

Reference No.: EMO-MNL-2023-M-023

Form 01 QC-2007 Rev.05

DATE : 28 July 2023

FOR : **ENGR. GILBERT C. GONZALES, CESO III**
Director, In Concurrent Capacity as
OIC Assistant Secretary for Luzon and Visayas
ENVIRONMENTAL MANAGEMENT BUREAU
DENR Compound, Visayas Ave.,
Diliman, Quezon City

Attention: **ENGR. ESPERANZA A. SAJUL**
Chief, Environmental Impact Assessment and Management Division

FROM : **BENJAMIN ARMAND A. TANSINGCO**
VP-Environmental Management

SUBJECT : **Co-Firing Tests of up to 10% Wood Pellet and Green Energy Pellet by weight to Coal Fuel to reduce Power Plant CO₂/Greenhouse Gas Emissions**

Dear Director Gonzales:

In line with the DENR and EMB's programs on the reduction of carbon emissions to mitigate climate change, Coral Bay Nickel Corporation (CBNC) conducted co-firing tests of up to 5% biomass fuel by weight with its coal fuel at its existing power plants. The attached report shows the results of the tests conducted in which we substituted up to 5% Wood Pellets (WP) for our coal fuel feed. This pilot testing was covered by the CNC issued by the EMB, which is attached.

To further determine the feasibility of using Biomass fuel as an alternative fuel mix to coal, CBNC would like to experiment further to utilize up to a 10% WP mix with the existing Sub-Bituminous coal fuel for the Company's two (2) coal-fired boilers with a combined capacity of 210 TPH of coal.

CBNC would also like to test another type of wood pellet product called Green Energy Pellet (GEP), which is derived from Acacia wood byproducts, to further determine different types of biomass fuel's effectivity to reduce CO₂ emissions. Similar to WP, the co-firing test of GEP would gradually increase the mixing ratio and evaluate the impact.

As in the previous pilot testing, these tests will not require additional equipment that can cause significant changes in the environmental aspects of the company. WP and GEP have no potential hazardous components that require special treatment based on the respective SDS that are attached. The programs to manage and monitor the environment that are currently being implemented by the company are adequate for the storage and handling of these pellets. The quantity to be utilized for this pilot testing/experiment is relatively small compared to that of our usual annual coal consumption, which is around 220,000 Tons.

CBNC plans to acquire around 3,000 tons of WP in 2023 and 2024 to continue the WP experiment. In addition, CBNC plans to acquire 4,000 tons of GEP in 2023 and 8,000 tons in 2024 to experiment with and

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test the performance of the GEP. These biomass fuels will be acquired and shipped to our plant in Rio Tuba, Bataraza, Palawan, from sources outside the Philippines for this testing. There may be a possibility that the schedule would change slightly and the WP and GEP would probably be delivered via several shipments due to import procedures and delivery time.

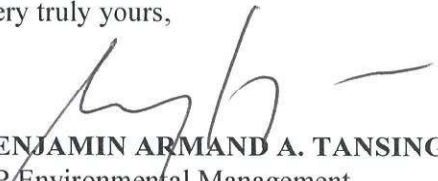
Through these tests, CBNC would like to determine the applicability of the various types of biomass fuels (WP and GEP) to our coal boilers. If applicable, CBNC will also explore the possibility of the local sourcing of similar biomass fuels in the Philippines in the future, especially from the local communities in our impact area.

We hope for your usual support as our partner in the continual improvement of the Company's environmental performance.

For your kind consideration.

Thank you very much.

Very truly yours,



BENJAMIN ARMAND A. TANSINGCO
VP/Environmental Management

Noted by:



SHIRO IMAI
President

cc: *EMB MIMAROPA*
MGB MIMAROPA
DENR MIMAROPA

PILOT TESTING REPORT ON THE CO-FIRING OF WOOD PELLET WITH COAL ON THE CBNC BOILER

I. Outline

In order to achieve CO₂ reduction targets, coal fuels, which account for the majority of emissions, must be converted. In order to reduce CO₂ emissions by replacing some of the coal with biomass fuel, which is considered a carbon-neutral fuel, a co-firing test was conducted in November 2022 using wood pellets (hereafter WP) at 1 cal% of coal. As no adverse effects on the boiler equipment or the environment were identified in the test, a short-term co-firing test with an increased WP mixing ratio was conducted on June 1, 2023. This report summarizes the results of the Flue Gas and Ash analysis values.

