

CERTIFICATE OF ACCREDITATION

This is to attest

SGS CHILE LTDA SOCIEDAD DE CONTROL

PUERTO MADERO # 130 PUDAHUEL 9020000, CHILE

Testing Laboratory TL-879

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.

Expiry Date September 1, 2024 Initial Accreditation Date December 9, 2019 Effective Date February 2, 2024



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SGS CHILE LTDA SOCIEDAD DE CONTROL

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Accredited to ISO/IEC 17025:2017

Effective Date February 2, 2024

FIELDS OF TESTING	MATERIAL/ MATRIX	DETERMINANT(S)/ ANALYTE(S)	METHOD REFERENCE
Environmental Inorganic	Seawater, Saline water, Ground water, Surface Water, wastewater, Drinking water, Source of drinking water, Water for industrial purposes	Dissolved trace elements by Direct Air-Acetylene Flame, FLAME ATOMIC ABSORPTION SPECTROMETRY in Dissolved: As, Cd, Ca, Co, Cu, Cr, Sr, Fe, Li, Mg, Mn, Ni, Ag, Pb, K, Na, TI, Zn	Standard Methods for the examination of water and wastewater Ed 23, 2017, Method 3030 B, Method 3111 B. Atomic Absorption
		Dissolved trace elements by Direct Nitrous Oxide- Acetylene Flame, FLAME ATOMIC ABSORPTION SPECTROMETRY. Dissolved: AI, Ba, Be, Ca, Sn, Sr, Mg, Mo, Si, V	Standard Methods for the examination of water and wastewater Ed 23, 2017, Method 3030 B, Method 3111 D. Atomic Absorption
	Seawater, saline water, Ground water, Surface Water, wastewater, Drinking water, Water for industrial purposes	Dissolved trace elements by Extraction/Air-Acetylene Flame Method. Dissolved: Cd, Co, Cu, Cr, Fe, Mn, Ni, Ag, Pb, V, Zn	Standard Methods for the examination of water and wastewater Ed 23, 2017, Method 3030 B, Method 3111 C. Atomic Absorption
	Ground water, Surface Water, wastewater, Drinking water, Source of drinking water, Water for industrial purposes	Dissolved trace elements by Inductively Coupled Plasma- Atomic Emission Spectrometry. Dissolved: Al, Sb, As, Ba, Be, B, Cd, Ca, Co, Cu, Cr, Sr, Fe, Li, Mg, Mn, Mo, Ni, Ag, Pb, K, Se, Si, SIO2, Na, Tl, V, Zn.	Standard Methods for the examination of water and wastewater Ed 23, 2017, Method 3030 B, SM 3120 B, ICPOES
		NO2 + NO3 by Calculation	DS 90/2000
		Ammonium, chloride, nitrate, nitrite, orthophosphate, silicate, and sulfate	ISO/DIS_15923-1- 2013 Determination of ions bya discrete analysis system and spectrophotometric detection



