

**NO: SAMM 106**(Issue 2, 5 July 2023 replacement  
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**LABORATORY LOCATION:**  
(PERMANENT LABORATORY)**SPECTRUM LABORATORIES (JOHOR) SDN. BHD.**  
**18A, JALAN MOLEK 2/5**  
**TAMAN MOLEK**  
**81100 JOHOR BAHRU, JOHOR**  
**MALAYSIA****FIELDS OF TESTING:****CHEMICAL AND 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**

<b>Materials/ Products Tested</b>	<b>Type of Test/ Properties Measured/ Range of Measurement</b>	<b>Standard Test Methods/ Equipment/Techniques</b>
<b>Environmental Monitoring</b>  <ul style="list-style-type: none"> <li>Effluent</li> </ul>	Alkalinity	APHA 2320 B
	Biochemical Oxygen Demand (BOD)	APHA 5210 B
	Chromium, Hexavalent	APHA 3500-Cr B
	Chromium, Trivalent	In house method no. 19 based on APHA 3500-Cr B
	Chemical Oxygen Demand (COD)	APHA 5220 B APHA 5220 C APHA 5220 D
	Cyanide	APHA 4500 – CN· C & F  OSRMA P-456

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
<b>Environmental Monitoring</b> (continued) <ul style="list-style-type: none"> <li>Effluent</li> </ul>	Colour	APHA 2120 B  APHA 2120 F
	Free Chlorine	APHA 4500-Cl F
	Formaldehyde	OSRMA PG-458  APHA 6252 B
	pH	APHA 4500-H <sup>+</sup> B
	Phenol	APHA 5530 B C
	Sulphide	APHA 4500-S <sup>2-</sup> F
	Total Solids	APHA 2540 B
	Total Dissolved Solid	APHA 2540 C
	Suspended Solids	APHA 2540 D
	Fixed and volatile solids ignited at 550°C (Mixed Liquor Volatile Suspended Solids or MLVSS)	APHA 2540 E
	Mixed Liquor Suspended Solids (MLSS)	In house method No.23 based On APHA 2540 D
	Nitrite	APHA 4500-NO <sub>2</sub> -B
	Nitrogen/ Nitrate as N/ NO <sub>3</sub>	AOAC 973.50
	Nitrate	APHA 4500-NO <sub>3</sub> <sup>-</sup> B
Phosphorus as P (or PO <sub>4</sub> )	APHA 4500-P B, C	
Chloride	APHA 4500-Cl <sup>-</sup> C	
Fluoride	APHA 4500-F <sup>-</sup> D	
Ammonia Nitrogen as N	APHA 4500-NH <sub>3</sub> B, C	

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
<b>Environmental Monitoring</b> (continued) <ul style="list-style-type: none"> <li>• Effluent</li> </ul>	Oil & Grease	APHA 5520 B
	Dissolved Oxygen	APHA 4500-O G
	Silica as SiO <sub>2</sub>	APHA 4500-SiO <sub>2</sub> D
	Anionic Surfactant as MBAS	APHA 5540 C
	Hardness (EDTA)	APHA 2340 C
	Hardness (Calculation)	APHA 2340 B
	Turbidity	APHA 2130 B
	Sulphate	APHA 4500-SO <sub>4</sub> <sup>2-</sup> E
	Bicarbonate Alkalinity	APHA 4500-CO <sub>2</sub> D
	Carbonate Alkalinity	APHA 4500-CO <sub>2</sub> D
	Free Carbon Dioxide	APHA 4500-CO <sub>2</sub> D
	Hydroxide Alkalinity	
	Total Carbon Dioxide	

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<b>Environmental Monitoring</b> (continued) <ul style="list-style-type: none"> <li>• Effluent</li> </ul>	<b>Preliminary Treatment of Samples:</b>  Digestion for metals  Nitric Acid Digestion  Nitric Acid-Hydrochloric Acid Digestion  Aluminium  Antimony  Arsenic  Boron  Mercury  Selenium  Tin	APHA 3030 D  APHA 3030 E  APHA 3030 F  APHA 3500-AI B  In house method no. 20 based on APHA 3114 C  APHA 3114 C  APHA 4500-B C  APHA 3112 B  APHA 3114 C  In house method No.1 based on APHA 3114 C

