

## APPENDIX A - On Site Material Sampling and Waste Consignment Permits



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sampling plan power  
station.pdf



Waste Consignment  
Permit No CP 8027.pc

**Waste Consignment Permit No: CP 8027**

20 May 2015



**Catherine Halpin  
obo Electrogas Malta Ltd  
Level 3  
Portomaso Buisness Tower  
St Julians**

### **PERMIT TO TRANSFER WASTE EXCAVATED MATERIAL**

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By virtue of the powers conferred by Legal Notice 184 of 2011 the Waste Management Regulations of 2011, the Malta Environment and Planning Authority hereby grants you a permit to transfer material excavated from the seabed (EWC Code 17 05 06) resulting from the construction of the Delimara Power Station to the off-shore spoil grounds located at 35°55.1' N, 014°34'E (outside the Grand Harbour), as indicated in PA 21/2014. This permit is subject to the following conditions:

1. The holder of this permit shall prevent any contraventions to the above mentioned regulations by any other person in the management of the waste originally produced and held by him.
2. The holder of this permit shall prevent escape of this waste from his control or that of any other person.
3. The holder of this permit is to ensure that waste is safely stored and presented for collection, safely contained.
4. The holder of this permit shall be legally responsible and accountable to ensure that the waste production or management activity for which he has been granted a permit is carried out in accordance with the above mentioned regulations as well as with any conditions stipulated in this permit.
5. The Malta Environment and Planning Authority is to be informed prior to the start of disposal operations;
6. This permit does not exempt the holder from obtaining any other permits which may be necessary;
7. The holder of this permit shall ensure that all possible measures to avoid any harm to the environment are taken.
8. The holder of this permit is responsible for any damage to the environment resulting from disposal of the said material.
9. No material other than the excavated material of approximately 20,500 Tonnes as indicated in Consignment Permit CP 8027 is to be deposited at off-shore spoil grounds.
10. The material shall be disposed of at the site indicated above (the disposal vessel should be equipped with accurate positioning systems).

11. The operation shall be supervised by a fit and proper person.
12. Consignment Notes (CN) forms must be filled properly and should be e-mailed on [contact.cn@mepa.org.mt](mailto:contact.cn@mepa.org.mt) prior to each consignment.
13. By virtue of the powers conferred by Legal Notice 128 of 1997 Deposit of Wastes and Rubble (Fees) Regulations 1997 article 9, a payment of €3.73 per metric tonne of material to be disposed is to be paid.
14. All barge loading operations shall be supervised by a monitoring consultant who should be present during the loading of all barges. The monitoring consultant should be identified and submitted for approval by MEPA prior to the commencement of any disposal operations.
15. The expenses incurred in adhering to condition 14 above shall be borne by the developer; i.e. Electrogas Malta Ltd.
16. The monitoring report which should be compiled by the monitoring consultant shall include data regarding the amount of inert waste loaded on each and every barge, the time of loading and the name of the vessel transporting the waste to the offshore spoil ground.
17. The monitoring consultant shall ensure that only the excavated material of approximately 20,500 Tonnes as indicated in Consignment Permit CP 8027 for which tests have been carried out, is to be disposed at sea.
18. If the dumping of the waste causes damage that was not anticipated when the permit was granted, or if the conditions of this permit are not adhered to, the Malta Environment and Planning Authority reserves the right to temporarily suspend this permit. If the damage is not remedied or if the conditions of this permit or rules are not complied with, the Malta Environment and Planning Authority reserves the right to withdraw the permit.
19. The data mentioned in condition 15 should reach Unit D from the Environment Protection Directorate on [contact.cn@mepa.org.mt](mailto:contact.cn@mepa.org.mt) periodically i.e. every 15 days;
20. Such records are to be retained by the permit holder for a minimum of three years.

**This permit is valid until 31 December 2015, provided that the relevant consignment notes (CN) cover each consignment.**

Regards,



**Kevin MERCIECA**  
*Unit D Manager*  
MEPA

29th January 2015

To whom it may concern:

SBL has been engaged by Joint Venture MEPP, the Contractor at the New Power Station in Delimara, to sample the waste material from the said cordoned off site.

Being an accredited laboratory, SBL has taken samples from the site in accordance to EN 14889:2005. The attached Sampling Form refers.

It is thus certified that the test samples undertaken at the accredited ALS Czech Republic s.r.o is accredited for. This is thus the chemical analysis on the sampled material from the Delimara Power Station. Attached please find a full chemical analysis based on the requirements for the National Authority governing such activities, MEPA.



Perit Joe Bugeja

Obo Solidbase Laboratory





## Sampling Plan and Sampling Preparation according to MSA EN 14899:2005

### Sampling Plan

#### GENERAL INFORMATION

Sampling Plan completed by:	Perit Joe Bugeja	On behalf of:	MEPP
Client Contact:	Perit David Cassar	Material allocation contact:	Perit David Cassar
Other parties involved:	None		
Sampling to be carried out by:	Solidbase Ltd	Name of sampler:	Tech Chris Azzopardi

#### SAMPLING OBJECTIVE

Establishing material characterization for possibility of discarding and use as subbase material

#### SAMPLING APPROACH

Justify sampling method:	Probabilistic sampling		
MATERIAL	General fill and Excavated material		
Type of material:	Granular and humid	Location:	Site: Delimara Power Station
Source of material:	Delimara Power Station		
Methods to produce material:	Sampling from 1 distinct pile		

#### SAMPLING METHODOLOGY

Specify sampling location:	loc 1-Top of heap of backfill material, loc 2-Bottom of heap of backfill, loc 3- Top, loc-4 - Bottom
Consignment to be sampled:	1 pile or heap
Point of sampling:	different heights of heap
Sampling time and date:	23/12/2015 in the afternoon
Persons present for sampling:	SBL tech Chris Azzopardi and site engineer perit David Cassar
Sampling technique:	Exposing material at 100mm from the surface of each heap and using a scoop
Equipment identity:	2 ltr scoop
Specific number of increments:	13
Specific size of increments:	2 kgs

#### DETAIL REQUIREMENTS FOR ON SITE DETERMINATIONS

As per sampling plan provided by perit David Cassar

#### IDENTIFY SAMPLE CODING METHODOLOGY

Identify precautions	As per sampling plan
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#### SUB SAMPLING

Using of a 100mm riffle box. Broke down sample from 30 kgs to 5 kgs

#### PACKAGING, PRESERVATION, STORAGE AND TRANSPORT REQUIREMENTS

Packaging	One side that is open ended.3mm plastic bag
Preservation	Boxed after closing off in plastic bags
Storage	At SBL laboratory
Transport	Tech Oswald Mifsud delivered the 4 samples to Reuben Sciortino
Analytical Laboratory	ENVIRONMENTAL MONITORING SERVICES LTD of ALS GROUP
Company Details	ALS Group, Na Harle, 336/9 Prague - Vysocany Czech Republic



## Sampling Record

### RECORD

Sampling date: 23/12/2015  
Operative: Tech Willred Brincat

### GENERAL INFORMATION

Waste producer: NA On behalf of: MEPP  
Location of sampling: Delimara Power Station Carried out by: SBL

### SAMPLING OBJECTIVE

Type of material: GRANULAR MATERIAL EXCAVATED FROM SAME SITE - DELIMARA POWER STATION  
Material description: GRANULAR MATERIAL OF DIFFERENT COLOURS AND HUMIDITY

### SAMPLING METHODOLOGY

Define consignment sampled: 1 pile or heap  
Place, point of sampling: Locations 1 through to location 4  
Access problems: No  
Date, time of sampling: 23/12/2015 afternoon  
Witness to sampling: Perit David Cassar  
Procedure adopted: Probabilistic  
Equipment used: 2 ltr scoop and plastic bags  
Number of increments: 13  
Increment size: 2 kgs  
Observations: Different colours and consistence

### DETAIL REQUIREMENTS FOR ON SITE DETERMINATIONS

Identify precautions: Defined by locations and scope

### SAMPLE PRETREATMENT

AS FOUND

### SUB SAMPLING

Use of 100mm riffle box to downsize from around 30 kgs to 5 kgs

### PACKAGING, PRESERVATION, STORAGE AND TRANSPORT REQUIREMENTS

Packaging: 3mm plastic bags and use of cable ties to retain consistence  
Preservation: Kept samples separated at all stages  
Storage: Bagged and boxed after riffling  
Transport: From SBL to Ruben Sciortino by Roberto Bugeja by car  
Analytical Laboratory: ENVOIRENMENTAL MONITORING SERVICES LTD of ALS GROUP  
Company Details: ALS Group, Na Harfe, 336/9 Prague - Vysocany Czech Republic

### CHAIN OF CUSTODY

Sample release date: 23/12/2015 Released to: Reuben Sciortino Delivered by: SBL O. Mifsud Signed off: Yes















## CERTIFICATE OF ANALYSIS

Work Order	: PR1600595	Issue Date	: 21-JAN-2016
Client	: Environmental Monitoring Services Limited	Laboratory	: ALS Czech Republic, s.r.o.
Contact	: Dr. George Peplow	Contact	: Client Service
Address	: Sorenson Triq Danny Cremona Hamrun Malta HMR 1513	Address	: Na Harfe 336/9 Prague 9 - Vysocany Czech Republic 190 00
E-mail	: peplowg@gmail.com	E-mail	: customer.support@alsglobal.com
Telephone	: +356 9947 0204	Telephone	: +420 226 226 228
Facsimile	: ---	Facsimile	: +420 284 081 635
Project	: Rock Samples for Analysis	Page	: 1 of 7
Order number	: ---	Date Samples Received	: 07-JAN-2016
C-O-C number	: ---	Quote number	: PR2015ENMON-MT0001
Site	: ---	Date of test	: 11-JAN-2016 - 20-JAN-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.  
Sample(s) PR1600595/001,003, method S-TPHFID01 - contain(s) high-boiling hydrocarbons with retention time higher than retention time of C40.  
Sample(s) PRXXX/XXX, method S-TOC-CC - lower LOR for TOC cannot be reached due to the comparable concentrations of TC and TIC.  
Methods S-TC-COU, S-TIC-COU, S-TOC-CC - samples were dried at 105 °C and pulverized before analysis.

### Responsible for accuracy

#### Signatories

Zdenek Jirak



#### Position

Environmental Business Unit  
Manager

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



ALS Czech Republic, s.r.o.

