

# Schedule

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Certificate No. : LA-2000-0178-F  
Issue No. : 23  
Date : 07 February 2018  
Page : 1 of 24

FIELD OF TESTING : Environmental Testing

MATERIALS / PRODUCTS TESTED	TESTS / PROPERTIES	STANDARD METHODS / TECHNIQUES / EQUIPMENT	SIGNATORIES
<b>A WATER</b>		APHA methods are based on the 2017 Edition.	
I Water for Drinking / Domestic Purposes / Swimming Pool Water	<p><b><u>Chemical Testing</u></b></p> <ol style="list-style-type: none"> <li>Acid Digestion for Elemental Analysis</li> <li>Alkalinity</li> <li>Anions by Ion Chromatography with Chemical Suppression of Eluent Conductivity – Bromide, Chloride, Fluoride, Nitrate, Nitrite, Phosphate and Sulphate</li> <li>Appearance</li> <li>Bromate by Ion Chromatography</li> <li>Chloride</li> <li>Chlorine (Residual)</li> <li>Chlorine (Total and Free)</li> </ol>	<p>APHA 3030F</p> <p>APHA 2320B</p> <p>APHA 4110B</p> <p>APHA 2110</p> <p>APHA 4110D / US EPA Method 300.0</p> <p>APHA 4500Cl<sup>-</sup> C</p> <p>APHA 4500Cl B</p> <p>HACH Method 8167 and 8021 ATS QWI ENV W47</p>	<p>JW, YKW, PT, TTH, SMH, LFX,</p> <p>JW, YKW, PT, TTH, SMH</p> <p>JW, YKW, PT, TTH, NDV</p> <p>JW, YKW, PT, TTH, SMH</p> <p>JW, YKW, PT, TTH, KT</p> <p>JW, YKW, PT, TTH, SMH</p> <p>JW, YKW, PT, TTH, SMH</p> <p>JW, YKW, PT, TTH, SMH</p>

# Schedule



Certificate No. : LA-2000-0178-F

Issue No. : 23

Date : 07 February 2018

Page : 2 of 24

MATERIALS / PRODUCTS TESTED	TESTS / PROPERTIES	STANDARD METHODS / TECHNIQUES / EQUIPMENT	SIGNATORIES
	9. Chlorophyll A	APHA 10200H	YKW, PT, TTH, SMH
	10. Chromium, Hexavalent	APHA 3500Cr B	YKW, PT, TTH, SMH, NDV
	11. Colour	APHA 2120B	JW, YKW, PT, TTH, SMH
	12. Colour by Lovibond Tintometer	ATS QWIENV W 43	JW, YKW, PT, TTH, SMH
	13. Colour-Spectrophotometric-Single-Wavelength Method	ATS QWIENV W 65 APHA 2120C	YKW, PT, TTH, SMH
	14. Conductivity	APHA 2510B	JW, YKW, PT, TTH, SMH
	15. Cyanuric Acid in water	ATS QWIENV W 63 (Merck Method)	YKW, PT, TTH
	16. Dissolved Oxygen	APHA 4500-OG	JW, YKW, PT, TTH, SMH, NDV
	17. Fixed and volatile solids in water ignited at 550°C	APHA 2540E	JW, YKW, PT, TTH, SMH
	18. Fluoride	APHA 4500F <sup>-</sup> D	JW, YKW, PT, TTH, SMH, SBH, NDV
	19. Hardness	APHA 2340B & C	YKW, PT, TTH, SMH, LFX
	20. Iodide	APHA 4500I <sup>-</sup> B	YKW, PT, TTH, SMH
	21. Iodine	APHA 4500I B	JW, YKW, PT, TTH, SMH

# Schedule



Certificate No. : LA-2000-0178-F

Issue No. : 23

Date : 07 February 2018

Page : 3 of 24

MATERIALS / PRODUCTS TESTED	TESTS / PROPERTIES	STANDARD METHODS / TECHNIQUES / EQUIPMENT	SIGNATORIES
	22. Metals: Aluminium, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Titanium, Vanadium, Zinc	APHA 3111B APHA 3120B USEPA 6010D (2014)	JW, YKW, PT, TTH, SMH, LFX
	23. Nitrogen (Ammonia)	APHA 4500NH <sub>3</sub> F	JW, YKW, PT, TTH, SMH
	24. Nitrogen (Ammonia) by Distillation And Flow Injection Analysis	APHA 4500NH <sub>3</sub> B, H	JW, YKW, PT, TTH, SMH
	25. Nitrogen (Nitrate-Nitrite) by Cadmium Reduction, Flow Injection Analysis	APHA 4500NO <sub>3</sub> <sup>-</sup> I	JW, YKW, PT, TTH, SMH
	26. Total Kjeldahl Nitrogen by Block Digestion and Flow Injection Analysis	APHA 4500 N <sub>org</sub> D	JW, YKW, PT, TTH, SMH
	27. Total Nitrogen by Persulfate Method	APHA 4500N C	JW, YKW, PT, TTH, SMH
	28. Total Nitrogen and Bound Nitrogen after Combustion and Oxidation to Nitrogen Dioxide using Chemiluminescence detection	ISO/TR 11905-2 BS EN 12260 (2003)	JW, YKW, PT, TTH, SMH
	29. Odour	APHA 2170B	JW, YKW, PT, TTH, SMH
	30. Oil and Grease	APHA 5520B	JW, YKW, PT, TTH, SBH, LFX, NDV