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
<b>Environmental Monitoring</b> (continued) <ul style="list-style-type: none"> <li>• Effluent</li> </ul>	Cadmium Calcium as Ca Chromium, Total Cobalt Copper Gold Iron Lead Magnesium Manganese Nickel Potassium Silver Sodium Zinc	APHA 3111 B
	<b>Volatile Organic Compounds (VOC)</b>  Benzene Toluene Ethylbenzene o-Xylene m,p-Xylene Total Xylene	APHA 6200 B
	<b>Trihalomethanes (THM)</b>  Chloroform Dichlorobromomethanes Dibromochloromethanes Bromoform	APHA 6232 C
	Chlorinated Phenoxy Acid Herbicides: 2,4-D	APHA 6640 B (18 <sup>th</sup> Edition)

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
<b>Environmental Monitoring</b> (continued) <ul style="list-style-type: none"> <li>• Effluent</li> </ul>	<b>Organochlorine Pesticides</b> Aldrin $\alpha$ -BHC $\beta$ -BHC $\delta$ -BHC $\gamma$ -BHC (Lindane) 4,4'-DDD 4,4'-DDE 4,4'-DDT Dieldrin Endosulfan I Endosulfan II Endosulfan sulfate Endrin Endrin aldehyde Endrin Ketone Heptachlor Heptachlor epoxide (isomer B) 4,4'-Methoxychlor Chlordane Hexachlorobenzene	APHA 6630 B

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
<b>Environmental Monitoring</b> (continued) <ul style="list-style-type: none"> <li>• Effluent</li> </ul>	Ammoniacal Nitrogen	APHA 4500-NH <sub>3</sub> F
	Beryllium	APHA 3120 B
	Molybdenum	APHA 3120 B
	Vanadium	APHA 3120 B
	Palladium	In house method No. 31 based on APHA 3120 B
	Phosphorus as P (or PO <sub>4</sub> )	APHA 4500-P B F, by Discrete Analyzer
	Nitrate as N (or NO <sub>3</sub> )	USEPA 353.2 by Discrete Analyzer
	Nitrite as N (or NO <sub>2</sub> )	
	Ammoniacal Nitrogen	APHA 4500-NH <sub>3</sub> G, by Discrete Analyzer
	Phenol	USEPA 420.2, by Discrete Analyzer
Cyanide	APHA 4500-CN C E, by Discrete Analyzer	
Fluoride	APHA 4500-F-C	

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
<b>Environmental Monitoring</b> <ul style="list-style-type: none"> <li>Rubber/ Palm Oil Mill Effluent</li> </ul>	pH	APHA 4500-H <sup>+</sup> B
	Chemical Oxygen Demand (COD) Ammoniacal Nitrogen as NH <sub>4</sub> -N	DOE (M) 1985 (Reference Method)
	Suspended Solids Oil & Grease Biochemical Oxygen Demand (BOD <sub>3</sub> ) 3 days at 30°C	DOE (M) 1985 (Alternative Method)
<ul style="list-style-type: none"> <li>Sewage</li> <li>Effluent</li> </ul>	Antimony Aluminium Arsenic Boron Barium Bismuth Calcium Cadmium Cobalt Chromium Copper Iron Gallium Indium Potassium Lithium Magnesium Manganese Sodium Nickel Lead Silicon Silver Selenium Strontium Thallium Zinc	APHA 3120 B



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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
<b>Environmental Monitoring</b> (continued) <ul style="list-style-type: none"> <li>Sewage</li> <li>Effluent</li> </ul>	Mercury	In-house method No. 24 based on APHA 3120 B
	Tin	In-house method No. 25 based on APHA 3120 B
<ul style="list-style-type: none"> <li>Sewage</li> </ul>	Chemical Oxygen Demand (COD)	APHA 5220 C
	Biochemical Oxygen Demand (BOD)	APHA 5210 B, APHA 4500-O G
	Suspended Solid	APHA 2540 D
	Ammoniacal Nitrogen as N	APHA 4500-NH <sub>3</sub> B, C
	Nitrate as N	APHA 4500-NO <sub>3</sub> <sup>-</sup> B
	Phosphorus as P (or PO <sub>4</sub> )	APHA 4500-P, B, C
	Oil & Grease	APHA 5520 B
	Phosphorus as P (or PO <sub>4</sub> )	APHA 4500-P B F
	Nitrate as N (or NO <sub>3</sub> ) Nitrite as N (or NO <sub>2</sub> )	USEPA 353.2, by Discrete Analyzer
	Ammoniacal Nitrogen as N Phenol Cyanide	APHA 4500-NH <sub>3</sub> G, by Discrete Analyzer USEPA 420.2, by Discrete Analyzer APHA 4500-CN C E, by Discrete Analyzer

