IFA-Proficiency Testing Scheme for Water Analysis

Round C68
Volatile Halogenated Hydrocarbons

Sample Dispatch: 27 February 2023

In accordance with the procedure: AVKPS.03

University of Natural Resources and Life Sciences Vienna, Department of Agrobiotechnology, IFA-Tulln
Institute of Bioanalytics and Agro-Metabolomics, IFA-Proficiency Testing Scheme
3430 Tulln, Konrad-Lorenz-Straße 20, www.ifatest.eu
tel.: +43 (0)1 47654 ext. 97306 or 97361, fax.: +43 (0)1 47654 97309

Address: **University of Natural Resources and Life Sciences, Vienna**
Department of Agrobiotechnology, IFA-Tulln
Institute of Bioanalytics and Agro-Metabolomics
Head: Prof. DI Dr. Rudolf Krska
Konrad-Lorenz-Str. 20
3430 Tulln
Austria

Website: www.ifatest.eu
www.ifa-tulln.boku.ac.at

Telephone/Fax: +43(0) 1 47654 - Ext
+43(0) 1 47654 - 97309

Proficiency Testing (PT) Scheme:

Coordinator and technical manager:

Dipl.-HTL-Ing. Andrea Koutnik Ext 97306 andrea.koutnik@boku.ac.at

Quality assurance representative:

Dr. Wolfgang Kandler Ext 97308 wolfgang.kandler@boku.ac.at

Method specialists:

Ing. Uta Kachelmeier Ext 97361 uta.kachelmeier@boku.ac.at
Ing. Caroline Stadlmann Ext 97306 caroline.stadlmann@boku.ac.at

Approved by:	Dipl.-HTL-Ing. Andrea Koutnik	
Round: C68	Date / Signature:	30.03.2023

Report: 1. Edition, created on 30 March 2023 by Ing. Caroline Stadlmann
87 pages

This report summarises the results of round “Volatile Halogenated Hydrocarbons” within the IFA-Test Proficiency Testing Scheme for Water Analysis. The samples were distributed to 19 participants on Monday, 27 February 2023. Each participant received two samples of 600 mL filled into aluminium bottles.

Closing date for reporting results to the IFA-Tulln was Friday, 24 March 2023. All laboratories submitted results. To make the participants anonymous, each laboratory obtained a letter code by random.

Samples

For sample preparation, ultrapure water was spiked with concentrated solutions of inorganic salts in order to simulate the ionic composition of natural ground water. The following salts were added to the samples: $Mg(NO_3)_2$, $MgSO_4$, Na_2SO_4, $NaHCO_3$, $KHCO_3$, $CaCl_2$ and $Ca(NO_3)_2$. Prior to sample preparation, samples of ultrapure water and artificial water matrix were analysed by Purge&Trap-GC-MS to exclude contamination.

The samples C68A and C68B were spiked with traces of trichloroethene, trichloromethane, 1,1,1-trichloroethane, tetrachloromethane, tribromomethane, tetrachloroethene, bromodichloromethane, 1,2-dichloroethane, dibromochloromethane, 1,1-dichloroethene, dichloromethane, cis-1,2-dichloroethene and trans-1,2-dichloroethene.

The calculation of the target concentrations of the compounds was based on the mass of standard added to the samples.

Homogeneity, accuracy and stability tests at the IFA-Tulln

For verification of homogeneity samples were analysed for the compounds of interest by Purge&Trap-GC-MS measurements prior to shipment to the participants. The results of the measurements are listed in the result tables and the parameter oriented part of the report (”IFA result”).

Usually we perform an additional check of PT-samples’ stability five weeks after sample preparation. The results of the measurements are also listed in the result tables and the parameter oriented part of the report (”Stability test”).

Results

Data evaluation was based on target concentrations that were calculated from the weights of the standards used to prepare the samples. Their uncertainty intervals correspond to the expanded uncertainty (coverage factor k = 2) as described in the EURACHEM/CITAC Guide “Quantifying Uncertainty in Analytical Measurement, 3rd Edition (2012)”.

Recoveries for individual laboratory results and overall mean values are related to the assigned target concentrations. The results were tested for outliers using the Hampel outlier test (level of significance 99 %). A minimum number of four results was required for the outlier test.

The substance concentrations adjusted by standard addition were between 0.204 µg/L (cis-1,2-dichloroethene in C68A) and 3.86 µg/L (trichloromethane in C68A).

Trans-1,2-dichloroethene was not added to sample C68A in order to check the analytical blank value. The target concentration was set to <0.1 µg/L, which meets the minimum quantifiable values defined by the Austrian ground and river water monitoring program and the quantification limits of the analytical methods applied in the IFA.

Standard deviations and coefficients of variation (CVs) were only calculated, when at least three results were available. The recoveries of the target concentrations, calculated from outlier-corrected data mean values ranged between 88.3 % (tetrachloroethene in sample C68B) and 110.7 % (1,1-dichloroethene in sample C68B) The between-laboratory coefficients of variation ranged from 3.5 % (bromodichloromethane in sample C68B) to 19.1 % (1,2-dichloroethane in sample C68A).

The confidence intervals of the outlier-corrected laboratory mean values encompass the corresponding target values with their uncertainties.

z-Scores

The most common approach is to form the z-score given by

$$z = \frac{x_i - X}{\sigma_{pt}}$$

z	z-score
x_i	result of laboratory
X	target value or mean value („consensus value“)
σ_{pt}	standard deviation for proficiency assessment

Thus, the z-score is the ratio of the estimated bias (difference between result and target value) and a standard deviation. The z-score criteria were determined from relative standard deviations from all interlaboratory comparisons that have been organised by the IFA-Tulln from 2012 to 2022. They represent average performance data of all former participating laboratories.

This approach was chosen, because standard deviations of the outlier-corrected measurements substantially vary between individual proficiency test rounds. Averaging standard deviations from proficiency testing rounds of several years can provide standard deviations for proficiency assessment on a broad data basis. It is therefore more suitable than a standard deviation taken directly from the interlaboratory comparison (EN ISO/IEC 17043:2010, B.3.1.3). Another advantage of previously determined standard deviations is that the participants can foresee which z-scores can be expected by their routine analysis methods before participation.

<u>Calculation example:</u>

A laboratory found 7.20 µg/L for the parameter Dichloromethane (recovery of 120 %). The target value for Dichloromethane was 6.02 µg/L (100 %). The relative standard deviation for proficiency assessment is given in the table below (as well as in the annual program www.ifatest.eu) by 14 %, which is 0.84 µg/L Dichloromethane, when based on the target value.

$$z = \frac{x_i - X}{\sigma_{PT}} = \frac{7.20\ \mu g/L - 6.02\ \mu g/L}{0.84\ \mu g/L} \approx 1.4 \quad \textbf{or} \quad \frac{120\% - 100\%}{14\ \%} \approx 1.4$$

z	z-score
x_i	7.20 µg/L equivalent to 120 % (value of the laboratory)
X	6.02 µg/L equivalent to 100 % (target value)
σ_{pt}	0.84 µg/L equivalent to 14 % (standard deviation for proficiency assessment, see table below)

In the case of recalculation, deviations in the last digits may occur due to the fact that rounded values are given in the report for clarity.

The following table lists the standard deviations for proficiency assessment and their limits of applicability. Z-scores were only calculated, if the target values were higher than these limits. **Thus, no z-scores were calculated for dichloromethane in sample C68A.**

Parameter	standard deviation for proficiency assessment based on the target value [%]	Lower limit [µg/L]
1,1,1-Trichloroethane	13	0.15
1,1-Dichloroethene	17	0.35
1,2-Dichloroethane	13	0.5
cis-1,2-Dichloroethene	14	0.15
trans-1,2-Dichloroethene	15	0.15
Bromodichloromethane	12	0.15
Dibromochloromethane	12	0.2
Dichloromethane	14	1
Tetrachloroethene	15	0.15
Tetrachloromethane	17	0.15
Tribromomethane	15	0.2
Trichloroethene	14	0.15
Trichloromethane	13	0.25

Normally, a classification based on z-scores is made this way:

|z-Score|	Classification
≤2	satisfactory
2<|z|<3	questionable
≥3	unsatisfactory

The z-scores are listed in the parameter-oriented evaluation in the tables next to the recoveries. Additionally, each laboratory receives a sheet on which the obtained z-scores are summarized and graphically represented. The standard deviations for proficiency assessment are given in concentration units there.

An overview table of all z-scores can be found after the result tables in the parameter-oriented part.

Illustration of results

An explanation to the illustration of the results is given on the following page.

The **laboratory oriented part** contains the measurement results and reported uncertainties of each individual laboratory for all parameters together with the achieved recoveries in graphical and tabular form. This part of the report also lists tables with the results originally reported by the laboratories.

In the **parameter oriented part** the reported results and corresponding uncertainties are illustrated together with recoveries of the target values and the z-scores for each parameter and all laboratories. This information is presented in graphical and tabular form. Results, which were identified as outliers by the Hampel test are marked with an asterisk (*) in the column “out”. These values were not considered for the calculation of statistical parameters (mean values, standard deviations and confidence intervals). Moreover, the parameter oriented part contains the uncertainties of the target value. The uncertainty intervals correspond to the expanded uncertainty (coverage factor k = 2) as described in the EURACHEM / CITAC Guide “Quantifying Uncertainty in Analytical Measurement, 3rd Edition (2012)”. The uncertainty interval of the reference concentration is illustrated in the graphs as a grey band around the 100 % recovery line.

Results, for which no recoveries could be calculated, are illustrated by one of the following symbols: **FN** (false negative), **FP** (false positive) or • - symbol.

- “FN”: a result is considered false negative when the “< result” reported is lower than the corresponding target value, or the measured value was given as “0” when the substance was added.
- “FP”: False positive results can only be obtained for compounds that were evaluated on the basis of a “< target value”. A result is termed FP if it does not include (strike) the “< target” with its measurement uncertainty.
- “•”: All other results for which no recovery can be calculated are illustrated by this symbol

Tulln, 31 March 2023

Sample C10B
Parameter Dichloromethane

Target value ± U (k=2) 10,4 µg/l ± 0,5 µg/l ***Obtained from mass weighed out, U = uncertainty***

IFA result ± U (k=2) 10,2 µg/l ± 1,0 µg/l ***Determined at IFA prior to shipment of samples***

Stability test ± U (k=2) 10,2 µg/l ± 1,0 µg/l ***Determined at IFA 5 weeks after sample dispatch***

Lab code	Result	Out	+/-	Unit	Recovery	z-Score
A	11,0		1,28	µg/l	106 %	0,30
B	9,0		1,8	µg/l	87 %	-0,71
C	10		2	µg/l	96 %	-0,20
D				µg/l		
E	13,7		0,40	µg/l	132 %	1,67
F	6,8		0,7	µg/l	65 %	-1,82
G	< 20			µg/l		
H				µg/l	•	
I	11,0			µg/l	106%	0,30
J	24,1	*	1,51	µg/l	232 %	6,93
K	10,09		1,22	µg/l	97 %	-0,16
L	2,76	*		µg/l	27 %	-3,87
M	6,38		1,87	µg/l	61 %	-2,03
N	< 5		0,5	µg/l	FN	
O	15,6	*	4	µg/l	150 %	2,63
P	10,3		1,0	µg/l	99 %	-0,05
Q	10		1,14	µg/l	96 %	-0,20
R	8,88		0,46	µg/l	85 %	-0,77
S				µg/l		
T	9,03		0,08	µg/l	87 %	-0,69
U	22,5	*	0,5	µg/l	216 %	6,12
V	10,33		0,25	µg/l	99 %	-0,04

Recovery of target value in percent

z-Score of the laboratory

An asterisk indicates a result detected as outlier by Hampel test

Interval expected to encompass target value as stated by participant

	All results	Outliers excl.	Unit
Mean +/- CI (99%) Recov. +/- CI (99%)	11,3 ± 3,8 108,3 ± 36,3	9,7 ± 1,6 93,6 ± 15,1	µg/l %
SD between labs RSD between labs	5,3 47,3	1,9 19,1	µg/l %
n for calculation	17	13	

Between laboratory standard deviation

Overall laboratory mean and recovery with corresponding confidence intervals (p=99%)

Number of data used for calculation of statistic parameters

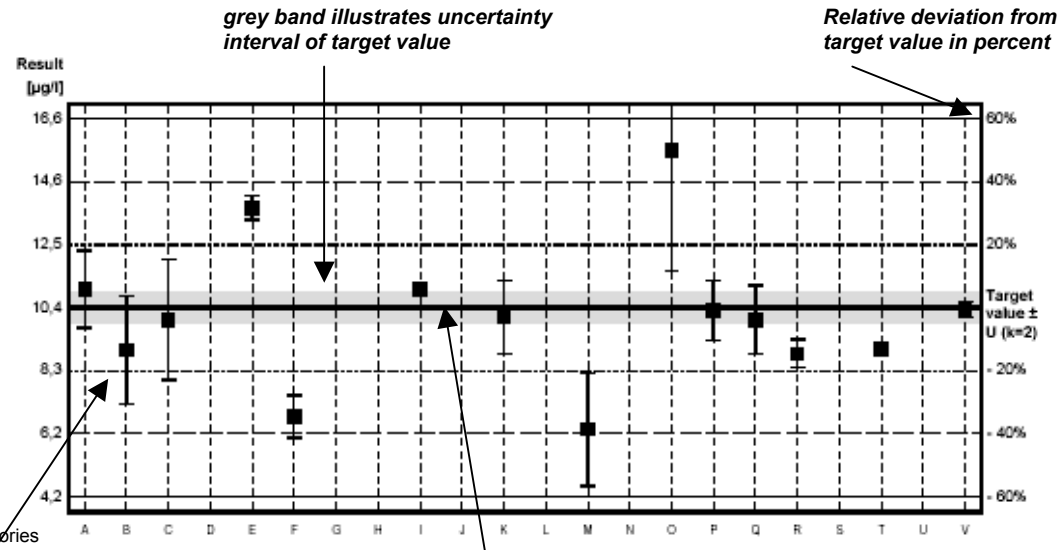


Diagram 1. Measurement results and corresponding uncertainty intervals

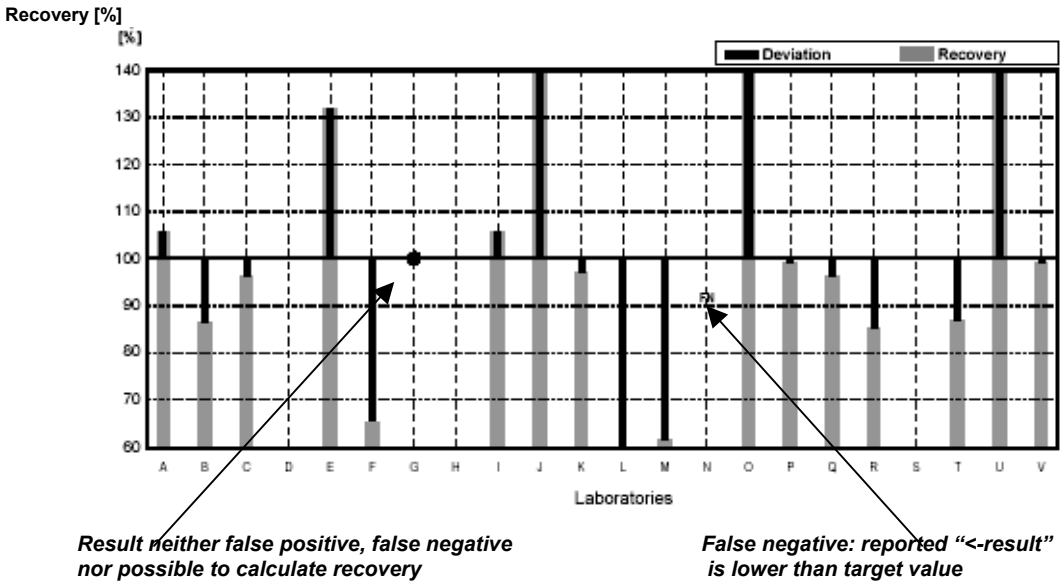


Diagram 2. Recoveries and deviations from target values

EXPLANATION

Illustration of Results
Tables and Parameter Oriented Part

Round C68
Volatile Halogenated Hydrocarbons

Sample Dispatch: 27 February 2023

Results Sample C68A

	Trichloro-ethene	Tetrachloro-ethene	1,1,1-Tri-chloroethane	Trichloro-methane	Tetrachloro-methane	1,1-Dichloro-ethene	Tribromo-methane
Target value	1.54	2.06	0.79	3.86	0.53	0.67	0.487
IFA Result	1.49	1.98	0.75	3.85	0.52	0.65	0.498
Stability test	1.54	2.04	0.77	3.79	0.53	0.67	0.504
A	1.39	1.63	0.67	3.84	0.410		0.53
B	1.22	1.55	0.75	3.85	0.51	0.64	0.53
C	1.46	1.81	0.715	3.60	0.503	0.758	0.419
D	1.500	1.645	0.800	3.440	0.525	0.613	0.455
E	1.30	2.39	0.82	3.60	0.490	0.69	0.451
F	1.48	1.79	0.744	4.16	0.486	0.724	0.511
G	1.43	1.63	0.742	3.84	0.461		
H	1.57	1.94	0.715	3.74	0.493	0.747	0.432
I			0.76				
J	1.41	1.92	0.80	3.53	0.50	n.a.	0.54
K	1.61	2.33	0.77	4.52	0.460		0.485
L	1.41	1.89	0.666	3.78	0.469	0.768	0.424
M	1.63	1.63	0.900	4.08	0.680	0.860	
N	1.13	1.37	0.570	3.33	0.360		0.320
O	1.73	2.17	0.854	3.93	0.634	0.724	0.440
P	1.44	1.87	0.77	3.56	0.50	0.57	0.470
Q	2.39	3.25	1.40	2.44	0.989		0.422
R	1.57	1.95	0.779	3.87	0.498	0.654	0.565
S	1.23	1.69	0.66	3.30	0.439	1.07	0.353

All data in µg/L

Measurement Uncertainties Sample C68A

	Trichloro-ethene ±	Tetrachloro-ethene ±	1,1,1-Tri-chloroethane ±	Trichloro-methane ±	Tetrachloro-methane ±	1,1-Dichloro-ethene ±	Tribromo-methane ±
Target value	0.08	0.11	0.05	0.20	0.04	0.04	0.029
IFA Result	0.15	0.20	0.08	0.40	0.05	0.07	0.075
Stability test	0.15	0.20	0.08	0.39	0.05	0.07	0.076
A	0.03	0.11	0.02	0.14	0.03		0.07
B	0.25	0.32	0.16	0.80	0.11	0.13	0.11
C	0.248	0.308	0.122	0.612	0.086	0.129	0.071
D	0.495	0.543	0.176	0.929	0.100	0.098	0.137
E	0.03	0.30	0.01	0.18	0.01	0.01	0.01
F	0.31	0.48	0.156	0.87	0.107	0.152	0.107
G	0.143	0.162	0.074	0.384	0.046		
H	0.31	0.34	0.14	0.75	0.098	0.15	0.086
I							
J	0.10	0.15	0.10	0.23	0.05		0.05
K	0.18	0.37	0.10	0.66	0.06		0.073
L	0.10	0.16	0.13	0.76	0.12	0.15	0.11
M	0.25	0.25	0.18	0.7	0.15	0.18	
N	0.0631	0.1263	0.0631	0.3157	0.0947		0.0947
O	0.068	0.055	0.082	0.049	0.188	0.104	0.067
P	0.22	0.28	0.12	0.53	0.08	0.09	0.07
Q							
R	0.24	0.29	0.117	0.580	0.075	0.098	0.085
S	0.3	0.4	0.2	0.8	0.1	0.3	0.09

All data in µg/L

Results Sample C68A

	Bromodichloro-methane	Dibromochloro-methane	Dichloro-methane	1,2-Dichloro-ethane	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene
Target value	1.16	1.35	0.77	2.42	0.204	<0.1
IFA Result	1.16	1.34	0.76	2.39	0.209	<0.1
Stability test	1.17	1.37	0.78	2.44	0.211	<0.1
A	1.13	1.33				
B	1.18	1.31	0.86	2.47	0.200	<0.1
C	1.13	1.24	0.797	2.29	0.188	<0.10
D	1.270	1.360	0.767	3.010	0.192	<0.08
E	0.94	1.13	0.65	2.15	0.134	<0.50
F	1.17	1.37	0.844	3.23	0.234	<0.10
G			0.695	1.95	0.131	
H	1.11	1.30	<bg	2.25	0.159	<bg
I					<0.50	
J	1.14	1.36	n.a.	n.a	n.a.	n.a.
K	0.91	1.28	0.77			
L	1.07	1.07	1.01	1.99	0.200	<0.10
M	1.07	1.50		2.38	0.180	<0.10
N	1.00	1.15	0.390	1.42		
O	1.17	1.27	0.847	2.54	0.201	<0.050
P	1.20	1.32	0.82	2.29	<0.13	<0.02
Q	1.45	1.47				
R	1.16	1.43	0.474	2.39	<0.5	<0.5
S	0.94	1.12	0.69	2.04	0.167	<0.05

All data in µg/L

Measurement Uncertainties Sample C68A

	Bromodichloro-methane ±	Dibromochloro-methane ±	Dichloro-methane ±	1,2-Dichloro-ethane ±	cis-1,2-Dichloroethene ±	trans-1,2-Dichloroethene ±
Target value	0.06	0.07	0.05	0.15	0.015	
IFA Result	0.13	0.13	0.08	0.24	0.021	
Stability test	0.13	0.14	0.08	0.24	0.021	
A	0.07	0.08				
B	0.24	0.27	0.18	0.51	0.04	
C	0.192	0.211	0.135	0.389	0.032	
D	0.318	0.354	0.222	1.023	0.044	0.021
E	0.01	0.01	0.01	0.03	0.06	
F	0.21	0.29	0.262	0.61	0.026	
G			0.070	0.195	0.013	
H	0.22	0.26		0.45	0.032	
I						
J	0.10	0.10				
K	0.12	0.23	0.12			
L	0.27	0.27	0.30	0.48	0.037	
M	0.2	0.25		0.5	0.04	
N	0.0947	0.1263	0.0631	0.0947		
O	0.068	0.046	0.098	0.089	0.014	
P	0.18	0.20	0.12	0.34		
Q						
R	0.17	0.21	0.071	0.36		
S	0.2	0.3	0.2	0.5	0.04	0.01

All data in µg/L

Results Sample C68B

	Trichloro-ethene	Tetrachloro-ethene	1,1,1-Tri-chloroethane	Trichloro-methane	Tetrachloro-methane	1,1-Dichloro-ethene	Tribromo-methane
Target value	0.63	0.52	2.10	0.94	2.08	2.44	1.26
IFA Result	0.65	0.55	2.10	0.96	2.08	2.48	1.26
Stability test	0.66	0.54	2.13	0.98	2.10	2.51	1.27
A	0.57	0.403	1.89	0.95	1.97		1.34
B	0.54	0.400	2.03	0.95	1.94	2.38	1.29
C	0.602	0.480	2.03	0.884	2.13	2.86	1.12
D	0.600	0.432	2.110	0.935	2.150	2.425	1.475
E	0.56	0.56	2.12	0.79	2.44	2.61	1.13
F	0.606	0.467	2.12	0.977	2.11	2.85	1.34
G	0.627	0.405	2.02	1.01	1.83		
H	0.651	0.481	1.96	0.92	1.932	2.615	1.15
I			2.46				
J	0.59	0.479	2.00	0.92	2.04	n.a.	1.27
K	0.50	0.345	2.69	0.91	2.23		1.17
L	0.563	0.515	1.89	0.955	1.88	2.89	1.12
M	0.680	0.520	2.37	1.07	2.62	3.09	
N	0.410	0.340	1.65	0.740	1.66		1.01
O	0.768	0.627	2.28	1.05		2.84	1.14
P	0.62	0.50	1.90	1.09	1.80	2.15	1.23
Q	0.942	0.759	3.97	0.838	4.32		1.18
R	0.601	0.423	2.05	0.912	2.00	2.42	1.37
S	0.52	0.426	1.76	0.79	1.68	3.28	1.00

All data in µg/L

Measurement Uncertainties Sample C68B

	Trichloro-ethene ±	Tetrachloro-ethene ±	1,1,1-Tri-chloroethane ±	Trichloro-methane ±	Tetrachloro-methane ±	1,1-Dichloro-ethene ±	Tribromo-methane ±
Target value	0.04	0.04	0.11	0.05	0.11	0.12	0.07
IFA Result	0.07	0.06	0.21	0.10	0.21	0.25	0.19
Stability test	0.07	0.05	0.22	0.10	0.21	0.25	0.19
A	0.02	0.029	0.16	0.05	0.15		0.02
B	0.11	0.08	0.42	0.20	0.40	0.49	0.27
C	0.102	0.082	0.345	0.150	0.362	0.486	0.190
D	0.198	0.143	0.464	0.252	0.409	0.388	0.443
E	0.06	0.08	0.22	0.08	0.33	0.13	0.12
F	0.127	0.126	0.45	0.205	0.47	0.60	0.28
G	0.063	0.040	0.202	0.101	0.183		
H	0.13	0.096	0.40	0.18	0.39	0.52	0.23
I							
J	0.05	0.05	0.17	0.05	0.10		0.10
K	0.06	0.055	0.35	0.13	0.25		0.18
L	0.040	0.043	0.36	0.19	0.48	0.57	0.28
M	0.15	0.11	0.4	0.2	0.5	0.6	
N	0.032	0.0	0.032	0.0	0.03		0.03
O	0.064	0.062	0.091	0.037		0.149	0.060
P	0.09	0.08	0.29	0.16	0.27	0.32	0.18
Q							
R	0.090	0.063	0.31	0.136	0.29	0.36	0.206
S	0.1	0.1	0.4	0.2	0.4	0.8	0.2

All data in µg/L

Results Sample C68B

	Bromodichloro-methane	Dibromochloro-methane	Dichloro-methane	1,2-Dichloro-ethane	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene
Target value	1.64	2.52	3.74	1.89	0.84	0.59
IFA Result	1.66	2.52	3.77	1.88	0.85	0.59
Stability test	1.68	2.55	3.81	1.91	0.86	0.61
A	1.61	2.56				
B	1.63	2.40	4.05	1.87	0.75	0.52
C	1.63	2.37	3.81	1.81	0.761	0.591
D	1.735	2.440	3.695	2.105	0.795	0.590
E	1.37	2.19	3.26	1.66	0.76	0.59
F	1.61	2.71	4.21	2.43	0.996	0.703
G			3.28	1.84	0.51	
H	1.581	2.48	3.129	1.831	0.77	0.69
I					0.89	
J	1.58	2.41	n.a.	n.a.	n.a.	n.a.
K	1.60	2.61	4.49			
L	1.62	2.17	3.61	1.59	0.782	0.578
M	1.64	2.85		1.95	0.740	0.560
N	1.41	2.24	3.00	1.00		
O	1.67	2.33	4.02	1.95	0.894	0.778
P	1.49	2.29	3.35	1.76	0.61	0.54
Q	2.18	3.21				
R	1.59	2.60	3.70	2.60	0.623	<0.5
S	1.35	2.00	3.23	1.55	0.68	0.500

All data in µg/L

Measurement Uncertainties Sample C68B

	Bromodichloro-methane ±	Dibromochloro-methane ±	Dichloro-methane ±	1,2-Dichloro-ethane ±	cis-1,2-Dichloroethene ±	trans-1,2-Dichloroethene ±
Target value	0.09	0.13	0.19	0.13	0.04	0.03
IFA Result	0.18	0.25	0.38	0.19	0.09	0.06
Stability test	0.19	0.26	0.38	0.19	0.09	0.06
A	0.07	0.15				
B	0.34	0.50	0.84	0.39	0.16	0.11
C	0.277	0.403	0.648	0.308	0.129	0.100
D	0.434	0.634	1.072	0.716	0.183	0.153
E	0.15	0.25	0.37	0.14	0.07	0.05
F	0.29	0.568	1.31	0.46	0.110	0.084
G			0.328	0.184	0.051	
H	0.32	0.50	0.63	0.37	0.15	0.14
I						
J	0.12	0.15				
K	0.21	0.48	0.72			
L	0.41	0.54	0.90	0.38	0.14	0.12
M	0.25	0.5		0.4	0.15	0.12
N	0.06	0.221	0.06	0.158		
O	0.067	0.045	0.190	0.080	0.051	0.059
P	0.22	0.34	0.50	0.26	0.09	0.08
Q						
R	0.24	0.39	0.55	0.39	0.093	
S	0.3	0.5	0.8	0.4	0.2	0.1

All data in µg/L

Z-Scores Sample C68A

	Trichloro-ethene	Tetrachloro-ethene	1,1,1-Tri-chloroethane	Trichloro-methane	Tetrachloro-methane	1,1-Dichloro-ethene	Tribromo-methane
A	-0.7	-1.39	-1.17	-0.04	-1.33		0.59
B	-1.48	-1.65	-0.39	-0.02	-0.22	-0.26	0.59
C	-0.37	-0.81	-0.73	-0.52	-0.3	0.77	-0.93
D	-0.19	-1.34	0.1	-0.84	-0.06	-0.5	-0.44
E	-1.11	1.07	0.29	-0.52	-0.44	0.18	-0.49
F	-0.28	-0.87	-0.45	0.6	-0.49	0.47	0.33
G	-0.51	-1.39	-0.47	-0.04	-0.77		
H	0.14	-0.39	-0.73	-0.24	-0.41	0.68	-0.75
I			-0.29				
J	-0.6	-0.45	0.1	-0.66	-0.33		0.73
K	0.32	0.87	-0.19	1.32	-0.78		-0.03
L	-0.6	-0.55	-1.21	-0.16	-0.68	0.86	-0.86
M	0.42	-1.39	1.07	0.44	1.66	1.67	
N	-1.9	-2.23	-2.14	-1.06	-1.89		-2.29
O	0.88	0.36	0.62	0.14	1.15	0.47	-0.64
P	-0.46	-0.61	-0.19	-0.6	-0.33	-0.88	-0.23
Q	3.94	3.85	5.94	-2.83	5.09		-0.89
R	0.14	-0.36	-0.11	0.02	-0.36	-0.14	1.07
S	-1.44	-1.2	-1.27	-1.12	-1.01	3.51	-1.83

Z-Scores Sample C68A

	Bromodichloro-methane	Dibromochloro-methane	Dichloro-methane	1,2-Dichloro-ethane	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene
A	-0.22	-0.12				
B	0.14	-0.25		0.16	-0.14	
C	-0.22	-0.68		-0.41	-0.56	
D	0.79	0.06		1.88	-0.42	
E	-1.58	-1.36		-0.86	-2.45	
F	0.07	0.12		2.57	1.05	
G				-1.49	-2.56	
H	-0.36	-0.31		-0.54	-1.58	
I						
J	-0.14	0.06				
K	-1.8	-0.43				
L	-0.65	-1.73		-1.37	-0.14	
M	-0.65	0.93		-0.13	-0.84	
N	-1.15	-1.23		-3.18		
O	0.07	-0.49		0.38	-0.11	
P	0.29	-0.19		-0.41		
Q	2.08	0.74				
R	0	0.49		-0.1		
S	-1.58	-1.42		-1.21	-1.3	

Z-Scores Sample C68B

	Trichloro-ethene	Tetrachloro-ethene	1,1,1-Tri-chloroethane	Trichloro-methane	Tetrachloro-methane	1,1-Dichloro-ethene	Tribromo-methane
A	-0.68	-1.5	-0.77	0.08	-0.31		0.42
B	-1.02	-1.54	-0.26	0.08	-0.4	-0.14	0.16
C	-0.32	-0.51	-0.26	-0.46	0.14	1.01	-0.74
D	-0.34	-1.13	0.04	-0.04	0.2	-0.04	1.14
E	-0.79	0.51	0.07	-1.23	1.02	0.41	-0.69
F	-0.27	-0.68	0.07	0.3	0.08	0.99	0.42
G	-0.03	-1.47	-0.29	0.57	-0.71		
H	0.24	-0.5	-0.51	-0.16	-0.42	0.42	-0.58
I			1.32				
J	-0.45	-0.53	-0.37	-0.16	-0.11		0.05
K	-1.47	-2.24	2.16	-0.25	0.42		-0.48
L	-0.76	-0.06	-0.77	0.12	-0.57	1.08	-0.74
M	0.57	0	0.99	1.06	1.53	1.57	
N	-2.49	-2.31	-1.65	-1.64	-1.19		-1.32
O	1.56	1.37	0.66	0.9		0.96	-0.63
P	-0.11	-0.26	-0.73	1.23	-0.79	-0.7	-0.16
Q	3.54	3.06	6.85	-0.83	6.33		-0.42
R	-0.33	-1.24	-0.18	-0.23	-0.23	-0.05	0.58
S	-1.25	-1.21	-1.25	-1.23	-1.13	2.03	-1.38

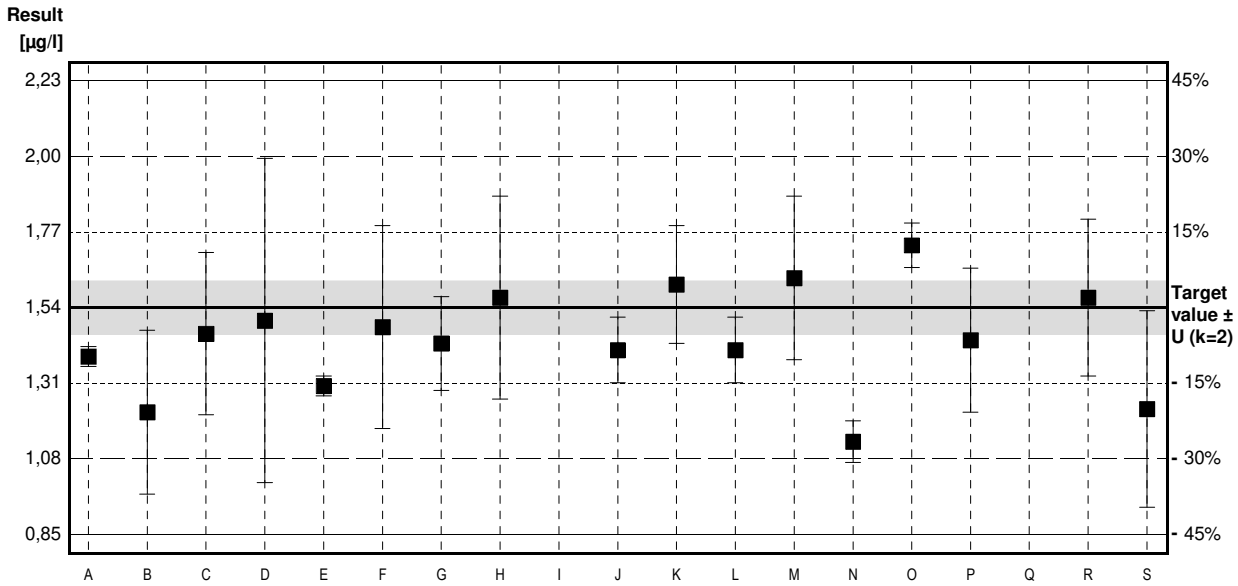
Z-Scores Sample C68B

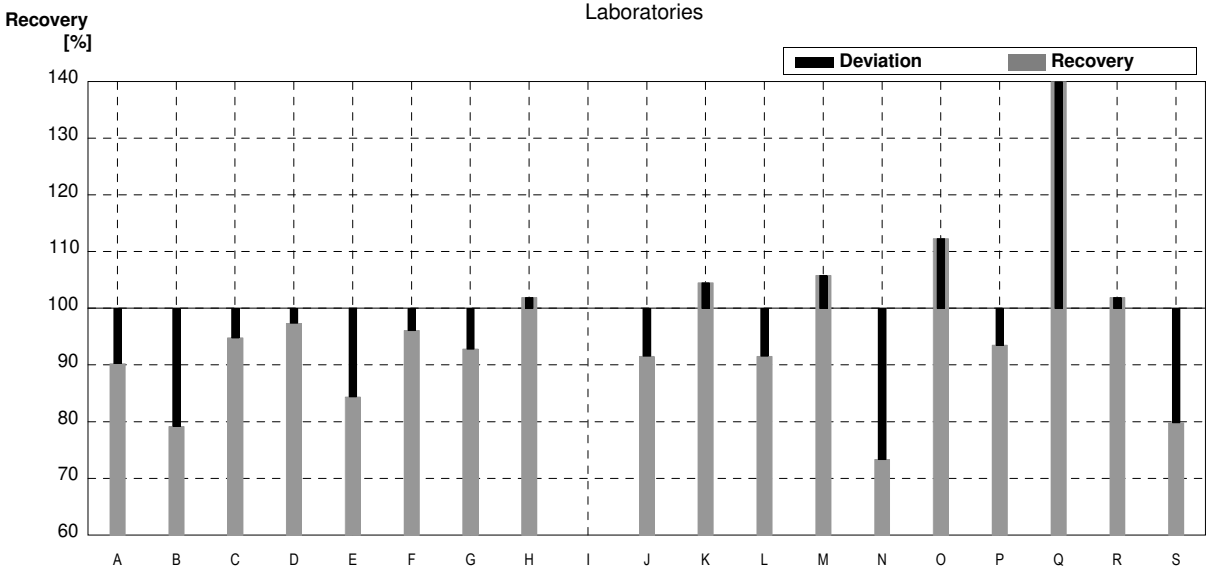
	Bromodichloro-methane	Dibromochloro-methane	Dichloro-methane	1,2-Dichloro-ethane	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene
A	-0.15	0.13				
B	-0.05	-0.4	0.59	-0.08	-0.77	-0.79
C	-0.05	-0.5	0.13	-0.33	-0.67	0.01
D	0.48	-0.26	-0.09	0.88	-0.38	0
E	-1.37	-1.09	-0.92	-0.94	-0.68	0
F	-0.15	0.63	0.9	2.2	1.33	1.28
G			-0.88	-0.2	-2.81	
H	-0.3	-0.13	-1.17	-0.24	-0.6	1.13
I					0.43	
J	-0.3	-0.36				
K	-0.2	0.3	1.43			
L	-0.1	-1.16	-0.25	-1.22	-0.49	-0.14
M	0	1.09		0.24	-0.85	-0.34
N	-1.17	-0.93	-1.41	-3.62		
O	0.15	-0.63	0.53	0.24	0.46	2.12
P	-0.76	-0.76	-0.74	-0.53	-1.96	-0.56
Q	2.74	2.28				
R	-0.25	0.26	-0.08	2.89	-1.85	
S	-1.47	-1.72	-0.97	-1.38	-1.36	-1.02

Sample C68A
Parameter Trichloroethene

Target value	± U (k=2)	1,54 µg/l	±	0,08 µg/l
IFA result	± U (k=2)	1,49 µg/l	±	0,15 µg/l
Stability test	± U (k=2)	1,54 µg/l	±	0,15 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	1,39	0,03	µg/l	90%	-0,70
B	1,22	0,25	µg/l	79%	-1,48
C	1,46	0,248	µg/l	95%	-0,37
D	1,500	0,495	µg/l	97%	-0,19
E	1,30	0,03	µg/l	84%	-1,11
F	1,48	0,31	µg/l	96%	-0,28
G	1,43	0,143	µg/l	93%	-0,51
H	1,57	0,31	µg/l	102%	0,14
I			µg/l		
J	1,41	0,10	µg/l	92%	-0,60
K	1,61	0,18	µg/l	105%	0,32
L	1,41	0,10	µg/l	92%	-0,60
M	1,63	0,25	µg/l	106%	0,42
N	1,13	0,0631	µg/l	73%	-1,90
O	1,73	0,068	µg/l	112%	0,88
P	1,44	0,22	µg/l	94%	-0,46
Q	2,39 *		µg/l	155%	3,94
R	1,57	0,24	µg/l	102%	0,14
S	1,23	0,3	µg/l	80%	-1,44



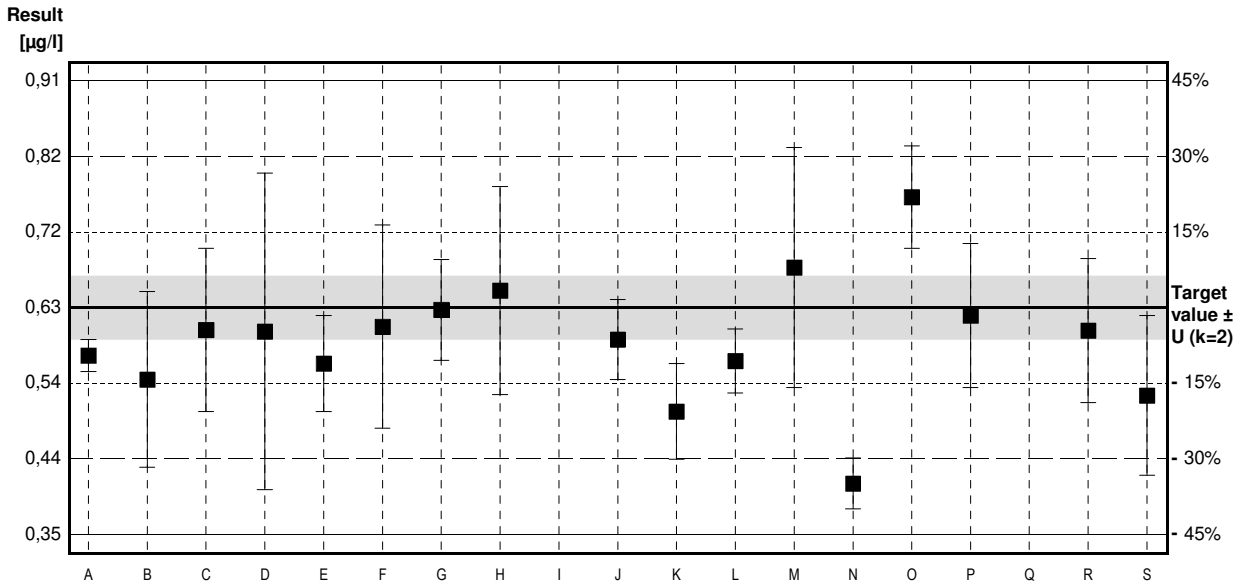


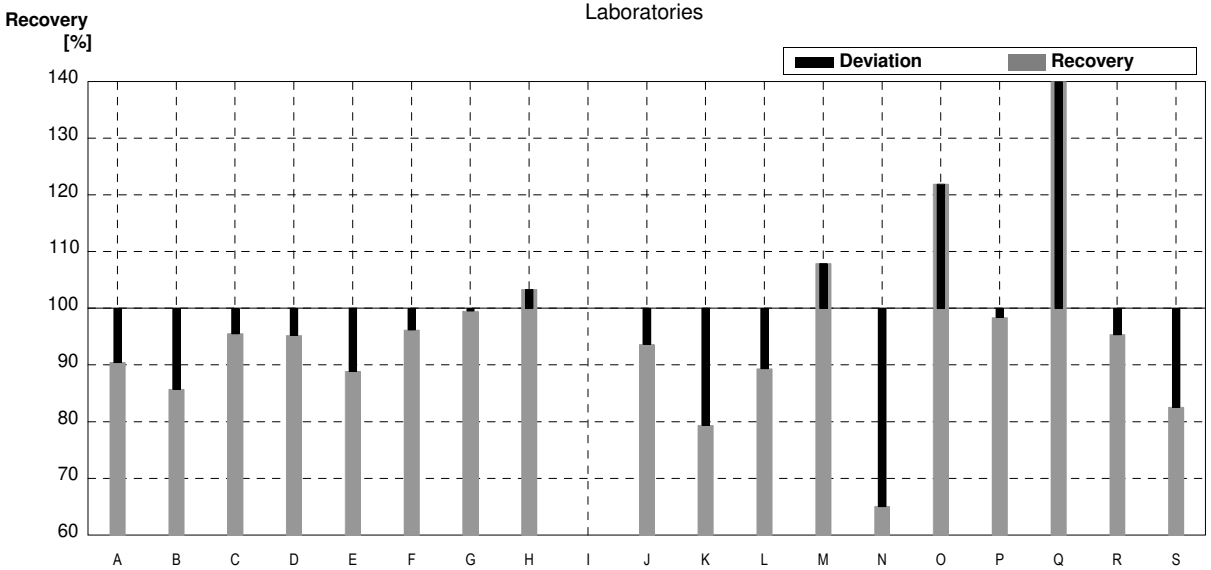
	All results	Outliers excl.	Unit
Mean ± CI(99%)	1,49 ± 0,19	1,44 ± 0,11	µg/l
Recov. ± CI(99%)	97,0 ± 12,0	93,6 ± 7,3	%
SD between labs	0,27	0,16	µg/l
RSD between labs	18,1	11,0	%
n for calculation	18	17	

