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PT IRIANA MUTIARA MINING



NICKEL RESOURCE ESTIMATE

QUALIFIED PERSON'S REPORT

USING JORC CODE 2012

MAY, 2024

EXECUTIVE SUMMARY

PT Iriana Mutiara Mining (IMM) nickel laterite project is located within the Regency of Sarmi in the Province of Papua, Indonesia.

PT Danmar Explorindo has estimated Nickel Resources, using the JORC Code, 2012 with a drill data cut-off at the 1st October 2023.

The IMM mining license covers 16,470ha and is currently under suspension while the Contract of Work is upgraded to an Operation and Production status.

Since 2021, Ultra Ground Penetrating Radar surveys have been used to show the distribution and relative thickness of the nickel laterite deposit in the IMM area so that drill programs could be optimized to focus on the thickest laterite areas.

Validated drill data, used in this Mineral Resource estimate, totals 2,078 holes with a cumulative total depth of 31,066m.

33,183 XRF analyses have been performed on drill cores samples to document the grade characteristics throughout the Nickel Resource.

The estimated Nickel Laterite Resource, covering 1,614ha, using a 0.8% Ni cut-off grade is as follows:

Laterite Resource	Resource Category	Wet Tonnes (million tons)	Dry Tonnes (million tons)	Ni %	Co %	Fe %	MgO %	SiO2 %	Nickel Metal (dry t)
Limonite	Indicated	11.9	**7.0**	1.06	0.11	43.90	5.47	10.44	74,537
	Inferred	28.5	**16.8**	1.04	0.10	42.87	5.54	11.03	174,748
	Total	**40.5**	**23.9**	**1.04**	**0.10**	**43.17**	**5.52**	**10.85**	**249,285**
Saprolite	Indicated	13.4	**8.7**	1.15	0.03	12.22	28.71	38.39	99,847
	Inferred	29.9	**19.4**	1.09	0.03	12.22	28.26	38.64	212,325
	Total	**43.3**	**28.1**	**1.11**	**0.03**	**12.22**	**28.40**	**38.56**	**312,172**
Total	Indicated	25.3	15.7	1.11	0.07	27.16	17.75	25.21	174,041
	Inferred	58.4	36.3	1.07	0.06	27.18	17.17	25.16	386,595
	Total	**83.7**	**52.0**	**1.08**	**0.06**	**27.17**	**17.34**	**25.18**	**560,627**

Exploration Targets covering more than 1,300ha have potential for 22-110 million wet metric tons, with nickel grades ranging from 0.7-1.1%, of additional laterite product in a similar geological environment. Although it is uncertain if further exploration will result in a Mineral Resource, the historical mapping in these areas gives confidence that further exploration will upgrade at least some of these areas for future Resource estimates.

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10) RESUME: DANIEL MADRE, TOBIAS MAYA, YORRIS WIBRIANA, HARMAN ADHITYO

LIST OF ABBREVIATIONS

Al2O3	aluminum oxide
APL	areal penggunaan lain (Forestry status for land with no Forestry restriction)
asl	above sea level
BRK	bedrock
cm	centimeter
Co	cobalt
COA	certificate of analysis
CRM	certified reference material
DA	pulp duplicate sample
DEX	PT Danmar Explorindo
dmt	dry metric tons
DR	coarse reject sample
DOS	direct shipping ore
Fe	iron
g	gram
GPR	ground penetrating radar
GPS	global positioning system
Ha	hectare
HPAL	high pressure acid leach
IDW2	Inverse distance weighted squared
IWIP	Indonesia Weda Bay Industrial Park
ISO	international standards organization
IUPOP	Indonesian mining business permit for operation and production
JORC	Joint ore reserve committee
LiDAR	Laser imaging detection and ranging
LIM	Limonite
m	meters
MC	Moisture Content
MgO	Magnesium oxide
Ni	Nickel
OK	Ordinary Kriging
OREAS	Ore Research and Exploration Australia Limited
QA/QC	quality assurance / quality control
RKEF	rotary kiln electric furnace
REP	replicate sample
RTK	GPS Real-Time Kinematic GPS giving high accuracy survey positioning
SAP	saprolite
SGS	Societe Generale Surveillance Indonesia; survey and analysis lab company
SIA	Social Impact Assessment
SiO2	quartz/silica
t	metric tons
wmt	wet metric tons
wmtpa	wet metric ton per annum
XRF	x-ray refraction

COMPETENT PERSON'S STATEMENT AND DECLARATION

AUTHORS AND CONTRIBUTOR

Table 1 Authors and contributors

Position	Name	Qualifications	Signature	Date
Competent Person / Author	Daniel Madre	MSc MAusIMM, MAIG, MIAGI	Digital Signature shown	May-24
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Resource Geologist / Contributing Author / Geostatistical Analysis	Yorris Wibriana	BSc MIAGI	Digital Signature shown	May-24
Resource Geologist / Geostatistical Analysis	Harman Adhityo	BSc	Digital Signature shown	May-24

REPORT OBJECTIVES

This report was prepared for PT Iriana Mutiara Mining (IMM) for the purpose of a nickel Resource estimate at the IMM project area at Siduarsi, Sarmi Regency, Papua Province, Indonesia. The report utilizes exploration data until 1 October, 2023.

REPORTING STANDARD

This report is intended to comply with the 2012 Code, of the Joint Ore Reserve Committee (JORC) of Australia for the reporting of Mineral Resources and Reserves (http://www.jorc.org/docs/jorc_code2012.pdf). All the information used in this report was assessed for compliance with the JORC Code and only information that was considered compliant was included in the estimate of a Nickel Resource as specified in the JORC Code of 2012. The competent persons, contributing to this report, have memberships to the Australasian Institute of Mining and Metallurgy that are current and in good standing.

AUTHORS QUALIFICATION STATEMENTS

The information in this report that relates to Exploration Results and Mineral Resources based on information compiled by Daniel Madre, Australasian Institute of Mining and Metallurgy member no: 100878 and Tobias Maya, member no: 304661.

Daniel Madre has a Master of Science degree majoring in geology and more than 40 years of experience as an exploration geologist of which more than 35 years has been working in

Indonesia. Since 2003, Daniel Madre has been involved in numerous laterite nickel exploration and mining projects in Indonesia and has held several senior roles in laterite nickel projects including, Managing Director of PT Telen Paser Prima, which opened the first laterite nickel mine in Kalimantan in 2005 and President Director of PT Itamatra Nusantara, that discovered laterite nickel in Morowali Regency in Central Sulawesi. Daniel Madre is currently managing director of PT Danmar Explorindo and a consultant to PT Iriana Mutiara Mining for the purpose of this study. PT Danmar Explorindo has also been the exploration contractor to PT Iriana Mutiara Mining since April 2021, providing exploration services including geological management, drilling, well site geology and core sample preparation.

Tobias Maya has a Bachelor of Science degree majoring in Spatial Science from Charles Sturt University, Australia. Tobias Maya is a Mineral Resource modeling specialist with more than 18 years of experience in exploration and modeling lateritic nickel resources in Indonesia. Tobias Maya is currently a director of PT Geo Search which has also provided Ultra-GPR (Ground Penetrating Radar) survey services to PT Iriana Mutiara Mining.

Daniel Madre and Tobias Maya have sufficient experience which is relevant to the style of mineralization and type of deposit under consideration and to the activity that they are undertaking, Reporting of Exploration Results and Mineral Resources. Daniel Madre and Tobias Maya consent to the inclusion in the report of the matters based on this information in the form and context in which it appears. Resumes for Daniel Madre and Tobias Maya are attached in Appendix 10.

AUTHORS QUALIFICATION STATEMENTS

Daniel Madre, Tobias Maya and PT Danmar Explorindo partners, directors, substantial shareholders and their associates are independent of PT Iriana Mutiara Mineral, its directors and substantial shareholders, its advisers and their associates.

Neither Daniel Madre and Tobias Maya or PT Danmar Explorindo nor any of its partners, directors, substantial shareholders, advisor's and their associates have any interest, direct or indirect in PT Iriana Mutiara Mining (IMM), its subsidiaries, associated companies, or any related entities in Indonesia or elsewhere in the world.

Daniel Madre, Tobias Maya and PT Danmar Explorindo have no conflicts of interest that might affect their objectivity in writing this report. PT Danmar Explorindo's fee for completing this report is based on normal commercial terms and the payment is not contingent upon the outcome and findings of this report.

DISCLAIMER

PT Danmar Explorindo has used the results of exploration programs provided by PT Iriana Mutiara Mining as well as the results of exploration drilling done on their behalf for the purpose of writing this report. In making this Mineral Resource estimation PT Danmar Explorindo has assumed as follows:

1) all the relevant data available was provided without prejudice
2) key assumptions are accepted as described in this report

In view of the above assumptions PT Danmar Explorindo has made reasonable enquiries and exercised their judgment on the reasonable use and validity of the data and found no reason to doubt its accuracy and reliability. For this reason, we believe that this report is an objective, accurate and reliable representation of the laterite nickel project at IMM nickel project, based on the exploration results until 1 October 2023. PT Danmar Explorindo makes no warranty to PT Iriana Mutiara Mining or any third parties with regard to any commercial investment on the basis of this report. The use of this report by PT Iriana Mutiara Mining or any other parties shall be at their own risk. The report must always be read in its entirety so that all the data and assumptions are fully considered and properly understood.

1 INTRODUCTION

1.1 BACKGROUND

On behalf of PT Iriana Mutiara Mining (IMM), PT Danmar Explorindo (DEX) was asked to provide a Nickel Resource estimate at the PT Iriana Mutiara Mining laterite nickel project, using the Joint Ore Reserve Committee of Australia (JORC) Code, 2012. This is the first formal Nickel Resource report using the JORC Code 2012, to be made on this area.

The first documented exploration in this area is from 1994, when Battle Mountain carried out field mapping and steam sediment sampling, while exploring for gold, in the area held by IMM today and reported a nickel anomaly. Further exploration work including drilling and hand auger sampling was carried out in 1995, by Battle Mountain. A resource was estimated and some preliminary metallurgical testwork was carried out, indicating the potential of the laterite for acid leaching. In 1998, Freeport McMoran Copper and Gold joint venture carried out a field exploration program including 4 test pits and a review of the data and a resource estimate was also carried out by PT Mineserve International. Starting in 2021, systematic mapping, Ultra-GPR (Ground Penetrating Radar) surveys and diamond drilling of 2,078 holes, with a total cumulative depth of 31,066m, have been completed. The objective was to delineate sufficient Resources of nickel laterite to support a viable mining operation into the future.

The competent person, who is the author of this report, visited the IMM site during June 2022. During the site visit, work on the Ultra GPR surveys were completed, the exploration drilling program was reviewed and visits were made to various target blocks to assess potential for further laterite areas. The results of the site visit showed a field crew familiar with the local area, good knowledge of the local geology and appropriate standard operating procedures for the exploration process giving confidence that the data produced is appropriate for use in this Resource estimate.

1.2 LEASE DETAILS

Mining rights for the area are held under a Contract of Work (CoW), with Area Code 99PK 0027. The area covers 16,470Ha and gives IMM the right to explore for nickel and its associated minerals. The CoW was granted by the Minister of Mines and Energy of Indonesia and is currently in suspension while the CoW is converted to an operation and production license. Table 2 shows the tenement license details of the IMM lease.

Table 2 License details

License holder	Province	Permit Type	Area (Ha)	Date of Issue	IUP Area Code	Commodity
PT IRIANA MUTIARA MINING	PAPUA	CONTRACT OF WORK	1,610,890	17-Mar-97	99PK 0027	gold, silver, copper,
PT IRIANA MUTIARA MINING	PAPUA	CONTRACT OF WORK	16,470	23-Dec-15	99PK 0027	nickel and associated minerals

The concession map for the area is shown in Figure 1.

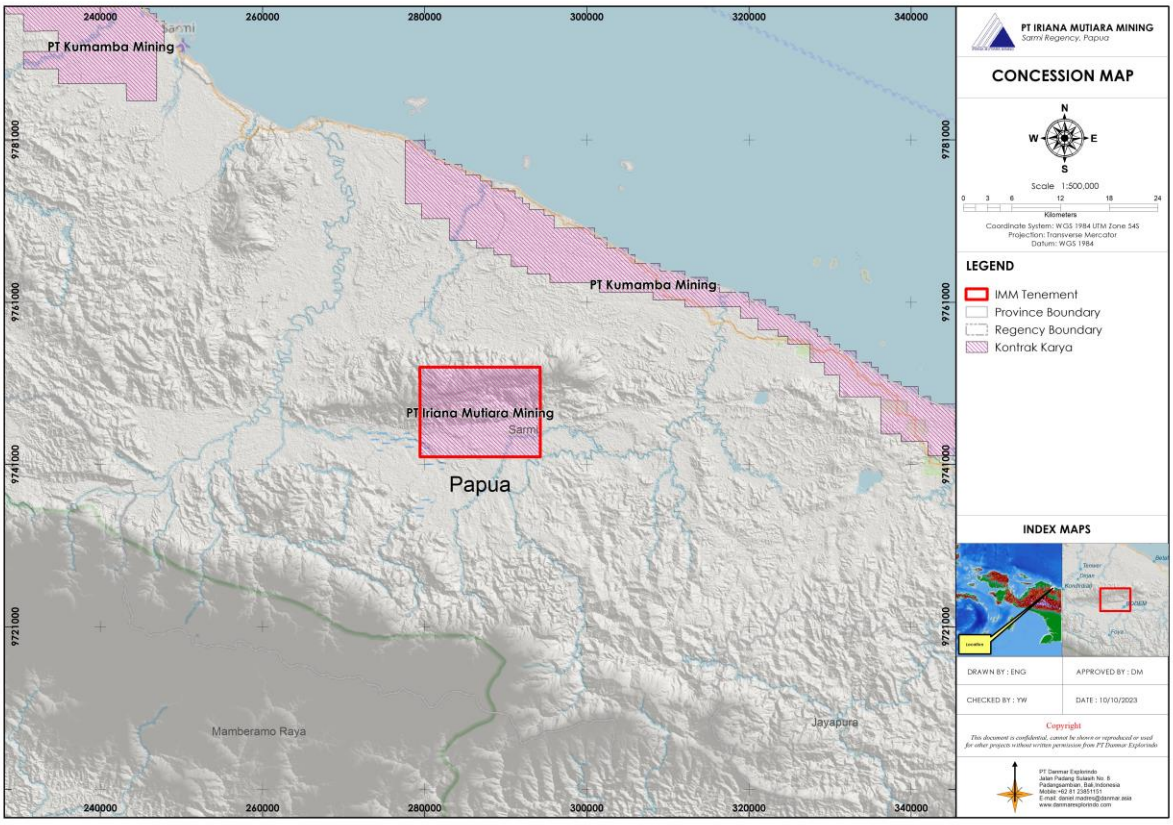


Figure 1 Iriana Mutiara Mining concession (red boundary) map

PT Iriana Mutiara Mining is owned by the following parties;

Tanis Resources S.A	80%
Iriana Cendrawana Pte Ltd	15%
PT Mutiara Iriana Minerals	2.5%
PT Indo Noble Abadi	2.5%

Nickel Industries Limited is farming in on the project with the view to start production of nickel and cobalt. Under the terms of the Definitive Agreement, the Company can acquire the Siduarsi CoW by meeting the following key conditions:

To acquire 100% ownership

- payment of A$500,000 upon signing of the Definitive Agreement.

To acquire 51% ownership

- expenditure of A$5 million in agreed exploration on the Siduarsi CoW over the next 24 months to earn a 51% interest and
- milestone payment of 4 million Nickel Industry shares upon delineation of a JORC compliant resource of not less than 50 million dry metric tonnes at 1.1% nickel.

To increase to 82.5% ownership

- completion of a feasibility study of a standard that will be accepted by the Indonesian mining department (Energy Sumber Daya Minerals), to allow the CoW to move into the next phase of its life cycle which is production and operation.

To increase to 100% ownership

- to be determined by an agreed third-party valuation on the economic value of the Siduarsi resource to Valmin Code 2015 standard (the 'Valuation'); the vendors may elect to take this consideration as 50% cash and 50% shares based on the 30-day VWAP of Nickel Industry shares on the ASX; and
- existing aggregate shareholder loans of no more than US$9 million to be paid out as 50% cash and 50% Nickel Industry shares (calculated on the 30-day VWAP on the ASX prior to the announcement of the Valuation).

The CoW mining license documents are shown in Appendix 2. Legal due diligence was not part of the scope of work for this report and for this reason was not carried out. At this time the CoW is in suspension while the application for conversion to a Production and Operation license is in process.

1.3 LOCATION AND ACCESS

The IMM lease is located in the Siduarsi Mountain Range, within the Regency of Sarmi in the Province of Papua, Indonesia. The location of the area in Indonesia is shown in Figure 2.



Figure 2 IMM Project location map in Indonesia

Access to the IMM concession, from Jakarta, is by a commercial flight (5.0 hours) to Jayapura, then to the site, 5 hours by car via highway to Takar village before turning left and using a logging road for 2 hours to reach the site. Figure 3 shows the access from Jayapura airport to the IMM project.

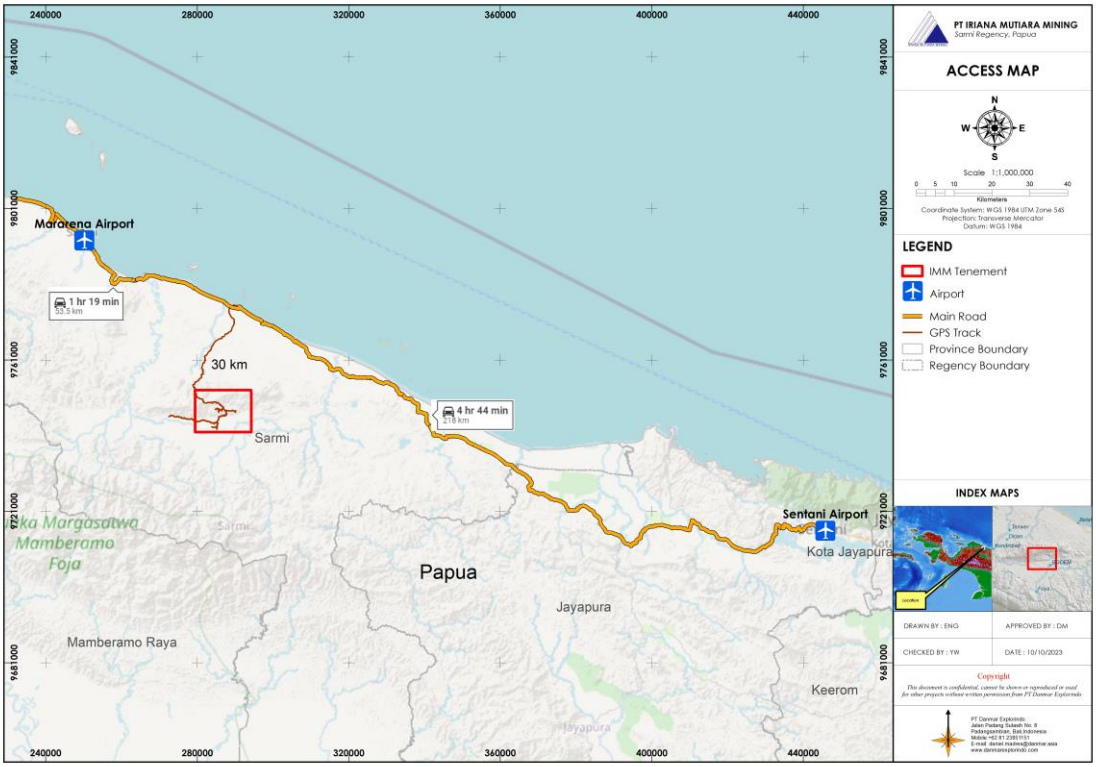


Figure 3 IMM project access from Jayapura city

1.4 ENVIRONMENT, SOCIAL AND GOVERNANCE

IMM has the objective of acting professionally, ethically and responsibly. The company prioritizes safety, health, community and environment with the objective of operating safely with regards to the environment and communities to enhance the sustainability and performance of the project. The IMM project commitment to these objectives is demonstrated by not only utilizing local labour but has also employed field staff and management of Papuan decent which helps to provide a more open and accessable relationship with the local communities.

To further optimize its interaction, with the local environment, IMM has made serious efforts to understand the social, environmental and governance status of the project area. To achieve this objective IMM has made a detailed Social Impact Assessment (SIA) of the project location.

Based on the results of the social study, conducted in the area surrounding the nickel exploration project at Siduarsi, several vital pieces of information have been gathered for use as a basis for policy-making related to the social, cultural, and economic aspects of the surrounding communities, as outlined below.

a) The people of Sarmi belong to five tribal groups inhabiting the Sarmi Regency namely; Sobey, Armati, Rumbuai, Manirem, and Isirawa.
b) The working area for nickel mining exploration by PT IMM is within the customary land rights of the Marya tribe, with the following boundaries:
    - Western Part: bordering the customary land rights of the Etik and Berik tribes.
    - Eastern Part: bordering the customary land rights of the Foya and Etik tribes.
    - Southern Part: bordering the customary land rights of the Noker tribe.
    - Northern Part: bordering the customary land rights of the Sendua tribe.
c) The access road to the nickel mining exploration site passes through the customary lands of several tribes, including:
    - Kilometer (KM) 1 to KM 15 constitutes the customary land of the Syef and Abi tribes.
    - Kilometer (KM) 15 to KM 27 comprises the customary land of the Wenken tribe.
    - Kilometer (KM) 27 to KM 37 encompasses the customary land of the Namwaram tribe.
    - Kilometer (KM) 42 to 62 is designated as the customary land of the Noker/Oisba/Maria tribes.
    - Kilometer (KM) 62 and beyond is recognized as the customary land of the Noker tribe.

d) The farming activities of the local community in and around the Nickel Exploration Project area are generally subsistence-based, where people rely on hunting and gathering for their livelihoods. However, for those near urban districts, commercial farming and animal husbandry activities have started under the guidance of the local government.

e) The presence of a population that has long adhered to customary traditions, where all social activities are closely linked to local customs, is noteworthy. Despite recent demographic changes, with the influx of settled communities engaged in gold mining and wood cutting, the entry of investors, including mining and timber activities, has contributed to the transformation of this area towards a more open society.

A full copy of the (SIA) report is contained in Appendix 3 of this report.



Photo 1 Drill pad rehabilitation with 4,528 trees already planted

1.5 FORESTRY AND LAND USE

At this time approximately 30% of the IMM IUP area is covered by Protected Forest. The remaining area (approximately 70%) of the concession area is a Production Forest. Figure 3 shows the IMM lease area on the published Forestry Map of Indonesia.

A Forestry permit (IPPKH), to allow exploration within a 909.2Ha area, has been granted by the Minister of Forestry (see Table 4) which covers approximately 12% of the IUP area. An IPPKH permit for exploration, where new nickel laterite is being delineated, covers 2,045.16Ha which is approximately 26% of the mining lease area. The IPPKH license documents are shown in Appendix 4.

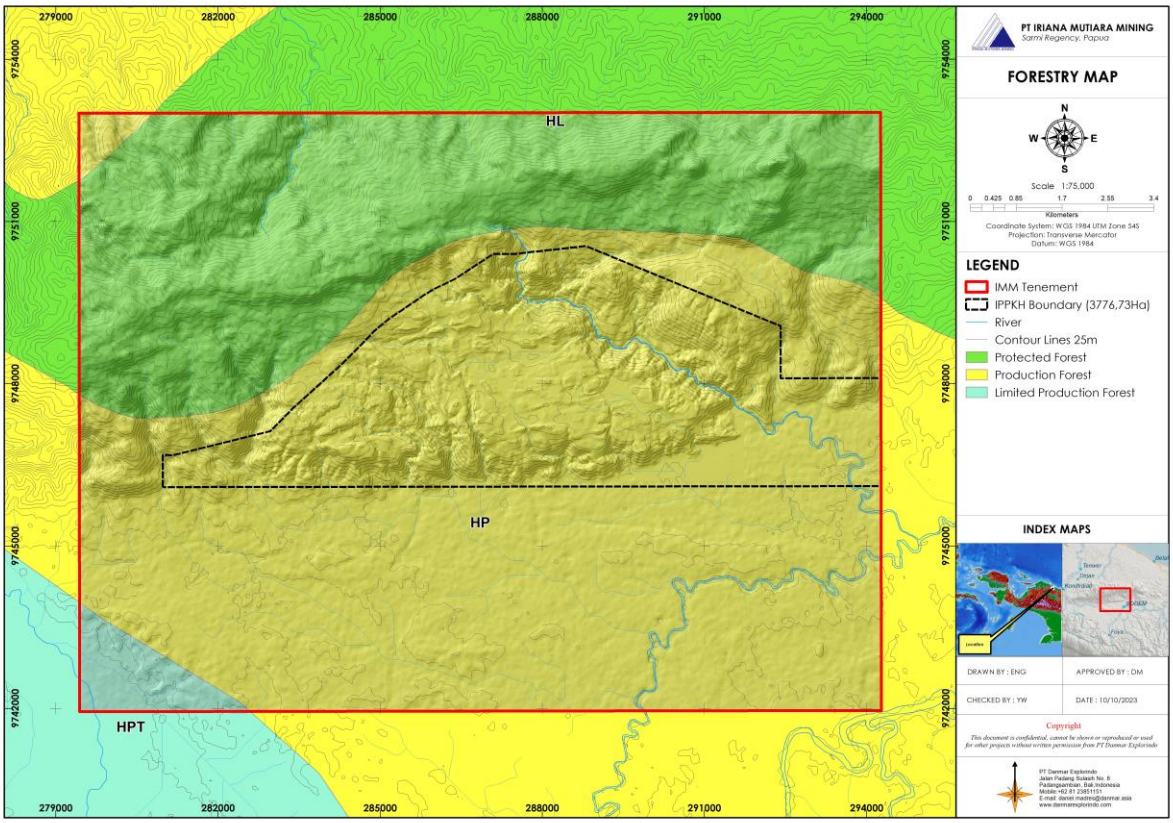


Figure 4 Forestry map of PT Iriana Mutiara Mining concession area

IMM has had several Forestry Permits (IPPKH) to allow exploration activities. Details are shown below. The permits have expired and will be renewed once the CoW has been converted to Operation and Production permit.

Table 3 Forestry (IPPKH) land borrow permits details

Forestry Permit	Permit Number	Status	Area (Ha)	Released Date	Expiry Date
IPPKH	SK.77/KLHK/2020	Exploration	3,776.73	27-Apr-2020	26-Apr-2021
IPPKH	SK191/MENLHK/SETJEN/PLA/4/2021	Exploration	3,776.73	27-Apr-2021	26-Apr-2022
IPPKH	SK463/MENLHK/SETJEN/PLA.0/5/2022	Exploration	3,776.73	27-Apr-2022	26-Apr-2023

Figure 5 is a satellite image that displays the forest condition in the area. No villages are located within the concession boundaries and no formal, commercial plantations or farms occur within the project area.

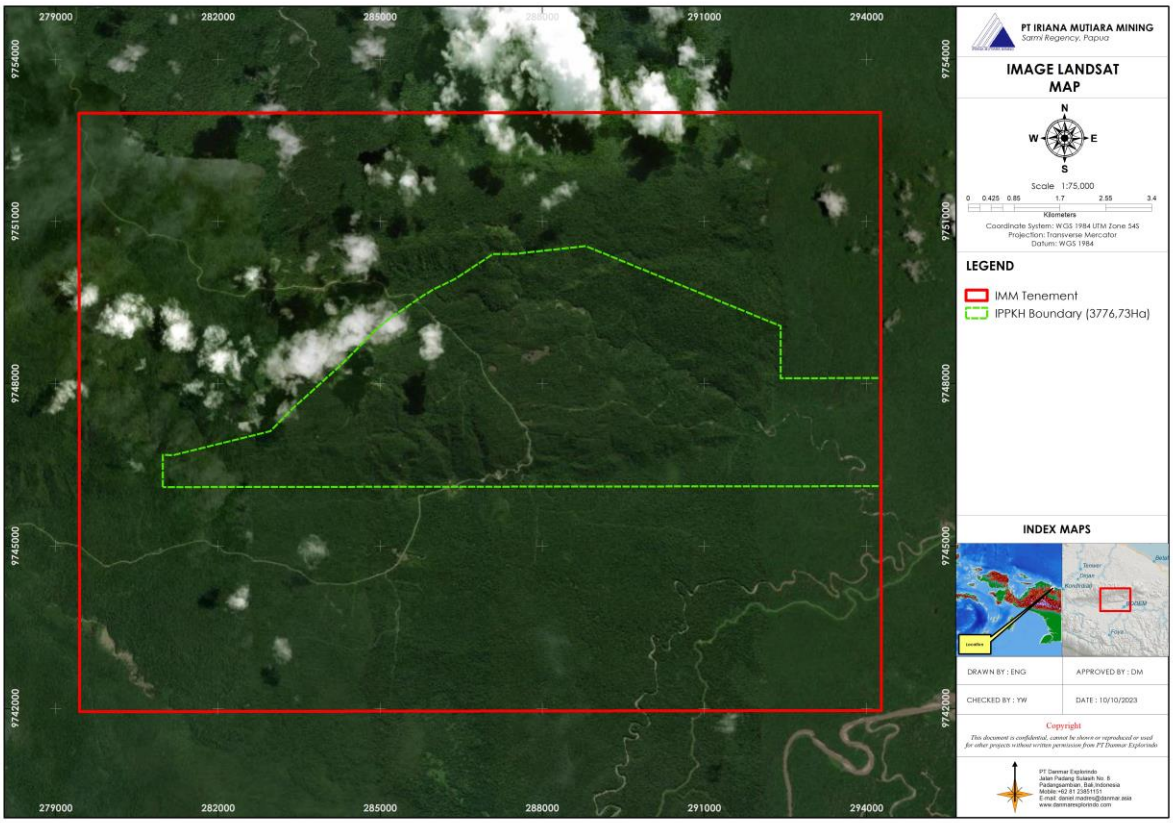


Figure 5 Satellite map displaying forest and land condition of the IMM concession

2 GEOLOGY

2.1 REGIONAL GEOLOGY

The IMM, Siduarsi Project is located on the northern part of the New Guinea Orogen (Cox et al 1986). Ultramafic and basic igneous rocks, as well Pliocene sedimentary rocks, occur in the area. Laterite enrichment of nickel, cobalt and other minerals has occurred over the ultramafic bedrock areas. The same gross tectonic setting occurs for similar laterite deposits in the northern parts of New Guinea mainland at Sentani, Ramu, Lake Trist, Wowo Gap and the islands of Wageo and Gag (Reynalds et al 1973). The New Guinea Orogen was possibly initiated in the Late Mesosoic (Davis et al 1997) with the onset of island arc and continental collision resulting in the obduction of the ophiolite belt. Oblique convegence between the Australian Plate and the oceanic Pacific Plate continues until today. This is evidenced by the consistent seismic activity of the area, that has resulted in the formation of the Central Highlands of the island of New Guinea. North of the Central Ranges, including where the Suduarsi Project is located, the northeast mainland of Papua is a structurally complex region, comprising terrane fragments of mantle and crustal rocks of both plates within a matrix of variably disrupted Tertiary clastic and calcareous sediments. Collectively this mega-breccia is known as the North Coast Basin (Davis et al 1997).

The area is structurally dominated by the Mamberamo Thrust Belt which is up to 100km wide extending southeast from the Mamberamo River Delta to the Papua New Guinea border. Arc normal faults have facilitated the emplacement of fault blocks containing island arc volcanics and ultramafic rocks such as the Siduarsi and Cyclops Ranges. Both Siduarsi and the Sentani laterite deposits are developed on these prominent horst blocks contaning basement ultramafic rocks forming isolated mountain massifs in the Siduarsi and Cyclops Ranges. Another feature of the Mamberamo Thrust Belt is the widespred occurance of mud-volanoes, formed by diaparism, which are also the result of this tectonically active structural geology (Davis et al 1997).

From the geological map of the Sarmi & Bufareh Sheets of Papua, published by the Indonesian Geological Research and Development Center (Gafoer & Budhitrisna, 1995), the IMM Project area consists of ultramafic rocks (um), Biri Formation (Teob), Darante Formation (Tomd), Aurimi Formation (Tmpa), Mud Deposits (Qmd) and Alluvium (Qa) as shown in Figure 6.

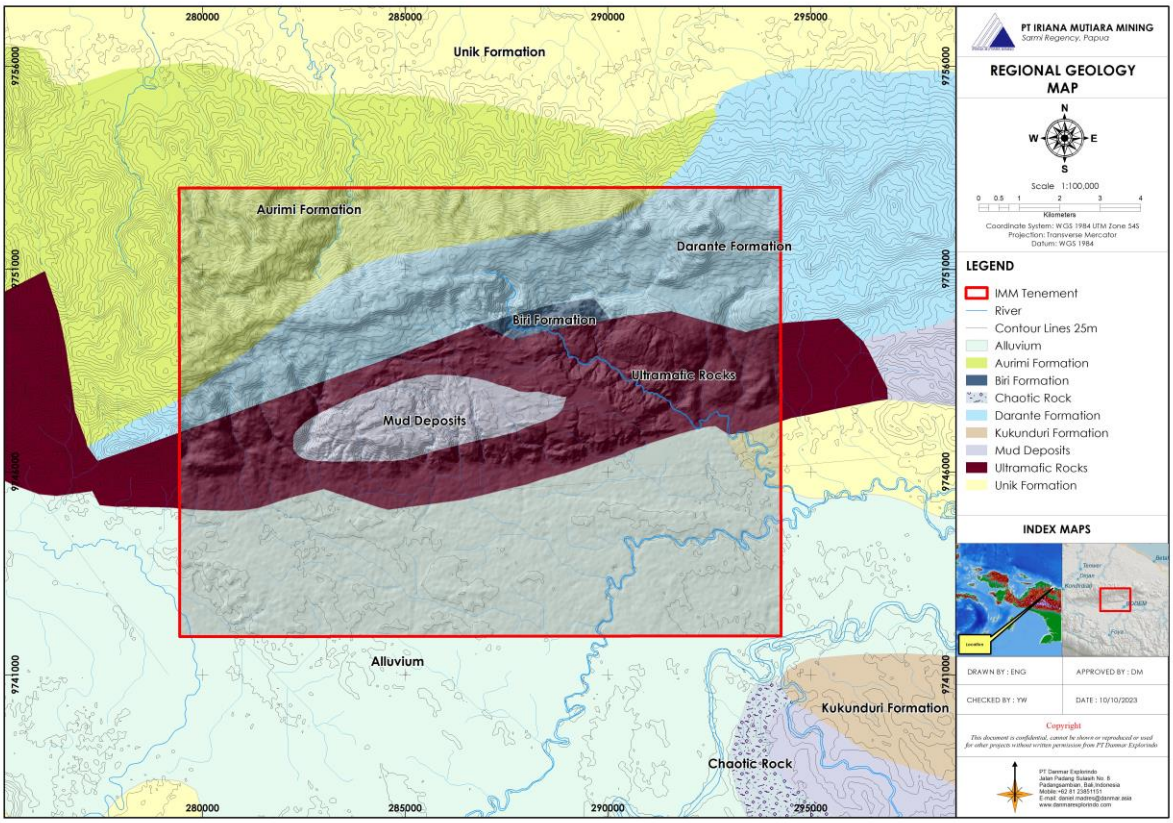


Figure 6 Published regional geology of the PT Iriana Mutiara Mining project area

Table 4 Generalized stratigraphy of IMM Project

Age				Surficial Sediments	Sedimentary and Volcanic Rocks	Intrusive Rocks	Tectonite
Cenozoic	Quarternary	Holocene		Qa			Qmd
		Pleistocene					
	Tertiary	Pliocene					
		Miocene	Late		Tmpa		
			Middle		Tomd		
			Early				
		Oligocene	Late				
			Middle		Teob		
			Early				
		Eocene	Late				
			Middle				
			Early				
Mesozoic		Paleocene				um	
		Cretaceous	Late				
			Early				
		Jurassic					

Description of the rock types on the Regional Geology map are as follows;

Alluvium (Qa): Clay, sand and gravel: forming river, coastal and swamp deposits.

Mud Deposits (Qmd): Mudflows and clay, associated with rock fragments/blocks which are produced by mudvolcanoes of which some mudvolcanoes are still active in the area.

Aurimi Formation of Mamberamo Group (Tmpa): Marl, calcarenite, sandstone, siltstone and claystone.

Darante Formation (Tomd): Calcarenite coraline limestone and intercalations of volcanic rocks. The volcanics are amygdaloidal lavas with vesicules filled by zeolite; breccias with intercalations of tuffaceous sandstone.

Biri Formation (Teob): Calcilutite, shale and intercalation of basalt lavas which are partly bedded and brecciated. Pillow structures and columnar joints also occur in the lavas.

Ultramafic Complex (um): Ultramafic intrusive rocks in the IMM area mostly consist of pyroxenite with a minor amount of peridotite.

2.2 LOCAL GEOLOGY

From the drill core, the ultramafic rocks, are typically black to dark green in colour, have low to medium serpentinization, with fine to medium grain sized minerals. Based on the recent field core descriptions and core photos it is interpreted that the Ultramafic intrusive rocks in the area mostly consist of pyroxenite with a minor amount of peridotite.

In several areas, mainly in the east and the west of the Resource area, mud has been deposited on top of the laterite and ultramafic rocks. The mud is assumed to be the product of a mud volcano. Although the location of the mud volcano is still unknown, the mud is assumed to have errupted to surface due to local subterranean pressure imbalances released through the faults and shears developed during the regional tectonic and seismic events in the project area. In this report, the muds are separated into two different generic names from top to bottom; Mud Upper and Mud Lower. Mud is often difficult to distinguish from laterite visually but has been clearly identified by using the geochemistry defined by the sample assay results. A local geology map, based on the latest mapping, drilling and assay results, is shown in Figure 7.

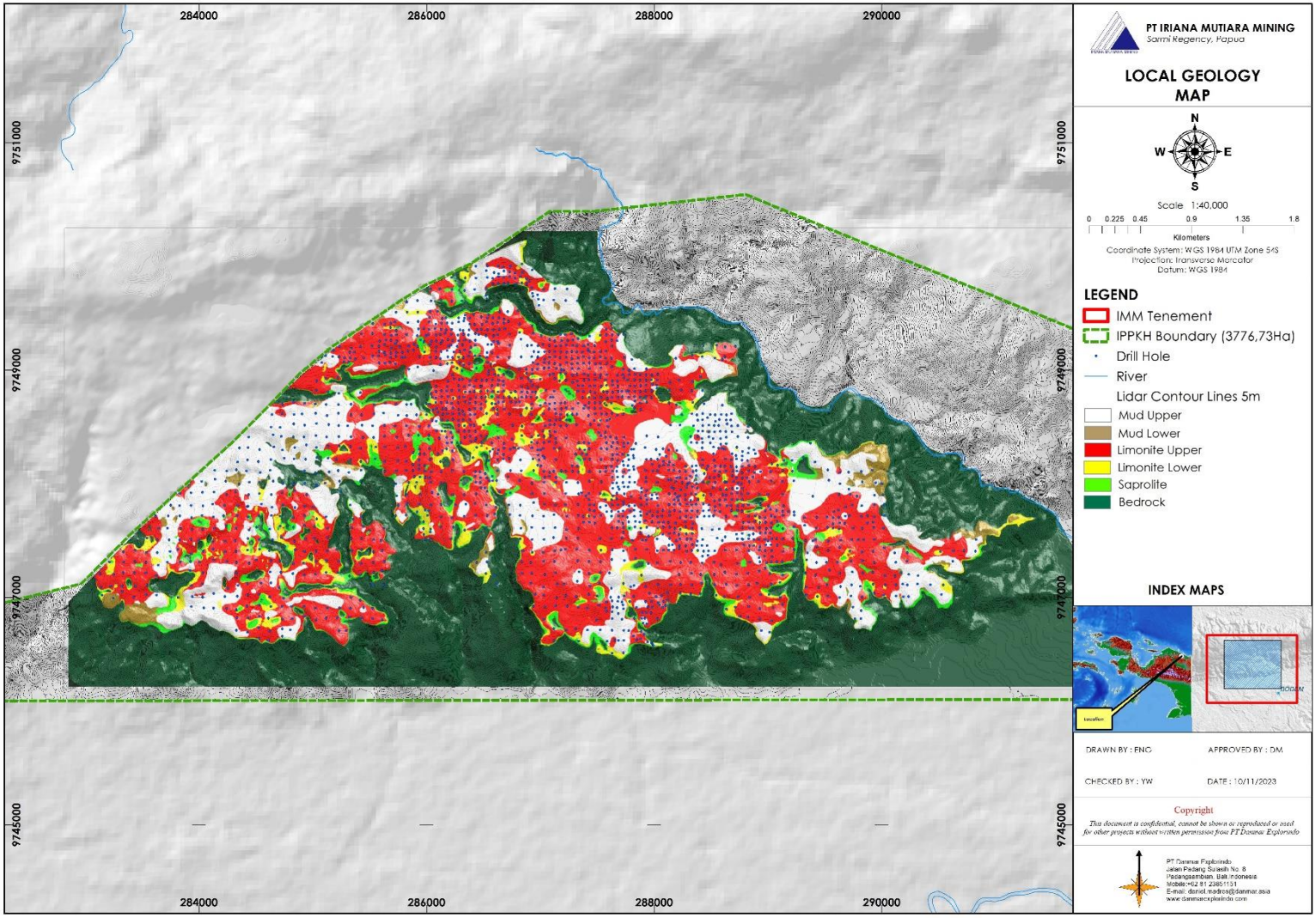


Figure 7 Local geology of IMM Project



Photo 2 Core photo of DE2775



Photo 3 Core photo of DE3044

2.3 MINERALISATION

The nickel laterite in the project area occurs as a product of supergene enrichment during the ultramafic rock's chemical weathering (lateratisation). Within the ultramafic group, rocks that are relatively high in nickel content (such as dunites and high-olivine peridotites) are more likely to yield higher concentrations of nickel than pyroxenites and hornblendites.

In the IMM project area, the ultramafic rocks appear to be dominated by pyroxenite which consists of pyroxene minerals (60-70%) and other secondary minerals including olivine and serpentine.

Certain elements such as nickel (Ni), cobalt (Co) and manganese (Mn) are relatively soluble in the acidic, terestrial (rain) waters percolating down (Davis et al 1997) through the laterite profile from the surface but become insoluble as the waters mix with the lower ph ground water below and are precipitated.

In the IMM project area, nickel grade in the upper limonite horizon has the average of 0.7% nickel while the lower limonite has the average nickel content of 1.2%. The saprolite layer has an average nickel grade of 1%. This is likely be a consequence of the type of ultramafic bedrock in the project area and the fluctuation of the acidic terestrial waters and ground watertable during the chemical weathering process.

Cobalt has relatively lower mobility than nickel in acidic rain water and for this reason is found more concentrated in the limonite profile. Cobalt tends to precipitated either at the lower part of the limonite zone or in the saprolite/limonite transition zone. The average grade for cobalt in the upper limonite and lower limonite are 0.10% and 0.09% respectively, while in the saprolite 0.03%.

2.4 PREVIOUS EXPLORATION, RESOURCE STUDIES AND REPORTS

The earliest documented exploration of this area is by Batlle Mountain in 1994, exploring the gold potential where the IMM concession is currently located. The work included mapping and 386 surface sediment and drainage samples which identified a nickel anomaly within the Siduarsi area. Subsequently 82 further samples from road cuttings identified a potentially large nickel and cobalt bearing laterite deposit with an average grade of 1.1% nickel and 0.113% cobalt in laterite up to 7m thick, over an area of 6km long by 1.4km wide. In 1995, Battle Mountain drilled 240 holes using hand augers and a drill machine on lines spaced between 100-400m apart, down to depths of around 6.5m. The holes were unable to penetrate the rocky saprolite layer. As a result in the fourth quarter of 1995, Battle Mountain drilled 24 diamond drill holes using NQ diameter drill equipment. Limonite thickness averaged 2.3m and

saprolite 5.0m. Wet density was measured as 1.55. Core recoveries were very low approximately 70%. As a result an Inferred Resource of dry tons of 27.7mt of limonite with 0.94% nickel and 0.1% cobalt with a cut-off grade of 0.6% nickel and 45.8mt of saprolite with 1.13% nickel and 0.03% cobalt was also reported using a 0.6% nickel grade cut off. This initial resource was estimated using an assumed dry density of 1.0. Preliminary metallurgical testing, at that time, suggested the resource was amenable to high pressure acid leach processing. In 1998, Freeport McMoran Copper and Gold joint venture had PT Mineserve International review of the available data and carry out a field program that culminated in additional auger sampling and 4 test pits. A new resource estimate was made and the results are summarized in Table 6 below. Limonite and saprolite were not separated.

Table 5 Previous reports of exploration results

Reporting Company	Report issue date	Title of Report	Report Authors
Battle Mountain	02-09-97	IRIANA RESOURCES CORPORATION PROSPECTUS, Siduarsi Exploration Report	G.Kachan & I.Bruce
PT Mineserve International	27-03-99	SIDUARSI NICKEL PROJECT Evaluation of exploration results	D. Wadsworth
PT Iriana Mutiara Mining	27-04-08	SIDUARSI NICKEL & COBALT PROJECT, Exploration Report	PT Iriana Mining Services
PT Iriana Mutiara Mining	01-08-18	SIDUARSI NICKEL & COBALT PROJECT, Exploration Report	PT Iriana Mining Services

Table 6 Historic resource estimates at IMM

Year	Resource Classification	Tonnes dry million tons	% Ni	% Co	Density Assumption	Author	Remarks
1996	Inferred resource	73	1.06	0.06	1.00	Battle Mountain	limonite & saprolite not separated, points of observation surface samples, auger drills and diamond drill holes, core recoveries around 70%
1998	Potential resource check	130	1.12	0.07	1.00	PT Mineserve International	test pit and auger sampling

3 CURRENT EXPLORATION PROGRAM METHOD

3.1 ULTRA GROUND PENETRATING RADAR SURVEY

Groundradar's Ultra GPR technology is a geophysical survey technique that can be used to detect subsurface geological layering and structure in nickel laterite. Relatively quick and easy to apply in the field, Ultra GPR enhances the exploration process for laterites by detecting laterite thickness and bedrock morphology. The use of the Ultra GPR survey is designed to increase the confidence of geological interpretation, provide a guide to thickness and depth of the target layers and help to optimize drill programs to focus on the best areas. As with all geophysical methods, Ultra GPR provides supportive data for points of observation provided by drilling for Resource estimation using the JORC Code.



Photo 4 Example survey acquisition using Ultra GPR (source: Groundradar.com)

At IMM, Ultra GPR has been a useful exploration tool to indicate the lithological contact between limonite (massive clays) and the saprolite (weathered rocks) as well as the bedrock. Results provide indicative volumes of potential limonite and saprolite located within the survey area. Results combined with drilling data can give greater confidence of nickel laterite ore body structure, dimensions and distribution. Figure 8 shows the close correlation of the interpreted GPR zones to the commonly named weathering profiles of nickel laterite.

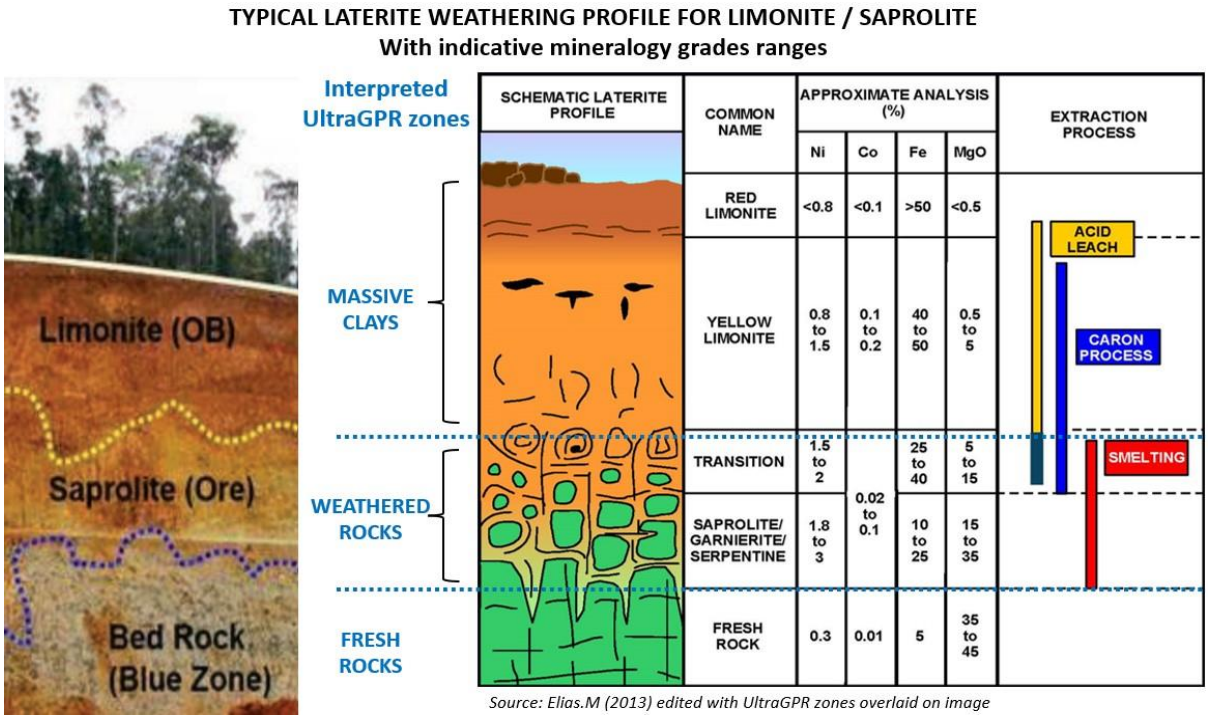


Figure 8 Diagrammatic representation of a typical laterite profile in Sulawesi

Highly weathered laterite zones are typically structurally controlled. Geological structure can influence the distribution of where thicker, higher grade limonite and saprolite may be found. Although these structures can often be interpreted from the topographic surface relief, with the help of Ultra GPR, these structures can be delineated with relative confidence providing drill targets to optimize drill programs towards the thickest and most prospective locations. Figure 9 shows an example of typical survey results using Ultra GPR technology on laterite at IMM.

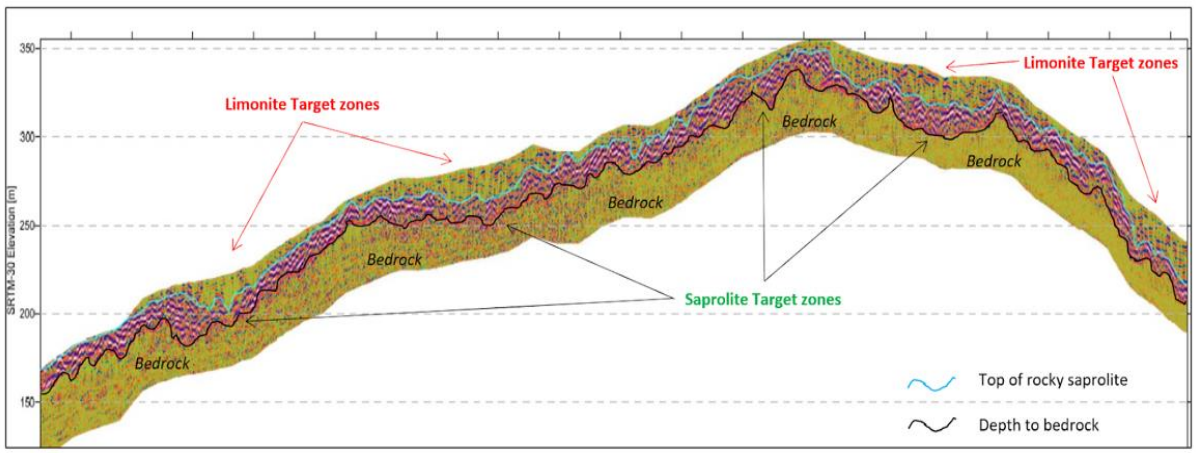


Figure 9 UltraGPR survey section line from IMM East Block, base of limonite is the red line and base of sapolite is the green line

3.2 DRILLING

In May 2021 two units of Jakro 200, operated by PT Lestari Technik, started to systematically drill the IMM nickel laterite project. These were replaced by 4 units of Dexdrill 200, operated by PT Danmar Explorindo in Jan 2022. The drills are ideally suited to laterite core drilling as they are lightweight and man portable. They have the added advantages of providing local people employment for manual moving between drill locations and also have low environmental impact with no need for road access or dozer support. The drills use HQ diameter triple tube core barrels.



Photo 5 Dexdrill 200 operating at IMM

Drilling was carried out using standard operating procedures designed to ensure drill data complies with the JORC Code to be used as points of observation in this study.

3.2.1 Core Recoveries

In the current drill program core runs were restricted to a maximum of 1meter intervals to optimize core recoveries. Core was extracted from the inner tube and directly transferred to the core box core based each core run. The core was then immediately measured for length to determine core recovery and or swelling. Core is arranged in maximum 1 meter runs inside the core box with each run filling a new row in the core box. Consecutive core runs are also arranged in new rows starting on the left side of the core box to avoid any mixing or contamination from other core samples. The bottom of each core interval is labeled for its

depth so that the depth of the core is clearly displayed. Core boxes that were partially filled at the wellsite, and not yet completed, were carefully covered so that the samples are kept free from contamination and damage while drilling of the hole is completed.

3.2.2 LiDAR and Drill Collar Survey

A drone survey was carried out between March and July 2023, by PT Hengjaya Mineralindo using a F90 Quantum System Drone. The objective of the work was to measure the topography within the CoW area and along 3 potential haul roads options leading to proposed port locations.



Photo 6 Drone survey at IMM

Drill collar survey using E-Survey and Trimble R8s LT RTK GPS equipment was used to ground survey the drill hole locations.



Photo 7 Drill collar survey at IMM

3.2.3 Geological Logging of Cores

The well site geologists follow a standard operating procedure for the core logging process so that all geological logs are standardized. The core description starts at the surface and follows each 1meter core run until the total depth is reached. The core description in a standard format allows the data is easily usable and recognizable by the project technical team. The core length is checked against the actual depth recorded in the core box. The detailed description is completed as required in the logging form.



Photo 8 Logging cores at wellsite at IMM

3.2.4 Core Photography

With the core boxes in position, in a level place, with no cover, in consecutive order, core photos can take place. Checks are carried out to make sure that the depth labels are clearly visible and in position at the bottom of each core run. Cores with swelling or core loss are clearly marked. The well site geologist checks to make sure the core box label shows the correct Hole Identification, sequential arrangement, depth interval, date of start and finish drilling, EOH (end of hole), initials of the wellsite geologist and the rig identification number. When this is ready photos are taken in good light conditions making sure to minimize shadows and reflections.



Photo 9 Core photo example

3.2.5 Drill Hole Sample Handling

Plastic sample bags are always double layered to protect the integrity of the samples against accidental contamination, damage or loss. Samples are bagged according to the geological horizon from which they belong and or in 1meter intervals, if there is no geological boundary and the plastic identity label placed inside. After each core box is emptied the outer layer sample bag is tied with string in a bow so that it can easily be undone at the camp for rechecking and final labeling. During the sampling process, the sample form is continuously filled out so that as samples are bagged every sample is recorded. Checks are made to ensure the sample intervals and labels are correct. Rechecks are done so that the sample intervals can be reconciled and there are no gaps in the depth intervals. Samples are then packed in sacks and tied with flagging tape showing the hole identification. If stored in the field the sacks are covered for protection from the weather. Samples are transported to the field camp on a daily basis. Sample numbers and the depth interval labels are recorded on sampling forms which are photographed and sent to Danmar head office for recording in the IMM database. During this sample labeling process, the condition of the sample bag is checked and changed if damaged. The total number of samples are rechecked against the total number of samples logged in the field at the wellsite.



Photo 10 Sample packing at the well site

3.3 LABORATORY SAMPLE AND ANALYSIS PROCEDURES

3.3.1 Field Sample Preparation

Once samples from the field are packed and labelled at the well site and delivered to the IMM sample preparation facility a reconciliation and checking of sample numbers, labels and condition is carried out before being packed into sacks and transported to Jayapura to be packed into shipping containers and shipped in to PT Geoservices laboratory in Jakarta.



Photo 11 Core sample processing at IMM camp

3.3.2 Geotechnical Drilling

A total of 13 drill holes with a cummulative total depth of 273m were completed in March – April 2023. Samples were wrapped and sealed in preparation to be sent to PT Geoservices in Jakarta for laboratory testing.

3.3.3 Metallurgical Testing

During October 2022 two testpits were used to take 2 bulk samples; one of limonite and 1 of saprolite for metallurgical testing. In February 2023, a composite bulk sample was also collected from the IMM site for the purpose of metallurgical testing. Three drill hole locations were selected because of the assay results that approximate a representative grade of limonite throughout the deposit. Samples were shipped to Jakarta for lab testing at PT Geoservices.

3.3.4 Sample Security, Audits and Review

Sample core store at the IMM field office was locked when unattended and had security which operated 24 hours per day.

3.3.5 Laboratory QA/QC Protocol

PT Geoservices Ltd is a certified commercial laboratory in Indonesia and is accredited by the Indonesian committee for national acreditation (KAN) as an official assay laboratory (Laboratorium Penguji LP1384-IDN) . The quality assurance and quality control in sample analyses and sample handling complies with ISO 17025:2017 requirement. Laboratory assay results are received as Certificates of Analyses. Figure 10 below displays the laboratory QA/QC protocol flow chart used for assay sampling and analyses.

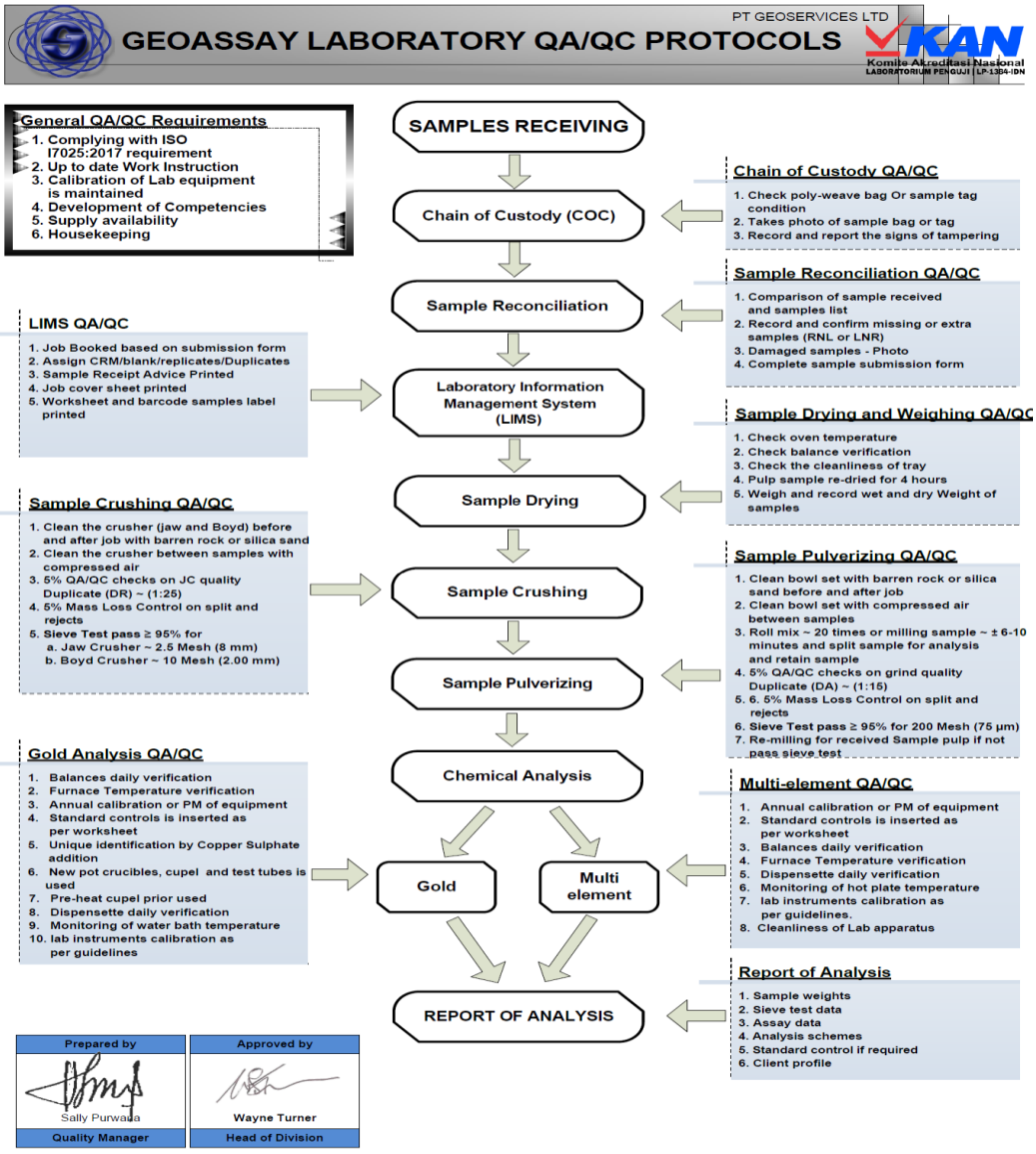


Figure 10 QA/QC flow chart for laboratory assay testing

The full PT Geoservices QA/QC report is attached in Appendix 5.

4 RESULTS

4.1 GPR SURVEY

Ultra GPR (Ground Penetrating Radar) survey results are summarized in Table 7.

Table 7 Ultra GPR survey summary

Phase	Date of Survey	Block ID	Survey Area (Ha)	Survey Completed (km)
1	Dec-21	East Block	1,200	100.8
2	Jul-22	West Block	650	66.4
UltraGPR Completed			**1,850**	**167**

The survey lines are shown in Figure 11 below. The Ultra GPR survey data from all areas were of good quality and were easily interpretable. Maps were created showing the interpreted thickness of limonite, saprolite and depth to bedrock. The total area surveyed was approximately 1,850Ha. The nominal spacing between GPR lines is 200m spacing. The Ultra GPR survey grid, where possible, is in the same location as the drill lines. Table 8 shows the resulting interpretation for laterite volumes using the Ultra GPR data.

Table 8 Ultra GPR survey laterite volume interpretation

Prospect	Area	Material Type	Volume	Tonnes (Wet)
PT Iriana Mutiara Mining All Blocks	1,850	Massive Clays (Lim/Sap)	57,000,000	102,400,000
		Weathered Rocks (Rocky Sap)	159,000,000	254,200,000
Total Laterite			**216,000,000**	**356,600,000**

- *Note: Using density assumptions for limonite 1.8 and saprolite 1.6*

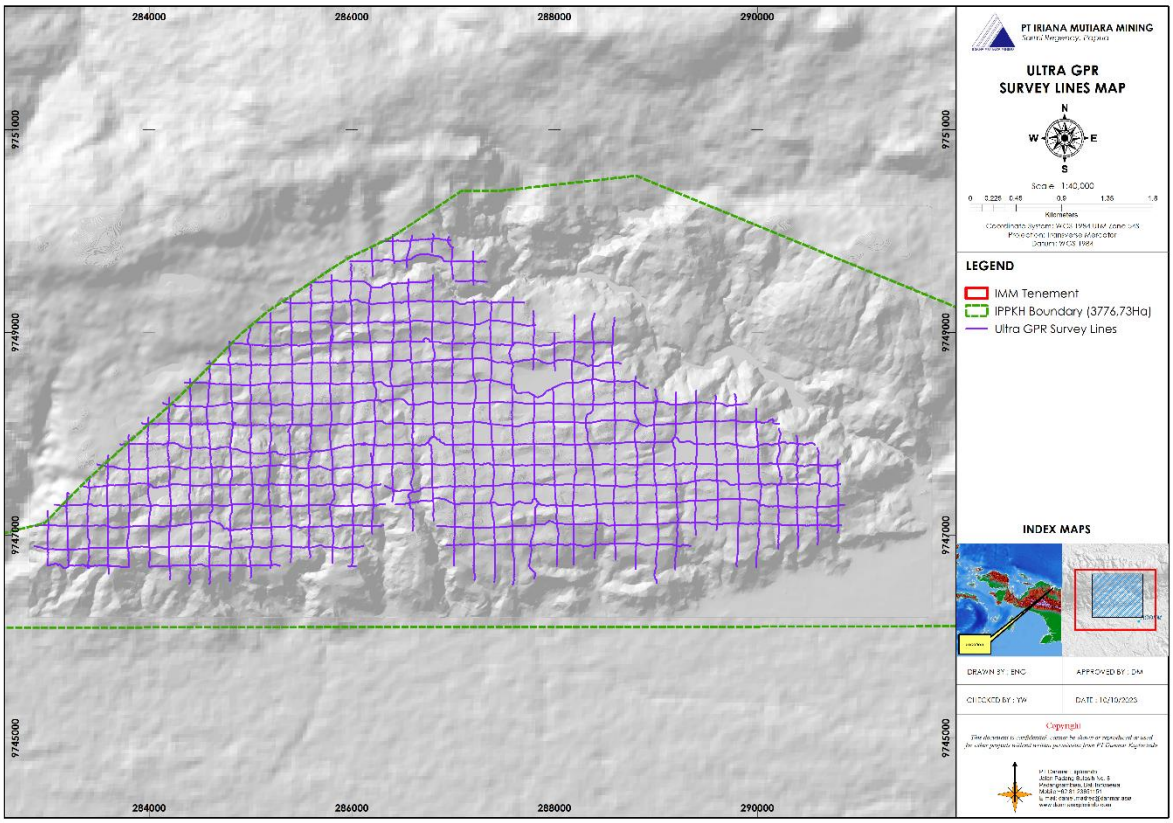


Figure 11 Ultra GPR survey lines on topographic map

An example of an Ultra-GPR section interpretation covering 1,350m in the East Block area is shown in Figure 12.

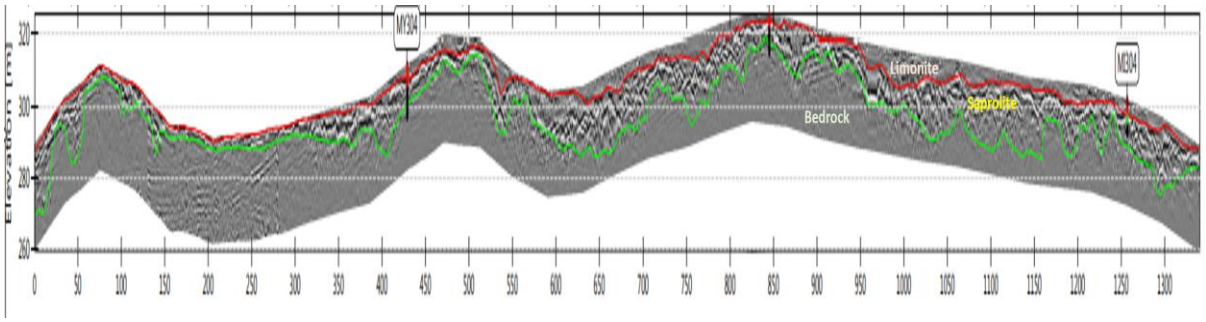


Figure 12 Ultra GPR section line interpretation example IMM East Block

From The Ultra GPR data the thickness of limonite appears to average around 3.2m over the survey area, with only some relatively limited zones showing thickness up to 18m. The thickness of rocky saprolite varies from 0 – 32 m, with an average 9.5m across all target zones. The total thickness of laterite varies from 0 m to 35.9 m with average of 12.7m of total combined thickness of limonite and rocky saprolite. Figure 13 shows the limonite thickness interpreted from the UltraGPR survey data. Figure 14 shows the saprolite thickness interpreted from the UltraGPR survey data.

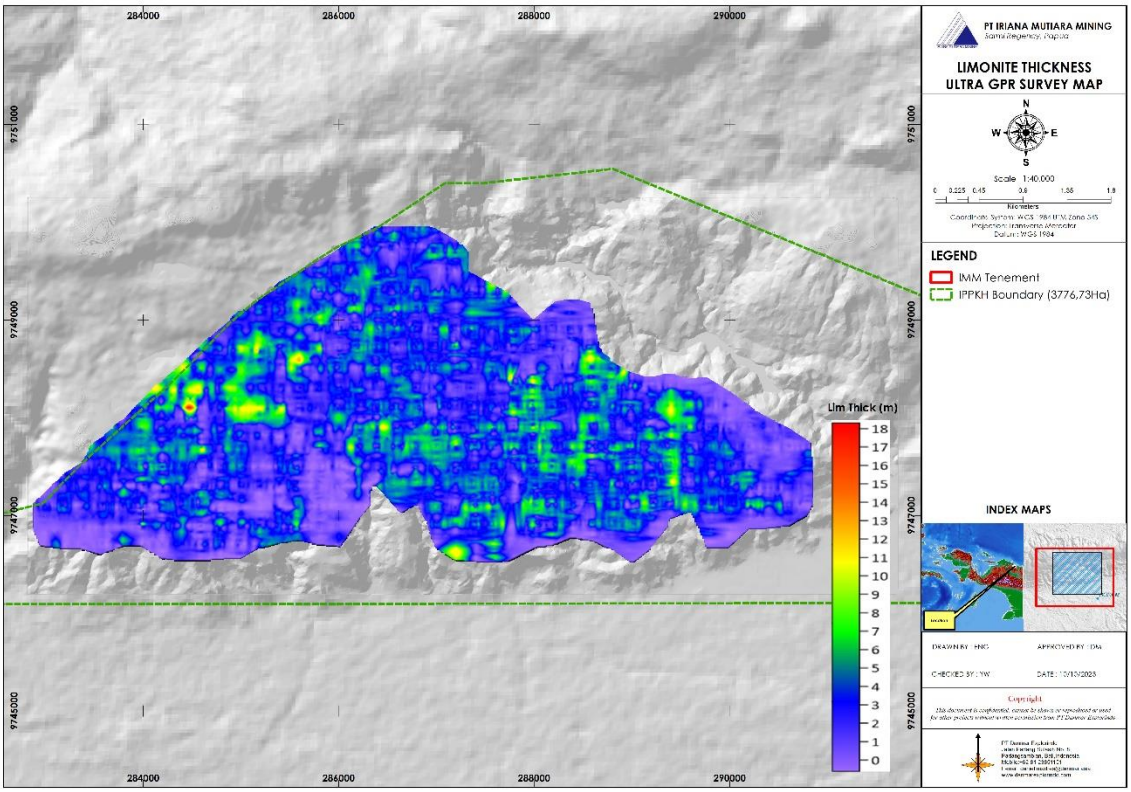


Figure 13 Limonite thickness interpreted from the Ultra-GPR survey

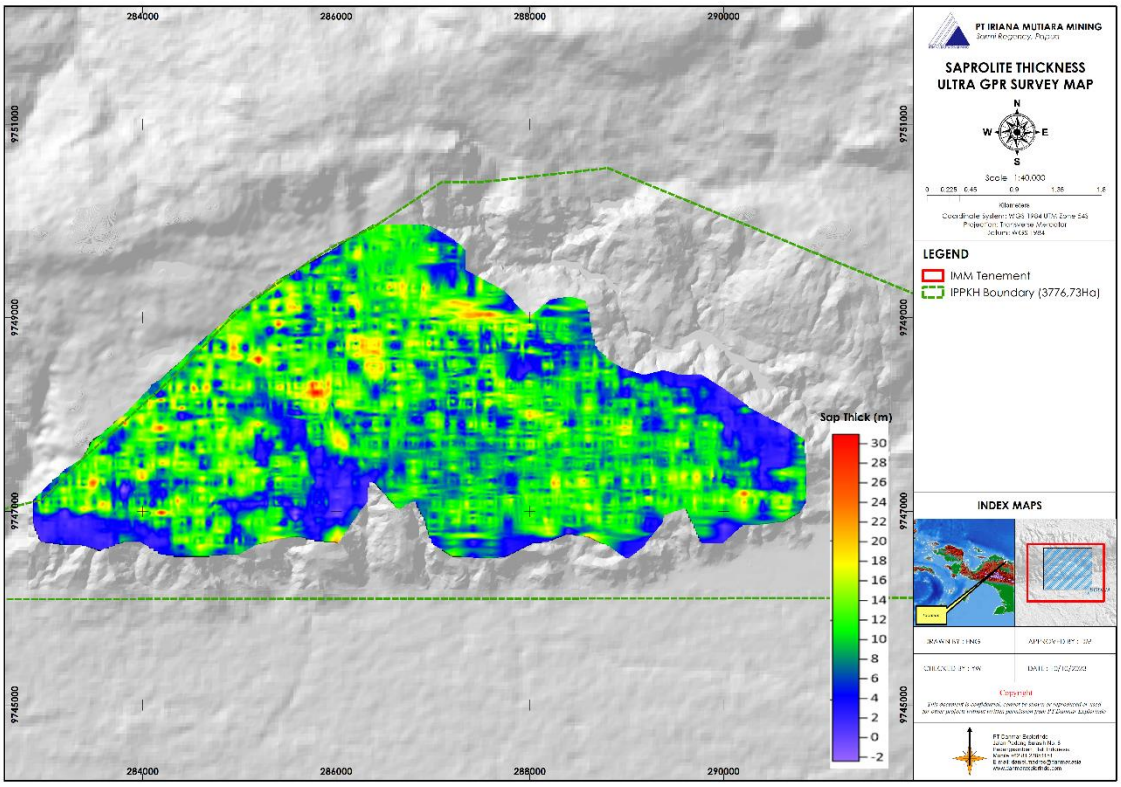


Figure 14 Saprolite thickness interpreted from the Ultra-GPR survey

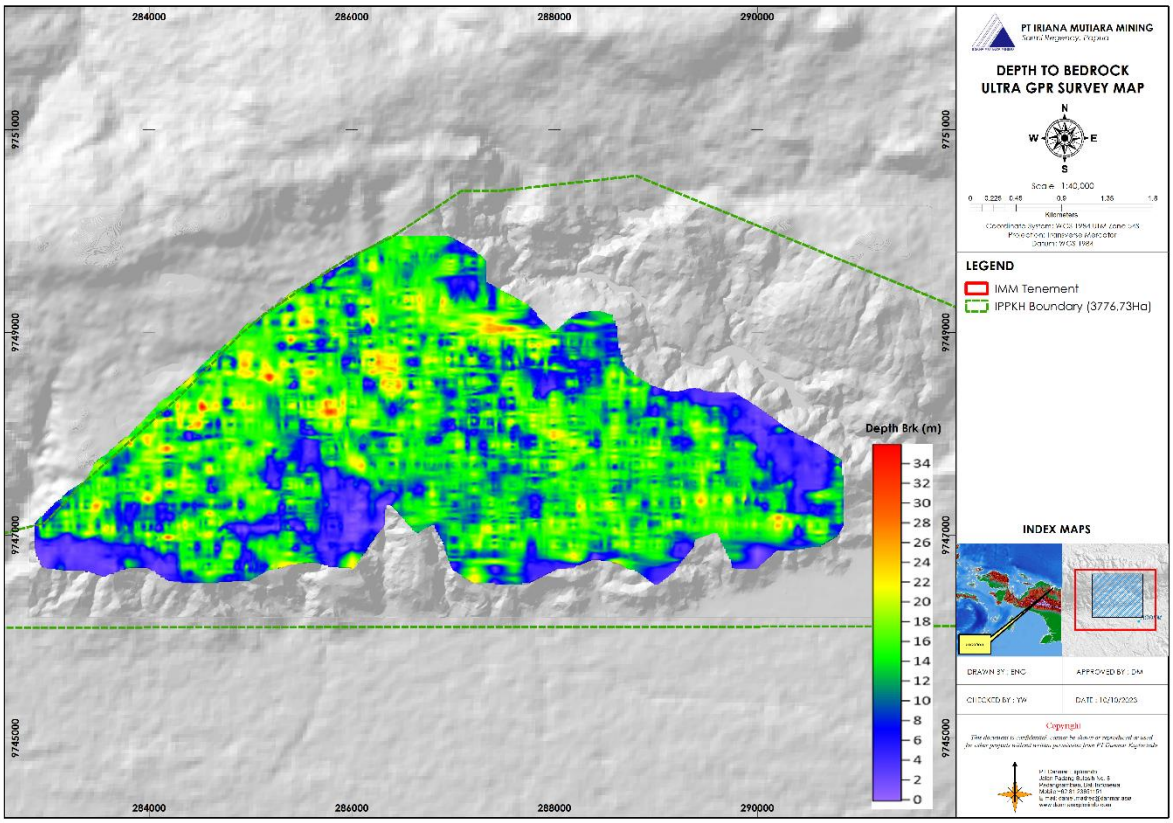


Figure 15 Depth to bedrock interpreted from Ultra-GPR

4.2 DRILL RESULTS

Validated drill data used in this study is summarized below in Table 9.

Table 9 Drill data statistics

Block	Drilling Used in Resource			Drilling Excluded from Resource		
Name	Drill holes	Cumulative (m)	Assays	Drill holes	Cumulative (m)	Assays
East100	450	6,461	6,931	5	64	23
North50	1,258	18,341	19,670	20	317	189
West100	370	6,264	6,581	3	86	-
Total	**2,078**	**31,066**	**33,182**	**28**	**467**	**212**

For the purpose of this Resource estimate, a database of validated drilling data including 2,078 drill holes with a cumulative total depth of 31,066m and 33,183 analyses results has been constructed. Most of the drilling is on a systematic grid, providing a regular spread of drill data over most of the laterite areas with Forestry permits. Geotechnical drill holes are excluded from the geological model since they do not have the geochemical (assay) analysis data.

Drill spacing has been done at 50m and 100m spacing with the objective of Resource definition in these areas. Figure 16 shows the drill location map.

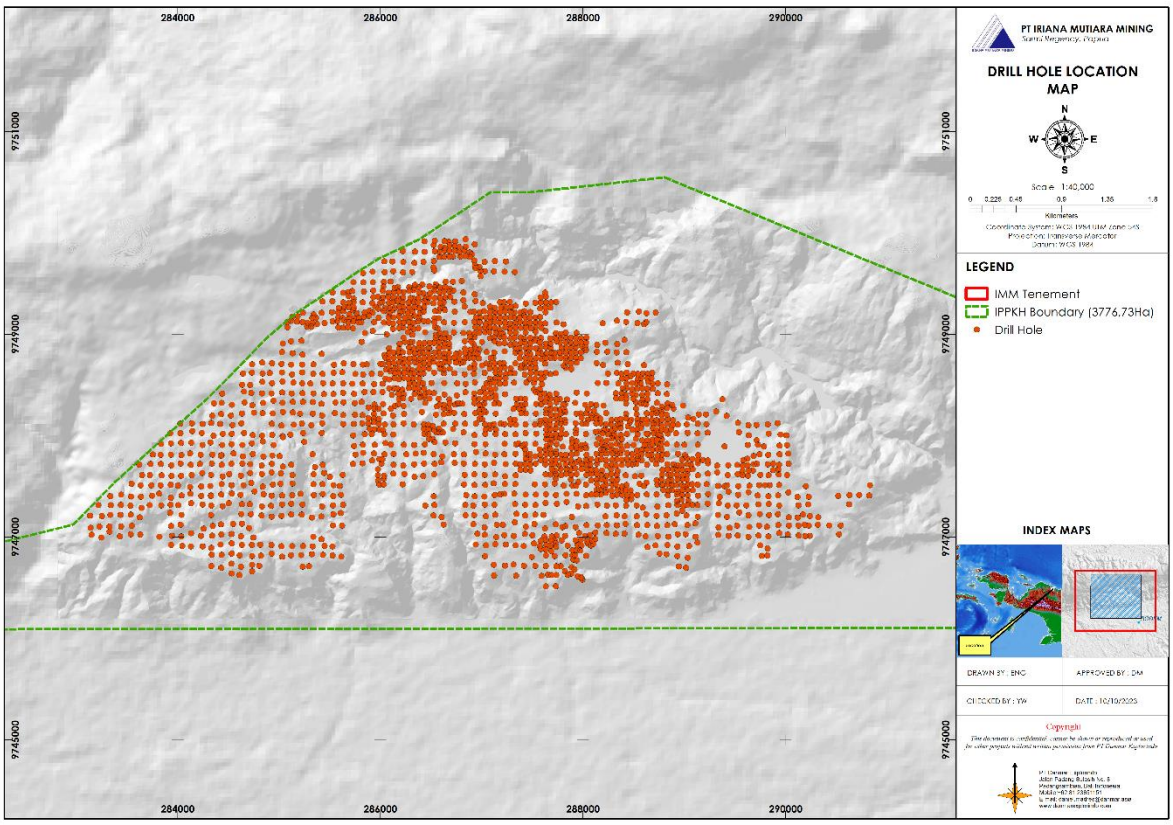


Figure 16 Drill hole location map

The distribution of drilling in each Resource block area is summarized in Table 10.

Table 10 Drilling distribution per Block

Block	Drilling Spacing (m)			
	<25-25	25-50	50-100	Exploration
East100	54	38	358	-
North50	-	1,173	85	-
West100	-	-	370	-
Total All Blocks	**54**	**1211**	**813**	**-**
% of Total Holes	2.60%	58.30%	39.10%	0.00%

Detail of drill locations in each Resource block area are shown below;

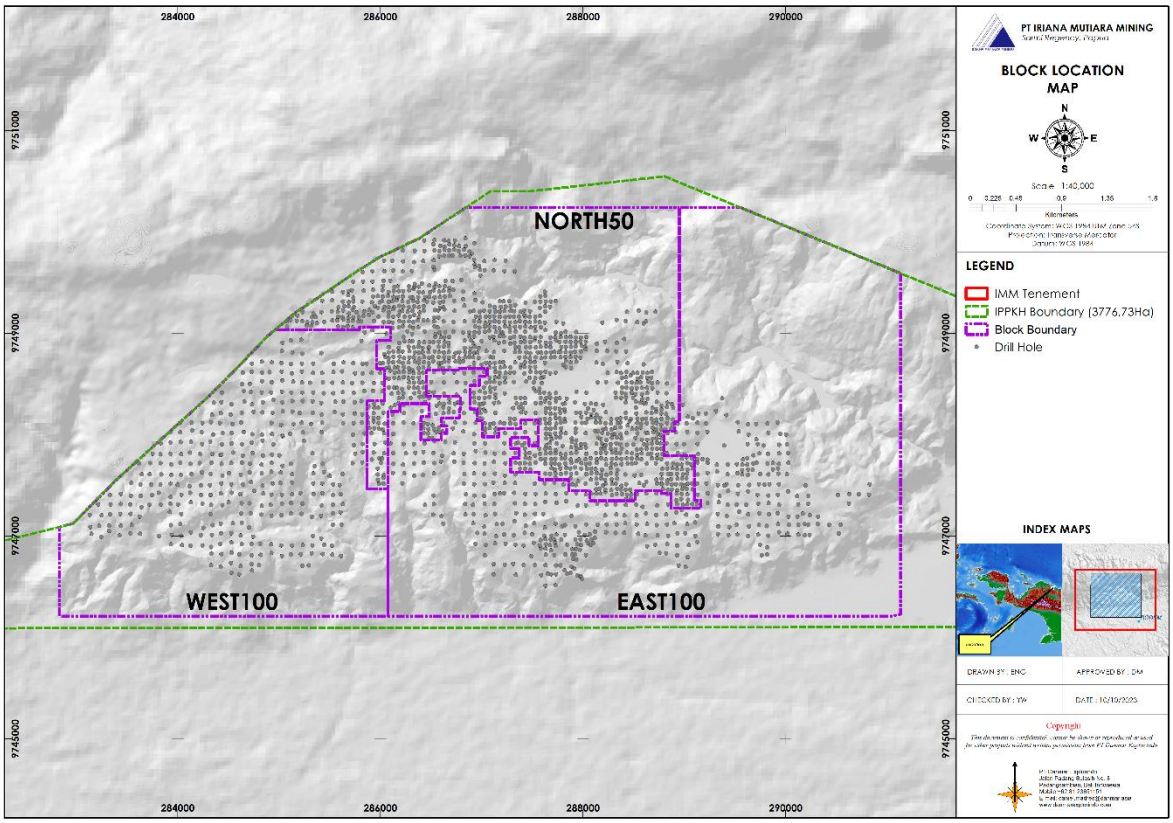


Figure 17 Block location map

Data from the latest drilling programs was systematically recorded and includes core recovery measurements supported by core photography. Core recovery data is summarized in Table 11.

Table 11 Core recoveries

Data Source	Lithological Code	Recorded Core Recovery			
		≥ 95%	95%-90%	90%-85%	< 85%
Danmar Explorindo	Mud Upper	100.00%	0.00%	0.00%	0.00%
	Mud Lower	100.00%	0.00%	0.00%	0.00%
	Limonite Upper	99.94%	0.00%	0.06%	0.00%
	Limonite Lower	99.92%	0.00%	0.08%	0.00%
	SAP	98.81%	0.17%	0.51%	0.51%
	BRK	98.15%	0.21%	0.64%	1.01%
	Average	99.47%	0.06%	0.22%	0.25%
Lestari Teknik	Mud Upper	98.00%	2.00%	0.00%	0.00%
	Mud Lower	100.00%	0.00%	0.00%	0.00%
	Limonite Upper	100.00%	0.00%	0.00%	0.00%
	Limonite Lower	100.00%	0.00%	0.00%	0.00%
	SAP	89.74%	8.97%	1.28%	0.00%
	BRK	90.24%	8.54%	1.22%	0.00%
	Average	96.33%	3.25%	0.42%	0.00%

4.3 GEOTECHNICAL SAMPLING

Geotechnical drilling was carried out in 13 hole locations and 273 core samples were collected for testing by PT Geoservices laboratory in Jakarta. The work carried out includes;

- 15 samples UCT (unconfined compressive test)
- 43 sample UCS (unconfined compressive strength)
- 23 sample triaxial CU (consolidated undrained triaxial shear test)
- 5 sample triaxial UU (unconsolidated undrained triaxial shear test)

The complete analyses results are attached in Appendix 6 of this report. A full geotechnical report for mining is in process but was not available at the time of writing this report.

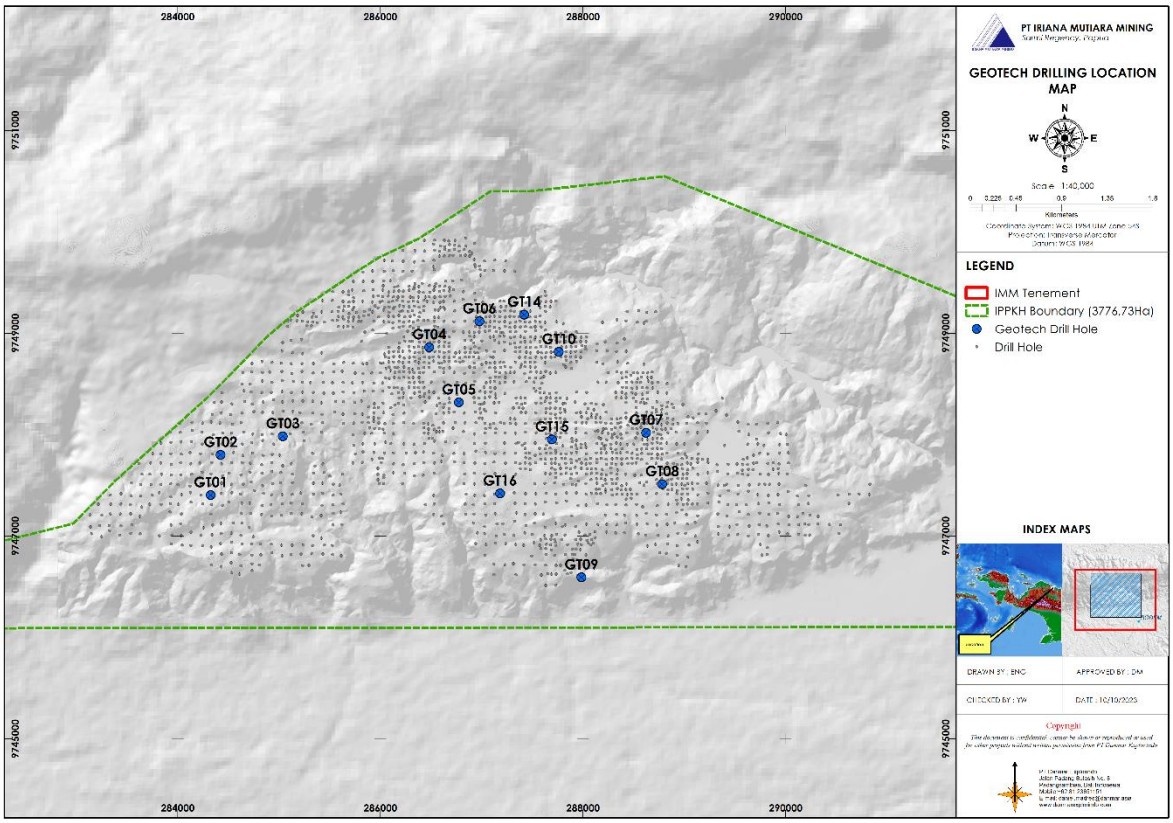


Figure 18 Geotechnical drilling location map

4.4 METALLURGY SAMPLING

In October 2022, 2 testpits were dug by excavator at the following drill holes;

- DE 1643 for a bulk sample of limonite totalling 304kg and
- DE 1106 for a bulk sample of 338kg of saprolite

Samples were sent to Jakarta for particle size analysis. The results are attached in Appendix 7. Density measurements were made by PT Geoservices laboratory on the bulk sample of limonite and saprolite. Then in February 2023, 3 additional test pits were completed by hand digging at drill hole locations DE-1796_TP, DE-1836_TP in the eastern block and DE-2116_TP in the western area of the IMM laterite Resource. Composite bulk samples totalling 5.6t of limonite were extracted and the results are attached in Appendix 7. The locations are also shown in Figure 19.



Photo 12 Bulk sampling limonite in February 2023

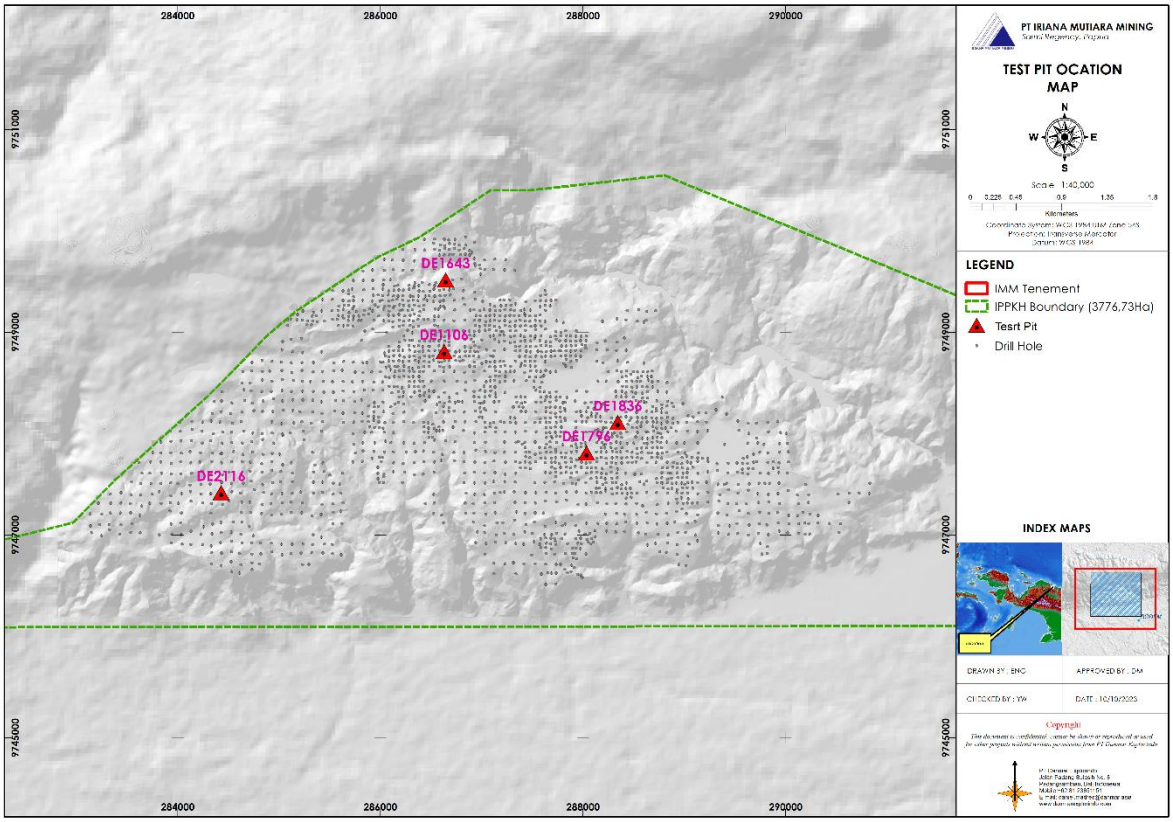


Figure 19 Bulk sample testpit location map

4.5 SURVEY RESULTS

LiDAR topography survey data covering the IMM CoW was started 13 March 2023 completed 13 July 2023. The results are summarized in Table 12.

Table 12 LiDAR survey results summary

Survey Company	Date of Survey	Topography Area (Ha)	Survey Activity
MicroUAV	2023	3,776	Airbourne LiDAR topography Resource area
	2023	1,844	Airbourne LiDAR topography at Maffin
	2023	1,853	Airbourne LiDAR topography at Betaf
	2023	2,391	Airbourne LiDAR topography at Padena
Total Area Survey		**9,862**	

The resulting topography survey map for the Resource area is shown in Figure 20.

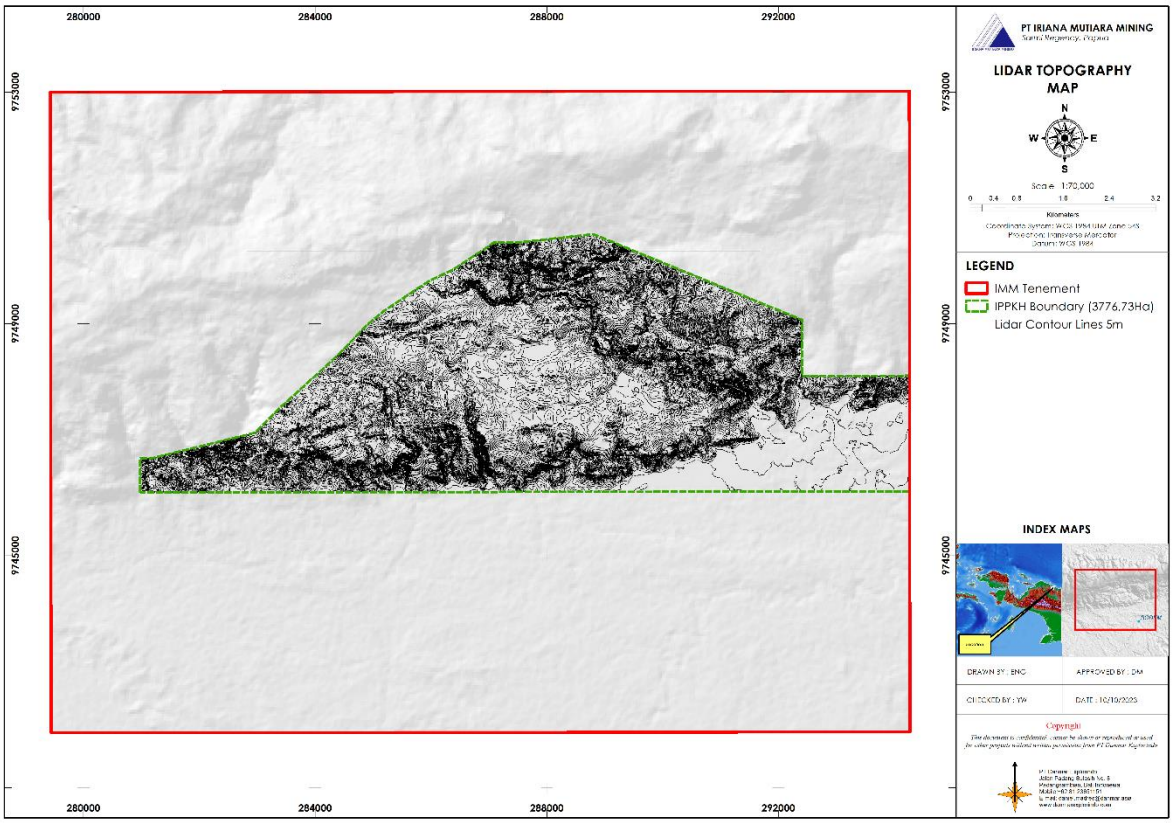


Figure 20 Topography map of Resource area

Drill collars have been surveyed by ground survey and these results are summarized in Table 13.

Table 13 Drill collar survey ground survey

Survey Company	Date of Survey	Drill Collar Surveyed	Survey Activity
PT Hengjaya Mineralindo	2022	1,101	Ground RTK survey borehole collars
PT Danmar Explorindo	2023	1,005	Ground RTK survey borehole collars
Total Drill Collars Surveyed		**2,106**	

4.6 ASSAY ANALYSIS RESULTS

33,183 XRF sample analyses have been performed on drill core samples to document the grade characteristics throughout the Nickel Resource area at IMM at this time. Sample interval has been predominantly 1m as per each core run. Where the sample interval has been less than 1m the analysis result has been weighted for the interval that it represents. Figure 21 displays the sample interval data.

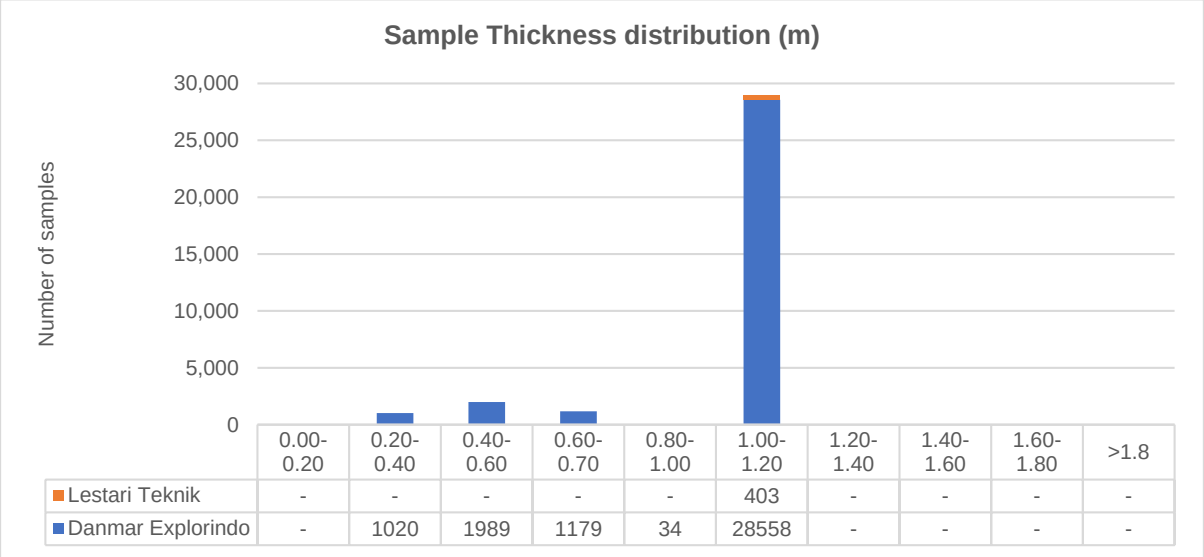


Figure 21 Sample interval

4.7 DENSITY AND MOISTURE MEASUREMENTS

Density and Moisture measurements were made by PT Geoservices laboratory on bulk composite sample of 304kg of limonite and 338kg saprolite taken from 2 testpit locations at drillhole locations DE 1643 and DE 1106 (see testpit locations in Figure 19). The same samples were also used to measure the Moisture Content. The results are summarized in Table 14 below.

Table 14 Moisture measurement from core sample by Geoservices

Layer	Location	Sample (kg)	Density t/m^3 (wet)	Moisture %	Remarks
Limonite	DE 1643	304	1.63	31.5	Bulk composite
Saprolite	DE 1106	338	1.56	27.6	Bulk composite

These measurements indicate samples have dried to some extent, probably during the on site sample preparation process and transportation from Papua to Jakarta over a period of approximately 2 months. In the assay database one drill core sample batch had Moisture measurements on the Certificate of Analysis (COA) and the results are shown in Table 15 below. Although these are only 63 core samples they show Moisture Content much higher than the composite bulk sample which indicates a more realistic moisture level. Additional moisture data was subsequently provided by Geoservices which supports the results received in the COA even though these analyses are not formal Moisture Content certificates.

Table 15 Moisture measurement from core sample by Geoservices

based on Geoservices COA

Lithological Code	Average Moisture Content	Number of Samples
MUD UPPER	46	4
MUD LOWER	-	-
LIM UPPER	43	13
LIM LOWER	40	5
SAP	35	45
BRK	14	50
based on Geoservices sampling data		
Lithological Code	**Average Moisture Content**	**Number of Samples**
MUD UPPER	44	800
MUD LOWER	44	250
LIM UPPER	40	1981
LIM LOWER	46	985
SAP	35	2702
BRK	18	4020

4.8 ASSAY SAMPLE QUALITY ASSURANCE AND CONTROL RESULTS

In total 33,183 sample assays have been completed. A summary of the results is shown in Table 16.

Table 16 Sample assay summary

Block	Lithological Code	Assay Observations	Core Recovery (%)	Average Assay results XRF dry					
				Ni %	Co %	Fe %	MgO %	SiO2 %	SM-Ratio
East100	**MUD UPPER**	506	99.83	0.18	0.03	21.86	1.47	28.81	19.63
	MUD LOWER	350	100.00	0.15	0.01	9.27	7.77	48.03	6.18
	LIM UPPER	907	100.00	0.75	0.10	49.46	1.00	4.75	4.74
	LIM LOWER	479	100.00	1.17	0.09	34.13	11.23	19.46	1.73
	SAP	1,389	99.86	1.04	0.03	11.35	28.97	39.16	1.35
	BRK	3,301	99.64	0.27	0.01	6.14	35.39	41.34	1.17
North50	**MUD UPPER**	932	99.94	0.24	0.03	25.17	1.32	25.55	19.42
	MUD LOWER	147	99.10	0.24	0.02	11.82	7.00	43.99	6.28
	LIM UPPER	3,270	99.99	0.78	0.10	50.71	0.92	3.68	3.98
	LIM LOWER	1,614	99.96	1.24	0.10	34.17	11.75	20.15	1.71
	SAP	4,803	99.77	1.06	0.03	11.69	29.30	38.73	1.32
	BRK	8,904	99.64	0.29	0.01	6.18	36.48	40.97	1.12
West100	**MUD UPPER**	752	100.00	0.13	0.02	18.61	1.63	34.41	21.11
	MUD LOWER	444	100.00	0.16	0.01	9.27	7.64	47.91	6.27
	LIM UPPER	643	99.93	0.75	0.10	48.77	1.11	4.37	3.93
	LIM LOWER	335	99.94	1.14	0.09	33.63	10.71	19.92	1.86
	SAP	932	99.80	1.03	0.03	12.62	27.53	38.61	1.40
	BRK	3,475	99.68	0.26	0.01	6.18	34.96	40.44	1.16
TOTAL ALL BLOCKS	**MUD UPPER**	**2,190**	**99.92**	**0.19**	**0.03**	**22.15**	**1.46**	**29.35**	**20.12**
	MUD LOWER	**941**	**99.70**	**0.17**	**0.01**	**9.67**	**7.59**	**47.34**	**6.24**
	LIM UPPER	**4,820**	**99.97**	**0.77**	**0.10**	**50.22**	**0.96**	**3.97**	**4.12**
	LIM LOWER	**2,428**	**99.97**	**1.21**	**0.09**	**34.08**	**11.51**	**19.99**	**1.74**
	SAP	**7,124**	**99.81**	**1.05**	**0.03**	**11.74**	**29.00**	**38.80**	**1.34**
	BRK	**15,680**	**99.65**	**0.28**	**0.01**	**6.17**	**35.92**	**40.93**	**1.14**
Total all Assay		**33,183**	**100**	**0.58**	**0.03**	**16.96**	**24.49**	**32.99**	**1.35**

4.8.1 Jaw Crush or Coarse Duplicates

Jaw crush duplicate samples (DR_DUP) are the duplicate samples that are taken after crushing using jaw crusher. The duplicate samples were inserted to be analized at intervals of every 25 samples with the grain size of the sample is ~ 2.5 Mesh (8mm).

A scatterplot (Figure 22) showing the results for the four elements Ni, Fe, MgO and SiO_2 from the original and jaw crush duplicate sample results from 1,537 exploration assays, were taken over the period of November 2021 to July 2023. The graphs show the original and jaw crush duplicate elemental values in black plotted on a middle red line representing the mean elemental values of these samples. The two yellow dashed lines above and below the mean line represent the correlation between the assay variables with a variance of +5% and -5%, and the outer green dashed lines represent the variance between the assay variables of +10%

and -10%. Scatterplots, where the results slope from the lower left to upper right, indicate a positive correlation.

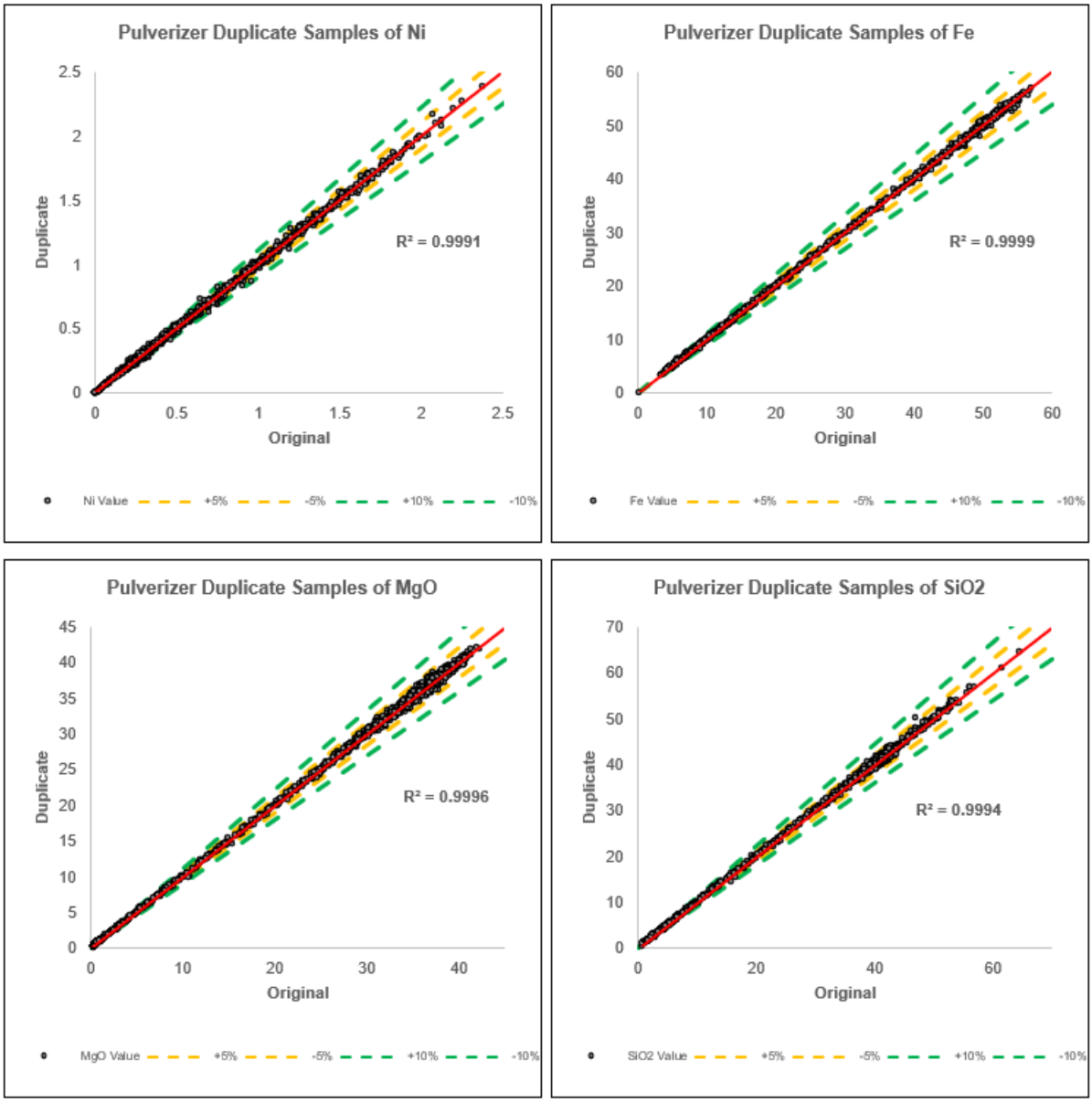


Figure 22 Scatterplot results of 1,537 jaw crush duplicate vs original assays

The figures above show that with all four elements the black dots plot within the +10% and -10% variance lines. In fact, the majority plotted between the +5% and -5% yellow dashed lines, showing there is a high correlation between the original and the duplicate assay values. This is further confirmed with the correlation coefficient (R^2) values more than 0.99 for the elements being assayed. These figures confirm the high precision of the jaw crushing reflecting an excelent sub-sampling precision and preparation quality.

4.8.2 Pulverizer Duplicate

Pulverize duplicates are second splits of the fine grained pulp samples that are collected in the final incremental splitting of the samples after pulverizing. The pulp duplicates are indicators of the analytical precision, which can be affected by the quality of the pulverization process and the homogenization of the sample. The duplicate samples were inserted to analized every 15 sample with the grain size of the sample is ~ 200 Mesh (75 µm).

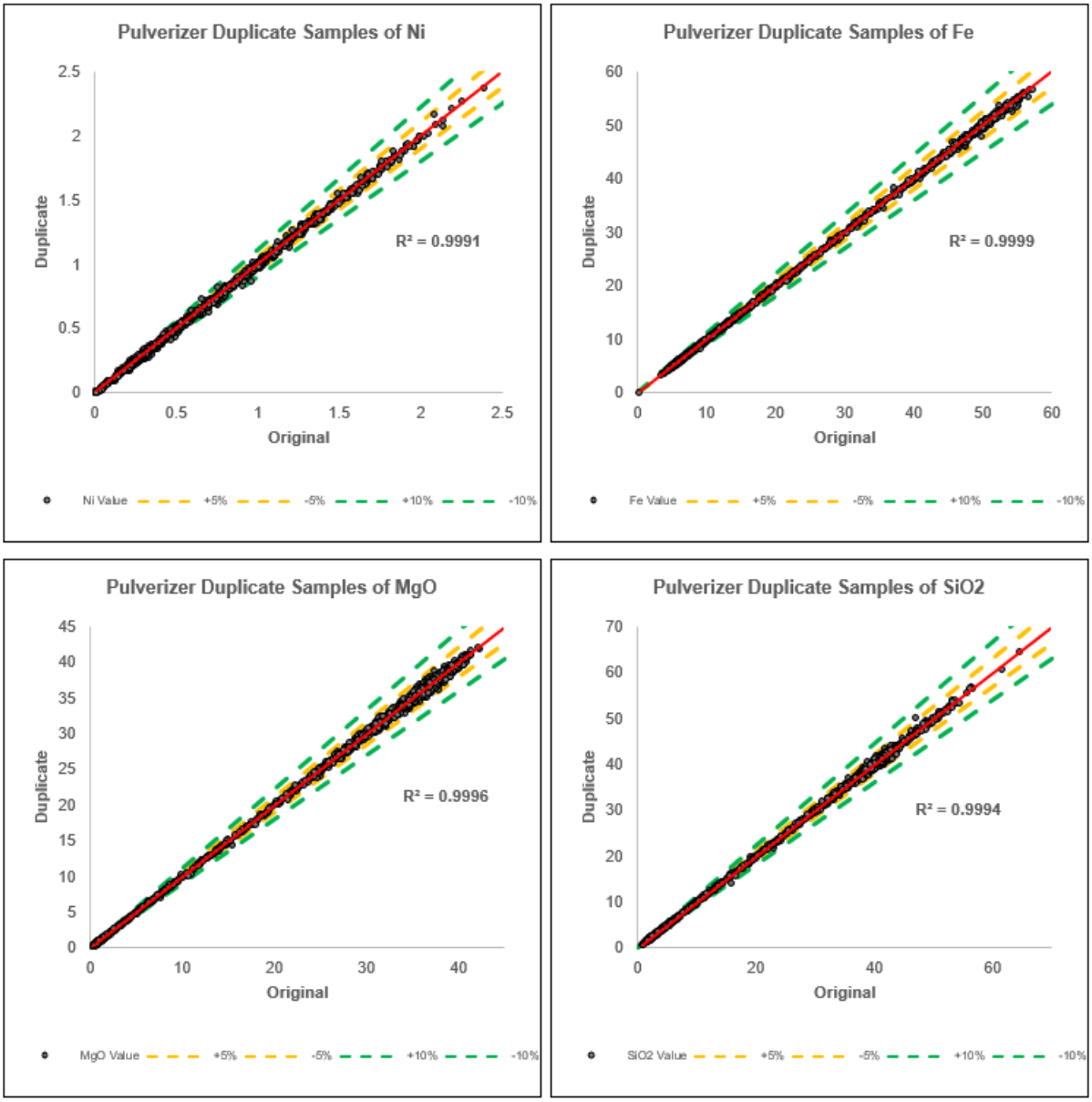


Figure 23 Scatterplot results of 2,365 plots for pulp duplicate vs original assays

The scatterplots in Figure 23 show results for Ni, Fe, MgO and SiO2 from pulp duplicate and original assays from 2,365 pulp samples analyzed between November 2021 to July 2023. The scatterplots are similar to those shown in Figure 21 for the jaw crush duplicate assays, where the majority plotted between the +5% and -5% yellow dashed lines, showing there is a high

correlation between the original and the pulp duplicate assay values and reflected with correlation coefficients more than 0.99. These figures confirm the high precision of the pulp duplicate samples indicates the pulverization process and the homogenization of the sample are good.

4.8.3 Pulp Replicate

Pulp replicates are the samples that were taken from the original sample after splitting the fine grained pulp. Total 277 pulp replicate samples were taken, between November 2021 and July 2023, are shown in scatterplots (Figure 23) for Ni, Fe, MgO and SiO^2.

The majority samples plotted between the +5% and -5% yellow dashed lines, showing there is a high correlation between the original and the pulp duplicate assay values and reflected with correlation coefficients more than 0.99. These figures confirm the high precision of the pulp replicate samples indicates the pulverization process and the homogenization of the sample are good.

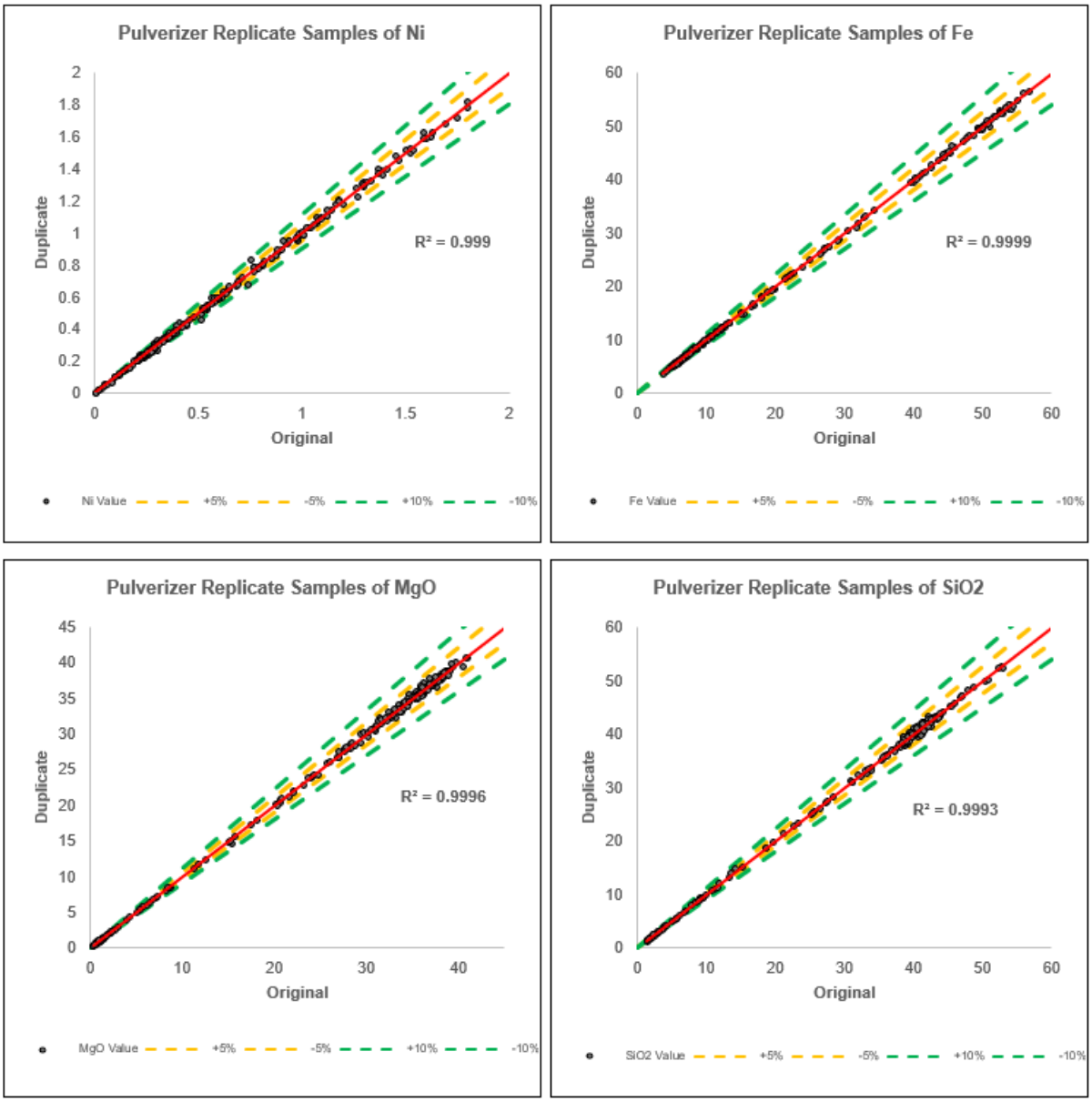


Figure 24 Scatterplot results of 277 plots for pulp replicate vs original assays

4.8.4 Check Standards, or Certified Reference Materials (CRM's)

Certified Reference Materials, (CRM's), are samples with certified grades, prepared under specially controlled conditions and have a certified mean value for the contained elements in that standard, along with associated confidence and tolerance limits. They are used in Quality Control to monitor the values of the standard against those of the unknown samples being assayed and allow the accuracy of the assay process to be monitored. Geoservices use CRMs produced by OREAS (Ore Research & Exploration P/L, from Victoria, Australia). OREAS CRMs used are 13 Standards with certified Nickel values shown in the Table 17.

Table 17 Certified Nickel values of OREAS CRMs

CRMs	Certified Nickel Values
OREAS 180	0.31
OREAS 181	0.51
OREAS 182	0.71
OREAS 183	1.00
OREAS 184	1.02
OREAS 185	1.14
OREAS 186	1.23
OREAS 189	1.48
OREAS 191	1.75
OREAS 193	1.93
OREAS 194	2.13
OREAS 195	2.94

In addition, these standards have certified standard deviations and state the 95% Confidence and Tolerance Limits with low and high values.

Figures 25, 26, and 27 are Shewhart Control Charts for the results of assays using the OREAS standards 182, 184, and 195 over one year and three months period. The assay results obtained, over a period of time, are plotted on a chart of showing certified values against the number of samples assayed, with one dotted line showing the certified mean value and green area showing the expected value plus/minus two standard deviations, also referred to as Upper and Lower Warning Limits, and the yellow areas representing the Upper and Lower Control Limits at three standard deviations.

Good quality analyses will be characterized by random distribution points around the certified mean value, with 95% of the data points lying within two standard deviations of the mean. The same number of analyses should fall above and below the mean.

The OREAS Standard 182 (Figure 25) with total 145 samples shows the results plotting within three standard deviations of the mean for both Ni and Fe_2O_3, even though the mean value is not really precise the result is showing a good accuracy.

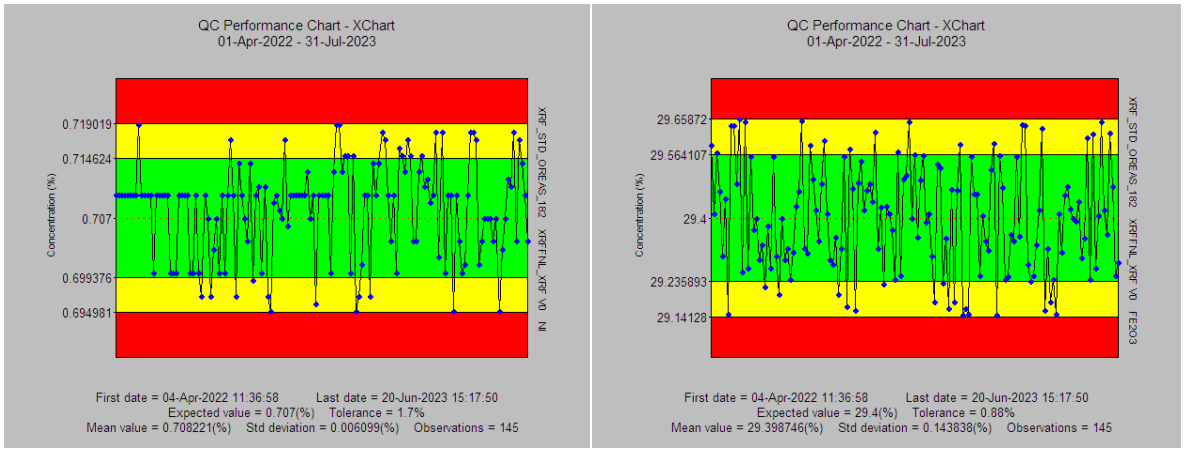


Figure 25 CRM OREAS182 - 145 sample analysis

Figure 26 shows the results for 180 samples of OREAS184 for Ni and Fe_2O_3, with Ni showing good accuracy, 95% of the results plotting within two standard deviations of the mean, and similar numbers of samples above and below the mean. The accuracy in the Fe_2O_3 graph is also good but the mean value is below the expected value.

