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LABORATORY LOCATION:
(PERMANENT LABORATORY)

PERMULAB SDN. BHD.
A-G-16 MERCHANT SQUARE @ TROPICANA
JALAN TROPICANA SELATAN 1, PJU 3
47410 PETALING JAYA
SELANGOR
MALAYSIA

FIELDS OF TESTING:

CHEMICAL, MECHANICAL, MICROBIOLOGY AND
NUCLEIC ACID

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 River Water Drinking Water Well Water Ground Water Effluent Waste Water Swimming Pool Water Cooling Tower Water Boiler Water Mineral Water Surface Water Raw Water Potable Water	pH Colour Turbidity Conductivity Temperature Total Dissolved Solids Total Suspended Solids Total Solids Total Alkalinity as CaCO ₃ Phenolphthalein Alkalinity as CaCO ₃ Caustic Alkalinity as CaCO ₃ Carbonate Alkalinity as CaCO ₃ Bicarbonate Alkalinity as CaCO ₃ Total Hardness as CaCO ₃ Carbonate Hardness as CaCO ₃ Non Carbonate Hardness as CaCO ₃ Biochemical Oxygen Demand @ 20°C for 5 Days Chemical Oxygen Demand Chloride as Cl Anionic Detergent MBAS Ammoniacal Nitrogen as N Nitrate Nitrogen as N Nitrite Nitrogen as N Nitrogen (Organic) as N	APHA - 4500-H B APHA - 2120B APHA - 2130B APHA - 2510B APHA - 2550B APHA - 2540C APHA - 2540D APHA - 2540B APHA - 2320B APHA - 2320B APHA - 2320B APHA - 2320B APHA - 2320B APHA - 2320B APHA - 2320B APHA - 2340C APHA - 2340A&C & 2320B APHA - 2340A&C & 2320B APHA - 5210B & APHA - 4500O-C or G APHA - 5220B or APHA - 5220C APHA - 4500CI-B APHA - 5540C APHA - 4500NH ₃ -B&C or B&F APHA - 418E* or APHA - 4500NO ₃ ⁻ D APHA - 4500NO ₂ ⁻ B APHA - 4500Norg B

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
1) River Water Drinking Water Well Water Ground Water Effluent Waste Water Swimming Pool Water Cooling Tower Water Boiler Water Mineral Water Surface Water Raw Water Potable Water (continue)	Total Nitrogen (Kjeldahl) as N Total Nitrogen as N Fluoride as F Mercury as Hg Arsenic as As Cyanide as Cn Aluminium as Al Dissolved Oxygen Silica as SiO ₂ Orthophosphorous as P / Total Phosphorous as P Iron as Fe ²⁺ Chromium, 6+ Chromium, 3+ Sulphate as SO ₄ Phenol Boron as B Free Chlorine as Cl ₂ Combined Chlorine as Cl ₂ (Monochloroamine and Dichloroamine) Total Chlorine as Cl ₂	APHA - 4500Norg B APHA - 4500Norg B & APHA - 418E* or APHA - 4500NO ₃ ⁻ D APHA - 4500F-B&D APHA - 4500F-B&C APHA - 3112B In-House No W68 (Based on APHA - 3114C) (AAS) APHA - 4500CN-C&D or C&F APHA - 3500Al-B APHA - 4500O-C or G APHA - 4500Si-C APHA - 4500P-D APHA - 3500FeB APHA - 3500CrB In-House No. W 26 APHA - 4500SO ₄ -E APHA - 5530D or APHA - 5530B&C APHA - 4500B-C APHA - 4500Cl-G APHA - 4500Cl-G APHA - 4500Cl-G

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
River Water Drinking Water Well Water Ground Water Effluent Waste Water Swimming Pool Water Cooling Tower Water Boiler Water Mineral Water Surface Water Raw Water Potable Water (continue)	Sulphide Oil & Grease Lignin & Tannin Metals: Antimony as Sb Beryllium as Be Cadmium as Cd Calcium as Ca Chromium as Cr Cobalt as Co Copper as Cu Iron as Fe Lead as Pb Lithium as Li Magnesium as Mg Manganese as Mn Molybdenum as Mo Nickel as Ni Selenium as Se Strontium as Sr Thalium as Tl Tin as Sn Titanium as Ti Vanadium as V Zinc as Zn Sodium as Na Potassium as K Barium as Ba Scandium as Sc Silver as Ag Boron as B Aluminium as Al Phosphorus as P	APHA - 4500S-F APHA - 5520B or APHA - 5520D APHA - 5503B USEPA Method 6010D; Inductive Coupled Plasma Optical Emission Spectroscopy (ICP OES) APHA - 3030E&F (HNO ₃ or HNO ₃ -HCl Digestion)
River Water Drinking Water Well/Ground Water Treated	Arsenic	In-House No. 126 (Based on Application Note 5991-6631EN)
Final Discharge Raw Waste Water Swimming Pool Water Cooling Tower Water Boiler Water Mineral Water	Mercury	In-House No. 127 (Based on Application Note 5991-6631EN)

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
River Water Drinking Water Well Water Ground Water Effluent Waste Water Swimming Pool Water Cooling Tower Water Boiler Water Mineral Water Surface Water Raw Water Potable Water (continue)	Metals: Antimony as Sb Beryllium as Be Cadmium as Cd Calcium as Ca Chromium as Cr Cobalt as Co Copper as Cu Iron as Fe Lead as Pb Lithium as Li Magnesium as Mg Manganese as Mn Molybdenum as Mo Nickel as Ni Selenium as Se Strontium as Sr Thalium as Tl Vanadium as V Zinc as Zn Sodium as Na Potassium as K Barium as Ba Silver as Ag Boron as B Aluminium as Al	APHA - 3120B; Inductive Coupled Plasma Optical Emission Spectroscopy: (ICP OES) APHA - 3030 E & F (HNO ₃ or HNO ₃ - HCl Digestion)
River Water Treated Water Drinking Water Well Water Ground Water	Tin as Sn Titanium as Ti Phosphorus as P Metals: Aluminium Antimony Arsenic Barium Beryllium Cadmium Calcium Chromium Cobalt Copper Lead Manganese Magnesium Mercury Molybdenum	In-House No. W86 (Based on APHA - 3120B) USEPA 200.8(ICPMS)

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
River Water Treated Water Drinking Water Well Water Ground Water	Nickel Potassium Selenium Silver Sodium Thallium Thorium Uranium Vanadium Zinc Iron Tin Boron	USEPA 200.8(ICPMS)
Sea Water, Marine Water, Salt Water	Metals; Copper Cadmium Arsenic Mercury Chromium Lead Zinc	Inhouse No W117 USEPA 200.8(ICPMS)
River Water Drinking Water Well Water Ground Water Effluent Waste Water Swimming Pool Water Cooling Tower Water Boiler Water Mineral Water Surface Water Raw Water Portable Water (continue)	Anions: Fluoride as F Chloride as Cl Nitrite as NO ₂ Sulphate as SO ₄ Bromide as Br Nitrate as NO ₃ Phosphate as PO ₄ Formaldehyde Formaldehyde Color Total Hydrocarbon Mineral Oil	APHA - 4110 B; Ion Chromatography with Chemical Suppression of Eluent Conductivity: In-House No. W97 HACH Method 8110 EPA 554 (HPLC) APHA 2120 F APHA 5520D&F

