



# CERTIFICATE OF ACCREDITATION

*This is to attest that*

**ECOLOGY RESEARCH AND MENTORING S.R.L.**  
CARLOS VILLARAN 1087 URB. SANTA CATALINA- LA VICTORIA LIMA, 15034  
LIMA, 0051, PERU

**Testing Laboratory TL-1216**

has met the requirements of AC89, *IAS Accreditation Criteria for Testing Laboratories*, and has demonstrated compliance with ISO/IEC Standard 17025:2017, *General requirements for the competence of testing and calibration laboratories*. This organization is accredited to provide the services specified in the scope of accreditation.

Effective Date February 1, 2024



A handwritten signature in black ink, reading 'Raj Nathan'.

**President**

IAS is an ILAC MRA Signatory

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# SCOPE OF ACCREDITATION

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## ECOLOGY RESEARCH AND MENTORING S.R.L.

<https://www.ecology.com.pe/>

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*Accredited to ISO/IEC 17025:2017*

*Effective Date February 1, 2024*

FIELDS OF TESTING	MATERIAL/ MATRIX	DETERMINANT(S)/ ANALYTE(S)	METHOD REFERENCE
<b>Occupational Health – Physical</b>	Occupational Health	Lighting	Official Mexican Standard NOM-025-STPS-2008, Lighting conditions in workplaces. /Lighting conditions in workplaces /2008
		Heat stress - heat	UNE-EN ISO 7243:2017 /Ergonomics of the thermal environment. Evaluation of heat stress using the WBGT index (wet bulb and globe temperature) (ISO 7243:2017) (Ratified by the Spanish Association for Standardization in November 2017.) /2017
		Total or inhalable particulate matter	NIOSH 0500 /Particulates not otherwise regulated. Total. /1994
		Occupational Noise	NTP-ISO 9612:2010 (revised 2020)/Acoustics. Determination of occupational noise exposure. Engineering Method /2020
		Heat stress - Due to cold	UNE-EN ISO 11079:2009. /Ergonomics of the thermal environment: determination and interpretation of cold stress using the required insulation of clothing (IREQ) and the effects of local cooling /2009
		Vibration	Bolivian Standard NB/ISO 2631-1 // Bolivian Standard NB/ISO 2631-2 /Mechanical Shock Vibration – Evaluation of Human Exposure to Whole-Body Vibration – Part 1: General Requirements // Vibration and Mechanical Shock – Evaluation of Human Exposure to Whole-Body

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<b>Occupational Health – Physical</b> (cont'd.)	Occupational Health (cont'd.)		Vibration – Part 2: Vibration in Buildings (1 Hz to 80 Hz) /2009
		Respirable Particulate Matter	NIOSH 600 /Particulates Not Otherwise Regulated, Respirable 0600 /1998
	Acoustic	Environmental Noise Measurement	NTP ISO 1996- 2:2021 / NTP ISO 1996- 1:2020 /Acoustics. Description, measurement and evaluation of environmental noise. Part 1: Basic Indices and Evaluation Procedure 2nd Edition/ Acoustics. Description, measurement and evaluation of environmental noise. Part 2: Determination of sound pressure levels. 2nd Edition /2020 / 2021
<b>Occupational Health - Chemical</b>	Occupational Health	Volatile Organic Compounds (VOCs), SO <sub>2</sub> , H <sub>2</sub> S, O <sub>2</sub> , CO: Carbon monoxide (CO), VOC, Sulfur dioxide (SO <sub>2</sub> ), Hydrogen sulfide (H <sub>2</sub> S), Oxygen (O <sub>2</sub> )	OSHA ID-209   03 1993 VALIDATED (OUT OF SCOPE) /Carbon Monoxide in the Workplace (Direct Measurement Monitor) OSHA Method ID-209   03 1993 /1993
<b>Environmental Chemistry - Volumetry</b>	Natural water, Waste Water, Water for human use and consumption, Process Water	Alkalinity: Total Alkalinity, Alkalinity by carbonates, Alkalinity by bicarbonates, Alkalinity by hydroxides	SMEWW-APHA-AWWA-WEF Part 2320 B, 24rd Ed. /Alkalinity Titration Method /2023
		Acidity	SMEWW-APHA-AWWA-WEF Part 2310-B. 24th Ed. 2023 /ACIDEZ - Titration/2023 Method
		Total Hardness	SMEWW-APHA-AWWA-WEF Part 2340-EDTA-C. 24th Ed. 2023 /Hardness-EDTA Titrimetric Method /2023
<b>Environmental Chemistry - Ion Chromatography</b>	Natural water, Waste Water, Water for human use and consumption, Process Water, Soil	Anions: Fluoride, Chloride, Nitrite-N, P-phosphate, Sulphate, Bromide, Nitrate-N	EPA Method 300.0, Rev.2.1 / Determination of Inorganic Anions by Ion Chromatography /1993
	Soil	Anions: Fluoride, Chloride, Nitrite-N, P-phosphate, Sulphate, Bromide, Nitrate-N	EPA Method 300.0, Rev.2.1 / Determination of Inorganic Anions by Ion Chromatography /1993
	Natural water, Waste Water, Water	Anions: Phosphate, Nitrate, Nitrite	EPA Method 300.0, Rev.2.1 VALIDATED (Modified) /

