ENDORSEMENT OF THE LABORATORY ASSESSMENT REPORT TO THE TECHNICAL ADVISORY GROUP FOR LABORATORY RECOGNITION (TAG-LR)

The Laboratory Assessment Report in nineteen (19) pages for **HiAdvance Philippines Incorporated** located at **3F Unit 1, 2, 5, 6, and 7 and Unit 403 Maga Centre, San Antonio St., Paseo de Magallanes, Makati City 1232** is hereby respectfully endorsed to the Technical Advisory Group for Laboratory Recognition (TAG-LR) for:

- ☐ issuance of certificate
- ☑ renewal of certificate
- ☐ revocation of certificate
- ☐ reinstatement of certificate
- ☐ amendment of certificate
  - ☐ increase in scope
  - ☐ reduction in scope
  - ☐ change in signatory
- ☐ information

SAMMY L. AYTONA
LIAT Chairperson

LABORATORY ASSESSMENT REPORT

DENR ENVIRONMENTAL LABORATORY RECOGNITION SCHEME

HiAdvance Philippines Incorporated
Laboratory Name

3F Unit 1, 2, 5, 6, and 7 and Unit 403 Maga Centre, San Antonio St., Paseo de Magallanes, Makati City 1232
Laboratory Address

NCR-27
ELR Laboratory Code

Environmental Management Bureau
Department of Environment and Natural Resources

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1. THE ASSESSMENT

1.1 PLAN FOR THE VISIT

LABORATORY UNIT	DATE	TIME
HiAdvance Philippines Incorporated	14 – 17 March 2022	0900 – 1600 H

1.2 PARTICIPANTS

1.2.1 PARTICIPANTS FROM THE LABORATORY

Personnel	Printed Name/ Signature	Designation/ Position
Management	Mylene R. Servino	Quality Assurance Manager
	Jeremiah Robin N. Llamas	Quality Assurance Associate
	Annabelle R. Bangoy	Senior Project Manager
Laboratory Head	Princess S. Galvez	Laboratory Manager
Laboratory Staff	Mylene R. Servino	Quality Assurance Manager
	Jeremiah Robin N. Llamas	Quality Assurance Associate
	Marizen Del Rosario Bendaña	Department Supervisor
	Marlon S. Ngo	Safety Officer
	Richard H. Carizon	Laboratory Analyst
	Mark Lemuel Llamoso	Laboratory Analyst
	Susan V. Villagracia	Laboratory Analyst
	Lovely Ann I. Quires	Laboratory Analyst
	Pauline Angelyn Palermo	Laboratory Analyst
	Hazel A. Cayetano	Department Supervisor
	Jara May S. Mandado	Laboratory Analyst
	Renz Troy E. Villanueva	Laboratory Analyst
	Ernani Hilario A. Espiritu	Department Supervisor
	Jimwell Rae D.C. Rosal	Laboratory Analyst
	Aljon De Chavez Bagting	Department Manager
	Thom Carlo M. Sindac	Pollution Control Officer
	Kimberly A. Garcia	Laboratory Analyst
	Marife A. De Juan	Department Supervisor
	Christian S. Guanzon	Laboratory Analyst

1.2.2 ASSESSORS

Designation	Printed Name/ Signature	Organization
LIAT Chairman	Sammy L. Aytona, RCh	EMB-CO
	Ellaine Gellie S. Nicdao, RCh	EMB-CO
	Khennyie-Ar G. Peroja, RCh	EMB-CO
	Menchie M. Alanis, RCh, Ph.D.	EMB-NCR
	Christina A. Binag, RCh, Ph.D.	ICP
	Glenn V. Alea, RCh, Ph.D.	ICP
Secretariat	Khennyie-Ar G. Peroja, RCh	EMB-CO