II. Objective

As stated in the reported [Pilot testing report on the co-firing of 1% wood pellet with coal on the CBNC boiler.], it was confirmed that a WP mixing ratio of 1 cal% is not likely to have adverse effects on boiler facilities and the environment. For further validation, actual field tests up to a mixing ratio of 5 cal% were carried out this time.

III. Test Plan

Test object

Line 1 boiler (Rated steam generation; 105t/h)

Line 1 boiler is easier to handle because there is less clinker formation in the furnace.

Biomass fuel

Various factors or elements

- Type : Wood pellets (White pellet)
- Trading company : Hanwa Co., Ltd.
- Amount used : 260 MT
- Exporting country : Malaysia
- Composition : See Table 1. Typical composition comparison table.

Table 1. Typical composition comparison table

PARAMETERS DESCRIPTION	Unit	Wood pellet	Adaro (Main Coal)
Proximate Analysis (dry basis)			
1 Moisture (a.r.b.)	%	8.98	28
2 Inherent Moisture (a.d.b.)	%	3.76	14.5
3 Ash (a.d.b.)	%	2.73	2.8
4 Volatile Matter (a.d.b.)	%	79.97	42.7
5 Fixed Carbon (a.d.b.)	%	13.54	40.1
6 Calorific Value (g.a.r.)	kcal/kg	4728	4900
7 Calorific Value (n.a.r.)	kcal/kg	4414	4554
8 Total Sulphur	%	0.013	0.1
Ultimate Analysis			
1 Carbon (dry ash free basis)	%	53.57	74
2 Hydrogen (dry ash free basis)	%	6.28	5.13
3 Nitrogen (dry ash free basis)	%	0.26	1.02
4 Oxygen (dry ash free basis)	%	39.89	19.7
5 Sulphur (dry ash free basis)	%	<0.013	0.15

Note:

a.r.b=as-received basis , a.d.b= air-dried-basis, g.a.r=gross calorific value, n.a.r= net calorific value

Testing period

June 1, 2023 to June 12, 2023 and June 15, 2023 to June 20, 2023.

IV. Testing Procedure

Coal and WP were mixed to a predetermined ratio in advance in the coal shelter at pier site, conveyed into the coal bunker and fed into the boiler Furnace (coal feed).

V. Results of Co-firing Testing

Fluctuations were closely monitored and recorded to ensure that emission values did not exceed regulatory limits during the test period. In addition, Ash sampling was carried out at each mixing ratio and Ash analysis was performed. The results are reported below.

Emission Gas

Table 2. shows the regulation values of the daily average Emission Gas and the average value for each mixing ratio during the test period. In order to strictly observe the air quality standard, the test could be stopped immediately in case of any abnormality, such as an increase in the Emission Gas analysis value, and the furnace condition was to be restored.

In conclusion, the various Emission Gas analysis values during this test period did not exceed the regulation values and the results were well within the regulation values. Therefore, it was concluded that there was no environmental impact from the Emission Gases during the consumption of the WP in this study. The status of each Emission Gas is described below.

Table 2. Result of Emission Gas values.

	Gas	NOx	SOx	CO	Opacity
	Unit	ppm	ppm	ppm	%
Regulation value	(daily ave)	532	267	437	20
Pure Coal	May30-31 ave	143.4	38.9	57.9	3.9
2cal% WP co-firing	Jun1-2 ave	143.3	39.2	57.3	3.8
3cal% WP co-firing	Jun3-5 ave	145.2	38.0	57.3	4.3
4cal% WP co-firing	Jun6-8 ave	150.0	38.0	65.0	3.1
5cal% WP co-firing	Jun9-20 ave	148.7	36.7	72.2	3.2

NOx (NO₂)

During the testing period, the NOx values tended to increase slightly compared with those during the pure coal operation, although it is clearly lower than the regulation value. The average value for the period was around 150 ppm for co-firing compared to 143 ppm for pure coal operations.

