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

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

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

EMEP – Analytical intercomparison of heavy metals in precipitation 2018

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 ^x
H1	As <i>µg/l</i>	-999	0.1	0.105	0.027		B
H2		-999	0.15	0.192	0.173		B
H3		-999	0.2	0.231	0.157		B
H4		-999	0.3	0.303	0.053		B
H1	Cd <i>µg/l</i>	-999	0.035	0.033	0.006		B
H2		-999	0.045	0.044	0.007		B
H3		-999	0.06	0.058	0.008		B
H4		-999	0.07	0.071	0.007		B
H1	Cr <i>µg/l</i>	-999	0.1	0.109	0.075		B
H2		-999	0.15	0.163	0.082		B
H3		-999	0.3	0.306	0.07		B
H4		-999	0.4	0.411	0.14		B
H1	Cu <i>µg/l</i>	-999	0.7	0.669	0.087		B
H2		-999	0.9	0.856	0.084		B
H3		-999	1.1	1.078	0.098		B
H4		-999	1.2	1.161	0.121		B
H1	Ni <i>µg/l</i>	-999	0.4	0.371	0.057		B
H2		-999	0.5	0.447	0.086		B
H3		-999	0.7	0.66	0.054		B
H4		-999	0.8	0.749	0.074		B
H1	Pb <i>µg/l</i>	-999	0.45	0.439	0.031		B
H2		-999	0.55	0.532	0.045		B
H3		-999	0.8	0.768	0.045		B
H4		-999	0.9	0.885	0.082		B
H1	Zn <i>µg/l</i>	-999	6	6.091	0.614		B
H2		-999	7	6.941	0.687		B
H3		-999	8	8.017	0.84		B
H4		-999	9	9.029	0.874		B

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, $\frac{1}{2}$ DL is taken as the reported value in further calculations.

* Z score in unitless

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

S – Satisfactory: Your results deviates less than $\pm 25\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and less than $\pm 15\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

Q – Questionable: Your result deviates between $\pm 25-50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and between $\pm 15-30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

U – Unsatisfactory: Your result deviates more than $\pm 50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and more than $\pm 30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

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

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

EMEP – Analytical intercomparison of heavy metals in precipitation 2018

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 ^x
H1	As $\mu\text{g/l}$	< 0.200	0.1	0.105	0.027		B
H2		< 0.200	0.15	0.192	0.173		B
H3		< 0.200	0.2	0.231	0.157	-0.831	Q
H4		0.23	0.3	0.303	0.053	-1.38	S
H1	Cd $\mu\text{g/l}$	0.05	0.035	0.033	0.006	3.085	Q
H2		0.06	0.045	0.044	0.007	2.325	Q
H3		0.07	0.06	0.058	0.008	1.552	S
H4		0.08	0.07	0.071	0.007	1.458	S
H1	Cr $\mu\text{g/l}$	0.1	0.1	0.109	0.075	-0.123	S
H2		0.13	0.15	0.163	0.082	-0.407	S
H3		0.28	0.3	0.306	0.07	-0.376	S
H4		0.36	0.4	0.411	0.14	-0.366	S
H1	Cu $\mu\text{g/l}$	0.6	0.7	0.669	0.087	-0.795	S
H2		0.7	0.9	0.856	0.084	-1.856	S
H3		1.05	1.1	1.078	0.098	-0.287	S
H4		1	1.2	1.161	0.121	-1.333	S
H1	Ni $\mu\text{g/l}$	< 0.900	0.4	0.371	0.057		B
H2		< 0.900	0.5	0.447	0.086		B
H3		< 0.900	0.7	0.66	0.054		B
H4		< 0.900	0.8	0.749	0.074		B
H1	Pb $\mu\text{g/l}$	0.6	0.45	0.439	0.031	5.253	Q
H2		0.65	0.55	0.532	0.045	2.643	S
H3		1.1	0.8	0.768	0.045	7.324	Q
H4		1.1	0.9	0.885	0.082	2.626	S
H1	Zn $\mu\text{g/l}$	6.5	6	6.091	0.614	0.665	S
H2		7	7	6.941	0.687	0.087	S
H3		8.5	8	8.017	0.84	0.574	S
H4		9	9	9.029	0.874	-0.033	S

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, $\frac{1}{2}$ DL is taken as the reported value in further calculations.

* Z score in unitless

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

S – Satisfactory: Your results deviates less than $\pm 25\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and less than $\pm 15\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

Q – Questionable: Your result deviates between $\pm 25-50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and between $\pm 15-30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

U – Unsatisfactory: Your result deviates more than $\pm 50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and more than $\pm 30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

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

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

EMEP – Analytical intercomparison of heavy metals in precipitation 2018

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 µg/l	0.134	0.1	0.105	0.027	1.053	Q
H2		0.146	0.15	0.192	0.173	-0.265	S
H3		0.186	0.2	0.231	0.157	-0.281	S
H4		0.296	0.3	0.303	0.053	-0.133	S
H1	Cd µg/l	0.042	0.035	0.033	0.006	1.653	S
H2		0.04	0.045	0.044	0.007	-0.525	S
H3		0.051	0.06	0.058	0.008	-0.754	S
H4		0.062	0.07	0.071	0.007	-1.311	S
H1	Cr µg/l	0.128	0.1	0.109	0.075	0.241	Q
H2		0.136	0.15	0.163	0.082	-0.34	S
H3		0.273	0.3	0.306	0.07	-0.483	S
H4		0.359	0.4	0.411	0.14	-0.373	S
H1	Cu µg/l	0.757	0.7	0.669	0.087	1.011	S
H2		0.976	0.9	0.856	0.084	1.427	S
H3		1.23	1.1	1.078	0.098	1.55	S
H4		1.246	1.2	1.161	0.121	0.705	S
H1	Ni µg/l	3.764	0.4	0.371	0.057	59.413	U
H2		7.618	0.5	0.447	0.086	83.839	U
H3		0.63	0.7	0.66	0.054	-0.55	S
H4		0.658	0.8	0.749	0.074	-1.225	S
H1	Pb µg/l	0.411	0.45	0.439	0.031	-0.923	S
H2		0.493	0.55	0.532	0.045	-0.865	S
H3		0.693	0.8	0.768	0.045	-1.65	S
H4		0.792	0.9	0.885	0.082	-1.136	S
H1	Zn µg/l	5.367	6	6.091	0.614	-1.179	S
H2		6.233	7	6.941	0.687	-1.03	S
H3		6.686	8	8.017	0.84	-1.584	S
H4		7.609	9	9.029	0.874	-1.624	S

**Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001**

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, $\frac{1}{2}$ DL is taken as the reported value in further calculations.

* Z score in unitless

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

S – Satisfactory: Your results deviates less than $\pm 25\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and less than $\pm 15\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

Q – Questionable: Your result deviates between $\pm 25-50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and between $\pm 15-30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

U – Unsatisfactory: Your result deviates more than $\pm 50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and more than $\pm 30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

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

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

EMEP – Analytical intercomparison of heavy metals in precipitation 2018

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 ^x
H1	As $\mu\text{g/l}$	< 0.300	0.1	0.105	0.027		B
H2		< 0.300	0.15	0.192	0.173		B
H3		< 0.300	0.2	0.231	0.157		B
H4		< 0.300	0.3	0.303	0.053	-2.892	Q
H1	Cd $\mu\text{g/l}$	< 0.070	0.035	0.033	0.006		B
H2		< 0.070	0.045	0.044	0.007		B
H3		< 0.070	0.06	0.058	0.008		B
H4		0.073	0.07	0.071	0.007	0.382	S
H1	Cr $\mu\text{g/l}$	< 0.800	0.1	0.109	0.075		B
H2		< 0.800	0.15	0.163	0.082		B
H3		< 0.800	0.3	0.306	0.07		B
H4		< 0.800	0.4	0.411	0.14		B
H1	Cu $\mu\text{g/l}$	< 1.000	0.7	0.669	0.087		B
H2		< 1.000	0.9	0.856	0.084		B
H3		1.09	1.1	1.078	0.098	0.122	S
H4		1.2	1.2	1.161	0.121	0.321	S
H1	Ni $\mu\text{g/l}$	< 0.800	0.4	0.371	0.057		B
H2		< 0.800	0.5	0.447	0.086		B
H3		< 0.800	0.7	0.66	0.054		B
H4		< 0.800	0.8	0.749	0.074	-4.695	Q
H1	Pb $\mu\text{g/l}$	0.56	0.45	0.439	0.031	3.945	S
H2		0.632	0.55	0.532	0.045	2.24	S
H3		0.88	0.8	0.768	0.045	2.473	S
H4		0.971	0.9	0.885	0.082	1.051	S
H1	Zn $\mu\text{g/l}$	5.7	6	6.091	0.614	-0.637	S
H2		6.71	7	6.941	0.687	-0.336	S
H3		7.89	8	8.017	0.84	-0.152	S
H4		8.87	9	9.029	0.874	-0.182	S

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, $\frac{1}{2}$ DL is taken as the reported value in further calculations.

* Z score in unitless

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

S – Satisfactory: Your results deviates less than $\pm 25\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and less than $\pm 15\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

Q – Questionable: Your result deviates between $\pm 25-50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and between $\pm 15-30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

U – Unsatisfactory: Your result deviates more than $\pm 50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and more than $\pm 30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

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

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

EMEP – Analytical intercomparison of heavy metals in precipitation 2018

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 $\mu\text{g/l}$	0.09	0.1	0.105	0.027	-0.559	S
H2		0.14	0.15	0.192	0.173	-0.3	S
H3		0.18	0.2	0.231	0.157	-0.323	S
H4		0.27	0.3	0.303	0.053	-0.624	S
H1	Cd $\mu\text{g/l}$	0.02	0.035	0.033	0.006	-2.285	Q
H2		0.03	0.045	0.044	0.007	-1.95	Q
H3		0.04	0.06	0.058	0.008	-2.187	Q
H4		0.05	0.07	0.071	0.007	-3.157	Q
H1	Cr $\mu\text{g/l}$	< 0.500	0.1	0.109	0.075		B
H2		< 0.500	0.15	0.163	0.082		B
H3		< 0.500	0.3	0.306	0.07		B
H4		< 0.500	0.4	0.411	0.14		B
H1	Cu $\mu\text{g/l}$	< 1.000	0.7	0.669	0.087		B
H2		< 1.000	0.9	0.856	0.084		B
H3		< 1.000	1.1	1.078	0.098	-5.916	U
H4		< 1.000	1.2	1.161	0.121	-5.466	U
H1	Ni $\mu\text{g/l}$	0.34	0.4	0.371	0.057	-0.547	S
H2		0.23	0.5	0.447	0.086	-2.541	U
H3		0.44	0.7	0.66	0.054	-4.04	Q
H4		0.52	0.8	0.749	0.074	-3.079	Q
H1	Pb $\mu\text{g/l}$	0.33	0.45	0.439	0.031	-3.57	Q
H2		0.41	0.55	0.532	0.045	-2.737	Q
H3		0.64	0.8	0.768	0.045	-2.819	S
H4		0.69	0.9	0.885	0.082	-2.382	S
H1	Zn $\mu\text{g/l}$	6.17	6	6.091	0.614	0.128	S
H2		6.5	7	6.941	0.687	-0.641	S
H3		7.13	8	8.017	0.84	-1.056	S
H4		8.58	9	9.029	0.874	-0.514	S

**Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001**

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, $\frac{1}{2}$ DL is taken as the reported value in further calculations.