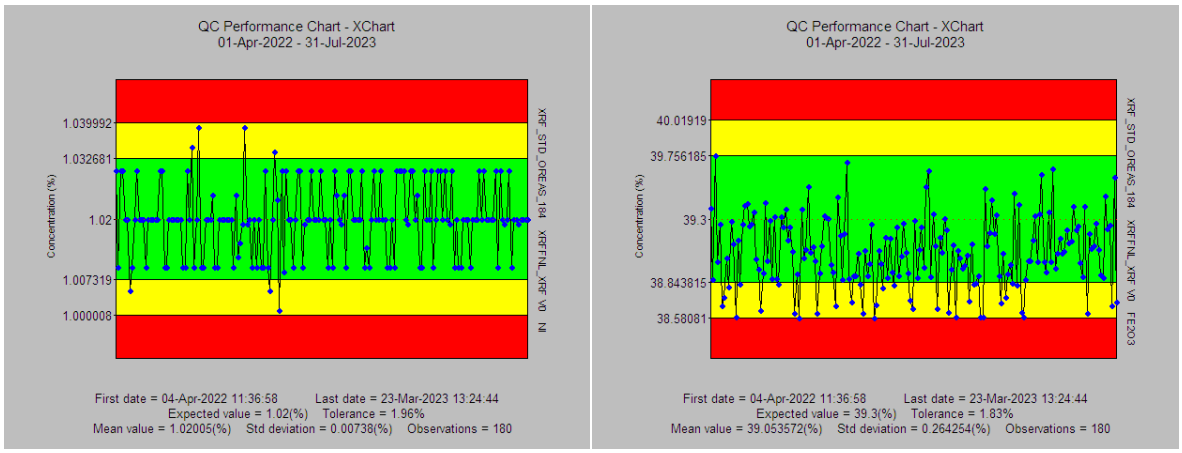


Figure 26 CRM OREAS184 - 180 sample analysis

The OREAS Standard 195 (Figure 27) with total 207 samples shows the results plotting majority within two standard deviations of the mean for Ni and showing a good accuracy. However, the Fe2O3 graph, the accuracy is within three standard deviations, and not as good as Ni.

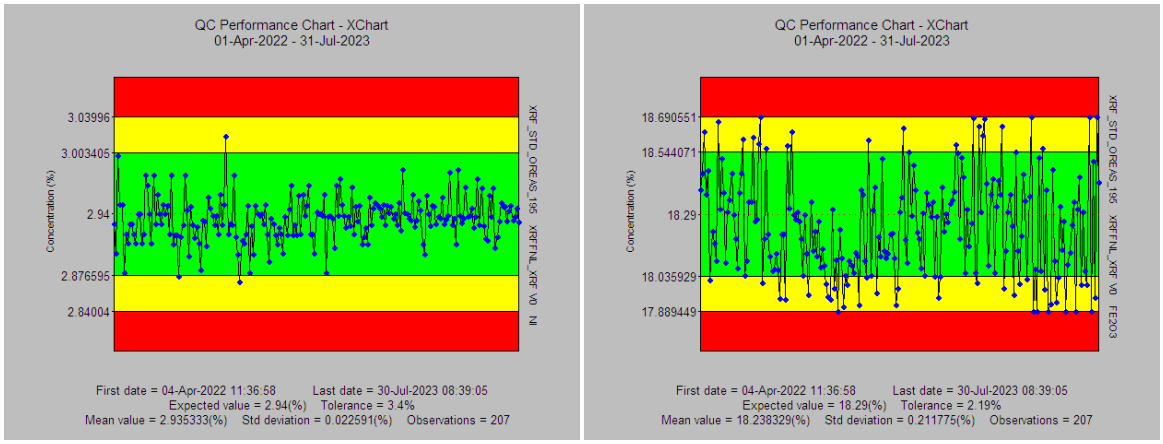


Figure 27 CRM OREAS195 - 207 sample analysis

For details of the CRM analysis see Appendix 5.

4.8.5 Replicate Samples

Replicate samples are the samples that were taken from the original sample before the preparation. A total of 2,210 replicate samples were taken between November 2021 and July 2023. These analysis results are shown in the following scatterplots (Figure 28) for Ni, Fe, MgO and SiO_2. The format of the scatterplots is the same as for the previous scatterplots.

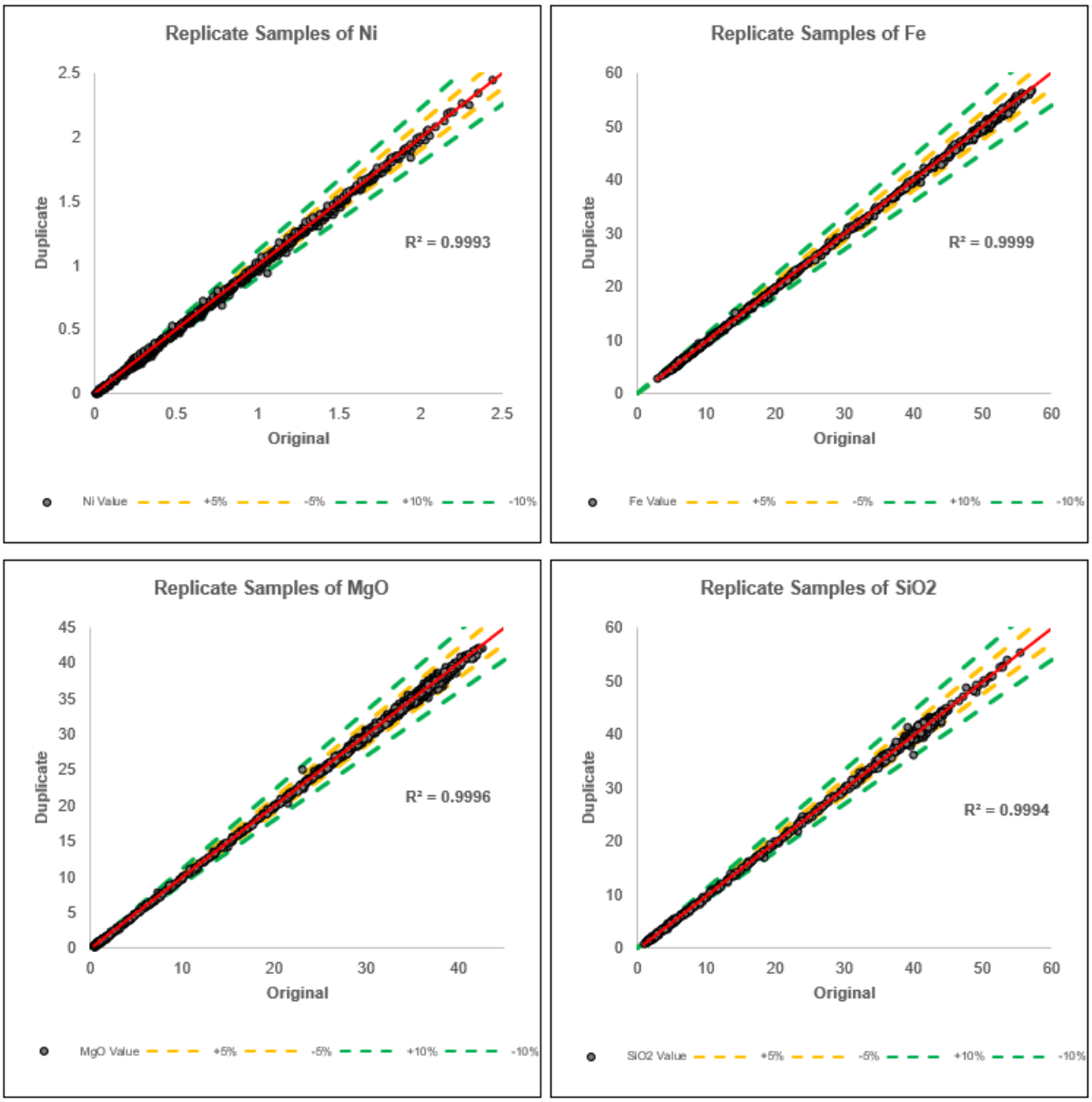


Figure 28 Scatterplot results of 2,210 plots for replicate vs original assays

The scatterplots for replicate sample assays shows the majority of the results plotting within the two yellow dashed lines indicating a 95% confidence in the result plotting within these limits and is considered an excellent result. The graphs also show correlation coefficients of more than 0.99 which is indicating high precision on assay quality.

4.8.6 Control Sample Insertion Rates

During the period November 2021 to July 2023 a total of 33,394 exploration samples were processed at the Geoservices Laboratory. The following check samples were added into this original sample stream:

Table 18 Sample Insertion Rates November 2021 – July 2023

Period	Exploration Samples	Jaw Crush Duplicate		Pulverize Duplicates		Pulverize Replicates		Replicate		CRM's	
		Total Samples	%	Total Samples	%	Total Samples	%	Total Samples	%	Total Samples	%
November 2021 - July 2023	33,394	1,537	4.6	2,365	7.1	277	0.8	2,210	6.6	1,600	4.8

The Coarse Reject and Pulp Duplicate samples comprise 4.6% and 7.1% of the samples submitted which are good insertion rates. Pulp Replicates and CRMs comprise 0.8% and 4.8% respectively of the samples inserted also are considered to be appropriate insertion rates.

2,210 Replicate samples were inserted as laboratory check samples at Geoservices, with insertion rates 6.6%. The twin samples were not collected at the sample collection stage, because the whole drill core is sent for sample preparation and assay, and the pulp blanks and coarse blank were also not inserted for this reason.

In summary, a total of 7,989 check samples were inserted into the sample stream of 33,394 exploration samples and submitted for assay at the Geoservices Assay Laboratory, this is a percentage 23.9% from the total samples. This means the total QAQC samples inserted ensures accuracy and precision that is appropriate for use in this Resource estimate.

5 DATA VERIFICATION

The primary author of this report visited the site in June 2022 during the Ultra GPR survey and exploration drilling program. The objective of the site visit was to review the protocols and processes in place to verify the data acquisition is suitable for use in this Resource study. Since then complition of the field program datasets have also been reviewed, checked and verified by comparing the original field data and core tray photos against the official laboratory Certificates of Analysis. A flowsheet for the data varification procedure is shown below.

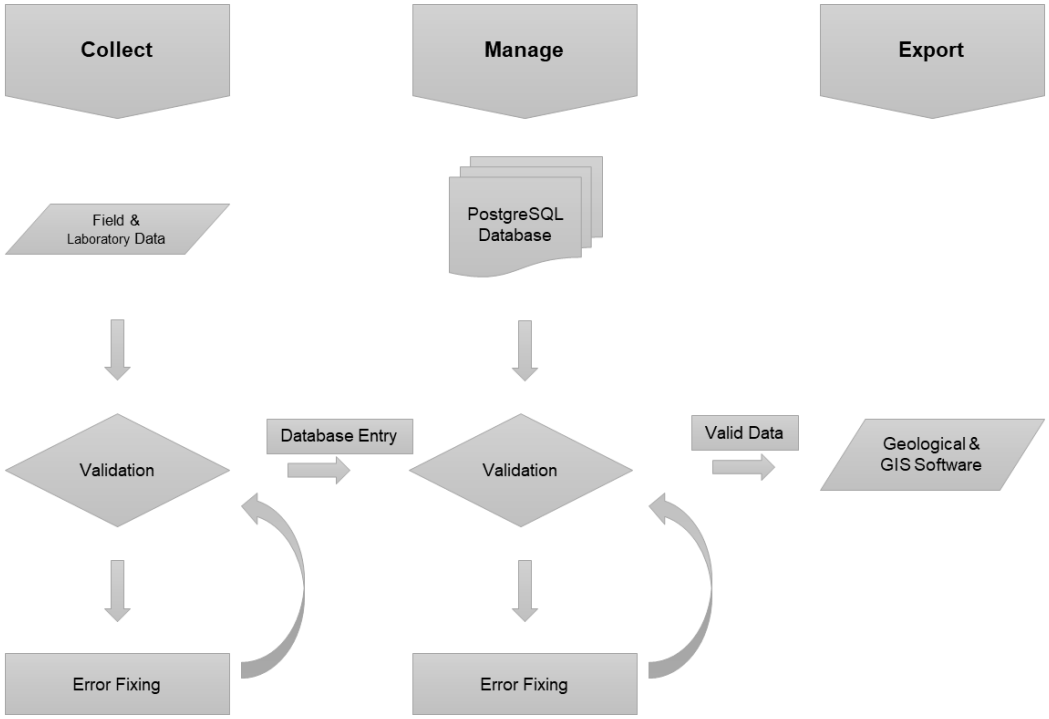


Figure 29 Simplified data verification workflow

5.1 DRILL HOLE COLLAR ELEVATION AND LIDAR TOPOGRAPHY

IMM has supplied a digital copy of LiDAR topographic data in CAD and DEM format. As this data was reviewed, significant variances between drill hole collar elevation and LiDAR topographic surface were identified. This is summarized in Figure 30 below.

The discrepency between the ground survey elevations and the LiDAR elevations is a result of the thick vegetation in some areas of the survey. After several meetings with IMM survey team and the LiDAR contractor, it was agreed to use the collar elevation drapped onto the LiDAR surface for geological modeling of the ground elevation in this report as recommended by the IMM surveyors.

The LiDAR topographphy report from the contractor is attached in the Appendix 8.

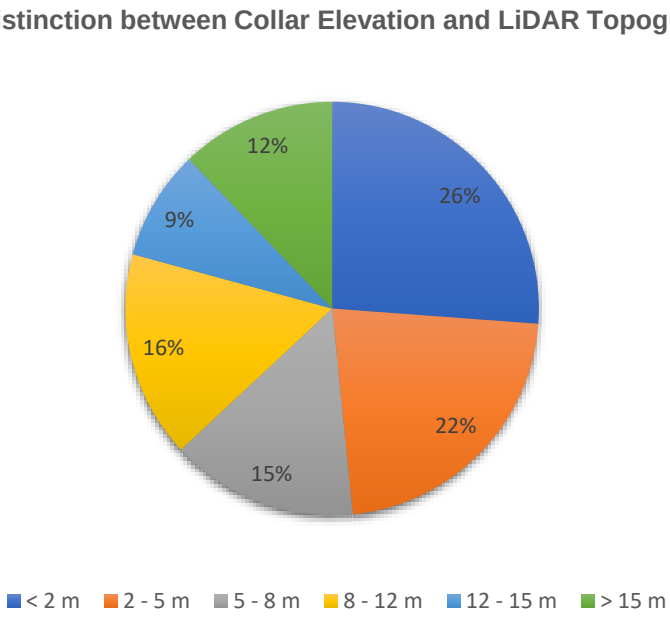


Figure 30 Discrepency between collar elevation and LiDAR Topography

5.2 DATABASE VALIDATION

Data supplied by IMM field team has been checked and validated using PostgreSQL software and a relational database built specifically for this project by the Danmar geology team.

The database validation has been done for common errors such as;

1. Typing errors
2. Numbering errors
3. Incorrect codes
4. Missing lithology intervals
5. Overlapping lithology intervals
6. Missing assay values
7. Negative assay values
8. Switched collar easting and northing

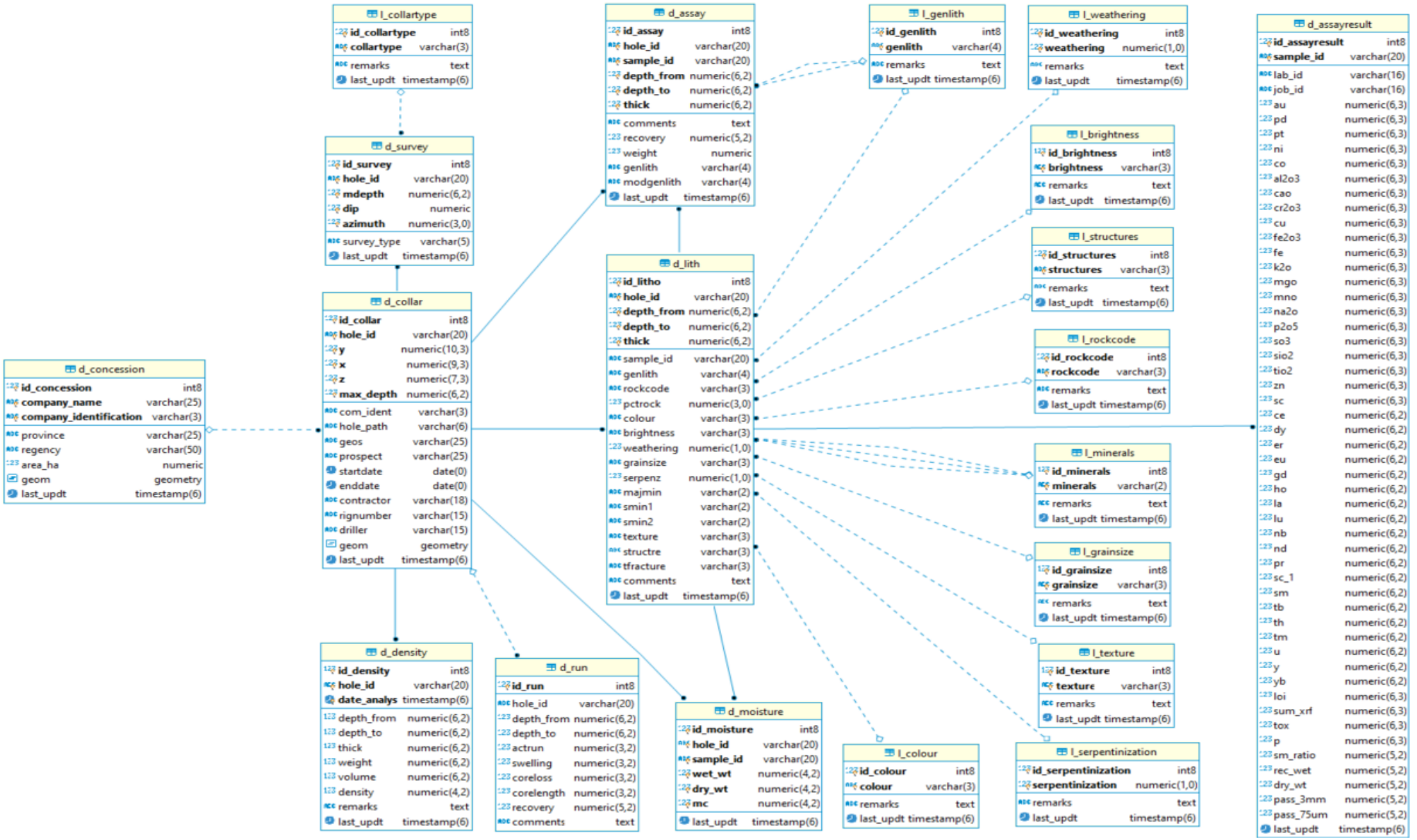


Figure 31 PostgreSQL software relational database system tables

5.3 GEOLOGICAL DOMAINS

The IMM nickel laterite project has been divided into 6 separate geological horizons based on their geochemical composition. As the exploration assay results have accumulated it appears that these can be regarded as distinct lithological domains where the exploration drilling work was completed. These domains can be defined based on the following characteristics:

a) Mud Al_2O_3, TiO_2, Fe, SiO_2 and Ni composition
b) Laterite Fe, MgO and SiO_2 composition
c) Bedrock Ni, Fe, MgO, SiO_2 composition
e) Distinct geostatistical population

At this time the 6 separate geological domain horizons are as follows:

1) MUD UPPER; upper mud volcano sediment
2) MUD LOWER; lower mud volcano sediment
3) LIM UPPER; upper limonite horizon
4) LIM LOWER; lower limonite horizon
5) SAP; saprolite/rocky semi weathered horizon
6) BRK; bedrock/ultramafic rock

Visual lithological descriptions from field geologist have been checked using assay data to make better geological definition of the lithological domains intersected in the drilling. As a result a generalized geochemical characteristic for each lithological domain has been defined as shown in Table 19. Each geological domain has been coded into the database and used for geological modeling.

Table 19 Generalized geological domains based on geochemistry data

Laterite Layers	Non Laterite	Al_2O_3	TiO_2	Fe	MgO	SiO_2	Ni
	MUD UPPER	>15%	> 0.75%	> 8%		≤ 30%	≤ 0.25%
	MUD LOWER	≤ 15%	≤ 0.75%	≤ 8%		> 30%	≤ 0.25%
LIM UPPER				> 50%	≤ 1%	≤ 3%	
LIM LOWER				35% > x ≥ 50%	1% > x ≤ 10%	3% > x ≤ 20%	
SAP				10% ≥ x ≤ 35%	10% > x ≤ 30%	20% > x ≤ 40%	
	BRK			< 10%	x > 30%	> 40%	≤ 0.25%

Figure 32 shows the average lithological thickness of each domain area based on the drilling results.

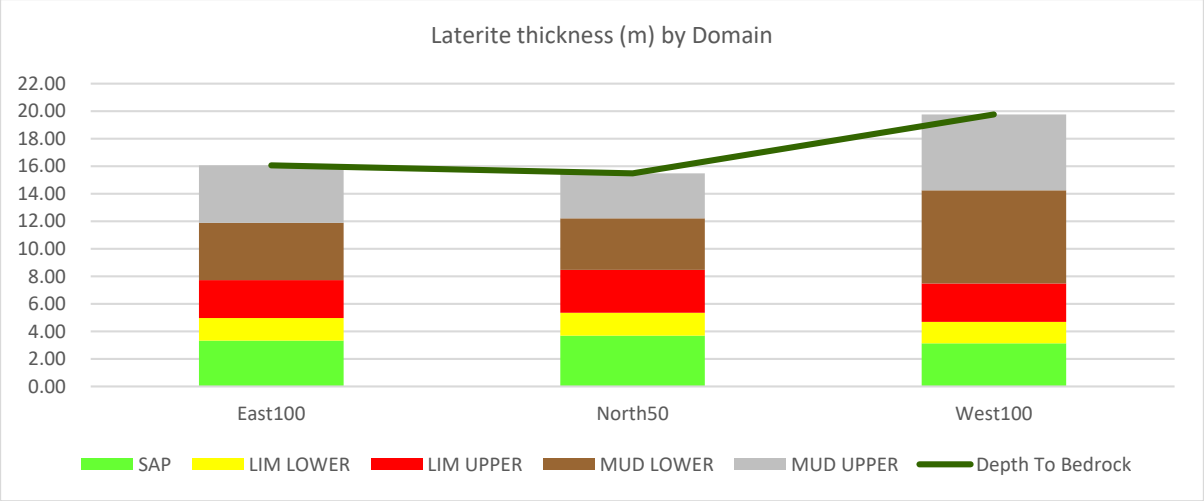


Figure 32 Average lithological thickness chart per Block

Table 20 shows the thckness data for each Block area as well.

Table 20 Lithological domain thickness at IMM

Block	Lithological Code	Composite Observations	Recorded zone thickness (m)		
			Min	Max	Mean
East100	MUD UPPER	506	1.00	14.00	4.17
	MUD LOWER	350	1.00	29.00	7.76
	LIM UPPER	907	0.40	9.00	2.75
	LIM LOWER	479	0.30	10.00	1.64
	SAP	1,389	0.20	15.00	3.33
	BRK	3,301	0.57	29.00	7.71
North50	MUD UPPER	932	1.00	12.42	3.27
	MUD LOWER	147	0.58	26.00	3.75
	LIM UPPER	3,270	0.74	12.58	3.12
	LIM LOWER	1,614	0.20	12.00	1.66
	SAP	4,803	0.31	16.65	3.70
	BRK	8,904	1.00	31.00	8.12
West100	MUD UPPER	752	0.75	21.00	5.51
	MUD LOWER	444	1.00	19.00	6.76
	LIM UPPER	643	1.00	10.00	2.79
	LIM LOWER	335	0.21	9.00	1.57
	SAP	932	0.68	17.00	3.13
	BRK	3,475	0.70	31.00	8.38
TOTAL ALL BLOCKS	**MUD UPPER**	**2,190**	**0.9**	**15.7**	**4.2**
	MUD LOWER	**941**	**0.9**	**23.8**	**6.7**
	LIM UPPER	**4,820**	**0.7**	**11.6**	**3.0**
	LIM LOWER	**2,428**	**0.2**	**11.2**	**1.6**
	SAP	**7,124**	**0.3**	**16.4**	**3.6**
	BRK	**15,680**	**0.8**	**30.6**	**8.1**
BEDROCK*	Shown as depth to Bedrock, not thickness				

Based on the drilling and assay results the thickness of limonite appears to be relatively consistent around 2.3m for Limonite Upper and 1.1m for Limonite Lower. Saprolite appears also be relatively consistent at around 3.2m.

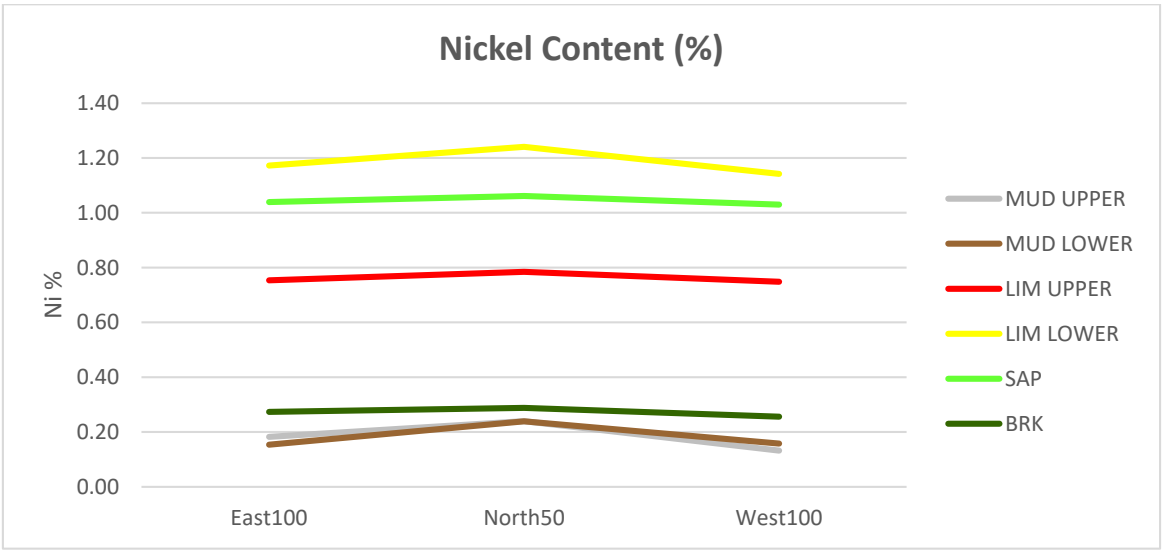


Figure 33 Ni grade average over the 6 domain layers

Average nickel grade of Limonite Lower is the highest, followed by Saprolite then Limonite Upper. Bedrock, Mud Upper and Mud Lower all have low Ni content.

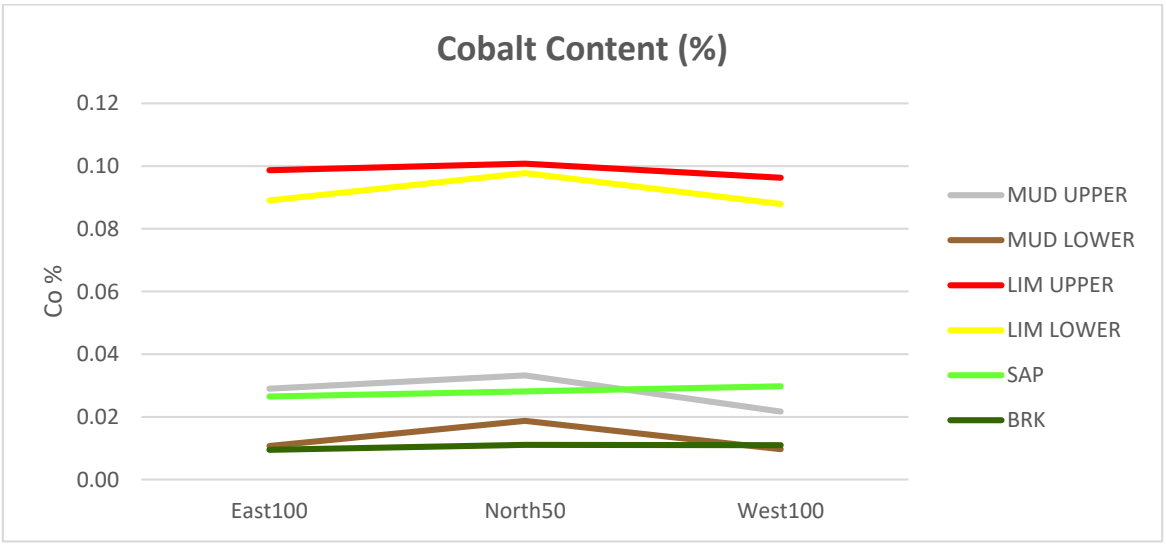


Figure 34 Cobalt grade over the 6 main domain layers

The cobalt content over the 6 lithological horizons shows that Limonite Upper and Limonite Lower have similar high cobalt contents while the other horizons have low cobalt levels.

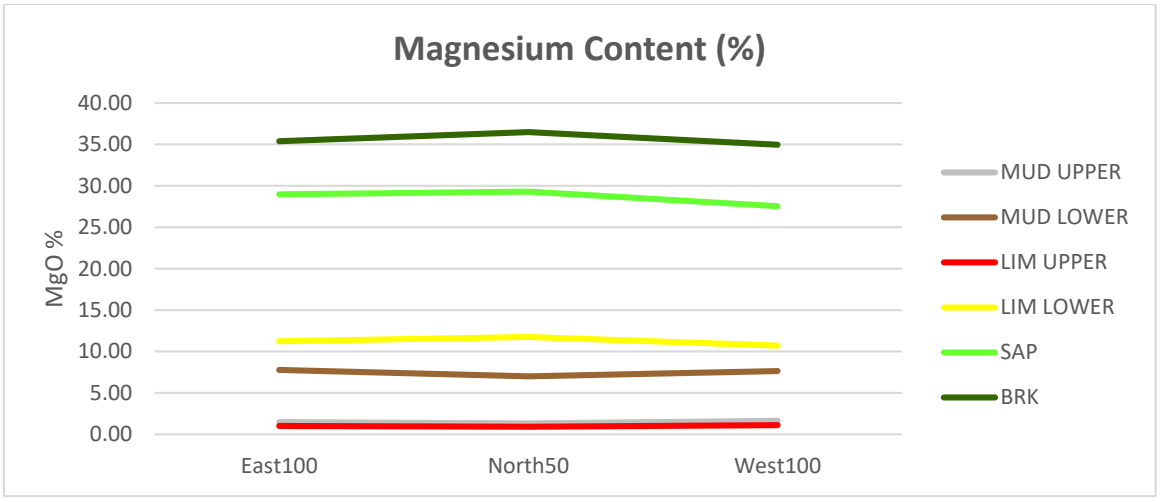


Figure 35 Magnesium content over the 6 domain layers

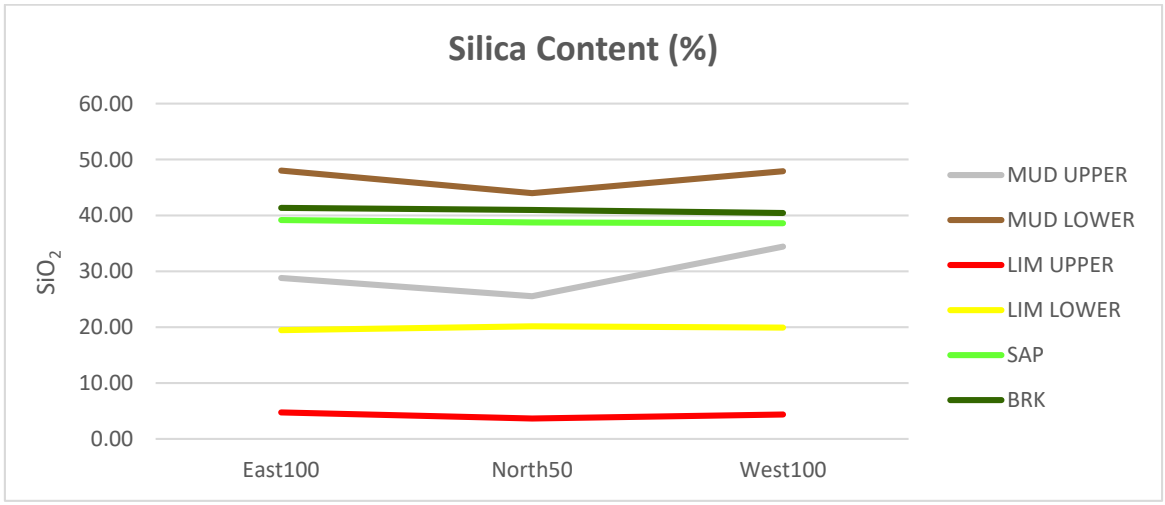


Figure 36 Silica content over the 6 main domain layers

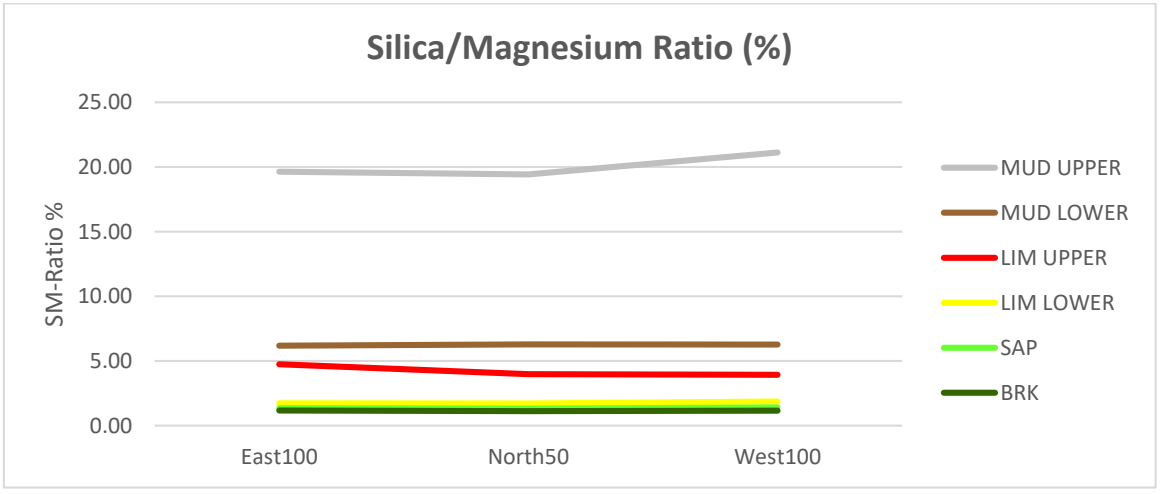


Figure 37 Silica magnesium ratios over the 6 domain layers

Complete descriptive statistics for each domain are summarized in Appendix 9.

6 MINERAL RESOURCE ESTIMATE

6.1 SOFTWARE

Geological modeling and Mineral Resource estimation were completed using Leapfrog Geo 2023.2.1.

The geostatistical study was carried out using Snowden Supervisor 8.15.1.1 to determine the variogram and Kriging Neighbour Analysis (KNA).

6.2 GEOLOGICAL MODELING

Each lithology in the drill hole data has been coded into distinct geological horizons, based on their chemical composition determined by the assay results. Each contact of the layer has been modeled in a 10 x10 meter grid surface and visually checked by easting and northing cross sections to ensure the surface fit the drill hole data. The topography surface was used to limit the top of mud, limonite, saprolite and bedrock.

The cummulative thickness of the domain layers was compared to the original drill hole data to check the accuracy of the geological model. The cummulative thickness is summarized in the Table 21 below.

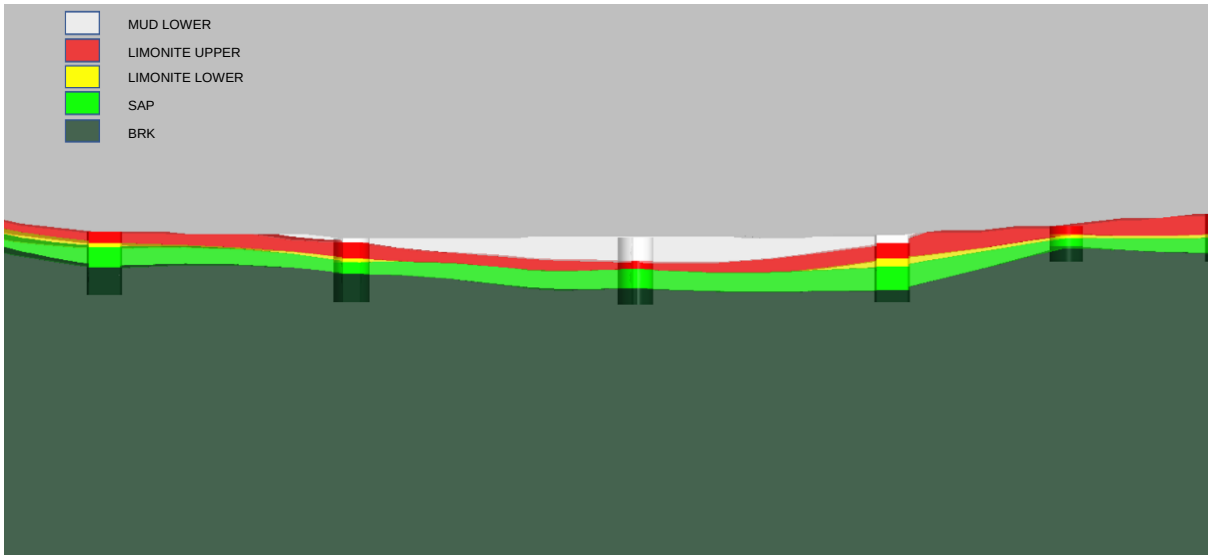


Figure 38 Geological model cross section example

Table 21 Drill hole and geological model cummulative thickness comparison

Domain Layer	Total Drill Hole Thickness (m)	Total Model Thickness (m)	% Different
MUD UPPER	2,194.68	2,109.56	96.12
MUD LOWER	933.70	916.54	98.16
LIM UPPER	4,814.02	4,656.37	96.73
LIM LOWER	2,335.91	2,300.11	98.47
SAP	6,518.40	6,489.62	99.56

6.3 EXTRAPOLATORY DATA ANALYSIS

The project area has been divided into three blocks namely, West 100, East 100 and North 50, of extrapolatory data and variography analysis as determined by the average drill hole spacing distribution (see Figure 17).

The drill hole samples were composited in 1m lengths. Any composites less 0.5m were added to the previous sample interval. The 1m compositing was selected because it represents the modal length of the samples taken during exploration and would preserve the detail of the information obtained in the samples.

Table 22 Composite statistics for Upper Limonite (LIM UPPER)

Parameter	Ni			Co			Fe			MgO			SiO2		
	West100	East100	North50	West100	East100	North50	West100	East100	North50	West100	East100	North50	West100	East100	North50
Number of sample	643	907	3,255	643	907	3,255	643	907	3,255	643	907	3,255	643	907	3,255
Mean	0.748	0.754	0.780	0.096	0.099	0.101	48.774	49.460	50.721	1.112	1.002	0.921	4.368	4.752	3.672
Std Dev	0.231	0.281	0.260	0.043	0.060	0.063	3.819	4.132	3.356	0.517	0.565	0.502	3.621	3.571	2.798
Variance	0.053	0.079	0.070	0.002	0.004	0.004	14.583	17.076	11.265	0.267	0.319	0.252	13.111	12.753	7.826
CV	0.309	0.373	0.330	0.446	0.604	0.624	0.078	0.084	0.066	0.465	0.564	0.545	0.829	0.752	0.762
Maximum	1.690	1.960	3.680	0.320	0.820	0.770	55.148	56.854	58.043	4.230	4.950	4.500	52.970	30.600	38.080
Median	0.710	0.700	0.750	0.090	0.090	0.090	49.525	50.402	51.448	0.955	0.820	0.780	3.510	3.700	2.670
Minimum	0.160	0.210	0.190	0.020	0.030	0.020	9.190	27.312	19.702	0.350	0.310	0.240	1.300	1.270	0.640
Number of top cut data	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
top cut data	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
% of top cut data	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 23 Composite statistics for Lower Limonite (LIM LOWER)

Parameter	Ni			Co			Fe			MgO			SiO2		
	West100	East100	North50	West100	East100	North50	West100	East100	North50	West100	East100	North50	West100	East100	North50
Number of sample	333	466	1,577	333	466	1,577	333	466	1,577	333	466	1,577	333	466	1,577
Mean	1.145	1.173	1.250	0.088	0.090	0.099	33.759	34.468	34.682	10.580	10.946	11.294	19.829	19.277	19.769
Std Dev	0.358	0.389	0.390	0.039	0.044	0.056	8.609	9.669	9.972	6.504	7.284	7.162	8.991	9.156	9.497
Variance	0.128	0.151	0.160	0.002	0.002	0.003	74.117	93.496	99.433	42.301	53.062	51.301	80.830	83.832	90.185
CV	0.313	0.332	0.320	0.447	0.493	0.561	0.255	0.281	0.288	0.615	0.665	0.634	0.453	0.475	0.480
Maximum	2.040	2.540	2.840	0.360	0.260	0.560	51.098	55.622	55.952	38.350	39.330	37.180	41.270	42.550	53.810
Median	1.130	1.170	1.270	0.080	0.080	0.080	33.729	34.166	34.463	9.120	9.510	10.335	19.460	19.180	20.225
Minimum	0.210	0.230	0.160	0.010	0.005	0.005	6.001	5.329	4.609	0.740	0.400	0.440	3.030	1.410	1.190
Number of top cut data	-	-	-	-	-	-	-	-	-	-	-	8.00	-	-	-
top cut data	-	-	-	-	-	-	-	-	-	-	-	37.18	-	-	-
% of top cut data	-	-	-	-	-	-	-	-	-	-	-	0.51	-	-	-

Table 24 Composite statistics for Saprolite (SAP)

Parameter	Ni			Co			Fe			MgO			SiO2		
	West100	East100	North50	West100	East100	North50	West100	East100	North50	West100	East100	North50	West100	East100	North50
Number of sample	878	1,295	4,437	878	1,295	4,437	878	1,295	4,437	878	1,295	4,437	878	1,295	4,437
Mean	1.033	1.042	1.070	0.030	0.027	0.028	12.831	11.515	11.900	27.263	28.685	29.024	38.537	39.133	38.667
Std Dev	0.409	0.427	0.450	0.020	0.018	0.019	5.628	4.648	4.912	45.455	6.379	5.641	3.938	3.535	3.464
Variance	0.167	0.183	0.200	0.000	0.000	0.000	31.669	21.607	24.124	0.247	40.694	31.824	15.511	12.499	12.001
CV	0.396	0.441	0.420	0.654	0.683	0.674	0.439	0.404	0.413	39.210	0.222	0.194	0.102	0.090	0.090
Maximum	2.340	2.700	2.580	0.240	0.160	0.120	48.923	49.993	53.140	39.210	41.480	42.040	56.660	51.890	53.820
Median	0.980	0.990	1.020	0.030	0.020	0.020	11.453	10.369	10.750	28.640	30.140	29.900	39.420	39.756	39.413
Minimum	0.220	0.040	0.160	0.005	0.005	0.005	5.225	3.525	4.385	1.970	1.010	0.750	8.720	3.740	2.330
Number of top cut data	-	-	4	-	-	25	-	-	-	-	-	-	-	-	-
top cut data	-	-	2.58	-	-	0.12	-	-	-	-	-	-	-	-	-
% of top cut data	-	-	0.09	-	-	0.56	-	-	-	-	-	-	-	-	-

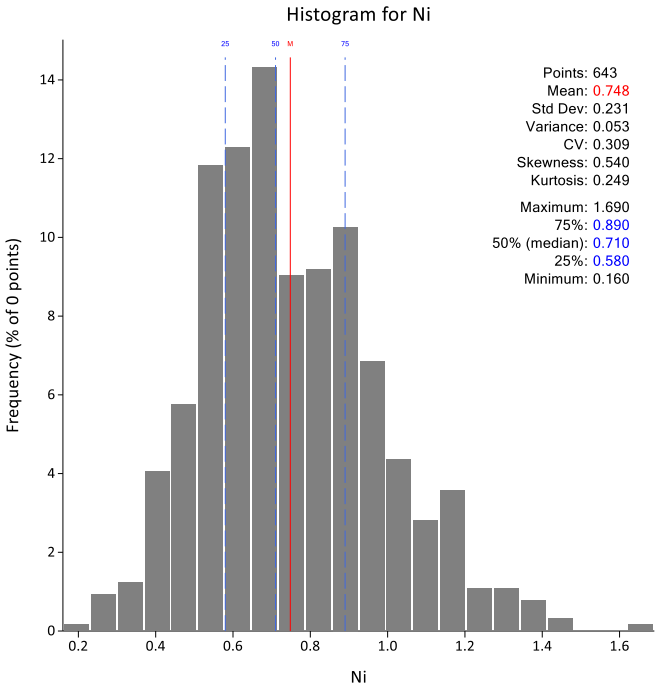


Figure 39 Histogram for Ni LIM UPPER in West100 Block

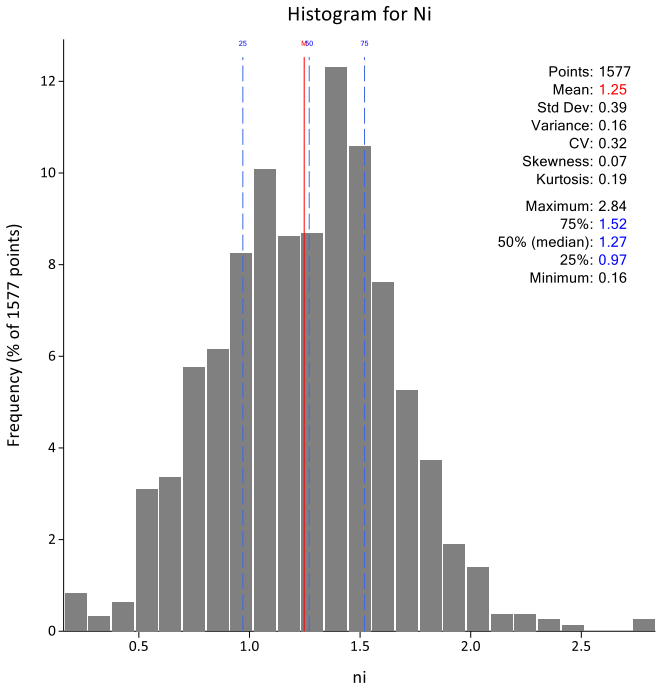


Figure 40 Histogram for Ni LIM LOWER in North50 Block

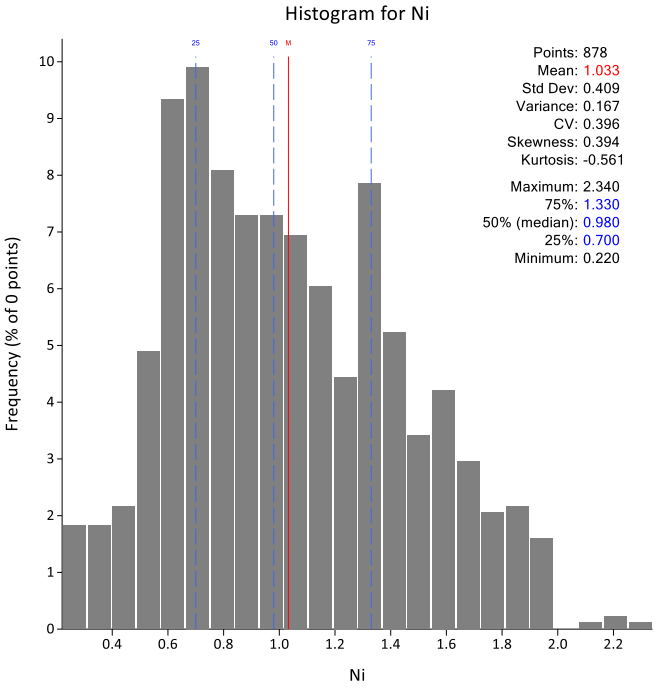


Figure 41 Histogram for Ni Saprolite in West100 Block

6.4 VARIOGRAPHY

6.4.1 Variogram

Variography is a statistical technique used to allow a quantitative assesment of the spatial continuity of a regionalised variable. A variogram is a graph relating the variance of the difference in value of an attribute between pairs of data points to the separation distance between those pairs. This relationship can be calculated for different directions such as azimuth (strike), plunge and dip.

The degree of variance determined will be used in the Resource estimation to provide the information whether the data is sufficient to satisfy the requirement for the standard Resource categories.

In the IMM project, variograms for all elements were modelled using the spherical formula in the normalized type of data. A lag of 1m was used for the downhole variogram distance and 50m to 100m was used for horizontal pairing. During fitting the variogram, all data has been transformed into normal score data to reduce the noise of the variogram and then back transformed again when exporting the variogram for grade estimation.

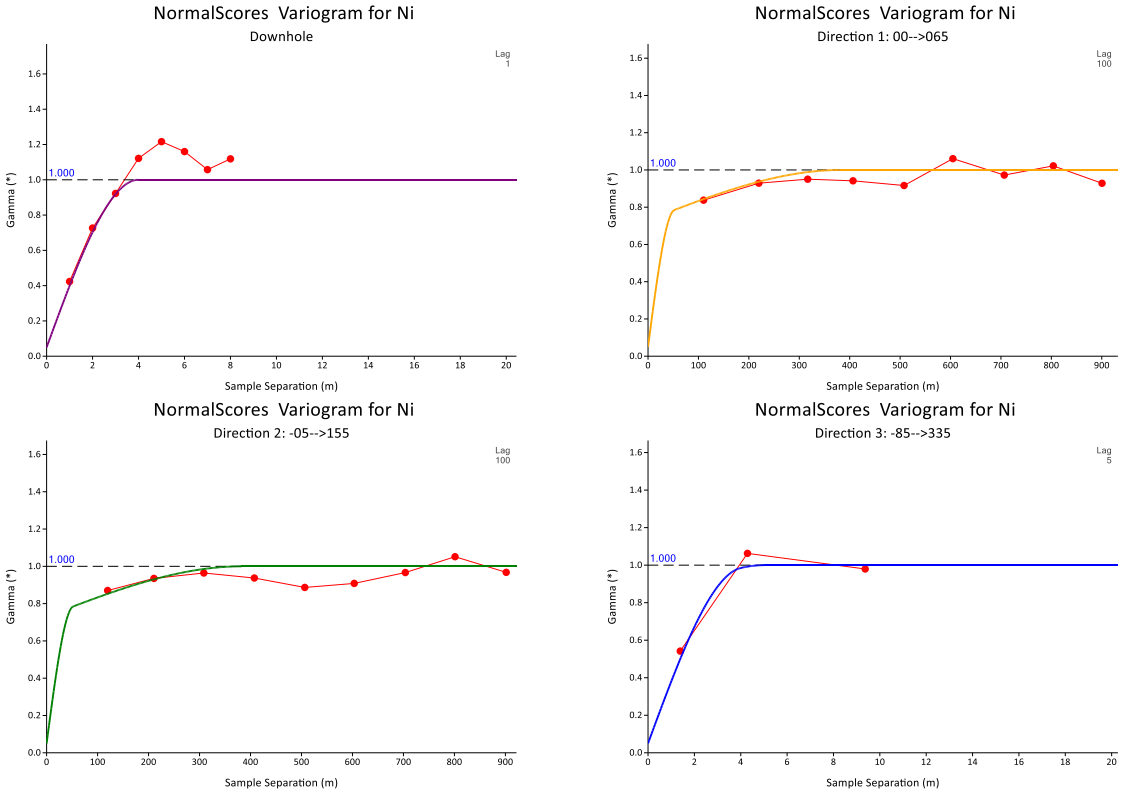


Figure 42 Variogram of Ni Saprolite in West100 Block

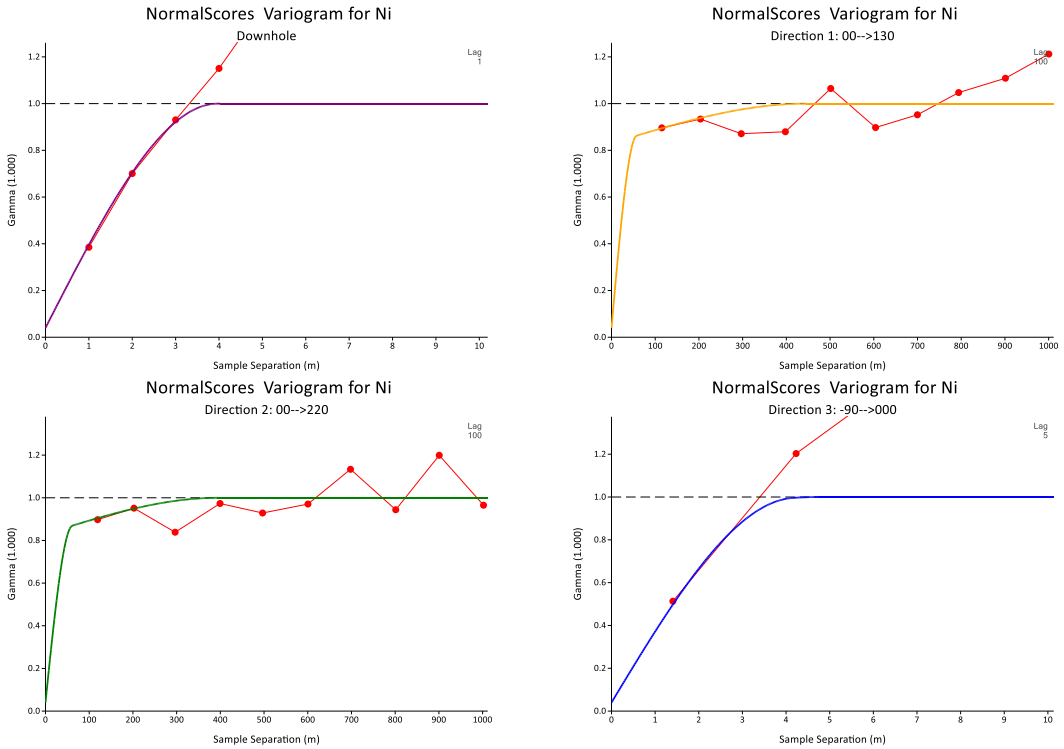


Figure 43 Variogram of Ni Saprolite in E100 Block

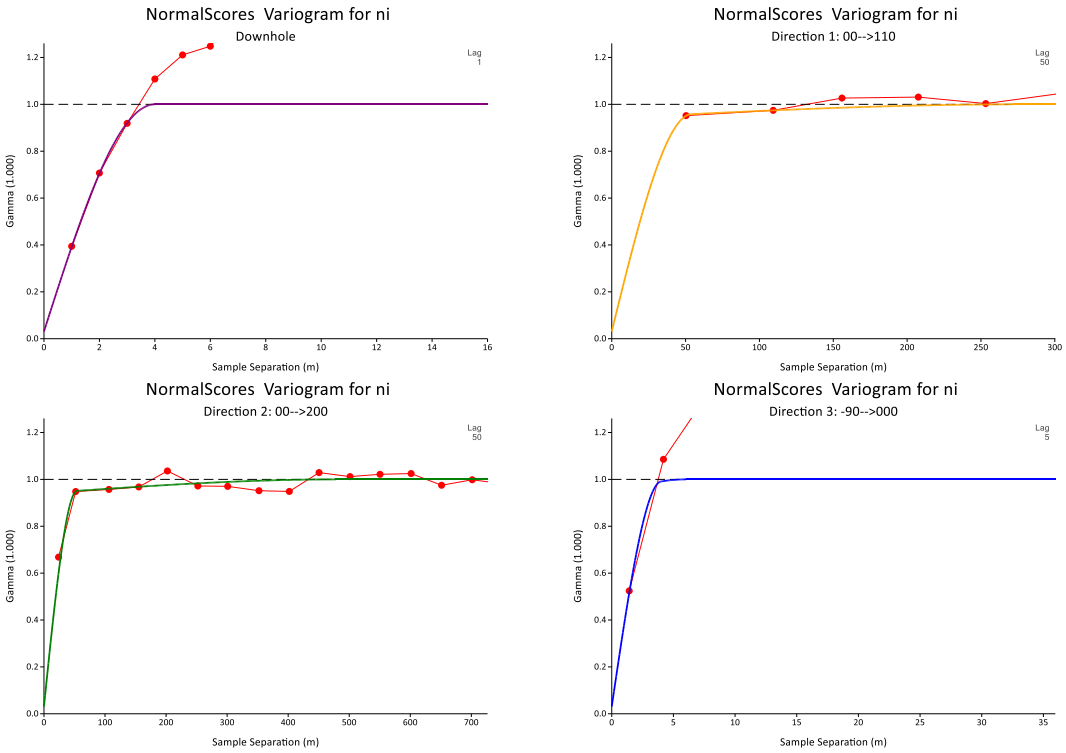


Figure 44 Variogram of Ni Saprolite in N50 Block

For details of the variography analysis see Appendix 9.

6.4.2 Kriging Neighbourhood Analysis (KNA)

The smoothing effect by Ordinary Kriging is the main source of conditional bias. To minimize the conditional bias, quantitative Kriging Neighbourhood Analysis (KNA) was performed to determine the optimum block size, number of samples, search ellipsoid ranges and discretization block on the selected variogram model. The Kriging efficiency and conditional bias slope is used to measure the degree of over smoothing in the local grade.

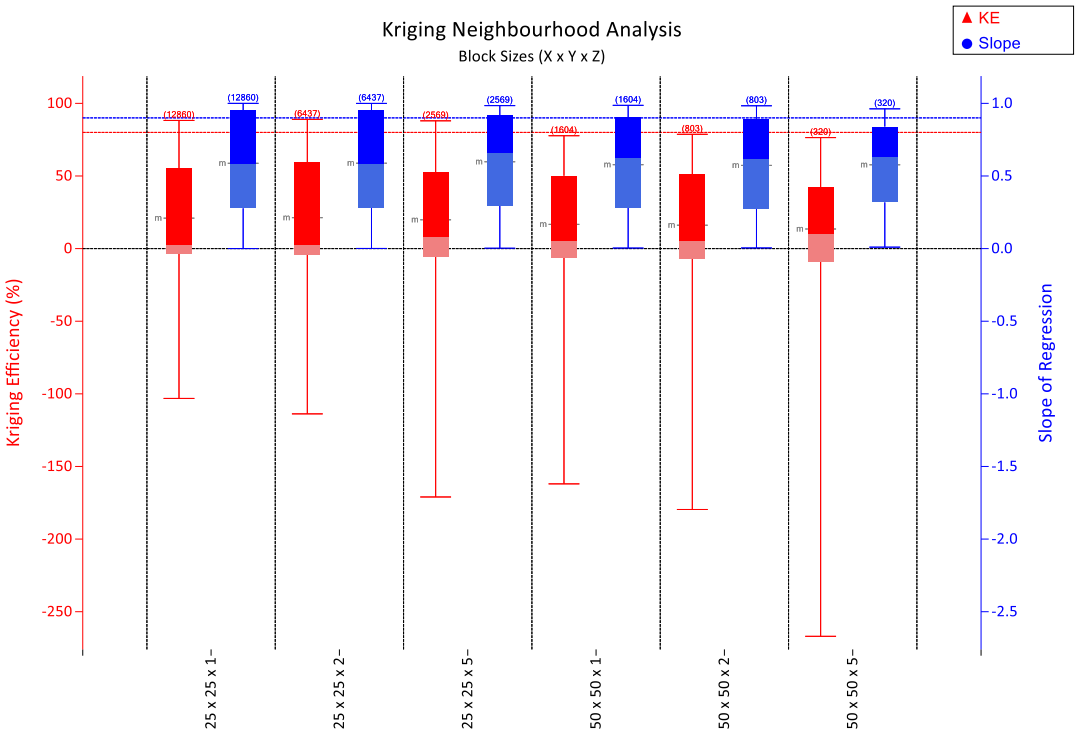


Figure 45 Example of KNA for optimum block size for saprolite in North50 Block

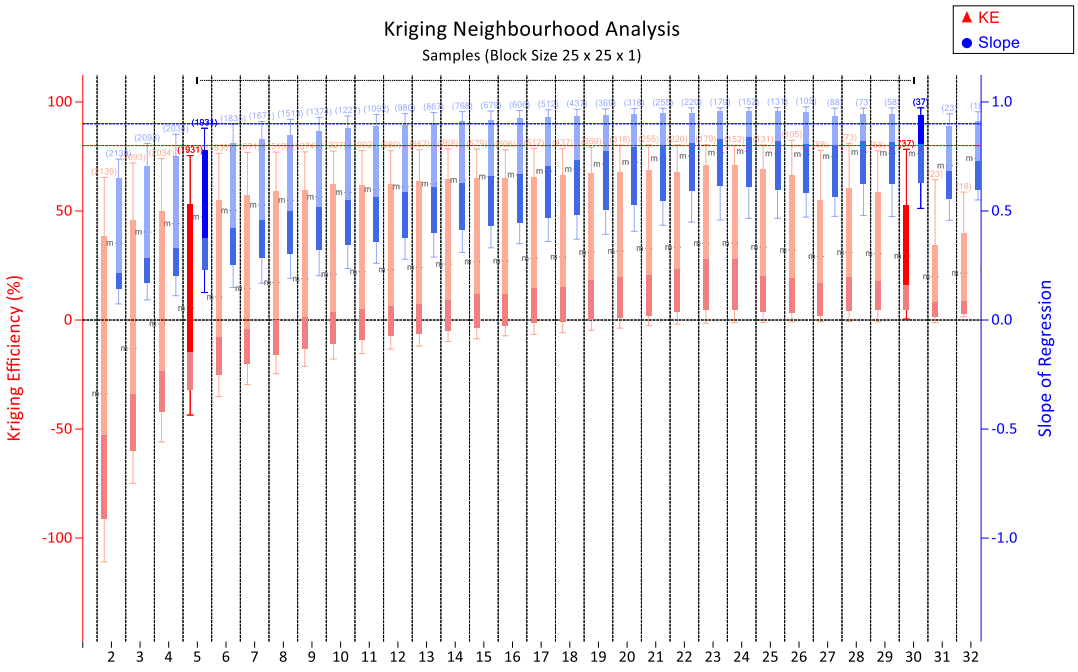


Figure 46 Example of KNA for optimum number of samples for saprolite in West100 Block

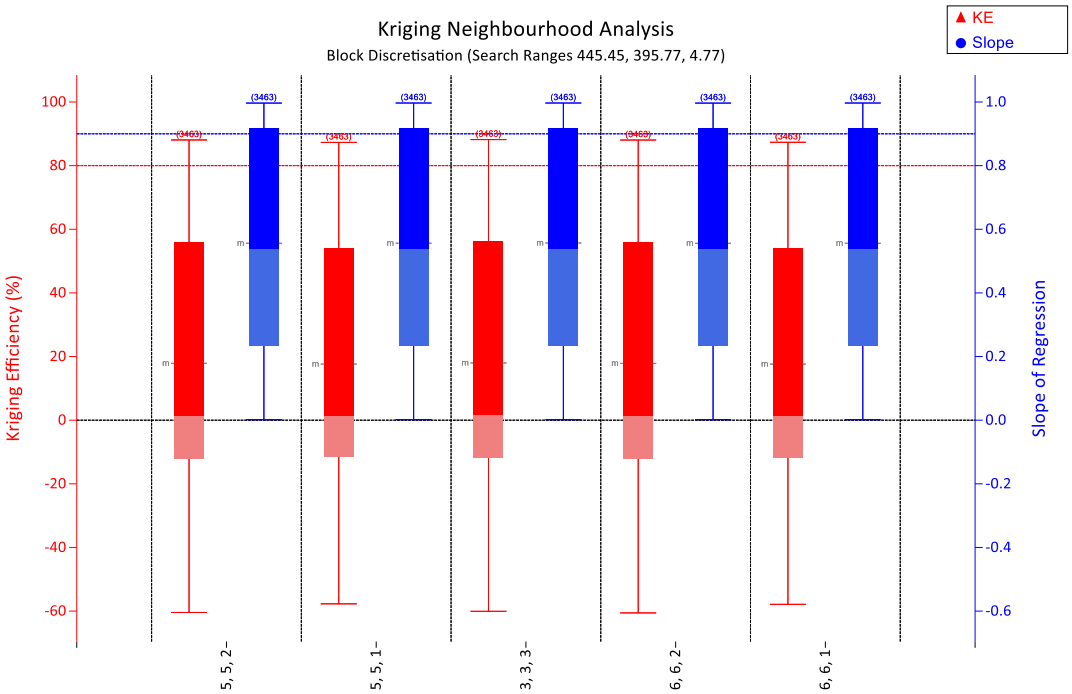


Figure 47 Example of KNA for optimum dicretization block for saprolite in East100 Block

The results of the discretization block study show that the size in each block does not have a significant difference, so the size of the discretization block used in all block models is 5x5x2m.

For details of the Kriging Neighbourhood Analysis see Appendix 9.

6.5 BLOCK MODEL

Three dimensional block models were constructed for the IMM project to cover all the interpreted generic lithological layers. A block model size of 25 x 25 x1 meter with no rotation has been selected for all blocks by considering the overall drill hole spacing which is mostly a 50m in the North Block and 100m in the West and East blocks.

The position of the block model centroid is placed as close as possible to the location of the drill hole collar in each block. No sub-blocking was applied to the parent block to reduce the grade bias in the Resource estimation. The percentages of material in each block from the interpreted geological wireframes has not been applied in the block model.

The attributes coded into the block models, including interpreted generic lithology, estimated grades and kriging estimation attributes are as shown in Table 26.

Table 25 Block model dimension

Type	Y	X	Z
Minimum Coordinates	9746184	282812.5	-20
Maximum Coordinates	9750259	291712.5	750
User Block Size	25	25	1
Min. Block Size	25	25	1
Rotation	0	0	0

Table 26 Block model attributes for all blocks

Attribute Name	Type	Decimals	Background	Description
al2o3_ok	Real	2	-99	OK interpolated grades for Aluminum Oxide (Al2O3%)
cao_ok	Real	2	-99	OK interpolated grades for Calcium Oxide (CaO%)
co_ok	Real	2	-99	OK interpolated grades for Cobalt (Co%)
cr2o3_ok	Real	2	-99	OK interpolated grades for Chromium Oxide (Cr2O3%)
density	Real	2	-99	Insitu lab density measurement (wet s.g)
block_id	Character	-	UNDEF	NORTH50, WEST100, EAST100
fe_ok	Real	2	-99	OK interpolated grades for Iron (Fe%)
lith_type	Character	-	UNDEF	Mud Upper, Mud Lower, Limonite Upper, Limonite Lower SAP, BRK
mgo_ok	Real	2	-99	OK interpolated grades for Magnesium Oxide (MgO%)
mno_ok	Real	2	-99	OK interpolated grades for Manganese Oxide (MnO%)
moisture_content	Real	2	-99	Moisture content (%) of core sample
ni_avd	Real	2	-99	Average Distance
ni_bvar	Real	2	-99	Block Variance
ni_cbs	Real	2	-99	Conditional Bias Slope
ni_keff	Real	2	-99	Kriging Efficiency
ni_kvar	Real	2	-99	Kriging Variance
ni_lag	Real	2	-99	Lagrange Multiplier
ni_negw	Integer	-	0	Number of Negative Weight
ni_ok	Real	2	-99	Estimated Ni
ni_pass	Integer	-	0	Kriging Pass 0=Undefined, 1=Pass 1, 2=Pass 2, 3=Pass 3, 4=Pass 4
ni_samples	Integer	-	0	No of sample kriging
p2o5_ok	Real	2	-99	OK interpolated grades for Phosphorus Pentoxide (P2O5%)
res_class	Character	-	UNDEF	MEASURED, INDICATED, INFERRED
sio2_ok	Real	2	-99	OK interpolated grades for Silica Oxide (SiO2%)
tio2_ok	Real	2	-99	OK interpolated grades for Titanium Oxide (TiO2%)

6.6 DENSITY AND MOISTURE

As discussed in section 4.7 of this report the results of Bulk Density measurements are not considered be representative of the laterite Density at IMM because it appears the samples dried during transportation from Papua to Jakarta. For this reason an assumed Bulk Density has been used for this Resource estimate, based on other nickel laterite projects in Indonesia. Moisture Content is also assumed to be similar to the sample measurements for Moisture Content shown in Table 15. The assumed Bulk Density and Moisture Content used in this Resource report are shown in Table 27.

Table 27 Assumed Bulk Density and Moisture Content

Laterite Layers	Assumed Bulk density (g/cm3)	Moisture Content (%)
Limonite	1.8	41
Saprolite	1.6	35

6.7 GRADE ESTIMATION

Ordinary Kriging grade estimate has been applied for Ni, Co, Fe, MgO, SiO_2, $Cr2O_3$, and Cr for all domains. The number of samples, search radius and dicretization block for each domain were taken from block size analysis results. For the search radius, the drill hole spacing was considered by taking into account the ratio of the ellipsoid produced from the variography analysis. Several run tests (passes) have been applied to the grade estimate to cover all the laterite domains in the block model. The first search radius (pass 1) was 1.5 times of the average drill hole spacing distance and then multiplied by 2 for the subsequent passes.

Table 28 Example of grade estimation for 50x50m drill hole grid

Parameter	Saprolite (Ni)				
	Pass 1	Pass 2	Pass 3	Pass 4	Pass 5
Minimum Sample	6	4	2	1	1
Maximum Sample	40				
Max. Search Radius	75	150	300	600	1200
Max. Vertical Distance	2	3	7	13	26
Bearing	110				
Plunge	0				
Dip	0				
Major/Semi-major 1	1.000				
Major/Semi-major 2	0.58				
Major/Minor 1	13.5				
Major/Minor 2	46.0				
Nugget	0.03				
Structure 1	0.91				
Structure 2	0.06				
Range 1	54				
Range 2	276				
Block Discretization	5 X 5 X 2				

Table 29 Example of grade estimation for 100x100m drill hole grid

Parameter	Saprolite (Ni)				
	Pass 1	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 5**
Minimum Sample	4	4	2	1	1
Maximum Sample	40				
Max. Search Radius	150	300	600	1200	2000
Max. Vertical Distance	2	4	7	14	23
Bearing	65				
Plunge	0				
Dip	0				
Major/Semi-major 1	1.00				
Major/Semi-major 2	1.00				
Major/Minor 1	13.0				
Major/Minor 2	85.2				
Nugget	0.052				
Structure 1	0.683				
Structure 2	0.265				
Range 1	52				
Range 2	426				
Block Discretization	5 X 5 X 2				

For details on grade estimation see Appendix 9.

6.8 BLOCK MODEL VALIDATION

The estimated block model was validated visually on the computer screen as well as by the statistical means.

The block model was compared with drill hole sample data on cross sections to verify the geological interpretation and estimated grades. Swath plots were used to visualize the statistical mean and magnitude of error between composite samples and the estimated grades.

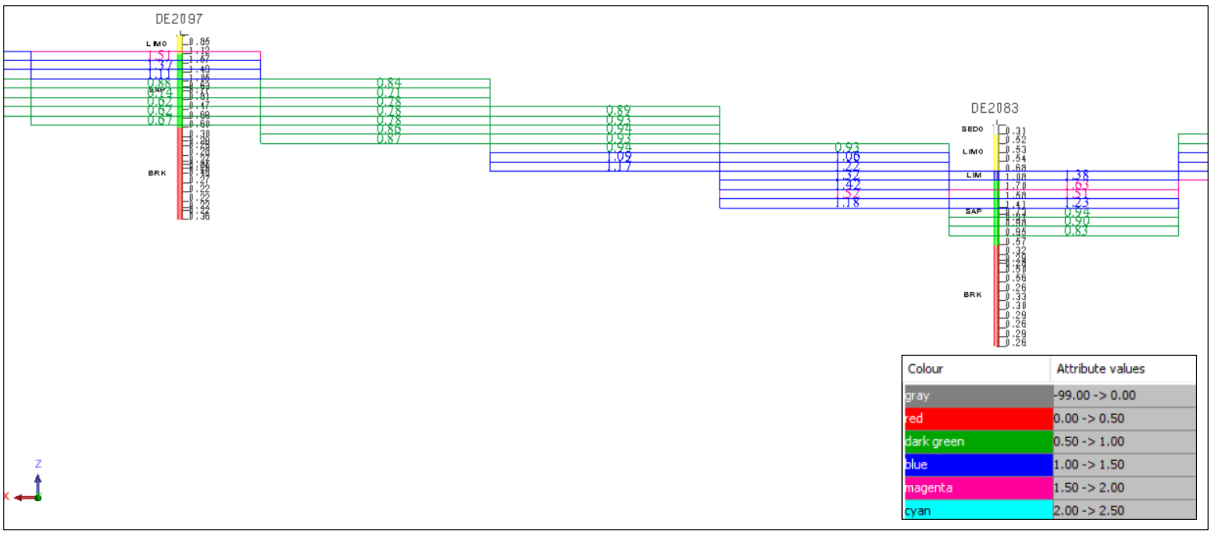
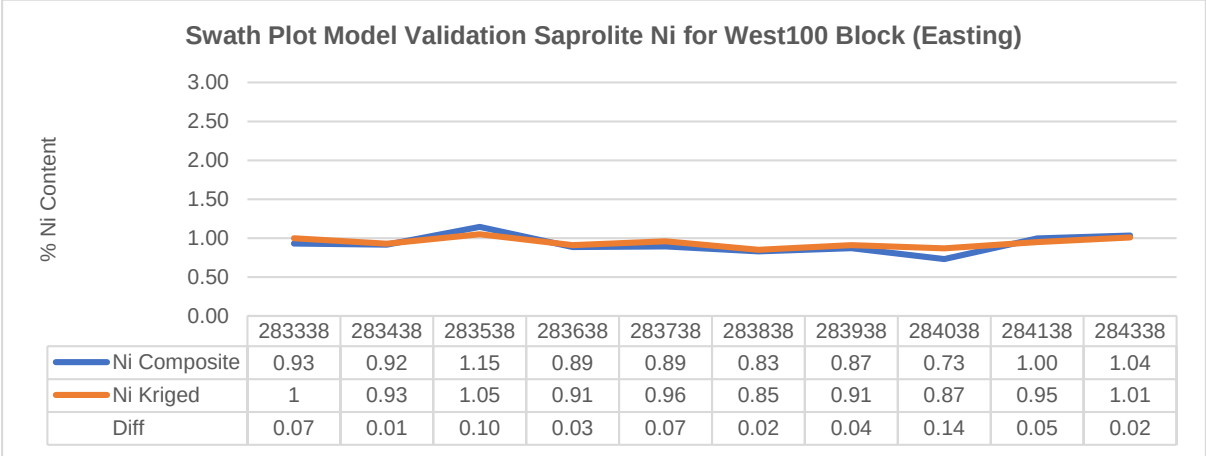


Figure 48 Example of block model validation for saprolite using visual method



	283338	283438	283538	283638	283738	283838	283938	284038	284138	284338
Ni Composite	0.93	0.92	1.15	0.89	0.89	0.83	0.87	0.73	1.00	1.04
Ni Kriged	1	0.93	1.05	0.91	0.96	0.85	0.91	0.87	0.95	1.01
Diff	0.07	0.01	0.10	0.03	0.07	0.02	0.04	0.14	0.05	0.02

Figure 49 Example of block model validation using swath plot

For more details regarding block model validation see Appendix 9.

6.9 RESOURCE CLASSIFICATION

The Mineral Resource has been classified on the basis of drill hole spacing grid, grade continuity with geostatistical considerations such as variogram range, Kriging variance and slope of regression.

The vast majority of the deposit is drilled in a 100x100m grid although in the northern part of the IUP, a 50x50m hole spacing grid has been drilled. At this time, the current drill hole spacing grid is considered to be insufficient to support Measured Resource categories.

The Kriging variance and slope of regression has been used to assess the confidence level of the estimation. Kriging variance less than 0.10 and slope of regression more than 0.80 has

been considered as high level confidence. A medium level of confidence has a Kriging variance between 0.10 and 0.40 and slope of regression between 0.20 and 0.80 which means coherent and spatially consistent with 50x50m drill spacing. Whereas low level confidence has Kriging variance higher than 0.40 and slope of regression less than 0.20 which means coherent and spatially consistent with 100x100m drill spacing.

Table 30 Kriging properties to assess the Resource classification at the IMM Project

Kriging Variance	Slope of Regression	Category
≤ 0.10	SOR ≥ 0.80	Measured
0.10 < x ≤ 0.40	0.20 ≤ x < 0.80	Indicated
> 0.40	SOR < 0.20	Inferred

The Mineral Resource also has been constrained by a boundary of 25m (half distance of 50x50m grid) from the drill hole location to determine the Indicated Resource category, any extrapolation beyond the boundary is considered as an Inferred Resource.

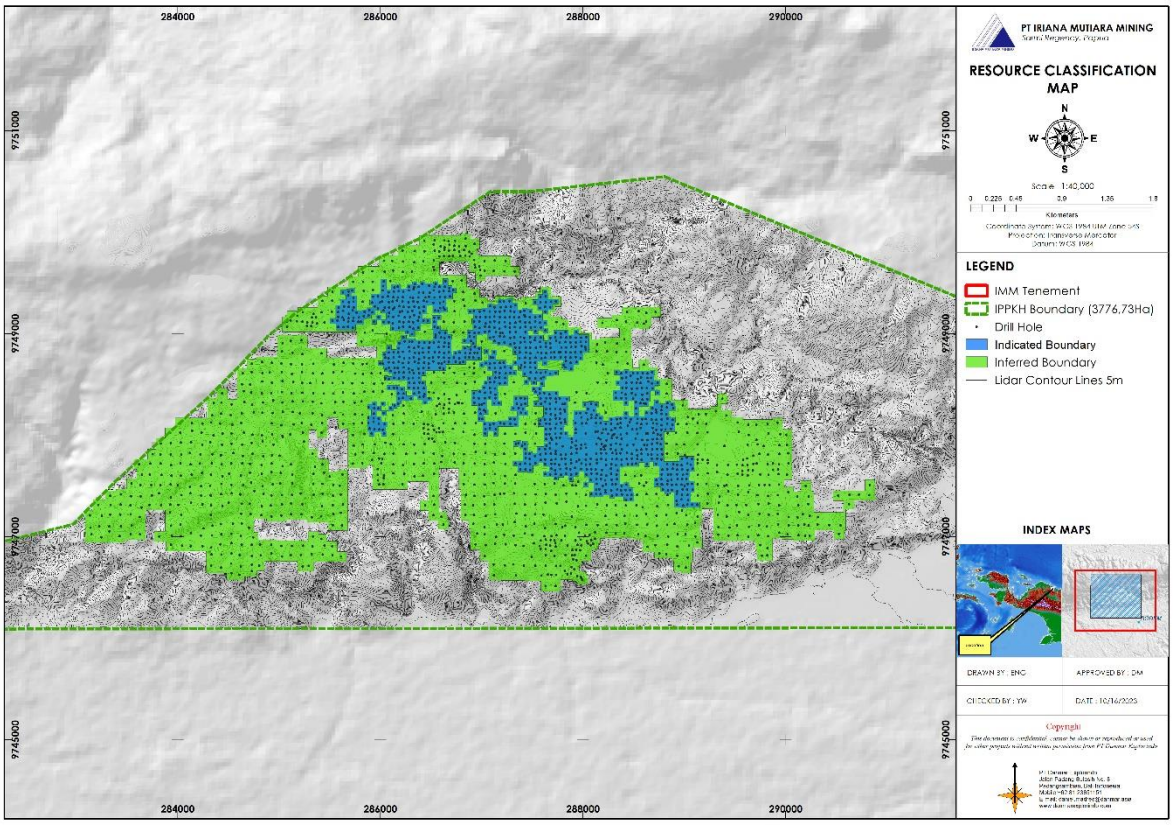


Figure 50 Resource classification map

6.10 STATEMENT OF MINERAL RESOURCES

This Mineral Resource estimate for the IMM Project has been completed using the data to the 1st October 2023. The Mineral Resource numbers have been rounded to reflect the relative accuracy of the estimate.

Table 31 shows the Mineral Resource estimation with a 0.5% nickel grade cut off applied.

Table 32, 33, 34, 35 and 36 show a breakdown of consecutive cut-off grades for the estmated Mineral Resource.

Table 31 Mineral Resource estimate for IMM Nickel Project

Block	Nickel Laterite	Resource Category	Wet Tonnes (million tons)	Dry Tonnes (million tons)	Ni %	Co %	Fe %	MgO %	SiO2 %	Al2O3 %	Cr2O3 %	TiO2 %	Nickel Metal (dry t)
North50	Limonite Upper	Indicated	14.8	**8.7**	0.79	0.10	50.54	0.93	3.73	5.18	3.78	0.14	68,986
		Inferred	9.2	**5.4**	0.76	0.10	50.48	0.99	3.80	5.16	3.86	0.15	41,113
		Total	**24.0**	**14.2**	**0.78**	**0.10**	**50.52**	**0.95**	**3.76**	**5.17**	**3.81**	**0.14**	**110,100**
	Limonite Lower	Indicated	5.2	**3.1**	1.26	0.10	35.12	11.47	19.25	3.00	2.50	0.06	39,111
		Inferred	3.3	**1.9**	1.14	0.09	34.05	11.24	20.02	3.43	2.56	0.09	21,900
		Total	**8.5**	**5.0**	**1.21**	**0.10**	**34.71**	**11.38**	**19.54**	**3.17**	**2.52**	**0.07**	**61,011**
	Saprolite	Indicated	15.0	**9.7**	1.10	0.03	12.00	29.00	38.53	0.90	0.89	0.02	107,132
		Inferred	8.4	**5.5**	1.01	0.03	12.39	28.50	38.39	1.11	0.91	0.03	55,066
		Total	**23.4**	**15.2**	**1.07**	**0.03**	**12.14**	**28.82**	**38.48**	**0.98**	**0.89**	**0.02**	**162,198**
	Total	Indicated	35.0	**21.6**	0.99	0.07	31.76	14.51	20.93	3.03	2.35	0.08	214,250
		Inferred	20.8	**12.8**	0.92	0.07	32.56	13.68	20.28	3.26	2.47	0.09	117,630
		Total	**55.9**	**34.4**	**0.97**	**0.07**	**32.06**	**14.20**	**20.68**	**3.11**	**2.40**	**0.08**	**331,879**
West100	Limonite Upper	Indicated	0.0	**0.0**	0.71	0.08	47.73	1.09	4.56	6.55	4.11	0.24	38
		Inferred	15.9	**9.4**	0.77	0.10	48.98	1.13	4.18	6.65	3.85	0.17	72,322
		Total	**15.9**	**9.4**	**0.77**	**0.10**	**48.98**	**1.13**	**4.18**	**6.65**	**3.85**	**0.17**	**72,360**
	Limonite Lower	Indicated	0.0	**0.0**	-	-	-	-	-	-	-	-	-
		Inferred	5.1	**3.0**	1.16	0.09	33.67	10.64	19.81	4.95	2.63	0.12	35,188
		Total	**5.1**	**3.0**	**1.16**	**0.09**	**33.67**	**10.64**	**19.81**	**4.95**	**2.63**	**0.12**	**35,188**
	Saprolite	Indicated	0.0	**0.0**	-	-	-	-	-	-	-	-	-
		Inferred	11.8	**7.7**	1.04	0.03	12.73	27.46	38.63	1.70	0.95	0.03	79,903
		Total	**11.8**	**7.7**	**1.04**	**0.03**	**12.73**	**27.46**	**38.63**	**1.70**	**0.95**	**0.03**	**79,903**
	Total	Indicated	0.0	**0.0**	0.71	0.08	47.73	1.09	4.56	6.55	4.11	0.24	38
		Inferred	32.9	**20.1**	0.93	0.07	33.57	12.07	18.99	4.61	2.62	0.11	186,598
		Total	**32.9**	**20.1**	**0.93**	**0.07**	**33.57**	**12.07**	**18.99**	**4.61**	**2.62**	**0.11**	**186,637**
East100	Limonite Upper	Indicated	0.0	**0.0**	-	-	-	-	-	-	-	-	-
		Inferred	17.5	**10.3**	0.75	0.10	49.59	1.01	4.70	6.00	3.66	0.21	77,737
		Total	**17.5**	**10.3**	**0.75**	**0.10**	**49.59**	**1.01**	**4.70**	**6.00**	**3.66**	**0.21**	**77,737**
	Limonite Lower	Indicated	0.0	**0.0**	-	-	-	-	-	-	-	-	-
		Inferred	5.7	**3.4**	1.14	0.09	34.37	10.96	19.57	4.15	2.58	0.12	38,111
		Total	**5.7**	**3.4**	**1.14**	**0.09**	**34.37**	**10.96**	**19.57**	**4.15**	**2.58**	**0.12**	**38,111**
	Saprolite	Indicated	0.0	**0.0**	-	-	-	-	-	-	-	-	-
		Inferred	14.7	**9.6**	1.05	0.03	11.36	29.14	39.09	1.25	0.85	0.03	100,064
		Total	**14.7**	**9.6**	**1.05**	**0.03**	**11.36**	**29.14**	**39.09**	**1.25**	**0.85**	**0.03**	**100,064**
	Total	Indicated	0.0	**0.0**	-	-	-	-	-	-	-	-	-
		Inferred	37.9	**23.2**	0.93	0.07	32.46	13.42	20.28	3.88	2.41	0.13	214,838
		Total	**37.9**	**23.2**	**0.93**	**0.07**	**32.46**	**13.42**	**20.28**	**3.88**	**2.41**	**0.13**	**214,838**
All Blocks	Limonite Upper	Indicated	14.8	**8.7**	0.79	0.10	50.54	0.93	3.73	5.18	3.78	0.14	69,024
		Inferred	42.6	**25.1**	0.76	0.10	49.55	1.05	4.31	6.06	3.77	0.18	191,173
		Total	**57.4**	**33.9**	**0.77**	**0.10**	**49.81**	**1.02**	**4.16**	**5.84**	**3.78**	**0.17**	**260,197**
	Limonite Lower	Indicated	5.2	**3.1**	1.26	0.10	35.12	11.47	19.25	3.00	2.50	0.06	39,111
		Inferred	14.1	**8.3**	1.14	0.09	34.04	10.91	19.76	4.28	2.59	0.11	95,199
		Total	**19.4**	**11.4**	**1.18**	**0.09**	**34.33**	**11.06**	**19.62**	**3.93**	**2.57**	**0.10**	**134,310**
	Saprolite	Indicated	15.0	**9.7**	1.10	0.03	12.00	29.00	38.53	0.90	0.89	0.02	107,132
		Inferred	34.9	**22.7**	1.04	0.03	12.07	28.42	38.76	1.37	0.90	0.03	235,033
		Total	**49.9**	**32.4**	**1.06**	**0.03**	**12.05**	**28.59**	**38.69**	**1.23**	**0.90**	**0.03**	**342,165**
	Total	Indicated	35.0	**21.6**	0.99	0.07	31.77	14.50	20.92	3.03	2.35	0.08	214,289
		Inferred	91.5	**56.1**	0.93	0.07	32.88	13.00	19.82	4.00	2.50	0.12	519,104
		Total	**126.6**	**77.7**	**0.94**	**0.07**	**32.57**	**13.41**	**20.12**	**3.73**	**2.46**	**0.10**	**733,290**

Table 32 Limonite Upper estimated Resource cut-off breakdown

LIMONITE UPPER - MINERAL RESOURCE ESTIMATE															
GRADE CUT-OFF RANGE	MINERAL RESOURCE		XRF (DRY ANALYSIS)										Moisture Content (%)	Relative Density (sg Wet)	Nickel Metal (tons)
	MILLION TONNES (Wet)	MILLION TONNES (Dry)	Ni %	Co %	Fe %	Fe2O3 %	MgO %	SiO2 %	SM Ratio	Al2O3 %	Cr2O3 %	TiO2 %			
>0.5	57.4	33.9	0.77	0.10	49.81	1.02	4.16	5.84	3.78	0.17	3.76	0.17	41.00	1.80	260,197
>0.6	51.6	30.5	0.79	0.10	49.96	71.43	1.03	4.03	3.92	5.71	3.77	0.16	41.00	1.80	241,378
>0.7	38.6	22.8	0.84	0.10	50.08	71.60	1.05	3.93	3.76	5.54	3.77	0.15	41.00	1.80	191,542
>0.8	22.5	13.3	0.91	0.11	50.16	71.71	1.09	3.87	3.56	5.38	3.74	0.14	41.00	1.80	120,714
>0.9	10.0	5.9	0.99	0.11	50.12	71.66	1.16	3.95	3.40	5.20	3.74	0.13	41.00	1.80	58,843
>1.0	3.7	2.2	1.09	0.12	50.09	71.62	1.24	4.00	3.22	4.90	3.78	0.12	41.00	1.80	24,023
>1.1	1.3	0.8	1.20	0.13	49.96	71.43	1.36	4.19	3.09	4.72	3.79	0.11	41.00	1.80	9,082
>1.2	0.5	0.3	1.31	0.13	49.88	71.32	1.46	4.43	3.03	4.50	3.76	0.10	41.00	1.80	3,653
>1.3	0.2	0.1	1.43	0.14	49.68	71.03	1.63	4.77	2.92	4.07	3.85	0.09	41.00	1.80	1,508
>1.4	0.1	0.1	1.51	0.13	49.77	71.16	1.59	4.81	3.03	3.93	3.86	0.08	41.00	1.80	850
>1.5	0.0	0.0	1.62	0.13	49.24	70.41	1.82	5.11	2.81	3.65	4.14	0.08	41.00	1.80	365
>1.6	0.0	0.0	1.70	0.13	49.23	70.39	1.79	5.29	2.96	3.69	4.09	0.08	41.00	1.80	192
>1.7	0.0	0.0	1.77	0.14	48.79	69.76	1.82	5.55	3.06	3.51	4.31	0.08	41.00	1.80	70
>1.8	0.0	0.0	1.81	0.13	48.83	69.82	1.67	4.31	2.59	4.14	4.70	0.08	41.00	1.80	36
>1.9															
>2.0															
>2.1															
>2.2															
>2.3															
>2.4															

Table 33 Limonite Lower estimated Resource cut-off breakdown

LIMONITE LOWER - MINERAL RESOURCE ESTIMATE															
GRADE CUT-OFF RANGE	MINERAL RESOURCE		XRF (DRY ANALYSIS)										Moisture Content (%)	Relative Density (sg Wet)	Nickel Metal (tons)
	MILLION TONNES (Wet)	MILLION TONNES (Dry)	Ni %	Co %	Fe %	Fe2O3 %	MgO %	SiO2 %	SM Ratio	Al2O3 %	Cr2O3 %	TiO2 %			
>0.5	19.4	11.4	1.18	0.09	34.33	49.09	11.06	19.62	1.77	3.93	2.57	0.10	41.00	1.80	134,310
>0.6	19.2	11.3	1.18	0.09	34.38	49.15	11.06	19.60	1.77	3.92	2.57	0.10	41.00	1.80	133,835
>0.7	18.7	11.0	1.19	0.09	34.39	49.17	11.08	19.62	1.77	3.90	2.56	0.10	41.00	1.80	131,975
>0.8	18.0	10.6	1.21	0.09	34.42	49.22	11.07	19.61	1.77	3.87	2.56	0.10	41.00	1.80	128,571
>0.9	16.7	9.9	1.24	0.09	34.41	49.19	11.18	19.62	1.75	3.80	2.54	0.09	41.00	1.80	122,461
>1.0	14.5	8.6	1.28	0.09	34.29	49.03	11.38	19.75	1.74	3.66	2.51	0.09	41.00	1.80	110,043
>1.1	11.9	7.0	1.34	0.10	34.12	48.79	11.52	19.86	1.72	3.51	2.48	0.08	41.00	1.80	94,145
>1.2	9.3	5.5	1.39	0.10	33.91	48.49	11.63	20.07	1.73	3.38	2.45	0.07	41.00	1.80	76,386
>1.3	6.5	3.9	1.45	0.10	33.70	48.18	11.76	20.40	1.73	3.24	2.42	0.07	41.00	1.80	55,962
>1.4	3.9	2.3	1.53	0.10	33.64	48.10	11.75	20.71	1.76	3.13	2.39	0.07	41.00	1.80	34,988
>1.5	2.0	1.2	1.61	0.10	33.43	47.80	11.73	21.01	1.79	3.09	2.36	0.07	41.00	1.80	18,886
>1.6	0.9	0.5	1.70	0.11	32.92	47.07	11.84	21.50	1.82	2.94	2.32	0.06	41.00	1.80	8,645
>1.7	0.4	0.2	1.79	0.12	32.31	46.20	12.17	22.52	1.85	2.53	2.27	0.05	41.00	1.80	3,781
>1.8	0.1	0.1	1.92	0.12	32.21	46.06	12.17	22.77	1.87	2.30	2.18	0.04	41.00	1.80	1,247
>1.9	0.0	0.0	2.02	0.12	30.42	43.49	13.10	24.10	1.84	2.23	2.04	0.04	41.00	1.80	589
>2.0	0.0	0.0	2.09	0.12	29.60	42.33	13.53	25.02	1.85	2.07	2.00	0.03	41.00	1.80	306
>2.1	0.0	0.0	2.27	0.11	28.10	40.18	15.48	25.51	1.65	1.79	1.71	0.04	41.00	1.80	90
>2.2	0.0	0.0	2.40	0.15	24.27	34.71	18.47	26.18	1.42	1.10	1.64	0.04	41.00	1.80	48
>2.3	0.0	0.0	2.40	0.15	24.27	34.71	18.47	26.18	1.42	1.10	1.64	0.04	41.00	1.80	48
>2.4	0.0	0.0	2.50	0.15	23.99	34.30	18.85	27.37	1.45	1.08	1.63	0.04	41.00	1.80	17
>2.5	0.0	0.0	2.50	0.15	23.99	34.30	18.85	27.37	1.45	1.08	1.63	0.04	41.00	1.80	17

Table 34 Limonite combined estimated Resource cut-off breakdown

LIMONITE COMBINED - MINERAL RESOURCE ESTIMATE															
GRADE CUT-OFF RANGE	MINERAL RESOURCE		XRF (DRY ANALYSIS)										Moisture Content (%)	Relative Density (sg Wet)	Nickel Metal (tons)
	MILLION TONNES (Wet)	MILLION TONNES (Dry)	Ni %	Co %	Fe %	Fe2O3 %	MgO %	SiO2 %	SM Ratio	Al2O3 %	Cr2O3 %	TiO2 %			
>0.5	76.7	45.3	0.87	0.10	45.91	65.64	5.90	9.31	1.58	1.12	3.46	0.15	41.00	1.80	394,507
>0.6	70.8	41.8	0.90	0.10	45.74	65.39	3.75	8.25	2.20	5.23	3.45	0.15	41.00	1.80	375,213
>0.7	57.3	33.8	0.96	0.10	44.95	64.27	4.32	9.05	2.10	5.01	3.37	0.13	41.00	1.80	323,516
>0.8	40.5	23.9	1.04	0.10	43.17	61.73	5.52	10.85	1.97	4.71	3.21	0.12	41.00	1.80	249,285
>0.9	26.8	15.8	1.15	0.10	40.29	57.61	7.43	13.75	1.85	4.32	2.99	0.11	41.00	1.80	181,304
>1.0	18.2	10.8	1.25	0.10	37.52	53.65	9.31	16.53	1.78	3.91	2.77	0.09	41.00	1.80	134,066
>1.1	13.2	7.8	1.32	0.10	35.66	50.99	10.54	18.34	1.74	3.63	2.61	0.08	41.00	1.80	103,226
>1.2	9.8	5.8	1.39	0.10	34.68	49.59	11.13	19.31	1.73	3.43	2.51	0.08	41.00	1.80	80,039
>1.3	6.7	4.0	1.45	0.10	34.12	48.79	11.49	19.98	1.74	3.26	2.46	0.07	41.00	1.80	57,470
>1.4	4.0	2.3	1.53	0.10	34.03	48.66	11.50	20.33	1.77	3.15	2.43	0.07	41.00	1.80	35,838
>1.5	2.0	1.2	1.61	0.10	33.73	48.23	11.54	20.71	1.79	3.10	2.39	0.07	41.00	1.80	19,251
>1.6	0.9	0.5	1.70	0.11	33.27	47.57	11.62	21.15	1.82	2.96	2.36	0.06	41.00	1.80	8,837
>1.7	0.4	0.2	1.79	0.12	32.62	46.63	11.98	22.21	1.85	2.55	2.31	0.05	41.00	1.80	3,852
>1.8	0.1	0.1	1.91	0.12	32.71	46.77	11.86	22.22	1.87	2.36	2.26	0.04	41.00	1.80	1,283
>1.9															
>2.0															
>2.1															
>2.2															
>2.3															
>2.4															

Table 35 Saprolite estimated Resource cut-off breakdown

SAPROLITE - MINERAL RESOURCE ESTIMATE															
GRADE CUT-OFF RANGE	MINERAL RESOURCE		XRF (DRY ANALYSIS)										Moisture Content (%)	Relative Density (sg Wet)	Nickel Metal (tons)
	MILLION TONNES (Wet)	MILLION TONNES (Dry)	Ni %	Co %	Fe %	Fe2O3 %	MgO %	SiO2 %	SM Ratio	Al2O3 %	Cr2O3 %	TiO2 %			
>0.5	49.9	32.4	1.06	0.03	12.05	17.23	28.59	38.69	1.35	1.23	0.90	0.03	35.00	1.60	342,165
>0.6	49.2	32.0	1.06	0.03	12.09	17.28	28.55	38.67	1.35	1.23	0.90	0.03	35.00	1.60	339,799
>0.7	47.4	30.8	1.08	0.03	12.14	17.35	28.49	38.63	1.36	1.23	0.90	0.03	35.00	1.60	332,295
>0.8	43.3	28.1	1.11	0.03	12.22	17.47	28.40	38.56	1.36	1.22	0.90	0.03	35.00	1.60	312,172
>0.9	37.2	24.2	1.15	0.03	12.32	17.61	28.30	38.46	1.36	1.21	0.91	0.03	35.00	1.60	278,455
>1.0	29.1	18.9	1.21	0.03	12.46	17.82	28.14	38.32	1.36	1.20	0.92	0.03	35.00	1.60	228,527
>1.1	20.0	13.0	1.28	0.03	12.62	18.04	27.91	38.20	1.37	1.19	0.93	0.03	35.00	1.60	167,365
>1.2	12.8	8.3	1.36	0.03	12.81	18.31	27.57	38.09	1.38	1.20	0.94	0.02	35.00	1.60	113,594
>1.3	7.6	5.0	1.45	0.03	13.01	18.60	27.23	37.97	1.39	1.19	0.95	0.02	35.00	1.60	71,930
>1.4	4.2	2.7	1.53	0.03	13.34	19.07	26.64	37.88	1.42	1.21	0.97	0.02	35.00	1.60	41,813
>1.5	2.2	1.4	1.62	0.04	13.46	19.25	26.37	37.81	1.43	1.20	0.97	0.02	35.00	1.60	22,934
>1.6	1.0	0.7	1.71	0.04	13.44	19.22	26.25	37.71	1.44	1.18	0.96	0.02	35.00	1.60	11,309
>1.7	0.4	0.3	1.80	0.04	13.82	19.76	25.88	37.38	1.44	1.13	0.97	0.02	35.00	1.60	5,255
>1.8	0.2	0.1	1.89	0.04	13.91	19.89	25.83	36.94	1.43	1.08	0.98	0.02	35.00	1.60	2,249
>1.9	0.1	0.0	1.99	0.04	14.21	20.32	25.28	36.56	1.45	1.08	1.01	0.02	35.00	1.60	789
>2.0	0.0	0.0	2.08	0.04	14.00	20.02	24.95	36.69	1.47	1.17	1.04	0.02	35.00	1.60	324
>2.1	0.0	0.0	2.14	0.03	13.07	18.69	25.64	37.04	1.44	1.32	1.00	0.03	35.00	1.60	139
>2.2	0.0	0.0	2.33	0.04	19.04	27.22	16.92	36.42	2.15	1.56	1.35	0.04	35.00	1.60	15
>2.3	0.0	0.0	2.33	0.04	19.04	27.22	16.92	36.42	2.15	1.56	1.35	0.04	35.00	1.60	15
>2.4															

Table 36 Nickel laterite Resource cut-off breakdown

LIMONITE UPPER, LIMONITE LOWER AND SAPROLITE - MINERAL RESOURCE ESTIMATE															
GRADE CUT-OFF RANGE	MINERAL RESOURCE		XRF (DRY ANALYSIS)										Moisture Content (%)	Relative Density (sg Wet)	Nickel Metal (tons)
	MILLION TONNES (Wet)	MILLION TONNES (Dry)	Ni %	Co %	Fe %	Fe2O3 %	MgO %	SiO2 %	SM Ratio	Al2O3 %	Cr2O3 %	TiO2 %			
>0.5	126.6	77.7	0.94	0.07	32.57	46.57	13.41	20.12	1.50	3.73	2.46	0.10	38.64	1.72	733,322
>0.6	120.0	73.8	0.97	0.07	31.95	45.68	13.91	20.72	1.49	3.59	2.40	0.10	38.54	1.72	712,137
>0.7	104.7	64.6	1.01	0.07	30.10	43.03	15.26	22.44	1.47	3.30	2.25	0.09	38.28	1.71	653,919
>0.8	83.7	52.0	1.08	0.06	27.17	38.85	17.34	25.18	1.45	2.91	2.02	0.07	37.90	1.70	560,641
>0.9	63.9	39.9	1.15	0.06	24.03	34.35	19.56	28.12	1.44	2.51	1.78	0.06	37.51	1.68	459,722
>1.0	47.3	29.7	1.22	0.06	22.13	31.64	20.88	29.92	1.43	2.24	1.63	0.05	37.31	1.68	362,832
>1.1	33.3	20.8	1.30	0.06	21.78	31.14	21.01	30.31	1.44	2.16	1.59	0.05	37.38	1.68	270,778
>1.2	22.6	14.1	1.37	0.06	22.28	31.85	20.46	29.96	1.46	2.16	1.62	0.05	37.60	1.69	193,708
>1.3	14.4	8.9	1.45	0.06	22.87	32.71	19.87	29.56	1.49	2.16	1.66	0.05	37.80	1.69	129,411
>1.4	8.2	5.1	1.53	0.07	23.41	33.47	19.28	29.34	1.52	2.15	1.68	0.05	37.92	1.70	77,643
>1.5	4.2	2.6	1.61	0.07	23.24	33.22	19.22	29.57	1.54	2.11	1.66	0.04	37.89	1.70	42,177
>1.6	1.9	1.2	1.71	0.07	22.65	32.38	19.46	30.03	1.54	2.00	1.61	0.04	37.78	1.69	20,143
>1.7	0.8	0.5	1.80	0.07	22.24	31.80	19.65	30.58	1.56	1.76	1.57	0.03	37.69	1.69	9,105
>1.8	0.3	0.2	1.90	0.07	21.11	30.18	20.47	31.30	1.53	1.57	1.47	0.03	37.30	1.68	3,533
>1.9	0.1	0.1	2.00	0.08	21.47	30.70	19.83	30.98	1.56	1.59	1.48	0.03	37.69	1.69	1,379
>2.0	0.0	0.0	2.09	0.08	21.92	31.35	19.15	30.76	1.61	1.63	1.52	0.03	38.05	1.70	630
>2.1	0.0	0.0	2.19	0.06	19.13	27.35	21.55	32.39	1.50	1.51	1.29	0.03	37.42	1.68	230
>2.2	0.0	0.0	2.38	0.12	23.08	33.00	18.12	28.52	1.57	1.21	1.57	0.04	39.63	1.75	63
>2.3	0.0	0.0	2.38	0.12	23.08	33.00	18.12	28.52	1.57	1.21	1.57	0.04	39.63	1.75	63
>2.4	0.0	0.0	2.50	0.15	23.99	34.30	18.85	27.37	1.45	1.08	1.63	0.04	41.00	1.80	17
>2.5	0.0	0.0	2.50	0.15	23.99	34.30	18.85	27.37	1.45	1.08	1.63	0.04	41.00	1.80	17

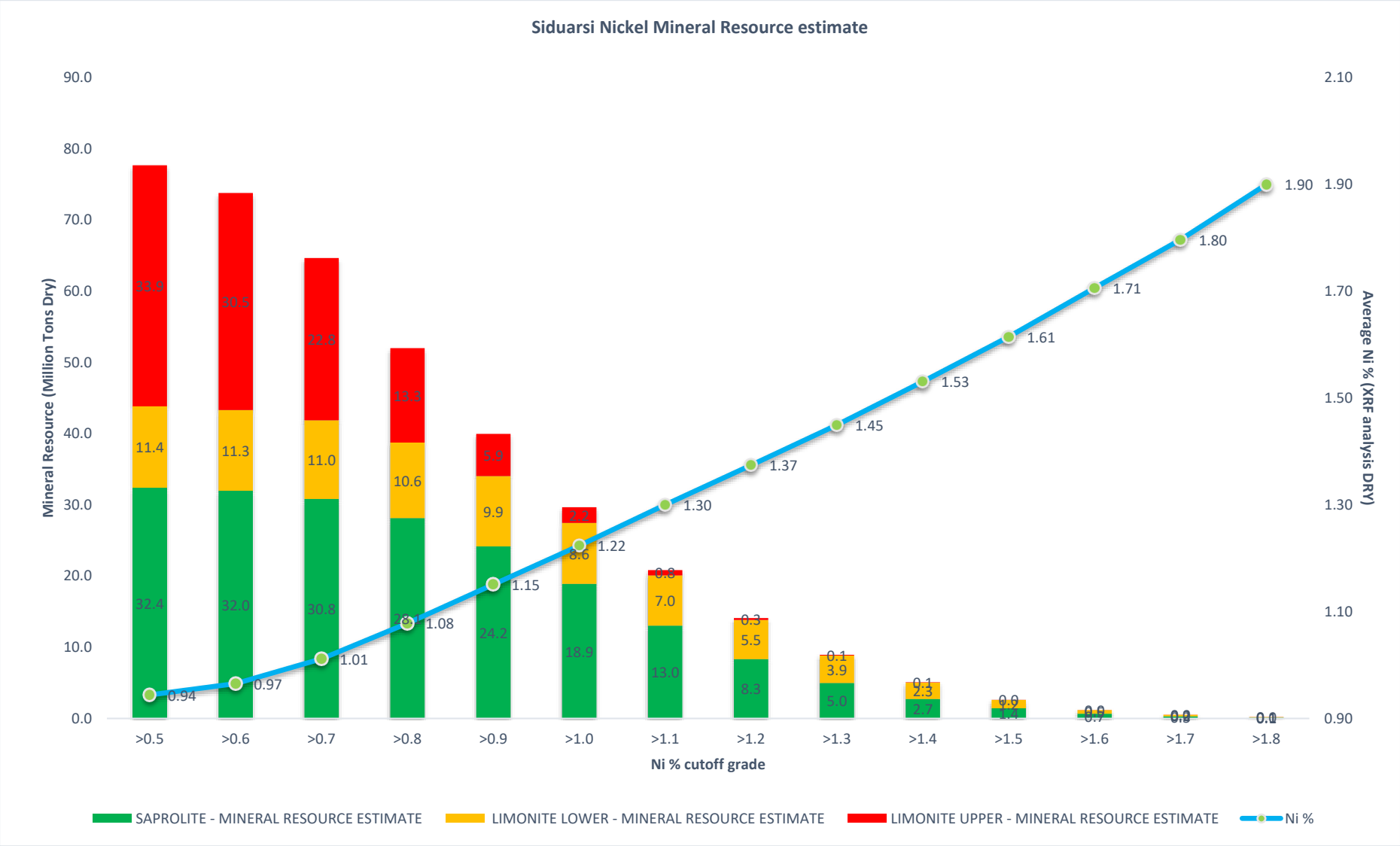


Figure 51 Nickel Resource grade tonnage chart

6.11 RISK AND OPPORTUNITIES

Systematic grid drilling spaced at 50m and 100m, the supportive data provided by Ultra GPR surveys and detailed core analyses, has greatly enhanced the confidence in the geological interpretation and resulting geological model at IMM.

The database has been validated and rechecked for errors. Drill holes, although all surveyed by ground RTK survey, have a significant misclose in terms of elevation with the airborn LiDAR survey elevation due to thick vegetation on the ground. For this reason drill collars have been draped onto the LiDAR topographic elevation to reduce potential error by assuming that the LiDAR elevation measurements are more accurate. As a result it is assumed that the geological model has relatively high confidence for the location accuracy of points of observation for the purpose of Indicated and Inferred Resource estimation.

The final geological models for Mud Upper, Mud Lower, Lim Upper, Lim Lower, Saprolite and Bedrock have been interpreted separately using lithological logs and analysis results so that all blocks in the geological model are correctly coded according to their occurrence in the laterite profile. For this reason, it is considered unlikely that any misallocation of lithology will have significant influence on the Nickel Resource.

Relative confidence in the laboratory analysis results is supported by proper quality assurance and quality control protocols including, sample blanks, sample standards and duplicate samples. Interlaboratory checks have not been included at this time which would be an important additional way to check assay accuracy. Detailed analysis of the Mud domains is recommented to investigate the potential for other minerals such as lithium and rare earth elements in mud volcano products and the laterite profile.

Geotechnical and hydrogeological conditions at IMM are a risk to the mining operation. High rainfall and steep topography require constant monitoring of drainage, batter slopes and ground stability. Moisture saturation of laterite must be monitored and minimized at all times so that pit and dump designs remain safe. This work is in progress but final reports have not been available during this Resource estimation study. Metalurgical studies are also underway and which may enhance prospects for eventual economic extraction of the laterite from this deposit.

Check modeling internally, using Ordinary Kriging (OK) and also a manual check of the Resource area multiplied by the average thickness of the laterite layers, using the same Resource boundaries adds confidence to the reliability of the Nickel Resource estimate.

The IMM nickel project is relatively remote and marine transportation of the ore to IWIP smelter on Halmahera Island, is more than 1,200km. However, the Resource is relatively close to the

coast where ship loading is possible and Nickel Industries Limited, who is currently earning a share in IMM, owns 4 smelters at IWIP that ensures that the ore can be marketed there.

6.12 EXPLORATION TARGETS

Exploration Targets, where nickel laterite has been identified by surface mapping and topography analysis, are recognized in the central, southwest and northwest part of the lease area. Figure 52 shows the Exploration Targets areas which are outside the Resource area. These Exploration Targets are in addition to the current Nickel Resource. Based on the available data nickel laterite targets of between 22-110 million tons, with similar nickel grades ranging from 0.7-1.1%, are postulated using average thickness of laterite and nickel grades from previous exploration data. Although it must be stated, that at this time, the potential quantity and grade is conceptual in nature and that there has been insufficient exploration to estimate a Mineral Resource. The northwest Exploration Target areas are also within a Protected Forest at this time. Although it is uncertain if further exploration will result in a Mineral Resource, the geological mapping within these Exploration Target areas by IMM and Nickel Industries geologists, provides greater confidence that further drilling and assay results will upgrade these areas for future Resource estimates. Table 37 shows the details of the Exploration Target areas.

Table 37 Exploration Targets at IMM

Exploration Target	Target Area (Ha)	LateriteThickness Assumtion		Estimate Wet Ton (Million)	
		Min (m)	Max (m)	Min (Mt)	Max (Mt)
Target 1	24	1	5	0.4	1.9
Target 2	31	1	5	0.5	2.5
Target 3	20	1	5	0.3	1.6
Target 4	350	1	5	5.6	28
Target 5	410	1	5	6.6	32.8
Target 6	539	1	5	8.6	43.1
Total	**1374**	**1**	**5**	**22**	**110**

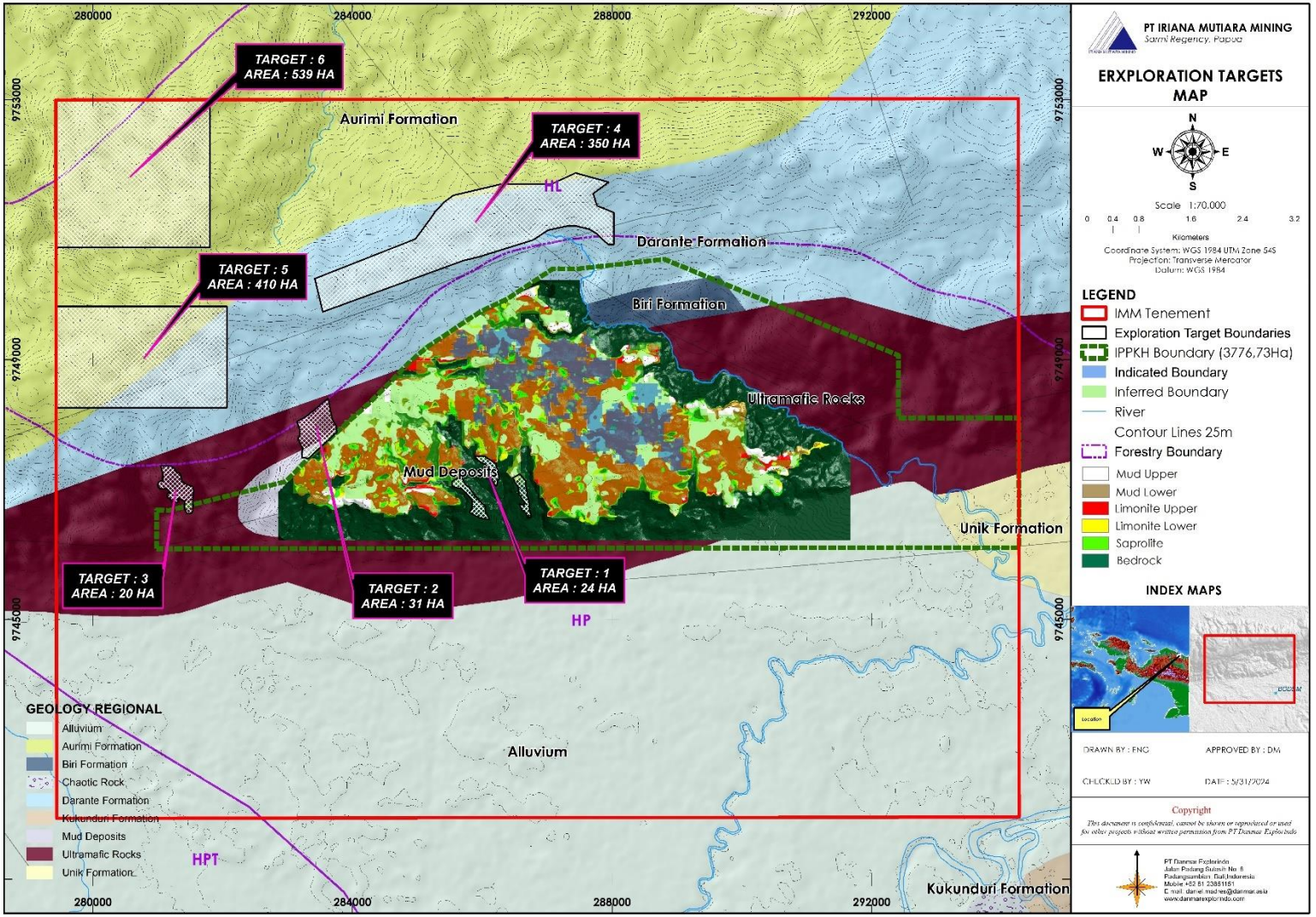


Figure 52 Exploration Target areas outside the current Resource area

6.0 CONCLUSIONS AND RECOMMENDATIONS

This Mineral Resource, covering 1,614ha, has been reported in compliance with the JORC Code of 2012, using only validated and compliant data.

The geology at the IMM project is characterized by relatively steep, disected terrain but has potential for nickel laterite deposits in areas where the topography is suitable. At this time 6 geological horizons have been identified where the laterite varies in distinct geochemical domains.

Drilling, Points of Observation are systematically and relatively evenly spread across current Resource areas. At this time most of the drilling is spaced at 50m and 100m grid intervals. Drill data, is well documented, with all drill collars surveyed and checked against LiDAR data. Although significant misclose between field survey measurements of drill collars with the LiDAR elevation have been identified, in some areas with thick vegetation, corrections have been made by draping the drill collar locations onto the LiDAR elevation. Despite this correction the drill data used in this report is considered to be of reasonable quality and reliability and appropriate for use in this Mineral Resource estimation of Indicated and Inferred status. Future Resource estimates will need to further enhance the digital terrain model of the area to be certain that the elevations used are as accurate as possible.

Quality Assurance and Quality Control team at the PT Geoservices Assay Laboratory is also appropriate, with the precision and accuracy within acceptable limits that is suitable for inclusion in this estimation of Mineral Resources for the JORC Compliant Report for PT IMM. It is recommended that Density and Total Moisture sampling be included in future exploration programs as well as interlaboratory sample checking to provide additional confidence to the analyses results in the future.

Geotechnical and hydrogeological conditions must be closely monitored and managed so that pits and dump designs remain safe.

Potential offtake agreements, to provide Saprolite and Limonite ore to the IWIP smelter, owned by Nickel Industries, ensures potential economic extraction of nickel ore into the foreseeable future from the project area but a detailed feasibility study will be required to determine the economic viabilty of the transportation logistics.

Exploration Targets covering more than 1,300ha have potential for 22-110 million wet metric tons and nickel grades ranging from 0.7-1.1%, of additional laterite product in a similar geological environment. Although it is uncertain if further exploration will result in a Mineral Resource, the historical mapping in these areas gives confidence that future exploration will upgrade at least some of these areas for future Resource estimates with similar nickel grades.

To maximize the Nickel Resource potential of the IMM project, a combination of Ultra GPR surveys followed by systematic drilling, optimized to focus on the GPR targets, is recommended to cover the entire nickel laterite areas. Infill drilling will also enhance the detail of the Resource and facilitate the upgrade to Measured and Indicated status.

8.0 REFERENCES

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APPENDIX

1) TABLE 1 OF THE JORC COMMITTEE
2) PT IRIANA MUTIARA MINING LEASE DOCUMENTS & COMMERCIAL TERMS OF NIC & IMM AGREEMENT
3) PT IMM SOCIAL IMPACT ASSESSMENT
4) FORESTRY PERMITS
5) PT GEOSERVICES QA/QC REPORTS
6) IMM GEOTECHNICAL ANALYSIS RESULTS
7) IMM METALLURGICAL TEST RESULTS
8) LiDAR SURVEY REPORT
9) IMM BLOCK MODEL DOCUMENTATION
10) RESUME: DANIEL MADRE, TOBIAS MAYA, YORRIS WIBRIANA, HARMAN ADHITYO

APPENDIX 1

TABLE 1 OF THE JORC CODE

JORC Code, 2012 Edition – Table 1 report template

Section 1 Sampling Techniques and Data

(Criteria in this section apply to all succeeding sections.)