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
<b>Water</b>  <ul style="list-style-type: none"> <li>Marine Water</li> </ul>	Antimony Aluminium Arsenic Boron Barium Cadmium Chromium Copper Iron Manganese Nickel Lead Silver Selenium Zinc	APHA 3120 B
	Mercury	In-house method No. 24 based on APHA 3120 B
	Tin	In-house method No. 25 based on APHA 3120 B
	Ammoniacal Nitrogen	APHA 4500-NH <sub>3</sub> F
	Phosphorus as P (or PO <sub>4</sub> )	USEPA 365.1
	Nitrate as N (or NO <sub>3</sub> ) Nitrite as N (or NO <sub>2</sub> )	USEPA 353.4, by Segmented Flow Analyzer
	Ammoniacal Nitrogen Phenol	USEPA 349.0 USEPA 420.4, by Segmented Flow Analyzer
	Total Organic Carbon	APHA 5310 B

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
<b>Water</b> <ul style="list-style-type: none"> <li>• Drinking Water</li> <li>• Potable Water</li> <li>• Processed Water</li> <li>• Surface Water</li> <li>• Ground Water</li> <li>• Mineral Water</li> </ul>	Alkalinity	APHA 2320 B
	Biochemical Oxygen Demand (BOD)	APHA 5210 B
	Chromium, Hexavalent	APHA 3500-Cr B
	Chromium, Trivalent	In house method no. 19 based on APHA 3500-Cr B
	Chemical Oxygen Demand (COD)	APHA 5220 B APHA 5220 C APHA 5220 D
	Cyanide	APHA 4500 – CN <sup>-</sup> C & F OSRMA P-456
	Colour	APHA 2120 B APHA 2120 F
	Free Chlorine	APHA 4500-CI F
	Formaldehyde	OSRMA PG-458 APHA 6252 B
pH	APHA 4500-H <sup>+</sup> B	
Phenol	APHA 5530 B C	
Sulphide	APHA 4500-S <sup>2-</sup> F	
Total Solids	APHA 2540 B	
Total Dissolved Solid	APHA 2540 C	

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
<b>Water</b> (continued) <ul style="list-style-type: none"> <li>• Drinking Water</li> <li>• Potable Water</li> <li>• Processed Water</li> <li>• Surface Water</li> <li>• Ground Water</li> <li>• Mineral Water</li> </ul>	Suspended Solids  Fixed and volatile solids ignited at 550°C (Mixed Liquor Volatile Suspended Solids or MLVSS)  Mixed Liquor Suspended Solids (MLSS)  Nitrite  Nitrogen/ Nitrate as N/ NO <sub>3</sub>  Nitrate  Phosphorus as P (or PO <sub>4</sub> )  Chloride  Fluoride  Ammonia Nitrogen as N  Oil & Grease  Dissolved Oxygen  Silica as SiO <sub>2</sub>  Anionic Surfactant as MBAS  Hardness (EDTA)  Hardness (Calculation)  Turbidity  Sulphate  Bicarbonate Alkalinity  Carbonate Alkalinity	APHA 2540 D  APHA 2540 E  In house method No.23 based On APHA 2540 D  APHA 4500-NO <sub>2</sub> -B  AOAC 973.50  APHA 4500-NO <sub>3</sub> - B  APHA 4500-P B, C  APHA 4500-Cl- C  APHA 4500-F- D  APHA 4500-NH <sub>3</sub> B, C  APHA 5520 B  APHA 4500-O G  APHA 4500-SiO <sub>2</sub> D  APHA 5540 C  APHA 2340 C  APHA 2340 B  APHA 2130 B  APHA 4500-SO <sub>4</sub> <sup>2-</sup> E  APHA 4500-CO <sub>2</sub> D  APHA 4500-CO <sub>2</sub> D

