



Plano de Monitorização para a Hidrogeologia

novembro 2013 – outubro 2014

IMA 64.14-12/02.13

DEZEMBRO 2014



Plano de Monitorização para a Hidrogeologia – United Resins

novembro 2013 – outubro 2014

Relatório elaborado para
UNITED RESINS – Produção de Resinas, S.A.
Rua Acácias Lote 126, Gala-São Pedro
3090-380 Figueira da Foz

IMA 64.14-12/02.13

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Ficha técnica

Designação do Projeto: Plano de Monitorização para a Hidrogeologia
novembro 2013 – outubro 2014

Cliente: UNITED RESINS – Produção de Resinas, S.A.
Rua Acácias Lote 126, Gala - São Pedro
3090-380 Figueira da Foz

Sector Operacional: Laboratório

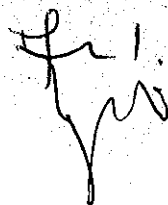
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1. Introdução

1.1 Considerações Gerais

O presente relatório de monitorização da componente de hidrogeologia, do projeto da “Unidade industrial United Resins – Produção de Resinas, S.A.”, foi elaborado na sequência da Declaração de Impacte Ambiental (DIA) e tendo em conta os planos de monitorização propostos no respetivo Relatório de Conformidade Ambiental do Projeto de Execução (RECAPE).

O plano de monitorização da água subterrânea no perímetro industrial da United Resins–Produção de Resinas, S.A., tem como principais objetivos:

- monitorizar as variações da qualidade da água subterrânea ao longo do tempo;
- identificar as tendências de variação natural da composição química da água;
- providenciar com a devida antecedência sinais que permitam identificar potenciais contaminações;
- providenciar dados hidroquímicos suficientes para permitir estabelecer relações de causa - efeito.

1.2 Âmbito do Relatório da Monitorização

O presente relatório regista o desenvolvimento ao longo de um ano do programa de monitorização. Neste contexto, o presente documento apresenta a descrição dos trabalhos desenvolvidos no período decorrente entre novembro 2013 e outubro de 2014. Os níveis de concentração de cada parâmetro apresentados neste relatório correspondem ao período compreendido entre a data do início da monitorização e a data do resultado mais atual disponível aquando da realização deste relatório.

1.3 Enquadramento Legal

Atualmente, o regime jurídico de Avaliação de Impacte Ambiental (AIA) encontra-se instituído pelo Decreto-Lei nº 197/2005, de 8 de novembro, o qual introduz alterações ao Decreto-Lei nº 69/2000, de 3 de maio, que esclarecem o âmbito da aplicação do diploma procedendo à sua republicação.

Nos termos do Anexo (nº 3, art.º 1 e n.º 6, Anexo I) do Decreto-Lei nº 197/2005, de 8 de novembro, as instalações químicas integradas, nomeadamente para o fabrico de produtos químicos orgânicos de base e produtos químicos inorgânicos de base, estão sujeitas a AIA.

A Portaria nº 330/2001, de 2 de abril (prevista pelo Decreto Lei nº 69/2000, de 3 de maio) regulamenta as normas relativas ao EIA, à proposta de definição do âmbito do EIA e ao conselho executivo de AIA, estipulando no seu Anexo V, a estrutura a adotar para a elaboração do relatório de monitorização

1.4 Apresentação da Estrutura do Relatório

O presente Relatório de Monitorização (RM) segue o definido no Anexo V da Portaria nº 330/2001 de 2 de abril, e encontra-se dividido nos seguintes capítulos:

1. Introdução;
2. Antecedentes;
3. Descrição do programa de monitorização;

4. Resultados do programa de monitorização;
5. Conclusões.

1.5 Autoria Técnica do Relatório

Este RM foi elaborado pelo Instituto do Ambiente e Desenvolvimento (IDAD). No Quadro 1.1 apresenta-se a composição da equipa técnica, responsável pela elaboração do RM.

Quadro 1.1 – Equipa técnica do RM.

Nome	Qualificações
Maria Teresa Condesso de Melo	Doutora em Geociências, CVRM, IST, UTL
Miguel Coutinho	Doutor em Ciências Aplicadas ao Ambiente, IDAD
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2. Antecedentes

2.1 Considerações Gerais

O Estudo de Impacte Ambiental (EIA) do Projeto de Ampliação da Unidade Industrial United Resins – Produção de Resinas, S.A. localizada no Parque Industrial e Empresarial da Figueira da Foz foi desenvolvido em conformidade com a legislação em vigor, tendo no entanto em atenção as especificações do projeto, as características da área de implantação do mesmo, bem como as recomendações e comentários referidos pelas diversas entidades consultadas e pela Comissão de Avaliação que analisou a Proposta de Definição do Âmbito (PDA).

Procedeu-se à avaliação da qualidade da água subterrânea tendo por base os resultados das determinações físico-químicas realizadas em uma amostra de água subterrânea recolhida no furo de captação LRS1 localizado no interior do perímetro fabril.

Em face da avaliação dos impactes ambientais, foi proposto um plano de monitorização de desempenho ambiental, com o objetivo de possibilitar a deteção de eventuais problemas ambientais associados ao funcionamento da unidade industrial.

Posteriormente, na sequência do Parecer Final da Comissão de Avaliação (CA), das Conclusões da Consulta Pública e a Proposta da Autoridade de Avaliação de Impacte Ambiental (AIA) relativo ao Procedimento de AIA em questão, foi emitida a Declaração de Impacte Ambiental (DIA) favorável condicionada, à concretização dos planos de monitorização.

Conforme apresentado no RECAPE, o plano de monitorização para a Hidrogeologia inclui a monitorização ao nível da quantidade e qualidade da água subterrânea no furo de captação (LRS1) e dois piezómetros (PZ1 e PZ2) no sistema aquífero Leirosa Monte Real e ao nível da bacia de águas pluviais.

2.1.1 Quantidade de Água

i) Parâmetros a monitorizar

- no campo: profundidade do nível freático (NHE).

ii) Frequência de amostragem

A frequência de amostragem deverá ser semestral (Abril e Setembro).

iii) Rede de monitorização

Os pontos de monitorização deveriam ser o furo de captação de água subterrânea (LRS1) e os dois piezómetros localizados no perímetro da Unidade Industrial United Resins – Produção de Resinas, S.A. No entanto, no furo (LRS1) essa medição não foi possível por se encontrar completamente selado.

iv) Periodicidade dos relatórios de monitorização

Os relatórios de monitorização, os quais devem obedecer ao disposto no Anexo V da Portaria n.º 330/2001, de 2 de abril, devem ser apresentados anualmente à autoridade de AIA.

2.1.2 Qualidade de Água

i) Parâmetros a monitorizar

- no campo: pH, temperatura (T), condutividade eléctrica (CE);
- em laboratório (compostos inorgânicos e orgânicos): cloretos (Cl), nitratos (NO₃), nitritos (NO₂), sulfatos (SO₄), mercúrio (Hg), arsénio (As), cádmio (Cd), chumbo (Pb), azoto amoniacal (NH₄), carência química de oxigénio (CQO), hidrocarbonetos de petróleo totais (TPH) e compostos orgânicos aromáticos (COA).

ii) Frequência de amostragem

A frequência de amostragem no furo deverá ser semestral (Abril e Setembro) e na bacia de águas pluviais, deverá ser bi-mensal durante os meses mais chuvosos (Outubro a Abril).

iii) Métodos Analíticos

Os métodos analíticos deverão estar de acordo com as especificações para a análise dos parâmetros indicadas no Decreto-Lei n.º 236/98, de 1 de agosto.

As análises dos controlos de rotina e de inspeção deverão ser efetuadas em laboratórios que garantam a qualidade dos respetivos resultados analíticos e que sejam supervisionados regularmente pela autoridade competente ou por uma entidade independente em que esta delegue, enquanto não tiver meios próprios.

iv) Rede de monitorização

Os pontos de monitorização são o furo de captação de água subterrânea (LRS1), os dois piezómetros e a bacia de águas pluviais, todos eles localizados no perímetro da Unidade Industrial United Resins – Produção de Resinas, S.A.

v) Periodicidade dos relatórios de monitorização

Os relatórios de monitorização, os quais devem obedecer ao disposto no Anexo V da Portaria n.º 330/2001, de 2 de abril, devem ser apresentados semestralmente à autoridade de AIA.

2.2 Reclamações relativas ao fator ambiental objeto de monitorização

A Unidade Industrial United Resins – Produção de Resinas, S.A. não tem conhecimento de quaisquer reclamações no âmbito da qualidade da água subterrânea.

3. Descrição do programa de monitorização

3.1 Parâmetros a medir

O programa de monitorização inclui a amostragem e análise dos seguintes parâmetros físico-químicos:

- no campo: pH, temperatura (T), condutividade eléctrica (CE) e profundidade do nível freático (NHE), este último parâmetro só é medido no furo de captação e nos piezómetros;
- em laboratório (compostos inorgânicos e orgânicos): cloretos (Cl), nitratos (NO_3), nitritos (NO_2), sulfatos (SO_4), mercúrio (Hg), arsénio (As), cádmio (Cd), chumbo (Pb), azoto amoniacal (NH_4), carência química de oxigénio (CQO), hidrocarbonetos de petróleo totais (TPH) e compostos orgânicos aromáticos.

3.2 Métodos e equipamentos de recolha de dados

A medição do nível freático foi efetuada em condições de repouso, ou seja na ausência de bombagem, e utilizando uma sonda eléctrica.

A amostragem foi realizada após bombagem prolongada para renovação da água e observação da estabilização dos seguintes parâmetros: temperatura (T), condutividade eléctrica (CE) e pH, medidos numa célula de fluxo em campo e em condições de ausência de contacto direto com o ar.

Uma vez estabilizados estes parâmetros, recolheram-se as correspondentes amostras de água para análise dos parâmetros analíticos indicados no ponto 3.1.

As amostras colhidas foram preservadas no local e imediatamente transferidas para o laboratório do IDAD, e enviadas para o *ALS Group* para determinação dos restantes parâmetros.

3.3 Amostragem

Os locais de amostragem incluem o furo de captação de águas subterrâneas, os dois piezómetros e bacia de águas pluviais (Figura 3.1).

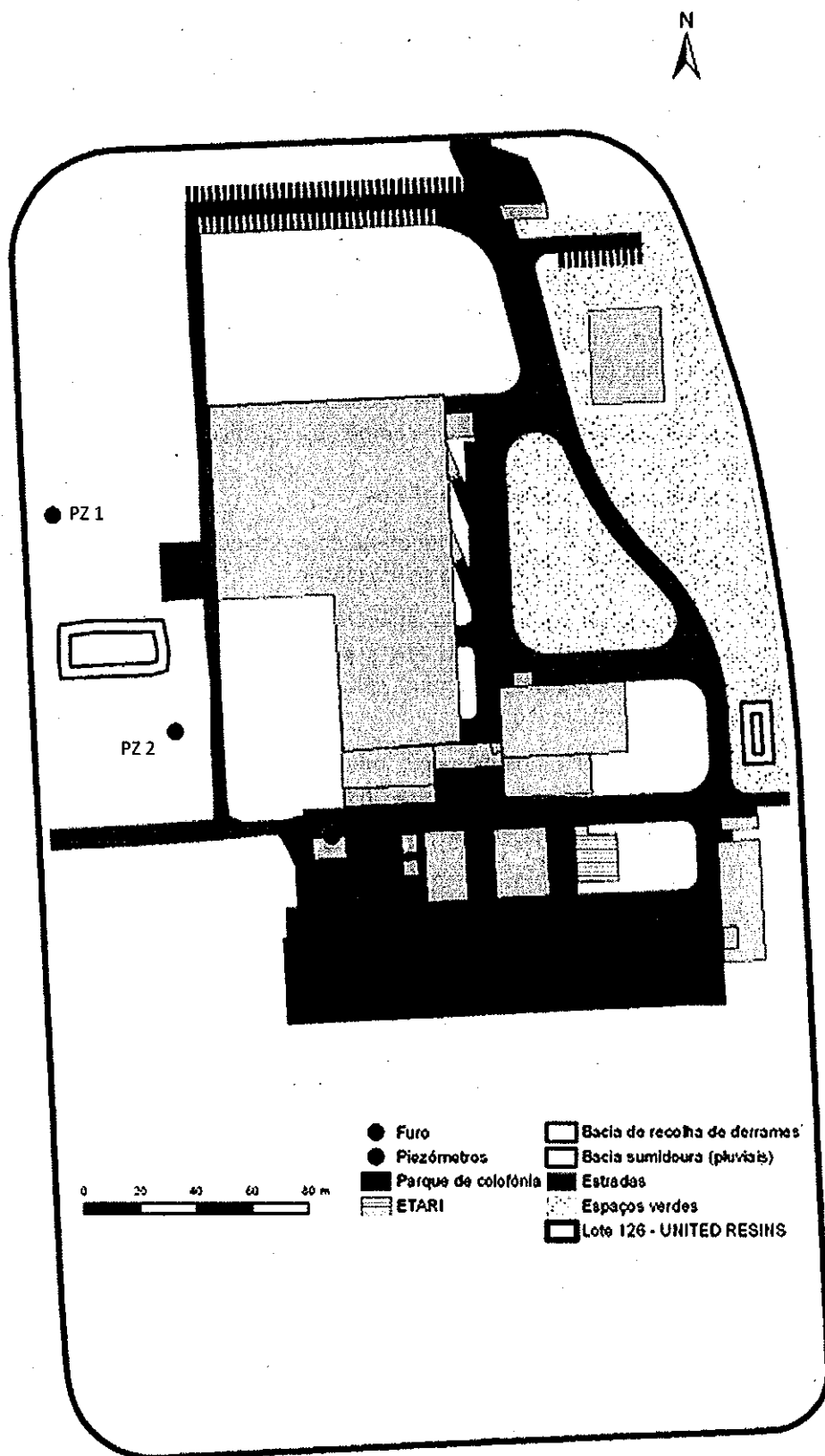


Figura 3.1 – Localização aproximada dos pontos de monitorização da qualidade da água subterrânea no perímetro da Unidade Industrial United Resins – Produção de Resinas, S.A.

3.4 Método de tratamento dos dados

Os dados da evolução temporal, quer dos parâmetros físico-químicos, quer dos dados de evolução da profundidade do nível de água (hidrogramas), foram analisados recorrendo à sua representação em Microsoft® Excel 2013 e Sigma Plot® 12.5 (Systat Software).

3.5 Relação dos dados com as características do projeto

O aquífero Leirosa – Monte Real apresenta hoje em dia, na área de estudo, águas subterrâneas com um quimismo que revelam a predominância de águas de composição essencialmente cloretada, tal como era de esperar numa zona tão próxima da costa. O sulfato é o segundo anião mais abundante embora em concentrações significativamente inferiores às de cloreto. Trata-se de um sistema aquífero com alguma capacidade de atenuação devido à existência de níveis interestratificados argilosos. Estes níveis foram identificados na zona de estudo, aquando da construção da captação, entre os 9 e os 34 m de profundidade. No entanto, devido à pouca profundidade do nível freático (-4,32 m sob o terreno) e à elevada extensão da área de recarga, deve considerar-se o sistema aquífero como bastante vulnerável.

De acordo com os dados do Estudo de Impacte Ambiental (EIA) realizado, verificou-se ainda que as águas subterrâneas apresentam:

- condutividade elétrica moderada (710 $\mu\text{S}/\text{cm}$);
- temperatura ligeiramente acima da temperatura média anual (17,6 °C);
- pH próximo da neutralidade (7,4);
- teores de oxigénio dissolvido baixos (0,14 mg/l); e,
- valores de potencial redox negativo (-31 mV).

Foi ainda identificado nitrato nas águas subterrâneas embora em concentrações muito baixas (1,9 mg/l NO_3). As concentrações baixas de nitrato confirmam a existência de impactos por contaminação difusa produzida pela atividade humana.

Relativamente aos metais só se encontravam acima do limite de deteção o arsénio (3,1 $\mu\text{g}/\text{l}$), o bário (12 $\mu\text{g}/\text{l}$) e o mercúrio (0,059 $\mu\text{g}/\text{l}$), todos eles inferiores aos valores paramétricos para a água destinada ao consumo humano. Foram ainda identificadas concentrações de flúor de 0,13 mg/l.

De todos os compostos orgânicos determinados apenas foi identificado um hidrocarboneto derivado do petróleo (TPH C10-C12) numa concentração de 15 $\mu\text{g}/\text{l}$. Este valor tanto podia indicar uma possível contaminação, ou o mais provável, é que fosse um valor anómalo, não representativo da formação aquífera mas apenas das condições no local de amostragem.

Foram assim identificadas as seguintes ações, como potencialmente contaminadoras do sistema aquífero, durante a fase de operação da unidade industrial:

- produção de efluentes líquidos industriais e domésticos;
- águas pluviais;
- consumo de água subterrânea.

Devido ao desenvolvimento da unidade industrial e às medidas de segurança e minimização já implementadas, todas estas situações foram consideradas como impactes negativos pouco significativos, tendo-se no entanto estabelecido um programa de monitorização, de forma a identificar qualquer alteração das condições atuais naturais no aquífero e evitar novas situações de risco.

3.6 Critérios de avaliação dos dados

Foi utilizado como critério fundamental para a avaliação dos dados de monitorização obtidos, a sua comparação com a caracterização da situação de referência encontrada no âmbito do Estudo de Impacto Ambiental efetuado em 2011.

A comparação com valores de referência para a zona (PGRH, 2011) ou com a legislação atual de água para abastecimento público é feita pontualmente.

São consideradas positivas as tendências de evolução que indicam melhoria da qualidade físico-química das águas subterrâneas, e que inclui:

- a estabilização dos valores de condutividade elétrica e pH;
- a ocorrência de temperaturas de água subterrânea próximas das temperaturas médias anuais do ar;
- o não aumento das concentrações dos principais elementos e compostos inorgânicos analisados;
- baixos valores de CQO;
- a ausência de variações espaciais significativas entre os parâmetros determinados nos piezómetros e furo de captação;
- a ausência de hidrocarbonetos de petróleo totais e compostos orgânicos aromáticos.

4. Resultados do programa de monitorização

4.1 Resultados obtidos

Realizadas as campanhas de monitorização nos dias 25 de novembro 2013, 16 de dezembro 2013, 14 de janeiro 2014, 10 de fevereiro 2014, 3 de março 2014, 14 de abril 2014, 15 de setembro 2014 e 6 de outubro 2014, procedeu-se ao tratamento dos dados e à sua representação gráfica.

Os resultados obtidos e correspondentes a este relatório de monitorização são apresentados em anexo, sob a forma de tabelas e gráficos (Anexo A), sempre que houver dados acima do valor limite de deteção.

No que diz respeito aos resultados obtidos, a análise efetuada neste relatório incide apenas sobre os poluentes cujos resultados se apresentam superiores aos respetivos limiares de deteção analítica

No Anexo A, os gráficos da página A1 à página A4 correspondem ao furo de captação, da página A5 à página A8 ao piezómetro P1, da página A9 à página A12 ao piezómetro P2 e da página A13 à página A15 à bacia de águas pluviais. Os gráficos relativos aos dados de monitorização correspondem à evolução temporal dos seguintes parâmetros:

- pH
- temperatura (T)
- condutividade eléctrica (CE)
- profundidade do nível freático (NHE)
- cloretos (Cl)
- nitratos (NO₃)
- nitritos (NO₂)
- sulfatos (SO₄)
- mercúrio (Hg)
- arsénio (As)
- cádmio (Cd)
- chumbo (Pb)
- azoto amoniacal (NH₄-N)
- carência química de oxigénio (CQO)
- hidrocarbonetos de petróleo totais (TPH)
- compostos orgânicos aromáticos.

No anexo B, apresentam-se os Relatórios de Ensaio relativos aos resultados apresentados e discutidos no presente documento. As amostras recolhidas encontram-se referenciadas nos Relatórios de Ensaio do Laboratório da ALS – Group de acordo com o apresentado no Quadro 4.1.

Quadro 4.1 – Referência das amostras de água recolhidas.

Ponto de amostragem	Referência das amostras	Relatório de Ensaio
Furo de captação	239.14	PR1421207
	700.14	PR1451843
Piezómetro P1	237.14	PR1421207
	698.14	PR1451843
Piezómetro P2	238.14	PR1421207
	699.14	PR1451843
Bacia de águas pluviais	1142.13	PR1358314
	1266.13	PR1362893
	44.14	PR1402568
	90.14	PR1406741
	107.14	PR1412595
	790.14	PR1460567

4.2 Avaliação dos resultados obtidos face aos critérios definidos

4.2.1 Quantidade de água

A evolução do nível freático entre Abril e Setembro 2014 revela um rebaixamento de 1,1 m no piezómetro 1 e de 1,25 no piezómetro 2. O maior rebaixamento observado no final do verão coincide com os meses de menor precipitação e portanto, menor recarga subterrânea. Ambos os rebaixamentos observados podem ser considerados normais.

4.2.2 Qualidade de Água

4.2.2.1 Furos e piezómetros

No quadro 4.2 apresentam-se os resultados obtidos nas determinações analíticas realizadas nas amostras de água recolhidas no furo e nos piezómetros.

Quadro 4.2- Resultados das determinações efetuadas nas amostras de água recolhidas no furo (LRS1) e nos piezómetros P1 e P2

Determinações Analíticas	Unidade	Furo		P1		P2	
		14abr14	15set14	14abr14	15set14	14abr14	15set14
		239.14	700.14	237.14	698.14	238.14	699.14
Condutividade**	µS/cm	571	695	191	250	460	549
pH	--	7,5	8,3	8,2	7,9	7,8	7,5
Temperatura**	°C	18	19	15	20	17	20
NHE**	m	--	--	3,20	4,30	2,48	3,73
Cloretos*	mg/L Cl ⁻	42,5	78,5	18,2	16,2	20,2	35,2
CQO*	mg/L O ₂	<5,0	16,0	9,0	<5,0	<5,0	<5,0
Arsénio*	mg/L As	0,0055	<0,0050	<0,0050	<0,0050	<0,0050	<0,0050
Nitratos*	mg/L NO ₃	6,34	0,331	<0,040	8,72	19,7	34,5
Nitritos*	mg/L NO ₂	0,058	0,218	<0,040	0,292	<0,040	<0,040
Sulfatos*	mg/L SO ₄	41,6	5,20	7,41	12,7	36,8	78,2
Amónia*	mg/L N	0,074	2,48	<0,040	<0,050	<0,040	<0,050
Hidroc. de Petróleo*							
C10 – C12	µg/L	11,8	<5,0	12,6	<5,0	15,5	<5,0
C10 – C16	µg/L	36	<10	39	<10	44	<10
C10 – C40	µg/L	<50	<50	<50	<50	<50	<50
C12 – C16	µg/L	23,8	<5,0	24,6	<5,0	29,8	<5,0
C16 – C22	µg/L	<10	<10	<10	<10	<10	<10
C16 – C35	µg/L	<30	<30	<30	<30	<30	<30
C22 – C30	µg/L	<15	<15	<15	<15	<15	<15

O ensaio assinalado com * não se encontra no âmbito da Acreditação do Laboratório e foi realizado em Laboratório subcontratado Acreditado
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 O símbolo < significa que o resultado obtido é inferior ao Limite de Quantificação do método

Determinações Analíticas	Unidade	Furo	P1	P2	Furo	P1	P2
		14abr14 239.14	15set14 700.14	14abr14 237.14	15set14 698.14	14abr14 238.14	15set14 699.14
C12 – C16	µg/L	23,8	<5,0	24,6	<5,0	29,8	<5,0
C16 – C22	µg/L	<10	<10	<10	<10	<10	<10
C16 – C35	µg/L	<30	<30	<30	<30	<30	<30
C22 – C30	µg/L	<15	<15	<15	<15	<15	<15

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No período de monitorização, os valores de **pH** da água subterrânea são sempre alcalinos (>7,5) e apresentam sempre uma ligeira variação entre Abril e Setembro. Mas enquanto no furo de captação, o valor de pH sobe de 7,5 para 8,3, nos piezómetros os valores de pH baixam ligeiramente (de 8,2 para 7,9 no piezómetro PZ1 e de 7,8 para 7,5 no piezómetro PZ2).

Os valores de **temperatura** da água subterrânea observados nos piezómetros variam de 3 a 5°C entre Abril e Setembro e são bastante mais estáveis no furo de captação (variação de apenas 1°C).

Os valores de **condutividade eléctrica** da água subterrânea observados nos três pontos de monitorização variam entre 571 e 695 µS/cm no furo de captação, 191 e 250 µS/cm no piezómetro PZ1 e 460 e 549 µS/cm no piezómetro PZ2, aumentando entre a campanha de Abril e Setembro.

Os valores de **cloreto** da água subterrânea observados em dois dos três pontos de monitorização seguem a tendência dos valores de condutividade eléctrica, aumentando entre a campanha de Abril e Setembro, de 42,5 para 78,5 mg/l no furo de captação e de 20,2 para 35,2 mg/l no piezómetro PZ2. No piezómetro PZ1 os valores de cloretos reduzem ligeiramente de 18,2 para 16,2 mg/l (tal como se tinha observado na campanha de monitorização do ano anterior).

Os valores de **sulfato** continuam a apresentar variações espaciais e temporais bastante significativas mas concordantes com as observações feitas no ano anterior. O teor de sulfato na água subterrânea captada no furo de captação varia entre 41,6 e 5,20 mg/l de abril para setembro, respectivamente. Mas os valores mais elevados de teor sulfato são novamente observados no piezómetro PZ2 (78,2 mg/l) no mês de setembro. As variações sazonais continuam por isso a ser importantes no furo e piezómetro PZ2 (>30 mg/l).

Os valores de **nitrato** da água subterrânea observados no furo e no piezómetro P1 são ainda bastante baixos (<9 mg/l) apresentando uma variação pouco significativa entre Abril e Setembro, mas no caso do piezómetro P2 já apresentam valores relativamente mais elevados (19,7 e 34,6 mg/l em Abril e Setembro, respectivamente) e com acentuada sazonalidade.

Os valores de **nitrito** da água subterrânea observados nos três pontos de monitorização são valores muito baixos, na maioria dos casos próximos ou mesmo inferiores ao limite de detecção.

Os valores de **amónio** da água subterrânea observados nos três pontos de monitorização são valores muito baixos, na maioria dos casos próximos ou mesmo inferiores ao limite de detecção.

Os valores de **mercúrio, arsénio, cádmio e chumbo** da água subterrânea observados nos três pontos de monitorização são na maioria dos casos inferiores ao limite de detecção.

Os valores da **carência química de oxigénio (CQO)** da água subterrânea observados nos três pontos de monitorização são inferiores ao limite de detecção.

Os valores do total de **hidrocarbonetos aromáticos** da água subterrânea observados nos três pontos de monitorização são inferiores ao limite de detecção.

Os valores do total de **compostos orgânicos aromáticos** da água subterrânea observados nos três pontos de monitorização são inferiores ao limite de detecção.

4.2.2.2 Bacia Águas Pluviais

No quadro 4.3 apresentam-se os resultados obtidos nas determinações analíticas realizadas nas amostras de água recolhidas na bacia de águas pluviais.

Quadro 4.3- Resultados das determinações efetuadas nas amostras de água recolhidas na bacia de águas pluviais

Determinações Analíticas	Unidade	Bacia de águas pluviais					
		25nov13	16dez13	14jan14	10fev14	3 mar 14	6out14
		1142.13	1266.13	44.14	90.14	107.14	790.14
Condutividade**	µS/cm	252	255	158	172	223	312
pH	--	7,7	7,6	8,2	7,9	7,4	7,5
Temperatura**	°C	11	11	14	13	14	19
Cloretos*	mg/L Cl	35,6	17,0	27,7	24,1	35,4	33,2
CQO*	mg/L O ₂	13	6,0	63,0	13,0	47,0	60,0
Nitratos*	mg/L NO ₃	<0,040	0,162	0,243	0,049	<0,040	0,079
Nitritos*	mg/L NO ₂	<0,040	<0,040	<0,040	<0,040	<0,040	<0,040
Sulfatos*	mg/L SO ₄	16,5	17,1	14,0	6,22	11,0	7,08
Amónia*	mg/L N	<0,040	<0,040	<0,040	<0,040	<0,040	<0,040
TPH*	mg/L	0,168	<0,050	0,172	<0,050	<0,050	<0,050
Antraceno*	µg/L	0,020	<0,010	0,031	<0,010	0,012	<0,010
Fenantreno*	µg/L	<0,010	<0,010	0,015	<0,010	0,011	<0,010
Pireno*	µg/L	<0,010	<0,010	0,015	<0,010	0,014	<0,010
n-propilbenzeno*	µg/L	<1,0	<1,0	<1,0	<1,0	0,112	<1,0
Hidroc. de Petróleo*							
C10 – C12	µg/L	<5,0	<5,0	7,7	<5,0	6,2	<5,0
C10 – C16	µg/L	<10	<10	22	<10	22	<10
C10 – C40	µg/L	<50	<50	87	<50	78	<50
C12 – C16	µg/L	<5,0	<5,0	14,1	<5,0	16,3	<5,0
C16 – C22	µg/L	<10	<10	31	<10	27	<10
C16 – C35	µg/L	<30	<30	61	14	55	14
C22 – C30	µg/L	<15	<15	24	<15	20	<15

O ensaio assinalado com * não se encontra no âmbito da Acreditação do Laboratório e foi realizado em Laboratório subcontratado Acreditado

O ensaio assinalado com ** não se encontra no âmbito da Acreditação do Laboratório

O símbolo <significa que o resultado obtido é inferior ao Limite de Quantificação do método

No período de monitorização as amostras de água recolhidas na bacia de águas pluviais revelaram **pH** próximos da neutralidade ou com tendência a ligeiramente básicos, e com variações dos valores entre 7,4 e 8,2. Os valores mais altos observam-se em geral nos meses de inverno (novembro a fevereiro).

Os valores de **temperatura** das águas pluviais são próximos da temperatura ambiente e revelam as correspondentes flutuações sazonais.

Os valores de **condutividade eléctrica** são relativamente baixos variando entre 158 e 255 µS/cm.

Os valores de **cloretos** (variam entre 17,0 e 35,6 mg/l) e neste período de monitorização já não apresentam variações importantes (ao contrário do que se tinha observado no período de monitorização anterior e que estaria relacionado com a quantidade e frequência dos eventos de precipitação).

Os valores de **sulfatos** (variam entre 6,22 e 17,1 mg/l) são relativamente baixos e sem impacto para o aquífero.

Os valores de **nitratos** são muito baixos nunca excedendo os 0,243 mg/l.

Os valores de **nitritos, amónia, mercúrio, arsénio, cádmio e chumbo** são na sua maioria inferiores ao limite de detecção.

Os valores da **carência química de oxigénio (CQO)** observados nas águas pluviais variam entre 6 e 63 mg/l. Os dois valores mais elevados foram detectados em janeiro e outubro 2014 coincidindo em janeiro com a detecção também de hidrocarbonetos aromáticos. No entanto, os valores de CQO determinados em todos os outros meses são baixos (<14 mg/l) e coincidem com

valores de hidrocarbonetos aromáticos e compostos orgânicos aromáticos próximos ou abaixo o limite de detecção.

Os valores do total de **hidrocarbonetos aromáticos** nas águas pluviais são na sua maioria inferiores ao limite de detecção, com exceção dos valores observados em novembro 2013 e janeiro 2014.

Os valores do total de **compostos orgânicos aromáticos** nas águas pluviais são inferiores ao limite de detecção.

4.3 Avaliação da eficácia das medidas adotadas

Da análise detalhada dos resultados neste segundo ano de monitorização, verifica-se a eficácia dos processos e das medidas de minimização, uma vez que os potenciais contaminantes inorgânicos e orgânicos não estão a ser detetados nas águas subterrâneas e apenas surgem pontualmente nas amostras analisadas na bacia de águas pluviais, mas sempre em quantidades vestigiais que não colocam em risco a qualidade da água subterrânea.

De salientar que se começam a verificar algumas tendências de evolução nas concentrações (Cl, SO₄) ou valores dos parâmetros de monitorização (pH, CE) que são concordantes nos dois anos de monitorização. No entanto, estas tendências não são possíveis de caracterizar espacialmente podendo mesmo ser antagónicas de ponto para ponto de monitorização.

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5. Conclusões

Neste segundo ano de monitorização das águas subterrâneas e das águas pluviais verificou-se a eficácia dos processos e das medidas de minimização.

Nos três pontos de monitorização das águas subterrâneas não foram detetados quantidades que indicassem qualquer contaminação pelos potenciais contaminantes inorgânicos (mercúrio, arsénio, cádmio e chumbo) e orgânicos (hidrocarbonetos de petróleo totais e compostos orgânicos aromáticos). Verificaram-se algumas variações importantes na distribuição espacial e por vezes temporal de parâmetros como a condutividade elétrica, os cloretos, os sulfatos e os nitratos mas que são ainda difíceis de justificar com apenas quatro amostragens. Haverá que continuar a acompanhar a evolução dos valores de todos estes parâmetros no próximo ano para poder distinguir variações naturais do meio aquífero de algum sinal indiciador de contaminação, que neste momento não é identificado.

