

IEG Case Study Summary

Selected Case Studies Using Groundwater Circulation Wells and other IEG Technologies:

No.	Location	Date Start	Date End	Type of System	Lithology	Groundwater Depth (m)	Gradient (%)	Groundwater Velocity	Horizontal Hydraulic Conductivity (m/s)	Depth of Well (m)	Area of Contamination (m ²)
1	Almelo/Netherlands	Aug-02	Ongoing	2 GCW	Medium/fine sand	3	0.001	0.02 m/day	5×10^{-5}	37	50,000
2	Osnabruck/Germany	Jun-99	Ongoing	3 GCW	Fine sand	1.5-2	0.002	1 cm/day	1×10^{-5}	13	1,500
3	Bydgoszcz/Poland	Jul-01	Jul-01	2 GCW 400 Stacked cells	Sand/gravel	15	0.001	0.04 m/day	1×10^{-4}	45	25,000
4	Magdeburg/Germany	Apr-98	Jun-03	1 GCW 3 CGS-Sparge	Medium/coarse sand silty sand	2.5	0.001	1 m/day	2×10^{-3}	9	10,000
5	Freiburg/Germany	Feb-96	Dec-97	1 SZB/GCW 2 peripheral wells	Sand/gravel	12.5-13.5	0.001	2.3 m/day	1×10^{-3}	20	500
6	Hamburg/Germany	Jun-96	Jun-03	1 GCW	Medium/fine sand	2.5	0.0002	0.6 cm/day	1×10^{-5}	7.5	1,000
7	Ludwigsburg/Germany	Mar-95	May-02	4 SAC/CGS-Sparge 6 aeration wells	Fractured claystone	10	3.6	2.2 m/day	1×10^{-6}	15	1000
8	Neckartenzlingen/Germany	Mar-95	Jul-97	3 CGS-Sparge 6 aeration wells	Silty sand/gravel	2	0.025	0.3 m/day	3×10^{-5}	7	400
9	Karlsruhe/Germany	Jul-94	Nov-96	1 SZB/GCW 2 peripheral wells	Medium/coarse sand Sand/gravel	06-Aug	0.001	0.4 m/day	8×10^{-4}	14	11,000
10	Belrin-Kladow/Germany	Nov-92	May-96	2 VVW reverse 2 SAC/CGS-Sparge	Silty sand	20	0.02 0.01	90 m/year	3×10^{-4}	47	5,000
11	Diepholz/Germany	Dec-91	Sep-97	2 VVW 400 standard 15 CGS-Sparge	Fine sand with silty layers Organic rich layers	1.5-3	0.002	2 cm/day	1×10^{-5}	11	3,000
12	Berlin-Alexandercaeserne/Germany	Mar-90	Apr-94	2 VVW 400 reverse	Medium/fine sand Sand/gravel with silty layers Organic rich layers	4	0.08	1.1 m/day	3.1×10^{-3}	11	10,000

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No.	Location	Start Concentration	End Concentration	Contaminant Removal	Consultant	Client	Remarks	Total Costs (£)	Comments
1	Almelo/Netherlands	20 mg/l 10 mg/l	<2 mg/l <1.5 mg/l	> 900 kg	Environ	Confidential	Still operational	266,000	
2	Osnabruck/Germany	3 mg/l 1.5 mg/l	<100 ug/l	80 kg	GfS mbH	Elastogran BASF Group	Still operational	175,000	
3	Bydgoszcz/Poland	10/mg/l	<50 ug/l	300 kg	ERM	Confidential	Work completed	77,000	Equipment only
4	Magdeburg/Germany	679/mg/l	<10 ug/l	18,000 kg GCW 973 kg CGS-Sparge	GfS mbH	Staatshochbauamt Magdeburg	Work completed	364,000	
5	Freiburg/Germany	2.35/mg/l	<20 ug/l	1,200 kg	GfS mbH	Deutsche Bundesbahn	Remediation closed	98,000	
6	Hamburg/Germany	18 mg/l 13 mg/l 1 mg/l	<20 ug/l	150 kg	GfS mbH Tewico	Beiersdorf AG	Remediation closed	182,000	
7	Ludwigsburg/Germany	20 mg/l 25 mg/l >50 gr/m ³ (soil)	<50 ug/l <150 ug/l	2.5 tonnes in soil >500 kg in groundwater 10 tonnes in situ	GfS mbH Sakosta	Shell	Remediation closed	259,000	
8	Neckartenzlingen/Germany	2.3 mg/l 1.4 mg/l	<1 ug/l <10 ug/l	124 kg BTEX 373 kg TPH 300 kg in situ	GfS mbH	BP	Remediation closed	63,000	
9	Karlsruhe/Germany	1,574 mg/kg 18,000 mg/kg 6600 ug/l	<500 mg/kg TPH 59 mg/kg TPH <1000 ug/l TPH	1.3 tonnes in soil 50 kg in groundwater 10.3 tonnes in situ	IEG Technologie GmbH	Amt fur Verteidigungslasten	Pilot study	280,000	Full scale pilot test
10	Belrin-Kladow/Germany	4 mg/l >11 gr/m ³ (soil)	<30 ug/l	1,260 kg	GfS mbH	Senat Berlin	Remediation closed	182,000	
11	Diepholz/Germany	264 mg/l >1 gr/m ³ (soil)	<50 ug/l	235 kg 212 kg	GfS mbH TUV Nord	Elastogran	Remediation closed	210,000	
12	Berlin-Alexandercaeserne/Germany	280 mg/l 1/mg/l	<5 ug/l <10 ug/l	9,000 kg	GfS mbH	Bundesbauamt Berlin	Remediation closed	280,000	