

NO: SAMM 778

(Issue 4, 13 November 2024 replacement
of SAMM 778 dated 29 March 2024)

Page: 1 of 9

LABORATORY LOCATION:
(PERMANENT LABORATORY)



T & T BORNEO LABORATORY SDN. BHD.
GROUND FLOOR, SUBLOT 20, LOT 5575
KUCHING CITY MALL,
NEW EXPRESSWAY 4.5 MILES
OFF PENRISSEN ROAD
93250 KUCHING, SARAWAK
MALAYSIA

FIELDS OF TESTING:

CHEMICAL, MICROBIOLOGY

This laboratory has demonstrated its technical competence to operate in accordance with MS ISO/IEC 17025:2017 (ISO/IEC 17025:2017).

This laboratory's fulfillment of the requirements of ISO/IEC 17025 means the laboratory meets both the technical competence requirements and management system requirements that are necessary for it to consistently deliver technically valid test results and calibrations. The management system requirements in ISO/IEC 17025 are written in language relevant to laboratory operations and operate generally in accordance with the principles of ISO 9001 (see Joint ISO-ILAC-IAF Communiqué dated April 2017).

SCOPE OF TESTING: CHEMICAL

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Water Industrial Effluent Wastewater Surface Water Portable Water Reverse Osmosis Water	pH	APHA 4500-H+ B (2005, 2017)
	Total Suspended Solids	APHA 2540 D (2005, 2017)
Water Industrial Effluent Wastewater Surface Water	Biochemical Oxygen Demand (BOD 5 days)	APHA 5210 B, APHA 4500-O G (2005, 2017)
	Chemical Oxygen Demand (COD)	APHA 5220 C (2005, 2017)
Water Potable Water/ Drinking Water Tap Water	Free Chlorine	APHA 4500-Cl G (2017)
	Colour	APHA 2120 B (2017)

NO: SAMM 778

(Issue 4, 13 November 2024 replacement
of SAMM 778 dated 29 March 2024)

Page: 2 of 9

SCOPE OF TESTING: CHEMICAL

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Water Potable Water/ Drinking Water Reverse Osmosis Water	Aluminium	APHA 3120 B, 23 rd Ed (2017)
	Cadmium	APHA 3120 B, 23 rd Ed (2017)
	Chromium	APHA 3120 B, 23 rd Ed (2017)
	Lead	APHA 3120 B, 23 rd Ed (2017)
	Manganese	APHA 3120 B, 23 rd Ed (2017)
	Silver	APHA 3120 B, 23 rd Ed (2017)
	Zinc	APHA 3120 B, 23 rd Ed (2017)
Water Potable Water/ Drinking Water Tap Water Wastewater Effluent Surface Water	Total Dissolved Solid	APHA 2540 C, 21 st Ed (2005), 23 rd Ed (2017)
	Total Solid	APHA 2540 B, 21 st Ed (2005), 23 rd Ed (2017)
	Nitrate	APHA 4500 NO ₃ ⁻ B, 23 rd Ed (2017)
	Nitrite	APHA 4500 NO ₂ ⁻ B, 23 rd Ed (2017)
	Phosphorus	APHA 4500-P B & C, 23 rd Ed (2017)
	Oil and Grease	APHA 5520 B, 21 st Ed (2005)
	Ammoniacal Nitrogen	APHA 4500 NH ₃ B & C, 23 rd Ed (2017)
	Conductivity	APHA 2510 B, 23 rd Ed (2017)
	Salinity	APHA 2520 B, 23 rd Ed (2017)
	Chloride	APHA 4500 Cl B, 23 rd Ed (2017)
	Total Alkalinity	APHA 2320 B, 23 rd Ed (2017)
	Turbidity	APHA 2130 B, 23 rd Ed (2017)
	Copper	APHA 3111 B, 23 rd (2017)
	Calcium	APHA 3111 B, 23 rd (2017)

NO: SAMM 778

(Issue 4, 13 November 2024 replacement
of SAMM 778 dated 29 March 2024)

Page: 3 of 9

SCOPE OF TESTING: CHEMICAL

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Water Potable Water/ Drinking Water Tap Water Wastewater Effluent Surface Water	Magnesium	APHA 3111 B, 23 rd Ed (2017)
	Iron	APHA 3111 B, 23 rd Ed (2017)
	Sodium	APHA 3111 B, 23 rd Ed (2017)
	Potassium	APHA 3111 B, 23 rd Ed (2017)
	Manganese	APHA 3111 B, 23 rd Ed (2017)
	Hardness (as CaCO ₃)	APHA 2340 B, 23 rd Ed (2017)
	Mercury	APHA 3112 B, 23 rd Ed (2017)
	Arsenic	APHA 3114 C, 23 rd Ed (2017)
	Fluoride	APHA 4500-F D (2017)
Water Drinking Water / Potable Water Surface Water	Bromodichloromethane Bromoform Chloroform Dibromochloromethane	In-house method TM TT-WE02034 based on APHA 6200 B (2012) and Journal Chromatography A1395 (2015) 41-47
	Organochlorine Pesticides Aldrin Chlordane DDT Dieldrin Endosulfan Heptachlor Heptachlor epoxide Lindane Methoxychlor	In-house method TM TT-WE02035 based on APHA 6630 D
Water Drinking Water Demineralized Water Cooling Water Wastewater	Aluminium Antimony Barium Boron Cadmium Chromium Copper Iron Lead Magnesium Manganese Nickel Selenium Silver Sodium Zinc	APHA 3120 B, 23 rd Ed (2017)