No ponto de monitorização na bacia de águas pluviais não foram detetados quaisquer valores elevados de condutividade elétrica, cloretos, sulfatos ou nitratos. Os potenciais contaminantes inorgânicos (mercúrio, arsénio, cádmio e chumbo) estão todos abaixo do limite de deteção e os orgânicos (hidrocarbonetos de petróleo totais e compostos orgânicos aromáticos) apenas aparecem pontualmente e em concentrações vestigiais nos meses de novembro 2013 e janeiro 2014, sem que constituam um risco para a massa de água subterrânea por infiltração direta.

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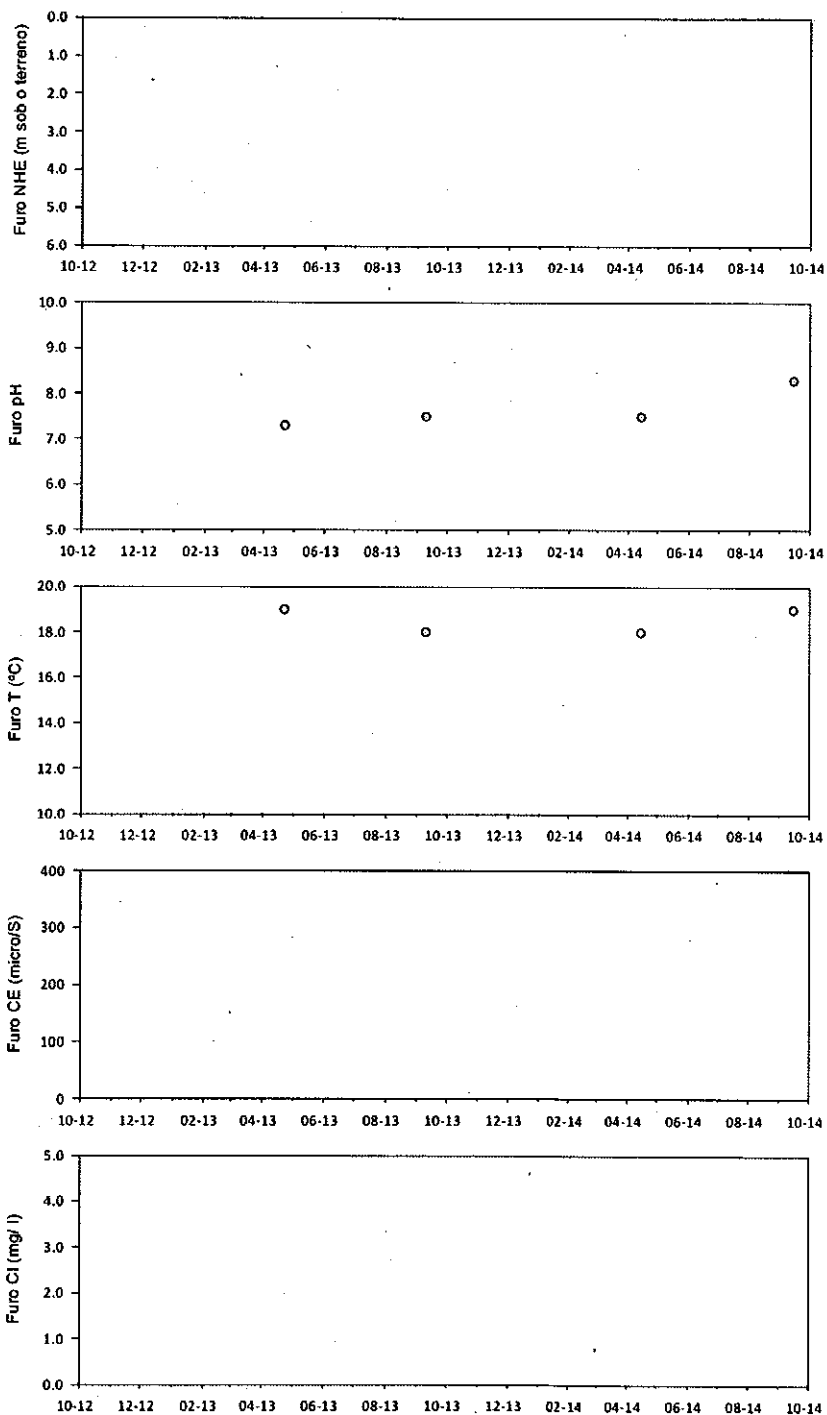
6. Referências

Echiron, Atkins, Cenor & Agripro.ambiente 2011. Plano de Gestão das Bacias Hidrográficas dos Rios Vouga, Mondego e Lis (RH4). Parte 2. ARH Centro, I.P.

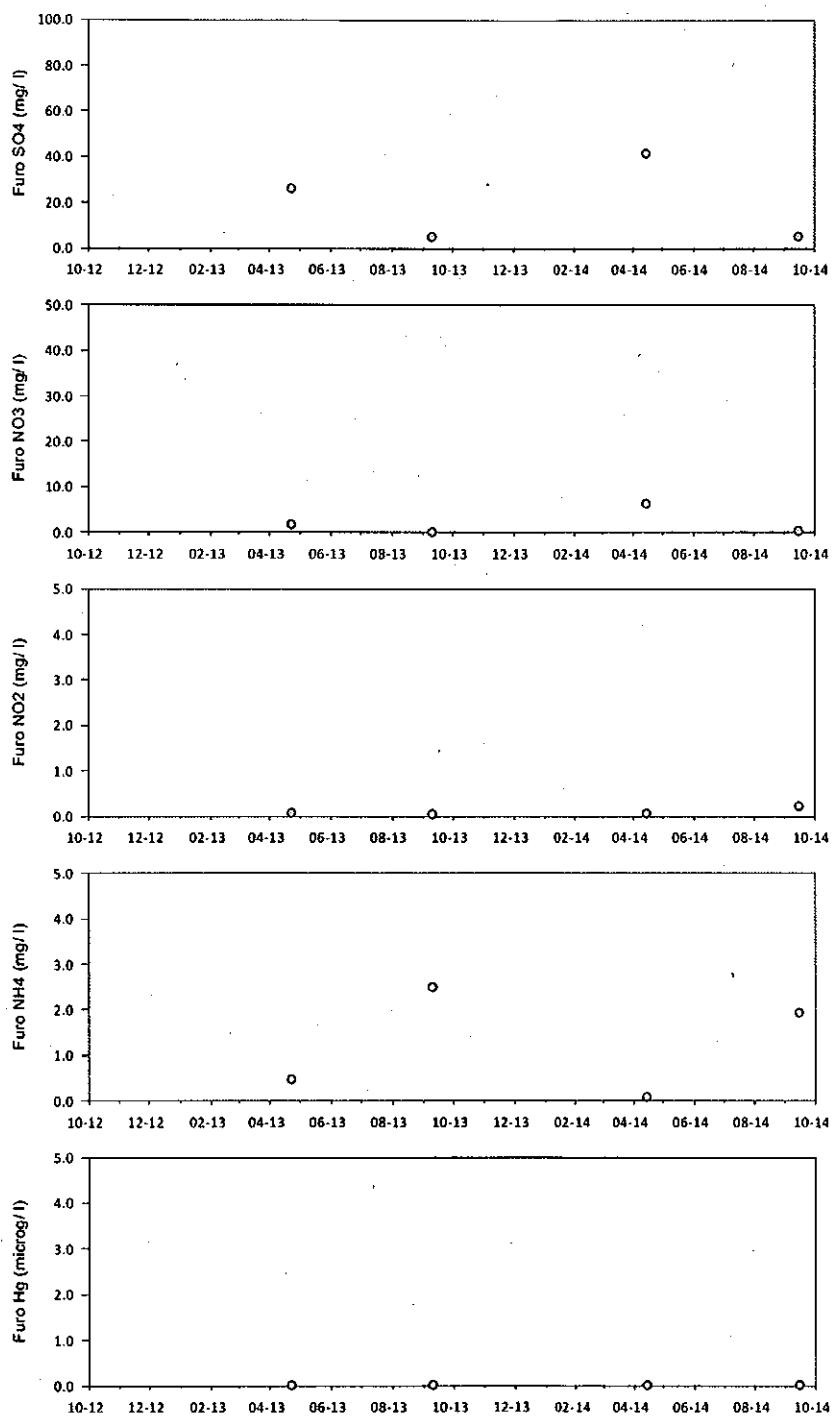
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Anexo A – Gráficos de Resultados

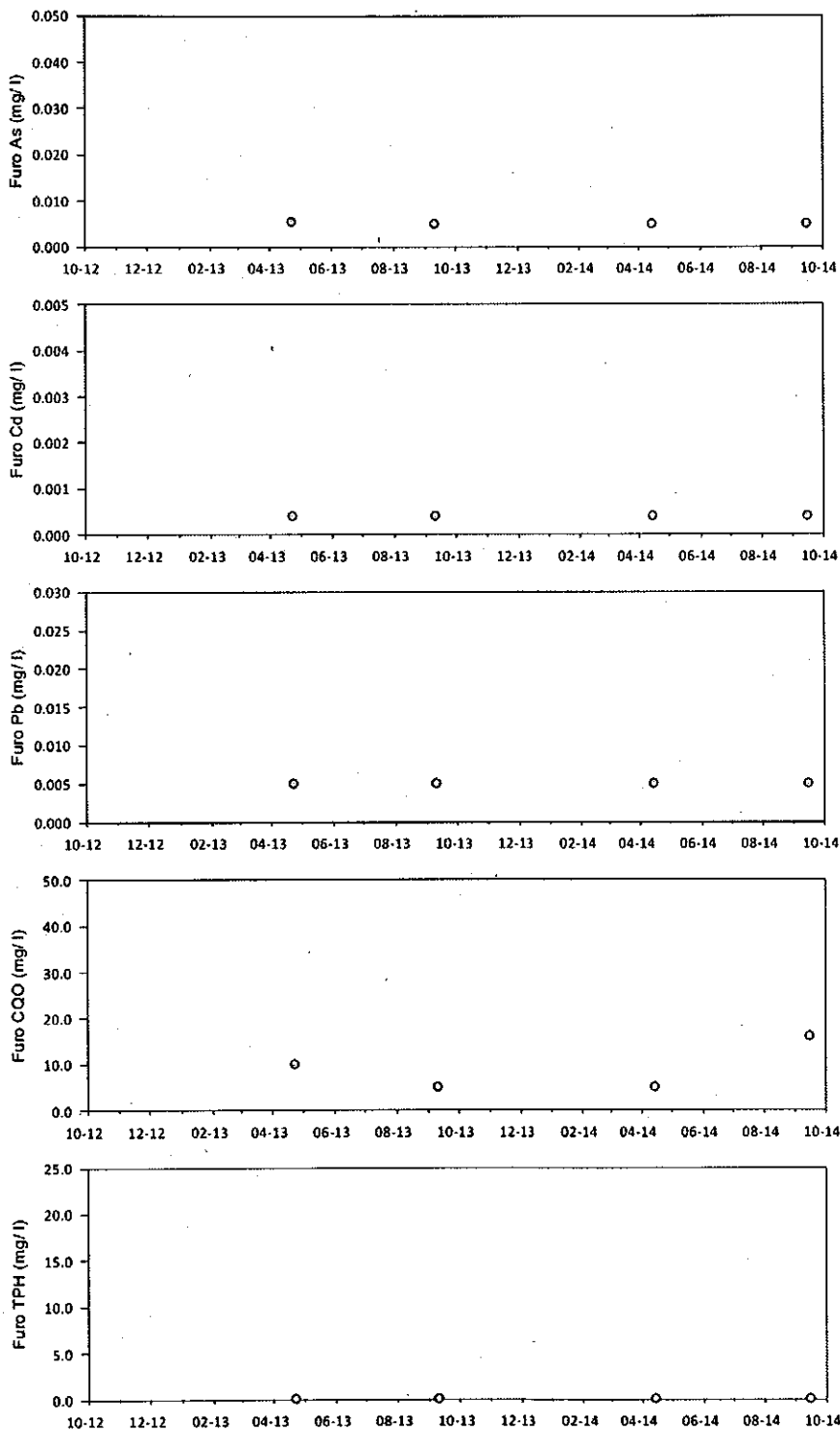
A1 – Furo (LRS1)



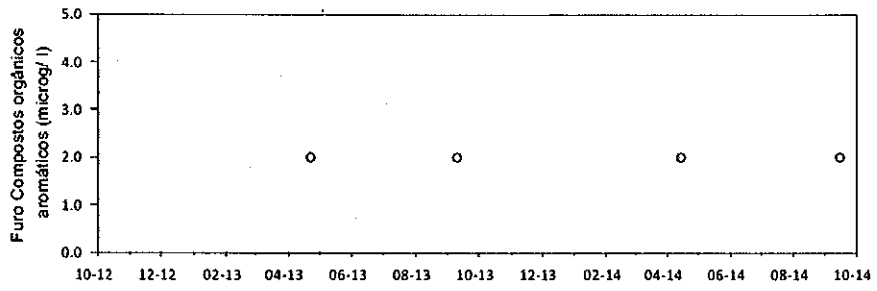
A2 – Furo (LRS1)



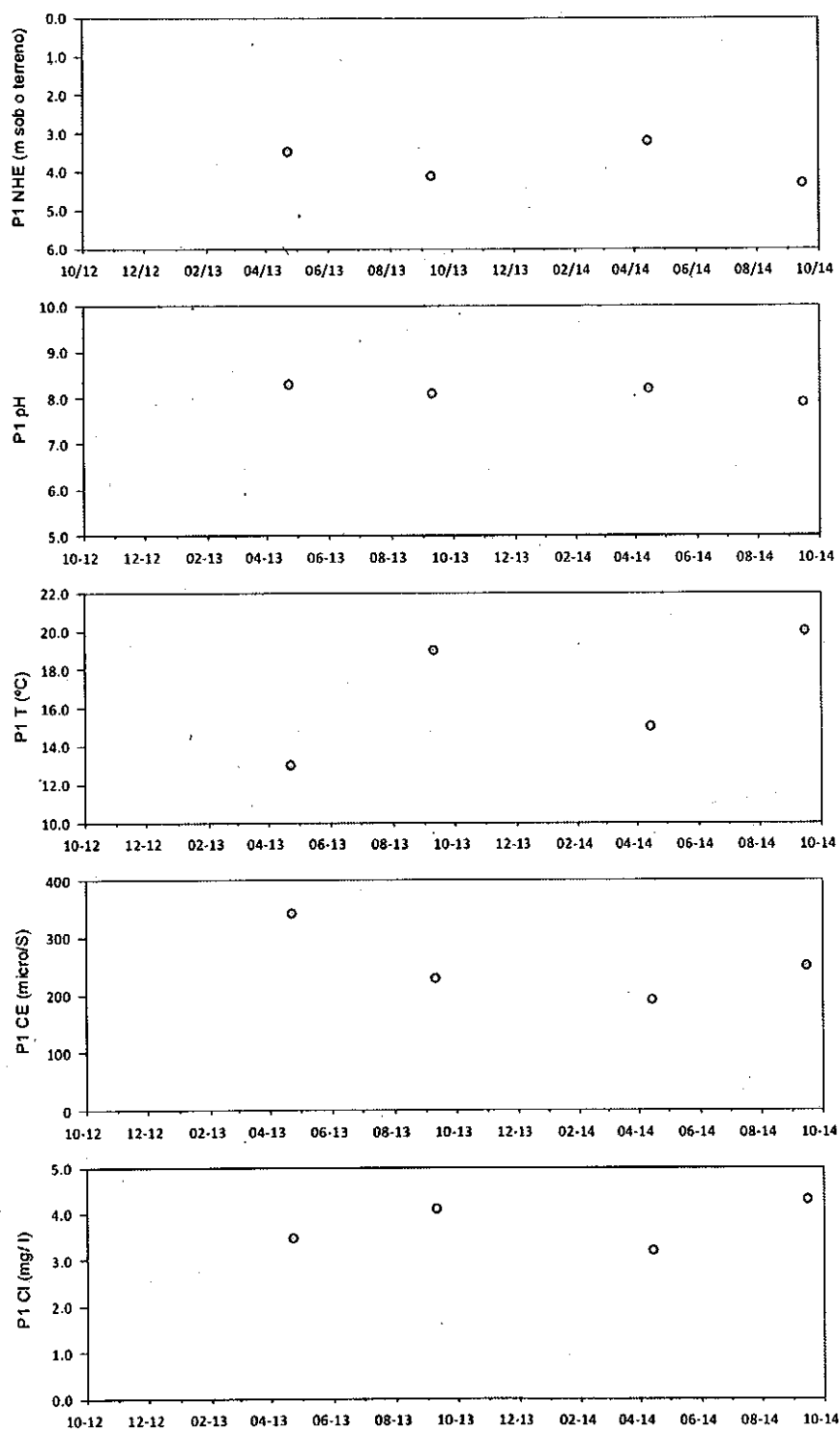
A3 – Furo (LRS1)



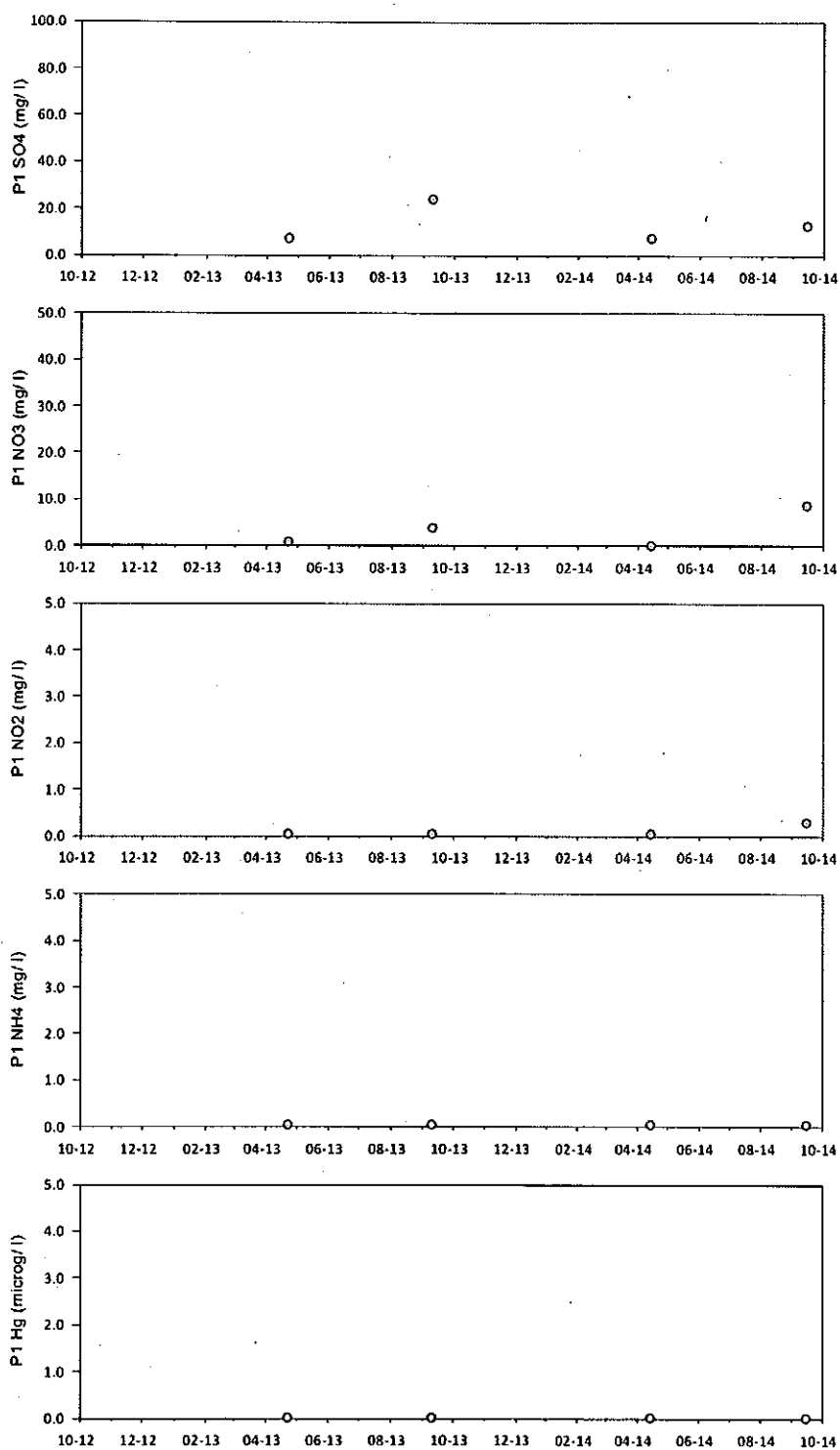
A4 – Furo (LRS1)