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FIELDS OF TESTING	MATERIAL/ MATRIX	DETERMINANT(S)/ ANALYTE(S)	METHOD REFERENCE
Environmental Inorganic (cont'd.)	Ground water, Surface Water, wastewater, Drinking water, Water for industrial purposes	Dissolved trace elements by Inductively Coupled Plasma- Atomic Emission Spectrometry. Dissolved: Sn, Bi, P, La, Th, W, U, Ti, Sc, Ge, Ga	I-ENV-LAB-103 Ed00 based Standard Methods for the examination of water and wastewater Ed 23, 2017, Method 3030 B, on EPA 200.7, 1994. ICPOES
	Seawater, Ground water, Surface Water, wastewater, Drinking water, Source of drinking water, Water for	Dissolved Antimony by Atomic Absorption, Borohydride Reduction. Dissolved: Sb	I-ENV-LAB-107 Ed00 Based on Standard Methods for the examination of water and wastewater 3030 B Ed23, 2017. EPA 7062 1994. Atomic Absorption
	Industrial purposes	Dissolved trace elements by Inductively Coupled Plasma- Mass Spectrometry. Dissolved: AI, Sb, As, Ba, Be, Bi, B, Cd, Ca, Ce, Cs, Co, Cu, Cr, Sc, Sn, Sr, Ga, Ge, Fe, Ho, La, Li, Mg, Mn, Mo, Ni, Ag, Pb, K, Se, Si, SIO2, Na, TI, Th, Ti, U, V, W, Zn	I-ENV-LAB-511 Ed00 based on Standard Methods for the examination of water and wastewater 3030 B Ed 23, EPA 200.8;1994, EPA 6020B, ISO 17294-2(2016), Standard Methods for the examination of water and wastewater 3125B Ed 23. ICPMS
		Bicarbonate by titration	Standard Methods for the examination of water and wastewater Ed 23, 2017, Method 2320 B
		Carbonate by titration	Standard Methods for the examination of water and wastewater Ed 23, 2017, Method 2320 B
		Dissolved Mercury by Cold Vapor AAS. Dissolved: Hg	Standard Methods for the examination of water and wastewater Ed 23, 2017, Method 3030 B, Standard Methods for the examination of water and wastewater 3112 B. Atomic Absorption with Cold Vapor Generation
		Dissolved Arsenic and Selenium by Hydride Generation AAS. Dissolved: As, Se	Standard Methods for the examination of water and wastewater Ed 23, 2017, Method 3030 B, Standard Methods for the examination of water and wastewater 3114 B. Atomic Absorption with Hydride Generation





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FIELDS OF TESTING	MATERIAL/ MATRIX	DETERMINANT(S)/ ANALYTE(S)	METHOD REFERENCE
Environmental Inorganic (cont'd.)	Seawater, Ground water, Surface Water, wastewater, Drinking water, Source of drinking water, Water for industrial purposes (cont'd.)	Total nitrogen by Calculation	Standard Methods for the examination of water and wastewater Ed 23, 2017. Method 4500-N org,4500-NH3 D, 4500-NO3 D ,4500-NO2 B
		Total Phosphate by Colorimetric	Standard Methods for the examination of water and wastewater Ed 23, 2017, Method 4500-P C
	Wastewater	Dissolved Iron by Flame AAS. Dissolved: Fe	Standard Methods for the examination of water and wastewater Ed 23, 2017, Method 3030 B & NCh 2313/10 Of 96
		Dissolved trace elements by Inductively Coupled Plasma- Atomic Emission Spectrometry. Dissolved: Al, Sb, As, Ba, Be, B, Cd, Ca, Zn, Co, Cu, Cr, Sn, Sr, Fe, Li, Mg, Mn, Mo, Ag, Pb, K, Se, Si, Na, Ni, Tl, V.	Standard Methods for the examination of water and wastewater Ed 23, 2017, Method 3030 B & NCh 2313/25 Of 97
	Seawater, Ground water, Surface Water, wastewater, Drinking water,	Anion-Cation Balance by Calculation	Standard Methods for the examination of water and wastewater Ed 23, 2017, Method 1030 E
	Water for industrial purposes	Odor Standard Me examination wastewater I Method 2150	Standard Methods for the examination of water and wastewater Ed 23, 2017 Method 2150 B
	Ground water, Surface Water, Drinking water, Source of drinking water, Water for industrial purposes	Langelier Index by Calculation	Standard Methods for the examination of water and wastewater Ed 23, 2017, Standard Methods for the examination of water and wastewater 2330 B
		Ryznar Index by Calculation	Standard Methods for the examination of water and wastewater Ed 23, 2017, Method 2330 B
		Reason NO2 – NO3 by Calculation	NCh 409/1 Of2005
		Sodium Adsorption Ratio (RAS) by Calculation	NCh1333.Of87 Point 3.7. Water quality requirements for different uses