Sample C68B
Parameter Trichloroethene

Target value	± U (k=2)	0,63 µg/l	±	0,04 µg/l
IFA result	± U (k=2)	0,65 µg/l	±	0,07 µg/l
Stability test	± U (k=2)	0,66 µg/l	±	0,07 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	0,57	0,02	µg/l	90%	-0,68
B	0,54	0,11	µg/l	86%	-1,02
C	0,602	0,102	µg/l	96%	-0,32
D	0,600	0,198	µg/l	95%	-0,34
E	0,56	0,06	µg/l	89%	-0,79
F	0,606	0,127	µg/l	96%	-0,27
G	0,627	0,063	µg/l	100%	-0,03
H	0,651	0,13	µg/l	103%	0,24
I			µg/l		
J	0,59	0,05	µg/l	94%	-0,45
K	0,50	0,06	µg/l	79%	-1,47
L	0,563	0,040	µg/l	89%	-0,76
M	0,680	0,15	µg/l	108%	0,57
N	0,410 *	0,032	µg/l	65%	-2,49
O	0,768	0,064	µg/l	122%	1,56
P	0,62	0,09	µg/l	98%	-0,11
Q	0,942 *		µg/l	150%	3,54
R	0,601	0,090	µg/l	95%	-0,33
S	0,52	0,1	µg/l	83%	-1,25



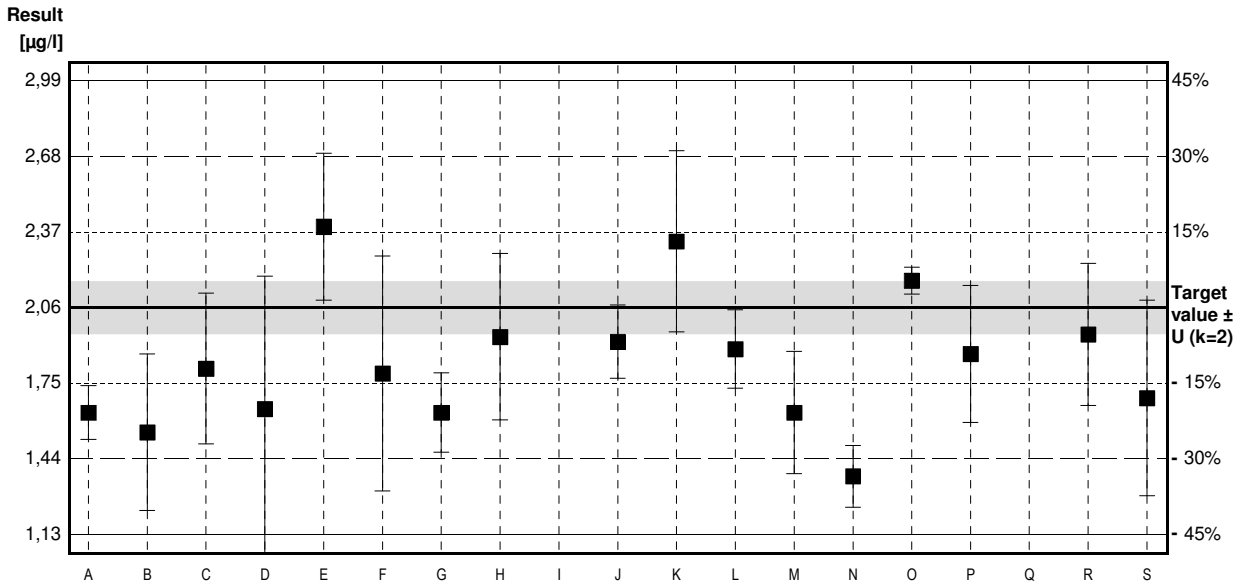


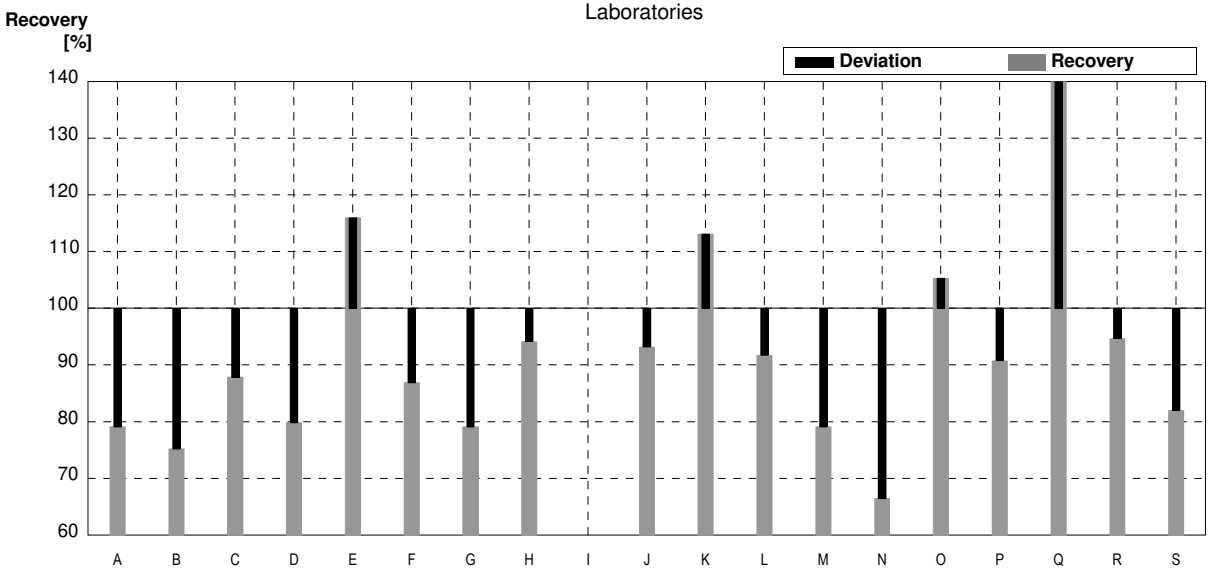
	All results	Outliers excl.	Unit
Mean ± CI(99%)	0,61 ± 0,08	0,60 ± 0,05	µg/l
Recov. ± CI(99%)	96,6 ± 12,2	95,2 ± 7,5	%
SD between labs	0,11	0,06	µg/l
RSD between labs	18,5	10,7	%
n for calculation	18	16	

Sample C68A
Parameter Tetrachloroethene

Target value	± U (k=2)	2,06 µg/l	±	0,11 µg/l
IFA result	± U (k=2)	1,98 µg/l	±	0,20 µg/l
Stability test	± U (k=2)	2,04 µg/l	±	0,20 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	1,63	0,11	µg/l	79%	-1,39
B	1,55	0,32	µg/l	75%	-1,65
C	1,81	0,308	µg/l	88%	-0,81
D	1,645	0,543	µg/l	80%	-1,34
E	2,39	0,30	µg/l	116%	1,07
F	1,79	0,48	µg/l	87%	-0,87
G	1,63	0,162	µg/l	79%	-1,39
H	1,94	0,34	µg/l	94%	-0,39
I			µg/l		
J	1,92	0,15	µg/l	93%	-0,45
K	2,33	0,37	µg/l	113%	0,87
L	1,89	0,16	µg/l	92%	-0,55
M	1,63	0,25	µg/l	79%	-1,39
N	1,37	0,1263	µg/l	67%	-2,23
O	2,17	0,055	µg/l	105%	0,36
P	1,87	0,28	µg/l	91%	-0,61
Q	3,25 *		µg/l	158%	3,85
R	1,95	0,29	µg/l	95%	-0,36
S	1,69	0,4	µg/l	82%	-1,20



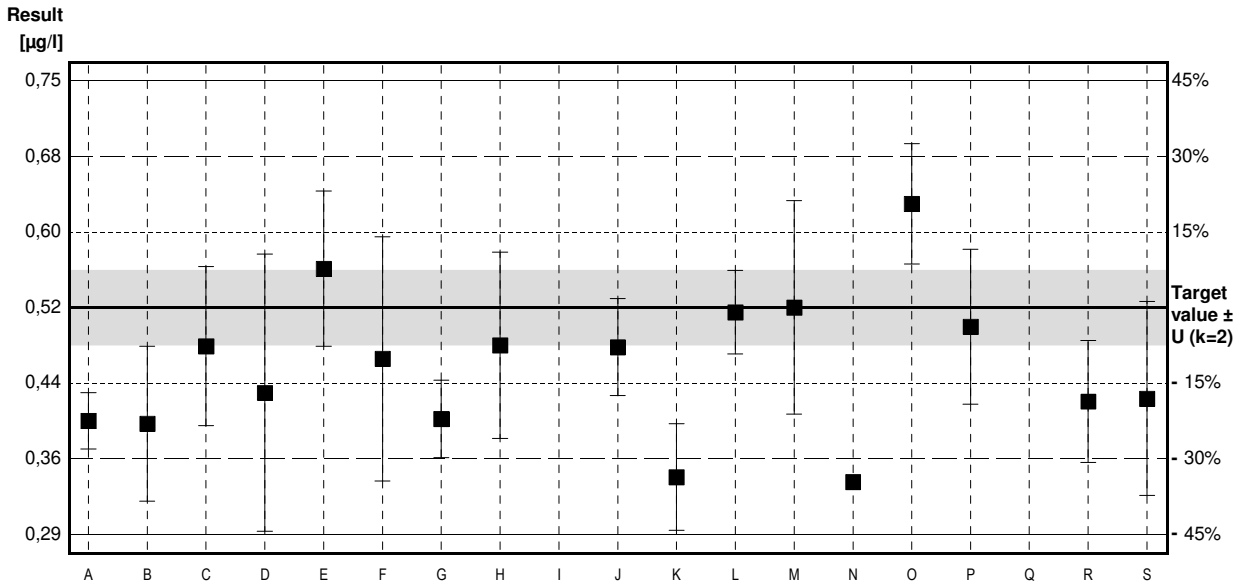


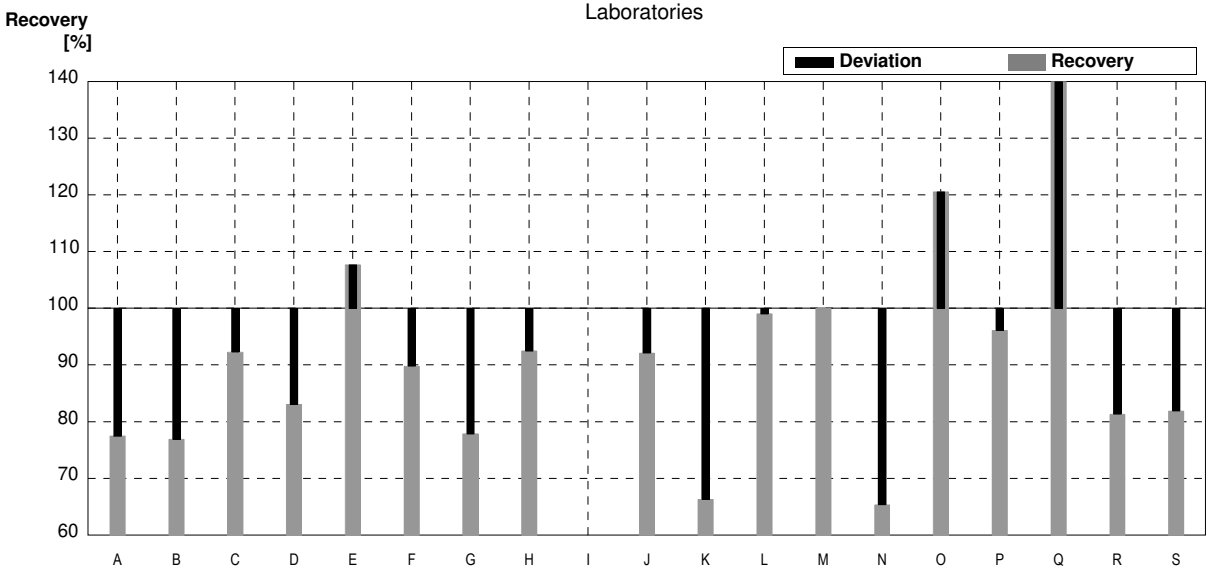
	All results	Outliers excl.	Unit
Mean ± CI(99%)	1,91 ± 0,29	1,84 ± 0,19	µg/l
Recov. ± CI(99%)	92,9 ± 14,1	89,1 ± 9,4	%
SD between labs	0,43	0,27	µg/l
RSD between labs	22,2	14,8	%
n for calculation	18	17	

Sample C68B
Parameter Tetrachloroethene

Target value	± U (k=2)	0,52 µg/l	±	0,04 µg/l
IFA result	± U (k=2)	0,55 µg/l	±	0,06 µg/l
Stability test	± U (k=2)	0,54 µg/l	±	0,05 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	0,403	0,029	µg/l	78%	-1,50
B	0,400	0,08	µg/l	77%	-1,54
C	0,480	0,082	µg/l	92%	-0,51
D	0,432	0,143	µg/l	83%	-1,13
E	0,56	0,08	µg/l	108%	0,51
F	0,467	0,126	µg/l	90%	-0,68
G	0,405	0,040	µg/l	78%	-1,47
H	0,481	0,096	µg/l	93%	-0,50
I			µg/l		
J	0,479	0,05	µg/l	92%	-0,53
K	0,345	0,055	µg/l	66%	-2,24
L	0,515	0,043	µg/l	99%	-0,06
M	0,520	0,11	µg/l	100%	0,00
N	0,340	0,0	µg/l	65%	-2,31
O	0,627	0,062	µg/l	121%	1,37
P	0,50	0,08	µg/l	96%	-0,26
Q	0,759 *		µg/l	146%	3,06
R	0,423	0,063	µg/l	81%	-1,24
S	0,426	0,1	µg/l	82%	-1,21



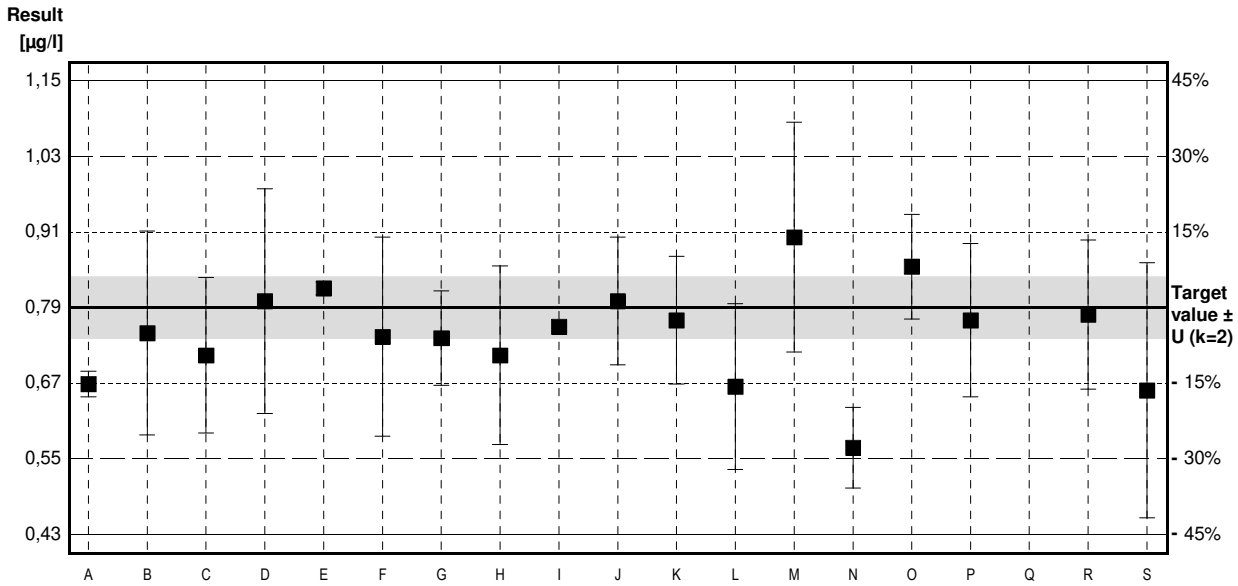


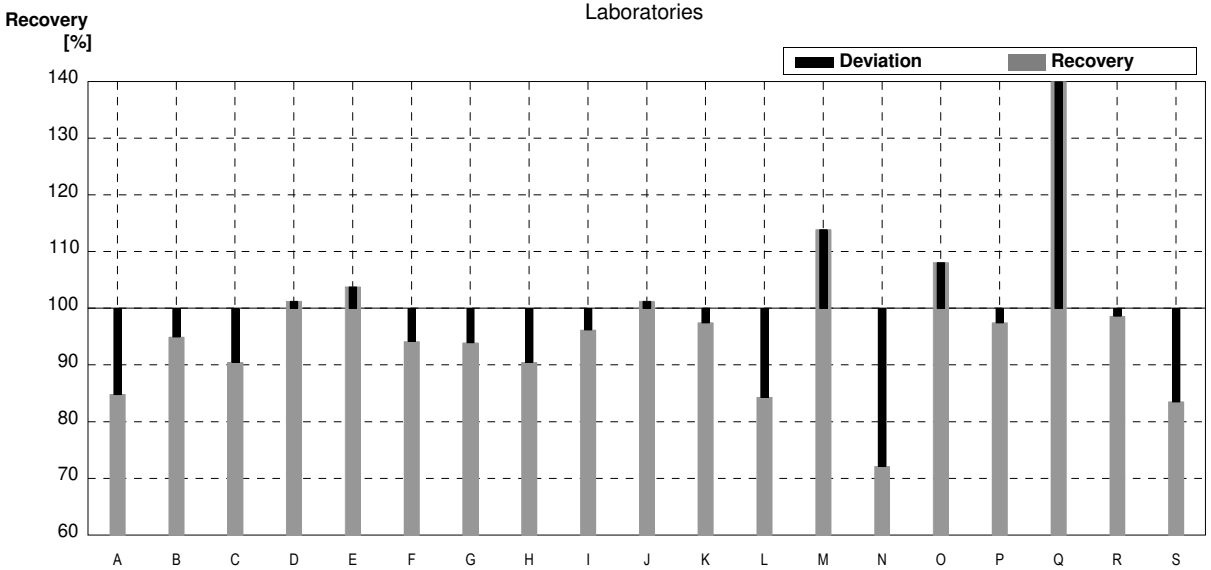
	All results	Outliers excl.	Unit
Mean ± CI(99%)	0,48 ± 0,07	0,46 ± 0,05	µg/l
Recov. ± CI(99%)	91,5 ± 13,3	88,3 ± 10,1	%
SD between labs	0,10	0,07	µg/l
RSD between labs	21,2	16,2	%
n for calculation	18	17	

Sample C68A
Parameter 1,1,1-Trichloroethane

Target value	± U (k=2)	0,79 µg/l	±	0,05 µg/l
IFA result	± U (k=2)	0,75 µg/l	±	0,08 µg/l
Stability test	± U (k=2)	0,77 µg/l	±	0,08 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	0,67	0,02	µg/l	85%	-1,17
B	0,75	0,16	µg/l	95%	-0,39
C	0,715	0,122	µg/l	91%	-0,73
D	0,800	0,176	µg/l	101%	0,10
E	0,82	0,01	µg/l	104%	0,29
F	0,744	0,156	µg/l	94%	-0,45
G	0,742	0,074	µg/l	94%	-0,47
H	0,715	0,14	µg/l	91%	-0,73
I	0,76		µg/l	96%	-0,29
J	0,80	0,10	µg/l	101%	0,10
K	0,77	0,10	µg/l	97%	-0,19
L	0,666	0,13	µg/l	84%	-1,21
M	0,900	0,18	µg/l	114%	1,07
N	0,570	0,0631	µg/l	72%	-2,14
O	0,854	0,082	µg/l	108%	0,62
P	0,77	0,12	µg/l	97%	-0,19
Q	1,40 *		µg/l	177%	5,94
R	0,779	0,117	µg/l	99%	-0,11
S	0,66	0,2	µg/l	84%	-1,27



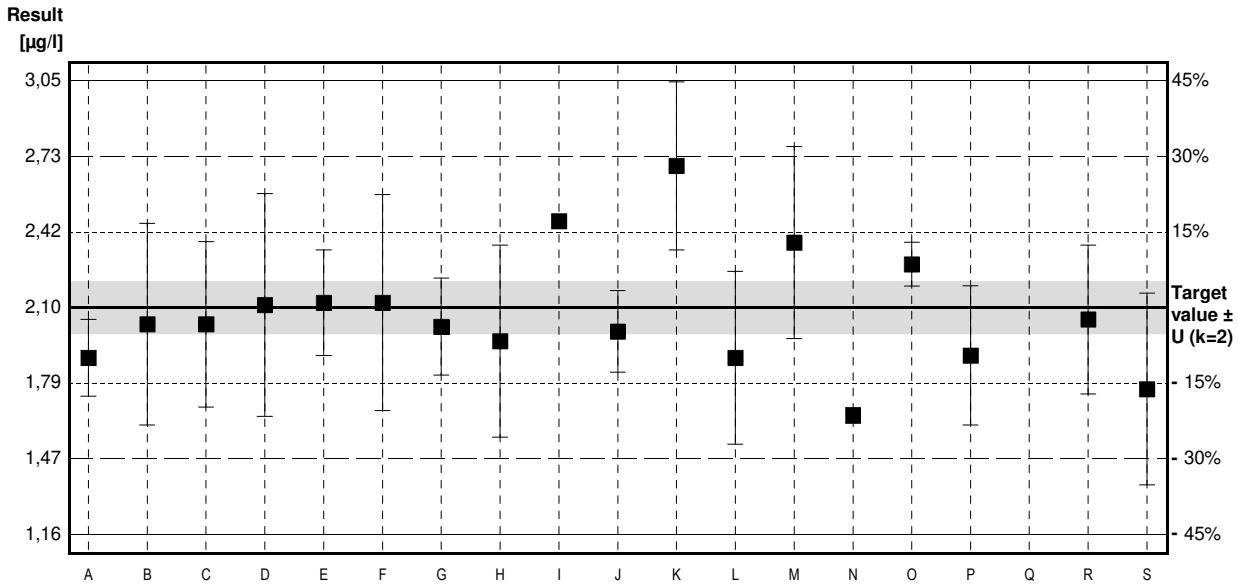


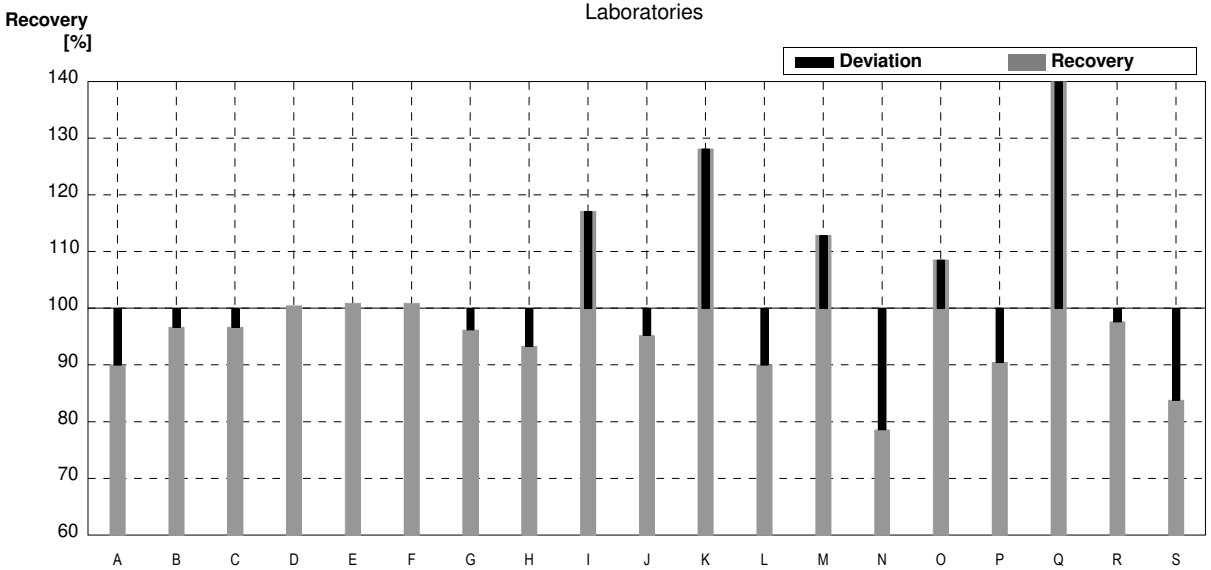
	All results	Outliers excl.	Unit
Mean ± CI(99%)	0,78 ± 0,11	0,75 ± 0,05	µg/l
Recov. ± CI(99%)	99,2 ± 14,0	94,8 ± 6,7	%
SD between labs	0,17	0,08	µg/l
RSD between labs	21,3	10,3	%
n for calculation	19	18	

Sample C68B
Parameter 1,1,1-Trichloroethane

Target value	± U (k=2)	2,10 µg/l	±	0,11 µg/l
IFA result	± U (k=2)	2,10 µg/l	±	0,21 µg/l
Stability test	± U (k=2)	2,13 µg/l	±	0,22 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	1,89	0,16	µg/l	90%	-0,77
B	2,03	0,42	µg/l	97%	-0,26
C	2,03	0,345	µg/l	97%	-0,26
D	2,110	0,464	µg/l	100%	0,04
E	2,12	0,22	µg/l	101%	0,07
F	2,12	0,45	µg/l	101%	0,07
G	2,02	0,202	µg/l	96%	-0,29
H	1,96	0,40	µg/l	93%	-0,51
I	2,46		µg/l	117%	1,32
J	2,00	0,17	µg/l	95%	-0,37
K	2,69 *	0,35	µg/l	128%	2,16
L	1,89	0,36	µg/l	90%	-0,77
M	2,37	0,4	µg/l	113%	0,99
N	1,65	0,032	µg/l	79%	-1,65
O	2,28	0,091	µg/l	109%	0,66
P	1,90	0,29	µg/l	90%	-0,73
Q	3,97 *		µg/l	189%	6,85
R	2,05	0,31	µg/l	98%	-0,18
S	1,76	0,4	µg/l	84%	-1,25



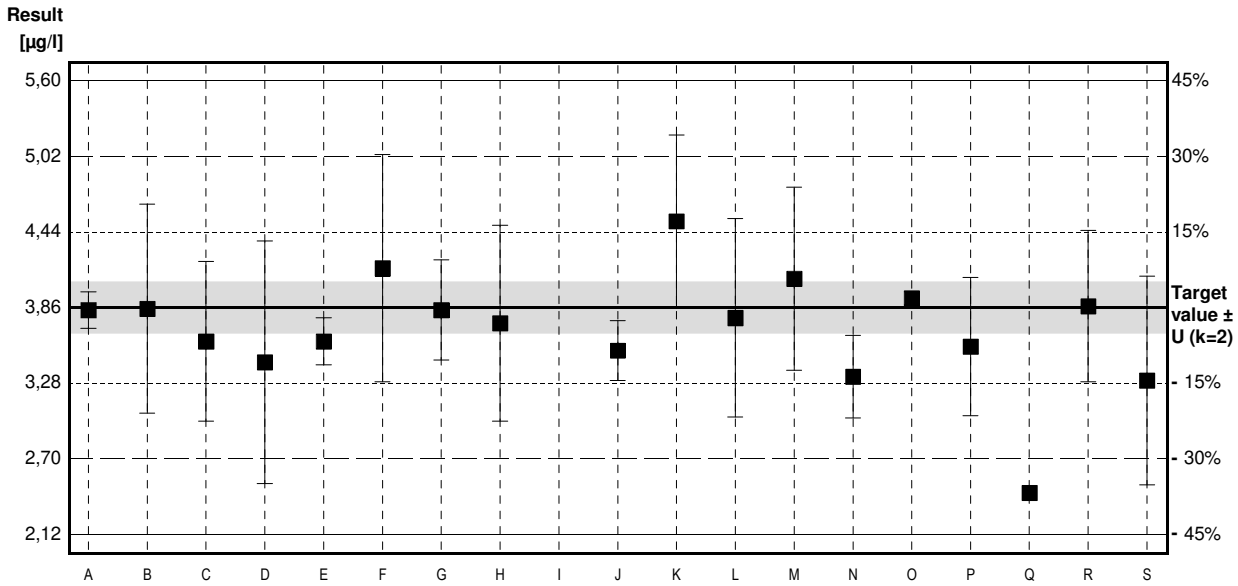


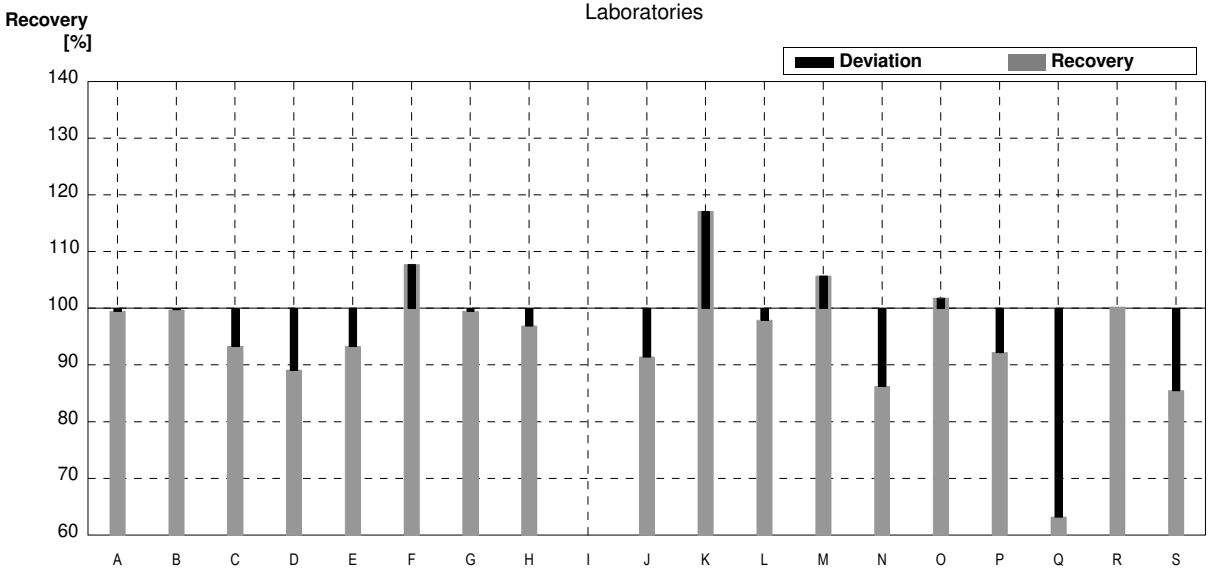
	All results	Outliers excl.	Unit
Mean ± CI(99%)	2,17 ± 0,33	2,04 ± 0,14	µg/l
Recov. ± CI(99%)	103,5 ± 15,7	97,0 ± 6,9	%
SD between labs	0,50	0,20	µg/l
RSD between labs	22,9	10,0	%
n for calculation	19	17	

Sample C68A
Parameter Trichloromethane

Target value ± U (k=2)	3,86	µg/l	±	0,20	µg/l
IFA result ± U (k=2)	3,85	µg/l	±	0,40	µg/l
Stability test ± U (k=2)	3,79	µg/l	±	0,39	µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	3,84	0,14	µg/l	99%	-0,04
B	3,85	0,80	µg/l	100%	-0,02
C	3,60	0,612	µg/l	93%	-0,52
D	3,440	0,929	µg/l	89%	-0,84
E	3,60	0,18	µg/l	93%	-0,52
F	4,16	0,87	µg/l	108%	0,60
G	3,84	0,384	µg/l	99%	-0,04
H	3,74	0,75	µg/l	97%	-0,24
I			µg/l		
J	3,53	0,23	µg/l	91%	-0,66
K	4,52	0,66	µg/l	117%	1,32
L	3,78	0,76	µg/l	98%	-0,16
M	4,08	0,7	µg/l	106%	0,44
N	3,33	0,3157	µg/l	86%	-1,06
O	3,93	0,049	µg/l	102%	0,14
P	3,56	0,53	µg/l	92%	-0,60
Q	2,44 *		µg/l	63%	-2,83
R	3,87	0,580	µg/l	100%	0,02
S	3,30	0,8	µg/l	85%	-1,12



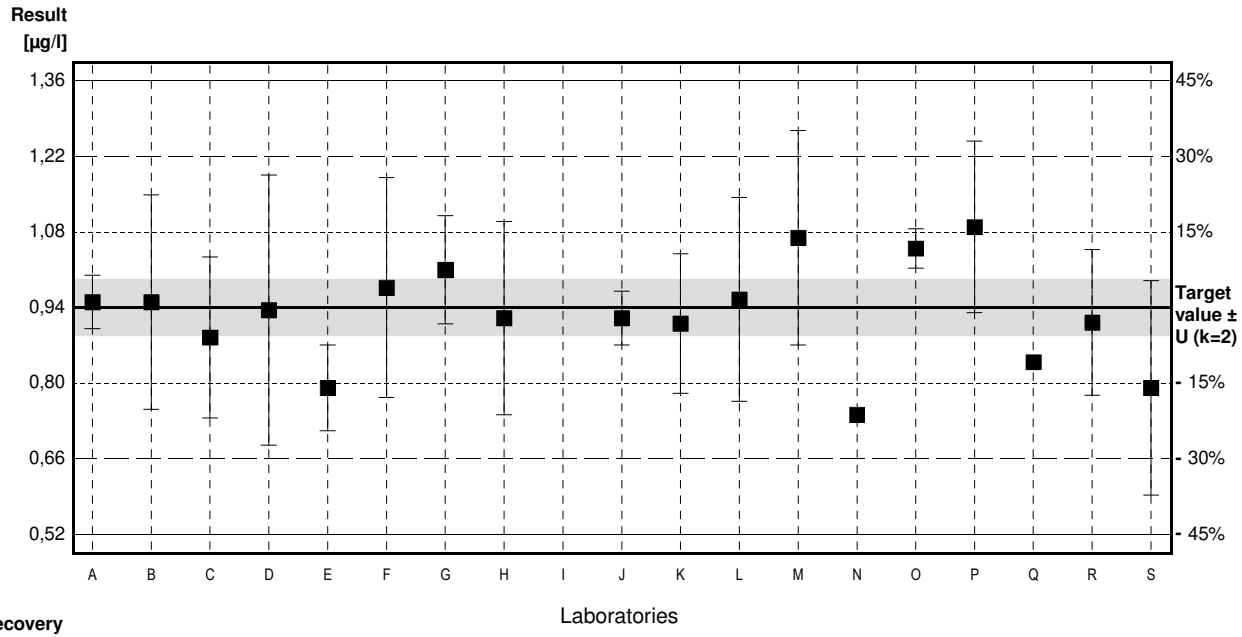


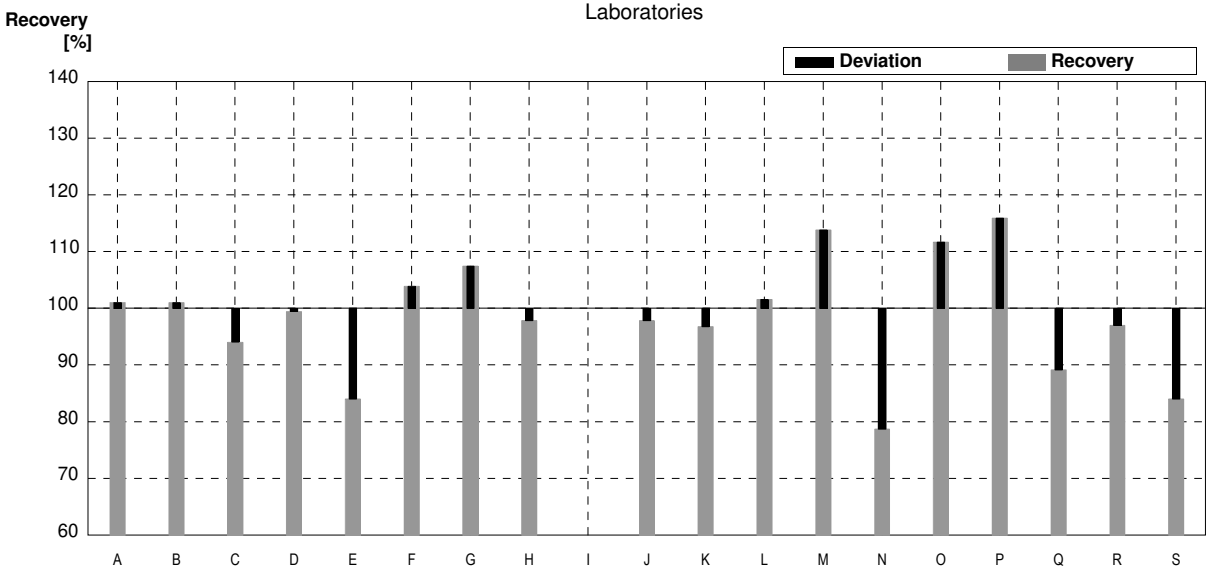
	All results	Outliers excl.	Unit
Mean ± CI(99%)	3,69 ± 0,30	3,76 ± 0,22	µg/l
Recov. ± CI(99%)	95,6 ± 7,7	97,5 ± 5,7	%
SD between labs	0,43	0,31	µg/l
RSD between labs	11,8	8,3	%
n for calculation	18	17	

Sample C68B
Parameter Trichloromethane

Target value	± U (k=2)	0,94 µg/l	±	0,05 µg/l
IFA result	± U (k=2)	0,96 µg/l	±	0,10 µg/l
Stability test	± U (k=2)	0,98 µg/l	±	0,10 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	0,95	0,05	µg/l	101%	0,08
B	0,95	0,20	µg/l	101%	0,08
C	0,884	0,150	µg/l	94%	-0,46
D	0,935	0,252	µg/l	99%	-0,04
E	0,79	0,08	µg/l	84%	-1,23
F	0,977	0,205	µg/l	104%	0,30
G	1,01	0,101	µg/l	107%	0,57
H	0,92	0,18	µg/l	98%	-0,16
I			µg/l		
J	0,92	0,05	µg/l	98%	-0,16
K	0,91	0,13	µg/l	97%	-0,25
L	0,955	0,19	µg/l	102%	0,12
M	1,07	0,2	µg/l	114%	1,06
N	0,740	0,0	µg/l	79%	-1,64
O	1,05	0,037	µg/l	112%	0,90
P	1,09	0,16	µg/l	116%	1,23
Q	0,838		µg/l	89%	-0,83
R	0,912	0,136	µg/l	97%	-0,23
S	0,79	0,2	µg/l	84%	-1,23



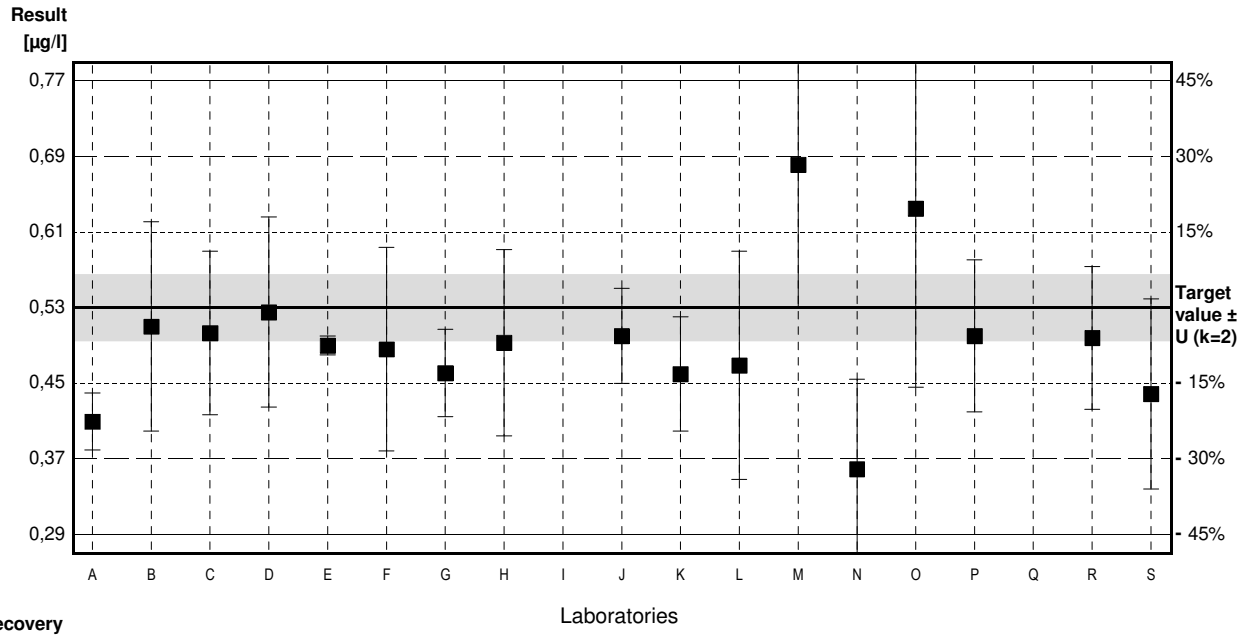


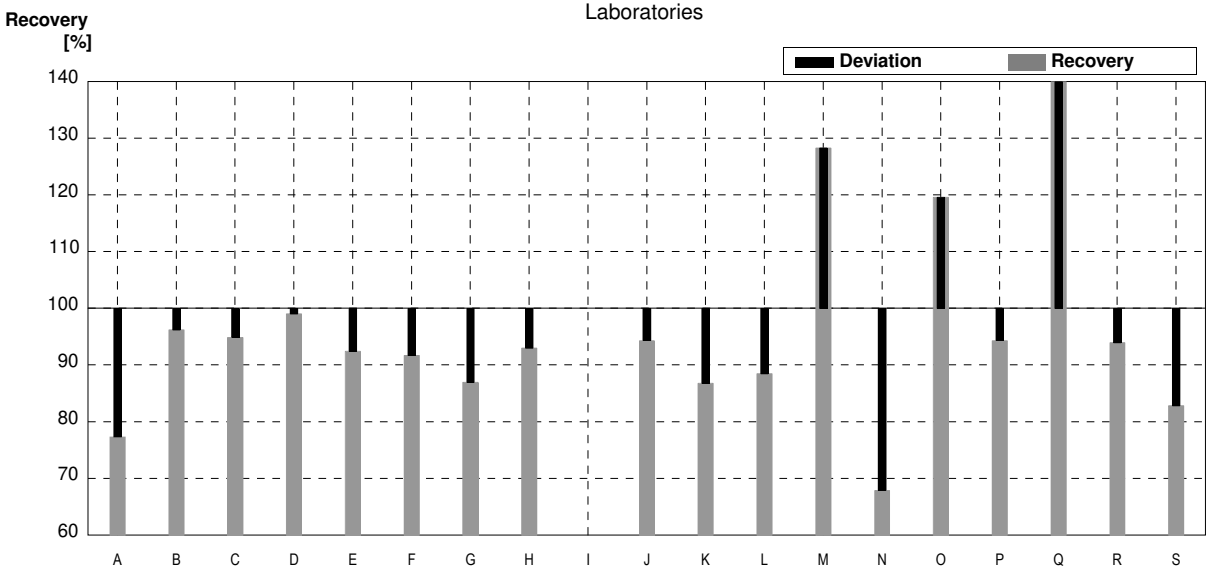
	All results	Outliers excl.	Unit
Mean ± CI(99%)	0,93 ± 0,07	0,93 ± 0,07	µg/l
Recov. ± CI(99%)	98,6 ± 7,0	98,6 ± 7,0	%
SD between labs	0,10	0,10	µg/l
RSD between labs	10,3	10,3	%
n for calculation	18	18	

Sample C68A
Parameter Tetrachloromethane

Target value	± U (k=2)	0,53 µg/l	±	0,04 µg/l
IFA result	± U (k=2)	0,52 µg/l	±	0,05 µg/l
Stability test	± U (k=2)	0,53 µg/l	±	0,05 µg/l

Lab Code	Result		±	Unit	Recovery	z-Score
A	0,410		0,03	µg/l	77%	-1,33
B	0,51		0,11	µg/l	96%	-0,22
C	0,503		0,086	µg/l	95%	-0,30
D	0,525		0,100	µg/l	99%	-0,06
E	0,490		0,01	µg/l	92%	-0,44
F	0,486		0,107	µg/l	92%	-0,49
G	0,461		0,046	µg/l	87%	-0,77
H	0,493		0,098	µg/l	93%	-0,41
I				µg/l		
J	0,50		0,05	µg/l	94%	-0,33
K	0,460		0,06	µg/l	87%	-0,78
L	0,469		0,12	µg/l	88%	-0,68
M	0,680	*	0,15	µg/l	128%	1,66
N	0,360	*	0,0947	µg/l	68%	-1,89
O	0,634	*	0,188	µg/l	120%	1,15
P	0,50		0,08	µg/l	94%	-0,33
Q	0,989	*		µg/l	187%	5,09
R	0,498		0,075	µg/l	94%	-0,36
S	0,439		0,1	µg/l	83%	-1,01



