



# Monitorização da Hidrogeologia United Resins

Setembro 2016 a agosto 2017

R176.17-16/06.10

Dezembro 2017



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**Setembro 2016 a agosto 2017**

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

**R176.17–16/06.10**

**Dezembro 2017**

# Ficha técnica

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**Designação do Projeto:** Monitorização da Hidrogeologia  
setembro 2016 – agosto 2017

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

**Nº do Relatório:** R176.17-16/06.10

**Tipo de Documento:** Relatório Final

**Data de Emissão:** 21 de dezembro de 2017

**Validação**



(Alexandra Passos Silva, Eng.º.)

**Aprovação**



(Miguel Coutinho, Doutor)

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## Equipa Técnica

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O presente relatório foi elaborado pela seguinte equipa técnica:

Miguel Coutinho (Doutor em Ciências Aplicadas ao Ambiente, IDAD)

Alexandra Passos Silva (Licenciada em Engenharia do Ambiente, IDAD)

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## 1. Introdução

O regime jurídico de Avaliação de Impacte Ambiental (AIA) encontra-se instituído pelo Decreto-Lei n.º 152-B/2017 de 11 de dezembro que altera o Decreto-Lei n.º 151-B/2013 de 31 de outubro anteriormente alterados pelos Decreto-Lei n.º 47/2014, de 24 de março, Decreto-Lei n.º 179/2015, de 27 de agosto, e pela Lei n.º 37/2017, de 2 de junho.

A Portaria n.º 395/2015 de 4 de novembro regulamenta as normas relativas à apreciação prévia e decisão de sujeição a AIA, à dispensa do procedimento de AIA, à proposta de definição de âmbito, ao modelo de declaração de impacte ambiental e à pós-avaliação. No anexo V da referida portaria é estipulada a estrutura e conteúdo dos relatórios de monitorização e restante documentação associada à pós-avaliação.

O presente Relatório de Monitorização (RM) segue o definido no Anexo V da Portaria n.º 395/2015 de 4 de novembro, 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.

São apresentados os resultados referentes à *monitorização para a hidrogeologia*, compreendendo amostragens realizadas no período de 1 de setembro de 2016 a 31 de agosto de 2017.

### 1.1 Identificação do projeto e da fase do projeto

O presente Relatório de Monitorização refere-se à fase de funcionamento do projeto “Unidade Industrial United Resins – Produção de Resinas, S.A.”.

### 1.2 Identificação e Objetivos da Monitorização

Na sequência da Declaração de Impacte Ambiental (DIA) do projeto “Unidade industrial United Resins – Produção de Resinas, S.A.” e tendo em conta o plano de monitorização definido no Relatório de Conformidade Ambiental do Projeto de Execução (RECAPE) o presente relatório tem como objetivo dar resposta ao plano de monitorização da hidrogeologia, através da 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.

### 1.3 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 setembro de 2016 e agosto de 2017 e os níveis de concentração obtidos para cada parâmetro determinado.

### 1.4 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
Miguel Coutinho	Doutor em Ciências Aplicadas ao Ambiente, IDAD
Alexandra Passos Silva	Licenciada em Engenharia do Ambiente, IDAD

## 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 (IDAD, 2011) 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 Relatório de Conformidade Ambiental do Projeto de Execução (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.

No âmbito do Projeto de Ampliação da Unidade Industrial United Resins – Produção de Resinas, S.A. foram elaborados, até à data, dois (2) Relatórios de Monitorização, com os períodos das campanhas de monitorização a coincidirem com o funcionamento da United Resins.

### 2.2 Medidas adotadas para prevenir ou reduzir os impactes objeto de monitorização

A Unidade Industrial United Resins - Produção de Resinas S.A., tem vindo a proceder a alterações de práticas operacionais com o objetivo principal de evitar que possam ocorrer contaminações. Assim, procedeu às seguintes alterações:

- Análise periódica dos BREF's aplicáveis à atividade por forma a acompanhar o desenvolvimento das MTD's;
- Implementação do programa de Manutenção Preventiva que engloba todos os equipamentos existentes na instalação;
- Operações periódicas de manutenção e limpeza dos sistemas de drenagem;
- Encaminhamento dos resíduos produzidos pela instalação apenas para gestores de resíduos devidamente licenciados.

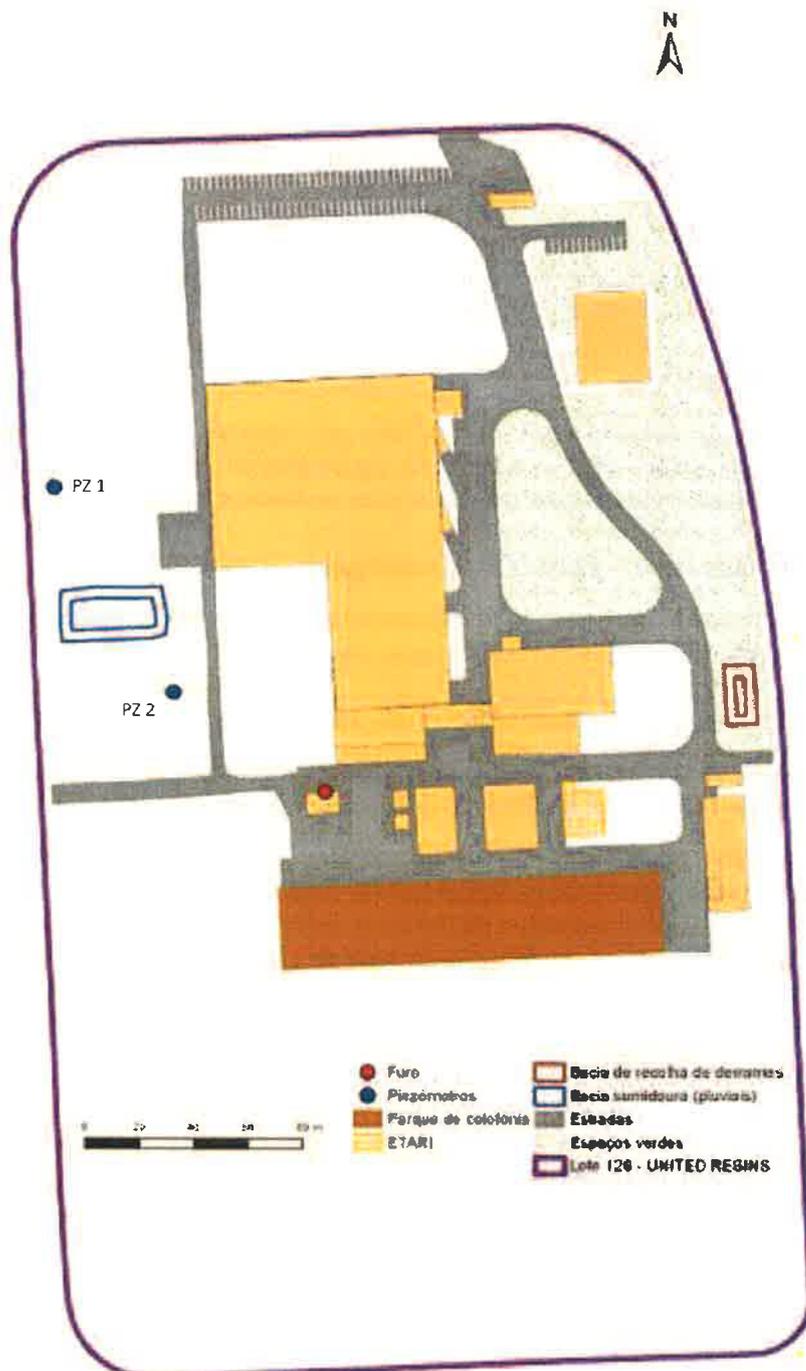
### 2.3 Reclamações relativas ao fator ambiental objeto de monitorização

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 monitorizar

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.



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

### 3.1.1 Quantidade de Água

#### a) Parâmetros a monitorizar

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

### 3.1.2 Qualidade de Água

#### a) Parâmetros a monitorizar

- no campo: pH, temperatura, condutividade elétrica;
- em laboratório (compostos inorgânicos e orgânicos): cloretos (Cl), nitratos (NO<sub>3</sub>), nitritos (NO<sub>2</sub>), sulfatos (SO<sub>4</sub>), mercúrio (Hg), arsénio (As), cádmio (Cd), chumbo (Pb), azoto amoniacal (NH<sub>4</sub>), carência química de oxigénio (CQO), hidrocarbonetos de petróleo e compostos orgânicos.

#### b) 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.

## 3.2 Locais de monitorização

Os pontos de monitorização são o furo de captação de água subterrânea (LRS1), os dois piezómetros (PZ1 e PZ2) e a bacia de águas pluviais, todos eles localizados no perímetro da Unidade Industrial United Resins – Produção de Resinas, S.A. (Figura 3.1).

## 3.3 Período definido para a frequência das amostragens

A frequência de amostragem no furo é semestral (abril e setembro) e bimensal durante os meses mais chuvosos (outubro a abril) na bacia de águas pluviais.

## 3.4 Métodos de amostragem e equipamentos utilizados

A medição do nível freático nos piezómetros é efetuada em condições de repouso, ou seja na ausência de bombagem, e utilizando uma sonda elétrica.

A amostragem nos piezómetros é realizada após bombagem prolongada para renovação da água e observação da estabilização dos seguintes parâmetros: temperatura (T), condutividade elétrica (CE) e pH, medidos numa célula de fluxo em condições de ausência de contacto direto com o ar. A amostragem das amostras de água no furo de captação e na bacia de águas pluviais é do tipo pontual sendo efetuada a leitura da temperatura (T), da condutividade elétrica (CE) e do pH no local e imediatamente após a recolha.

Nos ensaios em campo são utilizados equipamentos de leitura direta cujas características se apresentam no quadro 3.1.

**Quadro 3.1 – Características dos equipamentos de medição utilizados nos ensaios em campo.**

Parâmetro	Equipamento	Gama	Resolução	Exatidão
pH	VWR UM 6100H	0 -14	0,01	±0,01
Temperatura	- pHenomenal 111	-5,0 +105,0 °C	0,1 °C	±0,1 °C
Condutividade elétrica	WTW 197i - TetraCom 325	0...1999 µS/cm	±0,01	±0,5% do valor medido a uma temperatura ambiente 0°C a 35°C
		0,00 ... 19,99 mS/cm	0,01	
		0,0 ... 199,0 mS/cm	0,1	
		0 ... 500 mS/cm	1	
Nível hidrostático	Sonda de Nível	--	0,1 cm	--

As amostras de água recolhidas são preservadas no local e imediatamente transferidas para o laboratório do IDAD, e, posteriormente, enviadas para o ALS Group (<http://alsglobal.pt/servico-ao-cliente/order-forms>) para determinação de CQO, aniões, azoto amoniacal, metais, hidrocarbonetos de petróleo e compostos orgânicos.

No Quadro 3.2 são apresentados os métodos de ensaio e expressão dos resultados associados às determinações realizadas. Em anexo, nos Relatórios de Ensaio, são apresentados os limites de quantificação e incerteza associados a cada um dos métodos de ensaio.

**Quadro 3.2 – Métodos de ensaio e expressão dos resultados associadas à medição.**

Parâmetro	Método	Expressão dos resultados
pH	Potenciometria	Escala de Sorensen
Temperatura	Eletrometria	°C
Condutividade elétrica	Potenciometria	µS/cm
Nível hidrostático	Manual	m
CQO	Espectrofotometria	mg/L O <sub>2</sub>
NH <sub>4</sub>		mg/L NH <sub>4</sub>
As	Espectrometria de massa com indução de plasma	µg/L As
Hg		µg/L Hg
Cd		µg/L Cd
Pb		µg/L Pb
NO <sub>3</sub>		mg/L NO <sub>3</sub>
NO <sub>2</sub>	Cromatografia Iónica	mg/L NO <sub>2</sub>
Cl <sup>-</sup>		mg/L Cl
SO <sub>4</sub>		mg/L SO <sub>4</sub>
Hidrocarbonetos de Petróleo	Espectrofotometria	µg/L
Compostos Orgânicos	Cromatografia Gasosa	µg/L

### 3.5 Indicadores de atividade do projeto e relação com os resultados da monitorização

Não foram identificados indicadores de atividade do projeto com relação direta com os resultados da monitorização ao nível da quantidade e qualidade da água subterrânea no furo de captação (LRS1) e nos dois piezómetros (PZ1 e PZ2) no sistema aquífero Leirosa Monte Real e da monitorização da qualidade da água na bacia de águas pluviais.

### 3.6 Método de tratamento dos dados

Foi utilizado como critério 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 a legislação atual de água para abastecimento público é feita pontualmente. No presente caso, assumiram-se como normas de qualidade os valores paramétricos constantes do do Anexo VI (Qualidade da água para consumo humano) do Decreto-Lei n.º 236/1998, de 1 de agosto, uma vez que a água subterrânea no entorno da área de estudo é usada ainda hoje pelas populações locais para irrigação, abastecimento doméstico e pecuário. Relativamente à bacia de águas pluviais são ainda consideradas as normas de qualidade estabelecidas no Anexo XXI (Objetivos ambientais de qualidade mínima para as águas superficiais) do referido Decreto-Lei e no Anexo III (Normas de qualidade ambiental (NQA) para substâncias prioritárias e outros poluentes) do Decreto-Lei nº 103 de 24 de setembro de 2010.

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 piezômetros 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 30 de setembro de 2016, 3 de outubro de 2016, 7 de novembro 2016, 12 de dezembro 2016, 17 de janeiro 2017, 21 de fevereiro 2017, 6 de março 2017 e 19 de abril 2017, procedeu-se ao tratamento dos dados.

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.

Os resultados obtidos e correspondentes a este relatório de monitorização são apresentados sob a forma de tabelas (Quadros 4.2 e 4.3).

Em anexo, apresentam-se, ainda 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 do IDAD e 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 Ensaios	
		Laboratório do IDAD	Laboratório da ALS
Furo de captação	741.16	R166.16-16/06.10	PR1677013
	283.17	R167.17-16/06.10	PR1711756
Piezómetro PZ1	739.16	R166.16-16/06.10	PR1677013
	284.17	R167.17-16/06.10	PR1711756
Piezómetro PZ2	740.17	R166.16-16/06.10	PR1677013
	285.17	R167.17-16/06.10	PR1711756
Bacia de águas pluviais	749.16	R167.16-16/06.10	PR1677009
	848.16	R191.16-16/06.10	PR1690800
	963.16	R07.17-16/06.10	PR16A2692
	63.17	R45.17-16/06.10	PR17P1878
	157.17	R81.17-17/06.10	PR17Q3309
	181.17	R104.17-16/06.10	PR1703690

### 4.2 Avaliação dos resultados obtidos face aos critérios definidos

#### 4.2.1 Quantidade de água

A evolução do nível freático entre abril de 2017 e setembro de 2016 revela um rebaixamento de 0,58 m no piezómetro PZ1 e de 0,22 m no piezómetro PZ2. 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.

Salienta-se que tal como nos períodos de monitorização anterior apenas se procedeu à medição do nível freático nos piezómetros por o furo de captação se encontrar selado.

#### 4.2.2 Qualidade da 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 PZ1 e PZ2

Determinações Analíticas	Unidade	PZ1		PZ2		Furo	
		30set16	19abr17	30set16	19abr17	30set16	19abr17
		739,16	284,17	740,16	285,17	741,16	283,17
Condutividade**	µS/cm	286	619	478	282	765	767
pH	---	8,4	7,3	7,7	8,1	7,7	7,3
Temperatura**	°C	19	20	20	18	18	19
NHE**	m	4,42	3,82	3,43	3,21	---	---
Cloretos*	mg/L Cl <sup>-</sup>	20,8	2,7	27,9	35,3	82,8	69,3
CQO*	mg/L O <sub>2</sub>	20,0	100	24,0	28,0	<5,0	19,0
Nitratos*	mg/L NO <sub>3</sub>	0,043	0,279	51,0	23,7	0,168	0,542
Nitritos*	mg/L NO <sub>2</sub>	<0,040	0,040	0,092	<0,040	<0,040	<0,040
Sulfatos*	mg/L SO <sub>4</sub>	13,5	2,70	54,8	35,5	5,18	4,98
Azoto Amoniacal*	mg/L NH <sub>4</sub>	0,184	0,156	<0,050	0,101	3,60	2,79
Mercúrio*	µg/L Hg	0,023	0,032	0,020	0,057	<0,010	<0,010
Hidrocarbonetos policíclicos aromáticos (PAH)							
Fluoreno*	µg/L	<0,01	0,010	<0,01	<0,01	<0,01	<0,01

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, os valores de **pH** da água subterrânea são sempre alcalinos (>7,0) e apresentam uma ligeira variação entre setembro de 2016 e abril de 2017. Mas enquanto no piezómetro PZ2, o valor de pH sobe de 7,7 para 8,1, no piezómetro 1 e no furo de captação os valores de pH baixam ligeiramente (de 8,4 para 7,3 no piezómetro PZ1 e de 7,7 para 7,3 no furo de captação).

Os valores de **temperatura** da água subterrânea observados nos piezómetros variam de 1 a 2°C entre setembro de 2016 e abril de 2017 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, 286 e 619 µS/cm no piezómetro PZ1 e entre 478 e 282 µS/cm no piezómetro PZ2, entre as campanhas de setembro de 2016 e abril de 2017, enquanto se verifica uma estabilidade de valores (765 e 767 µS/cm) no furo de captação.

Os valores de **cloreto** da água subterrânea observados em um dos três pontos de monitorização diminuem entre a campanha de setembro e de abril de 20,8 para 2,7 mg/l no piezómetro PZ1 e de 82,8 para 69,3 mg/L no furo de captação. No piezómetro PZ2 verifica-se um aumento de 27,9 para 35,3 mg/L.

Os valores de **sulfato** continuam a apresentar variações espaciais e temporais bastante significativas mas concordantes com as observações feitas nos anos anteriores. O valor mais elevado de teor em sulfato foi novamente observado no piezómetro PZ2 (54,8 mg/l) no mês de setembro.

Os valores de **nitrato** da água subterrânea observados no furo e no piezómetro PZ1 são ainda bastante baixos (<1 mg/l) apresentando uma variação pouco significativa entre setembro e abril, mas no caso do piezómetro PZ2 já apresenta valores relativamente mais elevados (51,0 e 23,7 mg/l em setembro e abril, respetivamente) 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 quantificação.

Os valores de **azoto amoniacal** da água subterrânea observados nos três pontos de monitorização são valores muito baixos, na maioria dos casos próximos ao limite de quantificação, tendo sido os valores

mais elevados determinados no furo de captação (3,60 e 2,79 mg/L em setembro e abril respectivamente).

Efetuada a comparação dos valores de azoto amoniacal com os valores de qualidade estabelecidos no Anexo VI do Decreto Lei nº 236/98 verifica-se que os valores determinados em setembro e abril no furo de captação ultrapassaram quer o Valor Máximo Recomendado (VMR) quer o Valor Máximo Admissível (VMA) de 0,05 e 0,5 mg/L NH<sub>4</sub> respectivamente. Relativamente aos piezómetros PZ1 e PZ2 e também em setembro e abril, verificou-se o incumprimento do VMR

Os valores de **arsénio, cádmio e chumbo** da água subterrânea observados nos três pontos de monitorização são em todas as amostras analisadas inferiores ao limite de quantificação.

As amostras de água recolhidas nos piezómetros PZ1 e PZ2 apresentam valores baixos de **mercúrio** e próximos do limite de quantificação (valor máximo determinado foi de 0,057 µg/L no PZ2 em abril). No furo de captação os valores de mercúrio determinados foram não quantificados.

Os valores da **carência química de oxigénio (CQO)** da água subterrânea observados nos três pontos de monitorização são quantificados em todas as amostras analisadas com exceção da amostra de água recolhida em setembro no furo de captação. O valor mais elevado (de 100 mg/L) foi determinado no piezómetro PZ1 em abril.

Os valores do total de **hidrocarbonetos aromáticos** da água subterrânea observados nos três pontos de monitorização são inferiores ao limite de quantificação, com exceção do valor residual de 0,010 µg/L de Fluoreno determinado no piezómetro PZ1 em abril.

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

#### 4.2.2.2 Bacia de 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					
		3out16	7nov16	12dez16	17jan17	21fev17	6 mar 17
Condutividade**	µS/cm	749.16	848.16	963.16	63.17	157.17	181.17
pH	—	7,4	7,0	7,0	7,3	7,5	7,3
Temperatura**	°C	15	14	13	13	11	16
Cloretos*	mg/L Cl <sup>-</sup>	78,9	26,9	7,17	16,6	38,5	63,5
CQO*	mg/L O <sub>2</sub>	66,0	85,0	187	60,0	129	153
Nitratos*	mg/L NO <sub>3</sub>	0,068	0,655	0,170	0,220	<0,040	0,230
Sulfatos*	mg/L SO <sub>4</sub>	22,9	4,42	3,94	16,4	4,18	6,27
Azoto Amoniacal*	mg/L NH <sub>4</sub>	0,105	0,205	<0,050	<0,050	0,066	0,049
Mercúrio*	µg/L Hg	<0,010	<0,010	<0,010	0,036	<0,010	<0,010
TPH*	mg/L	<0,050	0,126	<0,050	<0,050	<0,050	0,052
Compostos orgânicos Voláteis							
Somatório BTEX*	µg/L	<1,60	<1,60	<1,60	<1,60	<1,60	4,83
Somatório Xilenos*	µg/L	<0,30	<0,30	<0,30	<0,30	<0,30	1,37
Somatório TEX*	µg/L	<1,40	<1,40	<1,40	<1,40	<1,40	4,83
Compostos Orgânicos Voláteis não halogenados							
Somatório BTEX*	µg/L	<1,80	<1,80	<1,80	<1,80	<1,80	6,14
Hidrocarbonetos policíclicos aromáticos							
Naftaleno*	µg/L	<0,010	0,046	0,044	0,045	0,116	3,29
Acenafileno*	µg/L	<0,010	0,026	<0,010	<0,010	<0,010	<0,010
Fluoreno*	µg/L	<0,01	<0,01	<0,01	<0,01	<0,01	0,015
Antraceno*	µg/L	<0,010	0,038	<0,010	<0,010	<0,010	0,683
Fenantreno*	µg/L	<0,010	0,019	<0,010	0,011	0,024	0,037
Pireno*	µg/L	<0,010	0,014	<0,010	<0,010	<0,010	<0,010

Determinações Analíticas	Unidade	Bacia de águas pluviais					
		3out16	7nov16	12dez16	17jan17	21fev17	6 mar 17
Criseno*	µg/L	749.16	848.16	963.16	63.17	157.17	181.17
Hidrocarbonetos de Petróleo		<0,010	0,010	<0,010	<0,010	<0,010	<0,010
Somatório alifáticos C10-C35*	µg/L	<30	44	<30	<30	<30	69
Somatório Aromáticos C8-C10*	µg/L	<0,60	<0,60	<0,60	<0,60	<0,60	3,38

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  
TPH – Hidrocarbonetos de Petróleo Totais

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 7,0 e 7,5. Os valores mais altos observam-se em geral nos meses de outubro e 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 138 e 314 µS/cm, com exceção do valor de 598 µS/cm determinado no mês de setembro.

Os valores de **cloretos** variam entre 7,17 e 78,9 mg/l, voltando a apresentar neste período de monitorização, tal como na primeira campanha, variações importantes (ao contrário do que se tinha observado no período anterior (novembro de 2013 a outubro de 2014). As variações verificadas seguem a tendência da condutividade eléctrica e estarão relacionadas com a quantidade e frequência dos eventos de precipitação.

Os valores de **sulfatos** (variam entre 3,94 e 22,9 mg/l) são relativamente baixos e sem impacto para o aquífero.

Os valores de **nitratos** são muito baixos nunca excedendo o valor de 0,220 mg/l.

Os valores de **nitritos, arsénio, cádmio e chumbo** são inferiores ao limite de quantificação dos métodos de ensaio.

Os valores de **Azoto Amoniacal** determinado nas amostras recolhidas em outubro, novembro e fevereiro ultrapassaram o VMR estabelecido no anexo VI do Decreto Lei nº 236/98.

Os valores de **mercúrio** determinados são inferiores ao limite de quantificação com exceção do valor de 0,036 µg/L determinado em janeiro.

Os valores da **carência química de oxigénio (CQO)** observados nas águas pluviais variam entre 60 e 189 mg/l. O valor mais elevado foi observado em dezembro.

Nos meses de novembro e de março foi identificada a presença, ainda que com concentrações baixas, de **hidrocarbonetos de petróleo** nas amostras de água recolhidas. As restantes amostras de água analisadas apresentaram valores não quantificados.

