Annexure-0005

samtamir

AMBIENT AIR QUALITY REPORT

Strictly confidential

Client
SAMTA MINES.

Operator
SAMTA METALS & ALLOYS S.A

Typology
Projet de construction d'une unité industrielle de production de métaux.

Localisation
ATLANTIC FREE ZONE de KENITRA.

CASABLANCA, on 26/12/2023

EL ADDAD
Bureau d'étude technique agréé

Bureau D'études Techniques Agrée

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EXCLUSIVE CONSTRUCTIONS
INGENIERIE, CONSEILS ET EXPERTISE

SUMMARY

I. STRUCTURAL / ENVIRONMENTAL OFFICE MISSIONS

1. Fields of intervention

Object

*The company SAMTA MINES asked us to carry out the environmental impact study of its project called "**SAMTA METALS & ALLOYS** – **INDUSTRIAL UNIT FOR PROCUDING METALS**", located in the Kenitra free zone "**ATLANTIC FREE ZONE**" .*

Expertise and environmental impact study

We limit ourselves to establishing our expert reports on our experience in environmental impact studies and on the possible basis of reports provided by our approved collaborators and experts in quality control of environmental components and analyzes (ambient air; groundwater, geology and geotechnics, materials, etc.). Consequently, the assessment of the state, conditions or projections is made under the following conditions:

- ***Site visits,***
- ***Mobilization of the approved control laboratory in terms of qualified materials and human resources,***
- ***Geographical location of sampling points,***
- ***The taking of ambient air samples for a period of 48 hours continues,***
- ***Classification of results and samples taken during mobilization in chronological order with a point-taking interval of 15 minutes,***
- ***Examination of documents provided by the approved control laboratory,***
- ***Interpretation and verification of the results within the corresponding normative framework,***
- ***Conclusion and summary of references and regulations.***

Independence – Conflicts of interest

We have not identified any conflicts of interest regarding the mission you have entrusted to us.

Limitation of use and right of communication

Our report is drawn up solely within the framework of the operation mentioned above. It cannot therefore be used for other purposes, or communicated to third parties, without the prior authorization of the BET

Limit of liability

Since the data must be evaluated based on the results, hypotheses or conclusions provided by the client, environmental experts or approved analysis laboratories, our liability cannot under any circumstances be engaged before any court.

Ownership and distribution of our reports

Our reports become the property of our clients upon full payment of our fees, subject to any usage limitations defined below. Our reports may only be distributed to third parties in their entirety, including annexes, unless our company's agreement to the distribution of extracts is obtained. They may neither be cited nor mentioned to third parties in any document intended to be published without the written consent of the BET, as to the form and circumstances in which they may appear.

Planes and Surfaces

We carry out our evaluations based on the surface areas of the land and buildings as they result from the information and documents provided to us (subject to verification and certification by an expert surveyor). We do not carry out any tests if this service is not included in our mission letter.

Property titles

Our mission does not include the examination of property titles, nor the control of the compliance of existing buildings with the legislation on Building Permits. Our conclusions therefore assume that the goods are in a legal situation with regard to the laws and regulations in force.

Lack or non-communication of information

It is the client's responsibility to provide us with all the relevant information necessary for our expertise.
If, for example, no modification, easement or hidden defect likely to disturb the envelope of the appraised works is reported to us, we presume its absence.

Use of data or documents communicated by the customer

Our intervention consists of identifying in these data or documents the information relevant to our evaluation. We do not carry out a full reading of the documents communicated, and even less an audit of these documents, the responsibility of which falls to other professionals.

References

- *Project to extend the Calcium carbonate production unit: Installation of the new production line, ZI Nouaceur /SAPINO; Province of Nouaceur, commune of OULAD AZZOUZ, Grand CASABLANCA.*
- *Project to extend the operation of an open-air quarry for the extraction of limestone rocks, presented by the Company, CARBONATE BEN AHMED, SARL, Municipality of Ain Dorbane Lahlaf, Province of Settat, Casablanca-Settat Region.*
- *Project to build the wastewater treatment plant in the center of Ouled Farès,*

- *Project to extend the operation of an open-air quarry for the extraction of limestone rocks (Ard Trik), presented by the Company YAJABI ET JAMAL, Municipality of Ain Dorbane Lahlaf, Province of Settat, Casablanca-Settat Region.*

- *Project to extend a food product production unit (biscuits, wafers, and sponge cake), Commune of Had Soualem, Province of Settat, Casablanca-Settat Region.*

- *Project to extend the operation of an open-air quarry for the extraction of limestone rocks (Blad Talaa), presented by the Company CARBONATE CHAOUIA, Municipality of Sidi Dahbi, Province of Settat, Casablanca-Settat Region.*

- *Carrying out an environmental assessment according to the terms of reference of law 49-17, of the project of the company Varun Beverages (PEPSI).*

- *Carrying out an environmental assessment according to the terms of reference of law 49-17, of the ALHALABI FOODS manufacturing unit project (AlHalabi foods industries and Trade).*

- *Production of an annual report for the year 2021 on the environmental situation of the shale extraction quarry by La Société Ciments de l'Atlas (CIMAT).*

- *Project to create a poultry slaughtering and white meat processing unit in the territorial commune of Settat.*

- *Carrying out (10) environmental impact studies of service stations and hydrocarbon distribution.*

Intervention teams

- *Ms. Fatima Zahra HIMRI: State engineer expert in Environment and Water engineering: 12 years of experience.*
- *Ms. Soukaina BARAKKAT: State engineer in environmental and climatic engineering: 11 years of experience.*
- *Mr. Adnane BENBARAKA: State engineer in water and environmental engineering: 13 years of experience.*
- *Mr. Zouhair FARHAT: State engineer in energy and environmental engineering: 07 years of experience.*
- *Mr. Mounaim EL ADDAD: State engineer in civil engineering, buildings and public works: 15 years of experience.*
- *Mr. Nacim ABDI: Professor and State Engineer in civil engineering, buildings and public works: 15 years of experience.*

I. STUDY ON THE STATE AND QUALITY OF AMBIENT AIR

1. Procedure and approach of intervention

The office carried out the studies and analyzes by adopting the following approach:

- *Establishment of a specialized unit for the verification and sampling of ambient air quality according to the footprint of the site subject to construction and possibly according to the dominant wind direction and the urban areas to be proximity.*
- *Positioning of the sampling team on two different points in order to cover a large area of land for the installation of the factory,*
- *Samples will be taken every 15 minutes for a continuous mobilization period of 48 hours.*

Sampling and measurements were carried out in accordance with the most widely used reference procedures and methods worldwide.
The parameters measured and which are considered indicators of atmospheric pollution are:

- ***Ozone (O3);***
- ***Carbon monoxide (CO);***
- ***Sulfur dioxide (SO2);***
- ***Nitrogen oxides (NO, NO2, NOx);***
- ***Benzene (C6H6);***
- ***PM10 dust;***
- ***Dust fallout;***
- ***Heavy metals (Pb and Cd).***

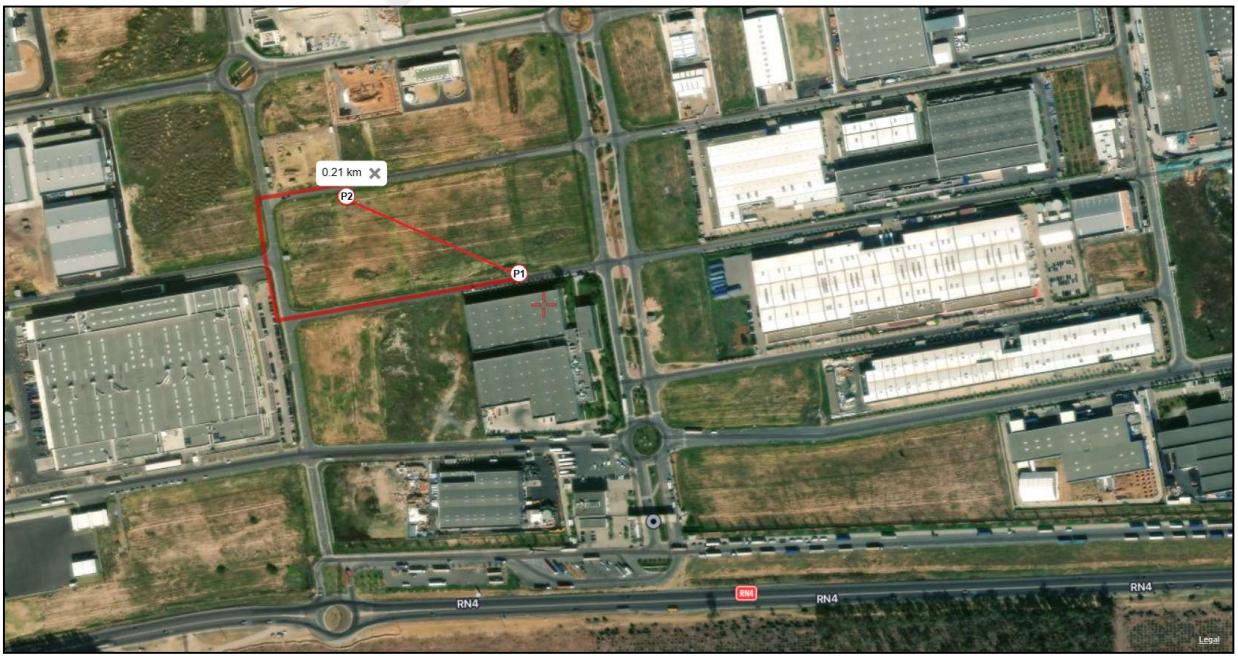
The environmental laboratory carried out sampling and measurements on site via a mobile laboratory equipped with the latest generation of ambient air quality measurement equipment from the Environnement SA brand.

Measurements of concentrations of gaseous pollutants such as: CO, CO2, SO2, NO2, PM10 dust and C6H6 are carried out using automatic analyzers installed in the mobile unit. These analyzers are TÜV Rheinland certified.

These analyzers are regularly serviced, preventive maintenance and calibrated using certified standard gases. Measurements of other parameters such as wind speed and direction, humidity and temperature are carried out using approved portable equipment. This material is also subject to regular verification by the metrological service.

The measurement points subject to mobilization are characterized by the following coordinates:

POINTS	***COORDINATES***
P1	***X : 34.301101, Y : - 6.397063***
P2	***X : 34.300654, Y : -6.394376***



a. Regulation titles and normative standards

The regulatory aspect is managed by decree No. 2-09-286 of 20 hija 1430 (December 8, 2009) implementing law No. 13-03 relating to the fight against air pollution, setting the air quality standards by providing limit values for the concentration levels of certain polluting substances in the air not to be exceeded. The table below summarizes these limit values..

POLLUTANTS	*NATURES OF THE THRESHOLD*	*LIMIT VALUES*	*EXPRESSION OF THE RESULT*
SO2 EN MG/M3	▪ *Health protection* ▪ *Protection of ecosystems*	▪ ***125*** ▪ ***20***	▪ *90.4 percentile of 24-hour averages.* ▪ *Annual average*
NO2 EN MG/M3	▪ *Health protection* ▪ *Protection of vegetation*	▪ ***200*** ▪ ***30***	▪ *98 percentile of 1 hour averages* ▪ *Average of the year*
CO EN MG/M3	*Health protection*	***10***	*Daily maximum of the 8-hour rolling average*
O3 EN MG/M3	*Health/vegetation protection*	▪ ***110*** ▪ ***65***	▪ *Average over 8 hours* ▪ *Daily average not to be exceeded for more than 3 consecutive days*
BENZENE C6H6 EN MG/M3	*Health protection*	***10***	*Annual average*
PM 10 EN MG/M3	*Health protection*	***50***	*90.4 percentile of 24-hour averages*
PB MG/M3	*Health protection*	***01***	*Annual average*
CD NG/ M3	*Health protection*	***05***	*Annual average*

b. Results obtained during the sampling campaign

The results obtained during the sampling campaign are as follows:

1 - Localisation P1 :