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
<b>Water</b> (continued) <ul style="list-style-type: none"> <li>• Drinking Water</li> <li>• Potable Water</li> <li>• Processed Water</li> <li>• Surface Water</li> <li>• Ground Water</li> <li>• Mineral Water</li> </ul>	Free Carbon Dioxide  Hydroxide Alkalinity  Total Carbon Dioxide	APHA 4500-CO <sub>2</sub> D
	<b>Preliminary Treatment of Samples:</b>  Digestion for metals  Nitric Acid Digestion  Nitric Acid-Hydrochloric Acid Digestion  Aluminium  Antimony  Arsenic  Boron	APHA 3030 D  APHA 3030 E  APHA 3030 F  APHA 3500-AI B  In house method no. 20 based on APHA 3114 C  APHA 3114 C  APHA 4500-B C
	Cadmium Calcium Chromium, Total Cobalt Copper Gold Iron Lead Magnesium Manganese Nickel Potassium Silver Sodium Zinc	APHA 3111 B

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
<p><b>Water</b> (continued)</p> <ul style="list-style-type: none"> <li>• Drinking Water</li> <li>• Potable Water</li> <li>• Processed Water</li> <li>• Surface Water</li> <li>• Ground Water</li> <li>• Mineral Water</li> </ul>	<p>Mercury</p> <p>Selenium</p> <p>Tin</p>	<p>APHA 3112 B</p> <p>APHA 3114 C</p> <p>In house method No.1 based on APHA 3114 C</p>
	<p><b>Volatile Organic Compounds (VOC)</b></p> <p>Benzene Toluene Ethylbenzene o-Xylene m,p-Xylene Total Xylene</p>	<p>APHA 6200 B</p>
	<p><b>Trihalomethanes (THM)</b></p> <p>Chloroform Dichlorobromomethanes Dibromochloromethanes Bromoform</p>	<p>APHA 6232 C</p>

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
<b>Water</b> (continued) <ul style="list-style-type: none"> <li>• Drinking Water</li> <li>• Potable Water</li> <li>• Processed Water</li> <li>• Surface Water</li> <li>• Ground Water</li> <li>• Mineral Water</li> </ul>	<b>Organochlorine Pesticides</b>  Aldrin $\alpha$ -BHC $\beta$ -BHC $\delta$ -BHC $\gamma$ -BHC (Lindane) 4,4'-DDD 4,4'-DDE 4,4'-DDT Dieldrin Endosulfan I Endosulfan II Endosulfan sulfate Endrin Endrin aldehyde Endrin Ketone Heptachlor Heptachlor epoxide (isomer B) 4,4'-Methoxychlor Chlordane Hexachlorobenzene	APHA 6630 B
	Chlorinated Phenoxy Acid Herbicides: 2,4-D	APHA 6640 B (18 <sup>th</sup> Edition)

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
<b>Water</b> <ul style="list-style-type: none"> <li>• Drinking Water</li> <li>• Potable Water</li> <li>• Processed Water</li> <li>• Surface Water</li> <li>• Ground Water</li> <li>• Mineral Water</li> </ul>	Antimony Aluminium Arsenic Boron Barium Bismuth Calcium Cadmium Cobalt Chromium Copper Iron Gallium Indium Potassium Lithium Magnesium Manganese Sodium Nickel Lead Silicon Silver Selenium Strontium Thallium Zinc	APHA 3120 B
	Mercury  Tin	In-house method No. 24 based on APHA 3120 B  In-house method No. 25 based on APHA 3120 B
	Phosphorus as P (or PO <sub>4</sub> )	APHA 4500-P B F, by Discrete Analyzer  USEPA 365.1, by Discrete Analyzer
	Nitrate as N (or NO <sub>3</sub> )	USEPA 353.2, by Discrete Analyzer  USEPA 353.4, by Segmented Flow Analyzer