* Z score in unitless

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

S – Satisfactory: Your results deviates less than $\pm 25\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and less than $\pm 15\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

Q – Questionable: Your result deviates between $\pm 25-50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and between $\pm 15-30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

U – Unsatisfactory: Your result deviates more than $\pm 50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and more than $\pm 30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

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

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

EMEP – Analytical intercomparison of heavy metals in precipitation 2018

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 <i>µg/l</i>	-999	0.1	0.105	0.027		B
H2		-999	0.15	0.192	0.173		B
H3		-999	0.2	0.231	0.157		B
H4		-999	0.3	0.303	0.053		B
H1	Cd <i>µg/l</i>	0.03	0.035	0.033	0.006	-0.495	S
H2		0.04	0.045	0.044	0.007	-0.525	S
H3		0.06	0.06	0.058	0.008	0.306	S
H4		0.07	0.07	0.071	0.007	-0.08	S
H1	Cr <i>µg/l</i>	0.1	0.1	0.109	0.075	-0.123	S
H2		0.15	0.15	0.163	0.082	-0.163	S
H3		0.3	0.3	0.306	0.07	-0.091	S
H4		0.4	0.4	0.411	0.14	-0.081	S
H1	Cu <i>µg/l</i>	0.6	0.7	0.669	0.087	-0.795	S
H2		0.8	0.9	0.856	0.084	-0.666	S
H3		1	1.1	1.078	0.098	-0.799	S
H4		1.1	1.2	1.161	0.121	-0.506	S
H1	Ni <i>µg/l</i>	-999	0.4	0.371	0.057		B
H2		-999	0.5	0.447	0.086		B
H3		-999	0.7	0.66	0.054		B
H4		-999	0.8	0.749	0.074		B
H1	Pb <i>µg/l</i>	0.4	0.45	0.439	0.031	-1.283	S
H2		0.5	0.55	0.532	0.045	-0.719	S
H3		0.8	0.8	0.768	0.045	0.709	S
H4		0.9	0.9	0.885	0.082	0.183	S
H1	Zn <i>µg/l</i>	6	6	6.091	0.614	-0.149	S
H2		7	7	6.941	0.687	0.087	S
H3		8	8	8.017	0.84	-0.021	S
H4		9	9	9.029	0.874	-0.033	S

**Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001**

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, $\frac{1}{2}$ DL is taken as the reported value in further calculations.

* Z score in unitless

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

S – Satisfactory: Your results deviates less than $\pm 25\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and less than $\pm 15\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

Q – Questionable: Your result deviates between $\pm 25-50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and between $\pm 15-30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

U – Unsatisfactory: Your result deviates more than $\pm 50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and more than $\pm 30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

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

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

EMEP – Analytical intercomparison of heavy metals in precipitation 2018

Laboratory 41, Micro Pollutants Technology (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 µg/l	< 0.100	0.1	0.105	0.027	-2.042	Q
H2		0.134	0.15	0.192	0.173	-0.334	S
H3		0.159	0.2	0.231	0.157	-0.456	S
H4		0.318	0.3	0.303	0.053	0.283	S
H1	Cd µg/l	< 0.100	0.035	0.033	0.006		B
H2		< 0.100	0.045	0.044	0.007		B
H3		< 0.100	0.06	0.058	0.008		B
H4		< 0.100	0.07	0.071	0.007		B
H1	Cr µg/l	< 0.500	0.1	0.109	0.075		B
H2		< 0.500	0.15	0.163	0.082		B
H3		< 0.500	0.3	0.306	0.07		B
H4		1.01	0.4	0.411	0.14	4.272	U
H1	Cu µg/l	0.639	0.7	0.669	0.087	-0.348	S
H2		0.834	0.9	0.856	0.084	-0.262	S
H3		1.08	1.1	1.078	0.098	0.02	S
H4		1.18	1.2	1.161	0.121	0.155	S
H1	Ni µg/l	< 0.500	0.4	0.371	0.057		B
H2		< 0.500	0.5	0.447	0.086	-2.308	Q
H3		< 0.500	0.7	0.66	0.054	-7.526	U
H4		0.543	0.8	0.749	0.074	-2.77	Q
H1	Pb µg/l	0.467	0.45	0.439	0.031	0.907	S
H2		0.542	0.55	0.532	0.045	0.222	S
H3		0.825	0.8	0.768	0.045	1.261	S
H4		2.14	0.9	0.885	0.082	15.329	U
H1	Zn µg/l	6.96	6	6.091	0.614	1.414	S
H2		8.12	7	6.941	0.687	1.716	S
H3		9.57	8	8.017	0.84	1.848	S
H4		12.59	9	9.029	0.874	4.076	Q

**Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001**

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, $\frac{1}{2}$ DL is taken as the reported value in further calculations.

* Z score in unitless

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

S – Satisfactory: Your results deviates less than $\pm 25\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and less than $\pm 15\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

Q – Questionable: Your result deviates between $\pm 25-50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and between $\pm 15-30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

U – Unsatisfactory: Your result deviates more than $\pm 50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and more than $\pm 30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

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

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

EMEP – Analytical intercomparison of heavy metals in precipitation 2018

Laboratory 48, Afdeling Rapportering Water Labovestiging Gent, VMM (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 <i>µg/l</i>	0.103	0.1	0.105	0.027	-0.078	S
H2		0.158	0.15	0.192	0.173	-0.196	S
H3		0.213	0.2	0.231	0.157	-0.113	S
H4		0.306	0.3	0.303	0.053	0.056	S
H1	Cd <i>µg/l</i>	0.034	0.035	0.033	0.006	0.221	S
H2		0.044	0.045	0.044	0.007	0.045	S
H3		0.062	0.06	0.058	0.008	0.555	S
H4		0.064	0.07	0.071	0.007	-1.003	S
H1	Cr <i>µg/l</i>	0	0.1	0.109	0.075	-1.449	U
H2		0.032	0.15	0.163	0.082	-1.605	U
H3		0.178	0.3	0.306	0.07	-1.83	Q
H4		0.253	0.4	0.411	0.14	-1.13	Q
H1	Cu <i>µg/l</i>	0.468	0.7	0.669	0.087	-2.31	Q
H2		0.684	0.9	0.856	0.084	-2.046	S
H3		0.859	1.1	1.078	0.098	-2.242	S
H4		0.897	1.2	1.161	0.121	-2.184	Q
H1	Ni <i>µg/l</i>	0.241	0.4	0.371	0.057	-2.281	Q
H2		0.338	0.5	0.447	0.086	-1.279	Q
H3		0.54	0.7	0.66	0.054	-2.205	S
H4		0.588	0.8	0.749	0.074	-2.164	Q
H1	Pb <i>µg/l</i>	0.42	0.45	0.439	0.031	-0.629	S
H2		0.531	0.55	0.532	0.045	-0.024	S
H3		0.761	0.8	0.768	0.045	-0.151	S
H4		0.846	0.9	0.885	0.082	-0.476	S
H1	Zn <i>µg/l</i>	5.998	6	6.091	0.614	-0.152	S
H2		7.312	7	6.941	0.687	0.541	S
H3		8.405	8	8.017	0.84	0.461	S
H4		8.93	9	9.029	0.874	-0.113	S

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, $\frac{1}{2}$ DL is taken as the reported value in further calculations.

* Z score in unitless

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

S – Satisfactory: Your results deviates less than $\pm 25\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and less than $\pm 15\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

Q – Questionable: Your result deviates between $\pm 25-50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and between $\pm 15-30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

U – Unsatisfactory: Your result deviates more than $\pm 50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and more than $\pm 30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

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

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

EMEP – Analytical intercomparison of heavy metals in precipitation 2018

Laboratory 51, TERA Environnement (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 µg/l	< 0.200	0.1	0.105	0.027		B
H2		< 0.200	0.15	0.192	0.173		B
H3		0.2	0.2	0.231	0.157	-0.195	S
H4		0.3	0.3	0.303	0.053	-0.057	S
H1	Cd µg/l	< 0.200	0.035	0.033	0.006		B
H2		< 0.200	0.045	0.044	0.007		B
H3		< 0.200	0.06	0.058	0.008		B
H4		< 0.200	0.07	0.071	0.007		B
H1	Cr µg/l	< 0.500	0.1	0.109	0.075		B
H2		< 0.500	0.15	0.163	0.082		B
H3		< 0.500	0.3	0.306	0.07		B
H4		< 0.500	0.4	0.411	0.14		B
H1	Cu µg/l	0.7	0.7	0.669	0.087	0.352	S
H2		0.8	0.9	0.856	0.084	-0.666	S
H3		1	1.1	1.078	0.098	-0.799	S
H4		1.1	1.2	1.161	0.121	-0.506	S
H1	Ni µg/l	< 0.500	0.4	0.371	0.057		B
H2		< 0.500	0.5	0.447	0.086	-2.308	Q
H3		0.6	0.7	0.66	0.054	-1.104	S
H4		0.7	0.8	0.749	0.074	-0.655	S
H1	Pb µg/l	0.4	0.45	0.439	0.031	-1.283	S
H2		0.5	0.55	0.532	0.045	-0.719	S
H3		0.8	0.8	0.768	0.045	0.709	S
H4		0.9	0.9	0.885	0.082	0.183	S
H1	Zn µg/l	5	6	6.091	0.614	-1.777	S
H2		5.8	7	6.941	0.687	-1.66	S
H3		6.9	8	8.017	0.84	-1.33	S
H4		7.6	9	9.029	0.874	-1.635	S

**Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001**

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, $\frac{1}{2}$ DL is taken as the reported value in further calculations.

