



**BUREAU
VERITAS**



Bureau Veritas Certification - Brazil

**VERIFICATION OF THE GREENHOUSE GAS
INVENTORY - 2023**

NEXA RESOURCES

Version: 00

March/2024



EXECUTIVE SUMMARY

Bureau Veritas Certification carried out the verification of the Greenhouse Gas Inventory (GHG) – reference year **2023**, of the Inventory Organization (OI) NEXA RESOURCES.

The verification process consisted of the following steps:

- i) Document analysis - inventory report, records and other relevant documents;
- ii) Visit to the facilities;
- iii) Preparation of an initial report - protocol prepared based on the verification criteria, pointing out any Requests for Corrective Action (SAC), Requests for Clarification (SE) and Opportunities for Improvement (OM);
- iv) Analysis of the responses to the initial report - analysis and acceptance of the Organization's responses to the demands raised by the protocol;
- v) Preparation of the final verification report;
- vi) Issuance of the Declaration of Verification.

OI revised its inventory, originating the March 2024 version, as a response to meet the findings identified.

In summary, Bureau Veritas Certification's opinion on the Greenhouse Gas Inventory – reference year **2023**, based on the process and procedures carried out, as described above, and reasonable confidence level, is that it:

- It is materially correct, is a fair representation of GHG data and information, and has been prepared in accordance with the EPB;
- It is prepared according to the NBR ISO 14064 - Part 1: Specification and guidance to organizations for quantification and reporting of emissions and removals of greenhouse gases.

Date of first issue:	03/25/2024
Verification Body:	Bureau Veritas Certification
Report^{No}:	011/2024
Organization Name:	NEXA RESOURCES
Work carried out by:	Rubens Ferreira – Lead Auditor Adriano Angelotti - Auditor Thiago Milagres – Independent Technical Review

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1. Introduction

Climate change has been identified as one of the greatest challenges to be faced by nations, governments, businesses and citizens in the decades to come. Climate change has implications for human and natural systems and could lead to significant changes in natural resource utilization, production, and economic activity. In response, international, regional, national and local initiatives are being developed and implemented to limit concentrations of greenhouse gases (GHGs) in the Earth's atmosphere. Such initiatives rely on the quantification, monitoring, reporting and verification of GHG emissions and/or removals.

The Inventory Organization is responsible for the greenhouse gas emissions reported in its emissions inventory in accordance with the requirements of the Brazilian GHG Protocol Program, detailed in the Specifications of the Brazilian GHG Protocol Program for Accounting, Quantification and Publication of Corporate Inventories of Greenhouse Gas Emissions (EPB).

The verification activities are carried out according to the Verification Specifications of the Brazilian GHG Protocol Program and the ABNT NBR ISO 14064-3:2007 standard.

This verification report, prepared by Bureau Veritas Certification, is a document that aims to describe in detail the verification activities and bring the observed results.

2. Goal

The primary purpose of third-party verification is to ensure the credibility of an Organization's GHG inventory. Organizations have different reasons for managing the quality of their GHG emissions inventories, from identifying opportunities for improvement to meeting the requirements of their stakeholders, to preparing the Organization to comply with voluntary and/or mandatory standards.

The main objective of the verification is to confirm that the emissions declared by the Organization comply with the requirements of the EPB and have no material deviations and to ensure that the principles defined in NBR ISO 14064 have been met.

Principles:

Relevance: selection of GHG sources, GHG sinks, GHG reservoirs, data and methodologies appropriate to the needs of the intended user;

Comprehensiveness: inclusion of all relevant GHG emissions and removals;

Consistency: possibility of significant comparisons of GHG-related information;

Precision: reduction of asymmetries and uncertainties to the extent feasible;

Transparency: disclosure of sufficient and appropriate GHG-related information to enable the intended user to make a decision with reasonable confidence.

3. Scope

The inventory of the Inventory Organization was verified within the following scope:

The Organization has consolidated GHG emissions and removals from its facilities in accordance with the operational control approach in which the Organization is responsible for all quantified GHG emissions and/or removals from facilities over which it has operational or financial control.