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





## Analytical Results

Sub-Matrix: ROCK

Client sample ID  
Laboratory sample ID  
Client sampling date / time

				Top		Bottom		Top of Heap	
				PR1600595001		PR1600595002		PR1600595003	
				07-JAN-2016 00:00		07-JAN-2016 00:00		07-JAN-2016 00:00	
Parameter	Method	LOR	Unit	Result	MU	Result	MU	Result	MU
<b>Physical Parameters</b>									
Dry matter @ 105°C	S-DRY-GRCI	0.10	%	74.5	±6.0 %	81.4	±6.0 %	73.6	±6.0 %
<b>Nonmetallic Inorganic Parameters</b>									
Total Organic Carbon	S-TOC-CC	0.010	% DW	<1.41	---	<1.41	---	<1.41	---
<b>Total Metals / Major Cations</b>									
Antimony	I-SB-ICPS	5.0	mg/kg DW	<5.0	---	<5.0	---	<5.0	---
Barium	I-BA-ICPS	0.50	mg/kg DW	51.8	±20.0 %	42.4	±20.0 %	24.1	±20.0 %
Cadmium	I-CD-ICPS	0.40	mg/kg DW	<0.40	---	<0.40	---	<0.40	---
Calcium	I-CA-ICPS	0.10	mg/kg DW	153000	±20.0 %	212000	±20.0 %	95700	±20.0 %
Chromium	I-CR-ICPS	0.50	mg/kg DW	33.1	±20.0 %	33.6	±20.0 %	27.8	±20.0 %
Cobalt	I-CO-ICPS	0.50	mg/kg DW	1.55	±24.4 %	1.33	±25.7 %	1.07	±28.4 %
Lead	I-PB-ICPS	5.0	mg/kg DW	<5.0	---	<5.0	---	<5.0	---
Molybdenum	I-MO-ICPS	0.50	mg/kg DW	9.48	±20.1 %	5.18	±20.4 %	5.81	±20.3 %
Nickel	I-NI-ICPS	0.50	mg/kg DW	17.8	±20.0 %	20.1	±20.0 %	19.9	±20.0 %
Selenium	I-SE-ICPS	5.0	mg/kg DW	<5.0	---	<5.0	---	<5.0	---
Silicon	I-SI-ICPS	5.0	mg/kg DW	378000	±20.0 %	198000	±20.0 %	221000	±20.0 %
Vanadium	I-V-ICPS	0.2	mg/kg DW	27.0	±20.0 %	21.4	±20.0 %	25.5	±20.0 %
Zinc	I-ZN-ICPS	0.50	mg/kg DW	25.5	±20.0 %	41.1	±20.0 %	42.8	±20.0 %
<b>BTEX</b>									
Benzene	S-VOCFID1	0.10	mg/kg DW	<0.10	---	<0.10	---	<0.10	---
Toluene	S-VOCFID1	0.10	mg/kg DW	<0.10	---	<0.10	---	<0.10	---
Ethylbenzene	S-VOCFID1	0.10	mg/kg DW	<0.10	---	<0.10	---	<0.10	---
meta- & para-Xylene	S-VOCFID1	0.120	mg/kg DW	<0.120	---	<0.120	---	<0.120	---
ortho-Xylene	S-VOCFID1	0.060	mg/kg DW	<0.060	---	<0.060	---	<0.060	---
Sum of BTEX	S-VOCFID1	0.480	mg/kg DW	<0.480	---	<0.480	---	<0.480	---
Sum of xylenes	S-VOCFID1	0.180	mg/kg DW	<0.180	---	<0.180	---	<0.180	---
<b>Polycyclic Aromatics Hydrocarbons (PAHs)</b>									
Naphthalene	S-SMVGMS01	0.010	mg/kg DW	0.028	±30.0 %	<0.010	---	0.055	±30.0 %
Acenaphthylene	S-SMVGMS01	0.010	mg/kg DW	<0.010	---	<0.010	---	<0.010	---
Acenaphthene	S-SMVGMS01	0.010	mg/kg DW	<0.010	---	<0.010	---	<0.010	---
Fluorene	S-SMVGMS01	0.010	mg/kg DW	0.011	±30.0 %	<0.010	---	0.022	±30.0 %
Phenanthrene	S-SMVGMS01	0.010	mg/kg DW	0.030	±30.0 %	<0.010	---	0.052	±30.0 %
Anthracene	S-SMVGMS01	0.010	mg/kg DW	<0.010	---	<0.010	---	<0.010	---
Fluoranthene	S-SMVGMS01	0.010	mg/kg DW	<0.010	---	0.019	±30.0 %	<0.010	---
Pyrene	S-SMVGMS01	0.010	mg/kg DW	<0.010	---	0.018	±30.0 %	0.012	±30.0 %
Benz(a)anthracene	S-SMVGMS01	0.010	mg/kg DW	<0.010	---	<0.010	---	<0.010	---
Chrysene	S-SMVGMS01	0.010	mg/kg DW	<0.010	---	0.012	±30.0 %	<0.010	---
Benzo(b)fluoranthene	S-SMVGMS01	0.010	mg/kg DW	<0.010	---	0.013	±30.0 %	<0.010	---
Benzo(k)fluoranthene	S-SMVGMS01	0.010	mg/kg DW	<0.010	---	<0.010	---	<0.010	---
Benzo(a)pyrene	S-SMVGMS01	0.010	mg/kg DW	<0.010	---	0.011	±30.0 %	<0.010	---
Indeno(1,2,3-cd)pyrene	S-SMVGMS01	0.010	mg/kg DW	<0.010	---	<0.010	---	<0.010	---
Benzo(g,h,i)perylene	S-SMVGMS01	0.010	mg/kg DW	<0.010	---	<0.010	---	<0.010	---
Dibenz(a,h)anthracene	S-SMVGMS01	0.010	mg/kg DW	<0.010	---	<0.010	---	<0.010	---
Sum of 16 PAH	S-SMVGMS01	0.160	mg/kg DW	<0.160	---	<0.160	---	<0.160	---
<b>PCBs</b>									
PCB 28	S-SMVGMS01	0.0200	mg/kg DW	<0.0200	---	<0.0200	---	<0.0200	---
PCB 52	S-SMVGMS01	0.0200	mg/kg DW	<0.0200	---	<0.0200	---	<0.0200	---
PCB 101	S-SMVGMS01	0.0200	mg/kg DW	<0.0200	---	<0.0200	---	<0.0200	---
PCB 118	S-SMVGMS01	0.0200	mg/kg DW	<0.0200	---	<0.0200	---	<0.0200	---
PCB 138	S-SMVGMS01	0.0200	mg/kg DW	<0.0200	---	<0.0200	---	<0.0200	---
PCB 153	S-SMVGMS01	0.0200	mg/kg DW	<0.0200	---	<0.0200	---	<0.0200	---
PCB 180	S-SMVGMS01	0.0200	mg/kg DW	<0.0200	---	<0.0200	---	<0.0200	---



Sub-Matrix: ROCK

Client sample ID  
Laboratory sample ID  
Client sampling date / time

Sub-Matrix: ROCK	Client sample ID			Top		Bottom		Top of Heap	
	Laboratory sample ID			PR1600595001		PR1600595002		PR1600595003	
	Client sampling date / time			07-JAN-2016 00:00		07-JAN-2016 00:00		07-JAN-2016 00:00	
Parameter	Method	LOR	Unit	Result	MU	Result	MU	Result	MU
PCBs - Continued									
Sum of 6 PCBs	S-SMVGMS01	0.120	mg/kg DW	<0.120	----	<0.120	----	<0.120	----
Sum of 7 PCBs	S-SMVGMS01	0.140	mg/kg DW	<0.140	----	<0.140	----	<0.140	----
Petroleum Hydrocarbons									
C10 - C40 Fraction	S-TPHFID01	20	mg/kg DW	310	±30.0 %	26	±30.0 %	163	±30.0 %

Sub-Matrix: ROCK

Client sample ID  
Laboratory sample ID  
Client sampling date / time

Parameter	Method	LOR	Unit	Bottom of Heap					
				PR1600595004					
				07-JAN-2016 00:00					
Result	MU	Result	MU	Result	MU	Result	MU	Result	MU
<b>Physical Parameters</b>									
Dry matter @ 105°C	S-DRY-GRCI	0.10	%	81.7	±5.0 %				
<b>Nonmetallic Inorganic Parameters</b>									
Total Organic Carbon	S-TOC-CC	0.010	% DW	<1.41	----				
<b>Total Metals / Major Cations</b>									
Antimony	I-SB-ICPS	5.0	mg/kg DW	<5.0	----				
Barium	I-BA-ICPS	0.50	mg/kg DW	84.0	±20.0 %				
Cadmium	I-CD-ICPS	0.40	mg/kg DW	<0.40	----				
Calcium	I-CA-ICPS	0.10	mg/kg DW	237000	±20.0 %				
Chromium	I-CR-ICPS	0.50	mg/kg DW	29.1	±20.0 %				
Cobalt	I-CO-ICPS	0.50	mg/kg DW	1.52	±24.5 %				
Lead	I-PB-ICPS	5.0	mg/kg DW	<5.0	----				
Molybdenum	I-MO-ICPS	0.50	mg/kg DW	4.18	±20.6 %				
Nickel	I-NI-ICPS	0.50	mg/kg DW	18.8	±20.0 %				
Selenium	I-SE-ICPS	5.0	mg/kg DW	<5.0	----				
Silicon	I-SI-ICPS	5.0	mg/kg DW	130000	±20.0 %				
Vanadium	I-V-ICPS	0.2	mg/kg DW	21.3	±20.0 %				
Zinc	I-ZN-ICPS	0.50	mg/kg DW	42.4	±20.0 %				
<b>BTEX</b>									
Benzene	S-VOCFID1	0.10	mg/kg DW	<0.10	----				
Toluene	S-VOCFID1	0.10	mg/kg DW	<0.10	----				
Ethylbenzene	S-VOCFID1	0.10	mg/kg DW	<0.10	----				
meta- & para-Xylene	S-VOCFID1	0.120	mg/kg DW	<0.120	----				
ortho-Xylene	S-VOCFID1	0.060	mg/kg DW	<0.060	----				
Sum of BTEX	S-VOCFID1	0.480	mg/kg DW	<0.480	----				
Sum of xylenes	S-VOCFID1	0.180	mg/kg DW	<0.180	----				
<b>Polycyclic Aromatics Hydrocarbons (PAHs)</b>									
Naphthalene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----				
Acenaphthylene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----				
Acenaphthene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----				
Fluorene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----				
Phenanthrene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----				
Anthracene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----				
Fluoranthene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----				
Pyrene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----				
Benz(a)anthracene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----				
Chrysene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----				
Benzo(b)fluoranthene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----				
Benzo(k)fluoranthene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----				
Benzo(a)pyrene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----				
Indeno(1,2,3-cd)pyrene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----				
Benzo(g,h,i)perylene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----				



Sub-Matrix: ROCK

Client sample ID  
Laboratory sample ID  
Client sampling date / time

Bottom of Heap			
PR1600595004			
07-JAN-2016 00:00			
Parameter	Method	LOR	Unit
Result	MU		
Polycyclic Aromatics Hydrocarbons (PAHs) - Continued			
Dibenz(a,h)anthracene	S-SMVGMS01	0.010	mg/kg DW
Sum of 16 PAH	S-SMVGMS01	0.160	mg/kg DW
PCBs			
PCB 28	S-SMVGMS01	0.0200	mg/kg DW
PCB 52	S-SMVGMS01	0.0200	mg/kg DW
PCB 101	S-SMVGMS01	0.0200	mg/kg DW
PCB 118	S-SMVGMS01	0.0200	mg/kg DW
PCB 138	S-SMVGMS01	0.0200	mg/kg DW
PCB 153	S-SMVGMS01	0.0200	mg/kg DW
PCB 180	S-SMVGMS01	0.0200	mg/kg DW
Sum of 6 PCBs	S-SMVGMS01	0.120	mg/kg DW
Sum of 7 PCBs	S-SMVGMS01	0.140	mg/kg DW
Petroleum Hydrocarbons			
C10 - C40 Fraction	S-TPHFID01	20	mg/kg DW
26	±30.0 %		

Sub-Matrix: LEACHATE

Client sample ID  
Laboratory sample ID  
Client sampling date / time

Top		Bottom		Top of Heap	
PR1600595001		PR1600595002		PR1600595003	
07-JAN-2016 00:00		07-JAN-2016 00:00		07-JAN-2016 00:00	
Parameter	Method	LOR	Unit	Result	MU
Result	MU	Result	MU	Result	MU
Aggregate Parameters					
Dissolved Organic Carbon	W-DOC-IR	10.0	mg/kg DW	34.1	±20.0 %
Phenol Index	W-PHI-PHO	0.05	mg/kg DW	<0.05	---
Nonmetallic Inorganic Parameters					
Chloride	W-CL-IC	10.0	mg/kg DW	3640	±15.0 %
Fluoride	W-F-IC	2.00	mg/kg DW	8.01	±15.0 %
Sulphate as SO4 2-	W-SO4-IC	50.0	mg/kg DW	3620	±15.0 %
Dissolved solids dried at 105 °C	W-TDS-GR	100	mg/kg DW	10600	±9.7 %
Total Metals / Major Cations					
Antimony	W-METMSFX1	0.010	mg/kg DW	0.066	±10.0 %
Arsenic	W-METMSFX1	0.050	mg/kg DW	<0.050	---
Barium	W-METMSFX2	0.050	mg/kg DW	0.399	±10.0 %
Cadmium	W-METMSFX1	0.0100	mg/kg DW	<0.0100	---
Chromium	W-METMSFX1	0.050	mg/kg DW	<0.050	---
Copper	W-METMSFX2	0.050	mg/kg DW	<0.050	---
Lead	W-METMSFX1	0.050	mg/kg DW	<0.050	---
Mercury	W-HG-AFSFX	0.00100	mg/kg DW	<0.00100	---
Molybdenum	W-METMSFX1	0.050	mg/kg DW	1.41	±10.0 %
Nickel	W-METMSFX1	0.050	mg/kg DW	0.071	±10.0 %
Selenium	W-METMSFX1	0.050	mg/kg DW	<0.050	---
Zinc	W-METMSFX2	0.050	mg/kg DW	0.108	±10.0 %