1.3 DOCUMENTS SUBMITTED BY THE LABORATORY FOR THE ASSESSMENT

DOCUMENT	DATE RECEIVED
Letter of Renewal (1 p) Notarized ELR Form 1 with the following attachments (3 p): - Scope of Desired recognition (2 p) - Technical Personnel Support list (5 p) - Copy of Laboratory Test Reports - Calibration Program - Maintenance Program - Reference literature List - Track Record of the Laboratory (3 p) - Track Record for the Additional Parameters (6 p) - Waste Management and Pollution Control Manual (33 p) - Floor Plan of the Laboratory - Test Procedures and Work Instructions - QC Charts - Copy of Training Certificates - Proficiency Testing Results - Copy of Environmental Permits - Accreditation Certificate	07 March 2021
Proficiency Testing Plan for 2022 (2 p) Training Records of Personnel Copy of Laboratory Test Reports Calibration Master list of Equipment (5 p)	11 March 2022

2. SCOPE OF DESIRED RECOGNITION

TYPE OF SAMPLES	PARAMETER	METHOD	REFERENCE
Water/ Wastewater	Ammonia as NH_3-N	Phenate Method	SMEWW 4500-NH_3 F
	Arsenic	Inductively Coupled Plasma – Emission Spectroscopy Method (Nitric Acid – Hydrochloric Acid/Hotplate Digestion)	SMEWW 3120 (SMEWW 3030F)
	Barium	Inductively Coupled Plasma – Emission Spectroscopy Method (Nitric Acid – Hydrochloric Acid/Hotplate Digestion)	SMEWW 3120 (SMEWW 3030F)
	Benzo(a)pyrene	Gas Chromatographic / Mass Spectrometric Method	US EPA 8270
		Gas Chromatographic / Flame Ionization Detector Method	US EPA 8100
	BOD	5 - Day BOD Test	SMEWW 5210 B
	Boron	Inductively Coupled Plasma – Emission Spectroscopy Method (Nitric Acid – Hydrochloric Acid/Hotplate Digestion)	SMEWW 3120 (SMEWW 3030 F)
	BTEX (Benzene, Toluene, Ethylbenzene, Xylene)	Purge and Trap Capillary – Column Gas Chromatographic/Mass Spectrometric Method	US EPA 8260
		Purge and Trap Capillary – Column Gas Chromatographic Method	US EPA 8021
	Cadmium	Inductively Coupled Plasma – Emission Spectroscopy Method (Nitric Acid – Hydrochloric Acid/Hotplate Digestion)	SMEWW 3120 (SMEWW 3030 F)
	Chemical Oxygen Demand	Open Reflux Method	SMEWW 5220 B
		Closed Reflux - Colorimetric Method	SMEWW 5220 D
	Chloride	Argentometric Method	SMEWW 4500-Cl^- B
	Chromium as Hexavalent Chromium (Cr^{6+})	Colorimetric Method	SMEWW 3500-Cr B
	Coliform, Fecal	Multiple Tube Fermentation Technique – Fecal Coliform Procedure	SMEWW 9221 E
	Coliform, Total	Multiple Tube Fermentation Technique – Standard Total Coliform Fermentation Technique	SMEWW 9221 B
	Color (True)	Visual Comparison Method	SMEWW 2120 B
	Color (Apparent)	Visual Comparison Method	SMEWW 2120 B

