Annex A: Sustainability Report

Contextual Information

Company Details	
Name of Organization	Benguet Corporation
Location of Headquarters	7F Universal RE Building, 106 Paseo de Roxas, 1226 Makati City Philippines
Location of Operations	Itogon, Benguet Province for mining of gold and silver Irisan, Baguio City for operation / processing of lime products
Report Boundary: Legal entities (e.g. subsidiaries) included in this report*	Benguet Gold Operations (BGO) Corporate Headquarters (CHQ) Irisan Lime Project (ILP)
Business Model, including Primary Activities, Brands, Products, and Services	Natural resources company engaged in, but not limited to the following: 1. Mineral exploration; 2. Mine development; 3. Mineral resources extraction; 4. Gold & silver processing; 5. Management of mine waste and mill tailings; 6. Production of quicklime and hydrated lime; and 7. Restoration / rehabilitation of mined-out areas.
Markets Served	Processed gold is sold to Bangko Sentral ng Pilipinas (BSP); Lime products are sold to mining and allied companies and farmers within Benguet and neighboring Provinces.
Scale of the Organization	1. Total average number of employees for 2024 is **301** employees which includes Central Headquarters (CHQ), Benguet Gold Operation (BGO) and Irisan Lime Project (ILP). 2. Total number of operations: ➢ One (1) – Mining and milling operations for gold and silver ➢ One (1) – 3 Kilns alternately operating for lime production. 3. Net Sales (private sector) ➢ Total Capitalization ➢ Debt – Php_1.69B ➢ Equity – Php7.934B 4. Quantity of products – ➢ Gold – 5,750.74 ounces ➢ Silver –999.10 ounces ➢ Lime – 6,362.14 Metric Tons
Reporting Period	CY 2024
Highest Ranking Person responsible for this report	Atty. Lina G. Fernandez – President

Materiality Process

Explain how you applied the materiality principle (or the materiality process) in identifying your material topics.[1]

The 2024 Sustainability Report provides the fundamentals of informing our stakeholders in understanding the most critical and material topics that contributed to and affected the 2024 ESG performance that impacted people's health, environment, and economy. Beyond the unprecedented challenges, the Company has embodied a solution-driven mindset to impart lasting value to its investors and stakeholders. The report provides a detailed overview of the way best sustainability practices are deeply rooted in Benguet Corporation's business.

It is of these facts that Benguet Corporation unceasingly strives to manage its operation under the following principles and commitments to attain its long-term objectives:

a. Profit and growth-oriented;
b. Responsible operation and care for the environment;
c. Commitment to improving the quality of life of our employees, the communities, and all stakeholders; and
d. Compliance with existing laws, rules, and other obligations

The Board has a clearly defined and updated vision, mission, and core values. Please refer to the BC website under the tab "About Us" http://:benguetcorp.com/about-us/

Please refer also to the Board Charter p.8 which states that one of the general responsibilities of the Board is to determine the Company's purpose, vision, mission, and strategies to carry out its objectives. http://:benguetcorp.com/corporate-governance/board-committee/

Economic Material Factors

Our economic performance is based on the value our operations contribute to the local and national governments, host and neighboring mining communities, and the environment, at large. Our operations have created derived demand resulting in the establishment of micro, small, and medium enterprises in our mining community as well as in other areas where we source our value chain. Through our operations, the quality of life of our shareholders, employees, and other stakeholders has improved, local economies vigorously grew, and protection of the environment- intensified

Environmental Material Factors

Benguet Corporation is committed to the protection and enhancement of the environment by ensuring that its mining operations are in full compliance with mining and environmental laws, rules, and regulations. It ensures close collaboration and coordination with the Department of Environment and Natural Resources (DENR), the Mines and Geosciences Bureau (MGB), the Environmental Management Bureau (EMB), and all the government agencies that monitor compliance. Sustainability is core to BC's corporate strategy and sits at the heart of everything it does. Our operation aims to be environmentally responsible, respecting human rights and supporting the communities in which BC operates. It is the leading value that enables our people to understand our common purpose, our values, how we measure success, and the basis for our decision-making. It is about managing our risks, reducing adverse environmental, social, economic, and cultural impacts, and supporting and sustaining the communities and environments in which we operate.

The Environmental Material Factors have been considered essential in keeping our operations successful. As a mining company, we are committed partners of the government in the conscientious development of the country's natural resources. This agreement comes with a huge responsibility not just to harness, but most specifically to protect, nurture, restore, and enhance the environment. Nature and the resources within are the main enablers of our business, and as such, considerable care is our priority. Mitigating any possible adverse effects of our operations on the environment is part of our day-to-day function. The Company's mining activity is guided by the provisions of the Philippine Laws, such as but is not limited to the following:

1. Department Administrative Order No. 2010-21 (Implementing Rules and Regulations of R.A. 7942 – The Philippine Mining Act of 1995)
2. R.A. 9275 – Philippine Clean Water Act 0f 2004
3. Department Administrative Order No. 2005-10 (IRR of R.A. 9275 – Philippine Clean Water Act);
4. Department Administrative Order No. 2000-98 (Mine Safety and Health Standard);

[1] See *GRI 102-46* (2016) for more guidance.

5. Department Administrative Order No. 2000-81 (IRR of R.A. 8749 – Philippine Clean Air Act);
6. R.A. 8371 – Indigenous Peoples Rights Act;
7. DENR Administrative Order N0. 2001-34 (IRR of R.A. No. 9003 – Ecological Solid Waste Management Act),
8. R.A. No. 6969 – An Act to Control Toxic Substances and Hazardous and Nuclear Wastes
9. Department Administrative Order No. 28 (IRR of R.A. 6969 – Toxic Substances and Hazardous and Nuclear Wastes Control Act); and
10. DENR Administrative Order No. 2003-30 (Revised Procedural Manual of P.D. 1586 – Environmental Impact Statement System).

We constantly monitor the land, air, and water quality, the siltation levels in bodies of water, as well as the forest cover / density in the affected areas within our operations and its surrounding environs. We adhere to the strict parameters laid out by the government in ensuring that we protect the ecosystem, promote biodiversity, and enhance the environment.

Social Material Factors

Benguet Corporation puts health and safety as top priority and believes that sustainability includes playing an appropriate role in addressing global issues such as climate change, supporting and respecting human rights, and advocating for social change such as by supporting the rights of Indigenous Peoples. As a century-old corporation, BC has witnessed and navigated through countless crises together with our employees, suppliers, and local communities but BC managed to put top priority concerns to people first.

As a responsible business entity, our Vision, Mission, Goals, Safety and Environmental Policies are centered on achieving productivity and advocating for the safety and health of our employees, assisting the people within our host and neighboring communities, and the continuous enhancement of our environment. We share the stewardship of our country's natural resources. As we operate within the indigenous communities, we support local cultures and respect human rights as we help drive economic development in the area.

As a responsible corporate partner of society, the Company has a social obligation not only to preserve, protect, and enhance the physical and ecological environment but also to improve the quality of life of the people in the communities surrounding the operation.

Aside from the Company's commitment to be socially responsible and environmentally conscious, it also aims to achieve competitiveness and excellence as a natural resource development Company through enhanced productivity and improvement of quality of life of its employees, their families and the host communities. At the heart of Benguet Corporation's philosophy are the people (employees and other stakeholders) promoting not only their interests and maintaining good community relationships but also to enable them to be empowered for the stewardship of the environment and natural resources surrounding them. To support this, we empowered and developed an inclusive and diverse workforce that is representative of the communities where we operate.

As a continuing commitment and manifestation of the Company's compliance with the implementation of its Social Development and Management Programs, Benguet Corporation has extended assistance on the various needs of its host and neighboring communities in all its areas of operations based on the following development framework as provided under the SDMP guidelines:

1. On Human Resource Development and Institutional Building,
2. On Enterprise Development and Networking,
3. On Assistance to Infrastructure Development and Support Services,
4. On Access to Education and Educational Support Programs,
5. On Access to Health Services, Health Facilities and Health Professionals
6. On Protection and Respect to Socio-Cultural Values
7. On the Development of Mining Technology, and
8. On United Nations Sustainable Development Goals.

This is our fundamental way to maintain our social license.

ECONOMIC PERFORMANCE

Direct Economic Value Generated and Distributed

Disclosure	Amount (2024) - BGO	Amount (2024) - ILP	Total Amount (2024)	Total Amount (2023)	Unit
Direct economic value generated (revenue)	791.96	100.02	891.77	727.81M	PhP
Direct economic value distributed:					
a. Operating costs	388.31	64.50	452.81	350.35M	PhP
b. Employee wages and benefits	98.42	4.34	102.76	123.59M	PhP
c. Payments to suppliers, other operating costs	134.00	11.07	145.07	182.92M	Php
d. Dividends given to stockholders	143.56		143.56	0.00	PhP
e. Interest payments to loan providers	7.934M		7.934M	2.521M	PhP
e. Taxes given to government (excise)	31.64	Consolidated BC		25.46M	PhP
f. Investments to community (e.g. donations, CSR)	4.91	0.67	5.58	6.77M	PhP

Identification of Impact	Stakeholders Affected	Management Approach
Benguet Corporation's mining operations encompass two key sites: the Benguet Gold Operation (BC-BGO) in Benguet, which utilizes underground mining or tunneling methods, and the Irisan Lime Project (ILP) in Baguio City. ILP sources its raw limestone from land development and quarrying suppliers in the surrounding areas of Baguio City and Benguet Province as feed material for its kiln plant. Total Revenue for 2024 increased to Php891.77 million, up Php163.96 million or approximately 22.5% from Php727.81 million in 2023. The increase was primarily driven by: • BGO contributing Php791.96 million, approximately 88.8% of total revenue. • ILP contributing Php100.02 million, about 11.2% of the total. Gold production in 2024 reached 5,508.05 ounces, lower compared to 5,931.97 ounces in 2023. Decline in production is due to lower ore milled this year. Increase in revenue is attributed to higher price of gold partly offset by lower volume of gold sold. Gold sold in 2024 decreased to 5,750.74 ounces from 5,803.21 ounces in 2023. ILP generated P100.02M revenue this year, slightly lower than 2023. Lime sold decline to 6,362.14 DMT from 6,464 DMT in 2023, but this was partly	The Company's operations generate significant economic impacts, benefiting a diverse range of stakeholders: • Employees • Mining Contractors • Host and Neighboring Communities • Local and National Government: Service Providers and Suppliers • Local Business Establishments • National Government: • Micro, Small, and Medium Enterprises (MSMEs • Shareholders	The Company manages its economic impacts through strict regulatory compliance, ethical business practices, and fulfillment of stakeholder commitments; it drives operational excellence and invests in long-term resilience via diversification into agribusiness, land development, and renewable energy; management, finance, health and safety, and diversification teams each have defined responsibilities, supported by proactive measures to mitigate potential negative economic impacts. The Company remains steadfast in its commitment to employees and host communities by providing the following key benefits: • Fosters economic growth in host and neighboring communities. • Maintains the family income of employees and community residents. • Delivers medical services through the Social Development and Management Program (SDMP). • Offers educational scholarships to deserving students from host and neighboring communities. • Ensures the continued collection of tax revenue by local government units. • Assists in local government infrastructure projects and sustains the delivery of essential community services via the SDMP. • Guarantees budgetary allocations for the protection and enhancement of the environment and for social development programs. • Subsidizes electricity and provides free

offset by the increase of price in 2024. A notable shift in 2024 was the payment of Php143.56 million in dividends to stockholders, whereas no dividends were distributed in 2023. This was due to the settlement of its old debt subject to the 1993 Restructuring Agreement. It underscores the company's commitment to shareholder returns.		water to employees and other stakeholders within the communities.

What are the Risk/s Identified?	Stakeholders Affected	Management Approach
. Risk identified that have affected the 2024 operation are the following: • Financial volatility, • Resource constraints, • Evolving regulatory uncertainties, • Illegal mining intrusions (both external and internal), • Internal theft, • Safety and security breaches, • Environmental risks (particularly water quality), • Unstable power supply, • Depletion of non-renewable resources, • Scarcity of timber for mine support, and • Increased competition for water resources.	• The Company • Employees of the Company and Mining Contractors • People in the Host and Neighboring Communities • Local and National Government • Service Providers and Suppliers	The Company employs a comprehensive approach encompassing environmental protection (ISO 14001:2015 EMS compliance and rehabilitation investments), proactive stakeholder engagement (with Indigenous Peoples, LGUs, and communities through SDMP), strong regulatory communication and compliance (with DENR, MGB, EMB), and robust asset protection measures (enhanced monitoring, increased security surveillance, and technology deployment to abate gold pilferage).

What are the Opportunity/ies Identified?	Stakeholders Affected	Management Approach
The Company actively pursues strategic opportunities to enhance operational efficiency and financial resilience in the context of rising energy costs and evolving market conditions: • By implementing shared mill charges, the Company reduces exposure to fluctuating fuel and power prices. • With continued increases in gold prices, BGO is investing in deeper-level mining studies to optimize ore extraction, leveraging external consultants for technical evaluations, for its Expansion in below Level 2000. • The Company is exploring advanced technologies to improve gold recovery from tailings, supporting both economic value creation and resource sustainability.	• The Company • Mining Contractors: • Investors	BGO addresses rising energy costs and leverages high gold prices by implementing shared mill charges to promote cost efficiency and sustainability. The Company engages consultants to assess other areas for increased production potential and is actively exploring new technologies to enhance gold recovery from tailings. These initiatives support long-term financial resilience and operational efficiency, aligned with the Company's sustainability goals.

Climate-related risks and opportunities[2]

Governance

Disclose the organization's governance around climate-related risks and opportunities.

The Company acknowledges the significant impacts of its energy-intensive activities, including GHG emissions. Climate-related risks and opportunities are integrated into the Company's governance structure and overseen by the Board Risk Oversight Committee (BROC). The BROC develops and implements the enterprise risk management plan, evaluating key risks, including climate and EESG factors. The Chief Risk Officer supervises risk management processes, while the executive team implements the climate strategy. The Company's ISO 14001:2015 certified EMS and the EPEP provide frameworks for managing climate risks, ensuring sustainable operations through Board oversight.

Please refer to Manual on Corporate Governance. http://benguetcorp.com/corporate- governance/board-committees/.

Strategy

Disclose the actual and potential impacts[3] of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning where such information is material.

Global warming is distinct. Climate change covers a wide range of different circumstances, such as the increasing number of natural calamities caused by abnormal weather conditions, depletion of water resources, food scarcity, flooding, typhoons, earthquakes, etc. Under each condition, the impacts to the mining operation of BC-BGO and to the surrounding environment are pronounced.

Every year, BGO and ILP allocate a portion of its operating cost to further strengthen its environmental programs that, to some extent, go beyond mere regulatory compliance.

BGO and ILP operations are in collaboration with the host and neighboring communities to actively participate in CO^2 sequestration by planting more trees in their surroundings.

All plantations that were previously established are being maintained yearly.

The total expenditures for the implementation of the environmental protection program of BC-BGO in 2024 amounted to P10,706,065.42.

Risk Management

Disclose how the organization identifies, assesses, and manages climate-related risks.

- Identification and Assessment: In accordance with ISO 14001:2015, BC-Benguet Gold Operation systematically identifies and assesses environmental aspects and their associated impacts, including climate-related risks. This process considers both direct and indirect impacts of our operations.
- Environmental Risk Management System Manual: All identified and assessed climate-related risks, along with their corresponding mitigation measures, are documented and addressed within our Environmental Management System (ERMS) Manual. This manual outlines procedures for managing these risks, including operational controls, monitoring, and emergency preparedness, Specifically: Benguet Corporation identifies, assesses, and manages climate-related risks through its enterprise risk management framework overseen by the Board Risk Oversight Committee (BROC). The committee develops and monitors risk management strategies that integrate climate-related risks with other environmental, economic, and social factors. Climate-related risks are assessed within the broader risk framework, with mitigation plans developed to manage them. Reports on risk exposures and the effectiveness of mitigation strategies are provided to the Board to ensure comprehensive management.
- Environmental Protection and Enhancement Program (EPEP): The Environmental Protection and Enhancement Program (EPEP), which is continuously monitored by regulatory agencies, includes specific measures to mitigate climate-related risks. This may include initiatives to reduce GHG emissions, improve energy efficiency, manage water resources sustainably, and protect biodiversity. The EPEP ensures that our operations comply with environmental regulations and strive for continuous improvement in our environmental performance.

[2] Adopted from the Recommendations of the Task Force on Climate-Related Financial Disclosures. The TCFD Recommendations apply to non-financial companies and financial-sector organizations, including banks, insurance companies, asset managers and asset owners.
[3] For this disclosure, impact refers to the impact of climate-related issues on the company.

- Monitoring and Review: The effectiveness of our climate-related risk management measures is continuously monitored and reviewed as part of our EMS and EPEP. This includes regular audits, performance evaluations, and management reviews to ensure that our strategies remain effective and aligned with best practices.

Please see Risk Management Charter https://benguetcorp.com/wp-content/uploads/2024/06/Risk-Management-Charter.pdf
And ERM Framework https://benguetcorp.com/wp-content/uploads/2024/06/Enterprise-Risk-Mgnt-Framework.pdf

Metrics and Targets

Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.

The Company continuously looks at ways in contributing to community and ecosystem resiliency.

With the approved Annual Environmental Protection and Enhancement Program (AEPEP), the Company laid out its annual targets and milestones to continuously address and mitigate the identified climate related risks which are stated in its Corporate Governance Manual.

Recommended Disclosures	
a) Describe the board's oversight of climate-related risks and opportunities. The Board of Directors of BC-Benguet Gold Operation oversees climate-related risks and opportunities through the Board Risk Oversight Committee (BROC). The BROC ensures these risks are identified, assessed, and managed within the enterprise risk management framework. It monitors implementation, advises on risk appetite, and integrates climate considerations into the EMS and EPEP, aligning with ISO 14001:2015. The Chief Risk Officer and executive team support the BROC with regular updates, ensuring that climate risks are addressed strategically and sustainably at the highest level of governance.	*a) Describe the climate-related risks and opportunities the organization has identified over the short, medium and long term.* Among the identified risks and opportunities related to climate change are the following: 1. Risks - a. Deforestation b. Landslide c. Forest fire / bush fire d. Underground water depletion e. Air pollution 2. Opportunities – a. Employment through reforestation activities b. Watershed enhancement c. Water spring and water impounding development d. Cleaner air
a) Describe the organization's processes for identifying and assessing climate-related risks. BC-Benguet Gold Operation employs a structured process for identifying and assessing climate-related risks, integrated into its broader risk management framework and aligned with ISO 14001:2015. Key elements include: 1. Systematic Risk Identification: Climate-related risks (physical and transition) are systematically identified as part of environmental aspect assessments, which aligns with the principles of ISO 14001:2015. 2. Site Manager Involvement: Site Managers assess operational risks. This ensures that operational realities and site-specific vulnerabilities to climate change are thoroughly considered. 3. Risk Response Development: Management develops mitigation plans with budget estimates. 4. Executive Management Approval: Plans are reported to Executive Management for approval, and to BROC, if	*a) Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process.* We recognize that there is increasing pressure to better understand and mitigate GHG emissions. Our Company strategically integrates the assessment of climate-related risks and opportunities in our business functions and risk management processes through transparent communication and a commitment to environmental stewardship, measured through the following : 1. Integrated Governance and Communication: Open lines of communication exist between the Board, Committees, Company Executives, and Site Management. We track the content of Board and Committee discussions pertaining to climate-related risks and opportunities.

necessary. 5. Implementation and Reporting: Site Management implements plans and reports on progress . 6. Monitoring: The Chief Risk Officer monitors mitigation effectiveness. 7. Regulatory Reporting: Risks and actions are reported to regulatory agencies. *Please refer to Board Risk Oversight Committee Charter link http://benguetcorp.com/wp-content/uploads/2020/06/C-Board-Risk-Oversight-Comm-Charter.pdf*	2. Prioritized Climate-Related Programs: Programs on climate-related risks, particularly water management, pollution control, tailings management and reforestation, are top management priorities. The effectiveness of our water management programs is assessed through metrics measured against regulatory standards. Pollution control efforts are evaluated based on reductions in air and water pollutant emissions (measured in relevant units like ppm or mg/L) and adherence to permitted levels. The success of reforestation activities is tracked by the number of hectares reforested and the survival rate of planted species. 3. Compliance with Environmental Laws and Regulations: BC-BGO and ILP adhere to the provisions of the following various Philippine Environmental Laws and Regulations: a. R.A. 9275 – Philippine Clean Water Act 0f 2004 b. DAO No. 2005-10 (IRR of R.A. 9275 – Philippine Clean Water Act); c. DAO No. 2000-81 (IRR of R.A. 8749 – Philippine Clean Air Act); d. DENR Administrative Order N0. 2001-34 (IRR of R.A. No. 9003 – Ecological Solid Waste Management Act); e. R.A. No. 6969 – An Act to Control Toxic Substances and Hazardous and Nuclear Wastes; f. Department Administrative Order No. 28 (IRR of R.A. 6969 –Toxic Substances and Hazardous and Nuclear Wastes Control Act); and g. DENR DAO No. 2003-30 (Revised Procedural Manual of P.D. 1586 – Environmental Impact Statement System). Our compliance with environmental regulations (R.A. 9275, DAO 2005-10, DAO 2000-81, DENR AO 2001-34, R.A. 6969, DAO 28, and DENR AO 2003-30) is rigorously monitored through regular audits and inspections, recording any instances of non-compliance and the corrective actions taken. We also track the number of environmental permits and licenses held and their renewal status to ensure continuous operational legality.
b) Describe management's role in assessing and managing climate-related risks and opportunities. • Executive management, led by the Chief Risk Officer (CRO), manages the day-to-day assessment and management of these risks. • At BC-Benguet Gold Operation, climate change management is a shared responsibility among key managers and front-line personnel. • Executive management's duties include: a. Identifying and assessing physical and transition risks through departmental collaboration. b. Developing and implementing mitigation and opportunity strategies. c. Monitoring effectiveness against set targets. d. Regularly reporting to Executive Management and BROC	*b) Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy and financial planning.* The mining operation is an extractive process that is always associated with environmental risk. Benguet Corporation's operation in Itogon is the subject of rigorous evaluation and monitoring by regulatory agencies on its compliance with environmental laws and regulations to reduce or eliminate pollution. The Company stands in solidarity with the government to arrest the deteriorating climate pattern through wise utilization of natural resources and lowering CO2 emission that affects the ozone layer.

(when necessary). e. Integrating climate considerations into the Environmental Management System (EMS) and Environmental Protection and Enhancement Program (EPEP), aligned with ISO 14001 standards. f. Collaborating with external stakeholders on climate issues. • The CRO oversees the Enterprise Risk Management (ERM) process and communicates top risks, including climate-related ones, to the BROC.	The Company's reforestation programs (Mining Forest Program and the National Greening Program) are its positive contribution to the worsening climate change. As presented in the approved Annual Environmental Protection and Enhancement Program of 2024, Plans/Programs/Activities (P/P/A's) are all provided with corresponding budget and monitoring strategies.
b) Describe the organization's processes for managing climate-related risks BC recognizes the role in collaborating with others to achieve progress in managing the challenges of climate change. Experts from the private sector, government agencies, the academe, and non-government organization are were consulted on various aspects to prevent and minimize the effects of climate change. The company implements programs that are consistent with its goals and targets. The budget for the full implementation of the reforestation program on denuded slopes of the mountain and rehabilitation of eroded areas are funded. Water pollution control measures are strictly monitored to prevent the escape of processed water from leaks that may contaminate the water bodies. The company seeks opportunities to work with partners to utilize technologies that will include carbon capture and the natural climate solutions of reforestation and afforestation. We will continue to seek opportunities to collaborate with value chain partners, investors, researchers, and government agencies to work towards reducing the negative effects of climate change.	*c) Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.* The implementation of the approved 2024 Environmental Protection and Enhancement Program (EPEP) of BGO and ILP includes the annual targets and corresponding budget per activity. The total expenditures for the implementation of the 2024 EPEP amount to PHP 10,706,065.42, reflecting approximately 59.09% of the approved PhP 18,117,248.00 AEPEP budget.
d) Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios including a 2°C or lower scenario. BC's environmental enhancement program, particularly on reforestation and forest protection, is aimed at reducing CO^2 in the atmosphere. In addition to the establishment of forest plantations, additional projects implemented to attain the different climate-related scenarios are as follows: • Increased preventive maintenance schedule of anti-pollution devices such as scrubbers to arrest air pollutants from gold smelting processes. • Dust emissions were reduced with a dust suppressor system using air and water to act as suppressors for spraying along roads inside industrial area. • Regular preventive maintenance program is being conducted on vehicles and equipment to ensure smoke emissions are within the DENR-prescribed standards.	*c) Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management.* The Board Risk Oversight Committee and CRO are tasked to make sure that the Company's environmental programs and compliances are integrated into the overall mine development program and implemented in accordance with the approved program by the Department of Environment and Natural Resources through the Mines and Geosciences Bureau and Environmental Management Bureau.

• All environmental safeguards are put in place to mitigate and reduce the emission of CO^2.	

Procurement Practices

Proportion of spending on local suppliers

Disclosure	Quantity				Units
	BGO		ILP		
	2024	2023	2024	2023	
Percentage of procurement budget used for significant locations of operations that is spent on local suppliers.	92% 123,830,567.00	91% 114,454,825.00	100% 62,131,972.29	100% 61,696,298	% Php

Identification of Impact	Stakeholders Affected	Management Approach
Both BGO and ILP demonstrate a very high proportion of their procurement budget being spent on local suppliers in both 2024 and 2023. BGO shows a slight increase in its percentage of spending on local suppliers from 91% in 2023 to 93% in 2024. On the other hand, ILP maintained a consistent 100% of its procurement budget spent on local suppliers in both years. The high proportion of spending on local suppliers by both BGO (91-92%) and ILP (100%) in 2023-2024 aligns strongly with the company's emphasis on sustainable procurement and working closely with key partners along the value chain. This preference for local sourcing contributes to several sustainability objectives: • Local Economic Development: By prioritizing local suppliers, both BGO and ILP are directly supporting the economies within the Philippines. This fosters local job creation, strengthens local businesses, and contributes to the overall economic well-being of the communities. • Reduced Transportation Emissions: Sourcing locally for essential commodities, supplies, and materials can significantly reduce the environmental impact associated with long-distance transportation, including lower GHG emissions	Employees in-charge of procurement Suppliers/manufacturers of product and services providers Materials Management Departments	BC believes that the success of the operation can be achieved through respect and transparent dealings between the management and the various agencies/entities and suppliers that provide the goods and services to the Company. It manages supplier relationships through its values and compliance with applicable regulatory frameworks. To ensure sustainability in our supply chain, a risk-based approach in assessing suppliers is in place. Suppliers must comply with the standard requirements, such as ISO certified or government standard compliances. We acknowledge the invaluable contributions of our suppliers and service providers who play an integral role in our holistic value chain.

from freight and reduced reliance on extensive logistics networks. • Stronger Partnerships: The practice of working closely with our key partners/suppliers fosters long-term relationships, promotes knowledge sharing on sustainability practices, and builds a more resilient and responsible supply chain within the Philippines.		
What are the Risk/s Identified?	**Stakeholders Affected**	**Management Approach**
Delays in the delivery of imported supplies and materials/equipment parts have affected the mechanical availability of the equipment. Sub-standard quality of supplies and materials or products that may affect or slow down the operation and reduce gold production. Sourcing imported materials is expensive and may delay the delivery of needed supplies which will affect production.	Shareholders – lesser revenue due to lower production; Employees of contractors and suppliers – productivity is affected; Operations – they must work around the limitations of local suppliers sometimes sacrificing the timeliness of the process which may result in higher production costs. Suppliers – loss of trust and confidence	To ensure sustainability in the supply chain, a risk-based approach is being taken in assessing suppliers. We engage them through a commercial framework that is aligned with BC's Purchasing Policy. Long-term planning on mining development and programs to advance the forecasting of needed materials and supplies to ensure availability when needed by the operation. The company has prioritized suppliers with ISO 14001-2015 Certification.
What are the Opportunity/ies Identified?	**Stakeholders Affected**	**Management Approach**
. Partnering with local suppliers gives BC better credit lines, more responsive lead times, and customization options (smaller minimum order requirement). Through its mining operation, the Company is opening doors and providing business opportunities to suppliers and service providers, (local and foreign suppliers, and community residents).	Suppliers – local suppliers can sustain and grow their operations because of the mining operation of BGO and ILP. MSMEs – as mining operations expand, intermediate industries are given the opportunity to address the needs in each part of the value chain. Employees – direct collaboration in dealing with local suppliers	Continue to develop good relationships with suppliers and service providers. Continue to work with local suppliers that provide quality services and products at lower costs.

Training on Anti-corruption Policies and Procedures

Disclosure	Quantity	Units / %
The percentage of employees to whom the organization's anti-corruption policies and procedures have been communicated to	100	%
Percentage of business partners to whom the organization's anti-corruption policies and procedures have been communicated to	100	%
Percentage of directors and management that have received anti-corruption training	100	%
Percentage of employees that have received anti-corruption training	100	%

Identification of Impact	Stakeholders affected	Management Approach
BC practices zero tolerance to corruption in the conduct of its business. Some potential sources of corruption are as follows: Employees may be involved in bribery and corruption on permit and license acquisition and during land acquisitions/negotiation. As there are numerous purchasing transactions, employees may be offered bribes/ incentives on these engagements. Giving or asking special favors to/from mining contractors, Service Contractors, or other stakeholders in exchange for personal gain such as but not limited to relaxing company policies and procedures.	Suppliers – all suppliers must go through the same screening. This ensures the company gets what it pays for, and the supplier delivers what it promises. Employees – must be the vanguards of integrity especially when representing the company to external parties. Community – those who support corruption by supporting peers engaged in unlawful conduct deprive honest businesses of the chance of flourishing their trade and contributing back to the community. Management – should always advocate a culture of excellence and integrity. They set the values of the company and must promote the example of anti-corruption. Government regulatory agencies – officials must practice global policies on anti-corruption in the conduct of government and private business transactions.	The board sets the tone and makes a stand against corrupt practices by adopting an Anti-fraud, Corruption, and Whistleblowing Policy and its Code of Employee and Business Conduct. *Pls refer to the following links:* *Anti-Fraud, Corruption and Whistleblowing Policy: https://benguetcorp.com/wp-content/uploads/2024/06/anti-fraud-corruption-whistleblowing-policy.pdf* *Policy on Whistle Blowing: https://benguetcorp.com/wp-content/uploads/2024/06/Policy-on-Whistle-Blowing.pdf* *Code of Employee Conduct and Discipline* http://benguetcorp.com/wp-content/uploads/2018/05/ECD%20with%20ee%20acknowledgement.pdf *Code of Business Conduct and Ethics http://benguetcorp.com/wp-content/uploads/2020/06/E.-Code- of-Conduct-of-Business-and- Ethics.pdf*
What are the Risk/s Identified?	**Stakeholders Affected**	**Management Approach**
Delay in the acquisition of permits and licenses. Engagement in corrupt practices may result in: • Cancellation or suspension of permit/licenses/contract agreements or other kinds of penalty • Court case • Business losses • Exposure to higher or additional operational costs	Mining contractors – reduced amount of share in volume and value LGU – less tax collection Employees – suspension and withholding of salaries and benefits, dismissal from employment. Host community –stoppage of the implementation of social development programs.	Prompt submission of documents and compliance with government requirements to avoid delay in the processing of permits and licenses. Maintain good relationships and close communication with concerned regulatory agencies. The company has clear and stringent Anti-Fraud and Corruption policies and procedures in curbing and penalizing employee involvement in offering, paying and receiving of bribes/unlawful benefits. The Company disseminated the anti-corruption policies and programs to employees throughout the organization via emails and employees signed acknowledgement.

		Pls refer to link Code of Employee Conduct and Discipline, link #41 & 47 Page 8 ECD with ee acknowledgement.pdf (benguetcorp.com)
What are the Opportunity/ies Identified?	**Stakeholders Affected**	**Management Approach**
With the existence of written policies and communication to all concerned and their vigorous implementation, possible involvement in corruption and bribery will be minimized if not eliminated. Harmonious relationship with the regulatory agencies, community, and other stakeholders. The continuous mining operation is assured, and the integrity and reputation of the Company are maintained with the absence of corruption and bribery in the organization.	Host community – increase in public investment and support to the organization. National government agencies and local government units – strengthen the position of the regulatory system and guarantee a degree of fairness. Suppliers/contractors / service providers – leads to a secure and long-term business relationship. Employees – job satisfaction and security and increase in employee morale and shared values.	Closer relationship with all the stakeholders in the mining circle and government agencies. Strict observance of the schedule for the submission of regulatory reports and compliances.

Incidents of Corruption

Disclosure	Quantity	Units
Number of incidents in which directors were removed or disciplined for corruption	0	#
Number of incidents in which employees were dismissed or disciplined for corruption	0	#
Number of incidents when contracts with business partners were terminated due to incidents of corruption	0	#

What is the impact and where does it occur? What is the organization's involvement in the impact?	Stakeholders Affected	Management Approach
The Company has not experienced and has no recorded incidents of corruption by any of its Board of Directors and Officers nor from its employees. The company's Code of Business Conduct and anti-corruption standards clearly prohibit bribery and corruption in all business dealings. Benguet Corporation has been recognized as a top Philippine publicly listed company for corporate governance based on the 2021 and 2022 ASEAN Corporate Governance Scorecard (ACGS) and Corporate Governance Scorecard (CGS)	The Company, Board of Directors, officers, Senior Managers, and all employees were all responsible for the strict implementation and compliance with the Employee Code of Conduct and compliant to all government and other pertinent governing bodies.	All employees are covered by the Anti-Fraud, Corruption, and Whistleblowing Policy and Employee Code of Business Conduct. Members of the Management Team continued to comply with governing bodies' requirements including Corporate Governance reports and compliances. *Pls refer to the following links:* *Anti-fraud, Corruption and Whistle-blowing Policy* http://benguetcorp.com/wp-content/uploads/2020/06/anti-fraud-

assessments by the Institute of Corporate Directors. This commitment is further evidenced by the Company receiving Golden Arrow Awards on January 20, 2023, September 28, 2023, and September 19, 2024. This consistent recognition underscores Management's strong and sustained dedication to good corporate governance.		corruption-whistleblowing-policy.pdf *ACGS Awarded Benguet Corporation as top performing publicly listed Company http://benguetcorp.com/corporate-governance/*
What are the Risk/s Identified?	**Stakeholders Affected**	**Management Approach**
Keeping the workplace free from corruption vis a' vis building a culture of integrity is always a continuous challenge as employees and stakeholders are exposed to high-valued minerals and assets. If the risk of income/profit loss due to corruption or pilferages will not be addressed, it will eventually lead to business closure.	Business closure may affect the following: Mining contractors – reduced amount of share in volume and value. LGU – lesser tax collection Employees – Suspension or termination of employment Host community - community development projects might be suspended/stopped.	Management, including its officers and managers, should set a personal example of integrity. Strong leadership and commitment in the implementation of the Anti-fraud, Corruption and Whistleblowing Policy and the Employee Code of Conduct should be uniformly implemented across all organizations and levels.
What are the Opportunity/ies Identified?	**Stakeholders Affected**	**Management Approach**
A workplace free of corruption with employees with high regard of integrity could lead to more productive and greater business opportunities for the Company.	The opportunities/outcome will surely be reaped by the communities, LGUs, employees, and other stakeholders.	Management endeavors to further strengthen its core values, systems, and procedures to reduce, if not totally eliminate corruption and fraud in the workplace.

ENVIRONMENTAL PERFORMANCE

Resource Management

Energy consumption within the organization:

Disclosure	Quantity						Units
	BGO		ILP		Total		
	2023	2024	2023	2024	2023	2024	
Energy consumption (kerosene)	2,117.62	1,472.37	0.0	0.00	2,117.62	1,472.37	GJ
Energy consumption (diesel)	4,685.02	3,601.155	311.34	231.12	4,996.36	3,832.275	GJ
Energy consumption (bunker fuel)	0.00	0.00	4,481.7789	4,903.1768	4,481.7789	4,903.1768	GJ
Energy consumption (electricity)	5,022,416.01	4,505,184.79	222,066	209,850	5,244,482.01	4,715,034.79	kWh
Energy consumption (gasoline)	29.32	45.57	8.73	0.00	38.05	45.57	GJ
Energy consumption (LPG)	0.00	0.00	0.00	0.00	0.00	0.00	

Reduction of energy consumption

Disclosure	Quantity						Units
	BGO		ILP		Total		
	2023	2024	2023	2024	2023	2024	
Energy reduction (kerosene)	1,122.75	645.21	**0.00**	0.00	1,122.75	645.21	GJ
Energy reduction (diesel)	1,448	1,083.865	0.00	80.22	1,448	1,164.085	GJ
Energy reduction (bunker fuel)	0.00	0.00	10,822.10	(421.3979)	2,738.8	(421.3979)	GJ
Energy reduction (electricity)	1,546,240	517,231.22	19,494	12,216	1,565,734	529,447.22	kWh
Energy reduction (gasoline)	29.32	(16.25)	8.73	8.73	38.05	(7.52)	GJ
Energy reduction (LPG)	0.00	0.00	0.00	0.00	0.00	0.00	

Identification of Impact	Stakeholders Affected	Management Approach
The 2024 energy data is shaped by two key operational events: the stoppage of contractor milling at BGO due to high power rates in the 1st Quarter and 2nd Qtr, stoppage of operation of BC Team and reduced mechanical availability of mining and milling equipment at both BGO due to delays in imported parts. The decrease in electricity consumption at BGO is likely a combination of these factors. There was a delay in the development of the underground workings due to the low mechanical availability of equipment that resulted in the slowdown of milling operation due to the lower extraction and delivery of ore. Considering the slowdown of the operation, the Company continuously observes the energy conservation guidelines. *Please refer to the following: Appendix "A"–EMS Guidelines on Power Conservation*	Operations – power cost is a significant cost driver in gold operations. Small-scale miners (SSM) – The Company monitored the disconnected illegal connections by SSM to eliminate pilferage of electricity. An increase in milling charges due to the increased cost of electricity and fuel/oil affected the operation of mining contractors. Employees – home activities of employee dependents are affected by the energy conservation measures being implemented.	Safeguards in the following measures to be sustainable: Conduct regular energy level monitoring/ reports. Schedule regular follow-up of the delivery of mechanical parts and supplies. Submission of regulatory reports on energy consumption to Mines and Geosciences Bureau and Environmental Management Bureau. Maintain BC Program on energy conservation. Disconnection of illegally connected power lines by small-scale miners. Regular monitoring is implemented to prevent reconnection. BC–BGO has been re-certified ISO 14001:2015 (by NQA) as proof of commitment to make operations aligned with international environmental and safety standards that include energy conservation.

What are the Risk/s Identified?	Stakeholders Affected	Management Approach
• Price of fuel and oil - The fluctuating world market price of diesel and bunker fuel has affected the overall operating cost and the profitability of the operation. • Ore grade - The low grade of ore from the mining operation has affected the milling cost. • Pilferage of processed and unprocessed ore - stealing of processed/loaded carbon has contributed to income loss. • Misappropriation – inappropriate target/goal setting affected the revenue projection.	BC Operation Suppliers of fuel & oil Employees/miners Community	BGO follows a strict set of environmental standards in the conduct of its operation to monitor power consumption and utilization. To be sustainable, there is a need to strictly implement the following: • Energy level monitoring; • Strengthen security measures and surveillance of mine and mill workers/employees; • Close monitoring of production vs budget and revise projections when necessary; • Submission of regulatory reports on energy consumption; • Conduct regular Preventive Maintenance Schedule on equipment and vehicles; and • Conduct regular monitoring of small-scale miners' operations in the area and implement immediate disconnection of illegally connected power lines.
What are the Opportunity/ies Identified?	**Stakeholders Affected**	**Management Approach**
. Cost savings initiatives are being implemented across the value chain to become the least-cost producer as well as achieve greener, cleaner operations. Develop a better understanding of the mine and mill operations process flow and coordination with security, mill, and mine managers that will improve relationships among department heads to prevent pilferage of commodities..	Community LGU	Continuously monitor its power consumption and check areas that can be subjected to power adjustments. The company maintained reducing power consumption in its industrial areas by shifting to energy-efficient motors and lighting fixtures for a cost-reduction program. Shared electricity rates through graduated increased milling charges to contractors.

Water consumption within the organization

Disclosure	Quantity						Units
	BGO		ILP		Total		
	2023	2024	2023	2024	2023	2024	
Water withdrawal Industrial	61,860.54	50,352.42	481	631*	62,341.54	50,983.42	Cubic meters
Domestic	7,131.60	7,191.40	200		7,331.60	7,191.40	
Water consumption Industrial	61,860.54	50.352.42	481	631*	62,341.54	50,983.42	Cubic meters
Domestic	7,131.60	7,191.40	200		7,331.60	7,191.40	
Water recycled and reused	0.00	0.00	0.00	0.00	0.00	0.00	Cubic meters

**Combined industrial and domestic figures*

Identification of Impact	Stakeholders Affected	Management Approach
Water is a critical input for the mining operations at the BC-BGO site. Recognizing its importance, the Company actively monitors the operational impact on adjacent river systems and downstream communities in Benguet to ensure water resources are maintained at levels that allow for equitable access by all stakeholders. Water Sourcing: • BC-BGO (Benguet): Industrial water for mining activities is sourced from the Company's old underground mine tunnel located in L-1200, Acupan, Itogon, Benguet. This withdrawal is governed by Water Rights Permit No. 16154 issued by the National Water Resources Board (NWRB). Potable water for employee's consumption at the BGO site is supplied by a private individual who owns and maintains a natural spring for his water delivery business, with the Company procuring this water at a fixed rate per drum. • ILP (Baguio City): Domestic water needs for the ILP operations in Baguio City is supplied by the Baguio Water District (BWD). Industrial water for ILP is supplied by private individual, sourced from a natural spring permitted by the government for his water delivery business, with costs negotiated per cubic meter.	The affected stakeholders are as follows: Company – has 24/7 access to water supply from its underground mine tunnels for industrial use. BC-BGO employees, contractors/service providers, have access to safe potable water within the mine site. Host, and neighboring communities – have free access to water sources present in the area since the Company source and utilize its water internally.	Access to water is a basic human right as it is a shared resource of high economic, environmental, and social value. Considering that its operation is dependent on the free-flowing water from the Company's underground mine tunnel and for the continuous water recharging of the aquifer, it developed a strategy through an intensified watershed development and management by implementing a reforestation program on denuded and sparsely vegetated areas within and outside the Company's mining claims. This activity is included in the Annual Environmental Protection and Enhancement Program. Streamflow measurement and water quality monitoring is done quarterly. *Please refer to Appendix "B" – Certificate of Approval of Annual Environmental Protection and Enhancement Program (AEPEP for BGO)* *Please refer to Appendix "B-1" – Certificate of Approval of Annual Environmental Protection and Enhancement Program (AEPEP) for ILP*
What are the Risk/s Identified?	**Stakeholders Affected**	**Management Approach**
The identified water-related risks are as follows: 1. Poor housekeeping practices by underground miners pose a risk to the quality of water intended for domestic use. 2. The growing population and business activity in the surrounding area are expected to double overall water demand, potentially impacting availability and cost. 3. Anticipated drying of some springs during the summer months will likely intensify competition for domestic water resources, potentially leading to price increases and volume limitations. 4. High water competition is expected during the dry season due to the water-intensive ball milling operations of illegal small-scale miners.	BC-BGO employees, contractors/service providers, community residents.	The company will continue to support a range of projects that offer sustainability co-benefits, including support for local communities' biodiversity conservation, and watershed rehabilitation. The Company's Mining Forest Program is a shared responsibility with the community while the government monitors the implementation of the program. The Company continues to engage with its host and neighboring communities for an uninterrupted partnership in the protection of the reforested areas to increase the water yield of the aquifer.

What are the Opportunity/ies Identified?	Stakeholders Affected	Management Approach
In 2024, total water withdrawal across our operations decreased by 16.44%, from 69,673.14 cubic meters in 2023 to 58,174.82 cubic meters. Industrial water withdrawal dropped by 18.13% due to operational efficiencies and improved process controls, while domestic water withdrawal decreased slightly by 1.91%, reflecting stable consumption patterns. Water consumption mirrored withdrawal trends, ensuring reductions were achieved without compromising operational requirements. No water recycling or reuse activities were recorded during the reporting period. Recognizing this opportunity, we are prioritizing the development of water reuse initiatives to enhance sustainability in future operations. In addition, intensified watershed development in the area has provided livelihood opportunities for Indigenous Peoples (IPs) through contract reforestation, seedling propagation, plantation maintenance, and forest protection activities — further strengthening the community's role in environmental stewardship. Moreover, the Company's abundant underground water source presents significant potential for business development, particularly to supply bulk water needs of the surrounding communities, contributing to local water security and economic development. Our progress demonstrates our commitment to responsible resource management, community development, and environmental sustainability.	Employees, contractors/service providers, community residents	The Company actively engages stakeholders by providing livelihood opportunities such as seedling propagation, contract-based tree planting, and maintenance of reforestation areas. These initiatives strengthen community relationships, empower Indigenous Peoples and local residents, and support long-term forest rehabilitation efforts. Through intensified tree-planting activities within the mining claim, forest cover is being significantly enhanced, leading to increased spring water yield and contributing to lower atmospheric temperatures in the surrounding areas — critical factors in sustaining local ecosystems and improving climate resilience. Additionally, the Company is evaluating the development of its Acupan underground water source as a potential business opportunity to supply bulk water to nearby communities, including Itogon and Baguio City. This initiative aims to contribute to regional water security while creating new avenues for sustainable economic development.

Materials used by the organization

Disclosure	Quantity				Units
	BGO		ILP		
	2023	2024	2023	2024	
Materials used by weight or volume					
Renewable (identify) – lumber, paper, sawdust, flour	333,767.25	92,535	73	592 (paper/carton)	kg/liters
Non-renewable - *lubricants, motor oils, bunker fuel oil, diesel oil, kerosene, dynamite explosive, sodium cyanide, nitric acid, ammonium nitrate, sodium hypochlorite, hydrochloric acid, activated carbon, lime and sulfuric acid, caustic soda, hydrochloric acid, nitric acid, etc.*	635,258.66	534,513.37	1,112,185.26	1,213,446.03	kg/liters
Percentage of recycled input materials used to manufacture the organization's primary products and services. *Note: Only sawdust was used for firing carbon ash while papers are recycled for printing internal reports and memo.*	0.09% (Saw Dust)	0.13% (sawdust) 0.11% (paper)	100 73 (paper)	100 592 (paper, carton)	% Kgms.

Disclosure	Quantity		
	Total (BGO and ILP)		Units
	2023	2024	
Materials used by weight or volume			
Renewable (identify) – lumber, paper, sawdust, flour	333,840.25	93,127	kg/liters
Non-renewable - *lubricants, motor oils, bunker fuel oil, diesel oil, kerosene, dynamite explosive, sodium cyanide, nitric acid, ammonium nitrate, sodium hypochlorite, hydrochloric acid, activated carbon, lime and sulfuric acid, caustic soda, hydrochloric acid,nitric acid, etc.*	1,747,443.92	1,747,959.4	kg/liters
Percentage of recycled input materials used to manufacture the organization's primary products and services. *Note: Only sawdust was used for firing carbon ash while papers are recycled for printing internal reports and memo.*	100 73 (paper)	100	% Kgms.

What is the impact and where does it occur? What is the organization's involvement in the impact?	Stakeholders Affected	Management Approach
BGO's underground mining operations utilize mine timbers for tunnel support to ensure the safety of mine workers. All timbers are procured legally, supported by Certificates of Lumber Origin issued by the DENR. To enhance sustainability, the Company	BGO mine and mill employees, community, suppliers and Irisan Lime Project employees and its surrounding residential areas. Employees of the mining contractors.	The underground workings/tunnels are supported by square-set mine timbers to provide safe working conditions for the mine workers. Pre-cast concrete columns are the alternative mine support, but the cost is expensive and may not last especially on heavy grounds and acidic underground. BC-BGO is committed to

recycles wood wastes, such as sawdust for firing carbon ash, and reuses papers internally for printing. Explosives necessary for underground development are handled responsibly, with permits issued by the Firearms and Explosives Unit of the Philippine National Police. The Company actively explores alternative materials for underground support structures. While pre-cast concrete columns are considered, they are often cost-prohibitive and vulnerable to acidic and heavy ground conditions. BC-BGO remains committed to minimizing timber usage without compromising worker safety. Forest plantation initiatives are promoted within the operational area, and suppliers are encouraged to support reforestation activities. The Company complies fully with ISO 14001:2015 standards and R.A. 9003 (Ecological Solid Waste Management Act), ensuring responsible material use and waste management practices. For the period 2024: a. Renewable material consumption dropped dramatically by 72.1%, possibly due to operational scaling or efficiency improvements; b. Non-renewable material usage remained almost flat, ensuring a stable environmental footprint despite operational needs; c. Recycling practices notably improved, reflecting strengthened environmental commitment.		continuing to explore other alternative materials as substitutes for mine timber for underground support without sacrificing the safety of mine workers. This is part of the Company's sustainability commitment to minimize the use of timber resources. Forest plantations will be part of the Company's sustainable commitment to environmental enhancement in its area of operation. It encourages suppliers of mine timber to participate in the reforestation program of the company and the government. In compliance with BC-BGO's commitment and its concurrence to the standards set in its ISO 14001:2015 certification, the company strictly adheres to the standards set by the regulatory agencies (DENR-EMB) on proper recording and labeling of renewable and non-renewable materials in accordance with R.A. 9003 (Ecological Solid Waste Management Act) provisions.
What are the Risk/s Identified?	**Stakeholders Affected**	**Management Approach**
• Depletion of Resources: Threatening the availability of renewable materials such as lumber and paper. • Environmental Degradation: Improper handling of non-renewables could lead to air, water, and soil pollution. • Health and Safety Risks: Worker exposure to hazardous materials increases occupational health risks. • Cost Management Risks: Heavy reliance on non-renewable materials can inflate production costs. • Operational Risks**:** Blasting activities pose safety hazards including fly rocks, noise pollution, and dust emissions if improperly managed.	Underground employees/miners/blasters Employees at the motor pool area, mine and mill mechanical shops; Communities adjacent to the operation.	• Regular monitoring of implementation of ISO 14001:2015 objectives, targets and performance vs. audit reports • Ensure secure storage, waste management, and disposal practices aligned with regulatory standards. • Continue regular quality monitoring tests and submission of reports to regulatory agencies for validation of results following DENR Standards. • Monitor the strict implementation of the Annual Environmental Protection and Enhancement Program. • Provision of complete PPE, regular training on chemical handling, and safety protocols enforcement

Please refer to the following: *Appendix "C' - Summary of Risks* *Appendix "D" – EMS Document # EMSG-03 (EMS Guidelines on Diesel, Oil and Grease Hauling, Transport and Storage)* *Appendix "E" – EMS Document # EMSG - 12 (EMS Guidelines on Contaminated Water)*		underground. • Conduct regular safety lectures, meetings, and pep talks before deployment in assigned working areas to remind workers of safety protocols in the underground mining activities and proper handling of chemicals at the mill.
What are the Opportunity/ies Identified?	**Stakeholders Affected**	**Management Approach**
• Sawdust is being recycled for firing carbon ash while jsed paper is recycled for printing internal reports and memo. • Continuous improvement in mining technologies and innovations and how it can benefit from renewable sources of energy throughout the stages of operation. • BGO's logistics and support services, on the other hand, utilize renewable materials such as wood and used packing materials (cartons or box containers made of cardboard). • Better planning and forecasting of usage of non-renewable materials in relation to programmed procurement systems can lead to cost efficiencies of the operation.	Residents in the surrounding communities stand to benefit from cleaner air and water. Employees Operations – cost efficiencies will deliver better profit margins without incremental damage to the environment.	Safety lectures and work briefings before deployment to assigned working areas. Continue to monitor the usage of non-renewable materials to attain reduction year over year without sacrificing production. Implement materials storage, handling, management, monitoring, and disposal of waste/tailings. Continue regular submission of reports to the regulatory body on the use of regulated chemicals. Regular water quality monitoring to ensure water is free from contaminants that are hazardous to human and animal health.

Ecosystems and biodiversity (whether in upland/watershed or coastal/marine)

Disclosure	Quantity		Units
	BGO	ILP	
Operational sites owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas	Crosby Park – 11.0 Has. Virac Timberyard – 6.0 Hectares Keystone – 3.0 Hectares Kelly Plantation - 3.0 Hectares	Plantation = within Irisan tenement 0.3711 Ha.	Ha.
Habitats protected or restored	0.00		Ha.
IUCN[4] Red List species and National Conservation List species with habitats in areas affected by operations	0.00	-	Ha.

[4] International Union for Conservation of Nature

Identification of Impact	Stakeholders Affected	Management Approach
The Company recognizes the importance of preserving ecosystems and biodiversity in the areas where it operates. BC continued its commitment to environmental stewardship through dedicated biodiversity and habitat management initiatives The established Crosby Forest Park, a 11.0-hectare man-made forest within the mining property, was continuously maintained and protected. This park serves as crucial support for the company's watershed development efforts. Enrichment planting activities were ongoing in areas with sparse tree cover to enhance the local greenery. The park also serves as a recreational area for employees' families and visitors, offering opportunities for enjoying the scenery and camping. In compliance with its environmental enhancement program, the company implemented a reforestation initiative within and around its mining claims. The Irisan Lime Project has continuously maintained a total plantation area of 3,711 square meters (0.3711 hectares). These areas contribute significantly to biodiversity conservation, watershed management, and ecological rehabilitation efforts. Although no formal designation as protected or restored habitats has been made, the Company's initiatives support ecosystem services that benefit both its operations and surrounding communities. Notably, no IUCN Red List species or nationally protected species have been recorded as impacted by the Company's activities within these sites.	Employees and families – benefit from using the Crosby Park Contractors and laborers of the reforestation project. Community residents – inhaling pollution-free and fresh air.	• Forest Park Maintenance: Continued care and maintenance activities under the Environmental Work Program (EWP), supported by a hired local caretaker. • Community Engagement: Engaged local communities for stewardship and protection of reforested areas. • Intensified Reforestation: Expanded reforestation and forest protection initiatives under the Annual Environmental Protection and Enhancement Program (AEPEP).

What are the Risk/s Identified?	Stakeholders Affected	Management Approach
Illegal cutting of trees and squatting. Illegal cattle grazing. Forest / bushfire	Employees and nearby residents	• Strengthened and frequent foot patrols by the Claims Protection Team to prevent illegal activities such as squatting and small-scale mining. • Ongoing surveillance, installation of warning signage, and coordination with local authorities to enhance protection efforts.

What are the Opportunity/ies Identified?	Stakeholders Affected	Management Approach
Opportunities identified from these efforts include the development of ecological tourism (such as at Crosby Park), watershed restoration that enhances water security and climate resilience, and community employment through reforestation activities. The reforestation and forest maintenance programs continue to provide income opportunities for local families and associations through seedling production, plantation establishment, and forest protection roles.	Employees and the host and neighboring communities.	BGO will sustain the maintenance and enrichment of Crosby Park to strengthen its role in ecological tourism and biodiversity conservation, while expanding reforestation efforts to enhance watershed functions and support landscape restoration. The Company actively works with nearby communities in maintaining these forest areas, conducting regular patrols to prevent illegal activities such as tree cutting and small-scale mining. Forest enrichment planting and further protection activities are continuously implemented to strengthen ecological integrity.

Environmental Impact Management

Air Emissions

GHG

Disclosure	Quantity						Units
	BGO		ILP		Total		
	2023	2024	2023	2024	2023	2024	
Direct (Scope 1) GHG Emissions (Diesel fuel, Gasoline, Kerosene, Bunker fuel)	537	391.78	2,992	3,767.38	3,529	4,159.16	Tonnes CO_2e
Energy indirect (Scope 2) GHG Emissions (electricity)	1,422	1,275.28276	63	59.40224	1,485	1,334.685	Tonnes CO_2e
Emissions of ozone-depleting substances (ODS)	0.00	0.00		0.00		0.00	Tonnes

Identification of Impact	Stakeholders Affected	Management Approach
In 2024, the Company recorded a total of 4,159.16 tonnes of direct (Scope 1) GHG emissions, reflecting an increase of approximately 17.84% compared to 3,529 tonnes CO_2e in 2023. The increase was mainly due to higher diesel, gasoline, kerosene, and bunker fuel consumption across operational sites. Meanwhile, energy indirect (Scope 2) GHG emissions related to electricity consumption totaled 1,334.69 tonnes CO_2e in 2024, representing a decrease of approximately 10.11% compared to 1,485 tonnes CO_2e in 2023. The reduction reflects the Company's continuous efforts in improving energy efficiency and reducing electricity use.	Employees and their families Community / IP's Suppliers	• Conduct a comprehensive assessment to identify additional sources of GHG emissions and implement targeted mitigation measures. • Optimize energy efficiency by evaluating and right-sizing the horsepower of air conditioning units relative to office floor area, ensuring appropriate cooling capacity while minimizing energy use. • Implement a regular preventive maintenance program for all diesel-powered motors and equipment to maintain optimal operating efficiency and reduce unnecessary fuel consumption and emissions. • Promote operational best practices and energy-saving behaviors across sites to further minimize the Company's carbon footprint.

What are the Risk/s Identified?	Stakeholders Affected	Management Approach
. **A. Lime Kiln Operations** • Prolonged operator exposure to high temperatures poses significant health risks, including heat stress and related illnesses. • Inhalation of dust from raw materials and fumes, particularly during start-up operations, may result in respiratory health issues. **B. Underground Mining Operations** • Failure or breakdown of air compressors could cause operational disruptions, leading to the suspension or slowdown of underground activities. • Inadequate ventilation can impair miner performance, decrease productivity, and elevate health risks. • Poor ventilation may result in the accumulation of carbon monoxide emissions from diesel-operated locomotives, posing serious health hazards and potential fatality risks to underground personnel.	. Employees - The health of employees is affected which will result in a reduced workforce. Company - reduced ore tonnage	For Lime Kiln Operations, the Company will provide heat-resistant PPE, improve ventilation, and conduct regular health monitoring and safety training to protect workers from heat and dust exposure. For Underground Mining Operations, preventive maintenance of air compressors, enhancement of ventilation systems, installation of gas detectors, and regular emergency drills will be enforced to safeguard miner health and ensure continuous operations.
What are the Opportunity/ies Identified?	**Stakeholders Affected**	**Management Approach**
. • Reduced Scope 1 GHG emissions through lower fuel consumption in BGO and ILP operations, supporting climate goals. • Lower operational costs and improved environmental performance from optimized equipment efficiency. • Increased kiln product output and sales, driving revenue growth.	Employees of the company and mining contractors. Residents residing in the camp.	The Company will strengthen coordination among operations and executives to address challenges efficiently. Regular preventive maintenance and monitoring of equipment running hours will minimize downtime, optimize fuel use, reduce GHG emissions, and support increased kiln production and revenue growth.

Air pollutants

Disclosure	Quantity				Unit
	BGO		ILP		
	2023	2024	2023	2024	
NO_x Stack emission Ambient	143 8.20	83.00mg/Ncm 13.18 ug/Nm3	132.9,82.20 9.0,9.0,5.33	<21.4 and 13.5 4/1.97/1.18	Mg/Nm3
Sox Stack emission Ambient	10.81 11	50.25 mg/Ncm 10.85 ug/Nm3	9.6,38.3 0.86,0.85,0.71	18.3 and 1.9 0.29/0.57/0.94 (3 sampling stations)	Mg/Nm3
Carbon Monoxide (CO)	0.00	36.75 mg/Ncm	0.00	121 and 25.2 (stack emission)	mg/Nm^3

Persistent organic pollutants (POPs) e.g. PCB's, PFOs; Biphenols; Phthalates: Atrazine (herbicide)	0.00		0.00		kg
Volatile organic compounds (VOCs) Propane, butane	0.00		0.00		kg
Hazardous air pollutants (HAPs) (Lead)	0.002745		0.00		kg
Particulate matter (PM10)	4.67	25.8 mg/Ncm	9.3,49.7	8.06/7.27/6.27 (ambient)	mg/Nm^3
CO Stack emission	0.00	36.57 mg/Ncm	133.2,105.4		

What is the impact and where does it occur? What is the organization's involvement in the impact?	**Stakeholders Affected**	**Management Approach**
Cognizant of the impact of mining operations on the environment particularly on-air quality, the company is very aware of its consequences but equally aware of managing it properly. The identified major sources of air pollution are as follows: 1. Generation of dust during mining development caused by blasting; 2. Generated fumes at the mill operation during gold smelting where chemicals are added to separate gold from other impurities; and 3. ILP operation – Kiln plant operation and generation of dust along access road. In 2024, the Company recorded notable improvements in managing air emissions. Nitrogen oxide (NO_x) stack emissions significantly decreased by approximately 42% at BGO and by over 75% at ILP, reflecting enhanced operational controls. Ambient NO_x concentrations at ILP also declined across all monitoring stations. Conversely, sulfur oxide (SO_x) emissions showed an increase, particularly in stack measurements, indicating the need for further emission control efforts. Carbon monoxide (CO) emissions, now being monitored, were detected at moderate levels, underscoring the importance of preventive maintenance and equipment efficiency improvements. *Please refer also to:* *Appendix "F" - Report Certification of Greentek Environmental Phils. Co., on Source Emission Test Result for BGO;* *Appendix "F-1" and "F-2" - Report Certification of BSI Environmental Management Service Provider on Source*	BC-BGO - Employees/workers, community. ILP -Employees, community/neighbouring Puroks of the Plant	The Company strengthens preventive maintenance of equipment to reduce emissions, enhance operational efficiency, and prevent breakdowns. Continuous monitoring of air quality parameters and stricter compliance with emission standards will be enforced. Coordination among operations and leadership will be intensified to proactively address air pollutant sources and implement timely corrective measures.

Emission Test Result for ILP and *Appendix "G", and "G-1" Ambient Air Quality and Noise Monitoring Report of Greentek Environmental Engineering Services for BGO and* *Appendix "G-2" Ambient Air Quality and Noise Monitoring Report of BSI Environmental Management Service Provider on Source Emission Test Result for ILP*		

What are the Risk/s Identified?	**Stakeholders Affected**	**Management Approach**
• Poor air quality may pose health risks to employees and nearby communities, potentially resulting in complaints filed with regulatory agencies against the Company (BGO and ILP). • Exceedance of DENR standards for dust and acid fumes may lead to regulatory penalties, suspension, or even stoppage of operations.	Employees/workers, adjacent communities ILP- community/ residents of direct impact areas (Purok 10 and 11; employees	• Strengthen air quality monitoring systems to ensure compliance with DENR standards. • Implement dust suppression measures and install fume extraction systems at critical emission points. • Conduct regular maintenance of equipment to minimize pollutant emissions. • Provide PPE and health monitoring programs for employees exposed to air pollutants. • Engage with nearby communities through information drives and grievance mechanisms to address concerns promptly.
What are the Opportunity/ies Identified?	**Stakeholders Affected**	**Management Approach**
. • Enhanced employee environmental awareness and commitment to air quality protection. • Training on advanced anti-pollution equipment operation, aligned with R.A. 8749. • Improved chemical handling practices to reduce workplace exposure risks. • Sustained compliance with DENR standards and ECC conditions through effective pollution control.	Employees/ workers, community	• Continue environmental awareness and pollution control training for employees. • Regularly update and maintain anti-pollution devices and technologies. • Strictly enforce safe handling protocols for chemicals and reagents. • Conduct periodic air emissions testing to ensure continuous compliance with DENR standards and ECC conditions. • Strengthen internal audits and corrective actions to immediately address any emission issues.

Solid and Hazardous Wastes

Solid Waste

Disclosure	Quantity				Units
	BGO		ILP		
	2023	2024	2023	2024	
Total solid waste generated	391,226.20	159,323.9	1,152.50	1,653	kg

Reusable (Sawdust, Paper)	411.96	223.90	176	592	kg
Recyclable (used sacks, cartons, pet bottles, cans)	6,606.20	19,500.00	131	254	kg
Composted	-	0.00	0.00	0.00	kg
Incinerated	N/A	0.00	0.00	0.00	kg
Residuals/Landfilled	384,660.00	139,600.00	845.50	807	kg

Disclosure	Quantity		
	Total (BGO and ILP)		Units
	2023	2024	
Total solid waste generated	392,378.7	160,976.9	kg
Reusable (Sawdust, Paper)	587.96	815.9	kg
Recyclable (used sacks, cartons, pet bottles, cans)	6,737.20	19,754	kg
Composted	0.00	0.00	kg
Incinerated	0.00	0.00	kg
Residuals/Landfilled	385,505.50	140,407	kg

What is the impact and where does it occur? What is the organization's involvement in the impact?	Stakeholders Affected	Management Approach
Residents in camps and concession stores are the major source of residual waste. In 2024, the total solid waste generated by both BGO and ILP operations decreased by 59.0% compared to 2023 (from 392,378.7 kg down to 160,976.9 kg). This notable reduction reflects the Company's continuous efforts to improve solid waste management practices. Reusable materials increased by 38.76%, and recyclables rose significantly, from 6,737.2 kg to 19,754 kg, demonstrating better segregation and resource recovery initiatives. Meanwhile, residual waste sent to landfills dropped by 63.56%, supporting the goal of minimizing landfill dependency. This positive trend is the result of a persistent information campaign on the provisions of R.A. 9003 (Ecological Solid Waste Management Act) and the regular collection of garbage in the camps. Increased awareness and practice of proper waste management have now become a sustained culture among the residents and employees, reinforcing the Company's commitment to environmental stewardship.	Employees of Benguet Corporation and workers of solid waste/residual waste hauling contractor. Owners of concession stores.	• Integrated proper waste management into daily housekeeping practices. • Enforced strict waste segregation at source in offices and residential areas. • Collected and hauled scrap materials regularly to designated depository areas. • Sold recyclable materials to DENR-accredited contractors to minimize waste generation. • Disposed of residual waste through licensed landfill contractors outside the region. • Operated and maintained a Material Recovery Facility (MRF) for recyclables and biodegradables. • Ensured continuous compliance with R.A. 9003 (Ecological Solid Waste Management Act) and DAO No. 2001-34. • Conducted regular monitoring by the Mine Environment Protection and Enhancement Officer (MEPEO). • Reminded contractors to provide PPE and maintain worker health and permit compliance. • Institutionalized a culture of waste management through persistent information campaigns.

What are the Risk/s Identified?	Stakeholders Affected	Management Approach
. • Health and Environmental Risks: Accumulation of uncollected waste may cause unsanitary conditions, foul odors, and health issues for workers and nearby communities. • Regulatory Compliance Risks: Failure to comply with R.A. 9003 could lead to complaints, penalties, or sanctions from regulatory agencies. • Contractor Worker Safety: Hauling contractor workers face health and safety risks without proper PPE and management oversight. • Water Pollution Risk: Improper waste management could contaminate nearby water bodies, impacting environmental and community health.	Workers of solid waste/residual waste hauling contractor Employees of the Company Community	• Strict Monitoring and Compliance: Regular inspection of waste segregation, collection schedules, and compliance with R.A. 9003 requirements. • Contractor Oversight: Require hauling contractors to maintain valid permits, provide full PPE to their workers, and conduct regular health and safety checks. • Immediate Waste Disposal: Ensure timely hauling and disposal of waste to avoid accumulation and unsanitary conditions. • Emergency Response Plans: Establish rapid response protocols for waste overflow, missed collections, or accidental spills. • Environmental Safeguards: Maintain the Material Recovery Facility (MRF) and enforce strict waste handling procedures to prevent water pollution. • Community Engagement: Continue awareness campaigns for employees and residents on proper waste segregation, recycling, and sanitation practices.
What are the Opportunity/ies Identified?	**Stakeholders Affected**	**Management Approach**
• Sustained cleanliness ensures full compliance with the Ecological Solid Waste Management Act (R.A. 9003) and its IRR (DAO No. 2001-34). • A clean, well-maintained environment enhances the quality of life for employees and surrounding communities. • Compliance strengthens the Company's environmental reputation and reduces risks of regulatory sanctions. • A litter-free, organized community promotes employee pride and fosters stronger community relations.	Company Hauling contractor Employees	• Sustain compliance with R.A. 9003 through regular waste collection and segregation. • Conduct continuous environmental education for employees and residents. • Maintain close coordination with accredited waste haulers. • Promote active involvement of employees and communities in maintaining clean surroundings.

Hazardous Waste

Disclosure	Quantity				Units
	BGO		ILP		
	2023	2024	2023	2024	
Total weight of hazardous waste generated: Type of waste generated – ➢ Mill tailings ➢ Other hazardous waste (lead compounds, busted fluorescent lamps, non-halogenated organic chemicals, clinical waste, oil contaminated materials, Waste electrical and electronic equipment, Mercury and mercury compounds)	 28,520.32 28.848	 22,638.52 6.540	 61.65	 0.0855015	 MT. MT.
Total weight of hazardous waste transported	0.00	14.450	0.00		Kg.

Disclosure	Quantity		Units
	Total (BGO and ILP)		
	2023	2024	
Total weight of hazardous waste generated: Type of waste generated – ➢ Mill tailings ➢ Other hazardous waste (lead compounds, busted fluorescent lamps, non-halogenated organic chemicals, clinical waste, oil contaminated materials, Waste electrical and electronic equipment, Mercury and mercury compounds)	 28,521.97 28.848	 22,638.52 6.6255	 MT. MT.
Total weight of hazardous waste transported	0.00	14.450	Kg.

What is the impact and where does it occur? What is the organization's involvement in the impact?	Stakeholders Affected	Management Approach
Mill tailings is the product from milling the gold-bearing mineral ore to produce said precious metal. The tailings are impounded in the ECC-approved Tailings Storage Facility (TSF) that serves as a treatment facility. In 2024, there was a notable decrease in the total hazardous waste generated, from 28,521.97 metric tons in 2023 to 22,638.52 metric tons. This reduction reflects improved waste management practices, particularly in the handling and disposal of mill tailings and other hazardous substances. Proper maintenance of the tailings treatment facility helped prevent potential soil and water contamination, mitigating environmental risks associated with cyanide and other chemicals present in the waste. For other hazardous wastes, strict protocols on proper labeling, storage, and regular hauling by an EMB-accredited contractor were effectively maintained. Importantly, in 2024, 14.45 kilograms of hazardous waste were successfully transported for proper	Employees of BC-BGO, and ILP Employees of mining contractors and hauler	The Company demonstrates corporate responsibility by strictly adhering to waste management and environmental quality protocols, including compliance with R.A. 9003, R.A. 9275, EMS Guidelines on Hazardous Waste Management, and its Environmental Compliance Certificate (ECC) conditions. Hazardous wastes are properly labeled, stored, and disposed of through a DENR-EMB accredited third-party service provider, ensuring full regulatory compliance. Aligned with the Company's Environmental Policy and Environmental Management System (EMS), continuous monitoring, repair, and maintenance of anti-pollution structures, penstocks, spillways, and tailings dam embankments are regularly carried out. Security personnel are deployed at the Tailings Storage Facility (TSF) to safeguard the structure and prevent unauthorized access. *Please refer to Appendix "H" – EMSG-07-A (EMS Guidelines on Hazardous Waste*

disposal, compared to zero recorded transport in 2023. This reflects the Company's commitment to regulatory compliance and proactive environmental stewardship. Overall, the Company's adherence to best practices in hazardous waste management, including persistent monitoring and maintenance, resulted in a cleaner operation and reduced environmental risk, ensuring ongoing compliance with Philippine environmental regulations.		*Management – Used Oil, Oil and Grease Contaminated Items)*
What are the Risk/s Identified?	**Stakeholders Affected**	**Management Approach**
• Water contamination of the Ambalanga River if hazardous waste, especially cyanide-laced tailings, is not properly contained and managed. • Siltation along the river system due to deposition of non-toxic tailings or sediments from accidental leaks, leading to ecosystem disruption and potential health hazards. • Chemical exposure and accidents from improper handling, storage, and transport of hazardous wastes like acids, alkalis, used oils, and organic solvents. • Non-compliance with environmental regulations such as R.A. 9275 (Philippine Clean Water Act of 2004) and R.A. 6969 (Toxic Substances and Hazardous and Nuclear Waste Control Act), risking suspension of operations or cancellation of the Environmental Compliance Certificate (ECC). • Fines, sanctions, or reputational damage arising from regulatory violations and community complaints.	Employees of BC-BGO, BC-CHQ and ILP Employees of mining contractors	• Strict enforcement of waste management protocols, especially inside the industrial area, to prevent accidental discharges into the environment. • Regular inspection and maintenance of the tailings treatment facility and pipelines to ensure the integrity of impoundment systems and prevent leaks. • Proper labeling, safe storage, and secure handling of all hazardous waste materials, with dedicated storage areas designed to avoid spills and leaks. • Utilization of EMB-accredited haulers for timely transport and final disposal of hazardous wastes, ensuring compliance with R.A. 6969 and DAO 2004-36. • Water quality monitoring programs along the Ambalanga River and other receiving bodies to detect any signs of contamination early and take corrective actions. • Implementation of emergency response protocols and spill containment procedures to immediately address accidental releases. • Regular employee training on hazardous waste management, chemical handling, emergency response, and environmental protection policies. • Strict compliance with the Environmental Compliance Certificate (ECC) conditions and continuous engagement with DENR-EMB to ensure environmental laws and regulations are met. • Community awareness programs to maintain transparency and strengthen trust with surrounding communities.
What are the Opportunity/ies Identified?	**Stakeholders Affected**	**Management Approach**
• Strengthened environmental stewardship by proactively managing hazardous and non-toxic tailings, enhancing the Company's reputation for responsible mining. • Continued regulatory compliance (R.A.	BC-BGO/ACMP, BC-CHQ and ILP employees Employees of mining contractors Suppliers	The Company strengthens its environmental stewardship through strict hazardous waste management, ensuring compliance with R.A. 9275 and R.A. 6969. This protects water bodies like the Ambalanga River, enhances employee safety, fosters community trust, and

9275, R.A. 6969) ensures uninterrupted operations, avoiding penalties, suspension, or cancellation of permits. • Improved environmental quality through effective waste management, maintaining a healthy river system and protecting biodiversity. • Enhanced employee skills through regular training on hazardous waste handling, boosting workplace safety and operational efficiency. • Increased community trust through transparent environmental practices and the Company's commitment to protecting local water bodies and ecosystems. • Support for a circular economy through proper recycling, recovery, and responsible waste disposal practices. • Positioning the Company as a model for sustainable operations in the mining and industrial sector	Community.	sustains operational continuity, positioning the Company as a model for sustainable practices. Please refer to Code of Business Conducts and Ethics link http://benguetcorp.com/wp-content/uploads/2020/06/E.-Code-of- Conduct-of-Business-and-Ethics.pdf

Effluents

Disclosure	Quantity	Units
Total volume of water discharges Effluent discharge from the mill	61,860.54	Cubic meters
Percent of wastewater recycled.	0.00	%

What is the impact and where does it occur? What is the organization's involvement in the impact?	Stakeholders Affected	Management Approach
In 2024, the mill discharged 50,352.42 cubic meters of effluent — an 18.6% decrease from 61,860.54 cubic meters in 2023 — reflecting improved water management practices. The reduction is primarily attributed to lower ore milling volumes and enhanced containment, recycling, and treatment efforts. Proper TSF operation and maintenance remain critical in minimizing environmental risks and ensuring continued regulatory compliance.	The Company; Employees; Community	The following are measures that were implemented to mitigate the impacts: • Treat wastewater through detoxification using sodium hypochlorite to neutralize harmful substances. • Maintain and monitor the Tailings Storage Facility (TSF) to prevent hazardous discharges. • Implement water recycling and optimize treatment processes to reduce effluent volume. • Regularly monitor water quality to ensure compliance with regulatory standards. • Engage with regulatory agencies and local communities to promote transparency and environmental stewardship. • The company adheres to the provisions of R.A. 9275 (Philippine Clean Water Act) and conditions set forth in the Environmental Compliance Certificate (ECC).

		Please refer to Appendix "I" – Environmental Compliance Certificate

What are the Risk/s Identified?	Stakeholders Affected	Management Approach
• Complaints from farmers/residents downstream of the Tailings Storage Facility (TSF). • Health and livelihood impacts of downstream communities of livelihood due to water contamination. • Fish kills along river systems. • Water contamination leading to suspension of operations. • Suspension of Environmental Compliance Certificate (ECC) and/or imposition of monetary penalties due to violation of R.A. 9275 (Philippine Clean Water Act of 2004) leading to regulatory sanctions.	The Company; Employees; Community	• Observe proper maintenance of the Tailings Storage Facilities and other appurtenant structures and implement mitigating measures to prevent accidental wastewater discharge/leaks. • Assessment of improvement downstream - keep a database of all improvements for future reference. • Strict enforcement and compliance with the provisions of environmental laws & policies and the ECC.
What are the Opportunity/ies Identified?	**Stakeholders Affected**	**Management Approach**
• Increased employee awareness of responsibility and accountability in environmental management. • Adoption and application of new technologies to treat wastewater and eliminate or reduce toxicity prior to discharge. • Improved environmental performance strengthens corporate image and stakeholder trust. • Reduction in water discharge volume demonstrates enhanced operational efficiency and environmental stewardship. • Strengthens the Company's reputation for environmental compliance. • Opportunity to further improve water recycling rates and sustainable water use.	Employees, community residents; Mines Environmental Protection and Enhancement Officer; Pollution Control Officer.	• Maintain and monitor pollution control facilities to ensure safe and compliant operations. • Conduct regular education and awareness programs for stakeholders. • Implement the Environmental Protection and Enhancement Program (EPEP) to promote responsible mining. • Ensure full compliance with all environmental laws and regulations. • Foster continuous improvement and a strong culture of environmental stewardship within the organization.

Environmental Compliance

Non-compliance with Environmental Laws and Regulations

Disclosure	Quantity	Units
Total amount of monetary fines for non-compliance with environmental laws and/or regulations No fines or penalty for violations committed against any provisions of environmental laws, permits and licenses that have been assessed or determined with finality during the period under report (2024).	0.00	PhP
No. of non-monetary sanctions for non-compliance with environmental laws and/or regulations	0.00	#
No. of cases resolved through dispute resolution mechanism	0.00	#

What is the impact and where does it occur? What is the organization's involvement in the impact?	Stakeholders Affected	Management Approach
Benguet Corporation remains firmly committed to environmental stewardship and regulatory compliance. As a responsible partner of the government, BC fully adheres to all applicable mining, environmental, and social laws and regulations. All required reports and submissions are completed, reviewed, and approved by the relevant government agencies. The Company implements comprehensive environmental and social programs, maintains regular compliance monitoring, and has consistently received certificates of compliance from regulatory authorities, demonstrating its dedication to sustainable and responsible operations.	The Company employees, service contractors, suppliers, investors, community, local and national government, other stakeholders.	Benguet Corporation is committed to full compliance with all environmental laws, permits, and regulations, maintaining its role as a responsible mining company. Environmental safeguards are in place to manage risks, and Benguet Gold Operation upholds an Environmental Policy focused on excellence in sustainable mineral resource development. Continuous monitoring and engagement with regulators ensure ongoing environmental stewardship.
What are the Risk/s Identified?	**Stakeholders Affected**	**Management Approach**
Failure to submit compliance reports on time, or delays and non-implementation of the approved Annual Environmental Protection and Enhancement Program (AEPEP), Annual Social Development and Management Program (ASDMP), and Annual Safety and Health Program (ASHP) may result in penalties and sanctions from regulatory agencies. Non-compliance with environmental laws and regulations could also lead to legal liabilities and reputational damage.	Benguet Corporation, employees, service contractors, suppliers, investors, community, local and national government, other stakeholders	Benguet Corporation ensures strict adherence to reporting schedules and program implementation. Dedicated teams are tasked with monitoring compliance, promptly preparing and submitting reports, and coordinating closely with regulatory bodies. The Company also continuously strengthens its internal processes and training to maintain high standards of environmental, social, and safety performance. *Please refer to link -* http://benguetcorp.com/wp-content/uploads/2020/06/O.-BC- Internal-Audit-Charter.pdf *BenguetCorp's Internal Audit Charter – Defining the Scope of Work of the Internal Audit Office (IAO) – Item II, #7-9, p.1 and Detailing Responsibility of IAO – Item V, # 4-6 p. 2 of the Charter.*
What are the Opportunity/ies Identified?	**Stakeholders Affected**	**Management Approach**
• Uninterrupted operations through full regulatory compliance. • Improved production via continuous mining activities. • Stronger environmental management through proactive risk mitigation.	Management, employees, mining contractors, stakeholders	• Re-assess and monitor pollution control structures regularly. • Conduct ongoing IEC activities for stakeholders. • Implement and strengthen the Environmental Protection and Enhancement Program

• Enhanced reputation from consistent environmental and social compliance.		(EPEP). • Promote full compliance with environmental laws and regulations. • Foster environmental awareness and continuous operational improvement. *Please refer to Appendix "J"– Registry of Compliance Obligations for C.Y. 2024*

SOCIAL PERFORMANCE

Employee Management
Employee Hiring and Benefits
Employee Data

Disclosure	Quantity (2024)			Units
	BGO/CHQ	ILP	TOTAL	
Total number of employees[5]	294	7	301	Headcount
a. Number of female employees	63	3	66	Headcount
b. Number of male employees	231	4	234	Headcount
Attrition rate[6]	.32	0		Percent Rate
Ratio of lowest paid employee against minimum wage (P470 lowest rate / regional min. wage of P470 (CAR) and P645 (NCR)		1:1 - about 4% higher rate than the prescribed minimum wage in the region		Ratio

Employee Benefits

List of Benefits	Y/N	% of female employees who availed for the year		% of male employees who availed for the year	
		BGO/CHQ	ILP	BGO/CHQ	ILP
SSS (premium)	Y	100%	100%	100%	100%
PhilHealth (premium)	Y	100%	100%	100%	100%
Pag-ibig (premium)	Y	100%	100%	100%	100%
Parental leaves					
Maternity	Y	8%	0	0	0
Paternity	Y	0	0	3%	0
Solo Parent	Y	1.3%	0	0	0
Vacation leaves	Y	100%	100%	100%	100%
Service Incentive Leave	Y	100%	100%	100%	100%
Sick leaves	Y	100%	100%	100%	100%
Medical benefits (aside from PhilHealth))	Y	100%	100%	100%	100%
Free Housing in camp	Y	100%	100%	100%	100%
Retirement fund (aside from SSS)	Y	1.49%	0	5.5%	0
Tuition Fee Refund	Y	14.2%	0	4.6%	0
Company stock options	Y	0	0	0	0
(Others)					
Insurance (Group life; Accident)	Y	100%	100%	100%	100%
Birthday Leave	Y	100%	100%	100%	100%
Mine workers onsite:					
Subsidized water	Y	14.2%	0	8.6%	0

[5] Employees are individuals who are in an employment relationship with the organization, according to national law or its application (GRI Standards 2016 Glossary)
[6] Attrition are = (no. of new hires – no. of turnover)/(average of total no. of employees of previous year and total no. of employees of current year)

Subsidized electricity	Y	4.7%	0	45.02%	0
Free meal during the shift	Y	30.1%	0	22.07%	0

What is the impact and where does it occur? What is the organization's involvement in the impact?	Management Approach
Rising inflation and labor costs pressured operations, leading to manpower rationalization despite high sales. Intense competition for skilled workers post-pandemic increased employee turnover risks. However, BC maintained an 81% local employment rate and upheld competitive benefits to support workforce stability.	• Maintained a lean but skilled workforce through strategic hiring and rationalization. • Strengthened employee retention through competitive compensation and benefits. • Focused on local hiring and continuous skills development. • Prioritized workforce stability as part of broader debt-free growth and diversification plans.
What are the Risk/s Identified?	**Management Approach**
• Rising Operational and Labor Costs: Inflation pressures could strain profitability, requiring strict cost control and efficient workforce management. • Talent Retention Challenges: Increased competition for skilled employees, with risks of poaching and attrition to higher-paying opportunities locally and abroad. • Lean Workforce Pressure: Maintaining productivity with fewer employees could cause operational gaps if skills and competencies are not properly managed. • Potential Talent Pipeline Gaps: Without strong succession planning, key leadership and technical roles may face future shortages.	• Control Costs: Maintain a lean, efficient workforce and optimize operations to manage rising expenses. • Strengthen Talent Retention: Enhance employee engagement through competitive pay, career growth opportunities, and a positive work environment. • Develop Internal Talent: Invest in succession planning, training, and upskilling to secure critical roles and ensure workforce adaptability. • Reinforce Employer Brand: Promote BC as a stable, growing company to attract and retain skilled employees. • Proactive Monitoring: Regularly track employee engagement and turnover to address risks early.
What are the Opportunity/ies Identified?	**Management Approach**
• Agile and High-Performing Workforce: Streamlining operations creates the opportunity to build a more skilled, efficient, and adaptable team. • Employer Branding: Strengthening employee value proposition can position BC as an employer of choice, attracting and retaining top talent. • Upskilling and Career Development: Investing in training, leadership development, and internal career growth strengthens workforce loyalty and capability. • Expansion of Career Opportunities: Diversification strategies can offer employees new roles and growth paths, enhancing retention and engagement.	• Invest in Workforce Development: Expand training programs and career pathways to build a highly skilled and loyal workforce. • Enhance Employee Value Proposition: Strengthen compensation, benefits, and work-life balance initiatives to position BC as an employer of choice. • Promote a Culture of Excellence: Foster innovation, collaboration, and continuous improvement through strong leadership and employee recognition. • Build Talent Pipelines: Partner with educational institutions and implement succession plans to ensure a steady flow of future talent. • Strengthen Safety and Operational Excellence: Integrate competency-based training and promote a strong safety culture to boost productivity and minimize risks.

Employee Training and Development

Disclosure	Quantity (2023)	Quantity (2024)	Units
Total training hours provided to employees	2,385	**1,679**	hours
a. Female employees	780	**775**	hours
b. Male employees	1,605	**904**	hours
Average training hours provided to employees	5.32	**12.34**	hours

a. Female employees	10.26	**11**	hours
b. Male employees	4.30	**14**	hours

What is the impact and where does it occur? What is the organization's involvement in the impact?	**Management Approach**
Manpower rationalization in 2024 led to a 30% reduction in total training hours compared to 2023. However, with a leaner workforce, there was a strategic shift towards more targeted and intensive employee development. This is aimed to maintain a skilled, versatile workforce capable of adapting to operational challenges and supporting strategic objectives. Safety and environmental risks remain critical focus areas, necessitating continuous training to ensure a safe and compliant working environment.	Management prioritizes maintaining a competent, adaptable workforce through focused training and skills development, delivering 1,679 training hours in 2024. Average training hours per employee increased, reflecting the shift towards quality over quantity. Safety, Health, and Environmental (SHE) training remains a core, ongoing initiative, embedded in daily operations to cultivate a culture of safety, environmental stewardship, and risk mitigation. Training efforts are tailored to address operational needs, employee well-being, and environmental protection, ensuring alignment with the Company's broader sustainability goals.
What are the Risk/s Identified?	**Management Approach**
The loss of skilled employees and insufficiently trained personnel could lead to operational inefficiencies, increased safety incidents, project delays, and regulatory non-compliance. External competition for talent heightens the risk of employee turnover, while inadequate training compromises productivity, workplace safety, and adherence to standards.	BC Management prioritizes retaining skilled employees and ensuring continuous workforce development to safeguard operational efficiency, safety, and compliance. A strong succession plan for critical roles is maintained, alongside initiatives promoting an inclusive, engaging, and trust-based workplace culture. Leadership development, regular monitoring of turnover, and proactive employee feedback mechanisms support continuous improvement. These strategies collectively aim to minimize talent loss, address skill gaps, and sustain a resilient and high-performing workforce.
What are the Opportunity/ies Identified?	**Management Approach**
BC has a strong opportunity to build a highly skilled, engaged, and loyal workforce by investing in employee development, offering competitive rewards, and fostering a positive, inclusive work environment. By strengthening retention and training strategies, BC can position itself as an "Employer of Choice" in the mining sector and beyond, attracting top talent while enhancing productivity, innovation, and operational efficiency. A continuous focus on safety, health, and environmental (SHE) training will reinforce a robust safety culture, minimize risks, and improve regulatory compliance. Additionally, boosting employee morale through growth opportunities and recognition will drive engagement and collaboration. By developing local talent and maintaining effective succession planning, BC can ensure a sustainable talent pipeline.	BC Management is committed to proactively leveraging identified opportunities to strengthen its workforce and drive sustainable growth. Talent development and retention are embedded into the Company's core strategy, supported by dedicated resources for training, competitive compensation, and employee engagement initiatives. Competency-based training, with a strong focus on Safety, Health, and Environment (SHE) standards, underpins operational excellence. BC also prioritizes an inclusive, thriving workplace through diversity, well-being programs, and regular feedback mechanisms. Strong partnerships with educational institutions and industry groups further enhance the talent pipeline. Through these actions, BC aims to transform talent management into a key driver of success, resilience, and competitive advantage.

Labor-Management Relations

Disclosure	Quantity	Units
% of employees covered with Collective Bargaining Agreements	0	%
Number of consultations conducted with employees concerning employee-related policies		%

What is the impact and where does it occur? What is the organization's involvement in the impact?	Management Approach
BC maintains a non-unionized environment, focusing on fostering harmonious relationships between management and employees. This approach directly impacts morale, productivity, and workplace stability within its primary operations. Labor-related policies are developed, reviewed, and communicated through the Policies and Procedures Committee and the HR Department, with structured mechanisms in place for addressing employee grievances.	• BC fosters a positive, stable, and engaged workforce in a non-unionized environment through proactive management practices. • Labor-related policies are developed and regularly reviewed with a focus on fairness, transparency, and employee input. • Open communication is promoted via accessible grievance mechanisms and leadership training in employee relations. • Competitive compensation and benefits are benchmarked to industry standards and clearly communicated. • The Company upholds fair labor practices, full legal compliance, and ethical management conduct. • Employee relations are monitored through turnover rates, grievance tracking, engagement surveys, and regular policy audits to ensure continuous improvement.
What are the Risk/s Identified?	**Management Approach**
Erring employees may seek attention from aggressive militant trade unions or organizations, which could disrupt the harmonious relationship and potentially lead to labor unrest. This risk is heightened if employees feel their concerns are not being adequately addressed through internal channels.	BC proactively fosters a positive, inclusive work environment by strengthening internal communication and grievance mechanisms. Through active listening, transparent processes, and daily leadership practices, the Company builds trust, addresses concerns early, and mitigates the risk of external disruption, ensuring a stable and engaged workforce.
What are the Opportunity/ies Identified?	**Management Approach**
By strengthening internal communication, grievance mechanisms, and leadership practices, BC can further enhance employee trust, engagement, and workplace stability, reducing the risk of external labor disruptions.	Management ensures that good leadership is maintained, there is competitive compensation package and established employee engagement strategies

Diversity and Equal Opportunity

Disclosure	Quantity (2023)		Units	Quantity (2024)		Units
% of female workers in the workforce	17%		%	21.9%		%
% of male workers in the workforce	83%		%	78.%		%
Number of employees from indigenous communities and/or vulnerable sector*						
	Elderly	16	#	Elderly	22	#
	Solo Parent	0	#	Solo Parent	5	#
	PWDs	2	#	PWDs	1	#
	Indigenous Peoples	198	#	Indigenous Peoples	118	#
	Approximately 90% of the site workforce are Indigenous people.		%	Approximately 40% of the site workforce are Indigenous people.		%

**Vulnerable sector includes, elderly, persons with disabilities, vulnerable women, refugees, migrants, internally displaced persons, people living with HIV and other diseases, solo parents, and the poor or the base of the pyramid (BOP; Class D and E).*

Workforce Distribution by Region

Region	No. of Employees (2023)	No. of Employees (2024)
National Capital Region (NCR)	52	55
CARAGA	1	0
Region 1	116	63
Region 2	7	6
Region 3	27	39
Region 4A (CALABARZON)	13	4
Region 4B	1	0
Region 5	5	4
Region 6	1	6
Region 7	8	0
Region 8	1	0
Region 11	4	2
Cordillera Administrative Region (CAR)	212	122
Total	448	301

What is the impact and where does it occur? What is the organization's involvement in the impact?	**Management Approach**
The Company's operations at Benguet Gold Operation (BGO) and Irisan Lime Project (ILP) have directly influenced employment levels and workforce composition in Benguet and nearby provinces. As of 2024, 81% of the workforce consisted of local residents, reflecting the Company's commitment to community employment and socio-economic development. Efforts to promote gender equality also increased female representation from 17% in 2023 to 21.9% in 2024. However, a manpower rationalization program initiated in early 2024, due to continued financial losses at BGO, resulted in a 30% workforce reduction, negatively impacting employment opportunities despite maintaining a high proportion of local hires.	BC prioritizes local hiring and upholds a non-discriminatory employment policy, prohibiting bias based on vulnerability, sex, or religious affiliation. The Company is committed to providing equal employment opportunities to qualified candidates from impact and nearby communities, achieving an 81% local employment rate as of 2024. Department Heads are responsible for enforcing hiring policies, while Medical and Safety teams monitor workplace conditions for persons with disabilities and underlying health concerns. Safety and HR departments jointly manage employee behavior regarding safety practices, with policy development supported by the HR department and the Policies and Procedures Committee. Key initiatives include local hiring preference, programs to increase female employment, succession planning with local employee inclusion, monitoring of vulnerable employees, and reinforcement of behavioral safety practices through disciplinary measures.
What are the Risk/s Identified?	**Management Approach**
• Vulnerable employees (elderly, persons with disabilities, female workers) may face restrictions in hazardous areas. • Productivity may decline if a large portion of the workforce is from vulnerable groups. • Accident rates may rise if vulnerable employees are not adequately trained.	Departments identify hazardous jobs during hiring, ensuring proper PPE is provided. Succession planning for elderly managers and close monitoring by Medical and Safety teams help maintain a safe and healthy work environment for vulnerable employees. Behavioral safety is strongly emphasized, with Safety and HR teams enforcing discipline for safety violations.
What are the Opportunity/ies Identified?	**Management Approach**
1. Knowledge and Skills Transfer: Seasoned employees can transfer knowledge to younger generations, benefiting both the company and the employee (though potentially with initial costs).	Management maintains its approach of giving equal opportunities in the workplace and in the communities where the Company operates. The Company will continue to uphold its Hiring Policy, strengthen safety protocols, and actively promote an inclusive culture that values the contributions of all employees. Management will also explore structured

2. Self-Actualization: Providing work opportunities for the vulnerable sector (PWDs and retirees) can lead to self-worth and actualization. 3. Equal Competence: Women have proven to be equally capable and competent as men.	mentorship programs to facilitate knowledge transfer and ensure that our commitment to equal opportunities translates into tangible career advancement for all segments of our workforce.

Workplace Conditions, Labor Standards, and Human Rights

Occupational Health and Safety

Disclosure	Quantity (2024) BGO-CHQ	Quantity (2024) ILP	Units
Safe Man-Hours	2,431,040	87,449	Man-hours
No. of work-related injuries	8	0	#
No. of work-related fatalities	2	0	#
No. of work related ill-health	0	0	#
No. of safety drills:			
1. Fire Evacuation &Rescue Drill	3	1	#
2. Evacuation & Response Earthquake Drill/Nationwide Simultaneous Earthquake Drill	5	3	#
3. Chemical Spill Drill	1	0	#

What is the impact and where does it occur? What is the organization's involvement in the impact?	Management Approach
During the 2024 reporting period, BGO unfortunately recorded two (2) work-related fatalities due to a cave-in and cardiac arrest, and eight (8) work-related injuries consisting of minor abrasions, wounds, and one fracture. No cases of work-related ill-health were reported at BGO. While operations at BGO continued without suspension, the Company acknowledges the significant impact of these incidents on workforce well-being and operational integrity. A thorough review and continuous improvement of safety management systems remain a key priority. In contrast, the ILP site, with a total of 87,449 safe man-hours, reported zero (0) work-related fatalities, injuries, or cases of work-related ill-health in 2024, indicating strong safety performance. This commitment to safety was further recognized with the SAFEST MINERAL PROCESSING-CALCINING PLANT CATEGORY 2024 award. To bolster emergency preparedness across operations, both BGO-CHQ and ILP conducted safety drills in 2024. BGO-CHQ carried out three drills: Fire Evacuation & Rescue (3), Earthquake Evacuation & Response (5), and a Chemical Spill Drill (1). ILP also conducted a Fire Evacuation & Rescue Drill (1) and an Earthquake Evacuation & Response Drill (3). These drills are integral to the Company's ongoing commitment to cultivating a proactive safety culture and minimizing operational risks. Further underscoring its commitment to safety, BGO received the 2nd Runner Up award in the Industrial Category and was Champion in the Bucket Relay at the 5th Itogon Fire Olympics. Additionally, the Company utilized 73.39% (₱5,285,148.81) of its allocated ASHP (Annual Safety and Health Program) budget for CY 2024.	Employee safety is a core priority across all operations. We implement comprehensive safety systems, conduct regular emergency drills, and provide ongoing training to ensure hazard awareness and risk mitigation. Incident monitoring and root cause analyses drive continuous improvement. Following 2024 incidents at BGO, we are strengthening safety protocols to further enhance workplace health, resilience, and operational integrity. The Company recognizes that the incidents at BGO-CHQ underscore the need for enhanced safety initiatives. Accordingly, a comprehensive review of safety practices and additional corrective actions are being prioritized to uphold the highest standards of occupational health and safety across all sites.

What are the Risk/s Identified?	Management Approach
• High-Consequence Hazards: The inherent dangers of mining and milling (strenuous work, perilous conditions) create a significant risk of serious incidents, including fatalities. • Persistent Injury Risk: Despite a decrease in injury numbers from 2023 to 2024, the continued occurrence of injuries indicates that hazards are not adequately controlled. • Potential for Negative Impacts: Fatalities and injuries can negatively affect employee morale, productivity, legal/regulatory standing, and the company's reputation.	Mining and milling operations inherently involve high-consequence hazards and persistent injury risks. The Company is committed to minimizing these risks by maintaining a robust safety management system, focused on hazard identification, risk assessment, and the implementation of effective controls. Comprehensive safety training, regular emergency response drills, and strict operational protocols are enforced to ensure all employees are physically prepared and fully aware of workplace hazards. Incident data is systematically analyzed to identify trends and inform continuous improvement initiatives. Following the occurrence of fatalities and injuries at BGO in 2024, the Company is strengthening its safety programs through enhanced training, targeted risk mitigation measures, and more frequent safety audits. These actions aim to protect employee well-being, sustain productivity, and uphold our legal, regulatory, and social license to operate. The Company remains fully committed to fostering a proactive safety culture, preventing serious incidents, and safeguarding both workforce morale and organizational resilience.
What are the Opportunity/ies Identified?	**Management Approach**
• Replicate best practices recognized through past safety awards. • Strive for industry leadership to enhance reputation and stakeholder trust. • Implement competency-based training to boost engagement and retention. • Strengthen emergency preparedness through ongoing ERT development. • Build on ILP's national safety recognition to drive continuous improvement. (The Irisan Lime Project (ILP) is awarded with SAFEST MINERAL PROCESSING-CALCINING PLANT CATEGORY in 2024 by the DENR-Mines and Geosciences Bureau and the Philippine Mine Safety and Environment Association in the pursuit of excellence in safety and health management.	The Company prioritizes strict compliance with its Occupational Health and Safety Policy, aligned with DENR DAO No. 2000-98, aiming to prevent all work-related fatalities, injuries, and illnesses. A proactive and preventive safety culture is fostered, emphasizing hazard anticipation and early intervention. Employees are empowered to take ownership of safety through active participation in hazard identification and improvement initiatives. The Company aspires to industry leadership in occupational health and safety by continuously improving practices and sharing best standards. Adequate resources are allocated to support these initiatives, the Company utilized 73.39% (₱5,285,148.81) of its allocated ASHP (Annual Safety and Health Program) budget for CY 2024 for BGO. *Please refer to Appendix "K" – Certificate of Approval of 2024 Safety and Health Program for BGO*

Labor Laws and Human Rights

Disclosure	Quantity	Units
No. of legal actions or employee grievances involving forced or child labor	0	# of employees

Do you have policies that explicitly disallows violations of labor laws and human rights (e.g. harassment, bullying) in the workplace?

Policy on Labor Laws and Human Rights

Topic	Y/N	If Yes, cite reference in the company policy
Forced labor	y	Policy contains provisions of RA 10364 – An Act to Institute Policies to Eliminate Trafficking in Persons specially Women and Children, Establishing the Necessary Institutional Mechanism for the Protection and Support of Trafficked Persons, Providing Penalty for Its Violation and for other Purposes…
Child labor	y	Policy contains provisions of RA 7610
Human Rights	y	Policy on Sexual Harassment – (see link- Policy on Sexual Harassment) Employees Code of Conduct – (see link http://benguetcorp.com/wpcontent/uploads/2018/05/ECD%20with%20ee%20acknowledgement.pdf)

What is the impact and where does it occur? What is the organization's involvement in the impact?	Management Approach
As a Company, Benguet Corporation does not tolerate forced or child labor and human right violations. It ensures that the Philippine law on such is strictly implemented across the organization.	As evidenced in the manpower profile, no employee in the roster is below 18 years of age. No incident of human right violation has been filed by any employee as of to date. Company Policy on Child Labor is in place. (*see link http://benguetcorp.com/wp-content/uploads/2023/04/Child-Labor- Policy.pdf*) No cases of child labor have been received as of this period.
What are the Risk/s Identified?	**Management Approach**
Contractors and suppliers may engage in forced labor or employment of minors or below 18 years of age and assign them on hazardous workplaces.	Provision in the contracts that Contractors and suppliers must comply with the Company policies and procedures applicable to them as well as with applicable Philippine laws. Stiffer penalty shall apply to those who will be in violation.
What are the Opportunity/ies Identified?	**Management Approach**
With the formulated policies on forced and child labor and human rights violation, Management and employees are properly guided	Employees are oriented on the Code of Discipline before start of employment and regular update is done as necessary.

Relationship with Community Significant Impacts on Local Communities

Operations with significant (positive or negative) impacts on local communities (exclude CSR projects; this has to be business operations)	The Company actively fulfills its commitment to its Social Development and Management Programs (SDMP) by addressing key needs in its host and neighboring communities. Aligned with the SDMP framework outlined in DAO 2010-21 and DAO 2010-13, the company invested in the following priority areas: 1. Human Resource and Institutional Building 2. Enterprise Development and Networking 3. Infrastructure Development and Support Services 4. Education and Educational Support Programs 5. Health Services, Facilities, and Professionals 6. Protection and Respect of Socio-cultural Values For the 2024 reporting period (January-December), SDMP implementation

	achieved 82.35%, with an expenditure of PhP 3,931,464.35 out of the PhP 4,774,155.24 budget. The main factor contributing to the 17.65% variance was the late submission of project proposals by beneficiary Barangays. The remaining funds will be allocated to the 2025 SDMP initiatives.
Location	Itogon, Benguet & Baguio City
Vulnerable groups (if applicable)	IPs, women, migrant groups, elderly, youth
Does the particular operation have impacts on indigenous people (Y/N)?	Yes
Collective or individual rights that have been identified that or particular concern for the community	Right to livelihood; Right to education; Right to shelter; Right to health; Water resource and Infrastructure developments;
Mitigating measures (if negative) or enhancement measures (if positive)	1. The Company continues to uphold and respect the rights of Indigenous Peoples (IPs) in the vicinity of its mining operations, actively contributing to poverty reduction and an improved quality of life 2. The Company actively shares the benefits of its operations with vulnerable community members to improve their quality of life. Furthermore, its mining operations and related projects generated significant employment opportunities for local communities. 3. Recognizing the development challenges in the region, the Company actively partnered with the national government on infrastructure and other key projects. This collaboration involved the proactive promotion of responsible mining practices with the DENR and support for initiatives by the DILG and DA. Despite the contributions of bilateral and multilateral projects in sectors like infrastructure, water resources, rural development, and governance, strengthening LGU capacity remained a priority. The Itogon Municipality and Barangays Virac and Poblacion LGUs are significantly dependent on Internal Revenue Allotment, and limited economic growth perpetuates low-income levels. Notably, the approved and well-executed Social Development and Management Program (SDMP) and Environmental Protection and Enhancement Program (EPEP) from BC-BGO and ILP operations have been instrumental in addressing these limitations and strengthening the LGUs' development projects within their operational areas.
Vulnerable sector includes children and youth, elderly, persons with disabilities, vulnerable women, refugees, migrants, internally displaced persons, people living with HIV and other diseases, solo parents, and the poor or the base of the pyramid (BOP; Class D and E)	

What are the Risk/s Identified?	Management Approach
The fact that the main reason for the 17.65% variance in SDMP implementation was the delayed or incomplete project implementation due to late submission of proposal by beneficiary Barangays highlights a risk. If this issue persists, it could lead to: • Communities may not receive the intended benefits (livelihood, infrastructure, education, health, etc.) in a timely manner, leading to dissatisfaction and erosion of trust. • Delays could be perceived as a lack of commitment from the company, fostering negative sentiment and potentially leading to social unrest. • Delayed projects can slow down the overall development progress in the host and neighboring communities.	It is the goal to ensure timely and efficient implementation of Social Development and Management Program (SDMP) projects by addressing the root causes of late proposal submissions from beneficiary Barangays, thereby meeting community needs, fostering trust, and supporting sustainable development. The following are being implemented: 1. Collaborative Engagement: Working in close partnership with the Barangays throughout the project cycle. 2. Capacity Building: Empowering Barangays with the knowledge and resources to develop timely and quality proposals. 3. Clear Communication: Establishing transparent and consistent communication channels.
What are the Opportunity/ies Identified?	**Management Approach**
The following may optimize the timely and effective implementation of SDMP projects through collaborative empowerment, streamlined processes, and continuous learning, thereby maximizing community benefits and strengthening stakeholder relationships: a. Simplifying the proposal submission and review process. b. Defining clear roles and responsibilities for both the Company and the Barangays. c. Identifying potential delays early and providing necessary assistance. d. Actively engage with the Itogon Municipality and Barangays Virac and Poblacion LGUs to ensure SDMP projects are strategically aligned with their broader development objectives and contribute to local government capacity building.	The Company moves beyond simply addressing delays to proactively empowering communities, fostering collaboration and learning, to ensure that SDMP projects are not only timely but also impactful and sustainable, contributing directly to the long-term development of the host and neighboring areas. The Community Relations Department leads the implementation of this management approach, providing necessary resources and support, facilitating capacity building, and ensuring effective monitoring and evaluation to foster even stronger relationships with the community and ensuring a more effective and timely delivery of benefits through the SDMP.

For operations that are affecting IPs, indicate the total number of Free and Prior Informed Consent (FPIC) undergoing consultations and Certification Preconditions (CPs) secured and still operational and provide a copy or link to the certificates if available:

Certificates	Quantity	Units
FPIC –	**0**	**#**
CP secured –	**0**	**#**

What are the Risk/s Identified?	Management Approach
Several of BC's upcoming projects (e.g., EXPA on mining claims, Malouf SMP, and BTP) are located in areas with Indigenous Peoples (IPs) and thus require FPIC to proceed with regulatory approvals and operations. The following risks are identified: • Denial of permits due to failure to secure FPIC (Free, Prior and Informed Consent) from Indigenous Peoples (IP) communities. • Costly and time-consuming FPIC process, limited to 3 years under DENR's Use it/Lose it policy. • IP community opposition influenced by anti-mining NGOs, LGUs, and small-scale miners. • Potential project cancellation, investment loss, and regulatory delays. • Ambiguity in policies and guidelines regarding PPAs (Programs, Projects & Activities) may lead to misinterpretations, disagreement, and implementation delays.	• Maintain Close Coordination with NCIP and IP Community: • Hiring an expert to develop and implement a strategic approach. • Continuous relationship-building efforts with IP communities to address concerns and reduce opposition. • Acknowledging and acting within the 3-year FPIC limit under DENR policy.
What are the Opportunity/ies Identified?	**Management Approach**
• **Improved Relations**: Strengthening relationships with IP communities and NCIP (National Commission on Indigenous Peoples) opens doors to better collaboration • **Strategic Advisory**: Engaging consultants for FPIC-related strategies helps BC proactively navigate the process. • **Reputation Enhancement**: Demonstrating respect for indigenous rights can improve corporate reputation and social license to operate.	• Uphold IPs' rights through transparent, inclusive, and culturally sensitive consultations. • Build trust-based relationships with IP communities through ongoing dialogue, community development projects, and clear communication of project impacts and benefits. • Secure long-term community acceptance by aligning development goals with community needs and values. • Adhere strictly to FPIC protocols under Indigenous Peoples Rights Act (IPRA) and DENR guidelines.

Customer Management Customer Satisfaction

Disclosure	Score	Did a third party conduct the customer satisfaction study (Y/N)?
Customer satisfaction	100%	N
What is the impact and where does it occur? What is the organization's involvement in the impact?	**Management Approach**	
The company has both products and services. Its gold productions are sold and purchased by the Bangko Sentral ng Pilipinas (BSP) based on the prevailing market price. The world market dictates the price of gold. As to the services, the company complied and extended all what is due to the communities. Their desired quantity of PPAs implemented might not have fully satisfied them but all were undertaken based on quality and resiliency standards.	Continued engagements with the Bangko Sentral ng Pilipinas as the buyer of our product and abide by its rules and regulations. Continued enhanced engagements with the clients/recipients of the services. Institutionalized participative approach in all stages of coming up with PPAs. For quality assurance, involved the communities from the planning stage up to implementation and monitoring.	

What are the Risk/s Identified?	Management Approach
Sudden/abrupt reduction of the price of gold in the world market.	Maintained close monitoring of gold prices while constantly engaging with the BSP.
What are the Opportunity/ies Identified?	**Management Approach**
Selling BC's gold production to BSP directly contributed to the Philippine economy as opposed to selling the product to foreign buyers. Maintained or improved the purity of gold sold to BSP.	Continue selling gold produced to Bangko Sentral ng Pilipinas (BSP) and silver to local market. Provided better service to BSP by selling gold concentrate.

Health and Safety

Disclosure	Quantity	Units
No. of substantiated complaints on product or service health and safety*	0.00	#
No. of complaints addressed	0.00	#
**Substantiated complaints include complaints from customers that went through the organization's formal communication channels and grievance mechanisms as well as complaints that were lodged to and acted upon by government agencies.*		

What is the impact and where does it occur? What is the organization's involvement in the impact?	Management Approach
Safety of employees during transport and delivery of gold to Bangko Sentral ng Pilipinas (BSP) in Baguio City.	No fixed schedule of transporting the commodity. Security alert must be imposed.
What are the Risk/s Identified?	**Management Approach**
There is potential possibility of hold-up and kidnap for ransom during delivery of gold to BSP in Baguio City.	Maintain confidentiality of information on gold production and details. No fixed schedule of transporting the commodity. Security alert imposed. Rotation of security escort during transport and delivery of product to Baguio City.
What are the Opportunity/ies Identified?	**Management Approach**
Accessibility of market – location of BSP is in Baguio City which is about 15 kms. away from the mine site.	Improve intelligence network and regular coordination with Itogon PNP.

Marketing and labelling

Disclosure	Quantity	Units
*No. of substantiated complaints on marketing and labelling** No complaints received in 2024 from our only customer which is the BSP on quality of our products.	0.00	#
No. of complaints addressed. No complaints received/addressed in 2024 from our only customer which is the BSP.	0.00	#
**Substantiated complaints include complaints from customers that went through the organization's formal communication channels and grievance mechanisms as well as complaints that were lodged to and acted upon by government agencies.*		

Identification of Impact	Management Approach
There was no determined impact because there are no complaints received/addressed in 2024 from BC's only customer, Bangko Sentral ng Pilipinas (BSP). Likewise, no complaint was received from ILP clients.	For the year under report, the Company did not receive any complaint from BC's customer, BSP, regarding the marketing and labeling of our gold product. Likewise, no complaint was received from ILP clients. If ever complaints arise in the future, the Company will handle/resolve the issues following the Company's policies and procedures.
What are the Risk/s Identified?	**Management Approach**
There were no determined risks because the Company delivers its product in accordance with the established guidelines of its sole customer, the BSP.	For the year under report, the Company did not receive any complaint from BC's sole customer, BSP, regarding the marketing and labeling of its product. Likewise, no complaint was received from ILP clients. If ever complaints arise in the future, the Company will handle/resolve the issues following the Company's policies and procedures.
What are the Opportunity/ies Identified?	**Management Approach**
Increased Gold sales will increase BSP's gold reserve.	Benguet Corporation will continue to maintain or improve further on gold production and purity.

Customer privacy

Disclosure	Quantity	Units
*No. of substantiated complaints on customer privacy**	0.00	#
No. of complaints addressed	0.00	#
No. of customers, users, and account holders whose information is used for secondary purposes	Limited only to authorized Company engagement.	#
**Substantiated complaints include complaints from customers that went through the organization's formal communication channels and grievance mechanisms as well as complaints that were lodged to and acted upon by government agencies.*		

What is the impact and where does it occur? What is the organization's involvement in the impact?	Management Approach
The gold products are sold only to Bangko Sentral ng Pilipinas. Benguet Corporation caters to a government institution as a customer. Thus, the company strives for confidentiality and accountability in all its public disclosures.	Observed the Data Privacy Policy of the company formulated in accordance with the Data Privacy Act of 2012 (R.A. 10173). This assures the confidentiality of customers' information. Moreover, the Company adopted control measures to prevent the occurrence of data breach incidents. Proactively managed risks to ensure the protection of data privacy at the start and throughout the lifecycle of any transaction. Appointment of Data Privacy Officer (DPO) for Baguio Operation.

What are the Risk/s Identified?	Management Approach
1. Loss of trust by either party (BC or customer) due to privacy breach. 2. Unauthorized processing which includes but not limited to collection, recording, storage, updating or modification, retrieval, consolidation, use, erasure, or destruction of information/data gathered that may result in financial injury to both the company and the customer.	Security of the data collected from the Bangko Sentral ng Pilipinas is undertaken by limiting access to such information after it's been gathered. Direct and upfront communication with the customers about the information gathered and plans for using it.
What are the Opportunity/ies Identified?	**Management Approach**
Build stronger relationship with the customer.	Give customers an online form or email address for communicating their problems or concerns. Management undertakes to respond to these messages. Such two-way communication can help build trust and loyalty -- and help avoid potential privacy breaches.

Data Security

Disclosure	Quantity	Units
No case of data breaches, including leaks, thefts, and losses of data. There were no reported data privacy incidents, notifiable data breaches relating to cyber security, data governance, or failure in the internal controls, any substantiated complaints concerning breaches of customer privacy and losses of customer data for the reporting period.	0.00	# of data breaches

What is the impact and where does it occur? What is the organization's involvement in the impact?	Management Approach
Benguet Corp has a Data Privacy Policy in place being rolled out to all employees. The penalty for the violation of privacy rights resulting in data breaches are also incorporated in the Employee's Code of Conduct, thus it raises the security and privacy awareness further in the organizational culture. The Company implemented and continuously improved its internal control to minimize the risk of data breaches.	To establish and further reinforce the knowledge about security and data protection, the Data Privacy Policy forms part of the onboarding process of newly hired employees. Moreover, the Company adopts control measures to prevent the occurrence of data breach incidents. BC management also ensures that our stakeholders and those we do business or partner with, including third-party providers, follow the law on data privacy. This year the Company has obtained the seal of registration issued by the NPC as proof of compliance.
What are the Risk/s Identified?	**Management Approach**
The accelerating cyber-attack and continuous changing threat landscape.	We are using several frameworks to improve our concept of layered security and defense i.e. Microsoft Defender, Microsoft 365 security, anti-malware and similar security frameworks. We continuously follow security alerts and related information from our IT environment to be able to respond timely to any incident. The Company is compliant with the Data Privacy Law of 2016. *Please refer to link on Data Privacy Policy* http://benguetcorp.com/wp- content/uploads/2018/05P7-Data-Privacy-Policy.pdf

What are the Opportunity/ies Identified?	Management Approach
More opportunities in the field of training to keep abreast of new regulations and compliance management. Opportunity to be certified on ISO 27001:2013.	To ensure that all applicable NPC regulations are followed, our team continuously monitor NPC circulars like the new registration platform that pursues automation of registration process of personal data processing system, notification regarding automated decision-making or profiling, designation of Data Protection Officer. To obtain certification on ISO 27001:2013- Information and Data Security to develop the capabilities of employees engaged with data protection.

UN SUSTAINABLE DEVELOPMENT GOALS

Product or Service Contribution to UN SDGs
Key products and services and its contribution to sustainable development.