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
2) Cooling Tower Water	pH Total Alkalinity as CaCO ₃ Total Hardness as CaCO ₃ Chloride as Cl Total Dissolved Solids Conductivity	APHA - 4500-H B APHA - 2320B APHA - 2340C APHA - 4500Cl-B APHA - 2540C APHA - 2510B
3) Boiler Water	pH Caustic Alkalinity as CaCO ₃ Total Hardness as CaCO ₃ Chloride as Cl Total Dissolved Solids	APHA - 4500-H B APHA - 2320B APHA - 2340C APHA - 4500-Cl B APHA - 2540C
4) Mineral Water	pH Silica as SiO ₂ Bicarbonate Alkalinity as CaCO ₃ Sulfate as SO ₄ Chloride as Cl Total Dissolved Solids Nitrite Nitrogen as N	APHA - 4500-H B APHA - 4500Si-C APHA - 2320B APHA - 4500SO ₄ E APHA - 4500-Cl B APHA - 2540C APHA - 4500NO ₂ ⁻ B
5) Swimming Pool Water	pH Turbidity Color Free Chlorine as Cl ₂ Total Alkalinity as CaCO ₃ Total Dissolved Solids Ammoniacal Nitrogen as N Nitrate Nitrogen as N Aluminium as Al	APHA - 4500-H B APHA - 2130B APHA - 2120B APHA - 4500Cl G APHA - 2320B APHA - 2540C APHA - 4500NH ₃ -B&C or B&F APHA - 418 E* or APHA - 4500NO ₃ ⁻ D APHA - 3500Al-B
6) For (1) to (5)	<u>Sample Pretreatment</u> 1) Heavy Metals (Ag, Cu, Co, Ca, Cd, Cr, Fe, K, Mn, Mg, Ni, Na, Pb, Zn, As, Hg, Se, Sn) 2) Soluble & Suspended Metals for the Above Elements	APHA - 3030E (HNO ₃ Digestion) APHA - 3030F (HNO ₃ - HCl Digestion) APHA - 3030B

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Cooling Tower Water, Chilled Water	Molybdenum	HACH Method 8036
River Water Treated Water Drinking Water Well Water Ground Water	Trihalomethanes: Chloroform Dichlorobromomethane Dibromochloromethane Bromoform	APHA - 6200 B (GCMS)
	Volatile Organic Compounds (Refer to Appendix 1)	USEPA 8260 D(GCMS) USEPA 5030C
Effluent, Waste Water	Fixed & Volatile Solids Ignited at 550°C (MLVSS, MLSS)	APHA - 2540E

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Sludge, Solid Waste, Soil	Moisture	(i) Gravimetric Method: BS:EN 12880:2000 (ii) Moisture Analyzer: In-House No. W9
	Loss on Ignition	BS:EN 12879:2000
Soil	Mercury	USEPA 7471B
	Heavy Metals Sample Preparation	USEPA 3050B
	Metals (Ag, Al, As, B, Be, Ba, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Na, Ti, V, Tl, Zn, Li, Sb, Se, P, Sn, Sr)	USEPA 6010D (ICP OES)
	Chromium Hexavalent Alkaline Digestion	USEPA 3060A APHA 3500 Cr B
	Chloride	MS 678:Part VI to IX:1980 & APHA 4500-Cl-B
	Total Organic Carbon	MS 678: Part I to V:1980
	Total Nitrogen	ISO 11261:1995
	Dry Matter and Water Content on a mass basis	ISO 11465:1993

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Marine Water	<p>Organophosphorus Pesticides Thionazin Sulfotep Phorate Dimethoate Parathion</p> <p>Methyl Parathion Disulfoton Famphur Chlorpyrifos</p> <p>Herbicides Metolachlor Simazine Atrazine Alachlor Ametryn Bentazone Napropamide Molinate</p> <p>Insecticides Permethrin Amitraz</p> <p>Organochlorine Pesticides Hexachlorobenzene Alpha-lindane Beta-lindane Gamma-lindane Delta-lindane Heptachlor Aldrin Heptachlor Epoxide Chlordane Endosulfan I Dieldrin Endrin Endosulfan II Endosulfan Sulfate Methoxychlor pp-DDD, pp-DDE & pp-DDT Endosulfan</p>	In-House No. G11 based on EPA 525.3

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Drinking Water Treated Water Well Water River Water Ground Water Marine Water	Polychlorobiphenyls(PCB) 2-Chlorobiphenyl 4-Chlorobiphenyl 2,4'-Dichlorobiphenyl 2,2',5'-Trichlorobiphenyl 2,4,4'-Trichlorobiphenyl 2,2',5,5'-Tetrachlorobiphenyl 2,2,3,5'-Tetrachlorobiphenyl 2,3',4',5'-Tetrachlorobiphenyl 2,3,3',4',6-Pentachlorobiphenyl 2,2',3,4,4',5-Hexachlorobiphenyl 2,3',4,4',5-Pentachlorobiphenyl 2,2',4,4',5,5'-Hexachlorobiphenyl 2,2',3,4',5',6-Hexachlorobiphenyl 2,2',3,4,4',5,5'-Heptachlorobiphenyl	In-House No. G2 based on EPA 525.3(GCMS)
Dialysis Water Reverse Osmosis Water	Total Hardness as CaCO ₃ Total Chlorine Anions: Fluoride as F Chloride as Cl Nitrite as NO ₂ Nitrate as NO ₃ Sulphate as SO ₄ Bromide as Br Phosphate as PO ₄ Metals: Aluminium Antimony Arsenic Barium Beryllium Boron Cadmium Calcium Chromium Cobalt Copper Iron Lead Manganese Magnesium Mercury Molybdenum Nickel Potassium Selenium Silver Sodium Thallium Thorium Tin Uranium Vanadium Zinc	APHA 2340B APHA 4500Cl-G APHA 4110B (Ion Chromatography with Chemical Suppression of Eluent Conductivity) USEPA 200.8 (ICPMS)

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Drinking Water Treated Water Well Water River Water Ground Water Marine Water	2,4-D (2,4 Dichlorophenoxy Acetic Acid) Silvex 2,4,5 TP (2,4,5-Trichlorophenoxypropionic Acid) 2,4,5-T (2,4,5-Trichlorophenoxy Acetic Acid) Total Petroleum Hydrocarbon (TPH) Aliphatic Hydrocarbon Fractions nC8 to nC12 n-Octane n-Nonane n-Decane n-Undecane n-Dodecane nC13 to nC28 n-Triadecane n-Tetradecane n-Pentadecane n-Hexadecane n-Heptadecane Pristane n-Octadecane Phytane n-Nonadecane n-Eicosane n-Docosane n-Heneicosane n-Tricosane n-Tetracosane n-Pentacosane n-Hexacosane n-Heptacosane n-Octacosane	In- House No.FH 09 Based on Department of Analytical Chemistry, Chemical Faculty Gdansk University of Technology (HPLC) TNRCC 1005,Rev 03,2001 (GCFID)