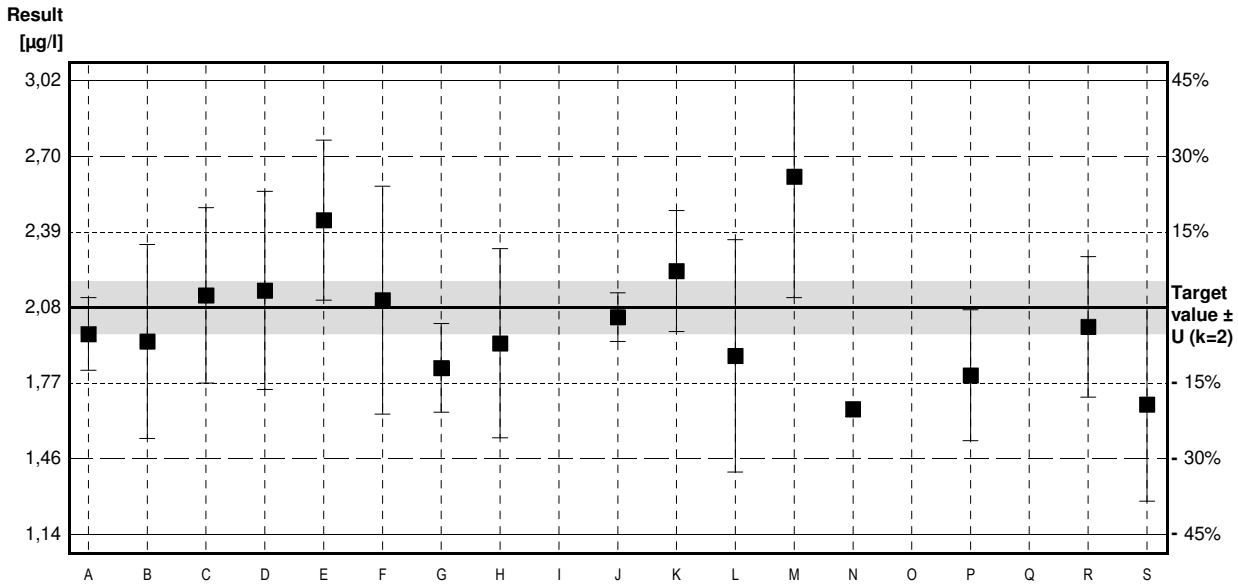


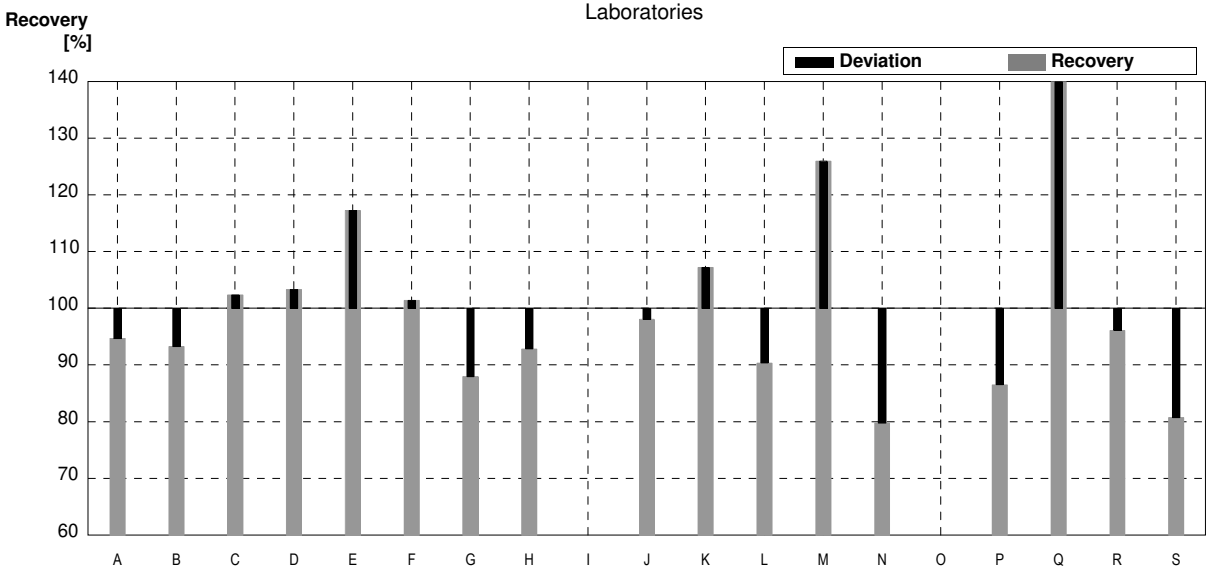
	All results	Outliers excl.	Unit
Mean ± CI(99%)	0,52 ± 0,09	0,48 ± 0,02	µg/l
Recov. ± CI(99%)	98,6 ± 17,6	90,9 ± 4,7	%
SD between labs	0,14	0,03	µg/l
RSD between labs	26,1	6,4	%
n for calculation	18	14	

Sample C68B
Parameter Tetrachloromethane

Target value	± U (k=2)	2,08 µg/l	±	0,11 µg/l
IFA result	± U (k=2)	2,08 µg/l	±	0,21 µg/l
Stability test	± U (k=2)	2,10 µg/l	±	0,21 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	1,97	0,15	µg/l	95%	-0,31
B	1,94	0,40	µg/l	93%	-0,40
C	2,13	0,362	µg/l	102%	0,14
D	2,150	0,409	µg/l	103%	0,20
E	2,44	0,33	µg/l	117%	1,02
F	2,11	0,47	µg/l	101%	0,08
G	1,83	0,183	µg/l	88%	-0,71
H	1,932	0,39	µg/l	93%	-0,42
I			µg/l		
J	2,04	0,10	µg/l	98%	-0,11
K	2,23	0,25	µg/l	107%	0,42
L	1,88	0,48	µg/l	90%	-0,57
M	2,62	0,5	µg/l	126%	1,53
N	1,66	0,03	µg/l	80%	-1,19
O			µg/l		
P	1,80	0,27	µg/l	87%	-0,79
Q	4,32 *		µg/l	208%	6,33
R	2,00	0,29	µg/l	96%	-0,23
S	1,68	0,4	µg/l	81%	-1,13



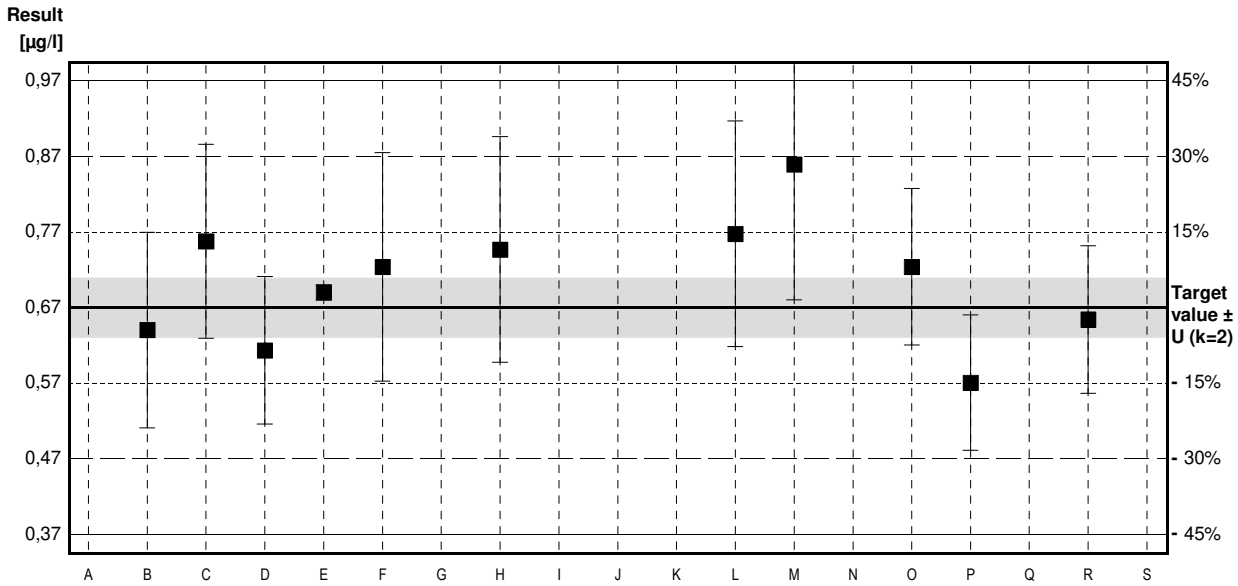


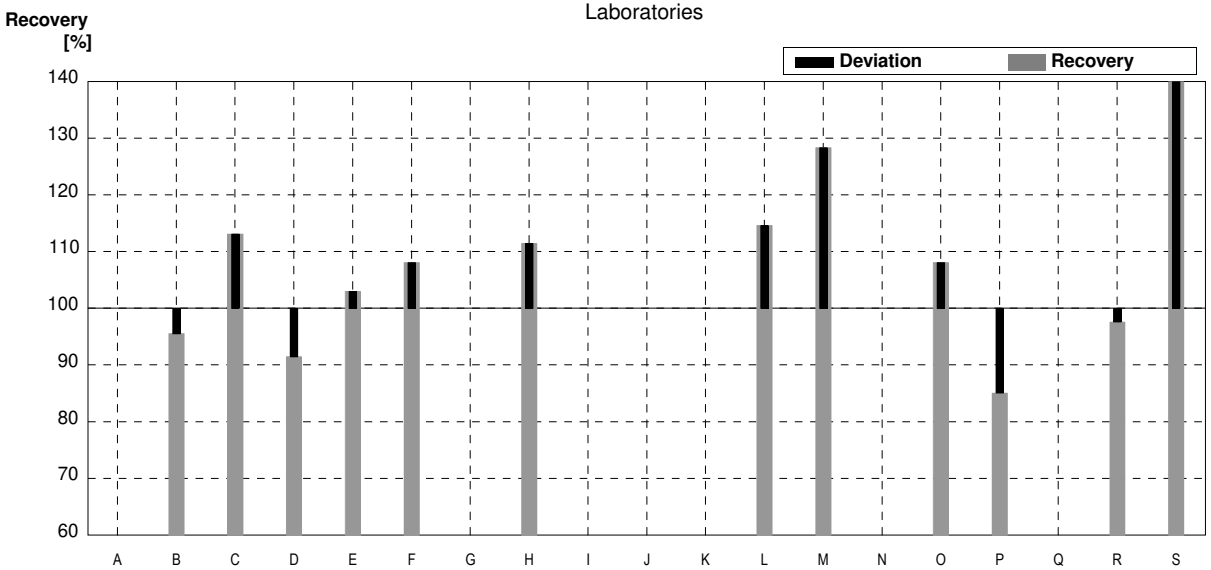
	All results	Outliers excl.	Unit
Mean ± CI(99%)	2,16 ± 0,43	2,03 ± 0,19	µg/l
Recov. ± CI(99%)	103,9 ± 20,7	97,4 ± 9,1	%
SD between labs	0,61	0,26	µg/l
RSD between labs	28,2	12,6	%
n for calculation	17	16	

Sample C68A
Parameter 1,1-Dichloroethene

Target value ± U (k=2)	0,67 µg/l	±	0,04 µg/l
IFA result ± U (k=2)	0,65 µg/l	±	0,07 µg/l
Stability test ± U (k=2)	0,67 µg/l	±	0,07 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A			µg/l		
B	0,64	0,13	µg/l	96%	-0,26
C	0,758	0,129	µg/l	113%	0,77
D	0,613	0,098	µg/l	91%	-0,50
E	0,69	0,01	µg/l	103%	0,18
F	0,724	0,152	µg/l	108%	0,47
G			µg/l		
H	0,747	0,15	µg/l	111%	0,68
I			µg/l		
J	n,a.		µg/l		
K			µg/l		
L	0,768	0,15	µg/l	115%	0,86
M	0,860	0,18	µg/l	128%	1,67
N			µg/l		
O	0,724	0,104	µg/l	108%	0,47
P	0,57	0,09	µg/l	85%	-0,88
Q			µg/l		
R	0,654	0,098	µg/l	98%	-0,14
S	1,07 *	0,3	µg/l	160%	3,51



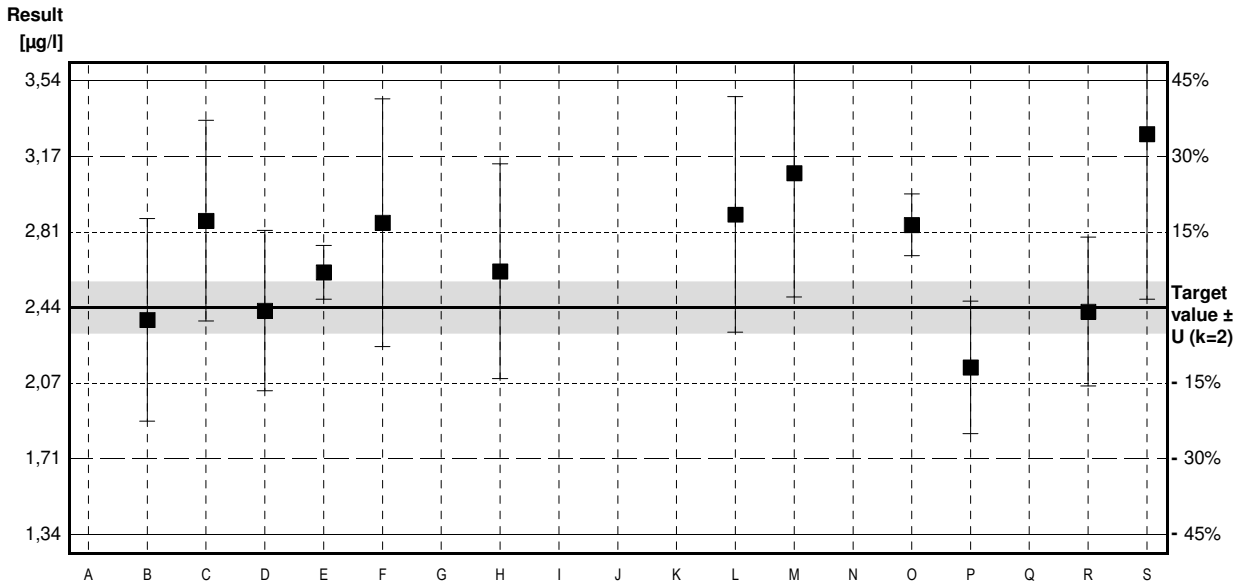


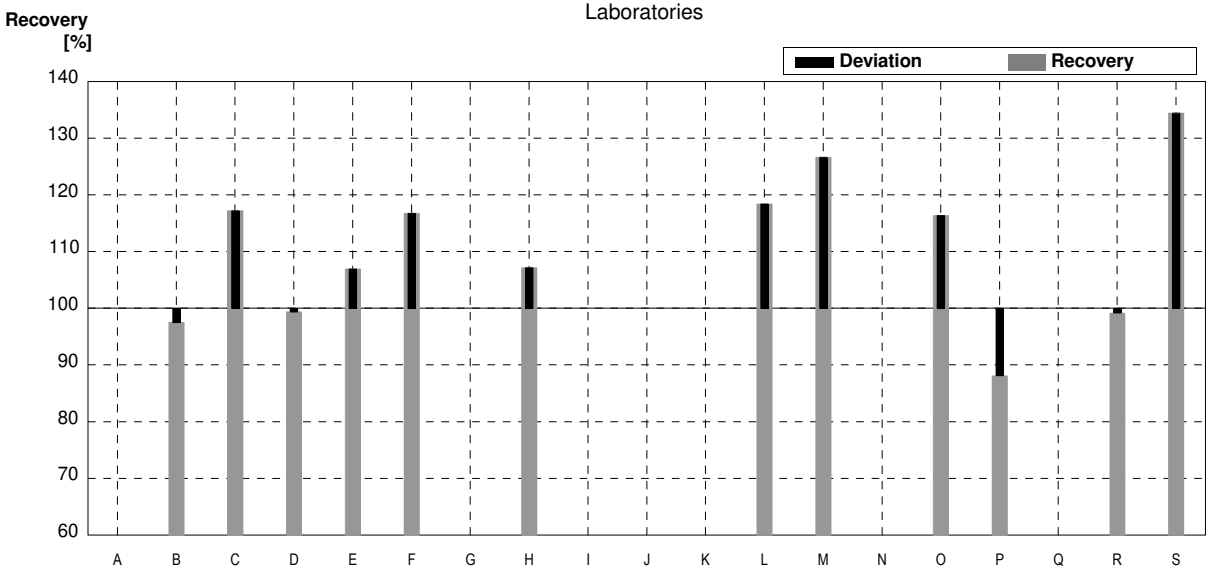
	All results	Outliers excl.	Unit
Mean ± CI(99%)	0,73 ± 0,12	0,70 ± 0,08	µg/l
Recov. ± CI(99%)	109,7 ± 17,6	105,1 ± 11,7	%
SD between labs	0,13	0,08	µg/l
RSD between labs	17,9	11,6	%
n for calculation	12	11	

Sample C68B
Parameter 1,1-Dichloroethene

Target value	± U (k=2)	2,44 µg/l	±	0,12 µg/l
IFA result	± U (k=2)	2,48 µg/l	±	0,25 µg/l
Stability test	± U (k=2)	2,51 µg/l	±	0,25 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A			µg/l		
B	2,38	0,49	µg/l	98%	-0,14
C	2,86	0,486	µg/l	117%	1,01
D	2,425	0,388	µg/l	99%	-0,04
E	2,61	0,13	µg/l	107%	0,41
F	2,85	0,60	µg/l	117%	0,99
G			µg/l		
H	2,615	0,52	µg/l	107%	0,42
I			µg/l		
J	n,a.		µg/l		
K			µg/l		
L	2,89	0,57	µg/l	118%	1,08
M	3,09	0,6	µg/l	127%	1,57
N			µg/l		
O	2,84	0,149	µg/l	116%	0,96
P	2,15	0,32	µg/l	88%	-0,70
Q			µg/l		
R	2,42	0,36	µg/l	99%	-0,05
S	3,28	0,8	µg/l	134%	2,03



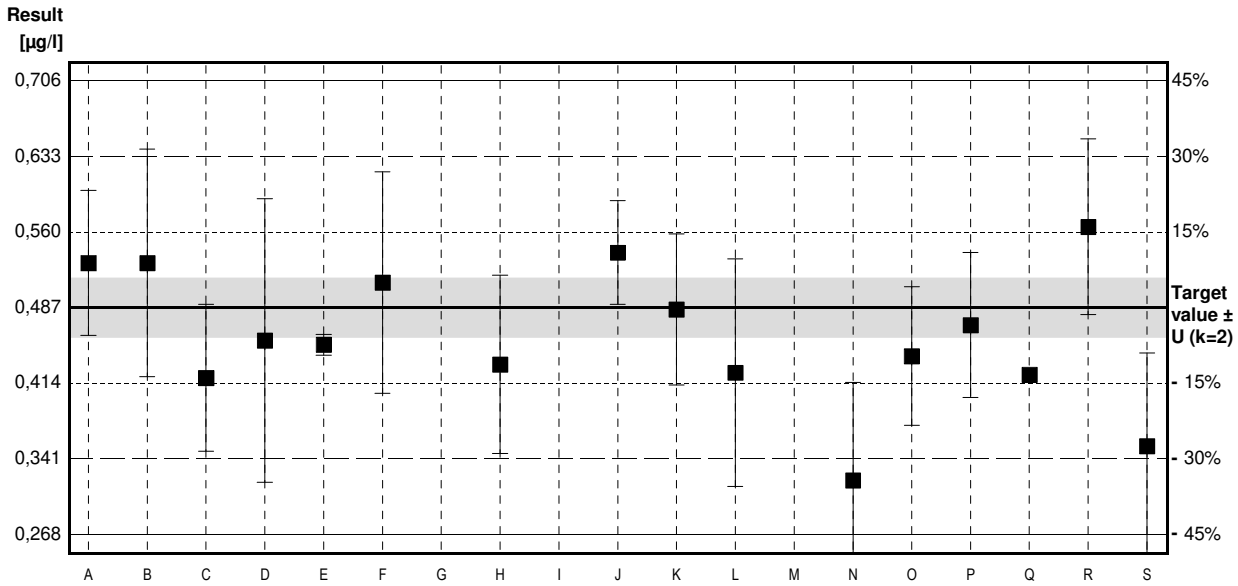


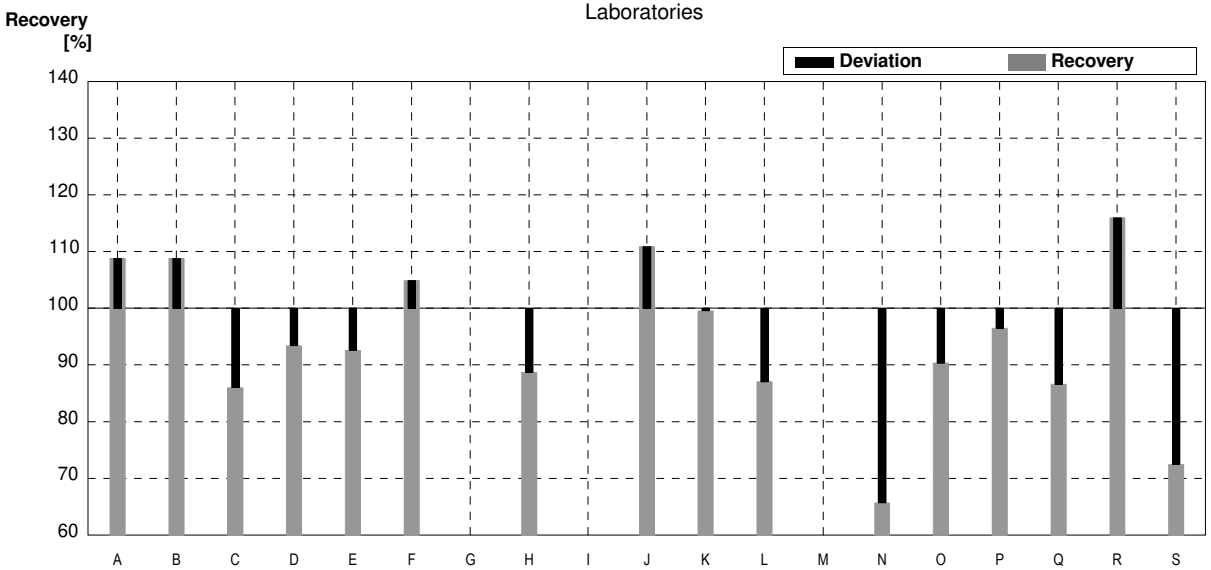
	All results	Outliers excl.	Unit
Mean ± CI(99%)	2,70 ± 0,29	2,70 ± 0,29	µg/l
Recov. ± CI(99%)	110,7 ± 12,0	110,7 ± 12,0	%
SD between labs	0,33	0,33	µg/l
RSD between labs	12,1	12,1	%
n for calculation	12	12	

Sample C68A
Parameter Tribromomethane

Target value	± U (k=2)	0,487 µg/l	±	0,029 µg/l
IFA result	± U (k=2)	0,498 µg/l	±	0,075 µg/l
Stability test	± U (k=2)	0,504 µg/l	±	0,076 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	0,53	0,07	µg/l	109%	0,59
B	0,53	0,11	µg/l	109%	0,59
C	0,419	0,071	µg/l	86%	-0,93
D	0,455	0,137	µg/l	93%	-0,44
E	0,451	0,01	µg/l	93%	-0,49
F	0,511	0,107	µg/l	105%	0,33
G			µg/l		
H	0,432	0,086	µg/l	89%	-0,75
I			µg/l		
J	0,54	0,05	µg/l	111%	0,73
K	0,485	0,073	µg/l	100%	-0,03
L	0,424	0,11	µg/l	87%	-0,86
M			µg/l		
N	0,320	0,0947	µg/l	66%	-2,29
O	0,440	0,067	µg/l	90%	-0,64
P	0,470	0,07	µg/l	97%	-0,23
Q	0,422		µg/l	87%	-0,89
R	0,565	0,085	µg/l	116%	1,07
S	0,353	0,09	µg/l	72%	-1,83



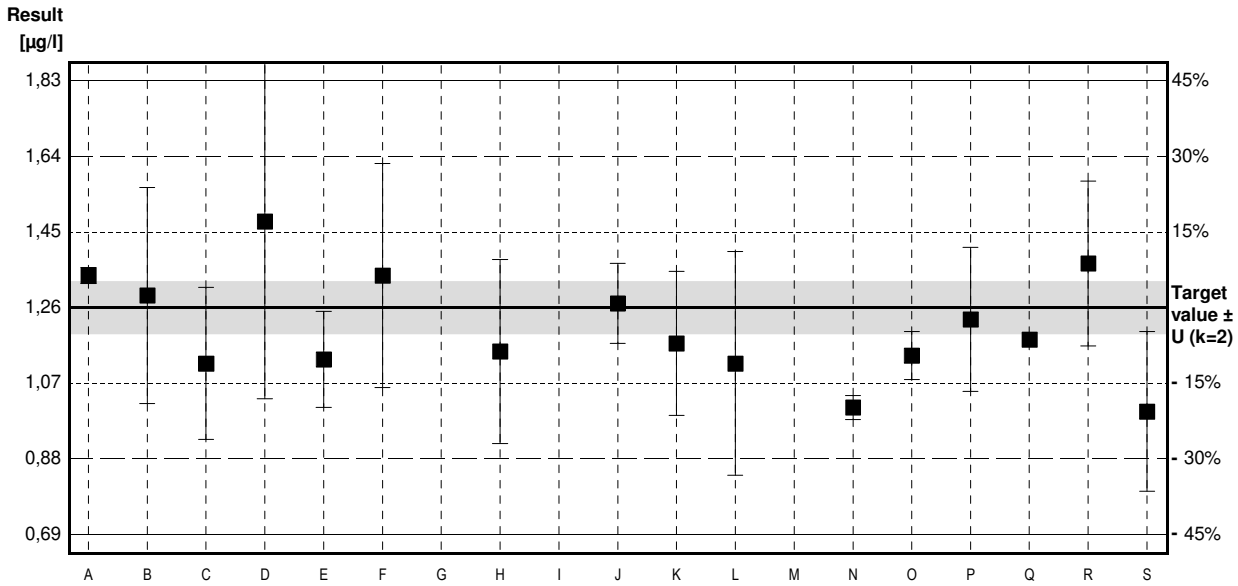


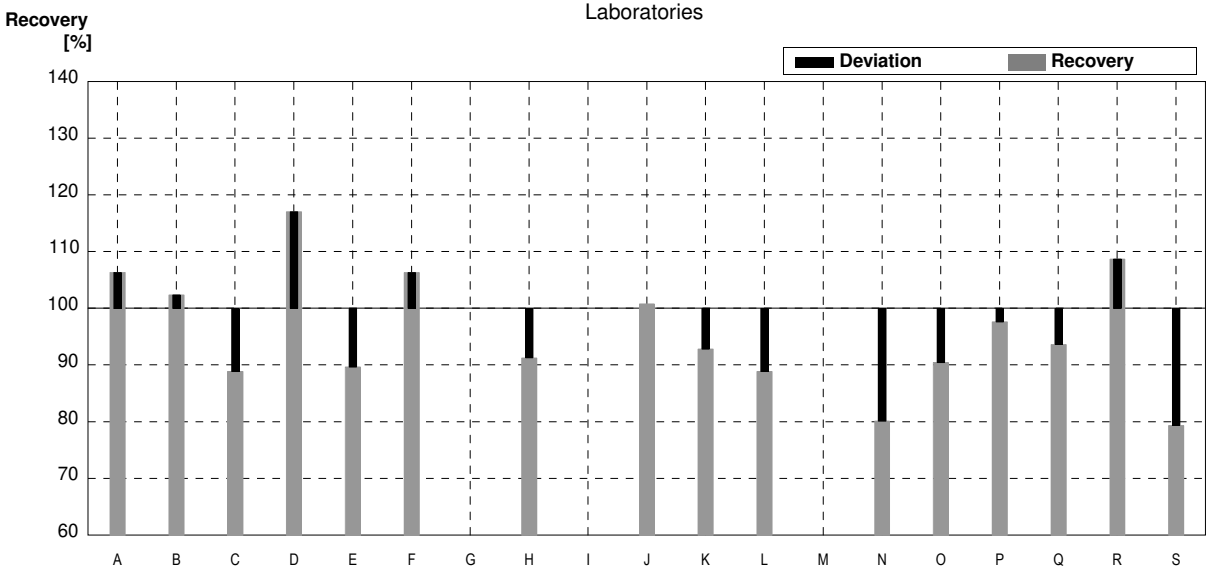
	All results	Outliers excl.	Unit
Mean ± CI(99%)	0,459 ± 0,049	0,459 ± 0,049	µg/l
Recov. ± CI(99%)	94,3 ± 10,1	94,3 ± 10,1	%
SD between labs	0,067	0,067	µg/l
RSD between labs	14,6	14,6	%
n for calculation	16	16	

Sample C68B
Parameter Tribromomethane

Target value	± U (k=2)	1,26 µg/l	±	0,07 µg/l
IFA result	± U (k=2)	1,26 µg/l	±	0,19 µg/l
Stability test	± U (k=2)	1,27 µg/l	±	0,19 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	1,34	0,02	µg/l	106%	0,42
B	1,29	0,27	µg/l	102%	0,16
C	1,12	0,190	µg/l	89%	-0,74
D	1,475	0,443	µg/l	117%	1,14
E	1,13	0,12	µg/l	90%	-0,69
F	1,34	0,28	µg/l	106%	0,42
G			µg/l		
H	1,15	0,23	µg/l	91%	-0,58
I			µg/l		
J	1,27	0,10	µg/l	101%	0,05
K	1,17	0,18	µg/l	93%	-0,48
L	1,12	0,28	µg/l	89%	-0,74
M			µg/l		
N	1,01	0,03	µg/l	80%	-1,32
O	1,14	0,060	µg/l	90%	-0,63
P	1,23	0,18	µg/l	98%	-0,16
Q	1,18		µg/l	94%	-0,42
R	1,37	0,206	µg/l	109%	0,58
S	1,00	0,2	µg/l	79%	-1,38



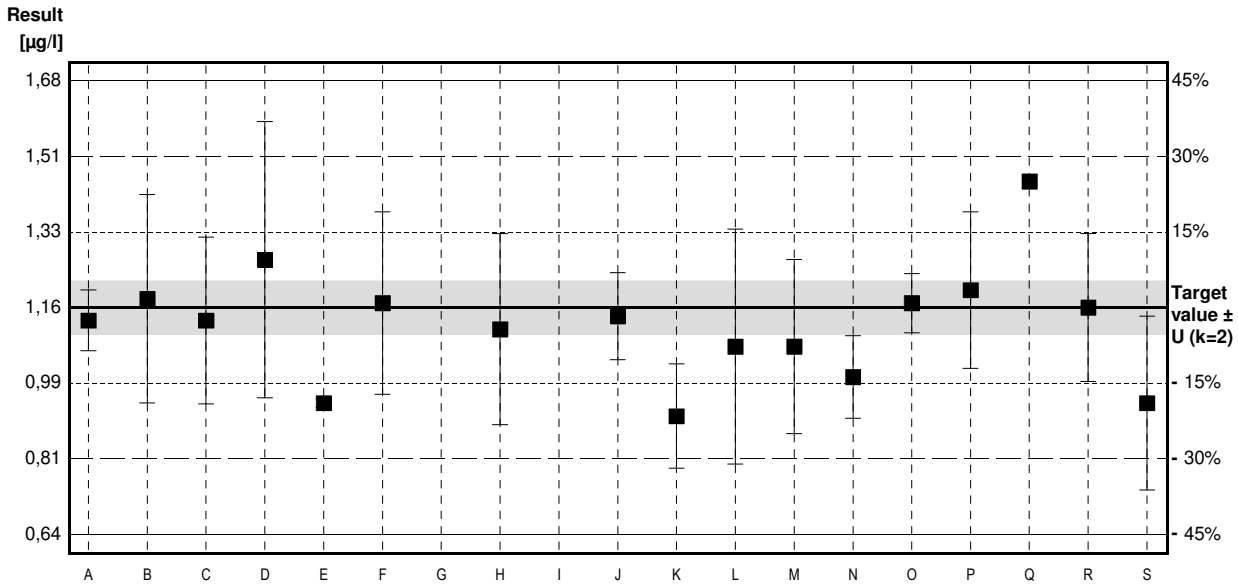


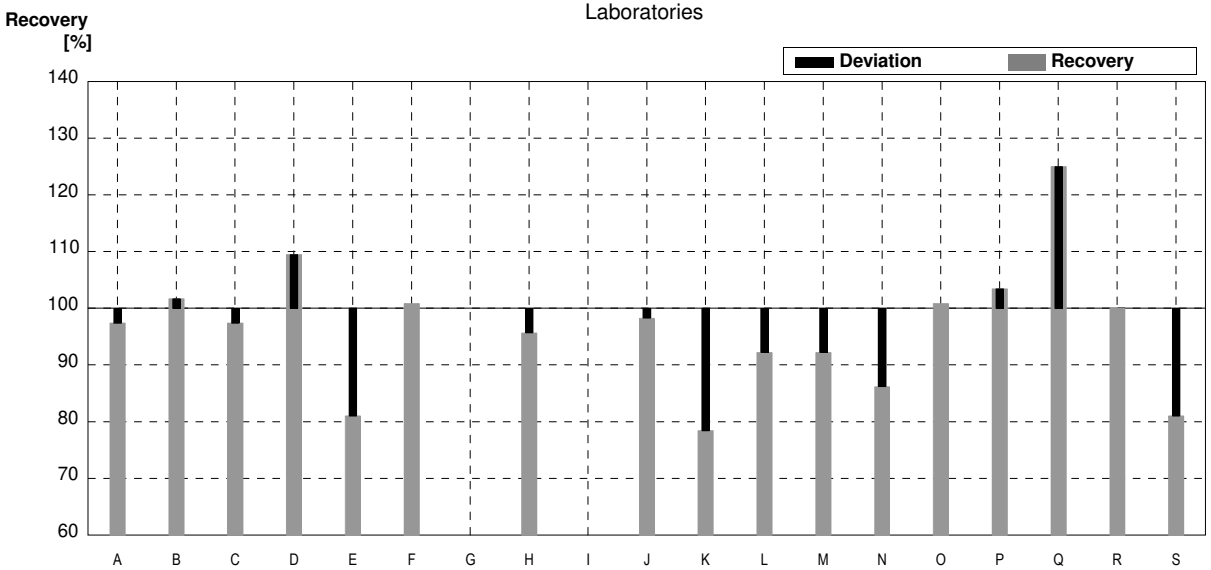
	All results	Outliers excl.	Unit
Mean ± CI(99%)	1,21 ± 0,10	1,21 ± 0,10	µg/l
Recov. ± CI(99%)	95,9 ± 7,7	95,9 ± 7,7	%
SD between labs	0,13	0,13	µg/l
RSD between labs	10,8	10,8	%
n for calculation	16	16	

Sample C68A
Parameter Bromodichloromethane

Target value	± U (k=2)	1,16 µg/l	±	0,06 µg/l
IFA result	± U (k=2)	1,16 µg/l	±	0,13 µg/l
Stability test	± U (k=2)	1,17 µg/l	±	0,13 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	1,13	0,07	µg/l	97%	-0,22
B	1,18	0,24	µg/l	102%	0,14
C	1,13	0,192	µg/l	97%	-0,22
D	1,270	0,318	µg/l	109%	0,79
E	0,94	0,01	µg/l	81%	-1,58
F	1,17	0,21	µg/l	101%	0,07
G			µg/l		
H	1,11	0,22	µg/l	96%	-0,36
I			µg/l		
J	1,14	0,10	µg/l	98%	-0,14
K	0,91	0,12	µg/l	78%	-1,80
L	1,07	0,27	µg/l	92%	-0,65
M	1,07	0,2	µg/l	92%	-0,65
N	1,00	0,0947	µg/l	86%	-1,15
O	1,17	0,068	µg/l	101%	0,07
P	1,20	0,18	µg/l	103%	0,29
Q	1,45 *		µg/l	125%	2,08
R	1,16	0,17	µg/l	100%	0,00
S	0,94	0,2	µg/l	81%	-1,58



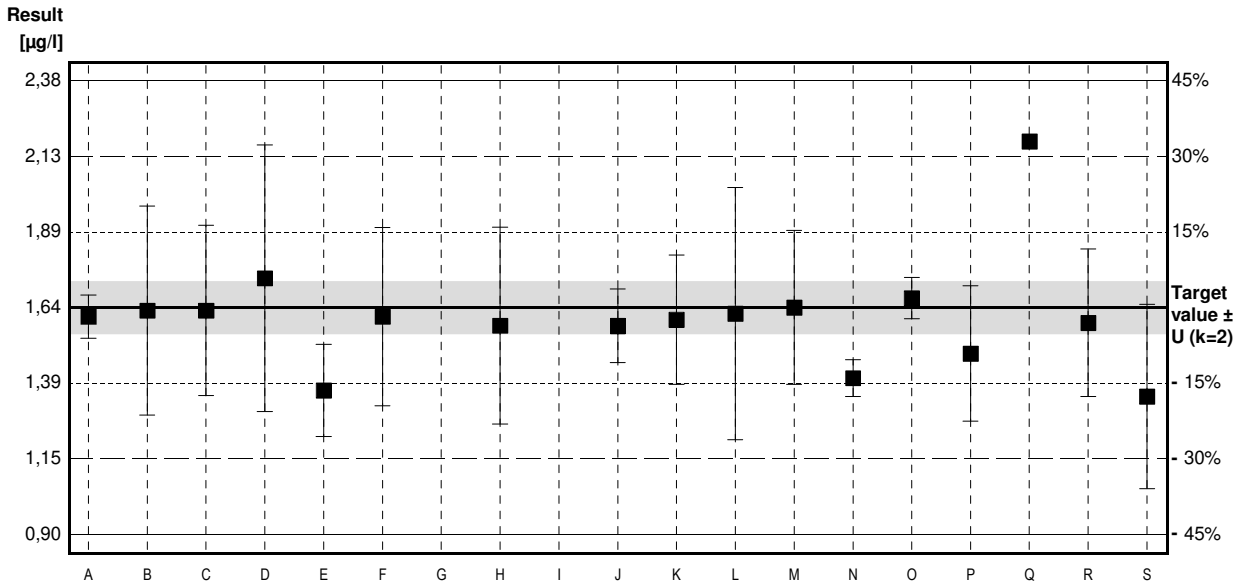


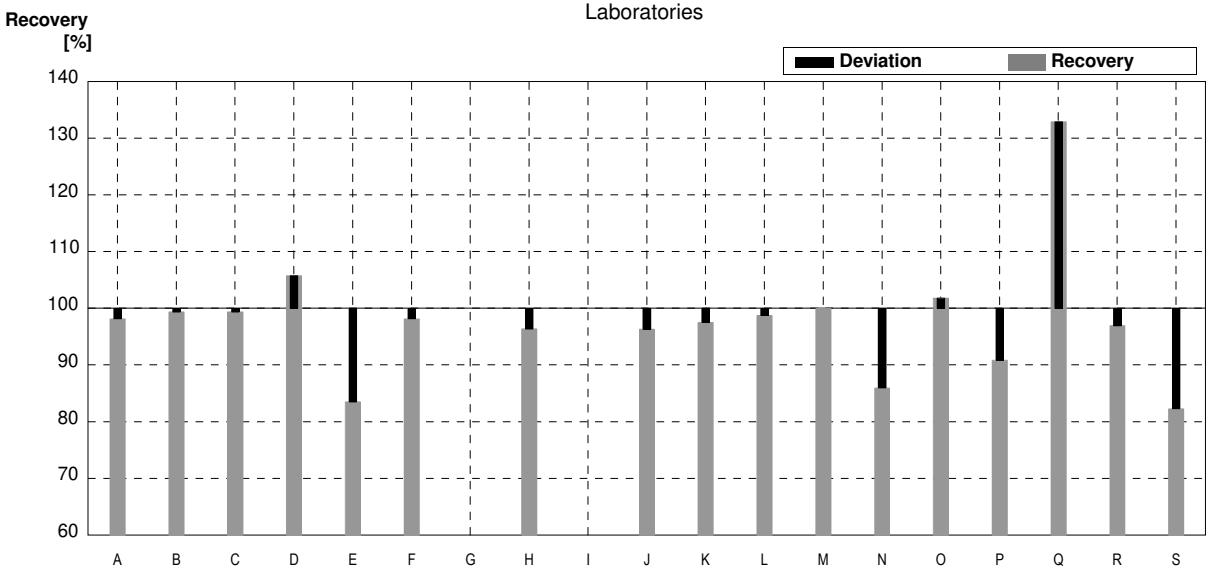
	All results	Outliers excl.	Unit
Mean ± CI(99%)	1,12 ± 0,09	1,10 ± 0,08	µg/l
Recov. ± CI(99%)	96,6 ± 8,0	94,8 ± 6,6	%
SD between labs	0,13	0,10	µg/l
RSD between labs	11,7	9,4	%
n for calculation	17	16	

Sample C68B
Parameter Bromodichloromethane

Target value	± U (k=2)	1,64 µg/l	±	0,09 µg/l
IFA result	± U (k=2)	1,66 µg/l	±	0,18 µg/l
Stability test	± U (k=2)	1,68 µg/l	±	0,19 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	1,61	0,07	µg/l	98%	-0,15
B	1,63	0,34	µg/l	99%	-0,05
C	1,63	0,277	µg/l	99%	-0,05
D	1,735	0,434	µg/l	106%	0,48
E	1,37 *	0,15	µg/l	84%	-1,37
F	1,61	0,29	µg/l	98%	-0,15
G			µg/l		
H	1,581	0,32	µg/l	96%	-0,30
I			µg/l		
J	1,58	0,12	µg/l	96%	-0,30
K	1,60	0,21	µg/l	98%	-0,20
L	1,62	0,41	µg/l	99%	-0,10
M	1,64	0,25	µg/l	100%	0,00
N	1,41 *	0,06	µg/l	86%	-1,17
O	1,67	0,067	µg/l	102%	0,15
P	1,49	0,22	µg/l	91%	-0,76
Q	2,18 *		µg/l	133%	2,74
R	1,59	0,24	µg/l	97%	-0,25
S	1,35 *	0,3	µg/l	82%	-1,47



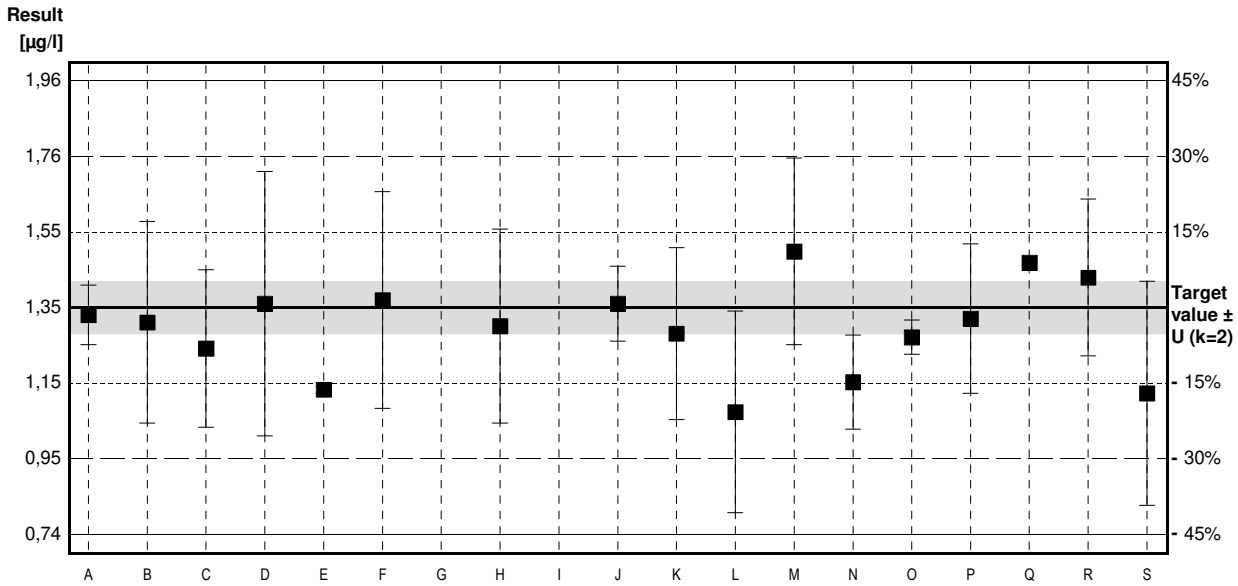


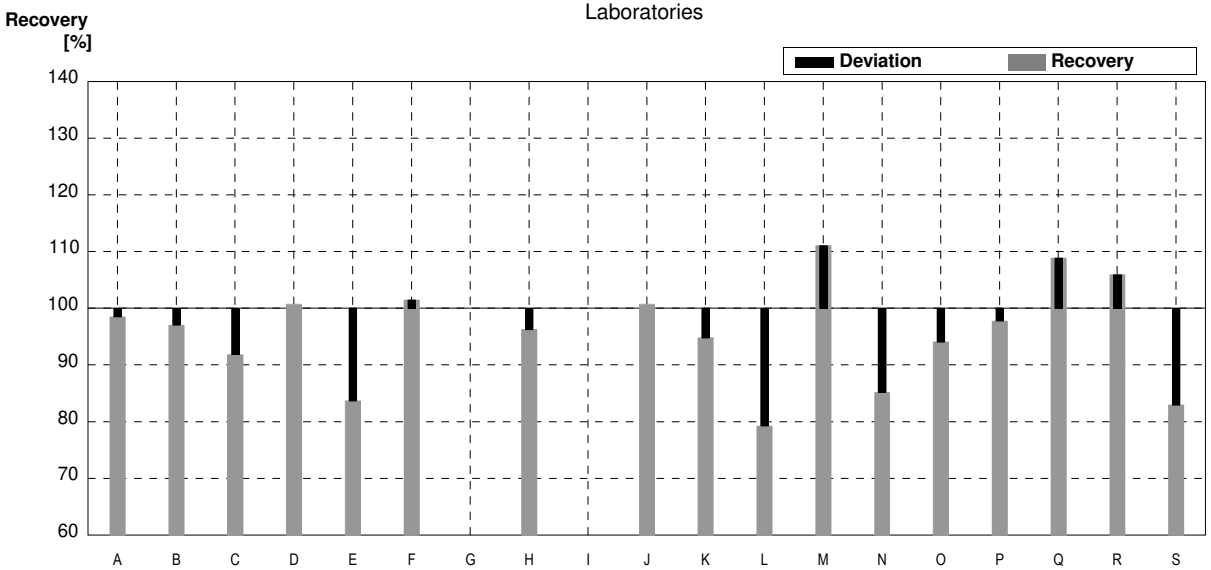
	All results	Outliers excl.	Unit
Mean ± CI(99%)	1,61 ± 0,13	1,61 ± 0,05	µg/l
Recov. ± CI(99%)	97,9 ± 7,8	98,4 ± 2,9	%
SD between labs	0,18	0,06	µg/l
RSD between labs	11,3	3,5	%
n for calculation	17	13	