SDG No. & Goal	Key Products / Services	Societal Value / Contribution	Potential Negative Impact	Management Approach to Negative Impact
SDG 1: No Poverty	Gold & Silver Production (BGO)	Contributes to national economy, BSP gold reserves, employment, taxes, and local commerce	Land degradation due to small-scale miners; IP migrant influx; illegal squatting	Partner with LGU, MGB, DENR for regulation; enforce camp rules; reduce environmental footprint
SDG 2: Zero Hunger	Gold & Lime Products	Social Development and Management Program (SDMP); Implements livelihood programs, infrastructure development, and food security initiatives; Supports agricultural sustainability and local productivity; Empowers communities through training and capacity building	Potential conflict or resource competition due to program reach	Sustained community-based development project implementation; Engage local communities during planning; Promote transparency and equal access to resources
SDG 3: Good Health and Well-being	Medical missions; Medical services to employees and IP communities	Promotes health and safety among workers and local IP residents; Delivers essential medical services to workers and local IPs; Improves health outcomes in isolated and underserved communities	Poor sanitation; improper PPE disposal	Exposure to hazardous materials; Conduct regular IEC campaigns; Implement robust solid waste and hazardous waste management compliant with RA 9003 and RA 9275; Provide PPE and safety training to workers |
SDG 4: Quality Education	Educational scholarships and IT equipment donation	Offers scholarships to indigent but deserving students; Enhances educational access and digital learning capacity in rural areas	Rivalries/envy from neighboring communities; Community tension from perceived favoritism or exclusion	Use objective, community-endorsed criteria for scholarship selection; Promote transparency and community consultation ; Candidate vetting by local officials;

SDG 6: Clean Water and Sanitation	Gold Processing / TSF operations and wastewater treatment	Equitable water access, solid waste segregation, pollution control; Ensures water quality in adjacent river systems; Prevents contamination through strict TSF operation protocol; Promotes community hygiene and water conservation	Tailings leakage, water contamination; Improper ecological solid waste management	Maintain and monitor TSF regularly, stop mill operation if leakage occurs, ISO 14001 compliance; Implement ISO 14001-aligned environmental protocols; Educate communities on waste disposal and sanitation practices
SDG 8: Decent Work & Economic Growth	All Mining & Support Operations	Livelihood generation, employment opportunities, wealth sharing with vulnerable sectors; Provides income-generating opportunities to local residents; Uplifts local economy through procurement and service contracts; Encourages inclusive economic participation	Limited job reach may exclude marginalized sectors; Fluctuations in demand may affect employment stability	Prioritize locals for jobs and contracts; Promote inclusive hiring policies and skill development
SDG 12: Responsible Consumption & Production	Procurement and supply chain management	Practices responsible sourcing and supplier partnerships; Ensures quality and timeliness of critical operational supplies; Encourages sustainable practices in logistics; Support to local suppliers	Substandard or delayed supply delivery; High costs of imported materials; Unstable supply chain affecting productivity	Vet suppliers with risk-based assessment; Require ISO certification and compliance; Develop long-term procurement forecasting and planning; Support capacity-building of local suppliers
SDG 13: Climate Action	Reforestation, Pollution Controls	Maintains reforested areas; Actively sequesters CO2 through tree planting; Minimizes air pollution with scrubbers and emission monitoring	Deforestation, air pollution, landslides, forest fires, underground water depletion	Continue preventive maintenance of equipment; Implement firebreaks and reforestation measures; Collaborate with local communities in disaster preparedness; Engage third-party air quality monitoring firms
SDG 15: Life on Land	Forest Park, Tree Planting and biodiversity programs	Preserves biodiversity through Crosby Forest Park; Promotes ecological tourism and awareness; Maintains reforestation efforts with tree density goals ,	Land encroachment or unsanctioned land use; Loss of tree cover if neglected |	Conduct regular forest inspections; Involve employee families in environmental stewardship; Sustain enrichment planting programs
SDG 16: Peace, Justice, and Strong Institutions	Security Operations and enforcement	Maintains peace and order within operational areas; prevents illegal mining & squatting	Disruption from illegal small-scale mining; Social instability from migrant influx	Partner with law enforcement and barangay units; Enforce rules fairly and transparently

SDG 17: Partnerships for the Goals	Employment and engagement with IP co-ops, contractors	Employment of workforce including IPs; Strengthens cooperation with MGB and other government agencies; Builds inclusive local economies thru business for suppliers and co-ops	Legal, financial, and reputational risks from non-compliance; Risk of conflict with unregulated small-scale mining	Maintain ISO 14001:2015 Certification; Align operations with DAO 2015-07; Continue partnerships that support responsible and inclusive development |

LIST OF APPENDICES:

APPENDIX NO.	TITLE
A	Environmental Management System Document No. EMSG-06 (Guidelines on Power Consumption)
B	Certificate of Approval of Annual Environmental Protection and Enhancement Program (AEPEP) given to Benguet Corporation-Acupan Contract Mining Project (ACMP)
B-1	Certificate of Approval of Annual Environmental Protection and Enhancement Program (AEPEP) given to BMC Forestry Corporation-Irisan Lime Project (ILP)
C	DRCS-09 (Summary of Risk and Opportunities)
D	Environmental Management System Document No. EMSG-03 (Guidelines on Diesel, Oil and Grease Handling, Transport and Storage)
E	Environmental Management System Document No. EMSG-12 (Guidelines on Contaminated Water)
F	Report of Greentek Environmental Engineering Services on Source Emission Test Result (BC-ACMP)
F-1	Report of BSI on Source Emission Test Result (BFC-ILP)
F-2	Report of BSI on Source Emission Test Result (BFC-ILP)
G	Ambient Air Quality and Noise Monitoring Report of Greentek Environmental Engineering Services (BC-ACMP)
G-1	Ambient Air Quality and Noise Monitoring Report of Greentek Environmental Engineering Services (BC-ACMP)
G-2	Ambient Air Quality and Noise Monitoring Report of BSI (BFC-ILP)
H	Environmental Management System Document No. EMSG-07-A (Guidelines on Hazardous Waste Management – Used Oil, Oil and Grease, and Contaminated Items)
I	Environmental Compliance Certificate (BC-ACMP)
I-1	Environmental Compliance Certificate (BFC-ILP)
J	Registry of Compliance Obligations
K	Certificate of Approval of Amended 2024 Safety and Health Program (BC-ACMP)
K-1	Certificate of Approval of 2024 Safety and Health Program (BFC-ILP)
L	Certificate of Approval of Annual Social Development and Management Program (ASDMP) of BC-ACMP
L-1	Certificate of Approval of Annual Social Development and Management Program (ASDMP) of BFC-ILP

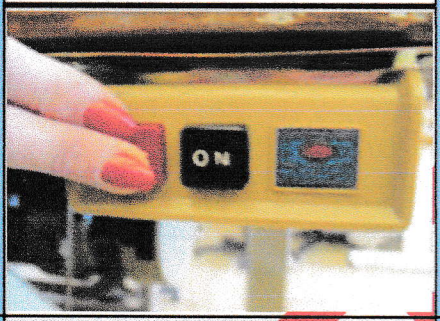
Document Title	EMS GUIDELINES			Appendix A	BenguetCorp
Process	Power Conservation				
Document Code	DRCS-12-06_EMSG_PC	Revision No.	01	Effective Date	Jan. 1, 2023
Department	Electrical, All Departments			Page Number	Page 1 of 1
Prepared by: GP AYSON	Reviewed by: BGO EMS			Approved by: VB BONGALOS JR.	

INDOORS/OFFICE

Use natural light whenever possible

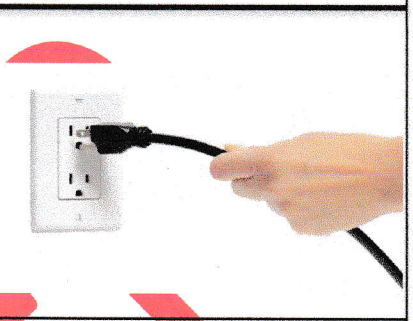
INDOORS/OFFICE

Turn off lights, machinery, computers, & appliances whenever possible



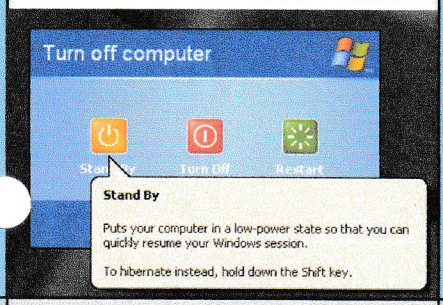
INDOORS/OFFICE

Unplug electrical appliances and chargers when they are not in use



INDOORS/OFFICE

Avoid leaving computers on standby when leaving the office for the day



INDOORS/OFFICE

Use air-conditioning only when necessary

INDOORS/OFFICE

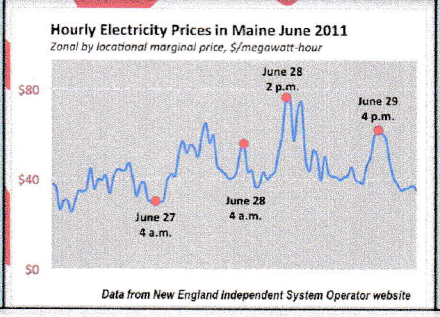
Shutdown all computers at break, when leaving the office for the day

INDUSTRIAL AREA

Make sure to turn off outside/outpost lamps first thing in the morning

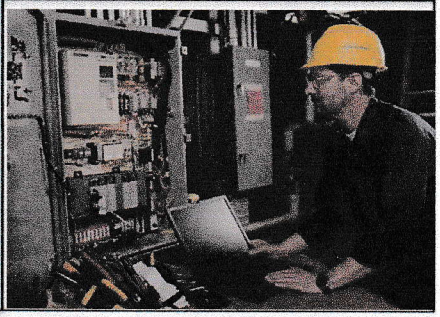
INDUSTRIAL AREA

Operating big tanks on hours with lower power rates



INDUSTRIAL AREA

Proper maintenance of equipment to maximize power efficiency



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Republic of the Philippines
Department of Environment and Natural Resources
MINES AND GEOSCIENCES BUREAU
Cordillera Administrative Region
80 Diego Silang St., Baguio City 2600
Tel. No. 63 74 442 6392; Fax No. 63 74 304 2596; Website: www.car.mgb.gov.ph
E-mail: car@mgb.gov.ph; car_mgb@yahoo.com; mgb.cordillera@gmail.com

ANNUAL ENVIRONMENTAL PROTECTION AND ENHANCEMENT PROGRAM (AEPEP)

CERTIFICATE OF APPROVAL
No. 2024-02-CAR

BENGUET CORPORATION-ACUPAN CONTRACT MINING PROJECT
PC-ACMP-002-CAR

The Mines and Geosciences Bureau - Cordillera Administrative Region (MGB-CAR) as Chair of the Mine Rehabilitation Fund Committee for Benguet Corporation-Acupan Contract Mining Project (MRFC-ACMP) that evaluated and approved the company's 2024 Annual Environmental Protection and Enhancement Program (AEPEP), hereby grants this Certificate of Approval of said AEPEP to **BENGUET CORPORATION-ACUPAN CONTRACT MINING PROJECT (BC-ACMP)** for its Patented Mining Claims-ACMP-002-CAR located at Barangay Virac, Itogon, Benguet after complying substantially with the requirements as mandated under DENR Administrative Order No. 2010-21.

This Certificate is being issued subject to the pertinent provisions of the above-mentioned DAO and to the following conditions:

1. This Certificate is valid only for the Programs/Projects/Activities (P/P/As) stipulated in the submitted 2024 AEPEP with a total budget of **PhP 18,117,248.00** reviewed and approved by the MRFC-BCACMP;
2. The Company shall submit a *quarterly accomplishment report within 30 calendar days after the end of each quarter and annual accomplishment report within 30 calendar days after the end of each calendar year* to MGB-CAR; and
3. Additional conditions may be imposed to implement the approved AEPEP effectively and efficiently should the results of monitoring by the Multipartite Monitoring Team (MMT) for BC-ACMP warrant them.

Non-compliance with the above conditions shall be sufficient ground for the cancellation, revocation or termination of this Certificate or suffer the penalty prescribed in the Penal Provisions of Republic Act No. 7942, the Philippine Mining Act of 1995.

Given this 14th day of December 2023 at MGB-CAR, Baguio City, Philippines.

FAY W. APIL
Regional Director

Department of Environment and Natural Resources
Mines and Geosciences Bureau
Cordillera Administrative Region
010124-CAR-51084
Certificate of Approval
2:23 PM 01/08/2024

"MINING SHALL BE PRO-PEOPLE AND PRO-ENVIRONMENT
IN SUSTAINING WEALTH CREATION AND IMPROVED QUALITY OF LIFE."

Republic of the Philippines
Department of Environment and Natural Resources
MINES AND GEOSCIENCES BUREAU
Cordillera Administrative Region
80 Diego Silang St., Baguio City 2600
Tel. No. 63 74 442 6392; Fax No. 63 74 304 2596; Website: www.car.mgb.gov.ph
E-mail: car@mgb.gov.ph; car_mgb@yahoo.com; mgb.cordillera@gmail.com

ANNUAL ENVIRONMENTAL PROTECTION AND ENHANCEMENT PROGRAM (AEPEP)

CERTIFICATE OF APPROVAL
No. 2024-04-CAR

BMC FORESTRY CORPORATION
Mineral Processing Permit No. 01C-2022-CAR

The Mines and Geosciences Bureau - Cordillera Administrative Region (MGB-CAR) as Chair of the Mine Rehabilitation Fund Committee for BMC Forestry Corporation-Irisan Lime Project (MRFC BFC-ILP) that evaluated and approved the company's 2024 Annual Environmental Protection and Enhancement Program (AEPEP), hereby grants this Certificate of Approval of said AEPEP to **BMC FORESTRY CORPORATION-IRISAN LIME PROJECT (BFC-ILP)** for its Mineral Processing Project located at Barangay Irisan, Baguio City under its Mineral Processing Permit No. 01C-2022-CAR, after complying substantially with the requirements as mandated under DENR Administrative Order (DAO) No. 2010-21.

This Certificate is being issued subject to the pertinent provisions of the above-mentioned DAO and to the following conditions:

1. This Certificate is valid only for the Programs/Projects/Activities (P/P/As) stipulated in the submitted 2024 AEPEP with a total budget of **PhP 2,182,693.00** reviewed and approved by the MRFC BFC-ILP;

2. The Company shall submit a quarterly accomplishment report within 30 calendar days after the end of each quarter and annual accomplishment report within 30 calendar days after the end of each calendar year to MGB-CAR; and

3. Additional conditions may be imposed to implement the approved AEPEP effectively and efficiently should the results of monitoring by the Multipartite Monitoring Team (MMT) for BFC-ILP warrant them.

Non-compliance with the above conditions shall be sufficient ground for the cancellation, revocation or termination of this Certificate or suffer the penalty prescribed in the Penal Provisions of Republic Act No. 7942, the Philippine Mining Act of 1995.

Given this 18th day of December 2023 at MGB-CAR, Baguio City, Philippines.

FAY W. APIL
Regional Director

Department of Environment and Natural Resources
Mines and Geosciences Bureau
Cordillera Administrative Region
010824-CAR-51090
Certificate of Approval
2:41 PM 01/08/2024

"MINING SHALL BE PRO-PEOPLE AND PRO-ENVIRONMENT
IN SUSTAINING WEALTH CREATION AND IMPROVED QUALITY OF LIFE."

Appendix C

BenguetCorp	Document Title	**SUMMARY OF RISKS**		
	Document Code	DRCS-09_EMS_SR		
	Revision	09	Effective Date	March 9, 2024
Prepared By: CAROLYN G. CRUZ		Reviewed by: BGO EMS		Approved by: VALERIANO B. BONGALOS, JR.

DEPARTMENT	PROCESS	RISK IDENTIFICATION				RISK ASSESSMENT
		RISK CATEGORY	DESCRIPTION	CAUSE	CONSEQUENCE	RISK RATING
Claims	Demolition of structures	Security and Safety	Safety being compromised while performing the said activity.	Hostile environment	Physical safety and attending legal issues	Moderate
ComRel	Implementation, monitoring and validation of approved SDMP Projects, Programs and Activities of host and neighboring Barangays	Operational	Failure to comply with SDMP Programs	LGU's late submission of SDMP Project proposals and approval of budget	May compromise company operations and lead to penalties, and cancellation of permits and/or ECCs	High
Construction	Infrastructure construction	Financial	Failure in implementing the project	No materials to be used	The project will be waiting	Moderate
Finance	Bookkeeping (making entries on various company transactions to come up with financial reports required by management and	Technical & Architectural / Operational/ Technology	Possible loss of data stored in cloud technology	Emergency and/or unscheduled power interruptions will disrupt the operations of our computerized accounting system; and cyber-attack and/or	No access to own computerized accounting system.	High

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BenguetCorp	Document Title	SUMMARY OF RISKS		
	Document Code	DRCS-09_EMS_SR		
	Revision	09	Effective Date	March 9, 2024

DEPARTMENT	PROCESS	RISK IDENTIFICATION				RISK ASSESSMENT
		RISK CATEGORY	DESCRIPTION	CAUSE	CONSEQUENCE	RISK RATING
	external users)			password theft (program hacking)		
GeoEx	Geologic Interpretation and Resource Estimation	Operational	Erroneous resource estimation	Inadequate training	If interpretation of geologic data is incorrect, there is a risk of mining unprofitable areas	Moderate
MEPEO	Implementation of environmental programs	Regulatory	Failure to implement the established environmental programs	Delayed approval of funds	Issuance of Notice of Violation (NOV) from the regulatory agencies, and eventual issuance of Cease-and-Desist Order (CDO)	Moderate
				Natural disasters & Pandemic	Imposition of penalties	
				Community resistance		
Procurement	Processing procurement documents, licenses, and permits	Operational	Lengthy process/method or system	inconsistencies of required documents/attachments	delayed approval of the required certificate, license and/or permit of explosives to operate.	Moderate
				change/revise authorize signatory		

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BenguetCorp	Document Title	SUMMARY OF RISKS		
	Document Code	DRCS-09_EMS_SR		
	Revision	09	Effective Date	March 9, 2024

DEPARTMENT	PROCESS	RISK IDENTIFICATION				RISK ASSESSMENT
		RISK CATEGORY	DESCRIPTION	CAUSE	CONSEQUENCE	RISK RATING
Safety	Underground and Surface Inspection	Operational	Failure to conduct full safety underground and surface inspection	Lack of manpower	Higher incident rate	Moderate
	Implementation of Safety Policy	Operational	Failure to implement the Company's Safety Policy	Inappropriate standard PPEs	Higher incident rate	
Special Project	Underdrain Tunnel/Penstock Failure; Piping	Safety and Risk	Structural failure of the stopper boards leading to piping	Structural Failure	Downstream Community being submerged through tailings	Moderate
		Regulatory	Work Stoppage	Non-compliant	Penalties and cease of operations	

BenguetCorp	Document Title	**SUMMARY OF OPPORTUNITIES**		
	Document Code	DRCS-10_EMS_SO		
	Revision	07	Effective Date	March 9, 2024
Prepared By: JS REY	Reviewed by: BGO EMS		Approved by: VALERIANO B. BONGALOS JR.	

NO.	DEPARTMENT	PROCESS	DESCRIPTION OF OPPORTUNITY	OPPORTUNITY RATING	ACTION
1	**Assay**	Assaying	Rendering Assaying services from external sources	Excellent	Opportunity shall be pursued immediately
2	**ComRel**	Development of SDMP Projects, Programs and Activities of host and neighboring Barangays	The company can create better partnership with the community in implementing environmental programs.	Excellent	Opportunity shall be pursued immediately
		Implementation, monitoring and validation of approved SDMP Projects, Programs and Activities of host and neighboring Barangays	Environmental awareness could be raised through community projects and programs.	Excellent	Opportunity shall be pursued immediately
		Administrative works	Cost saving measures from efficient use of energy, paper and other resource	Excellent	Opportunity shall be pursued immediately
3	**Construction & Civil Works**	Planning of proposed projects, drafts, and evaluation of project cost for construction/ repair/ rehabilitation projects.		Excellent	Opportunity shall be pursued immediately
4	**Electrical**	Energy Monitoring	Everyone will be energy conserving conscious and should participate in earth hour	Excellent	Opportunity shall be pursued immediately

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BenguetCorp	Document Title	SUMMARY OF OPPORTUNITIES		
	Document Code	DRCS-10_EMS_SO		
	Revision	07	Effective Date	March 9, 2024

NO.	DEPARTMENT	PROCESS	DESCRIPTION OF OPPORTUNITY	OPPORTUNITY RATING	ACTION
5	**GeoEx**	Mapping	Extend assistance such as geo-hazard mapping to other private and government entities	Excellent	Opportunity shall be pursued immediately
6	**Met Lab**	Metallurgical Tests	Optimization of plant operating parameters will result to higher gold production with the least operating cost (reagent and power consumption).	Excellent	Opportunity shall be pursued immediately
7	**Mill**	Carbon-in-Leach	Usage of other leaching reagents that are environmentally friendly and will produce higher gold recovery.	Excellent	Opportunity shall be pursued immediately
8	**Mill Mechanical**	Enhancement of the filtering of used hydraulic oil 68 for PMS lubrications.	Design a filtering device to be used for the filtering process of hydraulic oil 68.	Excellent	Opportunity shall be pursued immediately
9	**Mines**	Drilling and blasting	Worn out drill steel can be recycled and fabricated to pinch bars and claw bars	Excellent	Opportunity shall be pursued immediately
		Maintenance of track rails and cleaning at haulage roadways and drainage canal.	Worn out track rails can be used as ground support in underground	Excellent	Opportunity shall be pursued immediately
10	**Safety**	Emergency response	The company's Emergency Response Team (ERT) acts as volunteers during rescue operations within and nearby communities	Excellent	Opportunity shall be pursued immediately

BenguetCorp	Document Title	SUMMARY OF OPPORTUNITIES		
	Document Code	DRCS-10_EMS_SO		
	Revision	07	Effective Date	March 9, 2024

NO.	DEPARTMENT	PROCESS	DESCRIPTION OF OPPORTUNITY	OPPORTUNITY RATING	ACTION
11	**Security**	Administrative work	Cost saving measures from efficient use of energy, paper and other resources	Excellent	Opportunity shall be pursued immediately
12	**Warehouse**	Distribution of Inventory lists, Notice of Arrivals, & other documents to concerned department heads & end users (e-mailed instead of duplicating/xeroxing)	Cost saving measures from efficient use of energy, paper & other resources	Excellent	Opportunity shall be pursued immediately

Document Title	EMS GUIDELINES			BenguetCorp	
Process	Diesel – Handling, Transport and Storage				
Document Code	DRCS-12-03_EMSG_HTSD	Revision No.	01	Effective Date	Jan. 1, 2023
Department	Motorpool, Mine Mechanical, Mill Mechanical			Page Number	Page 1 of 2
Prepared by: FOR SALACO B. PAMPANICO	Reviewed by: BGO EMS			Approved by: VB BONGALOS JR.	

STORAGE

Long Term Storage: Steel Tanks

STORAGE

Short Term/Transport: Plastic Car Buoys

STORAGE

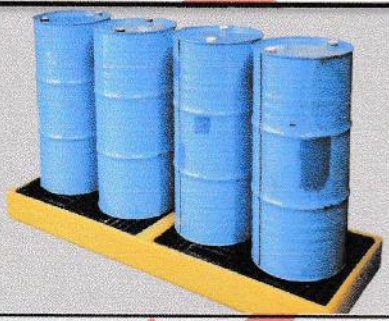
Short Term/Transport: Plastic/Steel Drums

STORAGE

Storage 6-12 months at an ambient temp higher than

STORAGE

Required secondary container



STORAGE

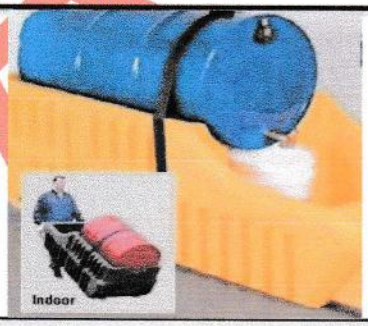
Proper GHS label on the containers

HANDLING

Use proper PPE

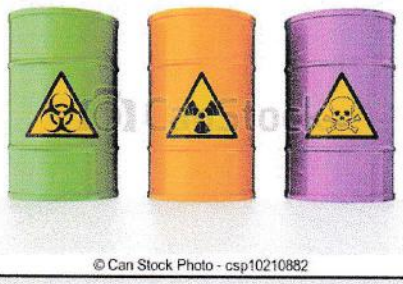
HANDLING

Secondary catchment when refilling/transferring container



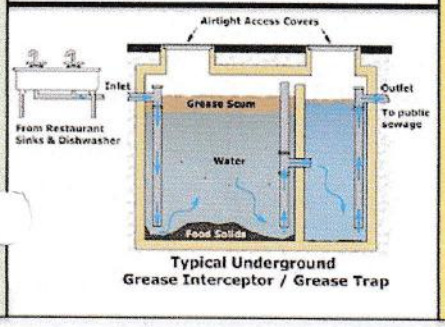
HANDLING

Oil-soaked materials are disposed separately



OIL RECOVERY

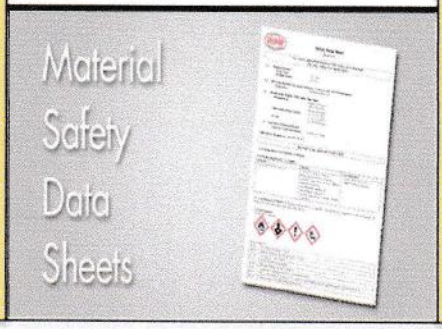
Oil-Water Separator



Typical Underground Grease Interceptor / Grease Trap

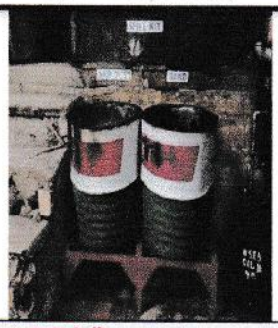
EMERGENCY

MSDS available



EMERGENCY

Spill Kit Nearby



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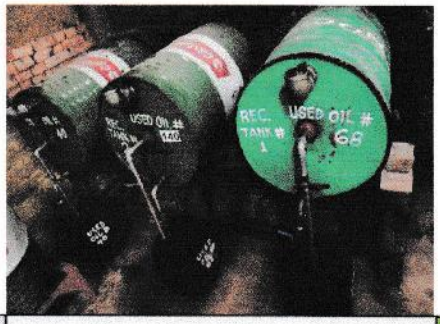
Document Title	EMS GUIDELINES			BenguetCorp	
Process	Diesel – Handling, Transport and Storage				
Document Code	DRCS-12-03_EMSG_HTSD	Revision No.	01	Effective Date	Jan. 1, 2023
Department	Motorpool, Mine Mechanical, Mill Mechanical			Page Number	Page 2 of 2
Prepared by: FOR SALACO B. PAMPANICO		Reviewed by: BGO EMS		Approved by: VB BONGALOS JR.	

Use of Oil-Settling Tanks



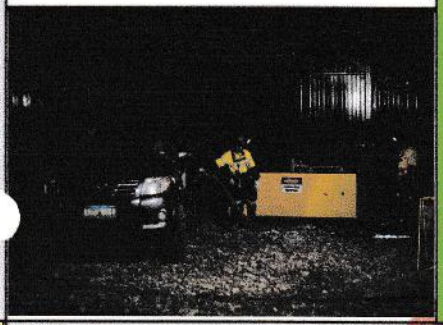
Monitoring and recording of consumption

REFUELING

Only authorized personnel are allowed to refuel diesel containers

REFUELING

Designated underground refuelling stations will be assigned



HANDLING

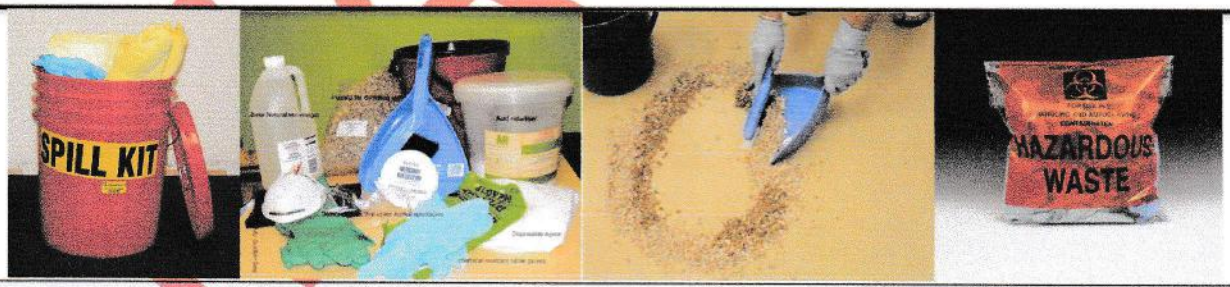
Use mine cars when transporting diesel underground

EMERGENCY

All vehicles are required to bring spill kit for emergency spills on site

EMERGENCY

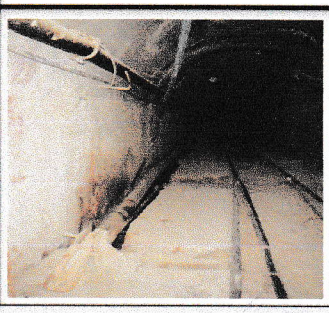
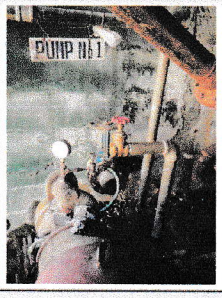
Spill Kit: contains SAND, hand shovel, small dustpan, rags, plastic bag (labeled "Toxic Waste"). After soaking the spill using sand, collect the contaminated sand into a labeled plastic bag. Dispose accordingly



Document Title	EMS GUIDELINES			Appendix E BenguetCorp	
Process	Contaminated Water				
Document Code	DRCS-12-12_EMSG_CW	Revision No.	01	Effective Date	Jan. 1, 2023
Department	Mill, Mine, Mill and Mine Mechanical, Motor Pool, Envi			Page Number	Page 1 of 2
Prepared by: CG CRUZ	Reviewed by: BGO EMS			Approved by: VB BONGALOS JR.	

MINES

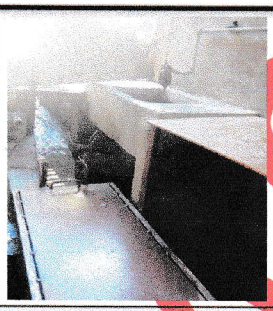
Built underground drainage systems and canals to drain run-off water. These canals are drained by pump station near the portal, where a settling dam is installed before being discharged in the river. Some water are pumped to the mill (recycled)



MOTORPOOL

Oil-water separator built in motor pool workshop/garage that "de-contaminates" used water. Collected used oil from separator is stored in a hazard waste container to be disposed appropriately

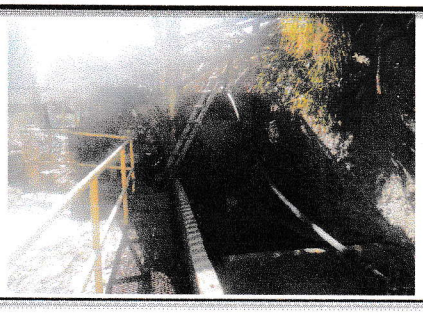
MINE MECHANICAL

Oil-water separator built in mechanical workshop that "de-contaminates" used water. Collected used oil from separator is stored in a hazard waste container to be disposed appropriately




MILL

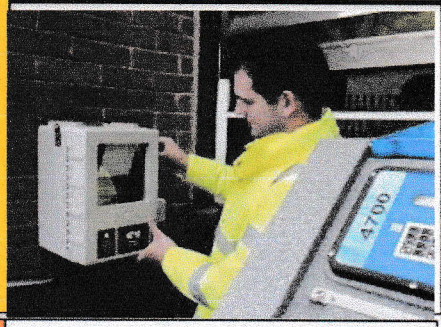
All discharge (pulp, tails, contaminated water) from the mill (from crushing, grinding to refining and smelting) goes into the Tails Treatment Facility. The solution is treated with SMBS before being pumped to Tails Storage Facility




Document Title	EMS GUIDELINES			BenguetCorp	
Process	Contaminated Water				
Document Code	DRCS-12-12_EMSG_CW	Revision No.	01	Effective Date	Jan. 1, 2023
Department	Mill, Mine, Mill and Mine Mechanical, Motor Pool, Envi			Page Number	Page 2 of 2
Prepared by: CG CRUZ	Reviewed by: BGO EMS			Approved by: VB BONGALOS JR.	

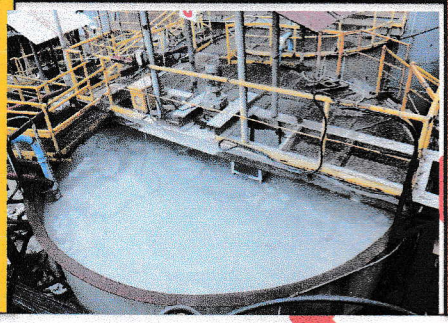
MONITORING

Effluent Monitoring



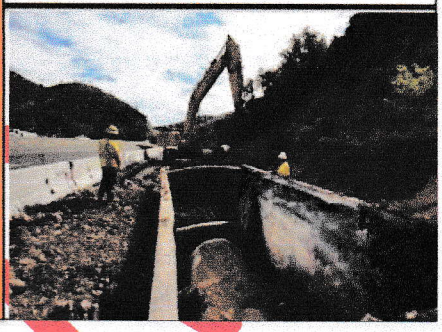
MONITORING

Monitor tanks to avoid overflow



MAINTENANCE

Regular cleanup of canal/drain



MAINTENANCE

Regular check of discharge valves pipes and connections

SOURCE EMISSION TEST REPORT

PARTICULATE MATTER (PM)

One (1) unit 46.58 m^3/min Krypton Dust Collection Facility System

PARTICULATE MATTER (PM), SULFUR OXIDES (SOx), NITROGEN OXIDES (NOx) AND CARBON MONOXIDE (CO)

One (1) unit 5,013CFM Verantis Acid Fume Scrubber

Reference No.: GEPC-SST-2406-040

Prepared for:

BENGUET CORPORATION
ACUPAN CONTRACT MINING PROJECT
Balatoc, Virac, Itogon, Benguet

Sampling Date: June 28 and 29, 2024

Report Date: July 23, 2024

REPORT CERTIFICATION

BENGUET CORPORATION
ACUPAN CONTRACT MINING PROJECT
Balatoc, Virac, Itogon, Benguet

SOURCE EMISSION TEST REPORT
Reference No. GEPC-SST-2406-040

One (1) unit 46.58 m^3/min Krypton Dust Collection Facility System
One (1) unit 5,013CFM Verantis Acid Fume Scrubber

The sampling performed for this report was carried out under my direction and supervision. The analytical results that were performed by subcontracted, recognized laboratories have been verified and found to be in order.

Thus, I hereby certify, to the best of my knowledge, that this test report is authentic and accurate.

Prepared and Signed By:

ANGELO V. GUEVARRA
QAQC MANAGER
SAT No. 2023-152

Date Signed: July 23, 2024

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LIST OF APPENDICES

SECTION 1.0

INTRODUCTION

Benguet Corporation - Acupan Contract Mining Project contracted **Greentek Environmental Phils. Co.** to conduct stationary stack emission test on one (1) unit 46.58 m3/min Krypton Dust Collection Facility System and One (1) unit 5,013CFM Verantis Acid Fume Scrubber in their facility located at Balatoc, Virac, Itogon, Benguet. The emission testing involved three runs to measure particulate matter (PM) for the Dust Collection Facility System, while for the Acid Fume Scrubber, it included three runs to measure particulate matter (PM), sulfur oxides (SOx), nitrogen oxides (NOx), and carbon monoxide (CO) emissions. The said activity is part of their environmental program and in determination of the facility's compliance as compared to emission limits defined in the Philippine Clean Air Act of 1999 (PCAA) and Implementing Rules and Regulations (IRR). A list of participants in the project is included in Appendix F.

A summary and discussion of the test results are provided in Section 2. The source description, test procedures, and quality assurance activities are described in the subsequent sections. All supporting field data, analytical reports, calibration records, testing participants, test plans, and a copy of the facility permit are provided in the appendices.

SECTION 2.0

SUMMARY OF DISCUSSION

Tables 2-1 and Table 2-2 present the summary of the test results for the sources tested in comparison to the National Emission Standards identified in IRR Part VII Rule XXV Table 2. Detailed descriptions of the specific run information and the example calculations used to calculate the tabular summary are attached in Appendix A. The raw field data used to prepare the run summary information in Appendix A is included in Appendix B. Emissions have been corrected to the standard conditions of 250°C and 760 mmHg on a dry basis (unless otherwise indicated).

The Greentek monitoring logsheets, filled out by the facility's representative, show that the One (1) unit 46.58 m3/min Krypton Dust Collection Facility System was installed in September 2018 while, the One (1) unit 5,013CFM Verantis Acid Fume Scrubber was installed on 2018, when the Philippine Clean Air Act (PCAA) and Implementing of Rules and Regulations (IRR) were already being implemented. The applicable standards under the PCAA/IRR categorize Dust Collector and Acid Fume Scrubber as *new sources: other stationary source* located in an industrial area under the PCAA/IRR standards.

The results of the testing indicate that the average PM concentrations for the Dust Collector Facility System are within the applicable IRR standards. Similarly, the average PM, SOx, NOx, and CO concentrations for the Acid Fume Scrubber are within the applicable IRR standards. Particulate matter (PM), sulfur oxides (SOx), and nitrogen oxides (NOx) samples were submitted to Ostrea Mineral Laboratories, Inc., while carbon monoxide (CO) samples were submitted to Greentech Laboratory and Allied Services, Inc. An attachment of the laboratory results is included in Appendix D of this report.

A description of any method deviations and quality assurance assessments is included in Sections 4 and 5 of this report. Based on a review of the sampling data, facility operating information, test method description, and quality assurance results, the average of the three test runs is judged to be representative of the source and suitable for comparison to the regulatory limits.

TABLE 2-1

SUMMARY OF TEST RESULTS
46.58 m3/min Krypton Dust Collection Facility System
N 16°21'34" E 120°39'31"
BENGUET CORPORATION - ACUPAN CONTRACT MINING PROJECT
Balatoc, Virac, Itogon, Benguet

Run Number Sampling Date Sampling Time	RUN 1 28-Jun-24 1323H-1437H	RUN 2 28-Jun-24 1459H-1615H	RUN 3 28-Jun-24 1630H-1743H	Average	CAA Limit mg / Ncm
Source Data					
Volumetric Flow Rate (dry std), Ncmm	47	44	46	**46**	
Volumetric Flow Rate (actual), Ncmm	55	53	55	**54**	
Moisture Content, %	2.7	3.1	3.6	**3.1**	
Stack Gas Temperature, °C	35	39	40	**38**	
Carbon Dioxide Concentration, %	0.0	0.0	0.0	**0.0**	
Oxygen Concentration, %	20.0	20.0	20.0	**20.0**	
Process Rate Information					
Kilograms of Dust Collected	30	30	30	**30**	
% of Capacity during test	100%	100.0%	100.0%	**100.0%**	
Hours of operation per year	550	550	550	**550**	
Particulate Matter (PM) Emissions					
O_2 Corrected Concentration, mg/Ncm	3	4	3	**3**	**200**
Mass Emission Rate, kg/hr	0.00917	0.00942	0.00891	0.00917	
Annual Emission Rate, MT/yr*	0.00504	0.00518	0.00490	0.00504	
DENR Classification	Other Stationary Source (New Source)				

** Annual emissions are presented as metric tons (MT) per year based on the reported plant operating hours per year.*

Remarks:
a. Particulate matter (as PM) Emissions : Within the standard of 200 mg/Ncm

Parameters:	***Sampling Method:***	***Analysis Method:***
a. Particulate matter (PM)	*USEPA Method 5*	*Gravimetric*

TABLE 2-2

SUMMARY OF TEST RESULTS
5,013CFM Verantis Acid Fume Scrubber #2
N 16°21'34" E 120°39'32"
BENGUET CORPORATION - ACUPAN CONTRACT MINING PROJECT
Balatoc, Virac, Itogon, Benguet

Run Number Sampling Date Sampling Time	RUN 1 29-Jun-24 1050H-1205H	RUN 2 29-Jun-24 1242H-1358H	RUN 3 29-Jun-24 1411H-1525H	Average	CAA Limit mg / Ncm
Source Data					
Volumetric Flow Rate (dry std), Ncmm	102	105	109	**105**	
Volumetric Flow Rate (actual), Ncmm	117	125	130	**124**	
Moisture Content, %	3.4	3.3	4.0	**3.6**	
Stack Gas Temperature, °C	27	39	37	**34**	
Carbon Dioxide Concentration, %	0.0	0.0	0.0	**0.0**	
Oxygen Concentration, %	19.0	19.0	19.0	**19.0**	
Process Rate Information					
ounces of gold produced	22.88	22.88	22.88	**22.88**	
% of Capacity during test	100%	100%	100%	**100%**	
Hours of operation per year	514.85	515	515	**515**	
Particulate Matter (PM) Emissions					
Concentration, mg/Ncm	65	66	73	**68**	200
Mass Emission Rate, kg/hr	0.40	0.42	0.47	0.43	
Annual Emission Rate, MT/yr*	0.20	0.21	0.24	0.22	
Sulfur oxides (as SO_2) Emissions					
Concentration, mg/Ncm	200	197	185	**194**	700
Mass Emission Rate, kg/hr	1.22	1.24	1.21	1.22	
Annual Emission Rate, MT/yr*	0.63	0.64	0.62	0.63	
Nitrogen oxides (as NO_2) Emissions					
Concentration, mg/Ncm	262	253	271	**262**	500
Mass Emission Rate, kg/hr	1.60	1.59	1.76	1.65	
Annual Emission Rate, MT/yr*	0.83	0.82	0.91	0.85	
Carbon monoxide (CO) Emissions					
Concentration, mg/Ncm	127	132	134	**131**	500
Mass Emission Rate, kg/hr	0.78	0.83	0.87	0.83	
Annual Emission Rate, MT/yr*	0.40	0.43	0.45	0.43	
DENR Classification	Other Stationary Source (New Source)				

** Annual emissions are presented as metric tons (MT) per year based on the reported plant operating hours per year.*

Remarks:

a. Particulate matter (as PM) Emissions	*Within the standard of 200 mg/Ncm*
b. Sulfur oxides (as SO_2) Emissions	*Within the standard of 700 mg/Ncm*
c. Nitrogen oxides (as NO_2) Emissions	*Within the standard of 500 mg/Ncm*
d. Carbon monoxide (CO) Emissions	*Within the standard of 500 mg/Ncm*

Parameters:	***Sampling Method:***	***Analysis Method:***
a. Particulate matter (PM)	*USEPA Method 5*	*Gravimetric*
b. Sulfur oxides (as SO_2)	*USEPA Method 6*	*Barium-Thorin Titration*
c. Nitrogen oxides (as NO_2)	*USEPA Method 7*	*Phenoldisulfonic Acid*
d. Carbon monoxide (CO)	*USEPA Method 10*	*Non-Dispersive Infrared (NDIR)*

SECTION 3.0

PROCESS DESCRIPTION AND OPERATION

Benguet Corporation - Acupan Contract Mining Project operates and maintains one (1) unit 46.58 m3/min Krypton Dust Collection Facility System and One (1) unit 5,013CFM Verantis Acid Fume Scrubber in their facility located at Balatoc, Virac, Itogon, Benguet. The sources are a Dust Collector and Acid Fume Scrubber as air pollution control device installed in the facility.

The **46.58 m3/min Dust Collection Facility System** manufactured by **Krypton** operated at 100% load, having a temperature of an average of 38°C and uses electricity to power the dust collector. According to the facility representative, the dust collector collected 30 kilograms of dust throughout the entire day of operation. They also indicated that this Dust Collection Facility System typically operates for an estimated 550 hours per year.

The **5,013CFM Acid Fume Scrubber** manufactured by **Verantis** operated at 100% load, having a temperature of an average of 34°C and consumed 153 liters of kerosene as fuel during sampling. According to the facility representative, the generator set produced 22.88 ounces of gold throughout the entire day of operation. They also indicated that this Acid Fume Scrubber typically operates for an estimated 514.85 hours per year.

The monitoring logsheets, process facility data completed by a Benguet Corporation - Acupan Contract Mining Project facility representative during sampling, and the photos for documentation were collected by Greentek Environmental Phils Co. Personnel are included in Appendix C.

SECTION 4.0

SAMPLING AND ANALYTICAL PROCEDURES

All sampling and analytical procedures were those recommended by the Philippines Department of Environmental and Natural Resources (DENR) and the United States Environmental Protection Agency (EPA). This section provides brief descriptions of the sampling and analytical procedures with the focus primarily on any clarifications, deviations, or modifications to the stated test methods.

The test team utilized the following EPA Reference Methods:

Method 1: Sample and Velocity Traverse Point Locations
Method 2: Stack Gas Velocity and Volumetric Flow Rate (S-type Pitot)
Method 3: Gas Analysis for Determination of Dry Molecular Weight
Method 4: Determination of Moisture Content in Stack Gases
Method 5: Determination of Particulate Matter Emissions from Stationary Sources
Method 6: Determination of Sulfur Dioxide Emissions from Stationary Sources
Method 7: Determination of Nitrogen Oxide Emissions from Stationary Sources
Method 10: Determination of Carbon Monoxide Emissions from Stationary Sources

METHODS 1-2 - STACK VELOCITY

A Sampling Points

The number and location of the sampling points were determined according to the procedures outlined in EPA Method 1. The pyrolysis reactors and thermal oil heater have two test ports were present in the same horizontal plane, forming two sampling axes at 90° to each other. A total of 24 points were sampled for pyrolysis reactor and thermal oil heater, with 12 points on each axis. Details of the number and location of sample points are included in the field data sheets in Appendix B.

B Cyclonic Flow Check

A type-S pitot tube assembly, a liquid manometer, and a universal protractor (angle finder) were used to determine the rotation angles at each of the sampling or velocity traverse points. The pitot tube was positioned at each point so that the planes of the face openings of the pitot tube were perpendicular to the cross-sectional plane, and

the rotational angles were determined by rotating the pitot tube until a null reading was obtained on the manometer. When the null angle reading was obtained the yaw angle of the pitot tube was recorded. the test location's average absolute value of the rotation angle was less than 20°, which met the Method 1 criteria.

C Flue Gas Velocity

The flue gas velocity and volumetric flow rate were determined according to the procedures outlined in EPA Method 2. Velocity head measurements (delta P) were made using type-S pitot tubes conforming to the geometric specifications outlined in EPA Method 2. Accordingly, each has been assigned a coefficient of 0.84. Differential pressures were measured with an inclined manometer. Flue gas temperatures were measured with chrome-alumel thermocouples equipped with digital readouts.

METHOD 3 – FLUE GAS COMPOSITION

The flue gas composition and molecular weight were determined using the EPA method 3. An integrated flue gas sample was collected from each particulate test point at a constant rate into a tedlar bag during EPA Method 5 and 6 sampling run. The sample was collected using a separate sample line attached to the Method 5 probe and using orsat sample pump, separate from the primary Method 5 pump, located in the Method 5-meter console. A small polyethyene knockout, maintained at ambient temperature, was place immediately before the gas sample entered the sample pump to remove any significant moisture. An fyrite analyzer was used to determine the concentration of oxygen and carbon dioxide in the sample. The same bag sample was also used for the carbon monoxide analysis by Method 10.

METHOD 4 – FLUE GAS MOISTURE CONTENT

The moisture content was determined by EPA Method 4 in conjunction with EPA Method 5 and 6, which was discussed in the following section.

METHODS 5/6 – PARTICULATE MATTER AND SULFUR OXIDES

A Sample Collection

Samples were withdrawn isokinetically from the source using an EPA Method 5 sampling train. The sampling train consisted of a stainless-steel nozzle, a heated 316 stainless steel probe with a type-S pitot tube attached, a heated filter, an unheated sample line, four chilled impingers, and a metering console. The particulate sample was collected on a glass fiber filter maintained at a temperature of 120°C ± 14°C. The sampling probe, a 316 stainless steel liner that is normally used in Method 5 particulate determinations. The liners were rinsed out prior to sampling and indicated no contamination or degradation. The first two impingers each contained 100 ml of 3 percent hydrogen peroxide, the third remained empty, and the fourth contained pre-weighed silica gel. Three replicate test runs, each approximately 60 minutes in duration of sampling.

B Sample Recovery

Sample recovery was performed inside a clean recovery area. The filter was removed from the filter holder and placed in a petri dish. The volume of water vapor condensed in the impingers and the volume of water vapor collected in the silica gel were summed and entered into moisture content calculations. The nozzle, probe, and front half of the filter holder were rinsed with acetone in a 500ml clear glass. A glass collection flask with a socket was attached to the ball end of the sample probe (opposite the nozzle) to facilitate cleaning the inside of the probe. The interior of the probe and nozzle were brushed repeatedly to remove any adhering PM from the inside surfaces. The brushes and interior surfaces were rinsed again into the flask and then combined with the rinses into the 500ml clear glass bottle.

The impingers were weighed individually, and the contents of impingers 1 to 3 were placed in a 500 ml polyethylene sample bottle. The three impingers connecting glassware were rinsed with distilled deionized (DI) water into the bottle containing the impinger contents. The silica gel was returned to the original container after weighing.

C Sample Analysis

EPA Method 5 analytical procedures were used to analyze the filter and front-half acetone rinse for filterable particulate matter. EPA Method 6 procedures were utilized to determine the mass of sulfur oxides in the impinger contents. Blank samples of the

acetone and peroxide solutions, sufficient to determine potential contamination or bias from the sampling media, were submitted to the laboratory for analysis with the stack samples.

METHOD 7 – NITROGEN OXIDES

A Sample Collection

Nitrogen oxides (composed of both NO and NO2) were determined for each test run according to EPA Reference Method 7, *"Determination of Nitrogen Oxide Emissions from Stationary Sources".* The sampling train consisted of an evacuated flask connected to a heated glass probe with glass wool at the tip to function as a filter. The evacuated flask contained 25 mL of the nitrogen oxide-absorbing solution. The flask was evacuated to within 75 mmHg (3 inHg) of absolute pressure or less. The initial flask temperature and evacuated pressure were recorded. The probe was placed in the stack and connected to the flask. After purging the probe, a grab sample was drawn into the flask. The flask was shaken for five minutes. Three flasks were collected for each test run.

B Sample Recovery

After a minimum of 16 hours, the flask was shaken for two minutes, and then the final flask temperature and pressure were measured. The contents were transferred to a polyethylene bottle, and the flask was rinsed as per the test method. The pH was adjusted to between 9 and 12.

C Sample Analysis

The samples were prepared for analysis as per EPA Method 7 and then measured colorimetrically using a spectrophotometer.

METHOD 10 CARBON MONOXIDE

The integrated grab sample that was collected per EPA Method 3 for oxygen and carbon dioxide was also used for EPA Method 10 analysis for carbon monoxide. An integrated flue gas sample was collected from each particulate test point at a constant rate into a Tedlar bag during EPA Method 5 and 6 sampling run. The sample was

analyzed in accordance with EPA Method 10 using the non-dispersive infrared (NDIR) analyzer HORIBA PG-350 S/N: 2JFEHYJ2 at Greentech Laboratory and Allied Services, Inc. Samples were analyzed using the 513 ppm analytical span. The analyzer has a built in sample pump and was filtered prior to introduction to the analyzer. Analytical results were recorded on the CO analytical data sheet in ppm from the analyzer display. The value was recorded several minutes after the sample was first introduced, and a stable concentration reading was observed.

SECTION 5.0

QA/QC PROCEDURES AND RESULTS

The objective of an internal quality assurance and quality control (QA/QC) program is to assure that the precision and accuracy of all data generated are scientifically sound and documented to be "in control". To accomplish this, standardized methods or procedures were used. They must be validated for their intended use, rigorously followed, and data reported with quality indicators (precision, accuracy, completeness, representativeness, etc.).

As a guide, Greentek uses the EPA document Quality Assurance Handbook for Air Pollution Measurement System, Volume III (EPA-600/4-77-027b). The Greentek QA/QC plan has incorporated certain considerations into the production of quality data in all its sampling programs, regardless of the scope and purpose of the testing. These considerations include:

- Planning the individual test programs by preparation and submission of a Source Specific Test Plan to (DENR-EMB (included in Appendix G)
- Using reliable and well-maintained calibrated equipment.
- Using appropriate forms for recording sampling data (Appendix B),
- Using calibration and audit gases traceable to the National Institute of Standards and Technology (NIST),
- Controlling errors by checking data input and performing redundant calculations,
- Analyzing audit materials, and
- Adhering to the established Test Plan.

5.1 Particulate Matter Sampling Procedures

Particulate matter (PM) was determined according to EPA Method 5 in *"Determination of Particulate Emissions from Stationary Sources". The appropriate* performance of this test method includes the performance of EPA Methods 1, 2, 3, and 4. The following items describe the primary quality control measures that The Greentek used to ensure a representative sample that met the method precision and bias criteria, was collected:

- Measurements of the upstream and downstream disturbances (to the velocity at the test location) and selection of the appropriate number of sampling test points to determine a representative stack gas velocity.
- Performance of a cyclonic flow check
- Calibration and QA/QC checks of the dry gas meter, thermocouples, pitot tubes, nozzles, temperature display, and manometer assembly,
- Leak checks of the entire Method 5 sampling train were performed before and after each sampling run. All leak checks and leakage rates were documented on the relevant field test data sheets. The acceptance criteria for the Method 5 train post-sample leak check are a leak rate of <0.00057 m^3/minute at the highest vacuum obtained during the test run.
- Maintenance of the chilled impinger system below 20°C (measured at the silica gel outlet),
- Collection of an integrated Tedlar bag sample for oxygen, carbon dioxide, and carbon monoxide
- Maintenance of the isokinetic sampling rate at 90–110% of the actual gas stream velocity.
- Maintenance of the heating system for the filter and sampling probe at 120°C (±14°C),
- Proper recovery of the sample.
- Accurate gravimetric analysis of samples.
- Collection and analysis of representative “blank” samples.

Equipment calibration procedures are described below.

5.2 Particulate Matter Sampling Equipment

A Barometer

Barometric pressure values for the testing period were recorded from a calibrated digital barometer on-site at the platform level. A digital barometer was calibrated in Swichtek Measurements Systems located at 4th Floor Northridge Plaza, Annex A, 12 Congressional Ave., Bahay Toro, Quezon City, 1100, Philippines. A copy of the barometer calibration form is in Appendix E.

B Probe Nozzle

The probe nozzles used in this test were calibrated initially by the manufacturer and prior to use by the field sampling crew by checking for dimension roundness. This was

done by making three separate measurements using alternative inside diameters and calculating the average. A micrometer with a minimum tolerance of 0.025mm was used for measuring. If a deviation of more than 0.1mm is found between any measurements, the nozzle is either discarded or repaired and re-measured. A copy of the nozzle calibration forms is in Appendix E.

C Pitot Tube

Each pitot tube used in sampling meets the design specifications for Type S pitot tubes in EPA Method 2. Therefore, in accordance with Method 2 procedures, a baseline coefficient (C_p) of 0.84 was assigned to each pitot tube. Calibration at the manufacturer for pitot face-opening alignment included measuring the external tubing diameter (dimension D_t) and the base-to-opening misalignment angles, with all terms as described in Figures 2-2 and 2-3 of EPA Method 2. Pitot tubes were visually inspected at the completion of the test to ensure structural integrity. A copy of the calibration check is included in Appendix E.

D Calibration Meter and Metering System

The meter console dry gas meter calibration was performed in accordance with EPA Method 5, Section 16, using critical orifices. The meter is allowed to warm up and is leak checked using the specifications in Method 5 of no detectable leak for a period of one minute. The dry gas meter is calibrated with five orifices with orifice values that ranged 14.50 to 116.0mm of water. For each critical orifice, the meter coefficient (γ or gamma) and the orifice pressure differential (delta H@) were calculated. The criterion for the gamma difference for each point is not to exceed ±0.02 of the average of all the points. The orifice pressure differential that equates to 0.0212 m3/min at standard conditions (Delta H@) was then calculated for each point and averaged. A copy of the metering system calibration is included in Appendix E.

E Post-Test Meter Calibration

Post-test meter calibrations to determine the γ (or Yqa) were conducted on the dry gas meter after the test to check their accuracy against the original pretest calibration. This post-test calibration was made using the alternative procedure defined by the EPA as ALT-009. This procedure is performed on site using the data collected for each of the test runs. It is preferred by EPA over the post-test procedure identified in Method 5 because it 1) eliminates the question of possible meter damage during transport after the emission test; and 2) because the calibration data are available in the field

immediately following the test, it eliminates the costly travel, remobilization, and scheduling of a retest should the meter fail the post-test calibration. A copy of the post-test calibration is included in Appendix E of this test report. A complete copy of EPA ALT-009 is available on the EPA website.

F Thermocouples and Digital Temperature Indicators

Thermocouples were calibrated by comparing them against an ASTM-3F mercury-in-glass thermometer at approximately 0^{oC} (ice water), ambient temperature, and approximately 100^{o}C (boiling water). A post-test calibration was performed in accordance with EPA ALT-011 using a single point calibration against an ASTM mercury-in-glass thermometer in addition to a continuity check of the thermocouple. The continuity check involved verifying that the thermocouple read-out trended in the appropriate direction when exposed to a temperature change. A copy of the original calibration and the ALT-011 post-test QA check is included in Appendix E. A complete copy of EPA ALT-011 is available on the EPA website.

Digital indicators were checked by introducing a series of millivolt signal strengths to the input and comparing the indicator reading with the actual signal strength. Acceptable calibration error does not exceed 1.5 percent when temperatures are expressed in ^{o}K.

5.3 Particulate Matter Analysis

The primary quality control procedures involved in the particulate matter analysis include use of a properly calibrated analytical balance, use of appropriately specified sampling media (filters and acetone) and following the Method 5 analytical procedures. The laboratory followed the procedures specified in the method and calibrated the analytical balance using Class S weights. A routine calibration log is maintained at the laboratory with the analytical balance. The acetone probe rinse was taken to dryness at ambient temperature in a laboratory fume hood. Pre- and post-measurements were made until replicate analyses at least 6 hours apart agreed within 0.5 mg. The summary gravimetric analysis data sheet presents the final measurement results, while any intermediate measurements are maintained in a sample log at the laboratory.

5.4 Oxygen and Carbon Dioxide Analysis

The primary quality control procedures involved in the analysis of the oxygen (O_2) and carbon dioxide (CO_2) samples include collection of a representative bag sample, use of fresh absorbing solutions. The Fyrite analyzers are checked against the ambient air for oxygen and exhale breath for carbon dioxide prior to sample analysis. The field staff followed the procedures specified in the method.

The Greentek work plan specified that the Fyrite analysis should be performed within 8 hours from the time the bag were collected, the values are considered valid. The O_2 and CO_2 values are used only in calculating for the molecular weights.

5.5 Sulfur Oxides

This sample procedure for sulfur oxides (SO_2) was combined with EPA Method 5 as described. The primary QA/QC procedures utilized during testing were as follows.

- Use of fresh chemical solutions (mixed daily).
- Proper recovery of the sample.
- Accurate analyses (using barium- thorin titration) of samples.
- Collection and analyses of representative “blank” samples.
- Calibration and QA/QC checks of the sampling system.
- Analysis of audit samples.

The laboratory followed the procedures specified in the method. EPA quality audit samples for SO_2 were analyzed within 30 days of the field samples using the barium chloride titration solution. The results of the laboratory’s audit analyses were within 5% of the audit value as required by the test method. The blank samples from the field test were analyzed with the samples and demonstrated the no contamination was present from the chemical reagents used.

5.6 Nitrogen Oxides

This sample procedure for nitrogen oxides (NOx) is described in Section 4.5. The primary QA/QC procedures utilized during testing and analysis were as follows:

- Use of fresh chemical solutions
- Proper recovery of the samples
- Accurate analyses (using spectrophotometry) of samples.
- Calibration of the spectrophotometer and verification of linearity

- Calibration and QA/QC checks of the sampling system

The laboratory followed the procedures specified in the method. The spectrophotometer was calibrated on the day the samples were analyzed and verified to be linear over the range to be measured.
If any of the three runs of NOx results from each set of sample runs are found to be outliers, the said results are discarded, and the final NOx result is computed from the average of the two remaining good runs. The discarded test trial runs are noted in the nitrogen oxide emission data as part of the Appendix Summary Table in Appendix A.

It should be noted that EPA Method 7 does not clearly specify a certain number of NOx samples for each run. The three NOx samples per run are generally practiced, providing a “spare set” in case one of the samples gets spoiled or becomes an outlier.

5.7 Carbon Monoxide

This sample procedure for carbon monoxide (CO) is describe. The primary QA/QC procedures utilized during the testing and analysis were as follows:

- Collection and analyses of representative gas samples
- Maintenance of a leak-free bag prior to sampling.
- Calibration of the CO NDIR instrument prior to analysis
- Analysis of samples within three days of collection.
- Strict acceptance of the span and drift criteria (2% and 10%, respectively).
- Use of EPA Protocol 1 calibration gases (although the method allows use of certified rather than Protocol 1 gas standards for calibration)
- Interference check for carbon dioxide (or use of an ascarite trap to remove CO_2)

The analyst in the field equipment office, where the analyzer is maintained, followed the procedures specified in the method. The CO analyzer met the calibration and the drift requirements in the test method. No audit samples, separate from the calibration gas, are specified in EPA Method 10. An interference check was performed on the CO analyzer prior to any analysis as described in EPA Method 20, to ensure there is no interference from carbon dioxide, oxygen, sulfur oxides and nitrogen oxides. The analyzer QA/QC check performed by the vendor also includes both a linearity verification of the 0-1,000 ppm scale and an interference check for carbon dioxide (for 10% and 22% CO_2). Because the analyzer met the acceptance limit for the interference, no ascarite trap to remove CO_2 was used during the analysis.

“APPENDIX A”

SUMMARY OF RESULTS AND EXAMPLE COMPUTATIONS

APPENDIX TABLE
TEST RESULTS
PARTICULATE MATTER
BENGUET CORPORATION - ACUPAN CONTRACT MINING PROJECT
Balatoc, Virac, Itogon, Benguet
46.58 m3/min Krypton Dust Collection Facility System

	RUN NUMBER	RUN 1	RUN 2	RUN 3	
	RUN DATE	28-Jun-24	28-Jun-24	28-Jun-24	**AVERAGE**
	RUN TIME	1323H-1437H	1459H-1615H	1630H-1743H	
	MEASURED DATA				
(Y)	Meter Box, Y	1.0102	1.0102	1.0102	
(Delta H)	Avg Delta H, mm H_2O	12.3	11.6	12.9	
(Pbar)	Barometric Pressure, mm Hg	690.4	690.9	691.1	
(Vm)	Meter Volume,m³	0.7928	0.7672	0.8084	
(Tm)	Avg Meter Temp, °C	35	38	36	
(Pg)	Static Pressure, mm H_2O	-3.0	-3.0	-3.0	
(Ts)	Avg Stack Temp, °C	35	39	40	
(Vlc)	Water Collected, mg	14.5	16.0	19.5	
(%CO_2)	Carbon Dioxide, %	0.0	0.0	0.0	0.0
(%O_2)	Oxygen, %	20.0	20.0	20.0	20.0
(%N_2)	Nitrogen, %	80.0	80.0	80.0	
(Cp)	Pitot Tube Coefficient	0.84	0.84	0.84	
(sqrtDeltaP)avg	Avg Sqrt Delta P, (mm H2O)½	3.519	3.349	3.527	
(time)	Sample Time, min	72	72	72	
(Dn)	Nozzle Diameter, mm	4.480	4.480	4.480	
	CALCULATED DATA				
(An)	Nozzle Area, m^2	1.58E-05	1.58E-05	1.58E-05	
(Vmstd)	Standard Meter Volume, Ncm	0.7055	0.6760	0.7170	
(Ps)	Stack Pressure, mm Hg	690.2	690.7	690.9	
(%H_2Omeas)	Moisture (measured), %	2.7	3.1	3.6	3.1
(%H_2Osat)	Moisture (at saturation), %	6.1	7.4	8.0	
(%H_2O)	Moisture (actual), %	2.7	3.1	3.6	3.1
(Vwstd)	Standard Water Vapor Volume, Ncm	0.020	0.022	0.026	
(Mfd)	Dry Mole Fraction	0.973	0.969	0.964	
(MWd)	Molecular Weight-dry, gm/gm-mole	28.80	28.80	28.80	
(MWs)	Molecular Weight-wet, gm/gm-mole	28.51	28.46	28.42	
(Vs)	Velocity, m/s	12.9	12.4	13.1	12.8
(A)	Stack Area, m²	0.07	0.07	0.07	
(%EA)	Percent Excess Air, %	126	126	126	126
Qa (act)	Actual Volumetric Flow, acmm	55	53	55	54
Qs (std)	Standard Volumetric Flow, dscmm	47	44	46	46
(I)	Isokinetic Rate, %	93.7	95.2	96.4	
	PARTICULATE EMISSIONS DATA				
(mg)	Mass, mg	2	2	2	
(mg/Ncm)	Concentration, mg/Ncm	3	4	3	3
(kg/hr)	Emission Rate, kg/hr	0.01	0.01	0.01	0.01

EXAMPLE CALCULATIONS
BENGUET CORPORATION - ACUPAN CONTRACT MINING PROJECT
46.58 m3/min Krypton Dust Collection Facility System
RUN 1

VOLUME OF DRY GAS SAMPLED AT STANDARD CONDITIONS

$$Vmstd = Y * 0.392 * Vm * \frac{Pbar + (Delta\ H / 13.6)}{(273 + Tm)}$$

$$Vmstd = 1.0102 * 0.392 * 0.7928 * \frac{690.4 + (12.3 / 13.6)}{(273 + 35)} = \mathbf{0.7055\ Ncm}$$

VOLUME OF WATER VAPOR AT STANDARD CONDITIONS

$$Vwstd = 0.001358 * Vlc$$

$$Vwstd = 0.001358 * 14.5 = \mathbf{0.020\ Ncm}$$

PERCENT MOISTURE, BY VOLUME, AS MEASURED IN FLUE GAS

$$\%H_2O = \left(\frac{Vwstd}{Vwstd + Vmstd}\right) x\ 100$$

$$\%H_2O = \left(\frac{0.020}{0.020 + 0.7055}\right) x\ 100 = \mathbf{2.7\ \%}$$

ABSOLUTE FLUE GAS PRESSURE

$$Ps = Pbar + \frac{Pg}{13.6}$$

$$Ps = 690.4 + \frac{-3.0}{13.6} = \mathbf{690.2\ mm\ Hg}$$

DRY MOLE FRACTION OF FLUE GAS

$$Mfd = 1 - \frac{\%H_20}{100}$$

$$Mfd = 1 - \frac{2.7}{100} = \mathbf{0.973\ (unitless)}$$

PERCENT EXCESS AIR

$$\%EA = (\%O_2 - 0.5 * \%CO)/[0.264 * \%N2 - (\%O_2 - (0.5 * \%CO))] x\ 100\ \%$$

$$\%EA = (20 - 0.5 * 0.0)/[0.264 * 80 - (20 - (0.5 * 0.0))] x\ 100\ \%$$

$$\%EA = \mathbf{126\ \%\ excess\ air}$$

DRY MOLECULAR WEIGHT OF FLUE GAS

$$MWd = \left(\%CO_2 * \frac{44}{100}\right) + \left(\%O_2 * \frac{32}{100}\right) + 100.0 - \%CO_2 - \%O_2 * \frac{28}{100}$$

$$MWd = \left(0.0 * \frac{44}{100}\right) + \left(20.0 * \frac{32}{100}\right) + 100.0 - 0.0 - 20.0 * \frac{28}{100}$$

$$MWd = \mathbf{28.80\ g/g\text{-}mole}$$

WET MOLECULAR WEIGHT OF FLUE GAS

$$MWs = (MWd * Mfd) + fwtH_2O * H_2O / 100$$

$$MWs = (28.80 * 0.973) + 18 * \frac{2.7}{100} = \mathbf{28.51\ g/g\text{-}mole}$$

AVERAGE FLUE GAS VELOCITY

$$Vs = 34.97 * Cp * (DeltaP)avg * \frac{Ts}{Ps} * \frac{+\ 273}{MWs}$$

$$Vs = 34.97 * 0.84 * 3.519 * \frac{35}{690.2} * \frac{+\ 273}{28.51} = \mathbf{12.9\ m/s}$$

VOLUMETRIC FLUE GAS FLOW RATE AT ACTUAL CONDITIONS (wet basis)

$$Qa(act) = 60 * Vs * A$$

$$Qa(act) = 60 * 12.9 * 0.07 = \mathbf{55}\ \mathbf{acmm}$$

VOLUMETRIC FLUE GAS FLOW RATE AT STANDARD CONDITIONS (dry standard basis)

$$Qs(std) = 60 * Mfd * Vs * A * \frac{298}{273 + Ts} * \frac{Ps}{Pstd}$$

$$Qs(std) = 60 * 0.973 * 12.9 * 0.07 * \frac{298}{273 + 35} * \frac{690.2}{760} = \mathbf{47}\ \mathbf{dscmm}$$

PERCENT ISOKINETIC OF SAMPLING RATE

$$I = \frac{Pstd}{Tstd} * \frac{100}{60} * \frac{Ts + 273}{Ps} * \frac{Vmstd}{Vs * Mfd * time * An}$$

$$I = \frac{760}{298} * \frac{100}{60} * \frac{35 + 273}{690.2} * \frac{0.7055}{12.9 * 0.973 * 72 * 0.000016}$$

$$I = \mathbf{93.7\ \%}$$

PARTICULATE CONCENTRATION

$$mg/Ncm = \frac{mg_{particulate}}{Ncm}$$

$$mg/Ncm = \frac{2.3}{0.7055} = \mathbf{3.3}\ \mathbf{mg/Ncm}$$

PARTICULATE MASS EMISSION RATE

$$kg/hr = \frac{60}{10\text{^}6} * \frac{O_{13\%}\ mg}{Ncm} * Qs$$

$$kg/hr = \frac{60}{10\text{^}6} * 3.3 * 47 = \mathbf{0.009}\ \mathbf{kg/hr}$$

APPENDIX SUMMARY TABLE
NITROGEN OXIDES (as NO2) EMISSIONS DATA
BENGUET CORPORATION - ACUPAN CONTRACT MINING PROJECT
Balatoc, Virac, Itogon, Benguet
46.58 m3/min Krypton Dust Collection Facility System

		Sample Collection Information					*Sample Recovery Information*				*Calculated Results*		
		Barometric Pressure, Pbar (in Hg):				29.68	Barometric Pressure, Pbar (in Hg):			29.72			
Sample ID	Flask Volume (ml)	Evacuated Pressure Pgi (in Hg)	Flask abs. Pressure Initial Pi, Pbar - Pgi (in Hg) [1]	Flask Temp °C	Flask Temp Ti °K	Sample Collection Time[2] 24-Hour	Final Pressure Pgf (in Hg)	Flask abs. Pressure Final Pf, Pbar - Pgf (in Hg) [1]	Flask Temp °C	Flask Temp Tf °K	Std. Gas Volume (ml)	Mass Catch Weight, µg (µg)	NOx Concentration, as NO2 (mg/Ncm)
Run 1A	2,212.50	28.33	1.35	32.8	305.8	1142	1.20	28.52	30.5	303.5	1,951	0	0
Run 1B	2,226.13	28.47	1.21	33.4	306.4	1147	1.16	28.56	30.2	303.2	1,978	0	0
Run 1C	2,221.18	28.16	1.52	33.5	306.5	1152	1.45	28.27	30.4	303.4	1,929	0	0
												Average	0
		Barometric Pressure, Pbar (in Hg):				29.67	Barometric Pressure, Pbar (in Hg):			29.72			
Run 2A	2,211.35	28.36	1.31	33.4	306.4	1213	1.29	28.43	30.6	303.6	1,945	0	0
Run 2B	2,210.08	28.25	1.42	33.6	306.6	1217	1.37	28.35	30.5	303.5	1,932	0	0
Run 2C	2,208.25	28.51	1.16	32.8	305.8	1221	1.10	28.62	30.2	303.2	1,969	0	0
												Average	0
		Barometric Pressure, Pbar (in Hg):				29.66	Barometric Pressure, Pbar (in Hg):			29.72			
Run 3A	2,196.25	28.27	1.39	32.7	305.7	1339	0.99	28.73	30.4	303.4	1,949	0	0
Run 3B	2,206.38	28.41	1.25	33.6	306.6	1342	1.23	28.49	30.3	303.3	1,952	0	0
Run 3C	2,201.00	28.19	1.47	33.7	306.7	1346	1.4	28.32	30.2	303.2	1,920	0	0
												Average	0

APPENDIX TABLE
TEST RESULTS
PARTICULATE MATTER, NITROGEN OXIDES, SULFUR OXIDES AND CARBON MONOXIDE
BENGUET CORPORATION - ACUPAN CONTRACT MINING PROJECT
Balatoc, Virac, Itogon, Benguet
5,013CFM Verantis Acid Fume Scrubber #2

	RUN NUMBER	RUN 1	RUN 2	RUN 3	
	RUN DATE	29-Jun-24	29-Jun-24	29-Jun-24	**AVERAGE**
	RUN TIME	1050H-1205H	1242H-1358H	1411H-1525H	
	MEASURED DATA				
(Y)	Meter Box, Y	1.0102	1.0102	1.0102	
(Delta H)	Avg Delta H, mm H_2O	16.6	17.6	18.5	
(Pbar)	Barometric Pressure, mm Hg	690.4	690.6	690.9	
(Vm)	Meter Volume,m³	0.8986	0.9516	0.9536	
(Tm)	Avg Meter Temp, °C	35	38	36	
(Pg)	Static Pressure, mm H_2O	-2.0	-2.0	-2.0	
(Ts)	Avg Stack Temp, °C	27	39	37	
(Vlc)	Water Collected, mg	20.5	21.0	26.0	
(%CO_2)	Carbon Dioxide, %	0.0	0.0	0.0	0.0
(%O_2)	Oxygen, %	19.0	19.0	19.0	19.0
(%N_2)	Nitrogen, %	81.0	81.0	81.0	
(Cp)	Pitot Tube Coefficient	0.84	0.84	0.84	
(sqrtDeltaP)avg	Avg Sqrt Delta P, (mm H2O)½	2.104	2.200	2.288	
(time)	Sample Time, min	72	72	72	
(Dn)	Nozzle Diameter, mm	6.090	6.090	6.090	
	CALCULATED DATA				
(An)	Nozzle Area, m^2	2.91E-05	2.91E-05	2.91E-05	
(Vmstd)	Standard Meter Volume, Ncm	0.7980	0.8381	0.8449	
(Ps)	Stack Pressure, mm Hg	690.2	690.5	690.7	
(%H_2Omeas)	Moisture (measured), %	3.4	3.3	4.0	3.6
(%H_2Osat)	Moisture (at saturation), %	3.8	7.7	7.0	
(%H_2O)	Moisture (actual), %	3.4	3.3	4.0	3.6
(Vwstd)	Standard Water Vapor Volume, Ncm	0.028	0.029	0.035	
(Mfd)	Dry Mole Fraction	0.966	0.967	0.960	
(MWd)	Molecular Weight-dry, gm/gm-mole	28.76	28.76	28.76	
(MWs)	Molecular Weight-wet, gm/gm-mole	28.39	28.41	28.33	
(Vs)	Velocity, m/s	7.6	8.2	8.5	8.1
(A)	Stack Area, m²	0.26	0.26	0.26	
(%EA)	Percent Excess Air, %	116	116	116	116
Qa (act)	Actual Volumetric Flow, acmm	117	125	130	124
Qs (std)	Standard Volumetric Flow, dscmm	102	105	109	105
(I)	Isokinetic Rate, %	95.1	97.4	94.7	
	PARTICULATE EMISSIONS DATA				
(mg)	Mass, mg	52	56	61	
(mg/Ncm)	Concentration, mg/Ncm	65	66	73	68
(kg/hr)	Emission Rate, kg/hr	0.40	0.42	0.47	0.43
	SULFUR OXIDES (as SO_2) EMISSIONS DATA				
(mg)	Mass, mg	159	165	156	
(mg/Ncm)	Concentration, mg/Ncm	200	197	185	194
(kg/hr)	Emission Rate, kg/hr	1.22	1.24	1.21	1.22
	NITROGEN OXIDES (as NO_2) EMISSIONS DATA				
(mg/Ncm)	Concentration, mg/Ncm	262	253	271	262
(kg/hr)	Emission Rate, kg/hr	1.60	1.59	1.76	1.65
	CARBON MONOXIDE EMISSIONS DATA				
(ppm)	Concentration, ppm dry	111	115	117	114
(mg/Ncm)	Concentration, mg/Ncm	127	132	134	131
(kg/hr)	Emission Rate, kg/hr	0.78	0.83	0.87	0.83

EXAMPLE CALCULATIONS
BENGUET CORPORATION - ACUPAN CONTRACT MINING PROJECT
5,013CFM Verantis Acid Fume Scrubber #2
RUN 1

VOLUME OF DRY GAS SAMPLED AT STANDARD CONDITIONS

$$Vmstd = Y * 0.392 * Vm * \frac{Pbar + (Delta\ H / 13.6)}{(273 + Tm)}$$

$$Vmstd = 1.0102 * 0.392 * 0.8986 * \frac{690.4 + (16.6 / 13.6)}{(273 + 35)} = \mathbf{0.7980\ Ncm}$$

VOLUME OF WATER VAPOR AT STANDARD CONDITIONS

$$Vwstd = 0.001358 * Vlc$$

$$Vwstd = 0.001358 * 20.5 = \mathbf{0.028\ Ncm}$$

PERCENT MOISTURE, BY VOLUME, AS MEASURED IN FLUE GAS

$$\%H_2O = \left(\frac{Vwstd}{Vwstd + Vmstd}\right) x\ 100$$

$$\%H_2O = \left(\frac{0.028}{0.028 + 0.7980}\right) x\ 100 = \mathbf{3.4\ \%}$$

ABSOLUTE FLUE GAS PRESSURE

$$Ps = Pbar + \frac{Pg}{13.6}$$

$$Ps = 690.4 + \frac{-2.0}{13.6} = \mathbf{690.2\ mm\ Hg}$$

DRY MOLE FRACTION OF FLUE GAS

$$Mfd = 1 - \frac{\%H_20}{100}$$

$$Mfd = 1 - \frac{3.4}{100} = \mathbf{0.966\ (unitless)}$$

PERCENT EXCESS AIR

$$\%EA = (\%O_2 - 0.5 * \%CO)/[0.264 * \%N2 - (\%O_2 - (0.5 * \%CO))] x\ 100\ \%$$

$$\%EA = (19 - 0.5 * 0.0)/[0.264 * 80.989 - (19 - (0.5 * 0.0))] x\ 100\ \%$$

$$\%EA = \mathbf{116\ \%\ excess\ air}$$

DRY MOLECULAR WEIGHT OF FLUE GAS

$$MWd = \left(\%CO_2 * \frac{44}{100}\right) + \left(\%O_2 * \frac{32}{100}\right) + 100.0 - \%CO_2 - \%O_2 * \frac{28}{100}$$

$$MWd = \left(0.0 * \frac{44}{100}\right) + \left(19.0 * \frac{32}{100}\right) + 100.0 - 0.0 - 19.0 * \frac{28}{100}$$

$$MWd = \mathbf{28.76\ g/g\text{-}mole}$$

WET MOLECULAR WEIGHT OF FLUE GAS

$$MWs = (MWd * Mfd) + fwtH_2O * H_2O / 100$$

$$MWs = (28.76 * 0.966) + 18 * \frac{3.4}{100} = \mathbf{28.39\ g/g\text{-}mole}$$

AVERAGE FLUE GAS VELOCITY

$$Vs = 34.97 * Cp * (DeltaP)avg * \frac{Ts + 273}{Ps * MWs}$$

$$Vs = 34.97 * 0.84 * 2.104 * \frac{27 + 273}{690.2 * 28.39} = \mathbf{7.6\ m/s}$$

VOLUMETRIC FLUE GAS FLOW RATE AT ACTUAL CONDITIONS (wet basis)

$Qa(act) = 60 * Vs * A$

$Qa(act) = 60 * 7.6 * 0.26 = \mathbf{117}$ **acmm**

VOLUMETRIC FLUE GAS FLOW RATE AT STANDARD CONDITIONS (dry standard basis)

$$Qs(std) = 60 * Mfd * Vs * A * \frac{298}{273 + Ts} * \frac{Ps}{Pstd}$$

$$Qs(std) = 60 * 0.966 * 7.6 * 0.26 * \frac{298}{273 + 27} * \frac{690.2}{760} = \mathbf{102}$$ **dscmm**

PERCENT ISOKINETIC OF SAMPLING RATE

$$I = \frac{Pstd}{Tstd} * \frac{100}{60} * \frac{Ts + 273}{Ps} * \frac{Vmstd}{Vs * Mfd * time * An}$$

$$I = \frac{760}{298} * \frac{100}{60} * \frac{27 + 273}{690.2} * \frac{0.7980}{7.6 * 0.966 * 72 * 0.000029}$$

$I = \mathbf{95.1}$ **%**

PARTICULATE CONCENTRATION

$$mg/Ncm = \frac{mg_{particulate}}{Ncm}$$

$$mg/Ncm = \frac{51.7}{0.7980} = \mathbf{64.8}$$ **mg/Ncm**

PARTICULATE MASS EMISSION RATE

$$kg/hr = \frac{60}{10\text{^}6} * \frac{O_{13\%}\ mg}{Ncm} * Qs$$

$$kg/hr = \frac{60}{10\text{^}6} * 64.8 * 102 = \mathbf{0.397}$$ **kg/hr**

SULFUR DIOXIDE CONCENTRATION

$$mg/Ncm = \frac{mg_{SO2}}{Ncm}$$

$$mg/Ncm = \frac{159}{0.7980} = \mathbf{200}$$ **mg/Ncm**

SULFUR DIOXIDE EMISSION RATE

$$kg/hr = \frac{60}{10\text{^}6} * \frac{O^{11\%}\ mg}{Ncm} * Qs$$

$$kg/hr = \frac{60}{10\text{^}6} * 200 * 102 = \mathbf{1.2237}$$ **kg/hr**

NITROGEN OXIDES (as NO2) EXAMPLE CALCULATIONS, RUN 1a

1.0 INITIAL ABSOLUTE PRESSURE IN FLASK

$P_{mmHg} = P_{inHg} \times 25.4$ mmHg/in Hg

$Pi = Pbar(i) - Pg(i)$

$Pi = 27.2 - 26.11 = \mathbf{1.09}$ **in Hg** $= \mathbf{27.686}$ **mm Hg**

2.0 FINAL ABSOLUTE PRESSURE IN FLASK

$Pf = Pbar(f) - Pg(f)$

$Pf = 27.12 - 1.02 = \mathbf{26.1}$ **in Hg** $= \mathbf{662.9}$ **mm Hg**

3.0 VOLUME OF DRY GAS SAMPLED AT STANDARD CONDITIONS USING FLASK

$$Vsc = (Vf-25) * \left(\frac{Pf}{Tf+273} - \frac{Pi}{Ti+273}\right) * 0.392$$

$$Vsc = (2226.3 - 25) * \left(\frac{662.9}{304.2} - \frac{27.7}{302}\right) * 0.392 = \mathbf{1,801}$$ **ml**

4.0 CONCENTRATION OF NO_x as NO_2

*mg/Ncm = (µg/Vsc) * 10^6 (1,000 ml/1L) * (1,000 L / Ncm) * (1mg / 1,000 ug)*

*mg/Ncm = (439 / 1,801) * 1,000 =* ***244*** ***mg/Ncm***

NITROGEN OXIDES EMISSION RATE

$$kg/hr = \frac{60}{10\text{^}6} * \frac{O^{13\%}\ mg}{Ncm} * Qs$$

$$kg/hr = \frac{60}{10\text{^}6} * 243.7 * 102 = \mathbf{1.493}\ \mathbf{kg/hr}$$

CARBON MONOXIDE (CO) CONVERSION, ppm to mg/Ncm (Run 1)

$$CO_{mg/Ncm} = (CO_{ppm} \times MW_{CO}) / 24.5 \text{ Liters CO/mole}$$

$$CO_{mg/Ncm} = 111.0 \times 28.01 / 24.45 = \mathbf{127.2}\ \mathbf{mg/Ncm}$$

CARBON MONOXIDE EMISSION RATE

$$kg/hr = \frac{60}{10\text{^}6} * \frac{O_{13\%}\ mg}{Ncm} * Qs$$

$$kg/hr = \frac{60}{10\text{^}6} * 127.2 * 102 = \mathbf{0.779}\ \mathbf{kg/hr}$$

APPENDIX SUMMARY TABLE
NITROGEN OXIDES (as NO2) EMISSIONS DATA
BENGUET CORPORATION - ACUPAN CONTRACT MINING PROJECT
Balatoc, Virac, Itogon, Benguet
5,013CFM Verantis Acid Fume Scrubber #2

		Sample Collection Information					*Sample Recovery Information*				*Calculated Results*		
		Barometric Pressure, Pbar (in Hg):				27.20	Barometric Pressure, Pbar (in Hg):			27.12			
Sample ID	Flask Volume (ml)	Evacuated Pressure Pgi (in Hg)	Flask abs. Pressure Initial Pi, Pbar - Pgi (in Hg) [1]	Flask Temp °C	Flask Temp Ti °K	Sample Collection Time[2] 24-Hour	Final Pressure Pgf (in Hg)	Flask abs. Pressure Final Pf, Pbar - Pgf (in Hg) [1]	Flask Temp °C	Flask Temp Tf °K	Std. Gas Volume (ml)	Mass Catch Weight, µg (µg)	NOx Concentration, as NO2 (mg/Ncm)
Run 1A	2,226.30	26.11	1.09	29.2	302.2	1132	1.02	26.10	31.2	304.2	1,801	439	244
Run 1B	2,247.00	25.79	1.41	28.6	301.6	1137	1.34	25.78	31.6	304.6	1,769	474	268
Run 1C	2,236.40	25.88	1.32	28.9	301.9	1142	1.25	25.87	31.4	304.4	1,775	485	273
												Average	262
		Barometric Pressure, Pbar (in Hg):				27.18	Barometric Pressure, Pbar (in Hg):			27.12			
Run 2A	2,221.30	25.98	1.20	28.3	301.3	1324	1.16	25.96	31.0	304.0	1,780	421	236
Run 2B	2,211.40	25.74	1.44	29.9	302.9	1329	1.41	25.71	32.6	305.6	1,728	480	278
Run 2C	2,227.20	26.03	1.15	28.7	301.7	1334	1.12	26.00	32.4	305.4	1,783	437	245
												Average	253
		Barometric Pressure, Pbar (in Hg):				27.17	Barometric Pressure, Pbar (in Hg):			27.12			
Run 3A	2,237.30	25.86	1.31	28.9	301.9	1413	1.27	25.85	32.6	305.6	1,768	471	266
Run 3B	2,225.00	25.77	1.40	28.8	301.8	1418	1.36	25.76	32.4	305.4	1,746	485	278
Run 3C	2,220.00	25.59	1.58	28.5	301.5	1423	1.58	25.54	32.6	305.6	1,712	458	268
												Average	271

“APPENDIX B”

FIELD DATA SHEETS

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GREENTEK
Environmental Testing Co.

METHOD 1

TRAVERSE POINT LOCATIONS

Facility Name	BENGUET LOAD-AGNO CONTRACT MINING PROJECT
Town/Province	ITOGON - BENGUET
Source Tested	DUST COLLECTION FACILITY SYSTEM
Personnel	DW, AVL, MFC, AME Date 06/28/24

Type of Stack		Circular ✓	Rectangle
Ports	No. of ports available		2
	No. of ports used		2
	Port inside dia., cm		10

Dimensions	Far wall to end of port, cm (a)	38.5
Draw a diagram of the test location on the back of the sheet	Port length, cm (b)	13.5
	Stack Dia. or depth, cm (a-b)	30
	Stack width (if rectangle), cm	-
	Equivalent Stack Diameter, cm	-
	Area of stack, m^2	0.071

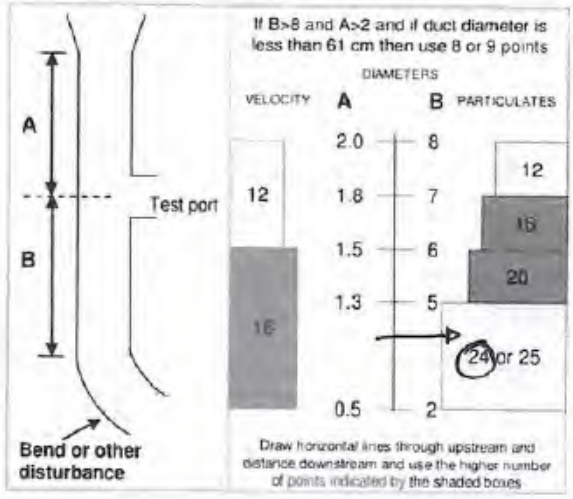
Distance to flow disturbance	Meters	Diameters
Upstream (A)	1.04	3.47D
Downstream (B)	1.15	3.83D

Minimum # of traverse points required:			
		Particulate traverse	24
		Velocity traverse	24
# of ports used	2	# points/port	12
		Number of traverse points used	24

Point #	Fraction of stack diameter	Dist. From inside wall	Port Length	Dist. From edge of port
1	0.021	1.30	8.5	9.8
2	0.067	2.01	8.5	10.5
3	0.118	3.54	8.5	12.0
4	0.177	5.31	8.5	13.8
5	0.250	7.50	8.5	16.0
6	0.356	10.68	8.5	19.2
7	0.644	19.32	8.5	27.8
8	0.750	22.5	8.5	31.0
9	0.823	24.69	8.5	33.2
10	0.882	26.46	8.5	34.96
11	0.933	27.99	8.5	36.5
12	0.979	29.7	8.5	37.2

*- for stacks having dia. bet. 30 to 61 cm, no traverse points shall be within 1.0cm of the stack walls.
*- for stacks having dia. greater than 61cm, no traverse point shall be within 2.5cm of the stack walls.

Note: When using 4 points in a circular duct, the probe is marked with only the points for the first half of the full diameter traverse.



Equivalent diameter for rectangular duct:
D_e = 2 x depth x width ÷ (depth + width)
D_e = 2 x ( ) x ( ) ÷ (+) =

LOCATION OF POINTS IN CIRCULAR STACK OR DUCTS
Fraction of stack diameter from inside wall

	2	4	6	8	10	12
1	0.146	0.067	0.044	0.032	0.026	0.021
2	0.854	0.250	0.146	0.105	0.082	0.067
3		0.750	0.296	0.194	0.146	0.118
4		0.933	0.704	0.323	0.266	0.177
5			0.854	0.677	0.342	0.250
6			0.956	0.806	0.658	0.356
7				0.895	0.774	0.644
8				0.958	0.854	0.750
9					0.918	0.823
10					0.974	0.882
11						0.933
12						0.979

LOCATION OF POINTS IN RECTANGULAR STACKS OR DUCTS
Fraction of stack diameter from inside wall

	2	3	4	5	6	7	8	9	10	11	12
1	.250	.167	.125	.100	.083	.071	.063	.056	.050	.045	.042
2	.750	.500	.375	.300	.250	.214	.188	.167	.150	.136	.125
3		.833	.625	.500	.417	.357	.313	.278	.250	.227	.208
4			.875	.700	.583	.500	.438	.389	.350	.318	.292
5				.900	.750	.643	.563	.500	.450	.409	.375
6					.917	.786	.688	.611	.550	.500	.458
7						.929	.813	.722	.650	.591	.542
8							.938	.833	.750	.682	.625
9								.944	.850	.773	.708
10									.950	.864	.792
11										.955	.875
12											.958

ACCEPTABLE MATRICES FOR SQUARE DUCTS

3 x 3	4 x 5	6 x 6
3 x 4	5 x 5	6 x 7
4 x 4	5 x 6	7 x 7

Team Leader / Date: DANIEL C. NAVIDAD JR. 06/28/24

QAQC / Date: ANGELO V. GUEVARRA 6/28/24

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SAT No. 2021-93

GREENTEK Environmental Phils. Co.

EPA METHOD 1 & 2

GAS VELOCITY and CYCLONIC FLOW CHECK

				Assume Values
Facility	BENGUET CORP-ACUPAN CONTRACT MINING PROJECT			
Town/Province	ITOGON, BENGUET			
Source	DUST COLLECTION FACILITY SYSTEM			%BWS = 7.0
Personnel	DLN, AVL, MPC, AMC	Bar. Pressure, inHg	27.18	MD = 30.0
Date / Time	04/28/24, 1306	Pitot Coefficient	0.84	TM = 35.0

Pitot Tube Leak Check, mmH_2O 230/86

Static Pressure, mmH_2O -3.0

Measured at which traverse point A-6

Traverse Point	Velocity Pressure (mmH_2O)	Temperature (°C)	Angle Which Yields Null (Degrees)
A - 12	15.0	26	10
11	15.0	26	11
10	16.0	26	12
9	16.0	27	16
8	15.0	27	14
7	15.0	27	14
6	15.0	26	12
5	14.0	26	11
4	14.0	26	10
3	15.0	26	10
2	15.0	25	9
1	18.0	25	11
B - 12	18.0	26	10
11	19.0	26	10
10	14.0	28	12
9	15.0	28	12
8	15.0	28	14
7	15.0	29	14
6	14.2	29	13
5	14.2	29	12
4	14.2	30	11
3	15.2	30	13
2	15.2	30	12
1	15.2	30	12
Average:	15.0917	27.3	11.9
Ave. √:	3.8826		

Team Leader / Date: DANIEL L. PANTIDAR JR. 04/28/24

QAQC / DATE: ANGELO V. GUBIARRA 4/28/24

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SAT No. 2019-115
SAT No. 2021-93

SET-FD-001 rev.08
Effectivity Date: Feb. 01, 2023

GREENTEK
Environmental Plans Co.

METHOD 3

FYRITE ANALYSIS FIELD DATA

Facility	BENGUET CORP - ATOKAN CONTRACT MINING PROJECT	Fuel Type	Electricity
Town/Province	ITOGON, BENGUET	Fyrite ID	GBE-TU1
Source	DUST COLLECTION FACILITY SYSTEM	Analysis Location	ON-SITE

Run No. 1 Bag ID: — Operator (name & sign): DLJ

Run Date	Date of Analysis	% CO_2	% O_2	% N_2
06/28/24	06/28/24			
Run Time	Time of Analysis	Reading (A)	Reading (B)	100-(A+B)
Start 1323	Start 1440	0	20.0	
		0	20.0	
Stop 1437	Stop 1443	0	20.0	
Leak check ☑	Average	0	20.0	80.0

Run No. 2 Bag ID: — Operator (name & sign): DLJ

Run Date	Date of Analysis	% CO_2	% O_2	% N_2
06/28/24	06/28/24			
Run Time	Time of Analysis	Reading (A)	Reading (B)	100-(A+B)
Start 1459	Start 1617	0	20.0	
		0	20.0	
Stop 1615	Stop 1620	0	20.0	
Leak check ☑	Average	0	20.0	80.0

Run No. 3 Bag ID: — Operator (name & sign): DLJ

Run Date	Date of Analysis	% CO_2	% O_2	% N_2
06/28/24	06/28/24			
Run Time	Time of Analysis	Reading (A)	Reading (B)	100-(A+B)
Start 1630	Start 1749	0	20.0	
		0	20.0	
Stop 1743	Stop 1747	0	20.0	
Leak check ☑	Average	0	20.0	80.0

Team Leader / Date : DANIEL L. SANTIAGO JR. 06/28/24

QAQC / Date: ANGELO V. CUEVARRA 6/28/24

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SAT No. 2019-115
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METHOD 4

MOISTURE ANALYSIS DATA SHEET

Facility	Benguet Corp - Acupan Contract Mining Project	Sample Method	5
Town/Province	Itogon, Benguet	Recovery Location	On-site
Source	Dust Collection Facility System	Personnel	AVG, DLN, MRC, AMC

Run Number	1	2	3	
Test Date	6/28/24	6/28/24	6/28/24	
Recovery Date	6/28/24	6/28/24	6/28/24	
Recovered By	AVG	AVG	AVG	
Impinger 1 100mL D.I H_2O				
Final Weight, g	636.0	632.5	642.5	
Initial Weight, g	629.0	625.5	632.5	
Net Weight, g	7.0	7.0	10.0	
Impinger 2 100mL D.I H_2O				
Final Weight, g	634.0	630.0	637.5	
Initial Weight, g	632.0	627.0	635.5	
Net Weight, g	2.0	3.0	2.0	
Impinger 3 Empty				
Final Weight, g	509.5	589.5	511.5	
Initial Weight, g	508.5	588.0	509.5	
Net Weight, g	1.0	1.5	2.0	
Impinger 4 200g - 300g Silica Gel				
Final Weight, g	776.0	795.0	781.0	
Initial Weight, g	771.5	790.5	775.5	
Net Weight, g	4.5	4.5	5.5	
Impinger 5 _____				
Final Weight, g				
Initial Weight, g				
Net Weight, g				
Impinger 6 _____				
Final Weight, g				
Initial Weight, g				
Net Weight, g				
Impinger 7 _____				
Final Weight, g				
Initial Weight, g				
Net Weight, g				

Total Catch, g	14.5	16.0	19.5	
Silica Gel Spent, %	5%	5%	5%	
Filter ID #	03245159	12235247	03245145	
Filter Wt.	0.2527	0.2456	0.2533	

Team Leader / Date: [signature] 06/28/24

QAQC / Date: ANGELO V. GUEVARRA 6/28/24

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SAT No. 2019-115
SAT No. 2021-93

SAT

GREENTEK Environmental Asia Co.

ISOKINETIC FIELD DATA SHEET

METHOD(S) 5

Facility Name	BENGUET CORP – ACUPAN CONTRACT MINING PROJECT	Run Number	1
Town/Province	ITOGON – BENGUET	Type of APCD Installed	~~WET~~ DUST SCRUBBER
Source	DUST COLLECTION FACILITY SYSTEM	Test Date	06/28/24
Test Personnel	DLH, AVG, MPC, AMC	Operator Signature	

Filter ID	Tare(s)	Barometric Pressure (In Hg)	Static Pressure (mmHg)	Meterbox ID #	Meterbox Gamma	Meterbox Delta H@	Nozzle ID#	Nozzle Diameter	Pitot Tube/Probe ID #	Pitot Tube/Probe Cp	Probe Material
03195159	0.2527	27.18	-3.0	GMC-01	1.0102	47.66	GNT-02	4.98	GP-09	0.84	SS

		Sample Train Leak Checks	Initial	Interim			Final	Fyrites Time	%CO_2	%O_2
K Factor	0.987	Vacuum, inHg	15.0				20	1318	0	20.0
Pitot Leak Checks		Leak Rate, m^3/m	0				0	–	–	–
230/86	Pre-test	Start Volume	421.4116				422.2062	Fyrite System Leak Check		OK
230/91	Post-test	Stop Volume	421.4110				422.2062	Bag ID		–

Port & Point	Clock (24-hr)	Test (mins)	DGM Reading (cu. Meter)	Pitot Reading (mmH_2O)	Delta H calc. (mmH_2O)	Delta H Actual (mmH_2O)	Gauge Vacuum (In Hg)	Stack °C	DGM °C	Probe °C	Filter °C	Imp. Exit °C
A-12	1323	0	421.4132	15.0	14.8	14.8	2.0	32	32	121	115	16
11	1326	3	421.4602	15.0	14.8	14.8	2.0	32	32	120	118	15
10	1329	6	421.4900	15.0	14.8	14.8	2.0	32	32	120	118	13
9	1332	9	421.5250	15.0	14.8	14.8	2.0	33	33	120	119	11
8	1335	12	421.5600	15.0	14.8	14.8	2.0	33	33	120	120	11
7	1338	15	421.5922	15.0	14.8	14.8	2.0	33	34	119	121	11
6	1342	18	421.6292	15.0	14.8	14.8	2.0	33	34	120	120	9
5	1344	21	421.6684	14.0	13.6	13.8	2.0	33	34	120	118	9
4	1347	24	421.7032	14.0	13.8	13.8	2.0	33	34	120	120	10
3	1350	27	421.7400	12.0	11.8	11.8	2.0	35	35	120	120	12
2	1353	30	421.7698	12.0	11.8	11.8	2.0	35	35	120	118	12
1	1356	33	421.8032	12.0	11.8	11.8	2.0	35	36	120	120	12
B-12	1401	36	421.8384	12.0	11.8	11.8	2.0	37	36	121	121	18
11	1404	39	421.8674	12.0	11.8	11.8	2.0	37	36	120	120	16
10	1407	42	421.8968	11.0	10.9	11.0	2.0	37	36	119	121	14
9	1410	45	421.9296	11.0	10.9	11	2.0	37	36	120	120	13
8	1413	48	421.9548	11.0	10.9	11	2.0	37	36	120	121	13
7	1416	51	421.9909	11.0	10.9	11	2.0	37	36	120	122	16
6	1419	54	422.0222	11.0	10.9	11	2.0	37	36	120	120	16
5	1422	57	422.0584	11.0	10.9	11	2.0	36	35	120	118	14
4	1425	60	422.0924	10.0	9.9	10	2.0	36	35	121	122	15
3	1428	63	422.1202	10.0	9.9	10	2.0	36	35	120	122	13
2	1431	66	422.1462	10.0	9.9	10	2.0	36	35	120	122	13
1	1434	69	422.1764	10.0	9.9	10	2.0	36	35	120	122	12
0	1437	72	422.2060									

Run Time	Total Volume	RMS Delta P
72	0.7928	3.5193

Delta H Ave.	High Vac.	Ts Ave.	Tm Ave.	Isokinetic %
~~10.54~~ 12.34	2.0	34.9	34.6	93.7

Team Leader / Date: DANILO L. HUMPAD Jr. 06/28/24

QAQC / Date: ANGELO V. GUEVARRA 6/28/24

GREENTEK
Environmental Plus Co.

ISOKINETIC FIELD DATA SHEET

METHOD(S) 5

Facility Name	BENGUET CORP. ACUPAN CONTRACT MINING PROJECT	Run Number	2
Town/Province	ITOGON, BENGUET	Type of APCD Installed	BAGHOUSE SCRUBBER
Source	DUST COLLECTION FACILITY SYSTEM	Test Date	06/28/24
Test Personnel	DMJ, AMB, MRC, AMC	Operator Signature	

Filter ID	Tare(s)	Barometric Pressure (In Hg)	Static Pressure (mmHg)	Meterbox ID #	Meterbox Gamma	Meterbox Delta H@	Nozzle ID#	Nozzle Diameter	Pitot Tube/Probe ID #	Pitot Tube/Probe Cp	Probe Material
123524	0.1952	27.20	-3.0	GMC-01	1.0102	97.66	GN7-02	9.98	GP-09	0.84	SS

Sample Train Leak Checks			Initial	Interim			Final	Fyrites Time	Fyrites %CO_2	Fyrites %O_2
K Factor	1.035	Vacuum, inHg	15.0				2.0	1110	0	20.9
Pilot Leak Checks		Leak Rate, m^3/m	0				0	-	-	-
730/846	Pre-test	Start Volume	422.2169				422.9856	Fyrite System Leak Check		OK
928/90	Post-test	Stop Volume	422.7169				422.9856	Bag ID		-

Port & Point	Time Clock (24-hr)	Time Test (mins)	DGM Reading (cu. Meter)	Pitot Reading (mmH_2O)	Delta H calc. (mmH_2O)	Delta H Actual (mmH_2O)	Gauge Vacuum (In Hg)	Temperature °C Stack	DGM	Probe	Filter	Imp. Exit
A-12	1459	0	422.7182	12.0	12.9	12.9	2.0	36	36	122	123	12
11	1502	3	422.2530	12.0	12.4	12.4	2.0	36	36	120	122	14
10	1505	6	422.7898	11.6	12.0	12.0	2.0	36	36	119	122	14
9	1508	9	422.3224	11.6	12.0	12.0	2.0	36	36	120	123	14
8	1511	12	422.3572	11.6	12.0	12.0	2.0	36	36	120	119	15
7	1514	15	422.3839	11.6	12.0	12.0	2.0	36	36	120	120	15
6	1517	18	422.4180	11.0	11.4	11.4	2.0	38	38	120	122	14
5	1520	21	422.4564	11.0	11.4	11.4	2.0	38	38	120	118	14
4	1523	24	422.4896	11.0	11.4	11.4	2.0	38	38	120	120	15
3	1526	27	422.5292	11.0	11.4	11.4	2.0	38	38	118	120	14
2	1529	30	422.5598	12.0	12.4	12.4	2.0	38	38	120	120	14
1	1532	33	422.5896	12.0	12.4	12.4	2.0	38	38	120	120	13
A-12	1535	36	422.6060	12.0	12.4	12.4	2.0	38	38	120	120	13
11	1542	39	422.6397	12.0	12.4	12.4	2.0	38	38	118	120	13
10	1545	42	422.6689	12.0	12.4	12.4	2.0	38	40	120	120	14
9	1548	45	422.7112	10.0	10.7	10.4	2.0	40	40	120	118	14
8	1551	48	422.7400	10.0	10.3	10.4	2.0	40	40	120	122	16
7	1554	51	422.7689	10.0	10.3	10.4	2.0	40	40	120	120	16
6	1557	54	422.7986	10.0	10.3	10.4	2.0	40	40	120	118	16
5	1600	57	422.8240	11.0	11.4	11.4	2.0	41	38	120	120	14
4	1603	60	422.8584	11.0	11.4	11.4	2.0	41	38	120	116	13
3	1606	63	422.8870	11.0	11.4	11.4	2.0	41	38	120	120	12
2	1609	66	422.9202	11.0	11.4	11.4	2.0	41	38	118	116	16
1	1612	69	422.9590	11.0	11.4	11.4	2.0	41	38	120	120	13
0	1615	72	422.9959									

Run Time	Total Volume	RMS Delta P
72	0.7672	3.3988

Delta H Ave.	High Vac.	Ts Ave.	Tm Ave.
11.63	2.0	39.5	37.9

Isokinetic %
95.2

Team Leader / Date: DANIEL C. DAMASO JR. 06/28/24

QAQC / Date: ANGELO V. GUEVARRA 6/28/24

DENR ACCREDITED
Source Emission Testing Firm
SAT No. 2019-116
SAT No. 2021-93

GREENTEK Environmental Phils Co.

ISOKINETIC FIELD DATA SHEET

METHOD(S) 5

Facility Name	BENGUET CORP-ACUPAN CONTRACT MINING PROJECT	Run Number	3
Town/Province	ITOGON, BENGUET	Type of APCD Installed	WET SCRUBBER
Source	DUST COLLECTION FACILITY SYSTEM	Test Date	06/28/24
Test Personnel	DJN, AVG, MRC, ANC	Operator Signature	

Filter ID	Tare(s)	Barometric Pressure (In Hg)	Static Pressure (mmHg)	Meterbox ID #	Meterbox Gamma	Meterbox Delta H@	Nozzle ID#	Nozzle Diameter	Pitot Tube/Probe ID #	Cp	Probe Material
0324S195	0.2533	27.21	-3.0	GMC-01	1.0102	47.606	GNT-02	4.98	6P-04	0.84	SS

		Sample Train Leak Checks	Initial	Interim	Interim	Interim	Final	Fyrites Time	%CO_2	%O_2
K Factor	1.027	Vacuum, inHg	15.0				2.0	1617	0	20.0
Pitot Leak Checks		Leak Rate, m^3/m	0				0	—	—	—
230/90	Pre-test	Start Volume	422.9888				423.7994	Fyrite System Leak Check		OK
290/94	Post-test	Stop Volume	422.9888				423.7994	Bag ID		—

Port & Point	Clock (24-hr)	Test (mins)	DGM Reading (cu. Meter)	Pitot Reading (mmH_2O)	Delta H calc. (mmH_2O)	Delta H Actual (mmH_2O)	Gauge Vacuum (In Hg)	Stack (°C)	DGM (°C)	Probe (°C)	Filter (°C)	Imp. Exit (°C)
A-12	1630	0	422.9908	11.0	11.3	11.4	2.0	39	35	121	123	16
11	1633	3	423.0392	11.0	11.3	11.4	2.0	39	35	120	120	19
10	1636	6	423.0602	11.0	11.3	11.4	2.0	39	35	120	120	14
9	1639	9	423.0890	11.0	11.3	11.4	2.0	39	35	120	118	14
8	1642	12	423.1170	13.0	13.3	13.4	2.0	39	35	120	120	16
7	1645	15	423.1550	13.0	13.3	13.4	2.0	39	36	120	118	14
6	1648	18	423.1884	13.0	13.3	13.4	2.0	39	36	120	120	13
5	1651	21	423.2204	13.0	13.3	12.4	2.0	39	36	120	120	13
4	1654	24	423.2590	12.0	12.3	12.4	2.0	40	35	120	120	13
3	1657	27	423.2910	12.0	12.3	12.4	2.0	40	35	120	120	13
2	1700	30	423.3240	12.0	12.3	12.4	2.0	40	35	120	120	14
1	1703	33	423.3560	12.0	12.3	12.4	2.0	40	35	120	118	14
B-12	~~1706~~ 1707	36	423.3882	12.0	12.3	12.4	2.0	40	36	120	120	15
11	1710	39	423.4214	14.0	14.4	14.4	2.0	40	36	121	121	15
10	1713	42	423.4570	14.0	14.4	14.4	2.0	40	36	120	118	15
9	1716	45	423.4930	14.0	14.4	14.4	2.0	40	36	120	120	14
8	1719	48	423.5298	12.0	12.3	12.4	2.0	40	36	120	120	14
7	1722	51	423.5662	12.0	12.3	12.4	2.0	41	37	120	120	14
6	1725	54	423.6034	12.0	12.3	12.4	2.0	41	37	120	118	14
5	1728	57	423.6306	13.0	13.3	13.4	2.0	41	37	120	120	14
4	1731	60	423.6664	13.0	13.3	13.4	2.0	41	37	120	120	14
3	1734	63	423.7002	13.0	13.3	13.4	2.0	41	37	120	120	13
2	1737	66	423.7362	13.0	13.3	13.4	2.0	42	38	120	120	13
1	1740	69	423.7640	13.0	13.3	13.4	2.0	42	38	120	120	14
0	1743	72	423.7992									

Run Time	Total Volume	RMS Delta P
72	0.8084	3.5273

Delta H Ave.	High Vac.	Ts Ave.	Tm Ave.
12.9	2.0	40.0	36.0

Isokinetic %
96.5

Team Leader / Date: DANIEL J. NAVIDAD JR. 06/28/24

QAQC / Date: ANGELO V. GUEVARRA 6/28/24

DENR ACCREDITED Source Emission Testing Firm SAT No. 2010-115 SAT No. 2021-03

GREENTEK
Environmental Projects

METHOD 1

TRAVERSE POINT LOCATIONS

Facility Name	BENGUET CORP-ACUPAN CONTRACT MINING PROJECT
Town/Province	ITOGON BENGUET
Source Tested	ACID PLANT CHAMBER NUMBER 2 W/ ACID FUME SCRUBBING #2
Personnel	DUN, ANG, MIKE, ARL Date 06/29/24

Type of Stack	Circular ✓	Rectangle
Ports	No. of ports available	2
	No. of ports used	2
	Port inside dia., cm	7.5

Dimensions		
Draw a diagram of the test location on the back of the sheet	Far wall to end of port, cm (a)	67
	Port length, cm (b)	10
	Stack Dia. or depth, cm (a-b)	57
	Stack width (if rectangle), cm	-
	Equivalent Stack Diameter, cm	-
	Area of stack, m²	0.255

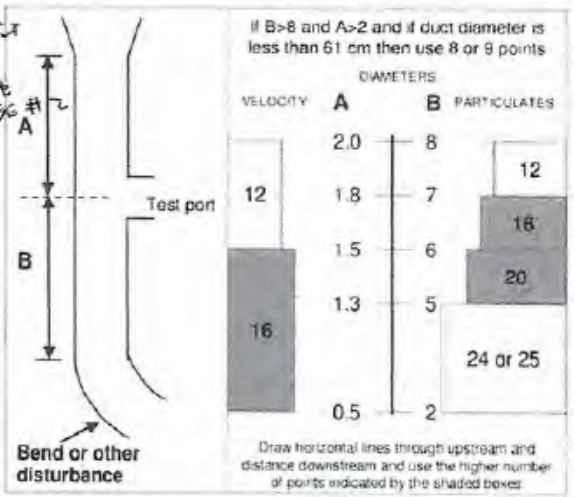
Distance to flow disturbance	Meters	Diameters
Upstream (A)	2.80	4.91D
Downstream (B)	1.15	2.02D

Minimum # of traverse points required:			
		Particulate traverse	24
		Velocity traverse	24
# of ports used	2	# points/port	12
		Number of traverse points used	24

Point #	Fraction of stack diameter	Dist. From inside wall	Port Length	Dist. From edge of port
1	0.021	1.30	10	11.3
2	0.067	3.81	10	13.8
3	0.118	6.73	10	16.7
4	0.177	10.09	10	20.1
5	0.250	14.25	10	24.3
6	0.356	20.29	10	30.3
7	0.694	36.71	10	46.7
8	0.750	42.75	10	52.8
9	0.823	46.91	10	56.9
10	0.882	50.27	10	60.3
11	0.933	53.20	10	63.2
12	0.979	55.7	10	65.7

*- for stacks having dia. bet. 30 to 61 cm, no traverse points shall be within 1.3cm of the stack walls.
*- for stacks having dia. greater than 61cm, no traverse point shall be within 2.5cm of the stack walls.

Note: When using 4 points in a circular duct, the probe is marked with only the points for the first half of the full diameter traverse.



Equivalent diameter for rectangular duct:

$D_e = 2 \times \text{depth} \times \text{width} \div (\text{depth} + \text{width})$

$D_e = 2 \times (\quad) \times (\quad) \div (\quad + \quad) =$

LOCATION OF POINTS IN CIRCULAR STACK OR DUCTS
Fraction of stack diameter from inside wall

	2	4	6	8	10	12
1	0.146	0.067	0.044	0.032	0.026	0.021
2	0.854	0.250	0.146	0.105	0.082	0.067
3		0.750	0.296	0.194	0.146	0.118
4		0.933	0.704	0.323	0.266	0.177
5			0.854	0.677	0.342	0.250
6			0.956	0.806	0.658	0.356
7				0.895	0.774	0.644
8				0.958	0.854	0.750
9					0.918	0.823
10					0.974	0.882
11						0.933
12						0.979

LOCATION OF POINTS IN RECTANGULAR STACKS OR DUCTS
Fraction of stack diameter from inside wall

	2	3	4	5	6	7	8	9	10	11	12
1	.250	.167	.125	.100	.083	.071	.063	.056	.050	.045	.042
2	.750	.500	.375	.300	.250	.214	.188	.167	.150	.136	.125
3		.833	.625	.500	.417	.357	.313	.278	.250	.227	.208
4			.875	.700	.583	.500	.438	.389	.350	.318	.292
5				.900	.750	.643	.563	.500	.450	.409	.375
6					.917	.786	.688	.611	.550	.500	.458
7						.929	.813	.722	.650	.591	.542
8							.938	.833	.750	.682	.625
9								.944	.850	.773	.708
10									.950	.864	.792
11										.955	.875
12											.958

ACCEPTABLE MATRICES FOR SQUARE DUCTS

3 x 3	4 x 5	6 x 6
3 x 4	5 x 5	6 x 7
4 x 4	5 x 6	7 x 7

Team Leader / Date: DANIEL T. UNGVICHIAN JR. 06/29/24

QAQC / Date: ANGELO V. GUEVARRA 6/29/24

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SAT No. 2018-115
SAT No. 2021-93

SAT

GREENTEK
Environmental Solutions

EPA METHOD 1 & 2

GAS VELOCITY and CYCLONIC FLOW CHECK

Facility	BENGUET CORP-ALNTAN CONTRACT MINING PROJECT			Assume Values
Town/Province	ITOGON, BENGUET			
Source	ACIDIFYING CHAMBER #2 W/ ACID MIST SCRUBBER #2			%BWS = ~~14~~ 12.5/7
Personnel	DLN, AVG, MEC, AMC, RMC	Bar. Pressure, inHg	27.18	MD = 30.0
Date / Time	06/29/24, 0920	Pitot Coefficient	0.84	TM = 35

Pitot Tube Leak Check, mmH_2O 290/88

Static Pressure, mmH_2O -2.0

Measured at which traverse point A-6

Traverse Point	Velocity Pressure (mmH_2O)	Temperature (°C)	Angle Which Yields Null (Degrees)
A-12	4.0	22	10
11	4.0	22	12
10	4.0	23	12
9	3.6	23	13
8	3.6	23	14
7	3.6	22	10
6	4.0	21	12
5	6.0	21	12
4	6.0	21	14
3	6.2	22	12
2	6.2	22	13
1	6.2	23	11
B-12	3.8	23	12
11	3.8	23	12
10	3.8	24	10
9	3.8	24	9
8	4.0	24	9
7	4.0	20	12
6	4.0	20	12
5	4.6	20	13
4	4.6	21	14
3	5.0	21	14
2	5.0	21	13
1	5.0	21	13
Average:	4.5333	21.9	12.0
Ave. √:	2.1190		

Team Leader / Date: [signature] 06/29/24

QAQC / DATE: ANGELO V. GUEVARRA 6/29/24

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SAT No. 2019-115
SAT No. 2021-93

GREENTEK
Environmental Services

METHOD 3

FYRITE ANALYSIS FIELD DATA

Facility	BENGUET CORP - ACUPAN CONTRACT MINING PROJECT	Fuel Type	KEROSENE
Town/Province	ITOGON, BENGUET	Fyrite ID	GDE-T01
Source	ADDIFYING CHAMBER #2 W/ACID FUME SCRUBBER #2	Analysis Location	OP-SITE

Run No. 1	Bag ID: BCACMP-S-M3/M4-R1	Operator (name & sign): DLN		
Run Date	Date of Analysis	% CO_2	% O_2	% N_2
06/29/24	06/29/24			
Run Time	Time of Analysis	Reading (A)	Reading (B)	100-(A+B)
Start 1050	Start 1228	0	19.0	
		0	19.0	
Stop 1205	Stop 1231	0	19.0	
Leak check ☑	Average	0	19.0	81.0

Run No. 2	Bag ID: BCACMP-S-M3/M4-R2	Operator (name & sign): DLN		
Run Date	Date of Analysis	% CO_2	% O_2	% N_2
06/29/24	06/29/24			
Run Time	Time of Analysis	Reading (A)	Reading (B)	100-(A+B)
Start 1242	Start 1402	0	19.0	
		0	19.0	
Stop 1358	Stop 1405	0	19.0	
Leak check ☑	Average	0	19.0	81.0

Run No. 3	Bag ID: BCACMP-S-M3/M4-R3	Operator (name & sign): DLN		
Run Date	Date of Analysis	% CO_2	% O_2	% N_2
06/29/24	06/29/24			
Run Time	Time of Analysis	Reading (A)	Reading (B)	100-(A+B)
Start 1411	Start 1526	0	19.0	
		0	19.0	
Stop 1525	Stop 1529	0	19.0	
Leak check ☑	Average	0	19.0	81.0

Team Leader / Date : [signature] 06/29/24

QAQC / Date: ANGELO V. GUEVARRA 6/29/24

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SAT No. 2019-115
SAT No. 2021-93

SAT

GREENTEK Environmental Phils Co.

METHOD 4
MOISTURE ANALYSIS DATA SHEET

Facility	Benguet Corp. - Acupan Contract Mining Project	Sample Method	6
Town/Province	Itogon, Benguet	Recovery Location	On-site
Source	Acidifying Chamber (2) w/ Acid Fume scrubber (2)	Personnel	AVG, DLN, MPC AMC, RMC

Run Number	Moisture Run	1	2	3
Test Date	6/29/24	6/29/24	6/29/24	6/29/24
Recovery Date	6/29/24	6/29/24	6/29/24	6/29/24
Recovered By	AVG	AVG	AVG	AVG
Impinger 1 100mL 3% H_2O_2				
Final Weight, g	639.5	622.0	640.5	623.0
Initial Weight, g	636.5	611.0	629.0	611.5
Net Weight, g	3.0	11.0	11.5	11.5
Impinger 2 100mL 3% H_2O_2				
Final Weight, g	642.0	641.0	644.0	641.5
Initial Weight, g	636.5	638.0	639.5	636.0
Net Weight, g	5.5	3.0	4.5	5.5
Impinger 3 Empty				
Final Weight, g	530.5	588.5	534.5	593.5
Initial Weight, g	528.5	587.5	533.5	590.5
Net Weight, g	2.0	1.0	1.0	3.0
Impinger 4 200g - 300g Silica Gel				
Final Weight, g	776.5	831.0	781.0	836.5
Initial Weight, g	771.0	825.5	776.0	830.5
Net Weight, g	5.5	5.5	5.0	6.0
Impinger 5 ______				
Final Weight, g				
Initial Weight, g				
Net Weight, g				
Impinger 6 ______				
Final Weight, g				
Initial Weight, g				
Net Weight, g				
Impinger 7 ______				
Final Weight, g				
Initial Weight, g				
Net Weight, g				

Total Catch, g	14.0	20.5	21.0	26.0
Silica Gel Spent, %	10%	10%	10%	10%
Filter ID #	-	0424579	0424578	0424561
Filter Wt.	-	0.2482	0.2470	0.2495

Team Leader / Date: DANTE C. P. CUADRO Jr. 06/29/24

QAQC / Date: ANGELO V. GUEVARRA 6/29/24

GREENTEK
Environmental Tests Co.