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
<b>Water</b> (continued) <ul style="list-style-type: none"> <li>• Drinking Water</li> <li>• Potable Water</li> <li>• Processed Water</li> <li>• Surface Water</li> <li>• Ground Water</li> <li>• Mineral Water</li> </ul>	Nitrite as N (or NO <sub>2</sub> )	USEPA 353.2, by Discrete Analyzer  USEPA 353.4, by Segmented Flow Analyzer
	Ammoniacal Nitrogen	APHA 4500-NH <sub>3</sub> G, by Discrete Analyzer  USEPA 349.0, by Segmented Flow Analyzer
	Phenol	USEPA 420.2, by Discrete Analyzer  USEPA 420.4, by Segmented Flow Analyzer
	Cyanide  Fluoride	APHA 4500-CN- C E, by Discrete Analyzer  APHA 4500-F-C
<ul style="list-style-type: none"> <li>• Drinking Water</li> </ul>	Beryllium  Molybdenum  Vanadium  Palladium	APHA 3120 B  APHA 3120 B  APHA 3120 B  In house method No. 31 based on APHA 3120 B

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
<b>Foods</b>		
• Seafood	Salt (Chlorine as Sodium Chloride)	AOAC 937.09
• Meats	Sulfurous acid (Free)	AOAC 892.02
• Non-solid Food and Beverages	Benzoic acid	AOAC 960.38
• Vitamin Preparations and Juices	Ascorbic acid	AOAC 967.21
• Molasses	Total Sugar expressed as Invert Sugar	AOAC 968.28
• Baking Powders	Starch	AOAC 920.44
• Cured Meat	Nitrites	AOAC 973.31
• Cocoa Products	Fat Moisture	AOAC 963.15 AOAC 931.04
• Fruits and Fruits Products	Phosphorus	AOAC 970.39
• Vinegar	Total acids	AOAC 930.35 (J) (1995)
• Milk	Nitrogen (Total)	AOAC 991.20 (1995)
• Food	Zinc Na, Pb, Ca, Cu, K, Mn, Mg, Zn, Cd, Ag, Ni, Cr and Fe Ash	AOAC 969.32 and In-house method no. 18 based on AAS Instrument Manual AOAC 31.012 (method 1)



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**SITE: CATEGORY I**

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
<p><b>Environmental Monitoring</b></p> <ul style="list-style-type: none"> <li>Flue Gas</li> </ul>	<p>Determination of particulate emissions from stationary sources</p> <p>Determination of sulfur dioxide emissions from stationary sources</p> <p>Determination of nitrogen oxide emissions from stationary sources</p> <p>Determination of sulfuric acid mist and sulfur dioxide emissions from stationary sources</p> <p>Determination of metals emissions from stationary sources</p> <p>Determination of concentration &amp; mass flow of particulate matter in flue gas for stationary source emissions</p> <p>Determination of dark smoke emissions from chimney using Ringelmann Smoke Chart</p> <p>Determination of dark smoke emissions from chimney using Ringelmann Smoke Chart</p> <p>Sampling of hydrogen halide and halogen emissions from stationary sources – isokinetic method</p> <p>Determination of NO &amp; NO<sub>2</sub> (Sum of NO and NO<sub>2</sub> expressed as NO<sub>2</sub> by calculation)</p> <p>Determination of CO &amp; O<sub>2</sub></p>	<p>EPA 40 CFR 60, App.A, Method - 5</p> <p>EPA 40 CFR 60, App.A, Method - 6</p> <p>EPA 40 CFR 60, App.A, Method - 7</p> <p>EPA 40 CFR 60, App.A, Method - 8</p> <p>EPA 40 CFR 60, App.A, Method -29</p> <p>MS 1596 : 2003</p> <p>United States Department of the Interior Bureau of Mines IC 8333, 1967</p> <p>BS 2742:1969</p> <p>US EPA Method 26A, 1998 (sampling)</p> <p>In house method No. 28 based on Manufacturer Method (Sum of NO and NO<sub>2</sub> expressed as NO<sub>2</sub> by calculation)</p> <p>In house method No. 29 based on Manufacturer Method</p>