NO: SAMM 778

(Issue 4, 13 November 2024 replacement
of SAMM 778 dated 29 March 2024)

Page: 4 of 9

SCOPE OF TESTING: CHEMICAL

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Water Drinking Water / Potable Water Surface Water Demineralized Water Wastewater	Cyanide	APHA 4500 CN E (2017)
	Temperature	APHA 2550 B (2017)
	Sulphate	APHA 4500-SO ₄ ²⁻ E (2017)
	Chromium Hexavalent	APHA 3500-Cr B (2017)
	Chromium Trivalent	In-house method TM TT-WE02030 based on APHA 3500-Cr B (2017) APHA 3120 B (2017) & HACH DOC316.53.01035
	Phenol	APHA 5530 B & D (2017)
Water Wastewater Surface Water	Colour (ADMI)	APHA 2120 F (2017)
Water Surface Water Wastewater Industrial Effluent	Total Kjeldahl Nitrogen	APHA 4500 Norg B (2017) APHA 4500 Norg B (2005)
Feed	Moisture	AOAC 930.15 (2010)
	Ash	AOAC 942.05 (2010)
	Crude Fiber	AOAC 978.10 (2010)
	Fat (Crude)	AOAC 920.39 (2010)
	Protein (Crude)	AOAC 2001.11 (2010)
	Sodium Potassium Calcium Magnesium Iron Copper	AOAC 968.08 (2005)
	Phosphorus	In-house method TM TT-FE02004 based on AOAC 965.17 (2005)

NO: SAMM 778

(Issue 4, 13 November 2024 replacement
of SAMM 778 dated 29 March 2024)

Page: 5 of 9

SCOPE OF TESTING: CHEMICAL

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Food	Moisture	AOAC 984.25 (2010)
	Ash	In-house method TM TT-FD02002 based on AOAC 923.03 & AOAC 940.26 (2010)
	Total Sugar	AOAC 968.28 (2010)
	Carbohydrate & Energy	Method of Analysis for Nutrition Labelling, AOAC 1993 Page 5 & 106
	Salt	AOAC 960.29 (2011)
	Fat (Crude)	In-house method TM TT-FD02004 based on AOAC 920.39 (2010)
	Protein	In-house method TM TT-FD02003 based on AOAC 2001.11 (2010)
	Sodium Potassium Calcium Magnesium Iron Copper	In-house method TM TT-FE02003 based on AOAC 968.08 (2005)
	Phosphorus	In-house method TM TT-FE02004 based on AOAC 965.17 (2005)
	Arsenic	In-house method TM TT-FD02013 based on AOAC 971.21 (2005)
	Mercury	In-house method TM TT-FD02012 based on AOAC 971.21 (2005)
	Lead Cadmium	In-house method TM TT-FD02011 based on AOAC 999.11 (2006)
	Antimony Tin	In-house method TM TT-FD02010 based on AOAC 985.01 (2005)
	Sulphur dioxide	Buchi Application Note No. 229/2016

NO: SAMM 778

(Issue 4, 13 November 2024 replacement
of SAMM 778 dated 29 March 2024)

Page: 6 of 9

SCOPE OF TESTING: CHEMICAL

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Food Products	Total Dietary Fiber	In-house method TM TT-FD02015 based on AOAC 985.29
	Available Carbohydrate and Energy	Guide to Nutrition Labelling & Claims pg 18 (2010)
	Calories from Fat	
	Fatty Acid Composition Monounsaturated Fat Saturated Fat Polyunsaturated Fat Trans Fatty Acid Total Omega-3 Fatty Acid Total Omega-6 Fatty Acid Total Omega-9 Fatty Acid Eicosatetraenoic Acid (EPA) Docosahexaenoic Acid (DHA) Alpha-Linolenic Acid (ALA)	In-house method TM TT-FD02018 based on AOAC 996.06
	Cholesterol	In-house method TM TT-FD02022 based on JAOAC Vol. 78, No. 6 (1995)
	Added Sugar (as Sucrose)	In-house method TM TT-FD02019 based on AOAC 968.28
	Benzoic Acid Sorbic Acid	In-house method TM TT-FD02016 based on AOAC 994.11
	Vitamin C	Journal of Liquid Chromatography & Related Technologies, 24:7, 1015-1020 (2001)
	Vitamin A Vitamin D Vitamin E	GB 5413.9-2010
Food Products, Beverages	Alcohol Content	In-house method TM TT-FD02017 based on J.Chem. Metrol: (2013) 7-9
Liquid Food Products, Beverages	Total Fat	In-house method TM TT-FD02005 based on AOAC 989.05 (2011)
Dairy Products	Fat	AOAC 989.05 (2011)