ISOKINETIC FIELD DATA SHEET

METHOD(S) 4

Facility Name	BENGUET ASRP-ACUPAN CONTRACT MINING PROJECT	Run Number	MOISTURE RUN
Town/Province	ITOGON BENGUET	Type of APCD Installed	ACID FUME SCRUBBER
Source	ACIDIFYING CHAMBER #2 IN/ACID FUME SCRUBBER OUT	Test Date	06/29/24
Test Personnel	DLN, AVG, MKC, AMC, RMC	Operator Signature	

Filter ID	Tare(s)	Barometric Pressure (In Hg)	Static Pressure (mmHg)	Meterbox ID #	Meterbox Gamma	Meterbox Delta H@	Nozzle ID#	Nozzle Diameter	Pitot Tube/Probe ID #	Pitot Tube/Probe Cp	Probe Material
—	—	27.19	-2.0	GMC-01	1.0102	97.66	—	—	GP-04	0.84	SS

Sample Train Leak Checks			Initial	Interim	Final	Fyrites Time	Fyrites %CO_2	Fyrites %O_2
K Factor	—	Vacuum, inHg	15.0		12.0	0948	0	19.0
Pitot Leak Checks		Leak Rate, m^3/m	0		0	—	—	—
220/84	Pre-test	Start Volume	423.8006		429.6202	Fyrite System Leak Check		OK
220/90	Post-test	Stop Volume	423.8006		429.6202	Bag ID		—

Port & Point	Time: Clock (24-hr)	Time: Test (mins)	DGM Reading (cu. Meter)	Pitot Reading (mmH_2O)	Delta H calc. (mmH_2O)	Delta H Actual (mmH_2O)	Gauge Vacuum (In Hg)	Temperature °C: Stack	DGM	Probe	Filter	Imp. Exit
A-6	0944	0	423.8070	5.0	—	98	2.0	20	30	122	124	16
A-6	0947	3	423.8312	5.0	—	98	2.0	20	30	120	120	19
A-6	0950	6	423.9007	5.0	—	98	2.0	20	30	120	118	19
A-6	0953	9	424.0090	5.0	—	98	2.0	20	35	120	120	13
A-6	0956	12	424.0562	5.0	—	98	2.0	22	35	120	120	13
A-6	0959	15	424.1488	5.0	—	98	2.0	22	35	120	118	13
A-6	1002	18	424.2396	5.0	—	98	2.0	22	35	120	120	12
A-6	1005	21	424.3356	5.0	—	98	2.0	22	35	120	118	13
A-6	1008	24	424.4260	5.0	—	98	2.0	20	34	120	120	13
A-6	1011	27	424.5186	5.0	—	98	2.0	20	34	120	118	12
A-6	1014	30	424.6090	5.0	—	98	2.0	20	34	120	120	12
A-6	1017	33	424.6992	5.0	—	98	2.0	20	34	120	120	13
A-6	1020	36	424.7804									

Run Time	Total Volume	RMS Delta P
36	0.8180	2.2361

Delta H Ave.	High Vac.	Ts Ave.	Tm Ave.
98	2.0	20.7	33.9

Isokinetic %
—

Team Leader / Date: DANIEL L. NAVARRO JR. 06/29/24

QAQC / Date: ANGELO V. GUEVARRA 6/29/24

DENR ACCREDITED
Source Emission Testing Firm
EAI No. 2015-115
SAT No. 2021-03

GREENTEK
Environmental Plus Co.

ISOKINETIC FIELD DATA SHEET

METHOD(S) 5/6

Facility Name	BENGUET CORP-PANTAY CONTRACT MINING PROJECT	Run Number	1
Town/Province	IGNOBON, BENGUET	Type of APCD Installed	ACID PUMP SCRUBBER
Source	ACCUMULATING CHAMBER #2 W/ ACID PUMP SCRUBBER #2	Test Date	06/29/24
Test Personnel	TLP, AVL, IMPE, AMC, RMC	Operator Signature	

Filter ID	Tare(s)	Barometric Pressure (In Hg)	Static Pressure (mmHg)	Meterbox ID #	Meterbox Gamma	Meterbox Delta H@	Nozzle ID#	Nozzle Diameter	Pitot Tube/Probe ID #	Pitot Tube/Probe Cp	Probe Material
0245794	0.2482	27.18	-2.0	GMC-01	1.0102	97.66	GNTH-03	6.09	GP-09	0.84	SS

Sample Train Leak Checks			Initial	Interim	Final	Fyrites Time	Fyrites %CO2	Fyrites %O2
K Factor	3.306	Vacuum, InHg	15.0		2.0	1011	0	17.0
Pitot Leak Checks		Leak Rate, m³/m	0		0	-	-	-
7:20/8:0	Pre-test	Start Volume	424.6234		425.5236	Fyrite System Leak Check		OK
7:25/8:06	Post-test	Stop Volume	429.6234		425.5234	Bag ID	BLACMP-S-M3/9.0-12	

Port & Point	Time: Clock (24-hr)	Time: Test (mins)	DGM Reading (cu. Meter)	Pilot Reading (mmH2O)	Delta H calc. (mmH2O)	Delta H Actual (mmH2O)	Gauge Vacuum (In Hg)	Temperature °C: Stack	DGM	Probe	Filter	Imp. Exit
A-12	1050	0	424.6244	3.4	12.6	12.6	2.0	20	30	123	117	18
11	1053	3	424.6612	3.4	12.6	12.6	2.0	20	30	123	122	18
10	1056	6	424.7022	3.4	12.6	12.6	2.0	20	30	122	122	17
9	1059	9	424.7302	3.4	12.6	12.6	2.0	22	32	120	120	17
8	1102	12	424.7550	3.4	12.6	12.6	2.0	22	32	120	120	16
7	1105	15	424.7776	5.2	19.3	19.4	2.0	22	34	120	118	16
6	1108	18	424.8012	5.2	19.3	19.4	2.0	23	34	120	120	13
5	1111	21	424.8204	5.8	21.5	21.6	2.0	23	34	120	118	13
4	1114	24	424.8420	5.8	21.5	21.6	2.0	23	34	120	120	13
3	1117	27	424.8640	5.8	21.5	21.6	2.0	23	34	120	118	12
2	1120	30	425.0010	5.8	21.5	21.6	2.0	25	36	120	120	12
1	1123	33	425.0420	5.8	21.5	21.6	2.0	25	36	118	119	15
B-12	1126	36	425.0800	4.4	16.3	16.4	2.0	25	36	120	122	15
11	1132	39	425.1224	4.4	16.3	16.4	2.0	27	38	120	121	14
10	1135	42	425.1622	4.4	16.3	16.4	2.0	27	38	120	118	14
9	1138	45	425.2048	4.4	16.3	16.4	2.0	30	38	120	121	15
8	1141	48	425.2369	4.4	16.3	16.4	2.0	30	38	120	120	14
7	1144	51	425.2672	4.2	15.6	15.6	2.0	32	38	120	118	14
6	1147	54	425.3042	4.2	15.6	15.6	2.0	32	38	120	120	14
5	1150	57	425.3420	4.2	15.6	15.6	2.0	32	38	120	118	15
4	1153	60	425.3796	4.2	15.6	15.6	2.0	34	38	120	120	15
3	1156	63	425.4164	4.0	14.8	14.8	2.0	34	38	120	118	15
2	1159	66	425.4542	4.0	14.8	14.8	2.0	34	38	120	120	14
1	1202	69	425.4870	4.0	14.8	14.8	2.0	34	38	120	118	13
0	1205	72	425.5234									

Run Time	Total Volume	RMS Delta P
72	0.8986	2.1093

Delta H Ave.	High Vac.	Ts Ave.	Tm Ave.
16.6	2.0	28.7	29.4

Isokinetic %
95.1

Team Leader / Date: [signature] 06/29/24

QAQC / Date: ANGELO V. GUEVARRA 6/29/24

DENR ACCREDITED
Source Emission Testing Firm
SAI No. 2019-15
SAT No. 2021-53

GREENTEK Environmental

ISOKINETIC FIELD DATA SHEET

METHOD(S) 5/6

Facility Name	BENGUET CORP.-ACUPAN CONTRACT MINING PROJECT	Run Number	2
Town/Province	ITOGON, BENGUET	Type of APCD Installed	ACID FUME SCRUBBER
Source	ACIDIFYING CHAMBER #2 W/ ACID FUME SCRUBBER #2	Test Date	06/29/24
Test Personnel	DLV, AVG, MRC, AMC, RMC	Operator Signature	(signature)

Filter ID	Tare(s)	Barometric Pressure (In Hg)	Static Pressure (mmHg)	Meterbox ID #	Meterbox Gamma	Meterbox Delta H@	Nozzle ID#	Nozzle Diameter	Pitot Tube/Probe ID #	Pitot Tube/Probe Cp	Probe Material
0724578	0.2970	27.19	-2.0	GMC-01	1.0106	47.66	GNT-09	6.09	GP-04	0.84	SS

			Sample Train Leak Checks: Initial	Interim			Final	Fyrites: Time	%CO₂	%O₂
K Factor	3.600	Vacuum, inHg	15.0				2.0	1228	0	19.0
Pitot Leak Checks		Leak Rate, m³/m	0				0	–	–	–
230/G1	Pre-test	Start Volume	425.5272				426.4804	Fyrite System Leak Check		OK
240/92	Post-test	Stop Volume	425.5272				426.4806	Bag ID	BCACMD-S-M3/GMM-2 [illegible]	

Port & Point	Time: Clock (24-hr)	Time: Test (mins)	DGM Reading (cu. Meter)	Pitot Reading (mmH₂O)	Delta H calc. (mmH₂O)	Delta H Actual (mmH₂O)	Gauge Vacuum (In Hg)	Temp °C: Stack	DGM	Probe	Filter	Imp. Exit
A-12	1242	0	425.5288	4.0	19.4	19.4	2.0	38	38	122	122	16
11	1245	3	425.5684	4.0	19.4	19.4	2.0	38	38	120	123	18
10	1248	6	425.6012	4.0	19.4	19.4	2.0	38	38	120	118	16
9	1251	9	425.6372	4.8	17.3	17.4	2.0	38	38	120	122	14
8	1254	12	425.6722	4.8	17.3	17.4	2.0	38	38	115	122	14
7	1257	15	425.7196	4.8	17.3	17.4	2.0	38	38	120	120	15
6	1300	18	425.7522	4.8	17.3	17.4	2.0	38	38	[illegible]	120	15
5	1303	21	425.7984	5.2	18.7	18.8	2.0	38	38	120	121	15
4	1306	24	425.8339	5.2	18.7	18.8	2.0	38	39	120	122	14
3	1309	27	425.8770	5.2	18.7	18.8	2.0	39	39	120	120	14
2	1312	30	425.9140	7.0	25.2	25.2	2.0	39	39	120	120	15
1	1315	33	425.9690	7.0	25.2	25.2	2.0	39	39	120	120	15
B-12	~~1318~~ 1322	36	426.0156	5.0	17.9	18.0	2.0	40	39	108	115	16
11	1325	39	426.0564	5.0	17.9	18.0	2.0	40	39	115	118	14
10	1328	42	426.1002	5.0	17.9	18.0	2.0	40	39	120	120	14
9	1331	45	426.1352	5.0	19.9	19.0	2.0	40	39	120	118	13
8	1334	48	426.1938	4.8	17.3	17.4	2.0	41	38	120	118	13
7	1337	51	426.2084	4.8	17.3	17.4	2.0	41	38	120	120	14
6	1340	54	426.2540	4.8	17.3	17.4	2.0	41	38	120	118	14
5	1343	57	426.2970	4.8	17.3	17.4	2.0	41	37	120	120	13
4	1346	60	426.3400	4.2	15.2	15.2	2.0	40	37	120	120	13
3	1349	63	426.3698	4.2	15.2	15.2	2.0	40	37	120	118	13
2	1352	66	426.4070	4.2	15.2	15.2	2.0	40	37	120	118	12
1	1355	69	426.4410	4.2	15.2	15.2	2.0	40	37	120	120	14
0	1358	72	426.4804									

Run Time	Total Volume	RMS Delta P
72	0.9516	2.2001

Delta H Ave.	High Vac.	Ts Ave.	Tm Ave.
17.6	2.0	39.3	38.1

Isokinetic %
97.5

Team Leader / Date: DANIEL L. NAVARRO JR. 06/29/24

QAQC / Date: ANGELO V. GUEVARRA 6/29/24

GREENTEK

ISOKINETIC FIELD DATA SHEET

METHOD(S) 5/C

Facility Name	BENGUET CORP-ALUPAN CONTRACT MINING PROJECT	Run Number	3
Town/Province	ITOGON, BENGUET	Type of APCD Installed	ACID FUME SCRUBBER
Source	ACIDIFYING CHAMBER #2 w/ ACID FUME SCRUBBER	Test Date	06/29/24
Test Personnel	DLN, AVL, MRC, AMC, PMC	Operator Signature	(signature)

Filter ID	Tare(s)	Barometric Pressure (In Hg)	Static Pressure (mmHg)	Meterbox ID #	Meterbox Gamma	Meterbox Delta H@	Nozzle ID#	Nozzle Diameter	Pitot Tube/Probe ID #	Pitot Tube/Probe Cp	Probe Material
0424561	0.2998	27.70	-2.0	GMC-01	1.0107	47.66	GN-03	6.09	GP-04	0.84	SS

		Sample Train Leak Checks	Initial	Interim	Interim	Interim	Final	Fyrites		
								Time	%CO₂	%O₂
K Factor	3.989	Vacuum, inHg	15.0				2.0	1402	0	19.0
Pitot Leak Checks		Leak Rate, m³/m	0				0	—	—	—
220/94	Pre-test	Start Volume	426.4809				427.9998	Fyrite System Leak Check		ok
210/90	Post-test	Stop Volume	426.4840				427.9998	Bag ID	BCACMP-S-M3/M10-T3	

Port & Point	Time Clock (24-hr)	Time Test (mins)	DGM Reading (cu. Meter)	Pitot Reading (mmH₂O)	Delta H calc. (mmH₂O)	Delta H Actual (mmH₂O)	Gauge Vacuum (In Hg)	Stack °C	DGM °C	Probe °C	Filter °C	Imp. Exit °C
A-12	1411	0	426.4910	3.4	11.9	12.0	2.0	34	34	123	120	16
11	1414	3	426.5234	3.4	11.9	12.0	2.0	34	34	119	123	14
10	1417	6	426.5546	3.4	11.9	12.0	2.0	34	34	120	123	14
9	1420	9	426.5890	3.4	11.9	12.0	2.0	34	34	118	119	15
8	1423	12	426.6204	5.0	17.4	17.4	2.0	36	34	120	120	15
7	1426	15	426.6560	5.0	17.4	17.4	2.0	36	36	120	120	14
6	1429	18	426.6952	5.0	17.4	17.4	2.0	36	36	120	118	13
5	1432	21	426.7308	5.0	17.4	17.4	2.0	38	36	120	120	13
4	1435	24	426.7782	5.0	17.4	17.4	2.0	38	36	118	118	13
3	1438	27	426.8180	5.0	17.4	17.4	2.0	38	36	120	120	12
2	1441	30	426.8600	7.2	25.1	25.2	2.0	39	37	120	120	12
1	1444	33	426.8940	7.2	25.1	25.2	2.0	38	37	120	120	12
B-12	1449	36	426.9414	7.2	25.1	25.2	2.0	38	37	120	120	17
11	1452	39	426.9920	7.2	25.1	25.2	2.0	38	37	120	118	17
10	1455	42	427.0330	6.0	20.9	21.0	2.0	38	37	120	120	16
9	1458	45	427.0764	6.0	20.9	21.0	2.0	38	37	120	118	14
8	1501	48	427.1184	6.0	20.9	21.0	2.0	38	37	120	120	14
7	1504	51	427.1630	6.0	20.9	21.0	2.0	38	37	120	118	14
6	1507	54	427.2068	5.2	18.1	18.2	2.0	39	37	120	120	16
5	1510	57	427.2458	5.2	18.1	18.2	2.0	39	38	120	120	16
4	1513	60	427.2864	5.2	18.1	18.2	2.0	39	38	120	120	18
3	1516	63	427.3304	5.2	18.1	18.2	2.0	39	38	120	122	16
2	1519	66	427.3650	5.0	17.4	17.4	2.0	39	38	120	120	14
1	1522	69	427.4030	5.0	17.4	17.4	2.0	39	38	120	120	14
0	1525	72	427.4996									

Run Time	Total Volume	RMS Delta P	Delta H Ave.	High Vac.	Ts Ave.	Tm Ave.	Isokinetic %
72	0.9536	2.2382	18.5	2.0	37.4	36.4	94.7

Team Leader / Date: DANILO L. NABOTIERRO Jr. 06/29/24

QAQC / Date: ANGELO V. GUEVARRA 6/29/24

DENR ACCREDITED Source Emission Testing Firm
RAT No. 2019-115
SAT No. 2021-30

GREENTEK

METHOD 7 FLASK SAMPLE AND RECOVERY DATA

Facility BENGUET INCORPORATION - ACUPAN CONTRACT MINING
Town/Province BALATOC, VIRAC, ITOGON BENGUET
Source ACID FUME CHAMBER NO. 2 W/ACID FUME
Personnel AVG, MRC, DLN, AMC, RMC
Test Date 6/29/24

Absorbing Solution, Volume, ml 25
Heated Probe? (check) Yes ✓ No ___* *If no, explain in "Remarks"
Filter Used? (check) Yes ✓ No ___* *If no, explain in "Remarks"
Remarks

Sample Collection Information — Bar. Pressure, (in Hg) Date Performed: 27.20 / 6/29/24 — System Leak Chk: Pre ✓ Post ✓ — By (Init) AMC / RMC

Run Number	Sample ID (From Sample Label)	Flask ID Number	Flask Volume (mL)	Leak Check <0.4 (inHg/min)	Evacuated Pressure Pgf[1] (inHg)	Flask Abs Press Initial Pi, Pbar - Pgf (inHg)	Flask Temp (°C)	Sample Collection Time[2] (24-Hour)	Shaken For 5mins?
1	BCACMP-S-M7-R1A	BF 11	2226.30	OK	26.11	1.09	29.2	1132	Yes
	BCACMP-S-M7-R1B	BF 12	2247.50	OK	25.79	1.41	28.6	1137	Yes
	BCACMP-S-M7-R1C	BF 19	2296.40	OK	25.88	1.32	28.9	1142	Yes

Sample Recovery Information — Bar. Pressure, (in Hg): 27.12 — Date: 07/01/24 — By (Init): DLN

Shaken for 2mins?	Sample Recovery Time[3] (24-hour)	Final Pressure Pgf (inHg)	Flask Abs Press Initial Pf, Pbar-Pgf (inHg)	Flask Temp (°C)
Yes	1003	1.02	26.10	31.2
Yes	1006	1.34	25.78	31.6
Yes	1009	1.25	25.87	31.9

Bar. Pressure, (in Hg) Date Performed: 27.18 / 6/29/24 — System Leak Chk: Pre ✓ Post ✓ — By (Init) AMC - RMC

Run No.	Sample ID	Flask ID	Vol. (mL)	Leak Chk.	(InHg)		Temp. (°C)	Time	Shaken
2	BCACMP-S-M7-R2A	BF 14	2221.30	OK	25.98	1.2	28.9	1324	Yes
	BCACMP-S-M7-R2B	BF 15	2211.40	OK	25.74	1.44	29.9	1329	Yes
	BCACMP-S-M7-R2C	BF 16	2227.20	OK	26.09	1.15	28.7	1334	Yes

Bar. Pressure, (in Hg): 27.12 — Date: 07/01/24 — By (Init): DLN

Yes	1012	1.16	25.96	31.0
Yes	1015	1.41	25.71	32.6
Yes	1018	1.12	26.0	32.9

Bar. Pressure, (in Hg) Date Performed: 27.19 / 6/29/24 — System Leak Chk: Pre ✓ Post ✓ — By (Init) AMC - RMC

Run No.	Sample ID	Flask ID	Vol. (mL)	Leak Chk.	(InHg)		Temp. (°C)	Time	Shaken
3	BCACMP-S-M7-R3A	BF 17	2227.30	OK	25.86	1.31	28.9	1413	Yes
	BCACMP-S-M7-R3B	BF 18	2225.50	OK	25.77	1.4	28.8	1418	Yes
	BCACMP-S-M7-R3C	BF 19	2220.10	OK	25.59	1.58	28.5	1423	Yes

Bar. Pressure, (in Hg): 27.12 — Date: 07/01/24 — By (Init): DLN

Yes	1021	1.27	25.85	32.6
Yes	1024	1.36	25.76	32.9
Yes	1027	1.58	25.54	32.6

Source Oxygen % Concentration? 19.0%
Was Additional Oxygen introduced to the Flask? (circle) Yes (No)

[1]Pgi, the initial flask pressure, must be evacuated to within 3 inches of mercury (inHg) of the absolute pressure (Barometric Pressure).
[2]Additional oxygen should be introduced to the flask if the Source O_2 is below 3%
[3]Flask must be stand for 16hours or greater after sampling before recovery can be performed.

DENR ACCREDITED Source Emission Testing Firm SAT No. 2019-118 SAT No. 2021-63

Team Leader / Date: DANIEL C. NAVIDAD JR. 06/29/24

QAQC / Date: ANGELO V. GUEVARRA 6/29/24

“APPENDIX C”

PROCESS DATA

GREENTEK MONITORING LOGSHEET

Facility Information

FACILITY NAME	Benguet Corporation - Acupan Contract Mining Project (BC-ACMP Assay Laboratory & Mill Refinery)
LOCATION	Balatoc, Virac, Itogon, Benguet
PCO NAME	Ms. Jemimah R. Salayog
TELEPHONE/FAX NUMBER	0917 - 136 - 1496
EMAIL ADDRESS	
DATE OF SAMPLING	June 28, 2024
STACK TEST PERSONNEL	AVG, DLN, MRC, ADM

Source Description

SOURCE TESTED (ID or NAME used by Facility)	Dust Collection Facility System
SOURCE TYPE (Genset, Boiler, etc.)	(1) Jaw Crusher, (2) Roller Crushers, (2) Pulverizers
BRAND (Made by)	Stunetant, BICO
RATED CAPACITY (with units: BHp, MW, MT/hr., etc.)	0.06 MT/hr, 0.06 MT/hr, 0.04 MT/hr
DATE CONSTRUCT STARTED (on source) month/year	✓ SEPT. 2012
DATE OF ANY MODIFICATION (that increased emissions)	N/A
HAS THE SOURCE BEEN MOVED (Specify Date)	YES / (NO) If Yes, Date Moved:
EXISTING (const. before 11/25/00) or NEW (or modified) SOURCE	EXISTING SOURCE / NEW SOURCE
OPERATION (estimated hours per year for source)	✓ 1550 HRS / YEAR
TYPE OF APCD* (baghouse, ESP, cyclone, scrubber, etc.)	DUST SCRUBBER
DATE OF APCD INSTALLED	✓ SEPT. 2018
TOTAL STACK HEIGHT (m, ft., etc.)	3M
STACK ORIENTATION	(VERTICAL) / HORIZONTAL ✓ w/ ___ w/o Cover

**** APCD – Air Pollution Control Device***

**** This item is critical for determining the standards that apply to the emission point***

Fuel Information

TYPE OF FUEL USED, %S (during sampling)	Electricity
ORIGINAL FUEL USED, %S	Electricity
DATE FUEL CHANGE?	N/A
ACTUAL FUEL CONSUMPTION DURING SAMPLING (liters, kg, etc.)	—

**** Provide Certificate of Fuel Analysis for strict compliance with DENR***

Process Information

OPERATING RATE DURING TESTING?	100%
IS THE APCD OPERATING DURING SAMPLING?	(YES) / NO
IS PROCESS LOGSHEET PROVIDED BY THE PLANT?	YES / (NO)
PRODUCTION OUTPUT DURING SAMPLING	✓ 30 KILOGRAMS

NOTES:

W/ EMB - CAR Representative : Earth Raymundo
EMED

Information recorded/gathered by:

ANGELO V. GUEVARRA

Name and signature of GEPC personnel on site

Information supplied by:

JEMIMAH R. SALAYOG

Name and signature of facility representative

DENR ACCREDITED
Source Emission Testing Firm
SAT No. 2019-115
SAT No. 2021-93

GREENTEK MONITORING LOGSHEET

Facility Information

FACILITY NAME	Benguet Corporation - Awpan contract Mining Project
LOCATION	Balatoc, Itogon, Benguet
PCO NAME	Ms. Jemimah R. Salayog
TELEPHONE/FAX NUMBER	0917 - 136 - 1496
EMAIL ADDRESS	
DATE OF SAMPLING	June 29, 2024
STACK TEST PERSONNEL	AVG, DLN, MRC, AMC, RMC

Source Description

SOURCE TESTED (ID or NAME used by Facility)	Acidifying Chamber # 2 w/ Acid Fume Scrubber
SOURCE TYPE (Genset, Boiler, etc.)	Acid Chamber
BRAND (Made by)	Fabricated
RATED CAPACITY (with units: BHp, MW, MT/hr., etc.)	N/A
DATE CONSTRUCT STARTED (on source) month/year	2003
DATE OF ANY MODIFICATION (that increased emissions)	N/A
HAS THE SOURCE BEEN MOVED (Specify Date)	YES / (NO) If Yes, Date Moved:
EXISTING (const. before 11/25/00) or NEW (or modified) SOURCE	EXISTING SOURCE / (NEW SOURCE)
OPERATION (estimated hours per year for source)	✓ 514.85 HRS.
TYPE OF APCD* (baghouse, ESP, cyclone, scrubber, etc.)	5013 CFM Verantis Acid Fume Scrubber System No. 2
DATE OF APCD INSTALLED	2013
TOTAL STACK HEIGHT (m, ft., etc.)	
STACK ORIENTATION	(VERTICAL) / HORIZONTAL w/ ✓ w/o Cover

**** APCD – Air Pollution Control Device***

**** This item is critical for determining the standards that apply to the emission point***

Fuel Information

TYPE OF FUEL USED, %S (during sampling)	KEROSENE
ORIGINAL FUEL USED, %S	KEROSENE
DATE FUEL CHANGE?	N/A
ACTUAL FUEL CONSUMPTION DURING SAMPLING (liters, kg, etc.)	✓ 153.LITERS

**** Provide Certificate of Fuel Analysis for strict compliance with DENR***

Process Information

OPERATING RATE DURING TESTING?	100%
IS THE APCD OPERATING DURING SAMPLING?	(YES) / NO
IS PROCESS LOGSHEET PROVIDED BY THE PLANT?	YES / (NO)
PRODUCTION OUTPUT DURING SAMPLING	✓ 22.88 02 OF GOLD

NOTES:

Information recorded/gathered by:

ANGELO N. GUEVARRA

Name and signature of GEPC personnel on site

Information supplied by:

JEMIMAH R. SALAYOG

Name and signature of facility representative

DENR ACCREDITED
Source Emission Testing Firm
SAT No. 2019-115
SAT No. 2021-93

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Total Quality. Assured.

TEST REPORT

Customer: CHEVRON PHILIPPINES, INC.
Location: Batangas Terminal

Reference: 0060-0424-CVX
Sample No.: BT-0089-04/24
Date Received: April 14, 2024
Date Tested: April 14, 2024
Date Released: April 14, 2024

Sample Description As Declared:
Product: Kerosene
Tank: 110
Batch Number: 5
Sample Type: Composite (U, M, L)

Sampling Date: April 14, 2024
Sampling Time: 2110H

The above sample was tested in accordance with the test method(s) stipulated, with the result(s) as follows:

TEST CONDUCTED	METHOD	UNIT	SPECIFICATION	RESULT
Appearance	Visual Inspection	-	Clear and Bright	Clear and Bright
*Burning Quality	ASTM D187	-	Pass	Pass
Color, Saybolt	ASTM D156	-	+16 Min	+24
Density at 15°C	ASTM D4052	kg/L	Report	0.7934
*Distillation, Recovered Basis				
Initial Boiling Point	ASTM D86	°C	Report	148.0
10% Recovered	ASTM D86	°C	205 Max	168.0
50% Recovered	ASTM D86	°C	Report	194.0
90% Recovered	ASTM D86	°C	Report	240.0
Final Boiling Point	ASTM D86	°C	300 Max	262.0
Flash Point, TCC	ASTM D56	°C	38 Min	39.5
*Smoke Point	ASTM D1322	mm	20 Min	24.0
*Sulfur Content	ASTM D4294	% mass	0.30 Max	0.209

Remarks:

1. The above results are descriptive of the sample tested and will be descriptive of the entire batch if the sample taken is fair and the proper procedures have been followed.

*2. *The result indicated is traceable to Certificate of Quality with Report No. YL24-20027053-D (MT San Jack Voyage Number 90015).*

PREPARED BY:

04/14/2024

Raffy M. Manga
Registered Chemist
PRC License No. 0013859

RECEIVED BY/ DATE:

ARVIN ATIENZA
Lead Operator, Comptroller
Oil Movements and Shipping
04/14/24

APPROVED BY:

Original Copy Signed
Manuel A. Bringuela, Jr.
Registered Chemist
PRC License No. 0006646

Intertek Testing Services Philippines, Inc.
Intertek Building, 2307 Chino Roces Ave. Extension, Makati City, 1231 Philippines
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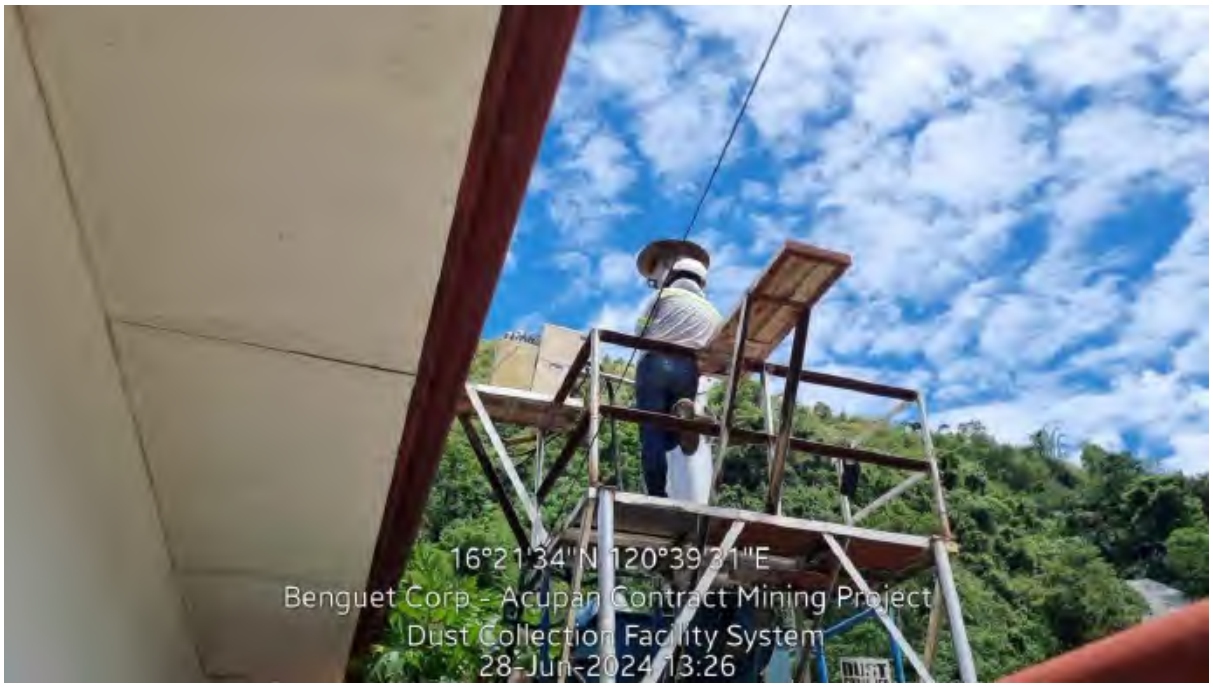
Intertek.com

One (1) unit 46.58 m3/min Krypton Dust Collection Facility System
Stack Sampling for Methods 5 – Run 1



One (1) unit 46.58 m3/min Krypton Dust Collection Facility System
Stack Sampling for Methods 5 – Run 2

One (1) unit 46.58 m3/min Krypton Dust Collection Facility System
Stack Sampling for Methods 5 – Run 3

One (1) unit 5,013CFM Verantis Acid Fume Scrubber

One (1) unit 5,013CFM Verantis Acid Fume Scrubber
Stack Sampling for Methods 5 – Run 1

One (1) unit 5,013CFM Verantis Acid Fume Scrubber
Stack Sampling for Methods 5 – Run 1

One (1) unit 5,013CFM Verantis Acid Fume Scrubber
Stack Sampling for Methods 5 – Run 2

One (1) unit 5,013CFM Verantis Acid Fume Scrubber
Stack Sampling for Methods 5 – Run 2

One (1) unit 5,013CFM Verantis Acid Fume Scrubber
Stack Sampling for Methods 5 – Run 3

“APPENDIX D”

ANALYTICAL DATA

OSTREA MINERAL LABORATORIES, Inc.
Assaying and Environmental Testing Specialist
Barangay Road, Bo. Mamplasan, Biñan, Laguna, Philippines 4024
Telefax : (02) 669-9058; (049) 539-0102; (02) 848-6951
Email : customer.service@ostrealabs.com.ph

USEPA METHOD 5
ANALYTICAL DATA SHEET

Source: 46.58 m3/min Krypton Dust Collection Facility System
RAN No.: B-27924
Date Analyzed: July 5 - 12, 2024

Analytical Balance: KERN & Sohn ABJ 220-4NM
Sensitivity: 0.1mg

SAMPLE ID	Units	Run 1	Run2	Run 3
FILTER ANALYSIS				
Filter ID		03245159	12235247	03245145
Filter appearance/observations		Off white		
Initial weight	g	0.2527	0.2456	0.2533
Final weight	g	0.2552	0.2482	0.2559
Particulate Mass filter, m_f	g	0.0025	0.0026	0.0026
ACETONE RINSE ANALYSIS				
Dried PM rinse appearance		Off white		
Acetone rinse, volume, A_r	mL	65	72	66
Beaker ID		SP29	SP28	SP30
Initial weight, beaker	g	76.7210	76.7441	76.2114
Final weight, beaker	g	76.7211	76.7442	76.2114
Particulate Mass, acetone rinse, m_a	g	0.0001	0.0001	0.0000
ACETONE REAGENT BLANK				
Acetone blank volume, A_b	mL	83	83	83
Acetone blank mass, A_m *	g	65.2131	65.2131	65.2131
Beaker ID		SP04	SP04	SP04
Initial weight, beaker	g	77.7721	77.7721	77.7721
Final weight, beaker	g	77.7724	77.7724	77.7724
Particulate Mass, blank, m_b	g	0.0003	0.0003	0.0003
$C_b = m_b/A_b$	g/mL	3.61446E-06	3.61446E-06	3.61446E-06
Acetone blank, $W_b = C_b \times A_r$	g	0.0002	0.0003	0.0002
Acetone Residue, <0.001	%	0.0005	0.0005	0.0005

* Density of acetone 0.7857 g/mL

** Acetone residue should be less than 0.001% otherwise apply corresponding correction factor from Total PM.

Acetone residue, % - $m_b / a_m \times 100$

Total PM = $m_f + m_{ar} - W_b$	mg	2.3	2.4	2.3

Analyzed by: Lyka S. Diaz **Reviewed by:** Kemberly M. Caraig **Certified correct by:** Ma. Cristina F. Referente

OSTREA MINERAL LABORATORIES, INC.
Assaying and Environmental Testing Specialist
Barangay Road, Bo. Mamplasan, Biñan, Laguna, Philippines 4024
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Email : customer.service@ostrealabs.com.ph

USEPA METHOD 5
ANALYTICAL DATA SHEET

Source: 5,013CFM Verantis Acid Fume Scrubber #2
RAN No.: B-27925
Date Analyzed: July 5 - 12, 2024

Analytical Balance: KERN & Sohn ABJ 220-4NM
Sensitivity: 0.1mg

SAMPLE ID	Units	Run 1	Run2	Run 3
FILTER ANALYSIS				
Filter ID		0424S79	0424S78	0424S61
Filter appearance/observations		Gray particulates		
Initial weight	g	0.2482	0.2470	0.2495
Final weight	g	0.2922	0.2970	0.2982
Particulate Mass filter, m_f	g	0.0440	0.0500	0.0487
ACETONE RINSE ANALYSIS				
Dried PM rinse appearance		Gray particulates		
Acetone rinse, volume, A_r	mL	66	69	67
Beaker ID		SP31	SP32	SP33
Initial weight, beaker	g	76.7210	76.7441	76.2114
Final weight, beaker	g	76.7290	76.7500	76.2244
Particulate Mass, acetone rinse, m_a	g	0.0080	0.0059	0.0130
ACETONE REAGENT BLANK				
Acetone blank volume, A_b	mL	83	83	83
Acetone blank mass, A_m *	g	65.2131	65.2131	65.2131
Beaker ID		SP04	SP04	SP04
Initial weight, beaker	g	77.7721	77.7721	77.7721
Final weight, beaker	g	77.7724	77.7724	77.7724
Particulate Mass, blank, m_b	g	0.0003	0.0003	0.0003
$C_b = m_b/A_b$	g/mL	3.61446E-06	3.61446E-06	3.61446E-06
Acetone blank, $W_b = C_b \times A_r$	g	0.0002	0.0003	0.0002
Acetone Residue, <0.001	%	0.0005	0.0005	0.0005

* Density of acetone 0.7857 g/mL

** Acetone residue should be less than 0.001% otherwise apply corresponding correction factor from Total PM.

Acetone residue, % = $m_b / a_m \times 100$

Total PM = $m_f + m_{ar} - W_b$	mg	51.7	55.6	61.4

Analyzed by: Lyka S. Diaz Reviewed by: Kemberly M. Caraig Certified correct by: Ma. Cristina F. Referente

OSTREA MINERAL LABORATORIES, INC.
Assaying and Environmental Testing Specialist
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Telefax : (02) 889-9058; (049) 539-0102; (02) 848-6951
Email : customer.service@ostrealabs.com.ph

USEPA METHOD 8
ANALYTICAL DATA SHEET

Source: 5,013CFM Verantis Acid Fume Scrubber #2
RAN No.: B-27925
Date Analyzed: July 8, 2024

SAMPLE ID	Volume, ml						Mass SO_2,mg
	Sample V_{soln}	Aliquot V_a	Titrant (T1)	Titrant (T1)	Titrant V_{ave}	Titrant V_{blk}	
Run 1	1000	10	5.4	5.3	5.35	0	159.4
Run 2	1000	10	5.6	5.5	5.55	0	165.3
Run 3	1000	10	5.2	5.3	5.25	0	156.4

$$\text{Mass } SO_2, \text{ mg} = (32.03)(N_{BaCl2})(V_{ave}-V_{blk})\left(\frac{V_{soln}}{V_a}\right)$$

BARIUM CHLORIDE STANDARDIZATION				
Trial No.	Volume, ml H_2SO_4	Normality, H_2SO_4	Volume, ml $BaCl_2$	Normality, $BaCl_2$
1	25	0.0109	29.1	0.009364
2	25	0.0109	29.2	0.009332
			Average	0.0093

Analyzed by: Lyka S. Diaz **Reviewed by:** Kemberly M. Caraig **Certified correct by:** Ma. Cristina F. Referente

OSTREA MINERAL LABORATORIES, Inc.
Assaying and Environmental Testing Specialist
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Telefax : (02) 889-9058; (049) 539-0102; (02) 848-6961
Email : customer.service@ostrealabs.com.ph

USEPA METHOD 7
ANALYTICAL DATA SHEET

Source: 5,013CFM Verantis Acid Fume Scrubber #2
RAN No.: B-27925
Date Analyzed: July 9, 2024

SAMPLE ID	*Sample absorbance, A*	*Blank adjusted absorbance, A1*	*Dilution factor, F*	*Total Mass Nox as NO_2 in sample, m (ug)*
Run 1A	0.245	0.245	1	439
Run 1B	0.265	0.265	1	474
Run 1C	0.271	0.271	1	485
Run 2A	0.235	0.235	1	421
Run 2B	0.268	0.268	1	480
Run 2C	0.244	0.244	1	437
Run 3A	0.263	0.263	1	471
Run 3B	0.271	0.271	1	485
Run 3C	0.256	0.256	1	458

Total NO_2 / sample, ug = 2 Kc A1 F

Blank Absorbance 0
Aliquot Factor 2
Calibration Factor 894.95

Note: If other than 25 ml aliquot is used for analysis, the factor 2 must be replaced by a corresponding factor

Analyzed by: Lyka S. Diez **Reviewed by:** Kemberly M. Caraig **Certified correct by:** Ma. Cristina F. Referente

GreenTech
Laboratory and Allied Services, Inc.

3F, Hizon Building, #29 Quezon Ave., Quezon City, Metro Manila
Tel. No.: (02) 7341-0962 | Mobile No.: +693173248175
Email: greentechlab@yahoo.com

ENVIRONMENTAL LABORATORY DEPARTMENT
Doc No. E-001

Certificate of Analysis

Client Name	Greentek Environmental Phils. Co.		
Address	2353 RJ Place Bldg. Unit 3A, Selya St. Pandacan, Manila		
Sample Source	Stack	**COA No.**	GLAS-24-253
Date of Sampling	June 29, 2024	**RAN No.**	RAN-24-059
Date of Analysis	July 5, 2024	**Laboratory Nos.**	A-24-0902 to A-24-0904

Pre-Test Calibration Check				
Time: 1244H	**Gas Value (ppm)**	**CO Response (ppm)**	**%Difference (% span)**	**Status (≤2% span)**
Zero Gas	0	0	0	Passed
CO Gas	513	513.2	0.0	Passed

Note: % Difference = (Gas Value - CO Response)/Gas Value x 100

Results				
Parameter	**Laboratory No.**	**Sample ID**	**Run No.**	**Result (ppm)**
CO Concentration (ppm)	A-24-0902	BCACMP-S	1	111
	A-24-0903		2	115
	A-24-0904		3	117

Post-Test Calibration Check				
Time: 1532H	**Gas Value (ppm)**	**CO Response (ppm)**	**% Drift (% span)**	**Status (≤10% span)**
Zero Gas	0	0	0	Passed
CO Gas	513	512.8	0.1	Passed

Note: % Drift = CO response (pre-test) - CO response (post-test)/Gas Value x 100

REMARKS:
1. Method of Analysis used: USEPA 40 CFR Appendix A-4 to Part 60 Method 10
2. The gas analyzer used throughout the analysis is HORIBA PG-350 S/N: 2JFEHYJ2.
3. The result values shown are based only upon the samples collected and submitted by Greentek Environmental Phils. Co. on July 5, 2024.
4. The test results shall be reproduced only in full and with approval of the laboratory.

Analyzed by:
Ruth Kathleen L. Tejada
Laboratory Analyst
PRC License No. 0001417

Certified by:
Alma A. Pascual-Ferareza
Laboratory Head
PRC License No. 0004984

Approved by:
Engr. Wilma R. Uyaco
Managing Director

GREENTEK Environmental Phils Co.

ENVIRONMENTAL PHILS. CO.

CHAIN OF CUSTODY, RECORD AND SAMPLE LOG

Name of firm: GREENTEK ENIVIRONMENTAL PHILS. CO. | Tested by QAQC & Team Leader: Angelo V. Guevarra

Address: 2353 RJ PLACE BLDG. UNIT 3A, SELYA ST. PANDACAN, MANILA | Type of fuel used by the facility during sampling: ELECTRICITY

Source:46.58 m3/min Krypton Dust Collection Facility System

Sample ID	Sample ID No. & Description			Sample Date	Sample Type	Type of Container	Analysis Requested
	Sample Method	Run #	Train Fraction				
BCACMP - D - R1	M5	1	FH ACETONE	28-Jun-24	ACETONE	PE BOTTLE	PM
BCACMP - D - M5 - FILTER - R1	M5	1	FILTER	28-Jun-24	FILTER	PETRI DISH	PM
Filter Id: 0324S159 Filter Wt: 0.2527							
BCACMP - D - R2	M5	2	FH ACETONE	28-Jun-24	ACETONE	PE BOTTLE	PM
BCACMP - D - M5 - FILTER - R2	M5	2	FILTER	28-Jun-24	FILTER	PETRI DISH	PM
Filter Id: 1223S247 Filter Wt: 0.2456							
BCACMP - D - R3	M5	3	FH ACETONE	28-Jun-24	ACETONE	PE BOTTLE	PM
BCACMP - D - M5 - FILTER - R3	M5	3	FILTER	28-Jun-24	FILTER	PETRI DISH	PM
Filter Id: 0324S145 Filter Wt: 0.2533							
BCACMP - D - BLANK	M5	1, 2, 3	FH ACETONE	28-Jun-24	ACETONE	PE BOTTLE	PM
BCACMP - D - M5 - FILTER - BLANK	M5	1, 2, 3	FILTER	28-Jun-24	FILTER	PETRI DISH	PM
Filter ID : Filter Wt. :							

To be assigned by the laboratory staff

RAN# (Request for Analysis Number) _____

Submitted by: JANINE DELEÑA 07/05/2024
Signature and Date

Received by: 07/05
Signature and Date

GREENTEK Environmental Phils. Co.

ENVIRONMENTAL PHILS. CO.

CHAIN OF CUSTODY, RECORD AND SAMPLE LOG

Name of firm: GREENTEK ENIVIRONMENTAL PHILS. CO. | Tested by QAQC & Team Leader: Angelo V. Guevarra

Address: 2353 RJ PLACE BLDG. UNIT 3A, SELYA ST. PANDACAN, MANILA | Type of fuel used by the facility during sampling: KEROSENE

Source:5,013 CFM Verantis Acid Fume Scrubber

Sample ID	Sample ID No. & Description			Sample Date	Sample Type	Type of Container	Analysis Requested
	Sample Method	Run #	Train Fraction				
BCACMP - S - R1	M5	1	FH ACETONE	29-Jun-24	ACETONE	PE BOTTLE	PM
BCACMP - S - M5 - FILTER - R1	M5	1	FILTER	29-Jun-24	FILTER	PETRI DISH	PM
Filter Id: 0424S79 Filter Wt: 0.2482							
BCACMP - S - R2	M5	2	FH ACETONE	29-Jun-24	ACETONE	PE BOTTLE	PM
BCACMP - S - M5 - FILTER - R2	M5	2	FILTER	29-Jun-24	FILTER	PETRI DISH	PM
Filter Id: 0424S78 Filter Wt: 0.2470							
BCACMP - S - R3	M5	3	FH ACETONE	29-Jun-24	ACETONE	PE BOTTLE	PM
BCACMP - S - M5 - FILTER - R3	M5	3	FILTER	29-Jun-24	FILTER	PETRI DISH	PM
Filter Id: 0424S61 Filter Wt: 0.2495							
BCACMP - S - BLANK	M5	1, 2, 3	FH ACETONE	29-Jun-24	ACETONE	PE BOTTLE	PM
BCACMP - S - M5 - FILTER - BLANK	M5	1, 2, 3	FILTER	29-Jun-24	FILTER	PETRI DISH	PM
Filter ID : Filter Wt. :							

To be assigned by the laboratory staff

RAN# (Request for Analysis Number) _____

Submitted by: JANINE DELOÑA 07/05/24
Signature and Date

Received by: 07/05
Signature and Date

GREENTEK Environmental Phils. Co. ENVIRONMENTAL PHILS. CO.

CHAIN OF CUSTODY, RECORD AND SAMPLE LOG

Name of firm: GREENTEK ENIVIRONMENTAL PHILS. CO. | Tested by QAQC & Team Leader: Angelo V. Guevarra

Address: 2353 RJ PLACE BLDG. UNIT 3A, SELYA ST. PANDACAN, MANILA | Type of fuel used by the facility during sampling: KEROSENE

Source:5,013 CFM Verantis Acid Fume Scrubber

Sample ID	Sample ID No. & Description			Sample Date	Sample Type	Type of Container	Analysis Requested
	Sample Method	Run #	Train Fraction				
BCACMP - S - R1	M6	1	IMPINGER	29-Jun-24	3% H_2O_2	PE BOTTLE	SO_x
BCACMP - S - R2	M6	2	IMPINGER	29-Jun-24	3% H_2O_2	PE BOTTLE	SO_x
BCACMP - S - R3	M6	3	IMPINGER	29-Jun-24	3% H_2O_2	PE BOTTLE	SO_x
BCACMP - S - BLANK	M6	BLANK		29-Jun-24	3% H_2O_2	PE BOTTLE	SO_x

To be assigned by the laboratory staff

RAN# (Request for Analysis Number) _____

Submitted by: JANINE DELEÑA 07/05/2024
Signature and Date

Received by: 07/05
Signature and Date

GREENTEK Environmental Phils. Co.

ENVIRONMENTAL PHILS. CO.

CHAIN OF CUSTODY, RECORD AND SAMPLE LOG

Name of firm: GREENTEK ENIVIRONMENTAL PHILS. CO. | Tested by QAQC & Team Leader: Angelo V. Guevarra

Address: 2353 RJ PLACE BLDG. UNIT 3A, SELYA ST. PANDACAN, MANILA | Type of fuel used by the facility during sampling: KEROSENE

Source:5,013 CFM Verantis Acid Fume Scrubber

Sample ID	Sample ID No. & Description			Sample Date	Sample Type	Type of Container	Analysis Requested
	Sample Method	Run #	Train Fraction				
BCACMP - S - R1A	M7	1	FLASK	29-Jun-24	Absorbing Solution	PE Bottle	NOx
BCACMP - S - R1B	M7	2	FLASK	29-Jun-24	Absorbing Solution	PE Bottle	NOx
BCACMP - S - R1C	M7	3	FLASK	29-Jun-24	Absorbing Solution	PE Bottle	NOx
BCACMP - S - R2A	M7	1	FLASK	29-Jun-24	Absorbing Solution	PE Bottle	NOx
BCACMP - S - R2B	M7	2	FLASK	29-Jun-24	Absorbing Solution	PE Bottle	NOx
BCACMP - S - R2C	M7	3	FLASK	29-Jun-24	Absorbing Solution	PE Bottle	NOx
BCACMP - S - R3A	M7	1	FLASK	29-Jun-24	Absorbing Solution	PE Bottle	NOx
BCACMP - S - R3B	M7	2	FLASK	29-Jun-24	Absorbing Solution	PE Bottle	NOx
BCACMP - S - R3C	M7	3	FLASK	29-Jun-24	Absorbing Solution	PE Bottle	NOx
BCACMP - S - BLANK	M7	1 , 2, 3	FLASK		Absorbing Solution	PE Bottle	NOx

To be assigned by the laboratory staff

RAN# (Request for Analysis Number) _____

Submitted by: JANINE DELEÑA 07/05/24
Signature and Date

Received by: 07/05
Signature and Date

GREENTEK Environmental Phils. Co.

ENVIRONMENTAL PHILS. CO.

CHAIN OF CUSTODY, RECORD AND SAMPLE LOG

Name of firm: GREENTEK ENIVIRONMENTAL PHILS. CO. | Tested by QAQC & Team Leader: Angelo V. Guevarra

2353 RJ PLACE BLDG. UNIT 3A, SELYA ST. PANDACAN, MANILA | Type of fuel used by the facility during sampling: KEROSENE

Source:5,013 CFM Verantis Acid Fume Scrubber

Sample ID	Sample ID No. & Description			Sample Date	Sample Type	Type of Container	Analysis Requested
	Sample Method	Run #	Train Fraction				
BCACMP - S - M10 - R1	M10	1	TEDLAR BAG	29-Jun-24	GAS	TEDLAR BAG	CO
BCACMP - S - M10 - R2	M10	2	TEDLAR BAG	29-Jun-24	GAS	TEDLAR BAG	CO
BCACMP - S - M10 - R3	M10	3	TEDLAR BAG	29-Jun-24	GAS	TEDLAR BAG	CO

To be assigned by the laboratory staff

RAN# (Request for Analysis Number) _____

Submitted by: JANINE DELEÑA 07/05/2024
Signature and Date

Received by: 07/05
Signature and Date

“APPENDIX E”

EQUIPMENT CALIBRATION RECORDS

METER BOX POST TEST CALIBRATION CHECK
BENGUET CORPORATION - ACUPAN CONTRACT MINING PROJECT
Balatoc, Virac, Itogon, Benguet
46.58 m3/min Krypton Dust Collection Facility System

Calculate Yqa for each test run using the following equation:

$$Y_{qa} = \frac{\theta}{V_m}\sqrt{\frac{0.00115\,T_m}{\Delta H_{@}\,(P_b + \frac{\Delta H_{avg}}{13.6})}\,\frac{29}{M_d}}\;(\sqrt{\Delta H})_{avg}$$

where:

Yqa	dry gas meter calibration check value, dimensionless.
θ	total run time, min.
Vm	total sample volume measured by dry gas meter, dcm.
Tm	absolute average dry gas meter temp., °K.
Pb	barometric pressure, mm Hg.
0.00115	= (760/298)(21.2/1000)^2 (mm Hg/°K) m^3/min$^{2.}$
ΔHavg	average orifice meter differential, mm H20.
$\Delta H_{@}$	orifice meter calibration coefficient, mm H2O.
Md	dry molecular weight of stack gas, gm/gm-mole.
29	dry molecular weight of air, gm/gm mole.
13.6	specific gravity of mercury.

After each test run series, do the following:

Average the three or more Yqa's obtained from the test run series and compare this average with the dry gas meter calibration factor, Y. The average Yqa must be within 5 percent of Y.

If the average Yqa does not meet the +/- 5 percent criterion, recalibrate the meter over the full range of orifice settings, as detailed in Section 5.3.1 of Method 5. Then follow the procedure in Section 5.3.3 of Method 5.

	RUN 1	RUN 2	RUN 3	Average
Meter Box	**GMC 01**	**GMC 01**	**GMC 01**	
time	72	72	72	
Vm - total	0.7928	0.7672	0.8084	
Tm avg, deg C	35	38	36	
Tm, degrees K	308	311	309	
Barometric, mm Hg	690.4	690.9	691.1	
DH_{avg}, mm H_2O	12.3	11.6	12.9	
DH@, mm H_2O	47.7	47.7	47.7	
Md stack gas, g/g-mole	28.80	28.80	28.80	
Md Air, g/g-mole	29.00	29.00	29.00	
Meter Box Gamma	1.0102	1.0102	1.0102	1.0102
QA Gamma	1.0462	1.0569	1.0179	1.0403
Difference:	-3.6%	-4.6%	-0.8%	-3.0%
Average Difference within +/-5%				**PASS***

The difference is based on the average QA gamma of the three test runs

METER BOX POST TEST CALIBRATION CHECK
BENGUET CORPORATION - ACUPAN CONTRACT MINING PROJECT
Balatoc, Virac, Itogon, Benguet
5,013CFM Verantis Acid Fume Scrubber #2

Calculate Yqa for each test run using the following equation:

$$Y_{qa} = \frac{\theta}{V_m}\sqrt{\frac{0.00115\,T_m}{\Delta H_{@}\,(P_b + \frac{\Delta H_{avg}}{13.6})}\,\frac{29}{M_d}}\;(\sqrt{\Delta H})_{avg}$$

where:

Yqa	dry gas meter calibration check value, dimensionless.
θ	total run time, min.
Vm	total sample volume measured by dry gas meter, dcm.
Tm	absolute average dry gas meter temp., °K.
Pb	barometric pressure, mm Hg.
0.00115	= (760/298)(21.2/1000)^2 (mm Hg/°K) m^3/min$^{2.}$
ΔHavg	average orifice meter differential, mm H20.
$\Delta H_{@}$	orifice meter calibration coefficient, mm H2O.
Md	dry molecular weight of stack gas, gm/gm-mole.
29	dry molecular weight of air, gm/gm mole.
13.6	specific gravity of mercury.

After each test run series, do the following:

Average the three or more Yqa's obtained from the test run series and compare this average with the dry gas meter calibration factor, Y. The average Yqa must be within 5 percent of Y.

If the average Yqa does not meet the +/- 5 percent criterion, recalibrate the meter over the full range of orifice settings, as detailed in Section 5.3.1 of Method 5. Then follow the procedure in Section 5.3.3 of Method 5.

	RUN 1	RUN 2	RUN 3	Average
Meter Box	**GMC 01**	**GMC 01**	**GMC 01**	
time	72	72	72	
Vm - total	0.8986	0.9516	0.9536	
Tm avg, deg C	35	38	36	
Tm, degrees K	308	311	309	
Barometric, mm Hg	690.4	690.6	690.9	
DH_{avg}, mm H_2O	16.6	17.6	18.5	
DH@, mm H_2O	47.7	47.7	47.7	
Md stack gas, g/g-mole	28.76	28.76	28.76	
Md Air, g/g-mole	29.00	29.00	29.00	
Meter Box Gamma	1.0102	1.0102	1.0102	1.0102
QA Gamma	1.0710	1.0466	1.0179	1.0451
Difference:	-6.0%	-3.6%	-0.8%	-3.5%
Average Difference within +/-5%				**PASS***

The difference is based on the average QA gamma of the three test runs

CERTIFICATE OF CALIBRATION

GREENTEK ENVIRONMENTAL PHILS. CO.

DRY GAS METER 5 POINT CALIBRATION

Meter Console Model:	XC-572-OV	Pressure Side Leak Check :	OK	Date and Time of Calibration :	07-May-24 1300H
Meter Console ID Number :	GMC-01	Vacuum Side Leak Check :	OK	Critical Orifice Model Number :	ST 40-73
Dry Gas Meter Model:	SK25EX			Theo. Critical Vacuum For Orifice :	15 in Hg
Dry Gas Meter Serial Number:	2344			Barometric Pressure :	752.602 mmHg

IMPORTANT!!!

**For the indivicual dry gas meter calibration factor, YI, the allowed variation is 0.02 from the average value.

**For the individual Dh@ values, the orifice setting that equates to 21.2 lpm, the allowed variation is 0.2 in. (5.1mm) from the average value.

**Acceptable range for the average Dh@ value is 46.7± 6.4 mmH2O (1.84 ± 0.25 inH2O).

Run No.	Orifice ID No.	Dry Gas Meter Volume (m^3)			Dry Gas Meter Temp.T_m (°C)			Amb. Temp.	Time	Orifice Rdg.	Pump Vac.
		Initial	Final	Diff., V_m	Initial	Final	Ave °K	T_{amb} °K	min.	mmH_2O	in.Hg
1	ST40	332.3020	332.3452	0.0432	30	30	303	298.6	5.0	8.4	15
2	ST48	332.3510	332.4260	0.0750	30	30	303	298.6	6.0	17.0	15
3	ST55	332.4340	332.5522	0.1182	30	30	303	298.4	7.0	30.0	15
4	ST63	332.5640	332.7428	0.1788	30	30	303	298.4	8.0	50.0	15
5	ST73	332.7550	333.0290	0.2740	30	30	303	298.2	9.0	92.0	15

			RESULTS					
Run No.	Orifice ID No.	K' Factor X 10^{-4}	Vmstd dscm	Vcrstd dscm	DGM Calib. Factor Y_i	Variation (≤ ± 0.02)	Dh@ mmH_2O	Variation (≤ ± 5.1)
1	ST40	1.9790	0.0421	0.0431	1.0235	-0.013	49.7	-2.0
2	ST48	2.8501	0.0732	0.0745	1.0180	-0.008	48.6	-0.9
3	ST55	3.8204	0.1155	0.1165	1.0092	0.001	47.8	-0.1
4	ST63	5.0531	0.1750	0.1761	1.0065	0.004	45.7	2.0
5	ST73	6.8217	0.2693	0.2676	0.9938	0.016	46.5	1.2
		Average ------>			1.0102	Average ------>		47.660

I certify that the above Dry Gas Meter was calibrated in accordance with EPA Method 5, Paragraph 7.2 CFR 40, Part 60, using Critical Orifice as calibration standard. From these results, I assign a value for the following parameters :

Y_i ----> 1.0102 & $DH_@$ --> 47.660 mmH_2O

As the average value of the individual results.

Calibrated by:

05/07/24

Daniel L. Navidad
Team Leader

Noted by:

5/7/24

ANGELO V. GUEVARRA
Angelo V. Guevarra
QA/QC Manager

GREENTEK Environmental Phils. Co.

GREENTEK ENVIRONMENTAL PHILS. CO.
CRITICAL ORIFICE COEFFICIENT CALCULATION

Dry Gas Meter Model Number :	SK25EX	Calibration Date and Time	07-May-24 1300H
Dry Gas Meter Serial Number :	2344	Barometric Pressure :	752.602 in Hg
Critical Orifice Model Number :	ST 40-73	Theo. Critical Vacuum For Orifice:	15 in Hg
Critical Orifice Calibration Factor, Yc :	1.0000	Leak Check :	OK

Run No.	Orifice ID No.	Dry Gas Meter Volume (m^3)			Dry Gas Meter Temp. T_m (^oC)			Amb. Temp.	Time	Orifice Rdg.	Pump Vac.
		Initial	Final	Diff., V_m	Initial	Final	Ave ^oK	T_{amb}, ^oK	min.	mmH_2O	in.Hg
1	ST 40	331.1110	331.1542	0.0432	23	23	296.0	299.5	5	8.40	15
2	ST 40	331.1580	331.2012	0.0432	24	24	297.0	299.5	5	8.40	15
1	ST 48	331.2070	331.2820	0.0750	25	25	298.0	299.5	6	17.0	15
2	ST 48	331.2890	331.3642	0.0752	26	26	299.0	299.5	6	17.0	15
1	ST 55	331.3730	331.4912	0.1182	27	27	300.0	298.9	7	30.0	15
2	ST 55	331.4940	331.6122	0.1182	28	28	301.0	298.9	7	30.0	15
1	ST 63	331.6240	331.8028	0.1788	29	29	302.0	298.6	8	50.0	15
2	ST 63	331.8100	331.9888	0.1788	29	29	302.0	302.0	8	50.0	15
1	ST 73	332.0130	332.2870	0.2740	32	32	305.0	298.4	9	92.0	15
2	ST 73	332.2882	332.5622	0.2740	32	32	305.0	298.4	9	92.0	15

IMPORTANT !!!
**For valid results, the actual vacuum should be 1 to 2 in. Hg greater than the theoretical critical vaccum.
**The average value for the K' FACTOR should not vary by more than ±0.5% from the individual results.
**The times should not differ by more than 3 seconds for each run.
**The unit for critical orifice coefficient is in m^3*K^0.5/(mmHg*min).

RESULTS

Run No.	Orifice ID No.	K' Factor $X 10^{-4}$	Average $X 10^{-4}$	Variation (≤ ± 0.5%)
1	ST 40	1.9823	1.9790	-0.17%
2	ST 40	1.9756	1.9790	0.17%
1	ST 48	2.8511	2.8501	-0.03%
2	ST 48	2.8491	2.8501	0.03%
1	ST 55	3.8267	3.8204	-0.17%
2	ST 55	3.8140	3.8204	0.17%
1	ST 63	5.0388	5.0531	0.28%
2	ST 63	5.0674	5.0531	-0.28%
1	ST 73	6.8217	6.8217	0.00%
2	ST 73	6.8217	6.8217	0.00%

Calibrated by: 05/07/24

Daniel L. Navidad
Team Leader

Noted by: 5/7/24

Angelo V. Guevarra
QA/QC Manager

GREENTEK
Environmental Phils. Co.

CERTIFICATE OF CALIBRATION
GREENTEK ENVIRONMENTAL PHILS. CO.
TEMPERATURE DISPLAY CALIBRATION

Meter Console No.:	GMC – 01	**Operator:**	DLN
Model:	XC – 572 – OV	**Calibration Date:**	May 07, 2024
Serial No.:	1703043	**Calibration Due:**	November 6, 2023

TC Channel ID	Reference Temp 1,°C	Temp. Reading 1,°C	Criteria	Criteria Met	Reference Temp 1,°C	Temp. Reading 1,°C	Criteria	Criteria Met
Probe	**0**	0	0	YES	**50**	51	-0.309	YES
Filter	**0**	0	0	YES	**50**	51	-0.309	YES
Exit	**0**	0	0	YES	**50**	51	-0.309	YES
Stack	**0**	0	0	YES	**50**	51	-0.309	YES
Stack	**200**	198	0.425	YES	**250**	248	-0.384	YES

TC Channel ID	Reference Temp 1,°C	Temp. Reading 1,°C	Criteria	Criteria Met	Reference Temp 1,°C	Temp. Reading 1,°C	Criteria	Criteria Met
Probe	**100**	100	0	YES	**150**	151	-0.236	YES
Filter	**100**	100	0	YES	**150**	151	-0.236	YES
Exit	**100**	100	0	YES	**150**	151	-0.236	YES
Stack	**100**	100	0	YES	**150**	151	-0.236	YES
Stack	**350**	348	0.322	YES	**450**	448	-0.277	YES

Criteria: *Percent difference between the Reference temperature and the Average Temperature can be only ±1.5% °K*

Equation: $$\frac{[(\text{Ref. Temp.} + 273) - (\text{Temp. Reading} + 273)] \times 100}{(\text{Ref. Temp.} + 273)}$$

Reference used in calibration					
Type	**Model**	**Serial No.**	**Calibration Date**	**Certificate No.**	**Issuing Lab/Traceability**
Thermocouple Simulator	ALTEK Series 22	9330065	August 17, 2023	23-08-106-2	Acculab Calibration Laboratory Inc.

Calibrated by:

05/7/24

Daniel L. Navidad, Jr.
Team Leader

Checked by:

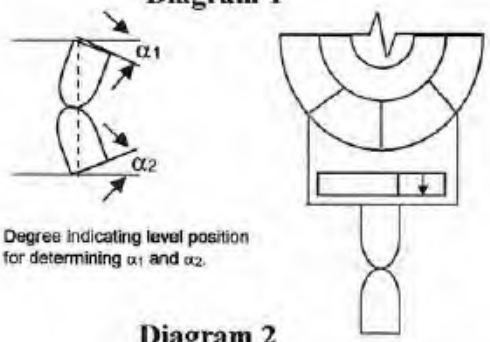
5/7/24

Angelo V. Guevarra
QA/QC Manager

GREENTEK ENVIRONMENTAL PHILS. CO.
PITOT TUBE INSPECTION DATA SHEET

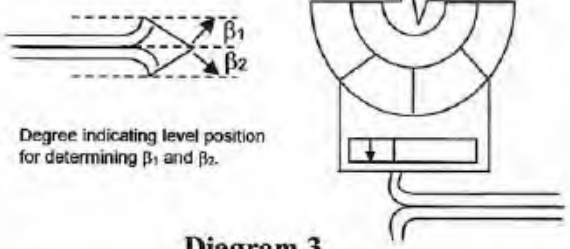
Pitot Number: **GP-04A** Date: **March 13, 2024**

Diagram 1



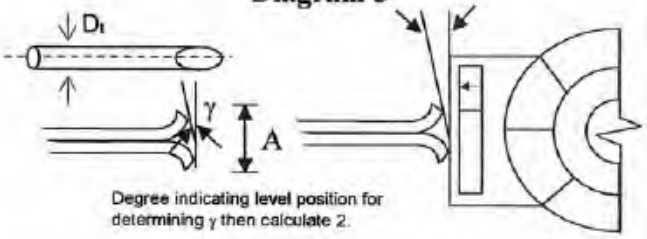
Degree indicating level position for determining α_1 and α_2.

Diagram 2

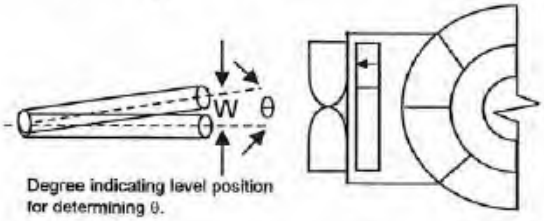


Degree indicating level position for determining β_1 and β_2.

Diagram 3



Degree indicating level position for determining γ then calculate 2.



Degree indicating level position for determining θ.

Level? =	**YES**
Obstructions? =	**NO**
Damaged? =	**NO**
Diagram 1	
$-10° < \square_1 < +10°$ =	**0°**
$-10° < \square_2 < +10°$ =	**1°**
Diagram 2	
$-5° < \beta_1 < +5°$ =	**1°**
$-5° < \beta_2 < +5°$ =	**0°**
Diagram 3	
γ =	**0°**
θ =	**0°**
A =	**2.46**
$1.05\ D_t < P_a < 1.5\ D_t$ =	**1.23**
$1.05\ D_t < P_b < 1.5\ D_t$ =	**1.23**
$0.48\ cm \leq D_t \leq 0.95$ =	**0.94**
A tan γ < 0.32 cm =	**0**
A tan θ < 0.08 cm =	**0**
$P_a = P_b$ =	**1.23**

Comments: _____

The pitot tube/probe meets or exceeds all specifications criteria and/or applicable design features and is hereby assigned a pitot tube calibration factor of ***0.84***.

Equipment used in calibration					
Type	**Model**	**Serial No.**	**Calibration Date**	**Certificate No.**	**Issuing Lab/Traceability**
Digital Caliper	MITUTOYO CD-6" ASX	A22099212	July 30, 2023	10 0000.01-8588-1.23	Switchtek Measurement Systems

Calibrated by:

Daniel L. Navidad Jr.
Team Leader

Reviewed by:

Angelo V. Guevarra
QA/QC Manager

GREENTEK
Environmental Phils.Co.

CERTIFICATE OF CALIBRATION
GREENTEK ENVIRONMENTAL PHILS. CO.
TEMPERATURE SENSOR CALIBRATION

Thermocouple No. **GP-04C** **Date:** **March 14, 2024**
Ambient Temperature: **20.6 °C**

Reference Point Number	Source (Specify)	Reference Thermometer Temperature °C	Thermocouple Display Temperature °C	Absolute Temperature Difference %
1	COLD WATER	3.4	2.7	0.3
2	TAP WATER	26.8	27.6	-0.3
3	HOT WATER	98.4	100.2	-0.5

Criteria: *Percent difference between the Reference temperature and the Average Temperature can be only* ***±1.5% °K***

Equation: $$\frac{[(\text{Ref. Temp.} + 273) - (\text{Temp. Reading} + 273)] \times 100}{(\text{Ref. Temp.} + 273)}$$

Reference used in calibration					
Type	**Model**	**Serial No.**	**Calibration Date**	**Certificate No.**	**Issuing Lab/Traceability**
Digital Thermometer	SUPCO	EM02	June 3, 2023	100.10-8227-2.23	Switchtek Measurement Systems

Calibrated by: _____
Team Leader

Checked by: _____
QAQC Manager

Switchtek
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A Division of Switchtek Construction Corporation
4th Floor Northridge Plaza, Annex A, 12 Congressional Ave.,
Bahay Toro,Quezon City, 1100, Philippines
Tel Nos.02 4267593 / 9282869 / 9287769 Fax No.4537694
email Address: admin@switchtek.com.ph
www.switchtek.com.ph

Certificate No.:	4000.23-9142-1.23	**Calibration of**	3 IN1 (barometer function)
Identification:	GREENTEK ENVIRONMENTAL PHILS., CO		
Job:	P1	Test and Verification	
Fin.acc:	32	Certificate of Calibration	
Done.....:	November 22, 2023	Initials....:	CAC
Categories	Calibration		
Cal Officer			

Men	Hours	Total cost	Type
2	1.00	-	Certificate

CERTIFICATE OF CALIBRATION - 3 IN 1 (Barometer Function)

This report of calibration shall document that the instrument herein was examined and tested in compliance with ISO/IEC 17025 against NIST traceable reference standards and its co-equal standards.

Issued to: GREENTEK ENVIRONMENTAL PHILS., CO
Address: 2353 RI PLACE UNIT 3A SELYA STREET BRGY.860 PANDACAN, MANILA, PHILIPPINES

UNIT UNDER TEST (UUT):

Instrument:	3 IN1 (barometer function)
Brand:	LUTRON
Model No.:	PHB-318
Serial No.:	No record
ID code:	No record
Range:	Temp. (0-50 Deg. C)
	Humidity (10 to 95%)
	Dewpoint (-25.3 to 48.9 Deg. C)
	Barometer (10 to 999.9 hPa)
Resolution:	Temp. (0.1 Deg. C)
	Humidity (0.1 %)
	Dewpoint (0.1 Deg. C)
	Barometer (1 hPa)
Accuracy:	
Temperature:	± 0.8 /1.5 °C °F
%RH	≧ ± (3% reading + 1% RH).
	< 70% RH - 3% RH.± 3% RH.
Barometric pressure	10.0 to 999.9 (± 1.5 hPa)
	1000 to 1100 (± 2 hPa)
Calibration Date:	November 20, 2023
Calibration Due:	November 19, 2024

CALIBRATOR INFORMATION:

Instrument:	Barigo, precision barometer
Instrument:	Druck, pressure calibrator
Instrument:	Lumel temp and humidity transmitter
Instrument:	Temperature and Humidity chamber
Model No.:	XB-CTS-34
Serial No.:	20130803
Traceability:	CNAS

Environmental Condition:

Condition:	DRY/BASIC/NEUTRAL
Relative Humidity:	55.6 ±5%, 1007 hPa

Ambient Temp. (Deg C): 24.4±2

Calibration Method:

By comparison technique, unit under test was placed in a Chamber with a Standard precision barometer, Temperature and Humidity calibrator. Procedures of calibration and test conform to the requirements of NPL, NIST and ISO/IEC Guide 17025. Data were gathered and plotted against an ideal curve.

Standard error and uncertainty of measurement are written on the attached sheet.

Remarks:

All data pertain only to the unit described obtained at the time of test. This certificate is not valid w/out seal and signature. Unauthorized reproduction is prohibited.

Calibrated By: C.A. CASADO
Date: November 20, 2023

Certified By: A.R. CAINDOY
Date: November 22, 2023

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Tel Nos.02 4267593 / 9282869 / 9287769 Fax No.4537694
email Address: admin@switchtek.com.ph
www.switchtek.com.ph

Certificate No.: 4000.23-9142-1.23 **Calibration of** 3 IN1 (barometer function)
Identification: GREENTEK ENVIRONMENTAL PHILS., CO
Address: 2353 RJ PLACE UNIT 3A SELYA STREET BRGY.860 PANDACAN, MANILA, PHILIPPINES

CERTIFICATE OF CALIBRATION - 3 IN 1 (Barometer Function)

This report of calibration shall document that the instrument herein was examined and tested in compliance with ISO/IEC 17025 against NIST traceable reference standards and its co-equal standards.

UNIT UNDER TEST (UUT):

Instrument: 3 IN1 (barometer function)
Brand: LUTRON
Model No.: PHB-318
Serial No.: No record
Range: Temp. (0-50 Deg. C)
Humidity (10 to 95%)
Dewpoint (-25.3 to 48.9 Deg. C)
Barometer (10 to 999.9 hPa)
Resolution: Temp. (0.1 Deg. C)
Humidity (0.1 %)
Dewpoint (0.1 Deg. C)
Barometer (1 hPa)
ID code: No record

Calibration Date: November 20, 2023
Calibration Due: November 19, 2024
Calibrated By: C.A. CASADO

Results:

Barometer

REFERENCE READING (hPa)	UNIT UNDER TEST READING (hPa)	ERROR IN READING (hPa)	STANDARD DEVIATION	REMARKS
1009.0	1003.0	6.00	4.2426	The user should determine the suitablity of the instrument for its intended use
1005.0	1000.0	5.00	3.5355	
1000.0	995.0	5.00	3.5355	
990.0	984.0	6.00	4.2426	

Standard error: ± 7.78 hPa
Uncertainty: ± 6.09 hPa

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email Address: admin@switchtek.com.ph
www.switchtek.com.ph

Certificate No.:	200.13-9142-1.23	Calibration of	Digital Vacuum Gauge
Identification:	GREENTEK ENVIRONMENTAL PHILS., CO		
Job:	P1	Test and Verification	
Fin.acc:	32	Certificate of Calibration	
Done.....:	November 25, 2023	Initials....	CAC
Categories	Calibration	Men	Hours / Total cost / Type
Cal Officer		1	1.0 / - / Certificate

CERTIFICATE OF CALIBRATION - PRESSURE

This report of calibration shall document that the instrument herein was examined and tested in compliance with ISO/IEC 17025 against NIST traceable reference standards and its co-equal standards.

Issued To: GREENTEK ENVIRONMENTAL PHILS., CO
Address: 2353 RI PLACE UNIT 3A SELYA STREET BRGY. 860 PANDACAN, MANILA, PHILIPPINES

UNIT UNDER TEST (UUT):

Instrument:	Digital Vacuum Gauge
Brand:	DWYER
Model No.:	DPGA-00
Serial No.:	No record
Range:	30 inHg to 0.0 in Hg
Resolution :	0.01 in Hg
Calibration Date:	November 24, 2023
Calibration Due:	November 23, 2024

CALIBRATOR INFORMATION:

Instrument:	Master gauge
Brand:	LA
Model No.:	No record
Serial No.:	E8090001
Range:	0 to 30.0 in Hg
Accuracy:	0.25%
Calibrated Against:	ASME B40.1, UKAS

Environmental Condition:

Condition:	DRY/BASIC/NEUTRAL
Relative Humidity:	52 ± 5%, 1010 hPa

Ambient Temp. (Deg C): 23 ±2

Calibration Method:

By comparison technique, test pressures were applied at the port, at planned intervals, by a Standard Pressure Calibrator. Procedures of test conducted conform to the requirements of UKAS and NIST in compliance with IEC/ISO Guide 17025. Data were gathered and tabulated.

During calibration, the unit was found to have a standard error of ± 0.15 inHg with a confidence level of not less than 95%. Uncertainty of measurement is ± 0.31 in Hg. Calculations were taken using the Standard Deviation Formula.

Reading:

APPLIED PRESSURE (inHg)	UNIT UNDER TEST READING (in Hg)	ERROR IN READING	STANDARD DEVIATION
0.00	0.0	0.000	0.0000
10.00	9.85	-0.150	0.1061
14.93	14.83	-0.100	0.0707
29.50	29.33	-0.170	0.1202

Remarks:
All data pertain only to the unit described obtained at the time of test. This certificate is not valid without seal and signature. Unauthorized reproduction is prohibited.

Calibrated By: C.A. CASADO
Date: November 24, 2023

Certified By: A.B. GAINDOC
Date: November 25, 2023

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Measurement Systems
A Division of Switchtek Construction Corporation
4th Floor Northridge Plaza, Annex A, 12 Congressional Ave.,
Bahay Toro,Quezon City, 1100, Philippines
Tel Nos.:84420560 / 89282869 / 89287769 Fax No.:84537694
email Address: switchtekbilers@yahoo.com
www.switchtek.com.ph

Certificate No.:	100.10-9142 -2.23	**Calibration of**	**Probe Heater Temperature Controller**
Identification:	GREENTEK ENVIRONMENTAL PHILS., CO		
Job:		Test and Calibration	
Fin.acc:	P1	Certificate of Calibration	
Done.....:	32	Initials...:	CAC
Categories	November 28, 2023	Men	Hours / Total cost / Type
Cal Officer	Calibration	1	1.0 - Certificate

CERTIFICATE OF CALIBRATION - TEMPERATURE

This report of calibration shall document that the instrument herein was examined and tested in compliance with ISO/IEC 17025 against NIST traceable reference standards and its co-equal standards.

Issued To: GREENTEK ENVIRONMENTAL PHILS., CO
Address: 2353 RI PLACE UNIT 3A SELYA STREET BRGY.860 PANDACAN, MANILA, PHILIPPINES

UNIT UNDER TEST (UUT):

Instrument:	Probe Heater Temperature Controller
Manufacturer:	CAL CONTROLS
Model No.:	CAL 3200
Serial No.:	3212212190
Code:	2022TCTZA
Range	-200 to 1800.0 Deg. C
Resolution:	1 Deg. C
Calibration Date:	November 27, 2023
Calibration Due:	November 26, 2024

CALIBRATOR INFORMATION:

Instrument:	SPRT, Standard Platinum resistance thermometer
Instrument:	Process Calibrator
Manufacturer:	FLUKE
Model No.:	726
Serial No.:	3266078
Traceability:	NIST

Environmental Condition:
Condition: DRY/BASIC/NEUTRAL
Relative Humidity: 52.3 ±5%, 1011 hPa

Ambient Temp. (Deg C): 25 ±2

Calibration Method:

By comparison technique, test temperatures were measured from the unit under test at fixed point method in reference with a Multi-function Calibrator, SPRT, NIST and ITS 1990. Procedures of test conform to the requirements of ISO/IEC Guide 17025. Data were gathered and tabulated.

During calibration the unit under test was found to have a standard error of ± 6 °C with a confidence error of not less than 95%. Uncertainty of unceasurement is ± 2.88 °C. Calculations were taken using the standard deviation formula.

Results:

REFERENCE READING (ACTUAL TEMP.)	UUT SETTING	CORRECTION	STANDARD DEVIATION	REMARKS
°C	°C	°C	°C	
30.00	27	-3.000	2.1213	The user should determine the suitability of the instrument of its intended use.
50.00	47	-3.000	2.1213	
80.00	77	-3.000	2.1213	
100.00	97	-3.000	2.1213	
120.00	117	-3.000	2.1213	
150.00	147	-3.000	2.1213	
180.00	177	-3.000	2.1213	
200.00	197	-3.000	2.1213	

Remarks:

All data pertain only to the unit described obtained at the time of test. This certificate is not valid without seal and signature. Unauthorized reproduction is prohibited.

Calibrated By:
Date: November 27, 2023

Certified By:
Date: November 28, 2023

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Tel Nos.02 4267593 / 9282869 / 9287769 Fax No.4537694
email Address: admin@switchtek.com.ph
www.switchtek.com.ph

Certificate No.:	100.08-9142-1.23	**Calibration of**	**Digital thermometer**		
Identification:	GREENTEK ENVIRONMENTAL PHILS., CO				
Job:	P1	Test and Calibration			
Fin.acc:	32	Certificate of Calibration			
Done.....:	November 28, 2023	Initials...:	CAC		
Categories	Calibration	Men	Hours	Total cost	Type
Cal Officer		1	1.0	-	Certificate

CERTIFICATE OF CALIBRATION - TEMPERATURE

This report of calibration shall document that the instrument herein was examined and tested in compliance with ISO/IEC 17025 against NIST traceable reference standards and its co-equal standards.

Identification: GREENTEK ENVIRONMENTAL PHILS., CO
Address: 2430 LAURA STREET BRGY. 862 PANDAN MANILA, PHILIPPINES

UNIT UNDER TEST (UUT):

Instrument:	Digital thermometer
Brand:	SUPCO
Model No.:	EM02
Serial No.:	No record
Location:	No record
Range:	-40.0 to 200.0 Deg. C
Resolution:	0.1 Deg. C
Calibration Date:	November 20, 2023
Calibration Due:	November 19, 2024

CALIBRATOR INFORMATION:

Instrument:	Liquid Bath Calibrator	**Instrument:**	Liquid Bath Calibrator
Brand:	TECHNO	**Brand:**	TECHNO
Model No:	TB-30	**Model No:**	TB-30
Serial No:	A275	**Serial No:**	A275
Instrument:	Standard platinum resistance thermometer	**Instrument:**	Process meter
Brand:	Heraeus	**Brand:**	FLUKE
Model No:	SPH-01	**Model No:**	726
Range:	-40 to 420.0 Deg. C	**Serial No:**	3266078
Connection:	Four (4) wires	**Traceability:**	NIST
Traceability:	INMETRO, UKAS		

Environmental Condition:
Condition: DRY/BASIC/NEUTRAL
Relative Humidity: 54.2 ± 5%, 1007 hPa
Ambient Temp. (Deg C): 22.2±2

Calibration Method:

By comparison technique, temperature values were simulated at planned intervals, using fixed point method in reference with a Temperature Bath Calibrator, Multifunction Calibrator, SPRT and ITS-1990. Span and errors were checked and tabulated. Procedures of tests conform to the requirements of ISO/IEC Guide 17025 and NIST.

During calibration the unit under test was found to have a standard error of ± 4.33 Deg. C with a confidence level of not less than 95.0 %.
Uncertainty of measurement is ± 2.41 Deg. C. Calculations were taken using the standard deviation formula.

Results:

REFERENCE READING (°C)	UNIT UNDER TEST READING (°C)	ERROR IN READING (°C)	STANDARD DEVIATION	REMARKS
-30.00	-32.0	-2.000	1.4142	The user should determine the suitability of the instrument for its intended use.
-10.00	-11.0	-1.000	0.7071	
0.00	-1.0	-1.000	0.7071	
10.00	9.8	-0.200	0.1414	
50.00	49.9	-0.100	0.0707	
100.00	97.0	-3.000	2.1213	
150.00	145.0	-5.000	3.5355	
200.00	195.0	-5.000	3.5355	

Remarks:

All data pertain only to the unit described obtained at the time of test. This certificate is not valid without seal and signature. Unauthorized reproduction is prohibited.

Calibrated By: C.A. CASADO
Date: November 20, 2023

Certified By: A.R. CAINDOC
Date: November 28, 2023

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Bahay Toro, Quezon City, 1100, Philippines
Tel Nos.84420560 / 89287769 / 89287769 Fax No.:89282869
email Address: admin@switchtek.com.ph
www.switchtek.com.ph

Certificate No.:	200.06-9142-1.23	Calibration of	Digital Manometer
Identification:	GREENTEK ENVIRONMENTAL PHILS., CO		
Job:	P1	Test and Calibration	
Fin.acc:	32	Certificate of Calibration	
Done.....:	November 25, 2023	Initials...:	CAC
Categories		Men	Hours / Total cost / Type
Cal Officer		1	1.0 / - / Certificate

CERTIFICATE OF CALIBRATION - PRESSURE

This report of calibration shall document that the instrument herein was examined and tested in compliance with ISO/IEC 17025 against NIST traceable reference standards and its co-equal standards.

Issued To: GREENTEK ENVIRONMENTAL PHILS., CO

Address: 2353 RJ PLACE UNIT 3A SELYA STREET BRGY. 860 PANDACAN, MANILA, PHILIPPINES

UNIT UNDER TEST (UUT):

Instrument:	Digital Manometer
Brand:	No record
Model No.:	HT-1890
Serial No.:	No record
Range:	± 4.072 in Hg
Graduation:	0.001 in Hg
ID code:	No record
Calibration Date:	November 24, 2023
Calibration Due:	November 23, 2024

CALIBRATOR INFORMATION:

Instrument:	Digital Pressure Calibrator
Manufacturer:	DRUCK
Model No.:	DPI 104
Serial No.:	SMS/ DPI 104
Traceability:	NIST

Environmental Condition:

Condition:	DRY/BASIC/NEUTRAL
Relative Humidity:	51.6 ±5%, 1006 hPa
Ambient Temp. (Deg C):	22.4 ±2

Calibration Method:

By comparison technique, test pressures were applied at the port, at planned intervals, by a Standard Pressure Calibrator. Procedures of test conducted conform to the requirements of ASME B40.1 and NIST in compliance with IEC/ISO Guide 17025. Data were gathered and tabulated.

During calibration the unit under test was found to have a standard error of ± 0.02 inHg with a confidence level of not less than 95.0 %.

Uncertainty of measurement is ± 0.018 in Hg. Calculations were taken using the standard deviation formula.

Results:

APPLIED PRESSURE (in Hg)	UNIT UNDER TEST READING (in Hg)	CORRECTION	STANDARD DEVIATION	REMARKS
0.000	0.000	0.000	0.0000	The user should determine the suitability of the instrument for its intended use.
0.100	0.099	0.001	0.0007	
0.500	0.507	-0.007	0.0049	
1.000	1.013	-0.013	0.0092	
2.000	1.997	0.003	0.0021	
3.000	3.026	-0.026	0.0184	
4.000	4.015	-0.015	0.0106	

Remarks:

All data pertain only to the unit described obtained at the time of test. This certificate is not valid without seal and signature. Unauthorized reproduction is prohibited.

Calibrated By: C.A. CASADO
Date: November 24, 2023

Certified By: A.H. CAINDEC
Date: November 25, 2023

Switchtek
Measurement Systems

A Division of Switchtek Construction Corporation
4th Floor Northridge Plaza, Annex A, 12 Congressional Ave.,
Bahay Toro,Quezon City, 1100, Philippines
Tel Nos.: 84420560/ 89282869 /8 9287769 Fax No.:84537694
email Address: switchtekboilers@yshoo.com

www.switchtek.com.ph

Certificate No.:	100.10-9142-3.23	Calibration of	Digital thermometer w/ dual input
Identification:	GREENTEK ENVIRONMENTAL PHILS., CO		
Job:	P1	Test and Verification	
Fin.acc:	32	Certificate of Calibration	
Done.....:	November 28, 2023	Initials...:	
Categories		Man Hours	Total cost Type
Cal Officer		2 8.0	- Certificate

CERTIFICATE OF CALIBRATION - TEMPERATURE

This test report shall document that the instrument herein was examined and tested in compliance with ISO/IEC 17025 against NIST traceable reference standards and its co-equal standards.

Issued To: GREENTEK ENVIRONMENTAL PHILS., CO
Address: 2353 RJ PLACE UNIT 3A SELYA STREET BRGY.860 PANDACAN, MANILA, PHILIPPINES

UNIT UNDER TEST (UUT):

Instrument:	Digital thermometer w/ dual input
Brand:	FLUKE
Model No.:	52
Serial No.:	5505853
ID code:	No record
Meter range:	-200.0 to 760.0 Deg. C, type J -200.0 to 1372.0 Deg. C, type k
Resolution:	0.1 °C
Calibration Date:	November 24, 2023
Calibration Due:	November 23, 2024

CALIBRATOR INFORMATION:

Instrument:	Process meter
Brand:	FLUKE
Model No:	726
Serial No:	3266078
Traceability:	NIST

Environmental Condition:

Condition:	DRY/BASIC/NEUTRAL
Relative Humidity:	51.2 ±5%, 1011 hPa

Ambient Temp. (Deg C): 22.3 ±2

Calibration Method:

By comparison technique, the temperature was simulated at planned intervals, using fixed point method in reference with a Temperature Process calibrator and ITS-1990. Procedures of test conform to the requirements of ISO/IEC Guide 17025. Data were gathered and tabulated.

Standard error and uncertainty of measurement were indicated on the attached sheet.

Remarks:

All data pertain only to the unit described obtained at the time of test. This certificate is not valid without seal and signature. Unauthorized reproduction is prohibited.

Calibrated By: C.A. CASADO
Date: November 24, 2023

Certified By: A.R. BUNDOC
Date: November 28, 2023

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4th Floor Northridge Plaza, Annex A, 12 Congressional Ave.,
Bahay Toro,Quezon City, 1100, Philippines
Tel Nos.: 84420560/ 89282869 /8 9287769 Fax No.:84537694
email Address: switchtekboilers@yshoo.com
www.switchtek.com.ph

Certificate No.: 100.10-9142-3.23 **Calibration of** Digital thermometer w/ dual input
Identification: GREENTEK ENVIRONMENTAL PHILS., CO
Address: 2353 RJ PLACE UNIT 3A SELYA STREET BRGY.860 PANDACAN, MANILA, PHILIPPINES

CERTIFICATE OF CALIBRATION - TEMPERATURE

This test report shall document that the instrument herein was examined and tested in compliance with ISO/IEC 17025 against NIST traceable reference standards and its co-equal standards.

UNIT UNDER TEST (UUT):

Instrument:	Digital thermometer w/ dual input
Brand:	FLUKE
Model No.:	52
Serial No.:	5505853
ID code:	No record

Calibration Date:	November 24, 2023
Calibration Due:	November 23, 2024
Calibrated by:	C.A. CASADO

TYPE K

Results: T1

REFERENCE READING (°C)	UNIT UNDER TEST READING (°C)	ERROR IN READING (°C)	STANDARD DEVIATION	REMARKS
-10.0	-10.2	-0.200	0.1414	The user should determine the suitability of the instrument for its intended used.
0.0	0.0	0.000	0.0000	
10.0	10.2	0.200	0.1414	
50.0	49.7	-0.300	0.2121	
100.0	100.0	0.000	0.0000	
300.0	300.0	0.000	0.0000	
500.0	499.8	-0.200	0.1414	
700.0	699.8	-0.200	0.1414	
1000.0	999.6	-0.400	0.2828	

Standard error: ± 0.35 °C
Uncertainty: ± 0.22 °C

Results: T2

REFERENCE READING (°C)	UNIT UNDER TEST READING (°C)	ERROR IN READING (°C)	STANDARD DEVIATION	REMARKS
-10.0	-10.4	-0.400	0.2828	The user should determine the suitability of the instrument for its intended used.
0.0	-1.0	-1.000	0.7071	
10.0	10.1	0.100	0.0707	
50.0	49.4	-0.600	0.4243	
100.0	99.7	-0.300	0.2121	
300.0	299.7	-0.300	0.2121	
500.0	499.9	-0.100	0.0707	
700.0	699.6	-0.400	0.2828	
1000.0	999.9	-0.100	0.0707	

Standard error: ± 0.78 °C
Uncertainty: ± 0.46 °C

Switchtek
Measurement Systems
A Division of Switchtek Construction Corporation
4th Floor Northridge Plaza, Annex A, 12 Congressional Ave.,
Bahay Toro,Quezon City, 1100, Philippines
Tel Nos.: 84420560/ 89282869 /8 9287769 Fax No.:84537694
email Address: switchtekboilers@yshoo.com
www.switchtek.com.ph

Certificate No.: 100.10-9142-3.23 **Calibration of** Digital thermometer w/ dual input
Identification: GREENTEK ENVIRONMENTAL PHILS., CO
Address: 2353 RJ PLACE UNIT 3A SELYA STREET BRGY.860 PANDACAN, MANILA, PHILIPPINES

CERTIFICATE OF CALIBRATION - TEMPERATURE

This test report shall document that the instrument herein was examined and tested in compliance with ISO/IEC 17025 against NIST traceable reference standards and its co-equal standards.

UNIT UNDER TEST (UUT):

Instrument: Digital thermometer w/ dual input
Brand: FLUKE
Model No.: 52
Serial No.: 5505853
ID code: No record

Calibration Date: November 24, 2023
Calibration Due: November 23, 2024
Calibrated by: C.A. CASADO

TYPE J

Results: T1

REFERENCE READING (°C)	UNIT UNDER TEST READING (°C)	ERROR IN READING (°C)	STANDARD DEVIATION	REMARKS
-200.0	-199.7	0.300	0.2121	The user should determine the suitability of the instrument for its intended used.
-100.0	-99.9	0.100	0.0707	
0.0	0.0	0.000	0.0000	
50.0	49.6	-0.400	0.2828	
100.0	99.9	-0.100	0.0707	
200.0	199.6	-0.400	0.2828	
300.0	300.1	0.100	0.0707	
400.0	399.9	-0.100	0.0707	
760.0	759.7	-0.300	0.2121	

Standard error: ± 0.42 °C
Uncertainty: ± 0.25 °C

Results: T2

REFERENCE READING (°C)	UNIT UNDER TEST READING (°C)	ERROR IN READING (°C)	STANDARD DEVIATION	REMARKS
-200.0	-199.5	0.500	0.3536	The user should determine the suitability of the instrument for its intended used.
-100.0	-99.8	0.200	0.1414	
0.0	0.0	0.000	0.0000	
50.0	49.4	-0.600	0.4243	
100.0	100.0	0.000	0.0000	
200.0	199.7	-0.300	0.2121	
300.0	300.0	0.000	0.0000	
400.0	399.9	-0.100	0.0707	
760.0	759.8	-0.200	0.1414	

Standard error: ± 0.45 °C
Uncertainty: ± 0.30 °C

Switchtek
Measurement Systems
A Division of Switchtek Construction Corporation
4th Floor Northridge Plaza, Annex A, 12 Congressional Ave.,
Bahay Toro,Quezon City, 1100, Philippines
Tel Nos.02 4267593 / 9282869 / 9287769 Fax No. 4537694
email Address: switchtek@pldtdsl.net
www.switchtek.com.ph

Certificate No.:	100.10-9142-1.23	**Calibration of**	Thermocouple, TC source calibrator
Identification:	GREENTEK ENVIRONMENTAL PHILS., CO		
Job:	P1	Test and Verification	
Fin.acc:	32	Certificate of Calibration	
Done.....:	November 28, 2023	**Initials...:**	CAC
Categories	Test and Calibration	**Men**	**Hours** / **Total cost** / **Type**
Cal Officer		2	1.0 - Certificate

CERTIFICATE OF CALIBRATION - THERMOCOUPLE TC SOURCE CALIBRATOR

This test report shall document that the instrument herein was examined and tested in compliance with ISO/IEC 17025 against NIST traceable reference standards and its co-equal standards.

Issued To: GREENTEK ENVIRONMENTAL PHILS., CO
Address: 2353 RJ PLACE UNIT 3A SELYA STREET BRGY. 860 PANDACAN, MANILA, PHILIPPINES

UNIT UNDER TEST (UUT):

Instrument:	Thermocouple, TC source calibrator
Brand:	ALTEK
Model No.:	SERIES 22
Serial No.:	107173
ID code:	No record
Ranges:	Thermocouple TYPE K -200 to 1371 Deg. C

CALIBRATOR INFORMATION:

Instrument:	Process meter
Brand:	FLUKE
Model No:	726
Serial No:	3266078
Traceability:	NIST

Calibration Date: November 26, 2023
Calibration Due: November 25, 2024

Environmental Condition:

Condition: DRY/BASIC/NEUTRAL
Relative Humidity: 54.5 ± 5%, 1008 hPa
Ambient Temp. (Deg C): 22.1 ±2

Calibration Method:

By comparison technique, electrical values/magnitudes were measured at the terminals in milliampere DC at planned intervals as a function of electrical values. Data gathered were referenced to a Standard Multimeter. Data were gathered and tabulated.

Standard error and uncertainties (u) of measurement were indicated on the attached sheet with a coverage factor of k=2 and with a confidence level of not less than 95%. Calculations were taken using the Standard Deviation Formula.

Remarks:

All data pertain only to the unit described obtained at the time of test. This certificate is not valid without seal and signature. Unauthorized reproduction is prohibited.

Calibrated By: C.A. CASADO
Date: November 26, 2023

Certified By: A.R. CAINDOC
Date: November 28, 2023

Switchtek
Measurement Systems
A Division of Switchtek Construction Corporation
4th Floor Northridge Plaza, Annex A, 12 Congressional Ave.,
Bahay Toro, Quezon City, 1100, Philippines
Tel Nos.02 4267593 / 9282869 / 9287769 Fax No. 4537694
email Address: switchtek@pldtdsl.net
www.switchtek.com.ph

Certificate No.: 100.10-9142-1.23 **Calibration of** Thermocouple, TC source calibrator
Identification: GREENTEK ENVIRONMENTAL PHILS., CO
Address: 2353 RJ PLACE UNIT 3A SELYA STREET BRGY. 860 PANDACAN, MANILA, PHILIPPINES

CERTIFICATE OF CALIBRATION - THERMOCOUPLE TC SOURCE CALIBRATOR

This test report shall document that the instrument herein was examined and tested in compliance with ISO/IEC 17025 against NIST traceable reference standards and its co-equal standards.

UNIT UNDER TEST (UUT):

Instrument: Thermocouple, TC source calibrator
Brand: ALTEK
Model No.: SERIES 22
Serial No.: 107173
ID code: No record
Ranges: Thermocouple TYPE K
-200 to 1371 Deg. C

Calibration Date: November 26, 2023
Calibration Due: November 25, 2024
Calibrated By: C.A. CASADO

Results:

REFERENCE READING (Deg. C)	UNIT UNDER TEST READING (Deg. C)	ERROR IN READING	SATNDARD DEVIATION
-54.10	-50.000	4.100	2.8991
0.10	0.000	-0.100	0.0707
50.30	50.000	-0.300	0.2121
100.10	100.000	-0.100	0.0707
200.00	200.000	0.000	0.0000
300.00	300.000	0.000	0.0000
399.90	400.000	0.100	0.0707
499.90	500.000	0.100	0.0707
600.00	600.000	0.000	0.0000
700.00	700.000	0.000	0.0000
800.00	800.000	0.000	0.0000
900.00	900.000	0.000	0.0000
1000.00	1000.000	0.000	0.0000

Standard error:± 0.9414 Deg. C **Uncertainty:±** 1.1430 Deg. C

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A Division of Switchtek Construction Corporation
4th Floor Northridge Plaza, Annex A, 12 Congressional Ave.,
Bahay Toro, Quezon City, 1100, Philippines
Tel Nos.:84420560 / 89282869 / 89287769 Fax No.:89282859
email Address: admin@switchtek.com.ph
www.switchtek.com.ph

Certificate No.:	600.01-8588-1.23	Calibration of	Set of Weights	
Identification:	GREENTEK ENVIRONMENTAL PHILS., CO			
Job:		Test and Verification		
Fin.acc:	32	Certificate of Calibration		
Done....:	August 2, 2023	Initials....	CAC	
Categories	Calibration	Hours	Total cost	Type
Cal Officer		1.0	Type	Certificate

CERTIFICATE OF CALIBRATION - SET OF WEIGHTS

This report of calibration shall document that the instrument herein was examined and tested in compliance with ISO/IEC 17025 against NIST traceable reference standards and its co-equal standards.

Issued To: GREENTEK ENVIRONMENTAL PHILS., CO
Address: 2353 RJ PLACE UNIT 3A SELYA STREET BRGY.860 PANDACAN, MANILA, PHILIPPINES

UNIT UNDER TEST (UUT):

Instrument:	Set of Weights
Brand:	No record
Model No.:	No record
Serial No.:	G.201501
Range:	10g;20g (2pcs.); 50 g, 100g (2 pcs.) 200g ; 500 g
ID code:	GSOW-01
Calibration Date:	July 29, 2023
Calibration Due:	July 28, 2024

CALIBRATOR INFORMATION:

Instrument:	Analytical Balance	Instrument:	Digital weighing scale
Brand:	KERN	Brand:	KERN
Model No.:	AES-200-4C	Model No.:	EG4200-2NM
Serial No.:	WL170025	Serial No.:	sms4200
Range:	220.0 g	Range:	4200.0 g
Graduation:	0.0001 g	Traceability:	NIST
Traceability:	NIST		

Environmental Condition:

Condition:	DRY/BASIC/NEUTRAL	Ambient Temp. (Deg C):	23.3 ±2
Relative Humidity:	58 ±5%, 1008 hPa		

Calibration Method:

By comparative technique, calibration was done in reference with a Calibrated precision scale at planned intervals. Procedures of test conform to the requirements of NIST. Data were gathered and tabulated.

Results:

NO.	REFERENCE READING (g)	UNIT UNDER TEST CAPACITY (g)	ERROR IN READING (g)	UNCERTAINTY OF MEASUREMENT (mg)	REMARKS
1	10.0030	10.0	-0.0030	1.587	The user should determine the suitability of the instrument of its intended use.
2	20.0005	20.0	-0.0005	1.16	
3	20.0060	20.0	-0.0060	3.21	
4	50.0027	50.0	-0.0027	1.76	
5	100.0064	100.0	-0.0064	3.39	
6	100.0062	100.0	-0.0062	3.30	
7	200.0127	200.0	-0.0127	6.40	
8	500.0040	500.0	-0.0040	2.17	

Remarks:

All data pertain only to the unit described obtained at the time of test. This certificate is not valid without seal and signature. Unauthorized reproduction is prohibited.

Calibrated By: C.A. CASA[illegible]
Date: July 29, 2023

Certified By: [illegible]
Date: August 2, 2023

Switchtek
Measurement Systems

A Division of Switchtek Construction Corporation
4th Floor Northridge Plaza, Annex A, 12 Congressional Ave.,
Bahay Toro,Quezon City, 1100, Philippines
Tel Nos.02 4267593 / 9282869 / 9287769 Fax No.4537694
email Address: admin@switchtek.com.ph
www.switchtek.com.ph

Certificate No.:	100.08-9142-1.23	**Calibration of**	Digital thermometer		
Identification:	GREENTEK ENVIRONMENTAL PHILS., CO				
Job:	P1	Test and Calibration			
Fin.acc:	32	Certificate of Calibration			
Done___:	February 2, 2024	Initials__:	CAC		
Categories	Calibration	Men	Hours	Total cost	Type
Cal Officer		1	1.0	-	Certificate

CERTIFICATE OF CALIBRATION - TEMPERATURE

This report of calibration shall document that the instrument herein was examined and tested in compliance with ISO/IEC 17025 against NIST traceable reference standards and its co-equal standards.

Identification: GREENTEK ENVIRONMENTAL PHILS., CO
Address: 2430 LAURA STREET BRGY. 862 PANDAN MANILA, PHILIPPINES

UNIT UNDER TEST (UUT):

Instrument:	Digital thermometer
Brand:	LUTRON
Model No.:	PT 816
Serial No.:	No record
Location:	No record
Range:	-40.0 to 230.0 Deg. C
Resolution:	0.1 Deg. C
Calibration Date:	February 1, 2024
Calibration Due:	January 31, 2025

CALIBRATOR INFORMATION:

Instrument:	Liquid Bath Calibrator	**Instrument:**	Liquid Bath Calibrator
Brand:	TECHNO	**Brand:**	TECHNO
Model No:	TB-30	**Model No:**	TB-30
Serial No:	A275	**Serial No:**	A275
Instrument:	Standard platinum resistance thermometer	**Instrument:**	Process meter
		Brand:	FLUKE
Brand:	Heraeus	**Model No:**	726
Model No:	SPH-01	**Serial No:**	3266078
Range:	-40 to 420.0 Deg. C	**Traceability:**	NIST
Connection:	Four (4) wires		
Traceability:	INMETRO, UKAS		

Environmental Condition:

Condition:	DRY/BASIC/NEUTRAL	**Ambient Temp. (Deg C):**	25 ±2
Relative Humidity:	55.2 ± 5%, 1010 hPa		

Calibration Method:

By comparison technique, temperature values were simulated at planned intervals, using fixed point method in reference with a Temperature Bath Calibrator, Multifunction Calibrator, SPRT and ITS-1990. Span and errors were checked and tabulated. Procedures of tests conform to the requirements of ISO/IEC Guide 17025 and NIST.

During calibration the unit under test was found to have a standard error of ± 1.03 Deg. C with a confidence level of not less than 95.0 %.

Uncertainty of measurement is ± 0.51 Deg. C. Calculations were taken using the standard deviation formula.

Results:

REFERENCE READING (°C)	UNIT UNDER TEST READING (°C)	ERROR IN READING (°C)	STANDARD DEVIATION	REMARKS
-25.00	-24.2	0.800	0.5657	The user should determine the suitability of the instrument for its intended use.
-10.00	-9.2	0.800	0.5657	
0.00	0.2	0.200	0.1414	
10.00	9.8	-0.200	0.1414	
40.00	40.2	0.200	0.1414	
100.00	99.2	-0.800	0.5657	
150.00	149.7	-0.300	0.2121	
200.00	199.2	-0.800	0.5657	

Remarks:

All data pertain only to the unit described obtained at the time of test. This certificate is not valid without seal and signature. Unauthorized reproduction is prohibited.

Calibrated By: C.A. CASADO
Date: February 1, 2024

Certified By: A.R. C[illegible]
Date: February 2, 2024

Switchtek Measurement Systems
A Division of Switchtek Construction Corporation
4th Floor Northridge Plaza, Annex A, 12 Congressional Ave.,
Bahay Toro,Quezon City, 1100, Philippines
Tel Nos.:84420560 / 89282869 / 89287769 Fax No.:8453769
email Address: switchtekbilers@yahoo.com
www.switchtek.com.ph

Certificate No.:	100.10-9390-1.24	Calibration of	Probe Heater Temperature Controller		
Identification:	GREENTEK ENVIRONMENTAL PHILS., CO				
Job:		Test and Calibration			
Fin.acc:	P1	Certificate of Calibration			
Done.....:	32	Initials...: CAC			
Categories	February 2, 2024	Men	Hours	Total cost	Type
Cal Officer	Calibration	1	1.0	-	Certificate

CERTIFICATE OF CALIBRATION - TEMPERATURE

This report of calibration shall document that the instrument herein was examined and tested in compliance with ISO/IEC 17025 against NIST traceable reference standards and its co-equal standards.

Issued To: GREENTEK ENVIRONMENTAL PHILS., CO
Address: 2353 RI PLACE UNIT 3A SELYA STREET BRGY.860 PANDACAN, MANILA, PHILIPPINES

UNIT UNDER TEST (UUT):

Instrument:	Probe Heater Temperature Controller
Manufacturer:	CAL CONTROLS
Model No.:	CAL 3200
Serial No.:	69928664089
Code:	2022TCT3A, TEAM 3A
Range	-200 to 1800.0 Deg. C
Resolution:	1 Deg. C
Calibration Date:	February 1, 2024
Calibration Due:	January 31, 2025

CALIBRATOR INFORMATION:

Instrument:	SPRT, Standard Platinum resistance thermometer
Instrument:	Process Calibrator
Manufacturer:	FLUKE
Model No.:	726
Serial No.:	3266078
Traceability:	NIST

Environmental Condition:
Condition: DRY/BASIC/NEUTRAL
Relative Humidity: 55 ±5%, 1011 hPa
Ambient Temp. (Deg C): 23.5 ±2

Calibration Method:

By comparison technique, test temperatures were measured from the unit under test at fixed point method in reference with a Multi-function Calibrator, SPRT, NIST and ITS 1990. Procedures of test conform to the requirements of ISO/IEC Guide 17025. Data were gathered and tabulated.

During calibration the unit under test was found to have a standard error of ± 0.26 °F with a confidence error of not less then 95%. Uncertainty of unceasurement is ± 0.69 °F. Calculations were taken using the standard deviation formula.

Results:

REFERENCE READING (ACTUAL TEMP.)	UUT SETTING	CORRECTION	STANDARD DEVIATION	REMARKS
°F	°F	°F	°F	
0.00	1	1.000	0.7071	The user should determine the suitability of the instrument of its intended use.
50.00	50	0.000	0.0000	
100.00	100	0.000	0.0000	
150.00	150	0.000	0.0000	
200.00	200	0.000	0.0000	
250.00	250	0.000	0.0000	
300.00	300	0.000	0.0000	

Remarks:
All data pertain only to the unit described obtained at the time of test. This certificate is not valid without seal and signature. Unauthorized reproduction is prohibited.

Calibrated By: C.A. CASADO
Date: February 1, 2024

Certified By: A.E. CANDO
Date: February 2, 2024

GREENTEK Environmental Phils.Co.

CERTIFICATE OF CALIBRATION
GREENTEK ENVIRONMENTAL PHILS. CO.
METHOD 7 – FLASK CALIBRATION

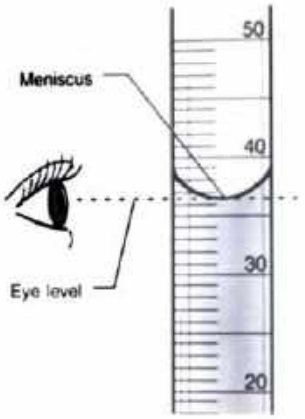
Date Calibrated: March 01, 2024 Graduated Cylinder: 1000mL, 500mL, 100mL

Date of Next Calibration: August 31, 2024 Pipette/Syringe: 10mL, 5mL

Flask Measurement with Valve? Yes ✓ No ___

Temperature(°C): 30.4 – 30.9 Relative Humidity: 80.8% - 80. %

Flask ID / Valve ID	Volume (mL) Trial 1	Volume (mL) Trial 2	Average (mL)
GF-11/V-11	2,226.20	2,226.40	2,226.30
GF-12/V-12	2,247.00	2,247.00	2,247.00
GF-13/V-13	2,236.20	2,236.60	2,236.40
GF-14/V-14	2,221.40	2,221.20	2,221.30
GF-15/V-15	2,227.20	2,227.20	2,227.20
GF-16/V-16	2,211.20	2,211.60	2,211.40
GF-17/V-17	2,237.00	2,237.60	2,237.30
GF-18/V-18	2,225.00	2,225.00	2,225.00
GF-19/V-19	2,220.00	2,220.20	2,220.10



Note: The flask volumes were measured within +/- 10mL. All calibrations are done in a room temperature. Glassware used during calibration are within ± 2.0mL tolerance for Graduated Cylinder (TC) and ± 0.02mL tolerance for Pipette (TD)

Reference used in calibration					
Type	**Model**	**Serial No.**	**Calibration Date**	**Certificate No.**	**Issuing Lab/Traceability**
Graduated Cylinder	Pyrex 100mL	No. 70075	April 10, 2023	2000.05-8004-3.23	Switchtek Measurement Systems
Graduated Cylinder	Pyrex 500mL	3025	April 11, 2023	2000.05-8004-2.23	Switchtek Measurement Systems
Graduated Cylinder	Pyrex 1000mL	3025	April 11, 2023	2000.05-8004-1.23	Switchtek Measurement Systems
Pipette	Pyrex 5mL	No. 7085	April 12, 2023	2000.07-8004-2.23	Switchtek Measurement Systems
Pipette	Pyrex 10mL	No. 7085	April 12, 2023	2000.07-8004-1.23	Switchtek Measurement Systems

QA/QC Check:

Completeness: ✓ Legibility: ✓ Accuracy: ✓ Specification: ✓ Reasonableness: ✓

Calibrated by: DANIEL L. NAVIDAD JR.
Team Leader

Checked By: ANGELO V. GUEVARRA
QA/QC Manager

CERTIFICATE OF CALIBRATION
GREENTEK ENVIRONMENTAL PHILS. CO.
NOZZLE CALIBRATION

Date of Calibration: March 13, 2024 **Calibration Due:** September 12,2024

Nozzle Box ID: GGN-T1 **Calibrated By:** AJRR
Nozzle Type: GLASS NOZZLE

Nozzle ID	D_1 (mm)	D_2 (mm)	D_3 (mm)	D (mm)	Average (mm)
GGNT1-01	4.64	4.61	4.62	0.03	4.62
GGNT1-02	4.80	4.80	4.81	0.01	4.80
GGNT1-03	6.40	6.41	6.41	0.01	6.41
GGNT1-04	7.80	7.81	7.83	0.01	7.81
GGNT1-05	9.58	9.57	9.57	0.01	9.57
GGNT1-06	11.10	11.13	11.11	0.02	11.11
GGNT1-07	12.79	12.78	12.80	0.02	12.79

Note:

D_1, D_2, and D_3 = Nozzle Diameter, measured different diameter. Tolerance = 0.0125mm
D = maximum difference in any two measurements. Tolerance = 0.1mm
Average = Average of D_1, D_2, and D_3.

Equipment used in calibration					
Type	**Model**	**Serial No.**	**Calibration Date**	**Certificate No.**	**Issuing Lab/Traceability**
Digital Caliper	MITUTOYO CD-6" ASX	A22099212	July 30, 2023	10 0000.01-8588-1.23	Switchtek Measurement Systems

Calibrated by:

Daniel L. Navidad Jr.
Team Leader

Checked by:

Angelo V. Guevarra
QA/QC Manager

CERTIFICATE OF CALIBRATION
GREENTEK ENVIRONMENTAL PHILS. CO.
BALANCE CALIBRATION

Date of Calibration: March 13, 2024 **Calibration Due:** September 12, 2024

Instrument: Top Loading Balance **Brand:** Tanita
Instrument ID: Team 1 **Model No.** KD-321

Environmental Conditions:

Temperature (C°): 20.8 - 22.2 **Relative Humidity (%):** 47.0

Test Point	Reference Weight (g)	Trial 1 (Reading) (g)	Trial 2 (Reading) (g)	Difference < 0.5g (g)	Remarks
1	10	10	10	0	OK
2	20	20	20	0	OK
3	50	49.9	49.9	0	OK
4	100	100	100	0	OK
5	200	199.8	199.8	0	OK
6	400	400	400	0	OK
7	500	499.5	499.5	0	OK
8	700	699.5	699.5	0	OK
9	800	799.5	799.5	0	OK
10	900	899.5	899.5	0	OK

Note:

Trial 1 and 2 shall be less than 0.5g difference. The instrument was left standby for a minimum of 30-mins before calibration. Reference weights used for the calibration of this instrument complied with ISO/IEC 17025 against NIST traceable reference standards and its co- equal standards.

Reference used in calibration					
Type	**Model**	**Serial No.**	**Calibration Date**	**Certificate No.**	**Issuing Lab/Traceability**
Set of Weights	No Record	G.201501	July 29, 2023	600.01-8588-1.23	Switchtek Measurement Systems

Calibrated by:

Daniel L. Navidad Jr.
Team Leader

Checked by:

Angelo V. Guevarra
QA/QC Manager

CERTIFICATE OF CALIBRATION
GREENTEK ENVIRONMENTAL PHILS. CO.
NOZZLE CALIBRATION

Date of Calibration: March 13, 2024 **Calibration Due:** September 12, 2024

Nozzle Box ID: GN-T1 **Calibrated By:** AJRR
Nozzle Type: STAINLESS STEEL

Nozzle ID	D_1 (mm)	D_2 (mm)	D_3 (mm)	D (mm)	Average (mm)
GNT1-01	3.11	3.12	3.11	0.01	3.12
GNT1-02	4.48	4.48	4.49	0.01	4.48
GNT1-03	6.08	6.08	6.10	0.02	6.09
GNT1-04	7.74	7.71	7.73	0.03	7.73
GNT1-05	9.60	9.60	9.59	0.01	9.60
GNT1-06	10.88	10.86	10.89	0.03	10.88
GNT1-07	12.32	12.34	12.33	0.02	12.33

Note:

D_1, D_2, and D_3 = Nozzle Diameter, measured different diameter. Tolerance = 0.0125mm
D = maximum difference in any two measurements. Tolerance = 0.1mm
Average = Average of D_1, D_2, and D_3.

Equipment used in calibration					
Type	**Model**	**Serial No.**	**Calibration Date**	**Certificate No.**	**Issuing Lab/Traceability**
Digital Caliper	MITUTOYO CD-6" ASX	A22099212	July 30, 2023	10 0000.01-8588-1.23	Switchtek Measurement Systems

Calibrated by:

Daniel L. Navidad Jr.
Team Leader

Checked by:

Angelo V. Guevarra
QA/QC Manager

“APPENDIX F”

TEST PARTICIPANTS

TEST PARTICIPANTS

BENGUET CORPORATION - ACUPAN CONTRACT MINING PROJECT

Ms. Jemimah R. Salayog	-	Pollution Control Officer

DENR EMB REPRESENTATIVE

Mr. Garth Raymundo	-	EMB CAR EMED Representative

GREENTEK ENVIRONMENTAL PHILS. CO.

Mr. Danilo M. Palaypay, Jr.	-	Technical & QA/QC Manager
Mr. Angelo V. Guevarra	-	Technical Head & QA/QC Manager
Mr. Daniel L Navidad, Jr.	-	Team Leader / Safety Officer
Mr. Manny R. Cruz	-	Senior Field Technician / Driver
Mr. Anthony M. Cabungcal	-	Field Technician
Mr. Rodel M. Castante	-	Field Technician
Mr. Leo R. Toca	-	On Call Field Technician / Welder

Republic of the Philippines
Department of Environment and Natural Resources
ENVIRONMENTAL MANAGEMENT BUREAU
Visayas Avenue, Diliman, Quezon City

SAT No. 2023 – 151

CERTIFICATE OF ACCREDITATION

Pursuant to DENR Administrative Order No. 26 Series of 2013 of the Department of Environment and Natural Resources having substantially met all the requirements prescribed therein,

GREENTEK ENVIRONMENTAL PHILS. CO.

#2430 Laura St., Pandacan Manila

is hereby duly accredited as

SOURCE EMISSION TESTING FIRM

As such, the following are authorized as:

QA/QC Manager
Danilo M. Palaypay, Jr.

Team Leader
Aaron Jonathan R. Regilme

This certification shall allow the above firm and personnel to conduct stack testing limited to the following methods and parameters:

1. US-EPA Method 1 to 5 – PM
2. US-EPA Method 6/8 – SO_2
3. US-EPA Method 7 – NO_x
4. US-EPA Method 10 – CO

Granted this December 22, 2023 and valid until December 22, 2026.

GILBERT C. GONZALES, CESO III
Director and concurrent
Assistant Secretary for Field Operations

Republic of the Philippines
Department of Environment and Natural Resources
ENVIRONMENTAL MANAGEMENT BUREAU
Visayas Avenue, Diliman, Quezon City

SAT No. 2023 – 152

CERTIFICATE OF ACCREDITATION

Pursuant to DENR Administrative Order No. 26 Series of 2013 of the Department of Environment and Natural Resources having substantially met all the requirements prescribed therein,

GREENTEK ENVIRONMENTAL PHILS. CO.

#2430 Laura St., Pandacan Manila

is hereby duly accredited as

SOURCE EMISSION TESTING FIRM

As such, the following are authorized as:

QA/QC Manager
Angelo V. Guevarra

Team Leader
Daniel L. Navidad, Jr.

This certification shall allow the above firm and personnel to conduct stack testing limited to the following methods and parameters:

1. US-EPA Method 1 to 5 – PM
2. US-EPA Method 6/8 – SO_2
3. US-EPA Method 7 – NO_x
4. US-EPA Method 10 – CO

Granted this **December 13, 2023** and valid until **December 13, 2026**.

GILBERT C. GONZALES, CESO III
Director and concurrent
Assistant Secretary for Field Operations

“APPENDIX G”

SOURCE SPECIFIC TEST PLAN
AND
FACILITY PERMIT

BenguetCorp

05 June 2024

ENGR. JEAN C. BORROMEO
OIC, Regional Director
Environmental Management Bureau
Cordillera Administrative Region
DENR Compound, Gibraltar Road,
Baguio City

Dear Director Borromeo:

We have contracted **GREENTEK ENVIRONMENTAL PHILS. CO.** to conduct Source Emission Test of the following:

1. **ONE (1) UNIT 5,013 CFM VERANTIS ACID FUME SCRUBBER**
2. **ONE (1) UNIT DUST COLLECTION FACILITY SYSTEM**
3. **THREE (3) STATIONS AMBIENT AIR (TSP, NO2, SO2 & NOISE LEVEL MEASUREMENT)**

The facility plant is located at **Benguet Corporation – Acupan Contract Mining Project (BC-ACMP Assay Laboratory and Mill Refinery), Balatoc, Virac, Itogon Benguet**. The purpose of this test is for our compliance to the terms and conditions of the issued Permit to Operate.