# Schedule



Certificate No. : LA-2000-0178-F

Issue No. : 23

Date : 07 February 2018

Page : 4 of 24

MATERIALS / PRODUCTS TESTED	TESTS / PROPERTIES	STANDARD METHODS / TECHNIQUES / EQUIPMENT	SIGNATORIES
	31. Oil and Grease (Hydrocarbons and Non-Hydrocarbon)	APHA 5520B,F	JW, YKW, PT, TTH, SBH, LFX, NDV
	32. Ortho-Phosphorus by Flow Injection Analysis	APHA 4500P G	JW, YKW, PT, TTH, SMH
	33. pH Value	APHA 4500H <sup>+</sup> B	JW, YKW, PT, TTH, SMH, SBH, LFX, NDV
	34. Salinity	APHA 2520B	JW, KW, PT, TTH, SMH
	35. Selected organotin compounds (Monobutyltin, Dibutyltin, Tributyltin) in water	ISO 17353:2004	JW, YKW, PT, TTH
	36. Silica	APHA 4500SiO <sub>2</sub> D APHA 3030F/3120B	JW, YKW, PT, TTH, SMH, LFX
	37. Silt Density Index (SDI)	ASTM D4189-95 (Reapproved 2002)	JW, YKW, PT, TTH, LFX
	38. Temperature	APHA 2550B	JW, YKW, PT, TTH, SMH
	39. Total Cyanide After Distillation	APHA 4500CN C USEPA 9010C (2004)	JW, YKW, PT, TTH, SMH
	40. Total Cyanide After Distillation by Flow Injection Analysis	APHA 4500CN N	YKW, PT, TTH, SMH
	41. Total Cyanide in Water by Flow Injection Analysis	ATS QWIENV INORG 16	YKW, PT, TTH, SMH
	42. Total Dissolved Solid	APHA 2540C	JW, YKW, PT, TTH, SMH, SBH, NDV
	43. Total Solids	APHA 2540B	YKW, PT, TTH, SMH, SBH, NDV

# Schedule



Certificate No. : LA-2000-0178-F

Issue No. : 23

Date : 07 February 2018

Page : 5 of 24

MATERIALS / PRODUCTS TESTED	TESTS / PROPERTIES	STANDARD METHODS / TECHNIQUES / EQUIPMENT	SIGNATORIES
	44. Total Suspended Solid	APHA 2540D	JW, YKW, PT, TTH, SMH, SBH, NDV
	45. Total and Dissolved Mercury by FIM-AAS	ATS QWIENV INORG 10	JW, YKW, PT, TTH, NDV
	46. Total Phosphorus	APHA 4500P B , H	JW, YKW, PT, TTH, SMH
	47. Trace Elements Aluminium, Antimony, Arsenic, Barium, Beryllium, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Thallium, Uranium, Vanadium, Zinc	US EPA 200.8 / ICP-MS (1994)	JW, YKW, PT, TTH, SMH
	48. Turbidity	APHA 2130B	JW, YKW, PT, TTH, SMH
	49. UV-Absorbing Organic Constituent	APHA 5910B	JW, YKW, PT, TTH, SMH
	<b><u>Microbiology Tests</u></b>		
	1. <i>Clostridium Perfringens</i> in Water	ISO 14189: 2013	JW, JT, SS, LKY, NCJ
	2. Faecal <i>Coliform</i> count (MF/MPN)	APHA 9222D/9221E	JW, JT, SS, LKY, NCJ
	3. <i>Faecal streptococcus</i>	APHA 9230C	JW, JT, SS, LKY, NCJ
	4. <i>Pseudomonas aeruginosa</i>	APHA 9213E	JW, JT, SS, LKY, NCJ
	5. <i>Salmonella spp.</i>	APHA 9260B	JW, JT, SS, LKY, NCJ

# Schedule



Certificate No. : LA-2000-0178-F

Issue No. : 23

Date : 07 February 2018

Page : 6 of 24

MATERIALS / PRODUCTS TESTED	TESTS / PROPERTIES	STANDARD METHODS / TECHNIQUES / EQUIPMENT	SIGNATORIES
	6. Spores of Sulfite Reducing Anaerobe	ATS QWIMIC 62 ISO 6461-2 – 1986 (E) / Re-affirm 2013 Membrane Filtration	JW, JT, SS, LKY, NCJ
	7. Sulfate-Reducing Bacteria in Water and Water-Formed Deposits	ASTM D4412-84 (Re- approved 2009)	JW, JT, SS, LKY, NCJ
	8. <i>Staphylococcus aureus</i>	APHA 9213B	JW, JT, SS, LKY, NCJ
	9. Total <i>coliform</i> count (MPN/MF)	APHA 9221B/9222B	JW, JT, SS, LKY, NCJ
	10. Total <i>E. coli</i> count	APHA 9222G	JW, JT, SS, LKY, NCJ
	11. Total Plate Count	APHA 9215B APHA 9215B (35°C for 24hrs)	JW, JT, SS, LKY, NCJ
	12. Total viable aerobic count	ATS QWI MIC 63 USP 40, 2017, harmonised with EP 8th Edition, Volume II	JW, JT, SS, LKY, NCJ
II General Water & Water from Cooling Towers and Fountain	1. Detection and Enumeration of <i>Legionella</i>	ATS QWI MIC 61 / AS/NZ Standard 3896 : 2008	JW, JT, SS, LKY, NCJ
	2. Examination for <i>Legionella</i> including <i>Legionella Pneumophila</i>	ATS QWI MIC 41 / ISO 11731 (2 <sup>nd</sup> Edition, 2017)	JW, JT, SS, LKY, NCJ
III Purified Water/ RO Water/ Dialysis Fluid	1. Endotoxin by Chromogenic method	ATS QWI MIC 73 USP 40, 2016 Ed. <85>	JW, JT, SS, LKY, NCJ
IV Trade Effluent / Groundwater / Seawater / DI water/ RO water / Purified water	1. Alkalinity	APHA 2320B	JW, YKW, PT, TTH, SMH