* Z score in unitless

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

S – Satisfactory: Your results deviates less than $\pm 25\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and less than $\pm 15\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

Q – Questionable: Your result deviates between $\pm 25-50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and between $\pm 15-30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

U – Unsatisfactory: Your result deviates more than $\pm 50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and more than $\pm 30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

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

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

EMEP – Analytical intercomparison of heavy metals in precipitation 2018

Laboratory 52, Voivodship Inspectorate 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 *
H1	As µg/l	0.11	0.1	0.105	0.027	0.182	S
H2		0.16	0.15	0.192	0.173	-0.184	S
H3		0.22	0.2	0.231	0.157	-0.068	S
H4		0.32	0.3	0.303	0.053	0.321	S
H1	Cd µg/l	0.032	0.035	0.033	0.006	-0.137	S
H2		0.044	0.045	0.044	0.007	0.045	S
H3		0.058	0.06	0.058	0.008	0.056	S
H4		0.069	0.07	0.071	0.007	-0.234	S
H1	Cr µg/l	-999	0.1	0.109	0.075		B
H2		-999	0.15	0.163	0.082		B
H3		-999	0.3	0.306	0.07		B
H4		-999	0.4	0.411	0.14		B
H1	Cu µg/l	-999	0.7	0.669	0.087		B
H2		-999	0.9	0.856	0.084		B
H3		-999	1.1	1.078	0.098		B
H4		-999	1.2	1.161	0.121		B
H1	Ni µg/l	0.33	0.4	0.371	0.057	-0.723	S
H2		0.42	0.5	0.447	0.086	-0.32	S
H3		0.62	0.7	0.66	0.054	-0.737	S
H4		0.71	0.8	0.749	0.074	-0.521	S
H1	Pb µg/l	0.42	0.45	0.439	0.031	-0.629	S
H2		0.53	0.55	0.532	0.045	-0.047	S
H3		0.77	0.8	0.768	0.045	0.048	S
H4		0.88	0.9	0.885	0.082	-0.061	S
H1	Zn µg/l	-999	6	6.091	0.614		B
H2		-999	7	6.941	0.687		B
H3		-999	8	8.017	0.84		B
H4		-999	9	9.029	0.874		B

**Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001**

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, $\frac{1}{2}$ DL is taken as the reported value in further calculations.

* Z score in unitless

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

S – Satisfactory: Your results deviates less than $\pm 25\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and less than $\pm 15\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

Q – Questionable: Your result deviates between $\pm 25-50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and between $\pm 15-30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

U – Unsatisfactory: Your result deviates more than $\pm 50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and more than $\pm 30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

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

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

EMEP – Analytical intercomparison of heavy metals in precipitation 2018

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 *
H1	As µg/l	0.1	0.1	0.105	0.027	-0.189	S
H2		0.13	0.15	0.192	0.173	-0.357	S
H3		0.21	0.2	0.231	0.157	-0.132	S
H4		0.3	0.3	0.303	0.053	-0.057	S
H1	Cd µg/l	0.035	0.035	0.033	0.006	0.4	S
H2		0.04	0.045	0.044	0.007	-0.525	S
H3		0.056	0.06	0.058	0.008	-0.193	S
H4		0.069	0.07	0.071	0.007	-0.234	S
H1	Cr µg/l	0.22	0.1	0.109	0.075	1.467	U
H2		0.25	0.15	0.163	0.082	1.059	U
H3		0.37	0.3	0.306	0.07	0.907	S
H4		0.45	0.4	0.411	0.14	0.276	S
H1	Cu µg/l	0.65	0.7	0.669	0.087	-0.222	S
H2		0.88	0.9	0.856	0.084	0.285	S
H3		1.08	1.1	1.078	0.098	0.02	S
H4		1.14	1.2	1.161	0.121	-0.175	S
H1	Ni µg/l	0.41	0.4	0.371	0.057	0.679	S
H2		0.52	0.5	0.447	0.086	0.849	S
H3		0.68	0.7	0.66	0.054	0.364	S
H4		0.77	0.8	0.749	0.074	0.287	S
H1	Pb µg/l	0.45	0.45	0.439	0.031	0.351	S
H2		0.54	0.55	0.532	0.045	0.178	S
H3		0.78	0.8	0.768	0.045	0.268	S
H4		0.88	0.9	0.885	0.082	-0.061	S
H1	Zn µg/l	5.8	6	6.091	0.614	-0.474	S
H2		6.4	7	6.941	0.687	-0.787	S
H3		7.6	8	8.017	0.84	-0.497	S
H4		8.4	9	9.029	0.874	-0.72	S

**Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001**

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, $\frac{1}{2}$ DL is taken as the reported value in further calculations.

* Z score in unitless

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

S – Satisfactory: Your results deviates less than $\pm 25\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and less than $\pm 15\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

Q – Questionable: Your result deviates between $\pm 25-50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and between $\pm 15-30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

U – Unsatisfactory: Your result deviates more than $\pm 50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and more than $\pm 30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

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

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

EMEP – Analytical intercomparison of heavy metals in precipitation 2018

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 $\mu\text{g/l}$	-999	0.1	0.105	0.027		B
H2		-999	0.15	0.192	0.173		B
H3		-999	0.2	0.231	0.157		B
H4		-999	0.3	0.303	0.053		B
H1	Cd $\mu\text{g/l}$	0.036	0.035	0.033	0.006	0.579	S
H2		0.048	0.045	0.044	0.007	0.615	S
H3		0.063	0.06	0.058	0.008	0.68	S
H4		0.073	0.07	0.071	0.007	0.382	S
H1	Cr $\mu\text{g/l}$	0.092	0.1	0.109	0.075	-0.229	S
H2		0.144	0.15	0.163	0.082	-0.236	S
H3		0.292	0.3	0.306	0.07	-0.205	S
H4		0.385	0.4	0.411	0.14	-0.188	S
H1	Cu $\mu\text{g/l}$	0.716	0.7	0.669	0.087	0.535	S
H2		0.917	0.9	0.856	0.084	0.726	S
H3		1.121	1.1	1.078	0.098	0.439	S
H4		2.001	1.2	1.161	0.121	6.942	U
H1	Ni $\mu\text{g/l}$	0.329	0.4	0.371	0.057	-0.74	S
H2		0.426	0.5	0.447	0.086	-0.25	S
H3		0.625	0.7	0.66	0.054	-0.646	S
H4		0.729	0.8	0.749	0.074	-0.265	S
H1	Pb $\mu\text{g/l}$	0.449	0.45	0.439	0.031	0.318	S
H2		0.551	0.55	0.532	0.045	0.424	S
H3		0.799	0.8	0.768	0.045	0.687	S
H4		0.904	0.9	0.885	0.082	0.232	S
H1	Zn $\mu\text{g/l}$	7.02	6	6.091	0.614	1.512	S
H2		8.18	7	6.941	0.687	1.804	S
H3		9.68	8	8.017	0.84	1.979	S
H4		11.52	9	9.029	0.874	2.852	Q

**Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001**

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, $\frac{1}{2}$ DL is taken as the reported value in further calculations.

* Z score in unitless

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

S – Satisfactory: Your results deviates less than $\pm 25\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and less than $\pm 15\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

Q – Questionable: Your result deviates between $\pm 25-50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and between $\pm 15-30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

U – Unsatisfactory: Your result deviates more than $\pm 50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and more than $\pm 30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

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

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

EMEP – Analytical intercomparison of heavy metals in precipitation 2018

Laboratory 114, C.N.R. Institute of Water Research (Italy)

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 µg/l	< 1.000	0.1	0.105	0.027		B
H2		1	0.15	0.192	0.173	4.662	U
H3		1	0.2	0.231	0.157	4.893	U
H4		1.5	0.3	0.303	0.053	22.623	U
H1	Cd µg/l	< 0.100	0.035	0.033	0.006		B
H2		< 0.100	0.045	0.044	0.007		B
H3		< 0.100	0.06	0.058	0.008		B
H4		< 0.100	0.07	0.071	0.007		B
H1	Cr µg/l	0.1	0.1	0.109	0.075	-0.123	S
H2		0.1	0.15	0.163	0.082	-0.774	Q
H3		0.3	0.3	0.306	0.07	-0.091	S
H4		0.4	0.4	0.411	0.14	-0.081	S
H1	Cu µg/l	0.7	0.7	0.669	0.087	0.352	S
H2		0.9	0.9	0.856	0.084	0.523	S
H3		1.1	1.1	1.078	0.098	0.225	S
H4		1.4	1.2	1.161	0.121	1.974	S
H1	Ni µg/l	0.3	0.4	0.371	0.057	-1.248	Q
H2		0.4	0.5	0.447	0.086	-0.554	S
H3		0.6	0.7	0.66	0.054	-1.104	S
H4		0.7	0.8	0.749	0.074	-0.655	S
H1	Pb µg/l	0.5	0.45	0.439	0.031	1.985	S
H2		0.9	0.55	0.532	0.045	8.248	U
H3		1.1	0.8	0.768	0.045	7.324	Q
H4		1.2	0.9	0.885	0.082	3.848	Q
H1	Zn µg/l	4.9	6	6.091	0.614	-1.939	S
H2		6.1	7	6.941	0.687	-1.223	S
H3		6.5	8	8.017	0.84	-1.806	S
H4		7.8	9	9.029	0.874	-1.406	S

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, $\frac{1}{2}$ DL is taken as the reported value in further calculations.

* Z score in unitless

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

S – Satisfactory: Your results deviates less than $\pm 25\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and less than $\pm 15\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

Q – Questionable: Your result deviates between $\pm 25-50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and between $\pm 15-30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

U – Unsatisfactory: Your result deviates more than $\pm 50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and more than $\pm 30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

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

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

EMEP – Analytical intercomparison of heavy metals in precipitation 2018

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 *
H1	As µg/l	0.111	0.1	0.105	0.027	0.219	S
H2		0.159	0.15	0.192	0.173	-0.19	S
H3		0.243	0.2	0.231	0.157	0.078	S
H4		0.343	0.3	0.303	0.053	0.755	S
H1	Cd µg/l	0.038	0.035	0.033	0.006	0.937	S
H2		0.049	0.045	0.044	0.007	0.757	S
H3		0.066	0.06	0.058	0.008	1.054	S
H4		0.076	0.07	0.071	0.007	0.843	S
H1	Cr µg/l	0.104	0.1	0.109	0.075	-0.07	S
H2		0.149	0.15	0.163	0.082	-0.175	S
H3		0.303	0.3	0.306	0.07	-0.048	S
H4		0.401	0.4	0.411	0.14	-0.073	S
H1	Cu µg/l	0.697	0.7	0.669	0.087	0.317	S
H2		0.882	0.9	0.856	0.084	0.309	S
H3		1.088	1.1	1.078	0.098	0.102	S
H4		1.222	1.2	1.161	0.121	0.503	S
H1	Ni µg/l	0.409	0.4	0.371	0.057	0.661	S
H2		0.487	0.5	0.447	0.086	0.463	S
H3		0.67	0.7	0.66	0.054	0.18	S
H4		0.794	0.8	0.749	0.074	0.61	S
H1	Pb µg/l	0.443	0.45	0.439	0.031	0.122	S
H2		0.534	0.55	0.532	0.045	0.043	S
H3		0.774	0.8	0.768	0.045	0.136	S
H4		0.888	0.9	0.885	0.082	0.037	S
H1	Zn µg/l	6.73	6	6.091	0.614	1.04	S
H2		7.13	7	6.941	0.687	0.276	S
H3		8.18	8	8.017	0.84	0.193	S
H4		9.19	9	9.029	0.874	0.185	S

**Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001**

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, $\frac{1}{2}$ DL is taken as the reported value in further calculations.