We therefore submit the attached source specific test plan which was prepared by **GREENTEK ENVIRONMENTAL PHILS. CO**. for your review and approval that the test will be accepted by EMB for the above purposes.

The proposed date of testing is on **June 28 & 29, 2024,** and each of the unit will be tested with a load of at least 90% of our rated capacity.

Thank you for your consideration on this request.

Respectfully yours,

JEMIMAH R. SALAYOG
Pollution Control Officer

VALERIANO B. BONGALOS JR.
VP / Resident Manager
Benguet Gold Operation

2353 RJ Place Bldg. Unit 3A, Selya St. Pandacan, Manila – OA
2430 Laura St. Pandacan, Manila -WO
Telephone no: (028)2446900, (027)5052335
Email address: greentek.services@yahoo.com

SITE SPECIFIC STACK EMISSION TEST PLAN

Facility Name: BENGUET CORPORATION – ACUPAN CONTRACT MINING PROJECT (BC-ACMP Assay Laboratory and Mill Refinery)

Facility Address: Balatoc, Virac, Itogon, Benguet

Sources to be tested: 1 unit Acid Fume Scrubber & 1 unit Dust Collection Facility System

INTRODUCTION:

GREENTEK ENVIRONMENTAL PHILS. CO. was contracted by **BENGUET CORPORATION – ACUPAN CONTRACT MINING PROJECT (BC-ACMP Assay Laboratory and Mill Refinery)** to conduct source emission testing at their facility located on the mentioned address.

The purpose of the test is to determine the compliance of the above sources with the emission standards. This test plan is prepared for review and approval by the **DENR-EMB – CAR** so that the results of the emission tests can be used as basis of their Permit to operate compliance to conditions.

The said sources will be tested of the following.

1. One (1) unit 5,013 CFM Verantis Acid Fume Scrubber – PM SOX NOX & CO

- Particulate Matter (PM), Sulfur Dioxide (Sox), Nitrogen Oxides (NOx), Carbon Monoxide (CO)

2. One (1) unit Dust Collection Facility System

- Particulate Matter (PM)

The test will be conducted in three (3) runs per unit source.

FACILITY INFORMATION:

The above testing activity will be performed at the facility specified below with the following contact information:

BENGUET CORPORATION – ACUPAN CONTRACT MINING PROJECT
(BC-ACMP Assay Laboratory and Mill Refinery)

Contact Person:	JEMIMAH R. SALAYOG POLLUTION CONTROL OFFICER	VALERIANO B. BONGALOS JR. VP/RESIDENT MANAGER BENGUET GOLD OPERATION
Contact Number:	0917-136-1496	

BRIEF DESCRIPTION OF THE SOURCE TO BE TESTED:

BENGUET CORPORATION – ACUPAN CONTRACT MINING PROJECT (BC-ACMP Assay Laboratory and Mill Refinery, is a mining company and has maintains and **One (1) unit 5,013 CFM Verantis Acid Fume Scrubber & One (1) unit Dust Collection Facility System.**

Emission testing will be conducted with a load of at least 90% for each of the unit source.

TEST METHODOLOGIES:

The sampling will be conducted in three sampling runs per source. The following DENR Standard Procedure (US-EPA Reference Methods) will be used in this stack- sampling program. These procedures are based on the US-EPA 40 CFR 60, Appendix A – Reference Methods for Emission Testing of Stationary Sources:

Method 1	Sample and velocity traverses
Method 2	Stack gas velocity and volumetric flowrate
Method 3	Gas analysis for O2 and CO2 and dry molecular weight
Method 4	Determination of moisture content
Method 5	Determination of particulate emission
Method 6	Determination of sulfur dioxide emission
Method 7	Determination of nitrogen oxides emission
Method 10	Determination of carbon monoxide emission

Methods 1 to 4 will be conducted in conjunction with Methods 5 and 6 which requires isokinetic emission sampling. **GREENTEK ENVIRONMENTAL PHILS. CO.,** will use stainless steel probe liner and sampling nozzle which is an accepted alternative of the USEPA (DENR approved) methods.

In addition to PM and SO_x sampling, the NO_x testing will be conducted using three samples per test run where one result may be disregarded if they are found to be an outlier from other values. CO samples will be collected in a tedlar bag and will be analyzed using a non-dispersive infra-red analyzer.

The table below describes the implementation of the above sampling procedures:

TABLE 1 – Sampling Matrix

Parameter	**Abbr.**	**Test Method**	**Test Duration**	**Notes**
Volumetric Flow Rate	VFR	EPA Method 1-4	Minimum of 60 minutes per run (3 Runs)	Performed concurrent with M5 test run
Particulate Matter	PM	EPA Method 5	Minimum of 60 minutes per run(3 Runs)	Performed concurrent with M5 test run
Sulfur Oxides	SOx (as SO2)	EPA Method 6	Minimum of 60 minutes per run (3 Runs)	Performed concurrent with M5 test run
Oxygen	O2	EPA Method 3Fyrite	Minimum of 60 minutes per run (3 Runs)	Integrated Tedlar bag sample during M5 test run
Carbon Dioxide	CO2	EPA Method 3Fyrite	Minimum of 60 minutes per run (3 Runs)	Integrated Tedlar bag sample during M5 test run
Nitrogen Oxides	NOx (as NO2)	EPA Method 7	Minimum of 60 minutes per run (3 Runs)	Grab Sampling during M5 test run
Carbon Monoxide	CO	EPA Method 10	Minimum of 60 minutes per run (3 Runs)	I integrated Tedlar bag sample during Method 5, same tedlar bag for CO2/ O2

The facility should operate each unit source continuously during the actual testing. In case the unit is operating intermittently, or the stack test ports did not comply with the Method 1 requirements, only gaseous pollutants will be tested such as SOx, NOx and CO including gas analysis of CO_2 and O_2. Three replicate test runs, about 30minutes in duration shall beperformed when the boilers are intermittently.

TEST SCHEDULE AND IMPLEMENTATION PLAN:

Table 2 – Sampling Schedule

Date	Source	Test Run	Notes
June 28 & 29, 2024	**One (1) unit 5,013 CFM Verantis Acid Fume Scrubber & One (1) unit Dust Collection Facility System.**	**Runs 1, 2 & 3**	**Duration of testing is 7 to8 hours includes set up to actual test per unit source.**

The actual run date and time may vary based on the facility process conditions, weather and testing logistics. The Test Team leader will coordinate the specific run plans with the designated facility representative.

TEST PERSONNEL:

Any of the following persons will be involved in the testing:

Danilo M. Palaypay Jr.	-	QA/QC MANAGER
Aaron Jonathan R. Regilme	-	TEAM LEADER
Angelo V. Guevarra	-	QAQC MANAGER
Daniel L. Navidad Jr.	-	TEAM LEADER

Sampling Personnel (any of the following)

Manny Cruz	Reynaldo S. Pile
Anthony M. Cabuncal	Ronnie S. Basa
Rodel M. Castante	Kristoffer Camarillo

Prepared by:

DANILO M. PALAYPAY JR.
QA/QC MANAGER

ANGELO V. GUEVARRA
QA/QC MANAGER

SAT NO: 2021-93 / 2023-151

SAT NO: 2023-152

Republic of the Philippines
Department of Environment and Natural Resources
ENVIRONMENTAL MANAGEMENT BUREAU
Cordillera Administrative Region
Baguio City

Permit No.	: **2007-POA-B-141105-043**
Date Issued	: **March 11, 2020**
Validity Period	: **February 17, 2020 to February 16, 2025**

PERMIT TO OPERATE
AIR POLLUTION SOURCE AND CONTROL INSTALLATION

Pursuant to Rule XIX, Part VI, of the Implementing Rules and Regulations of the Clean Air Act (Republic Act 8749), this Permit to Operate is hereby issued to:

BENGUET CORPORATION – ACUPAN CONTRACT MINING PROJECT
Balatoc, Virac, Itogon, Benguet
ECC CAR 1012-174-2110 (Amended)

for the emission, discharge or release of air pollutants from the following facilities/equipment (*16.359434, 120.658985*) installed at the **Mill Plant Refinery**:

Two (2) units Kerosene-fired Flame Torches of the Acidfying Chamber No. 2 which is connected to the **One (1) unit 5,013 CFM "VERANTIS" Acid Fume Scrubber System (No. 2)**

and are subject to the conditions specified on the attached two (2) pages.

Recommended by:

NESTOR M. DONAAL
OIC-Chief, Clearance & Permitting Division

Approved by:

MA. VICTORIA V. ABRERA
Regional Director

Permit Fee	: PhP 1,900.00	O.R. No.: 4702000	Date: January 21, 2020
	PhP 5,000.00	O.R. No.: 4702496	Date: March 3, 2020
Filing Fee	: PhP 600.00	O.R. No.: 4702000	Date: January 21, 2020
Pres. Decree 1856 Fee	: PhP 10.00	O.R. No.: 4702000	Date: January 21, 2020
Documentary Stamp Tax:	PhP 30.00	O.R. No.: 4700883	Date: January 21, 2020

RECORDS UNIT EMB-CAR
RECEIVED BY: ON: 3/13/2020
ON: 4/14/2020
ON:

20201800

CONDITIONS:

1. This Permit is issued for the permittee to operate ***two (2) units Kerosene-fired Flame Torches*** *of the Acidifying Chamber No. 2 which is connected to the* ***one (1) unit 5,013 CFM "VERANTIS" Acid Fume Scrubber System (No.2)*** at the permittee's establishment, **Benguet Corporation – Acupan Contract Mining Project**, located at ***Balatoc, Virac, Itogon, Benguet***.

2. This Permit shall be valid until February 16, 2025, as indicated in the *validity period* on page 1 of this Permit, unless suspended or revoked by the Bureau.

3. The Bureau may modify the Permit by amending any existing condition or imposing any new or additional condition during the period of validity, subject to the provisions of DENR Administrative Order No. 2004-26 (Amending Rule XIX of DENR Administrative Order No. 2000-81, the Implementing Rules and Regulations of RA 8749).

4. An application for renewal of this Permit shall be filed not less than thirty (30) days before the expiry date indicated on page 1 of the Permit.

5. Page 1 of this Permit shall be posted in a conspicuous location at the premises and shall be adequately framed or otherwise protected against damage.

6. The operation of any installation, process activity at this establishment that produces, generates, captures, treats, reduces, controls, emits, releases or disperses air pollutants without a valid Permit to Operate, or in a violation of any of the conditions of this Permit, shall be subject to penalties of not less than ten thousand (10,000) pesos and not more than one hundred thousand (100,000.00) pesos, pursuant to Rule LVI of the Implementing Rules and Regulations of RA 8749.

7. The installations, processes or activities at this establishment shall be operated, conducted and managed by the permittee, and the associated plant and equipment shall be properly maintained and operated by the permittee, so that emissions of air pollutants from the establishment, including fugitive or uncontrolled emissions or releases of air pollutants from abnormal or unexpected events, do not cause air pollution in the surrounding air environment or have adverse effects on persons in that environment.

8. Without limiting the generality of the previous condition, the permittee shall ensure that the emissions from the regulated installations or processes comply with:

   - The National Emission Standards for Source Specific Air Pollutants as specified in Rule XXV of the IRRs of RA 8749; and
   - The National Ambient Air Quality Standards for Source Specific Air Pollutants from Industrial Sources/Operations as specified in Rule XXVI of the IRRs of 8749.

9. The permittee shall submit Self–Monitoring Reports to the Bureau on a quarterly basis in accordance with DENR Administrative Order No. 27 (Series of 2003) and any written instructions by the Bureau based on the following schedule:

Quarter	Coverage	Submission	Quarter	Coverage	Submission
First	Jan. – Mar.	1-15 Apr.	Third	Jul. – Sept.	1-15 Oct.
Second	Apr. – Jun.	1-15 Jul.	Fourth	Oct. – Dec.	1-15 Jan.

10. The permittee shall at all times have an appointed or designated Pollution Control Officer (PCO) who shall be the day-by-day contact person between the Bureau and the establishment. The permittee shall ensure that the PCO is familiar with the operations and activities undertaken at the establishment, and the relevant emission sources and air pollution control devices and equipment. The permittee shall give the PCO the authority to implement corrective action in the event of a malfunction, accident, breakdown or other abnormal event that results in emissions that do not comply with emission standards or ambient air quality standards.

11. The permittee shall report in writing to the Bureau any malfunction, accident, breakdown, leak, spill or other abnormal or unexpected event which results in emissions to atmosphere that do not comply with the emission standards or ambient air quality standards, or in any other abnormal or unexpected releases of air pollutants. The report shall indicate the nature of the incident or event, its impact on emissions, the time period involved, and any actions or measures taken to control the emissions or releases, remedy any air pollution problems that may have occurred, and minimize the probability of a reoccurrence of the event the release.

12. The permittee shall at all times allow entry by the Department or the Bureau an access to any part of the establishment to conduct inspections, gather information, test emissions or take samples. The permittee and its personnel shall not obstruct such officers in the performance of these functions, and shall furnish pertinent information or materials requested from them. The permittee shall comply with any lawful instruction or direction given by the Department or the Bureau at all times.

13. The permittee shall not make or allow any alterations or modifications to operations, activities, installations, processes, plan or equipment at the establishment that may substantially change the nature or quantity of the associated emissions without obtaining the approval of the Bureau, including obtaining any necessary Permit to Operate.

BSI
Environmental Management Service Provider

31 July 2024

Ref. No.: LT-24-241-1-68

MR. FRANCISCO O. FLAVIER
Resident Manager
BMC FORESTRY CORPORATION
Irisan Lime Project.,
Irisan, Baguio City

ATTN: NARHY C. POMILBAN
Pollution Control Officer

Subject: ***Source Emission Monitoring Report***

Dear Mr. Flavier:

We are pleased to submit the final report of the source emission monitoring as a result of our visit to your facility in Irisan, Baguio City on May 28, 2024.

We hope that this report addresses your requirements.

Very truly yours,

EMMANUEL R. ALTAREJOS
Executive Vice President

ERA/*mla*

2nd Floor, VAG Bldg. Ortigas Ave., Greenhills
San Juan, Metro Manila, Philippines
Tel No. (632) 863-6129• Fax (632) 727-9831
Email: info@bsienv.com

Department of Environment and Natural Resources (DENR)
ENVIRONMENTAL MANAGEMENT BUREAU
ACCREDITED THIRD PARTY TESTER
Certificate No: SAT NO. 2022-72

OSHC-DOLE ACCREDITED WEM PROVIDER

SOURCE EMISSION MONITORING REPORT

One (1) Unit 1.08 MT/hr Vertical Shaft Kiln

BMC FORESTRY CORPORATION

Irisan, Baguio City

DENR SOURCE EMISSION TESTING FIRM
ACCREDITATION NO: SAT NO. 2022-72

2nd Floor, VAG Building
Ortigas Avenue, Greenhills, San Juan,
Metro Manila, Philippines

SOURCE EMISSION MONITORING REPORT
(May 28, 2024)

BMC FORESTRY CORPORATION
Irisan, Baguio City

Prepared for:

BMC Forestry Corporation
Km. 5, Naguilian Rd., Irisan, Baguio City
Tel. No.: 445-7177

Prepared by:

BSI
2nd Floor VAG Building, Ortigas Avenue
Greenhills, San Juan, Metro Manila
Tel. No.: (02) 863 6129; Fax. No.: (02) 727 9831

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Emission Test Report Certification

The emission sampling reported herein was performed under the direction and supervision of Mr. Edindo C. Fernando of BSI. The analyses of samples were conducted under the direction and supervision of Mr. Renato M. Gofredo, Jr. of ELARSI, Inc., a DENR-recognized Environmental Laboratory

I certify that the information contained in this report is authentic and accurate to the best of my knowledge.

Signed:.....

Edindo C. Fernando
BSI
DENR Accredited QA/QC Manager

Date:..07. AUG. 2024.....

1. INTRODUCTION

This report presents the procedures and results of the source emission monitoring conducted on May 28, 2024 at BMC Forestry Corporation situated in Irisan, Baguio City. BSI was commissioned to conduct the monitoring wherein Mr. Halcy Lemon P. Orquina led the team that administered the source emission sampling with Mr. Edindo C. Fernando as QA/QC Manager. Meanwhile, Mr. Francisco O. Flavier, Resident Manager of BMC Forestry Corporation, served as site contact person during sampling.

The pollutants considered for the source emission monitoring were: particulate matter (PM), sulfur oxides (as SO_2), nitrogen oxides (as NO_2) and carbon monoxide (CO) at one (1) unit 1.08 MT/hr vertical shaft kiln exhaust stack. The source was tested for three runs.

1.1 Process Description and Operation

BMC Forestry Corporation – BC ILP is an enterprise in the Philippines, with the main office in Baguio City. It operates in the Crop Production Industry *(https://www.emis.com/php/company-profile/PH/Bmc_Forestry_Corporation_en_3256166.html)* and a producer and supplier of burnt lime. Its Kiln plant located at Km. 5 Naguilian Road, Irisan, Baguio City operates three (3) vertical shaft kilns, three (3) gas scrubbers, two (2) cyclone dust collectors and one (1) jaw crusher.

One (1) unit of 1.08 MT/hr *Vertical Shaft Kiln No. 2* was operated at 100% operating rate was tested during sampling, and used low sulfur fuel oil as fuel source.

This report covers the source emission monitoring of the vertical shaft kiln no. 2 only.

1.2 Reason for Testing

The purpose of the monitoring was to verify the company's compliance with the source emission standards of the Department of Environment and Natural Resources (DENR) Administrative Order No. 81 Series of 2000 (Implementing Rules and Regulations of the Philippine Clean Air Act of 1999).

1.3 Facility Operating Conditions during the Test

The equipment information and operating conditions of the facility monitored were summarized in *Tables 1* and *2*, respectively.

Table 1. Equipment Information

Stationary Source Information		Vertical Shaft Kiln No. 2
Brand Name		N/A
Rated Capacity		1.08 MT/hr
Year Installed		No information provided
Exhaust Stack	Diameter	40 cm
	Height*	14 m
	Orientation	Vertical
Air Pollution Control Device		Wet Gas Scrubber
GPS Coordinates		16°25'9.012"N; 120°33'28.542"E

**Measured from the ground to the tip of the stack*

Table 2. Operating Conditions

Stationary Source Information	Vertical Shaft Kiln No. 2
Load During Sampling	100%
Fuel Used	BFO / IFO
Fuel Sulfur Content	No information provided
Fuel Consumption	No information available
Annual Operating Hours	8760 hours

2. SUMMARY OF RESULTS

Table 3 presents the summary of test results of the vertical shaft kiln no. 2 exhaust stack. The test results were compared with the National Emission Standards identified in IRR Part VII Rule XXV Table 2. A detailed description of the test run information and sample calculations used to derive the values in the tabular summary were attached in *Annex A*.

Three test runs were performed to collect: PM, SOx (as SO_2), NOx (as NO_2) and CO at vertical shaft kiln no. 2 exhaust stack. Three trial tests per run were conducted to collect samples of nitrogen oxides (as NO_2). The raw field data used to prepare the summary reports in *Annex A* was included in *Annex B*. Emissions have been corrected to the standard conditions of 25°C and 760 mmHg on dry basis (unless otherwise indicated). Moreover, in accordance with EMB Memorandum Circular No. 2021-15, the pollutant concentrations from the Vertical Shaft Kiln were not corrected with standard oxygen correction factor since the PTO of the unit was issued before the effectivity of the mentioned EMB memorandum.

Table 3. Vertical Shaft Kiln No. 2 Emission Test Results

		Run 1	Run 2	Run 3		
Sampling date		28-May-24	28-May-24	28-May-24		
Begin sampling time		1030H	1300H	1505H		
End sampling time		1135H	1410H	1610H		
Parameter	**Units**				**Average**	**DENR Standard**
Average stack temperature	°C	219.7	264.7	281.7	255.3	
CO_2 measured in stack gas	%	8.5	8.5	8.5	8.5	
Oxygen measured in stack gas	%	12.0	12.0	12.0	12.0	
Stack gas moisture content	%	6.77	6.94	6.62	6.78	
Flue gas velocity	m/s	15.86	16.42	16.70	16.33	
Actual volumetric flow	m^3/min	119.6	123.8	125.9	123.1	
Dry volumetric flow at STP	dsm^3/min	58.0	54.8	54.1	55.6	
Isokinetic flow rate	%	101.1	100.8	101.2		
Particulate matter data						
Concentration	mg/Nm^3	31.9	27.0	20.7	26.5	***150***
Annual emission rate	tons/yr	1.0	0.8	0.6	0.8	
Sulfur oxides data						
Concentration (as SO_2)	mg/Nm^3	24.0	16.4	14.5	18.3	***1500***
Annual emission rate	tons/yr	0.7	0.5	0.4	0.5	
Nitrogen oxides data						
Concentration (as NO_2) *	mg/Nm^3	< 23.6	< 20.4	< 20.3	< 21.4	***1000***
Annual emission rate	tons/yr	< 0.7	< 0.6	< 0.6	< 0.6	
Carbon monoxide data						
Concentration	mg/Nm^3	121.4	113.4	128.2	121.0	***500***
Annual emission rate	tons/yr	3.7	3.3	3.6	3.5	

Annual emission rates were based on one (1) year continuous operation.
** Average of three (3) trial tests*

2.1 Conclusions

A description of any method deviations and quality assurance assessment was included in *Sections 3* and *4* of this report. Based on a review of the sampling data, facility operating information, test method description and quality assurance results, the concentration values presented in *Table 3* have passed the criteria to be considered as representative emission test results of the source and are suitable for comparison with the regulatory limits.

Under the Implementing Rules and Regulations of the Clean Air Act (CAA), the standards applicable to vertical shaft kiln no. 2 are as "*existing fuel-burning equipment; other stationary source*".

In conclusion, the test results indicate that the average emissions from vertical shaft kiln no. 2 exhaust stack:

- comply with the applicable standard for PM emissions;
- comply with the applicable standard for SOx (as SO_2) emissions;
- comply with the applicable standard for NO_X (as NO_2) emissions; and
- comply with the applicable standard for CO emissions.

3. SAMPLING AND ANALYTICAL PROCEDURES

All sampling were undertaken in accordance with US EPA standard methods, viz:

Method 1	Sample and Velocity Traverse Point Locations
Method 2	Stack Gas Velocity and Volumetric Flow Rate (S-type Pitot Tube)
Method 3	Gas Analysis for Determination of Dry Molecular Weight
Method 4	Determination of Moisture Content in Stack Gases
Method 5	Determination of Particulate Matter Emissions from Stationary Sources
Method 6	Determination of Sulfur Dioxide Emissions from Stationary Sources
Method 7	Determination of Nitrogen Oxide Emissions from Stationary Sources
Method 10	Determination of Carbon Monoxide Emissions from Stationary Sources

3.1 Methods 1 and 2 – Traverse Point and Stack Velocity

3.1.1 Sampling points

For the vertical shaft kiln no. 1 exhaust stack, the number and location of the sampling points were determined using the procedures of US EPA Method 1 since the equivalent stack diameter was measured to be greater than 30 cm.

The vertical shaft kiln no. 1 was sampled at a total of twenty-four (24) traverse points. Having two (2) available portholes that are 90° apart, twelve (12) traverse points were sampled for each.

Some of the traverse points of the exhaust stack were less than the criterion of Method 1 for allowable distance from the stack wall of stacks with diameter less than 0.61 meters. These points were relocated 1.3 cm (0.5 in) away from the stack wall.

3.1.2 Cyclonic Flow Check

For each sampling point, the rotation angle was determined using an "S-type" pitot tube assembly, liquid manometer and angle finder in accordance with section 2.4 of US EPA Method 1.

For each test point, the average absolute value of the rotation angle was less than the 20 degrees criterion of Method 1.

3.1.3 Flue Gas Velocity

The procedures of US EPA Method 2 were employed to determine the flue gas velocity and volumetric flow rate using an "S-type" pitot tube in making velocity head measurements (Δp). The "S-type" pitot tube conforms to the geometric specifications of Method 2 and has therefore been assigned a coefficient of 0.84. An inclined manometer built onto the meter console box was used to measure the differential pressures, while flue gas temperatures were measured with chromel-alumel thermocouples equipped with digital readouts.

3.2 Method 3 – Flue Gas Composition

US EPA Method 3 procedures were used to determine the flue gas composition and molecular weight. An "Orsat" sample pump was operated continuously at a constant rate during each Method 5/6 (Modified) sampling run to collect an integrated flue gas sample into a tedlar bag through a separate sample line attached to the probe. Moisture was removed from the sample by passing it through a small impinger charged with silica gel.

The content of each tedlar bag was analyzed using a Fyrite analyzer to determine the concentration of oxygen and carbon dioxide in the sample.

The same bag samples were also used for the carbon monoxide analysis by Method 10.

3.3 Method 4 – Flue Gas Moisture Content

The moisture content of the flue gas was determined using the US EPA Method 4 procedures in conjunction with Method 5/6 (Modified).

3.4 Method 5/6 (Modified) – Particulate Matter and Sulfur Oxides

3.4.1 Sample Collection

A US EPA Method 5/6 (Modified) sampling train was used to extract samples isokinetically from the stack which comprised the following elements:

- a stainless steel nozzle;
- a heated stainless steel probe with "S-type" pitot tube;
- a glass fibre filter maintained at 120°C ± 14 °C;
- four chilled impingers:
  - 1st and 2nd containing 100 mL 3% H_2O_2;
  - 3rd left empty; and
  - 4th containing 200 to 300 grams of silica gel; and
- a metering console.

Each of the impingers was labeled and weighed.

Three test runs were conducted at the available sampling ports. The actual sampling time was 60 minutes per run.

3.4.2 Sample Recovery

Sample recovery was undertaken at the sheltered area near the source of emission. The filter was removed from the filter holder and placed on a petri dish. The volume of water vapor condensed in the impingers was measured to determine the volume of water vapor collected.

The nozzle, probe and front half of the filter holder were rinsed with acetone, and the interior of the probe and nozzle were rinsed and brushed repeatedly to remove any adhering PM from the inside surfaces. All rinses were collected into a 250 mL glass bottle.

The contents of the impingers 1, 2 and 3 were transferred to a 1000 mL polyethylene sample bottle. The glass sample line between the heated filter holder and the first impinger, the first three impingers and connecting glasswares were all rinsed with distilled deionized water and the rinse was added into the sample bottle.

3.4.3 Sample Analysis

The filter and sample bottles, together with the blank samples of acetone and H_2O_2, were submitted to a DENR-recognized laboratory.

The mass of filterable particulate matter collected on the filter and in the acetone rinse was determined in accordance with US EPA Method 5 analytical procedures.

The mass of sulfur oxides in the impinger contents and rinse water was determined in accordance with US EPA Method 6 analytical procedures.

3.5 Method 7 – Nitrogen Oxides

3.5.1 Sample Collection

The sampling of the flue gas to determine the concentration of nitrogen oxides was undertaken in accordance with US EPA Method 7 using a nominal 2 L glass collection flask containing 25 mL of NO_X absorbing reagent (Sulfuric Acid-Hydrogen Peroxide) connected to a Borosilicate glass probe sufficiently heated to avoid condensation and equipped with a glass wool filter at the end for particulate matter screening.

During the Method 7 testing, a flask was evacuated to an absolute pressure of 76 mmHg (3 inHg) at most less than the barometric pressure, and the initial flask temperature and pressure were recorded. The sampling train was then checked for leakage not exceeding 10 mmHg (0.4 inHg) in 1 min. The probe was inserted into the stack, connected to the flask and after purging the probe, a sample was drawn into the flask. The flask was then shaken for five minutes. This procedure was carried out thrice for three test runs resulting in the collection of nine samples for the exhaust stack.

3.5.2 Sample Recovery

The NO_x flasks were set at least 16 hours, shaken for two minutes and then the final flask temperature and pressure were measured. The contents of each flask were transferred to a leak-free polyethylene bottle and rinsed twice with 5 mL portions of deionized distilled water, and the rinse water was added into the bottle. Prior to analysis, the pH was adjusted to a value within 9 to 12 by adding 1N NaOH.

3.5.3 Sample Analysis

The sample preparation procedures of US EPA Method 7 were applied and each sample was then subjected to colorimetric analysis.

3.6 Method 10 – Carbon Monoxide

3.6.1 Sample Collection

The integrated samples that were collected into tedlar bags were used for the determination of CO in accordance with US EPA Method 10.

3.6.2 Sample Recovery

The tedlar bags were sealed and transported for analysis.

3.6.3 Sample Analysis

The sample was analyzed using a non-dispersive infrared (NDIR) analyzer. The analyzer was flushed with nitrogen and zero setting confirmed. The tedlar bag was attached to the sample input and the gas sample was introduced at a flow rate of about 0.5 L/min by applying gentle pressure to the tedlar bag. The concentration was recorded when the value indicated on the display stabilized.

4. QA PROCEDURES

The US EPA "Quality Assurance Handbook for Air Pollution Measurement Systems: Volume III Stationary Source-Specific Methods" was used as a guide to achieve the quality assurance objectives of producing data that are complete, representative and of known precision and accuracy.

4.1 Particulate Matter and Sulfur Oxides (as SO_2)

4.1.1 Sampling Procedure

US EPA Method 5/6 (Modified) was employed to determine the concentration of particulate matter in the gas stream. This method requires the use of Methods 1 to 4 to determine sampling port locations, sample traverse points within the stack, as well as the flow rate, molecular weight and moisture content of the flue gas.

The quality of the emission test was assured by:

- Ensuring that the test port is located sufficiently distant from both upstream and downstream flow disturbances (such as bends and changes in stack diameter).
- Ensuring that stack gas flow is essentially parallel to the stack walls by conducting a cyclonic flow check.
- Determination of a representative stack gas velocity by the selection of sampling test points appropriate to the stack diameter in accordance with the method.
- Leak testing of the sampling train before and after each sampling run.
- Testing and calibration of the dry gas meter, thermocouples and temperature displays, pitot tubes, nozzles, and manometer assembly.
- Ensuring that the temperature of the impinger system is maintained below 20°C.
- Maintaining the filter and sampling probe temperature at 120°C (±14°C).
- Sampling at between 90 - 110% of the actual gas stream velocity (isokinetic sampling).

The procedure for sampling SOx (as SO_2) was combined with US EPA Method 5 as described in *Section 3.4*. The quality of the test was assured by:

- The use of freshly-prepared chemical solutions;
- Care in the recovery of the sample;
- Attention to detail in the analysis of samples in accordance with the US EPA Method 6;
- The collection and analysis of representative "blank" samples; and
- Proper calibration and QA/QC checks of all elements of the sampling system.

4.1.2 Sampling Equipment

Copies of various calibration and test certificates were included in *Annex E*.

Barometer

A calibrated digital barometer was used to measure atmospheric pressure at the platform level.

Probe Nozzle

The probe nozzles were calibrated by the manufacturer and were inspected and checked for roundness before use to ensure that they met the specifications of the method.

Pitot Tube

The pitot tube meets the EPA Method 2 design specifications for "S-type" pitot tubes and was therefore assigned a baseline coefficient of 0.84. After each test, the pitot tube was visually inspected for damage.

Metering System

The meter box was leak checked and a calibration was carried out using five (5)-point calibrating orifices in accordance with EPA Method 5.

Post-Test Meter Calibration

A post-test meter calibration was made using the data collected for each of the test runs in accordance with the procedure set out in EPA ALT-009.

Temperature Sensors

An ethanol-filled thermometer with NIST traceable calibration was used to calibrate thermocouples at approximately 0°C in iced water, ambient temperature and approximately 100°C in boiling water. At the completion of each test, the thermocouples were compared to the ethanol-in-glass thermometer at ambient temperature and a continuity check was performed to ensure that the thermocouple read-out trended in the correct direction when subjected to a temperature change.

4.1.3 Analysis

Filters and acetone used in the emission test met the required specifications and Method 5 analytical procedures were employed using a properly calibrated analytical balance.

The mass of sulfur oxides in the impinger contents and rinse water were determined in accordance with US EPA Method 6 analytical procedures.

4.2 Nitrogen Oxides (as NO_2)

The procedure for sampling NO_X (as NO_2) was described in *Section 3.5*. The quality of the test was assured by:

- The use of freshly-prepared chemicals;
- Care in the recovery of the sample;
- Attention to detail in the analysis of samples in accordance with the US EPA Method 7;
- Calibration and verification of linearity of the spectrophotometer; and
- Proper calibration and QA/QC checks of all elements of the sampling system.

4.3 Carbon Monoxide

The procedure for sampling CO was described in *Section 3.6*. The quality of the test was assured by:

- Care in the collection of the gas samples to ensure that they are representative of the emission;
- Maintenance of a leak-free bag at all stages of sampling and analysis;
- Calibration of the analytical instrument prior to analysis; and
- Attention to detail in the analysis of samples in accordance with the US EPA Method 10.

ANNEX A

SOURCE EMISSION MONITORING SUMMARY OF RESULTS

EMISSION TEST RESULTS SUMMARY

BMC FORESTRY CORP. ILP
IRISAN, BAGUIO CITY
VERTICAL SHAFT KILN NO. 2

			Run 1	Run 2	Run 3	
	Sampling date		28-May-24	28-May-24	28-May-24	
	Begin sampling time		1030H	1300H	1505H	
	End sampling time		1135H	1410H	1610H	
Symbol	**Parameter**	**Units**				**Average**
Y	Meter box gamma	none	0.9884	0.9884	0.9884	
ΔH	Average ΔH	mm H_2O	63.5	58.0	52.3	
P_{bar}	Barometric pressure	mm Hg	652.7	651.5	650.5	
V_m	Metered sample gas volume	m^3	1.6272	1.5420	1.5294	
T_m	Average meter temperature	°C	29.8	30.5	29.9	
P_g	Static pressure	mm H_2O	10.0	10.0	10.0	
T_s	Average stack temperature	°C	219.7	264.7	281.7	255.3
Ds	Stack diameter	cm	40	40	40	
V_{lc}	Volume of water collected	mL	73.4	71.1	67.0	
$\%CO_2$	CO_2 measured in stack gas	%	8.5	8.5	8.5	8.5
$\%O_2$	Oxygen measured in stack gas	%	12.0	12.0	12.0	12.0
C_p	Pitot tube coefficient	none	0.84	0.84	0.84	
$\sqrt{\Delta P}$	Average of square roots of ΔP	$(mm\ H_2O)^{½}$	*3.350*	*3.316*	*3.321*	
θ	Sampling run time	min	60	60	60	
D_n	Nozzle diameter	mm	7.89	7.89	7.89	
A_n	Nozzle area	m^2	*4.89E-05*	*4.89E-05*	*4.89E-05*	
$V_{m(std)}$	Metered gas volume at STP	Nm^3	*1.3684*	*1.2904*	*1.2799*	
P_s	Stack pressure	mm Hg	*653.44*	*652.24*	*651.24*	
B_{ws}	Stack gas moisture content	%	*6.77*	*6.94*	*6.62*	6.78
$V_{w(std)}$	Water vapour volume at STP	Nm^3	*0.100*	*0.096*	*0.091*	
M_{fd}	Dry mole fraction of flue gas	none	*0.932*	*0.931*	*0.934*	
M_d	Dry molecular weight	g/g-mole	*29.84*	*29.84*	*29.84*	
M_s	Wet molecular weight	g/g-mole	*29.04*	*29.02*	*29.06*	
v_s	Flue gas velocity	m/s	*15.86*	*16.42*	*16.70*	16.33
A_s	Stack area	m^2	*0.126*	*0.126*	*0.126*	
$Q_{a(act)}$	Actual volumetric flow	m^3/min	*119.6*	*123.8*	*125.9*	123.1
$Q_{s(std)}$	Dry volumetric flow at STP	dsm^3/min	*58.0*	*54.8*	*54.1*	55.6
I	Isokinetic flow rate	%	*101.1*	*100.8*	*101.2*	
AOH	Annual operating hours	hrs/yr	8,760	8,760	8,760	
	Particulate matter data					
M_{part}	Measured mass	mg	43.6	34.8	26.5	
C_{part}	Concentration	mg/Nm^3	31.9	27.0	20.7	26.5
	Mass emission rate	kg/hr	0.11	0.09	0.07	0.09
	Annual emission rate	tons/yr	1.0	0.8	0.6	0.8
	Sulphur oxides data					
M_{SOx}	Measured mass	mg	32.78	21.22	18.57	
C_{SOx}	Concentration	mg/Nm^3	24.0	16.4	14.5	18.3
	Mass emission rate	kg/hr	0.08	0.05	0.05	0.06
	Annual emission rate	tons/yr	0.7	0.5	0.4	0.5
	Nitrogen oxides data					
C_{NOx}	Concentration	mg/Nm^3	< 23.6	< 20.4	< 20.3	< 21.4
	Mass emission rate	kg/hr	< 0.08	< 0.07	< 0.07	< 0.07
	Annual emission rate	tons/yr	< 0.7	< 0.6	< 0.6	< 0.6
	Carbon monoxide data					
C_{COppm}	Concentration	ppm	106.0	99.0	112.0	
C_{COmg}	Concentration	mg/Nm^3	121.4	113.4	128.2	121.0
	Mass emission rate	kg/hr	0.42	0.37	0.42	0.40
	Annual emission rate	tons/yr	3.7	3.3	3.6	3.5

Notes: *Italics indicates calculated value*
Annual emission rates were based on one (1) year continuous operation.

NITROGEN OXIDES (as NO_2) EMISSIONS DATA

BMC FORESTRY CORP. ILP

IRISAN, BAGUIO CITY

VERTICAL SHAFT KILN NO. 2

RUN 1

Sample Collection

Barometric Pressure, $P_{bar(i)}$ (in Hg): 29.69

Sample ID	Flask ID	Flask Volume	Evacuated Pressure	Initial Absolute Pressure	Flask Temp	Flask Temp	Collection Time
		V_f	P_{gi}	P_i		T_i	
		mL	in Hg	(in Hg)	°C	°K	
S1R1T1	BSI T2-F19	2315	23.30	6.39	27.6	300.75	1035H
S1R1T2	BSI T2-F20	2250	23.20	6.49	28.4	301.55	1045H
S1R1T3	BSI T2-F21	2310	23.40	6.29	28.3	301.45	1055H

Date Collected: 28-May-2024

Sample Recovery

Barometric Pressure, $P_{bar(f)}$ (in Hg): 29.70

Sample ID	Flask ID	Final Pressure	Final Absolute Pressure	Flask Temp	Flask Temp
		P_{gf}	P_f	Temp	T_f
		in Hg	in Hg	°C	°K
S1R1T1	BSI T2-F19	0.30	29.40	28.7	301.85
S1R1T2	BSI T2-F20	0.50	29.20	28.6	301.75
S1R1T3	BSI T2-F21	0.50	29.20	28.1	301.25

Date Recovered: 29-May-2024

Concentration Calculation

Volume at STP	Mass Catch	NO_x Conc.
V_{sc}	M_{NO2}	C_{NO2}
mL	µg	mg/Nm^3
1736.8	< 40.4	< 23.3
1667.4	< 40.4	< 24.2
1731.0	< 40.4	< 23.3
	Average	**< 23.6**

RUN 2

Sample Collection

Barometric Pressure, $P_{bar(i)}$ (in Hg): 25.65

Sample ID	Flask ID	Flask Volume	Evacuated Pressure	Initial Absolute Pressure	Flask Temp	Flask Temp	Collection Time
		V_f	P_{gi}	P_i		T_i	
		mL	in Hg	(in Hg)	°C	°K	
S1R2T1	BSI T2-F22	2250	23.20	2.45	27.7	300.85	1304H
S1R2T2	BSI T2-F23	2235	23.30	2.35	27.8	300.95	1314H
S1R2T3	BSI T2-F24	2285	23.30	2.35	28.2	301.35	1324H

Date Collected: 28-May-2024

Sample Recovery

Barometric Pressure, $P_{bar(f)}$ (in Hg): 29.70

Sample ID	Flask ID	Final Pressure	Final Absolute Pressure	Flask Temp	Flask Temp
		P_{gf}	P_f	Temp	T_f
		in Hg	in Hg	°C	°K
S1R2T1	BSI T2-F22	0.40	29.30	28.3	301.45
S1R2T2	BSI T2-F23	0.60	29.10	28.2	301.35
S1R2T3	BSI T2-F24	0.40	29.30	28.2	301.35

Date Recovered: 29-May-2024

Concentration Calculation

Volume at STP	Mass Catch	NO_x Conc.
V_{sc}	M_{NO2}	C_{NO2}
mL	µg	mg/Nm^3
1973.4	< 40.4	< 20.5
1953.6	< 40.4	< 20.7
2012.9	< 40.4	< 20.1
	Average	**< 20.4**

RUN 3

Sample Collection

Barometric Pressure, $P_{bar(i)}$ (in Hg): 25.61

Sample ID	Flask ID	Flask Volume	Evacuated Pressure	Initial Absolute Pressure	Flask Temp	Flask Temp	Collection Time
		V_f	P_{gi}	P_i		T_i	
		mL	in Hg	(in Hg)	°C	°K	
S1R3T1	BSI T2-F25	2250	23.30	2.31	27.0	300.15	1510H
S1R3T2	BSI T2-F26	2230	23.50	2.11	27.0	300.15	1520H
S1R3T3	BSI T2-F27	2280	23.50	2.11	27.2	300.35	1530H

Date Collected: 28-May-2024

Sample Recovery

Barometric Pressure, $P_{bar(f)}$ (in Hg): 29.70

Sample ID	Flask ID	Final Pressure	Final Absolute Pressure	Flask Temp	Flask Temp
		P_{gf}	P_f	Temp	T_f
		in Hg	in Hg	°C	°K
S1R3T1	BSI T2-F25	0.40	29.30	28.5	301.65
S1R3T2	BSI T2-F26	0.60	29.10	28.6	301.75
S1R3T3	BSI T2-F27	0.50	29.20	28.4	301.55

Date Recovered: 29-May-2024

Concentration Calculation

Volume at STP	Mass Catch	NO_x Conc.
V_{sc}	M_{NO2}	C_{NO2}
mL	µg	mg/Nm^3
1981.9	< 40.4	< 20.4
1963.4	< 40.4	< 20.6
2016.9	< 40.4	< 20.0
	Average	**< 20.3**

SAMPLE CALCULATIONS

BMC FORESTRY CORP. ILP

IRISAN, BAGUIO CITY

VERTICAL SHAFT KILN NO. 2

VOLUME OF DRY GAS SAMPLED AT STANDARD CONDITIONS

$$V_{m(std)} = Y \times 0.3921 \times V_m \times \frac{P_{bar} + (\Delta H \div 13.6)}{(273 + T_m)}$$

$$V_{m(std)} = 0.9884 \times 0.3921 \times 1.6272 \times \frac{652.7 + (63.5 \div 13.6)}{(273 + 29.8)} = 1.3684 \ Nm^3$$

VOLUME OF WATER VAPOUR AT STANDARD CONDITIONS

$$V_{w(std)} = 0.001356 \times V_{lc}$$

$$V_{w(std)} = 0.001356 \times 73.4 = 0.100 \ Nm^3$$

PERCENT MOISTURE IN FLUE GAS

$$B_{ws} = \frac{V_{w(std)}}{(V_{w(std)} + V_{m(std)})}$$

$$B_{ws} = \frac{0.100}{(0.100 + 1.3684)} = 6.77 \ \%$$

ABSOLUTE FLUE GAS PRESSURE

$$P_s = P_{bar} + \frac{P_g}{13.6}$$

$$P_s = 652.7 + \frac{10}{13.6} = 653.44 \ mm\ Hg$$

DRY MOLECULAR WEIGHT OF FLUE GAS

$$M_d = (\%CO_2 \times 0.44) + (\%O_2 \times 0.32) + [\{100 - (\%CO_2 + \%O_2)\} \times 0.28]$$

$$M_d = (8.5 \times 0.44) + (12.0 \times 0.32) + [\{100 - (8.5 + 12.0)\} \times 0.28] = 29.84 \ g/g\ mole$$

WET MOLECULAR WEIGHT OF FLUE GAS

$$M_s = M_d \times (1 - B_{ws}) + \left(\frac{mol.wt.}{H_2O} \times B_{ws}\right)$$

$$M_s = 29.84 \times (1 - 0.0677) + (18 \times 0.0677) = 29.04 \ g/g\ mole$$

AVERAGE FLUE GAS VELOCITY

$$v_s = 34.97 \times C_p \times \sqrt{\Delta P} \times \sqrt{\left\{\frac{T_s + 273}{P_s \times M_s}\right\}}$$

$$v_s = 34.97 \times 0.84 \times 3.350 \times \sqrt{\left\{\frac{219.7 + 273}{653.4 \times 29.04}\right\}} = 15.86 \ m/s$$

ACTUAL WET FLUE GAS FLOW RATE

$$Q_a = 60 \times v_s \times A_s$$

$$Q_a = 60 \times 15.86 \times 0.126 = 119.6 \ m^3/min$$

DRY, NORMAL FLUE GAS FLOW RATE

$$Q_s = Q_a \times M_{fd} \times \frac{298}{273 + T_s} \times \frac{P_s}{760}$$

$$Q_s = 119.6 \times 0.932 \times \frac{298}{273 + 219.7} \times \frac{653.4}{760} = 58.0 \ dsm^3/min$$

SAMPLE CALCULATIONS

BMC FORESTRY CORP. ILP

IRISAN, BAGUIO CITY

VERTICAL SHAFT KILN NO. 2

ISOKINETIC FLOW RATE

$$I = \frac{P_{std}}{T_{std}} \times \frac{100}{60} \times \frac{T_s + 273}{P_s} \times \frac{V_{m(std)}}{v_s \times M_{fd} \times \theta \times A_n}$$

$$I = \frac{760}{298.15} \times \frac{100}{60} \times \frac{219.7 + 273}{653.44} \times \frac{1.3684}{15.86 \times 0.932 \times 60 \times 4.89E\text{-}05} = 101.1\%$$

PARTICULATE MATTER CONCENTRATION

$$C_{part} = \frac{M_{part}}{V_{m(std)}}$$

$$C_{part} = \frac{43.6}{1.3684} = 31.9 \text{ mg/Nm}^3$$

SULPHUR OXIDES CONCENTRATION

Concentration of SO_x as SO_2

$$C_{SOx} = \frac{M_{SO2}}{V_{m(std)}}$$

$$C_{SOx} = 24.0 \text{ mg/Nm}^3$$

NITROGEN OXIDES CONCENTRATION

Concentration of NO_x as NO_2

$$C_{NOx} = \frac{M_{NO2}}{V_{sc}} \times 1000$$

$$C_{NOx} = 23.3 \text{ mg/Nm}^3$$

CONVERSION OF CO IN ppm TO mg/Nm^3

$$C_{CO(mg)} = \frac{C_{CO(ppm)} \times \text{mol. wt. CO}}{24.5}$$

$$C_{CO(mg)} = \frac{106.0 \times 28.01}{24.5} = 121.4 \text{ mg/Nm}^3$$

ANNEX B

SOURCE EMISSION MONITORING FIELD DATA

MONITORING LOGSHEET

Facility Information

Facility Name	BMC FORESTRY CORP. ICP
Facility Address	KM. 6 NAGUILIAN ROAD, IRISAN, BAGUIO CITY
Name of Pollution Control Officer	MS. NARHY C. POMILBAN
Maintenance Supervisor / Engineer	
Telephone and Fax Number	

Source Description

Source Type	VERTICAL SHAFT KILN #2
Source ID	P124 241 S1
Manufacturer / Brand of Equipment / Serial No.	✓
Equipment Capacity (BHp,MW,MT/hr)	1.08 MT/HR.
Date of Installation (month/year)	
Date of Modification (that may increase emissions)	
Operational Hours per Year (hrs/year)	✓ 8,760 hrs./year
Operating rate (%)	✓ 100 %

Air Pollution Control Device

Is there an Air Pollution Control Device (APCD) attached to the source?	____ YES ____ NO
Type of APCD	
Date of Installation	
APCD parameters (flowrate,gpm,delta P,etc)	
Is the APCD operating during emission sampling	____ YES ____ NO

Fuel Analysis / Information

Type of Fuel used during emission sampling (%S)	✓ Bunker (BFO) Fuel Oil / Industrial (IFO) Fuel Oil
Original Fuel used	✓ BFO
Date of Fuel change	
Daily Fuel Consumption (Liters/day)	
Is the Fuel Analysis Available?	____ YES ____ NO
Will the company provide the Fuel Analysis	____ YES ____ NO

Please attach the following
- -Fuel Analysis
- -Permit to Operate
- -APCD Process Logsheet
- -Source Process Logsheet

✓ Narhy C. Pomilban

Signature over printed name of Facility Representative

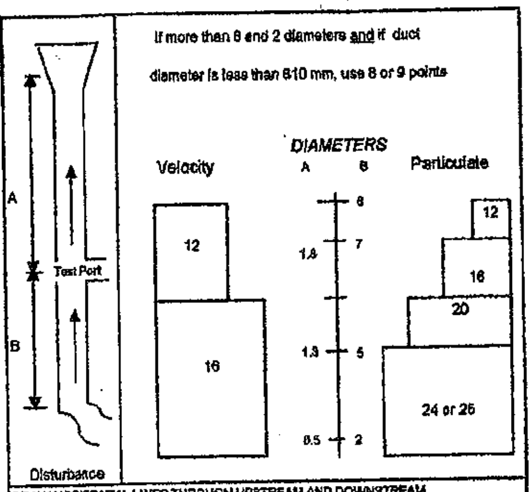
EMSP
Environmental Management Service Provider

METHOD 1 - TRAVERSE POINT LOCATIONS

Facility Name	BMC FORESTRY CORP. TLP
Address	NAGUILIAN ROAD, IRISAN, BAGUIO City
Source	1.08 MT/hr. VERTICAL SHAFT KILN # 2
Personnel / Date	ECE, HPD, RME, CAS, MSL, JBT

Stack / Ports				
	Type of Stack	Circular	✓	Rectangle
	No. of Ports Available		2	
	No. of Ports Used		2	
	Port inside Diameter, cm		8	

Dimensions		
	Far Wall to Outside of Port,cm(a)	49
Put diagram of test	Port length, cm (b)	9
location (s) on back	Stack Diameter or Depth,cm (a-b)	40
	Stack Width (if rectangle), cm	
	Stack Length (if rectangle), cm	
of this sheet	Equivalent Stack Diameter, cm	
	Area of Stack, cm²	



Distance to Flow Disturbances	Distance, cm	Diameters
Upstream (A)	185	4.625
Downstream (B)	140	3.50

Number of Traverse Points			Minimum # Required
		Particulate Traverse	24
		Velocity Traverse	16
# of Ports used	2	# Points / Port	12
		Number of Traverse Points Used	24

Equivalent Diameter (for rectangular ducts):
De = 2 * Depth * Width / Depth + Width)
De = 2 * ( ) * ( ) / ( ) + ( ) =

Point No.	Fraction of Stack Dia.	Dist. From Inside Wall	Port Length	Dist. From Edge of Port
1	0.021	0.84	9	9.84
2	0.067	2.68	9	11.68
3	0.118	4.72	9	13.72
4	0.177	7.08	9	16.08
5	0.250	10.0	9	19.0
6	0.356	14.24	9	23.24
7	0.644	25.76	9	34.76
8	0.750	30.0	9	39.0
9	0.823	32.92	9	41.92
10	0.882	35.28	9	44.28
11	0.933	37.32	9	46.32
12	0.979	39.16	9	48.16
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				

Note: when using 4 ports in a circular duct, the probe is marked with only the points for the first half of the full diameter traverse.

LOCATION OF POINTS IN CIRCULAR STACTS OR DUCTS
(Fraction of stack diameter from inside wall to traverse point)

	2	4	6	8	10	12
1	.146	.067	.044	.032	.026	.021
2	.854	.250	.146	.105	.082	.067
3		.750	.296	.194	.146	.118
4		.933	.704	.323	.226	.177
5			.854	.677	.342	.250
6			.956	.806	.658	.356
7				.895	.774	.644
8				.968	.854	.750
9					.918	.823
0					.974	.882
11						.933
12						.979

LOCATION OF POINTS IN RECTANGULAR STACKS OR DUCTS
(Fraction of stack diameter from inside wall to traverse point)

	2	3	4	5	6	7	8	9	10	11	12
1	.250	.167	.125	.100	.083	.071	.063	.056	.050	.045	.042
2	.750	.500	.375	.300	.250	.214	.188	.167	.150	.136	.125
3		.833	.625	.500	.417	.357	.313	.278	.250	.227	.208
4			.875	.700	.583	.500	.438	.389	.350	.318	.292
5				.900	.750	.643	.563	.500	.450	.409	.375
6					.917	.786	.688	.611	.550	.500	.458
7						.929	.813	.722	.650	.591	.542
8							.938	.833	.750	.682	.625
9								.944	.850	.773	.708
10									.950	.864	.792
11										.955	.875
12											.958

adjusted pt.

Notes/Remarks:

Team Leader / Date: HP. AQUINA / 28 MAY 24

QA/QC / Date: E. C. FERNANDO / 28 MAY 24

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Department of Environment and Natural Resources (DENR)
ENVIRONMENTAL MANAGEMENT BUREAU
ACCREDITED THIRD PARTY TESTER

BSI

EPA METHODS 1 & 2
GAS VELOCITY and CYCLONIC FLOW CHECK

Facility	BMC FORESTRY CORP. ILP	Thermocouple ID	TMC - T2
Town/Province	IRISAN, BAGUIO CITY	Manometer ID	MID - T2
Source	100 MT/hr VERTICAL SHAFT KILN 2	P barometer, mm Hg	652.2
Personnel	ECF, HPO, RME, MCL, CAC, JBT	Pitot ID	PT-T2-6
Date	28 MAY 2024 (TUESDAY)	Pitot Coefficient	0.84

Pitot Tube Leak Check: 130/130

Static Pressure, mm H_2O: 0.0

Measured at which Traverse Pt: @ A5

Traverse Point	Velocity Pressure (mm H_2O)	Temperature (Degrees C)	Angle Which Yields Null (degrees)
A - 12	10.6	180	12
11	10.4	180	12
10	10.6	185	10
9	11.0	185	10
8	11.0	190	8
7	11.0	190	8
6	11.4	190	8
5	11.4	190	10
4	11.0	185	10
3	11.0	185	10
2	10.6	180	12
1	10.6	180	12
B - 12	10.6	180	12
11	10.6	186	12
10	11.0	185	10
9	11.0	185	10
8	11.4	190	8
7	11.4	190	8
6	11.4	190	8
5	11.0	190	10
4	11.0	185	10
3	10.6	185	10
2	10.6	180	12
1	10.4	180	12
Average	√Δp avg = 3.304	185.0	passed cyclonic test

Note: O_2 = 12.0; CO_2 = 8.0; BWS = 5.0; ~~[illegible]~~ 7.89 (T2PS-4) ... meter = 5.672

Team Leader/Date: H.P. ORQUINA / 28 MAY 24 QA/QC / Date: E.C. FERNANDO / 28 MAY 24

Environmental Management Service Provider

ISOKINETIC FIELD DATA SHEET
METHOD(s) 4

Facility Name	BMC	Test Date	5-28-24
Address	Baguio City	Job Number	1024-241
Source	S1 /	Year Installed	
Control device		Field Personnel	
Contact Person		Operations Signature	

Filter ID	Tare(s)	Barometric (mm Hg)	Static (mm H_2O)	Meterbox ID#	Gamma	DeltaH @	Nozzle ID#	Dia.	Pitot Tube ID#	Cp	Probe ID#
565-669	0.3615										
		652.2	-10.0	BM12	0.9884	42.1749			[illegible]	0.84	[illegible]

Sample Train Leak Checks		Initial	Interim				Final	Fyrites Time	%O_2	%CO_2
Run No.										
K Factor	Vacuum, mm Hg	150					150	09/41H	12.0	8.0
Pitot Leak Checks	Leak rate, m³/m	0					0	0936H	12.0	8.0
Pretest 98/110	Start Volume	83.2240					83.8990	ORSAT Leak Check	ok	
Post-test 122/140	Stop Volume	83.2240					83.8990	Tedlar Bag ID	S1M4	

Ports & Points	Time Clock (24-hr)	Test (min)	DGM reading (m³)	Pitot Reading (mm H_2O)	Delta H Calc. (mm H_2O)	Delta H Actual (mm H_2O)	Gauge Vacuum (mm H_2O)	Stack	DGM	Probe	Filter	Imp. Exit
CA-5	0910H	0	83.2350	12.0		40	6.0	126	24	120	110	18
	0915H	5	83.3390	12.0		40	6.0	126	24	120	112	18
	0920H	10	83.4420	12.0		40	6.0	126	24	120	120	17
	0925H	15	83.5466	12.0		40	6.0	126	24	126	120	17
	0930H	20	83.6570	12.0		40	6.0	126	24	126	121	17
	0935H	25	83.7620	12.0		40	6.0	185	24	117	116	18
Pause	0940H	30	83.8546									

Run Time	Total Volume	RMS Delta P
30	0.6196	3.464

Delta H Avg	High Vac.	TS Stack Avg	Tmeter Avg
40	6.0	135.83	24

Team Leader / Date: [signature] 5-28-24

QA/QC / Date: [signature] / 28MAY24

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ACCREDITED THIRD PARTY TESTER

METHOD 3
FYRITE ANALYSIS DATA SHEET

Facility	BMC	**Fuel Type**	~~FB-12~~ LSFO
Town/Province	Baguio City	**Fyrite ID**	FID-12
Test Location	S1	**Analysis Location**	IN SIN

Run No. 1 Date: 28 May 24 Bag ID S1R1 Operator (Signature)

Run Time	Time of Analysis	% CO_2 Reading (A)	% O_2 Value (B-A)	% N_2 Value (100-C)
Start 1050H	1138H	8.5	12.0	
	1142H	8.5	12.0	
Stop 1150H	1147H	8.5	12.0	
Leak Check ☐				
	Avg	8.5	12.0	79.5

Run No. 2 Date: 28 May 24 Bag ID S1R2 Operator (Signature)

Run Time	Time of Analysis	% CO_2 Reading (A)	% O_2 Value (B-A)	% N_2 Value (100-C)
Start 1300H	1414H	8.5	12.0	
	1417H	8.5	12.0	
Stop 1410H	1422H	8.5	12.0	
Leak Check ☐				
	Avg	8.5	12.0	79.5

Run No. 3 Date: 28 May 24 Bag ID S1R3 Operator (Signature)

Run Time	Time of Analysis	% CO_2 Reading (A)	% O_2 Value (B-A)	% N_2 Value (100-C)
Start 1505H	1614H	8.5	12.0	
	1617H	8.5	12.0	
Stop 1610H	1622H	8.5	12.0	
Leak Check ☐				
	Avg	8.5	12.0	79.5

Team Leader/Date: 28 May 24 **QA/QC / Date:**

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METHOD 4 - MOISTURE ANALYSIS DATA SHEET

Facility	BMC FORESTRY CORPORATION, IRISAN LIME PROJECT (ILP)
Address	KM. 5, NAGUILIAN ROAD, IRISAN, BAGUIO CITY
Source	1.08 MT/HR VERTICAL SHAFT KILN NO. 2
Recovery Loaction	INSITU (SERVICE VEHICLE)

Run Number	MOISTURE RUN	PM - 1	PM - 2	PM - 3
Test Date	28 MAY 2024	28 MAY 2024	28 MAY 2024	MAY 2024
Recovery Date	28 MAY	MAY 2024	MAY 2024	MAY 2024
Recovered By	ECF HPO			
Impinger 1 100 mL	D.I. H2O	3% H2O2	3% H2O2	3% H2O2
Final Weight, g	725.5	741.1	799.3	742.7
Initial Weight, g	719.0	715.5	773.4	714.8
Net Weight, g	11.5	25.4	31.2	27.8
Impinger 2 100 mL	D.I. H2O	3% H2O2	3% H2O2	3% H2O2
Final Weight, g	704.5	722.1	717.4	720.1
Initial Weight, g	699.5	691.6	693.1	692.7
Net Weight, g	4.7	31.5	24.5	27.4
Impinger 3 EMPTY	EMPTY	EMPTY	EMPTY	EMPTY
Final Weight, g	616.8	615.7	615.5	610.4
Initial Weight, g	607.8	610.3	610.0	611.1
Net Weight, g	9.0	5.4	5.5	9.5
Impinger 4 200-300g	SILICA GEL	SILICA GEL	SILICA GEL	SILICA GEL
Final Weight, g	933.9	949.7	949.6	948.0
Initial Weight, g	927.9	933.8	939.7	940.7
Net Weight, g	6.0	10.9	9.9	7.3
Impinger 5				
Final Weight, g				
Initial Weight, g				
Net Weight, g				
Impinger 6				
Final Weight, g				
Initial Weight, g				
Net Weight, g				
Impinger 7				
Final Weight, g				
Initial Weight, g				
Net Weight, g				

Total Catch, g	26.5	73.4	71	67.0
Silica Gel Spent, %				

Team Leader / Date: H.P. ORDOÑA / 28 MAY 24 QA/QC/Date: E.C. FERNANDO / 28 MAY 2024

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Environmental Management Service Provider

ISOKINETIC FIELD DATA SHEET
METHOD(s) 5/6

Facility Name	BMC FORESTRY CORP, ILP	Test Date	28 MAY 2024
Address	KM.5 NAGUILIAN ROAD, IRISAN, BAGUIO CITY	Job Number	PJ24 241 S1 RUN 1
Source	1.08MT/hr. VERTICAL SHAFT KILN NO. 2	Year Installed	
Control device		Field Personnel	ECF, HPO, [illegible], MSE, CAC, JBT
Contact Person	MS. NARHY C. POMILBAN	Operations Signature	[signature]

Filter ID	Tare(s)	Barometric (mm Hg)	Static (mm H_2O)	Meterbox ID#	Meterbox Gamma	Meterbox DeltaH @	Nozzle ID#	Nozzle Dia.	Pitot Tube ID#	Pitot Tube Cp	Probe ID#
S5-081	0.3610	652.7	10.0	BSI-T2	6.9884	43.1884	TMM4	7.35	[illegible]	0.87	[illegible]

		Sample Train Leak Checks	Initial	Interim				Final	Fyrites Time	%O_2	%CO_2
Run No.	1										
K Factor	5.672	Vacuum, mm Hg	15.0					12.0	1023H	12.0	8.0
Pitot Leak Checks		Leak rate, m³/m	0					0	1123H	12.0	7.0
Pretest	10/10	Start Volume	83.9808					85.6430	ORSAT Leak Check		
Post-test	18/15	Stop Volume	83.9808					85.6430	Tedlar Bag ID	PJ24241 S1R1C0	

Ports & Points	Clock (24-hr)	Test (min)	DGM reading (m³)	Pitot Reading (mm H_2O)	Delta H Calc. (mm H_2O)	Delta H Actual (mm H_2O)	Gauge Vacuum (mm H_2O)	Stack	DGM	Probe	Filter	Imp. Exit
A 12	1030H	0	84.0110	10.6	60.12	60	6.0	190	26	116	110	15
11			84.0738	10.6	60.12	60	6.0	190	26	117	116	14
10	1035H	5	84.1426	10.6	60.12	60	6.0	190	26	117	116	10
9			84.2004	11.0	62.37	62	6.0	200	26	126	118	10
8	1040H	10	84.2714	11.0	62.37	62	6.0	200	26	127	118	16
7			84.3412	11.0	62.37	62	6.0	205	28	127	117	16
6	1045H	15	84.4090	12.0	68.04	68	7.0	220	28	126	118	19
5			84.4710	12.0	68.04	68	8.0	220	28	122	116	17
4	1050H	20	84.5368	12.0	68.04	68	8.5	225	29	126	130	11
3			84.6110	11.0	62.37	62	8.5	220	29	117	118	11
2	1055H	25	84.6964	11.0	62.37	62	8.5	228	30	119	130	11
1			84.7790	11.0	62.37	62	10	228	31	122	125	12
0	1100H	30	84.8304									
B-12	1100H	30	84.8304	11.0	62.37	62	10	220	31	110	119	14
11			84.9006	11.0	62.37	62	10	220	31	119	125	17
10	1105H	35	84.9632	11.0	62.37	62	10	225	31	125	125	13
9			85.0422	11.2	63.52	64	10	227	31	126	110	13
8	1110H	40	85.1190	11.2	63.52	64	10	230	31	121	117	14
7			85.1872	11.2	63.52	64	10	236	32	120	122	13
6	1120H	45	85.2576	12.0	68.04	68	10.5	236	32	117	122	19
5			85.3244	12.0	68.04	68	10.5	236	32	117	129	14
4	1125H	50	85.3966	12.0	68.04	68	10.5	236	32	116	122	19
3			85.4054	11.0	62.37	62	10.5	230	33	126	122	14
2	1130H	55	85.4770	11.0	62.37	62	10.5	230	33	120	116	18
1			85.5020	11.0	62.37	62	10.5	230	33	122	116	14
0	1135H	60	85.6382									

Run Time	Total Volume	RMS Delta P
60	1.6270	3.35

Delta H Avg	High Vac.	TS Stack Avg	Tmeter Avg
63.5	10.5	219.67	29.79

Team Leader / Date: H.P. ORQUIZA / 28 MAY 24

QA/QC/Date: E.C. FERNANDO / 28 MAY 24

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ISOKINETIC FIELD DATA SHEET
METHOD(S) 5/6

Facility Name	BMC FORESTRY CORPORATION (CLP)	Test Date	28 MAY 2024
Address	KM.5 (IRISAN ROAD) NAGUILIAN, BAGUIO CITY	Job Number	PJ24 24151 RUN 2
Source	1.08 MT/HR VERTICAL SHAFT KILN NO. 2	Year Installed	
Control device		Field Personnel	ECF, HPD, KME, MSL, CAS
Contact Person	MS. NARHY C. POMILBON	Operations Signature	

Filter ID	Tare(s)	Barometric (mm Hg)	Static (mm H_2O)	Meterbox ID#	Gamma	DeltaH @	Nozzle ID#	Dia.	Pitot Tube ID#	Cp	Probe ID#
S65-083	0.3610	651.5	10.0	BS172	0.984	43.1704	TN3-4	7.85	PT-6FT12	0.84	SP-6FT2

		Sample Train Leak Checks	Initial	Interim			Final	Fyrites Time	$\%O_2$	$\%CO_2$
Run No.	2									
K Factor	5.24	Vacuum, mm Hg	15.0				14.0	1304H	12.0	8.0
Pitot Leak Checks		Leak rate, m³/m	0				0	1347H	12.0	8.0
Pretest	20 / 14	Start Volume	85.6500				87.2014	Fyrite System Leak Check		
Post-test	14 / 14	Stop Volume	85.6500				87.2014	Tedlar ID	PJ24 24151 R2 CO	

Ports & Points	Clock (24-hr)	Test (min)	DGM reading (m³)	Pitot Reading (mm H_2O)	Delta H Calc. (mm H_2O)	Delta H Actual (mm H_2O)	Gauge Vacuum (mm H_2O)	Stack °C	DGM °C	Probe °C	Filter °C	Imp. Exit °C
A-12	1300H	0	85.6530	10.6	55.26	56	6.0	254	28	115	116	14
11			85.7110	10.6	55.26	56	6.0	254	28	122	119	12
10	1305H	5	85.7790	10.6	55.26	56	6.0	255	28	125	120	10
9			85.8504	11.0	57.35	58	6.0	260	28	123	109	9
8	1310H	10	85.9240	11.0	57.35	58	6.5	260	28	124	119	9
7			85.9960	11.0	57.35	58	8.0	260	28	122	117	9
6	1315H	15	86.0682	11.4	59.44	60	8.0	265	29	124	119	9
5			86.1322	11.4	59.44	60	8.0	265	30	126	125	9
4	1320H	20	86.1994	11.0	57.35	58	8.0	260	30	125	123	9
3			86.2650	11.0	57.35	58	9.0	260	30	117	120	10
2	1325H	25	86.3270	11.0	57.35	58	9.0	263	30	118	122	10
1			86.4088	11.0	57.35	58	9.0	265	32	120	125	9
STOP	1330H	30	86.4704									
B-12	1340H	30	86.4704	10.6	55.26	56	9.0	265	31	112	119	14
11			86.5340	10.6	55.26	56	9.0	268	31	118	119	6
10	1345H	35	86.6118	10.6	55.26	56	9.0	268	32	124	117	6
9			86.6770	11.0	57.35	58	10.0	270	32	122	116	9
8	1350H	40	86.7446	11.0	57.35	58	10.0	270	32	124	117	9
7			86.8118	11.4	59.44	60	10	270	32	123	124	10
6	1355H	45	86.8560	11.4	59.44	60	10	270	32	124	122	10
5			86.9104	11.4	59.44	60	10	270	32	120	122	9
4	1400H	50	86.9600	11.4	59.44	60	10	270	32	121	119	9
3			87.0096	11.0	57.35	58	10	270	32	120	114	11
2	1405H	55	87.1096	11.0	57.35	58	10	269	33	115	115	12
1			87.1920	11.0	57.35	58	10	269	33	117	115	12
END	1410H	60	87.1950									

Run Time	Total Volume	RMS Delta P
60	1.5420	3.314

Delta H Avg	High Vac.	TS Stack Avg	Tmeter Avg
58	10	264.6	30.54

Team Leader / Date: H.K. ORDUNA / 28 MAY 24

QA/QC / Date: E.C. FERNANDO / 28 MAY 24

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ISOKINETIC FIELD DATA SHEET

METHOD(S) 5/6

Facility Name	BMC FORESTRY CORPORATION (ILP)	Test Date	28 MAY 2024
Address	Km. 5 NAGUILIAN ROAD IRISAN, BAGUIO CITY	Job Number	PJ24 241 S1 RUN 3
Source	1.08 MT/hr VERTICAL SHAFT KILN NO. 2	Year Installed	
Control device		Field Personnel	ECF HPO RME MSL CAS
Contact Person	Ms. NARHY C. POMILBAN	Operations Signature	

Filter ID	Tare(s)	Barometric (mm Hg)	Static (mm H_2O)	Meterbox ID#	Gamma	DeltaH @	Nozzle ID#	Dia.	Pitot Tube ID#	Cp	Probe ID#
S65-082	0.3588	600.5	10.0	BSI-T2	0.9884	43.1724	TNS-4	7.39	PT-G-1172	0.84	SP-…

		Sample Train Leak Checks	Initial	Interim				Final	Fyrites Time	$\%O_2$	$\%CO_2$
Run No.	3										
K Factor	4.782	Vacuum, mm Hg	15.0					140	1524H	12.0	8.0
Pitot Leak Checks		Leak rate, m³/m	0					0	1547H	12.0	8.0
Pretest	30 / 150	Start Volume	87.2110					88.7750	Fyrite System Leak Check		
Post-test	120 / 118	Stop Volume	87.2110					88.7750	Tedlar ID	PJ24 241 S1 R3(1)	

Ports & Points	Time Clock (24-hr)	Test (min)	DGM reading (m³)	Pitot Reading (mm H_2O)	Delta H Calc. (mm H_2O)	Delta H Actual (mm H_2O)	Gauge Vacuum (mm H_2O)	Temperature °C Stack	DGM	Probe	Filter	Imp. Exit
A-12	1504H	0	87.2350	10.4	49.73	50	6.0	275	28	127	119	12
11			87.3006	10.4	49.73	50	6.0	275	28	127	117	12
10	1509H	5	87.3670	11.0	52.60	52	6.5	280	28	124	117	12
9			87.4250	11.0	52.60	52	6.5	280	28	122	115	10
8	1514H	10	87.4904	11.0	52.60	52	7.0	280	28	124	119	10
7			87.5506	11.4	54.52	54	8.0	285	28	124	120	10
6	1519H	15	87.6144	11.4	54.52	54	8.0	285	28	126	122	10
5			87.6778	11.4	54.52	54	8.0	285	28	126	120	10
4	1524H	20	87.7430	11.4	54.52	54	8.0	285	28	127	117	11
3			87.8104	11.0	52.60	52	9.0	280	29	124	118	11
2	1529H	25	87.8766	11.0	52.60	52	9.0	285	29	126	118	11
1			87.9384	11.0	52.60	52	9.0	280	29	126	122	12
STOP	1534H	30	87.9960									
B-12	1544H	30	87.9960	10.6	50.68	50	8.5	275	30	127	115	12
11			88.0644	10.6	50.68	50	8.5	275	30	127	120	12
10	1549H	35	88.1340	11.0	52.60	52	9.0	280	30	127	114	12
9			88.2004	11.0	52.60	52	9.0	280	30	116	117	12
8	1554H	40	88.2646	11.0	52.60	52	9.0	280	30	117	118	12
7			88.3260	11.4	54.52	54	9.5	285	32	124	119	13
6	1559H	45	88.3842	11.4	54.52	54	9.5	285	32	122	127	13
5			88.4500	11.4	54.52	54	10	285	32	122	117	14
4	1604H	50	88.5714	11.0	52.60	52	10	280	33	121	117	14
3			88.5840	11.0	52.60	52	10	285	33	120	117	14
2	1609H	55	88.6412	11.0	52.60	52	10	280	33	117	118	12
1			88.7010	11.0	52.60	52	10	280	33	116	117	12
END	1614H	60	88.7644									

Run Time	Total Volume	RMS Delta P
60	1.5294	3.324

Delta H *Avg	High Vac.	TS Stack Avg	Tmeter Avg
52.75	10	281.46	29.875

Team Leader / Date: H.P. OROVINA / 28 MAY 24

QA/QC / Date: E.C. FERNANDO / 28 MAY 2024

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METHOD 7 FLASK SAMPLE AND RECOVERY DATA

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Facility: BMC
Address: Baguio City
Source: S1 / K/h
Personnel: ECP, H2O, MEZ, PMO, CPS
Test Date: 28 May 24

Absorbing Solution Volume, ml: 25
Heated Probe? (check) Yes ✓ No ____ *If No, explain in "Remarks"
Filter Used? (check) Yes ____ No ____ *If No, explain in "Remarks"
Remarks ____

Sample Collection Information
Barometric Pressure, Pbar (in Hg): 25.69 / 25.65 / 25.61
Date Performed: 28 May 24 By: ECP, MEZ, PMO

Sample Collection Information (recovery)
Barometric Pressure, Pbar (in Hg): 29.70
Date Performed: 29 May 24 By: ECP, H2O, MEZ, PME

Sample ID	Run Number	Flask ID Number	Flask Volume (ml)	Leak Check (<0.4"Hg/min)	Evacuated Pressure Pgi (in Hg)	Flask abs. Press Initial Pi, Pbar-Pgi (in Hg)[1]	Flask Temp °C	Flask Temp. Ti (°K)	Sample Collection Time[2] 24hour	Shaken for 5min	Shaken for 2min	Sample Recovered Time[3] 24hour	Final Pressure Pgf (in Hg)	Flask abs. Press Initial Pi, Pbar-Pgi (in Hg)	Flask Temp °C	Flask Temp Tf °K	Sample pH Adjusted (9 – 12)
P	S1R1	B1FP[illegible]	2315	✓	23.30	2.39	27.6	300.75	1035H	✓	✓	0815H	0.30	29.40	28.7	301.85	✓
J	R2	P20	2350	✓	29.20	3.49	28.4	301.55	1049H	✓	✓	0820H	0.50	29.20	28.6	301.75	✓
2	R3	P24	2310	✓	23.40	2.29	28.3	301.45	1055H	✓	✓	0825H	0.50	29.20	28.1	301.25	✓
4	B1R1	F[illegible]	2350	✓	23.20	2.40	27.7	300.85	1304H	✓	✓	0830H	0.40	29.30	28.3	301.45	✓
—	R2	F[illegible]	2335	✓	23.30	2.30	27.8	300.95	1314H	✓	✓	0835H	0.40	29.10	28.2	301.35	✓
2	R3	F[illegible]	2325	✓	23.30	2.35	28.2	301.35	1324H	✓	✓	0840H	0.40	29.30	28.2	301.35	✓
4	R1	Fx	2350	✓	23.30	2.31	27.0	300.10	1500H	✓	✓	0845H	0.40	29.30	28.5	301.65	✓
1	R2	F[illegible]	2330	✓	23.50	3.21	27.0	300.10	1520H	✓	✓	0850H	0.60	29.10	28.6	301.75	✓
	R3	F[illegible]	2380	✓	23.30	2.21	27.2	300.35	1530H	✓	✓	0855H	0.50	29.70	28.4	301.55	✓

Source Oxygen Concentration? 3020/20
Was additional oxygen introduced to the Flask? Yes____ No ✓

[1]Pi = Pbar – Pgi, Flask must be evacuated to within 3 inches of mercury (Hg) of the absolute pressure (barometric pressure).
[2]Additional oxygen should be introduced to the flask if the source O_2 is below 3%
[3]Flask must stand for 16 hours or greater after sampling before recovery can be performed.

Checked By: ....

QA/QC / Date: E.C. FERNANDO / 29 MAY 24

Department of Environment and Natural Resources (DENR)
ENVIRONMENTAL MANAGEMENT BUREAU
ACCREDITED THIRD PARTY TESTER

2nd Floor, VAG Bldg. Ortigas Ave., Greenhills
San Juan City, Metro Manila, Philippines
Tels. 863-6129 • Fax (632) 727-5831

ANNEX C

PERMIT TO OPERATE
AND
FACILITY PROCESS DATA

Republic of the Philippines
Department of Environment and Natural Resources
ENVIRONMENTAL MANAGEMENT BUREAU
Cordillera Administrative Region (CAR)
Cordillera Administrative Region DENR Compound,Gibraltar Baguio City
Tel No: (074) 446-64-40

Permit No: PTO-OL-CAR-2021-09103-R
Application Type: Renewal

Date Issued: 30 Oct 2021
Date Expiration: 30 Oct 2026

PERMIT TO OPERATE
Air Pollution Source and Control Installations

Pursuant to Part IV, Rule XIX of the Rules and Regulations of R.A. 8749, authority is hereby granted to:

BMC Forestry Corporation (Irisan Lime Kiln) **Km. 5 Naguillan Road, Irisan, Baguio City, Benguet**

subject to the following terms and conditions:

TERMS AND CONDITIONS

1. This Permit is issued for the permittee to operate the following facilities/equipment described below at the permittee's establishment located at the above-mentioned address (geolocation of entrance gate: 16.419336°, 120.557358°):
   - **Air Pollution Source Installations/Equipment:**
     - *Three (3) units Vertical Shaft Kiln (Cap.: 1.08 MT/hr; Fuel used: Regular Fuel Oil or Bunker Oil)* - for the purpose of calcinations of limestones (geolocation of kiln plant building 16.419198°, 120.557922°);
     - *One (1) unit Jaw Crusher (Cap.: 1 MT/hr; With Conveyors)* - for the purpose of pulverizing the quicklimes;
     - *One (1) unit Lime Storage Silo (Cap.: 90 MT)*;
     - *One (1) unit Aboveground Fuel Storage Tank (Cap.: 60,000 liters; Fuel: Regular Fuel Oil or Bunker Oil; Vertical Cylinder)*;
     - *Seven (7) units Aboveground Fuel Storage Tanks (Cap.: 15,000 liters each; Fuels: Regular Fuel Oil of Bunker Oil; Horizontal Cylinders)*;
     - *One (1) unit Standby Generator Set (Cap.: 200 kW / 250 kVA; Make: SEALEY; Model: SLC250GF; S/N: 151118001; P.F. = 0.8; Silent-type): Alternator/Generator (Make: MBH; Model: XN274G; S/N: 31512006; Cap.: 180 kW / 225 kVA, continuous; P.F. = 0.8) primed by Diesel Engine (Make Chongqing Cummins; Model: NT855-GA; S/N: 41226017; Cap.: 257 kW @ 1800 RPM, max)*;
     - *One (1) unit Standby Generator Set (Cap.: 75 kW; Open-type): Alternator/Generator (Make: Caterpillar) primed by Diesel Engine (Make: Isuzu; Model: E120; S/N: 202587)*; and
     - *One (1) unit Standby Generator Set (Cap.: 200 kW / 250 kVA; Make: DCA; Model: 200DC; S/N: 8221-002; P.F. = 0.8; Open-type): Alternator/Generator (Make: DCA; Model: 200DC; S/N: A73281AC; Cap.: 200 kW / 250 kVA, standby; P.F. = 0.8) primed by Diesel Engine (Make: Cummins; Model: NT-855-G; S/N: 30104629)* - all generator sets are installed in the Powerhouse with geolocation of 16.419050°, 120.557809°; and
   - **Air Pollution Control Facilities:**
     - *Three (3) units Gas Scrubber Systems (Cap.: 66 m3/min; Wet-type; 1-unit scrubber is exclusively connected to 1-unit shaft kiln)*; and
     - *One (1) unit Dust Collector and Scrubber System (Cap.: 505.84 m3/min; composed of 1-unit 12,850 CFM Cyclone Dust Collector interconnected to 1-unit 5,000 CFM Cyclone Dust Collector with their bottom open and submerged on Water-bed Scrubber)* - for the purpose of controlling the airborne particulates/dusts from the sorting, crushing and loading areas (geolocation: 16.419132°, 120.557396°).

2. This Permit shall be valid until **SEPTEMBER 10, 2026 (PLEASE DISREGARD THE EXPIRATION DATE INDICATED ABOVE)** unless suspended or revoked by the Bureau.

3. The Bureau may modify the Permit by amending any existing condition or imposing any new or additional condition from the date of issuance (as indicated above) until its expiration on **SEPTEMBER 10, 2026**, subject to the provisions of Rule XIX of the Implementing Rules and Regulations (IRR) of the Republic Act No. 8749.

Filing Fee	: Php 600.00	O.R. No. : 1809914 & 1810468	Date : Oct. 11, 2021
Permit Fee	: Php 47300.00	O.R. No. : 1809914 & 1810468	Date : Oct. 11, 2021
PD1856	: Php 10.00	O.R. No. : 1809914 & 1810468	Date : Oct. 11, 2021
Documentary Stamp Tax	: Php 30.00	O.R. No. : 1809914 & 1810468	Date : Oct. 11, 2021

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4. An application for renewal of this Permit shall be filed not less than thirty (30) days before the expiry date the **expiry date - SEPTEMBER 10, 2026.**

5. This Permit shall be posted in a conspicuous location at the premises and shall be adequately framed or otherwise protected against damage.

6. The operation of any installation, process activity at this establishment that produces, generates, captures, treats, reduces, controls, emits, releases or disperse air pollutants without a valid Permit to Operate, or in violation of any of the conditions of this Permit, shall be subject to penalties pursuant to Rule LVI of the IRR of RA 8749.

7. The installations, processes or activities at this establishment shall be operated, conducted and managed by the permittee, and the associated plant and equipment shall be maintained and operated by the permittee, so that emissions of air pollutants are kept to a practicable minimum. The permittee shall be responsible for ensuring that any emissions of air pollutants from abnormal or unexpected events, do not cause air pollution in the surrounding air environment or have adverse effects on persons in that environment.

8. Without limiting the generality of the previous condition, the permittee shall ensure that the emissions from the permitted installations or processes comply with:
   - the National Emission Standards for Source Specific Air Pollutants as specified in Rule XXV of the IRR of RA 8749; and
   - the National Ambient Air Quality Standards for Source Specific Air Pollutants from Industrial Sources/Operations as specified in Rule XXVI of the IRR of RA 8749.

9. The permittee shall submit Self-Monitoring Reports to the Bureau on a quarterly basis in accordance with DENR Administrative Order No. 27 (Series of 2003) and any written instructions by the Bureau based on the following schedule:

Quarter	Coverage	Submission	Quarter	Coverage	Submission
First	Jan. - Mar.	1-15 Apr.	Third	Jul. - Sep.	1-15 Oct.
Second	Apr. - Jun.	1-15 Jul.	Fourth	Oct. - Dec.	1-15 Jan.

10. The permittee shall at all times has an accredited Pollution Control Officer (PCO) who shall be the day-by-day contact person between the Bureau and the establishment. The permittee shall ensure that the PCO is familiar with the operations and activities undertaken at the establishment, and the relevant emission sources and air pollution control devices and equipment. The permittee shall give the PCO the necessary authority to take or to direct corrective action in the event of a malfunction, accident, breakdown or other abnormal event that results in excessive emissions or emissions that do not comply with relevant Permit conditions, emission standards or ambient air quality standards.

11. The Permittee shall seek accreditation of his/her appointed/designated PCO pursuant to Section 8 of DAO 2014-02 (Revised Guidelines for Pollution Control Officer Accreditation).

12. In case of the resignation or termination of the services of the PCO, the Managing Head shall appoint/designate a new PCO. He/she shall inform, in writing, the concerned EMB Regional Office within fifteen (15) days and seek accreditation for the new PCO within thirty (30) days from the date of resignation or termination.

13. The permittee shall report in writing to the Bureau any malfunction, accident, breakdown, leak, spill or other abnormal or unexpected event which results in emissions to atmosphere that do not comply with relevant Permit conditions, emission standards or ambient quality standards, or in any other abnormal or unexpected releases of air pollutants. The report shall indicate the nature of the incident or event, its impact on emissions, the time period involved, and any actions or measures taken to control the emissions or releases, remedy any air pollution problems that may have occurred, and minimize the probability of reoccurrence of the event or the release.

14. The permittee shall at all times allow authorized or accredited officers of the Department or the Bureau entry to the establishment and access to any part of the establishment to conduct inspections, gather information, test emissions or take samples. The permittee and its personnel shall not obstruct such officers in the performance of these functions, and shall furnish any information or materials requested by them that is reasonable for them to have. The permittee shall obey any lawful instruction or direction given by the Department or the Bureau at all times.

Filing Fee	: Php 600.00	O.R. No. : 1809914 & 1810468	Date : Oct. 11, 2021
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15. The permittee shall not make or allow any alterations or modifications to operations, activities, installations, processes, plant or equipment at the establishment that might substantially change the nature or quantity of the associated emissions without obtaining the approval of the Bureau, including the obtaining of any necessary Permit to Operate.

SPECIFIC CONDITION

16. The permittee shall conduct emission testing for the three (3) units Vertical Shaft Kilns through a DENR accredited third party Source Emission Testing Firm twice each year for each year of operation with three (3) sampling runs to verify its compliance pursuant to Memorandum Circular No. 2007-003 (Policy on Compliance and Permitting for Industrial Facilities Relating to Air Quality). However, considering that each kiln is operated in a period of six (6) to eight (8) months, each kiln shall be subjected to two (2) emission testing within that period. The Test Reports will be a part of the requirements for the renewal of this Permit.

Recommended by:

ENGR. MARIE PIA L. RODAS
OIC-Chief, Clearance & Permitting Division

Approved by:

MA. VICTORIA V. ABRERA
Regional Director

Filing Fee	: Php 600.00	O.R. No. : 1809914 & 1810468	Date : Oct. 11, 2021
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Annex

Fuel Burning					
ID	APSI	Capacity	Brand name	Type of Fuel	APCD
130795	Vertical Shaft Kiln No. 1	1.08 MT/hr/equipment	N/A	Regular Fuel Oil	Gas Scrubber No. 1 (66.0 m^3/min)
130797	Vertical Shaft Kiln No. 2	1.08 MT/hr/equipment	N/A	Regular Fuel Oil	Gas Scrubber No. 2 (66.0 m^3/min)
130799	Vertical Shaft Kiln No. 3	1.08 MT/hr/equipment	N/A	Regular Fuel Oil	Gas Scrubber No. 3 (66.0 m^3/min)
140793	Standby Generator Set	250.0 kVA	DCA/CUMMINS	Diesel	---
140794	Standby Generator Set	200.0 kW	SEALEY/Cummins	Diesel	---
140795	Standby Generator Set	75.0 kW	Caterpillar/Isuzu	Diesel	---

Non Fuel Burning					
ID	APSI	Capacity	Brand name	Material	APCD
130801	Jaw Crusher	1.0 MT/hr/equipment	N/A		Dust Collector Collector System (505.84 m^3/min)
140796	Lime Storage Silo	90.0 MT	N/A		---
140797	Aboveground/Overhead Fuel Storage Tank	60000.0 Liters	N/A		---
140800	Aboveground/Overhead Fuel Storage Tank	15000.0 Liters	N/A		---
140801	Aboveground/Overhead Fuel Storage Tank	15000.0 liters	N/A		---
140802	Aboveground/Overhead Fuel Storage Tank	15000.0 liters	N/A		---
140803	Aboveground/Overhead Fuel Storage Tank	15000.0 liters	N/A		---
140804	Aboveground/Overhead Fuel Storage Tank	15000.0 liters	N/A		---
140805	Aboveground/Overhead Fuel Storage Tank	15000.0 liters	N/A		---
140806	Aboveground/Overhead Fuel Storage Tank	15000.0 liters	N/A		---

APCD-APSI Mapping			
ID	APCD	Connected APSIs (<name> (id))	Connected APCDs (<name> (id))
19030	Gas Scrubber No. 1 (1)	Vertical Shaft Kiln No. 1 (4)	---
19907	Gas Scrubber No. 2 (8)	Vertical Shaft Kiln No. 2 (5)	---
19908	Gas Scrubber No. 3 (9)	Vertical Shaft Kiln No. 3 (6)	---
19909	Dust Collector Collector System (10)	Jaw Crusher (7)	---

Filing Fee	: Php 600.00	O.R. No. : 1809914 & 1810468	Date : Oct. 11, 2021
Permit Fee	: Php 47300.00	O.R. No. : 1809914 & 1810468	Date : Oct. 11, 2021
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BMC
FORESTRY
CORPORATION

April 13, 2024

ENGR. JEAN C. BORROMEO
OIC, Regional Director
DENR – Environmental Management Bureau
Cordillera Administrative Region (CAR)
DENR Compound, Gibraltar Road, Baguio City

Dear Director Borromeo:

We are pleased to submit the **BMC Forestry Corporation – Irisan Lime Project's CY 2024 First Quarter Self-Monitoring Report (SMR).**

For your information and perusal.

Thank you.

Respectfully yours,

BMC FORESTRY CORPORATION
By:

NARHY C. POMILBAN
Pollution Control Officer

Approved by:

FRANCISCO O. FLAVIER
Resident Manager/Managing Head

P.O Box 105 Irisan, Baguio City *Tel No (074) 445 – 7180
email:foflavier@yahoo.com, npomilban@benguet.com

MODULE 1: GENERAL INFORMATION

Reference No. :26831

Year :2024 Quarter: 1

Name of Plant : BMC FORESTRY CORPORATION – IRISAN LIME PROJECT

Notes :
The Plant/Project has a land area of 18,541 square meters covered by MPP No. 01C-2022-CAR issued by MGB-CAR on March 22, 2022, renewable for five years. The Company maintains its stockyard of about 12,000 metric tons of raw feed for a year of processing. The Plant's projected production is 19,420 MT per year as per the Company's ECC-OL-CAR-2016-0058 issued by EMB-CAR on September 15, 2016. Total production for the first quarter of CY 2024 is 1,620.475 MT. The Plant has three (3) kilns; each kiln is designed to produce 20 metric tons per day. Stack#1 is in operation for the first quarter of CY 2024. Discharge Permit for the Settling Tank with DP No. DP-CAR-23-01505 which is valid until February 13, 2024 was renewed and was issued with DP No. DP-CAR-24-02323 valid until February 13, 2023.

DENR Permits/Licenses/Clearances

Environmental Laws	Permits	Date Issued	Expiry Date
RA 9275			
DP No. 0	DP-CAR-22-06621	2022-09-10	2024-09-10
DP No. 1	DP-CAR-23-05923	2023-06-09	2024-06-09
DP No. 2	DP-CAR-23-05924	2023-06-09	2024-06-09
DP No. 3	DP-CAR-23-05925	2023-06-09	2024-06-09
DP No. 4	DP-CAR-24-02323	2024-02-13	2026-02-13
PD 1586			
ECC/CNC No	ECC-OL-CAR-2016-0058	2016-09-15	
RA 6969			
DENR Registry ID	0L-GR-CAR-11-008852	2021-04-13	2000-01-01
Transporter Registration	N/A	2000-01-01	2000-01-01
TSD Registration	N/A	2000-01-01	2000-01-01
CCO Registry	N/A	2000-01-01	2000-01-01
Importation Clearance No.	N/A	2000-01-01	2000-01-01
Permit to Transport	N/A	2000-01-01	2000-01-01
Small Quantity Importation	N/A	2000-01-01	2000-01-01
Priority Chemical List	N/A	2000-01-01	2000-01-01
PMPIN	N/A	2000-01-01	2000-01-01
RA 8749			
PO No	PTO-OL-CAR-2021-09103-R	2021-10-30	2023-10-30
PO No	PTO-OL-CAR-2022-02437-R	2022-03-25	2027-03-25

Operation

	Operating hours/day	Operating days/week	# of shift/day
Average	24 hours/day	7 days/week	3 shifts/day
Maximum	24 hours/day	7 days/week	3 shifts/day

Operation/Production/Quality

Average Daily Production Output	17.807
Total Water Consumption this Quarter cm3	181
Total Output this Quarter	1,620.475
Total Electric Consumption	53466

MODULE 2: RA 6969

A. CCO Report

CCO Item No.	CCO Substance	Common Name/IUPAC/CAS Index Name	CAS No.	Trade Name	Intended Use	Quantity Issued (in CCO)
No records found						

For importers only

CCO Item No.	Importation Clearance No.	Quantity Issued (in IC)	Quantity Imported	Date of Arrival	Port of Entry	Country of Origin	Country of Manufacture	Total Quantity Requested (annual)	Total Quantity Received (annual)
No records found									

For Distributors (importers/non-importers)

CCO Item No.	Name of Client	License No.	Quantity	Date of Distribution	Country of Origin	Country of Manufacture	Total Quantity Distributed
No records found							

For non-importer users

CCO Item No.	Name of Distributor	Quantity	Date of Purchase	Total Quantity Purchased from Distributor
No records found				

For Producers

CCO Item No.	Average Daily Production Output	Total Output this Quarter	Quantity of Stock Inventory (Start of Quarter)	Quantity of Stock Inventory (End of Quarter)
No records found				

CCO Item No.	Name of Buyer	Quantity	Date of Purchase	Total Quantity Sold
No records found				

Used in Production (please fill up only if chemical/substance is not main product)

CCO Item No.	Average Daily Production Output	Total Output this Quarter	Average Quantity Used per month	Total Quantity Used this Quarter
No records found				

Describe any changes in Production/Process/Operations

Stock Inventory/Waste Chemical Generated

CCO Item No.	Average Quantity of Waste Chemical Generated per month	Total Quantity of Waste Chemical Generated this Quarter	Quantity of Stock Inventory(Start of quarter)	Quantity of Stock Inventory(End of quarter)
No records found				

Other Information

Manner of Handling Hazardous Wastes	Changes in Safety Management System	Chemical Substitute Plan

B. Hazardous Wastes Generator

HW Generation

HW No.	HW Class	HW Nature	HW Cataloguing	Quantity	Unit	Quantity	Unit
D407	Mercury and mercury compounds	Solid	Toxic (T)	0.00025		0.008	
I104	oil-contaminated materials	Solid	T/F	0.059		0.023	
J201	Containers previously containing toxic chemical substances	Solid	Toxic (T)	0.0014		0.008	
M506	waste electrical and electronic equipment	Solid	Toxic (T)	0.001		0.0035	
I101	Used industrial oil	Liquid	T/F	0		0.017	

Waste Storage, Treatment and Disposal(please fill-up one table per HW)

HW Details

HW No.: D407 Qty of HW Treated :0.00 Unit :

Storage

Name : ILP Hazardous Waste Storage Facility Method :Provided with secondary containment (drums) to prevent breakage with proper label and placard.

Transporter

Name . : Date :

Treater

Name . : Method : Date :

Disposal

ID .: Name: Method:

HW Details

HW No.: I104 Qty of HW Treated :0.00 Unit :

Storage

Name : ILP Hazardous Waste Storage Facility Method :Provided with secondary containment (drums) to prevent leakage with proper label and placard.

Transporter

Name . : Date :

Treater

Name . : Method : Date :

Disposal

ID .: Name: Method:

HW Details

HW No.: J201 Qty of HW Treated :0.00 Unit :

Storage

Name : ILP Hazardous Waste Storage Facility Method :Provided with secondary containment (drums) to prevent leakage with proper label and placard.

Transporter

Name . : Date :

Treater

Name . : Method : Date :

Disposal

ID .: Name: Method:

HW Details

HW No.: M506 Qty of HW Treated :0.00 Unit :

Storage

Name : ILP Hazardous Waste Storage Facility Method :Provided with secondary containment (drums) to prevent breakage with proper label and placard.

Transporter

Name . : Date :

Treater

Name . : Method : Date :

Disposal

ID .: Name: Method:

HW Details

HW No.: I101 Qty of HW Treated : Unit :

Storage

Name : Method :Immediately mixed with RFO in the RFO tank for calcination.

Transporter

Name . : Date :

Treater

Name . : Method : Date :

Disposal

ID .: Name: Method:

On-site self Inspection of Storage Area

Date Conducted	Premises/Area Inspected	Findings and Observations	Corrective Action Taken
2024-02-03	ILP Hazardous Wastes Storage Facility	Storage Facility Wastes are properly stored with proper label and placard	

2024-02-03	ILP Hazardous Wastes Storage Facility	Storage Facility Wastes are properly stored with proper label and placard	
2024-03-23	ILP Hazardous Wastes Storage Facility	Storage Facility Wastes are properly stored with proper label and placard	
--			
--			
--			
--			
--			

C. Hazardous Wastes Treater/Recycler

HW Stored and/Untreated as of End of Quarter

Type of Waste	HW Number	Wastes Generator	Date of Transport	Transport Permit/Date of Issue	Quantity	Type of Storage Container/# of Containers	Time Table for Treatment

HW Treated and/or Recycled as of End of Quarter

Type of Waste	HW Number	Wastes Generator	Date of Transport	Transport Permit/Date of Issue	Quantity	Type of Treatment of Recycling Process	Quantity of Recycled or Treated Product

Residual Wastes Generated from the Treatment and/or Recycling Operation

Type of Waste	HW Number	Process by which the Waste is Generated	Quantity	Type of Storage Containers/# Number of Containers	Disposal Option	Time Table for Disposal

MODULE 3: RA 9275

Water Pollution Data

Domestic wastewater (cubic meters/day) :	0.892	| Process wastewater (cubic meters/day) :	1.064
Cooling water (cubic meters/day) :	0.0065	| Others :	
Wash water, equipment (cubic meters/day) :	0.0264	| Wash water, floor (cubic meters/day) :	

Record Cost of Treatment

	Month 1	Month 2	Month 3
Person employed, (# of employess)	1	1	1
Person employed, (cost)	900.00	731.25	787.50
Cost of Chemicals used by WTP	N/A	N/A	N/A
Utility Costs of WTP(electricity & water)	N/A	N/A	N/A
Administrative and Overhead Costs	4,196.70	N/A	N/A
Cost of operating in-house laboratory	N/A	N/A	N/A
New/Additional investment in WTP (description)	N/A	N/A	N/A
Costs of New/Add Investments	N/A	N/A	N/A

WTP Discharge Location

Outlet Number	Location of the Outlet	Name of Receiving water body
1	Oil-water separator system	Asin-Gallano River
2	Dust settling tank discharge compartment	Asin-Gallano River

Detailed Report of Wastewater Characteristics for Conventional Pollutants

Outlet No.	DATE	Effluent Flow Rate (m3/day)	BOD (mg/L)	TSS (mg/L)	Color	Ph	Oil & Grease (mg/L)	Temp Rise (C)	Unit
1	2024-02-26			0.00		7.95	0.41		
	2000-01-01								
	2000-01-01								
	2000-01-01								
	2000-01-01								
	2000-01-01								

Detailed Report of Wastewater Characteristics for Other Pollutants

Outlet No.	DATE	Effluent Flow Rate							

		(m3/day)							
			/	/	/	/	/	/	/
	2000-01-01								
	2000-01-01								
	2000-01-01								
	2000-01-01								
	2000-01-01								
	2000-01-01								

MODULE 4: R.A. 8749 (Air Pollution)

Summary of APSE/APCF

Process Equipment.	Location	# of hours of operation for the quarter
hawk burner	Kiln Plant	2,208 HOURS

Fuel Burning Equipment	Location	Fuel Used (indicate % if mixed composition)	Quantity Consumed for the quarter	# of hours of operations for the quarter
hawk burner	Kiln No. 1	RFO	301.1736	2,208 HOURS
One (1) unit SEALEY/CUMMINS"	Power house	Diesel	0.1405	8.30

Pollution Control Facility	Location	# of hours of operation for the quarter
Wet gas scrubber	Kiln Vertical Shaft in the Kiln Plant	2,208 HOURS
Dust Collector and Scrubber System	Kiln Plant	2,208 HOURS

Record Cost of Treatment

	Month 1	Month 2	Month 3

Detailed Report of Air Emission Characteristics

FBE No.	DATE	Flow Rate (Ncm/day)	CO (mg/Ncm)	NOx (mg/Ncm)	Particulates (mg/Ncm)				
1	2023-11-29		105.4	82.20	49.7				
	2000-01-01								
	2000-01-01								
	2000-01-01								
	2000-01-01								
	2000-01-01								
	2000-01-01								
	2000-01-01								
	2000-01-01								

MODULE 5: P.D. 1586

Ambient Air Quality Monitoring (if required as part of ECC conditions)

Station Description	DATE	Noise Level (dB)	CO (mg/Ncm)	NOx (ng/Ncm)	Particulates (mg/Ncm)	(mg/Ncm)	(mg/Ncm)	(mg/Ncm)	(mg/Ncm)
N/A	2000-01-01								
	2000-01-01								
	2000-01-01								
	2000-01-01								
	2000-01-01								
	2000-01-01								
	2000-01-01								
	2000-01-01								
	2000-01-01								
	2000-01-01								
	2000-01-01								
	2000-01-01								
	2000-01-01								
	2000-01-01								
	2000-01-01								

Ambient Water Quality Monitoring (if required as part of ECC conditions)

Station Description	DATE	/	/	/	/	/	/	/	/
N/A	2000-01-01								
	2000-01-01								
	2000-01-01								
	2000-01-01								
	2000-01-01								
	2000-01-01								
	2000-01-01								
	2000-01-01								
	2000-01-01								
	2000-01-01								
	2000-01-01								
	2000-01-01								
	2000-01-01								
	2000-01-01								
	2000-01-01								

Other ECC Conditions

ECC Condition/s	Status of Compliance	Actions Taken
Voluntary cease its operation in the event of any malfunction in any of the appurtenant facilities until the time that said damages are rehabilitated or restored. Further, the proponent shall immediately inform the EMBCAR of said damages and of remedial measures undertaken.	No	No malfunctioning of operation facilities during the monitoring period in review.
Uncalcined limestone/discards shall be prevented from deposition to and along drainage/natural waterways and water bodies, and shall be disposed – off properly in an appropriate/designated disposal site(s) which shall be maintained in a stable and non-polluting condition.	Yes	Uncalcined limestone is maintained in a stable condition located at the Kiln stockpile area far from the drainage canal. 35.730 MT was donated to a constituent of Purok 12, Irisan for the backfill of their vacant lot and to Nurich Vitameal Corporation in Calasiao, Pangasinan for manufacturing organic fertilizers for the first quarter.
Timely construction of adequate engineered earth retaining structures along affected and	No	Ripraps were already established along the slopy/unstable areas in the kiln feed

geologically unstable areas, especially in the stockyard of limestone, to protect adjacent properties/environment.		stockpile area. There is no additional construction of retaining structures this first quarter of CY 2024.
The proponent shall plant at least 50 indigenous tree species along the periphery of the project site to serve as buffer for dust and noise and improvement of aesthetics and in the support of the National Greening Program and climate change initiatives of the government.	Yes	The Company established four (4) packets of Plantation Areas with an area of 3,711 square meters that serves as a buffer zone and carbon..... being enhanced and maintained yearly. These four packets of plantation areas were planted with Benguet coffees and Benguet Pine trees.
The legal requirements pursuant to RA 6969 or the Toxic Substances and Hazardous and Nuclear Wastes Control Act of 1990, RA 8749 or the Philippine Clean Air Act of 1999, RA 9003 or the Ecological Solid Waste Management Act of 2000 and RA 9275 or the Philippine Clean Water Act of 2004 shall be secured whenever applicable. Compliance with said requirements shall be coordinated with the Clearance and Permitting Division (CPD) of EMB-CAR, DENR.	Yes	Discharge Permit for the Settling Tank with DP No. DP-CAR-23-01505 which is valid until February 13, 2024 was renewed and was issued with DP No. DP-CAR-24-02323 valid until February 13, 2023.
The proponent shall secure regularly necessary permit(s)/clearances/authority from concerned national and local offices relative to project implementation.	Yes	A business permit for the operation covering CY 2024 was secured at the Mayor's Office on on January 29, 2024 valid until December 31, 2024.
The proponent shall allow entry of EMB-CAR personnel into the project site at all times to conduct monitoring and to validate project's compliance with the ECC conditions stipulated therein and EMP Mitigating Measures.	Yes	EMB Personnel visited the site in 2024 first quarter MMT monitoring on February 27, 2024.
The proponent shall submit to EMB-CAR within fifteen (15) days after every quarter a Self-Monitoring Report (SMR) and a Compliance Monitoring Report (CMR) semiannually.	Yes	Religiously submitting reports. The Company submitted the 2023 fourth quarter SMR on January 15, 2024 and 2023 second semester CMR on January 23, 2024.
The proponent shall cause the implementation of any undertaking which may be imposed by EMB-CAR as a result of Technical Conference/s called relative to environmental issues arising from the implementation of the project.	No	No technical conference during the monitoring period in review.
Limestone feed materials shall be sourced out from the Company's permitted quarry areas and/or other sources sanctioned by government authorities. Violation of this condition shall automatically cause the cancellation/revocation of this ECC or imposition of fine.	Yes	A supply agreement between the Company and Timber & Lime Multi-Purpose Cooperative (TLMC), as a supplier of the feed materials was signed on October 17, 2022 valid for two (2) years for the delivery of limestone feed materials. This agreement is registered at MGB-CAR with Certificate of Registration 102522-CAR-44622.
Project development shall be in accordance with the submitted documents. Major modifications and/or expansion shall be subject to a new Environmental Impact Assessment (EIA) requirement.	No	No modification or expansion, to date.
Any transfer of project ownership carries the same conditions and restriction in this ECC for which a written notification to the EMBCAR shall be made by the transferee/transferor within fifteen (15) days from such transfer.	No	No transfer of ownership, to date.
The project shall undergo the requirements specified in the implementing guidelines of the Department Administrative Order No. 2003-30 if the project construction has stopped for a period of five (5) years.	No	The project operation has not stopped, to date.

Environmental Management Plan/Program

Enhancement/Mitigation Measures/s	Status of Compliance	Actions Taken
Enhance planting at the vacant spaces within the project area boundaries where applicable.	Yes	Continuous enrichment and maintenance of the four (4) packets onsite Company's plantation areas with a total area of 0.3711 hectares with planted Benguet Pine trees, Benguet coffees and lemon.
Enhance the implementation of solid waste management at source (e.g. segregation, reuse, recycling or composting).	Yes	Maintained sorting waste bins (for recyclables, residuals, and biodegradables) placed in the different areas of the Plant site. A composting area also is being maintained for the generated biodegradable waste.
Enhance and maintain the Materials Recovery Facility (MRF).	Yes	Recyclables/reusable materials were stored neatly in their respective storage compartment. Collected materials are being brought to private junk shops at every end of the quarter.
Coordinate with the City/Barangay for regular collection of solid waste generation.	Yes	The Company complies with the schedule set by the Barangay for the waste collection which is scheduled every Friday of the week at 5:00 AM. The residual wastes were sorted at source.
Regular maintenance of the concrete bund within the perimeter of the Fuel tanks location, Oil-water separator and storage room for hazardous materials.	Yes	1. Increased the height of the 16 linear meters (circular) bund wall from 0.50 meters high to 1 meter high. A catchment in case of an oil spill from the RFO tank pipe was constructed with a bund wall leading to the oil-water separator system. The bund wall near the OWS was also improved. 2. Provided ventilation and safety signages for the hazardous waste storage facility. The hazardous waste drums compartment was lifted.
Disposal of Hazardous wastes through accredited transporter and treater.	No	No hauling of HW this quarter in review.
Reuse of changed oils from the standby generator sets.	No	No changed oil this quarter in review.
Regular inspection and maintenance of the septic tanks and the wastewater settling basins.	Yes	1. Regular inspections were being done. A small volume of accumulated dust settled in the bottom of the tank, hence, no removal of the suspended solids for the first quarter. 2. Regular maintenance of the OWS.
Effluent Monitoring	Yes	1. No discharge from the septic tanks during the monitoring period. 2. No discharge from the dust-settling tanks during the first quarter of CY 2024. 3. Regular maintenance of the OWS. Removed oil was stored in the I104 drum container in the hazardous waste storage facility. A discharge of 2 cubic meters from the OWS was recorded for the first quarter. Conducted a water sampling for the effluent on February 26, 2024 and results of analyses were within the DENR Standards.
Regular inspection and maintenance of existing canal that traverse the project area that includes removal of debris and other materials that may obstruct water flow.	Yes	Removal of the leaves/materials and regular cleaning of the sump in the drainage canal. The sump was constructed to catch debris before traversing into the Barangay drainage canal to prevent clogging.
Properly operate and maintain all emission sources.	Yes	The wet gas scrubber within the vertical shaft is being regularly maintained.
Install, when applicable, appropriate air pollution control device/s.	No	No installed air pollution control device/s this quarter.
Control vehicle speed to lessen suspension of road dust.	Yes	Limestone delivery trucks and RFO delivery trucks' speeds were in control at all times.
Conduct water spraying during dry days.	Yes	Implemented sprinkling seven (7) times for January, six (6) times for February, and three (3) times for March.
Cover delivery/hauling vehicles that may generate dust.	Yes	Open trucks of the customers were always equipped with cover (canvas/tolda) to prevent suspension of dust in the atmosphere.
Monitoring of ambient air quality and source emission.	No	No conducted test this quarter.
Properly operate and maintain all sources of	Yes	Regular maintenance of power house as one

noises.		source of noise pollution.
Install, when applicable, appropriate noise control device/s.	Yes	The roots blower in the power house was enclosed to lessen the generation of noise.
Monitoring of ambient noise level.	Yes	No conducted test this quarter.
Prioritize hiring of qualified local residents.	No	No hiring this quarter.
Regular coordination with LGU.	Yes	Regularly coordination with the LGU by the Community Relations Officer for issues and concerns concerning the Operation and the Social Development and Management Program of the Company. Also, Irisan LGU is a member of the BF-ILP MMT and was present during the 2024 first quarter MMT monitoring on February 27, 2024.
Promptly payment of local taxes.	Yes	Payment of taxes to BIR monthly and City for the Business Permit.
Provide appropriate traffic/warning signs.	No	
Maintain parking spaces within the project area.	Yes	Parking space in front of the admin building is always available.

Solid Waste Characterization/Information

	Recyclable	Biodegradable	Residual
Average Quantity Generated (tons/ month)	0.113		0.08
Total Quantity Generated (tons/ quarter)	0.339		0.240
Average Quantity Collected (tons/ month)	0.113		0.08
Total Quantity Collected (tons/quarter)	0.339		0.240
Entity in charge of collection			Baguio City garbage collection truck

Brief Description of Solid Waste Management Plan (e.g., waste reduction, segregation, recycling)

Segregation is initially done at the garbage bins at the admin office, bunkhouse/staff house, and kiln plant wherein biodegradable is segregated from non-biodegradable. Recyclable materials (pet bottles and cans) and reusable materials (paper and cartoon) were stored at the MRF of the Company and were bought by private junk shops. Residuals (non-bio) are disposed of in line with the Barangay ordinance. Wastes were being brought out to the designated collecting area in the Purok as per schedule being collected by the City truck waste every Friday. There is also a designated area for composting the biodegradable waste in the Campsite. The composted materials will be used in fertilizing the coffees/lemon in the Plantation Areas.

MODULE 6: OTHERS

Accidents & Emergency Records

Date	Area/Location	Findings & Observation	Actions Taken	Remarks
2000-01-01				
2000-01-01				
2000-01-01				

Personnel/Staff Training

Date Conducted	Course/Training Description	# of Personnel Trained
2024-03-7	Fire Safety Orientation	30
2000-01-01		
2000-01-01		

I hereby certify that the above information are true and correct.

Done this 12th day of April 2024, in **BAGUIO CITY, BENGUET**.

Narhy C. Pomilban
Name/Signature of PCO
COA No. 2023-CAR-14263 New

Francisco O. Flavier
Name/Signature of Managing Head

SUBSCRIBED AND SWORN before me, a Notary Public, this day of

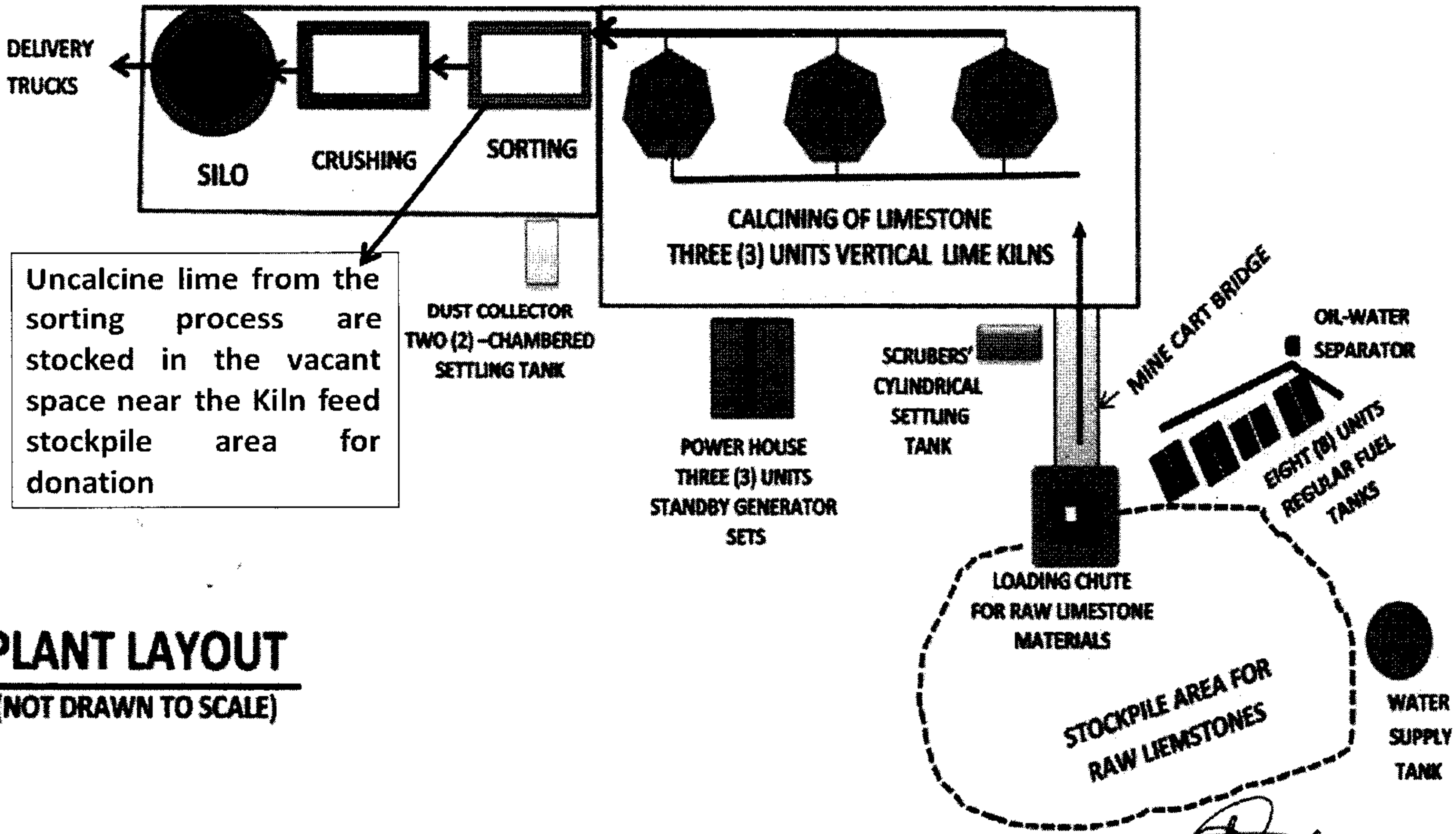
, affiants exhibiting to me their PTR:

Name	CTR No.	Issued at	Issued on
FRANCISCO O. FLAVIER	TIN 103-481-016	Baguio City	
NARHY C. POMILBAN	TIN 314-977-920	Baguio City	

SUBSCRIBED AND SWORN to before me this APR 12 2024 *in the City of Baguio, Philippines.*

Doc. No. 264;
Page No. 73;
Book No. 59;
Series of 2024.