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Drinking Water Treated Water Well Water River Water Ground Water Marine Water	nC29 to nC35 n-Nonacosane n-Triacontane n-Hentriacontane n-Dotriacontane n-Tritriacontane n-Tetratriacontane n-Pentatriacontane nC36 to nC40 n-Hexatriacontane n-Heptatriacontane n-Octatriacontane n-Nonatriacontane n-Tetracontane	In-House No.G10 based on EPA 525.3 (GCMS)
Palm Oil Waste Water & Effluent	Semi Volatile Organic Compound(SVOC) (Refer Appendix II) Chemical Oxygen Demand Ammonical Nitrogen Total Suspended Solids Total Nitrogen Oil & Grease Biochemical Oxygen Demand @ 30 °C for 3 Days	D.O.E Reference D.O.E Reference D.O.E Reference D.O.E Reference (Macro-Kjeldahl) D.O.E Reference D.O.E Reference (ALT)

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SCOPE OF TESTING: CHEMICAL

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Solid Waste	<p>Toxicity Leaching Characteristic Procedure (TCLP)</p> <p>For Metal Analysis: Arsenic as As Barium as Ba Boron as B Cadmium as Cd Chromium as Cr Copper as Cu Lead as Pb Mercury as Hg Nickel as Ni Selenium as Se Tin as Sn Zinc as Zn</p> <p>Toxicity Leaching Characteristic Procedure (TCLP) : 2,4-D (2,4 Dichlorophenoxy Acetic Acid) Silvex 2,4,5 TP (2,4,5-Trichlorophenoxypropionic Acid) 2,4,5-T (2,4,5-Trichlorophenoxy Acetic Acid)</p> <p>Total Threshold Limit Concentration (TTLIC): 2,4-D (2,4 Dichlorophenoxy Acetic Acid) Silvex 2,4,5 TP (2,4,5-Trichlorophenoxypropionic Acid) 2,4,5-T (2,4,5-Trichlorophenoxy Acetic Acid)</p>	<p>EPA 1311</p> <p>In- House No.FH 09 Based on Department of Analytical Chemistry, Chemical Faculty Gdansk University of Technology (HPLC)</p>
Sludge	Oil & Grease	APHA - 5520E
Fertilizer	<p>Total Magnesium as MgO Total Calcium as CaO Total Potassium as K₂O</p> <p>Total Nitrogen</p> <p>Total Organic Carbon</p> <p>Total Organic Matter</p> <p>Total Phosphorus as P₂O₅</p>	<p>In-House No. FT02 (Based on MS417:1994 & 1997)</p> <p>In-House No. FT01 (Based on MS 417: Part 3: 1994 & AOAC 991.20)</p> <p>MS 417: Part 8: 1997</p> <p>MS 417: Part 8: 1997</p> <p>MS 417: Part 4: 1994</p>

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Pharmaceutical Products Traditional Medicines	Cadmium, Lead	US EPA 6010D (Determination) AOAC 975.03 (Sample Preparation)
	Arsenic	In-House No. F3 (Based on APHA 3114C) AOAC 971.21 (Sample Preparation)
	Mercury	AOAC 971.21 (Flameless AAS Method)
	Arsenic	In-House No.F88 (Based on USEPA 6010D; ICP-OES AOAC 975.03
Pharmaceutical, Cosmetic and Toiletry Products 1) Non-sterile and Traditional (Herbs Medicinal) Products Powder/Granules Tablets Hard Gel Soft Gel Pill Oil Liquid (Syrup/Water) Cream Ointment Patch/Plaster	Heavy Metals (Pb, Cd, As, Hg) Uniformity of Weight	USP<233>,2013 (ICPMS) EP 7.0 (2.9.5),2011
Powder/Granules Tablets Hard Gel Soft Gel Pill	Disintegration	EP 5.0 (2.9.1),2005
Pharmaceutical product	Propyl Paraben Methyl Paraben	In-House No.FH19 (By HPLC)
	Lovastatin	In-House No.FH41 (By HPLC)

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Food		
Milk	Fat	AOAC 989.05 (Modified Mojonnier Ether Extraction Method)
	Total Nitrogen / Protein	AOAC 991.20 (Kjeldahl Method)
Coconut Cream, Beverages, Ice Cream	Fat	In-House No. F12 (Based on AOAC 989.05) (Modified Mojonnier Ether Extraction Method)
Petai, Tea, Bread, Sauces, Spices, Meat Products, Ice Cream Confectionery, Coconut Milk, Soybean Milk, Beverages	Total Nitrogen / Protein	In-House No. F7 (Based on AOAC 991.20) (Kjeldahl Method)
Cocoa Products	Moisture	AOAC 931.04
Butter Products	Salt	AOAC 960.29
Beverages, Sauces	Chloride / Salt	In-House No.F8 (Based on AOAC 960.29)
Beverages	pH	AOAC 945.10
Meat Products, Cocoa Products, Desiccated Coconut	Total Fat	In-House No.F13 (Modified Soxhlet Extraction Method) (Based on AOAC 963.15 and Pearson's Chemical Analysis of Foods, 7 th Ed., 1976; pg 14-15)
Sauces and Ketchup	3Chloro 1,2 Propanediol (3 MCPD)	In-house No. G7 Journal of AOAC International VOL.84 No.2, 2001. (GCMS)
Dried Plant	Metal (Ca, Cu, Fe, K, Mn, Mg, and Zn)	AOAC 975.03
Confectionary	Methyl,Propyl Paraben	In-House No.FH19 (HPLC)
Beverages, Coffee and Tea Products	Caffeine	In-House No.FH22 (HPLC)

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Food		
Sauces	Acidity	MS1120:2004
Fruit Juice	Acidity	AOAC 942.15B
Food Products	Total Dietary Fibre	AOAC 985.29 (Enzymatic-Gravimetric Method)
	Metal (Mercury-Hg)	AOAC 971.21 (Flameless AAS Method)
	Moisture, Total Solids	In-House No. F5 Based on AOAC 931.04); Air Oven Method
	Salt / Sodium Chloride	In-House No.F8 (Based on AOAC 960.29)
	Sugar	In-House No. F9 (Based on Pearson's Chemical Analysis of Foods; 7 th Ed., 1976; pg 121-127)
	Free Fatty Acid	In-House No. F136 (Based on AOCS Ca 5a-40)
	Peroxide Value	In-House No. F141 (Based on AOAC 965.33)