The SAC Programme is managed by SPRING Singapore

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# Schedule



Certificate No. : LA-2000-0178-F

Issue No. : 23

Date : 07 February 2018

Page : 7 of 24

MATERIALS / PRODUCTS TESTED	TESTS / PROPERTIES	STANDARD METHODS / TECHNIQUES / EQUIPMENT	SIGNATORIES
	2. Anions by Ion Chromatography with Chemical Suppression of Eluent Conductivity – Bromide, Chloride, Fluoride, Nitrate, Nitrite, Phosphate and Sulphate	APHA 4110B	JW, YKW, PT, TTH, NDV
	3. Appearance	APHA 2110	JW, YKW, PT, TTH, SMH
	4. Biochemical Oxygen Demand	APHA 5210B	YKW, PT, TTH, SMH, NDV
	5. Chemical Oxygen Demand	APHA 5220B APHA 5220C	JW, YKW, PT, TTH, SMH, NDV
	6. Chloride	APHA 4500Cl <sup>-</sup> C	YKW, PT, TTH, SMH
	7. Chlorine (Residual)	APHA 4500Cl B	YKW, PT, TTH, SMH
	8. Chlorine (Total and Free)	ATS QWI ENV W47 Hach Method 8167 and 8021	JW, YKW, PT, TTH, SMH
	9. Chlorophyll a	APHA 10200H	JW, YKW, PT, TTH, SMH
	10. Chromium, Hexavalent	APHA 3500Cr B	JW, YKW, PT, TTH, SMH, NDV
	11. Colour by Lovibond Tintometer	ATS QWIENV W43	JW, YKW, PT, TTH, SMH
	12. Colour-Spectrophotometric-Single-Wavelength Method	ATS QWIENV W 65 APHA 2120C	YKW, PT, TTH, SMH
	13. Conductivity	APHA 2510B	JW, YKW, PT, TTH, SMH
	14. Cyanide	APHA 4500CN E	JW, YKW, PT, TTH, SMH



# Schedule



Certificate No. : LA-2000-0178-F

Issue No. : 23

Date : 07 February 2018

Page : 8 of 24

MATERIALS / PRODUCTS TESTED	TESTS / PROPERTIES	STANDARD METHODS / TECHNIQUES / EQUIPMENT	SIGNATORIES
	15. Cyanuric Acid in water	ATS QWIENV W 63 (Merck Method)	YKW, PT, TTH
	16. Total Cyanide After Distillation	APHA 4500CN C USEPA 9010C (2004)	JW, YKW, PT, TTH, SMH
	17. Total Cyanide After Distillation by Flow Injection Analysis	APHA 4500CN N	JW, YKW, PT, TTH, SMH
	18. Detergent (as MBAS)	APHA 5540C	YKW, PT, TTH, SBH, LFX, NDV
	19. Dissolved Oxygen	APHA 4500-OG	JW, YKW, PT, TTH, SMH, NDV
	20. Fixed and volatile solids in water ignited at 550°C in water	APHA 2540E	JW, YKW, PT, TTH, SMH
	21. Fluoride	APHA 4500F <sup>-</sup> D	JW, YKW, PT, TTH, SMH, SBH, NDV
	22. Hardness	APHA 2340B & C	JW, YKW, PT, TTH, SMH, LFX
	23. Iodide	APHA 4500I <sup>-</sup> B	JW, YKW, PT, TTH, SMH
	24. Iodine	APHA 4500I B	JW, YKW, PT, TTH, SMH
	25. Metals: Aluminium, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Titanium, Vanadium, Zinc	APHA 3111B APHA 3120B USEPA 6010D (2014)	JW, YKW, PT, TTH, SMH, LFX



# Schedule



Certificate No. : LA-2000-0178-F

Issue No. : 23

Date : 07 February 2018

Page : 9 of 24

MATERIALS / PRODUCTS TESTED	TESTS / PROPERTIES	STANDARD METHODS / TECHNIQUES / EQUIPMENT	SIGNATORIES
	26. Total and Dissolved Mercury by FIM- AAS	ATS QWIENV INORG 10	JW, YKW, PT, TTH, NDV
	27. Nitrogen (Ammonia)	APHA 4500NH <sub>3</sub> F	JW, YKW, PT, TTH, SMH
	28. Nitrogen (Ammonia) by Distillation and Flow Injection Analysis	APHA 4500NH <sub>3</sub> B, H	JW, YKW, PT, TTH, SMH
	29. Nitrogen (Nitrate-Nitrite) by Cadmium Reduction, Flow Injection Analysis	APHA 4500NO <sub>3</sub> <sup>-</sup> I	JW, YKW, PT, TTH, SMH
	30. Total Kjeldahl Nitrogen by Block Digestion and Flow Injection Analysis	APHA 4500N <sub>org</sub> D	JW, YKW, PT, TTH, SMH
	31. Total Nitrogen by Persulfate Method	APHA 4500NC	JW, YKW, PT, TTH, SMH
	32. Bound Nitrogen and Total Nitrogen after Combustion and Oxidation to Nitrogen Dioxide using Chemiluminescence detection	ISO/TR 11905-2, BS EN 12260 (2003)	JW, YKW, PT, TTH, SMH, LFX
	33. Oil and Grease	APHA 5520B, C	JW, YKW, PT, TTH, SBH, LFX, NDV
	34. Oil and Grease (Hydrocarbons and Non-Hydrocarbon)	APHA 5520B, F	JW, YKW, PT, TTH, SBH, LFX, NDV
	35. pH Value	APHA 4500H <sup>+</sup> B	JW, YKW, PT, TTH, SMH, SBH, LFX, NDV
	36. Phenolic Compounds	APHA 5530C	JW, YKW, PT, TTH, LFX
	37. Phenolic compounds by Flow Injection Analysis	USEPA 9066 (1986) (ATS QWIENV W 64)	YKW, PT, TTH, SMH