Sub-Matrix: LEACHATE

Client sample ID  
Laboratory sample ID  
Client sampling date / time

Bottom of Heap			
PR1600595004			
07-JAN-2016 00:00			
Parameter	Method	LOR	Unit
Result	MU		
Aggregate Parameters			
Dissolved Organic Carbon	W-DOC-IR	10.0	mg/kg DW
Phenol Index	W-PHI-PHO	0.05	mg/kg DW
Nonmetallic Inorganic Parameters			
Chloride	W-CL-IC	10.0	mg/kg DW
406	±15.0 %		





Sub-Matrix: LEACHATE

Client sample ID

Laboratory sample ID

Client sampling date / time

Bottom of Heap

PR1600595004

07-JAN-2016 00:00

Parameter	Method	LOR	Unit	Result	MU				
<b>Nonmetallic Inorganic Parameters - Continued</b>									
Fluoride	W-F-IC	2.00	mg/kg DW	5.81	±15.0 %	----	----	----	----
Sulphate as SO4 2-	W-SO4-IC	50.0	mg/kg DW	5010	±15.0 %	----	----	----	----
Dissolved solids dried at 105 °C	W-TDS-GR	100	mg/kg DW	6940	±9.7 %	----	----	----	----
<b>Total Metals / Major Cations</b>									
Antimony	W-METMSFX1	0.010	mg/kg DW	<0.010	----	----	----	----	----
Arsenic	W-METMSFX1	0.050	mg/kg DW	<0.050	----	----	----	----	----
Barium	W-METMSFX2	0.050	mg/kg DW	0.426	±10.0 %	----	----	----	----
Cadmium	W-METMSFX1	0.0100	mg/kg DW	<0.0100	----	----	----	----	----
Chromium	W-METMSFX1	0.050	mg/kg DW	<0.050	----	----	----	----	----
Copper	W-METMSFX2	0.050	mg/kg DW	<0.050	----	----	----	----	----
Lead	W-METMSFX1	0.050	mg/kg DW	<0.050	----	----	----	----	----
Mercury	W-HG-AFSFX	0.00100	mg/kg DW	<0.00100	----	----	----	----	----
Molybdenum	W-METMSFX1	0.050	mg/kg DW	0.326	±10.0 %	----	----	----	----
Nickel	W-METMSFX1	0.050	mg/kg DW	0.065	±10.0 %	----	----	----	----
Selenium	W-METMSFX1	0.050	mg/kg DW	<0.050	----	----	----	----	----
Zinc	W-METMSFX2	0.050	mg/kg DW	0.182	±10.0 %	----	----	----	----

If the client does not specify the date and time of sample collection, the laboratory will specify the date on sample delivery in parentheses, instead. If the time of sample collection is specified as 0.00 it means that the client did specify the date but not the time. Measurement uncertainty is expressed as expanded measurement uncertainty with coverage factor  $k = 2$ , representing 95% confidence level.

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

### The end of result part of the certificate of analysis

#### Brief Method Summaries

Analytical Methods	Method Descriptions
Location of test performance: Bendlova 1687/7 Ceska Lipa Czech Republic 470 01	
I-BA-ICPS	CZ_SOP_D06_07_006 (CSN EN ISO 11885 samples prepared as per CZ_SOP_D06_07_P02 chap. 11-12, 14-16, 19) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values.
I-CA-ICPS	CZ_SOP_D06_07_006 (CSN EN ISO 11885 samples prepared as per CZ_SOP_D06_07_P02 chap. 11-12, 14-16, 19) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values.
I-CD-ICPS	CZ_SOP_D06_07_006 (CSN EN ISO 11885 samples prepared as per CZ_SOP_D06_07_P02 chap. 11-12, 14-16, 19) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values.
I-CO-ICPS	CZ_SOP_D06_07_006 (CSN EN ISO 11885 samples prepared as per CZ_SOP_D06_07_P02 chap. 11-12, 14-16, 19) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values.
I-CR-ICPS	CZ_SOP_D06_07_006 (CSN EN ISO 11885 samples prepared as per CZ_SOP_D06_07_P02 chap. 11-12, 14-16, 19) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values.
I-MO-ICPS	CZ_SOP_D06_07_006 (CSN EN ISO 11885 samples prepared as per CZ_SOP_D06_07_P02 chap. 11-12, 14-16, 19) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values.
I-NI-ICPS	CZ_SOP_D06_07_006 (CSN EN ISO 11885 samples prepared as per CZ_SOP_D06_07_P02 chap. 11-12, 14-16, 19) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values.
I-PB-ICPS	CZ_SOP_D06_07_006 (CSN EN ISO 11885 samples prepared as per CZ_SOP_D06_07_P02 chap. 11-12, 14-16, 19) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values.



Analytical Methods	Method Descriptions
I-SB-ICPS	CZ_SOP_D06_07_006 (CSN EN ISO 11885 samples prepared as per CZ_SOP_D06_07_P02 chap. 11-12, 14-16, 19) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values.
I-SE-ICPS	CZ_SOP_D06_07_006 (CSN EN ISO 11885 samples prepared as per CZ_SOP_D06_07_P02 chap. 11-12, 14-16, 19) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values.
I-SI-ICPS	CZ_SOP_D06_07_006 (CSN EN ISO 11885 samples prepared as per CZ_SOP_D06_07_P02 chap. 11-12, 14-16, 19) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values.
I-V-ICPS	CZ_SOP_D06_07_006 (CSN EN ISO 11885 samples prepared as per CZ_SOP_D06_07_P02 chap. 11-12, 14-16, 19) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values.
I-ZN-ICPS	CZ_SOP_D06_07_006 (CSN EN ISO 11885 samples prepared as per CZ_SOP_D06_07_P02 chap. 11-12, 14-16, 19) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values.
S-DRY-GRCI	CZ_SOP_D06_01_045, CZ_SOP_D06_07_046 (CSN ISO 11465) Determination of dry matter by gravimetry and determination of moisture by calculation from measured values.
S-TC-COU	CZ_SOP_D06_07_055 (CSN ISO 10694, CSN EN 13137, CSN EN 15936) Determination of total sulfur (TS), total carbon (TC) and inorganic carbon (TIC) by coulometry and determination of total organic carbon (TOC) and carbonate by calculation from measured values.
S-TIC-COU	CZ_SOP_D06_07_055 (CSN ISO 10694, CSN EN 13137, CSN EN 15936) Determination of total sulphur (TS), total carbon (TC), total organic carbon (TOC), total inorganic carbon (TIC) and carbonates in solid samples by coulometry.
S-TOC-CC	CZ_SOP_D06_07_055 (CSN ISO 10694, CSN EN 13137, CSN EN 15936) Determination of total sulphur (TS), total carbon (TC), total organic carbon (TOC), total inorganic carbon (TIC) and carbonates in solid samples by coulometry.
W-PHI-PHO	CZ_SOP_D06_07_030 (CSN ISO 6439) Determination of phenol index by spectrophotometric method after distillation.
Location of test performance: Na Harfe 336/9 Prague 9 - Vysocany Czech Republic 190 00	
S-SMVGMS01	CZ_SOP_D06_03_161 (EPA 8270, EPA 8131, EPA 8091, CSN EN ISO 6468) Determination of semi volatile organic compounds by gas chromatography method with MS or MS/MS detection and calculation of semi volatile organic compounds sums from measured values
S-TPHFID01	CZ_SOP_D06_03_150 (CSN EN 14039) 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
S-VOCFID1	CZ_SOP_D06_03_156 except chap. 9.1 a 9.2 (US EPA 8260, US EPA 8015, RBCA Petroleum Hydrocarbon Methods, ISO 15009) Determination of volatile organic compounds by gas chromatography method with detection FID and ECD and calculation of volatile organic compounds sums from measured values
W-CL-IC	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-DOC-IR	CZ_SOP_D06_02_056 Determination of total organic carbon (TOC), dissolved organic carbon (DOC) and total inorganic carbon (TIC) by IR detection (based on CSN EN 1484, CSN EN 16192, SM 5310).
W-F-IC	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-HG-AFSFX	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_J02 chap. 10.1 and 10.2.) Determination of Mercury by Fluorescence Spectrometry. Sample was fixed by nitric acid addition prior to analysis.
W-METMSFX1	CZ_SOP_D06_02_002 (US EPA 200.8, CSN EN ISO 17294-2, US EPA 6020A, samples prepared as per CZ_SOP_D06_02_J02 chap. 10.1 and 10.2) Determination of elements by mass 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 fixed by nitric acid addition prior to analysis.
W-METMSFX2	CZ_SOP_D06_02_002 (US EPA 200.8, CSN EN ISO 17294-2, US EPA 6020A, samples prepared as per CZ_SOP_D06_02_J02 chap. 10.1 and 10.2) Determination of elements by mass 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 fixed by nitric acid addition prior to analysis.
W-SO4-IC	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-TDS-GR	CZ_SOP_D06_02_071 Determination of dissolved solids (RL105) and dissolved solids annealed (RAS) using glass fibre filters by gravimetry and determination of loss of ignition of dissolved solids (RL550) by calculation from measured values (glass microfibre filter of porosity 1.5 µm - Environmental Express). (based on CSN 757346, CSN 757347, CSN EN 16192)

Issue Date 21-JAN-2016  
 Page 7 of 7  
 Work Order PR1600595  
 Client Environmental Monitoring Services Limited



Preparation Methods	Method Descriptions
Location of test performance: Bendlova 1687/7 Ceska Lipa Czech Republic 470 01	
*S-PPHOM.07	CZ_SOP_D06_07_P01 Preparation of solid samples for analysis (crushing, milling and pulverizing).
*S-PPHOM0.3	CZ_SOP_D06_07_P01 Preparation of solid samples for analysis (crushing, milling and pulverizing).
*S-PPHOM10	CSN EN 12457-4 Sieving and crushing of sample on the grain size < 10 mm.
*S-PPL24CE	CSN EN 12457-4 (CZ_SOP_D06_07_P04) Characterisation of waste - Leaching - Compliance test for leaching of granular waste materials and sludge - Part 4: One stage batch test at a liquid to solid ratio of 10 L/kg for materials with particle size below 10 mm (without or with size reduction). Liquid to Solid ratio was 10:1.

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

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





## CERTIFICATE OF ANALYSIS

Laboratory sample ID	: PR1563570001	Work Order	: PR1563570
Client	: Environmental Monitoring Services Limited	Issue Date	: 06-OCT-2015
Contact	: Dr. George Peplow	Laboratory	: ALS Czech Republic, s.r.o.
Address	: Sorenson Triq Danny Cremona Hamrun Malta HMR 1513	Contact	: Client Service
E-mail	: peplowg@gmail.com	Address	: Na Harfe 336/9 Prague 9 - Vysocany Czech Republic 190 00
Telephone	: +356 9947 0204	E-mail	: customer.support@alsglobal.com
Facsimile	: ----	Telephone	: +420 226 226 228
Project	: Rock Samples	Facsimile	: +420 284 081 635
Order number	: ----	Page	: 1 of 6
C-O-C number	: ----	Date Samples	: 25-SEP-2015
Site	: ----	Received	
Sampled by	: client	Quote number	: PR2015ENMON-MT0001
		Date of test	: 29-SEP-2015 - 06-OCT-2015
		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.

Methods S-TC-COU, S-TIC-COU, S-TOC-CC - samples were dried at 105 °C and pulverized before analysis.

Sample(s) PR1563570/001, method S-TOC-CC - lower LOR for TOC cannot be reached due to the comparable concentrations of TC and TIC.

Sample(s) PR1563570/001, method S-TPHFID01 - contain(s) high-boiling hydrocarbons with retention time higher than retention time of C40.

