

CERTIFICATE OF ANALYSIS

Work Order : KL2002517 Client : SMHB SDN BHD Contact : TANG YY-SAN Address : 38, JALAN 1/76D DESA PANDAN KUALA LUMPUR 55100 E-mail : tangys@smhb.com Telephone : ---- Facsimile : ---- Project : ENVIRONMENTAL MONITORING AT PULAU INDAH, KLANG Order number : ---- C-O-C number : ---- Sampler : CHOO/FADZIL/HUSNI Site : WESTPORT PHASE II DEVELOPMENT Quote number : KL2019SMHB0002	Page : 1 of 9 Laboratory : ALS Technichem (M) Sdn. Bhd. Contact : AbdulQaiyum Musa Address : WISMA ALS, 21, Jalan Astaka U8/84, Bukit Jelutong Shah Alam Selangor Malaysia 40150 E-mail : AbdulQaiyum.Musa@alsglobal.com Telephone : +60175552985 Facsimile : +603 7845 8258 QC Level : ALS Malaysia Standard Quality Schedule Date Samples Received : 27-Feb-2020 19:00 Date Analysis Commenced : 28-Feb-2020 Issue Date : 10-Mar-2020 18:12 No. of samples received : 12 No. of samples analysed : 12
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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
- Surrogate Control Limits



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
 Nuramira Abdmalek
 SitiAisha AbdAziz

Position

Lab Supervisor - Environmental (IKM No: M/3878/6603/13)
 Chemist (IKM No: M/4867/8027/18)
 Lab Supervisor - Microbiology (MJMM No: 0289)



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

∅ = ALS is not accredited for these tests.

~ = Indicates an estimated value.

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- In Situ measurement results provided by client
- Result < LOR = Not Detected (ND)
- Where moisture determination has been performed, results are reported on a dry weight basis.



Analytical Results

Sub-Matrix: SEAWATER

Compound	Method	LOR	Unit	Client sample ID	W1 HT TOP	W1 HT MIDDLE	W1 HT BOTTOM	W2 HT TOP	W2 HT MIDDLE
				Sampling date/time	27-Feb-2020 09:35	27-Feb-2020 09:16	27-Feb-2020 08:57	27-Feb-2020 08:45	27-Feb-2020 08:20
				KL2002517-001	KL2002517-002	KL2002517-003	KL2002517-004	KL2002517-005	KL2002517-005
Physical and Aggregate Properties									
Salinity	APHA2520B	0.1	parts/1000		25.1	24.8	24.4	24.6	24.0
Total Suspended Solids	APHA2540D	1	mg/L		10	26	30	14	20
Turbidity	APHA2130B	1.0	NTU		<1.0	41.8	42.7	51.9	52.2
Aggregate Organics									
Biochemical Oxygen Demand	APHA5210B	1	mg/L		4	3	4	3	3
Chemical Oxygen Demand	APHA5220D	1	mg/L		9	8	8	9	10
Oil & Grease	APHA5520B	1	mg/L		<1	<1	<1	<1	<1
Total Phenols	APHA5530B&D	10	µg/L		<10	<10	<10	<10	<10
Inorganic and Nonmetallic Properties									
Ammonia (Unionized)	APHA4500 NH3	10	µg/L		5	27	7	16	27
Hexavalent Chromium	APHA3500-Cr-D	10	µg/L		<10	<10	<10	<10	<10
Total Cyanide	APHA4500CN C&E	5	µg/L		<5	<5	<5	<5	<5
Nitrate as NO3	CH17-16	10	µg/L		63	170	49	42	131
Nitrite as NO2	APHA4500-NO2-B	10	µg/L		150	125	145	190	229
Phosphate as P	APHA4500-P F	10	µg/L		<10	<10	<10	<10	12
Metals and Major Cations									
Aluminium	APHA3125B	0.1	µg/L		63.4	274	381	205	182
Cadmium	APHA3125B	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Copper	APHA3125B	0.1	µg/L		8.7	0.8	12.4	0.6	0.8
Lead	APHA3125B	0.1	µg/L		0.9	2.1	11.4	0.8	1.4
Mercury	APHA3125B	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Zinc	APHA3125B	0.1	µg/L		14.2	11.1	30.4	6.6	8.9
Metals Speciation									
Arsenious Acid (As (III))	CH17-85	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
Polycyclic Aromatics Hydrocarbons (PAHs)									
Polycyclic Aromatic Hydrocarbons (PAHs)	USEPA8270C	5	µg/L		<5	<5	<5	<5	<5
Organotin									
Tributyltin	OG-17-33	2	ngSn/L		<2	<2	<2	<2	<2
In Situ Measurement									
Conductivity	SP-21-020	1	uS/cm		67200	68300	68000	66400	67000
Dissolved Oxygen	SP-21-019	0.01	mg/L		3.82	4.65	4.87	5.86	5.60
pH - Field	SP-21-017	0.1	pH Unit		8.2	8.7	7.9	8.2	8.1
Temperature	SP-21-018	0.1	°C		30.4	30.2	30.1	29.9	29.5
Microbiological Testing									