In general, Fuel NOx decreases when WP is consumed, as its Nitrogen content is lower than that of coal. As Thermal NOx varies depending on the combustion conditions, the increase in NOx values in this test can be attributed to an increase in Thermal NOx content, which can be controlled by adjusting the boiler's air-fuel ratio (primary and secondary air), which is empirically adjusted to the combustion

conditions in the furnace. This is adjusted empirically according to the combustion conditions in the furnace, so repeated adjustments should be made to study the optimum combustion conditions. The above results show that there is sufficient margin for the regulation of 532 ppm, so it is judged that there is no problem in continuing co-firing.

SO_x (SO₂)

During the testing period, the SO_x values tended to decrease slightly compared with those during the pure coal operation. The average value was 39 ppm for co-firing compared to 37 ppm for pure coal operations.

In general, when WP is consumed, SO_x decreases because its Sulphur content is lower than that of coal. A slight but decreasing trend was observed in this test.

The above results show that there is sufficient margin for the regulation of 267 ppm, so it is judged that there is no problem in continuing co-firing.

CO

During the testing period, the CO value increased compared to that during the pure coal operation. The average value for the period was 72 ppm for co-firing compared to 58 ppm for pure coal operations.

In general, when WP is consumed, volatile matter, a component that easily evaporates under high temperature conditions, is more abundant than coal, so volatile matter burns first and consumes O₂, resulting in a shortage of O₂ and an increase in CO due to incomplete combustion. As with NO_x, CO can be controlled by adjusting the air-fuel ratio of the boiler, so it is necessary to study the optimum combustion conditions through repeated adjustments.

The above results show that there is sufficient margin for the regulation of 437 ppm, so it is judged that there is no problem with continuing co-firing.

Opacity

During the testing period, there was no increase in the opacity value compared to the pure coal operation. The average value for the period was 4% for full-time burning and about 4% for mixed burning.

Although the Opacity is affected by the combustion conditions in the furnace and the charging conditions of the electrostatic precipitator, it was stable throughout the test period, and it was judged that there were no problems caused by co-firing.

Ash constituent

Table 3. Ash analysis results show the regulation values and the analysis values for each mixing ratio during the testing period based on "DAO 2013-22, DENR (Department of Environment and Natural Resources) Administrative Order No. 2013-22".

In conclusion, the Ash analysis values during the testing period did not exceed the regulation limits and were well within the limits. Therefore, it was concluded that there was no environmental impact from Ash during the consumption of WP in this study.

Table 3. Ash analysis results.

	Analyte	Lead, Pb	Arsenic, As	Mercury, Hg	Cadmium, Cd	Chromium, Cr	Barium, Ba	Selenium, Se	Flouride, F -
	Unit	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
Regulation value		< 1	< 1	< 0.1	< 0.3	< 5	< 70	< 1	< 100
2cal% WP co-firing	Jun1	< 0.10	< 0.10 *	< 0.08	< 0.03	< 0.010 *	0.212 *	0.20	< 0.5
3cal% WP co-firing	Jun3	< 0.10	< 0.010 *	< 0.08	< 0.03	< 0.010 *	0.188 *	0.111	< 0.5
4cal% WP co-firing	Jun6	< 0.10	< 0.010 *	< 0.08	< 0.03	0.019 *	0.205 *	0.147	< 0.5
5cal% WP co-firing	Jun9	< 0.10	< 0.010 *	< 0.08	< 0.03	0.023 *	0.201 *	0.120	< 0.5

Notes:

* indicates results of analysis by TCLP, others by TCA. Certificate of Analysis R.A.No. 111926 dated 19 Nov 2018

**Analysis was conducted by Ostrea Mineral Laboratories, Inc.

CO2 Reduction by WP Processing

The amount of CO2 reduction in this test is evaluated by the reduction in coal consumption. Table 4. The CO2 reduction in the WP co-firing test shows the reduction in this test. CBNC's coal-derived CO2 emissions are about 510,000 tons per year, and the reduction this time is equivalent to 0.1%, which is insignificant. In order to reduce CO2 emissions, it is essential to promote co-firing of biomass fuel, and continuous research is necessary for this purpose.