* Z score in unitless

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

S – Satisfactory: Your results deviates less than $\pm 25\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and less than $\pm 15\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

Q – Questionable: Your result deviates between $\pm 25-50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and between $\pm 15-30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

U – Unsatisfactory: Your result deviates more than $\pm 50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and more than $\pm 30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

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

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

EMEP – Analytical intercomparison of heavy metals in precipitation 2018

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 $\mu\text{g/l}$	-999	0.1	0.105	0.027		B
H2		-999	0.15	0.192	0.173		B
H3		-999	0.2	0.231	0.157		B
H4		-999	0.3	0.303	0.053		B
H1	Cd $\mu\text{g/l}$	0.021	0.035	0.033	0.006	-2.106	Q
H2		0.03	0.045	0.044	0.007	-1.95	Q
H3		0.041	0.06	0.058	0.008	-2.063	Q
H4		0.087	0.07	0.071	0.007	2.535	S
H1	Cr $\mu\text{g/l}$	< 0.400	0.1	0.109	0.075		B
H2		< 0.400	0.15	0.163	0.082		B
H3		< 0.400	0.3	0.306	0.07		B
H4		0.43	0.4	0.411	0.14	0.133	S
H1	Cu $\mu\text{g/l}$	0.51	0.7	0.669	0.087	-1.828	Q
H2		0.67	0.9	0.856	0.084	-2.213	Q
H3		0.92	1.1	1.078	0.098	-1.618	S
H4		1.12	1.2	1.161	0.121	-0.341	S
H1	Ni $\mu\text{g/l}$	-999	0.4	0.371	0.057		B
H2		-999	0.5	0.447	0.086		B
H3		-999	0.7	0.66	0.054		B
H4		-999	0.8	0.749	0.074		B
H1	Pb $\mu\text{g/l}$	0.58	0.45	0.439	0.031	4.599	Q
H2		0.71	0.55	0.532	0.045	3.988	Q
H3		0.98	0.8	0.768	0.045	4.678	S
H4		1.41	0.9	0.885	0.082	6.412	U
H1	Zn $\mu\text{g/l}$	7.7	6	6.091	0.614	2.619	Q
H2		9.7	7	6.941	0.687	4.016	Q
H3		9.3	8	8.017	0.84	1.526	S
H4		10.3	9	9.029	0.874	1.455	S

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, $\frac{1}{2}$ DL is taken as the reported value in further calculations.

* Z score in unitless

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

S – Satisfactory: Your results deviates less than $\pm 25\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and less than $\pm 15\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

Q – Questionable: Your result deviates between $\pm 25-50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and between $\pm 15-30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

U – Unsatisfactory: Your result deviates more than $\pm 50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and more than $\pm 30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

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

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

EMEP – Analytical intercomparison of heavy metals in precipitation 2018

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 µg/l	2.8	0.1	0.105	0.027	99.902	U
H2		2.8	0.15	0.192	0.173	15.047	U
H3		3	0.2	0.231	0.157	17.614	U
H4		2.5	0.3	0.303	0.053	41.524	U
H1	Cd µg/l	0.024	0.035	0.033	0.006	-1.569	Q
H2		0.035	0.045	0.044	0.007	-1.237	S
H3		0.05	0.06	0.058	0.008	-0.941	S
H4		0.061	0.07	0.071	0.007	-1.465	S
H1	Cr µg/l	1.9	0.1	0.109	0.075	23.733	U
H2		1.5	0.15	0.163	0.082	16.331	U
H3		1.7	0.3	0.306	0.07	19.873	U
H4		1.9	0.4	0.411	0.14	10.623	U
H1	Cu µg/l	1.2	0.7	0.669	0.087	6.088	U
H2		1.1	0.9	0.856	0.084	2.903	S
H3		1.3	1.1	1.078	0.098	2.272	S
H4		1.3	1.2	1.161	0.121	1.147	S
H1	Ni µg/l	< 20.000	0.4	0.371	0.057		B
H2		< 20.000	0.5	0.447	0.086		B
H3		< 20.000	0.7	0.66	0.054		B
H4		< 20.000	0.8	0.749	0.074		B
H1	Pb µg/l	0.45	0.45	0.439	0.031	0.351	S
H2		0.55	0.55	0.532	0.045	0.402	S
H3		0.78	0.8	0.768	0.045	0.268	S
H4		0.91	0.9	0.885	0.082	0.306	S
H1	Zn µg/l	6.57	6	6.091	0.614	0.779	S
H2		7.8	7	6.941	0.687	1.251	S
H3		8.42	8	8.017	0.84	0.479	S
H4		9.18	9	9.029	0.874	0.173	S

**Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001**

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, $\frac{1}{2}$ DL is taken as the reported value in further calculations.

* Z score in unitless

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

S – Satisfactory: Your results deviates less than $\pm 25\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and less than $\pm 15\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

Q – Questionable: Your result deviates between $\pm 25-50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and between $\pm 15-30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

U – Unsatisfactory: Your result deviates more than $\pm 50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and more than $\pm 30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

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

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

EMEP – Analytical intercomparison of heavy metals in precipitation 2018

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 $\mu\text{g/l}$	0.107	0.1	0.105	0.027	0.071	S
H2		0.154	0.15	0.192	0.173	-0.219	S
H3		0.215	0.2	0.231	0.157	-0.1	S
H4		0.329	0.3	0.303	0.053	0.491	S
H1	Cd $\mu\text{g/l}$	0.031	0.035	0.033	0.006	-0.316	S
H2		0.04	0.045	0.044	0.007	-0.525	S
H3		0.063	0.06	0.058	0.008	0.68	S
H4		0.081	0.07	0.071	0.007	1.612	S
H1	Cr $\mu\text{g/l}$	0.12	0.1	0.109	0.075	0.142	S
H2		0.175	0.15	0.163	0.082	0.143	S
H3		0.315	0.3	0.306	0.07	0.123	S
H4		0.42	0.4	0.411	0.14	0.062	S
H1	Cu $\mu\text{g/l}$	0.668	0.7	0.669	0.087	-0.015	S
H2		0.845	0.9	0.856	0.084	-0.131	S
H3		1.033	1.1	1.078	0.098	-0.461	S
H4		1.169	1.2	1.161	0.121	0.064	S
H1	Ni $\mu\text{g/l}$	0.398	0.4	0.371	0.057	0.468	S
H2		0.479	0.5	0.447	0.086	0.37	S
H3		0.762	0.7	0.66	0.054	1.868	S
H4		0.808	0.8	0.749	0.074	0.799	S
H1	Pb $\mu\text{g/l}$	0.452	0.45	0.439	0.031	0.416	S
H2		0.55	0.55	0.532	0.045	0.402	S
H3		0.783	0.8	0.768	0.045	0.334	S
H4		0.896	0.9	0.885	0.082	0.135	S
H1	Zn $\mu\text{g/l}$	5.606	6	6.091	0.614	-0.79	S
H2		6.984	7	6.941	0.687	0.063	S
H3		8.264	8	8.017	0.84	0.293	S
H4		9.121	9	9.029	0.874	0.106	S

**Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001**

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, $\frac{1}{2}$ DL is taken as the reported value in further calculations.

* Z score in unitless

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

S – Satisfactory: Your results deviates less than $\pm 25\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and less than $\pm 15\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

Q – Questionable: Your result deviates between $\pm 25-50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and between $\pm 15-30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

U – Unsatisfactory: Your result deviates more than $\pm 50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and more than $\pm 30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

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

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

EMEP – Analytical intercomparison of heavy metals in precipitation 2018

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 $\mu\text{g/l}$	< 0.200	0.1	0.105	0.027		B
H2		< 0.200	0.15	0.192	0.173		B
H3		< 0.200	0.2	0.231	0.157	-0.831	Q
H4		0.292	0.3	0.303	0.053	-0.209	S
H1	Cd $\mu\text{g/l}$	< 0.050	0.035	0.033	0.006		B
H2		< 0.050	0.045	0.044	0.007		B
H3		0.052	0.06	0.058	0.008	-0.691	S
H4		0.075	0.07	0.071	0.007	0.689	S
H1	Cr $\mu\text{g/l}$	< 0.250	0.1	0.109	0.075		B
H2		< 0.250	0.15	0.163	0.082		B
H3		0.302	0.3	0.306	0.07	-0.062	S
H4		0.395	0.4	0.411	0.14	-0.116	S
H1	Cu $\mu\text{g/l}$	0.705	0.7	0.669	0.087	0.409	S
H2		0.884	0.9	0.856	0.084	0.333	S
H3		1.095	1.1	1.078	0.098	0.173	S
H4		1.192	1.2	1.161	0.121	0.255	S
H1	Ni $\mu\text{g/l}$	0.46	0.4	0.371	0.057	1.554	S
H2		0.501	0.5	0.447	0.086	0.627	S
H3		0.661	0.7	0.66	0.054	0.015	S
H4		0.806	0.8	0.749	0.074	0.772	S
H1	Pb $\mu\text{g/l}$	0.444	0.45	0.439	0.031	0.155	S
H2		0.541	0.55	0.532	0.045	0.2	S
H3		0.775	0.8	0.768	0.045	0.158	S
H4		0.89	0.9	0.885	0.082	0.061	S
H1	Zn $\mu\text{g/l}$	5.717	6	6.091	0.614	-0.609	S
H2		6.659	7	6.941	0.687	-0.41	S
H3		7.541	8	8.017	0.84	-0.567	S
H4		8.484	9	9.029	0.874	-0.623	S

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, $\frac{1}{2}$ DL is taken as the reported value in further calculations.