Copper as Dissolved Copper	Inductively Coupled Plasma – Emission Spectroscopy Method (Nitric Acid – Hydrochloric Acid/Hotplate Digestion)	SMEWW 3120 (SMEWW 3030 F with SMEWW 3030 B)
Copper, Total	Inductively Coupled Plasma – Emission Spectroscopy Method (Nitric Acid – Hydrochloric Acid/Hotplate Digestion)	SMEWW 3120 (SMEWW 3030 F)
Cyanide as Free Cyanide	Cyanide – Selective Electrode Method (w/o distillation)	US EPA 9213
Dissolved Oxygen	Iodometric Method – Azide Modification	SMEWW 4500-O C
Fluoride	Ion-Selective Electrode Method	SMEWW 4500-F^- C
Iron	Inductively Coupled Plasma – Emission Spectroscopy Method (Nitric Acid – Hydrochloric Acid/Hotplate Digestion)	SMEWW 3120 (SMEWW 3030 F)
Lead	Inductively Coupled Plasma – Emission Spectroscopy Method (Nitric Acid – Hydrochloric Acid/Hotplate Digestion)	SMEWW 3120 (SMEWW 3030 E)
Manganese	Inductively Coupled Plasma – Emission Spectroscopy Method (Nitric Acid – Hydrochloric Acid/Hotplate Digestion)	SMEWW 3120 (SMEWW 3030 F)
Nickel	Inductively Coupled Plasma – Emission Spectroscopy Method (Nitric Acid – Hydrochloric Acid/Hotplate Digestion)	SMEWW 3120 (SMEWW 3030 F)
Nitrate as NO_3-N	Colorimetric, Brucine	US EPA 352.1
	Cadmium Reduction Method with Nitrite Correction using Colorimetric Method	SMEWW 4500-NO_3^- E SMEWW 4500-NO_2^- B
Oil and Grease	Liquid-Liquid Partition - Gravimetric Method	SMEWW 5520 B
Organochlorine Pesticides	Gas Chromatographic/Electron Capture Detector Method	US EPA 8081
pH	Electrometric Method	SMEWW 4500-H^+ B
Phenols	Chloroform Extraction	SMEWW 5530 C
Phenol and Phenolic Substances	Gas Chromatographic/Mass Spectrometric Method	US EPA 8270
Phosphate	Stannous Chloride Method	SMEWW 4500-P D
Polychlorinated Biphenyls (PCBs)	Gas Chromatography/ Electron Capture Detector Method	US EPA 8082A

	Selenium	Inductively Coupled Plasma – Emission Spectroscopy Method (Nitric Acid – Hydrochloric Acid/Hotplate Digestion)	SMEWW 3120 (SMEWW 3030 F)
	Settleable Solids	Imhoff Cone Method	SMEWW 2540 F
	Sulfate	Turbidimetric Method	SMEWW 4500 SO_4^{2}-E
	Surfactants (Methylene Blue Active Substances)	Anionic Surfactants as MBAS	SMEWW 5540 C
	Temperature	Laboratory and Field Methods	SMEWW 2550 B
	Total Dissolved Solids	Gravimetric, Dried at 180 °C	SMEWW 2540 C
	Total Suspended Solids	Gravimetric, Dried at 103-105 °C	SMEWW 2540 D
	Trichloroethylene	Purge and Trap Capillary – Column Gas Chromatographic/Mass Spectrometric Method	US EPA 8260
	Zinc	Inductively Coupled Plasma – Emission Spectroscopy Method (Nitric Acid – Hydrochloric Acid/Hotplate Digestion)	SMEWW 3120 (SMEWW 3030 F)

TYPE OF SAMPLES	PARAMETER	METHOD
Ambient Air	Nitrogen Dioxide	Griess-Saltzman Method
	Sulfur Dioxide	Colorimetric-Pararosaniline Method
	Suspended Particulate Matter – TSP and PM 10	Gravimetric Method
Stationary Source Emissions	NOx	Phenoldisulphonic Acid Method
	Particulates	Gravimetric Method
	Sulfur Oxides as SO_2	Barium Thorin Titration Method

3. LEGISLATIVE REQUIREMENTS FOR RECOGNITION

- DENR Administrative Order. No. 63 Series of 1998: Guidelines for the Designation of DENR Recognized Environmental. Laboratories.
- Presidential Decree No. 1586: The Philippine Environmental Impact Statement System of 1978.
- Republic Act No. 6969: Toxic Substances and Hazardous and Nuclear Wastes Control Act of 1990
- Republic Act No. 8749: Philippine Clean Air Act of 1999.
- Republic Act No. 9003: Ecological Solid Waste Management Act of 2000.
- Republic Act No. 9275: Philippine Clean Water Act of 2004.
- DENR Administrative Order No. 08 Series of 2016: Water Quality Guidelines and General Effluent Standards of 2016.
- EMB Memorandum Circular No. 012 Series of 2016: EMB Approved Methods for Water and Wastewater.
- Republic Act No. 10657: Chemistry Profession Act of 2015.