Table 4. CO2 reduction in WP Co-firing Test

		WP co-firing	Remarks
WP consumption	[t]	260	Equivalent Coal consumption; 222t
WP calorific value	[kcal/kg]	4,340	Coal calorific value; 5,090kcal/kg
Total calorie	[Mcal]	1,128,400	
Thermal Coal CO2 emission factor	[GJ/t]	25.70	
CO2 emission reductions	[t]	516	

VI. Conclusion

In this testing, the WP mixing ratio was increased up to 5 cal% to check for environmental impacts such as emission gases and ash. As a result, it was determined that a low mixing ratio of around 5 cal% has no overall impact on boiler operations. Generally, it is said that biomass fuel co-firing operations up to about 10 cal% do not require any modifications, such as handling equipment or process changes. Therefore, we would like to continue the current 5 cal% test and plan a new test up to 10 cal% for further knowledge.

So far, Wood pellets are used as biomass fuel, but other fuels are being considered. From the point of view of a stable supply, we currently have to rely on imports from abroad, but we are exploring the possibility of procuring biomass fuels in the Philippines in the future. The best-case scenario would be to be able to procure biomass fuel in the vicinity of CBNC. By that time, we would like to contribute to the reduction of CO2 emissions at CBNC and in the Philippines by continuing research on co-firing operations and aiming for an early fuel conversion.

Prepared by:


ENGR. WALTER T. HASIM, PME, ACPE
 Assistant Manager/ Energy Manager

Noted by:


YOSHITAKA OGURA
 Utilities Manager

Approved by:


HIDEAKI SATO
 Plant Manager



OSTREA MINERAL LABORATORIES, INC.

Assaying and Environmental Testing Specialist

Barangay Road, Bo. Mamplasan, Bifan, Laguna, Philippines 4024
Telefax : (02) 889-9058; (049) 539-0102; (02) 848-6951
Email : customer.service@ostrealabs.com.ph

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CERTIFICATE OF ANALYSIS

Customer : CORAL BAY NICKEL CORPORATION

Address : Rio Tuba Export Processing Zone, Brgy. Rio Tuba, Bataraza,
Palawan Philippines

Attention : MS. MAUREEN G. BELISARIO

Contact Information : (02) 548-7136/m.g.belisario@smm.com.ph

Date of Issue : 6/27/2023

RAN : B-15535

Date Received: 6/6/2023

Date Sampled: -

Date Analyzed: 6/6-22/2023

RESULTS OF ANALYSIS

Sample Descriptions	Parameters	Results	Units	Methods
Date Sampled: 6/2/2023				
2% Wood Pellet Ash	Arsenic (As)	6166.88	mg/kg	Manual Hydride Generation AAS
	Barium (Ba)	1604.33	mg/kg	Direct Nitrous Oxide-Acetylene Flame
	Cadmium (Cd)	<0.03	mg/kg	Direct Air-Acetylene Flame
	Chromium (Cr)	85.05	mg/kg	Direct Air-Acetylene Flame
	Fluoride	<0.5	mg/Kg	Ion-Selective Electrode
	Lead (Pb)	<0.10	mg/kg	Direct Air-Acetylene Flame
	Mercury (Hg)	<0.08	mg/kg	Cold Vapor AAS
	Selenium (Se)	0.200	mg/kg	Manual Hydride Generation AAS

Note : The customer is given 7 days upon receipt to raise questions or clarifications on any part or content of the certificate, otherwise the result(s) is /are deemed accepted.

Total No. of Samples : 1


Total Analysis : 8

Sample Submission : Submitted by the Customer


Reference : Dry Ashing

Remarks : Results relate only to the items tested and received by the laboratory.