### Signatories

#### Signatories

Zdenek Jirak



#### Position

Environmental Business Unit  
Manager

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





## Analytical Results

Sub-Matrix: LEACHATE

Laboratory sample ID

Client sampling date / time

				Rock 1	
				28-SEP-2015 00:00	
Parameter	Method	LOR	Unit	Result	MU
<b>Agregate Parameters</b>					
Dissolved Organic Carbon	W-DOC-IR	10.0	mg/kg DW	39.2	±20.0 %
Phenol Index	W-PHI-PHO	0.05	mg/kg DW	<0.05	----
<b>Nonmetallic Inorganic Parameters</b>					
Chloride	W-CL-IC	10.0	mg/kg DW	354	±15.0 %
Fluoride	W-F-IC	2.00	mg/kg DW	5.30	±15.0 %
Sulphate as SO <sub>4</sub> 2-	W-SO <sub>4</sub> -IC	50.0	mg/kg DW	5160	±15.0 %
Dissolved solids dried at 105 °C	W-TDS-GR	100	mg/kg DW	8720	±9.7 %
<b>Total Metals / Major Cations</b>					
Antimony	W-METMSFX1	0.010	mg/kg DW	<0.010	----
Arsenic	W-METMSFX1	0.050	mg/kg DW	<0.050	----
Barium	W-METMSFX2	0.050	mg/kg DW	0.549	±10.0 %
Cadmium	W-METMSFX1	0.0100	mg/kg DW	<0.0100	----
Chromium	W-METMSFX1	0.050	mg/kg DW	<0.050	----
Copper	W-METMSFX2	0.050	mg/kg DW	<0.050	----
Lead	W-METMSFX1	0.050	mg/kg DW	<0.050	----
Mercury	W-HG-AFSFX	0.00100	mg/kg DW	<0.00100	----
Molybdenum	W-METMSFX1	0.050	mg/kg DW	0.335	±10.0 %
Nickel	W-METMSFX1	0.050	mg/kg DW	0.093	±10.0 %
Selenium	W-METMSFX1	0.050	mg/kg DW	<0.050	----
Vanadium	W-METMSFX2	5.0	µg/L	<5.0	----
Zinc	W-METMSFX2	0.050	mg/kg DW	0.188	±10.0 %

Sub-Matrix: SOIL

Laboratory sample ID

Client sampling date / time

				Rock 1	
				28-SEP-2015 00:00	
Parameter	Method	LOR	Unit	Result	MU
<b>Physical Parameters</b>					
Dry matter @ 105°C	S-DRY-GRCl	0.10	%	96.5	±6.0 %
<b>Nonmetallic Inorganic Parameters</b>					
Total Organic Carbon	S-TOC-CC	0.010	% DW	<1.41	----
<b>Total Metals / Major Cations</b>					
Antimony	I-SB-ICPS	5.0	mg/kg DW	<5.0	----
Barium	I-BA-ICPS	0.50	mg/kg DW	29.3	±20.0 %
Cadmium	I-CD-ICPS	0.40	mg/kg DW	<0.40	----
Calcium	I-CA-ICPS	0.10	mg/kg DW	297000	±20.0 %
Chromium	I-CR-ICPS	0.50	mg/kg DW	25.5	±20.0 %
Cobalt	I-CO-ICPS	0.50	mg/kg DW	2.72	±21.5 %
Lead	I-PB-ICPS	5.0	mg/kg DW	<5.0	----
Molybdenum	I-MO-ICPS	0.50	mg/kg DW	3.04	±21.2 %



Nickel	I-NI-ICPS	0.50	mg/kg DW	22.5	±20.0 %
Silicon	I-SI-ICPS	5.0	mg/kg DW	407	±20.0 %
Vanadium	I-V-ICPS	0.2	mg/kg DW	19.5	±20.0 %
Zinc	I-ZN-ICPS	0.50	mg/kg DW	46.9	±20.0 %
<b>BTEX</b>					
Benzene	S-VOCFID1	0.10	mg/kg DW	<0.10	----
Toluene	S-VOCFID1	0.10	mg/kg DW	<0.10	----
Ethylbenzene	S-VOCFID1	0.10	mg/kg DW	<0.10	----
meta- & para-Xylene	S-VOCFID1	0.120	mg/kg DW	<0.120	----
ortho-Xylene	S-VOCFID1	0.060	mg/kg DW	<0.060	----
Sum of BTEX	S-VOCFID1	0.480	mg/kg DW	<0.480	----
Sum of xylenes	S-VOCFID1	0.180	mg/kg DW	<0.180	----
<b>Polycyclic Aromatics Hydrocarbons (PAHs)</b>					
Naphthalene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----
Acenaphthylene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----
Acenaphthene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----
Fluorene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----
Phenanthrene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----
Anthracene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----
Fluoranthene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----
Pyrene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----
Benz(a)anthracene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----
Chrysene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----
Benzo(b)fluoranthene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----
Benzo(k)fluoranthene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----
Benzo(a)pyrene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----
Indeno(1.2.3.cd)pyrene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----
Benzo(g,h,i)perylene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----
Dibenz(a,h)anthracene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----
Sum of 16 PAH	S-SMVGMS01	0.160	mg/kg DW	<0.160	----
<b>PCBs</b>					
PCB 28	S-SMVGMS01	0.0200	mg/kg DW	<0.0200	----
PCB 52	S-SMVGMS01	0.0200	mg/kg DW	<0.0200	----
PCB 101	S-SMVGMS01	0.0200	mg/kg DW	<0.0200	----
PCB 118	S-SMVGMS01	0.0200	mg/kg DW	<0.0200	----
PCB 138	S-SMVGMS01	0.0200	mg/kg DW	<0.0200	----
PCB 153	S-SMVGMS01	0.0200	mg/kg DW	<0.0200	----
PCB 180	S-SMVGMS01	0.0200	mg/kg DW	<0.0200	----
Sum of 6 PCBs	S-SMVGMS01	0.120	mg/kg DW	<0.120	----
Sum of 7 PCBs	S-SMVGMS01	0.140	mg/kg DW	<0.140	----
<b>Petroleum Hydrocarbons</b>					
C10 - C40 Fraction	S-TPHFID01	20	mg/kg DW	39	±30.0 %

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

Issue Date : 06-OCT-2015  
Page : 4 of 6  
Client sample ID : PR1563570001  
Client : Environmental Monitoring Services Limited

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time of sample collection is specified as 0:00 it means that the client did specify the date but not the time. Measurement uncertainty is expressed as expanded measurement uncertainty with coverage factor  $k = 2$ , representing 95% confidence level.

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

***The end of result part of the certificate of analysis***



## Brief Method Summaries

Analytical Methods	Method Descriptions
<i>Location of test performance: Bendlova 1687/7 Ceska Lipa Czech Republic 470 01</i>	
I-BA-ICPS	CZ_SOP_D06_07_006 (CSN EN ISO 11885 samples prepared as per CZ_SOP_D06_07_P02 chap. 11-12, 14-16, 19) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values.
I-CA-ICPS	CZ_SOP_D06_07_006 (CSN EN ISO 11885 samples prepared as per CZ_SOP_D06_07_P02 chap. 11-12, 14-16, 19) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values.
I-CD-ICPS	CZ_SOP_D06_07_006 (CSN EN ISO 11885 samples prepared as per CZ_SOP_D06_07_P02 chap. 11-12, 14-16, 19) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values.
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I-V-ICPS	CZ_SOP_D06_07_006 (CSN EN ISO 11885 samples prepared as per CZ_SOP_D06_07_P02 chap. 11-12, 14-16, 19) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values.
I-ZN-ICPS	CZ_SOP_D06_07_006 (CSN EN ISO 11885 samples prepared as per CZ_SOP_D06_07_P02 chap. 11-12, 14-16, 19) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values.
S-DRY-GRCI	CZ_SOP_D06_01_045, CZ_SOP_D06_07_046 (CSN ISO 11465) Determination of dry matter by gravimetry and determination of moisture by calculation from measured values.
S-TC-COU	CZ_SOP_D06_07_055 (CSN ISO 10694, CSN EN 13137, CSN EN 15936) Determination of total sulfur (TS), total carbon (TC) and inorganic carbon (TIC) by coulometry and determination of total organic carbon (TOC) and carbonate by calculation from measured values.
S-TIC-COU	CZ_SOP_D06_07_055 (CSN ISO 10694, CSN EN 13137, CSN EN 15936) Determination of total sulphur (TS), total carbon (TC), total organic carbon (TOC), total inorganic carbon (TIC) and carbonates in solid samples by coulometry.
S-TOC-CC	CZ_SOP_D06_07_055 (CSN ISO 10694, CSN EN 13137, CSN EN 15936) Determination of total sulphur (TS), total carbon (TC), total organic carbon (TOC), total inorganic carbon (TIC) and carbonates in solid samples by coulometry.
W-PHI-PHO	CZ_SOP_D06_07_030 (CSN ISO 6439) Determination of phenol index by spectrophotometric method after distillation.
<i>Location of test performance: Na Harfe 336/9 Prague 9 - Vysocany Czech Republic 190 00</i>	
S-SMVGMS01	CZ_SOP_D06_03_161 (EPA 8270, EPA 8131, EPA 8091, CSN EN ISO 6468) Determination of semi volatile organic compounds by gas chromatography method with MS or MS/MS detection and calculation of semi volatile organic compounds sums from measured values





<i>Analytical Methods</i>	<i>Method Descriptions</i>
S-TPHFID01	CZ_SOP_D06_03_150 (CSN EN 14039) 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
S-VOCFID1	CZ_SOP_D06_03_156 except chap. 9.1 a 9.2 (US EPA 8260, US EPA 8015, RBCA Petroleum Hydrocarbon Methods, ISO 15009) Determination of volatile organic compounds by gas chromatography method with detection FID and ECD and calculation of volatile organic compounds sums from measured values
W-CL-IC	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-DOC-IR	CZ_SOP_D06_02_056 Determination of total organic carbon (TOC), dissolved organic carbon (DOC) and total inorganic carbon (TIC) by IR detection (based on CSN EN 1484, CSN EN 16192, SM 5310).
W-F-IC	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-HG-AFSFX	CZ_SOP_D06_02_096 (US EPA 245.7, US EPA 1631, CSN EN ISO 178 52, CSN EN 16192, samples prepared as per CZ_SOP_D06_02_J02 chap. 10.1 and 10.2.) Determination of Mercury by Fluorescence Spectrometry. Sample was fixed by nitric acid addition prior to analysis.
W-METMSFX1	CZ_SOP_D06_02_002 (US EPA 200.8, CSN EN ISO 17294-2, US EPA 6020A, samples prepared as per CZ_SOP_D06_02_J02 chap. 10.1 and 10.2) Determination of elements by mass 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 fixed by nitric acid addition prior to analysis.
W-METMSFX2	CZ_SOP_D06_02_002 (US EPA 200.8, CSN EN ISO 17294-2, US EPA 6020A, samples prepared as per CZ_SOP_D06_02_J02 chap. 10.1 and 10.2) Determination of elements by mass 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 fixed by nitric acid addition prior to analysis.
W-SO4-IC	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-TDS-GR	CZ_SOP_D06_02_071 Determination of dissolved solids (RL105) and dissolved solids annealed (RAS) using glass fibre filters by gravimetry and determination of loss of ignition of dissolved solids (RL550) by calculation from measured values (glass microfibre filter of porosity 1,5 µm - Environmental Express), (based on CSN 757346, CSN 757347, CSN EN 16192).
<i>Preparation Methods</i>	<i>Method Descriptions</i>
<i>Location of test performance: Bendlova 1687/7 Ceska Lipa Czech Republic 470 01</i>	
*S-PPHOM.07	CZ_SOP_D06_07_P01 Preparation of solid samples for analysis (crushing, milling and pulverizing).
*S-PPHOM0.3	CZ_SOP_D06_07_P01 Preparation of solid samples for analysis (crushing, milling and pulverizing).
*S-PPHOM10	CSN EN 12457-4 Sieving and crushing of sample on the grain size < 10 mm.
*S-PPL24CE	CSN EN 12457-4 (CZ_SOP_D06_07_P04) Characterisation of waste - Leaching - Compliance test for leaching of granular waste materials and sludge - Part 4: One stage batch test at a liquid to solid ratio of 10 L/kg for materials with particle size below 10 mm (without or with size reduction). Liquid to Solid ratio was 10:1.

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

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

## CERTIFICATE OF ANALYSIS

Laboratory sample ID	: PR1563570002	Work Order	: PR1563570
		Issue Date	: 06-OCT-2015
Client	: Environmental Monitoring Services Limited	Laboratory	: ALS Czech Republic, s.r.o.
Contact	: Dr. George Peplow	Contact	: Client Service
Address	: Sorenson Triq Danny Cremona Hamrun Malta HMR 1513	Address	: Na Harfe 336/9 Prague 9 - Vysocany Czech Republic 190 00
E-mail	: peplowg@gmail.com	E-mail	: customer.support@alsglobal.com
Telephone	: +356 9947 0204	Telephone	: +420 226 226 228
Facsimile	: ----	Facsimile	: +420 284 081 635
Project	: Rock Samples	Page	: 1 of 6
Order number	: ----	Date Samples	: 25-SEP-2015
		Received	
C-O-C number	: ----	Quote number	: PR2015ENMON-MT0001
Site	: ----	Date of test	: 29-SEP-2015 - 06-OCT-2015
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.

Methods S-TC-COU, S-TIC-COU, S-TOC-CC - samples were dried at 105 °C and pulverized before analysis.