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Food Products (continue)	Fat	In-House No.F2 (Based on Pearson's Chemical Analysis of Foods, 7 th Ed., 1976; pg 14-15); Solvent Extraction-Submersion Method (Modified Soxhlet Extraction Method)
	Benzoic Acid & Sorbic Acid	In-House FH 01 (HPLC) (Based on Journal of Chromatography, Vol. 173, 1979, pg. 343-348)
	pH	In-House No.F6 (Based on AOAC 945.10)
	Crude Fibre	In-House No. F1 (Based on Pearson's Chemical Analysis of Foods, 7 th Ed., 1976; pg 16-18)
	Ash	In-House No. F11 (Based on Pearson's Chemical Analysis of Foods; 7 th Ed., 1976; pg 7-8)
	Energy as Calories	In-House No. F41 (Based on Method of Analysis for Nutrition Labeling, AOAC, 1993)
	Energy from Fat as Calories	In-House No. F42 (Based on Method of Analysis for Nutrition Labeling, AOAC, 1993)
	Total Carbohydrate	In-House No. F43 (Based on Method of Analysis for Nutrition Labeling, AOAC, 1993)
	Carbohydrate	In-House No. F44 (Based on Method of Analysis for Nutrition Labeling, AOAC, 1993)
Sulphur Dioxide	In-House No. F16 (Based on Pearson's Chemical Analysis of Food 7 th Edition, Pg 29-31)	

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Food Products (continue)	Water Activity	In-House No. F53 Based on Decagon Paw Kit Water Activity Meter Manual
	Fatty Acid Methyl Esters Saturated Fat / Saturated Fatty Acid Monounsaturated Fat / Monounsaturated Fatty Acid Polyunsaturated Fat / Polyunsaturated Fatty Acid Trans Fat / Tran Fatty Acid EPA(Eicosapentaenoic Acid) DHA (Docosahexaenoic Acid) Omega3 Fatty Acid Omega6 Fatty Acid Omega9 Fatty Acid	In-House No. G3 Based on AOCS (Ce 1-62 Reapproved 1997); GCFID
	Cholesterol	In-House No.GH12 Based on JAOAC International Volume 64, No.1 ,1981 & Volume 73, No 5.1990; GCFID
	Vitamin C as L-Ascorbic Acid	In-House No. FH02 Based on Vitamin Analysis For Food & Health Science, Ronald R. Eitenmiller W.O. Landen, Jr. 1999; HPLC
	Vitamin A as All Trans-Retinol	In-House No. FH03 Based on BS EN 12823-1:2000; HPLC
Flour Confectionary, Bread and Cakes	Propionic Acid	In-House No. G15 Based on JAOAC International Volume 64, No 2 1981; GCFID
Beverages, Sweets	Colour (Qualitative) Tartrazine, Sunset Yellow, Ponceau 4r, Carmoisine Colour (Brilliant Blue/Brown HT/Caramel)	In-House No F46 (Based on Pearson's Chemical Analysis of Food, 7 th Edition, Pg 50-60)
Spices, Salted Egg Yolk, Confectionary and Sauces	Sudan I, II, III, IV Para Red	In-House No. FH18 Based on Analysis of Illegal Dyes in Chili Powder by LGC, Oct 2006; HPLC

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Food Products Beverages, Flour Confection Fruit Products Honey Products Food Products Food Products Food Supplement Dietary Supplement	Saccharin	In-House No. FH15 (Based on Journal of Chromatography, 173 (1979), AOAC 979.08 & Merck HPLC Application Note 02138) (HPLC)
	Sugar Profile: Fructose Glucose Galactose Sucrose Lactose Maltose	In-House No. FH08 (HPLC)
	Aspartame	In-House No. FH15 (By HPLC)
	Vitamin E as Alpha Tocopherol	In-House No. FH03 (Based on BSEN 12822:2000) (HPLC)
	Nitrate as NaNO_3 Nitrite as NaNO_2 Nitrate and Nitrite as NaNO_3	In-House No. F90 GB5009.33-2010 (Based on National Food Safety Standard Determination of Nitrite and Nitrate in Food (People's Republic of China); Ion Chromatography)
	Di-n-Octyl Phthalate(DNOP) Dibutyl Phthalate(DBP) Diisononyl Phthalate(DINP) Benzyl Butyl Phthalate(BBP) Bis(2 ethyl hexyl)Phthalate(DEHP) Diisodecyl Phthalate(DIDP)	In-House No.G19 (Based on Cao,X.-L.(2010), Phthalate Esters in Foods: Sources, Occurrence and Analytical Methods (GCMS)
	Oil & Fat (Sample Preparation)	In-House No.F89 (Based on AOAC 989.05 Fat or Ether Method)
	Alcohol as Ethanol	In-House No.G14 (Headspace GCFID)
	Brix	In-House No. F19 (Based on Refractometry Method)
	Metal (As, Pb, Sn, Se, Sb, Cd, Ca, Na, Mg, K, Cu, Zn, Fe)	In-House No.F88 (Based on USEPA 6010D; ICP-OES AOAC 975.03,17 th Edition, 2000
	Heavy Metals (Pb, Cd, As, Hg, Sb, Sn, Se)	In house No. F123 based on AOAC 986.15/ ICPMS
	Sodium Cyclamate	In-house No. G9 (Based on GB/T5009.97-2003)GCMS

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SCOPE OF TESTING: CHEMICAL

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Beverages/Drinks Pharmaceutical Product	Vitamin B1 (Thiamine) Vitamin B2 (Riboflavin) Vitamin B3 (Nicotinamide) Vitamin B3 (Nicotinic Acid) Vitamin B5(Pantothenic Acid) Vitamin B6 (Pyridoxine) Vitamin B9 (Folic Acid) Vitamin B12 (Cyanocobalamine)	Inhouse FL No. 01 (Based on: •Vitamin Analysis for Health and Food Sciences by Ronald R.Eitenmiller •Agilent Application note 5989-7084EN (LCMSMS) •Measurement of vitamin B12 in beverage by LCMS/MS, Covance Lab Inc. Madison)
	Vitamin D3 (Cholecalciferol)	In-House No.FL 02 •Agilent Application Note 5990-8627EN •BS EN 12823-1:2000 (HPLC)
Food Products Beverages/Drinks Pharmaceutical Product	Vitamin E as Tocopheryl Acetate	In-House No. FH 25 (Phenomenex Application No. 18695) (HPLC)
	Vitamin A as Retinyl Acetate	In-House No. FH 25 (Determination of Vitamin A in Pharmaceutical Preparation by HPLC; Department of Chemistry, University of Balearic Island,Spain)
Cosmetics and Toiletries	Alpha Lipoic Acid	In-House No. FH 12 (Based on USP32-NF 07 pg:1043-1044)(HPLC)
	CoENZYME Q10 as Ubidecarenone	In-House No. FH 13 Based on USP30-NF25 Page 987)(HPLC)
	Hydroquinone	In-House No. FH 32 (Based on ASEAN method ACM INO 03))(HPLC)
	Tretinoin	In-House No. FH 33 (Based on ASEAN method ACM SIN 01))(HPLC)
	Salicylic Acid Triclosan	In-House No. FH16; HPLC In-House No. FH17; HPLC
	Propyl Paraben Methyl Paraben	In-House No. FH19 (By HPLC)