Os valores do total de **hidrocarbonetos aromáticos** nas águas pluviais são na sua maioria inferiores ao limite de quantificação, excetuando a presença de naftaleno identificada em todas as amostras recolhidas, com exceção da amostra correspondente a outubro. Foi ainda observada a presença de acenaftileno (novembro), fluoreno (março), antraceno (novembro e março), fenantreno (novembro, fevereiro e março), pireno e criseno (novembro).

Os valores do total de **compostos orgânicos aromáticos** nas águas pluviais são inferiores ao limite de quantificação, com exceção do somatório de BTEX (6,14 µg/L) observado na amostra recolhida em março.

Verificou-se ainda a ultrapassagem do valor de 2,4 ug/L referente à Noma de Qualidade estabelecida no Anexo III do Decreto-Lei nº 103/2010, para o **naftaleno**, na amostra de água recolhida em março.

### 4.3 Avaliação da eficácia das medidas adotadas para evitar, reduzir ou compensar os impactos objeto de monitorização

Da análise detalhada dos resultados neste terceiro 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, SO<sub>4</sub>) ou valores dos parâmetros de monitorização (pH, CE) que são concordantes nos três anos de monitorização. No entanto, estas tendências não são possíveis de caracterizar espacialmente podendo mesmo ser antagónicas de ponto para ponto de monitorização.

### 4.4 Comparação com as previsões efetuadas no EIA

O aquífero Leirosa – Monte Real apresenta, 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 do 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 (IDAD, 2011) realizado, verificou-se ainda que as águas subterrâneas apresentam:

- condutividade elétrica moderada (710 µS/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<sub>3</sub>). 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 µg/l), o bário (12 µg/l) e o mercúrio (0,059 µg/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 µg/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 impactos 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.

Os resultados da campanha de monitorização realizada entre setembro de 2016 e agosto de 2017 permitem verificar pontualmente e em concentrações vestigiais, a ultrapassagem dos valores estimados no EIA para os nitratos, nas águas subterrâneas e, para os hidrocarbonetos derivados de petróleo, hidrocarbonetos policíclicos aromáticos e compostos orgânicos voláteis, nas águas pluviais.

#### **4.5 Avaliação da eficácia dos métodos de amostragem**

Os métodos de amostragem revelam-se adequados face ao objetivo do programa de monitorização.

#### **4.6 Comparação com o histórico de resultados**

Em anexo efetua-se a representação gráfica do histórico de resultados obtidos nas três campanhas de monitorização (de novembro de 2012 a outubro de 2013, de novembro de 2013 a outubro de 2014 e de setembro 2016 a agosto de 2017) realizadas nos quatro pontos de amostragem: piezómetros (PZ1 e PZ2), furo de captação (páginas 75 a 78) e bacia de águas pluviais (páginas 78 a 83).

Os gráficos relativos aos dados de monitorização correspondem à evolução temporal de pH, temperatura (T), condutividade elétrica (CE), profundidade do nível freático (NHE), cloretos (Cl), nitratos ( $\text{NO}_3$ ), nitritos ( $\text{NO}_2$ ), sulfatos ( $\text{SO}_4$ ), mercúrio (Hg), arsénio (As), cádmio (Cd), azoto amoniacal ( $\text{NH}_4$ ) e carência química de oxigénio (CQO).

A análise dos resultados obtidos nas três campanhas de monitorização efetuadas permite verificar que as concentrações determinadas nos parâmetros monitorizados continuam a apresentar variabilidade na distribuição espacial e por vezes temporal de alguns parâmetros. Verifica-se ainda o acréscimo das concentrações dos parâmetros CQO e de algumas substâncias individualizadas dos grupos de hidrocarbonetos de petróleo e de compostos orgânicos na bacia de águas pluviais, eventualmente arrastadas pelo sistema de rede de drenagem em períodos de maior precipitação.

## 5. Conclusões

### 5.1 Síntese da avaliação dos impactos e eficácia das medidas adotadas

Neste terceiro 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 seis amostragens. Haverá que continuar a acompanhar a evolução dos valores de todos estes parâmetros 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) encontram-se em teores com concentração abaixo do limite de quantificação e os compostos orgânicos (hidrocarbonetos de petróleo e compostos orgânicos aromáticos) foram observados pontualmente, principalmente nos meses de novembro e março, sem que constituam um risco para a massa de água subterrânea por infiltração direta.

### 5.2 Proposta de novas medidas

Face aos resultados obtidos no período considerado no presente relatório, não é apresentada proposta de adoção de novas medidas.

### 5.3 Proposta de revisão do programa de monitorização e da periodicidade dos relatórios

Considera-se adequada a estratégia definida no presente programa de monitorização bem como a periodicidade estabelecida para os relatórios de monitorização.

## 6. Bibliografia

IDAD, 2011. Unidade industrial da UNITED RESINS Fabrico de Produtos Derivados da Colofónia. Projecto de Execução. Estudo de Impacte Ambiental. IMA 42.11-10/06.05

IDAD, 2013. Plano de Monitorização para a Hidrogeologia – United Resins. Novembro de 2012 a outubro de 2013. IMA 46.13-12/02.13.

IDAD, 2014. Plano de Monitorização para a Hidrogeologia – United Resins. Novembro de 2013 a outubro de 2014. IMA 64.14-12/02.13.

## 7. Anexos

### Relatórios de Ensaio (pág. 16 a 74)

- R166.16-16/06.10
- PR1677013
- R166.16-16/06.10
- PR1677009
- R191.16-16/06.10
- PR1690800
- R07.17-16/06.10
- PR16A2692
- R45.17-16/06.10
- PR17P1878
- R81.17-17/06.10
- PR17Q3309
- R104.17-16/06.10
- PR1703690
- R167.17-16/06.10
- PR1711756

### Gráficos temporais (pág. 75 a 83)

- pH
- temperatura (T)
- condutividade eléctrica (CE)
- profundidade do nível freático (NHE)
- cloretos (Cl)
- nitratos (NO<sub>3</sub>)
- nitritos (NO<sub>2</sub>)
- sulfatos (SO<sub>4</sub>)
- mercúrio (Hg)
- arsénio (As)
- cádmio (Cd)
- azoto amoniacal (NH<sub>4</sub>)
- carência química de oxigénio (CQO)

**Relatório de Ensaios**  
**R166.16-16/06.10**

**Requisitante:** United Resins

**Descrição amostra:** Água doce subterrânea

**Receção da amostra:** 30-09-2016

**Início ensaios:** 30-09-2016

**Conclusão ensaios:** 02-10-2016

**Emissão dos resultados:** 28-10-2016

**Amostragem:** A amostragem pontual foi realizada pelo IDAD.  
 A determinação do pH e da condutividade foi realizada no local de amostragem.  
 A amostragem realizada não se encontra no âmbito da Acreditação do Laboratório.

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

Ensaio	Piezómetro PZ1 Amostra 739.16	Piezómetro PZ2 Amostra 740.16	Furo Amostra 741.16	Método analítico/Técnica Analítica
Nível freático (m)*	4,42	3,43	-----	-----
pH	8,4 (19 °C)	7,7 (20 °C)	7,7 (18 °C)	MILI 13, ed3rev2 de 20dez2013
Condutividade (µS/cm)*	286 (19 °C)	478 (20 °C)	765 (18 °C)	Potenciometria

**Abreviaturas:**

- MILI Método Interno do Laboratório do IDAD
- LQ Limite de Quantificação
- ICP-OES Espectrofotometria de emissão ótica com indução de plasma

**Anexo:** Certificate of Analysis PR1677013 – ALS Group.

**Validação**



(Alexandra Passos Silva, Eng<sup>a</sup>.)  
 Gestor de Área

**Aprovação**



(Miguel Coutinho, Doutor)  
 Secretário Geral

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### CERTIFICATE OF ANALYSIS

<b>Work Order</b>	: <b>PR1677013</b>	<b>Issue Date</b>	: 21-OCT-2016
<b>Client</b>	: <b>IDAD - Instituto do Ambiente e Desenvolvimento</b>	<b>Laboratory</b>	: ALS Czech Republic, s.r.o.
<b>Contact</b>	: Mrs. Alexandra Passos Silva	<b>Contact</b>	: Client Service
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<b>Project</b>	: 16 06 10	<b>Page</b>	: 1 of 6
<b>Order number</b>	: ---	<b>Date Samples Received</b>	: 11-OCT-2016
<b>C-O-C number</b>	: ---	<b>Quote number</b>	: PR2016IDAIN-PT0017 (PT-300-16-0590)
<b>Site</b>	: ---	<b>Date of test</b>	: 11-OCT-2016 - 21-OCT-2016
<b>Sampled by</b>	: client	<b>QC Level</b>	: 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.  
 Should a sample contain sediment it is decanted prior to volatile compounds determination.

**Responsible for accuracy**

**Signatures**  
 Zdenek Jirak



**Position**  
 Environmental Business Unit  
 Manager

**Testing Laboratory Accredited by CAI according to CEN EN ISO/IEC 17025:2005**



Issue Date : 21-OCT-2016  
 Page : 2 of 6  
 Work Order : PR1677013  
 Client : IDAD - Instituto do Ambiente e Desenvolvimento



### Analytical Results

Sub-Matrix: GROUNDWATER				Client sample ID		739.16		740.16		741.16	
				Laboratory sample ID		PR1677013001		PR1677013002		PR1677013003	
				Client sampling date / time		30-SEP-2016 15:00		30-SEP-2016 15:00		30-SEP-2016 15:00	
Parameter	Method	LOR	Unit	Result	MU	Result	MU	Result	MU		
<b>Nonmetallic Inorganic Parameters</b>											
Ammonia and ammonium ions as N	W-NH4-SPC	0.040	mg/L	0.143	±15.0 %	<0.040	---	2.80	±15.0 %		
Ammonia and ammonium ions as NH4	W-NH4-SPC	0.050	mg/L	0.184	±15.0 %	<0.050	---	3.60	±15.0 %		
Bromide	W-ANI-ENV	0.050	mg/L	<0.050	---	0.077	±20.0 %	0.468	±20.0 %		
Chemical Oxygen Demand (COD-Cr)	W-COD-SPC	5.0	mg/L	20.0	±17.5 %	24.0	±17.1 %	<5.0	---		
Chloride	W-ANI-ENV	0.500	mg/L	20.8	±15.0 %	27.9	±15.0 %	82.8	±15.0 %		
Fluoride	W-ANI-ENV	0.020	mg/L	0.111	±15.0 %	0.039	±15.0 %	0.114	±15.0 %		
Nitrates	W-ANI-ENV	0.040	mg/L	0.043	±15.0 %	51.0	±15.0 %	0.168	±15.0 %		
Nitrites	W-ANI-ENV	0.040	mg/L	<0.040	---	0.092	±25.0 %	<0.040	---		
Sulphate as SO4 2-	W-ANI-ENV	0.500	mg/L	13.5	±15.0 %	54.8	±15.0 %	5.18	±15.0 %		
Nitrate as N	W-ANI-ENV	0.010	mg/L	<0.010	---	11.5	±15.0 %	0.038	±15.0 %		
Nitrite as N	W-ANI-ENV	0.010	mg/L	<0.010	---	0.028	±25.0 %	<0.010	---		
<b>Dissolved Metals / Major Cations</b>											
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	0.023	±10.0 %	0.020	±10.0 %	<0.010	---		

Sub-Matrix: GROUNDWATER				Client sample ID		739.16		740.16		741.16	
				Laboratory sample ID		PR1677013004		PR1677013005		PR1677013005	
				Client sampling date / time		30-SEP-2016 00:00		30-SEP-2016 00:00		30-SEP-2016 00:00	
Parameter	Method	LOR	Unit	Result	MU	Result	MU	Result	MU		
<b>Petroleum Hydrocarbons - FTIR</b>											
Total Petroleum Hydrocarbons	W-TPH-JR	0.050	mg/L	<0.050	---	<0.050	---	<0.050	---		
<b>BTEX</b>											
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	---		
<b>Halogenated Volatile Organic Compounds</b>											
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	---		

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 Client : IDAD - Instituto do Ambiente e Desenvolvimento



Parameter	Method	LCR	Unit	Client sample ID		739.16		740.16		741.16	
				Laboratory sample ID		PR1677013004		PR1677013005		PR1677013006	
				Client sampling date / time		30-SEP-2016 00:00		30-SEP-2016 00:00		30-SEP-2016 00:00	
				Result	MU	Result	MU	Result	MU		
<b>Halogenated Volatile Organic Compounds - Continued</b>											
cis-1,3-Dichloropropene	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	---		
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	---		
1,1,2,2-Tetrachloroethane	W-VOCGMS01	1.00	µg/L	<1.00	---	<1.00	---	<1.00	---		
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	---		
<b>Non-Halogenated Volatile Organic Compounds</b>											
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	---		
<b>Aromatic Compounds</b>											
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	---		

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Sub-Matrix: GROUNDWATER

Parameter	Method	LOR	Unit	Client sample ID		739.16		740.16		741.16	
				Laboratory sample ID		PR1677013004		PR1677013005		PR1677013006	
				Client sampling date / time		30-SEP-2016 00:00		30-SEP-2016 00:00		30-SEP-2016 00:00	
Parameter	Method	LOR	Unit	Result	MU	Result	MU	Result	MU		
<b>Aromatic Compounds - Continued</b>											
1,8-Dimethylnaphthalene	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@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@1,5-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	---		
<b>Polycyclic Aromatic Hydrocarbons (PAHs)</b>											
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	---		
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	---		
<b>PCBs</b>											
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	---		
Sum of 7 PCBs	W-PCBECD01	0.00730	µg/L	<0.00730	---	<0.00730	---	<0.00730	---		
<b>Petroleum Hydrocarbons</b>											

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Sub-Matrix: GROUNDWATER				Client sample ID			739.16			740.16			741.16		
				Laboratory sample ID			PR1677013004			PR1677013005			PR1677013006		
				Client sampling date / time			30-SEP-2016 00:00			30-SEP-2016 00:00			30-SEP-2016 00:00		
Parameter	Method	LOR	Unit	Result	MU	Result	MU	Result	MU						
<b>Petroleum Hydrocarbons - Continued</b>															
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	<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 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 and time of sample collection in parentheses. If the date of sample collection is specified as 00:00 means that the client did not specify the date and time of the test. Measurement uncertainty is expressed as expanded measurement uncertainty with coverage factor  $k=2$  representing 95% confidence level.  
 LOR = 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 Harte 336/9 Prague 9 - Vysocany Czech Republic 190 00	
W-ANI-ENV	CZ_SOP_D06_02_068 (CSN ISO 10304-1, CSN EN 16192) 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_076 A / CZ_SOP_D06_07_040 Determination of chemical oxygen demand using dichromate (COD-Cr) by titration (based on CSN ISO 6060, CSN ISO 15705)
W-HG-AFSFL	CZ_SOP_D06_02_096 (US EPA 245.7, US EPA 1631, CSN EN ISO 17852, CSN EN 16192, samples prepared as per CZ_SOP_D06_02_002 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 16192, US EPA 6010, SM 3120, samples prepared as per CZ_SOP_D06_02_002 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, SM 4500-NO2(-), SM 4500-NO3(-)) Determination of sum of ammonium and ammonium ions, nitrite and the sum of nitrite and nitrate ions by discrete spectrophotometry and determination of nitrite, nitrate, ammonia, inorganic, organic, total nitrogen, free ammonia and dissociated ammonium ions by calculation from measured values including the calculation of total mineralization.
W-PCBEC01	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 (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-C40, 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) Determination of extractable compounds in the range of hydrocarbons C5-C40, 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 extractable substances by infrared spectrometry and determination of polar extractable substances by calculation from measured values (based on CSN 75 7505:2006, STN 830540-4.)

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 Client : IDAD - Instituto do Ambiente e Desenvolvimento



Analytical Methods	Method Descriptions
W-VOCGMS01	CZ_SOP_D06_03_155 except chap 9.2 (US EPA 824, US EPA 8260, US EPA 8015, 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 824, US EPA 8260, US EPA 8015, 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.

**Relatório de Ensaíos**  
**R167.16-16/06.10**

**Requisitante:** United Resins

**Descrição amostra:** Água pluvial

**Receção da amostra:** 03.10-2016  
**Início ensaios:** 03.10-2016  
**Conclusão ensaios:** 21-10-2016  
**Emissão dos resultados:** 31-10-2016

**Amostragem:** A amostragem pontual foi realizada pelo IDAD.  
 A determinação do pH e da condutividade foi realizada no local de amostragem.  
 A amostragem realizada não se encontra no âmbito da Acreditação do Laboratório.

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

Ensaio	Bacia Sumidouira Amostra 749.16	Método analítico/Técnica Analítica
pH	7,4 (15 °C)	MILI 13, ed3rev2 de 20dez2013
Condutividade (µS/cm)*	598 (15 °C)	Potenciometria

**Abreviaturas:**

MILI Método Interno do Laboratório do IDAD  
 LQ Limite de Quantificação  
 ICP-OES Espectrofotometria de emissão ótica com indução de plasma

**Anexo:** Certificate of Analysis PR1677009 – ALS Group.

**Validação**



(Alexandra Passos Silva, Eng<sup>o</sup>.)  
 Gestor de Área

**Aprovação**



(Miguel Coutinho, Doutor)  
 Secretário Geral

Proibida a reprodução parcial deste relatório sem autorização do IDAD.  
 Os resultados dos ensaios referem-se exclusivamente aos itens ensaiados.  
 Laboratório do IDAD possui Acreditação IPAC nº L0313 e Anexo Técnico de Acreditação nº L0313-1, ed.17 de 22.12.2015 disponível em  
<http://www.ipac.pt/docs/ig/>, com o código SM70-ORX3-85AZ-8111



**CERTIFICATE OF ANALYSIS**

Work Order	: PR1677009	Issue Date	: 21-OCT-2016
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 3610-193	Address	: Na Harfe 336/9 Prague 9 - Vysočany Czech Republic 190 00
E-mail	: a.pessossilva@ua.pt	E-mail	: customer.support@alsglobal.com
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Facsimile	: ---	Facsimile	: +420 284 051 635
Project	: 16 06 10	Page	: 1 of 6
Order number	: ---	Date Samples Received	: 11-OCT-2016
C-O-C number	: ---	Quote number	: PR2016IDAIN-PT0017 (PT-300-16-0590)
Site	: ---	Date of test	: 12-OCT-2016 - 21-OCT-2016
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.  
Should a sample contain sediment it is decanted prior to volatile compounds determination.

**Responsible for accuracy**

Signature  
Zdenek Jirak

Position  
Environmental Business Unit  
Manager

Testing Laboratory Accredited by CAI  
according to CSN EN ISO/IEC 17025:2005



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### Analytical Results

Sub Matrix: GROUNDWATER

Client sample ID : 749.16  
 Laboratory sample ID : PR1677009001  
 Client sampling date / time : 03-OCT-2016 00:00

749.16	749.16	749.16
PR1677009001	PR1677009002	PR1677009002
03-OCT-2016 00:00	03-OCT-2016 00:00	03-OCT-2016 00:00

Parameter	Method	LCR	Unit	Result	MU	Result	MU
<b>Nonmetallic Inorganic Parameters</b>							
Ammonia and ammonium ions as N	W-NH4-SPC	0.040	mg/L	0.105	±15.0 %		
Ammonia and ammonium ions as NH4	W-NH4-SPC	0.050	mg/L	0.136	±15.0 %		
Bromide	W-ANI-ENV	0.050	mg/L	0.225	±20.0 %		
Chemical Oxygen Demand (COD-Cr)	W-COD-SPC	5.0	mg/L	66.0	±15.6 %		
Chloride	W-ANI-ENV	0.500	mg/L	78.9	±15.0 %		
Fluoride	W-ANI-ENV	0.020	mg/L	0.118	±15.0 %		
Nitrates	W-ANI-ENV	0.040	mg/L	0.068	±15.0 %		
Nitrites	W-ANI-ENV	0.040	mg/L	<0.040			
Sulphate as SO4 2-	W-ANI-ENV	0.500	mg/L	22.9	±15.0 %		
Nitrate as N	W-ANI-ENV	0.010	mg/L	0.015	±15.0 %		
Nitrite as N	W-ANI-ENV	0.010	mg/L	<0.010			
<b>Dissolved Metals / Major Cations</b>							
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			
<b>Petroleum Hydrocarbons - FTIR</b>							
Total Petroleum Hydrocarbons	W-TPH-IR	0.050	mg/L			<0.050	
<b>BTEX</b>							
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	
<b>Halogenated Volatile Organic Compounds</b>							
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-Dichloropropene	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	

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 Client : IDAD - Instituto do Ambiente e Desenvolvimento



Parameter	Method	LOR	Unit	Client sample ID		749.16		749.16	
				Laboratory sample ID		PR1677009001		PR1677009002	
				Client sampling date / time		03-OCT-2016 00:00		03-OCT-2016 09:00	
				Result	MU	Result	MU		
<b>Halogenated Volatile Organic Compounds - Continued</b>									
1.1.2-Trichloroethane	W-VOCGMS01	0.20	µg/L			<0.20			
1.2-Dibromoethane (EDB)	W-VOCGMS05	1.0	µg/L			<1.0			
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	1.00	µg/L			<1.00			
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			
<b>Non-Halogenated Volatile Organic Compounds</b>									
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			
<b>Aromatic Compounds</b>									
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			
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			

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Work Order : PR1677009  
Client : IDAD - Instituto do Ambiente e Desenvolvimento



Sub Matrix: GROUNDWATER				Client sample ID		749.16		749.16		****	
				Laboratory sample ID		PR1677009001		PR1677009002		****	
				Client sampling date / time		03-OCT-2016 00:00		03-OCT-2016 00:00		****	
Parameter	Method	LQR	Unit	Result	MU	Result	MU	****	****	****	****
<b>Aromatic Compounds - Continued</b>											
1,2-Dimethylnaphthalene	W-SPIGMS04	0.050	µg/L	---	---	<0.050	---	---	---	---	---
n-Propylbenzene	W-SPIGMS04	0.050	µg/L	---	---	<0.050	---	---	---	---	---
2,6-Dimethylnaphthalene	W-SPIGMS04	0.10	µg/L	---	---	<0.10	---	---	---	---	---
1,7-Dimethylnaphthalene	W-SPIGMS04	0.15	µg/L	---	---	<0.15	---	---	---	---	---
1,4-Dimethylnaphthalene	W-SPIGMS04	0.15	µg/L	---	---	<0.15	---	---	---	---	---
1,3,7-Trimethylnaphthalene	W-SPIGMS04	0.05	µg/L	---	---	<0.05	---	---	---	---	---
1,4,6-Dimethylnaphthalene	W-SPIGMS04	0.10	µg/L	---	---	<0.10	---	---	---	---	---
2,3,5-Trimethylnaphthalene	W-SPIGMS04	0.10	µg/L	---	---	<0.10	---	---	---	---	---
1,2,4-Trimethylnaphthalene	W-SPIGMS04	0.15	µg/L	---	---	<0.15	---	---	---	---	---
1,2,3-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	W-SPIGMS04	1.0	µg/L	---	---	<1.0	---	---	---	---	---
Methylchrysenes	W-SPIGMS04	1.0	µg/L	---	---	<1.0	---	---	---	---	---
Sum of Aromatics C16-C35	W-SPIGMS04	2.0	µg/L	---	---	<2.0	---	---	---	---	---
<b>Polycyclic Aromatic Hydrocarbons (PAHs)</b>											
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	---	---	---	---	---
<b>PCBs</b>											
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	---	---	---	---	---
<b>Petroleum Hydrocarbons</b>											
Aliphatics C10-C12	W-SPIGMS04	10	µg/L	---	---	<10	---	---	---	---	---
Aliphatics C12-C18	W-SPIGMS04	10	µg/L	---	---	<10	---	---	---	---	---
Aliphatics 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	---	---	---	---	---

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 Work Order : PR1677009  
 Client : IDAD - Instituto do Ambiente e Desenvolvimento



Parameter	Method	LOR	Unit	Client sample ID		749.16		749.16		---	
				Laboratory sample ID		PR1677009001		PR1677009002		---	
				Client sampling date / time		03-OCT-2016 00:00		03-OCT-2016 09:00		---	
				Result	MU	Result	MU	---	---		
<b>Petroleum Hydrocarbons - Continued</b>											
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 Aliphatics 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 date of sample collection is specified as 00:00 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 Harte 336/9 Prague 9 - Vysocany Czech Republic 190 00</i>	
W-ANI-ENV	CZ_SOP_D06_02_066 (CSN ISO 10304-1, CSN EN 16192) 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_076 A / CZ_SOP_D06_07_040 Determination of chemical oxygen demand using dichromate (COD-Cr) by titration (based on CSN ISO 6989, 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_002 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 16192, US EPA 6010, SM 3120, samples prepared as per CZ_SOP_D06_02_002 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, SM 4500-NO2(-), SM 4500-NO3(-)) Determination of sum of ammonium and ammonium ions, nitrite and the sum of nitrite and nitrate ions by discrete spectrophotometry and determination of nitrite, nitrate, ammonia, inorganic, organic, total nitrogen, free ammonia and dissociated ammonium ions by calculation from measured values including the calculation of total mineralization.
W-PCBECD01	CZ_SOP_D06_03_186 (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 (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-C40, 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) Determination of extractable compounds in the range of hydrocarbons C5-C40, 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 extractable substances by infrared spectrometry and determination of polar extractable substances by calculation from measured values (based on CSN 75 7505:2006 STN 830540-4).
W-VOCGMS01	CZ_SOP_D06_03_155 except chap. 9.2 (US EPA 624, US EPA 8260, US EPA 8015, 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, US EPA 8015, 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.