* Z score in unitless

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

S – Satisfactory: Your results deviates less than $\pm 25\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and less than $\pm 15\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

Q – Questionable: Your result deviates between $\pm 25-50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and between $\pm 15-30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

U – Unsatisfactory: Your result deviates more than $\pm 50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and more than $\pm 30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

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

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

EMEP – Analytical intercomparison of heavy metals in precipitation 2018

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 *
H1	As µg/l	0.107	0.1	0.105	0.027	0.071	S
H2		0.199	0.15	0.192	0.173	0.041	Q
H3		0.24	0.2	0.231	0.157	0.059	S
H4		0.378	0.3	0.303	0.053	1.417	Q
H1	Cd µg/l	0.035	0.035	0.033	0.006	0.4	S
H2		0.045	0.045	0.044	0.007	0.216	S
H3		0.059	0.06	0.058	0.008	0.144	S
H4		0.069	0.07	0.071	0.007	-0.218	S
H1	Cr µg/l	< 0.250	0.1	0.109	0.075		B
H2		< 0.250	0.15	0.163	0.082		B
H3		0.311	0.3	0.306	0.07	0.066	S
H4		0.389	0.4	0.411	0.14	-0.159	S
H1	Cu µg/l	0.332	0.7	0.669	0.087	-3.87	U
H2		0.469	0.9	0.856	0.084	-4.604	Q
H3		0.713	1.1	1.078	0.098	-3.736	Q
H4		0.798	1.2	1.161	0.121	-3.003	Q
H1	Ni µg/l	0.397	0.4	0.371	0.057	0.451	S
H2		0.476	0.5	0.447	0.086	0.335	S
H3		0.679	0.7	0.66	0.054	0.345	S
H4		0.773	0.8	0.749	0.074	0.328	S
H1	Pb µg/l	0.441	0.45	0.439	0.031	0.057	S
H2		0.52	0.55	0.532	0.045	-0.271	S
H3		0.779	0.8	0.768	0.045	0.246	S
H4		0.86	0.9	0.885	0.082	-0.305	S
H1	Zn µg/l	5.7	6	6.091	0.614	-0.637	S
H2		6.74	7	6.941	0.687	-0.292	S
H3		8.19	8	8.017	0.84	0.205	S
H4		9.15	9	9.029	0.874	0.139	S

**Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001**

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, $\frac{1}{2}$ DL is taken as the reported value in further calculations.

* Z score in unitless

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

S – Satisfactory: Your results deviates less than $\pm 25\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and less than $\pm 15\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

Q – Questionable: Your result deviates between $\pm 25-50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and between $\pm 15-30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

U – Unsatisfactory: Your result deviates more than $\pm 50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and more than $\pm 30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

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

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

EMEP – Analytical intercomparison of heavy metals in precipitation 2018

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 $\mu\text{g/l}$	< 5.000	0.1	0.105	0.027		B
H2		< 5.000	0.15	0.192	0.173		B
H3		< 5.000	0.2	0.231	0.157		B
H4		< 5.000	0.3	0.303	0.053		B
H1	Cd $\mu\text{g/l}$	< 5.000	0.035	0.033	0.006		B
H2		< 5.000	0.045	0.044	0.007		B
H3		< 5.000	0.06	0.058	0.008		B
H4		< 5.000	0.07	0.071	0.007		B
H1	Cr $\mu\text{g/l}$	< 5.000	0.1	0.109	0.075		B
H2		< 5.000	0.15	0.163	0.082		B
H3		< 5.000	0.3	0.306	0.07		B
H4		< 5.000	0.4	0.411	0.14		B
H1	Cu $\mu\text{g/l}$	< 5.000	0.7	0.669	0.087		B
H2		< 5.000	0.9	0.856	0.084		B
H3		< 5.000	1.1	1.078	0.098		B
H4		< 5.000	1.2	1.161	0.121		B
H1	Ni $\mu\text{g/l}$	< 5.000	0.4	0.371	0.057		B
H2		< 5.000	0.5	0.447	0.086		B
H3		< 5.000	0.7	0.66	0.054		B
H4		< 5.000	0.8	0.749	0.074		B
H1	Pb $\mu\text{g/l}$	< 5.000	0.45	0.439	0.031		B
H2		< 5.000	0.55	0.532	0.045		B
H3		< 5.000	0.8	0.768	0.045		B
H4		< 5.000	0.9	0.885	0.082		B
H1	Zn $\mu\text{g/l}$	6.371	6	6.091	0.614	0.455	S
H2		6.461	7	6.941	0.687	-0.698	S
H3		8.098	8	8.017	0.84	0.096	S
H4		8.409	9	9.029	0.874	-0.709	S

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, $\frac{1}{2}$ DL is taken as the reported value in further calculations.

* Z score in unitless

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

S – Satisfactory: Your results deviates less than $\pm 25\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and less than $\pm 15\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

Q – Questionable: Your result deviates between $\pm 25-50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and between $\pm 15-30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

U – Unsatisfactory: Your result deviates more than $\pm 50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and more than $\pm 30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

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

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

EMEP – Analytical intercomparison of heavy metals in precipitation 2018

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 µg/l	-999	0.1	0.105	0.027		B
H2		-999	0.15	0.192	0.173		B
H3		-999	0.2	0.231	0.157		B
H4		-999	0.3	0.303	0.053		B
H1	Cd µg/l	0.027	0.035	0.033	0.006	-1.032	S
H2		0.037	0.045	0.044	0.007	-0.952	S
H3		0.058	0.06	0.058	0.008	0.056	S
H4		0.068	0.07	0.071	0.007	-0.388	S
H1	Cr µg/l	-999	0.1	0.109	0.075		B
H2		-999	0.15	0.163	0.082		B
H3		-999	0.3	0.306	0.07		B
H4		-999	0.4	0.411	0.14		B
H1	Cu µg/l	-999	0.7	0.669	0.087		B
H2		-999	0.9	0.856	0.084		B
H3		-999	1.1	1.078	0.098		B
H4		-999	1.2	1.161	0.121		B
H1	Ni µg/l	-999	0.4	0.371	0.057		B
H2		-999	0.5	0.447	0.086		B
H3		-999	0.7	0.66	0.054		B
H4		-999	0.8	0.749	0.074		B
H1	Pb µg/l	-999	0.45	0.439	0.031		B
H2		-999	0.55	0.532	0.045		B
H3		-999	0.8	0.768	0.045		B
H4		-999	0.9	0.885	0.082		B
H1	Zn µg/l	-999	6	6.091	0.614		B
H2		-999	7	6.941	0.687		B
H3		-999	8	8.017	0.84		B
H4		-999	9	9.029	0.874		B

**Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001**

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, $\frac{1}{2}$ DL is taken as the reported value in further calculations.

* Z score in unitless

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

S – Satisfactory: Your results deviates less than $\pm 25\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and less than $\pm 15\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

Q – Questionable: Your result deviates between $\pm 25-50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and between $\pm 15-30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

U – Unsatisfactory: Your result deviates more than $\pm 50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and more than $\pm 30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

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

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

EMEP – Analytical intercomparison of heavy metals in precipitation 2018

Laboratory 145, Estonian Environmental Research Centre, Tartu laboratory (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 $\mu\text{g/l}$	0.103	0.1	0.105	0.027	-0.078	S
H2		0.15	0.15	0.192	0.173	-0.242	S
H3		0.196	0.2	0.231	0.157	-0.221	S
H4		0.3	0.3	0.303	0.053	-0.057	S
H1	Cd $\mu\text{g/l}$	0.039	0.035	0.033	0.006	1.098	S
H2		0.044	0.045	0.044	0.007	0.059	S
H3		0.067	0.06	0.058	0.008	1.116	S
H4		0.074	0.07	0.071	0.007	0.535	S
H1	Cr $\mu\text{g/l}$	< 0.500	0.1	0.109	0.075		B
H2		< 0.500	0.15	0.163	0.082		B
H3		< 0.500	0.3	0.306	0.07		B
H4		< 0.500	0.4	0.411	0.14		B
H1	Cu $\mu\text{g/l}$	< 1.000	0.7	0.669	0.087		B
H2		< 1.000	0.9	0.856	0.084		B
H3		1.21	1.1	1.078	0.098	1.35	S
H4		1.32	1.2	1.161	0.121	1.313	S
H1	Ni $\mu\text{g/l}$	0.467	0.4	0.371	0.057	1.677	S
H2		0.546	0.5	0.447	0.086	1.153	S
H3		0.77	0.7	0.66	0.054	2.015	S
H4		0.903	0.8	0.749	0.074	2.078	S
H1	Pb $\mu\text{g/l}$	0.446	0.45	0.439	0.031	0.22	S
H2		0.549	0.55	0.532	0.045	0.379	S
H3		0.785	0.8	0.768	0.045	0.379	S
H4		0.906	0.9	0.885	0.082	0.257	S
H1	Zn $\mu\text{g/l}$	5.79	6	6.091	0.614	-0.49	S
H2		6.76	7	6.941	0.687	-0.263	S
H3		7.64	8	8.017	0.84	-0.449	S
H4		8.79	9	9.029	0.874	-0.273	S

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, $\frac{1}{2}$ DL is taken as the reported value in further calculations.

* Z score in unitless

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

S – Satisfactory: Your results deviates less than $\pm 25\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and less than $\pm 15\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

Q – Questionable: Your result deviates between $\pm 25-50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and between $\pm 15-30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

U – Unsatisfactory: Your result deviates more than $\pm 50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and more than $\pm 30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

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

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

EMEP – Analytical intercomparison of heavy metals in precipitation 2018

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 $\mu\text{g/l}$	< 0.250	0.1	0.105	0.027		B
H2		< 0.250	0.15	0.192	0.173		B
H3		< 0.250	0.2	0.231	0.157		B
H4		0.275	0.3	0.303	0.053	-0.53	S
H1	Cd $\mu\text{g/l}$	0.037	0.035	0.033	0.006	0.758	S
H2		0.044	0.045	0.044	0.007	0.045	S
H3		0.057	0.06	0.058	0.008	-0.068	S
H4		0.073	0.07	0.071	0.007	0.382	S
H1	Cr $\mu\text{g/l}$	< 0.100	0.1	0.109	0.075	-0.786	Q
H2		0.149	0.15	0.163	0.082	-0.175	S
H3		0.302	0.3	0.306	0.07	-0.062	S
H4		0.395	0.4	0.411	0.14	-0.116	S
H1	Cu $\mu\text{g/l}$	0.693	0.7	0.669	0.087	0.272	S
H2		0.897	0.9	0.856	0.084	0.488	S
H3		1.09	1.1	1.078	0.098	0.122	S
H4		1.229	1.2	1.161	0.121	0.56	S
H1	Ni $\mu\text{g/l}$	0.393	0.4	0.371	0.057	0.381	S
H2		0.499	0.5	0.447	0.086	0.604	S
H3		0.672	0.7	0.66	0.054	0.217	S
H4		0.804	0.8	0.749	0.074	0.745	S
H1	Pb $\mu\text{g/l}$	0.469	0.45	0.439	0.031	0.972	S
H2		0.561	0.55	0.532	0.045	0.648	S
H3		0.791	0.8	0.768	0.045	0.511	S
H4		0.902	0.9	0.885	0.082	0.208	S
H1	Zn $\mu\text{g/l}$	5.829	6	6.091	0.614	-0.427	S
H2		7.159	7	6.941	0.687	0.318	S
H3		8.056	8	8.017	0.84	0.046	S
H4		9.283	9	9.029	0.874	0.291	S

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, $\frac{1}{2}$ DL is taken as the reported value in further calculations.