4. PERSONS RESPONSIBLE FOR THE TECHNICAL VALIDITY OF TEST REPORTS

Name of Personnel	Heading/ Areas of Responsibilities
Princess S. Galvez	Certified by (For All Analyses)
Marizen Del Rosario Bendaña	Reviewed by (Physical-Chemical Analyses)
Ernani Hilario A. Espiritu	Reviewed by (Bacteriological Analyses)
Aljon De Chavez Bagting	Reviewed by (Organics Analyses)

5. SUMMARY OF NON-COMPLIANCES

NON-COMPLIANCE REPORT NO.	DESCRIPTION OF NON-COMPLIANCE/S	TIME SCHEDULE (DATE) OF LABORATORY FOR CORRECTIVE ACTION	DATE EMB NOTIFIED OF CORRECTIVE ACTION
1	The procedure adopted by the Laboratory does not conform to the DENR approved method for Benzo(a)pyrene and Phenol and Phenolics substances. Reason: 1. The 6890/5973 GC/MS instrument used for analysis of samples for Benzo(a)pyrene and Phenol and Phenolics substances is under maintenance and for repair.	May 31, 2022	**CLOSED**  **05/31/2022**

Categories of Non-Compliances:

1. Equipment Calibration and Maintenance - #1

6. SUMMARY OF RECOMMENDATION/S GIVEN BY THE ASSESSORS TO THE LABORATORY

RECOM-MENDATION REPORT NO.	DESCRIPTION OF THE RECOMMENDATIONS	TIME SCHEDULE (DATE) OF LABORATORY FOR CORRECTIVE ACTION	DATE EMB NOTIFIED OF CORRECTIVE ACTION
1	In the form Results of Laboratory Analysis (Technical Reports) (a) The signature and name of the Project Manager Annabelle Bangoy under "Prepared by" was observed. The laboratory should consider to just have the names of the technical personnel in the Results of Laboratory Analysis form (e.g. Chemists as Analysts, Supervisors, Managers). The cover letter may bear the name and signature of the Project Manager but not the Technical Reports. (b) In the Physico-Chemical the signature under the 'Reviewed by" (doing the first to second levels for review) should be for License Chemists. The laboratory should consider to just have the name of the Chemist Laboratory Manager until a Chemist designated as Laboratory Supervisor is hired.	April 18, 2022	CLOSED 06/03/22
2	**1) Adequate Drainage** The laboratory does not have provisions for separate waste lines from domestic sewage and laboratory wastewater. The laboratory should plan for a better and effective separation of laboratory wastewater. The laboratory should have bigger containers (e.g. plastic drum) to collect the pre-washings and the final washings for the glassware. And this laboratory wastewater must be treated and then tested by a third party lab before proper disposal.	May 17, 2022	CLOSED 06/03/22

	2) Adequate physical provisions for the safety of laboratory personnel The laboratory should plan and execute Good Laboratory Practice (GLP) specifically on safety. (a) Most of the fume hoods were calibrated almost five (5) years ago (e.g. 07 July 2017); (b) there are materials (e.g. plastic bottles with water, box, etc.) on the floors and hallways (e.g. near Unit 6 the Sample Preparation Section and pantry areas). In the Microbiology Laboratory: The ante-room of the Microbiology laboratory should be a real ante-room to avoid any cross-contaminations (e.g. changing to lab gowns and appropriate shoes/foot wear). **(a) Compressed Gas Cylinders** The laboratory should add another sturdy strap to restrain each of the gas cylinders in Unit 1 Chromatography for VOC Section. **(b) Emergency evacuation routes** The laboratory should place emergency evacuation routes where it is visible like the wall nearest the door. In Unit 1, the Chromatography VOC Section, the evacuation route should be posted near the door and at eye le vel. In Unit 6, the Sample Preparation Section, the evacuation route s hould be posted not very high but at eye level. The laboratory should check that these evacuation routes are on the wall near the main door of th e laboratory and in all other rooms. **3) Emergency Shower** The laboratory has two (2) showers with fountain eyewash stations: one in Unit 6 the Sample Preparation Section and the other in Unit 5 the Physico-Chem Section. The emergency shower in Unit 5 the Physico-Chem Section showed poor water pressure when tested. The water spray pattern must have a		