Criteria	JORC Code explanation	Commentary
Sampling techniques	• *Nature and quality of sampling (eg cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc). These examples should not be taken as limiting the broad meaning of sampling.* • *Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.* • *Aspects of the determination of mineralisation that are Material to the Public Report.* • *In cases where 'industry standard' work has been done this would be relatively simple (eg 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30 g charge for fire assay'). In other cases more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (eg submarine nodules) may warrant disclosure of detailed information.*	• HQ core samples taken from 2,078 holes in 1m intervals and all core photographed and filed as a reference. 33,184 samples analysed to represent the deposit quality. • All drilling to date is on a systematic 100 X 100m grid over GPR targets. North Block has 50X50m infill grid over higher grade assay results. For this reason, the estimate has been classified as an Indicated Resource and Inferred Resource at this time. Future infill drilling will be required to raise confidence to estimate additional Indicated and Measured Resources. • High confidence in the laboratory analyses results are supported by rigorous quality assurance and quality control protocols including; sample blanks, sample standards and duplicate samples. • Whole cores were packed in plastics and sent to PT Geoservices lab for XRF analysis and QA/QC complying with ISO 17025-2017.
Drilling techniques	• *Drill type (eg core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc) and details (eg core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc).*	• HQ wireline triple tube coring in 1m runs to ensure accurate measurement of core expansion (swelling) and recovery. • Vertical drilling was appropriate as laterite is basically a horizontal deposit and core orientation is not required.
Drill sample recovery	• *Method of recording and assessing core and chip sample recoveries and results assessed.* • *Measures taken to maximise sample recovery and ensure representative nature of the samples.* • *Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material.*	• Full coring used and core recovery data collected for all runs (33,066m of drilling). Core recoveries also documented by photography. • Minimum 95% recovery maintained for all holes. • If 3 consecutive runs are less than 95% the hole was re-drilled. • Some lower recoveries in silica boxwork zones were tolerated due to geological conditions but overall drilling conditions are relatively good and recoveries remain consistently high.
Logging	• *Whether core and chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical*	• 100% of laterite layers drilled have been logged and photographed in drilling to date. • Logging includes core recoveries and core swelling measurements

Criteria	JORC Code explanation	Commentary
	studies. • *Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography.* • *The total length and percentage of the relevant intersections logged.*	• Every metre of the core is logged and sampled separately for lab analysis. • 33,066m of core is logged and 33,183samples have been analysed from a systematic drilling grid.
Sub-sampling techniques and sample preparation	• *If core, whether cut or sawn and whether quarter, half or all core taken.* • *If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry.* • *For all sample types, the nature, quality and appropriateness of the sample preparation technique.* • *Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.* • *Measures taken to ensure that the sampling is representative of the in situ material collected, including for instance results for field duplicate/second-half sampling.* • *Whether sample sizes are appropriate to the grain size of the material being sampled.*	• full HQ diameter drill core was submitted to the lab for analysis • Industry standard laboratory sample preparation methods suitable for nickel laterite mineralisation style and involve drying, crushing, incremental splitting and pulverizing to -75um pulps for assay. • All of the samples were analysed at PT Geoservices an external and certified commercial laboratory following XRF analysis and QA/QC complying with ISO 17025-2017 to maintain accuracy and precision at all sub-sampling stages e.g. coarse blanks, coarse replicates and 200# pulp sieve tests, whilst reducing sample particle size and volume. • Sample sizes are according to XRF analysis and QA/QC complying with ISO 17025-2017 Industry Standard and have shown to be effective regarding accuracy and precision with samples analysed at PT Geoservices (external lab) adding confidence to the accuracy of the results.
Quality of assay data and laboratory tests	• *The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.* • *For geophysical tools, spectrometers, handheld XRF instruments, etc, the parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc.* • *Nature of quality control procedures adopted (eg standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (ie lack of bias) and precision have been established.*	• Industry standard laboratory sample preparation methods suitable for nickel laterite mineralisation style and involve drying, crushing, incremental splitting and pulverizing to -75um pulps for assay. • Representivity, at sub-sampling stages at the sample prep lab was maintained by following ISO 17025-2017 Industry Standard. • SOP to maintain accuracy and precision at all sub-sampling stages e.g. coarse blanks, coarse replicates and 200# pulp sieve tests, whilst reducing sample particle size and volume.
Verification of sampling and assaying	• *The verification of significant intersections by either independent or alternative company personnel.* • *The use of twinned holes.* • *Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.* • *Discuss any adjustment to assay data.*	• Geological logs of the drill core are reconciled against assay results to verify lithology for any misallocation. • Database checked and rechecked for errors and anomalies. • Based on analysis of the downhole statistical data additional top cut constraints were applied to nickel and cobalt content to ensure grades in Block North 50 in 0.1% and 0.8% of samples respectively.
Location of data points	• *Accuracy and quality of surveys used to locate drill holes (collar and down-hole surveys), trenches, mine workings and other locations*	• All recent drilling located by ground RTK GPS survey methods. • UTM (Universal Traverse Mercator) Projection; WGS 1984 UTM Zone

Criteria	JORC Code explanation	Commentary
	used in Mineral Resource estimation. • *Specification of the grid system used.* • *Quality and adequacy of topographic control.*	515 grid is being applied in the Resource estimation. • LiDAR topographic surface was also used. • Significant mis-close between the LiDAR and drill collar survey caused by thick vegetation in many areas. For this reason it was decided to drape the drill collar elevation onto the LiDAR surface which is considered to be more representative of the actual elevation in the field and for this reason more suitable for use in this Mineral Resource for Indicated and Inferred categories. A LiDAR topography report is attached in Appendix 8 of this report.
Data spacing and distribution	• *Data spacing for reporting of Exploration Results.* • *Whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied.* • *Whether sample compositing has been applied.*	• Ultra GPR targets and geological surface mapping were used for Exploration Targets recognition only. • 100m grid drilling was used for Inferred Resource, for Indicated Resource definition closer spaced drilling (50m grid) was used. • Geostatistical analysis of Ni mineralisation was used to confirm the direction and distances to be applied to the Nickel Resource model. • Sample compositing into 6 distinct lithologies namely, Mud Upper, Mud Lower, Lim Upper, Lim Lower, Saprolite and Bedrock was applied to the raw data. Histograms of these 6 data lithology subsets were created which showed some skewness of the population most likely due to nickel grade outliers occurring as a result of the compositing process. To reduce the impact of these outliers, Nickel top cuts were applied to reduce the potential of overestimation of the nickel grade in the Resource. This top-cut strategy is considered adequate for this Resource as the frequency of anomalous grade outliers is relatively low. Complete descriptive statistics for each lithological domain is contained in Appendix 9.
Orientation of data in relation to geological structure	• *Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.* • *If the relationship between the drilling orientation and the orientation of key mineralised structures is considered to have introduced a sampling bias, this should be assessed and reported if material.*	• Vertical drilling is appropriate for nickel laterite as the laterite is relatively horizontal, so the drilling intersects a true thickness of each lithological horizon. • No bias, is considered to be introduced, as a result of the drilling orientation.
Sample security	• *The measures taken to ensure sample security.*	• Samples left in the field are properly stored, covered and guarded by night security at each drill rig. • Sample stores are locked and continuously guarded in the field. • Sample shipments were made within containers to keep samples protected and secure.
Audits or reviews	• *The results of any audits or reviews of sampling techniques and data.*	• Sample database and statistics were continuously monitored for anomalies and outliers. Database was checked and validated using

Criteria	JORC Code explanation	Commentary
		PostgreSQL software and a relational database build specifically for this project. • No formal audits have yet been carried out but sample residues have been stored and can be made available in the event of sample audit requirement.

Section 2 Reporting of Exploration Results

(Criteria listed in the preceding section also apply to this section.)

Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	• *Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings.* • *The security of the tenure held at the time of reporting along with any known impediments to obtaining a license to operate in the area.*	• Contract of Work with area code 99PK0027 granted by the Minister of Mines and Energy. • Nickel Industries is farming in on the project with the objective to develop a nickel and cobalt mine. It can acquire 100% ownership of the project by meeting the conditions outlined in Section 1.2 of the Resource Report. • A Social Impact Assessment report has been conducted to investigate native title interests (see Appendix 3).
Exploration done by other parties	• *Acknowledgment and appraisal of exploration by other parties.*	• The exploration work has been carried out over various stages since 1994 by Battle Mountain, Freeport McMoran Copper and Gold joint venture using PT Mineserve International as a consultant. Historic data records from this work are incomplete and for this reason were not used for Resource estimation.
Geology	• *Deposit type, geological setting and style of mineralisation.*	• Laterization of Ophiolite bedrocks, formed in a tropical climate environment through a process of surface leaching over time, two distinct enriched zones of Limonite and Saprolite clays and weathered rocks are typically found in this type of geological setting where concentrations of Ni, Co, Fe and other associated minerals are characteristic and diagnostic.

Drill hole Information	• *A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drill holes:*
	  ○ *easting and northing of the drill hole collar*
	  ○ *elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar*
	  ○ *dip and azimuth of the hole*
	  ○ *down hole length and interception depth*
	  ○ *hole length.*
		• The drill database at IMM contains 2,078 holes with a cumulative total depth of 31,066m. Assays total 33,182 samples.
		• A table of drill data is attached to this document summarising the drill hole details as required.
		• The Resource can be also represented by a compilation of large numbers of points of observation. For this reason, the report has described the deposit using maps of borehole locations, cross-sections, descriptive statistical analyses of assay results, variograms and swath plots of the data to understand the data and check its

Criteria	JORC Code explanation	Commentary
	• *If the exclusion of this information is justified on the basis that the information is not Material and this exclusion does not detract from the understanding of the report, the Competent Person should clearly explain why this is the case.*	validity and variability. • Appendix 9 summarizes the descriptive statistics and geostatistics based on the 33,182 assay results. • All drill collars were surveyed. Collar elevation was measured by ground survey and LiDAR. Some difference between ground survey and LiDAR was detected due to thick forest cover. It was eventually decided to use the LiDAR elevation as a more representative elevation for Inferred Resource status at this time. • Holes were all vertical, and depth accurately measured and recorded including photography of cores. • Historic data was not used as core recoveries were apparently very low and the data could not be validated.
Data aggregation methods	• *In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (eg cutting of high grades) and cut-off grades are usually Material and should be stated.* • *Where aggregate intercepts incorporate short lengths of high grade results and longer lengths of low grade results, the procedure used for such aggregation should be stated and some typical examples of such aggregations should be shown in detail.* • *The assumptions used for any reporting of metal equivalent values should be clearly stated.*	• Only assay data from the validated database were extracted for use in the compositing process. Composite lengths of 1m were used, which correlates with the majority of the sample length records and within statistical ranges suggested by the variography modeling. Composites were split into 6 lithologies namely; MUD Upper, MUD Lower, LIM Upper, LIM Lower, saprolite and bedrock. • Based on analysis of the downhole statistical data additional top cut constraints were applied to Ni and Co content to ensure grades in Block North 50 in 0.1% and 0.8% of samples respectively.
Relationship between mineralisation widths and intercept lengths	• *These relationships are particularly important in the reporting of Exploration Results.* • *If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.* • *If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (eg 'down hole length, true width not known').*	• Vertical drilling provides good representation of the deposit geometry and depth and reasonably assumed to represent true thickness, 1m core and assay sampling procedures were sufficient to provide accurate wellsite observations and reconciliation of logs. • Mineralisation is basically horizontally aligned. • Total depths of drilling were guided by the interpretation of the Ultra GPR surfaces and at least 2-3 metres of bedrock was intersected at the end of each hole to ensure the full laterite profile was intersected.
Diagrams	• *Appropriate maps and sections (with scales) and tabulations of intercepts should be included for any significant discovery being reported These should include, but not be limited to a plan view of drill hole collar locations and appropriate sectional views.*	• Diagrams, maps, sections are all included in the body of the report.
Balanced reporting	• *Where comprehensive reporting of all Exploration Results is not practicable, representative reporting of both low and high grades and/or widths should be practiced to avoid misleading reporting of Exploration Results.*	• All reliable(validated) data included without prejudice. • Thickness established through drilling intercepts supported with Ground Penetrating Radar (UltraGPR) geophysics and reliable. assays and core photos.

Criteria	JORC Code explanation	Commentary
Other substantive exploration data	• *Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.*	• 167.178km of Ultra Ground Penetrating Radar (UltraGPR) survey lines were completed, providing excellent section profiles showing views of limonite, saprolite and bedrock layers. Global volumes and thickness grids were used for exploration planning and understanding of the weathering patterns of the nickel laterites to best optimize the drilling patterns by domains and target the thickest and most prospective areas. • Bulk sampling was carried out in 5 locations. Bulk density measurements were not used as the samples had dried out during transportation and for this reason were assumed to not be representative of the true bulk density.
Further work	• *The nature and scale of planned further work (eg tests for lateral extensions or depth extensions or large-scale step-out drilling).* • *Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.*	• Plans for infill drilling in the Inferred Resource area will increase confidence in the Resource in the future. • Exploration Targets are based on geological mapping. Blocks 1, 2 and 3 planned to be drilled to delineate additional Resource area when the mining lease is renewed. This may take around 6 months. • Blocks 4, 5,and 6 are currently in a Protected Forest area that can only be accessed in the Forestry status is downgraded.

Section 3 Estimation and Reporting of Mineral Resources

(Criteria listed in section 1, and where relevant in section 2, also apply to this section.)

Criteria	JORC Code explanation	Commentary

Database integrity	• *Measures taken to ensure that data has not been corrupted by, for example, transcription or keying errors, between its initial collection and its use for Mineral Resource estimation purposes.*
	• *Data validation procedures used.*
		• Data supplied from the field operation was checked and validated using PostgreSQL software. The collar survey, assay and geology data sets were validated to correct data error issues such as:
		  • missing or duplicate collar records
		  • overlapping intervals in the assay records
		  • collar elevation errors compared to current LiDAR topography
		  • downhole accuracy issues, total depths, from/to intervals
		  • core recoveries and swelling
		  • lithology description from wellsite geologists
		  • reconciliation of lithology with laboratory assay results
		  • moisture records from core lab analysis
		  • downhole statistical analysis
		• Only data that could be validated was validated and included in the Resource estimate.

Criteria	JORC Code explanation	Commentary
Site visits	• *Comment on any site visits undertaken by the Competent Person and the outcome of those visits.* • *If no site visits have been undertaken indicate why this is the case.*	• A site visit by the CP (Daniel Madre) was completed to review exploration progress; including drilling, and sampling procedures, review sample handling, preparation and analyses. Site inspections of some Exploration Target areas were also carried out.
Geological interpretation	• *Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit.* • *Nature of the data used and of any assumptions made.* • *The effect, if any, of alternative interpretations on Mineral Resource estimation.* • *The use of geology in guiding and controlling Mineral Resource estimation.* • *The factors affecting continuity both of grade and geology.*	• Due to a systematic drill program on the same grid as more then 167km of UltraGPR survey, allows for a relatively high confidence in geological interpretation of the IMM nickel laterite deposit. Historical records for surface mapping, combined with the more recent UltraGPR survey traverse over 100% of the Resource area provides good correlation and understanding if the laterization distribution, bulk volumes and mineralisation. Considered sufficient for this statement of Mineral Resources. • All data included into the geological interpretation was validated to be free of errors and downhole wellsite logging reconciled with assay results into composited zones of Limonite, Saprolite and Bedrock. • Use of Ground Penetrating Radar (UltraGPR) interpretative data in combination with points of observations from the validated database assisted interpretation in extrapolating between holes. • Geological structure and bedrock topology, which are often displayed on Ultra-GPR interpretations, helped to identify thick, high grade laterite areas.
Dimensions	• *The extent and variability of the Mineral Resource expressed as length (along strike or otherwise), plan width, and depth below surface to the upper and lower limits of the Mineral Resource.*	• Resource dimensions defined by the drilled area, at this stage, is approximately 6,000m in length, 2,000m in width and covering 1,614ha laterization thickness for up to 20m to bedrock in some places. • Limonite thickness average in the Mineral Resource area is approximately 3.4m and saprolite thickness is averaging 3.2m. • Laterite thickness and grade is relatively variable but a systematic drill grid and sampling procedure involving 2,078 holes, 33,183 assay results provided sufficient data for meaningful geostatistical analyses and grade distribution for the purpose of Indicated and Inferred Resource at this stage.

Estimation and modelling techniques	• *The nature and appropriateness of the estimation technique(s) applied and key assumptions, including treatment of extreme grade values, domaining, interpolation parameters and maximum distance of extrapolation from data points. If a computer assisted estimation method was chosen include a description of computer software and parameters used.*
	• *The availability of check estimates, previous estimates and/or mine*
		• Modelling techniques and assumptions applied were considered appropriate for estimation of Mineral Resource for this style of nickel laterite deposit based on the CP's experience. Key assumption's include;
		  • Domaining by lithology determined by mineralogical, characteristics with distinct statistical population and geological layer
		  • Downhole and spatial geo-statistical analysis of the data and

Criteria	JORC Code explanation	Commentary
	production records and whether the Mineral Resource estimate takes appropriate account of such data. • *The assumptions made regarding recovery of by-products.* • *Estimation of deleterious elements or other non-grade variables of economic significance (eg sulphur for acid mine drainage characterisation).* • *In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.* • *Any assumptions behind modelling of selective mining units.* • *Any assumptions about correlation between variables.* • *Description of how the geological interpretation was used to control the resource estimates.* • *Discussion of basis for using or not using grade cutting or capping.* • *The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.*	domain sub-sets of data providing search ellipsoid ranges for grade interpolation and maximum extrapolation distances for Ni between data points • Geological modelling and Mineral Resource estimates were completed using Leapfrog Geo 2023 mining software (version 2.1). Ordinary Kriging (OK) algorithm was used in the grade interpolation for geochemical contents for limonite and saprolite zones using Snowden software. Moisture content was assumed to be 41% for Limonite and 35% for Saprolite as values for each layer determined by PT Geoservices appear to be too low, indicating sample drying during transportation from Papua to Jakarta for analysis. • A comparison against historic Mineral Resource by Battle Mountain, PT Mineserve Indonesia and a recent KCMI study used for the Feasibility study show reasonable correlation Resource estimate size and grades in this location. • Deleterious elements or acid drainage of the mineral resource was not considered in the model at this time of Mineral Resource estimation as pits are likely to be relatively shallow and are planned to be backfilled and rehabilitated progressively. A Geotechnical study is still underway and the results are not available at the time of writing this report. • Block size selected 25m x 25 x 1m was considered appropriate for the data set and the style of mineralisation reported. • Final block model and interpolated grades were validated using several visual and geostatistical techniques to gain further confidence in the Mineral Resource estimates stated in this report. Visual inspection of the block models in plan and sectional views to assess the grade interpolations performed conform with the lithological wireframes, surface models and drilling database. Further statistical validation, including swath plots of the Nickel Resource estimate was completed by comparing global averages of the sample composites against the block model global averages.
Moisture	• *Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.*	• Some Moisture measurements were performed at Geoservices laboratory but because of long transportation time to lab from Papua the results suggest samples may have dried. For this reason, an assumed moisture content was applied separately to limonite (41%) and saprolite (35%) layers. • Moisture content was used to adjust Wet to Dry tonnage for mineral Resource estimates.

Criteria	JORC Code explanation	Commentary
Cut-off parameters	• *The basis of the adopted cut-off grade(s) or quality parameters applied.*	• Based on statistical analysis of the domain databases a range of Ni and other compounds cut-off grades split by laterite type have been estimated.
Mining factors or assumptions	• *Assumptions made regarding possible mining methods, minimum mining dimensions and internal (or, if applicable, external) mining dilution. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential mining methods, but the assumptions made regarding mining methods and parameters when estimating Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the mining assumptions made.*	• Because this is still in Indicated and Inferred Resource no mining or modifying factors were applied to the Mineral Resource statement at this time. • At this stage it is assumed open pit mining would have the following design parameters; bench height 3m, single slope angles 55 degrees and overall batter slope 30-33 degrees. • Assumptions for open cut mining operation similar to current production at the Hengjaya Project in Sulawesi and supply agreements with IWIP smelter provide reasonable prospects for eventual economic extraction of the IMM Mineral Resource at this time. • A Feasibility Study is currently underway.
Metallurgical factors or assumptions	• *The basis for assumptions or predictions regarding metallurgical amenability. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential metallurgical methods, but the assumptions regarding metallurgical treatment processes and parameters made when reporting Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the metallurgical assumptions made.*	• Metallurgical factors and assumption based on ongoing supply requirement to the smelters, (majority owned by Nickel Industries) at the IWIP smelter facilities were considered for the Resource grade the cutoffs. • 1 drill hole (DE1028) was also sampled for limonite by hand digging to a depth of 4-6m and approximately 1,110wmt of limonite was recovered then then reduced by quartering and mixed to produce a composite sample of 200kg of Siduarsi limonite which was sent to the IMIP lab in Sulawesi for size analysis and acid leach testing. • Siduarsi sample achieved at acid to ore ratio 250 kg/ ton ore with residence time 1 h. The leachate metal concentration is 4.7 g/L, 0.34 g/L, 2.96 g/L, 4.71 g/L and 0.21 g/L respectively for Ni, Co, Mn, Mg and Cr. The result may not be representative as it came from only one location but does indicate the potential for acid leach processing of limonite ore from IMM.
Environmen-tal factors or assumptions	• *Assumptions made regarding possible waste and process residue disposal options. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider the potential environmental impacts of the mining and processing operation. While at this stage the determination of potential environmental impacts, particularly for a greenfields project, may not always be well advanced, the status of early consideration of these potential environmental impacts should be reported. Where these aspects have not been considered this should be reported with*	• Environmental Impact studies will be completed as part of the mining operation permitting process. • Sediment including mud volcano deposits and top soil composites were extracted separately and considered as overburden waste for future mine planning and rehabilitation of ex-opencast pit areas. This material usually occurs in the first 1-3meters from the surface and is usually below grade cutoff ranges and was not included in the Mineral Resource

Criteria	JORC Code explanation	Commentary
	an explanation of the environmental assumptions made.	
Bulk density	• *Whether assumed or determined. If assumed, the basis for the assumptions. If determined, the method used, whether wet or dry, the frequency of the measurements, the nature, size and representativeness of the samples.* • *The bulk density for bulk material must have been measured by methods that adequately account for void spaces (vugs, porosity, etc), moisture and differences between rock and alteration zones within the deposit.* • *Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.*	• An assumed density for each lithological layer based on density values used in other mining operations for this reason we don't believe there will be any significant impact using an assumed density at this time. • An assumed density value for limonite of 1.8 and saprolite 1.6 was applied to the Resource estimate based on other projects in Indonesia. • Density measurements appear to be less than representative probably due to samples drying out during shipment to Jakarta from Papua is the reason an assumed density was used.
Classification	• *The basis for the classification of the Mineral Resources into varying confidence categories.* • *Whether appropriate account has been taken of all relevant factors (ie relative confidence in tonnage/grade estimations, reliability of input data, confidence in continuity of geology and metal values, quality, quantity and distribution of the data).* • *Whether the result appropriately reflects the Competent Person's view of the deposit.*	• Determination of the Resource classes, at this stage, was applied to the Mineral Resource with a digitized polygon boundary based on the spatial continuity of each geological domain around a regular spaced drilling grid 100m for Inferred Resources and 50m for Indicated Resources. Also taken into account, was the Ultra GPR grid lines between the drilling locations increasing confidence in interpretation of the laterization contact surface between the points of observation in the model. • INFERRED - Areas of 100m of drill spacing on a continuous grid pattern, where significant influence from Pass 1, 2 and 3 dominate the search ellipsoids, with 50m extrapolation from the last line of drilling. • INDICATED -Areas of 50m of drill spacing on a continuous grid pattern, where significant influence from Pass 1, 2 and 3 dominate the search ellipsoids, with 25m extrapolation from the last line of drilling. • Another factor in selection of Resource polygon limits used for the Mineral Resource was a review of the geostatistical inputs and the weighting on each category. This was done by comparing the influence of each pass within the polygon boundaries.
Audits or reviews	• *The results of any audits or reviews of Mineral Resource estimates.*	• Internal audit was carried out by comparisons between 2 modeling methods namely; Ordinary Kriging model and a manual model to confirm the Resource volume. • Historical estimates from Battle Mountain and Mineserve International also show relatively similar laterite volumes.

Criteria	JORC Code explanation	Commentary
Discussion of relative accuracy/ confidence	• *Where appropriate a statement of the relative accuracy and confidence level in the Mineral Resource estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the resource within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors that could affect the relative accuracy and confidence of the estimate.* • *The statement should specify whether it relates to global or local estimates, and, if local, state the relevant tonnages, which should be relevant to technical and economic evaluation. Documentation should include assumptions made and the procedures used.* • *These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.*	• Sufficient exploration has been carried out at the IMM project to delineate a significant deposit of nickel laterite. The drilling used for the Mineral Resource estimate is based on systematic drill grids of 50m and 100m. The Resource classification is all Indicated for the 50m grid drilling and Inferred based on 100m spacing of points of observation. According to the geostatistical analysis, the data provides sufficient detail for the purpose of the Indicated and Inferred Mineral Resource stated in this report. • It is likely with further infill and exploration drilling in all domains the Mineral Resources, estimated in this report, will increase confidence in the Resource in the future. • Long term supply contracts from to refining facilities owned by Nickel Industries Limited, already in operation, significantly enhance the potential for eventual economic extraction of the IMM nickel laterite Mineral Resource

No	Hole ID	Easting	Northing	Elevation	Depth	Dip	Azimuth	Survey_Type
1	SO304	287779.429	9746712.027	223	20	-90	0	RTK GPS
2	SG304	287797.54	9747096.159	266.356	27	-90	0	RTK GPS
3	MY304	287808.621	9747507.695	293.267	15	-90	0	RTK GPS
4	MY320	288198.139	9747499.811	290.916	15	-90	0	RTK GPS
5	MY336	288601.953	9747503.481	281.734	13	-90	0	RTK GPS
6	MY352	289003.979	9747501.01	262.225	19	-90	0	RTK GPS
7	MY368	289397.931	9747501.673	260.779	25	-90	0	RTK GPS
8	MY384	289795.174	9747511.154	246.296	8	-90	0	RTK GPS
9	MY400	290200.029	9747500.945	232.115	11	-90	0	RTK GPS
10	MQ384	289785.477	9747892.166	257.93	10	-90	0	RTK GPS
11	MQ368	289396.52	9747892.506	249.994	16	-90	0	RTK GPS
12	MQ352	289001.27	9747908.303	280.143	10	-90	0	RTK GPS
13	MQ336	288605.976	9747904.602	280	7	-90	0	RTK GPS
14	MQ320	288205.377	9747884.065	290.06	10	-90	0	RTK GPS
15	MQ304	287802.444	9747890.072	309	10	-90	0	RTK GPS
16	MQ288	287400.176	9747896.877	295.596	8	-90	0	RTK GPS
17	MI272	287002.252	9748299.787	288.238	12	-90	0	RTK GPS
18	MI288	287393.272	9748300.964	293.957	7	-90	0	RTK GPS
19	MI304	287802.525	9748306.094	281.59	10	-90	0	RTK GPS
20	MI320	288201.829	9748294.662	296.647	8	-90	0	RTK GPS
21	MI336	288601.707	9748314.278	293.943	10	-90	0	RTK GPS
22	MI352	288986.358	9748295.52	292.152	8	-90	0	RTK GPS
23	MI368	289375.846	9748359.287	282.659	7	-90	0	RTK GPS
24	MA336	288601.774	9748694.606	296.061	14	-90	0	RTK GPS
25	MA320	288197.28	9748695.833	280.925	7	-90	0	RTK GPS
26	MA304	287811.402	9748688.735	296.393	6	-90	0	RTK GPS
27	MA288	287392.508	9748691.139	278.556	9	-90	0	RTK GPS
28	NS304	287808.053	9749095.338	304.798	18	-90	0	RTK GPS
29	NS320	288192.707	9749105.527	306.672	18	-90	0	RTK GPS
30	NS336	288603.182	9749098.827	280.749	14	-90	0	RTK GPS
31	MA272	287001.81	9748692.588	324.014	10	-90	0	RTK GPS
32	MA256	286605.528	9748705.36	329	21	-90	0	RTK GPS
33	DE1002	286554.842	9748030.159	300.32	16	-90	0	RTK GPS
34	DE1003	286618.269	9748030.425	299.097	10	-90	0	RTK GPS
35	DE1009	286519.165	9748092.05	305.707	10	-90	0	RTK GPS
36	DE1010	286624.805	9748117.493	296.442	13	-90	0	RTK GPS
37	DE1011	286739.733	9748118.02	306.976	12	-90	0	RTK GPS
38	DE1018	286548.927	9748205.432	304.826	10	-90	0	RTK GPS
39	DE1019	286627.404	9748211.165	300.255	17	-90	0	RTK GPS
40	DE1020	286728.299	9748224.796	300.264	11	-90	0	RTK GPS
41	DE1021	286827.552	9748211.294	300.984	22	-90	0	RTK GPS
42	DE1033	286633.421	9748300.522	299.396	19	-90	0	RTK GPS
43	DE1034	286738.097	9748305.469	298.198	16	-90	0	RTK GPS
44	DE1035	286809.151	9748314.198	302.259	12	-90	0	RTK GPS
45	DE1047	286337.634	9748410.13	322.639	19	-90	0	RTK GPS

46	DE1048	286437.187	9748402.15	319.884	20	-90	0	RTK GPS
47	DE1049	286529.917	9748418.121	308	8	-90	0	RTK GPS
48	DE1050	286633.288	9748404.987	299.276	16	-90	0	RTK GPS
49	DE1051	286754.96	9748395.933	296.596	10	-90	0	RTK GPS
50	DE1059	286336.173	9748512.188	324	16	-90	0	RTK GPS
51	DE1060	286420.615	9748515.53	328.595	16	-90	0	RTK GPS
52	DE1061	286505.521	9748519.666	329.886	24	-90	0	RTK GPS
53	DE1062	286630.169	9748519.673	309.135	17	-90	0	RTK GPS
54	DE1077	286729.919	9748614.174	319	12	-90	0	RTK GPS
55	DE1078	286831.746	9748604.584	319.251	7	-90	0	RTK GPS
56	DE1079	286922.836	9748611.218	324	10	-90	0	RTK GPS
57	DE1087	286341.427	9748722.499	355	19	-90	0	RTK GPS
58	DE1088	286433.037	9748713.971	333	18	-90	0	RTK GPS
59	DE1089	286525.72	9748725.652	327.558	22	-90	0	RTK GPS
60	DE1090	286635.648	9748720.554	327.991	20	-90	0	RTK GPS
61	DE1091	286743.532	9748721.648	332.413	18	-90	0	RTK GPS
62	DE1092	286818.874	9748722.991	337	19	-90	0	RTK GPS
63	DE1093	286927.102	9748703.383	328.992	15	-90	0	RTK GPS
64	DE1103	286342.558	9748812.587	357.841	8	-90	0	RTK GPS
65	DE1104	286420.645	9748813.684	342	24	-90	0	RTK GPS
66	DE1105	286539.058	9748819.254	334.698	14	-90	0	RTK GPS
67	DE1122	286435.45	9748910.576	346	14	-90	0	RTK GPS
68	DE1139	286441.99	9749018.543	379.311	24	-90	0	RTK GPS
69	DE1022	286938.335	9748222.343	297.874	16	-90	0	RTK GPS
70	DE1023	287039.817	9748231.278	288.284	12	-90	0	RTK GPS
71	DE1036	287027.997	9748314.59	287.682	14	-90	0	RTK GPS
72	DE1037	287125.476	9748313.251	287.392	12	-90	0	RTK GPS
73	DE1052	287136.751	9748399.385	295.394	20	-90	0	RTK GPS
74	DE1053	287230.346	9748407.701	286.831	16	-90	0	RTK GPS
75	DE1063	286759.093	9748515.313	303.363	15	-90	0	RTK GPS
76	DE1138	286271.574	9749018.714	355.04	23	-90	0	RTK GPS
77	DE1154	285939.786	9749118.292	363.178	10	-90	0	RTK GPS
78	DE1155	286034.993	9749114.361	369.63	12	-90	0	RTK GPS
79	DE1156	286124.342	9749104.09	365.249	28	-90	0	RTK GPS
80	DE1157	286231.134	9749112.346	367.047	13	-90	0	RTK GPS
81	DE1064	287045.681	9748512.007	303	20	-90	0	RTK GPS
82	DE1065	287127.323	9748523.179	304.318	16	-90	0	RTK GPS
83	DE1066	287232.815	9748514.256	290.385	12	-90	0	RTK GPS
84	DE1067	287320.503	9748520.156	287.959	20	-90	0	RTK GPS
85	DE1175	285728.189	9749233.505	424.626	15	-90	0	RTK GPS
86	DE1176	285846.326	9749213.31	404.551	12	-90	0	RTK GPS
87	DE1177	285923.993	9749210.737	388.296	20	-90	0	RTK GPS
88	DE1185	285736.496	9749312.738	415.948	22	-90	0	RTK GPS
89	DE1186	285825.034	9749312.981	403.725	8	-90	0	RTK GPS
90	DE1054	287535.37	9748428.393	276.168	14	-90	0	RTK GPS
91	DE1068	287516.355	9748519.421	281.147	12	-90	0	RTK GPS
92	DE1082	287424.804	9748603.169	282.552	23	-90	0	RTK GPS

93	DE1152	285732.764	9749124.768	396.867	15	-90	0	RTK GPS
94	DE1153	285810.664	9749117.344	386.823	15	-90	0	RTK GPS
95	DE1004	287930.508	9748020.291	294.99	26	-90	0	RTK GPS
96	DE1005	288029.222	9748014.197	308	20	-90	0	RTK GPS
97	DE1012	287825.066	9748127.341	286.854	19	-90	0	RTK GPS
98	DE1013	287926.8	9748121.614	288.237	28	-90	0	RTK GPS
99	DE1014	288033.688	9748116.492	294	29	-90	0	RTK GPS
100	DE1024	287634.269	9748218.459	284.411	16	-90	0	RTK GPS
101	DE1025	287728.264	9748199.149	283.636	17	-90	0	RTK GPS
102	DE1026	287823.294	9748228.993	287.702	23	-90	0	RTK GPS
103	DE1028	288032.707	9748218.815	296.082	22	-90	0	RTK GPS
104	DE1038	287626.685	9748329.203	281.21	15	-90	0	RTK GPS
105	DE1055	287617.71	9748415.23	275.313	17	-90	0	RTK GPS
106	DE1118	285816.597	9748923.033	347.912	21	-90	0	RTK GPS
107	DE1135	285847.491	9749010.877	355.641	29	-90	0	RTK GPS
108	DE1136	285925.652	9749030.785	356	23	-90	0	RTK GPS
109	DE1137	286062.785	9748997.982	386.209	18	-90	0	RTK GPS
110	DE1158	286325.094	9749113.217	386.57	12	-90	0	RTK GPS
111	DE1159	286427.228	9749129.053	398.75	13	-90	0	RTK GPS
112	DE1160	286533.816	9749116.482	386	12	-90	0	RTK GPS
113	DE1161	286627.949	9749116.416	378.341	18	-90	0	RTK GPS
114	DE1162	286725.374	9749112.643	370	23	-90	0	RTK GPS
115	DE1027	287935.793	9748216.906	292.489	16	-90	0	RTK GPS
116	DE1039	287736.193	9748327.369	278.148	18	-90	0	RTK GPS
117	DE1040	287824.205	9748307.675	282.211	11	-90	0	RTK GPS
118	DE1041	287923.122	9748321.735	284.339	21	-90	0	RTK GPS
119	DE1042	288021.637	9748303.027	293	23	-90	0	RTK GPS
120	DE1056	287736.719	9748412.618	273.798	15	-90	0	RTK GPS
121	DE1069	287596.188	9748506.435	275.049	17	-90	0	RTK GPS
122	DE1084	287632.136	9748622.382	277.94	18	-90	0	RTK GPS
123	DE1142	286932.188	9749006.204	341.843	22	-90	0	RTK GPS
124	DE1143	287034.652	9749019.533	327.19	21	-90	0	RTK GPS
125	DE1163	286833.246	9749118.049	363.552	39	-90	0	RTK GPS
126	DE1164	286928.065	9749121.172	349.002	28	-90	0	RTK GPS
127	DE1165	287040.407	9749099.589	329.463	26	-90	0	RTK GPS
128	DE1083	287540.914	9748616.632	280.967	19	-90	0	RTK GPS
129	DE1098	287834.356	9748729.877	305.494	17	-90	0	RTK GPS
130	DE1099	287937.05	9748721.214	280.536	16	-90	0	RTK GPS
131	DE1112	287555.204	9748814.377	303	20	-90	0	RTK GPS
132	DE1113	287638.727	9748806.903	307.277	15	-90	0	RTK GPS
133	DE1114	287717.215	9748816.123	305.016	21	-90	0	RTK GPS
134	DE1115	287832.022	9748817.268	305.125	16	-90	0	RTK GPS
135	DE1116	287924.488	9748819.416	300	23	-90	0	RTK GPS
136	DE1129	287634.49	9748907.033	299.754	24	-90	0	RTK GPS
137	DE1131	287830.425	9748916.693	302.389	15	-90	0	RTK GPS
138	DE1132	287932.214	9748914.296	301	17	-90	0	RTK GPS
139	DE1133	288031.564	9748916.402	311.162	22	-90	0	RTK GPS

140	DE1147	287432.913	9749017.36	302.219	19	-90	0	RTK GPS
141	DE1148	287533.128	9749023.1	297	25	-90	0	RTK GPS
142	DE1166	287128.661	9749120.226	316.489	26	-90	0	RTK GPS
143	DE1167	287228.73	9749113.518	312.1	24	-90	0	RTK GPS
144	DE1168	287336.071	9749107.798	303.576	12	-90	0	RTK GPS
145	DE1169	287432.064	9749110.125	297.617	17	-90	0	RTK GPS
146	DE1170	287530.535	9749116.259	301.477	24	-90	0	RTK GPS
147	DE1178	287137.194	9749216.963	326.419	15	-90	0	RTK GPS
148	DE1179	287227.769	9749222.928	318.656	26	-90	0	RTK GPS
149	DE1180	287324.74	9749216.317	309.492	20	-90	0	RTK GPS
150	DE1000	286038.578	9748015.015	317.844	21	-90	0	RTK GPS
151	DE1001	286128.328	9748011.567	313	25	-90	0	RTK GPS
152	DE1111	287440.851	9748813.865	287.827	11	-90	0	RTK GPS
153	DE1126	287226.092	9748913.206	294.22	20	-90	0	RTK GPS
154	DE1127	287326.44	9748905.785	296.895	29	-90	0	RTK GPS
155	DE1128	287427.704	9748916.868	298	28	-90	0	RTK GPS
156	DE1130	287736.481	9748930.84	302.487	22	-90	0	RTK GPS
157	DE1145	287210.632	9749004.845	313.316	27	-90	0	RTK GPS
158	DE1146	287338.55	9749015.286	305.504	23	-90	0	RTK GPS
159	DE1149	287732.062	9749009.686	307.837	20	-90	0	RTK GPS
160	DE1150	287829.769	9749014.135	316.885	21	-90	0	RTK GPS
161	DE1151	287935.025	9749012.335	314.93	16	-90	0	RTK GPS
162	DE1171	288336.637	9749132.927	308	21	-90	0	RTK GPS
163	DE1172	288426.339	9749121.552	311.479	17	-90	0	RTK GPS
164	DE1173	288537.12	9749107.687	294.99	15	-90	0	RTK GPS
165	DE1184	288717.694	9749212.665	255.488	9	-90	0	RTK GPS
166	DE1183	288627.584	9749206.019	275.205	14	-90	0	RTK GPS
167	DE1182	288551.763	9749221.981	280.393	13	-90	0	RTK GPS
168	DE1181	288435.007	9749213.276	290.606	24	-90	0	RTK GPS
169	DE1174	288624.723	9749118.925	275.587	16	-90	0	RTK GPS
170	DE1144	287143.569	9749014.709	315.889	32	-90	0	RTK GPS
171	DE1125	287128.473	9748927.925	305.447	16	-90	0	RTK GPS
172	DE1124	286636.493	9748910.868	333.464	24	-90	0	RTK GPS
173	DE1073	286332.349	9748609.888	336.101	25	-90	0	RTK GPS
174	DE1597	286145.071	9748615.198	340.726	15	-90	0	RTK GPS
175	DE1046	286231.03	9748408.99	318.472	12	-90	0	RTK GPS
176	DE1032	286230.838	9748291.656	331.65	19	-90	0	RTK GPS
177	DE1072	286232.831	9748618.526	336.682	15	-90	0	RTK GPS
178	DE1058	286022.868	9748510.021	332.078	12	-90	0	RTK GPS
179	DE1589	286003.081	9748610.76	315.912	17	-90	0	RTK GPS
180	DE1006	285936.51	9748131.919	310.154	22	-90	0	RTK GPS
181	DE1007	286044.579	9748108.665	324.427	24	-90	0	RTK GPS
182	DE1015	285937.088	9748211.864	322	12	-90	0	RTK GPS
183	DE1016	286034.161	9748218.56	322	21	-90	0	RTK GPS
184	DE1029	285942.166	9748304.708	325.653	12	-90	0	RTK GPS
185	DE1030	286026.359	9748311.433	326	20	-90	0	RTK GPS
186	DE1043	285932.084	9748430.156	337.725	13	-90	0	RTK GPS

187	DE1044	286023.093	9748430.427	332	12	-90	0	RTK GPS
188	DE1045	286113.984	9748403.046	340.24	18	-90	0	RTK GPS
189	DE1080	287029.889	9748618.194	313	24	-90	0	RTK GPS
190	DE1081	287138.357	9748620.818	314	13	-90	0	RTK GPS
191	DE1094	287046.054	9748709.335	316	10	-90	0	RTK GPS
192	DE1095	287131.657	9748711.059	299.685	14	-90	0	RTK GPS
193	DE1096	287218.273	9748714.669	287	31	-90	0	RTK GPS
194	DE1106	286630.055	9748810.459	335.19	26	-90	0	RTK GPS
195	DE1107	286744.313	9748805.348	329.515	26	-90	0	RTK GPS
196	DE1108	286840.893	9748810.997	327.236	20	-90	0	RTK GPS
197	DE1109	286931.364	9748811.141	320.58	16	-90	0	RTK GPS
198	DE1110	287048.913	9748823.001	300	16	-90	0	RTK GPS
199	DE1117	288029.283	9748841.402	302.102	16	-90	0	RTK GPS
200	DE1057	285939.234	9748507.281	330.065	18	-90	0	RTK GPS
201	DE1076	286626.522	9748614.032	321.593	19	-90	0	RTK GPS
202	DE1075	286530.679	9748621.137	328	29	-90	0	RTK GPS
203	DE1074	286425.162	9748611.894	331	19	-90	0	RTK GPS
204	DE1070	285830.567	9748602.829	339.558	23	-90	0	RTK GPS
205	DE1071	285916.196	9748607.727	327	16	-90	0	RTK GPS
206	DE1085	286131.578	9748715.204	347.778	16	-90	0	RTK GPS
207	DE1086	286224.748	9748710.366	343.897	27	-90	0	RTK GPS
208	DE1585	285920.881	9749306.174	394	20	-90	0	RTK GPS
209	DE1101	286132.14	9748819.344	325.458	21	-90	0	RTK GPS
210	DE1100	286040.971	9748795.466	332	23	-90	0	RTK GPS
211	DE1573	285838.013	9749418.657	398.44	13	-90	0	RTK GPS
212	DE1590	286027.534	9748704.943	331.611	36	-90	0	RTK GPS
213	DE1557	285733.65	9749510.975	407.817	12	-90	0	RTK GPS
214	DE1102	286222.201	9748822.833	330.255	22	-90	0	RTK GPS
215	DE1604	286243.307	9748924.191	333.27	17	-90	0	RTK GPS
216	DE1574	285832.171	9749511.812	401.5	12	-90	0	RTK GPS
217	DE1575	285830.662	9749602.349	393	16	-90	0	RTK GPS
218	DE1017	286125.507	9748198.267	338.915	12	-90	0	RTK GPS
219	DE1008	286131.205	9748111.285	325.297	17	-90	0	RTK GPS
220	DE1031	286142.766	9748291.164	344.099	20	-90	0	RTK GPS
221	DE1588	285924.046	9749614.092	396.249	22	-90	0	RTK GPS
222	DE1612	286318.112	9748920.758	340	16	-90	0	RTK GPS
223	DE1587	285925.814	9749511.745	400.447	26	-90	0	RTK GPS
224	DE1586	285929.363	9749429.117	401.917	23	-90	0	RTK GPS
225	DE1594	286025.814	9749425.493	404	11	-90	0	RTK GPS
226	DE1601	286100.829	9749518.768	396.127	6	-90	0	RTK GPS
227	DE1613	286316.47	9748993.757	351.297	19	-90	0	RTK GPS
228	DE1592	286035.096	9749514.798	398.202	17	-90	0	RTK GPS
229	DE1591	286032.273	9749227.605	395.1	24	-90	0	RTK GPS
230	DE1593	286018.816	9749316.295	407.373	16	-90	0	RTK GPS
231	DE1624	286426.358	9749403.405	393.936	20	-90	0	RTK GPS
232	DE1605	286217.869	9749219.213	372	20	-90	0	RTK GPS
233	DE1614	286318.005	9749223.67	374.802	15	-90	0	RTK GPS

234	DE1615	286328.504	9749317.716	387	16	-90	0	RTK GPS
235	DE1633	286529.381	9749425.983	391.385	19	-90	0	RTK GPS
236	DE1598	286126.874	9749238.998	384	18	-90	0	RTK GPS
237	DE1607	286228.296	9749415.471	391.6	19	-90	0	RTK GPS
238	DE1616	286330.851	9749435.744	391.419	19	-90	0	RTK GPS
239	DE1606	286219.998	9749315.608	386.185	24	-90	0	RTK GPS
240	DE1617	286341.285	9749486.604	387.713	28	-90	0	RTK GPS
241	DE1642	286625.635	9749420.112	398	19	-90	0	RTK GPS
242	DE1623	286431.053	9749323.451	387.118	14	-90	0	RTK GPS
243	DE1652	286722.999	9749428.768	394.686	17	-90	0	RTK GPS
244	DE1662	286819.939	9749408.258	376.639	18	-90	0	RTK GPS
245	DE1671	286930.937	9749392.813	364.254	19	-90	0	RTK GPS
246	DE1631	286541.928	9749229.294	378.772	29	-90	0	RTK GPS
247	DE1663	286802.485	9749525.4	389.775	11	-90	0	RTK GPS
248	DE1632	286525.102	9749303.238	380.185	15	-90	0	RTK GPS
249	DE1599	286121.717	9749315.222	392.603	17	-90	0	RTK GPS
250	DE1622	286428.504	9749221.815	381.444	17	-90	0	RTK GPS
251	DE1600	286134.029	9749414.694	395.004	12	-90	0	RTK GPS
252	DE1653	286715.536	9749517.465	402.768	18	-90	0	RTK GPS
253	DE1634	286547.159	9749490.08	388.887	12	-90	0	RTK GPS
254	DE1643	286643.984	9749517.376	402.509	12	-90	0	RTK GPS
255	DE1641	286624.359	9749313.556	384.12	16	-90	0	RTK GPS
256	DE1651	286730.202	9749319.191	374	18	-90	0	RTK GPS
257	DE1625	286416.259	9749489.844	392.63	24	-90	0	RTK GPS
258	DE1650	286733.696	9749220.048	370.383	26	-90	0	RTK GPS
259	DE1640	286637.361	9749236.746	380.738	12	-90	0	RTK GPS
260	DE1596	286039.817	9749718.108	380	15	-90	0	RTK GPS
261	DE1661	286820.667	9749334.228	370.231	16	-90	0	RTK GPS
262	DE1603	286119.326	9749716.23	380.414	27	-90	0	RTK GPS
263	DE1602	286127.831	9749620.627	383.556	16	-90	0	RTK GPS
264	DE1609	286224.29	9749608.59	388.44	16	-90	0	RTK GPS
265	DE1660	286831.715	9749273.686	362	24	-90	0	RTK GPS
266	DE1669	286924.75	9749222.133	348.124	20	-90	0	RTK GPS
267	DE1670	286938.85	9749325.966	352.888	16	-90	0	RTK GPS
268	DE1618	286313.144	9749613.053	371	9	-90	0	RTK GPS
269	DE1679	287010.5	9749305.648	345	11	-90	0	RTK GPS
270	DE1627	286426.233	9749711.215	392.686	22	-90	0	RTK GPS
271	DE1678	287026	9749226.865	339	20	-90	0	RTK GPS
272	DE1619	286335.592	9749702.288	376	22	-90	0	RTK GPS
273	DE1685	287220.014	9749314.944	318.009	14	-90	0	RTK GPS
274	DE1636	286529.958	9749720.679	402.989	11	-90	0	RTK GPS
275	DE1637	286537.72	9749818.083	419.756	25	-90	0	RTK GPS
276	DE1646	286635.421	9749826.504	427.001	16	-90	0	RTK GPS
277	DE1690	287422.28	9749227.022	306.309	23	-90	0	RTK GPS
278	DE1691	287436.413	9749302.447	306	21	-90	0	RTK GPS
279	DE1698	287634.174	9749312.59	302.433	16	-90	0	RTK GPS
280	DE1656	286732.393	9749823.383	419.566	15	-90	0	RTK GPS

281	DE1694	287529.095	9749310.096	301.924	23	-90	0	RTK GPS
282	DE1697	287630.77	9749216.947	304.157	20	-90	0	RTK GPS
283	DE1666	286828.201	9749823.423	410.432	20	-90	0	RTK GPS
284	DE1696	287626.914	9749106.799	304	24	-90	0	RTK GPS
285	DE1675	286904.264	9749786.578	402.974	19	-90	0	RTK GPS
286	DE1695	287630.56	9749031.022	294.358	14	-90	0	RTK GPS
287	DE1674	286927.975	9749726.432	390.258	22	-90	0	RTK GPS
288	DE1692	287525.953	9748935.891	299.304	22	-90	0	RTK GPS
289	DE1673	286936.878	9749651.704	383.619	30	-90	0	RTK GPS
290	DE1677	287001.717	9748924.463	333	16	-90	0	RTK GPS
291	DE1668	286919.965	9748902.893	342	15	-90	0	RTK GPS
292	DE1659	286819.39	9749010.474	356	19	-90	0	RTK GPS
293	DE1687	287238.935	9749716.265	403	16	-90	0	RTK GPS
294	DE1649	286725.342	9749017.437	344.503	16	-90	0	RTK GPS
295	DE1141	286642.461	9749008.757	344	16	-90	0	RTK GPS
296	DE1680	287030.569	9749620.69	388.657	24	-90	0	RTK GPS
297	DE1683	287119.635	9749619.195	369.9	15	-90	0	RTK GPS
298	DE1686	287225.965	9749615.157	377.244	21	-90	0	RTK GPS
299	DE1689	287326.867	9749613.473	361.948	16	-90	0	RTK GPS
300	DE1658	286834.283	9748928.998	332	31	-90	0	RTK GPS
301	DE1140	286546.383	9748991.69	356.512	16	-90	0	RTK GPS
302	DE1681	287029.189	9749712.802	382.623	24	-90	0	RTK GPS
303	DE1676	286931.06	9749885.866	437.001	14	-90	0	RTK GPS
304	DE1684	287130.546	9749720.994	388.241	24	-90	0	RTK GPS
305	DE1700	286925.069	9748415.258	296.775	15	-90	0	RTK GPS
306	DE1556	285721.801	9749425.911	405.561	24	-90	0	RTK GPS
307	DE1701	287035.481	9748417.75	293	15	-90	0	RTK GPS
308	DE1699	286930.4	9748318.948	293.812	15	-90	0	RTK GPS
309	DE1667	286841.885	9749936.611	448.989	18	-90	0	RTK GPS
310	DE1702	287138.223	9748217.132	289.292	13	-90	0	RTK GPS
311	DE1657	286737.993	9749915.081	423.765	15	-90	0	RTK GPS
312	DE1708	287224.756	9748112.015	294.782	20	-90	0	RTK GPS
313	DE1647	286632.587	9749916.868	421.952	15	-90	0	RTK GPS
314	DE1638	286537.678	9749919.869	428.171	17	-90	0	RTK GPS
315	DE1629	286434.853	9749915.416	404.922	25	-90	0	RTK GPS
316	DE1628	286438.161	9749812.511	396.822	29	-90	0	RTK GPS
317	DE1707	287232.606	9748015.474	291.341	20	-90	0	RTK GPS
318	DE1620	286341.845	9749813.618	386.28	12	-90	0	RTK GPS
319	DE1611	286222.575	9749817.636	382	16	-90	0	RTK GPS
320	DE1706	287227.221	9747916.412	293.368	14	-90	0	RTK GPS
321	DE1610	286225.77	9749710.786	377.096	15	-90	0	RTK GPS
322	DE1705	287224.172	9747816.245	298.26	8	-90	0	RTK GPS
323	DE1796	288035.996	9747810.289	303.097	13	-90	0	RTK GPS
324	DE1808	288133.016	9747818.811	298.987	14	-90	0	RTK GPS
325	DE1807	288139.693	9747724.728	299	19	-90	0	RTK GPS
326	DE1717	287334.861	9748712.323	280.762	16	-90	0	RTK GPS
327	DE1795	288031.13	9747710.376	287.721	13	-90	0	RTK GPS

328	DE1809	288134.635	9747913.859	290.686	11	-90	0	RTK GPS
329	DE1806	288139.08	9747620.052	289	20	-90	0	RTK GPS
330	DE1595	286042.514	9749611.072	372.631	30	-90	0	RTK GPS
331	DE1729	287527.032	9748714.449	278.684	14	-90	0	RTK GPS
332	DE1794	288036.161	9747613.305	293.611	21	-90	0	RTK GPS
333	DE1797	288022.038	9747908.615	302.074	20	-90	0	RTK GPS
334	DE1709	287238.312	9748608.377	312	8	-90	0	RTK GPS
335	DE1716	287324.116	9748614.129	295	22	-90	0	RTK GPS
336	DE1703	287124.738	9748816.939	291.694	12	-90	0	RTK GPS
337	DE1723	287441.937	9748522.369	284.607	18	-90	0	RTK GPS
338	DE1710	287225.599	9748830.766	283.119	8	-90	0	RTK GPS
339	DE1097	287430.234	9748713.191	278.107	15	-90	0	RTK GPS
340	DE1718	287331.821	9748818.223	287.148	13	-90	0	RTK GPS
341	DE1744	287626.01	9748710.939	299	7	-90	0	RTK GPS
342	DE1984	288135.87	9748196.708	298.536	22	-90	0	RTK GPS
343	DE1827	288219.335	9748914.799	330	14	-90	0	RTK GPS
344	DE1840	288332.275	9748820.31	286.442	16	-90	0	RTK GPS
345	DE1826	288241.275	9748826.721	310.66	10	-90	0	RTK GPS
346	DE1841	288337.701	9748904.084	303.791	7	-90	0	RTK GPS
347	DE1816	288140.775	9748895.008	319.224	8	-90	0	RTK GPS
348	DE1810	288123.731	9748035.281	317	22	-90	0	RTK GPS
349	DE1823	288225.778	9748113.202	292.766	31	-90	0	RTK GPS
350	DE1811	288130.056	9748119.66	298	35	-90	0	RTK GPS
351	DE1985	288130.758	9748301.946	293.964	16	-90	0	RTK GPS
352	DE1814	288133.98	9748713.407	274.975	15	-90	0	RTK GPS
353	DE1986	288228.834	9748222.947	296.267	20	-90	0	RTK GPS
354	DE1836	288343.837	9748111.193	287.741	24	-90	0	RTK GPS
355	DE1822	288247.825	9748013.484	308.938	16	-90	0	RTK GPS
356	DE1833	288331.585	9747817.122	292.918	13	-90	0	RTK GPS
357	DE1835	288310.966	9748010.197	306.846	16	-90	0	RTK GPS
358	DE1834	288330.698	9747917.669	302.876	21	-90	0	RTK GPS
359	DE1856	288441.353	9748703.107	278.136	11	-90	0	RTK GPS
360	DE1857	288426.799	9748822.12	276.772	13	-90	0	RTK GPS
361	DE1858	288409.865	9748943.747	302.016	12	-90	0	RTK GPS
362	DE1815	288137.647	9748825.188	299.187	10	-90	0	RTK GPS
363	DE1838	288333.676	9748619.484	272	24	-90	0	RTK GPS
364	DE1839	288341.872	9748717.38	279	8	-90	0	RTK GPS
365	DE1825	288247.311	9748611.171	277.576	11	-90	0	RTK GPS
366	DE1812	288147.398	9748519.931	277	17	-90	0	RTK GPS
367	DE1798	288037.116	9748415.802	278.517	22	-90	0	RTK GPS
368	DE1832	288325.486	9747704.709	297.565	22	-90	0	RTK GPS
369	DE1821	288229.936	9747822.546	295.309	25	-90	0	RTK GPS
370	DE1820	288229.499	9747705.535	301.699	37	-90	0	RTK GPS
371	DE1845	288421.599	9747608.326	281.184	29	-90	0	RTK GPS
372	DE1846	288443.295	9747716.627	286.708	17	-90	0	RTK GPS
373	DE1859	288525.808	9747719.864	283.559	23	-90	0	RTK GPS
374	DE1853	288423.051	9748401.496	293.188	23	-90	0	RTK GPS

375	DE1861	288501.481	9747907.168	283	23	-90	0	RTK GPS
376	DE1783	287938.402	9748423.975	274.537	21	-90	0	RTK GPS
377	DE1824	288230.629	9748518.515	279.935	22	-90	0	RTK GPS
378	DE1848	288436.957	9747901.722	279.844	20	-90	0	RTK GPS
379	DE1862	288538.349	9748013.047	293.444	10	-90	0	RTK GPS
380	DE1849	288434.138	9748016.028	301.267	20	-90	0	RTK GPS
381	DE1837	288347.414	9748513.537	276.957	11	-90	0	RTK GPS
382	DE1860	288536.354	9747801.782	278.232	20	-90	0	RTK GPS
383	DE1847	288434.764	9747825.105	280.645	13	-90	0	RTK GPS
384	DE1892	288831.073	9748114.746	293.49	16	-90	0	RTK GPS
385	DE1879	288729.571	9748115.306	306	15	-90	0	RTK GPS
386	DE1864	288528.302	9748210.886	299.099	31	-90	0	RTK GPS
387	DE1852	288426.174	9748317.123	285.416	26	-90	0	RTK GPS
388	DE1850	288443.036	9748091.447	308.225	27	-90	0	RTK GPS
389	DE1871	288632.087	9748114.711	293.238	12	-90	0	RTK GPS
390	DE1870	288640.797	9748015.282	281.527	16	-90	0	RTK GPS
391	DE1851	288425.23	9748213.713	288	12	-90	0	RTK GPS
392	DE1863	288536.872	9748116.092	306	30	-90	0	RTK GPS
393	DE1872	288628.496	9748219.583	303.573	24	-90	0	RTK GPS
394	DE1866	288521.944	9748399.915	290	15	-90	0	RTK GPS
395	DE1865	288524.899	9748326.764	291.638	23	-90	0	RTK GPS
396	DE1878	288739.848	9748008.115	283.015	12	-90	0	RTK GPS
397	DE1891	288837.477	9748019.44	287.756	22	-90	0	RTK GPS
398	DE1894	288835.899	9748316.315	294.539	25	-90	0	RTK GPS
399	DE1889	288829.181	9747818.705	285.609	5	-90	0	RTK GPS
400	DE1875	288721.195	9747717.916	278.842	15	-90	0	RTK GPS
401	DE1869	288643.894	9747809.901	277.585	20	-90	0	RTK GPS
402	DE1868	288633.349	9747714.858	276.971	16	-90	0	RTK GPS
403	DE1888	288832.233	9747717.907	280.872	7	-90	0	RTK GPS
404	DE1890	288828.703	9747916.416	292.694	12	-90	0	RTK GPS
405	DE1877	288734.23	9747923.309	277.99	20	-90	0	RTK GPS
406	DE1881	288729.597	9748323.669	302.053	25	-90	0	RTK GPS
407	DE1893	288824.685	9748206.721	299.794	24	-90	0	RTK GPS
408	DE1880	288726.038	9748222.27	306.591	16	-90	0	RTK GPS
409	DE1896	288829.75	9748505.439	307	13	-90	0	RTK GPS
410	DE1895	288827.978	9748409.348	293.739	21	-90	0	RTK GPS
411	DE1876	288735.965	9747806.474	286	8	-90	0	RTK GPS
412	DE1883	288738.812	9748515.839	307.599	19	-90	0	RTK GPS
413	DE1855	288429.418	9748621.366	286.113	14	-90	0	RTK GPS
414	DE1887	288841.924	9747612.109	272.485	12	-90	0	RTK GPS
415	DE1909	289031.707	9747721.12	259.805	19	-90	0	RTK GPS
416	DE1873	288637.466	9748411.567	292.131	22	-90	0	RTK GPS
417	DE1874	288645.683	9748528.505	311.412	18	-90	0	RTK GPS
418	DE1854	288428.794	9748515.883	292.174	21	-90	0	RTK GPS
419	DE1882	288738.239	9748416.961	293	25	-90	0	RTK GPS
420	DE1900	288930.016	9747615.372	264.303	14	-90	0	RTK GPS
421	DE1901	288931.833	9747707.837	268.528	24	-90	0	RTK GPS

422	DE1867	288532.083	9748514.077	301.097	20	-90	0	RTK GPS
423	DE1983	287741.319	9749115.431	306	23	-90	0	RTK GPS
424	DE1978	286934.172	9748524.45	299.439	12	-90	0	RTK GPS
425	DE1976	286842.068	9748508.502	304.951	6	-90	0	RTK GPS
426	DE1975	286840.767	9748427.432	297.976	10	-90	0	RTK GPS
427	DE1910	289007.059	9747806.078	259	14	-90	0	RTK GPS
428	DE1903	288925.667	9747908.636	286.298	8	-90	0	RTK GPS
429	DE1904	288920.126	9748023.786	289.56	18	-90	0	RTK GPS
430	DE1911	289031.48	9748026.465	286.886	11	-90	0	RTK GPS
431	DE1905	288937	9748108.635	280.072	23	-90	0	RTK GPS
432	DE1912	289025.663	9748109.971	282.63	14	-90	0	RTK GPS
433	DE1921	289132.934	9748118.847	286.351	12	-90	0	RTK GPS
434	DE1920	289130.602	9748022.03	275.14	6	-90	0	RTK GPS
435	DE1930	289217.138	9748112.657	260	26	-90	0	RTK GPS
436	DE1713	287339.129	9747914.106	293.14	13	-90	0	RTK GPS
437	DE1712	287333.338	9747818.817	295.205	6	-90	0	RTK GPS
438	DE1704	287235.546	9747717.377	299	19	-90	0	RTK GPS
439	DE1711	287335.498	9747722.918	296.74	15	-90	0	RTK GPS
440	DE1715	287338.218	9748106.308	292.678	12	-90	0	RTK GPS
441	DE1714	287334.799	9748012.942	290.38	15	-90	0	RTK GPS
442	DE1919	289132.637	9747909.911	254	12	-90	0	RTK GPS
443	DE1917	289133.517	9747726.629	254.532	23	-90	0	RTK GPS
444	DE1722	287434.157	9748110.497	296.519	14	-90	0	RTK GPS
445	DE1721	287433.595	9748024.221	290.754	24	-90	0	RTK GPS
446	DE1926	289235.266	9747727.161	251	20	-90	0	RTK GPS
447	DE1918	289138.097	9747808.071	250.888	9	-90	0	RTK GPS
448	DE1929	289230.203	9748029.505	253	24	-90	0	RTK GPS
449	DE1925	289231.455	9747623.78	255.992	6	-90	0	RTK GPS
450	DE1728	287527.675	9748111.293	296.855	26	-90	0	RTK GPS
451	DE1916	289134.617	9747608.762	267.742	14	-90	0	RTK GPS
452	DE1915	289131.741	9747517.544	273	22	-90	0	RTK GPS
453	DE1908	289030.026	9747616.539	259.819	24	-90	0	RTK GPS
454	DE1829	288333.373	9747415.595	283.769	16	-90	0	RTK GPS
455	DE1923	289235.009	9747423.814	252.512	30	-90	0	RTK GPS
456	DE1830	288325.865	9747516.718	280.863	13	-90	0	RTK GPS
457	DE1743	287637.695	9748115.255	289.372	12	-90	0	RTK GPS
458	DE1924	289219.225	9747520.549	268	12	-90	0	RTK GPS
459	DE1982	287538.068	9748311.13	295.985	10	-90	0	RTK GPS
460	DE1981	287534.254	9748216.124	298.668	22	-90	0	RTK GPS
461	DE1844	288429.408	9747512.054	278.851	22	-90	0	RTK GPS
462	DE1758	287738.245	9748107.782	290.896	14	-90	0	RTK GPS
463	DE1731	287655.947	9746628.301	212.093	10	-90	0	RTK GPS
464	DE1842	288425.012	9747306.631	277.698	14	-90	0	RTK GPS
465	DE1769	287831.657	9748014.86	294.291	20	-90	0	RTK GPS
466	DE1817	288236.615	9747309.218	282.412	6	-90	0	RTK GPS
467	DE1803	288142.29	9747319.901	286.026	10	-90	0	RTK GPS
468	DE1828	288323.315	9747312.174	279.119	11	-90	0	RTK GPS

469	DE1907	289033.136	9747411.518	259.029	24	-90	0	RTK GPS
470	DE1914	289135.165	9747408.161	267.17	19	-90	0	RTK GPS
471	DE1922	289229.834	9747327.865	245	12	-90	0	RTK GPS
472	DE1742	287638.316	9748009.504	300.816	16	-90	0	RTK GPS
473	DE1757	287728.674	9748013.785	296.745	17	-90	0	RTK GPS
474	DE1732	287631.97	9746714.203	227.202	26	-90	0	RTK GPS
475	DE1804	288131.766	9747419.381	288.788	21	-90	0	RTK GPS
476	DE1818	288223.65	9747435.463	289.798	16	-90	0	RTK GPS
477	DE1843	288436.829	9747408.948	281.505	19	-90	0	RTK GPS
478	DE1741	287640.077	9747895.685	300.7	17	-90	0	RTK GPS
479	DE1727	287539.946	9748018.178	301.984	9	-90	0	RTK GPS
480	DE1726	287528.594	9747916.36	294.719	8	-90	0	RTK GPS
481	DE1884	288842.403	9747313.453	271.941	13	-90	0	RTK GPS
482	DE1805	288138.52	9747521.104	285.568	16	-90	0	RTK GPS
483	DE1756	287739.808	9747913.596	306.182	14	-90	0	RTK GPS
484	DE1885	288835.517	9747412.273	270.381	20	-90	0	RTK GPS
485	DE1747	287735.718	9746711.803	229.042	39	-90	0	RTK GPS
486	DE1906	289032.111	9747315.088	260.997	16	-90	0	RTK GPS
487	DE1793	288029.243	9747516.26	290.117	21	-90	0	RTK GPS
488	DE1748	287720.367	9746810.716	247	14	-90	0	RTK GPS
489	DE1777	287935.059	9747425.09	288.92	16	-90	0	RTK GPS
490	DE1749	287728.13	9746936.755	277.032	21	-90	0	RTK GPS
491	DE1750	287743.228	9747328.02	284.139	8	-90	0	RTK GPS
492	DE1763	287847.228	9746915.743	255.686	12	-90	0	RTK GPS
493	DE1735	287631.576	9747336.509	282.912	12	-90	0	RTK GPS
494	DE1899	288922.288	9747512.825	266.57	24	-90	0	RTK GPS
495	DE1898	288926.732	9747418.861	266.406	15	-90	0	RTK GPS
496	DE1725	287528.185	9747796.274	298.978	10	-90	0	RTK GPS
497	DE1762	287828.037	9746819.049	229	20	-90	0	RTK GPS
498	DE1936	289715.358	9747723.135	250.785	19	-90	0	RTK GPS
499	DE1778	287932.234	9747505.513	284.795	20	-90	0	RTK GPS
500	DE1765	287838.256	9747425.949	285.424	16	-90	0	RTK GPS
501	DE1719	287429.44	9747720.609	299.233	9	-90	0	RTK GPS
502	DE1764	287838.106	9747345.31	282.992	18	-90	0	RTK GPS
503	DE1931	289624.181	9747705.188	248.598	15	-90	0	RTK GPS
504	DE1720	287436.255	9747817.075	304.13	15	-90	0	RTK GPS
505	DE1774	287920.782	9746819.8	229.867	24	-90	0	RTK GPS
506	DE2195	284833.777	9747999.648	340	19	-90	0	RTK GPS
507	DE2172	284741.111	9748004.745	361.911	10	-90	0	RTK GPS
508	DE2173	284732.793	9747923.942	367.625	15	-90	0	RTK GPS
509	DE1775	287947.052	9746919.111	257.296	15	-90	0	RTK GPS
510	DE1932	289683.245	9747797.573	251.023	9	-90	0	RTK GPS
511	DE2196	284839.659	9747942.417	359.255	17	-90	0	RTK GPS
512	DE2216	284933.149	9748006.305	340.845	11	-90	0	RTK GPS
513	DE1942	289828.67	9747809.961	266.519	23	-90	0	RTK GPS
514	DE1933	289627.458	9747906.209	254	22	-90	0	RTK GPS
515	DE1754	287726.837	9747719.171	291.466	17	-90	0	RTK GPS

516	DE1941	289823.216	9747717.021	261.535	12	-90	0	RTK GPS
517	DE1767	287830.841	9747715.72	291.359	19	-90	0	RTK GPS
518	DE1739	287628.347	9747716.559	297.03	12	-90	0	RTK GPS
519	DE1768	287832.49	9747809.621	293.386	16	-90	0	RTK GPS
520	DE1937	289741.616	9747816.664	257.094	23	-90	0	RTK GPS
521	DE1724	287532.954	9747724.691	292.206	15	-90	0	RTK GPS
522	DE1902	288937.96	9747820.145	275.791	5	-90	0	RTK GPS
523	DE1746	287736.442	9746624.476	221.88	23	-90	0	RTK GPS
524	DE1913	289128.48	9747316.194	262.25	13	-90	0	RTK GPS
525	DE1897	288931.299	9747314.736	265	16	-90	0	RTK GPS
526	DE2174	284739.756	9747817.452	358.482	16	-90	0	RTK GPS
527	DE2175	284716.957	9747718.903	354.489	13	-90	0	RTK GPS
528	DE2176	284715.868	9747631.374	329	14	-90	0	RTK GPS
529	DE2177	284725.742	9747532.765	325.924	17	-90	0	RTK GPS
530	DE2234	285035.969	9748322.122	361.026	8	-90	0	RTK GPS
531	DE2256	285136.311	9748332.841	361.023	12	-90	0	RTK GPS
532	DE2279	285236.824	9748331.702	346.794	11	-90	0	RTK GPS
533	DE2235	285038.338	9748232.417	343	4	-90	0	RTK GPS
534	DE2199	284832.269	9747621.635	359.311	7	-90	0	RTK GPS
535	DE2197	284846.1	9747793.216	355.521	19	-90	0	RTK GPS
536	DE2218	284933.871	9747804.556	353.358	20	-90	0	RTK GPS
537	DE2217	284947.171	9747907.748	361.986	16	-90	0	RTK GPS
538	DE2198	284830.294	9747703.663	353	17	-90	0	RTK GPS
539	DE2219	284929.459	9747722.755	361.58	14	-90	0	RTK GPS
540	DE2280	285207.83	9748216.983	332.704	20	-90	0	RTK GPS
541	DE2220	284927.009	9747637.637	359.618	9	-90	0	RTK GPS
542	DE2240	285037.786	9747694.751	359.183	13	-90	0	RTK GPS
543	DE2278	285231.495	9748417.267	351	12	-90	0	RTK GPS
544	DE2264	285132.765	9747527.379	330	8	-90	0	RTK GPS
545	DE2242	285015.414	9747525.532	334	15	-90	0	RTK GPS
546	DE2221	284938.957	9747517.055	330.147	15	-90	0	RTK GPS
547	DE2200	284840.968	9747496.292	326	14	-90	0	RTK GPS
548	DE2417	286129.707	9747712.873	303.692	11	-90	0	RTK GPS
549	DE2239	285006.368	9747796.927	362	16	-90	0	RTK GPS
550	DE2241	285019.464	9747626.744	357.665	12	-90	0	RTK GPS
551	DE2262	285120.176	9747712.192	355.065	19	-90	0	RTK GPS
552	DE2263	285133.351	9747610.471	343.96	13	-90	0	RTK GPS
553	DE2257	285136.692	9748228.559	338.96	19	-90	0	RTK GPS
554	DE1730	287633.199	9746511.953	189.32	10	-90	0	RTK GPS
555	DE1745	287731.791	9746513.926	197	14	-90	0	RTK GPS
556	DE1761	287847.619	9746628.31	213.47	24	-90	0	RTK GPS
557	DE1772	287945.297	9746612.632	217.334	17	-90	0	RTK GPS
558	DE1789	288032.09	9746814.398	235.24	20	-90	0	RTK GPS
559	DE1790	288052.143	9746934.261	265.59	8	-90	0	RTK GPS
560	DE1766	287834.441	9747623.09	298.263	16	-90	0	RTK GPS
561	DE1781	287937.725	9747823.892	304.552	10	-90	0	RTK GPS
562	DE1779	287937.296	9747620.828	296.207	12	-90	0	RTK GPS

563	DE1753	287732.053	9747618.288	300.915	7	-90	0	RTK GPS
564	DE1752	287720.55	9747526.399	297.824	7	-90	0	RTK GPS
565	DE1737	287624.741	9747519.905	299.756	7	-90	0	RTK GPS
566	DE1736	287635.288	9747421.994	287	9	-90	0	RTK GPS
567	DE1782	287930.103	9747898.307	303.486	17	-90	0	RTK GPS
568	DE1780	287936.623	9747739.192	292.413	19	-90	0	RTK GPS
569	DE1938	289726.457	9747908.404	263.058	17	-90	0	RTK GPS
570	DE1819	288233.347	9747601.563	285.953	6	-90	0	RTK GPS
571	DE1738	287630.557	9747615.635	310	5	-90	0	RTK GPS
572	DE1980	287121.563	9748112.107	300.039	10	-90	0	RTK GPS
573	DE1934	289636.477	9748001.961	250.931	22	-90	0	RTK GPS
574	DE1939	289713.582	9747954.631	252.559	16	-90	0	RTK GPS
575	DE1944	289823.666	9748110.735	250	15	-90	0	RTK GPS
576	DE1973	286717.162	9748064.047	304.905	6	-90	0	RTK GPS
577	DE1977	286944.33	9748117.835	303.641	9	-90	0	RTK GPS
578	DE1935	289632.235	9748101.89	254.946	8	-90	0	RTK GPS
579	DE1948	289950.545	9748010.379	238.353	20	-90	0	RTK GPS
580	DE1972	286737.864	9747922.656	304.366	6	-90	0	RTK GPS
581	DE1989	286821.064	9748030.994	306.831	5	-90	0	RTK GPS
582	DE1949	289920.38	9748122.11	236.126	12	-90	0	RTK GPS
583	DE1943	289831.451	9748018.335	239	14	-90	0	RTK GPS
584	DE1979	287032.984	9748109.528	302.926	8	-90	0	RTK GPS
585	DE1940	289712.148	9748105.068	255.466	14	-90	0	RTK GPS
586	DE1974	286836.872	9748115.669	300.445	6	-90	0	RTK GPS
587	DE1751	287733.222	9747414.072	287.553	18	-90	0	RTK GPS
588	DE2418	286129.384	9747625.14	296.689	24	-90	0	RTK GPS
589	DE2416	286129.874	9747820.679	308.461	8	-90	0	RTK GPS
590	DE2411	286051.432	9747925.085	319.209	8	-90	0	RTK GPS
591	DE2413	286010.992	9747724.456	294	9	-90	0	RTK GPS
592	DE2415	286104.849	9747911.071	312.813	9	-90	0	RTK GPS
593	DE1952	290014.525	9747906.055	270	8	-90	0	RTK GPS
594	DE1953	290006.653	9748001.767	257.103	29	-90	0	RTK GPS
595	DE1951	290027.295	9747822.17	267.182	16	-90	0	RTK GPS
596	DE1950	290029.166	9747722.628	267.293	5	-90	0	RTK GPS
597	DE1945	289935.963	9747711.995	258.647	31	-90	0	RTK GPS
598	DE2201	284848.534	9747420.694	311.961	16	-90	0	RTK GPS
599	DE2202	284831.238	9747301.144	305.484	11	-90	0	RTK GPS
600	DE2178	284759.112	9747448.995	311.154	19	-90	0	RTK GPS
601	DE2233	285031.301	9748424.824	386.501	20	-90	0	RTK GPS
602	DE2255	285124.312	9748414.901	373.577	23	-90	0	RTK GPS
603	DE2232	285034.982	9748532.219	365	30	-90	0	RTK GPS
604	DE2254	285143.637	9748523.53	351	19	-90	0	RTK GPS
605	DE2154	284624.572	9747604.557	347.612	19	-90	0	RTK GPS
606	DE2277	285229.872	9748514.745	347.879	19	-90	0	RTK GPS
607	DE2153	284639.431	9747724.385	356	15	-90	0	RTK GPS
608	DE2151	284638.664	9747907.704	369.569	23	-90	0	RTK GPS
609	DE2152	284645.273	9747795.809	368.183	25	-90	0	RTK GPS

610	DE2130	284533.944	9747915.042	366.63	20	-90	0	RTK GPS
611	DE2131	284551.921	9747823.877	361.392	14	-90	0	RTK GPS
612	DE1947	289940.482	9747901.574	258.926	24	-90	0	RTK GPS
613	DE2414	286037.221	9747603.328	288	13	-90	0	RTK GPS
614	DE1946	289939.928	9747815.257	265	36	-90	0	RTK GPS
615	DE2412	286040.621	9747816.328	311.198	8	-90	0	RTK GPS
616	DE2155	284648.477	9747511.044	334.348	10	-90	0	RTK GPS
617	DE2408	285937.863	9747823.024	283.87	8	-90	0	RTK GPS
618	DE2406	285915.222	9748015.249	284.23	9	-90	0	RTK GPS
619	DE2135	284534.973	9747427.591	342.35	13	-90	0	RTK GPS
620	DE2401	285845.892	9748012.193	275.035	11	-90	0	RTK GPS
621	DE2402	285827.17	9747908.902	258.039	10	-90	0	RTK GPS
622	DE2134	284530.701	9747511.302	341.209	17	-90	0	RTK GPS
623	DE2133	284509.285	9747621.022	341.713	15	-90	0	RTK GPS
624	DE2230	285025.579	9748706.977	338.412	8	-90	0	RTK GPS
625	DE2407	285946.329	9747909.058	286.824	6	-90	0	RTK GPS
626	DE2253	285129.494	9748602.355	346	27	-90	0	RTK GPS
627	DE2276	285229.289	9748621.668	344	21	-90	0	RTK GPS
628	DE2132	284531.701	9747722.131	342.859	9	-90	0	RTK GPS
629	DE2231	285029.176	9748622.313	349.973	8	-90	0	RTK GPS
630	DE2252	285120.66	9748699.208	338.848	11	-90	0	RTK GPS
631	DE2117	284443.062	9747304.341	359.698	18	-90	0	RTK GPS
632	DE2116	284430.052	9747418.827	348.111	17	-90	0	RTK GPS
633	DE2136	284505.562	9747333.844	351	12	-90	0	RTK GPS
634	DE2361	285632.939	9749407.134	407.637	9	-90	0	RTK GPS
635	DE2403	285828.945	9747830.229	252	9	-90	0	RTK GPS
636	DE2362	285632.089	9749314.721	414.427	18	-90	0	RTK GPS
637	DE2404	285824.092	9747725.681	253.889	11	-90	0	RTK GPS
638	DE2395	285730.144	9747719.719	258.214	8	-90	0	RTK GPS
639	DE2275	285229.228	9748699.629	338.403	15	-90	0	RTK GPS
640	DE2274	285231.341	9748797.986	333.032	8	-90	0	RTK GPS
641	DE2393	285740.97	9747897.848	263.225	20	-90	0	RTK GPS
642	DE2318	285449.189	9749111.339	397.931	20	-90	0	RTK GPS
643	DE2392	285731.824	9747999.885	279	10	-90	0	RTK GPS
644	DE2394	285753.886	9747811.074	265	12	-90	0	RTK GPS
645	DE2115	284433.502	9747520.719	343.576	14	-90	0	RTK GPS
646	DE2114	284442.972	9747597.191	335	17	-90	0	RTK GPS
647	DE2343	285529.529	9749126.069	397.786	18	-90	0	RTK GPS
648	DE2364	285641.767	9749136.901	396.352	17	-90	0	RTK GPS
649	DE2363	285634.27	9749226.035	412.479	8	-90	0	RTK GPS
650	DE2271	285231.54	9749119.03	404.684	14	-90	0	RTK GPS
651	DE2292	285332.564	9749110.787	399.32	21	-90	0	RTK GPS
652	DE2113	284435.466	9747712.524	338.148	13	-90	0	RTK GPS
653	DE2248	285115.548	9749130.345	414.276	20	-90	0	RTK GPS
654	DE2251	285134.118	9748810.751	356.95	8	-90	0	RTK GPS
655	DE2229	285031.497	9748823.894	361	9	-90	0	RTK GPS
656	DE2228	285037.87	9748906.581	375.58	14	-90	0	RTK GPS

657	DE2400	285821.296	9748119.797	307	17	-90	0	RTK GPS
658	DE2270	285236.71	9749209.436	415	17	-90	0	RTK GPS
659	DE2291	285343.015	9749194.574	404.114	15	-90	0	RTK GPS
660	DE2092	284353.844	9747998.468	363	12	-90	0	RTK GPS
661	DE2317	285422.303	9749209.716	405	19	-90	0	RTK GPS
662	DE2112	284432.947	9747804.847	354.373	22	-90	0	RTK GPS
663	DE2111	284438.714	9747907.632	367	25	-90	0	RTK GPS
664	DE2110	284445.236	9748016.935	361.124	26	-90	0	RTK GPS
665	DE2391	285738.036	9748114.818	315	11	-90	0	RTK GPS
666	DE2399	285822.818	9748202.244	320.226	11	-90	0	RTK GPS
667	DE2342	285523.496	9749216.843	407.055	20	-90	0	RTK GPS
668	DE2273	285222.272	9748935.278	374	15	-90	0	RTK GPS
669	DE2096	284330.468	9747612.12	336	22	-90	0	RTK GPS
670	DE2316	285429.798	9749321.623	420.548	12	-90	0	RTK GPS
671	DE2321	285421.576	9748805.463	348.591	14	-90	0	RTK GPS
672	DE2094	284344.934	9747810.755	350	21	-90	0	RTK GPS
673	DE2095	284338.825	9747723.274	344.397	14	-90	0	RTK GPS
674	DE2341	285527.571	9749323.959	417.437	22	-90	0	RTK GPS
675	DE2250	285119.482	9748928.69	374.623	12	-90	0	RTK GPS
676	DE2389	285749.071	9748320.552	345	11	-90	0	RTK GPS
677	DE2390	285749.822	9748206.138	326.003	7	-90	0	RTK GPS
678	DE2340	285529.381	9749410.779	410.56	16	-90	0	RTK GPS
679	DE2093	284323.768	9747931.163	366.969	16	-90	0	RTK GPS
680	DE2398	285814.938	9748332.007	346.412	9	-90	0	RTK GPS
681	DE2388	285740.984	9748411.372	352.328	12	-90	0	RTK GPS
682	DE2397	285845.075	9748428.633	346.559	10	-90	0	RTK GPS
683	DE2297	285338.637	9748609.399	336.655	10	-90	0	RTK GPS
684	DE2296	285340.413	9748702.784	337.015	17	-90	0	RTK GPS
685	DE2097	284321.35	9747503.341	339.742	20	-90	0	RTK GPS
686	DE2387	285724.874	9748511.145	339.79	26	-90	0	RTK GPS
687	DE2396	285825.916	9748512.769	339	18	-90	0	RTK GPS
688	DE2098	284327.625	9747408.268	355.31	22	-90	0	RTK GPS
689	DE2324	285435.727	9748516.673	335.258	8	-90	0	RTK GPS
690	DE2099	284332.89	9747309.417	369	17	-90	0	RTK GPS
691	DE2298	285309.401	9748512.228	345.806	19	-90	0	RTK GPS
692	DE2100	284330.56	9747216.436	351.234	15	-90	0	RTK GPS
693	DE2084	284232.229	9747406.045	345.282	18	-90	0	RTK GPS
694	DE2299	285339.278	9748414.453	342	17	-90	0	RTK GPS
695	DE2085	284246.674	9747320.241	362.779	17	-90	0	RTK GPS
696	DE2328	285426.84	9748120.201	307	20	-90	0	RTK GPS
697	DE2302	285320.473	9748102.421	320.295	16	-90	0	RTK GPS
698	DE2281	285226.514	9748118.076	327	24	-90	0	RTK GPS
699	DE2386	285751.987	9748605.916	339.414	28	-90	0	RTK GPS
700	DE2236	285025.324	9748097.485	327.269	19	-90	0	RTK GPS
701	DE2258	285146.96	9748105.993	326.64	22	-90	0	RTK GPS
702	DE2385	285734.4	9748704.874	341.922	16	-90	0	RTK GPS
703	DE1955	285827.217	9748700.29	346	30	-90	0	RTK GPS

704	DE2326	285419.712	9748312.954	329.315	9	-90	0	RTK GPS
705	DE2301	285334.152	9748216.431	319.993	10	-90	0	RTK GPS
706	DE2325	285444.449	9748409.159	337.896	7	-90	0	RTK GPS
707	DE2237	285034.867	9747994.898	317.777	20	-90	0	RTK GPS
708	DE2071	284123.403	9747491.994	334.191	13	-90	0	RTK GPS
709	DE2259	285111.593	9748007.954	307.421	9	-90	0	RTK GPS
710	DE2083	284232.337	9747499.102	330.015	24	-90	0	RTK GPS
711	DE2329	285420.769	9748025.81	307.268	8	-90	0	RTK GPS
712	DE2282	285238.257	9748024.702	311.668	11	-90	0	RTK GPS
713	DE2072	284126.513	9747427.363	332.067	20	-90	0	RTK GPS
714	DE2368	285638.147	9748711.201	337	20	-90	0	RTK GPS
715	DE1956	285866.911	9748701.427	347	27	-90	0	RTK GPS
716	DE2323	285428.877	9748607.824	335.278	8	-90	0	RTK GPS
717	DE2300	285333.805	9748330.336	335.073	8	-90	0	RTK GPS
718	DE2327	285425.041	9748198.785	310	10	-90	0	RTK GPS
719	DE2215	284928.957	9748117.242	339	12	-90	0	RTK GPS
720	DE2192	284844.23	9748321.809	356.962	16	-90	0	RTK GPS
721	DE2214	284938.858	9748217.893	358.371	19	-90	0	RTK GPS
722	DE2059	284039.516	9747409.814	331.897	20	-90	0	RTK GPS
723	DE2073	284133.385	9747334.63	356	20	-90	0	RTK GPS
724	DE2149	284629.133	9748121.349	354.822	5	-90	0	RTK GPS
725	DE2150	284655.511	9748025.816	350.179	14	-90	0	RTK GPS
726	DE2193	284837.178	9748219.462	338.93	10	-90	0	RTK GPS
727	DE2060	284007.332	9747313.277	336	22	-90	0	RTK GPS
728	DE2347	285543.77	9748697.126	336.78	15	-90	0	RTK GPS
729	DE2348	285539.18	9748618.551	337.437	27	-90	0	RTK GPS
730	DE2129	284533.2	9748016.774	356	13	-90	0	RTK GPS
731	DE2128	284542.208	9748102.118	357.922	20	-90	0	RTK GPS
732	DE2213	284944.747	9748343.843	374	29	-90	0	RTK GPS
733	DE2370	285631.883	9748515.563	341.768	13	-90	0	RTK GPS
734	DE2127	284525.392	9748197.464	371.499	28	-90	0	RTK GPS
735	DE2061	284037.353	9747217.22	349	23	-90	0	RTK GPS
736	DE2349	285530.057	9748512.835	336.216	24	-90	0	RTK GPS
737	DE2062	284028.277	9747121.074	354.151	17	-90	0	RTK GPS
738	DE2049	283934.789	9747108.708	351	10	-90	0	RTK GPS
739	DE2191	284831.629	9748416.212	359.54	15	-90	0	RTK GPS
740	DE2190	284836.342	9748528.89	380.759	25	-90	0	RTK GPS
741	DE2212	284926.278	9748416.225	359	18	-90	0	RTK GPS
742	DE2048	283925.578	9747237.588	329.082	14	-90	0	RTK GPS
743	DE2211	284932.042	9748517.112	374.954	25	-90	0	RTK GPS
744	DE2106	284440.286	9748413.867	366	11	-90	0	RTK GPS
745	DE2046	283934.008	9747386.663	339	13	-90	0	RTK GPS
746	DE2210	284909.314	9748616.118	370.706	16	-90	0	RTK GPS
747	DE2372	285636.417	9748327.372	348.338	20	-90	0	RTK GPS
748	DE2126	284535.624	9748304.343	349.901	20	-90	0	RTK GPS
749	DE2107	284432.787	9748321.627	359.509	15	-90	0	RTK GPS
750	DE2371	285632.888	9748420.459	348.201	20	-90	0	RTK GPS

751	DE2350	285537.49	9748408.63	343.154	20	-90	0	RTK GPS
752	DE2351	285556.807	9748325.962	343.428	8	-90	0	RTK GPS
753	DE2047	283930.23	9747317.398	342.274	17	-90	0	RTK GPS
754	DE2369	285623.915	9748624.972	339.863	33	-90	0	RTK GPS
755	DE2189	284838.856	9748612.749	374.146	23	-90	0	RTK GPS
756	DE2091	284332.756	9748125.427	358.312	20	-90	0	RTK GPS
757	DE2089	284358.269	9748318.123	374	27	-90	0	RTK GPS
758	DE2373	285632.734	9748202.087	326	11	-90	0	RTK GPS
759	DE2108	284429.157	9748211.151	381.213	31	-90	0	RTK GPS
760	DE2188	284833.771	9748720.097	364.638	8	-90	0	RTK GPS
761	DE2109	284420.274	9748114.265	357	20	-90	0	RTK GPS
762	DE2352	285551.552	9748222.81	327	10	-90	0	RTK GPS
763	DE2374	285634.267	9748112.726	307.106	8	-90	0	RTK GPS
764	DE2209	284932.045	9748711.552	347	18	-90	0	RTK GPS
765	DE1966	286431.634	9748110.055	319.796	12	-90	0	RTK GPS
766	DE2078	284238.998	9748024.72	356	20	-90	0	RTK GPS
767	DE1960	286233.369	9748212.882	333.967	9	-90	0	RTK GPS
768	DE1988	286328.969	9748109.844	333.462	14	-90	0	RTK GPS
769	DE2077	284246.557	9748114.718	349.371	15	-90	0	RTK GPS
770	DE1964	286439.699	9747913.539	318.362	12	-90	0	RTK GPS
771	DE1965	286432.839	9748017.824	321.94	16	-90	0	RTK GPS
772	DE1987	286230.978	9748121.003	343.379	12	-90	0	RTK GPS
773	DE2090	284343.073	9748195.995	382	25	-90	0	RTK GPS
774	DE2079	284243.548	9747906.54	363	14	-90	0	RTK GPS
775	DE2165	284735.274	9748700.912	375.161	11	-90	0	RTK GPS
776	DE2145	284637.817	9748501.101	378.078	24	-90	0	RTK GPS
777	DE2144	284644.033	9748610.142	366.247	15	-90	0	RTK GPS
778	DE2166	284732.663	9748621.478	368.879	16	-90	0	RTK GPS
779	DE2038	283838.387	9747312.365	352.228	20	-90	0	RTK GPS
780	DE2037	283818.36	9747428.073	363.903	22	-90	0	RTK GPS
781	DE2036	283832.864	9747509.288	366.395	17	-90	0	RTK GPS
782	DE2045	283931.536	9747514.128	380.535	16	-90	0	RTK GPS
783	DE2058	284002.453	9747506.701	367	22	-90	0	RTK GPS
784	DE2029	283748.41	9747406.78	361.473	20	-90	0	RTK GPS
785	DE2028	283739.973	9747509.442	373.712	28	-90	0	RTK GPS
786	DE2147	284661.978	9748326.072	342.813	15	-90	0	RTK GPS
787	DE2167	284715.546	9748498.122	383.936	28	-90	0	RTK GPS
788	DE2170	284751.682	9748225.311	351.639	21	-90	0	RTK GPS
789	DE2168	284725.978	9748422.304	375	24	-90	0	RTK GPS
790	DE2146	284655.381	9748434.419	371.055	15	-90	0	RTK GPS
791	DE2169	284737.346	9748298.942	354.084	20	-90	0	RTK GPS
792	DE2066	284144.964	9748043.286	355.675	20	-90	0	RTK GPS
793	DE2067	284135.503	9747929.604	366.961	27	-90	0	RTK GPS
794	DE1971	286643.419	9747932.323	313	20	-90	0	RTK GPS
795	DE1970	286559.779	9748287.584	311.736	9	-90	0	RTK GPS
796	DE1968	286443.832	9748320.933	299.412	8	-90	0	RTK GPS
797	DE2065	284140.757	9748120.812	363	20	-90	0	RTK GPS

798	DE1969	286535.08	9747935.737	311.407	26	-90	0	RTK GPS
799	DE2044	283940.023	9747602.586	379	20	-90	0	RTK GPS
800	DE2035	283843.08	9747607.465	366.69	23	-90	0	RTK GPS
801	DE2043	283936.753	9747705.018	360.665	24	-90	0	RTK GPS
802	DE2057	284033.188	9747601.509	377.844	17	-90	0	RTK GPS
803	DE2034	283833.864	9747720.851	357	25	-90	0	RTK GPS
804	DE2042	283932.661	9747811.223	359.138	28	-90	0	RTK GPS
805	DE2055	284037.436	9747808.023	361.132	28	-90	0	RTK GPS
806	DE2069	284128.861	9747711.75	360.103	26	-90	0	RTK GPS
807	DE2080	284226.901	9747811.767	363.77	28	-90	0	RTK GPS
808	DE2056	284028.861	9747723.569	359.068	22	-90	0	RTK GPS
809	DE1734	287637.863	9746920.196	270.768	21	-90	0	RTK GPS
810	DE1776	287952.553	9747302.029	288.511	13	-90	0	RTK GPS
811	DE1733	287634.705	9746817.453	249.946	21	-90	0	RTK GPS
812	DE1740	287633.934	9747818.529	297.029	17	-90	0	RTK GPS
813	DE1755	287732.727	9747816.672	292.413	17	-90	0	RTK GPS
814	DE1791	288030.609	9747305.333	292.303	16	-90	0	RTK GPS
815	DE1792	288031.521	9747410.543	296.341	11	-90	0	RTK GPS
816	DE2068	284121.704	9747824.813	357.701	20	-90	0	RTK GPS
817	DE2082	284242.854	9747631.498	354.214	25	-90	0	RTK GPS
818	DE2081	284219.135	9747719.839	354.156	24	-90	0	RTK GPS
819	DE2053	284026.219	9748022.434	354.853	22	-90	0	RTK GPS
820	DE2157	284634.113	9747324.585	329.215	13	-90	0	RTK GPS
821	DE2052	284024.14	9748116.054	372.171	30	-90	0	RTK GPS
822	DE2156	284621.082	9747415.345	349	22	-90	0	RTK GPS
823	DE2041	283933.374	9747924.297	367.746	30	-90	0	RTK GPS
824	DE2054	284033.773	9747927.84	367.708	30	-90	0	RTK GPS
825	DE2040	283927.162	9748022.218	358.615	18	-90	0	RTK GPS
826	DE2032	283836.418	9747917.725	357.181	20	-90	0	RTK GPS
827	DE1967	286410.924	9748232.646	299.465	20	-90	0	RTK GPS
828	DE2180	284721.441	9747224.732	291	17	-90	0	RTK GPS
829	DE2063	284035.244	9747004.001	310.186	16	-90	0	RTK GPS
830	DE2074	284132.418	9747036.331	310.31	17	-90	0	RTK GPS
831	DE2087	284229.658	9747011.064	307	19	-90	0	RTK GPS
832	DE2027	283727.151	9747611.321	368.564	26	-90	0	RTK GPS
833	DE2050	283944.084	9747010.805	325	13	-90	0	RTK GPS
834	DE2026	283732.72	9747720.6	358.198	21	-90	0	RTK GPS
835	DE2025	283754.357	9747813.126	360.284	17	-90	0	RTK GPS
836	DE2018	283648.998	9747611.196	358.346	18	-90	0	RTK GPS
837	DE2158	284627.991	9747226.977	308.134	20	-90	0	RTK GPS
838	DE2019	283634.101	9747509.75	354.457	20	-90	0	RTK GPS
839	DE2017	283621.014	9747715.022	374.558	21	-90	0	RTK GPS
840	DE2033	283831.729	9747809.355	359.181	16	-90	0	RTK GPS
841	DE2070	284138.813	9747609.472	376	20	-90	0	RTK GPS
842	DE2179	284711.86	9747323.605	310.933	14	-90	0	RTK GPS
843	DE2011	283546.029	9747525.005	341.94	13	-90	0	RTK GPS
844	DE2223	284921.124	9747308.477	308.297	12	-90	0	RTK GPS

845	DE2203	284826.888	9747212.272	304.605	22	-90	0	RTK GPS
846	DE2086	284256.418	9747081.785	310.183	13	-90	0	RTK GPS
847	DE2101	284345.446	9747108.59	308.963	13	-90	0	RTK GPS
848	DE2224	284927.356	9747199.083	282.187	14	-90	0	RTK GPS
849	DE2051	283935.873	9746921.425	296.065	26	-90	0	RTK GPS
850	DE2088	284245.937	9746908.203	314.592	18	-90	0	RTK GPS
851	DE2075	284130.703	9746907.436	316.569	20	-90	0	RTK GPS
852	DE2039	283819.411	9747003.022	298.313	15	-90	0	RTK GPS
853	DE2020	283637.158	9747398.034	373.003	23	-90	0	RTK GPS
854	DE2104	284335.941	9746825.281	343.538	24	-90	0	RTK GPS
855	DE2102	284341.004	9747013.129	313.52	20	-90	0	RTK GPS
856	DE2012	283542.253	9747399.163	374.168	13	-90	0	RTK GPS
857	DE2121	284422.535	9746924.755	309.765	16	-90	0	RTK GPS
858	DE2120	284432.496	9747024.773	323.616	12	-90	0	RTK GPS
859	DE2119	284427.293	9747124.239	313.351	20	-90	0	RTK GPS
860	DE2245	285024.347	9747208.001	271.531	18	-90	0	RTK GPS
861	DE2267	285120.69	9747221.572	256	12	-90	0	RTK GPS
862	DE2287	285223.829	9747221.109	238.239	14	-90	0	RTK GPS
863	DE2244	285030.349	9747319.16	291	12	-90	0	RTK GPS
864	DE2266	285120.723	9747328.086	287	12	-90	0	RTK GPS
865	DE1995	283217.685	9747314.575	380.13	6	-90	0	RTK GPS
866	DE2005	283442.586	9747417.284	384.03	10	-90	0	RTK GPS
867	DE1999	283335.023	9747402.934	383.752	11	-90	0	RTK GPS
868	DE2000	283340.536	9747313.412	385.821	20	-90	0	RTK GPS
869	DE2140	284533.399	9746938.239	296.433	17	-90	0	RTK GPS
870	DE2138	284546.838	9747129.618	314.686	16	-90	0	RTK GPS
871	DE2139	284531.771	9747029.777	312.479	16	-90	0	RTK GPS
872	DE2122	284433.821	9746823.215	342.206	21	-90	0	RTK GPS
873	DE2103	284332.157	9746893.253	312.661	21	-90	0	RTK GPS
874	DE2143	284532.375	9746640.277	311.059	14	-90	0	RTK GPS
875	DE2105	284331.862	9746714.548	334.486	21	-90	0	RTK GPS
876	DE2123	284428.616	9746696.079	327.147	23	-90	0	RTK GPS
877	DE2141	284532.955	9746835.064	325.692	18	-90	0	RTK GPS
878	DE2164	284610.358	9746624.67	287	24	-90	0	RTK GPS
879	DE2336	285417.752	9747200.994	252.047	14	-90	0	RTK GPS
880	DE2286	285231.818	9747319.179	268	12	-90	0	RTK GPS
881	DE2311	285326.358	9747192.325	229.729	12	-90	0	RTK GPS
882	DE2013	283534.497	9747310.205	380.277	11	-90	0	RTK GPS
883	DE2006	283439.549	9747316.274	382	26	-90	0	RTK GPS
884	DE2021	283644.918	9747286.895	380.777	20	-90	0	RTK GPS
885	DE2159	284634.01	9747131.7	308.99	21	-90	0	RTK GPS
886	DE2007	283436.372	9747218.317	383.696	21	-90	0	RTK GPS
887	DE2022	283626.801	9747192.983	385	10	-90	0	RTK GPS
888	DE2161	284635.038	9746921.187	310.999	9	-90	0	RTK GPS
889	DE2163	284624.863	9746706.02	315	10	-90	0	RTK GPS
890	DE2160	284624.184	9747007.139	303.163	10	-90	0	RTK GPS
891	DE2181	284705.394	9747087.3	305.196	22	-90	0	RTK GPS

892	DE2014	283537.401	9747220.765	385.623	20	-90	0	RTK GPS
893	DE2030	283723.365	9747314.47	360.498	12	-90	0	RTK GPS
894	DE2064	284045.414	9746910.982	313	21	-90	0	RTK GPS
895	DE2148	284633.931	9748216.683	344.107	12	-90	0	RTK GPS
896	DE2142	284529.795	9746737.363	327.522	18	-90	0	RTK GPS
897	DE2357	285536.263	9747223.31	268.638	12	-90	0	RTK GPS
898	DE2358	285532.451	9747114.543	255.399	14	-90	0	RTK GPS
899	DE2225	284926.225	9746921.525	297	16	-90	0	RTK GPS
900	DE2162	284613.354	9746819.936	332	23	-90	0	RTK GPS
901	DE2185	284735.24	9746725.695	308.897	24	-90	0	RTK GPS
902	DE1996	283252.46	9747205.281	380	19	-90	0	RTK GPS
903	DE1992	283135.068	9747210.41	365.791	16	-90	0	RTK GPS
904	DE2206	284806.347	9746715.436	305.524	20	-90	0	RTK GPS
905	DE2226	284927.209	9746836.958	267.853	15	-90	0	RTK GPS
906	DE2184	284735.104	9746811.774	315.903	20	-90	0	RTK GPS
907	DE2001	283336.272	9747218.26	388.808	21	-90	0	RTK GPS
908	DE2335	285425.901	9747301.801	279	16	-90	0	RTK GPS
909	DE2356	285533.181	9747310.912	289	16	-90	0	RTK GPS
910	DE2182	284746.562	9746994.175	309.167	10	-90	0	RTK GPS
911	DE2246	285024.653	9746909.647	296.327	15	-90	0	RTK GPS
912	DE2205	284821.996	9746816.054	308.399	17	-90	0	RTK GPS
913	DE2186	284734.169	9746660.367	301.06	12	-90	0	RTK GPS
914	DE2204	284816.425	9746923.628	294.643	14	-90	0	RTK GPS
915	DE2355	285535.625	9747403.092	285.324	8	-90	0	RTK GPS
916	DE2183	284731.991	9746921.807	310.923	16	-90	0	RTK GPS
917	DE2334	285432.435	9747422.661	286.989	16	-90	0	RTK GPS
918	DE2332	285444.877	9747631.303	294.957	16	-90	0	RTK GPS
919	DE2333	285429.443	9747521.708	298.422	8	-90	0	RTK GPS
920	DE2307	285341.761	9747617.838	307	9	-90	0	RTK GPS
921	DE2268	285130.809	9746908.425	287.404	15	-90	0	RTK GPS
922	DE2288	285238.689	9746911.173	268.558	12	-90	0	RTK GPS
923	DE2313	285332.366	9746908.144	262.657	15	-90	0	RTK GPS
924	DE2312	285338.469	9747001.722	252.771	14	-90	0	RTK GPS
925	DE2269	285119.152	9746819.26	286.561	15	-90	0	RTK GPS
926	DE2289	285218.167	9746822.668	264.687	17	-90	0	RTK GPS
927	DE1994	283151.682	9747023.193	341.583	17	-90	0	RTK GPS
928	DE1993	283140.189	9747089.923	347.442	23	-90	0	RTK GPS
929	DE2002	283325.638	9747103.185	377.181	8	-90	0	RTK GPS
930	DE1998	283248.019	9746994.862	358.444	10	-90	0	RTK GPS
931	DE1997	283228.654	9747101.722	358.81	16	-90	0	RTK GPS
932	DE2290	285234.743	9746708.887	263	18	-90	0	RTK GPS
933	DE2315	285294.608	9746712.031	251	20	-90	0	RTK GPS
934	DE2360	285529.425	9746818.359	266.779	16	-90	0	RTK GPS
935	DE2024	283631.576	9747022.705	337.029	20	-90	0	RTK GPS
936	DE2314	285323.97	9746830.144	259.014	17	-90	0	RTK GPS
937	DE2009	283428.826	9747006.393	348.403	28	-90	0	RTK GPS
938	DE2003	283328.772	9747054.265	369.065	22	-90	0	RTK GPS

939	DE2016	283536.911	9747028.054	343.648	23	-90	0	RTK GPS
940	DE2008	283442.144	9747102.916	368.342	14	-90	0	RTK GPS
941	DE2339	285433.811	9746823.77	258.007	17	-90	0	RTK GPS
942	DE2015	283548.266	9747109.5	374.221	20	-90	0	RTK GPS
943	DE2308	285339.818	9747521.187	296	25	-90	0	RTK GPS
944	DE2265	285131.093	9747410.673	299.399	9	-90	0	RTK GPS
945	DE2222	284927.014	9747408.196	322.281	15	-90	0	RTK GPS
946	DE2309	285343.532	9747413.766	286.191	9	-90	0	RTK GPS
947	DE2285	285214.014	9747425.036	286	12	-90	0	RTK GPS
948	DE2243	285031.806	9747408.899	306.666	13	-90	0	RTK GPS
949	DE2380	285622.782	9747111.828	268	20	-90	0	RTK GPS
950	DE2379	285609.83	9747237.136	267.464	8	-90	0	RTK GPS
951	DE2378	285632.124	9747317.708	277	10	-90	0	RTK GPS
952	DE2950	288279.834	9747620.418	286	9	-90	0	RTK GPS
953	DE2572	286186.223	9749059.121	366.818	17	-90	0	RTK GPS
954	DE2956	288338.972	9747565.336	281	14	-90	0	RTK GPS
955	DE2573	286226.908	9749067.173	362.636	15	-90	0	RTK GPS
956	DE2621	286190.179	9748904.751	330.902	10	-90	0	RTK GPS
957	DE2571	286124.483	9749052.339	372.452	17	-90	0	RTK GPS
958	DE2955	288286.088	9747562.589	284.777	7	-90	0	RTK GPS
959	DE2623	286385.447	9748911.237	345.303	19	-90	0	RTK GPS
960	DE2537	286082.469	9749167.451	372.276	18	-90	0	RTK GPS
961	DE2598	286230.819	9748963.997	342.464	10	-90	0	RTK GPS
962	DE2560	286085.817	9749112.732	365.737	22	-90	0	RTK GPS
963	DE2622	286290.188	9748919.748	337.478	13	-90	0	RTK GPS
964	DE2536	285984.687	9749160.714	366	7	-90	0	RTK GPS
965	DE2713	287078.987	9748660.749	313.51	18	-90	0	RTK GPS
966	DE2714	287132.252	9748659.938	308.649	16	-90	0	RTK GPS
967	DE2737	287081.627	9748559.758	304	12	-90	0	RTK GPS
968	DE2726	287179.636	9748612.477	314	17	-90	0	RTK GPS
969	DE2716	287230.47	9748670.381	296.208	16	-90	0	RTK GPS
970	DE2715	287186.864	9748660.307	304	8	-90	0	RTK GPS
971	DE2331	285431.346	9747711.995	288.696	24	-90	0	RTK GPS
972	DE2306	285355.701	9747689.216	295.053	18	-90	0	RTK GPS
973	DE2283	285247.693	9747937.202	303.225	26	-90	0	RTK GPS
974	DE2305	285332.795	9747816.094	304.726	26	-90	0	RTK GPS
975	DE2846	285881.764	9748118.848	298	8	-90	0	RTK GPS
976	DE2847	285986.027	9748114.882	305.999	12	-90	0	RTK GPS
977	DE2856	285894.975	9748066.15	292.223	12	-90	0	RTK GPS
978	DE2824	285934.815	9748167.973	317.033	8	-90	0	RTK GPS
979	DE2825	285983.367	9748163.406	318	16	-90	0	RTK GPS
980	DE2941	288278.039	9747672.153	301	8	-90	0	RTK GPS
981	DE2919	288289.373	9747763.723	300.188	8	-90	0	RTK GPS
982	DE2942	288342.757	9747651.803	289.172	8	-90	0	RTK GPS
983	DE2727	287284.126	9748615.423	302.163	17	-90	0	RTK GPS
984	DE2717	287287.08	9748662.685	293	26	-90	0	RTK GPS
985	DE2740	287233.548	9748563.017	298.244	6	-90	0	RTK GPS

986	DE2503	285949.161	9749268.813	390	10	-90	0	RTK GPS
987	DE2739	287174.734	9748566.89	307.43	7	-90	0	RTK GPS
988	DE2535	285886.209	9749178.756	391	18	-90	0	RTK GPS
989	DE2534	285838.154	9749171.916	395.23	14	-90	0	RTK GPS
990	DE2521	285892.181	9749231.069	400.66	13	-90	0	RTK GPS
991	DE2931	288283.068	9747714.102	299.867	19	-90	0	RTK GPS
992	DE2750	287180.217	9748511.222	295.779	15	-90	0	RTK GPS
993	DE2762	287132.967	9748459.224	300.559	12	-90	0	RTK GPS
994	DE2738	287136.333	9748565.662	308.366	11	-90	0	RTK GPS
995	DE2772	287089.554	9748423.967	299.829	10	-90	0	RTK GPS
996	DE3035	287084.836	9748704.875	309.4	12	-90	0	RTK GPS
997	DE2921	288382.901	9747760.824	290.16	9	-90	0	RTK GPS
998	DE2749	287086.722	9748521.463	304.259	19	-90	0	RTK GPS
999	DE3156	288483.436	9747815.221	279.154	10	-90	0	RTK GPS
1000	DE2922	288434.383	9747765.431	285.646	10	-90	0	RTK GPS
1001	DE2932	288382.276	9747710.151	289.65	16	-90	0	RTK GPS
1002	DE2788	287139.388	9748364.335	292.354	14	-90	0	RTK GPS
1003	DE3025	287089.563	9748765.626	300.099	21	-90	0	RTK GPS
1004	DE2761	287083.301	9748464.914	305.001	23	-90	0	RTK GPS
1005	DE2920	288333.67	9747763.996	297.393	8	-90	0	RTK GPS
1006	DE2787	287080.192	9748372.643	289	11	-90	0	RTK GPS
1007	DE2823	285883.494	9748171.517	306.621	12	-90	0	RTK GPS
1008	DE2802	285885.577	9748277.625	323.282	12	-90	0	RTK GPS
1009	DE2803	285940.897	9748264.239	323.462	10	-90	0	RTK GPS
1010	DE2805	286104.501	9748264.444	342.471	9	-90	0	RTK GPS
1011	DE2533	285788.688	9749158.989	398.789	20	-90	0	RTK GPS
1012	DE2502	285741.066	9749259.387	423.243	16	-90	0	RTK GPS
1013	DE2532	285735.545	9749157.687	400	20	-90	0	RTK GPS
1014	DE2468	285736.513	9749349.842	406	12	-90	0	RTK GPS
1015	DE2469	285932.183	9749363.699	401.018	22	-90	0	RTK GPS
1016	DE2520	285767.141	9749205.182	415.902	12	-90	0	RTK GPS
1017	DE2470	285978.928	9749368.537	405.088	16	-90	0	RTK GPS
1018	DE2778	286223.799	9748366.78	324.038	18	-90	0	RTK GPS
1019	DE2777	286185.931	9748359.829	334	10	-90	0	RTK GPS
1020	DE2558	285784.456	9749117.444	390.986	20	-90	0	RTK GPS
1021	DE2794	286178.973	9748309.169	339	12	-90	0	RTK GPS
1022	DE2804	285981.889	9748264.138	325.718	12	-90	0	RTK GPS
1023	DE2569	285730.812	9749057.876	387	10	-90	0	RTK GPS
1024	DE2755	286215.565	9748452.88	322	11	-90	0	RTK GPS
1025	DE2769	286179.695	9748410.373	330	16	-90	0	RTK GPS
1026	DE2754	286167.498	9748464.241	330.631	10	-90	0	RTK GPS
1027	DE3058	286136.966	9748466.313	334.669	10	-90	0	RTK GPS
1028	DE3057	286088.514	9748466.818	335.888	14	-90	0	RTK GPS
1029	DE2933	288486.812	9747715.711	285.719	17	-90	0	RTK GPS
1030	DE2923	288485.186	9747768.295	282.878	15	-90	0	RTK GPS
1031	DE3162	288580.284	9747757.467	277.34	12	-90	0	RTK GPS
1032	DE2924	288536.897	9747765.925	281	8	-90	0	RTK GPS

1033	DE2908	288579.701	9747815.602	279.97	16	-90	0	RTK GPS
1034	DE2898	288534.036	9747853.122	277.499	16	-90	0	RTK GPS
1035	DE3036	287180.627	9748712.705	290.111	17	-90	0	RTK GPS
1036	DE2719	287427.884	9748670.108	278.208	12	-90	0	RTK GPS
1037	DE2718	287384.786	9748664.41	281.458	12	-90	0	RTK GPS
1038	DE2728	287483.41	9748617.967	279.033	13	-90	0	RTK GPS
1039	DE2720	287480.643	9748666.401	277.849	17	-90	0	RTK GPS
1040	DE3027	287431.28	9748762.534	281.728	6	-90	0	RTK GPS
1041	DE3037	287482.796	9748713.701	277.788	13	-90	0	RTK GPS
1042	DE3029	287536.136	9748763.335	292.863	8	-90	0	RTK GPS
1043	DE3028	287478.108	9748756.379	282.96	12	-90	0	RTK GPS
1044	DE2721	287530.356	9748665.135	278.823	22	-90	0	RTK GPS
1045	DE2731	286139.036	9748563.542	321	10	-90	0	RTK GPS
1046	DE2732	286185.243	9748557.243	324.232	13	-90	0	RTK GPS
1047	DE2733	286232.612	9748569.995	326.659	15	-90	0	RTK GPS
1048	DE2730	286088.131	9748553.805	315	12	-90	0	RTK GPS
1049	DE3045	286050.533	9748560.912	314.459	16	-90	0	RTK GPS
1050	DE2247	285030.537	9746806.223	295.048	16	-90	0	RTK GPS
1051	DE2382	285614.253	9746805.019	264	20	-90	0	RTK GPS
1052	DE2377	285612.843	9747415.924	275.003	16	-90	0	RTK GPS
1053	DE2337	285419.924	9746977.333	250.207	20	-90	0	RTK GPS
1054	DE2376	285601.147	9747502.993	288.248	12	-90	0	RTK GPS
1055	DE2359	285526.644	9746907.442	262.141	16	-90	0	RTK GPS
1056	DE2338	285449.637	9746912.572	260.067	16	-90	0	RTK GPS
1057	DE2354	285538.05	9747510.817	291.816	20	-90	0	RTK GPS
1058	DE2375	285627.98	9747611.759	259	12	-90	0	RTK GPS
1059	DE2353	285503.312	9747591.933	271.928	17	-90	0	RTK GPS
1060	DE2899	288578.866	9747857.75	278.162	18	-90	0	RTK GPS
1061	DE2881	288586.952	9747952.021	279	17	-90	0	RTK GPS
1062	DE3152	288629.383	9747863.122	277	13	-90	0	RTK GPS
1063	DE3146	288635.721	9747901.39	279.524	12	-90	0	RTK GPS
1064	DE2880	288521.242	9747969.146	298.486	8	-90	0	RTK GPS
1065	DE2864	288531.527	9748057.737	300	6	-90	0	RTK GPS
1066	DE2854	288578.077	9748108.27	299.581	6	-90	0	RTK GPS
1067	DE2865	288572.567	9748071.335	296.801	9	-90	0	RTK GPS
1068	DE3019	287378.31	9748815.15	286.761	12	-90	0	RTK GPS
1069	DE3026	287374.289	9748760.755	280.518	14	-90	0	RTK GPS
1070	DE2472	286077.15	9749366.163	400	16	-90	0	RTK GPS
1071	DE2471	286026.036	9749361.172	407.676	16	-90	0	RTK GPS
1072	DE2451	286172.799	9749461.562	390	11	-90	0	RTK GPS
1073	DE2450	286141.887	9749456.64	393.307	15	-90	0	RTK GPS
1074	DE2461	286083.834	9749407.931	398.528	15	-90	0	RTK GPS
1075	DE2981	286028.662	9749467.545	402.146	15	-90	0	RTK GPS
1076	DE2453	286284.854	9749461.142	386.899	15	-90	0	RTK GPS
1077	DE2463	286285.249	9749425.03	394.234	23	-90	0	RTK GPS
1078	DE2455	286381.28	9749460.164	390.509	16	-90	0	RTK GPS
1079	DE2462	286183.074	9749417.125	392.319	19	-90	0	RTK GPS

1080	DE2454	286336.207	9749458.905	390	20	-90	0	RTK GPS
1081	DE2882	288689.637	9747960.27	281	8	-90	0	RTK GPS
1082	DE3147	288682.73	9747916.33	278.909	18	-90	0	RTK GPS
1083	DE3014	287480.856	9748863.176	292.282	12	-90	0	RTK GPS
1084	DE3012	287373.622	9748863.288	294.052	15	-90	0	RTK GPS
1085	DE3011	287335.022	9748862.334	293.33	19	-90	0	RTK GPS
1086	DE2842	288622.561	9748159.832	297.481	19	-90	0	RTK GPS
1087	DE3015	287537.579	9748861.348	297.692	14	-90	0	RTK GPS
1088	DE2612	287530.675	9748960.832	301.194	20	-90	0	RTK GPS
1089	DE3112	288678.597	9748153.404	300.33	14	-90	0	RTK GPS
1090	DE3119	288693.898	9748116.716	299	13	-90	0	RTK GPS
1091	DE2631	287576.711	9748918.092	298.843	12	-90	0	RTK GPS
1092	DE2866	288689.412	9748072.6	294	7	-90	0	RTK GPS
1093	DE2873	288698.708	9748022.329	286.863	12	-90	0	RTK GPS
1094	DE2900	288686.061	9747861.547	276.691	17	-90	0	RTK GPS
1095	DE3013	287437.572	9748861.905	290.556	12	-90	0	RTK GPS
1096	DE3020	287482.938	9748805.916	291.051	12	-90	0	RTK GPS
1097	DE2613	287586.222	9748962.384	299.63	18	-90	0	RTK GPS
1098	DE2841	288585.689	9748156.597	299.281	18	-90	0	RTK GPS
1099	DE3113	288725.741	9748151.86	309.007	10	-90	0	RTK GPS
1100	DE2649	287583.045	9748868.342	299.237	19	-90	0	RTK GPS
1101	DE2667	286084.726	9748756.495	340	14	-90	0	RTK GPS
1102	DE2668	286133.736	9748769.05	334.993	14	-90	0	RTK GPS
1103	DE2658	286086.263	9748813.247	326.269	13	-90	0	RTK GPS
1104	DE2636	286084.984	9748860.919	326.365	16	-90	0	RTK GPS
1105	DE2659	286178.985	9748816.772	327.369	16	-90	0	RTK GPS
1106	DE2464	286382.604	9749407.628	390.826	19	-90	0	RTK GPS
1107	DE2465	286490.652	9749404.009	392.969	12	-90	0	RTK GPS
1108	DE2458	286586.606	9749462.367	391.13	9	-90	0	RTK GPS
1109	DE2457	286536.857	9749459.469	389.408	11	-90	0	RTK GPS
1110	DE2456	286485.337	9749471.206	389	11	-90	0	RTK GPS
1111	DE2466	286583.155	9749411.284	396.72	16	-90	0	RTK GPS
1112	DE2460	286684.03	9749449.122	398	14	-90	0	RTK GPS
1113	DE2459	286639.509	9749462.658	394.531	16	-90	0	RTK GPS
1114	DE3024	286050.87	9748765.926	337.505	12	-90	0	RTK GPS
1115	DE2723	286185.612	9748618.899	342.154	16	-90	0	RTK GPS
1116	DE3039	286056.898	9748650.357	328.04	10	-90	0	RTK GPS
1117	DE3032	286001.028	9748707.76	324.979	10	-90	0	RTK GPS
1118	DE2699	286087.215	9748666.251	338.779	13	-90	0	RTK GPS
1119	DE2700	286143.018	9748661.115	349.259	17	-90	0	RTK GPS
1120	DE2701	286173.091	9748662.137	353.317	14	-90	0	RTK GPS
1121	DE3033	286083.205	9748718.216	347.204	14	-90	0	RTK GPS
1122	DE2722	286102.229	9748632.118	336.891	16	-90	0	RTK GPS
1123	DE2467	286681.088	9749418.338	399.678	12	-90	0	RTK GPS
1124	DE3007	287385.874	9748913.533	298.213	11	-90	0	RTK GPS
1125	DE3008	287482.692	9748914.899	294.927	10	-90	0	RTK GPS
1126	DE2637	286183.183	9748855.582	325.516	16	-90	0	RTK GPS

1127	DE2484	286688.846	9749366.862	389.838	10	-90	0	RTK GPS
1128	DE2482	286589.721	9749359.378	395.228	16	-90	0	RTK GPS
1129	DE3157	288677.403	9747811.064	278.258	20	-90	0	RTK GPS
1130	DE2483	286641.082	9749362.576	394.088	12	-90	0	RTK GPS
1131	DE2638	286283.91	9748865.964	336.027	13	-90	0	RTK GPS
1132	DE2610	287421.969	9748958.311	304.423	14	-90	0	RTK GPS
1133	DE3016	286289.688	9748824.691	344	17	-90	0	RTK GPS
1134	DE2609	287384.743	9748969.115	305.954	14	-90	0	RTK GPS
1135	DE2943	288784.724	9747660.531	276.462	16	-90	0	RTK GPS
1136	DE2925	288680.714	9747766.52	279.076	26	-90	0	RTK GPS
1137	DE2480	286482.556	9749362.71	394	16	-90	0	RTK GPS
1138	DE3164	288775.108	9747760.142	275.639	17	-90	0	RTK GPS
1139	DE3195	288529.636	9747310.665	276.445	18	-90	0	RTK GPS
1140	DE2957	288776.782	9747566.549	270.949	10	-90	0	RTK GPS
1141	DE2951	288779.105	9747615.508	275	26	-90	0	RTK GPS
1142	DE2479	286446.626	9749357.336	389.657	16	-90	0	RTK GPS
1143	DE2481	286537.51	9749356.432	395.765	10	-90	0	RTK GPS
1144	DE3192	288534.177	9747412.965	279.841	21	-90	0	RTK GPS
1145	DE3197	288530.427	9747204.668	280.654	12	-90	0	RTK GPS
1146	DE3163	288734.157	9747769.377	281.08	10	-90	0	RTK GPS
1147	DE2639	286334.838	9748857.592	345	21	-90	0	RTK GPS
1148	DE2640	286378.528	9748871.184	346	19	-90	0	RTK GPS
1149	DE3017	286383.658	9748809.967	352.41	11	-90	0	RTK GPS
1150	DE2607	287285.412	9748958.588	309.16	16	-90	0	RTK GPS
1151	DE2608	287323.134	9748966.316	308.824	10	-90	0	RTK GPS
1152	DE2606	287221.855	9748969.739	308.74	14	-90	0	RTK GPS
1153	DE2629	287171.552	9748908.093	298.401	8	-90	0	RTK GPS
1154	DE2641	286419.847	9748856.922	340.524	15	-90	0	RTK GPS
1155	DE2630	287284.824	9748894.557	294	12	-90	0	RTK GPS
1156	DE2605	287181.198	9748974.506	311	12	-90	0	RTK GPS
1157	DE2709	286624.405	9748656.076	328.114	11	-90	0	RTK GPS
1158	DE2708	286587.15	9748663.998	329.389	15	-90	0	RTK GPS
1159	DE2676	286521.34	9748767.908	332	15	-90	0	RTK GPS
1160	DE2696	286577.816	9748708.622	328.137	20	-90	0	RTK GPS
1161	DE2642	286478.058	9748859.604	340.134	16	-90	0	RTK GPS
1162	DE2496	286590.792	9749303.488	382.327	23	-90	0	RTK GPS
1163	DE2478	286376.993	9749356.241	387.932	16	-90	0	RTK GPS
1164	DE2524	286573.416	9749225.556	380.056	29	-90	0	RTK GPS
1165	DE2495	286462.685	9749312.871	385	25	-90	0	RTK GPS
1166	DE2494	286370.192	9749311.98	390.011	11	-90	0	RTK GPS
1167	DE2989	286623.849	9749254.628	378	17	-90	0	RTK GPS
1168	DE2582	287128.058	9749059.446	313	16	-90	0	RTK GPS
1169	DE2603	287084.221	9748960.973	314.981	20	-90	0	RTK GPS
1170	DE2595	287078.721	9749022.267	318.155	17	-90	0	RTK GPS
1171	DE2581	287078.674	9749065.119	319.915	20	-90	0	RTK GPS
1172	DE2604	287118.088	9748967.742	314.709	20	-90	0	RTK GPS
1173	DE2695	286479.567	9748706.613	328.448	24	-90	0	RTK GPS