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FIELDS OF TESTING	MATERIAL/ MATRIX	DETERMINANT(S)/ ANALYTE(S)	METHOD REFERENCE
Environmental Inorganic (cont'd.)		Percentage Sodium by Calculation	NCh1333.Of87 Point 3.8. Water quality requirements for different uses
	Seawater, Ground water, Surface Water, wastewater, Drinking water, Source of drinking water, Water for industrial purposes, Dialysis water	Hardness by Calculation	Standard Methods for the examination of water and wastewater Ed 23, 2017, Method 2340B
	Dialysis water	Total chlorine by colorimetric	Standard Methods for the examination of water and wastewater Ed 23, 2017, Method 4500-CI G
	Seawater, Ground water, Surface Water, wastewater, Drinking water, Source of drinking	Bromide, Phosphate	Standard Methods for the examination of water and wastewater Ed 23, 2017 Method 4110B
		Free Cyanide	EPA 9016 2010 Free Cyanide in Water, Soils and Solid Wastes by Microdiffusion
		True color, Apparent color	Standard Methods for the examination of water and wastewater Ed 23, 2017 2120 B Pt-Co
		Inorganic Carbon	Determination of Total Organic Carbon and Inorganic Carbon Total Standard Methods of Water and Wastewater 5310 B Ed.23, 2017
		Cyanide WAD	Standard Methods for the examination of water and wastewater Ed 23, 2017 Method 4500 CN-I.
	Seawater, Ground water, Surface Water, wastewater, Drinking water	Hexavalent Chromium	I-ENV-LAB-327 Ed00, Based on EPA 218.7
		Ammonium	I-ENV-LAB-249 Ed.00, based on Standard Methods for the Examination of Water & Wastewater, 23 rd Edition, 2017, Method 4500 NH3 BD
		Fe ⁺²	Standard Methods for the examination of water and wastewater Ed 23, 2017 Method 3500-Fe B





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FIELDS OF TESTING	MATERIAL/ MATRIX	DETERMINANT(S)/ ANALYTE(S)	METHOD REFERENCE
Environmental Inorganic (cont'd.)	Seawater, Ground water, Surface Water	Foam Power	I-ENV-LAB-288 Ed00 based on ISO 696:1975. Surface active agents – Measurement of foaming power – Modified Ross-Miles method. 1975.ISO.
	Seawater, Ground water, Surface Water, wastewater	Salinity	SM – APHA / AWWA / WEF 2520. B. Electrical Conductivity Method. 23° Edición.2017.
	Seawater, saline water, brines	Total Trace Elements Cd, Co, Cu, Pb, Ni, U and V - Dissolved Trace Elements Cd, Co, Cu, Pb, Ni, U and V.	NCh3633 Of.2021 Determination of metals by inductively coupled plasma mass spectrometry (ICP-MS) in seawater.
	Drinking water, Source of drinking water, Water for industrial purposes	Measurement of foaming power	I-ENV-LAB-288 Ed00 based on ISO 696:1975. Surface active agents – Measurement of foaming power – ModifiedRoss- Miles method. 1975.
	Wastewater, Ground water, Surface Water, Drinking water, Source of drinking water, Water for industrial purposes.	Fluoride, chloride, sulfate, bromide, nitrate, nitrite.	I-ENV-LAB-329 Ed. 00 Based on Standard Methods for the examination of water and wastewater, Ed.24 – 2023 Methods 4110B- Ion chromatography with chemical suppression of eluent conductivity, EPA Method 300.0-The deter- mination of inorganic anions in water by ion chromatography, and Application Notes-Thermo Fisher Scientific-Determination of inorganic anions in environmental waters using a hydroxide-selective column.
	Wastewater, Ground water, Surface Water, Drinking water, Source of drinking	Al, Sb, As, Ba, Be, B, Cd, Ca, Co,Cu, Cr, Sr, Fe, Li, Mg, Mn, Mo, Ni, Ag, Pb, K, Se, Si, SiO2,Na, Tl, V, Zn	I-ENV-LAB-322 Ed.00 Based Method EPA-3015A and SMEWW 3120B Inductively Coupled Plasma atomic emission spectrometry
	water, water for industrial purposes, Sea water	Disolved trace elements: Al, Sb, As, Ba, Be, B, Cd, Ca, Co, Cu, Cr, Sr, Fe, Li, Mg, Mn, Mo, Ni, Ag, Pb, K, Se, Si, SiO2, Na, Tl, V, Zn	Standard Methods for the examination of water and wastewater, Ed.24 – 2023 Method 3030B Standard Methods for the examination of water and wastewater, Ed.24 – 2023