	minimum diameter of 20" at 60" above the floor and with a water flow rate of 20 gallons per minute (GPM) at 30 pounds per square inch (PSI). With this condition of the emergency shower – this will not be able to address an emergency situation. This emergency device must be in a really sound working condition to deliver water with the required flow rate and pressure. **4) Emergency Eyewash Station** The emergency eye wash station in Unit 6 the Sample Preparation Section showed poor water pressure specially the left fountain when tested. The laboratory had documented this observation of poor pressure since October 2021. The laboratory should install handheld eyewash bottles the soonest possible time. Based from OSHA, eyewashes must supply a controlled flow of water to both eyes simultaneously at a velocity low enough so as not to injure the user. Eyewashes must deliver at least 0.4 gallons/minute for 15 minutes at a minimum of 30 psi of flow pressure (http://www.sh-guardist.com/ and https://osha.oregon.gov) With this condition of the emergency eyewash – this will not be able to address an emergency situation. This emergency device must be in a really sound working condition to deliver water with the required flow rate and pressure. **5) Fire Extinguishers** The laboratory should make sure that the fire extinguishers are free from obstruction e.g. Unit 6 Sample Preparation Section with waste basket beside the fire extinguisher and in Unit 5 the Physico-Chem Section with bulletin board beside the fire extinguisher. **6) First Aid Kits**		

	The laboratory has two (2) First Aid cabinets. The laboratory should place a label for the First aid cabinet (e.g. as suggested by the laboratory Safety Officer – a big green cross) to become more visible. **7) Fume hoods** (a) The laboratory should have all their fume hoods re-calibrated by a third party accredited by DOLE immediately. The laboratory has a total of nine (9) fume hoods and one (1) laminar flow cabinet. Out of the 9 fume hoods, 7 of these are working. Most of the fume hoods were last calibrated five (5) year ago by ESEK Technology on 07 July 2017 (e.g. Unit 6 Sample Preparation Section, Unit 5 Physico-Chem section) The laboratory presented verification documents for their internal face velocity measurement calibrations of their working fume hoods. This document showed 3 areas where the face velocities were measured, but the sash height was not indicated. The forms were not also signed and dated as reviewed and checked. *Note:* The acceptable face velocity ranges are 60 to 100 ft/min or 75 to 125 ft/min. (minimum of 0.30 m/s to 0.35 m/s) (b) The laboratory should make sure that the fume hoods are free from clutter e.g. set-ups/equipment (c) The laboratory should check the proper exhaust ducts and exhaust stacks for their fume hoods. The current exhaust ducts of the fume hoods were placed directly out of the window. The window was closed with wood or metal leaving the ducts without exhaust stacks. The window was not fully opened thus recirculation of the contaminated air will bounce back to the crevices of		