Analytical Results

Sub-Matrix: SEAWATER

Compound	Method	LOR	Unit	Client sample ID	W1 HT TOP	W1 HT MIDDLE	W1 HT BOTTOM	W2 HT TOP	W2 HT MIDDLE
				Sampling date/time	27-Feb-2020 09:35	27-Feb-2020 09:16	27-Feb-2020 08:57	27-Feb-2020 08:45	27-Feb-2020 08:20
				KL2002517-001	KL2002517-002	KL2002517-003	KL2002517-004	KL2002517-005	KL2002517-005
Microbiological Testing - Continued									
Enterococci	APHA9230C	1	CFU/100m L	<1	<1	4	<1	<1	
Total Faecal Coliform Count	APHA9222D	1	CFU/100m L	<1	120	8	16	2720	
Acid Extractable Surrogates									
2-Fluorophenol	USEPA8270C	0.5	%	44.4	42.7	41.1	43.7	47.1	
Phenol-d5	USEPA8270C	0.5	%	47.2	44.4	44.9	46.9	49.0	
2,4,6-Tribromophenol	USEPA8270C	0.5	%	116	101	106	103	122	
Base/Neutral Extractable Surrogates									
Nitrobenzene -d5	USEPA8270C	0.5	%	96.7	93.0	93.4	96.6	106	
2-Fluorobiphenyl	USEPA8270C	0.5	%	90.2	86.9	87.5	90.1	98.2	
4-Terphenyl-d14	USEPA8270C	0.5	%	80.2	85.9	82.2	81.7	88.1	