Table 1: List of units of the Organization and of companies included in this inventory

Installation	Relationship with the Holding	
	Company	Address
Aripuanã	Operating unit	Av. 2 de Dezembro, 407 - Centro Aripuanã - MT - 78325-000 - Brasil
Vazante	Operating unit	Rodovia LMG 706, Km 65 - Vazante - MG - 38780-000 - Brasil
Morro Agudo	Operating unit	Estrada Morro Agudo, S/N Zona Rural, Paracatu - MG - 38609-899 - Brasil
Três Marias	Operating unit	Rodovia BR 040 - Km 284, S/N, Três Marias - MG - 39205-000 - Brasil
Juiz de Fora	Operating unit	BR 267 - Km 970 - Bairro Igrejinha - Juiz de Fora - MG - 36091-237 - Brasil
Corporativo Brasil	Administrative Headquarters	Av. Eng. Luís Carlos Berrini, 105, 6º andar - São Paulo - SP - 04571-010 - Brasil
Corporativo Peru	Administrative Headquarters	Av. Circunvalación del Golf los Incas 170 (piso 22) Santiago de Surco - Lima - Peru
Cajamarquilla	Operating unit	Carretera Central Alt. Km 9,5 Lurigancho - Chosica Cajamarquilla - Lima Peru
Cerro Lindo	Operating unit	Carretera Chinchababin S/N Chavin 11 - Peru
Atacocha	Operating unit	Distrito de San Francisco de Asis de Yarusyacán, Provincia de Pasco, Peru
El Povenir	Operating unit	S/N Yanacancha 19 - Peru

The establishment of operational limits involves the identification of GHG emissions associated with the Organization's operations, classifying them as direct or indirect emissions and selecting the scope for accounting and preparation of the emissions inventory.

Table 2: Verified sources.

Font Description	Category	Scope
Generator – Stationary Combustion.	Stationary Combustion	1
Cooking gas consumption	Stationary Combustion	1
Fuel Consumption – Operational Support Vehicles – Mobile Source Combustion	Mobile Combustion	1
Refrigeration System (air conditioning)	Fugitive Emissions	1
Merger Process	Industrial Processes	1
Fertilizer consumption	Agricultural Activities	1
Solid Waste Treatment	Solid Waste	1
Liquid Effluents	Effluents	1
Acquisition of electrical energy	Localization Approach	2
Acquisition of electrical energy	Purchasing Choice Approach	2
Purchase of Thermas Energy	Indirect Emissions from Purchasing vapor	2
Purchased Goods and Services	1	3
Transport and Distribution (upstream)	4	3
Waste generated in operations	5	3
Home-to-work emissions	7	3
Transport and Distribution (downstream)	9	3
Processing of sold products	10	3
Use of goods and services sold	11	3

Note: [Emissions of GHGs and precursor gases thereof that are not covered by the Kyoto Protocol shall not be included in Scope 1, but may be reported separately. The inclusion or not of the verification of gases beyond those regulated by the Kyoto Protocol (Brazilian GHG Protocol, 2012) is informed.]*

In accordance with the principle of relevance, sources or gases of lesser expression may be excluded, provided that the cumulative emissions of all these sources represent a maximum of 5% of the sum of the company's total Scope 1 and 2 emissions in CO₂e. And in accordance with the principle of transparency, any exclusions should be clearly identified.

Excluded from verification: No deletion occurred.

4. Confidence Level

The NBR ISO 14064 standard defines two levels of confidence: reasonable or limited.

This level of trust is agreed with the Organization at the beginning of the verification process and determines the depth of detail with which the Verification Body (OVV) evaluates the greenhouse gas inventory, to determine if there are flaws, omissions, or misinterpretations.

This level of trust provides the basis for the issuance of the Verification Statement.

For this Organization the level of reasonable trust has been defined.

5. Materiality

Materiality is the concept according to which individual failures or a set of faults, omissions, and distortions, can affect the GHG declaration and influence the decisions of the intended user.

The determination of materiality involves both qualitative and quantitative aspects. As a result of these aspects, differences in quantity, even if relatively small, can have a significant effect on GHG declaration.

The acceptable materiality, defined based on the level of trust and agreed with the Organization, is 5%.