1174	DE2707	286480.786	9748660.691	329	15	-90	0	RTK GPS
1175	DE2674	286434.824	9748764.273	335.837	14	-90	0	RTK GPS
1176	DE2675	286484.12	9748760.257	331.561	22	-90	0	RTK GPS
1177	DE2673	286385.289	9748749.027	346.584	13	-90	0	RTK GPS
1178	DE2544	286575.043	9749157.41	386.243	11	-90	0	RTK GPS
1179	DE2958	288838.249	9747549.751	269.558	19	-90	0	RTK GPS
1180	DE2961	288979.846	9747570.086	263.287	14	-90	0	RTK GPS
1181	DE2998	286470.559	9749126.411	393.759	8	-90	0	RTK GPS
1182	DE2543	286535.143	9749156.786	387.764	29	-90	0	RTK GPS
1183	DE2962	289022.017	9747570.532	261.466	18	-90	0	RTK GPS
1184	DE2959	288875.022	9747561.029	267.041	16	-90	0	RTK GPS
1185	DE2953	288988.119	9747609.256	260.99	26	-90	0	RTK GPS
1186	DE2960	288934.796	9747567.042	264.412	18	-90	0	RTK GPS
1187	DE2510	286591.815	9749252.612	378.906	10	-90	0	RTK GPS
1188	DE3141	288636.342	9747951.928	286	8	-90	0	RTK GPS
1189	DE2565	287175.17	9749112.858	312.553	13	-90	0	RTK GPS
1190	DE2583	287176.816	9749048.156	311.79	18	-90	0	RTK GPS
1191	DE3200	290171.805	9747221.243	219.848	20	-90	0	RTK GPS
1192	DE2624	286488.848	9748913.069	343.535	21	-90	0	RTK GPS
1193	DE3204	290193.437	9747008.09	184.633	17	-90	0	RTK GPS
1194	DE2576	286536.364	9749069.113	381.077	20	-90	0	RTK GPS
1195	DE2672	286332.924	9748764.529	359.249	11	-90	0	RTK GPS
1196	DE3201	290186.984	9747120.225	201.904	25	-90	0	RTK GPS
1197	DE2671	286289.468	9748760.36	348.022	16	-90	0	RTK GPS
1198	DE2577	286567.794	9749057.923	383.178	16	-90	0	RTK GPS
1199	DE2625	286579.521	9748917.684	336.329	14	-90	0	RTK GPS
1200	DE2670	286237.205	9748754.886	341.919	13	-90	0	RTK GPS
1201	DE2566	287281.974	9749105.205	308.877	20	-90	0	RTK GPS
1202	DE3002	287280.37	9749017.925	308.337	20	-90	0	RTK GPS
1203	DE2693	286282.084	9748713.927	345.302	20	-90	0	RTK GPS
1204	DE2702	286234.726	9748667.826	341.869	14	-90	0	RTK GPS
1205	DE2586	287330.789	9749063.16	304.529	23	-90	0	RTK GPS
1206	DE2584	287234.697	9749067.961	310.749	21	-90	0	RTK GPS
1207	DE3034	286184.022	9748720.28	348.322	20	-90	0	RTK GPS
1208	DE2669	286191.498	9748770.986	336.129	12	-90	0	RTK GPS
1209	DE2585	287279.505	9749058.621	307.959	27	-90	0	RTK GPS
1210	DE2596	287187.029	9749007.798	315.361	23	-90	0	RTK GPS
1211	DE2574	286294.225	9749065.172	368.326	20	-90	0	RTK GPS
1212	DE2997	286371.807	9749126.196	392	19	-90	0	RTK GPS
1213	DE2575	286328.607	9749050.178	372.175	8	-90	0	RTK GPS
1214	DE2992	286391.094	9749204.742	384.347	9	-90	0	RTK GPS
1215	DE3193	289436.122	9747446.898	260.016	11	-90	0	RTK GPS
1216	DE3000	286376.151	9749057.26	375.018	28	-90	0	RTK GPS
1217	DE3196	289421.245	9747197.228	233.813	30	-90	0	RTK GPS
1218	DE2994	286381.801	9749160.762	391.249	14	-90	0	RTK GPS
1219	DE3337	289574.77	9747609.506	254.936	16	-90	0	RTK GPS
1220	DE3194	289429.974	9747310.172	244.165	33	-90	0	RTK GPS

1221	DE2706	286428.196	9748664.027	331.27	22	-90	0	RTK GPS
1222	DE2704	286319.741	9748641.179	339.665	17	-90	0	RTK GPS
1223	DE2703	286282.669	9748656.11	338.272	12	-90	0	RTK GPS
1224	DE2705	286379.622	9748654.226	337.191	18	-90	0	RTK GPS
1225	DE2724	286288.699	9748616.217	332	10	-90	0	RTK GPS
1226	DE2725	286384.259	9748610.856	337.37	16	-90	0	RTK GPS
1227	DE2734	286280.451	9748556.883	322.442	13	-90	0	RTK GPS
1228	DE2757	286334.872	9748464.704	325	12	-90	0	RTK GPS
1229	DE2735	286324.663	9748563.87	328.008	22	-90	0	RTK GPS
1230	DE2736	286382.774	9748563.022	336.454	10	-90	0	RTK GPS
1231	DE2756	286282.994	9748468.652	321.414	11	-90	0	RTK GPS
1232	DE2747	286287.422	9748513.92	323.055	18	-90	0	RTK GPS
1233	DE2748	286388.838	9748518.669	330.071	12	-90	0	RTK GPS
1234	DE2758	286374.857	9748464.33	328	13	-90	0	RTK GPS
1235	DE2507	286337.825	9749266.479	382.474	19	-90	0	RTK GPS
1236	DE2509	286432	9749264.764	382	25	-90	0	RTK GPS
1237	DE2542	286335.205	9749181.615	377.282	8	-90	0	RTK GPS
1238	DE3335	289632.301	9747657.637	251.969	20	-90	0	RTK GPS
1239	DE3334	289574.077	9747650.078	256.294	22	-90	0	RTK GPS
1240	DE2508	286383.189	9749256.489	385.661	14	-90	0	RTK GPS
1241	DE3332	289575.642	9747703.737	250.166	19	-90	0	RTK GPS
1242	DE3338	289629.548	9747604.156	250.179	16	-90	0	RTK GPS
1243	DE3336	289676.567	9747655.603	248.483	24	-90	0	RTK GPS
1244	DE2567	287381.44	9749121.504	301.403	21	-90	0	RTK GPS
1245	DE2589	287486.499	9749058.561	298.516	22	-90	0	RTK GPS
1246	DE2587	287382.935	9749061.129	300.71	20	-90	0	RTK GPS
1247	DE2588	287433.028	9749065.229	297.144	27	-90	0	RTK GPS
1248	DE3001	287587.249	9749060.758	296.36	24	-90	0	RTK GPS
1249	DE2568	287476.643	9749107.476	295.467	16	-90	0	RTK GPS
1250	DE2590	287529.789	9749064.385	299	18	-90	0	RTK GPS
1251	DE2999	287575.648	9749109.427	302.929	16	-90	0	RTK GPS
1252	DE2557	287530.293	9749164.233	294.844	20	-90	0	RTK GPS
1253	DE2556	287476.298	9749160.942	294	13	-90	0	RTK GPS
1254	DE2995	287577.887	9749169.28	298.025	20	-90	0	RTK GPS
1255	DE2554	287371.268	9749162.047	304.638	13	-90	0	RTK GPS
1256	DE2555	287431.476	9749167.544	301.66	19	-90	0	RTK GPS
1257	DE2553	287321.283	9749164.113	306.984	10	-90	0	RTK GPS
1258	DE2529	287286.682	9749220.3	311.406	13	-90	0	RTK GPS
1259	DE2552	287280.065	9749165.471	310.114	14	-90	0	RTK GPS
1260	DE3330	289582.719	9747756.495	249.097	12	-90	0	RTK GPS
1261	DE3331	289623.479	9747770.144	249.046	10	-90	0	RTK GPS
1262	DE3189	287034.995	9748016.137	303.657	14	-90	0	RTK GPS
1263	DE2562	286285.292	9749116.597	371.176	17	-90	0	RTK GPS
1264	DE3333	289684.446	9747717.329	249.331	12	-90	0	RTK GPS
1265	DE2540	286242.948	9749162.1	367.553	17	-90	0	RTK GPS
1266	DE2541	286294.446	9749165.792	370	10	-90	0	RTK GPS
1267	DE2523	286273.889	9749212.88	372.648	16	-90	0	RTK GPS

1268	DE2477	286323.181	9749350.237	387.563	16	-90	0	RTK GPS
1269	DE2493	286278.777	9749308.946	383.795	13	-90	0	RTK GPS
1270	DE2506	286284.907	9749261.377	377.443	12	-90	0	RTK GPS
1271	DE2476	286296.987	9749356.519	388.267	17	-90	0	RTK GPS
1272	DE2694	286381.399	9748709.443	344.785	8	-90	0	RTK GPS
1273	DE2759	286431.796	9748461.269	324	13	-90	0	RTK GPS
1274	DE2770	286385.699	9748421.799	325.494	14	-90	0	RTK GPS
1275	DE2780	286390.318	9748374.837	320.258	10	-90	0	RTK GPS
1276	DE3068	286480.081	9748425.288	317.484	9	-90	0	RTK GPS
1277	DE2781	286428.913	9748380.066	317.488	12	-90	0	RTK GPS
1278	DE2779	286303.554	9748363.384	319.694	10	-90	0	RTK GPS
1279	DE3072	286483.41	9748363.833	301.044	9	-90	0	RTK GPS
1280	DE2782	286575.646	9748362.095	302.352	16	-90	0	RTK GPS
1281	DE2475	286224.613	9749360.025	388.85	17	-90	0	RTK GPS
1282	DE2474	286175.658	9749356.111	391	9	-90	0	RTK GPS
1283	DE2504	286189.155	9749271.718	381.587	14	-90	0	RTK GPS
1284	DE2505	286231.104	9749263.539	378	16	-90	0	RTK GPS
1285	DE2473	286131.455	9749358.799	394	12	-90	0	RTK GPS
1286	DE3267	287039.701	9748058.128	298.924	11	-90	0	RTK GPS
1287	DE3268	287082.143	9748067.012	298.942	9	-90	0	RTK GPS
1288	DE2550	287181.764	9749163.058	316.483	13	-90	0	RTK GPS
1289	DE2528	287181.257	9749215.843	322.503	13	-90	0	RTK GPS
1290	DE2551	287235.001	9749159.225	313.009	11	-90	0	RTK GPS
1291	DE2548	287082.602	9749165.69	325	17	-90	0	RTK GPS
1292	DE2549	287125.848	9749167.356	321.648	16	-90	0	RTK GPS
1293	DE2492	286166.217	9749325.252	388.944	14	-90	0	RTK GPS
1294	DE3190	287036.998	9747915.779	314.536	21	-90	0	RTK GPS
1295	DE2522	286193.685	9749214.719	372	13	-90	0	RTK GPS
1296	DE3191	287038.271	9747824.745	307.019	19	-90	0	RTK GPS
1297	DE2807	286678.739	9748259.026	298.568	14	-90	0	RTK GPS
1298	DE2527	287082.535	9749218.188	332.143	13	-90	0	RTK GPS
1299	DE2783	286681.016	9748355.442	297.362	10	-90	0	RTK GPS
1300	DE2796	286682.833	9748315.052	297.437	11	-90	0	RTK GPS
1301	DE2795	286586.545	9748306.736	310.645	9	-90	0	RTK GPS
1302	DE2511	287083.881	9749270.496	335.74	11	-90	0	RTK GPS
1303	DE2806	286624.847	9748269.408	301.119	16	-90	0	RTK GPS
1304	DE3265	287084.726	9748103.401	302	12	-90	0	RTK GPS
1305	DE3381	287691.103	9747669.126	301.251	11	-90	0	RTK GPS
1306	DE2816	286677.409	9748219.836	300.084	19	-90	0	RTK GPS
1307	DE3382	287726.807	9747654.305	300.397	8	-90	0	RTK GPS
1308	DE2539	286183.581	9749174.599	366.937	15	-90	0	RTK GPS
1309	DE2538	286130.847	9749164.847	369	15	-90	0	RTK GPS
1310	DE2561	286188.646	9749118.652	365.301	18	-90	0	RTK GPS
1311	DE2491	286086.322	9749309.039	397.366	13	-90	0	RTK GPS
1312	DE2987	286087.742	9749258.584	392.033	14	-90	0	RTK GPS
1313	DE2991	286087.829	9749206.911	380	13	-90	0	RTK GPS
1314	DE2988	286141.485	9749257.878	385.27	15	-90	0	RTK GPS

1315	DE2986	286046.078	9749256.353	400	15	-90	0	RTK GPS
1316	DE2984	285996.756	9749305.711	403.814	11	-90	0	RTK GPS
1317	DE2784	286924.602	9748365.76	294.643	8	-90	0	RTK GPS
1318	DE3084	286766.359	9748320.062	298.661	10	-90	0	RTK GPS
1319	DE2985	285977.773	9749250.894	389.18	9	-90	0	RTK GPS
1320	DE2785	286974.936	9748361.518	290	9	-90	0	RTK GPS
1321	DE3383	287778.255	9747667.355	293.976	19	-90	0	RTK GPS
1322	DE3384	287838.15	9747671.845	291.821	22	-90	0	RTK GPS
1323	DE3379	287766.748	9747708.177	291.966	12	-90	0	RTK GPS
1324	DE3385	287876.434	9747665.523	290.471	15	-90	0	RTK GPS
1325	DE3389	287885.651	9747613.228	296.73	17	-90	0	RTK GPS
1326	DE3386	287923.478	9747676.642	289.771	18	-90	0	RTK GPS
1327	DE2965	289078.359	9747521.999	266	7	-90	0	RTK GPS
1328	DE2963	288974.659	9747513.601	265.699	12	-90	0	RTK GPS
1329	DE2964	289035.677	9747518.343	263	13	-90	0	RTK GPS
1330	DE2969	289083.76	9747462.953	261.451	12	-90	0	RTK GPS
1331	DE3184	288972.674	9747366.38	259.106	11	-90	0	RTK GPS
1332	DE2968	289029.084	9747465.59	260.705	13	-90	0	RTK GPS
1333	DE3341	288733.918	9747517.541	276.758	12	-90	0	RTK GPS
1334	DE3340	288726.942	9747556.711	273	14	-90	0	RTK GPS
1335	DE3342	288777.576	9747517.849	274.144	9	-90	0	RTK GPS
1336	DE3107	287005.977	9748159.827	301.845	12	-90	0	RTK GPS
1337	DE3102	286991	9748211.994	293.747	13	-90	0	RTK GPS
1338	DE2797	286978.22	9748302.338	289.407	13	-90	0	RTK GPS
1339	DE3106	286977.419	9748165.073	301.922	16	-90	0	RTK GPS
1340	DE2967	288983.759	9747466.562	261.508	15	-90	0	RTK GPS
1341	DE3091	287024.972	9748246.392	288	14	-90	0	RTK GPS
1342	DE2970	288978.544	9747414.413	261	11	-90	0	RTK GPS
1343	DE3185	289038.681	9747359.368	262.139	8	-90	0	RTK GPS
1344	DE2808	286983.176	9748254.468	290.961	13	-90	0	RTK GPS
1345	DE2978	286839.699	9749768.936	404.375	11	-90	0	RTK GPS
1346	DE3356	289079.577	9747316.256	263.648	16	-90	0	RTK GPS
1347	DE3186	288990.501	9747307.136	255.459	6	-90	0	RTK GPS
1348	DE2977	286791.406	9749764.997	406.433	5	-90	0	RTK GPS
1349	DE2427	286630.424	9749763.102	415	12	-90	0	RTK GPS
1350	DE2428	286681.337	9749763.706	411.209	12	-90	0	RTK GPS
1351	DE2433	286525.555	9749657.822	386.017	6	-90	0	RTK GPS
1352	DE2429	286717.222	9749766.274	409	7	-90	0	RTK GPS
1353	DE2430	286882.189	9749761.294	399	8	-90	0	RTK GPS
1354	DE2426	286583.628	9749760.428	417.916	8	-90	0	RTK GPS
1355	DE2488	287581.36	9749362.713	305	16	-90	0	RTK GPS
1356	DE2489	287631.826	9749369.652	287.313	8	-90	0	RTK GPS
1357	DE2513	287192.593	9749261.026	324.108	8	-90	0	RTK GPS
1358	DE2499	287582.082	9749310.735	300.946	16	-90	0	RTK GPS
1359	DE2497	287182.416	9749315.93	320	11	-90	0	RTK GPS
1360	DE2500	287684.89	9749313.528	298.144	12	-90	0	RTK GPS
1361	DE2514	287240.978	9749261.964	321.125	14	-90	0	RTK GPS

1362	DE2512	287129.002	9749257.849	331	13	-90	0	RTK GPS
1363	DE2501	287733.914	9749317.673	294	8	-90	0	RTK GPS
1364	DE3273	287626.242	9749409.905	276	12	-90	0	RTK GPS
1365	DE2516	287333.224	9749279.184	307.634	14	-90	0	RTK GPS
1366	DE2498	287277.089	9749320.417	320.262	10	-90	0	RTK GPS
1367	DE2678	286629.774	9748762.166	329.255	14	-90	0	RTK GPS
1368	DE2771	286983.987	9748426.817	291.533	10	-90	0	RTK GPS
1369	DE3347	288878.701	9747460.931	265.095	8	-90	0	RTK GPS
1370	DE3344	288879.44	9747510.284	263.996	15	-90	0	RTK GPS
1371	DE2679	286679.493	9748761.397	322.999	13	-90	0	RTK GPS
1372	DE2966	288931.572	9747448.512	264.346	10	-90	0	RTK GPS
1373	DE2760	287025.619	9748468.807	299.048	7	-90	0	RTK GPS
1374	DE3187	288977.599	9747259.735	258.165	12	-90	0	RTK GPS
1375	DE3183	288926.291	9747354.187	266.215	11	-90	0	RTK GPS
1376	DE2710	286686.261	9748658.355	321.088	10	-90	0	RTK GPS
1377	DE2697	286676.484	9748723.513	322	18	-90	0	RTK GPS
1378	DE3271	287170.661	9748315.748	292.878	14	-90	0	RTK GPS
1379	DE2786	287032.918	9748364.159	288.456	8	-90	0	RTK GPS
1380	DE3346	288839.433	9747456.032	268.508	8	-90	0	RTK GPS
1381	DE3345	288790.844	9747464.889	269	8	-90	0	RTK GPS
1382	DE3378	287689.943	9747718.245	291	16	-90	0	RTK GPS
1383	DE2911	287689.05	9747756.276	290.011	15	-90	0	RTK GPS
1384	DE2447	286989.56	9749571.857	385.875	17	-90	0	RTK GPS
1385	DE2437	286933.911	9749678.447	385.13	13	-90	0	RTK GPS
1386	DE2442	286986.281	9749627.006	387.555	23	-90	0	RTK GPS
1387	DE2438	286977.516	9749662.673	385.714	17	-90	0	RTK GPS
1388	DE2975	286843.449	9749862.649	422	9	-90	0	RTK GPS
1389	DE2974	286778.486	9749858.312	414	11	-90	0	RTK GPS
1390	DE2424	286880.872	9749806.203	408	6	-90	0	RTK GPS
1391	DE2971	286675.996	9749909.213	419.489	11	-90	0	RTK GPS
1392	DE2421	286684.226	9749874.349	417.516	7	-90	0	RTK GPS
1393	DE2976	286779.358	9749809.27	411.956	11	-90	0	RTK GPS
1394	DE2973	286732.177	9749867.199	417.637	10	-90	0	RTK GPS
1395	DE2682	286839.222	9748765.033	333	19	-90	0	RTK GPS
1396	DE2698	286786.382	9748716.58	338	12	-90	0	RTK GPS
1397	DE2711	286881.822	9748668.118	341.023	8	-90	0	RTK GPS
1398	DE2680	286728.332	9748766.276	328.693	12	-90	0	RTK GPS
1399	DE2683	286877.705	9748766.361	331	17	-90	0	RTK GPS
1400	DE2712	286927.822	9748662.795	336.219	8	-90	0	RTK GPS
1401	DE2684	286918.431	9748765.546	330.736	12	-90	0	RTK GPS
1402	DE2681	286781.534	9748756.227	344	16	-90	0	RTK GPS
1403	DE2903	287683.087	9747818.629	295.004	10	-90	0	RTK GPS
1404	DE2910	287628.111	9747760.728	291.574	12	-90	0	RTK GPS
1405	DE2909	287585.098	9747756.345	291.954	12	-90	0	RTK GPS
1406	DE2518	287629.559	9749265.352	303.68	13	-90	0	RTK GPS
1407	DE2517	287576.872	9749252.955	300.696	8	-90	0	RTK GPS
1408	DE2519	287678.025	9749260.957	306.75	15	-90	0	RTK GPS

1409	DE2614	287680.15	9748958.939	304	14	-90	0	RTK GPS
1410	DE2632	287679.421	9748905.905	299	13	-90	0	RTK GPS
1411	DE2633	287771.262	9748914.701	301.11	7	-90	0	RTK GPS
1412	DE2615	287728.436	9748962.076	306.415	10	-90	0	RTK GPS
1413	DE2616	287783.158	9748961.555	306.183	16	-90	0	RTK GPS
1414	DE3275	287782.905	9748999.809	311	16	-90	0	RTK GPS
1415	DE3276	287836.244	9748963.031	308.506	12	-90	0	RTK GPS
1416	DE2617	287879.053	9748963.682	308	7	-90	0	RTK GPS
1417	DE2634	287878.175	9748912.434	297	15	-90	0	RTK GPS
1418	DE2619	287982.621	9748959.705	316.284	7	-90	0	RTK GPS
1419	DE2618	287932.353	9748960.185	312.109	17	-90	0	RTK GPS
1420	DE2515	287288.566	9749267.363	316.523	12	-90	0	RTK GPS
1421	DE2657	288025.657	9748869.33	312.681	8	-90	0	RTK GPS
1422	DE2531	287479.704	9749217.753	294.44	10	-90	0	RTK GPS
1423	DE2530	287384.316	9749214.396	309.879	8	-90	0	RTK GPS
1424	DE2902	287580.202	9747809.207	298.488	11	-90	0	RTK GPS
1425	DE2913	287792.073	9747764.842	293.731	12	-90	0	RTK GPS
1426	DE2904	287783.946	9747808.279	289.967	9	-90	0	RTK GPS
1427	DE2889	287572.292	9747864.187	304.157	13	-90	0	RTK GPS
1428	DE2891	287676.342	9747869.408	308	8	-90	0	RTK GPS
1429	DE2892	287732.575	9747845.175	298.199	16	-90	0	RTK GPS
1430	DE3376	287826.214	9747769.778	294.677	16	-90	0	RTK GPS
1431	DE2890	287628.604	9747861.928	304.837	8	-90	0	RTK GPS
1432	DE2912	287729.301	9747762.493	291	13	-90	0	RTK GPS
1433	DE2663	286960.451	9748807.849	319.533	12	-90	0	RTK GPS
1434	DE2685	286972.961	9748760.442	328.667	11	-90	0	RTK GPS
1435	DE3272	287115.247	9748762.701	296.942	16	-90	0	RTK GPS
1436	DE2648	286975.919	9748851.341	327.1	13	-90	0	RTK GPS
1437	DE2602	286927.799	9748967.33	340.245	10	-90	0	RTK GPS
1438	DE2594	286976.029	9749010.371	336.962	19	-90	0	RTK GPS
1439	DE2579	286979.4	9749055.315	336.513	21	-90	0	RTK GPS
1440	DE2580	287035.461	9749069.002	327.921	18	-90	0	RTK GPS
1441	DE2620	288035.297	9748965.892	316.595	9	-90	0	RTK GPS
1442	DE2972	286527.449	9749878.544	421	15	-90	0	RTK GPS
1443	DE2420	286636.812	9749851.234	426	17	-90	0	RTK GPS
1444	DE3239	285688.926	9749263.965	416	8	-90	0	RTK GPS
1445	DE2423	286679.945	9749818.751	425.275	9	-90	0	RTK GPS
1446	DE3246	285589.105	9749257.086	410	8	-90	0	RTK GPS
1447	DE2422	286583.609	9749809.466	424.228	12	-90	0	RTK GPS
1448	DE3238	285644.563	9749267.868	411.961	9	-90	0	RTK GPS
1449	DE3237	285691.819	9749307.282	415.382	15	-90	0	RTK GPS
1450	DE3236	285685.732	9749377.576	401.904	12	-90	0	RTK GPS
1451	DE3235	285687.475	9749415.048	406.833	10	-90	0	RTK GPS
1452	DE2419	286596.691	9749859.703	427.595	15	-90	0	RTK GPS
1453	DE2546	286986.3	9749161.458	341	16	-90	0	RTK GPS
1454	DE2547	287041.8	9749163.24	334.959	13	-90	0	RTK GPS
1455	DE2526	286981.562	9749215.625	343.502	13	-90	0	RTK GPS

1456	DE2563	286978.846	9749117.474	341.806	12	-90	0	RTK GPS
1457	DE2578	286937.601	9749067.159	343	18	-90	0	RTK GPS
1458	DE2545	286945.47	9749165.221	345.789	16	-90	0	RTK GPS
1459	DE2525	286888.68	9749218.279	350.048	21	-90	0	RTK GPS
1460	DE3309	287621.554	9747005.278	276.282	23	-90	0	RTK GPS
1461	DE3205	287317.128	9747010.81	296.494	12	-90	0	RTK GPS
1462	DE3375	287882.672	9747757.622	293.858	15	-90	0	RTK GPS
1463	DE3380	287886.92	9747724.007	290.535	10	-90	0	RTK GPS
1464	DE2937	287984.317	9747667.549	288.588	13	-90	0	RTK GPS
1465	DE3311	287741.443	9747015.415	261.81	18	-90	0	RTK GPS
1466	DE3310	287690.724	9747005.5	274.726	14	-90	0	RTK GPS
1467	DE3316	287788.597	9746966.55	256.81	10	-90	0	RTK GPS
1468	DE3241	285629.379	9749158.408	399.042	16	-90	0	RTK GPS
1469	DE3242	285688.038	9749151.252	397.173	11	-90	0	RTK GPS
1470	DE3240	285692.575	9749193.106	408	10	-90	0	RTK GPS
1471	DE3248	285586.062	9749164.402	401.056	15	-90	0	RTK GPS
1472	DE3243	285685.855	9749116.346	396.523	11	-90	0	RTK GPS
1473	DE3247	285584.126	9749212.697	406.543	10	-90	0	RTK GPS
1474	DE3249	285576.93	9749127.97	396.307	14	-90	0	RTK GPS
1475	DE2656	287988.463	9748877.961	305.395	13	-90	0	RTK GPS
1476	DE2635	287978.204	9748916.95	306.297	12	-90	0	RTK GPS
1477	DE3022	287980.548	9748819.346	301.999	6	-90	0	RTK GPS
1478	DE2690	287781.538	9748764.777	306	16	-90	0	RTK GPS
1479	DE2664	287685.808	9748812.765	308	15	-90	0	RTK GPS
1480	DE2655	287929.339	9748869.893	298.999	8	-90	0	RTK GPS
1481	DE2653	287834.741	9748864.839	295.032	13	-90	0	RTK GPS
1482	DE3030	287930.108	9748769.055	283.397	6	-90	0	RTK GPS
1483	DE2691	287830.642	9748768.184	303	12	-90	0	RTK GPS
1484	DE2651	287680.694	9748859.983	296	13	-90	0	RTK GPS
1485	DE3031	287978.238	9748761.229	281	8	-90	0	RTK GPS
1486	DE2665	287780.908	9748815.789	303.736	12	-90	0	RTK GPS
1487	DE2650	287636.085	9748870.548	298.975	13	-90	0	RTK GPS
1488	DE2666	287880.338	9748813.06	301.252	8	-90	0	RTK GPS
1489	DE2652	287788.969	9748863.899	293.987	11	-90	0	RTK GPS
1490	DE2692	287877.762	9748765.51	293	10	-90	0	RTK GPS
1491	DE2654	287884.603	9748867.128	297.548	10	-90	0	RTK GPS
1492	DE3038	287880.33	9748711.312	295	5	-90	0	RTK GPS
1493	DE3041	287884.073	9748655.908	278.295	6	-90	0	RTK GPS
1494	DE3021	287589.493	9748807.428	307	12	-90	0	RTK GPS
1495	DE2688	287686.423	9748763.354	311.194	9	-90	0	RTK GPS
1496	DE2687	287630.341	9748762.678	307.396	13	-90	0	RTK GPS
1497	DE2686	287593.105	9748754.3	304.7	5	-90	0	RTK GPS
1498	DE2662	286887.433	9748807.927	324.206	17	-90	0	RTK GPS
1499	DE2660	286677.803	9748814.787	329	10	-90	0	RTK GPS
1500	DE2627	286896.873	9748928.207	336.811	16	-90	0	RTK GPS
1501	DE2645	286835.385	9748856.186	327.116	19	-90	0	RTK GPS
1502	DE2601	286882.483	9748972.371	348.218	12	-90	0	RTK GPS

1503	DE2646	286893.657	9748845.264	326.216	13	-90	0	RTK GPS
1504	DE2593	286878.834	9749010.689	350.427	19	-90	0	RTK GPS
1505	DE2661	286783.713	9748813.524	329.749	16	-90	0	RTK GPS
1506	DE3202	287326.916	9747144.523	299.792	17	-90	0	RTK GPS
1507	DE3312	287584.3	9746962.067	281	12	-90	0	RTK GPS
1508	DE3198	287344.855	9747227.636	296.798	24	-90	0	RTK GPS
1509	DE3320	287632.031	9746875.713	261	21	-90	0	RTK GPS
1510	DE3322	287584.246	9746880.234	262.955	16	-90	0	RTK GPS
1511	DE3317	287573.528	9746908.45	271	15	-90	0	RTK GPS
1512	DE3223	285375.798	9749100.449	395.135	14	-90	0	RTK GPS
1513	DE3224	285366.698	9749161.491	400.98	8	-90	0	RTK GPS
1514	DE3225	285328.129	9749160.038	401.966	11	-90	0	RTK GPS
1515	DE3229	285130.274	9749169.06	416.237	14	-90	0	RTK GPS
1516	DE3230	285183.154	9749175.027	413	16	-90	0	RTK GPS
1517	DE3227	285280.511	9749110.426	402.906	12	-90	0	RTK GPS
1518	DE3232	285177.863	9749122.416	406.366	14	-90	0	RTK GPS
1519	DE3233	285081.7	9749067.858	400.36	10	-90	0	RTK GPS
1520	DE3231	285081.261	9749118.679	415.529	13	-90	0	RTK GPS
1521	DE3010	286628.854	9748872.542	332	12	-90	0	RTK GPS
1522	DE2644	286677.515	9748870.536	327.424	10	-90	0	RTK GPS
1523	DE3040	287829.704	9748667.952	287.958	6	-90	0	RTK GPS
1524	DE2741	287530.243	9748559.033	281.584	12	-90	0	RTK GPS
1525	DE3042	287677.889	9748606.219	275.494	13	-90	0	RTK GPS
1526	DE2742	287588.054	9748558.026	277	12	-90	0	RTK GPS
1527	DE3278	287731.887	9748615.282	274.988	12	-90	0	RTK GPS
1528	DE3046	287614.654	9748572.488	274.53	11	-90	0	RTK GPS
1529	DE3069	287575.342	9748410.85	277.606	11	-90	0	RTK GPS
1530	DE2729	287583.331	9748613.855	279.174	7	-90	0	RTK GPS
1531	DE3059	287517.329	9748454.775	277.355	9	-90	0	RTK GPS
1532	DE3277	287473.269	9748559.398	283.631	11	-90	0	RTK GPS
1533	DE3321	287731.685	9746903.538	271.128	13	-90	0	RTK GPS
1534	DE3318	287678.317	9746912.798	276	20	-90	0	RTK GPS
1535	DE3319	287687.12	9746860.42	267.748	10	-90	0	RTK GPS
1536	DE3203	287927.421	9747097.169	267.143	18	-90	0	RTK GPS
1537	DE3315	287719.771	9746964.812	277	12	-90	0	RTK GPS
1538	DE3313	287633.708	9746971.532	278	10	-90	0	RTK GPS
1539	DE3314	287682.675	9746968.343	280.868	17	-90	0	RTK GPS
1540	DE3228	285276.926	9749075.726	402.078	15	-90	0	RTK GPS
1541	DE3245	285682.281	9749067.381	387.793	13	-90	0	RTK GPS
1542	DE3244	285635.881	9749063.855	391.19	14	-90	0	RTK GPS
1543	DE3250	285586.281	9749064.789	394.747	17	-90	0	RTK GPS
1544	DE3222	285319.587	9749073.77	398.66	15	-90	0	RTK GPS
1545	DE3081	287842.917	9748357.218	276.709	11	-90	0	RTK GPS
1546	DE3070	287671.835	9748402.805	274.764	10	-90	0	RTK GPS
1547	DE3060	287573.001	9748455.786	274.856	9	-90	0	RTK GPS
1548	DE3078	287679.565	9748365.303	275.305	9	-90	0	RTK GPS
1549	DE3079	287734.035	9748358.648	276	12	-90	0	RTK GPS

1550	DE3089	287674.623	9748311.372	278	8	-90	0	RTK GPS
1551	DE3080	287772.65	9748359.657	275.913	12	-90	0	RTK GPS
1552	DE3126	286475.58	9748055.074	315.665	16	-90	0	RTK GPS
1553	DE2643	286578.184	9748866.627	333.148	10	-90	0	RTK GPS
1554	DE2600	286600.726	9748962.105	343	12	-90	0	RTK GPS
1555	DE2677	286578.288	9748768.865	331.788	7	-90	0	RTK GPS
1556	DE2599	286544.475	9748963.637	348.297	14	-90	0	RTK GPS
1557	DE3117	286472.4	9748106.878	312.223	13	-90	0	RTK GPS
1558	DE3018	286583.363	9748816.125	333	8	-90	0	RTK GPS
1559	DE3003	286635.395	9748957.014	336.633	10	-90	0	RTK GPS
1560	DE3255	286478.716	9748815.139	336.362	11	-90	0	RTK GPS
1561	DE2592	286585.468	9749009.637	358	12	-90	0	RTK GPS
1562	DE3125	286426.784	9748068.269	321	9	-90	0	RTK GPS
1563	DE3127	286530.811	9748053.55	307.801	10	-90	0	RTK GPS
1564	DE3221	286580.511	9748068.184	296.041	10	-90	0	RTK GPS
1565	DE3132	286473.598	9748011.924	317	12	-90	0	RTK GPS
1566	DE3136	286480.859	9747966.967	317	13	-90	0	RTK GPS
1567	DE2626	286676.745	9748904.544	328.356	12	-90	0	RTK GPS
1568	DE3137	286514.439	9747966.095	310.716	13	-90	0	RTK GPS
1569	DE3199	287891.236	9747198.165	305	18	-90	0	RTK GPS
1570	DE3291	288068.297	9747016.693	259.511	14	-90	0	RTK GPS
1571	DE3206	287962.27	9747039.675	265.895	11	-90	0	RTK GPS
1572	DE3293	287979.058	9746971.182	268.427	10	-90	0	RTK GPS
1573	DE3290	288020.796	9747010.779	265.811	11	-90	0	RTK GPS
1574	DE3580	287826.461	9747109.006	269.849	21	-90	0	RTK GPS
1575	DE3292	287927.556	9746966.033	266.975	15	-90	0	RTK GPS
1576	DE3294	288039.284	9746956.483	267.767	12	-90	0	RTK GPS
1577	DE3296	288120.831	9746981.013	249.507	17	-90	0	RTK GPS
1578	DE3466	289526.706	9747620.003	259	11	-90	0	RTK GPS
1579	DE3299	288102.705	9746931.767	252.201	7	-90	0	RTK GPS
1580	DE3295	288083.132	9746966.588	256	12	-90	0	RTK GPS
1581	DE3298	288077.437	9746915.258	261	7	-90	0	RTK GPS
1582	DE2952	288870.451	9747613.303	270.047	16	-90	0	RTK GPS
1583	DE2947	288979.978	9747661.887	265.543	12	-90	0	RTK GPS
1584	DE2934	288893.542	9747715.191	275.038	8	-90	0	RTK GPS
1585	DE2949	289084.338	9747669.993	269.966	10	-90	0	RTK GPS
1586	DE2946	288932.188	9747661.617	268.125	8	-90	0	RTK GPS
1587	DE2945	288886.036	9747670.024	269.241	13	-90	0	RTK GPS
1588	DE2948	289033.213	9747657.294	265.46	10	-90	0	RTK GPS
1589	DE2936	289066.504	9747710.383	259.157	12	-90	0	RTK GPS
1590	DE2935	288976.457	9747703.672	263	9	-90	0	RTK GPS
1591	DE3464	289326.334	9747636.622	254.53	12	-90	0	RTK GPS
1592	DE2926	288978.428	9747765.465	265.871	9	-90	0	RTK GPS
1593	DE2927	289025.407	9747778.207	262.525	17	-90	0	RTK GPS
1594	DE2928	289076.87	9747767.973	256.98	14	-90	0	RTK GPS
1595	DE3270	287136.405	9748015.275	297.497	7	-90	0	RTK GPS
1596	DE3087	287431.374	9748310.178	289.877	8	-90	0	RTK GPS

1597	DE3093	287368.785	9748267.504	295.124	12	-90	0	RTK GPS
1598	DE3279	287285.582	9748113.295	296.181	10	-90	0	RTK GPS
1599	DE3086	287347.516	9748309.002	294	8	-90	0	RTK GPS
1600	DE3104	287435.003	9748218.979	302.813	12	-90	0	RTK GPS
1601	DE3103	287390.184	9748220.897	296.243	10	-90	0	RTK GPS
1602	DE3108	287328.127	9748157.043	299	12	-90	0	RTK GPS
1603	DE3094	287408.218	9748260.03	301	12	-90	0	RTK GPS
1604	DE3076	287584.859	9748362.071	284.421	10	-90	0	RTK GPS
1605	DE3088	287588.098	9748310.077	287.522	10	-90	0	RTK GPS
1606	DE3075	287429.239	9748359.568	286	9	-90	0	RTK GPS
1607	DE3073	287339.341	9748361.544	286.591	13	-90	0	RTK GPS
1608	DE3280	287283.897	9748158.343	302.308	11	-90	0	RTK GPS
1609	DE3092	287313.318	9748263.653	296.149	11	-90	0	RTK GPS
1610	DE3266	287186.091	9748119.252	297.109	7	-90	0	RTK GPS
1611	DE3269	287141.364	9748058.015	298.029	13	-90	0	RTK GPS
1612	DE3074	287385.837	9748363.777	285.626	10	-90	0	RTK GPS
1613	DE3124	286026.777	9748053.407	315.575	14	-90	0	RTK GPS
1614	DE3123	285989.634	9748056.766	303.027	13	-90	0	RTK GPS
1615	DE3471	286220.341	9747519.328	310.906	13	-90	0	RTK GPS
1616	DE3438	286225.722	9747703.934	303.219	12	-90	0	RTK GPS
1617	DE3077	287641.758	9748365.192	278.507	12	-90	0	RTK GPS
1618	DE3421	286334.085	9747908.006	324.424	11	-90	0	RTK GPS
1619	DE3428	286426.958	9747829.333	321.122	14	-90	0	RTK GPS
1620	DE3426	286257.616	9747815.69	306.788	16	-90	0	RTK GPS
1621	DE3420	286231.683	9747908.932	316	9	-90	0	RTK GPS
1622	DE3450	286237.647	9747619.728	305	14	-90	0	RTK GPS
1623	DE3440	286432.275	9747725.178	318	12	-90	0	RTK GPS
1624	DE3208	285989.646	9747769.946	289.601	8	-90	0	RTK GPS
1625	DE3220	286583.622	9748028.281	295.6	8	-90	0	RTK GPS
1626	DE3451	286338.413	9747593.837	330	8	-90	0	RTK GPS
1627	DE3427	286347.401	9747821.701	316.949	17	-90	0	RTK GPS
1628	DE3122	285943.309	9748062.588	294.956	13	-90	0	RTK GPS
1629	DE3439	286333.842	9747716.951	317.88	20	-90	0	RTK GPS
1630	DE3483	289419.058	9747510.285	258.285	11	-90	0	RTK GPS
1631	DE3484	289534.16	9747500.872	253.035	14	-90	0	RTK GPS
1632	DE3503	289350.055	9747395.077	240	19	-90	0	RTK GPS
1633	DE3594	289337.108	9747095.167	229.446	19	-90	0	RTK GPS
1634	DE3482	289333.936	9747503.371	258.585	15	-90	0	RTK GPS
1635	DE3529	289341.347	9747333.329	240.828	18	-90	0	RTK GPS
1636	DE3559	289332.929	9747217.762	238	14	-90	0	RTK GPS
1637	DE3444	286823.078	9747724.47	313.497	15	-90	0	RTK GPS
1638	DE3434	287132.33	9747810.722	301.592	10	-90	0	RTK GPS
1639	DE3446	287031.843	9747715.323	315	25	-90	0	RTK GPS
1640	DE3445	286934.146	9747719.248	318.532	23	-90	0	RTK GPS
1641	DE3443	286734.669	9747732.923	306.251	11	-90	0	RTK GPS
1642	DE3416	286930.29	9748004.02	315.342	12	-90	0	RTK GPS
1643	DE3432	286824.972	9747813.591	312.115	23	-90	0	RTK GPS

1644	DE3431	286725.829	9747816.512	301.029	16	-90	0	RTK GPS
1645	DE3422	286929.243	9747915.476	307.588	13	-90	0	RTK GPS
1646	DE3433	286944.53	9747837.86	307.5	18	-90	0	RTK GPS
1647	DE3596	289520.493	9747112.874	227.035	18	-90	0	RTK GPS
1648	DE3595	289447.196	9747090.207	228.36	17	-90	0	RTK GPS
1649	DE3626	289336.207	9747021.655	221.009	14	-90	0	RTK GPS
1650	DE3627	289438.462	9747010.239	220.887	16	-90	0	RTK GPS
1651	DE3629	289633.222	9747000.692	219.519	21	-90	0	RTK GPS
1652	DE3628	289526.617	9747015.47	215.743	17	-90	0	RTK GPS
1653	DE3597	289641.123	9747097.336	220.982	14	-90	0	RTK GPS
1654	DE3562	289743.971	9747225.693	237.416	16	-90	0	RTK GPS
1655	DE3449	289519.997	9747709.7	251.306	10	-90	0	RTK GPS
1656	DE3632	289938.177	9747038.832	204.826	9	-90	0	RTK GPS
1657	DE3448	289434.244	9747707.895	250.891	7	-90	0	RTK GPS
1658	DE3506	289724.817	9747409.944	251.104	9	-90	0	RTK GPS
1659	DE3600	289928.242	9747118.461	213.314	8	-90	0	RTK GPS
1660	DE3563	289836.269	9747216.647	228	8	-90	0	RTK GPS
1661	DE3486	289739.436	9747510.545	246.644	9	-90	0	RTK GPS
1662	DE3633	290020.875	9747023.858	195.046	8	-90	0	RTK GPS
1663	DE3532	289731.513	9747320.832	242.788	12	-90	0	RTK GPS
1664	DE3564	289923.772	9747224.259	227.416	13	-90	0	RTK GPS
1665	DE3565	290031.308	9747194.501	214.686	14	-90	0	RTK GPS
1666	DE3601	290033.583	9747113.391	203.775	10	-90	0	RTK GPS
1667	DE3465	289428.886	9747609.658	256.432	18	-90	0	RTK GPS
1668	DE2689	287722.064	9748767.911	312.56	8	-90	0	RTK GPS
1669	DE3453	286531.58	9747618.072	324	16	-90	0	RTK GPS
1670	DE3540	286605.041	9747196.322	315.449	9	-90	0	RTK GPS
1671	DE3491	286526.933	9747402.093	326.596	12	-90	0	RTK GPS
1672	DE3539	286525.858	9747211.468	314.926	10	-90	0	RTK GPS
1673	DE3442	286602.619	9747736.349	305.627	11	-90	0	RTK GPS
1674	DE3441	286535.363	9747719.965	323.174	15	-90	0	RTK GPS
1675	DE3417	286532.198	9747314.907	325.94	9	-90	0	RTK GPS
1676	DE3452	286424.101	9747601.17	330.192	8	-90	0	RTK GPS
1677	DE3516	286443.564	9747309.193	314.79	12	-90	0	RTK GPS
1678	DE3570	286624.355	9747122.843	306.569	25	-90	0	RTK GPS
1679	DE3561	289632.073	9747214.314	241.315	11	-90	0	RTK GPS
1680	DE3504	289530.483	9747416.124	255	13	-90	0	RTK GPS
1681	DE3630	289731.611	9747014.257	217.202	15	-90	0	RTK GPS
1682	DE3654	289751.322	9746918.171	215	16	-90	0	RTK GPS
1683	DE3530	289516.178	9747312.476	241.518	24	-90	0	RTK GPS
1684	DE3655	289821.053	9746886.398	219.468	22	-90	0	RTK GPS
1685	DE3560	289542.767	9747242.597	241.377	16	-90	0	RTK GPS
1686	DE3634	290129.441	9747015.24	192.013	12	-90	0	RTK GPS
1687	DE3566	290117.986	9747192.61	218.205	13	-90	0	RTK GPS
1688	DE3567	290239.944	9747205.36	212	16	-90	0	RTK GPS
1689	DE3568	290322.566	9747192.833	204.356	10	-90	0	RTK GPS
1690	DE3637	290527.072	9747026.733	194.932	23	-90	0	RTK GPS

1691	DE3604	290318.198	9747121.238	201.513	17	-90	0	RTK GPS
1692	DE3605	290432.083	9747115.47	210.624	20	-90	0	RTK GPS
1693	DE3603	290227.956	9747112.025	201.65	18	-90	0	RTK GPS
1694	DE3602	290125.792	9747112.655	203.529	8	-90	0	RTK GPS
1695	DE3635	290237.999	9747010.957	195.665	15	-90	0	RTK GPS
1696	DE3430	286612.623	9747794.698	306.445	12	-90	0	RTK GPS
1697	DE3579	287732.713	9747123.971	273.221	9	-90	0	RTK GPS
1698	DE3429	286526.62	9747817.906	319.066	16	-90	0	RTK GPS
1699	DE3548	287611.386	9747218.994	288.979	15	-90	0	RTK GPS
1700	DE3645	287516.427	9746935.652	291.143	8	-90	0	RTK GPS
1701	DE3547	287529.283	9747220.882	289.723	13	-90	0	RTK GPS
1702	DE3458	287029.443	9747612.158	320.946	24	-90	0	RTK GPS
1703	DE3495	287027.394	9747399.115	330	14	-90	0	RTK GPS
1704	DE3459	287133.199	9747616.45	306.987	22	-90	0	RTK GPS
1705	DE3477	287229.78	9747522.916	302.877	12	-90	0	RTK GPS
1706	DE3494	286932.499	9747400.378	345.126	15	-90	0	RTK GPS
1707	DE3475	287035.184	9747512.881	318	22	-90	0	RTK GPS
1708	DE3496	287127.999	9747413.067	322	14	-90	0	RTK GPS
1709	DE3474	286929.904	9747512.734	329.303	23	-90	0	RTK GPS
1710	DE3457	286927.639	9747619.117	325.017	17	-90	0	RTK GPS
1711	DE3461	287335.349	9747609.254	298.462	9	-90	0	RTK GPS
1712	DE3447	287121.837	9747731.168	302.376	7	-90	0	RTK GPS
1713	DE3460	287231.757	9747599.119	299.924	16	-90	0	RTK GPS
1714	DE3478	287332.443	9747522.399	291.77	12	-90	0	RTK GPS
1715	DE3493	286848.993	9747413.637	343	18	-90	0	RTK GPS
1716	DE3456	286831.975	9747611.589	323	16	-90	0	RTK GPS
1717	DE3473	286825.206	9747515.963	315.407	8	-90	0	RTK GPS
1718	DE3520	286838.123	9747315.156	341	15	-90	0	RTK GPS
1719	DE3476	287118.4	9747529.632	312	20	-90	0	RTK GPS
1720	DE3598	289738.607	9747113.059	224	14	-90	0	RTK GPS
1721	DE3631	289830.038	9747004.148	218	16	-90	0	RTK GPS
1722	DE3599	289814.692	9747101.025	215.155	19	-90	0	RTK GPS
1723	DE3531	289613.327	9747310.803	247.849	20	-90	0	RTK GPS
1724	DE3665	289766.165	9746813.135	211	14	-90	0	RTK GPS
1725	DE3666	289820.516	9746817.664	220.558	14	-90	0	RTK GPS
1726	DE3613	287501.163	9747016.713	293.015	9	-90	0	RTK GPS
1727	DE3546	287429.854	9747212.544	296.445	10	-90	0	RTK GPS
1728	DE3578	287626.915	9747083.689	281.017	17	-90	0	RTK GPS
1729	DE3577	287521.501	9747129.463	302.867	17	-90	0	RTK GPS
1730	DE3576	287437.902	9747102.805	301.337	11	-90	0	RTK GPS
1731	DE3612	287428.423	9747030.278	295.423	13	-90	0	RTK GPS
1732	DE3463	288575.146	9747603.73	272.951	17	-90	0	RTK GPS
1733	DE3481	288627.237	9747535.641	280.561	13	-90	0	RTK GPS
1734	DE3485	289642.079	9747504.98	251.475	16	-90	0	RTK GPS
1735	DE3505	289633.131	9747442.504	255.48	16	-90	0	RTK GPS
1736	DE3507	289830.821	9747400.221	245.005	8	-90	0	RTK GPS
1737	DE3534	289938.348	9747310.19	246.687	12	-90	0	RTK GPS

1738	DE3606	290543.953	9747112.611	206.412	8	-90	0	RTK GPS
1739	DE3508	289925.844	9747408.524	245.409	10	-90	0	RTK GPS
1740	DE3533	289833.315	9747326.03	243.722	8	-90	0	RTK GPS
1741	DE3643	287335.413	9746916.468	280.974	11	-90	0	RTK GPS
1742	DE3642	287239.03	9746924.78	272.533	18	-90	0	RTK GPS
1743	DE3575	287209.603	9747120.087	317.679	16	-90	0	RTK GPS
1744	DE3611	287224.176	9747018.198	294.347	14	-90	0	RTK GPS
1745	DE3545	287133.873	9747220.502	324	17	-90	0	RTK GPS
1746	DE3644	287415.361	9746909.168	279.236	15	-90	0	RTK GPS
1747	DE3574	287151.714	9747121.562	314	18	-90	0	RTK GPS
1748	DE3502	288726.024	9747419.762	276	14	-90	0	RTK GPS
1749	DE3480	288557.319	9747526.032	278.006	13	-90	0	RTK GPS
1750	DE3528	288734.45	9747300.107	273	11	-90	0	RTK GPS
1751	DE3462	288513.308	9747597.89	275.21	17	-90	0	RTK GPS
1752	DE3553	288726.48	9747208.056	268.465	8	-90	0	RTK GPS
1753	DE3501	288628.874	9747419.02	280.075	14	-90	0	RTK GPS
1754	DE3527	288589.916	9747289.539	276.257	8	-90	0	RTK GPS
1755	DE3544	287042.077	9747204.638	324.304	18	-90	0	RTK GPS
1756	DE3543	286925.483	9747217.024	325.257	14	-90	0	RTK GPS
1757	DE3521	286917.143	9747310.45	335.259	12	-90	0	RTK GPS
1758	DE3523	287126.931	9747316.832	322.668	11	-90	0	RTK GPS
1759	DE3524	287330.43	9747324.14	298	12	-90	0	RTK GPS
1760	DE3522	287030.925	9747319.305	337.219	16	-90	0	RTK GPS
1761	DE3497	287225.055	9747424.891	298.475	10	-90	0	RTK GPS
1762	DE3498	287322.387	9747427.666	297.002	10	-90	0	RTK GPS
1763	DE3487	289842.123	9747511.085	249	12	-90	0	RTK GPS
1764	DE3327	289926.88	9747664.573	255.171	10	-90	0	RTK GPS
1765	DE3488	289934.591	9747513.279	249.694	10	-90	0	RTK GPS
1766	DE3509	290027.364	9747440.211	235.248	7	-90	0	RTK GPS
1767	DE3468	289831.76	9747608.838	252.168	10	-90	0	RTK GPS
1768	DE3328	289875.806	9747658.786	255.695	4	-90	0	RTK GPS
1769	DE3325	289932.486	9747616.151	253.059	10	-90	0	RTK GPS
1770	DE3326	289877.107	9747721.663	261.583	6	-90	0	RTK GPS
1771	DE3467	289750.741	9747612.411	248.06	7	-90	0	RTK GPS
1772	DE3535	290127.091	9747311.917	240.977	15	-90	0	RTK GPS
1773	DE3469	290015.791	9747610.904	251	8	-90	0	RTK GPS
1774	DE3510	290117.198	9747394.547	237	15	-90	0	RTK GPS
1775	DE3557	289132.52	9747199.083	263	10	-90	0	RTK GPS
1776	DE3590	288905.554	9747127.419	259.033	12	-90	0	RTK GPS
1777	DE3556	289021.792	9747212.745	264.627	18	-90	0	RTK GPS
1778	DE3591	289031.086	9747118.143	274.64	11	-90	0	RTK GPS
1779	DE3555	288924.637	9747231.655	261.506	12	-90	0	RTK GPS
1780	DE3592	289108.281	9747133.988	269.28	12	-90	0	RTK GPS
1781	DE3554	288824.701	9747213.567	266.091	12	-90	0	RTK GPS
1782	DE3657	287033.953	9746810.609	264	17	-90	0	RTK GPS
1783	DE3610	287144.607	9746998.997	291	16	-90	0	RTK GPS
1784	DE3608	286957.999	9747031.636	318.478	18	-90	0	RTK GPS

1785	DE3573	287028.549	9747094.676	310.07	16	-90	0	RTK GPS
1786	DE3609	287031.277	9747023.432	311.085	16	-90	0	RTK GPS
1787	DE3639	286941.418	9746924.577	303.328	19	-90	0	RTK GPS
1788	DE3640	287043.054	9746916.464	295.177	18	-90	0	RTK GPS
1789	DE3667	287120.519	9746726.369	258.106	14	-90	0	RTK GPS
1790	DE3641	287135.255	9746929.058	281.324	17	-90	0	RTK GPS
1791	DE3572	286920.005	9747127.672	322.729	16	-90	0	RTK GPS
1792	DE3542	286842.866	9747213.126	322.078	19	-90	0	RTK GPS
1793	DE3585	288419.631	9747129.145	292.223	10	-90	0	RTK GPS
1794	DE3584	288333.876	9747113.564	297.957	12	-90	0	RTK GPS
1795	DE3587	288634.003	9747118.774	275.515	18	-90	0	RTK GPS
1796	DE3583	288233.576	9747116.564	304.738	8	-90	0	RTK GPS
1797	DE3620	288617.825	9747006.502	271.745	14	-90	0	RTK GPS
1798	DE3582	288146.998	9747114.323	300	14	-90	0	RTK GPS
1799	DE3586	288533.866	9747117.236	281	12	-90	0	RTK GPS
1800	DE3581	288034.767	9747117.311	286.23	20	-90	0	RTK GPS
1801	DE3649	288715.515	9746917.207	247.441	16	-90	0	RTK GPS
1802	DE3621	288738.513	9747009.713	262.769	13	-90	0	RTK GPS
1803	DE3648	288636.933	9746900.135	235.62	14	-90	0	RTK GPS
1804	DE3525	287430.251	9747317.065	290.408	14	-90	0	RTK GPS
1805	DE3526	287530.242	9747314.839	286.723	16	-90	0	RTK GPS
1806	DE3614	287824.486	9747010.874	256.65	10	-90	0	RTK GPS
1807	DE3479	287524.758	9747518.463	293.343	11	-90	0	RTK GPS
1808	DE3499	287434.117	9747417.651	286	12	-90	0	RTK GPS
1809	DE3500	287535.023	9747417.855	285.357	11	-90	0	RTK GPS
1810	DE3624	289012.143	9747027.554	248	16	-90	0	RTK GPS
1811	DE3664	289035.239	9746795.928	230.155	8	-90	0	RTK GPS
1812	DE3653	289129.909	9746943.557	237.391	13	-90	0	RTK GPS
1813	DE3652	289047.111	9746910.819	240.867	12	-90	0	RTK GPS
1814	DE3675	289017.454	9746695.693	205	12	-90	0	RTK GPS
1815	DE3625	289110.739	9747001.863	253	8	-90	0	RTK GPS
1816	DE3623	288936.247	9747026.134	248.48	12	-90	0	RTK GPS
1817	DE3537	290626.75	9747321.591	208.33	8	-90	0	RTK GPS
1818	DE3514	290725.364	9747415.127	221	16	-90	0	RTK GPS
1819	DE3363	288387.661	9747415.073	283.557	9	-90	0	RTK GPS
1820	DE3359	288339.638	9747467.406	284.328	12	-90	0	RTK GPS
1821	DE3513	290631.053	9747412.606	218	8	-90	0	RTK GPS
1822	DE3536	290225.072	9747321.317	224.521	12	-90	0	RTK GPS
1823	DE3357	288290.533	9747515.742	285.222	13	-90	0	RTK GPS
1824	DE3364	288480.327	9747411.313	280.201	12	-90	0	RTK GPS
1825	DE3490	290832.287	9747511.195	219.772	10	-90	0	RTK GPS
1826	DE3366	288476.208	9747372.729	278.903	8	-90	0	RTK GPS
1827	DE3512	290519.55	9747404.603	216.007	6	-90	0	RTK GPS
1828	DE3361	288423.965	9747460.685	284.427	16	-90	0	RTK GPS
1829	DE3362	288468.056	9747459.043	282.416	8	-90	0	RTK GPS
1830	DE3360	288377.103	9747458.365	284.869	14	-90	0	RTK GPS
1831	DE3515	290825.275	9747409.102	215.437	16	-90	0	RTK GPS

1832	DE3358	288382.157	9747496.788	282	11	-90	0	RTK GPS
1833	DE3511	290228.78	9747396.981	223.311	8	-90	0	RTK GPS
1834	DE3365	288427.699	9747364.271	279.833	12	-90	0	RTK GPS
1835	DE3674	288945.255	9746709.781	214	28	-90	0	RTK GPS
1836	DE3663	288930.563	9746812.597	235.188	13	-90	0	RTK GPS
1837	DE3650	288834.48	9746922.286	248.675	15	-90	0	RTK GPS
1838	DE3662	288823.592	9746829.705	240.452	8	-90	0	RTK GPS
1839	DE3588	288730.449	9747108.155	269.271	12	-90	0	RTK GPS
1840	DE3661	288756.174	9746836.516	237	10	-90	0	RTK GPS
1841	DE3651	288931.272	9746904.99	246.555	19	-90	0	RTK GPS
1842	DE3552	288624.99	9747223.619	274.841	13	-90	0	RTK GPS
1843	DE3589	288831.333	9747115.605	260.916	7	-90	0	RTK GPS
1844	DE3622	288843.088	9747002.388	249.111	13	-90	0	RTK GPS
1845	DE2940	288126.582	9747660.457	292.93	12	-90	0	RTK GPS
1846	DE3402	288188.776	9747657.159	296.611	13	-90	0	RTK GPS
1847	DE3403	288221.126	9747555.744	287.287	8	-90	0	RTK GPS
1848	DE3180	288084.671	9747419.516	293.779	14	-90	0	RTK GPS
1849	DE3175	288227.858	9747516.365	289.926	9	-90	0	RTK GPS
1850	DE3177	288163.184	9747466.634	289.666	11	-90	0	RTK GPS
1851	DE3172	288183.705	9747607.757	287.755	8	-90	0	RTK GPS
1852	DE3182	288289.613	9747406.089	284	8	-90	0	RTK GPS
1853	DE3181	288176.16	9747419.141	287.831	14	-90	0	RTK GPS
1854	DE3176	288131.941	9747462.906	289.215	13	-90	0	RTK GPS
1855	DE2954	288178.615	9747570.805	288.777	8	-90	0	RTK GPS
1856	DE3178	288221.367	9747460.811	290.23	15	-90	0	RTK GPS
1857	DE3179	288280.252	9747456.156	287.965	11	-90	0	RTK GPS
1858	DE3676	287122.92	9746621.14	226.111	16	-90	0	RTK GPS
1859	DE3668	287230.536	9746717.642	250.691	21	-90	0	RTK GPS
1860	DE3324	287589.794	9746616.81	215.736	9	-90	0	RTK GPS
1861	DE3678	287340.999	9746619.283	231.092	13	-90	0	RTK GPS
1862	DE3658	287494.172	9746803.915	252.745	14	-90	0	RTK GPS
1863	DE3281	287822.455	9746664.029	215.281	11	-90	0	RTK GPS
1864	DE3671	287528.779	9746717.102	241.577	18	-90	0	RTK GPS
1865	DE3670	287417.977	9746716.827	250.933	20	-90	0	RTK GPS
1866	DE3285	287978.986	9746605.603	214	9	-90	0	RTK GPS
1867	DE3301	287895.064	9746817.609	229.352	20	-90	0	RTK GPS
1868	DE3306	287905.944	9746777.836	218.795	10	-90	0	RTK GPS
1869	DE3288	287995.049	9746579.431	211.032	12	-90	0	RTK GPS
1870	DE3282	287881.795	9746638.597	217.502	9	-90	0	RTK GPS
1871	DE3669	287314.22	9746728.375	250.887	14	-90	0	RTK GPS
1872	DE3308	287938.301	9746769.495	217.246	14	-90	0	RTK GPS
1873	DE3283	287915.095	9746679.163	199.16	9	-90	0	RTK GPS
1874	DE3323	287689.731	9746625.445	216	19	-90	0	RTK GPS
1875	DE3305	287887.829	9746702.527	200.016	10	-90	0	RTK GPS
1876	DE3618	288409.28	9747034.118	275.502	11	-90	0	RTK GPS
1877	DE3616	288231.934	9747040.19	278.509	9	-90	0	RTK GPS
1878	DE3615	288120.661	9747043.013	273	12	-90	0	RTK GPS

1879	DE3367	287380.518	9747714.513	298.961	7	-90	0	RTK GPS
1880	DE3551	288410.897	9747203.098	291.844	10	-90	0	RTK GPS
1881	DE3549	288222.607	9747203.587	300.627	7	-90	0	RTK GPS
1882	DE3168	287382.749	9747664.086	300.632	11	-90	0	RTK GPS
1883	DE3550	288331.507	9747213.298	294.811	12	-90	0	RTK GPS
1884	DE3368	287434.747	9747772.772	302.617	12	-90	0	RTK GPS
1885	DE3160	287477.057	9747765.446	299.521	12	-90	0	RTK GPS
1886	DE3617	288324.192	9747032.033	275.61	12	-90	0	RTK GPS
1887	DE3149	287430.304	9747864.903	303.066	15	-90	0	RTK GPS
1888	DE3170	287481.348	9747655.42	296	8	-90	0	RTK GPS
1889	DE3167	287478.726	9747712.157	294.497	10	-90	0	RTK GPS
1890	DE3154	287473.5	9747817.178	305	10	-90	0	RTK GPS
1891	DE3169	287433.33	9747663.714	298.595	8	-90	0	RTK GPS
1892	DE3369	287364.213	9747923.788	292.453	10	-90	0	RTK GPS
1893	DE3143	287427.159	9747916.032	292.991	11	-90	0	RTK GPS
1894	DE2887	288277.619	9747904.676	296.313	11	-90	0	RTK GPS
1895	DE2879	288337.476	9747975.391	302.839	12	-90	0	RTK GPS
1896	DE2837	288372.063	9748162.203	285	10	-90	0	RTK GPS
1897	DE2838	288425.775	9748167.222	294	10	-90	0	RTK GPS
1898	DE3619	288546.962	9747022.501	269	9	-90	0	RTK GPS
1899	DE3148	288768.405	9747911.497	280.325	11	-90	0	RTK GPS
1900	DE2901	288733.879	9747864.584	277.288	11	-90	0	RTK GPS
1901	DE2867	288725.716	9748052.599	292.063	8	-90	0	RTK GPS
1902	DE2855	288775.537	9748097.639	300.489	12	-90	0	RTK GPS
1903	DE2868	288776.594	9748054.027	293	8	-90	0	RTK GPS
1904	DE3120	288884.797	9748102.69	282	16	-90	0	RTK GPS
1905	DE2896	288323.458	9747855.072	296.948	5	-90	0	RTK GPS
1906	DE2861	288319.934	9748069.973	298.407	13	-90	0	RTK GPS
1907	DE2836	288336.523	9748157.012	285.03	12	-90	0	RTK GPS
1908	DE2869	288815.878	9748055.274	290.842	12	-90	0	RTK GPS
1909	DE2870	288869.723	9748061.416	284.104	13	-90	0	RTK GPS
1910	DE2845	288888.195	9748151.807	291	15	-90	0	RTK GPS
1911	DE2844	288836.112	9748162.675	302	12	-90	0	RTK GPS
1912	DE2843	288778.021	9748155.836	313	16	-90	0	RTK GPS
1913	DE2822	288774.959	9748209.063	307.027	13	-90	0	RTK GPS
1914	DE3393	287954.289	9747541.913	288.241	14	-90	0	RTK GPS
1915	DE3392	287896.433	9747507.348	285.388	17	-90	0	RTK GPS
1916	DE3388	287784.326	9747610.849	301.352	8	-90	0	RTK GPS
1917	DE3391	287880.956	9747567.375	306.028	14	-90	0	RTK GPS
1918	DE3390	287732.361	9747576.622	298	16	-90	0	RTK GPS
1919	DE3174	288135.682	9747565.904	285.266	12	-90	0	RTK GPS
1920	DE3173	288079.825	9747557.918	284.767	14	-90	0	RTK GPS
1921	DE3387	287677.723	9747615.224	308.345	12	-90	0	RTK GPS
1922	DE2884	287676.253	9747918.74	304	16	-90	0	RTK GPS
1923	DE2791	288427.968	9748364.761	288.374	13	-90	0	RTK GPS
1924	DE3082	288587.315	9748350.513	290.26	11	-90	0	RTK GPS
1925	DE2793	288637.473	9748354.674	294.812	8	-90	0	RTK GPS

1926	DE2799	288622.259	9748308.11	295.364	11	-90	0	RTK GPS
1927	DE2743	288473.059	9748584.172	287	9	-90	0	RTK GPS
1928	DE2767	288633.187	9748461.098	299.095	15	-90	0	RTK GPS
1929	DE2768	288686.738	9748460.057	297.013	12	-90	0	RTK GPS
1930	DE2776	288585.846	9748399.426	292	21	-90	0	RTK GPS
1931	DE2790	288378.945	9748364.331	288.667	8	-90	0	RTK GPS
1932	DE2792	288495.559	9748362.599	289.491	11	-90	0	RTK GPS
1933	DE2798	288570.267	9748315.782	292	10	-90	0	RTK GPS
1934	DE2812	288525.665	9748264.696	291.75	10	-90	0	RTK GPS
1935	DE3050	288387.672	9748561.501	278.296	6	-90	0	RTK GPS
1936	DE3051	288427.321	9748565.713	283.808	8	-90	0	RTK GPS
1937	DE2775	288484.064	9748414.877	295.288	22	-90	0	RTK GPS
1938	DE2938	288041.547	9747662.62	290	11	-90	0	RTK GPS
1939	DE2914	287964.202	9747756.075	294.724	9	-90	0	RTK GPS
1940	DE2916	288077.556	9747765.956	298.094	10	-90	0	RTK GPS
1941	DE2929	287985.669	9747721.114	290.615	10	-90	0	RTK GPS
1942	DE2915	288028.915	9747756.009	297.707	12	-90	0	RTK GPS
1943	DE2930	288071.938	9747716.967	292	12	-90	0	RTK GPS
1944	DE3171	288083.346	9747622.244	291	16	-90	0	RTK GPS
1945	DE2939	288084.448	9747666.158	290.768	13	-90	0	RTK GPS
1946	DE3134	288375.396	9748004.738	287	8	-90	0	RTK GPS
1947	DE2888	288371.532	9747908.739	300.075	6	-90	0	RTK GPS
1948	DE2883	288731.434	9747962.5	278.002	16	-90	0	RTK GPS
1949	DE2862	288371.805	9748073.704	288.737	8	-90	0	RTK GPS
1950	DE2917	288180.976	9747767.092	301.92	9	-90	0	RTK GPS
1951	DE2918	288228.806	9747756.977	302.187	14	-90	0	RTK GPS
1952	DE2863	288488.744	9748058.538	303.795	8	-90	0	RTK GPS
1953	DE2852	288371.97	9748117.91	286.747	12	-90	0	RTK GPS
1954	DE3140	288382.434	9747964.546	291.159	8	-90	0	RTK GPS
1955	DE3142	288778.436	9747961.828	283.074	6	-90	0	RTK GPS
1956	DE2853	288462.686	9748130.766	303.849	12	-90	0	RTK GPS
1957	DE3135	288769.033	9747999.754	281.035	11	-90	0	RTK GPS
1958	DE2897	288384.905	9747862.532	289	9	-90	0	RTK GPS
1959	DE2907	288371.46	9747821.38	289.463	8	-90	0	RTK GPS
1960	DE3161	288138.036	9747759.844	301.425	8	-90	0	RTK GPS
1961	DE2906	288291.637	9747824.592	294	14	-90	0	RTK GPS
1962	DE3304	287934.47	9746869.83	242.345	18	-90	0	RTK GPS
1963	DE3302	287896.295	9746868.928	243.36	15	-90	0	RTK GPS
1964	DE3303	287974.47	9746866.925	242.711	11	-90	0	RTK GPS
1965	DE3297	287984.893	9746914.806	254	15	-90	0	RTK GPS
1966	DE3406	288591.464	9748612.377	297.911	22	-90	0	RTK GPS
1967	DE2751	288484.192	9748518.336	301.871	15	-90	0	RTK GPS
1968	DE2752	288569.749	9748514.785	298.643	12	-90	0	RTK GPS
1969	DE2753	288684.398	9748511.641	306.965	8	-90	0	RTK GPS
1970	DE2765	288485.241	9748458.875	298.505	14	-90	0	RTK GPS
1971	DE3052	288540.72	9748553.98	301.487	17	-90	0	RTK GPS
1972	DE3044	288496.966	9748610.151	285.333	8	-90	0	RTK GPS

1973	DE3067	288533.987	9748459.395	295.357	11	-90	0	RTK GPS
1974	DE3407	288538.796	9748608.127	289.774	17	-90	0	RTK GPS
1975	DE2766	288584.518	9748464.574	298.189	16	-90	0	RTK GPS
1976	DE3405	288639.038	9748608.217	303.432	17	-90	0	RTK GPS
1977	DE3404	288684.195	9748618.777	302.206	19	-90	0	RTK GPS
1978	DE2745	288637.204	9748562.999	309.034	19	-90	0	RTK GPS
1979	DE2744	288575.022	9748567.923	301.37	18	-90	0	RTK GPS
1980	DE2746	288676.365	9748563.078	310.313	15	-90	0	RTK GPS
1981	DE2859	288228.042	9748057.433	304	12	-90	0	RTK GPS
1982	DE2876	288175.851	9747959.322	294.013	10	-90	0	RTK GPS
1983	DE2877	288233.752	9747949.265	294.283	17	-90	0	RTK GPS
1984	DE2871	288191.439	9748020.968	305.501	12	-90	0	RTK GPS
1985	DE2905	288179.399	9747821.527	297.532	12	-90	0	RTK GPS
1986	DE3139	288154.932	9747969.396	295.87	15	-90	0	RTK GPS
1987	DE2893	288179.208	9747861.672	294	8	-90	0	RTK GPS
1988	DE3130	288148.461	9748037.597	312.595	10	-90	0	RTK GPS
1989	DE3377	287939.969	9747864.03	305.898	16	-90	0	RTK GPS
1990	DE2886	288225.056	9747897.859	288.537	17	-90	0	RTK GPS
1991	DE3151	288031.072	9747874.37	299.854	12	-90	0	RTK GPS
1992	DE2860	288283.602	9748048.589	305.372	7	-90	0	RTK GPS
1993	DE2858	288201.005	9748055.784	306.543	10	-90	0	RTK GPS
1994	DE3145	287984.087	9747905.771	305	16	-90	0	RTK GPS
1995	DE2872	288293.384	9747998.236	307.034	12	-90	0	RTK GPS
1996	DE2894	288216.518	9747857.49	293.824	12	-90	0	RTK GPS
1997	DE3150	287979.903	9747869.085	302.199	13	-90	0	RTK GPS
1998	DE2878	288286.319	9747969.794	304	6	-90	0	RTK GPS
1999	DE2885	288186.941	9747912.537	287	12	-90	0	RTK GPS
2000	DE2839	288476.127	9748158.178	301.645	12	-90	0	RTK GPS
2001	DE2840	288539.065	9748159.931	300.747	16	-90	0	RTK GPS
2002	DE2851	288279.248	9748111.098	292.916	14	-90	0	RTK GPS
2003	DE2834	288172.161	9748168.22	296.339	13	-90	0	RTK GPS
2004	DE2833	288126.366	9748166.878	299.115	16	-90	0	RTK GPS
2005	DE2831	288047.689	9748157.05	299.286	10	-90	0	RTK GPS
2006	DE3100	288688.399	9748264.648	301	7	-90	0	RTK GPS
2007	DE2800	288779.737	9748285.217	295.752	8	-90	0	RTK GPS
2008	DE2835	288280.257	9748152.996	287.952	13	-90	0	RTK GPS
2009	DE2850	288174.497	9748121.428	294.762	15	-90	0	RTK GPS
2010	DE2821	288084.055	9748201.527	299.416	17	-90	0	RTK GPS
2011	DE2814	288829.829	9748272.823	292.446	10	-90	0	RTK GPS
2012	DE3114	289037.021	9748176.994	274.576	12	-90	0	RTK GPS
2013	DE3408	289141.918	9748208.253	267	8	-90	0	RTK GPS
2014	DE3411	289313.521	9748235.698	272	7	-90	0	RTK GPS
2015	DE3105	288679.853	9748214.096	305.009	13	-90	0	RTK GPS
2016	DE3101	288722.775	9748249.774	302.47	8	-90	0	RTK GPS
2017	DE2813	288777.831	9748246.987	301.242	9	-90	0	RTK GPS
2018	DE2801	288881.196	9748301.383	290.294	7	-90	0	RTK GPS
2019	DE2815	288892.776	9748266.785	292.05	13	-90	0	RTK GPS

2020	DE3115	289087.508	9748166.284	270.388	8	-90	0	RTK GPS
2021	DE3410	289214.005	9748207.629	267.357	12	-90	0	RTK GPS
2022	DE2874	287685.509	9747973.812	300.767	15	-90	0	RTK GPS
2023	DE2773	288323.235	9748417.832	291	10	-90	0	RTK GPS
2024	DE2774	288383.814	9748416.613	292.169	18	-90	0	RTK GPS
2025	DE2789	288327.755	9748367.279	291.625	10	-90	0	RTK GPS
2026	DE3209	285918.866	9747755.344	263.536	12	-90	0	RTK GPS
2027	DE3212	285976.527	9747608.392	275.08	10	-90	0	RTK GPS
2028	DE3213	285978.409	9747555.78	263.117	4	-90	0	RTK GPS
2029	DE3216	285991.443	9747514.474	251.986	8	-90	0	RTK GPS
2030	DE2763	288390.903	9748465.766	289.071	11	-90	0	RTK GPS
2031	DE2764	288428.712	9748466.851	296.216	16	-90	0	RTK GPS
2032	DE3043	288377.865	9748608.949	279.073	8	-90	0	RTK GPS
2033	DE3217	285977.194	9747667.291	270.18	10	-90	0	RTK GPS
2034	DE3110	287678.064	9748153.78	284.581	12	-90	0	RTK GPS
2035	DE3372	287891.701	9747961.982	300.769	15	-90	0	RTK GPS
2036	DE3400	287673.945	9748010.953	299	20	-90	0	RTK GPS
2037	DE3395	287681.452	9748060.694	294.914	14	-90	0	RTK GPS
2038	DE3398	287637.3	9748059.219	299.919	17	-90	0	RTK GPS
2039	DE3109	287580.192	9748145.944	289	10	-90	0	RTK GPS
2040	DE2817	287683.056	9748206.333	281.727	13	-90	0	RTK GPS
2041	DE3396	287638.574	9747962.669	302.925	19	-90	0	RTK GPS
2042	DE3399	287575.949	9748110.611	292.636	11	-90	0	RTK GPS
2043	DE3394	287672.581	9748112.604	288	13	-90	0	RTK GPS
2044	DE3098	287774.817	9748254.53	282.15	9	-90	0	RTK GPS
2045	DE3118	287783.815	9748123.263	287.758	8	-90	0	RTK GPS
2046	DE3133	287785.149	9748016.422	295.068	19	-90	0	RTK GPS
2047	DE3138	287774.005	9747974.15	300.705	14	-90	0	RTK GPS
2048	DE3397	287626.057	9748155.993	286	7	-90	0	RTK GPS
2049	DE3097	287727.834	9748261.277	280.212	12	-90	0	RTK GPS
2050	DE2809	287819.946	9748250.138	286.363	12	-90	0	RTK GPS
2051	DE2827	287821.292	9748153.104	286.379	10	-90	0	RTK GPS
2052	DE2875	287739.375	9747976.739	299.946	14	-90	0	RTK GPS
2053	DE2826	287772.533	9748162.942	287.857	13	-90	0	RTK GPS
2054	DE3128	287727.406	9748065.831	293.02	11	-90	0	RTK GPS
2055	DE3095	287639.273	9748256.745	283.588	13	-90	0	RTK GPS
2056	DE3096	287677.928	9748260.113	281.206	10	-90	0	RTK GPS
2057	DE2818	287779.487	9748216.57	283.33	14	-90	0	RTK GPS
2058	DE3111	287734.583	9748164.643	288.041	10	-90	0	RTK GPS
2059	DE3129	287786.81	9748064.234	292.09	13	-90	0	RTK GPS
2060	DE3090	288081.228	9748310.253	291.842	17	-90	0	RTK GPS
2061	DE2810	288051.275	9748258.359	293.596	16	-90	0	RTK GPS
2062	DE2820	287976.998	9748218.043	293.213	10	-90	0	RTK GPS
2063	DE2830	287985.412	9748175.009	295.263	13	-90	0	RTK GPS
2064	DE3374	287934.747	9747943.105	299.908	8	-90	0	RTK GPS
2065	DE2811	288109.027	9748244.169	294.651	16	-90	0	RTK GPS
2066	DE2849	287992.397	9748115.889	292.751	11	-90	0	RTK GPS

2067	DE3415	289528.236	9748125.409	267.322	20	-90	0	RTK GPS
2068	DE2857	287930.905	9748057.287	298.561	16	-90	0	RTK GPS
2069	DE3412	289416.796	9748194.264	278.087	12	-90	0	RTK GPS
2070	DE3419	289540.197	9748033.102	253	7	-90	0	RTK GPS
2071	DE3370	287893.37	9747928.774	299.999	12	-90	0	RTK GPS
2072	DE3373	287885.626	9747878.614	310.349	11	-90	0	RTK GPS
2073	DE3371	287886.336	9747815.387	300	14	-90	0	RTK GPS
2074	DE3210	286021.76	9747765.864	298.961	4	-90	0	RTK GPS
2075	DE3352	289323.258	9747704.484	252.499	13	-90	0	RTK GPS
2076	DE3214	286035.616	9747577.674	285.17	5	-90	0	RTK GPS
2077	DE3215	286032.776	9747516.14	263	8	-90	0	RTK GPS
2078	DE2832	288084.904	9748169.504	300.437	12	-90	0	RTK GPS

APPENDIX 2

PT IRIANA MUTIARA MINING LEASE DOCUMENTS

&

COMMERCIAL TERMS OF NIC & IMM AGREEMENT



AMANDEMEN
KONTRAK KARYA

ANTARA

PEMERINTAH
REPUBLIK INDONESIA

DENGAN

PT IRIANA MUTIARA MINING



AMANDEMENT
OF CONTRACT OF WORK

BETWEEN

GOVERNMENT OF
REPUBLIC OF INDONESIA

AND

PT IRIANA MUTIARA MINING

AMANDEMEN KONTRAK KARYA

ANTARA

PEMERINTAH REPUBLIK INDONESIA

DENGAN

PT IRIANA MUTIARA MINING

Amandemen Kontrak Karya (selanjutnya disebut "**Amandemen**") ini, dibuat di Jakarta pada hari Rabu, tanggal 23 Desember 2015, oleh dan antara:

1. Pemerintah Republik Indonesia, dalam hal ini diwakili Menteri Energi dan Sumber Daya Mineral (selanjutnya disebut "**Pemerintah**"); dan
2. PT Iriana Mutiara Mining, sebuah perseroan terbatas yang telah didirikan secara sah menurut hukum Indonesia, berdomisili di Jakarta, dan berkantor pusat di Wisma GKBI, Lt. 18, Suite 1818, Jl. Jend. Sudirman No. 28, Jakarta Pusat, 10210, yang dalam perbuatan hukum ini diwakili oleh Kasudjono Harianto sebagai Direktur Utama (selanjutnya disebut "**Perusahaan**").

Pemerintah dan Perusahaan bersama-sama selanjutnya disebut "**Para Pihak**".

Para Pihak menerangkan terlebih dahulu hal-hal sebagai berikut:

1. Bahwa Pemerintah dan Perusahaan telah menandatangani dan melangsungkan Kontrak Karya tertanggal 28 bulan April tahun 1997 (selanjutnya disebut "**Persetujuan**") selanjutnya menyepakati perubahan Persetujuan antara Pemerintah dan PT Iriana Mutiara Mining tertanggal 23 Desember 2015.
2. Bahwa berdasarkan ketentuan Pasal 169 Undang-undang No. 4 Tahun 2009 tentang Pertambangan Mineral dan Batubara (selanjutnya disebut "UU Minerba") ketentuan yang ada dalam Persetujuan harus disesuaikan menurut ketentuan UU Minerba.
3. Bahwa untuk menghindarkan batalnya ketentuan dalam Persetujuan karena ketentuan yang ada bertentangan dengan peraturan perundangan, termasuk tetapi tidak terbatas pada UU Minerba maka Para Pihak telah sepakat untuk melakukan amandemen terhadap ketentuan-ketentuan yang tidak sesuai yang dinyatakan lebih rinci dalam Amandemen yang mengikat ini.
4. Bahwa Para Pihak telah merundingkan dan menghasilkan kesepakatan-kesepakatan demi selarasnya dengan UU Minerba.

Oleh karenanya Para Pihak sepakat untuk menuangkan hasil perundingan dalam Amandemen ini sebagai berikut:

CONTRACT OF WORK AMENDMENT

BETWEEN

GOVERNMENT OF THE REPUBLIC OF INDONESIA

WITH

PT IRIANA MUTIARA MINING

The Contract of Work Amendment (hereinafter refered to as "Amendment") is made in Jakarta on the 23rd December 2015, by and between:

1. The Government of the Republic of Indonesia, in this case represented by the Minister of Energy and Mineral Resources (hereinafter refered to as "**the Government**"); and
2. PT Iriana Mutiara Mining, a limited liability company that has been established lawfully Indonesia, located in Jakarta, with offices in Graha Simatupang Tower I Block D, Lt. 4. Jl. TB. Simatupang Kav. 38 in this legal act represented by Kasudjono Harianto as President Director (hereinafter refered to as "**The Company**").

The Government and Company together hereinafter referred to as "**the Parties**".

The Parties explain in advance the following matters:

1. That the Government and the Company has entered into and carried out a Contract Of Work dated 28 April 1997 (hereinafter "**the Agreement**") and further have agreed of the amendment to the Agreement between Government and PT Iriana Mutiara Mining dated 23rd December 2015.
2. Whereas under the provisions of Article 169 of Law No. 4 Year 2009 on Mineral and Coal Mining (hereinafter "Mining Law") provisions contained in the Agreement should be adjusted in accordance with the provisions of the Mining Law).
3. That in order to avoid the cancellation of provisions in respect of existing provisions contrary to the laws and regulations, including but not limited to the Mining Law, the Parties have agreed to amend the provisions that are not suitable which will be stated in more detail in this binding amendment.
4. That the Parties have negotiated and produced agreements that are aligned with the Mining Law.

Therefore, the Parties have agreed to declare the results of the negotiations in this amendment as follows:

Pasal I

Para Pihak sepakat untuk melakukan amandemen atas Persetujuan yang mengikuti pasal-pasal dalam Kontrak Karya sebagai berikut:

1. Ketentuan berikut ini ditambahkan sebagai menjadi "huruf F" dan "huruf G" pada Mukadimah Persetujuan ini sebagai berikut:

   F. Para Pihak bersedia untuk bekerjasama dalam pengembangan Sumber Daya Mineral atas dasar ketentuan-ketentuan Kontrak Karya ini dan amandemennya serta ketentuan peraturan perundang-undangan.

   G. Para Pihak sepakat bahwa Sesuai dengan Surat Direktur Jenderal Mineral dan Batubara Nomor 333/30/DJB/2014 tanggal 24 Februari 2014 perihal Persetujuan Perubahan Komoditas Tambang PT Iriana Mutiara Mining, maka bahan galian yang akan ditambang Perusahaan berdasarkan Persetujuan ini adalah Nikel dan mineral pengikutnya.

Pasal 1 Definisi

1. Kecuali dinyatakan di bawah ini, segala istilah yang diawali dengan huruf besar dalam Amandemen ini memiliki pengertian yang sama dengan yang ditentukan di dalam Kontrak Karya. Istilah-istilah di bawah ini akan memiliki arti sebagaimana disebutkan di bawah dan akan dicantumkan ke dalam Pasal 1dari Persetujuan sebagai tambahan atau pengganti dari istilah terkait yang telah ada sebelumnya (sebagaimana sesuai dengan maksudnya).

Ayat 1

"Afiliasi" adalah :

a. Hubungan keluarga karena perkawinan dan keturunan sampai dengan derajat kedua, baik secara horizontal maupun vertikal;

b. Hubungan antara Perusahaan dengan pegawai, direktur, atau komisaris dari Perusahaan tersebut;

c. Hubungan antara 2 (dua) perusahaan di mana terdapat satu atau lebih anggota direksi atau dewan komisaris yang samadengan Perusahaan;

d. Hubungan antara perusahaanlain danPerusahaan, baik langsung maupun tidak langsung, mengendalikan atau dikendalikan oleh perusahaan tersebut;

e. Hubungan antara 2 (dua) perusahaanlain yang dikendalikan, baik langsung maupun tidak langsung, oleh perusahaan yang sama; atau

f. Hubungan antara perusahaan lain dan pemegang saham utama di Perusahaan;

Ayat 4

"Cagar Alam" berarti kawasan suaka alam karena keadaan alamnya mempunyai kekhasan tumbuhan, satwa, dan ekosistemnya atau ekosistem tertentu yang perlu dilindungi dan perkembangannya berlangsung secara alami.

Article I

The Parties agree to amend the Agreement that correspond with the articles of the Contract of Work as follows:

1. The following provisions are added as "the letter F" and "the letter G" in the Preamble to this Agreement as follows:

   F. The Parties are willing to cooperate in the development of Mineral Resources on the basis of the provisions of the Contract of Work and its amendments as well as the provisions of the legislation.

   G. The Parties agree that in accordance with the Letter of the Director General of Mineral and Coal No. 333/30 / DJB / 2014 dated February 24, 2014 regarding Approval of Amendment Mining Commodities of PT Iriana Pearl Mining, the mineral to be mined by the Company under this Agreement are Nickel and its mineral derivatives.

Article 1 Definitions

1. Unless otherwise indicated below, all terms beginning with a capital letter in this Amendment has the same meaning as defined in the Contract of Work. The terms below shall have the meanings as set out below and are listed in Article 1 from the Agreement in addition to or in lieu of related terms that have been there before (as in accordance with the meaning)..

Paragraph 1

"Affiliate" is:

a. Family relationship by marriage and descendant to the second degree, both horizontally and vertically;

b. The relationship between The Company and its employees, directors, or commissioners of The Company;

c. The relationship between two (2) companies in which there are one or more members of the board of directors or board of commissioners that are the same with the Company;

d. The relationship between other companies and The Company, either directly or indirectly, that controls or is controlled by the company;

e. The relationship between two (2) other companies that is controlled, directly or indirectly, by the same company; or

f. The relationship between other companies and major shareholders in the Company;

Paragraph 4

"Nature Reserve" means the natural areas that due to its natural state has unique plants or animals and ecosystem, which needs to be protected and its development occurs naturally.

Ayat 7

"Kementerian" sebelumnya disebut Departemen, berarti perangkat Pemerintah yang membidangi urusan energi dan sumber daya mineral, kecuali konteksnya menunjukkan lain.

Ayat 8

"Usaha Pertambangan" berarti kegiatan dalam rangka pengusahaan mineral atau batubara yang meliputi tahapan kegiatan penyelidikan umum, eksplorasi, studi kelayakan, konstruksi, penambangan, pengolahan dan pemurnian, pengangkutan dan penjualan, serta pascatambang.

Ayat 9

"Lingkungan Hidup" berarti ruang dengan semua benda, daya, keadaan dan makhluk hidup termasuk manusia dan perilakunya yang mempengaruhi alam itu sendiri, kelangsungan peri kehidupan, dan kesejahteraan manusia serta makhluk hidup lain.

Ayat 11

"Eksplorasi" adalah tahapan kegiatan usaha pertambangan untuk memperoleh informasi secara terperinci dan teliti tentang lokasi, bentuk, dimensi, sebaran, kualitas dan sumber daya terukur dari bahan galian, serta informasi mengenai lingkungan sosial dan lingkungan hidup.

Ayat 14

"Studi Kelayakan" adalah tahapan kegiatan usaha pertambangan untuk memperoleh informasi secara rinci seluruh aspek yang berkaitan untuk menentukan kelayakan ekonomis dan teknis usaha pertambangan, termasuk analisis mengenai dampak lingkungan serta perencanaan pascatambang.

Ayat 17

"Penyelidikan Umum" adalah tahapan kegiatan pertambangan untuk mengetahui kondisi geologi regional dan indikasi adanya mineralisasi.

Ayat 19

"Pemerintah Pusat", yang selanjutnya disebut "Pemerintah", adalah Presiden Republik Indonesia yang memegang kekuasaan Pemerintah Negara Republik Indonesia sebagaimana dimaksud dalam Undang-Undang Dasar Negara Republik Indonesia Tahun 1945.

Ayat 20

"Mineral" adalah senyawa anorganik yang terbentuk di alam, yang memiliki sifat fisik dan kimia tertentu serta susunan kristal teratur atau gabungannya yang membentuk batuan, baik dalam bentuk lepas atau padu.

Ayat 21

"Penambangan" berarti adalah bagian kegiatan usaha pertambangan untuk memproduksi mineral dan/atau batubara dan mineral ikutannya.

Paragraph 7

"Ministry", formerly called the Depatment, meaning the Government in charge of energy affairs and mineral resources, unless the context indicates another.

Paragraph 8

"Mining Business" means activities within the framework of exploitation of minerals or coal which covers the stages of general survey, exploration, feasibility studies, construction, mining, processing and purification, transportation and sales, as well as post-mining.

Paragraph 9

"Environment" means area in which all things, power, and the state of the living creatures, including humans, and behavior that affect the natural conditions, the continuity of livelihood and well-being of humans and other living creatures.

Paragraph 11

"Exploration" is the stage of mining business activities to obtain detailed and accurate information about the location, shape, dimensions, distribution, quality and measured resources of minerals, as well as information about the social and environmental surroundings.

Paragraph 14

"Feasibility Study" is the stage of mining business activities to obtain detailed information about all aspects related to determining the economic and technical feasibility of mining, including environmental impact assessment and planning for post-mining.

Paragraph 17

"General Survey" is the stage of mining activity to determine the condition of the regional geology and the indications of mineralization.

Paragraph 19

"Central Government", hereinafter called "the Government", is the President of the Republic of Indonesia, which holds the power of the Government of the Republic of Indonesia as stipulated in the Constitution of the Republic of Indonesia Year 1945.

Paragraph 20

"Mineral" is an inorganic compound that is formed in nature, which has specific physical and chemical properties as well as a regular crystal composition or combination thereof which form rocks, either in loose or solid form.

Paragraph 21

"Mining" means a part of mining business activities to produce mineral and / or coal and associated minerals.

Ayat 24

"Taman Nasional" berarti kawasan pelestarian alam yang mempunyai ekosistem asli, dikelola dengan sistem zonasi yang dimanfaatkan untuk tujuan penelitian, ilmu pengetahuan, pendidikan, menunjang budidaya, pariwisata, dan rekreasi alam.

Ayat 26

"Pencemaran Lingkungan Hidup" berarti masuk atau dimasukannya makhluk hidup, zat, energi dan/atau komponen lain ke dalam lingkungan hidup oleh kegiatan manusia sehingga melampaui baku mutu lingkungan hidup yang telah ditetapkan.

2. Ketentuan Pasal 1 Ayat (27) Persetujuan ini diberi nomor urut baru menjadi "Ayat (27)", "Ayat (27.a)" dan "Ayat (27.b)" yang baru ditambahkan sebagai berikut:

Ayat 27

"Pengolahan dan Pemurnian" berarti kegiatan usaha pertambangan untuk meningkatkan mutu mineral serta untuk memanfaatkan dan memperoleh mineral ikutan.

Diusulkan Ayat 27.a, ditambahkan Ayat baru

"Pengolahan Mineral" merupakan upaya untuk meningkatkan mutu Mineral atau Batuan yang menghasilkan produk dengan sifat fisik dan kimia yang tidak berubah dari Mineral atau Batuan asal, antara lain berupa konsentrat Mineral Logam dan Batuan yang dipoles.

Diusulkan Ayat 27.b, ditambahkan Ayat baru

"Pemurnian Mineral" merupakan upaya untuk meningkatkan mutu Mineral Logam melalui proses ekstraksi serta proses peningkatan kemurnian lebih lanjut untuk menghasilkan produk dengan sifat fisik dan kimia yang berbeda dari Mineral asal, antara lain berupa logam dan logam paduan.

Ayat 33

"Limbah" berarti sisa suatu usaha dan/atau kegiatan.

3. Pasal 1 Ayat (34) dan Ayat (35) Persetujuan dihapus secara keseluruhan.

4. Istilah-istilah di bawah ini memiliki arti sebagaimana dijelaskan di bawah dan ditambahkan dalam Pasal 1 dari Persetujuan ini:

Ayat 36

"Operasi Produksi" berarti tahapan kegiatan usaha pertambangan yang meliputi konstruksi, penambangan, pengolahan, pemurnian, termasuk pengangkutan dan penjualan, serta sarana pengendalian dampak lingkungan sesuai dengan hasil studi kelayakan selanjutnya dalam Persetujuan ini disebut Periode Operasi.

Ayat 37

"Konstruksi" berarti kegiatan usaha pertambangan untuk melakukan pembangunan seluruh fasilitas operasi produksi, termasuk pengendalian dampak lingkungan.

Paragraph 24

"National park" means a nature conservation area which has an original ecosystem, managed by the zoning system which is utilized for the purpose of research, science, education, cultivation support, tourism and outdoor recreation.

Paragraph 26

"Environmental Pollution" means the introduction or exclusion of living creatures, substances, energy and / or other components into the environment by human activities that exceed the environmental quality standards have been set.

2. The provisions of Article 1 Paragraph (27) of this Agreement are given a new serial number as "Paragraph (27)", "Paragraph (27.a)" and "Paragraph (27.b)" are newly added as follows:

Paragraph 27

"Processing and Refining" means the mining business activities to improve the quality of minerals as well as to utilize and derive associated minerals.

Proposed Paragraph 27.a, add a new Paragraph

"Mineral Processing" is an effort to improve the quality of minerals or rocks that produce products with physical and chemical properties that do not change from mineral or rock origin, among others in the form of Metal Mineral concentrates and polished rocks.

Proposed Paragraph 27.b, add a new Paragraph

"Mineral Refining " is an effort to improve the quality of Metals Minerals through the extraction process as well as the process of increasing the purity further to produce a product with physical and chemical properties different from the original Minerals, which include metals and metal alloys.

Paragraph 33

"Waste" means the residue of a business and/or activity.

3. Article 1 Paragraph (34) and Paragraph (35) shall be deleted in its entirety.

4. The terms below have the meaning as described below and added to in Article 1 of this Agreement:

Paragraph 36

"Production Operation" means the stages of mining business activities which include construction, mining, processing, refining, including transportation and sales, as well as a means of controlling the environmental impact in accordance with the results of the feasibility study later in this Agreement called Operation Period.

Paragraph 37

"Construction" means the mining business activities to undertake the construction of the entire facility production operations, including environmental impact control.

Ayat 38

"Pengangkutan" berarti kegiatan usaha pertambangan untuk memindahkan mineral dan/atau batubara dari daerah tambang dan/atau tempat pengolahan dan pemurnian sampai tempat penyerahan.

Ayat 39

"Penjualan" berarti kegiatan usaha pertambangan untuk menjual hasil pertambangan mineral.

Ayat 40

"Analisis Mengenai Dampak Lingkungan," yang selanjutnya disebut Amdal, berarti kajian mengenai dampak penting suatu usaha dan/atau kegiatan yang direncanakan pada lingkungan hidup yang diperlukan bagi proses pengambilan keputusan tentang penyelenggaraan usaha dan/atau kegiatan.

Ayat 41

"Jasa Pertambangan" adalah jasa penunjang yang berkaitan dengan kegiatan usaha pertambangan.

Ayat 42

"Penanaman Modal Asing" berarti kegiatan menanam modal untuk melakukan usaha di wilayah negara Republik Indonesia yang dilakukan oleh penanam modal asing, baik yang menggunakan modal asing sepenuhnya maupun yang berpatungan dengan penanam modal dalam negeri.

Ayat 43

"Penanaman Modal Dalam Negeri" berarti kegiatan menanam modal untuk melakukan usaha di wilayah negara Republik Indonesia yang dilakukan oleh penanam modal dalam negeri dengan menggunakan modal dalam negeri.

Ayat 44

"Persetujuan" berarti Persetujuan bagi Kontrak Karya dalam rangka Penanaman Modal Asing di Bidang Pertambangan Umum tertanggal 28 April 1997 antara Pemerintah dan Perusahaan sebagaimana diubah dengan Amandemen.

Paragraph 38

"Transport" means the mining business activities to move mineral and/or coal from mining areas and/or where the processing and refining to the place of delivery.

Paragraph 39

"Sales" means the mining business activities to sell the mineral mining results.

Paragraph 40

"Environmental Impact Assessment," hereinafter called EIA, is a meaningful study on the significant and important impact of planned business and/or activities on the environment that is necessary for the decision making process regarding business and/or activity.

Paragraph 41

"Mining Services" is the supporting services related to mining activities.

Paragraph 42

"Foreign investment" means investment activity to conduct business in the territory of the Republic of Indonesia, made by a foreign investor, whether using foreign capital and joint venture with a domestic investor.

Paragraph 43

"Domestic investment" means investment activity to conduct business in the territory of the Republic of Indonesia by a domestic investor using domestic capital.

Paragraph 44

"Agreement" means the Agreement for the Contract of Work in the framework of Foreign Investment in General Mining Sector dated 28 April 1997 between the Government and the Company, as amended by Amendment.

Pasal 2 Penunjukan dan Tanggung Jawab Perusahaan

1. Ketentuan Pasal 2 Ayat (1) Persetujuan dihapus secara keseluruhan dan diganti dengan ketentuan sebagai berikut:

Ayat 1

Perusahaan dengan ini ditunjuk sebagai kontraktor tunggal dari Pemerintah yang berkenaan dengan Wilayah Kontrak Karya. Khususnya, Perusahaan akan diberi hak tunggal untuk melakukan Eksplorasi sesuatu Mineral di dalam Wilayah Kontrak Karya, menambang setiap endapan mineral yang ditemukan di dalam Wilayah Pertambangan, mengolah, memurnikan, menyimpan, dan mengangkut dengan cara apapun semua hasil mineral-mineral yang dihasilkan, memasarkan, menjual atau melepaskan semua produksi dari tambang di dalam dan di luar Indonesia setelah dilakukan Pengolahan dan Pemurnian di dalam negeri, serta melakukan semua operasi serta kegiatan-kegiatan lainnya yang mungkin perlu atau memudahkan serta akan dilaksanakan dengan betul-betul memperhatikan persyaratan Persetujuan ini. Dalam pertimbangan untuk memberikan hak-hak tersebut, Perusahaan harus melaksanakan pekerjaan dan memenuhi kewajibannya yang ditentukan dalam Persetujuan ini, termasuk tanpa kecuali kewajiban untuk menyediakan biaya seperti disebutkan dalam Pasal 5 ayat (2), Pasal 6 ayat (6) dan dalam Pasal 7 ayat (5), memenuhi kewajiban perpajakan dan pungutan lainnya kepada Pemerintah seperti ditentukan dalam Pasal 12 dan 13 serta kewajiban mengikuti standar pertambangan yang disebutkan dalam Pasal 10, dan peraturan Lingkungan Hidup, Keselamatan dan Kesehatan Kerja seperti disebutkan pada Pasal 26.

2. Ketentuan Pasal 2 Ayat (3) Persetujuan dihapus secara keseluruhan dan diganti dengan ketentuan sebagai berikut:

Ayat 3

Pemerintah memberikan hak kendali dan manajemen tunggal kepada Perusahaan dalam melaksanakan Pengusahaan Pertambangan berdasarkan Persetujuan ini, dan oleh karena itu Perusahaan akan mempunyai tanggung jawab penuh serta menanggung risiko atasnya, sesuai dengan ketentuan dan persyaratan dalam Persetujuan ini. Tanpa mengurangi tanggung jawab dan kewajiban berdasarkan Persetujuan ini, Perusahaan dapat mempekerjakan usaha jasa inti yang mempunyai izin dan non inti yang terdaftar, baik yang berafiliasi atau tidak dengan perusahaan untuk melakukan pekerjaan yang berhubungan dengan kegiatan operasi perusahaan berdasarkan Persetujuan ini, yang dilaksanakan sesuai peraturan perundang-undangan di bidang usaha Jasa Pertambangan.

Article 2 Appointment and Corporate Responsibility

1. The provisions of Article 2 Paragraph (1) shall be deleted in its entirety and replaced with the following provisions:

Paragraph 1

The Company is hereby designated as the sole contractor of the Government concerning the Contract of Work area. Specifically, the company will be given the sole right to perform Exploration of Minerals in the Contract of Work area, mine any mineral deposits are found in the Mining Area, treating, purifying, storing, and transporting in any way all minerals produced, market, sell or dispos of all production from the mine inside and outside Indonesia after the Processing and Refining in the country, as well as perform all operations as well as other activities that may be necessary or will be implemented with ease with careful regards to the terms of this Agreement. In consideration for providing these rights, the Company must carry out the work and meet the obligations specified in this Agreement, including without limitation any obligation to provide costs as mentioned in Article 5, Paragraph (2), Article 6 Paragraph (6) and in Article 7 Paragraph (5), fulfill tax obligations and other levies to the Government as defined in Articles 12 and 13 as well as the obligation to follow the mining standards mentioned in Article 10, and the regulations of Environment, Health and Safety as mentioned in Article 26.

2. The provisions of Article 2 Paragraph (3) shall be deleted in its entirety and replaced with the following provisions:

Paragraph 3

The Government grants sole control and management to the company in conducting Mining Business under this Agreement, and therefore the Company will have full responsibility and bear the risk of it, in accordance with the terms and conditions of this Agreement. Without prejudice to the responsibilities and obligations under this Agreement, the Company may employ licensed business core services and registered non-core services, whether affiliated or not with the company to perform work related to the company's operations under this Agreement, implemented in accordance to laws in the Mining Services business.

Pasal 3 Modus Operandi

1. Ketentuan Pasal 3 Ayat (3) Persetujuan dihapus secara keseluruhan dan diganti dengan ketentuan sebagai berikut:

Ayat 3

Dalam melaksanakan Operasi dan kegiatannya, Perusahaan dapat menggunakan/memanfaaatkan usaha Jasa Pertambangan sesuai dengan peraturan perundang-undangan.

2. Ketentuan Pasal 3 Ayat (4) Persetujuan dihapus secara keseluruhan dan diganti dengan ketentuan sebagai berikut:

Ayat 4

Selama berlakunya Persetujuan ini, Perusahaan akan melaksanakan tanpa penghentian sementara semua kegiatan usaha pertambangan dengan cara yang sesuai dengan Pasal 2 Persetujuan ini, kecuali yang dikarenakan hal-hal yang diatur oleh Pasal 19 dan Pasal 22, dengan ketentuan bahwa kegiatan mungkin terhenti sementara atau tertunda dengan persetujuan Menteri.

3. Ketentuan berikut ini ditambahkan sebagai "Pasal 3 Ayat (5) yang baru dari Persetujuan:

Ayat 5

Penghentian sementara sebagaimana dimaksud pada Ayat (4) dilakukan sesuai dengan Pasal 19 Persetujuan.

Article 3 Modus Operandi

1. The provisions of Article 3 Paragraph (3) shall be deleted in its entirety and replaced with the following provisions:

Paragraph 3

In carrying out the operations and activities, companies can use / memanfaaatkan mining service business in accordance with the provisions of the legislation.

2. The provisions of Article 3 Paragraph (4) shall be deleted in its entirety and replaced with the following provisions:

Paragraph 4

During the Agreement, the Company will carry out without a temporary suspension of all mining activities in a manner consistent with Article 2 of this Agreement, except those due to matters governed by Article 19 and Article 22, provided that the activities may be suspended or delayed by approval of the Minister.

3. The following rules are added as the updated "Article 3 Paragraph (5) of the Agreement:

Paragraph 5

Temporary suspension as referred to in Paragraph (4) carried out in accordance with Article 19 of the Agreement.

Pasal 4 Wilayah Kontrak Karya

1. Ketentuan Pasal 4 Ayat (1) Persetujuan dihapus secara keseluruhan dan diganti dengan ketentuan sebagai berikut:

Ayat 1

Wilayah Kontrak Karya adalah suatu wilayah yang ditetapkan sesuai ketentuan Pasal 171 ayat (1) Undang-Undang Nomor 4 Tahun 2009 tentang Pertambangan Mineral dan Batubara seluas 16.470 Ha (enam belas ribu empat ratus tujuh puluh hektar) sebagaimana tercantum dalam Lampiran "A" Persetujuan ini, yang dapat diubah melalui pengurangan-pengurangan sesuai dengan Persetujuan ini, tidak termasuk di dalamnya:

i) Izin Usaha Pertambangan (IUP);

ii) Izin Pertambangan Rakyat (IPR);

yang telah ditetapkan Pemerintah sebelum tanggal persetujuan prinsip dan sebagaimana dinyatakan dalam Lampiran "A" yang merupakan bagian tak terpisahkan dari persetujuan ini.

2. Pasal 4 Ayat (2) Persetujuan dihapus secara keseluruhan.

3. Ketentuan Pasal 4 Ayat (3) Persetujuan dihapus secara keseluruhan dan diganti dengan ketentuan sebagai berikut:

Ayat 3

Dengan permohonan tertulis kepada Menteri, Perusahaan dapat melepaskan semua atau setiap bagian dari Wilayah Kontrak Karya dari waktu ke waktu selama jangka waktu Persetujuan ini. Permohonan tersebut harus disampaikan beserta laporan pelepasan yang berisikan semua penemuan teknis dan geologis yang diperoleh Perusahaan di wilayah yang akan dilepaskan dan alasan pelepasan, serta data lapangan dari kegiatan yang dilakukan di wilayah tersebut. Semua data dasar dari wilayah yang dilepaskan harus diserahkan kepada Menteri dan menjadi milik Pemerintah.

Article 4 Contract of Work Area

1. The provisions of Article 4 Paragraph (1) shall be deleted in its entirety and replaced with the following provisions:

Paragraph 1

Contract of Work Area is an area that is defined in accordance with Article 171 Paragraph (1) of Law No. 4 of 2009 on Mineral and Coal with an area of 16,470 Ha (sixteen thousand four hundred seventy hectares) as contained in Appendix "A" of this Agreement, which can be changed through reductions in accordance with this Agreement, which does not include:

i) the Mining Business License (*Izin Usaha Pertambangan* - IUP);

ii) People's Mining Permit (*Izin Pertambangan Rakyat* - IPR);

that The government established prior to the date of approval in principle and as set out in Appendix "A" which is an integral part of this agreement.

2. Article 4 Paragraph (2) shall be deleted in its entirety.

3. The provisions of Article 4 Paragraph (3) shall be deleted in its entirety and replaced with the following provisions:

Paragraph 3

With a written application to the Minister, the Company may release all or any part of the Contract of Work Area from time to time during the term of this Agreement. The application shall be submitted along with the release of a report containing all the technical and geological discoveries obtained by the Company in the region that will be released and the reason for the release, as well as the data field of the activities carried out in the region. All basic data from the region that is released should be submitted to the Minister and owned by the Government.

Pasal 10 Periode Operasi

1. Ketentuan Pasal 10 Ayat (3) Persetujuan dihapus secara keseluruhan dan diganti dengan ketentuan sebagai berikut:

Ayat 3

Perusahaan harus mengolah bijih dan melakukan pemurnian untuk menghasilkan suatu produk yang dapat dipasarkan. Perusahaan akan bekerja dengan dan membantu Pemerintah dalam mewujudkan kebijaksanaan pembangunan fasilitas pemurnian logam di Indonesia yang berhubungan dengan peleburan dan pemurnian.

2. Ketentuan Pasal 10 Ayat (7) Persetujuan dihapus secara keseluruhan dan diganti dengan ketentuan sebagai berikut:

Ayat 7

Perusahaan harus menyerahkan kepada Pemerintah laporan Eksploitasi sebagai berikut :

(i) laporan produksi dan penjualan bulanan, mulai sejak bulan pertama Periode Operasi yang menyatakan banyaknya mineral yang ditambang, diolah, dimuat, diekspor dan ditumpuk.

(ii) laporan triwulanan yang dimulai sejak triwulan pertama Periode Operasi, mengenai kemajuan operasi pada Wilayah Kontrak Karya. Laporan ini akan menjelaskan selengkapnya :

(a) wilayah-wilayah pertambangan dimana endapan mineral, baik yang komersial atau tidak, dianggap telah ditemukan, (dengan semua yang berhubungan dengan perkiraan cadangan, jenis analisanya), jumlah dan uraian operasi penambangan yang telah berproduksi secara komersial dan hasil produksi tersebut, jumlah tenaga kerja pada tiap operasi penambangan dan status pekerjaan yang sedang berlangsung pada akhir triwulan berjalan serta pekerjaan yang akan dilakukan pada triwulan berikutnya.

(b) Pekerjaan yang diselesaikan selama triwulan berjalan sehubungan dengan instalasi dan fasilitas yang secara langsung atau tidak langsung berhubungan dengan Periode Operasi, bersama-sama dengan pekerjaan yang direncanakan dalam triwulan berikutnya yang berhubungan dengan instalasi dan fasilitas-fasilitas yang sama serta menunjukkan baik perkiraan investasi maupun realisasi investasi untuk instalasi dan fasilitas-fasilitas yang dibuat, yang telah dijanjikan atau akan dijanjikan sehubungan dengan instalasi dan fasilitas-fasilitas tersebut.

(iii) Laporan tahunan yang dimulai sejak tahun pertama setelah masuknya Periode Operasi yang harus mencakup :

(a) Jumlah dan uraian pekerjaan yang sedang dilaksanakan pada akhir tahun yang mendahului tahun berjalan (dengan petunjuk yang jelas terhadap penambangan yang telah mencapai produksi komersial); jumlah dan uraian pekerjaan yang ditinggalkan selama tahun tersebut, produksi tiap penambangan tanpa mempertimbangkan komersial atau tidak, dengan uraian yang jelas atas jenis dan mutu serta analisis mineral yang dihasilkan dari setiap penambangan, jumlah penambangan dimana kegiatan terus

Article 10 Operation Period

1. The provisions of Article 10 Paragraph (3) shall be deleted in its entirety and replaced with the following provisions:

Paragraph 3

The Company must process ore and perform purification to produce a product that can be marketed. The company will work with and assist the Government in realizing the construction of metal purification facilities in Indonesia related to smelting and refining.

2. The provisions of Article 10 Paragraph (7) shall be deleted in its entirety and replaced with the following provisions:

Paragraph 7

Companies must submit to the Government an Exploitation report as follows:

(i) the monthly production and sales reports, starting from the first month of Operation Period stating the amount of minerals mined, processed, loaded, exported and stacked.

(ii) quarterly reports starting from the first quarter period of operation, the operation progress in the Contract of Work Area. This report will explain in detail:

(a) areas of mining where mineral deposits, whether commercial or not, is considered to have been found, (with all that relates to estimated reserves, types of analysis), the number and description of mining operations of commercial production and production, the number workforce at each mining operation and the status of ongoing work at the end of the quarter as well as the work to be done in the next quarter.

(b) The work completed during the quarter with respect to installations and facilities that are directly or indirectly related to the period of operation, together with the planned work in the next quarter related to installations and facilities and shows a good estimate of the investment and realized investment for installations and facilities which are made, that has been promised or will be promised in connection with the installation and the facilities.

(iii) an annual report that started the first year after the entry period of operation which should include:

(a) The number and description of work being carried out at the end of the year preceding the current year (with a clear indication of the mining that has achieved commercial production); number and description of the work that was abandoned during the year, the production of each mining without considering commercial or not, with a clear description of the type and quality as well as analysis of minerals produced from each mining, the number of mining where the activity

berlangsung sampai akhir tahun, yang tidak mencapai tahap produksi komersial;

(b) Jumlah total volume mineral, jenis demi jenis, dibagi menjadi jumlah yang ditambang, jumlah yang diangkut dari tambang ke tempat tujuannya, jumlah yang ditumpuk di penambangan atau dimanapun di Indonesia, jumlah yang dijual atau diekspor (apakah dikapalkan dari Indonesia atau tidak), jumlah yang dikapalkan sebenarnya dari Indonesia (dengan rincian penuh tentang pembeli, tujuan dan syarat penjualan), dan jumlah yang dimurnikan, diolah dan/atau dipabrikasi di Indonesia (dengan laporan lengkap mengenai hasilnya) dengan spesifikasi lengkap; dan

(c) Pekerjaan yang diselesaikan dan pekerjaan yang berlangsung pada akhir tahun berjalan sehubungan dengan semua instalasi dan fasilitas-fasilitas yang berkaitan dengan Periode Operasi, beserta uraian lengkap seluruh pekerjaan direncanakan untuk tahun berikutnya sehubungan dengan instalasi dan fasilitas tersebut, termasuk sebuah laporan rinci atas seluruh investasi yang direalisasikan ataupun yang dijanjikan selama tahun berjalan dan seluruh investasi yang dijanjikan untuk tahun berikutnya atau tahun selanjutnya.

(iv) Perusahaan harus juga menyerahkan kepada Pemerintah semua keterangan lain yang berhubungan dengan kegiatan-kegiatan Perusahaan berdasarkan Persetujuan ini, yang telah atau dengan menggunakan usaha yang wajar akan dapat berada dalam pengendalian Perusahaan, yang mungkin diminta oleh Pemerintah agar dapat menilai sepenuhnya kegiatan-kegiatan Perusahaan

(v) laporan bulanan, mulai sejak bulan pertama Periode Operasi yang akan menyatakan jumlah dan uraian tempat-tempat kerja dimana pekerjaan telah dimulai selama bulan sebelumnya, jumlah tenaga kerja pada akhir bulan tersebut dan uraian singkat kemajuan kerja pada akhir bulan tersebut dan pekerjaan yang direncanakan pada bulan berikutnya.

Laporan-laporan bulanan dan triwulan harus diserahkan dalam rangkap 8 (delapan) kepada Menteri paling lama 30 (tiga puluh) hari sejak akhir:

(i) Bulan, untuk laporan bulanan; atau

(ii) Triwulan, untuk laporan triwulanan.

Laporan tahunan akan diserahkan dalam rangkap 8 (delapan) kepada Menteri paling lama 60 (enam puluh) hari dari akhir tahun yang bersangkutan.

4. Ketentuan berikut ini ditambahkan sebagai "Pasal 10 Ayat (10) dan Ayat (11)" yang baru dari Persetujuan:

Ayat (10) ditambahkan Ayat baru

Perusahaan pada Periode Operasi wajib melakukan pemurnian hasil penambangan di dalam negeri sesuai dengan peraturan perundang-undangan.

Ayat (11) ditambahkan Ayat baru

Pemurnian sebagaimana dimaksud pada Pasal 10 ayat (10) dapat dilakukan sendiri oleh Perusahaan atau dapat dilakukan kerjasama dengan badan usaha yang melakukan kegiatan pengolahan dan pemurnian di dalam negeri.

continued until the end of the year, which did not reach the stage commercial production;

(b) Number of total volume of mineral, type-by-type, divided into the amount mined, the amount of which is transported from the mine to its destination, the amount of which is stacked in the mines or elsewhere in Indonesia, the amount sold or exported (whether shipped from Indonesia or not) , the actual amount shipped from Indonesia (with full details on the buyer, purpose and terms of sale), and the amount of refined, processed and/or manufactured in Indonesia (with a full report on the results) with complete specifications; and

(c) The completed and on going work at the end of the current year in connection with all installations and facilities relating to the period of operation, along with a complete description of the entire work is planned for next year in connection with instalation and the facility, including a detailed report over the entire investments that are realized or promised for the current year and the entire investment promised for next year or the following year.

(iv) The company must also submit to the Government all other information relating to the activities of the Company under this Agreement, which have been or using reasonable effort will be under the control of the Company, which may be requested by the Government in order to fully assess the activities of the Company.

(v) monthly reports, starting from the first month of the Operations Period that will state the amount and description of workplaces where work has begun during the previous month, the number of workers at the end of the month, and a brief description of the progress of work at the end of the month and the planned work the following month.

Monthly and quarterly reports must be submitted in 8 (eight) copies to the Minister no later than 30 (thirty) days from the end of:

(i) the month, for the monthly report; or

(ii) each quarter, for the Quarterly report.

The annual report will be submitted in 8 (eight) copies to the Minister no later than 60 (sixty) days from the end of the year.

4. The following provisions are added as "Article 10 Paragraph (10) and Paragraph (11)" The new Agreement:

Paragraph (10) new Paragraph added

During the Operation Period, The Company is required to conduct purification mined in the country in accordance with the legislation.

Paragraph (11) new Paragraph added

Purification referred to in Article 10 Paragraph (10) may be conducted by the Company or may be done in cooperation with business entities that perform purification and processing activities in the country.

Pasal 11 Pemasaran

Ketentuan Pasal 11 Ayat (1) Persetujuan dihapus secara keseluruhan dan diganti dengan ketentuan sebagai berikut:

Ayat 1

Pemerintah memberi hak kepada Perusahaan untuk mengekspor hasil produksinya yang diperoleh dari operasi berdasarkan Persetujuan ini, yang pelaksanaannya mengikuti ketentuan peraturan perundang-undangan. Perusahaan harus memprioritaskan pemenuhan kebutuhan pasar dalam negeri dari hasil produksinya, sejalan dengan ketentuan kontrak penjualan ekspor Perusahaan yang telah disepakati untuk hasil produksinya.

Article 11 Marketing

The provisions of Article 11 Paragraph (1) shall be deleted in its entirety and replaced with the following provisions:

Paragraph 1

The government gives the right to the Company to export its products obtained from operations under this Agreement, whose implementation follows the provisions of the legislation. The Company must prioritize meeting the needs of the domestic market of products, in line with the provisions of the Company's export sales contracts that have been agreed for their products.

Pasal 12 Fasilitas Impor dan Re-ekspor

1. Pasal 12 Persetujuan diberi nomor urut baru menjadi "Pasal 12 Ayat (1.a)", "Pasal 12 Ayat (1.b)", "Pasal 12 Ayat (1.c)" dan "Pasal 12 Ayat (1.d)" yang baru ditambahkan sebagai berikut:

Ayat 1.a

Atas importasi barang-barang modal, peralatan (termasuk dan tidak terbatas pada peralatan laboratorium dan komputer yang digunakan di luar lapangan operasi), mesin-mesin, kendaraan-kendaraan, pesawat udara, alat angkutan air, alat angkutan lainnya, perbekalan, bahan baku, dan bahan kimia, dapat diberikan pembebasan atau keringanan Bea Masuk, dibebaskan/tidak dipungut Pajak Pertambahan Nilai (PPN) dan atau Pajak Penghasilan (PPh) Pasal 22, sepanjang memenuhi ketentuan peraturan perundang-undangan.