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Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
<p><b>Environmental Monitoring</b></p> <p>Air</p>	<p>Ambient Air-Determination of Total Suspended Particulates (TSP)</p> <p>Ambient Air-Determination of Lead (Pb)</p> <p>Nitrogen Dioxide (NO<sub>2</sub>) in the atmosphere (24 hrs Average)</p> <p>Sulphur Dioxide (SO<sub>2</sub>) in the atmosphere</p> <p>Suspended Particulate Matter – PM<sub>10</sub></p> <p>Ambient Air- Determination of PM 2.5</p> <p>Ambient Air- Determination of PM 10</p> <p>Determination of Ozone (O<sub>3</sub>)</p> <p>Determination of Carbon Monoxide (CO)</p>	<p>AS 2724.3</p> <p>AS 2800</p> <p>ISC Method 408</p> <p>ISC Method 704A</p> <p>AS 3580.9.6 - 1990</p> <p>In house method no. 27 based on Manufacturer Method</p> <p>In house method no. 27A based on Manufacturer Method</p> <p>In-house method No. 45 based on Aeroqual 500 Gas Analyser User Guide</p> <p>In-house method No. 46 based on Aeroqual 500 Gas Analyser User Guide</p>
<ul style="list-style-type: none"> <li>Environment</li> </ul>	<p>Measurement of noise</p>	<p>ISO 1996/1</p>
<ul style="list-style-type: none"> <li>Effluent</li> </ul>	<p>pH</p> <p>Temperature</p> <p>Dissolved oxygen</p>	<p>APHA 4500 H+B</p> <p>APHA 2550 B</p> <p>APHA 4500-O G</p>

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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
<b>Environmental Monitoring</b> (continued) <ul style="list-style-type: none"> <li>Water</li> </ul>	pH  Temperature  Dissolved oxygen	APHA 4500 H <sup>+</sup> B  APHA 2550 B  APHA 4500-O G
<ul style="list-style-type: none"> <li>Sewage</li> </ul>	Temperature  pH	APHA 2550 B  APHA 4500-H <sup>+</sup> B
Industrial Hygiene (Fumes, Particulates and Dust)	Lead	NIOSH 7082 by Flame AAS
Industrial Hygiene (Vapours)	Volatile Organic Compounds (screening) (Refer to Appendix I)	NIOSH 2549 by GC-MS
Industrial Hygiene (Fumes, Particulates and Dust)	Elements:  Aluminium Barium Cadmium Cobalt Chromium Copper Iron Lead Magnesium Manganese Nickel Zinc Arsenic Antimony Beryllium Molybdenum Tin Titanium	NIOSH 7303- Elements By ICP (Hot Block/HCl/HNO <sub>3</sub> Digestion)

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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
<b>Environmental Monitoring</b> (continued)		
Industrial Hygiene (Particulates and Dust)	Particulate Not Otherwise Regulated, Total (Inhalable Dust)	NIOSH 0500
Industrial Hygiene (Particulates and Dust)	Particulate Not Otherwise Regulated, Respirable (Respirable Dust)	NIOSH 0600

Note:

- APHA : Standard Methods for the Examination of Water and Wastewater, American Public Health Association, American Water Works Association and Water Environment Federation, 21<sup>st</sup> Edition, 2005
- OSRMA : Official Standardised and Recommended methods of Analysis, 2<sup>nd</sup> Edition, 1973
- DOE : Revised Standard Methods for Analysis of Rubber and Palm Oil Mill Effluent, 2<sup>nd</sup> Edition, 1995
- AS : Australia Standard
- ISC : Methods of Air Sampling and Analysis, 3<sup>rd</sup> Edition, 1990. APHA Intersociety Committee.
- AOAC : Association of Official Analytical Chemists, 13<sup>th</sup> Edition, 1995
- NIOSH : National Institute of Occupational Safety and Health, 4th Edition 1984.
- ISO : International Organization for Standardization, First Edition 1982.
- BS : British Standard, First Revision 1969.
- MS : Malaysian Standard, ICS 13.040.40, 2003
- EPA : Environmental Protection Agency, Part 60 Revised as of July 1, 1998
- USEPA : United States of Environmental Protection Agency

**Signatories:**

- |    |                               |                                |  |
|----|-------------------------------|--------------------------------|--|
| 1. | <b>Siew Yoke Lan</b>          | <b>IKM No.: L/0747/1771/86</b> | <b>(Non-resident)</b>  |
| 2. | <b>Kan King Choy</b>          | <b>IKM No.: L/0797/1886/88</b> | <b>(Non-resident)</b>  |
| 3. | <b>Low Poh Ling</b>           | <b>IKM No.: L/1237/4016/99</b> |  |
| 4. | <b>Nurhana binti Zainal</b>   | <b>IKM No.: L/2880/8511/19</b> | <b>(site: Environmental monitoring- Flue Gas, Air, Noise &amp; Industrial Hygiene)</b> |
| 5. | <b>Maizatul Saadiah Mesni</b> | <b>IKM No.: M/5685/9194/21</b> | <b>(Water &amp; Environmental Monitoring)</b>  |