Sample C68A
Parameter Dibromochloromethane

Target value	± U (k=2)	1,35 µg/l	±	0,07 µg/l
IFA result	± U (k=2)	1,34 µg/l	±	0,13 µg/l
Stability test	± U (k=2)	1,37 µg/l	±	0,14 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	1,33	0,08	µg/l	99%	-0,12
B	1,31	0,27	µg/l	97%	-0,25
C	1,24	0,211	µg/l	92%	-0,68
D	1,360	0,354	µg/l	101%	0,06
E	1,13	0,01	µg/l	84%	-1,36
F	1,37	0,29	µg/l	101%	0,12
G			µg/l		
H	1,30	0,26	µg/l	96%	-0,31
I			µg/l		
J	1,36	0,10	µg/l	101%	0,06
K	1,28	0,23	µg/l	95%	-0,43
L	1,07	0,27	µg/l	79%	-1,73
M	1,50	0,25	µg/l	111%	0,93
N	1,15	0,1263	µg/l	85%	-1,23
O	1,27	0,046	µg/l	94%	-0,49
P	1,32	0,20	µg/l	98%	-0,19
Q	1,47		µg/l	109%	0,74
R	1,43	0,21	µg/l	106%	0,49
S	1,12	0,3	µg/l	83%	-1,42



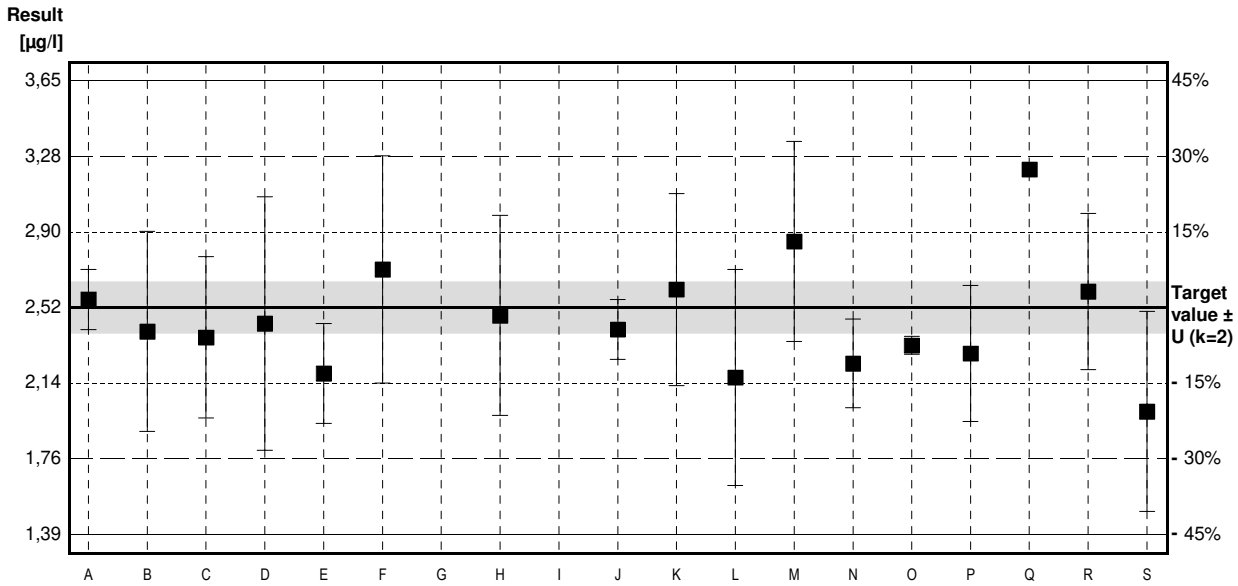


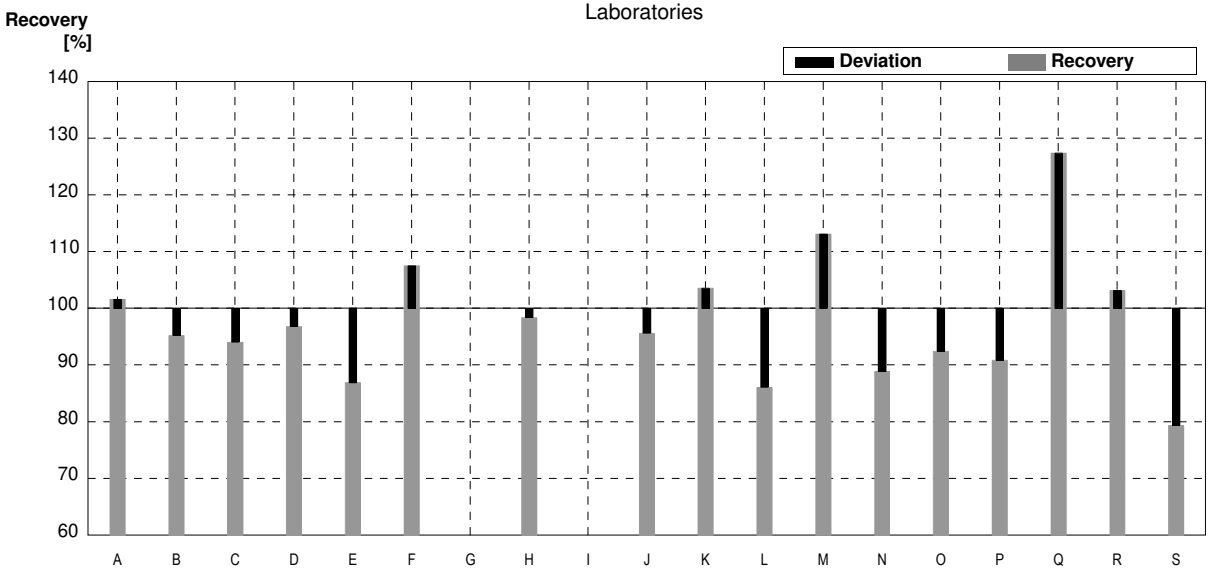
	All results	Outliers excl.	Unit
Mean ± CI(99%)	1,29 ± 0,09	1,29 ± 0,09	µg/l
Recov. ± CI(99%)	95,9 ± 6,4	95,9 ± 6,4	%
SD between labs	0,12	0,12	µg/l
RSD between labs	9,5	9,5	%
n for calculation	17	17	

Sample C68B
Parameter Dibromochloromethane

Target value	± U (k=2)	2,52 µg/l	±	0,13 µg/l
IFA result	± U (k=2)	2,52 µg/l	±	0,25 µg/l
Stability test	± U (k=2)	2,55 µg/l	±	0,26 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A	2,56	0,15	µg/l	102%	0,13
B	2,40	0,50	µg/l	95%	-0,40
C	2,37	0,403	µg/l	94%	-0,50
D	2,440	0,634	µg/l	97%	-0,26
E	2,19	0,25	µg/l	87%	-1,09
F	2,71	0,568	µg/l	108%	0,63
G			µg/l		
H	2,48	0,50	µg/l	98%	-0,13
I			µg/l		
J	2,41	0,15	µg/l	96%	-0,36
K	2,61	0,48	µg/l	104%	0,30
L	2,17	0,54	µg/l	86%	-1,16
M	2,85	0,5	µg/l	113%	1,09
N	2,24	0,221	µg/l	89%	-0,93
O	2,33	0,045	µg/l	92%	-0,63
P	2,29	0,34	µg/l	91%	-0,76
Q	3,21		µg/l	127%	2,28
R	2,60	0,39	µg/l	103%	0,26
S	2,00	0,5	µg/l	79%	-1,72



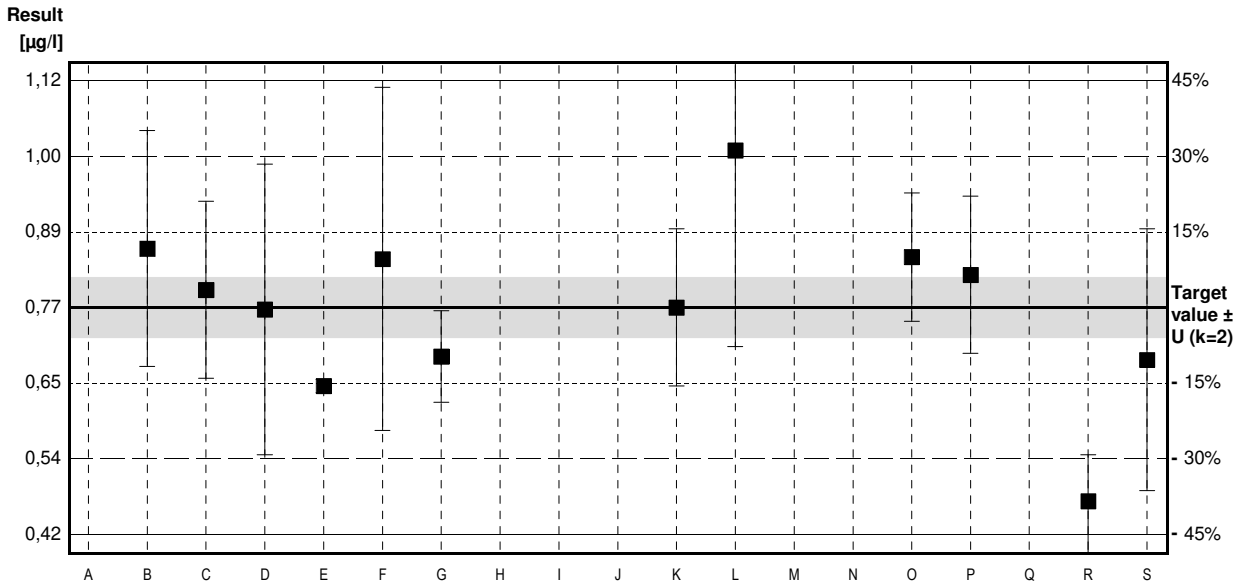


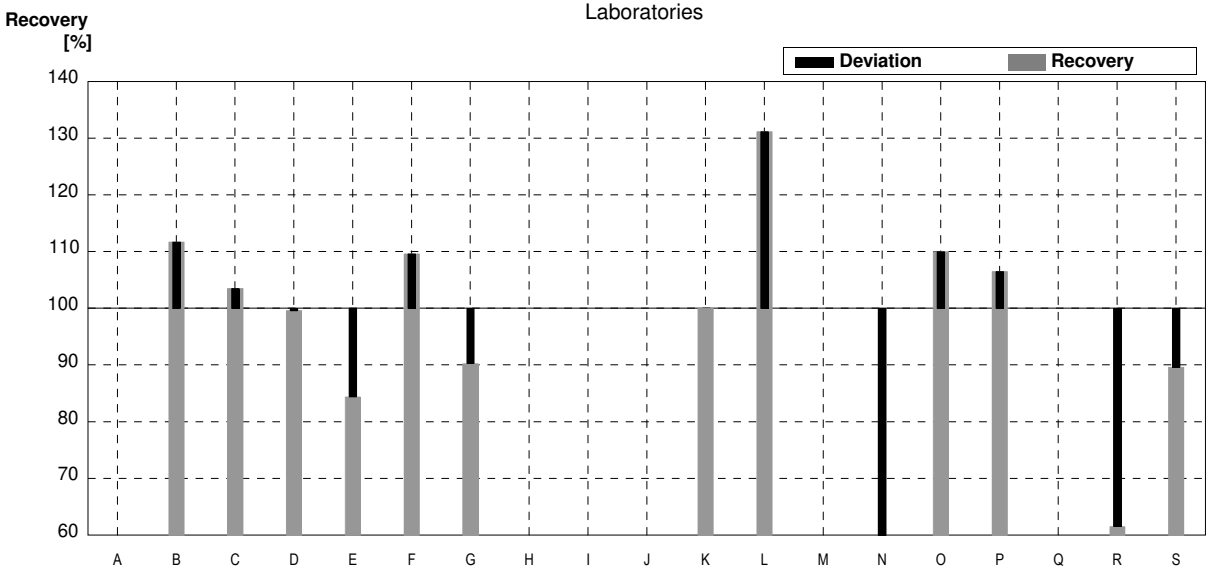
	All results	Outliers excl.	Unit
Mean ± CI(99%)	2,46 ± 0,20	2,46 ± 0,20	µg/l
Recov. ± CI(99%)	97,7 ± 8,0	97,7 ± 8,0	%
SD between labs	0,29	0,29	µg/l
RSD between labs	11,6	11,6	%
n for calculation	17	17	

Sample C68A
Parameter Dichloromethane

Target value	± U (k=2)	0,77 µg/l	±	0,05 µg/l
IFA result	± U (k=2)	0,76 µg/l	±	0,08 µg/l
Stability test	± U (k=2)	0,78 µg/l	±	0,08 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A			µg/l		
B	0,86	0,18	µg/l	112%	
C	0,797	0,135	µg/l	104%	
D	0,767	0,222	µg/l	100%	
E	0,65	0,01	µg/l	84%	
F	0,844	0,262	µg/l	110%	
G	0,695	0,070	µg/l	90%	
H	<bg		µg/l		
I			µg/l		
J	n,a.		µg/l		
K	0,77	0,12	µg/l	100%	
L	1,01	0,30	µg/l	131%	
M			µg/l		
N	0,390 *	0,0631	µg/l	51%	
O	0,847	0,098	µg/l	110%	
P	0,82	0,12	µg/l	106%	
Q			µg/l		
R	0,474	0,071	µg/l	62%	
S	0,69	0,2	µg/l	90%	



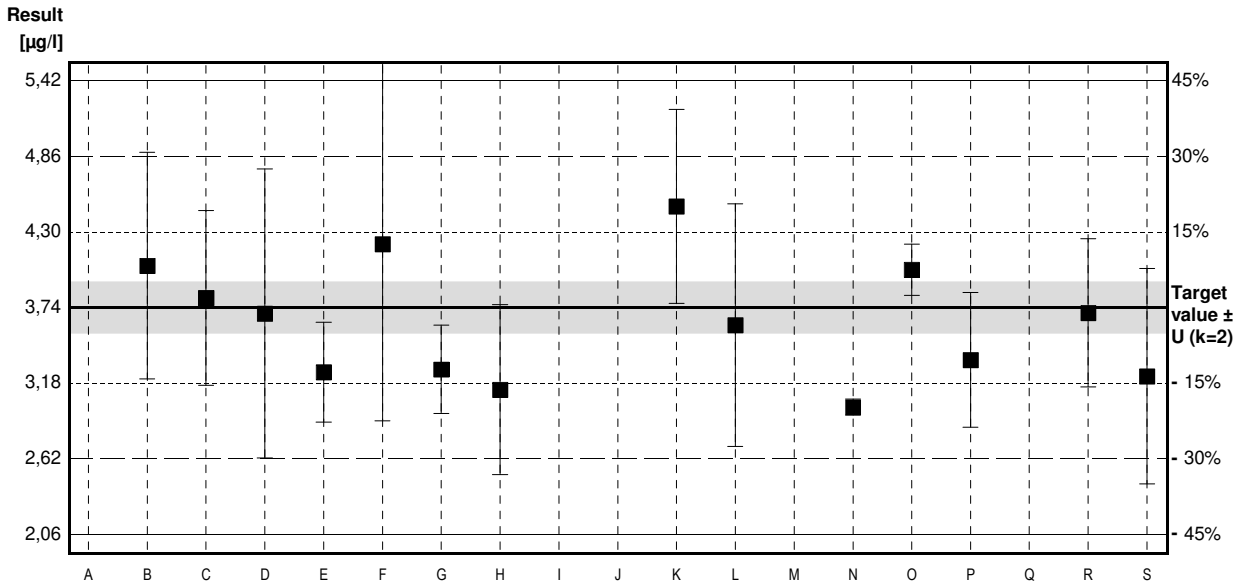


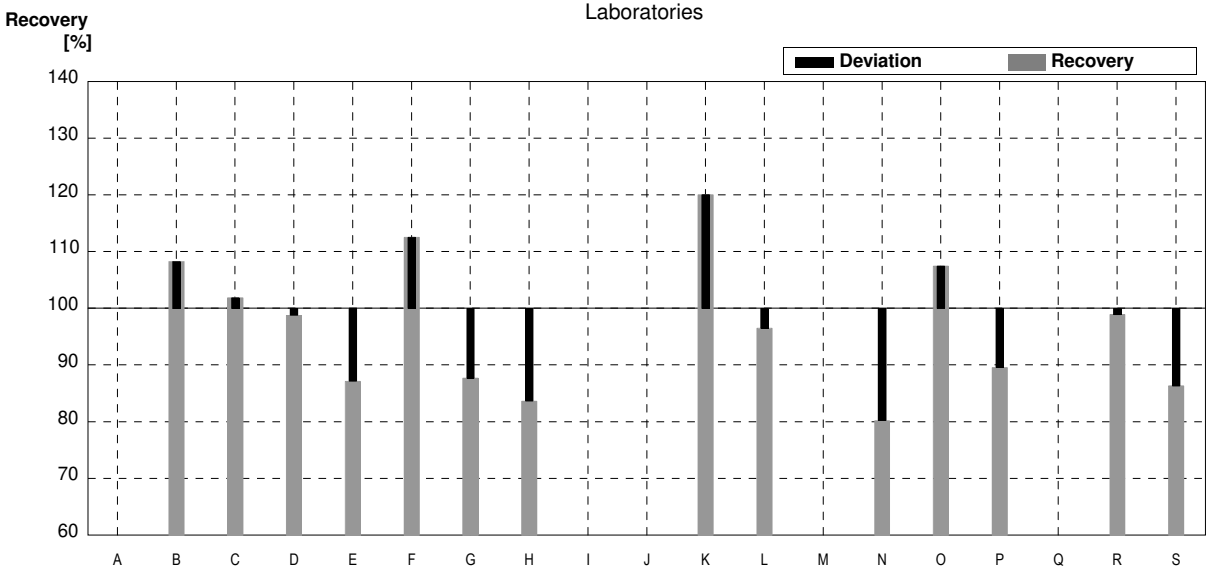
	All results	Outliers excl.	Unit
Mean ± CI(99%)	0,74 ± 0,14	0,77 ± 0,12	µg/l
Recov. ± CI(99%)	96,0 ± 18,1	99,8 ± 15,5	%
SD between labs	0,17	0,13	µg/l
RSD between labs	22,3	17,3	%
n for calculation	13	12	

Sample C68B
Parameter Dichloromethane

Target value	± U (k=2)	3,74 µg/l	±	0,19 µg/l
IFA result	± U (k=2)	3,77 µg/l	±	0,38 µg/l
Stability test	± U (k=2)	3,81 µg/l	±	0,38 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A			µg/l		
B	4,05	0,84	µg/l	108%	0,59
C	3,81	0,648	µg/l	102%	0,13
D	3,695	1,072	µg/l	99%	-0,09
E	3,26	0,37	µg/l	87%	-0,92
F	4,21	1,31	µg/l	113%	0,90
G	3,28	0,328	µg/l	88%	-0,88
H	3,129	0,63	µg/l	84%	-1,17
I			µg/l		
J	n,a.		µg/l		
K	4,49	0,72	µg/l	120%	1,43
L	3,61	0,90	µg/l	97%	-0,25
M			µg/l		
N	3,00	0,06	µg/l	80%	-1,41
O	4,02	0,190	µg/l	107%	0,53
P	3,35	0,50	µg/l	90%	-0,74
Q			µg/l		
R	3,70	0,55	µg/l	99%	-0,08
S	3,23	0,8	µg/l	86%	-0,97



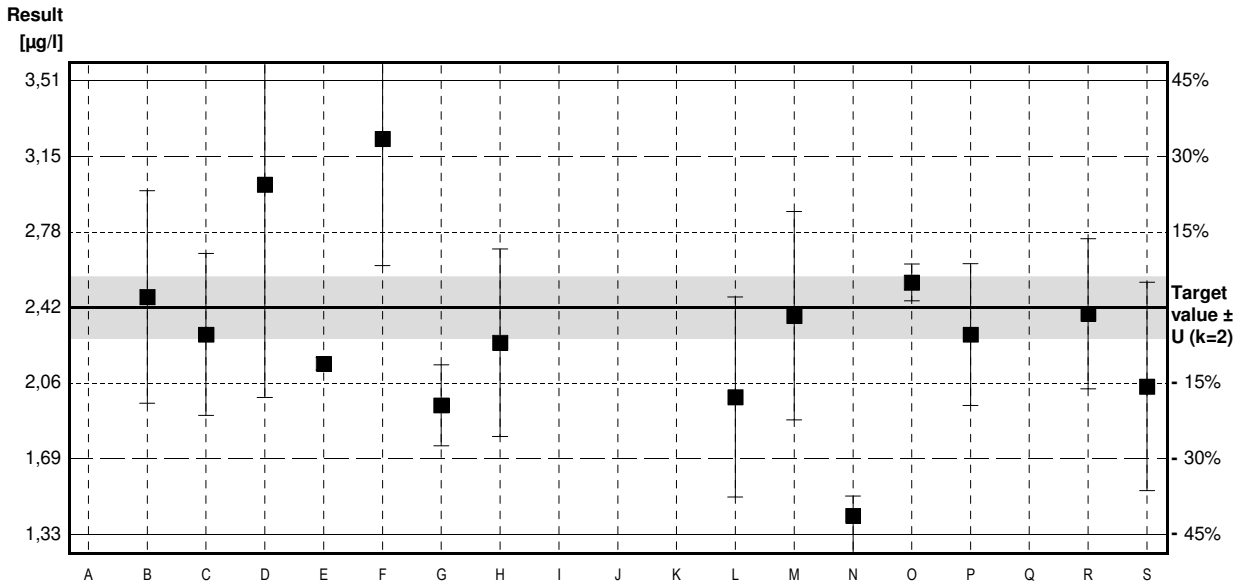


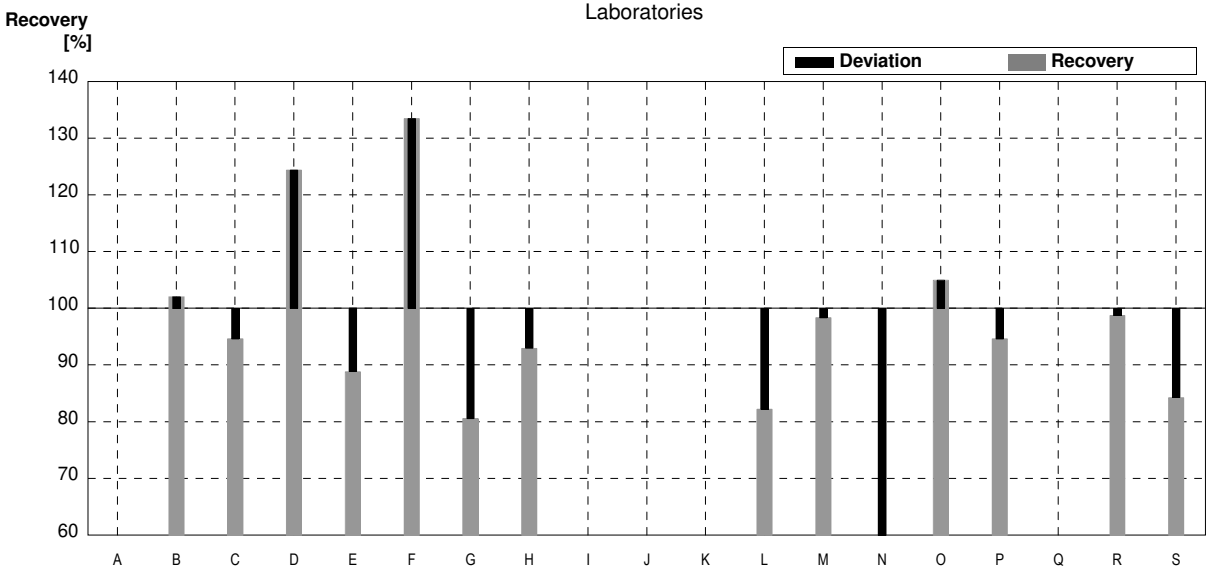
	All results	Outliers excl.	Unit
Mean ± CI(99%)	3,63 ± 0,36	3,63 ± 0,36	µg/l
Recov. ± CI(99%)	97,1 ± 9,6	97,1 ± 9,6	%
SD between labs	0,45	0,45	µg/l
RSD between labs	12,3	12,3	%
n for calculation	14	14	

Sample C68A
Parameter 1,2-Dichloroethane

Target value ± U (k=2)	2,42 µg/l	±	0,15 µg/l
IFA result ± U (k=2)	2,39 µg/l	±	0,24 µg/l
Stability test ± U (k=2)	2,44 µg/l	±	0,24 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A			µg/l		
B	2,47	0,51	µg/l	102%	0,16
C	2,29	0,389	µg/l	95%	-0,41
D	3,010	1,023	µg/l	124%	1,88
E	2,15	0,03	µg/l	89%	-0,86
F	3,23	0,61	µg/l	133%	2,57
G	1,95	0,195	µg/l	81%	-1,49
H	2,25	0,45	µg/l	93%	-0,54
I			µg/l		
J	n,a		µg/l		
K			µg/l		
L	1,99	0,48	µg/l	82%	-1,37
M	2,38	0,5	µg/l	98%	-0,13
N	1,42	0,0947	µg/l	59%	-3,18
O	2,54	0,089	µg/l	105%	0,38
P	2,29	0,34	µg/l	95%	-0,41
Q			µg/l		
R	2,39	0,36	µg/l	99%	-0,10
S	2,04	0,5	µg/l	84%	-1,21



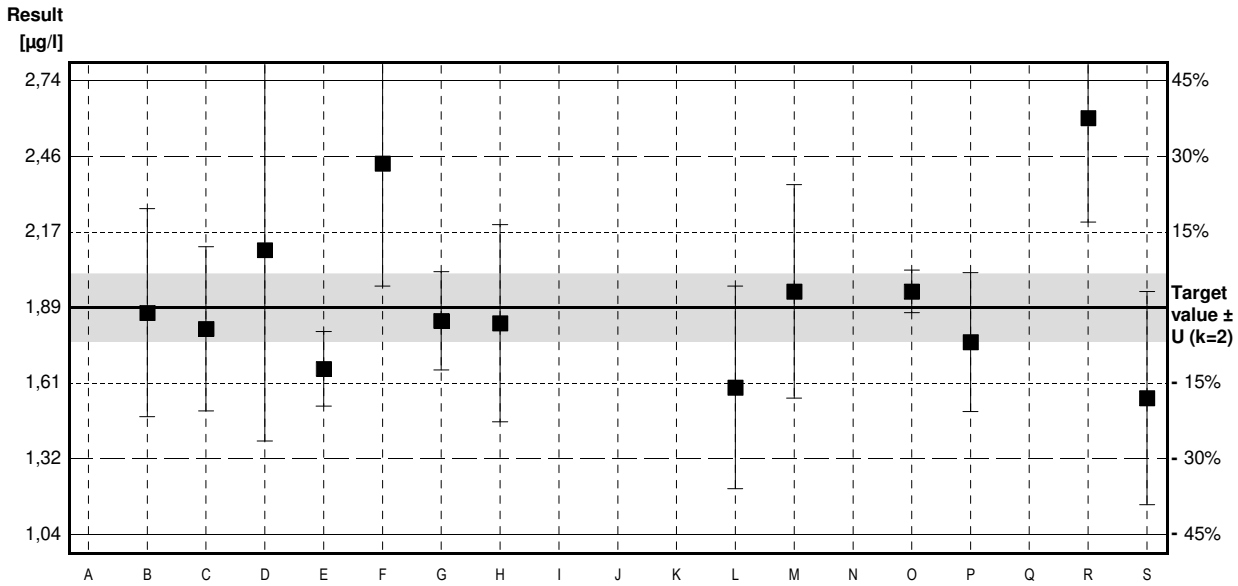


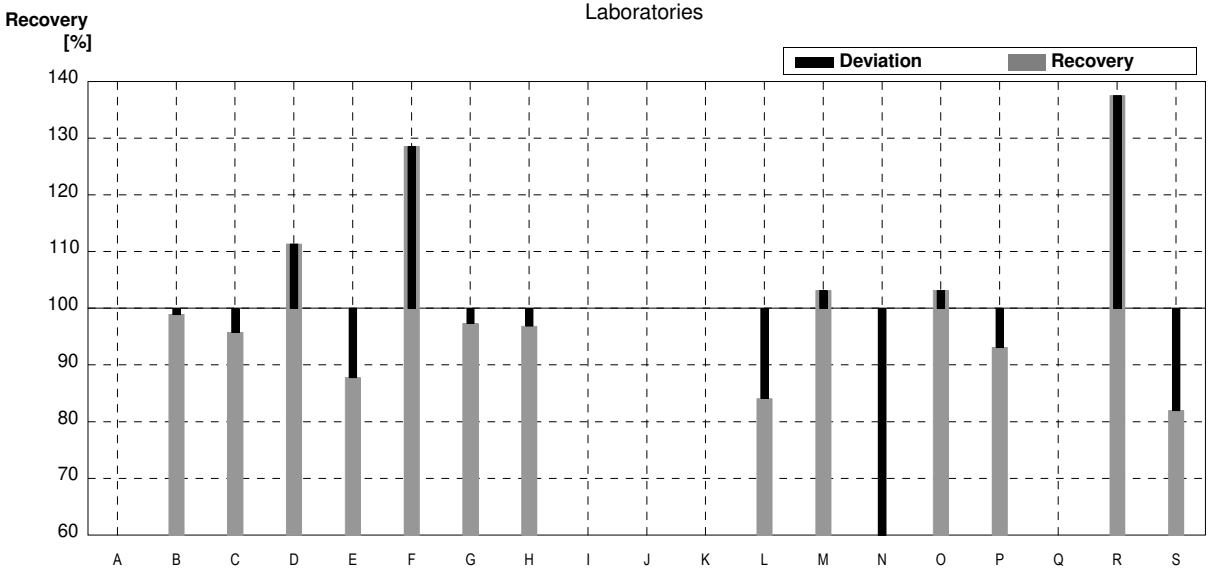
	All results	Outliers excl.	Unit
Mean ± CI(99%)	2,31 ± 0,36	2,31 ± 0,36	µg/l
Recov. ± CI(99%)	95,6 ± 14,7	95,6 ± 14,7	%
SD between labs	0,44	0,44	µg/l
RSD between labs	19,1	19,1	%
n for calculation	14	14	

Sample C68B
Parameter 1,2-Dichloroethane

Target value ± U (k=2)	1,89 µg/l	±	0,13 µg/l
IFA result ± U (k=2)	1,88 µg/l	±	0,19 µg/l
Stability test ± U (k=2)	1,91 µg/l	±	0,19 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A			µg/l		
B	1,87	0,39	µg/l	99%	-0,08
C	1,81	0,308	µg/l	96%	-0,33
D	2,105	0,716	µg/l	111%	0,88
E	1,66	0,14	µg/l	88%	-0,94
F	2,43	0,46	µg/l	129%	2,20
G	1,84	0,184	µg/l	97%	-0,20
H	1,831	0,37	µg/l	97%	-0,24
I			µg/l		
J	n,a.		µg/l		
K			µg/l		
L	1,59	0,38	µg/l	84%	-1,22
M	1,95	0,4	µg/l	103%	0,24
N	1,00 *	0,158	µg/l	53%	-3,62
O	1,95	0,080	µg/l	103%	0,24
P	1,76	0,26	µg/l	93%	-0,53
Q			µg/l		
R	2,60 *	0,39	µg/l	138%	2,89
S	1,55	0,4	µg/l	82%	-1,38





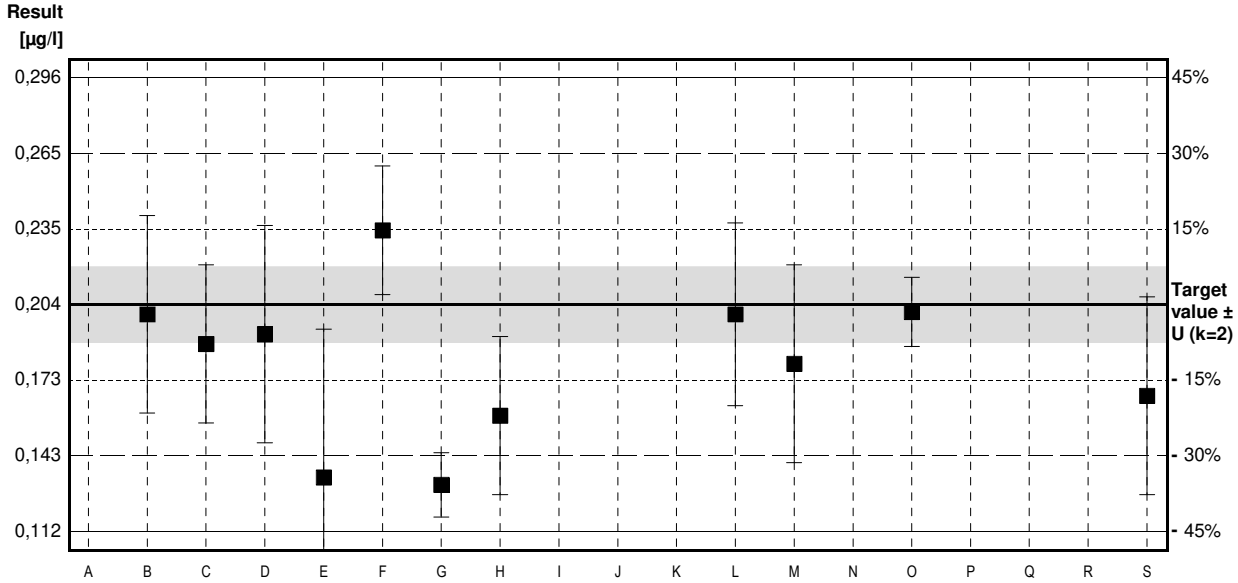
	All results	Outliers excl.	Unit
Mean ± CI(99%)	1,85 ± 0,31	1,86 ± 0,21	µg/l
Recov. ± CI(99%)	98,1 ± 16,3	98,5 ± 11,3	%
SD between labs	0,38	0,24	µg/l
RSD between labs	20,7	12,8	%
n for calculation	14	12	

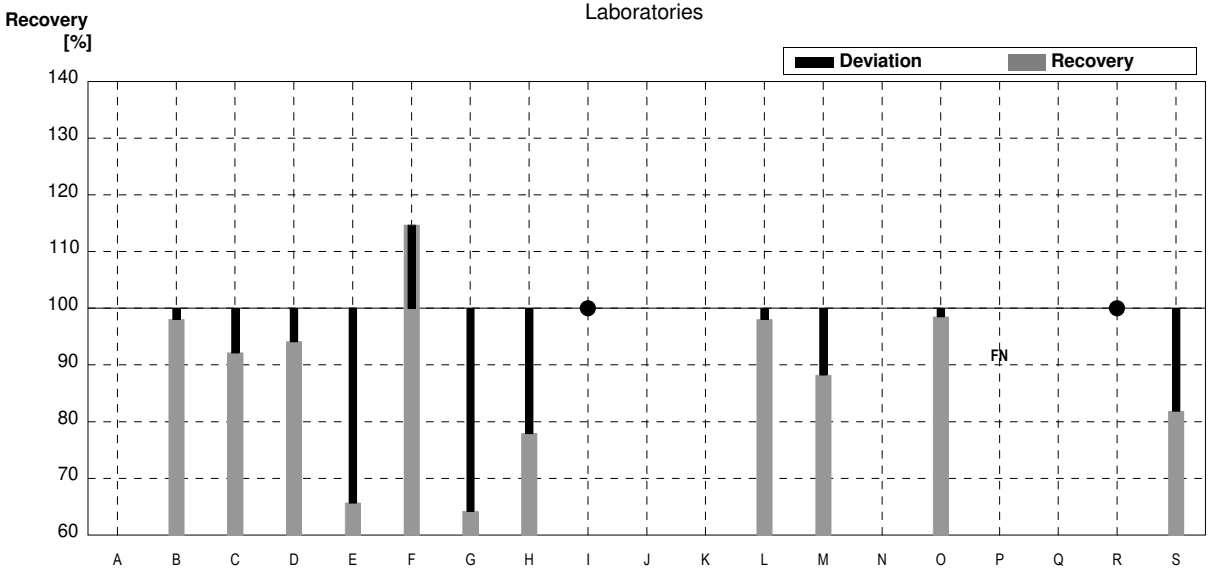
Sample C68A

Parameter cis-1,2-Dichloroethene

Target value	± U (k=2)	0,204 µg/l	±	0,015 µg/l
IFA result	± U (k=2)	0,209 µg/l	±	0,021 µg/l
Stability test	± U (k=2)	0,211 µg/l	±	0,021 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A			µg/l		
B	0,200	0,04	µg/l	98%	-0,14
C	0,188	0,032	µg/l	92%	-0,56
D	0,192	0,044	µg/l	94%	-0,42
E	0,134	0,06	µg/l	66%	-2,45
F	0,234	0,026	µg/l	115%	1,05
G	0,131	0,013	µg/l	64%	-2,56
H	0,159	0,032	µg/l	78%	-1,58
I	<0,50		µg/l	•	
J	n,a.		µg/l		
K			µg/l		
L	0,200	0,037	µg/l	98%	-0,14
M	0,180	0,04	µg/l	88%	-0,84
N			µg/l		
O	0,201	0,014	µg/l	99%	-0,11
P	<0,13		µg/l	FN	
Q			µg/l		
R	<0,5		µg/l	•	
S	0,167	0,04	µg/l	82%	-1,30





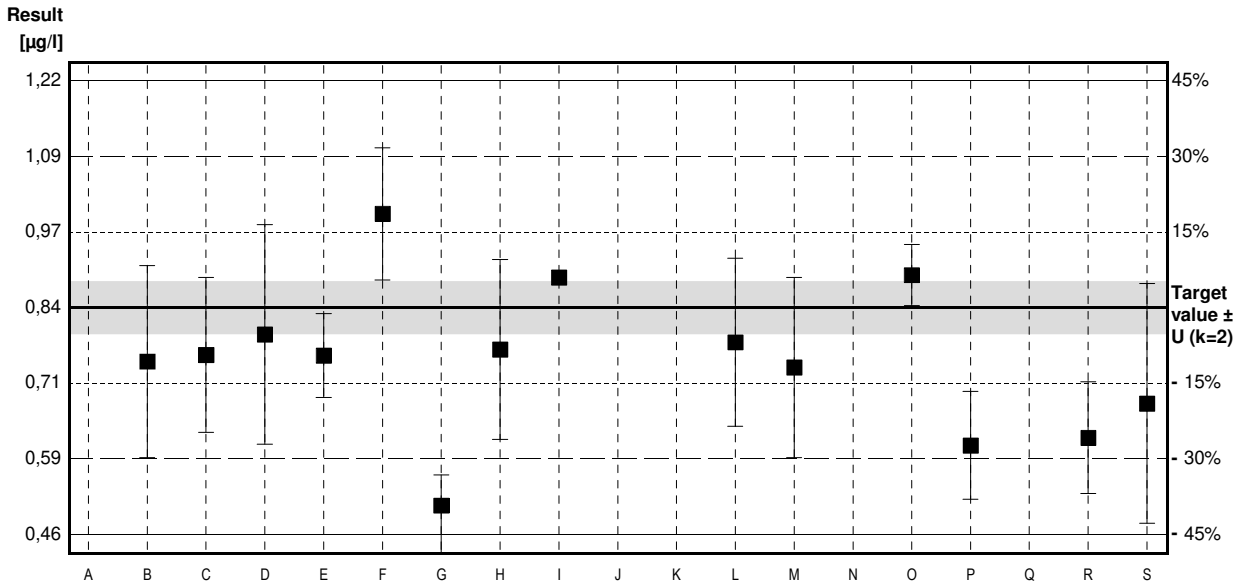
	All results	Outliers excl.	Unit
Mean ± CI(99%)	0,181 ± 0,029	0,181 ± 0,029	µg/l
Recov. ± CI(99%)	88,5 ± 14,4	88,5 ± 14,4	%
SD between labs	0,031	0,031	µg/l
RSD between labs	17,1	17,1	%
n for calculation	11	11	

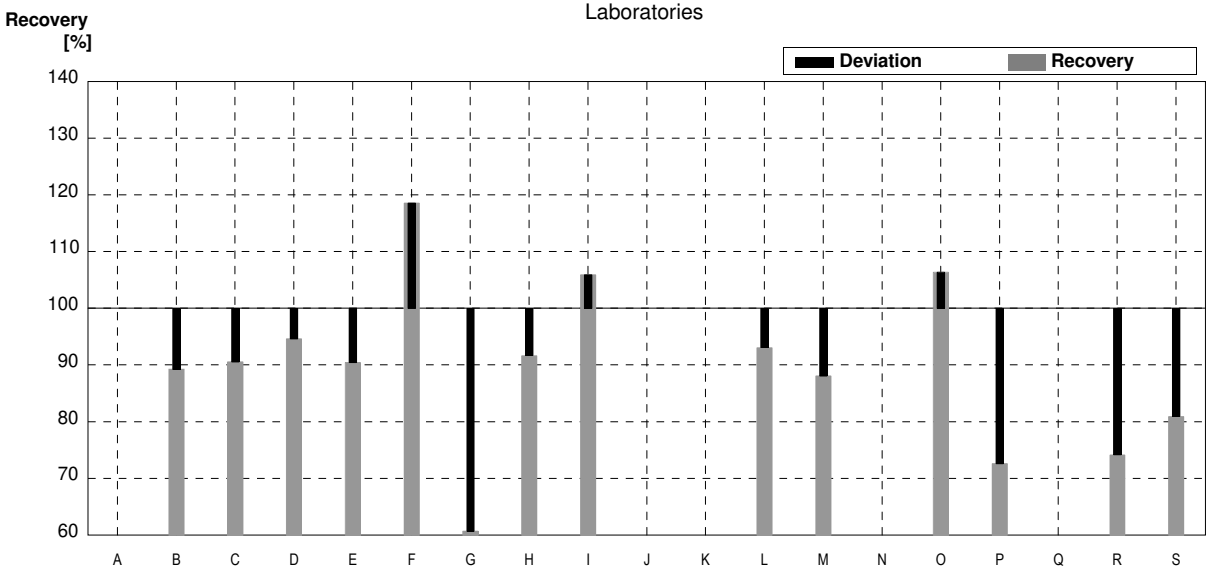
Sample C68B

Parameter cis-1,2-Dichloroethene

Target value	± U (k=2)	0,84 µg/l	±	0,04 µg/l
IFA result	± U (k=2)	0,85 µg/l	±	0,09 µg/l
Stability test	± U (k=2)	0,86 µg/l	±	0,09 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A			µg/l		
B	0,75	0,16	µg/l	89%	-0,77
C	0,761	0,129	µg/l	91%	-0,67
D	0,795	0,183	µg/l	95%	-0,38
E	0,76	0,07	µg/l	90%	-0,68
F	0,996	0,110	µg/l	119%	1,33
G	0,51	0,051	µg/l	61%	-2,81
H	0,77	0,15	µg/l	92%	-0,60
I	0,89		µg/l	106%	0,43
J	n,a.		µg/l		
K			µg/l		
L	0,782	0,14	µg/l	93%	-0,49
M	0,740	0,15	µg/l	88%	-0,85
N			µg/l		
O	0,894	0,051	µg/l	106%	0,46
P	0,61	0,09	µg/l	73%	-1,96
Q			µg/l		
R	0,623	0,093	µg/l	74%	-1,85
S	0,68	0,2	µg/l	81%	-1,36