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Work Order : PR1677009  
Client : IDAD - Instituto do Ambiente e Desenvolvimento



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.

**Relatório de Ensaio**  
**R191.16-16/06.10**

**Requisitante:** United Resins

**Descrição amostra:** Água pluvial

**Receção da amostra:** 07-11-2016

**Início ensaios:** 07-11-2016

**Conclusão ensaios:** 20-11-2016

**Emissão dos resultados:** 30-11-2016

**Amostragem:** A amostragem pontual foi realizada pelo IDAD.  
A determinação do pH e da condutividade foi realizada no local de amostragem.  
A amostragem realizada não se encontra no âmbito da Acreditação do Laboratório.

**Observações:** O ensaio assinado com \* não se encontra no âmbito da Acreditação do Laboratório

Ensaio	Bacia Sumidouira Amostra 248.16	Método analítico/Técnica Analítica
pH	7,0 (14 °C)	MILI 13, ed3rev2 de 20dez2013
Condutividade (µS/cm)*	156,3 (14 °C)	Potenciometria

**Abreviaturas:**

MILJ Método Interno do Laboratório do IDAD

LQ Limite de Quantificação

ICP-OES Espectrofotometria de emissão ótica com indução de plasma

**Anexo:** Certificate of Analysis PR1690800 – ALS Group.

**Validação**



(Alexandre Passos Silva, Eng.º.)  
Gestor de Área

**Aprovação**



(Miguel Coutinho, Doutor)  
Secretário Geral

Proibida a reprodução parcial deste relatório sem autorização do IDAD.  
Os resultados dos ensaios referem-se exclusivamente aos itens ensaiados.  
Laboratório do IDAD possui Acreditação IPAC nº L0313 e Anexo Técnico de Acreditação nº L0313-1, ed.17 de 22.12.2015 disponível em  
<http://www.ipac.pt/docsig/>, com o código SM70-ORX3-85AZ-BH1



## CERTIFICATE OF ANALYSIS

<b>Work Order</b>	<b>PR1690800</b>	<b>Issue Date</b>	<b>29-NOV-2016</b>
<b>Client</b>	<b>IDAD - Instituto do Ambiente e Desenvolvimento</b>	<b>Laboratory</b>	<b>ALS Czech Republic, s.r.o.</b>
<b>Contact</b>	<b>Mrs. Alexandra Passos Silva</b>	<b>Contact</b>	<b>Client Service</b>
<b>Address</b>	<b>Campus Universitario Aveiro Portugal 3810-183</b>	<b>Address</b>	<b>Na Hrabě 336/9 Pragma 9 - Vysocany Czech Republic 190 00</b>
<b>E-mail</b>	<b>a.passosilva@ua.pt</b>	<b>E-mail</b>	<b>customer.support@alsglobal.com</b>
<b>Telephone</b>	<b>+351 2344 00800</b>	<b>Telephone</b>	<b>+420 226 226 226</b>
<b>Facsimile</b>	<b>---</b>	<b>Facsimile</b>	<b>+420 284 081 635</b>
<b>Project</b>	<b>16 06 10</b>	<b>Page</b>	<b>1 of 6</b>
<b>Order number</b>	<b>---</b>	<b>Date Samples Received</b>	<b>18-NOV-2016</b>
<b>C-O-C number</b>	<b>---</b>	<b>Quote number</b>	<b>PR2016IDAIN-PT0017 (PT-300-16-0590)</b>
<b>Site</b>	<b>---</b>	<b>Date of test</b>	<b>18-NOV-2016 - 29-NOV-2016</b>
<b>Sampled by</b>	<b>Client</b>	<b>QC Level</b>	<b>ALS CR Standard Quality Control Schedule</b>

### 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.  
 Should a sample contain sediment it is decanted prior to volatile compounds determination.

### Responsible for accuracy

**Signatories**  
 Zdenek Jirak



**Position**  
 Environmental Business Unit  
 Manager

Testing Laboratory Accredited by CAI  
 according to CSN EN ISO/IEC 17025:2005



Issue Date : 29-NOV-2016  
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 Work Order : PR1690800  
 Client : IDAD - Instituto do Ambiente e Desenvolvimento



### Analytical Results

Sub-Matrix: GROUNDWATER

Client sample ID  
 Laboratory sample ID  
 Client sampling date / time

Parameter	Method	LOR	Unit	848.16		848.16		---
				Result	MU	Result	MU	
				PR1690800001		PR1690800002		
				07-NOV-2016 00:00		07-NOV-2016 00:00		
<b>Nonmetallic Inorganic Parameters</b>								
Ammonia and ammonium ions as N	W-NH4-SPC	0.040	mg/L	0.159	±15.0 %	---	---	---
Ammonia and ammonium ions as NH4	W-NH4-SPC	0.050	mg/L	0.205	±15.0 %	---	---	---
Bromide	W-ANI-ENV	0.050	mg/L	0.062	±20.0 %	---	---	---
Chemical Oxygen Demand (COD-Cr)	W-COD-SPC	5.0	mg/L	85.0	±15.6 %	---	---	---
Chloride	W-ANI-ENV	0.500	mg/L	26.9	±15.0 %	---	---	---
Fluoride	W-ANI-ENV	0.020	mg/L	0.111	±15.0 %	---	---	---
Nitrates	W-ANI-ENV	0.040	mg/L	0.655	±15.0 %	---	---	---
Nitrites	W-ANI-ENV	0.040	mg/L	<0.040		---	---	---
Sulphate as SO4 2-	W-ANI-ENV	0.500	mg/L	4.42	±15.0 %	---	---	---
Nitrate as N	W-ANI-ENV	0.010	mg/L	0.148	±15.0 %	---	---	---
Nitrite as N	W-ANI-ENV	0.010	mg/L	<0.010		---	---	---
<b>Dissolved Metals / Major Cations</b>								
Arsenic	W-METAXFL1	0.0050	mg/L	<0.0050		---	---	---
Cadmium	W-METAXFL1	0.0040	mg/L	0.00093	±10.1 %	---	---	---
Lead	W-METAXFL1	0.0050	mg/L	<0.0050		---	---	---
Mercury	W-HG-AFSFL	0.010	µg/L	0.255	±10.0 %	---	---	---
<b>Petroleum Hydrocarbons - FTIR</b>								
Total Petroleum Hydrocarbons	W-TPH-IR	0.050	mg/L	---	---	0.126	±20.0 %	---
<b>BTEX</b>								
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		---
<b>Halogenated Volatile Organic Compounds</b>								
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-Dichloropropene	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-Dichloropropene	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		---

Issue Date : 29-NOV-2016  
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 Work Order : PR1690800  
 Client : IDAD - Instituto do Ambiente e Desenvolvimento



Sub Matrix: GROUNDWATER

Client sample ID  
 Laboratory sample ID  
 Client sampling date / time

Parameter	Method	LOR	Unit	848.16		848.16		MU	
				Result	MU	Result	MU		
									PR169080001
				07-NOV-2016 00:00		07-NOV-2016 00:00			
<b>Halogenated Volatile Organic Compounds - Continued</b>									
1.1.2-Trichloroethane	W-VOCGMS01	0.20	µg/L			<0.20			
1.2-Dibromoethane (EDB)	W-VOCGMS05	1.0	µg/L			<1.0			
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			
Tetrachloroethane	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	1.00	µg/L			<1.00			
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			
<b>Non-Halogenated Volatile Organic Compounds</b>									
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			
<b>Aromatic Compounds</b>									
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			0.062	1.25		
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			
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			

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Work Order : PR16908000  
Client : IDAD - Instituto do Ambiente e Desenvolvimento



Parameter	Method	LOR	Unit	Client sample ID		Laboratory sample ID		Client sampling date / time	
				848.16	848.16	PR169080001	PR169080002	07-NOV-2016 00:00	07-NOV-2016 00:00
				Result	MU	Result	MU		
<b>Sub-Matrix: GROUNDWATER</b>									
<b>Aromatic Compounds - Continued</b>									
1,2-Dimethylnaphthalene	W-SPIGMS04	0.050	µg/L			<0.050			
n-Propylbenzene	W-SPIGMS04	0.050	µg/L			<0.050			
2,6-Dimethylnaphthalene	W-SPIGMS04	0.10	µg/L			<0.10			
1,7-Dimethylnaphthalene	W-SPIGMS04	0.15	µg/L			<0.15			
1,4-Dimethylnaphthalene	W-SPIGMS04	0.15	µg/L			<0.15			
1,3,7-Trimethylnaphthalene	W-SPIGMS04	0.05	µg/L			<0.05			
1,4,6-Trimethylnaphthalene	W-SPIGMS04	0.10	µg/L			<0.10			
2,3,5-Trimethylnaphthalene	W-SPIGMS04	0.10	µg/L			<0.10			
1,2,4-Trimethylnaphthalene	W-SPIGMS04	0.15	µg/L			<0.15			
1,2,3-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	W-SPIGMS04	1.0	µg/L			<1.0			
Methylchrysenes	W-SPIGMS04	1.0	µg/L			<1.0			
Sum of Aromatics C16-C35	W-SPIGMS04	2.0	µg/L			<2.0			
<b>Polycyclic Aromatics Hydrocarbons (PAHs)</b>									
Naphthalene	W-SPIGMS04	0.010	µg/L			0.046	459.0 %		
Acenaphthylene	W-SPIGMS04	0.010	µg/L			0.028	280.0 %		
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			0.019	190.0 %		
Anthracene	W-SPIGMS04	0.010	µg/L			0.038	380.0 %		
Fluoranthene	W-SPIGMS04	0.010	µg/L			<0.010			
Pyrene	W-SPIGMS04	0.010	µg/L			0.014	140.0 %		
Benzo(a)anthracene	W-SPIGMS04	0.010	µg/L			<0.010			
Chrysene	W-SPIGMS04	0.010	µg/L			0.010	100.0 %		
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			
<b>PCBs</b>									
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			
<b>Petroleum Hydrocarbons</b>									
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			44	440.0 %		
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			

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Parameter	Method	LOR	Unit	Client sample ID		Laboratory sample ID		Result	MU
				848.16	848.16	PR169080001	PR169080002		
				Client sampling date / time		07-NOV-2016 00:00			
<b>Petroleum Hydrocarbons - Continued</b>									
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 Aliphatics C10-C35	W-SPIGMS04	30	µg/L					44	136.9%
Sum of Aromatics C10-C16	W-SPIGMS04	1.55	µg/L					<1.55	
Sum of Aromatics C6-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 of the time of sample collection is specified as (field) 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 16192) 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 including the calculation of total mineralization.
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_076 A / CZ_SOP_D06_07_040 Determination of chemical oxygen demand using dichromate (COD-Cr) by titration (based on CSN ISO 6060, CSN ISO 15705)
W-HG-AFSFL	CZ_SOP_D06_02_098 (US EPA 245.7, US EPA 1631, CSN EN ISO 17852, CSN EN 16192, samples prepared as per CZ_SOP_D06_02_002 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 16192, US EPA 6010, SM 3120, samples prepared as per CZ_SOP_D06_02_002 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, SM 4500-NO2(-), SM 4500-NO3(-)) Determination of sum of ammonium and ammonium ions, nitrite and the sum of nitrite and nitrate ions by discrete spectrophotometry and determination of nitrite, nitrate, ammonia, inorganic, organic, total nitrogen, free ammonia and dissociated ammonium ions by calculation from measured values including the calculation of total mineralization.
W-PCBECD01	CZ_SOP_D06_03_186 (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 (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-C40, 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) Determination of extractable compounds in the range of hydrocarbons C5-C40, 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 extractable substances by infrared spectrometry and determination of polar extractable substances by calculation from measured values (based on CSN 75 7505:2006, STN 830540-4.)
W-VOCGMS01	CZ_SOP_D06_03_155 except chap. 9.2 (US EPA 624, US EPA 8260, US EPA 8015, 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, US EPA 8015, 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

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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.

### Relatório de Ensaios R07.17-16/06.10

**Requisitante:** United Resins

**Descrição amostra:** Água pluvial

**Receção da amostra:** 12-12-2016

**Início ensaios:** 12-12-2016

**Conclusão ensaios:** 30-12-2016

**Emissão dos resultados:** 10-01-2017

**Amostragem:** A amostragem pontual foi realizada pelo IDAD.  
 A determinação do pH e da condutividade foi realizada no local de amostragem.  
 A amostragem realizada não se encontra no âmbito da Acreditação do Laboratório.

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

Ensaio	Bacia Sumidoura Amostra 963.16	Método analítico/Técnica Analítica
pH	7,0 (13 °C)	MILI 13, ed3rev4 de 17mai2016
Condutividade (µS/cm)*	138,4 (13 °C)	Potenciometria

**Abreviaturas:**

MILI Método Interno do Laboratório do IDAD

LQ Limite de Quantificação

ICP-OES Espectrofotometria de emissão ótica com indução de plasma

**Anexo:** Certificate of Analysis PR16A2692 – ALS Group.

**Validação**



(Alexandra Passos Silva, Eng<sup>ª</sup>)  
 Gestor de Área

**Aprovação**



(Miguel Coutinho, Doutor)  
 Secretário Geral

Proibida a reprodução parcial deste relatório sem autorização do IDAD.  
 Os resultados dos ensaios referem-se exclusivamente aos itens ensaiados.  
 Laboratório do IDAD possui Acreditação IPAC nº L0313 e Anexo Técnico de Acreditação nº L0313-1, ed.19 de 22.12.2016 disponível em  
<http://www.ipac.pt/docsig/>, com o código 39DJ-1603-9K0X-US1G



## CERTIFICATE OF ANALYSIS

<b>Work Order</b>	: <b>PR16A2692</b>	<b>Issue Date</b>	: 30-DEC-2016
<b>Client</b>	: <b>IDAD - Instituto do Ambiente e Desenvolvimento</b>	<b>Laboratory</b>	: <b>ALS Czech Republic, s.r.o.</b>
<b>Contact</b>	: <b>Mrs. Alexandra Passos Silva</b>	<b>Contact</b>	: <b>Client Service</b>
<b>Address</b>	: <b>Campus Universitario Aveiro Portugal 3810-193</b>	<b>Address</b>	: <b>Na Harte 336/9 Prague 9 - Vysocany Czech Republic 190 00</b>
<b>E-mail</b>	: <b>a.passeosilva@ua.pt</b>	<b>E-mail</b>	: <b>customer_support@alsglobal.com</b>
<b>Telephone</b>	: <b>+351 2344 00800</b>	<b>Telephone</b>	: <b>+420 226 226 228</b>
<b>Facsimile</b>	: <b>---</b>	<b>Facsimile</b>	: <b>+420 284 081 635</b>
<b>Project</b>	: <b>16 06 10</b>	<b>Page</b>	: <b>1 of 6</b>
<b>Order number</b>	: <b>---</b>	<b>Date Samples Received</b>	: <b>20-DEC-2016</b>
<b>C-O-C number</b>	: <b>---</b>	<b>Quote number</b>	: <b>PR2016IDAIN-PT0017 (PT-300-16-0590)</b>
<b>Site</b>	: <b>---</b>	<b>Date of test</b>	: <b>21-DEC-2016 - 30-DEC-2016</b>
<b>Sampled by</b>	: <b>Client</b>	<b>QC Level</b>	: <b>ALS CR Standard Quality Control Schedule</b>

### 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.  
Should a sample contain sediment it is decanted prior to volatile compounds determination.

### Responsible for accuracy

**Signature**  
Zdenek Jirak



**Position**  
Environmental Business Unit  
Manager

Testing Laboratory Accredited by CAI  
according to CSM EN ISO/IEC 17025:2005



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### Analytical Results

Sub-Matrix: GROUNDWATER				Client sample ID		963.16		963.16	
				Laboratory sample ID		PR16A2692001		PR16A2692002	
				Client sampling date / time		12-DEC-2016 00:00		12-DEC-2016 00:00	
Parameter	Method	LCR	Unit	Result	MU	Result	MU		
<b>Nonmetallic Inorganic Parameters</b>									
Ammonia and ammonium ions as N	W-NH4-SPC	0.040	mg/L	<0.040					
Ammonia and ammonium ions as NH4	W-NH4-SPC	0.050	mg/L	<0.050					
Bromide	W-ANI-ENV	0.050	mg/L	<0.050					
Chemical Oxygen Demand (COD-Cr)	W-COD-SPC	5.0	mg/L	187	±15.0 %				
Chloride	W-ANI-ENV	0.500	mg/L	7.17	±15.0 %				
Fluoride	W-ANI-ENV	0.020	mg/L	0.271	±15.0 %				
Nitrates	W-ANI-ENV	0.040	mg/L	0.170	±15.0 %				
Nitrites	W-ANI-ENV	0.040	mg/L	<0.040					
Sulphate as SO4 2-	W-ANI-ENV	0.500	mg/L	3.94	±15.0 %				
Nitrate as N	W-ANI-ENV	0.010	mg/L	0.038	±15.0 %				
Nitrite as N	W-ANI-ENV	0.010	mg/L	<0.010					
<b>Dissolved Metals / Major Cations</b>									
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					
<b>Petroleum Hydrocarbons - FTIR</b>									
Total Petroleum Hydrocarbons	W-TPH-IR	0.050	mg/L			<0.050			
<b>BTEX</b>									
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			
<b>Halogenated Volatile Organic Compounds</b>									
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-Dichloropropene	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-Dichloropropene	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			

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Parameter	Method	LOR	Unit	Client sample ID		Client sampling date / time	
				963.16	963.16	963.16	963.16
				PR16A2692001	PR16A2692002	12-DEC-2016 00:00	12-DEC-2016 00:00
<b>Sub-Matrix: GROUNDWATER</b>							
<b>Halogenated Volatile Organic Compounds - Continued</b>							
1.1.2-Trichloroethane	W-VOCGMS01	0.20	µg/L			<0.20	
1.2-Dibromoethane (EDB)	W-VOCGMS05	1.0	µg/L			<1.0	
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	1.00	µg/L			<1.00	
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	
<b>Non-Halogenated Volatile Organic Compounds</b>							
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	
<b>Aromatic Compounds</b>							
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-Ethylnaphthalene	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	
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	

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Parameter	Method	LOR	Unit	963.16		963.16		MU	MU
				Client sample ID		Client sample ID			
				Laboratory sample ID		Laboratory sample ID			
				PR16A2692001	PR16A2692002	12-DEC-2016 00:00	12-DEC-2016 00:00		
				Client sampling date / time	Client sampling date / time				
Parameter	Method	LOR	Unit	Result	MU	Result	MU	MU	MU
<b>Aromatic Compounds - Continued</b>									
1,2-Dimethylnaphthalene	W-SPIGMS04	0.050	µg/L			<0.050			
n-Propylbenzene	W-SPIGMS04	0.050	µg/L			<0.050			
2,6-Dimethylnaphthalene	W-SPIGMS04	0.10	µg/L			<0.10			
1,7-Dimethylnaphthalene	W-SPIGMS04	0.15	µg/L			<0.15			
1,4-Dimethylnaphthalene	W-SPIGMS04	0.15	µg/L			<0.15			
1,3,7-Trimethylnaphthalene	W-SPIGMS04	0.05	µg/L			<0.05			
1,4,6-Trimethylnaphthalene	W-SPIGMS04	0.10	µg/L			<0.10			
2,3,5-Trimethylnaphthalene	W-SPIGMS04	0.10	µg/L			<0.10			
1,2,4,5-Tetramethylnaphthalene	W-SPIGMS04	0.15	µg/L			<0.15			
1,2,3,6-Tetramethylnaphthalene	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	W-SPIGMS04	1.0	µg/L			<1.0			
Methylchrysones	W-SPIGMS04	1.0	µg/L			<1.0			
Sum of Aromatics C16-C35	W-SPIGMS04	2.0	µg/L			<2.0			
<b>Polycyclic Aromatics Hydrocarbons (PAHs)</b>									
Naphthalene	W-SPIGMS04	0.010	µg/L			0.044	430.0%		
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			
Benzo(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			
Dibenzo(a,h)anthracene	W-SPIGMS04	0.010	µg/L			<0.010			
<b>PCBs</b>									
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			
<b>Petroleum Hydrocarbons</b>									
Aliphatics C10-C12	W-SPIGMS04	10	µg/L			<10			
Aliphatics C12-C16	W-SPIGMS04	10	µg/L			<10			
Aliphatics C16-C35	W-SPIGMS04	10	µg/L			20	430.0%		
C10 - C12 Fraction	W-TPHFID01	5.0	µg/L			<5.0			
C10 - C16 Fraction	W-TPHFID02	10	µg/L			<10			
C10 - C40 Fraction	W-TPHFID01	50	µg/L			<50			

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Sub-Matrix: GROUNDWATER				Client sample ID		963.16		963.16		---	
				Laboratory sample ID		PR16A2692001		PR16A2692002		---	
				Client sampling date / time		12-DEC-2016 00:00		12-DEC-2016 00:00		---	
Parameter	Method	LOR	Unit	Result	MU	Result	MU	---	---	---	---
<b>Petroleum Hydrocarbons - Continued</b>											
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 date of sample collection is specified as 0:00 it means that the client did specify the date but not the time. Measurement uncertainty is increased 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 Harte 336/9 Prague 9 - Vysocany Czech Republic 190 00</i>	
W-ANI-ENV	CZ_SOP_D06_02_066 (CSN ISO 10304-1, CSN EN 16192) 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 including the calculation of total mineralization.
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_076 A / CZ_SOP_D06_07_040 Determination of chemical oxygen demand using dichromate (COD-Cr) by titration (based on CSN ISO 6060, CSN ISO 15705).
W-HG-AFSFL	CZ_SOP_D06_02_096 (US EPA 245.7, US EPA 1631, CSN EN ISO 17852, CSN EN 16192, samples prepared as per CZ_SOP_D06_02_002 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 16192, US EPA 6010, SM 3120, samples prepared as per CZ_SOP_D06_02_002 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, SM 4500-NO2(-), SM 4500-NO3(-)) Determination of sum of ammonium and ammonium ions, nitrite and the sum of nitrite and nitrate ions by discrete spectrophotometry and determination of nitrite, nitrate, ammonia, inorganic, organic total nitrogen, free ammonia and dissociated ammonium ions by calculation from measured values including the calculation of total mineralization.
W-PCBECD01	CZ_SOP_D06_03_186 (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 (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-C40, 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) Determination of extractable compounds in the range of hydrocarbons C5-C40, 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 extractable substances by infrared spectrometry and determination of polar extractable substances by calculation from measured values (based on CSN 75 7505/2006, STN 830540-4).
W-VOCGMS01	CZ_SOP_D06_03_155 except chap. 9.2 (US EPA 624, US EPA 8260, US EPA 8015, 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, US EPA 8015, 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.

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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.

**Relatório de Ensaios**  
**R45.17-16/06.10**

**Requisitante:** United Resins  
Parque Industrial e Empresarial da Figueira da Foz  
Praça das Oliveiras, Lote 126  
3090-380 Figueira da Foz

**Descrição amostra:** Água pluvial

**Receção da amostra:** 17-01-2017  
**Início ensaios:** 17-01-2017  
**Conclusão ensaios:** 02-02-2017  
**Emissão dos resultados:** 02-02-2017

**Amostragem:** A amostragem pontual foi realizada pelo IDAD.  
A determinação do pH e da condutividade foi realizada no local de amostragem.  
A amostragem realizada não se encontra no âmbito da Acreditação do Laboratório.