NO: SAMM 778

(Issue 4, 13 November 2024 replacement
of SAMM 778 dated 29 March 2024)

Page: 7 of 9

SCOPE OF TESTING: CHEMICAL

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Palm Oil Mill Effluent	Biochemical Oxygen Demand (BOD ₃ days)	DOE, 2019 Alternative Method
Palm Oil & Palm Oil Products	Free Fatty Acid	MPOB p2.5:2004
	Iodine Value	MPOB p3.2:2004
	Peroxide Value	MPOB p2.3:2004
	Moisture and Volatile Matter	MPOB p2.1 Part 1:2004
	Deterioration of Bleachability Index (DOBI)	MPOB p2.9:2004
	Unsaponifiable Matter	AOCS Ca 6a-40
Fertilizer	Ash	MS 417: Part 2: 1994
	Calcium (as CaO)	MS 417: Part 8: 1997
	Potassium (as K ₂ O)	MS 417: Part 5: 1994
	Magnesium (as MgO)	MS 417: Part 6: 1994, Clause 5&7
	Moisture	MS 417: Part 2: 1994, Method 1
	Nitrogen	In-house method TM TT-FT02005 based on Buchi Application Note 041/2010
	Phosphorus (as P ₂ O ₅)	MS 417: Part 4: 1994, Method 1
Soil	pH value (6% w/v solution)	MS 2457:2012
	Conductivity	MS 2458:2012
	Total Organic Carbon	MS 2469:2012
	Nitrogen	In-house method TM TT-FT02005 based on Buchi Application Note 041/2010
	C:N ratio	In-house method TM TT-FT02008 based on TM TT-FT02005 and MS 2469:2012

NO: SAMM 778

(Issue 4, 13 November 2024 replacement
of SAMM 778 dated 29 March 2024)

Page: 8 of 9

SCOPE OF TESTING: MICROBIOLOGY

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Foods and Feeds	Total Plate Count	AOAC 966.23 (2005)
	Coliform and <i>Escherichia coli</i> (MPN)	AOAC 966.24 (2005)
	Coliform and <i>Escherichia coli</i> Count (Petrifilm)	AOAC 998.08 (2005)
	Coliform and <i>Escherichia coli</i> Count (Rapid Petrifilm)	AOAC 2018.13 (2018)
	Total Yeasts and Moulds	FDA Bacteriological Analytical Method, Chapter 18 (2001)
	Yeast and Mould Count (Petrifilm)	AOAC 997.02 (2005)
	Detection of <i>Salmonella</i>	AOAC 995.20 (2005)
Foods	<i>Staphylococcus aureus</i> Count	AOAC 975.55 (2005)
	<i>Lactobacillus</i> Count	In-house method, TM-TT-FD03007, Based on Merck Microbiology Manual 12 th Edition (2010)
	Detection of <i>Listeria monocytogenes</i>	FDA Bacteriological Analytical Method, Chapter 10 (2017)
	<i>Campylobacter</i> spp. Count	ISO 10272-2:2017
	<i>Bacillus cereus</i> Count	In-house method TM TT-FD03012 based on FDA BAM Chapter 14 (2020)
Water	Total Heterotrophic Plate Count	APHA 9215 B (2012)
	Total Heterotrophic Plate Count (Membrane Filtration)	APHA 9215 D (2012)
	Total Coliform Count	APHA 9221 B (2012)
	<i>Escherichia coli</i> count	APHA 9221 B & 9221 F (2012)
	<i>Fecal Enterococcus</i> / <i>Streptococcus</i> Count	APHA 9230 B (2012)
	<i>Pseudomonas aeruginosa</i> Count	APHA 9213 E (2012)
	Detection of <i>Clostridium perfringens</i>	ISO 14189 (2013)
	Sulfite-reducing Anaerobes (<i>Clostridia</i>)	ISO 6461/2 (1986)
	<i>Legionella</i> spp.	AS/NZS 3896:2008

NO: SAMM 778

(Issue 4, 13 November 2024 replacement
of SAMM 778 dated 29 March 2024)

Page: 9 of 9

SCOPE OF TESTING: MICROBIOLOGY

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Settled Plates (for air sampling)	Total plate count	In-house method TM TT- MS03002 based on Compendium of Methods for the Microbiological Examination of Foods, 5 th Edition 2015, Chapter 3
	Total yeast and mould count	
Surface swab, Hand swab	Total plate count	
	Total yeast and mould count	
	Coliform count	
	<i>Escherichia coli</i> count	
	<i>Staphylococcus aureus</i> count	
	<i>Salmonella spp.</i>	
	<i>Listeria spp.</i>	

Notes:

APHA: American Public Health Association

AOAC: Official Methods of Analysis

ISO: International Organization for Standardization