Analytical Results

Sub-Matrix: SEAWATER

Compound	Method	LOR	Unit	Client sample ID	W2 HT BOTTOM	W3 HT TOP	W3 HT MIDDLE	W3 HT BOTTOM	W4 HT TOP
				Sampling date/time	27-Feb-2020 08:00	27-Feb-2020 10:45	27-Feb-2020 10:55	27-Feb-2020 11:05	27-Feb-2020 11:30
				KL2002517-006	KL2002517-007	KL2002517-008	KL2002517-009	KL2002517-010	KL2002517-010
Physical and Aggregate Properties									
Salinity	APHA2520B	0.1	parts/1000		24.7	24.6	24.9	24.5	25.0
Total Suspended Solids	APHA2540D	1	mg/L		90	10	7	124	13
Turbidity	APHA2130B	1.0	NTU		60.3	30.3	33.4	114	19.7
Aggregate Organics									
Biochemical Oxygen Demand	APHA5210B	1	mg/L		4	3	4	4	5
Chemical Oxygen Demand	APHA5220D	1	mg/L		8	9	11	10	12
Oil & Grease	APHA5520B	1	mg/L		<1	<1	<1	<1	<1
Total Phenols	APHA5530B&D	10	µg/L		<10	<10	<10	<10	<10
Inorganic and Nonmetallic Properties									
Ammonia (Unionized)	APHA4500 NH3	10	µg/L		11	7	12	25	18
Hexavalent Chromium	APHA3500-Cr-D	10	µg/L		<10	<10	<10	<10	<10
Total Cyanide	APHA4500CN C&E	5	µg/L		<5	<5	<5	<5	<5
Nitrate as NO3	CH17-16	10	µg/L		50	86	205	317	58
Nitrite as NO2	APHA4500-NO2-B	10	µg/L		215	115	147	48	190
Phosphate as P	APHA4500-P F	10	µg/L		<10	<10	<10	<10	<10
Metals and Major Cations									
Aluminium	APHA3125B	0.1	µg/L		311	86.7	82.2	414	80.6
Cadmium	APHA3125B	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Copper	APHA3125B	0.1	µg/L		1.1	0.4	1.9	6.9	0.4
Lead	APHA3125B	0.1	µg/L		3.2	0.9	3.6	9.1	0.8
Mercury	APHA3125B	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Zinc	APHA3125B	0.1	µg/L		14.2	6.9	22.0	29.6	6.2
Metals Speciation									
Arsenious Acid (As (III))	CH17-85	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
Polycyclic Aromatics Hydrocarbons (PAHs)									
Polycyclic Aromatic Hydrocarbons (PAHs)	USEPA8270C	5	µg/L		<5	<5	<5	<5	<5
Organotin									
Tributyltin	OG-17-33	2	ngSn/L		<2	<2	<2	<2	<2
In Situ Measurement									
Conductivity	SP-21-020	1	uS/cm		66500	68300	67700	67800	67000
Dissolved Oxygen	SP-21-019	0.01	mg/L		4.30	8.39	8.58	6.10	4.95
pH - Field	SP-21-017	0.1	pH Unit		8.0	8.2	8.0	9.4	8.4
Temperature	SP-21-018	0.1	°C		29.1	30.3	29.9	29.6	29.8
Microbiological Testing									



Analytical Results

Sub-Matrix: SEAWATER

Compound	Method	LOR	Unit	Client sample ID	W2 HT BOTTOM	W3 HT TOP	W3 HT MIDDLE	W3 HT BOTTOM	W4 HT TOP
				Sampling date/time	27-Feb-2020 08:00	27-Feb-2020 10:45	27-Feb-2020 10:55	27-Feb-2020 11:05	27-Feb-2020 11:30
				KL2002517-006	KL2002517-007	KL2002517-008	KL2002517-009	KL2002517-010	KL2002517-010
Microbiological Testing - Continued									
Enterococci	APHA9230C	1	CFU/100m L	<1	<1	<1	<1	<1	<1
Total Faecal Coliform Count	APHA9222D	1	CFU/100m L	10200	2880	7000	340	440	
Acid Extractable Surrogates									
2-Fluorophenol	USEPA8270C	0.5	%	44.3	45.3	54.4	50.9	52.2	
Phenol-d5	USEPA8270C	0.5	%	46.3	47.4	55.1	55.2	54.4	
2,4,6-Tribromophenol	USEPA8270C	0.5	%	113	120	88.5	85.1	84.0	
Base/Neutral Extractable Surrogates									
Nitrobenzene -d5	USEPA8270C	0.5	%	96.4	98.8	101	99.5	96.0	
2-Fluorobiphenyl	USEPA8270C	0.5	%	89.9	97.3	90.1	88.0	84.4	
4-Terphenyl-d14	USEPA8270C	0.5	%	76.7	82.0	75.9	72.6	61.3	