Photos of the P1 sampling area

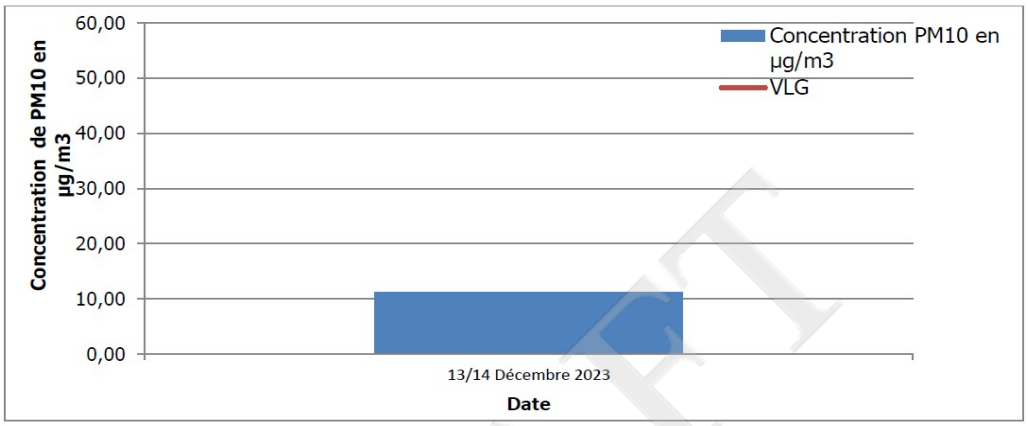
❖ ***PM10 dust rate:***

The table below represents the summary of the results obtained for PM10 dust at sampling point P1:

SAMPLING POINT	TEST NO.	START DATE AND TIME	END DATE AND TIME	CONCENTRATION
PM10	*1*	*13/12/2023 à 13h00*	*14/12/2023 à 13h00*	***11,26***
	Average			***11,26***
	90.4 percentile of 24-hour averages			***11,26***
	Tolerated Limit Value			***50***

The daily concentration of PM10 dust in this campaign is 11.26 µg/m3 and a 90.4 percentile of 11.26 µg/m3 which is lower than the tolerated limit value of 50 µg/m3.

The evolution of the daily concentration of PM10 dust at this measurement point is represented by the following figure:

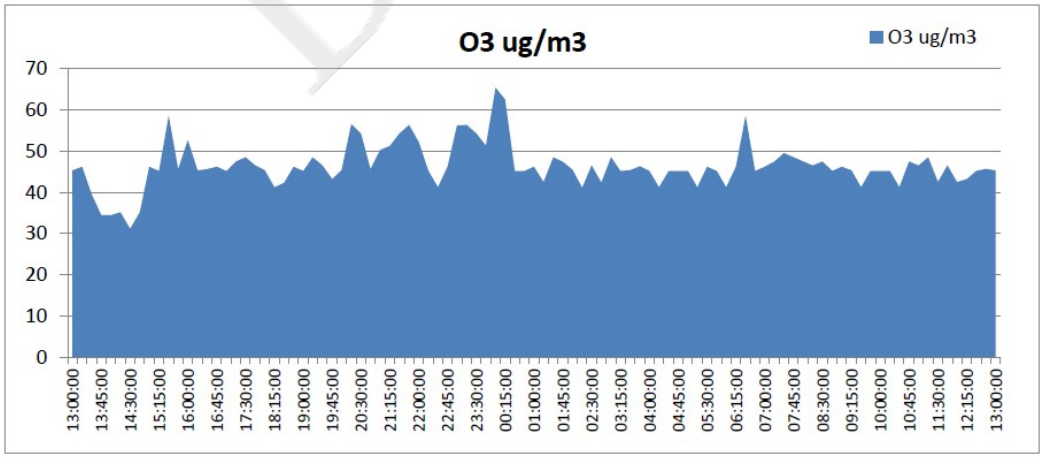


Evolution de la concentration moyenne journalière des poussières PM10 relative à la période des mesures du 13/12/2023 au 14/12/2023 au niveau du point de mesure

❖ ***Ozone O3:***

The hourly ozone concentrations in this campaign are 46.40 µg/m3 which is lower than the tolerated limit of 65 µg/m3 and an average over an 08 hour range of 46.42 µg/m3 which is lower than the tolerated limit of 110 µg/m3.

The dispersion of ozone levels in ambient air during the 24 hours of the measurement campaign is represented in the histogram below:



Histogramme de la dispersion des taux d'O_3 pendant les 24 heures de mesure

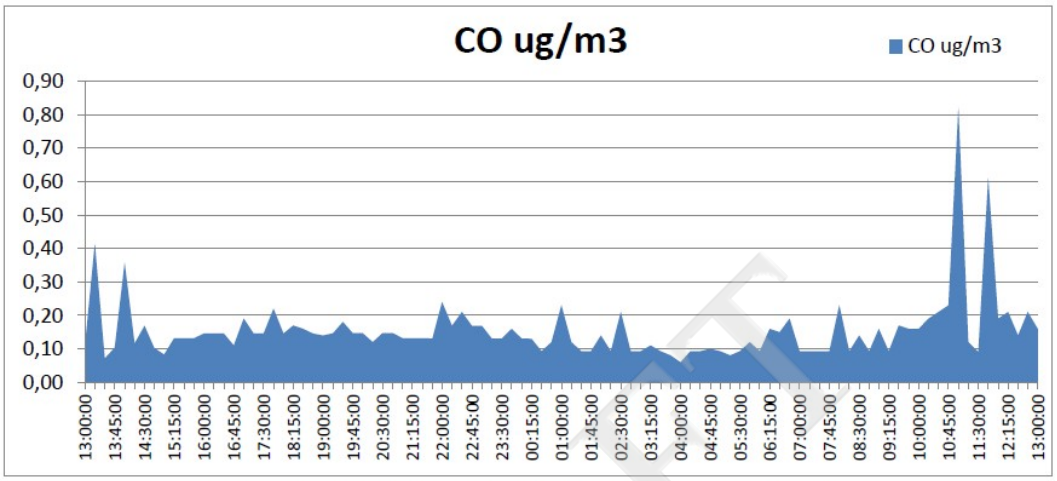
The ozone concentration level relating to the measurement period from 12/13/2023 to 12/14/2023 at the sampling point, represented by Figure 7 in Appendix 2, shows background noise around this sampling point with a maximum concentration of around 65.30µg/m3, oriented in the west direction of the sampling point.