Sample(s) PR1563570/002, method S-TOC-CC - lower LOR for TOC cannot be reached due to the comparable concentrations of TC and TIC.

### Signatories

Signatories  
Zdenek Jirak



Position  
Environmental Business Unit  
Manager

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





## Analytical Results

Sub-Matrix: LEACHATE

Laboratory sample ID

Client sampling date / time

Rock 2

28-SEP-2015 00:00

Parameter	Method	LOR	Unit	Result	MU
<b>Agregate Parameters</b>					
Dissolved Organic Carbon	W-DOC-IR	10.0	mg/kg DW	21.9	±20.0 %
Phenol Index	W-PHI-PHO	0.05	mg/kg DW	<0.05	----
<b>Nonmetallic Inorganic Parameters</b>					
Chloride	W-CL-IC	10.0	mg/kg DW	1940	±15.0 %
Fluoride	W-F-IC	2.00	mg/kg DW	2.46	±15.0 %
Sulphate as SO <sub>4</sub> 2-	W-SO <sub>4</sub> -IC	50.0	mg/kg DW	4020	±15.0 %
Dissolved solids dried at 105 °C	W-TDS-GR	100	mg/kg DW	9980	±9.7 %
<b>Total Metals / Major Cations</b>					
Antimony	W-METMSFX1	0.010	mg/kg DW	<0.010	----
Arsenic	W-METMSFX1	0.050	mg/kg DW	<0.050	----
Barium	W-METMSFX2	0.050	mg/kg DW	0.570	±10.0 %
Cadmium	W-METMSFX1	0.0100	mg/kg DW	<0.0100	----
Chromium	W-METMSFX1	0.050	mg/kg DW	<0.050	----
Copper	W-METMSFX2	0.050	mg/kg DW	<0.050	----
Lead	W-METMSFX1	0.050	mg/kg DW	<0.050	----
Mercury	W-HG-AFSFX	0.00100	mg/kg DW	<0.00100	----
Molybdenum	W-METMSFX1	0.050	mg/kg DW	0.346	±10.0 %
Nickel	W-METMSFX1	0.050	mg/kg DW	0.061	±10.0 %
Selenium	W-METMSFX1	0.050	mg/kg DW	<0.050	----
Vanadium	W-METMSFX2	5.0	µg/L	<5.0	----
Zinc	W-METMSFX2	0.050	mg/kg DW	0.248	±10.0 %

Sub-Matrix: SOIL

Laboratory sample ID

Client sampling date / time

Rock 2

28-SEP-2015 00:00

Parameter	Method	LOR	Unit	Result	MU
<b>Physical Parameters</b>					
Dry matter @ 105°C	S-DRY-GRCl	0.10	%	79.3	±6.0 %
<b>Nonmetallic Inorganic Parameters</b>					
Total Organic Carbon	S-TOC-CC	0.010	% DW	<1.41	----
<b>Total Metals / Major Cations</b>					
Antimony	I-SB-ICPS	5.0	mg/kg DW	<5.0	----
Barium	I-BA-ICPS	0.50	mg/kg DW	22.2	±20.0 %
Cadmium	I-CD-ICPS	0.40	mg/kg DW	<0.40	----
Calcium	I-CA-ICPS	0.10	mg/kg DW	276000	±20.0 %
Chromium	I-CR-ICPS	0.50	mg/kg DW	30.0	±20.0 %
Cobalt	I-CO-ICPS	0.50	mg/kg DW	2.84	±21.4 %
Lead	I-PB-ICPS	5.0	mg/kg DW	<5.0	----
Molybdenum	I-MO-ICPS	0.50	mg/kg DW	2.26	±22.2 %



Nickel	I-NI-ICPS	0.50	mg/kg DW	23.1	±20.0 %
Silicon	I-SI-ICPS	5.0	mg/kg DW	195	±20.0 %
Vanadium	I-V-ICPS	0.2	mg/kg DW	32.4	±20.0 %
Zinc	I-ZN-ICPS	0.50	mg/kg DW	55.4	±20.0 %
<b>BTEX</b>					
Benzene	S-VOCFID1	0.10	mg/kg DW	<0.10	----
Toluene	S-VOCFID1	0.10	mg/kg DW	<0.10	----
Ethylbenzene	S-VOCFID1	0.10	mg/kg DW	<0.10	----
meta- & para-Xylene	S-VOCFID1	0.120	mg/kg DW	<0.120	----
ortho-Xylene	S-VOCFID1	0.060	mg/kg DW	<0.060	----
Sum of BTEX	S-VOCFID1	0.480	mg/kg DW	<0.480	----
Sum of xylenes	S-VOCFID1	0.180	mg/kg DW	<0.180	----
<b>Polycyclic Aromatics Hydrocarbons (PAHs)</b>					
Naphthalene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----
Acenaphthylene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----
Acenaphthene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----
Fluorene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----
Phenanthrene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----
Anthracene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----
Fluoranthene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----
Pyrene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----
Benz(a)anthracene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----
Chrysene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----
Benzo(b)fluoranthene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----
Benzo(k)fluoranthene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----
Benzo(a)pyrene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----
Indeno(1.2.3.cd)pyrene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----
Benzo(g,h,i)perylene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----
Dibenz(a,h)anthracene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----
Sum of 16 PAH	S-SMVGMS01	0.160	mg/kg DW	<0.160	----
<b>PCBs</b>					
PCB 28	S-SMVGMS01	0.0200	mg/kg DW	<0.0200	----
PCB 52	S-SMVGMS01	0.0200	mg/kg DW	<0.0200	----
PCB 101	S-SMVGMS01	0.0200	mg/kg DW	<0.0200	----
PCB 118	S-SMVGMS01	0.0200	mg/kg DW	<0.0200	----
PCB 138	S-SMVGMS01	0.0200	mg/kg DW	<0.0200	----
PCB 153	S-SMVGMS01	0.0200	mg/kg DW	<0.0200	----
PCB 180	S-SMVGMS01	0.0200	mg/kg DW	<0.0200	----
Sum of 6 PCBs	S-SMVGMS01	0.120	mg/kg DW	<0.120	----
Sum of 7 PCBs	S-SMVGMS01	0.140	mg/kg DW	<0.140	----
<b>Petroleum Hydrocarbons</b>					
C10 - C40 Fraction	S-TPHFID01	20	mg/kg DW	<20	----

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

Issue Date : 06-OCT-2015  
Page : 4 of 6  
Client sample ID : PR1563570002  
Client : Environmental Monitoring Services Limited

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time of sample collection is specified as 0:00 it means that the client did specify the date but not the time. Measurement uncertainty is expressed as expanded measurement uncertainty with coverage factor  $k = 2$ , representing 95% confidence level.

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

***The end of result part of the certificate of analysis***



## Brief Method Summaries

Analytical Methods	Method Descriptions
<i>Location of test performance: Bendlova 1687/7 Ceska Lipa Czech Republic 470 01</i>	
I-BA-ICPS	CZ_SOP_D06_07_006 (CSN EN ISO 11885 samples prepared as per CZ_SOP_D06_07_P02 chap. 11-12, 14-16, 19) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values.
I-CA-ICPS	CZ_SOP_D06_07_006 (CSN EN ISO 11885 samples prepared as per CZ_SOP_D06_07_P02 chap. 11-12, 14-16, 19) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values.
I-CD-ICPS	CZ_SOP_D06_07_006 (CSN EN ISO 11885 samples prepared as per CZ_SOP_D06_07_P02 chap. 11-12, 14-16, 19) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values.
I-CO-ICPS	CZ_SOP_D06_07_006 (CSN EN ISO 11885 samples prepared as per CZ_SOP_D06_07_P02 chap. 11-12, 14-16, 19) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values.
I-CR-ICPS	CZ_SOP_D06_07_006 (CSN EN ISO 11885 samples prepared as per CZ_SOP_D06_07_P02 chap. 11-12, 14-16, 19) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values.
I-MO-ICPS	CZ_SOP_D06_07_006 (CSN EN ISO 11885 samples prepared as per CZ_SOP_D06_07_P02 chap. 11-12, 14-16, 19) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values.
I-NI-ICPS	CZ_SOP_D06_07_006 (CSN EN ISO 11885 samples prepared as per CZ_SOP_D06_07_P02 chap. 11-12, 14-16, 19) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values.
I-PB-ICPS	CZ_SOP_D06_07_006 (CSN EN ISO 11885 samples prepared as per CZ_SOP_D06_07_P02 chap. 11-12, 14-16, 19) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values.
I-SB-ICPS	CZ_SOP_D06_07_006 (CSN EN ISO 11885 samples prepared as per CZ_SOP_D06_07_P02 chap. 11-12, 14-16, 19) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values.
I-SI-ICPS	CZ_SOP_D06_07_006 (CSN EN ISO 11885 samples prepared as per CZ_SOP_D06_07_P02 chap. 11-12, 14-16, 19) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values.
I-V-ICPS	CZ_SOP_D06_07_006 (CSN EN ISO 11885 samples prepared as per CZ_SOP_D06_07_P02 chap. 11-12, 14-16, 19) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values.
I-ZN-ICPS	CZ_SOP_D06_07_006 (CSN EN ISO 11885 samples prepared as per CZ_SOP_D06_07_P02 chap. 11-12, 14-16, 19) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values.
S-DRY-GRCI	CZ_SOP_D06_01_045, CZ_SOP_D06_07_046 (CSN ISO 11465) Determination of dry matter by gravimetry and determination of moisture by calculation from measured values.
S-TC-COU	CZ_SOP_D06_07_055 (CSN ISO 10694, CSN EN 13137, CSN EN 15936) Determination of total sulfur (TS), total carbon (TC) and inorganic carbon (TIC) by coulometry and determination of total organic carbon (TOC) and carbonate by calculation from measured values.
S-TIC-COU	CZ_SOP_D06_07_055 (CSN ISO 10694, CSN EN 13137, CSN EN 15936) Determination of total sulphur (TS), total carbon (TC), total organic carbon (TOC), total inorganic carbon (TIC) and carbonates in solid samples by coulometry.
S-TOC-CC	CZ_SOP_D06_07_055 (CSN ISO 10694, CSN EN 13137, CSN EN 15936) Determination of total sulphur (TS), total carbon (TC), total organic carbon (TOC), total inorganic carbon (TIC) and carbonates in solid samples by coulometry.
W-PHI-PHO	CZ_SOP_D06_07_030 (CSN ISO 6439) Determination of phenol index by spectrophotometric method after distillation.
<i>Location of test performance: Na Harfe 336/9 Prague 9 - Vysocany Czech Republic 190 00</i>	
S-SMVGMS01	CZ_SOP_D06_03_161 (EPA 8270, EPA 8131, EPA 8091, CSN EN ISO 6468) Determination of semi volatile organic compounds by gas chromatography method with MS or MS/MS detection and calculation of semi volatile organic compounds sums from measured values





<i>Analytical Methods</i>	<i>Method Descriptions</i>
S-TPHFID01	CZ_SOP_D06_03_150 (CSN EN 14039) 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
S-VOCFID1	CZ_SOP_D06_03_156 except chap. 9.1 a 9.2 (US EPA 8260, US EPA 8015, RBCA Petroleum Hydrocarbon Methods, ISO 15009) Determination of volatile organic compounds by gas chromatography method with detection FID and ECD and calculation of volatile organic compounds sums from measured values
W-CL-IC	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-DOC-IR	CZ_SOP_D06_02_056 Determination of total organic carbon (TOC), dissolved organic carbon (DOC) and total inorganic carbon (TIC) by IR detection (based on CSN EN 1484, CSN EN 16192, SM 5310).
W-F-IC	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-HG-AFSFX	CZ_SOP_D06_02_096 (US EPA 245.7, US EPA 1631, CSN EN ISO 178 52, CSN EN 16192, samples prepared as per CZ_SOP_D06_02_J02 chap. 10.1 and 10.2.) Determination of Mercury by Fluorescence Spectrometry. Sample was fixed by nitric acid addition prior to analysis.
W-METMSFX1	CZ_SOP_D06_02_002 (US EPA 200.8, CSN EN ISO 17294-2, US EPA 6020A, samples prepared as per CZ_SOP_D06_02_J02 chap. 10.1 and 10.2) Determination of elements by mass 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 fixed by nitric acid addition prior to analysis.
W-METMSFX2	CZ_SOP_D06_02_002 (US EPA 200.8, CSN EN ISO 17294-2, US EPA 6020A, samples prepared as per CZ_SOP_D06_02_J02 chap. 10.1 and 10.2) Determination of elements by mass 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 fixed by nitric acid addition prior to analysis.
W-SO4-IC	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-TDS-GR	CZ_SOP_D06_02_071 Determination of dissolved solids (RL105) and dissolved solids annealed (RAS) using glass fibre filters by gravimetry and determination of loss of ignition of dissolved solids (RL550) by calculation from measured values (glass microfibre filter of porosity 1,5 µm - Environmental Express), (based on CSN 757346, CSN 757347, CSN EN 16192).
<i>Preparation Methods</i>	<i>Method Descriptions</i>
<i>Location of test performance: Bendlova 1687/7 Ceska Lipa Czech Republic 470 01</i>	
*S-PPHOM.07	CZ_SOP_D06_07_P01 Preparation of solid samples for analysis (crushing, milling and pulverizing).
*S-PPHOM0.3	CZ_SOP_D06_07_P01 Preparation of solid samples for analysis (crushing, milling and pulverizing).
*S-PPHOM10	CSN EN 12457-4 Sieving and crushing of sample on the grain size < 10 mm.
*S-PPL24CE	CSN EN 12457-4 (CZ_SOP_D06_07_P04) Characterisation of waste - Leaching - Compliance test for leaching of granular waste materials and sludge - Part 4: One stage batch test at a liquid to solid ratio of 10 L/kg for materials with particle size below 10 mm (without or with size reduction). Liquid to Solid ratio was 10:1.