CRISTINA I. VALDEZ
Notary Public in Baguio City
Until December 31, 2024
NA-136-[illegible]
PTR O.R. No. 6822466; December 19, 2023; Baguio City
IBP OR No. 331199; December 19, 2023; Manila
Roll No. 61611; April 25, 2023; Manila
MCLE Compliance Certificate No. VI-0021828
Until 04-14-2025
Rm. 28, Sacred Heart Building, Diego Silang St., Baguio City



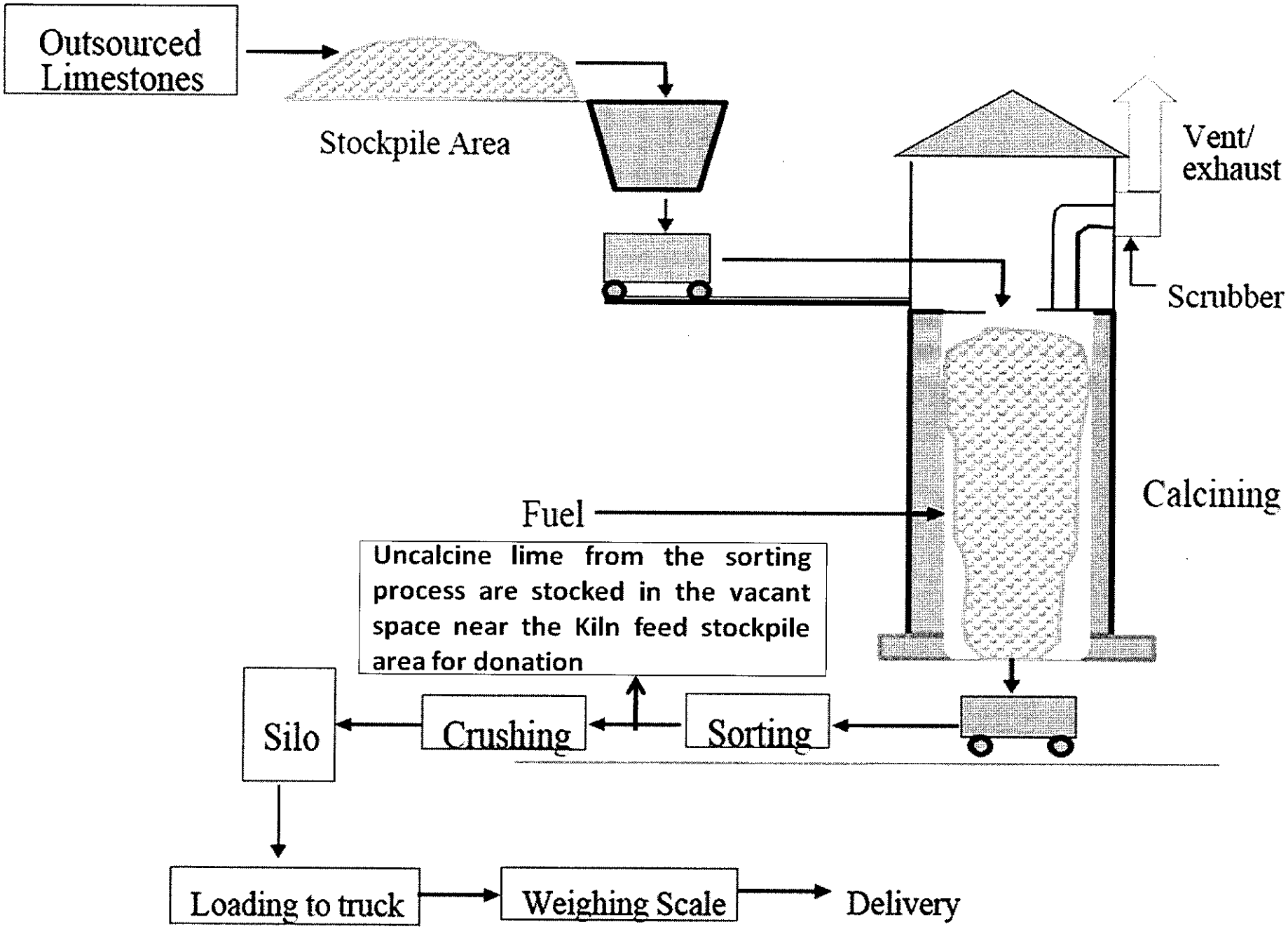
PLANT LAYOUT

(NOT DRAWN TO SCALE)

PROJECT : **IRISAN LIME KILNS**
LOCATION : KM.5, IRISAN, BAGUIO CITY
PROPONENT : BMC FORESTRY CORPORATION

FRANCIS O. FLAVIER
OPERATIONS MANAGER

TANDY L. PAGUIT
SE 00841 valid until 2/14/17
CE 22356 valid until 2/14/17


Outsourced Limestones
Stockpile Area
Vent/ exhaust
Scrubber
Calcining
Fuel
Uncalcine lime from the sorting process are stocked in the vacant space near the Kiln feed stockpile area for donation
Silo
Crushing
Sorting
Loading to truck
Weighing Scale
Delivery

[redacted]

Petroleum Products and Trucking Services Provider

CERTIFICATE OF ANALYSIS
(Special Low Sulfur Fuel Oil)

PROPERTY	METHOD (ASTM)	RESULT
Specific Gravity at 15°C	D 1298	0.81 kg/l
SI - Kinematic Viscosity @50°C	D 445	5.261
SI - Flash Point, PMMC	D 93B	40.0°C
SI - Pour Point	D 97	27°C
Ash from Petroleum Products	D 482	0.003 %(m/m)
SI - Total Sulfur Content	D 4294	0.107 % (m/m)
Water & Sediment in Fuel Oils by Centrifuge Method	D 1796 (Modified)	0.20 % (v/v)
SI - Sediment by Extraction	D 473	0.03 % (m/m)
High Heating Value, BTU/lb	D 4868	19558
Low Heating Value, BTU/lb	D 4868	18359
SI - Determination of NI, V & Fe by AAS -Acid Decomposition Method Vanadium	D 6863 (Method A)	9.0 ppm (m/m)
SI - Na, NI, V in Crude Oils & Residual Fuels by AAS Sodium	D 5863 (Method B)	11 ppm (m/m)
SI - Carbon Residue -Micro Method	D 4530 (Method A)	0.64 % (m/m)
Water Content	D 96	<0.1 % (v/m)
end of analysis		

For your reference.

Royal Cebu Building, Osmeña corner Judge Juan Luna Street, 6000 Cebu City
Telefax No. (032) 232-9999, (032) 232-1999

SGS

PAB ACCREDITED TESTING LABORATORY PAB ISO/IEC 17025:2017 LA-2016-2026

Certificate of Analysis: MK22-00020.002

Date: 12/05/2023
MAXFUEL PETROLEUM PRODUCTS TRADING
Sitio Maglanque, Concepcion, San Simon Pampanga

This laboratory is accredited under ISO/IEC 17025. The results reported herein have been performed in accordance with the laboratory's term of accreditation except calibrations/tests marked with an asterisk (*) in this report which are not within the scope of accreditation for our laboratory.

CUSTOMER ORDER NUMBER :	PO No. 05	SGS ORDER NO.:	2002943
CUSTOMER ID :	Requested by Ms. Maxine Uy		
LOCATION :	Not Indicated	PRODUCT DESCRIPTION :	IFO-100
SAMPLE SOURCE :	As Supplied		
SAMPLE TYPE :	As submitted	SAMPLED BY :	Client
SAMPLED :	--	RECEIVED :	11/05/2023
ANALYSED :	12/05/2022	COMPLETED :	12/05/2023

PROPERTY	METHOD	RESULT	UNIT	
Relative Density (SG) at 15.0/15.0 °C	ASTM D1298	0.8954	---	
Kinematic Viscosity at 40 °C (104 °F)	ASTM D445	46.43	mm²/s	
Flash Point by PMCC	ASTM D93B	175.0	°C	
High Heating Value (HHV)	ASTM D4868	19176	Btu/lb	
Lower Heating Value (LHV)	ASTM D4868	18021	Btu/lb	
Ash from Petroleum Products	ASTM D482			
Ash		0.860	% (m/m)	#
Total Sulfur Content *	ASTM D4294	0.300	% (m/m)	
Water Content	ASTM D95	0.2	% (v/m)	

** End of Analytical Results **

This document is only valid in its entirety and your attention is drawn to the Terms and Conditions on Page 1 of this report.

REPORTED BY :

[illegible] Reg. No. [illegible] Expiry: 6/15/2023
PTR No. 8090295, Issued: 01/03/2022, Makati

DIANA GEE T. ELIMEN
Lab Analyst I

CERTIFIED BY :

Chemist Reg. No. 0007546, Expiry 03/28/2024
PTR No. 9551765, Issued 01/27/2022, Lapu-Lapu

REY MANINGO
Laboratory Manager

14022022155000000006138

MONITORING LOGSHEET

Facility Information

Facility Name	BMC FORESTRY CORP. ICP
Facility Address	KM. 6 NAGUILIAN ROAD, IRISAN, BAGUIO CITY
Name of Pollution Control Officer	MS. NARHY C. POMILBAN
Maintenance Supervisor / Engineer	
Telephone and Fax Number	

Source Description

Source Type	VERTICAL SHAFT KILN #2
Source ID	PJ24 241 S1
Manufacturer / Brand of Equipment / Serial No.	✓
Equipment Capacity (BHp,MW,MT/hr)	1.08 MT/HR
Date of Installation (month/year)	
Date of Modification (that may increase emissions)	
Operational Hours per Year (hrs/year)	✓ 8,760 hrs./year
Operating rate (%)	✓ 100 %

Air Pollution Control Device

Is there an Air Pollution Control Device (APCD) attached to the source?	___ YES ___ NO
Type of APCD	
Date of Installation	
APCD parameters (flowrate,gpm,delta P,etc)	
Is the APCD operating during emission sampling	___ YES ___ NO

Fuel Analysis / Information

Type of Fuel used during emission sampling (%S)	✓ Bunker (BFO) Fuel Oil / Industrial (IFO) Fuel Oil
Original Fuel used	✓ BFO
Date of Fuel change	
Daily Fuel Consumption (Liters/day)	
Is the Fuel Analysis Available?	___ YES ___ NO
Will the company provide the Fuel Analysis	___ YES ___ NO

Please attach the following
- -Fuel Analysis
- -Permit to Operate
- -APCD Process Logsheet
- -Source Process Logsheet

✓Narhy C. Pomilban

Signature over printed name of Facility Representative

ANNEX D

ANALYTICAL DATA

ELARSI, INC.

Unit 201-204 & 406 Rizalina Annex Bldg. 1677 Quezon Avenue, Quezon City
Tel. No. 8927-77-15 Fax No. 8929-4824 Email: info@elarsi.com

CLIENT	: **BSI**	Lab. Report No.	: 241930-SA
ADDRESS	: 2nd Flr., VAG Bldg Ortigas Ave. Greenhills San Juan, Metro Manila	Date/Time Sampled	: 05-28-24 1800H
		Date Received	: 05-31-24
Contact Number	: 8863-6129	Date Analyzed	: 05-31-24 to 06-10-24
Nature of Sample/s	: Stationary Source Emission	Date Reported	: 06-10-24
No. of Sample/s Submitted	: Three (3)		

[REPORT OF ANALYSES]

Sample No.	Sample ID	PM (with acetone rinse), mg[a]	Analysis Date/Time
ES-2408629	PJ 24 241 S1R1	43.6	06-07-24 0850H
ES-2408630	PJ 24 241 S1R2	34.8	06-07-24 0850H
ES-2408631	PJ 24 241 S1R3	26.5	06-07-24 0850H

[a] - Method 5 / Gravimetric

Reference.
CFR 40 Part 60 Revised as of July 1, 2000

Analyzed By:

JOCELYN T. PAMITTAN, RChT
Laboratory Chemical Technician
PRC Lic. No. 0005410

Checked By:

JEMMA D. JACINTO, RCh
Laboratory Supervisor
PRC Lic. No. 0010872

Certified Correct By:

RENATO M. GOFREDO, JR., RCh
Laboratory Manager
PRC Lic. No. 0009824

Test results reflect the quality of the samples as received.

DENR RECOGNIZED LABORATORY C.R. No. 005/2021

PAB ACCREDITED TESTING LABORATORY PNS ISO/IEC 17025:2017 LA-2023-438A

ELARSI, INC.

Particulate Matter (PM) (METHOD 5) ANALYTICAL DATA SHEET (EI-APA-15)

Project No. :	PM24 241	**Lab Report No. :**	241930-SA
Nature of Sample :	SSE	**Date Received:**	05.31.24
Analytical Balance:	EI-EQPTREC-[illegible]	**Date Analysis Started:**	06-09-24 0850 H
Sensitivity:	0.1 mg	**Date Analysis Finished:**	06-10-24 0445H
Detection Limit:	0.1 mg	**Temperature (°C)**	
		Relative Humidity(%)	

	Units				
Sample ID		PM24 241 S1A	PM24 241 S1B2	PM24 241 S1B3	Blank
Sample No.		ES-2406629	ES-2406630	ES-2406631	-

Filter Analysis

Filter ID		SOS 095	SOS 089	SOS 082	-
Filter Appearance		brown	brown	brown	-
Initial Weight	g	0.3610	0.3610	0.3584	-
Final Weight	g	0.3964	0.3891	0.3779	-
Particulate Mass Filter, m_f	mg	35.4	28.1	19.1	-

Acetone Rinse Analysis

Dried PM Rinse Appearance		grey	grey	grey	clear
Acetone Rince Volume , V_{ar}	ml	112	32	71	100
Beaker ID		PM19	PM20	62	PM08
Initial Weight, Beaker	g	110.0628	109.4554	113.6054	111.9438X6
Final Weight, Beaker	g	110.0710	109.4621	113.6128	111.9434X4
Particulate Mass, Acetone Rinse, m_{ar}	mg	8.2	6.7	7.4	40.1

Acetone Reagent Blank

Acetone Blank Volume, V_a	ml	100	100	100	100
Beaker ID		PM08	PM08	PM08	PM08
Initial Weight, Beaker	g	111.9438	111.9438	111.9438	111.9438
Final Weight, Beaker	g	111.9434	111.9434	111.9434	111.9434
Blank Residue Mass, m_a	mg	0.0000	0.0000	0.0000	0.0000
$C_a = m_a / V_a$	mg/ml	0.0000	0.0000	0.0000	0.0000
Acetone Blank, $W_a = C_a \times V_{ar}$	mg	0.0000	0.0000	0.0000	0.0000
Max Blank Corr. Allowed, W_m*	mg	0.8600	0.3657	0.5578	0.7857
Acetone Blank Value Used **	mg	0.0000	0.0000	0.0000	0.0000

* *Maximum Acetone Blank is 0.001% A_r mass. W_m = Var x 0.7857x 0.00001 (where 0.7857 g/ml is acetone density @ 25° C)*

** *Maximum Mass of Acetone Blank Correction should be less than 0.001% of the Ar mass, otherwise use, W_m.*

Total PM = $m_f + m_{ar} - W_a$	mg	43.6	34.8	26.5	40.1
or **Total PM = $m_f + m_{ar} - Wm$**			ND (Not Detected)		

Analyzed by JTP
Date&Time 06-10-24 1000 H

Checked by JDJ
Date&Time 6/10/24 1500H

Approved by Rung
Date&Time 6/10/24 6 PM

EI_LABAIRFORM_15

ELARSI, INC.

Unit 201-204 & 406 Rizalina Annex Bldg. 1677 Quezon Avenue, Quezon City
Tel. No. 8927-77-15 Fax No. 8929-4824 Email: info@elarsi.com

CLIENT	: **BSI**	Lab. Report No.	: 241931-SA
ADDRESS	: 2nd Flr., VAG Bldg Ortigas Ave. Greenhills San Juan, Metro Manila	Date/Time Sampled	: 05-28-24 1800H
		Date Received	: 05-31-24
Contact Number	: 8863-6129	Date Analyzed	: 06-11-24
Nature of Sample/s	: Stationary Source Emission	Date Reported	: 06-12-24
No. of Sample/s Submitted	: Three (3)		

[REPORT OF ANALYSES]

Sample No.	Sample ID	SO_2, mg[a]	Analysis Date/Time
ES-2408632	PJ 24 241 S1R1	32.78	06-11-24 1300H
ES-2408633	PJ 24 241 S1R2	21.22	06-11-24 1300H
ES-2408634	PJ 24 241 S1R3	18.57	06-11-24 1300H

[a] - Method 6 ; Barium – Thorin Titration

Reference:
CFR 40 Part 60 Revised as of August 3, 2017

Analyzed By:

CHYLA DREXIE C. MORADA, RChT
Laboratory Chemical Technician
PRC Lic. No. 0009323

Checked By:

JEMMA D. JACINTO, RCh
Laboratory Supervisor
PRC Lic. No. 0010872

Certified Correct By:

RENATO M. GOFREDO, JR., RCh
Laboratory Manager
PRC Lic. No. 0009824

DENR
RECOGNIZED
LABORATORY
C.R. No. 005/2021

Test results reflect the quality of the samples as received.

ELARSI, INC.

SOx (METHOD 6/METHOD 8) ANALYTICAL DATA SHEET (EI-APA-14)

Project No. :	P) 24 241	**Lab Report No. :**	241931 - SA
Nature of Sample :	SSE	**Date Received:**	31 MAY 2024
N BaCl2 used :	0.0101066 8788	**Date Analysis Started:**	1 JUN 2024 1300H
IPA (used for titration) **:**	415400		
Detection Limit/s :	**SO2 (2.70 mg)**	**Date Analysis Finished:**	11 JUN 2024 1800H
	SO3 (3.27 mg) ; H2SO4 (4.00 mg)		

Computations:

IPA Check (Abs @ 352nm) IPA LOT No. 415400
Blank 0.00 *IPA* 0.004

Mass H2SO4 (mg) $= \left\{ \frac{(49.04)(N_{BaCl2})(V_{ave} - V_{IPAblank})V_{soln}}{V_a} \right\}$

Mass SO2 (mg) $\left\{ \frac{(32.03)(N_{BaCl2})(V_{ave} - V_{IPAblank})V_{soln}}{V_a} \right\}$

Mass SO3 (mg) = mass H2SO4 (mg) x $\frac{MW SO3 (80.061)}{MW H2SO4 (98.076)}$

where: V_{soln} *sample volume* V_{ave} *average volume of titrant used for sample*
V_a *volume aliquot*
$V_{IPAblank}$ *volume of titrant used for IPA blank*

ND (Not Detected)

Sample No	Sample ID	V_{soln}	V_a	Titrant Volume (ml) Buret Reading (Final - Initial)	Trial 1	(Final - Initial)	Trial 2	V_{ave}	SO2 Mass (mg)
	IPA Blank	100	10	0.00 - 0.00	0.00	0.00 - 0.00	0.00	0.00	< 2.70
EC-24086632	PJ 24 241 SAK 1	450		2.20 - 0.00	2.20	2.30 - 0.00	2.30	2.25	32.78
33	SAK 2	570		1.10 - 0.00	1.10	1.20 - 0.00	1.20	1.15	21.22
34	SAK 3	570		1.50 - 0.00	1.50	1.60 - 0.00	1.60	1.55	18.57

REMARKS:
Reagent & Standard Code/s:

0.0100 N Barium Standard Solution: SCI 0063
Thorin Indicator: SCI 0037
Isopropanol Brand/Lot#: 415400

Analyzed by ccm

Checked by [signature]
Date&Time 6/11/24 1800H

Checked by RWG
Date&Time 6/11/24 6PM

EI_LABAIRFORM_14(A)

ELARSI, INC.

REAGENTS STANDARDIZATION for SOx ANALYSIS (EI-APA-14)

Project No.: 01 24 24
Lab Report No. 24931-SA

Date Received: 31 MAY 2024
Date & Time Analysis Started: 11 JUN 2024 1300H
Date & Time Analysis Finished: 11 JUN 2024 1800H

Computations:

Standardization of 0.0100 ± 0.0002 N BaCl2:				
Trial No.	Volume (ml)	Normality (N)	Volume (ml)	Normality (N)
	H_2SO_4	H_2SO_4	$BaCl_2$	$BaCl_2$
1	25	0.009944816533	24.7	0.01006560378
2	25	0.009944816533	24.5	0.01014777197
			average	0.01010668788

$$N_{BaCl2} = \frac{N_{H2SO4} V_{H2SO4}}{V_{BaCl2}}$$

Standardization of 0.0100 ± 0.0002 N H2SO4:				
Trial No.	Volume (ml)	Normality (N)	Volume (ml)	Normality (N)
	NaOH	NaOH	H_2SO_4	H_2SO_4
1	25.2	0.009807511373	25	0.009885971464
2	25.5	0.009807511373	25	0.0100036616
			average	0.009944816533

$$N_{H2SO4} = \frac{N_{NaOH} V_{NaOH}}{V_{H2SO4}}$$

Standardization of NaOH:				
Trial No.	Weight (g)	Weight (g)	Volume (ml)	Normality (N)
	NaOH	KHP	NaOH	NaOH
1	40	0.1005	50.2	0.009802634441
2	40	0.1006	50.2	0.009812388306
			average	0.009807511373

$$N_{NaOH} = \frac{\text{Weight of KHP}}{0.20423 \times V_{NaOH}}$$

Analyzed by ccm
Date&Time 11 JUN 2024 1800H

Checked by JB
Date&Time 6/11/24 18H

Approved by RWG
Date&Time 6/11/24 6PM

EI_LABAIRFORM_14(B)

ELARSI, INC.

Unit 201-204 & 406 Rizalina Annex Bldg. 1677 Quezon Avenue, Quezon City
Tel. No. 8927-77-15 Fax No. 8929-4824 Email: info@elarsi.com

CLIENT	: **BSI**	Lab. Report No.	: 241932-SA
ADDRESS	: 2nd Flr., VAG Bldg Ortigas Ave. Greenhills San Juan, Metro Manila	Date/Time Sampled	: 05-28-24 1800H
		Date Received	: 05-31-24
Contact Number	: 8863-6129	Date Analyzed	: 06-10-24
Nature of Sample/s	: Stationary Source Emission	Date Reported	: 06-11-24
No. of Sample/s Submitted	: Ten (10)		

[REPORT OF ANALYSES]

Sample No.	Sample ID	NO_x (as NO_2), mg[a]	Analysis Date/Time
ES-2408635	PJ 24 241 S1R1T1	< 0.0404	06-10-24 0900H
ES-2408636	PJ 24 241 S1R1T1	< 0.0404	06-10-24 0900H
ES-2408637	PJ 24 241 S1R1T1	< 0.0404	06-10-24 0900H
ES-2408638	PJ 24 241 S1R2T1	< 0.0404	06-10-24 0900H
ES-2408639	PJ 24 241 S1R2T1	< 0.0404	06-10-24 0900H
ES-2408640	PJ 24 241 S1R2T1	< 0.0404	06-10-24 0900H
ES-2408641	PJ 24 241 S1R3T1	< 0.0404	06-10-24 0900H
ES-2408642	PJ 24 241 S1R3T1	< 0.0404	06-10-24 0900H
ES-2408643	PJ 24 241 S1R3T1	< 0.0404	06-10-24 0900H
ES-2408644	PJ 24 241 S1 Blank	< 0.0404	06-10-24 0900H

[a] - Method 7 / Phenoldisulfonic Acid

Reference
CFR 40 Appendix A-4 Part 60 as of May 31, 2023

Analyzed By:

CHYLA DREXIE C. MORADA, RChT
Laboratory Chemical Technician
PRC Lic. No. 0009323

Checked By:

JEMMA D. JACINTO, RCh
Laboratory Supervisor
PRC Lic. No. 0010872

Certified Correct By:

RENATO M. GORREDO, JR., RCh
Laboratory Manager
PRC Lic. No. 0009824

Test results reflect the quality of the samples as received.

DENR RECOGNIZED LABORATORY
C.R. No. 005/2021

ELARSI, INC.

STANDARD CALIBRATION for NOx ANALYSIS (EI-APA-10)

Project No. : [illegible] 24 341
Lab Report No. : 24932-SA
Spectrophotometer : EI-EQPTREC-297
Wavelength (nm) : 408 nm
Note: Wavelength is varies based on the optimum wavelength determination every 6 months.

Date Received : 31 MAY 2024
Date Analysis Started: 10 JUN 2024 0900H
Date Analysis Finished: 10 JUN 2024 1600H

Calibration Number	Standard Actual Concentration (µg)	Measured Absorbance	Corrected Absorbance a	Calculated Concentration (µg) b	Concentration (% difference) c
Blank	0	0.024			
1	100	0.151	0.127	98.83	1.17
2	200	0.279	0.255	198.44	0.78
3	300	0.410	0.386	300.38	-0.13
4	400	0.539	0.515	400.77	-0.19
QC	200	0.268	0.244	189.88	5.06

% REC = 94.94

Computations:

- a = Corrected absorbance for A1 through A4 is blank corrected
- b = Corrected absorbance x Kc
- c = Concentration, % difference should be less than 7%

Calibration Factor (K_c) = $\dfrac{a_1 + 2a_2 + 3a_3 + 4a_4}{a_1^2 + a_2^2 + a_3^2 + a_4^2} * 100 =$ 778.1083 3469.5204

% difference = $\dfrac{\text{actual concentration - calculated concentration}}{\text{actual concentration}} \times 100$

REMARKS:
Reagent & Standard Code/s:

1N NaOH	0148	Ammonium Hydroxide	0119
Phenoldisulfonic Acid Reagent	0112	Std. KNO3 Solution	0134 0135
Conc. H_2SO_4	0109	Working Std. KNO3 Solution	0150 0151

Prepared by: [illegible]
Approved by: Rung
Reviewed by: [illegible]

ELARSI, INC.

NOx (METHOD 7) ANALYTICAL DATA SHEET (EI-APA-10)

Project No. : BJ 24 241
Nature of Sample : SSE
Aliquot Factor : 2
Calibration Factor (K_c) : 718.0R32A595C4
Detection Limit : 0.0404 mg

ND (Not Detected)

Sample No.	Sample ID	Sample Absorbance	Blank Adjusted Absorbance (A')	Dilution Factor (F)	Total Mass of Nox as NO2 in Sample (mg) m
	BLANK	0.025	0		<0.0404
BS-240835		0.038	0.013		
36	1	0.028	0.003		
37	3	0.052	0.027		
38	1	0.040	0.015		
39	2	0.037	0.012		
40	3	0.030	0.005		
41	1	0.025	0.000		
42	2	0.035	0.010		
43	3	0.024	-0.001		
44	[illegible]	0.028	0.003		
					Mass, µg / %Recovery / %Diff.
	QC (200µg)	0.269	0.244	1	189.58 / 94.94 / 5.06
					Mass, µg / %Recovery / %Diff.
	QC (200µg)				

(A') = Sample Absorbance - Blank Absorbance

$m = 2 K_c A^1 F / 10^3$

Note: If other than a 25 mL aliquot is used for analysis, the factor 2 must be replaced by a corresponding factor, i.e., volume solution divided by the volume aliquot evaporated

Analyzed by [illegible]
Date&Time 10 JAN. 2024 16:00H

Checked by JU
Date&Time 6/10/24 1304

Approved by RMG
Date&Time 6/10/24 6Pm

REQUEST FOR ANALYSIS / CHAIN OF CUSTODY FORM

ELARSI, INC.
Unit 201-204 & 406 Rizalina Annex Bldg. 1677 Quezon Avenue, Quezon City
Tel. No. 8927-77-15 , 8994-3443 * Fax No. 8929-48-24 * E-mail: info@elarsi.com

Inv # ____ OR# ____ *FOR LABORATORY USE ONLY*
Lab. Report No. 241930-32-SA

Company : BSI
Address : ORDOÑEZ AVE.
Contact Person : HALCY LEMON ORQUIZA Contact No./s 0956-779-0664

Submitted by: H. P. ORTIZ (Printed Name/Signature) Date/Time: 5-29-24 / 1:00
Reviewed by: (Printed Name/Signature) Date/Time: 31MAY24
Approved by: Jenna Jecinth Sat (Printed Name/Signature) Date/Time: 5/31/24

Method of Transport
✓ Walk-in ____ Courier ____ Pick-up ____ Others

Sample Condition Upon Receipt
✓ Sealed / Container Intact
✓ Chilled/Frozen
✓ Room Temp
__ Preserved

Container Type
✓ Plastic Bottle
✓ Glass/Sterile Glass
__ TEDLAR Bag
__ Others Filter

Turn Around Time
__ Urgent/Rush (3-5 Working Days)
✓ Routine (7-12 Working Days)

Nature of Sample (PLEASE CHECK)[1]
Water: __ Drinking Water __ Wastewater __ Others
Air: ✓ Stack Source Emission __ Ambient Air Sample __ Work Env. Measurement __ Others
Metals: __ Water __ Air __ Others
Solids: __ Soil __ Sludge __ Sediment __ Others

FOR LAB. USE ONLY Sample No.	Sample Identification	Analyses Requested	Method Of Analysis	Date of Sampling/Time	No. of Samples	Remarks
	PJ24-241					
PM						
ES-2408629-31	S1 R1	PM	- Gravimetric		3	
	R2	Acetone Wash		28 MAY	3	
SOx	R3	SOx	- Barium thorin titration		3	
ES-2408632-34				2024	(9)	w/ Blank
NOx	S1 R1 T1-T3					for NOx
ES-2408635-44	R2 T1-T3	NOx	Phenoldisulfonic Acid		(9)	
	R3 T1-T3					
	blank					
					1800	

FOR LAB. USE ONLY DATE OF THE FOLLOWING

Certificate Sent/Reported	Worksheet Sent	COC Sent	Sample Disposed

1 USE ONE(1) COC FOR EACH NATURE OF SAMPLE
2 Unless otherwise requested, all samples will be disposed two (2) weeks after analysis
3 Use HRAFORM_56 waiver form if Sample condition & requirements are not met.

AFORM_03

Serial No. 2022

BSI
Environmental Management Service Provider

CO MEASUREMENT DATA

Tedlar Bag Samples

Facility:	BMC FORESTRY CORPORATION	Analysis Date:	May 31, 2024
Sample Date:	May 28, 2024	Analyzed By:	JOSE ARJAY M. SANTIAGO
Collected By:	ECF, HPO, RME, MSL, JBT	Signature:	

CO Analyzer Manufacturer	**FUJI ELECTRIC CO., LTD.**
Analyzer Model Serial Number	**ZPAABBY2 / N2C0833**
Analyzer Range Setting, ppm	**0 - 1000**
Analyzer Span Value, ppm	**800**

Pre-Measurement Calibration

Time 0800H	Cylinder No.	Gas Value (ppm)	CO response (ppm)	% Difference* (% span)	Status (≤ 2% span)
Zero Gas	**N2 240403**	**0**	0	**0.0000**	**Passed**
Certified Gas 1	**D962229**	**200**	201	**-0.1250**	**Passed**
Certified Gas 2	**D962122**	**500**	499	**0.1250**	**Passed**
Certified Gas 3	**D962087**	**800**	800	**0.0000**	**Passed**

*((Gas Value- CO Response) /Span Value))x 100%

CO Tedlar Bag Samples

Time	Tedlar Bag ID No.	CO (ppm)	Time	Tedlar Bag ID No.	CO (ppm)
0900H	**PJ24-241 S1R1**	**106**			
0910H	**PJ24-241 S1R2**	**99**			
0920H	**PJ24-241 S1R3**	**112**			

Post-Measurement Calibration Drift Check

Time 1800H	Gas Value (ppm)	Pre-Meas CO Response (ppm)	Post-Meas CO Response (ppm	% Drift** (% span)	Status (≤ 10 % span)
Zero Gas	**0**	0	0	**0.0000**	**Passed**
Certified Gas 1	**200**	201	198	**0.3750**	**Passed**
Certified Gas 2	**500**	499	495	**0.5000**	**Passed**
Certified Gas 3	**800**	800	797	**0.3750**	**Passed**

**((CO Resp from the Pre-Meas Cal-Co Resp for the Post-Meas)/Span Value)) x 100%

QA/QC Check: Completeness ✓ Legibility ✓ Accuracy ✓ Specifications ✓ Reasonableness ✓ Over 8 hours ✓

Checked By: **JANS CHOLO E. CHUA**
Signature Over Printed Name

QA/QC/Date: **EDINDO C. FERNANDO**
Signature Over Printed Name

2nd Floor, VAG Bldg. Ortigas Ave., Greenhills
San Juan City, Metro Manila, Philippines
Tels. (632) 663-6129• Fax (632) 727-6831

ANNEX E

EQUIPMENT CALIBRATION CERTIFICATES

METER BOX POST-TEST CALIBRATION CHECK

USEPA Approved Alternative Method ALT-009

BMC FORESTRY CORP. ILP
IRISAN, BAGUIO CITY
VERTICAL SHAFT KILN NO. 2

Meter Box #: 2

Calibration	Date	$\Delta H_@$	Y
5-point orifice calibration	18-Jan-24	43.1764	0.9884

Calculate Y_{qa} for each test run using the following equation:

$$Y_{qa} = \frac{\theta}{V_m}\sqrt{\frac{0.0011503\,T_m}{\Delta H_@\left(P_b + \frac{\Delta H_{avg}}{13.6}\right)}} \times \frac{29}{M_d} \times \left(\sqrt{\Delta H}\right)_{avg}$$

where:

Y_{qa}	dry gas meter calibration check, value dimensionless.
θ	total run time, min.
V_m	total sample volume measured by dry gas meter, m^3.
T_m	absolute average dry gas meter temp., °K.
P_b	barometric pressure, mm Hg.
0.0011503	$=(760/298)\,(0.75 \times 0.0238)^2$ (mm Hg/°K) $(m^3/min)^2$
ΔH_{avg}	average orifice meter differential, mm H_2O.
$\Delta H_@$	orifice meter calibration coefficient, mm H_2O.
M_d	dry molecular weight of stack gas, gm/gm mole.
29	dry molecular weight of air, gm/gm mole.
13.6	specific gravity of mercury.

After each test run series, do the following:

Average the three or more values of Y_{qa} obtained from the test run series and compare this average with the dry gas meter calibration factor, Y. The average Y_{qa} must be within ±5% of Y.

If the average Y_{qa} does not meet the ±5% criterion, recalibrate the meter over the run full range of orifice settings, as detailed in Method 5. Then follow the subsequent procedure in Method 5.

METER BOX POST-TEST CALIBRATION CHECK				
		Run 1	Run 2	Run 3
Meter Box		Meter Box #: 2	Meter Box #: 2	Meter Box #: 2
Time, min	θ	60.0	60.0	60.0
Total volume, dry m^3	V_m	1.6272	1.5420	1.5294
Average meter temp, °C		29.79	30.54	29.88
Average meter temp, °K	T_m	302.94	303.69	303.03
Barometric pressure, mm Hg	P_b	652.70	651.50	650.50
ΔH_{avg}, mm H_2O		63.500	58.000	52.250
$\Delta H_@$, mm H_2O		43.1764		
Mol. wt. of stack gas, g/g-mole	M_d	29.84	29.84	29.84
QA gamma	Y_{qa}	1.0147	1.0261	0.9819
Average Yqa		1.0076		
Meter box gamma	Y	0.9884		
Difference to be within 5%		1.9% - PASS		

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TEAM NO.2: HPO - CRITICAL ORIFICE

DETERMINATION OF ORIFICE COEFFICIENT K'

Console Model Number	XC572-QC6V	**Date**	18-Jan-24	**Time**	0845H	**Std Temp**	298.15 °K
Console Serial Number	1404036	**Barometric Pressure**		755.9	mm Hg	**Std Press**	760 mm Hg
DGM Model Number	G1.6	**Theoretical Critical Vacuum**		357mm Hg or 14in Hg		**K_1**	0.3858
DGM Serial Number	2012-014438	**Calibration Technician**		HPO		**Previous calibration**	1.0000

Metering Console							Critical Orifice						
Run #	Elapsed Time	DGM Orifice ΔH	Volume		Outlet Temp		Orifice ID	Ambient Temp		Critical Vacuum	Actual Vacuum *1-2in or 25-50mm > Critical*	Coeff. x10⁴	Diff %
			Initial	Final	Initial	Final		Initial	Final				
	θ	P_{in}	V_{mi}	V_{mf}	t_{mi}	t_{mf}		t_{amb}	t_{amb}	in Hg or mm Hg		K'	< ±0.5
	min	mm H_2O	m^3	m^3	°C	°C		°C	°C				
1	5	10	0.3140	0.3616	24.0	24.0	40	27.3	27.2	15	17	2.14490	0.21
2	5	10	0.3616	0.4090	24.0	24.0	40	27.2	27.2	15	17	2.13571	0.21
											Average	**2.14030**	
1	5	20	0.4150	0.4847	24.0	24.0	48	27.2	27.5	15	17	3.14432	0.02
2	5	20	0.4847	0.5544	24.0	24.0	48	27.5	27.6	15	17	3.14536	0.02
											Average	**3.14484**	
1	5	32	0.5620	0.6528	24.0	24.0	55	27.6	27.5	15	17	4.10232	0.02
2	5	32	0.6528	0.7438	24.0	25.0	55	27.5	27.5	15	17	4.10411	0.02
											Average	**4.10321**	
1	5	54	0.7550	0.8722	25.0	25.0	63	27.5	27.5	15	17	5.28812	0.09
2	5	54	0.8722	0.9892	25.0	25.0	63	27.4	27.4	15	17	5.27821	0.09
											Average	**5.28317**	
1	5	94	0.9980	1.1577	25.0	25.0	73	27.2	27.2	15	16	7.23002	0.08
2	5	94	1.1577	1.3174	25.0	24.0	73	27.2	27.2	15	16	7.24217	0.08
											Average	**7.23609**	

Calibrated By: Halcy Lemon P. Orquina
Signature over Printed Name

Checked By: Jans Cholo E. Chua
Signature over Printed Name

QA/QC: Edindo C. Fernando
Signature over Printed Name

Date: 18 January 2024

2nd Floor, VAG Bldg. Ortigas Ave., Greenhills
San Juan City, Metro Manila, Philippine
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Email: info@bsienv.com.ph

Department of Environment and Natural Resources (DENR)
ENVIRONMENTAL MANAGEMENT BUREAU
ACCREDITED THIRD PARTY TESTER
Certificate No: SAT NO. 2022-72

BSI
Environmental Management Service Provider

TEAM NO.2: HPO - CRITICAL ORIFICE

USING FIVE CRITICAL ORIFICES

Console Model Number	XC572-QC6V	**Date**	18-Jan-24	**Time**	1005H	**Std Temp**	298 °K
Console Serial Number	1404036	**Barometric Pressure**	755.9 mm Hg			**Std Press**	760 mm Hg
DGM Model Number	G1.6	**Theoretical Critical Vacuum**	357mm Hg or 14in Hg			K_1	0.3858
DGM Serial Number	2012-014438	**Calibration Technician**	HPO			**Previous calibration**	1.0000

Metering Console							Critical Orifice					
Elapsed Time	DGM Orifice ΔH	Volume			Outlet Temp.		Serial #	Coef. x10⁴	Ambient Temp.		Critical Vacuum	Actual Vacuum
		Initial	Final	Dif	Initial	Final			Initial	Final		
θ	P_m	V_{mi}	V_{mf}	V_m	t_{mi}	t_{mf}		K'	t_{amb}	t_{amb}		*1-2in or 25-50mm > Critical*
min	mm H_2O	m^3	m^3	>0.14m^3	°C	°C		metric units	°C	°C	in Hg or mm Hg	
17.0	8.0	1.3380	1.5040	0.166	25.0	25.0	40	2.14030	27.1	27.6	15.0	17.0
11.0	20.0	1.5170	1.6732	0.156	25.0	25.0	48	3.14484	27.6	26.8	15.0	17.0
9.0	32.0	1.6824	1.8484	0.166	25.0	25.0	55	4.10321	26.8	26.3	15.0	17.0
7.0	54.0	1.8560	2.0212	0.165	25.0	25.0	63	5.28317	26.3	26.4	15.0	17.0
5.0	94.0	2.0410	2.2016	0.161	25.0	25.0	73	7.23609	26.4	26.4	15.0	16.0

Standardized Data				Dry Gas Meter				
Dry Gas Meter		Critical Orifice		Calibration Factor		Flowrate	$\Delta H_@$	
				Value	Var'n	Std & Corr	0.0212 m^3_{std}/min	Variation
$V_{m(std)}$	$Q_{m(std)}$	$V_{cr(std)}$	$Q_{cr(std)}$	Y	ΔY	$Q_{m(std)(corr)}$	$\Delta H_@$	$\Delta\Delta H_@$
m^3	m^3/min	m^3	m^3/min		±2%	m^3/min	mm H_2O	±5.1mm Hg
0.1626	0.0096	0.1587	0.0093	0.9762	-1.24	0.0093	39.9299	-3.2
0.1532	0.0139	0.1509	0.0137	0.9854	-0.30	0.0137	46.3219	3.1
0.1630	0.0181	0.1613	0.0179	0.9898	0.14	0.0179	43.5437	0.4
0.1625	0.0232	0.1616	0.0231	0.9942	0.58	0.0231	44.4826	1.3
0.1586	0.0317	0.1581	0.0316	0.9966	0.82	0.0316	41.6038	-1.6
			Y Average	**0.9884**			$\Delta H_@$ Average	**43.1764**

I certify that the above Dry Gas Meter was calibrated in accordance with USEPA Method 5.

Signature: HALCY LEMON P. ORQUINA / JANS CHOLO E. CHUA / EDINDO C. FERNANDO Date: 18-Jan-24

2nd Floor, VAG Bldg. Ortigas Ave., Greenhills
San Juan City, Metro Manila Philippine
Tels. (632) 863 6129 · Fax (632) 727-9831
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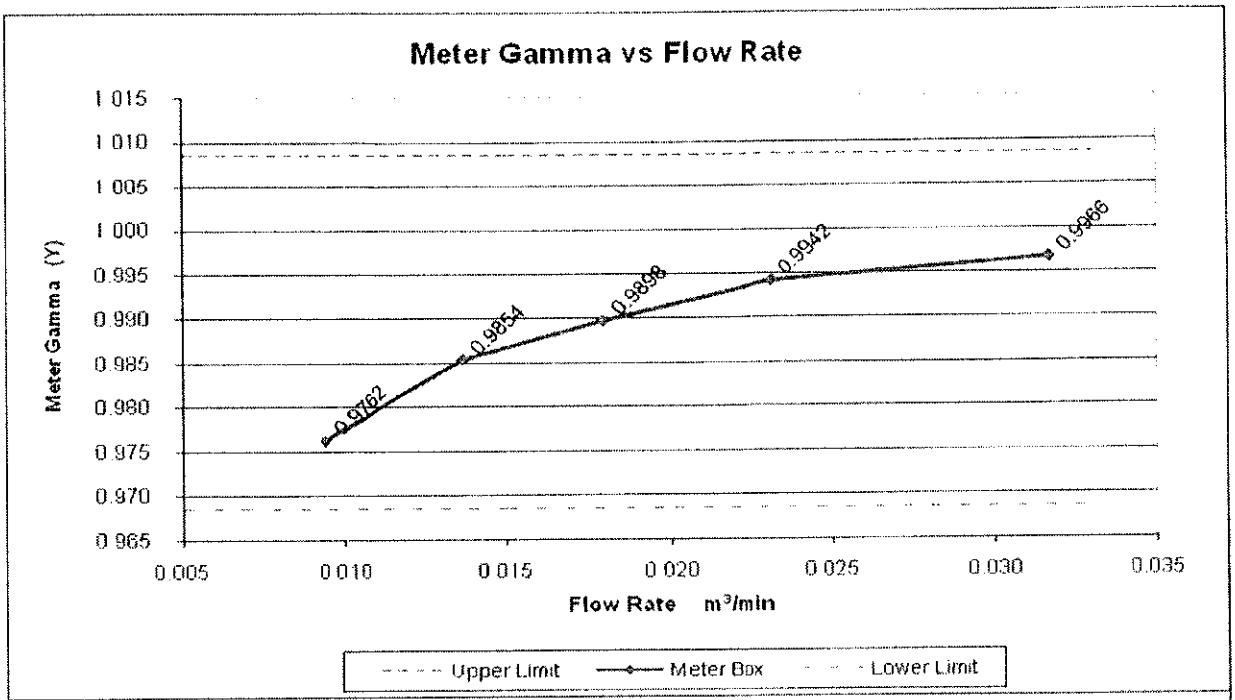
Department of Environment and Natural Resources (DENR)
ENVIRONMENTAL MANAGEMENT BUREAU
ACCREDITED THIRD PARTY TESTER
Certificate No: SAT NO. 2022-72

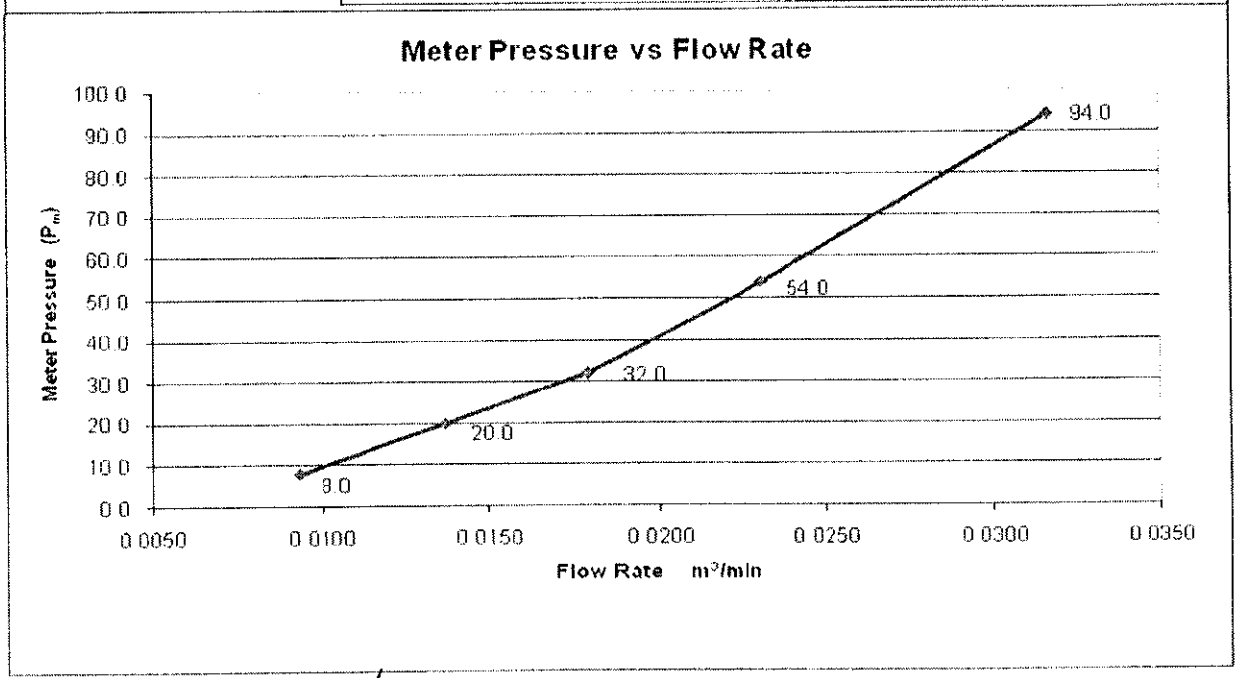
BSI

Environmental Management Service Provider

TEAM NO. 2 - CRITICAL ORIFICE

USING FIVE CRITICAL ORIFICES





Calibrated By: Haley Lemon P. Orquina
Signature over Printed Name

Checked By: Jans Cholo E. Chua
Signature over Printed Name

QA/QC: Edindo C. Fernando
Signature over Printed Name

Date: 18 January 2024

2nd Floor, VAG Bldg. Ortigas Ave., Greenhills
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Department of Environment and Natural Resources (DENR)
ENVIRONMENTAL MANAGEMENT BUREAU
ACCREDITED THIRD PARTY TESTER
Certificate No: SAT NO. 2022-72

BSI

Environmental Management Service Provider

TEMPERATURE DISPLAY CALIBRATION

Meter Console No.	**BSI - T2**	**Personnel**	**HPO, RCG**
Reference Calibration Maker	**PIE**	**Pretest**	**OK**
Model	**520B**	**Posttest**	**OK**
Serial No.	**223734**	**Date**	**18 January2024**

TC CHANNEL ID	Reference Temp. 1, °C	Temp. Reading 1, °C	Criteria	Criteria Met	Reference Temp. 2, °C	Temp. Reading 1, °C	Criteria	Criteria Met
PROBE	0	0	0	Y	50	49	0.310	Y
FILTER	0	0	0	Y	50	49	0.310	Y
EXIT	0	0	0	Y	50	49	0.310	Y
AUX	0	0	0	Y	50	49	0.310	Y
STACK	0	0	0	Y	50	48	0.619	Y
STACK	0	0	0	Y	250	247	0.574	Y

TC CHANNEL ID	Reference Temp. 3, °C	Temp. Reading 1, °C	Criteria	Criteria Met	Reference Temp. 4, °C	Temp. Reading 1, °C	Criteria	Criteria Met
PROBE	100	99	0.268	Y	150	148	0.473	Y
FILTER	100	99	0.268	Y	150	148	0.473	Y
EXIT	100	99	0.268	Y	150	149	0.236	Y
AUX	100	99	0.268	Y	150	149	0.236	Y
STACK	100	99	0.268	Y	150	149	0.236	Y
STACK	350	349	0.161	Y	450	447	0.415	Y

CRITERIA: Percent difference between the Reference Temperature and the average Temperature can be only ± 1.5%°K.

EQUATION: $\frac{[(\text{Ref. Temp.} + 273) - (\text{Temp. Reading} + 273)] \times 100}{(\text{Ref.Temp.} + 273)}$

Calibrated By: Halcy Lemon P. Orquina
Signature over Printed Name

Checked By: Jans Cholo E. Chua
Signature over Printed Name

QA/QC: Edmdo C. Fernando
Signature over Printed Name

Date: 18 January 2024

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San Juan City, Philippines
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Department of Environment and Natural Resources (DENR)
ENVIRONMENTAL MANAGEMENT BUREAU
ACCREDITED THIRD PARTY TESTER
Certificate No: SAT NO. 2022-72

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TEMPERATURE SENSOR CALIBRATION DATA SHEET

Date	18 January 2024	Thermocouple No.	**TMC – T2**
Personnel	**HPO, MSL**	Reference	Alcohol Thermometer

Date	Reference Point Number	Source (Specify)	Reference Thermometer Temp., °C	Thermocouple Display Temp., °C	Absolute Temperature Difference, %
18 Jan 2024	1	**HOT WATER**	**99.8**	**100**	**0.2**
	2	**AMBIENT**	**28.1**	**28**	**0.1**
	3	**ICE WATER**	**2.2**	**2**	**0.2**
30 Jun 2023	1	**HOT WATER**	**99.2**	**99**	**0.2**
	2	**AMBIENT**	**28.1**	**28**	**0.1**
	3	**ICE WATER**	**2.2**	**2**	**0.2**
11 Jan 2023	1	**HOT WATER**	**99.2**	**99**	**0.2**
	2	**AMBIENT**	**28.1**	**28**	**0.1**
	3	**ICE WATER**	**2.2**	**2**	**0.2**

Calibrated By: Haley Lemon P. Orquina
Signature over Printed Name

Checked By: Jans Cholo E. Chua
Signature over Printed Name

QA/QC: Edindo C. Fernando
Signature over Printed Name

Date: 18 January 2024

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POST TEST THERMOCOUPLE CALIBRATION CHECK

EPA Approved Alternative Method (Alt-011)
Single Point Calibration

Thermocouple ID	TMC- T2	**Probe / Pitot Tube ID**	SPA-6FT-2 / PT-6FT-2
Personnel	HPO, RCG	**Date**	18January 2024

Sensor	Calibrated By:	Reference Temp. °C [1]	Thermocouple Temp. °C	Difference [2] (within ± 1°C)	Continuity Check [3]	PASS / FAIL
PROBE	HPO	30.2	30	0.2	OK	PASSED
FILTER	HPO	30.1	30	0.1	OK	PASSED
STACK	HPO	30.1	30	0.1	OK	PASSED
EXIT	HPO	30.1	30	0.1	OK	PASSED
OVEN	HPO	30.2	30	0.2	OK	PASSED
AUX.	HPO	30.2	30	0.2	OK	PASSED

[1] Reference Thermometer is mercury-in-glass and ASTM certified, unless otherwise noted.
[2]After each test run series, check the accuracy (and, hence, the calibration) of each thermocouple system at ambient temperature. The temperature of the thermocouple and reference thermometers shall agree with ± 1 °C.
[3]The continuity check involves subjecting the tip of the thermocouple to a change in temperature to check the crimps, loose connections. Thermocouples with crimps and loose connections will not immediately respond to temperature changes, and those with wrong connections will show an opposite change in temperature.

Calibrated By: Halcy Lemon P. Orquina
Signature over Printed Name

Checked By: Jans Cholo E. Chua
Signature over Printed Name

QA/QC: Edindo C. Fernando
Signature over Printed Name

Date: 18 January 2024

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TYPE-S PITOT TUBE CALIBRATION

PITOT TUBE ID	**PT-6FT-2**	**Probe Assembly ID**	**SPA-6FT-2**
Calibrated by:	HPO, RCG	**Date Calibrated**	18 January 2024

PARAMETER	VALUE	ALLOWABLE RANGE
Assembly Level	**YES**	YES
Holes Damaged	**NO**	NO
Obstructed	**NO**	NO
$\alpha 1$	**0**	$-10° < \alpha 1 < +10°$
$\alpha 2$	**0**	$-10° < \alpha 2 < +10°$
$\beta 1$	**1**	$-5° < \beta 1 < +5°$
$\beta 2$	**0**	$-5° < \beta 2 < +5°$
Y	**1**	
θ	**1**	
A	**0.935**	For ¼" OD, 0.526 to 0.750" For ⅜" OD, 0.788 to 1.125"
Z =A sin Y	**0.016**	Z = ≤ 0.125"
W = A sin θ	**0.016**	W = ≤ 0.031"
P_A	**0.418**	For ¼" OD, 0.263 to 0.375" For ⅜" OD, 0.394 to 0.563"
P_B	**0.433**	For ¼" OD, 0.263 to 0.375" For ⅜" OD, 0.394 to 0.563"
$P_A - P_B$	**-0.015**	-0.063 to 0.063"
D_T	**0.320**	0.188 to 0.375"

Where: $\alpha 1$ & $\alpha 2$ = angles between the pitot tube opening and the horizontal plane when viewed from the end

$\beta 1$&$\beta 2$ = angles between the pitot tube opening and the horizontal plane when viewed from the side

Y= the angle measured when calculating the difference in length between the two pitot tube legs

0 = the angle measured when calculating the distance that the pitot tubes are rotated

A = the distance between the tips of the pitot tube opening

Z =The difference in length between the two pitot tube legs

W= the distance that the pitot tube legs are rotated

P_A&P_B= vertical distance between each pitot tube opening plane & the center line of the pitot tube

D_T = the tube external diameter

Certification

I certify that the Type S pitot tube meets or exceeds all specifications, criteria and / or applicable design features and is hereby assigned a pitot tube calibration factor (Cp) of 0.84.

Calibrated By: Halcy Lemon P. Orquina
Signature over Printed Name

Checked By: Jans Cholo E. Chua
Signature over Printed Name

QA/QC: Edindo C. Fernando
Signature over Printed Name

Date: 18 January 2024

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NOZZLE CALIBRATION SHEET

Date	18 January 2024	**Personnel**	HPO, RCG
Nozzle Box ID	**NS – T2**	**Nozzle Type**	**Stainless Steel**

ID	D_1(mm)	D_2(mm)	D_3(mm)	D (mm)	Average (mm)
T2 NS-1	3.04	3.06	3.02	0.04	**3.04**
T2 NS-2	4.09	4.09	4.09	0.00	**4.09**
T2 NS-3	5.90	5.90	5.87	0.02	**5.89**
T2 NS-4	7.90	7.88	7.90	0.01	**7.89**
T2 NS-5	9.36	9.37	9.36	0.01	**9.36**
T2 NS-6	10.86	10.90	10.90	0.04	**10.89**
T2 NS-7	12.50	12.50	12.50	0.00	**12.50**

D = Maximum difference in any two measurements. Tolerance = 0.1 mm ; Average = Average of $D_{1,2,3}$

Calibrated By: Haley Lemon P. Orquina
Signature over Printed Name

Checked By: Jans Cholo E. Chua
Signature over Printed Name

QA/QC: Edindo C. Fernando
Signature over Printed Name

Date: 18 January 2024

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FLASK CALIBRATION SHEET

Date	18 January 2024	**Personnel**	HPO, RCG
FLASK BOX ID	**T2- M7 Flask-C**	**Flask Type**	**Glass**

FLASK ID	1st Volume(mL)	2nd Volume(mL)	3rd Volume(mL)	Average Volume (mL)
BSI T2 – F19	2315	2310	2320	**2315**
BSI T2 – F20	2250	2250	2250	**2250**
BSI T2 – F21	2308	2310	2312	**2310**
BSI T2 – F22	2247	2253	2250	**2250**
BSI T2 – F23	2235	2230	2240	**2235**
BSI T2 – F24	2286	2286	2283	**2285**
BSI T2 – F25	2250	2250	2250	**2250**
BSI T2 – F26	2228	2232	2230	**2230**
BSI T2 – F27	2280	2280	2280	**2280**

***Note: The flask volumes are measured within +/- 10mL. All calibrations are at room temperature.**

Calibrated By: Halcy Lemon P. Orquina
Signature over Printed Name

Checked By: Jans Choto E. Chua
Signature over Printed Name

QA/QC: Edindo C. Fernando
Signature over Printed Name

Date: 18 January 2024

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DIGITAL BALANCE CALIBRATION

Digital Balance ID	DB - T2	**Personnel**	HPO, MSL
Manufacturer	AND CO. LTD.	**Date**	18 January 2024
Model	EJ-1500	**Calibration Standard**	1000g
Serial Number	BA2826513	**Type**	Weights (1500g max)

Eccentricity Test		**Repeatability Test**	
Test Load	1000g	When Loaded up to 1500g (Using 1000g& 500g standard weights)	
Position	Balance Indication	Trial	Balance Indication
1	1000.0	1	1549.9
2	1000.0	2	1549.9
3	1000.0	3	1549.9
4	999.9	4	1549.9
5	1000.0	5	1549.9
Test Results	0.1	Standard Deviation	0

Linearity Test				
Nominal Load	**Unit under Test Reading**	**Deviation from Nominal**	**Coverage Factor**	**UE at 95% C.L**
Weights	g	g	k	g
0	0	0	2	0
200g	199.9	0.1	2	0.16
500g	500	0	2	0
1000g	1000	0	2	0
1500g	1499.9	0.1	2	0.16

[1]Acceptable EPA Method 4 tolerance must be less than 0.5 gram.
[2]Acceptable EPA Method 5 tolerance must less than 0.5 gram.

Equipment Description	**Equipment ID**	**Traceability Reference**
Standard Weight	1254	08-09-2022-BSI-T2

Calibrated By: Halcy Lemon P. Orquina
Signature over Printed Name

Checked By: Jans Cholo E. Chua
Signature over Printed Name

QA/QC: Edindo C. Fernando
Signature over Printed Name

Date: 18 January 2024

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Department of Environment and Natural Resources (DENR)
ENVIRONMENTAL MANAGEMENT BUREAU
ACCREDITED THIRD PARTY TESTER
Certificate No: SAT NO. 2022-72

Switchtek
Measurement Systems
A Division of Switchtek Construction Corporation
4th Floor Northridge Plaza, Annex A, 12 Congressional Ave.,
Bahay Toro,Quezon City, 1100, Philippines
Tel Nos.02 4267593 / 9282869 / 9287769 Fax No.4537694
email Address: admin@switchtek.com.ph
www.switchtek.com.ph

Certificate No.:	**4000.23-8979-4.23**	**Calibration of**	**3 IN1 (Anemometer, Barometer, %RH)**		
Identification:	**BERKMAN SYSTEMS INCORPORATED**				
Job:	P1	Test and Verification			
Fin.acc:	32	Certificate of Calibration			
Done.....:	December 5, 2023	Initials...:	CAC		
Categories	Calibration	Men	Hours	Total cost	Type
Cal Officer		2	1.00	-	Certificate

CERTIFICATE OF CALIBRATION - 3 IN 1 (ANEMOMETER, BAROMETER, % RH)

This report of calibration shall document that the instrument herein was examined and tested in compliance with ISO/IEC 17025 against NIST traceable reference standards and its co-equal standards.

Issued to: BERKMAN SYSTEMS INCORPORATED
Address: Suite 208 VAG Bldg., Ortigas Avenue, Greenhills, San Juan, Metro Manila, Philippines

UNIT UNDER TEST (UUT):

Instrument:	3 IN1 (Anemometer, Barometer, %RH)
Brand:	LUTRON
Model No.:	ABH-4225
Serial No.:	AJ.79434
Range:	Velocity (0-30.0 m/s)
	Temp. (0-50 Deg. C)
	Humidity (10 to 95%)
	Dewpoint (-25.3 to 48.9 Deg. C)
	10.0 to 999.9 hPa
Resolution:	Velocity (0-30.0 m/s)/0.1 m/s
	Temp. (0-50 Deg. C)/0.1 Deg. C
	Humidity (10 to 95%)/0.1 %RH
	Dewpoint (-25.3 to 48.9 Deg. C)/0.01 Deg. C
	Barometeric (10.0 to 999.9 hPa) /0.1

CALIBRATOR INFORMATION:

Instrument:	Temperature and Humidity chamber
Model No.:	XB-OTS-34
Serial No.:	20130803
Traceability:	CNAS
Instrument:	Rotating Vane Anemometer
Manufacturer:	LUTRON
Model No:	AM-4206M
Serial No:	Q432206
Range:	0 to 30.0 m/s
	0 to 50.0 °C
Calibrated Against:	UKAS, thru Laser Doppler Anemometer
Instrument:	Barigo, Precision Barometer
Calibrated Against:	NIST

Calibration Date: December 4, 2023
Calibration Due: December 3, 2024

Environmental Condition:
Condition: DRY/BASIC/NEUTRAL **Ambient Temp. (Deg C):** 23 ±2
Relative Humidity: 52.2 ±5%, 1010 hPa

Calibration Method:

By comparison technique, unit under test was tested in reference with a Rotating vane anemometer, precision barometer, Standard Temperature and Humidity calibrator. Procedures of calibration and test conform to the requirements of NPL, NIST and ISO/IEC Guide 17025. Data were gathered and plotted against an ideal curve.
Standard error and uncertainty of measurement are written on the attached sheet.

Remarks:

All data pertain only to the unit described obtained at the time of test. This certificate is not valid w/out seal and signature. Unauthorized reproduction is prohibited.

Calibrated By:	**C.A. CASADO**	**Certified By:**	**[illegible]R. CA[illegible]DOC**
Date:	**December 4, 2023**	**Date:**	**December 5, 2023**

Switchtek
Measurement Systems
A Division of Switchtek Construction Corporation
4th Floor Northridge Plaza, Annex A, 12 Congressional Ave.,
Bahay Toro,Quezon City, 1100, Philippines
Tel Nos.02 4267593 / 9282869 / 9287769 Fax No.4537694
email Address: admin@switchtek.com.ph
www.switchtek.com.ph

Certificate No.: 4000.23-8979-4.23 **Calibration of** 3 IN1 (Anemometer, Barometer, %RH)
Identification: BERKMAN SYSTEMS INCORPORATED
Address: Suite 208 VAG Bldg., Ortigas Avenue, Greenhills, San Juan, Metro Manila, Philippines

CERTIFICATE OF CALIBRATION - 3 IN 1 (ANEMOMETER, BAROMETER, % RH)

This report of calibration shall document that the instrument herein was examined and tested in compliance with ISO/IEC 17025 against NIST traceable reference standards and its co-equal standards.

UNIT UNDER TEST (UUT):

Instrument: 3 IN1 (Anemometer, Barometer, %RH)
Brand: LUTRON
Model No.: ABH-4225
Serial No.: A.I.79434
Range: Velocity (0-30.0 m/s)
Temp. (0-50 Deg. C)
Humidity (10 to 95%)
Dewpoint (-25.3 to 48.9 Deg. C)
10.0 to 999.9 hPa
Resolution: Velocity (0-30.0 m/s)/0.1 m/s
Temp. (0-50 Deg. C)/0.1 Deg. C
Humidity (10 to 95%)/0.1 %RH
Dewpoint (-25.3 to 48.9 Deg. C)/0.01 Deg. C
Barometeric (10.0 to 999.9 hPa) /0.1

Calibration Date: December 4, 2023
Calibration Due: December 3, 2024
Calibrated By: C.A. CASADO

MODE: THERMOHYGROMETER

Results:

Temperature:

REFERENCE READING (°C)	UNIT UNDER TEST READING (°C)	ERROR IN READING (°C)	STANDARD DEVIATION	REMARKS
9.6	9.9	-0.30	0.2121	The user should determine the suitability of the instrument of its intended use.
20.0	21.3	-1.30	0.9192	
23.9	24.8	-0.90	0.6364	
40.4	39.8	0.60	0.4243	

Standard error: ± 1.10 °C
Uncertainty: ± 1.22 °C

Relative Humidity:

REFERENCE READING (% RH)	UNIT UNDER TEST READING (% RH)	ERROR IN READING (% RH)	STANDARD DEVIATION	REMARKS
73.7	58.0	15.70	11.1016	DO NOT USE THIS MODE
64.2	50.6	13.60	9.6167	
55.0	42.0	13.00	9.1924	
47.0	35.0	12.00	8.4853	

Standard error: ± 19.20 % RH
Uncertainty: ± 12.01 % RH

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Tel Nos.02 4267593 / 9282869 / 9287769 Fax No.4537694
email Address: admin@switchtek.com.ph
www.switchtek.com.ph

Certificate No.: 4000.23-8979-4.23 **Calibration of** 3 IN1 (Anemometer, Barometer, %RH)
Identification: BERKMAN SYSTEMS INCORPORATED
Address: Suite 208 VAG Bldg., Ortigas Avenue, Greenhills, San Juan, Metro Manila, Philippines

CERTIFICATE OF CALIBRATION - 3 IN 1 (ANEMOMETER, BAROMETER, % RH)

This report of calibration shall document that the instrument herein was examined and tested in compliance with ISO/IEC 17025 against NIST traceable reference standards and its co-equal standards.

UNIT UNDER TEST (UUT):

Instrument: 3 IN1 (Anemometer, Barometer, %RH)
Brand: LUTRON
Model No.: ABH-4225
Serial No.: A.J.79434
Range: Velocity (0-30.0 m/s)
Temp. (0-50 Deg. C)
Humidity (10 to 95%)
Dewpoint (-25.3 to 48.9 Deg. C)
10.0 to 999.9 hPa
Resolution: Velocity (0-30.0 m/s)/0.1 m/s
Temp. (0-50 Deg. C)/0.1 Deg. C
Humidity (10 to 95%)/0.1 %RH
Dewpoint (-25.3 to 48.9 Deg. C)/0.01 Deg. C
Barometeric (10.0 to 999.9 hPa) /0.1

Calibration Date: December 4, 2023
Calibration Due: December 3, 2024
Calibrated By: C.A. CASADO

MODE: THERMOHYGROMETER

Results:

Barometric

REFERENCE READING (hPa)	UNIT UNDER TEST READING (hPa)	ERROR IN READING (hPa)	STANDARD DEVIATION	REMARKS
1015	1007	8.00	5.6569	The user should determine the suitablity of the instrument for its intended use
1010	1004	6.00	4.2426	
1000	993	7.00	4.9497	

Standard error: ± 8.57 hPa
Uncertainty: ± 7.87 hPa

Velocity

REFERENCE READING (m/s)	UNIT UNDER TEST READING (m/s)	ERROR IN READING (m/s)	STANDARD DEVIATION	REMARKS
0.00	0.00	0.00	0.0000	The user should determine the suitablity of the instrument for its intended use
5.20	5.10	0.10	0.0707	
9.55	9.40	0.15	0.1061	
15.10	14.90	0.20	0.1414	

Standard error: ± 0.16 m/s
Uncertainty: ± 0.59 m/s

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CERTIFICATE NUMBER : 90168754/D962229
REVISION NUMBER :
REVISION DATE :

CERTIFIED STANDARD

Certificate of Analysis

Material Number : S802100-AE-C6 **Customer Tag :**

Customer : LINDE PHILIPPINES INC.
Job Card : 90168754
Certification Date : 29-Nov-2021

PO Number : 9300463129
Order Date : 08-Nov-2021
SO Number : 128002321
Vcode : GM34242/10A/S BS4

CYLINDER NUMBER

D962229

SPECIFICATION

Component	Requested Concentration	Certified Concentration	Unit	Certified Uncertainty (% +/-)
NITROGEN			Balance	
CARBON MONOXIDE	200	200	ppm	2

The Certified uncertainty is relative unless specified "abs" as absolute with a confidence level of 95% (coverage factor K=2).

CYLINDER 10L ALUM
VALVE BS4 BRASS

Content 1,494 M3 **Pressure** 150 Bar(a) **Reference Temperature** 20'C
Shelf Life 36 Month **UN Number** 1956 **Min. Usage Pressure** 5 BAR G
Recommended Storage and Usage Temperature 10 to 40'C

TRACEBILITY

Category	Traceabiltiy Type	Traceable To	Reference Procedure
PROCESS	WEIGHT	National Metrology Centre(NMC)	ISO6142:2001

METHOD OF CERTIFICATION
Method Gravimetric

INSTRUMENTATION
Method of Analysis
LS71704

REMARKS

Certified By

LINDE GAS SINGAPORE 15 [illegible] KT HAN

Checked By

LINDE GAS SINGAPORE 15 [illegible] JONATHAN YOON

Product filled gravimetrically using high-load high-accuracy, weight traceable to National Metrology Centre (NMC) standards. Linde Gas Singapore has obtained a corporate License complying to ISO 9001 standard.

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50 Jurong Island Highway
Singapore 627877
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Fax +65 6896 7745
Co Reg. No. 199303758R

5 Tuas Basin Link
Jurong Industrial Estate
Singapore 638759
Phone +65 6867 8993 Fax +65 6861 5610
www.linde.com.sg

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CERTIFICATE NUMBER : 90168756/D962122
REVISION NUMBER :
REVISION DATE :

CERTIFIED STANDARD

Certificate of Analysis

Material Number : S823400-AE-C6 **Customer Tag :**

Customer : LINDE PHILIPPINES INC.
Job Card : 90168756
Certification Date : 22-Nov-2021

PO Number : 9300463129
Order Date : 08-Nov-2021
SO Number : 128002321
Vcode : GM34553/10A/S BS4

CYLINDER NUMBER

D962122

SPECIFICATION

Component	Requested Concentration	Certified Concentration	Unit	Certified Uncertainty (% +/-)
NITROGEN			Balance	
CARBON MONOXIDE	500	500	ppm	2

The Certified uncertainty is relative unless specified "abs" as absolute with a confidence level of 95% (coverage factor K=2).

CYLINDER 10L ALUM
VALVE BS4 BRASS

Content 1.470 M3 **Pressure** 150 Bar(a) **Reference Temperature** 20'C
Shelf Life 36 Month **UN Number** 1956 **Min. Usage Pressure** 5 BAR G
Recommended Storage and Usage Temperature 10 to 40'C

TRACEBILITY

Category	Traceabiltiy Type	Traceable To	Reference Procedure
PROCESS	WEIGHT	National Metrology Centre(NMC)	ISO6142:2001

METHOD OF CERTIFICATION
Method Gravimetric

INSTRUMENTATION
Method of Analysis

REMARKS

Certified By

LINDE GAS SINGAPORE 22 NOV 2021 JONATHAN YOON

Checked By

LINDE GAS SINGAPORE 22 NOV 2021 KT HAN

Product filled gravimetrically using high-load high-accuracy, weight traceable to National Metrology Centre (NMC) standards. Linde Gas Singapore has obtained a corporate License complying to ISO 9001 standard.

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50 Jurong Island Highway
Singapore 627877
Phone +65 6867 8998
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Co Reg. No 199303758R

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CERTIFICATE NUMBER : 90168755/D962087
REVISION NUMBER :
REVISION DATE :

CERTIFIED STANDARD

Certificate of Analysis

Material Number : S803400-AE-C6 **Customer Tag :**

Customer : LINDE PHILIPPINES INC.
Job Card : 90168755
Certification Date : 22-Nov-2021

PO Number : 9300463129
Order Date : 08-Nov-2021
SO Number : 128002321
Vcode : GM23712

CYLINDER NUMBER

D962087

SPECIFICATION

Component	Requested Concentration	Certified Concentration	Unit	Certified Uncertainty (% +/-)
NITROGEN			Balance	
CARBON MONOXIDE	800	800	ppm	2

The Certified uncertainty is relative unless specified "abs" as absolute with a confidence level of 95% (coverage factor K=2).

CYLINDER 10L AL
VALVE BS4 BRASS

Content 1.494 M3 **Pressure** 150 Bar(a) **Reference Temperature** 20'C
Shelf Life 36 Month **UN Number** 1956 **Min. Usage Pressure** 5 BAR G
Recommended Storage and Usage Temperature 10 to 40'C

TRACEBILITY

Category	Traceabiltiy Type	Traceable To	Reference Procedure
PROCESS	WEIGHT	National Metrology Centre(NMC)	ISO6142:2001

METHOD OF CERTIFICATION
Method Gravimetric

INSTRUMENTATION
Method of Analysis

REMARKS

Certified By

LINDE GAS SINGAPORE 22 NOV 2021 JONATHAN YOON

Checked By

LINDE GAS SINGAPORE 22 NOV 2021 KT HAN

Product filled gravimetrically using high-load high-accuracy, weight traceable to National Metrology Centre (NMC) standards. Linde Gas Singapore has obtained a corporate License complying to ISO 9001 standard.

Linde Gas Singapore Pte. Ltd.
50 Jurong Island Highway
Singapore 627877
Phone +65 6867 8998
Fax +65 6896 7745
Co Reg No 199303758R

5 Tuas Basin Link
Jurong Industrial Estate
Singapore 638759
Phone +65 6867 8998 Fax +65 6861 5610
www.linde.com.sg

ANNEX F

DENR ACCREDITATION

Republic of the Philippines
Department of Environment and Natural Resources
ENVIRONMENTAL MANAGEMENT BUREAU
Visayas Avenue, Diliman, Quezon City

SAT No. 2022-72

CERTIFICATE OF ACCREDITATION

Pursuant to DENR Administrative Order No. 26 Series of 2013 of the Department of Environment and Natural Resources having substantially met all the requirements prescribed therein,

BERKMAN SYSTEMS INCORPORATED (BSI)

208 VAG Building, Ortigas Ave.,
Greenhills, San Juan City, Metro Manila

is hereby duly accredited as

SOURCE EMISSION TESTING FIRM

As such, the following are authorized as:

QA/QC Manager
Edindo C. Fernando

Team Leader
Halcey Lemon P. Orquina

This certification shall allow the above firm and personnel to conduct stack testing limited to the following methods and parameters:

1. US-EPA Method 1 to 5 - PM
2. US-EPA Method 6/8 - SO_2
3. US-EPA Method 7 - NO_x
4. US-EPA Method 10 - CO

Granted this 14th day of July 2022 and valid until July 14, 2025.

ENGR. WILLIAM P. CUÑADO
Director

Digitally signed by Cuñado William Purgatorio
DN: cn=Cuñado William Purgatorio, serialNumber=001006000462A, ou=Environmental Management Bureau, o=Department of the Environment and Natural Resources, c=PH

ANNEX G

TEST PARTICIPANTS

TEST PARTICIPANTS

BMC FORESTRY CORPORATION

Mr. Jovelino C. Catacutan	-	Pollution Control Officer

BSI

Mr. Halcy Lemon P. Orquina	-	DENR Accredited Team Leader / Field Engineer
Mr. Romeo M. Elsisura	-	Field Technician
Mr. Marvin S. Llarena	-	Field Technician
Mr. Christian A. Soleta	-	Outsource Technician
Mr. Jimuel B. Torellino	-	Sampling Aide/Driver
Mr. Edindo C. Fernando	-	DENR Accredited QA/QC Manager

ANNEX H

TEST PLAN

May 6, 2024

ENGR. JEAN C. BORROMEO
OIC, Regional Director
DENR – Environmental Management Bureau
Cordillera Administrative Region (CAR)
DENR Compound, Gibraltar Road, Baguio City

CC : ENGR. RAUL G. CUBANGAY
OIC Chief, Environmental Monitoring and Enforcement Division

Subject: Test Plan for BMC Forestry Corporation – Irisan Lime Project

Dear Director Borromeo:

We are pleased to submit the test plan for our proposed Source Emission Test to be conducted by Berkman Systems, Inc., an accredited third-party tester at **BMC Forestry Corporation – Irisan Lime Project** located at **Km.5, Naguilian Road, Irisan, Baguio City.**

We hope this addresses your requirements.

Thank you.

Very truly yours,

BMC FORESTRY CORPORATION
By:

NARHY C. POMILBAN
Pollution Control Officer

Noted by:

FRANCISCO O. FLAVIER
Resident Manager

P.O Box 105 Irisan, Baguio City * Tel No. (074) 445 – 7180 * Telfax (074) 446 – 2555
email:foflavier@yahoo.com, npomilban@benguet.com

BSI

Environmental Management Service Provider

BSI-2022-72-24-025

May 9, 2024

ENGR. JEAN C. BORROMEO
OIC, Regional Director
CC : ENGR. RAUL G. CUBANGAY
Chief, Environmental Monitoring and Enforcement Division
ENVIRONMENTAL MANAGEMENT BUREAU
CORDILLERA ADMINISTRATIVE REGION (CAR)
DENR Forestry Compound, Pacdal District
Baguio City, Benguet

Subject: Test Plan for BMC Forestry Corporation - Irisan Lime Project

Dear Dir. Borromeo:

We are pleased to submit the test plan for our proposed Source Emission Monitoring to be conducted at BMC Forestry Corporation - Irisan Lime Project located at Km.5, Naguilian Road, Irisan, Baguio City.

We hope that this addresses your requirements.

Very truly yours,

BSI

EDINDO C. FERNANDO
Field Operations Manager
DENR Accredited QA/QC Manager
SAT No. 2022-72

2nd Floor, VAG Bldg. Ortigas Ave., Greenhills
San Juan City, Metro Manila, Philippines
Tels. (632) 863-6129 • Fax (632) 727-9831
Email: info@bsienv.com.ph

Department of Environment and Natural Resources (DENR)
ENVIRONMENTAL MANAGEMENT BUREAU
ACCREDITED THIRD PARTY TESTER
Certificate No: SAT NO. 2022-72

Environmental Management Service Provider

SOURCE SPECIFIC TEST PLAN

This document is the Source Specific Test Plan of **BSI** (Formerly **Berkman Systems, Inc.**) that describes the emission testing that will be completed at BMC Forestry Corporation - Irisan Lime Project located at Km.5, Naguilian Road, Irisan, Baguio City.

Section A: FACILITY INFORMATION

BMC Forestry Corporation - Irisan Lime Project
Irisan, Baguio City

Contact Person: **Narhy C. Pomilban**
Pollution Control Officer

Telephone: (074) 445-7180

Section B: PRODUCTION INFORMATION AND FACILITY REQUIREMENTS

The plant should operate the **one (1) unit of 1.08 MT/hr Vertical Shaft Kiln** set for at 90% or greater of permitted capacity during testing. The Implementing Rules and Regulations of the Philippine Clean Air Act specify that the operating capacity during emission testing shall be the basis for setting the maximum allowable operating capacity during permit application.

The facility must provide the following items:

- The client shall provide an on-site single phase **220VAC/60Hz**-power supply.
- The client shall provide at least **two (2)** sampling portholes based on the existing stack diameter and pipe length. Sampling platforms should be installed or constructed properly for the safety of the sampling personnel.
- Copy of latest Permit to Operate **(PTO)**
- Schematic diagram of the process
- Copy of the latest certificate of fuel analysis and delivery receipt.
- Copy of engine log sheet during sampling
- Photo documentation and Video coverage will be taken by the accredited sampling personnel during sampling activity.

Section C: SOURCE INFORMATION

The test will be at **one (1) unit of 1.08 MT/hr Vertical Shaft Kiln** set for 3 sampling runs and **3 stations of 24 hours Ambient air** with parameters PM_{10}, SO_2, NO_2 and noise to be conducted on May 27 to 31, 2024.

Parameters to be tested and duration – see Table 1.

TABLE 1 – TEST METHODOLOGY

Particulars	Parameter	Sampling Methodology	No. of Test runs/Duration	Notes
one (1) unit of 1.08 MT/hr Vertical Shaft Kiln	Volumetric Flow Rate **(VFR)**	EPA Method 1-4	3 one-hour run/ exhaust	Performed concurrent with PM test
	Oxygen / Carbon Dioxide	EPA Method 3 By Fyrite Method	3 runs / exhaust	Integrated Tedlar bag sample during M5 test
	Particulate Matter **(PM)**	EPA Method 5	3 one-hour run/ exhaust	Performed with Method 5 set-up
	Sulfur Oxides **(SOx)**	EPA Method 6 modified	3 one-hour run/ exhaust	Simultaneous with Method 5
	Nitrogen Oxide **(NOx)**	EPA Method 7	3 runs / exhaust	Three grab sample flasks collected per run
	Carbon Monoxide **(CO)**	EPA Method 10 By NDIR	3 runs / exhaust	Integrated Tedlar bag sample during M5 test

Section D: QUALITY ASSURANCE / QUALITY CONTROL PROCEDURES

Normal QA/QC procedures described in the Methods will be strictly followed.

Section E: SAMPLING DATE

May 28 to 29, 2024

The sampling team leader will coordinate the specific run plans with the abovementioned Plant representative. The sampling team will be at the Plant on or before 9:00 AM of the sampling date.

Section F: SAMPLING PERSONNEL

The proposed sampling team shall consist of the following personnel:

Team:

1. Halcy Lemon P. Orquina	-	Accredited Team Leader
2. Edindo C. Fernando	-	QA/QC Manager
3. Ruel P. Abando	-	Accredited Team Leader (back up)
4. Jose Arjay M. Santiago	-	QA/QC Manager (back up)
5. Romeo M. Elsisura	-	Field Technician
6. Marvin S. Llarena	-	Field Technician
7. Kariel G. Cabel	-	Field Technician
8. Christian A. Soleta	-	Field Technician
9. Jimuel B. Torrelino	-	Driver / Technician
10. Joseph Dandy A. Quilet	-	Driver / Technician

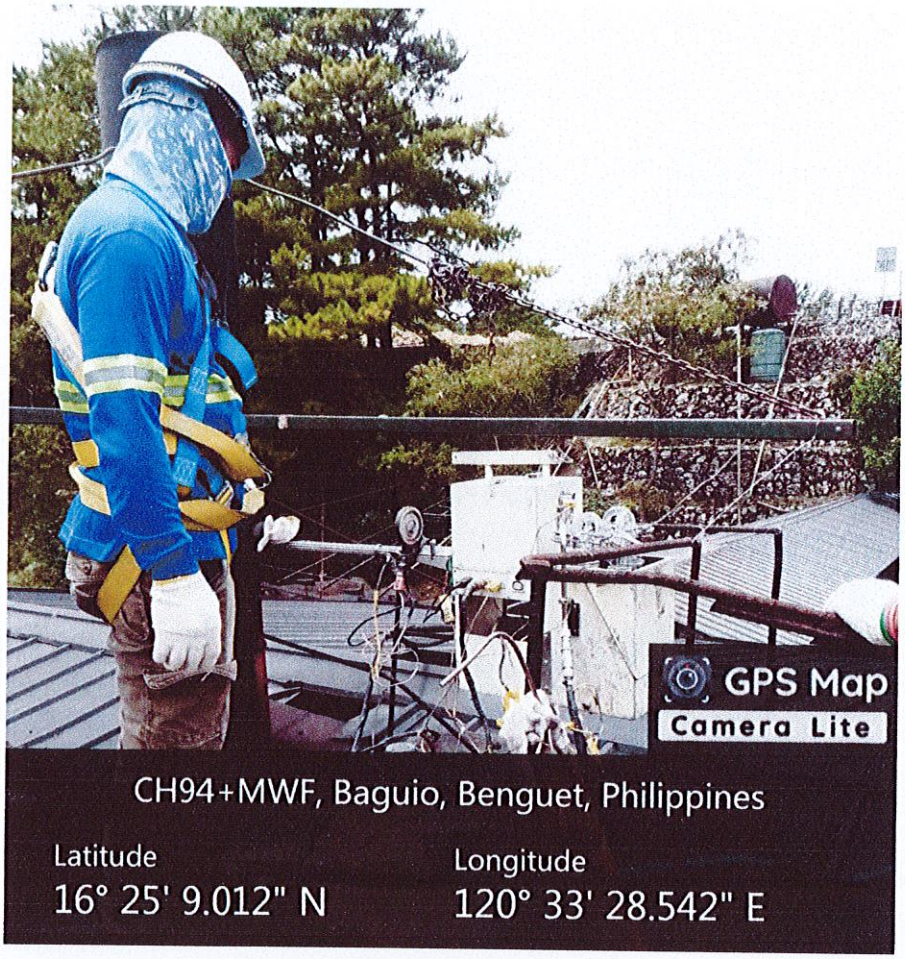
Signed:

EDINDO C. FERNANDO
Field Operations Manager
DENR Accredited QA/QC Manager
SAT No. 2022-72

ANNEX I

PHOTO DOCUMENTATION

PHOTO DOCUMENTATION



Vertical Shaft Kiln No. 2

BSI

Source Emission Monitoring
BMC FORESTRY CORPORATION
Irisan, Baguio City
May 28, 2024

BERKMAN SYSTEMS INC.
Environmental Management Service Provider

22 January 2025

Ref. No.: LT-24-566-1-72

MR. NARHY C. POMILBAN
Pollution Control Officer
BMC FORESTRY CORPORATION
Km. 5, Naguilian Rd., Irisan, Baguio City

Subject: ***Source Emission Monitoring Report***

Dear Mr. Pomilban:

We are pleased to submit the final report of the source emission monitoring as a result of our visit to your facility in Irisan, Baguio City on December 13, 2024.

We hope that this report addresses your requirements.

Very truly yours,

EMMANUEL R. ALTAREJOS
Executive Vice President

ERA/*jdm*

2nd Floor, VAG Bldg. Ortigas Ave., Greenhills
San Juan, Metro Manila, Philippines
Tel No. (632) 863-6129• Fax (632) 727-9831
Email: info@bsienv.com

SOURCE EMISSION MONITORING REPORT

One (1) Unit 1.08 MT/hr Vertical Shaft Kiln

BMC FORESTRY CORPORATION

Irisan, Baguio City

DENR SOURCE EMISSION TESTING FIRM
ACCREDITATION NO: SAT NO. 2022-72

2nd Floor, VAG Building
Ortigas Avenue, Greenhills, San Juan,
Metro Manila, Philippines

PJ- 24-566

SOURCE EMISSION MONITORING REPORT
(December 13, 2024)

BMC FORESTRY CORPORATION
Irisan, Baguio City

Prepared for:

BMC Forestry Corporation
Km. 5, Naguilian Rd., Irisan, Baguio City
Tel. No.: (074) 445-7180

Prepared by:

BSI
2nd Floor VAG Building, Ortigas Avenue
Greenhills, San Juan, Metro Manila
Tel. No.: (02) 863 6129; Fax. No.: (02) 727 9831

TABLE OF CONTENTS

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LIST OF TABLES

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Emission Test Report Certification

The emission sampling reported herein was performed under the direction and supervision of Mr. Edindo C. Fernando of BSI. The analyses of samples were conducted under the direction and supervision of Mr. Renato M. Gofredo, Jr. of ELARSI, Inc., a DENR-recognized Environmental Laboratory

I certify that the information contained in this report is authentic and accurate to the best of my knowledge.

Signed:.....

Edindo C. Fernando
BSI
DENR Accredited QA/QC Manager

Date: 24 January 2025

1. INTRODUCTION

This report presents the procedures and results of the source emission monitoring conducted on December 13, 2024 at BMC Forestry Corporation situated in Irisan, Baguio City. BSI was commissioned to conduct the monitoring wherein Mr. Halcy Lemon P. Orquina led the team that administered the source emission sampling with Mr. Edindo C. Fernando as QA/QC Manager. Meanwhile, Mr. Narhy C. Pomilban, Pollution Control Officer of BMC Forestry Corporation, served as site contact person during sampling.

The pollutants considered for the source emission monitoring were: particulate matter (PM), sulfur oxides (as SO_2), nitrogen oxides (as NO_2) and carbon monoxide (CO) at one (1) unit 1.08 MT/hr vertical shaft kiln exhaust stack. The source was tested for three runs.

1.1 Process Description and Operation

BMC Forestry Corporation – BC ILP is an enterprise in the Philippines, with the main office in Baguio City. It operates in the Crop Production Industry *(https://www.emis.com/php/company-profile/PH/Bmc_Forestry_Corporation_en_3256166.html)* and a producer and supplier of burnt lime. Its Kiln plant located at Km. 5 Naguilian Road, Irisan, Baguio City operates three (3) vertical shaft kilns, three (3) gas scrubbers, two (2) cyclone dust collectors and one (1) jaw crusher.

One (1) unit of 1.08 MT/hr *Vertical Shaft Kiln No. 2* was operated at a minimum of 95% operating rate was tested during sampling, and used low sulfur fuel oil/regular fuel oil as fuel source.

This report covers the source emission monitoring of the vertical shaft kiln no. 2 only.

1.2 Reason for Testing

The purpose of the monitoring was to verify the company's compliance with the source emission standards of the Department of Environment and Natural Resources (DENR) Administrative Order No. 81 Series of 2000 (Implementing Rules and Regulations of the Philippine Clean Air Act of 1999).

1.3 Facility Operating Conditions during the Test

The equipment information and operating conditions of the facility monitored were summarized in *Tables 1* and *2*, respectively.

Table 1. Equipment Information

Stationary Source Information		Vertical Shaft Kiln No. 2
Brand Name		N/A
Rated Capacity		1.08 MT/hr
Year Installed*		August 1940
Exhaust Stack	Diameter	36 cm
	Height**	8.5 m
	Orientation	Vertical
Air Pollution Control Device*		Wet Gas Scrubber
GPS Coordinates		16° 25 ' 9.11"N; 120° 33' 28.52"E

**Based from previous sampling records*
***Measured from the ground to the tip of the stack*

Table 2. Operating Conditions

Stationary Source Information	Vertical Shaft Kiln No. 2
Minimum Load During Sampling	95%
Fuel Used	LSFO/Regular Fuel Oil
Fuel Sulfur Content	No Fuel Analysis Provided
Fuel Consumption	No Information Provided
Annual Operating Hours	No Information Provided

2. SUMMARY OF RESULTS

Table 3 presents the summary of test results of the vertical shaft kiln no. 2 exhaust stack. The test results were compared with the National Emission Standards identified in IRR Part VII Rule XXV Table 2. A detailed description of the test run information and sample calculations used to derive the values in the tabular summary were attached in *Annex A*.

Three test runs were performed to collect: PM, SOx (as SO_2), NOx (as NO_2) and CO at vertical shaft kiln no. 2 exhaust stack. Three trial tests per run were conducted to collect samples of nitrogen oxides (as NO_2). The raw field data used to prepare the summary reports in *Annex A* was included in *Annex B*. Emissions have been corrected to the standard conditions of 25°C and 760 mmHg on dry basis (unless otherwise indicated). Moreover, the emissions are not applicable for the corrected oxygen factor since the source is not included in the list of equipment under DENR EMB Memorandum Circular No. 2021-15.

Table 3. Vertical Shaft Kiln No. 2 Emission Test Results

		Run 1	Run 2	Run 3		
Sampling date		13-Dec-24	13-Dec-24	13-Dec-24		
Begin sampling time		1010H	1145H	1330H		
End sampling time		1115H	1250H	1435H		
Parameter	**Units**				**Average**	**DENR Standard**
Average stack temperature	°C	292.5	292.9	297.5	294.3	
CO_2 measured in stack gas	%	6.8	6.7	6.8	6.8	
Oxygen measured in stack gas	%	13.7	14.3	13.7	13.9	
Stack gas moisture content	%	6.86	6.66	6.43	6.65	
Flue gas velocity	m/s	17.25	17.24	17.42	17.30	
Actual volumetric flow	m^3/min	105.3	105.3	106.4	105.7	
Dry volumetric flow at STP	dsm^3/min	44.5	44.6	44.8	44.6	
Isokinetic flow rate	%	102.0	99.9	100.1		
Particulate matter data						
Concentration	mg/Nm^3	16.9	18.6	30.8	22.1	***150***
Annual emission rate	tons/yr	0.4	0.4	0.7	0.5	
Sulfur oxides data						
Concentration (as SO_2)	mg/Nm^3	2.3	1.5	< 1.5	1.9*	***1500***
Annual emission rate	tons/yr	0.1	0.04	< 0.03	0.04*	
Nitrogen oxides data						
Concentration (as NO_2) **	mg/Nm^3	13.5	13.0	14.0	13.5	***1000***
Annual emission rate	tons/yr	0.3	0.3	0.3	0.3	
Carbon monoxide data						
Concentration	mg/Nm^3	28.6	29.8	17.2	25.2	***500***
Annual emission rate	tons/yr	0.7	0.7	0.4	0.6	

Annual emission rates were based on one (1) year continuous operation.
** Average of detected values.*
***Average of three (3) trial tests*
Emissions are not applicable for the corrected oxygen factor since the source is not included in the list of equipment under DENR EMB Memorandum Circular No. 2021-15.

2.1 Conclusions

A description of any method deviations and quality assurance assessment was included in *Sections 3* and *4* of this report. Based on a review of the sampling data, facility operating information, test method description and quality assurance results, the concentration values presented in *Table 3* have passed the criteria to be considered as representative emission test results of the source and are suitable for comparison with the regulatory limits.

Under the Implementing Rules and Regulations of the Clean Air Act (CAA), the standards applicable to vertical shaft kiln no. 2 are as "*existing fuel-burning equipment; other stationary source*".

In conclusion, the test results indicate that the average emissions from vertical shaft kiln no. 2 exhaust stack:

- comply with the applicable standard for PM emissions;
- comply with the applicable standard for SOx (as SO_2) emissions;
- comply with the applicable standard for NO_X (as NO_2) emissions; and
- comply with the applicable standard for CO emissions.

3. SAMPLING AND ANALYTICAL PROCEDURES

All sampling were undertaken in accordance with US EPA standard methods, viz:

Method 1	Sample and Velocity Traverse Point Locations
Method 2	Stack Gas Velocity and Volumetric Flow Rate (S-type Pitot Tube)
Method 3	Gas Analysis for Determination of Dry Molecular Weight
Method 4	Determination of Moisture Content in Stack Gases
Method 5	Determination of Particulate Matter Emissions from Stationary Sources
Method 6	Determination of Sulfur Dioxide Emissions from Stationary Sources
Method 7	Determination of Nitrogen Oxide Emissions from Stationary Sources
Method 10	Determination of Carbon Monoxide Emissions from Stationary Sources

3.1 Methods 1 and 2 – Traverse Point and Stack Velocity

3.1.1 Sampling points

For the vertical shaft kiln no. 2 exhaust stack, the number and location of the sampling points were determined using the procedures of US EPA Method 1 since the equivalent stack diameter was measured to be greater than 30 cm.

The vertical shaft kiln no. 2 was sampled at a total of twenty-four (24) traverse points. Having two (2) available portholes that are 90° apart, twelve (12) traverse points were sampled for each.

Some of the traverse points of the exhaust stack were less than the criterion of Method 1 for allowable distance from the stack wall of stacks with diameter less than 0.61 meters. These points were relocated 1.3 cm (0.5 in) away from the stack wall.

3.1.2 Cyclonic Flow Check

For each sampling point, the rotation angle was determined using an "S-type" pitot tube assembly, liquid manometer and angle finder in accordance with section 2.4 of US EPA Method 1.

For each test point, the average absolute value of the rotation angle was less than the 20 degrees criterion of Method 1.

3.1.3 Flue Gas Velocity

The procedures of US EPA Method 2 were employed to determine the flue gas velocity and volumetric flow rate using an "S-type" pitot tube in making velocity head measurements (Δp). The "S-type" pitot tube conforms to the geometric specifications of Method 2 and has therefore been assigned a coefficient of 0.84. An inclined manometer built onto the meter console box was used to measure the differential pressures, while flue gas temperatures were measured with chromel-alumel thermocouples equipped with digital readouts.

3.2 Method 3 – Flue Gas Composition

US EPA Method 3 procedures were used to determine the flue gas composition and molecular weight. An "Orsat" sample pump was operated continuously at a constant rate during each Method 5/6 (Modified) sampling run to collect an integrated flue gas sample into a tedlar bag through a separate sample line attached to the probe. Moisture was removed from the sample by passing it through a small impinger charged with silica gel.

The content of each tedlar bag was analyzed using a Fyrite analyzer to determine the concentration of oxygen and carbon dioxide in the sample.

The same bag samples were also used for the carbon monoxide analysis by Method 10.

3.3 Method 4 – Flue Gas Moisture Content

The moisture content of the flue gas was determined using the US EPA Method 4 procedures in conjunction with Method 5/6 (Modified).

3.4 Method 5/6 (Modified) – Particulate Matter and Sulfur Oxides

3.4.1 Sample Collection

A US EPA Method 5/6 (Modified) sampling train was used to extract samples isokinetically from the stack which comprised the following elements:

- a stainless steel nozzle;
- a heated stainless steel probe with "S-type" pitot tube;
- a glass fibre filter maintained at 120°C ± 14 °C;
- four chilled impingers:
  - 1st and 2nd containing 100 mL 3% H_2O_2;
  - 3rd left empty; and
  - 4th containing 200 to 300 grams of silica gel; and
- a metering console.

Each of the impingers was labeled and weighed.

Three test runs were conducted at the available sampling ports. The actual sampling time was 60 minutes per run.

3.4.2 Sample Recovery

Sample recovery was undertaken at the sheltered area near the source of emission. The filter was removed from the filter holder and placed on a petri dish. The volume of water vapor condensed in the impingers was measured to determine the volume of water vapor collected.

The nozzle, probe and front half of the filter holder were rinsed with acetone, and the interior of the probe and nozzle were rinsed and brushed repeatedly to remove any adhering PM from the inside surfaces. All rinses were collected into a 250 mL glass bottle.

The contents of the impingers 1, 2 and 3 were transferred to a 1000 mL polyethylene sample bottle. The glass sample line between the heated filter holder and the first impinger, the first three impingers and connecting glasswares were all rinsed with distilled deionized water and the rinse was added into the sample bottle.

3.4.3 Sample Analysis

The filter and sample bottles, together with the blank samples of acetone and H_2O_2, were submitted to a DENR-recognized laboratory.

The mass of filterable particulate matter collected on the filter and in the acetone rinse was determined in accordance with US EPA Method 5 analytical procedures.

The mass of sulfur oxides in the impinger contents and rinse water was determined in accordance with US EPA Method 6 analytical procedures.

3.5 Method 7 – Nitrogen Oxides

3.5.1 Sample Collection

The sampling of the flue gas to determine the concentration of nitrogen oxides was undertaken in accordance with US EPA Method 7 using a nominal 2 L glass collection flask containing 25 mL of NO_X absorbing reagent (Sulfuric Acid-Hydrogen Peroxide) connected to a Borosilicate glass probe sufficiently heated to avoid condensation and equipped with a glass wool filter at the end for particulate matter screening.

During the Method 7 testing, a flask was evacuated to an absolute pressure of 76 mmHg (3 inHg) at most less than the barometric pressure, and the initial flask temperature and pressure were recorded. The sampling train was then checked for leakage not exceeding 10 mmHg (0.4 inHg) in 1 min. The probe was inserted into the stack, connected to the flask and after purging the probe, a sample was drawn into the flask. The flask was then shaken for five minutes. This procedure was carried out thrice for three test runs resulting in the collection of nine samples for the exhaust stack.

3.5.2 Sample Recovery

The NO_x flasks were set at least 16 hours, shaken for two minutes and then the final flask temperature and pressure were measured. The contents of each flask were transferred to a leak-free polyethylene bottle and rinsed twice with 5 mL portions of deionized distilled water, and the rinse water was added into the bottle. Prior to analysis, the pH was adjusted to a value within 9 to 12 by adding 1N NaOH.

3.5.3 Sample Analysis

The sample preparation procedures of US EPA Method 7 were applied and each sample was then subjected to colorimetric analysis.

3.6 Method 10 – Carbon Monoxide

3.6.1 Sample Collection

The integrated samples that were collected into tedlar bags were used for the determination of CO in accordance with US EPA Method 10.

3.6.2 Sample Recovery

The tedlar bags were sealed and transported for analysis.

3.6.3 Sample Analysis

The sample was analyzed using a non-dispersive infrared (NDIR) analyzer. The analyzer was flushed with nitrogen and zero setting confirmed. The tedlar bag was attached to the sample input and the gas sample was introduced at a flow rate of about 0.5 L/min by applying gentle pressure to the tedlar bag. The concentration was recorded when the value indicated on the display stabilized.

4. QA PROCEDURES

The US EPA "Quality Assurance Handbook for Air Pollution Measurement Systems: Volume III Stationary Source-Specific Methods" was used as a guide to achieve the quality assurance objectives of producing data that are complete, representative and of known precision and accuracy.

4.1 Particulate Matter and Sulfur Oxides (as SO_2)

4.1.1 Sampling Procedure

US EPA Method 5/6 (Modified) was employed to determine the concentration of particulate matter in the gas stream. This method requires the use of Methods 1 to 4 to determine sampling port locations, sample traverse points within the stack, as well as the flow rate, molecular weight and moisture content of the flue gas.

The quality of the emission test was assured by:

- Ensuring that the test port is located sufficiently distant from both upstream and downstream flow disturbances (such as bends and changes in stack diameter).
- Ensuring that stack gas flow is essentially parallel to the stack walls by conducting a cyclonic flow check.

- Determination of a representative stack gas velocity by the selection of sampling test points appropriate to the stack diameter in accordance with the method.
- Leak testing of the sampling train before and after each sampling run.
- Testing and calibration of the dry gas meter, thermocouples and temperature displays, pitot tubes, nozzles, and manometer assembly.
- Ensuring that the temperature of the impinger system is maintained below 20°C.
- Maintaining the filter and sampling probe temperature at 120°C (±14°C).
- Sampling at between 90 - 110% of the actual gas stream velocity (isokinetic sampling).

The procedure for sampling SOx (as SO_2) was combined with US EPA Method 5 as described in *Section 3.4*. The quality of the test was assured by:

- The use of freshly-prepared chemical solutions;
- Care in the recovery of the sample;
- Attention to detail in the analysis of samples in accordance with the US EPA Method 6;
- The collection and analysis of representative "blank" samples; and
- Proper calibration and QA/QC checks of all elements of the sampling system.

4.1.2 Sampling Equipment

Copies of various calibration and test certificates were included in *Annex E.*

Barometer

A calibrated digital barometer was used to measure atmospheric pressure at the platform level.

Probe Nozzle

The probe nozzles were calibrated by the manufacturer and were inspected and checked for roundness before use to ensure that they met the specifications of the method.

Pitot Tube

The pitot tube meets the EPA Method 2 design specifications for "S-type" pitot tubes and was therefore assigned a baseline coefficient of 0.84. After each test, the pitot tube was visually inspected for damage.

Metering System

The meter box was leak checked and a calibration was carried out using five (5)-point calibrating orifices in accordance with EPA Method 5.

Post-Test Meter Calibration

A post-test meter calibration was made using the data collected for each of the test runs in accordance with the procedure set out in EPA ALT-009.

Temperature Sensors

An ethanol-filled thermometer with NIST traceable calibration was used to calibrate thermocouples at approximately 0°C in iced water, ambient temperature and approximately 100°C in boiling water. At the completion of each test, the thermocouples were compared to the ethanol-in-glass thermometer at ambient temperature and a continuity check was performed to ensure that the thermocouple read-out trended in the correct direction when subjected to a temperature change.

4.1.3 Analysis

Filters and acetone used in the emission test met the required specifications and Method 5 analytical procedures were employed using a properly calibrated analytical balance.

The mass of sulfur oxides in the impinger contents and rinse water were determined in accordance with US EPA Method 6 analytical procedures.

4.2 Nitrogen Oxides (as NO_2)

The procedure for sampling NO_X (as NO_2) was described in *Section 3.5*. The quality of the test was assured by:

- The use of freshly-prepared chemicals;
- Care in the recovery of the sample;
- Attention to detail in the analysis of samples in accordance with the US EPA Method 7;
- Calibration and verification of linearity of the spectrophotometer; and
- Proper calibration and QA/QC checks of all elements of the sampling system.

4.3 Carbon Monoxide

The procedure for sampling CO was described in *Section 3.6*. The quality of the test was assured by:

- Care in the collection of the gas samples to ensure that they are representative of the emission;
- Maintenance of a leak-free bag at all stages of sampling and analysis;
- Calibration of the analytical instrument prior to analysis; and
- Attention to detail in the analysis of samples in accordance with the US EPA Method 10.

ANNEX A

SOURCE EMISSION MONITORING SUMMARY OF RESULTS

EMISSION TEST RESULTS SUMMARY

BMC FORESTRY CORP. ILP

IRISAN, BAGUIO CITY

VERTICAL SHAFT KILN NO. 2

			Run 1	Run 2	Run 3	
	Sampling date		13-Dec-24	13-Dec-24	13-Dec-24	
	Begin sampling time		1010H	1145H	1330H	
	End sampling time		1115H	1250H	1435H	
Symbol	**Parameter**	**Units**				**Average**
Y	Meter box gamma	none	0.9754	0.9754	0.9754	
ΔH	Average ΔH	mm H_2O	59.9	57.2	58.7	
P_{bar}	Barometric pressure	mm Hg	654.3	654.7	654.3	
V_m	Metered sample gas volume	m^3	1.5500	1.5208	1.5350	
T_m	Average meter temperature	°C	24.8	25.0	25.8	
P_g	Static pressure	mm H_2O	8.6	8.6	8.6	
T_s	Average stack temperature	°C	292.5	292.9	297.5	294.3
Ds	Stack diameter	cm	36	36	36	
V_{lc}	Volume of water collected	mL	71.3	67.7	65.6	
$\%CO_2$	CO_2 measured in stack gas	%	6.8	6.7	6.8	6.8
$\%O_2$	Oxygen measured in stack gas	%	13.7	14.3	13.7	13.9
C_p	Pitot tube coefficient	none	0.84	0.84	0.84	
$\sqrt{\Delta P}$	Average of square roots of ΔP	$(mm\ H_2O)^{½}$	*3.393*	*3.392*	*3.415*	
θ	Sampling run time	min	60	60	60	
D_n	Nozzle diameter	mm	7.89	7.89	7.89	
A_n	Nozzle area	m^2	*4.89E-05*	*4.89E-05*	*4.89E-05*	
$V_{m(std)}$	Metered gas volume at STP	Nm^3	*1.3104*	*1.2854*	*1.2936*	
P_s	Stack pressure	mm Hg	*654.93*	*655.33*	*654.93*	
B_{ws}	Stack gas moisture content	%	*6.86*	*6.66*	*6.43*	6.65
$V_{w(std)}$	Water vapour volume at STP	Nm^3	*0.097*	*0.092*	*0.089*	
M_{fd}	Dry mole fraction of flue gas	none	*0.931*	*0.933*	*0.936*	
M_d	Dry molecular weight	g/g-mole	*29.64*	*29.64*	*29.64*	
M_s	Wet molecular weight	g/g-mole	*28.84*	*28.87*	*28.89*	
v_s	Flue gas velocity	m/s	*17.25*	*17.24*	*17.42*	17.30
A_s	Stack area	m^2	*0.102*	*0.102*	*0.102*	
$Q_{a(act)}$	Actual volumetric flow	m^3/min	*105.3*	*105.3*	*106.4*	105.7
$Q_{s(std)}$	Dry volumetric flow at STP	dsm^3/min	*44.5*	*44.6*	*44.8*	44.6
I	Isokinetic flow rate	%	*102.0*	*99.9*	*100.1*	
AOH	Annual operating hours	hrs/yr	8,760	8,760	8,760	
	Particulate matter data					
M_{part}	Measured mass	mg	22.1	23.9	39.8	
C_{part}	Concentration	mg/Nm^3	16.9	18.6	30.8	22.1
	Mass emission rate	kg/hr	0.05	0.05	0.08	0.06
	Annual emission rate	tons/yr	0.4	0.4	0.7	0.5
	Sulphur oxides data					
M_{SOx}	Measured mass	mg	3.02	1.95	< 1.9	
C_{SOx}	Concentration	mg/Nm^3	2.3	1.5	< 1.5	1.9*
	Mass emission rate	kg/hr	0.01	0.004	< 0.004	0.01*
	Annual emission rate	tons/yr	0.1	0.04	< 0.03	0.04*
	Nitrogen oxides data					
C_{NOx}	Concentration	mg/Nm^3	13.5	13.0	14.0	13.5
	Mass emission rate	kg/hr	0.04	0.03	0.04	0.04
	Annual emission rate	tons/yr	0.3	0.3	0.3	0.3
	Carbon monoxide data					
C_{COppm}	Concentration	ppm	25.0	26.0	15.0	
C_{COmg}	Concentration	mg/Nm^3	28.6	29.8	17.2	25.2
	Mass emission rate	kg/hr	0.08	0.08	0.05	0.07
	Annual emission rate	tons/yr	0.7	0.7	0.4	0.6

Notes: *Italics indicates calculated value*

Annual emission rates were based on one (1) year continuous operation.

*Average of detected values only.

NITROGEN OXIDES (as NO_2) EMISSIONS DATA
BMC FORESTRY CORP. ILP
IRISAN, BAGUIO CITY
VERTICAL SHAFT KILN NO. 2

RUN 1

Sample Collection

Barometric Pressure, $P_{bar(i)}$ (in Hg): 25.76

Sample ID	Flask ID	Flask Volume	Evacuated Pressure	Initial Absolute Pressure	Flask Temp	Flask Temp	Collection Time
		V_f	P_{gf}	P_i		T_i	
		mL	in Hg	(in Hg)	°C	°K	
S1R1T1	BSI T2-F1	2230	24.30	1.46	28.3	301.45	1030H
S1R1T2	BSI T2-F2	2230	24.30	1.46	28.6	301.75	1040H
S1R1T3	BSI T2-F3	2250	24.20	1.56	29.0	302.15	1050H

Date Collected: 13-December-2024

Sample Recovery

Barometric Pressure, $P_{bar(f)}$ (in Hg): 25.90

Sample ID	Flask ID	Final Pressure	Final Absolute Pressure	Flask Temp	Flask Temp
		P_{gf}	P_f	Temp	T_f
		in Hg	in Hg	°C	°K
S1R1T1	BSI T2-F1	0.30	25.60	25.6	298.75
S1R1T2	BSI T2-F2	0.50	25.40	25.4	298.55
S1R1T3	BSI T2-F3	0.40	25.50	25.5	298.65

Date Recovered: 14-December-2024

Concentration Calculation

Volume at STP	Mass Catch	NO_x Conc.
V_{sc}	M_{NO2}	C_{NO2}
mL	µg	mg/Nm^3
1775.4	26.8	15.1
1762.1	26.8	15.2
1777.7	18.3	10.3
	Average	**13.5**

RUN 2

Sample Collection

Barometric Pressure, $P_{bar(i)}$ (in Hg): 25.78

Sample ID	Flask ID	Flask Volume	Evacuated Pressure	Initial Absolute Pressure	Flask Temp	Flask Temp	Collection Time
		V_f	P_{gf}	P_i		T_i	
		mL	in Hg	(in Hg)	°C	°K	
S1R2T1	BSI T2-F4	2230	24.10	1.68	29.2	302.35	1200H
S1R2T2	BSI T2-F5	2230	24.30	1.48	29.2	302.35	1210H
S1R2T3	BSI T2-F6	2250	24.50	1.28	29.6	302.75	1220H

Date Collected: 13-December-2024

Sample Recovery

Barometric Pressure, $P_{bar(f)}$ (in Hg): 25.90

Sample ID	Flask ID	Final Pressure	Final Absolute Pressure	Flask Temp	Flask Temp
		P_{gf}	P_f	Temp	T_f
		in Hg	in Hg	°C	°K
S1R2T1	BSI T2-F4	0.40	25.50	25.5	298.65
S1R2T2	BSI T2-F5	0.50	25.40	25.4	298.55
S1R2T3	BSI T2-F6	0.60	25.30	25.3	298.45

Date Recovered: 14-December-2024

Concentration Calculation

Volume at STP	Mass Catch	NO_x Conc.
V_{sc}	M_{NO2}	C_{NO2}
mL	µg	mg/Nm^3
1753.0	31.0	17.7
1760.8	21.1	12.0
1784.8	16.9	9.5
	Average	**13.0**

RUN 3

Sample Collection

Barometric Pressure, $P_{bar(i)}$ (in Hg): 25.75

Sample ID	Flask ID	Flask Volume	Evacuated Pressure	Initial Absolute Pressure	Flask Temp	Flask Temp	Collection Time
		V_f	P_{gf}	P_i		T_i	
		mL	in Hg	(in Hg)	°C	°K	
S1R3T1	BSI T2-F7	2230	24.40	1.35	29.0	302.15	1350H
S1R3T2	BSI T2-F8	2240	24.40	1.35	28.7	301.85	1400H
S1R3T3	BSI T2-F9	2250	24.50	1.25	28.7	301.85	1410H

Date Collected: 13-December-2024

Sample Recovery

Barometric Pressure, $P_{bar(f)}$ (in Hg): 25.90

Sample ID	Flask ID	Final Pressure	Final Absolute Pressure	Flask Temp	Flask Temp
		P_{gf}	P_f	Temp	T_f
		in Hg	in Hg	°C	°K
S1R3T1	BSI T2-F7	0.60	25.30	25.3	298.45
S1R3T2	BSI T2-F8	0.50	25.40	25.4	298.55
S1R3T3	BSI T2-F9	0.40	25.50	25.5	298.65

Date Recovered: 14-December-2024

Concentration Calculation

Volume at STP	Mass Catch	NO_x Conc.
V_{sc}	M_{NO2}	C_{NO2}
mL	µg	mg/Nm^3
1763.5	21.1	12.0
1778.2	35.2	19.8
1800.3	18.3	10.2
	Average	**14.0**

SAMPLE CALCULATIONS

BMC FORESTRY CORP. ILP

IRISAN, BAGUIO CITY

VERTICAL SHAFT KILN NO. 2

VOLUME OF DRY GAS SAMPLED AT STANDARD CONDITIONS

$$V_{m(std)} = Y \times 0.3921 \times V_m \times \frac{P_{bar} + (\Delta H \div 13.6)}{(273 + T_m)}$$

$$V_{m(std)} = 0.9754 \times 0.3921 \times 1.55 \times \frac{654.3 + (59.9 \div 13.6)}{(273 + 24.8)} = 1.3104 \ Nm^3$$

VOLUME OF WATER VAPOUR AT STANDARD CONDITIONS

$$V_{w(std)} = 0.001356 \times V_{lc}$$

$$V_{w(std)} = 0.001356 \times 71.3 = 0.097 \ Nm^3$$

PERCENT MOISTURE IN FLUE GAS

$$B_{ws} = \frac{V_{w(std)}}{(V_{w(std)} + V_{m(std)})}$$

$$B_{ws} = \frac{0.097}{(0.097 + 1.3104)} = 6.86 \ \%$$

ABSOLUTE FLUE GAS PRESSURE

$$P_s = P_{bar} + \frac{P_g}{13.6}$$

$$P_s = 654.3 + \frac{8.6}{13.6} = 654.93 \ mm\ Hg$$

DRY MOLECULAR WEIGHT OF FLUE GAS

$$M_d = (\%CO_2 \times 0.44) + (\%O_2 \times 0.32) + [\{100 - (\%CO_2 + \%O_2)\} \times 0.28]$$

$$M_d = (6.8 \times 0.44) + (13.7 \times 0.32) + [\{100 - (6.8 + 13.7)\} \times 0.28] = 29.64 \ g/g\ mole$$

WET MOLECULAR WEIGHT OF FLUE GAS

$$M_s = M_d \times (1 - B_{ws}) + \left(\frac{mol.wt.}{H_2O} \times B_{ws}\right)$$

$$M_s = 29.64 \times (1 - 0.0686) + (18 \times 0.0686) = 28.84 \ g/g\ mole$$

AVERAGE FLUE GAS VELOCITY

$$v_s = 34.97 \times C_p \times \sqrt{\Delta P} \times \sqrt{\left\{\frac{T_s + 273}{P_s \times M_s}\right\}}$$

$$v_s = 34.97 \times 0.84 \times 3.393 \times \sqrt{\left\{\frac{292.5 + 273}{654.9 \times 28.84}\right\}} = 17.25 \ m/s$$

ACTUAL WET FLUE GAS FLOW RATE

$$Q_a = 60 \times v_s \times A_s$$

$$Q_a = 60 \times 17.25 \times 0.102 = 105.3 \ m^3/min$$

DRY, NORMAL FLUE GAS FLOW RATE

$$Q_s = Q_a \times M_{fd} \times \frac{298}{273 + T_s} \times \frac{P_s}{760}$$

$$Q_s = 105.3 \times 0.931 \times \frac{298}{273 + 292.5} \times \frac{654.9}{760} = 44.5 \ dsm^3/min$$

SAMPLE CALCULATIONS

BMC FORESTRY CORP. ILP

IRISAN, BAGUIO CITY

VERTICAL SHAFT KILN NO. 2

ISOKINETIC FLOW RATE

$$I = \frac{P_{std}}{T_{std}} \times \frac{100}{60} \times \frac{T_s + 273}{P_s} \times \frac{V_{m(std)}}{v_s \times M_{fd} \times \theta \times A_n}$$

$$I = \frac{760}{298.15} \times \frac{100}{60} \times \frac{292.5 + 273}{654.93} \times \frac{1.3104}{17.25 \times 0.931 \times 60 \times 4.89E\text{-}05} = 102.0\%$$

PARTICULATE MATTER CONCENTRATION

$$C_{part} = \frac{M_{part}}{V_{m(std)}}$$

$$C_{part} = \frac{22.1}{1.3104} = 16.9 \text{ mg/Nm}^3$$

SULPHUR OXIDES CONCENTRATION

Concentration of SO_x as SO_2

$$C_{SOx} = \frac{M_{SO2}}{V_{m(std)}}$$

$$C_{SOx} = 2.3 \text{ mg/Nm}^3$$

NITROGEN OXIDES CONCENTRATION

Concentration of NO_x as NO_2

$$C_{NOx} = \frac{M_{NO2}}{V_{sc}} \times 1000$$

$$C_{NOx} = 15.1 \text{ mg/Nm}^3$$

CONVERSION OF CO IN ppm TO mg/Nm^3

$$C_{CO(mg)} = \frac{C_{CO(ppm)} \times \text{mol. wt. CO}}{24.5}$$

$$C_{CO(mg)} = \frac{25.0 \times 28.01}{24.5} = 28.6 \text{ mg/Nm}^3$$

ANNEX B

SOURCE EMISSION MONITORING FIELD DATA

MONITORING LOGSHEET

Facility Information

Facility Name	BMC FORESTRY CORP. BC ILP
Facility Address	KM. 5 NAGUILIAN ROAD. IRISAN. BAGUIO CITY
Name of Pollution Control Officer	MS. NARHY C. POMILBAN
Maintenance Supervisor / Engineer	
Telephone and Fax Number	445-7180 / 09306480332

Source Description

Source Type	VERTICAL SHAFT KILN EXHAUST STACK NO.
Source ID	PU24 566 S1
Manufacturer / Brand of Equipment / Serial No.	✓
Equipment Capacity (BHp,MW,MT/hr)	1.00 MT / HR.
Date of Installation (month/year)	
Date of Modification (that may increase emissions)	
Operational Hours per Year (hrs/year)	
Operating rate (%)	95 %

Air Pollution Control Device

Is there an Air Pollution Control Device (APCD) attached to the source?	___ YES ___ NO
Type of APCD	✓ Wet Gas Scrubber
Date of Installation	
APCD parameters (flowrate,gpm,delta P,etc)	
Is the APCD operating during emission sampling	___ YES ___ NO

Fuel Analysis / Information

Type of Fuel used during emission sampling (%S)	✓ RFO
Original Fuel used	✓ RFO
Date of Fuel change	
Daily Fuel Consumption (Liters/day)	
Is the Fuel Analysis Available?	___ YES ___ NO
Will the company provide the Fuel Analysis	___ YES ___ NO

Please attach the following
- -Fuel Analysis
- -Permit to Operate
- -APCD Process Logsheet
- -Source Process Logsheet

Narhy C. Pomilban

Signature over printed name of Facility Representative

PCO

Environmental Management Service Provider

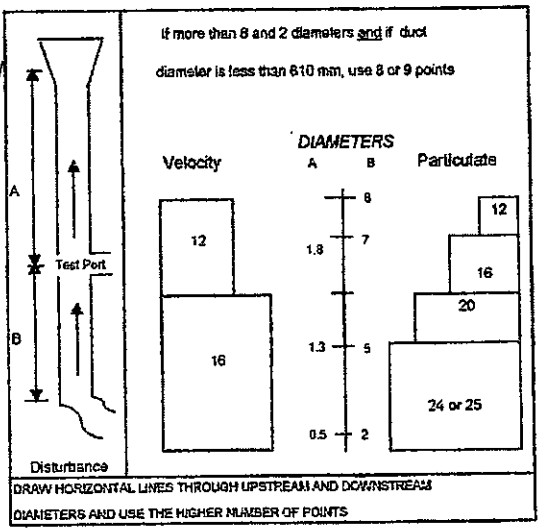
METHOD 1 - TRAVERSE POINT LOCATIONS

Facility Name	BMC FORESTRY CORP. BC - ILP
Address	KM.5, NAGUILIAN ROAD, IRISAN, BAGUIO CITY
Source	1.08 MT/hr. VERTICAL SHAFT KILN NO.
Personnel / Date	ECF, HPO, MSL, CAS, JBT / 13DEC. 2024

Stack / Ports	Type of Stack	Circular	✓	Rectangle	
	No. of Ports Available				2
	No. of Ports Used				2
	Port Inside Diameter, cm				10

Dimensions		
	Far Wall to Outside of Port,cm(a)	46
	Port length, cm (b)	10
Put diagram of test location (s) on back of this sheet	Stack Diameter or Depth,cm (a-b)	36
	Stack Width (if rectangle), cm	
	Stack Length (if rectangle), cm	
	Equivalent Stack Diameter, cm	
	Area of Stack, cm^2	

Distance to Flow Disturbances	Distance, cm	Diameters
Upstream (A)	184	5.111
Downstream (B)	95	2.639



DRAW HORIZONTAL LINES THROUGH UPSTREAM AND DOWNSTREAM DIAMETERS AND USE THE HIGHER NUMBER OF POINTS

Number of Traverse Points			Minimum # Required
		Particulate Traverse	20
		Velocity Traverse	16
# of Ports used	2	# Points / Port	12
		Number of Traverse Points Used	24

Equivalent Diameter (for rectangular ducts):

De = 2 * Depth * Width / Depth + Width)

De = 2 * ( ) * ( ) / ( ) + ( ) =

Point No.	Fraction of Stack Dia.	Dist. From Inside Wall	Port Length	Dist. From Edge of Port
1	0.021	0.756	10	10.756
2	0.067	2.412	10	12.912
3	0.118	4.248	10	14.748
4	0.177	6.372	10	16.372
5	0.250	9.0	10	19.0
6	0.356	12.816	10	22.816
7	0.644	23.184	10	33.184
8	0.750	27	10	37.0
9	0.823	29.628	10	39.628
10	0.882	31.752	10	41.752
11	0.933	33.588	10	43.588
12	0.979	35.244	10	45.244
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				

Note: when using 4 ports in a circular duct, the probe is marked with only the points for the first half of the full diameter traverse.