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SCOPE OF TESTING: CHEMICAL

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Food		
Flour and confectionery Nuts, fruits and vegetables and derived products	Acrylamide in Food	In-House No.FH 10 J.Iran.Chem.Soc.,Vol.7,No.4, December 2010 (HPLC)
Dairy products Flour and confectionery Nuts, fruits and vegetables and derived products Sauces, herbs, spices and condiments Pet foods Infant Food	Aflatoxin B1 Aflatoxin B2 Aflatoxin G1 Aflatoxin G2	In-House No.FH 40 Journal of AOAC International Vol.89,No.3,2006 (HPLC)
Dairy products Eggs and egg products Essential nutrients, including vitamins Flour and confectionery Food additives and supplements Infant foods Nuts, fruits and vegetables and derived products Pet foods Sugars and sugar products	Melamine	In-House No. FL 03 based on Agilent Application note 5989-9950EN (LCMSMS)
Fish and fish products Seafood Meat, poultry and derived products	Malachite Green & Leucomalachite Green Crystal Violet & Leucocrystal Violet	In-House No. FL 07 Varian application note SI-01313 (LCMSMS)
	Oxolinic Acid	In-House No.FH 38 Journal of Chromatography B, 51(2001) (LCMSMS)
Bird Nest,Dairy Products	Sialic Acid	In-house No. F82 (Based on Chinese Journal Health Laboratory Technology, Mar 2011; Vol 21)
Bird Nest	Hydrogen Peroxide	In-House No.F133 based on GB/T 23499-2009

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SCOPE OF TESTING: CHEMICAL

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Food		
Meat and Seafood/Aquaculture Product	Chloramphenicol	In-House No. M11 (Based on Direct Competitive ELISA Method)
Flour Confection, Mooncakes Milk Powder Milk and Milk Based Products Egg and Egg Products Honey	Chloramphenicol	In-House No. M27 (based on Direct Competitive ELISA Method)
Meat and Seafood/Aquaculture Product	Nitrofurans: Furazolidone (AOZ) Furaltadone (AMOZ) Nitrofurazone (SEM) Nitrofurantoin (AHD)	In-House No. M12 (Based on Direct Competitive ELISA Method)
Meat and Poultry	Oxytetracycline	In-House No. M13 (Based on Direct Competitive ELISA Method)
Food Products	Total Aflatoxin	In-House No. M14 (Based on Direct Competitive ELISA Method)
Food Products Grain, cereal, cocoa, corn, coffee, beer and wine	Ochratoxin	In-House No. M17 (Based on Direct Competitive ELISA Method)
Meat and Meat Products Seafood and Seafood Products	Beta Agonist	In-House No. M18 (Based on Direct Competitive ELISA Method)
Milk and Milk Powder	Aflatoxin M1	In-house No. M19 (Based on Direct Competitive ELISA Method)
Alcoholic Beverages Dairy Products Edible oil, fats & its products Egg products Flour & confectionery Supplements Meat, poultry & derived products Non-Alcoholic Beverages Nuts, Fruits & Vegetable Derived products Sauces, Herbs, Spices & Condiments Sugar Products Noodle & Pasta Swabs (Workers, Equipment & Uniform)	Allergen – Gluten	In-House No. M20 (based on ELISA method)
	Allergen – Egg	In-House No. M21 (based on ELISA method)
	Allergen – Soy	In-House No. M22 (based on ELISA method)
	Allergen – Peanut	In-House No. M23 (based on ELISA method)
	Allergen - Milk	In-House No. M24 (based on ELISA method)

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SCOPE OF TESTING: CHEMICAL

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Edible Oil and Fats	Peroxide Value	AOAC 965.33
	Iodine Value	AOAC 993.20
Oil & Oil Products Fats & Fat Products	Saponification Value	AOAC 920.160
	Free Fatty Acid	AOCS Ca5a-40
	Slip Melting Point	ISO 6321: 2002(E)
	Unsaponifiable Matter	AOCS Ca 6a-40
	Moisture and Volatile Matter	ISO 662: 2016 (E)
	Specific Gravity/ Density/ Conventional Mass per Volume Refractive Index	ISO 6883 :2017 (E) AOCS Cc 7-25
	Insoluble Impurities	ISO 663: 2017 (E)
	Cloud Point	AOCS Cc 6-25
	Soap Content	AOCS Cc 17-95
	Anisidine Value	USP30-NF25
	Total Oxidation Value (TOTOX)	USP30-NF25
	Moisture/Water Content (Karl Fischer)	ISO 8534: 2017 (E)
	Peroxide Value	ISO 3960 : 2017 (E)
	Lovibond Colour	ISO 15305: 1998 (E)
	Acid Value/ Acidity/ Free Fatty Acid	ISO 660: 2009 (E)
	Iodine Value	ISO 3961 :2013 (E)
	Sample Preparation for Test Samples	ISO 661:2003 (E)
Palm Oil Products/ Edible Oils	DOBI	ISO 17932 :2011 (E)
	Total Carotene	ISO 17932 : 2011(E)

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SCOPE OF TESTING: CHEMICAL

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Coffee, , Fruits and Vegetables	<p>Organochlorine Pesticides Hexachlorobenzene Alpha-lindane Beta-lindane Gamma-lindane Delta-lindane Heptachlor Aldrin Heptachlor Epoxide Chlordane Endosulfan I Dieldrin Endrin Endosulfan II Endosulfan Sulfate Methoxychlor pp-DDD pp-DDE pp-DDT Endrin Aldehyde Endrin Ketone Endosulfan</p> <p>Organophosphorus Pesticides Thionazin Sulfotep Phorate Dimethoate Methyl Parathion Parathion Disulfoton Famphur Chlorpyrifos Ethion Trithion Malathion Metolachor</p> <p>Herbicides Molinate Simazine Atrazine Alachlor Ametryn Bentazone Napropamide</p> <p>Insecticides Permethrin Amitraz Pirimicarb</p>	In-House No.G1 (based on AOAC 2007.01)

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SCOPE OF TESTING: CHEMICAL

SITE : CATEFORY I

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Environmental		
Ambient Air	Total Suspended Particulate	ASTM D 4096-17
	Nitrogen Dioxide	ASTM D 1607-91 (Reapproved 2018)
	Nitrogen Dioxide	APHA Method of Air Sampling and Analysis 1977 (Method No. 42602-03-73T)
	Sulfur Dioxide	ASTM D 2914-91(West-Gaeke Method)
	Carbon Monoxide	ASTM D 4599-14 (using Length-of-Stain Dosimeter)
	Particulate Matter 10 Micrometers (PM10)	US EPA 40CFR Part 50 Appendix J
	Particulate Matter 2.5 Micrometers (PM2.5)	US EPA 40CFR Part 50 Appendix L
Work Place Air	Free Chlorine	APHA Method of Air Sampling and Analysis 1977 (Method No. 209)
	Cyanide	APHA Method of Air Sampling and Analysis 1977 (Method No. P & CAM 116)
River Water, Drinking Water, Well Water, Ground Water, Effluent, Waste Water, Swimming Pool Water, Cooling Tower, Boiler Water.	pH	In-House Method E1 Based on APHA 4500-H B (In Situ)
	Free Chlorine	In-House Method E2 Based on HACH Method for Chlorine (Cl ₂) (In Situ)
	Turbidity	APHA - 2130 B (In Situ)
	Colour	APHA - 2120 B (In Situ)
	Dissolved Oxygen	APHA - 4500-O G (In Situ)
	Temperature	APHA - 2550 B (In Situ)
	Total Chlorine	In-House Method E3 Based on HACH Method for Chlorine (Cl ₂)