	the window covering. Exhaust stacks shall be designed and built to prevent recirculation of contaminated air from the fume hood exhaust system into the fresh air supply of the facility or adjacent facilities. The effluent exhaust shall escape the building envelope. The stack shall also provide significant effluent dispersal so that effluent downwash does not occur at ground level.		
3	In the conduct of BTEX, TCE analyses, the Laboratory should consider the following; 1. Avoid opening of the VOA vial cap when making aliquot of the sample and spiking of the standards. This technique is necessary to prevent the possible loss of target analytes in the sample. 2. Adopt the latest update of standard method US EPA 8260D on internal standard assignment and must indicate this on the standard operating procedures for VOCs analysis.	April 18, 2022	**CLOSED** **05/31/2022**
4	The laboratory should conduct MDL study for the analysis of Aroclors 1221, 1232, 1242, 1248, 1254, 1262, 1268 in water/ wastewater.	April 18, 2022	CLOSED 06/03/22
5	In the analysis of Oil and Grease, the laboratory should use n-hexane as extraction solvent for the samples and quality control.	April 18, 2022	CLOSED 05/02/22
6	The laboratory is recommended to record the volume of acid or base added as milliliter and not as drops for the adjustment of pH of samples for BOD analysis. This is done to ensure that the volume of sample is not diluted to > 0.5%.	April 18, 2022	CLOSED 05/02/2022
7	The laboratory is recommended to provide the reference used as basis in the preparation of laboratory control samples for pH.	April 18, 2022	CLOSED 05/02/2022
8	The laboratory is recommended to ensure that the equipment used to measure the	April 18, 2022	

	temperature onsite is calibrated for temperature.		CLOSED 05/02/2022
9	The laboratory should check the adequacy of ventilation in the hazardous waste storage area. The laboratory should adopt the proper hazardous waste symbols based on DENR AO 2013-22 for the labels for the hazardous waste storage rooms. The laboratory should provide a barrier for the shelf with bottles in the waste storage area.	April 18, 2022	CLOSED 06/03/22

7. LABORATORY'S PARTICIPATION IN PROFICIENCY TESTING/ INTERLABORATORY COMPARISON

DATE / TITLE / ORGANIZING BODY	TYPE OF SAMPLE/S	PARAMETER	COMMENTS BY EMB ON PERFORMANCE
18 Jan – 04 March 2021 / AE0121 / Phenova	Air	SO_2	Satisfactory
	Air	NO_2	Satisfactory
05 Feb – 01 Mar 2021 / R29957 / Phenova	Water/Wastewater	BOD	Satisfactory
		COD (Titrimetric)	Satisfactory
		COD (Closed Reflux)	Satisfactory
24 Oct – 18 Nov 2021 / WP 1021 / Phenova	Water/Wastewater	Arsenic	Satisfactory
		Barium	Satisfactory
		Boron	Satisfactory
		Cadmium	Satisfactory
		Copper	Satisfactory
		Iron	Satisfactory
		Lead	Satisfactory
		Manganese	Satisfactory
		Nickel	Satisfactory
		Selenium	Questionable
		Zinc	Satisfactory
		Hexavalent Chromium	Satisfactory
		Total Dissolved Solids	Satisfactory
		Total Suspended Solids	Satisfactory
		Total Solids	Satisfactory
		Phosphate as P	Satisfactory
		Color	Satisfactory
		Ammonia as N	Satisfactory

		Nitrate as N	Unsatisfactory
		Oil and Grease	Satisfactory
		pH	Unsatisfactory
		Total Phenolics	Satisfactory
		Surfactants	Satisfactory
		Benzo(a)pyrene	Satisfactory
		2-Chlorophenol	Satisfactory
		2,4-Dichlorophenol	Satisfactory
		Phenol	Satisfactory
		2,4,6-Trichlorophenol	Satisfactory
		Benzene	Satisfactory
		Toluene	Satisfactory
		Ethylbenzene	Satisfactory
		Xylenes	Satisfactory
		Trichloroethene	Satisfactory
		Pesticides	Satisfactory
		PCBs	Satisfactory
11 Oct – 24 Nov 2021 / WS 1021 / Phenova	Water/Wastewater	Chloride	Satisfactory
		Fluoride	Satisfactory
		Nitrate as N	Unsatisfactory
		Phosphate	Satisfactory
		Sulfate	Satisfactory
		Cyanide	Satisfactory
		Aldrin	Satisfactory
		Dieldrin	Satisfactory
		Endrin	Unsatisfactory
		Heptachlor	Satisfactory
		Heptachlor Epoxide	Satisfactory
		Lindane	Satisfactory
		Methoxychlor	Satisfactory