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

Ensaio	Bacia Sumidouira Amostra 63.17	Método analítico/Técnica Analítica
pH	7,3 (13 °C)	MILI 13, ed3rev4
Condutividade (µS/cm)*	145,1 (13 °C)	Potenciometria

**Abreviaturas:**

MILI Método Interno do Laboratório do IDAD  
LQ Limite de Quantificação

**Anexo:** Certificate of Analysis PR17P1878 – ALS Group.

**Validação**



(Alexandra Passos Silva, Eng<sup>a</sup>.)  
Gestor de Área

**Aprovação**



(Miguel Coutinho, Doutor)  
Secretário Geral



### CERTIFICATE OF ANALYSIS

<b>Work Order</b>	<b>PR17P1878</b>	<b>Issue Date</b>	02-FEB-2017
<b>Client</b>	<b>IDAD - Instituto do Ambiente e Desenvolvimento</b>	<b>Laboratory</b>	ALS Czech Republic, s.r.o.
<b>Contact</b>	Mrs. Alexandra Passos Silva	<b>Contact</b>	Client Service
<b>Address</b>	Campus Universitario Aveiro Portugal 3810-193	<b>Address</b>	Na Hrade 336/9 Pragua 9 - Vysočany Czech Republic 190 00
<b>E-mail</b>	a.passosilva@us.pt	<b>E-mail</b>	customer.support@alsglobal.com
<b>Telephone</b>	+351 2344 00800	<b>Telephone</b>	+420 226 226 228
<b>Facsimile</b>	---	<b>Facsimile</b>	+420 264 081 635
<b>Project</b>	16 06 10	<b>Page</b>	1 of 6
<b>Order number</b>	---	<b>Date Samples Received</b>	24-JAN-2017
<b>C-O-C number</b>	---	<b>Quote number</b>	PR2016IDAIN-PT0017 (PT-300-16-0590)
<b>Site</b>	---	<b>Date of test</b>	24-JAN-2017 - 02-FEB-2017
<b>Sampled by</b>	client	<b>QC Level</b>	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 PR17P1878/002, method W-PCBECD01 - the limit of quantification was increased due to matrix interference  
 Should a sample contain sediment it is decanted prior to volatile compounds determination.

**Responsible for accuracy**

**Signature**  
Zdenek Jirak



**Position**  
Environmental Business Unit  
Manager

Testing Laboratory Accredited by CAI  
according to CSM EN ISO/IEC 17025:2005



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### Analytical Results

Sub-Matrix: GROUNDWATER

Client sample ID  
 Laboratory sample ID  
 Client sampling date / time

Parameter	Method	LOR	Unit	63.17		63.17		MU	MU
				PR17P1878001	PR17P1878002	PR17P1878001	PR17P1878002		
				[24-JAN-2017]	24-JAN-2017 06:00				
<b>Nonmetallic Inorganic Parameters</b>									
Ammonia and ammonium ions as N	W-NH4-SPC	0.040	mg/L	<0.040					
Ammonia and ammonium ions as NH4	W-NH4-SPC	0.050	mg/L	<0.050					
Bromide	W-ANI-ENV	0.050	mg/L	<0.050					
Chemical Oxygen Demand (COD-Cr)	W-COD-SPC	5.0	mg/L	60.0	±15.6 %				
Chloride	W-ANI-ENV	0.500	mg/L	16.6	±15.0 %				
Fluoride	W-ANI-ENV	0.020	mg/L	0.088	±15.0 %				
Nitrates	W-ANI-ENV	0.040	mg/L	0.220	±15.0 %				
Nitrites	W-ANI-ENV	0.040	mg/L	<0.040					
Sulphate as SO4 2-	W-ANI-ENV	0.500	mg/L	16.4	±15.0 %				
Nitrate as N	W-ANI-ENV	0.010	mg/L	0.050	±15.0 %				
Nitrite as N	W-ANI-ENV	0.010	mg/L	<0.010					
<b>Dissolved Metals / Major Cations</b>									
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	0.036	±10.0 %				
<b>Petroleum Hydrocarbons - FTIR</b>									
Total Petroleum Hydrocarbons	W-TPH-JR	0.050	mg/L			<0.050			
<b>BTEX</b>									
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			
<b>Halogenated Volatile Organic Compounds</b>									
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-Dichloroethane	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-Dichloroethane	W-VOCGMS01	0.10	µg/L			<0.10			
Chloroethane	W-VOCGMS05	1.0	µg/L			<1.0			
cis-1,2-Dichloroethane	W-VOCGMS01	0.10	µg/L			0.12	±49.0 %		
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-Dichloropropene	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-Dichloropropene	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			
Trichloroethane	W-VOCGMS01	0.10	µg/L			<0.10			

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Sub Matrix: GROUNDWATER				Client sample ID		63.17		63.17		.....	
				Laboratory sample ID		PR17P1878001		PR17P1878002		.....	
				Client sampling date / time		[24-JAN-2017]		24-JAN-2017 00:00		.....	
Parameter	Method	LCR	Unit	Result	MU	Result	MU	.....	.....	.....	.....
<b>Halogenated Volatile Organic Compounds - continued</b>											
1,1,2-Trichloroethane	W-VOCGMS01	0.20	µg/L	.....	.....	<0.20	.....	.....	.....	.....	.....
1,2-Dibromoethane (EDB)	W-VOCGMS05	1.0	µg/L	.....	.....	<1.0	.....	.....	.....	.....	.....
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	1.00	µg/L	.....	.....	<1.00	.....	.....	.....	.....	.....
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	.....	.....	.....	.....	.....
<b>Non-Halogenated Volatile Organic Compounds</b>											
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	.....	.....	.....	.....	.....
<b>Aromatic Compounds</b>											
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	.....	.....	.....	.....	.....
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	.....	.....	.....	.....	.....

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 Client : IDAD - Instituto do Ambiente e Desenvolvimento



Sub-Matrix: GROUNDWATER				Client sample ID		63.17		63.17			
				Laboratory sample ID		PR17P1878001		PR17P1878002			
				Client sampling date / time		[24-JAN-2017]		24-JAN-2017 00:00			
Parameter	Method	LOR	Unit	Result	MU	Result	MU				
<b>Aromatic Compounds - Continued</b>											
1,2-Dimethylnaphthalene	W-SPIGMS04	0.050	µg/L			<0.050					
n-Propylbenzene	W-SPIGMS04	0.050	µg/L			<0.050					
2,6-Dimethylnaphthalene	W-SPIGMS04	0.10	µg/L			<0.10					
1,7-Dimethylnaphthalene	W-SPIGMS04	0.15	µg/L			<0.15					
1,4-Dimethylnaphthalene	W-SPIGMS04	0.15	µg/L			<0.15					
1,3,7-Trimethylnaphthalene	W-SPIGMS04	0.05	µg/L			<0.05					
1,4,6-Trimethylnaphthalene	W-SPIGMS04	0.10	µg/L			<0.10					
2,3,5-Trimethylnaphthalene	W-SPIGMS04	0.10	µg/L			<0.10					
1,2,4-Trimethylnaphthalene	W-SPIGMS04	0.15	µg/L			<0.15					
1,2,3-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	W-SPIGMS04	1.0	µg/L			<1.0					
Methylchrysenes	W-SPIGMS04	1.0	µg/L			<1.0					
Sum of Aromatics C16-C35	W-SPIGMS04	2.0	µg/L			<2.0					
<b>Polycyclic Aromatic Hydrocarbons (PAHs)</b>											
Naphthalene	W-SPIGMS04	0.010	µg/L			0.045	±50 %				
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 %				
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					
Benzo(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					
<b>PCBs</b>											
PCB 28	W-PCBECD01	0.00110	µg/L			<0.00220					
PCB 52	W-PCBECD01	0.00110	µg/L			<0.00220					
PCB 101	W-PCBECD01	0.000750	µg/L			<0.00150					
PCB 118	W-PCBECD01	0.00110	µg/L			<0.00220					
PCB 138	W-PCBECD01	0.00120	µg/L			<0.00240					
PCB 153	W-PCBECD01	0.00110	µg/L			<0.00220					
PCB 180	W-PCBECD01	0.000950	µg/L			<0.00190					
Sum of 6 PCBs	W-PCBECD01	0.00620	µg/L			<0.0124					
Sum of 7 PCBs	W-PCBECD01	0.00730	µg/L			<0.0146					
<b>Petroleum Hydrocarbons</b>											
Allphates C10-C12	W-SPIGMS04	10	µg/L			<10					
Allphates C12-C18	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-TPHFID01	50	µg/L			<50					

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 Client : IDAD - Instituto do Ambiente e Desenvolvimento



Sub-Matrix: GROUNDWATER				Client sample ID		63.17		63.17		---	
				Laboratory sample ID		PR17P1878001		PR17P1878002		---	
				Client sampling date / time		[24-JAN-2017]		24-JAN-2017 00:00		---	
Parameter	Method	LOR	Unit	Result	MU	Result	MU	---	---	---	---
<b>Petroleum Hydrocarbons - Continued</b>											
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 Aliphatics 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 and sample delivery in parentheses. Invoiced 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 Harte 338/9 Prague 9 - Vysocany Czech Republic 190 00	
W-ANI-ENV	CZ_SOP_D06_02_068 (CSN ISO 10304-1, CSN EN 16192) 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 including the calculation of total mineralization.
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_076 A / CZ_SOP_D06_07_040 Determination of chemical oxygen demand using dichromate (COD-Cr) by titration (based on CSN ISO 8960, CSN ISO 15705).
W-HG-AFSFL	CZ_SOP_D06_02_096 (US EPA 245.7, US EPA 1631, CSN EN ISO 17852, CSN EN 16192, samples prepared as per CZ_SOP_D06_02_002 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 16192, US EPA 6010, SM 3120, samples prepared as per CZ_SOP_D06_02_002 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, SM 4500-NO2(-), SM 4500-NO3(-)) Determination of sum of ammonium and ammonium ions, nitrite and the sum of nitrite and nitrate ions by discrete spectrophotometry and determination of nitrite, nitrate, ammonia, inorganic, organic, total nitrogen, free ammonia and dissociated ammonium ions by calculation from measured values including the calculation of total mineralization.
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 (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-C40, 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) Determination of extractable compounds in the range of hydrocarbons C5-C40, 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 extractable substances by infrared spectrometry and determination of polar extractable substances by calculation from measured values (based on CSN 75 7505:2006, STN 630540-4.)
W-VOCGMS01	CZ_SOP_D06_03_155 except chap. 9.2 (US EPA 624, US EPA 8260, US EPA 8015, 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, US EPA 8015, 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.

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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.

**Relatório de Ensaios**  
**R81.17-16/06.10**

**Requisitante:** United Resins  
 Parque Industrial e Empresarial da Figueira da Foz  
 Praça das Oliveiras, Lote 126  
 3090-380 Figueira da Foz

**Descrição amostra:** Água pluvial

**Receção da amostra:** 21-02-2017

**Início ensaios:** 21-02-2017

**Conclusão ensaios:** 08-03-2017

**Emissão dos resultados:** 09-03-2017

**Amostragem:** A amostragem pontual foi realizada pelo IDAD.  
 A determinação do pH e da condutividade foi realizada no local de amostragem.  
 A amostragem realizada não se encontra no âmbito da Acreditação do Laboratório.

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

Ensaio	Bacia Sumidoura Amostra 157.17	Método analítico/Técnica Analítica
pH	7,5 (11 °C)	MILI 13, ed3rev4
Condutividade (µS/cm)*	294 (11 °C)	Potenciometria

**Abreviaturas:**

MILI Método Interno do Laboratório do IDAD  
 LQ Limite de Quantificação

**Anexo:** Certificate of Analysis PR17Q3309 – ALS Group.

**Validação**



(Alexandra Passos Silva, Eng.º.)  
 Gestor de Área

**Aprovação**



(Miguel Coutinho, Doutor)  
 Secretário Geral

Proibida a reprodução parcial deste relatório sem autorização do IDAD.  
 Os resultados dos ensaios referem-se exclusivamente aos itens ensaiados.  
 Laboratório do IDAD possui Acreditação IPAC nº LD313 e Anexo Técnico de Acreditação nº L0313-1, ed.19 de 19.01.2017 disponível em  
<http://www.ipac.pt/docs/ig/>, com o código 9DE9-9L2E-618B-W0P8



**CERTIFICATE OF ANALYSIS**

<b>Work Order</b>	<b>PR17Q3309</b>	<b>Issue Date</b>	<b>08-MAR-2017</b>
<b>Client</b>	<b>IDAD - Instituto do Ambiente e Desenvolvimento</b>	<b>Laboratory</b>	<b>ALS Czech Republic, s.r.o.</b>
<b>Contact</b>	<b>Mrs. Alexandra Passos Silva</b>	<b>Contact</b>	<b>Client Service</b>
<b>Address</b>	<b>Campus Universitario Aveiro Portugal 3810-193</b>	<b>Address</b>	<b>Na Harfe 336/9 Prague 9 - Vysocany Czech Republic 190 00</b>
<b>E-mail</b>	<b>a.pessossilva@ua.pt</b>	<b>E-mail</b>	<b>customer.support@alsglobal.com</b>
<b>Telephone</b>	<b>+351 2344 00800</b>	<b>Telephone</b>	<b>+420 226 226 228</b>
<b>Facsimile</b>	<b>---</b>	<b>Facsimile</b>	<b>+420 284 081 835</b>
<b>Project</b>	<b>16 06 10</b>	<b>Page</b>	<b>1 of 6</b>
<b>Order number</b>	<b>---</b>	<b>Date Samples Received</b>	<b>28-FEB-2017</b>
<b>C-O-C number</b>	<b>---</b>	<b>Quote number</b>	<b>PR2016IDAIN-PT0017 (PT-300-16-0590)</b>
<b>Site</b>	<b>---</b>	<b>Date of test</b>	<b>28-FEB-2017 - 08-MAR-2017</b>
<b>Sampled by</b>	<b>Client</b>	<b>QC Level</b>	<b>ALS CR Standard Quality Control Schedule</b>

**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.  
Should a sample contain sediment it is decanted prior to volatile compounds determination.

**Responsible for accuracy**

Testing Laboratory Accredited by CAI according to CSN EN ISO/IEC 17025:2005

**Signature**  
Zdenek Jirak

**Position**  
Environmental Business Unit Manager



L 1163

Issue Date 08-MAR-2017  
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Work Order PR17Q3309  
Client IDAD - Instituto do Ambiente e Desenvolvimento



**Analytical Results**

Sub Matrix: GROUNDWATER

Client sample ID

157.17

157.17

Laboratory sample ID

PR17Q3309001

PR17Q3309002

Client sampling date / time

21-FEB-2017 00:00

21-FEB-2017 00:00

Parameter	Method	LCR	Unit	Result	MU	Result	MU
<b>Nonmetallic Inorganic Parameters</b>							
Ammonia and ammonium ions as N	W-NH4-SPC	0.040	mg/L	0.051	±15.0%		
Ammonia and ammonium ions as NH4	W-NH4-SPC	0.050	mg/L	0.066	±15.0%		
Bromide	W-ANI-ENV	0.050	mg/L	<0.050			
Chemical Oxygen Demand (COD-Cr)	W-COD-SPC	5.0	mg/L	129	±15.4%		
Chloride	W-ANI-ENV	0.500	mg/L	38.5	±15.0%		
Fluoride	W-ANI-ENV	0.020	mg/L	0.051	±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	4.18	±15.0%		
Nitrate as N	W-ANI-ENV	0.010	mg/L	<0.010			
Nitrite as N	W-ANI-ENV	0.010	mg/L	<0.010			
<b>Dissolved Metals / Major Cations</b>							
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			
<b>Petroleum Hydrocarbons - FTIR</b>							
Total Petroleum Hydrocarbons	W-TPH-IR	0.050	mg/L			<0.050	
<b>BTEX</b>							
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	
<b>Halogenated Volatile Organic Compounds</b>							
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-Dichloroethane	W-VOCGMS01	0.10	µg/L			<0.10	
Bromomethane	W-VOCGMS05	1.0	µg/L			<1.0	
Dichloromethane	W-VOCGMS01	5.0	µg/L			<5.0	
1,1-Dichloroethene	W-VOCGMS01	0.10	µg/L			<0.10	
Chloroethane	W-VOCGMS05	1.0	µg/L			<1.0	
cis-1,2-Dichloroethane	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-Dichloropropane	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-Dichloropropene	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	

Issue Date : 08-MAR-2017  
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Work Order : PR17Q3309  
Client : IDAD - Instituto de Ambiente e Desenvolvimento



Sub-Matrix: GROUNDWATER		Client sample ID		157.17	157.17		
		Laboratory sample ID		Filtered			
		Client sampling date / time		PR17Q3309001	PR17Q3309002		
				21-FEB-2017 00:00	21-FEB-2017 00:00		
Parameter	Method	LOR	Unit	Result	MU	Result	MU
<b>Halogenated Volatile Organic Compounds - Continued</b>							
Trichloroethane	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	
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	
Tetrachloroethane	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	1.00	µg/L			<1.00	
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	
<b>Non-Halogenated Volatile Organic Compounds</b>							
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	1.60	µg/L			<1.60	
<b>Aromatic Compounds</b>							
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-Ethylnaphthalene	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	
1-Methylanthracene@1-Methylphenanthrene	W-SPIGMS04	0.10	µg/L			<0.10	

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Client : IDAD - Instituto do Ambiente e Desenvolvimento



Sub-Matrix: GROUNDWATER				Client sample ID		157.17		157.17		---	
				Laboratory sample ID		Filtered					
				Client sampling date / time		PR17Q3309001		PR17Q3309002			
						21-FEB-2017 00:00		21-FEB-2017 00:00			
Parameter	Method	LOR	Unit	Result	MU	Result	MU	---	---	---	---
<b>Aromatic Compounds - Continued</b>											
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-Dimethylnaphthalene	W-SPIGMS04	0.10	µg/L	---	---	<0.10	---	---	---	---	---
1,7-Dimethylnaphthalene	W-SPIGMS04	0.15	µg/L	---	---	<0.15	---	---	---	---	---
1,4-Dimethylnaphthalene	W-SPIGMS04	0.15	µg/L	---	---	<0.15	---	---	---	---	---
1,3,7-Trimethylnaphthalene	W-SPIGMS04	0.05	µg/L	---	---	<0.05	---	---	---	---	---
1,4,6-Trimethylnaphthalene	W-SPIGMS04	0.10	µg/L	---	---	<0.10	---	---	---	---	---
2,3,5-Trimethylnaphthalene	W-SPIGMS04	0.10	µg/L	---	---	<0.10	---	---	---	---	---
1,2,4-Trimethylnaphthalene	W-SPIGMS04	0.15	µg/L	---	---	<0.15	---	---	---	---	---
1,2,3-Trimethylnaphthalene	W-SPIGMS04	0.10	µg/L	---	---	<0.10	---	---	---	---	---
1,4,5,7-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	---	---	---	---	---
<b>Polycyclic Aromatics Hydrocarbons (PAHs)</b>											
Naphthalene	W-SPIGMS04	0.010	µg/L	---	---	0.116	±30.0%	---	---	---	---
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	---	---	0.024	±30.0%	---	---	---	---
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	---	---	---	---	---
Benzo(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	---	---	---	---	---
<b>PCBs</b>											
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 136	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	---	---	---	---	---
<b>Petroleum Hydrocarbons</b>											
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	---	---	17	±30.0%	---	---	---	---

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Sub-Matrix: GROUNDWATER		Client sample ID		157.17	157.17		
		Laboratory sample ID		Filtered			
		Client sampling date / time		PR17Q3309001	PR17Q3309002		
				21-FEB-2017 00:00	21-FEB-2017 00:00		
Parameter	Method	LOR	Unit	Result	MU	Result	MU
<b>Petroleum Hydrocarbons - Continued</b>							
C10 - C12 Fraction	W-TPHFID01	5.0	µg/L			8.1	±30.0 %
C10 - C16 Fraction	W-TPHFID02	10	µg/L			10	±30.0 %
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 Aliphatics 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	0.80	µg/L			<0.80	

If the client does not specify the date and time of sample collection, the laboratory will specify the date and time (displayed in parentheses) nearest to the time of sample collection as specified. A 2.00 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 interval.  
 Neg: 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 - Vysočany Czech Republic 190 00
W-ANI-ENV	CZ_SOP_D06_02_068 (CSN ISO 10304-1, CSN EN 16192) 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 including the calculation of total mineralization.
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_076 A / CZ_SOP_D06_07_040 Determination of chemical oxygen demand using dichromate (COD-Cr) by titration (based on CSN ISO 6060, CSN ISO 15705).
W-HG-AFSFL	CZ_SOP_D06_02_096 (US EPA 245.7, US EPA 1631, CSN EN ISO 17852, CSN EN 16192, samples prepared as per CZ_SOP_D06_02_002 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 16192, US EPA 6010, SM 3120, samples prepared as per CZ_SOP_D06_02_002 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, SM 4500-NO2(-), SM 4500-NO3(-)) Determination of sum of ammonium and ammonium ions, nitrite and the sum of nitrite and nitrate ions by discrete spectrophotometry and determination of nitrite, nitrate, ammonia, inorganic organic total nitrogen, free ammonia and dissociated ammonium ions by calculation from measured values including the calculation of total mineralization.
W-PCBECD01	CZ_SOP_D06_03_166 (DIN 38407, part 2, US EPA 8082, samples prepared as per 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, US EPA 8015, US EPA 3510, TNRCC Method 1006) Determination of extractable compounds in the range of hydrocarbons C5 - C40, 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, US EPA 8015, US EPA 3510, TNRCC Method 1006) Determination of extractable compounds in the range of hydrocarbons C5 - C40, 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 extractable substances by infrared spectrometry and determination of polar extractable substances by calculation from measured values (based on CSN 75 7505:2006, STN 830540-4.)

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Analytical Methods	Method Descriptions
W-VOCGMS01	CZ_SOP_D06_03_155 except chap. 9.2 (US EPA 624, US EPA 8260, US EPA 8015, 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, US EPA 8015, 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.

**Relatório de Ensaios**  
**R104.17-16/06.10**

**Requisitante:** United Resins  
Parque Industrial e Empresarial da Figueira da Foz  
Praça das Oliveiras, Lote 126  
3090-380 Figueira da Foz

**Descrição amostra:** Água pluvial

**Receção da amostra:** 06-03-2017  
**Início ensaios:** 06-03-2017  
**Conclusão ensaios:** 27-03-2017  
**Emissão dos resultados:** 29-03-2017

**Amostragem:** A amostragem pontual foi realizada pelo IDAD.  
A determinação do pH e da condutividade foi realizada no local de amostragem.  
A amostragem realizada não se encontra no âmbito da Acreditação do Laboratório.

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

Ensaio	Bacia Sumidoura Amostra 18L17	Método analítico/Técnica Analítica
pH	7,3 (16 °C)	MILU 13, ed3rev4
Condutividade (µS/cm)*	314 (15 °C)	Potenciometria

**Abreviaturas:**

MILI Método Interno do Laboratório do IDAD

**Anexo:** Certificate of Analysis PR171703690 – ALS Group.

**Validação**



(Alexandra Passos Silva, Eng<sup>l</sup>.)  
Responsável Técnico

**Aprovação**



(Miguel Coutinho, Doutor)  
Secretário Geral

Proibida a reprodução parcial deste relatório sem autorização do IDAD.  
Os resultados dos ensaios referem-se exclusivamente aos itens ensaiados.  
Laboratório do IDAD possui Acreditação IPAC nº I0313 e Anexo Técnico de Acreditação nº I0313-1, ed.19 de 19.01.2017 disponível em <http://www.ipac.pt/docstg/>, com o código 9DE9-9L2E-6188-WOP8



## CERTIFICATE OF ANALYSIS

<b>Work Order</b>	<b>PR1703690</b>	<b>Issue Date</b>	27-Mar-2017
<b>Client</b>	<b>IDAD - Instituto do Ambiente e Desenvolvimento</b>	<b>Laboratory</b>	ALS Czech Republic, s.r.o.
<b>Contact</b>	Mrs. Alexandra Passos Silva	<b>Contact</b>	Client Service
<b>Address</b>	Campus Universitario 3810-193 Aveiro Portugal	<b>Address</b>	Na Hrabě 336/9 Prague 9 - Vysocany 190 00 Czech Republic
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<b>Telephone</b>	+351 2344 00600	<b>Telephone</b>	+420 226 226 228
<b>Facsimile</b>	----	<b>Facsimile</b>	+420 284 081 635
<b>Project</b>	16.06.10	<b>Page</b>	1 of 6
<b>Order number</b>	----	<b>Date Samples Received</b>	17-Mar-2017
<b>C-O-C number</b>	----	<b>Quote number</b>	PR2016IDAIN-PT0017 (PT-300-16-0590)
<b>Site</b>	----	<b>Date of test</b>	19-Mar-2017 - 24-Mar-2017
<b>Sampled by</b>	Client	<b>QC Level</b>	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) PR1703690/001, method W-TPHFID01 - was(were) prepared with repeated clean-up (Florisil 2x2g). The sample contains higher amount of interfering compounds (polar or semi-polar, aromatic compounds).  
 Sample(s) PR1703690/001, method W-TPHFID01 - contain(s) low-boiling hydrocarbons with retention time less than retention time of C10.  
 Should a sample contain sediment it is decanted prior to volatile compounds determination.