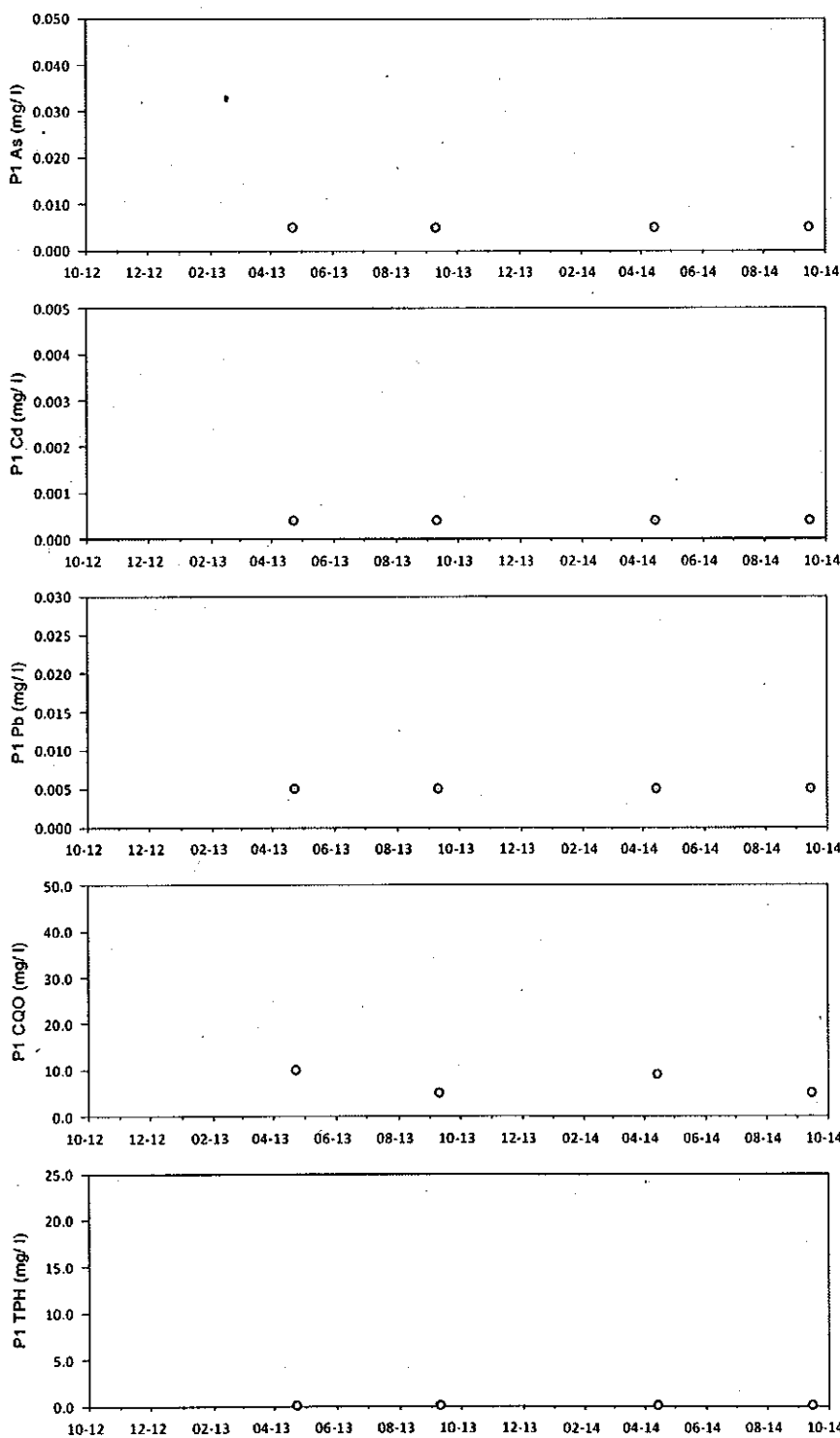
A5 – Piezômetro 1



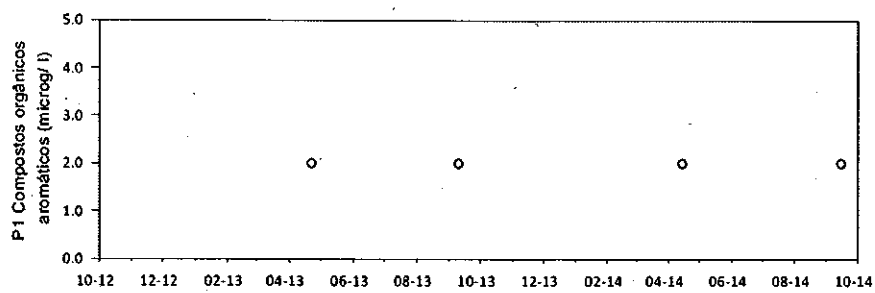
A6 – Piezómetro 1



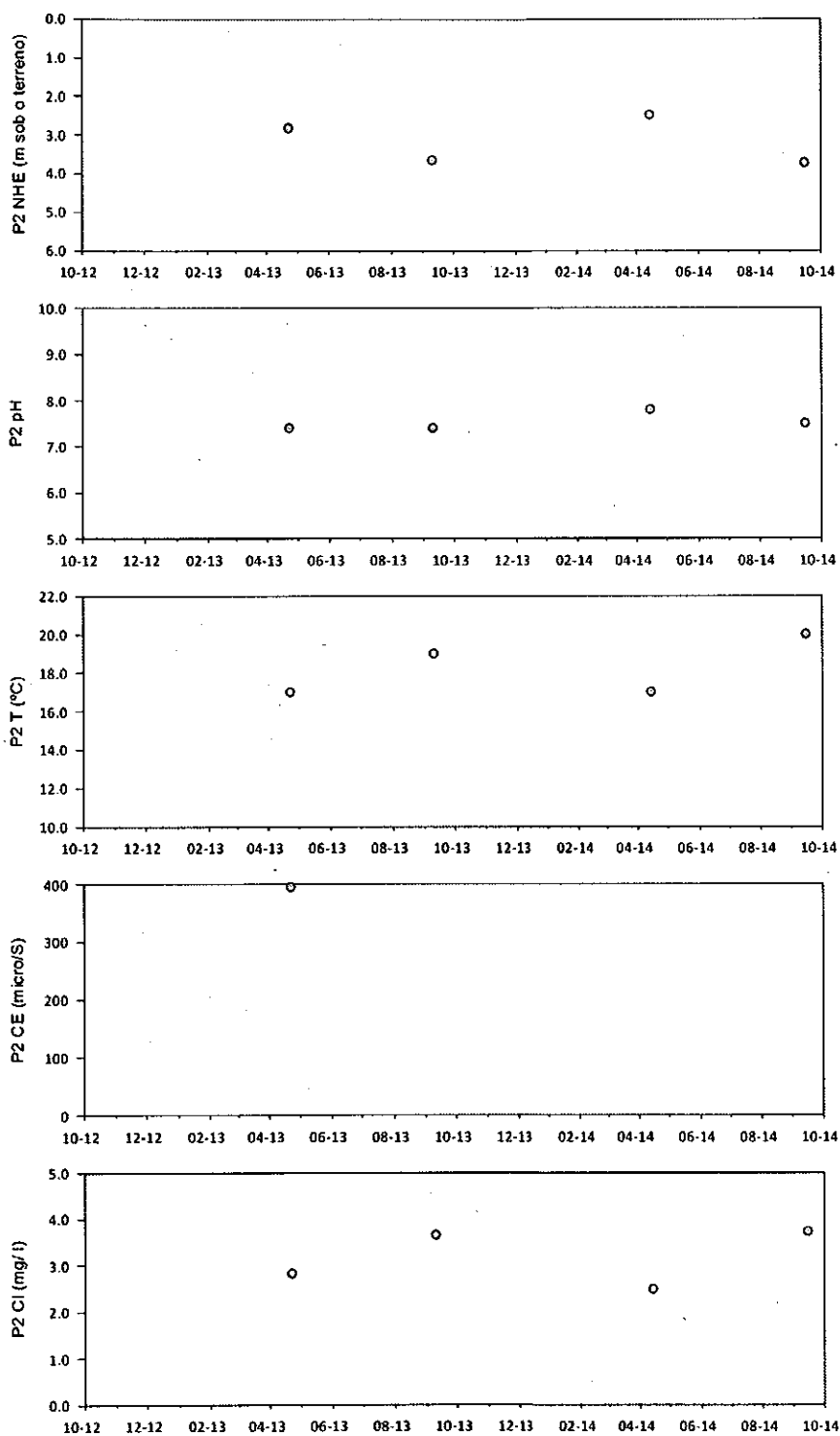
A7 – Piezômetro 1



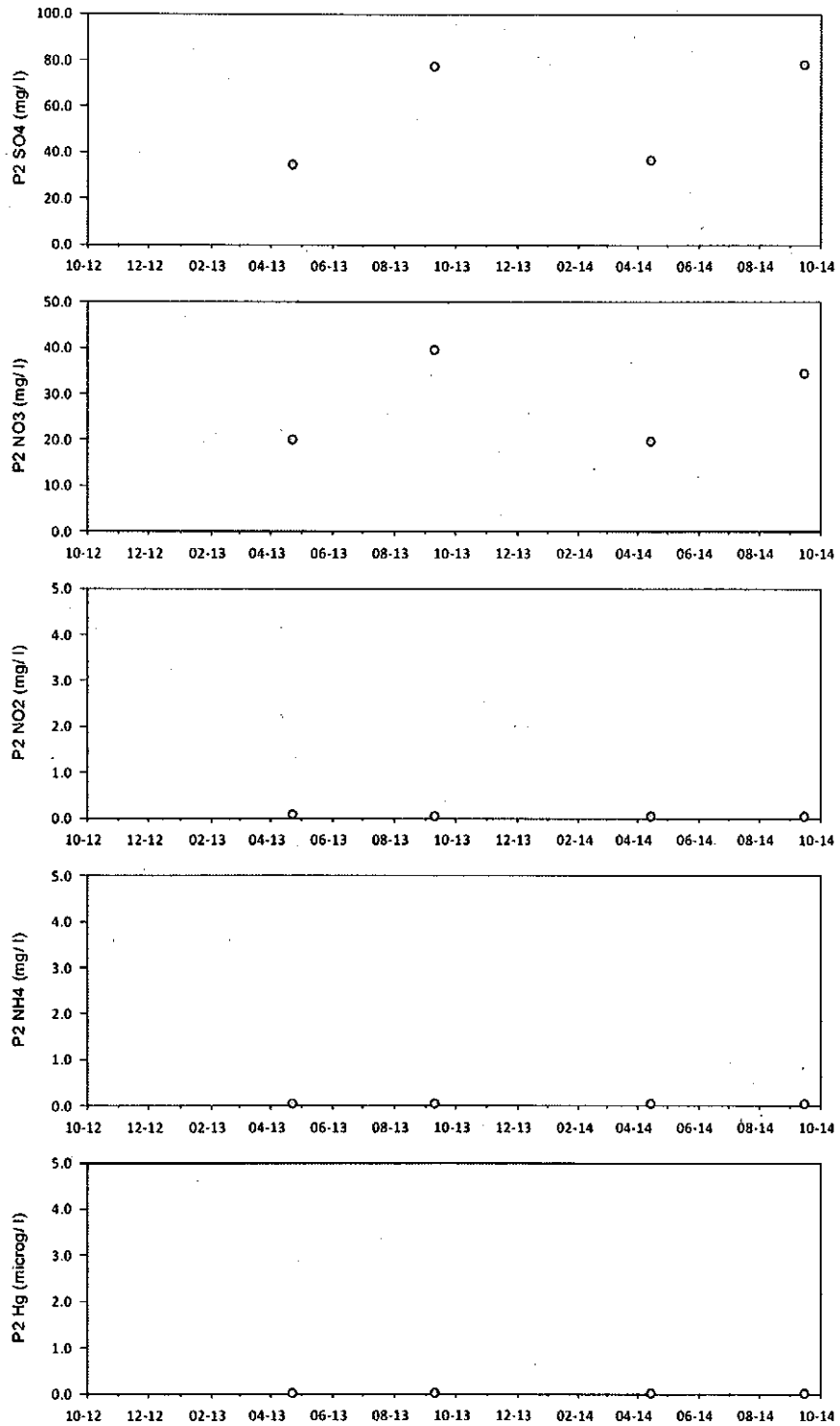
A8 – Piezómetro 1



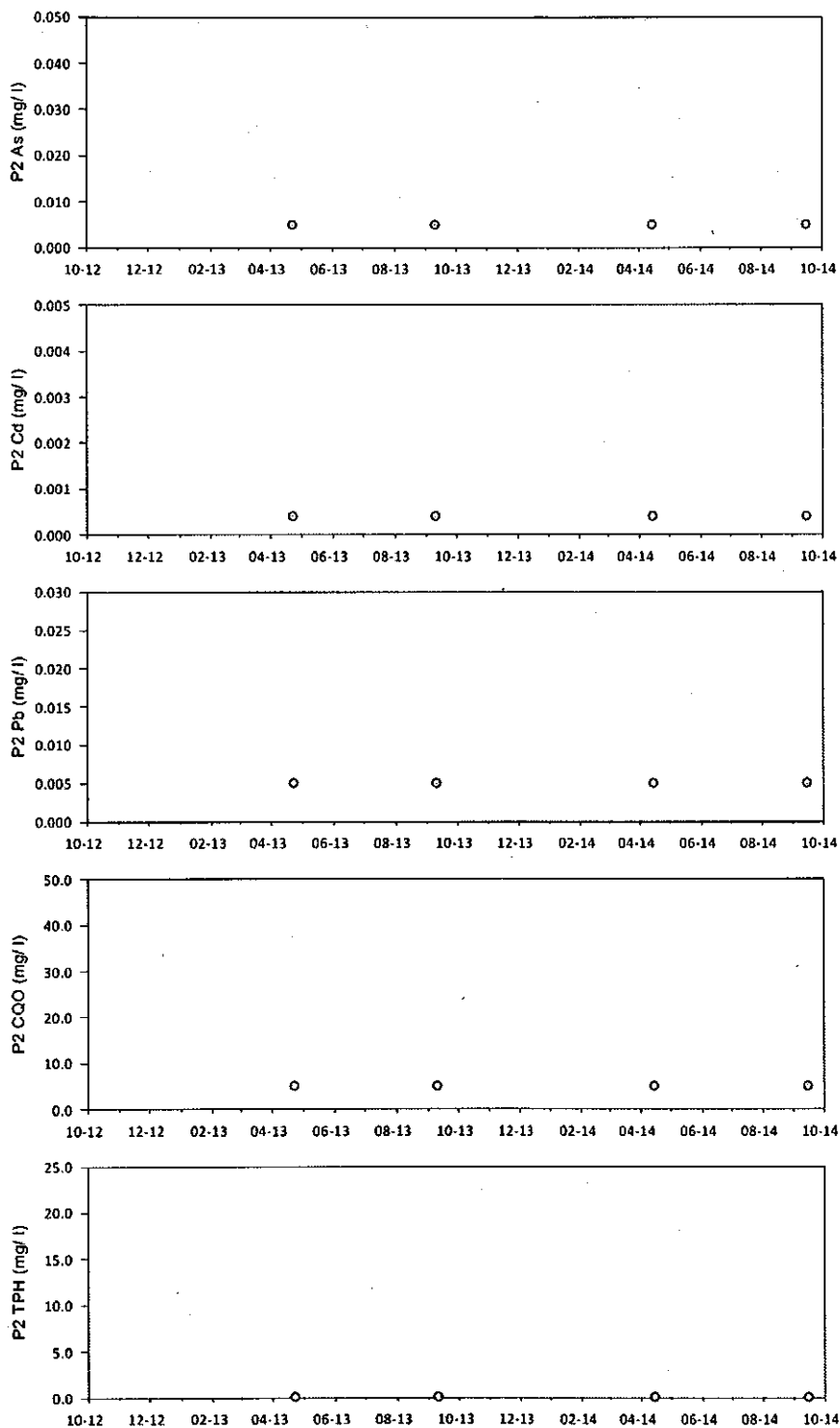
A9 – Piezômetro 2



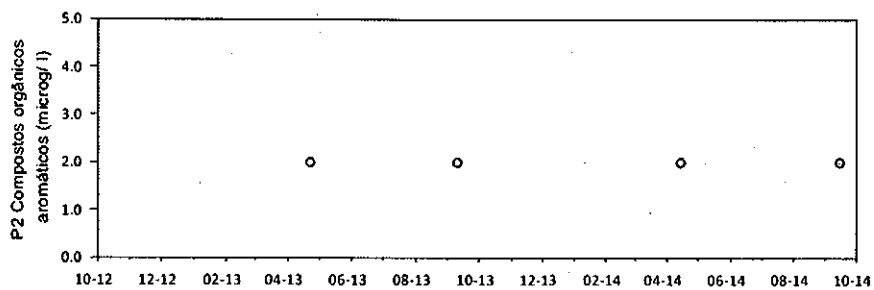
A10 – Piezómetro 2



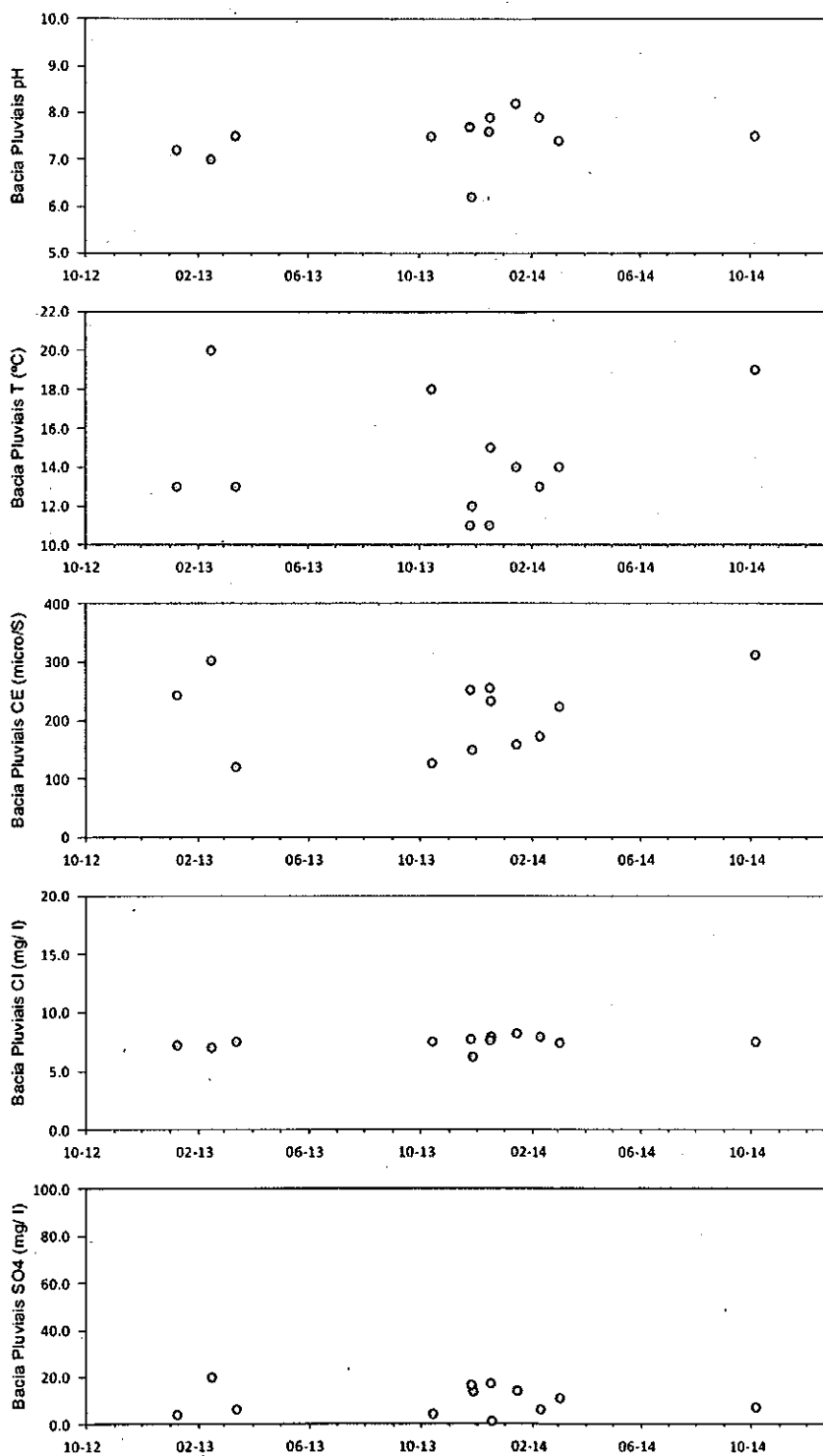
A11 – Piezômetro 2



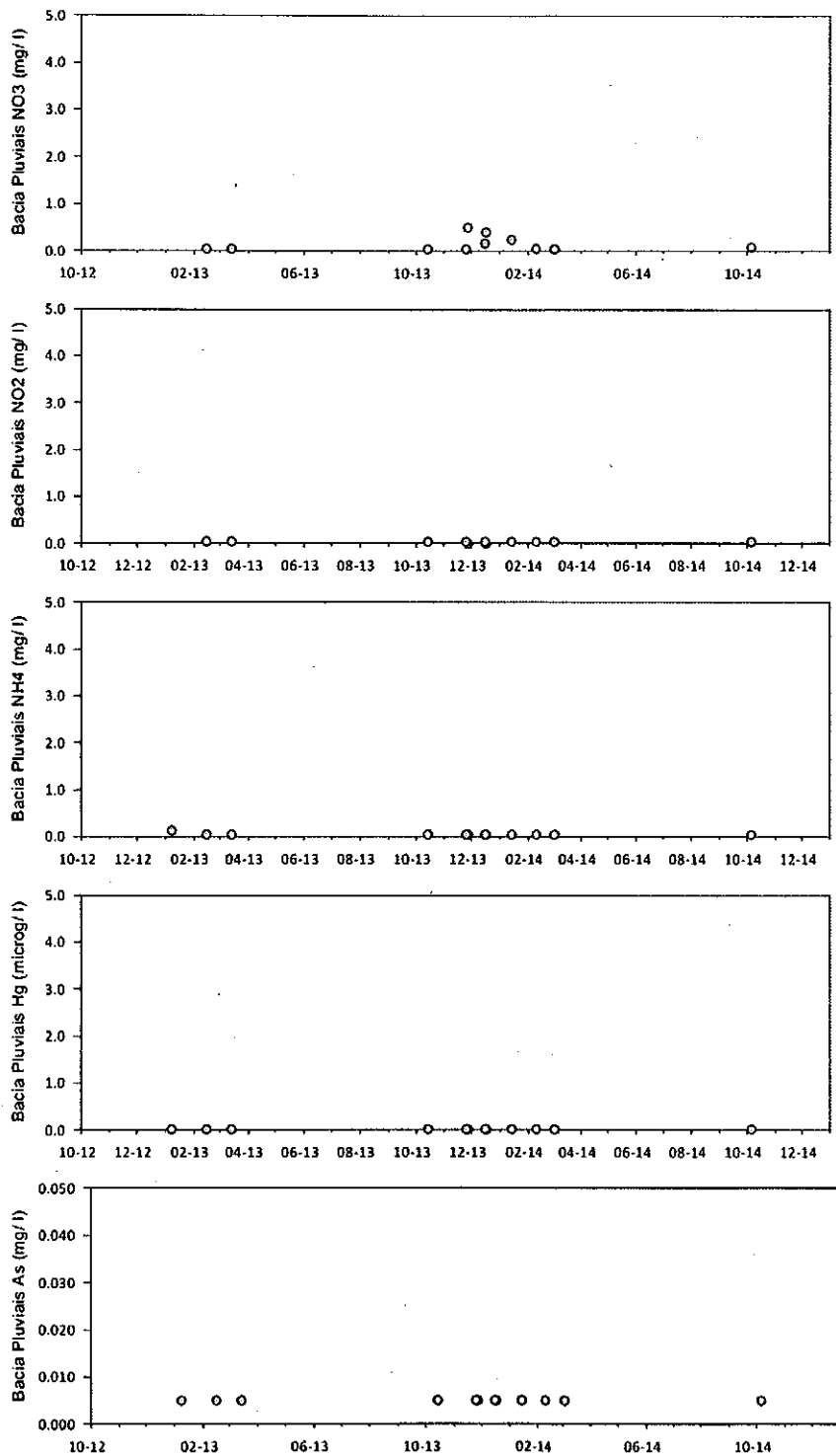
A12 – Piezómetro 2



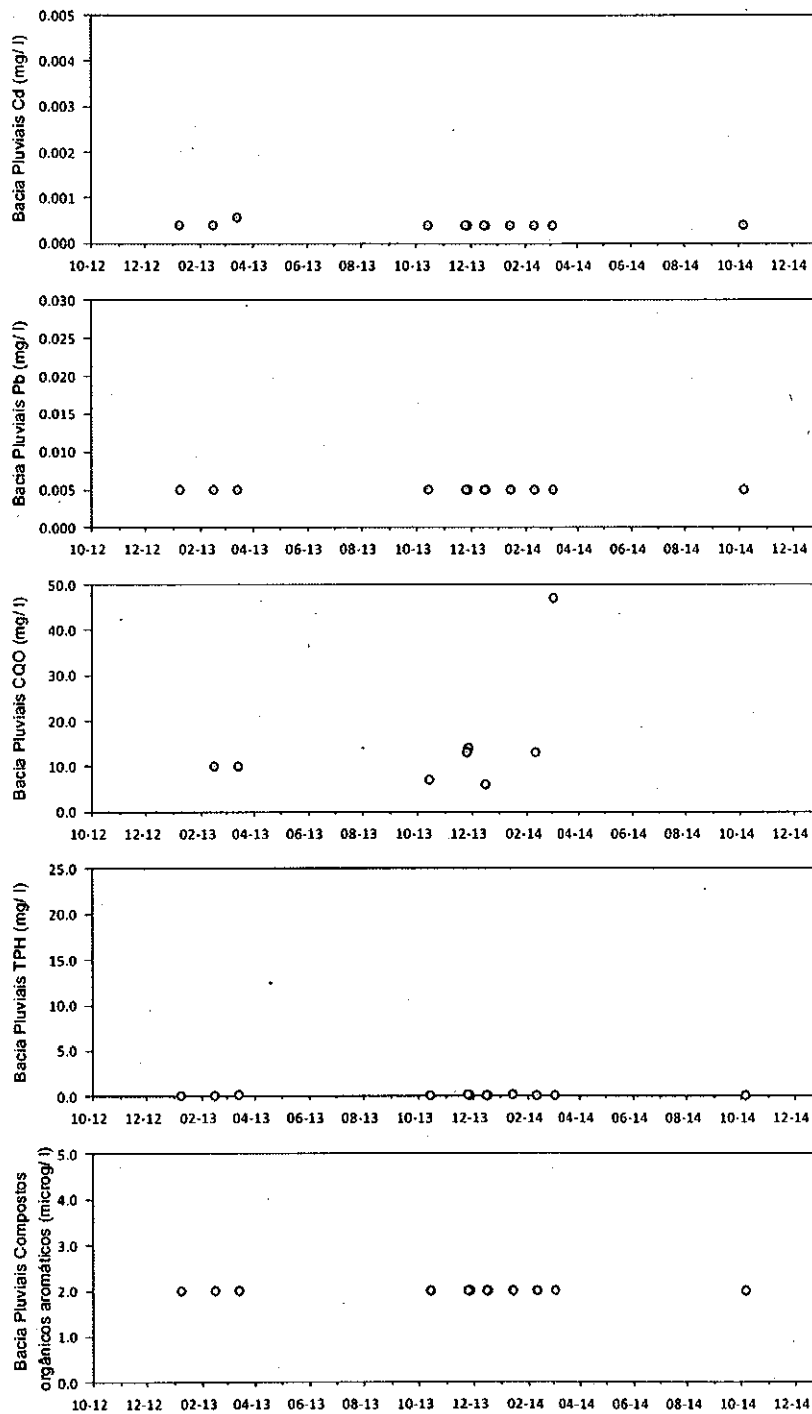
A13 – Bacia de Águas Pluviais



A14 – Bacia de Águas Pluviais



A15 – Bacia de Águas Pluviais



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Anexo B – Relatórios de Ensaio ALS Group

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CERTIFICATE OF ANALYSIS

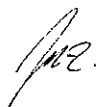
Work Order	: PR1358314	Issue Date	: 09-DEC-2013
Client	: IDAD - Instituto do Ambiente e Desenvolvimento	Laboratory	: ALS Czech Republic, s.r.o.
Contact	: Mrs. Alexandra Passos Silva	Contact	: Client Service
Address	: Campus Universitario Aveiro Portugal 3810-193	Address	: Na Harfe 336/9 Prague 9 - Vysocany Czech Republic 190 00
E-mail	: a.passosilva@ua.pt	E-mail	: customer.support@alsglobal.com
Telephone	: +351 2344 00800	Telephone	: +420 226 226 228
Facsimile	: ----	Facsimile	: +420 284 081 635
Project	: IMA 12 02 13	Page	: 1 of 6
Order number	: ----	Date Samples Received	: 03-DEC-2013
C-O-C number	: ----	Quote number	: PR2013IDAIN-PT0012 (PT-300-13-0029)
Site	: ----	Date of test	: 03-DEC-2013 - 09-DEC-2013
Sampled by	: client	QC Level	: ALS CR Standard Quality Control Schedule

General Comments

This report shall not be reproduced except in full, without prior written approval from the laboratory.
The laboratory declares that the test results relate only to the listed samples.

Responsible for accuracy

Signatories
Zdenek Jirak



Position
Environmental Business Unit
Manager

Testing Laboratory
Accredited by CAI



L 1163

ALS Czech Republic, s.r.o.

Na Harfe 336/9 Prague 9 - Vysocany Czech Republic 190 00



Analytical Results

Sub-Matrix: GROUNDWATER		Client sample ID		1142.13-12/02.13	----	----	----
		Laboratory sample ID		PR1358314001	----	----	----
		Client sampling date / time		25-NOV-2013 00:00	----	----	----
Parameter	Method	LOR	Unit	Result	MU	----	----
Nonmetallic Inorganic Parameters							
Ammonia and ammonium ions	W-NH4-SPC	0.050	mg/L	<0.050	----	----	----
Chemical Oxygen Demand (COD-Cr)	W-COD-SPC	5.0	mg/L	13.0	±18.8 %	----	----
Ammonia as N	W-NH4-SPC	0.040	mg/L	<0.040	----	----	----
Chloride	W-ANI-ENV	0.500	mg/L	35.6	±15.0 %	----	----
Nitrates	W-ANI-ENV	0.040	mg/L	<0.040	----	----	----
Nitrites	W-ANI-ENV	0.040	mg/L	<0.040	----	----	----
Sulphate as SO4 2-	W-ANI-ENV	0.500	mg/L	16.5	±15.0 %	----	----
Dissolved Metals / Major Cations							
Arsenic	W-METAXFL1	0.0050	mg/L	<0.0050	----	----	----
Cadmium	W-METAXFL1	0.00040	mg/L	<0.00040	----	----	----
Lead	W-METAXFL1	0.0050	mg/L	<0.0050	----	----	----
Mercury	W-HG-AFSFL	0.010	µg/L	<0.010	----	----	----
Petroleum Hydrocarbons - FTIR							
Total Petroleum Hydrocarbons	W-TPH-IR	0.050	mg/L	0.168	±20.0 %	----	----
BTEX							
Benzene	W-VOCGMS01	0.20	µg/L	<0.20	----	----	----
Toluene	W-VOCGMS01	1.00	µg/L	<1.00	----	----	----
Ethylbenzene	W-VOCGMS01	0.10	µg/L	<0.10	----	----	----
meta- & para-Xylene	W-VOCGMS01	0.20	µg/L	<0.20	----	----	----
ortho-Xylene	W-VOCGMS01	0.10	µg/L	<0.10	----	----	----
Sum of BTEX	W-VOCGMS01	1.60	µg/L	<1.60	----	----	----
Sum of xylenes	W-VOCGMS01	0.30	µg/L	<0.30	----	----	----
Sum of TEX	W-VOCGMS01	1.40	µg/L	<1.40	----	----	----
Halogenated Volatile Organic Compounds							
Dichlorodifluoromethane	W-VOCGMS05	1.0	µg/L	<1.0	----	----	----
Vinyl chloride	W-VOCGMS01	1.00	µg/L	<1.00	----	----	----
Chloromethane	W-VOCGMS05	10	µg/L	<10	----	----	----
trans-1,2-Dichloroethene	W-VOCGMS01	0.10	µg/L	<0.10	----	----	----
Bromomethane	W-VOCGMS05	1.0	µg/L	<1.0	----	----	----
Dichloromethane	W-VOCGMS01	6.0	µg/L	<6.0	----	----	----
1,1-Dichloroethene	W-VOCGMS01	0.10	µg/L	<0.10	----	----	----
Chloroethane	W-VOCGMS05	1.0	µg/L	<1.0	----	----	----
cis-1,2-Dichloroethene	W-VOCGMS01	0.10	µg/L	<0.10	----	----	----
Trichlorofluoromethane	W-VOCGMS05	1.0	µg/L	<1.0	----	----	----
1,1-Dichloroethane	W-VOCGMS01	0.10	µg/L	<0.10	----	----	----
Bromochloromethane	W-VOCGMS05	2.0	µg/L	<2.0	----	----	----
2,2-Dichloropropane	W-VOCGMS05	1.0	µg/L	<1.0	----	----	----
Chloroform	W-VOCGMS01	0.30	µg/L	<0.30	----	----	----
1,1-Dichloropropylene	W-VOCGMS05	1.0	µg/L	<1.0	----	----	----
1,2-Dichloroethane	W-VOCGMS01	1.00	µg/L	<1.00	----	----	----
1,1,1-Trichloroethane	W-VOCGMS01	0.10	µg/L	<0.10	----	----	----
Dibromomethane	W-VOCGMS05	1.0	µg/L	<1.0	----	----	----
cis-1,3-Dichloropropylene	W-VOCGMS05	1.0	µg/L	<1.0	----	----	----
Tetrachloromethane	W-VOCGMS01	0.10	µg/L	<0.10	----	----	----
Bromodichloromethane	W-VOCGMS01	0.10	µg/L	<0.10	----	----	----
trans-1,3-Dichloropropene	W-VOCGMS05	1.0	µg/L	<1.0	----	----	----
1,3-Dichloropropane	W-VOCGMS05	1.0	µg/L	<1.0	----	----	----
Trichloroethene	W-VOCGMS01	0.10	µg/L	<0.10	----	----	----
1,1,2-Trichloroethane	W-VOCGMS01	0.20	µg/L	<0.20	----	----	----
1,2-Dibromoethane (EDB)	W-VOCGMS05	1.0	µg/L	<1.0	----	----	----



Sub-Matrix: GROUNDWATER		Client sample ID		1142.13-12/02.13	---	---
		Laboratory sample ID		PR1358314001	---	---
		Client sampling date / time		25-NOV-2013 00:00	---	---
Parameter	Method	LOR	Unit	Result	MU	
Aromatic Compounds - Continued						
1-Methylanthracene@1-Methylphenanthrene	W-SPIGMS04	0.10	µg/L	<0.10	---	---
2-Methylphenanthrene	W-SPIGMS04	0.050	µg/L	<0.050	---	---
Isopropylbenzene	W-SPIGMS04	0.050	µg/L	<0.050	---	---
1,2-Dimethylnaphthalene	W-SPIGMS04	0.050	µg/L	<0.050	---	---
n-Propylbenzene	W-SPIGMS04	0.050	µg/L	<0.050	---	---
2,6@2,7-Dimethylnaphthalene	W-SPIGMS04	0.10	µg/L	<0.10	---	---
1,7@1,3@1,6-Dimethylnaphthalene	W-SPIGMS04	0.15	µg/L	<0.15	---	---
1,4@2,3@1,5-Dimethylnaphthalene	W-SPIGMS04	0.15	µg/L	<0.15	---	---
1,3,7-Trimethylnaphthalene	W-SPIGMS04	0.05	µg/L	<0.05	---	---
1,4,6@2,3,6-Trimethylnaphthalene	W-SPIGMS04	0.10	µg/L	<0.10	---	---
2,3,5@1,2,6-Trimethylnaphthalene	W-SPIGMS04	0.10	µg/L	<0.10	---	---
1,2,4@2,4,5@1,2,5-Trimethylnaphthalene	W-SPIGMS04	0.15	µg/L	<0.15	---	---
1,2,3@1,4,5-Trimethylnaphthalene	W-SPIGMS04	0.10	µg/L	<0.10	---	---
1,4,6,7-Tetramethylnaphthalene	W-SPIGMS04	0.050	µg/L	<0.050	---	---
1,2,5,6-Tetramethylnaphthalene	W-SPIGMS04	0.050	µg/L	<0.050	---	---
Methylpyrenes@Methylfluoranthenes	W-SPIGMS04	1.0	µg/L	<1.0	---	---
Methylchrysenes@Methylbenz(a)anthracenes	W-SPIGMS04	1.0	µg/L	<1.0	---	---
Sum of Aromatics C16-C35	W-SPIGMS04	2.0	µg/L	<2.0	---	---
Sum of Aromatics C16-C35 (M1)	W-SPIGMS04	1.0	µg/L	<1.0	---	---
Polycyclic Aromatics Hydrocarbons (PAHs)						
Naphthalene	W-SPIGMS04	0.010	µg/L	<0.010	---	---
Acenaphthylene	W-SPIGMS04	0.010	µg/L	<0.010	---	---
Acenaphthene	W-SPIGMS04	0.010	µg/L	<0.010	---	---
Fluorene	W-SPIGMS04	0.010	µg/L	<0.010	---	---
Phenanthrene	W-SPIGMS04	0.010	µg/L	<0.010	---	---
Anthracene	W-SPIGMS04	0.010	µg/L	<0.010	---	---
Naphthalene	W-VOCGMS05	1.0	µg/L	<1.0	---	---
Fluoranthene	W-SPIGMS04	0.010	µg/L	<0.010	---	---
Pyrene	W-SPIGMS04	0.010	µg/L	<0.010	---	---
Benz(a)anthracene	W-SPIGMS04	0.010	µg/L	<0.010	---	---
Chrysene	W-SPIGMS04	0.010	µg/L	<0.010	---	---
Benzo(b)fluoranthene	W-SPIGMS04	0.010	µg/L	<0.010	---	---
Benzo(k)fluoranthene	W-SPIGMS04	0.010	µg/L	<0.010	---	---
Benzo(a)pyrene	W-SPIGMS04	0.010	µg/L	<0.010	---	---
Indeno(1,2,3.cd)pyrene	W-SPIGMS04	0.010	µg/L	<0.010	---	---
Benzo(g,h,i)perylene	W-SPIGMS04	0.010	µg/L	<0.010	---	---
Dibenz(a,h)anthracene	W-SPIGMS04	0.010	µg/L	<0.010	---	---
Sum of 16 PAH (M1)	W-SPIGMS04	0.080	µg/L	<0.080	---	---
Sum of carcinogenic PAH (M1)	W-SPIGMS04	0.035	µg/L	<0.035	---	---
Sum of other PAH (M1)	W-SPIGMS04	0.045	µg/L	<0.045	---	---
Sum of PAH L (M1)	W-SPIGMS04	0.0150	µg/L	<0.0150	---	---
Sum of PAH M (M1)	W-SPIGMS04	0.0250	µg/L	<0.0250	---	---
Sum of PAH H (M1)	W-SPIGMS04	0.040	µg/L	<0.040	---	---
PCBs						



Sub-Matrix: GROUNDWATER

Client sample ID : 1142.13-12/02.13
 Laboratory sample ID : PR1358314001
 Client sampling date / time : 25-NOV-2013 00:00

Parameter	Method	LOR	Unit	Result	MU			
Halogenated Volatile Organic Compounds - Continued								
1,2,3-Trichloropropane	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---
Dibromochloromethane	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---	---
Bromobenzene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---
Tetrachloroethene	W-VOCGMS01	0.20	µg/L	<0.20	---	---	---	---
1,1,1,2-Tetrachloroethane	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---	---
2-Chlorotoluene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---
Chlorobenzene	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---	---
4-Chlorotoluene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---
Bromoform	W-VOCGMS01	0.20	µg/L	<0.20	---	---	---	---
1,1,1,2-Tetrachloroethane	W-VOCGMS01	1.0	µg/L	<1.0	---	---	---	---
1,2-Dichlorobenzene	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---	---
1,2-Dibromo-3-chloropropane	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---
1,4-Dichlorobenzene	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---	---
1,3-Dichlorobenzene	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---	---
1,2,4-Trichlorobenzene	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---	---
Hexachlorobutadiene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---
1,2,3-Trichlorobenzene	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---	---
1,3,5-Trichlorobenzene	W-VOCGMS01	0.20	µg/L	<0.20	---	---	---	---
1,2-Dichloropropane	W-VOCGMS01	1.0	µg/L	<1.0	---	---	---	---
Sum of 4 Trihalomethanes	W-VOCGMS01	0.70	µg/L	<0.70	---	---	---	---
Sum of 3 Dichlorobenzenes	W-VOCGMS01	0.30	µg/L	<0.30	---	---	---	---
Sum of 3 Trichlorobenzenes	W-VOCGMS01	0.40	µg/L	<0.40	---	---	---	---
Non-Halogenated Volatile Organic Compounds								
Isopropylbenzene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---
n-Propylbenzene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---
1,2,4-Trimethylbenzene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---
p-Isopropyltoluene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---
1,3,5-Trimethylbenzene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---
Styrene	W-VOCGMS01	0.20	µg/L	<0.20	---	---	---	---
sec-Butylbenzene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---
tert-Butylbenzene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---
n-Butylbenzene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---
Methyl tert-Butyl Ether (MTBE)	W-VOCGMS01	0.20	µg/L	<0.20	---	---	---	---
tert-Butyl alcohol	W-VOCGMS01	5.0	µg/L	<5.0	---	---	---	---
Sum of BTEXS	W-VOCGMS01	1.80	µg/L	<1.80	---	---	---	---
Aromatic Compounds								
1-Ethyl-2-methylbenzene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---	---
1-Ethyl-3-methylbenzene@1-Ethyl-4-methylbenzene	W-SPIGMS04	0.10	µg/L	<0.10	---	---	---	---
1,3,5-Trimethylbenzene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---	---
1,2,4-Trimethylbenzene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---	---
1,2,3-Trimethylbenzene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---	---
1,2@1,4-Diethylbenzene	W-SPIGMS04	0.10	µg/L	<0.10	---	---	---	---
1,3-Diethylbenzene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---	---
1,2,4,5-Tetramethylbenzene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---	---
2-Methylnaphthalene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---	---
1-Methylnaphthalene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---	---
Biphenyl	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---	---
2@1-Ethyl-naphthalene	W-SPIGMS04	0.10	µg/L	<0.10	---	---	---	---
1,8-Dimethylnaphthalene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---	---
2-Methylantracene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---	---



Sub-Matrix: GROUNDWATER		Client sample ID		1142.13-12/02.13	----	----
		Laboratory sample ID		PR1358314001	----	----
		Client sampling date / time		25-NOV-2013 00:00	----	----
Parameter	Method	LOR	Unit	Result	MU	----
PCBs - Continued						
PCB 28	W-PCBECD01	0.00110	µg/L	<0.00110	----	----
PCB 52	W-PCBECD01	0.00110	µg/L	<0.00110	----	----
PCB 101	W-PCBECD01	0.000750	µg/L	<0.000750	----	----
PCB 118	W-PCBECD01	0.00110	µg/L	<0.00110	----	----
PCB 138	W-PCBECD01	0.00120	µg/L	<0.00120	----	----
PCB 153	W-PCBECD01	0.00110	µg/L	<0.00110	----	----
PCB 180	W-PCBECD01	0.000950	µg/L	<0.000950	----	----
Sum of 6 PCBs	W-PCBECD01	0.00620	µg/L	<0.00620	----	----
Sum of 7 PCBs	W-PCBECD01	0.00730	µg/L	<0.00730	----	----
Petroleum Hydrocarbons						
Aliphates C10-C12	W-SPIGMS04	10	µg/L	<10	----	----
Aliphates C12-C16	W-SPIGMS04	10	µg/L	<10	----	----
Aliphates C16-C35	W-SPIGMS04	10	µg/L	<10	----	----
C10 - C12 Fraction	W-TPHFID01	5.0	µg/L	<5.0	----	----
C10 - C16 Fraction	W-TPHFID02	10	µg/L	<10	----	----
C10 - C40 Fraction	W-TPHFID02	50	µg/L	<50	----	----
C10 - C40 Fraction	W-TPHFID01	50	µg/L	<50	----	----
C12 - C16 Fraction	W-TPHFID01	5.0	µg/L	<5.0	----	----
C16 - C22 Fraction	W-TPHFID02	10	µg/L	<10	----	----
C16 - C35 Fraction	W-TPHFID01	30	µg/L	<30	----	----
C22 - C30 Fraction	W-TPHFID02	15	µg/L	<15	----	----
C30 - C40 Fraction	W-TPHFID02	15	µg/L	<15	----	----
C35 - C40 Fraction	W-TPHFID01	10	µg/L	<10	----	----
Sum of Aliphates C10-C35	W-SPIGMS04	30	µg/L	<30	----	----
Sum of Aliphates C10-C35 (M1)	W-SPIGMS04	15	µg/L	<15	----	----
Sum of Aliphates C12-C35 (M1)	W-SPIGMS04	10	µg/L	<10	----	----
Sum of Aromatics C10-C16	W-SPIGMS04	1.55	µg/L	<1.55	----	----
Sum of Aromatics C10-C16 (M1)	W-SPIGMS04	0.775	µg/L	<0.775	----	----
Sum of Aromatics C8-C10	W-SPIGMS04	0.60	µg/L	<0.60	----	----
Sum of Aromatics C8-C10 (M1)	W-SPIGMS04	0.30	µg/L	<0.30	----	----

If the client does not specify the date and time of sample collection, the laboratory will specify the date on sample delivery in parentheses, instead. If the time of sample collection is specified as 0:00 it means that the client did specify the date but not the time. Measurement uncertainty is expressed as expanded measurement uncertainty with coverage factor k = 2, representing 95% confidence level.
 Key: LOR = Limit of reporting; MU = Measurement Uncertainty

The end of result part of the certificate of analysis

Brief Method Summaries

Analytical Methods	Method Descriptions
Location of test performance: Na Harfe 336/9 Prague 9 - Vysocany Czech Republic 190 00	
W-ANI-ENV	CZ_SOP_D06_02_068 (CSN ISO 10304-1, CSN EN 12506) Determination of dissolved fluoride, chloride, nitrite, bromide, nitrate and sulphate by ion liquid chromatography and determination of nitrite nitrogen and nitrate nitrogen by calculation from measured values.
W-COD-SPC	CZ_SOP_D06_02_076 Determination of chemical oxygen demand using dichromate (COD-Cr) by photometry (based on CSN ISO 15705) / CZ_SOP_D06_02_076A / CZ_SOP_D06_07_040 Determination of chemical oxygen demand using dichromate (COD-Cr) by titration (based on CSN ISO 6060 and CSN ISO 15705).
W-HG-AFSFL	CZ_SOP_D06_02_096 (US EPA 245.7, US EPA 1631, CSN EN ISO 17852, CSN EN 13370 samples prepared as per CZ_SOP_D06_02_J02 chap. 10.1 and 10.2.) Determination of Mercury by Fluorescence Spectrometry. Sample was filtered by microfilter with porosity 0.45 µm followed by nitric acid addition prior to analysis.