Certified Correct by:


MA. CRISTINA F. REFERENTE, RCh
PRC No. 0007398
Laboratory Head

Approved by:


ALVIN P. BASCO, RCh
PRC No. 0011786
Vice President-Operations

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Barangay Road, Bo. Mamplasan, Bifan, Laguna, Philippines 4024
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Palawan Philippines

Attention : MS. MAUREEN G. BELISARIO

Contact Information : (02) 548-7136/m.g.belisario@smm.com.ph

Date of Issue : 6/27/2023

RAN : B-15535A

Date Received: 6/6/2023

Date Sampled: -

Date Analyzed: 6/6-22/2023

RESULTS OF ANALYSIS

Sample Descriptions	Parameters	Results	Units	Methods
Date Sampled: 6/4/2023				
3% Wood Pellet Ash	Arsenic (As)	6277.81	mg/kg	Manual Hydride Generation AAS
	Barium (Ba)	1365.71	mg/kg	Direct Nitrous Oxide-Acetylene Flame
	Cadmium (Cd)	<0.03	mg/kg	Direct Air-Acetylene Flame
	Chromium (Cr)	118.59	mg/kg	Direct Air-Acetylene Flame
	Fluoride	<0.5	mg/Kg	Ion-Selective Electrode
	Lead (Pb)	<0.10	mg/kg	Direct Air-Acetylene Flame
	Mercury (Hg)	<0.08	mg/kg	Cold Vapor AAS
	Selenium (Se)	0.111	mg/kg	Manual Hydride Generation AAS

Note : The customer is given 7 days upon receipt to raise questions or clarifications on any part or content of the certificate, otherwise the result(s) is /are deemed accepted.

Total No. of Samples : 1


Total Analysis : 8

Sample Submission : Submitted by the Customer


Reference : Dry Ashing

Remarks : Results relate only to the items tested and received by the laboratory.

Certified Correct by:


MA. CRISTINA F. REFERENTE, RCh
PRC No. 0007398
Laboratory Head

Approved by:


ALVIN P. BASCO, RCh
PRC No. 0011786
Vice President-Operations

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Telefax : (02) 889-9058; (049) 539-0102; (02) 848-6951
Email : customer.service@ostrealabs.com.ph



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Address : Rio Tuba Export Processing Zone, Brgy. Rio Tuba, Bataraza,
Palawan Philippines

Attention : MS. MAUREEN G. BELISARIO

Contact Information : (02) 548-7136/m.g.belisario@smm.com.ph

Date of Issue : 7/11/2023

RAN : B-15535B

Date Received: 6/6/2023

Date Sampled: -

Date Analyzed: 6/30-7/10/2023

RESULTS OF ANALYSIS

Sample Descriptions	Parameters	Results	Units	Methods	DAO 2013-22 Standards
Toxicity Characteristic Leaching Procedure Date Sampled: 6/2/2023					
2% Wood Pellet Ash	Arsenic (As)	<0.010	mg/L	USEPA 1311/ICP-OES	1.0
	Barium (Ba)	0.212	mg/L	USEPA 1311/ICP-OES	70
	Chromium (Cr)	<0.010	mg/L	USEPA 1311/ICP-OES	5.0

Note : The customer is given 7 days upon receipt to raise questions or clarifications on any part or content of the certificate, otherwise the result(s) is /are deemed accepted.

Total No. of Samples : 1

Total Analysis : 3

Sample Submission : Submitted by the Customer

Reference : Standard Methods for the Examination of Water and Wastewater, 23rd ed.

Remarks : Results relate only to the items tested and received by the laboratory.

Certified Correct by:

MA. CRISTINA F. REFERENTE, RCh
PRC No. 0007398
Laboratory Head

Approved by:

ALVIN P. BASCO, RCh
PRC No. 0011786
Vice President-Operations

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Telefax : (02) 889-9058; (049) 539-0102; (02) 848-6951

Email : customer.service@ostrealabs.com.ph



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Palawan Philippines

Attention : MS. MAUREEN G. BELISARIO

Contact Information : (02) 548-7136/m.g.belisario@smm.com.ph

Date of Issue : 7/11/2023

RAN : B-15535C

Date Received: 6/6/2023

Date Sampled: -

Date Analyzed: 6/30-7/10/2023

RESULTS OF ANALYSIS

Sample Descriptions	Parameters	Results	Units	Methods	DAO 2013-22 Standards
<i>Toxicity Characteristic Leaching Procedure Date Sampled: 6/4/2023</i>					
3% Wood Pellet Ash	Arsenic (As)	<0.010	mg/L	USEPA 1311/ICP-OES	1.0
	Barium (Ba)	0.188	mg/L	USEPA 1311/ICP-OES	70
	Chromium (Cr)	<0.010	mg/L	USEPA 1311/ICP-OES	5.0

Note : The customer is given 7 days upon receipt to raise questions or clarifications on any part or content of the certificate, otherwise the result(s) is /are deemed accepted.