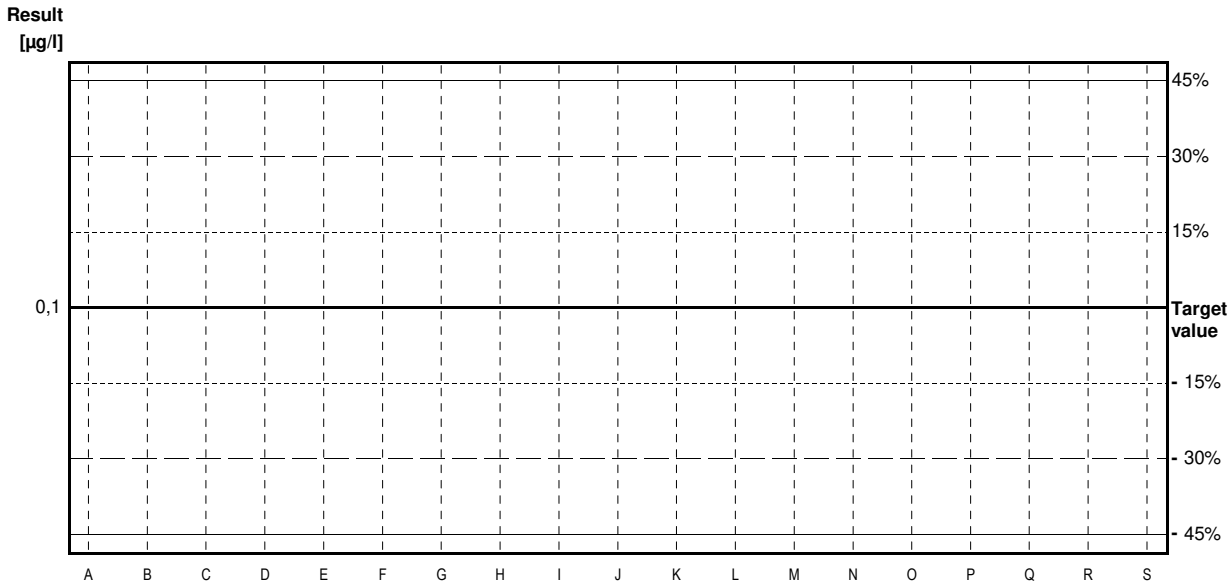


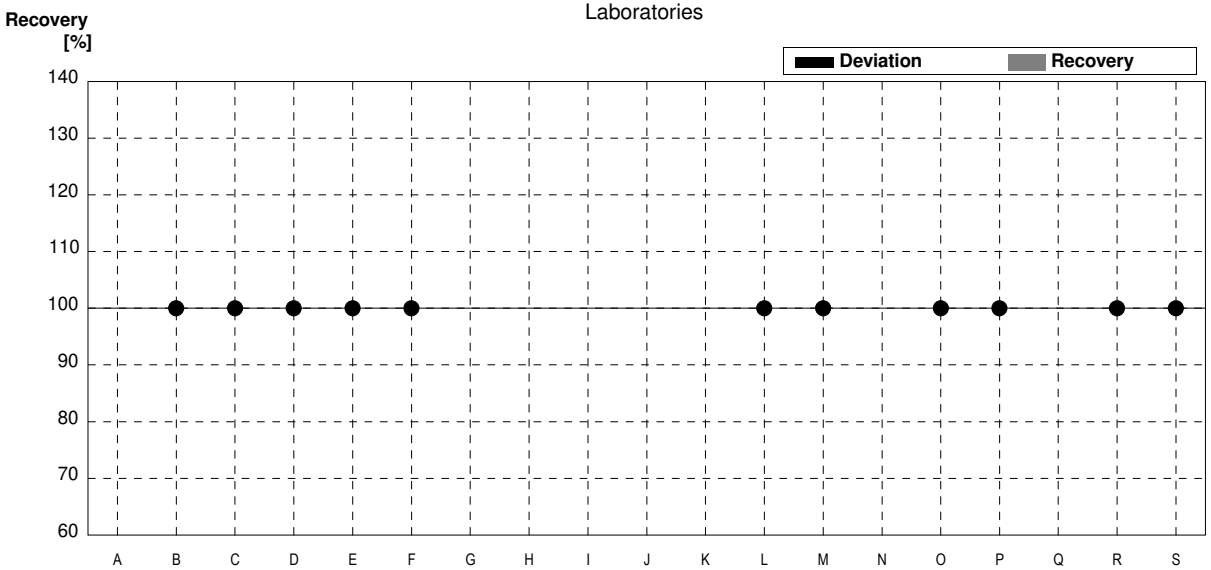
	All results	Outliers excl.	Unit
Mean ± CI(99%)	0,75 ± 0,10	0,75 ± 0,10	µg/l
Recov. ± CI(99%)	89,8 ± 12,0	89,8 ± 12,0	%
SD between labs	0,12	0,12	µg/l
RSD between labs	16,5	16,5	%
n for calculation	14	14	

Sample C68A
Parameter trans-1,2-Dichloroethene

Target value	<0,1	µg/l
IFA result	<0,1	µg/l
Stability test	<0,1	µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A			µg/l		
B	<0,1		µg/l	•	
C	<0,10		µg/l	•	
D	<0,08	0,021	µg/l	•	
E	<0,50		µg/l	•	
F	<0,10		µg/l	•	
G			µg/l		
H	<bg		µg/l		
I			µg/l		
J	n,a.		µg/l		
K			µg/l		
L	<0,10		µg/l	•	
M	<0,10		µg/l	•	
N			µg/l		
O	<0,050		µg/l	•	
P	<0,02		µg/l	•	
Q			µg/l		
R	<0,5		µg/l	•	
S	<0,05	0,01	µg/l	•	



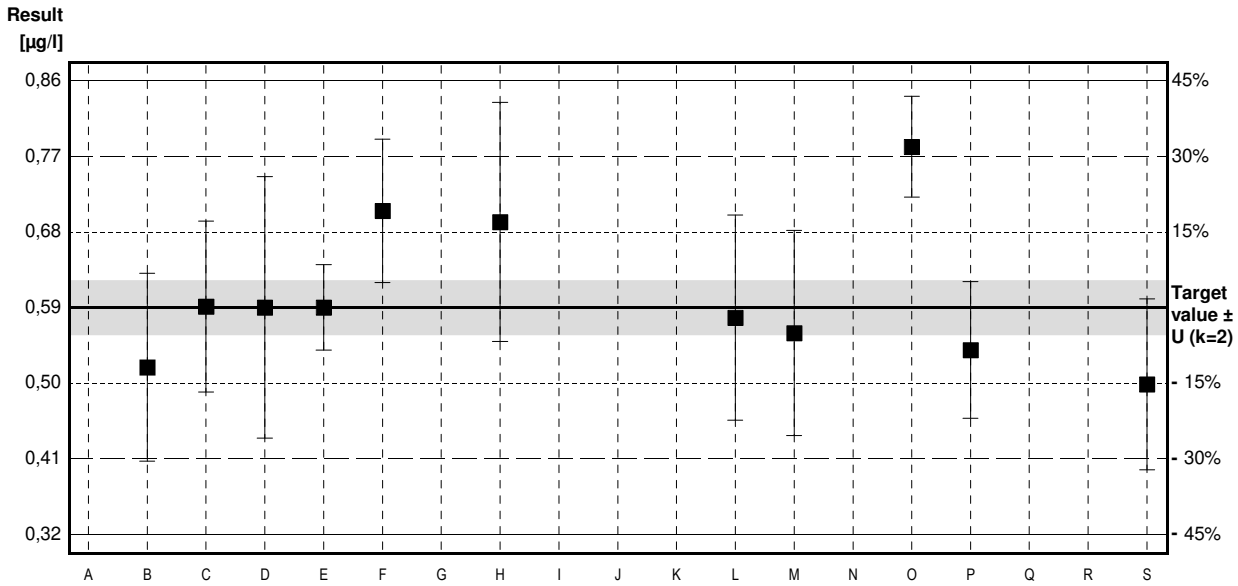


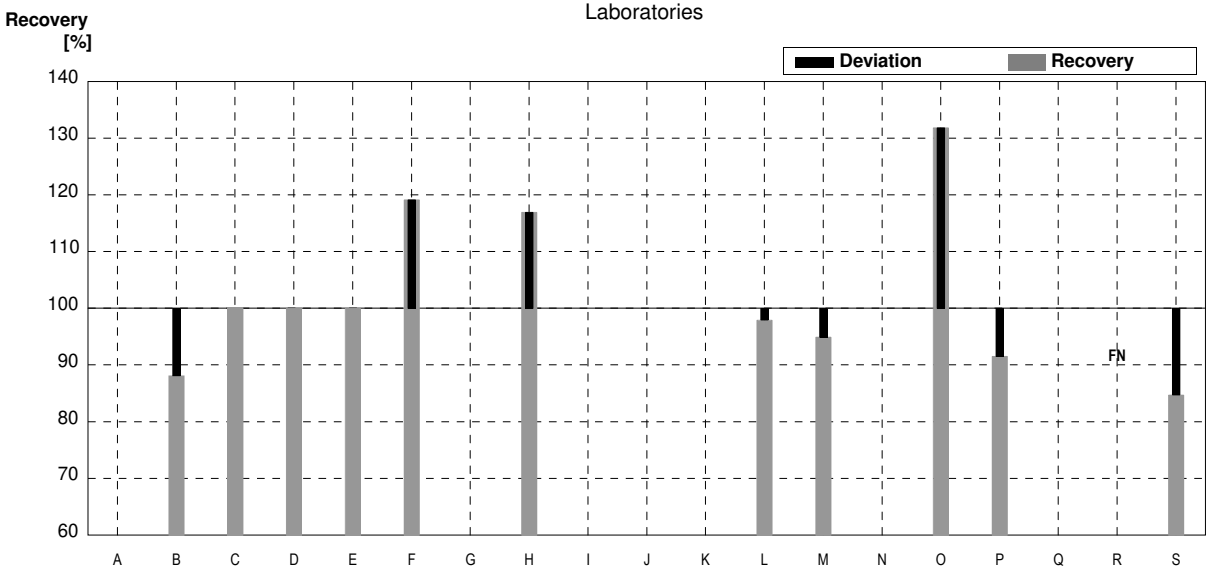
	All results	Outliers excl.	Unit
Mean ± CI(99%) Recov. ± CI(99%)			µg/l %
SD between labs RSD between labs			µg/l %
n for calculation			

Sample C68B
Parameter trans-1,2-Dichloroethene

Target value	± U (k=2)	0,59 µg/l	±	0,03 µg/l
IFA result	± U (k=2)	0,59 µg/l	±	0,06 µg/l
Stability test	± U (k=2)	0,61 µg/l	±	0,06 µg/l

Lab Code	Result	±	Unit	Recovery	z-Score
A			µg/l		
B	0,52	0,11	µg/l	88%	-0,79
C	0,591	0,100	µg/l	100%	0,01
D	0,590	0,153	µg/l	100%	0,00
E	0,59	0,05	µg/l	100%	0,00
F	0,703	0,084	µg/l	119%	1,28
G			µg/l		
H	0,69	0,14	µg/l	117%	1,13
I			µg/l		
J	n,a.		µg/l		
K			µg/l		
L	0,578	0,12	µg/l	98%	-0,14
M	0,560	0,12	µg/l	95%	-0,34
N			µg/l		
O	0,778	0,059	µg/l	132%	2,12
P	0,54	0,08	µg/l	92%	-0,56
Q			µg/l		
R	<0,5		µg/l	FN	
S	0,500	0,1	µg/l	85%	-1,02





	All results	Outliers excl.	Unit
Mean ± CI(99%)	0,60 ± 0,08	0,60 ± 0,08	µg/l
Recov. ± CI(99%)	102,3 ± 13,8	102,3 ± 13,8	%
SD between labs	0,09	0,09	µg/l
RSD between labs	14,1	14,1	%
n for calculation	11	11	

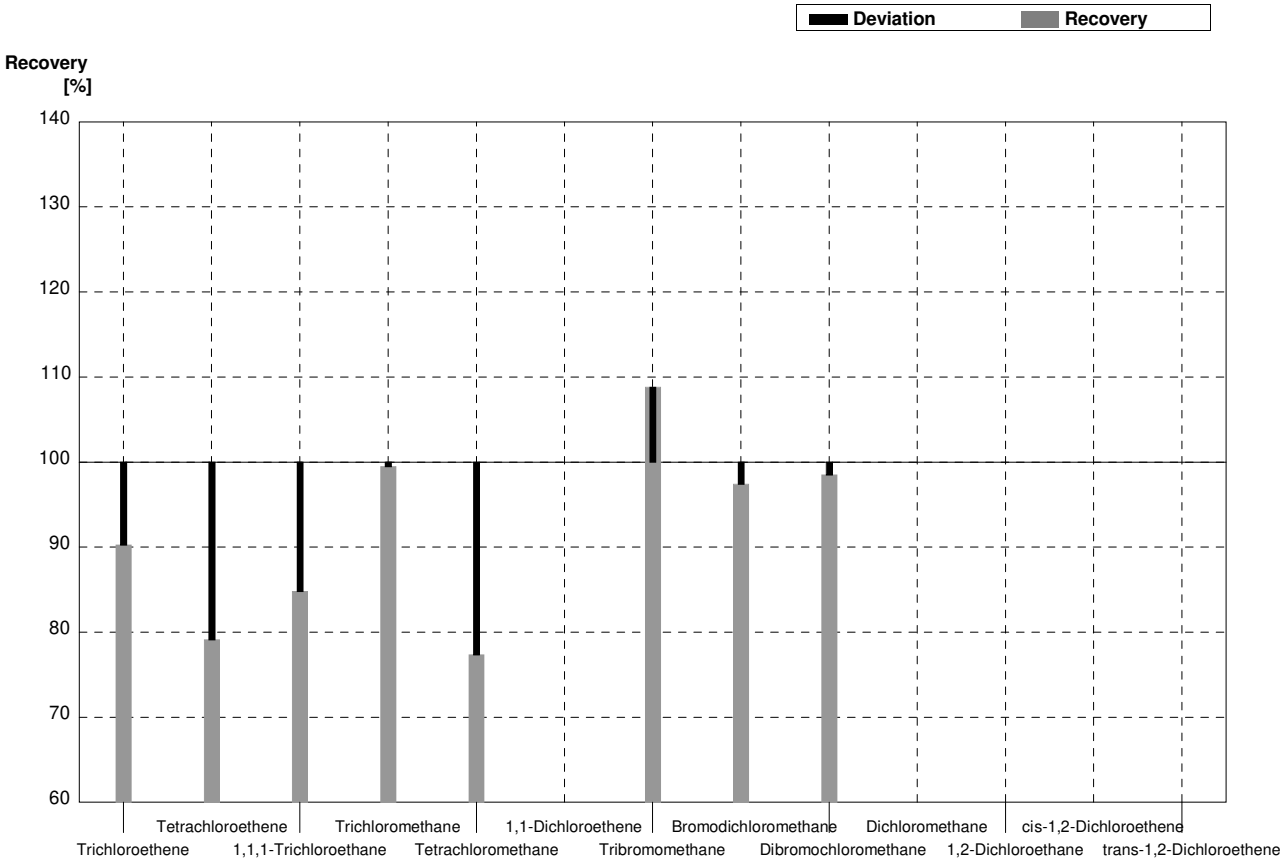
Illustration of Results
Laboratory Oriented Part

Round C68
Volatile Halogenated Hydrocarbons

Sample Dispatch: 27 February 2023

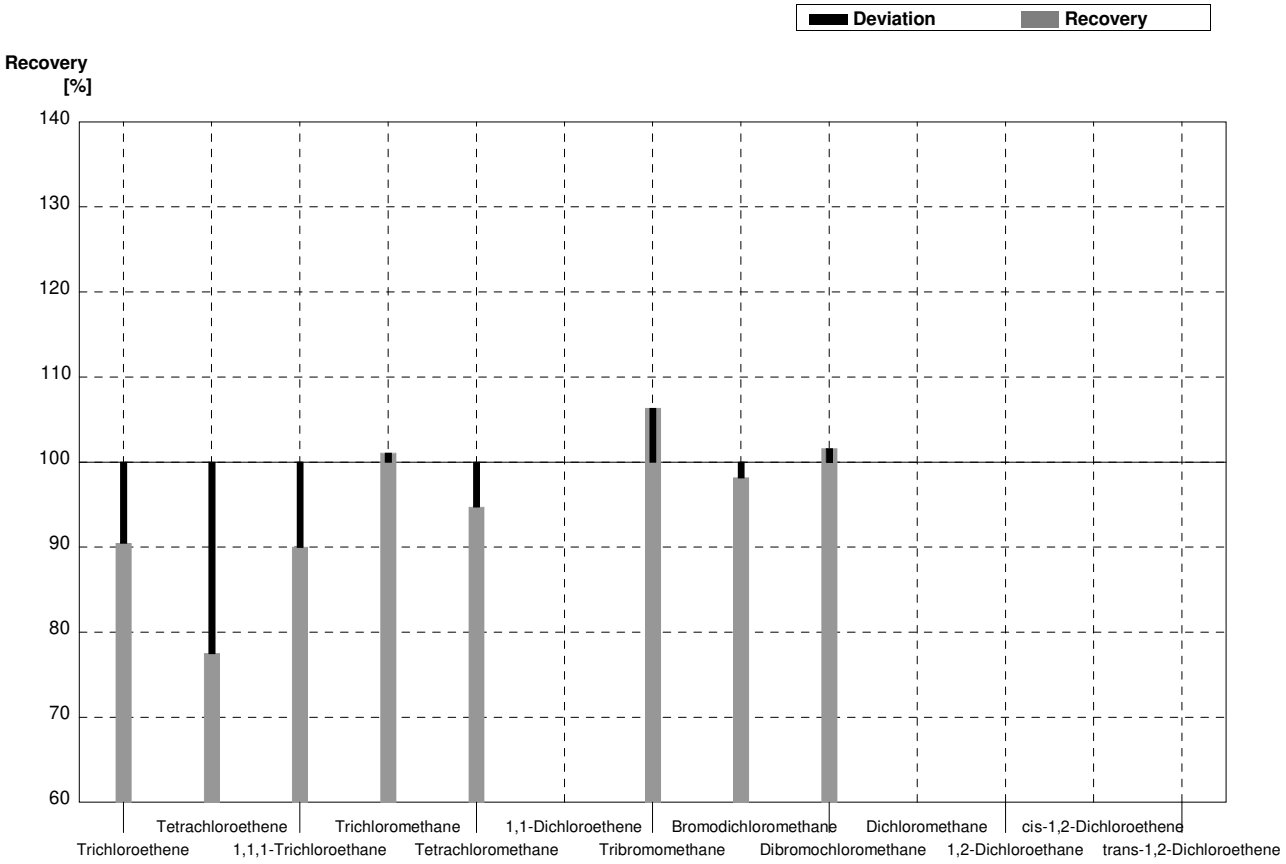
Sample C68A
Laboratory A

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	1,54	0,08	1,39	0,03	µg/l	90%
Tetrachloroethene	2,06	0,11	1,63	0,11	µg/l	79%
1,1,1-Trichloroethane	0,79	0,05	0,67	0,02	µg/l	85%
Trichloromethane	3,86	0,20	3,84	0,14	µg/l	99%
Tetrachloromethane	0,53	0,04	0,410	0,03	µg/l	77%
1,1-Dichloroethene	0,67	0,04			µg/l	
Tribromomethane	0,487	0,029	0,53	0,07	µg/l	109%
Bromodichloromethane	1,16	0,06	1,13	0,07	µg/l	97%
Dibromochloromethane	1,35	0,07	1,33	0,08	µg/l	99%
Dichloromethane	0,77	0,05			µg/l	
1,2-Dichloroethane	2,42	0,15			µg/l	
cis-1,2-Dichloroethene	0,204	0,015			µg/l	
trans-1,2-Dichloroethene	<0,1				µg/l	



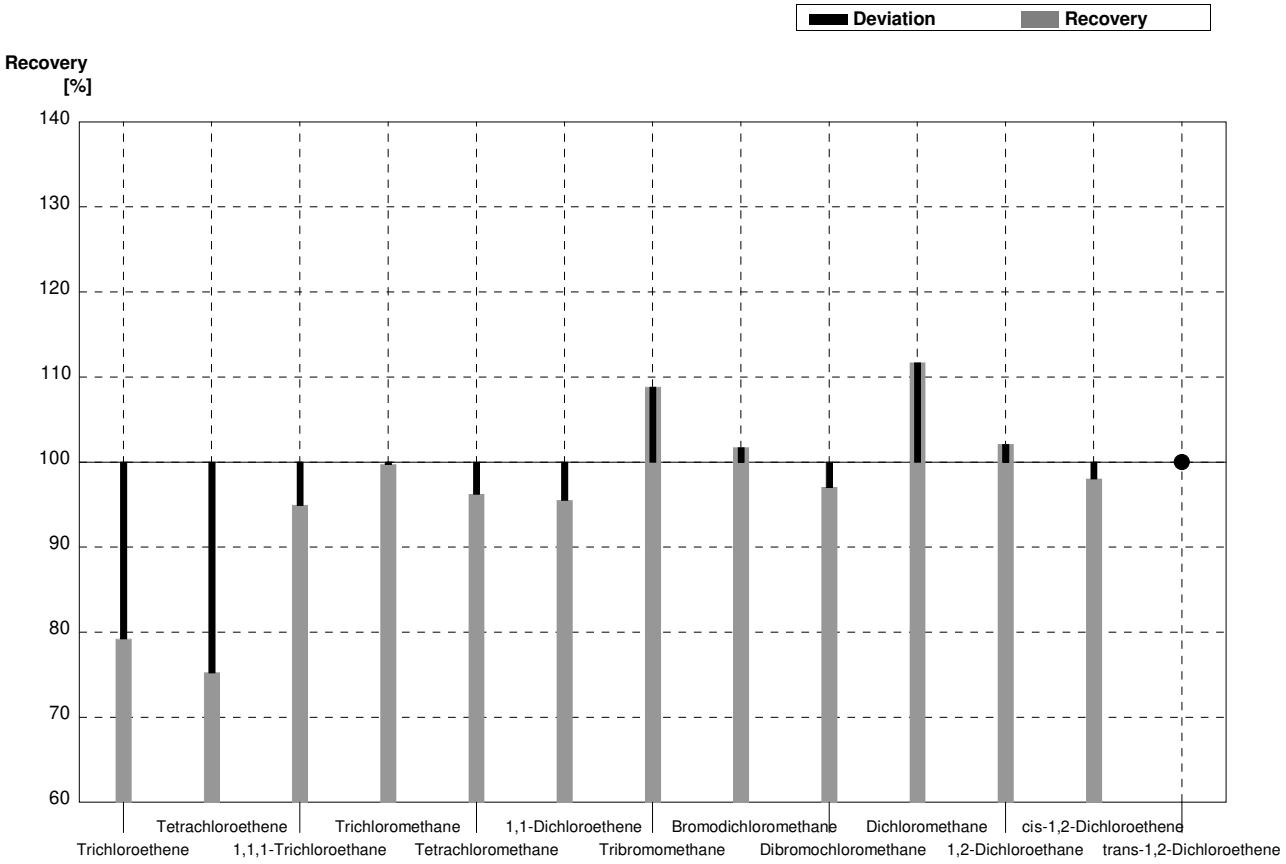
Sample C68B
Laboratory A

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	0,63	0,04	0,57	0,02	µg/l	90%
Tetrachloroethene	0,52	0,04	0,403	0,029	µg/l	78%
1,1,1-Trichloroethane	2,10	0,11	1,89	0,16	µg/l	90%
Trichloromethane	0,94	0,05	0,95	0,05	µg/l	101%
Tetrachloromethane	2,08	0,11	1,97	0,15	µg/l	95%
1,1-Dichloroethene	2,44	0,12			µg/l	
Tribromomethane	1,26	0,07	1,34	0,02	µg/l	106%
Bromodichloromethane	1,64	0,09	1,61	0,07	µg/l	98%
Dibromochloromethane	2,52	0,13	2,56	0,15	µg/l	102%
Dichloromethane	3,74	0,19			µg/l	
1,2-Dichloroethane	1,89	0,13			µg/l	
cis-1,2-Dichloroethene	0,84	0,04			µg/l	
trans-1,2-Dichloroethene	0,59	0,03			µg/l	



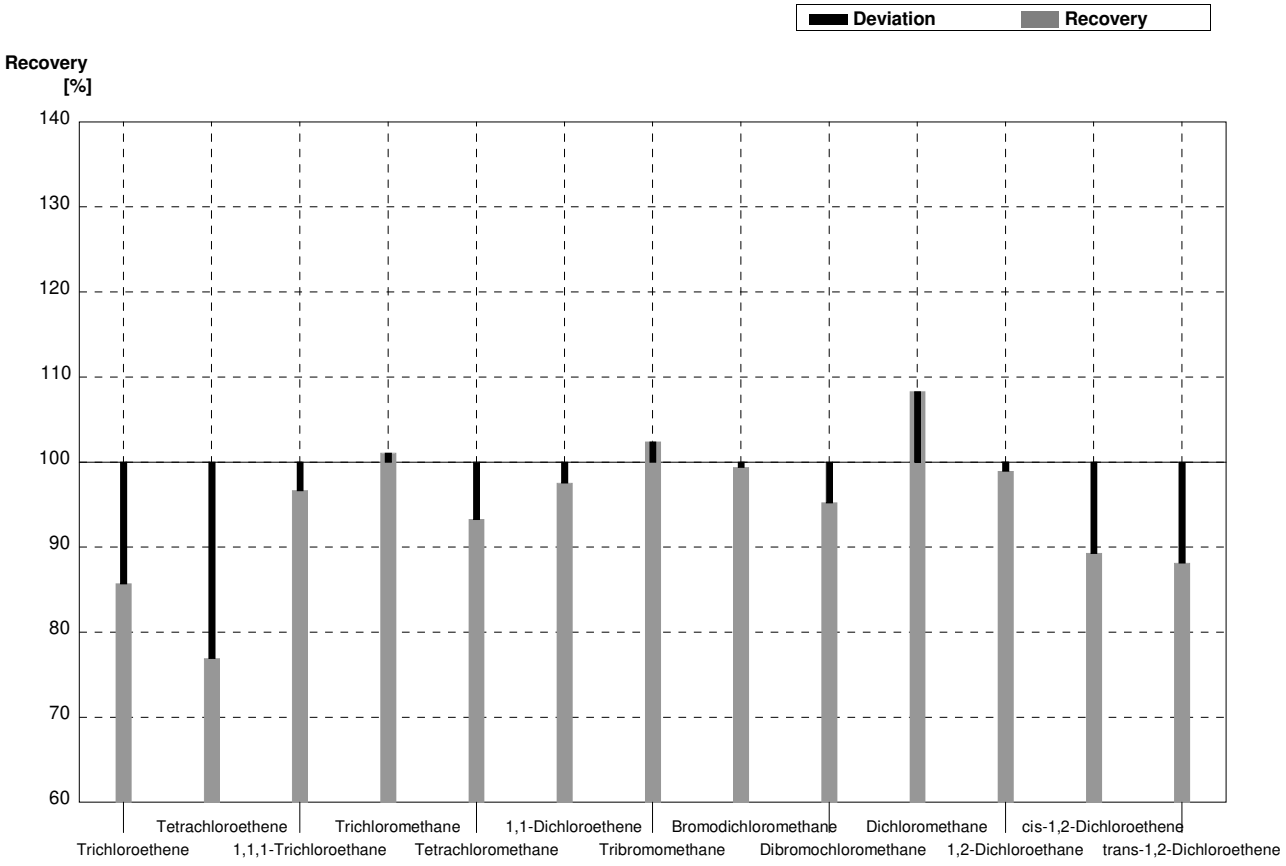
Sample C68A
Laboratory B

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	1,54	0,08	1,22	0,25	µg/l	79%
Tetrachloroethene	2,06	0,11	1,55	0,32	µg/l	75%
1,1,1-Trichloroethane	0,79	0,05	0,75	0,16	µg/l	95%
Trichloromethane	3,86	0,20	3,85	0,80	µg/l	100%
Tetrachloromethane	0,53	0,04	0,51	0,11	µg/l	96%
1,1-Dichloroethene	0,67	0,04	0,64	0,13	µg/l	96%
Tribromomethane	0,487	0,029	0,53	0,11	µg/l	109%
Bromodichloromethane	1,16	0,06	1,18	0,24	µg/l	102%
Dibromochloromethane	1,35	0,07	1,31	0,27	µg/l	97%
Dichloromethane	0,77	0,05	0,86	0,18	µg/l	112%
1,2-Dichloroethane	2,42	0,15	2,47	0,51	µg/l	102%
cis-1,2-Dichloroethene	0,204	0,015	0,200	0,04	µg/l	98%
trans-1,2-Dichloroethene	<0,1		<0,1		µg/l	•



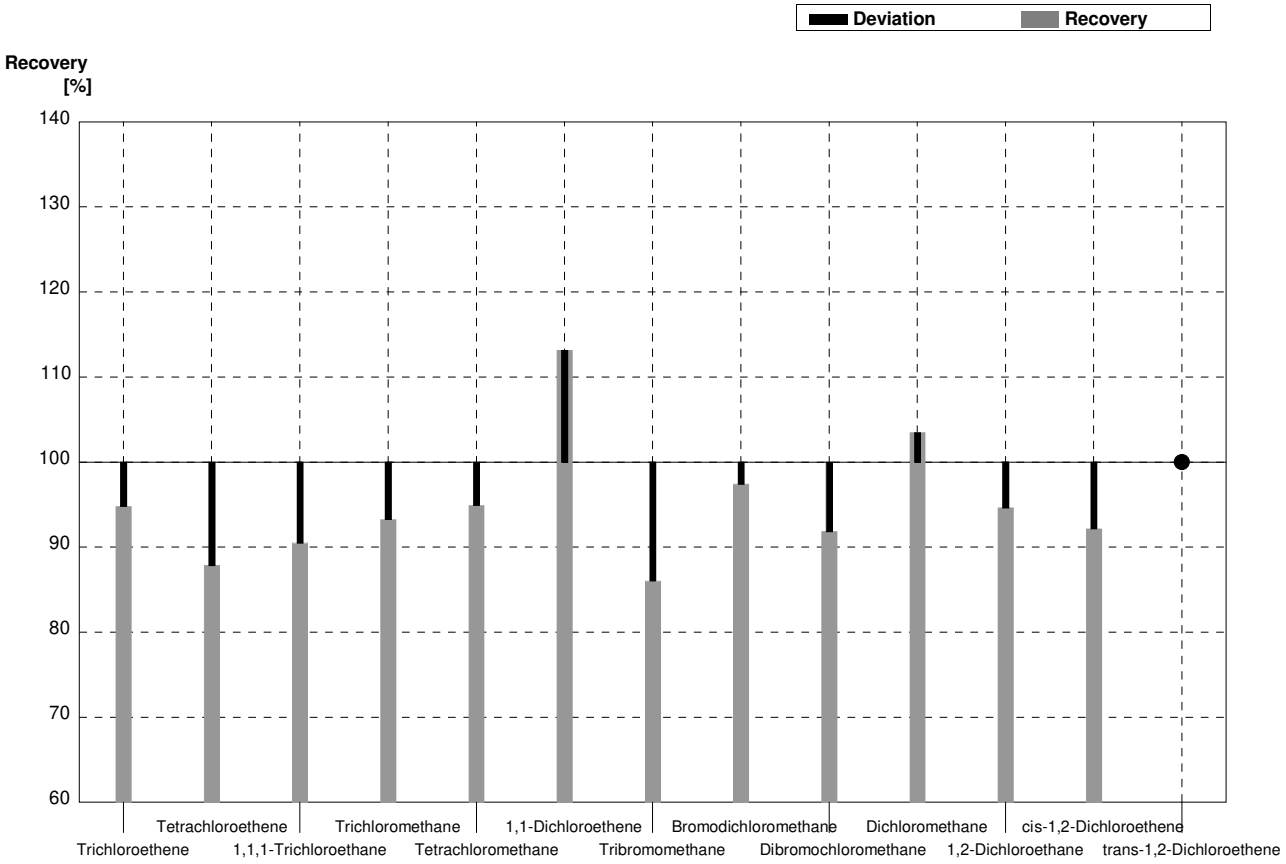
Sample C68B
Laboratory B

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	0,63	0,04	0,54	0,11	µg/l	86%
Tetrachloroethene	0,52	0,04	0,400	0,08	µg/l	77%
1,1,1-Trichloroethane	2,10	0,11	2,03	0,42	µg/l	97%
Trichloromethane	0,94	0,05	0,95	0,20	µg/l	101%
Tetrachloromethane	2,08	0,11	1,94	0,40	µg/l	93%
1,1-Dichloroethene	2,44	0,12	2,38	0,49	µg/l	98%
Tribromomethane	1,26	0,07	1,29	0,27	µg/l	102%
Bromodichloromethane	1,64	0,09	1,63	0,34	µg/l	99%
Dibromochloromethane	2,52	0,13	2,40	0,50	µg/l	95%
Dichloromethane	3,74	0,19	4,05	0,84	µg/l	108%
1,2-Dichloroethane	1,89	0,13	1,87	0,39	µg/l	99%
cis-1,2-Dichloroethene	0,84	0,04	0,75	0,16	µg/l	89%
trans-1,2-Dichloroethene	0,59	0,03	0,52	0,11	µg/l	88%



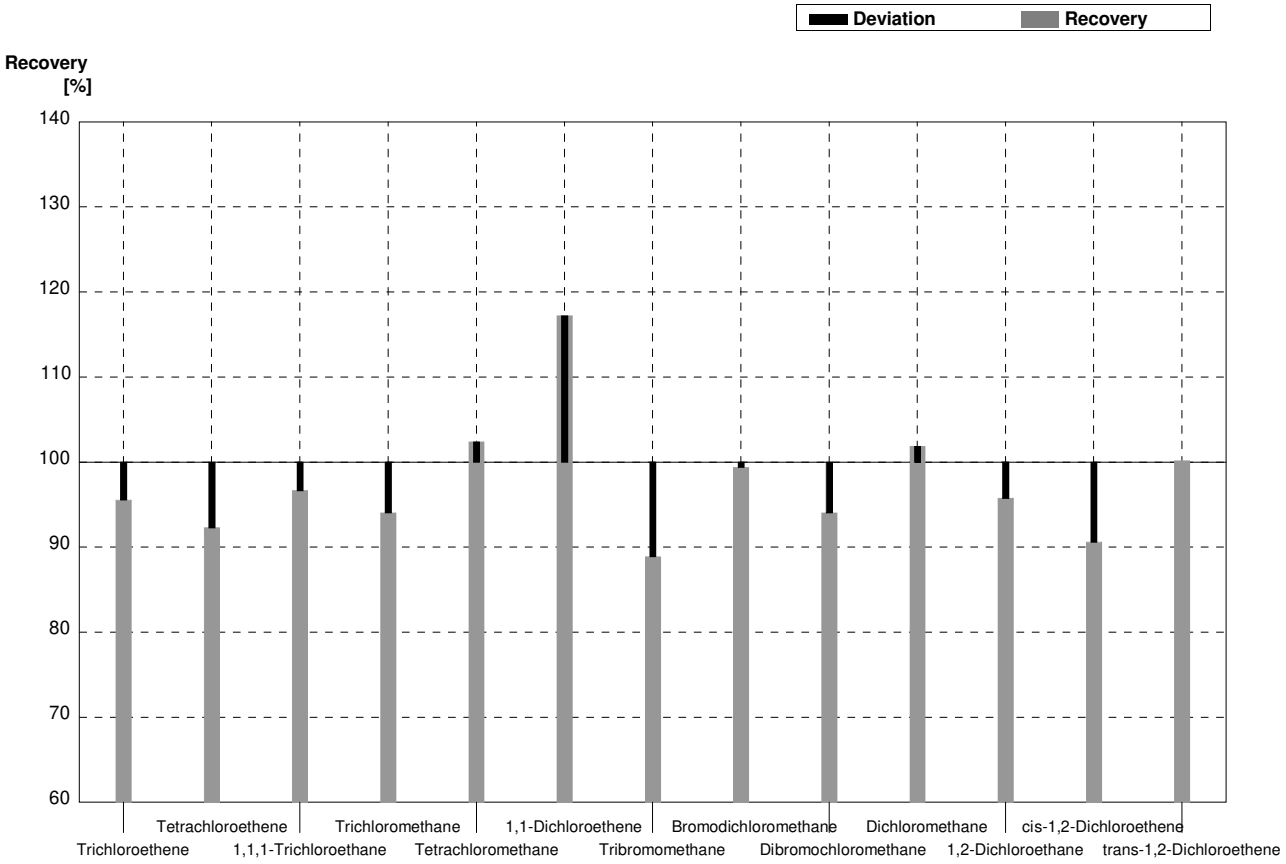
Sample **C68A**
Laboratory **C**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	1,54	0,08	1,46	0,248	µg/l	95%
Tetrachloroethene	2,06	0,11	1,81	0,308	µg/l	88%
1,1,1-Trichloroethane	0,79	0,05	0,715	0,122	µg/l	91%
Trichloromethane	3,86	0,20	3,60	0,612	µg/l	93%
Tetrachloromethane	0,53	0,04	0,503	0,086	µg/l	95%
1,1-Dichloroethene	0,67	0,04	0,758	0,129	µg/l	113%
Tribromomethane	0,487	0,029	0,419	0,071	µg/l	86%
Bromodichloromethane	1,16	0,06	1,13	0,192	µg/l	97%
Dibromochloromethane	1,35	0,07	1,24	0,211	µg/l	92%
Dichloromethane	0,77	0,05	0,797	0,135	µg/l	104%
1,2-Dichloroethane	2,42	0,15	2,29	0,389	µg/l	95%
cis-1,2-Dichloroethene	0,204	0,015	0,188	0,032	µg/l	92%
trans-1,2-Dichloroethene	<0,1		<0,10		µg/l	•



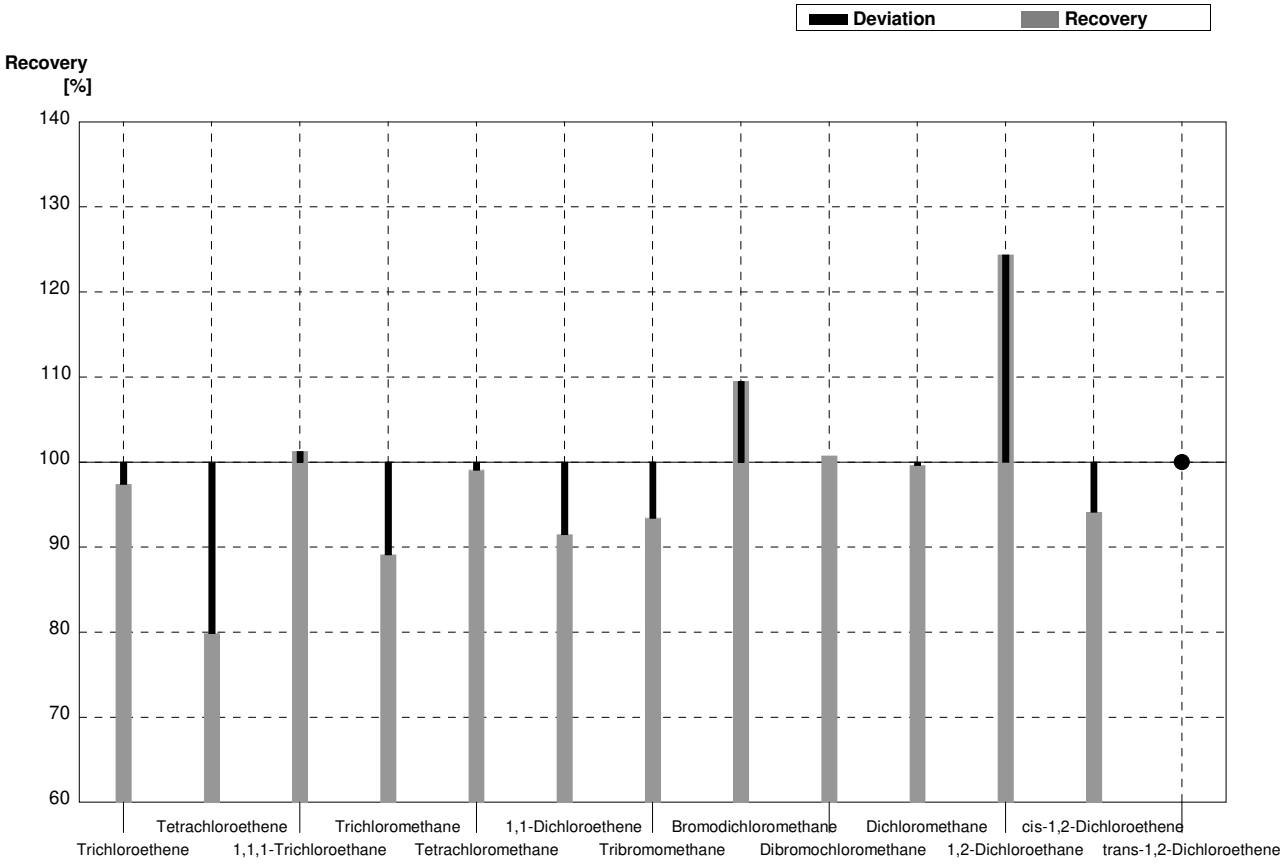
Sample **C68B**
Laboratory **C**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	0,63	0,04	0,602	0,102	µg/l	96%
Tetrachloroethene	0,52	0,04	0,480	0,082	µg/l	92%
1,1,1-Trichloroethane	2,10	0,11	2,03	0,345	µg/l	97%
Trichloromethane	0,94	0,05	0,884	0,150	µg/l	94%
Tetrachloromethane	2,08	0,11	2,13	0,362	µg/l	102%
1,1-Dichloroethene	2,44	0,12	2,86	0,486	µg/l	117%
Tribromomethane	1,26	0,07	1,12	0,190	µg/l	89%
Bromodichloromethane	1,64	0,09	1,63	0,277	µg/l	99%
Dibromochloromethane	2,52	0,13	2,37	0,403	µg/l	94%
Dichloromethane	3,74	0,19	3,81	0,648	µg/l	102%
1,2-Dichloroethane	1,89	0,13	1,81	0,308	µg/l	96%
cis-1,2-Dichloroethene	0,84	0,04	0,761	0,129	µg/l	91%
trans-1,2-Dichloroethene	0,59	0,03	0,591	0,100	µg/l	100%



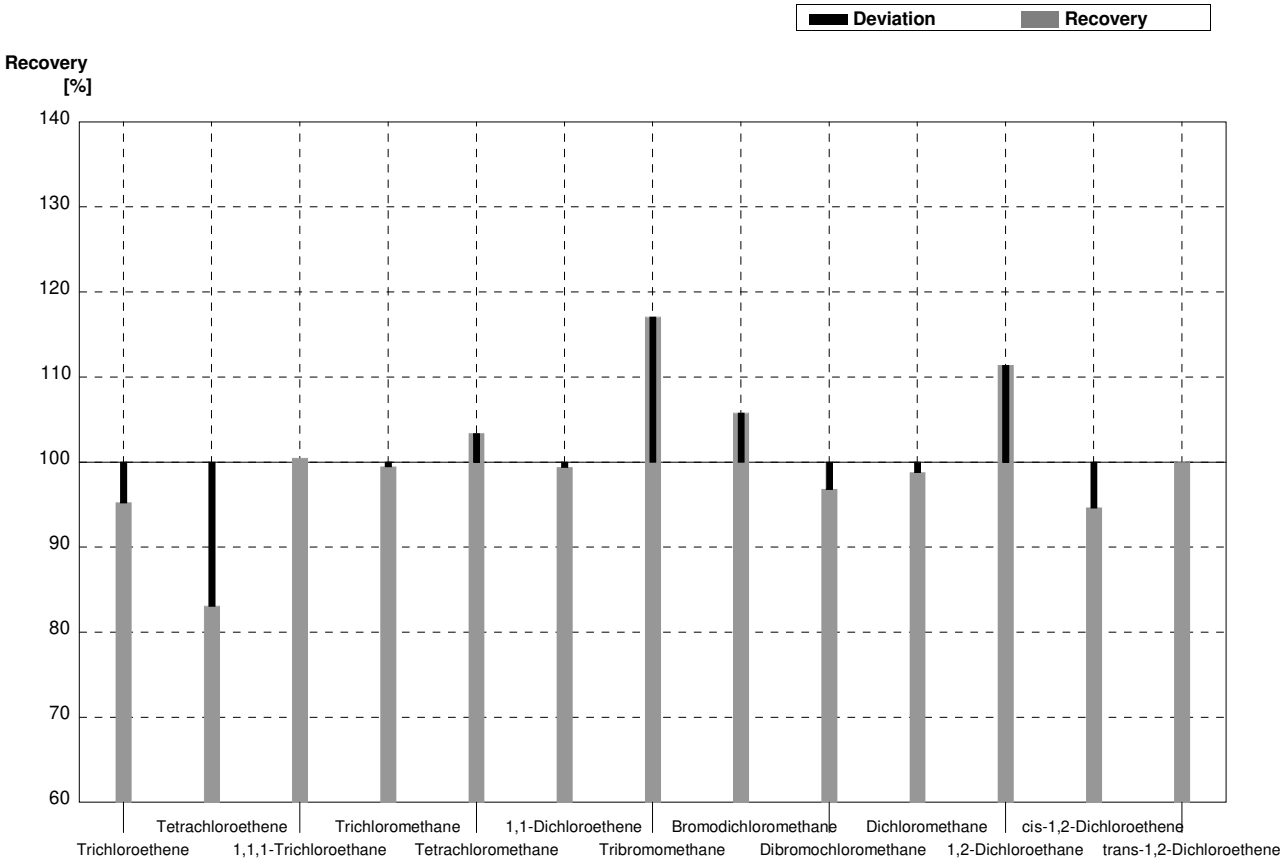
Sample C68A
Laboratory D

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	1,54	0,08	1,500	0,495	µg/l	97%
Tetrachloroethene	2,06	0,11	1,645	0,543	µg/l	80%
1,1,1-Trichloroethane	0,79	0,05	0,800	0,176	µg/l	101%
Trichloromethane	3,86	0,20	3,440	0,929	µg/l	89%
Tetrachloromethane	0,53	0,04	0,525	0,100	µg/l	99%
1,1-Dichloroethene	0,67	0,04	0,613	0,098	µg/l	91%
Tribromomethane	0,487	0,029	0,455	0,137	µg/l	93%
Bromodichloromethane	1,16	0,06	1,270	0,318	µg/l	109%
Dibromochloromethane	1,35	0,07	1,360	0,354	µg/l	101%
Dichloromethane	0,77	0,05	0,767	0,222	µg/l	100%
1,2-Dichloroethane	2,42	0,15	3,010	1,023	µg/l	124%
cis-1,2-Dichloroethene	0,204	0,015	0,192	0,044	µg/l	94%
trans-1,2-Dichloroethene	<0,1		<0,08	0,021	µg/l	•