Analytical Methods	Method Descriptions
W-METAXFL1	CZ_SOP_D06_02_001 (US EPA 200.7, ISO 11885, EN 12506, samples prepared as per CZ_SOP_D06_02_J02 chap. 10.1 and 10.2) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values. Sample was filtered by microfilter with porosity 0.45 µm followed by nitric acid addition prior to analysis.
W-NH4-SPC	CZ_SOP_D06_02_019 (CSN EN ISO 11732, CSN EN ISO 13395, CSN EN 13370, CSN EN 12506) Determination of ammonium, nitrite and the sum of nitrite and nitrate ions by discrete spectrophotometry and determination of nitrite, nitrate, ammonia, inorganic, organic, total nitrogen and free ammonia by calculation from measured values.
W-PCBECD01	CZ_SOP_D06_03_166 (DIN 38407, part 2, US EPA 8082, samples preparation according to CZ_SOP_D06_03_P01 chap. 9.1, CZ_SOP_D06_03_P02 chap. 9.1) Determination of polychlorinated biphenyls - congener analyses by gas chromatography method with ECD detection and calculation of polychlorinated biphenyls sums from measured values
W-SPIGMS04	CZ_SOP_D06_03_157 except chap. 9.3 (SPIMFAB) Determination of organic contaminants by gas chromatography method with MS detection (SPIMFAB) and calculation of organic contaminants sums from measured values
W-TPHFID01	CZ_SOP_D06_03_151 (CSN EN ISO 9377-2, Z1, TNRCC Method 1006) Determination of extractable compounds in the range of hydrocarbons C5 - C50, their fractions calculated from the measured values by gas chromatography method with FID detection
W-TPHFID02	CZ_SOP_D06_03_151 (CSN EN ISO 9377-2, Z1, TNRCC Method 1006) Determination of extractable compounds in the range of hydrocarbons C5 - C50, their fractions calculated from the measured values by gas chromatography method with FID detection
W-TPH-IR	CZ_SOP_D06_02_057 Determination of nonpolar extractives by infrared spectrometry (based on CSN 75 7505:2006, CSN 830540-4)
W-VOCGMS01	CZ_SOP_D06_03_155 except chap. 9.2 (US EPA 624, US EPA 8260, EN ISO 10301, MADEP 2004, rev. 1.1) Determination of volatile organic compounds by gas chromatography method with FID and MS detection and calculation of volatile organic compounds sums from measured values
W-VOCGMS05	CZ_SOP_D06_03_155 except chap. 9.2 (US EPA 624, US EPA 8260, EN ISO 10301, MADEP 2004, rev. 1.1) Determination of volatile organic compounds by gas chromatography method with FID and MS detection and calculation of volatile organic compounds sums from measured values

A "*" symbol preceding any method indicates non-accredited test. In the case when a procedure belonging to an accredited method was used for non-accredited matrix, would apply that the reported results are non-accredited. Please refer to General Comment section on front page for information.

The calculation methods of summation parameters are available on request in the client service.



CERTIFICATE OF ANALYSIS

Work Order	: PR1362893	Issue Date	: 03-JAN-2014
Client	: IDAD - Instituto do Ambiente e Desenvolvimento	Laboratory	: ALS Czech Republic, s.r.o.
Contact	: Mrs. Alexandra Passos Silva	Contact	: Client Service
Address	: Campus Universitario Aveiro Portugal 3810-193	Address	: Na Harfe 336/9 Prague 9 - Vysocany Czech Republic 190 00
E-mail	: a.passosilva@ua.pt	E-mail	: customer.support@alsglobal.com
Telephone	: +351 2344 00800	Telephone	: +420 226 226 228
Facsimile	: ----	Facsimile	: +420 284 081 635
Project	: IMA 12 02 13	Page	: 1 of 6
Order number	: ----	Date Samples	: 27-DEC-2013
C-O-C number	: ----	Received	
Site	: ----	Quote number	: PR2013IDAIN-PT0012 (PT-300-13-0029)
Sampled by	: client	Date of test	: 27-DEC-2013 - 03-JAN-2014
		QC Level	: ALS CR Standard Quality Control Schedule

General Comments

This report shall not be reproduced except in full, without prior written approval from the laboratory.
The laboratory declares that the test results relate only to the listed samples.

Responsible for accuracy

Signatories
Zdenek Jirak

Position
Environmental Business Unit
Manager



Testing Laboratory
Accredited by CAI



L 1163

ALS Czech Republic, s.r.o.
Na Harfe 336/9 Prague 9 - Vysocany Czech Republic 190 00



Analytical Results

Sub-Matrix: GROUNDWATER				Client sample ID		1266.13-12/02.13		1266.13-12/02.13		---	
				Laboratory sample ID		PR1362893001		PR1362893002		---	
				Client sampling date / time		16-DEC-2013 00:00		08-DEC-2013 00:00		---	
Parameter	Method	LOR	Unit	Result	MU	Result	MU	---	---	---	---
Nonmetallic Inorganic Parameters											
Ammonia and ammonium ions	W-NH4-SPC	0.050	mg/L	<0.050	---	---	---	---	---	---	---
Chemical Oxygen Demand (COD-Cr)	W-COD-SPC	5.0	mg/L	6.0	±23.3%	---	---	---	---	---	---
Ammonia as N	W-NH4-SPC	0.040	mg/L	<0.040	---	---	---	---	---	---	---
Chloride	W-ANI-ENV	0.500	mg/L	17.0	±15.0%	---	---	---	---	---	---
Nitrates	W-ANI-ENV	0.040	mg/L	0.162	±15.0%	---	---	---	---	---	---
Nitrites	W-ANI-ENV	0.040	mg/L	<0.040	---	---	---	---	---	---	---
Sulphate as SO4 2-	W-ANI-ENV	0.500	mg/L	17.1	±15.0%	---	---	---	---	---	---
Dissolved Metals / Major Cations											
Arsenic	W-METAXFL1	0.0050	mg/L	<0.0050	---	---	---	---	---	---	---
Cadmium	W-METAXFL1	0.00040	mg/L	<0.00040	---	---	---	---	---	---	---
Lead	W-METAXFL1	0.0050	mg/L	<0.0050	---	---	---	---	---	---	---
Mercury	W-HG-AFSFL	0.010	µg/L	<0.010	---	---	---	---	---	---	---
Petroleum Hydrocarbons - FTIR											
Total Petroleum Hydrocarbons	W-TPH-IR	0.050	mg/L	---	---	<0.050	---	---	---	---	---
BTEX											
Benzene	W-VOCGMS01	0.20	µg/L	---	---	<0.20	---	---	---	---	---
Toluene	W-VOCGMS01	1.00	µg/L	---	---	<1.00	---	---	---	---	---
Ethylbenzene	W-VOCGMS01	0.10	µg/L	---	---	<0.10	---	---	---	---	---
meta- & para-Xylene	W-VOCGMS01	0.20	µg/L	---	---	<0.20	---	---	---	---	---
ortho-Xylene	W-VOCGMS01	0.10	µg/L	---	---	<0.10	---	---	---	---	---
Sum of BTEX	W-VOCGMS01	1.60	µg/L	---	---	<1.60	---	---	---	---	---
Sum of xylenes	W-VOCGMS01	0.30	µg/L	---	---	<0.30	---	---	---	---	---
Sum of TEX	W-VOCGMS01	1.40	µg/L	---	---	<1.40	---	---	---	---	---
Halogenated Volatile Organic Compounds											
Dichlorodifluoromethane	W-VOCGMS05	1.0	µg/L	---	---	<1.0	---	---	---	---	---
Vinyl chloride	W-VOCGMS01	1.00	µg/L	---	---	<1.00	---	---	---	---	---
Chloromethane	W-VOCGMS05	10	µg/L	---	---	<10	---	---	---	---	---
trans-1,2-Dichloroethene	W-VOCGMS01	0.10	µg/L	---	---	<0.10	---	---	---	---	---
Bromomethane	W-VOCGMS05	1.0	µg/L	---	---	<1.0	---	---	---	---	---
Dichloromethane	W-VOCGMS01	6.0	µg/L	---	---	<6.0	---	---	---	---	---
1,1-Dichloroethene	W-VOCGMS01	0.10	µg/L	---	---	<0.10	---	---	---	---	---
Chloroethane	W-VOCGMS05	1.0	µg/L	---	---	<1.0	---	---	---	---	---
cis-1,2-Dichloroethene	W-VOCGMS01	0.10	µg/L	---	---	<0.10	---	---	---	---	---
Trichlorofluoromethane	W-VOCGMS05	1.0	µg/L	---	---	<1.0	---	---	---	---	---
1,1-Dichloroethane	W-VOCGMS01	0.10	µg/L	---	---	<0.10	---	---	---	---	---
Bromochloromethane	W-VOCGMS05	2.0	µg/L	---	---	<2.0	---	---	---	---	---
2,2-Dichloropropane	W-VOCGMS05	1.0	µg/L	---	---	<1.0	---	---	---	---	---
Chloroform	W-VOCGMS01	0.30	µg/L	---	---	<0.30	---	---	---	---	---
1,1-Dichloropropylene	W-VOCGMS05	1.0	µg/L	---	---	<1.0	---	---	---	---	---
1,2-Dichloroethane	W-VOCGMS01	1.00	µg/L	---	---	<1.00	---	---	---	---	---
1,1,1-Trichloroethane	W-VOCGMS01	0.10	µg/L	---	---	<0.10	---	---	---	---	---
Dibromomethane	W-VOCGMS05	1.0	µg/L	---	---	<1.0	---	---	---	---	---
cis-1,3-Dichloropropylene	W-VOCGMS05	1.0	µg/L	---	---	<1.0	---	---	---	---	---
Tetrachloromethane	W-VOCGMS01	0.10	µg/L	---	---	<0.10	---	---	---	---	---
Bromodichloromethane	W-VOCGMS01	0.10	µg/L	---	---	<0.10	---	---	---	---	---
trans-1,3-Dichloropropene	W-VOCGMS05	1.0	µg/L	---	---	<1.0	---	---	---	---	---
1,3-Dichloropropane	W-VOCGMS05	1.0	µg/L	---	---	<1.0	---	---	---	---	---
Trichloroethene	W-VOCGMS01	0.10	µg/L	---	---	<0.10	---	---	---	---	---
1,1,2-Trichloroethane	W-VOCGMS01	0.20	µg/L	---	---	<0.20	---	---	---	---	---
1,2-Dibromoethane (EDB)	W-VOCGMS05	1.0	µg/L	---	---	<1.0	---	---	---	---	---



Sub-Matrix: GROUNDWATER				Client sample ID		1266.13-12/02.13		1266.13-12/02.13		---	
				Laboratory sample ID		PR1362893001		PR1362893002		---	
				Client sampling date / time		16-DEC-2013 00:00		06-DEC-2013 00:00		---	
Parameter	Method	LOR	Unit	Result	MU	Result	MU	---	---		
Halogenated Volatile Organic Compounds - Continued											
1,2,3-Trichloropropane	W-VOCGMS05	1.0	µg/L	---	---	<1.0	---	---	---		
Dibromochloromethane	W-VOCGMS01	0.10	µg/L	---	---	<0.10	---	---	---		
Bromobenzene	W-VOCGMS05	1.0	µg/L	---	---	<1.0	---	---	---		
Tetrachloroethene	W-VOCGMS01	0.20	µg/L	---	---	<0.20	---	---	---		
1,1,1,2-Tetrachloroethane	W-VOCGMS01	0.10	µg/L	---	---	<0.10	---	---	---		
2-Chlorotoluene	W-VOCGMS05	1.0	µg/L	---	---	<1.0	---	---	---		
Chlorobenzene	W-VOCGMS01	0.10	µg/L	---	---	<0.10	---	---	---		
4-Chlorotoluene	W-VOCGMS05	1.0	µg/L	---	---	<1.0	---	---	---		
Bromoform	W-VOCGMS01	0.20	µg/L	---	---	<0.20	---	---	---		
1,1,1,2,2-Tetrachloroethane	W-VOCGMS01	1.0	µg/L	---	---	<1.0	---	---	---		
1,2-Dichlorobenzene	W-VOCGMS01	0.10	µg/L	---	---	<0.10	---	---	---		
1,2-Dibromo-3-chloropropane	W-VOCGMS05	1.0	µg/L	---	---	<1.0	---	---	---		
1,4-Dichlorobenzene	W-VOCGMS01	0.10	µg/L	---	---	<0.10	---	---	---		
1,3-Dichlorobenzene	W-VOCGMS01	0.10	µg/L	---	---	<0.10	---	---	---		
1,2,4-Trichlorobenzene	W-VOCGMS01	0.10	µg/L	---	---	<0.10	---	---	---		
Hexachlorobutadiene	W-VOCGMS05	1.0	µg/L	---	---	<1.0	---	---	---		
1,2,3-Trichlorobenzene	W-VOCGMS01	0.10	µg/L	---	---	<0.10	---	---	---		
1,3,5-Trichlorobenzene	W-VOCGMS01	0.20	µg/L	---	---	<0.20	---	---	---		
1,2-Dichloropropane	W-VOCGMS01	1.0	µg/L	---	---	<1.0	---	---	---		
Sum of 4 Trihalomethanes	W-VOCGMS01	0.70	µg/L	---	---	<0.70	---	---	---		
Sum of 3 Dichlorobenzenes	W-VOCGMS01	0.30	µg/L	---	---	<0.30	---	---	---		
Sum of 3 Trichlorobenzenes	W-VOCGMS01	0.40	µg/L	---	---	<0.40	---	---	---		
Non-Halogenated Volatile Organic Compounds											
Isopropylbenzene	W-VOCGMS05	1.0	µg/L	---	---	<1.0	---	---	---		
n-Propylbenzene	W-VOCGMS05	1.0	µg/L	---	---	<1.0	---	---	---		
1,2,4-Trimethylbenzene	W-VOCGMS05	1.0	µg/L	---	---	<1.0	---	---	---		
p-Isopropyltoluene	W-VOCGMS05	1.0	µg/L	---	---	<1.0	---	---	---		
1,3,5-Trimethylbenzene	W-VOCGMS05	1.0	µg/L	---	---	<1.0	---	---	---		
Styrene	W-VOCGMS01	0.20	µg/L	---	---	<0.20	---	---	---		
sec-Butylbenzene	W-VOCGMS05	1.0	µg/L	---	---	<1.0	---	---	---		
tert-Butylbenzene	W-VOCGMS05	1.0	µg/L	---	---	<1.0	---	---	---		
n-Butylbenzene	W-VOCGMS05	1.0	µg/L	---	---	<1.0	---	---	---		
Methyl tert-Butyl Ether (MTBE)	W-VOCGMS01	0.20	µg/L	---	---	<0.20	---	---	---		
tert-Butyl alcohol	W-VOCGMS01	5.0	µg/L	---	---	<5.0	---	---	---		
Sum of BTEXS	W-VOCGMS01	1.80	µg/L	---	---	<1.80	---	---	---		
Aromatic Compounds											
1-Ethyl-2-methylbenzene	W-SPIGMS04	0.050	µg/L	---	---	<0.050	---	---	---		
1-Ethyl-3-methylbenzene@1-Ethyl-4-methylbenzene	W-SPIGMS04	0.10	µg/L	---	---	<0.10	---	---	---		
1,3,5-Trimethylbenzene	W-SPIGMS04	0.050	µg/L	---	---	<0.050	---	---	---		
1,2,4-Trimethylbenzene	W-SPIGMS04	0.050	µg/L	---	---	<0.050	---	---	---		
1,2,3-Trimethylbenzene	W-SPIGMS04	0.050	µg/L	---	---	<0.050	---	---	---		
1,2@1,4-Diethylbenzene	W-SPIGMS04	0.10	µg/L	---	---	<0.10	---	---	---		
1,3-Diethylbenzene	W-SPIGMS04	0.050	µg/L	---	---	<0.050	---	---	---		
1,2,4,5-Tetramethylbenzene	W-SPIGMS04	0.050	µg/L	---	---	<0.050	---	---	---		
2-Methylnaphthalene	W-SPIGMS04	0.050	µg/L	---	---	<0.050	---	---	---		
1-Methylnaphthalene	W-SPIGMS04	0.050	µg/L	---	---	<0.050	---	---	---		
Biphenyl	W-SPIGMS04	0.050	µg/L	---	---	<0.050	---	---	---		
2@1-Ethyl-naphthalene	W-SPIGMS04	0.10	µg/L	---	---	<0.10	---	---	---		
1,8-Dimethylnaphthalene	W-SPIGMS04	0.050	µg/L	---	---	<0.050	---	---	---		
2-Methylantracene	W-SPIGMS04	0.050	µg/L	---	---	<0.050	---	---	---		



Sub-Matrix: GROUNDWATER

Client sample ID
 Laboratory sample ID
 Client sampling date / time

1266.13-12/02.13	1266.13-12/02.13	---
PR1362893001	PR1362893002	---
16-DEC-2013 00:00	06-DEC-2013 00:00	---

Parameter	Method	LOR	Unit	Result	MU	Result	MU	---	---
Aromatic Compounds - Continued									
1-Methylanthracene@1-Methylphenanthrene	W-SPIGMS04	0.10	µg/L	---	---	<0.10	---	---	---
2-Methylphenanthrene	W-SPIGMS04	0.050	µg/L	---	---	<0.050	---	---	---
Isopropylbenzene	W-SPIGMS04	0.050	µg/L	---	---	<0.050	---	---	---
1,2-Dimethylnaphthalene	W-SPIGMS04	0.050	µg/L	---	---	<0.050	---	---	---
n-Propylbenzene	W-SPIGMS04	0.050	µg/L	---	---	<0.050	---	---	---
2,6@2,7-Dimethylnaphthalene	W-SPIGMS04	0.10	µg/L	---	---	<0.10	---	---	---
1,7@1,3@1,6-Dimethylnaphthalene	W-SPIGMS04	0.15	µg/L	---	---	<0.15	---	---	---
1,4@2,3@1,5-Dimethylnaphthalene	W-SPIGMS04	0.15	µg/L	---	---	<0.15	---	---	---
1,3,7-Trimethylnaphthalene	W-SPIGMS04	0.05	µg/L	---	---	<0.05	---	---	---
1,4,6@2,3,6-Trimethylnaphthalene	W-SPIGMS04	0.10	µg/L	---	---	<0.10	---	---	---
2,3,5@1,2,6-Trimethylnaphthalene	W-SPIGMS04	0.10	µg/L	---	---	<0.10	---	---	---
1,2,4@2,4,5@1,2,5-Trimethylnaphthalene	W-SPIGMS04	0.15	µg/L	---	---	<0.15	---	---	---
1,2,3@1,4,5-Trimethylnaphthalene	W-SPIGMS04	0.10	µg/L	---	---	<0.10	---	---	---
1,4,6,7-Tetramethylnaphthalene	W-SPIGMS04	0.050	µg/L	---	---	<0.050	---	---	---
1,2,5,6-Tetramethylnaphthalene	W-SPIGMS04	0.050	µg/L	---	---	<0.050	---	---	---
Methylpyrenes@Methylfluoranthenes	W-SPIGMS04	1.0	µg/L	---	---	<1.0	---	---	---
Methylchrysenes@Methylbenz(a)anthracenes	W-SPIGMS04	1.0	µg/L	---	---	<1.0	---	---	---
Sum of Aromatics C16-C35	W-SPIGMS04	2.0	µg/L	---	---	<2.0	---	---	---
Polycyclic Aromatics Hydrocarbons (PAHs)									
Naphthalene	W-SPIGMS04	0.010	µg/L	---	---	<0.010	---	---	---
Acenaphthylene	W-SPIGMS04	0.010	µg/L	---	---	<0.010	---	---	---
Acenaphthene	W-SPIGMS04	0.010	µg/L	---	---	<0.010	---	---	---
Fluorene	W-SPIGMS04	0.010	µg/L	---	---	<0.010	---	---	---
Phenanthrene	W-SPIGMS04	0.010	µg/L	---	---	<0.010	---	---	---
Anthracene	W-SPIGMS04	0.010	µg/L	---	---	<0.010	---	---	---
Fluoranthene	W-SPIGMS04	0.010	µg/L	---	---	<0.010	---	---	---
Pyrene	W-SPIGMS04	0.010	µg/L	---	---	<0.010	---	---	---
Benz(a)anthracene	W-SPIGMS04	0.010	µg/L	---	---	<0.010	---	---	---
Chrysene	W-SPIGMS04	0.010	µg/L	---	---	<0.010	---	---	---
Benzo(b)fluoranthene	W-SPIGMS04	0.010	µg/L	---	---	<0.010	---	---	---
Benzo(k)fluoranthene	W-SPIGMS04	0.010	µg/L	---	---	<0.010	---	---	---
Benzo(a)pyrene	W-SPIGMS04	0.010	µg/L	---	---	<0.010	---	---	---
Indeno(1,2,3,cd)pyrene	W-SPIGMS04	0.010	µg/L	---	---	<0.010	---	---	---
Benzo(g,h,i)perylene	W-SPIGMS04	0.010	µg/L	---	---	<0.010	---	---	---
Dibenz(a,h)anthracene	W-SPIGMS04	0.010	µg/L	---	---	<0.010	---	---	---
Sum of 16 PAH	W-SPIGMS04	0.160	µg/L	---	---	<0.160	---	---	---
Sum of carcinogenic PAH	W-SPIGMS04	0.070	µg/L	---	---	<0.070	---	---	---
Sum of other PAH	W-SPIGMS04	0.090	µg/L	---	---	<0.090	---	---	---
PCBs									
PCB 28	W-PCBECD01	0.00110	µg/L	---	---	<0.00110	---	---	---
PCB 62	W-PCBECD01	0.00110	µg/L	---	---	<0.00110	---	---	---
PCB 101	W-PCBECD01	0.000750	µg/L	---	---	<0.000750	---	---	---
PCB 118	W-PCBECD01	0.00110	µg/L	---	---	<0.00110	---	---	---
PCB 138	W-PCBECD01	0.00120	µg/L	---	---	<0.00120	---	---	---



Sub-Matrix: GROUNDWATER				Client sample ID	1266.13-12/02.13	1266.13-12/02.13	---	
				Laboratory sample ID	PR1362893001	PR1362893002	---	
				Client sampling date / time	16-DEC-2013 00:00	06-DEC-2013 00:00	---	
Parameter	Method	LOR	Unit	Result	MU	Result	MU	---
PCBs - Continued								
PCB 153	W-PCBECD01	0.00110	µg/L	---	---	<0.00110	---	---
PCB 180	W-PCBECD01	0.000950	µg/L	---	---	<0.000950	---	---
Sum of 6 PCBs	W-PCBECD01	0.00620	µg/L	---	---	<0.00620	---	---
Sum of 7 PCBs	W-PCBECD01	0.00730	µg/L	---	---	<0.00730	---	---
Petroleum Hydrocarbons								
Aliphates C10-C12	W-SPIGMS04	10	µg/L	---	---	<10	---	---
Aliphates C12-C16	W-SPIGMS04	10	µg/L	---	---	<10	---	---
Aliphates C16-C35	W-SPIGMS04	10	µg/L	---	---	<10	---	---
C10 - C12 Fraction	W-TPHFID01	5.0	µg/L	---	---	<5.0	---	---
C10 - C16 Fraction	W-TPHFID02	10	µg/L	---	---	<10	---	---
C10 - C40 Fraction	W-TPHFID02	50	µg/L	---	---	<50	---	---
C10 - C40 Fraction	W-TPHFID01	50	µg/L	---	---	<50	---	---
C12 - C16 Fraction	W-TPHFID01	5.0	µg/L	---	---	<5.0	---	---
C16 - C22 Fraction	W-TPHFID02	10	µg/L	---	---	<10	---	---
C16 - C35 Fraction	W-TPHFID01	30	µg/L	---	---	<30	---	---
C22 - C30 Fraction	W-TPHFID02	15	µg/L	---	---	<15	---	---
C30 - C40 Fraction	W-TPHFID02	15	µg/L	---	---	<15	---	---
C35 - C40 Fraction	W-TPHFID01	10	µg/L	---	---	<10	---	---
Sum of Aliphates C10-C35	W-SPIGMS04	30	µg/L	---	---	<30	---	---
Sum of Aliphates C12-C35	W-SPIGMS04	20	µg/L	---	---	<20	---	---
Sum of Aromatics C10-C16	W-SPIGMS04	1.55	µg/L	---	---	<1.55	---	---
Sum of Aromatics C8-C10	W-SPIGMS04	0.60	µg/L	---	---	<0.60	---	---

If the client does not specify the date and time of sample collection, the laboratory will specify the date on sample delivery in parentheses, instead. If the time of sample collection is specified as 0:00 it means that the client did specify the date but not the time. Measurement uncertainty is expressed as expanded measurement uncertainty with coverage factor k = 2, representing 95% confidence level.

Key: LOR = Limit of reporting; MU = Measurement Uncertainty

The end of result part of the certificate of analysis

Brief Method Summaries

Analytical Methods	Method Descriptions
<i>Location of test performance: Na Harfe 336/9 Prague 9 - Vysocany Czech Republic 190 00</i>	
W-ANI-ENV	CZ_SOP_D06_02_068 (CSN ISO 10304-1, CSN EN 12506) Determination of dissolved fluoride, chloride, nitrite, bromide, nitrate and sulphate by ion liquid chromatography and determination of nitrite nitrogen and nitrate nitrogen by calculation from measured values.
W-COD-SPC	CZ_SOP_D06_02_076 Determination of chemical oxygen demand using dichromate (COD-Cr) by photometry (based on CSN ISO 15705) / CZ_SOP_D06_02_078A / CZ_SOP_D06_07_040 Determination of chemical oxygen demand using dichromate (COD-Cr) by titration (based on CSN ISO 6080 and CSN ISO 15705).
W-HG-AFSFL	CZ_SOP_D06_02_096 (US EPA 245.7, US EPA 1631, CSN EN ISO 17852, CSN EN 13370 samples prepared as per CZ_SOP_D06_02_J02 chap. 10.1 and 10.2.) Determination of Mercury by Fluorescence Spectrometry. Sample was filtered by microfilter with porosity 0.45 µm followed by nitric acid addition prior to analysis.
W-METAXFL1	CZ_SOP_D06_02_001 (US EPA 200.7, ISO 11885, EN 12506, samples prepared as per CZ_SOP_D06_02_J02 chap. 10.1 and 10.2) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values. Sample was filtered by microfilter with porosity 0.45 µm followed by nitric acid addition prior to analysis.
W-NH4-SPC	CZ_SOP_D06_02_019 (CSN EN ISO 11732, CSN EN ISO 13395, CSN EN 13370, CSN EN 12506) Determination of ammonium, nitrite and the sum of nitrite and nitrate ions by discrete spectrophotometry and determination of nitrite, nitrate, ammonia, inorganic, organic, total nitrogen and free ammonia by calculation from measured values.



Analytical Methods	Method Descriptions
W-PCBECD01	CZ_SOP_D06_03_166 (DIN 38407, part 2, US EPA 8082, samples preparation according to CZ_SOP_D06_03_P01 chap. 9.1, CZ_SOP_D06_03_P02 chap. 9.1) Determination of polychlorinated biphenyls - congener analyses by gas chromatography method with ECD detection and calculation of polychlorinated biphenyls sums from measured values
W-SPIGMS04	CZ_SOP_D06_03_157 except chap. 9.3 (SPIMFAB) Determination of organic contaminants by gas chromatography method with MS detection (SPIMFAB) and calculation of organic contaminants sums from measured values
W-TPHFID01	CZ_SOP_D06_03_151 (CSN EN ISO 9377-2, Z1, TNRCC Method 1006) Determination of extractable compounds in the range of hydrocarbons C5- C50, their fractions calculated from the measured values by gas chromatography method with FID detection
W-TPHFID02	CZ_SOP_D06_03_151 (CSN EN ISO 9377-2, Z1, TNRCC Method 1006) Determination of extractable compounds in the range of hydrocarbons C5- C50, their fractions calculated from the measured values by gas chromatography method with FID detection
W-TPH-IR	CZ_SOP_D06_02_057 Determination of nonpolar extractives by infrared spectrometry (based on CSN 75 7505:2006, CSN 830540-4)
W-VOCGMS01	CZ_SOP_D06_03_155 except chap. 9.2 (US EPA 624, US EPA 8260, EN ISO 10301, MADEP 2004, rev. 1.1) Determination of volatile organic compounds by gas chromatography method with FID and MS detection and calculation of volatile organic compounds sums from measured values
W-VOCGMS05	CZ_SOP_D06_03_155 except chap. 9.2 (US EPA 624, US EPA 8260, EN ISO 10301, MADEP 2004, rev. 1.1) Determination of volatile organic compounds by gas chromatography method with FID and MS detection and calculation of volatile organic compounds sums from measured values

A "*" symbol preceding any method indicates non-accredited test. In the case when a procedure belonging to an accredited method was used for non-accredited matrix, would apply that the reported results are non-accredited. Please refer to General Comment section on front page for information.

The calculation methods of summation parameters are available on request in the client service.



CERTIFICATE OF ANALYSIS

Work Order	: PR1402568	Issue Date	: 27-JAN-2014
Client	: IDAD - Instituto do Ambiente e Desenvolvimento	Laboratory	: ALS Czech Republic, s.r.o.
Contact	: Mrs. Alexandra Passos Silva	Contact	: Client Service
Address	: Campus Universitario Aveiro Portugal 3810-193	Address	: Na Harfe 336/9 Prague 9 - Vysocany Czech Republic 190 00
E-mail	: a.passosilva@ua.pt	E-mail	: customer.support@alsglobal.com
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Facsimile	: ----	Facsimile	: +420 284 081 635
Project	: IMA 12 02 13	Page	: 1 of 6
Order number	: ----	Date Samples Received	: 21-JAN-2014
C-O-C number	: ----	Quote number	: PR2013IDAIN-PT0012 (PT-300-13-0029)
Site	: ----	Date of test	: 21-JAN-2014 - 27-JAN-2014
Sampled by	: client	QC Level	: ALS CR Standard Quality Control Schedule

General Comments

This report shall not be reproduced except in full, without prior written approval from the laboratory.
The laboratory declares that the test results relate only to the listed samples.