Notes:

/z/ ≤ 2 = satisfactory performance

2 < /z/ < 3 = questionable result

/z/ ≥ 3 = unsatisfactory performance

8. RECOMMENDATION OF THE ASSESSMENT TEAM

8.1. SCOPE RECOMMENDED TO BE RECOGNIZED

TYPE OF SAMPLES	PARAMETER	METHOD	REFERENCE
Water/ Wastewater	Ammonia as NH_3-N	Phenate Method	SMEWW 4500-NH_3 F
	Arsenic	Inductively Coupled Plasma – Emission Spectroscopy Method (Nitric Acid – Hydrochloric Acid/Hotplate Digestion)	SMEWW 3120 (SMEWW 3030F)
	Barium	Inductively Coupled Plasma – Emission Spectroscopy Method (Nitric Acid – Hydrochloric Acid/Hotplate Digestion)	SMEWW 3120 (SMEWW 3030F)
	Benzo(a)pyrene	Gas Chromatographic / Mass Spectrometric Method	US EPA 8270
		Gas Chromatographic / Flame Ionization Detector Method	US EPA 8100
	BOD	5 - Day BOD Test	SMEWW 5210 B
	Boron	Inductively Coupled Plasma – Emission Spectroscopy Method (Nitric Acid – Hydrochloric Acid/Hotplate Digestion)	SMEWW 3120 (SMEWW 3030 F)
	BTEX (Benzene, Toluene, Ethylbenzene, Xylene)	Purge and Trap Capillary – Column Gas Chromatographic/Mass Spectrometric Method	US EPA 8260
		Purge and Trap Capillary – Column Gas Chromatographic Method	US EPA 8021
	Cadmium	Inductively Coupled Plasma – Emission Spectroscopy Method (Nitric Acid – Hydrochloric Acid/Hotplate Digestion)	SMEWW 3120 (SMEWW 3030 F)
	Chemical Oxygen Demand	Open Reflux Method	SMEWW 5220 B
		Closed Reflux - Colorimetric Method	SMEWW 5220 D
	Chloride	Argentometric Method	SMEWW 4500-Cl^- B
	Chromium as Hexavalent Chromium (Cr^{6+})	Colorimetric Method	SMEWW 3500-Cr B
	Coliform, Fecal	Multiple Tube Fermentation Technique – Fecal Coliform Procedure	SMEWW 9221 E
	Coliform, Total	Multiple Tube Fermentation Technique – Standard Total Coliform Fermentation Technique	SMEWW 9221 B
	Color (True)	Visual Comparison Method	SMEWW 2120 B
	Color (Apparent)	Visual Comparison Method	SMEWW 2120 B

Copper as Dissolved Copper	Inductively Coupled Plasma – Emission Spectroscopy Method (Nitric Acid – Hydrochloric Acid/Hotplate Digestion)	SMEWW 3120 (SMEWW 3030 F with SMEWW 3030 B)
Copper, Total	Inductively Coupled Plasma – Emission Spectroscopy Method (Nitric Acid – Hydrochloric Acid/Hotplate Digestion)	SMEWW 3120 (SMEWW 3030 F)
Cyanide as Free Cyanide	Cyanide – Selective Electrode Method (w/o distillation)	US EPA 9213
Dissolved Oxygen	Iodometric Method – Azide Modification	SMEWW 4500-O C
Fluoride	Ion-Selective Electrode Method	SMEWW 4500-F^- C
Iron	Inductively Coupled Plasma – Emission Spectroscopy Method (Nitric Acid – Hydrochloric Acid/Hotplate Digestion)	SMEWW 3120 (SMEWW 3030 F)
Lead	Inductively Coupled Plasma – Emission Spectroscopy Method (Nitric Acid – Hydrochloric Acid/Hotplate Digestion)	SMEWW 3120 (SMEWW 3030 F)
Manganese	Inductively Coupled Plasma – Emission Spectroscopy Method (Nitric Acid – Hydrochloric Acid/Hotplate Digestion)	SMEWW 3120 (SMEWW 3030 F)
Nickel	Inductively Coupled Plasma – Emission Spectroscopy Method (Nitric Acid – Hydrochloric Acid/Hotplate Digestion)	SMEWW 3120 (SMEWW 3030 F)
Nitrate as NO_3-N	Colorimetric, Brucine	US EPA 352.1
	Cadmium Reduction Method with Nitrite Correction using Colorimetric Method	SMEWW 4500-NO_3^- E SMEWW 4500-NO_2^- B
Oil and Grease	Liquid-Liquid Partition - Gravimetric Method	SMEWW 5520 B
Organochlorine Pesticides	Gas Chromatographic/Electron Capture Detector Method	US EPA 8081
pH	Electrometric Method	SMEWW 4500-H^+ B
Phenols	Chloroform Extraction	SMEWW 5530 C
Phenol and Phenolic Substances	Gas Chromatographic/Mass Spectrometric Method	US EPA 8270
Phosphate	Stannous Chloride Method	SMEWW 4500-P D
Polychlorinated Biphenyls (PCBs)	Gas Chromatography/ Electron Capture Detector Method	US EPA 8082A