Barang-barang impor yang diberikan pembebasan atau keringanan Bea Masuk, dibebaskan/tidak dipungut Pajak Pertambahan Nilai (PPN) dan atau Pajak Penghasilan (PPh) Pasal 22, tersebut harus berhubungan langsung untuk kegiatan pada Periode Penyelidikan Umum, Eksplorasi, Studi Kelayakan, Konstruksi, Operasi Produksi serta kegiatan teknis pendukung pengusahaan.

Ayat 1.b

Pemberian fasilitas sebagaimana mana dimaksud pada Ayat (1.a) tidak termasuk atas impor suku cadang dan kendaraan pengangkut penumpang.

Ayat 1.c

Fasilitas sebagaimana dimaksud pada Ayat (1.a) diberlakukan selama jangka waktu terhitung sejak tanggal pertama kali ditandatanganinya Persetujuan yang diamandemen beberapa kali terakhir dengan Persetujuan ini sampai dengan dan termasuk tahun kesepuluh dari Periode Operasi atau Operasi Produksi. Dalam hal Perusahaan mengoperasikan lebih dari satu Wilayah Pertambangan, tahun kesepuluh Periode Operasi atau Operasi Produksi ini harus dihitung dari tanggal dimulainya operasi pada Wilayah Pertambangan yang pertama.

Ayat 1.d

Pengecualian pemberian fasilitas atas impor berupa suku cadang dan kendaraan pengangkut penumpang sebagaimana dimaksud pada Ayat (1.b) diberlakukan sampai dengan tanggal 31 Desember 2015

2. Ketentuan Pasal 12 Ayat (2) Persetujuan dihapus secara keseluruhan dan diganti dengan ketentuan sebagai berikut:

Ayat 2

Pembebasan atau keringanan atas bea masuk sebagaimana dimaksud pada Ayat (1) hanya akan berlaku sepanjang:

a. barang-barang yang diimpor itu tidak dihasilkan atau diproduksi di Indonesia; atau
b. barang-barang lokal tidak dapat diperoleh atas dasar waktu, biaya dan mutu yang bersaing, dengan ketentuan bahwa untuk tujuan membandingkan biaya impor dan biaya barang yang diproduksi dan dihasilkan di Indonesia (tidak

Article 12 Import and Re-export Facilities

1. Article 12 shall be given a new serial number "Article 12 Paragraph (1a)", "Article 8 Paragraph (1.b)", "Article 8 Paragraph (1.c)" and "Article 8 Paragraph (1.d) "are newly added as follows:

Paragraph 1.a

Upon import of capital goods, equipment (including but not limited to laboratory equipment and computers used outside the operating field), machinery, vehicles, aircraft, means of water transport, other transportation equipment, supplies, raw materials, and chemicals, may be granted exemption or relief from import duty, exempt/free of Value Added Tax (VAT) or Income Tax (VAT) of Article 22, that they meet the provisions of the legislation.

Imported goods that are granted exemption or relief from import duty, exempt/free of Value Added Tax (VAT) or Income Tax (VAT) of Article 22, must relate directly to the activities in the General Survey, Exploration, Feasibility Studies, Construction, Production Operations Period as well as technical activities supporting business.

Paragraph 1.b

The provision of facilities as referred to in Paragraph 1.a does not include the import of spare parts and passenger vehicles.

Paragraph 1.c

Facilities referred to in Paragraph 1.a imposed during a period commencing from the date of the first time the Agreement was amended several times by this Agreement up to and including the tenth year of the period of operation or production operation. In the event that the Company operates more than one mining area, the ten-year period of operation or production operation is to be calculated from the date of commencement of operations at the first mining area.

Paragraph 1.d

Exceptions on the provision of facilities for the import of spare parts and passenger vehicles as referred to in Paragraph 1.b is enforced until 31 December 2015

2. The provisions of Article 12 Paragraph (2) shall be deleted in its entirety and replaced with the following provisions:

Paragraph 2

Exemption or remission of import duty as referred to in Paragraph (1) shall be applied provided that:

a. the imported goods are not produced or manufactured in Indonesia; or
b. local goods can not be obtained on the basis of time, cost and quality that is competitive, provided that for the purpose of comparing the cost of imports and the cost of goods manufactured and produced in Indonesia

termasuk PPN), suatu premi tidak lebih besar dari 12,5% (dua belas koma lima persen) akan ditambahkan pada biaya pengimporan.

3. Ketentuan Pasal 12 Ayat (3) Persetujuan dihapus secara keseluruhan dan diganti dengan ketentuan sebagai berikut:

Ayat 3

Setiap peralatan (yang harus dinyatakan dengan jelas) dan barang yang tidak terpakai habis atau belum habis usia pakainya yang diimpor oleh Perusahaan atau oleh subkontraktor-subkontraktornya yang terdaftar dengan tujuan semata-mata untuk memberikan jasa-jasa kepada Perusahaan, dan dimaksudkan untuk diekspor kembali, akan diberikan pembebasan atau keringanan Bea Masuk, dibebaskan/tidak dipungut PPN dan atau PPh Pasal 22 dan pungutan-pungutan lainnya sesuai dengan ketentuan peraturan perundang-undangan.

Apabila peralatan dan bahan-bahan tersebut ternyata tidak diekspor kembali dalam waktu yang telah ditentukan ketika barang-barang tersebut diimpor termasuk setiap perpanjangannya, maka subkontraktor-subkontraktornya yang terdaftar wajib membayar Bea Masuk, PPN, PPh Pasal 22, beserta sanksi administrasi, dan pungutan lain yang tidak dibayar pada waktu pemasukannya ke Indonesia, kecuali periode atau perpanjangannya telah diperpanjang lagi atau peralatan dimaksud dan barang-barang tidak terpakai dibebaskan karena alasan-alasan yang dapat diterima Pemerintah, Perusahaan harus bertanggung-jawab atas kebenaran pelaksanaan kewajiban-kewajiban subkontraktor-subkontraktor menurut Pasal ini.

4. Ketentuan Pasal 12 Ayat (4) Persetujuan dihapus secara keseluruhan dan diganti dengan ketentuan sebagai berikut

Ayat 4

Terhadap barang yang diimpor oleh Perusahaan atau oleh subkontraktor-subkontraktornya yang terdaftar sesuai dengan Pasal ini telah selesai digunakan dan/atau tidak diperlukan lagi untuk kegiatan-kegiatan eksplorasi dan operasi produksi, Perusahaan dapat memindahtangankan barang impor tersebut kepada pihak lain di dalam negeri dengan membayar Bea Masuk dan Pajak Dalam Rangka Impor sesuai dengan peraturan perundang-undangan. Pemindahtanganan barang impor kepada pihak lain di luar negeri atau diekspor kembali dapat dibebaskan dari kewajiban membayar Bea Masuk dan Pajak Dalam Rangka Impor sesuai dengan ketentuan peraturan perundang-undangan.

5. Ketentuan Pasal 12 Ayat (7) Persetujuan dihapus secara keseluruhan dan diganti dengan ketentuan sebagai berikut:

Ayat 7

Dengan tidak mengurangi ketentuan-ketentuan sebagaimana dimaksud pada Ayat (1), Ayat (2), dan Ayat (3) dalam Pasal ini, Perusahaan akan sungguh-sungguh mematuhi ketentuan larangan dan pembatasan impor serta ketentuan umum di bidang impor.

(excluding VAT), a premium not greater than 12.5% (twelve point five percent) will be added to the cost of importing.

3. The provisions of Article 12 Paragraph (3) shall be deleted in its entirety and replaced with the following provisions:

Paragraph 3

Each piece of equipment (which should be clearly stated) and goods that are unused depleted or has not exhausted its shelf life that is imported by the Company or by subcontractors registered with the sole purpose to provide services to the Company, and are intended for re-export, will be granted exemption or relief from import duty, exempt/free of VAT or Income Tax Article 22 and other levies in accordance with the provisions of the legislation.

If the equipment and materials was not re-exported within a predetermined time when the goods are imported, including any extension, then the subcontractors listed shall pay import duty, VAT, Income Tax Article 22, as well as administrative sanctions, and other levies that were not paid at the time of import into Indonesia, except for the period or its extension has been extended again or equipment in question and unused goods were released for reasons acceptable to The Government, the Company shall be responsible for the correctness of the implementation of the obligations of the subcontractors according to this article.

4. The provisions of Article 12 Paragraph (4) shall be deleted in its entirety and replaced with the following provisions:

Paragraph 4

The goods imported by the Company or by subcontractors registered in accordance with this Article that has completed its use and/or no longer needed for exploration and production operations, the Company may transfer the imported goods to the other parties in the country by paying Duties and Import Taxes in accordance with legislations. Transfer of imported goods to other parties outside the country or re-exported may be exempt from the obligation to pay Duties and Import Taxes in accordance with the provisions of the legislation.

5. The provisions of Article 12 Paragraph (7) shall be deleted in its entirety and replaced with the following provisions:

Paragraph 7

Without prejudice to the provisions referred to in Paragraph 1, Paragraph 2, and Paragraph 3 of this Article, the Company will sincerely comply with the prohibitions and restrictions on imports as well as the general provisions in the import sector.

4. Ketentuan berikut ini ditambahkan sebagai "Pasal 12 Ayat (9) yang baru dari Persetujuan:

Ayat 9

Pembebasan dan/atau keringanan Bea Masuk, Bea Keluar, dan Cukai atas impor atau ekspor kembali barang pribadi (termasuk peralatan dan barang-barang rumah tangga dan kebutuhan sehari-hari) milik Tenaga Kerja Asing dapat diberikan sesuai dengan ketentuan peraturan perundang-undangan di bidang Kepabeanan dan Cukai serta perubahan, tambahan, dan/atau penggantinya.

4. The following provisio is added as the updated "Article 12 Paragraph (9) in the Agreement:

Paragraph 9

Exemption and/or reduction of import duty, export duty and excise on imports or exports on personal items (including equipment and items of household and daily necessities) of Foreign Workers may be granted in accordance with the provisions and the changes, additions, and/or replacement of the legislation in the Customs and Excise field.

Pasal 13 Pajak-Pajak dan Lain-Lain Kewajiban Keuangan Perusahaan

1. Paragraf pembukaan dari Pasal 13 dari Persetujuan dihapus secara keseluruhan dan diganti dengan ketentuan sebagai berikut:

   Perusahaan wajib memenuhi kewajiban perpajakan, penerimaan negara bukan pajak, pajak daerah dan retribusi daerah, bea-bea, serta pungutan atau iuran lainnya, sebagai berikut:

2. Ketentuan Pasal 13 Ayat (1) dari Persetujuan dihapus secara keseluruhan termasuk Lampiran D Persetujuan ini dan diganti dengan ketentuan sebagai berikut:

Ayat 1

Iuran tetap untuk Wilayah Kontrak Karya

Perusahaan wajib membayar sejumlah uang untuk tiap tahun pada bulan Januari sebagai iuran tetap yang akan dihitung menurut jumlah hektar yang termasuk masing-masing Wilayah Kontrak Karya, yang besaran/tarif dan tata cara pembayarannya sesuai dengan ketentuan peraturan perundang-undangan di bidang Penerimaan Negara Bukan Pajak beserta perubahan, tambahan, dan/atau penggantinya.

3. Ketentuan Pasal 13 Ayat (2) dari Persetujuan dihapus secara keseluruhan termasuk Lampiran F dan Lampiran G Persetujuan ini dan diganti dengan ketentuan sebagai berikut:

Ayat 2

Iuran produksi (royalti) untuk Mineral yang diproduksi Perusahaan.

(i) Perusahaan wajib membayar iuran produksi untuk mineral yang diproduksi Perusahaan dari Wilayah Pertambangan, yang besaran/tarif atas jenis dan tata cara perhitungan dan pembayarannya berdasarkan peraturan perundang-undangan di bidang Penerimaan Negara Bukan Pajak, serta perubahan, tambahan dan/atau penggantinya.

(ii) Iuran produksi harus dibayar sesuai tarif dalam peraturan perundang-undangan untuk setiap bahan galian mineral bukan logam dan batuan yang ditambang secara terpisah dari Wilayah Kontrak Karya untuk Pengusahaan, kecuali untuk mineral industri (mineral bukan logam dan batuan) yang digunakan untuk pengembangan wilayah.

(iii) Apabila di kemudian hari diterbitkan peraturan perundang-undangan yang mengatur mengenai besaran/tarif atas jenis dan tata cara perhitungan dan pembayaran setiap bahan galian mineral bukan logam dan batuan yang ditambang secara terpisah dari Wilayah Kontrak Karya untuk Pengusahaan sebagaimana dimaksud pada butir (ii), maka ketentuan mengenai besaran/tarif atas jenis dan tata cara perhitungan dan pembayaran yang berlaku adalah sebagaimana diatur dalam ketentuan peraturan perundang-undangan di bidang Penerimaan Negara Bukan Pajak, serta perubahan, tambahan dan/atau penggantinya.

Article 13 Taxes and Other Financial Liabilities of The Company

1. The opening Paragraph of Article 13 of the Agreement shall be deleted in its entirety and replaced with the following provisions:

   The Company shall fulfill tax obligations, non-tax revenue, local taxes and levies, duties, and fees or other fees, as follows:

2. The provisions of Article 13 Paragraph (1) shall be deleted in its entirety and replaced with the following provisions:

Paragraph 1

Fixed fees for the Contract of Work Area

The Company shall pay a sum of money for each year in January as fixed fees which will be calculated according to the number of hectares that includes each Agreement Area or mining region, with the amount/rate and manner of payment in accordance with the provisions of the legislation in the field of State Revenues along with the tax changes, additions, and/or replacement.

3. The provisions of Article 13 Paragraph (2) of the Agreement shall be deleted in its entirety and replaced with the following provisions:

Paragraph 2

Production fees (royalties) for the minerals produced by the Company.

(i) The Company is obligated to pay production fees for minerals produced by the Company from the mining area, which the amount/rate of the type and manner of calculation and payment is based on legislation in the field of Non-Tax Revenues, as well as changes, additions and/or replacement.

(ii) Production Fess should be paid according to rates in the legislation for each non-metallic minerals and rocks mined separately from the Contract of Work area for the Business, except for the mineral industry (non-metallic minerals and rocks) which are used for regional development.

(iii) If at a later published legislation which regulates the amount/rate of the type and manner of calculation and payment of any non-metallic minerals and rocks that are mined separately from the Contract of Work area for the Exploitation referred to in item (ii) , the provisions on the amount/rate of the type and manner of calculation and payment of the applicable is as set out in the provisions of the legislation in the field of Non-Tax Revenues, as well as changes, additions and/or replacement.

4. Ketentuan Pasal 13 Ayat (3) dari Persetujuan dihapus secara keseluruhan termasuk Lampiran H Persetujuan ini dan diganti dengan ketentuan sebagai berikut:

Ayat 3

Pajak Penghasilan atas penghasilan yang diterima atau diperoleh Perusahaan:

(i) Perusahaan wajib membayar Pajak Penghasilan atas penghasilan, yaitu setiap tambahan kemampuan ekonomis yang diterima atau diperoleh Perusahaan, baik yang berasal dari Indonesia maupun dari luar Indonesia, yang dapat dipakai untuk konsumsi atau untuk menambah kekayaan Perusahaan yang bersangkutan, dengan nama dan dalam bentuk apa pun, dengan tarif pajak yang akan dikenakan selama jangka waktu Persetujuan ini adalah sebagai berikut:

a) 10% (sepuluh persen) untuk penghasilan kena pajak sampai dengan Rp. 25.000.000,00 (dua puluh lima juta rupiah);

b) 15% (lima belas persen) untuk penghasilan kena pajak lebih dari Rp. 25.000.000,00 (dua puluh lima juta rupiah) sampai dengan Rp. 50.000.000,00 (lima puluh juta rupiah);

c) 30% (tiga puluh persen) untuk penghasilan kena pajak lebih dari Rp. 50.000.000,00 (lima puluh juta rupiah).

(ii) Untuk menghitung penghasilan kena pajak sebagaimana dimaksud pada butir (i) berlaku tata cara penghitungan Pajak Penghasilan sesuai dengan ketentuan peraturan perundang-undangan di bidang Pajak Penghasilan, beserta perubahan, tambahan, dan/atau penggantinya.

(iii) Penghitungan penghasilan kena pajak sebagaimana dimaksud pada butir (ii) juga memperhitungkan biaya bunga yang dibayarkan atau timbul dalam suatu tahun atas modal yang dipinjam, termasuk bunga atas pinjaman kepada pemegang saham sepanjang modal dasar Perusahaan telah disetor penuh, dengan ketentuan bahwa perbandingan modal yang dipinjam Perusahaan dengan modal sendiri yang telah disetor tidak akan melebihi suatu tingkat perbandingan 5:1 bagi yang jumlah investasinya tidak lebih dari US$ 200.000.000,- (dua ratus juta dollar AS) dan 8:1 bagi yang jumlah investasinya lebih dari US$ 200.000.000,- (dua ratus juta dollar AS) dan bunga atas pinjaman tidak lebih tinggi dari tingkat bunga yang berlaku umum di pasar pada saat peminjaman.

(iv) Apabila di kemudian hari diterbitkan peraturan perundang-undangan yang mengatur mengenai perbandingan modal dan utang untuk keperluan penghitungan pajak sebagaimana dimaksud pada butir (iii), maka ketentuan mengenai perbandingan modal dan utang yang berlaku adalah sebagaimana diatur dalam ketentuan peraturan perundang-undangan.

(v) Perusahaan wajib membayar angsuran Pajak Penghasilan dalam tahun pajak berjalan sesuai dengan ketentuan peraturan perundang-undangan di bidang Pajak Penghasilan, serta perubahan, tambahan, dan/atau penggantinya.

(vi) Atas penghasilan Perusahaan yang telah dipotong dan/atau dipungut Pajak Penghasilan yang bersifat final, dikenakan tarif pajak tersendiri sesuai dengan ketentuan peraturan perundang-undangan di bidang Pajak Penghasilan, serta perubahan, tambahan, dan/atau penggantinya.

(vii) Ketentuan peralihan:

4. The provisions of Article 13 Paragraph (3) of the Agreement shall be deleted in its entirety and replaced with the following provisions:

Paragraph 3

Income tax on income derived by the Company:

(i) The Company is obligated to pay income tax on income, i.e. any additional economic capability received or acquired by the Company, both from Indonesia and outside Indonesia, which can be used for consumption or to increase the wealth of the company concerned, the name and form whatever, with the tax rate that will be charged during the term of this Agreement are as follows:

a) 10% (ten percent) for taxable income up to Rp 25,000,000.00 (twenty five million rupiah);

b) 15% (fifteen percent) for taxable income of more than Rp 25,000,000.00 (twenty five million rupiah) up to Rp 50,000,000.00 (fifty million rupiah);

c) 30% (thirty percent) of taxable income of more than US $ 50,000,000.00 (fifty million rupiah).

(ii) To calculate the taxable income referred to in item (i) applies the valid method of calculating the income tax in accordance with the provisions of the legislation in the field of income tax, together with changes, additions, and/or replacement.

(iii) The calculation of taxable income referred to in item (ii) also takes into account the interest costs paid or incurred in a year on capital borrowed, including interest on the loan to the shareholders of all the Company's authorized capital that has been fully paid, provided that the ratio of capital borrowed by the Company's own capital already paid will not exceed a level ratio of 5:1 for the amount of the investment not more than US $ 200.000.000, - (two hundred million US dollars) and 8:1 for the amount of investment more than US $ 200.000.000, - (two hundred million US dollars) and interest on the loan is not higher than the prevailing interest rate prevalent in the market at the time of borrowing.

(iv) If at a later time there is published legislation regulating the ratio of capital and debt for tax purposes as referred to in item (iii), the provisions regarding the ratio of capital and debt that apply are as stipulated in the legislation.

(v) The Company must pay the installments of income tax in the current tax year in accordance with the provisions of the legislation in the field of income tax, as well as changes, additions, and/or replacement.

(vi) On the Company income that have been cut and/or collected income tax which is final, it is subject to its own tax rates in accordance with the provisions of the legislation in the field of income tax, as well as changes, additions, and/or replacement.

(vii) the transition provisions:

a) Ketentuan Pajak Penghasilan sebagaimana dimaksud pada Ayat (3) Amandemen ini mulai berlaku sejak Tahun Pajak 2016.

b) Pemenuhan hak dan kewajiban Pajak Penghasilan Perusahaan sebagaimana dimaksud pada ayat (3) sampai dengan Tahun Pajak 2015 dan cara penghitungan Pajak Penghasilannya, diberlakukan ketentuan sebagaimana dimaksud dalam Persetujuan sebelumnya.

c) Terhadap aktiva tetap yang diperoleh dan telah disusutkan/ diamortisasi berdasarkan ketentuan dalam Persetujuan sebelumnya, dilakukan penyusutan/amortisasi sesuai ketentuan dalam Persetujuan sebelumnya tersebut sampai dengan berakhirnya masa manfaat aktiva tetap tersebut.

Terhadap kerugian yang dialami oleh Perusahaan pada Tahun Pajak 2013, Tahun Pajak 2014, dan Tahun Pajak 2015 dapat dikompensasikan dengan penghasilan mulai tahun pajak berikutnya berturut-turut sampai dengan paling lama Tahun Pajak 2019.

Ayat 4

Pemotongan dan/atau pemungutan Pajak Penghasilan

Perusahaan wajib melakukan pemotongan dan/atau pemungutan Pajak Penghasilan atas penghasilan yang dibayarkan, disediakan untuk dibayarkan, atau telah jatuh tempo pembayarannya, kepada pihak lain sesuai dengan ketentuan peraturan perundang-undangan di bidang Pajak Penghasilan, beserta perubahan, tambahan, dan/atau penggantinya.

5. Pasal 13 Ayat (5) Persetujuan dihapus secara keseluruhan.

6. Ketentuan Pasal 13 Ayat (6) dari Persetujuan dihapus secara keseluruhan dan diganti dengan ketentuan sebagai berikut:

Ayat 6

Pajak Pertambahan Nilai (PPN) dan Pajak Penjualan atas barang mewah (PPnBM):

Perusahaan berkewajiban melaksanakan ketentuan peraturan perundang-undangan di bidang PPN dan PPnBM, beserta perubahan, tambahan, dan/atau penggantinya.

7. Ketentuan Pasal 13 Ayat (7) dari Persetujuan dihapus secara keseluruhan dan diganti dengan ketentuan sebagai berikut:

Ayat 7

Bea Materai:

Perusahaan dikenakan Bea Meterai sesuai dengan ketentuan peraturan perundang-undangan di bidang Bea Meterai, beserta perubahan, tambahan, dan/atau penggantinya.

a) The provision of income tax referred to in Paragraph 3 of this Amendent shall come into force since the 2016 tax year.

b) The fulfillment of the rights and obligations of the Company Income Tax referred to in Paragraph 3 to the 2015 tax year and their income tax calculation method, applied provisions referred to in the previous agreement.

c) The assets acquired and depreciated/amortized based on the provisions of the previous agreement, applies depreciation/amortization as stipulated in the previous agreement until the end of the useful life of fixed assets.

Against losses suffered by the Company in the 2013 Tax Year, 2014 Tax Year and 2015 Tax Year can be offset by income tax starting in the next row until the tax year 2019 at the latest.

Paragraph 4

Cutting and/or collection of income tax

The Company is obliged to cut and/or collect income tax on income paid, provided to be paid, or has been due for payment, to the other party in accordance with the provisions of the legislation in the field of income tax, together with changes, additions, and/or replacement.

5. Article 13 Paragraph (5) shall be deleted in its entirety.

6. The provisions Article 13 Paragraph (6) of the Agreement shall be deleted in its entirety and replaced with the following provisions:

Paragraph 6

Value Added Tax (VAT) and sales tax on luxury goods (PPnBM):

The Company is obliged to implement the provisions of the legislation in the field of VAT and luxury sales tax, along with the changes, additions, and / or replacement.

7. The provisions of Article 13 Paragraph (7) of the Agreement shall be deleted in its entirety and replaced with the following provisions:

Paragraph 7

Stamp Duty:

Companies are subject to stamp duty in accordance with the provisions of the legislation in the field of stamp duty, along with the changes, additions, and / or replacement.

8. Ketentuan Pasal 13 Ayat (8) dari Persetujuan dihapus secara keseluruhan dan diganti dengan ketentuan sebagai berikut:

Ayat 8

Bea Masuk, Bea Keluar, dan Cukai:

(i) Pembebasan dan/atau keringanan Bea Masuk atas impor barang modal, peralatan dan mesin dan bahan-bahan yang diberikan kepada Perusahaan sebagaimana dimaksud dalam Pasal 12 Persetujuan ini dapat diberikan sesuai dengan ketentuan peraturan Perundang-undangan di bidang Kepabeanan, serta perubahan, tambahan, dan/atau penggantinya.

Perusahaan dapat diberikan pembebasan dan/atau keringanan Bea Masuk dengan mengajukan permohonan fasilitas tersebut sesuai ketentuan peraturan perundang-undangan.

(ii) Pemasukan barang-barang lain termasuk milik pribadi ke dalam daerah pabean Indonesia dilakukan sesuai dengan ketentuan peraturan Perundang-undangan di bidang Kepabeanan, beserta perubahan, tambahan, dan/atau penggantinya.

(iii) Perusahaan wajib membayar Bea Keluar atas produk pertambangan sesuai dengan ketentuan peraturan perundang-undangan di bidang Kepabeanan, serta perubahan, tambahan, dan/atau penggantinya.

(iv) Perusahaan wajib membayar Cukai atas barang-barang kena Cukai sesuai dengan ketentuan peraturan perundang-undangan di bidang Cukai, serta perubahan, tambahan, dan/atau penggantinya.

9. Ketentuan Pasal 13 Ayat (9) dari Persetujuan dihapus secara keseluruhan dan diganti dengan ketentuan sebagai berikut:

Ayat 9

Pajak Bumi dan Bangunan (PBB):

Sejak tahun pajak 2017, Perusahaan berkewajiban melaksanakan ketentuan peraturan perundang-undangan di bidang PBB, beserta perubahan, tambahan, dan/atau penggantinya.

10. Ketentuan Pasal 13 Ayat (10) dari Persetujuan dihapus secara keseluruhan dan diganti dengan ketentuan sebagai berikut:

Ayat 10

Pajak Daerah dan Retribusi Daerah:

Perusahaan wajib membayar Pajak Daerah dan Retribusi Daerah sesuai dengan ketentuan peraturan perundang-undangan di bidang Pajak Daerah dan Retribusi Daerah, serta perubahan, tambahan, dan/atau penggantinya.

8. The provisions of Article 13 Paragraph (8) of the Agreement shall be deleted in its entirety and replaced with the following provisions:

Paragraph 8

Import Duty, Export Duty, and Excise tax:

(i) Exemption and/or reduction of import duty on import of capital goods, equipment and machinery and materials provided to the Company as referred to in Article 12 of this Agreement may be granted in accordance with the provisions of legislation in the field of customs, as well as changes, additions and/or replacement.

The Company may be granted exemption and/or reduction of import duty to apply for the facility in accordance with the legislation.

(ii) The import of other items including personal property to the Indonesian customs area carried out in accordance with the provisions of legislation in the field of customs, along with the changes, additions, and / or replacement.

(iii) the Company is obliged to pay the export duty on mining products in accordance with the provisions of the legislation in the field of customs, as well as changes, additions, and/or replacement.

(iv) the Company shall pay the excise on goods subject to excise in accordance with the provisions of the legislation in the field of Customs, as well as changes, additions, and/or replacement.

9. The provisions of Article 13 Paragraph (9) of the Agreement shall be deleted in its entirety and replaced with the following provisio:

Paragraph 9

Land and Building Tax:

Start from tax year of 2017, The Company is obliged to implement the provisions of the legislation in the field of the Land and Building Tax, along with the changes, additions, and/or replacement.

10. The provisions of Article 13 Paragraph (10) of the Agreement shall be deleted in its entirety and replaced with the following provisions:

Paragraph 10

Local Taxes and Levies:

The Company must pay Local Taxes and Levies in accordance with the provisions of the legislation in the field of Regional Tax and Retribution, as well as changes, additions, and/or replacement.

11. Ketentuan Pasal 13 Ayat (11) dari Persetujuan dihapus secara keseluruhan dan diganti dengan ketentuan sebagai berikut:

Ayat 11

Pungutan-pungutan administrasi umum dan pembebanan-pembebanan untuk fasilitas atau jasa dan hak-hak khusus yang diberikan oleh Pemerintah:

Perusahaan wajib membayar pungutan-pungutan administrasi umum dan pembebanan-pembebanan untuk fasilitas-fasilitas atau jasa-jasa dan hak-hak khusus yang diberikan oleh Pemerintah sesuai dengan peraturan perundang-undangan.

12. Ketentuan Pasal 13 Ayat (12) dari Persetujuan dihapus secara keseluruhan dan diganti dengan ketentuan sebagai berikut:

Ayat 12

Perusahaan wajib membayar Bea Balik Nama atas Akte pendaftaran dan pemindahan kapal-kapal atau alat-alat angkutan laut yang beroperasi di Indonesia sesuai dengan ketentuan peraturan perundang-undangan.

13. Paragraf penutup dari Pasal 13 dari Persetujuan dihapus secara keseluruhan dan diganti dengan ketentuan sebagai berikut:

Selain ketentuan mengenai tarif Pajak Penghasilan sebagaimana dimaksud dalam Ayat 3 butir (i) di atas, pemenuhan hak dan kewajiban pajak, penerimaan negara bukan pajak, pajak daerah dan retribusi daerah, bea masuk, bea keluar, dan cukai dari Perusahaan dan subsidiarinya atau Afiliasinya yang berhubungan dengan ketentuan formal dan material, dilakukan sesuai dengan ketentuan peraturan perundang-undangan.

11. The provisions of Article 13 Paragraph (11) of the Agreement shall be deleted in its entirety and replaced with the following provisions:

Paragraph 11

General administrative charges and burden for facilities or services and privileges granted by the Government:

The Company is obliged to pay general administration levies and burden for facilities or services and privileges granted by the government in accordance with the legislation.

12. The provisisons of Article 13 Paragraph (12) of the Agreement shall be deleted in its entirety and replaced with the following provisions:

Paragraph 12

The Company is obligated to pay transfer duties on deed registration and transfer of the ships or the means of sea transport operating in Indonesia in accordance with the provisions of the legislation.

13. The concluding paragraph of Article 13 of the Agreement shall be deleted in its entirety and replaced with the following provisions:

In addition to the provisions of the income tax rate referred to in Paragraph 3 point (i) above, the fulfillment of the rights and obligations of tax, non-tax revenue, local taxes and levies, import duties, export duties and taxes of the Company and its subsidiaries or its Affiliates are related to the formal and material provision, are to be carried out in accordance with the provisions of the legislation.

Pasal 14 Pelaporan, Inspeksi dan Rencana Kerja

1. Ketentuan Pasal 14 Ayat (1) dari Persetujuan dihapus secara keseluruhan dan diganti dengan ketentuan sebagai berikut:

Ayat 1

Perusahaan wajib menyelenggarakan pembukuan dan catatan-catatan teknis di Indonesia dengan benar, lengkap dan sistematis sehubungan dengan laporan keuangan yang menunjukkan suatu gambaran yang benar dan wajar dari semua kegiatannya, dan status dari cadangan bahan galian terukur, terunjuk dan tereka, termasuk penambangan, pengolahan/pemurnian, pengangkutan dan pemasaran, sesuai dasar-dasar pembukuanyang lazim dipakai di Indonesia yang dinyatakan dalam Rupiah atau mata uang asing lainnya yang diijinkan sesuai ketentuan peraturan perundang-undangan.

Laporan keuangan dan laporan lainnya wajib dibuat dalam bahasa Indonesia atau dalam bahasa asing lainnya yang diijinkan sesuai dengan ketentuan peraturan perundang-undangan.

Perusahaan wajib menyampaikan surat pemberitahuan dengan benar, lengkap dan jelas untuk melaporkan penghitungan dan/atau pembayaran pajak, objek pajak dan/atau bukan objek pajak, dan/atau harta dan kewajiban sesuai dengan ketentuan peraturan perundang-undangan di bidang perpajakan.

2. Ketentuan Pasal 14 Ayat (2) dari Persetujuan dihapus secara keseluruhan dan diganti dengan ketentuan sebagai berikut:

Ayat 2

Pemerintah atau instansi yang berwenang berhak untuk melakukan penelitian dan mengadakan pemeriksaan (audit) atas pemenuhan kewajiban keuangan kepada negara sesuai dengan ketentuan peraturan perundang-undangan.

3. Ketentuan berikut ini ditambahkan sebagai "Pasal 14 Ayat (3.a) dan Pasal 14 Ayat (3.b)" yang baru dari Persetujuan:

Ayat 3.a.

Perusahaan yang diperiksa wajib:

(i) memperlihatkan dan atau meminjamkan buku atau catatan dan dokumen yang menjadi dasarnya, serta dokumen lain yang berhubungan dengan kegiatan usaha Perusahaan;

(ii) memberikan kesempatan untuk memasuki tempat atau ruangan yang dipandang perlu dan memberi bantuan guna kelancaran pemeriksaan; dan/atau;

(iii) memberikan keterangan lain yang diperlukan, kepada Pemerintah atau instansiyang berwenang.

Ayat 3.b.

Pemenuhan kewajiban oleh Perusahaan sebagaimana dimaksud pada ayat (3.a) dilaksanakan sesuai ketentuan peraturan perundang-undangan.

Article 14 Reporting, Inspection and Work Plan

1. The provisions of Article 14 Paragraph (1) shall be deleted in its entirety and replaced with the following provisions:

Paragraph 1

The Company shall keep books and technical records in Indonesia with the correct, complete and systematic correlating with the financial statements that sproject a true picture and proper performance of all its activities, and the status of reserve minerals measured, Indicated and inferred, including mining, processing/refining, transportation and marketing, in accordance to basic bookkeeping prevalent in Indonesian that is stated in Rupiah or other foreign currencies that are allowed in accordance with legislation.

Financial statements and other reports shall be made in Indonesian or in other foreign languages are permitted in accordance with the provisions of the legislation.

The Company is obliged to submit a notification letter that is correct, complete and clear for reporting accounting and/or tax payments, taxes and/or non-taxable income and/or assets and liabilities in accordance with the provisions of the legislation in the field of taxation.

2. The provisions of Article 14 Paragraph (2) of the Agreement shall be deleted in its entirety and replaced with the following provisions:

Paragraph 2

The Government or an authorized agency is entitled to carry out research and conduct the examination (audit) on the fulfillment of financial obligations to the state in accordance with the provisions of the legislation.

3. The following provisions are added as the updated "Article 14 Paragraph (3A) and Article 14, Paragraph (3b)" in the Agreement:

Paragraph 3.a.

The Company that is inspected shall:

(i) exhibit or lend books or records and documents from which it is based, as well as other documents related to the activities of the Company;

(ii) provides an opportunity to enter a place or room that is deemed necessary and provide assistance in order to expedite the examination; and/or;

(iii)provide other necessary information, to the Government or other authorized institutions.

Paragraph 3.b.

Fulfillment of obligations by the Company as referred to in Paragraph 3.A is carried out in accordance with legislation.

4. Ketentuan Pasal 14 Ayat (4) dari Persetujuan dihapus secara keseluruhan dan diganti dengan ketentuan sebagai berikut

Ayat 4

Perusahaan harus menyampaikan kepada Pemerintah, tidak lebih lama dari 6 (enam) minggu sebelum dimulainya tahun anggaran Perusahaan selama jangka waktu Persetujuan ini, rencana kerja, rencana anggaran pendapatan dan belanja termasuk kontrak-kontrak pembelian barang, kontrak-kontrak penjualan dan rencana pemasaran/penjualan untuk tahun berikutnya, dengan rincian yang cukup agar Pemerintah dapat meneliti rencana fisik, keuangan dan pemasaran/penjualan-penjualan tersebut dan menetapkan apakah rencana-rencana itu sesuai dengan kewajiban Perusahaan sesuai dengan Persetujuan ini. Suatu rencana kerja dan rencana anggaran pendapatan dan belanja untuk tahun pertama dari Persetujuan ini harus disampaikan kepada Pemerintah segera setelah Persetujuan ini ditandatangani.

4. The provisions of Article 14 Paragraph (4) of the Agreement shall be deleted in its entirety and replaced with the following provisions

Paragraph 4

The Company must submit to the Government, not later than six (6) weeks before the start of the fiscal year of the Company during the term of this Agreement, the work plan, budget revenue and expenditure plan including contracts covering goods, contracts of sales and marketing plan/sales for the next year, with sufficient detail so that the Government can examine the physical plan, finance and marketing/sales and determine whether the plans are in accordance with the Company's obligations in accordance with this Agreement. A work plan and budget revenue and expenditure for the first year of this Agreement shall be submitted to the Government shortly after this Agreement is signed.

Pasal 15 Pertukaran Alat Pembayaran

1. Ketentuan Pasal 15 Ayat (1) dari Persetujuan dihapus secara keseluruhan dan diganti dengan ketentuan sebagai berikut:

Ayat 1

Semua pembayaran yang wajib dipenuhi oleh Perusahaan kepada Pemerintah berdasarkan Persetujuan ini dilakukan dalam mata uang rupiah dan/atau dalam mata uang asing yang disepakati oleh Para Pihak dan ditempatkan pada bank di Indonesia yang ditunjuk oleh Pemerintah.

2. KetentuanPasal 15 Ayat (2) dari Persetujuan dihapus secara keseluruhan dan diganti dengan ketentuan sebagai berikut:

Ayat 2

Dalam hal terdapat pembayaran Pemerintah kepada Perusahaan berdasarkan Persetujuan ini, pembayaran dilakukan dalam mata uang Rupiah dan ditempatkan pada bank di Indonesia yang ditunjuk oleh Perusahaan.

3. Ketentuan Pasal 15 Ayat (3) dari Persetujuan dihapus secara keseluruhan dan diganti dengan ketentuan sebagai berikut:

Ayat 3

Hasil penjualan ekspor mineral-mineral dan setiap hasil produksi yang berasal daripadanya dapat dimiliki dan digunakan sesuai dengan kebutuhan Perusahaan. Dengan tidak mengurangi ketentuan di muka, Perusahaan akan mengelola penerimaan ekspor tersebut sesuai dengan peraturan perundang-undangan di Indonesia, antara lain ketentuanBankIndonesia yang mengatur mengenai penerimaan devisa hasil ekspor (DHE), dan kewajiban penggunaan Rupiah di wilayah Indonesia.

4. Ketentuan Pasal 15 Ayat (4) dari Persetujuan dihapus secara keseluruhan dan diganti dengan ketentuan sebagai berikut:

Ayat 4

Semua setoran penanaman modal yang masuk ke Indonesia (termasuk tetapi tidak terbatas pada modal dan pinjaman-pinjaman) wajib ditempatkan oleh Perusahaan di satu atau lebih bank di Indonesia serta dapat digunakan sesuai dengan hukum dan ketentuan yang berlaku di Indonesia.

Article 15 Exchange Payment Instruments

1. Article 15 Approval was given a new serial number into "Article 15 Paragraph (1)" andnewly added as follows:

Paragraph 1

All payments that must be fulfilled by the Company to the Government pursuant to this Agreement is done in Rupiah currency and/or in foreign currency agreed upon by the Parties and placed in banks in Indonesia which is appointed by the Government.

2. The provisions of Article 15 Paragraph (2) of the Agreement shall be deleted in its entirety and replaced with the following provisions:

Paragraph 2

In the event of a Government payment to the Company under this Agreement, payment is made in Rupiah and placed in banks in Indonesia which is appointed by the Company.

3. The provisions of Article 15 Paragraph (3) of the Agreement shall be deleted in its entirety and replaced with the following provisions:

Paragraph 3

Results of export sales of minerals and every production derived therefrom can be owned and used in accordance with the needs of the Company. Without prejudice to the provisions in advance, the Company will manage the export earnings in accordance with the laws and regulations in Indonesia, including Bank Indonesia regulations governing foreign exchange earnings from exports, and the obligation to use rupiah in Indonesia.

4. The provisions of Article 15 Paragraph (4) of the Agreement shall be deleted in its entirety and replaced with the following provisions:

Paragraph 4

All deposits of investment that enter Indonesia (including but not limited to capital and loans) must be placed by the Company in one or more banks in Indonesia and can be used in accordance with the laws and regulations in Indonesia.

5. Ketentuan Pasal 15 Ayat (5) dari Persetujuan dihapus secara keseluruhan dan diganti dengan ketentuan sebagai berikut:

Ayat 5

Perusahaan, didalam melaksanakan dan menunaikan hak-hak dan kewajiban-kewajibannya yang dicantumkan di dalam Persetujuan ini berhak untuk membayar ke luar negeri, dalam setiap mata uang yang diingininya, tanpa konversi ke dalam Rupiah untuk barang-barang dan jasa-jasa yang diperlukannya dan membiayai di luar negeri dalam setiap mata uang yang diingininya, setiap pengeluaran lain yang timbul bagi operasi-operasi pertambangan sesuai peraturan perundang-undangan di Indonesia.

6. Ketentuan Pasal 15 Ayat (6) dari Persetujuan dihapus secara keseluruhan dan diganti dengan ketentuan sebagai berikut:

Ayat 6

Perusahaan menyampaikan laporan kepada Bank Indonesia sesuai dengan peraturan perundang-undangan di Indonesia, antara lain laporan mengenai lalu lintas devisa, penerimaan DHE, dan laporan utang luar negeri.

5. The provisions of Article 15 Paragraph (5) of the Agreement shall be deleted in its entirety and replaced with the following provisions:

Paragraph 5

The Company, in implementing and fulfilling the rights and obligations set forth in this Agreement shall be entitled to pay abroad, in any currency he wants, without conversion to Rupiah to goods and services he needs and finance abroad in any currency he wants, any other expenses incurred for mining operations in accordance legislation in Indonesia.

6. The provisions of Article 15 Paragraph (6) of the Agreement shall be deleted in its entirety and replaced with the following provisions:

Paragraph 6

The company submit a report to Bank Indonesia in accordance with the laws and regulations in Indonesia, among others, statements regarding the traffic exchange, receiving foreign exchange earnings from exports, and reports foreign debt.

Pasal 16 Hak-Hak Khusus Pemerintah

Ketentuan berikut ini ditambahkan sebagai "Pasal 16 Ayat (1) butir (vi)" dan Pasal 16 Ayat (1) butir (vii)" yang baru dari Persetujuan:

(vi) Mengagunkan atau dengan cara lain menggadaikan Persetujuan ini kepada pihak lain.

(vii) Mengagunkan atau dengan cara lain menggadaikan Saham yang akan didivestasikan.

Article 16 Special Government Rights

The following rules are added as the updated "Article 16 Paragraph (1) point (vi)" and Article 16 Paragraph (1) (vii) " in the Agreement:

(vi) pledge or otherwise mortgage this Agreement to any other party.
(vii) pledge or otherwise mortgage shares to be divested.

Pasal 17 Kesempatan Kerja dan Latihan Bagi Warga Negara Indonesia

Ketentuan Pasal 17 Ayat (1) dari Persetujuan dihapus secara keseluruhan dan diganti dengan ketentuan sebagai berikut:

Ayat 1

Perusahaan wajib mempekerjakan Tenaga Kerja Indonesia dengan mengutamakan sebanyak mungkin tenaga kerja setempat berdasarkan tingkat kebutuhan tenaga kerja (jabatan, keahlian dan tingkat pendidikan) sesuai dengan ketentuan peraturan perundang-undangan.

Article 17 Employment and Training for Indonesian Citizen

The provisions of Article 17 Paragraph (1) shall be deleted in its entirety and replaced with the following provisions:

Paragraph 1

The Company shall employ Indonesian Workers with emphasis on local labor as much as possible based on labor requirements (position, expertise and level of education) in accordance with the provisions of the legislation.

Pasal 19 Keadaan Kahar

Judul dari Pasal 19 Kontrak Karya diubah menjadi "Pasal 19 – Keadaan Kahar, Keadaan yang Menghalangi dan Kondisi Daya Dukung Lingkungan"

1. Ketentuan Pasal 19 Ayat (1) dari Persetujuan dihapus secara keseluruhan dan diganti dengan ketentuan sebagai berikut:

Ayat 1

"Setiap kegagalan Pemerintah atau Perusahaan, untuk melaksanakan sesuatu kewajibannya menurut Persetujuan ini, tidak akan dianggap sebagai suatu pelanggaran kontrak ataupun kelalaian, apabila kegagalan itu disebabkan oleh:

(a) suatu "keadaan kahar";

(b) suatu "keadaan yang menghalangi"; atau

(c) suatu "kondisi daya dukung lingkungan",

dengan ketentuan bahwa pihak yang bersangkutan telah melakukan semua langkah pengamanan yang sesuai, telah betul- betul menjaga dan mengambil langkah-langkah alternatif yang wajar dengan tujuan untuk menghindarkan kegagalan tersebut dan untuk melaksanakan kewajiban-kewajibannya berdasarkan Persetujuan ini.

Untuk maksud Persetujuan ini, "keadaan kahar" meliputi antara lain peperangan, kerusuhan sipil, pemberontakan, ledakan, epidemi, gempa bumi, banjir, kebakaran, angin ribut, petir, takdir Tuhan lainnya diluar kemampuan manusia dan setiap sebab lainnya (baik yang sejenis seperti yang diuraikan di atas maupun yang tidak) yang secara wajar tidak dapat dikendalikan oleh pihak yang terkena sebab-sebab itu, dan yang sifatnya sedemikian rupa, sehingga mengakibatkan penundaan, pembatasan atau menghalangi tindakan tepat pada waktunya oleh pihak yang terkena pengaruh.

Untuk maksud Persetujuan ini "keadaan yang menghalangi" meliputi antara lain blokade, pemogokan, perselisihan perburuhan di luar kesalahan Perusahaan, sabotase, embargo, perbuatan musuh masyarakat, kerusakan pada mesin-mesin yang berpengaruh besar terhadap kegiatan Pengusahaan, perintah atau petunjuk (*adverse order or direction*) yang merugikan dari setiap Pemerintah "*de jure*" ataupun "*de facto*" atau perangkatnya atau sub divisinya dan ketentuan peraturan perundang-undangan yang diterbitkan oleh Pemerintah yang menghambat kegiatan usaha pertambangan mineral yang sedang berjalan.

Untuk maksud Persetujuan ini, kondisi daya dukung lingkungan adalah apabila kondisi daya dukung lingkungan wilayah tersebut tidak dapat menanggung beban kegiatan operasi produksi sumber daya mineral yang dilakukan di wilayahnya."

Article 19 Force Majeure

The title of Article 19 Contract of Work changed to "*Article 19 - Force Majeure, Obstructive Situations and Environment Carrying Capacity Conditions* "

1. The provisions of Article 19 Paragraph (1) shall be deleted in its entirety and replaced with the following provisions:

Paragraph 1

"Any failure of the Government or the Company, to implement something obligations under this Agreement, shall not be considered as a breach of contract or negligence, if the failure was caused by:

(a) a "force majeure";;

(b) an "obstructive situation"; or

(c) a "condition of the carrying capacity of the environment",

provided that the parties concerned have done all the appropriate security measures, have been utterly inconceivable to maintain and take steps that a reasonable alternative for the purpose of avoiding such failures and to perform its obligations under this Agreement.

For the purpose of this Agreement, "force majeure" includes, among others, war, civil unrest, rebellion, explosions, epidemics, earthquakes, floods, fires, hurricanes, lightning, God's destiny others beyond human ability and any other cause (whether similar as described above or not) which naturally can not be controlled by the party affected by those causes, and that are such that the resulting delays, restrictions or impede timely action by the affected parties.

For the purpose of this Agreement "obstructive situations" includes, among others, blockades, strikes, labor disputes outside the error of the Company, sabotage, embargo, act of public enemy, damage to machines that have a big impact on the activities of Business, orders or instructions *(adParagraph order or direction)* detrimental than any government "*de jure*" or "*de facto*" or devices or sub-division and the provisions of laws and regulations issued by the Government which inhibits mineral mining operations that are running.

For the purpose of this Agreement, the carrying capacity of the environment is a condition when the condition of the environmental carrying capacity of the region can not bear the burden of production operations carried out mineral resources in the region. "

2. Ketentuan Pasal 19 Ayat (2) dari Persetujuan dihapus secara keseluruhan dan diganti dengan ketentuan sebagai berikut:

Ayat 2

(a) Pihak yang kemampuannya untuk melaksanakan kewajiban-kewajiban terkena oleh keadaan kahar, harus memberitahukan hal itu sesegera mungkin kepada pihak lainnya secara tertulis, dengan menyebutkan sebabnya, dan kedua belah pihak akan berusaha untuk melakukan semua tindakan dan hal-hal yang wajar dalam batas-batas kemampuannya, untuk mengatasi keadaan tersebut; akan tetapi dengan ketentuan bahwa masing-masing pihak tidak diwajibkan untuk menyelesaikan atau menghentikan suatu perselisihan dengan pihak ketiga, kecuali dengan syarat-syarat yang dapat diterima atau sesuai dengan keputusan final dari badan arbitrase, pengadilan atau badan-badan yang ditetapkan oleh undang-undang yang mempunyai wewenang hukum, untuk memutuskan perselisihan itu.

(b) Pihak yang kemampuannya untuk melaksanakan kewajiban-kewajiban terkena oleh keadaan yang menghalangi atau kondisi daya dukung lingkungan harus memberitahukan hal itu sesegera mungkin kepada pihak lainnya secara tertulis, dengan menyebutkan sebab keadaan yang menghalangi atau kondisi daya dukung lingkungan tersebut, dan Pihak yang kemampuannya untuk melaksanakan kewajiban-kewajiban terdampak akan berusaha untuk melakukan semua tindakan dan hal-hal yang wajar dalam batas-batas kemampuannya untuk mengatasi keadaan tersebut; akan tetapi dengan ketentuan bahwa Pihak yang kemampuannya untuk melaksanakan kewajiban-kewajiban terdampak tidak diwajibkan untuk menyelesaikan atau menghentikan suatu perselisihan dengan pihak ketiga, termasuk perselisihan-perselisihan perburuhan, kecuali dengan syarat-syarat yang dapat diterima atau sesuai dengan keputusan final dari badan arbitrase, pengadilan atau badan-badan yang ditetapkan oleh undang-undang yang mempunyai wewenang hukum, untuk memutuskan perselisihan itu. Mengenai sengketa-sengketa perburuhan, Perusahaan dapat meminta kepada Pemerintah untuk bekerjasama dalam suatu usaha bersama untuk mengatasi setiap perselisihan yang mungkin timbul."

2. The provisions of Article 19 Paragraph (2) of the Agreement shall be deleted in its entirety and replaced with the following provisions:

Paragraph 2

(a) Parties whose obligations are affected by force majeure, must notify it as soon as possible to the other party in writing, stating the reason, and the two sides will endeavor to do all acts and things that are reasonable within the limit of its ability to cope with the situation; but with the provision that each of the parties are not required to complete or terminate a dispute with third parties, except on terms that are acceptable in accordance with the final decision of the arbitration body, the courts or agencies established by legislation has the legal authority to decide the dispute.

(b) Parties whose ability to perform the duties affected by circumstances that prevent or condition of the carrying capacity of the environment must notify it as soon as possible to the other party in writing, stating the reasons state that preclude or condition of the carrying capacity of the environment, and the Party whose ability to perform the duties affected will attempt to do all acts and things that are reasonable in the limits of its ability to cope with the situation; but with the provision that the parties ability to perform the duties of the affected are not required to complete or terminate a dispute with third parties, including disputes labor, except on terms that are acceptable in accordance with the final decision of the arbitration body, the court or bodies established by law has jurisdiction to decide the dispute. Regarding labor disputes, the Company may request the Government to cooperate in a joint effort to resolve any disputes that may arise."

3. Ketentuan berikut ini ditambahkan sebagai "Pasal 19 Ayat (3) yang baru dari Persetujuan:

Ayat 3

"Penghentian sementara dapat terjadi sebagai akibat dari suatu keadaan sebagaimana tersebut pada ayat (1) (a), (b) dan (c) di atas.

Dalam hal terjadi penghentian sementara dan Perusahaan meminta pembebasan terhadap kewajiban-kewajiban keuangannya, maka Perusahaan akan meminta persetujuan terlebih dahulu kepada Pemerintah mengenai jangka waktu dari penghentian sementara tersebut dengan ketentuan sebagai berikut:

(i) Penghentian sementara karena keadaan kahar dapat diberikan paling lama 1 (satu) tahun dan dapat diperpanjang 1 (satu) kali.

(ii) Penghentian sementara karena keadaan yang menghalangi, dapat diberikan paling lama 1 (satu) tahun dan dapat diperpanjang 1 (satu) kali dengan jangka waktu paling lama 1 (satu) tahun.

(iii) Dalam hal penghentian sementara sebagaimana pada butir (ii) tidak mencukupi waktunya, dapat diberikan tambahan waktu atas evaluasi dari Menteri.

Setiap penghentian sementara harus menyatakan alasan, perkiraan waktu dan kemungkinan implikasi lain yang mengakibatkan penundaan kegiatan. Selama masa penghentian sementara Perusahaan akan memperhitungkan pengaruhnya terhadap pemasaran dan penjualan Perusahaan.

Jika suatu kegiatan tertunda, terbatasi atau terhalang oleh keadaan kahar, keadaan yang menghalangi atau kondisi daya dukung lingkungan, maka sekalipun terdapat ketentuan di dalam Persetujuan ini yang menetapkan lain, waktu untuk melaksanakan kegiatan yang terkena pengaruh oleh keadaan kahar dan jangka waktu Persetujuan ini seperti yang dicantumkan dalam Pasal 31, masing-masing akan diperpanjang dengan jangka waktu yang sama dengan jumlah waktu selama sebab-sebab atau pengaruh-pengaruh itu berlangsung, dan untuk suatu periode perpanjangan tambahan, jika perlu, sebagaimana diperlukan untuk menggantikan kerugian waktu, yang diakibatkan keadaan kahar, keadaan yang menghalangi atau kondisi daya dukung lingkungan tersebut."

3. The provisions following is added as an update to "Article 19 Paragraph (3) in the Agreement:

Paragraph 3

"Temporary suspension may occur as a result of a situation as referred to in Paragraph (1) (a), (b) and (c) above.

In the event of the temporary suspension and the Company requesting the release of its financial obligations, the Company will require prior approval from the Government on the duration of the temporary suspension with the following provisions:

(i) Temporary suspension due to force majeure can be given a maximum of one (1) year and may be extended for 1 (one) time.

(ii) Temporary suspension due to circumstances that prevent, can be given a maximum of one (1) year and may be extended for 1 (one) time with a period of one (1) year.

(iii) In the event of a temporary suspension as in item (ii) is insufficient, additional time may be granted on an evaluation by the Minister.

Each temporary suspension shall state the reasons, the time and the possibility of other implications resulting in the delay of activities. During the period of temporary suspension of the Company will take into account the effect of the Company's marketing and sales.

If an activity is delayed, restricted or impeded by force majeure, circumstances that prevent or condition of the carrying capacity of the environment, although there are provisions in this Agreement which set another time to carry out activities that are affected by the force majeure and the term of this Agreement as included in Article 31, each of which will be extended by a period equal to the amount of time for causes or influences took place, and for a period of an additional extension, if necessary, as may be necessary to replace losses of time, due to force majeure , circumstances or conditions that prevent the carrying capacity of the environment."

Pasal 20 Kelalaian

Pasal 20 Ayat (2) Persetujuan diganti seluruhnya dan diberi nomor urut baru menjadi "Pasal 20 Ayat (2.a), Pasal 20 Ayat (2.b) dan Pasal 20 Ayat (2.c) yang baru ditambahkan sebagai berikut:

Ayat 2.a

Jika Perusahaan lalai membayar kewajiban keuangan kepada Negara sebagaimana dimaksud dalam Pasal 12 atau Pasal 13 Persetujuan ini, walaupun terdapat ketentuan-ketentuan sebagaimana tercantum pada ayat (1), jangka waktu yang diberikan kepada Perusahaan untuk memenuhi seluruh kewajiban keuangan kepada Negara akibat kelalaian Perusahaan adalah tidak lebih dari 30 (tiga puluh) hari setelah diterimanya surat teguran.

Ayat 2.b

Pemberian jangka waktu untuk memenuhi seluruh kewajiban keuangan kepada Negara akibat kelalaian Perusahaan sebagaimana dimaksud pada ayat (2.a), tidak membatalkan pengenaan sanksi administrasi terhadap keterlambatan pembayaran kewajiban keuangan sebagaimana dimaksud dalam Pasal 12 atau Pasal 13 sesuai dengan ketentuan peraturan perundang-undangan di bidang Perpajakan dan Penerimaan Negara Bukan Pajak serta perubahan, tambahan dan atau penggantinya.

Ayat 2.c

Sanksi administrasi dalam Pasal ini tidak boleh dikurangkan dari penghasilan bruto dalam menghitung Penghasilan Kena Pajak.

Article 20 Negligence

Article 20 Paragraph (2) shall be given a new serial number into "Article 20 Paragraph (2.a), Article 20 Paragraph (2B) and Article 20 Paragraph (2.c) newly added as follows:

Paragraph 2a

If the company is delinquent in financial obligations to the State referred to in Article 12 or Article 13 of this Agreement, although there are provisions as contained in Paragraph (1), the period granted to The Company to fulfill all financial obligations to the State due to the negligence of the Company is no more than 30 (thirty) days after receiving the warning letter.

Paragraph 2b

Granting a period of time to meet all financial obligations to the State due to the negligence of The Company referred to in Paragraph 2.a, does not invalidate the imposition of administrative sanctions against the late payment of financial obligations referred to in Article 12 or Article 13 in accordance with the laws in Taxation and Non-tax Revenue including changes, additions or replacements in the law.

Paragraph 2.c

Administrative sanctions in this article may not be deducted from gross income in calculating taxable income.

Pasal 21 Penyelesaian Sengketa

1. Pasal 21 Persetujuan diberi nomor urut baru menjadi "Pasal 21 Ayat (1.a) dan Pasal 21 Ayat (2.b) yang baru ditambahkan sebagai berikut:

Ayat 1.a.

Pemerintah dan Perusahaan dengan ini bersepakat untuk menyerahkan semua sengketa antara kedua belah pihak yang timbul sebelum atau sesudah pengakhiran Persetujuan ini atau penerapannya atau operasi-operasi dibawah Persetujuan ini, termasuk anggapan-anggapan bahwa satu pihak lalai dalam melaksanakan kewajiban-kewajibannya, untuk penyelesaian akhir, baik kepada konsiliasi kalau para pihak berkeinginan untuk meminta suatu penyelesaian secara baik dengan cara konsiliasi, atau kepada arbitrase. Dalam hal para Pihak meminta suatu penyelesaian secara baik dengan cara konsiliasi maka, konsiliasi akan berlangsung sesuai dengan peraturan-peraturan Konsiliasi UNCITRAL dalam resolusi 35/52 yang disetujui oleh Majelis Umum Perserikatan Bangsa-Bangsa pada tanggal 4 Desember 1980 yang berjudul "Conciliation Rules of the United Nations Commission on International Trade Law" yang pada waktu ini masih berlaku. Dalam hal para pihak akan menggunakan arbitrase, maka sengketa akan disclesaikan oleh arbitrase sesuai dengan Peraturan-peraturan Arbitrase UNCITRAL yang dimuat dalam resolusi 31/98, yang disetujui Majelis Umum Perserikatan Bangsa-Bangsa pada tanggal 15 Desember 1976 yang berjudul "Arbitration Rules of the United Nations Commission on International Trade Law" yang pada saat ini masih berlaku. Bahasa yang akan digunakan dalam acara kerja konsiliasi dan arbitrase adalah Bahasa Inggris kecuali kedua belah pihak menyetujui lain.

Ayat 1.b.

Dikecualikan dari ketentuan sebagaimana dimaksud pada ayat (1.a) sengketa di bidang:

(i) perpajakan termasuk bea masuk, bea keluar, dan cukai, dilakukan penyelesaian berdasarkan ketentuan peraturan perundang-undangan di bidang perpajakan; dan
(ii) penerimaan negara bukan pajak, dan pungutan-pungutan lainnya sebagaimana tersebut pada Pasal 13 Amandemen ini dilakukan penyelesaian berdasarkan ketentuan peraturan perundang-undangan.

2. Ketentuan Pasal 21 Ayat (3) dari Persetujuan dihapus secara keseluruhan dan diganti dengan ketentuan sebagai berikut:

Ayat 3

Acara kerja konsiliasi atau arbitrase yang dilaksanakan menurut Pasal ini, akan diselesaikan melalui pengadilan dan arbitrase dalam negeri sesuai dengan ketentuan peraturan perundang-undangan.

Article 21 Settlement of Disputes

1. Article 21 shall be given a new serial number into "Article 21 Paragraph (1a) and Article 21 Paragraph (2B) newly added as follows:

Paragraph 1.a.

The Government and the Company hereby agree to submit all disputes between the parties arising before or after termination of this Agreement or its implementation or operations under this Agreement, including the assumptions that one party negligent in carrying out its obligations, for a final settlement, either to conciliation if the parties wish to request a settlement either by means of conciliation or to arbitration. In the event that the Parties requesting a good settlement by means of conciliation, the conciliator will take place in accordance with the UNCITRAL Conciliation regulations in resolution 35/52 approved by the United Nations General Assembly on December 4, 1980, entitled "Conciliation Rules of the United Nations Commission on International Trade Law "which at this time are still valid. In the event that the parties will use the arbitration, then the dispute will be resolved by arbitration in accordance with the UNCITRAL Arbitration Rules contained in resolution 31/98, which was approved by United Nations General Assembly on December 15, 1976, entitled "Arbitration Rules of the United Nations Commission on International Trade Law "which at this point is still valid. The language to be used in the proceedings of the Conciliation and Arbitration is English unless both parties agree otherwise.

Paragraph 1.b.

Excluded from the provisions referred to in Paragraph 1.A, disputes in the field:

(i) taxation including import fees, export fees and customs, made the completion under the terms of legislation in the field of taxation; and
(ii) non-tax revenue, and other levies is resolved under the provisions of the legislation.

2. The provisions of Article 21 Paragraph (3) of the Agreement shall be deleted in its entirety and replaced with the following provisions:

Paragraph 3

Conciliation or arbitration proceedings conducted in accordance with this Article, will be resolved through the domestic courts and arbitration in accordance with the provisions of the legislation.

Pasal 24 Promosi Kepentingan Nasional

1. Pasal 24 Ayat (2) Persetujuan dihapus secara keseluruhan.

2. Pasal 24 Ayat (3) Persetujuan diberi nomor urut baru menjadi "Pasal 24 Ayat (3.a), Pasal 24 Ayat (3.b), Pasal 24 Ayat (3.c), Pasal 24 Ayat (3.d), Pasal 24 Ayat (3.e), Pasal 24 Ayat (3.f) yang baru ditambahkan sebagai berikut:

Ayat 3.a

Perusahaan dalam rangka penanaman modal asing yang tidak melakukan sendiri kegiatan pengolahan setelah 5 (lima) tahun sejak berproduksi wajib melakukan divestasi saham secara bertahap paling sedikit sebagai berikut:

a) Tahun keenam 20% (dua puluh persen);
b) Tahun ketujuh 30% (tiga puluh persen);
c) Tahun kedelapan 37% (tiga puluh tujuh persen);
d) Tahun kesembilan 44% (empat puluh empat persen);
e) Tahun kesepuluh 51% (lima puluh satu persen);

dari jumlah seluruh saham

Ayat 3.b

Perusahaan dalam rangka penanaman modal asing yang melakukan sendiri kegiatan pengolahan dan/atau pemurnian setelah 5 (lima) tahun sejak berproduksi wajib melakukan divestasi saham secara bertahap paling sedikit sebagai berikut:

a) Tahun keenam 20% (dua puluh persen);
b) Tahun kesepuluh 30% (tiga puluh persen);
c) Tahun kelimabelas 40% (empat puluh persen);

dari jumlah seluruh saham

Ayat 3.c

Perusahaan dalam rangka penanaman modal asing yang melakukan kegiatan penambangan dengan menggunakan metode penambangan bawah tanah setelah 5 (lima) tahun sejak berproduksi wajib melakukan divestasi saham secara bertahap paling sedikit sebagai berikut:

a) Tahun keenam 20% (dua puluh persen);
b) Tahun kesepuluh 25% (dua puluh lima persen);
c) Tahun kelimabelas 30% (tiga puluh persen);

dari jumlah seluruh saham

Article 24 Promotion of National Interest

1. Article 24 Paragraph (2) shall be deleted in its entirety.

2. Article 24 Paragraph (3) shall be given a new serial number "Article 24 Paragraph (3A), Article 24 Paragraph (3b) and Article 24, Paragraph (3.c) newly added as follows:

Paragraph 3.a

The Company in the context of foreign investment that does not do its own processing activities after 5 (five) years of production must divest the shares gradually at least as follows:

a) 20% (twenty percent) in the sixth year;
b) 30% (thirty percent) in the sixth year;
c) 37% (thirty-seven per cent) in the sixth year;
d) 44% (forty-four percent) in the sixth year;
e) 51% (fifty one percent) in the sixth year;

of the total shares

Paragraph 3.b

The Company in the context of foreign investment that do their own processing activities and / or purification after five (5) years of production must divest the shares gradually at least as follows:

a) 20% (twenty percent) in the sixth year;
b) 30% (thirty percent) in the tenth year;
c) 40% (forty percent) in the fifteenth year;

of the total shares

Paragraph 3.c

The Company in the context of foreign investment that have mining operations using underground mining methods after five (5) years of production must divest the shares gradually at least as follows:

a) 20% (twenty percent) in the sixth year;
b) 25% (twenty five percent) in the tenth year;
c) 30% (thirty percent) in the fifteenth year;

of the total shares

Paragraph 3.d

The Company in the context of foreign investment that have mining operations using underground and open pit mining methods after five (5) years of production must divest the shares gradually at least as follows:

a) 20% (twenty percent) in the sixth year;
b) 25% (twenty five percent) in the eight year;
c) 30% (thirty percent) in the tenth year;

of the total shares

Ayat 3.d

Perusahaan dalam rangka penanaman modal asing yang melakukan kegiatan penambangan dengan menggunakan metode penambangan bawah tanah dan penambangan terbuka setelah 5 (lima) tahun sejak berproduksi wajib melakukan divestasi saham secara bertahap paling sedikit sebagai berikut:

a) Tahun keenam 20% (dua puluh persen);
b) Tahun kedelapan25% (dua puluh lima persen);
c) Tahun kesepuluh 30% (tiga puluh persen);

dari jumlah seluruh saham

Ayat 3.e

Pengalihan (divestasi) saham asing pada Perusahaan dapat dilakukan melalui bursa saham Indonesia, sesuai ketentuan peraturan perundang-undangan.

Ayat 3.f

Pelaksanaan lebih lanjut mengenai tata cara divestasi saham dan mekanisme penetapan harga saham disesuaikan dengan peraturan perundang-undangan.

3. Ketentuan berikut ini ditambahkan sebagai "Pasal 21 Ayat (4) yang baru dari Persetujuan:

Ayat 4

Dalam hal peningkatan jumlah modal perseroan, peserta Indonesia sahamnya tidak boleh terdilusi menjadi lebih kecil dari persentasi sesuai pentahapan.

Paragraph 3.e

Diversion (divestment) of foreign shares in the Company shall be executed through the stock exchange Indonesia, in accordance with legislation.

aragraph 3.f

Further implementation of the procedures for divestiture and stock pricing mechanism adapted to the legislation.

3. The following rules are added as an updated "Article 21 Paragraph (4) in the Agreement:

Paragraph 4

In terms of increasing the amount of capital of the company, Indonesian shares should not be diluted to less than the corresponding percentage phasing.

Pasal 25 Kerjasama Daerah Dalam Pengadaan Prasarana Tambahan

Ketentuan berikut ini ditambahkan sebagai "Pasal 25 Ayat (10) yang baru dari Persetujuan:

Ayat 10

Perusahaan wajib menyusun dan melaksanakan program pengembangan dan pemberdayaan masyarakat sejalan dengan kegiatan-kegiatan pengusahaan yang dilaksanakan selama masa kegiatan Perusahaan sesuai dengan ketentuan peraturan perundang-undangan.

Article 25 Regional Cooperation in Infrastructure Supplement Procurement

The following rules are added as "Article 25 Paragraph (10) The new Agreement:

Paragraph 10

Companies must formulate and implement development programs and community empowerment in line with the activities carried out during the operation of the Company's activities in accordance with the provisions of the legislation.

Pasal 29 Pengalihan Hak

Ketentuan berikut ini ditambahkan sebagai "Pasal 29 Ayat (3) yang baru dari Persetujuan:

Ayat 3

Untuk pengalihan kepemilikan dan/atau saham di bursa saham Indonesia hanya dapat dilakukan setelah melakukan kegiatan eksplorasi tahapan tertentu yaitu telah ditemukan minimal 2 (dua) wilayah prospek dalam kegiatan eksplorasi, dengan memberitahukan kepada Menteri.

Article 29 Transfer of Rights

The following rules are added as the updated "Article 29 Paragraph (3) in the Agreement:

Paragraph 3

Transfer of ownership and/or shares in the Indonesian stock market can only be done after a certain stage of exploration activities in which at least 2 (two) prospective regions have been found in exploration activities, and by notifying the Minister.

Pasal 31 Jangka Waktu

1. Ketentuan Pasal 31 Ayat (3) dari Persetujuan dihapus secara keseluruhan dan diganti dengan ketentuan sebagai berikut:

Ayat 3

Perusahaan dapat mengajukan permohonan kelanjutan operasi pertambangan dalam bentuk izin usaha di bidang pertambangan sesuai peraturan perundang-undangan. Pemerintah dapat memberikan kelanjutan operasi pertambangan apabila Perusahaan memenuhi kewajibannya dalam Amandemen, yaitu :

a. Pengolahan dan Pemurnian dalam negeri,
b. kewajiban pengutamaan penggunaan tenaga kerja, barang-barang dan jasa dalam negeri,
c. penyesuaian luas wilayah,
d. penerimaan Negara,
e. divestasi, dan
f. persyaratan aspek hukum, administratif, teknis, finansial dan pengelolaan lingkungan.

Pemerintah akan menyampaikan secara tertulis kepada Perusahaan apabila terdapat suatu penilaian dari Pemerintah bahwa Perusahaan, secara material, tidak mematuhi kewajiban-kewajibannya dalam paragraf ini. Para Pihak akan mendiskusikan penilaian Pemerintah tersebut dan Perusahaan setuju untuk melakukan perbaikan terhadap ketidakpatuhan dimaksud sesegera mungkin.

Article 31 Term

The provisions of Article 31 Paragraph (3) of the Agreement shall be deleted in its entirety and replaced with the following provisions:

Paragraph 3

Companies can apply for the continuation of mining operations in the form of business licenses in the mining sector in accordance with laws and legislations. Government may grant the continuation of mining operations if the Company meets its obligations in the Amendment, in regards to:

a. Processing and Refining in the country,
b. obligation in preferential use of labor, goods and services in the country,
c. conformation of area of a region,
d. State revenue,
e. divestment, and
f. legal aspects, administrative, technical, financial and environmental management requirements.

The Government will submit in writing to the Company if there is an assessment of the Government that the Company, materially, is not complying with its obligations in this Paragraph. The Parties will discuss the assessment of the Government and the Company agrees to make improvements to the question of non-compliance as soon as possible.

Pasal 32 Pilihan Hukum

Ketentuan Pasal 32 Ayat (2) dari Persetujuan dihapus secara keseluruhan dan diganti dengan ketentuan sebagai berikut:

Ayat 2

Persetujuan ini dibuat dalam bahasa Indonesia dan bahasa Inggris dan kedua naskah/teks tersebut adalah sah. Dalam hal terdapat perbedaan penafsiran antara kedua naskah tersebut, maka bahasa Indonesia yang berlaku.

Article 32 Choice of Law

The provisions of Article 32 Paragraph (2) of the Agreement shall be deleted in its entirety and replaced with the following provisions:

Paragraph 2

This Agreement is made in Indonesian and English and both texts are legitimate. In the event of any difference of interpretation between the two texts, the Indonesian text prevails.

Pasal II

Para Pihak sepakat untuk melakukan amandemen lebih lanjut dari Persetujuan apabila di kemudian hari terdapat ketentuan-ketentuan yang masih belum sesuai dengan peraturan perundangan.

Pasal III

Amandemen ini berlaku sejak ditandatangani dan berakhir pada saat jangka waktu dalam Persetujuanberakhir.

Pasal IV

Amandemen ini merupakan bagian integral dan tidak terpisahkan dari Kontrak Karya.

Demikian Amandemen ini dibuat dalam rangkap 4 (empat) bermaterai cukup, masing-masing berlaku sebagai aslinya dan mempunyai kekuatan hukum yang sama.

PEMERINTAH REPUBLIK INDONESIA	PTIRIANA MUTIARA MINING
Sudirman Said	Kasudjono Harianto
Menteri Energi dan Sumber Daya Mineral	Direktur Utama

Article II

The Parties agree to further amend the Agreement at a later date if there are provisions that are still not in accordance with regulations.

Article III

This amendment applies since signed and expires when the term of the Agreement expires.

Article IV

This amendment is an integral and inseparable part of the Contract of Work.

Thus this amendment is made in four (4) stamped copies, each valid as the original and has the same legal power.

GOVERNMENT OF THE REPUBLIC OF INDONESIA	PT IRIANA MUTIARA MINING
Sudirman Said	Kasudjono Harianto
Minister of Energy and Mineral Resources	President Director

LAMPIRAN A

WILAYAH KONTRAK KARYA

Wilayah Kontrak Karya adalah daerah yang terletak di Pulau Papua, dan dibatasi oleh titik koordinat 1 (satu) sampai 4 (empat) sebagaimana tercantum di bawah ini :

No	Garis Bujur (BT)				Garis Lintang (LS)			
	°	'	"	BB/BT	°	'	"	LU/LS
1	139	1	0	BT	2	14	0	LS
2	139	9	0	BT	2	14	0	LS
3	139	9	0	BT	2	20	0	LS
4	139	1	0	BT	2	20	0	LS

Jumlah luas Kontrak Karya tersebut di atas ditetapkan dengan cara perhitungan teoritas, dengan menganggap tiap sisi derajat equator adalah 111,11 km, didasarkan atas Peta Badan Informasi Geospasial (BIG) Tahun 2012 dengan skala 1 : 150,000, seluas 16.470 Ha.

ANNEX A

CONTRACT OF WORK AREA

Contract of work area is the mainland of the island of Papua, bounded by points 1 (one) through 4 (four) defined by coordinates listed follows :

No	Longitude				Latitude			
	°	'	"		°	'	"	
1	139	1	0	S	2	14	0	E
2	139	9	0	S	2	14	0	E
3	139	9	0	S	2	20	0	E
4	139	1	0	S	2	20	0	E

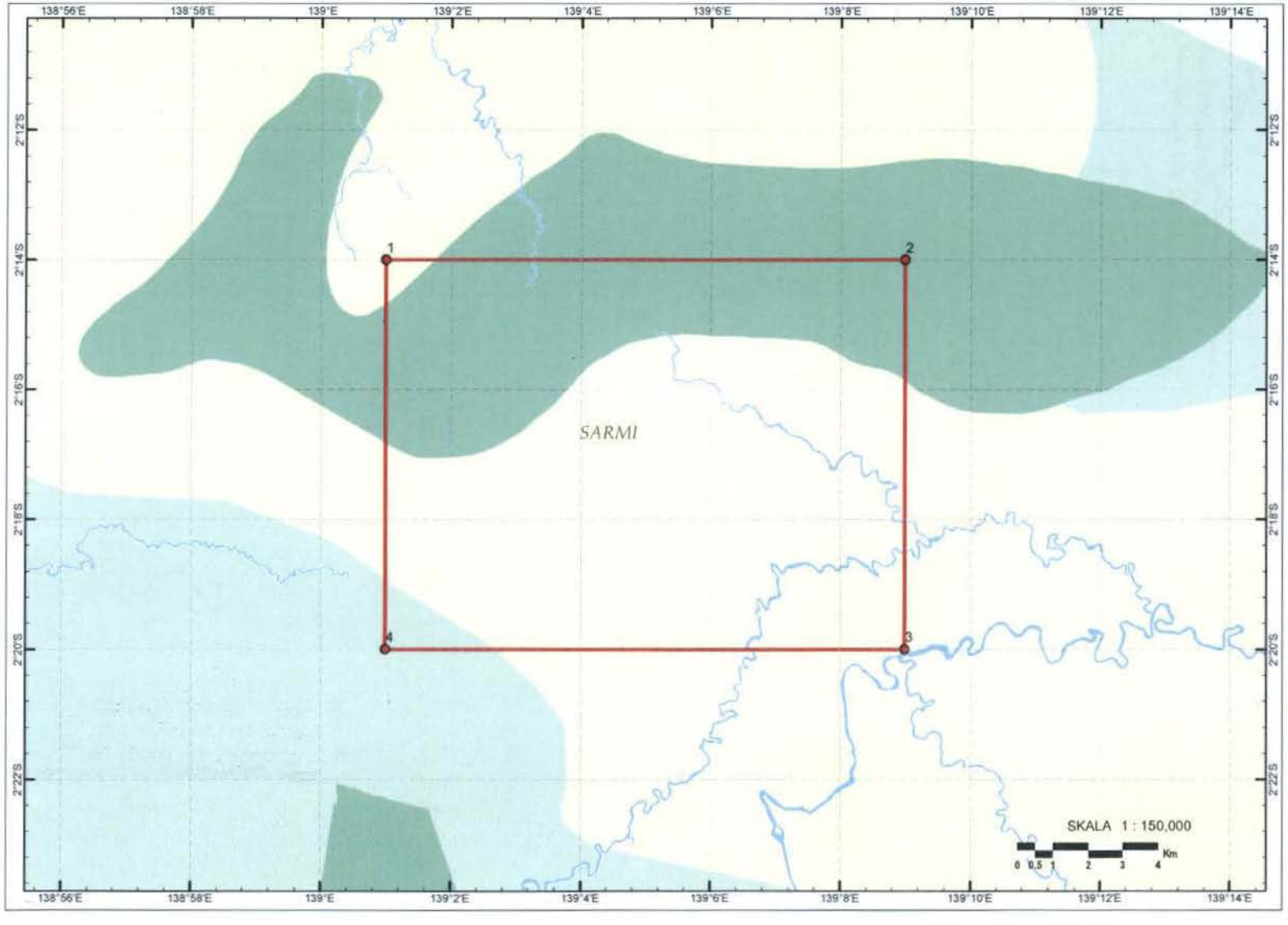
The amount of Contract of Work area mentioned above is set by means of theoritical calculations, by assuming each side of the equator degree is 111,11 KM, based on the map of the Geospatial Information Entities year 2012 scale 1 : 150.000, covering an area of 16.470 Ha.

LAMPIRAN B

Lihat peta terlampir dengan skala 1 : 150,000

ANNEX B

See the map attached scale of 1 : 150.000



PETA
WILAYAH KONTRAK KARYA
PT IRIANA MUTIARA MINING

KABUPATEN SARMI
PROVINSI PAPUA

U

Kode Wilayah	Luas (Ha)	Komoditas	Tahap Kegiatan
99PK0027	16.470	Emas DMP	Eksplorasi

LEGENDA

- Ibukota Provinsi
- Ibukota Kabupaten
- Batas Negara
- Batas Provinsi
- Batas Kabupaten
- Danau
- Sungai

Kelas Jalan

- Jalan
- Jalan
- Jalan

Tata Guna Hutan

- Hutan Konservasi
- Hutan Lindung
- Hutan Produksi
- Hutan Produksi Terbatas
- Hutan Produksi Dapat Dikonversi

KETERANGAN

Sistem Proyeksi	: Transverse Mercator
Sistem Grid	: Geografis (Longitude/Latitude)
Datum	: WGS 1984
Sumber	: Peta Indikasi Batas Administrasi, B.I.G. - 2012
	Peta Kehutanan, Kementerian Kehutanan - 2012

Peta ini bukan referensi resmi mengenai garis-garis batas administrasi nasional dan internasional

LOKASI PETA



DIREKTORAT JENDERAL MINERAL DAN BATUBARA
KEMENTERIAN ENERGI DAN SUMBER DAYA MINERAL

TRANSLATOR'S STATEMENT

I, the undersigned, Togi Pangaribuan, S.H., LL.M., a sworn translator of legal documents pursuant to Decision of the Governor of DKI Jakarta No.1607/2008 certifies that this document, the amendment of Contract of Work between the Government of the Republic of Indonesia and PT Iriana Mutiara Mining, is a true and certified English translation of its original that was presented to me.

TOGI PANGARIBUAN, S.H., LL.M.
Sworn Translator | S.K. Gub. DKI Jakarta No. 1607/2008



KONTRAK KARYA

ANTARA

PEMERINTAH
REPUBLIK INDONESIA

DENGAN

PT. IRIANA MUTIARA MINING

PRESIDEN
REPUBLIK INDONESIA

Jakarta, 17 Maret 1997

Nomor : B.143/Pres/3/1997
Sifat : Segera
Lampiran : 1 (satu) expl.
Perihal : Persetujuan bagi 68 (enam puluh delapan) Kontrak Karya dalam rangka PMA di bidang Pertambangan Umum.

Kepada Yth.
Sdr. MENTERI PERTAMBANGAN DAN ENERGI
di
Jakarta

Sehubungan dengan surat Saudara Nomor 4302/29/M.DJP/1996 tanggal 31 Oktober 1996 perihal tersebut pada pokok surat, dengan ini diberitahukan bahwa kami dapat menyetujui 68 (enam puluh delapan) Kontrak Karya dalam rangka Penanaman Modal Asing di bidang pertambangan umum untuk perusahaan-perusahaan sebagaimana tercantum dalam lampiran surat ini.

Selanjutnya agar Saudara Menteri bertindak atas nama Pemerintah Republik Indonesia untuk menandatangani Naskah Kontrak-kontrak Karya tersebut, serta mengambil langkah-langkah dan koordinasi yang diperlukan agar dalam pelaksanaannya dapat berjalan dengan sebaik-baiknya sesuai dengan ketentuan peraturan perundang-undangan yang berlaku.

PRESIDEN REPUBLIK INDONESIA,

SOEHARTO

Tembusan disampaikan kepada Yth :

1. Sdr. Pimpinan Dewan Perwakilan Rakyat;
2. Sdr. Wakil Presiden;
3. Sdr. Menteri Koordinator Bidang Ekonomi, Keuangan dan Pengawasan Pembangunan;
4. Sdr. Menteri Dalam Negeri;
5. Sdr. Menteri Kehakiman;
6. Sdr. Menteri Kehutanan;
7. Sdr. Menteri Negara Penggerak Dana Investasi/Ketua BKPM;
8. Sdr. Gubernur Bank Indonesia.

Lampiran
Surat Persetujuan Presiden Republik Indonesia bagi 68
(enam puluh delapan) Kontrak Karya VI dalam rangka PMA
Nomor : B-143/Pres/3/1997
Tanggal : 17 Maret 1997

PRESIDEN
REPUBLIK INDONESIA

No.	Pemohon	Saham (%)	Wilayah Kontrak Karya		Bahan Galian
			Propinsi/Kabupaten	Luas (Ha)	
	1 s/d 10				
11.	- BATTLE MOUNTAIN (IRIAN JAYA) LTD - (USA) - IRIANA CENDRAWANA PTE.LTD.; (SINGAPURA) - PT MUTIARA IRIANA MINERALS	80 15 5	IRIAN JAYA YAPEN WAROPEN/JAYAPURA & PANIAI	1.610.890	EMAS, PERAK DAN TEMBAGA
	12 s/d 68				

Sesuai dengan aslinya
SEKRETARIAT JENDERAL
DEPARTEMEN PERTAMBANGAN DAN ENERGI
KEPALA BIRO HUKUM,

B.L. NOORMANDIRI, S.H.
NIP 100003435

PRESIDEN REPUBLIK INDONESIA
t.t.d.

SOEHARTO

CONTRACT OF WORK

BETWEEN

THE GOVERNMENT OF THE
REPUBLIC OF INDONESIA

AND

PT. IRIANA MUTIARA MINING

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MUKADIMAH

Persetujuan ini, disepakati dan dibuat di Jakarta, Republik Indonesia, pada tanggal 28 bulan **April** tahun **1997** oleh dan antara **Pemerintah Republik Indonesia,** dalam hal ini diwakili oleh Menteri Pertambangan dan Energi Republik Indonesia, (selanjutnya disebut Pemerintah); dan **PT. Iriana Mutiara Mining** (perusahaan berbadan hukum Indonesia) yang didirikan dengan Akte Notaris Nomor **197** tanggal **24 April 1997**, Surat Keputusan Menteri Kehakiman Nomor **C2-3059 HT.01.01.TH.97** tanggal **25 April 1997**, (selanjutnya disebut Perusahaan), yang semua saham-sahamnya pada waktu didirikan dimiliki oleh:

1. Berkenaan dengan 80% (delapan puluh persen) oleh:
   Battle Mountain (Irian Jaya) Ltd., Perusahaan yang didirikan dibawah hukum Nevada dan kantornya beralamat di One East First Street Reno, Nevada, USA 89501;

2. Berkenaan dengan 15% (lima belas persen) oleh:
   Iriana Cendrawana Pte. Ltd., Perusahaan yang didirikan dibawah hukum Singapura dan kantornya beralamat di 50 Raffles Place #17-01, Shell Tower, Singapore 048623; dan

3. Berkenaan dengan 5% (lima persen) oleh:
   PT Mutiara Iriana Minerals, badan hukum Indonesia yang didirikan dengan Akte Notaris Nomor 84 tanggal 8 April 1993, dibuat dihadapan Benny Kristianto, SH, Notaris di Jakarta, Keputusan Menteri Kehakiman Nomor C2-2519 HT.01.01 Th. 1993 tanggal 26 April 1993, yang beralamat di Price Waterhouse Center, Jl. H.R. Said Kav. C-3, Jakarta 12920, Indonesia.

MENGAKUI BAHWA

A. Semua sumberdaya mineral yang terdapat di dalam wilayah hukum Republik Indonesia, termasuk daerah lepas pantai, adalah kekayaan nasional Bangsa Indonesia;

B. Pemerintah ingin mendorong dan meningkatkan kegiatan eksplorasi dan mengembangkan sumberdaya mineral Indonesia. Pemerintah juga bermaksud untuk memungkinkan pengembangan endapan bijih jika ditemukan dalam jumlah komersial dan mengoperasikan kegiatan usaha pertambangan yang bersangkutan;

PREAMBLE

This Agreement, made and entered into in Jakarta, the Republic of Indonesia, on the **28th** day of **April 1997** by and between the **Government of the Republic of Indonesia,** represented herein by the Minister of Mines and Energy of the Government of the Republic of Indonesia (hereinafter called the Government) and **PT. Iriana Mutiara Mining** (a judicial body incorporated in Indonesia by Notarial Deed Numbered **197** dated **April 24th 1997**, Decree of Minister of Justice Numbered **C2-3059 HT.01.01.TH.97** dated **April 25th 1997** (hereinafter called the Company), all of which shares at the time of its incorporation are owned :

1. With respect to eighty percent (80%) thereof, by:
   Battle Mountain (Irian Jaya) Ltd., a company incorporated by virtue of the Law of Nevada and having registered office at One East First Street Reno, Nevada, USA 89501;

2. With respect to fifteen percent (15%) thereof, by:
   Iriana Cendrawana Pte. Ltd., a company incorporated by virtue of the Law of Singapore and having registered office at 50 Raffles Place #17-01, Shell Tower, Singapore 048623; and

3. With respect to five percent (5%) thereof, by:
   PT. Mutiara Iriana Minerals, an Indonesian judicial body incorporated by Notarial Deed Numbered 84 dated April 8, 1993, made before Benny Kristianto, SH, Notary in Jakarta, Decree of Minister of Justice Numbered C2-2519 HT.01.01. Th. 93 dated April 26, 1993, whose address is Price Waterhouse Center, Jl. H.R. Said Kav. C-3, Jakarta 12920 , Indonesia.

WITNESSETH THAT:

A. All Mineral resources contained in the territories of the Republic of Indonesia, including the offshore areas, are the national wealth of the Indonesian Nation;

B. The Government desires to encourage and promote the exploration and development of the Mineral resources of Indonesia. The Government is also desirous of facilitating the development of ore deposits if commercial quantities are found to exist and the operation of Mining enterprises in connection therewith;

C. Melalui kegiatan usaha pertambangan, Pemerintah bermaksud menciptakan pusat-pusat pertumbuhan bagi pembangunan daerah, menciptakan kesempatan kerja yang lebih banyak, mendorong dan mengembangkan usaha setempat, dan untuk menjamin agar keterampilan, pengetahuan dan teknologi dialihkan kepada warga negara Indonesia, memperoleh data dasar mengenai dan sehubungan dengan sumberdaya mineral Negara dan melindungi serta merehabilitasi lingkungan alam untuk pembangunan Indonesia selanjutnya;

D. Perusahaan, melalui Battle Mountain Gold Company, satu Perusahaan yang didirikan di Nevada, memiliki ataupun dapat memperoleh keterangan, pengetahuan, pengalaman serta kemampuan teknis dan keuangan yang telah dibuktikan dan sumberdaya lainnya untuk melaksanakan program Penyelidikan Umum, Eksplorasi, Studi Kelayakan, Pengembangan, Konstruksi, Penambangan, Pengolahan dan Penjualan yang berkenaan dengan Wilayah Kontrak Karya, serta siap dan bersedia untuk melanjutkan ke arah usaha-usaha tersebut sesuai dengan persyaratan-persyaratan dan ketentuan-ketentuan yang tercantum di dalam Persetujuan ini.

E. Pemerintah dan Perusahaan bersedia untuk bekerjasama dalam pengembangan sumber daya mineral atas dasar ketentuan-ketentuan dan Undang-Undang serta peraturan-peraturan Republik Indonesia, khususnya Undang-Undang Nomor 11 Tahun 1967 tentang Undang-Undang Pokok Pertambangan dan Undang-Undang Nomor 1 Tahun 1967 tentang Penanaman Modal Asing, dan perubahannya yaitu Undang-Undang Nomor 11 Tahun 1970 serta peraturan perundang-undangan yang berkaitan.

Maka, dengan memperhatikan janji bersama dan persetujuan serta persyaratan yang akan dirinci lebih lanjut untuk dilaksanakan dan ditepati oleh kedua belah pihak, dan dengan maksud agar terikat secara hukum, ditetapkanlah dan disetujui bersama kedua belah pihak sebagai berikut:

C. The Government, through the operation of Mining enterprises, is desirous of creating growth centers for regional development, creating more employment opportunities, encouraging and developing local business and ensuring that skills, know-how and technology are transferred to Indonesian nationals, acquiring basic data regarding and related to the country's Mineral resources and preserving, and rehabilitating the natural Environment for further development of Indonesia;

D. The Company through Battle Mountain Gold Company, a Company incorporated in Nevada has and has access to the information, knowledge, experience and proven technical and financial capability and other resources to undertake a program of General Survey, Exploration, Feasibility Study, Development, Construction, Mining, Processing and Marketing with respect to the Contract Area, and is ready and willing to proceed thereto under the terms and subject to the conditions set forth in this Agreement;

E. The Government and the Company are willing to cooperate in developing the Mineral resources hereinafter described on the basic provisions hereof and of the laws and regulations of the Republic of Indonesia, specifically Law No. 11 of 1967 on the Basic Provisions of Mining (Undang-Undang Pokok Pertambangan) and Law No.1 of 1967 on Foreign Capital Investment (Undang-Undang Penanaman Modal Asing) and its amendment Law No. 11 of 1970 and the relevant laws and regulations pertaining thereto.

NOW, THEREFORE, in consideration of the mutual promises, covenants and conditions hereinafter set out to be performed and kept by the Parties hereto, and intending to be legally bound hereby, it is stipulated and agreed between the Parties hereto as follows :

Pasal 1

D E F I N I S I

Istilah-istilah yang dicantumkan di bawah ini akan mempunyai arti sesuai pengertiannya masing-masing, dimanapun istilah itu muncul di dalam Persetujuan ini, baik ditulis dengan huruf besar maupun dengan huruf kecil.

1. "Afiliasi" dari suatu Badan berarti setiap Badan lain yang langsung ataupun tidak langsung, melalui satu atau lebih perantara, mengendalikan atau dikendalikan oleh atau berada di bawah pengendalian bersama dengan Badan termaksud. "Pengendalian" (termasuk istilah "dikendalikan oleh" dan "berada dibawah pengendalian bersama dengan" dan "mengendalikan") berarti pemilikan kemampuan, langsung ataupun tidak langsung untuk mempengaruhi keputusan-keputusan manajemen dan kebijaksanaan satu Badan. Dengan tidak membatasi pengertian umum tersebut di atas, pengaruh tersebut dianggap ada apabila sesuatu Badan memiliki langsung ataupun tidak langsung 25% atau lebih saham-sahain yang mempunyai hak suara daripada badan lainnya.

2. "Mineral Ikutan" dari suatu Mineral tertentu berarti Mineral-Mineral yang secara geologis terdapat bersama-sama dan tidak dapat dipisah-pisahkan dari dan harus ditambang dan diolah bersama dengan Mineral tertentu tersebut.

3. "Pemanfaatan" berarti penggunaan Lingkungan Hidup atau setiap unsur atau bagian dari Lingkungan Hidup yang mendatangkan manfaat bagi masyarakat, kesejahteraan, keselamatan atau kesehatan dan yang membutuhkan perlindungan dari akibat-akibat pembuangan-pembuangan, emisi dan pengendapan limbah.

4. "Cagar Alam dan Hutan Lindung " diartikan sebagai tercantum dalam Undang-Undang Kehutanan (Undang-Undang Nomor 5 Tahun 1967), dimana setiap pengelolaannya akan mengacu kepada keputusan bersama antara Menteri Pertambangan dan Energi dan Menteri Kehutanan yang berlaku dari waktu ke waktu tentang kebijaksanaan pelaksanaan pertambangan dalam wilayah hutan.

5 "Periode Konstruksi", berarti jangka waktu sebagaimana ditetapkan dalam Pasal 9 Persetujuan ini, selama waktu tersebut Perusahaan harus membangun tambang dan fasilitas-fasilitas yang berkaitan.

6. "Wilayah Kontrak Karya" berarti wilayah yang sebagaimana dirumuskan di Lampiran "A", Lampiran "B" dan Pasal 4 ayat (1) Persetujuan ini.

7. "Departemen", kecuali konteksnya menunjukkan lain, berarti badan Pemerintah yang bertugas melaksanakan Undang-Undang dan peraturan-peraturan pertambangan Indonesia.

Article 1

DEFINITIONS

The terms set forth below shall have the meanings therein set forth, respectively, wherever the same shall appear in this Agreement and whether or not the same shall be capitalized.

1. "Affiliate" of any Person means any other Person that directly, or indirectly through one or more intermediaries, controls or is controlled by or is under common control with, such Person. "Control" (including the terms "controlled by" and "under common control with" and "controls") means the possession, directly or indirectly, of the ability to direct the management and policies of a person. Without limiting the generality of the above, such ability is presumed to exist in a Person if it holds, directly or indirectly, 25% or more of the outstanding voting shares of another person.

2. "Associated Minerals" with respect to a particular Mineral means Minerals which geologically occur together with, are inseparable by mining from and must necessarily be mined and processed together with such Mineral.

3. "Beneficial Use" means a use of the Environment or any element or segment of the Environment that is conducive to public benefit, welfare, safety or health and which requires protection from the effects of waste discharges, emissions and deposits.

4. "Cagar Alam (Nature reserve) and Hutan Lindung (Protected Forest)" are defined based on the Forestry Law (Law Number-5, year 1967), wherein any undertaking would be governed by the joint decree which is in force from time to time, between the Minister of Mines and Energy and the Minister of Forestry on Policy guidance on the implementation of mining undertakings in forest areas.

5. "Construction Period" means the time period referred to in Article 9 of this Agreement during which the Company shall construct mining and related facilities.

6. "Contract Area" means that area described in Annex "A", Annex "B", and Article 4 paragraph (1) of this Agreement.

7. "Department", unless the context otherwise indicates, means that Government agency charged with the administration of the Indonesian Mining laws and regulations.

8. "Pengusahaan" berarti semua kegiatan Perusahaan yang ditetapkan di dalam atau dimaksudkan oleh Persetujuan ini, termasuk Penyelidikan Umum, Eksplorasi, Evaluasi, Pengembangan, Konstruksi, Penambangan, Operasi, Pengolahan, Penjualan, kegiatan pasca operasi dan semua kegiatan-kegiatan lainnya yang dilakukan oleh Perusahaan untuk tujuan atau sehubungan dengan Persetujuan ini.

9. "Lingkungan Hidup" berarti faktor-faktor fisik dan kimia alam sekitar kehidupan manusia, termasuk tanah, air, udara, iklim, suara, bau-bau yang merusak, selera dan faktor-faktor biologis dari hewan dan tumbuh-tumbuhan serta faktor-faktor sosial estetika, dengan tetap mengacu pada Undang-Undang Nomor 4 Tahun 1982 tentang Ketentuan-Ketentuan Pokok Pengelolaan Lingkungan Hidup.

10. "Individu Asing" atau "Orang Asing" berarti perorangan-perorangan yang bukan warga negara Indonesia.

11. "Eksplorasi" berarti mencari mineral-mineral dengan cara geologi, geofisika, geokimia termasuk penggunaan lubang bor, sumur uji, parit uji, galian dipermukaan atau di bawah tanah, lubang horizontal atau terowongan untuk memastikan adanya endapan-endapan mineral ekonomis dan untuk menentukan sifat, bentuk dan kadarnya dan kata "Mengeksplorasi" mempunyai makna yang sama.

12. "Wilayah Eksplorasi" berarti setiap bagian Wilayah Kontrak sehubungan dengan Eksplorasi selama Periode Eksplorasi.

13. "Periode Eksplorasi" berarti jangka waktu yang diatur dalam Pasal 6 Persetujuan ini selama jangka waktu tersebut Eksplorasi harus berlangsung.

14. "Studi Kelayakan" berarti studi-studi, sebagaimana diuraikan dalam Lampiran "E", untuk menetapkan Kelayakan Komersial dari pengembangan suatu endapan atau endapan-endapan mineral pada setiap bagian Wilayah Kontrak Karya.

15. "Periode Studi Kelayakan" berarti jangka waktu yang diatur dalam Pasal 8 Persetujuan ini selama jangka waktu tersebut Studi Kelayakan harus berlangsung.

16. "Mata Uang Asing" berarti setiap mata uang selain Rupiah.

17. "Penyelidikan Umum" berarti suatu penyelidikan atau suatu kegiatan eksplorasi pendahuluan yang dilakukan atas kenampakan umum tertentu dari suatu wilayah untuk menemukan tanda- tanda mineralisasi.

18. "Periode Penyelidikan Umum" berarti jangka waktu yang diatur dalam Pasal 5 Perjanjian ini selama jangka waktu tersebut Penyelidikan Umum harus berlangsung.

19. "Pemerintah" berarti Pemerintah Republik Indonesia, Menteri, Departemen, Badan, Lembaga, Pemerintah Daerah, Kepala Daerah Tingkat I atau Tingkat II nya.

8. "Enterprise" means all activities of the Company provided for in or contemplated by this Agreement, including the General Survey, Exploration, Evaluation, Development, Construction, Mining, Operating, Processing, Selling, post operation activities and all other activities by the Company for the purposes of or in connection with this Agreement.

9. "Environment" means physical and chemical factors of the surroundings of human beings, including land, water, atmosphere, climate, sound, odors, tastes and biological factors of animals and plants and the social factors of aesthetics; pursuant to Article 1 Law No. 4 of 1982 regarding the regulation of Environmental Management.

10. "Expatriate Individuals" or "Expatriates" means individuals who are non Indonesian nationals.

11. "Exploration" means the search for Minerals using Geological, geophysical and geochemical methods, including the use of boreholes, test pits, trenches, surface or underground headings, drifts or tunnels in order to locate the presence of economic Mineral deposits and to find out their nature, shape and grade, and "Explore" has a corresponding meaning.

12. "Exploration Area" means any part of the Contract Area subject to Exploration during the Exploration Period.

13. "Exploration Period" means the time period set forth in Article 6 of this Agreement during which Exploration shall occur.

14. "Feasibility Study" means studies, as described in Annex "E", to determine the feasibility of commercially developing a mineral deposit or deposits in any part of the Contract Area.

15. "Feasibility Study Period" means the time period set forth in Article 8 of this Agreement during which the Feasibility Study shall occur.

16. "Foreign Currency" means any currency other than Rupiah.

17. "General Survey" means an investigation or a preliminary Exploration carried out along certain broad features of an area for indications of mineralization.

18. "General Survey Period" means the time period set forth in Article 5 of this Agreement during which the General Survey shall occur.

19. "Government" means the Government of the Republic of Indonesia, its Ministers, Ministries, Departments, Agencies and Instrumentalities, and all Regional, Provincial or Dis uthorities.

20. "Mineral-Mineral" berarti semua endapan alamiah dan timbunan alamiah yang mengandung unsur-unsur kimia baik dalam bentuk unsur maupun dalam assosiasi atau senyawa kimia dengan unsur-unsur logam lain atau unsur-unsur bukan logam.

21. "Penambangan" berarti kegiatan pengambilan yang bertujuan untuk melakukan eksploitasi secara ekonomis satu atau lebih endapan bijih yang sudah diketahui, dan kata "Menambang" mempunyai makna yang sama.

22. "Wilayah Pertambangan" berarti semua daerah di dalam Wilayah Kontrak Karya yang mengandung endapan atau endapan-endapan Mineral yang secara ekonomis potensial, yang dipilih oleh Perusahaan untuk pengembangan pertambangan dan dinyatakan di atas peta dengan garis lintang dan garis bujur disertai penjelasannya, pada atau sebelum berakhirnya Periode Studi Kelayakan sebagaimana diuraikan dalam Pasal 8 Persetujuan ini dan di daerah mana Perusahaan akan memulai menambang.

23. "Menteri" kecuali konteksnya menunjukkan lain berarti orang yang bertugas pada waktu yang ditentukan sebagai Menteri dari Departemen Pertambangan dan Energi.

24. "Taman Nasional" berarti suatu wilayah hutan yang mempunyai fungsi khusus dimana di dalamnya dilarang melakukan setiap kegiatan yang bertujuan komersial termasuk usaha pertambangan.

25. "Person" ("Badan") berarti setiap perorangan, persekutuan, perusahaan, baik yang berbentuk badan hukum atau bukan badan hukum, dan semua badan dan perkumpulan lain yang menurut hukum berdiri secara tersendiri, baik yang berupa badan hukum maupun bukan badan hukum.

26. "Pencemaran" berarti setiap perubahan langsung atau tidak langsung sifat-sifat fisik, temperatur, kimia, biologi atau radioaktif dari setiap bagian Lingkungan Hidup yang disebabkan oleh buangan, emisi, atau endapan limbah sedemikian rupa sehingga secara fisik dan non fisik mempengaruhi manfaat, atau yang menyebabkan keadaan yang membahayakan atau berpotensi untuk membahayakan kesehatan, keselamatan, atau kesejahteraan umum atau kepada binatang, burung-burung, satwa liar, ikan atau kehidupan air, atau tumbuh-tumbuhan; dan kata "mencemari" mempunyai makna yang sama, dengan tetap mengacu pada Pasal 1 Undang-Undang Nomor 4 Tahun 1982 tentang Ketentuan-Ketentuan Pokok Pengelolaan Lingkungan Hidup.

27. "Pengolahan" berarti memproses bijih sesudah ditambang untuk menghasilkan suatu konsentrat mineral yang dapat dipasarkan atau suatu produk mineral yang dimurnikan, dan kata "Olah" mempunyai makna yang sama.

28. "Produk" berarti semua bijih, mineral, konsentrat, presipitat dan logam, termasuk produk yang dimurnikan, yang diperoleh sebagai hasil penambangan atau pengolahan sesudah dikurangi jumlah yang hilang, dibuang, yang rusak atau yang dipakai di penelitian, pengujian, penambangan, pengolahan atau pengangkutan.

20. "Minerals" means all natural deposits and natural accumulations containing chemical elements of all kinds, either in elemental form or in association or chemical combination with other metallic or non metallic elements.

21. "Mining," means recovery activities aimed at the economic exploitation of one or more identified deposits of Minerals, and "Mine" has a corresponding meaning.

22. "Mining Area" means all those territories within the Contract Area containing potentially economic mineral deposit or deposits which the Company selects for mining development and designates by latitude and longitude on maps and by description upon or before the expiration of the Feasibility Study Period as described in Article 8 of this Agreement and in which the Company shall propose to commence Mining.

23. "Minister", unless the context otherwise indicates, means that person who is acting at any given time as the Minister of the Department of Mines and Energy.

24. "National Park" means a forestry area having as special function wherein any commercial activities including mining enterprise are prohibited.

25. "Person" means any individual, partnership, corporation, wherever organized or incorporated, and all other judicially distinct entities and associations, whether or not incorporated.

26. "Pollution" means any direct or indirect alteration of the physical, thermal, chemical, biological or radioactive properties of any part of the Environment by the discharge, emission or deposit of Wastes so as to affect any Beneficial Use materially and adversely, or to cause a condition which is hazardous or potentially hazardous to public health, safety or welfare, or to animals, birds, wildlife, fish or aquatic life, or to plants, and "Pollute" has a corresponding meaning; pursuant to Article 1 Law No. 4 of 1982, regarding the Regulations of Environmental Management.

27. "Processing" means treatment of Mineral ore after it has been Mined to produce a marketable Mineral concentrate or a further refined Mineral Product, and "Process" has a corresponding meaning.

28. "Products" means all ores, Minerals, concentrates, precipitates and metals, including refined products, obtained as a result of Mining, or Processing, after deducting any quantities thereof which are lost, discarded, destroyed or used in research, testing, Mining, Processing or transportation.

29. "Wilayah Proyek" sehubungan dengan suatu Wilayah Pertambangan berarti wilayah di luar Wilayah Pertambangan atau suatu wilayah yang direncanakan untuk Wilayah Proyek seperti ditetapkan dalam laporan studi kelayakan bagi pengembangan pertambangan oleh Perusahaan yang diperlukan untuk fasilitas pengolahan dan prasarana lainnya sehubungan dengan pengembangan pertambangan termasuk didalamnya tambahan wilayah yang diperlukan untuk pengembangan pertambangan, dan pengolahan.

30. "Rupiah" berarti mata uang yang merupakan alat pembayaran yang sah di Indonesia.

31. "SIPP" berarti Izin Penyelidikan Pendahuluan yang diberikan oleh Direktorat Jenderal Pertambangan Umum untuk melakukan pekerjaan survai pendahuluan di dalam wilayah yang dicadangkan sebelum tanggal diberikannya Kontrak Karya, pada saat mana SIPP tersebut berakhir.

32. "Subsidiari" dari sesuatu Badan berarti setiap usaha yang dikendalikan oleh Badan tersebut melalui pemilikan langsung atau tidak langsung atas 50% (lima puluh persen) atau lebih saham yang diterbitkan yang mempunyai hak suara atau setiap usaha bersama atau usaha patungan yang dikendalikan oleh Person tersebut.

33. "Limbah" dalam hal ini meliputi setiap zat baik cairan, padatan, gas atau radioaktip yang dibuang, diemisi, atau diendapkan di dalam Lingkungan Hidup dalam jumlah, bentuk, jenis atau cara tertentu yang dapat menyebabkan perubahan Lingkungan Hidup.

34. "Undang-Undang Pajak Penghasilan 1994" berarti Undang-Undang Nomor 7 Tahun 1983 tentang Pajak Penghasilan, sebagaimana telah diubah terakhir dengan Undang-Undang Nomor 10 Tahun 1994, termasuk peraturan-peraturan pelaksanaannya.

35. "Undang-Undang Pajak Pertambahan Nilai 1994" berarti Undang-Undang Nomor 8 Tahun 1983 tentang Pajak Pertambahan Nilai Barang dan Jasa dan Pajak Penjualan atas Barang Mewah, sebagaimana telah diubah dengan Undang-Undang Nomor 11 Tahun 1994, termasuk peraturan-peraturan pelaksanaannya.

29. "Project Area" means, with respect to any Mining Area, an area outside such Mining Area heretofore designated as a Project-Area or any such area hereafter designated as a Project Area and delineated in a feasibility study report for Mining development by the Company as necessary or desirable for the Processing facilities and other infrastructure facilities related to such Mining development, including any additions to any such area required for Mining development or Processing.

30. "Rupiah" means the currency that constitutes legal tender in Indonesia.'

31. "SIPP" means the Preliminary Survey Licence(s) granted by the Directorate General of Mines to conduct a preliminary survey work in the granted area prior to the date of granting of this Contract of Work, which SIPP will thereupon expire.

32. "Subsidiary" of any Person means any corporation controlled by such Person through the direct or indirect ownership of fifty percent or more of the issued shares having power to vote or any partnership or joint venture controlled by such Person.

33. "Waste" includes any matter whether liquid, solid, gaseous or radioactive, which is discharged, emitted, or deposited in the Environment in such volume, consistency, type or manner as to cause a material and adverse alteration of the Environment.

34. "Income Tax Law 1994" shall mean Law Number 7 of 1983 concerning Income Tax as lastly amended by Law Number 10 of 1994, including the regulations promulgated thereunder.

35. "Value Added Tax Law 1994" shall mean Law Number 8 of 1983 concerning VAT on Goods and Services and Sales Tax on Luxury Goods as amended by Law Number 11 of 1994, including the regulations promulgated thereunder.

Pasal 2

PENUNJUKAN DAN TANGGUNG JAWAB PERUSAHAAN

1. Perusahaan dengan ini ditunjuk sebagai kontraktor tunggal dari Pemerintah yang berkenaan dengan Wilayah Kontrak Karya. Khususnya, Perusahaan akan diberi hak tunggal untuk melakukan Eksplorasi sesuatu Mineral di dalam Wilayah Kontrak Karya, menambang setiap endapan mineral yang ditemukan di dalam Wilayah Pertambangan, mengolah, menyimpan, dan mengangkut dengan cara apapun sesuatu Mineral yang dihasilkan, memasarkan, menjual atau melepaskan semua produksi dari tambang dan mengolah, di dalam dan di luar Indonesia, serta melakukan semua operasi serta kegiatan-kegiatan lainnya yang mungkin perlu atau memudahkan serta akan dilaksanakan dengan betul-betul memperhatikan persyaratan Persetujuan ini. Dalam pertimbangan untuk memberikan hak-hak tersebut, Perusahaan harus melaksanakan pekerjaan dan memenuhi kewajibannya yang ditentukan dalam Persetujuan ini, termasuk tanpa kecuali kewajiban untuk menyediakan biaya seperti disebutkan dalam Pasal 5 ayat (2), Pasal 6 ayat (6) dan dalam Pasal 7 ayat (5), kewajiban membayar pajak dan pungutan lainnya kepada Pemerintah seperti ditentukan dalam Pasal 12 dan 13 serta kewajiban mengikuti standar pertambangan yang disebutkan dalam Pasal 10, dan peraturan Lingkungan Hidup, Keselamatan dan Kesehatan Kerja seperti disebutkan pada Pasal 26.

2. Tanpa mengurangi Pasal 2 ayat (1) di atas, Perusahaan tidak akan menambang mineral radioaktif, persenyawaan-persenyawaan hidrokarbon, batubara dan mineral industri tanpa sebelumnya memperoleh persetujuan dari Pemerintah. Dalam hal Pemerintah bermaksud mengembangkan endapan-endapan mineral radioaktif, batubara, atau mineral industri di dalam Wilayah Kontrak Karya dan Perusahaan tidak berniat untuk melaksanakannya, Perusahaan harus dengan itikad baik dan semangat kerjasama mempertimbangkan syarat-syarat pengembangan tersebut oleh Pemerintah atau pihak lain, dengan ketentuan bahwa pengembangan tersebut tidak akan menghalangi Perusahaan untuk melaksanakan hak-haknya berdasarkan Pasal 2 ayat (1) Persetujuan ini.

3. Pemerintah memberikan hak kendali dan manajemen tunggal kepada Perusahaan atas semua kegiatannya berdasarkan Persetujuan ini dan oleh karenanya akan mempunyai tanggung jawab penuh serta memikul semua risiko atasnya dan sesuai dengan ketentuan-ketentuan dan persyaratan-persyaratan dari Persetujuan ini. Tanpa mengurangi tanggung jawab dan kewajiban-kewajiban berdasarkan Persetujuan ini, Perusahaan dapat memperkerjakan sub kontraktor-sub kontraktor terdaftar baik yang berafiliasi atau tidak dengan Perusahaan untuk melaksanakan tahap-tahap operasinya apabila dipandang perlu oleh Perusahaan, termasuk pembangunan fasilitas dan keperluan-keperluan teknik, manajemen dan pelayanan administrasi. Laporan-laporan dari sub kontraktor tersebut yang ada hubungannya dengan operasi Perusahaan menurut Persetujuan ini harus selalu tersedia, bagi pengawas-pengawas Pemerintah.

Article 2

APPOINTMENT AND RESPONSIBILITY OF THE COMPANY

1 The Company is hereby appointed the sole contractor for the Government with respect to the Contract Area. In particular, the Company shall be granted the sole rights to Explore for certain Minerals in the Contract Area, to Mine any deposit of Minerals found in the Mining Area, to Process, store, and transport by any means certain Minerals extracted therefrom, to market, sell or dispose of all the Products of such Mining and Processing, inside and outside Indonesia, and to perform all other operations and activities which may be necessary or convenient in connection therewith, with due observance of the requirements of this Agreement. In consideration for the grant of such rights, the Company shall perform the work and carry out the obligations imposed on it by this Agreement, including, without limitation, the obligation to make expenditures as provided in paragraph 2 of Article 5, in paragraph 6 of Article 6 and in paragraph 5 of Article 7, the obligation to pay taxes and other charges to the Government as provided in Article 12 and 13 and the obligation to adhere to the Mining standards described in Article 10 and to the Environmental, safety and health standards described in Article 26.

2. Notwithstanding paragraph 1 of this Article 2, the Company shall not mine any radioactive minerals, hydrocarbon compounds, coal and industrial minerals without first obtaining the approval of the Government. In the event that the Government is desirous of developing deposits of radioactive minerals, coal, or industrial minerals in the Contract Area and the Company is unwilling to do so, the Company shall, in good faith and in a spirit of cooperation, consider the terms under which such development by the Government or other parties might take place, provided that such development shall not prevent the Company from exercising its rights under Article 2, paragraph 1 of this Agreement.

3. The Government authorizes the Company to have the sole control and management of all of the Company's activities under this Agreement and the Company shall have full responsibility therefor and shall assume all risk with respect thereto in accordance with the terms and conditions of this Agreement. Without in any way detracting from the Company's responsibilities and obligations hereunder, the Company may engage registered sub-contractors, whether or not affiliates to the Company, for the execution of such phases of its operation as the Company deems appropriate, including contracting for construction of facilities and for necessary technical, management and administrative services. The records of such subcontractors relative to operations for the Company, under this Agreement shall be made available to Government inspectors.

4. Perusahaan harus mengambil langkah-langkah yang wajar untuk mencegah kerusakan terhadap hak-hak dan milik Pemerintah ataupun pihak ketiga. Dalam hal kelalaian berada dipihak Perusahaan atau perwakilannya ataupun oleh sub kontraktor yang melaksanakan operasi atau kegiatan untuk Perusahaan berdasarkan Persetujuan ini, Perusahaan atau sub kontraktor yang terdaftar sesuai dengan kejadiannya, akan dikenakan sanksi berdasarkan Undang-Undang yang berlaku di Indonesia.

4. The Company shall take all reasonable measures to prevent damage to the rights and property of the Government or third parties. In the event of negligence on the part of the Company or its agents or of any sub-contractor carrying on operations or activities for the Company under this Agreement, the Company or such registered sub-contractor, as the case may be, shall be liable for such negligence in accordance with the laws of Indonesia.

Pasal 3

MODUS OPERANDI

1. Perusahaan adalah suatu badan usaha yang didirikan berdasarkan Undang-Undang Republik Indonesia dan berkedudukan di Indonesia serta tunduk kepada Undang-Undang dan yurisdiksi pengadilan di Indonesia yang biasanya mempunyai kewenangan hukum atas perusahaan-perusahaan yang melakukan kegiatan usaha atau yang tergabung didalamnya. Perusahaan harus mendirikan kantor pusat di Indonesia di tempat mana yang mudah untuk menerima setiap pemberitahuan dan komunikasi resmi serta komunikasi hukum lainnya. Apabila perusahaan mendirikan kantor pusat di luar wilayah propinsi dimana Wilayah Kontrak Karya berada, maka perusahaan harus mendirikan kantor perwakilan/penghubung di ibu kota propinsi tersebut.

2. Perusahaan menyusun suatu program Pengusahaan, dimulai dengan suatu Penyelidikan Umum di Wilayah Kontrak Karya diikuti dengan Eksplorasi di daerah-daerah yang terpilih. Seluruh program akan dibagi dalam lima Periode atau tahap, yang selanjutnya akan disebut sebagai "Periode Penyelidikan Umum", "Periode Eksplorasi", "Periode Studi Kelayakan", "Periode Konstruksi" dan "Periode Operasi", berturut-turut sebagaimana dirumuskan lebih lanjut dalam Pasal-Pasal bersangkutan.

3. Perusahaan dapat mengkontrakkan pekerjaan jasa-jasa teknis, manajemen dan administrasi yang dianggap perlu, dengan ketentuan bahwa Perusahaan tidak akan dibebaskan dari setiap kewajibannya yang manapun berdasarkan Persetujuan ini. Dalam hal jasa-jasa tersebut dikontrakkan kepada Afiliasi, maka pemberian jasa tersebut hanya diperkenankan dengan harga yang tidak lebih tinggi dari harga yang ditetapkan oleh Perusahaan yang bukan Afiliasi dengan persyaratan-persyaratan, ketentuan-ketentuan dan standar yang sama dalam melakukan jasa-jasa tersebut. Semua pembebanan itu harus wajar dan layak dan dapat dipertanggung jawabkan sesuai dengan prinsip akuntansi yang diterapkan secara konsisten. Atas permintaan dari Departemen, Perusahaan harus memberikan bukti-bukti yang membenarkan semua pembebanan itu.

4. Perusahaan berjanji untuk melakukan semua kegiatan sesuai dengan cara dan tunduk kepada persyaratan-persyaratan dalam Pasal 2 Persetujuan ini dan melanjutkan semua kegiatan tersebut, pada waktu Periode Penyelidikan Umum, Eksplorasi, Studi Kelayakan dan Konstruksi tanpa interupsi, tunduk pada Pasal 19 dan Pasal 22, selama jangka waktu Persetujuan ini, dengan ketentuan bahwa kegiatan-kegiatan tersebut boleh diinterupsi atau ditunda dengan persetujuan Departemen. Setiap interupsi atau penundaan tersebut tidak boleh mempengaruhi hak-hak dan kewajiban kedua belah pihak di bawah Persetujuan ini.

Article 3

MODUS OPERANDI

1. The Company is incorporated under the laws of the Republic of Indonesia and domiciled in Indonesia, and shall be subject to the laws and the jurisdiction of courts in Indonesia which normally have jurisdiction over corporations doing business or incorporated therein. The Company shall maintain in a favorable place in Indonesia a principal office for receipt of any notification or other official or legal communication. If the Company establish a principal office outside territory of the Province within which the Contract Area is located, the Company shall maintain a representative/liaison office in the capital of such Province.

2. The Company contemplates a program for the Enterprise commencing with a General Survey of the Contract Area followed by Exploration on selected areas. The whole program will be divided into five periods or stages hereinafter referred to as "General Survey Period", "Exploration Period", "Feasibility Study Period", "Construction Period" and "Operating Period", respectively as further defined in the following Articles hereof.

3. The Company may contract for necessary technical, management and administrative services, provided that it shall not be released from any of its obligations hereunder. In the event that such services are contracted from Affiliates, such services shall be obtained only at a charge not more than a non-affiliated party with equivalent qualifications to perform such services would charge for provision of such services to equivalent standards. All such charges should be fair and reasonable and accounted for in accordance with generally accepted accounting principles consistently applied. The Company shall produce on request by the Department evidence verifying all such charges.

4. The Company undertakes to conduct all activities hereunder in the manner and subject to the conditions of Article 2 of this Agreement and to continue such activities, during the General Survey, Exploration, Feasibility Study and Construction Periods of this Agreement without interruption subject to Article 19 and Article 22, during the term of this Agreement, provided that such activities may be interrupted or suspended with the concurrence of the Department. Any such interruption or suspension shall not affect the mutual rights and obligations of the Parties hereto under this Agreement.

Pasal 4

WILAYAH KONTRAK KARYA

1. Wilayah Kontrak Karya ialah wilayah yang dirumuskan di Lampiran "A" dari Persetujuan ini yang dirubah karena pengurangan dan perluasan sebagaimana adanya sesuai dengan Persetujuan ini, tidak termasuk di dalamnya.

   (i) Kuasa Pertambangan yang telah diberikan oleh Pemerintah untuk Mineral golongan A dan B (seperti didaftarkan di Lampiran "C");

   (ii) Kuasa Pertambangan yang telah diberikan oleh Pemerintah untuk Mineral golongan C (seperti didaftarkan di Lampiran "C"); dan

   (iii) Wilayah Pertambangan Rakyat;

   yang telah dinyatakan ada sebelum diterbitkan surat persetujuan prinsip dari Pemerintah tentang pemberian izin Wilayah Kontrak Karya, seperti didaftarkan di Lampiran "C" yang diikutsertakan pada dan menjadi bagian dari Persetujuan ini.