Responsible for accuracy

Signatories
Zdenek Jirak

Position
Environmental Business Unit
Manager

Testing Laboratory
Accredited by CAI



L 1163

ALS Czech Republic, s.r.o.
Na Harfe 336/9 Prague 9 - Vysocany Czech Republic 190 00



Analytical Results

Sub-Matrix: GROUNDWATER				Client sample ID	44.14	---	---
				Laboratory sample ID	PR1402568001	---	---
				Client sampling date / time	14-JAN-2014 00:00	---	---
Parameter	Method	LOR	Unit	Result	MU	---	---
Nonmetallic Inorganic Parameters							
Ammonia and ammonium ions	W-NH4-SPC	0.050	mg/L	<0.050	---	---	---
Chemical Oxygen Demand (COD-Cr)	W-COD-SPC	5.0	mg/L	63.0	±15.8 %	---	---
Ammonia as N	W-NH4-SPC	0.040	mg/L	<0.040	---	---	---
Chloride	W-ANI-ENV	0.500	mg/L	27.7	±15.0 %	---	---
Nitrates	W-ANI-ENV	0.040	mg/L	0.243	±15.0 %	---	---
Nitrites	W-ANI-ENV	0.040	mg/L	<0.040	---	---	---
Sulphate as SO4 2-	W-ANI-ENV	0.500	mg/L	14.0	±15.0 %	---	---
Dissolved Metals / Major Cations							
Arsenic	W-METAXFL1	0.0050	mg/L	<0.0050	---	---	---
Cadmium	W-METAXFL1	0.00040	mg/L	<0.00040	---	---	---
Lead	W-METAXFL1	0.0050	mg/L	<0.0050	---	---	---
Mercury	W-HG-AFSFL	0.010	µg/L	<0.010	---	---	---
Petroleum Hydrocarbons - FTIR							
Total Petroleum Hydrocarbons	W-TPH-IR	0.050	mg/L	0.172	±20.0 %	---	---
BTEX							
Benzene	W-VOCGMS01	0.20	µg/L	<0.20	---	---	---
Toluene	W-VOCGMS01	1.00	µg/L	<1.00	---	---	---
Ethylbenzene	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---
meta- & para-Xylene	W-VOCGMS01	0.20	µg/L	<0.20	---	---	---
ortho-Xylene	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---
Sum of BTEX	W-VOCGMS01	1.60	µg/L	<1.60	---	---	---
Sum of xylenes	W-VOCGMS01	0.30	µg/L	<0.30	---	---	---
Sum of TEX	W-VOCGMS01	1.40	µg/L	<1.40	---	---	---
Halogenated Volatile Organic Compounds							
Dichlorodifluoromethane	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---
Vinyl chloride	W-VOCGMS01	1.00	µg/L	<1.00	---	---	---
Chloromethane	W-VOCGMS05	10	µg/L	<10	---	---	---
trans-1,2-Dichloroethene	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---
Bromomethane	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---
Dichloromethane	W-VOCGMS01	6.0	µg/L	<6.0	---	---	---
1,1-Dichloroethene	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---
Chloroethane	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---
cis-1,2-Dichloroethene	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---
Trichlorofluoromethane	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---
1,1-Dichloroethane	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---
Bromochloromethane	W-VOCGMS05	2.0	µg/L	<2.0	---	---	---
2,2-Dichloropropane	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---
Chloroform	W-VOCGMS01	0.30	µg/L	<0.30	---	---	---
1,1-Dichloropropylene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---
1,2-Dichloroethane	W-VOCGMS01	1.00	µg/L	<1.00	---	---	---
1,1,1-Trichloroethane	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---
Dibromomethane	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---
cis-1,3-Dichloropropylene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---
Tetrachloromethane	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---
Bromodichloromethane	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---
trans-1,3-Dichloropropene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---
1,3-Dichloropropane	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---
Trichloroethene	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---
1,1,2-Trichloroethane	W-VOCGMS01	0.20	µg/L	<0.20	---	---	---
1,2-Dibromoethane (EDB)	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---



Sub-Matrix: GROUNDWATER				Client sample ID	44.14	---	---
				Laboratory sample ID	PR1402568001	---	---
				Client sampling date / time	14-JAN-2014 00:00	---	---
Parameter	Method	LOR	Unit	Result	MU	---	---
Halogenated Volatile Organic Compounds - Continued							
1,2,3-Trichloropropane	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---
Dibromochloromethane	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---
Bromobenzene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---
Tetrachloroethene	W-VOCGMS01	0.20	µg/L	<0.20	---	---	---
1,1,1,2-Tetrachloroethane	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---
2-Chlorotoluene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---
Chlorobenzene	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---
4-Chlorotoluene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---
Bromoform	W-VOCGMS01	0.20	µg/L	<0.20	---	---	---
1,1,2,2-Tetrachloroethane	W-VOCGMS01	1.0	µg/L	<1.0	---	---	---
1,2-Dichlorobenzene	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---
1,2-Dibromo-3-chloropropane	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---
1,4-Dichlorobenzene	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---
1,3-Dichlorobenzene	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---
1,2,4-Trichlorobenzene	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---
Hexachlorobutadiene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---
1,2,3-Trichlorobenzene	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---
1,3,5-Trichlorobenzene	W-VOCGMS01	0.20	µg/L	<0.20	---	---	---
1,2-Dichloropropane	W-VOCGMS01	1.0	µg/L	<1.0	---	---	---
Sum of 4 Trihalomethanes	W-VOCGMS01	0.70	µg/L	<0.70	---	---	---
Sum of 3 Dichlorobenzenes	W-VOCGMS01	0.30	µg/L	<0.30	---	---	---
Sum of 3 Trichlorobenzenes	W-VOCGMS01	0.40	µg/L	<0.40	---	---	---
Non-Halogenated Volatile Organic Compounds							
Isopropylbenzene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---
n-Propylbenzene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---
1,2,4-Trimethylbenzene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---
p-Isopropyltoluene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---
1,3,5-Trimethylbenzene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---
Styrene	W-VOCGMS01	0.20	µg/L	<0.20	---	---	---
sec-Butylbenzene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---
tert-Butylbenzene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---
n-Butylbenzene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---
Methyl tert-Butyl Ether (MTBE)	W-VOCGMS01	0.20	µg/L	<0.20	---	---	---
tert-Butyl alcohol	W-VOCGMS01	5.0	µg/L	<5.0	---	---	---
Sum of BTEXS	W-VOCGMS01	1.80	µg/L	<1.80	---	---	---
Aromatic Compounds							
1-Ethyl-2-methylbenzene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---
1-Ethyl-3-methylbenzene@1-Ethyl-4-methylbenzene	W-SPIGMS04	0.10	µg/L	<0.10	---	---	---
1,3,5-Trimethylbenzene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---
1,2,4-Trimethylbenzene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---
1,2,3-Trimethylbenzene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---
1,2@1,4-Diethylbenzene	W-SPIGMS04	0.10	µg/L	<0.10	---	---	---
1,3-Diethylbenzene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---
1,2,4,5-Tetramethylbenzene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---
2-Methylnaphthalene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---
1-Methylnaphthalene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---
Biphenyl	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---
2@1-Ethyl-naphthalene	W-SPIGMS04	0.10	µg/L	<0.10	---	---	---
1,8-Dimethylnaphthalene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---
2-Methylantracene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---



Sub-Matrix: GROUNDWATER

Client sample ID
Laboratory sample ID
Client sampling date / time

44.14	---	---
PR1402568001	---	---
14-JAN-2014 00:00	---	---

Parameter	Method	LOR	Unit	Result	MU	---	---	---	---
Aromatic Compounds - Continued									
1-Methylanthracene@1-Methylphenanthrene	W-SPIGMS04	0.10	µg/L	<0.10	---	---	---	---	---
2-Methylphenanthrene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---	---	---
Isopropylbenzene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---	---	---
1,2-Dimethylnaphthalene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---	---	---
n-Propylbenzene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---	---	---
2,6@2,7-Dimethylnaphthalene	W-SPIGMS04	0.10	µg/L	<0.10	---	---	---	---	---
1,7@1,3@1,6-Dimethylnaphthalene	W-SPIGMS04	0.15	µg/L	<0.15	---	---	---	---	---
1,4@2,3@1,5-Dimethylnaphthalene	W-SPIGMS04	0.15	µg/L	<0.15	---	---	---	---	---
1,3,7-Trimethylnaphthalene	W-SPIGMS04	0.05	µg/L	<0.05	---	---	---	---	---
1,4,6@2,3,6-Trimethylnaphthalene	W-SPIGMS04	0.10	µg/L	<0.10	---	---	---	---	---
2,3,5@1,2,6-Trimethylnaphthalene	W-SPIGMS04	0.10	µg/L	<0.10	---	---	---	---	---
1,2,4@2,4,5@1,2,5-Trimethylnaphthalene	W-SPIGMS04	0.15	µg/L	<0.15	---	---	---	---	---
1,2,3@1,4,5-Trimethylnaphthalene	W-SPIGMS04	0.10	µg/L	<0.10	---	---	---	---	---
1,4,6,7-Tetramethylnaphthalene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---	---	---
1,2,5,6-Tetramethylnaphthalene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---	---	---
Methylpyrenes@Methylfluoranthenes	W-SPIGMS04	1.0	µg/L	<1.0	---	---	---	---	---
Methylchrysenes@Methylbenz(a)anthracenes	W-SPIGMS04	1.0	µg/L	<1.0	---	---	---	---	---
Sum of Aromatics C16-C35	W-SPIGMS04	2.0	µg/L	<2.0	---	---	---	---	---
Polycyclic Aromatics Hydrocarbons (PAHs)									
Naphthalene	W-SPIGMS04	0.010	µg/L	<0.010	---	---	---	---	---
Acenaphthylene	W-SPIGMS04	0.010	µg/L	<0.010	---	---	---	---	---
Acenaphthene	W-SPIGMS04	0.010	µg/L	<0.010	---	---	---	---	---
Fluorene	W-SPIGMS04	0.010	µg/L	<0.010	---	---	---	---	---
Phenanthrene	W-SPIGMS04	0.010	µg/L	0.015	±30.0 %	---	---	---	---
Anthracene	W-SPIGMS04	0.010	µg/L	0.031	±30.0 %	---	---	---	---
Fluoranthene	W-SPIGMS04	0.010	µg/L	<0.010	---	---	---	---	---
Pyrene	W-SPIGMS04	0.010	µg/L	<0.010	---	---	---	---	---
Benz(a)anthracene	W-SPIGMS04	0.010	µg/L	<0.010	---	---	---	---	---
Chrysene	W-SPIGMS04	0.010	µg/L	<0.010	---	---	---	---	---
Benzo(b)fluoranthene	W-SPIGMS04	0.010	µg/L	<0.010	---	---	---	---	---
Benzo(k)fluoranthene	W-SPIGMS04	0.010	µg/L	<0.010	---	---	---	---	---
Benzo(a)pyrene	W-SPIGMS04	0.010	µg/L	<0.010	---	---	---	---	---
Indeno(1,2,3-cd)pyrene	W-SPIGMS04	0.010	µg/L	<0.010	---	---	---	---	---
Benzo(g,h,i)perylene	W-SPIGMS04	0.010	µg/L	<0.010	---	---	---	---	---
Dibenz(a,h)anthracene	W-SPIGMS04	0.010	µg/L	<0.010	---	---	---	---	---
PCBs									
PCB 28	W-PCBECD01	0.00110	µg/L	<0.00110	---	---	---	---	---
PCB 52	W-PCBECD01	0.00110	µg/L	<0.00110	---	---	---	---	---
PCB 101	W-PCBECD01	0.000750	µg/L	<0.000750	---	---	---	---	---
PCB 118	W-PCBECD01	0.00110	µg/L	<0.00110	---	---	---	---	---
PCB 138	W-PCBECD01	0.00120	µg/L	<0.00120	---	---	---	---	---
PCB 153	W-PCBECD01	0.00110	µg/L	<0.00110	---	---	---	---	---
PCB 180	W-PCBECD01	0.000950	µg/L	<0.000950	---	---	---	---	---
Sum of 6 PCBs	W-PCBECD01	0.00620	µg/L	<0.00620	---	---	---	---	---



Sub-Matrix: GROUNDWATER		Client sample ID		44.14		---		---	
		Laboratory sample ID		PR1402568001		---		---	
		Client sampling date / time		14-JAN-2014 00:00		---		---	
Parameter	Method	LOR	Unit	Result	MU	---	---	---	---
PCBs - Continued									
Sum of 7 PCBs	W-PCBECD01	0.00730	µg/L	<0.00730	---	---	---	---	---
Petroleum Hydrocarbons									
Aliphates C10-C12	W-SPIGMS04	10	µg/L	<10	---	---	---	---	---
Aliphates C12-C16	W-SPIGMS04	10	µg/L	<10	---	---	---	---	---
Aliphates C16-C35	W-SPIGMS04	10	µg/L	20	±30.0 %	---	---	---	---
C10 - C12 Fraction	W-TPHFID01	5.0	µg/L	7.7	±30.0 %	---	---	---	---
C10 - C16 Fraction	W-TPHFID02	10	µg/L	22	±30.0 %	---	---	---	---
C10 - C40 Fraction	W-TPHFID01	50	µg/L	87	±30.0 %	---	---	---	---
C12 - C16 Fraction	W-TPHFID01	5.0	µg/L	14.1	±30.0 %	---	---	---	---
C16 - C22 Fraction	W-TPHFID02	10	µg/L	31	±30.0 %	---	---	---	---
C16 - C35 Fraction	W-TPHFID01	30	µg/L	61	±30.0 %	---	---	---	---
C22 - C30 Fraction	W-TPHFID02	15	µg/L	24	±30.0 %	---	---	---	---
C30 - C40 Fraction	W-TPHFID02	15	µg/L	<15	---	---	---	---	---
C35 - C40 Fraction	W-TPHFID01	10	µg/L	<10	---	---	---	---	---
Sum of Aliphates C10-C35	W-SPIGMS04	30	µg/L	<30	---	---	---	---	---
Sum of Aromatics C10-C16	W-SPIGMS04	1.55	µg/L	<1.55	---	---	---	---	---
Sum of Aromatics C8-C10	W-SPIGMS04	0.60	µg/L	<0.60	---	---	---	---	---

If the client does not specify the date and time of sample collection, the laboratory will specify the date on sample delivery in parentheses, instead. If the time of sample collection is specified as 0:00 it means that the client did specify the date but not the time. Measurement uncertainty is expressed as expanded measurement uncertainty with coverage factor k = 2, representing 95% confidence level.

Key: LOR = Limit of reporting; MU = Measurement Uncertainty

The end of result part of the certificate of analysis

Brief Method Summaries

Analytical Methods	Method Descriptions
Location of test performance: Na Harfe 336/9 Prague 9 - Vysocany Czech Republic 190 00	
W-ANI-ENV	CZ_SOP_D06_02_068 (CSN ISO 10304-1, CSN EN 12506) Determination of dissolved fluoride, chloride, nitrite, bromide, nitrate and sulphate by ion liquid chromatography and determination of nitrite nitrogen and nitrate nitrogen by calculation from measured values.
W-COD-SPC	CZ_SOP_D06_02_076 Determination of chemical oxygen demand using dichromate (COD-Cr) by photometry (based on CSN ISO 15705) / CZ_SOP_D06_02_076A / CZ_SOP_D06_07_040 Determination of chemical oxygen demand using dichromate (COD-Cr) by titration (based on CSN ISO 6080 and CSN ISO 15705).
W-HG-AFSFL	CZ_SOP_D06_02_096 (US EPA 245.7, US EPA 1631, CSN EN ISO 17852, CSN EN 13370 samples prepared as per CZ_SOP_D06_02_J02 chap. 10.1 and 10.2.) Determination of Mercury by Fluorescence Spectrometry. Sample was filtered by microfilter with porosity 0.45 µm followed by nitric acid addition prior to analysis.
W-METAXFL1	CZ_SOP_D06_02_001 (US EPA 200.7, ISO 11885, EN 12506, samples prepared as per CZ_SOP_D06_02_J02 chap. 10.1 and 10.2) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values. Sample was filtered by microfilter with porosity 0.45 µm followed by nitric acid addition prior to analysis.
W-NH4-SPC	CZ_SOP_D06_02_019 (CSN EN ISO 11732, CSN EN ISO 13395, CSN EN 13370, CSN EN 12506) Determination of ammonium, nitrite and the sum of nitrite and nitrate ions by discrete spectrophotometry and determination of nitrite, nitrate, ammonia, inorganic, organic, total nitrogen and free ammonia by calculation from measured values.
W-PCBECD01	CZ_SOP_D06_03_166 (DIN 38407, part 2, US EPA 8082, samples preparation according to CZ_SOP_D06_03_P01 chap. 9.1, CZ_SOP_D06_03_P02 chap. 9.1) Determination of polychlorinated biphenyls - congener analyses by gas chromatography method with ECD detection and calculation of polychlorinated biphenyls sums from measured values
W-SPIGMS04	CZ_SOP_D06_03_157 except chap. 9.3 (SPIMFAB) Determination of organic contaminants by gas chromatography method with MS detection (SPIMFAB) and calculation of organic contaminants sums from measured values
W-TPHFID01	CZ_SOP_D06_03_151 (CSN EN ISO 9377-2, Z1, TNRCC Method 1006) Determination of extractable compounds in the range of hydrocarbons C5- C50, their fractions calculated from the measured values by gas chromatography method with FID detection

Issue Date : 27-JAN-2014
Page : 6 of 6
Work Order : PR1402568
Client : IDAD - Instituto do Ambiente e Desenvolvimento



Analytical Methods	Method Descriptions
W-TPHFID02	CZ_SOP_D06_03_151 (CSN EN ISO 9377-2, Z1, TNRCC Method 1006) Determination of extractable compounds in the range of hydrocarbons C5 - C50, their fractions calculated from the measured values by gas chromatography method with FID detection
W-TPH-IR	CZ_SOP_D06_02_057 Determination of nonpolar extractives by infrared spectrometry (based on CSN 75 7505:2006, CSN 830540-4)
W-VOCGMS01	CZ_SOP_D06_03_155 except chap. 9.2 (US EPA 624, US EPA 8260, EN ISO 10301, MADEP 2004, rev. 1.1) Determination of volatile organic compounds by gas chromatography method with FID and MS detection and calculation of volatile organic compounds sums from measured values
W-VOCGMS05	CZ_SOP_D06_03_155 except chap. 9.2 (US EPA 624, US EPA 8260, EN ISO 10301, MADEP 2004, rev. 1.1) Determination of volatile organic compounds by gas chromatography method with FID and MS detection and calculation of volatile organic compounds sums from measured values

A ** symbol preceding any method indicates non-accredited test. In the case when a procedure belonging to an accredited method was used for non-accredited matrix, would apply that the reported results are non-accredited. Please refer to General Comment section on front page for information.

The calculation methods of summation parameters are available on request in the client service.



CERTIFICATE OF ANALYSIS

Work Order	: PR1406741	Issue Date	: 24-FEB-2014
Client	: IDAD - Instituto do Ambiente e Desenvolvimento	Laboratory	: ALS Czech Republic, s.r.o.
Contact	: Mrs. Alexandra Passos Silva	Contact	: Client Service
Address	: Campus Universitario Aveiro Portugal 3810-193	Address	: Na Harfe 336/9 Prague 9 - Vysocany Czech Republic 190 00
E-mail	: a.passosilva@ua.pt	E-mail	: customer.support@alsglobal.com
Telephone	: +351 2344 00800	Telephone	: +420 226 226 228
Facsimile	: ----	Facsimile	: +420 284 081 635
Project	: IMA 12 02 13	Page	: 1 of 6
Order number	: ----	Date Samples	: 14-FEB-2014
C-O-C number	: ----	Received	
Site	: ----	Quote number	: PR2014IDAIN-PT0013 (PT-300-14-0230)
Sampled by	: client	Date of test	: 14-FEB-2014 - 21-FEB-2014
		QC Level	: ALS CR Standard Quality Control Schedule

General Comments

This report shall not be reproduced except in full, without prior written approval from the laboratory.

The laboratory declares that the test results relate only to the listed samples.

Sample(s) PR1406741/001, method W-TPHFID01,W-TPHFID02 was/were filtered prior to analysis (filter porosity 0.45 µm).

Responsible for accuracy

Signatories
Zdenek Jirak

Position
Environmental Business Unit
Manager

Testing Laboratory
Accredited by CAI



L 1163

ALS Czech Republic, s.r.o.
Na Harfe 336/9 Prague 9 - Vysocany Czech Republic 190 00



Analytical Results

Sub-Matrix: GROUNDWATER		Client sample ID		90.14		---		---	
		Laboratory sample ID		PR1406741001		---		---	
		Client sampling date / time		10-FEB-2014 00:00		---		---	
Parameter	Method	LOR	Unit	Result	MU	---	---	---	---
Nonmetallic Inorganic Parameters									
Ammonia and ammonium ions	W-NH4-SPC	0.050	mg/L	<0.050	---	---	---	---	---
Chemical Oxygen Demand (COD-Cr)	W-COD-SPC	5.0	mg/L	13.0	±18.8%	---	---	---	---
Ammonia as N	W-NH4-SPC	0.040	mg/L	<0.040	---	---	---	---	---
Chloride	W-ANI-ENV	0.500	mg/L	24.1	±15.0%	---	---	---	---
Nitrates	W-ANI-ENV	0.040	mg/L	0.049	±15.0%	---	---	---	---
Nitrites	W-ANI-ENV	0.040	mg/L	<0.040	---	---	---	---	---
Sulphate as SO4 2-	W-ANI-ENV	0.500	mg/L	6.22	±15.0%	---	---	---	---
Dissolved Metals / Major Cations									
Arsenic	W-METAXFL1	0.0050	mg/L	<0.0050	---	---	---	---	---
Cadmium	W-METAXFL1	0.00040	mg/L	<0.00040	---	---	---	---	---
Lead	W-METAXFL1	0.0050	mg/L	<0.0050	---	---	---	---	---
Mercury	W-HG-AFSFL	0.010	µg/L	<0.010	---	---	---	---	---
Petroleum Hydrocarbons - FTIR									
Total Petroleum Hydrocarbons	W-TPH-IR	0.050	mg/L	<0.050	---	---	---	---	---
BTEX									
Benzene	W-VOCGMS01	0.20	µg/L	<0.20	---	---	---	---	---
Toluene	W-VOCGMS01	1.00	µg/L	<1.00	---	---	---	---	---
Ethylbenzene	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---	---	---
meta- & para-Xylene	W-VOCGMS01	0.20	µg/L	<0.20	---	---	---	---	---
ortho-Xylene	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---	---	---
Sum of BTEX	W-VOCGMS01	1.60	µg/L	<1.60	---	---	---	---	---
Sum of xylenes	W-VOCGMS01	0.30	µg/L	<0.30	---	---	---	---	---
Sum of TEX	W-VOCGMS01	1.40	µg/L	<1.40	---	---	---	---	---
Halogenated Volatile Organic Compounds									
Dichlorodifluoromethane	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---	---
Vinyl chloride	W-VOCGMS01	1.00	µg/L	<1.00	---	---	---	---	---
Chloromethane	W-VOCGMS05	10	µg/L	<10	---	---	---	---	---
trans-1,2-Dichloroethene	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---	---	---
Bromomethane	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---	---
Dichloromethane	W-VOCGMS01	6.0	µg/L	<6.0	---	---	---	---	---
1,1-Dichloroethene	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---	---	---
Chloroethane	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---	---
cis-1,2-Dichloroethene	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---	---	---
Trichlorofluoromethane	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---	---
1,1-Dichloroethane	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---	---	---
Bromochloromethane	W-VOCGMS05	2.0	µg/L	<2.0	---	---	---	---	---
2,2-Dichloropropane	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---	---
Chloroform	W-VOCGMS01	0.30	µg/L	<0.30	---	---	---	---	---
1,1-Dichloropropylene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---	---
1,2-Dichloroethane	W-VOCGMS01	1.00	µg/L	<1.00	---	---	---	---	---
1,1,1-Trichloroethane	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---	---	---
Dibromomethane	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---	---
cis-1,3-Dichloropropylene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---	---
Tetrachloromethane	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---	---	---
Bromodichloromethane	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---	---	---
trans-1,3-Dichloropropene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---	---
1,3-Dichloropropane	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---	---
Trichloroethene	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---	---	---
1,1,2-Trichloroethane	W-VOCGMS01	0.20	µg/L	<0.20	---	---	---	---	---
1,2-Dibromoethane (EDB)	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---	---



Sub-Matrix: GROUNDWATER				Client sample ID	90.14	---	---
				Laboratory sample ID	PR1406741001	---	---
				Client sampling date / time	10-FEB-2014 00:00	---	---
Parameter	Method	LOR	Unit	Result	MU	---	---
Halogenated Volatile Organic Compounds - Continued							
1,2,3-Trichloropropane	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---
Dibromochloromethane	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---
Bromobenzene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---
Tetrachloroethene	W-VOCGMS01	0.20	µg/L	<0.20	---	---	---
1,1,1,2-Tetrachloroethane	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---
2-Chlorotoluene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---
Chlorobenzene	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---
4-Chlorotoluene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---
Bromoform	W-VOCGMS01	0.20	µg/L	<0.20	---	---	---
1,1,1,2,2-Tetrachloroethane	W-VOCGMS01	1.0	µg/L	<1.0	---	---	---
1,2-Dichlorobenzene	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---
1,2-Dibromo-3-chloropropane	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---
1,4-Dichlorobenzene	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---
1,3-Dichlorobenzene	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---
1,2,4-Trichlorobenzene	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---
Hexachlorobutadiene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---
1,2,3-Trichlorobenzene	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---
1,3,5-Trichlorobenzene	W-VOCGMS01	0.20	µg/L	<0.20	---	---	---
1,2-Dichloropropane	W-VOCGMS01	1.0	µg/L	<1.0	---	---	---
Sum of 4 Trihalomethanes	W-VOCGMS01	0.70	µg/L	<0.70	---	---	---
Sum of 3 Dichlorobenzenes	W-VOCGMS01	0.30	µg/L	<0.30	---	---	---
Sum of 3 Trichlorobenzenes	W-VOCGMS01	0.40	µg/L	<0.40	---	---	---
Non-Halogenated Volatile Organic Compounds							
Isopropylbenzene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---
n-Propylbenzene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---
1,2,4-Trimethylbenzene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---
p-Isopropyltoluene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---
1,3,5-Trimethylbenzene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---
Styrene	W-VOCGMS01	0.20	µg/L	<0.20	---	---	---
sec-Butylbenzene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---
tert-Butylbenzene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---
n-Butylbenzene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---
Methyl tert-Butyl Ether (MTBE)	W-VOCGMS01	0.20	µg/L	<0.20	---	---	---
tert-Butyl alcohol	W-VOCGMS01	5.0	µg/L	<5.0	---	---	---
Sum of BTEXS	W-VOCGMS01	1.80	µg/L	<1.80	---	---	---
Aromatic Compounds							
1-Ethyl-2-methylbenzene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---
1-Ethyl-3-methylbenzene@1-Ethyl-4-methylbenzene	W-SPIGMS04	0.10	µg/L	<0.10	---	---	---
1,3,5-Trimethylbenzene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---
1,2,4-Trimethylbenzene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---
1,2,3-Trimethylbenzene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---
1,2@1,4-Diethylbenzene	W-SPIGMS04	0.10	µg/L	<0.10	---	---	---
1,3-Diethylbenzene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---
1,2,4,5-Tetramethylbenzene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---
2-Methylnaphthalene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---
1-Methylnaphthalene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---
Biphenyl	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---
2@1-Ethyl-naphthalene	W-SPIGMS04	0.10	µg/L	<0.10	---	---	---
1,8-Dimethylnaphthalene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---
2-Methylanthracene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---



Sub-Matrix: GROUNDWATER

Client sample ID
 Laboratory sample ID
 Client sampling date / time

90.14	---	---
PR1406741001	---	---
10-FEB-2014 00:00	---	---

Parameter	Method	LOR	Unit	Result	MU	---	---	---
Aromatic Compounds - Continued								
1-Methylanthracene@1-Methylphenanthrene	W-SPIGMS04	0.10	µg/L	<0.10	---	---	---	---
2-Methylphenanthrene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---	---
Isopropylbenzene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---	---
1,2-Dimethylnaphthalene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---	---
n-Propylbenzene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---	---
2,6@2,7-Dimethylnaphthalene	W-SPIGMS04	0.10	µg/L	<0.10	---	---	---	---
1,7@1,3@1,6-Dimethylnaphthalene	W-SPIGMS04	0.15	µg/L	<0.15	---	---	---	---
1,4@2,3@1,5-Dimethylnaphthalene	W-SPIGMS04	0.15	µg/L	<0.15	---	---	---	---
1,3,7-Trimethylnaphthalene	W-SPIGMS04	0.05	µg/L	<0.05	---	---	---	---
1,4,6@2,3,6-Trimethylnaphthalene	W-SPIGMS04	0.10	µg/L	<0.10	---	---	---	---
2,3,5@1,2,6-Trimethylnaphthalene	W-SPIGMS04	0.10	µg/L	<0.10	---	---	---	---
1,2,4@2,4,5@1,2,5-Trimethylnaphthalene	W-SPIGMS04	0.15	µg/L	<0.15	---	---	---	---
1,2,3@1,4,5-Trimethylnaphthalene	W-SPIGMS04	0.10	µg/L	<0.10	---	---	---	---
1,4,6,7-Tetramethylnaphthalene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---	---
1,2,5,6-Tetramethylnaphthalene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---	---
Methylpyrenes@Methylfluoranthenes	W-SPIGMS04	1.0	µg/L	<1.0	---	---	---	---
Methylchrysenes@Methylbenzanthracenes	W-SPIGMS04	1.0	µg/L	<1.0	---	---	---	---
Sum of Aromatics C16-C35	W-SPIGMS04	2.0	µg/L	<2.0	---	---	---	---
Polycyclic Aromatics Hydrocarbons (PAHs)								
Naphthalene	W-SPIGMS04	0.010	µg/L	<0.010	---	---	---	---
Acenaphthylene	W-SPIGMS04	0.010	µg/L	<0.010	---	---	---	---
Acenaphthene	W-SPIGMS04	0.010	µg/L	<0.010	---	---	---	---
Fluorene	W-SPIGMS04	0.010	µg/L	<0.010	---	---	---	---
Phenanthrene	W-SPIGMS04	0.010	µg/L	<0.010	---	---	---	---
Anthracene	W-SPIGMS04	0.010	µg/L	<0.010	---	---	---	---
Naphthalene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---
Fluoranthene	W-SPIGMS04	0.010	µg/L	<0.010	---	---	---	---
Pyrene	W-SPIGMS04	0.010	µg/L	<0.010	---	---	---	---
Benz(a)anthracene	W-SPIGMS04	0.010	µg/L	<0.010	---	---	---	---
Chrysene	W-SPIGMS04	0.010	µg/L	<0.010	---	---	---	---
Benzo(b)fluoranthene	W-SPIGMS04	0.010	µg/L	<0.010	---	---	---	---
Benzo(k)fluoranthene	W-SPIGMS04	0.010	µg/L	<0.010	---	---	---	---
Benzo(a)pyrene	W-SPIGMS04	0.010	µg/L	<0.010	---	---	---	---
Indeno(1,2,3,cd)pyrene	W-SPIGMS04	0.010	µg/L	<0.010	---	---	---	---
Benzo(g,h,i)perylene	W-SPIGMS04	0.010	µg/L	<0.010	---	---	---	---
Dibenz(a,h)anthracene	W-SPIGMS04	0.010	µg/L	<0.010	---	---	---	---
Sum of 16 PAH (M1)	W-SPIGMS04	0.080	µg/L	<0.080	---	---	---	---
Sum of carcinogenic PAH (M1)	W-SPIGMS04	0.035	µg/L	<0.035	---	---	---	---
Sum of other PAH (M1)	W-SPIGMS04	0.045	µg/L	<0.045	---	---	---	---
Sum of PAH L (M1)	W-SPIGMS04	0.0150	µg/L	<0.0150	---	---	---	---
Sum of PAH M (M1)	W-SPIGMS04	0.0250	µg/L	<0.0250	---	---	---	---
Sum of PAH H (M1)	W-SPIGMS04	0.040	µg/L	<0.040	---	---	---	---
PCBs								
PCB 28	W-PCBECD01	0.00110	µg/L	<0.00110	---	---	---	---



Sub-Matrix: GROUNDWATER

Client sample ID

90.14

Laboratory sample ID

PR1406741001

Client sampling date / time

10-FEB-2014 00:00

Parameter	Method	LOR	Unit	Result	MU	---	---	---
PCBs - Continued								
PCB 52	W-PCBECD01	0.00110	µg/L	<0.00110	---	---	---	---
PCB 101	W-PCBECD01	0.000750	µg/L	<0.000750	---	---	---	---
PCB 118	W-PCBECD01	0.00110	µg/L	<0.00110	---	---	---	---
PCB 138	W-PCBECD01	0.00120	µg/L	<0.00120	---	---	---	---
PCB 153	W-PCBECD01	0.00110	µg/L	<0.00110	---	---	---	---
PCB 180	W-PCBECD01	0.000950	µg/L	<0.000950	---	---	---	---
Sum of 6 PCBs	W-PCBECD01	0.00620	µg/L	<0.00620	---	---	---	---
Sum of 7 PCBs	W-PCBECD01	0.00730	µg/L	<0.00730	---	---	---	---
Petroleum Hydrocarbons								
Aliphates C10-C12	W-SPIGMS04	10	µg/L	<10	---	---	---	---
Aliphates C12-C16	W-SPIGMS04	10	µg/L	<10	---	---	---	---
Aliphates C16-C35	W-SPIGMS04	10	µg/L	14	±30.0 %	---	---	---
C10 - C12 Fraction	W-TPHFID01	5.0	µg/L	<5.0	---	---	---	---
C10 - C16 Fraction	W-TPHFID02	10	µg/L	<10	---	---	---	---
C10 - C40 Fraction	W-TPHFID02	50	µg/L	<50	---	---	---	---
C10 - C40 Fraction	W-TPHFID01	50	µg/L	<50	---	---	---	---
C12 - C16 Fraction	W-TPHFID01	5.0	µg/L	<5.0	---	---	---	---
C16 - C22 Fraction	W-TPHFID02	10	µg/L	<10	---	---	---	---
C16 - C35 Fraction	W-TPHFID01	30	µg/L	<30	---	---	---	---
C22 - C30 Fraction	W-TPHFID02	15	µg/L	<15	---	---	---	---
C30 - C40 Fraction	W-TPHFID02	15	µg/L	<15	---	---	---	---
C35 - C40 Fraction	W-TPHFID01	10	µg/L	<10	---	---	---	---
Sum of Aliphates C10-C35	W-SPIGMS04	30	µg/L	<30	---	---	---	---
Sum of Aromatics C10-C16	W-SPIGMS04	1.55	µg/L	<1.55	---	---	---	---
Sum of Aromatics C8-C10	W-SPIGMS04	0.60	µg/L	<0.60	---	---	---	---

If the client does not specify the date and time of sample collection, the laboratory will specify the date on sample delivery in parentheses. Instead if the time of sample collection is specified as 0:00 it means that the client did specify the date but not the time. Measurement uncertainty is expressed as expanded measurement uncertainty with coverage factor $k = 2$, representing 95% confidence level.