Total No. of Samples : 1

Total Analysis : 3

Sample Submission : Submitted by the Customer

Reference : Standard Methods for the Examination of Water and Wastewater, 23rd ed.

Remarks : Results relate only to the items tested and received by the laboratory.

Certified Correct by:

MA. CRISTINA F. REFERENTE, RCh
PRC No. 0007398
Laboratory Head

Approved by:

ALVIN P. BASCO, RCh
PRC No. 0011786
Vice President-Operations

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Palawan Philippines

Attention : MS. MAUREEN GURTIZA BELISARIO

Contact Information : (02) 548-7136/m.g.belisario@smm.com.ph

Date of Issue : 7/7/2023

RAN : B-16099

Date Received: 6/21/2023

Date Sampled: -

Date Analyzed: 6/21-7/5/2023

RESULTS OF ANALYSIS

Sample Descriptions	Parameters	Results	Units	Methods
4% Wood Pellet Ash	Arsenic (As) ^a	84.95	mg/kg	Manual Hydride Generation AAS
Date: June 7, 2023	Barium (Ba) ^a	1473.38	mg/kg	Direct Nitrous Oxide-Acetylene Flame
	Cadmium (Cd) ^a	< 0.03	mg/kg	Direct Air-Acetylene Flame
	Chromium (Cr) ^a	138.52	mg/kg	Direct Air-Acetylene Flame
	Fluoride	< 0.5	mg/Kg	Ion-Selective Electrode
	Lead (Pb) ^a	< 0.10	mg/kg	Direct Air-Acetylene Flame
	Mercury (Hg) ^b	< 0.08	mg/kg	Cold Vapor AAS
	Selenium (Se) ^a	0.147	mg/kg	Manual Hydride Generation AAS

Note : The customer is given 7 days upon receipt to raise questions or clarifications on any part or content of the certificate, otherwise the result(s) is /are deemed accepted.

Total No. of Sample : 1

Total Analysis : 8

Sample Submission : Submitted by the Customer

Reference : ^a Acid Digestion; ^b USEPA Method 7471B.

Remarks : Results relate only to the item tested and received by the laboratory.

Certified Correct by:

MA. CRISTINA F. REFERENTE, RCh
PRC No. 0007398
Laboratory Head

Approved by:

ALVIN P. BASCO, RCh
PRC No. 0011786
Vice President-Operations

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Attention : MS. MAUREEN GURTIZA BELISARIO

Contact Information : (02) 548-7136/m.g.belisario@smm.com.ph

Date of Issue : 7/7/2023

RAN : B-16099A

Date Received: 6/21/2023

Date Sampled: -

Date Analyzed: 6/21-7/5/2023

RESULTS OF ANALYSIS

Sample Descriptions	Parameters	Results	Units	Methods
5% Wood Pellet Ash	Arsenic (As) ^a	95.34	mg/kg	Manual Hydride Generation AAS
Date: June 15, 2023	Barium (Ba) ^a	1578.32	mg/kg	Direct Nitrous Oxide-Acetylene Flame
	Cadmium (Cd) ^a	< 0.03	mg/kg	Direct Air-Acetylene Flame
	Chromium (Cr) ^a	173.06	mg/kg	Direct Air-Acetylene Flame
	Fluoride	< 0.5	mg/Kg	Ion-Selective Electrode
	Lead (Pb) ^a	< 0.10	mg/kg	Direct Air-Acetylene Flame
	Mercury (Hg) ^b	< 0.08	mg/kg	Cold Vapor AAS
	Selenium (Se) ^a	0.120	mg/kg	Manual Hydride Generation AAS

Note : The customer is given 7 days upon receipt to raise questions or clarifications on any part or content of the certificate, otherwise the result(s) is /are deemed accepted.

Total No. of Sample : 1

Total Analysis : 8

Sample Submission : Submitted by the Customer

Reference : ^a Acid Digestion; ^b USEPA Method 7471B.

Remarks : Results relate only to the item tested and received by the laboratory.