2. Dalam hal terdapat wilayah Kuasa Pertambangan yang tidak termasuk Wilayah Kontrak Karya oleh karena ketentuan di atas, atau yang pada tanggal surat persetujuan prinsip dari Pemerintah mengenai pemberian Wilayah Kontrak Karya berbatasan dengan Wilayah Kontrak Karya berakhir, dibatalkan, diciutkan atau oleh sebab apapun Wilayah Kuasa Pertambangan tersebut menjadi bebas, atau suatu dari daerah tersebut menjadi tersedia, maka Perusahaan dapat memohon perluasan sesuai peraturan dan perundang-undangan yang berlaku dari waktu ke waktu. Setiap wilayah yang dimasukkan dengan cara demikian itu akan berada dalam Tahap yang tidak lebih lambat dengan Tahap kegiatan yang sedang berjalan yang berlaku bagi setiap bagian Wilayah Kontrak Karya.

3. Perusahaan dapat, dengan permohonan tertulis kepada Departemen, melepaskan semua atau suatu bagian dari Wilayah Kontrak Karya pada setiap waktu dan sewaktu-waktu selama jangka waktu Persetujuan ini. Setiap permohonan seperti itu harus diserahkan dengan laporan pelepasan, yang berisi semua penemuan-penemuan teknis dan geologis yang diperoleh Perusahaan di wilayah yang akan dilepaskan dan alasan-alasan pelepasan dengan disertai data lapangan dari kegiatan-kegiatan yang telah dilakukan di wilayah-wilayah tersebut. Semua data dasar dari wilayah yang dilepaskan harus diserahkan kepada Departemen dan akan menjadi milik Pemerintah. Perusahaan melalui pelepasan wilayah (termasuk penciutan sesuai ayat ini, Pasal 5 ayat (5) dan Pasal 6 ayat (2)), harus, mengurangi Wilayah Kontrak Karya:

   (i) pada saat atau sebelum berakhirnya Periode Penyelidikan Umum sampai tidak lebih dari 75% (tujuh puluh lima persen) Wilayah Kontrak Karya semula;

Article 4

CONTRACT AREA

1. Contract Area is the area defined in Annex "A" to this Agreement as changed by reductions and extensions as the case may be in accordance with this Agreement, excluding therefrom,

   (i) Mining Authorizations granted by the Government for Category A and B Minerals (as defined in Annex "C");

   (ii) Mining Authorizations granted by the Government for Category C Minerals (as defined in Annex "C"); and

   (iii) People Mining's right;

   declared before the date of the letter of approval in principle by the Government of the award of the Contract Area, and as set forth in Annex "C" attached to and hereby made part of this Agreement.

2. In the event that any areas covered by Mining Authorization which were excluded from the Contract Area by the definition thereof or which on the date of the letter of approval in principle by the Government of the award of the Contract Area had a common boundary with the Contract Area lapse, are canceled or are relinquished, or by any means the area of such Authorizations becomes vacant, or any such area otherwise become available, then, the Company may apply for an extension of the Contract Area in accordance with prevailing regulations from time to time in effect. Any area so included shall fall into the Period which is not later than the current Period which then applies to any part of the Contract Area.

3. The Company may, by written application to the Department, relinquish all or any part of the Contract Area at any time and from time to time during the term of this Agreement. Any such application shall be submitted with a relinquishment report stating all technical and geological findings the Company has made with respect to the relinquished areas and the reasons for the relinquishment, supported by field data of activities undertaken in those areas. All basic data with respect to the relinquished areas shall be submitted to the Department and become the property of the Government. The Company through relinquishment (including relinquishment pursuant to this paragraph, paragraph 5 of Article 5 and paragraph 2 of Article 6), shall, reduce the Contract Area :

   (i) on or before the end of the General Survey Period, to not more than seventy five percent (75 %) of the original Contract Area ;

(ii) pada saat atau sebelum ulang tahun kedua dimulainya Periode Eksplorasi sampai tidak lebih dari 50% (lima puluh persen) Wilayah Kontrak Karya semula; dan

(iii) pada saat atau sebelum berakhirnya Studi Kelayakan sampai tidak lebih dari 25% (dua puluh lima persen) Wilayah Kontrak Karya semula,

4. Perusahaan harus melakukan pekerjaan di dalam Wilayah Kontrak Karya dengan tujuan untuk menetapkan/membatasi Wilayah Pertambangan untuk pengembangan selama jangka waktu Persetujuan ini. Rencana pengembangan Perusahaan harus mencakup kapasitas yang direncanakan dari masing-masing operasi penambangan dan pengolahan dan setiap pekerjaan evaluasi lanjutan yang diperlukan seperti tercantum dalam Studi Kelayakan, dan kegiatan eksplorasi lainnya. Bagian-bagian Wilayah Kontrak Karya yang tidak termasuk dalam rencana pengembangan Perusahaan dimaksud harus dikembalikan kepada Pemerintah berikut semua data geologi, eksplorasi, metalurgi dan data lainnya yang berhubungan dengan bagian-bagian daerah tersebut, dan bagian Wilayah Kontrak Karya yang dipertahankan selanjutnya disebut Wilayah Pertambangan.

5. Setiap penyerahan daerah dalam Pasal ini tidak mengurangi kewajiban atau tanggung jawab yang manapun yang dikenakan oleh atau yang timbul berdasarkan Persetujuan ini sebelum tanggal berlakunya penyerahan tersebut.

(ii) on or before the second anniversary of commencement of the Exploration Period, to not more than fifty percent (50%) of the original Contract Area; and

(iii) on or before the end of the Feasibility Study, to not more than twenty-five percent (25 %) of the original Contract Area.

4. The Company shall conduct work within the Contract Area with the objective of delineating Mining Areas for development during the term of this Contract. The Company's development plans shall include the intended capacity of each mining and processing operation and any further evaluation work required as provided in the Feasibility Study and other exploration activities. Those parts of the Contract Area not included in an intended development plan of the Company should be returned to the Government, with all the basic geological, exploration, metallurgical and other data related to those parts, and that part of the Contract Area that remains shall thereafter be referred to as the Mining Area.

5. Any surrender of areas under this Article shall be without prejudice to any obligation or liability imposed by or incurred under this Agreement prior to the effective date of such surrender.

Pasal 5

PERIODE PENYELIDIKAN UMUM

1. Perusahaan harus memulai sesegera mungkin tetapi tidak lebih lambat dari 6 (enam) bulan setelah penandatanganan Persetujuan ini, suatu Penyelidikan Umum atas Wilayah Kontrak Karya untuk menentukan di bagian mana dari Wilayah Kontrak Karya endapan-endapan mineral sangat mungkin terdapat. "Periode Penyelidikan Umum" akan berakhir 12 (dua belas) bulan setelah tanggal dimulainya Penyelidikan Umum atau pada saat yang lebih awal dalam suatu areal dalam Kontrak Karya yang mana Perusahaan telah memberitahukan kepada Departemen bahwa Perusahaan menetapkan untuk melanjutkan ke Periode Eksplorasi sesuai ayat (6) Pasal ini. Dengan hal seperti di atas berdasarkan permohonan oleh Perusahaan sesuai dengan Pasal 23 ayat (3.ii) Departemen dapat memberikan perpanjangan Periode Penyelidikan Umum sekali selama 12 (duabelas) bulan.

   Dalam hal Surat Izin Penyelidikan Pendahuluan (SIPP) diberikan sebelum penandatanganan Kontrak Karya, sesuai dengan Keputusan Menteri Pertambangan dan Energi No. 2202.K/201/M.PE/1994 tanggal 18 Nopember 1994 tentang Pemberian Surat Izin Penyelidikan Pendahuluan Dalam Rangka Penanaman Modal Asing atau Penanaman Modal Dalam Negeri di Bidang Pertambangan Umum, tahap Periode Penyelidikan Umum diatur sebagai berikut :

   (i) apabila SIPP diberikan dan kegiatan lapangan dilaksanakan untuk selama 1 (satu) tahun atau kurang, maka Penyelidikan Umum tersebut dapat diperpanjang selama 1 (satu) tahun;

   (ii) apabila SIPP tersebut diperpanjang dan kegiatan lapangan dilaksanakan selama 2 (dua) tahun penuh, maka tahap Penyelidikan Umum tidak dapat diperpanjang; dan

   (iii) apabila SIPP tersebut diperpanjang akan tetapi kegiatan lapangan berlangsung kurang dari 2 (dua) tahun, maka tahap Penyelidikan Umum tersebut dapat diperpanjang untuk selama sisa jangka waktu perpanjangan SIPP tersebut.

2. Pada akhir 12 (duabelas) bulan pertama dari Periode Penyelidikan Umum, termasuk tahap dari SIPP, Perusahaan harus telah mengeluarkan tidak kurang dari US$ 130,00 (seratus tiga puluh Dollar Amerika Serikat) untuk setiap kilometer persegi Wilayah Kontrak Karya, bagi biaya lapangan. Pengeluaran tersebut akan termasuk didalamnya biaya pengorganisasian dan biaya administrasi yang langsung berhubungan dengan kegiatan lapangan berdasarkan Persetujuan ini.

3. Jika pada akhir 12 (duabelas) bulan pertama dari Periode Penyelidikan Umum atau setiap saat sesudah itu, diketahui oleh Departemen setelah mempertimbangkan alasan-alasan khusus bahwa Perusahaan benar-benar telah melalaikan kewajiban-kewajibannya berkenaan dengan pengeluaran minimum sebagaimana tercantum

Article 5

GENERAL SURVEY PERIOD

1. The Company shall commence, as soon as possible and not later than six (6) months after the signing of this Agreement, a General Survey of the Contract Area to determine in what parts of the Contract Area deposits of Minerals are most likely to occur. The "General Survey Period" shall end twelve (12) months after the date of commencement of the General Survey or at such earlier date in respect of a part of the Contract Area for which the Company has notified the Department that it elects to proceed with the Exploration Period pursuant to paragraph 6 of this Article. Notwithstanding the above, upon application by the Company under paragraph 3(ii) of Article 23 the Department may extend the term of the General Survey Period by one (1) twelve (12) month period.

   In the event a Preliminary General Survey Period License (SIPP) is granted prior to the signing of this Agreement in accordance with Ministerial Decree No. 2202.K/201/M.PE/1994 date November 18, 1994, concerning Preliminary Survey License for Foreign or Domestic Investment in General Mines, the period of General Survey phase shall be as follow :

   (i) if the SIPP is granted and field work has been carried out for one (1) year or less the General Survey Period may be extended for one (1) year;

   (ii) if such SIPP License is extended and field work has been carried out for full two (2) years the General Survey Period shall not be extended; and

   (iii) if such SIPP License is extended but field work has been carried out less than two (2) years then General Survey Period may be extended for a period of unexpired portion of the extension of SIPP.

2. By the end of the first twelve (12) months of the General Survey Period, including the SIPP Period, the Company shall have spent, with respect to the Contract Area, not less than one hundred and thirty United States Dollars (US$ 130.00) per square kilometer of the Contract Area on field expenditure. Such expenditures may include general organizational overhead and administrative expenses directly connected with field activities under this Agreement.

3. If at the expiration of the first twelve (12) months of the General Survey Period, it appears to the Department having considered the specific circumstances that the Company has seriously neglected its obligations with respect to minimum

dalam ayat (2) Pasal ini, maka Departemen dapat mensyaratkan Perusahaan untuk menyerahkan kepada Departemen suatu jaminan yang tidak akan melebihi jumlah kewajiban pengeluaran yang belum dipenuhi atau Departemen akan menyampaikan rekomendasi kepada Pemerintah agar Perjanjian ini diakhiri. Jaminan tersebut dengan jumlah tertentu dalam bentuk uang jaminan atau jaminan bank sesudah jangka waktu 3 (tiga) tahun sejak penandatanganan Persetujuan ini dapat menjadi milik Pemerintah dalam hal Perusahaan gagal memenuhi kewajiban-kewajiban pengeluarannya. Kecuali terjadi pemindahan pemilikan seperti tersebut di atas, jaminan tersebut akan dicairkan pada akhir Periode 3 (tiga) tahun tersebut.

4. Sehubungan dengan kewajiban-kewajiban Perusahaan dalam Pasal ini, Perusahaan harus menyerahkan kepada Departemen, dalam waktu 2 (dua) bulan dari berakhirnya Periode Penyelidikan Umum, satu laporan yang berisi jenis dan jumlah pengeluaran selama Periode Penyelidikan Umum. Perusahaan akan melengkapi laporan tersebut dengan bukti-bukti pengeluaran (dokumentasi) yang wajar, jika Departemen menghendaki demikian.

5. Perusahaan dapat setiap waktu menghentikan Penyelidikan Umum atas suatu bagian atau beberapa bagian Wilayah Kontrak Karya, dengan alasan bahwa kelanjutan dari Penyelidikan umum itu tidak lagi layak secara komersial ataupun tidak lagi praktis untuk diusulkan dan Perusahaan akan meminta secara tertulis kepada Departemen dengan memperhatikan betul-betul Pasal 4 ayat (3) untuk melepaskan suatu bagian atau beberapa bagian Wilayah Kontrak Karya tersebut. Bersamaan dengan itu, maka Wilayah Kontrak Karya akan dikurangi sampai menjadi wilayah yang tersisa setelah pelepasan tersebut.

6. Jika sewaktu-waktu selama Periode Penyelidikan Umum, Perusahaan menemukan endapan-endapan mineral di suatu bagian atau beberapa bagian dari Wilayah Kontrak Karya dan memutuskan untuk melanjutkan ke Tahap Eksplorasi dari satu atau lebih endapan tersebut, Perusahaan harus mengajukan satu permohonan tertulis dan penjelasannya kepada Departemen dan akan menetapkan satu atau lebih Wilayah Eksplorasi dari endapan atau endapan-endapan tersebut dan akan memulai kegiatan eksplorasi didalamnya, tanpa mempengaruhi hak-hak dan kewajiban-kewajibannya berdasarkan Persetujuan ini atas daerah-daerah lainnya.

expenditures as provided in paragraph 2 of this Article, the Department may require the Company to deliver to the Department a guarantee to a sum which shall not exceed the total outstanding expenditure obligations remaining unfulfilled or otherwise the Department may recommend the Government to terminate the Agreement. Such guarantee in the form of a bond or a Banker's Guarantee may at the end of the three (3) years period commencing on the date of the signing of this Agreement be forfeited to the Government to the extent that the Company shall have failed to fulfill such expenditure obligations. Except to the extent of any such forfeiture, such guarantee shall be released at the end of such three year period.

4. In connection with the Company's obligations under this Article, the Company shall submit to the Department, within two (2) months after the end of the General Survey Period, a report setting forth the items and amounts of expenditure during such Period. The Company shall be prepared to support such report with reasonable documentation of expenditures should the Department so request.

5. The Company may at any time discontinue the General Survey with respect to any part or parts of the Contract Area on the grounds that the continuation of such General Survey is no longer commercially feasible or practical and shall apply in writing to the Department in accordance with paragraph 3 of Article 4 for the relinquishment of such part or parts of the Contract Area. The Contract Area shall thereby be reduced to the area which remains after such relinquishment.

6. If, at any time or times during the General Survey Period, the Company discovers deposits of Minerals in any part or parts of the Contract Area and decides to proceed into the Exploration Period with respect to one or more of such deposits, it shall submit a written notice and explanation to such effect to the Department and shall establish one or more Exploration Areas with respect to such deposit or deposits and begin the Exploration thereof without affecting its rights and obligations under this Agreement in respect of other portions of the Contract Area.

Pasal 6

PERIODE EKSPLORASI

1. Setelah menyelesaikan Penyelidikan Umum, Perusahaan harus memulai Periode Eksplorasi. Perusahaan harus bekerja berdasarkan program eksplorasi selama Periode Eksplorasi. Program Eksplorasi tersebut akan meliputi penyelidikan geologi, geofisika dan geokimia secara rinci serta kegiatan pengambilan contoh, pembuatan sumur uji dan pemboran bilamana dianggap perlu oleh Perusahaan. Perusahaan harus mengajukan rencana kerja dan anggaran tahunan kepada Departemen. Dalam tahun pertama Periode Eksplorasi, rencana dan anggaran tersebut sepenuhnya ditetapkan oleh Perusahaan. Jika pada akhir tahun pertama Perusahaan terbukti tidak mengeluarkan biaya sejumlah minimum 80% (delapanpuluh persen) dari anggaran tersebut, Departemen dapat merekomendasikan kepada Pemerintah agar Perjanjian ini diakhiri.

   Setiap pengeluaran selama Periode Penyelidikan Umum (termasuk SIPP) yang dilakukan oleh Perusahaan dimana pengeluaran tersebut menyangkut jenis kegiatan Eksplorasi dan setelah dipertimbangkan oleh Departemen karena alasan yang khusus, maka apabila pengeluaran tersebut melebihi pengeluaran yang ditetapkan pada Pasal 5 ayat (2), kelebihan tersebut dapat dipertimbangkan sebagai bagian pengeluaran untuk memenuhi pengeluaran Periode Eksplorasi sebagaimana ditetapkan pada Pasal 6 ayat (6). Pengeluaran-pengeluaran Eksplorasi, dapat mencakup pengeluaran-pengeluaran umum untuk pengorganisasian dan administrasi yang langsung berkaitan dengan kegiatan lapangan berdasarkan Persetujuan ini.

2. Perusahaan dapat sewaktu-waktu menghentikan Eksplorasi di setiap bagian atau beberapa bagian Wilayah Kontrak Karya dengan alasan bahwa kelanjutan dari Eksplorasi tersebut tidak lagi layak atau praktis secara komersial, dan Perusahaan harus meminta secara tertulis kepada Departemen dengan memperhatikan Pasal 4 ayat (3) untuk pelepasan atas sebagian atau beberapa bagian wilayah eksplorasi tersebut. Bersamaan dengan itu maka Wilayah Kontrak Karya akan dikurangi sampai wilayah yang dipertahankan setelah pelepasan tersebut.

3. Jika sewaktu-waktu selama Periode Ekplorasi, Perusahaan menemukan satu atau lebih endapan mineral yang diduga mempunyai kadar dan jumlah komersial disatu bagian atau beberapa bagian Wilayah Eksplorasi dan memutuskan untuk mengevaluasi lebih lanjut pada bagian tersebut, Perusahaan harus mengajukan suatu pemberitahuan tertulis kepada Departemen tentang hal tersebut dan bagian Wilayah Eksplorasi tersebut memasuki Periode Studi Kelayakan tanpa mengurangi hak-hak dan kewajiban-kewajiban Perusahaan berdasarkan Persetujuan ini atas sisa Wilayah Kontrak Karya tersebut.

4. Periode Eksplorasi akan:

   (i) mulai segera setelah berakhirnya Periode Penyelidikan Umum, dan

Article 6

EXPLORATION PERIOD

1. Upon completion of the General Survey, the Company shall commence the Exploration Period. During the Exploration Period, the Company shall engage in an Exploration program. The Exploration program shall include such detailed geology, geophysics and geochemistry and such sampling, pitting, and drilling activities as the Company considers appropriate. The Company shall submit to the Department an annual work program and budget. In the first year of the Exploration Period, such program and budget shall be is solely decided by the Company. If at the end of the first year the Company has not spent an amount of minimum 80% of such budget, the Department may recommend the Government to terminate the Agreement.

   Any expenditure upon Exploration type activities incurred by the Company and approved by the Department, having considered the specific circumstances, during the General Survey Period (including the SIPP period(s)) above the amount required to satisfy paragraph 2 of Article 5 shall be considered to be part of the amount spent in the Exploration Period to satisfy this Paragraph 1 of Article 6. Exploration expenses may include general organizational overhead and administrative expenses directly connected with field activities under this Agreement.

2. The Company may at any time discontinue Exploration in any part or parts of the Contract Area on the grounds that the continuation of such Exploration is no longer commercially feasible or practical and shall apply in writing to the Department in accordance with paragraph 3 of Article 4 for the relinquishment of such Exploration Area from the Contract Area. The Contract Area shall thereby be reduced to the area which remains after such relinquishment.

3. If at any time prior to the end of the Exploration Period the Company discovers one or more deposits of minerals of apparent commercial grade and quantity in any Exploration Area and decides to proceed with further evaluation thereof, it shall submit a written notice to such effect to the Department and enter into the Feasibility Study Period with respect to such Exploration Area without affecting its rights and obligations under this Agreement in respect of the balance of the Contract Area.

4. The Exploration Period shall:

   (i) commence immediately following the end of the General Survey Period; and

(ii) berakhir 36 (tiga puluh enam) bulan berikutnya, kecuali bagi suatu Wilayah Eksplorasi akan berakhir pada suatu tanggal lebih dahulu jika Periode Studi Kelayakan sudah harus dimulai di wilayah tersebut.

Tanpa mengurangi sub ayat (ii), atas permohonan oleh Perusahaan sesuai Pasal 23 ayat (3.ii), Departemen dapat memperpanjang waktu Periode Eksplorasi dua kali berturut-turut selama 12 (dua belas) bulan

5. Sebelum Periode Eksplorasi berakhir, Perusahaan harus memberitahukan kepada Departemen apakah Perusahaan berkeinginan atau tidak untuk melanjutkan ke Periode Studi Kelayakan pada setiap Wilayah Eksplorasi. Dalam hal Perusahaan memberitahukan kepada Departemen, bahwa Perusahaan tidak ingin melanjutkan ke Periode Studi Kelayakan dari suatu Wilayah Eksplorasi, maka pemberitahuan tersebut harus merupakan permohonan tertulis ke Departemen sesuai Pasal 4 ayat (3) mengenai pelepasan dari Wilayah Eksplorasi yang dimaksud. Dalam hal itu Perusahaan harus menyerahkan kepada Departemen:

(i) peta-peta yang menunjukkan semua tempat dalam Wilayah Eksplorasi dimana Perusahaan telah mengadakan pemboran atau menggali sumur-sumur;

(ii) salinan daftar dari lubang-lubang bor (drilling log) dan sumur-sumur tersebut dan hasil pemeriksaan dari contoh yang telah dianalisa yang diambil, dan

(iii) salinan dari setiap peta geologi atau geofisika dan geokimia dari Wilayah Eksplorasi yang seharusnya telah disiapkan oleh Perusahaan.

Setiap pelepasan wilayah demikian tidak mengurangi kewajiban atau tanggung jawab yang dikenakan oleh atau yang terjadi berdasarkan Persetujuan ini terhadap Perusahaan sebelum tanggal berlakunya pelepasan wilayah tersebut.

6. Selama Periode Eksplorasi, Perusahaan harus mengeluarkan tidak kurang dari US$ 1.000,00 (seribu Dollar Amerika Serikat) untuk setiap kilometer persegi bagi kelanjutan kegiatan eksplorasi di Wilayah Kontrak Karya. Jika pada akhir dari 36 (tiga puluh enam) bulan sejak permulaan Periode Eksplorasi atau setiap saat sesudah itu, diketahui oleh Departemen setelah mempertimbangkan alasan-alasan khusus bahwa Perusahaan benar-benar melalaikan kewajiban-kewajiban pengeluaran minimum sebagaimana tercantum dalam ayat ini, maka Departemen dapat mensyaratkan Perusahaan untuk menyerahkan kepada Departemen suatu jaminan dalam bentuk uang jaminan atau Jaminan Bank sejumlah tertentu, yang tidak akan melebihi jumlah kewajiban pengeluaran yang belum dipenuhi. Jaminan tersebut, pada akhir Periode Eksplorasi akan menjadi milik Pemerintah dalam hal Perusahaan gagal memenuhi kewajiban-kewajiban pengeluarannya. Kecuali terjadi pemindahan pemilikan seperti tersebut diatas jaminan itu akan dicairkan pada akhir Periode Eksplorasi.

(ii) end thirty six (36) months thereafter; provided that, with respect to any Exploration Area it shall end at such earlier date as the Feasibility Study Period shall have begun with respect to such Exploration Area.

Notwithstanding sub-paragraph (ii), upon application by the Company under paragraph 3(ii) of Article 23 the Department may extend the term of the Exploration Period by two (2) consecutive twelve (12) month periods.

5. Prior to the end of the Exploration Period, the Company shall give notice to the Department stating whether or not the Company desires to proceed into the Feasibility Study Period with respect to any Exploration Area. Should the Company give notice to the Department that it does not wish to proceed into the Feasibility Study Period with respect to any Exploration Area, such notice shall constitute an application in writing to the Department in accordance with paragraph 3 of Article 4 for the relinquishment of such Exploration Area. In such a case, the Company shall turn over to the Department:

(i) maps indicating all places in such Exploration Area in which the Company has drilled holes or sunk pits.

(ii) copies of logs of such drill holes and pits and of assay results with respect to any analyzed samples recovered therefrom, and

(iii) copies of any geological or geophysical and geochemical maps of the Exploration Area which have been prepared by the Company.

Any such relinquishment shall be without prejudice to any obligation or liability imposed by or incurred under this Agreement prior to the effective date of such relinquishment.

6. During the Exploration period, the Company shall spend not less than one thousand United States Dollars (US$ 1,000.00) per square kilometer on further Exploration activities with respect to the Contract Area. If at the expiration of thirty six (36) months from date of the commencement of the exploration period, it appears to the Department having considered the specific circumstances that the Company has seriously neglected its obligation with respect to minimum expenditures as provided in this paragraph, the Department may require the Company to deliver for the Department a guarantee in the form of a bond or a Banker's Guarantee to a sum which shall not exceed the total outstanding expenditure obligations remaining unfulfilled. Such guarantee may, at the end of the Exploration Period, be forfeited to the Government to the extent that the Company shall have failed to fulfill such expenditure obligations. Except to the extent of any such forfeiture, such guarantee shall be released at the end of the Exploration Period.

Pasal 7

LAPORAN DAN DEPOSITO JAMINAN

1. Perusahaan harus senantiasa melaporkan kepada Pemerintah melalui Departemen dengan menyerahkan laporan-laporan kemajuan triwulan, mengenai Pengusahaan dan kegiatan-kegiatan lain yang berkaitan dengannya sesuai dengan Persetujuan ini. Di dalam laporan kemajuan triwulan tersebut harus termasuk data yang komprehensif mengenai Penyelidikan Umum, Eksplorasi, Penggunaan Tenaga Kerja dan Pembiayaan. Laporan-laporan kemajuan triwulan ini harus diserahkan dalam waktu 30 (tiga puluh) hari setelah akhir dari tiap triwulan takwim ditambah dengan sisa yang ada dari triwulan takwim sesudah tanggal penandatanganan Persetujuan ini, dan dalam bentuk seperti yang dari waktu ke waktu dapat ditetapkan oleh Departemen. Laporan-laporan kemajuan triwulan yang berhubungan dengan kegiatan Eksplorasi akan meliputi:

   (i) hasil-hasil penyelidikan geologi dan geofisika dan pembuktian endapan-endapan bijih di Wilayah Kontrak Karya dan contoh dari endapan-endapan tersebut;

   (ii) hasil-hasil dari setiap pengamatan (reconnaissance) dari bermacam-macam tempat operasi dan kegiatan yang diusulkan berdasarkan Persetujuan ini;

   (iii) rencana-rencana dan keterangan lainnya mengenai kemajuan kegiatan Perusahaan dalam Wilayah Kontrak Karya yang dari waktu ke waktu akan/dapat diminta oleh Departemen;

   (iv) realisasi pengeluaran;

   (v) realisasi pengadaan dan pemakaian peralatan; dan

   (vi) daftar tenaga kerja dan pelatihan yang diselenggarakan.

2. Dalam waktu 1 (satu) tahun setelah dimulainya Periode Studi Kelayakan, Perusahaan harus juga menyampaikan kepada Departemen suatu ringkasan dari penyelidikan-penyelidikan geologi dan metalurgi, semua data geologi, geofisika, topografi dan hidrografi, yang diperoleh dari Periode Penyelidikan Umum dan Eksplorasi serta contoh yang mewakili tiap jenis dari mineralisasi yang ditemukan dalam penyelidikannya.

3. Paling lambat 1 (satu) tahun setelah berakhirnya Periode Eksplorasi, Perusahaan harus menyerahkan kepada Departemen suatu peta geologi umum dari seluruh Wilayah Kontrak Karya dengan skala 1 : 250.000 dengan dilampiri laporan berdasarkan observasi geologi oleh Perusahaan; peta geologi itu hanya perlu memuat hasil observasi tentang jenis-jenis batuan dan penyebaran serta strukturnya, yang telah dilakukan Perusahaan selama Periode Penyelidikan Umum dan Eksplorasi.

Article 7

REPORT AND SECURITY DEPOSIT

1 The Company shall keep the Government informed through the Department by submitting quarterly progress reports on the Enterprise and other related activities subject to this Agreement. The quarterly progress reports shall include comprehensive data on General Survey, Exploration, Employment and Expenditures. These progress reports should be submitted within thirty (30) days after the end of each calendar quarter plus any part of a calendar quarter that remains following the date of signing of this Agreement, and be in such form as the Department may from time to time prescribe. These quarterly progress reports relating to Exploration activities shall include:

(i) the results of geological and geophysical investigation and proving of ore deposits in the Contract Area and the sampling of such deposits;

(ii) the results of any general reconnaissance of the various sites of proposed operations and activities under this Agreement;

(iii) such other plans and information as to the progress of the Company's activities in the Contract Area as the Department may from time to time require.

(iv) actual expenditure

(v) actual procurement and utilization of equipment.

(vi) list of employment and training conducted.

2. Within one (1) year after the beginning of the Feasibility Study Period, the Company will also file with the Department a summary of its geological and metallurgical investigations and all geological, geophysical, topographic and hydrographic data obtained from the General Survey and Exploration Periods and a sample representative of each principal type of mineralisation encountered in its investigations.

3. At the latest one (1) year after the expiration of the Exploration Period, the Company shall submit to Department a general geological map of the whole Contract Area on the scale of 1 : 250,000 with attendant reports based on the Company's geological observations; such geological map need only contain the observations of rock types and their distribution and structure which have been made by the Company during the General Survey and Exploration Periods.

4. Disamping peta geologi sebagaimana disebut dalam ayat (3) Pasal ini, Perusahaan harus menyerahkan kepada Pemerintah :

(i) peta-peta yang menunjukkan semua tempat di dalam Wilayah Kontrak Karya dimana Perusahaan telah membuat lubang-lubang bor atau menggali sumur-sumur;

(ii) salinan-salinan daftar dari lubang-lubang bor (drilling log) dan sumur-sumur tersebut dan hasil analisis dari contoh-contoh yang telah dianalisis yang berasal dari lubang-lubang tersebut;

(iii) salinan-salinan dari setiap peta geofisika dari Wilayah Kontrak Karya yang telah dibuat oleh Perusahaan; dan

(iv) semua keterangan lain yang langsung berhubungan dengan kegiatan-kegiatan Eksplorasi Perusahaan berdasarkan Persetujuan ini yang diminta oleh Pemerintah dan yang telah dikuasai Perusahaan maupun yang dapat diperolehnya melalui usaha yang wajar, agar kegiatan-kegiatan penyelidikan Perusahaan berdasarkan Persetujuan ini dapat dinilai.

5. Dalam waktu 30 (tiga puluh) hari setelah penandatanganan Persetujuan ini Perusahaan harus membuka rekening bank yang berbunga sebagai jaminan kepada Pemerintah, disuatu bank di Indonesia yang disetujui oleh Departemen sejumlah US$ 428.300,00 (empat ratus dua puluh delapan ribu tiga ratus Dollar Amerika Serikat) dikurangi jumlah yang telah didepositokan untuk jaminan SIPP, ditambah Jaminan Bank sejumlah US$ 999.300,00 (sembilan ratus sembilan puluh sembilan ribu tiga ratus Dollar Amerika Serikat) yang selanjutnya disebut "Deposito Jaminan".

Deposito Jaminan tersebut akan dicairkan oleh Pemerintah sebesar 50% (lima puluh persen) dari padanya sesudah:

(i) berakhirnya Periode Penyelidikan Umum;

(ii) penyerahan kepada Departemen seperti tersebut diatas dalam ayat (1) Pasal ini atas empat laporan kemajuan triwulan secara berturut-turut atau dalam hal Periode Penyelidikan Umum selesai kurang dari 1 (satu) tahun, laporan-laporan triwulan yang mencakup waktu tersebut, dengan ketentuan bahwa jika Periode Penyelidikan Umum telah disetujui dimulai sebelum penandatanganan Persetujuan ini, laporan-laporan yang mencakup masa sebelumnya tersebut dihitung sebagai pemenuhan kewajiban; dan

(iii) atau:

a) pelaksanaan yang memuaskan (menurut penilaian Menteri setelah mempertimbangkan alasan-alasan khusus) untuk Periode Penyelidikan Umum tersebut, atau

4. In addition to the geological map as mentioned in paragraph 3 of this Article, the Company shall submit to the Government:

   (i) maps indicating all places in the Contract Area in which the Company has drilled holes or sunk pits,

   (ii) copies of logs of such drill holes and pits and of assay results with respect to any analyzed samples recovered from them,

   (iii) copies of any geophysical maps of the Contract Area which have been prepared by the Company, and

   (iv) all other information directly relevant to the Company's Exploration activities under this Agreement which the Government may request and which is, or could, by the exercise of reasonable efforts by the Company, have been within the Company's control in order to appraise the Company's investigation activities under this Agreement.

5. The Company shall within thirty (30) days after the date of signing of this Agreement establish for the benefit of the Government in a bank in Indonesia approved by the Department an interest-bearing escrow account in the amount of four hundred twenty eight thousand three hundred United States Dollars (US$ 428,300.00) less any amount already deposited on the granting of a SIPP, plus a Banker's Guarantee in the amount of nine hundred ninety nine thousand three hundred United States Dollars (US$ 999,300.00), all hereinafter called the "Security Deposit".

   The Security Deposit shall be released by the Government as to fifty percent (50%) thereof after:

   (i) the expiration of the General Survey Period;

   (ii) the submission as specified in paragraph 1 of this Article of four consecutive quarterly progress reports to the Department or where the General Survey Period is completed in less than one year, quarterly reports covering such lesser period, provided that where the General Survey Period has been agreed to have commenced prior to the date of signing of this Agreement, report(s) covering this earlier period shall count towards satisfaction of this obligation, and

   (iii) either:

      a) satisfactory performance (according to the Minister's judgment having considered the specific circumstances) for such General Survey Period, or

b) pengeluaran Perusahaan selama Periode Penyelidikan Umum itu sebesar US$ 713.800,00 (tujuh ratus tiga belas ribu delapan ratus Dollar Amerika Serikat) untuk Wilayah Kontrak Karya.

Sisa 50% (lima puluh persen) dari Deposito Jaminan akan dicairkan untuk Perusahaan setelah satu peta geologi umum (dengan lampiran laporan mengenai hal itu), berdasarkan observasi-observasi geologi Perusahaan dengan skala 1:250.000 telah diserahkan kepada dan disetujui oleh Departemen, persetujuan mana tidak akan ditangguhkan atau diperlambat dengan tidak wajar. Apabila Perusahaan tidak memenuhi ketentuan-ketentuan tersebut di atas dalam waktu 6 (enam) tahun setelah penanda-tanganan Persetujuan ini selalu tunduk kepada Pasal 19, maka Deposito Jaminan tersebut dengan sendirinya akan diserahkan kepada Kas Negara dan Perusahaan tidak mempunyai hak lagi atasnya. Bunga yang diperoleh dari Deposito Jaminan itu akan menjadi milik Perusahaan.

6. Terkecuali ditetapkan sebaliknya dalam ayat (6) ini, Pemerintah akan memiliki semua data dan laporan-laporan yang diserahkan oleh Perusahaan kepada Departemen atau Pemerintah menurut ketentuan-ketentuan Persetujuan ini. Data dan laporan-laporan tersebut akan diperlakukan oleh Pemerintah sebagai sangat rahasia sepanjang hal tersebut diminta oleh Perusahaan, kecuali data tersebut sudah termasuk yang boleh dipakai umum (karena sudah pernah diterbitkan dalam kepustakaan umum yang dapat diperoleh atau karena nilai utamanya sudah lebih bersifat ilmiah dari pada komersial, seperti data geologi dan geofisika) dan data yang telah diterbitkan berdasarkan Undang-Undang dan peraturan-peraturan Indonesia atau oleh satu negara asing dimana satu pemegang saham berdomisili (seperti laporan-laporan tahunan badan-badan umum atau perusahaan-perusahaan), tidak dikenakan pembatasan-pembatasan tersebut di atas; kecuali selanjutnya bahwa istilah "data" seperti apa yang digunakan dalam ayat ini meliputi (tanpa pembatasan) setiap dan semua dokumen, peta-peta, rencana-rencana, lembaran-lembaran kerja serta data dan keterangan teknis, maupun segala data dan keterangan yang berhubungan dengan masalah keuangan dan perdagangan.
Dalam hal data yang berhubungan semata-mata dengan wilayah yang dilepaskan oleh Perusahaan dari Wilayah Kontrak Karya sesuai Pasal 4, pembatasan tersebut di atas akan tidak berlaku sejak tanggal dilepaskannya wilayah-wilayah dimaksud. Tambahan pula, jika Persetujuan ini telah berakhir sesuai Pasal 20 atau Pasal 22, pembatasan-pembatasan yang dimaksud di atas akan tidak berlaku lagi.
Selain dari yang dikemukakan di atas, pengetahuan-pengetahuan teknik eksklusif yang dimiliki Perusahaan, kontraktor-kontraktor atau Afiliasi-Afiliasinya yang dimuat di dalam data atau laporan-laporan yang diserahkan oleh Perusahaan kepada Departemen atau Pemerintah menurut ketentuan-ketentuan Persetujuan ini dan yang telah diidentifikasikan seperti demikian oleh Perusahaan, hanya akan dapat dipakai oleh Pemerintah dalam hubungan dengan pelaksanaan Persetujuan ini dan tidak akan ditunjukkan oleh Pemerintah kepada pihak ketiga, tanpa persetujuan tertulis dari Perusahaan. Pengetahuan eksklusip dimaksud, sepanjang masih merupakan pengetahuan yang eksklusip dari Perusahaan, kontraktor-kontraktor atau Afiliasi-Afiliasinya sebagaimana adanya, tetap semata-mata milik dari Perusahaan, kontraktor-kontraktor atau Afiliasi-Afiliasinya, sebagaimana adanya.

b) the expenditure by the Company in such General Survey Period of seven hundred thirteen thousand eight hundred United States Dollars (US$ 713,800.00) on the Contract Area.

The remaining fifty percent (50%) of this Security Deposit will be released on behalf of the Company when a general geological map (with attendant report thereon) based on the Company's Geological observations, on the scale of 1: 250,000 has been submitted to and approved by the Department which approval the Department shall not unreasonably withhold or delay. In the event that the Company does not satisfy the above mentioned requirement within six (6) years after the date of signing of this Agreement subject always to Article 19, the balance of the said Security Deposit shall automatically be forwarded to the Government Treasury and the Company shall have no further claim thereon. Interest on the Security Deposit shall accrue for the benefit of the Company.

6. Except as otherwise provided in this paragraph 6, the Government has title to all data and reports submitted by the Company to the Department or the Government pursuant to the provisions of this Agreement. Such data and reports will be treated as strictly confidential by the Government to the extent that the Company shall so request provided, however, that data belonging to the public domain (because of having been published in generally accessible literature or of their mainly scientific rather than commercial value, such as geological and geophysical data) and data which has been published pursuant to laws and regulations of Indonesia or of a foreign country in which a shareholder may be domiciled (such as the yearly report of public bodies or companies) shall not be subject to the foregoing restrictions; provided further that the term "data" as used in this paragraph shall include (without limitations) any and all documents, maps, plans, worksheets and other technical data and information, as well as data and information concerning financial and commercial matters.
In respect of data relating solely to the areas relinquished by the Company from the Contract Area pursuant to Article 4, the foregoing restrictions shall cease to apply as from the date of relinquishment of such areas. In addition, where this Agreement has been terminated pursuant to Article 20 or Article 22, the foregoing restrictions shall cease to apply.
Notwithstanding the foregoing, exclusive know-how of the Company, its contractors or Affiliates contained in data or reports submitted by the Company to the Department or the Government pursuant to the provisions of this Agreement and which shall have been identified as such by the Company, shall only be used by the Government in relation to the administration of this Agreement and shall not be disclosed by the Government to third parties without the prior written consent of the Company. Such exclusive know-how, as long as it remains exclusive know-how of the Company, its contractors or Affiliates as the case may be, remains the sole property of the Company, its contractors or Affiliates as the case may be.

Pasal 8

PERIODE STUDI KELAYAKAN

1. Periode Studi Kelayakan untuk setiap bagian Wilayah Kontrak Karya dimulai pada tanggal Perusahaan menyampaikan permohonan tertulis seperti ditentukan di atas kepada Departemen sehubungan dengan keputusannya untuk melanjutkan kegiatan evaluasi dan akan berakhir pada saat dimulainya Periode Konstruksi seperti diatur lebih lanjut.

2. Segera setelah Perusahaan menyampaikan permohonan tertulis tersebut, Perusahaan harus mulai melakukan studi-studi untuk menentukan kelayakan pengembangan secara komersial dari endapan atau endapan-endapan yang sudah ditemukan. Perusahaan akan diberi waktu selama 12 (dua belas) bulan untuk menyelesaikan studi-studi tersebut dan menetapkan serta membatasi wilayah di daerah mana Perusahaan akan mulai kegiatan operasi. Wilayah tersebut ditetapkan sebagai "Wilayah Pertambangan", dengan ketentuan bahwa Menteri, dengan mengingat Pasal 16 ayat (2) dapat menyatakan keberatan terhadap usul penetapan Wilayah Pertambangan tersebut dalam waktu 3 (tiga) bulan sejak ditetapkannya daerah tadi oleh Perusahaan, berdasarkan alasan keamanan nasional atau bahwa pelaksanaan pertambangan di Wilayah Pertambangan yang di usulkan itu akan merusak keseimbangan Lingkungan Hidup secara tidak wajar atau akan membatasi potensi pengembangannya lebih lanjut atau secara nyata akan merusak stabilitas sosial politik daerah yang bersangkutan. Pemerintah dan Perusahaan setuju untuk berkonsultasi dengan itikad baik untuk mengatasi keberatan-keberatan tersebut. Jika dalam waktu 3 (tiga) bulan terhitung mulai dari tanggal pemberitahuan akan keberatan oleh Pemerintah, masih belum ada pemecahan terhadap persoalan itu, maka setiap Pihak dapat mengajukan pemecahan masalah tersebut berdasarkan Pasal 21 ayat (1). Sesudah Studi Kelayakan tersebut selesai, Perusahaan harus menyerahkan satu laporan Studi Kelayakan dalam bentuk seperti terdapat dalam Lampiran "E", yang memuat perhitungan dan alasan-alasan kelayakan secara teknis dan ekonomis dari Pengusahaan didukung dengan data, seperti dirinci dalam Lampiran "E", perhitungan-perhitungan, gambar-gambar, peta-peta dan informasi yang berkaitan yang mengarah kepada keputusan apakah Pengusahaan dilanjutkan atau tidak. Laporan Study Kelayakan harus juga berisikan informasi mengenai hal-hal yang penting bagi Pemerintah selama masa hidup Pengusahaan. Atas permintaan Perusahaan, Pemerintah dapat memberikan perpanjangan waktu selama 12 (dua belas) bulan untuk Periode Studi Kalayakan, jika Perusahaan menganggap bahwa data dan hal-hal lainnya yang diperlukan belum cukup tersedia untuk mencapai satu keputusan akhir atau Menteri mengajukan keberatan atas Wilayah Pertambangan yang diusulkan seperti tersebut di atas.

3. Setiap waktu selama Periode Studi Kelayakan, Perusahaan dapat menyampaikan permohonan tertulis kepada Departemen, bahwa Perusahaan bermaksud untuk melanjutkan konstruksi suatu tambang dan fasilitas yang akan digunakan oleh Perusahaan dalam operasinya.
   Jika Departemen tidak menyatakan keberatan secara tertulis terhadap permohonan tersebut, maka persetujuannya akan diterima oleh Perusahaan dalam waktu 3 bulan

Article 8

FEASIBILITY STUDY PERIOD

1. The Feasibility Study Period for any part of the Contract Area shall commence on the date the Company submits a written application as hereinabove provided to the Department in relation to its decision to proceed with the evaluation and shall end upon the commencement of the Construction Period therefor as hereinafter provided.

2. As soon as the Company has submitted written application, the Company shall commence studies to determine the feasibility of commercially developing the deposit or deposits in question. The Company will be allowed a period of twelve (12) months to complete such studies and to select and delineate the area in which the Company may commence mining operation. Such area shall constitute the "Mining Area" provided that the Minister may, subject to paragraph 2 of Article 16, on grounds of national security or that the conduct of mining in the proposed Mining Area will disproportionately and unreasonably damage the surrounding environment or limit its further development potential or significantly disrupt the sociopolitical stability in the region, object to the area proposed as the Mining Area within three (3) months of the Company's designation of such Area. The Government and the Company agree to consult in good faith to overcome any such objections. If after a period of three (3) months from the date of notification of such objection by the Government, there has been no resolution of the matter, then either Party may proceed to resolve the matter in accordance with Article 21 paragraph 1. After the completion of such feasibility studies, the Company shall submit a Feasibility Study Report in the form set out in Annex 'E', which shall contain calculations and reasons for the technical and economical feasibility of the Enterprise supported by data, as specified in Annex "E", calculations, drawings, maps and relevant information leading toward the decision whether or not to proceed with the Enterprise. The Feasibility Study report shall also contain information concerning matters of interest to the Government during the whole life of the Enterprise. The Government may, upon request by the Company, grant an extension of twelve (12) months for the Feasibility Studies Period if the Company considers that the data required and other necessary matters are not sufficiently available to come to a final decision or the Minister raises objections to the proposed Mining Area as set out above.

3. At any time during the Feasibility Studies Period the Company may submit a written application to the Department that it desires to proceed with the construction of a mine and facilities to be used by the Company in its operation. If the Department does not object, in writing, to such application, its approval shall be received by the Company within three (3) months of receipt of such

sesudah diterima permohonan termaksud. Setelah permohonan tersebut disetujui, Perusahaan harus memulai dan dengan kesungguhan yang wajar melaksanakan sampai selesai semua rancangan fasilitas, dan mengajukannya kepada Departemen untuk disetujui, disertai dengan suatu perkiraan biaya dari fasilitas tersebut dan jadwal pelaksanaan konstruksinya, dimana sepanjang hal itu layak dari segi ekonomis dan praktisnya, ditetapkan bahwa waktu penyelesaian tadi adalah 36 (tiga puluh enam) bulan setelah disetujuinya rancangan tersebut. Dalam waktu 3 (tiga) bulan setelah penyerahan tersebut, Departemen akan memberitahu Perusahaan tentang persetujuannya (yang tidak akan ditunda tanpa alasan yang wajar) atau penolakannya terhadap rencana penambangan, rancangan dan jadwal waktu untuk pembangunan tersebut dengan mengingat kepada Pasal 16 ayat (2). Dalam hal ditolak, Departemen akan memberitahu Perusahaan sebab-sebab penolakannya dan Pemerintah serta Perusahaan akan berkonsultasi dengan itikad baik untuk berusaha mengatasi sebab-sebab penolakan tersebut. Jika, sesudah 3 (tiga) bulan sejak pemberitahuan penolakan tersebut masih belum ada pemecahannya, maka setiap pihak dapat mengajukan pemecahan masalah tersebut berdasarkan Pasal 21 ayat (1).

4. Laporan Studi Kelayakan sebagaimana diuraikan di dalam Lampiran "E", harus termasuk penelitian dampak Lingkungan Hidup dari pengaruh kegiatan Pengusahaan terhadap Lingkungan Hidup dan dibuat sesuai petunjuk yang terdapat dalam Pasal 26. Studi-studi tersebut dapat dilakukan melalui jasa konsultan yang independen dan mampu, yang disewa oleh Perusahaan dan disetujui Pemerintah, persetujuan mana tidak akan ditahan tanpa alasan yang wajar.

5. Perusahaan akan bekerjasama dengan dan senantiasa memberitahukan Departemen melalui laporan-laporan berkala tentang kemajuan, hasil-hasil dan biaya-biaya yang timbul sehubungan dengan penyelidikan-penyelidikan dan studi-studi; dan apabila Departemen wajar meminta, Perusahaan harus menyediakan laporan penyelidikan dan studi yang disebut dalam ayat (4) di atas, serta semua salinan dari penemuan-penemuan dan laporan-laporan yang disiapkan oleh Perusahaan.

6. Perusahaan sesudah menyelesaikan semua penyelidikan dan studi, menyampaikan kepada Departemen suatu laporan akhir yang berisikan hasil-hasil dan biaya-biaya yang timbul sehubungan dengan penyelidikan serta studi dan analisa Perusahaan, kesimpulannya, proyeksinya yang berhubungan dengan hasil-hasil itu dan keterangan lainnya yang menyangkut Pengusahaan atau Wilayah Pertambangan yang dimiliki oleh Perusahaan dan yang diminta secara wajar oleh Pemerintah.

7. Dengan mengingat ketentuan Pasal 7 ayat (6), semua laporan dan keterangan yang diserahkan kepada Pemerintah berdasarkan Pasal ini akan diperlakukan secara rahasia, dengan pengecualian untuk hal-hal yang perlu untuk digunakan Pemerintah bagi kepentingan nasional, dengan ketentuan bahwa (dengan mengingat yang disebut

application. Upon approval of that application, the Company shall commence and, with reasonable diligence, execute to completion the design of the facilities and subject-to completion of the design of the facilities shall supply the same for the approval of the Department, together with an estimate of the cost of such facilities and a time schedule for the construction thereof which time schedule shall, to the extent economically and practically feasible, provide for completing the construction of such facilities within thirty six (36) months after the approval of the plans and designs and time schedule for construction of such facilities. Within three (3) months after submission the Department shall notify the Company of its approval (which will not be unreasonably withhe d) or disapproval of the mining plan, design and time schedule for construction, subject to paragraph 2 of Article 16. In the event of disapproval, the Company shall be notified by the Department of the cause for disapproval and the Department and the Company shall consult in a good faith to attempt to remove the cause for such disapproval. If, after a period of three (3) months from the notification of such disapproval, there has been no resolution of the matter then either party may proceed to resolve the matter in accordance with Article 21 paragraph 1.

4. The Feasibility Study Report as described in Annex "E" shall include Environmental impact studies into the effects of the operation of the Enterprise on the Environment and shall be prepared in accordance with the terms of reference set out in Article 26. Such studies shall be carried out in consultation with appropriately qualified registered independent consultants retained by the Company and approved by the Government which approval will not be unreasonably withheld.

5. The Company shall collaborate with and keep the Department informed by regular reports as to the progress and results of and costs incurred in respect of the investigations and studies and shall as and when the Department may reasonably require furnish the Department with the investigations and studies referred to in paragraph 4 above and with copies of all relevant findings made and reports prepared by the Company.

6. The Company shall, at the completion of all the investigations and studies, submit to the Department a final report stating the results of and the cost incurred in respect of the investigations and studies and the Company's analysis of and its conclusions and projections in respect of those results, and such other information relating to the Enterprise or the Mining Area which is in the possession of the Company and which the Government may reasonably request.

7. Subject to the provisions of paragraph 6 of Article 7, all reports and information supplied to the Government under this Article shall be treated as confidential, with the exception of those required for use by the Government for the national interest, provided that (and subject as aforesaid), if this Agreement is terminated

sebelumnya), jika Persetujuan ini berakhir sesuai Pasal 22, maka laporan dan keterangan tersebut akan menjadi milik Pemerintah dan dapat digunakan oleh Pemerintah, jika dikehendaki demikian.

8. Perusahaan boleh mempertahankan maksimum 25% (duapuluh lima persen) dari luas Wilayah Kontrak Karya semula. Perusahaan harus menyerahkan rencana-rencana kerja jangka panjang untuk seluruh wilayah yang dipertahankan pada saat Penyusunan Studi Kelayakan. Pertama yang menunjukkan hasil yang layak untuk seluruh daerah yang dipertahankan akan dikenakan kewajiban membayar Iuran sebagaimana ditetapkan dalam Pasal 13 Perjanjian ini.

pursuant to Article 22 hereof, the reports and information shall become the property of the Government and may be used by the Government in such manner as it thinks fit.

8 The Company may retain a maximum twenty five percent (25 %) of its original Contract Area. The Company shall submit long term work plans for all areas retained at the time of its first positive Feasibility Study. All retained areas will be subject to the payment of its financial obligations as stipulated in Article 13 of this Agreement.

Pasal 9

PERIODE KONSTRUKSI

1. Segera setelah diterima persetujuan dari Departemen atas rancangan dan jadwal waktu Konstruksi seperti ditetapkan dalam Pasal 8 ayat (3), Perusahaan harus, sesuai dengan jadwal waktu yang disetujui tersebut memulai melakukan Konstruksi atas fasilitas dan melakukannya dengan sebaik mungkin, tergantung dengan kondisi-kondisi yang ditetapkan dalam Pasal 19, untuk menyelesaikan fasilitas tersebut apabila jadwal waktu yang telah disetujui tersebut terbukti tidak dapat dilaksanakan, Perusahaan sesuai Pasal 23 ayat (3.ii) dapat meminta persetujuan Menteri untuk merevisi jadwal waktu yang telah disetujui semula.

2. Perusahaan dapat menggunakan setiap fasilitas yang dimiliki oleh Perusahaan lain, baik yang berafiliasi dengan Perusahaan atau tidak dan dalam hal Perusahaan menggunakan fasilitas seperti yang disebut dimuka, Perusahaan akan mengadakan pengaturan yang dipandangnya layak mengenai pembayaran, pemilikan atau hal-hal lain tentang fasilitas- fasilitas itu dengan ketentuan bahwa, Menteri dapat memberitahukan kepada Perusahaan keberatan-keberatan berdasarkan keamanan nasional, kepentingan umum atau kebijaksanaan luar negeri Pemerintah.

Article 9

CONSTRUCTION PERIOD

1. Following receipt from the Department of approval with respect to the design and time schedule for construction provided for in paragraph 3 of Article 8 the Company shall, in accordance with such approved time schedule, commence construction of the facilities and use its best efforts, subject to the provisions of Article 19, to complete such facilities within such approved time schedule. If such approved time schedule proves unworkable the Company may, pursuant to paragraph 3 (ii) of Article 23 seek the Minister's approval to revise the approved time schedule.

2. The Company may make use of any facilities belonging to other companies whether or not affiliated with the Company and in the event of the Company making use of any such facilities as aforesaid it shall come to such arrangement as it shall think fit regarding payment, ownership or otherwise of such facilities, provided, however, that the Minister may make known to the Company objections based on grounds of national security, public interest or foreign policy of the Government.

Pasal 10

PERIODE OPERASI

1. Segera sesudah selesai pembangunan fasilitas dimaksud dalam Pasal 9 Persetujuan ini, Perusahaan harus mulai kegiatan operasi di Wilayah Pertambangan atau bagian daripadanya dimana fasilitas tersebut telah dibangun.

2. Perusahaan harus melaksanakan operasi penambangan dan kegiatan Pengusahaan lainnya sehubungan dengan suatu Wilayah Pertambangan, untuk jangka waktu Periode Operasi Wilayah Pertambangan tersebut. Periode Operasi untuk setiap Wilayah Pertambangan akan dianggap telah mulai pada hari pertama bulan berikutnya dari bulan pertama kali dimana produksi harian rata-rata mencapai sekurang-kurangnya 70% (tujuh puluh persen) dari kapasitas fasilitas yang direncanakan untuk tujuan Penambangan endapan atau endapan-endapan bahan galian di Wilayah Pertambangan tersebut, tetapi tidak akan lebih lambat dari 6 (enam) bulan sesudah tanggal penyelesaian pembangunan fasilitas tersebut. Periode Operasi untuk setiap Wilayah Pertambangan akan berlangsung selama 30 (tiga puluh) tahun setelah saat dimulainya operasi penambangan yang pertama, atau Periode yang lebih lama yang dapat disetujui oleh Departemen, atas permohonan tertulis dari Perusahaan. Permulaan Periode Operasi tersebut tidak akan melebihi 8 (delapan) tahun (atau Periode yang lebih lama sebagai akibat dari perpanjangan-perpanjangan yang diberikan oleh Departemen untuk menyelesaikan tahap-tahap sebelumnya menurut Persetujuan ini) dari sejak dimulainya Periode Penyelidikan Umum yang diizinkan untuk seluruh Wilayah Kontrak Karya.

3. Perusahaan harus mengolah bijih untuk menghasilkan logam atau konsentrat yang dapat dipasarkan. Perusahaan harus bekerjasama dan membantu Pemerintah dalam mewujudkan kebijaksanaan pembangunan industri hilir di Indonesia yang berkaitan dengan peleburan, pemurnian dan/atau pembuatan dan pabrikasi logam, apabila mineral yang akan ditambang oleh Perusahaan jumlahnya cukup dan secara teknis dan ekonomis layak dikerjakan. Jika dan apabila sesuatu fasilitas pengolahan yang demikian dibangun, Para Pihak setuju untuk selanjutnya membicarakan dan mempertimbangkan dengan itikad baik, kelayakan dari penambahan fasilitas pengolahan berikutnya, yang mungkin berbentuk peningkatan kapasitas fasilitas yang telah ada atau pembangunan fasilitas yang sebelumnya belum ada.

4. Perusahaan harus meyampaikan kepada Departemen hasil studi sehubungan dengan kalayakan dari pembangunan fasilitas tersebut, (sebagaimana dijelaskan dalam ayat 3 Pasal ini) di Indonesia, yang disiapkan oleh Perusahaan dengan berkonsultasi dengan akhli atau Perusahaan Konsultan yang dapat diterima oleh Pemerintah.

Article 10

OPERATING PERIOD

1. Upon completion of the construction of the facilities provided for in Article 9 of this Agreement, the Company shall commence operation of the Mining Area or part thereof for which such facilities have been constructed.

2. The Company shall conduct mining operations and any activity of the Enterprise with respect to a Mining Area, for the duration of the Operating Period of such Mining Area. The Operating Period for such Mining Area shall be deemed to commence on the first day of the calendar month following the first calendar month during which the average daily throughput is at least seventy percent (70%) of the design capacity of the facilities constructed for the purpose of Mining the deposit or deposits in such Mining Area, but not later than the date falling six (6) months after the date of completion of such facilities. The Operating Period for each Mining Area shall continue for thirty (30) years beginning at the commencement of the first mining operation, or such longer period as the Department, on the written application of the Company, may approve. The commencement of the Operating Period shall not occur more than eight (8) years (or such longer period as may result from extensions granted by the Department for the completion of succeeding stages under this Agreement) from the commencement of the General Survey Period allowed for the whole Contract Area.

3. The Company shall process ore to produce metal or marketable concentrate. The Company will work towards and assist the Government in achieving the policy of the establishment of downstream metals processing facilities in Indonesia in relation to smelting, refining and or metals manufacturing and fabricating if, according, to recognized economic, technical and scientific standards, the Minerals to be mined by the Company are of sufficient tonnages and are Minerals amenable to smelting, refining or metal manufacturing and provided it is economically and practically feasible to do so. If and when any of such processing facilities are constructed, the Parties agree to discuss thereafter and consider, in good faith, the feasibility of subsequent additional processing facilities which may be in the form of increases in the capacity of the existing facilities or the establishment of facilities previously not in existence.

4. The Company shall submit to the Department copies of studies relating to the feasibility of establishing those facilities (as described in paragraph 3 of this Article) in Indonesia prepared by the Company in consultation with an agency or consultant acceptable to the Government.

5. (i) Dalam hal fasilitas peleburan, pemurnian atau pabrikasi, telah dibangun di Indonesia oleh pihak lain di luar Perusahaan, untuk pengolahan lebih lanjut hasil-hasil tambang, maka Perusahaan akan menyediakan hasil produksinya bagi pihak lain tersebut untuk pengolahan lebih lanjut dengan syarat tidak kurang menguntungkan dibandingkan dengan syarat-syarat yang dapat diperoleh Perusahaan dari perusahaan pengolah lain untuk menghasilkan kualitas dan kuantitas yang sama, pada waktu yang sama dan pada tempat penyerahan yang sama, dengan syarat hasil produksi yang diolah memakai merk yang diakui, yang dalam hal emas dan perak oleh London Bullion Market Association dan dalam hal logam lainnya oleh London Metal Exchange dan hasil produksi tersebut akan diserahkan dalam bentuk lempengan yang baik serta dapat diterima di pasar logam mulia internasional. Kewajiban Perusahaan ini berlaku dengan memperhatikan dan tunduk kepada setiap perjanjian peleburan, pemurnian atau pabrikasi atau pemasaran yang dibuat oleh Perusahaan sebelum pembangunan fasilitas tersebut.

   (ii) Dalam hal fasilitas peleburan, pemurnian dan pabrikasi tidak dibangun oleh Perusahaan, tetapi dibangun oleh pihak lain di Indonesia, maka pihak lain tersebut harus diizinkan untuk membeli hasil produksi Perusahaan pada harga f.o.b. yang paling menguntungkan yang diberikan oleh Perusahaan kepada pihak lain dengan ketentuan bahwa syarat dan kondisi kontrak yang bersangkutan yang diberikan Perusahaan kepada pihak lain itu, juga berlaku, dengan mengingat hak-hak dan kewajiban dari Perusahaan seperti diuraikan dalam Pasal 11. Setiap waktu jika Perusahaan ingin membangun fasilitas peleburan, pemurnian dan pabrikasi sendiri di Indonesia, Perusahaan akan dapat melakukannya, tergantung kepada persetujuan Pemerintah, yang tidak akan ditahan tanpa alasan yang wajar. Kewajiban Perusahaan tersebut berlaku dengan memperhatikan dan tunduk kepada setiap kontrak peleburan, pemurnian atau pabrikasi atau pemasaran yang dibuat Perusahaan sebelum pembangunan fasilitas itu.

6. Fasilitas proyek mencakup fasilitas pengolahan tambang dan setiap fasilitas pelabuhan, fasilitas pendaratan kapal terbang dan pengangkutan, komunikasi, penyediaan air dan fasilitas lain yang berhubungan yang diperlukan. Untuk itu, dengan mengingat hak-hak pihak lain dengan ini diberikan kepada Perusahaan semua izin dan persetujuan yang diperlukan untuk membangun dan mengoperasikannya sesuai dengan undang- undang dan peraturan-peraturan keselamatan kerja yang berhubungan dengan perencanaan, konstruksi dan pengoperasian, yang dari waktu ke waktu akan berlaku dan ditetapkan secara umum di Indonesia.

7. Perusahaan harus menyerahkan kepada Departemen laporan Eksploitasi sebagai berikut :

   (i) laporan statistik dwi-mingguan, mulai sejak dua minggu pertama sesudah dimulainya Periode Operasi yang menyatakan banyaknya bijih yang ditambang, diolah, diekspor dan persediaan.

5. (i) In the event that smelting, refining or manufacturing facilities are established in Indonesia by an entity other than the Company for the further processing of mining products, the Company shall make its products available to that entity for further processing on conditions not less favorable than the conditions that can be obtained by the Company from other further processors for the processing of the same quantity and quality at the same time and at the same place of delivery and provided the processed product bears a mark recognized in the case of gold and silver by the London Bullion Market Association, in the case of others me al by the London Metal Exchange and such product shall be in the form of good delivery bars acceptable in international precious metal markets. This obligation of the Company is subject and subordinate to any smelting, refining, manufacturing or marketing contracts entered into by the Company prior to the establishment of such facilities.

(ii) In the event that smelting, refining or manufacturing facilities are not established by the Company but are established by any party other than the Company in Indonesia, such party shall be permitted to purchase the product at the most favorable f.o.b. price given by the Company to any other purchaser, provided that the respective contractual terms and conditions given by the Company to that other purchaser shall also apply, subject to the rights and obligations of the Company as spelled out in Article 11. At any time if the Company wishes to establish its own smelting, refining or manufacturing, facilities in Indonesia, it can do so subject to approval of the Government which will not be unreasonably withheld. This obligation of the Company is subject and subordinate to any smelting, refining or manufacturing or marketing contracts entered into by the Company prior to the establishment of such facilities.

6. Project facilities shall include the mine's processing facilities, and any port facilities, aircraft landing facilities and transportation, communication, water supply and other necessarily related facilities, for which the Company is, subject to the rights of third parties, hereby granted all necessary licences and permits to construct and operate in accordance with laws and regulations and such reasonable safety regulations relating to design, construction and operation as may from time to time be in force and of general applicability in Indonesia.

7. The Company shall submit to the Department the following Exploitation Reports:

(i) a fortnightly statistical report beginning with the first two weeks following the commencement of the Operating Period, which shall set forth the amount of material mined, processed, exported and stocks.

(ii) laporan statistik bulanan, mulai sejak bulan pertama sesudah dimulainya Periode Operasi yang harus menyatakan jumlah dan tempat-tempat kerja dimana pekerjaan telah dimulai selama bulan sebelumnya, jumlah pekerja yang dipekerjakan di tempat tersebut pada akhir yang bersangkutan, satu daftar peralatan di tiap-tiap tempat kerja pada bulan itu dan uraian singkat kemajuan kerja pada akhir bulan tersebut dan pekerjaan yang akan dilakukan pada bulan berikutnya.

(iii) laporan triwulan mulai sejak triwulan pertama sesudah dimulainya Periode Operasi tentang kemajuan operasi-operasinya di Wilayah Kontrak Karya. Laporan ini akan merinci secara lengkap :

a) tempat-tempat kerja di tempat mana bijih dianggap telah ditemukan, tanpa menghiraukan apakah endapan- endapan dianggap komersial atau tidak (bersama semua data yang berhubungan dengan perkiraan jumlah cadangan, jenis atau jenis-jenis bijih yang ditemukan dan hasil analisanya); jumlah dan uraian pekerjaan-pekerjaan yang telah ditetapkan didalam produksi komersial dan data khusus lengkap tentang pengaturan produksi tersebut, jumlah pekerja yang dipekerjakan di setiap tempat kerja pada pekerjaan yang sedang berjalan pada akhir triwulan yang dimaksud dan pekerjaan yang direncanakan dalam triwulan berikutnya,

b) Pekerjaan yang diselesaikan selama triwulan yang dimaksud yang berhubungan dengan semua instalasi dan fasilitas yang langsung atau tidak langsung berhubungan dengan rencana eksploitasinya, bersama- sama dengan pekerjaan yang direncanakan dalam triwulan berikutnya yang berhubungan dengan instalasi dan fasilitas yang sama; serta menunjukkan baik perkiraan maupun realisasi investasi untuk instalasi dan fasilitas yang dibuat, yang telah dijanjikan atau akan dijanjikan sehubungan dengan instalasi dan fasilitas tersebut.

(iv) laporan tahunan, mulai dari tahun penuh pertama sesudah dimulainya Periode Operasi yang akan meliputi :

a) jumlah dan uraian pekerjaan yang sedang berjalan pada akhir tahun yang mendahului tahun yang dilaporkan (dengan menunjukkan yang mana berada dalam produksi komersial); jumlah dan uraian pekerjaan yang tidak terselesaikan selama tahun itu, produksi dari setiap tambang, tanpa menghiraukan apakah berada dalam produksi komersial atau tidak, dengan uraian lengkap dari jenis dan mutu serta analisa dari bijih yang dihasilkan dari setiap tambang; jumlah pekerjaan dimana kegiatan sedang berlangsung sampai pada akhir tahun, tetapi yang belum memasuki produksi komersial.

b) jumlah keseluruhan bijih, jenis per jenis, dirinci meliputi jumlah yang ditambang, yang diangkut dari pertambangan dan tujuan-tujuannya, yang

(ii) a monthly statistical report beginning with the first month following the commencement of the Operating Period which shall set forth the number and location of the workings on which work was begun during the preceding month; of the number workmen employed thereon at the end of the month; a list of the equipment at each working at the end of the month and a brief description of the work in progress at the end of the month and of the work contemplated during the following month.

(iii) a quarterly report beginning with the first quarter following the commencement of the Operating Period concerning the progress of its operations in the Contract Area. This report shall specify in full :

a) those workings in which ore is considered to have been found, regardless of whether the deposits are deemed to be commercial or not (together with all data relative to the estimated volumes of the reserves, the kind or kinds of such ore encountered and the analyses thereof); the number and description of workings which have been placed in commercial production and full particulars concerning the disposition of such production; the number of workmen employed on each of such workings, the work in progress at the end of the quarter in question and the work contemplated during the ensuing quarter;

b) the work accomplished during the quarter in question with respect to all installations and facilities directly or indirectly related to its exploitation program, together with the work contemplated for the ensuing quarter with respect to the same installations and facilities and indicating both actual and estimated investment in such installations and facilities made, committed or to be committed with respect to such installations and facilities.

(iv) an annual report beginning with the first complete year following the commencement of the Operating Period which shall include :

a) the number and description of the workings which were in progress at the end of the year preceding the year in question (with a showing as to which are in commercial production); the number and description of workings abandoned during the year; the production of each of the workings, regardless of whether in commercial production or not, with a full description of the kind and quality and analyses of ore produced from each working, the number of workings on which activities are continuing at the year end, but which have not gone into commercial production;

b) the total volume of ores, kind-by-kind, broken down into volumes mined, volumes transported from the mines and their corresponding

ditimbun di tambang atau dimana saja di Indonesia, yang dijual atau akan diekspor (apakah sebenarnya dikapalkan dari Indonesia atau tidak), jumlah yang sebenarnya dikapalkan dari Indonesia (dengan rincian lengkap mengenai pembeli, tempat tujuan dan syarat-syarat penjualan), dan jika diketahui oleh Perusahaan sesudah penyelidikan yang seksama, jumlah yang dimurnikan, diolah dan/atau dipabrikasi di Indonesia dengan spesifikasi lengkap tentang hasil produksi setengah jadi, sampingan atau akhir, digunakan kembali di Indonesia (dengan menunjukkan keterangan lengkap mengenai pelepasan dari hasil produksi setengah jadi, sampingan atau akhir serta syarat-syarat pelepasannya); dan,

c) pekerjaan yang dicapai dan pekerjaan yang sedang dikerjakan pada akhir tahun yang dilaporkan yang bersangkutan dengan rencana eksploitasi beserta uraian lengkap dari seluruh pekerjaan yang direncanakan untuk tahun berikutnya sehubungan dengan instalasi dan fasilitas termasuk sebuah laporan terinci dari semua investasi yang terrealisasi atau yang dijanjikan selama tahun tersebut dan semua investasi yang dijanjikan untuk tahun atau tahun-tahun berikutnya.

(v) Perusahaan harus juga menyerahkan kepada Pemerintah semua keterangan lain yang berhubungan dengan kegiatan- kegiatan Perusahaan berdasarkan Persetujuan ini, yang telah atau dengan menggunakan usaha yang wajar akan dapat berada dalam pengendalian Perusahaan, yang mungkin diminta oleh Pemerintah agar dapat menilai sepenuhnya kegiatan-kegiatan Perusahaan.

Laporan-laporan bulanan dan triwulan harus diserahkan dalam rangkap 8 (delapan) dalam waktu 30 (tiga puluh) hari dari akhir bulan atau triwulan yang bersangkutan. Laporan tahunan akan diserahkan dalam rangkap 8 (delapan) dalam periode 90 (sembilan puluh) hari dari akhir tahun yang bersangkutan.

8. Perusahaan harus melaksanakan pengawasan dan manajemen penuh serta efektip terhadap segala hal yang berhubungan dengan operasi Pengusahaan, termasuk produksi dan pemasaran hasilnya sesuai dengan kebijaksanaan jangka panjang yang masuk akal. Perusahaan dapat membuat perluasan, perobahan, penyempurnaan dan penggantian fasilitas pengusahaan, dan boleh menambah fasilitas baru yang dianggap perlu oleh Perusahaan untuk operasi Pengusahaan tersebut atau menyediakan jasa-jasa atau untuk melaksanakan kegiatan-kegiatan sebagai pelengkap atau tambahan yang diperlukan untuk Pengusahaan. Semua perluasan, perubahan, penyempurnaan, penggantian dan tambahan akan dipertimbangkan sebagai bagian dari fasilitas proyek.

9. Pemerintah akan bekerjasama dengan Perusahaan dengan tujuan agar Perusahaan dapat memilih kapal-kapal dan fasilitas pengangkutan lainnya untuk digunakan dalam hubungan dengan impor dan ekspor barang-barang berdasarkan Persetujuan ini sesuai ketentuan dan peraturan-peraturan yang berlaku.

destination, volumes stockpiled at the mines or elsewhere in Indonesia, volumes sold or committed for export (whether actually shipped from Indonesia or not), volumes actually shipped from Indonesia (with full details as to purchaser, destination and terms of sale), and if known to the Company after diligent enquiry volumes refined, processed and or manufactured within Indonesia with full specifications as to the intermediate products, by-products, or final products, out turned within Indonesia (with full showing as to the disposition of such intermediate products, by-products or final products and of the terms on which they were disposed); and

c) work accomplished and work in progress at the end of the year in question with respect to all of the installations and facilities related to the exploitation program, together with a full description of all work programmed for the ensuing year with respect to such installations and facilities including a detailed report of all investment actually made or committed during the year in question and all investment committed for the ensuing year or years.

(v) the Company shall also furnish to the Government all other information related to the Company's activities under this Agreement of whatever kind and which is, or could by the exercise of reasonable efforts by the Company, have been, within the control of the Company which the Government may request in order that the Government may be fully apprised of the Company's activities.

Monthly and quarterly reports shall be submitted in eightfold within thirty (30) days of the end of the month or quarter in question. Annual reports shall be submitted in eightfold within ninety (90) days of the end of the year in question.

8. The Company shall be in full and effective control and management of all matters relating to the operation of the Enterprise including the production and marketing of its products in accordance with sound, long term policies. The Company may make expansions, modifications, improvements and replacements to the Enterprise's facilities, and additional new facilities, as the Company shall consider necessary for the operation of the Enterprise or for the provision of services or activities ancillary or incidental to the Enterprise. All such expansions, modifications, improvements, replacements and new additional facilities shall be considered part of the project facilities.

9. The Government will cooperate with the Company to the end that the Company may, in compliance with the existing rules and regulations, select the vessels and other transportation facilities to be used in connection with imports and exports of goods under this Agreement.

Pasal 11

PEMASARAN

1. Pemerintah akan memberi hak kepada Perusahaan untuk mengekspor hasil produksinya yang diperoleh dari operasi berdasarkan Persetujuan ini. Dengan tidak mengurangi hak utama Perusahaan untuk mengekspor hasil produksinya, ekspor tersebut tunduk kepada ketentuan-ketentuan undang-undang dan peraturan-peraturan ekspor yang berlaku di Indonesia. Perusahaan harus selalu berusaha untuk memenuhi permintaan pasar dalam negeri dari hasil produksinya sejalan dengan ketentuan kontrak penjualan ekspor Perusahaan yang telah disepakati untuk hasil produksinya.

2. Perusahaan harus menjual hasil produksinya sesuai dengan praktek-praktek usaha internasional yang umum berlaku, dan berusaha sebaik-baiknya untuk melaksanakannya pada tingkat harga dan sesuai dengan persyaratan penjualan yang akan meningkatkan perolehan ekonomi secara maksimal dari operasi-operasi tersebut, memberikan pengaruh kepada kondisi-kondisi pasar dunia dan keadaan lainnya yang berlaku pada saat penjualan atau kontrak dibuat; dengan ketentuan bahwa Pemerintah mempunyai hak atas dasar yang berlaku umum dan tidak mendiskriminasi terhadap Perusahaan, untuk melarang penjualan atau ekspor mineral-mineral atau produk-produk apabila penjualan atau ekspor tersebut akan bertentangan dengan kewajiban-kewajiban internasional dari Pemerintah atau menurut pertimbangan politik luar negeri akan mempengaruhi kepentingan nasional Indonesia. Dalam hal ada larangan tersebut (selain untuk keperluan kuota yang diterapkan sesuai Perjanjian Komoditi Internasional), jika Perusahaan tidak dapat menemukan pasar lain dengan syarat-syarat dan kondisi-kondisi yang sama, maka Perusahaan akan diberikan bantuan dan bekerjasama dengan Pemerintah untuk mengatasi akibat-akibat yang mungkin timbul dari larangan tersebut.

3. Dalam hal apapun, ikatan penjualan dengan Affiliasi harus dilaksanakan berdasarkan pada harga yang sama dan dengan persyaratan serta kondisi serupa, seandainya ikatan penjualan tersebut dilakukan dengan pihak-pihak yang tidak beraffiliasi. Perusahaan harus menyerahkan kepada Pemerintah bukti kebenaran dari angka-angka yang digunakan dalam menghitung harga-harga tersebut diatas, penentuan kadar logam dan analisis dari material yang dikapalkan serta salinan dari kontrak penjualan.

4. Apabila Pemerintah berpendapat bahwa suatu angka yang dipergunakan dalam perhitungan penerimaan tidak sesuai dengan ketentuan ayat (2) dan (3) Pasal ini Pemerintah dapat dalam kesempatan pertama sesudah hasil produksi itu diekspor tetapi dalam hal ini tidak lebih lama dari 24 (duapuluh empat) bulan setelah berakhirnya bulan pada setiap produk diekspor memberitahukan hal ini kepada Perusahaan secara tertulis. Perusahaan harus menyerahkan bukti kebenaran angka-angka itu dalam waktu 45 (empat puluh lima) hari setelah pemberitahuan diterima.

Article 11

MARKETING

1. The Government will grant the Company the right to export its Products obtained from the operations under this Agreement. Without in any way prejudicing the Company's basic right to export its Products, such export will be subject to the provisions of the export laws and regulations of Indonesia. The Company shall endeavor at all times to fulfill the requirements of the domestic market for its Products subject and subordinate to the Company's committed export sales agreements of its Product.

2. The Company shall sell its Products in accordance with generally accepted international business practices, and use its best efforts to do so at prices and on term of sale which will maximize the economic return from the operations hereunder, giving effect to world market conditions and other circumstances prevailing at the time of sale or contract: provided that the Government shall have the right, on a basis which is of general applicability and nondiscriminatory as to the Company, to prohibit the sale or export of Minerals or Products if such sale or export would be contrary to the international obligations of the Government or to external political considerations affecting the national interest of Indonesia. In the event of such prohibition (other than a quota requirement imposed pursuant to an International Commodity Marketing Agreement), if the Company is unable to find alternative markets on equivalent terms and conditions, the Company shall be given assistance and cooperation by the Government to overcome the possible consequences of such prohibition.

3. In any event sales commitments with Affiliates shall be made only at prices based on or equivalent to arm's length sales and in accordance with such terms and conditions at which such agreements would be made if the parties had not been affiliated with due allowance for normal selling discounts and commissions. The Company shall submit to the Government evidence of the correctness of the figures used in computing the prices, determination of metals content and analysis of materials shipped and copies of the sales contracts.

4. In the event that the Government believes any figures used in computing the revenues are not in accordance with the provisions of paragraph 2 and 3 of this Article, the Government may, in the first priority after such Products were exported but in any event no later than the expiry of twenty four (24) months after the end of the calendar month in which such Products were exported, advise the Company in writing. The Company shall submit evidence of the correctness of the figures within forty-five (45) days after receipt of such advice.

Dalam waktu 45 (empat puluh lima) hari setelah bukti tersebut diterima, Pemerintah dapat memberitahukan kepada Perusahaan secara tertulis, bahwa Pemerintah masih tidak puas dengan kebenaran angka-angka itu, dan dalam waktu 10 (sepuluh) hari setelah penerimaan pemberitahuan tersebut oleh Perusahaan, suatu Panitia harus dibentuk yang terdiri dari seorang wakil dari atau diangkat oleh Pemerintah dan seorang wakil dari atau diangkat oleh Perusahaan, untuk mempelajari persoalannya. Panitia harus mengadakan rapat segera di suatu tempat yang disetujui bersama di Indonesia dan jika anggota-anggota Panitia tidak mencapai persetujuan dalam waktu 20 (dua puluh) hari sesudah pengangkatannya atau dalam waktu yang lebih lama yang dapat disetujui bersama oleh Pemerintah dan Perusahaan, maka wakil-wakil tersebut akan menunjuk seorang anggota ketiga untuk Panitia tersebut, yang harus mempunyai keakhlian dalam ilmu hukum internasional dan yang menguasai industri mineral internasional. Setelah meneliti semua bukti- bukti, Panitia akan menentukan apakah angka yang dipergunakan Perusahaan, atau angka lain, adalah sesuai dengan ayat (2) dan (3) Pasal ini. Keputusan kedua anggota Panitia akan mengikat bagi kedua belah pihak. Kegagalan kedua wakil untuk mengangkat seorang anggota ketiga untuk Panitia akan mensyaratkan, bahwa persoalan tersebut akan diserahkan kepada arbitrase sesuai Pasal 21 dari Persetujuan ini. Dalam waktu 90 (sembilan puluh) hari setelah persoalan terakhir diputuskan, sesuai ayat ini, penyesuaian-penyesuaian yang wajar yang berlaku surut akan dibuat sesuai dengan keputusan Panitia. Perusahaan dan Pemerintah masing-masing akan membayar biaya-biaya anggotanya sendiri dalam Panitia dan setengah dari semua biaya lainnya untuk kegiatan Panitia.

5. Dalam hal Perusahaan menghasilkan suatu konsentrat yang berisi emas, perak, platina, tembaga dan logam berharga lainnya yang dengan mudah dapat dipisahkan, apabila secara ekonomi dianggap layak, maka Perusahaan harus mengusahakan semaksimal mungkin untuk memisahkan masing-masing metal tersebut.

6. Dalam hal penjualan emas, perak, platina dan tembaga kepada suatu Afiliasi atau kepada pasar dalam negeri atau kepada instansi yang ditunjuk Pemerintah, dipahami bahwa, kecuali disetujui lain oleh Para Pihak, harga emas yang dihasilkan oleh Perusahaan akan ditetapkan pada hari penjualan yang tidak lebih rendah dari ketetapan harga emas pada jam 15.00 sebagaimana disetujui oleh anggota-anggota "the London Bullion Market Association" dan sebagaimana harga yang dicatat pada hari itu dalam "Metal Bulletin", atau referensi lain yang disetujui bersama, harga perak akan ditetapkan pada hari penjualan yang tidak lebih rendah dari ketetapan harga perak sebagaimana disetujui oleh anggota-anggota "the London Bullion Market Association" dan sebagaimana dicatat untuk hari itu dalam "the Metal Bulletin", atau referensi lain yang disetujui bersama, dan harga logam lainnya akan ditetapkan tidak lebih rendah dari harga "the Johnson Matthey unfabricated daily world producers" pada hari penjualan sebagaimana dicatat untuk hari itu di dalam "the Metals Week" atau referensi lain yang disetujui bersama, dikurangi dengan ongkos-ongkos penjualan dan beban-beban yang dirumuskan dalam Lampiran "H". Dalam hal "the London Bullion Market Association" tidak lagi merupakan suatu referensi harga yang tepat, Pemerintah dan Perusahaan akan saling berkonsultasi untuk menyetujui cara yang dapat diterima untuk menetapkan harga tersebut. Hari penjualan adalah hari pada

Within forty-five (45) days after receipt of such evidence, the Government may give notice to the Company in writing that it is still not satisfied with the correctness of the figures and, within ten (10) days after receipt of such notice by the Company, a Committee consisting of one representative of or appointed by the Government and one representative of or appointed by the Company, shall be constituted to review the issue. The Committee shall meet as soon as convenient at a mutually agreeable place in Indonesia and, if the members of the Committee do not reach agreement within twenty (20) days after their appointment or such longer period as the Government and the Company mutually agree, the representatives shall appoint a third member of the Committee, who shall be a person of international standing in jurisprudence and shall be familiar with the international mineral industry. The Committee after reviewing all the evidence, shall determine whether the figures used by the Company or any other figures are in accordance with paragraph 2 and 3 of this Article. The decision of two members of the Committee shall be binding upon the Parties. Failure of two representatives to appoint third member of the Committee shall require the issue to be submitted to arbitration pursuant to Article 21 of this Agreement. Within ninety (90) days after the issue has been finally decided, pursuant to this paragraph, appropriate retroactive adjustment shall be made in conformity with the Committee's decision. The Company and the Government each shall pay the expenses of its own member on the Committee and one half of all other expenses of the Committee's proceedings.

5. In the event that the Company produces a concentrate containing, gold, silver, platinum, copper and other such valuable metals which are easily recoverable, the Company shall, if it is economically feasible, make maximum efforts to recover those individual metals.

6. In the event of a sale of gold, silver, platinum and copper to an Affiliate or to the domestic market or to the Government's, designated agency, it is understood that, unless otherwise agreed by the Parties, the price of the gold produced by the Company shall be determined on the day of sale at not less than the 15.00 hours gold fixing as agreed by members of "the London Bullion Market Association" and as quoted for that day in the "Metal Bulletin" or other reference mutually agreed, that the price of silver shall be determined on the day of sale at not less than the silver fixing as agreed by members of the London Bullion Market Association and as quoted for that day in the "Metal Bulletin" or other reference mutually agreed and that the price of other metals shall be determined at not less than the Johnson Matthey unfabricated daily world producers' price on the day of sale as quoted for that day in "Metals Week" or other reference mutually agreed less, in each case, selling expenses and charges as defined in Annex "H". In the event that the London Bullion Market Association ceases to be a suitable reference for pricing, the Government and the Company will consult together to agree on an acceptable method of determining such prices. The day of sale shall be construed as the day on which

waktu berlangsung peralihan pemilikan hasil produksi secara hukum dari Perusahaan kepada pembeli. Kecuali disetujui lain, hari tersebut adalah hari pada waktu penyerahannya. Pembayaran kepada Perusahaan harus dilakukan dengan U.S. Dollar dalam waktu 2 (dua) hari setelah penjualan.

7. Jika sewaktu-waktu dalam pelaksanaan pemasarannya, Perusahaan memurnikan, atau menyerahkan penyerahan emas atau perak yang dimurnikan dari hasil produksinya, maka emas dan perak tersebut akan berbentuk dan mempunyai merk yang dapat diterima dalam pasar logam mulia internasional. Untuk emas dan perak ini berarti "the London Bullion Market Association".

legal title to the products is transferred by the Company to the purchaser. Unless otherwise agreed, this shall be the day of the delivery. Payment shall be made to the Company in United States Dollars within two (2) days of the day of sale.

7. If, at any stage in the course of its marketing arrangement, the Company refines, or takes delivery of gold or silver refined from its products, then such gold and silver will be in a form and bear marks which will make them acceptable in the international precious metals markets. For gold and silver this means the London Bullion Market Association.

Pasal 12

FASILITAS IMPOR DAN RE-EKSPOR

1. Perusahaan dapat mengimpor ke Indonesia barang-barang modal, peralatan (termasuk dan tidak terbatas pada peralatan laboratorium dan komputer yang digunakan diluar lapangan operasi), mesin-mesin (termasuk suku cadang), kendaraan-kendaraan (kecuali mobil sedan dan station wagon), pesawat udara, alat angkutan air, alat angkutan lainnya, perbekalan, bahan baku dan bahan kimia yang diperlukan untuk kegiatan pada Periode Penyelidikan Umum, Eksplorasi, Studi Kelayakan, Konstruksi, Operasi Produksi serta kegiatan teknis pendukung untuk Pengusahaan. Semua barang import tersebut akan bebas atau memenuhi syarat keringanan bea masuk demikian pula Pajak Pertambahan Nilai (PPN) dan Pajak Penghasilan sebagaimana Pasal 22 dari Undang-Undang Pajak Penghasilan Tahun 1994 sepanjang memenuhi ketentuan yang berlaku. Pembebasan bea masuk tersebut akan diberlakukan selama jangka waktu terhitung mulai tanggal ditandatanganinya Perjanjian ini sampai dengan dan termasuk tahun ke-sepuluh dari Periode Operasi. Dalam hal Perusahaan mengoperasikan lebih dari satu Wilayah Pertambangan, tahun ke-sepuluh Periode Operasi ini harus dihitung dari tanggal dimulainya operasi pada Wilayah Pertambangan yang pertama.

2. Pembebasan dan keringanan atas bea masuk seperti tersebut dalam ayat (1) Pasal ini hanya akan berlaku selama barang-barang yang diimpor itu tidak dihasilkan atau diproduksi di Indonesia atau barang-barang lokal tersebut tidak dapat diperoleh atas dasar waktu, biaya dan mutu yang bersaing, dengan ketentuan, bahwa untuk tujuan membandingkan biaya impor dan biaya barang yang diproduksi dan dihasilkan di Indonesia(tidak termasuk Pajak Pertambahan Nilai) suatu premi (tidak lebih besar dari 12,5%) harus ditambahkan pada biaya pengimporan.

3. Setiap peralatan (yang harus dirinci dengan jelas) dan barang yang tidak terpakai habis yang diimpor Perusahaan atau oleh subkontraktor-subkontraktor Perusahaan yang terdaftar dengan tujuan semata-mata untuk memberikan jasa-jasa kepada Perusahaan dan dimaksudkan untuk diekspor kembali akan dibebaskan atau diberikan keringanan dari bea masuk, Pajak Pertambahan Nilai dan pungutan-pungutan lainnya. Apabila peralatan dan bahan-bahan tersebut ternyata tidak diekspor kembali dalam waktu yang telah ditentukan bilamana barang-barang tersebut diimpor dan setiap perpanjangannya maka subkontraktor-subkontraktor terdaftar dari Perusahaan harus membayar bea masuk dan sanksi administrasi sesuai ketentuan yang berlaku, pajak pertambahan nilai dan pungutan lain yang tidak dibayar pada waktu pemasukannya ke Indonesia, kecuali periode atau perpanjangan tersebut telah diperpanjang lagi atau peralatan dimaksud dan barang-barang tidak terpakai dibebaskan karena alasan-alasan yang dapat diterima oleh Pemerintah. Perusahaan akan bertanggung-jawab atas kebenaran pelaksanaan kewajiban-kewajiban subkontraktor-subkontraktor menurut Pasal ini.

4. Setiap barang yang diimpor oleh Perusahaan atau sub-kontraktor sub-kontraktornya yang terdaftar sesuai dengan Pasal ini tidak lagi diperlukan untuk kegiatan-kegiatan eksplorasi dan produksi Perusahaan dapat dijual di luar Indonesia dan diekspor

Article 12

IMPORT AND RE-EXPORT FACILITIES

1. The Company may import into Indonesia all capital goods, equipment (including but not limited to laboratory and computer equipment located outside its field operation area), machinery (including spare parts), vehicles (except for sedan cars and station wagons), aircraft, vessels, other means of transport, supplies, raw materials, and chemicals being items needed during the period of General Survey, Exploration, Feasibility Study, Construction, Production, and supporting technical activities of the Enterprise. All such imported items shall be exempt from, or eligible for relief from import duties as well as from Value Added Tax (VAT) and Income Tax under article 22 of Income Tax Law 1994, to the extent that this complies with the prevailing regulations. Such exemption from import duties shall only apply for the duration of the period commencing as from the date of signing of this Agreement up to and including the tenth year of the Operating Period. In case the Company is operating more than one Mining Area, this tenth year of the Operating Period shall be computed from the date of the commencement of operation of the first Mining Area.

2. The exemption and relief from import duties as referred to in paragraph 1 of this Article shall apply only to the extent that the imported goods are not produced or manufactured in Indonesia or that locally produced or manufactured products are not available on a competitive time, cost and quality basis, provided that for the purpose of comparing the costs of imports and the cost of goods manufactured or produced in Indonesia (excluding VAT) a premium (not in excess of 12.5%) shall be applied to the cost of imports.

3. Any equipment (which must be clearly identified) and unconsumed material imported by the company or the registered sub-contractor(s) of the Company for the exclusive purpose of providing services to the Company and intended to be re-exported will be exempted or eligible for relief from import duties, VAT and other levies. If such equipment and materials shall not have been re-exported within the period prescribed when they were imported and any extension thereof, the registered sub-contractor(s) of the Company, unless such period or extension thereof has been further extended or the subject equipment and unconsumed materials have been exempted for reasons acceptable to the Government, shall pay import duties penalty in accordance with prevailing regulation, VAT and other levies which were not paid upon importation into Indonesia. The Company shall be responsible for proper implementing of its sub-contractor(s) obligations under this Article.

4. Any item imported by the Company or its registered sub-contractor(s) pursuant to this Article which are no longer needed for the exploration and production

kembali bebas dari pajak ekspor dan bea masuk lainnya (tidak termasuk Pajak Penghasilan) dan Pajak Pertambahan Nilai sesudah memenuhi ketentuan Undang-Undang dan peraturan-peraturan yang pada waktu penjualan tersebut berlaku dan diterapkan secara umum di Indonesia. Tidak akan ada barang impor yang dapat dijual di dalam negeri atau dipakai selain yang berhubungan dengan Pengusahaan, kecuali setelah memenuhi ketentuan Undang-Undang dan peraturan-peraturan impor yang pada saat pengimporannya itu berlaku dan diterapkan secara umum di Indonesia.

5. Melihat kenyataan, bahwa barang-barang dan jasa-jasa itu masih harus diimpor dari luar negeri dan bahwa berbagai bagian Wilayah Kontrak Karya letaknya terpencil, maka untuk segala tujuan kepraktisan urusan kepabeanan di pelabuhan laut yang sudah ada dan pelabuhan-pelabuhan masuk (ports of entry) lainnya untuk urusan pabean, Pemerintah akan mempertimbangkan permohonan yang wajar dari Perusahaan yang diajukan sewaktu-waktu untuk membangun pelabuhan laut atau pelabuhan masuk demikian itu, lengkap dengan kantor bea cukai yang diperlukan; setiap kantor bea cukai demikian itu yang didirikan atas permintaan Perusahaan akan dilengkapi dan dipelihara atas biaya Perusahaan dan sesuai dengan ketentuan-ketentuan dan peraturan-peraturan yang berlaku.

6. Perusahaan akan menyerahkan kepada Pemerintah, paling lambat 6 (enam) minggu sebelum tahun anggarannya dimulai, kecuali peraturan yang berlaku menetapkan lain, suatu daftar peralatan dan bahan yang akan di impor selama tahun takwim berikutnya untuk memungkinkan Pemerintah meneliti dan menyetujui macam-macam barang yang akan diimpor untuk keperluan Pengusahaan. Meskipun demikian, Perusahaan dapat mengajukan permohonan (dengan menyebutkan alasannya) kepada Pemerintah untuk merubah daftar peralatan dan bahan yang diperlukan selama tahun yang bersangkutan.

7. Dengan tidak mengurangi ketentuan-ketentuan di muka sebagaimana dinyatakan dalam Pasal ini, Perusahaan harus sungguh-sungguh mematuhi pembatasan-pembatasan dan larangan- larangan impor serta peraturan dan tatacara yang berlaku umum.

8. Barang pribadi (termasuk peralatan dan barang-barang rumah tangga dan kebutuhan sehari-hari) milik tenaga kerja asing akan dibebaskan dari ijin impor atau ekspor kembali, pungutan-pungutan dan biaya-biaya.

activities of the Company may be sold outside Indonesia and re-exported free from export taxes and other customs duties (excluding Income Tax) and VAT after compliance with laws and regulations which shall at the time of such sale be in force and of general application in Indonesia. No imported item shall be sold domestically or used otherwise than in connection with the Enterprise except after compliance with import laws and regulations which are at the time of such importation in force and of general application in Indonesia.

5. In view of the fact that goods and services will have to be imported from abroad and that various parts of the Contract Area are remote, for all practical purposes from presently existing sea ports and other ports of entry for customs purposes, the Government will consider the Company's reasonable request for establishing such sea port or port of entry and the requisite customs office thereat from time to time; in consideration thereof, each such customs office so established at the request of the Company shall be furnished and maintained of the Company's expense in accordance with the existing rules and regulations.

6. The Company shall submit to the Government not later than six (6) weeks prior to the commencement of its financial year, except where the prevailing regulations provide for other procedures, a list of equipment and material to be imported during the next calendar year to enable the Government to review and to approve the various items to be imported for the Enterprise. However, the Company may request (stating the reasons) the Government to amend the list of equipment and materials as required during the year.

7. Without prejudice to the foregoing provisions as referred to in this Article, the Company shall duly observe import restrictions and prohibitions and the rules and procedures of general application.

8. Personnel effects (including household and living equipment and goods) belonging to expatriate employees shall be exempted from import or re-export licences, fees and duties.

Pasal 13

PAJAK-PAJAK DAN LAIN-LAIN KEWAJIBAN KEUANGAN PERUSAHAAN

Dengan mengindahkan ketentuan-ketentuan dalam Persetujuan ini, Perusahaan akan membayar kepada Pemerintah dan akan memenuhi kewajiban-kewajiban pajaknya, termasuk kewajibannya sebagai pemungut pajak, seperti yang ditetapkan sebagai berikut :

(i) Iuran tetap untuk Wilayah Kontrak Karya atau Wilayah Pertambangan;

(ii) Iuran eksploitasi / produksi (royalti) untuk Mineral yang diproduksi Perusahaan;

(iii) Pajak Penghasilan Badan atas Penghasilan yang diterima atau diperoleh Perusahaan;

(iv) Pajak Penghasilan Karyawan (PPh Pasal 21/26);

(v) Kewajiban memotong Pajak Penghasilan Pasal 23 dan/atau Pasal 26 atas pembayaran dividen, bunga, termasuk imbalan karena jaminan pengembalian utang, sewa, royalty dan penghasilan lain sehubungan dengan penggunaan harta, imbalan atas jasa teknik dan jasa manajemen serta jasa lainnya;

(vi) Pajak Pertambahan Nilai (PPN) dan Pajak Penjualan atas Barang Mewah (PPn BM) atas impor dan penyerahan barang kena pajak dan atau jasa kena pajak;

(vii) Bea Materai atas dokumen-dokumen;

(viii) Bea masuk atas barang-barang yang diimpor ke Indonesia;

(ix) Pajak Bumi dan Bangunan (PBB) untuk :

a) Wilayah Kontrak Karya atau Wilayah Pertambangan; dan

b) penggunaan bumi dan bangunan dimana Perusahaan membangun fasilitas untuk operasi penambangannya.

(x) Pungutan-pungutan, pajak-pajak, pembebanan-pembebanan dan bea-bea yang dikenakan oleh Pemerintah Daerah di Indonesia yang telah disetujui oleh Pemerintah Pusat;

(xi) Pungutan-pungutan administrasi umum dan pembebanan-pembebanan untuk fasilitas atau jasa dan hak-hak khusus yang diberikan oleh Pemerintah sepanjang pungutan-pungutan dan pembebanan-pembebanan itu telah disetujui oleh Pemerintah Pusat;

Article 13

TAXES AND OTHER FINANCIAL OBLIGATIONS OF THE COMPANY

Subject to the provisions in this Agreement, the Company shall pay to the Government and fulfill its tax liabilities including its obligation as a tax withholder as hereinafter provided:

(i) Deadrent in respect of the Contract of Work Area or the Mining Area;

(ii) Royalties in respect of the Company's production of Minerals;

(iii) Corporate Income Tax in respect of income received or accrued by the Company;

(iv) Personal Income Tax (Article 21/26);

(v) Obligation to withhold income tax under Article 23 and or Article 26 of Income Tax Law 1994 in respect of payment of dividends, interest, including remuneration due to loan payment warranty, rents, royalties and other income related to the utilization of property, remuneration for technical and management services as well as any other services;

(vi) Value Added Tax (VAT) and Sales Tax on Luxury Goods on import and or delivery of taxable goods and or services;

(vii) Stamp Duty on documents;

(viii) Import Duty on goods imported into Indonesia;

(ix) Land and Building Tax in respect of:

a) the Contract of Work Area or the Mining Area; and

b) the utilization of land and building in the area where the Company constructs facilities for its mining operations.

(x) Levies, taxes, charges and duties imposed by Local Government in Indonesia which have been approved by the Central Government;

(xi) General administrative fees and charges for facilities or services rendered and particular rights granted by the Government to the extent that such fees and charges have been approved by the Central Government;

(xii) Bea Balik Nama atas akte pendaftaran dan pemindahan hak pemilikan atas kendaraan bermotor dan kapal di Indonesia.

Perusahaan tidak wajib membayar lain-lain pajak, bea-bea, pungutan-pungutan, sumbangan-sumbangan, pembebanan-pembebanan atau biaya-biaya sekarang maupun dikemudian hari yang dipungut atau dikenakan atau disetujui oleh Pemerintah selain dari yang ditetapkan dalam Pasal ini dan pasal lain dalam Persetujuan ini.

1. Iuran tetap untuk Wilayah Kontrak Karya atau Wilayah Pertambangan.

   Perusahaan harus membayar, dalam Rupiah atau dalam mata uang lain yang disetujui bersama, sejumlah uang untuk tiap tahun sebagai iuran tetap yang akan dihitung menurut jumlah hektar yang termasuk masing-masing Wilayah Kontrak Karya atau Wilayah Pertambangan, dihitung, pada tanggal 1 Januari dan 1 Juli dari setiap tahun, pembayaran tersebut akan dilakukan dimuka dalam dua kali pembayaran masing-masing dalam waktu 30 (tiga puluh) hari setelah tanggal-tanggal tersebut selama jangka waktu Persetujuan ini dan dapat dibayarkan sebagaimana ditetapkan dalam lampiran "D".

2. Iuran eksploitasi / produksi (royalti) atas Mineral yang diproduksi Perusahaan.

   (i) Perusahaan harus membayar iuran eksploitasi/produksi untuk hasil produksi (sebagaimana dirumuskan dalam lampiran "F" dan penjelasannya pada lampiran G), dari Wilayah Pertambangan, sepanjang hasil produksi itu merupakan produk yang nilainya sesuai dengan kebiasaan umum dibayar atau dapat dibayar kepada Perusahaan oleh Pembeli. Iuran eksploitasi/produksi akan dibayar dalam Rupiah atau mata uang lain yang disetujui bersama dan harus dibayar pada atau sebelum hari terakhir dari bulan setelah setiap triwulan. Setiap pembayaran harus disertai dengan suatu pernyataan yang cukup terinci yang merupakan dasar perhitungan iuran eksploitasi/produksi untuk produksi yang dihasilkan selama triwulan sebelumnya.

   Iuran eksploitasi/produksi akan dihitung dengan tarif yang ditetapkan dalam Lampiran "F" sebagai berikut :

   a) tonase atau jumlah berat yang digunakan di dalam perhitungan adalah didasarkan atas produksi akhir yang dihasilkan dari Perusahaan. Dalam hal konsentrat atau dore bullion, jumlah berat setiap mineral yang dikenakan iuran eksploitasi/produksi ditetapkan secara tepat dengan metoda perhitungan yang dapat diterima secara internasional.

   b) Pemerintah akan (atas permintaan tertulis dari Perusahaan) merinci besarnya tarif iuran eksploitasi/produksi pada lajur 5 Lampiran "F" untuk Mineral yang tidak ada patokannya.

   (ii) Perusahaan akan berkewajiban agar setiap penambangan, pengolahan atau penanganan bijih sebelum penjualan dalam negeri atau pengapalan ekspor dilakukan sesuai dengan norma-norma internasional yang dapat diterima serta

(xii) Duty on registration and transfer of ownership of motorized vehicles and ships in Indonesia.

The Company shall not be subject to any other taxes, duties, levies, contributions, charges or fees now or hereafter levied or imposed or approved by the Government other than those provided for in this Article and elsewhere in this Agreement.

1. Deadrent in respect of the Contract of Work Area or the Mining Area.

   The Company shall pay, in Rupiah or in such other currency as may be mutually agreed, an annual amount of money as deadrent to be measured by the number of hectares included in the Contract Area or Mining Area respectively, calculated on January 1st and July 1st of each Year, such payments shall be made in advance and in two installments each payable within thirty (30) days after the said dates during the term of this Agreement and payable as stipulated in Annex "D" attached hereto.

2. Royalties in respect of the Company's production of Minerals.

   (i) The Company shall pay royalties in respect of the products (as defined in Annex "F" and detailed in Annex "G") from the Mining Area, to the extent that such products are products for which value according to general practice is paid or payable to the Company by a buyer. Royalties shall be paid in Rupiah or such other currency as may be mutually agreed and shall be paid on or before the last day of the month following each calendar quarter. Each payment shall be accompanied by a statement showing in reasonable detail the basis of computation of royalties due in respect of the production of the Company during the preceding calendar quarter.

   Royalties will be computed in accordance with the rates specified in Annex "F" as follows:

   a) the tonnage or quantity by weight used in the computation shall be based on the final product produced by the Company. In the case of concentrates or dore bullion, the quantity by weight of each mineral, and or metal subject to royalty shall be properly determined by internationally accepted assay methods.

   b) the Government shall (upon written request by the Company) specify the royalty tariff in column 5 of Annex "F" for those minerals for which no tariff reference is given.

   (ii) The Company undertakes that any mining, processing or treatment of ore prior to domestic sale or export shipment by the Company shall be conducted in accordance with such generally accepted international

layak secara ekonomis dan teknis, dan sesuai dengan norma-norma tersebut Perusahaan berkewajiban untuk menggunakan semua usaha dengan wajar guna mempertinggi perolehan bijih ditambang seoptimal mungkin dari cadangan terukur dan perolehan produksi secara metalurgi dari bijih, sepanjang secara ekonomis dan teknis dapat dilaksanakan, dan harus menyerahkan pembuktian kepada Departemen bahwa Perusahaan telah melakukan kewajiban tersebut. Iuran eksploitasi/produksi harus dibayar sesuai tarif pada Lampiran "F" untuk setiap bahan galian golongan C yang ditambang secara terpisah dari Wilayah Kontrak Karya untuk Pengusahaan, kecuali untuk mineral industri (mineral golongan C) yang digunakan untuk pengembangan wilayah. Setiap limbah/material pengotor yang dipindahkan untuk memungkinkan operasi dapat dilaksanakan atau dipisahkan dalam kegiatan penambangan dan digunakan dalam Pengusahaan dikecualikan dari pembayaran iuran eksploitasi/produksi tersebut.

(iii) Apabila menurut pendapat Pemerintah, Perusahaan tanpa alasan yang kuat gagal untuk memperoleh produk sesuai dengan tingkat perolehan (recovery rate) yang dinyatakan dalam Studi Kelayakan, Pemerintah dapat memberitahukan secara tertulis kepada Perusahaan. Dalam waktu 3 (tiga) bulan setelah menerima pemberitahuan ini, Perusahaan harus:

a) memulai pekerjaan untuk memperbaiki metoda penambangan, penanganan dan fasilitas pengolahan sebagaimana dikehendaki Pemerintah, secara wajar, dengan ketentuan bahwa Perusahaan dalam keadaan bagaimanapun tidak wajib melakukan penambangan, pengolahan atau aktivitas penanganan selain dari pada yang telah ditentukan dalam Pasal 13.2 (ii);

b) menyerahkan kepada Pemerintah bukti-bukti yang membenarkan hasil pekerjaannya sesuai dengan sub ayat (ii) Pasal 13 ini. Dalam hal Pemerintah tetap tidak puas atas hasil pekerjaan Perusahaan dalam menambang bijih dari cadangan terukur dan memperoleh mineral dari bijih, maka Pemerintah berhak menunjuk konsultan yang tidak memihak untuk melaksanakan studi teknis guna menetapkan suatu tingkat perolehan rata-rata yang wajar dengan memperhatikan sifat dari cadangan terukur dan bijih dan kelayakan ekonomis serta teknis untuk mencapai peningkatan perolehan oleh Perusahaan sesuai dengan sub ayat (ii) ayat 2 Pasal 13 ini. Studi tersebut akan dilaksanakan oleh konsultan yang diakui secara internasional, ditunjuk oleh Pemerintah dan disetujui oleh Perusahaan.Dalam hal bahwa Pemerintah dan Perusahaan tidak dapat menyetujui ketetapan konsultan, para pihak harus menunjuk suatu konsultan. Kedua konsultan harus secara bersama menunjuk satu konsultan ketiga. Dalam hal ini hasilnya akan ditetapkan berdasarkan temuan-temuan mayoritas. Pemerintah dan Perusahaan akan mempunyai hak untuk menyiapkan bahan-bahan bagi konsultan tersebut. Jika konsultan tersebut berpendapat bahwa pelaksanaan dari operasi Perusahaan tidak memuaskan, maka biayanya akan ditanggung oleh Perusahaan. Jika konsultan berpendapat bahwa pelaksanaan kewajiban Perusahaan adalah memuaskan, maka biayanya akan ditanggung oleh Pemerintah. Apabila, setelah selesai studi tersebut, Perusahaan gagal, dalam

standards as are economically and technically feasible, and in accordance with such standards the Company undertakes to use all reasonable efforts to optimize the mining recovery of products from the ore, provided it is economically and technically feasible to do so, and shall submit evidence to the Department of compliance with this undertaking. Royalty shall be payable at the rates specified in Annex "F" on any industrial minerals separately quarried from the Contract Area by the Enterprise except for those industrial minerals (C minerals category) used for regional development. Any waste materials moved to allow operations to proceed or extracted in the course of mining and used by the Enterprise are exempted from such royalty.

(iii) If in the opinion of the Government, the Company is failing without good cause to recover products at the recovery rate indicated in the feasibility study, it may give notice in writing to the Company. Within three (3) months of the receipt of this notice the Company shall :

a) commence work to improve its mining method, treatment and processing facilities to the reasonable satisfaction of the Government, provided that the Company shall in no event be obliged to conduct mining, processing or treatment activities otherwise than as provided in Article 13.2 (ii);

b) submit to the Government evidence in justification of its performance in accordance with sub-paragraph (ii) of this Article 13 paragraph 2. In the event that the Government remains unsatisfied with the Company's performance in mining ore from the proven reserve and recovering products from the ore, the Government shall have the right to commission independent technical studies to determine a fair average recovery rate taking into account the nature of the proven reserve and the ore and the economic and technical feasibility of achieving increased recovery by the Company in accordance with sub-paragraph (ii) of this Article 13 paragraph 2. Such studies shall be carried out by internationally recognized consultants appointed by the Government and agreed to by the Company. In the event that the Government and the Company fail to agree on the appointment of the consultant, each party shall appoint one consultant. The two consultants shall the jointly appoint a third consultant. The results shall be determined by the findings of the majority in this event. The Government and the Company shall have the right to prepare submissions to the consultants. If the said consultants find that the performance of the Company's operations is not satisfactory, then the cost shall be borne by the Company. If it is found that the performance of the Company's obligations is satisfactory, then the cost shall be borne by the Government. If following the completion of such studies, the Company

suatu jangka waktu yang wajar, untuk mencapai tingkat perolehan yang ditetapkan berdasarkan studi itu, Pemerintah berhak apabila Perusahaan kemudian tidak menjalankan pelaksanaan dalam Pasal 13 Paragraf 2, butir (ii) untuk meningkatkan secara proporsional iuran eksploitasi/ produksi yang berlaku atas produksi tersebut secara sebanding, sepanjang perolehan atas produksi yang bersangkutan oleh Perusahaan kurang dari tingkat perolehan rata-rata yang wajar sebagaimana ditunjukkan oleh studi tersebut. Tetapi tidak sekali-kali pembayaran kenaikan iuran eksploitasi/produksi demikian itu membebaskan Perusahaan dari kewajibannya untuk mentaati pelaksanaan dari Pasal 13, Paragraf 2, sub paragraf (ii) ini.

3. Pajak Penghasilan Badan atas penghasilan yang diterima atau diperoleh Perusahaan.

(i) Perusahaan harus membayar Pajak Penghasilan atas penghasilan, yaitu setiap tambahan kemampuan ekonomis yang diterima atau diperoleh Perusahaan, baik yang berasal dari Indonesia maupun dari luar Indonesia, dengan nama dan dalam bentuk apapun, termasuk, tetapi tidak terbatas kepada laba bruto atas usaha, dividen, bunga dan royalti, dan tarif pajak yang akan dikenakan selama jangka waktu Persetujuan ini adalah sebagai berikut :

a) 10% (sepuluh persen) untuk penghasilan kena pajak sampai dengan Rp. 25.000.000,00 (dua puluh lima juta rupiah);

b) 15% (lima belas persen) untuk penghasilan kena pajak lebih dari Rp. 25.000.000,00 (dua puluh lima juta rupiah) sampai dengan Rp. 50.000.000,00 (lima puluh juta rupiah);

c) 30% (tiga puluh persen) atau lebih kecil dari 30% (tiga puluh persen) sesuai dengan tarif tertinggi yang ditetapkan dengan Peraturan Pemerintah untuk penghasilan kena pajak lebih dari Rp. 50.000.000,00 (lima puluh juta rupiah).

Apabila Lapisan Penghasilan Kena Pajak diubah dengan Keputusan Menteri Keuangan, maka tarif tersebut pada huruf (a), (b) dan (c) diterapkan terhadap Lapisan Kena Pajak yang telah diubah tersebut.

(ii) Untuk menghitung penghasilan kena pajak berlaku tatacara perhitungan Pajak Penghasilan sebagaimana tercantum dalam Lampiran "H" yang merupakan bagian dari Persetujuan ini. Kecuali ditetapkan lain dalam Persetujuan ini berlaku ketentuan sebagaimana dinyatakan dalam Undang-Undang Pajak Penghasilan 1994 dan Peraturan Pelaksanaannya;

(iii) Perusahaan harus membayar angsuran pajak dalam tahun pajak berjalan sesuai dengan ketentuan Pasal 25 Undang-Undang Pajak Penghasilan 1994 dan peraturan pelaksanaannya;

fails within a reasonable period to achieve the recovery rate indicated by the majority of such studies, the Government shall have the right if the Company is not then observing its undertaking in sub-paragraph (ii) of this Article 13 paragraph 2 to increase the royalty applicable to such products in proportion to the extent that recovery of such products by the Company falls short of the fair average rate indicated by such studies. But at no time shall the payment of such increased royalty free the Company from the obligation to observe its undertaking in sub-paragraph (ii) of this Article 13 paragraph 2.

3. Corporate Income Tax in respect of income received or accrued by the Company:

(i) The Company shall pay Income Tax on income, that is any increase in economic ability received or accrued by the Company, whether originating from within or outside Indonesia, in whatever name and form, including but not limited to gross profit from business, dividends, interest and royalties and the tax rates to be charged for the duration of this Agreement shall be as follows:

a) Ten percent (10%) for taxable income up to twenty five million Rupiah (Rp 25,000,000);

b) Fifteen percent (15%) for taxable income exceeding twenty five million Rupiah (Rp 25,000,000) up to fifty million Rupiah (Rp 50,000,000);

c) Thirty percent (30%) or lower rate as set forth by the Government regulations for taxable income exceeding fifty million Rupiah (Rp 50,000,000).

Should the income brackets be amended by the Minister of Finance, then the tax rates mentioned in a), b), c) will be applied to the amended income brackets.

(ii) To calculate the taxable income, the rules for computation of Income Tax as provided for in Annex "H" attached to and made part of this Agreement shall apply. Except as otherwise stipulated in this Agreement, the rules as provided in Income Tax Law 1994, and its implementing regulations, shall apply.

(iii) The Company shall pay tax instalments for its current tax year in accordance with Article 25 Income Tax Law 1994 and its implementing regulations.

(iv) Atas penghasilan tertentu sebagaimana dimaksud Pasal 4 ayat (2) Undang-Undang Pajak Penghasilan 1994 dikenakan tarif pajak tersendiri sesuai dengan ketentuan yang diatur dalam Peraturan Pemerintah.

4. Pajak Penghasilan Karyawan (PPh Pasal 21/Pasal 26).

(i) Perusahaan berkewajiban untuk memotong dan menyetorkan Pajak Penghasilan atas penghasilan sehubungan dengan pekerjaan, termasuk pesangon dan pensiun, yang dibayarkan kepada pegawai Perusahaan yang berkedudukan sebagai Wajib Pajak dalam negeri, berdasarkan Pasal 21 atau Pasal 26 Undang-Undang Pajak Penghasilan 1994;

(ii) Orang Asing yang dipekerjakan atau dimanfaatkan oleh Perusahaan, yang berada di Indonesia kurang dari 183 (seratus delapan puluh tiga) hari dalam setiap jangka waktu 12 (dua belas) bulan, harus dikenakan pajak penghasilan melalui pemotongan (withholding tax) oleh Perusahaan berdasarkan Pasal 26 Undang-Undang Pajak Penghasilan 1994 dengan tarif 20% (dua puluh persen), atau persentase lain yang lebih rendah karena diberlakukannya satu Perjanjian Penghindaran Pajak Berganda yang relevan, atas penghasilan bruto berupa imbalan jasa, kegiatan atau pekerjaan. Penghasilan dari Perorangan Asing tersebut yang dikenakan pajak di Indonesia termasuk jenis penghasilan yang dibayarkan kepada mereka untuk jasa yang diberikan dengan tunduk pada ketentuan ayat 7 Lampiran H;

(iii) Orang Asing yang dipekerjakan atau dimanfaatkan oleh Perusahaan, yang berada di Indonesia lebih dari 183 (seratus delapan puluh tiga) hari dalam setiap jangka waktu 12 (dua belas) bulan atau bermaksud untuk bertempat tinggal di Indonesia, dikenakan pajak Penghasilan melalui pemotongan (withholding tax) oleh Perusahaan berdasarkan Pasal 21 Undang-Undang Pajak Penghasilan 1994, dari penghasilan yang dibayarkan kepada pegawai Perusahaan dengan mempertimbangkan peraturan yang berkenaan dengan penghasilan yang dapat dikurangkan. Penghasilan orang Asing tersebut mencakup segala jenis penghasilan yang dibayarkan kepada mereka oleh Perusahaan, dengan memperhatikan persetujuan yang dimaksud dalam Paragraf 7 Lampiran "H";

(iv) Pesangon yang diberikan kepada pegawai Perusahaan yang bekerja di Wilayah Kontrak Karya tidak akan dikenakan pajak penghasilan sesuai dengan ketentuan yang berlaku.

5. Pajak Penghasilan Pasal 23 dan Pasal 26.

Perusahaan sesuai dengan Undang-Undang Pajak Penghasilan 1994 dan peraturan-peraturan yang berlaku pada waktu ditandatanganinya Persetujuan ini, berkewajiban untuk memotong dan menyetorkan kepada Pemerintah, Pajak Penghasilan dengan tarif yang ditentukan dalam Pasal ini atau tarif lain yang lebih rendah karena diberlakukannya suatu Perjanjian Penghindaran Pajak Berganda yang relevan, sebagai berikut:

(i) dividen, bunga dalam bentuk apapun termasuk imbalan sehubungan dengan pengembalian hutang;

(ii) sewa, royalti dan penghasilan lainnya sehubungan dengan penggunaan harta;

(iv) For specific income as stipulated in Article 4 Paragraph (2) of Income Tax Law 1994, shall be subject to specific tax rate in accordance with the provisions of Goverment Regulation.

4. Personal Income Tax (Article 21/Article 26)

(i) the Company has liability to withhold and remit Income Tax on income related to work, including severance payment and pension paid to employees of the Company as resident taxpaye. according to Article 21 or Article 26 of the Income Tax Law 1994.

(ii) expatriate Individuals employed or engaged by the Company who are present in Indonesia for less than one hundred and eighty three (183) days in any twelve month period shall be subject to Income Tax through withholding tax by the Company based on Article 26 of the Income Tax Law 1994, with a rate of twenty percent (20%) or such lower rates due to the relevant Tax Treaty on the gross income for services, activities or works in Indonesia.
The income of such Expatriate Individuals, which is taxable in Indonesia shall include all kinds of remuneration paid to them for services rendered in Indonesia subject to the provision of paragraph 7 of Annex "H".

(iii) expatriate individuals employed or engaged by the Company and who are present in Indonesia for more than one hundred and eighty three (183) days in any twelve month period or intending to reside in Indonesia, shall be subject to Income Tax through withholding tax by the Company based on Article 21 of the Income Tax Law 1994, from the income paid to the Company's employees with consideration being given to the regulations relating to non taxable income. The income of such Expatriate Individuals shall include all kinds of remuneration paid to them by the Company, subject to the provision of paragraph 7 of Annex "H".

(iv) severance payments paid to the employees working in the Contract Area shall be subject to Income Tax in accordance with the prevailing regulation.

5. Income tax under Article 23 and Article 26.

The Company in accordance with the Income Tax Law 1994 and regulation prevailing at the date of the signing of this Agreement is obliged to withhold and remit Income Tax to the Government at a rate specified in this Article or such lower rate due to the enforcement of relevant Tax Treaty as follows:

(i) dividends, interest in whatever form including loan guarantee fee;

(ii) rents, royalties and other income related to the utilization of property;

(iii) imbalan yang dibayarkan untuk jasa teknik atau jasa manajemen dan jasa lainnya;

(iv) hadiah dan penghargaan ;

(v) premi asuransi yang dibayar ke luar negeri.

Tarif Pajak yang berlaku sejak ditandatanganinya Persetujuan ini adalah :

a) 15% (lima belas persen) dari jumlah bruto dalam hal pembayaran dividen, bunga dan royalty yang dibayarkan kepada Wajib Pajak dalam negeri, kecuali deviden yang dibayarkan kepada perseroan terbatas, koperasi, yayasan atau organisasi sejenis, badan usaha milik negara atau badan usaha milik daerah.

b) 7,5% (tujuh koma lima persen) dari jumlah bruto dalam hal pembayaran dividen kepada pemegang saham pendiri luar negeri dan pemegang saham pendiri orang pribadi dalam negeri.

c) 15% (lima belas persen) dari perkiraan penghasilan neto atas sewa dan penghasilan sehubungan dengan penggunaan harta, dan atas imbalan yang dibayarkan untuk jasa teknik, jasa manajemen danjasa lainnya sesuai dengan ketentuan Pajak Penghasilan Pasal 23 dalan hal pembayaran dilakukan kepada Wajib Pajak dalam negeri.

d) 20% (dua puluh persen) dari jumlah bruto atau presentase lain yang lebih rendah karena diberlakukannya Perjanjian Penghindaran Pajak Berganda yang relevan dalam hal pembayaran penghasilan sebagaimana dimaksud dalam Pasal 26 Undang-Undang Pajak Penghasilan 1994 yang dilakukan kepada Wajib Pajak luar negeri.

6. Pajak Pertambahan Nilai (PPN) dan Pajak Penjualan atas Barang Mewah (PPn BM) sesuai dengan Undang-Undang Pajak Pertambahan Nilai 1994 dan peraturan-peraturan pelaksanaan yang berlaku.