Key: LOR = Limit of reporting; MU = Measurement Uncertainty

The end of result part of the certificate of analysis

Brief Method Summaries

Analytical Methods	Method Descriptions
Location of test performance: Na Harfe 336/9 Prague 9 - Vysocany Czech Republic 190 00	
W-ANI-ENV	CZ_SOP_D06_02_068 (CSN ISO 10304-1, CSN EN 12506) Determination of dissolved fluoride, chloride, nitrite, bromide, nitrate and sulphate by ion liquid chromatography and determination of nitrite nitrogen and nitrate nitrogen by calculation from measured values.
W-COD-SPC	CZ_SOP_D06_02_076 Determination of chemical oxygen demand using dichromate (COD-Cr) by photometry (based on CSN ISO 15705) / CZ_SOP_D06_02_076A / CZ_SOP_D06_07_040 Determination of chemical oxygen demand using dichromate (COD-Cr) by titration (based on CSN ISO 6060 and CSN ISO 15705).
W-HG-AFSFL	CZ_SOP_D06_02_096 (US EPA 245.7, US EPA 1631, CSN EN ISO 17852, CSN EN 13370 samples prepared as per CZ_SOP_D06_02_J02 chap. 10.1 and 10.2.) Determination of Mercury by Fluorescence Spectrometry. Sample was filtered by microfilter with porosity 0.45 µm followed by nitric acid addition prior to analysis.
W-METAXFL1	CZ_SOP_D06_02_001 (US EPA 200.7, ISO 11885, EN 12506, samples prepared as per CZ_SOP_D06_02_J02 chap. 10.1 and 10.2) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values. Sample was filtered by microfilter with porosity 0.45 µm followed by nitric acid addition prior to analysis.
W-NH4-SPC	CZ_SOP_D06_02_019 (CSN EN ISO. 11732, CSN EN ISO 13395, CSN EN 13370, CSN EN 12506) Determination of ammonium, nitrite and the sum of nitrite and nitrate ions by discrete spectrophotometry and determination of nitrite, nitrate, ammonia, inorganic, organic, total nitrogen and free ammonia by calculation from measured values.



Analytical Methods	Method Descriptions
W-PCBECD01	CZ_SOP_D06_03_166 (DIN 38407, part 2, US EPA 8082, samples preparation according to CZ_SOP_D06_03_P01 chap. 9.1, CZ_SOP_D06_03_P02 chap. 9.1) Determination of polychlorinated biphenyls - congener analyses by gas chromatography method with ECD detection and calculation of polychlorinated biphenyls sums from measured values
W-SPIGMS04	CZ_SOP_D06_03_157 except chap. 9.3 (SPIMFAB) Determination of organic contaminants by gas chromatography method with MS detection (SPIMFAB) and calculation of organic contaminants sums from measured values
W-TPHFID01	CZ_SOP_D06_03_151 (CSN EN ISO 9377-2, Z1, TNRCC Method 1006) Determination of extractable compounds in the range of hydrocarbons C5 - C50, their fractions calculated from the measured values by gas chromatography method with FID detection
W-TPHFID02	CZ_SOP_D06_03_151 (CSN EN ISO 9377-2, Z1, TNRCC Method 1006) Determination of extractable compounds in the range of hydrocarbons C5 - C50, their fractions calculated from the measured values by gas chromatography method with FID detection
W-TPH-IR	CZ_SOP_D06_02_057 Determination of nonpolar extractives by infrared spectrometry (based on CSN 75 7505:2006, CSN 830540-4)
W-VOCGMS01	CZ_SOP_D06_03_155 except chap. 9.2 (US EPA 624, US EPA 8260, EN ISO 10301, MADEP 2004, rev. 1.1) Determination of volatile organic compounds by gas chromatography method with FID and MS detection and calculation of volatile organic compounds sums from measured values
W-VOCGMS05	CZ_SOP_D06_03_155 except chap. 9.2 (US EPA 624, US EPA 8260, EN ISO 10301, MADEP 2004, rev. 1.1) Determination of volatile organic compounds by gas chromatography method with FID and MS detection and calculation of volatile organic compounds sums from measured values

A ** symbol preceding any method indicates non-accredited test. In the case when a procedure belonging to an accredited method was used for non-accredited matrix, would apply that the reported results are non-accredited. Please refer to General Comment section on front page for information.

The calculation methods of summation parameters are available on request in the client service.



CERTIFICATE OF ANALYSIS

Work Order	: PR1412595	Issue Date	: 25-MAR-2014
Client	: IDAD - Instituto do Ambiente e Desenvolvimento	Laboratory	: ALS Czech Republic, s.r.o.
Contact	: Mrs. Alexandra Passos Silva	Contact	: Client Service
Address	: Campus Universitario Aveiro Portugal 3810-193	Address	: Na Harfe 336/9 Prague 9 - Vysocany Czech Republic 190 00
E-mail	: a.passossilva@ua.pt	E-mail	: customer.support@alsglobal.com
Telephone	: +351 2344 00800	Telephone	: +420 226 226 228
Facsimile	: ---	Facsimile	: +420 284 081 635
Project	: IMA 12 02 13	Page	: 1 of 6
Order number	: ----	Date Samples Received	: 18-MAR-2014
C-O-C number	: ----	Quote number	: PR2014IDAIN-PT0013 (PT-300-14-0230)
Site	: ----	Date of test	: 18-MAR-2014 - 25-MAR-2014
Sampled by	: Client	QC Level	: ALS CR Standard Quality Control Schedule

General Comments

This report shall not be reproduced except in full, without prior written approval from the laboratory.

The laboratory declares that the test results relate only to the listed samples.

Sample(s) PR1412595/001, method W-TPHFID01,W-TPHFID02 - was(were) prepared with repeated clean-up (Florisil 2x2g). The sample contains higher amount of interfering compounds (polar or semi-polar, aromatic compounds).

Responsible for accuracy

Signatories
Zdenek Jirak

Position
Environmental Business Unit
Manager

Testing Laboratory
Accredited by CAI



ALS Czech Republic, s.r.o.

Na Harfe 336/9 Prague 9 - Vysocany Czech Republic 190 00



Analytical Results

Sub-Matrix: GROUNDWATER

Client sample ID

107.14

Laboratory sample ID

PR1412595001

Client sampling date / time

03-MAR-2014 11:20

Parameter	Method	LOR	Unit	Result	MU			
Nonmetallic Inorganic Parameters								
Ammonia and ammonium ions	W-NH4-SPC	0.050	mg/L	<0.050	---	---	---	---
Chemical Oxygen Demand (COD-Cr)	W-COD-SPC	5.0	mg/L	47.0	±16.1 %	---	---	---
Ammonia as N	W-NH4-SPC	0.040	mg/L	<0.040	---	---	---	---
Chloride	W-ANI-ENV	0.500	mg/L	36.4	±15.0 %	---	---	---
Nitrates	W-ANI-ENV	0.040	mg/L	<0.040	---	---	---	---
Nitrites	W-ANI-ENV	0.040	mg/L	<0.040	---	---	---	---
Sulphate as SO4 2-	W-ANI-ENV	0.500	mg/L	11.0	±15.0 %	---	---	---
Dissolved Metals / Major Cations								
Arsenic	W-METAXFL1	0.0050	mg/L	<0.0050	---	---	---	---
Cadmium	W-METAXFL1	0.00040	mg/L	<0.00040	---	---	---	---
Lead	W-METAXFL1	0.0050	mg/L	<0.0050	---	---	---	---
Mercury	W-HG-AFSFL	0.010	µg/L	<0.010	---	---	---	---
Petroleum Hydrocarbons - FTIR								
Total Petroleum Hydrocarbons	W-TPH-IR	0.050	mg/L	<0.050	---	---	---	---
BTEX								
Benzene	W-VOCGMS01	0.20	µg/L	<0.20	---	---	---	---
Toluene	W-VOCGMS01	1.00	µg/L	<1.00	---	---	---	---
Ethylbenzene	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---	---
meta- & para-Xylene	W-VOCGMS01	0.20	µg/L	<0.20	---	---	---	---
ortho-Xylene	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---	---
Sum of BTEX	W-VOCGMS01	1.60	µg/L	<1.60	---	---	---	---
Sum of xylenes	W-VOCGMS01	0.30	µg/L	<0.30	---	---	---	---
Sum of TEX	W-VOCGMS01	1.40	µg/L	<1.40	---	---	---	---
Halogenated Volatile Organic Compounds								
Dichlorodifluoromethane	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---
Vinyl chloride	W-VOCGMS01	1.00	µg/L	<1.00	---	---	---	---
Chloromethane	W-VOCGMS05	10	µg/L	<10	---	---	---	---
trans-1,2-Dichloroethene	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---	---
Bromomethane	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---
Dichloromethane	W-VOCGMS01	6.0	µg/L	<6.0	---	---	---	---
1,1-Dichloroethene	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---	---
Chloroethane	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---
cis-1,2-Dichloroethene	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---	---
Trichlorofluoromethane	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---
1,1-Dichloroethane	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---	---
Bromochloromethane	W-VOCGMS05	2.0	µg/L	<2.0	---	---	---	---
2,2-Dichloropropane	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---
Chloroform	W-VOCGMS01	0.30	µg/L	<0.30	---	---	---	---
1,1-Dichloropropylene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---
1,2-Dichloroethane	W-VOCGMS01	1.00	µg/L	<1.00	---	---	---	---
1,1,1-Trichloroethane	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---	---
Dibromomethane	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---
cis-1,3-Dichloropropylene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---
Tetrachloromethane	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---	---
Bromodichloromethane	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---	---
trans-1,3-Dichloropropene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---
1,3-Dichloropropane	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---
Trichloroethene	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---	---
1,1,2-Trichloroethane	W-VOCGMS01	0.20	µg/L	<0.20	---	---	---	---
1,2-Dibromoethane (EDB)	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---



Sub-Matrix: GROUNDWATER	Client sample ID	107.14	---	---
	Laboratory sample ID	PR1412595001	---	---
	Client sampling date / time	03-MAR-2014 11:20	---	---

Parameter	Method	LOR	Unit	Result	MU	---	---	---	---
Halogenated Volatile Organic Compounds - Continued									
1.2.3-Trichloropropane	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---	---
Dibromochloromethane	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---	---	---
Bromobenzene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---	---
Tetrachloroethene	W-VOCGMS01	0.20	µg/L	<0.20	---	---	---	---	---
1.1.1.2-Tetrachloroethane	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---	---	---
2-Chlorotoluene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---	---
Chlorobenzene	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---	---	---
4-Chlorotoluene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---	---
Bromoform	W-VOCGMS01	0.20	µg/L	<0.20	---	---	---	---	---
1.1.2.2-Tetrachloroethane	W-VOCGMS01	1.0	µg/L	<1.0	---	---	---	---	---
1.2-Dichlorobenzene	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---	---	---
1.2-Dibromo-3-chloropropane	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---	---
1.4-Dichlorobenzene	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---	---	---
1.3-Dichlorobenzene	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---	---	---
1.2.4-Trichlorobenzene	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---	---	---
Hexachlorobutadiene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---	---
1.2.3-Trichlorobenzene	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---	---	---
1.3.5-Trichlorobenzene	W-VOCGMS01	0.20	µg/L	<0.20	---	---	---	---	---
1.2-Dichloropropane	W-VOCGMS01	1.0	µg/L	<1.0	---	---	---	---	---
Sum of 4 Trihalomethanes	W-VOCGMS01	0.70	µg/L	<0.70	---	---	---	---	---
Sum of 3 Dichlorobenzenes	W-VOCGMS01	0.30	µg/L	<0.30	---	---	---	---	---
Sum of 3 Trichlorobenzenes	W-VOCGMS01	0.40	µg/L	<0.40	---	---	---	---	---
Non-Halogenated Volatile Organic Compounds									
Isopropylbenzene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---	---
n-Propylbenzene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---	---
1.2.4-Trimethylbenzene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---	---
p-Isopropyltoluene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---	---
1.3.5-Trimethylbenzene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---	---
Styrene	W-VOCGMS01	0.20	µg/L	<0.20	---	---	---	---	---
sec-Butylbenzene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---	---
tert-Butylbenzene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---	---
n-Butylbenzene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---	---
Methyl tert-Butyl Ether (MTBE)	W-VOCGMS01	0.20	µg/L	<0.20	---	---	---	---	---
tert-Butyl alcohol	W-VOCGMS01	5.0	µg/L	<5.0	---	---	---	---	---
Sum of BTEXS	W-VOCGMS01	1.80	µg/L	<1.80	---	---	---	---	---
Aromatic Compounds									
1-Ethyl-2-methylbenzene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---	---	---
1-Ethyl-3-methylbenzene@1-Ethyl-4-methylbenzene	W-SPIGMS04	0.10	µg/L	<0.10	---	---	---	---	---
1.3.5-Trimethylbenzene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---	---	---
1.2.4-Trimethylbenzene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---	---	---
1.2.3-Trimethylbenzene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---	---	---
1.2@1.4-Diethylbenzene	W-SPIGMS04	0.10	µg/L	<0.10	---	---	---	---	---
1.3-Diethylbenzene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---	---	---
1.2.4.5-Tetramethylbenzene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---	---	---
2-Methylnaphthalene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---	---	---
1-Methylnaphthalene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---	---	---
Biphenyl	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---	---	---
2@1-Ethyl-naphthalene	W-SPIGMS04	0.10	µg/L	<0.10	---	---	---	---	---
1.8-Dimethylnaphthalene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---	---	---
2-Methylantracene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---	---	---



Sub-Matrix: GROUNDWATER		Client sample ID		107.14		---		---	
		Laboratory sample ID		PR1412595001		---		---	
		Client sampling date / time		03-MAR-2014 11:20		---		---	
Parameter	Method	LOR	Unit	Result	MU	---	---	---	---
Aromatic Compounds - Continued									
1-Methylantracene@1-Methylphenanthrene	W-SPIGMS04	0.10	µg/L	<0.10	---	---	---	---	---
2-Methylphenanthrene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---	---	---
Isopropylbenzene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---	---	---
1,2-Dimethylnaphthalene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---	---	---
n-Propylbenzene	W-SPIGMS04	0.050	µg/L	0.112	±30.0 %	---	---	---	---
2,6@2,7-Dimethylnaphthalene	W-SPIGMS04	0.10	µg/L	<0.10	---	---	---	---	---
1,7@1,3@1,6-Dimethylnaphthalene	W-SPIGMS04	0.15	µg/L	<0.15	---	---	---	---	---
1,4@2,3@1,5-Dimethylnaphthalene	W-SPIGMS04	0.15	µg/L	<0.15	---	---	---	---	---
1,3,7-Trimethylnaphthalene	W-SPIGMS04	0.05	µg/L	<0.05	---	---	---	---	---
1,4,6@2,3,6-Trimethylnaphthalene	W-SPIGMS04	0.10	µg/L	<0.10	---	---	---	---	---
2,3,5@1,2,6-Trimethylnaphthalene	W-SPIGMS04	0.10	µg/L	<0.10	---	---	---	---	---
1,2,4@2,4,5@1,2,5-Trimethylnaphthalene	W-SPIGMS04	0.15	µg/L	<0.15	---	---	---	---	---
1,2,3@1,4,5-Trimethylnaphthalene	W-SPIGMS04	0.10	µg/L	<0.10	---	---	---	---	---
1,4,6,7-Tetramethylnaphthalene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---	---	---
1,2,5,6-Tetramethylnaphthalene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---	---	---
Methylpyrenes@Methylfluoranthenes	W-SPIGMS04	1.0	µg/L	<1.0	---	---	---	---	---
Methylchrysenes@Methylbenz(a)anthracenes	W-SPIGMS04	1.0	µg/L	<1.0	---	---	---	---	---
Sum of Aromatics C16-C35	W-SPIGMS04	2.0	µg/L	<2.0	---	---	---	---	---
Polycyclic Aromatics Hydrocarbons (PAHs)									
Naphthalene	W-SPIGMS04	0.010	µg/L	<0.010	---	---	---	---	---
Acenaphthylene	W-SPIGMS04	0.010	µg/L	<0.010	---	---	---	---	---
Acenaphthene	W-SPIGMS04	0.010	µg/L	<0.010	---	---	---	---	---
Fluorene	W-SPIGMS04	0.010	µg/L	<0.010	---	---	---	---	---
Phenanthrene	W-SPIGMS04	0.010	µg/L	0.011	±30.0 %	---	---	---	---
Anthracene	W-SPIGMS04	0.010	µg/L	0.012	±30.0 %	---	---	---	---
Fluoranthene	W-SPIGMS04	0.010	µg/L	<0.010	---	---	---	---	---
Pyrene	W-SPIGMS04	0.010	µg/L	0.014	±30.0 %	---	---	---	---
Benz(a)anthracene	W-SPIGMS04	0.010	µg/L	<0.010	---	---	---	---	---
Chrysene	W-SPIGMS04	0.010	µg/L	<0.010	---	---	---	---	---
Benzo(b)fluoranthene	W-SPIGMS04	0.010	µg/L	<0.010	---	---	---	---	---
Benzo(k)fluoranthene	W-SPIGMS04	0.010	µg/L	<0.010	---	---	---	---	---
Benzo(a)pyrene	W-SPIGMS04	0.010	µg/L	<0.010	---	---	---	---	---
Indeno(1,2,3,cd)pyrene	W-SPIGMS04	0.010	µg/L	<0.010	---	---	---	---	---
Benzo(g,h,i)perylene	W-SPIGMS04	0.010	µg/L	<0.010	---	---	---	---	---
Dibenz(a,h)anthracene	W-SPIGMS04	0.010	µg/L	<0.010	---	---	---	---	---
PCBs									
PCB 28	W-PCBECD01	0.00110	µg/L	<0.00110	---	---	---	---	---
PCB 52	W-PCBECD01	0.00110	µg/L	<0.00110	---	---	---	---	---
PCB 101	W-PCBECD01	0.000750	µg/L	<0.000750	---	---	---	---	---
PCB 118	W-PCBECD01	0.00110	µg/L	<0.00110	---	---	---	---	---
PCB 138	W-PCBECD01	0.00120	µg/L	<0.00120	---	---	---	---	---
PCB 153	W-PCBECD01	0.00110	µg/L	<0.00110	---	---	---	---	---
PCB 180	W-PCBECD01	0.000950	µg/L	<0.000950	---	---	---	---	---
Sum of 6 PCBs	W-PCBECD01	0.00620	µg/L	<0.00620	---	---	---	---	---



Sub-Matrix: GROUNDWATER				Client sample ID	107.14	---	---
				Laboratory sample ID	PR1412595001	---	---
				Client sampling date / time	03-MAR-2014 11:20	---	---
Parameter	Method	LOR	Unit	Result	MU	---	---
PCBs - Continued							
Sum of 7 PCBs	W-PCBECD01	0.00730	µg/L	<0.00730	---	---	---
Petroleum Hydrocarbons							
Aliphates C10-C12	W-SPIGMS04	10	µg/L	<10	---	---	---
Aliphates C12-C16	W-SPIGMS04	10	µg/L	<10	---	---	---
Aliphates C16-C35	W-SPIGMS04	10	µg/L	<10	---	---	---
C10 - C12 Fraction	W-TPHFID01	5.0	µg/L	6.2	±30.0%	---	---
C10 - C16 Fraction	W-TPHFID02	10	µg/L	22	±30.0%	---	---
C10 - C40 Fraction	W-TPHFID02	50	µg/L	78	±30.0%	---	---
C10 - C40 Fraction	W-TPHFID01	50	µg/L	78	±30.0%	---	---
C12 - C16 Fraction	W-TPHFID01	5.0	µg/L	16.3	±30.0%	---	---
C16 - C22 Fraction	W-TPHFID02	10	µg/L	27	±30.0%	---	---
C16 - C35 Fraction	W-TPHFID01	30	µg/L	55	±30.0%	---	---
C22 - C30 Fraction	W-TPHFID02	15	µg/L	20	±30.0%	---	---
C30 - C40 Fraction	W-TPHFID02	15	µg/L	<15	---	---	---
C36 - C40 Fraction	W-TPHFID01	10	µg/L	<10	---	---	---
Sum of Aliphates C10-C35	W-SPIGMS04	30	µg/L	<30	---	---	---
Sum of Aromatics C10-C16	W-SPIGMS04	1.55	µg/L	<1.55	---	---	---
Sum of Aromatics C8-C10	W-SPIGMS04	0.60	µg/L	<0.60	---	---	---

If the client does not specify the date and time of sample collection, the laboratory will specify the date on sample delivery in parentheses, instead if the time of sample collection is specified as 0:00 it means that the client did specify the date but not the time. Measurement uncertainty is expressed as expanded measurement uncertainty with coverage factor k = 2, representing 95% confidence level.

Key: LOR = Limit of reporting; MU = Measurement Uncertainty

The end of result part of the certificate of analysis

Brief Method Summaries

Analytical Methods	Method Descriptions
Location of test performance: Na Harfe 336/9 Prague 9 - Vysocany Czech Republic 190 00	
W-ANI-ENV	CZ_SOP_D06_02_068 (CSN ISO 10304-1, CSN EN 12506) Determination of dissolved fluoride, chloride, nitrite, bromide, nitrate and sulphate by ion liquid chromatography and determination of nitrite nitrogen and nitrate nitrogen by calculation from measured values.
W-COD-SPC	CZ_SOP_D06_02_076 Determination of chemical oxygen demand using dichromate (COD-Cr) by photometry (based on CSN ISO 15705) / CZ_SOP_D06_02_076A / CZ_SOP_D06_07_040 Determination of chemical oxygen demand using dichromate (COD-Cr) by titration (based on CSN ISO 6060 and CSN ISO 15705).
W-HG-AFSFL	CZ_SOP_D06_02_096 (US EPA 245.7, US EPA 1631, CSN EN ISO 17852, CSN EN 13370 samples prepared as per CZ_SOP_D06_02_J02 chap. 10.1 and 10.2.) Determination of Mercury by Fluorescence Spectrometry. Sample was filtered by microfilter with porosity 0.45 µm followed by nitric acid addition prior to analysis.
W-METAXFL1	CZ_SOP_D06_02_001 (US EPA 200.7, ISO 11885, EN 12506, samples prepared as per CZ_SOP_D06_02_J02 chap. 10.1 and 10.2) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values. Sample was filtered by microfilter with porosity 0.45 µm followed by nitric acid addition prior to analysis.
W-NH4-SPC	CZ_SOP_D06_02_019 (CSN EN ISO 11732, CSN EN ISO 13395, CSN EN 13370, CSN EN 12506) Determination of ammonium, nitrite and the sum of nitrite and nitrate ions by discrete spectrophotometry and determination of nitrite, nitrate, ammonia, inorganic, organic, total nitrogen and free ammonia by calculation from measured values.
W-PCBECD01	CZ_SOP_D06_03_166 (DIN 38407, part 2, US EPA 8082, samples preparation according to CZ_SOP_D06_03_P01 chap. 9.1, CZ_SOP_D06_03_P02 chap. 9.1) Determination of polychlorinated biphenyls - congener analyses by gas chromatography method with ECD detection and calculation of polychlorinated biphenyls sums from measured values
W-SPIGMS04	CZ_SOP_D06_03_157 except chap. 9.3 (SPIMFAB) Determination of organic contaminants by gas chromatography method with MS detection (SPIMFAB) and calculation of organic contaminants sums from measured values



Analytical Methods	Method Descriptions
W-TPHFID01	CZ_SOP_D06_03_151 (CSN EN ISO 9377-2, Z1, TNRCC Method 1006) Determination of extractable compounds in the range of hydrocarbons C5- C50, their fractions calculated from the measured values by gas chromatography method with FID detection
W-TPHFID02	CZ_SOP_D06_03_151 (CSN EN ISO 9377-2, Z1, TNRCC Method 1006) Determination of extractable compounds in the range of hydrocarbons C5- C50, their fractions calculated from the measured values by gas chromatography method with FID detection
W-TPH-IR	CZ_SOP_D06_02_057 Determination of nonpolar extractives by infrared spectrometry (based on CSN 75 7505:2006, CSN 830540-4)
W-VOCGMS01	CZ_SOP_D06_03_155 except chap. 9.2 (US EPA 624, US EPA 8260, EN ISO 10301, MADEP 2004, rev. 1.1) Determination of volatile organic compounds by gas chromatography method with FID and MS detection and calculation of volatile organic compounds sums from measured values
W-VOCGMS05	CZ_SOP_D06_03_155 except chap. 9.2 (US EPA 624, US EPA 8260, EN ISO 10301, MADEP 2004, rev. 1.1) Determination of volatile organic compounds by gas chromatography method with FID and MS detection and calculation of volatile organic compounds sums from measured values

A "*" symbol preceding any method indicates non-accredited test. In the case when a procedure belonging to an accredited method was used for non-accredited matrix, would apply that the reported results are non-accredited. Please refer to General Comment section on front page for information.

The calculation methods of summation parameters are available on request in the client service.



CERTIFICATE OF ANALYSIS

Work Order	: PR1421207	Issue Date	: 02-MAY-2014
Client	: IDAD - Instituto do Ambiente e Desenvolvimento	Laboratory	: ALS Czech Republic, s.r.o.
Contact	: Mrs. Alexandra Passos Silva	Contact	: Client Service
Address	: Campus Universitario Aveiro Portugal 3810-193	Address	: Na Harfe 336/9 Prague 9 - Vysocany Czech Republic 190 00
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Facsimile	: ----	Facsimile	: +420 284 081 635
Project	: IMA 12 02 13	Page	: 1 of 6
Order number	: ----	Date Samples Received	: 25-APR-2014
C-O-C number	: ----	Quote number	: PR2014IDAIN-PT0013 (PT-300-14-0230)
Site	: ----	Date of test	: 26-APR-2014 - 02-MAY-2014
Sampled by	: client	QC Level	: ALS CR Standard Quality Control Schedule

General Comments

This report shall not be reproduced except in full, without prior written approval from the laboratory.
The laboratory declares that the test results relate only to the listed samples.

Responsible for accuracy

Signatories
Zdenek Jirak

Position
Environmental Business Unit
Manager

Testing Laboratory
Accredited by CAI



ALS Czech Republic, s.r.o.
Na Harfe 336/9 Prague 9 - Vysocany Czech Republic 190 00



Analytical Results

Sub-Matrix: GROUNDWATER

Client sample ID
Laboratory sample ID
Client sampling date / time

Parameter	Method	LOR	Unit	237.14		238.14		239.14	
				PR1421207001		PR1421207002		PR1421207003	
				14-APR-2014 00:00		14-APR-2014 00:00		14-APR-2014 00:00	
				Result	MU	Result	MU	Result	MU
Nonmetallic Inorganic Parameters									
Ammonia and ammonium ions	W-NH4-SPC	0.050	mg/L	<0.050	---	<0.050	---	0.096	±15.0 %
Chemical Oxygen Demand (COD-Cr)	W-COD-SPC	5.0	mg/L	9.0	±20.6 %	<5.0	---	<5.0	---
Ammonia as N	W-NH4-SPC	0.040	mg/L	<0.040	---	<0.040	---	0.074	±15.0 %
Chloride	W-ANI-ENV	0.500	mg/L	18.2	±15.0 %	20.2	±15.0 %	42.5	±15.0 %
Nitrates	W-ANI-ENV	0.040	mg/L	<0.040	---	19.7	±15.0 %	6.34	±15.0 %
Nitrites	W-ANI-ENV	0.040	mg/L	<0.040	---	<0.040	---	0.058	±25.0 %
Sulphate as SO4 2-	W-ANI-ENV	0.500	mg/L	7.41	±15.0 %	36.8	±15.0 %	41.6	±15.0 %
Dissolved Metals / Major Cations									
Arsenic	W-METAXFL1	0.0050	mg/L	<0.0050	---	<0.0050	---	<0.0050	---
Cadmium	W-METAXFL1	0.00040	mg/L	<0.00040	---	<0.00040	---	<0.00040	---
Lead	W-METAXFL1	0.0050	mg/L	<0.0050	---	<0.0050	---	<0.0050	---
Mercury	W-HG-AFSFL	0.010	µg/L	<0.010	---	<0.010	---	<0.010	---
Petroleum Hydrocarbons - FTIR									
Total Petroleum Hydrocarbons	W-TPH-IR	0.050	mg/L	<0.050	---	<0.050	---	<0.050	---
BTEX									
Benzene	W-VOCGMS01	0.20	µg/L	<0.20	---	<0.20	---	<0.20	---
Toluene	W-VOCGMS01	1.00	µg/L	<1.00	---	<1.00	---	<1.00	---
Ethylbenzene	W-VOCGMS01	0.10	µg/L	<0.10	---	<0.10	---	<0.10	---
meta- & para-Xylene	W-VOCGMS01	0.20	µg/L	<0.20	---	<0.20	---	<0.20	---
ortho-Xylene	W-VOCGMS01	0.10	µg/L	<0.10	---	<0.10	---	<0.10	---
Sum of BTEX	W-VOCGMS01	1.60	µg/L	<1.60	---	<1.60	---	<1.60	---
Sum of xylenes	W-VOCGMS01	0.30	µg/L	<0.30	---	<0.30	---	<0.30	---
Sum of TEX	W-VOCGMS01	1.40	µg/L	<1.40	---	<1.40	---	<1.40	---
Halogenated Volatile Organic Compounds									
Dichlorodifluoromethane	W-VOCGMS05	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---
Vinyl chloride	W-VOCGMS01	1.00	µg/L	<1.00	---	<1.00	---	<1.00	---
Chloromethane	W-VOCGMS05	10	µg/L	<10	---	<10	---	<10	---
trans-1,2-Dichloroethene	W-VOCGMS01	0.10	µg/L	<0.10	---	<0.10	---	<0.10	---
Bromomethane	W-VOCGMS05	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---
Dichloromethane	W-VOCGMS01	6.0	µg/L	<6.0	---	<6.0	---	<6.0	---
1,1-Dichloroethene	W-VOCGMS01	0.10	µg/L	<0.10	---	<0.10	---	<0.10	---
Chloroethane	W-VOCGMS05	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---
cis-1,2-Dichloroethene	W-VOCGMS01	0.10	µg/L	<0.10	---	<0.10	---	<0.10	---
Trichlorofluoromethane	W-VOCGMS05	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---
1,1-Dichloroethane	W-VOCGMS01	0.10	µg/L	<0.10	---	<0.10	---	<0.10	---
Bromochloromethane	W-VOCGMS05	2.0	µg/L	<2.0	---	<2.0	---	<2.0	---
2,2-Dichloropropane	W-VOCGMS05	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---
Chloroform	W-VOCGMS01	0.30	µg/L	<0.30	---	<0.30	---	<0.30	---
1,1-Dichloropropylene	W-VOCGMS05	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---
1,2-Dichloroethane	W-VOCGMS01	1.00	µg/L	<1.00	---	<1.00	---	<1.00	---
1,1,1-Trichloroethane	W-VOCGMS01	0.10	µg/L	<0.10	---	<0.10	---	<0.10	---
Dibromomethane	W-VOCGMS05	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---
cis-1,3-Dichloropropylene	W-VOCGMS05	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---
Tetrachloromethane	W-VOCGMS01	0.10	µg/L	<0.10	---	<0.10	---	<0.10	---
Bromodichloromethane	W-VOCGMS01	0.10	µg/L	<0.10	---	<0.10	---	<0.10	---
trans-1,3-Dichloropropene	W-VOCGMS05	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---
1,3-Dichloropropane	W-VOCGMS05	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---
Trichloroethene	W-VOCGMS01	0.10	µg/L	<0.10	---	<0.10	---	<0.10	---
1,1,2-Trichloroethane	W-VOCGMS01	0.20	µg/L	<0.20	---	<0.20	---	<0.20	---
1,2-Dibromoethane (EDB)	W-VOCGMS05	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---