* Z score in unitless

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

S – Satisfactory: Your results deviates less than $\pm 25\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and less than $\pm 15\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

Q – Questionable: Your result deviates between $\pm 25-50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and between $\pm 15-30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

U – Unsatisfactory: Your result deviates more than $\pm 50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and more than $\pm 30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

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

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

EMEP – Analytical intercomparison of heavy metals in precipitation 2018

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 ^x
H1	As <i>µg/l</i>	-999	0.1	0.105	0.027		B
H2		-999	0.15	0.192	0.173		B
H3		-999	0.2	0.231	0.157		B
H4		-999	0.3	0.303	0.053		B
H1	Cd <i>µg/l</i>	-999	0.035	0.033	0.006		B
H2		-999	0.045	0.044	0.007		B
H3		-999	0.06	0.058	0.008		B
H4		-999	0.07	0.071	0.007		B
H1	Cr <i>µg/l</i>	-999	0.1	0.109	0.075		B
H2		-999	0.15	0.163	0.082		B
H3		-999	0.3	0.306	0.07		B
H4		-999	0.4	0.411	0.14		B
H1	Cu <i>µg/l</i>	-999	0.7	0.669	0.087		B
H2		-999	0.9	0.856	0.084		B
H3		-999	1.1	1.078	0.098		B
H4		-999	1.2	1.161	0.121		B
H1	Ni <i>µg/l</i>	-999	0.4	0.371	0.057		B
H2		-999	0.5	0.447	0.086		B
H3		-999	0.7	0.66	0.054		B
H4		-999	0.8	0.749	0.074		B
H1	Pb <i>µg/l</i>	-999	0.45	0.439	0.031		B
H2		-999	0.55	0.532	0.045		B
H3		-999	0.8	0.768	0.045		B
H4		-999	0.9	0.885	0.082		B
H1	Zn <i>µg/l</i>	6.5	6	6.091	0.614	0.665	S
H2		7.5	7	6.941	0.687	0.814	S
H3		8.8	8	8.017	0.84	0.931	S
H4		10.1	9	9.029	0.874	1.226	S

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, $\frac{1}{2}$ DL is taken as the reported value in further calculations.

* Z score in unitless

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

S – Satisfactory: Your results deviates less than $\pm 25\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and less than $\pm 15\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

Q – Questionable: Your result deviates between $\pm 25-50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and between $\pm 15-30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

U – Unsatisfactory: Your result deviates more than $\pm 50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and more than $\pm 30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

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

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

EMEP – Analytical intercomparison of heavy metals in precipitation 2018

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 *
H1	As $\mu\text{g/l}$	0.151	0.1	0.105	0.027	1.702	U
H2		0.202	0.15	0.192	0.173	0.058	Q
H3		0.259	0.2	0.231	0.157	0.18	Q
H4		0.324	0.3	0.303	0.053	0.396	S
H1	Cd $\mu\text{g/l}$	0.033	0.035	0.033	0.006	-0.012	S
H2		0.044	0.045	0.044	0.007	0.088	S
H3		0.058	0.06	0.058	0.008	0.056	S
H4		0.066	0.07	0.071	0.007	-0.741	S
H1	Cr $\mu\text{g/l}$	0.144	0.1	0.109	0.075	0.46	Q
H2		0.194	0.15	0.163	0.082	0.375	Q
H3		0.352	0.3	0.306	0.07	0.651	S
H4		0.385	0.4	0.411	0.14	-0.188	S
H1	Cu $\mu\text{g/l}$	0.675	0.7	0.669	0.087	0.065	S
H2		0.855	0.9	0.856	0.084	-0.012	S
H3		1.05	1.1	1.078	0.098	-0.287	S
H4		1.167	1.2	1.161	0.121	0.048	S
H1	Ni $\mu\text{g/l}$	0.367	0.4	0.371	0.057	-0.075	S
H2		0.454	0.5	0.447	0.086	0.078	S
H3		0.641	0.7	0.66	0.054	-0.352	S
H4		0.749	0.8	0.749	0.074	0.004	S
H1	Pb $\mu\text{g/l}$	0.435	0.45	0.439	0.031	-0.139	S
H2		0.536	0.55	0.532	0.045	0.088	S
H3		0.763	0.8	0.768	0.045	-0.107	S
H4		0.877	0.9	0.885	0.082	-0.098	S
H1	Zn $\mu\text{g/l}$	6.123	6	6.091	0.614	0.052	S
H2		7.12	7	6.941	0.687	0.261	S
H3		8.043	8	8.017	0.84	0.03	S
H4		9.337	9	9.029	0.874	0.353	S

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, $\frac{1}{2}$ DL is taken as the reported value in further calculations.

* Z score in unitless

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

S – Satisfactory: Your results deviates less than $\pm 25\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and less than $\pm 15\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

Q – Questionable: Your result deviates between $\pm 25-50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and between $\pm 15-30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

U – Unsatisfactory: Your result deviates more than $\pm 50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and more than $\pm 30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

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

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

EMEP – Analytical intercomparison of heavy metals in precipitation 2018

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 µg/l	0.097	0.1	0.105	0.027	-0.3	S
H2		0.149	0.15	0.192	0.173	-0.248	S
H3		0.201	0.2	0.231	0.157	-0.189	S
H4		0.302	0.3	0.303	0.053	-0.02	S
H1	Cd µg/l	0.033	0.035	0.033	0.006	0.042	S
H2		0.044	0.045	0.044	0.007	0.045	S
H3		0.058	0.06	0.058	0.008	0.056	S
H4		0.069	0.07	0.071	0.007	-0.234	S
H1	Cr µg/l	0.093	0.1	0.109	0.075	-0.216	S
H2		0.142	0.15	0.163	0.082	-0.261	S
H3		0.284	0.3	0.306	0.07	-0.319	S
H4		0.383	0.4	0.411	0.14	-0.202	S
H1	Cu µg/l	0.643	0.7	0.669	0.087	-0.302	S
H2		0.839	0.9	0.856	0.084	-0.202	S
H3		1.017	1.1	1.078	0.098	-0.625	S
H4		1.122	1.2	1.161	0.121	-0.324	S
H1	Ni µg/l	0.388	0.4	0.371	0.057	0.293	S
H2		0.49	0.5	0.447	0.086	0.499	S
H3		0.686	0.7	0.66	0.054	0.474	S
H4		0.779	0.8	0.749	0.074	0.408	S
H1	Pb µg/l	0.431	0.45	0.439	0.031	-0.27	S
H2		0.532	0.55	0.532	0.045	-0.002	S
H3		0.762	0.8	0.768	0.045	-0.129	S
H4		0.867	0.9	0.885	0.082	-0.22	S
H1	Zn µg/l	6.202	6	6.091	0.614	0.18	S
H2		7.425	7	6.941	0.687	0.705	S
H3		8.372	8	8.017	0.84	0.422	S
H4		9.915	9	9.029	0.874	1.014	S

**Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001**

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, $\frac{1}{2}$ DL is taken as the reported value in further calculations.

* Z score in unitless

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

S – Satisfactory: Your results deviates less than $\pm 25\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and less than $\pm 15\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

Q – Questionable: Your result deviates between $\pm 25-50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and between $\pm 15-30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

U – Unsatisfactory: Your result deviates more than $\pm 50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and more than $\pm 30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

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

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

EMEP – Analytical intercomparison of heavy metals in precipitation 2018

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 µg/l	-999	0.1	0.105	0.027		B
H2		-999	0.15	0.192	0.173		B
H3		-999	0.2	0.231	0.157		B
H4		-999	0.3	0.303	0.053		B
H1	Cd µg/l	0.022	0.035	0.033	0.006	-1.927	Q
H2		0.026	0.045	0.044	0.007	-2.52	Q
H3		0.036	0.06	0.058	0.008	-2.686	Q
H4		0.044	0.07	0.071	0.007	-4.08	Q
H1	Cr µg/l	-999	0.1	0.109	0.075		B
H2		-999	0.15	0.163	0.082		B
H3		-999	0.3	0.306	0.07		B
H4		-999	0.4	0.411	0.14		B
H1	Cu µg/l	0.99	0.7	0.669	0.087	3.679	Q
H2		0.53	0.9	0.856	0.084	-3.878	Q
H3		0.64	1.1	1.078	0.098	-4.484	Q
H4		0.67	1.2	1.161	0.121	-4.061	Q
H1	Ni µg/l	-999	0.4	0.371	0.057		B
H2		-999	0.5	0.447	0.086		B
H3		-999	0.7	0.66	0.054		B
H4		-999	0.8	0.749	0.074		B
H1	Pb µg/l	0.38	0.45	0.439	0.031	-1.936	S
H2		0.48	0.55	0.532	0.045	-1.168	S
H3		0.69	0.8	0.768	0.045	-1.716	S
H4		0.8	0.9	0.885	0.082	-1.038	S
H1	Zn µg/l	-999	6	6.091	0.614		B
H2		-999	7	6.941	0.687		B
H3		-999	8	8.017	0.84		B
H4		-999	9	9.029	0.874		B

**Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001**

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, $\frac{1}{2}$ DL is taken as the reported value in further calculations.

* Z score in unitless

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

S – Satisfactory: Your results deviates less than $\pm 25\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and less than $\pm 15\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

Q – Questionable: Your result deviates between $\pm 25-50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and between $\pm 15-30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

U – Unsatisfactory: Your result deviates more than $\pm 50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and more than $\pm 30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

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

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

EMEP – Analytical intercomparison of heavy metals in precipitation 2018

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 µg/l	0.1	0.1	0.105	0.027	-0.189	S
H2		0.2	0.15	0.192	0.173	0.047	Q
H3		0.2	0.2	0.231	0.157	-0.195	S
H4		0.3	0.3	0.303	0.053	-0.057	S
H1	Cd µg/l	0.04	0.035	0.033	0.006	1.295	S
H2		0.05	0.045	0.044	0.007	0.9	S
H3		0.06	0.06	0.058	0.008	0.306	S
H4		0.08	0.07	0.071	0.007	1.458	S
H1	Cr µg/l	0.4	0.1	0.109	0.075	3.853	U
H2		0.5	0.15	0.163	0.082	4.113	U
H3		0.6	0.3	0.306	0.07	4.187	U
H4		0.7	0.4	0.411	0.14	2.06	U
H1	Cu µg/l	0.8	0.7	0.669	0.087	1.499	S
H2		0.9	0.9	0.856	0.084	0.523	S
H3		1.1	1.1	1.078	0.098	0.225	S
H4		1.2	1.2	1.161	0.121	0.321	S
H1	Ni µg/l	0.4	0.4	0.371	0.057	0.503	S
H2		0.5	0.5	0.447	0.086	0.615	S
H3		0.7	0.7	0.66	0.054	0.731	S
H4		0.8	0.8	0.749	0.074	0.691	S
H1	Pb µg/l	0.5	0.45	0.439	0.031	1.985	S
H2		0.6	0.55	0.532	0.045	1.523	S
H3		0.8	0.8	0.768	0.045	0.709	S
H4		0.9	0.9	0.885	0.082	0.183	S
H1	Zn µg/l	6.3	6	6.091	0.614	0.34	S
H2		7.4	7	6.941	0.687	0.669	S
H3		8.5	8	8.017	0.84	0.574	S
H4		9.5	9	9.029	0.874	0.539	S

**Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001**

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, $\frac{1}{2}$ DL is taken as the reported value in further calculations.