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

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

## CERTIFICATE OF ANALYSIS

Laboratory sample ID	: PR1563570003	Work Order	: PR1563570
Client	: Environmental Monitoring Services Limited	Issue Date	: 06-OCT-2015
Contact	: Dr. George Peplow	Laboratory	: ALS Czech Republic, s.r.o.
Address	: Sorenson Triq Danny Cremona Hamrun Malta HMR 1513	Contact	: Client Service
E-mail	: peplowg@gmail.com	Address	: Na Harfe 336/9 Prague 9 - Vysocany Czech Republic 190 00
Telephone	: +356 9947 0204	E-mail	: customer.support@alsglobal.com
Facsimile	: ----	Telephone	: +420 226 226 228
Project	: Rock Samples	Facsimile	: +420 284 081 635
Order number	: ----	Page	: 1 of 6
C-O-C number	: ----	Date Samples	: 25-SEP-2015
Site	: ----	Received	
Sampled by	: client	Quote number	: PR2015ENMON-MT0001
		Date of test	: 29-SEP-2015 - 06-OCT-2015
		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.

Methods S-TC-COU, S-TIC-COU, S-TOC-CC - samples were dried at 105 °C and pulverized before analysis.

Sample(s) PR1563570/003, method S-TPHFID01 - contain(s) high-boiling hydrocarbons with retention time higher than retention time of C40.

Sample(s) PR1563570/001, method S-TOC-CC - lower LOR for TOC cannot be reached due to the comparable concentrations of TC and TIC.

### Signatories

Signatories  
Zdenek Jirak



Position  
Environmental Business Unit  
Manager

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





## Analytical Results

Sub-Matrix: LEACHATE

Laboratory sample ID

Client sampling date / time

				Rock 3	
				28-SEP-2015 00:00	
Parameter	Method	LOR	Unit	Result	MU
<b>Agregate Parameters</b>					
Dissolved Organic Carbon	W-DOC-IR	10.0	mg/kg DW	72.4	±20.0 %
Phenol Index	W-PHI-PHO	0.05	mg/kg DW	<0.05	----
<b>Nonmetallic Inorganic Parameters</b>					
Chloride	W-CL-IC	10.0	mg/kg DW	468	±15.0 %
Fluoride	W-F-IC	2.00	mg/kg DW	2.38	±15.0 %
Sulphate as SO4 2-	W-SO4-IC	50.0	mg/kg DW	6790	±15.0 %
Dissolved solids dried at 105 °C	W-TDS-GR	100	mg/kg DW	12300	±9.7 %
<b>Total Metals / Major Cations</b>					
Antimony	W-METMSFX1	0.010	mg/kg DW	<0.010	----
Arsenic	W-METMSFX1	0.050	mg/kg DW	<0.050	----
Barium	W-METMSFX2	0.050	mg/kg DW	0.568	±10.0 %
Cadmium	W-METMSFX1	0.0100	mg/kg DW	<0.0100	----
Chromium	W-METMSFX1	0.050	mg/kg DW	<0.050	----
Copper	W-METMSFX2	0.050	mg/kg DW	<0.050	----
Lead	W-METMSFX1	0.050	mg/kg DW	<0.050	----
Mercury	W-HG-AFSFX	0.00100	mg/kg DW	<0.00100	----
Molybdenum	W-METMSFX1	0.050	mg/kg DW	0.318	±10.0 %
Nickel	W-METMSFX1	0.050	mg/kg DW	0.145	±10.0 %
Selenium	W-METMSFX1	0.050	mg/kg DW	<0.050	----
Vanadium	W-METMSFX2	5.0	µg/L	<5.0	----
Zinc	W-METMSFX2	0.050	mg/kg DW	0.223	±10.0 %

Sub-Matrix: SOIL

Laboratory sample ID

Client sampling date / time

				Rock 3	
				28-SEP-2015 00:00	
Parameter	Method	LOR	Unit	Result	MU
<b>Physical Parameters</b>					
Dry matter @ 105°C	S-DRY-GRCl	0.10	%	93.0	±6.0 %
<b>Nonmetallic Inorganic Parameters</b>					
Total Organic Carbon	S-TOC-CC	0.010	% DW	<1.41	----
<b>Total Metals / Major Cations</b>					
Antimony	I-SB-ICPS	5.0	mg/kg DW	<5.0	----
Barium	I-BA-ICPS	0.50	mg/kg DW	26.5	±20.0 %
Cadmium	I-CD-ICPS	0.40	mg/kg DW	<0.40	----
Calcium	I-CA-ICPS	0.10	mg/kg DW	285000	±20.0 %
Chromium	I-CR-ICPS	0.50	mg/kg DW	27.0	±20.0 %
Cobalt	I-CO-ICPS	0.50	mg/kg DW	3.00	±21.2 %
Lead	I-PB-ICPS	5.0	mg/kg DW	<5.0	----
Molybdenum	I-MO-ICPS	0.50	mg/kg DW	2.96	±21.3 %



Nickel	I-NI-ICPS	0.50	mg/kg DW	22.3	±20.0 %
Silicon	I-SI-ICPS	5.0	mg/kg DW	259	±20.0 %
Vanadium	I-V-ICPS	0.2	mg/kg DW	20.9	±20.0 %
Zinc	I-ZN-ICPS	0.50	mg/kg DW	50.1	±20.0 %
<b>BTEX</b>					
Benzene	S-VOCFID1	0.10	mg/kg DW	<0.10	----
Toluene	S-VOCFID1	0.10	mg/kg DW	<0.10	----
Ethylbenzene	S-VOCFID1	0.10	mg/kg DW	<0.10	----
meta- & para-Xylene	S-VOCFID1	0.120	mg/kg DW	<0.120	----
ortho-Xylene	S-VOCFID1	0.060	mg/kg DW	<0.060	----
Sum of BTEX	S-VOCFID1	0.480	mg/kg DW	<0.480	----
Sum of xylenes	S-VOCFID1	0.180	mg/kg DW	<0.180	----
<b>Polycyclic Aromatics Hydrocarbons (PAHs)</b>					
Naphthalene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----
Acenaphthylene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----
Acenaphthene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----
Fluorene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----
Phenanthrene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----
Anthracene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----
Fluoranthene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----
Pyrene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----
Benz(a)anthracene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----
Chrysene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----
Benzo(b)fluoranthene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----
Benzo(k)fluoranthene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----
Benzo(a)pyrene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----
Indeno(1.2.3.cd)pyrene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----
Benzo(g,h,i)perylene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----
Dibenz(a,h)anthracene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----
Sum of 16 PAH	S-SMVGMS01	0.160	mg/kg DW	<0.160	----
<b>PCBs</b>					
PCB 28	S-SMVGMS01	0.0200	mg/kg DW	<0.0200	----
PCB 52	S-SMVGMS01	0.0200	mg/kg DW	<0.0200	----
PCB 101	S-SMVGMS01	0.0200	mg/kg DW	<0.0200	----
PCB 118	S-SMVGMS01	0.0200	mg/kg DW	<0.0200	----
PCB 138	S-SMVGMS01	0.0200	mg/kg DW	<0.0200	----
PCB 153	S-SMVGMS01	0.0200	mg/kg DW	<0.0200	----
PCB 180	S-SMVGMS01	0.0200	mg/kg DW	<0.0200	----
Sum of 6 PCBs	S-SMVGMS01	0.120	mg/kg DW	<0.120	----
Sum of 7 PCBs	S-SMVGMS01	0.140	mg/kg DW	<0.140	----
<b>Petroleum Hydrocarbons</b>					
C10 - C40 Fraction	S-TPHFID01	20	mg/kg DW	50	±30.0 %

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

Issue Date : 06-OCT-2015  
Page : 4 of 6  
Client sample ID : PR1563570003  
Client : Environmental Monitoring Services Limited

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time of sample collection is specified as 0:00 it means that the client did specify the date but not the time. Measurement uncertainty is expressed as expanded measurement uncertainty with coverage factor  $k = 2$ , representing 95% confidence level.

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

***The end of result part of the certificate of analysis***



## Brief Method Summaries

Analytical Methods	Method Descriptions
<i>Location of test performance: Bendlova 1687/7 Ceska Lipa Czech Republic 470 01</i>	
I-BA-ICPS	CZ_SOP_D06_07_006 (CSN EN ISO 11885 samples prepared as per CZ_SOP_D06_07_P02 chap. 11-12, 14-16, 19) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values.
I-CA-ICPS	CZ_SOP_D06_07_006 (CSN EN ISO 11885 samples prepared as per CZ_SOP_D06_07_P02 chap. 11-12, 14-16, 19) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values.
I-CD-ICPS	CZ_SOP_D06_07_006 (CSN EN ISO 11885 samples prepared as per CZ_SOP_D06_07_P02 chap. 11-12, 14-16, 19) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values.
I-CO-ICPS	CZ_SOP_D06_07_006 (CSN EN ISO 11885 samples prepared as per CZ_SOP_D06_07_P02 chap. 11-12, 14-16, 19) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values.
I-CR-ICPS	CZ_SOP_D06_07_006 (CSN EN ISO 11885 samples prepared as per CZ_SOP_D06_07_P02 chap. 11-12, 14-16, 19) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values.
I-MO-ICPS	CZ_SOP_D06_07_006 (CSN EN ISO 11885 samples prepared as per CZ_SOP_D06_07_P02 chap. 11-12, 14-16, 19) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values.
I-NI-ICPS	CZ_SOP_D06_07_006 (CSN EN ISO 11885 samples prepared as per CZ_SOP_D06_07_P02 chap. 11-12, 14-16, 19) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values.
I-PB-ICPS	CZ_SOP_D06_07_006 (CSN EN ISO 11885 samples prepared as per CZ_SOP_D06_07_P02 chap. 11-12, 14-16, 19) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values.
I-SB-ICPS	CZ_SOP_D06_07_006 (CSN EN ISO 11885 samples prepared as per CZ_SOP_D06_07_P02 chap. 11-12, 14-16, 19) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values.
I-SI-ICPS	CZ_SOP_D06_07_006 (CSN EN ISO 11885 samples prepared as per CZ_SOP_D06_07_P02 chap. 11-12, 14-16, 19) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values.
I-V-ICPS	CZ_SOP_D06_07_006 (CSN EN ISO 11885 samples prepared as per CZ_SOP_D06_07_P02 chap. 11-12, 14-16, 19) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values.
I-ZN-ICPS	CZ_SOP_D06_07_006 (CSN EN ISO 11885 samples prepared as per CZ_SOP_D06_07_P02 chap. 11-12, 14-16, 19) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values.
S-DRY-GRCI	CZ_SOP_D06_01_045, CZ_SOP_D06_07_046 (CSN ISO 11465) Determination of dry matter by gravimetry and determination of moisture by calculation from measured values.
S-TC-COU	CZ_SOP_D06_07_055 (CSN ISO 10694, CSN EN 13137, CSN EN 15936) Determination of total sulfur (TS), total carbon (TC) and inorganic carbon (TIC) by coulometry and determination of total organic carbon (TOC) and carbonate by calculation from measured values.
S-TIC-COU	CZ_SOP_D06_07_055 (CSN ISO 10694, CSN EN 13137, CSN EN 15936) Determination of total sulphur (TS), total carbon (TC), total organic carbon (TOC), total inorganic carbon (TIC) and carbonates in solid samples by coulometry.
S-TOC-CC	CZ_SOP_D06_07_055 (CSN ISO 10694, CSN EN 13137, CSN EN 15936) Determination of total sulphur (TS), total carbon (TC), total organic carbon (TOC), total inorganic carbon (TIC) and carbonates in solid samples by coulometry.
W-PHI-PHO	CZ_SOP_D06_07_030 (CSN ISO 6439) Determination of phenol index by spectrophotometric method after distillation.
<i>Location of test performance: Na Harfe 336/9 Prague 9 - Vysocany Czech Republic 190 00</i>	
S-SMVGMS01	CZ_SOP_D06_03_161 (EPA 8270, EPA 8131, EPA 8091, CSN EN ISO 6468) Determination of semi volatile organic compounds by gas chromatography method with MS or MS/MS detection and calculation of semi volatile organic compounds sums from measured values



