

CERTIFICATE OF ANALYSIS

Work Order	: KL1909793	Page	: 1 of 4
Client	: UNIVERSITI KEBANGSAAN MALAYSIA	Laboratory	: ALS Technichem (M) Sdn. Bhd.
Contact	: Assoc Prof, PhD. Wan Zuhairi Yaacob	Contact	: Farid Abdul Rahman
Address	: Geology Programme, School of Environmental Sciences and Natural Resources, Faculty of Science and Technology, UKM, 43600 Bangi, Selangor BANGI Malaysia 43600	Address	: WISMA ALS, 21, Jalan Astaka U8/84, Bukit Jelutong Shah Alam Selangor Malaysia 40150
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Telephone	: +603 8921 5390	Telephone	: 60378458257
Facsimile	: ----	Facsimile	: +603 7845 8258
Project	: JERANTUT GROUNDWATER MONITORING	QC Level	: ALS Malaysia Standard Quality Schedule
Order number	:	Date Samples Received	: 20-Sep-2019 19:00
C-O-C number	: 14650	Date Analysis Commenced	: 21-Sep-2019
Sampler	: ----	Issue Date	: 02-Oct-2019 17:49
Site	: ----		
Quote number	: KL2019UKMSCBNGI0005_GW	No. of samples received	: 2
		No. of samples analysed	: 2

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results



Signatories

This laboratory is accredited under STANDARDS MALAYSIA. The tests reported herein have been performed in accordance with laboratory's Terms of Accreditation. This document has been electronically signed by authorized signatories indicated below. Electronic signing has been carried out in compliance with procedure specified in 21 CFR Part 11.

Signatories

Nazirah Ariffin
Norain Yahya
SuAnn Lee

Position

Lab Supervisor - Environmental (IKM No: M/3878/6603/13)
Chemist (IKM No: M/4233/7042/15)
Lab Manager - Microbiology (MJMM No: 0288)



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, ASTM, NIOSH and BS EN. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

ø = ALS is not accredited for these tests.

~ = Indicates an estimated value.

- ALS TECHNICHEM prepares this Test Report based on the tests requested and on the specific sample(s) submitted for analysis. The significance of this Report is subject to the adequacy and representative character of the sample(s) and to the comprehensiveness of the tests requested or made. ALS TECHNICHEM assumes no responsibility for variations in quality or other characteristic of the product produced or supplied under conditions over which ALS TECHNICHEM has no control.
ALS TECHNICHEM acts for the customer from whom the instructions to act have originated. No other party is entitled to give instructions, particularly on the scope of analysis or delivery of report or certificate, unless so authorized by the customer.
- ALS TECHNICHEM undertakes to exercise due care and skill in the performance of its analytical and consultancy services but no warranties are given and none may be implied directly or indirectly relating to ALS TECHNICHEM's test results, services or facilities. In no event shall ALS TECHNICHEM be liable to collateral, special or consequential damage.
- Result < LOR = Not Detected (ND)
- Where moisture determination has been performed, results are reported on a dry weight basis.

Sub-Matrix: **WATER**

Sampling date/time

18-Sep-2019 10:00

18-Sep-2019 11:00

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Compound

Method

LOR

Unit

KL1909793-001

KL1909793-002

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Conductivity	APHA2510B	0.001	mS/cm	0.323	0.130	----	----	----
pH Value	APHA4500H+B	0.1	pH Unit	6.5	7.0	----	----	----
Salinity	APHA2520B	0.1	parts/1000	0.2	<0.1	----	----	----
Total Dissolved Solids	APHA2540C	1	mg/L	178	71	----	----	----
Total Hardness as CaCO3	APHA2340B	0.1	mg/L	135	135	----	----	----
Total Suspended Solids	APHA2540D	1	mg/L	58	38	----	----	----
Carbonate Alkalinity as CO3	APHA2320B	1	mg/L	<1	<1	----	----	----
Bicarbonate Alkalinity as HCO3	APHA2320B	1	mg/L	149	83	----	----	----