Absolute confidence is not achievable due to the inherent limitations of control and the qualitative nature of some types of evidence.

6. Verification Plan

The agency has the responsibility to identify the areas with the greatest potential for material deviations based on a risk analysis and determine the most representative sample of the volume emitted to visit the facilities and recalculate their emissions.

The plan should be corrected, where necessary, based on any new risk or material concerns that could potentially lead to errors, omissions and false information identified during the verification process.

Table 3: List of facilities visited.

Installation	Date of visit
BH Office	02/21/24
Três Marias Facility	02/20/24
Juiz de Fora Facility	02/23/24
Cajamarquilla Facility	03/13/24

7. Assessment of the inventory's compliance with publication requirements

A public GHG emissions inventory must include the following information to be considered complete:

Table 4: Inventory Information

Requirement	Comments	Compliance
<i>One person to contact.</i>	Júlia Morelli Faria julia.faria@nexaresources.com	Y
<i>Description of company and inventory boundaries.</i>	<i>Duly presented.</i>	Y
<i>A list of legal entities included in the inventory.</i>	<i>Duly presented.</i>	Y
<i>A schematic of the chosen organizational boundaries, including the consolidation approach chosen.</i>	<i>Duly presented.</i>	Y
<i>A schematic of the chosen operational limits and, if Scope 3 is included, a list that specifies what types of activities were included.</i>	<i>Duly presented.</i>	Y
<i>The total emissions of Scopes 1 and 2, regardless of any GHG exchanges, such as sales, purchases, transfers or banking of carbon credits.</i>	<i>Duly presented.</i>	Y
<i>Emissions data separated by scope.</i>	<i>Duly presented.</i>	Y
<i>Disaggregated emissions per operating unit for units where Scope 1 emissions from stationary combustion, industrial and fugitive processes add up to 10,000 tCO₂ or more.</i>	-	NA
<i>Emissions data for the six gases/GHG gas family separately (CO₂, CH₄, N₂O, HFCs, PFCs, SF₆) in metric tons of CO₂ equivalent.</i>	<i>Duly presented.</i>	Y
<i>The inventory period.</i>	<i>January 1 to December 31, 2023</i>	Y
<i>The year chosen as the base year, plus an emissions profile over time that is consistent with (and clarifies the reasons for) the recalculation of the base year's emissions.</i>	<i>Duly presented.</i>	Y
<i>The appropriate context of any significant changes in emissions that have caused the need to recalculate base-year emissions (acquisitions or disposals, outsourcing or de-outsourcing, changes in inventory limits or calculation methodologies, etc.).</i>	<i>Duly presented.</i>	S

<i>GHG emissions data for all years between the base year and the inventory year (including details of and reasons for recalculations, if applicable). Applicable only for complete inventories.</i>	<i>Duly presented.</i>	Y
<i>Emissions data for direct CO2 emissions from biologically fixed carbon (e.g. CO2 from biomass burning or biofuels), reported separately from scopes.</i>	<i>Duly presented.</i>	Y
<i>The methodologies used to calculate or measure emissions by providing the reference or a link to the calculation tools used.</i>	<i>Duly presented.</i>	Y
<i>Any specific deletions of sources, units, or operations.</i>	<i>Duly presented.</i>	Y
<i>A schematic of any external certifications obtained and, if any, copies of audit certificates of the reported issuance data.</i>	-	NA
<i>Information about reductions in sources within the inventory limit that were sold or transferred as offset credits to third parties. Specify whether the reduction has been verified, certified, or approved by an external GHG program.</i>	-	NA

8. Evaluation of the GHG information and control system

During the verification of the Organization's emissions inventory, the verification team evaluated the GHG information system and its controls, to look for evidence that confirms what is reported in the Inventory's Greenhouse Gas Inventory.

In this evaluation, the following were taken into consideration:

- Selection and management of GHG data and information;
- Processes of collection, processing, consolidation and reporting of GHG data and information;
- Systems and processes that ensure the accuracy of GHG data and information;
- Planning and maintenance of the GHG information system;
- Systems and processes that support the GHG information system.