Certified Correct by:

MA. CRISTINA F. REFERENTE, RCh
PRC No. 0007398
Laboratory Head

Approved by:

ALVIN P. BASCO, RCh
PRC No. 0011786
Vice President-Operations

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Uninterrupted Total Quality Service Since
1976



OSTREA MINERAL LABORATORIES, INC.

Assaying and Environmental Testing Specialist

Barangay Road, Bo. Mamplasan, Biñan, Laguna, Philippines 4024
Telefax : (02) 889-9058; (049) 539-0102; (02) 848-6951
Email : customer.service@ostrealabs.com.ph



DENR Recognized
Laboratory with
C.R No. 011/2021

Original Issue ☒
Duplicate issue by request ☐
Revision Copy ☐

CERTIFICATE OF ANALYSIS

Customer : CORAL BAY NICKEL CORPORATION

Address : Rio Tuba Export Processing Zone, Brgy. Rio Tuba, Bataraza,
Palawan Philippines

Attention : MS. MAUREEN GURTIZA BELISARIO

Contact Information : (02) 548-7136/m.g.belisario@smm.com.ph

Date of Issue : 7/25/2023

RAN : B-16099B

Date Received: 6/21/2023

Date Sampled: -

Date Analyzed: 7/18-25/2023

RESULTS OF ANALYSIS

Sample Descriptions	Parameters	Results	Units	Methods	DAO 2013-22 Standards
Additional Analysis					
Toxicity Characteristic Leaching Procedure					
4% Wood Pellet Ash	Arsenic (As)	<0.010	mg/L	USEPA 1311/ICP-OES	1.0
Date: June 7, 2023	Barium (Ba)	0.205	mg/L	USEPA 1311/ICP-OES	70
	Chromium (Cr)	0.019	mg/L	USEPA 1311/ICP-OES	5.0

Note : The customer is given 7 days upon receipt to raise questions or clarifications on any part or content of the certificate, otherwise the result(s) is /are deemed accepted.

Total No. of Sample: 1

Total Analysis : 3

Sample Submission : Submitted by the Customer

Reference : Standard Methods for the Examination of Water and Wastewater, 23rd ed.

Remarks : Results relate only to the item tested and received by the laboratory.

Certified Correct by:

MA. CRISTINA F. REFLENTE, RCh
PRC No. 0007398
Laboratory Head

Approved by:

ALVIN P. BASCO, RCh
PRC No. 0011786
Vice President-Operations

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Original Issue ☒
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CERTIFICATE OF ANALYSIS

Customer : CORAL BAY NICKEL CORPORATION

Address : Rio Tuba Export Processing Zone, Brgy. Rio Tuba, Bataraza,
Palawan Philippines

Attention : MS. MAUREEN GURTIZA BELISARIO

Contact Information : (02) 548-7136/m.g.belisario@smm.com.ph

Date of Issue : 7/25/2023

RAN : B-16099C

Date Received: 6/21/2023

Date Sampled: -

Date Analyzed: 7/18-25/2023

RESULTS OF ANALYSIS

Sample Descriptions	Parameters	Results	Units	Methods	DAO 2013-22 Standards
Additional Analysis					
Toxicity Characteristic					
Leaching Procedure					
5% Wood Pellet Ash	Arsenic (As)	<0.010	mg/L	USEPA 1311/ICP-OES	1.0
Date: June 15, 2023	Barium (Ba)	0.201	mg/L	USEPA 1311/ICP-OES	70
	Chromium (Cr)	0.023	mg/L	USEPA 1311/ICP-OES	5.0

Note : The customer is given 7 days upon receipt to raise questions or clarifications on any part or content of the certificate, otherwise the result(s) is /are deemed accepted.

Total No. of Sample: 1

Total Analysis : 3

Sample Submission : Submitted by the Customer

Reference : Standard Methods for the Examination of Water and Wastewater, 23rd ed.

Remarks : Results relate only to the item tested and received by the laboratory.

Certified Correct by:

MA. CRISTINA F. REFERENTE, RCh
PRC No. 0007398
Laboratory Head

Approved by:

ALVIN P. BASCO, RCh
PRC No. 0011786
Vice President-Operations

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