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FIELDS OF TESTING	MATERIAL/MATRIX	DETERMINANT(S)/ANALYTE(S)	METHOD REFERENCE
	for human use and consumption, Process Water, Soil		Determination of Inorganic Anions by Ion Chromatography VALIDATED (Modified) /2023
<b>Environmental Chemistry - Emission</b>	Emissions From Stationary Sources	Metals in ICP-MS Emissions: Silver, Arsenic, Barium, Beryllium, Cadmium, Cobalt, Chromium, Copper, Manganese, Nickel, Phosphorus, Lead, Antimony, Selenium, Thallium, Zinc, Mercury	EPA CFR Title 40, Appendix A-8 to Part 60, Method 29 /Inductively Coupled Plasma-Mass Spectrometry (Microwave assisted acid digestion of sediments, sludges, soils, and oils) /2017
		Metals in ICP-MS Emissions: Tin, Titanium, Vanadium	EPA CFR Title 40, Appendix A-8 to Part 60, Method 29 Validated – Out of Scope /Determination of Metal Emissions from Stationary Sources Validated – Out of Scope /2023
		Metals in ICP-MS Emissions: Silver, Arsenic, Barium, Beryllium, Cadmium, Cobalt, Chromium, Copper, Manganese, Nickel, Phosphorus, Lead, Antimony, Selenium, Thallium, Zinc, Mercury	NTP 712.110:2022 /MONITORING OF AIR EMISSIONS. Determination of metal emissions from stationary sources. 1st Edition /2022
		Metals in ICP-MS Emissions: Tin, Titanium, Vanadium	NTP 712.110:2022 VALIDATED (Out of Scope)/AIR EMISSIONS MONITORING. Determination of metal emissions from stationary sources. 1st Edition VALIDATED (Out of Scope) /2023
<b>Environmental Chemistry – Air</b>	Air	Filter Metals By ICP - MS. PM 10 High Volume: Boron, Calcium, Cerium, Iron, Mercury, Potassium, Lithium, Magnesium, Sodium, Phosphorus, Silica, Silicon, Tin, Strontium, Titanium	EPA - Compendium Method IO-3.5 (Sample Preparation: EPA - Compendium Method IO-3.1) VALIDATED (Out of Scope) /Determination Of Metals In Ambient Particulate Matter Using Inductively Coupled Plasma/ Mass Spectrometry (ICP/MS) Validated (Out of Scope) /2023
		Filter Metals By ICP - MS. Validated (Modified) Filter	EPA - Compendium Method IO-3.5 (Sample Preparation: EPA -