### Responsible for accuracy

Signatories  
Zdenek Jirak



Position  
Environmental Business Unit  
Manager

Testing Laboratory Accredited by CAI  
according to CSN EN ISO/IEC 17025:2005



Issue Date : 27-Mar-2017  
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 Client : IDAD - Instituto do Ambiente e Desenvolvimento



### Analytical Results

Sub-Matrix: GROUNDWATER

Client sample ID : 181.17  
 Laboratory sample ID : PR170369G-001  
 Client sampling date / time : 06-Mar-2017 00:00

Parameter	Method	LOR	Unit	Result	MU	Result	MU	Result	MU
<b>Nonmetallic Inorganic Parameters</b>									
Ammonia and ammonium ions as N	W-NH4-SPC	0.04	mg/L	0.049	± 15.0%				
Ammonia and ammonium ions as NH4	W-NH4-SPC	0.05	mg/L	0.063	± 15.0%				
Bromide	W-ANI-ENV	0.05	mg/L	0.666	± 20.0%				
Chemical Oxygen Demand (COD-Cr)	W-COD-SPC	5	mg/L	153	± 15.0%				
Chloride	W-ANI-ENV	0.5	mg/L	63.5	± 15.0%				
Fluoride	W-ANI-ENV	0.02	mg/L	0.386	± 15.0%				
Nitrates	W-ANI-ENV	0.04	mg/L	0.230	± 15.0%				
Nitrites	W-ANI-ENV	0.04	mg/L	<0.040					
Sulphate as SO4 2-	W-ANI-ENV	0.5	mg/L	5.27	± 15.0%				
Nitrate as N	W-ANI-ENV	0.01	mg/L	0.052	± 15.0%				
Nitrite as N	W-ANI-ENV	0.01	mg/L	<0.010					
<b>Dissolved Metals / Major Cations</b>									
Arsenic	W-METAXFL1	0.005	mg/L	<0.0050					
Cadmium	W-METAXFL1	0.0004	mg/L	<0.00040					
Lead	W-METAXFL1	0.005	mg/L	<0.0050					
Mercury	W-HG-AFSFL	0.01	µg/L	<0.010					
<b>Petroleum Hydrocarbons - FTIR</b>									
Total Petroleum Hydrocarbons	W-TPH-IR	0.05	mg/L	0.052	± 20.0%				
<b>BTEX</b>									
Benzene	W-VOCGMS01	0.2	µg/L	<0.20					
Toluene	W-VOCGMS01	1	µg/L	2.13	± 40.0%				
Ethylbenzene	W-VOCGMS01	0.1	µg/L	1.33	± 40.0%				
meta- & para-Xylene	W-VOCGMS01	0.2	µg/L	0.91	± 40.0%				
ortho-Xylene	W-VOCGMS01	0.1	µg/L	0.46	± 40.0%				
Sum of BTEX	W-VOCGMS01	1.6	µg/L	4.83					
Sum of xylenes	W-VOCGMS01	0.3	µg/L	1.37					
Sum of TEX	W-VOCGMS01	1.4	µg/L	4.83					
<b>Halogenated Volatile Organic Compounds</b>									
Dichlorodifluoromethane	W-VOCGMS05	1	µg/L	<1.0					
Vinyl chloride	W-VOCGMS01	1	µg/L	<1.00					
Chloromethane	W-VOCGMS05	10	µg/L	<10					
trans-1,2-Dichloroethane	W-VOCGMS01	0.1	µg/L	<0.10					
Bromomethane	W-VOCGMS05	1	µg/L	<1.0					
Dichloromethane	W-VOCGMS01	6	µg/L	<6.0					
1,1-Dichloroethane	W-VOCGMS01	0.1	µg/L	<0.10					
Chloroethane	W-VOCGMS05	1	µg/L	<1.0					
cis-1,2-Dichloroethane	W-VOCGMS01	0.1	µg/L	<0.10					
Trichlorofluoromethane	W-VOCGMS05	1	µg/L	<1.0					
1,1-Dichloroethane	W-VOCGMS01	0.1	µg/L	<0.10					
Bromochloromethane	W-VOCGMS05	2	µg/L	<2.0					
2,2-Dichloropropane	W-VOCGMS05	1	µg/L	<1.0					
Chloroform	W-VOCGMS01	0.3	µg/L	<0.30					
1,1-Dichloropropene	W-VOCGMS05	1	µg/L	<1.0					
1,2-Dichloroethane	W-VOCGMS01	1	µg/L	<1.00					
1,1,1-Trichloroethane	W-VOCGMS01	0.1	µg/L	<0.10					
Dibromomethane	W-VOCGMS05	1	µg/L	<1.0					
cis-1,3-Dichloropropene	W-VOCGMS05	1	µg/L	<1.0					
Tetrachloromethane	W-VOCGMS01	0.1	µg/L	<0.10					
Bromodichloromethane	W-VOCGMS01	0.1	µg/L	<0.10					
trans-1,3-Dichloropropene	W-VOCGMS05	1	µg/L	<1.0					
1,3-Dichloropropane	W-VOCGMS05	1	µg/L	<1.0					
Trichloroethene	W-VOCGMS01	0.1	µg/L	<0.10					
1,1,2-Trichloroethane	W-VOCGMS01	0.2	µg/L	<0.20					

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Work Order : PR1703690  
Client : IDAD - Instituto do Ambiente e Desenvolvimento



Sub-Matrix: GROUNDWATER

Client sample ID : 181.17  
Laboratory sample ID : PR1703690-001  
Client sampling date / time : 06-Mar-2017 00:00

Parameter	Method	LCR	Unit	Result	MU	Result	MU	Result	MU
<b>Halogenated Volatile Organic Compounds - Continued</b>									
1,2-Dibromoethane (EDB)	W-VOCGMS05	1	µg/L	<1.0	---	---	---	---	---
1,2,3-Trichloropropane	W-VOCGMS05	1	µg/L	<1.0	---	---	---	---	---
Dibromochloromethane	W-VOCGMS01	0.1	µg/L	<0.10	---	---	---	---	---
Bromobenzene	W-VOCGMS05	1	µg/L	<1.0	---	---	---	---	---
Tetrachloroethane	W-VOCGMS01	0.2	µg/L	<0.20	---	---	---	---	---
1,1,1,2-Tetrachloroethane	W-VOCGMS01	0.1	µg/L	<0.10	---	---	---	---	---
2-Chlorotoluene	W-VOCGMS05	1	µg/L	<1.0	---	---	---	---	---
Chlorobenzene	W-VOCGMS01	0.1	µg/L	<0.10	---	---	---	---	---
4-Chlorotoluene	W-VOCGMS05	1	µg/L	<1.0	---	---	---	---	---
Bromoform	W-VOCGMS01	0.2	µg/L	<0.20	---	---	---	---	---
1,1,2,2-Tetrachloroethane	W-VOCGMS01	1	µg/L	<1.00	---	---	---	---	---
1,2-Dichlorobenzene	W-VOCGMS01	0.1	µg/L	<0.10	---	---	---	---	---
1,2-Dibromo-3-chloropropane	W-VOCGMS05	1	µg/L	<1.0	---	---	---	---	---
1,4-Dichlorobenzene	W-VOCGMS01	0.1	µg/L	<0.10	---	---	---	---	---
1,3-Dichlorobenzene	W-VOCGMS01	0.1	µg/L	<0.10	---	---	---	---	---
1,2,4-Trichlorobenzene	W-VOCGMS01	0.1	µg/L	<0.10	---	---	---	---	---
Hexachlorobutadiene	W-VOCGMS05	1	µg/L	<1.0	---	---	---	---	---
1,2,3-Trichlorobenzene	W-VOCGMS01	0.1	µg/L	<0.10	---	---	---	---	---
1,3,5-Trichlorobenzene	W-VOCGMS01	0.2	µg/L	<0.20	---	---	---	---	---
1,2-Dichloropropane	W-VOCGMS01	1	µg/L	<1.0	---	---	---	---	---
Sum of 4 Trihalomethanes	W-VOCGMS01	0.7	µg/L	<0.70	---	---	---	---	---
Sum of 3 Dichlorobenzenes	W-VOCGMS01	0.3	µg/L	<0.30	---	---	---	---	---
Sum of 3 Trichlorobenzenes	W-VOCGMS01	0.4	µg/L	<0.40	---	---	---	---	---
<b>Non-Halogenated Volatile Organic Compounds</b>									
Isopropylbenzene	W-VOCGMS05	1	µg/L	<1.0	---	---	---	---	---
n-Propylbenzene	W-VOCGMS05	1	µg/L	<1.0	---	---	---	---	---
1,2,4-Trimethylbenzene	W-VOCGMS05	1	µg/L	<1.0	---	---	---	---	---
p-Isopropyltoluene	W-VOCGMS05	1	µg/L	3.6	± 40.0%	---	---	---	---
1,3,5-Trimethylbenzene	W-VOCGMS05	1	µg/L	<1.0	---	---	---	---	---
Styrene	W-VOCGMS01	0.2	µg/L	1.31	± 45.0%	---	---	---	---
sec-Butylbenzene	W-VOCGMS05	1	µg/L	<1.0	---	---	---	---	---
tert-Butylbenzene	W-VOCGMS05	1	µg/L	<1.0	---	---	---	---	---
n-Butylbenzene	W-VOCGMS05	1	µg/L	<1.0	---	---	---	---	---
Methyl tert-Butyl Ether (MTBE)	W-VOCGMS01	0.2	µg/L	<0.20	---	---	---	---	---
tert-Butyl alcohol	W-VOCGMS01	5	µg/L	<5.0	---	---	---	---	---
Sum of BTEXS	W-VOCGMS01	1.8	µg/L	6.14	---	---	---	---	---
<b>Aromatic Compounds</b>									
1-Ethyl-2-methylbenzene	W-SPIGMS04	0.05	µg/L	<0.050	---	---	---	---	---
1-Ethyl-3-methylbenzene@1-Ethyl-4-methylbenzene	W-SPIGMS04	0.1	µg/L	1.40	± 35.0%	---	---	---	---
1,3,5-Trimethylbenzene	W-SPIGMS04	0.05	µg/L	0.447	± 33.0%	---	---	---	---
1,2,4-Trimethylbenzene	W-SPIGMS04	0.05	µg/L	0.203	± 35.0%	---	---	---	---
1,2,3-Trimethylbenzene	W-SPIGMS04	0.05	µg/L	0.317	± 35.0%	---	---	---	---
1,2@1,4-Diethylbenzene	W-SPIGMS04	0.1	µg/L	<0.10	---	---	---	---	---
1,3-Diethylbenzene	W-SPIGMS04	0.05	µg/L	<0.050	---	---	---	---	---
1,2,4,5-Tetramethylbenzene	W-SPIGMS04	0.05	µg/L	0.058	± 35.0%	---	---	---	---
2-Methylnaphthalene	W-SPIGMS04	0.05	µg/L	0.132	± 35.0%	---	---	---	---
1-Methylnaphthalene	W-SPIGMS04	0.05	µg/L	0.122	± 39.0%	---	---	---	---
Biphenyl	W-SPIGMS04	0.05	µg/L	0.097	± 33.0%	---	---	---	---
2@1-Ethynaphthalene	W-SPIGMS04	0.1	µg/L	<0.10	---	---	---	---	---
1,8-Dimethylnaphthalene	W-SPIGMS04	0.05	µg/L	<0.050	---	---	---	---	---
2-Methylantracene	W-SPIGMS04	0.05	µg/L	<0.050	---	---	---	---	---
1-Methylantracene@1-Methylphenanthrene	W-SPIGMS04	0.1	µg/L	<0.10	---	---	---	---	---
2-Methylphenanthrene	W-SPIGMS04	0.05	µg/L	<0.050	---	---	---	---	---
Isopropylbenzene	W-SPIGMS04	0.05	µg/L	0.743	± 33.0%	---	---	---	---
1,2-Dimethylnaphthalene	W-SPIGMS04	0.05	µg/L	<0.050	---	---	---	---	---
n-Propylbenzene	W-SPIGMS04	0.05	µg/L	0.208	± 35.0%	---	---	---	---

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 Client : IDAD - Instituto do Ambiente e Desenvolvimento



Sub-Matrix: GROUNDWATER				Client sample ID	181.17	---	---
				Laboratory sample ID	PR1703690-001	---	---
				Client sampling date / time	06-Mar-2017 00:00	---	---
Parameter	Method	LOR	Unit	Result	MU	Result	MU
<b>Aromatic Compounds - Continued</b>							
2,6-Dimethylnaphthalene	W-SPIGMS04	0.1	µg/L	<0.10	---	---	---
1,7-Dimethylnaphthalene	W-SPIGMS04	0.15	µg/L	<0.15	---	---	---
1,4-Dimethylnaphthalene	W-SPIGMS04	0.15	µg/L	<0.15	---	---	---
1,3,7-Trimethylnaphthalene	W-SPIGMS04	0.05	µg/L	<0.05	---	---	---
1,4,6-Trimethylnaphthalene	W-SPIGMS04	0.1	µg/L	<0.10	---	---	---
2,3,5-Trimethylnaphthalene	W-SPIGMS04	0.1	µg/L	<0.10	---	---	---
1,2,4,5-Tetramethylnaphthalene	W-SPIGMS04	0.15	µg/L	<0.15	---	---	---
1,2,3,6-Tetramethylnaphthalene	W-SPIGMS04	0.1	µg/L	<0.10	---	---	---
1,4,6,7-Tetramethylnaphthalene	W-SPIGMS04	0.05	µg/L	<0.050	---	---	---
1,2,5,6-Tetramethylnaphthalene	W-SPIGMS04	0.05	µg/L	<0.050	---	---	---
Methylpyrenes	W-SPIGMS04	1	µg/L	<1.0	---	---	---
Methylchrysenes	W-SPIGMS04	1	µg/L	<1.0	---	---	---
Sum of Aromatics C15-C35	W-SPIGMS04	2	µg/L	<2.0	---	---	---
<b>Polycyclic Aromatic Hydrocarbons (PAHs)</b>							
Naphthalene	W-SPIGMS04	0.01	µg/L	3.29	± 30.0%	---	---
Acenaphthylene	W-SPIGMS04	0.01	µg/L	<0.010	---	---	---
Acenaphthene	W-SPIGMS04	0.01	µg/L	<0.010	---	---	---
Fluorene	W-SPIGMS04	0.01	µg/L	0.015	± 30.0%	---	---
Phenanthrene	W-SPIGMS04	0.01	µg/L	0.037	± 30.0%	---	---
Anthracene	W-SPIGMS04	0.01	µg/L	0.683	± 30.0%	---	---
Fluoranthene	W-SPIGMS04	0.01	µg/L	<0.010	---	---	---
Pyrene	W-SPIGMS04	0.01	µg/L	<0.010	---	---	---
Benz(a)anthracene	W-SPIGMS04	0.01	µg/L	<0.010	---	---	---
Chrysene	W-SPIGMS04	0.01	µg/L	<0.010	---	---	---
Benzo(b)fluoranthene	W-SPIGMS04	0.01	µg/L	<0.010	---	---	---
Benzo(k)fluoranthene	W-SPIGMS04	0.01	µg/L	<0.010	---	---	---
Benzo(a)pyrene	W-SPIGMS04	0.01	µg/L	<0.010	---	---	---
Indeno(1,2,3-cd)pyrene	W-SPIGMS04	0.01	µg/L	<0.010	---	---	---
Benzo(g,h,i)perylene	W-SPIGMS04	0.01	µg/L	<0.010	---	---	---
Dibenz(a,h)anthracene	W-SPIGMS04	0.01	µg/L	<0.010	---	---	---
<b>PCBs</b>							
PCB 28	W-PCBECD01	0.0011	µg/L	<0.00110	---	---	---
PCB 52	W-PCBECD01	0.0011	µg/L	<0.00110	---	---	---
PCB 101	W-PCBECD01	0.00075	µg/L	<0.000750	---	---	---
PCB 118	W-PCBECD01	0.0011	µg/L	<0.00110	---	---	---
PCB 138	W-PCBECD01	0.0012	µg/L	<0.00120	---	---	---
PCB 153	W-PCBECD01	0.0011	µg/L	<0.00110	---	---	---
PCB 180	W-PCBECD01	0.00095	µg/L	<0.000950	---	---	---
Sum of 6 PCBs	W-PCBECD01	0.0062	µg/L	<0.00620	---	---	---
Sum of 7 PCBs	W-PCBECD01	0.0073	µg/L	<0.00730	---	---	---
<b>Petroleum Hydrocarbons</b>							
Aliphates C10-C12	W-SPIGMS04	10	µg/L	21	± 30.0%	---	---
Aliphates C12-C16	W-SPIGMS04	10	µg/L	<10	---	---	---
Aliphates C16-C35	W-SPIGMS04	10	µg/L	48	± 30.0%	---	---
C10 - C12 Fraction	W-TPHFID01	5	µg/L	123	± 30.0%	---	---
C10 - C16 Fraction	W-TPHFID02	10	µg/L	143	± 30.0%	---	---
C10 - C40 Fraction	W-TPHFID01	50	µg/L	190	± 30.0%	---	---
C10 - C40 Fraction	W-TPHFID02	50	µg/L	190	± 30.0%	---	---
C12 - C16 Fraction	W-TPHFID01	5	µg/L	19.7	± 30.0%	---	---
C16 - C22 Fraction	W-TPHFID02	10	µg/L	40	± 30.0%	---	---

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 Client : IDAD - Instituto do Ambiente e Desenvolvimento



Sub-Matrix: GROUNDWATER				Client sample ID		181.17		----		----	
				Laboratory sample ID		PR1703690-001		----		----	
				Client sampling date / time		06-Mar-2017 00:00		----		----	
Parameter	Method	LGR	Unit	Result	MU	Result	MU	Result	MU		
<b>Petroleum Hydrocarbons - Continued</b>											
C16 - C35 Fraction	W-TPHFID01	30	µg/L	47	± 30.0%	----	----	----	----		
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 Aliphatics C10-C35	W-SPIGMS04	30	µg/L	69	± 30.0%	----	----	----	----		
Sum of Aromatics C10-C16	W-SPIGMS04	1.55	µg/L	<1.55	----	----	----	----	----		
Sum of Aromatics C8-C10	W-SPIGMS04	0.6	µg/L	3.38	± 30.0%	----	----	----	----		

If no sampling time is provided, the sampling time will default to 00:00 on the date of sampling. If no sampling date is provided, delivery date is typically within a 5 day period will be displayed instead. Measurement uncertainty is expressed as extended measurement uncertainty with coverage factor k=2 (representing 95% confidence level).  
 Key: LGR = Limit 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 – Vysočany Czech Republic 190 00</i>	
W-ANI-ENV	CZ_SOP_D06_02_068 (CSN ISO 10304-1, CSN EN 18192) 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 including the calculation of total mineralization
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_076 A / CZ_SOP_D06_07_040 Determination of chemical oxygen demand using dichromate (COD-Cr) by titration (based on CSN ISO 6060, CSN ISO 15705)
W-HG-AFSFL	CZ_SOP_D06_02_096 (US EPA 245.7, US EPA 1631, CSN EN ISO 17852, CSN EN 16192, samples prepared as per CZ_SOP_D06_02_002 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 16192, US EPA 6010, SM 3120, samples prepared as per CZ_SOP_D06_02_002 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, SM 4500-NO2(-), SM 4500-NO3(-)) Determination of sum of ammonium and ammonium ions, nitrite and the sum of nitrite and nitrate ions by discrete spectrophotometry and determination of nitrite, nitrate, ammonia, inorganic, organic, total nitrogen, free ammonia and dissociated ammonium ions by calculation from measured values including the calculation of total mineralization
W-PCBECD01	CZ_SOP_D06_03_166 (DIN 38407, part 2, US EPA 8082, samples prepared as per 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, US EPA 8015, US EPA 3510, TNRCC Method 1006) Determination of extractable compounds in the range of hydrocarbons C5 - C40, 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, US EPA 8015, US EPA 3510, TNRCC Method 1006) Determination of extractable compounds in the range of hydrocarbons C5 - C40, 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 extractable substances by infrared spectrometry and determination of polar extractable substances by calculation from measured values (based on CSN 75 7505:2006, STN 830540-4.)
W-VOICGMS01	CZ_SOP_D06_03_155 except chap 10.5, 10.6 (US EPA 824, US EPA 8260, US EPA 8015, EN ISO 10301, MADEP 2004, rev. 1.1, ISO 11423, ISO 15680) Determination of volatile organic compounds by gas chromatography method with FID and MS detection and calculation of volatile organic compounds sums from measured values

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Analytical Methods	Method Descriptions
W-VOCGMS05	C2_SOP_D06_03_155 except chap. 10.5, 10.6 (US EPA 824, US EPA 8260, US EPA 8015, EN ISO 10301, MADEP 2004, rev. 1.1, ISO 11423, ISO 15680) 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.

**Relatório de Ensaios**  
**R167.17-16/06.10**

**Requisitante:** United Resins

**Descrição amostra:** Água doce subterrânea

**Receção da amostra:** 19-04-2017

**Início ensaios:** 19-04-2017

**Conclusão ensaios:** 11-05-2017

**Emissão dos resultados:** 31-05-2017

**Amostragem:** A amostragem pontual foi realizada pelo IDAD.  
A determinação do pH e da condutividade foi realizada no local de amostragem.  
A amostragem realizada não se encontra no âmbito da Acreditação do Laboratório.

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

Ensaio	Piezómetro PZ1 Amostra Z84.17	Piezómetro PZ2 Amostra Z85.17	Furo Amostra Z83.17	Método analítico/Técnica Analítica
Nível freático (m)*	3,82	3,21	---	---
pH	7,3 (20 °C)	8,1 (18 °C)	7,3 (19 °C)	MILI 13, ed3rev4
Condutividade (µS/cm)*	619 (19 °C)	282 (18 °C)	767 (19 °C)	Potenciometria

**Abreviaturas:**

MILI Método Interno do Laboratório do IDAD

**Anexo:** Certificate of Analysis PR1711756 – ALS Group.

**Validação**



(Alexandra Passos Silva, Eng.º.)  
Responsável Técnico

**Aprovação**



(Miguel Coutinho, Doutor)  
Secretário Geral

Proibida a reprodução parcial deste relatório sem autorização do IDAD.  
Os resultados dos ensaios referem-se exclusivamente aos itens ensaiados.  
Laboratório do IDAD possui Acreditação IPAC nº L0313 e Anexo Técnico de Acreditação nº L0313-1, ed.19 de 19.01.2017 disponível em <http://www.ipac.pt/docs/g/>, com o código 90E9-9L2E-61BB-W0P8

R167.17-16/06.10

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## CERTIFICATE OF ANALYSIS

<b>Work Order</b>	: PR1711756	<b>Issue Date</b>	: 11-May-2017
<b>Client</b>	: IDAD - Instituto do Ambiente e Desenvolvimento	<b>Laboratory</b>	: ALS Czech Republic, s.r.o.
<b>Contact</b>	: Mrs. Alexandra Passos Silva	<b>Contact</b>	: Client Service
<b>Address</b>	: Campus Universitario 3810-193 Aveiro Portugal	<b>Address</b>	: Na Harte 336/9 Prague 9 - Vysocany 190 00 Czech Republic
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<b>Telephone</b>	: +351 2344 00600	<b>Telephone</b>	: +420 226 226 228
<b>Facsimile</b>	: ---	<b>Facsimile</b>	: +420 284 081 635
<b>Project</b>	: 16/06.10	<b>Page</b>	: 1 of 9
<b>Order number</b>	: ---	<b>Date Samples Received</b>	: 26-Apr-2017
<b>C-O-C number</b>	: ---	<b>Quote number</b>	: PR2016IDAIN-PT0017 (PT-300-16-0580)
<b>Site</b>	: ---	<b>Date of test</b>	: 29-Apr-2017 - 11-May-2017
<b>Sampled by</b>	: client	<b>QC Level</b>	: 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.  
 Should a sample contain sediment it is decanted prior to volatile compounds determination.