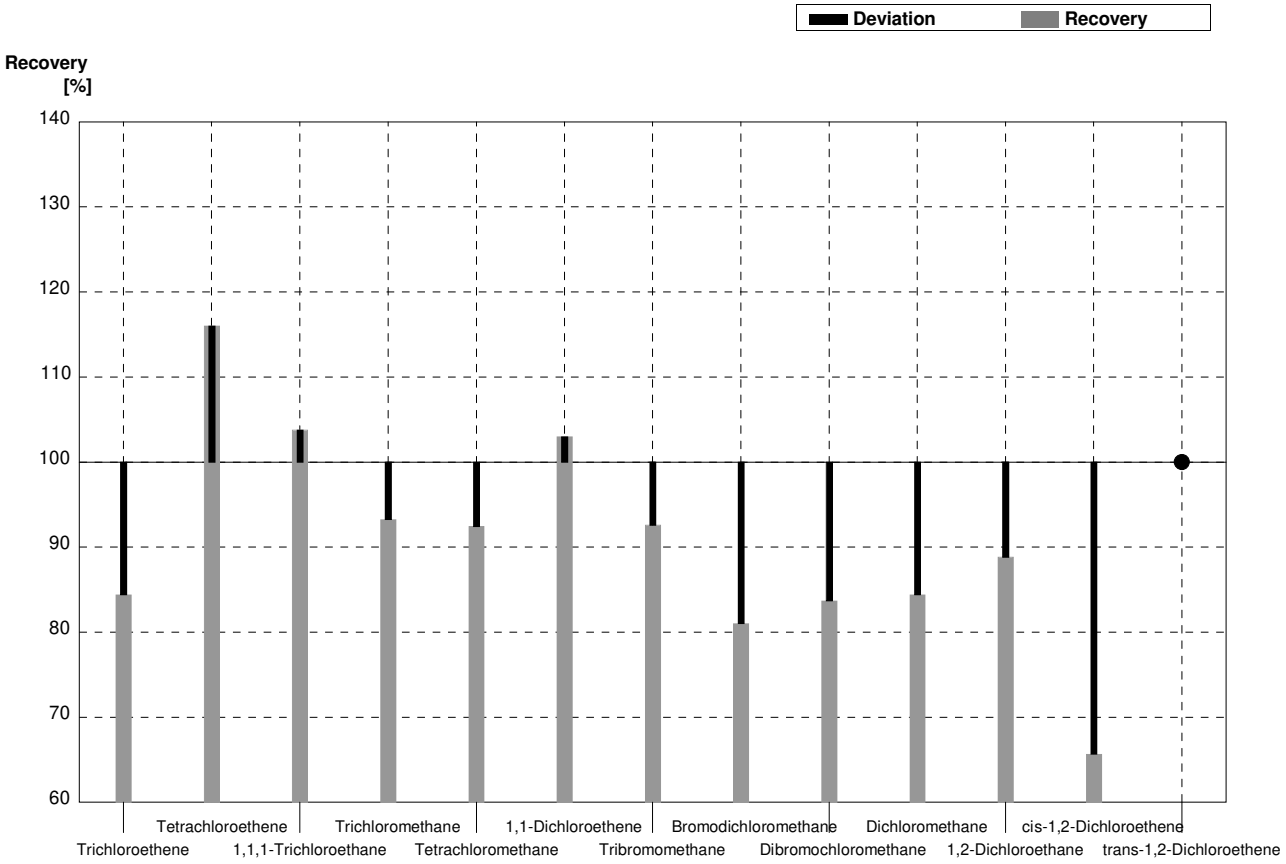
Sample C68B
Laboratory D

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	0,63	0,04	0,600	0,198	µg/l	95%
Tetrachloroethene	0,52	0,04	0,432	0,143	µg/l	83%
1,1,1-Trichloroethane	2,10	0,11	2,110	0,464	µg/l	100%
Trichloromethane	0,94	0,05	0,935	0,252	µg/l	99%
Tetrachloromethane	2,08	0,11	2,150	0,409	µg/l	103%
1,1-Dichloroethene	2,44	0,12	2,425	0,388	µg/l	99%
Tribromomethane	1,26	0,07	1,475	0,443	µg/l	117%
Bromodichloromethane	1,64	0,09	1,735	0,434	µg/l	106%
Dibromochloromethane	2,52	0,13	2,440	0,634	µg/l	97%
Dichloromethane	3,74	0,19	3,695	1,072	µg/l	99%
1,2-Dichloroethane	1,89	0,13	2,105	0,716	µg/l	111%
cis-1,2-Dichloroethene	0,84	0,04	0,795	0,183	µg/l	95%
trans-1,2-Dichloroethene	0,59	0,03	0,590	0,153	µg/l	100%



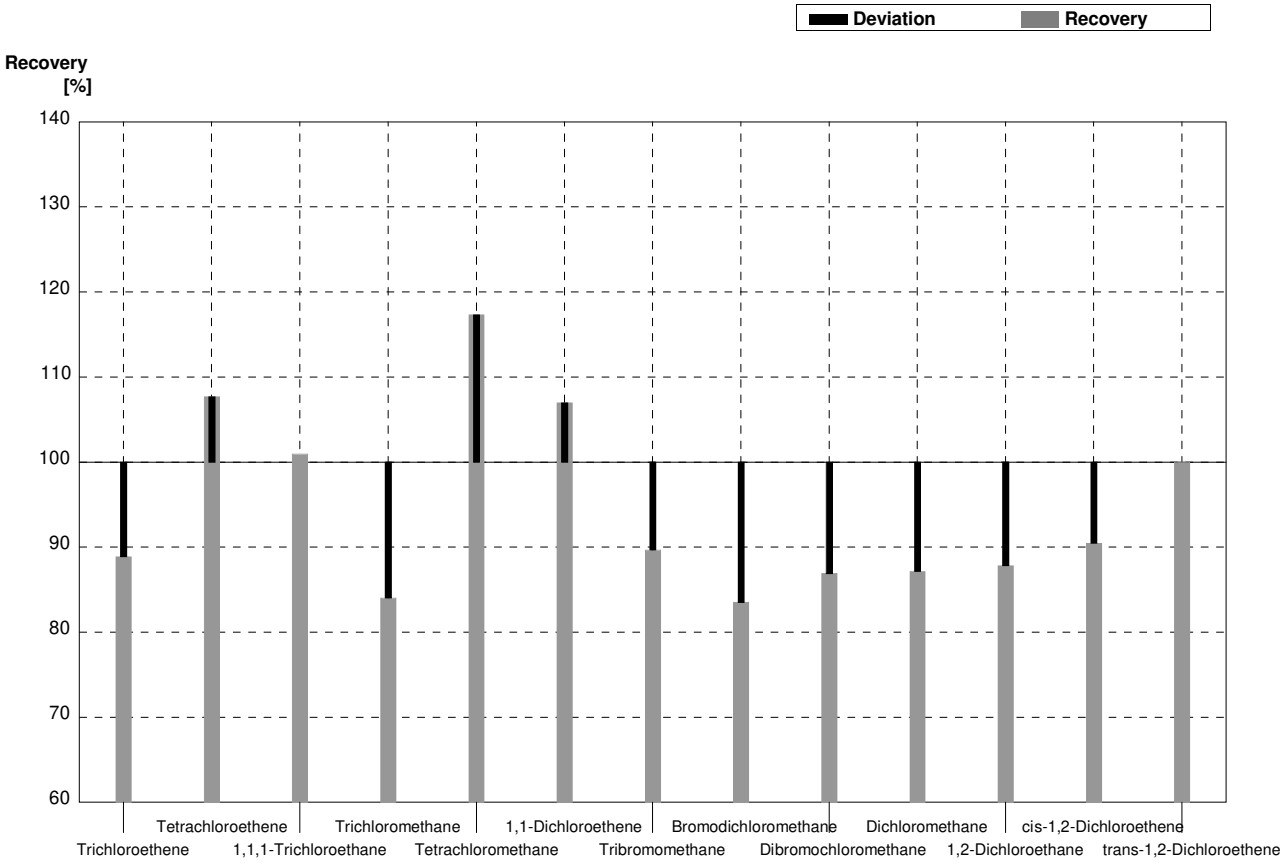
Sample **C68A**
Laboratory **E**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	1,54	0,08	1,30	0,03	µg/l	84%
Tetrachloroethene	2,06	0,11	2,39	0,30	µg/l	116%
1,1,1-Trichloroethane	0,79	0,05	0,82	0,01	µg/l	104%
Trichloromethane	3,86	0,20	3,60	0,18	µg/l	93%
Tetrachloromethane	0,53	0,04	0,490	0,01	µg/l	92%
1,1-Dichloroethene	0,67	0,04	0,69	0,01	µg/l	103%
Tribromomethane	0,487	0,029	0,451	0,01	µg/l	93%
Bromodichloromethane	1,16	0,06	0,94	0,01	µg/l	81%
Dibromochloromethane	1,35	0,07	1,13	0,01	µg/l	84%
Dichloromethane	0,77	0,05	0,65	0,01	µg/l	84%
1,2-Dichloroethane	2,42	0,15	2,15	0,03	µg/l	89%
cis-1,2-Dichloroethene	0,204	0,015	0,134	0,06	µg/l	66%
trans-1,2-Dichloroethene	<0,1		<0,50		µg/l	•



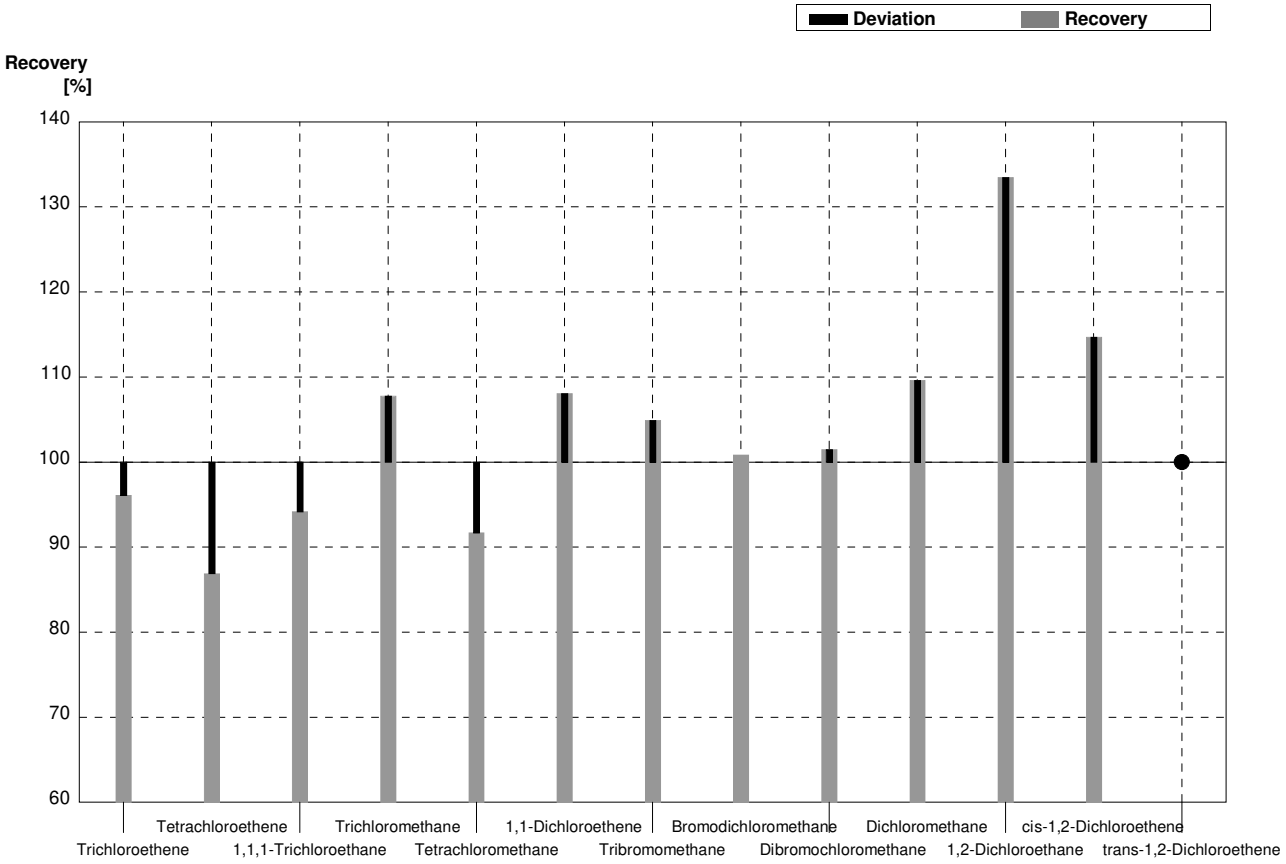
Sample C68B
Laboratory E

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	0,63	0,04	0,56	0,06	µg/l	89%
Tetrachloroethene	0,52	0,04	0,56	0,08	µg/l	108%
1,1,1-Trichloroethane	2,10	0,11	2,12	0,22	µg/l	101%
Trichloromethane	0,94	0,05	0,79	0,08	µg/l	84%
Tetrachloromethane	2,08	0,11	2,44	0,33	µg/l	117%
1,1-Dichloroethene	2,44	0,12	2,61	0,13	µg/l	107%
Tribromomethane	1,26	0,07	1,13	0,12	µg/l	90%
Bromodichloromethane	1,64	0,09	1,37	0,15	µg/l	84%
Dibromochloromethane	2,52	0,13	2,19	0,25	µg/l	87%
Dichloromethane	3,74	0,19	3,26	0,37	µg/l	87%
1,2-Dichloroethane	1,89	0,13	1,66	0,14	µg/l	88%
cis-1,2-Dichloroethene	0,84	0,04	0,76	0,07	µg/l	90%
trans-1,2-Dichloroethene	0,59	0,03	0,59	0,05	µg/l	100%



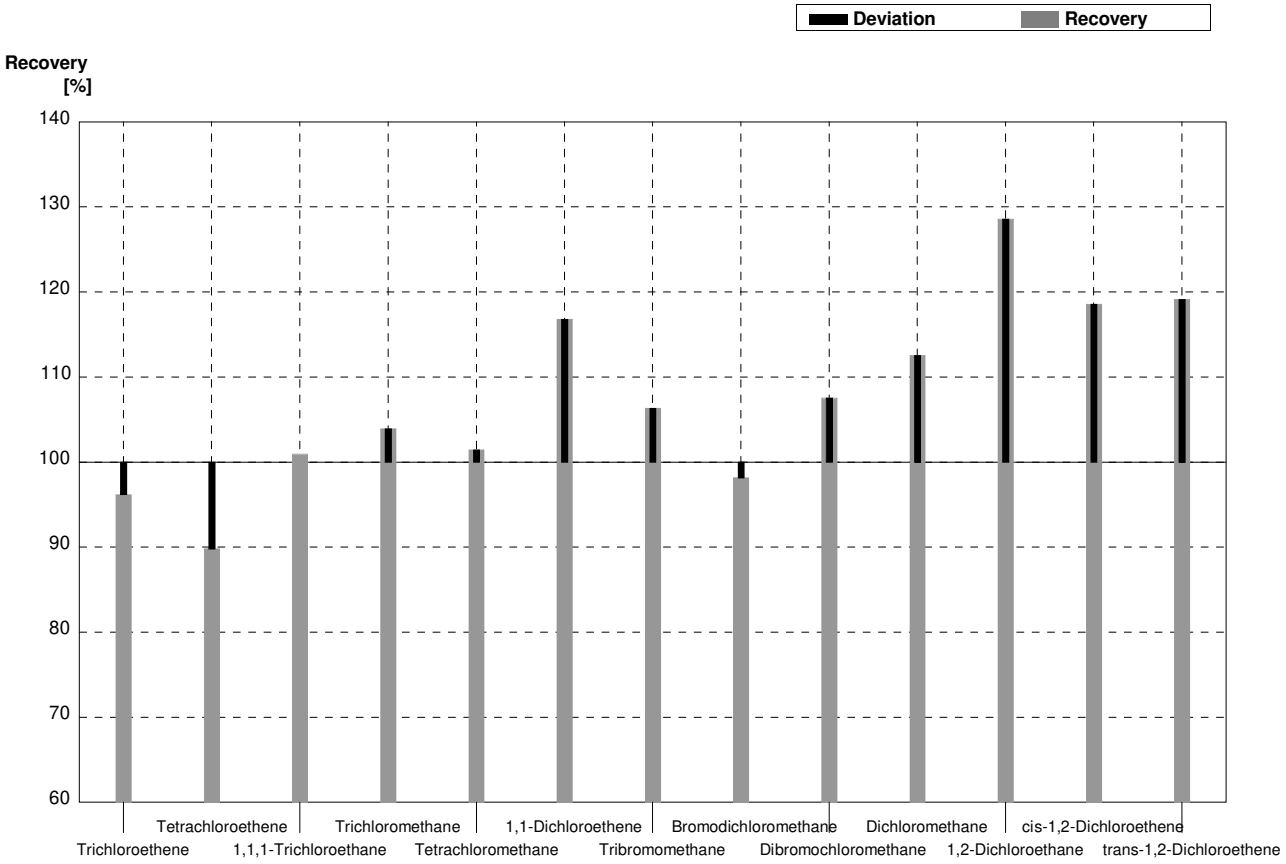
Sample C68A
Laboratory F

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	1,54	0,08	1,48	0,31	µg/l	96%
Tetrachloroethene	2,06	0,11	1,79	0,48	µg/l	87%
1,1,1-Trichloroethane	0,79	0,05	0,744	0,156	µg/l	94%
Trichloromethane	3,86	0,20	4,16	0,87	µg/l	108%
Tetrachloromethane	0,53	0,04	0,486	0,107	µg/l	92%
1,1-Dichloroethene	0,67	0,04	0,724	0,152	µg/l	108%
Tribromomethane	0,487	0,029	0,511	0,107	µg/l	105%
Bromodichloromethane	1,16	0,06	1,17	0,21	µg/l	101%
Dibromochloromethane	1,35	0,07	1,37	0,29	µg/l	101%
Dichloromethane	0,77	0,05	0,844	0,262	µg/l	110%
1,2-Dichloroethane	2,42	0,15	3,23	0,61	µg/l	133%
cis-1,2-Dichloroethene	0,204	0,015	0,234	0,026	µg/l	115%
trans-1,2-Dichloroethene	<0,1		<0,10		µg/l	•



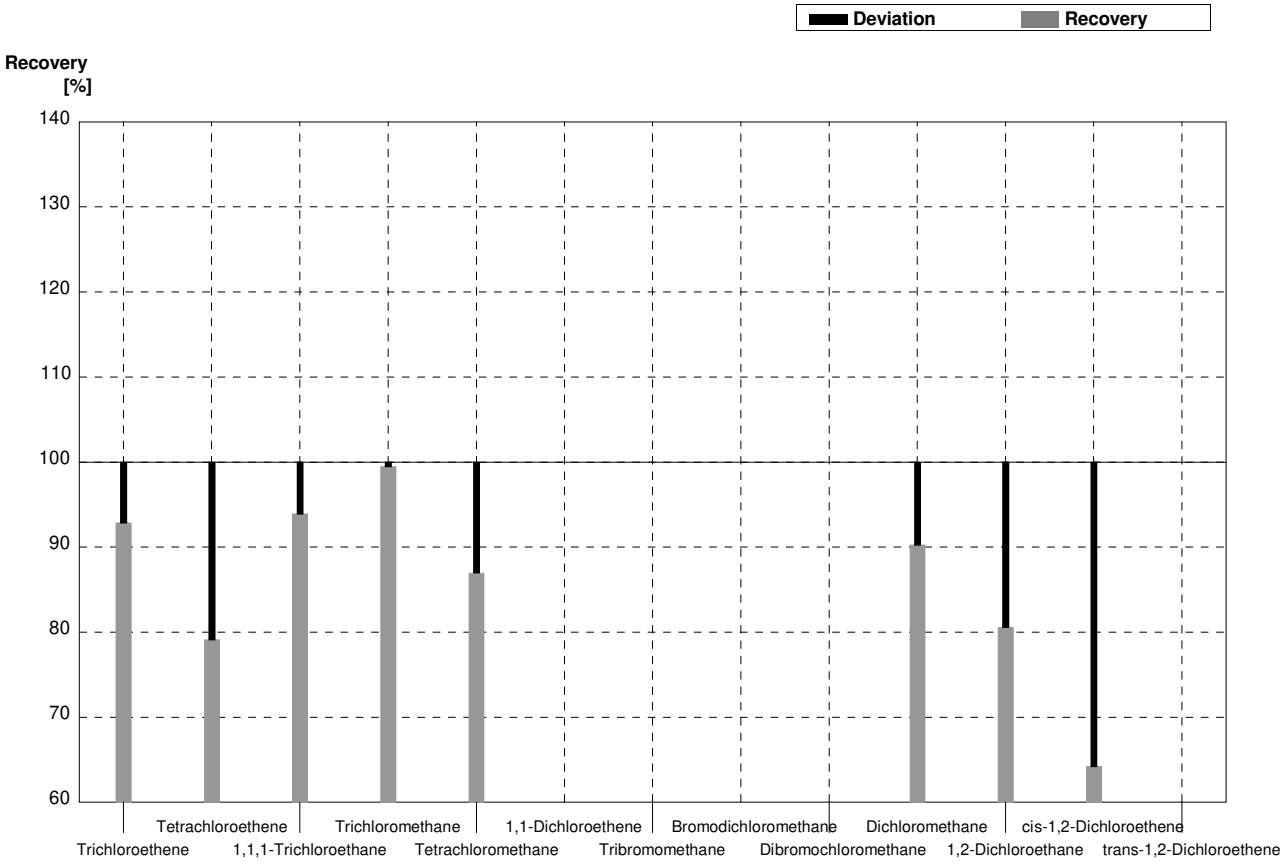
Sample C68B
Laboratory F

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	0,63	0,04	0,606	0,127	µg/l	96%
Tetrachloroethene	0,52	0,04	0,467	0,126	µg/l	90%
1,1,1-Trichloroethane	2,10	0,11	2,12	0,45	µg/l	101%
Trichloromethane	0,94	0,05	0,977	0,205	µg/l	104%
Tetrachloromethane	2,08	0,11	2,11	0,47	µg/l	101%
1,1-Dichloroethene	2,44	0,12	2,85	0,60	µg/l	117%
Tribromomethane	1,26	0,07	1,34	0,28	µg/l	106%
Bromodichloromethane	1,64	0,09	1,61	0,29	µg/l	98%
Dibromochloromethane	2,52	0,13	2,71	0,568	µg/l	108%
Dichloromethane	3,74	0,19	4,21	1,31	µg/l	113%
1,2-Dichloroethane	1,89	0,13	2,43	0,46	µg/l	129%
cis-1,2-Dichloroethene	0,84	0,04	0,996	0,110	µg/l	119%
trans-1,2-Dichloroethene	0,59	0,03	0,703	0,084	µg/l	119%



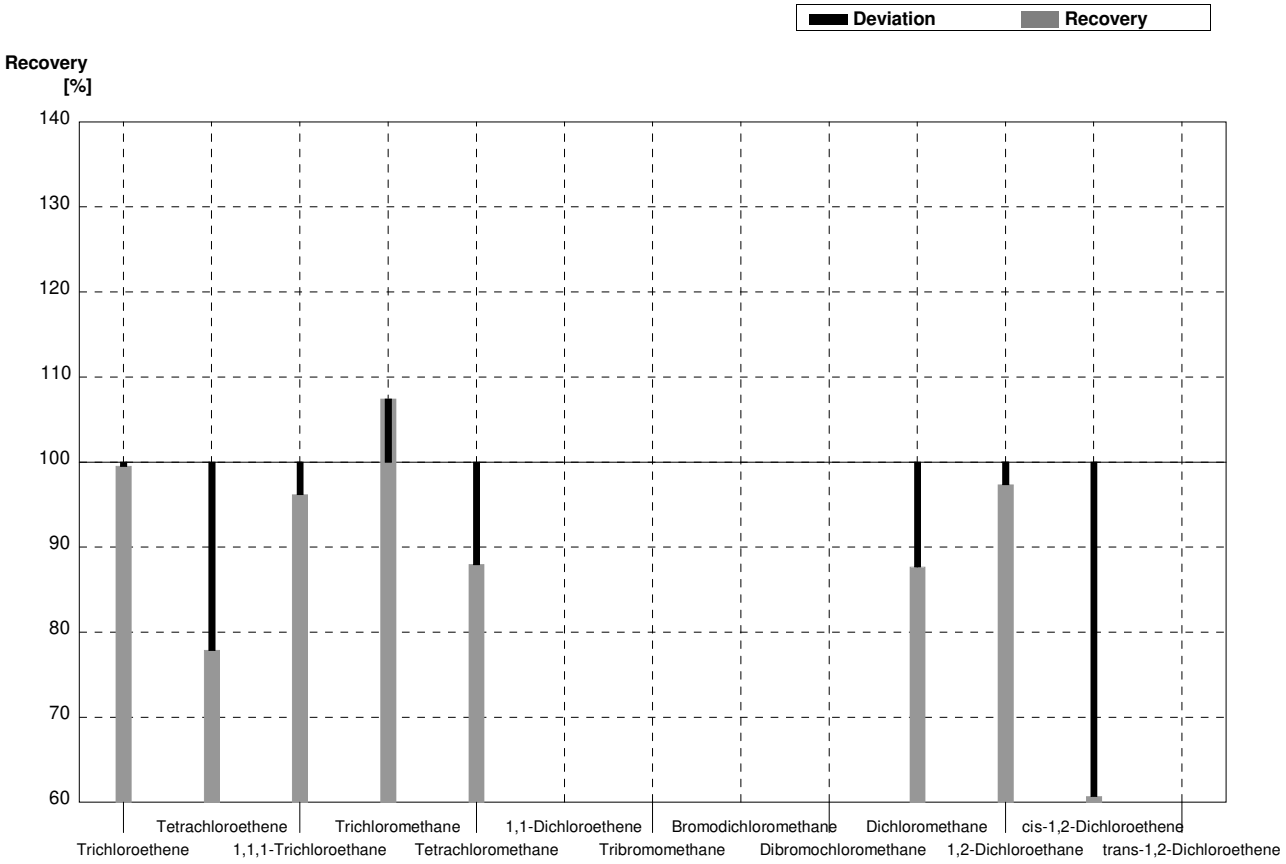
Sample **C68A**
Laboratory **G**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	1,54	0,08	1,43	0,143	µg/l	93%
Tetrachloroethene	2,06	0,11	1,63	0,162	µg/l	79%
1,1,1-Trichloroethane	0,79	0,05	0,742	0,074	µg/l	94%
Trichloromethane	3,86	0,20	3,84	0,384	µg/l	99%
Tetrachloromethane	0,53	0,04	0,461	0,046	µg/l	87%
1,1-Dichloroethene	0,67	0,04			µg/l	
Tribromomethane	0,487	0,029			µg/l	
Bromodichloromethane	1,16	0,06			µg/l	
Dibromochloromethane	1,35	0,07			µg/l	
Dichloromethane	0,77	0,05	0,695	0,070	µg/l	90%
1,2-Dichloroethane	2,42	0,15	1,95	0,195	µg/l	81%
cis-1,2-Dichloroethene	0,204	0,015	0,131	0,013	µg/l	64%
trans-1,2-Dichloroethene	<0,1				µg/l	



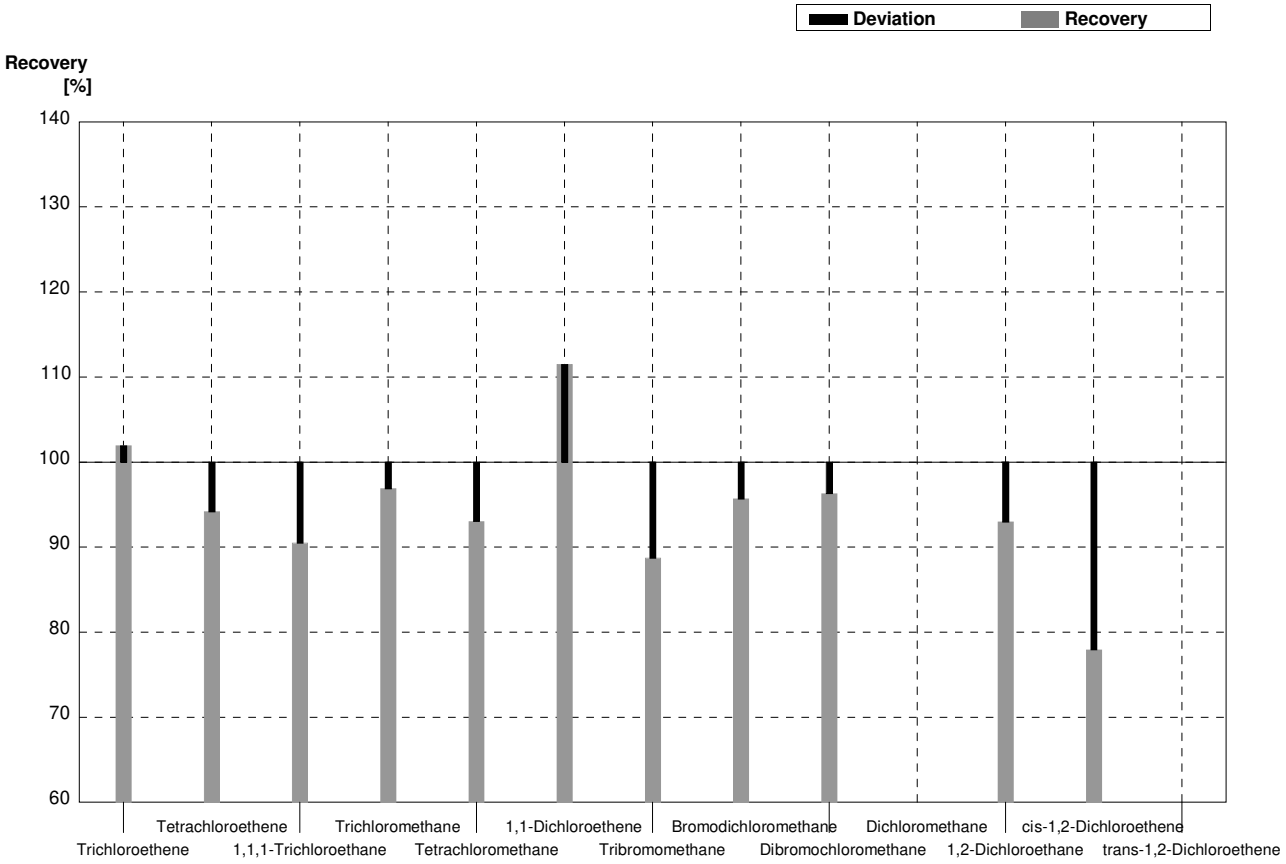
Sample **C68B**
Laboratory **G**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	0,63	0,04	0,627	0,063	µg/l	100%
Tetrachloroethene	0,52	0,04	0,405	0,040	µg/l	78%
1,1,1-Trichloroethane	2,10	0,11	2,02	0,202	µg/l	96%
Trichloromethane	0,94	0,05	1,01	0,101	µg/l	107%
Tetrachloromethane	2,08	0,11	1,83	0,183	µg/l	88%
1,1-Dichloroethene	2,44	0,12			µg/l	
Tribromomethane	1,26	0,07			µg/l	
Bromodichloromethane	1,64	0,09			µg/l	
Dibromochloromethane	2,52	0,13			µg/l	
Dichloromethane	3,74	0,19	3,28	0,328	µg/l	88%
1,2-Dichloroethane	1,89	0,13	1,84	0,184	µg/l	97%
cis-1,2-Dichloroethene	0,84	0,04	0,51	0,051	µg/l	61%
trans-1,2-Dichloroethene	0,59	0,03			µg/l	



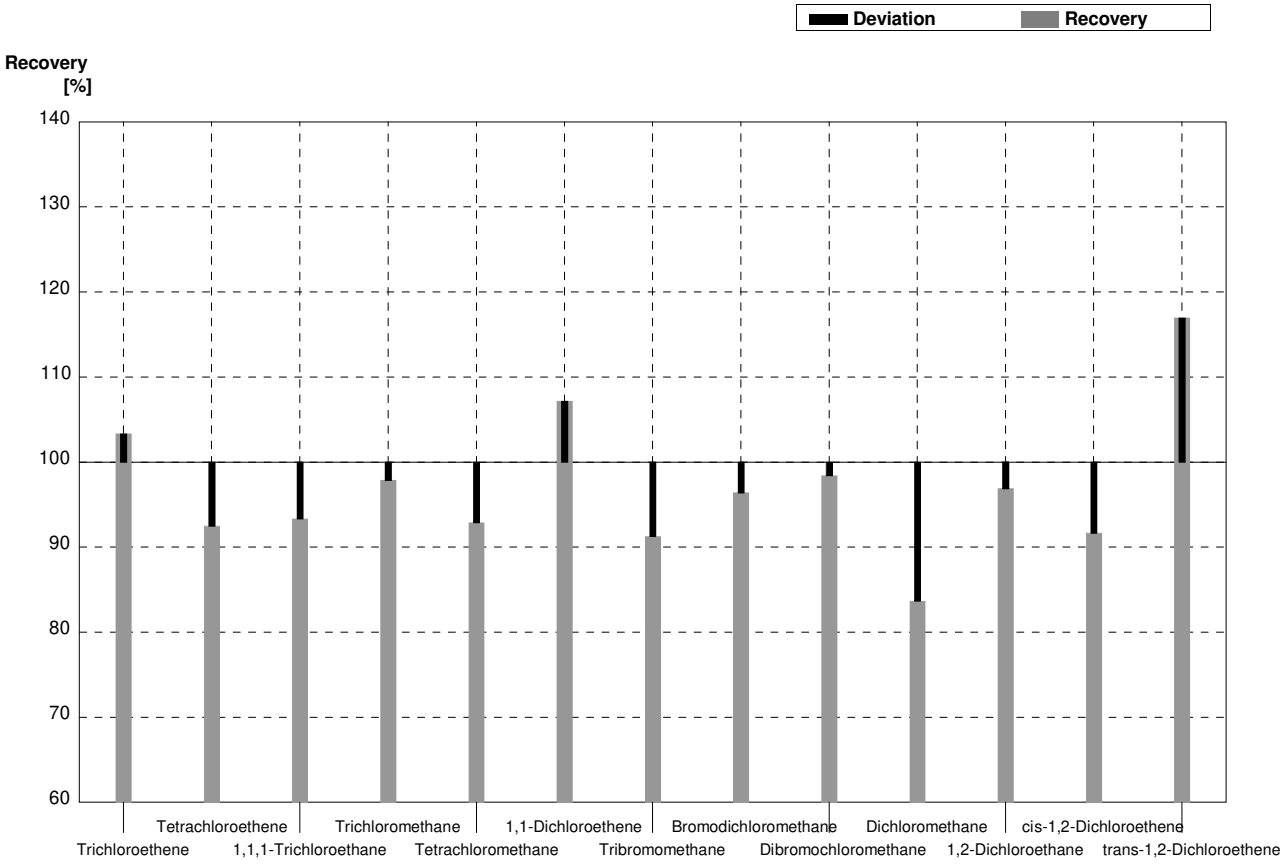
Sample C68A
Laboratory H

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	1,54	0,08	1,57	0,31	µg/l	102%
Tetrachloroethene	2,06	0,11	1,94	0,34	µg/l	94%
1,1,1-Trichloroethane	0,79	0,05	0,715	0,14	µg/l	91%
Trichloromethane	3,86	0,20	3,74	0,75	µg/l	97%
Tetrachloromethane	0,53	0,04	0,493	0,098	µg/l	93%
1,1-Dichloroethene	0,67	0,04	0,747	0,15	µg/l	111%
Tribromomethane	0,487	0,029	0,432	0,086	µg/l	89%
Bromodichloromethane	1,16	0,06	1,11	0,22	µg/l	96%
Dibromochloromethane	1,35	0,07	1,30	0,26	µg/l	96%
Dichloromethane	0,77	0,05	<bg		µg/l	
1,2-Dichloroethane	2,42	0,15	2,25	0,45	µg/l	93%
cis-1,2-Dichloroethene	0,204	0,015	0,159	0,032	µg/l	78%
trans-1,2-Dichloroethene	<0,1		<bg		µg/l	



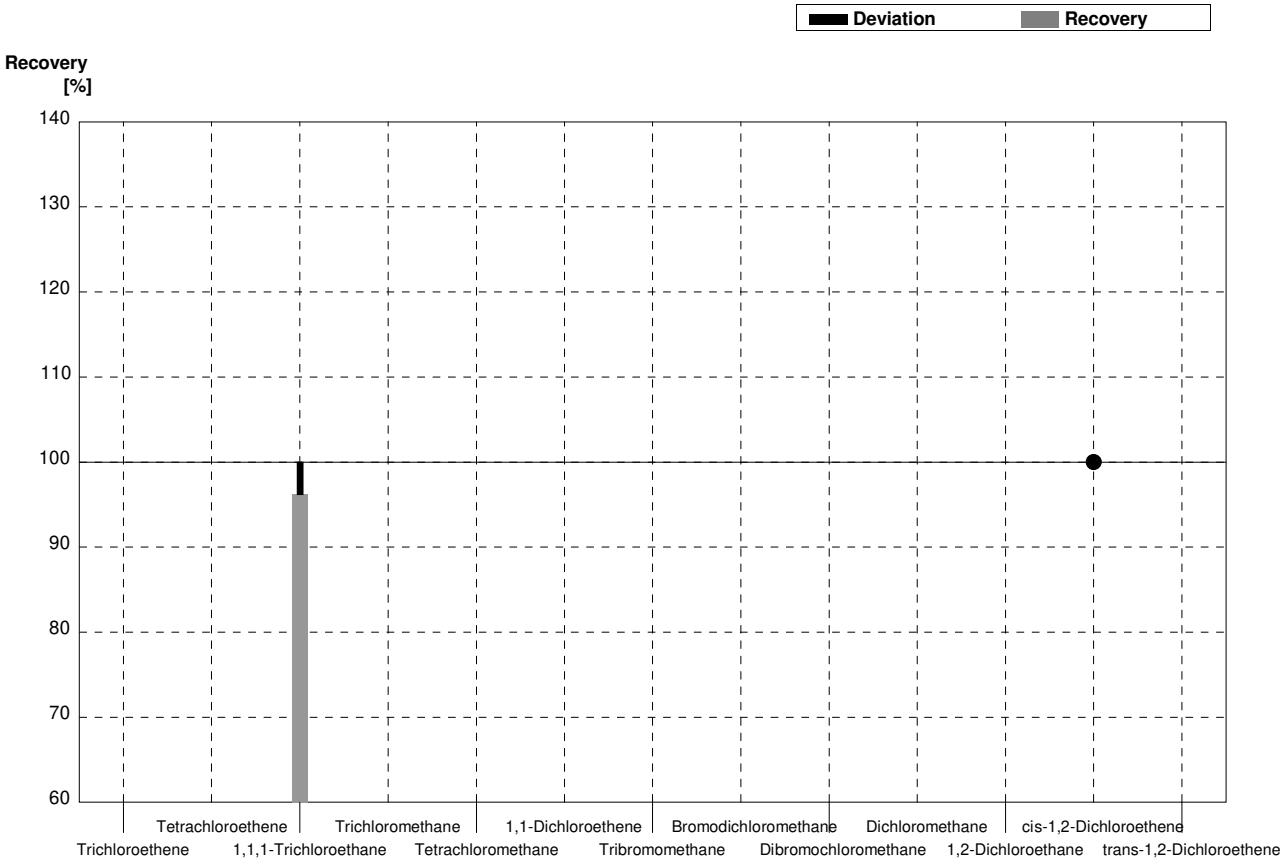
Sample C68B
Laboratory H

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	0,63	0,04	0,651	0,13	µg/l	103%
Tetrachloroethene	0,52	0,04	0,481	0,096	µg/l	93%
1,1,1-Trichloroethane	2,10	0,11	1,96	0,40	µg/l	93%
Trichloromethane	0,94	0,05	0,92	0,18	µg/l	98%
Tetrachloromethane	2,08	0,11	1,932	0,39	µg/l	93%
1,1-Dichloroethene	2,44	0,12	2,615	0,52	µg/l	107%
Tribromomethane	1,26	0,07	1,15	0,23	µg/l	91%
Bromodichloromethane	1,64	0,09	1,581	0,32	µg/l	96%
Dibromochloromethane	2,52	0,13	2,48	0,50	µg/l	98%
Dichloromethane	3,74	0,19	3,129	0,63	µg/l	84%
1,2-Dichloroethane	1,89	0,13	1,831	0,37	µg/l	97%
cis-1,2-Dichloroethene	0,84	0,04	0,77	0,15	µg/l	92%
trans-1,2-Dichloroethene	0,59	0,03	0,69	0,14	µg/l	117%