	Selenium	Inductively Coupled Plasma – Emission Spectroscopy Method (Nitric Acid – Hydrochloric Acid/Hotplate Digestion)	SMEWW 3120 (SMEWW 3030 F)
	Settleable Solids	Imhoff Cone Method	SMEWW 2540 F
	Sulfate	Turbidimetric Method	SMEWW 4500 SO_4^{2}-E
	Surfactants (Methylene Blue Active Substances)	Anionic Surfactants as MBAS	SMEWW 5540 C
	Temperature	Laboratory and Field Methods	SMEWW 2550 B
	Total Dissolved Solids	Gravimetric, Dried at 180 °C	SMEWW 2540 C
	Total Suspended Solids	Gravimetric, Dried at 103-105 °C	SMEWW 2540 D
	Trichloroethylene	Purge and Trap Capillary – Column Gas Chromatographic/Mass Spectrometric Method	US EPA 8260
	Zinc	Inductively Coupled Plasma – Emission Spectroscopy Method (Nitric Acid – Hydrochloric Acid/Hotplate Digestion)	SMEWW 3120 (SMEWW 3030 F)

TYPE OF SAMPLES	PARAMETER	METHOD
Ambient Air	Nitrogen Dioxide	Griess-Saltzman Method
	Sulfur Dioxide	Colorimetric-Pararosaniline Method
	Suspended Particulate Matter – TSP and PM 10	Gravimetric Method
Stationary Source Emissions	NOx	Phenoldisulphonic Acid Method
	Particulates	Gravimetric Method
	Sulfur Oxides as SO_2	Barium Thorin Titration Method

8.2 PERSONS RECOMMENDED TO BE RECOGNIZED BY THE DENR AS RESPONSIBLE FOR THE TECHNICAL VALIDITY OF TEST REPORTS

Name of Signatory	Profession/ License No.	Area/s of responsibility/ies
Princess S. Galvez	Chemist/ PRC License No. 0009207	All Analyses
Aljon D. Bagting	Chemist/ PRC License No. 0011685	Organics Analyses
Ernani Hilario A. Espiritu	Medical Technologist/ PRC License No. 0037503	Bacteriological Analyses

9. SIGNATURES OF THE ASSESSMENT TEAM MEMBERS

Chairperson	SAMMY L. AYTONA, RCh
EMB Assessors	KHENNYIE-AR G. PEROJA, RCh, ELLAINE GELLIE S. NICDAO, RCh
External Assessors	CHRISTINA A. BINAG, RCh, Ph.D. GLENN V. ALEA, RCh., Ph.D.
EMB Regional Assessor	MENCHIE M. ALANIS, RCh, Ph.D.
Secretariat	KHENNYIE-AR G. PEROJA, RCh