Sub-Matrix: GROUNDWATER				Client sample ID		237.14		238.14		239.14	
				Laboratory sample ID		PR1421207001		PR1421207002		PR1421207003	
				Client sampling date / time		14-APR-2014 00:00		14-APR-2014 00:00		14-APR-2014 00:00	
Parameter	Method	LOR	Unit	Result	MU	Result	MU	Result	MU		
Halogenated Volatile Organic Compounds - Continued											
1,2,3-Trichloropropane	W-VOCGMS05	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---		
Dibromochloromethane	W-VOCGMS01	0.10	µg/L	<0.10	---	<0.10	---	<0.10	---		
Bromobenzene	W-VOCGMS05	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---		
Tetrachloroethene	W-VOCGMS01	0.20	µg/L	<0.20	---	<0.20	---	<0.20	---		
1,1,1,2-Tetrachloroethane	W-VOCGMS01	0.10	µg/L	<0.10	---	<0.10	---	<0.10	---		
2-Chlorotoluene	W-VOCGMS05	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---		
Chlorobenzene	W-VOCGMS01	0.10	µg/L	<0.10	---	<0.10	---	<0.10	---		
4-Chlorotoluene	W-VOCGMS05	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---		
Bromoform	W-VOCGMS01	0.20	µg/L	<0.20	---	<0.20	---	<0.20	---		
1,1,1,2,2-Tetrachloroethane	W-VOCGMS01	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---		
1,2-Dichlorobenzene	W-VOCGMS01	0.10	µg/L	<0.10	---	<0.10	---	<0.10	---		
1,2-Dibromo-3-chloropropane	W-VOCGMS05	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---		
1,4-Dichlorobenzene	W-VOCGMS01	0.10	µg/L	<0.10	---	<0.10	---	<0.10	---		
1,3-Dichlorobenzene	W-VOCGMS01	0.10	µg/L	<0.10	---	<0.10	---	<0.10	---		
1,2,4-Trichlorobenzene	W-VOCGMS01	0.10	µg/L	<0.10	---	<0.10	---	<0.10	---		
Hexachlorobutadiene	W-VOCGMS05	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---		
1,2,3-Trichlorobenzene	W-VOCGMS01	0.10	µg/L	<0.10	---	<0.10	---	<0.10	---		
1,3,5-Trichlorobenzene	W-VOCGMS01	0.20	µg/L	<0.20	---	<0.20	---	<0.20	---		
1,2-Dichloropropane	W-VOCGMS01	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---		
Sum of 4 Trihalomethanes	W-VOCGMS01	0.70	µg/L	<0.70	---	<0.70	---	<0.70	---		
Sum of 3 Dichlorobenzenes	W-VOCGMS01	0.30	µg/L	<0.30	---	<0.30	---	<0.30	---		
Sum of 3 Trichlorobenzenes	W-VOCGMS01	0.40	µg/L	<0.40	---	<0.40	---	<0.40	---		
Non-Halogenated Volatile Organic Compounds											
Isopropylbenzene	W-VOCGMS05	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---		
n-Propylbenzene	W-VOCGMS05	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---		
1,2,4-Trimethylbenzene	W-VOCGMS05	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---		
p-Isopropyltoluene	W-VOCGMS05	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---		
1,3,5-Trimethylbenzene	W-VOCGMS05	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---		
Styrene	W-VOCGMS01	0.20	µg/L	<0.20	---	<0.20	---	<0.20	---		
sec-Butylbenzene	W-VOCGMS05	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---		
tert-Butylbenzene	W-VOCGMS05	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---		
n-Butylbenzene	W-VOCGMS05	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---		
Methyl tert-Butyl Ether (MTBE)	W-VOCGMS01	0.20	µg/L	<0.20	---	<0.20	---	<0.20	---		
tert-Butyl alcohol	W-VOCGMS01	5.0	µg/L	<5.0	---	<5.0	---	<5.0	---		
Sum of BTEXS	W-VOCGMS01	1.80	µg/L	<1.80	---	<1.80	---	<1.80	---		
Aromatic Compounds											
1-Ethyl-2-methylbenzene	W-SPIGMS04	0.050	µg/L	<0.050	---	<0.050	---	<0.050	---		
1-Ethyl-3-methylbenzene@1-Ethyl-4-methylbenzene	W-SPIGMS04	0.10	µg/L	<0.10	---	<0.10	---	<0.10	---		
1,3,5-Trimethylbenzene	W-SPIGMS04	0.050	µg/L	<0.050	---	<0.050	---	<0.050	---		
1,2,4-Trimethylbenzene	W-SPIGMS04	0.050	µg/L	<0.050	---	<0.050	---	<0.050	---		
1,2,3-Trimethylbenzene	W-SPIGMS04	0.050	µg/L	<0.050	---	<0.050	---	<0.050	---		
1,2@1,4-Diethylbenzene	W-SPIGMS04	0.10	µg/L	<0.10	---	<0.10	---	<0.10	---		
1,3-Diethylbenzene	W-SPIGMS04	0.050	µg/L	<0.050	---	<0.050	---	<0.050	---		
1,2,4,5-Tetramethylbenzene	W-SPIGMS04	0.050	µg/L	<0.050	---	<0.050	---	<0.050	---		
2-Methylnaphthalene	W-SPIGMS04	0.050	µg/L	<0.050	---	<0.050	---	<0.050	---		
1-Methylnaphthalene	W-SPIGMS04	0.050	µg/L	<0.050	---	<0.050	---	<0.050	---		
Biphenyl	W-SPIGMS04	0.050	µg/L	<0.050	---	<0.050	---	<0.050	---		
2@1-Ethynaphthalene	W-SPIGMS04	0.10	µg/L	<0.10	---	<0.10	---	<0.10	---		
1,8-Dimethylnaphthalene	W-SPIGMS04	0.050	µg/L	<0.050	---	<0.050	---	<0.050	---		
2-Methylantracene	W-SPIGMS04	0.050	µg/L	<0.050	---	<0.050	---	<0.050	---		



Parameter	Method	LOR	Unit	Client sample ID		237.14		238.14		239.14	
				Laboratory sample ID		PR1421207001		PR1421207002		PR1421207003	
				Client sampling date / time		14-APR-2014 00:00		14-APR-2014 00:00		14-APR-2014 00:00	
				Result	MU	Result	MU	Result	MU		
Aromatic Compounds - Continued											
1-Methylantracene@1-Methylphenanthrene	W-SPIGMS04	0.10	µg/L	<0.10	---	<0.10	---	<0.10	---		
2-Methylphenanthrene	W-SPIGMS04	0.050	µg/L	<0.050	---	<0.050	---	<0.050	---		
Isopropylbenzene	W-SPIGMS04	0.050	µg/L	<0.050	---	<0.050	---	<0.050	---		
1,2-Dimethylnaphthalene	W-SPIGMS04	0.050	µg/L	<0.050	---	<0.050	---	<0.050	---		
n-Propylbenzene	W-SPIGMS04	0.050	µg/L	<0.050	---	<0.050	---	<0.050	---		
2,6@2,7-Dimethylnaphthalene	W-SPIGMS04	0.10	µg/L	<0.10	---	<0.10	---	<0.10	---		
1,7@1,3@1,6-Dimethylnaphthalene	W-SPIGMS04	0.15	µg/L	<0.15	---	<0.15	---	<0.15	---		
1,4@2,3@1,5-Dimethylnaphthalene	W-SPIGMS04	0.15	µg/L	<0.15	---	<0.15	---	<0.15	---		
1,3,7-Trimethylnaphthalene	W-SPIGMS04	0.05	µg/L	<0.05	---	<0.05	---	<0.05	---		
1,4,6@2,3,6-Trimethylnaphthalene	W-SPIGMS04	0.10	µg/L	<0.10	---	<0.10	---	<0.10	---		
2,3,5@1,2,6-Trimethylnaphthalene	W-SPIGMS04	0.10	µg/L	<0.10	---	<0.10	---	<0.10	---		
1,2,4@2,4,5@1,2,5-Trimethylnaphthalene	W-SPIGMS04	0.15	µg/L	<0.15	---	<0.15	---	<0.15	---		
1,2,3@1,4,5-Trimethylnaphthalene	W-SPIGMS04	0.10	µg/L	<0.10	---	<0.10	---	<0.10	---		
1,4,6,7-Tetramethylnaphthalene	W-SPIGMS04	0.050	µg/L	<0.050	---	<0.050	---	<0.050	---		
1,2,5,6-Tetramethylnaphthalene	W-SPIGMS04	0.050	µg/L	<0.050	---	<0.050	---	<0.050	---		
Methylpyrenes@Methylfluoranthenes	W-SPIGMS04	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---		
Methylchrysenes@Methylbenz(a)anthracenes	W-SPIGMS04	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---		
Sum of Aromatics C16-C35	W-SPIGMS04	2.0	µg/L	<2.0	---	<2.0	---	<2.0	---		
Polycyclic Aromatics Hydrocarbons (PAHs)											
Naphthalene	W-SPIGMS04	0.010	µg/L	<0.010	---	<0.010	---	<0.010	---		
Acenaphthylene	W-SPIGMS04	0.010	µg/L	<0.010	---	<0.010	---	<0.010	---		
Acenaphthene	W-SPIGMS04	0.010	µg/L	<0.010	---	<0.010	---	<0.010	---		
Fluorene	W-SPIGMS04	0.010	µg/L	<0.010	---	<0.010	---	<0.010	---		
Phenanthrene	W-SPIGMS04	0.010	µg/L	<0.010	---	<0.010	---	<0.010	---		
Anthracene	W-SPIGMS04	0.010	µg/L	<0.010	---	<0.010	---	<0.010	---		
Fluoranthene	W-SPIGMS04	0.010	µg/L	<0.010	---	<0.010	---	<0.010	---		
Pyrene	W-SPIGMS04	0.010	µg/L	<0.010	---	<0.010	---	<0.010	---		
Benz(a)anthracene	W-SPIGMS04	0.010	µg/L	<0.010	---	<0.010	---	<0.010	---		
Chrysenes	W-SPIGMS04	0.010	µg/L	<0.010	---	<0.010	---	<0.010	---		
Benzo(b)fluoranthene	W-SPIGMS04	0.010	µg/L	<0.010	---	<0.010	---	<0.010	---		
Benzo(k)fluoranthene	W-SPIGMS04	0.010	µg/L	<0.010	---	<0.010	---	<0.010	---		
Benzo(a)pyrene	W-SPIGMS04	0.010	µg/L	<0.010	---	<0.010	---	<0.010	---		
Indeno(1,2,3-cd)pyrene	W-SPIGMS04	0.010	µg/L	<0.010	---	<0.010	---	<0.010	---		
Benzo(g,h,i)perylene	W-SPIGMS04	0.010	µg/L	<0.010	---	<0.010	---	<0.010	---		
Dibenz(a,h)anthracene	W-SPIGMS04	0.010	µg/L	<0.010	---	<0.010	---	<0.010	---		
PCBs											
PCB 28	W-PCBECD01	0.00110	µg/L	<0.00110	---	<0.00110	---	<0.00110	---		
PCB 52	W-PCBECD01	0.00110	µg/L	<0.00110	---	<0.00110	---	<0.00110	---		
PCB 101	W-PCBECD01	0.000750	µg/L	<0.000750	---	<0.000750	---	<0.000750	---		
PCB 118	W-PCBECD01	0.00110	µg/L	<0.00110	---	<0.00110	---	<0.00110	---		
PCB 138	W-PCBECD01	0.00120	µg/L	<0.00120	---	<0.00120	---	<0.00120	---		
PCB 153	W-PCBECD01	0.00110	µg/L	<0.00110	---	<0.00110	---	<0.00110	---		
PCB 180	W-PCBECD01	0.000950	µg/L	<0.000950	---	<0.000950	---	<0.000950	---		
Sum of 6 PCBs	W-PCBECD01	0.00620	µg/L	<0.00620	---	<0.00620	---	<0.00620	---		



Sub-Matrix: GROUNDWATER				Client sample ID		237.14		238.14		239.14	
				Laboratory sample ID		PR1421207001		PR1421207002		PR1421207003	
				Client sampling date / time		14-APR-2014 00:00		14-APR-2014 00:00		14-APR-2014 00:00	
Parameter	Method	LOR	Unit	Result	MU	Result	MU	Result	MU		
PCBs - Continued											
Sum of 7 PCBs	W-PCBECD01	0.00730	µg/L	<0.00730	---	<0.00730	---	<0.00730	---		
Petroleum Hydrocarbons											
Aliphates C10-C12	W-SPIGMS04	10	µg/L	<10	---	<10	---	<10	---		
Aliphates C12-C16	W-SPIGMS04	10	µg/L	<10	---	<10	---	<10	---		
Aliphates C16-C35	W-SPIGMS04	10	µg/L	<10	---	<10	---	<10	---		
C10 - C12 Fraction	W-TPHFID01	5.0	µg/L	12.6	±30.0 %	15.5	±30.0 %	11.8	±30.0 %		
C10 - C16 Fraction	W-TPHFID02	10	µg/L	39	±30.0 %	44	±30.0 %	36	±30.0 %		
C10 - C40 Fraction	W-TPHFID02	50	µg/L	<50	---	<50	---	<50	---		
C10 - C40 Fraction	W-TPHFID01	50	µg/L	<50	---	<50	---	<50	---		
C12 - C16 Fraction	W-TPHFID01	5.0	µg/L	26.4	±30.0 %	29.8	±30.0 %	23.8	±30.0 %		
C16 - C22 Fraction	W-TPHFID02	10	µg/L	<10	---	<10	---	<10	---		
C16 - C35 Fraction	W-TPHFID01	30	µg/L	<30	---	<30	---	<30	---		
C22 - C30 Fraction	W-TPHFID02	15	µg/L	<15	---	<15	---	<15	---		
C30 - C40 Fraction	W-TPHFID02	15	µg/L	<15	---	<15	---	<15	---		
C35 - C40 Fraction	W-TPHFID01	10	µg/L	<10	---	<10	---	<10	---		
Sum of Aliphates C10-C35	W-SPIGMS04	30	µg/L	<30	---	<30	---	<30	---		
Sum of Aromatics C10-C16	W-SPIGMS04	1.55	µg/L	<1.55	---	<1.55	---	<1.55	---		
Sum of Aromatics C8-C10	W-SPIGMS04	0.60	µg/L	<0.60	---	<0.60	---	<0.60	---		

If the client does not specify the date and time of sample collection, the laboratory will specify the date on sample delivery in parentheses, instead. If the time of sample collection is specified as 0:00 it means that the client did specify the date but not the time. Measurement uncertainty is expressed as expanded measurement uncertainty with coverage factor k = 2, representing 95% confidence level.

Key: LOR = Limit of reporting; MU = Measurement Uncertainty

The end of result part of the certificate of analysis

Brief Method Summaries

Analytical Methods	Method Descriptions
Location of test performance: Na Harfe 336/9 Prague 9 - Vysocany Czech Republic 190 00	
W-ANI-ENV	CZ_SOP_D06_02_068 (CSN ISO 10304-1, CSN EN 12506) Determination of dissolved fluoride, chloride, nitrite, bromide, nitrate and sulphate by ion liquid chromatography and determination of nitrite nitrogen and nitrate nitrogen by calculation from measured values.
W-COD-SPC	CZ_SOP_D06_02_076 Determination of chemical oxygen demand using dichromate (COD-Cr) by photometry (based on CSN ISO 15705) / CZ_SOP_D06_02_076A / CZ_SOP_D06_07_040 Determination of chemical oxygen demand using dichromate (COD-Cr) by titration (based on CSN ISO 6060 and CSN ISO 15705).
W-HG-AFSFL	CZ_SOP_D06_02_096 (US EPA 245.7, US EPA 1631, CSN EN ISO 17852, CSN EN 13370 samples prepared as per CZ_SOP_D06_02_J02 chap. 10.1 and 10.2.) Determination of Mercury by Fluorescence Spectrometry. Sample was filtered by microfilter with porosity 0.45 µm followed by nitric acid addition prior to analysis.
W-METAXFL1	CZ_SOP_D06_02_001 (US EPA 200.7, ISO 11885, EN 12506, samples prepared as per CZ_SOP_D06_02_J02 chap. 10.1 and 10.2) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values. Sample was filtered by microfilter with porosity 0.45 µm followed by nitric acid addition prior to analysis.
W-NH4-SPC	CZ_SOP_D06_02_019 (CSN EN ISO 11732, CSN EN ISO 13395, CSN EN 13370, CSN EN 12506) Determination of ammonium, nitrite and the sum of nitrite and nitrate ions by discrete spectrophotometry and determination of nitrite, nitrate, ammonia, inorganic, organic, total nitrogen and free ammonia by calculation from measured values.
W-PCBECD01	CZ_SOP_D06_03_166 (DIN 38407, part 2, US EPA 8082, samples preparation according to CZ_SOP_D06_03_P01 chap. 9.1, CZ_SOP_D06_03_P02 chap. 9.1) Determination of polychlorinated biphenyls - congener analyses by gas chromatography method with ECD detection and calculation of polychlorinated biphenyls sums from measured values.
W-SPIGMS04	CZ_SOP_D06_03_157 except chap. 9.3 (SPIMFAB) Determination of organic contaminants by gas chromatography method with MS detection (SPIMFAB) and calculation of organic contaminants sums from measured values.

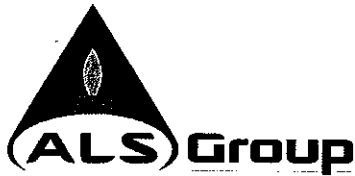
Issue Date : 02-MAY-2014
Page : 6 of 6
Work Order : PR1421207
Client : IDAD - Instituto do Ambiente e Desenvolvimento



Analytical Methods	Method Descriptions
W-TPHFID01	CZ_SOP_D06_03_151 (CSN EN ISO 9377-2, Z1, TNRCC Method 1006) Determination of extractable compounds in the range of hydrocarbons C5 - C50, their fractions calculated from the measured values by gas chromatography method with FID detection
W-TPHFID02	CZ_SOP_D06_03_151 (CSN EN ISO 9377-2, Z1, TNRCC Method 1006) Determination of extractable compounds in the range of hydrocarbons C5 - C50, their fractions calculated from the measured values by gas chromatography method with FID detection
W-TPH-IR	CZ_SOP_D06_02_057 Determination of nonpolar extractives by infrared spectrometry (based on CSN 75 7505:2006, CSN 830540-4)
W-VOCGMS01	CZ_SOP_D06_03_155 except chap. 9.2 (US EPA 624, US EPA 8260, EN ISO 10301, MADEP 2004, rev. 1.1) Determination of volatile organic compounds by gas chromatography method with FID and MS detection and calculation of volatile organic compounds sums from measured values
W-VOCGMS05	CZ_SOP_D06_03_155 except chap. 9.2 (US EPA 624, US EPA 8260, EN ISO 10301, MADEP 2004, rev. 1.1) Determination of volatile organic compounds by gas chromatography method with FID and MS detection and calculation of volatile organic compounds sums from measured values

A "*" symbol preceding any method indicates non-accredited test. In the case when a procedure belonging to an accredited method was used for non-accredited matrix, would apply that the reported results are non-accredited. Please refer to General Comment section on front page for information.

The calculation methods of summation parameters are available on request in the client service.



CERTIFICATE OF ANALYSIS

Work Order	: PR1451843	Issue Date	: 30-SEP-2014
Client	: IDAD - Instituto do Ambiente e Desenvolvimento	Laboratory	: ALS Czech Republic, s.r.o.
Contact	: Mrs. Alexandra Passos Silva	Contact	: Client Service
Address	: Campus Universitario Aveiro Portugal 3810-193	Address	: Na Harfe 336/9 Prague 9 - Vysocany Czech Republic 190 00
E-mail	: a.passosilva@ua.pt	E-mail	: customer.support@alsglobal.com
Telephone	: +351 2344 00800	Telephone	: +420 226 226 228
Facsimile	: ----	Facsimile	: +420 284 081 635
Project	: IMA 12 02 13	Page	: 1 of 6
Order number	: ----	Date Samples Received	: 19-SEP-2014
C-O-C number	: ----	Quote number	: PR2014IDAIN-PT0013 (PT-300-14-0230)
Site	: ----	Date of test	: 24-SEP-2014 - 30-SEP-2014
Sampled by	: client	QC Level	: ALS CR Standard Quality Control Schedule

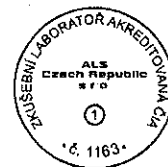
General Comments

This report shall not be reproduced except in full, without prior written approval from the laboratory.
The laboratory declares that the test results relate only to the listed samples.
Sample(s) PR1451843/001, 002, method W-NH4-SPC was/were filtered prior to analysis (filter porosity 0.45 µm).
Samples PR1451843/001-003 method W-COD-SPC - filtered prior to analysis (filter porosity 1.2 µm).

Responsible for accuracy

Signatories
Zdenek Jirak

Position
Environmental Business Unit
Manager



Testing Laboratory
Accredited by CAI



ALS Czech Republic, s.r.o.
Na Harfe 336/9 Prague 9 - Vysocany Czech Republic 190 00



Analytical Results

Sub-Matrix: GROUNDWATER

Client sample ID
Laboratory sample ID
Client sampling date / time

Parameter	Method	LOR	Unit	698.14		699.14		700.14	
				PR1451843001		PR1451843002		PR1451843003	
				15-SEP-2014 00:00		15-SEP-2014 00:00		15-SEP-2014 00:00	
				Result	MU	Result	MU	Result	MU
Nonmetallic Inorganic Parameters									
Ammonia and ammonium ions	W-NH4-SPC	0.050	mg/L	<0.050	---	<0.050	---	2.48	±15.0 %
Chemical Oxygen Demand (COD-Cr)	W-COD-SPC	5.0	mg/L	<5.0	---	<5.0	---	16.0	±18.1 %
Ammonia as N	W-NH4-SPC	0.040	mg/L	<0.040	---	<0.040	---	1.93	±15.0 %
Chloride	W-ANI-ENV	0.500	mg/L	16.2	±15.0 %	36.2	±15.0 %	78.5	±15.0 %
Nitrates	W-ANI-ENV	0.040	mg/L	8.72	±15.0 %	34.5	±15.0 %	0.331	±15.0 %
Nitrites	W-ANI-ENV	0.040	mg/L	0.292	±25.0 %	<0.040	---	0.218	±25.0 %
Sulphate as SO4 2-	W-ANI-ENV	0.500	mg/L	12.7	±15.0 %	78.2	±15.0 %	5.20	±15.0 %
Dissolved Metals / Major Cations									
Arsenic	W-METAXFL1	0.0050	mg/L	<0.0050	---	<0.0050	---	<0.0050	---
Cadmium	W-METAXFL1	0.00040	mg/L	<0.00040	---	<0.00040	---	<0.00040	---
Lead	W-METAXFL1	0.0050	mg/L	<0.0050	---	<0.0050	---	<0.0050	---
Mercury	W-HG-AFSFL	0.010	µg/L	<0.010	---	<0.010	---	<0.010	---
Petroleum Hydrocarbons - FTIR									
Total Petroleum Hydrocarbons	W-TPH-IR	0.050	mg/L	<0.050	---	<0.050	---	<0.050	---
BTEX									
Benzene	W-VOCGMS01	0.20	µg/L	<0.20	---	<0.20	---	<0.20	---
Toluene	W-VOCGMS01	1.00	µg/L	<1.00	---	<1.00	---	<1.00	---
Ethylbenzene	W-VOCGMS01	0.10	µg/L	<0.10	---	<0.10	---	<0.10	---
meta- & para-Xylene	W-VOCGMS01	0.20	µg/L	<0.20	---	<0.20	---	<0.20	---
ortho-Xylene	W-VOCGMS01	0.10	µg/L	<0.10	---	<0.10	---	<0.10	---
Sum of BTEX	W-VOCGMS01	1.60	µg/L	<1.60	---	<1.60	---	<1.60	---
Sum of xylenes	W-VOCGMS01	0.30	µg/L	<0.30	---	<0.30	---	<0.30	---
Sum of TEX	W-VOCGMS01	1.40	µg/L	<1.40	---	<1.40	---	<1.40	---
Halogenated Volatile Organic Compounds									
Dichlorodifluoromethane	W-VOCGMS05	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---
Vinyl chloride	W-VOCGMS01	1.00	µg/L	<1.00	---	<1.00	---	<1.00	---
Chloromethane	W-VOCGMS05	10	µg/L	<10	---	<10	---	<10	---
trans-1,2-Dichloroethene	W-VOCGMS01	0.10	µg/L	<0.10	---	<0.10	---	<0.10	---
Bromomethane	W-VOCGMS05	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---
Dichloromethane	W-VOCGMS01	6.0	µg/L	<6.0	---	<6.0	---	<6.0	---
1,1-Dichloroethene	W-VOCGMS01	0.10	µg/L	<0.10	---	<0.10	---	<0.10	---
Chloroethane	W-VOCGMS05	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---
cis-1,2-Dichloroethene	W-VOCGMS01	0.10	µg/L	<0.10	---	<0.10	---	<0.10	---
Trichlorofluoromethane	W-VOCGMS05	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---
1,1-Dichloroethane	W-VOCGMS01	0.10	µg/L	<0.10	---	<0.10	---	<0.10	---
Bromochloromethane	W-VOCGMS05	2.0	µg/L	<2.0	---	<2.0	---	<2.0	---
2,2-Dichloropropane	W-VOCGMS05	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---
Chloroform	W-VOCGMS01	0.30	µg/L	<0.30	---	<0.30	---	<0.30	---
1,1-Dichloropropylene	W-VOCGMS05	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---
1,2-Dichloroethane	W-VOCGMS01	1.00	µg/L	<1.00	---	<1.00	---	<1.00	---
1,1,1-Trichloroethane	W-VOCGMS01	0.10	µg/L	<0.10	---	<0.10	---	<0.10	---
Dibromomethane	W-VOCGMS05	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---
cis-1,3-Dichloropropylene	W-VOCGMS05	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---
Tetrachloromethane	W-VOCGMS01	0.10	µg/L	<0.10	---	<0.10	---	<0.10	---
Bromodichloromethane	W-VOCGMS01	0.10	µg/L	<0.10	---	<0.10	---	<0.10	---
trans-1,3-Dichloropropene	W-VOCGMS05	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---
1,3-Dichloropropane	W-VOCGMS05	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---
Trichloroethene	W-VOCGMS01	0.10	µg/L	<0.10	---	<0.10	---	<0.10	---
1,1,2-Trichloroethane	W-VOCGMS01	0.20	µg/L	<0.20	---	<0.20	---	<0.20	---
1,2-Dibromoethane (EDB)	W-VOCGMS05	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---



Sub-Matrix: GROUNDWATER				Client sample ID		698.14		699.14		700.14	
				Laboratory sample ID		PR1451843001		PR1451843002		PR1451843003	
				Client sampling date / time		15-SEP-2014 00:00		15-SEP-2014 00:00		15-SEP-2014 00:00	
Parameter	Method	LOR	Unit	Result	MU	Result	MU	Result	MU		
Halogenated Volatile Organic Compounds - Continued											
1,2,3-Trichloropropane	W-VOCGMS05	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---		
Dibromochloromethane	W-VOCGMS01	0.10	µg/L	<0.10	---	<0.10	---	<0.10	---		
Bromobenzene	W-VOCGMS05	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---		
Tetrachloroethene	W-VOCGMS01	0.20	µg/L	<0.20	---	<0.20	---	<0.20	---		
1,1,1,2-Tetrachloroethane	W-VOCGMS01	0.10	µg/L	<0.10	---	<0.10	---	<0.10	---		
2-Chlorotoluene	W-VOCGMS05	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---		
Chlorobenzene	W-VOCGMS01	0.10	µg/L	<0.10	---	<0.10	---	<0.10	---		
4-Chlorotoluene	W-VOCGMS05	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---		
Bromoform	W-VOCGMS01	0.20	µg/L	<0.20	---	<0.20	---	<0.20	---		
1,1,1,2,2-Tetrachloroethane	W-VOCGMS01	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---		
1,2-Dichlorobenzene	W-VOCGMS01	0.10	µg/L	<0.10	---	<0.10	---	<0.10	---		
1,2-Dibromo-3-chloropropane	W-VOCGMS05	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---		
1,4-Dichlorobenzene	W-VOCGMS01	0.10	µg/L	<0.10	---	<0.10	---	<0.10	---		
1,3-Dichlorobenzene	W-VOCGMS01	0.10	µg/L	<0.10	---	<0.10	---	<0.10	---		
1,2,4-Trichlorobenzene	W-VOCGMS01	0.10	µg/L	<0.10	---	<0.10	---	<0.10	---		
Hexachlorobutadiene	W-VOCGMS05	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---		
1,2,3-Trichlorobenzene	W-VOCGMS01	0.10	µg/L	<0.10	---	<0.10	---	<0.10	---		
1,3,5-Trichlorobenzene	W-VOCGMS01	0.20	µg/L	<0.20	---	<0.20	---	<0.20	---		
1,2-Dichloropropane	W-VOCGMS01	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---		
Sum of 4 Trihalomethanes	W-VOCGMS01	0.70	µg/L	<0.70	---	<0.70	---	<0.70	---		
Sum of 3 Dichlorobenzenes	W-VOCGMS01	0.30	µg/L	<0.30	---	<0.30	---	<0.30	---		
Sum of 3 Trichlorobenzenes	W-VOCGMS01	0.40	µg/L	<0.40	---	<0.40	---	<0.40	---		
Non-Halogenated Volatile Organic Compounds											
Isopropylbenzene	W-VOCGMS05	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---		
n-Propylbenzene	W-VOCGMS05	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---		
1,2,4-Trimethylbenzene	W-VOCGMS05	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---		
p-Isopropyltoluene	W-VOCGMS05	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---		
1,3,5-Trimethylbenzene	W-VOCGMS05	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---		
Styrene	W-VOCGMS01	0.20	µg/L	<0.20	---	<0.20	---	<0.20	---		
sec-Butylbenzene	W-VOCGMS05	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---		
tert-Butylbenzene	W-VOCGMS05	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---		
n-Butylbenzene	W-VOCGMS05	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---		
Methyl tert-Butyl Ether (MTBE)	W-VOCGMS01	0.20	µg/L	<0.20	---	<0.20	---	<0.20	---		
tert-Butyl alcohol	W-VOCGMS01	5.0	µg/L	<5.0	---	<5.0	---	<5.0	---		
Sum of BTEXS	W-VOCGMS01	1.80	µg/L	<1.80	---	<1.80	---	<1.80	---		
Aromatic Compounds											
1-Ethyl-2-methylbenzene	W-SPIGMS04	0.050	µg/L	<0.050	---	<0.050	---	<0.050	---		
1-Ethyl-3-methylbenzene@1-Ethyl-4-methylbenzene	W-SPIGMS04	0.10	µg/L	<0.10	---	<0.10	---	<0.10	---		
1,3,5-Trimethylbenzene	W-SPIGMS04	0.050	µg/L	<0.050	---	<0.050	---	<0.050	---		
1,2,4-Trimethylbenzene	W-SPIGMS04	0.050	µg/L	<0.050	---	<0.050	---	<0.050	---		
1,2,3-Trimethylbenzene	W-SPIGMS04	0.050	µg/L	<0.050	---	<0.050	---	<0.050	---		
1,2@1,4-Diethylbenzene	W-SPIGMS04	0.10	µg/L	<0.10	---	<0.10	---	<0.10	---		
1,3-Diethylbenzene	W-SPIGMS04	0.050	µg/L	<0.050	---	<0.050	---	<0.050	---		
1,2,4,6-Tetramethylbenzene	W-SPIGMS04	0.050	µg/L	<0.050	---	<0.050	---	<0.050	---		
2-Methylnaphthalene	W-SPIGMS04	0.050	µg/L	<0.050	---	<0.050	---	<0.050	---		
1-Methylnaphthalene	W-SPIGMS04	0.050	µg/L	<0.050	---	<0.050	---	<0.050	---		
Biphenyl	W-SPIGMS04	0.050	µg/L	<0.050	---	<0.050	---	<0.050	---		
2@1-Ethyl-naphthalene	W-SPIGMS04	0.10	µg/L	<0.10	---	<0.10	---	<0.10	---		
1,8-Dimethylnaphthalene	W-SPIGMS04	0.050	µg/L	<0.050	---	<0.050	---	<0.050	---		
2-Methylanthracene	W-SPIGMS04	0.050	µg/L	<0.050	---	<0.050	---	<0.050	---		