### Responsible for accuracy

Signature  
Zdeněk Jirák



Position  
Environmental Business Unit  
Manager

Testing Laboratory Accredited by CAI  
according to CSN EN ISO/IEC 17025:2005



Issue Date : 11-May-2017  
 Page : 2 of 9  
 Work Order : PR1711756  
 Client : IDAD - Instituto do Ambiente e Desenvolvimento



### Analytical Results

Parameter	Method	LOR	Unit	Client sample ID		283.17		283.17		284.17	
				Laboratory sample ID		PR1711756-001		PR1711756-002		PR1711756-003	
				Client sampling date / time		19-Apr-2017 00:00		19-Apr-2017 09:00		19-Apr-2017 00:00	
				Result	MU	Result	MU	Result	MU		
<b>Nonmetallic Inorganic Parameters</b>											
Ammonia and ammonium ions as N	W-NH4-SPC	0.04	mg/L	2.16	± 15.0%	---	---	0.121	± 15.0%	---	---
Ammonia and ammonium ions as NH4	W-NH4-SPC	0.05	mg/L	2.79	± 15.0%	---	---	0.156	± 15.0%	---	---
Bromide	W-ANI-ENV	0.05	mg/L	0.216	± 20.0%	---	---	<0.050	---	---	---
Chemical Oxygen Demand (COD-Cr)	W-COD-SPC	5	mg/L	19.0	± 17.5%	---	---	100	± 15.0%	---	---
Chloride	W-ANI-ENV	0.5	mg/L	69.3	± 15.0%	---	---	25.2	± 15.0%	---	---
Fluoride	W-ANI-ENV	0.02	mg/L	0.122	± 15.0%	---	---	0.137	± 15.0%	---	---
Nitrates	W-ANI-ENV	0.04	mg/L	0.542	± 15.0%	---	---	0.278	± 15.0%	---	---
Nitrites	W-ANI-ENV	0.04	mg/L	<0.040	---	---	---	0.040	± 25.0%	---	---
Sulphate as SO4 2-	W-ANI-ENV	0.5	mg/L	4.98	± 15.0%	---	---	2.70	± 15.0%	---	---
Nitrate as N	W-ANI-ENV	0.01	mg/L	0.122	± 15.0%	---	---	0.063	± 15.0%	---	---
Nitrite as N	W-ANI-ENV	0.01	mg/L	<0.010	---	---	---	0.012	± 25.0%	---	---
<b>Dissolved Metals / Major Cations</b>											
Arsenic	W-METAXFL1	0.005	mg/L	<0.0050	---	---	---	<0.0050	---	---	---
Cadmium	W-METAXFL1	0.0004	mg/L	<0.00040	---	---	---	<0.00040	---	---	---
Lead	W-METAXFL1	0.005	mg/L	<0.0050	---	---	---	<0.0050	---	---	---
Mercury	W-HG-AFSFL	0.01	µg/L	<0.010	---	---	---	0.032	± 10.0%	---	---
<b>Petroleum Hydrocarbons - FTIR</b>											
Total Petroleum Hydrocarbons	W-TPH-JR	0.05	mg/L	---	---	---	---	<0.050	---	---	---
<b>BTEX</b>											
Benzene	W-VOCGMS01	0.2	µg/L	---	---	---	---	<0.20	---	---	---
Toluene	W-VOCGMS01	1	µg/L	---	---	---	---	<1.00	---	---	---
Ethylbenzene	W-VOCGMS01	0.1	µg/L	---	---	---	---	<0.10	---	---	---
meta- & para-Xylene	W-VOCGMS01	0.2	µg/L	---	---	---	---	<0.20	---	---	---
ortho-Xylene	W-VOCGMS01	0.1	µg/L	---	---	---	---	<0.10	---	---	---
Sum of BTEX	W-VOCGMS01	1.6	µg/L	---	---	---	---	<1.60	---	---	---
Sum of xylenes	W-VOCGMS01	0.3	µg/L	---	---	---	---	<0.30	---	---	---
Sum of TEK	W-VOCGMS01	1.4	µg/L	---	---	---	---	<1.40	---	---	---
<b>Halogenated Volatile Organic Compounds</b>											
Dichlorodifluoromethane	W-VOCGMS05	1	µg/L	---	---	---	---	<1.0	---	---	---
Vinyl chloride	W-VOCGMS01	1	µg/L	---	---	---	---	<1.00	---	---	---
Chloromethane	W-VOCGMS05	10	µg/L	---	---	---	---	<10	---	---	---
trans-1,2-Dichloroethene	W-VOCGMS01	0.1	µg/L	---	---	---	---	<0.10	---	---	---
Bromomethane	W-VOCGMS05	1	µg/L	---	---	---	---	<1.0	---	---	---
Dichloromethane	W-VOCGMS01	6	µg/L	---	---	---	---	<6.0	---	---	---
1,1-Dichloroethene	W-VOCGMS01	0.1	µg/L	---	---	---	---	<0.10	---	---	---
Chloroethane	W-VOCGMS05	1	µg/L	---	---	---	---	<1.0	---	---	---
cis-1,2-Dichloroethene	W-VOCGMS01	0.1	µg/L	---	---	---	---	<0.10	---	---	---
Trichlorofluoromethane	W-VOCGMS05	1	µg/L	---	---	---	---	<1.0	---	---	---
1,1-Dichloroethane	W-VOCGMS01	0.1	µg/L	---	---	---	---	<0.10	---	---	---
Bromochloromethane	W-VOCGMS05	2	µg/L	---	---	---	---	<2.0	---	---	---
2,2-Dichloropropane	W-VOCGMS05	1	µg/L	---	---	---	---	<1.0	---	---	---
Chloroform	W-VOCGMS01	0.3	µg/L	---	---	---	---	<0.30	---	---	---
1,1-Dichloropropene	W-VOCGMS05	1	µg/L	---	---	---	---	<1.0	---	---	---
1,2-Dichloroethane	W-VOCGMS01	1	µg/L	---	---	---	---	<1.00	---	---	---
1,1,1-Trichloroethane	W-VOCGMS01	0.1	µg/L	---	---	---	---	<0.10	---	---	---
Dibromomethane	W-VOCGMS05	1	µg/L	---	---	---	---	<1.0	---	---	---
cis-1,3-Dichloropropene	W-VOCGMS05	1	µg/L	---	---	---	---	<1.0	---	---	---
Tetrachloromethane	W-VOCGMS01	0.1	µg/L	---	---	---	---	<0.10	---	---	---
Bromodichloromethane	W-VOCGMS01	0.1	µg/L	---	---	---	---	<0.10	---	---	---
trans-1,3-Dichloropropene	W-VOCGMS05	1	µg/L	---	---	---	---	<1.0	---	---	---
1,3-Dichloropropane	W-VOCGMS05	1	µg/L	---	---	---	---	<1.0	---	---	---
Trichloroethene	W-VOCGMS01	0.1	µg/L	---	---	---	---	<0.10	---	---	---
1,1,2-Trichloroethane	W-VOCGMS01	0.2	µg/L	---	---	---	---	<0.20	---	---	---

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Sub-Matrix: GROUNDWATER				Client sample ID		283.17		283.17		284.17	
				Laboratory sample ID		PR1711755-001		PR1711756-002		PR1711756-003	
				Client sampling date / time		19-Apr-2017 00:00		19-Apr-2017 00:00		19-Apr-2017 00:00	
Parameter	Method	LOR	Unit	Result	MU	Result	MU	Result	MU		
<b>Halogenated Volatile Organic Compounds - Continued</b>											
1,2-Dibromoethane (EDB)	W-VOCGMS05	1	µg/L	----	----	<1.0	----	----	----		
1,2,3-Trichloropropane	W-VOCGMS05	1	µg/L	----	----	<1.0	----	----	----		
Dibromochloromethane	W-VOCGMS01	0.1	µg/L	----	----	<0.10	----	----	----		
Bromobenzene	W-VOCGMS05	1	µg/L	----	----	<1.0	----	----	----		
Tetrachloroethene	W-VOCGMS01	0.2	µg/L	----	----	<0.20	----	----	----		
1,1,1,2-Tetrachloroethane	W-VOCGMS01	0.1	µg/L	----	----	<0.10	----	----	----		
2-Chlorotoluene	W-VOCGMS05	1	µg/L	----	----	<1.0	----	----	----		
Chlorobenzene	W-VOCGMS01	0.1	µg/L	----	----	<0.10	----	----	----		
4-Chlorotoluene	W-VOCGMS05	1	µg/L	----	----	<1.0	----	----	----		
Bromoform	W-VOCGMS01	0.2	µg/L	----	----	<0.20	----	----	----		
1,1,2,2-Tetrachloroethane	W-VOCGMS01	1	µg/L	----	----	<1.00	----	----	----		
1,2-Dichlorobenzene	W-VOCGMS01	0.1	µg/L	----	----	<0.10	----	----	----		
1,2-Dibromo-3-chloropropane	W-VOCGMS05	1	µg/L	----	----	<1.0	----	----	----		
1,4-Dichlorobenzene	W-VOCGMS01	0.1	µg/L	----	----	<0.10	----	----	----		
1,3-Dichlorobenzene	W-VOCGMS01	0.1	µg/L	----	----	<0.10	----	----	----		
1,2,4-Trichlorobenzene	W-VOCGMS01	0.1	µg/L	----	----	<0.10	----	----	----		
Hexachlorobutadiene	W-VOCGMS05	1	µg/L	----	----	<1.0	----	----	----		
1,2,3-Trichlorobenzene	W-VOCGMS01	0.1	µg/L	----	----	<0.10	----	----	----		
1,3,5-Trichlorobenzene	W-VOCGMS01	0.2	µg/L	----	----	<0.20	----	----	----		
1,2-Dichloropropane	W-VOCGMS01	1	µg/L	----	----	<1.0	----	----	----		
Sum of 4 Trihalomethanes	W-VOCGMS01	0.7	µg/L	----	----	<0.70	----	----	----		
Sum of 3 Dichlorobenzenes	W-VOCGMS01	0.3	µg/L	----	----	<0.30	----	----	----		
Sum of 3 Trichlorobenzenes	W-VOCGMS01	0.4	µg/L	----	----	<0.40	----	----	----		
<b>Non-Halogenated Volatile Organic Compounds</b>											
Isopropylbenzene	W-VOCGMS05	1	µg/L	----	----	<1.0	----	----	----		
n-Propylbenzene	W-VOCGMS05	1	µg/L	----	----	<1.0	----	----	----		
1,2,4-Trimethylbenzene	W-VOCGMS05	1	µg/L	----	----	<1.0	----	----	----		
p-Isopropyltoluene	W-VOCGMS05	1	µg/L	----	----	<1.0	----	----	----		
1,3,5-Trimethylbenzene	W-VOCGMS05	1	µg/L	----	----	<1.0	----	----	----		
Styrene	W-VOCGMS01	0.2	µg/L	----	----	<0.20	----	----	----		
sec-Butylbenzene	W-VOCGMS05	1	µg/L	----	----	<1.0	----	----	----		
tert-Butylbenzene	W-VOCGMS05	1	µg/L	----	----	<1.0	----	----	----		
n-Butylbenzene	W-VOCGMS05	1	µg/L	----	----	<1.0	----	----	----		
Methyl tert-Butyl Ether (MTBE)	W-VOCGMS01	0.2	µg/L	----	----	<0.20	----	----	----		
tert-Butyl alcohol	W-VOCGMS01	5	µg/L	----	----	<5.0	----	----	----		
Sum of BTEXS	W-VOCGMS01	1.6	µg/L	----	----	<1.80	----	----	----		
<b>Aromatic Compounds</b>											
1-Ethyl-2-methylbenzene	W-SPIGMS04	0.05	µg/L	----	----	<0.050	----	----	----		
1-Ethyl-3-methylbenzene@1-Ethyl-4-methylbenzene	W-SPIGMS04	0.1	µg/L	----	----	<0.10	----	----	----		
1,3,5-Trimethylbenzene	W-SPIGMS04	0.05	µg/L	----	----	<0.050	----	----	----		
1,2,4-Trimethylbenzene	W-SPIGMS04	0.05	µg/L	----	----	<0.050	----	----	----		
1,2,3-Trimethylbenzene	W-SPIGMS04	0.05	µg/L	----	----	<0.050	----	----	----		
1,2@1,4-Diethylbenzene	W-SPIGMS04	0.1	µg/L	----	----	<0.10	----	----	----		
1,3-Diethylbenzene	W-SPIGMS04	0.05	µg/L	----	----	<0.050	----	----	----		
1,2,4,5-Tetramethylbenzene	W-SPIGMS04	0.05	µg/L	----	----	<0.050	----	----	----		
2-Methylnaphthalene	W-SPIGMS04	0.05	µg/L	----	----	<0.050	----	----	----		
1-Methylnaphthalene	W-SPIGMS04	0.05	µg/L	----	----	<0.050	----	----	----		
Biphenyl	W-SPIGMS04	0.05	µg/L	----	----	<0.050	----	----	----		
2@1-Ethyl-naphthalene	W-SPIGMS04	0.1	µg/L	----	----	<0.10	----	----	----		
1,8-Dimethylnaphthalene	W-SPIGMS04	0.05	µg/L	----	----	<0.050	----	----	----		
2-Methylanthracene	W-SPIGMS04	0.05	µg/L	----	----	<0.050	----	----	----		
1-Methylanthracene@1-Methylphenanthrene	W-SPIGMS04	0.1	µg/L	----	----	<0.10	----	----	----		
2-Methylphenanthrene	W-SPIGMS04	0.05	µg/L	----	----	<0.050	----	----	----		
Isopropylbenzene	W-SPIGMS04	0.05	µg/L	----	----	<0.050	----	----	----		
1,2-Dimethylnaphthalene	W-SPIGMS04	0.05	µg/L	----	----	<0.050	----	----	----		
n-Propylbenzene	W-SPIGMS04	0.05	µg/L	----	----	<0.050	----	----	----		

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Parameter	Method	LOR	Unit	283.17		283.17		284.17	
				PR1711756-001		PR1711756-002		PR1711756-003	
				19-Apr-2017 00:00		19-Apr-2017 00:00		19-Apr-2017 00:00	
Result	MU	Result	MU	Result	MU	Result	MU		
<b>Aromatic Compounds - Continued</b>									
2,6-Dimethylnaphthalene	W-SPIGMS04	0.1	µg/L	---	---	<0.10	---	---	---
1,7-Dimethylnaphthalene	W-SPIGMS04	0.15	µg/L	---	---	<0.15	---	---	---
1,4-Dimethylnaphthalene	W-SPIGMS04	0.15	µg/L	---	---	<0.15	---	---	---
1,3,7-Trimethylnaphthalene	W-SPIGMS04	0.05	µg/L	---	---	<0.05	---	---	---
1,4,6-Trimethylnaphthalene	W-SPIGMS04	0.1	µg/L	---	---	<0.10	---	---	---
2,3,5-Trimethylnaphthalene	W-SPIGMS04	0.1	µg/L	---	---	<0.10	---	---	---
1,2,4,5-Trimethylnaphthalene	W-SPIGMS04	0.15	µg/L	---	---	<0.15	---	---	---
1,2,3,5-Trimethylnaphthalene	W-SPIGMS04	0.1	µg/L	---	---	<0.10	---	---	---
1,4,6,7-Tetramethylnaphthalene	W-SPIGMS04	0.05	µg/L	---	---	<0.050	---	---	---
1,2,5,6-Tetramethylnaphthalene	W-SPIGMS04	0.05	µg/L	---	---	<0.050	---	---	---
Methylpyrenes&Methylfluoranthones	W-SPIGMS04	1	µg/L	---	---	<1.0	---	---	---
Methylchrysenes&Methylbenz(a)anthracenes	W-SPIGMS04	1	µg/L	---	---	<1.0	---	---	---
Sum of Aromatics C16-C35	W-SPIGMS04	2	µg/L	---	---	<2.0	---	---	---
<b>Polycyclic Aromatics Hydrocarbons (PAHs)</b>									
Naphthalene	W-SPIGMS04	0.01	µg/L	---	---	<0.010	---	---	---
Acenaphthylene	W-SPIGMS04	0.01	µg/L	---	---	<0.010	---	---	---
Acenaphthene	W-SPIGMS04	0.01	µg/L	---	---	<0.010	---	---	---
Fluorene	W-SPIGMS04	0.01	µg/L	---	---	<0.010	---	---	---
Phenanthrene	W-SPIGMS04	0.01	µg/L	---	---	<0.010	---	---	---
Anthracene	W-SPIGMS04	0.01	µg/L	---	---	<0.010	---	---	---
Fluoranthene	W-SPIGMS04	0.01	µg/L	---	---	<0.010	---	---	---
Pyrene	W-SPIGMS04	0.01	µg/L	---	---	<0.010	---	---	---
Benz(a)anthracene	W-SPIGMS04	0.01	µg/L	---	---	<0.010	---	---	---
Chrysenes	W-SPIGMS04	0.01	µg/L	---	---	<0.010	---	---	---
Benzo(b)fluoranthene	W-SPIGMS04	0.01	µg/L	---	---	<0.010	---	---	---
Benzo(k)fluoranthene	W-SPIGMS04	0.01	µg/L	---	---	<0.010	---	---	---
Benzo(a)pyrene	W-SPIGMS04	0.01	µg/L	---	---	<0.010	---	---	---
Indeno(1,2,3-cd)pyrene	W-SPIGMS04	0.01	µg/L	---	---	<0.010	---	---	---
Benzo(g,h,i)perylene	W-SPIGMS04	0.01	µg/L	---	---	<0.010	---	---	---
Dibenz(a,h)anthracene	W-SPIGMS04	0.01	µg/L	---	---	<0.010	---	---	---
<b>PCBs</b>									
PCB 28	W-PCBECD01	0.0011	µg/L	---	---	<0.00110	---	---	---
PCB 52	W-PCBECD01	0.0011	µg/L	---	---	<0.00110	---	---	---
PCB 101	W-PCBECD01	0.00075	µg/L	---	---	<0.000750	---	---	---
PCB 118	W-PCBECD01	0.0011	µg/L	---	---	<0.00110	---	---	---
PCB 138	W-PCBECD01	0.0012	µg/L	---	---	<0.00120	---	---	---
PCB 153	W-PCBECD01	0.0011	µg/L	---	---	<0.00110	---	---	---
PCB 180	W-PCBECD01	0.00095	µg/L	---	---	<0.000950	---	---	---
Sum of 6 PCBs	W-PCBECD01	0.0082	µg/L	---	---	<0.00820	---	---	---
Sum of 7 PCBs	W-PCBECD01	0.0073	µg/L	---	---	<0.00730	---	---	---
<b>Petroleum Hydrocarbons</b>									
Aliphatics C10-C12	W-SPIGMS04	10	µg/L	---	---	<10	---	---	---
Aliphatics C12-C16	W-SPIGMS04	10	µg/L	---	---	<10	---	---	---
Aliphatics C16-C35	W-SPIGMS04	10	µg/L	---	---	<10	---	---	---
C10 - C12 Fraction	W-TPHFID01	5	µg/L	---	---	<5.0	---	---	---
C10 - C16 Fraction	W-TPHFID02	10	µg/L	---	---	<10	---	---	---
C10 - C40 Fraction	W-TPHFID01	50	µg/L	---	---	<50	---	---	---
C12 - C16 Fraction	W-TPHFID01	5	µg/L	---	---	<5.0	---	---	---
C16 - C22 Fraction	W-TPHFID02	10	µg/L	---	---	<10	---	---	---
C16 - C35 Fraction	W-TPHFID01	30	µg/L	---	---	<30	---	---	---

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Sub-Matrix: GROUNDWATER				Client sample ID		283.17		283.17		284.17	
				Laboratory sample ID		PR1711756-001		PR1711756-002		PR1711756-003	
				Client sampling date / time		19-Apr-2017 00:00		19-Apr-2017 00:00		19-Apr-2017 00:00	
Parameter	Method	LOR	Unit	Result	MU	Result	MU	Result	MU		
<b>Petroleum Hydrocarbons - Continued</b>											
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 Aliphatics C10-C35	W-SPIGMS04	30	µg/L	---	---	<30	---	---	---		
Sum of Aromatics C10-C18	W-SPIGMS04	1.55	µg/L	---	---	<1.55	---	---	---		
Sum of Aromatics C8-C10	W-SPIGMS04	0.6	µg/L	---	---	<0.60	---	---	---		

Sub-Matrix: GROUNDWATER				Client sample ID		284.17		285.17		285.17	
				Laboratory sample ID		PR1711756-004		PR1711756-005		PR1711756-006	
				Client sampling date / time		19-Apr-2017 00:00		19-Apr-2017 00:00		19-Apr-2017 00:00	
Parameter	Method	LOR	Unit	Result	MU	Result	MU	Result	MU		
<b>Nonmetallic Inorganic Parameters</b>											
Ammonia and ammonium ions as N	W-NH4-SPC	0.04	mg/L	---	---	0.078	± 15.0%	---	---		
Ammonia and ammonium ions as NH4	W-NH4-SPC	0.05	mg/L	---	---	0.101	± 15.0%	---	---		
Bromide	W-ANI-ENV	0.05	mg/L	---	---	<0.050	---	---	---		
Chemical Oxygen Demand (COD-Cr)	W-COD-SPC	5	mg/L	---	---	28.0	± 15.0%	---	---		
Chloride	W-ANI-ENV	0.5	mg/L	---	---	35.3	± 15.0%	---	---		
Fluoride	W-ANI-ENV	0.02	mg/L	---	---	0.051	± 15.0%	---	---		
Nitrates	W-ANI-ENV	0.04	mg/L	---	---	23.7	± 15.0%	---	---		
Nitrites	W-ANI-ENV	0.04	mg/L	---	---	<0.040	---	---	---		
Sulphate as SO4 2-	W-ANI-ENV	0.5	mg/L	---	---	35.5	± 15.0%	---	---		
Nitrate as N	W-ANI-ENV	0.01	mg/L	---	---	5.36	± 15.0%	---	---		
Nitrite as N	W-ANI-ENV	0.01	mg/L	---	---	<0.010	---	---	---		
<b>Dissolved Metals / Major Cations</b>											
Arsenic	W-METAXFL1	0.005	mg/L	---	---	<0.0050	---	---	---		
Cadmium	W-METAXFL1	0.0004	mg/L	---	---	<0.00040	---	---	---		
Lead	W-METAXFL1	0.005	mg/L	---	---	<0.0050	---	---	---		
Mercury	W-HG-AFSFL	0.01	µg/L	---	---	0.057	± 10.0%	---	---		
<b>Petroleum Hydrocarbons - FTIR</b>											
Total Petroleum Hydrocarbons	W-TPH-IR	0.05	mg/L	<0.050	---	---	---	<0.050	---		
<b>BTEX</b>											
Benzene	W-VOCGMS01	0.2	µg/L	<0.20	---	---	---	<0.20	---		
Toluene	W-VOCGMS01	1	µg/L	<1.00	---	---	---	<1.00	---		
Ethylbenzene	W-VOCGMS01	0.1	µg/L	<0.10	---	---	---	<0.10	---		
meta- & para-Xylene	W-VOCGMS01	0.2	µg/L	<0.20	---	---	---	<0.20	---		
ortho-Xylene	W-VOCGMS01	0.1	µg/L	<0.10	---	---	---	<0.10	---		
Sum of BTEX	W-VOCGMS01	1.6	µg/L	<1.60	---	---	---	<1.60	---		
Sum of xylenes	W-VOCGMS01	0.3	µg/L	<0.30	---	---	---	<0.30	---		
Sum of TEX	W-VOCGMS01	1.4	µg/L	<1.40	---	---	---	<1.40	---		
<b>Halogenated Volatile Organic Compounds</b>											
Dichlorodifluoromethane	W-VOCGMS05	1	µg/L	<1.0	---	---	---	<1.0	---		
Vinyl chloride	W-VOCGMS01	1	µg/L	<1.00	---	---	---	<1.00	---		
Chloromethane	W-VOCGMS05	10	µg/L	<10	---	---	---	<10	---		
trans-1,2-Dichloroethene	W-VOCGMS01	0.1	µg/L	<0.10	---	---	---	<0.10	---		
Bromomethane	W-VOCGMS05	1	µg/L	<1.0	---	---	---	<1.0	---		
Dichloromethane	W-VOCGMS01	6	µg/L	<6.0	---	---	---	<6.0	---		
1,1-Dichloroethane	W-VOCGMS01	0.1	µg/L	<0.10	---	---	---	<0.10	---		
Chloroethane	W-VOCGMS05	1	µg/L	<1.0	---	---	---	<1.0	---		
cis-1,2-Dichloroethene	W-VOCGMS01	0.1	µg/L	<0.10	---	---	---	<0.10	---		
Trichlorofluoromethane	W-VOCGMS05	1	µg/L	<1.0	---	---	---	<1.0	---		
1,1-Dichloroethane	W-VOCGMS01	0.1	µg/L	<0.10	---	---	---	<0.10	---		
Bromochloromethane	W-VOCGMS05	2	µg/L	<2.0	---	---	---	<2.0	---		
2,2-Dichloropropane	W-VOCGMS05	1	µg/L	<1.0	---	---	---	<1.0	---		
Chloroform	W-VOCGMS01	0.3	µg/L	<0.30	---	---	---	<0.30	---		