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FIELDS OF TESTING	MATERIAL/ MATRIX	DETERMINANT(S)/ ANALYTE(S)	METHOD REFERENCE
Environmental Inorganic (cont'd.)	Wastewater, Ground water, Surface Water, Drinking water, Source of drinking water, Water for industrial purposes, Sea water (cont'd.)		Method 3120B Dissolved trace elements by Inductively Coupled Plasmaatomic emission spectrometry:
	Soils, aquatic sediments, lake sediments, marine sediments, sludges and biota.	Adsorbable organically bound halogens (AOX). Sum of organically bound chlorine, bromine, and iodine	I-ENV-LAB-328, Ed.00 Based on ISO 9562:2004. Water quality - Determination of adsorbableorganically bound halogens (AOX).
		Total mercury	Method EPA 7473 Mercury in solids andsolutions by thermal decomposition, amalgamation, and atomic absorption spectrophotometry.
	Soils, Solid Industrial Waste, Solid waste	Cd, Cr, Ag, Pb	Synthetic precipitation leaching procedure, EPA Method 1312. 1994 EPA.3111. B. Direct Air- Acetylene Flame Method. Metals by Flame Atomic Absorption Spectrometry. 23rd Edtion,.2017.
		Ва	Synthetic precipitation leaching procedure, EPA Method 1312. 1994 EPA.3111. D. Direct Nitrous Oxide-Acetylene Flame Method. Metals by Flame Atomic Absorption Spectrometry. 23rd Edtion,.2017.
		Hg	Synthetic precipitation leaching procedure, EPA Method 1312. 1994 EPA. 3112. B. Cold-Vapor Atomic Absorption Spectrometric Method. Metals by Cold-Vapor Atomic Absorption Spectrometry. 23rd Edtion,.2017.
		Hg	EPA 7473 Mercury in Solids and Solutions by Thermal Decomposition, Amalgamation, and Atomic