❖ ***Carbon monoxide :***

A small portion is geological in origin, a substantial portion comes from the burning of fossil energy resources, but the bulk comes from biomass fires. These fires are partly of natural origin, but most often of anthropogenic origin (forest fires, bush fires, etc.). Emitted in large quantities by forest fires, and more diffusely by boilers and heat engines.

The hourly concentrations of carbon monoxide in this campaign vary between 0.06 and 0.82 µg/m3 with an average of 0.15 µg/m3 and a daily maximum of the rolling average over an 08-hour range of 0.2 µg/m3 which is lower than the tolerated limit of 10 mg/m3 (10,000µg/m3).

The dispersion of carbon monoxide levels in the ambient air during the 24 hours of the measurement campaign is represented in the histogram below:

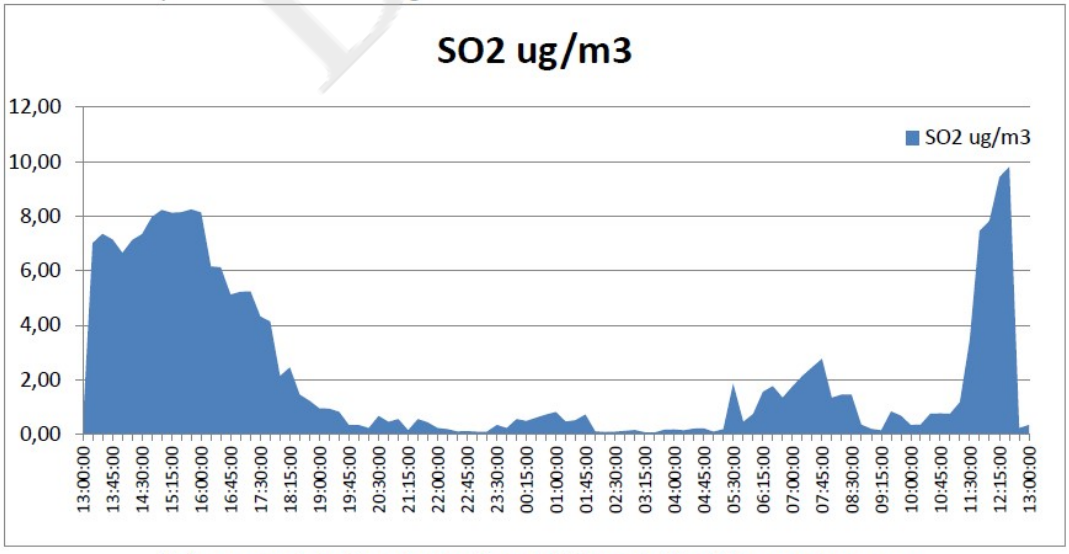


Histogramme de la dispersion des taux du CO pendant les 24 de mesure

The CO concentration level shows a maximum concentration of around 0.82 µg/m3 oriented in the WNW direction (West-North-West).

❖ ***Sulphur dioxide :***

*The hourly concentrations of sulfur dioxide in this campaign vary between **0.06 and 9.81 µg/m3** with an average of **2.22 µg/m3** and a 99.2 percentile of 24-hour averages of **9.52 µg/m3** which is well below the tolerated limit value of **125 µg/m3**.*
*The dispersion of **SO2** levels in ambient air during the 24 hours of the measurement campaign is represented in the histogram below:*



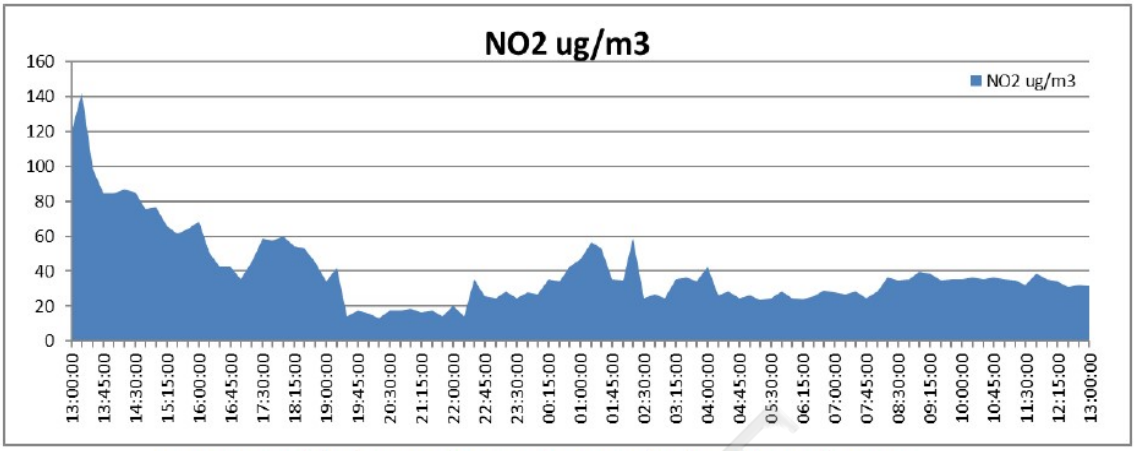
Histogramme de la dispersion des taux du SO_2 pendant les 24 heures de mesure

The SO2 concentration level shows a maximum concentration of around 9.81 µg/m3 oriented in the SSE direction (South-South-East).