# Schedule



Certificate No. : LA-2000-0178-F

Issue No. : 23

Date : 07 February 2018

Page : 10 of 24

MATERIALS / PRODUCTS TESTED	TESTS / PROPERTIES	STANDARD METHODS / TECHNIQUES / EQUIPMENT	SIGNATORIES
	38. Ortho-Phosphorus by Flow Injection Analysis	APHA 4500P G	JW, YKW, PT, TTH, SMH
	39. Total Phosphorus in Water	APHA 4500P B, H	JW, YKW, PT, TTH, SMH
	40. Salinity	APHA 2520B	JW, YKW, PT, TTH, SMH
	41. Selected organotin compounds (Monobutyltin, Dibutyltin, Tributyltin) in water	ISO 17353:2004	JW, YKW, PT, TTH,
	42. Silica	APHA 4500SiO <sub>2</sub> D APHA 3030F/3120B	JW, YKW, PT, TTH, SMH, LFX
	43. Silt Density Index (SDI)	ASTM D4189-95 (Reapproved 2002)	YKW, PT, TTH, LFX
	44. Sulphate	APHA 4500SO <sub>4</sub> <sup>2-</sup> D, E	YKW, PT, TTH, SMH
	45. Sulphide	APHA 4500S <sup>2-</sup> D	JW, YKW, PT, TTH, LFX
	46. Temperature	APHA 2550B	JW, YKW, PT, TTH, SMH
	47. Total Organic Carbon	APHA 5310B	JW, YKW, PT, TTH, SMH, LFX
	48. Total Dissolved Solids	APHA 2540C	JW, YKW, PT, TTH, SMH, SBH, NDV
	49. Total Cyanide in Water by Flow Injection Analysis	ATS QWIENV INORG 16	YKW, PT, TTH, SMH
	50. Total Solids	APHA 2540B	JW, YKW, PT, TTH, SMH, SBH, NDV
	51. Total Suspended Solids	APHA 2540D	JW, YKW, PT, TTH, SMH, SBH, NDV

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# Schedule



Certificate No. : LA-2000-0178-F

Issue No. : 23

Date : 07 February 2018

Page : 11 of 24

MATERIALS / PRODUCTS TESTED	TESTS / PROPERTIES	STANDARD METHODS / TECHNIQUES / EQUIPMENT	SIGNATORIES
<b>B WASTE</b> Water / Soil / Sediments / Sludge	52. Turbidity	APHA 2130B	JW, YKW, PT, TTH, SMH
	53. UV-Absorbing Organic Constituent	APHA 5910B	JW, YKW, PT, TTH, SMH
	1. Acid digestion (liquid)	USEPA 3010A (1996) APHA 3030F	PT, TTH
	2. Acid digestion (solids)	USEPA 3050B (1996)	PT, TTH
	3. Alkaline Digestion for Hexavalent Chromium in Soil and Sludges	USEPA 3060A (1996)	YKW, PT, TTH,
	4. Chlorophyll a	APHA 10200H	YKW, PT, TTH, SMH
	5. Chromium, Hexavalent	USEPA 7196A (1992)	YKW, PT, TTH
	6. Colour-Spectrophotometric-Single-Wavelength Method	ATS QWIENV W 65 APHA 2120C	YKW, PT, TTH, SMH
	7. Dissolved Oxygen	APHA 4500-OG	YKW, PT, TTH, SMH, NDV
	8. Fixed and volatile solids in water ignited at 550°C	APHA 2540E	YKW, PT, TTH, SMH
	9. Mercury	USEPA 7471B / Cold Vapor Technique (2007)	PT, TTH, NDV
	10. Mercury in soils and solutions by Thermal Decomposition, Amalgamation and Atomic Absorption Spectrophotometry	ATS QWIENV INORG 17 USEPA Method 7473 (2007)	YKW, PT, TTH, NDV
	11. Microwave Assisted Acid Digestion	USEPA 3051A (2007)	PT, TTH
12. Oil & Grease Extraction Method for Sludge	USEPA 9071A (1994)	PT, TTH	
13. Total Recoverable Oil & Grease	USEPA 9070 (1996)	PT, TTH	

# Schedule



Certificate No. : LA-2000-0178-F

Issue No. : 23

Date : 07 February 2018

Page : 12 of 24

MATERIALS / PRODUCTS TESTED	TESTS / PROPERTIES	STANDARD METHODS / TECHNIQUES / EQUIPMENT	SIGNATORIES
	14. Phenolic Compounds by Flow Injection Analysis	USEPA 9066 (1986) (ATS QWIENV W 64)	YKW, PT, TTH, SMH
	15. Purge & Trap Technique (Liquid)	USEPA 5030C (2003)	PT, TTH
	16. Purge & Trap Technique (Solids)	USEPA 5035A (2002)	PT, TTH
	17. Priority pollutant metals: - Aluminium, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Titanium, Vanadium, Zinc	USEPA 6010D (2014)	PT, TTH
	18. Semi-Volatile Organic Scan Analysis	USEPA 8270D (2007) *Refer to Appendix 1 for List of Semi-Volatile Organics	PT, TTH
	19. Selected organotin compounds (Monobutyltin, Dibutyltin, Tributyltin) in water	ISO 17353:2004	YKW, PT, TTH
	20. Selected organotin compounds (Monobutyltin, Dibutyltin, Tributyltin) in soil/sludge/sediments	ISO 23161:2009	YKW, PT, TTH
	21. Separatory Funnel Liquid - Liquid Extraction	USEPA 3510C (1996)	PT, TTH
	22. Silt Density Index (SDI)	ASTM D4189-95 (Reapproved 2002)	YKW, PT, TTH, LFX
	23. Soil pH	USEPA 9045D (2004)	PT, TTH
	24. Soxhlet Extraction	USEPA 3540C (1996)	PT, TTH
	25. Static Headspace Technique	USEPA 3810 (1996)	PT, TTH