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FIELDS OF TESTING	MATERIAL/ MATRIX	DETERMINANT(S)/ ANALYTE(S)	METHOD REFERENCE
Environmental Inorganic (cont'd.)	Soils, Solid Industrial Waste, Solid waste (cont'd.)		Absorption Spectrophotometry; Mercury.
		As, Se	Synthetic precipitation leaching procedure, EPA Method 1312. 1994 EPA. 3114. B. Manual Hydride Generation/Atomic Absorption Spectrometric Method. Arsenic and Selenium by Hydride Generation/Atomic Absorption Spectrometry (1997). 23rd Edtion,.2017.
		Corrosiveness	I-ENV LAB-311 Ed00, based on EPA 1110A Rev01, 2004
	Solid Industrial Waste, Solid waste, Liquid Waste	Flammability	EPA 1010 B Pensky martens
	Soils, Sludges, Aquatic Sediments, Lake Sediment, Marine Sediments	Removable Metals by ICP- MS: Al, Sb, As, Ba, Be, Bi, B, Cd, Ca, Ce, Cs, Co, Cu, Cr, Sc, Sn, Sr, Ga, Ge, Fe, Ho, La, Li, Mg, Mn, Mo, Ni, Ag, P, Pb, K, S, Se, Si, SIO2, Na, Tl, Th, Ti, U, V, W, Zn	I-ENV-LAB-517 Ed00 Based on EPA 3051 (1994) Digestion, EPA 6020 B (2014), ISO 17294-2 (2016) Inductively coupled plasma emission spectroscopy (ICP-MS)
		Removable Metals by Inductively Coupled Plasma- Atomic Emission Spectrometry Al, Sb, As, Ba, Be, Bi, B, Cd, Ca, Ce, Cs, Co, Cu, Cr, Sc, Sn, Sr, Ga, Ge, Fe, Ho, La, Li, Mg, Mn, Mo, Ni, Ag, P, Pb, K, S, Se, Si, SIO2, Na, TI, Th, Ti, U, V, W, Zn	I-ENV-LAB-518 Ed00. Based on EPA Methods 3050B Digestion. Based on EPA Methods 6010B and Standard Methods for the examination of water and wastewater Ed 23, 2017. Method 3120B Inductively coupled plasma emission spectroscopy (ICP- OES)
		Electrical conductivity by Potentiometry	I-ENV-LAB-270 Ed 00 Based on Recommended method of analysis for soils in Chile, Instituto de Investigaciones Agropecuarias INIA 2006
		pH by Potentiometry	I-ENV-LAB-271 Ed 00 Based on Based on Recommended method of analysis for soils in Chile, Instituto de Investigaciones Agropecuarias INIA 2006



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Environmental Organic	Ground water, Surface Water, Drinking water, Source of drinking water, Water for industrial purposes	DDD+DDT+DDE by Calculation	ME-20-2007 Gas Chromatography with electronic capture detector
		Reason Trihalomethanes by Calculation	NCh 409/1 Of2005
	Seawater, Ground water, Surface Water, Drinking water, Source of	Trihalomethanes by Calculation	Standard Methods for the examination of water and wastewater Ed 23, 2017 Method 6232
drinking wate Water for ind purposes, Wastewater	drinking water, Water for industrial purposes, Wastewater	Total Hydrocarbons by Calculation	Standard Methods for the examination of water and wastewater Ed 23, 2017 Method 5520F, I-ENV-LAB-304 Ed 00 Based on NCh2313/7.Of97
	Wastewater	Total hydrocarbons	NCh2313/7 of. 2021 – Part A Gravimetry-GC
		Total hydrocarbons	NCh2313/7 of. 2021 – Part B Partition-IR
		Fixed hydrocarbons	NCh2313/7 of. 2021 – Part A Gravimetry
		Volatile hydrocarbons	NCh2313/7 of. 2021 – Part A GC
		рН	NCh2313/1 Of. 2021 Analysis methods: pH determination; pH
	Seawater, Ground water, Surface Water, Drinking water, Source of drinking water, Water for industrial purposes, Wastewater	Hg	EPA 7473 Mercury in Solids and Solutions by Thermal Decomposition, Amalgamation, and Atomic Absorption Spectrophotometry; Mercury.
		Volatile hydrocarbons (C5 to C12)	I-ENV-LAB-304 Ed.00 Based on NCh2313/7. Of2021 Head Space FID-GC