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Parameter	Method	LOR	Unit	284.17		285.17		285.17	
				PR1711756 004		PR1711756 005		PR1711756-006	
				19-Apr-2017 00:00		19-Apr-2017 00:00		19-Apr-2017 00:00	
Client sample ID	Laboratory sample ID	Client sampling date / time	Result	MU	Result	MU	Result	MU	
<b>Halogenated Volatile Organic Compounds - Continued</b>									
1.1-Dichloropropene	W-VOCGMS05	1	µg/L	<1.0	---	---	---	<1.0	---
1.2-Dichloroethane	W-VOCGMS01	1	µg/L	<1.00	---	---	---	<1.00	---
1.1.1-Trichloroethane	W-VOCGMS01	0.1	µg/L	<0.10	---	---	---	<0.10	---
Dibromomethane	W-VOCGMS05	1	µg/L	<1.0	---	---	---	<1.0	---
cis-1,3-Dichloropropene	W-VOCGMS05	1	µg/L	<1.0	---	---	---	<1.0	---
Tetrachloromethane	W-VOCGMS01	0.1	µg/L	<0.10	---	---	---	<0.10	---
Bromodichloromethane	W-VOCGMS01	0.1	µg/L	<0.10	---	---	---	<0.10	---
trans-1,3-Dichloropropene	W-VOCGMS05	1	µg/L	<1.0	---	---	---	<1.0	---
1,3-Dichloropropane	W-VOCGMS05	1	µg/L	<1.0	---	---	---	<1.0	---
Trichloroethene	W-VOCGMS01	0.1	µg/L	<0.10	---	---	---	<0.10	---
1,1,2-Trichloroethane	W-VOCGMS01	0.2	µg/L	<0.20	---	---	---	<0.20	---
1,2-Dibromoethane (EDB)	W-VOCGMS05	1	µg/L	<1.0	---	---	---	<1.0	---
1,2,3-Trichloropropane	W-VOCGMS05	1	µg/L	<1.0	---	---	---	<1.0	---
Dibromochloromethane	W-VOCGMS01	0.1	µg/L	<0.10	---	---	---	<0.10	---
Bromobenzene	W-VOCGMS05	1	µg/L	<1.0	---	---	---	<1.0	---
Tetrachloroethane	W-VOCGMS01	0.2	µg/L	<0.20	---	---	---	<0.20	---
1,1,1,2-Tetrachloroethane	W-VOCGMS01	0.1	µg/L	<0.10	---	---	---	<0.10	---
2-Chlorotoluene	W-VOCGMS05	1	µg/L	<1.0	---	---	---	<1.0	---
Chlorobenzene	W-VOCGMS01	0.1	µg/L	<0.10	---	---	---	<0.10	---
4-Chlorotoluene	W-VOCGMS05	1	µg/L	<1.0	---	---	---	<1.0	---
Bromoform	W-VOCGMS01	0.2	µg/L	<0.20	---	---	---	<0.20	---
1,1,2,2-Tetrachloroethane	W-VOCGMS01	1	µg/L	<1.00	---	---	---	<1.00	---
1,2-Dichlorobenzene	W-VOCGMS01	0.1	µg/L	<0.10	---	---	---	<0.10	---
1,2-Dibromo-3-chloropropane	W-VOCGMS05	1	µg/L	<1.0	---	---	---	<1.0	---
1,4-Dichlorobenzene	W-VOCGMS01	0.1	µg/L	<0.10	---	---	---	<0.10	---
1,3-Dichlorobenzene	W-VOCGMS01	0.1	µg/L	<0.10	---	---	---	<0.10	---
1,2,4-Trichlorobenzene	W-VOCGMS01	0.1	µg/L	<0.10	---	---	---	<0.10	---
Hexachlorobutadiene	W-VOCGMS05	1	µg/L	<1.0	---	---	---	<1.0	---
1,2,3-Trichlorobenzene	W-VOCGMS01	0.1	µg/L	<0.10	---	---	---	<0.10	---
1,3,5-Trichlorobenzene	W-VOCGMS01	0.2	µg/L	<0.20	---	---	---	<0.20	---
1,2-Dichloropropane	W-VOCGMS01	1	µg/L	<1.0	---	---	---	<1.0	---
Sum of 4 Trihalomethanes	W-VOCGMS01	0.7	µg/L	<0.70	---	---	---	<0.70	---
Sum of 3 Dichlorobenzenes	W-VOCGMS01	0.3	µg/L	<0.30	---	---	---	<0.30	---
Sum of 3 Trichlorobenzenes	W-VOCGMS01	0.4	µg/L	<0.40	---	---	---	<0.40	---
<b>Non-Halogenated Volatile Organic Compounds</b>									
Isopropylbenzene	W-VOCGMS05	1	µg/L	<1.0	---	---	---	<1.0	---
n-Propylbenzene	W-VOCGMS05	1	µg/L	<1.0	---	---	---	<1.0	---
1,2,4-Trimethylbenzene	W-VOCGMS05	1	µg/L	<1.0	---	---	---	<1.0	---
p-Isopropyltoluene	W-VOCGMS05	1	µg/L	<1.0	---	---	---	<1.0	---
1,3,5-Trimethylbenzene	W-VOCGMS05	1	µg/L	<1.0	---	---	---	<1.0	---
Styrene	W-VOCGMS01	0.2	µg/L	<0.20	---	---	---	<0.20	---
sec-Butylbenzene	W-VOCGMS05	1	µg/L	<1.0	---	---	---	<1.0	---
tert-Butylbenzene	W-VOCGMS05	1	µg/L	<1.0	---	---	---	<1.0	---
n-Butylbenzene	W-VOCGMS05	1	µg/L	<1.0	---	---	---	<1.0	---
Methyl tert-Butyl Ether (MTBE)	W-VOCGMS01	0.2	µg/L	<0.20	---	---	---	<0.20	---
tert-Butyl alcohol	W-VOCGMS01	5	µg/L	<5.0	---	---	---	<5.0	---
Sum of BTEXS	W-VOCGMS01	1.8	µg/L	<1.80	---	---	---	<1.80	---
<b>Aromatic Compounds</b>									
1-Ethyl-2-methylbenzene	W-SPIGMS04	0.05	µg/L	<0.050	---	---	---	<0.050	---
1-Ethyl-3-methylbenzene@1-Ethyl-4-methylbenzene	W-SPIGMS04	0.1	µg/L	<0.10	---	---	---	<0.10	---
1,3,5-Trimethylbenzene	W-SPIGMS04	0.05	µg/L	<0.050	---	---	---	<0.050	---
1,2,4-Trimethylbenzene	W-SPIGMS04	0.05	µg/L	<0.050	---	---	---	<0.050	---
1,2,3-Trimethylbenzene	W-SPIGMS04	0.05	µg/L	<0.050	---	---	---	<0.050	---
1,2@1,4-Diethylbenzene	W-SPIGMS04	0.1	µg/L	<0.10	---	---	---	<0.10	---
1,3-Diethylbenzene	W-SPIGMS04	0.05	µg/L	<0.050	---	---	---	<0.050	---
1,2,4,5-Tetramethylbenzene	W-SPIGMS04	0.05	µg/L	<0.050	---	---	---	<0.050	---
2-Methylnaphthalene	W-SPIGMS04	0.05	µg/L	<0.050	---	---	---	<0.050	---

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Parameter	Method	LOR	Unit	Client sample ID		284.17		285.17		285.17	
				Laboratory sample ID		PR1711755-004		PR1711756-005		PR1711756-006	
				Client sampling date / time		19-Apr-2017 00:00		19-Apr-2017 00:00		19-Apr-2017 00:00	
Parameter	Method	LOR	Unit	Result	MU	Result	MU	Result	MU		
<b>Aromatic Compounds - Continued</b>											
1-Methylnaphthalene	W-SPIGMS04	0.05	µg/L	<0.050	---	---	---	<0.050	---		
Biphenyl	W-SPIGMS04	0.05	µg/L	<0.050	---	---	---	<0.050	---		
2@1-Ethyl-naphthalene	W-SPIGMS04	0.1	µg/L	<0.10	---	---	---	<0.10	---		
1,8-Dimethylnaphthalene	W-SPIGMS04	0.05	µg/L	<0.050	---	---	---	<0.050	---		
2-Methylanthracene	W-SPIGMS04	0.05	µg/L	<0.050	---	---	---	<0.050	---		
1-Methylanthracene@1-Methylphenanthrene	W-SPIGMS04	0.1	µg/L	0.11	± 30.0%	---	---	<0.10	---		
2-Methylphenanthrene	W-SPIGMS04	0.05	µg/L	<0.050	---	---	---	<0.050	---		
Isopropylbenzene	W-SPIGMS04	0.05	µg/L	<0.050	---	---	---	<0.050	---		
1,2-Dimethylnaphthalene	W-SPIGMS04	0.05	µg/L	<0.050	---	---	---	<0.050	---		
n-Propylbenzene	W-SPIGMS04	0.05	µg/L	<0.050	---	---	---	<0.050	---		
2,6@2,7-Dimethylnaphthalene	W-SPIGMS04	0.1	µg/L	<0.10	---	---	---	<0.10	---		
1,7@1,3@1,6-Dimethylnaphthalene	W-SPIGMS04	0.15	µg/L	<0.15	---	---	---	<0.15	---		
1,4@2,3@1,5-Dimethylnaphthalene	W-SPIGMS04	0.15	µg/L	<0.15	---	---	---	<0.15	---		
1,3,7-Trimethylnaphthalene	W-SPIGMS04	0.05	µg/L	<0.05	---	---	---	<0.05	---		
1,4,6@2,3,6-Trimethylnaphthalene	W-SPIGMS04	0.1	µg/L	<0.10	---	---	---	<0.10	---		
2,3,5@1,2,6-Trimethylnaphthalene	W-SPIGMS04	0.1	µg/L	<0.10	---	---	---	<0.10	---		
1,2,4@2,4,5@1,2,5-Trimethylnaphthalene	W-SPIGMS04	0.15	µg/L	<0.15	---	---	---	<0.15	---		
1,2,3@1,4,5-Trimethylnaphthalene	W-SPIGMS04	0.1	µg/L	<0.10	---	---	---	<0.10	---		
1,4,6,7-Tetramethylnaphthalene	W-SPIGMS04	0.05	µg/L	<0.050	---	---	---	<0.050	---		
1,2,3,6-Tetramethylnaphthalene	W-SPIGMS04	0.05	µg/L	<0.050	---	---	---	<0.050	---		
Methylpyrenes@Methylfluoranthenes	W-SPIGMS04	1	µg/L	<1.0	---	---	---	<1.0	---		
Methylchrysenes@Methylbenz(a)anthracenes	W-SPIGMS04	1	µg/L	<1.0	---	---	---	<1.0	---		
Sum of Aromatics C16-C35	W-SPIGMS04	2	µg/L	<2.0	---	---	---	<2.0	---		
<b>Polycyclic Aromatic Hydrocarbons (PAHs)</b>											
Naphthalene	W-SPIGMS04	0.01	µg/L	<0.010	---	---	---	<0.010	---		
Acenaphthylene	W-SPIGMS04	0.01	µg/L	<0.010	---	---	---	<0.010	---		
Acenaphthene	W-SPIGMS04	0.01	µg/L	<0.010	---	---	---	<0.010	---		
Fluorene	W-SPIGMS04	0.01	µg/L	0.010	± 30.0%	---	---	<0.010	---		
Phenanthrene	W-SPIGMS04	0.01	µg/L	<0.010	---	---	---	<0.010	---		
Anthracene	W-SPIGMS04	0.01	µg/L	<0.010	---	---	---	<0.010	---		
Fluoranthene	W-SPIGMS04	0.01	µg/L	<0.010	---	---	---	<0.010	---		
Pyrene	W-SPIGMS04	0.01	µg/L	<0.010	---	---	---	<0.010	---		
Benz(a)anthracene	W-SPIGMS04	0.01	µg/L	<0.010	---	---	---	<0.010	---		
Chrysene	W-SPIGMS04	0.01	µg/L	<0.010	---	---	---	<0.010	---		
Benzo(b)fluoranthene	W-SPIGMS04	0.01	µg/L	<0.010	---	---	---	<0.010	---		
Benzo(k)fluoranthene	W-SPIGMS04	0.01	µg/L	<0.010	---	---	---	<0.010	---		
Benzo(e)pyrene	W-SPIGMS04	0.01	µg/L	<0.010	---	---	---	<0.010	---		
Indeno(1,2,3-cd)pyrene	W-SPIGMS04	0.01	µg/L	<0.010	---	---	---	<0.010	---		
Benzo(g,h,i)perylene	W-SPIGMS04	0.01	µg/L	<0.010	---	---	---	<0.010	---		
Dibenz(a,h)anthracene	W-SPIGMS04	0.01	µg/L	<0.010	---	---	---	<0.010	---		
<b>PCBs</b>											
PCB 28	W-PCBECD01	0.0011	µg/L	<0.00110	---	---	---	<0.00110	---		
PCB 52	W-PCBECD01	0.0011	µg/L	<0.00110	---	---	---	<0.00110	---		
PCB 101	W-PCBECD01	0.00075	µg/L	<0.000750	---	---	---	<0.000750	---		
PCB 116	W-PCBECD01	0.0011	µg/L	<0.00110	---	---	---	<0.00110	---		
PCB 136	W-PCBECD01	0.0012	µg/L	<0.00120	---	---	---	<0.00120	---		
PCB 153	W-PCBECD01	0.0011	µg/L	<0.00110	---	---	---	<0.00110	---		
PCB 180	W-PCBECD01	0.00095	µg/L	<0.000950	---	---	---	<0.000950	---		
Sum of 6 PCBs	W-PCBECD01	0.0062	µg/L	<0.00620	---	---	---	<0.00620	---		

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Sub-Matrix: GROUNDWATER				Client sample ID		284.17		285.17		285.17	
Laboratory sample ID				PR1711756-004		PR1711756-005		PR1711756-006			
Client sampling date / time				19-Apr-2017 00:00		19-Apr-2017 00:00		19-Apr-2017 00:00			
Parameter	Method	LOR	Unit	Result	MU	Result	MU	Result	MU	Result	MU
<b>PCBs - Continued</b>											
Sum of 7 PCBs	W-PCBECD01	0.0073	µg/L	<0.00730	---	---	---	<0.00730	---	---	---
<b>Petroleum Hydrocarbons</b>											
Aliphates C10-C12	W-SPIGMS04	10	µg/L	<10	---	---	---	<10	---	---	---
Aliphates C12-C16	W-SPIGMS04	10	µg/L	<10	---	---	---	<10	---	---	---
Aliphates C16-C35	W-SPIGMS04	10	µg/L	<10	---	---	---	<10	---	---	---
C10 - C12 Fraction	W-TPHFID01	5	µg/L	<5.0	---	---	---	<5.0	---	---	---
C10 - C16 Fraction	W-TPHFID02	10	µg/L	<10	---	---	---	<10	---	---	---
C10 - C40 Fraction	W-TPHFID01	50	µg/L	<50	---	---	---	<50	---	---	---
C12 - C16 Fraction	W-TPHFID01	5	µg/L	<5.0	---	---	---	<5.0	---	---	---
C16 - C22 Fraction	W-TPHFID02	10	µg/L	<10	---	---	---	<10	---	---	---
C16 - C35 Fraction	W-TPHFID01	30	µg/L	<30	---	---	---	<30	---	---	---
C22 - C30 Fraction	W-TPHFID02	15	µg/L	<15	---	---	---	<15	---	---	---
C30 - C40 Fraction	W-TPHFID02	15	µg/L	<15	---	---	---	<15	---	---	---
C35 - C40 Fraction	W-TPHFID01	10	µg/L	<10	---	---	---	<10	---	---	---
Sum of Aliphates C10-C35	W-SPIGMS04	30	µg/L	<30	---	---	---	<30	---	---	---
Sum of Aromatics C10-C18	W-SPIGMS04	1.55	µg/L	<1.55	---	---	---	<1.55	---	---	---
Sum of Aromatics C8-C10	W-SPIGMS04	0.6	µg/L	<0.60	---	---	---	<0.60	---	---	---

If no sampling time is provided the sampling time will default to 00:00:00 the date of sampling. If no sampling date is provided, delivery date in brackets without a time component will be displayed instead. 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 Horle 336/9 Prague 9 - Vyzocany Czech Republic 190 00
W-ANI-ENV	CZ_SOP_D06_02_068 (CSN ISO 10304-1, CSN EN 16192) 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 including the calculation of total mineralization.
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_076 A / CZ_SOP_D06_07_040 Determination of chemical oxygen demand using dichromate (COD-Cr) by titration (based on CSN ISO 6060, CSN ISO 15705).
W-HG-AFSFL	CZ_SOP_D06_02_090 (US EPA 245.7, CSN EN ISO 178 52, CSN EN 16192, samples prepared as per CZ_SOP_D06_02_022 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 18192, US EPA 8010, SM 3120, CSN 75 7358 samples prepared as per CZ_SOP_D06_02_002 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, SM 4500-NH2(-), SM 4500-NH3(-)) Determination of sum of ammonium and ammonium ions, nitrite and the sum of nitrite and nitrate ions by discrete spectrophotometry and determination of nitrite, nitrate, ammonia, inorganic, organic, total nitrogen, free ammonia and dissociated ammonium ions by calculation from measured values including the calculation of total mineralization.
W-PCBECD01	CZ_SOP_D06_03_166 (DIN 38407, part 2, US EPA 8082, samples prepared as per 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 9.2 (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, US EPA 8015, US EPA 3510, TNRCC Method 1006) Determination of extractable compounds in the range of hydrocarbons C10- C40, 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, US EPA 8015, US EPA 3510, TNRCC Method 1006) Determination of extractable compounds in the range of hydrocarbons C10- C40, their fractions calculated from the measured values by gas chromatography method with FID detection.

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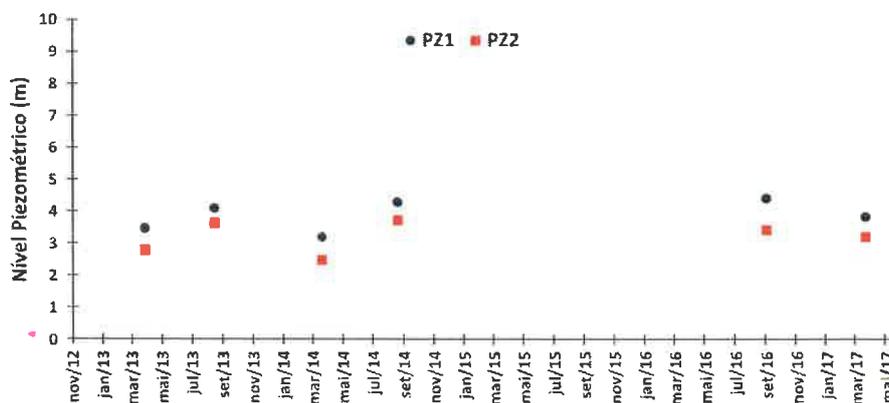


Analytical Methods	Method Descriptions
W-TPH-IR	CZ_SOP_D06_02_057 Determination of nonpolar extractable substances by infrared spectrometry and determination of polar extractable substances by calculation from measured values (based on CSN 75 7505:2006, STN 830540-4.)
W-VOCGMS01	CZ_SOP_D06_03_155 except chap. 10.5, 10.6 (US EPA 624, US EPA 8260, US EPA 8015, EN ISO 10301, MADEP 2004, rev. 1.1, ISO 11423, ISO 15680) 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. 10.5, 10.6 (US EPA 624, US EPA 8260, US EPA 8015, EN ISO 10301, MADEP 2004, rev. 1.1, ISO 11423, ISO 15680) Determination of volatile organic compounds by gas chromatography method with FID and MS detection and calculation of volatile organic compounds sums from measured values

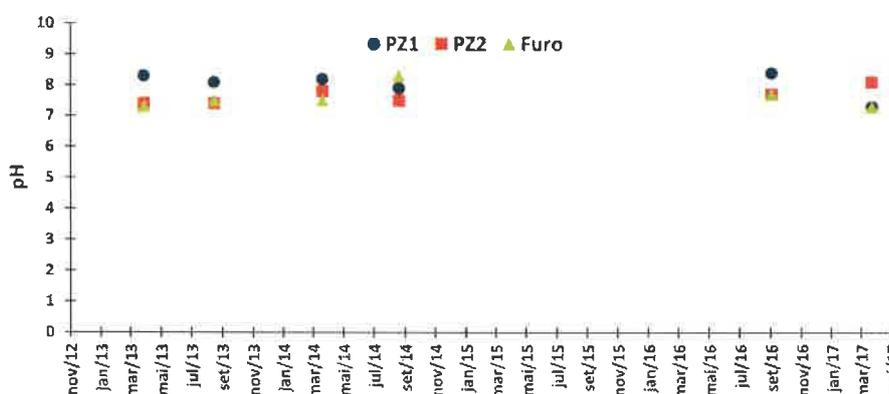
A '\*' symbol preceding any method indicates non-accredited test. In the case when a procedure belonging to an accredited method was used for non-accredited matrix, would apply that the reported results are non-accredited. Please refer to General Comment section on front page for information.

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

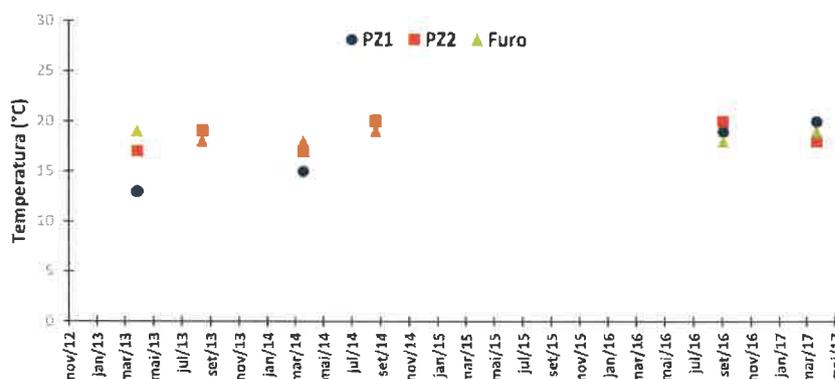
**Gráficos temporais dos valores individuais determinados nas 3 campanhas de monitorização: novembro de 2012 a agosto de 2017**



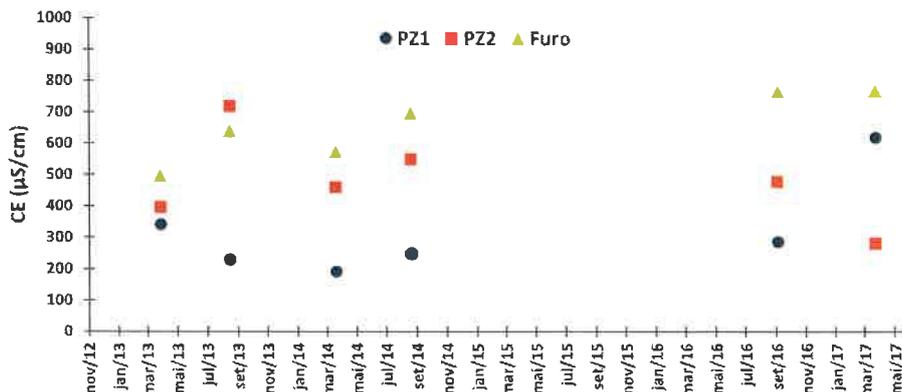
Valores individuais de nível piezométrico determinados nos pontos PZ1 e PZ2.



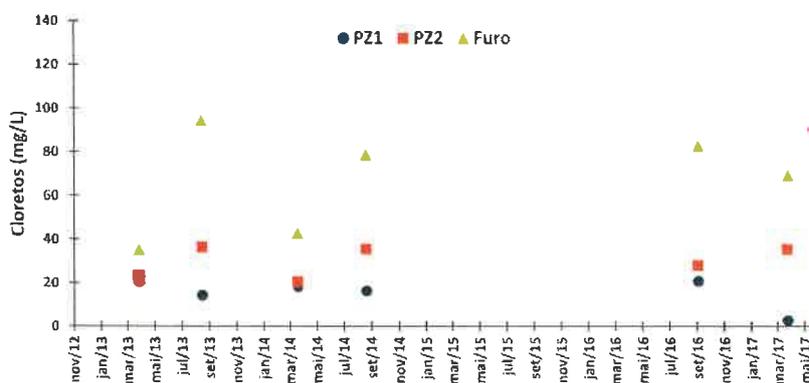
Valores individuais de pH determinados nas amostras de água recolhidas nos pontos PZ1, PZ2 e Furo de captação.