LOCATION OF POINTS IN CIRCULAR STACKS OR DUCTS

(Fraction of stack diameter from inside wall to traverse point)

	2	4	6	8	10	12
1	.146	.067	.044	.032	.026	.021
2	.854	.250	.146	.105	.082	.067
3		.750	.295	.194	.146	.118
4		.933	.704	.323	.226	.177
5			.854	.677	.342	.250
6			.956	.806	.658	.356
7				.895	.774	.644
8				.968	.854	.750
9					.918	.823
0					.974	.882
11						.933
12						.979

LOCATION OF POINTS IN RECTANGULAR STACKS OR DUCTS

(Fraction of stack diameter from inside wall to traverse point)

	2	3	4	5	6	7	8	9	10	11	12
1	.250	.167	.125	.100	.083	.071	.063	.056	.050	.045	.042
2	.750	.500	.375	.300	.250	.214	.188	.167	.150	.136	.125
3		.833	.625	.500	.417	.357	.313	.278	.250	.227	.208
4			.875	.700	.583	.500	.438	.389	.350	.318	.292
5				.900	.750	.643	.563	.500	.450	.409	.375
6					.917	.786	.688	.611	.550	.500	.458
7						.929	.813	.722	.650	.591	.542
8							.938	.833	.750	.682	.625
9								.944	.850	.773	.708
10									.950	.864	.792
11										.955	.875
12											.958

Notes/Remarks: Isolated pt

Elevation = 2.5m

Team Leader / Date: H.P. ORQUINA / 13DEC.24

QA/QC / Date: E.C. FERNANDO / 13DEC.24

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Department of Environment and Natural Resources (DENR)
ENVIRONMENTAL MANAGEMENT BUREAU
ACCREDITED THIRD PARTY TESTER

EPA METHODS 1 & 2
GAS VELOCITY and CYCLONIC FLOW CHECK

Facility	BMC FORESTRY CORP. BC-IIP	**Thermocouple ID**	TMC-T2
Town/Province	NAGUILIAN RD. IRISAN. BAGUIO CITY	**Manometer ID**	MID-T2
Source	1.08MT/HR. VERTICAL SHAFT KILN#	**P barometer, mm Hg**	654.1
Personnel	ECF HPO MSL CAS JBT	**Pitot ID**	PT-T2-CF1
Date	13 DECEMBER 2024	**Pitot Coefficient**	0.84

Pitot Tube Leak Check 1m/1m

Static Pressure, mm H_2O 8.6

Measured at which Traverse Pt 2 A-8

Traverse Point	Velocity Pressure (mm H_2O)	Temperature (Degrees C)	Angle Which Yields Null (degrees)
A - 12	11.0	250	12
11	11.0	250	12
10	11.6	257	10
9	11.6	257	10
8	12	260	10
7	12	260	3
6	12	260	3
5	12	260	3
4	11.6	257	10
3	11.6	257	10
2	11.0	250	12
1	11.0	250	12
B - 12	11.0	250	12
11	11.0	250	12
10	11.6	257	10
9	11.6	257	10
8	12.0	260	3
7	12.0	260	3
6	12.0	260	3
5	12.0	260	3
4	11.6	257	10
3	11.6	257	10
2	11.0	250	12
1	11.0	250	12
Average	√Δp ave = 3.393	255.67	prad Cyclonic flo

V = 8.9759 Ave = 8/6/1705

Note: D = 15.0, 8D = 5.5 ; 3D = 6.0 Ave = 7.89 Fpath = 5.25

Team Leader/Date: H.P. ORONIA / 13 DEC 24 QA/QC / Date: E.C. FERNANDO / 13 DEC 2024

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Department of Environment and Natural Resources (DENR)
ENVIRONMENTAL MANAGEMENT BUREAU
ACCREDITED THIRD PARTY TESTER
Certificate No: SAT NO. 2007-02

METHOD 3
FYRITE ANALYSIS DATA SHEET

Facility	BMC FORESTRY CORPORATION BC-II	**Fuel Type**	
Town/Province	KM. 5, NAGUILIAN ROAD, IRISAN, BAGUIO CITY	**Fyrite ID**	FB-T2
Test Location	1.08 MT/hr. VERTICAL SHAFT KILN NO. 2	**Analysis Location**	INSITU

Run No. 1 Date: 13 DEC. 2024 Bag ID PJ24 5GGS1R1 Operator (Signature)

Run Time	Time of Analysis	% CO_2 Reading (A)	% O_2 Value (B-A)	% N_2 Value (100-C)
Start 1210H	1120H	7.0	13.5	
	1170H	7.0	13.5	
Stop 1115H	1170H	6.5	14.0	
Leak Check ☐				
	Avg	6.83	13.67	79.5

Run No. 2 Date: 13 DEC. 2024 Bag ID PJ24 5GGS1R2 Operator (Signature)

Run Time	Time of Analysis	% CO_2 Reading (A)	% O_2 Value (B-A)	% N_2 Value (100-C)
Start 1145H	1255H	7.0	14.0	
	1300H	7.0	14.0	
Stop 1305H	1205H	6.0	15.0	
Leak Check ☐				
	Avg	6.67	14.33	79.0

Run No. 3 Date: 13 DEC. 2024 Bag ID PJ24 5GGS1R3 Operator (Signature)

Run Time	Time of Analysis	% CO_2 Reading (A)	% O_2 Value (B-A)	% N_2 Value (100-C)
Start 1330H	1440H	7.0	13.5	
	1445H	6.5	13.5	
Stop 1435H	1450H	7.0	14.0	
Leak Check ☐				
	Avg	6.83	13.67	79.5

Team Leader/Date: H.P. ORQUINA / 13 DEC 2024 **QA/QC / Date:** E.C. FERNANDO / 13 DEC. 2024

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METHOD 4 - MOISTURE ANALYSIS DATA SHEET

Facility	BMC FORESTRY CORPORATION BC-IP
Address	KM. 5. NAGUILIAN ROAD, IRISAN, BAGUIO CITY
Source	1.08 MT/HR, VERTICAL SHAFT KILN NO. 2
Recovery Loaction	SERVICE VEHICLE (INSITU)

Run Number	% MOISTURE	PM - 1	PM - 2	PM - 3
Test Date	13 DEC. 2024	13 DEC. 2024	13 DEC. 2024	13 DEC. 2024
Recovery Date	DEC. 2024	DEC. 2024	DEC. 2024	DEC. 2024
Recovered By	ECE HPO MSL CAS JBT	ECE HPO MSL CAS JBT	ECE HPO MSL CAS JBT	ECE HPO MSL CAS JBT
Impinger 1 100 mL	D.I. H_2O	3% H_2O_2	3% H_2O_2	3% H_2O_2
Final Weight, g	727.2	757.4	752.5	754.0
Initial Weight, g	717.4	714.8	713.8	715.0
Net Weight, g	10.6	42.6	38.7	39.0
Impinger 2 100 mL	D.I. H_2O	3% H_2O_2	3% H_2O_2	3% H_2O_2
Final Weight, g	710.6	717.4	622.2	717.6
Initial Weight, g	699.7	702.6	699.6	705.6
Net Weight, g	10.3	10.2	12.6	12.0
Impinger 3 EMPTY	EMPTY	EMPTY	EMPTY	EMPTY
Final Weight, g	607.8	613.9	613.0	615.7
Initial Weight, g	605.8	608.3	606.8	610.7
Net Weight, g	2.0	5.6	6.2	5.0
Impinger 4 200-300 g	SILICA GEL	SILICA GEL	SILICA GEL	SILICA GEL
Final Weight, g	815.7	824.0	834.2	843.8
Initial Weight, g	811.5	817.7	824.0	834.2
Net Weight, g	4.2	6.3	10.2	9.6
Impinger 5				
Final Weight, g				
Initial Weight, g				
Net Weight, g				
Impinger 6				
Final Weight, g				
Initial Weight, g				
Net Weight, g				
Impinger 7				
Final Weight, g				
Initial Weight, g				
Net Weight, g				

Total Catch, g	31.1	71.3	67.7	65.6
Silica Gel Spent, %				

Team Leader / Date: H.P. PERALTA / 13 DEC. 24 QA/QC/Date: E.C. FERNANDO / 13 DEC. 2024

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ISOKINETIC FIELD DATA SHEET
METHOD(s) 4

Facility Name	BMC FORESTRY CORP. BC-ILP	Test Date	13 DECEMBER 2024
Address	KM. 5, NAGUILIAN ROAD, IRISAN, BAGUIO CITY	Job Number	PJ24 566 S1 M4
Source	1.08 MT/HR, VERTICAL SHAFT KILN NO.	Year Installed	
Control device	CYCLONE DUST COLLECTOR	Field Personnel	ECF HPO, MSI CAS, LBT
Contact Person	MS. NARHY C. PAMILBAN	Operators Signature	

Filter ID	Tare(s)	Barometric (mm Hg)	Static (mm H_2O)	Meterbox ID#	Meterbox Gamma	Meterbox DeltaH @	Nozzle ID#	Nozzle Dia.	Pitot Tube ID#	Pitot Tube Cp	Probe ID#
		652.1	3.0	BSI-T2	0.9864	46.4705	NS-T2-4	7.29	PT-T2-	0.84	SPL-T2-

Sample Train Leak Checks							Fyrites		
Run No.	S1 M4		Initial	Interim		Final	Time	$\%O_2$	$\%CO_2$
K Factor		Vacuum, mm Hg	150			0	0532H	16.0	5.0
Pitot Leak Checks		Leak rate, m^3/m	0			0	0946H	16.0	5.0
Pretest	11/13/24	Start Volume	313.0780			313.2100	ORSAT Leak Check		
Post-test	11/13/24	Stop Volume	313.0780			313.2100	Tedlar Bag ID	PJ24	566 S1 M4

Ports & Points	Time Clock (24-hr)	Time Test (min)	DGM reading (m^3)	Pitot Reading (mm H_2O)	Delta H Calc. (mm H_2O)	Delta H Actual (mm H_2O)	Gauge Vacuum (mm H_2O)	Temperature °C Stack	DGM	Probe	Filter	Imp. Exit
A-2	0815H	0	313.0822	11.6		40	5.0	257	20	112	117	17
	0820H	5	313.1316	11.4		40	5.0	257	20	118	113	15
	0825H	10	313.2822	11.6		40	5.0	257	20	120	134	16
	0830H	15	313.3964	11.8		40	5.0	257	20	120	122	16
	0835H	20	313.4956	11.6		40	5.0	257	20	117	121	18
	0840H	25	313.6003	12.0		40	5.0	257	20	114	112	18
	0845H	30	313.7018									
	0847H											

Run Time	Total Volume	RMS Delta P
30	6.6196	3.317

Delta H Avg	High Vac.	TS Stack Avg	Tmeter Avg
40	5.0	257	20

Team Leader / Date: H.P. TROVINA | 13 DEC. 24

QA/QC / Date: E.C. FERNANDO | 13 DEC. 24

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ISOKINETIC FIELD DATA SHEET
METHOD(s) 5/6

Facility Name	BMC FORESTRY CORPORATION BC- ILP	Test Date	13 DECEMBER 2024
Address	KM. 5, NAGUILIAN ROAD, IRISAN, BAGUIO CITY	Job Number	P324 S66 BMC S1 R1
Source	1.08 MT/hr. VERTICAL SHAFT KILN NO. 2	Year Installed	
Control device	CYCLONE DUST COLLECTOR	Field Personnel	FCF, HPO, MSL, CAE, JBT
Contact Person	MS. NARHY C. ROMILBAN	Operators Signature	

Filter ID	Tare(s)	Barometric (mm Hg)	Static (mm H_2O)	Meterbox ID#	Meterbox Gamma	Meterbox DeltaH @	Nozzle ID#	Nozzle Dia.	Pitot Tube ID#	Pitot Tube Cp	Probe ID#
		604.3	-0.6	RSI-T2	0.9954	46.4706	NS-T2-4	9.3	PT-T2-4FT	0.84	SPL-T2-4FT

Run No.	S1 RUN 1	Sample Train Leak Checks	Initial	Interim			Final	Fyrites Time	Fyrites %O_2	Fyrites %CO_2
Factor	5.204	Vacuum, mm Hg	15.0				15	1033	14.0	7.0
Pitot Leak Checks		Leak rate, m^3/m	0				0	1108H	14.0	7.0
Pretest	11C / 12V	Start Volume	313.718				315.2740	ORSAT Leak Check		
Post-test	1PM / 14	Stop Volume	319.713				321.7716	Tedlar Bag ID	P324	S66 S1 R1 CO

Ports & Points	Time Clock (24-hr)	Time Test (min)	DGM reading (m^3)	Pitot Reading (mm H_2O)	Delta H Calc. (mm H_2O)	Delta H Actual (mm H_2O)	Gauge Vacuum (mm H_2O)	Temperature °C Stack	DGM	Probe	Filter	Imp. Exit
12	1010	0	313.7120	11.2	57.24	53	6.0	290	24	116	117	19
11			313.7782	11.2	57.24	53	6.0	290	24	118	120	19
10	1015	5	313.2440	11.2	57.24	53	6.0	290	24	120	120	17
9			313.9116	11.4	60.36	60	6.0	295	24	117	114	17
8	1020	10	313.9718	11.6	60.24	60	7.0	295	25	120	120	17
7			314.0320	12.0	62.46	62	7.0	295	25	117	118	16
6	1025	15	314.1008	12.0	62.46	62	7.0	295	25	116	120	16
5			314.1680	12.0	62.46	62	7.0	295	25	118	120	16
4	1030	20	314.2322	11.6	60.24	60	7.0	295	25	120	120	17
3			314.2922	11.6	60.36	60	7.0	295	25	120	120	16
2	1035	25	314.3526	11.6	60.36	60	7.0	295	25	120	120	16
1			314.4220	11.6	60.36	60	7.0	290	25	120	120	17
STOP	1040	30	314.4888									
12	1045	30	314.5580	11.0	57.24	58	6.0	290	25	117	114	18
11			314.6250	11.2	57.24	58	6.0	290	25	118	120	18
10	1050	35	314.6914	11.0	57.24	58	6.0	290	25	120	120	17
9			314.7580	11.4	60.36	60	7.0	295	25	120	120	17
8	1055	40	314.8248	11.6	60.36	60	7.0	295	25	120	120	17
7			314.8920	12.0	62.46	62	7.0	295	25	120	120	16
6	1100	45	314.9614	12.0	62.46	62	7.0	295	25	120	117	16
5			315.0320	12.0	62.46	62	7.0	295	25	117	118	16
4	1105	50	315.1000	12.0	62.46	62	7.0	295	25	117	121	17
3			315.1692	11.6	60.36	60	7.0	290	25	118	120	17
2	1110	55	315.2342	11.0	57.24	58	7.0	290	25	120	121	17
1			315.1720	11.0	57.24	58	7.0	290	25	121	116	18
END	1115	60	315.2680									

Run Time	Total Volume	RMS Delta P
60	1.5500	3.393

Delta H *Avg	High Vac.	TS Stack Avg	Tmeter Avg
59.97	7.0	292.1	20.93

Team Leader / Date: H.P. ORQUINA / 13 DEC 24

QA/QC / Date: E.C. FERNANDO / 13DEC 2024

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ISOKINETIC FIELD DATA SHEET
METHOD(s) 5/6

Facility Name	BMC FORESTRY CORPORATION BC ILP	Test Date	13 DECEMBER 2024
Address	KM.6, NAGUILIAN ROAD, IRISAN, BAGUIO CITY	Job Number	RJ24 566 S1 RUN 2
Source	1.08 MT/HR. VERTICAL SHAFT KILN NO.2	Year Installed	
Control device	CYCLONE DUST COLLECTOR	Field Personnel	ECF HPO MVS CAS JBT
Contact Person	MR. NARITH C. POMILBAN	Operators Signature	

Filter ID	Tare(s)	Barometric (mm Hg)	Static (mm H_2O)	Meterbox ID#	Meterbox Gamma	Meterbox DeltaH @	Nozzle ID#	Nozzle Dia.	Pitot Tube ID#	Pitot Tube Cp	Probe ID#
		654.7	8.4	RSF-T2	0.9754	46.4705	NS-T2-4	7.39	PT-T2-4FT	0.84	SPT-T2-4FT

Sample Train Leak Checks								Fyntes		
Run No.	S1 RUN 2		Initial	Interim			Final	Time	$\%O_2$	$\%CO_2$
K Factor	4.920	Vacuum, mm Hg	15.0				11.0	1158	14	7
Pitot Leak Checks		Leak rate, m^3/m	0				0	1202	14	7
Pretest	13/18	Start Volume	315.2850				316.3210	ORSAT Leak Check	OK	
Post-test	24/20	Stop Volume	315.2850				316.8210	Tedlar Bag ID	RJ24	566 S1R2 CO

Ports & Points	Time: Clock (24-hr)	Time: Test (min)	DGM reading (m^3)	Pitot Reading (mm H_2O)	Delta H Calc. (mm-H_2O)	Delta H Actual (mm H_2O)	Gauge Vacuum (mm H_2O)	Temperature °C: Stack	DGM	Probe	Filter	Imp. Exit
A-12	1145	0	315.2918	11.0	54.17	54	6.0	240	24	117	117	19
11			315.3503	11.0	54.17	54	6.0	240	24	118	118	3
10	1150	5	315.4112	11.0	54.12	54	6.0	240	24	120	120	3
9			315.4746	11.6	57.17	58	6.0	239	24	119	120	3
8	1155	10	315.5382	12.0	59.04	60	6.0	239	24	120	119	13
7			315.6012	12.0	59.04	60	6.0	240	25	120	121	5
6	1200	15	315.6618	12.0	59.09	60	6.0	240	26	120	121	17
5			315.7211	12.0	59.09	60	6.0	240	25	120	120	17
4	1205	20	315.7950	11.6	57.17	58	6.0	240	25	117	120	16
3			315.8566	11.6	57.17	58	7.0	239	25	117	120	16
2	1210	25	315.9122	11.0	54.12	54	7.0	240	25	116	117	16
1			315.9710	11.0	54.17	54	7.0	240	25	116	117	17
STOP	1215	30	316.0478									
B-12	1240	30	316.0478	11.0	54.12	54	7.0	240	25	116	117	17
11			316.1019	11.0	54.12	54	7.0	240	24	118	118	17
10	1245	35	316.1632	11.6	57.17	58	7.0	239	25	119	120	13
9			316.2280	11.6	57.17	58	7.0	239	25	119	121	13
8	1250	40	316.2976	12.0	59.09	60	7.0	239	25	120	120	13
7			316.3542	12.0	59.09	60	7.0	239	24	120	120	13
6	1255	45	316.4104	12.0	59.09	60	8.0	239	25	120	121	14
5			316.4734	12.0	59.09	60	8.0	239	24	120	120	13
4	1300	50	316.5420	11.6	57.17	58	8.0	239	24	117	120	17
3			316.6016	11.6	57.17	58	8.0	240	24	117	117	17
2	1305	55	316.6682	11.0	54.12	54	8.0	240	24	115	116	17
1			316.7320	11.0	54.17	54	8.0	240	24	117	117	15
END	1310	60	316.8176									

Run Time	Total Volume	RMS Delta P
60	1.5203	3.933

Delta H *Avg	High Vac.	TS Stack Avg	Tmeter Avg
57.17	20	242.92	24.0

Team Leader / Date: H.P. ORQUINA / 13 DEC 24

QA/QC / Date: E.C. FERNANDO / 13 DEC. 24

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ISOKINETIC FIELD DATA SHEET

METHOD(s) 5/6

Facility Name	BMC FORESTRY CORPORATION BC-ILP	Test Date	13 DECEMBER 2024
Address	KM.5, NAGUILIAN ROAD, IRISAN, BAGUIO CITY	Job Number	P124 566 S1 RUN 3
Source	1.08 MT/HR. VERTICAL SHAFT KILN NO. 2	Year Installed	
Control device	CYCLONE DUST COLLECTOR	Field Personnel	ECF HPO MSL CAS JBT
Contact Person	MS. NARHY C. POMILBAN	Operations Signature	

Filter ID	Tare(s)	Barometric (mm Hg)	Static (mm H_2O)	Meterbox ID#	Meterbox Gamma	Meterbox DeltaH @	Nozzle ID#	Nozzle Dia.	Pitot Tube ID#	Pitot Tube Cp	Probe ID#
		654.3	8.6	BSI-T2	0.9754	46.4705	NS-T2-4	7.89	PT-T2-4FT	0.84	SPL-T2-4FT

		Sample Train Leak Checks	Initial	Interim				Final	Fyrites Time	%O_2	%CO_2
Run No.	S1 RUN3										
K Factor	1.05	Vacuum, mm Hg	15.0					11.0	1342H	19	7
Pitot Leak Checks		Leak rate, m³/m	0					0	1418H	19	7
Pretest	11/12/12	Start Volume	316.8350					317.3842	ORSAT Leak Check		
Post-test	13/14/14	Stop Volume	318.8350					318.3842	Tedlar Bag ID	P124 566 S1R3CO	

Ports & Points	Time Clock (24-hr)	Time Test (min)	DGM reading (m³)	Pitot Reading (mm H_2O)	Delta H Calc. (mm H_2O)	Delta H Actual (mm H_2O)	Gauge Vacuum (mm H_2O)	Temperature °C Stack	DGM	Probe	Filter	Imp. Exit
A-12	1330H	0	316.8448	11.4	57.57	58	6.0	295	25	170	116	19
11			316.9050	11.4	57.57	58	6.0	295	25	116	118	19
10	1335H	5	317.9652	11.6	58.58	58	6.0	295	25	121	120	19
9			316.8264	11.6	58.18	58	6.0	300	25	120	120	18
8	1340H	10	317.0966	12.0	60.6	60	6.0	300	25	120	120	18
7			317.1578	12.0	60.6	60	6.0	300	25	120	121	17
6	1345H	15	317.2172	12.0	60.6	60	7.0	300	26	121	120	17
5			317.2820	12.0	60.6	60	7.0	300	26	121	120	17
4	1350H	20	317.3492	11.6	58.58	58	7.0	300	26	122	120	16
3			317.4009	11.4	57.78	58	7.0	295	26	120	117	15
2	1355H	25	317.4700	11.4	57.57	58	7.0	295	26	117	117	16
1			317.5318	11.4	57.57	58	7.0	295	26	117	115	16
STOP	1400H	30	317.5918					30				
B-12	1405H	30	317.5912	11.4	57.57	58	7.0	295	26	117	117	16
11			317.6530	11.4	57.57	58	7.0	295	26	117	117	16
10	1410H	35	317.7234	11.6	58.58	58	7.0	295	26	121	121	16
9			317.7840	11.6	58.58	58	7.0	300	26	120	120	17
8	1415H	40	317.8442	12.0	60.6	60	7.0	300	26	120	120	17
7			317.9156	12.0	60.6	60	7.0	300	26	121	121	17
6	1420H	45	317.9758	12.0	60.6	60	8.0	300	26	120	121	17
5			318.0360	12.0	60.6	60	8.0	300	26	121	120	16
4	1425H	50	318.0972	11.6	58.58	58	8.0	300	26	117	120	16
3			318.1676	11.6	58.58	58	8.0	295	26	117	117	17
2	1430H	55	318.2388	11.4	57.57	58	8.0	295	26	115	117	17
1			318.3090	11.4	57.57	58	8.0	295	26	116	116	17
END	1435H	60	318.3799									

Run Time	Total Volume	RMS Delta P
60	1.5350	3.415

Delta H Avg	High Vac.	TS Stack Avg	Tmeter Avg
58.67	8.0	297.5	25.5

Team Leader / Date: H.P. ORDINA / 13 DEC. 24

QA/QC / Date: E. C. FERNANDO / 13 DEC. 24

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METHOD 7 FLASK SAMPLE AND RECOVERY DATA

Facility BMC FORESTRY CORPORATION BC-ILP
Address KM.5, NAGUILIAN ROAD, IRISAN, BAGUIO CITY
Source 1.08 MT/hr. VERTICAL SHAFT KILN NO. 2
Personnel ECF HPO MSL CAS JBT
Test Date 13 DECEMBER

Absorbing Solution Volume, ml 25 mL
Heated Probe? (check) Yes ✓ No ____ *If No, explain in "Remarks"
Filter Used? (check) Yes ✓ No ____ *If No, explain in "Remarks"
Remarks ____________________

Sample Collection Information: Barometric Pressure, Pbar (in Hg) 25.76 / 25.78 / 25.75; Date Performed: 13 DECEMBER 2024 By: ECF HPO MSL CAS JBT

Sample Collection Information (recovery): Barometric Pressure, Pbar (in Hg) 25.9; Date Performed: 14 DEC 24 By: ECF, HPO, MSL, CAS

Run Number	Sample ID	Flask ID Number	Flask Volume (ml)	Leak Check (<0.4"Hg/min)	Evacuated Pressure Pgi (in Hg)	Flask abs. Press Initial Pi, Pbar-Pgi (in Hg)[1]	Flask Temp °C	Flask Temp, Ti (°K)	Sample Collection Time[2] 24hour	Shaken for 5min	Shaken for 2min	Sample Recovered Time[3] 24hour	Final Pressure Pgf (in Hg)	Flask abs. Press Initial Pi, Pbar-Pgi (in Hg)	Flask Temp °C	Flask Temp Tf °K	Sample pH Adjusted (9 – 12)
P	R1 T1	BS/F27	2232	✓	24.30	1.46	28.3	301.45	1330H	✓	✓	0900H	0.3	25.6	30.1	303.25	✓
J	T2	F2	2242	✓	24.30	1.46	28.6	301.75	1340H	✓	✓	0905H	0.50	25.4	31.2	304.35	✓
L	T3	F3	2250	✓	24.70	1.56	29.0	302.15	1300H	✓	✓	0910H	0.4	25.5	31.6	304.75	✓
4	R2 T1	F4	2232	✓	24.10	1.67	29.2	302.35	1200H	✓	✓	0915H	0.4	25.5	30.7	303.85	✓
-	T2	F5	2272	✓	24.40	1.43	29.2	302.35	1210H	✓	✓	0920H	0.5	25.4	30.8	303.95	✓
5	T3	F6	2250	✓	24.50	1.28	29.6	302.75	1230H	✓	✓	0925H	0.6	25.3	31.1	304.25	✓
6	R3 T1	F7	2230	✓	24.40	1.38	29.0	302.15	1350H	✓	✓	0930H	0.6	25.3	31.2	304.35	✓
6	T2	F8	2240	✓	24.40	1.38	28.7	301.85	1400H	✓	✓	0940H	0.5	25.4	30.7	303.85	✓
S1	T3	F9	2250	✓	24.50	1.28	27.7	301.85	1410H	✓	✓	0945H	0.4	25.5	30.1	303.25	✓

Source Oxygen Concentration? % O2 14.0

Was additional oxygen introduced to the Flask? Yes____ No ✓

[1] Pi = Pbar – Pgi, Flask must be evacuated to within 3 inches of mercury (Hg) of the absolute pressure (barometric pressure).
[2] Additional oxygen should be introduced to the flask if the source O_2 is below 3%
[3] Flask must stand for 16 hours or greater after sampling before recovery can be performed.

E.C. FERNANDO

Checked By: H.P. ORQUINA 14 DEC 2024

Department of Environment and Natural Resources (DENR)
ENVIRONMENTAL MANAGEMENT BUREAU
ACCREDITED THIRD PARTY TESTER

2nd Floor, VAO Bldg. Ortigas Ave., Greenhills
San Juan City, Metro Manila, Philippines
Tels. 883-6125 • Fax (632) 727-9831

ANNEX C

PERMIT TO OPERATE
AND
FACILITY PROCESS DATA

Republic of the Philippines
Department of Environment and Natural Resources
ENVIRONMENTAL MANAGEMENT BUREAU
Cordillera Administrative Region (CAR)
Cordillera Administrative Region DENR Compound,Gibraltar Baguio City
Tel No: (074) 446-64-40

Permit No: PTO-OL-CAR-2021-09103-R
Application Type: Renewal

Date Issued: 30 Oct 2021
Date Expiration: 30 Oct 2026

PERMIT TO OPERATE
Air Pollution Source and Control Installations

Pursuant to Part IV, Rule XIX of the Rules and Regulations of R.A. 8749, authority is hereby granted to:

BMC Forestry Corporation (Irisan Lime Kiln) **Km. 5 Naguilian Road, Irisan, Baguio City, Benguet**

subject to the following terms and conditions:

TERMS AND CONDITIONS

1. This Permit is issued for the permittee to operate the following facilities/equipment described below at the permittee's establishment located at the above-mentioned address (geolocation of entrance gate: 16.419336°, 120.557358°):
   - **Air Pollution Source Installations/Equipment**:
     - *Three (3) units Vertical Shaft Kiln (Cap.: 1.08 MT/hr; Fuel used: Regular Fuel Oil or Bunker Oil)* - for the purpose of calcinations of limestones (geolocation of kiln plant building 16.419198°, 120.557922°);
     - *One (1) unit Jaw Crusher (Cap.: 1 MT/hr; With Conveyors)* - for the purpose of pulverizing the quicklimes;
     - *One (1) unit Lime Storage Silo (Cap.: 90 MT)*;
     - *One (1) unit Aboveground Fuel Storage Tank (Cap.: 60,000 liters; Fuel: Regular Fuel Oil or Bunker Oil; Vertical Cylinder)*;
     - *Seven (7) units Aboveground Fuel Storage Tanks (Cap.: 15,000 liters each; Fuels: Regular Fuel Oil of Bunker Oil; Horizontal Cylinders)*;
     - *One (1) unit Standby Generator Set (Cap.: 200 kW / 250 kVA; Make: SEALEY; Model: SLC250GF; S/N: 151118001; P.F. = 0.8; Silent-type): Alternator/Generator (Make: MBH; Model: XN274G; S/N: 31512006; Cap.: 180 kW / 225 kVA, continuous; P.F. = 0.8) primed by Diesel Engine (Make Chongqing Cummins; Model: NT855-GA; S/N: 41226017; Cap.: 257 kW @ 1800 RPM, max)*;
     - *One (1) unit Standby Generator Set (Cap.: 75 kW; Open-type): Alternator/Generator (Make: Caterpillar) primed by Diesel Engine (Make: Isuzu; Model: E120; S/N: 202587)*; and
     - *One (1) unit Standby Generator Set (Cap.: 200 kW / 250 kVA; Make: DCA; Model: 200DC; S/N: 8221-002; P.F. = 0.8; Open-type): Alternator/Generator (Make: DCA; Model: 200DC; S/N: A73281AC; Cap.: 200 kW / 250 kVA, standby; P.F. = 0.8) primed by Diesel Engine (Make: Cummins; Model: NT-855-G; S/N: 30104629)* - all generator sets are installed in the Powerhouse with geolocation of 16.419050°, 120.557809°; and
   - **Air Pollution Control Facilities:**
     - *Three (3) units Gas Scrubber Systems (Cap.: 66 m3/min; Wet-type; 1-unit scrubber is exclusively connected to 1-unit shaft kiln)*; and
     - *One (1) unit Dust Collector and Scrubber System (Cap.: 505.84 m3/min; composed of 1-unit 12,850 CFM Cyclone Dust Collector interconnected to 1-unit 5,000 CFM Cyclone Dust Collector with their bottom open and submerged on Water-bed Scrubber)* - for the purpose of controlling the airborne particulates/dusts from the sorting, crushing and loading areas (geolocation: 16.419132°, 120.557396°).

2. This Permit shall be valid until **SEPTEMBER 10, 2026 (PLEASE DISREGARD THE EXPIRATION DATE INDICATED ABOVE)** unless suspended or revoked by the Bureau.

3. The Bureau may modify the Permit by amending any existing condition or imposing any new or additional condition from the date of issuance (as indicated above) until its expiration on **SEPTEMBER 10, 2026**, subject to the provisions of Rule XIX of the Implementing Rules and Regulations (IRR) of the Republic Act No. 8749.

Filing Fee	: Php 600.00	O.R. No. : 1809914 & 1810468	Date : Oct. 11, 2021
Permit Fee	: Php 47300.00	O.R. No. : 1809914 & 1810468	Date : Oct. 11, 2021
PD1856	: Php 10.00	O.R. No. : 1809914 & 1810468	Date : Oct. 11, 2021

4. An application for renewal of this Permit shall be filed not less than thirty (30) days before the expiry date the **expiry date - SEPTEMBER 10, 2026.**

5. This Permit shall be posted in a conspicuous location at the premises and shall be adequately framed or otherwise protected against damage.

6. The operation of any installation, process activity at this establishment that produces, generates, captures, treats, reduces, controls, emits, releases or disperse air pollutants without a valid Permit to Operate, or in violation of any of the conditions of this Permit, shall be subject to penalties pursuant to Rule LVI of the IRR of RA 8749.

7. The installations, processes or activities at this establishment shall be operated, conducted and managed by the permittee, and the associated plant and equipment shall be maintained and operated by the permittee, so that emissions of air pollutants are kept to a practicable minimum. The permittee shall be responsible for ensuring that any emissions of air pollutants from abnormal or unexpected events, do not cause air pollution in the surrounding air environment or have adverse effects on persons in that environment.

8. Without limiting the generality of the previous condition, the permittee shall ensure that the emissions from the permitted installations or processes comply with:
   - the National Emission Standards for Source Specific Air Pollutants as specified in Rule XXV of the IRR of RA 8749; and
   - the National Ambient Air Quality Standards for Source Specific Air Pollutants from Industrial Sources/Operations as specified in Rule XXVI of the IRR of RA 8749.

9. The permittee shall submit Self-Monitoring Reports to the Bureau on a quarterly basis in accordance with DENR Administrative Order No. 27 (Series of 2003) and any written instructions by the Bureau based on the following schedule:

Quarter	Coverage	Submission	Quarter	Coverage	Submission
First	Jan. - Mar.	1-15 Apr.	Third	Jul. - Sep.	1-15 Oct.
Second	Apr. - Jun.	1-15 Jul.	Fourth	Oct. - Dec.	1-15 Jan.

10. The permittee shall at all times has an accredited Pollution Control Officer (PCO) who shall be the day-by-day contact person between the Bureau and the establishment. The permittee shall ensure that the PCO is familiar with the operations and activities undertaken at the establishment, and the relevant emission sources and air pollution control devices and equipment. The permittee shall give the PCO the necessary authority to take or to direct corrective action in the event of a malfunction, accident, breakdown or other abnormal event that results in excessive emissions or emissions that do not comply with relevant Permit conditions, emission standards or ambient air quality standards.

11. The Permittee shall seek accreditation of his/her appointed/designated PCO pursuant to Section 8 of DAO 2014-02 (Revised Guidelines for Pollution Control Officer Accreditation).

12. In case of the resignation or termination of the services of the PCO, the Managing Head shall appoint/designate a new PCO. He/she shall inform, in writing, the concerned EMB Regional Office within fifteen (15) days and seek accreditation for the new PCO within thirty (30) days from the date of resignation or termination.

13. The permittee shall report in writing to the Bureau any malfunction, accident, breakdown, leak, spill or other abnormal or unexpected event which results in emissions to atmosphere that do not comply with relevant Permit conditions, emission standards or ambient quality standards, or in any other abnormal or unexpected releases of air pollutants. The report shall indicate the nature of the incident or event, its impact on emissions, the time period involved, and any actions or measures taken to control the emissions or releases, remedy any air pollution problems that may have occurred, and minimize the probability of reoccurrence of the event or the release.

14. The permittee shall at all times allow authorized or accredited officers of the Department or the Bureau entry to the establishment and access to any part of the establishment to conduct inspections, gather information, test emissions or take samples. The permittee and its personnel shall not obstruct such officers in the performance of these functions, and shall furnish any information or materials requested by them that is reasonable for them to have. The permittee shall obey any lawful instruction or direction given by the Department or the Bureau at all times.

Filing Fee	: Php 600.00	O.R. No. : 1809914 & 1810468	Date : Oct. 11, 2021
Permit Fee	: Php 47300.00	O.R. No. : 1809914 & 1810468	Date : Oct. 11, 2021
PD1856	: Php 10.00	O.R. No. : 1809914 & 1810468	Date : Oct. 11, 2021

15. The permittee shall not make or allow any alterations or modifications to operations, activities, installations, processes, plant or equipment at the establishment that might substantially change the nature or quantity of the associated emissions without obtaining the approval of the Bureau, including the obtaining of any necessary Permit to Operate.

SPECIFIC CONDITION

16. The permittee shall conduct emission testing for the three (3) units Vertical Shaft Kilns through a DENR accredited third party Source Emission Testing Firm twice each year for each year of operation with three (3) sampling runs to verify its compliance pursuant to Memorandum Circular No. 2007-003 (Policy on Compliance and Permitting for Industrial Facilities Relating to Air Quality). However, considering that each kiln is operated in a period of six (6) to eight (8) months, each kiln shall be subjected to two (2) emission testing within that period. The Test Reports will be a part of the requirements for the renewal of this Permit.

Recommended by:

ENGR. MARIE PINA L. RODAS
OIC-Chief, Clearance & Permitting Division

Approved by:

MA. VICTORIA V. ABRERA
Regional Director

Filing Fee	: Php 600.00	O.R. No. : 1809914 & 1810468	Date : Oct. 11, 2021
Permit Fee	: Php 47300.00	O.R. No. : 1809914 & 1810468	Date : Oct. 11, 2021
PD1856	: Php 10.00	O.R. No. : 1809914 & 1810468	Date : Oct. 11, 2021

Annex

Fuel Burning					
ID	APSI	Capacity	Brand name	Type of Fuel	APCD
130795	Vertical Shaft Kiln No. 1	1.08 MT/hr/equipment	N/A	Regular Fuel Oil	Gas Scrubber No. 1 (66.0 m^3/min)
130797	Vertical Shaft Kiln No. 2	1.08 MT/hr/equipment	N/A	Regular Fuel Oil	Gas Scrubber No. 2 (66.0 m^3/min)
130799	Vertical Shaft Kiln No. 3	1.08 MT/hr/equipment	N/A	Regular Fuel Oil	Gas Scrubber No. 3 (66.0 m^3/min)
140793	Standby Generator Set	250.0 kVA	DCA/CUMMINS	Diesel	---
140794	Standby Generator Set	200.0 kW	SEALEY/Cummins	Diesel	---
140795	Standby Generator Set	75.0 kW	Caterpillar/Isuzu	Diesel	---

Non Fuel Burning					
ID	APSI	Capacity	Brand name	Material	APCD
130801	Jaw Crusher	1.0 MT/hr/equipment	N/A		Dust Collector Collector System (505.84 m^3/min)
140796	Lime Storage Silo	90.0 MT	N/A		---
140797	Aboveground/Overhead Fuel Storage Tank	60000.0 Liters	N/A		---
140800	Aboveground/Overhead Fuel Storage Tank	15000.0 Liters	N/A		---
140801	Aboveground/Overhead Fuel Storage Tank	15000.0 liters	N/A		---
140802	Aboveground/Overhead Fuel Storage Tank	15000.0 liters	N/A		---
140803	Aboveground/Overhead Fuel Storage Tank	15000.0 liters	N/A		---
140804	Aboveground/Overhead Fuel Storage Tank	15000.0 liters	N/A		---
140805	Aboveground/Overhead Fuel Storage Tank	15000.0 liters	N/A		---
140806	Aboveground/Overhead Fuel Storage Tank	15000.0 liters	N/A		---

APCD-APSI Mapping			
ID	APCD	Connected APSIs (<name> (id))	Connected APCDs (<name> (id))
19030	Gas Scrubber No. 1 (1)	Vertical Shaft Kiln No. 1 (4)	---
19907	Gas Scrubber No. 2 (8)	Vertical Shaft Kiln No. 2 (5)	---
19908	Gas Scrubber No. 3 (9)	Vertical Shaft Kiln No. 3 (6)	---
19909	Dust Collector Collector System (10)	Jaw Crusher (7)	---

Filing Fee	: Php 600.00	O.R. No. : 1809914 & 1810468	Date : Oct. 11, 2021
Permit Fee	: Php 47300.00	O.R. No. : 1809914 & 1810468	Date : Oct. 11, 2021
PD1856	: Php 10.00	O.R. No. : 1809914 & 1810468	Date : Oct. 11, 2021

MONITORING LOGSHEET

Facility Information

Facility Name	BMC FORESTRY CORP. BC ILP
Facility Address	KM. 5 NAGUILIAN ROAD, IRISAN, BAGUIO CITY
Name of Pollution Control Officer	MS. NARHY C. POMILBAN
Maintenance Supervisor / Engineer	
Telephone and Fax Number	445-7180 / 09306480332

Source Description

Source Type	VERTICAL SHAFT KILN EXHAUST STACK NO.
Source ID	PJ24 566 S1
Manufacturer / Brand of Equipment / Serial No.	✓
Equipment Capacity (BHp,MW,MT/hr)	1.08 MT / HR
Date of Installation (month/year)	
Date of Modification (that may increase emissions)	
Operational Hours per Year (hrs/year)	
Operating rate (%)	95 %

Air Pollution Control Device

Is there an Air Pollution Control Device (APCD) attached to the source?	___ YES ___ NO
Type of APCD	✓ Wet Gas Scrubber
Date of Installation	
APCD parameters (flowrate,gpm,delta P,etc)	
Is the APCD operating during emission sampling	___ YES ___ NO

Fuel Analysis / Information

Type of Fuel used during emission sampling (%S)	✓ RFO
Original Fuel used	✓ RFO
Date of Fuel change	
Daily Fuel Consumption (Liters/day)	
Is the Fuel Analysis Available?	___ YES ___ NO
Will the company provide the Fuel Analysis	___ YES ___ NO

Please attach the following
- -Fuel Analysis
- -Permit to Operate
- -APCD Process Logsheet
- -Source Process Logsheet

Narhy C. Pomilban
Signature over printed name of Facility Representative

PCO

ANNEX D

ANALYTICAL DATA

ELARSI, INC.
Unit 201-204 & 406 Rizalina Annex Bldg. 1677 Quezon Avenue, Quezon City
Tel. No. 8927-77-15 Fax No. 8929-4824 Email: info@elarsi.com

CLIENT	: **BSI**	Lab. Report No.	: 244456-SA
ADDRESS	: 2nd Flr., VAG Bldg Ortigas Ave. Greenhills San Juan, Metro Manila	Date/Time Sampled	: 12-13-24 1100H
		Date Received	12-16-24
Contact Number	: 8863-6129	Date Analyzed	: 12-18-24 to 12-23-24
Nature of Sample/s	: Stationary Source Emission	Date Reported	: 12-23-24
No. of Sample/s Submitted	: Three (3)		

[REPORT OF ANALYSES]

Sample No.	Sample ID	PM (with acetone rinse), mg[a]	Analysis Date/Time
ES-2420808	PJ 24 566 S1R1	22.1	12-18-24 0830H
ES-2420809	PJ 24 566 S1R2	23.9	12-18-24 0830H
ES-2420810	PJ 24 566 S1R3	39.8	12-18-24 0830H

[a] - Method 5 / Gravimetric

Reference
CFR 40 Part 60 Revised as of December 20, 2020

Note: Date and time of sampling for As Received samples were provided by client

Analyzed By:

CHYLA DREXIE C. MORADA, RChT
Laboratory Chemical Technician
PRC Lic. No. 0009323

Checked By:

JEMMA D. JACINTO, RCh
Laboratory Supervisor
PRC Lic. No. 0010872

Certified Correct By:

RENATO M. GOFREDO, JR., RCh
Laboratory Manager
PRC Lic. No. 0009824

DENR RECOGNIZED LABORATORY C.R. No. 005/2024

PAB ACCREDITED TESTING LABORATORY PNS ISO/IEC 17025:2017 LA-2023-436A

Test results reflect the quality of the samples as received.

ELARSI, INC.

REAGENTS STANDARDIZATION for SOx ANALYSIS (EI-APA-14)

Project No. : PJ 24 566
Lab Report No. 244457-59

Date Received: 12/16/24
Date & Time Analysis Started: 12/17/24 1300H
Date & Time Analysis Finished: 12/17/24 1600H

Computations:

Standardization of 0.0100 ± 0.0002 N BaCl2:				
Trial No.	Volume (ml)	Normality (N)	Volume (ml)	Normality (N)
	H_2SO_4	H_2SO_4	$BaCl_2$	$BaCl_2$
1	25	0.009907 4085	24.5	0.01009601
2	25	0.009907 4085	24.3	0.01012807
			Average	0.01015204

$$N_{BaCl2} = \frac{(N_{H2SO4})(V_{H2SO4})}{V_{BaCl2}}$$

Standardization of 0.0100 ± 0.0002 N H2SO4:				
Trial No.	Volume (ml)	Normality (N)	Volume (ml)	Normality (N)
	NaOH	NaOH	H_2SO_4	H_2SO_4
1	24.7	0.01002774 14	25	0.009907 4085
2	24.7	0.01002774 14	25	0.009907 4085
			Average	0.009907 4085

$$N_{H2SO4} = \frac{(N_{NaOH})(V_{NaOH})}{V_{H2SO4}}$$

Standardization of NaOH:				
Trial No.	Weight (g)	Weight (g)	Volume (ml)	Normality (N)
	NaOH	KHP	NaOH	NaOH
1	40.0012	0.1004	40.1	0.01001 22730
2	40.0012	0.1003	48.9	0.01004 32098
			Average	0.01002774 14

$$N_{H2SO4} = \frac{Weight\ of\ KHP}{(0.20423)(V_{NaOH})}$$

Analyzed by JGB LCM
Date & Time 12/17/24 1300H

Approved by RMG
Date & Time 12/20/24 5PM

Checked by JDL
Date & Time 12/20/24 1400H

ELARSI, INC.

SOx (METHOD 8/METHOD 8) ANALYTICAL DATA SHEET (EI-APA-14)

Project No.:	PJ 24 566	**Lab Report No.:**	244457-SA
Nature of Sample:	SSE	**Date Received:**	12/16/24
N BaCl2 used:	0.00512024	**Date Analysis Started:**	12/17/24
IPA (used for titration):	247430	**Date Analysis Finished:**	12/17/24
Detection Limit/s:	SO_2 (1.90 mg) SO_3 (3.27 mg); H_2SO_4 (4.00 mg)		

Computations:

IPA Check (Abs @ 352nm) IPA LOT No. 247430
Blank 0.00 IPA 0.002

Mass H_2SO_4 (mg) = $\left[\frac{(49.04)(N_{BaCl2})(V_{ave} - V_{IPAblank})V_{soln}}{V_a}\right]$

Mass SO_2 (mg) = $\left[\frac{(32.03)(N_{BaCl2})(V_{ave} - V_{IPAblank})V_{soln}}{V_a}\right]$

Mass SO_3 (mg) = mass H_2SO_4 (mg) x $\frac{MW\,SO_3\,(80.061)}{MW\,H_2SO_4\,(98.078)}$

where: V_{soln} - sample volume; V_{ave} - average volume of titrant used for sample
V_a - volume aliquot
$V_{IPAblank}$ - volume of titrant used for IPA blank

ND (Not Detected)

Sample No.	Sample ID	V_{soln}	V_a	Titrant Volume (ml) Buret Reading (Final - Initial)	Trial 1	(Final - Initial)	Trial 2	V_{ave}	SO_2 Mass (mg)
	IPA Blank	100	10	0.0 - 0.0	0.0	0.0 - 0.0	0.0	0.00	<1.90
ES-2420811	PJ 24566 S1 R1	310	|	0.4 - 0.0	0.4	0.2 - 0.0	0.2	0.30	3.02
812	R2	240	10	0.3 - 0.0	0.3	0.2 - 0.0	0.2	0.25	1.95
813	R3	350	|	0.1 - 0.0	0.1	0.1 - 0.0	0.1	0.10	<1.90

REMARKS:
Reagent & Standard Code/s:

0.0100 N Barium Standard Solution: S24 016
Thorin Indicator: S24 0109
Isopropanol Brand/Lot#: 247430

Analyzed by: JGG CCM
Date&Time: 12/17/24 1800H

Checked by: JDJ
Date&Time: 12/20/24 09 wH

Checked by: [illegible]
Date&Time: 12/20/24 5P

EI_LABAIRFORM_14(A)

ELARSI, INC.
Unit 201-204 & 406 Rizalina Annex Bldg. 1677 Quezon Avenue, Quezon City
Tel. No. 8927-77-15 Fax No. 8929-4824 Email: info@elarsi.com

CLIENT	: **BSI**	Lab. Report No.	: 244458-SA
ADDRESS	: 2nd Flr., VAG Bldg Ortigas Ave. Greenhills San Juan, Metro Manila	Date/Time Sampled	: 12-13-24 1100H
		Date Received	: 12-16-24
Contact Number	: 8863-6129	Date Analyzed	: 12-21-24 to 12-27-24
Nature of Sample/s	: Stationary Source Emission	Date Reported	: 12-27-24
No. of Sample/s Submitted	: Ten (10)		

[REPORT OF ANALYSES]

Sample No.	Sample ID	NO_x (as NO_2) mg[a]	Analysis Date/Time
ES-2420814	PJ 24 566 S1R1T1	0.0268	12-21-24 0900H
ES-2420815	PJ 24 566 S1R1T2	0.0268	12-21-24 0900H
ES-2420816	PJ 24 566 S1R1T3	0.0183	12-21-24 0900H
ES-2420817	PJ 24 566 S1R2T1	0 0310	12-21-24 0900H
ES-2420818	PJ 24 566 S1R2T2	0.0211	12-21-24 0900H
ES-2420819	PJ 24 566 S1R2T3	0.0169	12-21-24 0900H
ES-2420820	PJ 24 566 S1R3T1	0.0211	12-21-24 0900H
ES-2420821	PJ 24 566 S1R3T2	0.0352	12-21-24 0900H
ES-2420822	PJ 24 566 S1R3T3	0.0183	12-21-24 0900H
ES-2420823	PJ 24 566 S1 Blank	< 0.0078	12-21-24 0900H

[a] - Method 7 / Phenoldisulfonic Acid

Reference
CFR 40 Appendix A-4 Part 60 as of May 31, 2023

Note: Date and time of sampling for "As Received" samples were provided by client.

Analyzed By:

CHYLA DREXIE C. MORADA, RChT
Laboratory Chemical Technician
PRC Lic. No. 0009323

Checked By:

JEMMA D. JACINTO, RCh
Laboratory Supervisor
PRC Lic. No. 0010872

Certified Correct By:

RENATO M. GOFREDO, JR., RCh
Laboratory Manager
PRC Lic. No. 0009824

Test results reflect the quality of the samples as received.

DENR
RECOGNIZED
LABORATORY
C.R. No. 005/2024

REQUEST FOR ANALYSIS / CHAIN OF CUSTODY FORM

Unit 201-204 & 406 Rizalina Annex Bldg. 1677 Quezon Avenue, Quezon City
Tel. No 8927-77-15 , 8994-3443 * Fax No. 8929-48-24 * E-mail: info@elarsi.com

FOR LABORATORY USE ONLY
Inv # ____ OR# ____ Lab. Report No. 200456-58-SA

Company : BSI
Address : Marilles Laguna
Contact Person : M Saulgan MVI. Contact No./s 09958469485

Submitted by: M.S. [signature] (Printed Name/Signature) Date/Time 12-16-24 0900H
Reviewed by: MBDA (Printed Name/Signature) Date/Time 16DEC24 1100H
Approved by: Jenra Juin (Printed Name/Signature) Date/Time 12/16/24 11:00

Method of Transport
___ Walk-in ___ Courier ___ Pick-up ___ Others

Sample Condition Upon Receipt
✓ Sealed / Container Intact
___ Chilled/Frozen
___ Room Temp
___ Preserved

Container Type
✓ Plastic Bottle
___ Glass/Sterile Glass
___ TEDLAR Bag
___ Others

Turn Around Time
___ Urgent/Rush (3-5 Working Days)
✓ Routine (7-12 Working Days)

Nature of Sample (PLEASE CHECK)[1]

Water
___ Drinking Water
___ Wastewater
___ Others

Air
✓ Stack Source Emission
___ Ambient Air Sample
___ Work Env. Measurement
___ Others

Metals
___ Water
___ Air
___ Others

Solids
___ Soil
___ Sludge
___ Sediment
___ Others

FOR LAB. USE ONLY Sample No.	Sample Identification	Analyses Requested	Method Of Analysis	Date of Sampling/Time	No. of Samples	Remarks
	PJ24-566			DEC. 13 24		
PM / FS-2020808-10	STR1	PM	Gravimetric	1100H	3	SOx - no blank
SOX /	R2	SOx	Barium Thorin-titration		3	
FS-2020811-13	R3					
		ACETONE			3	
NOX /	STR1T1					
FS-2020814-23	T2					
	T3	NOx	Phenoldisulfonic Acid		9	W/BLANK
	R2T1					
	T2					
	T3					
	R3T1					
	T2					
	T3					
	Blank					

FOR LAB. USE ONLY

DATE OF THE FOLLOWING			
Certificate Sent/Reported	Worksheet Sent	COC Sent	Sample Disposed

[1] USE ONE (1) COC FOR EACH NATURE OF SAMPLE
[2] Unless otherwise requested, all samples will be disposed two (2) weeks after analysis.
[3] Use HRA/ ORM 56 waiver form if Sample condition & requirements are not met.

Serial No. 2139

EI_HRAFORM_03

BSI

Environmental Management Service Provider

CO MEASUREMENT DATA

Tedlar Bag Samples

Facility:	BMC FORESTRY CORPORATION	Analysis Date:	December 16, 2024
Sample Date:	December 13, 2024	Analyzed By:	JOSE ARIAY M. SANTIAGO
Collected By:	ECF, HPO, MSL, JBT	Signature:	

CO Analyzer Manufacturer	**FUJI ELECTRIC CO., LTD.**
Analyzer Model Serial Number	**ZPAABBY2 / N2C0833**
Analyzer Range Setting, ppm	**0 - 1000**
Analyzer Span Value, ppm	**800**

Pre-Measurement Calibration

Time 0800H	Cylinder No.	Gas Value (ppm)	CO response (ppm)	% Difference* (% span)	Status (≤ 2% span)
Zero Gas	**N2 240403**	**0**	0	**0.0000**	**Passed**
Certified Gas 1	**D962229**	**200**	201	**-0.1250**	**Passed**
Certified Gas 2	**D962122**	**500**	499	**0.1250**	**Passed**
Certified Gas 3	**D962087**	**800**	800	**0.0000**	**Passed**

*((Gas Value- CO Response) /Span Value))x 100%

CO Tedlar Bag Samples

Time	Tedlar Bag ID No.	CO (ppm)	Time	Tedlar Bag ID No.	CO (ppm)
0900H	**PJ24-566 S1R1**	**25**			
0910H	**PJ24-566 S1R2**	**26**			
0920H	**PJ24-566 S1R3**	**15**			

Post-Measurement Calibration Drift Check

Time 1800H	Gas Value (ppm)	Pre-Meas CO Response (ppm)	Post-Meas CO Response (ppm	% Drift** (% span)	Status[1] (≤ 10 % span)
Zero Gas	**0**	0	0	**0.0000**	**Passed**
Certified Gas 1	**200**	201	198	**0.3750**	**Passed**
Certified Gas 2	**500**	499	495	**0.5000**	**Passed**
Certified Gas 3	**800**	800	797	**0.3750**	**Passed**

**((CO Resp from the Pre-Meas Cal-Co Resp for the Post-Meas)/Span Value)) x 100%

QA/QC Check: Completeness ✓ Legibility ✓ Accuracy ✓ Specifications ✓ Reasonableness ✓ Over 8 hours

Checked By: JANS CHOLO E. CHUA
Signature Over Printed Name

QA/QC/Date: EDINDO C. FERNANDO
Signature Over Printed Name

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ANNEX E

EQUIPMENT CALIBRATION CERTIFICATES

METER BOX POST-TEST CALIBRATION CHECK

USEPA Approved Alternative Method ALT-009

BMC FORESTRY CORP. ILP
IRISAN, BAGUIO CITY
VERTICAL SHAFT KILN NO. 2

Meter Box #: 2

Calibration	Date	$\Delta H_@$	Y
5-point orifice calibration	25-Nov-24	46.4705	0.9754

Calculate Y_{qa} for each test run using the following equation:

$$Y_{qa} = \frac{\theta}{V_m}\sqrt{\frac{0.0011503\,T_m}{\Delta H_@\left(P_b + \frac{\Delta H_{avg}}{13.6}\right)}} \times \frac{29}{M_d} \times \left(\sqrt{\Delta H}\right)_{avg}$$

where:

Y_{qa}	dry gas meter calibration check, value dimensionless.
θ	total run time, min.
V_m	total sample volume measured by dry gas meter, m^3.
T_m	absolute average dry gas meter temp., °K.
P_b	barometric pressure, mm Hg.
0.0011503	$=(760/298)\,(0.75 \times 0.0238)^2$ (mm Hg/°K) $(m^3/min)^2$
ΔH_{avg}	average orifice meter differential, mm H_2O.
$\Delta H_@$	orifice meter calibration coefficient, mm H_2O.
M_d	dry molecular weight of stack gas, gm/gm mole.
29	dry molecular weight of air, gm/gm mole.
13.6	specific gravity of mercury.

After each test run series, do the following:

Average the three or more values of Y_{qa} obtained from the test run series and compare this average with the dry gas meter calibration factor, Y. The average Y_{qa} must be within ±5% of Y.

If the average Y_{qa} does not meet the ±5% criterion, recalibrate the meter over the run full range of orifice settings, as detailed in Method 5. Then follow the subsequent procedure in Method 5.

METER BOX POST-TEST CALIBRATION CHECK				
		Run 1	**Run 2**	**Run 3**
Meter Box		**Meter Box #: 2**	**Meter Box #: 2**	**Meter Box #: 2**
Time, min	θ	60.0	60.0	60.0
Total volume, dry m^3	V_m	1.5500	1.5208	1.5350
Average meter temp, °C		24.83	25.00	25.75
Average meter temp, °K	T_m	297.98	298.15	298.90
Barometric pressure, mm Hg	P_b	654.30	654.70	654.30
ΔH_{avg}, mm H_2O		59.917	57.167	58.667
$\Delta H_@$, mm H_2O		46.4705		
Mol. wt. of stack gas, g/g-mole	M_d	29.64	29.64	29.64
QA gamma	Y_{qa}	0.9917	0.9872	0.9925
Average Yqa		0.9905		
Meter box gamma	Y	0.9754		
Difference to be within 5%		**1.5% - PASS**		

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TRAM NO. 3 - CRITICAL ORIFICE

USING FIVE CRITICAL ORIFICES

Console Model Number	XC572-QC6V	**Date**	25-Nov-24	**Time**	1300H	**Std Temp**	298 °K
Console Serial Number	1404036	**Barometric Pressure**		755.9 mm Hg		**Std Press**	760 mm Hg
DGM Model Number	G1.6	**Theoretical Critical Vacuum**		357mm Hg or 14in Hg		K_1	0.3858
DGM Serial Number	2012-014438	**Calibration Technician**		HPO		**Previous calibration**	0.9873

Metering Console							Critical Orifice					
Elapsed Time	DGM Orifice ΔH	Volume			Outlet Temp.		Serial #	Coef. x10⁴	Ambient Temp.		Critical Vacuum	Actual Vacuum
		Initial	Final	Dif	Initial	Final			Initial	Final		
θ	P_m	V_{mi}	V_{mf}	V_m	t_{mi}	t_{mf}		K'	t_{amb}	t_{amb}	in Hg or mm Hg	*1-2in or 25-50mm > Critical*
min	mm H_2O	m^3	m^3	>0.14m^3	°C	°C		metric units	°C	°C		
17.0	10.0	300.1000	300.2640	0.164	25.0	25.0	40	2.09977	27.1	27.6	15.0	17.0
11.0	20.0	300.2750	300.4312	0.156	25.0	25.0	48	3.10936	27.6	26.8	15.0	17.0
9.0	32.0	300.4388	300.6048	0.166	25.0	25.0	55	4.05110	26.8	26.3	15.0	16.0
7.0	54.0	300.6102	300.7768	0.167	25.0	25.0	63	5.20716	26.3	26.4	15.0	16.0
5.0	94.0	300.7850	300.9456	0.161	25.0	25.0	73	7.14867	26.4	26.4	15.0	16.0

Standardized Data				Dry Gas Meter				
Dry Gas Meter		Critical Orifice		Calibration Factor		Flowrate	$\Delta H_@$	
				Value	Var'n	Std & Corr	0.0212 m^3_{std}/min	Variation
$V_{m(std)}$	$Q_{m(std)}$	$V_{cr(std)}$	$Q_{cr(std)}$	Y	ΔY	$Q_{m(std)(corr)}$	$\Delta H_@$	$\Delta\Delta H_@$
m^3	m^3/min	m^3	m^3/min		±2%	m^3/min	mm H_2O	±5.1mm Hg
0.1606	0.0094	0.1557	0.0092	0.9692	-0.64	0.0092	51.8778	4.4
0.1532	0.0139	0.1492	0.0136	0.9743	-0.11	0.0136	47.3852	0.9
0.1630	0.0181	0.1592	0.0177	0.9772	0.19	0.0177	44.6711	-1.8
0.1639	0.0234	0.1592	0.0227	0.9717	-0.38	0.0227	45.7906	-0.7
0.1586	0.0317	0.1561	0.0312	0.9845	0.94	0.0312	42.6276	-3.8
			Y Average	0.9754			$\Delta H_@$ Average	46.4705

I certify that the above Dry Gas Meter was calibrated in accordance with USEPA Method 5.

Signature: HALCY LEMON P. ORQUINA / MANZ L. AGDALPEN /EDINDO G. FERNANDO Date: 25-Nov-24

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TEAM NO. 2 - CRITICAL ORIFICE

DETERMINATION OF ORIFICE COEFFICIENT K'

Console Model Number	XC572-QC6V	**Date**	25-Nov-24	**Time**	0915H	**Std Temp**	298.15 °K
Console Serial Number	1404036	**Barometric Pressure**		755.9	mm Hg	**Std Press**	760 mm Hg
DGM Model Number	G1.6	**Theoretical Critical Vacuum**		357mm Hg or 14in Hg		K_1	0.3858
DGM Serial Number	2012-014438	**Calibration Technician**		HPO		**Previous calibration**	0.9873

Metering Console							Critical Orifice						
Run	Elapsed Time	DGM Orifice ΔH	Volume		Outlet Temp		Orifice ID	Ambient Temp		Critical Vacuum	Actual Vacuum *1-2in or 25-50mm > Critical*	Coeff. x10³	Diff %
			Initial	Final	Initial	Final		Initial	Final				
	θ	P_m	V_{mi}	V_{mf}	t_{mi}	t_{mf}		t_{amb}	t_{amb}	in Hg or mm Hg		K'	< ±0.5
	min	mm H_2O	m^3	m^3	°C	°C		°C	°C				
1	5	10	299.1000	299.1472	24.0	24.0	40	27.3	27.2	15	17	2.09986	0.00
2	5	10	299.1472	299.1944	24.0	24.0	40	27.2	27.2	15	17	2.09969	0.00
											Average	**2.09977**	
1	5	20	299.1980	299.2676	24.0	24.0	48	27.2	27.5	15	17	3.09993	0.30
2	5	20	299.2676	299.3376	24.0	24.0	48	27.5	27.6	15	17	3.11878	0.30
											Average	**3.10936**	
1	5	32	299.3400	299.4308	24.0	24.0	55	27.6	27.5	15	17	4.05022	0.02
2	5	32	299.4308	299.5218	24.0	25.0	55	27.5	27.5	15	17	4.05198	0.02
											Average	**4.05110**	
1	5	54	299.5300	299.6472	25.0	25.0	63	27.5	27.5	15	16	5.22096	0.26
2	5	54	299.6472	299.7638	25.0	25.0	63	27.4	27.4	15	16	5.19337	0.26
											Average	**5.20716**	
1	5	94	299.7710	299.9308	25.0	25.0	73	27.2	27.2	15	16	7.14266	0.08
2	5	94	299.9308	300.0906	25.0	24.0	73	27.2	27.2	15	16	7.15467	0.08
											Average	**7.14867**	

Calibrated By: Halcy Lemon P. Orquina
Signature over Printed Name

Checked By: Manz L. Agdalpen
Signature over Printed Name

QA/QC: Edindo C. Fernando
Signature over Printed Name

Date: 25 November 2024

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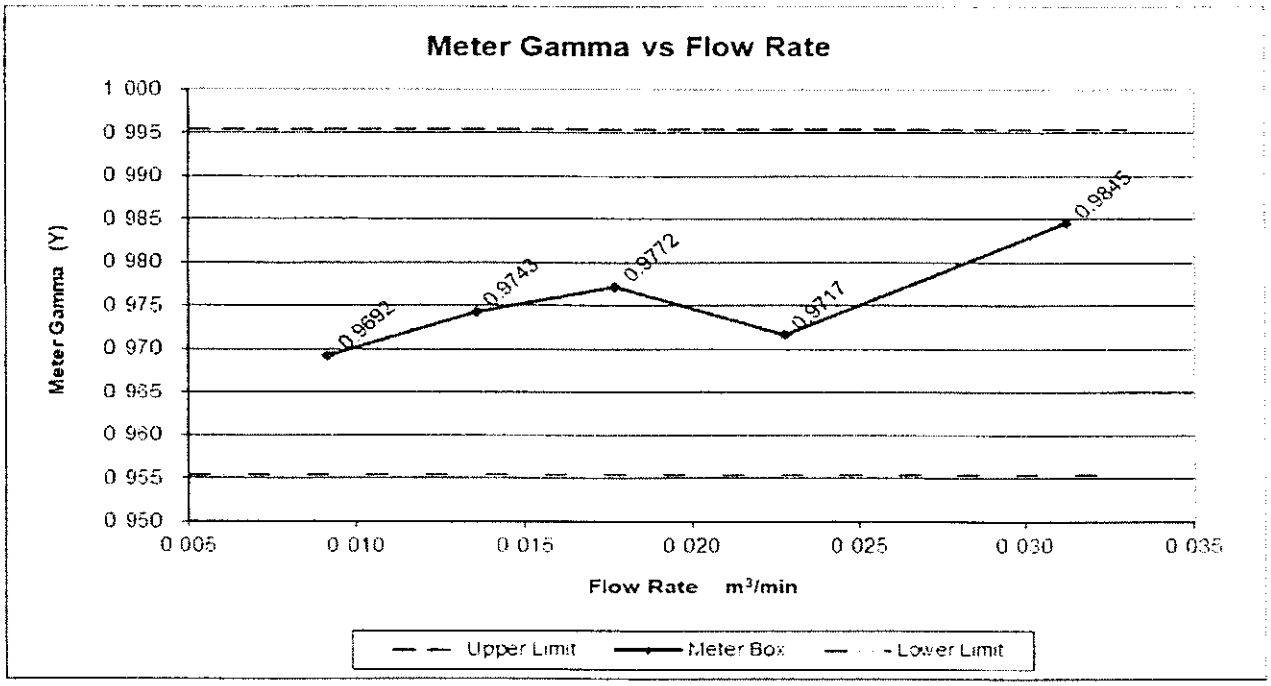

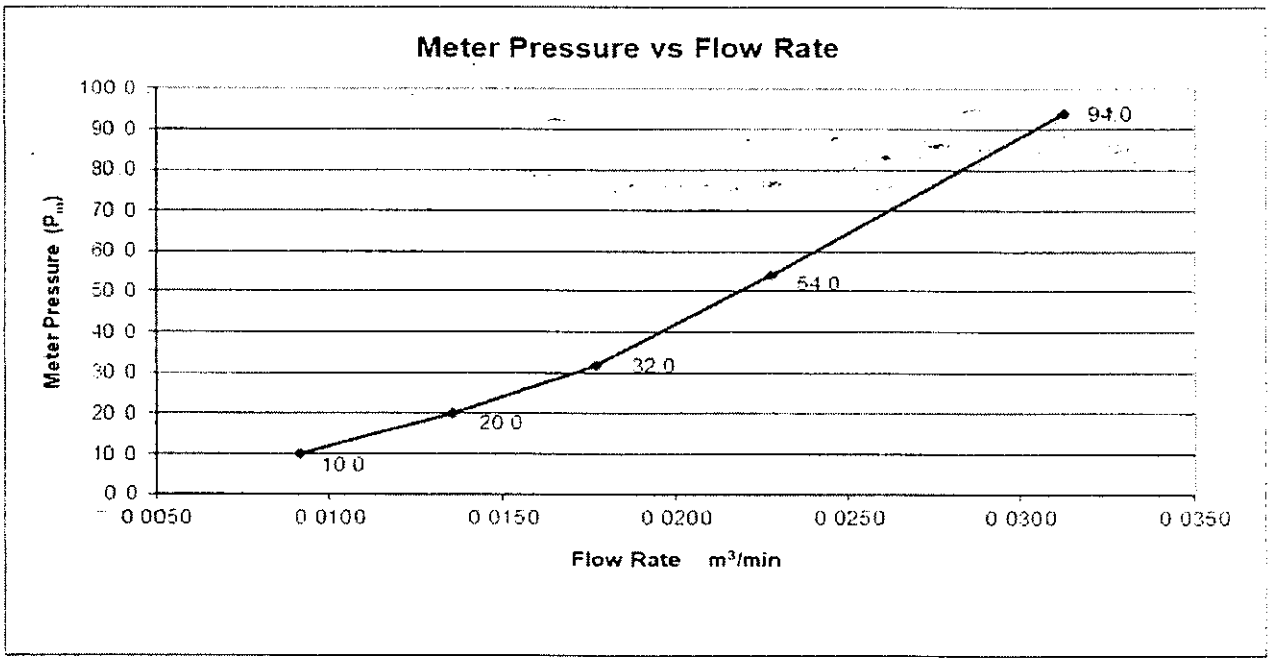

Calibrated By: Haley Lemon P. Orquina
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POST TEST THERMOCOUPLE CALIBRATION CHECK

EPA Approved Alternative Method (Alt-011)
Single Point Calibration

Thermocouple ID	TMC- T2	**Probe / Pitot Tube ID**	SPA-6FT-2 / PT-6FT-2
Personnel	HPO, MSL, CAS	**Date**	25 November 2024

Sensor	Calibrated By:	Reference Temp. °C [1]	Thermocouple Temp. °C	Difference [2] (within ± 1°C)	Continuity Check [3]	PASS / FAIL
PROBE	HPO	30.1	30	0.1	OK	PASSED
FILTER	HPO	30.2	30	0.2	OK	PASSED
STACK	HPO	30.2	30	0.2	OK	PASSED
EXIT	HPO	30.1	30	0.1	OK	PASSED
OVEN	HPO	30.2	30	0.2	OK	PASSED
AUX.	HPO	30.1	30	0.1	OK	PASSED

[1] Reference Thermometer is mercury-in-glass and ASTM certified, unless otherwise noted.
[2]After each test run series, check the accuracy (and, hence, the calibration) of each thermocouple system at ambient temperature. The temperature of the thermocouple and reference thermometers shall agree with ± 1 °C.
[3]The continuity check involves subjecting the tip of the thermocouple to a change in temperature to check the crimps, loose connections. Thermocouples with crimps and loose connections will not immediately respond to temperature changes, and those with wrong connections will show an opposite change in temperature.

Calibrated By: Halcy Lemon P. Orquina
Signature over Printed Name

Checked By: Manz L. Agdalpen
Signature over Printed Name

QA/QC: Edindo C. Fernando
Signature over Printed Name

Date: 25 November 2024

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TEMPERATURE DISPLAY CALIBRATION

Meter Console No.	**BSI - T2**	**Personnel**	**HPO, MSL, CAS**
Reference Calibration Maker	**PIE**	**Pretest**	**OK**
Model	**520B**	**Posttest**	**OK**
Serial No.	**223734**	**Date**	**25 Nov 2024**

TC CHANNEL ID	Reference Temp. 1, °C	Temp. Reading 1, °C	Criteria	Criteria Met	Reference Temp. 2, °C	Temp. Reading 1, °C	Criteria	Criteria Met
PROBE	0	0	0	Y	50	49	0.310	Y
FILTER	0	0	0	Y	50	49	0.310	Y
EXIT	0	0	0	Y	50	49	0.310	Y
AUX	0	0	0	Y	50	49	0.310	Y
STACK	0	0	0	Y	50	48	0.619	Y
STACK	0	0	0	Y	250	247	0.574	Y

TC CHANNEL ID	Reference Temp. 3, °C	Temp. Reading 1, °C	Criteria	Criteria Met	Reference Temp. 4, °C	Temp. Reading 1, °C	Criteria	Criteria Met
PROBE	100	99	0.268	Y	150	148	0.473	Y
FILTER	100	99	0.268	Y	150	148	0.473	Y
EXIT	100	99	0.268	Y	150	149	0.236	Y
AUX	100	99	0.268	Y	150	149	0.236	Y
STACK	100	99	0.268	Y	150	149	0.236	Y
STACK	350	349	0.161	Y	450	447	0.415	Y

CRITERIA: Percent difference between the Reference Temperature and the average Temperature can be only ± 1.5%°K.

EQUATION: $\frac{[(\text{Ref. Temp.} + 273) - (\text{Temp. Reading} + 273)] \times 100}{(\text{Ref.Temp.} + 273)}$

Calibrated By: Halcy Lemon P. Orquina
Signature over Printed Name

Checked By: Manz L. Agdalpen
Signature over Printed Name

QA/QC: Edindo C. Fernando
Signature over Printed Name

Date: 25 November 2024

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TEMPERATURE SENSOR CALIBRATION DATA SHEET

Date	25 November 2024	Thermocouple No.	**TMC – T2**
Personnel	**HPO, MSL, CAS**	Reference	AlcoholThermometer

Date	Reference Point Number	Source (Specify)	Reference Thermometer Temp., °C	Thermocouple Display Temp., °C	Absolute Temperature Difference. %
25 Nov 2024	1	**HOT WATER**	**99.9**	**100**	**0.1**
	2	**AMBIENT**	**28.3**	**28**	**0.3**
	3	**ICE WATER**	**2**	**2**	**0**
18 Jan 2024	1	**HOT WATER**	**99.8**	**100**	**0.2**
	2	**AMBIENT**	**28.1**	**28**	**0.1**
	3	**ICE WATER**	**2.2**	**2**	**0.2**
30 Jun 2023	1	**HOT WATER**	**99.2**	**99**	**0.2**
	2	**AMBIENT**	**28.1**	**28**	**0.1**
	3	**ICE WATER**	**2.2**	**2**	**0.2**

Calibrated By: Halcy Lemon P. Orquina
Signature over Printed Name

Checked By: Manz L. Agdalpen
Signature over Printed Name

QA/QC: Edindo C. Fernando
Signature over Printed Name

Date: 25 November 2024

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TYPE-S PITOT TUBE CALIBRATION

PITOT TUBE ID	PT-T2-4FT	**Probe Assembly ID**	SPA- T2-4FT
Calibrated by:	HPO, MSL, CAS	**Date Calibrated**	26 November 2024

PARAMETER	VALUE	ALLOWABLE RANGE
Assembly Level	**YES**	YES
Holes Damaged	**NO**	NO
Obstructed	**NO**	NO
$\alpha 1$	**0**	$-10° < \alpha 1 < +10°$
$\alpha 2$	**0**	$-10° < \alpha 2 < +10°$
$\beta 1$	**1**	$-5° < \beta 1 < +5°$
$\beta 2$	**0**	$-5° < \beta 2 < +5°$
Y	**1**	
θ	**1**	
A	**0.905**	For ¼" OD, 0.526 to 0.750" For ⅜" OD, 0.788 to 1.125"
Z =A sin Y	**0.016**	Z = ≤ 0.125"
W = A sin θ	**0.016**	W = ≤ 0.031"
P_A	**0.469**	For ¼" OD, 0.263 to 0.375" For ⅜" OD, 0.394 to 0.563"
P_B	**0.474**	For ¼" OD, 0.263 to 0.375" For ⅜" OD, 0.394 to 0.563"
$P_A - P_B$	**-0.005**	-0.063 to 0.063"
D_T	**0.318**	0.188 to 0.375"

Where: $\alpha 1$& $\alpha 2$ = angles between the pitot tube opening and the horizontal plane when viewed from the end

$\beta 1$&$\beta 2$ = angles between the pitot tube opening and the horizontal plane when viewed from the side

Y= the angle measured when calculating the difference in length between the two pitot tube legs

θ = the angle measured when calculating the distance that the pitot tubes are rotated

A = the distance between the tips of the pitot tube opening

Z =The difference in length between the two pitot tube legs

W= the distance that the pitot tube legs are rotated

P_A&P_B= vertical distance between each pitot tube opening plane & the center line of the pitot tube

D_T = the tube external diameter

Certification

I certify that the Type S pitot tube meets or exceeds all specifications, criteria and / or applicable design features and is hereby assigned a pitot tube calibration factor (Cp) of 0.84.

Calibrated By: Halcy Lemon P. Orquina
Signature over Printed Name

Checked By: Manz L. Agdalpen
Signature over Printed Name

QA/QC: Edindo C. Fernando
Signature over Printed Name

Date: 26 November 2024

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NOZZLE CALIBRATION SHEET

Date	26 November 2024	**Personnel**	HPO, MSL CAS
Nozzle Box ID	**NS – T2**	**Nozzle Type**	**Stainless Steel**

ID	D_1(mm)	D_2(mm)	D_3(mm)	D (mm)	**Average** (mm)
T2 NS-1	3.06	3.04	3.02	0.04	**3.04**
T2 NS-2	4.09	4.09	4.09	0.00	**4.09**
T2 NS-3	5.90	5.87	5.90	0.02	**5.89**
T2 NS-4	7.90	7.88	7.90	0.01	**7.89**
T2 NS-5	9.35	9.34	9.36	0.02	**9.35**
T2 NS-6	10.90	10.90	10.90	0.00	**10.90**
T2 NS-7	12.41	12.40	12.39	0.00	**12.40**

D = Maximum difference in any two measurements. Tolerance = 0.1 mm ; Average = Average of $D_{1,2,3}$

Calibrated By: Halcy Lemon P. Orquina
Signature over Printed Name

Checked By: Manz L. Agdalpen
Signature over Printed Name

QA/QC: Edindo C. Fernando
Signature over Printed Name

Date: 26 November 2024

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FLASK CALIBRATION SHEET

Date	26 November 2024	**Personnel**	HPO, MSL, CAS
FLASK BOX ID	T2- M7 Flask-A	**Flask Type**	Glass

FLASK ID	1st Volume(mL)	2nd Volume(mL)	3rd Volume(mL)	Average Volume (mL)
BSI T2 – F1	2231	2228	2231	2230
BSI T2 – F2	2233	2232	2225	2230
BSI T2 – F3	2248	2250	2252	2250
BSI T2 – F4	2230	2228	2232	2230
BSI T2 – F5	2229	2231	2230	2230
BSI T2 – F6	2246	2251	2253	2250
BSI T2 – F7	2229	2229	2232	2230
BSI T2 – F8	2238	2241	2241	2240
BSI T2 – F9	2247	2251	2252	2250

*Note: The flask volumes are measured within +/- 10mL. All calibrations are at room temperature.

Calibrated By: Haley Lemon P. Orquina
Signature over Printed Name

Checked By: Manz L. Agdalpen
Signature over Printed Name

QA/QC: Edindo C. Fernando
Signature over Printed Name

Date: 26 November 2024

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DIGITAL BALANCE CALIBRATION

Digital Balance ID	DB - T2	**Personnel**	HPO, MSL, CAS
Manufacturer	AND CO. LTD.	**Date**	26 November 2024
Model	EJ-1500	**Calibration Standard**	1000g
Serial Number	BA2826513	**Type**	Weights (1500g max)

Eccentricity Test		**Repeatability Test**	
Test Load	1000g	When Loaded up to 1500g (Using 1000g& 500g standard weights)	
Position	Balance Indication	Trial	Balance Indication
1	1000.0	1	1549.9
2	1000.0	2	1549.9
3	1000.0	3	1549.9
4	999.9	4	1549.9
5	1000.0	5	1549.9
Test Results	0.1	Standard Deviation	0

Linearity Test				
Nominal Load	**Unit under Test Reading**	**Deviation from Nominal**	**Coverage Factor**	**UE at 95% C.L**
Weights	g	g	k	g
0	0	0	2	0
200g	200	0	2	0
500g	500	0	2	0
1000g	1000	0	2	0
1500g	1499.9	0.1	2	0.16

[1]Acceptable EPA Method 4 tolerance must be less than 0.5 gram.
[2]Acceptable EPA Method 5 tolerance must less than 0.5 gram.

Equipment Description	**Equipment ID**	**Traceability Reference**
Standard Weight	1254	08-09-2022-BSI-T2

Calibrated By: Halcy Lemon P. Orquina
Signature over Printed Name

Checked By: Manz L. Agdalpen
Signature over Printed Name

QA/QC: Edindo C. Fernando
Signature over Printed Name

Date: 26 November 2024

2nd Floor, VAG Bldg. Ortigas Ave., Greenhills
San Juan City, Metro Manila, Philippines
Tels. (632) 853-6129 • Fax (632) 727-9831
Email: info@bsienv.com

Department of Environment and Natural Resources (DENR)
ENVIRONMENTAL MANAGEMENT BUREAU
ACCREDITED THIRD PARTY TESTER
Certificate No: SAT NO. 2022-72

Making our world more productive

CERTIFICATE NUMBER : 90168754/D962229
REVISION NUMBER :
REVISION DATE :

CERTIFIED STANDARD

Certificate of Analysis

Material Number : S802100-AE-C6 **Customer Tag :**

Customer : LINDE PHILIPPINES INC.
Job Card : 90168754
Certification Date : 29-Nov-2021

PO Number : 9300463129
Order Date : 08-Nov-2021
SO Number : 128002321
Vcode : GM34242/10A/S BS4

CYLINDER NUMBER

D962229

SPECIFICATION

Component	Requested Concentration	Certified Concentration	Unit	Certified Uncertainty (% +/-)
NITROGEN			Balance	
CARBON MONOXIDE	200	200	ppm	2

The Certified uncertainty is relative unless specified "abs" as absolute with a confidence level of 95% (coverage factor K=2).

CYLINDER 10L ALUM
VALVE BS4 BRASS

Content 1.494 M3 **Pressure** 150 Bar(a) **Reference Temperature** 20'C
Shelf Life 36 Month **UN Number** 1956 **Min. Usage Pressure** 5 BAR G
Recommended Storage and Usage Temperature 10 to 40'C

TRACEBILITY

Category	Traceabiltiy Type	Traceable To	Reference Procedure
PROCESS	WEIGHT	National Metrology Centre(NMC)	ISO6142:2001

METHOD OF CERTIFICATION
Method Gravimetric

INSTRUMENTATION
Method of Analysis
LS71704

REMARKS

Certified By

LINDE GAS SINGAPORE 15 DEC 2021 KT HAN

Checked By

LINDE GAS SINGAPORE 15 DEC 2021 JONATHAN VOON

Product filled gravimetrically using high-load high-accuracy, weight traceable to National Metrology Centre (NMC) standards. Linde Gas Singapore has obtained a corporate License complying to ISO 9001 standard.

Linde Gas Singapore Pte. Ltd
50 Jurong Island Highway
Singapore 627877
Phone +65 6867 8998
Fax +65 6896 7745
Co Reg No 199303758R

5 Tuas Basin Link
Jurong Industrial Estate
Singapore 638759
Phone +65 6867 8998 Fax +65 6861 5610
www.linde.com.sg

Making our world more productive

CERTIFICATE NUMBER : 90168756/D962122
REVISION NUMBER :
REVISION DATE :

CERTIFIED STANDARD

Certificate of Analysis

Material Number : S823400-AE-C6 **Customer Tag :**

Customer : LINDE PHILIPPINES INC.
Job Card : 90168756
Certification Date : 22-Nov-2021

PO Number : 9300463129
Order Date : 08-Nov-2021
SO Number : 128002321
Vcode : GM34553/10A/S BS4

CYLINDER NUMBER

D962122

SPECIFICATION

Component	Requested Concentration	Certified Concentration	Unit	Certified Uncertainty (% +/-)
NITROGEN			Balance	
CARBON MONOXIDE	500	500	ppm	2

The Certified uncertainty is relative unless specified "abs" as absolute with a confidence level of 95% (coverage factor K=2).

CYLINDER 10L ALUM
VALVE BS4 BRASS

Content 1.470 M3 **Pressure** 150 Bar(a) **Reference Temperature** 20'C
Shelf Life 36 Month **UN Number** 1956 **Min. Usage Pressure** 5 BAR G
Recommended Storage and Usage Temperature 10 to 40'C

TRACEBILITY

Category	Traceabiltiy Type	Traceable To	Reference Procedure
PROCESS	WEIGHT	National Metrology Centre(NMC)	ISO6142:2001

METHOD OF CERTIFICATION
Method Gravimetric

INSTRUMENTATION
Method of Analysis

REMARKS

Certified By

LINDE GAS SINGAPORE
22 NOV 2021
JONATHAN VOON

Checked By

LINDE GAS SINGAPORE
22 NOV 2021
KT HAN

Product filled gravimetrically using high-load high-accuracy, weight traceable to National Metrology Centre (NMC) standards. Linde Gas Singapore has obtained a corporate License complying to ISO 9001 standard.

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Singapore 627877
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Co Reg No 199303758R

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www.linde.com.sg

Making our world more productive

CERTIFICATE NUMBER : 90168755/D962087
REVISION NUMBER :
REVISION DATE :

CERTIFIED STANDARD

Certificate of Analysis

Material Number : S803400-AE-C6 **Customer Tag :**

Customer : LINDE PHILIPPINES INC.
Job Card : 90168755
Certification Date : 22-Nov-2021

PO Number : 9300463129
Order Date : 08-Nov-2021
SO Number : 128002321
Vcode : GM23712

CYLINDER NUMBER

D962087

SPECIFICATION

Component	Requested Concentration	Certified Concentration	Unit	Certified Uncertainty (% +/-)
NITROGEN			Balance	
CARBON MONOXIDE	800	800	ppm	2

The Certified uncertainty is relative unless specified "abs" as absolute with a confidence level of 95% (coverage factor K=2).

CYLINDER 10L AL
VALVE BS4 BRASS

Content 1.494 M3 **Pressure** 150 Bar(a) **Reference Temperature** 20'C
Shelf Life 36 Month **UN Number** 1956 **Min. Usage Pressure** 5 BAR G
Recommended Storage and Usage Temperature 10 to 40'C

TRACEBILITY

Category	Traceabiltiy Type	Traceable To	Reference Procedure
PROCESS	WEIGHT	National Metrology Centre(NMC)	ISO6142:2001

METHOD OF CERTIFICATION
Method Gravimetric

INSTRUMENTATION
Method of Analysis

REMARKS

Certified By

LINDE GAS SINGAPORE 22 NOV 2021 JONATHAN YOON

Checked By

LINDE GAS SINGAPORE 22 NOV 2021 KT HAN

Product filled gravimetrically using high-load high-accuracy, weight traceable to National Metrology Centre (NMC) standards. Linde Gas Singapore has obtained a corporate License complying to ISO 9001 standard.

Linde Gas Singapore Pte. Ltd.
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5 Tuas Basin Link
Jurong Industrial Estate
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Phone +65 6867 8998 Fax +65 6861 5610
www.linde.com.sg

LUTRON ELECTRONIC ENTERPRISE CO., LTD.

ADDRESS : 4F, 106, Min Chuan West Road, 103 Taipei, Taiwan

Tel : +886-2-25570844, 2553-3067 Fax : +886-2-25577132 E-MAIL : lutron@lutron.com.tw

http://www.lutron.com.tw

CALIBRATION & TEST CERTIFICATE

To whom it my concern:

We hereby certify that the instrument under mentioned has been certainly calibrated according to our calibration standard and the testing result in the calibration procedure has been good enough within the tolerance regulated in our specification.

Name of Model	: HUMIDITY/TEMP/BARO	Temperature	: 23.2°C
Model Number	: PHB-318	Humidity	: 65 %RH
Serial Number	: AM.02197	Date of Calibration	: Apr. 2, 2024

(The standard generators used for calibration procedure are proofed once a year and can be traceable to the standard authorized by public organization.)

LUTRON ELECTRONIC ENTERPRISE CO., LTD.

Signature

D. C. Lin

President

Lutron

LUTRON ELECTRONIC

The Art of Measurement

ANNEX F

DENR ACCREDITATION

Republic of the Philippines
Department of Environment and Natural Resources
ENVIRONMENTAL MANAGEMENT BUREAU
Visayas Avenue, Diliman, Quezon City

SAT No. 2022-72

CERTIFICATE OF ACCREDITATION

Pursuant to DENR Administrative Order No. 26 Series of 2013 of the Department of Environment and Natural Resources having substantially met all the requirements prescribed therein,

BERKMAN SYSTEMS INCORPORATED (BSI)

208 VAG Building, Ortigas Ave.,
Greenhills, San Juan City, Metro Manila

is hereby duly accredited as

SOURCE EMISSION TESTING FIRM

As such, the following are authorized as:

QA/QC Manager
Edindo C. Fernando

Team Leader
Halcey Lemon P. Orquina

This certification shall allow the above firm and personnel to conduct stack testing limited to the following methods and parameters:

1. US-EPA Method 1 to 5 - PM
2. US-EPA Method 6/8 - SO_2
3. US-EPA Method 7 - NO_x
4. US-EPA Method 10 - CO

Granted this 14th day of July 2022 and valid until July 14, 2025.

Digitally signed by Cuñado William Purgatorio
DN: cn=Cuñado William Purgatorio, serialNumber=001006000462A, ou=Environmental Manager, ou=Environment, o=Department of the Environment and Natural Resources, c=PH

ENGR. WILLIAM P. CUÑADO
Director

ANNEX G

TEST PARTICIPANTS

TEST PARTICIPANTS

BMC FORESTRY CORPORATION

Mr. Narhy C. Pomilban	-	Pollution Control Officer

BSI

Mr. Halcy Lemon P. Orquina	-	DENR Accredited Team Leader / Field Engineer
Mr. Marvin S. Llarena	-	Field Technician
Mr. Christian A. Soleta	-	Field Technician
Mr. Jimuel B. Torrelino	-	Sampling Aide/Driver
Mr. Edindo C. Fernando	-	DENR Accredited QA/QC Manager

ANNEX H

TEST PLAN

November 8, 2024

ENGR. JEAN C. BORROMEO
OIC, Regional Director
DENR – Environmental Management Bureau
Cordillera Administrative Region (CAR)
DENR Compound, Gibraltar Road, Baguio City

CC : ENGR. RAUL G. CUBANGAY
OIC Chief, Environmental Monitoring and Enforcement Division

Subject: Test Plan for BMC Forestry Corporation – Irisan Lime Project

Dear Director Borromeo:

We are pleased to submit the test plan for our proposed Source Emission Test to be conducted by Berkman Systems, Inc., an accredited third-party tester at **BMC Forestry Corporation – Irisan Lime Project** located at **Km.5 Naguilian Road, Irisan, Baguio City.**

We hope this addresses your requirements.

Thank you.

Very truly yours,

BMC FORESTRY CORPORATION
By:

NARHY C. POMILBAN
Pollution Control Officer

Noted by:

FRANCISCO O. FLAVIER
Resident Manager

fofiavier@yahoo.com, ncpomilban@benguet.com

BERKMAN SYSTEMS INC.
Environmental Management Service Provider

BSI-2022-72-24-062

November 15, 2024

ENGR. JEAN C. BORROMEO
OIC, Regional Director
CC : ENGR. RAUL G. CUBANGAY
Chief, Environmental Monitoring and Enforcement Division
ENVIRONMENTAL MANAGEMENT BUREAU
CORDILLERA ADMINISTRATIVE REGION (CAR)
DENR Forestry Compound, Pacdal District
Baguio City, Benguet

Subject: Test Plan for BMC Forestry Corporation - Irisan Lime Project

Dear Dir. Borromeo:

We are pleased to submit the test plan for our proposed Source Emission Monitoring to be conducted at BMC Forestry Corporation - Irisan Lime Project located at Km.5, Naguilian Road, Irisan, Baguio City.

We hope that this addresses your requirements.

Very truly yours,

BSI

EDINDO C. FERNANDO
Field Operations Manager
DENR Accredited QA/QC Manager
SAT No. 2022-72

Environmental Management Service Provider

SOURCE SPECIFIC TEST PLAN

This document is the Source Specific Test Plan of **BSI (Berkman Systems, Inc.)** that describes the emission testing that will be completed at BMC Forestry Corporation - Irisan Lime Project located at Km.5, Naguilian Road, Irisan, Baguio City.

Section A: FACILITY INFORMATION

BMC Forestry Corporation - Irisan Lime Project
Irisan, Baguio City

Contact Person: **Narhy C. Pomilban**
Pollution Control Officer

Telephone: (074) 445-7180

Section B: PRODUCTION INFORMATION AND FACILITY REQUIREMENTS

The plant should operate the **one (1) unit of 1.08 MT/hr Vertical Shaft Kiln** set for at 90% or greater of permitted capacity during testing. The Implementing Rules and Regulations of the Philippine Clean Air Act specify that the operating capacity during emission testing shall be the basis for setting the maximum allowable operating capacity during permit application.

The facility must provide the following items:

- The client shall provide an on-site single phase **220VAC/60Hz**-power supply.
- The client shall provide at least **two (2)** sampling portholes based on the existing stack diameter and pipe length. Sampling platforms should be installed or constructed properly for the safety of the sampling personnel.
- Copy of latest Permit to Operate **(PTO)**
- Schematic diagram of the process
- Copy of the latest certificate of fuel analysis and delivery receipt.
- Copy of engine log sheet during sampling
- Photo documentation and Video coverage will be taken by the accredited sampling personnel during sampling activity.

Section C: SOURCE INFORMATION

The test will be at **one (1) unit of 1.08 MT/hr Vertical Shaft Kiln** set for 3 sampling runs to be conducted on December 12-14, 2024.

Parameters to be tested and duration – see Table 1.

TABLE 1 – TEST METHODOLOGY

Particulars	Parameter	Sampling Methodology	No. of Test runs/Duration	Notes
one (1) unit of 1.08 MT/hr Vertical Shaft Kiln	Volumetric Flow Rate **(VFR)**	EPA Method 1-4	3 one-hour run/ exhaust	Performed concurrent with PM test
	Oxygen / Carbon Dioxide	EPA Method 3 By Fyrite Method	3 runs / exhaust	Integrated Tedlar bag sample during M5 test
	Particulate Matter **(PM)**	EPA Method 5	3 one-hour run/ exhaust	Performed with Method 5 set-up
	Sulfur Oxides **(SOx)**	EPA Method 6 modified	3 one-hour run/ exhaust	Simultaneous with Method 5
	Nitrogen Oxide **(NOx)**	EPA Method 7	3 runs / exhaust	Three grab sample flasks collected per run
	Carbon Monoxide **(CO)**	EPA Method 10 By NDIR	3 runs / exhaust	Integrated Tedlar bag sample during M5 test

Section D: QUALITY ASSURANCE / QUALITY CONTROL PROCEDURES

Normal QA/QC procedures described in the Methods will be strictly followed.

Section E: SAMPLING DATE

December 12-14, 2024

The sampling team leader will coordinate the specific run plans with the abovementioned Plant representative. The sampling team will be at the Plant on or before 9:00 AM of the sampling date.

Section F: SAMPLING PERSONNEL

The proposed sampling team shall consist of the following personnel:

Team:

1. Halcy Lemon P. Orquina	-	Accredited Team Leader
2. Edindo C. Fernando	-	QA/QC Manager
3. Ruel P. Abando	-	Accredited Team Leader (back up)
4. Jose Arjay M. Santiago	-	QA/QC Manager (back up)
5. Romeo M. Elsisura	-	Field Technician
6. Marvin S. Llarena	-	Field Technician
7. Eugene B. Salazar	-	Field Technician
8. Christian A. Soleta	-	Field Technician
9. Jimuel B. Torrelino	-	Driver / Technician
10. Joseph Dandy A. Quilet	-	Driver / Technician

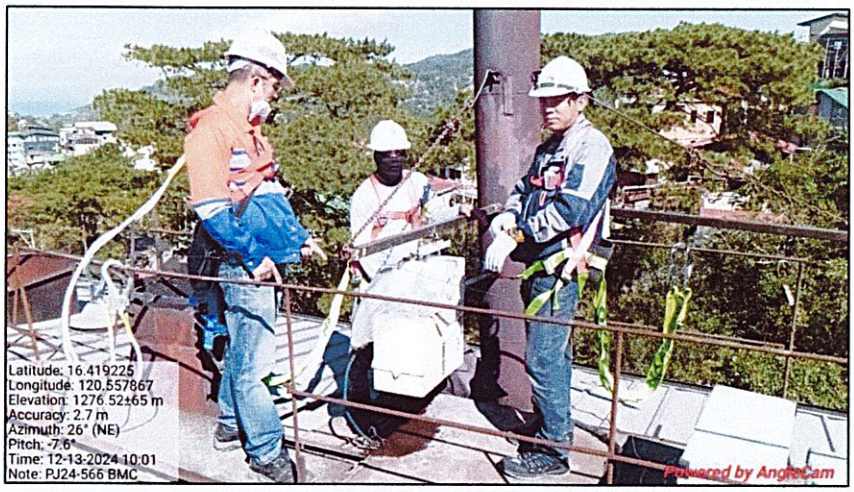
Signed:

EDINDO C. FERNANDO
Field Operations Manager
DENR Accredited QA/QC Manager
SAT No. 2022-72

ANNEX I

PHOTO DOCUMENTATION

PHOTO DOCUMENTATION



Vertical Shaft Kiln No. 2

BSI

Source Emission Monitoring
BMC FORESTRY CORPORATION
Irisan, Baguio City
December 13, 2024

BERKMAN SYSTEMS INC.
Environmental Management Service Provider

To:	**MR. NARHY C. POMILBAN**	Email:	npomilban@benguetcorp.com
Company:	**BMC FORESTRY CORPORATION – BC ILP**	Date:	22 January 2025
From:	**ENGR. JUBELL D.C. MOGOTE**	Page 1 of:	2
cc:	--	BSI Project No:	PJ 24 566

Special Instructions: ☐ Confidential ☐ Urgent ☑ Please reply ☑ For your information ☐ For follow-up

If you do not receive all pages or transmission is illegible, please contact the originator to re-send. Should the e-mail be sent to a wrong address, please notify BSI immediately and destroy this copy. Thank you.

Subject: Initial Report on Source Emission Monitoring

Dear Mr. Pomilban,

Please find in the succeeding pages the results of the source emission monitoring conducted on December 13, 2024 at your plant in Irisan, Baguio City.

Source Emission Monitoring Results

Source Information		PM (mg/Nm^3)	SO_X (as SO_2) (mg/Nm^3)	NO_X* (as NO_2) (mg/Nm^3)	CO (mg/Nm^3)
VERTICAL SHAFT KILN NO. 2 *Brand Name:* **No information provided** *Date Installed:* **August 1940**** *Rated Capacity:* **1.08 MT/hr** *Load During Sampling:* **95%** *Fuel Used:* **LSFOI / RFO** *Fuel Sulfur Content:* **No Fuel Analysis Provided** *Fuel Consumption:* **No Information Provided** *Annual Operating Hours:* **8,760 hours**	**Run 1**	16.9	2.3	13.5	28.6
	Run 2	18.6	1.5	13.0	29.8
	Run 3	30.8	< 1.5	14.0	17.2
	Average	***22.1***	***1.9******	***13.5***	***25.2***
	DENR Standards *(existing source fuel burning equipment; other stationary source)*	**150**	**1500**	**1000**	**500**

**Average of three (3) trial tests*
***Based from previous sampling records*
****Average of detected values only.*
Emissions are not applicable for the corrected oxygen factor since the source is not included in the list of equipment under DENR EMB Memorandum Circular No. 2021-15.

We would like to request a scanned copy of your ***process flow chart, annual operating records, copy of self-monitoring report (SMR) if possible, monitoring logsheet, fuel consumption during sampling,*** and ***fuel delivery receipt*** in line with the source emission monitoring conducted at your facilities. These documents will be attached to the final report as per DENR mandatory requirement. Please be informed that DENR-EMB requires that all third party testers to comply with all mandatory requirements including the submission of source emission summary.

The final report will be prepared as soon as we receive a scanned copy of this document with your signature. If we are unable to receive a response from you within three (3) working days upon receipt of this initial report, we will start preparing the final report.

If you have concerns, please do not hesitate to contact us.

Thank you and best regards.

JUBELL D.C. MOGOTE
Environmental Specialist

Noted by:

EDINDO C. FERNANDO
DENR-EMB Accredited QA/QC Manager
SAT No. 2022-72

Conforme:

Francisco O. Flavier/ Managing Head
BMC FORESTRY CORPORATION – BC ILP

BMC
FORESTRY
CORPORATION

CERTIFICATION

This is to certify that **BSI** has satisfactorily completed the ***Source Emission Monitoring*** conducted on December 13, 2024 at **BMC FORESTRY CORPORATION – BC ILP** located in Km. 5, Naguilian Road, Irisan, Baguio City.

We commend BSI for the successful completion of the contracted scope of work to the full satisfaction of our company.

This certification is being issued upon the request of **BSI** this **22nd day of January 2025.**

BMC FORESTRY CORPORATION
By:

Francisco O. Flavier
Resident Manager/Managing Head

AMBIENT AIR QUALITY AND NOISE LEVEL MEASUREMENT MONITORING REPORT

Reference No.: GEPC-AAQM-2406-035

Prepared for:

BENGUET CORPORATION
ACUPAN CONTRACT MINING PROJECT
Balatoc, Virac, Itogon, Benguet

Sampling Date: **June 29, 2024**

Report Date: **July 17, 2024**

AMBIENT AIR QUALITY AND NOISE LEVEL MEASUREMENT MONITORING
REPORT CERTIFICATION

THREE (3) STATIONS AREA TESTS

PARAMETERS:

TOTAL SUSPENDED PARTICULATE **(TSP)**
SULFUR DIOXIDE **(SO_2)**
NITROGEN DIOXIDE **(NO_2)**
NOISE LEVEL MEASUREMENT

BENGUET CORPORATION
ACUPAN CONTRACT MINING PROJECT
Balatoc, Virac, Itogon, Benguet

The ambient air monitoring and noise level measurement monitoring results reported herein were headed and performed by Mr. Angelo V. Guevarra and his team. The laboratory analysis of the collected samples is conducted by Mach Union Laboratories Inc. and has been verified and found to be orderly.

I have certified that the information discussed in this report is accurate to the best of my knowledge.

Signed by:

ANGELO V. GUEVARRA
SAT No. 2023-152

Date Signed: July 17, 2024

AMBIENT AIR QUALITY MONITORING REPORT

FACILITY NAME: **Benguet Corporation**
Acupan Contract Mining Project

FACILITY ADDRESS: Balatoc, Virac, Itogon, Benguet

1.0 INTRODUCTION

Greentek Environmental Phils. Co. was contracted by **Benguet Corporation - Acupan Contract Mining Project** to conduct ambient air sampling for three (3) Stations within their plant facility as a requirement of their environmental permit and partly for their regular environmental monitoring.

Ambient air sampling was conducted on June 29, 2024, to analyze nitrogen dioxide (NO2), sulfur dioxide (SO2) and total suspended particulate (TSP) levels.

2.0 SAMPLING METHODOLOGY

The DENR standard ambient air sampling equipment and analytical procedures were used in the sampling activity. These equipment and procedures are specified below:

Total Suspended Particulate Matter (TSP)

Reference Procedure:	USEPA, 40 CFR 50, Appendix B
Sampling Equipment:	High Volume Sampler (1-Hour Air Sampler)
Method of Analysis:	Gravimetric Method

Sulfur dioxide (SO_2)

Reference Procedure:	USEPA, 40 CFR 50, Appendix A
Sampling Equipment:	Gas Bubbler Sampler (USEPA compliant)
Method of Analysis:	Pararosaniline Method

Nitrogen dioxide (NO_2)

Reference Procedure:	Air Pollution Monitoring Manual, EMB-1994
Sampling Equipment:	Gas Bubbler Sampler (USEPA compliant)
Method of Analysis:	Colorimetric, Griess Saltzman

The SO2 and NO2 samples were stored in an icebox, and the TSP filters were placed in a clean envelope. All collected samples were then transported to the laboratory for analysis.

3.0 SAMPLING LOCATIONS

There are Three (3) sampling stations for ambient air monitoring. The table below shows the location and observations made during the sampling activity.

STN	LOCATION	OBSERVATION / ACTIVITY IN THE AREA DURING THE TIME OF SAMPLING
1	Along Keymens Road **(Upwind)**	The sampling site at Along Keymens Road is dry with light winds. The facility remains operational during sampling to ensure accurate data collection under typical conditions. Throughout this time, a total of 2 dump trucks, 2 jeeps, 8 motorcycles and 10 cars passed by the site.
2	Near Assay Laboratory & Gate 2 **(Downwind)**	The sampling site at Near Assay Laboratory & Gate 2 is dry with light winds. The facility remains operational during sampling to ensure accurate data collection under typical conditions. Throughout this time, a total of 4 cars, 8 motorcycles and 7 jeeps passed by the site.
3	Near BCACMP Office **(Upwind)**	The sampling site at Near BCACMP Office is dry with light winds. The facility remains operational during sampling to ensure accurate data collection under typical conditions. Throughout this time, a total of 2 motorcycles and 9 cars passed by the site.

4.0 SUMMARY OF RESULTS

The summary results of the laboratory analysis are presented below for all sampling areas.

Table 1
Laboratory Analysis Results and Standard Limits for 60 minutes sampling

Stn	Location	Date / Time Sampling	TSP (ug / Nm^3)	SO_2 (ug / Nm^3)	NO_2 (ug / Nm^3)
1	Along Keymens Road **(Upwind)**	29-June-2024 1021H-1121H	284.4	10.9	9.9
2	Near Assay Laboratory & Gate 2 **(Downwind)**	29-June-2024 1132H-1232H	207.1	10.9	10.9
3	Near BCACMP Office **(Upwind)**	29-June-2024 1244H-1344H	227.7	10.9	10.1
DENR NAAQ Standards for 60 minutes sampling			**300**	**340**	**260**

These data are measured to standardize the test results to 25°C and 760mmHg and for comparison purposes.

Table 2
Meteorological Monitoring Reading for 60 minutes sampling

STN	Location (GPS)	Date / Time Sampling	Barometric Pressure. (Inch Hg) Result Avg.	Ambient Temp.(˚C) Result Avg.	% Relative Humidity Result Avg.	Wind Speed Avg. (m/s)
1	Along Keymens Road **(Upwind)** N 16°21'36" E 120°39'32"	29-June-2024 1021H-1121H	27.09	31.9	58.3	0.2
2	Near Assay Laboratory & Gate 2 **(Upwind)** N 16°21'34" E 120°39'31"	29-June-2024 1132H-1232H	27.33	34.5	51.4	0.2
3	Near BCACMP Office **(Upwind)** N 16°21'38" E 120°39'36"	29-June-2024 1244H-1344H	29.63	34.2	54.6	0.5

5.0 DISCUSSION OF RESULTS

The USEPA "Quality Assurance Handbook for Air Pollution Measurement Systems, Environmental Management Bureau, Department of Environment and Natural Resources, Philippine Environmental Policies, Laws, and Regulations handbook was used as a guide to achieve the quality assurance objectives of producing data that is complete, representative, and of known precision and accuracy.

The above results of analysis are compared to the National Ambient Air Quality Standards (NAAQS) for source-specific air pollutants from industrial operations. These standards are specified in the Implementing Rules and Regulations of the Philippine Clean Air Act of 1999.

During sampling on June 29, 2024, the weather from station 1 to 3 was cloudy to sunny with prevailing light to moderate wind blowing from the Southwest to Northeast. *Thus, the results of* ***TSP, SO_2 and NO_2 concentrations are within the applicable CAA/IRR standard for 60 minutes of sampling.***

NOISE LEVEL MEASUREMENT MONITORING REPORT

FACILITY NAME: **Benguet Corporation**
Acupan Contract Mining Project

FACILITY ADDRESS: Balatoc, Virac, Itogon, Benguet

INTRODUCTION

Environmental noise is the unwanted or harmful outdoor sound created by human activity. On June 29, 2024, daytime noise level monitoring was conducted in three (3) stations within the premises of their facility located at the above address. Noise level measurement was performed, and the measurement was conducted as part of their environmental monitoring and permit requirements.

OBJECTIVE OF THE MONITORING

The objective of noise monitoring is to provide data regarding the level of noise in a location so that it may be compared to the National Pollution Control Commission's (NPCC) noise limit standard. It is also to assess the impact of industrial activities on noise pollution and implement mitigation strategies to safeguard both workers well-being and the surrounding environment.

SAMPLING METHODOLOGY

A precision-type digital sound level meter was used for noise measurement. The said instrument is a LUTRON sound level meter, Model SL-4033SD. The sound level meter meets the IEC 61672 class 1 standard. The sound level meter that was used to measure the level was calibrated at Switchtek Measurement Systems with an acoustical calibrator (Lutron Sound Level). The noise was measured using an “A” weighting network and “slow response” with different limits for various times of the day and area categories. Noise measurement was performed for about 3 minutes per station after the 1-hour ambient sampling activity. The noise sampler was handheld at about thirty degrees (30°) from the plane directly pointing to the facility.

SAMPLING LOCATIONS

There are three (3) sampling stations for noise level measurement monitoring. The table below shows the location and observations made during the sampling activity.

STN	LOCATION	OBSERVATION / DURING NOISE LEVEL MEASUREMENT
1	Along Keymens Road	The audible noise detected came from the machinery around the area.
2	Near Assay Laboratory & Gate 2	The audible noise detected came from the people's voices and vehicles that passed by near the sampling point.
3	Near BCACMP Office	The audible noise detected came from the guard post (radio) near the sampling point.

SUMMARY OF RESULTS

Table 3
Noise Level Measurement Monitoring Reading

Location	Time	Median (dBA)	Category of the Area	DENR Standard (dBA)
Along Keymens Road	1123H-1126H	57.8	Class C	70
Near Assay Laboratory & Gate 2	1235H-1238H	57.4	Class C	70
Near BCACMP Office	1345H-1348H	56.3	Class C	70

Table 4
Environmental Noise Quality Standards in General Areas

Category of the Area	Maximum Allowable Noise (dBA)		
	Day Time 0900H to 1800H	Morning & Evening 0500H to 0900H / 1800H to 2200H	Nighttime 2200H to 0500H
AA	50	45	40
A	55	50	45
B	65	60	55
C	70	65	60
D	75	70	65

The Philippines standard for noise is categorized into five (5) classes of sections, and the maximum allowable noise is classified in different time.

Description per Category

Class AA A section or contiguous area which requires quietness, such as areas within 100 meters from school sites, nursery schools, hospital, and special home for the aged.

Class A A section or contiguous area which is primarily used for residential purposes.

Class B A section or contiguous area which zoned or used as a commercial area.

Class C A section primarily zoned or used as a light industrial area.

Class D A section which is primarily reserved, zoned, or used as a heavy industrial area.

DISCUSSION OF RESULTS

The environmental noise standards are based on Memorandum Circular No. 002 Series of 1980 of the National Pollution Control Commission. The noise was measured using an "A" weighting network and "slow response" with different limits for various times of the day and area categories. The location of Benguet Corporation - Acupan Contract Mining Project is primarily zoned or used as light industrial area (Class C) with a DENR Daytime Noise Standard of 70 dBA.

The results of the noise level measurement reading show that the noise level in ***stations 1 to 3 is within the applicable DENR daytime limit of 70 dBA.*** The audible noise detected came from the vehicles that passed by near the sampling point.

"APPENDIX A"

AMBIENT AIR MONITORING
FIELD DATAS

AMBIENT AIR MONITORING DATA
Benguet Corporation - Acupan Contract Mining Project
June 29, 2024

GPS Location: N 16°21'36" E 120°39'32"

Station 1 *(Upwind)*	**Along Keymens Road**			Flowrate			
				TSP	NO2	SO2	Wind Speed
Time	Pbar inHg	Amb. Tmp. °C	RH%	m3/min	lpm	lpm	m/s
1021H-1031H	27.10	33.8	54.9	1.0	0.5	0.5	0.2
1031H-1041H	27.10	32.2	56.6	1.0	0.5	0.5	0.1
1041H-1051H	27.09	31.3	59.2	1.0	0.5	0.5	0.2
1051H-1101H	27.09	30.1	59.9	1.0	0.5	0.5	0.3
1101H-1110H	27.09	31.9	60.5	1.0	0.5	0.5	0.1
1111H-1121H	27.09	32.1	58.7	1.0	0.5	0.5	0.2
Average	27.09	31.9	58.3	1.0	0.5	0.5	0.2

GPS Location: N 16°21'34" E 120°39'31"

Station 2 *(Downwind)*	**Near Assay Laboratory & Gate 2**			Flowrate			
				TSP	NO2	SO2	Wind Speed
Time	Pbar inHg	Amb. Tmp. °C	RH%	m3/min	lpm	lpm	m/s
1132H-1142H	28.17	34.7	52.8	1.0	0.5	0.5	0.2
1142H-1152H	27.17	35.2	49.1	1.0	0.5	0.5	0.1
1152H-1202H	27.17	34.9	48.6	1.0	0.5	0.5	0.2
1202H-1212H	27.16	34.4	51.8	1.0	0.5	0.5	0.2
1212H-1222H	27.16	33.8	52.6	1.0	0.5	0.5	0.1
1222H-1232H	27.16	34.1	53.4	1.0	0.5	0.5	0.2
Average	27.33	34.5	51.4	1.0	0.5	0.5	0.2

GPS Location: N 16°21'38" E 120°39'36"

Station 3 *(Upwind)*	**Near BCACMP Office**			Flowrate			
				TSP	NO2	SO2	Wind Speed
Time	Pbar inHg	Amb. Tmp. °C	RH%	m3/min	lpm	lpm	m/s
1244H-1254H	27.13	33.4	54.8	1.0	0.5	0.5	0.3
1254H-1304H	27.13	31.6	61.3	1.0	0.5	0.5	0.2
1304H-1314H	27.13	32.5	59.8	1.0	0.5	0.5	0.2
1314H-1324H	27.13	31.4	58.1	1.0	0.5	0.5	0.3
1324H-1334H	27.12	32.9	59.5	1.0	0.5	0.5	0.2
1334H-1344H	27.12	30.6	63.4	1.0	0.5	0.5	0.4
Average	27.13	32.1	59.5	1.0	0.5	0.5	0.3

NOISE LEVEL MEASUREMENT MONITORING RESULTS
Benguet Corporation - Acupan Contract Mining Project
June 29, 2024

Station 1	**Along Keymens Road**		
Time of Sampling (1123H- 1126H)			
58.1	59.2	55.7	58.4
57.2	57.6	56.2	58.8
58.8	59.4	58.1	57.1
55.4	58.9	57.5	56.9
56.7	57.7	55.8	58.3
55.6	57.8	53.2	59.6
58.2	58.2	54.6	58.9
Median =	***57.8***	***Average =***	***57.43***
Minimum =	***53.2***	***Maximum =***	***59.6***

Station 2	**Near Assay Laboratory & Gate 2**		
Time of Sampling (1235H - 1238H)			
55.7	54.7	62.8	54.1
57.5	56.4	60.1	57.3
59.3	53.8	58.7	56.6
58.6	55.9	59.1	57.5
57.2	58.2	56.8	59.4
58.1	59.6	52.9	58.6
56.8	62.4	53.7	55.3
Median =	***57.4***	***Average =***	***57.40***
Minimum =	***52.9***	***Maximum =***	***62.8***

Station 3	**Near BCACMP Office**		
Time of Sampling (1345H - 1348H)			
49.8	59.4	57.8	55.1
49.9	57.8	55.9	55.8
54.6	58.7	53.1	58.3
52.1	58.9	54.6	57.6
55.8	59.6	56.7	54.5
54.3	61.3	58.2	53.8
58.2	60.4	56.8	55.9
Median =	***56.3***	***Average =***	***56.25***
Minimum =	***49.8***	***Maximum =***	***61.3***

AMBIENT AIR QUALITY AND NOISE LEVEL MONITORING

Name of Facility: Benguet Corporation - Acupan Contract Mining Project
Facility Address: Balatoc, Viras, Itogon Benguet
Facility Representative: LLOYD F. CAMADO Personnel: MIKE, RAIC

Station No.: 1 (UPWIND)
Specific Location: Along Kelmeas Road
Sampling Date: 6/29/25 Coordinates: 16°21'36"N 120°39'32"E
Filter ID: 2402217 Filter Weight: 2-0992
2-0891

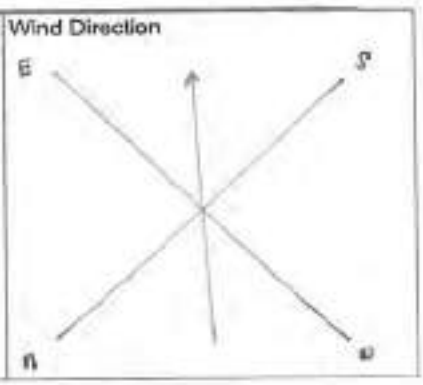
Time	pBar inHg	RH%	Ambient Temp., °C	SO2 Flow Rate, lpm	NO2 Flow Rate, lpm	TSP Flow Rate, lpm	Weather Condition	Wind Direction	Wind Speed m/s
10:21 - 10:36	27.10	54.9	20.8	0.5	0.5	1.0	SUNNY	NW-SE	0.2
10:36 - 10:51	27.10	54.12	22.2	0.5	0.5	1.0	SUNNY	NW-SE	0.1
10:51 - 11:06	27.09	54.2	21.9	0.5	0.5	1.0	SUNNY	NW-SE	0.2
11:06 - 11:21	27.09	54.9	20.1	0.5	0.5	1.0	SUNNY	NW-SE	0.3
11:21 - 11:36	27.09	40.5	21.9	0.5	0.5	1.0	SUNNY	NW-SE	0.1
11:36 - 11:51	27.09	55.7	22.1	0.5	0.5	1.0	SUNNY	NW-SE	0.2

Description of the sampling location and observations: (*use separate sheet if necessary*)
- BCA CAMP IS OPERATIONAL DURING SAMPLING PERIOD.
- THE AREA WAS DRY WITH LIGHT WIND.
- THE SAMPLING LOCATION POINT IS LOCATED ALONG KELMEAS ROAD.

Dump truck - 11
Jeep - 1
Motorcycle - 111 - 11
Car - 111 - 111

Sketch of sampling location showing landmarks.