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**SCOPE OF TESTING: MICROBIOLOGY**

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
<b>Food</b>	Aerobic Plate Count/Total Plate Count	FDA – BAM Chapter 3
	Yeast and Mold	FDA – BAM Chapter 18
	Coliform, Fecal Coliform and E. coli	FDA – BAM Chapter 4
	Staphylococcus aureus	FDA – BAM Chapter 12
<b>Water</b>	Heterotrophic Plate Count/ Total Plate Count	APHA 9215 B
	Heterotrophic Plate Count/ Total Plate Count	APHA 9215 C
	Coliform	APHA 9221 B
	Fecal Coliform and <i>Escherichia coli</i>	APHA 9221 E
	Coliform	In house method No. 12 based on APHA 9222 B (Membrane Filtration method)
	<i>Escherichia coli</i>	In house method No. 13 based on APHA 9222 G (Membrane Filtration method)

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- APHA : Standard Methods for the Examination of Water and Wastewater, American Public Health Association, American Water Works Association and Water Environment Federation, 21<sup>st</sup> Edition, 2005
- FDA : Bacteriological Analytical Manual, Food & Drug Administration , Edition 8 Revision A, 1998

**Signatories:**

- |                             |                         |                               |
|-----------------------------|-------------------------|-------------------------------|
| 1. Prof. Dr. Thong Kwai Lin |                         | (Non-resident)                |
| 2. Siew Yoke Lan            | IKM No.: L/0747/1771/86 | (Water testing- Non-resident) |
| 3. Munirah binti Muzamil    | MJMM 0949               |                               |

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**SCOPE OF TESTING: MICROBIOLOGY**

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
<b>Water</b>	Pseudomonas aeruginosa	In-house method No. 38 based on APHA 9213 E (Membrane Filtration method)
	Enterococci	APHA 9230 C (Membrane Filtration method)
	Fecal Streptococci	APHA 9230 C (Membrane Filtration method)
	Fecal Coliform Membrane Filter Procedure	APHA 9222 D

**Note:**

- APHA : Standard Methods for the Examination of Water and Wastewater, American Public Health Association, American Water Works Association and Water Environment Federation, 21<sup>st</sup> Edition, 2005
- FDA : Bacteriological Analytical Manual, Food & Drug Administration , Edition 8 Revision A, 1998

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**APPENDIX I:****VOLATILE ORGANIC COMPOUNDS SCREENING- NIOSH 2549  
Analysis Result of 48 component VOC (Screening by GC-MS)**

No.	VOC Name
1.	Acetone
2.	2-Propanol
3.	Methylene Chloride
4.	1-Propanol
5.	Hexane
6.	2-Butanone (MEK)
7.	Ethyl Acetate
8.	Chloroform
9.	2,4-Dimethylpentane
10.	1,2-Dichloroethane
11.	Benzene
12.	Iso-Octane
13.	n-Butanol
14.	n-Heptane
15.	Trichloroethylene
16.	1,2-Dichloropropane
17.	Bromodichloromethane
18.	4-Methyl-2-Pentanone (MIBK)
19.	Toluene
20.	Dibromochloromethane
21.	n-octane
22.	Tetrachloroethane
23.	N-Butyl acetate
24.	Ethylbenzene
25.	p-Xylene
26.	m-Xylene
27.	o-Xylene
28.	n-Nonane
29.	(1s)-(-)- $\alpha$ -Pinene
30.	Nonanal
31.	2-Ethyltoluene
32.	3-Ethyl Toluene
33.	4-Ethyl Toluene
34.	1,2,4-Trimethylbenzene
35.	1,3,5-Trimethylbenzene
36.	B-Pinene
37.	n-Dodecane
38.	Decanal
39.	1,2,3-Trimethylbenzene
40.	n-Decane
41.	1,4-Dichlorobenzene
42.	n-Tridecane
43.	(R)-(+)-Limonene
44.	n-Tetradecane
45.	n-Pentadecane
46.	n-Hexadecane
47.	n-Undecane
48.	1,2,4,5-Tetramethyl benzene