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FIELDS OF TESTING	MATERIAL/MATRIX	DETERMINANT(S)/ANALYTE(S)	METHOD REFERENCE
Environmental Chemistry – Air (cont'd.)	Air (cont'd.)	Metals, PM 2.5 High Volume And PM 10 Low Volume: Silver, Aluminum, Arsenic, Boron, Barium, Beryllium, Cadmium, Cobalt, Chromium, Copper, Manganese, Molybdenum, Nickel, Lead, Antimony, Selenium, Thorium, Thallium, Uranium, Vanadium, Zinc, Calcium, Cerium, Iron, Mercury, Potassium, Lithium, Magnesium, Sodium, Phosphorus, Silica, Silicon, Tin, Strontium, Titanium	Compendium Method IO-3.1) VALIDATED (MODIFIED) /Determination Of Metals In Ambient Particulate Matter Using Inductively Coupled Plasma/ Mass Spectrometry (ICP/MS) VALIDATED (MODIFIED) /2023
		VOC With Absorbent Tube	ASTM D3687-19 // ASTM D3686-20 Validated - modified /Standard Test Method for Analysis of Organic Compound Vapors Collected by the Activated Charcoal Tube Adsorption Method // Standard Practice for Sampling Atmospheres to Collect Organic Compound Vapors (Activated Charcoal Tube Adsorption Method) /2019 / 2020
		Determination of Total Hydrocarbons Expressed as Hexane	EPA-6004-75-010 /Hydrocarbon Measurement discrepancies among several analyzers using flame-ionization detectors /1975
		Filter Metals By ICP - MS. PM 10 High Volume: Silver, Aluminum, Arsenic, Barium, Beryllium, Cadmium, Cobalt, Chromium, Copper, Manganese, Molybdenum, Nickel, Lead, Antimony, Selenium, Thorium, Thallium, Uranium, Vanadium, Zinc	EPA - Compendium Method IO-3.5 (Sample preparation: EPA - Compendium Method IO-3.1) /Determination Of Metals In Ambient Particulate Matter Using Inductively Coupled Plasma/ Mass Spectrometry (ICP/MS) /1999
		Meteorological parameters: Atmospheric Pressure, Relative humidity, Precipitation, Solar radiation, Temperature,	EPA-454/B-08-002 March 2008 /Quality Assurance Handbook for Air Pollution Measurement Systems. Volume IV:

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<b>Environmental Chemistry – Air</b> (cont'd.)	Air (cont'd.)	Wind Direction, Wind speed	Meteorological Measurements Version 2.0 (Final) /2008
		Total Hydrocarbons With Absorbent Tube	ASTM D7675-15 // ASTM D3686-20 VALIDATED - MODIFIED /Standard Test Method for Determination of Total Hydrocarbons in Hydrogen by FID-Based Total Hydrocarbon (THC) Analyzer/ Standard Practice for Sampling Atmospheres to Collect Organic Compound Vapors (Activated Charcoal Tube Adsorption Method) /2015/2020
		Mercury With Absorbent Tube	NIOSH 6009 VALIDATED - MODIFIED /Mercury /1994
<b>Environmental Chemistry – Spectrometry</b>	Natural water, Waste Water, Water for human use and consumption, Process Water	Total and Dissolved Metals by ICP-MS: Silver, Aluminum, Arsenic, Barium, Beryllium, Calcium, Cadmium, Cobalt, Chromium, Copper, Iron, Mercury, Potassium, Magnesium, Manganese, Sodium, Nickel, Lead, Antimony, Selenium, Thallium, Vanadium, Zinc	EPA Method 6020B:2014 (Preparation of sample: EPA Method 3015A:2007 y EPA Method 3051A: 2007) /Inductively Coupled Plasma-Mass Spectrometry (Microwave assisted acid digestion of sediments, sludges, soils, and oils) /2014
	Soil	Metals in Soil by ICP -MS: Silver, Aluminum, Arsenic, Barium, Beryllium, Calcium, Cadmium, Cobalt, Chromium, Copper, Iron, Mercury, Potassium, Magnesium, Manganese, Sodium, Nickel, Lead, Antimony, Thallium, Vanadium, Zinc	EPA Method 6020B:2014 (Preparation of sample: EPA Method 3015A:2007 y EPA Method 3051A: 2007) /Inductively Coupled Plasma-Mass Spectrometry (Microwave assisted acid digestion of sediments, sludges, soils, and oils) /2014
	Soil	Metals in Soil by ICP -MS: Boron, Lithium, Molybdenum, Selenium, Strontium, Titanium, Uranium	EPA Method 6020B:2014 (Sample preparation: EPA Method 3015A:2007 y EPA Method 3051A: 2007) Validated – Out of Scope /Inductively Coupled Plasma-Mass Spectrometry (Microwave assisted acid digestion of sediments, sludges, soils, and oils) Validated – Out of Scope /2014