Wind Direction



Noise Level Monitoring

Station No.: 1 (UPWIND) Sampling Date: 6/29/25
Specific Location: ALONG KELMEAS ROAD

Time					Noise Source / Observation
12:00 H	58.1	59.2	55.7	58.4	NOISE CAME FROM MACHINERY AROUND THE AREA.
	57.2	57.6	56.2	58.8	
	58.8	59.4	58.1	57.1	
	55.4	58.9	57.5	56.9	
	56.7	57.7	55.8	58.9	
	55.6	57.8	53.2	59.6	
12:60 H	58.2	58.2	54.6	58.9	

AMBIENT AIR QUALITY AND NOISE LEVEL MONITORING

Name of Facility: [illegible] CORPORATION - ACHPAR CONTRACT [illegible] PROJECT
Facility Address: [illegible] VIRAC ITOGON BENGUET
Facility Representative: LLOYD P. CAMADO Personnel: [illegible] - [illegible]

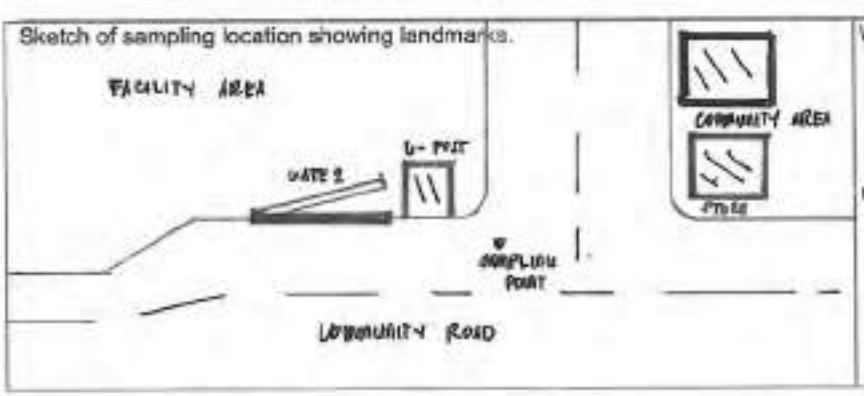
Station No.: 2 (DOWNWIND)
Specific Location: NEAR ASSAY LAB & GATE 2
Sampling Date: 11/29/24 Coordinates: 16°21'34"N / 120°39'51"E
Filter ID: 2[illegible]18 Filter Weight: 2.4[illegible]2

Time	pBar inHg	RH%	Ambient Temp., °C	SO2 Flow Rate, lpm	NO2 Flow Rate, lpm	TSP Flow Rate, lpm	Weather Condition	Wind Direction	Wind Speed m/s
[illegible]	27.17	52.8	64.7	0.5	0.5	1.0	SUNNY	NW - SE	0.2
[illegible]	27.17	49.1	65.2	0.5	0.5	1.0	SUNNY	NW - SE	0.1
[illegible]	27.16	46.6	64.9	0.5	0.5	1.0	SUNNY	NW - SE	0.2
[illegible]	27.16	51.8	64.6	0.5	0.5	1.0	SUNNY	NW - SE	0.2
[illegible]	27.17	52.6	64.9	0.5	0.5	1.0	SUNNY	NW - SE	0.1
[illegible]	27.16	53.4	64.1	0.5	0.5	1.0	SUNNY	NW - SE	0.2

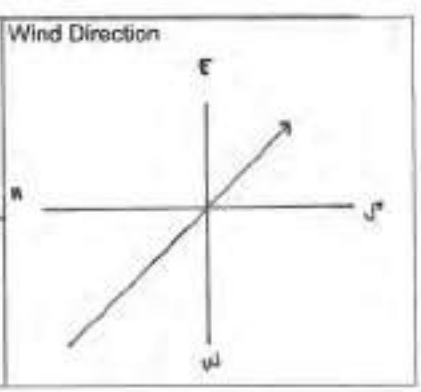
Description of the sampling location and observations: (*use separate sheet if necessary*)
- [illegible]CAMP IS OPERATIONAL DURING SAMPLING PERIOD.
- THE SAMPLING LOCATION POINT IS NEAR ASSAY LAB AND GATE 2.
- THE AREA WAS DRY WITH LIGHT WIND.

CAR - [illegible]
MOTORCYCLE - [illegible] - [illegible]
JEEP - [illegible] - 6

Sketch of sampling location showing landmarks.



Wind Direction



Noise Level Monitoring

Station No.: 2 (DOWNWIND) Sampling Date: 11/29/24
Specific Location: NEAR ASSAY LAB & GATE 2

Time					Noise Source / Observation
1235 H	55.7	54.7	62.8	54.1	NOISE CAME FROM PEOPLE VOICE AND VEHICLE PASSED BY.
	57.5	56.4	60.1	57.3	
	59.3	63.8	58.7	56.6	
	58.6	55.9	59.1	59.5	
	57.2	58.2	56.8	59.4	
	58.1	59.6	57.9	58.6	
1238 H	54.8	62.4	59.7	55.3	

AMBIENT AIR QUALITY AND NOISE LEVEL MONITORING

GREENTEK

Name of Facility: BENGUET CORPORATION - ACUPAN CONTRACT MINING PROJECT
Facility Address: BALATOC, VIRAC, ITOGON BENGUET
Facility Representative: LLOYD P. CAMADO Personnel: MRC - RMC

Station No.: 5 (UPWIND)
Specific Location: NEAR BCACMP OFFICE
Sampling Date: 6/29/24 Coordinates: 16°21'76"N / 120°39'36"E
Filter ID: 240226 Filter Weight: 2.4247

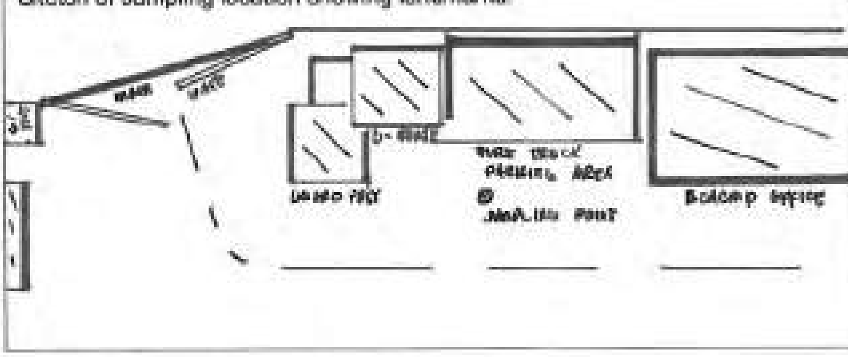
Time	pBar inHg	RH%	Ambient Temp., °C	SO2 Flow Rate, lpm	NO2 Flow Rate, lpm	TSP Flow Rate, lpm	Weather Condition	Wind Direction	Wind Speed m/s
1244H-1254H	27.15	54.2	33.4	0.5	0.5	1.0	SUNNY	NW-SE	0.3
1254H-1304H	27.15	61.3	31.6	0.5	0.5	1.0	SUNNY	NW-SE	0.2
1304H-1314H	27.15	59.8	32.5	0.5	0.5	1.0	SUNNY	NW-SE	0.2
1314H-1324H	27.15	58.1	31.1	0.5	0.5	1.0	SUNNY	NW-SE	0.3
1324H-1334H	27.12	59.5	32.7	0.5	0.5	1.0	SUNNY	NW-SE	0.2
1334H-1344H	27.12	60.4	30.6	0.5	0.5	1.0	SUNNY	NW-SE	0.4

Description of the sampling location and observations: (*use separate sheet if necessary*)

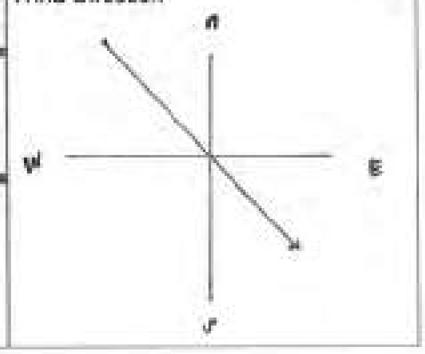
- BCACMP IS OPERATIONAL DURING SAMPLING PERIOD.
- THE AREA WAS DRY WITH LIGHT WIND.
- THE SAMPLING POINT IS NEAR BCACMP OFFICE

MOTORCYCLE - II
CAR - ~~IIII~~ - III

Sketch of sampling location showing landmarks.



Wind Direction



Noise Level Monitoring

Station No.: 5 (UPWIND) Sampling Date: 6/29/24
Specific Location: NEAR BCACMP OFFICE

Time					Noise Source / Observation
1346H	49.8	54.4	57.8	55.1	NOISE CAME FROM GUARD POST WHILE RADIOING THE AREA.
	49.9	57.8	55.9	55.8	
	54.6	58.7	53.1	58.3	
	52.1	58.9	54.6	57.6	
	55.8	59.6	56.7	54.5	
	54.3	61.3	58.2	53.8	
1356H	58.2	60.4	56.8	55.9	

"APPENDIX B"

RESULTS OF LABORATORY ANALYSIS

AMBIENT AIR SAMPLING LABORATORY REPORT
Benguet Corporation - Acupan Contract Mining Project
June 29, 2024

Laboratory Data

Station #	TSP ug	SO2 ug	NO2 ug
Station 1	15,100	0.29	0.262
Station 2	11,000	0.29	0.299
Station 3	12,100	0.29	0.269

Computation

TSP = (concentration-ug)/((flowrate-1.0)*(298/(Tm-ave.+273))*((Pbar-ave.*25.4)/760))*60
SO2 = (concentration-ug)/((flowrate-0.5/1000)*(298/(Tm-ave.+273))*((Pbar-ave.*25.4)/760))*60
NO2 = (concentration-ug)/((flowrate-0.5/1000)*(298/(Tm-ave.+273))*((Pbar-ave.*25.4)/760))*60

Concentration at Standard Condition

Station #	TSP ug/Ncm	SO2 ug/Ncm	NO2 ug/Ncm
Station 1	284.4	10.9	9.9
Station 2	207.1	10.9	10.9
Station 3	227.7	10.9	10.1

MACH UNION LABORATORIES INC.

Main Office: Mach Union Building, 335 Alabang-Zapote Road, Talon 3, 1740 Las Pilas City, Philippines
Extension Office: ANFRA Bldg., FMC-LTO Cmpd., 314 Alabang-Zapote Road, Talon 1, 1740 Las Pilas City
Tel. No.: (02)8553-8381 / (02)8553-8382 / (02)8553-8879/(02)8550-2573 Fax No.: (02) 8553-8878
Email: info@machunion.com • Website: www.machunion.com • http://www.facebook.com/MachUnion
Accredited: Philippine Accreditation Bureau (DTI-PAB) • Department of Health • Food & Drug Administration
Recognized: Department of Environment & Natural Resources (DENR-EMB) • Bureau of Animal Industry (DA-BAI)

CERTIFICATE OF ANALYSIS

Work Order	: **MU24013542**	**Lab. Sample ID :**	**MU24013542-001**	**Date Reported:**	**07/16/2024**
Client ID	: NCRMUL-000356				
CUSTOMER	: **GREENTEK ENVIRONMENTAL PHILS., CO.** 2353 RJ Place Bldg., Unit 3A, Selya St., Pandacan, Manila				
Attention	: Liwayway P. Gaddi 09175139249 jd.greentek@gmail.com				
PROJECT DETAILS:	**Benguet Corporation - Acupan Contract Mining Project**				

SAMPLE INFORMATION

Sample Type	Air Ambient	Storage Condition	Chilled and Ambient
Identification	BENGUET CORPORATION - ACUPAN CONTRACT MINING PROJECT		
Description	Air Ambient Sample in Absorbing Solution in 50mL HDPE and Filter Paper (Round)		
Collection Date and Time	06/29/2024 12:00 AM	Received Date and Time	07/03/2024 01:00 PM
Collected by	CUSTOMER	Analyzed Start Date and Time	07/03/2024 09:30 AM
		Analyzed End Date and Time	07/12/2024 08:00 PM

Comments:

1. *All sample information stated herein are based on the details provided by the customer. The results in this certificate of testing relates only to the samples submitted to and tested by the laboratory.*

MACH UNION LABORATORIES INC.

Main Office: Mach Union Building, 325 Alabang-Zapote Road, Talon 3, 1740 Las Piñas City, Philippines
Extension Office: ANPRA Bldg., FMC-LTO Cmpd., 314 Alabang-Zapote Road, Talon 3, 1740 Las Piñas City
Tel. No.: (02)8553-8381 / (02)8553-8382 / (02)8553-8879 / (02)8550-2573 Fax No.: (02) 8553-8878
Email: info@machunion.com • Website: www.machunion.com • http://www.facebook.com/MachUnion
Accredited: Philippine Accreditation Bureau (DTI-PAB) • Department of Health • Food & Drug Administration
Recognized: Department of Environment & Natural Resources (DENR-EMB) • Bureau of Animal Industry (DA-BAI)

PAB ACCREDITED
TESTING LABORATORY
PNS ISO/IEC 17025:2017
LA-2012-215C

CERTIFICATE OF ANALYSIS

Work Order : MU24013542 Lab. Sample ID : MU24013542-001 Date Reported : 07/16/2024

CUSTOMER : GREENTEK ENVIRONMENTAL PHILS. CO.

Sample Source : ATI AIR QUALITY MONITORING

LABORATORY TEST RESULTS

SAMPLE ID	PARAMETER	TEST METHOD	UNIT	RESULT
BCACMP - STN 1	Nitrogen dioxide	Griess Saltzman Method	ug	0.282
BCACMP - STN 1	Sulfur dioxide	Pararosaniline Method	ug	< 0.29
BCACMP - STN 1	Total Suspended Particulate	High Volume /Gravimetric Method	ug	15100
BCACMP - STN 2	Nitrogen dioxide	Griess Saltzman Method	ug	0.299
BCACMP - STN 2	Sulfur dioxide	Pararosaniline Method	ug	< 0.29
BCACMP - STN 2	Total Suspended Particulate	High Volume /Gravimetric Method	ug	11000
BCACMP - STN 3	Nitrogen dioxide	Griess Saltzman Method	ug	0.269
BCACMP - STN 3	Sulfur dioxide	Pararosaniline Method	ug	< 0.29
BCACMP - STN 3	Total Suspended Particulate	High Volume /Gravimetric Method	ug	12100

Test Method Reference:
Code of Federal Regulations, Title 40 Parts 50 to 57, USA, 1985.
Selected Methods of Measuring Air Pollutants, WHO, 1976.
US EPA Title 40 Code of Federal Regulations, Part 50, Standard of Performance for New Stationary Sources, Appendix A to D, 1991

Checked by:

Katrina [illegible]agulayan, RCh
Chemist III
PRC# [illegible]13881

Certified by:

Marisa T. Manaor, RCh
Supervising Chemist
PRC# 0005465

Approved for Release by:

Aladino M. Abulencia, ChE
Technical Manager
PRC License No. 0006351

"APPENDIX C"

SAMPLING ACTIVITY PHOTOS AND VICINITY MAP

Station 1 - Along Keymens Road (UPWIND)

Station 2 - Near Assay Laboratory & Gate 2 (DOWNWIND)

Station 3 - Near BCACMP Office (UPWIND)

"APPENDIX D"

AMBIENT AIR EQUIPMENT CALIBRATION CERTIFICATES

Switchtek
Measurement Systems

A Division of Switchtek Construction Corporation
4th Floor Northridge Plaza, Annex A, 12 Congressional Ave.,
Bahay Toro, Quezon City, 1100, Philippines
Tel Nos.02 4267593 / 9282869 / 9267769 Fax No.4537694
email Address: admin@switchtek.com.ph
www.switchtek.com.ph

Certificate No.:	4000.23-0142-1.23	Calibration of	3 IN1 (barometer function)		
Identification:	GREENTEK ENVIRONMENTAL PHILS., CO				
Job:	P1	Test and Verification			
Fin.acc:	32	Certificate of Calibration			
Date......:	November 22, 2023	Initials...:	CAC		
Categories:	Calibration	Man	Hours	Total cost	Type
Cal Officer		2	1.00	-	Certificate

CERTIFICATE OF CALIBRATION - 3 IN 1 (Barometer Function)

This report of calibration shall document that the instrument herein was examined and tested in compliance with ISO/IEC 17025 against NIST traceable reference standards and its co-equal standards.

Issued to: GREENTEK ENVIRONMENTAL PHILS., CO
Address: 2353 RJ PLACE UNIT 3A SELYA STREET BRGY.860 PANDACAN, MANILA, PHILIPPINES

UNIT UNDER TEST (UUT):

Instrument:	3 IN1 (barometer function)
Brand:	LUTRON
Model No.:	PHB-318
Serial No.:	No record
ID code:	No record
Range:	Temp. (0-50 Deg. C) Humidity (10 to 95%) Dewpoint (-25.3 to 48.9 Deg. C) Barometer (10 to 999.9 hPa)
Resolution:	Temp. (0.1 Deg. C) Humidity (0.1 %) Dewpoint (0.1 Deg. C) Barometer (1 hPa)

Accuracy:

Temperature:	± 0.8 /1.5 °C °F
%RH	≧ ± (3% reading + 1% RH). < 70% RH - 3% RH ± 3% RH.
Barometric pressure	10.0 to 999.9 (± 1.5 hPa) 1000 to 1100 (± 2 hPa)
Calibration Date:	November 20, 2023
Calibration Due:	November 19, 2024

CALIBRATOR INFORMATION:

Instrument:	Barigo, precision barometer
Instrument:	Druck, pressure calibrator
Instrument:	Lumel temp and humidity transmitter
Instrument:	Temperature and Humidity chamber
Model No.:	XB-OTS-34
Serial No.:	20150803
Traceability:	CNAS

Environmental Condition:

Condition:	DRY/BASIC/NEUTRAL	Ambient Temp. (Deg C):	24.4 ±2
Relative Humidity:	55.6 ±5%, 1007 hPa		

Calibration Method:

By comparison technique, unit under test was placed in a Chamber with a Standard precision barometer, Temperature and Humidity calibrator. Procedures of calibration and test conform to the requirements of NPL, NIST and ISO/IEC Guide 17025. Data were gathered and plotted against an ideal curve.

Standard error and uncertainty of measurement are written on the attached sheet.

Remarks:

All data pertain only to the unit described obtained at the time of test. This certificate is not valid w/out seal and signature. Unauthorized reproduction is prohibited.

Calibrated By:	C.A. CASADO	Certified By:	A.B. CANDOG
Date:	November 20, 2023	Date:	November 22, 2023

Switchtek
Measurement Systems
A Division of Switchtek Construction Corporation
4th Floor Northridge Plaza, Annex A, 12 Congressional Ave.,
Bahay Toro,Quezon City, 1100, Philippines
Tel Nos.02 4267593 / 9282869 / 9287769 Fax No.4537684
email Address: admin@switchtek.com.ph
www.switchtek.com.ph

Certificate No.:	4000.23-9142-1.23	**Calibration of**	3 IN1 (barometer function)
Identification:	GREENTEK ENVIRONMENTAL PHILS., CO		
Address:	2353 RJ PLACE UNIT 3A SELYA STREET BRGY.860 PANDACAN, MANILA, PHILIPPINES		

CERTIFICATE OF CALIBRATION - 3 IN 1 (Barometer Function)

This report of calibration shall document that the instrument herein was examined and tested in compliance with ISO/IEC 17025 against NIST traceable reference standards and its co-equal standards.

UNIT UNDER TEST (UUT):

Instrument:	3 IN1 (barometer function)
Brand:	LUTRON
Model No.:	PHB-318
Serial No.:	No record
Range:	Temp. (0-50 Deg. C) Humidity (10 to 95%) Dewpoint (-25.3 to 48.9 Deg. C) Barometer (10 to 999.9 hPa)
Resolution:	Temp. (0.1 Deg. C) Humidity (0.1 %) Dewpoint (0.1 Deg. C) Barometer (1 hPa)
ID code:	No record

Calibration Date:	November 20, 2023
Calibration Due:	November 19, 2024
Calibrated By:	C.A. CASADO

Results:

Barometer

REFERENCE READING (hPa)	UNIT UNDER TEST READING (hPa)	ERROR IN READING (hPa)	STANDARD DEVIATION	REMARKS
1009.0	1003.0	6.00	4.2426	The user should determine the suitabilty of the instrument for its intended use
1005.0	1000.0	5.00	3.5355	
1000.0	995.0	5.00	3.5355	
990.0	984.0	6.00	4.2426	

Standard error: ± 7.78 hPa
Uncertainty: ± 6.09 hPa

Switchtek
Measurement Systems

A Division of SwitchTek Construction Corporation
4th Floor Northridge Plaza, Annex A, 12 Congressional Ave.,
Bahay Toro, Quezon City, 1100, Philippines
Tel Nos.83517471 / 89282869 / 89287769 Fax No. 89828269
email Address: admin@switchtek.com.ph
www.switchtek.com.ph

Certificate No.:	4000.05-5664-2.23, REV	Calibration of	Rotameter			
Identification:	GREENTEK ENVIRONMENTAL PHILS., CO					
Job:	P1	Test and Verification				
Fin.acc:	32	Certificate of Calibration				
Done......	July 20, 2024	Initials.....	CAC			
Categories	Test and Calibration	Men	Hours	Total cost	Type	
Cal Officer		2	1.0	-	Certificate	

CERTIFICATE OF CALIBRATION - ROTAMETER

This report of calibration shall document that the instrument herein was examined and tested in compliance with ISO/IEC 17025 against NIST traceable reference standards and its co-equal standards.

Issued To: GREENTEK ENVIRONMENTAL PHILS., CO
Address: 2430 LAURA STREET, PANDACAN, MANILA, PHILIPPINES

UNIT UNDER TEST (UUT):

Instrument:	Rotameter
Brand:	KIMOTO
Model No:	PM-40383
Serial No:	No record
Property ID:	No record
Range:	0.1 to 2.5 LPM
Graduation:	0.1 LPM
Calibration Date:	July 02, 2024
Calibration Due:	July 02, 2025

CALIBRATOR INFORMATION:

Instrument:	DWYER, Rotameter
Inert Gas:	Pure (N2) Nitrogen Gas
Standard Thermometer:	Heraeus, Standard platinum resistance thermometer
Standard Gauge:	Test Gauge, NABL UKAS, CertSMS200.01
Instrument:	Primary DC DRYCAL
Brand:	BIOS
Serial No.:	4229
Traceability:	NIST, NPL and PTB Lab.

Environmental Condition:
Condition: DRY/BASIC/NEUTRAL
Relative Humidity: 48 ±5%, 1009 hPa
Ambient Temp. (Deg C): 19.8 ±2

Calibration Method:

By comparative technique, unit under test was tested and calibrated in referenced with a Standard Flowmeter at planned intervals using dried and filtered inert gas and in accordance with NIST, NPL and ISO/IEC Guide 17025. Data were gathered and tabulated.

During calibration, the unit was found to have a standard error of ± 0.0000 LPM with a confidence level of not less than 95%. Uncertainty of measurement is ± 0.056 LPM. Calculations were taken using Standard Deviation Formula.

Result:

NO. OF TEST	REFERENCE READING (LPM)	UNIT UNDER TEST READING (LPM)	ERROR IN READING (LPM)	STANDARD DEVIATION
1	0.000	0.00	0.000	0.0000
2	0.500	0.50	0.000	0.0000
3	1.000	1.00	0.000	0.0000
4	1.500	1.50	0.000	0.0000
5	2.000	2.00	0.000	0.0000

Remarks:
All data pertain only to the unit described obtained at the time of test. This certificate is not valid w/out seal and signature. Unauthorized reproduction is prohibited.

********** *NOTE MEASUREMENT INDICATOR IS AT THE UPPER PART OF THE FLOATER* **********

Calibrated By: C.A. CASADO
Date: July 02, 2024

Certified By: A.R. CAINGUC
Date: July 02, 2024

Switchtek Measurement Systems

A Division of Switchtek Construction Corporation

4th Floor Northbridge Plaza, Annex A, 12 Congressional Ave., Bahay Toro, Quezon City, 1100, Philippines

Tel Nos.02 4267593 / 9282869 / 9287769 Fax No.4537694

email Address: admin@switchtek.com.ph

www.switchtek.com.ph

Certificate No.:	400.01-8227-1.23	**Calibration of**		**Sound Level Meter**	
Identification:	GREENTEK ENVIRONMENTAL PHILS., CO				
Job:	P1	Test and Verification			
File.acc:	32	Certificate of Calibration			
Done.....:	June 4, 2024	Initials...:	CAC		
Categories	Calibration	Men	Hours	Total cost	Type
Cal Officer		2	1.0		Certificate

CERTIFICATE OF CALIBRATION - SOUND LEVEL METER

This report of calibration shall document that the instrument herein was examined and tested in compliance with ISO/IEC 17025 against NIST traceable reference standards and its co-equal standards.

Issued To: GREENTEK ENVIRONMENTAL PHILS., CO

Address: 2555 RJ PLACE UNIT 5A SELYA STREET BRGY. 860 PANDACAN, MANILA, PHILIPPINES

UNIT UNDER TEST (UUT):

Instrument: Sound Level Meter
Brand: LUTRON
Model No: SL-4033SD
Serial No: I433801
Range: 35 to 130 dB
ID Code: No record
Calibration Date: June 3, 2024
Calibration Due: June 2, 2025

CALIBRATOR INFORMATION:

Instrument: Sound Level Calibrator
Brand: Lutron
Serial No: I.278821
Model No: SC-942
Traceability: IEC 60942 Type II A Standard
NIST and NPL

Environmental Condition:

Condition: DRY/BASIC/NEUTRAL
Ambient Temp. (Deg C): 21..7 ±2
Relative Humidity: 41.2 ±5%, 1006 hPa

Calibration Method:

By comparative technique, Standard Sound Generator was introduced at the unit under test at a constant value of 94.0 dB to 114 dB at a uniform frequency of 1000 Hz. Data were gathered and tabulated. Procedures of test conform to the requirements of OIML 88 Guidelines, IEC 60942 of the NIST and National Physical Laboratories.

During calibration, the unit was found to have a standard error of +0.00 dB with a confidence level of not less than 95%. Uncertainty of measurement is ±0.58 dB. Calculations were taken using the Standard Deviation Formula.

Results:

TRIALS	REFERENCE READING (dB)	UNIT UNDER TEST READING (dB)		ERROR IN READING	STANDARD DEVIATION	REMARKS
		AS FOUND	AS LEFT			
1	94.0	93.8	94.0	0.00	0.0000	Passed
2	114.0	114.0	114.2	0.30	0.2121	

Remarks:

All data pertain only to the unit described obtained at the time of test. This certificate is not valid w/out seal and signature. Unauthorized reproduction is prohibited.

Calibrated By: C.A. CASADO
Date: June 3, 2024

Certified By: A.R. CAINOC
Date: June 4, 2024

[illegible]

Switchtek Measurement Systems

A Division of Switchtek Construction Corporation

4th Floor Northridge Plaza, Annex A, 12 Congressional Ave.,

Bahay Toro,Quezon City, 1106, Philippines

Tel Nos: 3453-7694 ; 8928-2869 ; 8928-7769 Fax No.: 8426-7593

email Address: admin@switchtek.com.ph

www.switchtek.com.ph

Certificate No.:	4000.05-8227-1.23	**Calibration of**	High Volume Sampler		
Identification:	GREENTEK ENVIRONMENTAL PHILS., CO				
Job:	F1	Test and Verification			
Fin.acc:	32	Certificate of Calibration			
Done......:	May 15, 2024	Initials...:	CAC		
Categories		Men	Hours	Total cost	Type
Cal Officer		1	1.0	-	Certificate

CERTIFICATE OF CALIBRATION - HIGH VOLUME SAMPLER

This report of calibration shall document that the instrument herein was examined and tested in compliance with ISO/IEC 17025 against NIST traceable reference standards and its co-equal standards.

Issued To: GREENTEK ENVIRONMENTAL PHILS., CO
Address: 2353 RJ PLACE UNIT 3A SELYA STREET BRGY. 860 PANDACAN, MANILA, PHILIPPINES

UNIT UNDER TEST (UUT):

Instrument:	High Volume Sampler
Brand:	STAPLEX
Model No:	TFIA-2
Serial No:	25707T
Range:	0.5 to 2 m3/min.
Graduation:	0.1 m3
ID code:	No record
Calibration Date:	May 11, 2024
Calibration Due:	May 10, 2025

CALIBRATOR INFORMATION:

Instrument:	Rotating Vane Anemometer
Manufacturer:	LUTRON
Model No:	AM-4206M
Serial No:	Q432206
Range:	0 to 30.0 m/s 0 to 50.0 °C
Origin:	USA
Calibrated Against:	UKAS, thru Laser Doppler Anemometer

Environmental Condition:

Condition: DRY/BASIC/NEUTRAL
Relative Humidity: 56 ±5%, 1011 hPa
Ambient Temp. (Deg C): 24.5 ±2

Calibration Method:

By comparative technique, unit under test was tested and calibrated in reference with a rotating vane anemometer at planned intervals using dried and filtered inert gas and with NIST, NPL and ISO/IEC Guide 17025. Data were gathered and tabulated.

During calibration, the unit was found to have a standard error of ±0.008 m3/min. with a confidence level of not less than 95%. Uncertainty of measurement is ±0. 062m3/min. Calculations were taken using Standard Deviation Formula.

Results:

NO. OF TEST	REFERENCE READING (m3/min.)	UNIT UNDER TEST READING (m3/min.)	ERROR IN READING (m3/min.)	STANDARD DEVIATION
1	1.00	1.0	0.000	0.0000
2	1.49	1.5	0.010	0.0071
3	2.01	2.0	-0.010	0.0071

Remarks:

All data pertain only to the unit described obtained at the time of test. This certificate is not valid w/out seal and signature. Unauthorized reproduction is prohibited.

Calibrated By: [illegible]
Date: May 13, 2024

Certified By: [illegible]
Date: May 13, 2024

"APPENDIX E"

AMBIENT AIR TESTING PARTICIPANTS

AMBIENT AIR TESTING PARTICIPANTS

BENGUET CORPORATION - ACUPAN CONTRACT MINING PROJECT

Mr. Lloyd P. Camado	-	Facility Representative

GREENTEK ENVIRONMENTAL PHILS. CO.

Mr. Angelo V. Guevarra	-	QA/QC Manager
Mr. Manny R. Cruz	-	Field Technician
Mr. Rodel M. Castante	-	Field Technician

Republic of the Philippines
Department of Environment and Natural Resources
ENVIRONMENTAL MANAGEMENT BUREAU
Visayas Avenue, Diliman, Quezon City

SAT No. 2023 – 151

CERTIFICATE OF ACCREDITATION

Pursuant to DENR Administrative Order No. 26 Series of 2013 of the Department of Environment and Natural Resources having substantially met all the requirements prescribed therein,

GREENTEK ENVIRONMENTAL PHILS. CO.

#2430 Laura St., Pandacan Manila

is hereby duly accredited as

SOURCE EMISSION TESTING FIRM

As such, the following are authorized as:

QA/QC Manager
Danilo M. Palaypay, Jr.

Team Leader
Aaron Jonathan R. Regilme

This certification shall allow the above firm and personnel to conduct stack testing limited to the following methods and parameters:

1. US-EPA Method 1 to 5 – PM
2. US-EPA Method 6/8 – SO_2
3. US-EPA Method 7 – NO_x
4. US-EPA Method 10 – CO

Granted this December 22, 2023 and valid until December 22, 2026.

GILBERT C. GONZALES, CESO III
Director and concurrent
Assistant Secretary for Field Operations

"APPENDIX F"

LABORATORY CERTIFICATES OF RECOGNITION

SCOPE OF RECOGNITION*

Water and Wastewater

Ammonia as NH_3-N; Arsenic
Barium; BOD; Boron; Cadmium
Chemical Oxygen Demand; Chloride
Chromium as Hexavalent Chromium (Cr^{6+})
Coliform, Fecal; Coliform, Total
Color (True); Copper as Dissolved Copper
Copper, Total; Cyanide as Free Cyanide
Dissolved Oxygen; Fluoride; Iron; Lead
Manganese; Mercury; Nickel; Nitrate as NO_3-N
Oil and Grease; pH; Phosphate; Selenium
Settleable Solids; Sulfate

DENR RECOGNIZED SIGNATORIES

For Air, Metals, Physical-Chemical and Waste Analyses
Marisa T. Manaor

For Bacteriological Analysis
Luchie S. Ignacio

*Exclusive of sampling. Analytical methods and references approved for water and wastewater are in Annex CR 040/2020.

ELR LABORATORY CODE NO. NCR-29
Page 1 of 8

Republic of the Philippines
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
Visayas Avenue, Diliman, Quezon City

This

CERTIFICATE OF RECOGNITION

C.R. No. 040/2020

is hereby granted to

Mach Union Laboratories, Inc.

Mach Union Bldg., 335 Alabang-Zapote Road, Talon 3, Las Piñas City
and ANFRA Bldg., FMC-LTO Compound, Alabang-Zapote Road, Talon 1, Las Piñas City

after having been assessed and found to comply with the documentation, analytical performance and other technical requirements of Administrative Order No. 63, Series of 1998, Guidelines for the Designation of DENR Recognized Environmental Laboratories.

This certificate is valid for three years from date of issue unless otherwise revoked or cancelled.

In testimony whereof, I have hereunto signed this Certificate and issued the same this thirtieth day of June, year two thousand and twenty at Quezon City, Philippines.

ROY A. CIMATU
Secretary

SCOPE OF RECOGNITION*

Water and Wastewater

Surfactants (Methylene Blue Active Substances)

Temperature; Total Dissolved Solids

Total Suspended Solids; Zinc

Ambient Air

Nitrogen Dioxide; Sulfur Dioxide

Suspended Particulate Matter – PM10

Suspended Particulate Matter - TSP

Stationary Source Emissions

NO_X; Particulates

Sulfur Oxides as SO_2

DENR RECOGNIZED SIGNATORIES

For Air, Metals, Physical-Chemical and Waste Analyses

Marisa T. Manaor

For Bacteriological Analysis

Luchie S. Ignacio.

**Exclusive of sampling. Analytical methods and references approved for water and wastewater are in Annex CR 040/2020.*

ELR LABORATORY CODE NO. NCR-29

Republic of the Philippines

DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

Visayas Avenue, Diliman, Quezon City

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C.R. No. 040/2020

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In testimony whereof, I have hereunto signed this Certificate and issued the same this thirtieth day of June, year two thousand and twenty at Quezon City, Philippines.

ROY A. CIMATU
Secretary

SCOPE OF RECOGNITION*

Sediments

Arsenic

Total Cadmium, Copper, Iron

Lead, Manganese, Nickel

Silver, Zinc; Total Mercury

Wastes

Antimony; Antimony compounds

Arsenic and its compounds

Barium and its compounds

Cadmium and its compounds

Chromium compounds

Lead compounds

Mercury and mercury compounds

Selenium and its compounds.

DENR RECOGNIZED SIGNATORIES

For Air, Metals, Physical-Chemical and Waste Analyses
Marisa T. Manaor

For Bacteriological Analysis
Lachie S. Ignacio.

**Exclusive of sampling; Analytical methods and references approved for water and wastewater are in Annex CR 040/2020.*

ELR LABORATORY CODE NO. NCR-09
Page 3 of 8

Republic of the Philippines
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
Visayas Avenue, Diliman, Quezon City

This

CERTIFICATE OF RECOGNITION

C.R. No. 040/2020

is hereby granted to

Mach Union Laboratories, Inc.

Mach Union Bldg., 335 Alabang-Zapote Road, Talon 3, Las Piñas City
and ANFRA Bldg., FMC-LTO Compound, Alabang-Zapote Road, Talon 1, Las Piñas City

after having been assessed and found to comply with the documentation, analytical performance and other technical requirements of Administrative Order No. 63, Series of 1998, Guidelines for the Designation of DENR Recognized Environmental Laboratories.

This certificate is valid for three years from date of issue unless otherwise revoked or cancelled.

In testimony whereof, I have hereunto signed this Certificate and issued the same this thirtieth day of June, year two thousand and twenty at Quezon City, Philippines.

ROY A. CIMATU
Secretary

ANNEX CR 040/2020
Mach Union Laboratories, Inc.

RECOGNIZED PARAMETERS AND ANALYTICAL METHODS

Water and Wastewater

PARAMETERS	ANALYTICAL METHODS	REFERENCES
Ammonia as NH_3-N	Phenate Method	SMEWW 4500-NH_3 F
Arsenic	Electrothermal Atomic Absorption Spectrometric Method (Nitric Acid / Hotplate Digestion)	SMEWW 3113 B (SMEWW 3030E)
	Manual Hydride Generation/ Atomic Absorption Spectrometric Method	SMEWW 3114 B
	Inductively Coupled Plasma – Emission Spectroscopy Method (Nitric Acid – Hydrochloric Acid / Hotplate Method)	SMEWW 3120 (SMEWW 3030 F)
Barium	Direct Nitrous Oxide – Acetylene Flame Method (Nitric Acid – Hydrochloric Acid / Hotplate Digestion)	SMEWW 3111 D (SMEWW 3030 F)
	Inductively Coupled Plasma – Emission Spectroscopy Method (Nitric Acid – Hydrochloric Acid / Hotplate Method)	SMEWW 3120 (SMEWW 3030 F)
BOD	5-Day BOD Test	SMEWW 5210 B
Boron	Carmine Method	SMEWW 4500-B C
	Inductively Coupled Plasma – Emission Spectroscopy Method (Nitric Acid – Hydrochloric Acid / Hotplate Method)	SMEWW 3120 (SMEWW 3030 F)
Cadmium	Direct Air-Acetylene Flame Method (Nitric Acid - Hydrochloric Acid/ Hotplate Digestion Method)	SMEWW 3111 B (SMEWW 3030 F)

ANNEX CR 040/2020
Mach Union Laboratories, Inc.

RECOGNIZED PARAMETERS AND ANALYTICAL METHODS

Water and Wastewater

PARAMETERS	ANALYTICAL METHODS	REFERENCES
Cadmium	Electrothermal Atomic Absorption Spectrometric Method (Nitric Acid / Hotplate Digestion)	SMEWW 3113 B (SMEWW 3030E)
	Inductively Coupled Plasma – Emission Spectroscopy Method (Nitric Acid – Hydrochloric Acid / Hotplate Method)	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
	Ion Chromatography with Chemical Suppression of Eluent Conductivity	SMEWW 4110 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
Copper as Dissolved Copper	Direct Air-Acetylene Flame Method (Nitric Acid - Hydrochloric Acid / Hotplate Digestion Method)	SMEWW 3111 B (SMEWW 3030 F with SMEWW 3030 B)
	Electrothermal Atomic Absorption Spectrometric Method (Nitric Acid / Hotplate Digestion)	SMEWW 3113 B (SMEWW 3030 E with SMEWW 3030 B)

ANNEX CR 040/2020
Mach Union Laboratories, Inc.

RECOGNIZED PARAMETERS AND ANALYTICAL METHODS

Water and Wastewater

PARAMETERS	ANALYTICAL METHODS	REFERENCES
Copper, Total	Direct Air-Acetylene Flame Method (Nitric Acid - Hydrochloric Acid / Hotplate Digestion Method)	SMEWW 3111 B (SMEWW 3030 F)
	Electrothermal Atomic Absorption Spectrometric Method (Nitric Acid / Hotplate Digestion)	SMEWW 3113 B (SMEWW 3030E)
	Inductively Coupled Plasma – Emission Spectroscopy Method (Nitric Acid – Hydrochloric Acid / Hotplate Method)	SMEWW 3120 (SMEWW 3030 F)
Cyanide as Free Cyanide	Cyanide – Selective Electrode (w/o distillation)	SMEWW 4500-CN^- F
Dissolved Oxygen	Iodometric Method - Azide Modification	SMEWW 4500-O C
	Membrane Electrode Method	SMEWW 4500-O G
Fluoride	Ion Chromatography with Chemical Suppression of Eluent Conductivity	SMEWW 4110 B
	Ion-Selective Electrode Method	SMEWW 4500-F^- C
Iron	Direct Air-Acetylene Flame Method (Nitric – Hydrochloric Acid/ Hotplate Digestion)	SMEWW 3111 B (SMEWW 3030 F)
	Inductively Coupled Plasma – Emission Spectroscopy Method (Nitric – Hydrochloric Acid/ Hotplate Digestion)	SMEWW 3120 B (SMEWW 3030 F)
Lead	Direct Air-Acetylene Flame Method (Nitric Acid/ Hotplate Digestion)	SMEWW 3111 B (SMEWW 3030 E)

ANNEX CR 040/2020
Mach Union Laboratories, Inc.

RECOGNIZED PARAMETERS AND ANALYTICAL METHODS

Water and Wastewater

PARAMETERS	ANALYTICAL METHODS	REFERENCES
Lead	Electrothermal Atomic Absorption Spectrometric Method (Nitric Acid/ Hotplate Digestion)	SMEWW 3111 B (SMEWW 3030 E)
	Inductively Coupled Plasma – Emission Spectroscopy Method (Nitric Acid – Hydrochloric Acid / Hotplate Method)	SMEWW 3120 (SMEWW 3030 F)
Manganese	Direct Air-Acetylene Flame Method (Nitric – Hydrochloric Acid / Hotplate Digestion)	SMEWW 3111 B (SMEWW 3030 F)
	Inductively Coupled Plasma – Emission Spectroscopy Method (Nitric Acid – Hydrochloric Acid / Hotplate Method)	SMEWW 3120 (SMEWW 3030 F)
Mercury	Cold-Vapor Atomic Absorption Spectrophotometric Method	SMEWW 3112 B
Nickel	Direct Air-Acetylene Flame Method (Nitric – Hydrochloric Acid / Hotplate Digestion)	SMEWW 3111 B (SMEWW 3030 F)
	Inductively Coupled Plasma – Emission Spectroscopy Method (Nitric Acid – Hydrochloric Acid / Hotplate Method)	SMEWW 3120 (SMEWW 3030 F)
Nitrate as NO3-N	Ion Chromatography with Chemical Suppression of Eluent Conductivity	SMEWW 4110 B
	Nitrate Electrode Method	SMEWW 4500-NO_3^- D

Republic of the Philippines
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
Visayas Avenue, Diliman, Quezon City

ANNEX CR 040/2020
Mach Union Laboratories, Inc.

RECOGNIZED PARAMETERS AND ANALYTICAL METHODS

Water and Wastewater

PARAMETERS	ANALYTICAL METHODS	REFERENCES
Oil and Grease	Liquid-Liquid, Partition - Gravimetric Method	SMEWW 5520 B
pH	Electrometric Method	SMEWW 4500-H^+ B
Phosphate	Stannous Chloride Method	SMEWW 4500-P D
Selenium	Electrothermal Atomic Absorption Spectrometric Method (Nitric Acid / Hotplate Digestion)	SMEWW 3113 B (SMEWW 3030 E)
	Inductively Coupled Plasma – Emission Spectroscopy Method (Nitric Acid – Hydrochloric Acid / Hotplate Method)	SMEWW 3120 (SMEWW 3030 F)
	Manual Hydride Generation/ Atomic Absorption Spectrometric Method	SMEWW 3114 B
Settleable Solids	Imhoff Cone Method	SMEWW 2540 F
Sulfate	Ion Chromatography with Chemical Suppression of Eluent Conductivity	SMEWW 4110 B
	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
Zinc	Direct Air-Acetylene Flame Method (Nitric – Hydrochloric Acid / Hotplate Digestion)	SMEWW 3111 B (SMEWW 3030 F)
	Inductively Coupled Plasma – Emission Spectroscopy Method (Nitric Acid – Hydrochloric Acid / Hotplate Method)	SMEWW 3120 (SMEWW 3030 F)

AMBIENT AIR QUALITY AND NOISE LEVEL MEASUREMENT MONITORING REPORT

Reference No.: GEPC-AAQM-2412-072

Prepared for:

BENGUET CORPORATION ACUPAN CONTRACT MINING PROJECT

Balatoc, Virac, Itogon, Benguet

Sampling Date: **December 13, 2024**

Report Date: **December 27, 2024**

AMBIENT AIR QUALITY AND NOISE LEVEL MEASUREMENT MONITORING
REPORT CERTIFICATION

THREE (3) STATIONS AREA TESTS

PARAMETERS:

TOTAL SUSPENDED PARTICULATE **(TSP)**
SULFUR DIOXIDE **(SO_2)**
NITROGEN DIOXIDE **(NO_2)**
NOISE LEVEL MEASUREMENT

BENGUET CORPORATION ACUPAN CONTRACT MINING PROJECT

Balatoc, Virac, Itogon, Benguet

The ambient air monitoring and noise level measurement monitoring results reported herein were headed and performed by Mr. Danilo M. Palaypay, Jr. and his team. The laboratory analysis of the collected samples is conducted by Mach Union Laboratories Inc. and has been verified and found to be orderly.

I have certified that the information discussed in this report is accurate to the best of my knowledge.

Signed by:

DANILO M. PALAYPAY, JR.
SAT No. 2023-151
Date Signed: December 27, 2024

AMBIENT AIR QUALITY MONITORING REPORT

FACILITY NAME: **Benguet Corporation Acupan Contract Mining Project**

FACILITY ADDRESS: Balatoc, Virac, Itogon, Benguet

1.0 INTRODUCTION

Greentek Environmental Phils. Co. was contracted by **Benguet Corporation Acupan Contract Mining Project** to conduct ambient air sampling for Three (3) stations within their plant facility as a requirement of their environmental permit and partly for their regular environmental monitoring.

Ambient air sampling was conducted on December 13, 2024, to analyze nitrogen dioxide (NO2), sulfur dioxide (SO2) and total suspended particulate (TSP) levels.

2.0 SAMPLING METHODOLOGY

The DENR standard ambient air sampling equipment and analytical procedures were used in the sampling activity. These equipment and procedures are specified below:

Total Suspended Particulate Matter (TSP)

Reference Procedure:	USEPA, 40 CFR 50, Appendix B
Sampling Equipment:	High Volume Sampler (1-Hour Air Sampler)
Method of Analysis:	Gravimetric Method

Sulfur dioxide (SO_2)

Reference Procedure:	USEPA, 40 CFR 50, Appendix A
Sampling Equipment:	Gas Bubbler Sampler (USEPA compliant)
Method of Analysis:	Pararosaniline Method

Nitrogen dioxide (NO_2)

Reference Procedure:	Air Pollution Monitoring Manual, EMB-1994
Sampling Equipment:	Gas Bubbler Sampler (USEPA compliant)
Method of Analysis:	Colorimetric, Griess Saltzman

The SO2 and NO2 samples were stored in an icebox, the TSP filters were placed in a clean envelope. All collected samples were then transported to the laboratory for analysis.

3.0 SAMPLING LOCATIONS

There are Three (3) sampling stations for ambient air monitoring. The table below shows the location and observations made during the sampling activity.

STN	LOCATION	OBSERVATION / ACTIVITY IN THE AREA DURING THE TIME OF SAMPLING
1	Along Keymens Road **(Upwind)**	The Plant facility was operational during sampling with light to moderate wind. There were twelve (12) cars, fourteen (14) trucks and fifteen (15) motorcycles that passed by during sampling.
2	Near Assay Laboratory & Gate 2 **(Upwind)**	The Plant facility was operational during sampling with light to moderate wind. There were ten (10) trucks, five (5) car and eight (8) motorcycles that passed by during sampling.
3	Near BCACMP Office **(Downwind)**	The Plant facility was operational during sampling with light to moderate wind. There were five (5) trucks and one (1) car that passed by during sampling.

4.0 SUMMARY OF RESULTS

The summary results of the laboratory analysis are presented below for all sampling areas.

Table 1
Laboratory Analysis Results and Standard Limits for 60 minutes sampling

Stn	Location	Date / Time Sampling	TSP (ug / Nm^3)	SO_2 (ug / Nm^3)	NO_2 (ug / Nm^3)
1	Along Keymens Road **(Upwind)**	13-Dec-2024 1315H-1415H	270.6	10.8	19.9
2	Near Assay Laboratory & Gate 2 **(Upwind)**	13-Dec-2024 1135H-1235H	190.3	10.8	15.9
3	Near BCACMP Office **(Downwind)**	13-Dec-2024 1015H-1115H	182.2	10.8	12.4
DENR NAAQ Standards for 60 minutes sampling			**300**	**340**	**260**

These data are measured to standardize the test results to 25°C and 760mmHg and for comparison purposes.

Table 2
Meteorological Monitoring Reading for 60 minutes sampling

STN	Location (GPS)	Date / Time Sampling	Barometric Pressure. (Inch Hg) Result Avg.	Ambient Temp.(˚C) Result Avg.	% Relative Humidity Result Avg.	Wind Speed Avg. (m/s)
1	Along Keymens Road **(Upwind)** N 16°21'35.718" E 120°39'31.724"	4-Dec-2024 1315H-1415H	27.12	29.4	59.9	1.7
2	Near Assay Laboratory & Gate 2 **(Upwind)** N 16°21'33.744" E 120°39'30.636"	13-Dec-2024 1135H-1235H	27.25	30.7	56.9	1.2
2	Near BCACMP Office **(Downwind)** N 16°21'38.406" E 120°39'36.17"	13-Dec-2024 1135H-1235H	27.27	29.9	55.8	1.1

5.0 DISCUSSION OF RESULTS

The USEPA "Quality Assurance Handbook for Air Pollution Measurement Systems, Environmental Management Bureau, Department of Environment and Natural Resources, Philippine Environmental Policies, Laws, and Regulations handbook was used as a guide to achieve the quality assurance objectives of producing data that is complete, representative, and of known precision and accuracy.

The above results of analysis are compared to the National Ambient Air Quality Standards (NAAQS) for source-specific air pollutants from industrial operations. These standards are specified in the Implementing Rules and Regulations of the Philippine Clean Air Act of 1999.

During sampling on December 12, 2024, the weather from stations 2 to 3 was sunny with prevailing light to moderate wind blowing from the Northeast to Southwest, while on December 13, 2024, the weather from station 1 was sunny with prevailing light to moderate wind blowing from the Southwest to Northeast, respectively. *Thus, the results of* ***TSP, SO_2 and NO_2 concentrations are within the applicable CAA/IRR standard for 60 minutes of sampling.***

NOISE LEVEL MEASUREMENT MONITORING REPORT

FACILITY NAME: **Benguet Corporation Acupan Contract Mining Project**

FACILITY ADDRESS: Balatoc, Virac, Itogon, Benguet

INTRODUCTION

Environmental noise is the unwanted or harmful outdoor sound created by human activity. On December 13, 2024, daytime noise level monitoring was conducted in Three (3) stations within the premises of their facility located at the above address. Noise level measurement was performed, and the measurement was conducted as part of their environmental monitoring and permit requirements.

OBJECTIVE OF THE MONITORING

The objective of noise monitoring is to provide data regarding the level of noise in a location so that it may be compared to the National Pollution Control Commission's (NPCC) noise limit standard. It is also to assess the impact of industrial activities on noise pollution and implement mitigation strategies to safeguard both workers well-being and the surrounding environment.

SAMPLING METHODOLOGY

A precision-type digital sound level meter was used for noise measurement. The said instrument is a LUTRON sound level meter, Model SL-4033SD. The sound level meter meets the IEC 61672 class 1 standard. The sound level meter that was used to measure the level was calibrated at Switchtek Measurement Systems with an acoustical calibrator (Lutron Sound Level). The noise was measured using an “A” weighting network and “slow response” with different limits for various times of the day and area categories. Noise measurement was performed for about 3 to 5 minutes per

station after the 1-hour ambient sampling activity. The noise sampler was handheld at about thirty degrees (30°) from the plane directly pointing to the facility.

SAMPLING LOCATIONS

There are Three (3) sampling stations for noise level measurement monitoring. The table below shows the location and observations made during the sampling activity.

STN	LOCATION	OBSERVATION / DURING NOISE LEVEL MEASUREMENT
1	Along Keymens Road	The audible noise was detected from the plant facility that the generator set was operational during sampling.
2	Near Assay Laboratory & Gate 2	The audible noise was detected from the plant facility that the generator set was operational during sampling.
2	Near BCACMP Office	The audible noise was detected from the plant facility that the generator set was operational during sampling.

SUMMARY OF RESULTS

Table 3
Noise Level Measurement Monitoring Reading

Location	Time	Median (dBA)	Category of the Area	DENR Standard (dBA)
Along Keymens Road	1420H-1423H	62.9	Class C	70
Near Assay Laboratory & Gate 2	1238H-1241H	55.8	Class C	70
Near BCACMP Office	1120H-1123H	49.5	Class C	70

Table 4
Environmental Noise Quality Standards in General Areas

Category of the Area	Maximum Allowable Noise (dBA)		
	Day Time 0900H to 2900H	Morning & Evening 0500H to 0900H / 2900H to 2200H	Nighttime 2200H to 0500H
AA	50	45	40
A	55	50	45
B	65	60	55
C	70	65	60
D	75	70	65

The Philippines standard for noise is categorized into Three (3) classes of sections, and the maximum allowable noise is classified in different time.

Description per Category

Class AA — A section or contiguous area which requires quietness, such as areas within 100 meters from school sites, nursery schools, hospital, and special home for the aged.

Class A — A section or contiguous area which is primarily used for residential purposes.

Class B — A section or contiguous area which zoned or used as a commercial area.

Class C — A section primarily zoned or used as a light industrial area.

Class D — A section which is primarily reserved, zoned, or used as a heavy industrial area.

DISCUSSION OF RESULTS

The environmental noise standards are based on Memorandum Circular No. 002 Series of 1980 of the National Pollution Control Commission. The noise was measured using an "A" weighting network and "slow response" with different limits for various times of the day and area categories. The location of Benguet Corporation Acupan Contract Mining Project is primarily zoned or used as a industrial area (Class C) with a DENR Daytime Noise Standard of 70 dBA.

The results of the noise level measurement reading show that the noise level in ***stations 1 to 3 were within the applicable DENR daytime limit of 70 dBA.*** The audible noise was detected from the plant facility and vehicle that passing by during sampling.

“APPENDIX A”

AMBIENT AIR MONITORING
FIELD DATAS

AMBIENT AIR MONITORING DATA
Benguet Corporation - Acupan Contract Mining Project
December 13, 2024

GPS Location: N 16°21'35.718" E 120°39'31.724"

Station 1 ***(Upwind)***	**Along Keymens Road**			Flowrate			
				TSP	NO2	SO2	Wind Speed
Time	Pbar inHg	Amb. Tmp. °C	RH%	m3/min	lpm	lpm	m/s
1315H-1325H	27.12	31.1	59.2	1.0	0.5	0.5	1.8
1325H-1335H	27.12	29.7	59.6	1.0	0.5	0.5	1.6
1335H-1345H	27.12	29.6	58.7	1.0	0.5	0.5	1.6
1345H-1355H	27.11	29.0	60.0	1.0	0.5	0.5	1.8
1355H-1405H	27.11	28.6	60.7	1.0	0.5	0.5	1.8
1405H-1415H	27.11	28.3	61.2	1.0	0.5	0.5	1.8
Average	27.12	29.4	59.9	1.0	0.5	0.5	1.7

GPS Location: N 16°21'33.744" E 120°39'30.636"

Station 2 ***(Upwind)***	**Near Assay Laboratory & Gate 2**			Flowrate			
				TSP	NO2	SO2	Wind Speed
Time	Pbar inHg	Amb. Tmp. °C	RH%	m3/min	lpm	lpm	m/s
1135H-1145H	27.25	31.2	53.2	1.0	0.5	0.5	1.2
1145H-1155H	27.25	31.1	57.5	1.0	0.5	0.5	1.0
1155H-1205H	27.25	30.8	57.7	1.0	0.5	0.5	1.0
1205H-1215H	27.24	30.7	56.7	1.0	0.5	0.5	1.2
1215H-1225H	27.24	29.5	59.5	1.0	0.5	0.5	1.4
1225H-1235H	27.24	31.0	56.8	1.0	0.5	0.5	1.2
Average	27.25	30.7	56.9	1.0	0.5	0.5	1.2

GPS Location: N 16°21'38.406" E 120°39'36.17"

Station 3 ***(Downwind)***	**BCACMP Office**			Flowrate			
				TSP	NO2	SO2	Wind Speed
Time	Pbar inHg	Amb. Tmp. °C	RH%	m3/min	lpm	lpm	m/s
1015H-1025H	27.27	28.7	58.9	1.0	0.5	0.5	1.0
1025H-1035H	27.27	29.5	57.7	1.0	0.5	0.5	1.0
1035H-1045H	27.27	29.9	56.3	1.0	0.5	0.5	1.2
1045H-1055H	27.27	30.0	55.9	1.0	0.5	0.5	1.0
1055H-1105H	27.26	30.6	53.2	1.0	0.5	0.5	1.2
1105H-1115H	27.26	30.9	53.0	1.0	0.5	0.5	1.2
Average	27.27	29.9	55.8	1.0	0.5	0.5	1.1

NOISE LEVEL MEASUREMENT MONITORING RESULTS
Benguet Corporation - Acupan Contract Mining Project
December 13, 2024

Station 1	**Along Keymens Road**		
Time of Sampling (1420H- 1423H)			
65.0	62.0	63.2	62.0
64.5	62.9	63.7	62.7
64.3	61.9	63.6	62.5
69.6	62.5	62.5	63.1
66.0	65.6	62.2	62.8
63.9	62.6	62.3	62.6
63.0	63.7	61.7	62.5
Median =	***62.9***	***Average =***	***63.39***
Minimum =	***61.7***	***Maximum =***	***69.6***

Station 2	**Near Assay Laboratory & Gate 2**		
Time of Sampling (1238H - 1241H)			
54.6	59.8	56.5	56.3
53.6	69.8	55.8	55.7
53.2	63.2	56.3	55.8
58.2	68.5	57.8	55.5
53.3	55.5	55.4	61.7
55.0	55.4	56.0	50.2
54.5	56.6	56.1	52.1
Median =	***55.8***	***Average =***	***56.87***
Minimum =	***50.2***	***Maximum =***	***69.8***

Station 3	**BCACMP Office**		
Time of Sampling (1120H - 1123H)			
53.5	50.6	52.0	48.4
48.8	49.8	51.0	50.6
51.3	48.6	49.0	49.6
48.6	48.5	48.5	49.1
54.1	48.5	50.6	54.6
52.4	48.8	50.8	48.8
51.5	47.9	49.1	49.3
Median =	***49.5***	***Average =***	49.3
Minimum =	***47.9***	***Maximum =***	***54.6***

GREENTEK Environmental Phils. Co.

AMBIENT AIR QUALITY AND NOISE LEVEL MONITORING

Name of Facility: Benguet Corp Acupan Contract Mining Project
Facility Address: ITOGON Benguet
Facility Representative: Ms. Jamimah Salayog Personnel: RSP, BCB, EGT

Station No.: 1 Cupwing
Specific Location: Along Keyman's Road
Sampling Date: 12-13-24 Coordinates: 16°21'35.714"N 120°39'31.824E
Filter ID: 240478 Filter Weight: 2.6956

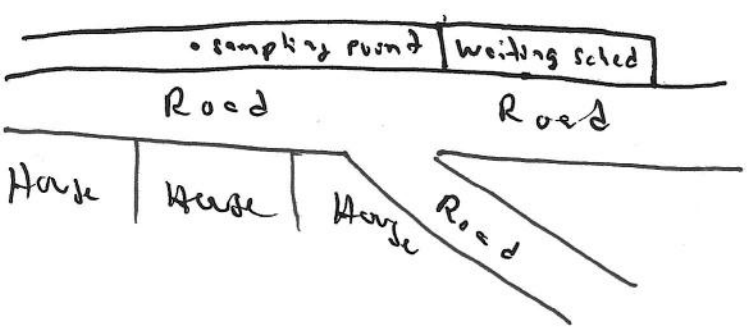
Time	Barometric Pressure inHg	RH%	Ambient Temp., °C	TSP Flow Rate m³/min	NO2 Flow Rate, lpm	SO2 Flow Rate, lpm	Weather Condition	Wind Direction	Wind Speed m/s
1315 - 1325	27.12	59.2	31.1	1.0	0.5	0.5	Sunny	SW-NE	1.8
1325 - 1335	27.12	59.6	29.7	1.0	0.5	0.5	Sunny	SW-NE	1.6
1335 - 1345	27.12	58.7	29.6	1.0	0.5	0.5	Sunny	SW-NE	1.6
1345 - 1355	27.11	60.0	29.0	1.0	0.5	0.5	Sunny	SW-NE	1.8
1355 - 14:05	27.11	60.7	28.6	1.0	0.5	0.5	Sunny	SW-NE	1.8
1405 - 1415	27.11	61.2	28.3	1.0	0.5	0.5	Sunny	SW-NE	1.8

Description of the sampling location and observations: (*use separate sheet if necessary*)

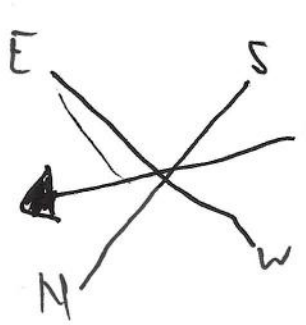
- The Area is light moderate wind.
- The Plant Facility operational during sampling period.

Vehicle
Car - ||||-||||-||
Truck - ||||-||||-||||-
Motorcycle- ||||-||||-||||-

Sketch of sampling location showing landmarks.



Wind Direction



Noise Level Monitoring

Station No.: 1 Sampling Date: 12-13-24
Specific Location: Along Keyman's Road

Time					Noise Source / Observation
1420	65.0	62.0	63.2	62.0	Noise Came From Facility Operation
	64.5	62.4	63.7	62.7	
	64.3	61.5	63.6	62.5	
	64.6	62.5	62.5	63.1	
	64.0	65.6	62.2	62.6	
	63.9	62.6	62.3	62.6	
1423	63.0	63.7	61.7	62.5	

GREENTEK Environmental Phils.Co.

AMBIENT AIR QUALITY AND NOISE LEVEL MONITORING

Name of Facility: Benguet Corp Acupan contract Mining Project
Facility Address: ITOGON Benguet
Facility Representative: Ms. Jemimah Salayog Personnel: RSP, BCB, EGJ

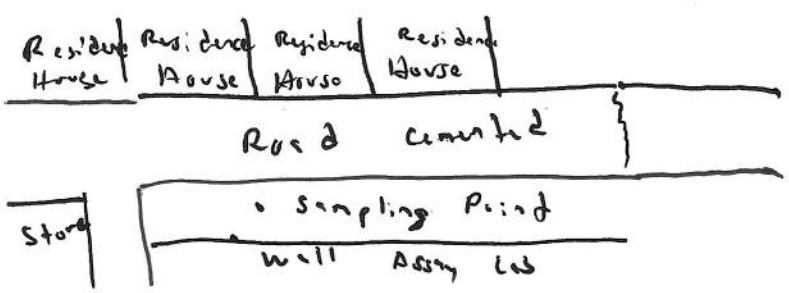
Station No.: 2 (upwind)
Specific Location: Near Assay Lab and Met lab
Sampling Date: 12-13-24 Coordinates: 16°21'33.744"N 120°39'30.636"E
Filter ID: 240477 Filter Weight: 2.6826

Time	Barometric Pressure inHg	RH%	Ambient Temp., °C	TSP Flow Rate m³/min	NO2 Flow Rate, lpm	SO2 Flow Rate, lpm	Weather Condition	Wind Direction	Wind Speed m/s
1135 - 1145	27.25	53.2	31.2	1.0	0.5	0.5	Sunny	NE-SW	1.2
1145 - 1155	27.25	57.5	31.1	1.0	0.5	0.5	Sunny	NE-SW	1.0
1155 - 1205	27.25	57.7	30.8	1.0	0.5	0.5	Sunny	NE-SW	1.0
1205 - 1215	27.24	56.7	30.7	1.0	0.5	0.5	Sunny	NE-SW	1.2
1215 - 1225	27.24	59.5	29.5	1.0	0.5	0.5	Sunny	NE-SW	1.4
1225 - 1235	27.24	56.8	31.0	1.0	0.5	0.5	Sunny	NE-SW	1.2

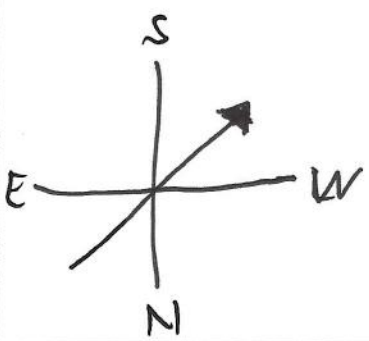
Description of the sampling location and observations: (*use separate sheet if necessary*)
The Area is cemented but dusty because of the vehicle passing by the road.
the Area is light moderate wind

Vehicle
Truck - IIII - IIII -
Car - IIII -
Motorcycle - IIII - III

Sketch of sampling location showing landmarks.



Wind Direction



Noise Level Monitoring

Station No.: 2 Sampling Date: 12-13-24
Specific Location: Near Assay Lab and Met lab

Time					Noise Source / Observation
1238	54.6	59.8	56.5	56.3	Noise came from the vehicle passing by the road.
	53.6	69.8	55.8	55.7	
	55.2	63.2	56.3	55.8	
	58.2	68.5	57.8	55.5	
	57.3	55.5	55.4	61.7	
	55.0	55.4	56.0	50.2	
1241	54.4	56.6	56.1	52.1	

GREENTEK Environmental Phils.Co.

AMBIENT AIR QUALITY AND NOISE LEVEL MONITORING

Name of Facility: Benguet Corp ACCUPan Contract Mining Project
Facility Address: ITOGON BENGUET
Facility Representative: Ms. Jemimah Salayog Personnel: RSP, BCB, EGJ

Station No.: 3 (Downwind)
Specific Location: BCACMP - OFFICE
Sampling Date: 12-13-24 Coordinates: 16°21'38.406"N 120°39'36.17"E
Filter ID: 240476 Filter Weight: 2.6923

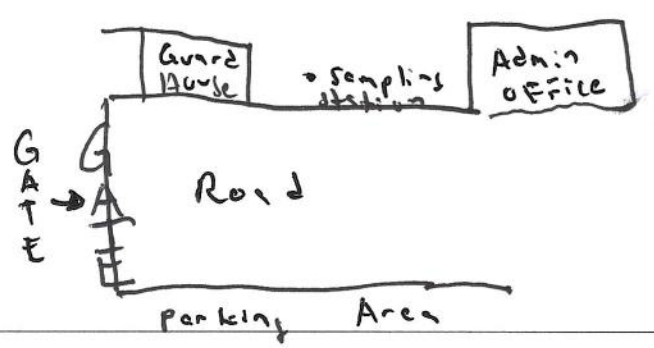
Time	Barometric Pressure inHg	RH%	Ambient Temp., °C	TSP Flow Rate m³/min	NO2 Flow Rate, lpm	SO2 Flow Rate, lpm	Weather Condition	Wind Direction	Wind Speed m/s
1015 - 1025	27.27	58.9	28.7	1.0	0.5	0.5	Sunny	NE-SW	1.0
1025 - 1035	27.27	57.7	29.5	1.0	0.5	0.5	Sunny	NE-SW	1.0
1035 - 1045	27.27	56.3	29.9	1.0	0.5	0.5	Sunny	NE-SW	1.2
1045 - 1055	27.27	55.9	30.0	1.0	0.5	0.5	Sunny	NE-SW	1.0
1055 - 1105	27.26	53.2	30.6	1.0	0.5	0.5	Sunny	NE-SW	1.2
1105 - 1115	27.26	53.0	30.9	1.0	0.5	0.5	Sunny	NE-SW	1.2

Description of the sampling location and observations: (*use separate sheet if necessary*)

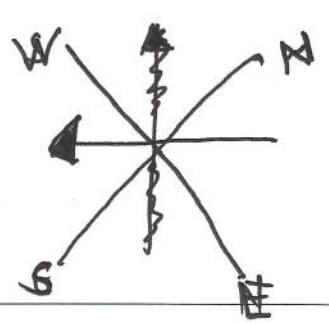
- The Facility is operation during sampling period.
- The Area is light Moderate wind.

Vehicle
Truck - NIL - Motorcycle -
Car - 1

Sketch of sampling location showing landmarks.



Wind Direction



Noise Level Monitoring

Station No.: 3 Sampling Date: 12-13-24
Specific Location: BCAMP - OFFICE

Time					Noise Source / Observation
1120	53.2	50.6	52.0	48.9	Noise come from the vehicle passing by near Road.
	48.8	49.8	51.0	50.6	
	51.3	48.6	46.0	49.6	
	48.4	48.5	48.9	49.1	
	54.1	48.5	50.4	54.6	
	52.4	48.8	50.8	48.8	
1123	51.5	47.9	49.1	49.4	

“APPENDIX B”

RESULTS OF LABORATORY ANALYSIS

AMBIENT AIR SAMPLING LABORATORY REPORT
Benguet Corporation - Acupan Contract Mining Project
December 13, 2024

Laboratory Data

Station #	TSP ug	SO2 ug	NO2 ug
Station 1	14,500	0.29	0.532
Station 2	10,200	0.29	0.425
Station 3	9,800	0.29	0.333

Computation

TSP = (concentration-ug)/((flowrate-1.0)*(298/(Tm-ave.+273))*((Pbar-ave.*25.4)/760))*60
SO2 = (concentration-ug)/((flowrate-0.5/1000)*(298/(Tm-ave.+273))*((Pbar-ave.*25.4)/760))*60
NO2 = (concentration-ug)/((flowrate-0.5/1000)*(298/(Tm-ave.+273))*((Pbar-ave.*25.4)/760))*60

Concentration at Standard Condition

Station #	TSP ug/Ncm	SO2 ug/Ncm	NO2 ug/Ncm
Station 1	270.6	10.8	19.9
Station 2	190.3	10.8	15.9
Station 3	182.2	10.8	12.4

MACH UNION LABORATORIES INC.

Main Office: Mach Union Building, 335 Alabang-Zapote Road, Talon 3, 1740 Las Piñas City, Philippines
Extension Office: ANFRA Bldg., FMC-LTO Cmpd., 314 Alabang-Zapote Road, Talon 1, 1740 Las Piñas City
Tel. No.: (02)8553-8381 / (02)8553-8382 / (02)8553-8879/ (02)8550-2573 Fax No.: (02) 8553-8878
Email: info@machunion.com • Website: www.machunion.com • http://www.facebook.com/MachUnion
Accredited: Philippine Accreditation Bureau (DTI-PAB) • Department of Health • Food & Drug Administration
Recognized: Department of Environment & Natural Resources (DENR-EMB) • Bureau of Animal Industry (DA–BAI)

CERTIFICATE OF ANALYSIS

Work Order : **MU24035702** **Lab. Sample ID :** **MU24035702-001** **Date Reported:** **12/21/2024**

Client ID : NCRMUL-000356

CUSTOMER : **GREENTEK ENVIRONMENTAL PHILS. CO.**
2430 Laura St., Brgy. 862, Pandacan, Manila

Attention Liwayway P. Gaddi
09175139249
greentek.services@yahoo.com

PROJECT DETAILS: BENGUET CORP ACUPAN CONTRACT MINING PROJECT
Itogon, Benguet

SAMPLE INFORMATION

Sample Type : Air Ambient
Identification : BCACMP AIR QUALITY MONITORING
Description : Air Ambient Sample in Absorbing Solution in 50mL HDPE and Filter Paper (8X10)
Collection Date and Time : 12/13/2024 12:00 AM
Collected by : CUSTOMER

Storage Condition : Chilled and Ambient

Received Date and Time : 12/16/2024 02:35 PM
Analyzed Start Date and Time : 12/16/2024 03:15 PM
Analyzed End Date and Time : 12/20/2024 06:00 PM

Comments:

1 *All sample information stated herein are based on the details provided by the client. The results in this certificate of testing relates only to the samples submitted to and tested by the laboratory.*

MACH UNION LABORATORIES INC.

Main Office: Mach Union Building, 335 Alabang-Zapote Road, Talon 3, 1740 Las Piñas City, Philippines
Extension Office: ANFRA Bldg., FMC-LTO Cmpd., 314 Alabang-Zapote Road, Talon 1, 1740 Las Piñas City
Tel. No.: (02)8553-8381 / (02)8553-8382 / (02)8553-8879/ (02)8550-2573 Fax No.: (02) 8553-8878
Email: info@machunion.com • Website: www.machunion.com • http://www.facebook.com/MachUnion
Accredited: Philippine Accreditation Bureau (DTI-PAB) • Department of Health • Food & Drug Administration
Recognized: Department of Environment & Natural Resources (DENR-EMB) • Bureau of Animal Industry (DA-BAI)

PAB ACCREDITED
TESTING LABORATORY
PNS ISO/IEC 17025:2017
LA-2012-215C

CERTIFICATE OF ANALYSIS

Work Order : MU24035702 **Lab. Sample ID :** MU24035702-001 **Date Reported:** 12/21/2024

CUSTOMER : GREENTEK ENVIRONMENTAL PHILS., CO.

Sample Source : BCACMP AIR QUALITY MONITORING

LABORATORY TEST RESULTS

SAMPLE ID	PARAMETER	TEST METHOD	UNIT	RESULT
BCACMP – STN 1	Nitrogen Dioxide	Griess Saltzman Method	ug	0.532
BCACMP – STN 1	Sulfur dioxide	Pararosaniline Method	ug	< 0.29
BCACMP – STN 1	Total Suspended Particulate	High Volume /Gravimetric Method	ug	14500
BCACMP – STN 2	Nitrogen Dioxide	Griess Saltzman Method	ug	0.425
BCACMP – STN 2	Sulfur dioxide	Pararosaniline Method	ug	< 0.29
BCACMP – STN 2	Total Suspended Particulate	High Volume /Gravimetric Method	ug	10200
BCACMP – STN 3	Nitrogen Dioxide	Griess Saltzman Method	ug	0.333
BCACMP – STN 3	Sulfur dioxide	Pararosaniline Method	ug	< 0.29
BCACMP – STN 3	Total Suspended Particulate	High Volume /Gravimetric Method	ug	9800

Test Method Reference:

Code of Federal Regulations Title 40 Parts 50 to 51. USA. 1999.
Selected Methods of Measuring Air Pollutants. WHO. 1976.
US EPA Title 40 Code of Federal Regulations. Part 50 Standard of Performance for New Stationary Sources. Appendix A to O. 1991

Checked by:

Victor Gregory Jude D. Garcia, RCh
Chemist III
PRC# 0043349

Certified by:

Marisa T. Manaor, RCh
Supervising Chemist
PRC#: 0005465

Approved for Release by:

Aladino M. Abulencia, ChE
Technical Manager
PRC License No. 0008351

MU24035702_FINAL_241221 0917H

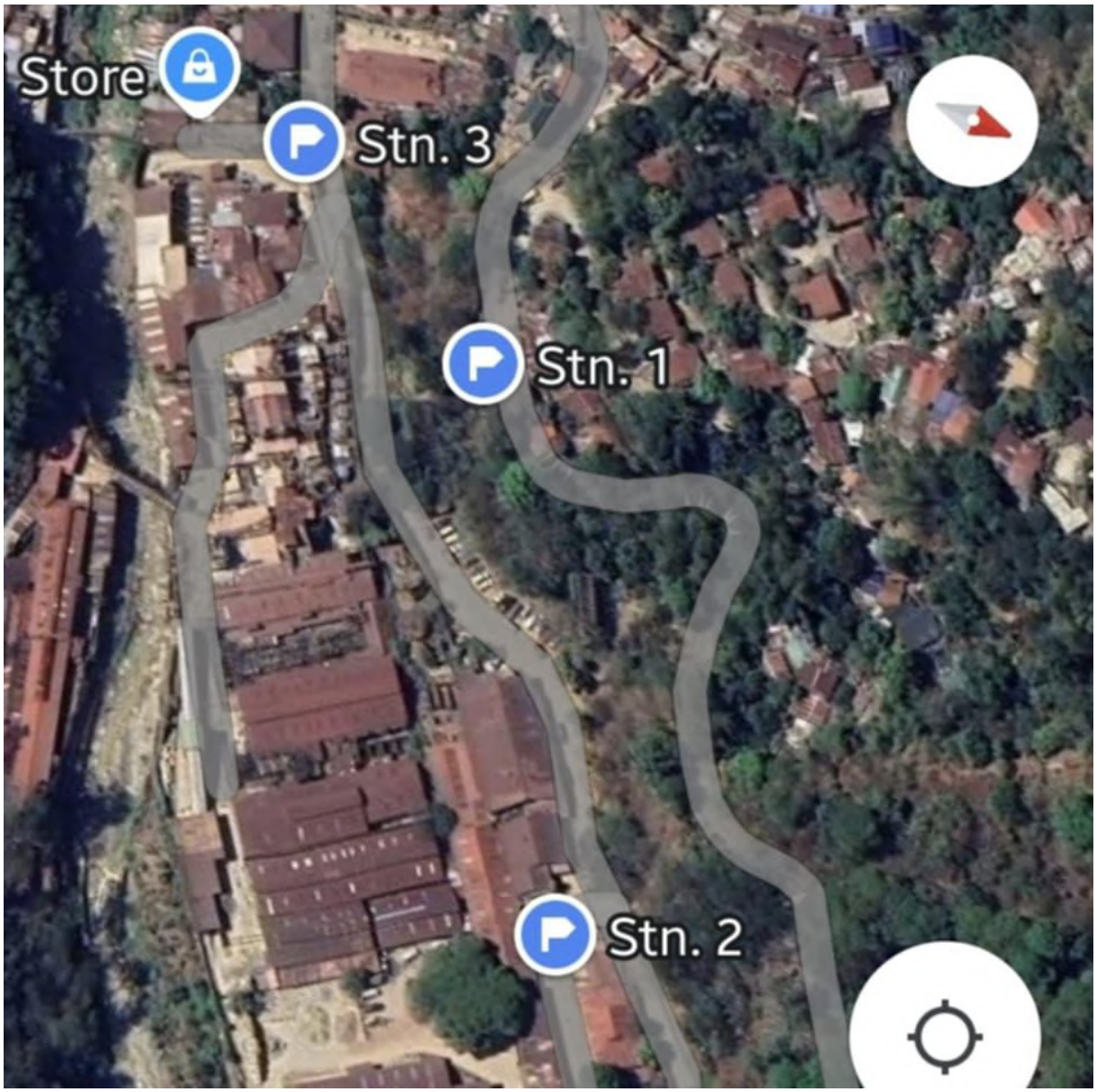
"APPENDIX C"

SAMPLING ACTIVITY PHOTOS AND VICINITY MAP

Station 1 - Along Keymens Road (Upwind)

Station 2 - Near Assay Laboratory & Gate 2 (Upwind)

Station 3 - Near BCACMP Office (Downwind)



VICINITY MAP

“APPENDIX D”

AMBIENT AIR EQUIPMENT CALIBRATION CERTIFICATES

Switchtek
Measurement Systems
A Division of Switchtek Construction Corporation
4th Floor Northridge Plaza, Annex A, 12 Congressional Ave.,
Bahay Toro,Quezon City, 1100, Philippines
Tel Nos.02 4267593 / 9282869 / 9287769 Fax No.4537694
email Address: admin@switchtek.com.ph
www.switchtek.com.ph

Certificate No.: 4000.23-9142-1.23 **Calibration of** 3 IN1 (barometer function)
Identification: GREENTEK ENVIRONMENTAL PHILS., CO
Address: 2353 RJ PLACE UNIT 3A SELYA STREET BRGY.860 PANDACAN, MANILA, PHILIPPINES

CERTIFICATE OF CALIBRATION - 3 IN 1 (Barometer Function)

This report of calibration shall document that the instrument herein was examined and tested in compliance with ISO/IEC 17025 against NIST traceable reference standards and its co-equal standards.

UNIT UNDER TEST (UUT):

Instrument: 3 IN1 (barometer function)
Brand: LUTRON
Model No.: PHB-318
Serial No.: No record
Range: Temp. (0-50 Deg. C)
Humidity (10 to 95%)
Dewpoint (-25.3 to 48.9 Deg. C)
Barometer (10 to 999.9 hPa)
Resolution: Temp. (0.1 Deg. C)
Humidity (0.1 %)
Dewpoint (0.1 Deg. C)
Barometer (1 hPa)
ID code: No record

Calibration Date: November 20, 2024
Calibration Due: November 19, 2025
Calibrated By: C.A. CASADO

Results:

Barometer

REFERENCE READING (hPa)	UNIT UNDER TEST READING (hPa)	ERROR IN READING (hPa)	STANDARD DEVIATION	REMARKS
1009.0	1003.0	6.00	4.2426	The user should determine the suitablity of the instrument for its intended use
1005.0	1000.0	5.00	3.5355	
1000.0	995.0	5.00	3.5355	
990.0	984.0	6.00	4.2426	

Standard error: ± 7.78 hPa
Uncertainty: ± 6.09 hPa

Switchtek
Measurement Systems
A Division of Switchtek Construction Corporation
4th Floor Northridge Plaza, Annex A, 12 Congressional Ave.,
Bahay Toro,Quezon City, 1100, Philippines
Tel Nos.83517471 / 89282869 / 89287769 Fax No. 89828269
email Address: admin@switchtek.com.ph
www.switchtek.com.ph

Certificate No.:	**4000.05-5664-2.23. REV**	**Calibration of**	**Rotameter**
Identification:	**GREENTEK ENVIRONMENTAL PHILS., CO**		
Job:	P1	Test and Verification	
Fin.acc:	32	Certificate of Calibration	
Done.....:	**July 20, 2024**	Initials....:	**CAC**
Categories	Test and Calibration	**Men**	**Hours**
Cal Officer		2	1.0

Total cost	**Type**
-	Certificate

CERTIFICATE OF CALIBRATION - ROTAMETER

This report of calibration shall document that the instrument herein was examined and tested in compliance with ISO/IEC 17025 against NIST traceable reference standards and its co-equal standards.

Issued To: **GREENTEK ENVIRONMENTAL PHILS., CO**
Address: **2430 LAURA STREET, PANDACAN, MANILA, PHILIPPINES**

UNIT UNDER TEST (UUT):

Instrument:	Rotameter
Brand:	KIMOTO
Model No:	F94-40883
Serial No:	No record
Property ID:	No record
Range:	0.1 to 2.5 LPM
Graduation:	0.1 LPM
Calibration Date:	July 02, 2024
Calibration Due:	July 02, 2025

CALIBRATOR INFORMATION:

Instrument:	DWYER, Rotameter
Inert Gas:	Pure (N2) Nitrogen Gas
Standard Thermometer:	Heraeus, Standard platinum resistance thermometer
Standard Gauge:	Test Gauge, NABL,UKAS, Cert#SMS200.01
Instrument:	Primary DC DRYCAL
Brand:	BIOS
Serial No.:	4329
Traceability:	NIST, NPL and PTB Lab.

Environmental Condition:
Condition: DRY/BASIC/NEUTRAL
Relative Humidity: 48 ±5%, 1009 hPa

Ambient Temp. (Deg C): 19.8 ±2

Calibration Method:

By comparative technique, unit under test was tested and calibrated in referenced with a Standard Flowmeter at planned intervals using dried and filtered inert gas and in accordance with NIST, NPL and ISO/IEC Guide 17025. Data were gathered and tabulated.

During calibration, the unit was found to have a standard error of ± 0.0000 LPM with a confidence level of not less than 95%. Uncertainty of measurement is ± 0.058 LPM. Calculations were taken using Standard Deviation Formula.

Result:

NO. OF TEST	REFERENCE READING (LPM)	UNIT UNDER TEST READING (LPM)	ERROR IN READING (LPM)	STANDARD DEVIATION
1	0.000	0.00	0.000	0.0000
2	0.500	0.50	0.000	0.0000
3	1.000	1.00	0.000	0.0000
4	1.500	1.50	0.000	0.0000
5	2.000	2.00	0.000	0.0000

Remarks:
All data pertain only to the unit described obtained at the time of test. This certificate is not valid w/out seal and signature. Unauthorized reproduction is prohibited.

********** *NOTE MEASUREMENT INDICATOR IS AT THE UPPER PART OF THE FLOATER* **********

Calibrated By: C.A. CASADO
Date: July 02, 2024

Certified By: A.R. CAINDOC
Date: July 02, 2024

Switchtek
Measurement Systems
A Division of Switchtek Construction Corporation
4th Floor Northridge Plaza, Annex A, 12 Congressional Ave.,
Bahay Toro,Quezon City, 1100, Philippines
Tel Nos.02 4267593 / 9282869 / 9287769 Fax No.4537694
email Address: admin@switchtek.com.ph
www.switchtek.com.ph

Certificate No.:	**400.01-8227-1.23**	**Calibration of**	**Sound Level Meter**
Identification:	**GREENTEK ENVIRONMENTAL PHILS., CO**		
Job:	P1	Test and Verification	
Fin.acc:	32	Certificate of Calibration	
Done.....:	**June 4, 2024**	Initials...:	**CAC**
Categories	**Calibration**	**Men** / **Hours** / **Total cost** / **Type**	
Cal Officer		2 / 1.0 / - / Certificate	

CERTIFICATE OF CALIBRATION - SOUND LEVEL METER

This report of calibration shall document that the instrument herein was examined and tested in compliance with ISO/IEC 17025 against NIST traceable reference standards and its co-equal standards.

Issued To: **GREENTEK ENVIRONMENTAL PHILS., CO**
Address: **2353 RJ PLACE UNIT 3A SELYA STREET BRGY. 860 PANDACAN, MANILA, PHILIPPINES**

UNIT UNDER TEST (UUT):

Instrument:	Sound Level Meter
Brand:	LUTRON
Model No:	SL-4033SD
Serial No:	I.433801
Range:	35 to 130 dB
ID Code:	No record
Calibration Date:	June 3, 2024
Calibration Due:	June 2, 2025

CALIBRATOR INFORMATION:

Instrument:	Sound Level Calibrator
Brand:	Lutron
Serial No:	I.278821
Model No:	SC-942
Traceability:	IEC 60942 Type II A Standard
	NIST and NPL

Environmental Condition:

Condition:	DRY/BASIC/NEUTRAL
Relative Humidity:	41.2 ±5%, 1006 hPa
Ambient Temp. (Deg C):	23..7 ±2

Calibration Method:

By comparative technique, Standard Sound Generator was introduced at the unit under test at a constant value of 94.0 dB to 114 dB at a uniform frequency of 1000 Hz. Data were gathered and tabulated. Procedures of test conform to the requirements of OIML 88 Guidelines, IEC 60942 of the NIST and National Physical Laboratories.

During calibration, the unit was found to have a standard error of ±0.00 dB with a confidence level of not less than 95%. Uncertainty of measurement is ±0.58 dB. Calculations were taken using the Standard Deviation Formula.

Results:

TRIALS	REFERENCE READING (dB)	UNIT UNDER TEST READING (dB)		ERROR IN READING	STANDARD DEVIATION	REMARKS
		AS FOUND	AS LEFT			
1	94.0	93.8	94.0	0.00	0.0000	Passed
2	114.0	114.0	114.3	0.30	0.2121	

Remarks:

All data pertain only to the unit described obtained at the time of test. This certificate is not valid w/out seal and signature. Unauthorized reproduction is prohibited.

Calibrated By: C.A. CASADO
Date: June 3, 2024

Certified By: A.R. CAINDOC
Date: June 4, 2024

Switchtek
Measurement Systems
A Division of Switchtek Construction Corporation
4th Floor Northridge Plaza, Annex A, 12 Congressional Ave.,
Bahay Toro,Quezon City, 1106, Philippines
Tel Nos: 3453-7694 ; 8928-2869 ; 8928-7769 Fax No.: 8426-7593
email Address: admin@switchtek.com.ph
www.switchtek.com.ph

Certificate No.:	**4000.05-8227-1.23**	**Calibration of**	**High Volume Sampler**		
Identification:	**GREENTEK ENVIRONMENTAL PHILS., CO**				
Job:	P1	Test and Verification			
Fin.acc:	32	Certificate of Calibration			
Done.....:	May 15, 2024	Initials...:	CAC		
Categories		Men	Hours	Total cost	Type
Cal Officer		1	1.0	-	Certificate

CERTIFICATE OF CALIBRATION - HIGH VOLUME SAMPLER

This report of calibration shall document that the instrument herein was examined and tested in compliance with ISO/IEC 17025 against NIST traceable reference standards and its co-equal standards.

Issued To: GREENTEK ENVIRONMENTAL PHILS., CO
Address: 2353 RJ PLACE UNIT 3A SELVA STREET BRGY. 860 PANDACAN, MANILA, PHILIPPINES

UNIT UNDER TEST (UUT):

Instrument:	High Volume Sampler
Brand:	STAPLEX
Model No:	TFIA-2
Serial No:	25707T
Range:	0.5 to 2 m3/min.
Graduation:	0.1 m3
ID code:	No record
Calibration Date:	May 11, 2024
Calibration Due:	May 10, 2025

CALIBRATOR INFORMATION:

Instrument:	Rotating Vane Anemometer
Manufacturer:	LUTRON
Model No:	AM-4206M
Serial No:	Q432206
Range:	0 to 30.0 m/s
	0 to 50.0 °C
Origin:	USA
Calibrated Against:	UKAS, thru Laser Doppler Anemometer

Environmental Condition:
Condition: DRY/BASIC/NEUTRAL
Relative Humidity: 56 ±5%, 1011 hPa

Ambient Temp. (Deg C): 24.5 ±2

Calibration Method:

By comparative technique, unit under test was tested and calibrated in reference with a rotating vane anemometer at planned intervals using dried and filtered inert gas and with NIST, NPL and ISO/IEC Guide 17025. Data were gathered and tabulated.

During calibration, the unit was found to have a standard error of ± 0.008 m3/min. with a confidence level of not less than 95%. Uncertainty of measurement is ± 0. 062m3/min. Calculations were taken using Standard Deviation Formula.

Results:

NO. OF TEST	REFERENCE READING (m3/min.)	UNIT UNDER TEST READING (m3/min.)	ERROR IN READING (m3/min.)	STANDARD DEVIATION
1	1.00	1.0	0.000	0.0000
2	1.49	1.5	0.010	0.0071
3	2.01	2.0	-0.010	0.0071

Remarks:
All data pertain only to the unit described obtained at the time of test. This certificate is not valid w/out seal and signature. Unauthorized reproduction is prohibited.

Calibrated By: C. CASADO
Date: May 11, 2024

Certified By: A. CANDOS
Date: May 11, 2024

“APPENDIX E”

AMBIENT AIR TESTING PARTICIPANTS

AMBIENT AIR TESTING PARTICIPANTS

BENGUET CORPORATION ACUPAN CONTRACT MINING PROJECT

Ms. Jemimah Salayog	-	Facility Representative

GREENTEK ENVIRONMENTAL PHILS. CO.

Mr. Danilo M. Palaypay, Jr.	-	Technical and QA/QC Manager
Mr. Bryan C. Badon	-	Team Leader - Trainee
Mr. Emerbill G. Justo	-	Team Leader - Trainee
Mr. Reynaldo S. Pile	-	Field Technician / Driver

Republic of the Philippines
Department of Environment and Natural Resources
ENVIRONMENTAL MANAGEMENT BUREAU
Visayas Avenue, Diliman, Quezon City

SAT No. 2023 – 151

CERTIFICATE OF ACCREDITATION

Pursuant to DENR Administrative Order No. 26 Series of 2013 of the Department of Environment and Natural Resources having substantially met all the requirements prescribed therein,

GREENTEK ENVIRONMENTAL PHILS. CO.

#2430 Laura St., Pandacan Manila

is hereby duly accredited as

SOURCE EMISSION TESTING FIRM

As such, the following are authorized as:

QA/QC Manager
Danilo M. Palaypay, Jr.

Team Leader
Aaron Jonathan R. Regilme

This certification shall allow the above firm and personnel to conduct stack testing limited to the following methods and parameters:

1. US-EPA Method 1 to 5 – PM
2. US-EPA Method 6/8 – SO_2
3. US-EPA Method 7 – NO_x
4. US-EPA Method 10 – CO

Granted this December 22, 2023 and valid until December 22, 2026.

GILBERT C. GONZALES, CESO III
Director and concurrent
Assistant Secretary for Field Operations

“APPENDIX F”

LABORATORY CERTIFICATES OF RECOGNITION

SCOPE OF RECOGNITION AND DENR RECOGNIZED SIGNATORIES ARE SPECIFIED AND CAN BE VERIFIED AT https://emb.gov.ph/denr-recognized-environmental-laboratory/ AND ARE INTEGRAL PARTS OF THIS CERTIFICATE.

ISSUE DATE: JULY 25, 2023
EXPIRY DATE: JULY 25, 2026

ELR LABORATORY CODE NO. NCR-29

Republic of the Philippines
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
Visayas Avenue, Diliman, Quezon City

This

CERTIFICATE OF RECOGNITION

C.R. No. 040/2023

is hereby granted to

Mach Union Laboratories Inc.

Mach Union Bldg., 335 Alabang-Zapote Road, Talon Tres, Las Piñas City & ANFRA Bldg., FMC-LTO Compound 314 Alabang Zapote Road, Talon Uno, Las Piñas City

after having been assessed and found to comply with the documentation, analytical performance and other technical requirements of Administrative Order No. 63, series of 1998 (AO 63), Guidelines for the Designation of DENR Recognized Environmental Laboratories.

This certificate remains valid subject to continued compliance with the requirements of AO 63.

In testimony whereof, I have hereunto signed this Certificate at Quezon City, Philippines.

MARIA ANTONIA YULO LOYZAGA
Secretary

Expiry Date: July 25, 2026

Laboratory Head: Marisa T. Manaor

SCOPE OF RECOGNITION

(Exclusive of Sampling)

Water and Wastewater

PARAMETERS	ANALYTICAL METHODS	REFERENCES
Ammonia as NH_3-N	Ammonia – Selective Electrode Method	SMEWW 4500-NH_3 D
Ammonia as NH_3-N	Phenate Method	SMEWW 4500-NH_3 F
Arsenic	Electrothermal Atomic Absorption Spectrometric Method (Nitric Acid / Hotplate Digestion)	SMEWW 3113 (SMEWW 3030 E)
	Inductively Coupled Plasma – Emission Spectroscopy Method (Nitric Acid – Hydrochloric Acid / Hotplate Digestion)	SMEWW 3120 (SMEWW 3030 F)
	Manual Hydride Generation/ Atomic Absorption Spectrometric Method	SMEWW 3114 B
Barium	Direct Nitrous Oxide-Acetylene Flame Method (Nitric Acid – Hydrochloric Acid / Hotplate Digestion)	SMEWW 3111 D (SMEWW 3030 F)
	Inductively Coupled Plasma – Emission Spectroscopy Method (Nitric Acid – Hydrochloric Acid / Hotplate Digestion)	SMEWW 3120 (SMEWW 3030 F)
BOD	5-Day BOD Test	SMEWW 5210 B
Boron	Carmine Method	SMEWW 4500-B C
	Inductively Coupled Plasma – Emission Spectroscopy Method (Nitric Acid – Hydrochloric Acid/ Hotplate Digestion)	SMEWW 3120 (SMEWW 3030 F)
Cadmium	Direct Air-Acetylene Flame Method (Nitric Acid – Hydrochloric Acid/ Hotplate Digestion)	SMEWW 3111 B (SMEWW 3030 F)
	Electrothermal Atomic Absorption Spectrometric Method (Nitric Acid / Hotplate Digestion)	SMEWW 3113 (SMEWW 3030 E)
	Inductively Coupled Plasma – Emission Spectroscopy Method (Nitric Acid – Hydrochloric Acid / Hotplate Digestion)	SMEWW 3120 (SMEWW 3030 F)
Chemical Oxygen Demand	Closed Reflux, Colorimetric Method	SMEWW 5220 D
	Open Reflux Method	SMEWW 5220 B
Chloride	Argentometric Method	SMEWW 4500-Cl^- B
	Ion Chromatography with Chemical Suppression of Eluent Conductivity	SMEWW 4110 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 (Apparent)	Visual Comparison Method	SMEWW 2120 B

Color (True)	Visual Comparison Method	SMEWW 2120 B
Copper, Total	Direct Air-Acetylene Flame Method (Nitric Acid – Hydrochloric Acid/ Hotplate Digestion)	SMEWW 3111 B (SMEWW 3030 F)
	Electrothermal Atomic Absorption Spectrometric Method (Nitric Acid / Hotplate Digestion)	SMEWW 3113 (SMEWW 3030 E)
	Inductively Coupled Plasma – Emission Spectroscopy Method (Nitric Acid – Hydrochloric Acid / Hotplate Digestion)	SMEWW 3120 (SMEWW 3030 F)
Copper as Dissolved Copper	Direct Air-Acetylene Flame Method (Filtration; Nitric Acid – Hydrochloric Acid/ Hotplate Digestion)	SMEWW 3111 B (SMEWW 3030 F with SMEWW 3030 B)
	Electrothermal Atomic Absorption Spectrometric Method (Filtration; Nitric Acid / Hotplate Digestion)	SMEWW 3113 (SMEWW 3030 E with SMEWW 3030 B)
	Inductively Coupled Plasma – Emission Spectroscopy Method (Filtration; Nitric Acid – Hydrochloric Acid / Hotplate Digestion)	SMEWW 3120 (SMEWW 3030 F with SMEWW 3030 B)
Cyanide as Free Cyanide	Cyanide – Selective Electrode (w/o distillation)	SMEWW 4500-CN^- F
Dissolved Oxygen	Iodometric Method – Azide Modification	SMEWW 4500-O C
	Membrane Electrode Method	SMEWW 4500-O G
Fluoride	Ion Chromatography with Chemical Suppression of Eluent Conductivity	SMEWW 4110 B
	Ion-Selective Electrode Method	SMEWW 4500-F^- C
Iron	Direct Air-Acetylene Flame Method (Nitric Acid – Hydrochloric Acid/ Hotplate Digestion)	SMEWW 3111 B (SMEWW 3030 F)
	Inductively Coupled Plasma – Emission Spectroscopy Method (Nitric Acid – Hydrochloric Acid / Hotplate Digestion)	SMEWW 3120 (SMEWW 3030 F)
Lead	Direct Air-Acetylene Flame Method (Nitric Acid/ Hotplate Digestion)	SMEWW 3111 B (SMEWW 3030 E)
	Electrothermal Atomic Absorption Spectrometric Method (Nitric Acid / Hotplate Digestion)	SMEWW 3113 (SMEWW 3030 E)
	Inductively Coupled Plasma – Emission Spectroscopy Method (Nitric Acid – Hydrochloric Acid / Hotplate Digestion)	SMEWW 3120 (SMEWW 3030 F)
Manganese	Direct Air-Acetylene Flame Method (Nitric Acid – Hydrochloric Acid/ Hotplate Digestion)	SMEWW 3111 B (SMEWW 3030 F)
	Inductively Coupled Plasma – Emission Spectroscopy Method (Nitric Acid – Hydrochloric Acid / Hotplate Digestion)	SMEWW 3120 (SMEWW 3030 F)
Mercury	Cold – Vapor Atomic Absorption Spectrophotometric Method	SMEWW 3112 B
Nickel	Direct Air-Acetylene Flame Method (Nitric Acid – Hydrochloric Acid/ Hotplate Digestion)	SMEWW 3111 B (SMEWW 3030 F)
	Inductively Coupled Plasma – Emission Spectroscopy Method (Nitric Acid – Hydrochloric Acid / Hotplate Digestion)	SMEWW 3120 (SMEWW 3030 F)
Nitrate as NO_3-N	Ion Chromatography with Chemical Suppression of Eluent Conductivity	SMEWW 4110 B
	Nitrate Electrode Method	SMEWW 4500-NO_3^- D
	Colorimetric, Brucine	US EPA 352.1
Oil and Grease	Liquid-Liquid, Partition – Gravimetric Method	SMEWW 5520 B

Phosphate as Phosphorus (Total, Reactive)	Electrometric Method	SMEWW 4500 – H^+ B
	Stannous Chloride Method	SMEWW 4500-P D
	Vanadomolybdophosphoric Acid Colorimetric Method	SMEWW 4500-P C
Selenium	Electrothermal Atomic Absorption Spectrometric Method (Nitric Acid / Hotplate Digestion)	SMEWW 3113 (SMEWW 3030 E)
	Inductively Coupled Plasma – Emission Spectroscopy Method (Nitric Acid – Hydrochloric Acid / Hotplate Digestion)	SMEWW 3120 (SMEWW 3030 F)
	Manual Hydride Generation/ Atomic Absorption Spectrometric Method	SMEWW 3114 B
Settleable Solids	Imhoff Cone Method	SMEWW 2540 F
Sulfate	Ion Chromatography with Chemical Suppression of Eluent Conductivity	SMEWW 4110 B
	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
Zinc	Direct Air-Acetylene Flame Method (Nitric Acid – Hydrochloric Acid/ Hotplate Digestion)	SMEWW 3111 B (SMEWW 3030 F)
	Inductively Coupled Plasma – Emission Spectroscopy Method (Nitric Acid – Hydrochloric Acid / Hotplate Digestion)	SMEWW 3120 (SMEWW 3030 F)

Sediments

PARAMETERS	ANALYTICAL METHODS
Arsenic	Manual Hydride Generation / Atomic Absorption Spectrophotometric Method
Barium	Direct Nitrous Oxide – Acetylene Flame Method
Total Cadmium, Copper, Iron, Lead, Manganese, Nickel, Silver, Zinc	Atomic Absorption Spectrophotometric Method (Wet Ashing)
Total Mercury	Cold – Vapor Atomic Absorption Spectrophotometric Method

Ambient Air

PARAMETERS	ANALYTICAL METHODS
Nitrogen Dioxide	Gas Bubbler Griess-Saltzman Method
Sulfur Dioxide	Gas Bubbler and Pararosaniline Method
Suspended Particulate Matter-TSP	High Volume and Gravimetric Method
Suspended Particulate Matter-PM_{10}	High Volume with 10-micron particle size inlet; Gravimetric

PARAMETERS	ANALYTICAL METHODS
NOx	Phenoldisulfonic Acid Method
Particulates	Gravimetric Method
Sulfur Oxides as SO_2	Titration Method with Barium Chloride using Thorin as indicator

Wastes

PARAMETERS	ANALYTICAL METHODS
Antimony; Antimony compounds	US EPA Method 1311/ Hydride Generation AAS
Arsenic and its compounds	US EPA Method 1311/ Hydride Generation AAS
Barium and its compounds	US EPA Method 1311 / Flame AAS Method
Cadmium and its compounds	US EPA Method 1311 / Flame AAS Method
Chromium and its compounds	US EPA Method 1311 / Flame AAS Method
Fluoride and its compounds	US EPA Method 1311 / Ion Selective Electrode Method
Hexavalent chromium compounds	US EPA Method 1311 / Colorimetric Method
Lead compounds	US EPA Method 1311 / Flame AAS Method
Mercury and mercury compounds	US EPA Method 1311 / Cold-Vapor AAS Method
Silver and its compounds	US EPA Method 1311 / Flame AAS Method

DENR RECOGNIZED SIGNATORIES

NAME OF SIGNATORY	AREA/S OF RESPONSIBILITY/IES
Gino Franco P. Camposano	Physical-Chemical Analyses
Luchie S. Ignacio	Bacteriological Analysis
Marisa T. Manaor	All Analyses
Katrina U. Pagulayan	Air, Metals and Physical-Chemical Analyses
Liza Louise P. Perez	Bacteriological Analysis

BSI
Environmental Management Service Provider

7 August 2024 Ref. No.: LT-24-241-25-68

MR. FRANCISCO O. FLAVIER
Resident Manager
BMC FORESTRY CORPORATION – BC ILP
Km. 5 Naguilan Road, Irisan, Baguio City

Subject: ***24-Hours Ambient Air Quality and Noise Level Monitoring Report***

Dear Mr. Flavier,

We are pleased to submit the final report of the 24-hours ambient air quality and noise level monitoring as a result of our visit to your plant in Irisan, Baguio City on May 27 to 29, 2024.

We hope that this report addresses your requirements.

Very truly yours,

EMMANUEL R. ALTAREJOS
Executive Vice President

ERA/mla

24-HOURS AMBIENT AIR QUALITY AND NOISE LEVEL MONITORING REPORT

BMC FORESTRY CORPORATION – BC ILP

Km. 5 Naguilan Road, Irisan, Baguio City

BSI

Environmental Management Service Provider

2nd Floor, VAG Building
Ortigas Avenue, Greenhills,
San Juan, Metro Manila,
Philippines

24-HOURS AMBIENT AIR QUALITY AND NOISE LEVEL MONITORING REPORT

(May 27 to 30, 2024)

BMC FORESTRY CORPORATION – BC ILP

Irisan, Baguio City

Prepared for:

BMC Forestry Corporation – BC ILP
Km. 5 Naguilan Road, Irisan, Baguio City
Tel. No.: (074) 445-7180; Fax No.: (074) 445-7185

Prepared by:

BSI
2nd Floor VAG Building, Ortigas Avenue
Greenhills, San Juan, Metro Manila
Tel. No.: (02) 863 6129 ; Fax. No.: (02) 727 9831

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LIST OF ANNEXES

1. INTRODUCTION

This report presents the procedures and results of the ambient air quality and noise level monitoring conducted on May 27 to 30, 2024 at BMC Forestry Corporation – BC ILP situated in Irisan, Baguio City. BSI was commissioned to conduct the monitoring wherein Mr. Halcy Lemon P. Orquina led the team that conducted the 24-hours ambient air quality and noise level monitoring. Meanwhile, Mr. Francisco O. Flavier, Resident Manager of BMC Forestry Corporation – BC ILP, served as site contact person during the activity.

The pollutants considered for the 24-hours ambient air quality monitoring were particulate matter less than 10 microns (PM_{10}), sulfur dioxide (SO_2), and nitrogen dioxide (NO_2) at three (3) designated sampling stations within the plant's vicinity (see *Annex A*). In addition, noise level measurements were also undertaken at the same stations.

2. OBJECTIVE OF THE MONITORING

The purpose of the monitoring was to verify the company's compliance with the ambient air quality guideline values of the Department of Environment and Natural Resources (DENR) Administrative Order No. 2000-81 *(Implementing Rules and Regulations of the Philippine Clean Air Act of 1999)*, and the noise level standards of the *National Pollution Control Commission (NPCC)* Memorandum Circular 002 Series of 1980.

3. METHODS OF SAMPLING AND ANALYSIS

3.1 24-Hours Ambient Air Quality Monitoring

The prescribed methods of sampling and analysis in DAO No. 2000-81 for PM_{10}, SO_2, and NO_2 were employed. The methodologies are discussed in this section and presented in *Table 1*.

Table 1. Methods of Ambient Air Sampling and Analysis

Parameter	Sampling Methodology / Analysis
Particulate Matter less than 10 microns (PM_{10})	Low Volume – Gravimetric Method
Sulfur Dioxide (SO_2)	Bubbler – Pararosaniline Method
Nitrogen Dioxide (NO_2)	Bubbler – Griess-Saltzman Reaction Method

Reference: USEPA 40 CFR, Part 50

3.1.1 Particulate Matter less than 10 microns

Sampling of PM_{10} was carried out by using a low volume PM_{10} sampler. Ambient air was drawn at a controlled flow rate into a specially-shaped cyclone inlet where the larger particulates are inertially separated from PM_{10} size range. Each size fraction in the PM_{10} size range is then collected on a pre-weighed glass microfiber filter over the specified sampling period. The filter paper with retained particles was recovered after sampling and desiccated for 24 hours in the laboratory followed by accurate weighing using a calibrated mass balance. The net weight (mass gain) from the initial and final masses of the filter paper corresponds to the amount of PM_{10} collected. The concentration of PM_{10} in ambient air was determined from the ratio of total mass of PM_{10} collected and the total normal volume of air sampled.

3.1.2 Sulfur Dioxide

Sulfur dioxide in the ambient air was sampled using a handy gas sampler by aspirating air at a controlled flowrate into a solution of 0.04 M sodium tetrachloromercurate (TCM) through a glass midget impinger over the specified sampling period. The solution was then treated in the laboratory with formaldehyde and with a specially purified acid-bleached pararosaniline to form an intensely colored pararosaniline methyl sulfonic acid. The color intensity was measured spectrophotometrically at 548 nm and is directly related to the amount of SO_2 collected. SO_2 concentration was determined from the difference between the absorbance of the sample and blank, multiplied by the calibration factor, and divided by the total normal volume of air sampled.

3.1.3 Nitrogen Dioxide

Nitrogen dioxide in the ambient air was determined using Griess-Saltzman Reaction Method. Air was drawn using a handy gas sampler at a controlled flowrate into an azo dye forming reagent through a glass midget impinger over a specified sampling period. The absorption reaction produces a stable red-violet color. The color intensity was read by a spectrophotometer in a laboratory at 550 nm and is directly related to the amount of NO_2 collected. NO_2 concentration was determined from the difference between the absorbance of the sample and blank, multiplied by the calibration factor, and divided by the total normal volume of air sampled.

3.2 Sampling Observations

Meteorological observations such as wind direction and speed were recorded during the duration of the activity in order to correlate the interpretation of the gathered concentrations.

3.2.1 Wind Direction

Wind direction is the direction from which the wind originates. It is reported in the cardinal directions. The wind direction in a certain station is determined by observing the motion of the wind from field observation of objects such as trees, grasses, smoke, etc. using a compass as a reference.

3.2.2 Wind Speed

Wind speeds were recorded during the sampling activity using the Beaufort Wind Scale as a guide. Devised by Britain's Admiral Sir Francis Beaufort, this was one of the first scales used to estimate and report wind speeds via visual observations. The scale starts with *0* and goes to a force of *12*. *Table 4* details the categorization of the Beaufort wind forces *0* to *4* only, along with the corresponding equivalent speeds, wind descriptions, and land observations.

Table 2. Modern Beaufort Wind Scale

Force	Equivalent Speed (m/s)	Description	Land Observation
BF0	0.0 - 0.2	Calm	• Calm • Smoke rises vertically
BF1	0.3 - 1.5	Light Air	• Direction of wind shown by smoke drift, but not by wind vanes
BF2	1.6 - 3.3	Light Breeze	• Wind felt on exposed skin • Leaves rustle • Wind vanes begin to move
BF3	3.4 - 5.4	Gentle Breeze	• Leaves and small twigs constantly moving • Light flags extended
BF4	5.5 - 7.9	Moderate Breeze	• Dust and loose paper raised • Small branches begin to move

Source: Encyclopedia of Coastal Science (2005)

3.2.3 Cloud and Rain Description

The systems used to describe sky condition and rain description during the sampling period are outlined in *Tables 3* and *4*, respectively. These terminologies were adopted and used by the Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA).

Table 3. Cloud Description

Sky Condition	Definition / Description
Clear or Sunny Skies	• State of the sky when it is cloudless, totally clear or with a few small light clouds visible. • Has a total cloud cover of less than one okta.
Partly Cloudy	• State of the sky is within 2-5 oktas total cloud cover or has between 30% to 70% cover of the celestial dome.
Partly Cloudy to at Times Cloudy	• Mostly partly cloudy but there are times when more than 70% of the celestial dome is covered with clouds.
Mostly or Mainly Cloudy	• The sky is mostly covered with clouds but with possible brief periods of sunshine. • The total cloud cover is between 6 to 8 oktas.
Cloudy	• The sky is covered with clouds between 6 to 8 oktas or has more than 70% cloud cover. • Predominantly more clouds than clear sky. • For a longer period during the day, the sun is obscured by clouds.
Overcast	• The sky is totally or completely covered with thick and opaque clouds, 8 oktas or around 100% cloud cover.

Source: PAGASA

Table 4. Rain Description

Rain Description	Definition / Description
Very Light Rains	• Scattered drops that do not completely wet an exposed surface regardless of duration.
Light Rains	• The rate of fall is from trace to 2.5 mm per hour. • Individual drops easily identified and puddles (small muddy pools) form slowly. • Small streams may flow in gutters.
Moderate Rains	• The rate of fall is between 2.5 mm to 7.5 mm per hour. • Puddles rapidly forming and down pipes flowing freely.
Heavy Rains	• The rate of fall is greater than 7.5 mm per hour. • The sky is overcast, there is a continuous precipitation. • Falls in sheets, misty spray over hard surfaces. • May cause roaring noise on roofs.
Monsoon Rains	• Heavy and continuous precipitation attributed to either the Southwest or Northeast Monsoon.
Occasional Rains	• Not frequent but is recurrent precipitation.
Widespread Rains	• Precipitation occurring extensively throughout an area.
Frequent rains	• Precipitation occurring regularly and often throughout the time duration.
Intermittent Rains	• Precipitation which ceases at times and re-occur again.

Source: PAGASA

3.3 24-Hours Ambient Noise Level Monitoring

A direct-reading sound level meter (in A-weighting network) was used to collect noise level data at each sampling station. A-weighted (dBA) scale was selected as required by the 1978 NPCC and the 1980 NPCC standards were also based on the same weighting network. A-weighting network most closely approximates the response of human ear to various sound frequencies.

The procedure used followed that of Wilson (1989), in which at least a total of fifty (50) readings were recorded in order to increase the confidence limits of the data. Procedures outlined by Wilson (1989) were adopted in the monitoring as the time interval, duration of sampling, size of data needed, and methods of noise level analysis were not specified in the 1978 NPCC.

According to the provision provided in the NPCC Memorandum Circular 002 (1980), the arithmetic median of seven (7) maximum-recorded noise levels is regarded as the noise level comparable to the standard. 24-Hours ambient noise levels were undertaken at four periods with the inclusive times as seen in *Table 5*. Field observations during the monitoring were also noted so as to identify the primary sources of noise in each area.

Table 5. Noise Monitoring Periods

Period	Time
Morning	5:00 AM - 9:00 AM
Daytime	9:00 AM - 6:00 PM
Evening	6:00 PM - 10:00 PM
Nighttime	10:00 PM - 5:00 AM

4. RESULTS AND DISCUSSION

4.1 24-Hours Ambient Air Quality Monitoring

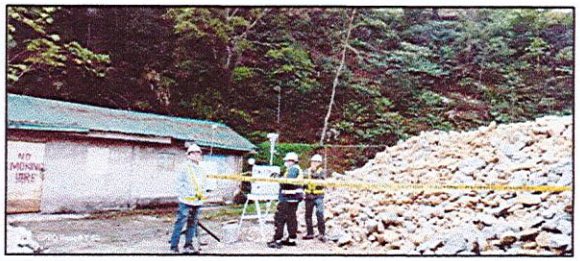
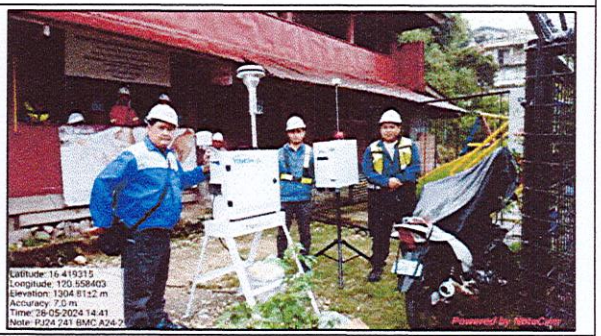
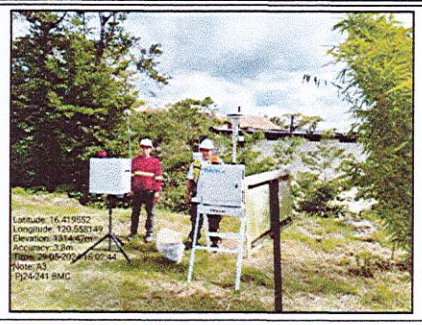
Three (3) designated sampling stations were assessed with PM_{10}, SO_2 and NO_2. The pollutant concentrations, as presented in *Table 6*, were within the DENR National Ambient Air Quality Guideline Values (NAAQGV) for Criteria Pollutants of 150 µg/Ncm for PM_{10}, 180 µg/Ncm for SO_2, and 150 µg/Ncm for NO_2 based on 24 hours averaging time.

Table 6. 24-Hours Ambient Air Quality Monitoring Results

Station	Location	Date / Time of Sampling	PM_{10} (µg/Ncm)	SO_2 (µg/Ncm)	NO_2 (µg/Ncm)
A24-1	Basketball Area	May 27-28, 2024 / 1420H-1420H	8.06	0.29	4.00
A24-2	Near Plant Barracks	May 28-29, 2024 / 1433H-1433H	7.27	0.57	1.97
A24-3	Near Bamboo Plantation/Water Tank	May 29-30, 2024 / 1500H-1500H	6.27	0.94	1.18
DENR National Ambient Air Quality Guideline Values for Criteria Pollutants based on 24 hours averaging time			**150**	**180**	**150**

Sampling observations during the monitoring as well as photo documentations are summarized in *Table 7.* Moreover, the summary of results including the gathered meteorological data, laboratory certificate of analyses, and calibration records of the equipment used were attached in *Annexes B, C,* and *D,* respectively.

Table 7. Field Observations and Photo Documentations during Sampling

Station	Field Observations	Photo Documentations
A24-1 Basketball Area May 27 to 28, 2024 1420H-1420H	The monitoring station is located on cement ground of the basketball court. Behind the station is a rocky terrain. The area is surrounded by trees and grass. No vehicular activities were observed. Plant is at normal operation during the monitoring. Weather was generally cold with mostly cloudy to overcast skies. Wind was blowing predominantly from the southeast at light air condition. Light to heavy rainfall occurred during the periods between 1520H to 1920H, 0620H to 0820H and 1320H to 1420H occurred during sampling. Air temperature ranged from 20.1 to 28.3°C, with hourly readings averaging to 23.4°C.	
A24-2 Near Plant Barracks May 28 to 29, 2024 1433H-1433H	The monitoring station is located on gravelly ground partly covered with grass near Plant Barracks. The area is surrounded by trees and plants. No vehicular activities were observed. Plant is at normal operation during the monitoring. Weather was generally cold with partly cloudy to overcast skies. Wind was blowing predominantly from the southeast at light air to light breeze condition. Light rainfall occurred during the period between 1533H to 1833H and 0133H to 0333H occurred during sampling. Air temperature ranged from 21.2 to 30.5°C, with hourly readings averaging to 24.3°C.	
A24-3 Near Water Tank May 29 to 30, 2024 1500H-1500H	The monitoring station is located on an elevated and unpaved soil ground covered with grass. The area is surrounded by trees and small plants. No vehicular activities were observed. Plant is at normal operation during the monitoring. Weather was generally cold with partly cloudy to overcast skies. Wind was blowing predominantly from the southeast at light air condition. Light rainfall occurred during the period between 1600H to 2300H and 0400H to 0600H occurred during sampling. Air temperature ranged from 20.4 to 29.6°C, with hourly readings averaging to 23.8°C.	

4.2 24-Hours Ambient Noise Level Monitoring

The same three (3) ambient air quality stations were monitored for 24-hours ambient noise level and the results are presented in *Table 8.*

All stations are categorized under Class C areas (a section which is primarily reserved as a light industrial area). As per NPCC Memorandum Circular 002 Series of 1980, the applicable standards for Class C areas are 65 dBA for morning, 70 dBA for daytime, 65 dBA for evening, and 60 dBA for nighttime measurements.

Table 8. 24-Hours Ambient Noise Level Monitoring Results

Station	Location	Date / Time of Sampling	Period	Noise Level (dBA)	NPCC Standards Class C (dBA)
N24-1	Basketball Court Area	May 28, 2024 / 0606H-0616H	MORNING	54	**65**
		May 27, 2024 / 1630H-1640H	DAYTIME	52	**70**
		May 27, 2024 / 1803H-1813H	EVENING	52	**65**
		May 27, 2024 / 2203H-2213H	NIGHTTIME	44	**60**
N24-2	Near Plant Barracks	May 29, 2024 / 0530H-0540H	MORNING	56	**65**
		May 28, 2024 / 1441H-1451H	DAYTIME	56	**70**
		May 28, 2024 / 1800H-1810H	EVENING	55	**65**
		May 28, 2024 / 1000H-1010H	NIGHTTIME	55	**60**
N24-3	Near Bamboo Plantation / Water Tank	May 30, 2024 / 0600H-0610H	MORNING	56	**65**
		May 29, 2024 / 1438H-1448H	DAYTIME	55	**70**
		May 29, 2024 / 1000H-1010H	EVENING	55	**65**
		May 29, 2024 / 2200H-2210H	NIGHTTIME	56	**60**

Class C - A section primarily reserved as a light industrial area

The results indicate that all stations complied with the 24-hours ambient noise level standards. The primary sources of noise are summarized in *Table 9.* The equipment calibration certificate of the noise meter used during the measurement is attached in *Annex D.*

Table 9. Sources of 24-Hrs Ambient Noise

Station	Location	Period	Sources of Noise
N24-1	Basketball Court Area	Morning	Kiln operation, compressor and rustling of tree leaves
		Daytime	Kiln operation, compressor and rustling of tree leaves
		Evening	Kiln compressor, chirring insects and rustling of tree leaves
		Nighttime	Compressor, chirring insects and rustling of tree leaves
N24-2	Near Plant Barracks	Morning	Kiln #2 operation
		Daytime	People conversation and kiln #2 operation
		Evening	Raindrops, kiln #2 operation and people conversation
		Nighttime	Kiln #2 operation and chirring insects
N24-3	Near Bamboo Plantation / Water Tank	Morning	Kiln #2 operation, compressor and rustling of tree leaves
		Daytime	Kiln #2 operation, compressor and rustling of tree leaves
		Evening	Kiln #2 operation, compressor and rustling of tree leaves
		Nighttime	Kiln #2 operation, compressor and rustling of tree leaves

5. REFERENCES

DENR Administrative Order No. 2000-81. 1999. Implementing Rules and Regulations of the Philippine Clean Air Act of 1999.