# Schedule



Certificate No. : LA-2000-0178-F

Issue No. : 23

Date : 07 February 2018

Page : 13 of 24

MATERIALS / PRODUCTS TESTED	TESTS / PROPERTIES	STANDARD METHODS / TECHNIQUES / EQUIPMENT	SIGNATORIES
<b>C SOURCE EMISSION TESTING</b>	26. Total Cyanide in Soil and Water by Flow Injection Analysis	ATS QWIENV INORG 16	YKW, PT, TTH, SMH
	27. Total and Dissolved Mercury by FIM-AAS	ATS QWIENV INORG 10	PT, TTH
	28. Total Recoverable Petroleum Hydrocarbons	USEPA 418.1 (IR) / USEPA 8015D (2003)	PT, TTH
	29. Toxicity characteristic leaching procedure	USEPA 1311 (1992)	PT, TTH
	30. Volatile Organic Compounds by GC/MS	USEPA 8260C (2006) *Refer to Appendix 2 for List of Volatile Organics	PT, TTH
	1. Carbon Monoxide emission from stationary sources (Instrumental Analyzer Procedure)	USEPA Method 10	TTH, HJS, EDC
	2. Hydrogen Halide and Halogen Emissions from Stationary Sources	ATS QWIENV AM 46 USEPA 26 & 26A	TTH, HJS, EDC
	3. Metal Emissions from Stationary Sources	ATS QWIENV AM 45 USEPA 29	TTH, HJS, EDC
	4. Nitrogen Oxides emission from stationary sources (Instrumental Analyzer Procedure)	USEPA Method 7E	TTH, HJS, EDC
	5. Oxygen and Carbon Dioxide emission from stationary sources (Instrumental Analyzer Procedure)	USEPA Method 3A	TTH, HJS, EDC
	6. Particulate Matter Emission	USEPA Method 5	TTH, HJS, EDC
	7. Polychlorinated Dibenzo-p-dioxins and Polchlorinated Dibenzofurans from stationary sources (Sampling Only)	ATS QWIENV AM 47 USEPA 23	TTH, HJS, EDC

# Schedule



Certificate No. : LA-2000-0178-F

Issue No. : 23

Date : 07 February 2018

Page : 14 of 24

MATERIALS / PRODUCTS TESTED	TESTS / PROPERTIES	STANDARD METHODS / TECHNIQUES / EQUIPMENT	SIGNATORIES
<b>D INDUSTRIAL HYGIENE/ ATMOSPHERIC AIR</b>	8. Particulate Matter Emissions from Stationary Sources	USEPA Method 17	TTH, HJS, EDC
	9. Stack Sampling and Velocity Traverse Points	USEPA Method 1	TTH, HJS, EDC
	10. Stack Velocity and Volumetric Flow Rate	USEPA Method 2	TTH, HJS, EDC
	11. Stack Gas Composition and Dry Molecular Weight	USEPA Method 3	TTH, HJS, EDC
	12. Stack Moisture Content	USEPA Method 4	TTH, HJS, EDC
	13. Sulphur Dioxides emission from stationary sources (Instrumental Analyzer Procedure)	USEPA Method 6C	TTH, HJS, EDC
	1. Alcohol I (ethanol, iso-propanol) in Airborne Samples	NIOSH 1400 (1994-Issue 2)	YKW, TTH
	2. Alcohol II (1-butanol, iso-butanol, 1- propanol) in Airborne Samples	NIOSH 1401 (1994-Issue 2)	YKW, TTH
	3. Alkaline Dusts in Airborne Sample	NIOSH 7401 (1994 Issue 2)	YKW, PT, TTH
	4. Asbestos and Other Fibres	NIOSH 7400 (1994-Issue 2)	YKW, TTH
	5. Asbestos (Bulk) by PLM	NIOSH 9002 (1994-Issue 2)	YKW, TTH
	6. Chromium (VI) in Airborne Sample	NIOSH 7600 (1994 Issue 2)	YKW, PT, TTH
	7. Ethylene Oxide in Airborne Samples	OSHA 1010 (2014)	YKW, TTH
	8. Formaldehyde in Airborne Samples	NIOSH 3500 (1994-Issue 2)	YKW, TTH
	9. Hydrocarbons, aromatic (BTEX) in Airborne Samples	NIOSH 1501 (2003 –Issue 3)	YKW, PT, TTH