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Environmental Chemistry – Spectrometry (cont'd.)	Natural water, Waste Water, Water for human use and consumption, Process Water	Total and Dissolved Metals by ICP-MS: Boro, Bismuth, Cerium, Cesium, Gallium, Germanium, Hafnium, Lanthanum, Lithium, Lutetium, Molybdenum, Phosphorus, Rubidium, Silica, Silicon, Tin, Strontium, Tellurium, Thorium, Titanium, Uranium, Tungsten, Ytterbium, Zirconium	EPA METHOD 6020B, Rev. 2 July (Validated out of scope) / Inductively Coupled Plasma-Mass Spectrometry /2023
	Saline Water	Total and Dissolved Metals by ICP-MS: Silver, Aluminum, Arsenic, Barium, Beryllium, Calcium, Cadmium, Cobalt, Chromium, Copper, Iron, Mercury, Potassium, Magnesium, Manganese, Sodium, Nickel, Lead, Antimony, Selenium, Thallium, Vanadium, Zinc, Boron, Bismuth, Cerium, Cesium, Gallium, Germanium, Hafnium, Lanthanum, Lithium, Lutetium, Molybdenum, Phosphorus, Rubidium, Silica, Silicon, Tin, Strontium, Tellurium, Thorium, Titanium, Uranium, Tungsten, Ytterbium, Zirconium	EPA Method 6020B (Sample Preparation: EPA Method 3015A, 2007) Validated – Out of Scope /Inductively Coupled Plasma-Mass Spectrometry (Microwave assisted acid digestion of sediments, sludges, soils, and oils) Validated – Out of Scope) /2023
Environmental Chemistry	Natural water, Waste Water, Water for human use and consumption, Process Water, Soil	Temperature (Field measurements)	SMEWW-APHA- AWWA-WEF. Part 2550 B. 24 rd. Edition. / Temperature /2023
		Hydrogen Potential (Field measurements)	SMEWW-APHA-AWWA-WEF Part 4500-H+ B, 24rd Ed. /pH Value. Electrometric Method /2023
		Turbidity (Field measurements)	SMEWW-APHA-AWWA-WEF Part 2130 B, 24rd Ed. VALIDATED- MODIFIED /Turbidity. Nephelometric Method /2023
		Dissolved Oxygen OD (Field measurements)	SMEWW-APHA-AWWA-WEF Part 4500-O G, 24rd Ed.

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<b>Environmental Chemistry</b> (cont'd.)	Natural water, Waste Water, Water for human use and consumption, Process Water, Soil (cont'd.)		/Membrane Electrode Method. /2023
		Conductivity (Field measurements)	SMEWW-APHA-AWWA-WEF Part 2510 B, 24rd Ed. /Conductivity. Laboratory Method /2023
		Resistivity (Field measurements)	SMEWW-APHA-AWWA-WEF Part 2510 B, 24rd Ed. VALIDATED (Out of Scope) /Conductivity. Laboratory Method /2023
		Total Dissolved Solids (Field measurements)	SMEWW-APHA-AWWA-WEF Part 2540 C, 24rd Ed. Validated (Out of scope) /Solids. Total Dissolved Solids Dried at 180 °C /2023
		Nitrogen-ammonium (Field measurements)	SMEWW-APHA-AWWA-WEF Part 4500-NH3 D, 24rd Ed. Validated - Modified / Nitrogen (Ammonia). Ammonia-Selective Electrode Method. /2023
		Chloride (Field measurements)	SMEWW-APHA-AWWA-WEF Part 4500-Cl- D, 24rd Ed. Validated - Modified / Chloride. Potentiometric Method. /2023
		Nitrogen-nitrate (Field measurements)	SMEWW-APHA-AWWA-WEF Part 4500-NO3- D, 24rd Ed. /Nitrogen (Nitrite). Nitrate Electrode Method. /2023
		Salinity (Field measurements)	SMEWW-APHA-AWWA-WEF Part 2520 B, 24rd Ed. /Salinity. Electrical Conductivity Method /2023
<b>Environmental - Physical</b>	Natural water, Waste Water, Water for human use and consumption, Process Water, Soil	Flow rate (current meter, volumetric and float) VALIDATED (out of scope)	NCh 3205-2011 Validated (Out of Scope) /Wastewater Flow Meters - Requirement - First Edition. Validated (Out of Scope) /2023