National Pollution Control Commission. 1978. Rules and Regulations of the National Pollution Control Commission, Chapter IV Article I - Noise Control Regulations, Sections 74-79, Implementing Rules and Regulations, Presidential Decree No. 984 (National Pollution Control Decree of 1976). Manila: Official Gazette. June 1978, 4477-4479 pp.

National Pollution Control Commission. 1980. NPCC Memorandum Circular 002 Series of 1980 - Amendments to Article 1 (Noise Control Regulations), Chapter IV (Miscellaneous Regulations), Rules and Regulations of the National Pollution Control Commission. Manila: Official Gazette.

PAG-ASA. 2004. Definition and description of weather forecast terminologies used and adopted by PAG-ASA. http://kidlat.pagasa.dost.gov.ph/wb/terminology.html (Accessed November 2013).

U.S. National Archives and Records Administration. Code of Federal Regulations. Title 40 Part 50. National Primary and Secondary Ambient Air Quality Standards. 2000.

Wilson, C. E. 1989. Noise Control: Measurements, Analysis, and Control of Sound and Vibration. New York: Harper & Row, Publishers, Inc.

ANNEX A

MAP OF AMBIENT AIR QUALITY AND NOISE LEVEL MONITORING STATIONS

BMC FORESTRY CORPORATION – BC ILP

Irisan, Baguio City

Note: Arrow indicates wind direction during sampling

BSI

MAP OF AMBIENT AIR QUALITY AND NOISE LEVEL MONITORING STATIONS

ANNEX B

AMBIENT AIR QUALITY MONITORING SUMMARY OF RESULTS

Ambient Air Quality Summary of Results for the 24-Hour Monitoring of TSP, PM_{10}, Particulate Pb, SO_2, and NO_2

Project No. : PJ24-241
Client : BMC Forestry Corp. ILP
Location : Irisan, Baguio City

Station Code	A1	A2	A3
Location	Basket Ball Area	Near Plant Barracks Area	Near Bamboo Plantation / Water Tank
Date of Sampling	May 27, 2024	May 28, 2024	May 29, 2024
Time of Sampling	1420H-1420H	1433H-1433H	1500H-1500H

Particulate Matter Less than 10 Microns (PM_{10}) Data			
Volume of air for PM_{10} sampling, Ncm	20.7239	20.6357	20.7240
PM_{10} Weight, µg	167	150	130
PM_{10} Concentration, µg/Ncm	8.06	7.27	6.27

Sulfur Dioxide (SO_2) and Nitrogen Dioxide (NO_2) Data			
Volume of air for SO_2 and NO_2 sampling, Ncm	1.2410	1.2357	1.2410
SO_2 Weight, µg	0.357	0.700	1.170
SO_2 Concentration, µg/Ncm	0.29	0.57	0.94
NO_2 Weight, µg	4.970	2.440	1.460
NO_2 Concentration, µg/Ncm	4.00	1.97	1.18

Average Temperature, °C	23.4	24.3	23.8
Clouds (Octa)	5/8 to 8/8	5/8 to 8/8	5/8 to 8/8
Prevailing Wind Direction	BF1	BF1, BF2	BF1, BF2
Prevailing Wind Condition	SE	SE	SE

Remarks:

BF	*Beaufort Force*	*BF1*	*Light Air (0.3 - 1.5 m/s)*	*BF3*	*Gentle Breeze (3.4 - 5.4 m/s)*
BF0	*Calm (0.0 - 0.2 m/s)*	*BF2*	*Light Breeze (1.6 - 3.3 m/s)*	*BF4*	*Moderate Breeze (5.5 - 7.9 m/s)*

ANNEX C

LABORATORY CERTIFICATES

ELARSI, INC.

Unit 201-204 & 406 Rizalina Annex Bldg. 1677 Quezon Avenue, Quezon City
Tel. No. 8927-77-15 Fax No. 8929-4824 Email: info@elarsi.com

CLIENT : **BSI**
ADDRESS : 2nd Flr., VAG Bldg Ortigas Ave. Greenhills San Juan, Metro Manila
Contact Number : 8863-6129
Nature of Sample/s : Ambient Air Sample
No. of Sample/s Submitted : Four (4)

Lab. Report No. : 241927-AA
Date/Time Sampled : 05-27-24 to 05-30-24 1600H
Date Received : 05-31-24
Date Analyzed : 05-31-24 to 06-06-24
Date Reported : 06-06-24

[REPORT OF ANALYSES]

Sample No.	Sample ID	NO_2, ug[a]	Analysis Date/Time
ES-2408616	PJ 24 241 A24-1	4.97	05-31-24 1614H
ES-2408617	PJ 24 241 A24-2	2.44	05-31-24 1614H
ES-2408618	PJ 24 241 A24-3	1.46	05-31-24 1614H
ES-2408619	PJ 24 241 Blank	< 0.038	05-31-24 1614H

[a] - Method 406 / Griess-Saltzman

Reference:
James P. Lodge. Methods for Ambient Air Sampling & Analysis, 3rd edition

Analyzed By:
JENAIA A. ANDAYA, RChT
Laboratory Chemical Technician
PRC Lic. No. 0009297

Checked By:
JEMMA B. JACINTO, RCh
Laboratory Supervisor
PRC Lic. No. 0010872

Analyzed By:
JESSEMAR G. GUIMBAOLIBOT, RChT
Laboratory Chemical Technician
PRC Lic. No. 0006100

Certified Correct By:
RENATO M. GOFREDO, JR., RCh
Laboratory Manager
PRC Lic. No. 0009824

DENR
RECOGNIZED
LABORATORY
C.R. No. 006/2021

Test results reflect the quality of the samples as received.

ELARSI, INC.

Unit 201-204 & 406 Rizalina Annex Bldg. 1677 Quezon Avenue, Quezon City
Tel. No. 8927-77-15 Fax No. 8929-4824 Email: info@elarsi.com

CLIENT	: **BSI**	Lab. Report No.	: 241926-AA
ADDRESS	: 2nd Flr., VAG Bldg Ortigas Ave. Greenhills San Juan, Metro Manila	Date/Time Sampled	: 05-27-24 to 05-30-24 1600H
		Date Received	: 05-31-24
Contact Number	: 8863-6129	Date Analyzed	: 06-27-24 to 07-04-24
Nature of Sample/s	: Ambient Air Sample	Date Reported	: 07-04-24
No. of Sample/s Submitted	: Four (4)		

[REPORT OF ANALYSES]

Sample No.	Sample ID	SO_2, ug[a]	Analysis Date/Time
ES-2408612	PJ 24 241 A24-1	0.357	06-27-24 1400H
ES-2408613	PJ 24 241 A24-2	0.700	06-27-24 1400H
ES-2408614	PJ 24 241 A24-3	1.17	06-27-24 1400H
ES-2408615	PJ 24 241 Blank	< 0.155	06-27-24 1400H

[a] - Pararosaniline Method / Colorimetric

Reference
CFR 40 Appendix A2 to Part 50

Analyzed By:

JESSEMAR G. GUIMBAOLIBOT, RChT
Laboratory Chemical Technician
PRC Lic. No. 0006100

Checked By:

JEMMA D. JACINTO, RCh
Laboratory Supervisor
PRC Lic. No. 0010872

Certified Correct By:

RENATO M. GOFREDO, JR., RCh
Laboratory Manager
PRC Lic. No. 0009824

DENR
RECOGNIZED
LABORATORY
C.R. No. 005/2021

Test results reflect the quality of the samples as received.

ELARSI, INC.

Unit 201-204 & 406 Rizalina Annex Bldg. 1677 Quezon Avenue, Quezon City
Tel. No. 8927-77-15 Fax No. 8929-4824 Email: info@elarsi.com

CLIENT	: **BSI**	Lab. Report No.	: 241925-AA
ADDRESS	: 2nd Flr., VAG Bldg Ortigas Ave. Greenhills San Juan, Metro Manila	Date/Time Sampled	: 05-27-24 to 05-30-24 1600H
		Date Received	: 05-31-24
Contact Number	: 8863-6129	Date Analyzed	: 06-06-24 to 06-10-24
Nature of Sample/s	: Ambient Air Sample	Date Reported	: 06-10-24
No. of Sample/s Submitted	: Four (4)		

[REPORT OF ANALYSES]

Sample No.	Sample ID	PM_{10}, ug[a]	Analysis Date/Time
ES-2408608	PJ 24 241 A24-1	167	06-06-24 0845H
ES-2408609	PJ 24 241 A24-2	150	06-06-24 0845H
ES-2408610	PJ 24 241 A24-3	130	06-06-24 0845H
ES-2408611	PJ 24 241 Blank	< 100	06-06-24 0845H

[a] - Method 501 / Gravimetric

Reference:
James P. Lodge, Methods for Ambient Air Sampling & Analysis, 3rd edition

Analyzed By:

JENAIA A. ANDAYA, RChT
Laboratory Chemical Technician
PRC Lic. No. 0009297

Checked By:

JEMMA D. JACINTO, RCh
Laboratory Supervisor
PRC Lic. No. 0010872

Certified Correct By:

RENATO M. GOFREDO, JR., RCh
Laboratory Manager
PRC Lic. No. 0009824

Test results reflect the quality of the samples as received.

DENR
RECOGNIZED
LABORATORY
C.R. No. 005/2021

REQUEST FOR ANALYSIS / CHAIN OF CUSTODY FORM

ELARSI, INC.
Unit 201-204 & 406 Rizalina Annex Bldg. 1677 Quezon Avenue, Quezon City
Tel. No. 8927-77-15 , 8994-3443 * Fax No. 8929-48-24 * E-mail: info@elarsi.com

Inv # ______ OR# ______ *FOR LABORATORY USE ONLY*
Lab. Report No. 241925-AA - 241927

Company : BSI
Address : Ortigas Ave
Contact Person : Haley Lance Obrique **Contact No./s** 0936-879-0664

Submitted by: [signature] H.P. Orquin (Printed Name/Signature) Date/Time: 27 May '24
Reviewed by: [signature] (Printed Name/Signature) Date/Time: 31 May '24 1037H
Approved by: [signature] (Printed Name/Signature) Date/Time: 5/31/24 1140

Method of Transport
✓ Walk-in ____ Courier ____ Pick-up ____ Others

Sample Condition Upon Receipt
Sealed / Container Intact
✓ Chilled/Frozen
✓ Room Temp
Preserved

Container Type
✓ Plastic Bottle
Glass/Sterile Glass
TEDLAR Bag
Others: Filter

Turn Around Time
____ Urgent/Rush (3-5 Working Days) ✓ Routine (7-12 Working Days)

Nature of Sample (PLEASE CHECK)[1]
Water: Drinking Water, Wastewater, Others
Metals: Water, Air, Others
Air: Stack Source Emission, ✓ Ambient Air Sample, Work Env. Measurement, Others
Solids: Soil, Sludge, Sediment, Others

Sample No. (*FOR LAB. USE ONLY*)	Sample Identification	Analyses Requested	Method Of Analysis	Date of Sampling/Time	No. of Samples	Remarks	Certificate Sent/Reported	Worksheet Sent	COC Sent	Sample Disposed
	PJ24-241									
PM10 EC-2408608-11	A1-24Hrs	PM10, SO2, NOx	Gravimetric, Pararosaniline, Griess-Saltzman	27-28 May 2024	3					
SO2 EC-2408612-15	A2-24Hrs	PM10, SO2, NOx		28-29 May 2024	3	w/ Blank				
NO2 EC-2408616-19	A3-24Hrs Blank	PM10, SO2, NOx		29-30 May 2024	3					

FOR LAB. USE ONLY DATE OF THE FOLLOWING

1 USE ONE (1) COC FOR EACH NATURE OF SAMPLE
2 Unless otherwise requested, all samples will be disposed two (2) weeks after analysis
3 Use HRAFORM_56 waiver form if Sample condition & requirements are not met

Serial No 2023

EI_HRAFORM_03

ANNEX D

EQUIPMENT CALIBRATION CERTIFICATES

Calibration Report

Tisch Particulate Matter 10 (PM_{10}) Air Sampler

No. 06012024PM_{10}475-11

Submitted by: Edindo C. Fernando
BSI (Berkman Systems Inc.,)
Address: 2nd Floor VAG Bldg., Greenhills, San Juan

Site	Calibrator Make/Model
Location: On-Site	Make: BGI Tetracal
Date: Jun 1, 2024	Model/S.N.: 139/#1, Range: 6-30LPM
Tech.: Roberto L. Co	Result of Venturi Calibration
Sampler: TE-Wilbur PM_{10} Air Sampler	No. 1: 5.37813 $\Delta\hat{P}$ ^ 0.52138
Serial #: 475 / TSP - D SN: 3868	Overall Uncertainty: 0.35%

Temp (° F):	--	Elevation (ft):	--
Ta (° K):	295	SL Press (in Hg):	--
Ta (° C):	22	Pa (mm Hg):	752

Test Points	Sampler Flowmeter Setting, LPM	Q_a, LPM	Q_s, STP, LPM
1	15.0	15.050	14.950
2	16.7	16.746	16.670
3	18.4	18.368	18.300

Remarks:

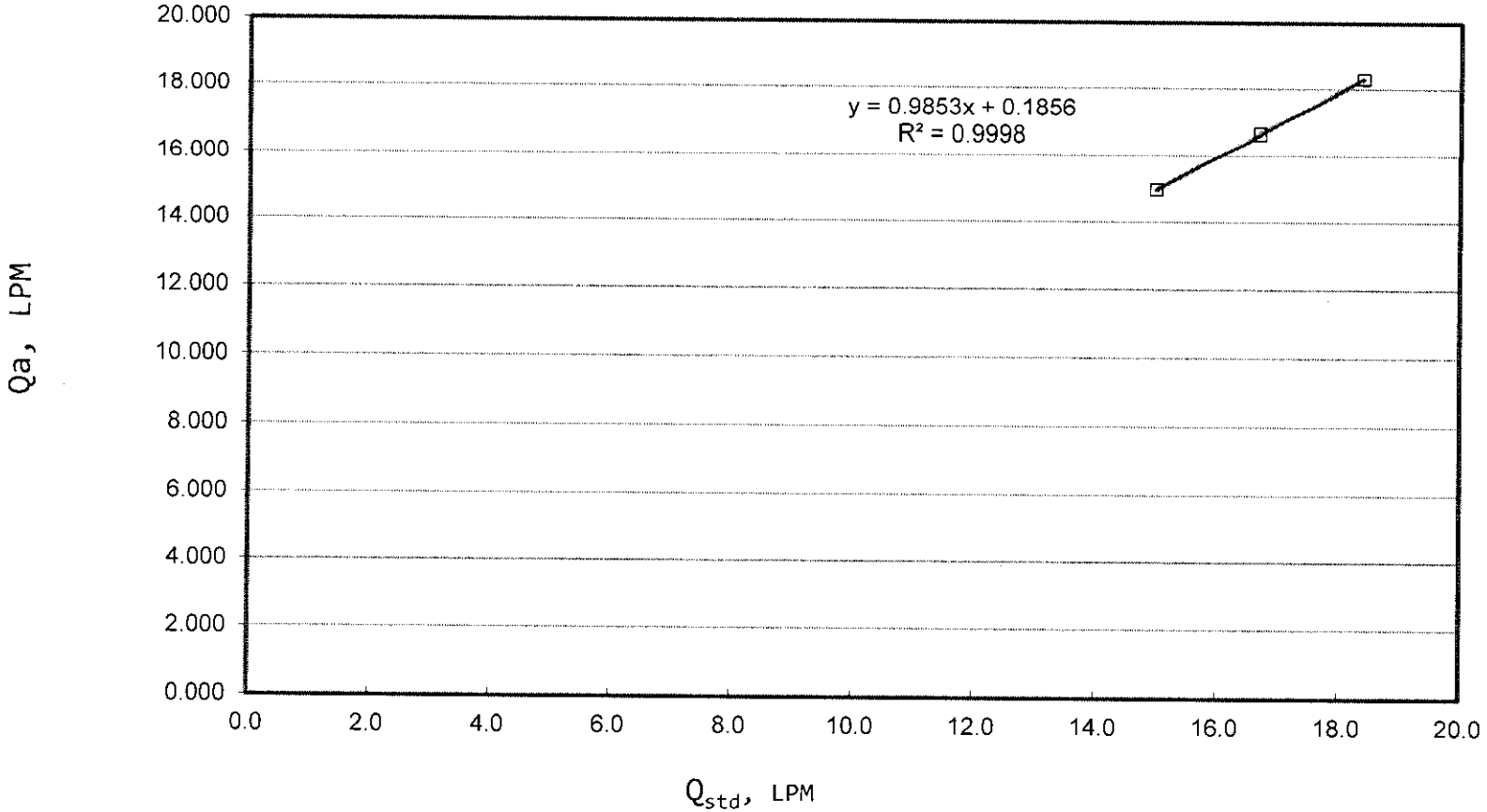
1. The above values are those obtained at the time of test and refer only to the particular instrument submitted.

2. The flow rate controller was set at 16.7 LPM.

Calibrated by:

ROBERTO L. CO

Calibration Graph



CALIBRATION REPORT
No. 06292024GS-BSI-DGS-2-10

Instrument/Model: BSI Dual Gas Sampler
Serial Number: BSI DGS-2
Submitted by: Mr. Edindo Fernando
Address: BSI (Berkman System Inc)
Barometric Pressure, mm Hg: 752

Standard Used: Agilent ADM1000
Range: 1000ml/min
Temp.,°C: 25
Rel. Humidity,%: 60
Date: 29-Jun-24

CALIBRATION DATA

FLOW RATE 1

Test Point	UUT Flowmeter Setting, LPM	Qa, Actual, LPM	Q_s, STP, LPM
1	0.5	0.50	0.49
2	1.0	1.00	0.99
3	1.5	1.50	1.46

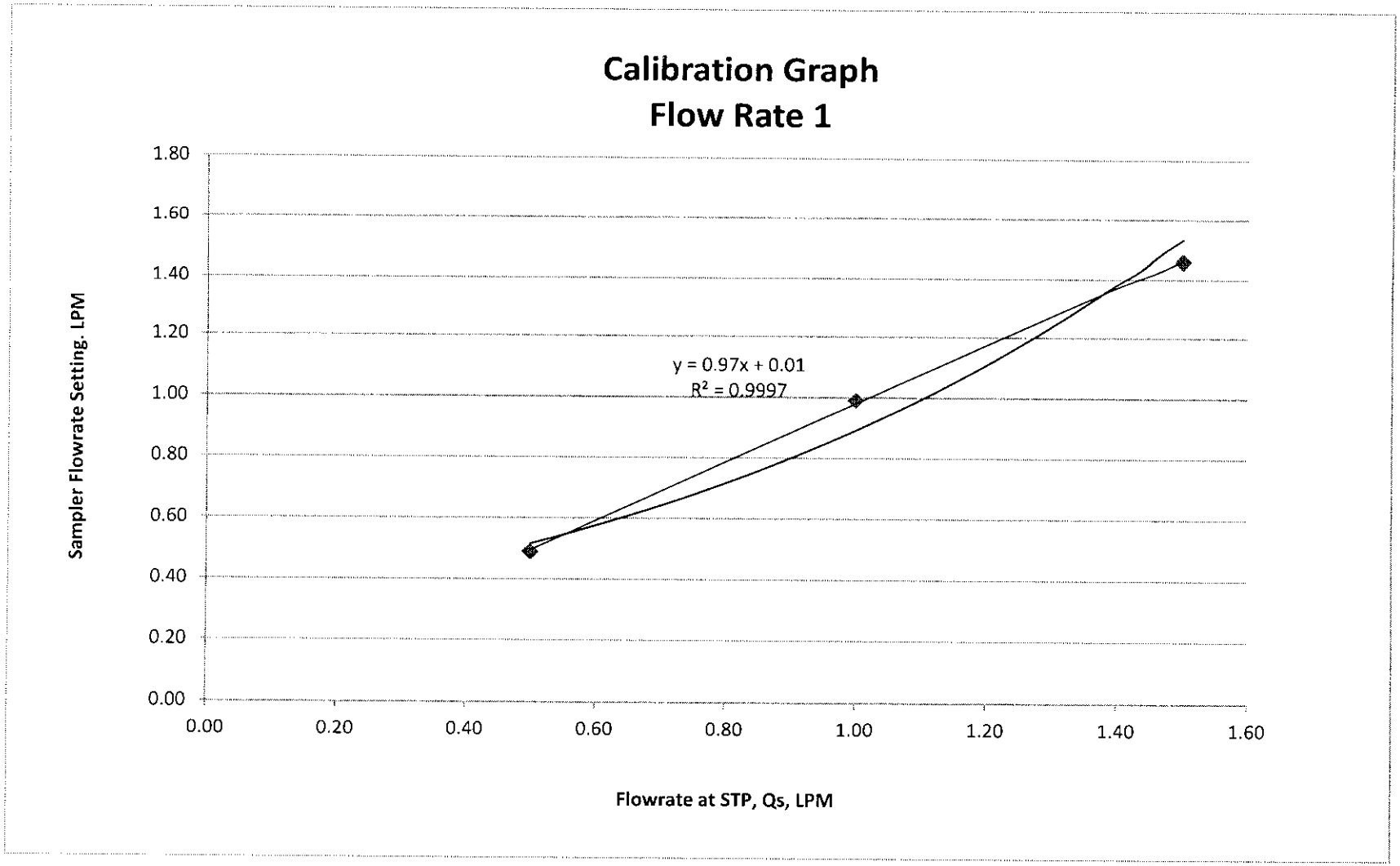
FLOW RATE 2

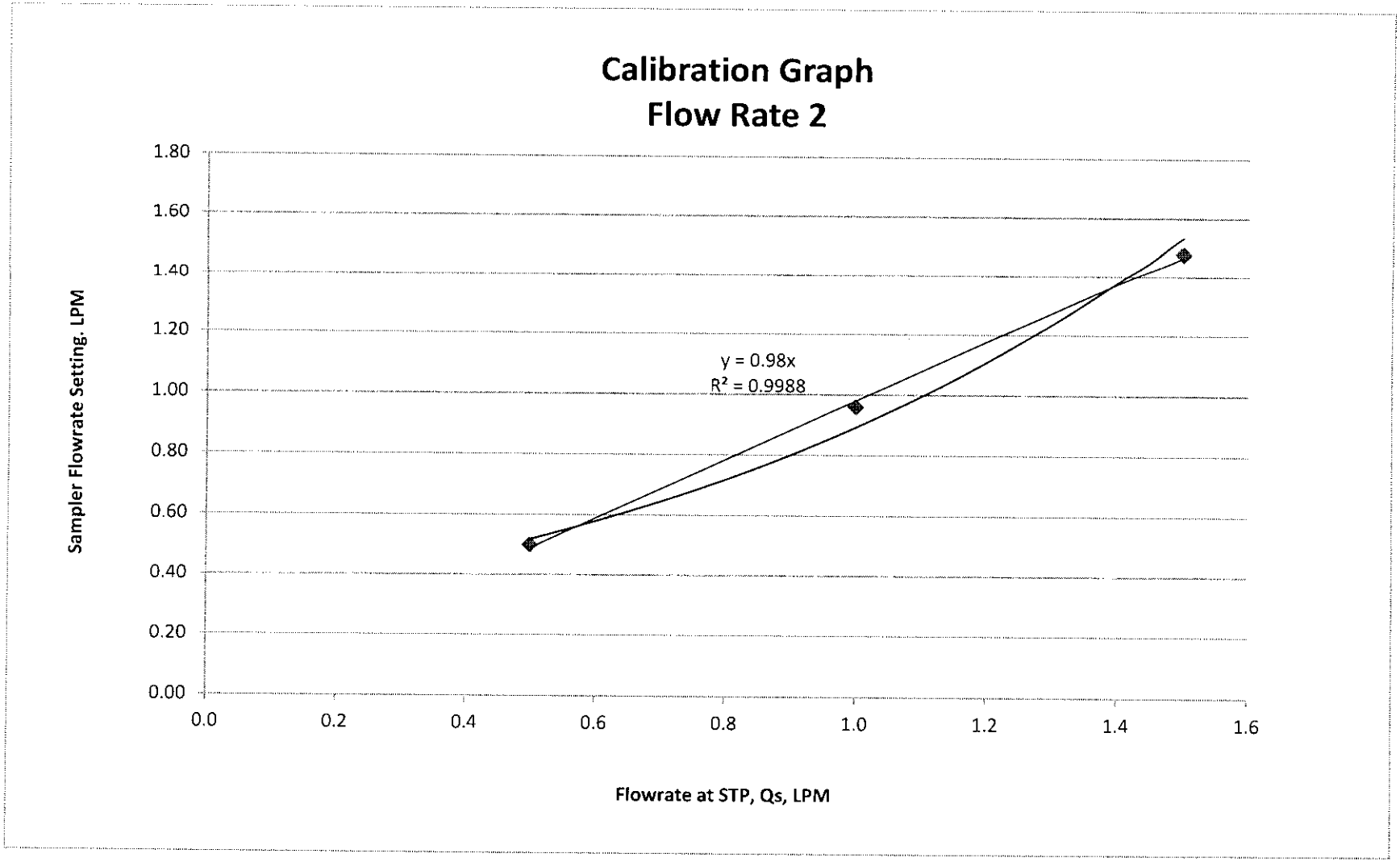
Test Point	UUT Flowmeter Setting, LPM	Qa, Actual, LPM	Q_s, STP, LPM
1	0.5	0.50	0.50
2	1.0	0.98	0.96
3	1.5	1.50	1.48

Remarks: 1. The above values are those obtained at the time of test and refer only to the particular instrument submitted.

Calibrated By:

Roberto L. Co


Calibration Graph
Flow Rate 1
Sampler Flowrate Setting, LPM
1.80
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
y = 0.97x + 0.01
R² = 0.9997
0.00
0.20
0.40
0.60
0.80
1.00
1.20
1.40
1.60
Flowrate at STP, Qs, LPM


Calibration Graph
Flow Rate 2
Sampler Flowrate Setting, LPM
1.80
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
y = 0.98x
R² = 0.9988
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
Flowrate at STP, Qs, LPM

Switchtek
Measurement Systems
A Division of Switchtek Construction Corporation
4th Floor Northridge Plaza, Annex A, 12 Congressional Ave.,
Bahay Toro,Quezon City, 1100, Philippines
Tel Nos.02 4267593 / 9282869 / 9287769 Fax No.4537694
email Address: admin@switchtek.com.ph
www.switchtek.com.ph

Certificate No.:	**4000.23-8979-4.23**	**Calibration of**	**3 IN1 (Anemometer, Barometer, %RH)**		
Identification:	**BERKMAN SYSTEMS INCORPORATED**				
Job:	**P1**	Test and Verification			
Fin.acc:	**32**	Certificate of Calibration			
Done....:	**December 5, 2023**	Initials...:	**CAC**		
Categories	**Calibration**	**Men**	**Hours**	**Total cost**	**Type**
Cal Officer		2	1.00	-	Certificate

CERTIFICATE OF CALIBRATION - 3 IN 1 (ANEMOMETER, BAROMETER, % RH)

This report of calibration shall document that the instrument herein was examined and tested in compliance with ISO/IEC 17025 against NIST traceable reference standards and its co-equal standards.

Issued to: **BERKMAN SYSTEMS INCORPORATED**
Address: **Suite 208 VAG Bldg., Ortigas Avenue, Greenhills, San Juan, Metro Manila, Philippines**

UNIT UNDER TEST (UUT):

Instrument:	3 IN1 (Anemometer, Barometer, %RH)
Brand:	LUTRON
Model No.:	ABH-4225
Serial No.:	AJ.79434
Range:	Velocity (0-30.0 m/s) Temp. (0-50 Deg. C) Humidity (10 to 95%) Dewpoint (-25.3 to 48.9 Deg. C) 10.0 to 999.9 hPa
Resolution:	Velocity (0-30.0 m/s)/0.1 m/s Temp. (0-50 Deg. C)/0.1 Deg. C Humidity (10 to 95%)/0.1 %RH Dewpoint (-25.3 to 48.9 Deg. C)/0.01 Deg. C Barometeric (10.0 to 999.9 hPa) /0.1
Calibration Date:	December 4, 2023
Calibration Due:	December 3, 2024

CALIBRATOR INFORMATION:

Instrument:	Temperature and Humidity chamber
Model No.:	XB-OTS-34
Serial No.:	20130803
Traceability:	CNAS
Instrument:	Rotating Vane Anemometer
Manufacturer:	LUTRON
Model No:	AM-4206M
Serial No:	Q432206
Range:	0 to 30.0 m/s 0 to 50.0 °C
Calibrated Against:	UKAS, thru Laser Doppler Anemometer
Instrument:	Barigo, Precision Barometer
Calibrated Against:	NIST

Environmental Condition:

Condition: DRY/BASIC/NEUTRAL
Ambient Temp. (Deg C): 23 ±2
Relative Humidity: 52.2 ±5%, 1010 hPa

Calibration Method:

By comparison technique, unit under test was tested in reference with a Rotating vane anemometer, precision barometer, Standard Temperature and Humidity calibrator. Procedures of calibration and test conform to the requirements of NPL, NIST and ISO/IEC Guide 17025. Data were gathered and plotted against an ideal curve.
Standard error and uncertainty of measurement are written on the attached sheet.

Remarks:

All data pertain only to the unit described obtained at the time of test. This certificate is not valid w/out seal and signature. Unauthorized reproduction is prohibited.

Calibrated By: **C.A. CASADO**
Date: **December 4, 2023**

Certified By: **R. CANDOC**
Date: **December 5, 2023**

Switchtek
Measurement Systems
A Division of Switchtek Construction Corporation
4th Floor Northridge Plaza, Annex A, 12 Congressional Ave.,
Bahay Toro,Quezon City, 1100, Philippines
Tel Nos.02 4267593 / 9282869 / 9287769 Fax No.4537694
email Address: admin@switchtek.com.ph
www.switchtek.com.ph

Certificate No.: 4000.23-8979-4.23 **Calibration of** 3 IN1 (Anemometer, Barometer, %RH)
Identification: BERKMAN SYSTEMS INCORPORATED
Address: Suite 208 VAG Bldg., Ortigas Avenue, Greenhills, San Juan, Metro Manila, Philippines

CERTIFICATE OF CALIBRATION - 3 IN 1 (ANEMOMETER, BAROMETER, % RH)

This report of calibration shall document that the instrument herein was examined and tested in compliance with ISO/IEC 17025 against NIST traceable reference standards and its co-equal standards.

UNIT UNDER TEST (UUT):

Instrument: 3 IN1 (Anemometer, Barometer, %RH)
Brand: LUTRON
Model No.: ABH-4225
Serial No.: AJ.79434
Range: Velocity (0-30.0 m/s)
Temp. (0-50 Deg. C)
Humidity (10 to 95%)
Dewpoint (-25.3 to 48.9 Deg. C)
10.0 to 999.9 hPa
Resolution: Velocity (0-30.0 m/s)/0.1 m/s
Temp. (0-50 Deg. C)/0.1 Deg. C
Humidity (10 to 95%)/0.1 %RH
Dewpoint (-25.3 to 48.9 Deg. C)/0.01 Deg. C
Barometeric (10.0 to 999.9 hPa) /0.1

Calibration Date: December 4, 2023
Calibration Due: December 3, 2024
Calibrated By: C.A. CASADO

MODE: THERMOHYGROMETER

Results:

Temperature:

REFERENCE READING (°C)	UNIT UNDER TEST READING (°C)	ERROR IN READING (°C)	STANDARD DEVIATION	REMARKS
9.6	9.9	-0.30	0.2121	The user should determine the suitability of the instrument of its intended use.
20.0	21.3	-1.30	0.9192	
23.9	24.8	-0.90	0.6364	
40.4	39.8	0.60	0.4243	

Standard error: ± 1.10 °C
Uncertainty: ± 1.22 °C

Relative Humidity:

REFERENCE READING (% RH)	UNIT UNDER TEST READING (% RH)	ERROR IN READING (% RH)	STANDARD DEVIATION	REMARKS
73.7	58.0	15.70	11.1016	DO NOT USE THIS MODE
64.2	50.6	13.60	9.6167	
55.0	42.0	13.00	9.1924	
47.0	35.0	12.00	8.4853	

Standard error: ± 19.20 % RH
Uncertainty: ± 12.01 % RH

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Tel Nos.02 4267593 / 9282869 / 9287769 Fax No.4537694
email Address: admin@switchtek.com.ph
www.switchtek.com.ph

Certificate No.: 4000.23-8979-4.23 **Calibration of** 3 IN1 (Anemometer, Barometer, %RH)
Identification: BERKMAN SYSTEMS INCORPORATED
Address: Suite 208 VAG Bldg., Ortigas Avenue, Greenhills, San Juan, Metro Manila, Philippines

CERTIFICATE OF CALIBRATION - 3 IN 1 (ANEMOMETER, BAROMETER, % RH)

This report of calibration shall document that the instrument herein was examined and tested in compliance with ISO/IEC 17025 against NIST traceable reference standards and its co-equal standards.

UNIT UNDER TEST (UUT):

Instrument: 3 IN1 (Anemometer, Barometer, %RH)
Brand: LUTRON
Model No.: ABH-4225
Serial No.: A.J.79434
Range: Velocity (0-30.0 m/s)
Temp. (0-50 Deg. C)
Humidity (10 to 95%)
Dewpoint (-25.3 to 48.9 Deg. C)
10.0 to 999.9 hPa
Resolution: Velocity (0-30.0 m/s)/0.1 m/s
Temp. (0-50 Deg. C)/0.1 Deg. C
Humidity (10 to 95%)/0.1 %RH
Dewpoint (-25.3 to 48.9 Deg. C)/0.01 Deg. C
Barometeric (10.0 to 999.9 hPa) /0.1

Calibration Date: December 4, 2023
Calibration Due: December 3, 2024
Calibrated By: C.A. CASADO

MODE: THERMOHYGROMETER

Results:

Barometric

REFERENCE READING (hPa)	UNIT UNDER TEST READING (hPa)	ERROR IN READING (hPa)	STANDARD DEVIATION	REMARKS
1015	1007	8.00	5.6569	The user should determine the suitablity of the instrument for its intended use
1010	1004	6.00	4.2426	
1000	993	7.00	4.9497	

Standard error: ± 8.57 hPa
Uncertainty: ± 7.87 hPa

Velocity

REFERENCE READING (m/s)	UNIT UNDER TEST READING (m/s)	ERROR IN READING (m/s)	STANDARD DEVIATION	REMARKS
0.00	0.00	0.00	0.0000	The user should determine the suitablity of the instrument for its intended use
5.20	5.10	0.10	0.0707	
9.55	9.40	0.15	0.1061	
15.10	14.90	0.20	0.1414	

Standard error: ± 0.16 m/s
Uncertainty: ± 0.59 m/s

Switchtek
Measurement Systems
A Division of Switchtek Construction Corporation
4th Floor Northridge Plaza, Annex A, 12 Congressional Ave.,
Bahay Toro,Quezon City, 1100, Philippines
Tel Nos.83517471 / 89282869 / 89287769 Fax No.84420560
email Address: admin@switchtek.com.ph
www.switchtek.com.ph

Certificate No.:	**400.01-8979-1.23**	**Calibration of**	**Sound Level Meter**		
Identification:	**BERKMAN SYSTEMS INCORPORATED**				
Job:	PI	Test and Verification			
Fin.acc:	32	Certificate of Calibration			
Done.....:	**November 3, 2023**	Initials...:	CAC		
Categories	**Calibration**	**Men**	**Hours**	**Total cost**	**Type**
Cal Officer		2	1.0	-	Certificate

CERTIFICATE OF CALIBRATION - SOUND LEVEL METER

This report of calibration shall document that the instrument herein was examined and tested in compliance with ISO/IEC 17025 against NIST traceable reference standards and its co-equal standards.

Issued To: **BERKMAN SYSTEMS INCORPORATED**
Address: **Suite 208 VAG Bldg., Ortigas Avenue, Greenhills, San Juan, Metro Manila, Philippines**

UNIT UNDER TEST (UUT):

Instrument:	Sound Level Meter
Brand:	Lutron
Model No:	SL-4030
Serial No:	I.503730
ID Code:	No record
Range:	30 to 130 dB
Graduation:	0.1 dB
Calibration Date:	November 3, 2023
Calibration Due:	November 2, 2024

CALIBRATOR INFORMATION:

Instrument:	Sound Level Calibrator
Brand:	Lutron
Serial No:	I.278821
Model No:	SC-942
Traceability:	IEC 60942 Type II A Standard
	NIST and NPL

Environmental Condition:

Condition: DRY/BASIC/NEUTRAL
Relative Humidity: 51.3 ±5%,1006 hPa
Ambient Temp. (Deg C): 21.7 ±2

Calibration Method:

By comparative technique, Standard Sound Generator was introduced at the unit under test at a constant value of 94.0 dB and 114.0 dB at a uniform frequency of 1000 Hz. Data were gathered and tabulated. Procedures of test conform to the requirements of OIML 88 Guidelines, IEC 60942 of the NIST and National Physical Laboratories.

During calibration, the unit was found to have a standard error of ± 0.10 dB with a confidence level of not less than 95%. Uncertainty of measurement is ± 0.28 dB. Calculations were taken using the Standard Deviation Formula.

Results:

TRIALS	REFERENCE READING (dB)	UNIT UNDER TEST READING (dB)		ERROR IN READING (dB)	STANDARD DEVIATION	REMARKS
		AS FOUND	AS LEFT			
1	94.0	94.3	94	0.000	0.0000	Passed
2	114.0	114.5	114.2	0.200	0.1414	Passed

Remarks:

All data pertain only to the unit described obtained at the time of test. This certificate is not valid w/out seal and signature. Unauthorized reproduction is prohibited.

Calibrated By: C.A. CASADO
Date: November 3, 2023

Certified By: A.R. C[illegible]
Date: November 3, 2023

ANNEX E

TEST PARTICIPANTS

TEST PARTICIPANTS

BMC FORESTRY CORPORATION – BC ILP

Mr. Franciso O. Flavier - Resident Manager

BSI

Mr. Halcy Lemon P. Orquina - Field Engineer

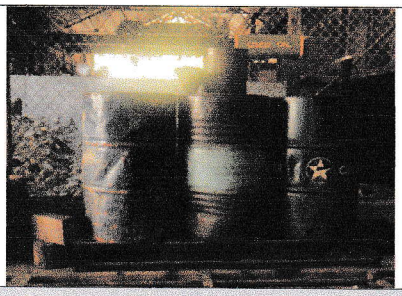
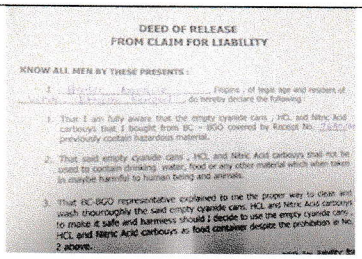
Mr. Edindo C. Fernando - QA/QC Manager

Mr. Joseph Dandy A. Quilet - Field Technician

Mr. Christian A. Soleta - Field Technician

Mr. Jimuel B. Torellino - Sampling Aide / Driver

Document Title	EMS GUIDELINES				
Process	Hazardous Waste Management (Used Oil, Oil and Grease Contaminated Items)				
Document Code	DRCS-12-07-A_EMSG_HWMCI	Revision No.	02	Effective Date	Jan. 2, 2024
Department	Mill, Mill Mechanical, Mine Mechanical, Motorpool, Warehouse, MEPEO Department			Page Number	Page **1** of **2**
Prepared by: CJ CHAPDIAN	Reviewed by: BGO EMS			Approved by: VB BONGALOS JR.	

USED OIL	USED OIL	USED OIL
Each department will assign a designated storage area for used oil	Use tightly sealed and properly labeled containers with secondary containment	When full, notify MEPEO Dept for proper inventory & documentation
		
USED OIL	**USED OIL**	**USED OIL**
Collected containers will be stored in a centralized temporary storage facility	Accumulated used oil will be sold to EMB-accredited buyer	A signed waiver will be issued to by the buyer to the company
		 DEED OF RELEASE FROM CLAIM FOR LIABILITY KNOW ALL MEN BY THESE PRESENTS :
USED OIL	**OIL CONTAMINATED**	**OIL CONTAMINATED**
Used oil from mill mechanical will be re-used	All contaminated items will be disposed in hazardous trash bin	When full, seal the container and notify MEPEO Dept. for inventory
		

MASTER COPY

OIL CONTAMINATED	OIL CONTAMINATED	OIL CONTAMINATED
Collected containers will be stored in a centralized temporary storage facility	Contact an EMB-accredited Treatment/Storage/Disposal Company	Used spill kit materials are disposed in the hazardous trash bin
		

MASTER COPY

Document Title	EMS GUIDELINES			BenguetCorp	
Process	Hazardous Waste Management (Aerosol Cans)				
Document Code	DRCS-12-07-B_EMSG_HWM_AC	Revision No.	01	Effective Date	Jan. 1, 2023
Department	Warehouse, Geology, Mine Technical Services (Survey), MEPEO Department			Page Number	Page 1 of 1
Prepared by: SV CAO-ROSARIO	Reviewed by: BGO EMS			Approved by: VB BONGALOS JR.	

AEROSOL CANS

Each department will be responsible for collecting all their empty cans

AEROSOL CANS

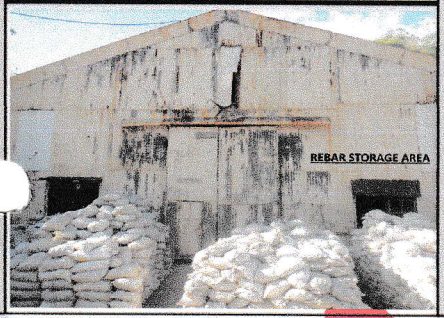
Empty cans will be stored in it's original box (labeled "empty")

AEROSOL CANS

When the box is full, seal the box & notify MEPEO Dept for inventory

AEROSOL CANS

Collected containers will be stored in a centralized temporary storage



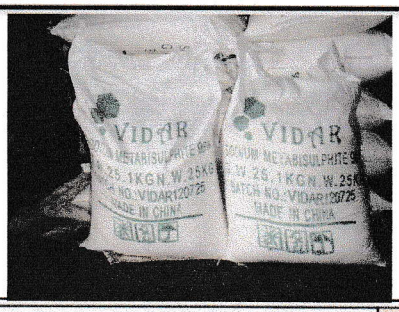
AEROSOL CANS

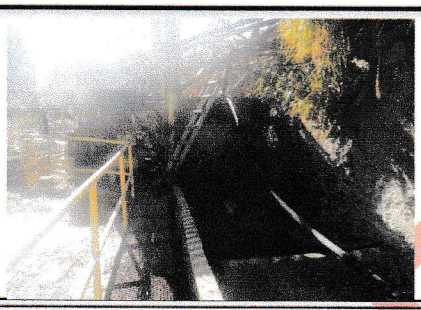
Contact an EMB-accredited Treatment/Storage/Disposal Company

Document Title	EMS GUIDELINES				
Process	Hazardous Waste Management – Mill Tailings (including Excess Metallurgic Samples, Sample Rejects)				
Document Code	DRCS-12-07-C_EMSG_HWM_MT	Revision No.	01	Effective Date	Jan. 1, 2023
Department	Mill, Metallurgy Laboratory, MEPEO Department			Page Number	Page 1 of 1
Prepared by: CG CRUZ	Reviewed by: BGO EMS			Approved by: VB BONGALOS JR.	

MILL

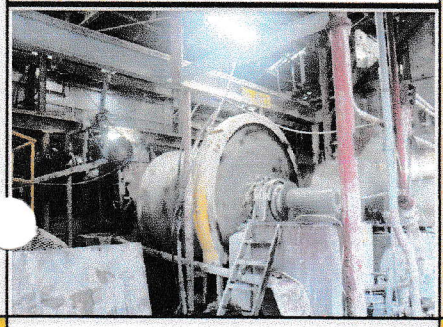
All discharge (pulp, tails, contaminated water) from the mill (from crushing, grinding to refining and smelting) goes into Tails Treatment Facility. The solution is treated with SMBS before being pumped to Tails Storage Facility (TSF)






MET LAB SAMPLES

All excess samples and rejects from Met Lab are returned to the Mill

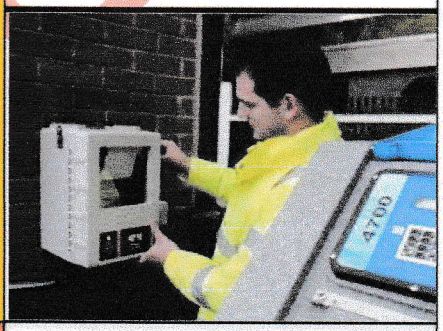


SPILL

Sluice all spill towards canals that are connected to the treatment facility

MONITORING

Discharge monitoring



MONITORING

Monitor tanks to avoid overflow

MONITORING

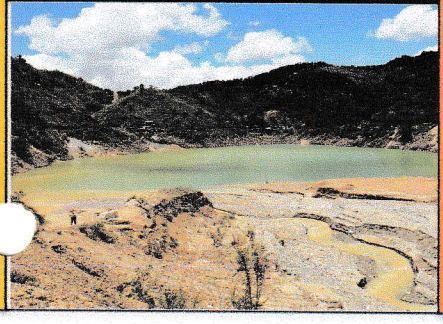
Regular cleanup of canal/drain

MAINTENANCE

Regular check of discharge valves pipes and connections

MONITORING

Regular monitoring of TSF

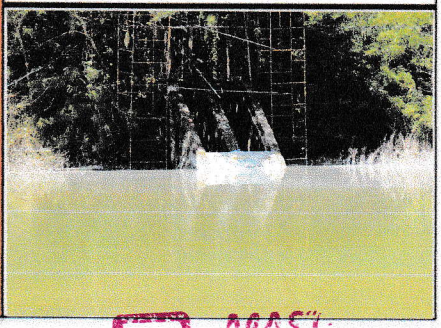


MAINTENANCE

Installation of piezometer to monitor TSF (dam's) strength

MAINTENANCE

Installation of stopper boards at TSF



Document Title	EMS GUIDELINES			BenguetCorp	
Process	Hazardous Waste Management – Cyanide Cans/Contaminated Plastic				
Document Code	DRCS-12-07-D_EMSG_HWM_CC	Revision No.	01	Effective Date	Jan. 1, 2023
Department	Warehouse, Mill, Safety, and Enviro Department			Page Number	Page 1 of 1
Prepared by: JAM ALMEROL	Reviewed by: BGO EMS			Approved by: VB BONGALOS JR.	

CYANIDE CANS

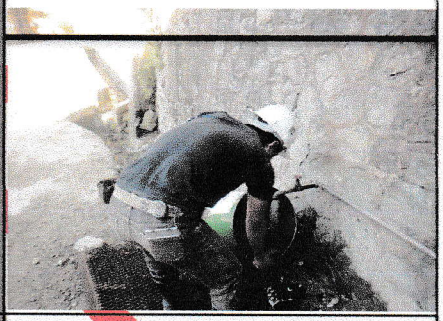
Mill will assign designated stockpile area for empty cyanide cans

CYANIDE CANS

Met Lab will collect all empty cans for re-use

CYANIDE CANS

All cans are washed properly with water and soap before reuse



CYANIDE CANS

Use designated wash area to control contaminated wash water

CYANIDE CANS

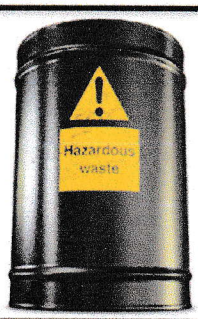
Puncture holes at the bottom to discourage reusing for any liquids

CYANIDE PLASTIC

All packaging from the cyanide crate are considered haz-waste

CYANIDE PLASTIC

All cyanide packaging will be disposed in the haz-waste trash bin

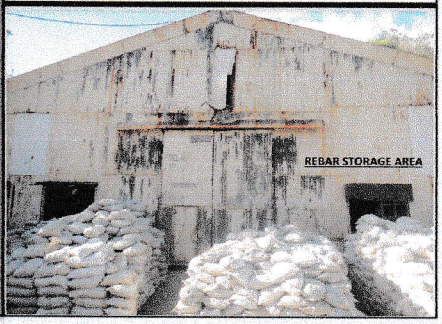


CYANIDE PLASTIC

When full, seal the container and notify MEPEO Dept for inventory

CYANIDE PLASTIC

Collected waste bags will be stored in a centralized temporary storage



CYANIDE PLASTIC

Contact an EMB-accredited Treatment/Storage/Disposal Company

MASTER COPY

Document Title	**EMS GUIDELINES**			BenguetCorp	
Process	**Hazardous Waste Management – Reagent/Chemical Sacks and Bags**				
Document Code	DRCS-12-07-E_EMSG_HWM_RS	**Revision No.**	01	**Effective Date**	Jan. 1, 2023
Department	Mill, Metallurgy Lab, Assay Lab, Warehouse, and MEPEO Department			**Page Number**	Page **1** of **1**
Prepared by: CG CRUZ	**Reviewed by:** BGO EMS			**Approved by:** VB BONGALOS JR.	

REAGENT SACKS/BAGS

All department users will assign designated area for empty sacks

REAGENT SACKS/BAGS

Accumulated sacks will be transferred to a centralized temporary storage

REAGENT SACKS/BAGS

Notify MEPEO Dept for proper inventory and documentation

REAGENT SACKS/BAGS

Contact an EMB-accredited Treatment/Storage/Disposal Company

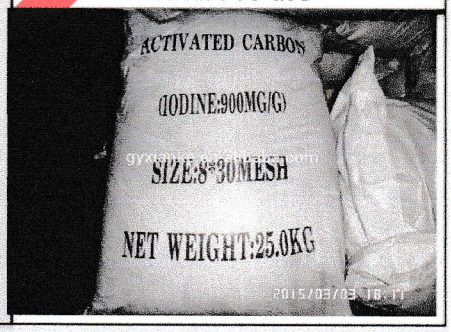
REAGENT SACKS/BAGS

The sacks from the following reagents are considered haz-waste

Caustic Soda
Borax
Soda Ash, Light
Litharge

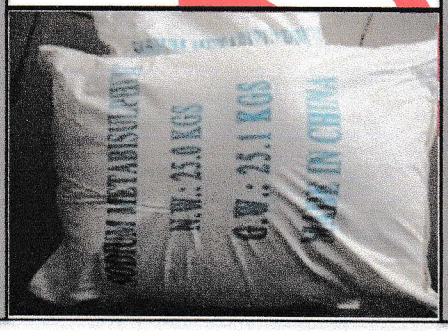
CARBON SACKS

Empty carbon sacks can be stored for future re-use



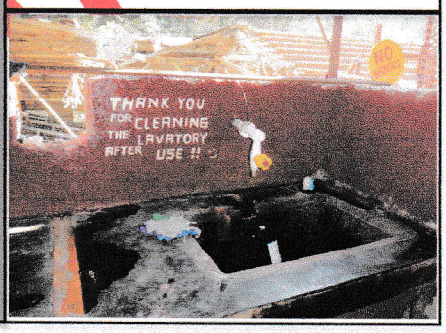
$Na_2S_2O_5$ BAGS

Empty sodium metabisulfite bags are washed for re-use



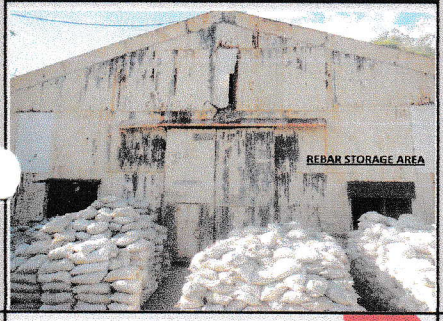
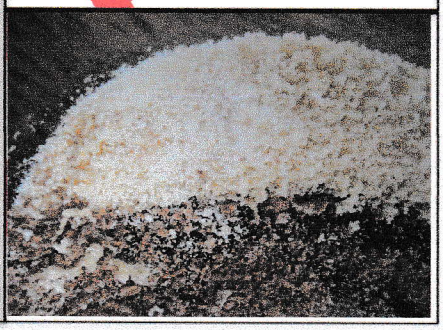
$Na_2S_2O_5$ BAGS

Use designated wash area to control contaminated wash water



Document Title	EMS GUIDELINES				
Process	Hazardous Waste Management (Laboratory/Mill Procedure Wastes – Slags, Used Bowl Clay, Crucibles and Cupels, Contaminated Lab Equipment/Tiles)				
Document Code	DRCS-12-07-F_EMSG_HWM_CLE	Revision No.	01	Effective Date	Jan. 1, 2023
Department	Assay Lab, Metallurgy Lab, Mill, and MEPEO Department			Page Number	Page 1 of 1
Prepared by: CG CRUZ	Reviewed by: BGC EMS			Approved by: VB BONGALOS JR.	

BenguetCorp

LAB/MILL WASTE	Each department will be responsible for collecting their own lab waste Assay Laboratory Mill Metallurgy Laboratory	LAB/MILL WASTE	Assign designated temporary storage for collected waste per department 
LAB/MILL WASTE	Each lab waste is disposed separately, properly sealed and labeled 	LAB/MILL WASTE	Accumulated sacks will be transferred to a centralized temporary storage 
LAB/MILL WASTE	Notify ENVIRO Dept for proper inventory and documentation 	LAB/MILL WASTE	Maintain segregation for different lab waste (properly labeled) 
LAB/MILL WASTE	Contact an EMB-accredited Treatment/Storage/Disposal Company 	LAB/MILL WASTE	Chemical precipitates on the acid scrubber is dissolved before disposal 

Document Title	EMS GUIDELINES				
Process	Hazardous Waste Management (Acid Carbuoys)				
Document Code	DRCS-12-07-G_EMSG_HWM_AC	Revision No.	02	Effective Date	Jan. 2, 2024
Department	Assay Lab, Metallurgy Lab, Mill, Warehouse and MEPEO Department			Page Number	Page 1 of 1
Prepared by: CJ CHAPDIAN	Reviewed by: BGO EMS			Approved by: VB BONGALOS JR.	

BenguetCorp

HCL/HNO_3 CARBUOYS

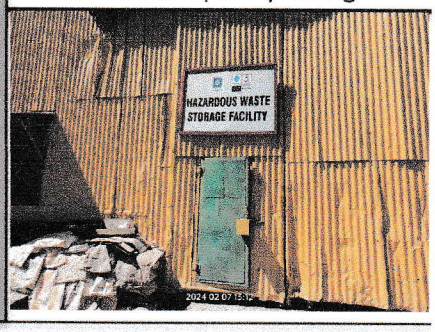
Each department will have a temporary space for empty carbuoy storage

HCL/HNO_3 CARBUOYS

When space is full, notify MEPEO for proper inventory & documentation

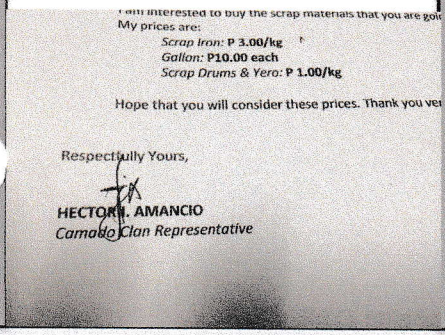
HCL/HNO_3 CARBUOYS

Collected carbuoys will be stored in a centralized temporary storage



HCL/HNO_3 CARBUOYS

Materials & Management Group will contact interested buyers



I am interested to buy the scrap materials that you are go
My prices are:
Scrap Iron: **P 3.00/kg**
Gallon: **P10.00 each**
Scrap Drums & Yero: **P 1.00/kg**

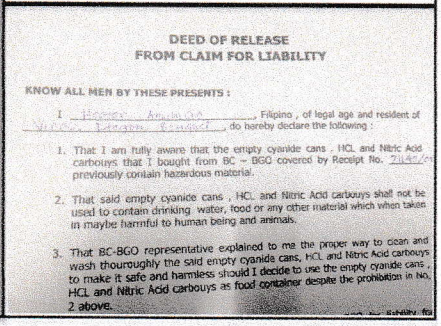
Hope that you will consider these prices. Thank you ve

Respectfully Yours,

HECTOR M. AMANCIO
Camodo Clan Representative

HCL/HNO_3 CARBUOYS

A signed waiver will be issued by the buyer to the company



DEED OF RELEASE
FROM CLAIM FOR LIABILITY

KNOW ALL MEN BY THESE PRESENTS :

I _____, Filipino , of legal age and resident of _____, do hereby declare the following :

1. That I am fully aware that the empty cyanide cans , HCL and Nitric Acid carbuoys that I bought from BC – BGO covered by Receipt No. _____ previously contain hazardous material.
2. That said empty cyanide cans , HCL and Nitric Acid carbuoys shall not be used to contain drinking water, food or any other material which when taken in maybe harmful to human being and animals.
3. That BC-BGO representative explained to me the proper way to clean and wash thouroughly the said empty cyanide cans, HCL and Nitric Acid carbuoys to make it safe and harmless should I decide to use the empty cyanide cans , HCL and Nitric Acid carbouys as food container despite the prohibition in no. 2 above.

MASTER COPY

Document Title	EMS GUIDELINES			BenguetCorp	
Process	Hazardous Waste Management (Batteries)				
Document Code	DRCS-12-07-H_HWM_B	Revision No.	01	Effective Date	Jan. 1, 2023
Department	All Departments, Motorpool, Mine Mechanical, Electrical, Warehouse, and MEPEO Department			Page Number	Page 1 of 1
Prepared by: SV CAO-ROSARIO	Reviewed by: BGO EMS			Approved by: VB BONGALOS JR.	

VEHICLE BATTERY

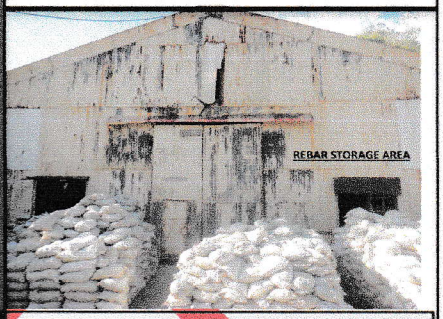
Motorpool will collect all unusable batteries in a designated space

VEHICLE BATTERY

When space is full, notify MEPEO for proper inventory & documentation

VEHICLE BATTERY

Collected batteries will be stored in a centralized temporary storage



VEHICLE BATTERY

Contact an EMB-accredited Treatment/Storage/Disposal Company

DRY CELL BATTERIES

Electrical Dept will collect all empty batteries from all departments

DRY CELL BATTERIES

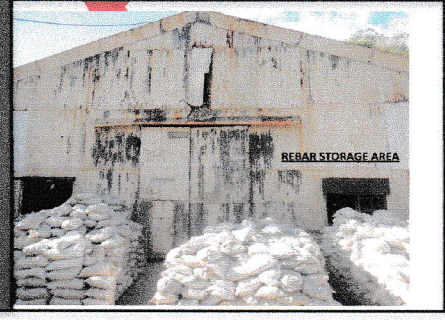
Collected batteries will be stored in a leak-proof waste container

DRY CELL BATTERIES

When bin is full, notify MEPEO for proper inventory & documentation

DRY CELL BATTERIES

Collected batteries will be stored in a centralized temporary storage



DRY CELL BATTERIES

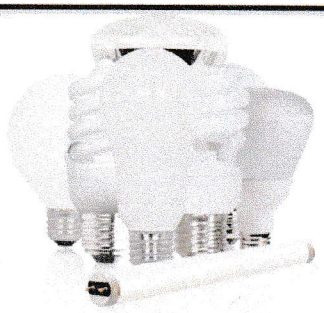
Contact an EMB-accredited Treatment/Storage/Disposal Company

MASTER COPY

Document Title	EMS GUIDELINES				
Process	Hazardous Waste Management – Fluorescent Lamps and Bulbs				
Document Code	DRCS-12-07-I_EMSG_HWM_FLB	Revision No.	02	Effective Date	Jan. 2, 2024
Department	All Departments, Electrical, Warehouse, and MEPEO			Page Number	Page 1 of 1
Prepared by: CJ CHAPDIAN	Reviewed by: BGO EMS			Approved by: VB BONGALOS JR.	

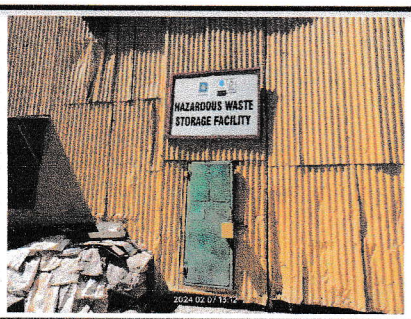
FLUORESCENT LAMPS/BULBS

All busted lamps and bulbs are collected by the Electrical Dept



FLUORESCENT LAMPS/BULBS

Collected lights/bulbs are stored in a centralized temporary storage



FLUORESCENT LAMPS/BULBS

Notify MEPEO Department for proper inventory & documentation

FLUORESCENT LAMPS/BULBS

Contact an EMB-accredited Treatment/Storage/Disposal Company

MASTER COPY

Document Title	EMS GUIDELINES			BenguetCorp	
Process	Hazardous Waste Management – Medical Waste				
Document Code	DRCS-12-07-K_EMSG_HWM_MW	Revision No.	02	Effective Date	Jan. 2, 2024
Department	Clinic, Safety, MEPEO Department			Page Number	Page 1 of 1
Prepared by: CJ CHAPDIAN	Reviewed by: BGO EMS			Approved by: VB BONGALOS JR.	

MEDICAL WASTE

Medical waste is collected in a separate waste bin

MEDICAL WASTE

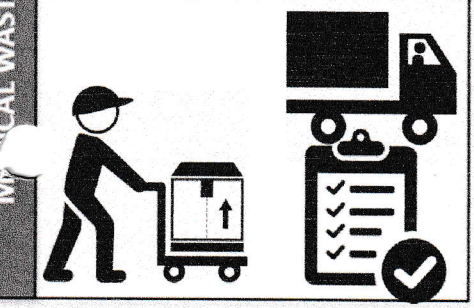
When bin is full, it is transferred to specially marked "biohazard" bags

MEDICAL WASTE

MEPEO Department is notified for proper inventory & documentation

MEDICAL WASTE

Clinic will coordinate with MEPEO & Motorpool for delivery logistics



MASTER COPY

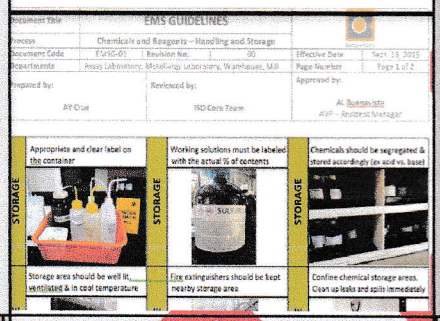
Document Title	EMS GUIDELINES				
Process	Hazardous Waste Management – Other Chemical/Reagent Containers (Crates, Boxes, & Bottles)				
Document Code	DRCS-12-07-L_EMSG_HWM	Revision No.	01	Effective Date	Jan. 1, 2023
Department	Warehouse, Mill, Metallurgy Lab, Assay Lab, and MEPEO Department			Page Number	Page 1 of 1
Prepared by: CG CRUZ	Reviewed by: BGO EMS			Approved by: VB BONGALOS JR.	

ACID BOTTLES

Assign designated areas for temp storage of empty bottles per dept.

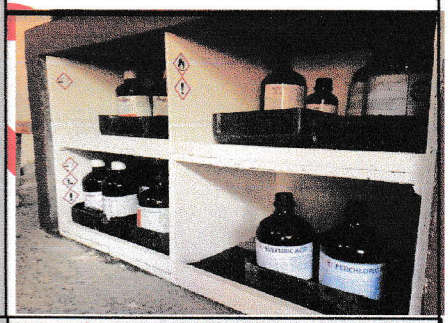
ACID BOTTLES

Segregate bottles and containers by following EMS guideline for chemicals



REAGENT CONTAINERS

Label designated areas properly

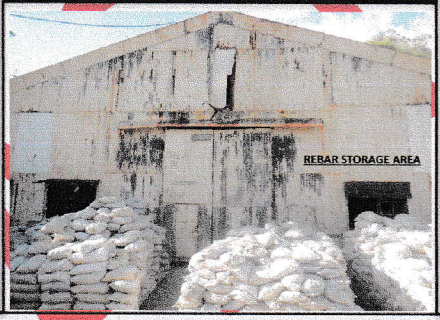


REAGENT CONTAINERS

When storage is full, notify Enviro for proper inventory& documentation

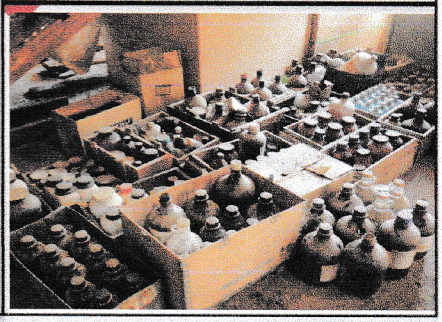
REAGENT CONTAINERS

Collected containers are stored in a centralized temporary storage



REAGENT CONTAINERS

Maintain segregation and labels in the central storage (rebar)



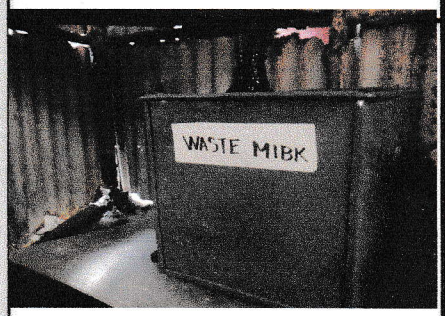
REAGENT CONTAINERS

Contact an EMB-accredited Treatment/Storage/Disposal Company

Document Title	EMS GUIDELINES			BenguetCorp	
Process	Hazardous Waste Management – MIBK Waste				
Document Code	DRCS-12-07-M_EMSG_HWM_MW	Revision No.	01	Effective Date	Jan. 1, 2023
Department	Assay Lab, and MEPEO Department			Page Number	Page 1 of 1
Prepared by: CG CRUZ	Reviewed by: BGO EMS			Approved by: VB BONGALOS JR.	

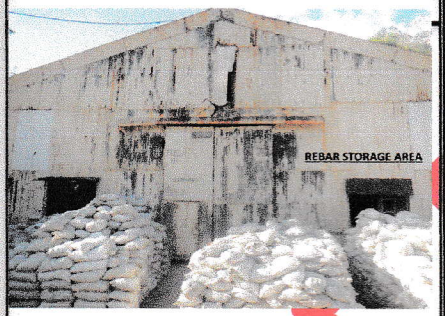
MIBK WASTE

Waste MIBK is stored back to it's original container for containment



MIBK WASTE

All filled up containers are sent to a centralized temporary storage



MIBK WASTE

Notify MEPEO Dept for proper inventory and documentation

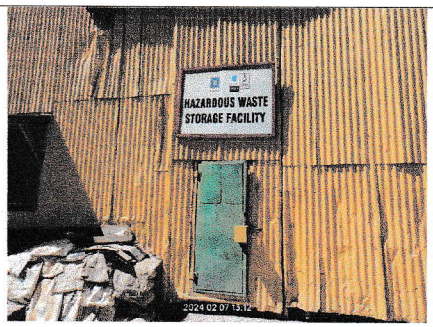
MIBK WASTE

In the central storage, all will be transferred in an approved steel drum

MIBK WASTE

Contact an EMB-accredited Treatment/Storage/Disposal Company

Document Title	EMS GUIDELINES			BenguetCorp	
Process	Hazardous Waste Management – Ink Cartridges / Bottles				
Document Code	DRCS-12-07-N_EMSG_HWMIC	Revision No.	02	Effective Date	Jan. 2, 2024
Department	MEPEO, All Departments			Page Number	Page 1 of 1
Prepared by: CJ CHAPDIAN	Reviewed by: BGO EMS			Approved by: VB BONGALOS JR.	

DISPOSAL	DISPOSAL	DISPOSAL
Empty printer ink cartridges/ bottles are collected from each department.	MEPEO Dept. is notified for proper inventory and documentation of the empty cartridges/ bottles that are disposable.	Collected empty cartridges/ bottles that are disposable are stored in the Hazardous Waste Storage Facility.
 		

DISPOSAL	RECYCLING
Contact an EMB-accredited Transporter and Treater for proper disposal	Collected empty cartridges/ bottles are turned over to the Procurement Dept. which handles the refilling.
	

MASTER COPY

Republic of the Philippines
Department of Environment and Natural Resources
ENVIRONMENTAL MANAGEMENT BUREAU
Cordillera Administrative Region
Baguio City

ENVIRONMENTAL COMPLIANCE CERTIFICATE

CAR 1012 – 174 – 2110 (Amended)

The Department of Environment and Natural Resources (DENR) thru the Environmental Management Bureau – Cordillera Administrative Region (EMB-CAR) hereby grants this Environmental Compliance Certificate (ECC) for the **Acupan Contract Mining Project (ACMP)** of **Benguet Corporation** located at the former Balatoc Power Station Area, Virac, Itogon, Benguet, after complying with the Environmental Impact Assessment (EIA) requirements as prescribed in the promulgated guidelines implementing section 3 (b) of P.D. 1586.

This Certificate is further specified as follows:

A. Scope:

1. This Certificate is valid only for the abovecited project with a rated milling capacity not to exceed 300 dry metric tons per day (300 DMT/Day) and/or as described in the submitted documents.

2. This Certificate does not exempt the project from the requirements of other concerned agencies;

B. Conditions:

1. The development and operation of the project shall be in accordance with the plans and specifications described in the submitted documents. Any major modification and/or expansion shall be subject to the Environmental Impact Statement (EIS) System requirement;

2. The proponent shall cause the implementation of the Environmental Management Plan (EMP) and all other BC commitments described in the submitted EIA documents;

3. Tailings and other wastes generated from the operation of the plant shall be contained and disposed-off properly in the designated pollution control facility(ies) as described in the submitted EIA documents;

4. Pond/plant effluent discharges shall conform with the standards set forth under RA 9275 otherwise known as the Clean Water Act of the Philippines and its implementing Rules and Regulations;

5. Piezometer monitoring station(s) shall be installed along strategic area(s) at tailings pond nos. 1 and 2 (TP #1 & TP #2) to monitor phreatic level stability;

6. The legal requirements pursuant to RA 6969 also known as the Toxic Substances and Hazardous and Nuclear Waste Control Act of 1990, RA 9275 or the Philippine Clean Water Act of 2004 and, RA 8749 or the Philippine Clean Air Act of 1999 shall be secured consistent to the operations of the plant. Compliance to said requirements shall be coordinated with the EMB-CAR;

7. Should there be a breakdown in the pollution control appurtenances and/or major damage(s) incurred, the proponent shall voluntary cease its operation until such time that said damages incurred shall be rehabilitated or restored. Further, the proponent shall immediately inform the EMB, DENR-CAR of said damages and of the remedial measures undertaken;

8. The proponent shall submit to EMB-CAR one (1) year prior to the final shutdown of the plant a comprehensive abandonment plan. In relation, the EMB shall first review and approve the environmental aspects/components of the plan consistent with EMB functions prior to implementation;

9. To oversee the compliance of the proponent with the ECC conditions, the proponent shall maintain the operation of the established Sectoral Monitoring Team including the Environmental Monitoring Fund (EMF) to cover all costs attendant to the said monitoring.

10. The project is subject to on-the-spot monitoring/inspection at any reasonable time by the EMB-CAR which may be in coordination with concerned groups.

11. The proponent shall cause the implementation of any undertaking which may be imposed by the EMB-CAR as a result of Technical Conference/s called relative hereof;

12. This Certificate supersedes the Environmental Compliance Certificate (ECC) NO. CAR 0211-144-120 issued the project on November 29, 2002.

13. This Certificate shall be deemed automatically expired if the project is not implemented within five (5) years from the date of issuance; and

14. Any transfer of project proprietorship or project name carries the same conditions in this ECC for which notification to the EMB-CAR shall be made by the proponent within fifteen (15) days from such transfer.

Non-compliance with any of the above stipulations will be sufficient cause for the suspension or cancellation of this Certificate, administrative sanctions against the office head and/or imposition of fine in the amount not to exceed Fifty Thousand Pesos (₱

50,000.00) for every violations thereof, at the discretion of the DENR (Section 9 of P. D. 1586).

C. Recommendations (for the consideration of the project proponent, the PMRB-Benguet/MGB-CAR and, other concerned agencies in the issuance of applicable permits/authorities):

1. The recommendations cited in the Geotechnical Analysis of Dam and Review of the Hydrology for the Re-mining of Tailings from the BGO Tailings Ponds No. I, II, & III final report, where applicable, should be given preferential consideration under the requirements of the MGB-CAR;

2. Qualified local residents should be given priority employment during the development and operation of the project;

3. Construction works should be under the tight supervision of a technical personnel to ensure that standards and requirements of sound engineering, safety and health practices are strictly followed;

4. An emergency response and contingency plan in the event of failure of any of the project appurtenant facilities and/or during disaster/calamity; and

5. The appurtenant physical structures and equipment of the project, where applicable, are subject to the requirements of the National Building Code of the Philippines and the permitting requirements of MGB-CAR/LGU-concerned.

Issued this _____day of 15 DEC 2010, Year Two Thousand Ten.

RECOMMENDING APPROVAL:

NESTOR M. DONAAL
Chief, EIA Division

APPROVED:

PAQUITO T. MORENO, JR.
Regional Director

Amendment of ECC Condition ₱ 1,200.00 O.R. No. _____ Date _____
Legal Research Fee ₱ 240.00 O.R. No. _____ Date _____

NOTE: NOT VALID WITHOUT SEAL

Appendix I-1

Republic of the Philippines
Department of Environment and Natural Resources
ENVIRONMENTAL MANAGEMENT BUREAU
Cordillera Administrative Region
Baguio City

February 22, 2018

opd-087-18
Office of the Regional Director
EMB-CAR
RELEASED
By _____ Date 2/26

MR. FRANCISCO O. FLAVIER
Operations Manager
BMC Forestry Corporation
Km. 5, Naguilian Rd., Irisan, Baguio City

SUBJECT : AMENDMENT OF ECC NO. ECC-OL-CAR-2016-0058 ISSUED ON SEPTEMBER 15, 2016 TO BMC FORESTRY CORPORATION FOR THE IRISAN LIME PROCESSING PLANT LOCATED AT KM. 5, NAGUILIAN RD., IRISAN, BAGUIO CITY

Dear Mr. Flavier:

This has reference to the letter dated October 23, 2017 requesting for an amendment of the Environmental Compliance Certificate (ECC) numbered ECC-OL-CAR-2016-0058 issued on September 15, 2016 for maximizing the plant production capacity of the Irisan Lime Processing Plant.

After careful evaluation of the submitted documents and in consideration of the payment of PhP 2,035.00 under O.R. numbers 2673464 and 7643336 dated 11/23/2017, this office has decided to grant the ECC amendment. The project description of the ECC shall now read as follows:

ENVIRONMENTAL MANAGEMENT BUREAU
CORDILLERA ADMINISTRATIVE REGION
ECC-AMEND-50-2018
26/02/2018 10:41:28 AM

PROJECT DESCRIPTION

*The ECC covers the operation of the Irisan Lime Processing project with an annual production capacity of **19,420 MT** and the full operations of the three (3) vertical shaft kilns located within an 18,541sq. m. lot at Km. 5, Naguilian Rd., Irisan, Baguio City covered by the Transfer Certificate of Title numbered 018-2013000103 in the name of Ifaratoc Mineral Resources Corporation (IMRC). The project involves the processing of raw lime stones into quicklime and slaked lime through calcination process by subjecting the limestone feeds into continuous heat in vertical shaft kilns.*

All other provisions of the original ECC (No. ECC-OL-CAR-2016-0058 issued on September 15, 2016) not herein amended shall remain valid and existing. Consequently, non-compliance with the said conditions shall be sufficient cause for the imposition of fines in accordance with the penal provisions of PD 1586 and/or cancellation of the ECC.

This letter shall be attached to and shall form part of the aforementioned ECC.

For information and record.

Very truly yours,

REYNALDO S. DIGAMO
OIC, Regional Director

EMB-CAR RECORDS UNIT
IN: 2/26/18
ON: 2/26/18
ON:

DENR Cmpd., Gibraltar Rd.
Baguio City 2600
P.O. Box 1959

Telefax No. (074) 444-6440
Tel. No. (074) 442-2346/ 442-3896
(074) 446-2881/ 443-4909

Republic of the Philippines
Department of Environment and Natural Resource
ENVIRONMENTAL MANAGEMENT BUREAU
DENR Compound, Gibraltar, Baguio City
Telephone No.(074) 442-2346, (074) 446-2881, (074) 443-4909 Fax No.(074) 446-6440
car@emb.gov.ph
Visit us at http://www.emb.gov.ph/portal/car

September 15, 2016

ECC-OL-CAR-2016-0058

MR. FRANCISCO O. FLAVIER
Operations Manager
BMC Forestry Corporation
Km. 5, Naguilian Rd., Irisan, Baguio City

Subject: **ENVIRONMENTAL COMPLIANCE CERTIFICATE**

Dear **Mr. Flavier:**

This refers to the Environmental Compliance Certificate (ECC) application for the **Irisan Lime Kilns** operation at Km. 5, Naguilian, Irisan, Baguio City.

After satisfying the requirements of the said application, this Bureau has decided to grant an ECC for the above-mentioned project.

With the issuance of this ECC, you are expected to implement the measures presented in the Initial Environmental Examination Checklist (IEEC), intended to protect and mitigate the project's adverse impacts on community health, welfare and the environment. Environmental considerations shall be incorporated in all phases and aspects of the project. You may proceed with the project implementation after securing all the necessary permits from other pertinent Government agencies. This Office will be monitoring the project periodically to ensure your compliance with stipulations cited in the attached ECC.

Please be guided accordingly.

Very truly yours,

REYNALDO S. DIGAMO
OIC, Regional Director

Republic of the Philippines
Department of Environment and Natural Resource
ENVIRONMENTAL MANAGEMENT BUREAU
DENR Compound, Gibraltar, Baguio City
Telephone No.(074) 442-2346, (074) 446-2881, (074) 443-4909 Fax No.(074) 446-6440
car@emb.gov.ph
Visit us at http://www.emb.gov.ph/portal/car

ENVIRONMENTAL COMPLIANCE CERTIFICATE

(Issued under Presidential Decree 1586)

ECC-OL-CAR-2016-0058

THIS IS TO CERTIFY THAT the **BMC Forestry Corporation,** a subsidiary of Benguet Corporation, Inc., herein represented by its Operations Manager, **Francisco O. Flavier,** is granted this ECC for the operation of the **Irisan Lime Processing Plant,** by the Department of Environment and Natural Resources (DENR), through the Environmental Management Bureau (EMB).

SUBJECT ONLY to the conditions and restrictions set in this ECC and in the attached document labelled as Annexes A and B.

This Certificate is issued with the following details and supersedes the unnumbered ECC issued by the National Environmental Protection Council (NEPC) on December 2, 1982.

PROJECT DESCRIPTION

The ECC covers the operation of the Irisan Lime Processing project with an annual production capacity of 9,500 MT located within an 18,541 sq. m. lot at Km. 5, Naguilian Rd., Irisan, Baguio City covered by the Transfer Certificate of Title numbered 018-2013000103 in the name of Ifaratoc Mineral Resources Corporation (IMRC). The project involves the processing of raw lime stones into quicklime and slaked lime through calcination process by subjecting the limestone feeds into continuous heat in vertical shaft kilns. The details of the project components, amenities and facilities are found in Annex C hereof.

This Certificate is issued in compliance with the requirements of Presidential Decree No. 1586, and in accordance to DENR Administrative Order (D.A.O.) No. 2003-30. The EMB, however, is not precluded from reevaluating and correcting any deficiencies or errors that may be found after issuance of this Certificate.

Issued at EMB-CAR, DENR Compound, Gibraltar, Baguio City this September 15, 2016.

Recommending Approval:

NESTOR M. DONAAL
OIC-Chief, Clearance & Permitting Division

Approved:

REYNALDO S. DIGAMO

OIC, Regional Director

SWORN ACCOUNTABILITY STATEMENT

I, FRANCISCO O. FLAVIER, Operations Manager, representing the BMC FORESTRY CORPORATION with Office address at Km. 5, Naguilian Rd., Baguio City, takes full responsibility in complying with all conditions in this Environmental Compliance Certificate (ECC).

FRANCISCO O. FLAVIER
Signature

TIN No. 103-481-016

Subscribed and sworn before me this 16 SEP 2016, the above-named affiant taking oath presenting his CTC 13724959, issued on June 01, 2016 at Baguio City.

CRISTINA I. VALDEZ
Notary Public
My Commission Expires on 31 December 2016
Roll No. 61811; 25 August 2013; Manila
IBP No. 1003788; 01-07-16; Baguio-Benguet
PTR No. 2436102; 12-21-15; Baguio City

Notary Public

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Book No. 19
Series of 2016

Annex A

I. CONDITIONS

ENVIRONMENTAL MANAGEMENT

All commitments, mitigating measures and monitoring requirements, contained in the Initial Environmental Examination Checklist Report for the lime processing plant project, particularly in the Environmental Management Plan/ Environmental Monitoring Plan, including any modifications and/or additional information as approved by the EMB, shall be instituted to minimize any adverse impact of the project to the environment throughout its implementation, which shall include among others, to wit:

1. Voluntary cease its operation in the event of any malfunction in any of the appurtenant facilities until the time that said damages are rehabilitated or restored, Further, the proponent shall immediately inform the EMB-CAR of said damages and of remedial measures undertaken;

2. Uncalcined limestone/discards shall be prevented from deposition to and along drainage/natural waterways and water bodies, and shall be disposed – off properly in an appropriate/designated disposal site(s) which shall be maintained in a stable and non-polluting condition;

3. Timely construction of adequate engineered earth retaining structures along affected and geologically unstable areas, especially in the stockyard of limestone and quarry areas, to protect adjacent properties/environment;

4. The proponent shall plant appropriate/indigenous tree species along the periphery of the project site to serve as buffer for dust and noise and improvement of aesthetics and in the support of the National Greening Program and climate change initiatives of the government;

GENERAL CONDITIONS

5. The legal requirements pursuant to RA 6969 or the Toxic Substances and Hazardous and Nuclear Wastes Control Act of 1990, RA 8749 or the Philippine Clean Air Act of 1999, RA 9003 or the Ecological Solid Waste Management Act of 2000 and RA 9275 or the Philippine Clean Water Act of 2004 shall be secured whenever applicable. Compliance with said requirements shall be coordinated with the Clearance and Permitting Division (CPD) of EMBCAR, DENR;

6. The proponent shall secure regularly necessary permit(s)/clearances/authority from concerned national and local offices relative to project implementation;

7. The proponent shall allow entry of EMB-CAR personnel into the project site at all times to conduct monitoring and to validate project's compliance with the ECC conditions stipulated therein and EMP Mitigating Measures;

8. The proponent shall submit to EMB-CAR within fifteen (15) days after every quarter a Self-monitoring Report (SMR) and a Compliance Monitoring Report (CMR) semi-annually;

9. The proponent shall cause the implementation of any undertaking which may be imposed by EMB-CAR as a result of Technical Conference/s called relative to environmental issues arising from the implementation of the project;

II. RESTRICTIONS

10. Limestone feed materials shall be strictly sourced out from the company's permitted quarry areas and/or other sources sanctioned by government authorities. Violation of this condition shall automatically cause the cancellation/revocation of this ECC or imposition of fine;

11. Project development shall be in accordance with the submitted documents. Major modifications and/or expansion shall be subject to a new Environmental Impact Assessment (EIA) requirement;

12. Any transfer of project ownership carries the same conditions and restriction in this ECC for which a written notification to the EMB-CAR shall be made by the transferee/transferor within fifteen (15) days from such transfer; and

13. The project shall undergo the requirements specified in the implementing guidelines of the Department Administrative Order No. 2003-30 if the project construction has stopped for a period of five (5) years.

Non-compliance with any of the provisions of this Certificate shall be a sufficient cause for the cancellation of this Certificate and/or imposition of a fine in an amount not to exceed Fifty Thousand Pesos (P50, 000.00) for every violation thereof without prejudice to imposition of fines and penalties under other environmental laws.

***NOTE:** *This Certificate **cancels** the ECC issued by the National Environmental Protection Council (NEPC) on December 2, 1982.*

Annex B

PROJECT ASSESSMENT PLANNING TOOL

For the assistance of the Proponent and the Government agencies concerned in the management of the Project and for better coordination in mitigation of the impacts of the Project on its surrounding areas and the environment, the following are recommended for appropriate action.

OTHER REGULATORY REQUIREMENTS/CONDITIONS	CONCERNED GOVERNMENT AGENCIES/ENTITIES
1. Compliance with the Labor Code of the Philippines	DOLE – Bureau of Working Condition
2. Compliance with the Sanitation Code of the Philippines	Department of Health (DOH)
3. Compliance with the Ecological Solid Waste Management Act.	LGU Concerned
4. Compliance to the Mining Act of the Philippines	MGB, DENR/LGU concerned
ENVIRONMENTAL PLANNING RECOMMENDATIONS FOR THE PROPONENT	
5. Priority of employment shall be given to qualified local residents. Adequate public information for jobs available to local residents in the affected areas shall be provided;	
6. Preservation of the existing trees be included as an essential part of the development/improvement scheme;	
7. Undertake project during reasonable time periods of the day so as not to cause undue disturbance;	
8. Strict supervision of project implementation by competent technical personnel to ensure that standards and requirements of sound engineering, safety and health practices are strictly followed; and	
9. Working areas should have appropriate warning signs, lighting during night time and barricade to prevent accident.	

Annex C

PROJECT COMPONENTS, AMENITIES AND FACILITIES

Processing Plant Components/Facilities
1. Three (3) units 2 m. x 4 m. high vertical shaft kilns 2. Three (3) units fuel oil pumps 3. Seven (7) units – 15,000-liter each capacity fuel oil tanks 4. One (1) unit – 60,000-liter capacity overhead fuel storage tank 5. One (1) unit – 90 MT silo storage 6. Two (2) units – 95 MT lime and limestone bins 7. Two (2) units lump lime discharge bins 8. Two (2) units crushed lime discharge bins 9. Two (2) units settling tanks 10. Three (3) units – 66 m^3/min each capacity gas scrubber 11. Three (3) units dust collector 12. Three (3) units standby generator sets • One (1) unit 50 KW capacity "CATERPILLAR" standby generator set • Two (2) units 200 KW each capacity "CUMMINS" standby generator set 13. One (1) unit-three (3) compartments oil-water separator 14. One (1) unit platform scale 15. One (1) unit air compressor 16. One (1) unit skip bucket elevator 17. One (1) unit belt conveyor 18. One (1) unit brick cutter 19. One (1) unit lime crusher
Buildings/Amenities/Others
1. Two-storey 489.75 sq. m. office building with one unit – two-chambered septic tank 2. Two-storey 520.0 sq. m. bunkhouse with two units – two-chambered septic tanks 3. One-storey 310.50 sq. m. staff house with one unit – two-chambered septic tank 4. 225 sq. m. parking area 5. 4,340 sq. m. stockyard (raw materials sourced-out from legal sources and from lot development activities) 6. A basketball court

NESTOR M. DONAAL
OIC-Chief, Clearance & Permitting Division

REYNALDO S. DIGAMO
OIC, Regional Director

BenguetCorp	Document Title	REGISTRY OF COMPLIANCE OBLIGATIONS		
	Document Code	DRCS-11_EMS_CO_01	**Revision**	10
	Department	MEPEO	**Effective Date**	February 28, 2025
Prepared by: CJ CHAPDIAN		**Department Head:** JR SALAYOG	**Reviewed By:** BGO EMS	**Approved By:** VALERIANO B. BONGALOS JR.

No.	Governing Laws, Rules and Regulations	Applicable Requirement	Interested Parties	Evidence of Compliance	Status of Compliance	Remarks
1	General Environment **PD 1586 Establishing an Environment Impact Statement System including other Environmental Manangement related measures and for other purposes** **DAO 2003-30** Implementing Rules and Regulations (IRR) for the Philippine Environmental Impact Statement (EIS) System	Securing ECC	DENR - EMB	ECC NO: CAR 1012 - 174 - 2110 (Amended - December 15, 2010)	**COMPLIANT**	Restricted to 300 tonnes per day
2	**DAO 2014-02- Revised Guidelines for Pollution Control Officer Accreditation**	Accreditation of Pollution Control Officer	*DENR - EMB*	Compliances\MEPEO\Accreditation of Pollution Control Officer-COA No. 2023-CAR-5329 Renewal.pdf	**COMPLIANT**	Accreditation is valid until April 17, 2026
3		*Training Course for Managing Head*		EMB CAR 419-2015 (Training Course for Managing Head)	**COMPLIANT**	Attended by VBB on Feb. 17, 2020
4	**DAO 2003-27** **Amending DAO 26, DAO 29 and DAO 81, Among others on the Submission of Self-Monitoring-Report (SMR)**	Preparation and Submission of Self-Monitoring-Report (SMR)	DENR/ EMB	Self-Monitoring-Report 4th Quarter of 2024	**COMPLIANT**	Submitted on January 15, 2025
5				Solid Waste Management Guidelines	**COMPLIANT**	EMSG-09: Solid Waste Management Guidelines

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No.	Governing Laws, Rules and Regulations	Applicable Requirement	Interested Parties	Evidence of Compliance	Status of Compliance	Remarks
6	**R.A. 9003 Ecological Solid Waste Management Act of 2000;**	Section 4, Segragation, Collection and Transport of Solid Waste	DENR - EMB	Annual Environmental Protection and Enhancement Program for ACMP-Benguet Corp 2025	**COMPLIANT**	**Proposed AEPEP** Submited: Nov. 29, 2024 **Revised AEPEP** Submited: December 5, 2024 (Revised Solid waste management is included into the program)
7	**DAO 2001-34 Implementing Rules & Regulations of RA 9003**			Module-5, Self-Monitoring-Report 4th Quarter of 2024 (Solid Waste Collection and Monitoring Report)	**COMPLIANT**	Submitted on January 15, 2025
8	**R.A. 9275 Philippine Clean Water Act of 2004;**	*Section 14: Discharge Permit*	DENR - EMB	Discharge Permit for Phase II Tailings Dam Application Permit Update	***PARTIALLY COMPLIANT***	The renewal of the Discharge Permit (DP) is already on processed and submitted through online application, though the releasing of the DP will depends on the water analysis results if the arsenic parameter will normalize.
9				Discharge Permit of Oil-Water Separator at Mine Mechanical Shop (DP-CAR-24-10617)	**COMPLIANT**	Expiry date: July 21, 2025
10				Discharge Permit of Oil-Water Separator at Motorpool Shop (DP-CAR-23-07804)	**COMPLIANT**	Expiry date: July 21, 2025
11				Discharge Permit of one (1) unit 2-Chambered Septic Tank for the Administartion Building (DP-CAR-24-08775)	**COMPLIANT**	Approved: Sep. 9, 2024 Valid Until: Sep. 9, 2025
12	**DAO 2005-10 Implementing Rules & Regulations of RA 9275**			Discharge Permit of one (1) unit 2-Chambered Septic Tank for the Assay Laboratory Building (DP-CAR-24-12186)	**COMPLIANT**	Approved: Dec. 3, 2024 Valid Until: Dec. 3, 2025

No.	Governing Laws, Rules and Regulations	Applicable Requirement	Interested Parties	Evidence of Compliance	Status of Compliance	Remarks
13				Discharge Permit of one (1) unit 2-Chambered Septic Tank for the Metallurgy Laboratory (DP-CAR-24-11549)	**COMPLIANT**	Approved: Nov. 20, 2024 Valid Until: Nov. 20, 2025
14				Discharge Permit of one (1) unit 2-Chambered Septic Tank for the Motorpool Department (DP-CAR-24-08775)	**COMPLIANT**	Approved: Sep. 16, 2024 Valid Until: Sep. 16, 2025
15		*Section 14.6: Self-Monitoring Report*	DENR - EMB	Self-Monitoring-Report 4th Quarter of 2024	**COMPLIANT**	SMR 4th Qtr 2023 - Module 3
16	**DAO 2016-08 Water Quality and General Effluent Standards 0f 2019**			A. Latest Quarterly MMT Water Quality Sampling & Testing	**COMPLIANT**	Date sampled: November 12, 2024
17				B. Latest Monthly water quality sampling & testing.	**COMPLIANT**	Date sampled: January 16, 2025
18				C. Motorpool Shop Oil-Water Separator water quality testing	**COMPLIANT**	Date sampled: January 16, 2025
19				D. Mine Mechanical Shop Oil-Water Separator water quality testing	**COMPLIANT**	Date sampled: January 16, 2025
20				Permit to Operate 2-unit Thermo Digestion Chamber w/ 1-unit Scrubber at Assay Lab. PTO-OL-CAR-2021-03214-R	**COMPLIANT**	Date Issued: May 22, 2021 Date Expires: January 22, 2026
21				Permit to operate 2-unit Cupellation Furnace w/ 1-unit Lead fume scrubber system at Assay Lab. Permit No: PTO-OL-CAR-2023-00343-R	**COMPLIANT**	Date Issued: January 12, 2023 Date Expires: January 12, 2026
22	***R.A. 8749 Philippine Clean Air Act of 1999;***			Permit to Operate Dust Collection Facility System (Application)	**COMPLIANT**	Date Issued: May 3, 2024 Date Expires: August 3, 2028

No.	Governing Laws, Rules and Regulations	Applicable Requirement	Interested Parties	Evidence of Compliance	Status of Compliance	Remarks
13				Discharge Permit of one (1) unit 2-Chambered Septic Tank for the Metallurgy Laboratory (DP-CAR-24-11549)	**COMPLIANT**	Approved: Nov. 20, 2024 Valid Until: Nov. 20, 2025
14				Discharge Permit of one (1) unit 2-Chambered Septic Tank for the Motorpool Department (DP-CAR-24-08775)	**COMPLIANT**	Approved: Sep. 16, 2024 Valid Until: Sep. 16, 2025
15		*Section 14.6: Self-Monitoring Report*	DENR - EMB	Self-Monitoring-Report 4th Quarter of 2024	**COMPLIANT**	SMR 4th Qtr 2023 - Module 3
16	**DAO 2016-08 Water Quality and General Effluent Standards 0f 2019**			A. Latest Quarterly MMT Water Quality Sampling & Testing	**COMPLIANT**	Date sampled: November 12, 2024
17				B. Latest Monthly water quality sampling & testing.	**COMPLIANT**	Date sampled: January 16, 2025
18				C. Motorpool Shop Oil-Water Separator water quality testing	**COMPLIANT**	Date sampled: January 16, 2025
19				D. Mine Mechanical Shop Oil-Water Separator water quality testing	**COMPLIANT**	Date sampled: January 16, 2025
20				Permit to Operate 2-unit Thermo Digestion Chamber w/ 1-unit Scrubber at Assay Lab. PTO-OL-CAR-2021-03214-R	**COMPLIANT**	Date Issued: May 22, 2021 Date Expires: January 22, 2026
21				Permit to operate 2-unit Cupellation Furnace w/ 1-unit Lead fume scrubber system at Assay Lab. Permit No: PTO-OL-CAR-2023-00343-R	**COMPLIANT**	Date Issued: January 12, 2023 Date Expires: January 12, 2026
22	***R.A. 8749 Philippine Clean Air Act of 1999;***			Permit to Operate Dust Collection Facility System (Application)	**COMPLIANT**	Date Issued: May 3, 2024 Date Expires: August 3, 2028

No.	Governing Laws, Rules and Regulations	Applicable Requirement	Interested Parties	Evidence of Compliance	Status of Compliance	Remarks
23	***Article 4, Section 21-Pollution From Motor Vehicles Article 5, Section 24 Pollution From Other Sources DAO 2000-81 Implementing Rules & Regulations of RA 8749***	Permit to Operate of Air Polltion Sources	DENR - EMB	PTO One Unit Acid Fume Scrubber System at Mill Refinery PO No.	**PARTIALLY COMPLIANT**	Issued: March 11, 2020 Expires on February 16, 2025 Renewal is on process: Submited online: January 15, 2025
24				Permit to Operate Two Units 25 kVa Genarator Sets Permit No.: PTO-OL-CAR-2023-08042-R	**COMPLIANT**	Issued: June 21, 2023 Expires on June 20, 2027
25				Permit to Operate 12 units 15kgs/hr eavh Assing Vessels	**COMPLIANT**	Issued: July 2, 2024 Expires on April 2, 2029
R.A. 6969, Toxic Substances and Hazardous and Nuclear Wastes Control Act of 1990; DAO 1992-29 Implementing Rules & Regulations of RA 6969						
26	***DAO NO. 1997-39 Chemical Control Order for Cyanide and Cyanide Compounds***	*Securing CCO Reg. Cert.*	*DENR - EMB*	CCO Registration Certificate for Cyanide and Cyanide Compounds *RCN: CCOr-CAR-CN-2020-00058*	**COMPLIANT**	Online registration Issued on March 4, 2020
27	***DAO NO. 2013-24 Chemical Control Order for Lead and Lead Compounds***	*Securing CCO Reg. Cert.*		CCO Registration Certificate for Lead and Lead Compounds *RCN: CCOr-2024-00222*	**COMPLIANT**	Online registration Issued on Nov. 20, 2024
28	***DAO NO. 2004-01 Chemical Control Order for Polychlorrinated Biphenyls (PCBs)***	*Securing CCO Reg. Cert.*		CCO Registaration Certificate for Polychlorrinated Biphenyls (PCBs) *RCN: CCO-PCB-RCAR-BEN-32*	**COMPLIANT**	Online registration Issued on June 6, 2016
29	***DAO NO. 2019-17 Chemical Control Order for Arsenic and Arsenic Compound***	*Securing CCO Reg. Cert.*		CCO Registaration Certificate for Arsenic *RCN: CCOr-CEN-As-2024-00144*	**COMPLIANT**	Online registration Issued on August 5, 2025

No.	Governing Laws, Rules and Regulations	Applicable Requirement	Interested Parties	Evidence of Compliance	Status of Compliance	Remarks
30	***MEMORANDUM CIRCULAR NO. 2003 – 008 Series of 2003-Procedural and Reference Manual for DAO 2003-27***	*Quarterly SMR submission/s*		Quarterly Hazardous Waste Monitoring and Inventory	**COMPLIANT**	SMR 4th Qtr 2024- Module 2
31	**DAO 2013-22, Revised Procedures and Standards for the Management of Hazardous Waste (Revising DAO 2004-36) 3.3 Requirement for Waste Generators**	*1. Hazardous Waste Genarator Registration Certificate*	*DENR - EMB*	Hazardous Waste Genarator Registration Certificate	**COMPLIANT**	Genarator ID No. OL-GR-CAR-11-000978
32	**DAO 1992-29, Section 29. Hazardous Waste Storage and Labelling**	2. Quarterly Report (SMR)		Self-Monitoring-Report 4th Quarter of 2024	**COMPLIANT**	Submitted on January 15, 2025
33	**DOA 136-14 Guidelines for the Implementation of Globally harmonized System (GHS) in Chemical safety Program in the Workplace**	*3. Comprehensive Emergency Contingy PlanS*		Contingency Program for Hazardous Waste- Benguet Corporation	**COMPLIANT**	Prepared by: JRS Reviewed by: GPG Approved by: VBB Jr.
34	**DAO 1992-29, Section 29. Hazardous Waste Storage and Labelling** **DOA 136-14 Guidelines for the Implementation of Globally harmonized System (GHS) in Chemical safety Program in the Workplace**	4. Storage and Labeling requirements		*EMS Guidelines*	**COMPLIANT**	DRCS-12-01_EMSG_HSCR, DRCS-12-02_EMSG_HSDCC, DRCS-12-03_EMSG_HTSD, DRCS-12-03_EMSG_HTSD, DRCS-12-07-A_EMSG_HWMCI, DRCS-12-07-B_EMSG_HWMC_AC, DRCS-12-07-A_EMSG_HWM_MT, DRCS-12-07-D_EMSG_HWM_CC, DRCS-12-07-E_EMSG_HWM_CLE, DRCS-12-07-G_EMSG_HWM_AC, DRCS-12-07-I_EMSG_HWM_FLB, DRCS-12-07-J_EMSG_HWM_PCB, DRCS-12-07-K_EMSG_HWM_MW, DRCS-12-07-L_EMSG_HWM, DRCS-12-07-O_EMSG_HWMFM, DRCS-12-07-N_EMSG_HWMIC, DRCS-12-09_EMSG_SWM, DRCS-12-11-N_EMSG_ACF

No.	Governing Laws, Rules and Regulations	Applicable Requirement	Interested Parties	Evidence of Compliance	Status of Compliance	Remarks
35	***DAO 2013-22, 4.0 Governing Rules and Regulation for Hazardous Waste Transporter Section 26. Waste Generators***	Registered Waste Tranporters, Duly Authorized by DENR	*DENR - EMB*	All Waste Services, Inc. ECC	**COMPLIANT**	All Waste Services, Inc. ECC Amended Issued- March 18 2016
36	***DAO 2013-22, 4.0 Governing Rules and Regulation for Hazardous Waste Transporter Section 27 Waste Transporter***	Waste Generator ID	*DENR - EMB*	Transporter's Hazardous Wase Generator Registration Certificate	**COMPLIANT**	Genarator ID No.: OL-GR-R3-14-000183
37	***DAO 2013-22, 4.0 Governing Rules and Regulation for Hazardous Waste Transporter, 50 Governing Rules and Regulations for Hazardous Waste Treatment Storage and Disposal (TSD) Facilities.***	TSD Registration Certificate	*DENR - EMB*	TSD Registration Certificate	***PARTIALLY COMPLIANT***	The renewal is on process thru online registration of HWMS-EMB. Awaiting for the approval of the Discharge permit of the TSF 2 as it is one of the requirements for the releasing of the TSD Certificate HWMS Portal update
R.A. 7942 Philippine Mining Act of 1995 **DAO 2010-21 Implementing Rules & Regulations of RA 7942**						
38	Section 270. Reporting Requirements	Records of Extraction	MGB	Semi-Annual Report on Mine Waste and Mill Tailings Produced, Contained and/ or Utilized for the Period of July-December 2024	**COMPLIANT**	Submitted at MGB-CAR: Feb. 14, 2024 Submitted at MGB-CENTRAL: Feb. 10, 2024
39	Section 166. General Provision for Environmental protection Section 168. Environmental Work Program (EWP)	Establishment of Environmental Protection Program	MGB	Environmental Protection and Enhance Program (EPEP)	**COMPLIANT**	Submitted: Nov. 08, 2019 (Hard copy Available at MEPEO Dept.)
40	Section 169. Environmental Protection and Enhancement Program Section 171. Annual Environmental Protection and Enhancement Program			Annual Environmental Protection and Enhancement Program of Benguet Corp-ACMP for 2025	**COMPLIANT**	Proposed AEPEPE Submited: Nov. 29, 2024 Revised AEPEP Submitted: Jan. 15, 2025

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No.	Governing Laws, Rules and Regulations	Applicable Requirement	Interested Parties	Evidence of Compliance	Status of Compliance	Remarks
41	Section 173. Organization of a Mine Environmental Protection and Enhancement Office (MEPEO)	Establishment of MEPEO as integral part of Mine Organization	MGB	Table of Organization of MEPEO Department	**COMPLIANT**	Updated: March 2025
42	Section 174. Environmental Monitoring Audit	Monitoring by MMT at least every quarter	MGB	4th Quarter 2024 ACMP- MMT Compliance Monitoring and Validation Report (CMVR)	**COMPLIANT**	2024 4th Qtr. MRFC Meeting Conducted on: Dec. 5, 2024 Submited at EMB: Jan. 15, 2024
43	Section 189. Mine Waste and Tailings Fess Reserve Fund Section 190. Mine Waste and Tailings Fees Section 191. Payment of Mine Waste and Tailings Fees Due	MWT payment semi-annually	MGB	Payment for BC - ACMP MWT Fee for July-December 2024	**COMPLIANT**	Awaiting for the scheduled Validation of MGB-CAR
44	Section 270. Reporting Requirements: n. Semiannual Status Report on the Environmental Work Program DAO 2010-21 Revised Implementing Rules and Regulations of R.A. 7942, otherwise known as the Philippine Mining Act of 1995	Monthly, Quarterly and Integrated Annual Reporting	MGB	4th Quarter Compliance Monitoring Report (CMR) / Accomplishment Report relative to the Annual Environmental Protection and Enhancement Program (AEPEP)	**COMPLIANT**	Submitted: Jan. 15, 2025
45	DAO 2015-02 on the harmonization of the Philippine Environmental Impact System and the Philippine Mining Act of 1995 in relation to Mining Projects.			2024 AEPEP Annual Accomplishment Report	**COMPLIANT**	Submited: January 30, 2025
46	Executive Order 26 of 2011 and Executive Order 193 of 2015 - Enhanced National Greening Program	Implementation and Quarterly Submission of National Greening Program (NGP) Report	MGB/CENRO	NGP Report 4th Qtr. 2024	**COMPLIANT**	Submitted: Jan. 15, 2025

No.	Governing Laws, Rules and Regulations	Applicable Requirement	Interested Parties	Evidence of Compliance	Status of Compliance	Remarks
47	Administrative Order (DAO) No. 22, series of 1989 - Adopt-A-Tree Adopt-A-Mining Forest Program	Implementation and Semi Annual Submission of Mining Forest Program Report	MGB	Mining Forest Program 2nd Sem. 2024	**COMPLIANT**	Submitted: Jan. 15, 2025
48	MGB-MEMORANDOM dated July 10, 2020 - Establishment of Bamboo Plantation in Mining Areas	Submission Quarterly Accomplishment Report	MGB	4th Quarter 2024 Bamboo Plantation Accomplishment Report	**COMPLIANT**	Submitted: Jan. 15, 2025
49	DAO 02 Series of 2017- The Revise Procedural Manual for DENR Administrative Orders No. 30, Series of 2003 DENR-EMB-MEMORANDUM CIRCULAR NO. 2016-001	Submission of online Semestral Compliance Monitoring Report (CMR)	EMB	Online CMR 2nd Sem 2024	**COMPLIANT**	Submitted: January 31, 2025

SUMMARY OF ENVIRONMENTAL COMPLIANCE OBLIGATIONS		
Total Number of Compliances	49	**Percentage**
Number of Compliant	*46*	***93.88 %***
Number of Partially- Compliant	*3*	***6.12 %***
Number of Non- Compliant	0	***0.00 %***

Compliance Obligation Indicators:	
COMPLIANT	Actions / requirements have been fully implemented, accomplished and approved.
PARTIALLY COMPLIANT	Actions have been taken to address the requirements, however, approval / implementation of the same is pending.
NON-COMPLIANT	No actions have been taken to address the requirements.

Republic of the Philippines
Department of Environment and Natural Resources
MINES AND GEOSCIENCES BUREAU
Cordillera Administrative Region
80 Diego Silang St., Baguio City 2600
Tel. No. 63 74 442 6392; Fax No. 63 74 304 2596; Website: www.car.mgb.gov.ph
E-mail: car@mgb.gov.ph; car_mgb@yahoo.com; mgb.cordillera@gmail.com

CERTIFICATE OF APPROVAL

SHP # 04A-2024-CAR

The Mines and Geosciences Bureau-CAR, having evaluated the submitted amended 2024 Safety and Health Program (SHP) in accordance with the provisions of Department of Environment and Natural Resources Administrative Order (DAO) No. 2010-21, the Revised Implementing Rules and Regulations of Republic Act (RA) No. 7942, otherwise known as the "Philippine Mining Act of 1995", hereby grants this Certificate of Approval to **BENGUET CORPORATION-ACUPAN CONTRACT MINING PROJECT (BC-ACMP)**, **PC-ACMP-002-CAR**, located at Virac, Itogon, Benguet.

This Certificate is issued subject to the pertinent provisions of the abovementioned laws, rules and regulations, and to the following conditions:

1. This Certificate is valid only for programs, projects, and activities stipulated in the CY 2024 SHP;

2. The committed budget for the CY 2024 SHP is Seven Million One Hundred Sixty-Two Thousand and Two Hundred Seventeen Pesos (PhP7,162,217.00);

3. The implementation of identified programs, projects and activities shall be subject to validation by the **MGB-CAR** and auditing of the **MGB Central Office (MGB-CO)**;

4. Benguet Corporation-Acupan Contract Mining Project (BC-ACMP), shall submit to **MGB-CAR** a quarterly accomplishment reports within 15 working days at the end of each quarter and an annual accomplishment report 30 days after the end of the calendar year;

5. The company shall notify the **MGB-CAR** of any amendment in the approved SHP. Provided that the amendments do not compromise the overall safety and health programs and conditions of the project; and

"MINING SHALL BE PRO-PEOPLE AND PRO-ENVIRONMENT
IN SUSTAINING WEALTH CREATION AND IMPROVED QUALITY OF LIFE."

Republic of the Philippines
Department of Environment and Natural Resources
MINES AND GEOSCIENCES BUREAU
Cordillera Administrative Region
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Tel. No. 63 74 442 6392; Fax No. 63 74 304 2596; Website: www.car.mgb.gov.ph
E-mail: car@mgb.gov.ph; car_mgb@yahoo.com; mgb.cordillera@gmail.com

6. Additional conditions may be imposed to effectively implement the approved SHP should the results of the monitoring by the **MGB-CAR** or audit by the **MGB-CO** warrants them.

Non-compliance with the above conditions shall be sufficient ground for the penalties indicated in the Philippine Mining Act of 1995 and its implementing rules and regulations.

Given this 18th day of June 2024 at the Mines and Geosciences Bureau-CAR, Baguio City

FAY W. APIL
Regional Director

Department of Environment and Natural Resources
Mines and Geosciences Bureau
Cordillera Administrative Region
Office of the Regional Director
061924-CAR-53560
Certificate of Approval
11:37 AM 06/19/2024

CONFORME:

MR. VALERIANO B. BONGALOS, JR.
VP/Resident Manager
Benguet Corporation-Acupan Contract Mining Project
Virac, Itogon, Benguet

"MINING SHALL BE PRO-PEOPLE AND PRO-ENVIRONMENT
IN SUSTAINING WEALTH CREATION AND IMPROVED QUALITY OF LIFE."

Republic of the Philippines
Department of Environment and Natural Resources
MINES AND GEOSCIENCES BUREAU
Cordillera Administrative Region
80 Diego Silang St., Baguio City 2600
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E-mail: car@mgb.gov.ph; car_mgb@yahoo.com; mgb.cordillera@gmail.com

CERTIFICATE OF APPROVAL

SHP # 07-2024-CAR

The Mines and Geosciences Bureau-CAR, having evaluated the submitted 2024 Safety and Health Program (SHP) in accordance with the provisions of Department of Environment and Natural Resources Administrative Order (DAO) No. 2010-21, the Revised Implementing Rules and Regulations of Republic Act (RA) No. 7942, otherwise known as the "Philippine Mining Act of 1995", hereby grants this Certificate of Approval to **BMC FORESTRY CORPORATION-IRISAN LIME PROJECT (BMC FC-ILP), MPP No. 01C-2022-CAR,** located at Km. 5 Naguilian Road, Irisan, Baguio City.

This Certificate is issued subject to the pertinent provisions of the abovementioned laws, rules and regulations, and to the following conditions:

1. This Certificate is valid only for programs, projects, and activities stipulated in the CY 2024 SHP;
2. The committed budget for the CY 2024 SHP is One Hundred Fifty Seven Thousand and Seven Hundred Eighty Pesos (PhP157,780.00);
3. The implementation of identified programs, projects and activities shall be subject to validation by the **MGB-CAR** and auditing of the **MGB Central Office (MGB-CO)**;
4. BMC Forestry Corporation-Irisan Lime Project, shall submit to **MGB-CAR** a quarterly accomplishment reports within 15 working days at the end of each quarter and an annual accomplishment report 30 days after the end of the calendar year;
5. The company shall notify the **MGB-CAR** of any amendment in the approved SHP. Provided that the amendments do not compromise the overall safety and health programs and conditions of the project; and

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E-mail: car@mgb.gov.ph; car_mgb@yahoo.com; mgb.cordillera@gmail.com

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6. Additional conditions may be imposed to effectively implement the approved SHP should the results of the monitoring by the **MGB-CAR** or audit by the **MGB-CO** warrants them.

Non-compliance with the above conditions shall be sufficient ground for the penalties indicated in the Philippine Mining Act of 1995 and its implementing rules and regulations.

Given this 30th day of January 2024 at the Mines and Geosciences Bureau-CAR, Baguio City

FAY W. APIL
Regional Director

Department of Environment and Natural Resources
Mines and Geosciences Bureau
Cordillera Administrative Region
013024-CAR-51475
Certificate of Approval
01/30/2024
601 PM

CONFORME:

MR. FRANCISCO O. FLAVIER
Resident Manager
BMC Forestry Corporation-ILP
Km. 5 Naguilian Road, Irisan, Baguio City

Republic of the Philippines
Department of Environment and Natural Resources
MINES AND GEOSCIENCES BUREAU
Cordillera Administrative Region

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ISO 14001 : 2015
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ISO 45001 : 2018
Registered

ANNUAL SOCIAL DEVELOPMENT AND MANAGEMENT PROGRAM (ASDMP)

CERTIFICATE OF APPROVAL
ASDMP No. 2024-04-CAR (4th)

The Mines and Geosciences Bureau-CAR, having evaluated the 2024 Annual Social Development and Management Program (ASDMP), hereby grants this Certificate of Approval to **BENGUET CORPORATION** for its Acupan Contract Mining Project located in *Barangay Virac, Municipality of Itogon, Province of Benguet,* under the **Mining Patent No. PC-ACMP-002-CAR** after substantially complying with the requirements as mandated under DENR Administrative Order (D.A.O) No. 2010-21.

This Certificate is being issued subject to the pertinent provisions of the abovementioned DAO and to the following conditions:

1. This Certificate is valid only for the Programs/Projects/Activities (P/P/As) stipulated in the submitted 2024 ASDMP;

2. The budget allocation for this ASDMP amounts to Four Million Seven Hundred Seventy-four Thousand One Hundred Fifty-five **and 24/100 (Php 4,774,155.24),** which is equivalent to the 1.5% of the previous years' operating cost as declared in its Affidavit to implement the P/P/As stipulated in the Program which is broken down as follows:

2023 Operating Cost (Php)	Basis of Allocation	2024 ASDMP Total Amount (Php)
318,277,016.27	(75%) Development of Host and Neighboring Communities	3,580,616.43
	Balance	456,866.29
	(15%) Information, Education Communication	716,123.29
	Balance	15,064.80
	(10%) Development of Mining Technology and Geosciences	447,415.52
	Balance	175,590.35
	Sub-Total	4,774,155.24
	Sub-total (*Balance from previous ASDMP*)	647,521.44
	GRAND TOTAL	**5,421,676.68**

3. The Company shall include the remaining balance *(Php 647,521.44)* from its previous ASDMP after determination of the 1.5% projected/operating cost to implement the P/P/As stipulated in the Program. Said balance shall be treated separately on accomplishment/monitoring reports;

4. The Company may incorporate any alterations and/or re-alignment of P/P/As and funds from the approved ASDMP. Provided that, such changes is the result of consultations with its host and neighboring communities, accompanied by supporting documents such as resolutions, and approved by the MGB RO;

5. The Company shall submit a quarterly monitoring report fifteen (15) calendar days after the end of each quarter to MGB RO. Likewise, the annual accomplishment report shall be submitted thirty (30) calendar days after the end of each calendar year to the MGB RO, copy furnished the MGB Central Office (CO); and

6. Additional conditions may be imposed to effectively and efficiently implement the approved SDMP should the results of monitoring by the MGB RO or audit by the MGB CO warrant them.

Non-compliance with the above conditions shall be sufficient ground for the cancellation, revocation or termination of this Certificate or suffer the penalty prescribed in the Penal Provisions of Republic Act No. 7942, the Philippine Mining Act of 1995.

Given this **1st** day of **March 2024** at the Mines and Geoscience Bureau-CAR, Baguio City, Philippines.

FAY W. APIL
Regional Director
MGB-CAR

Department of Environment and Natural Resources
Mines and Geosciences Bureau
Cordillera Administrative Region
030-24-CAR-52036
Certificate of Approval
03/01/2024
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Republic of the Philippines
Department of Environment and Natural Resources
MINES AND GEOSCIENCES BUREAU
Cordillera Administrative Region

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ANNUAL SOCIAL DEVELOPMENT AND MANAGEMENT PROGRAM (ASDMP)

CERTIFICATE OF APPROVAL
ASDMP No. 2024-01-CAR (3rd)

The Mines and Geosciences Bureau-CAR, having evaluated the 2024 Annual Social Development and Management Program (ASDMP), hereby grants this Certificate of Approval to **BMC FORESTRY CORPORATION** for its Irisan Lime Project located at *Barangay Irisan, in the City of Baguio, Province of Benguet,* under Mineral Processing Permit (MPP) No. 01C-2022-CAR after substantially complying with the requirements as mandated under DENR Administrative Order (D.A.O) No. 2010-21.

This Certificate is being issued subject to the pertinent provisions of the abovementioned DAO and to the following conditions:

1. This Certificate is valid only for the Programs/Projects/Activities (P/P/As) stipulated in the submitted 2024 ASDMP;

2. The budget allocation for this ASDMP amounts to **Eight Hundred Fifty-nine Thousand Six Hundred Seventy-seven and 87/100 (Php 859,627.87),** which is equivalent to the 1.5% of the previous years' operating cost as declared in its Affidavit to implement the P/P/As stipulated in the Program which is broken down as follows:

2023 Operating Cost (Php)	Basis of Allocation	2024 ASDMP Total Amount (Php)
57,308,524.51	(75%) Development of Host and Neighboring Communities	644,720.90
	Balance	0.00
	(15%) Information, Education Communication	128,944.18
	Balance	0.00
	(10%) Development of Mining Technology and Geosciences	85,962.79
	Balance	0.00
	Sub-Total	859,627.87
	Sub-total (*Balance from previous ASDMP*)	0.00
	GRAND TOTAL	**859,627.87**

3. The Company shall include the remaining balance *(Php 0.00)* from its previous ASDMP after determination of the 1.5% projected/operating cost to implement the P/P/As stipulated in the Program. Said balance shall be treated separately on accomplishment/monitoring reports;

4. The Company may incorporate any alterations and/or re-alignment of P/P/As and funds from the approved ASDMP. Provided that, such changes is the result of consultations with its host and neighboring communities, accompanied by supporting documents such as resolutions, and approved by the MGB RO;

5. The Company shall submit a quarterly monitoring report fifteen (15) calendar days after the end of each quarter to MGB RO. Likewise, the annual accomplishment report shall be submitted thirty (30) calendar days after the end of each calendar year to the MGB RO, copy furnished the MGB Central Office (CO); and

6. Additional conditions may be imposed to effectively and efficiently implement the approved SDMP should the results of monitoring by the MGB RO or audit by the MGB CO warrant them.

Non-compliance with the above conditions shall be sufficient ground for the cancellation, revocation or termination of this Certificate or suffer the penalty prescribed in the Penal Provisions of Republic Act No. 7942, the Philippine Mining Act of 1995.

Given this **20th** day of **February 2024** at the Mines and Geoscience Bureau-CAR, Baguio City, Philippines.

FAY W. APIL
Regional Director
MGB-CAR

Department of Environment and Natural Resources
Mines and Geosciences Bureau
Cordillera Administrative Region
022124-CAR-51868
Certificate of Approval
02/21/2024
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