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# Schedule



Certificate No. : LA-2000-0178-F

Issue No. : 23

Date : 07 February 2018

Page : 15 of 24

MATERIALS / PRODUCTS TESTED	TESTS / PROPERTIES	STANDARD METHODS / TECHNIQUES / EQUIPMENT	SIGNATORIES
<b>E INDOOR AIR QUALITY</b>	10. Inorganic Acid in Airborne Sample: Hydrofluoric Acid (HF), Hydrochloric Acid (HCl), Phosphoric Acid (H <sub>3</sub> PO <sub>4</sub> ), Hydrogen Bromide (HBr), Nitric Acid (HNO <sub>3</sub> ) and Sulphuric Acid (H <sub>2</sub> SO <sub>4</sub> )	ATS QWIENV AM 21	YKW, PT, TTH
	11. Elements by ICP in Airborne Sample: Ag, Al, As, Be, B, Ba, Ca, Cd, Co, Cr, Cu, Fe, K, Mg, Mn, Mo, Na, Ni, P, Pb, Pd, Pt, Rh, Sb, Se, Si, Sn, Sr, Ta, Te, Ti, Tl, U, V, W and Zn	NIOSH 7303 (March 2003 Issue 1)	YKW, TTH
	12. Mercury in Airborne Samples	NIOSH 6009 (1994-Issue 2)	YKW, TTH
	13. Mercury Vapour in Workplace Atmosphere	OSHA ID- 140 (1991)	YKW, TTH
	14. Total Particulates in Airborne Sample	NIOSH 0500 (1994-Issue 2)	YKW, TTH
	15. Respirable Particulates in Airborne Sample	NIOSH 0600 (1994-Issue 3)	YKW, TTH
	1. Air Movement	ATS QWIENV AM 05	YKW, TTH
	2. Carbon Dioxide	ATS QWIENV AM 06	YKW, TTH
	3. Carbon Monoxide	ATS QWIENV AM 06	YKW, TTH
	4. Formaldehyde	ATS QWIENV AM 03	YKW, TTH
	5. Operative Temperature	ATS QWIENV AM 23	YKW, TTH
	6. Ozone	ATS QWIENV AM 02	YKW, TTH
	7. Particulate Matter (PM <sub>1.0</sub> , PM <sub>2.5</sub> , PM <sub>4</sub> , PM <sub>7</sub> , PM <sub>10</sub> & TSP)	ATS QWIENV AM 43	YKW, TTH



# Schedule



Certificate No. : LA-2000-0178-F

Issue No. : 23

Date : 07 February 2018

Page : 16 of 24

MATERIALS / PRODUCTS TESTED	TESTS / PROPERTIES	STANDARD METHODS / TECHNIQUES / EQUIPMENT	SIGNATORIES
	8. Relative Humidity	ATS QWIENV AM 06	YKW, TTH
	9. Respirable Suspended Particulates	ATS QWIENV AM 04	YKW, TTH
	10. Temperature	ATS QWIENV AM 06	YKW, TTH
	11. Total Volatile Organic Compounds	ATS QWIENV AM 06	YKW, TTH
	12. Total Viable Aerobic Count / Total Bacteria Count	ATS QWI MIC 34	JW, JT, SS, LKY, NCJ
	13. Total Yeast and Mould Count / Total Fungi Count	ATS QWI MIC 34	JW, JT, SS, LKY, NCJ
<b>F IN-SITU MEASUREMENT</b>	1. In-Situ Measurement of Depth, ORP, pH, Temperature, Conductivity, Turbidity, Dissolved Oxygen, Total Dissolved Solids, Salinity and Water Flow Velocity	ATS QWI ENV W48	YKW, PT, TTH
<b>G SOILS &amp; GROUND WATER FOR CIVIL ENGINEERING PURPOSES</b>	1. Loss on Ignition	)	)
	2. Carbonate Content	)	)
	3. Chloride Content	)	)
	4. Total sulphate content	)	)
	5. pH Value	) BS 1377 : Part 3: 1990	) PT, TTH
	6. Organic Matter Content	)	)
	7. Total Dissolved Solids in Ground Water	)	)
	8. Sulphate in Ground Water	)	)
	9. Water Soluble Sulphate	)	)
<b>H AGGREGATES</b>	1. Shell Content of Fine Aggregate	SANS 5840:2008 Ed 2.2	YKW, PT, TTH

# Schedule



Certificate No. : LA-2000-0178-F

Issue No. : 23

Date : 07 February 2018

Page : 17 of 24

MATERIALS / PRODUCTS TESTED	TESTS / PROPERTIES	STANDARD METHODS / TECHNIQUES / EQUIPMENT	SIGNATORIES
	2. Shell Content (as Acid-Soluble Material) in Fine Aggregate	BS 812: Part 119:1985	YKW, PT, TTH

<u>INITIALS</u>	<u>NAMES</u>
JW	Mrs. Jeanette Wong
YKW	Mr. Yao Kai Wen
PT	Ms. Pansy Teo
TTH	Mr. Tan Teong Huat
SMH	Ms. Sim Min Hong
KT	Mr. Kent Tan
LFX	Mr. Lo Fu Xuan
SBH	Mr. Seet Boon Hiang
NDV	Norvena Dela Vega
HJS	Hue Jack Son
EDC	Edmundo II Dio Casapao
JT	Mr. Jasper Tan
SS	Ms. Sandra Sng
LKY	Ms. Lee Kim Yin
NCJ	Ms. Ng Ching Joo

Note:

This laboratory is accredited in accordance with the recognised International Standard ISO/IEC 17025. A laboratory's fulfilment 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. 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.