Total Phenols	APHA5530B&D	0.001	mg/L	<0.001	0.011	----	----	----
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Total Phenols	APHA5530B&D	0.001	mg/L	<0.001	0.011	----	----	----
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Chloride	APHA4500-Cl-E	1	mg/L	<1	<1	----	----	----
Hexavalent Chromium	APHA3500-Cr-D	0.01	mg/L	<0.01	<0.01	----	----	----
Nitrate as NO3	APHA4500-NO3-H	0.01	mg/L	4.38	<0.01	----	----	----
Phosphorus as P	APHA4500P F	0.01	mg/L	0.04	0.02	----	----	----
Sulphate	CH17-11	1	mg/L	4	<1	----	----	----
Total Cyanide	APHA4500CN C&E	0.050	mg/L	<0.050	<0.050	----	----	----
Total Nitrogen as N	APHA 4500Norg B NO3H	1	mg/L	1	<1	----	----	----

Chloride	APHA4500-Cl-E	1	mg/L	<1	<1	----	----	----
Hexavalent Chromium	APHA3500-Cr-D	0.01	mg/L	<0.01	<0.01	----	----	----
Nitrate as NO3	APHA4500-NO3-H	0.01	mg/L	4.38	<0.01	----	----	----
Phosphorus as P	APHA4500P F	0.01	mg/L	0.04	0.02	----	----	----
Sulphate	CH17-11	1	mg/L	4	<1	----	----	----
Total Cyanide	APHA4500CN C&E	0.050	mg/L	<0.050	<0.050	----	----	----
Total Nitrogen as N	APHA 4500Norg B NO3H	1	mg/L	1	<1	----	----	----

Aluminium	APHA3125B	0.0010	mg/L	0.0455	0.104	----	----	----
Arsenic	APHA3125B	0.0010	mg/L	0.0022	0.0015	----	----	----
Cadmium	APHA3125B	0.0005	mg/L	<0.0005	<0.0005	----	----	----
Calcium	APHA3120B	0.1	mg/L	47.1	47.2	----	----	----
Copper	APHA3125B	0.0010	mg/L	<0.0010	0.0030	----	----	----
Iron	APHA3125B	0.0010	mg/L	2.85	0.921	----	----	----
Lead	APHA3125B	0.0010	mg/L	0.0444	0.398	----	----	----
Magnesium	APHA3120B	0.1	mg/L	4.2	4.2	----	----	----
Manganese	APHA3125B	0.0010	mg/L	0.805	0.125	----	----	----
Potassium	APHA3120B	0.1	mg/L	1.7	4.1	----	----	----
Selenium	APHA3125B	0.0020	mg/L	<0.0020	<0.0020	----	----	----
Sodium	APHA3120B	0.1	mg/L	12.1	9.6	----	----	----
Zinc	APHA3125B	0.0010	mg/L	0.0161	0.0149	----	----	----

Aluminium	APHA3125B	0.0010	mg/L	0.0455	0.104	----	----	----
Arsenic	APHA3125B	0.0010	mg/L	0.0022	0.0015	----	----	----
Cadmium	APHA3125B	0.0005	mg/L	<0.0005	<0.0005	----	----	----
Calcium	APHA3120B	0.1	mg/L	47.1	47.2	----	----	----
Copper	APHA3125B	0.0010	mg/L	<0.0010	0.0030	----	----	----
Iron	APHA3125B	0.0010	mg/L	2.85	0.921	----	----	----
Lead	APHA3125B	0.0010	mg/L	0.0444	0.398	----	----	----
Magnesium	APHA3120B	0.1	mg/L	4.2	4.2	----	----	----
Manganese	APHA3125B	0.0010	mg/L	0.805	0.125	----	----	----
Potassium	APHA3120B	0.1	mg/L	1.7	4.1	----	----	----
Selenium	APHA3125B	0.0020	mg/L	<0.0020	<0.0020	----	----	----
Sodium	APHA3120B	0.1	mg/L	12.1	9.6	----	----	----
Zinc	APHA3125B	0.0010	mg/L	0.0161	0.0149	----	----	----



Analytical Results

Sub-Matrix: **WATER**

				<i>Client sample ID</i>				
				<i>Sampling date/time</i>				
<i>Compound</i>	<i>Method</i>	<i>LOR</i>	<i>Unit</i>	BH6 TH20K	BH7 TH20K			
				18-Sep-2019 10:00	18-Sep-2019 11:00	----	----	----
				KL1909793-001	KL1909793-002	-----	-----	-----
Microbiological Testing - Continued								
Total Escherichia coli Count	MB-17-22	1	CFU/100m L	<1	8	----	----	----