Dengan memperhatikan kewajiban umum yang dimaksud dalam Undang-Undang Pajak Pertambahan Nilai tahun 1994 dan peraturan pelaksanaannya, Perusahaan berkewajiban untuk:

(i) melaporkan usahanya untuk dikukuhkan menjadi Pengusaha Kena Pajak;

(ii) memungut, menyetor dan melaporkan Pajak Pertambahan Nilai atas penyerahan barang kena pajak dan/atau jasa kena pajak dengan tarif 10% (sepuluh persen) atau tarif lain, sesuai dengan Undang-Undang Pajak Pertambahan Nilai 1994 dan peraturan-peraturan pelaksanaannya;

(iii) memungut, menyetor dan melaporkan Pajak Pertambahan Nilai dan/atau Pajak Penjualan atas Barang Mewah sebagai Pemungut. Pajak berdasarkan Undang-Undang Pajak Pertambahan Nilai 1994 dan peraturan pelaksanaannya;

(iii) compensation paid for technical services, managerial services, and other services;

(iv) grant and reward;

(v) insurance premiums which are paid to non-resident insurance company;

The rates of such withholding tax in force as from the date of the signing of this Agreement are :

a) fifteen percent (15%) of gross income in the case of payments of dividends, interest and royalties, paid to the resident taxpayer excluding dividend, paid to a resident company, cooperative, foundation or similar organization, state owned company or company owned by local government.

b) seven and half percent (7.5%) of gross income in the case of payment of dividend to a non resident founder shareholder and individual resident founder shareholder.

c) fifteen percent (15%) of deemed net income on rents and income related to the use of property, and compensation paid for technical, management and other services in accordance with Article 23 Income Tax Law, 1994 in case of payment made to resident taxpayer.

d) twenty percent (20%) of gross income or such lower rate due to the relevant Tax Treaty in case of income payment as stipulated in Article 26 of Income Tax Law 1994 made to non resident taxpayer.

6. Value Added Tax (VAT) and Sales Tax on Luxury Goods according to the VAT Law 1994 and its implementing regulations in effect.

With due regard to the general liability under VAT Law 1994 and all of its implementing regulations, the Company has liability

(i) to report its business and apply for registration as a Taxable Firm;

(ii) to collect, remit and report VAT on the delivery of taxable goods and or services at the rate of ten percent (10%) or other rates in accordance with VAT Law 1994 and its implementing regulations;

(iii) to withold remit and report VAT and or Sales Tax on Luxury Goods as VAT witholder based on the VAT Law 1994 and its implementing regulations;

(iv) perusahaan dikenakan Pajak Pertambahan Nilai dan/atau Pajak Penjualan atas Barang Mewah atas impor atau pembelian Barang Kena Pajak atau Perolehan Jasa Kena Pajak yang berdasarkan Undang-Undang Pajak Pertambahan Nilai 1994 dan Peraturan Pelaksanaannya tentang Pajak Pertambahan Nilai dan/atau Pajak Penjualan atas Barang Mewah;

(v) dalam hal Pajak Masukan lebih besar dari Pajak Keluaran untuk suatu masa pajak, maka kelebihan Pajak Masukan tersebut dikompensasikan dengan Pajak Keluaran untuk masa pajak berikutnya kecuali kelebihan pembayaran Pajak Masukan yang disebabkan ekspor dan/atau penyerahan kepada Pemungut Pajak Pertambahan Nilai dapat diajukan permohonan pengembalian pada setiap Masa Pajak;

(vi) barang Kena Pajak dan/atau Jasa Kena Pajak yang berhubungan langsung dengan proyek Kontrak Karya yang diperoleh oleh pemegang saham yang merupakan bagian pengeluaran sebelum perusahaan didirikan yang kemudian dialihkan kepada Perusahaan, tidak dianggap sebagai penyerahan Barang Kena Pajak atau Jasa Kena Pajak sepanjang pemegang saham adalah Pengusaha Kena Pajak;

(vii) Pajak Masukan atas Barang Kena Pajak dan/atau Jasa Kena Pajak yang dialihkan tersebut pada butir (vi) dapat dikreditkan oleh Perusahaan sepanjang belum dikreditkan oleh pemegang saham.

7. Bea Materai atas dokumen-dokumen.

Perusahaan dikenakan Bea Materai sesuai dengan ketentuan- ketentuan sebagaimana dimaksudkan dalam Undang-Undang No. 13 Tahun 1985 tentang Bea Materai, beserta peraturan-peraturan pelaksanaannya.

8. Bea masuk atas barang-barang yang diimpor ke Indonesia.

(i) Pembebasan dan keringanan-keringanan Bea Masuk atas impor barang-barang modal, peralatan dan mesin dan bahan-bahan yang diberikan kepada Perusahaan berdasarkan Undang-Undang No. 1 Tahun 1967 tentang Penanaman Modal Asing sebagaimana telah diubah dengan Undang-Undang No. 11 Tahun 1970, sebagaimana ditetapkan dalam Pasal 12 Persetujuan ini.

(ii) Pemasukan ke dalam daerah pabean Indonesia barang-barang lain termasuk milik pribadi akan tunduk kepada ketentuan-ketentuan pabean sesuai dengan peraturan perUndang-Undangan yang berlaku.

(iii) Pengenaan Cukai atas tembakau dan minuman keras tunduk kepada ketentuan cukai sesuai dengan peraturan perUndang-Undangan yang berlaku.

9. Pajak Bumi dan Bangunan (PBB).

Perusahaan harus membayar Pajak Bumi dan Bangunan (PBB) dalam Rupiah atau dalam mata uang lain yang disetujui bersama, sebagai berikut :

(iv) the company is subject to the VAT and or Sales Tax on Luxury Goods on import or the purchasing of taxable goods or obtaining taxable services which are based on VAT Law 1994 and its implementing regulations, subject to VAT and or Sales Tax on Luxury Goods;

(v) in case Input Tax exceeds Output Tax in a particular tax period, overpayment of Input Tax can be compensated with Output Tax for the following tax period, exept for overpayment on Input Tax resulting from export and or delivery to the VAT witholder which may submit a request for refund at any tax period;

(vi) taxable goods and or services related directly to the Contract of Work which were accrued by the shareholder as a part of expenses before the establishment of the Company and thereafter transferred to the Company will not be considered as delivery of taxable good and or services for VAT purposes to the extent that such shareholder is a Taxable Firm;

(vii) the transferred Input Tax on taxable goods and or services, for VAT purposes, referred to sub paragraph (vi) paragraph 6 of this Article, may be credited by the Company, to the extent it has not been credited yet by the shareholder.

7. Stamp Duty on Documents.

The Company shall pay Stamp Duty in accordance with the provisions stipulated in the Law Number 13 Year 1985 regarding Stamp Duty and its implementing regulations.

8. Import Duty on goods imported into Indonesia.

(i) exemption and tax reliefs on import duty of capital goods, equipment, and machinery and supplies are granted to the Company based on Law Number 1 Year 1967 concerning Foreign Capital Investment as amended by Law Number 11 Year 1970, as provided in Article 12 of this Agreement.

(ii) import of other goods into Indonesian customs areas, including personal effects shall be subject to the customs rule in accordance with the prevailing Law and Regulations.

(iii) execise tax on tobacco and liquor are governed by prevailing legislation.

9. Land and Building Tax.

The company shall pay Land and Building Tax (PBB) in Rupiah or in other currencies as may be mutually agreed, as follows :

(i) Pada tahap-tahap Pra Produksi (Penyelidikan Umum, Eksplorasi, Studi Kelayakan dan Konstruksi), Perusahaan harus membayar Pajak Bumi dan Bangunan (PBB) yang jumlahnya sama dengan jumlah iuran tetap (deadrent) sebagaimana dimaksud dalam Pasal 13 Paragraf 1 Persetujuan ini.

(ii) Pada tahap Operasi/Produksi perusahaan harus membayar PBB yang jumlahnya sama dengan jumlah iuran tetap ditambah suatu jumlah yang besarnya 0,5% x 30% dari penerimaan kotor hasil operasi pertambangan.

(iii) Selain itu, Perusahaan juga harus membayar Pajak Bumi dan Bangunan (PBB) atas tanah/perairan bangunan yang berada di luar atau di dalam areal Kontrak Karya/Wilayah pertambangan yang dipakai oleh Perusahaan untuk fasilitas yang tertutup untuk umum, yang besarnya ditetapkan berdasarkan meter persegi luas tanah/perairan dan luas serta jenis bangunan sesuai dengan ketentuan Undang-Undang Nomor 12 Tahun 1985 sebagaimana telah diubah dengan Undang-Undang Nomor 12 tahun 1994 dan klasifikasi dan besarnya Nilai Jual Obyek Pajak (NJOP) yang ditetapkan oleh Kantor Wilayah Direktorat Jenderal Pajak serta pembayaran PBB tersebut akan dilaksanakan sepanjang berlakunya Persetujuan ini.

(iv) Pengenaan dan pembayaran PBB untuk areal Kontrak Karya/Wilayah Pertambangan pada tahap Pra Produksi sebagaimana dimaksud pada butir (i) di atas, mengikuti tata cara pembayaran PBB yang berlaku secara umum.

(v) Pengenaan dan pembayaran PBB untuk areal Kontrak Karya/Wilayah pertambangan pada tahap Operasi/Produksi dan untuk tanah/perairan dan bangunan yang dipakai oleh perusahaan, mengikuti tata cara pengenaan sebagaimana dimaksud pada butir (ii) dan butir (iii) di atas dan tata cara pembayaran PBB yang berlaku secara umum.

10. Perusahaan akan membayar pungutan-pungutan, pajak-pajak, pembebanan-pembebanan, dan bea-bea yang dikenakan oleh Pemerintah Daerah di Indonesia yang telah disetujui oleh Pemerintah Pusat sesuai dengan Undang-Undang dan peraturan-peraturan yang berlaku dengan tarif dan dihitung sedemikian rupa sehingga tidak lebih besar dari jumlah yang dihitung berdasarkan Undang-Undang dan Peraturan-Peraturan yang berlaku pada tanggal Persetujuan ini ditandatangani.

11. Perusahaan akan membayar pungutan-pungutan administrasi umum dan pembebanan-pembebanan untuk fasilitas-fasilitas atau jasa-jasa dan hak-hak khusus yang diberikan oleh Pemerintah Daerah sepanjang pungutan-pungutan dan pembebanan-pembebanan itu telah disetujui oleh Pemerintah Pusat.

12. Pajak atas pemindahan hak pemilikan.

Perusahaan akan membayar Bea Balik Nama atas :

(i) during pre production periods (General Survey, Exploration, Feasibility Studies and Construction Periods), the Company shall pay Land and Building Tax of an amount equal to the amount of deadrent as stated in Article 13 paragraph (1) of this Agreement;

(ii) during the Operating Production Period, the company shall pay Land and Building Tax of an amount equal to the amount of deadrent plus an amount of *0.5%* x 30 % of gross revenue from the mining operations;

(iii) the Company shall also pay Land and Building Tax on land/water area and building area outside or inside the Contract Area/Mining Area used by the Company for its facilities which are closed to the public, an amount to be measured by the number of square metres of land/water and floor space and type of the building in accordance with the provisions of Law Number 12 of 1985 as amended by Law Number 12 of 1994 and the classification and the amount of Sales Value of Tax Object stipulated by the Regional Tax Office of the Directorate General of Taxes and such Land and Building tax payment shall be imposed during the term of this Agreement;

(iv) imposition and payment of Land and Building Tax for the Contract Area during the pre-production period as stipulated in sub paragraph (i) above, shall be governed by the general payment procedure on Land and Building Tax;

(v) imposition and payment of Land and Building Tax for the Contract Area/Mining Area during the Operating Production Period and for land/water and building used by the Company, shall be governed by sub paragraph (ii) and (iii) above, and the general payment procedure on Land and Building Tax.

10. The Company shall pay levies, taxes, charges, and duties imposed by the Local Government in Indonesia which have been approved by the Central Government in accordance with the prevailing laws and regulations at rates and calculated in a manner not greater than the amount calculated based on the laws and regulations in force at the date of the signing of this Agreement.

11. The company shall pay general administrative fees and charges for facilities or services and special rights granted by the Local Government to the extent that such fees and charges have been approved by the Central Government.

12. Duty on transfer of ownership.

The Company shall pay duties on transfer of ownership for :

(i) Kendaraan-kendaraan bermotor, yang dipungut oleh Pemerintah Daerah dimana kendaraan-kendaraan tersebut didaftarkan dengan tarif sesuai dengan peraturan Pemerintah Daerah yang berkenaan.

(ii) Akte pendaftaran dan pemindahan kapal-kapal atau alat-alat angkutan laut yang beroperasi di Indonesia.

Pemenuhan kewajiban pajak dari Perusahaan dan Subsidiarinya atau Afiliasinya yang berhubungan dengan kewajiban-kewajiban formal dan material perpajakan seperti Nomor Pokok Wajib Pajak, Pengembalian Pajak, Pembayaran Pajak, Pelaporan dan sebagainya dan hak-hak perpajakan seperti keberatan atas besarnya pajak, pembayaran kembali, kredit pajak, kompensasi dan sanksi-sanksi adalah tunduk kepada ketentuan-ketentuan sebagaimana dimaksud dalam Undang-Undang Nomor 6 Tahun 1983 tentang Ketentuan Umum dan Tata Cara Perpajakan sebagaimana telah diubah dengan Undang-undang Nomor 9 Tahun 1994, Undang-Undang Pajak Penghasilan 1994, Undang-Undang Pajak Pertambahan Nilai 1994, Undang-Undang Nomor 12 Tahun 1985 tentang Pajak Bumi dan Bangunan sebagaimana telah diubah dengan Undang-undang Nomor 12 Tahun 1994, Undang-Undang Nomor 13 Tahun 1985 tentang Bea Materai, serta segala peraturan pelaksanaannya.

Dalam menetapkan penghasilan kena pajak dari Perusahaan, akan diterapkan prinsip-prinsip pembukuan yang sehat, konsisten dan diterima secara umum sebagaimana yang layak digunakan dalam industri pertambangan, dengan ketentuan, bahwa dimana ditemui oleh Pemerintah lebih dari satu praktek pembukuan yang diterapkan terhadap hal tertentu, maka Pemerintah akan berkonsultasi dengan Perusahaan sehubungan hal tersebut.
Tanpa membatasi ketentuan umum tersebut, untuk tujuan pembukuan, Pemerintah dalam keadaan bagaimanapun, tidak akan terikat oleh sifat khusus sesuatu transaksi dengan suatu Afiliasi sebagaimana didalihkan oleh Perusahaan. Dalam hal Pemerintah memastikan adanya suatu ketidak wajaran, atau tidak sesuai dengan kebiasaan umum yang dianut oleh pihak-pihak yang independen dalam transaksi yang serupa atas suatu pembayaran, potongan, pembebanan untuk pengeluaran-pengeluaran atau transaksi lainnya dengan satu Afiliasi maka untuk tujuan menetapkan pajak penghasilan Perusahaan, Pemerintah menggantikan pembayaran, potongan, pembebanan pengeluaran atau transaksi lainnya yang berlaku seandainya transaksi itu berlangsung antara pihak-pihak independen.

(i) motor vehicles, which shall be levied by the Local Government where the vehicles are registered at a rate in accordance with the relevant Local Government regulations;

(ii) registration certificates and transfer of ships or sea transportation operating in Indonesia.

Tax compliance of the Company and its subsidiaries or its Affiliates, in connection with formal and material tax obligations such as Tax Identification Numbers, Tax Returns, Tax payments, Reporting, etc, and rights on taxation such as appeal on tax assessment, refund, tax credit, compensation and penalties are subject to provisions provided in Law Number 6 of 1983 concerning General Tax Provisions and Procedures as amended by Law Number 9 of 1994, Income Tax Law of 1994, Value Added Tax Law 1994, Law Number 12 of 1985 concerning Land and Building Tax as amended by Law Number 12 of 1994, Law Number 13 of 1985 concerning Stamp Duty, and all of its implementing regulations.

In determining the Company's net taxable income, sound, consistent and generally accepted accounting principles as usually used in the mining industry shall be employed, provided, however, that where more than one accounting practice is found by the Government to prevail with regard to a particular item, the Government shall consult with the Company in relation to such particular item. Without limiting the generality of the foregoing, for accounting purposes, the Government shall in no event be bound by the Company's characterization of any transaction with an Affiliate as stated by the Company.
In the event that the Government has determined an unreasonable situation exists, or one that is not in accordance with general practice followed by independent parties in similar transactions on a certain payment, deduction, charges for expenses or other transactions with an Affiliate for the purposes of determining the Company's income tax, the Government shall substitute the payment, deduction, charges for expenses or other transactions which would have prevailed had the transaction occurred between independent parties.

Pasal 14

PELAPORAN, INSPEKSI DAN RENCANA KERJA

1. Perusahaan harus senantiasa membuat dan memelihara di Indonesia, catatan-catatan teknis yang benar, lengkap dan sistematis sehubungan dengan laporan keuangan yang menunjukkan suatu gambaran yang benar dan wajar, dari semua kegiatannya, dan status dari cadangan bahan galian terukur, terunjuk dan terkira, termasuk penambangan, pengolahan, pengangkutan dan pemasaran sesuai dengan dasar-dasar pembukuan yang berlaku umum (generally accepted accounting principles), yang dinyatakan dalam Rupiah atau dalam dollar Amerika Serikat. Laporan Keuangan dan laporan lainnya boleh dibuat dalam bahasa Indonesia atau dalam Bahasa Inggris dan mata uang Dollar Amerika Serikat berdampingan dengan konversinya dalam mata uang Rupiah.

   Surat Pemberitahuan (SPT) pajak beserta lampiran-lampirannya dan kewajiban pembayaran pajak tetap dilaksanakan dalam Bahasa Indonesia dan mata uang Rupiah.
   Perusahaan wajib menyimpan pembukuan atau pencatatan dan dokumen yang menjadi dasarnya serta dokumen lain yang berhubungan dengan kegiatan usahanya selama 10 (sepuluh) tahun. Perusahaan harus menyerahkan kepada Pemerintah laporan keuangan (financial statements) tahunan yang terdiri dari neraca dan laporan rugi laba dan semua keterangan keuangan lainnya sesuai dengan prinsip pembukuan yang berlaku di Indonesia dan semua keterangan lain mengenai operasinya dengan rincian yang wajar dan dalam rincian sebagaimana dikehendaki oleh Pemerintah.

2. Pemerintah dan wakilnya yang berwenang mempunyai hak untuk meneliti dan mengadakan pemeriksaan (audit) atas laporan keuangan dalam waktu 10 (sepuluh) tahun setelah akhir tahun pajak yang bersangkutan. Apabila Pemerintah tidak mengeluarkan ketetapan untuk tambahan pembayaran iuran tetap, iuran produksi, Pajak Penghasilan atau pembayaran-pembayaran lainnya kepada Pemerintah dalam jangka waktu 10 (sepuluh) tahun tersebut, maka hak Pemerintah tersebut menjadi gugur, kecuali Wajib Pajak dipidana karena melakukan tindak pidana sebagaimana dimaksud dalam Pasal 13 ayat (5) dan Pasal 15 ayat (4) Undang-Undang Nomor 6 Tahun 1983 sebagaimana telah diubah dengan Undang-Undang Nomor 9 Tahun 1994.

3. Pemerintah dan wakilnya yang berwenang dapat memasuki Wilayah Kontrak Karya dan setiap usaha Perusahaan lainnya dimanapun, untuk mengadakan pemeriksaan kegiatan Perusahaan pada setiap waktu dan dari waktu ke waktu selama jam-jam kerja. Perusahaan harus memberikan bantuan yang diperlukan untuk memungkinkan wakil-wakil Pemerintah mengadakan pemeriksaan catatan-catatan mengenai hal-hal teknis dan keuangan yang berhubungan dengan kegiatan Perusahaan dan harus memberikan kepada wakil-wakil tersebut keterangan yang diminta secara wajar. Wakil-wakil Pemerintah tersebut akan melakukan pemeriksaan atas risiko sendiri dan akan menghindari campur tangan terhadap kegiatan rutin Perusahaan.

4. Perusahaan harus menyampaikan kepada Pemerintah, tidak lebih lama dari 6 (enam) minggu sebelum dimulainya tahun anggaran Perusahaan selama jangka waktu Persetujuan ini, rencana kerja, rencana anggaran pendapatan dan belanja, kontrak-kontrak penjualan dan rencana pemasaran/penjualan untuk tahun berikutnya, dengan rincian yang cukup agar Pemerintah dapat meneliti rencana fisik, keuangan dan

Article 14

RECORDS, INSPECTION AND WORK PROGRAM

1. The Company shall always conduct and maintain in Indonesia, precise, complete, and systematic technical records in connection with financial reports showing a true and fair view of all of its operations and the status of proven, probable and possible ore reserves, including mining, processing, transportation and marketing in accordance with generally accepted accounting principles, stated in Rupiah or in equivalent United States dollars. The financial and other reports may be presented in English and in US Dollars together with its conversion into Rupiah.

   The Tax Return (SPT) with its appendices and tax payment liability shall be maintained in the Indonesian language and Rupiah currency. The Company shall keep financial record or notes and basic documents and other supporting documents which relate to the Enterprise for ten (10) years. The Company shall furnish to the Government annual financial statements consisting of a balance sheet and income statement and all such other financial information in accordance with generally accepted accounting principles in Indonesia and all such other information concerning its operations in reasonable detail and such detail as the Government may reasonably request.

2. The Government and its authorized representatives have the right to review and audit such financial statements within ten (10) years after the end of such taxable year. If the Government does not issue any notice of tax deficiency within the ten (10) year period, this shall preclude such right of the Government, unless the taxpayer is being sentenced due to criminal offence as stipulated in Article 13 paragraph 5 and Article 15 paragraph 4 Law Number 6 of 1983 as amended by Law Number 9 of 1994.

3. The Government and its authorized representatives may enter the Contract Area and any other place of business of the Company to inspect its operation at any time as well as from time to time during regular business hours. The Company shall render all necessary assistance to enable the representatives to inspect technical and financial records relating to the Company's operation and shall give the said representatives such information as they may reasonably request. The said representatives shall conduct such inspection at their own risk and shall avoid interference in the normal operations of the company.

4. The Company shall submit to the Government, not later than six (6) weeks prior to the commencement of the Companies fiscal year during the term of this Agreement, its work program, budget plan, sales contracts and marketing/sales plan for the following year in sufficient detail to permit the Government to

pemasaran/penjualan-penjualan tersebut dan menetapkan apakah rencana-rencana itu sesuai dengan kewajiban Perusahaan sesuai dengan Persetujuan ini. Suatu rencana kerja dan rencana anggaran pendapatan dan belanja untuk tahun pertama dari Persetujuan ini harus disampaikan kepada Pemerintah segera setelah Persetujuan ini ditandatangani.

5. Sebagai tambahan, hal-hal berikut harus disampaikan kepada Pemerintah :

   (i) Salinan yang disahkan dari semua persetujuan mengenai penjualan, manajemen, komersial dan keuangan yang dibuat dengan Afiliasi-Afiliasi dan pihak-pihak yang bebas (independen) serta semua persetujuan lain yang dibuat dengan Afiliasi-Afiliasi, yang harus diserahkan dalam waktu satu bulan setelah dibuat.

   (ii) Laporan bulanan yang menyatakan jumlah dan mutu Mineral yang dihasilkan, dikapalkan, dijual, digunakan atau dilepas dengan cara lain dan harga-harga yang diperoleh. Perusahaan harus menyerahkan kepada Pemerintah semua keterangan lain yang berhubungan dengan kegiatan Pengusahaan yang mungkin diminta oleh Pemerintah, baik yang telah dikuasainya maupun yang dapat diperolehnya melalui usaha yang wajar, supaya Pemerintah dapat sepenuhnya menilai kegiatan-kegiatan eksplorasi dan eksploitasi Perusahaan.

6. Semua keterangan yang disebut dalam ayat (5) Pasal ini harus diserahkan kepada Pemerintah dalam bahasa Inggris atau bahasa Indonesia dan semua data keuangan harus dibukukan dalam mata uang Rupiah atau Dollar Amerika Serikat dan catatan-catatan harus juga dibuat untuk nilai-nilai tukar yang berlaku terhadap mata uang aslinya.

7. Perusahaan harus memelihara semua catatan asli dan laporan yang berhubungan dengan kegiatan operasinya sesuai dengan Persetujuan ini termasuk semua dokumen yang berkaitan dengan transaksi-transaksi keuangan dan komersial dengan pihak-pihak lain (independent parties) serta Afiliasi-Afiliasi dikantor pusatnya di Indonesia. Catatan-catatan dan laporan-laporan ini terbuka untuk keperluan pemeriksaan oleh Pemerintah melalui wakilnya yang berwenang. Laporan-laporan dan catatan-catatan tersebut harus dibuat dalam bahasa Indonesia atau bahasa Inggris dan semua data keuangan harus dicatat dalam mata uang Rupiah atau mata uang Dollar Amerika Serikat dan catatan-catatan harus juga dibuat untuk nilai-nilai tukar yang berlaku terhadap mata uang aslinya.

8. Perusahaan harus meminta kepada rekan usahanya, Afiliasi-afiliasi, dan subkontraktor-subkontraktor sepanjang rekan usaha, Afiliasi, ataupun sub kontraktor tersebut melakukan operasi dan kegiatannya sebagai kelanjutan dari kewajiban-kewajiban, kegiatan-kegiatan dan operasi-operasi Perusahaan berdasarkan Persetujuan ini, untuk memelihara semua laporan keuangan, catatan, data dan keterangan yang perlu untuk memungkinkan Perusahaan menjalankan ketentuan-ketentuan dalam Pasal ini.

9. Dengan tidak mengurangi arti ketentuan Pasal 7 ayat (6), setiap keterangan yang diserahkan oleh Perusahaan akan (kecuali dengan persetujuan tertulis dari Perusahaan, persetujuan mana tidak akan ditangguhkan tanpa alasan yang wajar) diperlakukan oleh

review such physical, financial and marketing/sales program and determine whether they are in accordance with the Company's obligations under this Agreement. A work program and budget for the first year of this Agreement shall be submitted as soon as possible after the signing of this Agreement.

5. In addition, the following shall be delivered to the Government :

   (i) conformed copies of all sales, management, commercial and financial agreements concluded with Affiliates and independent parties, and all other arrangements concluded with affiliates should be submitted within one month of conclusion;

   (ii) monthly reports setting forth the quantities and qualities of minerals produced, shipped, sold, utilized or otherwise disposed of and the prices obtained. The Company shall furnish the Government with all other information of whatever kind relative to the Enterprise which the latter may request, which is, or could by the exercise of reasonable efforts by the Company have been, within the control of the Company in order that the Government may be fully appraised of the Company's exploration and exploitation activities.

6. All information mentioned in paragraph 5 of this Article furnished to the Government shall be either in English or Indonesian and all financial data shall be recorded in Rupiah or US Dollars and records shall also be kept of conversion rates applied to the original currency.

7. The Company shall maintain all original records and reports relating to its activities and operations under this Agreement including all documents relating to financial and commercial transactions with independent parties and Affiliates in its principal office in Indonesia. These records and reports shall be open to inspection by the Government through an authorized representative. Such reports and records shall be maintained in Indonesian or English and all financial data shall be recorded in Rupiah or US Dollars, and all records shall also be kept of the conversion rates applied to the original currency.

8. The Company shall require of the Company's co-participants, Affiliates and sub-contractors to the extent that such co-participants, Affiliates, or subcontractors carry out operations and activities in furtherance of the Company's obligations, activities and operations under this Agreement, to keep all financial statements, records, data and information necessary to enable the Company to observe the provisions of this Article 14.

9. Without prejudice to paragraph 6 of Article 7, any information supplied by the Company shall (except with the written consent of the Company which shall not be unreasonably withheld) be treated by all persons in the service of the

semua pejabat Pemerintah Republik Indonesia sebagai rahasia, tetapi meskipun demikian Pemerintah akan mempunyai hak untuk setiap saat menggunakan semua keterangan yang diterima dari Perusahaan untuk tujuan mempersiapkan dan menerbitkan angka-angka statistik serta laporan-laporan umum tentang prospeksi bijih atau kegiatan-kegiatan pertambangan di Indonesia dan untuk keperluan arbitrase atau proses pengadilan antara Pemerintah dan Perusahaan.

10. Semua catatan, laporan, rencana, peta, grafik, pembukuan dan keterangan yang diwajibkan atau dari waktu ke waktu dapat diwajibkan untuk diserahkan oleh Perusahaan berdasarkan ketentuan-ketentuan dalam Persetujuan ini harus diserahkan atas biaya Perusahaan.

Government of the Republic of Indonesia as confidential, but the Government shall nevertheless be entitled at any time to make use of any information received from the Company for the purpose of preparing and publishing aggregated returns and general reports on the extent of minerals prospecting or minerals mining operations in Indonesia and for the purpose of any arbitration or litigation between the Government and the Company.

10. All records, reports, plans, maps, charts, accounts and information which the Company is or may from time to time be required to supply under the provisions of this Agreement shall be supplied at the expense of the Company.

Pasal 15

PERTUKARAN ALAT PEMBAYARAN

1. Semua pengiriman uang untuk penanaman modal ke Indonesia yang digunakan untuk setiap pengeluaran yang akan dibuat di Indonesia (termasuk tetapi tidak terbatas pada modal saham maupun pinjaman) akan dimasukkan dalam rekening penanaman modal asing ("PMA Account") yang dibuka di satu bank atau beberapa bank devisa di Indonesia. Semua pengiriman uang untuk penanaman modal tersebut harus digunakan menurut peraturan penanaman modal dan penggunaan dana luar negeri yang berlaku bagi perusahaan penanaman modal asing yang didirikan sesuai Undang-Undang Penanaman Modal Asing No. 1 Tahun 1967 dan yang disempurnakan dengan Undang-Undang No. 11 Tahun 1970. Penukaran atau penjualan valuta asing yang berasal dari rekening PMA akan dilaksanakan melalui Bank Devisa.

2. Perusahaan diberi hak untuk mentransfer ke luar negeri dana-dana dalam mata uang yang dapat dikonversikan/dipertukarkan dengan ketentuan bahwa transfer tersebut dilaksanakan sesuai dengan Undang-Undang dan peraturan yang berlaku dan didasarkan atas nilai tukar pasar yang berlaku umum terhadap transaksi-transaksi perdagangan sehubungan dengan hal-hal berikut:

   (i) keuntungan bersih dari Perusahaan sebanding dengan saham yang dipegang oleh Penanam Modal yang bukan Indonesia;

   (ii) pembayaran kembali pinjaman pokok dan bunganya serta upah dan biaya-biaya yang terkait, sepanjang pinjaman itu merupakan bagian dari rencana investasi Perusahaan yang telah disetujui oleh Pemerintah;

   (iii) cadangan penyusutan barang-barang modal yang pada umumnya berlaku bagi perusahaan Penanaman Modal Asing yang didirikan sesuai Undang-Undang Penanaman Modal Asing No. 1 Tahun 1967 yang disempurnakan dengan Undang-Undang No. 11 Tahun 1970;

   (iv) hasil penjualan saham yang dijual sesuai dengan ketentuan ayat 3 dari Pasal 24;

   (v) biaya untuk Tenaga Kerja Asing yang dipekerjakan oleh Perusahaan serta keluarganya dan untuk pelatihan tenaga Indonesia di Luar Negeri;

   (vi) hutang Perusahaan dinyatakan dalam valuta asing termasuk utang kepada kontraktor dan penjual peralatan dan bahan baku atau jasa komisi;

   (vii) biaya untuk perbantuan teknik;

   (viii) biaya perizinan ;

Article 15

CURRENCY EXCHANGE

1. All investment remittances into Indonesia for the purpose of any expenditures to be made in Indonesia (including but not limited to equity capital and loan capital) shall be deposited into a foreign investment account (the PMA Account') established at one or more foreign exchange banks in Indonesia. All such investment remittances shall be used in accordance with the prevailing investment and utilization of offshore funds regulations applicable to foreign investment law companies established under the Foreign Investment Law, Law No. I of 1967 and its amendment Law No. 11 of 1970. The conversion or sale of foreign exchange originating from the PMA foreign currency account is to be done with foreign exchange banks.

2. The company shall be granted the right to transfer abroad, in any convertible currency, funds in respect of the following items, provided that such transfers are effected in accordance with the prevailing laws and regulations and at the prevailing market rates of exchange to commercial transactions as follows:

   (i) net operating profits of the Company in proportion to the shareholding of any non-Indonesian investor;

   (ii) repayment of loan principal and the interest thereon and all fees and expenses related thereto, insofar as it is a part of the Company's investment which has been approved by the Government;

   (iii) allowance for depreciation of the capital assets generally applicable to foreign investment companies established under the Foreign Investment Law, Law No.1 of 1967 and its amendment Law No. 11 of 1970;

   (iv) proceeds from sales of shares sold pursuant to paragraph 3 of Article 24;

   (v) expenses for Expatriates employed by the Company and their families and for training of Indonesian personnel abroad;

   (vi) debts of the Company denominated in foreign currency, including debts owed to contractors and sellers of equipment and raw materials, or for commissions;

   (vii) technical assistance fees;

   (viii) license fees;

(ix) komisi keagenan yang dibayar kepada pihak ketiga di luar negeri;

(x) pembayaran kepada pemasok asing dari Perusahaan, sepanjang pembelian barang-barang dan jasa pelayanan luar negeri termasuk manajemen dan pelayanan jasa yang berkaitan, diperlukan untuk operasi Perusahaan atau Pengusahaan;

(xi) repatriasi (pengiriman kembali) modal karena likuidasi Perusahaan atau yang diperoleh dari restrukturisasi permodalan yang disetujui oleh Pemerintah;

(xii) segala fasilitas pertukaran mata uang asing lainnya yang disediakan dari waktu ke waktu bagi Perusahaan yang didirikan berdasarkan Undang-Undang Penanaman Modal Asing No. 1 Tahun 1967 yang sudah disempurnakan atau dilengkapi dengan Undang-Undang dan peraturan-peraturan lain yang berlaku.

(xiii) kompensasi dalam hal nasionalisasi Perusahaan.

3. Hasil penjualan ekspor mineral-mineral dan setiap hasil produksi yang berasal dari padanya dapat digunakan sesuai dengan kebutuhan Perusahaan. Dengan tidak mengurangi hak-hak Perusahaan yang disebutkan dimuka, Perusahaan menyetujui bahwa segala sesuatu mengenai hasil penjualan ekspornya harus sesuai dengan Undang-Undang dan peraturan-peraturan yang dari waktu ke waktu berlaku.

4. Perusahaan, dalam melaksanakan hak-hak dan menunaikan kewajiban-kewajibannya yang tercantum dalam Persetujuan ini akan diijinkan untuk membayar ke luar negeri, dalam setiap mata uang yang dapat dikonversikan/dipertukarkan, tanpa penukaran ke dalam Rupiah untuk barang-barang dan jasa-jasa yang diperlukannya dan untuk membiayai di luar negeri, setiap pengeluaran lain yang timbul bagi operasi pertambangan berdasarkan Persetujuan ini.

5. Sehubungan dengan hal-hal lain mengenai valuta asing yang timbul dengan cara apapun atau dalam hubungan dengan Persetujuan ini, Perusahaan berhak untuk mendapatkan perlakuan yang tidak kurang menguntungkan daripada yang diberikan kepada Perusahaan tambang lainnya yang melaksanakan operasi di Indonesia.

6. Dengan mempertimbangkan ayat-ayat di muka dalam Pasal ini, Perusahaan harus memenuhi semua laporan keuangan dan persetujuan yang diperlukan yang berlaku bagi perusahaan Penanam Modal Asing yang didirikan berdasarkan Undang-Undang Penanaman Modal Asing No. 1 Tahun 1967 dan yang disempurnakan dengan Undang-Undang No. 11 Tahun 1970.

(ix) agency commissions payable to third parties abroad;

(x) payments to foreign suppliers of the Company, to the extent that the purchases of foreign goods and services, including management and related services, are necessary for the operation of the Company or the Enterprise;

(xi) repatriation of capital on the liquidation of the Company, or resulting from capital restructuring approved by the Government;

(xii) any other foreign exchange facilities provided from time to time to foreign investment companies established under the Foreign Investment Law, Law No. 1 of 1967, as amended or provided by any regulations adopted pursuant thereto or by any other laws or regulations;

(xiii) compensation in the event of nationalization of the Company.

3. The proceeds of the export sales of minerals and any products derived from them can be used as the Company sees fit. Without prejudicing the foregoing rights of the Company, the Company agrees that with regard to the proceeds of the Company's export sales it shall comply with laws and regulations from time to time in force.

4. The Company in the exercise and performance of its rights and obligations set forth in this Agreement shall be authorized to pay abroad, in any convertible currency, without conversion into Rupiah, for the goods and services it may require and to defray abroad, in any currency it may desire, any other expenses incurred for mining operations under this Agreement.

5. In respect of other matters of foreign currency arising in any way out of or in connection with this Agreement, the Company shall be entitled to receive treatment no less favorable to the Company than that accorded to any other Mining Company carrying on operations in Indonesia.

6. Subject to the foregoing paragraphs of this Article 15, the Company shall comply with all financial reporting and approval requirements applicable to foreign investment law companies established under the Foreign Investment Law, Law No. 1 of 1967 and its amendment Law No. 11 of 1970.

Pasal 16

HAK-HAK KHUSUS PEMERINTAH

1. Tanpa persetujuan lebih dahulu dari Pemerintah, Perusahaan dan para pemegang sahamnya setuju, bahwa mereka tidak akan :

   (i) merubah Akte Pendirian Perusahaan;

   (ii) mengganti tujuan usaha pokok Perusahaan;

   (iii) melikuidasi atau mengakhiri Perusahaan secara sukarela;

   (iv) bergabung atau mengkonsolidasikan Perusahaan dengan Perusahaan lain;

   (v) menjaminkan atau dengan cara lain menggadaikan Mineral di dalam Wilayah Kontrak Karya.

2. Pemerintah berhak untuk menangguhkan persetujuannya atas rencana-rencana dan rancangan-rancangan yang berhubungan dengan konstruksi, operasi, perluasan, modifikasi, dan penggantian fasilitas-fasilitas Pengusahaan di Wilayah Kontrak Karya yang tidak sesuai dan tidak wajar yang dapat merusak Lingkungan Hidup atau membatasi potensi pengembangannya lebih lanjut atau sangat mengganggu stabilitas sosial politik di daerah itu atau bertentangan dengan kepentingan keamanan nasional. Seperti diterangkan lebih jelas pada Pasal 8 ayat (3), Pemerintah akan memberikan persetujuan tertulis dalam waktu 3 (tiga) bulan.

3. Pemerintah berhak untuk memasuki Wilayah Kontrak Karya sebagaimana disebutkan dalam Pasal 14 ayat (3).

Article 16

SPECIAL RIGHTS OF THE GOVERNMENT

1. The Company and its shareholders agree that they will not without the Government's prior approval :

   (i) amend the Articles of Incorporation of the Company;

   (ii) change the basic nature of the business of the Company;

   (iii) voluntarily liquidate or wind up the Company;

   (iv) merge or consolidate the Company with any other Company;

   (v) pledge or otherwise use as security the Minerals in the Contract Area.

2. The Government reserves the right to withhold its approval of plans and designs relating to construction, operation, expansion, modification and replacement of facilities of the Enterprise in the Contract Area which may disproportionately and unreasonably damage the surrounding Environment or limit its further development potential or significantly disrupt the socio-political stability in the area or be adverse to the interests of national security. As more fully described in paragraph 3 of Article 8, the Government will issue its written approval within three (3) months.

3. The Government shall have the right of access to the Contract Area as provided in paragraph 3 of Article 14.

Pasal 17

KESEMPATAN KERJA DAN LATIHAN BAGI WARGA NEGARA INDONESIA

1. Perusahaan wajib mempekerjakan tenaga kerja Indonesia dengan mengutamakan sebanyak mungkin penggunaan tenaga kerja setempat/lokal dalam batas-batas yang praktis sesuai dengan operasi yang efisien, dengan mengingat peraturan perundang-undangan yang berlaku dari waktu ke waktu di Indonesia.

2. Perusahaan tidak dibatasi dalam pengangkatan atau pemberhentian tenaga kerja, dengan ketentuan, bahwa berdasarkan syarat-syarat yang berlaku untuk hal-hal tersebut di atas, syarat-syarat dan kondisi pengangkatan dan pemberhentian serta pendisiplinan tenaga kerja Indonesia harus dilaksanakan berdasarkan Undang-Undang dan peraturan-peraturan Indonesia yang berlaku umum pada waktu itu.

3. Perusahaan harus mengikutsertakan langsung partisipasi warga Indonesia dalam Pengusahaan dengan menempatkan warga negara Indonesia dalam pimpinan Perusahaan dan diantara anggota Dewan Direksinya. Untuk jabatan Direksi dan Dewan Komisaris sesuai dengan peraturan perundang-undangan yang berlaku dari waktu ke waktu di Indonesia. Perusahaan juga wajib melatih warga negara Indonesia untuk menduduki jabatan-jabatan lain yang mempunyai tanggung jawab.

4. Perusahaan harus mengadakan suatu rencana pelatihan yang luas untuk tenaga kerja Indonesia di Indonesia dan negara-negara lain serta sesuai dengan persetujuan Pemerintah, dan melaksanakan rencana pelatihan dan pendidikan tersebut dalam rangka memenuhi persyaratan berbagai klasifikasi pekerjaan tetap (full time) pada kegiatan-kegiatannya di Indonesia dalam waktu sesingkat-singkatnya yang dapat dilaksanakan setelah menyampaikan permohonan tertulis kepada dan mendapatkan persetujuan Pemerintah sesuai Pasal 8 ayat (3), sehubungan dengan keputusannya untuk melanjutkan pengembangan endapan-endapan itu. Perusahaan juga wajib melaksanakan suatu program untuk memperkenalkan kepada semua tenaga kerja Asing dan sub kontraktor yang terdaftar, tentang hukum dan adat kebiasaan Indonesia.

5. Perusahaan dan sub-sub kontraktornya yang terdaftar dapat memasukkan ke Indonesia tenaga-tenaga kerja asing, yang menurut pertimbangan Perusahaan diperlukan untuk melaksanakan kegiatan-kegiatannya dengan efisien; dengan ketentuan bahwa Menteri dapat memberitahukan kepada Perusahaan dan Perusahaan harus mempertimbangkan dengan sungguh-sungguh, keberatan-keberatan berdasarkan keamanan nasional atau kebijaksanaan-kebijaksanaan luar negeri Pemerintah. Atas permintaan perusahaan (yang akan disertai dengan keterangan pendidikan, pengalaman dan kwalifikasi lainnya dari tenaga kerja yang bersangkutan) sesuai dengan tata cara dan peraturan-peraturan yang berlaku, Pemerintah akan mengatur cara-cara untuk memperoleh semua izin yang diperlukan (termasuk izin masuk dan izin keluar, izin kerja, visa dan izin-izin

Article 17

EMPLOYMENT AND TRAINING OF INDONESIAN NATIONALS

1. The Company shall employ Indonesian personnel, giving preference to the local work force to the maximum extent practicable consistent with efficient operations, subject to the provisions of the existing laws and regulations which may from time to time be in force in Indonesia.

2. The Company shall not be restricted in its assignment or discharge of personnel; provided however that subject to the foregoing requirements the terms and conditions of such assignment and discharge or disciplining of Indonesian personnel shall be carried out in compliance with the laws and regulations of Indonesia which at the time are generally applied.

3. The Company shall seek to provide direct Indonesian participation in the Enterprise through the inclusion of Indonesian nationals in the management of the Company and among the members of its Board of Directors, in compliance with the prevailing laws and regulations from time to time in force in Indonesia. The Company will also train Indonesian nationals to occupy other responsible positions.

4. The Company shall conduct a comprehensive training program for Indonesian personnel in Indonesia and, subject to the approval of the Government, in other countries and carry out such program for training and education in order to meet the requirement for various classifications of full time employment for its operations in Indonesia within the shortest practicable period of time after having submitted written application to the Government and upon approval thereof in accordance with paragraph 3 of Article 8 in relation to its decision to proceed with development of the deposits. The Company shall also conduct a program to acquaint all Expatriate employees and registered sub-contractors with the laws and customs of Indonesia.

5. The Company and its registered sub-contractors may bring into Indonesia such Expatriate Individuals as in the Company's judgment are required to carry out the operations efficiently; provided however, that the Minister may make known to the Company, and the Company shall duly observe, objections based on grounds of national security or foreign policy of the Government. At the Company's request (which shall be accompanied by information concerning the education, experience and other qualifications of the individuals concerned) and in compliance with the existing rules and regulations, the Government will make arrangement for the acquisition of all necessary permits, (including entry and exit permits, work permits, visas and such other permits, as may be required);

lain yang mungkin diperlukan); dalam hubungan ini Perusahaan secara berkala akan menyerahkan kepada Pemerintah rencana-rencana keperluan tenaga kerja, laporan tenaga kerja, program penggantian tenaga kerja asing oleh tenaga kerja Indonesia, rencana dan laporan pelaksanaan pendidikan dan pelatihan bagi tenaga kerja Indonesia.

6. Perusahaan setuju bahwa akan selalu ada perlakuan, dan pemberian fasilitas dan kesempatan yang sama antara tenaga-tenaga kerja dalam tingkatan jabatan yang sama mengenai gaji, fasilitas dan kesempatan dalam industri pertambangan, tanpa memandang kebangsaan dan Perusahaan mematuhi dengan sungguh-sungguh Undang-Undang dan peraturan-peraturan tenaga kerja yang berlaku di Indonesia.

7. Perusahaan mengakui bahwa sesuai ketentuan yang berlaku di Indonesia, tenaga kerja Perusahaan membentuk serikat pekerja yang bertujuan untuk mengadakan perundingan kesepakatan kerja bersama dengan Perusahaan. Perusahaan mengakui bahwa memang diperlukan mengadakan perundingan kesepakatan kerja bersama dari waktu ke waktu dengan serikat pekerja yang demikian tersebut. Oleh karena itu Perusahaan berkewajiban mendukung secara moral pekerja untuk membentuk serikat pekerja dan menjaga hubungan baik dengan serikat pekerja tersebut.

8. Sebelum pemukiman tetap didirikan, Perusahaan akan menyediakan secara cuma-cuma pemeliharaan dan perawatan kesehatan kepada semua pegawai yang berkerja di wilayah yang termasuk dalam Persetujuan ini, secara wajar dan akan mengadakan atau memberikan perawatan kesehatan yang cukup sekurang-kurangnya sebanding dengan perawatan yang diberikan dalam keadaan yang sama di Indonesia. Jika Perusahaan mendirikan pemukiman tetap, Perusahaan harus menyediakan pemeliharaan dan perawatan kesehatan dengan cuma-cuma kepada semua pegawainya serta kepada semua Pejabat Pemerintah yang bekerja di wilayah yang termasuk dalam Persetujuan ini, atas permintaan Perusahaan, secara wajar dan akan mengangkat petugas dan menyediakan sebuah apotek, klinik atau rumah sakit yang memadai untuk keadaan itu sesuai dengan Undang-Undang dan peraturan-peraturan yang berlaku di Indonesia.

9. Jika Perusahaan mendirikan pemukiman tetap memasukan bagi keluarga-keluarga pegawai bergabung dalam Pengusahaan, Perusahaan harus menyediakan secara cuma-cuma fasilitas pendidikan dasar dan menengah bagi semua anak-anak pegawai. Tatacara, peraturan dan norma yang berlaku umum bagi fasilitas pendidikan yang sepadan di Indonesia yang dikeluarkan Depertemen Pendidikan dan Kebudayaan harus dipatuhi.

in this connection the Company shall periodically submit to Government its manpower requirement plans, manpower substitution program of expatriates by Indonesia manpower, training and education programs and its implementation report is respect of Indonesian employees.

6. The Company agrees that there shall at all times be equal treatment, facilities and opportunities among employees in the same job classification with respect to salaries, facilities and opportunities within the mining industry regardless of nationality and the Company shall duly observe the existing manpower laws and regulations which may from time to time be in force in Indonesia.

7. The Company acknowledges that pursuant to prevailing law and regulations in Indonesia, employees of the Company have the right to form a trade union for purposes of collective bargaining with the company. The Company acknowledges that it may be required from time to time to enter into collective bargaining with such trade union. Therefore the Company is obliged to morally support the employees to form the union and to liaise with such union.

8. Prior to the establishment of a permanent settlement the Company shall furnish free medical care and attention to all its employees working in the area covered by this Agreement as is reasonable and shall maintain or have available adequate medical services at least commensurate with such services provided in similar circumstances in Indonesia. If the Company establishes a permanent settlement, the Company shall furnish such free medical care and attention to all its employees and all Government officials requested by the Company working in the area covered by this Agreement as is reasonable and shall establish a staff and maintain a dispensary, clinic or hospital which shall be reasonably adequate under the circumstances according to the prevailing laws and regulations of Indonesia.

9. If the Company establishes a permanent settlement incorporating families for the employees associated with the Enterprise, the Company shall provide, free of charge, primary and secondary education facilities for the children of employees. Rules, regulations and standards of general application for comparable education facilities in Indonesia established by the Department of Education and Culture shall be followed.

Pasal 18

KETENTUAN - KETENTUAN KEMUDAHAN

1. Pemerintah akan memberikan kepada Perusahaan hak-hak yang diperlukan dan akan mengambil tindakan-tindakan lain yang barangkali diperlukan untuk mencapai tujuan bersama dari Persetujuan ini. Perusahaan akan mempunyai hak-hak seperti tersebut di bawah:

   (i) hak tunggal untuk memasuki Wilayah Kontrak Karya atau Wilayah Pertambangan untuk maksud-maksud Persetujuan ini, untuk membuat lubang-lubang bor, sumur-sumur uji dan penggalian-penggalian, dan untuk mengambil dan memindahkan tanpa membayar iuran eksploitasi/produksi ataupun pembayaran-pembayaran lainnya, contoh-contoh untuk analisa dan untuk maksud-maksud riset metalurgi, serta riset di pabrik percobaan (pilot plant) dan di laboratorium, termasuk contoh-contoh ruahan (bulk) untuk maksud-maksud tersebut; dengan ketentuan bahwa Perusahaan harus mendapat persetujuan Pemerintah sebelum mengekspor setiap contoh dimaksud, yang akan diberikan sekali dalam setahun dalam hal sesuatu contoh atau sebagian daripadanya sesudah diuji mempunyai nilai ekonomi harus membayar iuran eksploitasi/produksi.

   (ii) untuk memasuki dan tinggal di dalam Wilayah Kontrak Karya dan Wilayah Proyek (yang berhubungan dengan Wilayah Kontrak Karya termasuk bagian dari ruang udara dan garis pantai), tunduk pada hak Departemen untuk berkeberatan atas suatu Wilayah Pertambangan sesuai Pasal 8 ayat (2) Perusahaan akan mengakui hal-hal yang tercantum dalam Pasal 16 Undang-Undang Nomor 11 Tahun 1967, tunduk pada ketentuan Pasal 16 ayat (2) tersebut.

2. Dalam melaksanakan kegiatan-kegiatannya berdasarkan Persetujuan ini, Perusahaan tunduk kepada peraturan perundang-undangan yang berlaku dari waktu ke waktu di Indonesia, mempunyai hak untuk membangun fasilitas-fasilitas yang dianggap perlu, dengan ketentuan bahwa :

   (i) sehubungan dengan penggunaan tanah oleh Perusahaan untuk membangun fasilitas-fasilitas, sebagaimana dicantumkan dalam Persetujuan ini, Perusahaan akan membayar pungutan-pungutan yang lazim untuk pengukuran dan pendaftaran tanah yang dipungut oleh Badan Pertanahan Nasional (BPN). Dalam memperoleh hak-hak tanah di luar Wilayah Pertambangan, Perusahaan harus mematuhi undang-undang dan peraturan-peraturan yang berlaku umum dari waktu ke waktu.

   (ii) sehubungan dengan kegiatan-kegiatan Perusahaan, tetapi dengan mengingat ketentuan dari Pasal 13, Perusahaan harus membayar biaya dan pungutan yang berlaku umum untuk pelayanan, fasilitas, dan hak khusus yang diberikan oleh Pemerintah, dengan ketentuan, bahwa pelayanan, fasilitas dan hak tersebut diminta oleh Perusahaan.

3. Dengan tunduk kepada peraturan perundang-undangan yang berlaku dari waktu ke waktu di Indonesia dan dengan tunduk pula pada ketentuan Pasal 25 ayat (2) dan Pasal 16 ayat (2), Perusahaan setiap waktu dapat mengajukan suatu rencana atau rencana-rencana kepada Departemen dan sesudah itu dapat mengajukan rencana-rencana tambahan atau rencana perubahan yang meliputi:

Article 18

ENABLING PROVISIONS

1. The Government will grant the Company the necessary rights and will take such other action as may be desirable to achieve the mutual objectives of this Agreement. The Company shall have the following rights:

   (i) the sole right to enter the Contract Area or any Mining Area for the purposes of this Agreement, to make drill holes, test pits and excavations, and to take and remove, without royalty or other charge, samples for assays and for metallurgical, pilot plant and laboratory research purposes, including bulk samples for such purposes provided that the Company shall have received the approval by the Government prior to the export of any such samples, to be given on a yearly basis, and shall pay any royalties applicable thereto.

   (ii) to enter upon and remain within the Contract Area and the Project Areas (related to the Contract Area including portions of the air space and shore line), subject to the right of the Department to object to any Mining Area as provided in paragraph 2 of Article 8. The Company shall recognize the items referred to in Article 16 of Law No.11 of 1967, subject to the provision of paragraph 2 of the said Article 16.

2. In carrying out its activities under this Agreement, the Company subject to the laws and regulations from time to time in effect in Indonesia, shall have the right to construct facilities as it deems necessary, provided that

   (i) in connection with the use of land by the Company for construction of facilities as provided in this Agreement, the Company shall pay the usual surveying and registration fees charged by the Land Registration Office. In acquiring titles to land outside any Mining Area, the Company shall comply with laws and regulations of general application from time to time in effect.

   (ii) in connection with the activities of the Company, but subject to the provisions of Article 13, the Company shall pay generally applicable fees and charges for services performed, facilities provided and special rights granted by the Government; provided that such services, facilities and rights are requested by the Company.

3. Subject to laws and regulations which may from time to time be in force in Indonesia, and subject also to the provisions of paragraph 2 of Article 25 and paragraph 2 of article 16, the Company may at any time file with the Department a plan or plans and may thereafter file additional or amended plans covering :

(i) daerah pertambangan atau daerah-daerah dimana Perusahaan bermaksud untuk membangun fasilitas-fasilitas yang berhubungan dengan produksi;

(ii) semua daerah lainnya dimana Perusahaan bermaksud untuk membangun fasilitas-fasilitas lainnya yang diperlukan untuk Pengusahaan, dan letak dari semua hak-hak tersebut pada dan di atas daratan, termasuk kemudahan-kemudahan, hak-hak untuk lewat, dan hak-hak untuk meletakkan atau melewati, di atas atau di bawah tanah, setiap jalan, rel-rel, pipa-pipa, saluran-saluran pipa, saluran-saluran pembuangan, saluran-saluran pengering, kabel-kabel, kawat-kawat atau fasilitas-fasilitas yang serupa yang mungkin diperlukan untuk Pengusahaan; dan

(iii) semua daerah dimana Perusahaan berhak untuk membangun fasilitas-fasilitas tambahan yang oleh Perusahaan dianggap perlu atau memudahkan bagi Pengusahaan.

Pemerintah selanjutnya akan mengambil langkah-langkah untuk memungkinkan Perusahaan menggunakan dan tinggal di dalam semua daerah dan tanah yang tercakup oleh rencana-rencana tersebut (atau daerah-daerah semacam itu sesuai dengan persetujuan antara Pemerintah dengan Perusahaan) dan untuk melaksanakan hak-hak lainnya seperti diutarakan di atas mengenai masing-masing daerah itu. Penggunaan dan penguasaan sesuatu daerah yang tercakup oleh rencana-rencana termaksud, tidak akan membebani Perusahaan untuk membayar pungutan-pungutan atau biaya-biaya selain yang ditetapkan di bagian lain di dalam Persetujuan ini. Rencana-rencana yang diajukan sesuai dengan ayat ini, sepanjang dapat dilaksanakan harus memuat penjelasan secara cukup terinci, demi untuk identifikasi setepat mungkin dari daerah-daerah yang direncanakan. Pemerintah akan membantu Perusahaan dalam pengaturan untuk setiap pemukiman kembali penduduk setempat yang diperlukan dari sesuatu bagian dari Wilayah Kontrak Karya atau Wilayah Proyek, dan Perusahaan harus membayar ganti rugi yang wajar untuk setiap rumah tinggal, tanah-tanah hak milik (termasuk tanah-tanah hak milik berdasarkan adat atau hukum adat Indonesia, yang berlaku umum atau yang berlaku setempat) tanaman panen dan tumbuh-tumbuhan hak milik atau perbaikan-perbaikan lainnya yang terdapat pada tiap bagian tersebut yang diambil atau dirusak oleh Perusahaan sehubungan dengan pelaksanaan kegiatan-kegiatannya berdasarkan Persetujuan ini.

4. Dengan memperhatikan pembayaran-pembayaran sebagaimana diatur dalam Pasal 13 Persetujuan ini dan pembayaran-pembayaran serta ketentuan-ketentuan yang dicantumkan dalam Undang-Undang dan peraturan-peraturan Pemerintah Pusat dan Pemerintah Daerah yang berlaku umum, dan tanpa mengurangi hak-hak pihak-pihak lain dan pembayaran ganti rugi yang wajar sebagaimana lazim berlaku dalam Wilayah Kontrak Karya, maka Perusahaan atas biaya sendiri sesudah mendapat persetujuan Pemerintah, dapat mengambil dan menggunakan dari Wilayah Kontrak Karya, kayu (untuk keperluan konstruksi), tanah, batu,pasir, kerikil, gamping, air dan produk serta bahan-bahan lainnya yang dibutuhkan untuk atau yang akan digunakan oleh Perusahaan. Dalam melakukan hal tersebut, Perusahaan akan memperhatikan peraturan-peraturan yang berlaku yang mengatur eksploitasi dan penggunaan sumber daya alam tersebut.

(i) the Mining Area or Areas in which the Company proposes to construct facilities related to production;

(ii) all other areas in which the Company proposes to construct any other facilities necessary for the Enterprise and the location of all such rights in and over land including easements, rights of way and rights to lay or pass on, over or under land, any roads, railways, pipes, pipelines, sewers, drains, wires, lines or similar facilities as may be necessary for the Enterprise; and

(iii) all other areas in which the Company shall have the right to construct such additional facilities as the Company deems necessary or convenient for the Enterprise.

The Government shall thereupon make arrangements for the Company to utilize and remain within all such areas and such land covered by such plans (or such comparable areas as may be agreed between the Government and the Company) and to exercise the other rights specified above with respect to each such area. The use and occupancy of any areas covered by such plans shall not be subject to payment by the Company of any charges or fees other than those specified elsewhere in this Agreement. The plans filed pursuant to this paragraph shall, to the extent practicable, give description in sufficient detail to permit precise identification of the designated areas. The Government shall assist the Company in arrangements for any necessary resettlement of local inhabitants whose resettlement from any part of the Contract Area or the Project Areas is necessary and the Company shall pay for the resettlement and give reasonable compensation for any dwelling, privately owned lands (including such land ownership based on any Indonesian customs or customary laws, generally or locally applicable) privately owned crops and flora or other improvements in existence on any such parts which are taken or damaged by the Company in connection with its activities under this Agreement.

4. Subject to the payments provided for in Article 13 of this Agreement and payments and provisions laid down in generally applicable Central Government, Regional Government and Provincial laws and regulations, and without prejudice to the rights of private parties and to payments of reasonable compensation as may be customary in the Contract Area, the Company at its own expense after approval of the Government may take and use from the Contract Area such timber (for construction purposes), soil, stone, sand, gravel, lime, water, other products and materials as are necessary for or are to be used by the Enterprise. In doing so, the Company shall observe the then effective regulations governing the exploitation and use of said natural resources.

5. Perusahaan juga berhak dengan persetujuan Pemerintah dan dengan mematuhi tatacara dan peraturan-peraturan yang berlaku, untuk menebang dan memindahkan pohon-pohon, tanah penutup dan penghalang lainnya, yang dianggap perlu atau dikehendaki untuk penambangan, fasilitas-fasilitas konstruksi dan setiap kegiatan lain dari Perusahaan berdasarkan Persetujuan ini, dengan ketentuan, bahwa Perusahaan akan menghormati hak-hak lain yang telah diberikan oleh Pemerintah, seperti hak penggembalaan, hak penebangan kayu dan hak-hak bercocok tanam, serta hak-hak melewati jalan, dengan melaksanakan kegiatan-kegiatannya berdasarkan Persetujuan ini sedemikian rupa agar sekecil mungkin mengganggu hak-hak tersebut.

6. Perusahaan dapat, atas biaya sendiri, juga mengambil dan menggunakan setiap hasil dan bahan-bahan dari daerah lain di luar Wilayah Kontrak Karya dengan mengingat kepada hak-hak pihak-pihak lain, berdasarkan persetujuan Pemerintah, dan dengan membayar ganti rugi sebagaimana disetujui antara Perusahaan dan pihak-pihak lain atau Pemerintah dan sesuai dengan peraturan perundang-undangan yang berlaku.

7. Atas permintaan Perusahaan, Pemerintah akan bekerjasama dalam usaha untuk mengurangi setiap gangguan yang mungkin timbul dari pihak-pihak lain yang beroperasi berdasarkan hak-hak yang berbeda.

5. The Company shall also have the right subject to the approval of the Government and in compliance with existing rules and regulations, to clear away and remove such timber, overburden and other obstructions as may be necessary or desirable for the mining, construction of facilities and any other operations of the Company under this Agreement, provided that the Company shall take into account other rights granted by the Government such as grazing, timber cutting and cultivation rights, and rights of way, by conducting its operations under this Agreement so as to interfere as little as possible with such rights.

6. The Company may, at its own expense, also take and use any of such products and materials from other areas outside the Contract Area subject to the rights of other parties, and with the approval of the Government, and to the payment of such compensation as may be agreed between the Company and such other parties or the Government and in accordance with the prevailing laws and regulations.

7. At the request of the Company, the Government shall co-operate in a joint endeavor to alleviate any interference which may arise from others operating under conflicting rights.

Pasal 19

KEADAAN MEMAKSA

1. Setiap kegagalan dari Pemerintah atau dari Perusahaan, untuk melaksanakan setiap kewajibannya di bawah Persetujuan ini, tidak akan dianggap sebagai suatu pelanggaran kontrak ataupun kelalaian, apabila kegagalan itu disebabkan oleh keadaan memaksa, pihak yang bersangkutan telah melakukan semua langkah pengamanan yang sesuai, telah betul-betul menjaga dan mengambil langkah-langkah pilihan yang wajar dengan sasaran untuk menghindarkan kegagalan tersebut dan untuk melaksanakan kewajiban-kewajibannya berdasarkan Persetujuan ini. Jika suatu kegiatan tertunda, terbatasi atau terhalang oleh keadaan memaksa, maka sekalipun bertentangan dengan apa yang tersebut di dalam Persetujuan ini, waktu untuk melaksanakan kegiatan yang kena pengaruh oleh keadaan memaksa dan jangka waktu Persetujuan seperti yang dicantumkan dalam Pasal 31, masing-masing akan diperpanjang dengan jangka waktu yang sama dengan jumlah waktu pengaruh-pengaruh itu berlangsung, dan untuk suatu periode perpanjangan, jika ada, sebagaimana diperlukan untuk menggantikan kerugian waktu,yang diakibatkan keadaan memaksa tersebut. Untuk maksud Persetujuan ini, keadaan memaksa meliputi antara lain: peperangan, pemberontakan, kerusuhan sipil, blokade, sabotase, embargo, pemogokan, dan perselisihan perburuhan lainnya, keributan, epidemi, gempa bumi, angin ribut, banjir atau keadaan-keadaan cuaca lainnya yang merugikan, ledakan, kebakaran, petir, perintah atau petunjuk (adverse order or direction) yang merugikan dari setiap Pemerintah "de jure" ataupun "defacto" atau perangkatnya atau sub divisinya, takdir Tuhan atau kerusakan pada mesin-mesin yang berpengaruh besar terhadap kegiatan Pengusahaan, dan setiap sebab lainnya (seperti yang diuraikan di atas, baik yang sejenis maupun yang tidak) yang secara wajar tidak dapat dikuasai oleh pihak yang terkena sebab-sebab itu, dan yang sifatnya sedemikian rupa, sehingga mengakibatkan penundaan, pembatasan atau menghalangi tindakan tepat pada waktunya oleh pihak yang terkena pengaruh.

2. Pihak yang kemampuannya untuk melaksanakan kewajiban-kewajibannya terkena oleh keadaan memaksa, harus memberitahukan hal itu sesegera mungkin kepada pihak lainnya secara tertulis, dengan menyebutkan sebabnya, dan kedua belah pihak akan berusaha untuk melakukan semua tindakan dan hal-hal yang perlu dalam batas-batas kemampuannya, untuk mengatasi keadaan tersebut, akan tetapi dengan ketentuan bahwa masing-masing pihak tidak diwajibkan untuk menyelesaikan atau menghentikan suatu perselisihan dengan pihak ketiga, termasuk perselisihan-perselisihan perburuhan, kecuali dengan syarat-syarat yang dapat diterima atau sesuai dengan keputusan terakhir dari badan arbitrase, pengadilan atau badan-badan yang ditetapkan oleh undang-undang yang mempunyai wewenang hukum, untuk akhirnya menyelesaikan perselisihan itu. Mengenai sengketa-sengketa perburuhan, Perusahaan dapat meminta kepada Pemerintah untuk bekerjasama dalam suatu usaha bersama untuk meringankan setiap perselisihan yang mungkin timbul.

Article 19

FORCE MAJEURE

1. Any failure by Government or by the Company to carry out any of its obligations under this Agreement shall not be deemed a breach of contract or default if such failure is caused by force majeure, that party haven taken all appropriate precautions, due care and reasonable alternative measures with the objectives of avoiding such failure and of carrying out its obligations under this Agreement. If any activity is delayed, curtailed or prevented by force majeure, then anything in this Agreement to the contrary notwithstanding, the time for carrying out the activity thereby affected and the term of this Agreement specified in Article 31 shall each be extended for a period equal to the total of the periods during which such causes or their effects were operative, and for such further periods, if any, as shall be necessary to make good the time lost as a result of such force majeure. For the purposes of this Agreement, force majeure shall include among other things: war, insurrection, civil disturbance, blockade, sabotage, embargo, strike and other labor conflict, riot, epidemic, earthquake, storm, flood, or other adverse weather conditions, explosion, fire, lightning, adverse order or direction of any Government de jure or de facto or any instrumentality or subdivision thereof, act of God, breakdown of machinery having a major effect on the operation of the Enterprise and any cause (whether or not of the kind hereinbefore described) over which the affected party has no reasonable control and which is of such a nature as to delay, curtail or prevent timely action by the Party affected.

2. The Party whose ability to perform its obligations is affected by force majeure shall notify as soon as practicable the other Party thereof in writing, stating the cause, and the Parties shall endeavor to do all reasonable acts and things within their power to remove such cause, provided, however, that neither Party shall be obligated to resolve or terminate any disagreement with third parties, including labor disputes, except under conditions acceptable to it or pursuant to the final decision of any arbitral, judicial or statutory agencies having jurisdiction to finally resolve the disagreement. As to labor disputes, the Company may request the Government to co-operate in a joint endeavor to alleviate any conflict which may arise.

Pasal 20

KELALAIAN

1. Dengan tunduk kepada ketentuan-ketentuan Pasal 19 Persetujuan ini, dalam hal, Perusahaan ternyata lalai dalam melaksanakan ketentuan Persetujuan ini, maka Pemerintah, sebagai usaha untuk memperbaikinya berdasarkan Persetujuan ini, akan menyampaikan pemberitahuan tertulis tentang hal tersebut kepada Perusahaan (pemberitahuan mana harus menyatakan bahwa hal itu sesuai dengan Pasal ini) dan Perusahaan akan mendapat jangka waktu maksimum 180 (seratus delapan puluh) hari setelah menerima pemberitahuan tersebut, untuk memperbaiki kelalaian itu. Waktu yang sebenarnya diperlukan untuk memperbaiki kelalaian tersebut, harus dicantumkan di dalam pemberitahuan tertulis untuk setiap kelalaian, sebagaimana wajarnya dalam suatu keadaan dengan mempertimbangkan sifat dari kelalaian. Dalam hal Perusahaan telah memperbaiki kelalaian tersebut dalam jangka waktu yang ditetapkan, maka Persetujuan ini akan tetap berlaku penuh dan tidak mengurangi hak Pemerintah (untuk melakukan teguran) terhadap sesuatu kelalaian dikemudian hari. Dalam hal Perusahaan tidak memperbaiki kelalaian tersebut dalam jangka waktu yang ditetapkan di dalam pemberitahuan, maka Pemerintah berhak untuk mengakhiri Persetujuan ini sesuai dengan ketentuan- ketentuan Pasal 22, tergantung pada masalahnya.

2. Tanpa mengurangi ketentuan-ketentuan ayat (1) Pasal ini, dalam hal Perusahaan lalai dalam melakukan suatu pembayaran uang kepada Pemerintah yang diwajibkan terhadap Perusahaan sesuai dengan Pasal 12 atau Pasal 13, maka jangka waktu dalam mana Perusahaan harus memperbaiki kelalaian tersebut, adalah 30 (tiga puluh) hari setelah menerima pemberitahuan itu. Denda untuk pembayaran yang terlambat adalah beban bunga atas jumlah uang yang lalai dibayar, yang terhitung dari tanggal seharusnya pembayaran dilakukan, dengan tingkat bunga pokok yang berlaku di New York pada tanggal kelalaian itu terjadi ditambah 4% (empat persen). Denda ini atau hukuman- hukuman lain yang ditetapkan dalam Pasal ini tidak boleh dianggap sebagai potongan dalam menghitung pendapatan kena pajak.

3. Perusahaan belum dianggap lalai dalam pelaksanaan suatu ketentuan dalam Persetujuan ini mengenai hal yang masih disengketakan antara kedua belah pihak, sampai waktu semua sengketa itu, termasuk setiap anggapan bahwa Perusahaan lalai dalam pelaksanaan dari padanya atau sesuatu sengketa dimana Perusahaan telah disediakan kesempatan yang wajar untuk memperbaikinya, telah terselesaikan sebagaimana diatur dalam Pasal 21.

Article 20

DEFAULT

1. Subject to provisions of Article 19 of this Agreement, in the event that the Company is found to be in default in the performance of any provision of this Agreement, the Government, as its remedy under this Agreement, shall give the Company written notice thereof (which notice must state that it is pursuant to this Article) and the Company shall have a period of a maximum one hundred and eighty (180) days after receipt of such notice to correct such default. The actual time within which to correct such default shall be stipulated in the said written notice in each individual case as may be reasonable under the circumstances considering the nature of the default. In the event the Company corrects such default within such period, this Agreement shall remain in full force and effect without prejudice to any future right of the Government in respect of any future default. In the event the Company does not correct such default within the time stipulated in the notice, the Government shall have the right to terminate this Agreement in accordance with the provisions of Article 22 as the case may be.

2. Notwithstanding the provision of paragraph 1 of this Article, in the event the Company shall be found to be in default in the making of any payment of money to the Government which the Company is required to make pursuant to Article 12 or Article 13, the period within which the Company must correct such default shall be thirty (30) days after the receipt of notice thereof. The penalty for late payment shall be an interest charge on the amount in default from the date the payment was due, at the rate of the New York prime interest rate in effect at the date of default plus four percent (4%). This or other penalties provided for in this Article may not be taken as deductions in the calculation of taxable income.

3. The Company shall not be deemed to be in default in the performance of any provision of this Agreement concerning which there is any dispute between the Parties until such time as all disputes concerning such provision, including any contention that the Company is in default in the performance thereof or any dispute as to whether the Company was provided a reasonable opportunity to correct a default, have been settled as provided in Article 21.

Pasal 21

PENYELESAIAN SENGKETA

1. Pemerintah dan Perusahaan dengan ini bersepakat untuk menyerahkan semua sengketa antara kedua belah pihak yang timbul sebelum atau sesudah pengakhiran Persetujuan ini atau penerapannya atau operasi-operasi dibawah Persetujuan ini, termasuk anggapan-anggapan bahwa satu pihak lalai dalam melaksanakan kewajiban-kewajibannya, untuk penyelesaian akhir, baik kepada konsiliasi kalau para pihak berkeinginan untuk meminta suatu penyelesaian secara baik dengan cara konsiliasi, atau kepada arbitrase. Dalam hal para Pihak meminta suatu penyelesaian secara baik dengan cara konsiliasi maka, konsiliasi akan berlangsung sesuai dengan peraturan-peraturan Konsiliasi UNCITRAL dalam resolusi 35/52 yang disetujui oleh Majelis Umum Perserikatan Bangsa-Bangsa pada tanggal 4 Desember 1980 yang berjudul "Conciliation Rules of the United Nations Commission on International Trade Law" yang pada waktu ini masih berlaku. Dalam hal para pihak akan menggunakan arbitrase, maka sengketa akan diselesaikan oleh arbitrase sesuai dengan Peraturan-peraturan Arbitrase UNCITRAL yang dimuat dalam resolusi 31/98, yang disetujui Majelis Umum Perserikatan Bangsa-Bangsa pada tanggal 15 Desember 1976 yang berjudul "Arbitration Rules of the United Nations Commission on International Trade Law" yang pada saat ini masih berlaku. Ketentuan-ketentuan tersebut di atas ini tidak berlaku untuk masalah-masalah perpajakan yang tunduk kepada yurisdiksi Majelis Pertimbangan Pajak. Bahasa yang akan digunakan dalam acara kerja Konsiliasi dan Arbitrase adalah Bahasa Inggris kecuali kedua belah pihak menyetujui lain.

2. Sebelum Pemerintah atau Perusahaan menempuh upaya arbitrase berdasarkan peraturan-peraturan Arbitrase UNCITRAL, mereka akan berupaya sebaik mungkin untuk menyelesaikan sengketa tersebut melalui konsultasi dan menggunakan cara pemecahan administratif; dengan ketentuan bahwa Perusahaan tidak diwajibkan mencari sesuatu pemecahanannya untuk waktu lebih dari 90 (sembilan puluh) hari setelah memberitahukan Pemerintah tentang sengketa yang akan timbul jika pemecahan tersebut menyangkut suatu permohonan kepada Pemerintah atau sesuatu departemen atau instansinya.

3. Acara kerja konsiliasi atau arbitrase yang dilaksanakan menurut Pasal ini, apabila dapat dilakukan pengaturan yang serasi, akan diadakan di Jakarta, Indonesia, kecuali kedua belah pihak mufakat untuk memilih tempat lain atau kecuali peraturan-peraturan atau tata cara tersebut di atas menghendaki lain. Ketentuan-ketentuan Pasal ini akan tetap berlaku meskipun Persetujuan ini berakhir. Suatu keputusan menurut acara arbitrase tersebut harus dapat dilaksanakan dan mengikat kedua belah pihak, dan secara khusus harus dapat dilaksanakan di Indonesia sekalipun acara arbitrase tersebut tidak diadakan di Indonesia.

Article 21

SETTLEMENT OF DISPUTES

1. The Government and the Company hereby consent to submit all disputes between the Parties hereto arising, before or after termination hereof, out of this Agreement or the application hereof or the operations hereunder, including contentions that a Party is in default in the performance of its obligations hereunder, for final settlement, either by conciliation, if the Parties wish to seek an amicable settlement by conciliation, or to arbitration. Where the Parties seek an amicable settlement of a dispute by conciliation, the conciliation shall take place in accordance with the UNCITRAL Conciliation Rules contained in resolution 35/52 adopted by the United Nations General Assembly on 4 December, 1980 and entitled "Conciliation Rules of the United Nations Commission on International Trade Law" as at present in force. Where the Parties arbitrate, the dispute shall be settled by arbitration in accordance with the UNCITRAL Arbitration Rules contained in resolution 31/98 adopted by the United Nations General Assembly on 15 December, 1976 and entitled "Arbitration Rules of the United Nations Commission on International Trade Law", as at present in force. The foregoing provisions of this paragraph do not apply to tax matters which are subject to the jurisdiction of Majelis Pertimbangan Pajak (The Consultative Board of Taxes). The language to be used in conciliation and arbitration proceedings shall be the English language, unless the parties otherwise agree.

2. Before the Government or the Company institutes an arbitration proceeding under the UNCITRAL Arbitration Rules, it will use its best endeavors to resolve the dispute through consultation and use of administrative remedies; provided that the Company shall not be obligated to pursue any such remedies for more than ninety days after it has notified the Government of an impending dispute if such remedies involve a request or application to the Government or any of its departments or instrumentalities.

3. Conciliation or arbitration proceedings conducted pursuant to this Article shall, if appropriate arrangements can be made, be held in Jakarta, Indonesia, unless the Parties agree upon another location or unless the aforesaid rules or the procedures thereunder otherwise require. The provisions of this Article shall continue in force notwithstanding the termination of this Agreement. An award pursuant to any such arbitration proceedings shall be enforceable against and binding upon the Parties hereto, and shall be specifically enforceable in Indonesia, whether or not the proceedings have been held in Indonesia.

Pasal 22

PENGAKHIRAN

1. Setiap waktu selama jangka waktu Persetujuan ini, setelah mempergunakan segenap kesungguhan yang wajar di dalam usahanya untuk melaksanakan kegiatan-kegiatannya berdasarkan Persetujuan ini, apabila menurut pendapat Perusahan bahwa Pengusahaan tidak dapat dikerjakan, Perusahaan akan berkonsultasi dengan Menteri dan kemudian dapat menyampaikan pemberitahuan tertulis kepada Menteri untuk mengakhiri Persetujuan ini. Pemberitahuan tersebut harus disertai dengan data dan keterangan tentang kegiatan Perusahaan berdasarkan Persetujuan ini yang meliputi, tetapi tidak terbatas pada, dokumen-dokumen, peta-peta, rencana-rencana, lembaran-lembaran kerja dan lain-lain data dan keterangan teknis. Persetujuan ini akan berakhir dan Perusahaan akan dibebaskan dari semua kewajiban-kewajibannya menurut Persetujuan ini setelah ada penegasan (konfirmasi) atas pengakhiran tersebut dari Menteri. Konfirmasi tersebut harus diterbitkan dalam jangka waktu tidak lebih dari 6 (enam) bulan sejak tanggal Perusahaan menyerahkan pemberitahuan tersebut, dengan ketentuan bahwa data dan pemenuhan kewajiban-kewajiban oleh Perusahaan telah dipenuhi dan dapat diterima oleh Menteri. Dalam hal Departemen tidak memberikan pemberitahuan dalam jangka waktu 6 (enam) bulan tersebut, maka Persetujuan ini dengan sendirinya akan berakhir dan Perusahaan akan dibebaskan dari kewajiban-kewajibannya. Dalam hal kewajiban-kewajiban dan data tersebut tidak dapat dipenuhi oleh Perusahaan, Departemen akan memberikan pemberitahuan, dan pengakhiran akan diberlakukan pada waktu data dan kewajiban-kewajiban tersebut telah dipenuhi.

2. Apabila pengakhiran terjadi pada Periode-Periode Penyelidikan Umum atau Eksplorasi, Perusahaan akan mendapat kesempatan selama 6 (enam) bulan untuk menjual, memindahkan atau dengan cara apapun menyingkirkan harta kekayaannya di Indonesia dan menyerahkan kepada Pemerintah semua informasi tentang hasil-hasil pekerjaan yang telah dilaksanakan oleh Perusahaan sampai tanggal pemberitahuan tersebut di atas. Semua harta kekayaan yang tidak dipindahkan atau disingkirkan akan menjadi milik Pemerintah tanpa suatu kompensasi kepada Perusahaan.

3. Apabila pengakhiran terjadi pada Periode Studi Kelayakan, semua harta kekayaan Perusahaan, baik yang bergerak maupun yang tidak bergerak yang berada di dalam Wilayah Kontrak Karya akan ditawarkan untuk dijual kepada Pemerintah, dan Pemerintah akan mendapat opsi yang berlaku 30 (tiga puluh) hari, terhitung mulai tanggal penawaran diajukan, untuk membeli semua harta kekayaan tersebut dari Perusahaan dengan harga yang wajar sesuai harga pasar waktu itu, yang dapat dibayar dengan mata uang yang dapat ditukarkan secara bebas di Indonesia melalui sebuah bank yang disetujui oleh kedua belah pihak, dalam waktu 90 (sembilan puluh) hari setelah Pemerintah menerima penawaran termaksud. Apabila dalam waktu 30 (tiga puluh) hari tersebut, Pemerintah menolak penawaran itu, maka Perusahaan boleh menjual, memindahkan atau dengan cara lain menyingkirkan semua harta kekayaan tersebut dalam jangka waktu 6 (enam) bulan terhitung sejak berakhirnya penawaran tersebut. Semua harta kekayaan yang tidak terjual, dipindahkan atau dengan cara lain disingkirkan akan menjadi milik Pemerintah tanpa suatu kompensasi kepada Perusahaan.

Article 22

TERMINATION

1. At any time during the term of this Agreement, after having used all reasonable diligence in its endeavor to conduct its activities under this Agreement, if in the Company's opinion the Enterprise is not workable, the Company shall consult with the Minister and may thereafter submit a written notice to terminate this Agreement. Such notice shall be accompanied with all data and information of the Company's activities under this Agreement which shall include but not be limited to documents, maps, plans, worksheets and other technical data and information. This Agreement shall terminate and the Company shall be relieved of its obligation under this Agreement upon confirmation of termination by the Minister. Such confirmation shall be issued within a period not later than six (6) months from the date the Company submits the notice, provided that the data and fulfillment of the obligation by the Company are considered acceptable to the Minister. In the event that the Department does not give any notice within 6 (six) months period, then the Agreement shall automatically terminate and the Company shall be relieved of its obligations. In the event that the obligations and data are not fully fulfilled by the Company, the Department will give notice, and the termination shall come into effect at the time such data and obligations are fulfilled.

2. If termination occurs during the General Survey or Exploration Periods, the Company shall have a period of six (6) months within which to sell, remove or otherwise dispose of its property in Indonesia and to furnish the Government with the information to be turned over to it in respect of the work which the Company has performed to the date of the giving of the aforementioned notice. Any property not so removed or otherwise disposed of shall become the property of the Government without any compensation to the Company.

3. If termination occurs during the Feasibility Studies Period all property of the Company, movable and immovable, located in the Contract Area shall be offered for sale to the Government, which shall have an option, valid for thirty (30) days from the date of such offer, to buy all such property at a fair and reasonable market price from the Company payable in any currency freely convertible in Indonesia and through a bank to be agreed upon by both parties within ninety (90) days after acceptance by the Government of such offer. If the Government does not accept such offer within the said thirty (30) day period, the Company may sell, remove or otherwise dispose of any or all of such property during a period of six (6) months after the expiration of such offer.
   Any property not so sold, removed or otherwise disposed of shall become the property of the Government without any compensation to the Company.

4. Apabila pengakhiran terjadi pada Periode Konstruksi, semua harta kekayaan Perusahaan, baik yang bergerak maupun yang tidak bergerak yang berada di dalam Wilayah Kontrak Karya akan ditawarkan untuk dijual pertama kali kepada Pemerintah, dan Pemerintah akan mempunyai opsi selama 30 (tiga puluh) hari, terhitung mulai tanggal diajukan penawaran untuk membeli semua harta kekayaan tersebut dengan harga yang wajar sesuai harga pasar waktu itu yang dapat dibayar dengan setiap mata uang yang dapat ditukarkan secara bebas di Indonesia melalui sebuah Bank yang disetujui oleh kedua belah pihak dalam waktu 90 (sembilan puluh) hari setelah persetujuan Pemerintah terhadap penawaran tersebut. Apabila Pemerintah dalam waktu 30 (tiga puluh) hari tersebut menolak penawaran itu, maka Perusahaan boleh menjual, memindahkan atau dengan cara lain menyingkirkan, setiap atau semua harta kekayaan tersebut dalam waktu 12 (dua belas) bulan setelah berakhirnya penawaran tersebut. Semua harta kekayaan yang tidak terjual, dipindahkan atau dengan cara lain disingkirkan akan menjadi milik Pemerintah tanpa suatu kompensasi kepada Perusahaan.

5. Apabila pengakhiran terjadi pada Periode Operasi atau sebagai akibat berakhirnya jangka waktu Persetujuan ini, semua harta kekayaan Perusahaan, baik yang bergerak maupun yang tidak bergerak, yang berada didalam Wilayah Kontrak Karya harus ditawarkan untuk dijual kepada Pemerintah dengan harga yang besarnya sama dengan ongkos perolehan atau menurut harga pasar yang lebih rendah, tetapi bagaimanapun tidak akan lebih rendah dari nilai buku. Pemerintah akan mendapat opsi yang berlaku untuk 30 (tiga puluh) hari, terhitung mulai tanggal penawaran itu, untuk membeli harta kekayaan tersebut dengan harga yang disetujui, dapat dibayar dengan setiap mata uang yang dapat ditukarkan secara bebas di Indonesia melalui sebuah bank yang disetujui bersama dalam waktu 90 (sembilan puluh) hari setelah persetujuan Pemerintah terhadap penawaran tersebut. Apabila Pemerintah, dalam waktu 30 (tiga puluh) hari tersebut menolak penawaran itu, maka Perusahaan boleh menjual, memindahkan atau dengan cara lain menyingkirkan setiap atau semua harta kekayaan tersebut dalam waktu 12 (dua belas) bulan setelah berakhirnya penawaran tersebut. Semua harta kekayaan yang tidak terjual, dipindahkan atau dengan cara lain disingkirkan, akan menjadi milik Pemerintah tanpa suatu kompensasi kepada Perusahaan.

6. Meskipun demikian, disetujui, bahwa setiap harta kekayaan Perusahaan di Indonesia, baik yang bergerak maupun yang tidak bergerak yang pada setiap pemutusan Persetujuan ini dipergunakan untuk kepentingan umum, seperti jalan-jalan, sekolah-sekolah dan/atau rumah sakit-rumah sakit, termasuk alat-alat perlengkapannya, segera akan menjadi milik Pemerintah tanpa suatu kompensasi kepada Perusahaan; dan Perusahaan akan menghormati hal-hal yang tercantum dalam ketentuan Pasal 24 ayat (1.c) Undang-Undang No. 11 Tahun 1967 mengenai pengamanan dan penggalian dan ayat (3), (4), (5) pasal 46 Peraturan Pemerintah No. 32 Tahun 1969.

7. Semua penjualan, pemindahan atau penyingkiran harta kekayaan Perusahaan sehubungan dengan Pengakhiran Persetujuan ini harus dilaksanakan sesuai dengan peraturan perundang-undangan yang berlaku; setiap keuntungan atau kerugian sebagai akibat penjualan atau sehubungan dengan penghapusan nilai pembukuan, akan ditetapkan menurut Pasal 13 Persetujuan ini. Semua nilai akan didasarkan pada azas-azas akuntansi yang berlaku umum.

4. If termination occurs during the Construction Period all property of the Company, both movable and immovable, located in the Contract Area shall in the first instance be offered for sale to the Government which shall have an option, valid for thirty (30) days from the date of such offer, to buy all such property at a fair and reasonable market price from the Company payable in any currency freely convertible in Indonesia and through a bank to be agreed upon by both Parties within ninety (90) days after acceptance by the Government of such offer. If the Government does not accept such offer within the said thirty (30) day period, the Company may sell, remove or otherwise dispose of any or all of such property during a period of twelve (12) months after the expiration of such offer. Any property not so sold, removed or otherwise disposed of shall become the property of the Government without any compensation to the Company.

5. If termination occurs during the Operating Period or by reason of the expiration of the term of this Agreement, all property of the Company, both movable and immovable, located in the Contract Area shall be offered for sale to the Government at cost or market value whichever is the lower, but in no event lower than the depreciated book value. The Government shall have an option, valid for 30 (thirty) days from the date of such offer, to buy all such property at the agreed value payable in any currency freely convertible in Indonesia and through a bank to be agreed upon by both Parties within ninety (90) days after acceptance by the Government of such offer. If the Government does not accept such offer within the said thirty (30) day period, the Company may sell, remove or otherwise dispose of any or all of such property during a period of twelve (12) months after the expiration of such offer. Any property not so sold removed or otherwise disposed of shall become the property of the Government without any compensation to the Company.

6. It is agreed, however, that any property of the Company in Indonesia, movable or immovable, as shall at the termination of this Agreement be in use for public purposes such as roads, schools and/or hospitals with their equipment shall immediately become the property of the Government without any compensation to the Company; and the Company shall recognize the items referred to in paragraph (c) of sub-paragraph 1 of Article 24 of Law No. 11, 1967 relating to safety and the right to excavate, and paragraphs 3, 4, 5 of Article 46 of Government Regulations No. 32 of 1969.

7. All sales, removals or disposals of the Company's property pursuant to the termination of this Agreement shall be effected according to the prevailing laws and regulations. Any gain or loss from sale or disposal as relating to the written down book value shall be determined in accordance with Article 13 of this Agreement. All values shall be based on generally accepted accounting principles.

8. Hak-hak dan kewajiban-kewajiban yang telah mulai berlaku sebelum pengakhiran Persetujuan ini, serta hak-hak dan kewajiban-kewajiban sehubungan dengan transfer mata uang dan harta kekayaan, yang pelaksanaannya belum selesai pada saat pengakhiran dimaksud, akan tetap berlaku sepenuhnya selama waktu yang diperlukan atau yang wajar untuk pelaksanaan hak- hak dan kewajiban-kewajiban demikian itu. Disamping itu, Perusahaan diberi hak untuk mentransfer ke Luar Negeri semua atau setiap hasil penjualan yang diterima berdasarkan Pasal 22 dengan mengingat ketentuan Pasal 15 ayat (2).

8. Rights and obligations which have come into effect prior to the termination of this Agreement and rights and obligations relating to transfer of currencies and properties which have not yet been completed at the time of such termination shall continue in effect for the time necessary or appropriate to fully exercise such rights and discharge such obligations. Additionally, the Company shall be granted the right to transfer abroad all or any proceeds of sale received under this Article 22 subject to the requirement of paragraph 2 of Article 15.

Pasal 23

KERJASAMA PARA PIHAK

1. Kedua belah pihak dalam Persetujuan ini setuju bahwa setiap waktu mereka akan berusaha sebaik-baiknya untuk melaksanakan ketentuan-ketentuan Persetujuan ini dengan tujuan agar Pengusahaan senantiasa dapat dilakukan dengan cara yang efisien guna mencapai manfaat yang sebesar-besarnya bagi kedua belah pihak.

2. Perusahaan setuju untuk merencanakan dan melaksanakan semua kegiatan sesuai dengan standar dan persyaratan yang ditetapkan dalam Persetujuan ini, demi pengembangan yang baik dan progresif bagi industri pertambangan di Indonesia, dan dengan sepenuhnya senantiasa akan memperhatikan aspirasi-aspirasi dan kesejahteraan rakyat Republik Indonesia dan pembangunan Bangsa, dan akan bekerja sama dengan Pemerintah dalam meningkatkan pertumbuhan serta pengembangan struktur ekonomi dan sosial Indonesia dan dengan mengingat akan ketentuan-ketentuan Persetujuan ini, senantiasa akan mentaati semua peraturan perundang-undangan Republik Indonesia.

3. Setiap waktu selama berlakunya Persetujuan ini, atas permintaan salah satu pihak, Pemerintah dan Perusahaan akan saling berkonsultasi :

   (i) untuk menetapkan apakah ketentuan-ketentuan keuangan atau ketentuan-ketentuan lain dalam Persetujuan ini memerlukan perubahan sehubungan dengan semua keadaan yang bertalian dengan itu, untuk menjamin agar Persetujuan ini memadai pelaksanaannya dan tanpa merugikan kepentingan salah satu Pihak. Keadaan-keadaan tersebut meliputi kondisi produksi mineral seperti jumlah, lokasi dan lapisan penutup endapan-endapan mineral, mutu mineral, kondisi pasar mineral, daya beli uang yang sedang berlaku dan syarat-syarat serta kondisi yang ada untuk usaha bahan galian yang sejenis. Dalam usaha mencapai kesepakatan atas setiap perubahan Persetujuan berdasarkan ayat 3 Pasal ini, kedua belah pihak akan menjamin bahwa revisi Persetujuan ini tidak akan mengurangi kemampuan Perusahaan untuk mempertahankan kredibilitas finansialnya di luar negeri dan menghimpun dana melalui pinjaman internasional sesuai dengan cara dan persyaratan yang umum berlaku di industri pertambangan, dan

   (ii) mengenai kemajuan Pengusahaan; dalam hal ini, Pemerintah menyadari bahwa dengan tidak mengurangi ketentuan lainnya dalam Persetujuan ini, Perusahaan dapat memohon perpanjangan waktu bagi setiap Periode atau tahap yang dimaksud dalam Pasal 3 ayat (2), dan Pemerintah dengan kewenangannya dapat memberikan suatu perpanjangan waktu atas periode-periode atau tahap-tahap tersebut. Untuk tujuan setiap pengajuan oleh Perusahaan, setiap pengajuan tersebut akan menetapkan alasan-alasan untuk perpanjangan yang diminta, pekerjaan yang dilaksanakan selama periode perpanjangan dan pengeluaran-pengeluaran yang diperkirakan selama periode tersebut. Di dalam evaluasi pengajuan tersebut

Article 23

COOPERATION OF THE PARTIES

1. The Parties to this Agreement agree that they will at all times use their best efforts to carry out the provisions of this Agreement to the end that the Enterprise may at all times be conducted with efficiency and for the optimum benefit of the Parties.

2. The Company agrees to plan and conduct all operations under this Agreement in accordance with the standards and requirements imposed elsewhere in this Agreement for the sound and progressive development of the mining industry in Indonesia, to give at all times full consideration to the aspirations and welfare of the people of the Republic of Indonesia and to the development of the Nation, and to cooperate with the Government in promoting the growth and development of the Indonesian economic and social structure, and subject to the provisions of this Agreement at all times to comply with the laws and regulations of Indonesia.

3. At any time during the term of this Agreement, upon request by either Party, the Government and the Company shall consult with each other

   (i) to determine whether in the light of all relevant circumstances, the financial or other provisions of this Agreement need revision in order to ensure that the Agreement operates equitably and without major detriment to the interests of either Party. Such circumstances shall include the conditions under which the mineral production is carried out such as the size, location and overburden of mineral deposits, the quality of the mineral, the market conditions for the mineral, the prevailing purchasing power of money and the terms and conditions prevailing for comparable mineral ventures. In reaching agreement on any revision of this Agreement pursuant to this paragraph 3, both Parties shall ensure that no revision of this Agreement shall prejudice the Company's ability to retain financial credibility abroad and to raise finance by borrowing internationally in a manner and on terms normal to the mining industry, and

   (ii) concerning the progress of the Enterprise. In this regard, the Government acknowledges that without prejudice to the other provisions of this Agreement, the Company may apply for an extension of any period or stage referred to in paragraph 2 of Article 3 and the Government may in its discretion grant an extension of such period(s) or stage(s). For the purposes of any such application by the Company, each such application shall state the reasons for seeking the extension, the work to be conducted during the extension period and the estimated expenditure during such period. In

Pemerintah akan mempertimbangkan dengan sungguh-sungguh keadaan-keadaan yang khusus dari permohonan Perusahaan dan rencana serta anggaran yang dikirim oleh Perusahaan dalam hubungannya dengan periode perpanjangan. Dalam waktu 3 (tiga) bulan permohonan tersebut oleh Pemerintah, Menteri akan memberitahukan secara tertulis kepada Perusahaan mengenai persetujuan atau penolakan atas permohonan untuk perpanjangan. Dalam hal Menteri berkeberatan, Perusahaan dan Pemerintah akan segera berkonsultasi dengan tujuan untuk memecahkan keberatan tersebut.

4. Semua konsultasi diantara pihak-pihak harus dilaksanakan dengan semangat kerjasama serta dengan memperhatikan sepenuhnya maksud dan tujuan dari masing-masing Pihak. Kedua belah pihak berkeinginan untuk merealisir keberhasilan dari Pengusahaan bagi kepentingan rakyat Republik Indonesia, pembangunan bangsa, perkembangan ekonomi dan struktur sosial, operasi yang berkelanjutan dari Perusahaan dan pengembangan sumberdaya mineral Republik Indonesia.

evaluating such application the Government shall fully consider the specific circumstances of the Company's request and the programme and budget submitted by the Company in relation to the extension period. Within 3 (three) months of receipt of such an application by the Government, the Minister shall advise the Company in writing of his approval of, or objections to, the application for extension. In the event that the Minister advises of objections, the Company and the Government shall immediately thereafter enter into consultations with the aim of resolving such objections.

4. All consultations between the Parties shall be carried out in a spirit of cooperation with due regard to the intent and objectives of the respective Parties. Both Parties desire to realize the success of the Enterprise for the benefit of the people of the Republic of Indonesia, the development of the Nation, the growth and development of the economic and social structure, the continued operation of the Company and the development of the mineral resources of the Republic of Indonesia.

Pasal 24

PROMOSI KEPENTINGAN NASIONAL

1. Dalam pelaksanaan kegiatannya berdasarkan Persetujuan ini, Perusahaan sesuai dengan hak-hak dan kewajiban-kewajibannya yang manapun menurut Persetujuan ini, harus mengutamakan untuk memenuhi permintaan konsumen Indonesia atas hasil produksinya; dan Perusahaan serta Afiliasi-Afiliasinya dan sub-kontraktor-sub-kontraktor terdaftar, dengan itikad baik dan sejauh mungkin sepanjang masih dapat dilaksanakan harus menggunakan tenaga kerja Indonesia, jasa-jasa dan bahan-bahan mentah yang dihasilkan dari sumber Indonesia dan produk-produk yang dibuat di Indonesia sepanjang jasa-jasa dan produk-produk tersebut tersedia dalam waktu, harga, dan dasar mutu yang bersaing, dengan ketentuan, bahwa dalam membandingkan harga barang-barang yang diproduksi atau dihasilkan di Indonesia dengan harga barang-barang yang diimpor harus ditambahkan premi (maksimum dua belas setengah persen) dan biaya-biaya lain (tidak termasuk PPN) yang timbul sampai saat barang-barang yang diimpor tiba di Indonesia.

2. Perusahaan akan senantiasa memenuhi ketentuan-ketentuan Peraturan Pemerintah No. 20 Tahun 1994 tentang Kepemilikan Saham Dalam Perusahaan yang Didirikan Dalam Rangka Penanaman Modal Asing sebagaimana ketentuan tersebut berlaku dari waktu ke waktu.

3. Jumlah saham yang harus ditawarkan kepada Peserta Indonesia harus memenuhi ketentuan Peraturan Pemerintah No. 20 Tahun 1994, sebagai ketentuan yang diberlakukan dalam Pemilikan Saham Penanaman Modal Asing.

4. Dalam hal ada penambahan jumlah modal saham Perusahaan, Peserta Indonesia akan berhak membeli saham-saham baru sebanding dengan saham-saham yang telah mereka pegang guna memberikan kesempatan untuk mempertahankan perbandingan saham yang telah mereka miliki di dalam Perusahaan; dengan ketentuan bahwa hak tersebut tidak berlaku untuk saham yang ditawarkan di Bursa Saham Indonesia.

5. Dalam keadaan bagaimanapun, saham-saham yang dipegang oleh peserta Indonesia, tidak akan diperlakukan kurang menguntungkan dibandingkan dengan saham-saham yang dipegang oleh pemegang saham lainnya.

6. Peserta-peserta Indonesia berhak untuk mengangkat anggota-anggota Dewan Komisaris Perusahaan sesuai dengan perbandingan saham yang dimilikinya dalam Perusahaan; akan tetapi Perusahaan tidak akan diminta untuk meningkatkan jumlah anggota Dewan Komisaris lebih dari 10 (sepuluh) orang guna mempertahankan secara proporsional jumlah anggota Dewan Komisaris yang diangkat oleh Peserta Asing dan oleh Peserta Indonesia.

Article 24

PROMOTION OF NATIONAL INTEREST

1. In the conduct of its activities under this Agreement the Company shall, consistent with its rights and obligations elsewhere under this Agreement, give preference to Indonesian consumers requirements for its Products and the Company and its Affiliates and registered sub-contractors shall, in good faith to the fullest practicable extent, utilize Indonesian manpower, services and raw materials produced from Indonesian sources and products manufactured in Indonesia to the extent such services and products are available on a competitive time, cost and quality basis, provided that in comparing prices of goods produced or manufactured in Indonesia to the price of imported goods there shall be added a premium not in excess of twelve and half percent (12.5%) and other expenses (excluding VAT) incurred up to the time the imported goods are landed in Indonesia.

2. The Company shall at all times be in compliance with the requirements of Government Regulation No. 20 of 1994 regarding the Shares Ownership in Foreign Capital Investment Companies as such requirements apply from time to time.

3. The amount of shares to be offered to the Indonesian Participants shall be in compliance with the requirements of Government Regulation No. 20 of 1994, as the requirements apply for share ownership in Foreign Capital Investment Companies.

4. In the event of an increase in the share capital of the Company, the Indonesian Participants shall be entitled to subscribe for new shares in proportion to their existing shareholding so as to give them the opportunity to maintain their existing proportionate shareholding in the Company; provided that the foregoing shall not apply to shares which the Company lists on any Indonesian stock exchange.

5. In no event shall shares held by Indonesian Participants be treated less favorably than those held by any others.

6. The Indonesian Participants shall be entitled to appoint members of the Board of Commissioners of the Company in proportion to their shareholding in the Company, but the Company shall not be required to increase the number of members of its Board of Commissioners beyond ten (10) simply to maintain absolute proportionality of the members of the Board of Commissioners appointed by the foreign participant(s) and by the Indonesian Participants.

Pasal 25

KERJASAMA DAERAH DALAM PENGADAAN PRASARANA TAMBAHAN

1. Perusahaan senantiasa harus bekerjasama dengan Pemerintah dengan berusaha sebaik-baiknya untuk merencanakan dan mengkoordinir kegiatan-kegiatannya serta proyek yang direncanakan di Wilayah Kontrak Karya atau Wilayah Proyek sehubungan dengan pembangunan regional baik di daerah propinsi atau di daerah setempat. Akomodasi dan fasilitas-fasilitas penghidupan serta kondisi kerja yang disediakan oleh Perusahaan untuk kegiatannya harus sesuai dengan standar Pemerintah, setaraf dengan yang digunakan oleh para pengusaha yang baik yang bekerja di Indonesia.

2. Dalam hubungan dengan daerah, Perusahaan harus berusaha untuk membantu Pemerintah meningkatkan semaksimal mungkin manfaat ekonomi dan sosial yang ditimbulkan Pengusahaan di dalam Wilayah Kontrak Karya dalam hal:

   (i) mengkoordinasikan manfaat tersebut dengan hasil studi prasarana daerah dan wilayah setempat yang dilakukan oleh Pemerintah bersama-sama dengan setiap manfaat yang ditimbulkan oleh pihak lainnya baik yang berasal dari setempat, asing, maupun badan umum internasional yang berkepentingan; dan

   (ii) membantu dan memberikan saran kepada Pemerintah, apabila diminta, dalam perencanaan prasarana dan pengembangan daerah, yang oleh Perusahaan dianggap berguna untuk Pengusahaannya dan untuk industri-industri dan kegiatan-kegiatan yang telah ada dan direncanakan di dalam wilayah Pengusahaan.

3. Perusahaan membolehkan masyarakat umum dan Pemerintah untuk menggunakan instalasi-instalasi dermaga dan pelabuhan, lapangan terbang dan jalan-jalan yang dibangun oleh Perusahaan berdasarkan Persetujuan ini dan yang berada di luar Wilayah Pertambangan dan Wilayah Proyeknya dengan ketentuan bahwa

   (i) setiap penggunaan tersebut harus tunduk kepada peraturan dan batasan-batasan yang akan dikenakan oleh Perusahaan secara wajar dan sama sekali tidak akan merugikan dan mengganggu kegiatan Perusahaan; dan

   (ii) Perusahaan berhak memungut pembayaran atasnya yang wajar untuk mengganti biaya pemeliharaan fasilitas dimaksud, sedang bagi penggunaan komersial atas fasilitas-fasilitas tersebut, adalah untuk penggantian biaya modal pembangunannya; dan

   (iii) besarnya pungutan dan tatacara termaksud pada butir (i) dan (ii) di atas harus terlebih dahulu dikonsultasikan dengan Pemerintah Daerah.

4. Perusahaan harus memelihara dan bertanggung jawab atas pemeliharaan semua jalan di Wilayah Pertambangan.

Article 25

REGIONAL COOPERATION IN REGARD TO ADDITIONAL INFRASTRUCTURE

1. The Company shall at all times co-operate with the Government in utilizing its best efforts to plan and coordinate its activities, and proposed future projects in Contract Area or the Project Areas in conjunction with regional development either provincial or in the villages. Living accommodation and facilities and working conditions provided by the Company for its operations shall be of a Government standard commensurate with those of good employers operating in Indonesia.

2. In relation to the region, the Company shall endeavor to assist the Government in maximizing the economic and social benefits generated by the Enterprise in the Contract Area in respect to:

   (i) coordinating such benefits with local and regional infrastructure studies undertaken by the Government together with any benefits generated by other interested local, foreign and international public and private entities; and

   (ii) assisting and advising the Government, when requested, in its planning of the infrastructure and regional development which the Company may deem useful to the Enterprise and to existing and future industries and activities in the area of the Enterprise.

3. The Company shall allow the public and the Government to use any wharf and harbor installations, air strips or roads which have been constructed by the Company pursuant to this Agreement and which are located outside the Mining Areas and the related Project Areas provided that

   (i) any such use will be subject to such regulations and limitations as the Company will reasonably impose, and shall in no event adversely affect or interfere with the Company's operations hereunder; and

   (ii) the Company will be entitled to impose such charges therefor as shall be appropriate to reflect the cost of maintaining such facilities and, with respect to any commercial use of such facilities, the capital cost thereof.

   (iii) the amount of charge and procedure of imposition mentioned in sub-paragraph (i) and (ii) above shall first be consulted to the Local Government.

4. The Company shall maintain and be responsible for the maintenance of all roads in the Mining Areas.

5. Semua jalan yang dibangun oleh Perusahaan di luar Wilayah Pertambangan akan menjadi jalan umum sebagaimana dimaksud dalam Undang-Undang Jalan dan Undang-Undang Lalu Lintas yang berlaku di Indonesia. Pembangunan jaringan jalan ini harus berpedoman kepada pola rencana jaringan jalan Nasional, Propinsi maupun Kabupaten/Kotamadya sampai jalan Desa. Selanjutnya Pemerintah dapat membuat Peraturan Khusus yang dianggap perlu atau dibutuhkan berdasarkan Undang-Undang Jalan dan Undang-Undang Lalu Lintas untuk keselamatan pemakai jalan tersebut.

6. Jika penggunaan jalan-jalan umum yang telah ada oleh Perusahaan mengakibatkan atau cenderung mengakibatkan kerusakan atau deteriorasi yang berarti, maka Perusahaan harus membayar kepada Pemerintah atau penguasa lain yang mempunyai wewenang terhadap jalan itu, biaya pencegahan atau perbaikan kerusakan-kerusakan atau deteriorasi tersebut, (atau sebagian biaya dengan memperhitungkan penggunaan jalan tersebut oleh pemakai-pemakai lain) atau biaya untuk peningkatan standar yang diperlukan dengan memperhitungkan peningkatan lalu lintas. Sebagai tambahan, Pemerintah atau penguasa lain yang mempunyai wewenang atas jalan tersebut, dapat meminta Perusahaan untuk membayar biaya pemeliharaan atas dasar pemakaian yang layak dan wajar dengan mempertimbangkan biaya rutin (tanpa suatu keuntungan kepada Pemerintah atau penguasa lain) bagi operasi dan pemeliharaan jalan itu serta penggunaan jalan itu oleh pihak-pihak lain. Sebagai pengganti dari pembayaran tersebut, Perusahaan berhak memilih untuk memelihara dengan biaya sendiri jalan yang diperlukan untuk operasi Perusahaan.

7. Dalam hal Pemerintah tidak dapat menyediakan fasilitas telekomunikasi yang cukup, Perusahaan dapat, sesuai dengan peraturan perundang-undangan yang berlaku dari waktu ke waktu di Indonesia memasang dan mengoperasikan fasilitas telekomunikasi, dengan ketentuan bahwa Perusahaan akan memperbolehkan Pemerintah dan masyarakat umum untuk menggunakan fasilitas tersebut dengan syarat-syarat sebagai berikut:

   (i) setiap penggunaan demikian harus tunduk kepada peraturan dan pembatasan yang akan dikenakan oleh Perusahaan dan sama sekali tidak akan merugikan dan mengganggu kegiatan Perusahaan; dan

   (ii) Perusahaan berhak memungut pembayaran atasnya yang wajar untuk mengganti biaya pemeliharaan fasilitas, sedang bagi penggunaan komersial atas fasilitas tersebut, adalah untuk penggantian biaya modal fasilitas tersebut.

8. Dalam hal fasilitas telekomunikasi dapat disediakan oleh Pemerintah, Perusahaan diwajibkan untuk menggunakan jaringan Pemerintah tersebut dan membayar sesuai tarif umum untuk jasa-jasa telekomunikasi.

9. Perusahaan dengan biaya sendiri, sesuai dengan peraturan perundang-undangan yang berlaku dari waktu ke waktu di Indonesia boleh merancang dan mendirikan serta membangun perkemahan ataupun fasilitas yang permanen yang cukup untuk melayani kebutuhan kegiatan Pengusahaan.

5. All roads constructed by the Company outside the Mining Areas, shall be public roads for the purposes of the provisions of the Roads Law and the Traffic Law in effect in Indonesia. The construction of such roads shall be comply with the National, province, district down to rural roads network. The Government will make special regulations under the Roads Law and the Traffic Law as it considers necessary or desirable for the proper safety of the users of the said roads.

6. If the Company's use of the existing public roads results in or is likely to result in significant damage or deterioration, the Company shall pay to the Government or other authority having control over the roads the cost (or an equitable proportion thereof having regard to the use of such roads by others) of preventing or making good such damages or deterioration or of upgrading to a standard necessary having regard to the increased of traffic. In addition, the Government or other authority having control over any such road may require the Company to pay a maintenance user charge based upon what is fair and reasonable having regard to the continuing cost (excluding any profit to the Government or such other authority) of operation and maintenance of that road and the use of that road by others. In lieu of making such payments, the Company will have the right to elect to maintain at its own expense any such road needed by it for its operations hereunder.

7. In the event that the Government is unable to provide adequate telecommunications facilities, the Company may, in accordance with laws and regulations from time to time in effect in Indonesia, install and operate such telecommunications facilities; provided that it shall allow the Government and the public to use such facilities on the following terms

   (i) any such use shall be subject to such regulations and limitations as the Company will reasonably impose, and shall in no event adversely affect or interfere with the Company's operations hereunder; and

   (ii) the Company will be entitled to impose such charges therefor as will be appropriate to reflect the cost of maintaining and operating such facilities and, with respect to any commercial use of such facilities, the capital cost thereof.

8. In the event that telecommunications facilities can be provided by the Government, the Company shall be obliged to use the Government's network and pay standard charges for telecommunications services.

9. The Company may at its own cost, in accordance with the laws and regulations from time to time in effect in Indonesia, construct and establish and develop camps or permanent facilities sufficient to service the needs of the Enterprise.

Pasal 26

PENGELOLAAN DAN PERLINDUNGAN LINGKUNGAN HIDUP

1. Perusahaan sesuai dengan peraturan perundang-undangan perlindungan lingkungan hidup dan suaka alam yang berlaku dari waktu ke waktu di Indonesia, harus berusaha sungguh-sungguh melakukan kegiatannya menurut Persetujuan ini sedemikian rupa untuk mengurangi dan menanggulangi kerusakan Lingkungan Hidup dan mempergunakan praktek industri penambangan modern yang sudah diakui untuk melindungi sumberdaya alam terhadap kerusakan yang tidak perlu, mengurangi pencemaran dan pengotoran oleh pembuangan gas beracun kepada Lingkungan Hidup, membuang limbah dengan cara yang selalu menuruti syarat-syarat pembuangan limbah yang sudah ditetapkan, dan secara umum memelihara kesehatan dan keselamatan pegawainya dan peri kehidupan masyarakat setempat. Perusahaan tidak akan melakukan tindakan yang mungkin menutup atau membatasi secara tidak perlu dan tidak wajar pengembangan lebih lanjut sumberdaya daerah tempat beroperasi.

2. Perusahaan harus memasang dan mempergunakan alat keselamatan termasuk alat untuk pencegahan dan pemadaman kebakaran menurut peraturan perundang-undangan yang berlaku dari waktu ke waktu.

3. Sesuai dengan peraturan perundang-undangan yang berlaku dari waktu ke waktu, Perusahaan harus menyertakan ke dalam Studi Kelayakan untuk masing-masing Wilayah Pertambangannya suatu hasil studi mengenai Dampak Lingkungan Hidup yang menganalisis pengaruh yang mungkin terjadi akibat operasinya terhadap tanah, air, udara, sumberdaya biologis dan sosial, ekonomi, budaya, kesehatan masyarakat. Laporan mengenai dampak Lingkungan Hidup ini juga menguraikan tindakan-tindakan yang dilakukan Perusahaan guna mengurangi pengaruh yang merugikan.

4. Setiap hasil pengelolaan Lingkungan Hidup yang dilakukan oleh pihak perusahaan baik sebelum, pada saat maupun pasca konstruksi harus dilaporkan kepada Pemerintah Daerah yang diberi hak untuk melakukan pemantauan dan pengawasan dalam waktu yang tidak mengikat.

Article 26

ENVIRONMENTAL MANAGEMENT AND PROTECTION

1. The Company shall, in accordance with prevailing Environmental protection and natural preservation laws and regulations of Indonesia from time to time in effect, use its best efforts to conduct its operations under this Agreement so as to minimize and cope with harm to the Environment and utilize recognized modern Mining industry practices to protect natural resources against unnecessary damage, to minimize Pollution and harmful emissions into the Environment, to dispose of Waste in a manner consistent with good Waste Disposal practices, and in general to provide for the health and safety of its employees and the local community. The Company shall not take any acts which may unnecessarily and unreasonably block or limit the further development of the resources of the area in which it operates.

2. The Company shall install and utilize safety devices including measures designed to prevent and control fires according to the prevailing laws and regulations from time to time in effect.

3. The Company shall, in accordance with the then effective laws and regulations include in the Feasibility Study for each Mining Area an Environmental Impact Statement which analyzes the potential impact of its operations on land, water, air, biological resources and social, economic, culture and public health. The Environmental impact statement will also outline measures which the Company intends to use to mitigate adverse impacts.

4. Any outcome of the Environmental management carried out by the Company prior to, during and after Construction shall be reported to the local Government who is given the rights at any time to monitor and to supervise such outcome.

Pasal 27

PENGEMBANGAN KEGIATAN USAHA SETEMPAT

1. Perusahaan harus, sepanjang hal itu layak dan dapat dilakukan secara ekonomis, dengan mengingat sifat dari barang-barang dan jasa tertentu, memajukan, menunjang, mendorong dan membantu warganegara Indonesia yang ingin mendirikan Perusahaan dan usaha-usaha yang akan menyediakan barang-barang dan jasa-jasa untuk Pengusahaan dan untuk pemukiman tetap (jika ada), yang dibangun oleh Perusahaan beserta penduduk setempat, dan secara umum memajukan, menunjang, mendorong dan membantu pembangunan dan kegiatan usaha-usaha setempat di dalam Wilayah Pertambangan.

2. Perusahaan wajib menggunakan secara maksimal sub kontraktor-sub kontraktor Indonesia yang terdaftar apabila jasa-jasa mereka tersedia dengan harga yang bersaing dan standar yang sebanding dengan yang dapat diperoleh dari tempat lain baik di dalam maupun di luar Indonesia.

3. Sejauh dapat dilakukan Perusahaan dalam memberikan bantuan akan mendahulukan pemilik-pemilik tanah di dalam daerah Pengusahaan dan orang-orang lain yang berasal dalam daerah Pengusahaan.

4. Perusahaan pada saat dimulainya Periode Studi Kelayakan, harus menunjuk untuk jangka waktu tersebut apabila diperlukan seorang anggota stafnya yang telah mempunyai pengalaman di Indonesia dalam pembentukan, pengendalian dan menjalankan usaha sehari-hari Perusahaan yang dikendalikan dan dijalankan oleh warganegara Indonesia, dan yang akan

   (i) mengidentifikasi kegiatan-kegiatan yang ada hubungannya dengan Pengusahaan termasuk penyediaan barang-barang dan jasa-jasa seperti diuraikan di atas yang dapat dilaksanakan oleh warganegara Indonesia atau perusahaan-perusahaan setempat.

   (ii) memberikan saran dan membantu warganegara Indonesia yang ingin menjalankan kegiatan-kegiatan tersebut atau mendirikan perusahaan untuk menjalankan kegiatan yang sama; dan

   (iii) atas nama Perusahaan, menerapkan atau membantu dalam pelaksanaan Program Pengembangan Usaha seperti yang akan diuraikan lebih lanjut.

   Anggota staf yang ditunjuk untuk maksud ini harus seorang pegawai tetap Perusahaan.

5. Melalui konsultasi dengan Pemerintah, Perusahaan harus mempersiapkan suatu Program Pengembangan Usaha bagi pengembangan usaha dan pengusahaan-pengusahaan warganegara Indonesia yang secara rutin atau insidentil berhubungan dengan Pengusahaan, yang harus disampaikan kepada Pemerintah sebagai bagian dari laporan Studi Kelayakan Perusahaan sebagimana diuraikan dalam Lampiran "E".

Article 27

LOCAL BUSINESS DEVELOPMENT

1. The Company shall to the extent reasonably and economically practicable having regard to the nature of the particular goods and services promote, support, encourage and lend assistance to Indonesian nationals desirous of establishing enterprises and businesses providing goods and services for the Enterprise and for the permanent settlement (if any) constructed by the Company and the residents thereof, and shall generally promote, support, encourage and assist the establishment and operation of local enterprises in the Mining Area.

2. The Company shall make maximum use of registered Indonesian sub-contractors where services are available from them at competitive prices and of comparable standards with those obtainable from other third party suppliers elsewhere, whether inside or outside Indonesia.

3. Insofar as it is practicable the Company shall give first preference in its assistance hereunder to landowners in and other people originating from the area of the Enterprise.

4. The Company shall, at the commencement of the Feasibility Studies Period, appoint, for such period as is reasonably necessary, a member of its staff who has had experience within Indonesia of the establishment, control and day-to-day running of enterprises controlled and run by Indonesians and who shall :

   (i) identify activities related to the Enterprise including the provision of goods and services as described above which can be carried on by Indonesian nationals or local enterprises;

   (ii) advise and assist Indonesian nationals desirous of carrying on those activities or of estabilishing enterprises to do the same; and

   (iii) implement, or assist in the implementation of, the Business Development Program as hereinafter described on behalf of the Company.

   The staff member appointed for this purpose shall be a full time employee of the Company.

5. The Company shall, in consultation with the Government prepare a Business Development Program for the development of Indonesian business and enterprises associated with or incidental to the Enterprise which shall be submitted to the Government as part of the Company's Feasibility Study report as described in Annex "E".

6. Program Pengembangan Usaha akan menetapkan ketentuan-ketentuan sejauh dapat dilaksanakan, untuk hal-hal berikut

(i) perusahaan-perusahaan yang bergerak dalam penyediaan dan perawatan peralatan pertambangan (selain yang dilakukan oleh Perusahaan) dan penyediaan bahan-bahan yang habis pakai;

(ii) pensubkontrakan (subcontracting) kepada operator-operator peralatan yang berusaha sendiri untuk pembangunan jalan dan pemeliharaannya;

(iii) pensubkontrakan pekerjaan persiapan lahan, pembangunan dan pemeliharaan rumah-rumah, gedung-gedung pemerintah, fasilitas industri dan lain-lain perkerjaan dan gedung-gedung serta fasilitas yang akan dibangun lainnya, termasuk pembetonan, pengelasan, pembangunan tangki-tangki, konstruksi baja, pemasangan pipa-pipa, pekerjaan listrik dan pemotongan kayu;

(iv) perusahaan yang bergerak dalam pelayanan kota seperti pembersihan saluran-saluran air dan pengumpulan, pengolahan dan pembuangan sampah, angkutan penumpang, angkutan barang-barang konsumsi dan pekerjaan bongkar muat kapal;

(v) perusahaan yang bergerak dalam pertokoan, swalayan, pedagang pengecer lainnya, kantin, restoran, kedai minuman, bioskop, usaha binatu, fasilitas perbaikan dan pemeliharaan kendaraan;

(vi) perusahaan-perusahaan yang bergerak dalam penyediaan buah-buahan segar, sayur mayur, daging dan ikan;

dan dapat mencakup ketentuan-ketentuan untuk kegiatan-kegiatan lain yang disetujui oleh Perusahaan dan Pemerintah.

7. Program Pengembangan Usaha harus juga mencakup rincian atas

(i) jadwal waktu pelaksanaannya;

(ii) kegiatan tambahan yang mungkin didirikan oleh warganegara Indonesia;

(iii) kegiatan yang dimaksudkan Perusahaan untuk memulai operasinya tetapi akan dialihkan kepada warganegara Indonesia dikemudian hari atas dasar komersial; dan

(iv) setiap fasilitas untuk pelatihan, bantuan teknis atau keuangan yang dapat disediakan untuk memperlancar peralihan pemilikan dan pelaksanaan operasinya kepada warganegara Indonesia.