<i>Analytical Methods</i>	<i>Method Descriptions</i>
S-TPHFID01	CZ_SOP_D06_03_150 (CSN EN 14039) 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
S-VOCFID1	CZ_SOP_D06_03_156 except chap. 9.1 a 9.2 (US EPA 8260, US EPA 8015, RBCA Petroleum Hydrocarbon Methods, ISO 15009) Determination of volatile organic compounds by gas chromatography method with detection FID and ECD and calculation of volatile organic compounds sums from measured values
W-CL-IC	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-DOC-IR	CZ_SOP_D06_02_056 Determination of total organic carbon (TOC), dissolved organic carbon (DOC) and total inorganic carbon (TIC) by IR detection (based on CSN EN 1484, CSN EN 16192, SM 5310).
W-F-IC	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-HG-AFSFX	CZ_SOP_D06_02_096 (US EPA 245.7, US EPA 1631, CSN EN ISO 178 52, CSN EN 16192, samples prepared as per CZ_SOP_D06_02_J02 chap. 10.1 and 10.2.) Determination of Mercury by Fluorescence Spectrometry. Sample was fixed by nitric acid addition prior to analysis.
W-METMSFX1	CZ_SOP_D06_02_002 (US EPA 200.8, CSN EN ISO 17294-2, US EPA 6020A, samples prepared as per CZ_SOP_D06_02_J02 chap. 10.1 and 10.2) Determination of elements by mass 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 fixed by nitric acid addition prior to analysis.
W-METMSFX2	CZ_SOP_D06_02_002 (US EPA 200.8, CSN EN ISO 17294-2, US EPA 6020A, samples prepared as per CZ_SOP_D06_02_J02 chap. 10.1 and 10.2) Determination of elements by mass 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 fixed by nitric acid addition prior to analysis.
W-SO4-IC	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-TDS-GR	CZ_SOP_D06_02_071 Determination of dissolved solids (RL105) and dissolved solids annealed (RAS) using glass fibre filters by gravimetry and determination of loss of ignition of dissolved solids (RL550) by calculation from measured values (glass microfibre filter of porosity 1,5 µm - Environmental Express), (based on CSN 757346, CSN 757347, CSN EN 16192).
<i>Preparation Methods</i>	<i>Method Descriptions</i>
<i>Location of test performance: Bendlova 1687/7 Ceska Lipa Czech Republic 470 01</i>	
*S-PPHOM.07	CZ_SOP_D06_07_P01 Preparation of solid samples for analysis (crushing, milling and pulverizing).
*S-PPHOM0.3	CZ_SOP_D06_07_P01 Preparation of solid samples for analysis (crushing, milling and pulverizing).
*S-PPHOM10	CSN EN 12457-4 Sieving and crushing of sample on the grain size < 10 mm.
*S-PPL24CE	CSN EN 12457-4 (CZ_SOP_D06_07_P04) Characterisation of waste - Leaching - Compliance test for leaching of granular waste materials and sludge - Part 4: One stage batch test at a liquid to solid ratio of 10 L/kg for materials with particle size below 10 mm (without or with size reduction). Liquid to Solid ratio was 10:1.

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

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

## CERTIFICATE OF ANALYSIS

Laboratory sample ID	: PR1563570004	Work Order	: PR1563570
		Issue Date	: 06-OCT-2015
Client	: Environmental Monitoring Services Limited	Laboratory	: ALS Czech Republic, s.r.o.
Contact	: Dr. George Peplow	Contact	: Client Service
Address	: Sorenson Triq Danny Cremona Hamrun Malta HMR 1513	Address	: Na Harfe 336/9 Prague 9 - Vysocany Czech Republic 190 00
E-mail	: peplowg@gmail.com	E-mail	: customer.support@alsglobal.com
Telephone	: +356 9947 0204	Telephone	: +420 226 226 228
Facsimile	: ----	Facsimile	: +420 284 081 635
Project	: Rock Samples	Page	: 1 of 6
Order number	: ----	Date Samples	: 25-SEP-2015
		Received	
C-O-C number	: ----	Quote number	: PR2015ENMON-MT0001
Site	: ----	Date of test	: 29-SEP-2015 - 06-OCT-2015
Sampled by	: client	QC Level	: ALS CR Standard Quality Control Schedule

### General Comments

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

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

Sample(s) PR1563570/004, method S-TPHFID01 - contain(s) hydrocarbons with retention time less than retention time of C10 and retention time higher than retention time of C40.

Methods S-TC-COU, S-TIC-COU, S-TOC-CC - samples were dried at 105 °C and pulverized before analysis.

Sample(s) PR1563570/004, method S-TPHFID01 - typical response corresponding to natural organic matter (peat, compost) found.

### Signatories

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

Signatories  
Zdenek Jirak



Position  
Environmental Business Unit  
Manager







## Analytical Results

Sub-Matrix: LEACHATE

Laboratory sample ID

Client sampling date / time

Rock 4

28-SEP-2015 00:00

Parameter	Method	LOR	Unit	Result	MU
<b>Agregate Parameters</b>					
Dissolved Organic Carbon	W-DOC-IR	10.0	mg/kg DW	159	±20.0 %
Phenol Index	W-PHI-PHO	0.05	mg/kg DW	<0.05	----
<b>Nonmetallic Inorganic Parameters</b>					
Chloride	W-CL-IC	10.0	mg/kg DW	478	±15.0 %
Fluoride	W-F-IC	2.00	mg/kg DW	<2.00	----
Sulphate as SO4 2-	W-SO4-IC	50.0	mg/kg DW	229	±15.0 %
Dissolved solids dried at 105 °C	W-TDS-GR	100	mg/kg DW	4550	±9.8 %
<b>Total Metals / Major Cations</b>					
Antimony	W-METMSFX1	0.010	mg/kg DW	0.040	±10.0 %
Arsenic	W-METMSFX1	0.050	mg/kg DW	<0.050	----
Barium	W-METMSFX2	0.050	mg/kg DW	0.767	±10.0 %
Cadmium	W-METMSFX1	0.0100	mg/kg DW	<0.0100	----
Chromium	W-METMSFX1	0.050	mg/kg DW	<0.050	----
Copper	W-METMSFX2	0.050	mg/kg DW	0.113	±10.0 %
Lead	W-METMSFX1	0.050	mg/kg DW	0.298	±10.0 %
Mercury	W-HG-AFSFX	0.00100	mg/kg DW	<0.00100	----
Molybdenum	W-METMSFX1	0.050	mg/kg DW	<0.050	----
Nickel	W-METMSFX1	0.050	mg/kg DW	0.068	±10.0 %
Selenium	W-METMSFX1	0.050	mg/kg DW	<0.050	----
Vanadium	W-METMSFX2	5.0	µg/L	46.3	±10.0 %
Zinc	W-METMSFX2	0.050	mg/kg DW	0.396	±10.0 %

Sub-Matrix: SOIL

Laboratory sample ID

Client sampling date / time

Rock 4

28-SEP-2015 00:00

Parameter	Method	LOR	Unit	Result	MU
<b>Physical Parameters</b>					
Dry matter @ 105°C	S-DRY-GRCl	0.10	%	89.1	±6.0 %
<b>Nonmetallic Inorganic Parameters</b>					
Total Organic Carbon	S-TOC-CC	0.010	% DW	2.35	----
<b>Total Metals / Major Cations</b>					
Antimony	I-SB-ICPS	5.0	mg/kg DW	<5.0	----
Barium	I-BA-ICPS	0.50	mg/kg DW	67.8	±20.0 %
Cadmium	I-CD-ICPS	0.40	mg/kg DW	0.48	±49.1 %
Calcium	I-CA-ICPS	0.10	mg/kg DW	237000	±20.0 %
Chromium	I-CR-ICPS	0.50	mg/kg DW	34.0	±20.0 %
Cobalt	I-CO-ICPS	0.50	mg/kg DW	4.90	±20.5 %
Lead	I-PB-ICPS	5.0	mg/kg DW	80.5	±20.2 %
Molybdenum	I-MO-ICPS	0.50	mg/kg DW	<0.50	----



Nickel	I-NI-ICPS	0.50	mg/kg DW	24.0	±20.0 %
Silicon	I-SI-ICPS	5.0	mg/kg DW	215	±20.0 %
Vanadium	I-V-ICPS	0.2	mg/kg DW	40.4	±20.0 %
Zinc	I-ZN-ICPS	0.50	mg/kg DW	125	±20.0 %
<b>BTEX</b>					
Benzene	S-VOCFID1	0.10	mg/kg DW	<0.10	----
Toluene	S-VOCFID1	0.10	mg/kg DW	<0.10	----
Ethylbenzene	S-VOCFID1	0.10	mg/kg DW	<0.10	----
meta- & para-Xylene	S-VOCFID1	0.120	mg/kg DW	<0.120	----
ortho-Xylene	S-VOCFID1	0.060	mg/kg DW	<0.060	----
Sum of BTEX	S-VOCFID1	0.480	mg/kg DW	<0.480	----
Sum of xylenes	S-VOCFID1	0.180	mg/kg DW	<0.180	----
<b>Polycyclic Aromatics Hydrocarbons (PAHs)</b>					
Naphthalene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----
Acenaphthylene	S-SMVGMS01	0.010	mg/kg DW	0.022	±30.0 %
Acenaphthene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----
Fluorene	S-SMVGMS01	0.010	mg/kg DW	<0.010	----
Phenanthrene	S-SMVGMS01	0.010	mg/kg DW	0.291	±30.0 %
Anthracene	S-SMVGMS01	0.010	mg/kg DW	0.024	±30.0 %
Fluoranthene	S-SMVGMS01	0.010	mg/kg DW	0.664	±30.0 %
Pyrene	S-SMVGMS01	0.010	mg/kg DW	0.579	±30.0 %
Benz(a)anthracene	S-SMVGMS01	0.010	mg/kg DW	0.196	±30.0 %
Chrysene	S-SMVGMS01	0.010	mg/kg DW	0.248	±30.0 %
Benzo(b)fluoranthene	S-SMVGMS01	0.010	mg/kg DW	0.364	±30.0 %
Benzo(k)fluoranthene	S-SMVGMS01	0.010	mg/kg DW	0.147	±30.0 %
Benzo(a)pyrene	S-SMVGMS01	0.010	mg/kg DW	0.295	±30.0 %
Indeno(1.2.3.cd)pyrene	S-SMVGMS01	0.010	mg/kg DW	0.192	±30.0 %
Benzo(g,h,i)perylene	S-SMVGMS01	0.010	mg/kg DW	0.209	±30.0 %
Dibenz(a,h)anthracene	S-SMVGMS01	0.010	mg/kg DW	0.033	±30.0 %
Sum of 16 PAH	S-SMVGMS01	0.160	mg/kg DW	3.26	±30.0 %
<b>PCBs</b>					
PCB 28	S-SMVGMS01	0.0200	mg/kg DW	<0.0200	----
PCB 52	S-SMVGMS01	0.0200	mg/kg DW	<0.0200	----
PCB 101	S-SMVGMS01	0.0200	mg/kg DW	<0.0200	----
PCB 118	S-SMVGMS01	0.0200	mg/kg DW	<0.0200	----
PCB 138	S-SMVGMS01	0.0200	mg/kg DW	<0.0200	----
PCB 153	S-SMVGMS01	0.0200	mg/kg DW	<0.0200	----
PCB 180	S-SMVGMS01	0.0200	mg/kg DW	<0.0200	----
Sum of 6 PCBs	S-SMVGMS01	0.120	mg/kg DW	<0.120	----
Sum of 7 PCBs	S-SMVGMS01	0.140	mg/kg DW	<0.140	----
<b>Petroleum Hydrocarbons</b>					
C10 - C40 Fraction	S-TPHFID01	20	mg/kg DW	57	±30.0 %

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

Issue Date : 06-OCT-2015  
Page : 4 of 6  
Client sample ID : PR1563570004  
Client : Environmental Monitoring Services Limited

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time of sample collection is specified as 0:00 it means that the client did specify the date but not the time. Measurement uncertainty is expressed as expanded measurement uncertainty with coverage factor  $k = 2$ , representing 95% confidence level.