* Z score in unitless

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

S – Satisfactory: Your results deviates less than $\pm 25\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and less than $\pm 15\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

Q – Questionable: Your result deviates between $\pm 25-50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and between $\pm 15-30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

U – Unsatisfactory: Your result deviates more than $\pm 50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and more than $\pm 30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

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

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

EMEP – Analytical intercomparison of heavy metals in precipitation 2018

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 µg/l	0.16	0.1	0.105	0.027	2.035	U
H2		0.13	0.15	0.192	0.173	-0.357	S
H3		0.33	0.2	0.231	0.157	0.631	U
H4		0.47	0.3	0.303	0.053	3.156	U
H1	Cd µg/l	0.027	0.035	0.033	0.006	-1.032	S
H2		0.042	0.045	0.044	0.007	-0.24	S
H3		0.065	0.06	0.058	0.008	0.929	S
H4		0.073	0.07	0.071	0.007	0.382	S
H1	Cr µg/l	0.11	0.1	0.109	0.075	0.009	S
H2		0.2	0.15	0.163	0.082	0.448	Q
H3		0.28	0.3	0.306	0.07	-0.376	S
H4		0.34	0.4	0.411	0.14	-0.509	S
H1	Cu µg/l	0.6	0.7	0.669	0.087	-0.795	S
H2		0.77	0.9	0.856	0.084	-1.023	S
H3		1	1.1	1.078	0.098	-0.799	S
H4		1.12	1.2	1.161	0.121	-0.341	S
H1	Ni µg/l	0.43	0.4	0.371	0.057	1.029	S
H2		0.52	0.5	0.447	0.086	0.849	S
H3		0.66	0.7	0.66	0.054	-0.003	S
H4		0.8	0.8	0.749	0.074	0.691	S
H1	Pb µg/l	0.51	0.45	0.439	0.031	2.312	S
H2		0.56	0.55	0.532	0.045	0.626	S
H3		0.78	0.8	0.768	0.045	0.268	S
H4		0.9	0.9	0.885	0.082	0.183	S
H1	Zn µg/l	5.35	6	6.091	0.614	-1.207	S
H2		6.18	7	6.941	0.687	-1.107	S
H3		6.75	8	8.017	0.84	-1.508	S
H4		7.76	9	9.029	0.874	-1.452	S

**Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001**

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, $\frac{1}{2}$ DL is taken as the reported value in further calculations.

* Z score in unitless

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

S – Satisfactory: Your results deviates less than $\pm 25\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and less than $\pm 15\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

Q – Questionable: Your result deviates between $\pm 25-50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and between $\pm 15-30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

U – Unsatisfactory: Your result deviates more than $\pm 50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and more than $\pm 30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

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

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

EMEP – Analytical intercomparison of heavy metals in precipitation 2018

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 ^x
H1	As <i>µg/l</i>	0.09	0.1	0.105	0.027	-0.559	S
H2		0.16	0.15	0.192	0.173	-0.184	S
H3		0.2	0.2	0.231	0.157	-0.195	S
H4		0.3	0.3	0.303	0.053	-0.057	S
H1	Cd <i>µg/l</i>	0.03	0.035	0.033	0.006	-0.495	S
H2		0.05	0.045	0.044	0.007	0.9	S
H3		0.06	0.06	0.058	0.008	0.306	S
H4		0.07	0.07	0.071	0.007	-0.08	S
H1	Cr <i>µg/l</i>	0.1	0.1	0.109	0.075	-0.123	S
H2		0.15	0.15	0.163	0.082	-0.163	S
H3		0.28	0.3	0.306	0.07	-0.376	S
H4		0.39	0.4	0.411	0.14	-0.152	S
H1	Cu <i>µg/l</i>	0.71	0.7	0.669	0.087	0.467	S
H2		0.88	0.9	0.856	0.084	0.285	S
H3		1.07	1.1	1.078	0.098	-0.082	S
H4		1.14	1.2	1.161	0.121	-0.175	S
H1	Ni <i>µg/l</i>	0.39	0.4	0.371	0.057	0.328	S
H2		0.5	0.5	0.447	0.086	0.615	S
H3		0.72	0.7	0.66	0.054	1.098	S
H4		0.73	0.8	0.749	0.074	-0.251	S
H1	Pb <i>µg/l</i>	0.44	0.45	0.439	0.031	0.024	S
H2		0.54	0.55	0.532	0.045	0.178	S
H3		0.78	0.8	0.768	0.045	0.268	S
H4		0.89	0.9	0.885	0.082	0.061	S
H1	Zn <i>µg/l</i>	6.9	6	6.091	0.614	1.317	S
H2		7.3	7	6.941	0.687	0.523	S
H3		7.9	8	8.017	0.84	-0.14	S
H4		9.4	9	9.029	0.874	0.425	S

**Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001**

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, $\frac{1}{2}$ DL is taken as the reported value in further calculations.

* Z score in unitless

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

S – Satisfactory: Your results deviates less than $\pm 25\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and less than $\pm 15\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

Q – Questionable: Your result deviates between $\pm 25-50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and between $\pm 15-30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

U – Unsatisfactory: Your result deviates more than $\pm 50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and more than $\pm 30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

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

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

EMEP – Analytical intercomparison of heavy metals in precipitation 2018

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 ^x
H1	As µg/l	-999	0.1	0.105	0.027		B
H2		-999	0.15	0.192	0.173		B
H3		-999	0.2	0.231	0.157		B
H4		-999	0.3	0.303	0.053		B
H1	Cd µg/l	-999	0.035	0.033	0.006		B
H2		-999	0.045	0.044	0.007		B
H3		-999	0.06	0.058	0.008		B
H4		-999	0.07	0.071	0.007		B
H1	Cr µg/l	-999	0.1	0.109	0.075		B
H2		-999	0.15	0.163	0.082		B
H3		-999	0.3	0.306	0.07		B
H4		-999	0.4	0.411	0.14		B
H1	Cu µg/l	-999	0.7	0.669	0.087		B
H2		-999	0.9	0.856	0.084		B
H3		-999	1.1	1.078	0.098		B
H4		-999	1.2	1.161	0.121		B
H1	Ni µg/l	< 3.000	0.4	0.371	0.057		B
H2		< 3.000	0.5	0.447	0.086		B
H3		< 3.000	0.7	0.66	0.054		B
H4		< 3.000	0.8	0.749	0.074		B
H1	Pb µg/l	-999	0.45	0.439	0.031		B
H2		-999	0.55	0.532	0.045		B
H3		-999	0.8	0.768	0.045		B
H4		-999	0.9	0.885	0.082		B
H1	Zn µg/l	-999	6	6.091	0.614		B
H2		-999	7	6.941	0.687		B
H3		-999	8	8.017	0.84		B
H4		-999	9	9.029	0.874		B

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, $\frac{1}{2}$ DL is taken as the reported value in further calculations.

* Z score in unitless

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

S – Satisfactory: Your results deviates less than $\pm 25\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and less than $\pm 15\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

Q – Questionable: Your result deviates between $\pm 25-50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and between $\pm 15-30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

U – Unsatisfactory: Your result deviates more than $\pm 50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and more than $\pm 30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

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

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

EMEP – Analytical intercomparison of heavy metals in precipitation 2018

Laboratory 185, Public Health Centre - Cacak, Department for Sanitary Chemistry and Ecotoxicology (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 ^x
H1	As µg/l	-999	0.1	0.105	0.027		B
H2		-999	0.15	0.192	0.173		B
H3		< 2.000	0.2	0.231	0.157		B
H4		< 2.000	0.3	0.303	0.053		B
H1	Cd µg/l	-999	0.035	0.033	0.006		B
H2		-999	0.045	0.044	0.007		B
H3		< 0.100	0.06	0.058	0.008		B
H4		< 0.100	0.07	0.071	0.007		B
H1	Cr µg/l	-999	0.1	0.109	0.075		B
H2		-999	0.15	0.163	0.082		B
H3		-999	0.3	0.306	0.07		B
H4		-999	0.4	0.411	0.14		B
H1	Cu µg/l	-999	0.7	0.669	0.087		B
H2		-999	0.9	0.856	0.084		B
H3		-999	1.1	1.078	0.098		B
H4		-999	1.2	1.161	0.121		B
H1	Ni µg/l	-999	0.4	0.371	0.057		B
H2		-999	0.5	0.447	0.086		B
H3		< 3.000	0.7	0.66	0.054		B
H4		< 3.000	0.8	0.749	0.074		B
H1	Pb µg/l	-999	0.45	0.439	0.031		B
H2		-999	0.55	0.532	0.045		B
H3		< 2.000	0.8	0.768	0.045		B
H4		< 2.000	0.9	0.885	0.082		B
H1	Zn µg/l	-999	6	6.091	0.614		B
H2		-999	7	6.941	0.687		B
H3		-999	8	8.017	0.84		B
H4		-999	9	9.029	0.874		B

**Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001**

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, $\frac{1}{2}$ DL is taken as the reported value in further calculations.

* Z score in unitless

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

S – Satisfactory: Your results deviates less than $\pm 25\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and less than $\pm 15\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

Q – Questionable: Your result deviates between $\pm 25-50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and between $\pm 15-30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

U – Unsatisfactory: Your result deviates more than $\pm 50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and more than $\pm 30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

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

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

EMEP – Analytical intercomparison of heavy metals in precipitation 2018

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 ^x
H1	As <i>µg/l</i>	-999	0.1	0.105	0.027		B
H2		-999	0.15	0.192	0.173		B
H3		-999	0.2	0.231	0.157		B
H4		-999	0.3	0.303	0.053		B
H1	Cd <i>µg/l</i>	0.03	0.035	0.033	0.006	-0.495	S
H2		0.072	0.045	0.044	0.007	4.035	U
H3		0.042	0.06	0.058	0.008	-1.938	Q
H4		0.066	0.07	0.071	0.007	-0.695	S
H1	Cr <i>µg/l</i>	-999	0.1	0.109	0.075		B
H2		-999	0.15	0.163	0.082		B
H3		-999	0.3	0.306	0.07		B
H4		-999	0.4	0.411	0.14		B
H1	Cu <i>µg/l</i>	-999	0.7	0.669	0.087		B
H2		-999	0.9	0.856	0.084		B
H3		-999	1.1	1.078	0.098		B
H4		-999	1.2	1.161	0.121		B
H1	Ni <i>µg/l</i>	-999	0.4	0.371	0.057		B
H2		-999	0.5	0.447	0.086		B
H3		-999	0.7	0.66	0.054		B
H4		-999	0.8	0.749	0.074		B
H1	Pb <i>µg/l</i>	0.411	0.45	0.439	0.031	-0.923	S
H2		0.495	0.55	0.532	0.045	-0.831	S
H3		0.699	0.8	0.768	0.045	-1.518	S
H4		0.813	0.9	0.885	0.082	-0.879	S
H1	Zn <i>µg/l</i>	5.354	6	6.091	0.614	-1.2	S
H2		5.801	7	6.941	0.687	-1.658	S
H3		6.971	8	8.017	0.84	-1.245	S
H4		8.083	9	9.029	0.874	-1.082	S

**Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001**

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, $\frac{1}{2}$ DL is taken as the reported value in further calculations.