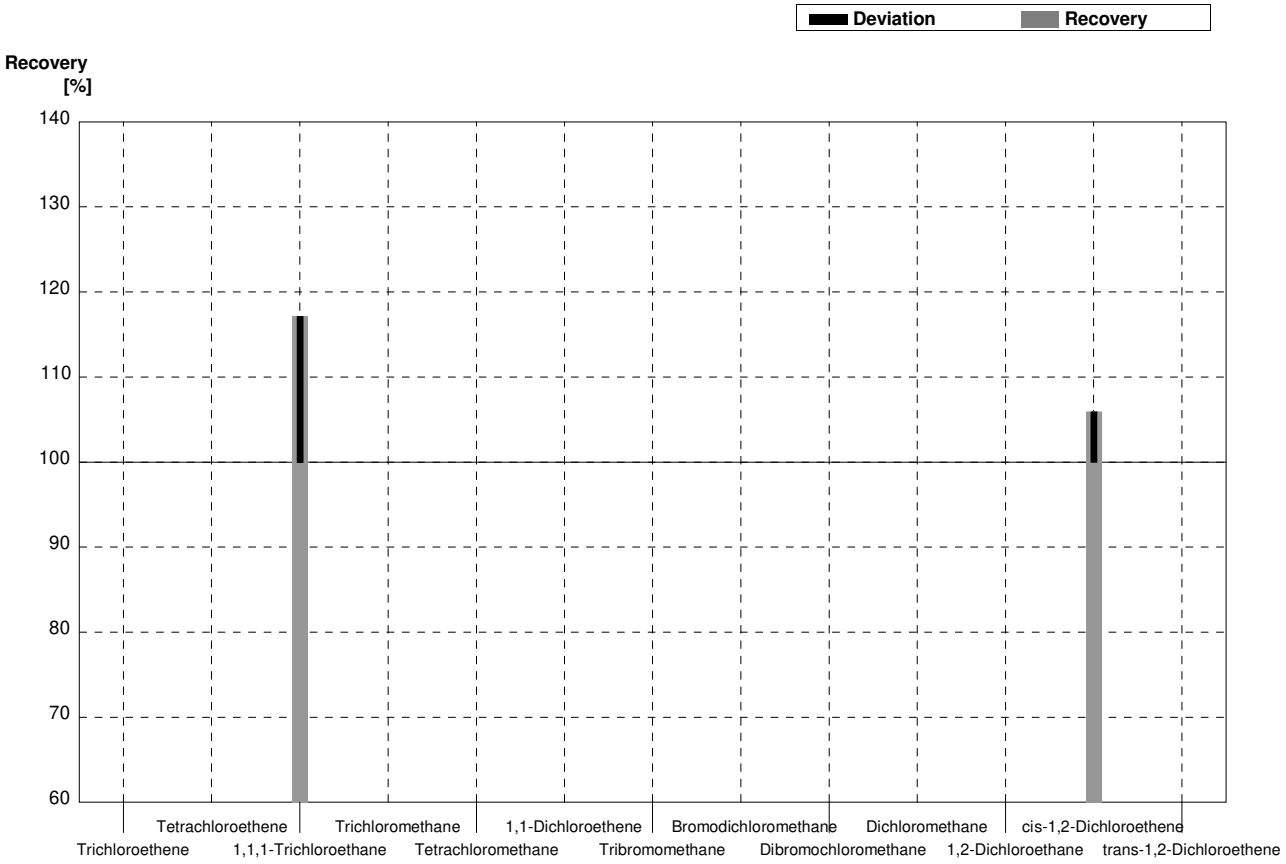
Sample C68A
Laboratory I

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	1,54	0,08			µg/l	
Tetrachloroethene	2,06	0,11			µg/l	
1,1,1-Trichloroethane	0,79	0,05	0,76		µg/l	96%
Trichloromethane	3,86	0,20			µg/l	
Tetrachloromethane	0,53	0,04			µg/l	
1,1-Dichloroethene	0,67	0,04			µg/l	
Tribromomethane	0,487	0,029			µg/l	
Bromodichloromethane	1,16	0,06			µg/l	
Dibromochloromethane	1,35	0,07			µg/l	
Dichloromethane	0,77	0,05			µg/l	
1,2-Dichloroethane	2,42	0,15			µg/l	
cis-1,2-Dichloroethene	0,204	0,015	<0,50		µg/l	•
trans-1,2-Dichloroethene	<0,1				µg/l	



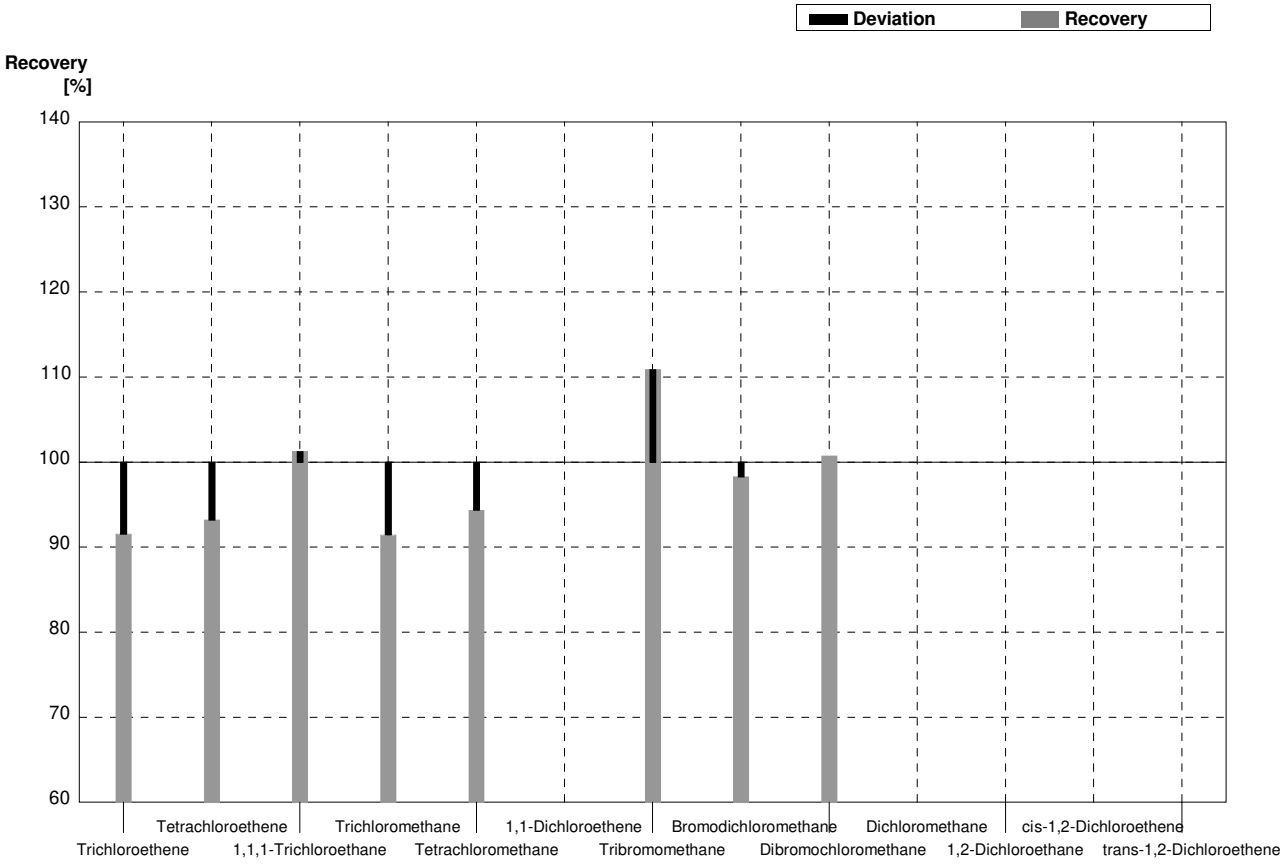
Sample C68B
Laboratory I

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	0,63	0,04			µg/l	
Tetrachloroethene	0,52	0,04			µg/l	
1,1,1-Trichloroethane	2,10	0,11	2,46		µg/l	117%
Trichloromethane	0,94	0,05			µg/l	
Tetrachloromethane	2,08	0,11			µg/l	
1,1-Dichloroethene	2,44	0,12			µg/l	
Tribromomethane	1,26	0,07			µg/l	
Bromodichloromethane	1,64	0,09			µg/l	
Dibromochloromethane	2,52	0,13			µg/l	
Dichloromethane	3,74	0,19			µg/l	
1,2-Dichloroethane	1,89	0,13			µg/l	
cis-1,2-Dichloroethene	0,84	0,04	0,89		µg/l	106%
trans-1,2-Dichloroethene	0,59	0,03			µg/l	



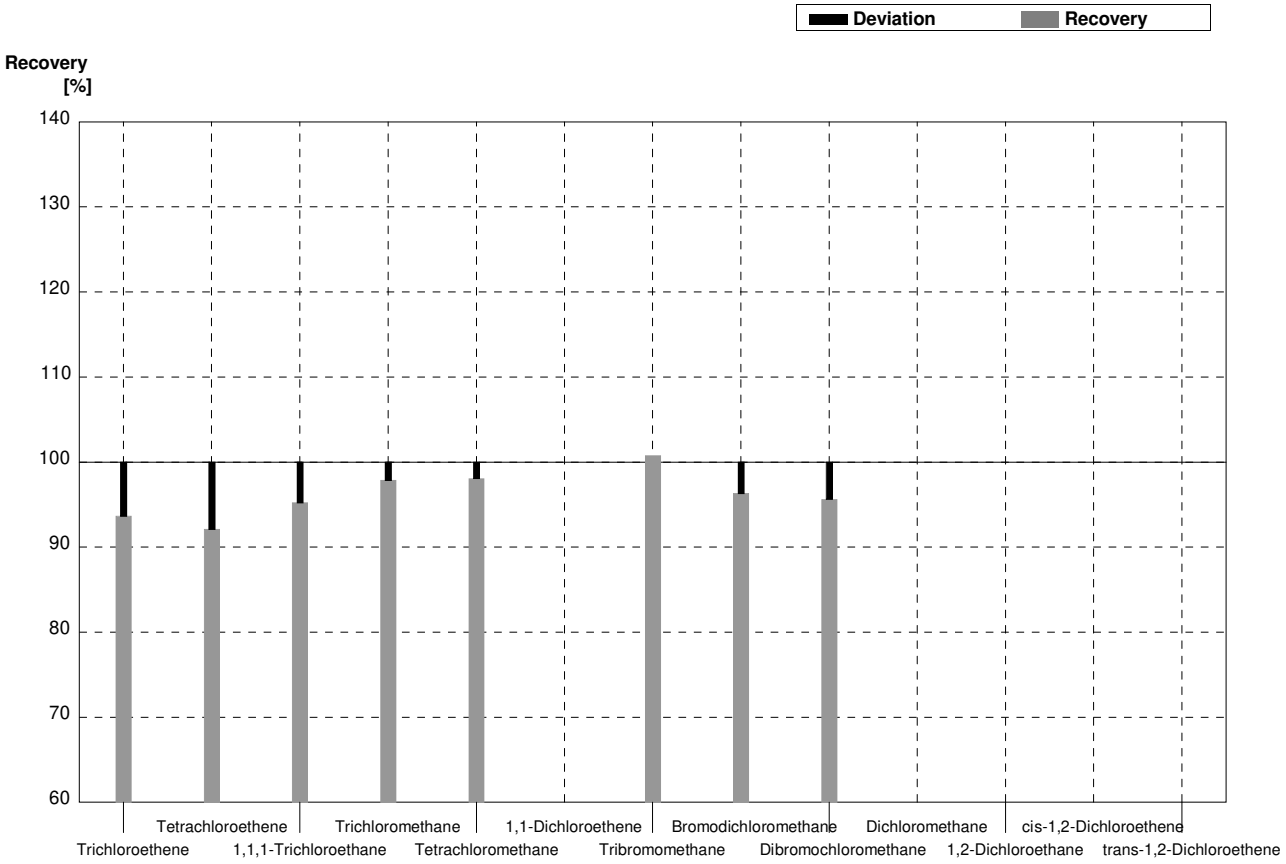
Sample C68A
Laboratory J

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	1,54	0,08	1,41	0,10	µg/l	92%
Tetrachloroethene	2,06	0,11	1,92	0,15	µg/l	93%
1,1,1-Trichloroethane	0,79	0,05	0,80	0,10	µg/l	101%
Trichloromethane	3,86	0,20	3,53	0,23	µg/l	91%
Tetrachloromethane	0,53	0,04	0,50	0,05	µg/l	94%
1,1-Dichloroethene	0,67	0,04	n,a.		µg/l	
Tribromomethane	0,487	0,029	0,54	0,05	µg/l	111%
Bromodichloromethane	1,16	0,06	1,14	0,10	µg/l	98%
Dibromochloromethane	1,35	0,07	1,36	0,10	µg/l	101%
Dichloromethane	0,77	0,05	n,a.		µg/l	
1,2-Dichloroethane	2,42	0,15	n,a		µg/l	
cis-1,2-Dichloroethene	0,204	0,015	n,a.		µg/l	
trans-1,2-Dichloroethene	<0,1		n,a.		µg/l	



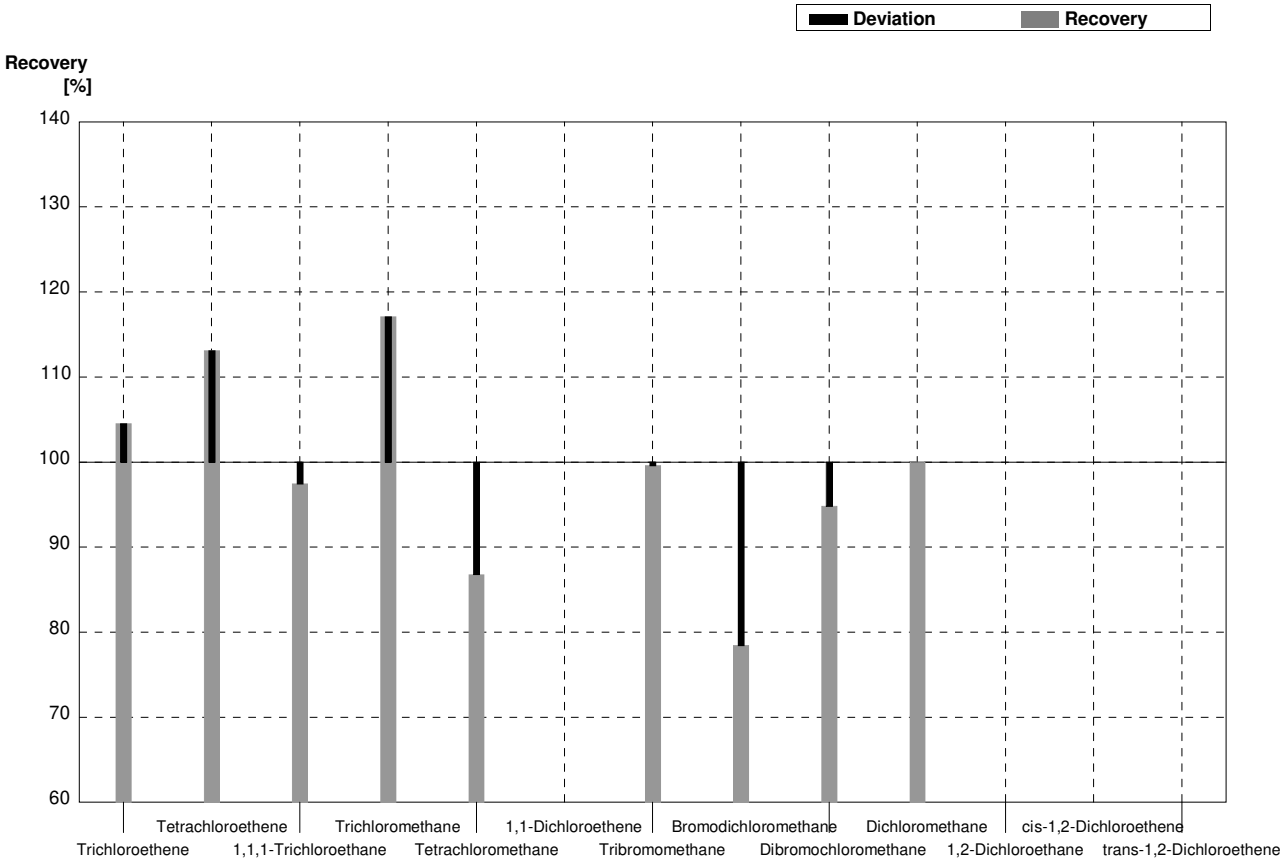
Sample C68B
Laboratory J

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	0,63	0,04	0,59	0,05	µg/l	94%
Tetrachloroethene	0,52	0,04	0,479	0,05	µg/l	92%
1,1,1-Trichloroethane	2,10	0,11	2,00	0,17	µg/l	95%
Trichloromethane	0,94	0,05	0,92	0,05	µg/l	98%
Tetrachloromethane	2,08	0,11	2,04	0,10	µg/l	98%
1,1-Dichloroethene	2,44	0,12	n,a.		µg/l	
Tribromomethane	1,26	0,07	1,27	0,10	µg/l	101%
Bromodichloromethane	1,64	0,09	1,58	0,12	µg/l	96%
Dibromochloromethane	2,52	0,13	2,41	0,15	µg/l	96%
Dichloromethane	3,74	0,19	n,a.		µg/l	
1,2-Dichloroethane	1,89	0,13	n,a.		µg/l	
cis-1,2-Dichloroethene	0,84	0,04	n,a.		µg/l	
trans-1,2-Dichloroethene	0,59	0,03	n,a.		µg/l	



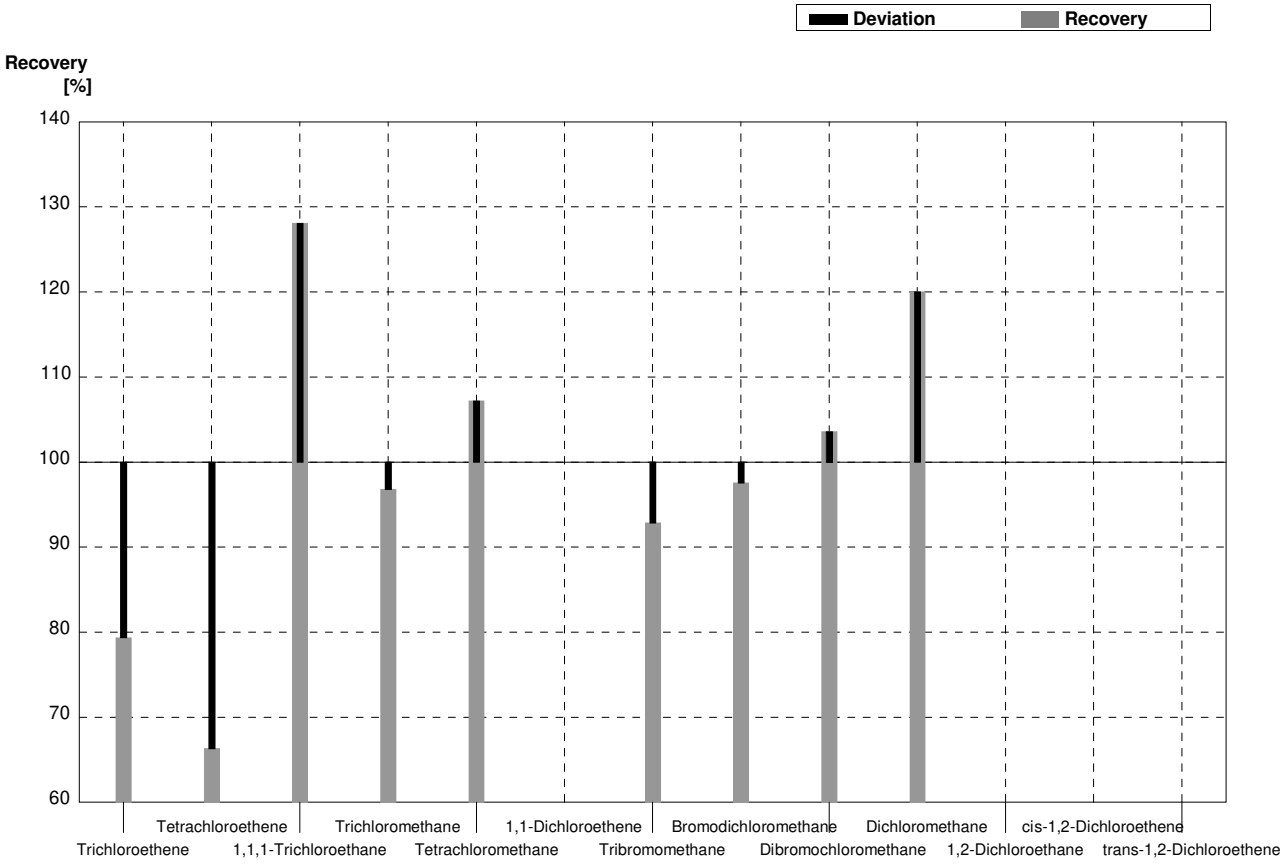
Sample C68A
Laboratory K

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	1,54	0,08	1,61	0,18	µg/l	105%
Tetrachloroethene	2,06	0,11	2,33	0,37	µg/l	113%
1,1,1-Trichloroethane	0,79	0,05	0,77	0,10	µg/l	97%
Trichloromethane	3,86	0,20	4,52	0,66	µg/l	117%
Tetrachloromethane	0,53	0,04	0,460	0,06	µg/l	87%
1,1-Dichloroethene	0,67	0,04			µg/l	
Tribromomethane	0,487	0,029	0,485	0,073	µg/l	100%
Bromodichloromethane	1,16	0,06	0,91	0,12	µg/l	78%
Dibromochloromethane	1,35	0,07	1,28	0,23	µg/l	95%
Dichloromethane	0,77	0,05	0,77	0,12	µg/l	100%
1,2-Dichloroethane	2,42	0,15			µg/l	
cis-1,2-Dichloroethene	0,204	0,015			µg/l	
trans-1,2-Dichloroethene	<0,1				µg/l	



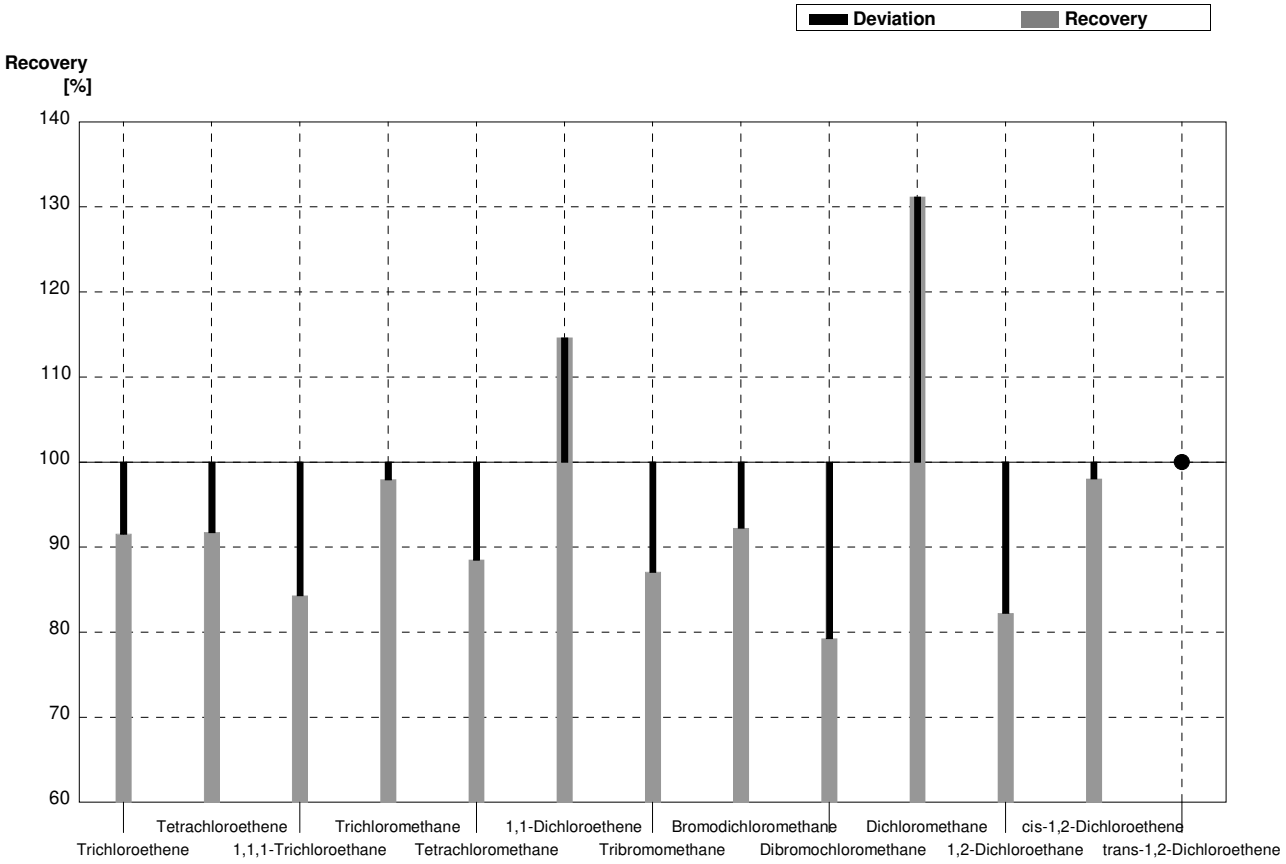
Sample C68B
Laboratory K

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	0,63	0,04	0,50	0,06	µg/l	79%
Tetrachloroethene	0,52	0,04	0,345	0,055	µg/l	66%
1,1,1-Trichloroethane	2,10	0,11	2,69	0,35	µg/l	128%
Trichloromethane	0,94	0,05	0,91	0,13	µg/l	97%
Tetrachloromethane	2,08	0,11	2,23	0,25	µg/l	107%
1,1-Dichloroethene	2,44	0,12			µg/l	
Tribromomethane	1,26	0,07	1,17	0,18	µg/l	93%
Bromodichloromethane	1,64	0,09	1,60	0,21	µg/l	98%
Dibromochloromethane	2,52	0,13	2,61	0,48	µg/l	104%
Dichloromethane	3,74	0,19	4,49	0,72	µg/l	120%
1,2-Dichloroethane	1,89	0,13			µg/l	
cis-1,2-Dichloroethene	0,84	0,04			µg/l	
trans-1,2-Dichloroethene	0,59	0,03			µg/l	



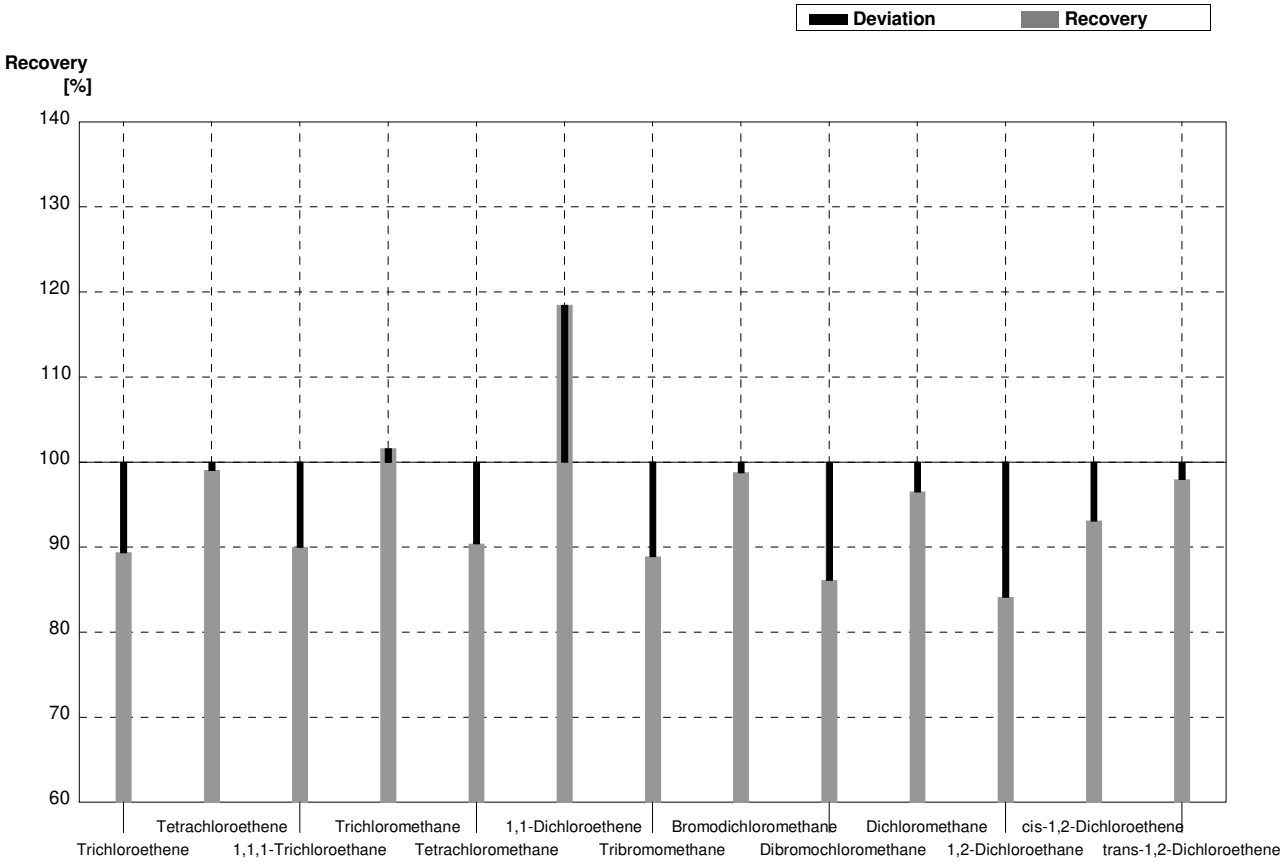
Sample C68A
Laboratory L

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	1,54	0,08	1,41	0,10	µg/l	92%
Tetrachloroethene	2,06	0,11	1,89	0,16	µg/l	92%
1,1,1-Trichloroethane	0,79	0,05	0,666	0,13	µg/l	84%
Trichloromethane	3,86	0,20	3,78	0,76	µg/l	98%
Tetrachloromethane	0,53	0,04	0,469	0,12	µg/l	88%
1,1-Dichloroethene	0,67	0,04	0,768	0,15	µg/l	115%
Tribromomethane	0,487	0,029	0,424	0,11	µg/l	87%
Bromodichloromethane	1,16	0,06	1,07	0,27	µg/l	92%
Dibromochloromethane	1,35	0,07	1,07	0,27	µg/l	79%
Dichloromethane	0,77	0,05	1,01	0,30	µg/l	131%
1,2-Dichloroethane	2,42	0,15	1,99	0,48	µg/l	82%
cis-1,2-Dichloroethene	0,204	0,015	0,200	0,037	µg/l	98%
trans-1,2-Dichloroethene	<0,1		<0,10		µg/l	•



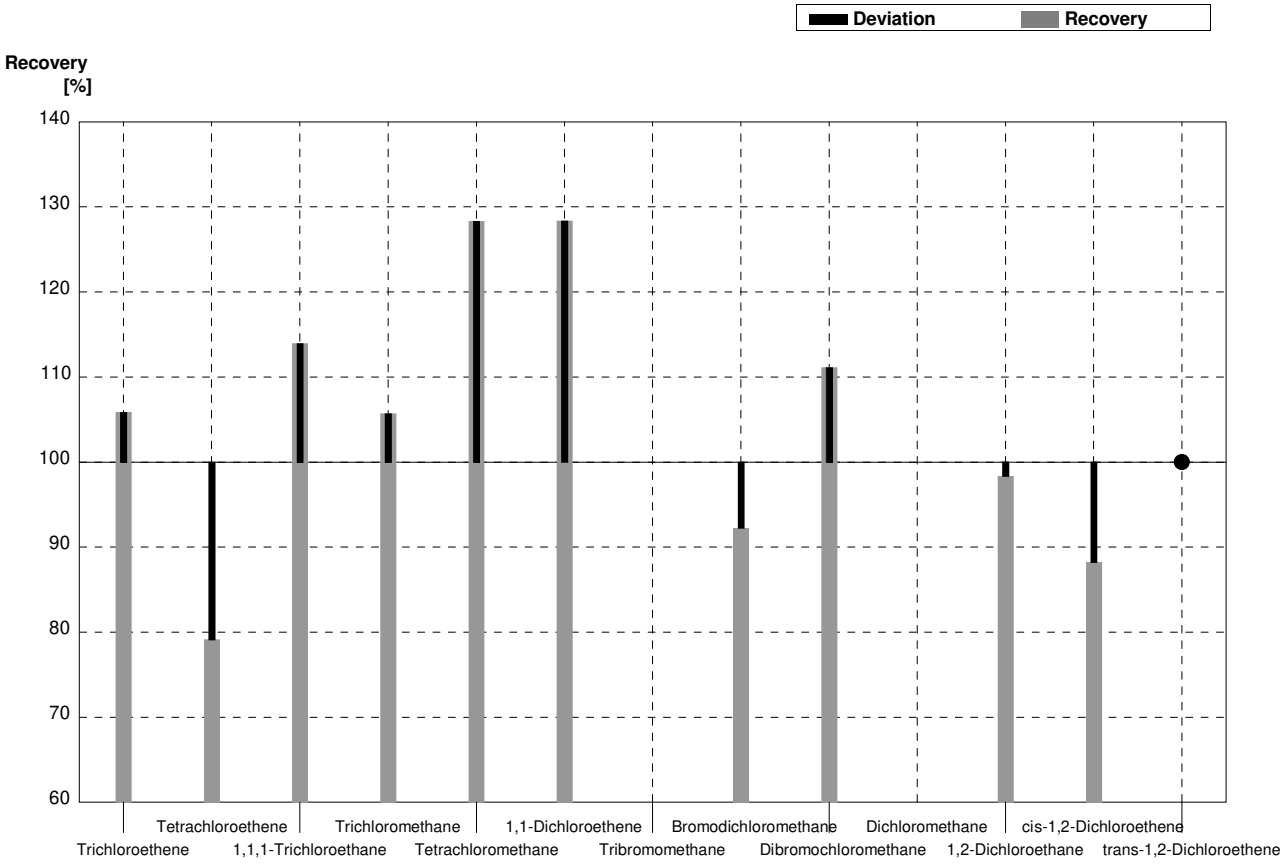
Sample C68B
Laboratory L

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	0,63	0,04	0,563	0,040	µg/l	89%
Tetrachloroethene	0,52	0,04	0,515	0,043	µg/l	99%
1,1,1-Trichloroethane	2,10	0,11	1,89	0,36	µg/l	90%
Trichloromethane	0,94	0,05	0,955	0,19	µg/l	102%
Tetrachloromethane	2,08	0,11	1,88	0,48	µg/l	90%
1,1-Dichloroethene	2,44	0,12	2,89	0,57	µg/l	118%
Tribromomethane	1,26	0,07	1,12	0,28	µg/l	89%
Bromodichloromethane	1,64	0,09	1,62	0,41	µg/l	99%
Dibromochloromethane	2,52	0,13	2,17	0,54	µg/l	86%
Dichloromethane	3,74	0,19	3,61	0,90	µg/l	97%
1,2-Dichloroethane	1,89	0,13	1,59	0,38	µg/l	84%
cis-1,2-Dichloroethene	0,84	0,04	0,782	0,14	µg/l	93%
trans-1,2-Dichloroethene	0,59	0,03	0,578	0,12	µg/l	98%



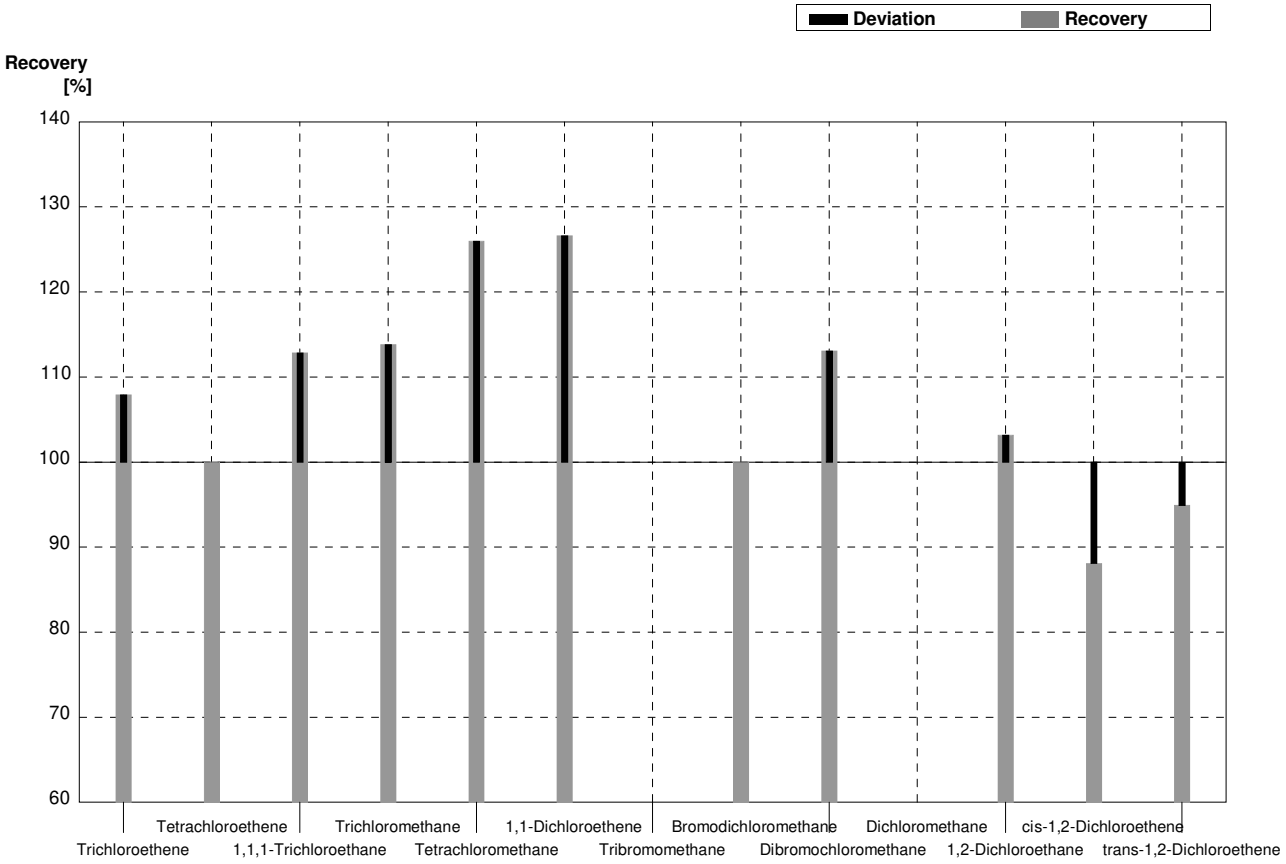
Sample C68A
Laboratory M

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	1,54	0,08	1,63	0,25	µg/l	106%
Tetrachloroethene	2,06	0,11	1,63	0,25	µg/l	79%
1,1,1-Trichloroethane	0,79	0,05	0,900	0,18	µg/l	114%
Trichloromethane	3,86	0,20	4,08	0,7	µg/l	106%
Tetrachloromethane	0,53	0,04	0,680	0,15	µg/l	128%
1,1-Dichloroethene	0,67	0,04	0,860	0,18	µg/l	128%
Tribromomethane	0,487	0,029			µg/l	
Bromodichloromethane	1,16	0,06	1,07	0,2	µg/l	92%
Dibromochloromethane	1,35	0,07	1,50	0,25	µg/l	111%
Dichloromethane	0,77	0,05			µg/l	
1,2-Dichloroethane	2,42	0,15	2,38	0,5	µg/l	98%
cis-1,2-Dichloroethene	0,204	0,015	0,180	0,04	µg/l	88%
trans-1,2-Dichloroethene	<0,1		<0,10		µg/l	•



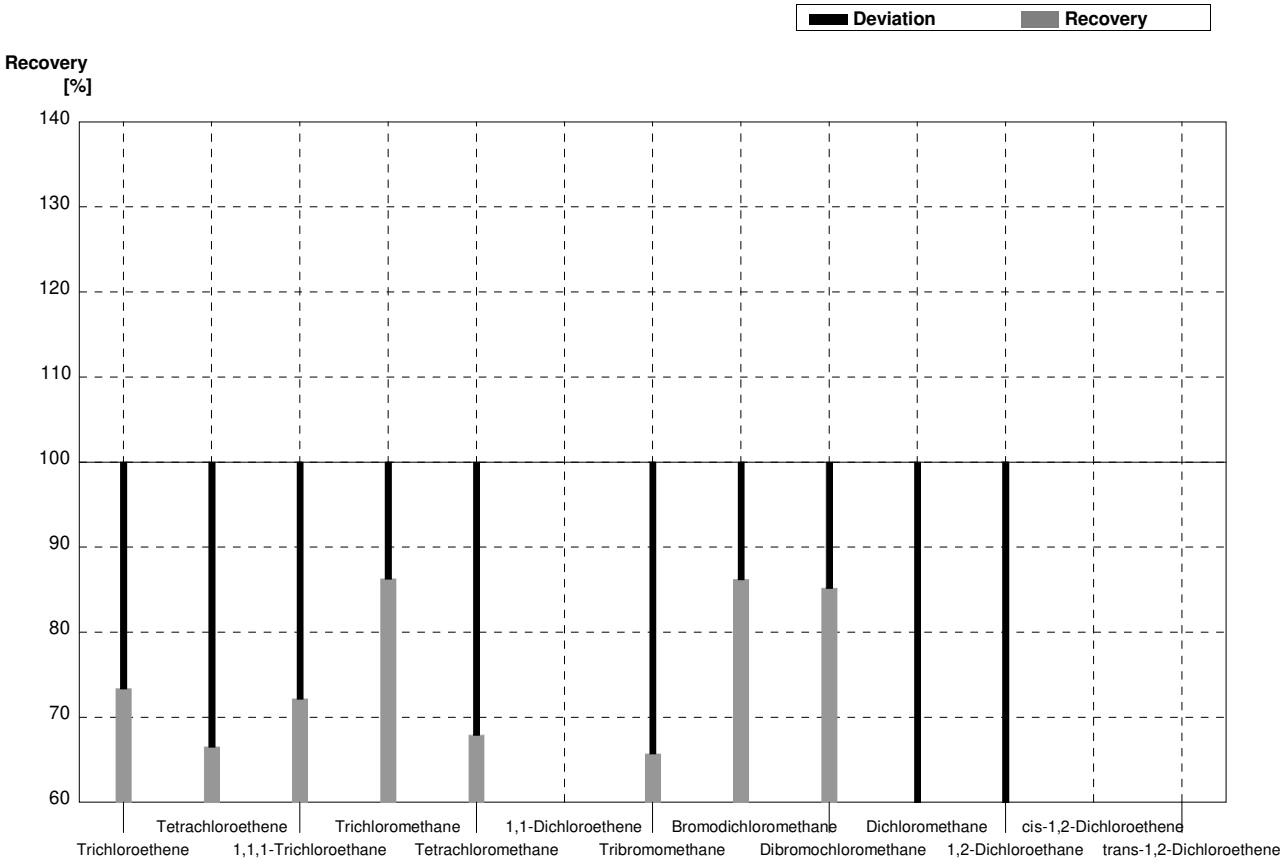
Sample **C68B**
Laboratory **M**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	0,63	0,04	0,680	0,15	µg/l	108%
Tetrachloroethene	0,52	0,04	0,520	0,11	µg/l	100%
1,1,1-Trichloroethane	2,10	0,11	2,37	0,4	µg/l	113%
Trichloromethane	0,94	0,05	1,07	0,2	µg/l	114%
Tetrachloromethane	2,08	0,11	2,62	0,5	µg/l	126%
1,1-Dichloroethene	2,44	0,12	3,09	0,6	µg/l	127%
Tribromomethane	1,26	0,07			µg/l	
Bromodichloromethane	1,64	0,09	1,64	0,25	µg/l	100%
Dibromochloromethane	2,52	0,13	2,85	0,5	µg/l	113%
Dichloromethane	3,74	0,19			µg/l	
1,2-Dichloroethane	1,89	0,13	1,95	0,4	µg/l	103%
cis-1,2-Dichloroethene	0,84	0,04	0,740	0,15	µg/l	88%
trans-1,2-Dichloroethene	0,59	0,03	0,560	0,12	µg/l	95%



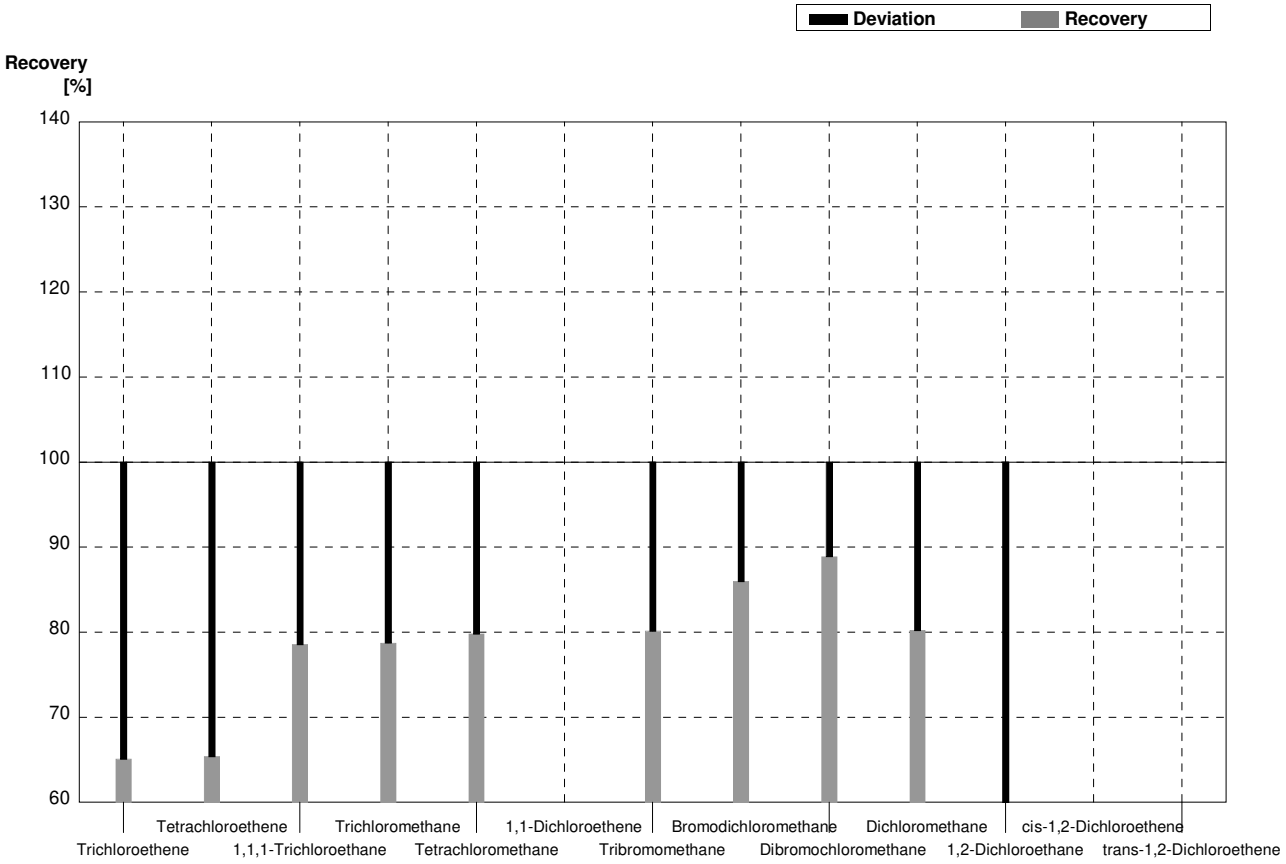
Sample C68A
Laboratory N

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	1,54	0,08	1,13	0,0631	µg/l	73%
Tetrachloroethene	2,06	0,11	1,37	0,1263	µg/l	67%
1,1,1-Trichloroethane	0,79	0,05	0,570	0,0631	µg/l	72%
Trichloromethane	3,86	0,20	3,33	0,3157	µg/l	86%
Tetrachloromethane	0,53	0,04	0,360	0,0947	µg/l	68%
1,1-Dichloroethene	0,67	0,04			µg/l	
Tribromomethane	0,487	0,029	0,320	0,0947	µg/l	66%
Bromodichloromethane	1,16	0,06	1,00	0,0947	µg/l	86%
Dibromochloromethane	1,35	0,07	1,15	0,1263	µg/l	85%
Dichloromethane	0,77	0,05	0,390	0,0631	µg/l	51%
1,2-Dichloroethane	2,42	0,15	1,42	0,0947	µg/l	59%
cis-1,2-Dichloroethene	0,204	0,015			µg/l	
trans-1,2-Dichloroethene	<0,1				µg/l	



