Ash Analysis Lab Result

Type of Waste: Municipal Solid Waste (House Hold waste)
Temperature: 750 degrees
Ash: Bottom Ash (BA)

The bottom ash from Municipal Solid Waste (MSW) result below shows that the ash produce from BLACKHOLE™ is safe to be dispose into landfill as the Total Organic Carbon (TOC) is within standard landfill regulation which is **5 %** .

The ash can also be used as an enhancer in concrete mixing where studies have shown that the ash can act as a strengthener to the concrete products.

CERTIFICATE OF ANALYSIS

CERTIFICATE NO : CN 12116 - 2016
Date of Issue : 29/12/2016
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Lab Ref No. : 5215/2016 – 12

Company : **Alam Avani Sdn. Bhd.**
41 – 3A, Jalan PJU 5/9,
Dataran Sunway, Kota Damansara,
47810 Petaling Jaya,
Selangor Darul Ehsan.

Attention : *Mr. Dev*

Date Samples Received : 14/12/2016
No. of Sample : 1 Ash sample
Sample Marking : 5215 – Ash Analysis
Sampling : Samples were collected by client.

No	Parameter	Unit	1755	Analysis Method
1.	Total Solid	%	98.23	APHA 3500 K B, APIIA 3030 B
2.	Total Organic Carbon	%	1	MS 678: Part A: 1980
3.	Sulfide	mg/kg	2.41	In House Method based on Method for the Examination of Water and Associated materials (Environment Agency)

APHA: Denotes American Public Health Association, 21st Edition (2005)

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Azita Ayu Abdul Halim
BSc(App.Chem), MSc(Mar.Sc), AMIC

Sludge Analysis
Type of Waste : Municipal Solid Waste (Plastics, Aluminum foil packaging , food wraps ,)
Temperature: 800 degrees
Sampling: Sludge from 8 way - Water Scrubber System

Our sludge analysis was done to identify the usage of the sludge from the BLACKHOLE™ . The first parameter shows that there is **high concentration of oil & grease** where the material can be used to create

a) Coal
b) Asphalt
c) Greasing agent
d) Burning agent

TCLP reports also shows that the sludge is safe to the environment and within all the standard norms .

CERTIFICATE OF ANALYSIS

CERTIFICATE NO : CN 12116A - 2016
Date of Issue : 29/12/2016
Page : 2 of 2
Lab Ref No. : 5216/2016 – 12

Company : **Alam Avani Sdn. Bhd.**
41 – 3A, Jalan PJU 5/9,
Dataran Sunway, Kota Damansara,
47810 Petaling Jaya,
Selangor Darul Ehsan.

Attention : *Mr. Dev*

Date Samples Received : 14/12/2016
No. of Sample : 1 sludge sample
Sample Marking : 5216 – Sludge Analysis
Sampling : Samples were collected by client.

Results of Analysis: Results are based on samples submitted by customer unless otherwise stated.

No	Parameter	Unit	5216 Sludge Analysis	#Limit	Method of Analysis
1.	Oil & Grease	mg/kg	849136	1000	APHA 5520 E
2.	Total Organic Carbon	%	62	<10	MS 678: Part A: 1980

*After Toxicity Characteristics Leaching Procedure (TCLP) Extraction					
1.	Arsenic as As	mg/l	ND<0.001	5.0	APHA 3114 - B, APHA 3030 F
2.	*Barium as Ba	mg/l	0.01	100.0	APHA 3120 B (2005)
3.	Cadmium as Cd	mg/l	0.025	1.0	APHA 3111- B, APHA 3030 F
4.	Chromium	mg/l	0.17	5.0	APHA 3111 B, APHA 3030 F
5.	Lead as Pb	mg/l	0.12	5.0	APHA 3111- B, APHA 3030 F
6.	Mercury as Hg	mg/l	ND<0.001	0.2	APHA 3112 - B
7.	Selenium as Se	mg/l	ND<0.02	1.0	APHA 3500 - Se D
8.	Silver as Ag	mg/l	ND<0.01	5.0	APHA 3111 B, APHA 3030 F
9.	Copper as Cu	mg/l	0.22	25.0	APHA 3111- B, APHA 3030F
10.	Nickel as Ni	mg/l	0.03	20.0	APHA 3111- B, APHA 3030 F
11.	Tin as Sn	mg/l	0.002	-	In - House Method No.1 (Hydride Method)
12.	Zinc as Zn	mg/l	1.67	250.0	APHA 3111- B, APHA 3030 F
13.	Boron as B	mg/l	ND<0.10	400	APHA 4500 - B C

#Standard limits as stipulated in the Guidelines for the Application of Special Management of Scheduled Waste 2005
*Sub-Contracted to Accredited Laboratory
ND: Not Detectable

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Azita Ayu Abdul Halim
BSc(App.Chem), MSc(Mar.Sc), AMIC
A/2448/5081/2007
(Lab Manager)