* Z score in unitless

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

S – Satisfactory: Your results deviates less than $\pm 25\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and less than $\pm 15\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

Q – Questionable: Your result deviates between $\pm 25-50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and between $\pm 15-30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

U – Unsatisfactory: Your result deviates more than $\pm 50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and more than $\pm 30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

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

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

EMEP – Analytical intercomparison of heavy metals in precipitation 2018

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 $\mu\text{g/l}$	0.107	0.1	0.105	0.027	0.071	S
H2		0.148	0.15	0.192	0.173	-0.253	S
H3		0.131	0.2	0.231	0.157	-0.634	Q
H4		0.22	0.3	0.303	0.053	-1.569	Q
H1	Cd $\mu\text{g/l}$	0.036	0.035	0.033	0.006	0.579	S
H2		0.066	0.045	0.044	0.007	3.18	Q
H3		0.048	0.06	0.058	0.008	-1.19	S
H4		0.072	0.07	0.071	0.007	0.228	S
H1	Cr $\mu\text{g/l}$	0.08	0.1	0.109	0.075	-0.388	S
H2		0.145	0.15	0.163	0.082	-0.224	S
H3		0.277	0.3	0.306	0.07	-0.419	S
H4		0.326	0.4	0.411	0.14	-0.609	S
H1	Cu $\mu\text{g/l}$	0.789	0.7	0.669	0.087	1.373	S
H2		0.855	0.9	0.856	0.084	-0.012	S
H3		1.15	1.1	1.078	0.098	0.736	S
H4		1.16	1.2	1.161	0.121	-0.01	S
H1	Ni $\mu\text{g/l}$	0.347	0.4	0.371	0.057	-0.425	S
H2		0.506	0.5	0.447	0.086	0.686	S
H3		0.643	0.7	0.66	0.054	-0.315	S
H4		0.707	0.8	0.749	0.074	-0.561	S
H1	Pb $\mu\text{g/l}$	0.419	0.45	0.439	0.031	-0.662	S
H2		0.484	0.55	0.532	0.045	-1.078	S
H3		0.709	0.8	0.768	0.045	-1.297	S
H4		0.822	0.9	0.885	0.082	-0.769	S
H1	Zn $\mu\text{g/l}$	5.43	6	6.091	0.614	-1.077	S
H2		5.71	7	6.941	0.687	-1.791	S
H3		6.88	8	8.017	0.84	-1.354	S
H4		8.14	9	9.029	0.874	-1.017	S

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, $\frac{1}{2}$ DL is taken as the reported value in further calculations.

* Z score in unitless

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

S – Satisfactory: Your results deviates less than $\pm 25\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and less than $\pm 15\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

Q – Questionable: Your result deviates between $\pm 25-50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and between $\pm 15-30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

U – Unsatisfactory: Your result deviates more than $\pm 50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and more than $\pm 30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

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

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

EMEP – Analytical intercomparison of heavy metals in precipitation 2018

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 ^x
H1	As µg/l	-999	0.1	0.105	0.027		B
H2		-999	0.15	0.192	0.173		B
H3		-999	0.2	0.231	0.157		B
H4		-999	0.3	0.303	0.053		B
H1	Cd µg/l	-999	0.035	0.033	0.006		B
H2		-999	0.045	0.044	0.007		B
H3		-999	0.06	0.058	0.008		B
H4		-999	0.07	0.071	0.007		B
H1	Cr µg/l	-999	0.1	0.109	0.075		B
H2		-999	0.15	0.163	0.082		B
H3		-999	0.3	0.306	0.07		B
H4		-999	0.4	0.411	0.14		B
H1	Cu µg/l	-999	0.7	0.669	0.087		B
H2		-999	0.9	0.856	0.084		B
H3		-999	1.1	1.078	0.098		B
H4		-999	1.2	1.161	0.121		B
H1	Ni µg/l	< 2.000	0.4	0.371	0.057		B
H2		< 2.000	0.5	0.447	0.086		B
H3		< 2.000	0.7	0.66	0.054		B
H4		< 2.000	0.8	0.749	0.074		B
H1	Pb µg/l	-999	0.45	0.439	0.031		B
H2		-999	0.55	0.532	0.045		B
H3		-999	0.8	0.768	0.045		B
H4		-999	0.9	0.885	0.082		B
H1	Zn µg/l	-999	6	6.091	0.614		B
H2		-999	7	6.941	0.687		B
H3		-999	8	8.017	0.84		B
H4		-999	9	9.029	0.874		B

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, $\frac{1}{2}$ DL is taken as the reported value in further calculations.

* Z score in unitless

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

S – Satisfactory: Your results deviates less than $\pm 25\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and less than $\pm 15\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

Q – Questionable: Your result deviates between $\pm 25-50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and between $\pm 15-30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

U – Unsatisfactory: Your result deviates more than $\pm 50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and more than $\pm 30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

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

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

EMEP – Analytical intercomparison of heavy metals in precipitation 2018

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 ^x
H1	As µg/l	-999	0.1	0.105	0.027		B
H2		-999	0.15	0.192	0.173		B
H3		-999	0.2	0.231	0.157		B
H4		-999	0.3	0.303	0.053		B
H1	Cd µg/l	-999	0.035	0.033	0.006		B
H2		-999	0.045	0.044	0.007		B
H3		-999	0.06	0.058	0.008		B
H4		-999	0.07	0.071	0.007		B
H1	Cr µg/l	-999	0.1	0.109	0.075		B
H2		-999	0.15	0.163	0.082		B
H3		-999	0.3	0.306	0.07		B
H4		-999	0.4	0.411	0.14		B
H1	Cu µg/l	-999	0.7	0.669	0.087		B
H2		-999	0.9	0.856	0.084		B
H3		-999	1.1	1.078	0.098		B
H4		-999	1.2	1.161	0.121		B
H1	Ni µg/l	-999	0.4	0.371	0.057		B
H2		-999	0.5	0.447	0.086		B
H3		-999	0.7	0.66	0.054		B
H4		-999	0.8	0.749	0.074		B
H1	Pb µg/l	-999	0.45	0.439	0.031		B
H2		-999	0.55	0.532	0.045		B
H3		-999	0.8	0.768	0.045		B
H4		-999	0.9	0.885	0.082		B
H1	Zn µg/l	< 22.000	6	6.091	0.614		B
H2		< 22.000	7	6.941	0.687		B
H3		< 22.000	8	8.017	0.84		B
H4		< 22.000	9	9.029	0.874		B

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, $\frac{1}{2}$ DL is taken as the reported value in further calculations.

* Z score in unitless

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

S – Satisfactory: Your results deviates less than $\pm 25\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and less than $\pm 15\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

Q – Questionable: Your result deviates between $\pm 25-50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and between $\pm 15-30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

U – Unsatisfactory: Your result deviates more than $\pm 50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and more than $\pm 30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

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

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

EMEP – Analytical intercomparison of heavy metals in precipitation 2018

Laboratory 203, The Public Health Institute Vranje (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 ^x
H1	As $\mu\text{g/l}$	< 0.500	0.1	0.105	0.027		B
H2		< 0.500	0.15	0.192	0.173		B
H3		< 0.500	0.2	0.231	0.157		B
H4		< 0.500	0.3	0.303	0.053		B
H1	Cd $\mu\text{g/l}$	< 0.250	0.035	0.033	0.006		B
H2		< 0.250	0.045	0.044	0.007		B
H3		< 0.250	0.06	0.058	0.008		B
H4		< 0.250	0.07	0.071	0.007		B
H1	Cr $\mu\text{g/l}$	< 0.500	0.1	0.109	0.075		B
H2		< 0.500	0.15	0.163	0.082		B
H3		< 0.500	0.3	0.306	0.07		B
H4		< 0.500	0.4	0.411	0.14		B
H1	Cu $\mu\text{g/l}$	< 1.500	0.7	0.669	0.087		B
H2		< 1.500	0.9	0.856	0.084		B
H3		< 1.500	1.1	1.078	0.098		B
H4		< 1.500	1.2	1.161	0.121		B
H1	Ni $\mu\text{g/l}$	< 1.000	0.4	0.371	0.057		B
H2		< 1.000	0.5	0.447	0.086		B
H3		< 1.000	0.7	0.66	0.054		B
H4		< 1.000	0.8	0.749	0.074		B
H1	Pb $\mu\text{g/l}$	< 1.000	0.45	0.439	0.031		B
H2		< 1.000	0.55	0.532	0.045		B
H3		< 1.000	0.8	0.768	0.045		B
H4		< 1.000	0.9	0.885	0.082		B
H1	Zn $\mu\text{g/l}$	< 10.000	6	6.091	0.614		B
H2		< 10.000	7	6.941	0.687		B
H3		< 10.000	8	8.017	0.84		B
H4		< 10.000	9	9.029	0.874		B

**Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001**

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

If your laboratory reported values as less than the detection limit, and your detection limit equal or is lower than the expected value, $\frac{1}{2}$ DL is taken as the reported value in further calculations.

* Z score in unitless

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

S – Satisfactory: Your results deviates less than $\pm 25\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and less than $\pm 15\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

Q – Questionable: Your result deviates between $\pm 25-50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and between $\pm 15-30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

U – Unsatisfactory: Your result deviates more than $\pm 50\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $< 1 \mu\text{g/l}$, Cd $< 0,5 \mu\text{g/l}$, Zn $< 10 \mu\text{g/l}$ and Cu $< 2 \mu\text{g/l}$ and more than $\pm 30\%$ of the expected value for theoretical values of Pb, Ni, Cr and As $> 1 \mu\text{g/l}$, Cd $> 0,5 \mu\text{g/l}$, Zn $> 10 \mu\text{g/l}$ and Cu $> 2 \mu\text{g/l}$

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

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