❖ ***Nitrogen dioxide NO2:***

The hourly concentrations of nitrogen dioxide NO2 in this campaign vary between ***13.25 and 142.23 µg/m3*** *with an average of* ***39.90 µg/m3*** *and a 98 percentile of hourly averages of* ***94.80 µg/m3*** *which is lower than the tolerated limit value of* ***200 µg/m3.***

The dispersion of ***NO2*** *levels in ambient air during the 24 hours of the measurement campaign is represented in the histogram below:*



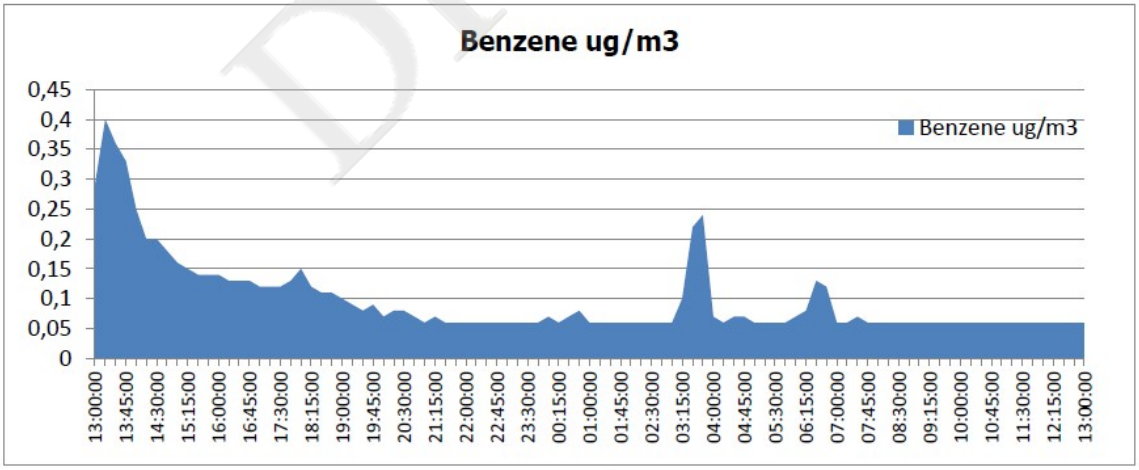
Histogramme de la dispersion des taux du NO2 pendant les 24 heures de mesure

The NO2 concentration level shows a concentration of 142.23 µg/m3 represented by the most intense peak which appears in the SSE direction.

❖ ***Benzène :***

The hourly concentrations of benzene in this campaign vary between ***0.06 and 0.40 µg/m3*** *with an average of* ***0.10 µg/m3*** *which is lower than the limit value (annual average) set at* ***10 µg/m3****.*

The dispersion of ***C6H6*** *levels in ambient air during the 24 hours of the measurement campaign is represented in the histograms below:*



Histogramme de la dispersion des taux du benzène pendant les 24 heures de mesure

❖ ***Heavy metals (Pb and Cd):***

The table below gives a summary of the results obtained for the Pb and Cd concentrations:

SAMPLING POINT	*TEST NO.*	*START DATE AND TIME*	*END DATE AND TIME*	*CONCENTRATION*	
				Pb ng/m3	***Cd ng/m3***
P1	*1*	*13/12/2023 à 13h00*	*14/12/2023 à 13h00*	***0,004***	***0,02***
	Average			***0,004***	***0,02***
	Tolerated Limit Value			***1***	***5***

The measured concentrations of Pb and Cd are well below the limit values set by the regulations.

2 - Localisation P2 :

Photos of the P2 sampling area.

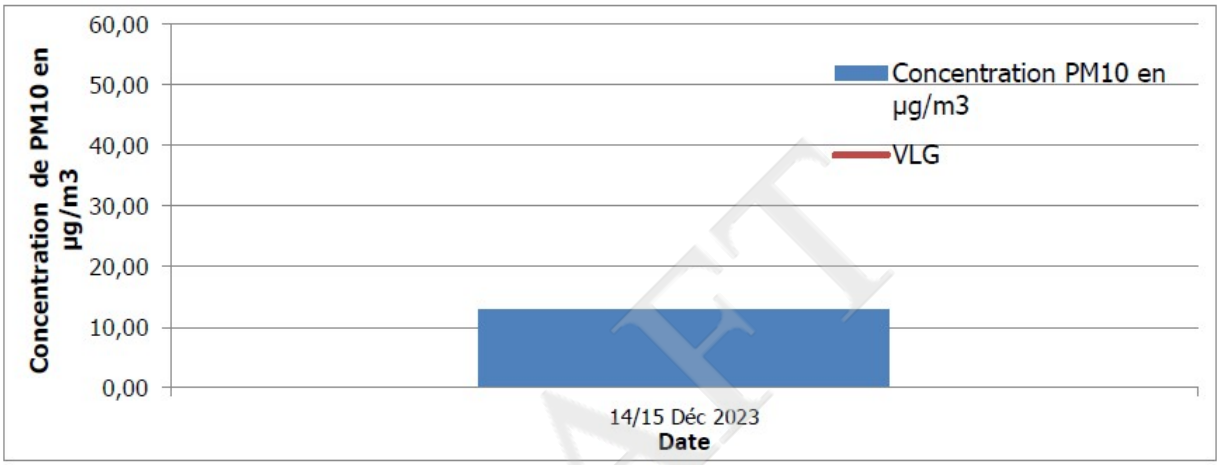
❖ ***PM10 dust rate:***

The table below represents the summary of the results obtained for PM10 dust at sampling point P2:

SAMPLING POINT	*TEST NO.*	*START DATE AND TIME*	*END DATE AND TIME*	*CONCENTRATION*
PM10	*2*	*14/12/2023 à 14h15*	*15/12/2023 à 14h15*	***12.88***
	Average			***12.88***
	90.4 percentile of 24-hour averages			***12.88***
	Tolerated Limit Value			***50***

*The daily concentration of **PM10** dust in this campaign is **12.88 µg/m3** and a 90.4 percentile of **12.88 µg/m3** which is lower than the tolerated limit value of **50 µg/m3**.*

The evolution of the daily concentration of PM10 dust at this measurement point is represented by the following figure:

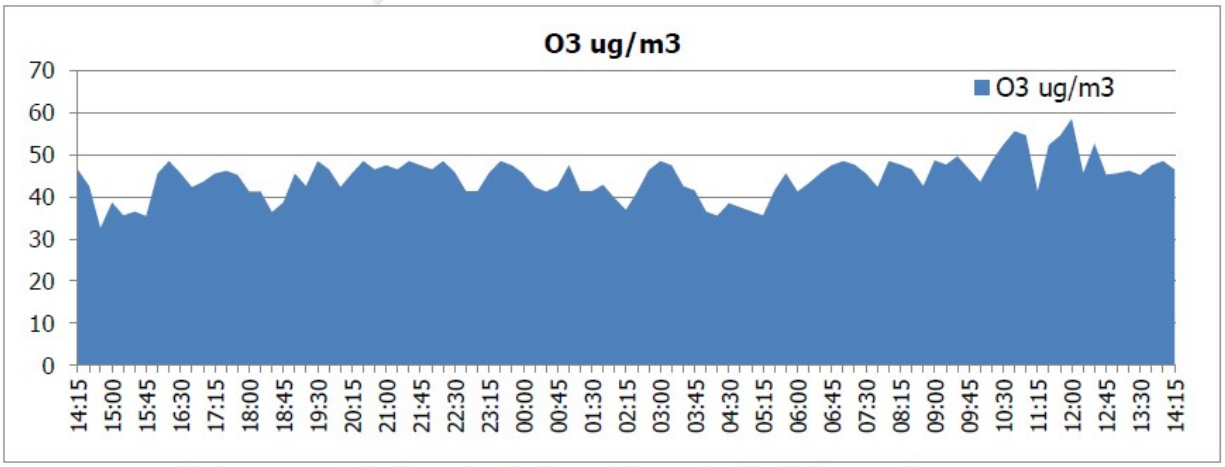


Evolution de la concentration moyenne journalière des poussières PM10 relative à la période des mesures du 14/12/2023 au 15/12/2023 au niveau du point de mesure

❖ ***Ozone O3:***

*The hourly concentrations of ozone in this campaign is **46.12 µg/m3** which is lower than the tolerated limit of **65 µg/m3** and an average over an **08 hour** range of **44.63 µg/m3** which is lower than the tolerated limit of **110 µg/m3.***

The dispersion of ozone levels in ambient air during the 24 hours of the measurement campaign is represented in the histogram below:



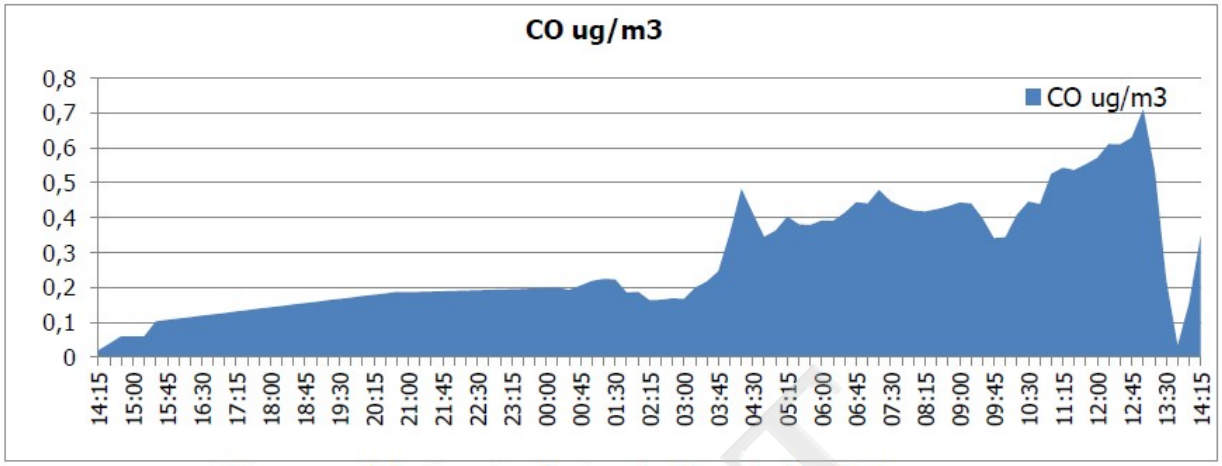
Histogramme de la dispersion des taux d'O_3 pendant les 72 heures de mesure

*The ozone concentration level relating to the measurement period from 12/14/2023 to 12/15/2023 at the sampling point, with a maximum concentration of around **59.50µg/m3**, oriented in the 90° direction of the sampling point.*

❖ ***Carbon monoxide :***

*The hourly concentrations of carbon monoxide in this campaign vary between **0.20 and 0.99 µg/m3** with an average of **0.46 µg/m3** and a daily maximum of the rolling average over an 08-hour range of **0.5 µg/m3** which is lower than the tolerated limit of **10 mg/m3 (10,000µg/m3**).*

The dispersion of carbon monoxide levels in the ambient air during the 24 hours of the measurement campaign is represented in the histogram below:



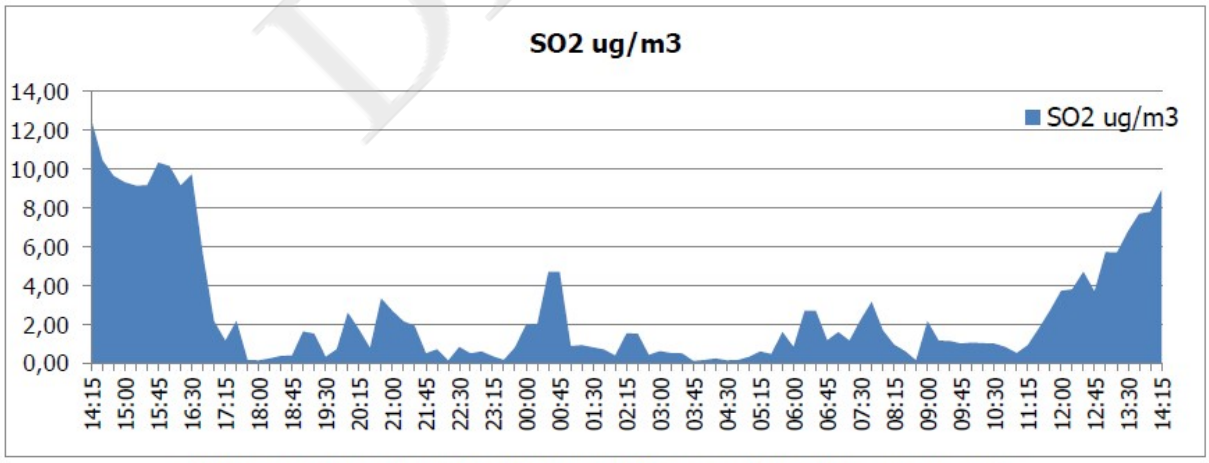
Histogramme de la dispersion des taux du CO pendant les 72 de mesure

The CO concentration level shows a maximum concentration of around 0.99 µg/m3 oriented in the NE (Northeast) direction.