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SCOPE OF TESTING: CHEMICAL

SITE : CATEGORY I

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Air Emission	Sample and Velocity Traverses for Stationary Sources	US EPA Method 1
	Gas Velocity and Volumetric Flow Rate	US EPA Method 2 (Type S Pitot Tube)
	Moisture Content	US EPA Method 4
	Particulate Matter	US EPA Method 5
	Sulfuric Acid and Sulfur Dioxide	US EPA Method 8
	Hydrogen Chloride Chlorine Hydrofluoric Acid Fluorine	US EPA Method 26A (Sampling Part Only)
	Mercury Cadmium Lead Antimony Arsenic Zinc Copper	US EPA Method 29
	Concentration and Mass Flow of Particulate Matter	MS 1596: 2003
	Dark Smoke	BS 2742:1969 (Ringelmann Smoke Chart)

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- | | |
|-----------------------------|--|
| 1. Chitra Thurisingam | IKM No. M/1891/4268/02 |
| 2. Lam Kah Chen | IKM No. M/2242/4769/05 |
| 3. Kok Sing Chuan | IKM No. M/3227/5250/08/11 |
| 4. Yong Li Peng | IKM No. M/3228/5632/09/11 |
| 5. Norhaniza Ramlan | IKM No. M/3229/5634/09/11 |
| 6. Chin Mei Fong | IKM No. M/3207/6013/11 |
| 7. Loi Mun Yee | IKM. No. M/3310/5471/08/11 |
| 8. Roziana Mohd Ross | IKM. No. M/3205/6011/11 |
| 9. Chew Lian Nie | IKM. No. M/4235/6806/14/15 |
| 10. Chong Chin Siong | IKM No. M/5038/8287/19
(Water and Wastewater) |
| 11. Muhammad Mursyid Mazlan | IKM No. M/2763/8185/18 (Environmental) |
| 12. Chen Tian Hong | IKM No. M/5412/8829/20 |

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SCOPE OF TESTING: MECHANICAL**SITE: CATEGORY I**

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Noise Measurement	Noise Level	ISO1996 (Part 1, 2 and 3), 2 nd Edition, 2013
Vibration Measurement	Vibration Level	BS 6472: 1992 Guide to evaluation to human exposure to vibration in buildings (1 Hz to 80 Hz) DIN 4150-Part 3: Structural vibration in buildings

Signatories:

- | | |
|---------------------------------------|-------------------------------|
| 1. Chitra Thurisingam | IKM No. M/1891/4268/02 |
| 2. Lam Kah Chen | IKM No. M/2242/4769/05 |
| 3. Chin Mei Fong | IKM No. M/3207/6013/11 |
| 4. Muhammad Mursyid
Mazlan | IKM No. M/2763/8185/18 |

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SCOPE OF TESTING: MICROBIOLOGY

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Water		
River Water	Heterotrophic Plate Count (35°C)	APHA - 9215B; 2017 (Pour Plate Method)
Drinking Water	Total Coliform	APHA - 9221B; 2017 (MPN Method)
Well Water		
Ground Water	Fecal Coliform	APHA - 9221E.1; 2017 (MPN Method)
Effluent		
Waste Water		
Raw Water	<i>Escherichia coli</i>	APHA – 9221G.2; 2017 (MPN Method)
Sewage		
Treated Water	Total Coliform (100 ml)	APHA - 9222B; 2017 (Membrane Filtration Procedure)
Swimming Pool	Fecal Coliform (100 ml)	APHA - 9222D; 2017 (Membrane Filtration Procedure)
Cooling Tower Water		
Mineral Water		
Marine Water	<i>Escherichia coli</i> (100 ml)	APHA – 9222I; 2017 (Membrane Filtration Partition Procedure)
Reverse Osmosis Water	Total <i>Legionella</i>	AS/NZS 3896: 1998 (Count)
Deionised Water	<i>Legionella pneumophila</i> Serogroup 1	AS/NZS 3896: 1998 (Count)
Dialysis Water	<i>Legionella pneumophila</i> Serogroup 2-14	AS/NZS 3896: 1998 (Count)
	<i>Legionella spp.</i> (unidentified)	AS/NZS 3896: 1998 (Count)
	<i>Pseudomonas aeruginosa</i> (100 ml)	APHA - 9213E: 2017 (Membrane Filtration Procedure)
	<i>Staphylococcus aureus</i> (100 ml)	APHA - 9213B.6; 2017 (Membrane Filtration Procedure)
	Heterotrophic Plate Count (100 ml)	APHA 9215 D; 2017 (Membrane Filtration Method)
	Total Fungal	APHA 9610B; 2017 (Count)
	<i>Clostridium perfringens</i>	NSM W5, 2004 (Count)
	Salmonella	APHA 9260B, 2017 (Detection)
	Fecal Streptococci / Enterococci	APHA 9230C (CFU); 2017
	Fecal Streptococci / Enterococci	APHA 9230B (MPN); 2017
Reverse Osmosis and Deionized Water	Total Aerobic Microbial Count	BP (2013/2019) Appendix XVI B.5
	Total Yeasts and Molds Count	BP (2013/2019) Appendix XVI B.5

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SCOPE OF TESTING: MICROBIOLOGY

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Dialysis water Reverse osmosis water Ultra pure water	Endotoxin Heterotrophic Plate Count (35°C)	USP 36 <85>; 2012. Bacterial Endotoxin Test APHA 9215B, 2017 (Pour Plate Method)
Drinking Water Treated Water Mineral Water Reverse Osmosis Water Deionised Water	Sulphite-reducing Anaerobes (Clostridia) (100 ml)	ISO 6461/2: 1986
Dairy and probiotics product and Health Supplements	Bifidobacteria Bifidobacterium Count Lactobacillus spp	ISO 29981: 2010 In-House No. M32 (based on B.M Vol 29.2010) (Pour Plate) CLMM; Chapter 38, 1998
UHT milk/Sterilized dairy product	Aerobic Plate Count	National Standard Method: Plate Count Test at 30°C
Seafood and Seafood Product	<i>Vibro parahaemolyticus</i>	FDA/BAM; Chapter 9 (MPN); 2004

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SCOPE OF TESTING: MICROBIOLOGY