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

***The end of result part of the certificate of analysis***



## Brief Method Summaries

Analytical Methods	Method Descriptions
<i>Location of test performance: Bendlova 1687/7 Ceska Lipa Czech Republic 470 01</i>	
I-BA-ICPS	CZ_SOP_D06_07_006 (CSN EN ISO 11885 samples prepared as per CZ_SOP_D06_07_P02 chap. 11-12, 14-16, 19) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values.
I-CA-ICPS	CZ_SOP_D06_07_006 (CSN EN ISO 11885 samples prepared as per CZ_SOP_D06_07_P02 chap. 11-12, 14-16, 19) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values.
I-CD-ICPS	CZ_SOP_D06_07_006 (CSN EN ISO 11885 samples prepared as per CZ_SOP_D06_07_P02 chap. 11-12, 14-16, 19) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values.
I-CO-ICPS	CZ_SOP_D06_07_006 (CSN EN ISO 11885 samples prepared as per CZ_SOP_D06_07_P02 chap. 11-12, 14-16, 19) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values.
I-CR-ICPS	CZ_SOP_D06_07_006 (CSN EN ISO 11885 samples prepared as per CZ_SOP_D06_07_P02 chap. 11-12, 14-16, 19) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values.
I-MO-ICPS	CZ_SOP_D06_07_006 (CSN EN ISO 11885 samples prepared as per CZ_SOP_D06_07_P02 chap. 11-12, 14-16, 19) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values.
I-NI-ICPS	CZ_SOP_D06_07_006 (CSN EN ISO 11885 samples prepared as per CZ_SOP_D06_07_P02 chap. 11-12, 14-16, 19) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values.
I-PB-ICPS	CZ_SOP_D06_07_006 (CSN EN ISO 11885 samples prepared as per CZ_SOP_D06_07_P02 chap. 11-12, 14-16, 19) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values.
I-SB-ICPS	CZ_SOP_D06_07_006 (CSN EN ISO 11885 samples prepared as per CZ_SOP_D06_07_P02 chap. 11-12, 14-16, 19) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values.
I-SI-ICPS	CZ_SOP_D06_07_006 (CSN EN ISO 11885 samples prepared as per CZ_SOP_D06_07_P02 chap. 11-12, 14-16, 19) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values.
I-V-ICPS	CZ_SOP_D06_07_006 (CSN EN ISO 11885 samples prepared as per CZ_SOP_D06_07_P02 chap. 11-12, 14-16, 19) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values.
I-ZN-ICPS	CZ_SOP_D06_07_006 (CSN EN ISO 11885 samples prepared as per CZ_SOP_D06_07_P02 chap. 11-12, 14-16, 19) Determination of elements by atomic emission spectrometry with inductively coupled plasma and stoichiometric calculations of compounds concentration from measured values.
S-DRY-GRCI	CZ_SOP_D06_01_045, CZ_SOP_D06_07_046 (CSN ISO 11465) Determination of dry matter by gravimetry and determination of moisture by calculation from measured values.
S-TC-COU	CZ_SOP_D06_07_055 (CSN ISO 10694, CSN EN 13137, CSN EN 15936) Determination of total sulfur (TS), total carbon (TC) and inorganic carbon (TIC) by coulometry and determination of total organic carbon (TOC) and carbonate by calculation from measured values.
S-TIC-COU	CZ_SOP_D06_07_055 (CSN ISO 10694, CSN EN 13137, CSN EN 15936) Determination of total sulphur (TS), total carbon (TC), total organic carbon (TOC), total inorganic carbon (TIC) and carbonates in solid samples by coulometry.
S-TOC-CC	CZ_SOP_D06_07_055 (CSN ISO 10694, CSN EN 13137, CSN EN 15936) Determination of total sulphur (TS), total carbon (TC), total organic carbon (TOC), total inorganic carbon (TIC) and carbonates in solid samples by coulometry.
W-PHI-PHO	CZ_SOP_D06_07_030 (CSN ISO 6439) Determination of phenol index by spectrophotometric method after distillation.
<i>Location of test performance: Na Harfe 336/9 Prague 9 - Vysocany Czech Republic 190 00</i>	
S-SMVGMS01	CZ_SOP_D06_03_161 (EPA 8270, EPA 8131, EPA 8091, CSN EN ISO 6468) Determination of semi volatile organic compounds by gas chromatography method with MS or MS/MS detection and calculation of semi volatile organic compounds sums from measured values



<i>Analytical Methods</i>	<i>Method Descriptions</i>
S-TPHFID01	CZ_SOP_D06_03_150 (CSN EN 14039) 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
S-VOCFID1	CZ_SOP_D06_03_156 except chap. 9.1 a 9.2 (US EPA 8260, US EPA 8015, RBCA Petroleum Hydrocarbon Methods, ISO 15009) Determination of volatile organic compounds by gas chromatography method with detection FID and ECD and calculation of volatile organic compounds sums from measured values
W-CL-IC	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-DOC-IR	CZ_SOP_D06_02_056 Determination of total organic carbon (TOC), dissolved organic carbon (DOC) and total inorganic carbon (TIC) by IR detection (based on CSN EN 1484, CSN EN 16192, SM 5310).
W-F-IC	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-HG-AFSFX	CZ_SOP_D06_02_096 (US EPA 245.7, US EPA 1631, CSN EN ISO 178 52, CSN EN 16192, samples prepared as per CZ_SOP_D06_02_J02 chap. 10.1 and 10.2.) Determination of Mercury by Fluorescence Spectrometry. Sample was fixed by nitric acid addition prior to analysis.
W-METMSFX1	CZ_SOP_D06_02_002 (US EPA 200.8, CSN EN ISO 17294-2, US EPA 6020A, samples prepared as per CZ_SOP_D06_02_J02 chap. 10.1 and 10.2) Determination of elements by mass 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 fixed by nitric acid addition prior to analysis.
W-METMSFX2	CZ_SOP_D06_02_002 (US EPA 200.8, CSN EN ISO 17294-2, US EPA 6020A, samples prepared as per CZ_SOP_D06_02_J02 chap. 10.1 and 10.2) Determination of elements by mass 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 fixed by nitric acid addition prior to analysis.
W-SO4-IC	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-TDS-GR	CZ_SOP_D06_02_071 Determination of dissolved solids (RL105) and dissolved solids annealed (RAS) using glass fibre filters by gravimetry and determination of loss of ignition of dissolved solids (RL550) by calculation from measured values (glass microfibre filter of porosity 1,5 µm - Environmental Express), (based on CSN 757346, CSN 757347, CSN EN 16192).
<i>Preparation Methods</i>	<i>Method Descriptions</i>
<i>Location of test performance: Bendlova 1687/7 Ceska Lipa Czech Republic 470 01</i>	
*S-PPHOM.07	CZ_SOP_D06_07_P01 Preparation of solid samples for analysis (crushing, milling and pulverizing).
*S-PPHOM0.3	CZ_SOP_D06_07_P01 Preparation of solid samples for analysis (crushing, milling and pulverizing).
*S-PPHOM10	CSN EN 12457-4 Sieving and crushing of sample on the grain size < 10 mm.
*S-PPL24CE	CSN EN 12457-4 (CZ_SOP_D06_07_P04) Characterisation of waste - Leaching - Compliance test for leaching of granular waste materials and sludge - Part 4: One stage batch test at a liquid to solid ratio of 10 L/kg for materials with particle size below 10 mm (without or with size reduction). Liquid to Solid ratio was 10:1.

A `` symbol preceeding 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.

## Sampling Plan and Sampling Preparation according to MSA EN 14899:2005

### Sampling Plan

#### GENERAL INFORMATION

Sampling Plan completed by:	Perit Joe Bugeja	On behalf of:	MEPP
Client Contact:	Perit David Cassar	Material allocation contact:	Perit David Cassar
Other parties involved:	None		
Sampling to be carried out by:	Solidbase Ltd	Name of sampler:	Tech Wilfred Brincat

#### SAMPLING OBJECTIVE

Establishing material characterization for possibility of discarding and use as subbase material

#### SAMPLING APPROACH

Justify sampling method:	Probabilistic sampling		
MATERIAL	General fill and Excavated material		
Type of material:	Granular and humid	Location:	Site: Delimara Power Station
Source of material:	Delimara Power Station		
Methods to produce material:	Sampling from 4 distinct piles		

#### SAMPLING METHODOLOGY

Specify sampling location:	loc 1-GRP backfill materia, loc 2-GRP disposal, loc 3- disposal, loc 4-disposal
Consignment to be sampled:	4 piles or heaps
Point of sampling:	different heights of each heap
Sampling time and date:	02/09/2015 in the afternoon
Persons present for sampling:	SBL tech Wilfred Brincat and site engineer perit David Cassar
Sampling technique:	Exposing material at 100mm from the surface of each heap and using a scoop
Equipment identity:	2 ltr scoop
Specific number of increments:	13
Specific size of increments:	2 kgs

#### DETAIL REQUIREMENTS FOR ON SITE DETERMINATIONS

As per sampling plan provided by perit David Cassar

#### IDENTIFY SAMPLE CODING MEHTODOLGY

Identify precautions As per sampling plan

#### SUB SAMPLING

Using of a 100mm riffle box. Broke down sample from 30 kgs to 5 kgs

#### PACKAGING, PRESERVATION, STORAGE AND TRANSPPORT REQUIREMENTS

Packaging	One side that is open ended.3mm plastic bag
Preservation	Boxed after closing off in plastic bags
Storage	At SBL laboratory
Transport	Tech Andrew Cutajar delivered the 4 samples to Ruben Sciortino
Analytical Laboratory	ENVOIRENMENTAL MONITORING SERVICES LTD of ALS FROUP
Company Details	ALS Group, Na Harle, 336/9 Prague - Vysocany Czech Republic

## Sampling Record

### RECORD

Sampling date: 02/09/2015  
Operative: Tech Wilfred Brincat

### GENERAL INFORMATION

Waste producer: NA On behalf of: MEPP  
Location of sampling: Delimara Power Station Carried out by: SBL

### SAMPLING OBJECTIVE

Type of material: GRANULAR MATERIAL EXCAVATED FROM SAME SITE - DELIMARA POWER STATION  
Material description: GRANULAR MATERIAL OF DIFFERENT COLOURS AND HUMIDITY

### SAMPLING METHODOLOGY

Define consignment sampled: 4 piles or heaps  
Place, point of sampling: Locations 1 through to location 4  
Access problems: No  
Date, time of sampling: 02/09/2015 afternoon  
Witness to sampling: Perit David Cassar  
Procedure adopted: Probabilistic  
Equipment used: 2 ltr scoop and plastic bags  
Number of increments: 13  
Increment size: 2 kgs  
Observations: Different colours and consistence

### DETAIL REQUIREMENTS FOR ON SITE DETERMINATIONS

Identify precautions: Defined by locations and scope

### SAMPLE PRETREATMENT

AS FOUND

### SUB SAMPLING

Use of 100mm riffle box to downsize from around 30 kgs to 5 kgs

### PACKAGING, PRESERVATION, STORAGE AND TRANSPORT REQUIREMENTS

Packaging: 300 plastic bags and use of cable ties to retain consistence  
Preservation: Kept samples separated at all stages  
Storage: Bagged and boxed after riffing  
Transport: From SBL to Ruben Sciortino by Andrew Cutajar by van  
Analytical Laboratory: ENVOIRENMENTAL MONITORING SERVICES LTD of ALS GROUP  
Company Details: ALS Group, Na Harfe, 336/9 Prague - Vysocany Czech Republic

### CHAIN OF CUSTODY

Sample release date: 11/09/2015 Released to: Ruben Sciortino Delivered by: SBL A. Cutajar Signed off: Yes