# Schedule



Certificate No. : LA-2000-0178-F

Issue No. : 23

Date : 07 February 2018

Page : 18 of 24

## APPENDIX 1

<b>SEMI-VOLATILE ORGANICS (EPA 8270C)</b>	<b>WATER</b>	<b>SOIL</b>
<b>TEST PARAMETER</b>	<b>LOR</b>	<b>LOR</b>
	<b>µg/L</b>	<b>mg/kg</b>
<b>PHENOLS</b>		
Phenol	2	0.2
2-Chlorophenol	2	0.2
2-Methylphenol (o-Cresol)	2	0.2
4-Methylphenol (p-Cresol)	2	0.2
1,2-Dihydroxybenzene (Catechol)	5	5
1,3-Dihydroxybenzene (Resorcinol)	5	5
1,4-Dihydroxybenzene (Hydroquinone)	5	5
2-Nitrophenol	2	0.2
2,4-Dimethylphenol	2	0.2
2,4-Dichlorophenol	2	0.2
4-Chloro-3-methylphenol	2	0.2
2,4,6-Trichlorophenol	2	0.2
2,4,5-Trichlorophenol	2	0.2
Pentachlorophenol	5	1
<b>POLYNUCLEAR AROMATICS</b>		
Naphthalene	2	0.2
2-Methylnaphthalene	2	0.2
2-Chloronaphthalene	2	0.2
Acenaphthalene	2	0.2
Acenaphthene	2	0.2
Fluorene	2	0.2
Phenanthrene	2	0.2
Anthracene	2	0.2
Fluoranthrene	2	0.2
Pyrene	2	0.2
N-2-Fluorenylacetimide	2	0.2
Benz(a)anthracene	2	0.2
Chrysene	2	0.2
Benzo(b)&(k)fluoranthene	5	0.5
7,12-Dimethyl benz(a)anthracene	2	0.2
Benzo(a)pyrene	2	0.2
3-Methylchloanthrene	2	0.2
Indeno(1,2,3-cd)pyrene	2	0.2
Dibenz(a,h)anthracene	2	0.2
Benzo(g,h,i)perylene	2	0.2

# Schedule



Certificate No. : LA-2000-0178-F

Issue No. : 23

Date : 07 February 2018

Page : 19 of 24

<b>SEMI-VOLATILE ORGANICS (EPA 8270C)</b>	<b>WATER</b>	<b>SOIL</b>
<b>TEST PARAMETER</b>	<b>LOR</b>	<b>LOR</b>
	<b>µg/L</b>	<b>mg/kg</b>
<b>PHTHALATE ESTERS</b>		
Dimethylphthalate	2	0.2
Diethylphthalate	2	0.2
Di-n-butylphthalate	2	0.2
Benzy butylphthalate	2	0.2
Bis(2-ethylhexyl)phthalate	10	2
Di-n-octylphthalate	2	0.2
<b>NITROAMINES</b>		
Pyridine	2	0.2
N-Nitrosomethylethylamine	2	0.2
N-Nitrosodiethylamine	2	0.2
N-Nitrosopyrrolidine	5	1
N-Nitromorpholine	2	0.2
N-Nitrosodi-n-propylamine	2	0.2
N-Nitrosopiperidine	2	0.2
N-Nitrosodibutylamine	2	0.2
Diphenylamine	2	1
Diallate	2	0.2
Methapyrilene	2	0.2
<b>NITROAROMATICS AND KETONES</b>		
2-Picoline	2	0.2
Acetophenone	2	0.2
Nitrobenzene	2	0.2
Isophorone	2	0.2
2,6-Dinitrotoluene	5	0.2
2,4-Dinitrotoluene	5	0.2
1-Naphthalamine	2	0.2
4-Nitroquinoline-N-oxide	2	0.2
5-Nitro-o-toluidine	2	0.2
Azobenzene	2	0.2
1,3,5-Trinitrobenzene	2	0.2
Phenacetin	2	0.2
4-Aminobiphenyl	2	0.2
Pentachloronitrobenzene	5	0.5
Dimethylaminoazobenzene	2	0.2
Chlorobenzilate	2	0.2

# Schedule



Certificate No. : LA-2000-0178-F

Issue No. : 23

Date : 07 February 2018

Page : 20 of 24

<b>SEMI-VOLATILE ORGANICS (EPA 8270C)</b>	<b>WATER</b>	<b>SOIL</b>
<b>TEST PARAMETER</b>	<b>LOR</b> µg/L	<b>LOR</b> mg/kg
<b>HALOETHERS</b>		
Bis(2-chloroethyl)ether	2	0.2
Bis(2-chloroethoxy)methane	2	0.2
4-Chlorophenyl phenylether	2	0.2
4-Bromophenyl phenylether	2	0.2
<b>CHLORINATED HYDROCARBONS</b>		
1,3-Dichlorobenzene	2	0.2
1,4-Dichlorobenzene	2	0.2
1,2-Dichlorobenzene	2	0.2
Hexachloroethane	2	0.2
1,2,4-Trichlorobenzene	2	0.2
Hexachloropropylene	2	0.2
Hexachlorobutadiene	2	0.2
Hexachlorocyclopentadiene	5	1
Chloronaphthalene	2	0.2
Pentachlorobenzene	2	0.2
Hexachlorobenzene	5	0.2
<b>ANILINES AND BENZIDINES</b>		
Aniline	2	0.2
4-Chloroaniline	2	0.2
2-Nitroaniline	5	1
3-Nitroaniline	5	1
Dibenzofuran	2	0.2
4-Nitroaniline	2	0.2
Carbazole	2	0.2
3,3'-Dichlorobenzidine	2	0.2