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Food, Perishable Food Products, Canned Foods	Yeasts and Molds	FDA / BAM Chapter 18; 2001 (Count)
	Aerobic Plate Count	FDA / BAM Chapter 3 (Pour Plate Method); 2001
	Coliforms	FDA / BAM Chapter 4 (MPN Method); 2002
	Fecal Coliforms	FDA / BAM Chapter 4 (MPN Method); 2002
	<i>Escherichia coli</i>	FDA / BAM Chapter 4 (MPN Method); 2002
	Coliform Counts	AOAC 991.14 (3M Petrifilm); 1995
	<i>Escherichia coli</i> Counts	AOAC 991.14 (3M Petrifilm); 1995
	<i>Salmonella</i>	FDA / BAM Chapter 5; 2018 (Detection)
	<i>Staphylococcus aureus</i>	FDA / BAM Chapter 12; 2001 (Count/MPN)
	<i>Listeria</i> spp	FDA / BAM Chapter 10; 2017 (Detection)
	<i>Listeria monocytogenes</i>	FDA / BAM Chapter 10; 2017 (Detection)
	<i>Lactobacillus</i> spp	CLMM Chapter 38; 1998 (Count)
	<i>Bacillus cereus</i>	AOAC 980.31; 1995 (Count)
	Enterobacteriaceae	BS ISO 21528:2004 (MPN)
	Yeast and Mold	AOAC 997.02 (3M Petrifilm); 2000
	<i>Clostridium perfringens</i>	FDA/BAM Chapter 16; 2001 (Count)
	Aerobic Plate Count	AOAC 990.12 (3M); 2000
	Standard Plate Count	AS 1766.2.1-1991
	<i>Enterobacteriaceae</i>	AOAC 2003.01 (Petrifilm) (3M)
<i>Shigella</i> spp	BS EN ISO 21567:2004 (Detection)	

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SCOPE OF TESTING: MICROBIOLOGY

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Pharmaceutical Pharmaceutical Product	Total Viable Aerobic Count (Bacteria & Fungi)	BP 2007 Appendix XVI B.2 (Count)
	Enterobacteria & Certain Other Gram Negative Bacteria	BP 2007 Appendix XVI B.1 (Count)
	<i>Escherichia coli</i>	BP 2007 Appendix XVI B.1 (Detection)
	<i>Staphylococcus aureus</i>	BP 2007 Appendix XVI B.1 (Detection)
	<i>Salmonella</i>	BP 2007 Appendix XVI B.1 (Detection)
	<i>Pseudomonas aeruginosa</i>	BP 2007 Appendix XVI B.1 (Detection)
Cosmetic Product	Aerobic Plate Count	FDA / BAM Chapter 23; 2017 (Count)
	<i>Staphylococcus aureus</i>	FDA / BAM Chapter 23; 2017 (Count)
	Yeasts and Molds	FDA / BAM Chapter 23; 2017 (Count)

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SCOPE OF TESTING: MICROBIOLOGY

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Pharmaceutical, Cosmetic and Toiletry Products		
1) Non-sterile and Traditional (Herbs Medicinal) Products		
Powder/Granules Tablets Hard Gel Soft Gel Pill Oil Liquid (Syrup/Water) Cream Ointment Patch/Plaster	Total Viable Aerobic Count as Total Aerobic Microbial Count and Total Combined Yeasts and Moulds Count	BP 2013/2019 Appendix XVI B.5
	Bile - Tolerant Gram-Negative Bacteria	BP 2013/2019 Appendix XVI B.4.1 (Count)
	<i>Escherichia coli</i>	BP 2013/2019 Appendix XVI B.4.2 (Detection)
	<i>Staphylococcus aureus</i>	BP 2013/2019 Appendix XVI B.4.5 (Detection)
	<i>Salmonella</i> (10 g)	BP 2013/2019 Appendix XVI B.4.3 (Detection)
	<i>Pseudomonas aeruginosa</i>	BP 2013/2019 Appendix XVI B.4.4 (Detection)
	<i>Candida albican</i>	BP 2013/2019 Appendix XVI B.4.7 (Detection)
	<i>Burkholderia cepacia</i>	In-house M128 (based on BP2013 appendix XVI B4 and Hi-Media Manual) (Detection)
2) Traditional (Herbs Medicinal) Products	Bile - Tolerant Gram-Negative Bacteria (25 g)	BP 2013/2019 Appendix XVI F (Count)
Using boiling water	<i>Escherichia coli</i> (25 g)	BP 2013/2019 Appendix XVI F (Detection)
Uses pre-treatment Without/low level of pre-treatment	<i>Salmonella</i> (25 g)	BP 2013/2019 Appendix XVI F (Detection)

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SCOPE OF TESTING: MICROBIOLOGY

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Environmental Swab	Aerobic Plate Count	CMMEF Chapter 3; 1992 & FDA / BAM; Chapter 3; 2001 (Count)
	Yeasts & Molds	CMMEF Chapter 3; 1992 & FDA / BAM; Chapter 18; 2001 (Count)
	Coliforms	CMMEF Chapter 3; 1992 & FDA / BAM; Chapter 4; 2002 (Count)
	<i>Escherichia coli</i>	CMMEF Chapter 3, 1992 & FDA / BAM; Chapter 4; 2002 (Count)
	<i>Salmonella</i> spp	CMMEF Chapter 3, 1992 & FDA/BAM Chapter 5; 2006 (Detection)
	<i>Listeria</i> spp	CMMEF Chapter 3, 1992 & FDA/BAM Chapter 10; 2003 (Detection)
Swab (Sponge Method)	Aerobic Plate Count	In-House No. M1 (Based on ISO 18593: 2004 (E) & FDA/BAM; Chapter 3); 2001 (Count)
	Yeasts & Molds	In-House No.M2 (Based on ISO 18593: 2004 (E) & FDA/BAM; Chapter 18); 2001 (Count)
	<i>Salmonella</i> spp	In-house No. M176 (Based on ISO 18593: 2004 (E) & FDA/BAM; Chapter 5); 2006 (Detection)
	<i>Listeria</i> spp	In-house No. M177 (Based on ISO 18593: 2004 (E) & FDA/BAM; Chapter 10); 2003 (Detection)

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SCOPE OF TESTING: MICROBIOLOGY

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Microbial Air Density	Aerobic Plate Count	APHA - 9020 B.2.e; 1998 & FDA/BAM; Chapter 3 (Open Plate Method)
	Yeasts & Molds	APHA - 9020 B.2.e; 1998 & FDA/BAM; Chapter 18 (Open Plate Method); 2001
	Total Bacteria Count	In-House No. M29 (based on USP 2013 & USP 2017) (Open Plate)
	Total Fungi Count	In-House No. M29 (based on USP 2013 & USP 2017) (Open Plate)
	Total Microbial Count	In-House No. M29 (based on USP 2013 & USP 2017) (Open Plate)
Microbial Air Monitoring	Aerobic Plate Count	In-House No.M3 [Based on Merck MAS 100 ECO, FDA/BAM; Chapter 3; 2001 & 0800, Issue 1; 1998 (NMAM)]
	Yeasts & Molds	In-House No.M4 [Based on Merck MAS 100 ECO, FDA/BAM; Chapter 18; 2001 & 0800, Issue 1; 1998 (NMAM)]
	Total Bacteria Count	In-House No.M5 [Based on Merck MAS 100 ECO, USP NF 25; 2007 & 0800, Issue 1; 1998 (NMAM)]
	Total Fungal Count	In-House No.M6 [Based on Merck MAS 100 ECO, USP NF 25; 2007 & 0800, Issue 1; 1998 (NMAM)]
	Total Microbial Count	In-House No.M7 [Based on Merck MAS 100 ECO, USP NF 25; 2007 & 0800, Issue 1; 1998 (NMAM)]