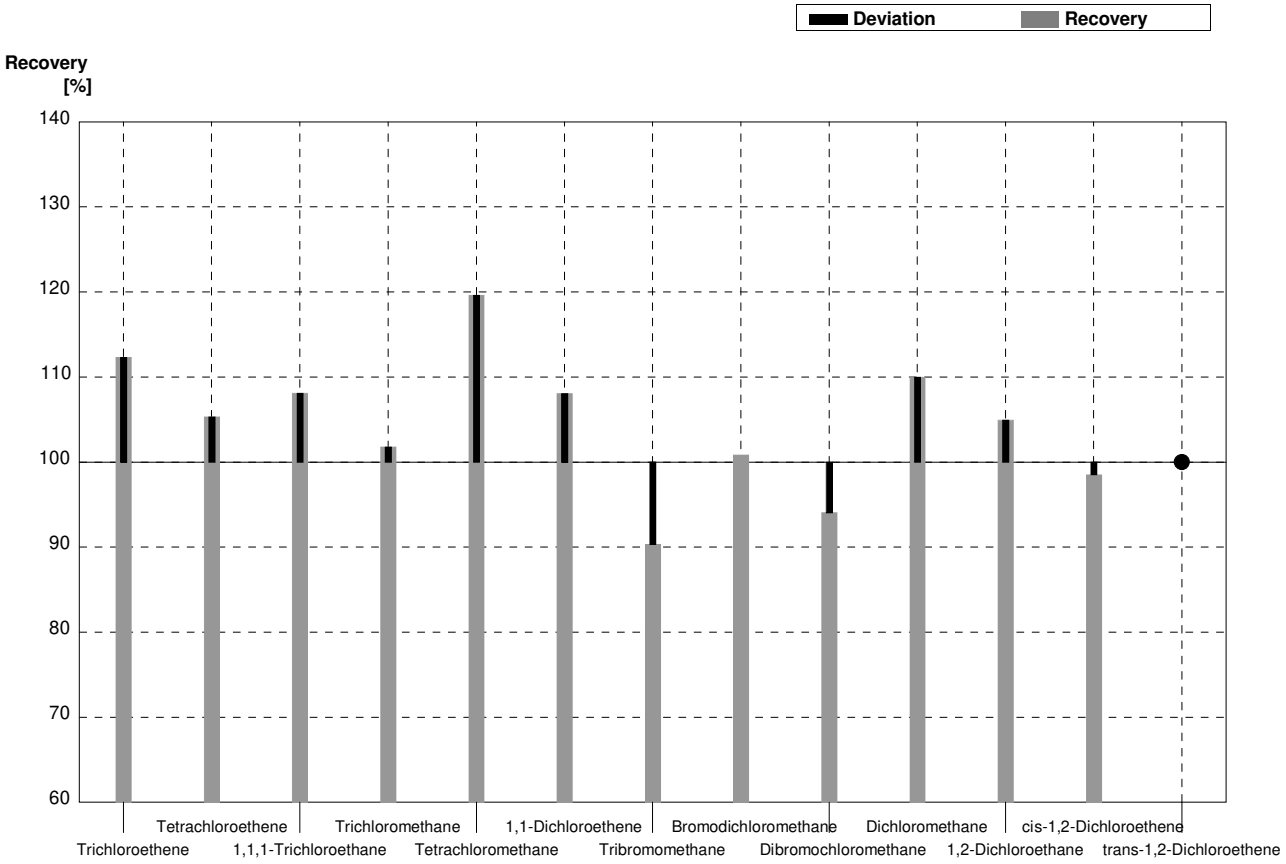
Sample C68B
Laboratory N

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	0,63	0,04	0,410	0,032	µg/l	65%
Tetrachloroethene	0,52	0,04	0,340	0,0	µg/l	65%
1,1,1-Trichloroethane	2,10	0,11	1,65	0,032	µg/l	79%
Trichloromethane	0,94	0,05	0,740	0,0	µg/l	79%
Tetrachloromethane	2,08	0,11	1,66	0,03	µg/l	80%
1,1-Dichloroethene	2,44	0,12			µg/l	
Tribromomethane	1,26	0,07	1,01	0,03	µg/l	80%
Bromodichloromethane	1,64	0,09	1,41	0,06	µg/l	86%
Dibromochloromethane	2,52	0,13	2,24	0,221	µg/l	89%
Dichloromethane	3,74	0,19	3,00	0,06	µg/l	80%
1,2-Dichloroethane	1,89	0,13	1,00	0,158	µg/l	53%
cis-1,2-Dichloroethene	0,84	0,04			µg/l	
trans-1,2-Dichloroethene	0,59	0,03			µg/l	



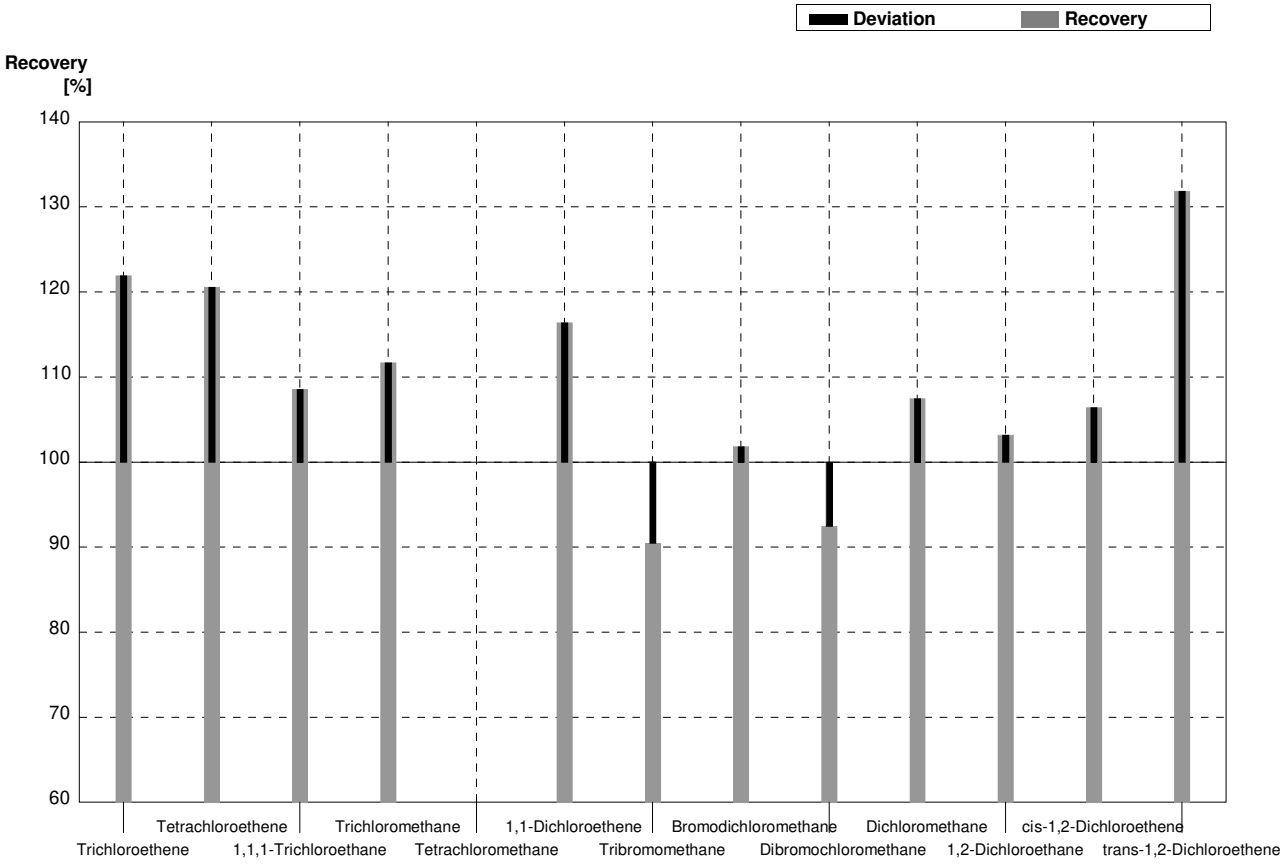
Sample **C68A**
Laboratory **O**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	1,54	0,08	1,73	0,068	µg/l	112%
Tetrachloroethene	2,06	0,11	2,17	0,055	µg/l	105%
1,1,1-Trichloroethane	0,79	0,05	0,854	0,082	µg/l	108%
Trichloromethane	3,86	0,20	3,93	0,049	µg/l	102%
Tetrachloromethane	0,53	0,04	0,634	0,188	µg/l	120%
1,1-Dichloroethene	0,67	0,04	0,724	0,104	µg/l	108%
Tribromomethane	0,487	0,029	0,440	0,067	µg/l	90%
Bromodichloromethane	1,16	0,06	1,17	0,068	µg/l	101%
Dibromochloromethane	1,35	0,07	1,27	0,046	µg/l	94%
Dichloromethane	0,77	0,05	0,847	0,098	µg/l	110%
1,2-Dichloroethane	2,42	0,15	2,54	0,089	µg/l	105%
cis-1,2-Dichloroethene	0,204	0,015	0,201	0,014	µg/l	99%
trans-1,2-Dichloroethene	<0,1		<0,050		µg/l	•



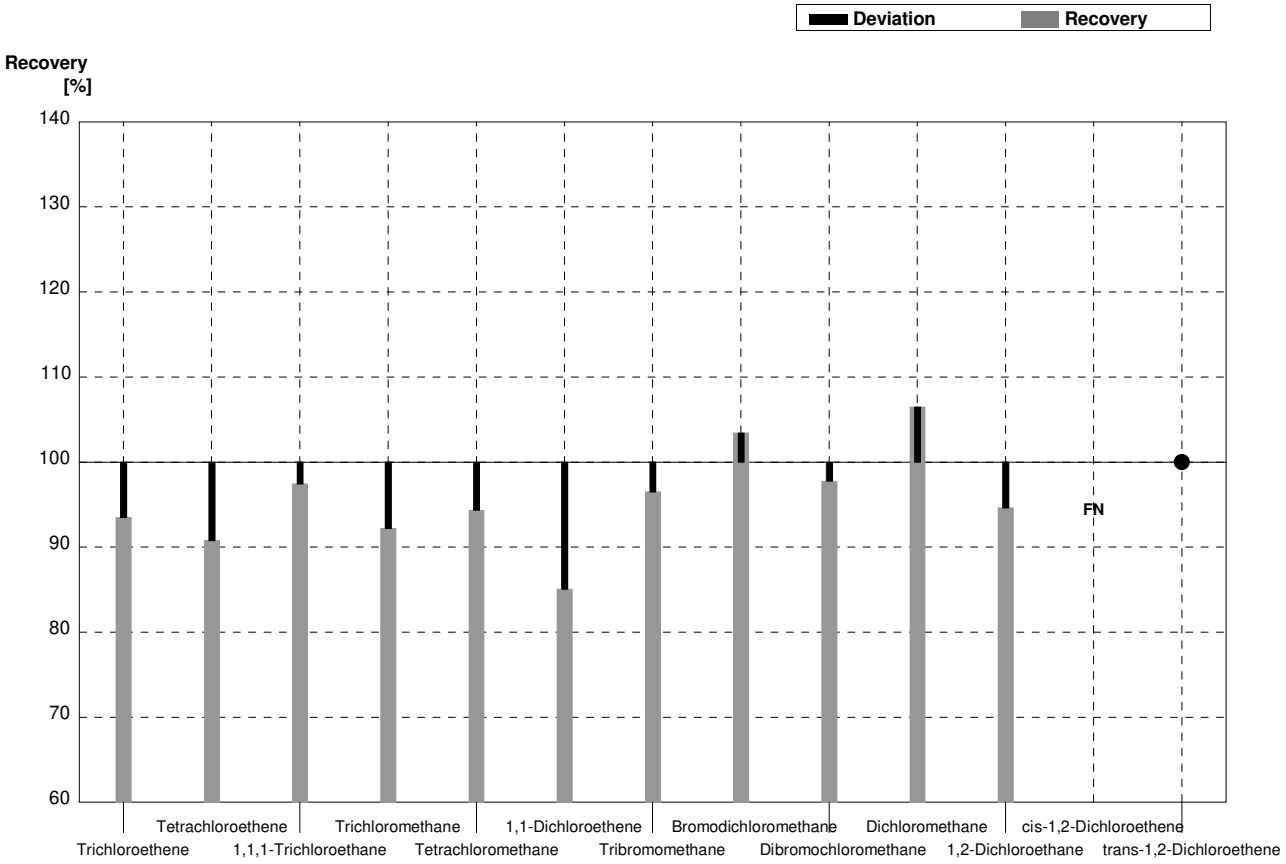
Sample **C68B**
Laboratory **O**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	0,63	0,04	0,768	0,064	µg/l	122%
Tetrachloroethene	0,52	0,04	0,627	0,062	µg/l	121%
1,1,1-Trichloroethane	2,10	0,11	2,28	0,091	µg/l	109%
Trichloromethane	0,94	0,05	1,05	0,037	µg/l	112%
Tetrachloromethane	2,08	0,11			µg/l	
1,1-Dichloroethene	2,44	0,12	2,84	0,149	µg/l	116%
Tribromomethane	1,26	0,07	1,14	0,060	µg/l	90%
Bromodichloromethane	1,64	0,09	1,67	0,067	µg/l	102%
Dibromochloromethane	2,52	0,13	2,33	0,045	µg/l	92%
Dichloromethane	3,74	0,19	4,02	0,190	µg/l	107%
1,2-Dichloroethane	1,89	0,13	1,95	0,080	µg/l	103%
cis-1,2-Dichloroethene	0,84	0,04	0,894	0,051	µg/l	106%
trans-1,2-Dichloroethene	0,59	0,03	0,778	0,059	µg/l	132%



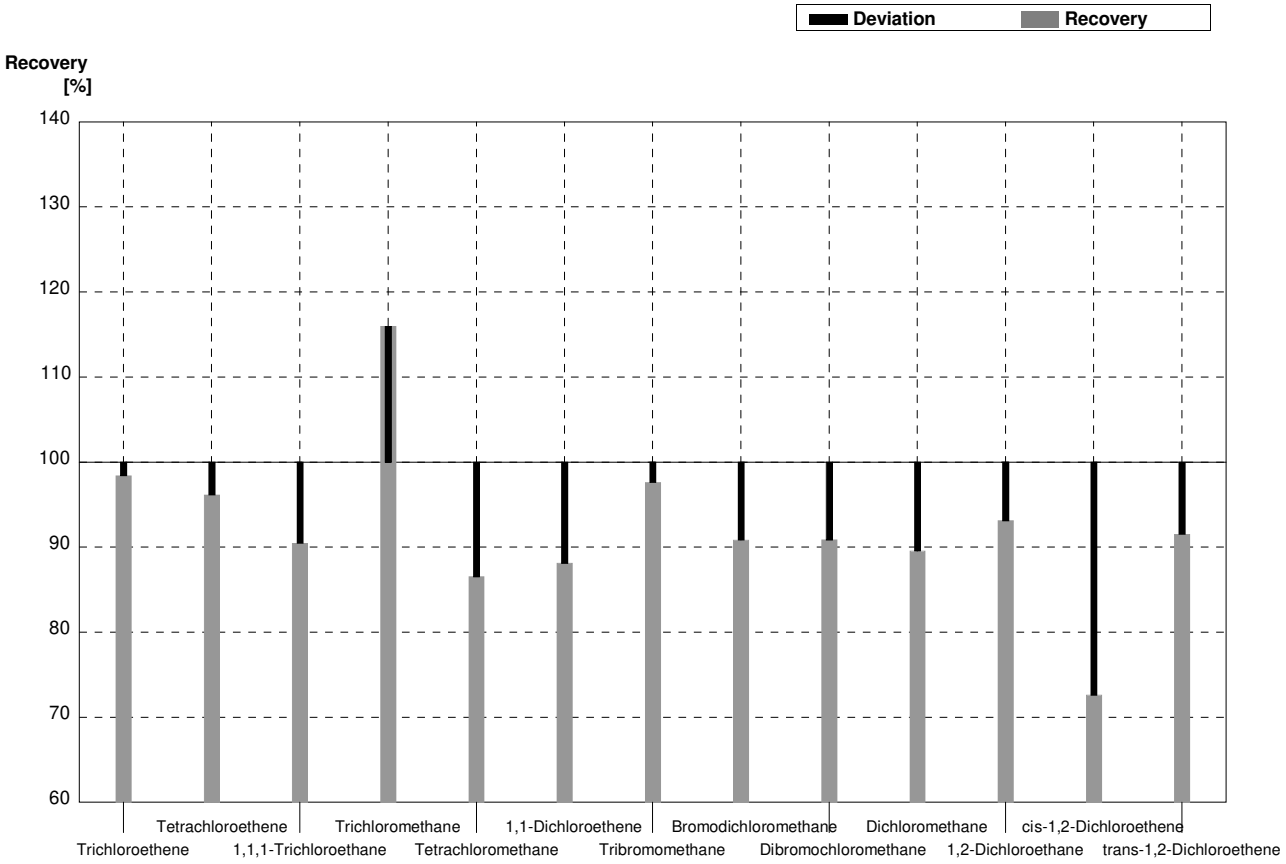
Sample C68A
Laboratory P

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	1,54	0,08	1,44	0,22	µg/l	94%
Tetrachloroethene	2,06	0,11	1,87	0,28	µg/l	91%
1,1,1-Trichloroethane	0,79	0,05	0,77	0,12	µg/l	97%
Trichloromethane	3,86	0,20	3,56	0,53	µg/l	92%
Tetrachloromethane	0,53	0,04	0,50	0,08	µg/l	94%
1,1-Dichloroethene	0,67	0,04	0,57	0,09	µg/l	85%
Tribromomethane	0,487	0,029	0,470	0,07	µg/l	97%
Bromodichloromethane	1,16	0,06	1,20	0,18	µg/l	103%
Dibromochloromethane	1,35	0,07	1,32	0,20	µg/l	98%
Dichloromethane	0,77	0,05	0,82	0,12	µg/l	106%
1,2-Dichloroethane	2,42	0,15	2,29	0,34	µg/l	95%
cis-1,2-Dichloroethene	0,204	0,015	<0,13		µg/l	FN
trans-1,2-Dichloroethene	<0,1		<0,02		µg/l	•



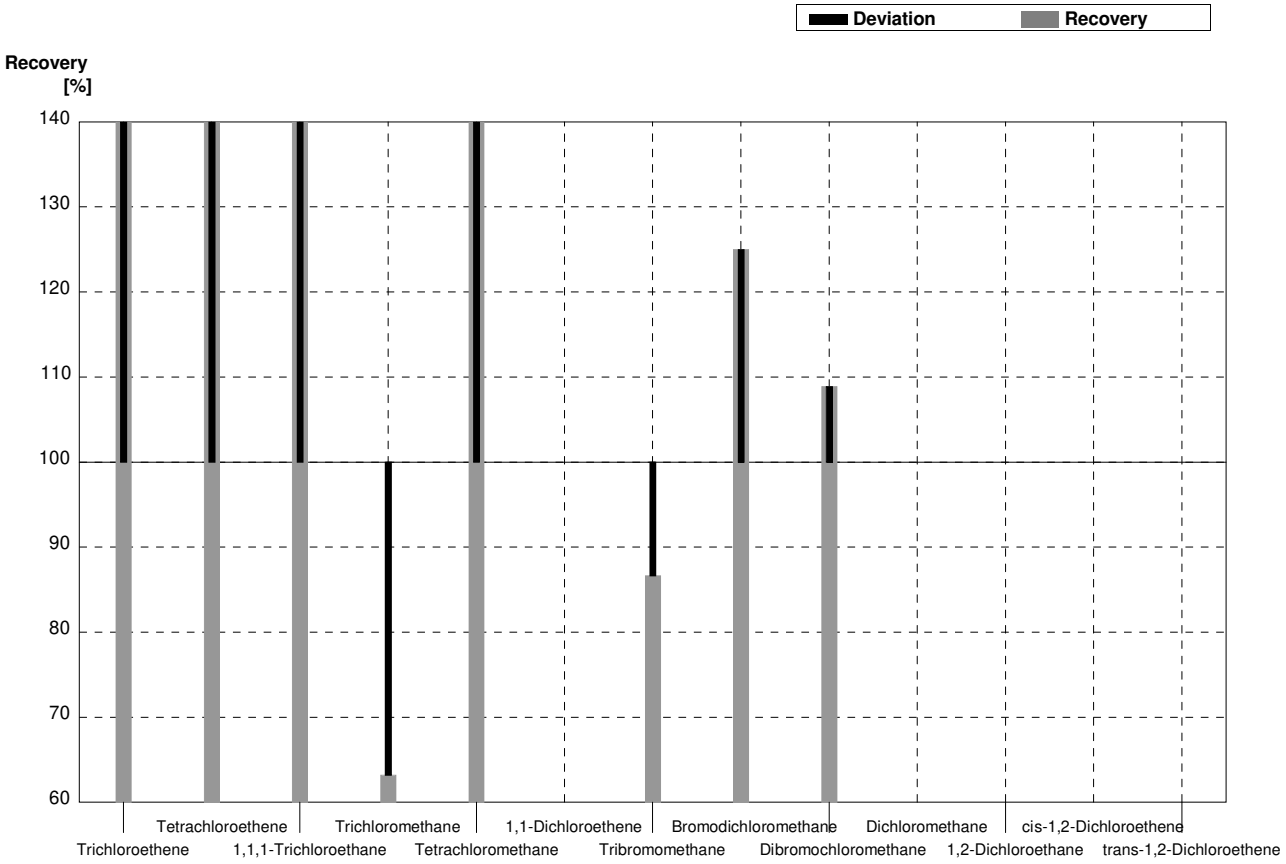
Sample C68B
Laboratory P

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	0,63	0,04	0,62	0,09	µg/l	98%
Tetrachloroethene	0,52	0,04	0,50	0,08	µg/l	96%
1,1,1-Trichloroethane	2,10	0,11	1,90	0,29	µg/l	90%
Trichloromethane	0,94	0,05	1,09	0,16	µg/l	116%
Tetrachloromethane	2,08	0,11	1,80	0,27	µg/l	87%
1,1-Dichloroethene	2,44	0,12	2,15	0,32	µg/l	88%
Tribromomethane	1,26	0,07	1,23	0,18	µg/l	98%
Bromodichloromethane	1,64	0,09	1,49	0,22	µg/l	91%
Dibromochloromethane	2,52	0,13	2,29	0,34	µg/l	91%
Dichloromethane	3,74	0,19	3,35	0,50	µg/l	90%
1,2-Dichloroethane	1,89	0,13	1,76	0,26	µg/l	93%
cis-1,2-Dichloroethene	0,84	0,04	0,61	0,09	µg/l	73%
trans-1,2-Dichloroethene	0,59	0,03	0,54	0,08	µg/l	92%



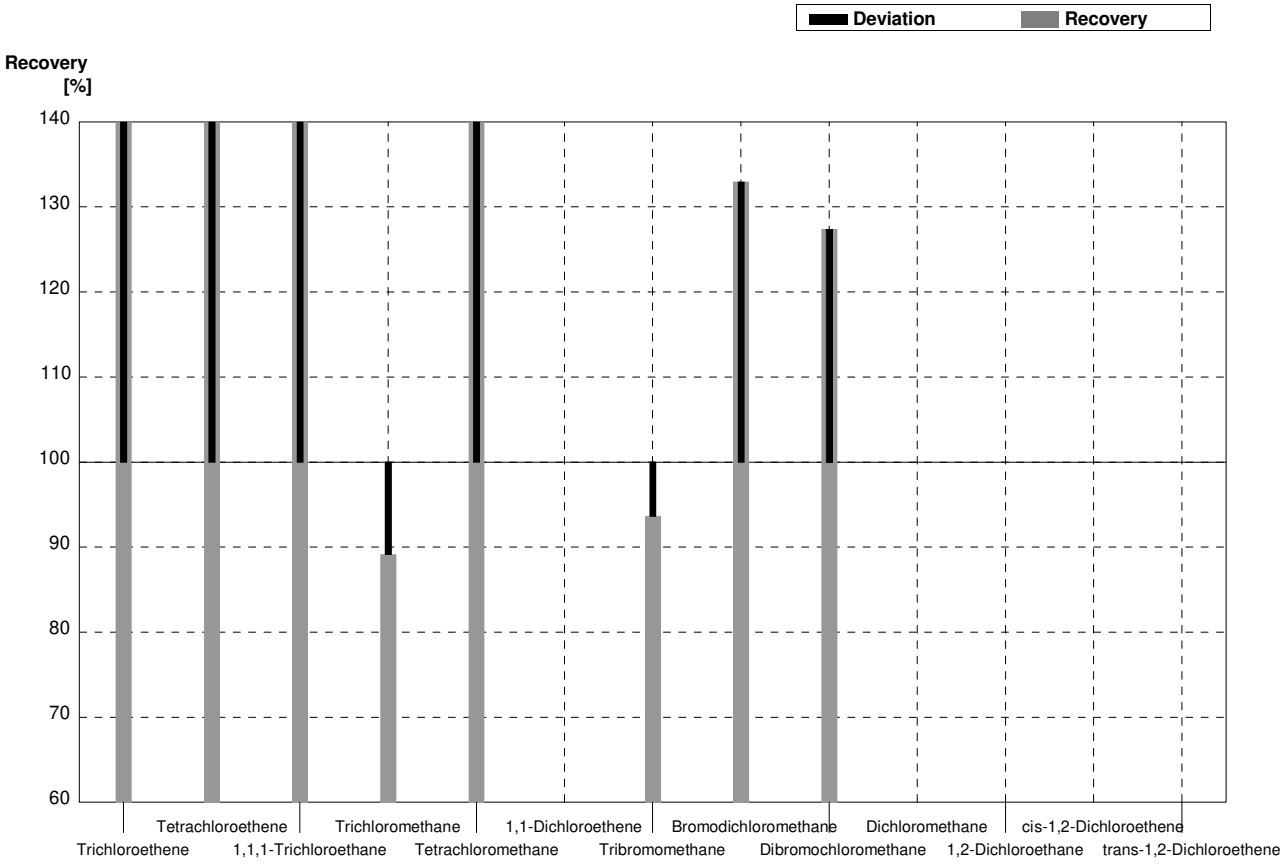
Sample **C68A**
Laboratory **Q**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	1,54	0,08	2,39		µg/l	155%
Tetrachloroethene	2,06	0,11	3,25		µg/l	158%
1,1,1-Trichloroethane	0,79	0,05	1,40		µg/l	177%
Trichloromethane	3,86	0,20	2,44		µg/l	63%
Tetrachloromethane	0,53	0,04	0,989		µg/l	187%
1,1-Dichloroethene	0,67	0,04			µg/l	
Tribromomethane	0,487	0,029	0,422		µg/l	87%
Bromodichloromethane	1,16	0,06	1,45		µg/l	125%
Dibromochloromethane	1,35	0,07	1,47		µg/l	109%
Dichloromethane	0,77	0,05			µg/l	
1,2-Dichloroethane	2,42	0,15			µg/l	
cis-1,2-Dichloroethene	0,204	0,015			µg/l	
trans-1,2-Dichloroethene	<0,1				µg/l	



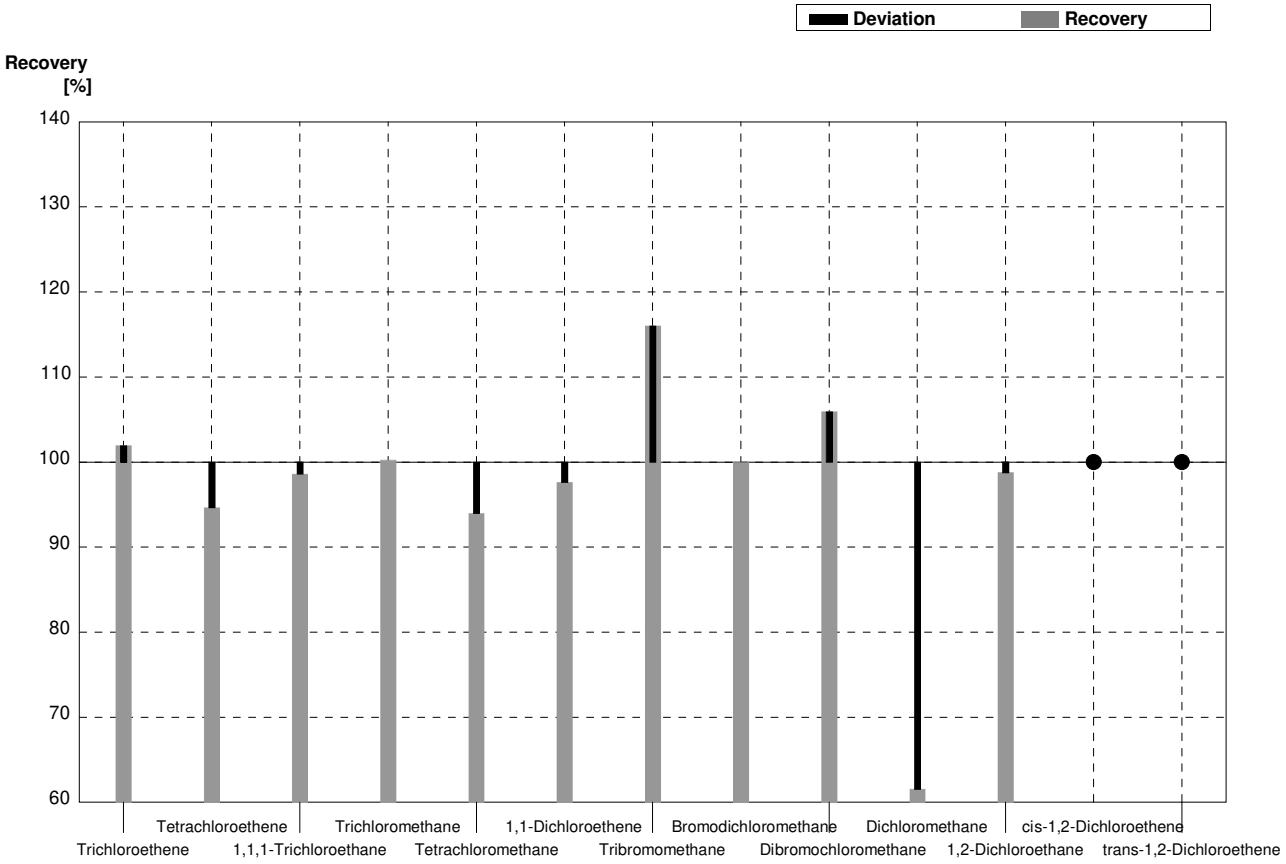
Sample **C68B**
Laboratory **Q**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	0,63	0,04	0,942		µg/l	150%
Tetrachloroethene	0,52	0,04	0,759		µg/l	146%
1,1,1-Trichloroethane	2,10	0,11	3,97		µg/l	189%
Trichloromethane	0,94	0,05	0,838		µg/l	89%
Tetrachloromethane	2,08	0,11	4,32		µg/l	208%
1,1-Dichloroethene	2,44	0,12			µg/l	
Tribromomethane	1,26	0,07	1,18		µg/l	94%
Bromodichloromethane	1,64	0,09	2,18		µg/l	133%
Dibromochloromethane	2,52	0,13	3,21		µg/l	127%
Dichloromethane	3,74	0,19			µg/l	
1,2-Dichloroethane	1,89	0,13			µg/l	
cis-1,2-Dichloroethene	0,84	0,04			µg/l	
trans-1,2-Dichloroethene	0,59	0,03			µg/l	



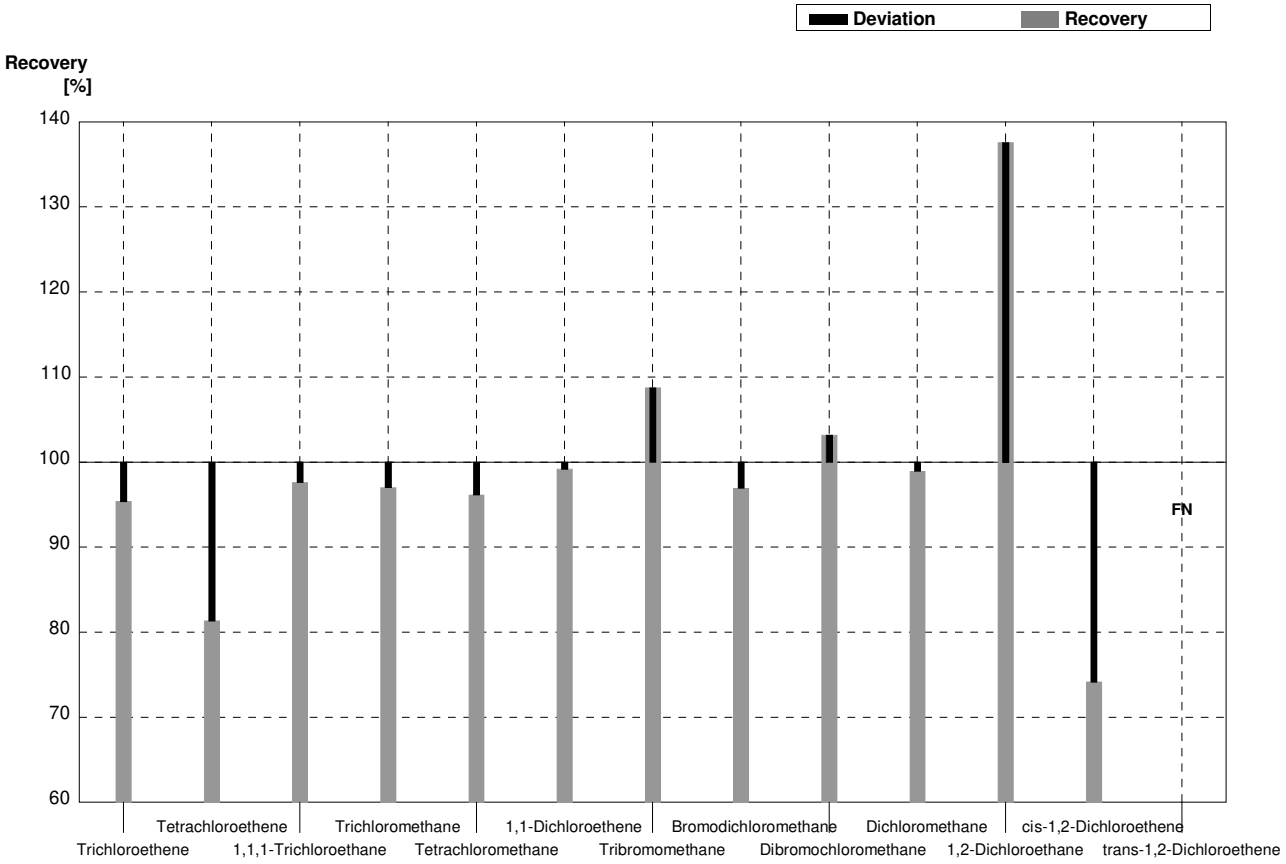
Sample **C68A**
Laboratory **R**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	1,54	0,08	1,57	0,24	µg/l	102%
Tetrachloroethene	2,06	0,11	1,95	0,29	µg/l	95%
1,1,1-Trichloroethane	0,79	0,05	0,779	0,117	µg/l	99%
Trichloromethane	3,86	0,20	3,87	0,580	µg/l	100%
Tetrachloromethane	0,53	0,04	0,498	0,075	µg/l	94%
1,1-Dichloroethene	0,67	0,04	0,654	0,098	µg/l	98%
Tribromomethane	0,487	0,029	0,565	0,085	µg/l	116%
Bromodichloromethane	1,16	0,06	1,16	0,17	µg/l	100%
Dibromochloromethane	1,35	0,07	1,43	0,21	µg/l	106%
Dichloromethane	0,77	0,05	0,474	0,071	µg/l	62%
1,2-Dichloroethane	2,42	0,15	2,39	0,36	µg/l	99%
cis-1,2-Dichloroethene	0,204	0,015	<0,5		µg/l	•
trans-1,2-Dichloroethene	<0,1		<0,5		µg/l	•



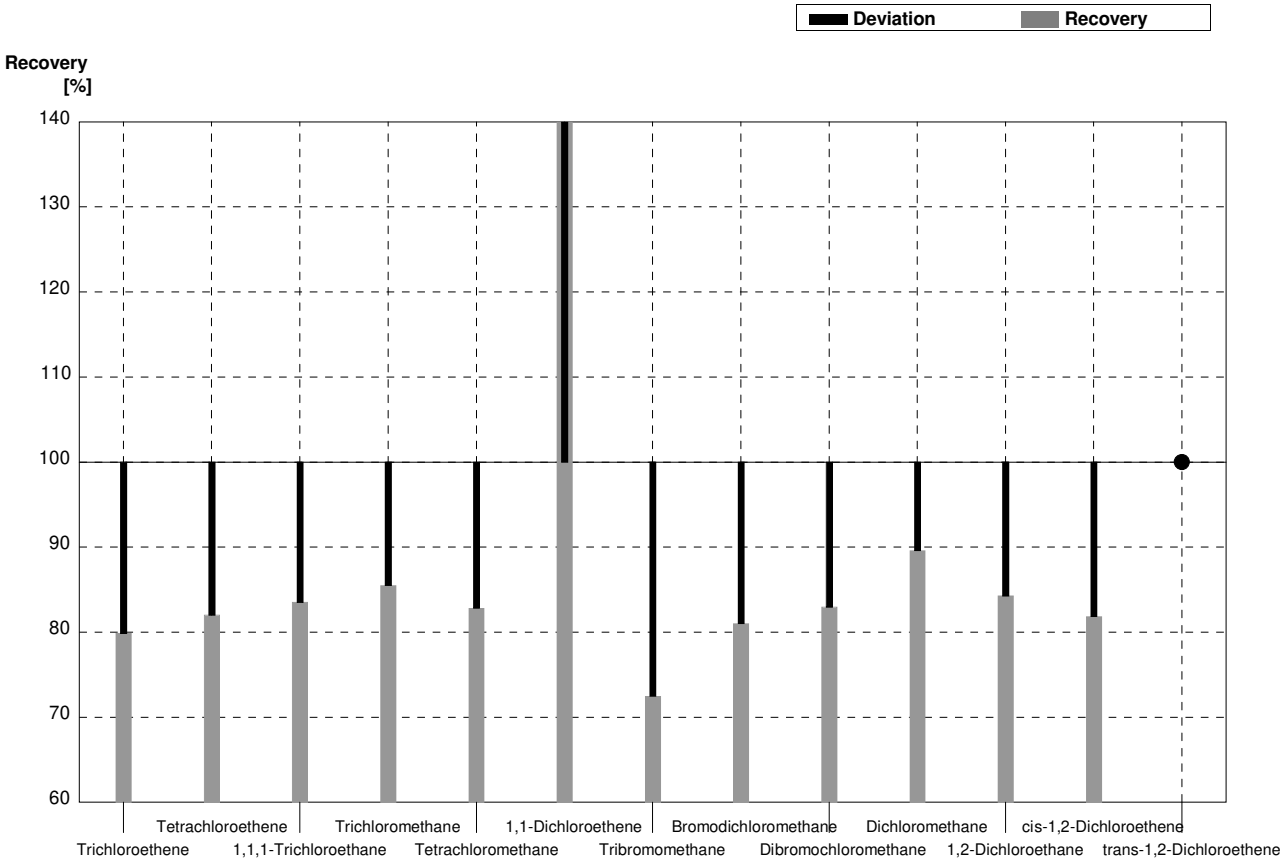
Sample **C68B**
Laboratory **R**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	0,63	0,04	0,601	0,090	µg/l	95%
Tetrachloroethene	0,52	0,04	0,423	0,063	µg/l	81%
1,1,1-Trichloroethane	2,10	0,11	2,05	0,31	µg/l	98%
Trichloromethane	0,94	0,05	0,912	0,136	µg/l	97%
Tetrachloromethane	2,08	0,11	2,00	0,29	µg/l	96%
1,1-Dichloroethene	2,44	0,12	2,42	0,36	µg/l	99%
Tribromomethane	1,26	0,07	1,37	0,206	µg/l	109%
Bromodichloromethane	1,64	0,09	1,59	0,24	µg/l	97%
Dibromochloromethane	2,52	0,13	2,60	0,39	µg/l	103%
Dichloromethane	3,74	0,19	3,70	0,55	µg/l	99%
1,2-Dichloroethane	1,89	0,13	2,60	0,39	µg/l	138%
cis-1,2-Dichloroethene	0,84	0,04	0,623	0,093	µg/l	74%
trans-1,2-Dichloroethene	0,59	0,03	<0,5		µg/l	FN



Sample **C68A**
Laboratory **S**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	1,54	0,08	1,23	0,3	µg/l	80%
Tetrachloroethene	2,06	0,11	1,69	0,4	µg/l	82%
1,1,1-Trichloroethane	0,79	0,05	0,66	0,2	µg/l	84%
Trichloromethane	3,86	0,20	3,30	0,8	µg/l	85%
Tetrachloromethane	0,53	0,04	0,439	0,1	µg/l	83%
1,1-Dichloroethene	0,67	0,04	1,07	0,3	µg/l	160%
Tribromomethane	0,487	0,029	0,353	0,09	µg/l	72%
Bromodichloromethane	1,16	0,06	0,94	0,2	µg/l	81%
Dibromochloromethane	1,35	0,07	1,12	0,3	µg/l	83%
Dichloromethane	0,77	0,05	0,69	0,2	µg/l	90%
1,2-Dichloroethane	2,42	0,15	2,04	0,5	µg/l	84%
cis-1,2-Dichloroethene	0,204	0,015	0,167	0,04	µg/l	82%
trans-1,2-Dichloroethene	<0,1		<0,05	0,01	µg/l	•



Sample **C68B**
Laboratory **S**

Parameter	Target value	± U (k=2)	Result	±	Unit	Recovery
Trichloroethene	0,63	0,04	0,52	0,1	µg/l	83%
Tetrachloroethene	0,52	0,04	0,426	0,1	µg/l	82%
1,1,1-Trichloroethane	2,10	0,11	1,76	0,4	µg/l	84%
Trichloromethane	0,94	0,05	0,79	0,2	µg/l	84%
Tetrachloromethane	2,08	0,11	1,68	0,4	µg/l	81%
1,1-Dichloroethene	2,44	0,12	3,28	0,8	µg/l	134%
Tribromomethane	1,26	0,07	1,00	0,2	µg/l	79%
Bromodichloromethane	1,64	0,09	1,35	0,3	µg/l	82%
Dibromochloromethane	2,52	0,13	2,00	0,5	µg/l	79%
Dichloromethane	3,74	0,19	3,23	0,8	µg/l	86%
1,2-Dichloroethane	1,89	0,13	1,55	0,4	µg/l	82%
cis-1,2-Dichloroethene	0,84	0,04	0,68	0,2	µg/l	81%
trans-1,2-Dichloroethene	0,59	0,03	0,500	0,1	µg/l	85%