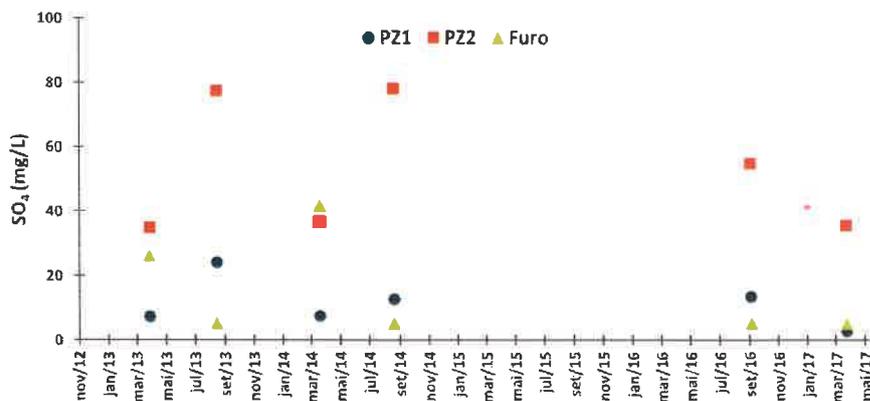
Valores individuais de Temperatura determinados nas amostras de água recolhidas nos pontos PZ1, PZ2 e Furo de captação



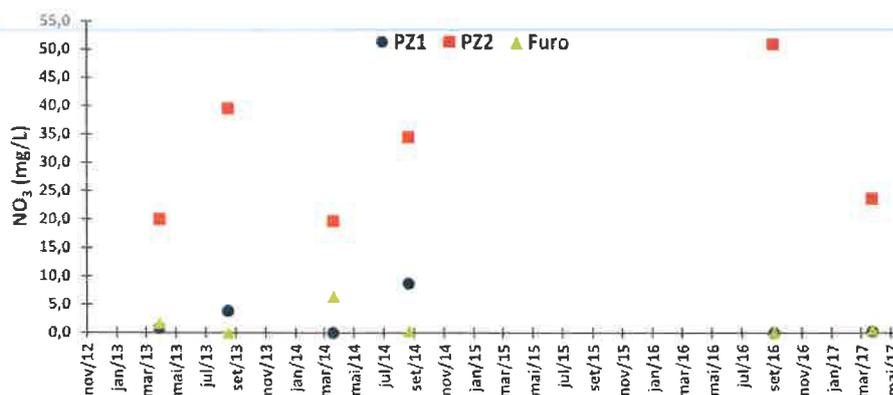
Valores individuais de Condutividade Elétrica determinados nas amostras de água recolhidas pontos PZ1, PZ2 e Furo de captação.



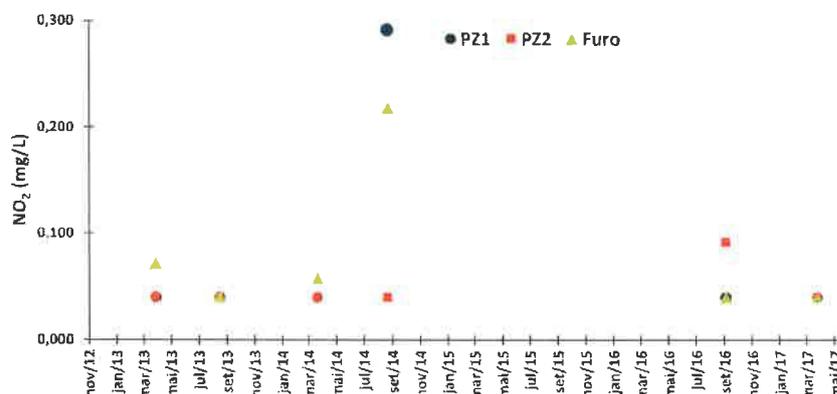
Valores individuais de Clorretos determinados nas amostras de água recolhidas nos pontos PZ1, PZ2 e Furo de captação.



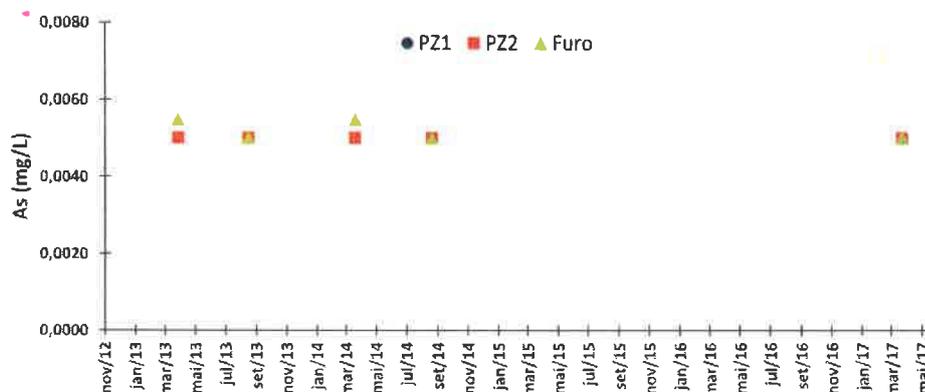
Valores individuais de Sulfato determinados nas amostras de água recolhidas nos pontos PZ1, PZ2 e Furo de captação.



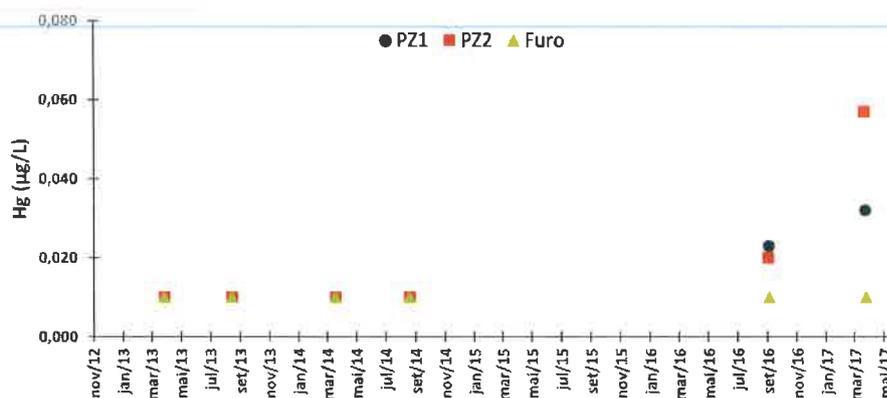
Valores individuais de Nitrato determinados nas amostras de água recolhidas nos pontos PZ1, PZ2 e Furo de captação.



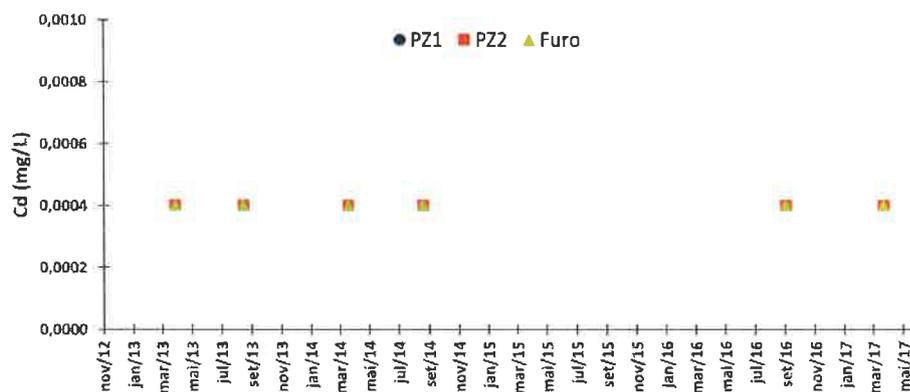
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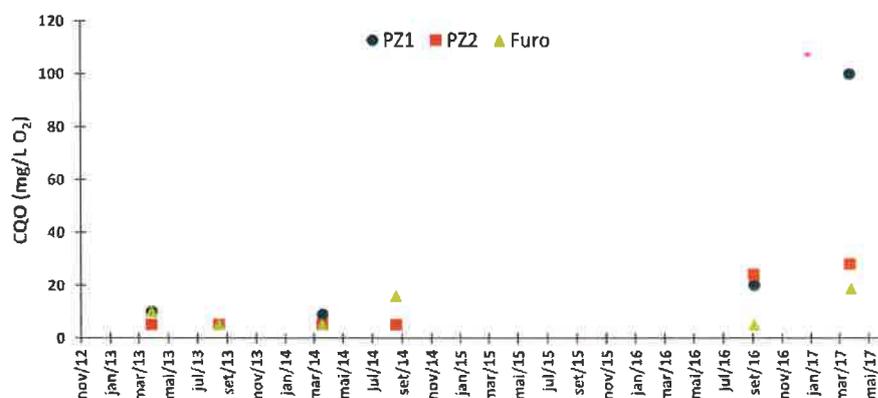
Valores individuais de Arsênio determinados nas amostras de água recolhidas nos pontos PZ1, PZ2 e Furo de captação.



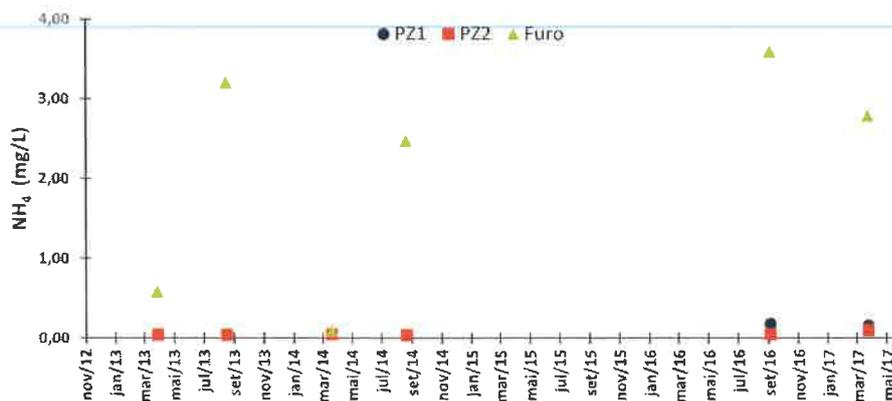
Valores individuais de Mercúrio determinados nas amostras de água recolhidas nos pontos PZ1, PZ2 e Furo de captação.



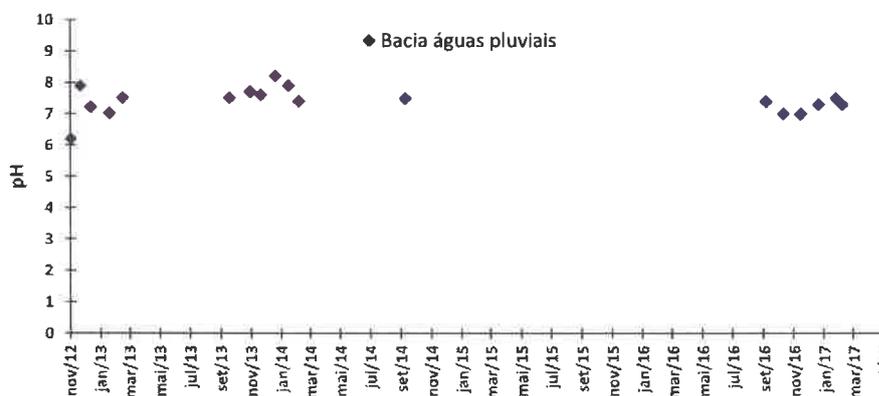
Valores individuais de Cádmi determinados nas amostras de água recolhidas nos pontos PZ1, PZ2 e Furo de captação.



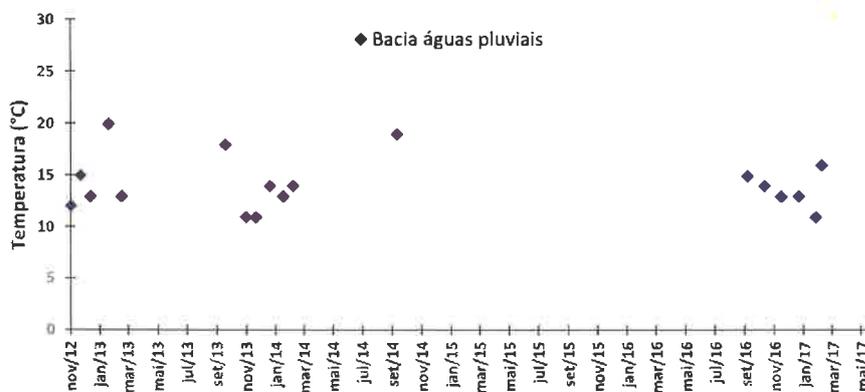
Valores individuais de CQO determinados nas amostras de água recolhidas nos pontos PZ1, PZ2 e Furo de captação.



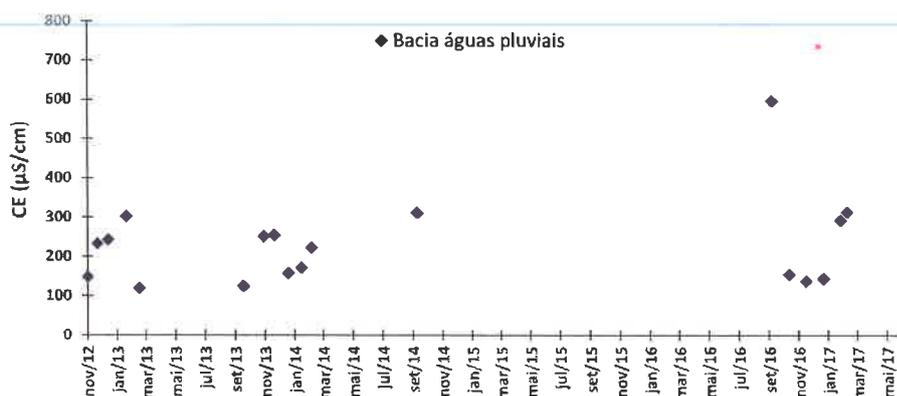
Valores individuais de Amónia determinados nas amostras de água recolhidas nos pontos PZ1, PZ2 e Furo de captação.



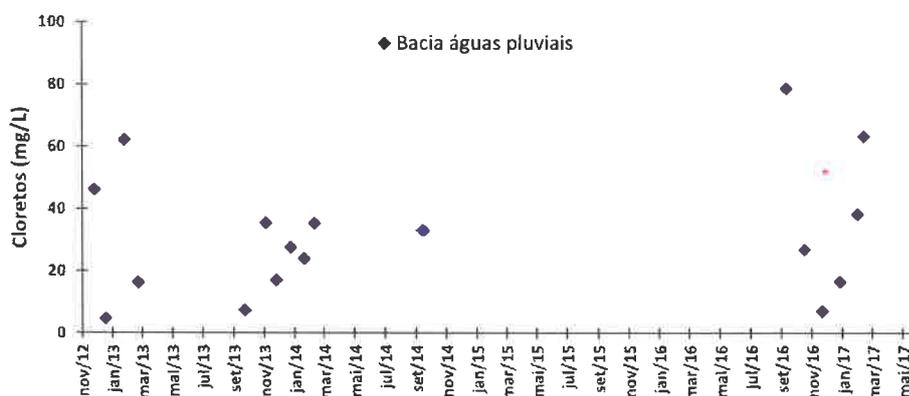
Valores individuais de pH determinados nas amostras de água recolhidas no ponto Bacia de Águas Pluviais.



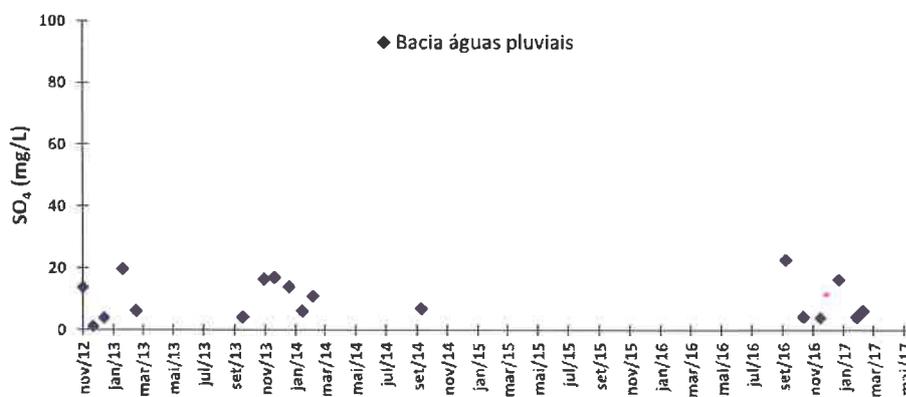
Valores individuais de pH determinados nas amostras de água recolhidas no ponto Bacia de Águas Pluviais.



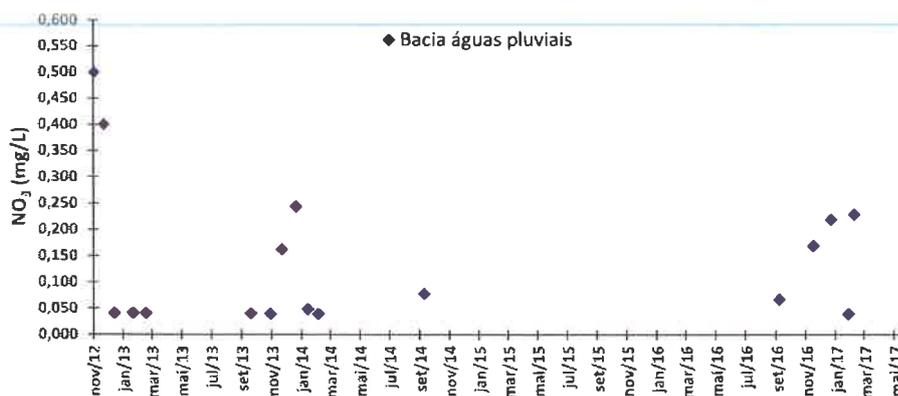
Valores individuais de Temperatura determinados nas amostras de água recolhidas no ponto Bacia de Águas Pluviais.



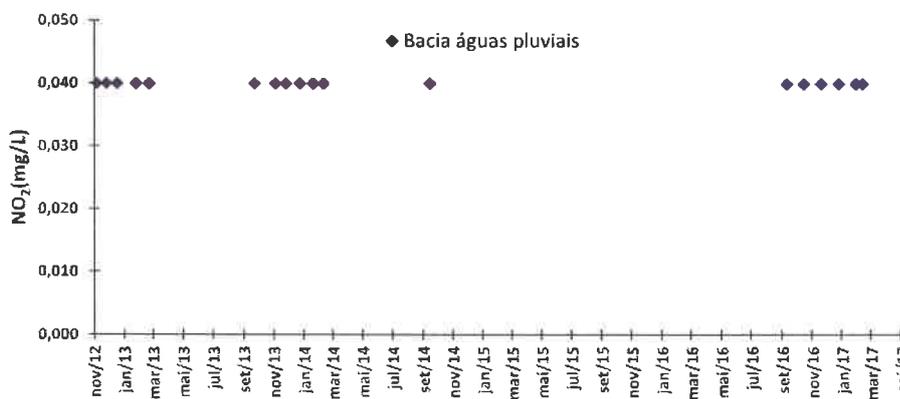
Valores individuais de Cloreto determinados nas amostras de água recolhidas no ponto Bacia de Águas Pluviais.



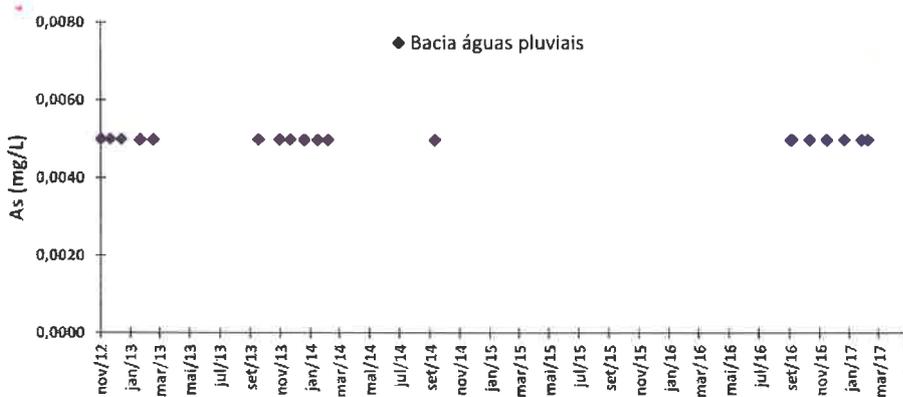
Valores individuais de Sulfato determinados nas amostras de água recolhidas no ponto Bacia de Águas Pluviais.



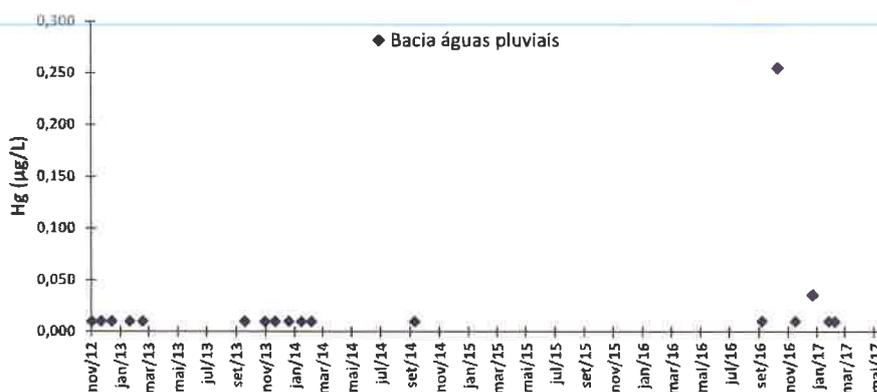
Valores individuais de Nitrato determinados nas amostras de água recolhidas no ponto Bacia de Águas Pluviais.



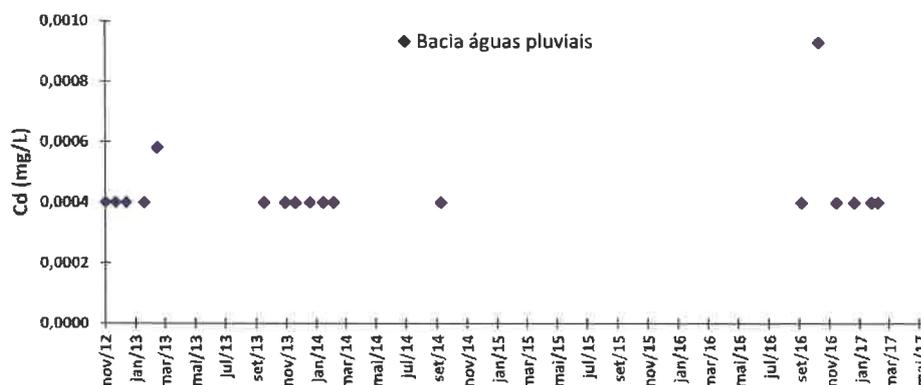
Valores individuais de Nitrato determinados nas amostras de água recolhidas no ponto Bacia de Águas Pluviais.



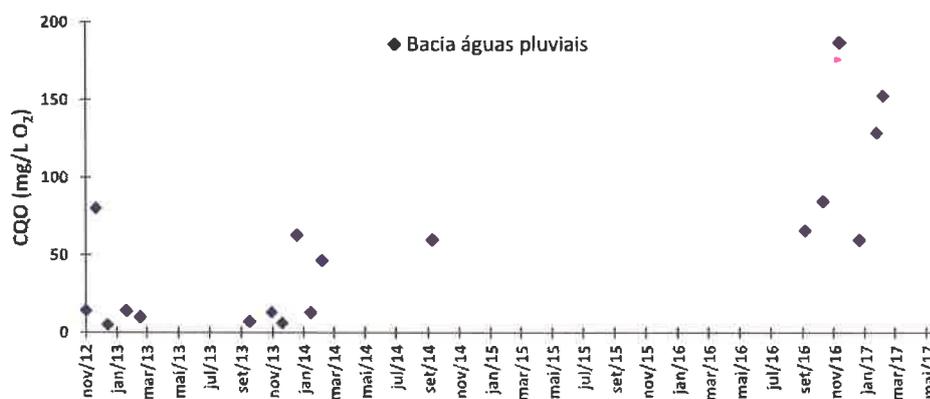
Valores individuais de Arsénio determinados nas amostras de água recolhidas no ponto Bacia de Águas Pluviais.



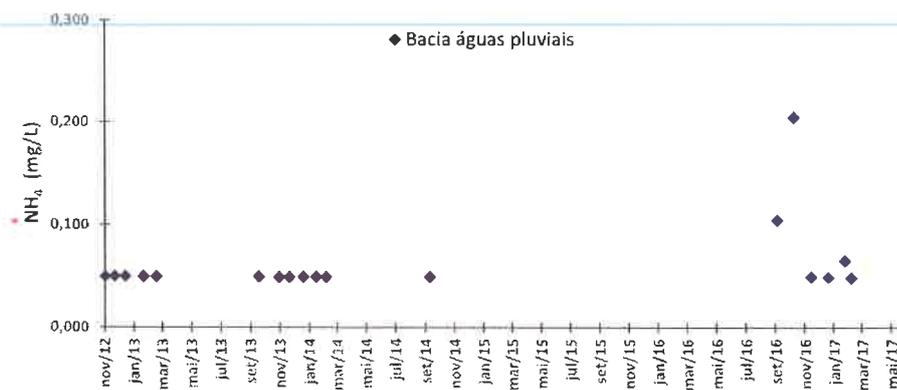
Valores individuais de Mercúrio determinados nas amostras de água recolhidas no ponto Bacia de Águas Pluviais.



Valores individuais de Cádmi determinados nas amostras de água recolhidas no ponto Bacia de Águas Pluviais.



Valores individuais de CQO determinados nas amostras de água recolhidas no ponto Bacia de Águas Pluviais entre novembro de 2012 e abril de 2017.



Valores individuais de NH<sub>4</sub> determinados nas amostras de água recolhidas no ponto Bacia de Águas Pluviais.