A sampling and analysis of several data was made, among them:

- GHG data consolidation worksheets;
- Calculation Memorial
- Data ERP System.
- Interviews with those responsible for the information in the GHG inventory report of the Organization.

The full list of the evidence analyzed can be found in the Annex to this report.

9. Findings

Scope 1 (GHG – Kyoto)	Total emissions reported by OI:	244,991.80 tCO ₂ and
	Total emissions estimated by the OV:	244,991.80 tCO ₂ and
	Difference:	0 tCO ₂ and
	Detour:	0 %
Scope 2 (GHG – Kyoto)	Total emissions reported by OI:	463,078.99 tCO ₂ and
	Total emissions estimated by the OV:	463,078.99 tCO ₂ and
	Difference:	0 tCO ₂ and
	Detour:	0 %
Scope 3 (GHG – Kyoto)	Total emissions reported by OI:	1.199.463,15 tCO ₂ e
	Total emissions estimated by the OV:	1.199.463,15 tCO ₂ e
	Difference:	0 tCO ₂ e
	Detour:	0%
Other greenhouse gases not covered by the Kyoto Protocol (HCFC-22)	Total emissions reported by OI:	0 tCO ₂ and
	Total emissions estimated by the OV:	0 tCO ₂ and
	Difference:	0 tCO ₂ and
	Detour:	0 %

10. Conclusion and recommendation

In this check was identified 01 improvement opportunity (OM).

Details and evidence presented for the closure are presented in the Annex to this report.

All the findings raised were clarified by the Organization for the subsequent issuance of the Declaration of Verification of the OVV regarding the GHG Inventory.

The verification team confirmed that all emission sources, arising from the existing processes in the Organization's operations and activities, are consistent with the information contained in its Greenhouse Gas Inventory and supporting documents.

The most recent IPCC guidelines for Greenhouse Gas Inventories, their emission factors and methodologies, when applicable, were used as reference.

It is noteworthy that improvements in the GHG system are the result of the maturation of the system and the effective implementation of the requirements of NBR ISO 14064-1.

The Inventory Organization has established appropriate systems to implement the principles of ISO 14064.

The verification team recommends the issuance of the Verification Statement for the inventory of GHG emissions of the Inventory Organization - **reference year 2023**.

This statement will be issued by Bureau Veritas Certification upon independent review of this verification.

The independent review is carried out by a qualified professional and without any involvement in the verification process. It aims to assess the quality of the verification and confirm the applicability of the regulatory requirements.

The Verification Statement considers the level of trust agreed with the Organization, i.e. **reasonable**, and the procedures described in this verification report. It states that information is presented in a clear, understandable, accessible way, and allows the reader to form an opinion about the performance and situation in the year considered for the defined scope.

It also confirms that the Inventory of Greenhouse Gases – reference year **2023** of the Inventory Organization:

- It is materially correct, is a fair representation of GHG data and information, and has been prepared in accordance with the EPB;
- It is prepared according to the NBR ISO 14064 - Part 1: Specification and guidance to organizations for quantification and reporting of emissions and removals of greenhouse gases.

São Paulo, March 25, 2024.

A handwritten signature in black ink, appearing to read 'Rubens', with a stylized flourish at the end.

Rubens da Silva Ferreira

03/25/2024

Annex 1: References, persons interviewed and observers.

References:

1. Inventário do PBGHGP 2023;
2. Planilha do Consolidado do Inventário de 2023;
3. Estudo da WayCarbon;
4. Referência IZA;
5. Análise de risco das mudanças climáticas;
6. Inventário da Unidade do Peru;
7. Relatório anual de 2023;
8. Road Map de descarbonização;
9. Site NEXA - evidências de metas;
10. Apresentação sobre gestão das emissões;
11. Status Report;
12. Cronograma de implantação da DEEP;
13. Print da página de apresentação do ESG Gestão de GEE, com Avaliação geral e comparações;
14. Certificados de Treinamento;
15. Inventário Corporativo de 2022;
16. Inventários das Unidades;
17. Gás consumido GLP restaurante (NF de março, junho e outubro) - Juiz de Fora;
18. Combustão Móvel - consumo de diesel anual por áreas (NF de três meses) - Juiz de Fora;
19. Emissões Fugitivas (dados de ar-condicionado - R410 e R22) - Juiz de Fora;
20. Planilha de consumo dos dados extraídos via SAP - NF de três meses - Juiz de Fora;
21. Planilha de consolidação dos dados dos Processos Industriais - Planilha dos dados do Forno Wals - Juiz de Fora;
22. Planilha de consumo de adubo e NF de compra do ano - Juiz de Fora;
23. Resíduos Sólidos - Planilha do volume de resíduos e inventário de resíduos da unidade - Juiz de Fora;
24. Efluentes - Planilha de Cálculo de Efluentes Líquidos - medição diária - planilha consolidada mensal - Juiz de Fora;
25. Contas de Energia do ano de 2023 - Juiz de Fora;
26. Deslocamento Casa-Trabalho - Planilha de Dados da empresa ANSAL Fretamento e Turismo - Quantidade de combustível gasto - Juiz de Fora;
27. Escopo 1: Combustão Móveis (planilha SAP e notas fiscais de 3 meses)/Combustão Estacionária (planilha SAP)/Resíduos Sólidos - Escopo 1 (planilha emissões estação de tratamento) / Uso de fertilizantes com Notas fiscais de aquisição de produtos - Três Marias;
28. Escopo 2: Notas fiscais consumo de energia elétrica / planilha dados da biomassa para geração de vapor (planilha SAP) para energia térmica - Três Marias;
29. Escopo 3: Cat 1 - Bens e Serviços (corporativo) / Cat 4 (corporativo) / Resíduos Sólidos (MTR - manifestos) / Transporte e distribuição (downstream) / Deslocamento casa- trabalho (dados de combustíveis imputados por empresas terceiras através de documentos - Três Marias;
30. Hoja por tipo de gás anual - Cajamarquilla;
31. Hoja de cálculo anual de CO2 biogénico - Cajamarquilla;
32. Hoja de cálculo general de todos los escopos 1, 2 e 3 / Hojas de cálculo de consumo anual de GLP, GN y diesel y 3 facturas de GLP, GN y Diesel / Hoja de cálculo de los vehículos ligeros y 3 NF de consumo / Hoja vehículos de carga pesada de consumo de diesel / Hoja de cálculo anual de los gases R-404a y R-410a y facturas anuales destes gases / Hoja de cálculo de los gastos

com energia comprada y de la energia que producen / Hoja de cálculo del desplazamiento de trabajadores casa-trabajo, hojas de calculos anual de la distribucion de distribución de entregas - Cajamarquilla;

33. Hoja de responsables de los areas - correo eletrônicos - Cajamarquilla;
34. Evidências de los proyectos de mitigación - 3 evidencias - Cajamarquilla;
35. Registros de calibración - Cajamarquilla.

People interviewed:

Persons interviewed during the verification process:

1. Júlia Morelli Faria - Corporativo;
2. Fernanda Noreira Amaral - Juiz de Fora;
3. Luiz Paulo Alves Leandro - Juiz de Fora;
4. Gleidson Albano de Macedo - Juiz de Fora;
5. Chrystian Lopes Lourenço - Juiz de Fora;
6. Lidiane Lopes Sales - Juiz de Fora;
7. Nandialla Pereira Cesar da Silva - Juiz de Fora;
8. Gislene Gomes Rocha - Juiz de Fora;
9. Flávio Carpanis da Silva - Juiz de Fora;
10. Bruna Ribeiro da Silva Nascimento - Três Marias;
11. Alexandre Akira Inamura - Três Marias;
12. Angela Ascarza Alcuña - Cajamarquilla.

Observers:

During the verification process, the following participated as Observers: N/A.

Annex 2: Verification Protocol

Table 5: Resolution of Corrective Action Request (SAC), Clarification Request (SE) and Improvement Opportunity (OM).

SAC / SE / OM	Normative Reference	Customer response	Completion of the verification team
OM-01 Date: 02/23/24 Carry out removal calculations for reforestation and composting activities	5.2.2 Emissões e remoções diretas de GEE 14064-1:2022	Ok, we will take this matter to those responsible as a means of continuous improvement of our processes	.