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Environmental Organic (cont'd.)	Seawater, Ground water, Surface Water, Drinking water, Source of drinking water, Water for industrial purposes, Wastewater, Brine	Relative density	ASTM D1429-08 Standard Test Methods for Specific Gravity of Water and Brine
	Wastewater	Trihalomethanes by Calculation	NCh2313/20 Of98
	Soils, Sludges, Aquatic Sediments, Lake Sediment, Marine Sediments.	Total Hydrocarbons by Calculation	I-ENV-LAB-231 Ed 00 Based on EPA 3540C NCh2313/7.Of97, I-ENV-LAB- 310 Rev00 Based on EPA 5021, EPA 8015
	Soils, Solid Industrial Waste, Solid waste	Benzene, Carbon Tetrachloride, Chlorobenzene, Chloroform, 1,2-Dichlorobenzene 1,4- Dichlorobenzene, 1,2- dichloroethane, 1,1- Dichloroethylene, Methyl Ethyl Ketone, Tetrachlorethylene, Trichlorethylene, Vinyl Chloride, Pyridine	Method 1311. Toxicity Characteristic Leaching Procedure. Test Methods for Evaluating Solid Waste: Physical/Chemical Methods Compendium (SW-846). 1992. Test methods for Evaluation solid Waste, US EPA method 8260B, Revision 2, 1996, Quantification.
		Cresol, o-Cresol, m-Cresol, p-Cresol, 2,4-dinitrotoluene, Hexachlorobenzene, Hechlorobutadiene, Hexachloroethane, Nitrobenzene, 2,4,5- Trichlorophenol, 2,4,6- Trichlorophenol	Method 1311. Toxicity Characteristic Leaching Procedure. Test Methods for Evaluating Solid Waste: Physical/Chemical Methods Compendium (SW-846). 1992.Test methods for Evaluation solid Waste Physically/Chemicals Methods. EPA 8270D, Revision 2, 2014, Quantification.
		Chlordane, endrin, heptachlor, heptachlor epoxide, Lindane (BHC range), Methoxychlor, Toxaphene	Method 1311. Toxicity Characteristic Leaching Procedure. Test Methods for Evaluating Solid Waste: Physical/Chemical Methods Compendium (SW-846). 1992. Standard Method 6630-B, Ed 23, 2017, Quantification



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FIELDS OF TESTING	MATERIAL/ MATRIX	DETERMINANT(S)/ ANALYTE(S)	METHOD REFERENCE
Environmental Organic (cont'd.)	Soils, Solid Industrial Waste, Solid waste (cont'd.)	2,4-D, 2,4,5 TP (Silvex), Pentachlorophenol	Method 1311. Toxicity Characteristic Leaching Procedure. Test Methods for Evaluating Solid Waste: Physical/Chemical Methods Compendium (SW-846). 1992. I-ENV-LAB-326 Ed 00, based on Standard Method 6640-B, Ed 23, 2017, Quantification
Hydrobiology-Inorganic	Hydrobiological products	Al, Sb, As, Ba, Be, Bi, B, Cd, Ca, Zn, Co, Cu, Cr, Sn, Sr, P, Ti, Fe, Mn, Mg, Mo, Ni, Ag, Pb, K, Se, Na, Tl, U, V	I-ENV-LAB-516, Ed 00. Based EPA 6020 B, ISO 17294: 2016 and AOAC 2013.6
		Hg	I-ENV-LAB-124, Ed 00. Based on Standard Methods for the examination of water and wastewater, Method 3112 B, 23rd Edtion,2017 Cold-Vapor Atomic Absorption and Atomic Spectrometry MHS 15 Mercury Hydride System
Hydrobiology-Organic	BIOTA (Hydrobiological products)	PAHs: Acenaphthene Acenaphthylene Anthracene Benzo (g, h, i) perylene Benzo (k) fluoranthene Benzo (a) anthracene Benzo (a) pyrene Benzo (b) fluoranthene Chriseno Dibenzo (a, h) anthracene Phenanthrene Fluorene Indene (1,2,3-c, d) pyrene Naphthalene Pyrene Fluoranthene	I-CTS-LAB-347 Ed 00 Determination of PAHs In Water, Soil, Sediment, and Biota Samples, GC-MS/MS and GC-MS
Clinical- Animal	Urine Urine (cont'd.)	Arsenic	I-ENV-LAB-122 Ed01. Based on: ME-515.01-001 ISP Chile- Determination of Arsenic in Urine. AAS hydride generation
	Blood	Lead	I-ENV-LAB-519 ED00, Based in MTA/MB-011/R92 Determination of lead in blood