# Schedule



Certificate No. : LA-2000-0178-F

Issue No. : 23

Date : 07 February 2018

Page : 21 of 24

<b>SEMI-VOLATILE ORGANICS (EPA 8270C)</b>	<b>WATER</b>	<b>SOIL</b>
<b>TEST PARAMETER</b>	<b>LOR</b>	<b>LOR</b>
	<b>µg/L</b>	<b>mg/kg</b>
<b>PESTICIDES</b>		
Alpha-HCH	2	0.2
Beta & Gamma-HCH	2	0.2
Delta-HCH	2	0.2
Heptachlor	2	0.2
Aldrin	2	0.2
Heptachlor epoxide	2	0.2
Endosulfan	2	0.2
p,p'-DDE	2	0.2
Dieldrin	2	0.2
Endrin	2	0.2
Carbaryl	2	0.2
Carbofuran	2	0.2
p,p'-DDD	2	0.2
Endosulfan sulfate	2	0.2
p,p'-DDT	5	1
Chlordane	5	1
Malathion	2	0.2
Methanesulfonate methyl	2	0.2
Methanesulfonate ethyl	2	0.2
Dichlorvos	2	0.2
cis-Isosfarole	2	0.2
Trans-Isosfarole	2	0.2
Safarole	2	0.2
Dimethoate	2	0.2
Diazinon	2	0.2
Chlorpyrifos methyl	2	0.2
Ethion	2	0.2
Fenthion	2	0.2
Chlorpyrifos	2	0.2
Pirimipos ethyl	2	0.2
Prothiofos	2	0.2
Thiophene (Tetrahydrothiophene)	2	0.2

# Schedule



Certificate No. : LA-2000-0178-F

Issue No. : 23

Date : 07 February 2018

Page : 22 of 24

## APPENDIX 2

<b>VOLATILE ORGANICS (EPA 8260B)</b>	<b>WATER LOR µg/L</b>	<b>SOIL LOR mg/kg</b>
<b>TEST PARAMETER</b>		
<b>MONOCYCLIC AROMATICS</b>		
Benzene	1	0.2
Toluene	1	0.2
Ethylbenzene	1	0.2
O,m,p-Xylenes	2	0.5
Styrene	1	0.2
Isopropylbenzene	1	0.2
n-Propylbenzene	1	0.2
1,2,4-Trimethylbenzene	1	0.2
1,3,5-Trimethylbenzene	1	0.2
Sec-Butylbenzene	1	0.2
Tert-Butylbenzene	1	0.2
<b>OXYGENATED COMPOUNDS</b>		
Acetone (2-Propanone)	10	2
Vinyl acetate	10	2
2-Butanone (MEK)	5	1
4-Methyl-2-pentanone (MIBK)	5	1
2-Hexanone (MBK)	2	0.5
Cyclohexanone	2	0.5
Tetrahydrofuran	2	0.5
<b>FUMIGANTS</b>		
2,2-Dichloropropane	1	0.2
1,2-Dichloropropane	1	0.2
1,3-Dichloropropene	2	0.5
<b>HALOGENATED ALIPATICS</b>		
Vinyl chloride	10	2
Dichloroethenes	10	2
Bromomethane	10	2
Chloroethane	10	2
Trichlorofluoromethane	10	2
Methylene chloride (Dichloromethane)	10	2
1,1-Dichloroethene	1	0.2
cis-1,2-Dichloroethene	1	0.2
1,1-Dichloroethane	1	0.2
1,2-Dichloroethane	1	0.2
1,1,1-Trichloroethane	1	0.2
1,1,2-Trichloroethane	1	0.2
Trichloroethene	1	0.2



# Schedule



Certificate No. : LA-2000-0178-F

Issue No. : 23

Date : 07 February 2018

Page : 23 of 24

<b>VOLATILE ORGANICS (EPA 8260B)</b>	<b>WATER LOR µg/L</b>	<b>SOIL LOR mg/kg</b>
<b>TEST PARAMETER</b>		
Carbon tetrachloride	1	0.2
Dibromoethane	1	0.2
1,1,1,2-Tetrachloroethane	1	0.2
1,1,2,2-Tetrachloroethane	1	0.2
1,2-Dichloropropane	1	0.2
1,3-Dichloropropane	1	0.2
2,2-Dichloropropane	1	0.2
1,1-Dichloropropene	1	0.2
Tetrachloroethene	1	0.2
1,4-Dichloro-2-butene	1	0.2
Hexachlorobutadiene	1	0.2
<b>HALOGENATED AROMATICS</b>		
Chlorobenzene	1	0.2
Bromobenzene	1	0.2
2-Chlorotoluene	1	0.2
4-Chlorotoluene	1	0.2
1,2-Dichlorobenzene	1	0.2
1,3-Dichlorobenzene	1	0.2
1,4-Dichlorobenzene	1	0.2
1,2,3-Trichlorobenzene	1	0.2
1,2,4-Trichlorobenzene	1	0.2
<b>TRIHALOMETHANES</b>		
Chloroform	1	0.2
Bromodichloromethane	1	0.2
Dibromochloromethane	1	0.2
Bromoform	1	0.2
<b>OTHER COMPOUNDS</b>		
Carbon disulphide	2	0.5
Naphthalene	2	0.5

# Schedule



Certificate No. : LA-2000-0178-F

Issue No. : 23

Date : 07 February 2018

Page : 24 of 24

<b>PUB VOCS - EPA 8260C</b>	<b>WATER</b>
<b>TEST PARAMETER</b>	<b>LOR</b>
	<b>µg/L</b>
<b>PROHIBITED ORGANIC COMPOUNDS / PUB VOC</b>	
Furan	5
Diethyl ether	5
Dimethyl sulfide	5
Methylene chloride	5
Methyl tert-butyl ether	5
Hexane	5
Di-Isopropyl ether	5
2-butanone(MEK)	50
Isobutanol	50
Tetrahydrofuran	5
1,1,1-trichloroethylene	5
Carbon tetrachloride	5
Benzene	5
Heptane	5
Trichloroethylene	5
Methyl iso-butyl ketone (MIBK)	50
1,1,2-trichloroethane	5
Toluene	5
Octane	5
Tetrachloroethene	5
Ethyl benzene	5
m&p-xylene	5
Nonane	5
Styrene	5
o-xylene	5
Turpentine oil	5
Decane	5
1,2,4-trimethylbenzene	5