❖ ***Sulphur dioxide :***

*The hourly concentrations of sulfur dioxide in this campaign vary between 0.13 and 12.51 µg/m3 with an average of **2.85 µg/m3** and a 99.2 percentile of 24-hour averages of **10.39 µg/m3** which is well below the tolerated limit value of **125 µg/m3**.*

The dispersion of SO2 levels in ambient air during the 24 hours of the measurement campaign is represented in the histogram below:



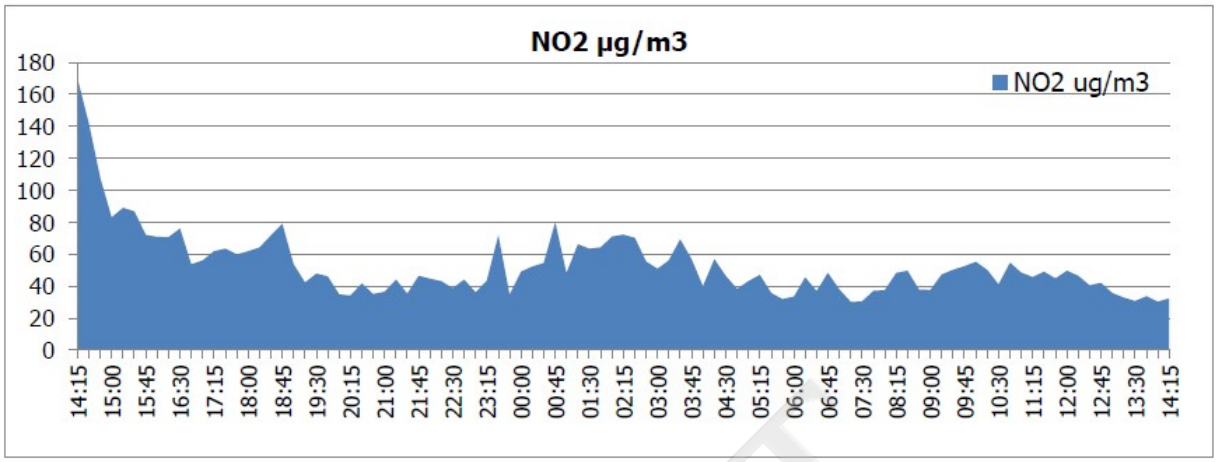
Histogramme de la dispersion des taux du SO_2 pendant les 72 heures de mesure

The SO2 concentration level shows a maximum concentration of around 9.81 µg/m3 oriented in the 20° direction.

❖ ***Nitrogen dioxide NO2:***

The hourly concentrations of nitrogen dioxide NO2 in this campaign vary between ***30.19 and 162.51 µg/m3*** *with an average of* ***52.98 µg/m3*** *and a 98th percentile of hourly averages of* ***52.74 µg/m3*** *which is lower than the tolerated limit value* ***of 200 µg/m3.***

The dispersion of NO2 levels in ambient air during the 24 hours of the measurement campaign is represented in the histogram below:



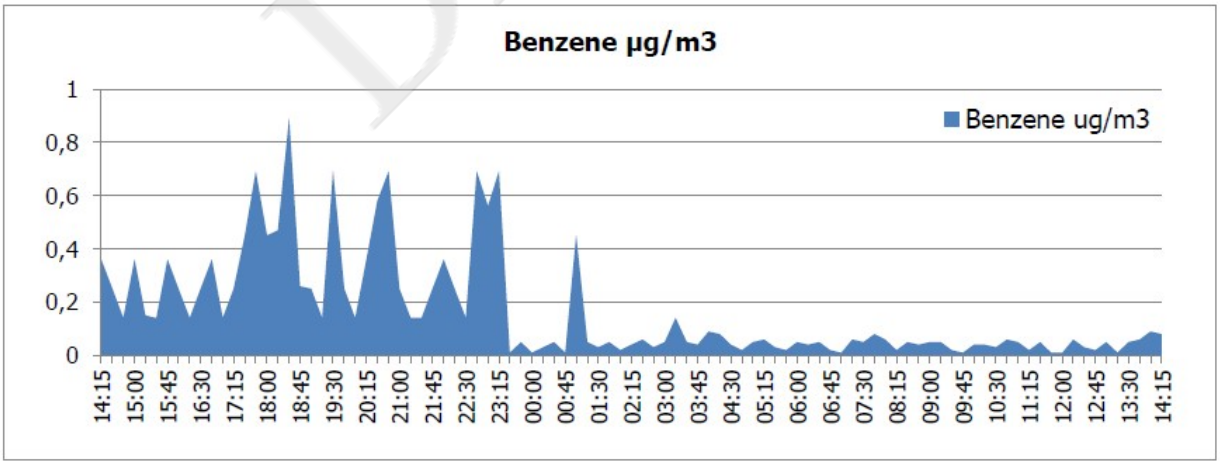
Histogramme de la dispersion des taux du NO2 pendant les 72 heures de mesure

La rose de concentration de NO2 montre une concentration de 169,51 µg/m3 représentée par le pic le plus intense qui apparait dans la direction 20°.

❖ ***Benzène :***

The hourly concentrations of benzene in this campaign vary between ***0.01 and 0.89 µg/m3*** *with an average of* ***0.16 µg/m3*** *which is lower than the limit value (annual average) set at* ***10 µg/m3****.*

The dispersion of ***C6H6*** *levels in ambient air during the 24 hours of the measurement campaign is represented in the histograms below:*



Histogramme de la dispersion des taux du benzène pendant les 72 heures de mesure

❖ ***Heavy metals (Pb and Cd):***

Rarely found alone in its natural state, cadmium is generally associated with other metals in ores. It can also come from metallurgical processes, waste incineration and phosphorus fertilizers. Its uses are numerous: anti-corrosion treatment of alloys, manufacturing of plastics, rechargeable batteries, dyes or electronic products, etc.