Sub-Matrix: GROUNDWATER				Client sample ID		698.14		699.14		700.14	
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				Client sampling date / time		15-SEP-2014 00:00		15-SEP-2014 00:00		15-SEP-2014 00:00	
Parameter	Method	LOR	Unit	Result	MU	Result	MU	Result	MU		
Aromatic Compounds - Continued											
1-Methylantracene@1-Methylphenanthrene	W-SPIGMS04	0.10	µg/L	<0.10	---	<0.10	---	<0.10	---		
2-Methylphenanthrene	W-SPIGMS04	0.050	µg/L	<0.050	---	<0.050	---	<0.050	---		
Isopropylbenzene	W-SPIGMS04	0.050	µg/L	<0.050	---	<0.050	---	<0.050	---		
1,2-Dimethylnaphthalene	W-SPIGMS04	0.050	µg/L	<0.050	---	<0.050	---	<0.050	---		
n-Propylbenzene	W-SPIGMS04	0.050	µg/L	<0.050	---	<0.050	---	<0.050	---		
2,6@2,7-Dimethylnaphthalene	W-SPIGMS04	0.10	µg/L	<0.10	---	<0.10	---	<0.10	---		
1,7@1,3@1,6-Dimethylnaphthalene	W-SPIGMS04	0.15	µg/L	<0.15	---	<0.15	---	<0.15	---		
1,4@2,3@1,5-Dimethylnaphthalene	W-SPIGMS04	0.15	µg/L	<0.15	---	<0.15	---	<0.15	---		
1,3,7-Trimethylnaphthalene	W-SPIGMS04	0.05	µg/L	<0.05	---	<0.05	---	<0.05	---		
1,4,6@2,3,6-Trimethylnaphthalene	W-SPIGMS04	0.10	µg/L	<0.10	---	<0.10	---	<0.10	---		
2,3,6@1,2,6-Trimethylnaphthalene	W-SPIGMS04	0.10	µg/L	<0.10	---	<0.10	---	<0.10	---		
1,2,4@2,4,5@1,2,5-Trimethylnaphthalene	W-SPIGMS04	0.15	µg/L	<0.15	---	<0.15	---	<0.15	---		
1,2,3@1,4,5-Trimethylnaphthalene	W-SPIGMS04	0.10	µg/L	<0.10	---	<0.10	---	<0.10	---		
1,4,6,7-Tetramethylnaphthalene	W-SPIGMS04	0.050	µg/L	<0.050	---	<0.050	---	<0.050	---		
1,2,5,6-Tetramethylnaphthalene	W-SPIGMS04	0.050	µg/L	<0.050	---	<0.050	---	<0.050	---		
Methylpyrenes@Methylfluoranthenes	W-SPIGMS04	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---		
Methylchrysenes@Methylbenz(a)anthracenes	W-SPIGMS04	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---		
Sum of Aromatics C16-C35	W-SPIGMS04	2.0	µg/L	<2.0	---	<2.0	---	<2.0	---		
Sum of Aromatics C16-C35 (M1)	W-SPIGMS04	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---		
Polycyclic Aromatics Hydrocarbons (PAHs)											
Naphthalene	W-SPIGMS04	0.010	µg/L	<0.010	---	<0.010	---	<0.010	---		
Acenaphthylene	W-SPIGMS04	0.010	µg/L	<0.010	---	<0.010	---	<0.010	---		
Acenaphthene	W-SPIGMS04	0.010	µg/L	<0.010	---	<0.010	---	<0.010	---		
Fluorene	W-SPIGMS04	0.010	µg/L	<0.010	---	<0.010	---	<0.010	---		
Phenanthrene	W-SPIGMS04	0.010	µg/L	<0.010	---	<0.010	---	<0.010	---		
Anthracene	W-SPIGMS04	0.010	µg/L	<0.010	---	<0.010	---	<0.010	---		
Naphthalene	W-VOCGMS05	1.0	µg/L	<1.0	---	<1.0	---	<1.0	---		
Fluoranthene	W-SPIGMS04	0.010	µg/L	<0.010	---	<0.010	---	<0.010	---		
Pyrene	W-SPIGMS04	0.010	µg/L	<0.010	---	<0.010	---	<0.010	---		
Benz(a)anthracene	W-SPIGMS04	0.010	µg/L	<0.010	---	<0.010	---	<0.010	---		
Chrysene	W-SPIGMS04	0.010	µg/L	<0.010	---	<0.010	---	<0.010	---		
Benzo(b)fluoranthene	W-SPIGMS04	0.010	µg/L	<0.010	---	<0.010	---	<0.010	---		
Benzo(k)fluoranthene	W-SPIGMS04	0.010	µg/L	<0.010	---	<0.010	---	<0.010	---		
Benzo(a)pyrene	W-SPIGMS04	0.010	µg/L	<0.010	---	<0.010	---	<0.010	---		
Indeno(1,2,3-cd)pyrene	W-SPIGMS04	0.010	µg/L	<0.010	---	<0.010	---	<0.010	---		
Benzo(g,h,i)perylene	W-SPIGMS04	0.010	µg/L	<0.010	---	<0.010	---	<0.010	---		
Dibenz(a,h)anthracene	W-SPIGMS04	0.010	µg/L	<0.010	---	<0.010	---	<0.010	---		
Sum of 16 PAH (M1)	W-SPIGMS04	0.080	µg/L	<0.080	---	<0.080	---	<0.080	---		
Sum of carcinogenic PAH (M1)	W-SPIGMS04	0.035	µg/L	<0.035	---	<0.035	---	<0.035	---		
Sum of other PAH (M1)	W-SPIGMS04	0.045	µg/L	<0.045	---	<0.045	---	<0.045	---		
Sum of PAH L (M1)	W-SPIGMS04	0.0150	µg/L	<0.0150	---	<0.0150	---	<0.0150	---		
Sum of PAH M (M1)	W-SPIGMS04	0.0250	µg/L	<0.0250	---	<0.0250	---	<0.0250	---		
Sum of PAH H (M1)	W-SPIGMS04	0.040	µg/L	<0.040	---	<0.040	---	<0.040	---		
PCBs											



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Parameter	Method	LOR	Unit	Result	MU	Result	MU	Result	MU		
PCBs - Continued											
PCB 28	W-PCBECD01	0.00110	µg/L	<0.00110	---	<0.00110	---	<0.00110	---		
PCB 62	W-PCBECD01	0.00110	µg/L	<0.00110	---	<0.00110	---	<0.00110	---		
PCB 101	W-PCBECD01	0.000750	µg/L	<0.000750	---	<0.000750	---	<0.000750	---		
PCB 118	W-PCBECD01	0.00110	µg/L	<0.00110	---	<0.00110	---	<0.00110	---		
PCB 138	W-PCBECD01	0.00120	µg/L	<0.00120	---	<0.00120	---	<0.00120	---		
PCB 153	W-PCBECD01	0.00110	µg/L	<0.00110	---	<0.00110	---	<0.00110	---		
PCB 180	W-PCBECD01	0.000950	µg/L	<0.000950	---	<0.000950	---	<0.000950	---		
Sum of 6 PCBs	W-PCBECD01	0.00620	µg/L	<0.00620	---	<0.00620	---	<0.00620	---		
Sum of 6 PCBs (M1)	W-PCBECD01	0.00310	µg/L	<0.00310	---	<0.00310	---	<0.00310	---		
Sum of 7 PCBs	W-PCBECD01	0.00730	µg/L	<0.00730	---	<0.00730	---	<0.00730	---		
Sum of 7 PCBs (M1)	W-PCBECD01	0.00365	µg/L	<0.00365	---	<0.00365	---	<0.00365	---		
Petroleum Hydrocarbons											
Alliphates C10-C12	W-SPIGMS04	10	µg/L	<10	---	<10	---	<10	---		
Alliphates C12-C16	W-SPIGMS04	10	µg/L	<10	---	<10	---	<10	---		
Alliphates C16-C35	W-SPIGMS04	10	µg/L	<10	---	<10	---	<10	---		
C10 - C12 Fraction	W-TPHFID01	5.0	µg/L	<5.0	---	<5.0	---	<5.0	---		
C10 - C16 Fraction	W-TPHFID02	10	µg/L	<10	---	<10	---	<10	---		
C10 - C40 Fraction	W-TPHFID02	50	µg/L	<50	---	<50	---	<50	---		
C10 - C40 Fraction	W-TPHFID01	50	µg/L	<50	---	<50	---	<50	---		
C12 - C16 Fraction	W-TPHFID01	5.0	µg/L	<5.0	---	<5.0	---	<5.0	---		
C16 - C22 Fraction	W-TPHFID02	10	µg/L	<10	---	<10	---	<10	---		
C16 - C35 Fraction	W-TPHFID01	30	µg/L	<30	---	<30	---	<30	---		
C22 - C30 Fraction	W-TPHFID02	15	µg/L	<15	---	<15	---	<15	---		
C30 - C40 Fraction	W-TPHFID02	15	µg/L	<15	---	<15	---	<15	---		
C35 - C40 Fraction	W-TPHFID01	10	µg/L	<10	---	<10	---	<10	---		
Sum of Alliphates C10-C35	W-SPIGMS04	30	µg/L	<30	---	<30	---	<30	---		
Sum of Alliphates C10-C35 (M1)	W-SPIGMS04	15	µg/L	<15	---	<15	---	<15	---		
Sum of Alliphates C12-C35 (M1)	W-SPIGMS04	10	µg/L	<10	---	<10	---	<10	---		
Sum of Aromatics C10-C16	W-SPIGMS04	1.55	µg/L	<1.55	---	<1.55	---	<1.55	---		
Sum of Aromatics C10-C16 (M1)	W-SPIGMS04	0.775	µg/L	<0.775	---	<0.775	---	<0.775	---		
Sum of Aromatics C8-C10	W-SPIGMS04	0.60	µg/L	<0.60	---	<0.60	---	<0.60	---		
Sum of Aromatics C8-C10 (M1)	W-SPIGMS04	0.30	µg/L	<0.30	---	<0.30	---	<0.30	---		

If the client does not specify the date and time of sample collection, the laboratory will specify the date on sample delivery in parentheses, instead. If the time of sample collection is specified as 0:00 it means that the client did specify the date but not the time. Measurement uncertainty is expressed as expanded measurement uncertainty with coverage factor k = 2, representing 95% confidence level.

Key: LOR = Limit of reporting; MU = Measurement Uncertainty

The end of result part of the certificate of analysis

Brief Method Summaries

Analytical Methods	Method Descriptions
Location of test performance: Na Harfe 336/9 Prague 9 - Vysocany Czech Republic 190 00	
W-ANI-ENV	CZ_SOP_D06_02_068 (CSN ISO 10304-1, CSN EN 12506) Determination of dissolved fluoride, chloride, nitrite, bromide, nitrate and sulphate by ion liquid chromatography and determination of nitrite nitrogen and nitrate nitrogen and sulfate sulfur by calculation from measured values.
W-COD-SPC	CZ_SOP_D06_02_076 Determination of chemical oxygen demand using dichromate (COD-Cr) by photometry (based on CSN ISO 15705) / CZ_SOP_D06_02_076A / CZ_SOP_D06_07_040 Determination of chemical oxygen demand using dichromate (COD-Cr) by titration (based on CSN ISO 15705).
W-HG-AFSFL	CZ_SOP_D06_02_096 (US EPA 245.7, US EPA 1631, CSN EN ISO 178 52, CSN EN 16192, samples prepared as per CZ_SOP_D06_02_J02 chap. 10.1 and 10.2). Determination of Mercury by Fluorescence Spectrometry. Sample was filtered by microfilter with porosity 0.45 µm followed by nitric acid addition prior to analysis.



Analytical Methods	Method Descriptions
W-METAXFL1	CZ_SOP_D06_02_001 (US EPA 200.7, ISO 11885, CSN EN 12506, US EPA 6010, SM 3120, samples prepared as per CZ_SOP_D06_02_J02 chap. 10.1 and 10.2) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values including the calculation of total mineralization and calculating the sum of Ca+Mg. Sample was filtered by microfilter with porosity 0.45 µm followed by nitric acid addition prior to analysis.
W-NH4-SPC	CZ_SOP_D06_02_019 (CSN EN ISO 11732, CSN EN ISO 13395, CSN EN 16192, CSN EN 12506, SM 4500-NO2(-), SM 4500-NO3(-)) Determination of ammonium, nitrite and the sum of nitrite and nitrate ions by discrete spectrophotometry and determination of nitrite, nitrate, ammonia, inorganic, organic, total nitrogen and free ammonia by calculation from measured values.
W-PCBECD01	CZ_SOP_D06_03_166 (DIN 38407, part 2, US EPA 8082, samples preparation according to CZ_SOP_D06_03_P01 chap. 9.1, CZ_SOP_D06_03_P02 chap. 9.1) Determination of polychlorinated biphenyls - congener analyses by gas chromatography method with ECD detection and calculation of polychlorinated biphenyls sums from measured values
W-SPIGMS04	CZ_SOP_D06_03_157 except chap. 9.3 (SPIMFAB) Determination of organic contaminants by gas chromatography method with MS detection (SPIMFAB) and calculation of organic contaminants sums from measured values
W-TPHFID01	CZ_SOP_D06_03_151 (CSN EN ISO 9377-2) Determination of extractable compounds in the range of hydrocarbons C5 - C50, their fractions calculated from the measured values by gas chromatography method with FID detection
W-TPHFID02	CZ_SOP_D06_03_151 (CSN EN ISO 9377-2, Z1, TNRCC Method 1006) Determination of extractable compounds in the range of hydrocarbons C5 - C50, their fractions calculated from the measured values by gas chromatography method with FID detection
W-TPH-IR	CZ_SOP_D06_02_057 Determination of nonpolar extractive substances by infrared spectrometry (based on CSN 75 7505:2006, CSN 830540-4)
W-VOCGMS01	CZ_SOP_D06_03_155 except chap. 9.2 (US EPA 624, US EPA 8260, EN ISO 10301, MADEP 2004, rev. 1.1) Determination of volatile organic compounds by gas chromatography method with FID and MS detection and calculation of volatile organic compounds sums from measured values
W-VOCGMS05	CZ_SOP_D06_03_155 except chap. 9.2 (US EPA 624, US EPA 8260, EN ISO 10301, MADEP 2004, rev. 1.1) Determination of volatile organic compounds by gas chromatography method with FID and MS detection and calculation of volatile organic compounds sums from measured values
Preparation Methods	Method Descriptions
Location of test performance: Na Harfe 336/9 Prague 9 - Vysocany Czech Republic 190 00	
*W-PPFILTR	Filtration of the sample by glass microfibre filter of porosity 1.2 µm before analysis.

A ** symbol preceding any method indicates non-accredited test. In the case when a procedure belonging to an accredited method was used for non-accredited matrix, would apply that the reported results are non-accredited. Please refer to General Comment section on front page for information.

The calculation methods of summation parameters are available on request in the client service.

CERTIFICATE OF ANALYSIS

Work Order	: PR1460567	Issue Date	: 03-NOV-2014
Client	: IDAD - Instituto do Ambiente e Desenvolvimento	Laboratory	: ALS Czech Republic, s.r.o.
Contact	: Mrs. Alexandra Passos Silva	Contact	: Client Service
Address	: Campus Universitario Aveiro Portugal 3810-193	Address	: Na Harfe 336/9 Prague 9 - Vysocany Czech Republic 190 00
E-mail	: a.passosilva@ua.pt	E-mail	: customer.support@alsglobal.com
Telephone	: +351 2344 00800	Telephone	: +420 226 226 228
Facsimile	: ----	Facsimile	: +420 284 081 635
Project	: IMA 12 02 13	Page	: 1 of 6
Order number	: ----	Date Samples Received	: 24-OCT-2014
C-O-C number	: ----	Quote number	: PR2014IDAIN-PT0013 (PT-300-14-0230)
Site	: ----	Date of test	: 24-OCT-2014 - 03-NOV-2014
Sampled by	: client	QC Level	: ALS CR Standard Quality Control Schedule

General Comments

This report shall not be reproduced except in full, without prior written approval from the laboratory.
The laboratory declares that the test results relate only to the listed samples.

Responsible for accuracy

Signatories
Zdenek Jirak



Position
Environmental Business Unit
Manager

Testing Laboratory
Accredited by CAI





Analytical Results

Sub-Matrix: GROUNDWATER		Client sample ID		790.14		---		---	
		Laboratory sample ID		PR1460567001		---		---	
		Client sampling date / time		06-OCT-2014 00:00		---		---	
Parameter	Method	LOR	Unit	Result	MU	---	---	---	---
Nonmetallic Inorganic Parameters									
Ammonia and ammonium ions	W-NH4-SPC	0.050	mg/L	<0.050	---	---	---	---	---
Chemical Oxygen Demand (COD-Cr)	W-COD-SPC	5.0	mg/L	60.0	±15.8 %	---	---	---	---
Ammonia as N	W-NH4-SPC	0.040	mg/L	<0.040	---	---	---	---	---
Chloride	W-ANI-ENV	0.500	mg/L	33.2	±15.0 %	---	---	---	---
Nitrates	W-ANI-ENV	0.040	mg/L	0.079	±15.0 %	---	---	---	---
Nitrites	W-ANI-ENV	0.040	mg/L	<0.040	---	---	---	---	---
Sulphate as SO4 2-	W-ANI-ENV	0.500	mg/L	7.08	±15.0 %	---	---	---	---
Dissolved Metals / Major Cations									
Arsenic	W-METAXFL1	0.0050	mg/L	<0.0050	---	---	---	---	---
Cadmium	W-METAXFL1	0.00040	mg/L	<0.00040	---	---	---	---	---
Lead	W-METAXFL1	0.0050	mg/L	<0.0050	---	---	---	---	---
Mercury	W-HG-AFSFL	0.010	µg/L	<0.010	---	---	---	---	---
Petroleum Hydrocarbons - FTIR									
Total Petroleum Hydrocarbons	W-TPH-IR	0.050	mg/L	<0.050	---	---	---	---	---
BTEX									
Benzene	W-VOCGMS01	0.20	µg/L	<0.20	---	---	---	---	---
Toluene	W-VOCGMS01	1.00	µg/L	<1.00	---	---	---	---	---
Ethylbenzene	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---	---	---
meta- & para-Xylene	W-VOCGMS01	0.20	µg/L	<0.20	---	---	---	---	---
ortho-Xylene	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---	---	---
Sum of BTEX	W-VOCGMS01	1.60	µg/L	<1.60	---	---	---	---	---
Sum of xylenes	W-VOCGMS01	0.30	µg/L	<0.30	---	---	---	---	---
Sum of TEX	W-VOCGMS01	1.40	µg/L	<1.40	---	---	---	---	---
Halogenated Volatile Organic Compounds									
Dichlorodifluoromethane	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---	---
Vinyl chloride	W-VOCGMS01	1.00	µg/L	<1.00	---	---	---	---	---
Chloromethane	W-VOCGMS05	10	µg/L	<10	---	---	---	---	---
trans-1,2-Dichloroethene	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---	---	---
Bromomethane	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---	---
Dichloromethane	W-VOCGMS01	6.0	µg/L	<6.0	---	---	---	---	---
1,1-Dichloroethene	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---	---	---
Chloroethane	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---	---
cis-1,2-Dichloroethene	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---	---	---
Trichlorofluoromethane	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---	---
1,1-Dichloroethane	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---	---	---
Bromochloromethane	W-VOCGMS05	2.0	µg/L	<2.0	---	---	---	---	---
2,2-Dichloropropane	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---	---
Chloroform	W-VOCGMS01	0.30	µg/L	<0.30	---	---	---	---	---
1,1-Dichloropropylene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---	---
1,2-Dichloroethane	W-VOCGMS01	1.00	µg/L	<1.00	---	---	---	---	---
1,1,1-Trichloroethane	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---	---	---
Dibromomethane	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---	---
cis-1,3-Dichloropropylene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---	---
Tetrachloromethane	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---	---	---
Bromodichloromethane	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---	---	---
trans-1,3-Dichloropropene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---	---
1,3-Dichloropropane	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---	---
Trichloroethene	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---	---	---
1,1,2-Trichloroethane	W-VOCGMS01	0.20	µg/L	<0.20	---	---	---	---	---
1,2-Dibromoethane (EDB)	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---	---



Sub-Matrix: GROUNDWATER

Client sample ID

790.14

Laboratory sample ID

PR1460567001

Client sampling date / time

06-OCT-2014 00:00

Parameter	Method	LOR	Unit	Result	MU			
Halogenated Volatile Organic Compounds - Continued								
1,2,3-Trichloropropane	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---
Dibromochloromethane	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---	---
Bromobenzene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---
Tetrachloroethene	W-VOCGMS01	0.20	µg/L	<0.20	---	---	---	---
1,1,1,2-Tetrachloroethane	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---	---
2-Chlorotoluene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---
Chlorobenzene	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---	---
4-Chlorotoluene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---
Bromoform	W-VOCGMS01	0.20	µg/L	<0.20	---	---	---	---
1,1,2,2-Tetrachloroethane	W-VOCGMS01	1.0	µg/L	<1.0	---	---	---	---
1,2-Dichlorobenzene	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---	---
1,2-Dibromo-3-chloropropane	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---
1,4-Dichlorobenzene	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---	---
1,3-Dichlorobenzene	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---	---
1,2,4-Trichlorobenzene	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---	---
Hexachlorobutadiene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---
1,2,3-Trichlorobenzene	W-VOCGMS01	0.10	µg/L	<0.10	---	---	---	---
1,3,5-Trichlorobenzene	W-VOCGMS01	0.20	µg/L	<0.20	---	---	---	---
1,2-Dichloropropane	W-VOCGMS01	1.0	µg/L	<1.0	---	---	---	---
Sum of 4 Trihalomethanes	W-VOCGMS01	0.70	µg/L	<0.70	---	---	---	---
Sum of 3 Dichlorobenzenes	W-VOCGMS01	0.30	µg/L	<0.30	---	---	---	---
Sum of 3 Trichlorobenzenes	W-VOCGMS01	0.40	µg/L	<0.40	---	---	---	---
Non-Halogenated Volatile Organic Compounds								
Isopropylbenzene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---
n-Propylbenzene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---
1,2,4-Trimethylbenzene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---
p-Isopropyltoluene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---
1,3,5-Trimethylbenzene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---
Styrene	W-VOCGMS01	0.20	µg/L	<0.20	---	---	---	---
sec-Butylbenzene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---
tert-Butylbenzene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---
n-Butylbenzene	W-VOCGMS05	1.0	µg/L	<1.0	---	---	---	---
Methyl tert-Butyl Ether (MTBE)	W-VOCGMS01	0.20	µg/L	<0.20	---	---	---	---
tert-Butyl alcohol	W-VOCGMS01	5.0	µg/L	<5.0	---	---	---	---
Sum of BTEXS	W-VOCGMS01	1.80	µg/L	<1.80	---	---	---	---
Aromatic Compounds								
1-Ethyl-2-methylbenzene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---	---
1-Ethyl-3-methylbenzene@1-Ethyl-4-methylbenzene	W-SPIGMS04	0.10	µg/L	<0.10	---	---	---	---
1,3,5-Trimethylbenzene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---	---
1,2,4-Trimethylbenzene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---	---
1,2,3-Trimethylbenzene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---	---
1,2@1,4-Diethylbenzene	W-SPIGMS04	0.10	µg/L	<0.10	---	---	---	---
1,3-Diethylbenzene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---	---
1,2,4,5-Tetramethylbenzene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---	---
2-Methylnaphthalene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---	---
1-Methylnaphthalene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---	---
Biphenyl	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---	---
2@1-Ethynaphthalene	W-SPIGMS04	0.10	µg/L	<0.10	---	---	---	---
1,8-Dimethylnaphthalene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---	---
2-Methylantracene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---	---



Sub-Matrix: GROUNDWATER

Client sample ID
 Laboratory sample ID
 Client sampling date / time

790.14	---	---
PR1460567001	---	---
06-OCT-2014 00:00	---	---

Parameter	Method	LOR	Unit	Result	MU	---	---	---
Aromatic Compounds - Continued								
1-Methylantracene@1-Methylphenanthrene	W-SPIGMS04	0.10	µg/L	<0.10	---	---	---	---
2-Methylphenanthrene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---	---
Isopropylbenzene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---	---
1,2-Dimethylnaphthalene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---	---
n-Propylbenzene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---	---
2,6@2,7-Dimethylnaphthalene	W-SPIGMS04	0.10	µg/L	<0.10	---	---	---	---
1,7@1,3@1,6-Dimethylnaphthalene	W-SPIGMS04	0.15	µg/L	<0.15	---	---	---	---
1,4@2,3@1,5-Dimethylnaphthalene	W-SPIGMS04	0.15	µg/L	<0.15	---	---	---	---
1,3,7-Trimethylnaphthalene	W-SPIGMS04	0.05	µg/L	<0.05	---	---	---	---
1,4,6@2,3,6-Trimethylnaphthalene	W-SPIGMS04	0.10	µg/L	<0.10	---	---	---	---
2,3,5@1,2,6-Trimethylnaphthalene	W-SPIGMS04	0.10	µg/L	<0.10	---	---	---	---
1,2,4@2,4,5@1,2,5-Trimethylnaphthalene	W-SPIGMS04	0.15	µg/L	<0.15	---	---	---	---
1,2,3@1,4,5-Trimethylnaphthalene	W-SPIGMS04	0.10	µg/L	<0.10	---	---	---	---
1,4,6,7-Tetramethylnaphthalene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---	---
1,2,5,6-Tetramethylnaphthalene	W-SPIGMS04	0.050	µg/L	<0.050	---	---	---	---
Methylpyrenes@Methylfluoranthenes	W-SPIGMS04	1.0	µg/L	<1.0	---	---	---	---
Methylchrysenes@Methylbenz(a)anthracenes	W-SPIGMS04	1.0	µg/L	<1.0	---	---	---	---
Sum of Aromatics C16-C35	W-SPIGMS04	2.0	µg/L	<2.0	---	---	---	---
Polycyclic Aromatics Hydrocarbons (PAHs)								
Naphthalene	W-SPIGMS04	0.010	µg/L	<0.010	---	---	---	---
Acenaphthylene	W-SPIGMS04	0.010	µg/L	<0.010	---	---	---	---
Acenaphthene	W-SPIGMS04	0.010	µg/L	<0.010	---	---	---	---
Fluorene	W-SPIGMS04	0.010	µg/L	<0.010	---	---	---	---
Phenanthrene	W-SPIGMS04	0.010	µg/L	<0.010	---	---	---	---
Anthracene	W-SPIGMS04	0.010	µg/L	<0.010	---	---	---	---
Fluoranthene	W-SPIGMS04	0.010	µg/L	<0.010	---	---	---	---
Pyrene	W-SPIGMS04	0.010	µg/L	<0.010	---	---	---	---
Benz(a)anthracene	W-SPIGMS04	0.010	µg/L	<0.010	---	---	---	---
Chrysene	W-SPIGMS04	0.010	µg/L	<0.010	---	---	---	---
Benzo(b)fluoranthene	W-SPIGMS04	0.010	µg/L	<0.010	---	---	---	---
Benzo(k)fluoranthene	W-SPIGMS04	0.010	µg/L	<0.010	---	---	---	---
Benzo(a)pyrene	W-SPIGMS04	0.010	µg/L	<0.010	---	---	---	---
Indeno(1,2,3,cd)pyrene	W-SPIGMS04	0.010	µg/L	<0.010	---	---	---	---
Benzo(g,h,i)perylene	W-SPIGMS04	0.010	µg/L	<0.010	---	---	---	---
Dibenz(a,h)anthracene	W-SPIGMS04	0.010	µg/L	<0.010	---	---	---	---
Sum of 16 PAH (M1)	W-SPIGMS04	0.080	µg/L	<0.080	---	---	---	---
PCBs								
PCB 28	W-PCBECD01	0.00110	µg/L	<0.00110	---	---	---	---
PCB 52	W-PCBECD01	0.00110	µg/L	<0.00110	---	---	---	---
PCB 101	W-PCBECD01	0.000750	µg/L	<0.000750	---	---	---	---
PCB 118	W-PCBECD01	0.00110	µg/L	<0.00110	---	---	---	---
PCB 138	W-PCBECD01	0.00120	µg/L	<0.00120	---	---	---	---
PCB 153	W-PCBECD01	0.00110	µg/L	<0.00110	---	---	---	---
PCB 180	W-PCBECD01	0.000950	µg/L	<0.000950	---	---	---	---



Sub-Matrix: GROUNDWATER		Client sample ID		790.14	---	---
		Laboratory sample ID		PR1460567001	---	---
		Client sampling date / time		06-OCT-2014 00:00	---	---
Parameter	Method	LOR	Unit	Result	MU	---
PCBs - Continued						
Sum of 6 PCBs	W-PCBECD01	0.00620	µg/L	<0.00620	---	---
Sum of 7 PCBs	W-PCBECD01	0.00730	µg/L	<0.00730	---	---
Petroleum Hydrocarbons						
Allphates C10-C12	W-SPIGMS04	10	µg/L	<10	---	---
Allphates C16-C35	W-SPIGMS04	10	µg/L	<10	---	---
C10 - C12 Fraction	W-TPHFID01	5.0	µg/L	<5.0	---	---
C10 - C16 Fraction	W-TPHFID02	10	µg/L	<10	---	---
C10 - C40 Fraction	W-TPHFID02	50	µg/L	<50	---	---
C10 - C40 Fraction	W-TPHFID01	50	µg/L	<50	---	---
C12 - C16 Fraction	W-TPHFID01	5.0	µg/L	<5.0	---	---
C16 - C22 Fraction	W-TPHFID02	10	µg/L	<10	---	---
C16 - C35 Fraction	W-TPHFID01	30	µg/L	<30	---	---
C22 - C30 Fraction	W-TPHFID02	15	µg/L	<15	---	---
C30 - C40 Fraction	W-TPHFID02	15	µg/L	<15	---	---
C35 - C40 Fraction	W-TPHFID01	10	µg/L	<10	---	---
Sum of Allphates C10-C35	W-SPIGMS04	30	µg/L	<30	---	---
Sum of Aromatics C10-C16	W-SPIGMS04	1.55	µg/L	<1.55	---	---
Sum of Aromatics C8-C10	W-SPIGMS04	0.60	µg/L	<0.60	---	---

If the client does not specify the date and time of sample collection, the laboratory will specify the date on sample delivery in parentheses, instead. If the time of sample collection is specified as 0:00 it means that the client did specify the date but not the time. Measurement uncertainty is expressed as expanded measurement uncertainty with coverage factor k = 2, representing 95% confidence level.

Key: LOR = Limit of reporting, MU = Measurement Uncertainty

The end of result part of the certificate of analysis

Brief Method Summaries

Analytical Methods	Method Descriptions
<i>Location of test performance: Na Harfe 336/9 Prague 9 - Vysocany Czech Republic 190 00</i>	
W-ANI-ENV	CZ_SOP_D06_02_068 (CSN ISO 10304-1, CSN EN 12506) Determination of dissolved fluoride, chloride, nitrite, bromide, nitrate and sulphate by ion liquid chromatography and determination of nitrite nitrogen and nitrate nitrogen and sulfate sulfur by calculation from measured values.
W-COD-SPC	CZ_SOP_D06_02_076 Determination of chemical oxygen demand using dichromate (COD-Cr) by photometry (based on CSN ISO 15705) / CZ_SOP_D06_02_076A / CZ_SOP_D06_07_040 Determination of chemical oxygen demand using dichromate (COD-Cr) by titration (based on CSN ISO 15705).
W-HG-AFSFL	CZ_SOP_D06_02_096 (US EPA 245.7, US EPA 1631, CSN EN ISO 178 52, CSN EN 16192, samples prepared as per CZ_SOP_D06_02_J02 chap. 10.1 and 10.2.). Determination of Mercury by Fluorescence Spectrometry. Sample was filtered by microfilter with porosity 0.45 µm followed by nitric acid addition prior to analysis.
W-METAXFL1	CZ_SOP_D06_02_001 (US EPA 200.7, ISO 11885, CSN EN 12506, US EPA 6010, SM 3120, samples prepared as per CZ_SOP_D06_02_J02 chap. 10.1 and 10.2) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values including the calculation of total mineralization and calculating the sum of Ca+Mg. Sample was filtered by microfilter with porosity 0.45 µm followed by nitric acid addition prior to analysis.
W-NH4-SPC	CZ_SOP_D06_02_019 (CSN EN ISO 11732, CSN EN ISO 13395, CSN EN 16192, CSN EN 12506, SM 4500-NO2(-), SM 4500-NO3(-)) Determination of ammonium, nitrite and the sum of nitrite and nitrate ions by discrete spectrophotometry and determination of nitrite, nitrate, ammonia, inorganic, organic, total nitrogen and free ammonia by calculation from measured values.
W-PCBECD01	CZ_SOP_D06_03_166 (DIN 38407, part 2, US EPA 8082, samples preparation according to CZ_SOP_D06_03_P01 chap. 9.1, CZ_SOP_D06_03_P02 chap. 9.1) Determination of polychlorinated biphenyls - congener analyses by gas chromatography method with ECD detection and calculation of polychlorinated biphenyls sums from measured values
W-SPIGMS04	CZ_SOP_D06_03_157 except chap. 9.3 (SPIMFAB) Determination of organic contaminants by gas chromatography method with MS detection (SPIMFAB) and calculation of organic contaminants sums from measured values



Analytical Methods	Method Descriptions
W-TPHFID01	CZ_SOP_D06_03_151 (CSN EN ISO 9377-2) Determination of extractable compounds in the range of hydrocarbons C5-C50, their fractions calculated from the measured values by gas chromatography method with FID detection
W-TPHFID02	CZ_SOP_D06_03_151 (CSN EN ISO 9377-2, Z1, TNRCC Method 1006) Determination of extractable compounds in the range of hydrocarbons C5- C50, their fractions calculated from the measured values by gas chromatography method with FID detection
W-TPH-IR	CZ_SOP_D06_02_057 Determination of nonpolar extractive substances by infrared spectrometry (based on CSN 75 7505:2006, CSN 830540-4)
W-VOCGMS01	CZ_SOP_D06_03_155 except chap. 9.2 (US EPA 624,US EPA 8260, EN ISO 10301, MADEP 2004, rev. 1.1) Determination of volatile organic compounds by gas chromatography method with FID and MS detection and calculation of volatile organic compounds sums from measured values
W-VOCGMS05	CZ_SOP_D06_03_155 except chap. 9.2 (US EPA 624,US EPA 8260, EN ISO 10301, MADEP 2004, rev. 1.1) Determination of volatile organic compounds by gas chromatography method with FID and MS detection and calculation of volatile organic compounds sums from measured values

A "*" symbol preceding any method indicates non-accredited test. In the case when a procedure belonging to an accredited method was used for non-accredited matrix, would apply that the reported results are non-accredited. Please refer to General Comment section on front page for information.

The calculation methods of summation parameters are available on request in the client service.