Analytical Results

Sub-Matrix: SEAWATER

				Client sample ID	W4 HT MIDDLE	W4 HT BOTTOM	----	----	----
				Sampling date/time	27-Feb-2020 12:55	27-Feb-2020 12:30	----	----	----
Compound	Method	LOR	Unit	KL2002517-011	KL2002517-012	-----	-----	-----	
Physical and Aggregate Properties									
Salinity	APHA2520B	0.1	parts/1000	25.1	25.4	----	----	----	
Total Suspended Solids	APHA2540D	1	mg/L	11	6	----	----	----	
Turbidity	APHA2130B	1.0	NTU	23.7	10.3	----	----	----	
Aggregate Organics									
Biochemical Oxygen Demand	APHA5210B	1	mg/L	3	3	----	----	----	
Chemical Oxygen Demand	APHA5220D	1	mg/L	9	8	----	----	----	
Oil & Grease	APHA5520B	1	mg/L	<1	<1	----	----	----	
Total Phenols	APHA5530B&D	10	µg/L	<10	<10	----	----	----	
Inorganic and Nonmetallic Properties									
Ammonia (Unionized)	APHA4500 NH3	10	µg/L	12	6	----	----	----	
Hexavalent Chromium	APHA3500-Cr-D	10	µg/L	<10	<10	----	----	----	
Total Cyanide	APHA4500CN C&E	5	µg/L	<5	<5	----	----	----	
Nitrate as NO3	CH17-16	10	µg/L	716	53	----	----	----	
Nitrite as NO2	APHA4500-NO2-B	10	µg/L	44	64	----	----	----	
Phosphate as P	APHA4500-P F	10	µg/L	<10	<10	----	----	----	
Metals and Major Cations									
Aluminium	APHA3125B	0.1	µg/L	81.6	207	----	----	----	
Cadmium	APHA3125B	0.1	µg/L	<0.1	<0.1	----	----	----	
Copper	APHA3125B	0.1	µg/L	1.0	0.6	----	----	----	
Lead	APHA3125B	0.1	µg/L	2.9	1.9	----	----	----	
Mercury	APHA3125B	0.1	µg/L	<0.1	<0.1	----	----	----	
Zinc	APHA3125B	0.1	µg/L	16.6	10.2	----	----	----	
Metals Speciation									
Arsenious Acid (As (III))	CH17-85	0.5	µg/L	<0.5	<0.5	----	----	----	
Polycyclic Aromatics Hydrocarbons (PAHs)									
Polycyclic Aromatic Hydrocarbons (PAHs)	USEPA8270C	5	µg/L	<5	<5	----	----	----	
Organotin									
Tributyltin	OG-17-33	2	ngSn/L	<2	<2	----	----	----	
In Situ Measurement									
Conductivity	SP-21-020	1	uS/cm	68700	67500	----	----	----	
Dissolved Oxygen	SP-21-019	0.01	mg/L	6.70	6.36	----	----	----	
pH - Field	SP-21-017	0.1	pH Unit	8.3	8.4	----	----	----	
Temperature	SP-21-018	0.1	°C	29.4	28.8	----	----	----	
Microbiological Testing									



Analytical Results

Sub-Matrix: SEAWATER

				Client sample ID	W4 HT MIDDLE	W4 HT BOTTOM	----	----	----
				Sampling date/time	27-Feb-2020 12:55	27-Feb-2020 12:30	----	----	----
Compound	Method	LOR	Unit	KL2002517-011	KL2002517-012	-----	-----	-----	
Microbiological Testing - Continued									
<i>Enterococci</i>	APHA9230C	1	CFU/100m L	8	<1	----	----	----	
Total Faecal Coliform Count	APHA9222D	1	CFU/100m L	2800	<1	----	----	----	
Acid Extractable Surrogates									
2-Fluorophenol	USEPA8270C	0.5	%	56.9	49.0	----	----	----	
Phenol-d5	USEPA8270C	0.5	%	56.9	43.0	----	----	----	
2,4,6-Tribromophenol	USEPA8270C	0.5	%	88.2	68.9	----	----	----	
Base/Neutral Extractable Surrogates									
Nitrobenzene -d5	USEPA8270C	0.5	%	106	93.7	----	----	----	
2-Fluorobiphenyl	USEPA8270C	0.5	%	89.2	74.4	----	----	----	
4-Terphenyl-d14	USEPA8270C	0.5	%	74.5	69.0	----	----	----	



Surrogate Control Limits

Sub-Matrix: SEAWATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
Acid Extractable Surrogates			
2-Fluorophenol	367-12-4	20	60
Phenol-d5	----	20	60
2,4,6-Tribromophenol	118-79-6	50	140
Base/Neutral Extractable Surrogates			
Nitrobenzene -d5	4165-60-0	50	140
2-Fluorobiphenyl	321-60-8	50	140
4-Terphenyl-d14	1718-51-0	50	140