Present in soils and the earth's crust, lead is mainly extracted from an ore, galena. Its uses are numerous: batteries, hunting shot, ceramics, paints, fuses, etc. It has today become one of the main toxic contaminants in the environment.

*The table below gives a summary of the results obtained for the **Pb** and **Cd** concentrations :*

SAMPLING POINT	TEST NO.	START DATE AND TIME	END DATE AND TIME	CONCENTRATION	
				Pb ng/m3	Cd ng/m3
P2	2	13/12/2023 à 13h00	14/12/2023 à 13h00	0,3	0,85
	Average			0,3	0,85
	Tolerated Limit Value			1	5

The measured concentrations of Pb and Cd are well below the limit values set by the regulations in force.

3. Interprétation des résultats dans le cadre normatif

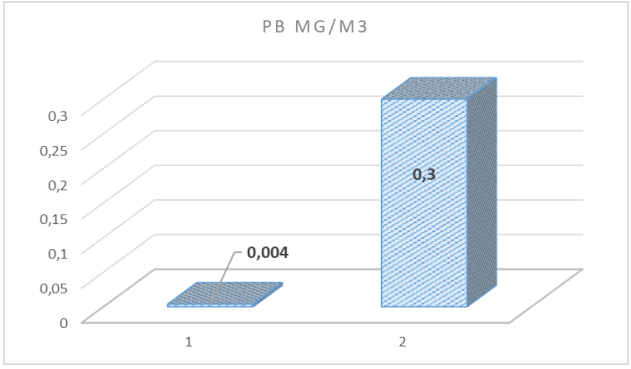
*As part of the mission of the design office, and after having taken the necessary samples to better interpret the reference state of the ambient air within the AFZ zone and precisely the land subject to the future **SAMTA METALS & ALLOYS** industrial unit, we first cite the results summarized as follows:*

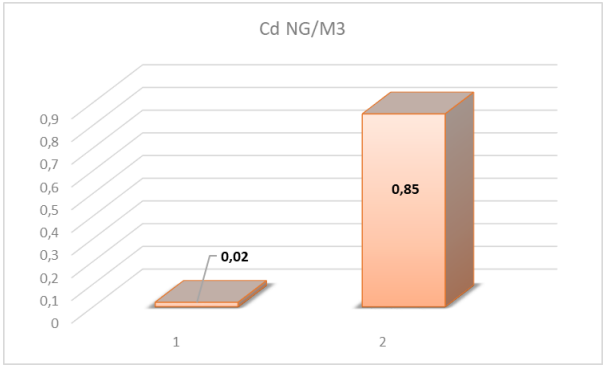
Point	Dust PM10 µg/m3	Sulfur Dioxide SO2 µg/m3	Nitrogen Dioxide NO2 µg/m3	Ozone O3 µg/m3		Carbon Monoxide CO µg/m3	Pb µg/m3	Cd ng/m3
				Moy / 8 Heures	Moy/ Jour			
P1	11,26	9,52	94,80	46,42	46,40	0,2	0,004	0,02
P2	12,88	10,39	109,90	44,63	46,12	0,5	0,3	0,85
VLG	50	125	200	110	65	10 000	1,00	5,00
Notice	OK	OK	OK	OK	OK	OK	OK	OK

**P1: sampling point No. 1*
**P2: sampling point No. 2*
**VRT: General limit value tolerated by the regulations and standards in force.*

Comparison of the results of the measurement campaign (P1) with the values of the measurement campaign (P2), summarized in the table above, reveals the following:

- *A negligible difference in **PM10** dust mainly due to the circulation of construction machinery and wind direction.*
- *A negligible difference in terms of **Sulfur Dioxide SO2**, **Nitrogen NO2**, **Ozone O3**.*
- *A negligible difference in air saturation with **Carbon Monoxide CO** due mainly to the positioning of the sampling companion where we can see its proximity to an active and operational industrial unit.*
- *The difference observed in the presence of Lead and Cadmium between the measurement point **P1** and **P2**, where we can see the variation in the dosage (see graph below):*





mainly due to the positioning of the sampling site where we can see its proximity to an active and operational industrial unit.

1. Conclusion

*As usual and on the basis of the analysis results provided by our **CETEMCO** approved control laboratory, we can, unless the reference state is revised on 15/12/2023, rule on good quality of ambient air in the area where the **SAMTA METALS & ALLOYS** industrial unit is located, in accordance with the standards and thresholds tolerated by international regulations.*

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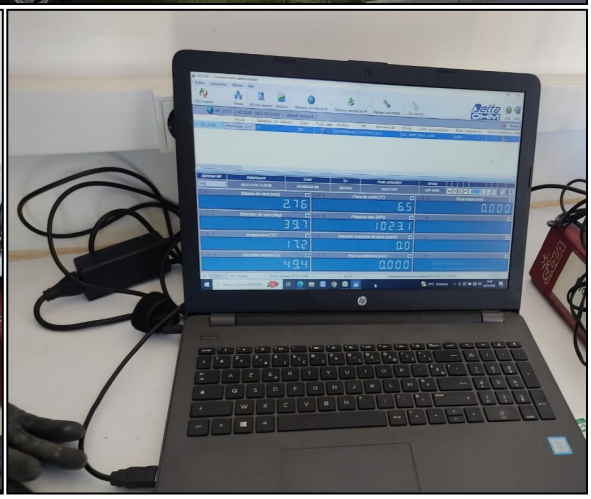
Visa
Environmental studies office

III. APPENDICES

1. Photographic Report




Environnement s.a


Environnement s.a


Environnement
AF 22M
EN SERIES
Environnement s.A
O3 42M
EN SERIES
Environnement s.A
CO 12M
EN SERIES
Environnement s.A


Environnement s.A
MP 101M
Environnement s.A