Annex 3: Curriculum vitae of the verification team

Lead Auditor: Rubens Ferreira

Graduated in Chemical Engineering and Accounting Sciences, with a specialization in Occupational Safety Engineering, postgraduate degree in Quality and Productivity Management and with MBAs in Environmental Management, Corporate Risk Management, Project Management. Currently studying an MBA in Circular Economy and Sustainable Development. Professional with over 35 years of experience, thirteen years in industry (ISOVER-Saint Gobain), working in the areas of Quality, Environment and Industrial Process Development. 18 years of experience in Auditing and Certifications, acting as Lead Auditor in Quality Management Systems, Environment, Occupational Health and Safety and Energy Efficiency. Verifier of Sustainability Reports, Greenhouse Gas Inventories and Green Bonds. During this period he also worked with the Validation and Verification of Clean Development Mechanism (CDM) Projects, as well as other voluntary mechanisms (VCS, Gold Standard), having participated in the validation/verification of more than 40 of these projects (Bureau Veritas Certification) . He was Certification Manager, managing activities related to the Validation and Verification of Carbon Credit Projects, as well as Verification of Greenhouse Gas Inventories (IBOPE Ambiental), having even participated in the qualification processes with UNFCCC and INMETRO. He recently served as Carbon Project Development Manager at Waycarbon, managing the team responsible for developing carbon credit projects related to nature-based and technology-based solutions. He currently works providing services in the area of Sustainability for Bureau Veritas, as an independent consultant on Climate Change, and coordinates the Climate Commitment Program of the Ekos Institute. He is also a postgraduate professor in subjects related to climate change and preparation and verification of greenhouse gas inventories (Bureau Veritas).

Auditor: Adriano Angelotti

Master in Environment, Specialist in Environmental Sciences and Specialist in Quality Management from the University of Granada - UGR, in Spain. Specialist in Environmental Sciences and Specialist in Quality Management. Lines of Research in Product Life Cycle Analysis / 3rd Party Audit Techniques. MBA in Sustainability and ESG from Instituto ETHOS. Postgraduate in Carbon Market and Climate Change. Business Administrator by UNIBERO. He has 15 years of experience with Sustainability, HSE and Climate Change, having worked in large companies such as Petrobras, Nuclebras, Eletrobras, the Brazilian Olympic Committee – COB, among other large companies. Lead Auditor IRCA International for ISO 14001, 9001 and OHSAS 18001. Lead Auditor for ISO 14064 – Greenhouse Gas Inventory and ISO 14067 – Carbon Footprint. Special Advisor for Sustainability at the ESG Foundation, an organization based in London. Independent consultant for the implementation of Sustainability/ESG, Environmental Management Systems and Preparation of Carbon Credit Projects.

Independent Reviewer: Thiago Milagres

Graduated in Water Resources and Environmental Engineering from UFF, postgraduate in Economics and Sustainability Management from UFRJ. He worked at the Brazilian Association of Technical Standards (ABNT) in the area of sustainability, managing greenhouse gas inventory verification processes and Environmental Labeling Type I and III certification. Member of the Center for Industrial

Environmental Studies at UERJ, he has been working with greenhouse gas inventories for five years. He is a leading Management Systems (QSM) auditor, GHG validator and verifier.

Annex 4: Table of emissions by scope and greenhouse gas

Table 6: Emissions by scope and greenhouse gas emissions

In metric tons of CO ₂ equivalent (tCO ₂ e)				
GEE	Scope 1	Scope 2 - Localization approach	Scope 2 - Purchase Choice Approach	Scope 3
CO ₂	235,450.02	447,248.48	11,769.40	1,198,876.46
CH ₄	3,660.22	897.68	897.68	144.14
N ₂ O	1,737.08	1,132.88	1,132.88	442.55
HFC	4,144.49	-	-	-
PFC	-	-	-	-
SF ₆	-	-	-	-
NF ₃	-	-	-	-
Total	244,991.80	449,279.04	13,799.95	1,199,463.15
Biogenic CO₂	7,940.89	119,511.33	119,511.33	3,026.62