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- | | |
|---------------------------|--|
| 1. Nuraizah Mohd Anis | MJMM 0195 (All microbiology test) |
| 2. Lam Kah Chen | Heterotropic Plate Count, Coliform, Fecal Coliform, <i>Escherichia coli</i> |
| 3. Chitra Thurisingam | Heterotropic Plate Count, Coliform, Fecal Coliform, <i>Escherichia coli</i> |
| 4. Mohammad Zariq Idris | MJMM 0798 (All Microbiology Test) |
| 5. Ahmad Zariff Mat Wazir | MJMM 0799 (All Microbiology Test) |
| 6. Too Lih Yuan | MJMM 0931 (Food and Water Microbiology Test) |

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SCOPE OF TESTING: NUCLEIC ACID

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Food products, pharmaceutical, cosmetic and toiletry products	Pork DNA Identification	In-house No. M26 Qualitative Detection using Real-Time PCR
Plants and Plants Derived Products	GMO Identification -35S Promoter -NOS Terminator -34S FMV	In-House No. M16 Qualitative Detection Using Real Time PCR

Signatories:

- | | |
|------------------------------|------------------|
| 1. Nuraizah Mohd Anis | MJMM0195 |
| 2. Too Lih Yuan | MJMM 0931 |

Abbreviation:

APHA	American Public Health Association, 21 st Ed., 2005, 23 rd Ed, 2017
APHA *	American Public Health Association, 16 th Ed., 1989.
FDA/BAM	Food and Drugs Administration / Bacteriological Analytical Manual (FDA/BAM) Online
AOAC	Official Methods of Analysis of AOAC International, 16 th Ed., 1995 / 2003
AS/NZS 3896	Standard Method for the Examination of Water for Legionella including Legionella pneumophila 1998 (Australia / New Zealand Standard).
ASTM	Associated Standard Testing Methods.
EPA	Environmental Protection Agency Methods.
AOCS	Official Methods of American Oil of Chemists Society.
BP	British Pharmacopeia
CMMEF	Compendium of Microbiological Method Examination of Food, 3 rd Edition
CLMM	Collins and Lyne's Microbiological Methods; 7 th Edition 1998.
ISO	International Organisation for Standardisation
JAOAC	Journal of AOAC International
LGC	London Government Chemist
BS EN	British Standard - European Number
BS	British Standard
TNRCC	Texas Natural Resource Conservation Commission

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Chemical Testing on Water:

- 1) Standard Method for the Examination of Water and Waste Water (2005), 21st Ed. APHA, AWWA, WEF.
- 2) Standard Method for the Examination of Water and Waste Water (1989), 16th Ed. APHA, AWWA, WPCF.
- 3) Environmental Protection Agency Methods. 1994, 1996, 2012, 2018.
- 4) Revised Standard Method for Analysis of Rubber and Palm Oil Mill Effluent 3rd Edition DOE 2011.
- 5) Standard Method for the Examination of Water and Waste Water (2018), 23rd Ed. APHA AWWA, WEF.

Chemical Testing on Food:

- 1) Official Methods of Analysis of AOAC, 21st Edition (2019).
- 2) The Chemical Analysis of Foods, 7th Edition, Pearson, D. (1976).
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APPENDIX I

VOLATILE ORGANIC COMPOUNDS (VOC)

1,1,1,2-Tetrachloroethane	Chloroethane
1,1,1-Trichloroethane	Chloroform
1,1,2,2-Tetrachloroethane	Chloromethane
1,1,2-Trichloroethane	Cis-1, 2-Dichloroethene
1,1-Dichloroethane	Cis-1,3-Dichloropropene
1,1-Dichloroethene	Dibromochloromethane
1,1-Dichloropropene	Dibromomethane
1,2,3-Trichlorobenzene	Dichlorofluoromethane
1,2,3-Trichloropropane	Ethylbenzene
1,2,4-Trichlorobenzene	Hexachlorobutadiene
1,2,4-Trimethylbenzene	Isopropylbenzene
1,2-Dibromo-3-chloropropane	m-Xylene
1,2-Dibromoethane	methylene chloride
1,2-Dichlorobenzene	n-butylbenzene
1,2-Dichloroethane	n-propylbenzene
1,2-Dichloropropane	Naphthalene
1,3,5-Trimethylbenzene	O-xylene
1,3-Dichlorobenzene	p-Isopropyltoluene
1,3-Dichloropropane	p-Xylene
1,4-Dichlorobenzene	sec-Butylbenzene
2-Chlorotoluene	Styrene
4-Chlorotoluene	Tert-butylbenzene
Benzene	Tetrachloroethene
Bromobenzene	Toluene
Bromochloromethane	Trans-1,2-Dichloroethene
Bromodichloromethane	Trans-1,3-Dichloropropene
Bromoform	Trichloroethene
Bromomethane	Trichlorofluoromethane
Carbon Tetrachloride	Vinyl Chloride
Chlorobenzene	

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APPENDIX II

SEMI VOLATILE ORGANIC COMPOUNDS (SVOC)

Pyridine
Phenol
Aniline
2-Chlorophenol
Benzyl alcohol
2-Methylphenol
Bis(2-chloroisopropyl)ether
4-Methylphenol (p-Cresol)
Hexachloroethane
Nitrobenzene
2-Nitrophenol
2,4-Dimethylphenol
Bis(2-chloroethoxy)methane
2,4-Dichlorophenol
1,2,4-Trichlorobenzene
Naphthalene
p-Chloroaniline
4-Chloro-3-methylphenol
2-Methylnaphthalene
1-Methylnaphthalene
Hexachlorocyclopentadiene
2,4,6-Trichlorophenol
2,4,5-Trichlorophenol
2-Chloronaphthalene
Dibenzofuran
2,3,4,6-Tetrachlorophenol
2,3,5,6-Tetrachlorophenol
4-Chlorodiphenyl ether
Diphenylamine
Azobenzene
4-Bromodiphenyl ether
Carbazole
Fluoranthene
Diisooctyl Adipate
Di-n-octyl phthalate (DnOP)
Isophorone
Dimethyl phthalate
2,6-Dinitrotoluene
Acenaphthylene
Acenaphthene
Diethyl phthalate
Fluorene
Hexachlorobenzene
Phenanthrene
Anthracene
Dibutyl phthalate
Pyrene
Butylbenzylphthalate
Chrysene
Bis(2-ethylhexyl)phthalate (DEHP)
Benzo(b)fluoranthene
Benzo(k)fluoranthene
Benzo(a)pyrene