8. Program Pengembangan Usaha akan ditinjau setiap tahun oleh Perusahaan dengan berkonsultasi dengan Pemerintah dan dapat diubah atas persetujuan bersama antara

6. The Business Development Program will make provision as far as is practicable for the following

   (i) enterprises involved in the supply and maintenance of mining equipment (other than that carried out by the Company) and the provision of consumable supplies;

   (ii) subcontracting to self-employed equipment operators for road construction and maintenance;

   (iii) subcontracting of site preparation, construction and maintenance of houses, government buildings, industrial facilities and other works and buildings and facilities to be established, including concreting, welding, tank constructions, steel fabrication, plumbing, electrical work and timberwork;

   (iv) enterprises involved in town services such as sewerage and garbage collection, treatment and disposal, passenger transport, freight carriage of consumer items and stevedoring;

   (v) enterprises involved in trade stores, supermarkets, other retail outlets, canteens, restaurants, taverns, cinemas, cleaning and laundry, and vehicle maintenance and repair facilities;

   (vi) enterprises involved in the supply of fresh fruits, vegetables, meat and fish;

   and may include provision for other activities agreed to by the Company and the Government.

7. The Business Development Program shall also include details of:

   (i) the time schedule for its implementation;

   (ii) those additional activities which could be established by Indonesian nationals;

   (iii) those activities in which the Company intends to commence operating but which will be transferred to Indonesian nationals at a later date, on a commercial basis; and

   (iv) any facilities by way of training, technical or financial assistance which can be made available to facilitate the smooth transition of ownership and operation to Indonesian nationals.

8. The Business Development Program shall be reviewed annually by the Company, in consultation with the Government, and may be altered by mutual

Perusahaan dan Pemerintah dengan maksud untuk menjamin manfaat sebesar-besarnya bagi warganegara Indonesia dan usaha-usaha setempat dari kegiatan Perusahaan serta dalam pelaksanaan Pengusahaan.

9. Perusahaan dari waktu ke waktu akan berkonsultasi dengan wakil-wakil Pemerintah dan menyerahkan laporan triwulan kepada Pemerintah tentang hal-hal berikut

   (i) pelaksanaan program pelatihan dan aspek ketenagakerjaan dari Program Pengembangan Usaha;

   (ii) pelaksanaan ketentuan-ketentuan sehubungan dengan pembelian bahan-bahan dari daerah setempat; dan

   (iii) pelaksanaan ketentuan-ketentuan sehubungan dengan pengembangan usaha setempat.

consent between the Company and the Government with a view to securing the maximum benefit to Indonesian nationals and local enterprises from the operations of the Company and the carrying out of the Enterprise.

9. The Company shall consult from time to time with representatives of the Government and furnish the Government at quarterly intervals with a report concerning the following:

   (i) the implementation of the training and manpower aspects of the Business Development Program;

   (ii) the implementation of provisions relating to local purchasing of supplies; and

   (iii) the implementation of provisions relating to local business development.

Pasal 28

KETENTUAN LAIN-LAIN

1. Masing-masing Pihak setuju untuk melaksanakan dan menyediakan segala sesuatu, serta melakukan dan selanjutnya menjalankan semua tindakan dan segala sesuatu yang perlu atau yang patut untuk memenuhi ketentuan-ketentuan Persetujuan ini.

2. Setiap pemberitahuan, permintaan, pembatalan, izin, persetujuan dan pengumuman-pengumuman lain yang diperlukan atau diizinkan berdasarkan Persetujuan ini harus dilakukan dengan tertulis dan dianggap sudah diserahkan atau disampaikan pada waktu penyerahan secara langsung atau pengiriman dengan pos-udara, faksimile, telegram, kawat atau radiogram dengan perangko atau ongkos-ongkos pengiriman yang telah dibayar lunas, yang ditujukan kepada Pihak yang dimaksud pada alamat tersebut dibawah ini atau pada alamat lainnya yang akan ditunjuk oleh Pihak yang bersangkutan dengan pemberitahuan kepada Pihak yang akan menyampaikan pemberitahuan atau permintaan.

   Kepada Pemerintah dialamatkan ke :

   Departemen Pertambangan dan Energi Republik Indonesia
   u.p : Direktur Jenderal Pertambangan Umum
   Jl. Jenderal Gatot Subroto Kav. 49
   Telp. 5254508
   Fax. 5251494 - 5255863
   JAKARTA-INDONESIA

   Kepada Perusahaan pada kantor pusatnya di Indonesia dengan satu tembusan yang dikirim dengan pos udara, faksimile, telegram, telex, kawat atau radiogram, dengan perangko atau ongkos pengiriman yang telah dibayar lunas kepada:

   Vice-President Explorationari
   Battle Mountain (Irian Jaya) Ltd.
   333 Clay Street, 42nd Floor. Houston, Texas 77002 USA
   Phone : (1-713) 650-6400 Fax: (1-713) 650-3636

   atau alamat lain yang akan diberitahukan sewaktu-waktu oleh Perusahaan.

3. Menteri dapat mengambil suatu tindakan atau memberikan suatu persetujuan atas nama Pemerintah yang dianggap perlu, atau untuk mempermudah berdasarkan atau sehubungan dengan Persetujuan ini, demi pelaksanaan yang lebih baik, dan setiap tindakan yang diambil atau persetujuan yang diberikan itu akan mengikat bagi Pemerintah dan aparat atau bagiannya.

Article 28

MISCELLANEOUS PROVISIONS

1. Each of the Parties agrees to execute and deliver all such further instruments, and to do and perform all such further acts and things, as shall be necessary or convenient to carry out the provisions of this Agreement.

2. Any notice, request, waiver, consent, approval and other communication required or permitted under this Agreement shall be in writing and shall be deemed to have been duly given or made when it shall be delivered by hand or by mail, facsimile, telegraph, cable or radiograph, with postage or transmission charges fully prepaid, to the Party to which it is required or permitted to be given or made at such Party's address hereinafter specified, or at such other addresses as such Party shall have designated by notice to the Party giving such notice or making such request:

   To the Government addressed to :

   The Ministry of Mines and Energy of the
   Republic of Indonesia
   c/o. The Director General of Mines
   Jalan Jenderal Gatot Subroto Kav. 49
   Telp. 5254508
   Fax. 5251494 - 5255863
   JAKARTA - INDONESIA

   To the Company at its principal office in Indonesia with one copy by airmail, facsimile, telegram, telex, cable or radiogram, with postage or transmission charges fully prepaid to:

   Vice-President Explorationari
   Battle Mountain (Irian Jaya) Ltd.
   333 Clay Street, 42nd Floor. Houston, Texas 77002 USA
   Phone : (1-713) 650-6400 Fax: (1-713) 650-3636

   or such other address as the Company may notify from time to time.

3. The Minister may take any action or give any consent on behalf of the Government which may be necessary or convenient under or in connection with this Agreement for its better implementation and any action so taken or consent so given shall be binding upon the Government and any instrumentality or sub-division thereof.

4. Apabila dikehendaki oleh maksud Persetujuan ini, maka setiap angka (tunggal atau jamak) akan meliputi semua angka dan setiap jenis akan meliputi semua jenis. Judul-judul yang tercantum di dalam Persetujuan ini tidak boleh diartikan sebagai penafsiran dari teks atau ketentuan-ketentuan Persetujuan ini, akan tetapi hanya dimaksudkan untuk mempermudah referensi.

5. Ketentuan-ketentuan Persetujuan ini merupakan keseluruhan persetujuan antara kedua belah Pihak, dan tidak ada komunikasi, usul-usul atau persetujuan-persetujuan terdahulu, baik secara lisan maupun tertulis, yang diadakan antara kedua belah Pihak mengenai pokok persoalan Persetujuan ini, yang akan dapat mengubah ketentuan-ketentuan Persetujuan ini.

6. Kecuali konteks tersebut menentukan lain, dalam hal referensi yang dibuat dalam Persetujuan ini menunjuk undang-undang atau peraturan-peraturan Indonesia, maka referensi tersebut adalah peraturan perundang-undangan Indonesia yang berlaku dari waktu ke waktu dan yang diberlakukan secara umum bagi perusahaan-perusahaan pertambangan asing di Indonesia.

7. Jika suatu persetujuan atau tidak berkeberatan atau izin dari Departemen atau Pemerintah Indonesia atau suatu bagian atau aparat dari padanya diminta, dan jika suatu permohonan diajukan oleh Perusahaan kepada Pemerintah Indonesia berdasarkan Persetujuan ini, maka persetujuan atau izin tersebut tidak akan ditahan atau ditunda tanpa alasan yang wajar.

4. When required by the context of this Agreement, each number (singular or plural) shall include all numbers and each gender shall include all genders. The headings appearing in this Agreement are not to be construed as interpretations of the text or provisions hereof, but are intended only for convenience of reference.

5. The terms of this Agreement constitute the entire agreement between the Parties hereto and no previous communications, representations or agreements, either oral or written between the Parties hereto with respect to the subject matter thereof shall va. y the terms of this Agreement.

6. Unless the context otherwise expressly requires, where reference is made in this Agreement to the laws or regulations of Indonesia such reference shall be to the laws and regulations of Indonesia generally applicable to foreign mining companies in Indonesia in force from time to time.

7. Where an approval or consent or concurrence of a Department or the Government of Indonesia or any sub-division or instrumentality thereof is required, and where an application is made by the Company to the Government of Indonesia under this Agreement such approval or consent will not be unreasonably withheld or delayed.

Pasal 29

PENGALIHAN HAK

1. Persetujuan ini tidak dapat diserahterimakan atau dialihkan (termasuk untuk tujuan pembiayaan), baik seluruhnya atau sebagiannya tanpa izin tertulis dari Menteri; dengan ketentuan bahwa dalam hal Menteri mengizinkan suatu penyerahterimaan atau pengalihan, Perusahaan tidak akan dibebaskan dari kewajiban-kewajibannya berdasarkan Persetujuan ini, kecuali jika pihak yang menerima penyerahan atau pengalihan akan bertanggung jawab dan dalam kenyataan melaksanakan kewajiban-kewajiban tersebut.

2. Para pemegang saham dalam Perusahaan tidak boleh mengalihkan saham-sahamnya dalam Perusahaan tanpa terlebih dahulu memperoleh izin tertulis dari Menteri yang tidak akan ditahan atau ditunda tanpa alasan yang wajar, dengan ketentuan bahwa izin tertulis dari Menteri tidak diperlukan dalam hal:

   (i) pengalihan saham-saham Perusahaan menurut Pasal 24; atau

   (ii) pengalihan oleh pemegang saham seluruhnya atau sebagian saham dalam Perusahaan kepada afiliasinya atau subsidiari pemegang saham.

Article 29

ASSIGNMENT

1. This Agreement may not be transferred or assigned (including for the purpose of financing) in whole or in part, without the prior written consent of the Minister; provided however, that where the Minister consents to a transfer or assignment, the Company shall not be relieved from any of its obligations hereunder except to the extent that the transferee or assignee shall assume and in fact perform such obligations.

2. The shareholders in the Company shall not transfer shares in the Company without the prior written consent of the Minister which shall not be unreasonably withheld or delayed provided that the written consent of the Minister shall not be required in the case of :

   (i) a transfer of shares in the Company pursuant to Article 24; or

   (ii) a transfer by a shareholder of all or some of its shares in the Company to an affiliate or subsidiary of that shareholder.

Pasal 30

PEMBIAYAAN

1. Perusahaan bertanggung jawab penuh atas pembiayaan Pengusahaan dan harus menyediakan modal yang cukup untuk melaksanakan kewajiban-kewajibannya berdasarkan Persetujuan ini. Perusahaan dapat menentukan cara memperoleh pembiayaan melalui penerbitan saham-saham Perusahaan atau melalui pinjaman oleh Perusahaan, dengan ketentuan bahwa sejak permulaan Periode Konstruksi, Perusahaan harus berusaha mempertahankan suatu perbandingan antara modal saham dengan pinjaman dari pihak ketiga untuk menjamin kelangsungan kemampuan membayar dari Perusahaan untuk melindungi kepentingan Pemerintah, kreditor dan pemegang-pemegang saham.

2. Setiap pinjaman jangka panjang oleh Perusahaan berdasarkan Persetujuan ini, harus didasarkan atas persyaratan pembayaran kembali dan tingkat bunga (termasuk potongan-potongan, kompensasi yang seimbang dan biaya-biaya lain untuk memperoleh pinjaman tersebut) yang wajar dan layak untuk perusahaan-perusahaan pertambangan dalam keadaan yang berlaku di pasar uang dan/atau modal internasional, setelah disesuaikan dengan tatacara yang berlaku untuk memperoleh dan melaporkan pinjaman-pinjaman luar negeri.

Article 30

FINANCING

1. The Company shall have sole responsibility for financing the Enterprise and shall maintain sufficient capital to carry out its obligations under this Agreement. The Company may determine the extent to which the financing shall be accomplished through issuance of shares of the Company or through borrowings by the Company, provided that from the start of the Construction Period the Company shall endeavor to maintain a ratio of shareholder's capital to third party borrowings so as to guarantee the continuing solvency of the Company in order to protect the legitimate interests of the Government, the lenders and the shareholders.

2. Any long term borrowing by the Company under this Agreement shall be on such repayment terms and at such effective rates of interest (including discounts, compensating balances and other costs of obtaining such borrowings) which are reasonable and appropriate for mining companies in circumstances then prevailing in the international money and/or stock markets after complying with existing procedures for obtaining and reporting of foreign loans.

Pasal 31

JANGKA WAKTU

1. Persetujuan ini mulai berlaku efektif pada tanggal yang dicantumkan pada awal Persetujuan ini.

2. Sesuai dengan ketentuan-ketentuan yang tercantum didalamnya, Persetujuan ini akan tetap berlaku sampai berakhirnya Periode Operasi terakhir untuk suatu Wilayah Pertambangan dan, jika ada pertambahan jangka waktu periode tersebut, maka persetujuan ini harus diperbaharui atau diperpanjang.

3. Tanpa mengurangi maksud ayat (2) Pasal ini, Pemerintah setuju, bahwa dalam waktu yang cukup sebelum berakhirnya Periode Operasi bagi suatu Wilayah Pertambangan, untuk mempertimbangkan dengan baik setiap permohonan Perusahaan mengenai perpanjangan Periode Operasi untuk jangka waktu maksimum yang diizinkan berdasarkan Undang-Undang No.11 Tahun 1967 dan Peraturan Pelaksanaannya dengan menyadari pentingnya pengusahaan Mineral secara ekonomis di setiap Wilayah Pertambangan tersebut.

Article 31

TERM

1. This Agreement shall become effective on the date set out at the beginning of this Agreement.

2. Subject to the provisions herein contained, this Agreement shall continue in force until the expiration of the last Operating Period for a Mining Area and for such additional period, if any, for which this Agreement shall be renewed or otherwise extended.

3. Notwithstanding paragraph 2 of this Article, the Government agrees that within a reasonable period prior to the expiration of the Operating Period for any Mining Area it will give sympathetic consideration to any request by the Company to extend the Operating Period in question by the maximum period in accordance with Law No. 11 of 1967 and its implementation regulations in recognition of the requirements for appropriate economic recovery of Minerals from any such Mining Area.

Pasal 32

PILIHAN HUKUM

1. Kecuali ditetapkan lain, pelaksanaan Persetujuan ini akan diatur, tunduk kepada dan ditafsirkan sesuai dengan hukum Republik Indonesia.

2. Persetujuan ini dibuat dalam bahasa Indonesia dan bahasa Inggris, dan kedua naskah tersebut adalah sah. Dalam hal terdapat suatu perbedaan penafsiran antara kedua naskah tersebut, maka naskah bahasa Inggris, yang akan dipergunakan.

Dengan mengingat hal-hal tersebut di atas, kedua belah Pihak berusaha agar Persetujuan ini segera dilaksanakan sejak tanggal seperti tertulis pada awal Persetujuan ini.

UNTUK : PEMERINTAH
REPUBLIK INDONESIA

oleh : IR. SUDJANA
Menteri Pertambangan dan Energi

UNTUK : P.T. IRIANA MUTIARA MINING

oleh :

oleh :

Article 32

GOVERNING LAW

1. Except as otherwise expressly provided herein, this Agreement, its implementation and operation shall be governed and construed and interpreted in accordance with the laws of the Republic of Indonesia.

2. This Agreement has been drawn up in both the Indonesian and English languages and both texts are valid. In the event of any divergency between the two texts, however, the English text shall be applied.

In witness whereof, the Parties hereto have caused this Agreement to be duly executed as of the date appearing at the beginning of this Agreement.

FOR THE GOVERNMENT OF THE REPUBLIC OF INDONESIA,

by : J.B. SUDJANA
Minister of Mines and Energy

FOR : PT. IRIANA MUTIARA MINING

by : _____

by : _____

Annex "A"

CONTRACT AREA

The "Contract Area" is the mainland of the island of Irian comprising of 5 (five) blocks which area each defined by coordinates listed follows :

Point	Longitude				Latitude				Area (Ha)
	°	'	"		°	'	"		
Block I									
1	136	10	0.0	E	3	7	0.0	S	
2	136	10	0.0	E	3	15	0.0	S	
3	136	1	0.0	E	3	15	0.0	S	
4	136	1	0.0	E	3	7	0.0	S	24,690
Block II									
1	136	14	14.6	E	3	5	0.0	S	
2	136	24	48.0	E	3	5	0.0	S	
3	136	24	48.0	E	3	28	0.0	S	
4	136	0	0.0	E	3	28	0.0	S	
5	136	0	0.0	E	3	15	0.0	S	
6	136	10	0.0	E	3	15	0.0	S	
7	136	10	0.0	E	3	5	0.0	S	
8	136	12	5.0	E	3	5	0.0	S	
9	136	12	5.0	E	3	7	51.8	S	
10	136	12	37.4	E	3	7	51.8	S	
11	136	12	37.4	E	3	9	29.0	S	
12	136	13	9.8	E	3	9	29.0	S	
13	136	13	9.8	E	3	11	6.2	S	
14	136	14	47.0	E	3	11	6.2	S	
15	136	14	47.0	E	3	9	29.0	S	
16	136	14	14.6	E	3	9	29.0	S	157,400
Block III									
1	136	30	0.0	E	3	23	0.0	S	
2	136	50	0.0	E	3	23	0.0	S	
3	136	50	0.0	E	3	0	0.0	S	
4	137	3	0.0	E	3	0	0.0	S	
5	137	3	0.0	E	3	10	0.0	S	
6	137	15	0.0	E	3	10	0.0	S	
7	137	15	0.0	E	3	33	0.0	S	
8	136	30	0.0	E	3	33	0.0	S	310,300

Annex "A"

CONTRACT AREA

The "Contract Area" is the mainland of the island of Irian comprising of 5 (five) blocks which area each defined by coordinates listed follows :

Point	Longitude				Latitude				Area (Ha)
	0	'	"		0	'	"		
Block I									
1	136	10	0.0	E	3	7	0.0	S	
2	136	10	0.0	E	3	15	0.0	S	
3	136	1	0.0	E	3	15	0.0	S	
4	136	1	0.0	E	3	7	0.0	S	24,690
Block II									
1	136	14	14.6	E	3	5	0.0	S	
2	136	24	48.0	E	3	5	0.0	S	
3	136	24	48.0	E	3	28	0.0	S	
4	136	0	0.0	E	3	28	0.0	S	
5	136	0	0.0	E	3	15	0.0	S	
6	136	10	0.0	E	3	15	0.0	S	
7	136	10	0.0	E	3	5	0.0	S	
8	136	12	5.0	E	3	5	0.0	S	
9	136	12	5.0	E	3	7	51.8	S	
10	136	12	37.4	E	3	7	51.8	S	
11	136	12	37.4	E	3	9	29.0	S	
12	136	13	9.8	E	3	9	29.0	S	
13	136	13	9.8	E	3	11	6.2	S	
14	136	14	47.0	E	3	11	6.2	S	
15	136	14	47.0	E	3	9	29.0	S	
16	136	14	14.6	E	3	9	29.0	S	157,400
Block III									
1	136	30	0.0	E	3	23	0.0	S	
2	136	50	0.0	E	3	23	0.0	S	
3	136	50	0.0	E	3	0	0.0	S	
4	137	3	0.0	E	3	0	0.0	S	
5	137	3	0.0	E	3	10	0.0	S	
6	137	15	0.0	E	3	10	0.0	S	
7	137	15	0.0	E	3	33	0.0	S	
8	136	30	0.0	E	3	33	0.0	S	310,300

Titik	Garis Bujur				Garis Lintang				Luas (Ha)
	0	'	"		0	'	"		
Blok IV									
1	137	36	0,0	E	2	43	0,0	LS	
2	137	36	0,0	E	2	21	0,0	LS	
3	136	48	0,0	E	2	21	0,0	LS	
4	136	48	0,0	E	2	43	0,0	LS	362.300
Blok V									
1	139	28	0,0	E	2	15	0,0	LS	
2	139	19	0,0	E	2	15	0,0	LS	
3	139	19	0,0	E	2	12	0,0	LS	
4	138	20	0,0	E	2	12	0,0	LS	
5	138	20	0,0	E	2	29	0,0	LS	
6	138	24	0,0	E	2	29	0,0	LS	
7	138	24	0,0	E	2	40	0,0	LS	
8	138	32	0,0	E	2	40	0,0	LS	
9	138	32	0,0	E	2	43	0,0	LS	
10	138	37	0,0	E	2	43	0,0	LS	
11	138	37	0,0	E	2	45	0,0	LS	
12	138	42	0,0	E	2	45	0,0	LS	
13	138	42	0,0	E	2	49	0,0	LS	
14	139	0	0,0	E	2	49	0,0	LS	
15	139	0	0,0	E	2	45	0,0	LS	
16	139	5	0,0	E	2	45	0,0	LS	
17	139	5	0,0	E	2	42	0,0	LS	
18	139	32	0,0	E	2	42	0,0	LS	
19	139	32	0,0	E	2	19	0,0	LS	
20	139	31	0,0	E	2	19	0,0	LS	
21	139	31	0,0	E	2	17	0,0	LS	
22	139	28	0,0	E	2	17	0,0	LS	756.200

Jumlah luas "Wilayah Kontrak Karya" tersebut diatas ditetapkan dengan cara perhitungan teoritis, dengan menganggap tiap sisi derajat equator adalah 111,11 km, didasarkan atas Peta Topografi Indonesia (Peta Ikhtisar Topografi) terbitan Jawatan Topografi Angkatan Darat dengan skala 1 : 250.000, diperkirakan seluas 1.610.890 (satu juta enam ratus sepuluh ribu delapan ratus sembilan puluh) hektar, (sampai didapatkan satu peta yang lebih teliti dan/atau cara untuk menghitung permukaan luas tanah yang disetujui bersama oleh Perusahaan dan Pemerintah).

Point	Longitude				Latitude				Area (Ha)
	o	'	"		o	'	"		
Block IV									
1	137	36	0.0	E	2	43	0.0	S	
2	137	36	0.0	E	2	21	0.0	S	
3	136	48	0.0	E	2	21	0.0	S	
4	136	48	0.0	E	2	43	0.0	S	362,300
Block V									
1	139	28	0.0	E	2	15	0.0	S	
2	139	19	0.0	E	2	15	0.0	S	
3	139	19	0.0	E	2	12	0.0	S	
4	138	20	0.0	E	2	12	0.0	S	
5	138	20	0.0	E	2	29	0.0	S	
6	138	24	0.0	E	2	29	0.0	S	
7	138	24	0.0	E	2	40	0.0	S	
8	138	32	0.0	E	2	40	0.0	S	
9	138	32	0.0	E	2	43	0.0	S	
10	138	37	0.0	E	2	43	0.0	S	
11	138	37	0.0	E	2	45	0.0	S	
12	138	42	0.0	E	2	45	0.0	S	
13	138	42	0.0	E	2	49	0.0	S	
14	139	0	0.0	E	2	49	0.0	S	
15	139	0	0.0	E	2	45	0.0	S	
16	139	5	0.0	E	2	45	0.0	S	
17	139	5	0.0	E	2	42	0.0	S	
18	139	32	0.0	E	2	42	0.0	S	
19	139	32	0.0	E	2	19	0.0	S	
20	139	31	0.0	E	2	19	0.0	S	
21	139	31	0.0	E	2	17	0.0	S	
22	139	28	0.0	E	2	17	0.0	S	756,200

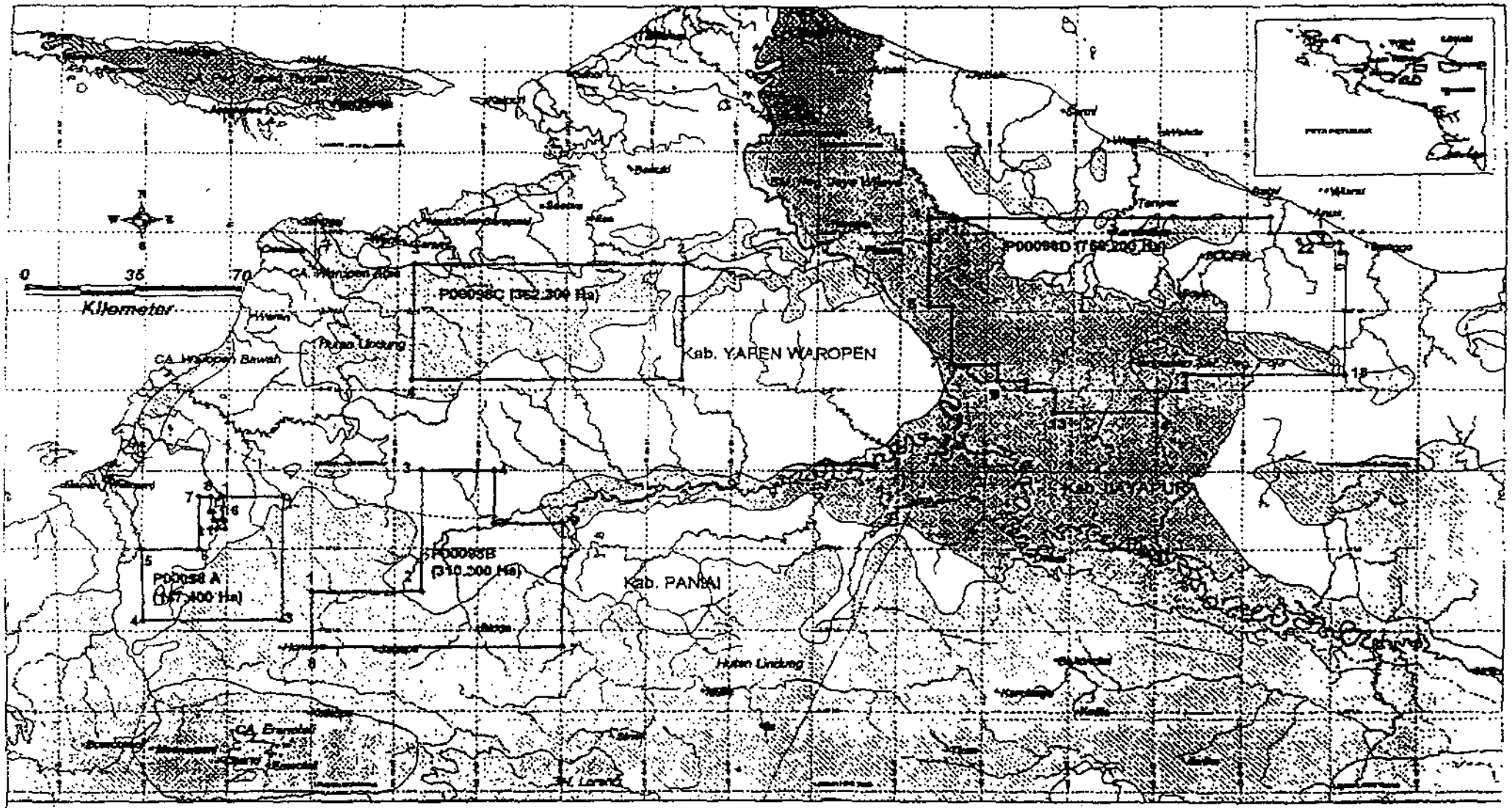
The total area of the above defined "Contract Area" is by theoretical calculation assuming the side of an equatorial degree square as being 111.11 km based on Indonesian topographic map (Peta Ikhtisar Top). Issued by "Jawatan Topografi Angkatan Darat" on Scale 1 : 250,000. deemed to contain approximately one million six hundred ten thousand eight hundred and ninety (1,610,890) hectares (until a more accurate map and or method is agreed upon by the Company and the Government to calculate the surface land area).

Lampiran "B"

PETA WILAYAH KONTRAK KARYA

Annex "B"

MAP OF CONTRACT AREA



PETA WILAYAH KONTRAK KARYA

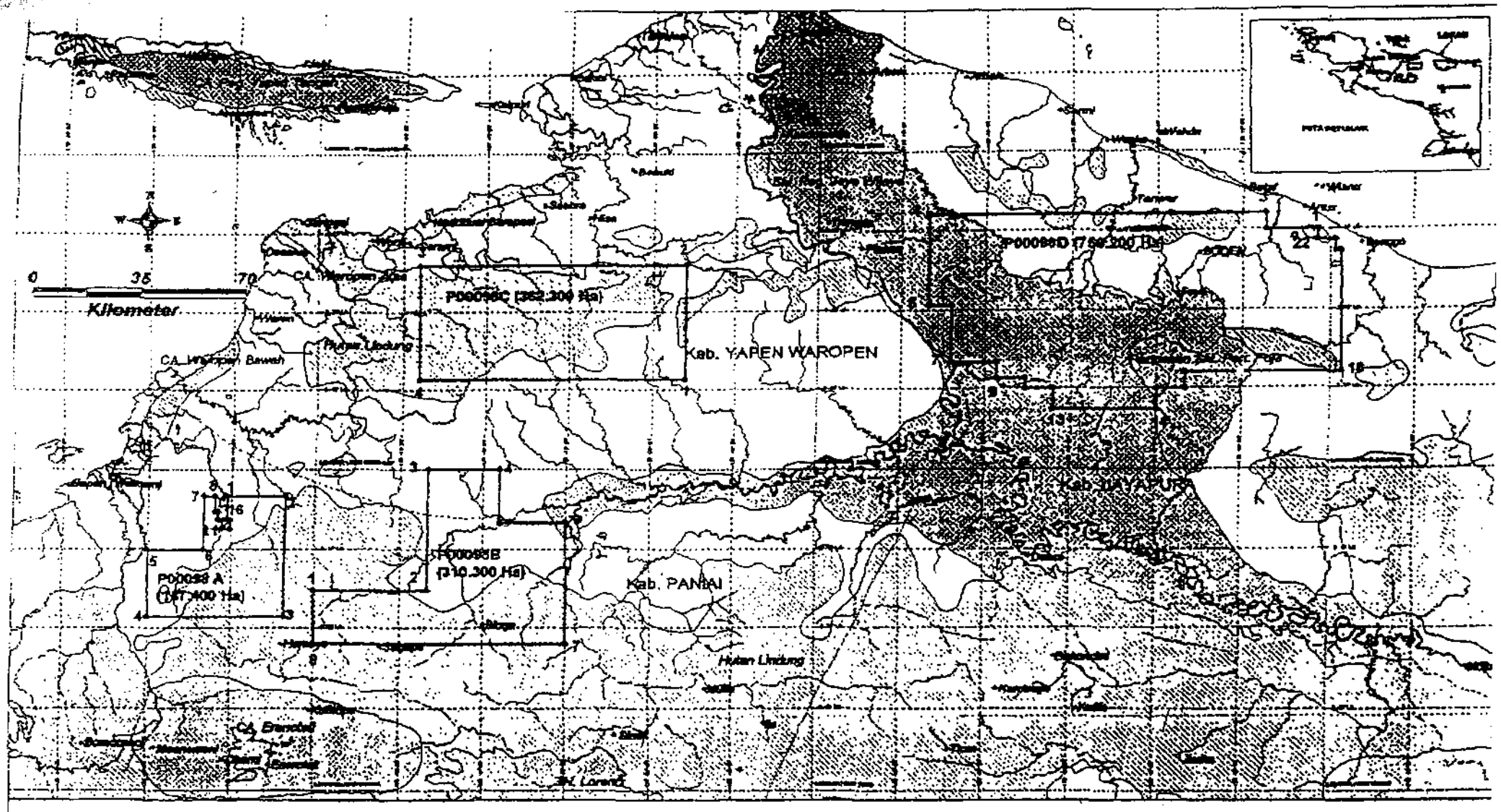
Diperuntukkan bagi	: PT. IRIANA MUTIARA MINING
Tanggal Proses	: 24 APRIL 1997
Operator	: GULTOM
Kode Wilayah	: 96P00098

LOKASI KEGIATAN

Propinsi	: IRIAN JAYA
Kabupaten	: YAPEN WAROPEN, JAYAPURA & PANIAI
Bahan Galian	: EMAS, PERAK & TEMBAGA
Tahap	: PENYELIDIKAN UMUM
Luas areal	: 1.506.200 Ha

UNIT PELAYANAN INFORMASI DAN
PENCADANGAN WILAYAH PERTAMBANGAN (UPIPWP)
DIREKTORAT JENDERAL PERTAMBANGAN UMUM
DEPARTEMEN PERTAMBANGAN DAN ENERGI

PETA WILAYAH KONTRAK KARYA



PETA WILAYAH KONTRAK KARYA

Diperuntukkan bagi : PT. IRIANA MUTIARA MINING
Tanggal Proses : 24 APRIL 1997
Operator : GULTOM
Kode Wilayah : 96P00096

LOKASI KEGIATAN

Propinsi : IRIAN JAYA
Kabupaten : YAPEN WAROPEN, JAYAPURA & PANIAI
Bahan Galian : EMAS, PERAK & TEMBAGA
Tahap : PENYELIDIKAN UMUM
Luas areal : 1.586.200 Ha

UNIT PELAYANAN INFORMASI DAN
PENCADANGAN WILAYAH PERTAMBANGAN (UPIPWP)
DIREKTORAT JENDERAL PERTAMBANGAN UMUM
DEPARTEMEN PERTAMBANGAN DAN ENERGI

PETA WILAYAH KONTRAK KARYA

Lampiran "C"

DAFTAR KUASA PERTAMBANGAN YANG MASIH BERLAKU

NO.	PEMEGANG/STATUS	LOKASI	LUAS (Ha)	KOMODITI MINERAL	KETERANGAN
1.	.....	.....	.....	-	.....
	.....	.....			
2.	.....	.....		.....	.....
		.....			.....
3.	.....	.....	.....	.....	.....
	.....	.....	.....	.....	.....
		.....	.....	.....	.....
		.....	.....	.....	.....
		.....	.....	.....	.....
		.....			
4.	.....	.....	.....	.....	.....
		.....	.....	.....	.....
		.....	.....	.....	.....
		.....	.....	.....	.....
		.....	.....	.....	.....
		.....			

Annex "C"

LIST OF OUT STANDING MINING AUTHORIZATIONS

	HOLDER/STATUS	LOCATION	AREA (Ha)	MINERAL COMMODITY	REFERENCE
1.	.....	.....	.....	.....	.....
	.....	.....			
2.	.....	.....		.....	.....
		.....			.....
3.	.....	.....	.....	.....	.....
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Lampiran "D"

IURAN TETAP UNTUK BERBAGAI TAHAP KEGIATAN **)

Periode	Penyelidikan Umum		Eksplorasi					Studi Kelayakan		Konstruksi			Operasi	
Tahun	I	II *)	I	II	III	IV*)	V*)	I	II*)	I	II	III	I — xxx	
													x)	y)
$ US Tiap hektar tiap tahun	0.025	0.05	0.10	0.12	0.15	0.25	0.35	0.50	0.50	0.50	0.50	0.50	1,50	3.00

*). Perpanjangan waktu berdasarkan persetujuan Menteri.

x). Untuk endapan lateritik dan endapan permukaan lainnya yang penyebarannya meluas.

y). Untuk endapan selain dari (x).

**) Tarif iuran tetap untuk wilayah lepas pantai akan dihitung sebagai berikut :

-selama tahap Pra Produksi (s/d akhir Periode Pra Produksi) dikenakan tarif 1/4 (satu per empat) dari tarif tersebut di atas.

-selama tahap operasi dikenakan tarif 1/10 (satu per sepuluh) dari tarif tersebut di atas.

Annex "D"

DEADRENT FOR VARIOUS STAGES OF ACTIVITIES **)

Period	General Survey		Exploration					Feasibility Study		Construction			Operation	
Year	I	II *)	I	II	III	IV*)	V*)	I	II*)	I	II	III	I — xxx	
													x)	y)
US Dollars per hectare per annum	0.025	0.05	0.10	0.12	0.15	0.25	0.35	0.50	0.50	0.50	0.50	0.50	1.50	3.00

*). Extension period subject to the approval of the Minister

x). Laterite and other extensive surface deposits

y). Deposits other than x).

**). Deadrent tariff with regard to offshore area shall be calculated as follow:

- During pre-operating stage (up to the end of construction period), the tariff will be one fourth (1/4) of the general tariff listed above;
- During an operating period, the tariff will be one tenth (1/10) of the general tariff listed above.

Lampiran "E"

LAPORAN STUDI KELAYAKAN

Sesuai dengan Pasal 8 Persetujuan ini, Perusahaan harus menyerahkan kepada Pemerintah suatu laporan lengkap tentang studi kelayakan yang dilakukan oleh Perusahaan.
Dengan tidak mengurangi pengertian umum yang terdapat dalam Pasal 8, penyelidikan-penyelidikan dan studi ini akan mencakup :

1. Suatu penyelidikan geologi yang mendalam dan pembuktian endapan-endapan bijih dalam Wilayah Pertambangan termasuk cadangan-cadangan bijih yang terukur, terunjuk dan terkira sepanjang diperlukan bagi kelayakan ekonomis dari pada Pengusahaan untuk dipertimbangkan, dan pengujian-pengujian serta pengambilan contoh endapan-endapan yang bernilai tersebut sesuai dengan rencana kerja yang telah disetujui.

2. Suatu pengamatan dan informasi yang terinci mengenai lokasi untuk kegiatan operasi yang termasuk dalam Pengusahaan berikut penyiapan peta-peta dan gambar-gambar yang berhubungan dengan mengenai lokasi-lokasi tersebut.

3. Suatu studi kelayakan teknis dan ekonomis mengenai penambangan, pengangkutan, pemuatan dan pengapalan bijih, konsentrat-konsentrat dan hasil dalam bentuk lain dari Wilayah Pertambangan, termasuk penyelidikan teknis tentang kemungkinan lokasi pelabuhan, jalan-jalan penghubung dari tambang ke pelabuhan sungai dan cara pengangkutan lain yang cocok.

4. Suatu penyelidikan tentang setiap kemungkinan pengaruh pengangkutan dengan menggunakan tongkang atau kapal.

5. Suatu penyelidikan tentang lokasi dan rancang bangun lapangan terbang dan termasuk fasilitas pelabuhan dan pendaratan, apabila dianggap perlu.

6. Penyelidikan dan perencanaan bagi pengembangan suatu yang berhubungan dengan pemukiman tetap yang sesuai, termasuk rancang bangun fasilitas perumahan dan fasilitas sosial, kebudayaan dan kemasyarakatan sejauh diperlukan untuk memenuhi kebutuhan masyarakat yang mungkin berkembang akibat kegiatan-kegiatan Perusahaan dalam waktu lima tahun setelah dimulainya Periode Operasi.

7. Suatu studi tentang kebutuhan tenaga kerja dikemudian hari untuk Pengusahaan dengan memperkirakan jenis dan lamanya pelatihan yang diperlukan untuk menjamin penggantian Tenaga Kerja Asing oleh Tenaga Kerja Indonesia dan penggunaan tenaga kerja setempat semaksimum mungkin sejalan dengan operasi yang aman dan efisien dari Pengusahaan.

Annex "E"

FEASIBILITY STUDY REPORT

In accordance with Article 8 of this Agreement, the Company shall submit to the Government a full report on the feasibility studies conducted by the Company.

Without limiting the generality of Article 8, these investigations and studies shall include:

1. A thorough geological investigation and proving of the ore deposits in the Mining Area including proven, probable and possible ore reserves to the extent necessary for the economic feasibility of the Enterprise to be judged and the testing and sampling of those deposits substantially in accordance with the agreed work program.

2. Detailed and reconnaissance site information for the operations included in the Enterprise together with the preparation of suitable maps and drawings of such sites.

3. A study of the technical and economic feasibility of the mining, transporting, handling and shipping of ores, concentrates and other forms of Minerals from the Mining Area, including engineering investigations of possible port sites, road links from mine sites to river terminals and other appropriate means of transport.

4. An investigation into the possible effect of any proposed barging or shipping transportation.

5. An investigation into the location and design of an airstrip and associated landing and terminal facilities, when deemed necessary.

6. Investigation and assessment planning for the development of suitable permanent settlement, including design of housing facilities and associated social, cultural and civic facilities as may be necessary to meet the needs of a community of such a size as is likely to be generated by the Company's operations within a period of five years following the commencement of the Operating Period.

7. A study into future employee requirements for the Enterprise with a view to estimating the kind and extent of training required to ensure the replacement of Expatriate workers by Indonesians and maximum rate of localization as is consistent with the safe and efficient operation of the Enterprise.

8. Studi dampak phisik mengenai pengaruh yang akan timbul terhadap lingkungan hidup sebagai akibat kegiatan Pengusahaan, studi tersebut akan dilakukan dengan berkonsultasi dengan konsultan independen yang memenuhi persyaratan dan sesuai dengan ketentuan yang ditetapkan dalam Pasal 26 Persetujuan ini.

9. Suatu penyelidikan tentang jumlah dan jenis usaha setempat yang mungkin diperlukan untuk melayani kebutuhan Pengusahaan dan pemukiman tetap yang mungkin berkembang dalam jangka waktu lima tahun setelah dimulainya Periode Operasi.

10. Riset metalurgi dan pemasaran untuk menentukan kemampuan hasil perolehan bijih dan kemungkinan penjualan konsentrat serta persyaratan kontrak penjualannya.

11. Suatu penyelidikan pendahuluan tentang kelayakan mendirikan fasilitas peleburan dan pemurnian, yang cukup untuk memperkirakan modal dan biaya operasi serta kemungkinan sumber tenaga listrik yang diperlukan dikemudian hari.

12. Suatu analisa keuangan yang menyeluruh, berdasarkan kriteria yang tepat untuk suatu usaha pertambangan, atas aliran kas (cash flow) yang prospek dan tingkat pengembalian (rate of return) dari Pengusahaan.

13. Suatu penyelidikan tentang fasilitas penyediaan air yang sesuai untuk keperluan tambang, industri dan pemukiman tetap.

14. Studi dan penyelidikan yang lengkap sehubungan dengan hal-hal berikut

    (i) kelayakan dan biaya untuk membangun fasilitas telekomunikasi yang sesuai;

    (ii) kelayakan dan biaya pembangunan serta fasilitas pengoperasian untuk penyediaan tenaga listrik yang diperlukan bagi konstruksi, penambangan, industri dan pemukiman tetap sehubungan dengan Pengusahaan; dan

    (iii) kelayakan dan biaya untuk pembangunan Instalasi Air yang sesuai dengan kebutuhan Pengusahaan.

8. Environment impact studies into the likely effects of the operation of the Enterprise on the Environment, such studies to be carried out in consultation with appropriately qualified independent consultants and under the terms of reference set out in Article 26 of this Agreement.

9. An investigation into the number and types of local businesses likely to be required to service the needs of the Enterprise and the permanent settlement likely to be generated thereby within a period of five years following the commencement of the Operating Period.

10. Metallurgical and market research to establish the recoverability of ore, and the possibility of selling ore concentrates and likely contract terms on which such products could be sold.

11. A preliminary investigation into the feasibility of establishing a smelting and refining operation sufficient to indicate the approximate capital and operating costs thereof and possible future sources of power.

12. A thorough financial analysis, based upon appropriate criteria for a mining company, of prospective cash flow and rates of return of the Enterprise.

13. An investigation into suitable water supply facilities for mining, industrial and permanent settlement purposes

14. Complete studies and investigation in relation to the following :

    (i) the feasibility and cost of establishing suitable telecommunications facilities;

    (ii) the feasibility and cost of construction and operating facilities to supply the power required for construction, mining, industrial and permanent settlement to be used in connection with the Enterprise; and

    (iii) the feasibility and cost of establishing suitable water works required in connection with the Enterprise.

Lampiran "F"

IURAN EKSPLOITASI/PRODUKSI ATAS PRODUKSI MINERAL

(Keputusan Menteri Pertambangan dan Energi No. 1166.K/844/M.PE/1992 tanggal 12 September 1992)

No.	Jenis Mineral Bahan Galian	Tingkat Produksi	Satuan	Tarif Iuran Eksploitasi/Produksi (US $)	Dasar Perhitungan Iuran
1	2	3	4	5	6
1	Bijih Nikel (Garnierite)	<1250 ≥1250	Ton	70.00/ton 78.00/ton	Logam
2	Bijih Nikel (Limonite)	<750 ≥750	Ton	62.00/ton 63.00/ton	Logam
3	Kobal	<500 ≥500	Ton	140.00/ton 156.00/ton	Logam
4	Timah	<50000 ≥50000	Ton	59.00/ton 64.00/ton	Logam
5	Tembaga	<80000 ≥80000	Ton	45.00/ton 55.00/ton	Logam
6	Timbal	<6000 ≥6000	Ton	17.00/ton 18.00/ton	Logam
7	Seng	<4000 ≥4000	Ton	12.00/ton 12.50/ton	Logam
8	Besi	<100000 ≥100000	Ton	2.70/ton 2.90/ton	Logam
9	Emas	<2000 ≥2000	Kg	225.00/Kg 235.00/Kg	Logam
10	Perak	<25000 ≥25000	Kg	1.90/Kg 2.00/Kg	Logam
11	Platina	<100 ≥100	Kg	35.50/Kg 38.50/Kg	Logam
12	Air Raksa	<500000 ≥500000	Kg	0.16/Kg 0.17/Kg	Logam
13	Antimonit	<100000 ≥100000	Kg	0.55/Kg 0.60/Kg	Logam
14	Bismut	<1000 ≥1000	Kg	45.00/Kg 50.00/Kg	Logam
15	Wolfram	<12.5 ≥12.5	Ton	0.30/Ton 0.40/Ton	Logam
16	Vanadium	<12.5 ≥12.5	Ton	0.10/Ton 0.15/Ton	Logam
17	Molibdenit	<500 ≥500	Ton	612.00/Ton 624.00/Ton	Logam

Annex "F"

ROYALTY ON MINERAL PRODUCTION

(Mine and Energy Ministerial Decree No 1166.K/844/M.PE/1992 date September 12, 1992)

No.	Mineral	Total production per calendar year	Unit	Royalty Tariff (US $)	Explanation
1	2	3	4	5	6
1	Nickel ore (Garnierite)	<1250 ≥1250	Tonne	70.00/tonne 78.00/tonne	Metal
2	Nickel ore (Limonite)	<750 ≥750	Tonne	62.00/tonne 63.00/tonne	Metal
3	Cobalt	<500 ≥500	Tonne	140.00/tonne 156.00/tonne	Metal
4	Tin	<50000 ≥50000	Tonne	59.00/tonne 64.00/tonne	Metal
5	Copper	<80000 ≥80000	Tonne	45.00/tonne 55.00/tonne	Metal
6	Lead	<6000 ≥6000	Tonne	17.00/tonne 18.00/tonne	Metal
7	Zinc	<4000 ≥4000	Tonne	12.00/tonne 12.50/tonne	Metal
8	Iron	<100000 ≥100000	Tonne	2.70/tonne 2.90/tonne	Metal
9	Gold	<2000 ≥2000	Kg	225.00/Kg 235.00/Kg	Metal
10	Silver	<25000 ≥25000	Kg	1.90/Kg 2.00/Kg	Metal
11	Platinum	<100 ≥100	Kg	35.50/Kg 38.50/Kg	Metal
12	Mercury	<500000 ≥500000	Kg	0.16/Kg 0.17/Kg	Metal
13	Antimony	<100000 ≥100000	Kg	0.55/Kg 0.60/Kg	Metal
14	Bismuth	<1000 ≥1000	Kg	45.00/Kg 50.00/Kg	Metal
15	Wolframite	<12.5 ≥12.5	Tonne	0.30/Tonne 0.40/Tonne	Metal
16	Vanadium	<12.5 ≥12.5	Tonne	0.10/Tonne 0.15/Tonne	Metal
17	Molybdenum	<500 ≥500	Tonne	612.00/Tonne 624.00/Tonne	Metal

1	2	3	4	5	6
18	Titanium	<20000 ≥20000	Ton	41.00/Ton 42,00/Ton	Logam
19	Kromit	<15000 ≥15000	Ton	0.35/Ton 0.45/Ton	Konsentrat
20	Monasit	<10000 ≥10000	Ton	60.00/Ton 65.00/Ton	Konsentrat
21	Xenotim	<100000 ≥100000	Ton	80.00/Ton 85.00/Ton	Konsentrat
22	Ilmenit	<12.5 ≥12.5	Ton	0.60/Ton 0.90/Ton	Konsentrat
23	Zircon	<12.5 ≥12.5	Ton	17.50/Ton 18.50/Ton	Konsentrat
24	Rutile	<12.5 ≥12.5	Ton	4.75/Ton 5.50/Ton	Konsentrat
25	Pasir Besi	<100000 ≥100000	Ton	0.60/Ton 0.70/Ton	Konsentrat
26	Belerang	<5000 ≥5000	Ton	2.10/Ton 2.20/Ton	Konsentrat
27	Bauksit	<200000 ≥200000	Ton	0.40/Ton 0.50/Ton	Bijih
28	Mangan	<10000 ≥10000	Ton	0.25/Ton 0.35/Ton	Bijih
29	Aspal	<200000 ≥200000	Ton	0.17/Ton 0.20/Ton	
30	Barit	<10000 ≥10000	Ton	0.15/Ton 0.25/Ton	
31	Yodium	<500 ≥500	Ton	83.00/Ton 88.00/Ton	
32	Pasir Urug (lepas pantai)	<100000 ≥100000	Ton	0.29/Ton 0.30/Ton	
33	Kristal Kuasa	<10000 ≥10000	Ton	0.70/Ton 0.75/Ton	
34	Pirit	<10000 ≥10000	Ton	0.15/Ton 0.20/Ton	
35	Intan *)	———	-- --	-- --	-----
36	Nitrat	<500000 ≥500000	Ton	0.88/Ton 0.90/Ton	
37	Phosfat	<500000 ≥500000	Ton	1.05/Ton 1.08/Ton	
38	Garam Batu	<500000 ≥500000	Ton	0.88/Ton 0.90/Ton	
39	Asbes	<500000 ≥500000	Ton	1.05/Ton 1.08/Ton	

1	2	3	4	5	6
18	Titanium	<20000 ≥20000	Tonne	41.00/Tonne 42.00/Tonne	Metal
19	Chromite	<15000 ≥15000	Tonne	0.35/Tonne 0.45/Tonne	Concentrate
20	Monazite	<10000 ≥10000	Tonne	60.00/Tonne 65.00/Tonne	Concentrate
21	Xenotim	<100000 ≥100000	Tonne	80.00/Tonne 85.00/Tonne	Concentrate
22	Ilmenite	<12.5 ≥12.5	Tonne	0.60/Tonne 0.90/Tonne	Concentrate
23	Zircon	<12.5 ≥12.5	Tonne	17.50/Tonne 18.50/Tonne	Concentrate
24	Rutile	<12.5 ≥12.5	Tonne	4.75/Tonne 5.50/Tonne	Concentrate
25	Iron Sand	<100000 ≥100000	Tonne	0.60/Tonne 0.70/Tonne	Concentrate
26	Sulfur	<5000 ≥5000	Tonne	2.10/Tonne 2.20/Tonne	Concentrate
27	Bauxite	<200000 ≥200000	Tonne	0.40/Tonne 0.50/Tonne	Ore
28	Manganese	<10000 ≥10000	Tonne	0.25/Tonne 0.35/Tonne	Ore
29	Natural/Rock Asphalt	<200000 ≥200000	Tonne	0.17/Tonne 0.20/Tonne	
30	Barite	<10000 ≥10000	Tonne	0.15/Tonne 0.25/Tonne	
31	Iodine	<500 ≥500	Tonne	83.00/Tonne 88.00/Tonne	
32	Beach Sand	<100000 ≥100000	Tonne	0.29/Tonne 0.30/Tonne	
33	Crystal Quartz	<10000 ≥10000	Tonne	0.70/Tonne 0.75/Tonne	
34	Pyrite	<10000 ≥10000	Tonne	0.15/Tonne 0.20/Tonne	
35	Diamond*)			-- --	
36	Nitrate	<500000 ≥500000	Tonne	0.88/Tonne 0.90/Tonne	
37	Phosphates	<500000 ≥500000	Tonne	1.05/Tonne 1.08/Tonne	
38	Salite	<500000 ≥500000	Tonne	0.88/Tonne 0.90/Tonne	
39	Asbestos	<500000 ≥500000	Tonne	1.05/Tonne 1.08/Tonne	

1	2	3	4	5	6
40	Talk	<500000 ≥500000	Ton	1.05/Ton 1.08/Ton	
41	Mika	<500000 ≥500000	Ton	1.05/Ton 1.08/Ton	
42	Magnesit	<500000 ≥500000	Ton	1.05/Ton 1.08/Ton	
43	Grafit	<500000 ≥500000	Ton	1.05/Ton 1.08/Ton	
44	Yarosit	<500000 ≥500000	Ton	1.05/Ton 1.08/Ton	
45	Tawas (Alum)	<500000 ≥500000	Ton	0.88/Ton 0.90/Ton	
46	Leusit	<500000 ≥500000	Ton	1.05/Ton 1.08/Ton	
47	Oker	<500000 ≥500000	Ton	0.70/Ton 0.72/Ton	
48	Pasir Kuarsa	<500000 ≥500000	Ton	0.70/Ton 0.72/Ton	
49	Kaolin	<500000 ≥500000	Ton	0.70/Ton 0.72/Ton	
50	Feldspar	<500000 ≥500000	Ton	0.70/Ton 0.72/Ton	
51	Gips	<500000 ≥500000	Ton	0.70/Ton 0.72/Ton	
52	Bentonit	<500000 ≥500000	Ton	0.70/Ton 0.72/Ton	
53	Batu apung	<500000 ≥500000	Ton	0.70/Ton 0.72/Ton	
54	Tras	<500000 ≥500000	Ton	0.14/Ton 0.16/Ton	
55	Obsidian	<500000 ≥500000	Ton	0.41/Ton 0.42/Ton	
56	Perlit	<500000 ≥500000	Ton	0.41/Ton 0.42/Ton	
57	Tanah Diatoma	<500000 ≥500000	Ton	0.70/Ton 0.72/Ton	
58	Tanah Serap	<500000 ≥500000	Ton	0.70/Ton 0.72/Ton	
59	Marmer	<500000 ≥500000	Ton	0.70/Ton 0.72/Ton	
60	Batu tulis	<500000 ≥500000	Ton	0.14/Ton 0.16/Ton	

1	2	3	4	5	6
40	Talc	<500000 ≥500000	Tonne	1.05/Tonne 1.08/Tonne	
41	Mica	<500000 ≥500000	Tonne	1.05/Tonne 1.08/Tonne	
42	Magnesite	<500000 ≥500000	Tonne	1.05/Tonne 1.08/Tonne	
43	Graphite	<500000 ≥500000	Tonne	1.05/Tonne 1.08/Tonne	
44	Yaro site	<500000 ≥500000	Tonne	1.05/Tonne 1.08/Tonne	
45	Alum	<500000 ≥500000	Tonne	0.88/Tonne 0.90/Tonne	
46	Lensite	<500000 ≥500000	Tonne	1.05/Tonne 1.08/Tonne	
47	Ocher	<500000 ≥500000	Tonne	0.70/Tonne 0.72/Tonne	
48	Quartz Sand	<500000 ≥500000	Tonne	0.70/Tonne 0.72/Tonne	
49	Kaolin	<500000 ≥500000	Tonne	0.70/Tonne 0.72/Tonne	
50	Feldspar	<500000 ≥500000	Tonne	0.70/Tonne 0.72/Tonne	
51	Gips	<500000 ≥500000	Tonne	0.70/Tonne 0.72/Tonne	
52	Bentonite	<500000 ≥500000	Tonne	0.70/Tonne 0.72/Tonne	
53	Pumice	<500000 ≥500000	Tonne	0.70/Tonne 0.72/Tonne	
54	Trass	<500000 ≥500000	Tonne	0.14/Tonne 0.16/Tonne	
55	Obsidian	<500000 ≥500000	Tonne	0.41/Tonne 0.42/Tonne	
56	Perlite	<500000 ≥500000	Tonne	0.41/Tonne 0.42/Tonne	
57	Diatomite Earth	<500000 ≥500000	Tonne	0.70/Tonne 0.72/Tonne	
58	Fuller's Earth	<500000 ≥500000	Tonne	0.70/Tonne 0.72/Tonne	
59	Marbles	<500000 ≥500000	Tonne	0.70/Tonne 0.72/Tonne	
60	Flint	<500000 ≥500000	Tonne	0.14/Tonne 0.16/Tonne	

1	2	3	4	5	6
61	Batu kapur	<500000 ≥500000	Ton	0.14/Ton 0.16/Ton	
62	Dolomit	<500000 ≥500000	Ton	0.26/Ton 0.28/Ton	
63	Kalsit	<500000 ≥500000	Ton	0.26/Ton 0.28/Ton	
64	Granit :				
	a. Bubuk Pecah	<500000 ≥500000	Ton Ton	0.24/Ton 0.26/Ton	
	b. Blok	<500000 ≥500000	Ton Ton	1.03/Ton 1.05/Ton	
65	Granite, Andesite, Basalt, Trachite (Bahan Bangunan)	<500000 ≥500000	Ton Ton	0.26/Ton 0.28/Ton	
66	Tanah Liat :				
	a. Tanah Liat Tahan Api/ Bali clay	<500000 ≥500000	Ton Ton	0.47/Ton 0.48/Ton	
	b. Tanah Liat Bahan Bangunan	<500000 ≥500000	Ton Ton	0.235/Ton 0.240/Ton	
67	Tanah Uruk	<500000 ≥500000	Ton Ton	0.14/Ton 0.16/Ton	
68	Pasir, Kerikil	<500000 ≥500000	Ton Ton	0.25/Ton 0.30/Ton	
69	Zeolit	<500000 ≥500000	Ton Ton	0.70/Ton 0.72/Ton	
70	Batu permata	-	-	10 %	
71	Batu setengah permata	-	-	10 %	

*) Berdasarkan Keputusan Menteri Pertambangan dan Energi Nomor 2338.K/844/M.PE/1994 tanggal 12 Desember 1994

1	2	3	4	5	6
61	Limestonne	<500000 ≥500000	Tonne	0.14/Tonne 0.16/Tonne	
62	Dolomite	<500000 ≥500000	Tonne	0.26/Tonne 0.28/Tonne	
63	Calcite	<500000 ≥500000	Tonne	0.26/Tonne 0.28/Tonne	
64	Granite :				
	a. Break/ Crush	<500000 ≥500000	Tonne Tonne	0.24/Tonne 0.26/Tonne	
	b. Block	<500000 ≥500000	Tonne Tonne	1.03/Tonne 1.05/Tonne	
65	Granite, Andesite, Basalt, Trachite (Building Material)	<500000 ≥500000	Tonne Tonne	0.26/Tonne 0.28/Tonne	
66	Clay :				
	a. Fire Clay/Ball clay	<500000 ≥500000	Tonne Tonne	0.47/Tonne 0.48/Tonne	
	b. Building Material	<500000 ≥500000	Tonne Tonne	0.235/Tonne 0.240/Tonne	
67	Sand	<500000 ≥500000	Tonne Tonne	0.14/Tonne 0.16/Tonne	
68	Quartz,Gravel	<500000 ≥500000	Tonne Tonne	0.25/Tonne 0.30/Tonne	
69	Zeolite	<500000 ≥500000	Tonne Tonne	0.70/Tonne 0.72/Tonne	
70	Gemstonne	-	-	10 %	
71	Semi Precious Stonne	-	-	10 %	

*) pursuant to Mine and Energy Ministerial Decree No. 2338.K/844/M.PE/1994 date Desember 12,1994

Lampiran "G"

PELAKSANAAN LAMPIRAN "F"

Metoda perhitungan tarif iuran eksploitasi/produksi didasarkan pada Keputusan Direktur Jenderal Pertambangan Umum No. 514.K/844/DDJP/1992 tanggal 28 Desember 1992

Untuk menginterpretasikan dan melaksanakan Tarif iuran eksploitasi/produksi untuk produksi bahan galian (S.K. Menteri Pertambangan dan Energi No. 1166.K/844/M.PE/1992 tertanggal 12 September 1992), maka judul setiap jalur pada Lampiran "F" mempunyai arti sebagai berikut :

Kolom 1. No.

memuat nomor acuan untuk setiap jenis hasil tambang yang dapat dikenakan iuran eksploitasi dan produksi bahan galian.

Kolom 2. Produk

menyatakan mineral utama yang terdapat di dalam hasil tambang dan atau produk pengolahan yang untuk dijual oleh perusahaan dalam bentuk bijih, konsentrat penggilingan, matte peleburan atau logam yang telah dimurnikan.

Kolom 3. Tingkat Produksi

menunjukkan jumlah produksi terukur dari setiap produk yang akan dijual oleh perusahaan. Jumlah produksi yang dihasilkan dalam jangka waktu 1 (satu) tahun takwim.

Kolom 4. Satuan

menunjukkan satuan produksi setiap produk untuk perhitungan iuran produksi. Semua dalam ukuran berat metrik (metrik ton, kilogram), kecuali karat untuk mengukur intan.

Kolom 5. Tarif iuran

yang dinyatakan dalam dolar Amerika Serikat per satuan produksi, berlaku untuk logam terkandung, konsentrat atau bijihnya (seperti yang dinyatakan pada kolom 6) yang penjualannya dibayar sesuai dengan ketentuan umum dengan harga yang pantas atau dapat dibayar kepada perusahaan oleh pembeli, tetapi dengan mengecualikan produk ikutan yang merusak atau sulit dimanfaatkan dan harganya sangat rendah, sesuai data perusahaan mengenai produksi, pengapalan dan penjualan.

Kolom 6. Dasar Perhitungan Iuran

menunjukkan apakah iuran seperti yang disebutkan pada kolom 5 dapat dikenakan terhadap kandungan logam atau jumlah konsentrat atau berat bijih yang dihasilkan.

Petunjuk selanjutnya mengenai pelaksanaan dan kontrol Tarif iuran untuk produksi mineral diuraikan pada Pasal 13 ayat (2) Kontrak Karya.

Contoh perhitungan iuran produksi :

Annex "G"

THE IMPLEMENTING OF ANNEX F

(Based on Directorate General of Mines Decree
No. 514.K/844/DDJP/1992 Dated December 28, 1992)

In interpreting and implementing the Royalty on Mineral Production (Mines and Energy Ministerial Decree No. 1166.K/844/M.PE/1992 dated Septembe 12 1992), the column headings in ANNEX "F" are defined as follows:

Column 1. No.

provides a reference number for each of the various products that may be subject to the Royalty on Mineral Production.

Column 2. Product.

identifies the elemental mineral constituent in the final mined and/or processed product that is destined for sale by the Company, be it ore, mill concentrates, smelter matte or refined metal.

Column 3. Production

refers to the measured yield of final production of each product for sale by the Company. Total production is for the period of one calendar year.

Column 4. Unit

refers to the unit of production for each product for royalty computation. All are in metric weight measures (i.e. metric tons, kilograms), except carat for diamond.

Column 5. Royalty Tariff

is the rate, in $US per unit of production, applicable to those contained metals, concentrates or ores (as specified in column 6) for which value according to general practice is paid or payable to the Company by a buyer, but excluding deleterious or poorly recoverable by-products of relatively low value, as determined from the Company's production, shipping and sales records.

Column 6. Explanation

indicates whether the Royalty Tariff specified in Column 5 is applied to the metal content of the product or to the total concentrate or ore weight of the product Further directions regarding the implementing and control of the Royalty of Mineral Production are set forth in Article 13.2 of the Contract of Work.
Example of royalty calculations :

Untuk produksi tahunan 300.000 metrik ton (t) konsentrat yang mengandung 35% tembaga (Cu), 15,55 gram per metrik ton (g/t) emas (Au) dan 108,86 g/t perak (Ag), Tarif iuran produksi mineralnya adalah :

Kandungan Cu : 0,35 x 300.000 = 105.000 t Cu.
Jumlah iuran : (80.000 x US$ 45) + [(105,000 - 80.000) x US$ 55]
= US$ 3.600.000 + US$ 1.375.000
= US$ 4.975.000

Kandungan Au : 15,55 x 300.000/1000 = 4.665 kilogram Au.
Jumlah iuran : (2.000 x US$ 225) + [(4665 - 2000) x US$ 235]
=US$ 450.000 + US$ 626.275 = US$ 1.076.275

Kandungan Ag : 108,86 x 300.000/1000 = 32.658 kg Ag
Jumlah iuran : (25.000 x US$ 1,90) + [(32.658 - 25.000) x
= US$ 2,001]
= US$ 47,500 + US$ 15,316 = US $ 62,816

Jumlah total iuran untuk produksi konsentrat yang mengandung (Cu + Au + Ag) di atas = US$ 6.114.091

For annual production of 300,000 metric tons (t) of concentrate containing 35% copper (Cu), 15.55 grams per metric ton (g/t) of gold (Au) and 108.86 g/t silver (Ag), the Royalty on Mineral Production would be :

Cu metal content : 0.35 x 300,000 = 105,000 t Cu.
Royalty : (80,000 x US$ 45) + [(105,000 - 80,000) x US$ 55]
= US$ 3,600,000 + US$ 1,375,000
= US$ 4,975,000

Au metal content : 15.55 x 300,000/1000 = 4,665 kilograms Au
Royalty :(2,000 x US$ 225) + [(4665 - 2000) x US$ 235]
=US$ 450,000 + US$ 626,275 = US$ 1,076,275

Ag metal content : 108.86 x 300,000/1000 = 32,658 kg Ag
Royalty : (25,000 x US$ 1.90) + [(32,658 - 25,000) x US$ 2.001]
= US$ 47,500 + US$ 15,316 = US $ 62,816

Total Royalty on such concentrate (containing Cu + Au + Ag) above = US$ 6,114,091

Lampiran "H"

ATURAN MENGHITUNG PAJAK PENGHASILAN

1. "Tahun", kecuali disepakati lain oleh Para Pihak, berarti:

   (A) tahun takwim atau bagian daripadanya mulai tanggal penandatanganan Persetujuan ini sampai dengan 31 Desember yang pertama;

   (B) setiap tahun takwim penuh berikutnya, mulai 1 Januari sampai 31 Desember, termasuk selama jangka waktu Persetujuan ini; dan

   (C) jangka waktu mulai 1 Januari sampai tanggal pengakhiran Persetujuan ini untuk tahun takwim atau bagian daripadanya dimana Persetujuan ini harus berakhir.

2. "Produk" mempunyai arti sebagaimana tercantum pada Pasal 1 Persetujuan ini.

3. Dengan memperhatikan ketentuan-ketentuan yang dimaksud dalam Undang-undang Pajak Penghasilan 1994 serta segala peraturan pelaksanaannya, "biaya operasi" dalam suatu tahun berarti jumlah yang terutang atau dibayarkan untuk semua pengeluaran yang diakibatkan oleh Pengusahaan dalam tahun tersebut sepanjang masa manfaatnya tidak lebih dari 1 (satu) tahun. Biaya operasi mencakup, antara lain, biaya-biaya sebagai berikut:

   a) Biaya sehubungan dengan pengadaan barang-barang, bahan-bahan, peralatan dan perlengkapan lainnya.

   b) Biaya untuk jasa-jasa yang diborongkan atas nama Perusahaan;

   c) Biaya untuk premi Asuransi (luar dan dalam negri) atas aktiva berwujud, inventaris dan premi-premi terhadap gangguan-gangguan usaha dan operasi, dan untuk premi terhadap tuntutan kerugian dari pihak lain dengan ketentuan bahwa apabila premi dibayarkan kepada Afiliasi, premi itu tidak boleh melebihi jumlah yang harus dibayarkan dalam transaksi dengan pihak lain yang tidak ada kaitannya dengan Perusahaan;

   d) Biaya yang berhubungan dengan kerusakan atau kerugian-kerugian yang tidak diganti sepenuhnya oleh asuransi atau dengan cara lain;

   e) Biaya untuk iuran ekploitasi/produksi, bunga dan pembayaran-pembayaran lain termasuk yang dibayarkan kepada Afiliasi untuk paten-paten, rancangan, informasi teknis dan jasa-jasa dengan ketentuan bahwa biaya dan pembayaran-pembayaran tersebut tidak melebihi jumlah yang harus dibayarkan dalam transaksi yang sama atau serupa dengan pihak yang independen;

   f) Jumlah yang berhubungan dengan kerugian-kerugian akibat keusangan, pencurian, atau kerusakan inventaris, sehingga tidak dipergunakan lagi dalam pengusahaan

Annex "H"

RULES FOR COMPUTATION OF INCOME TAX

1. "Year", unless otherwise agreed by the Parties, means

   A) Calendar year or part thereof as from the date of the signing of this Agreement up to the first December 31st;

   B) Each subsequent full calendar year from January 1st up to December 31st, inclusive during the term of this Agreement; and

   C) The period from January 1 up to the date of termination of this Agreement for the calendar year or part thereof where this Agreement shall be terminated.

2. "Products" has the same meaning as set out in Article 1 of this Agreement.

3. Subject to the provisions of the Income Tax Law 1994 and its implementing regulations, "Operating Expenses" in any year means the amount paid or accrued for all expenditures attributable to the Enterprise in such year, to the extent that the useful life is less than one (1) year. Operating expenses include, among others, the following expenses :

   a) expenses in respect of material, supplies, equipment and utilities;

   b) expenses for contracted services on behalf of the Enterprise ;

   c) expenses for premiums of insurance (foreign and domestic) on tangible assets, inventories and for premiums against business and operational interruptions and for premiums against other parties indemnities claims, provided that where such premiums are paid to an Affiliate, the premiums shall not exceed the amount payable in arm's length transaction to other independent parties.

   d) expenses in respect of damage or losses to the extent that they are not fully compensated for by insurance or otherwise;

   e) expenses for royalties, interest and other payments including those to Affiliates for patents, designs, technical information and services provided that such amounts and payments shall not exceed the amount paid for similar transactions with the independent parties.

   f) amounts in respect to losses resulting from obsolescence, theft, or inventory damage that make them no longer useable in operations, supported by

yang didukung dengan bukti-bukti yang cukup dengan berita acara yang disaksikan oleh Departemen. Jumlah yang dapat dikurangkan adalah harga sisa buku dari inventaris yang bersangkutan;

g) Biaya untuk pembayaran sewa barang berwujud;

h) Biaya untuk iuran tetap, Pajak Bumi dan Bangunan, Iuran Eksploitasi/produksi, Pajak Pertambahan Nilai yang tidak dapat dikreditkan, Pajak Penjualan atas Barang Mewah, Bea Meterai, Bea Balik Nama, Bea Masuk dan pungutan-pungutan yang dibayarkan berdasarkan Persetujuan ini kecuali PPh badan;

i) Biaya untuk pengolahan (treatment), pencucian dan biaya pengolahan lainnya;

j) Biaya untuk pekerjaan-pekerjaan bongkar muat, penyimpanan, pengangkutan dan pengapalan;

k) Biaya untuk perbaikan dan pemeliharaan;

l) Biaya untuk komisi dan potongan-potongan, termasuk yang dibayarkan kepada Afiliasi dengan ketentuan bahwa biaya dan pembayaran-pembayaran tersebut tidak melebihi jumlah yang harus dibayarkan dalam transaksi yang sama atau serupa dengan pihak independen;

m) Biaya pengelolaan lingkungan, demikian pula biaya reklamasi yang pembebanannya dilakukan melalui perkiraan cadangan biaya reklamasi;

n) Biaya untuk pengurangan yang di perkenankan sesuai Paragraf 5 sampai dengan 13 dibawah ini.

4. Kelompok aset dan tarif penyusutan untuk aktiva yang dimiliki dan dipergunakan di Wilayah Kontrak Karya dan Wilayah Proyek mengacu sepenuhnya pada Peraturan Pemerintah Nomor 34 Tahun 1994. Apabila kemudian ternyata umur tambang lebih pendek maka harga sisa buku disusutkan sekaligus.

appropriate evidence with an official report witnessed by the Department. The amount to be deducted is the book value of such inventory.

g) expenses for rental payment of tangible goods.

h) expenses for Deadrent, Land and Building Tax, Royalties, uncredited Value Added Tax, Sales Tax on Luxury Goods, *Stamp* Duty, transfer of ownership tax, import duty and levies paid based on this Agreement, except the Company's Income Tax;

i) expenses for treatment, washing, and other processing expenses;

j) expenses for handling, loading, storing, transporting and shipping;

k) expenses for repairs and maintenance;

l) expenses for commissions and discounts, including expenses paid to the Affiliates, provided that such cost and payments shall not exceed the amount should have been paid for similar transaction with independent parties;

m) Environment Management and Reclamation Costs, which is deducted from reserve for reclamation cost account;

n) allowable for deductions governed by paragraph 4 through 12 below.

4. Group of Assets and rate of depreciation for tangible assets owned and used in the Contract Area and Project Area are based on Government Regulation Number 34 of 1994. If the lifetime of mine is shorter, then the remaining book value may be fully depreciated at once.

TABEL PENYUSUTAN DAN AMORTISASI
MENURUT PERATURAN PEMERINTAH NOMOR 34 TAHUN 1994

Kelompok Harta	Masa Manfaat menjadi	Tarif penyusutan dan Amortisasi berdasarkan metode	
		Garis lurus	Saldo menurun
I. Bukan bangunan atau harta tak berwujud			
Kelompok 1	2 tahun	50%	100%
Kelompok 2	4 tahun	25%	50%
Kelompok 3	8 tahun	12.5%	25%
Kelompok 4	10 tahun	10%	20%
II. Bangunan			
Permanen	20 tahun	10%	
Tidak permanen	10 tahun	20%	

Aktiva yang dapat disusutkan terdiri dari aktiva berwujud yang dimiliki dan dipergunakan dalam perusahaan atau yang dimiliki untuk mendapatkan, menagih, dan memelihara penghasi- lan dengan masa manfaat lebih dari satu tahun termasuk gedung gedung, mesin-mesin, alat-alat, kapal-kapal lainnya, jalan-jalan kereta api, kendaraan-kendaraan, jembatan-jembatan, dermaga-dermaga (pier), jalan-jalan, galangan-galangan, dan aktiva berwujud lainnya yang dapat disusutkan menurut prinsip prinsip akuntansi yang berlaku umum, ditambah dengan segala sesuatu yang disediakan oleh Perusahaan untuk kepentingan umum seperti antara lain, jalan-jalan, sekolah-sekolah dan rumah sakit-rumah sakit berikut peralatannya yang berada di Wilayah Kontrak Karya atau Wialyah Proyek. Untuk aktiva berwujud yang dapat disusutkan lainnya yang dimiliki dan dipergunakan oleh Perusahaan yang berada di luar Wilayah Kontrak Karya atau Wilayah Proyek berlaku ketentuan sebagaimana dimaksud Pasal 11dan 11 A Undang-undang Pajak Penghasilan 1994.

5. Kelompok aset dan tarif amortisasi mengacu sepenuhnya pada Peraturan Pemerintah Nomor 34 tahun 1994. Apabila kemudian ternyata umur tambang lebih pendek maka nilai sisa buku aktiva diamortisasikan sekaligus.
   Pengeluaran untuk aktiva tidak berwujud yang dapat diamortisasikan adalah pengeluaran untuk aktiva tidak berwujud yang mempunyai masa manfaat lebih dari 1 (satu) tahun yang dimiliki dan dipergunakan oleh perusahaan untuk mendapat, menagih dan memelihara penghasilan, termasuk :

   A) Pengeluaran untuk paten-paten, hak-hak, konsesi-konsesi, lisensi-lisensi, kontrak-kontak sewa; dan aktiva tidak berwujud lainnya yang dapat diamortisasikan menurut prinsip akuntansi yang berlaku umum,

DEPRECIATION AND AMORTIZATION TABLE
ACCORDING TO GOVERNMENT REGULATION NUMBER 34 OF 1994

Group of Assets	Life time	Rates of Depreciation and Amortization based on the method of	
		Straight line	Declining balance
I. Non Building or intangible asset			
Group 1	2 years	50%	100%
Group 2	4 years	25%	50%
Group 3	8 years	12.5%	25%
Group 4	10 years	10%	20%
II. Building			
Permanent	20 years	10%	
Non permanent	10 years	20%	

Depreciable assets comprise tangible assets owned and used in the enterprise or owned to obtain, to claim and to maintain income with a useful life of more than one year including buildings, machinery, equipment, vessels, railways, vehicles, bridges, piers, roads, shipyards, and other depreciable tangibles assets in accordance with generally accepted accounting principles, including facilities provided by the Company for public purposes, such as roads, schools, and hospitals together with their equipment in the Contract Area or Project Area.
For other depreciable tangible assets owned and used by the Company located outside the Contract Area or Project Area, provision as provided in Article 11 and 11 A of Income Tax Law 1994 will apply.

5. Group of assets and rate of amortization for intangible assets are based on the Government Regulation Number 34 of 1994. If the lifetime of mine is shorter then the remaining book value may all be amortized at once at the end of the lifetime in the last year of the lifetime.
Expenses on amortizable intangible assets is an expense on intangible assets with a useful life more than one (1) year, owned and used by the Company to obtain, collect or preserve income, including :

A) expenses on patents, rights, concessions, licenses, rental contracts and other intangible assets which can be amortized in accordance with generally accepted accounting principles;

B) Pengeluaran sebelum dimulainya Periode Operasi, termasuk biaya untuk memperoleh hak-hak menambang atau penyelidikan, atau informasi penambangan atau penyelidikan, Penyelidikan Umum, Eksplorasi, kelayakan dan pengembangan, latihan pegawai, bantuan untuk pendidikan dan pengurangan lain yang diizinkan berdasarkan Persetujuan ini dan diperbolehkan menurut Undang-undang Pajak Penghasilan 1994.

6. "Pengeluaran-pengeluaran sebelum Perusahaan didirikan" yang telah dikeluarkan oleh para pemegang saham dan langsung berhubungan dengan proyek KontrakKarya ini, dapat dikonsolidasikan ke dalam rekening Perusahaan sebagai unsur-unsur biaya. Pengeluaran-pengeluaran tersebut harus diaudit oleh akuntan publik dan disetujui oleh Direktorat Pajak.

7. Dengan memperhatikan ketentuan-ketentuan dalam Undang-undang Pajak Penghasilan 1994 dan segenap peraturan pelaksanaannya "biaya-biaya Penjualan, Biaya-biaya Umum dan Biaya-biaya Administrasi" dalam setiap tahun dapat dikurangkan dari penghasilan bruto dan meliputi tetapi tidak terbatas pada biaya-biaya manajemen, uang kompensasi untuk jasa-jasa yang diberikan diluar negeri, gaji pegawai pimpinan, biaya-biaya komunikasi, kontribusi dan biaya biaya langganan-langganan, biaya iklan dan lain-lain biaya penjualan, biaya hubungan masyarakat, biaya kantor, biaya-biaya pemasaran (tetapi hanya terbatas kepada biaya-biaya yang secara wajar berkenaan dengan pengusahaan penambangan dan tidak termasuk biaya riset produksi yang tidak ada hubungannya), biaya hukum dan pemeriksaan pembukuan, biaya administrasi umum, termasuk tagihan yang wajar dari Afiliasi yang dialokasikan kepada operasi di Indonesia sepanjang biaya-biaya ini mewakili biaya jasa sebenarnya yang diberikan dalam tahun itu.
Hal-hal berikut juga akan dimasukkan dalam biaya-biaya penjualan, Biaya Umum dan Biaya Administrasi perusahaan :

a). Upah-upah, gaji-gaji dan tunjangan lainnya termasuk tunjangan-tunjangan pegawai yang diangkat atau dipekerjakan oleh Perusahaan dan setiap Afiliasi dari Perusahaan, yang ditugaskan pada dan dibayarkan oleh Perusahaan atas dasar sementara, paruh waktu ("part-time") ataupun tetap.

b) Imbalan berupa kenikmatan yang diberikan kepada pegawai tersebut yang dipekerjakan di Wilayah Kontrak Karya atau wilayah proyek berupa:

- fasilitas pengangkutan karyawan dan keluarganya dari tempat tinggal semula di dalam negeri ke wilayah Kontrak Karya dengan sarana pengangkutan darat, air dan udara dengan fasilitas kelas ekonomi;

- fasilitas tempat tinggal termasuk perumahan, bagi karyawan dan keluarganya di wilayah Kontrak Karya atau wilayah Proyek;

- penggantian atau imbalan dalam bentuk natura berupa penyediaan makanan/minuman kepada Karyawan di lokasi pekerjaan dan penyediaan bahan makanan kepada keluarganya untuk memenuhi kebutuhan pokok sehari-hari;

B) all expenses incurred prior to commencement of the Operating Period including expenses to obtain mining or survey rights, or mining and survey information, general survey, exploration, feasibility and development, employee training, assistance for education and other deductions allowed under this Agreement and permitted under Income Tax Law 1994.

6. "Expenses incurred prior to the establishment of the Company" expended by shareholders, and directly related to this Contract of Work Agreement, can be consolidated into the Company's account as cost element. These expenses must be audited by public accountant and approved by the Director General of Taxes.

7. With due regard to the provisions of the Income Tax Law 1994 and all of its implementing regulations, "selling, general and administration expenses" in any year can be deducted from gross income and include but are not limited to management expenses, compensation fees for services rendered abroad, executive salaries, communication expenses, contributions and subscriptions, advertising and other selling expenses, public relations and office expenses, marketing expenses (but limited only to reasonable expenses relating to the mining enterprise and excluding expenses for unrelated production research), legal and auditing expenses, general administration expenses, including reasonable charges from Affiliates to be allocated to the operations in Indonesia to the extent that such charges represent actual cost of services provided in such year.

The following items shall also be included in selling, general and administration expenses of the Company :

a) Wages, salaries and other compensation including remunerations of personnel employed or engaged by the Company or any Affiliate of the Company, who are assigned to the Company on a temporary, part-time or permanent basis.

b) Remuneration in the form of benefit in kind given to the employee assigned in the Contract Area or Project Area in the form of :

- transportation facilities for employees and their families from the point of hire within Indonesia to the Contract Area by means of land, water, and air transport facilities on economy class fares;

- accommodation including housing for employees and their families in the Contract Area or Project Area;

- compensation or remuneration given in kind such as supply of food/drink for employees on the job location and supply of foodstuffs for their families to fulfill their daily basic necessities;

- pelayanan kesehatan di wilayah Kontrak Karya atau wilayah Proyek atau di daerah lain di Indonesia sepanjang tidak tersedia di wilayah Kontrak Karya atau Wilayah Proyek meliputi pemeriksaan kesehatan dan perawatan medis terbatas untuk memenuhi persyaratan kesehatan untuk melaksanakan tugas pekerjaan, penempatan termasuk pemberian pengobatan serta perawatan di rumah sakit baik di wilayah Kontrak Karya atau wilayah Proyek maupun di daerah lain di Indonesia sepanjang tidak tersedia di wilayah Kontrak Karya atau Wilayah Proyek.

- fasilitas pendidikan bagi keluarga karyawan terbatas pada pendidikan umum Sekolah Dasar (SD), Sekolah Lanjutan Tingkat Pertama (SLTP) dan Sekolah Lanjutan Tingkat Atas (SLTA) dan yang sederajat di wilayah Kontrak Karya;

- fasilitas olahraga bagi karyawan dan keluarganya di wilayah Kontrak Karya, tidak termasuk fasilitas olahraga golf, boating, squash, bowling, berburu, pacuan kuda dan terbang layang;

- fasilitas perjalanan cuti di dalam negeri bagi karyawan, termasuk tenaga kerja asing, satu kali dalam satu tahun maksimum dalam 14 (empat belas) hari terbatas pada penggantian biaya transport pulang pergi;

- fasilitas pengangkutan karyawan dan keluarganya dari wilayah Kontrak Karya atau wilayah Proyek ke daerah asalnya pada saat pemutusan hubungan kerja baik karena pensiun atau karena sebab lain, hanya terbatas pada fasilitas angkutan darat, air dan udara dengan kelas ekonomi;

- dengan ketentuan bahwa pembayaran tersebut bagi pegawai yang menerimanya tidak diperhitungkan sebagai penghasilan.

c) Semua fasilitas yang perlu disediakan di Wilayah Kontrak Karya atau Wilayah Proyek untuk pendidikan dan pelatihan karyawan, fasilitas untuk sarana ibadah, dan dapur umum.

d) Biaya administrasi untuk riset hasil produksi, pengembangan pemasaran, dan jasa-jasa teknis, hukum dan jasa akuntan dari pegawai yang diangkat atau dipekerjakan oleh salah satu Afiliasi Perusahaan, yang tidak ditugaskan di perusahaan, tetapi jasa-jasa itu diperlukan untuk keuntungan Perusahaan, tetapi tidak melebihi jumlah yang harus dibayarkan bagi transaksi yang sama dengan pihak yang bukan afiliasi dengan Perusahaan.

e) Semua pengeluaran untuk perjalanan yang perlu dilakukan di Indonesia dalam hubungan dengan Perusahaan, ke dan dari Indonesia dan negara-negara lain. Dalam hal pegawai tersebut ditugaskan untuk perusahaan, pengeluaran-pengeluaran perjalanan tersebut akan termasuk biaya-biaya akomodasi yang wajar bagi mereka ke dan dari Indonesia dan negara tempat kedudukan mereka.

f) Tagihan atas jasa laboratorium dan jasa teknik yang diberikan kepada Perusahaan oleh salah satu Afiliasinya dan/atau sub kontraktornya. Biaya-biaya itu akan terdiri

- medical services in the Contract Area or Project Area or in other areas within Indonesia to the extent that these are unavailable in the Contract Area or Project Area, including limited medical check ups and medical treatment to fulfill medical requirements of their job, assignment, including medicinal treatment as well as hospital treatment either in the Contract Area or Project Area or in other areas within Indonesia, to the extent that these are unavailable in the Contract Area or Project Area;

- education facilities for employees families limited to general education of Elementary School, Junior High School, Senior High School and other School at the same level in the Contract Area;

- sports facilities for employees and their families in the Contract Area, excluding golf, boating, squash, bowling, hunting, horse racing, and gliding facilities;

- domestic leave travel allowance for employees, including expatriates, once a year for maximum fourteen (14) days, these limited to the round trip transportation allowance reimbursement;

- transportation facilities for employees and their families from the Contract Area or Project Area to the point of hire at the time of termination either in the case of pension or other reasons, limited only to land, water, and air transport by economy class fare;

- provided that the payment received by the employees are not included as income.

c) all facilities necessary to be provided in the Contract Area or Project Area for employees' education and training, and the facility for religious activities, and employee canteen;

d) General administrative expenses for product research and development, market development and technical services, legal and accounting services of personnel employed or engaged by any of the Company's Affiliates, who are not assigned to the Company, but such services are required for the benefit of the Enterprise, but not exceeding the amount to be paid in similar transactions with other parties not affiliated to the Company;

e) All necessary travelling expenses for travelling within Indonesia, to and from Indonesia, and other countries in relation to Company business. In the case of an employee is assigned to the enterprise, such travel expenses shall include reasonable accommodation expenses to and from Indonesia and his country of residence;

f) Charges for laboratory and technical services rendered to the Company by any of its Affiliates and/or sub-contractors. These expenses shall consist of

dari biaya untuk jasa-jasa tersebut dan tidak akan melebihi ongkos yang harus dibayar kepada bukan Afiliasi untuk jasa-jasa tersebut.

8. "Biaya-biaya Bunga" yang dibayarkan atau yang timbul dalam suatu tahun terhadap modal yang dipinjam termasuk bunga atas pinjaman kepada pemegang saham sepanjang modal dasar perusahaan telah disetor penuh, dengan ketentuan bahwa perbandingan modal yang dipinjam Perusahaan dengan modal sendiri tidak akan melebihi suatu tingkat perbandingan 5:1 bagi yang jumlah investasinya tidak lebih dari U$ 200,000,000 (dua ratus juta dolar Amerika) dan 8 : 1 bagi yang jumlah investasinya lebih dari U$ 200,000,000 (dua ratus juta dolar Amerika) dan bunga atas pinjaman tidak lebih tinggi dari tingkat bunga yang berlaku umum di Pasar pada saat peminjaman.

9. Dalam hal penghasilan bruto dikurangi biaya-biaya seperti tersebut dalam pasal-pasal di atas didapat kerugian, maka kerugian tersebut dapat dikompensasikan dengan penghasilan dalam 8 (delapan) tahun berikut sesudah tahun, pada saat kerugian itu diderita. Kerugian-kerugian yang pertama kali timbul harus dikurangi lebih dahulu dari penghasilan bersih yang diperoleh dalam tahun-tahun berikutnya selama 8 (delapan) tahun.

10. "Biaya-biaya Eksplorasi" dalam suatu tahun adalah semua biaya yang berhubungan dengan eksplorasi atau evaluasi endapan-endapan mineral, termasuk tetapi tidak terbatas kepada biaya pembangunan kemah (camp), pembayaran kompensasi, iuran tetap, pemboran, pengembangan, pemompaan, buruh, penebangan, jalan-jalan penghubung, saluran-saluran untuk listrik dan air, biaya jasa untuk mendirikan saluran-saluran transmisi, pemasangan pipa-pipa, fasilitas-fasilitas komunikasi proyek dan biaya-biaya serupa lainnya yang timbul untuk mempersiapkan suatu Wilayah Kontrak Karya atau Wilayah Proyek atau Penambangan atau Pengolahan Mineral.

11. "Cadangan Biaya Reklamasi" adalah biaya yang disisihkan dengan jalan memperhitungkannya di dalam pembukuan Perusahaan untuk keperluan pengelolaan lingkungan dan reklamasi yang akan dilaksanakan selama masa persetujuan dan pada saat berakhirnya umur tambang dihitung mulai tahap operasi dan revisi setiap tahun (tunduk pada hasil audit oleh akuntan publik dan disetujui oleh Direktorat Jenderal Pajak). Bagian yang disisihkan tersebut dihitung sesuai dengan ketentuan yang berlaku dan disimpan di Bank Pemerintah. Realisasi biaya pengelolaan lingkungan dan pemeliharaan pasca tambang yang timbul selama jangka waktu Persetujuan diperhitungkan terlebih dahulu pada penyisihan yang telah dilakukan, apabila jumlahnya lebih besar dari jumlah penyisihan, maka sisanya merupakan biaya.

12. "Biaya Lain-lain" dalam suatu tahun ialah biaya yang berhubungan dengan pengeluaran-pengeluaran yang wajar yang terjadi dalam tahun itu untuk mendapatkan, menagih dan memelihara penghasilan atau untuk maksud Pengusahaan dalam tahun tersebut sebagaimana dimaksud dalam Pasal 6 Undang-Undang Pajak Penghasilan 1994.

13. "Penghasilan Bruto" berarti semua penghasilan, selain dari penghasilan yang dikecualikan yang ditetapkan menurut Undang-undang Pajak Penghasilan 1994 dan peraturan yang berlaku pada tanggal penandatanganan Persetujuan ini, yang dibayar kepada atau yang diperoleh Perusahaan terdiri dari dan tidak terbatas pada:

the charge for such services and shall not exceed the cost payable to a non Affiliated party for such services.

8. "Interest Expenses" paid or incurred in any year on loan capital including loan from shareholders in so far as the authorized capital of the Company has been fully paid, provided that the ratio between the loan capital over the equity capital does not exceed 5 : 1 for investment of an amount up to two hundred million United States Dollars (US$ 200,000,000) and 8 : 1 for investment of an amount more than two hundred million United States Dollars (US$ 200,000,000) and the interest on loan capital does not exceed the generally applicable market interest rate at the time of borrowing.

9. In the event of a loss incurred after gross income is deducted by the expenses mentioned in the above Articles, such loss can be compensated with income within the following eight (8) years after the year in which the loss occurred. The first losses occurring should be first deducted from net income in the following eight (8) succeeding years.

10. "Exploration Expenses" in any year means all amount of expenses related to exploration or evaluation of mineral deposits, including but not limited to camp construction cost, compensation payment, land rent, drilling, development, pumping, labor, clearing, access roads, electricity connection and waterworks, service charges for erecting transmission lines, piping, project communication facilities and other similar expenses incurred in preparing the Contract Area or Project Area or Mining Area or in the Processing of Minerals.

11. "Reserve for Reclamation Cost" is an amount retained by way of calculation in the financial records of the Company in respect of management of environment and reclamation work to be carried out during the contract period and at the end of the mine life calculated from the commencement of the Operating Period and revised annually (subject to audit by public accountant and approved by the Directorate General of Taxes). Such amount retained shall be calculated in accordance with the regulations in force, and deposited in the State owned Bank The actual cost of management of environment and reclamation incurred during the contract period shall firstly be drawn from such reserve, if the amount of actual cost exceeds such reserve then the excess is deductible as expenses.

12. "Other Expenses" in any year means expenses in respect of reasonable expenditure during such year to obtain, claim and maintain income, or for the purpose of the Enterprise in such year as stipulated in Article 6 of Income Tax Law 1994.

13. "Gross Income" means all income, other than exempt income defined under Income Tax Law 1994 and regulations which are in force at the date of signing of this Agreement, paid to or accrued by the Company, comprising of and not limited to :

a) Penghasilan bruto yang diterima atau diperoleh dari penjualan hasil produksi atas dasar F.O.B. tempat pengapalan di Indonesia berdasarkan ketentuan-ketentuan yang dirumuskan pada Pasal 11.

b) Penghasilan dari penjualan dan pengalihan kekayaan, akan diperlakukan sesuai dengan Pasal 4 dari Undang-undang Pajak Penghasilan 1994.

c) Penghasilan lain dari Perusahaan yang tidak disebut diatas yang nyata-nyata diterima atau diperoleh.

14. "Penghasilan Kena Pajak" dalam suatu tahun berarti Penghasilan Bruto dalam tahun itu sesudah dikurangi dengan pengeluaran-pengeluaran, biaya-biaya (termasuk jenis-jenis yang disebut pada Paragraf 4 sampai 13 di atas) yang diizinkan oleh Undang-undang Pajak Penghasilan 1994 dan peraturan-peraturan yang berlaku dan berdasarkan Persetujuan ini.

a) gross income received or accrued from sale of products on F.O.B. port of shipping in Indonesia based on the rule formulated in Article 11 of this Agreement..

b) income from sale or transfer of property shall be treated in accordance with Article 4 of Income Tax Law 1994.

c) other income of the Company other than mentioned above which is actually received or accrued.

14. "Taxable Income" in any year means Gross Income in such year after deducting expenditures, costs (including the items defined in paragraph 4 to 13 above) as permitted under Income Tax Law 1994 and prevailing regulations in force and under this Agreement.

Commercial terms for Agreement between Nickel Industries Ltd & PT Iriana Mutiara Mining

Under the terms of the MoA, the Company can acquire up to 100% of the Siduarsi CoW by meeting the following key conditions:

- payment of A$500,000 upon signing of the Definitive Agreement. **COMPLETED**

To acquire 51% ownership of PT IMM:

- expenditure of A$5 million in agreed exploration on the Siduarsi CoW over 24 months to earn a 51% interest **COMPLETED**; and
- milestone payment of 4 million Nickel Industries shares upon delineation of a JORC compliant resource of not less than 50 million dry metric tonnes at 1.1% nickel. **COMPLETED**

To increase to 82.5% ownership:

- completion of a feasibility study of a standard that will be accepted by the Indonesian mining department (Energy Sumber Daya Minerals), to allow the CoW to move into the next phase of its life cycle which is production/operation. **IN PROGRESS**

To increase to 100% ownership*:*

- to be determined by an agreed third-party valuation on the economic value of the Siduarsi resource to Valmin Code 2015 standard (the 'Valuation'); the vendors may elect to take this consideration as 50% cash and 50% shares based on the 30-day VWAP of Nickel Industries shares on the ASX; and
- existing aggregate shareholder loans of no more than US$9 million to be paid out as 50% cash and 50% Nickel Mines shares (calculated on the 30-day VWAP on the ASX prior to the announcement of the Valuation).

APPENDIX 3

IMM SOCIAL IMPACT ASSESSMENT

Final Report

A SOCIAL ENVIRONMENTAL STUDY OF THE NICKEL-COBALT MINING EXPLORATION PROJECT IN THE SIDUARSI REGION OF SARMI REGENCY, PAPUA PROVINCE, INDONESIA







FACULTY OF MATHEMATICS AND NATURAL SCIENCES
CENDERAWASIH UNIVERSITY
IN COLLABORATION WITH
PT. IRIANA MUTIARA MINING

JAYAPURA 2022

Preface

Praise and gratitude be unto the Almighty God, who has bestowed protection, facilitation, mercy, and His grace upon us, enabling the completion of the commissioned research project undertaken by the team from the Faculty of Mathematics and Natural Sciences at Cenderawasih University. This research endeavor focused on conducting a socioeconomic and cultural study near the Nickel-Cobalt Mining Exploration Project in the Sarmi Regency of Papua Province, Indonesia.

This report encompasses various aspects of the study, including mapping agricultural activities within and around the Siduarsi mining operation area and demographic conditions encompassing population figures by various criteria such as gender, education level, ethnic origin, religion, occupation, income, and more. Additionally, it includes delineating territorial and local boundaries, such as village and district boundaries, ownership rights or customary rights over natural resources among clans or tribes, and key stakeholders such as government, religious institutions, and traditional authorities. Furthermore, it examines regional minimum wage and its projection for the next five years, available public facilities in the region, existing community development programs, social risks, and potential conflicts within the area.

This report has been compiled with the hope that it will be helpful to PT. IMM, the commissioning entity, and relevant stakeholders. On this occasion, we extend our heartfelt gratitude to all those who have directly or indirectly contributed to the successful completion of this study, both in moral and material support.

Jayapura, November 25, 2022
Faculty of Mathematics and Natural Sciences
Cenderawasih University

Dr. Dirk. Y. Runtuboi, M.Kes
NIP.

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CHAPTER 1
INTRODUCTION

1.1. Background

Mining is an economic endeavor conducted with the primary aim of promoting the well-being of society, especially the communities residing in mining areas. The prosperity of communities is considered achievable through mining activities when such endeavors align with the regional government's policy choices aimed at economic development.

Social Impact Assessment (SIA) represents an approach or tool in social management. The utilization of this SIA approach or tool depends on the specific social management objectives in question. The ultimate goal (vision) of social management within the context of development activities (in fields such as forestry, agriculture, mining, industry, etc.) is to attain a state of sustainable social environment, commonly referred to as "Social Sustainability."

Social sustainability is not easily attainable, as failure by mining companies to address social aspects can have adverse repercussions on the environmental and economic dimensions prepared for post-mining activities. Anatan (2009) states that social sustainability extends economic and environmental sustainability concepts. The emergence of various issues resulting from business communities' negligence in upholding corporate responsibility towards the environment and surrounding communities has prompted companies to embrace the concept of Corporate Social Responsibility (CSR).

Article 74 of Law No. 40 of 2007 concerning Limited Liability Companies (UUPT) regulates Social and Environmental Responsibility, mandating that companies engaged in natural resource-related activities must implement such responsibilities. Therefore, as a mining company, we are committed to sustainably implementing our Corporate Social

Responsibility (CSR) programs. We recognize that our operational activities can have economic, social, and environmental impacts on the communities surrounding our projects.

The CSR programs implemented by the company are expected to serve as a means to engage with the community, garner support for our operational activities, and provide tangible benefits to the community from our initiatives. This commitment aligns with the provisions of Law No. 4 of 2009 concerning Mineral and Coal Mining, which stipulates that Business Entities or Permanent Business Entities engaged in mining activities share responsibility for developing the local environment and community.

The implementation of the Social Responsibility program adopts a "bottom-up" approach, where the company, in collaboration with the local government, openly facilitates community-driven program development tailored to their needs and executed responsibly. This approach aims to optimize the CSR program's effectiveness and directly benefit the community and regional development around the mining site. The current focus of program implementation primarily revolves around fulfilling educational programs, including scholarships, school facility improvements, infrastructure development such as village road construction, electrification, renovation of places of worship, and other village infrastructure. The CSR program encompasses social responsibility in environmental matters, labor practices, health and safety, social programs, and responsibility regarding products and services.

The company is committed to improving the quality of life for the local community and fostering harmonious relationships with the community and government agencies near our operations. This commitment is realized through our CSR programs.

1.2. Objectives

The objective of the Social Impact Assessment for the Nickel-Cobalt Siduarsi Project in Sarmi Regency is to compile initial data that will be utilized for project scoping and pre-feasibility studies aimed at the development of Corporate Social Responsibility (CSR) initiatives for the local community residing in the vicinity of the Siduarsi nickel mining operation area.

1.3. Scope

The Scope of Work for the Consultant's Activities must encompass all villages in the vicinity of the Siduarsi Project and provide information on several topics as follows:

1. Mapping of agricultural activities within the location and surrounding areas of the Siduarsi mining operation.
2. Population Census/Demographics: (population figures based on total population, gender, education level, ethnic origin, religion, occupation, income, etc.).
3. Mapping of territorial and local boundaries (inter-village boundaries, inter-district boundaries, boundaries of ownership rights or customary rights over natural resources among clans/tribes, boundaries of community activities such as hunting areas, sago forests, sacred areas, cultural sites, etc.).
4. Key stakeholders (government, religious institutions, and customary authorities).
5. Regional minimum wage and its projection for the next five years.
6. Available public facilities in the area.
7. Existing community development programs.
8. Social risks and potential conflicts in the region.
9. Other community statistics that may be relevant to the Siduarsi Project.

1.4. Implementation Method

Data collection in the field is carried out using the following methods:

1. Observation: This method is employed to comprehend on-the-ground facts that indicate social issues and impacts directly. Observations are conducted concurrently with the collection of other data.

2. Interviews: Interviews are conducted with key informants, including village heads, tribal chiefs, traditional leaders, religious figures, representatives from relevant government agencies, and residents residing near the Nickel-Cobalt Siduarsi Mining Project in Mamberamo Regency. The aim is to delve deeper into emerging issues. Respondent selection is based on their knowledge or direct involvement in or experience of the impacts of the Nickel-Cobalt Siduarsi mining operation.

3. Discussions: This method is used to identify stakeholders, explore impact-related issues, unearth expectations, ideas, and aspirations, and seek solutions to the issues at hand. Discussions occur through formal and informal meetings, including specific-topic Focus Group Discussions (FGDs). These discussions involve residents from villages adjacent to the Nickel-Cobalt Siduarsi Project area in Mamberamo Regency.

4. Documentation Study: This method is employed to gain an understanding of the social and environmental context of the identified area, serving as supporting information related to the Scope of Work for the Social Impact Assessment of the Nickel-Cobalt Siduarsi Project in Mamberamo Regency, Papua Province, Indonesia.

1.5. Time and Location

The implementation of the survey for the Scope of Work of the Social Impact Assessment of the Nickel-Cobalt Siduarsi Project in Mamberamo Regency, Papua Province, is scheduled to take place over 14 working days in the field within the villages situated around the Nickel-Cobalt Siduarsi mining project site.

1.6. Implementation Budget

The implementation budget is funded by Nikel Industries Limited, with a total amount of **IDR 212,870,000**,- (Two hundred twelve million eight hundred seventy thousand Indonesian Rupiah)

➔ ***The budget is adjusted for fluctuations in fuel prices and reorganization.***

1.7. Organizational Team for Implementation

a. Penaggung Jawab: Dr. Dirk. Y. Runtuboi, M.Kes (Dean of the Faculty of Mathematics and Natural Sciences, UNCEN)
b. Chairperson : Dr. Basa T. Rumahorbo, M.Si.
c. Secretary : Bonang Pamungkas, SE, M.Ak.
d. Field Team Coordinator : Dr. Maklon Warpur, M.Si.

Field Team Members

1. Dr. Basa T. Rumahorbo, M.Si (Chairperson)
2. Dr. Maklon Warpur, M.Si (Member)
3. Muhamad Hisyam, S.I.K., M.Si (Member)
4. Apner Krei, S.Sos, M.Si (Member)
5. Khristhoper Aris. A. Manalu, S. Kel, M.Si.
6. Vido Samalo, S.Kel.
7. Marco Rumbiak, ST
8. Alfrets Dimara, S.Kel.

CHAPTER II
LITERATURE REVIEW

2.1. Theoretical Framework

2.1.1. Human Social System and its Relationship with Ecosystem

The social system is akin to an ecological or ecosystem system, in which the social system is composed of various interacting components, such as population, technology, and social structure (Iskandar, 2009). Each constituent of the social components mutually influences one another. For example, religion or belief, as an aspect of ideology, is influenced by the community's social structure. Conversely, the existing societal structure is greatly affected by the beliefs of the society, especially traditional beliefs that continue to shape the community's identity.

In daily life, humans, with their social systems, continually interact with their ecosystems, forming complex, reciprocal relationships between the social system and its ecosystem. Individuals in their daily lives, influenced by their social system elements like ideology, population, technology, and others, impact their ecosystems. Likewise, ecosystem factors such as forests, soil, water, and others, affected by various human actions within their social systems, can, in turn, affect human life. Therefore, it can be said that a community's social system background significantly influences the existing ecosystem's conditions.

It can be observed in traditional communities, which generally maintain a close relationship with their environment due to their ideology. They consistently ensure that their actions toward the environment uphold harmony among them. Traditional communities tend to possess lower technology levels but maintain solid ideological ties with their environment through various robust customary rules. Generally, the environmental damage resulting from their actions is relatively minimal. In contrast, non-traditional communities, characterized by high population

numbers, modern technology for natural resource exploitation, and a weaker ideological connection to their environment, typically cause more significant ecological damage due to their actions (Iskandar, 2009). The relationship between a community's social system and its ecosystem is dynamic, influenced by changes in both social system factors and ecological systems.

It is well-known that development is seen as a deliberate effort to alter human culture to enhance the variety, quality, and quantity of basic needs to improve human well-being. In this context, human culture is crucial for human life, and elements of culture, including economic and technological aspects, must be changed and adapted to efforts to improve community well-being (Suparlan, 1996). Therefore, developmental activities can lead to changes in both the social system and the ecosystem. Development aimed at altering the social system can eventually result in changes in the ecosystem. Similarly, development intended to modify the ecosystem can impact changes in the social system. Subsequently, social changes can also lead to alterations in the ecosystem.

2.1.2. Human Perception of their Environment

According to Alfian (1985), perception is a process in which each individual interprets and organizes impressions from their senses to give meaning to their environment. Meanwhile, Mar'at (1981) defines perception as a cognitive process used by an individual to interpret and understand their surroundings. Therefore, based on the views of these two experts, it can be concluded that perception is the process of attributing meaning to the environment based on external stimuli. People receive information from their environment and transform it into psychological awareness. Thus, perception plays a crucial role in any activity because differences in perception can influence an individual's behavior and actions.

Perception is related to an individual's attitude toward a particular activity, whereas attitude is an individual's response to received stimuli (Azwar, 1988). A response will only occur when an individual is exposed to stimuli that require an individual response. An evaluative response occurs when an individual's response, expressed as an attitude, is based on an evaluation process within the individual. This evaluation results in a conclusion regarding the value of the stimulus, whether good or bad, positive or negative, pleasant or unpleasant, liked or disliked. This conclusion then crystallizes into an attitude towards the subject.

Human perception of their environment is constructed from various information gathered about the environment. In their interaction with the natural world, humans acquire various imaginings and stories about their environment, which form the basis of their perception. Knowledge and understanding aspects contribute to establishing social systems' relationships with their environment. Subsequently, human perception influences their decision-making processes regarding the management of the environment. Through interaction with their peers within their respective groups, individuals share their perceptions and stories about the environment, creating a collective understanding within society. People and communities use this understanding to interpret environmental information and formulate various activities to manage their environment (Iskandar, 2009). Internally, the inclination towards various human actions is influenced by external stimuli in the form of information or knowledge and an individual's attitudes (Rosenberg and Hovland, 1960, as cited in Iskandar, 2009). Internal factors (perception) can also be influenced by external systems, such as economic factors and legal regulations, among others.

Human perception of their natural resources significantly impacts their actions in managing them based on their concepts. The concept of anthropocentrism regards humans as the center of the universe's natural

order. Humans and their interests are the most significant factors in the ecosystem's order. Therefore, in all policies related to nature, whether directly or indirectly, human interests are of the utmost importance. Everything else in the universe only holds value and attention to the extent that it supports human interests. Nature is viewed as an object, tool, or means for fulfilling human needs and does not possess intrinsic value. Even if humans display concern for the environment, it is solely for securing human interests rather than acknowledging the inherent value of nature.

The argument of anthropocentrism is generally associated with Western philosophy and the entire tradition of liberal thought, including modern science, and is considered the root of anthropocentric ethics. In Western traditions and religions, only humans are deemed ethically significant, while all other elements are regarded as means to human ends (Meffe and Carroll, 1994). It aligns with Norton's (1991) assertion, as cited in Meffe and Carroll (1994), that effective conservation can be built upon the foundation of Western culture. In anthropocentrism, humans are motivated to save the environment because they need it for their interests.

As a revitalization of the anthropocentric conservation modern concept, the concept of stewardship emerges as a significant responsibility for the contemporary environmental crisis. It is championed by some Christians and Jews who care about the environment and oppose White's (1967) interpretation of biblical environmental values (Barr, 1972). According to this perspective, after God created everything, He saw that everything was good, thereby bestowing intrinsic value on all creatures, not just humans. The power granted to humans should be viewed as the power to be stewards and responsible servants. In the same way, that God cares for humanity, humans should care for the Earth (Meffe and Carroll, 1994).

On the other hand, the concept of Biocentrism, as the foundation

for developing "local knowledge," rejects anthropocentric arguments. Biocentrism theory (Albert Schweitzer, as cited in Keraf, 2002) asserts that it is untrue that only humans have value; nature also possesses value independently of human interests. This theory contends that all life and living beings have inherent value and worth, deserving of moral consideration. Nature should be treated morally, regardless of whether it has value for humans. The moral principle underlying this theory is that every life on Earth has the same moral value and should be protected and preserved. This perspective bases morality on the dignity of all living beings. Therefore, ethics is required to guide humans in acting benevolently to safeguard and protect life.

Another theory related to natural resource management is Ecocentrism. Ecocentrism's ethical perspective encompasses the entire community, where humans are considered ordinary members and citizens of the biotic community. According to Leopold (Meffe and Carroll, 1994), common scientific facts generate ethical responsibilities as fellow travelers on the journey of evolution among fellow members of the biotic community. Ecocentrism's viewpoint is based on a neutral, non-religious biological perspective. Ecocentrism is one of the conservation ethics theories known as Aldo Leopold's Land Ethic (Meffe and Carroll, 1994). Arness (1973), as cited in Keraf (2002), also refers to it as deep ecology. Deep ecology can also be termed ecosophy, signifying wisdom in harmonizing life with the broader universe. In this regard, ecosophy encompasses a shift from mere science to wisdom. Environmental consciousness becomes a science and a way of life, a pattern of living in harmony with nature. Consequently, it can be said that the ecocentric approach in conservation ethics centers ethics on the entire ecological community, whether living or non-living. The same moral obligations and responsibilities apply to all ecological realities.

Thus, perception is related to an individual's attitude in responding

to activities, such as the nickel exploration efforts in Siduarsi. Aspects related to knowledge, understanding, and the ability to apply them in actions can enhance community participation at the individual and group levels (Woodworth and Marquis, 1957, as cited in Sabri, 1992).

Moreover, external systems can also influence internal factors (perception), such as economic influences, legal regulations, and other factors. The presence of these external factors does not always bring about informative perceptions or lead to human actions in line with their perceptions. It can be illustrated as shown in Figure 2.1 below.

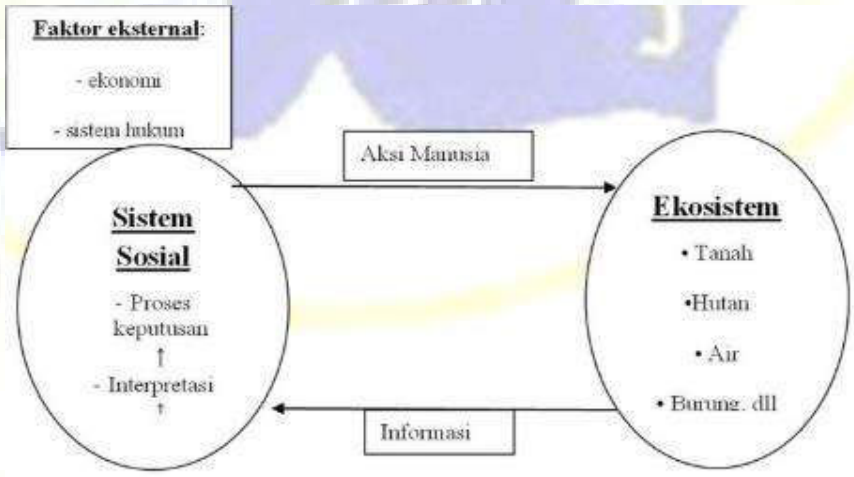


Figure 2.1. The Influence of Human Perception on Their Ecosystem, Shaping Various Human Actions Toward Their Ecosystem (Marten, 2001, as cited in Rumahorbo, 2012)

CHAPTER III
GENERAL OVERVIEW OF SARMI REGENCY

3.1. A Brief History of the Name Sarmi and the Formation of Sarmi Regency

The name Sarmi is an abbreviation derived from the names of major ethnic groups residing in this region, namely the **S**obey, **A**rmati, **R**umbuai, **M**anirem, and **I**sirawa tribes (SARMI). Their presence has long interested Dutch anthropologist Van Kouwenhoven, who subsequently coined the SARMI, which later became the official name for the district/sub-district in Sarmi District. Before its establishment, Sarmi Regency was initially part of the Jayapura Regency as Sarmi District. However, with the advent of the reform era and the spirit of regional autonomy and improved service delivery, Sarmi District was separated to form its regency, Sarmi Regency.

Therefore, Sarmi Regency is the result of the division of the administrative region of Jayapura Regency, following Law Number 26 of 2002. Its administrative area covers Mamberamo Hilir District, Mamberamo Tengah District, Mamberamo Hulu District, Pantai Barat District, Sarmi District, Tor Atas District, Pantai Timur District, and Bonggo District. Subsequently, with the enactment of Sarmi Regency Regulation Number 4 of 200, there was further division, increasing the number of districts to 11. In 2006, based on Regional Regulation No. 5 of 2006, four new districts were established, bringing the total to 15 districts.

In 2007, there was a public aspiration to divide the Sarmi Regency into two separate regencies. It resulted in the enactment of Law Number 17 of 2007, which separated Mamberamo Hilir District, Mamberamo Tengah District, Mamberamo Hulu District, and Roufer District from Sarmi Regency, forming a new administrative region called Mamberamo

Raya Regency. In early 2013, there was yet another district division process, increasing the total number of districts from 10 to 19.

3.2. Geophysical Conditions

3.2.1. Geographic Location

Geographic location refers to the position of a region concerning its location compared to other regions on the Earth's surface. Geographic location is typically delineated by various geographical features on Earth and the names of regions directly adjacent to it. Geographically, Sarmi Regency is situated between 138°05' East Longitude - 140°30' East Longitude and 1°35' South Latitude - 3°35' South Latitude, with the following territorial boundaries:

- To the north, it borders the Pacific Ocean.
- - To the south, it borders Mamberamo Tengah Regency and Tolikara Regency.
- - To the west, it borders Mamberamo Raya Regency.
- - To the east, it borders Jayapura Regency.

The topography and morphology of Sarmi Regency exhibit diverse relative slope conditions, ranging from flat coastal areas to mountainous regions with slopes varying from gentle to steep (see Figure 3.1).

Figure 3.1. Slope Classes in Sarmi Regency

Class	Slope	Area (Ha)	Percentage (%)	Notes
1	0-8%	951,281	52.75	flat
2	8-15%	293,066	16.25	gently sloping
3	15-25%	290,320	16.10	moderately steep
4	26-40%	175,634	9.74	steep
5	>40%	93,077	5.16	very steep
	Total	**1,803,377**	**100.00**	

Source: Sarmi Regency RPJM 2019

The slope inclination in the Sarmi Regency area varies considerably. More than half (52.75%) of the Sarmi Regency is characterized by gently undulating terrain with slopes ranging from 0-8%, including the districts of Pantai Timur, the western part of Pantai Timur, Bonggo, and Bonggo Timur. The hilly terrain is evenly distributed across almost all districts, except for a small portion in the Apawer Hulu District, with slopes exceeding 26%, while slopes exceeding 40% are found in the Tor Atas, Apawer Hulu, Pantai Timur, and Pantai Barat Districts.

The region's elevation analysis shows that the Sarmi Regency is dominated by elevations below 2000 meters above sea level (masl), accounting for 46.82% of the total area. Areas with elevations exceeding 2000 masl are mainly found in the Tor Atas and Sarmi Selatan Districts. This configuration indicates that a significant portion of Sarmi falls under a protected area category, while the flat coastal regions are susceptible to flooding and waterlogging. The composition and distribution of elevation levels in the Sarmi Regency are presented in Table 3.2 below:

Table 3.2. Elevation Classes from Sea Level (masl) in Sarmi Regency

Elevation (m)	Area (Ha)	Percentage (%)
0-50	245,806	13.63
50-100	472,965	26.23
100-500	844,310	46.82
500-1000	153,814	8.53
1000-2000	85,026	4.71
>2000	1,456	0.08
Total	1,803,376	100.00

Source: Analysis results of SRTM DEM (Digital Elevation Model) with a 90m resolution, CGIAR-CSI, 2008.

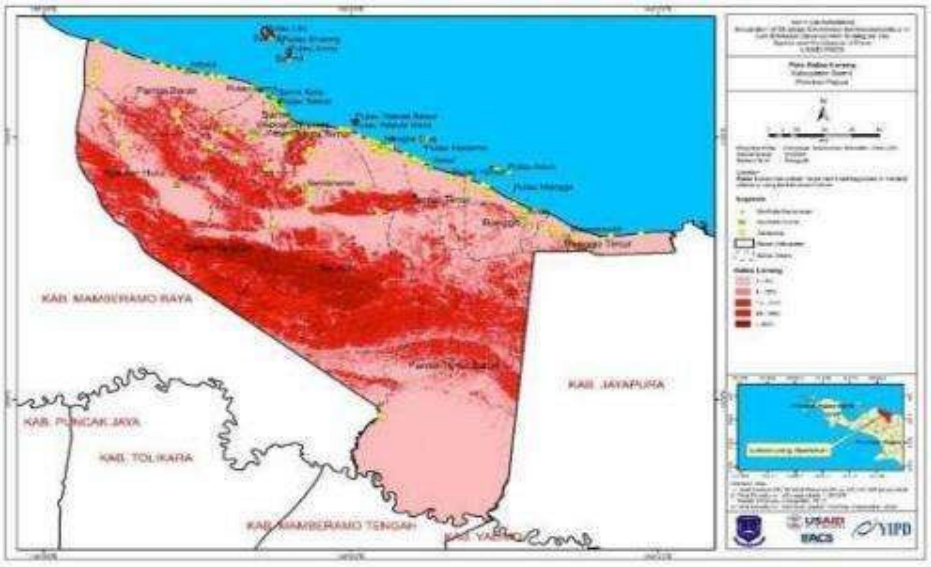


Figure 3.1. Slope Class Map of Sarmi Regency Source: Neighborhood Unit/Community Unit Sarmi Regency 2013-2022.

3.2.2. Hydrology

The potential surface water resources in Sarmi Regency are relatively high, comprising lakes and rivers. The major lakes in Sarmi Regency include Bomberai Lake, with an area of 133,500 m²; Piamfon Lake, covering 2,384 m²; and Teun Lake, spanning 4,568 m² (Department of Public Works of Papua Province, 2012). However, the analysis results indicate that only 58.91% of Sarmi Regency's area has medium-depth groundwater (moderately productive), while 41.09% has scarce groundwater resources (rare groundwater).

Sarmi Regency is home to several major rivers, including Apawer, Iramuar, Muwar, Verkam, Verkam1a, Moaif, Bulianang, Verkam1, Bier, Unk, Biri, Wiru, Wiru1, Sermoif, and Tor. All these rivers are part of River Basins, which are further divided into Apauwer, Bier, Biri, Erpo, Grime, Kwanton, Mansubu, Mamberamo, Muwar, Orai, Sermo, Toarim, Tor, Verkam, Wiru, and Woske. The detailed division of River Basins in Sarmi Regency is presented in Table 3.3 below.

Table 3.2. River Basins (DAS) in Sarmi Regency and Their Areas

Name of DAS	Area (Ha)	Percentage (%)
DAS Apauwer	260,893	14.47
DAS Bier	74,854	4.15
DAS Biri	193,040	10.70
DAS Erpo	17,920	0.99
DAS Grime	3,960	0.22
DAS Kwanton	22,777	1.26
DAS Mansubu	4,691	0.26
DAS Memberamo	634,310	35.17
DAS Muwar	75,477	4.19
DAS Orai	39,182	2.17
DAS Sermo	19,460	1.08
DAS Toarim	15,714	0.87
DAS Tor	200,175	11.10
DAS Verkame	70,709	3.92
DAS Wiru	115,167	6.39
DAS Woske	42,829	2.37
Sungai Ganda	12,219	0.68
Total	1,803,377	100.00

Source: BPDAS-PS, Ministry of Forestry, 2011

3.2.3. Climatology

The climate conditions in Sarmi Regency can be generally characterized by a dry season from June to September and a rainy season from December to March, with transitional periods in April-May and October-November. The average rainfall in Kabupaten Sarmi is 253.9 mm. The highest recorded rainfall is in July, reaching 479 mm, while the lowest is in June, with 123.7 mm. The air temperature in Sarmi Regency ranges from 30.8 ºC to 32.2 ºC. The highest temperatures are experienced in November-December, reaching 32.2 ºC, while the lowest temperatures

occur in March, at 30.8 ºC. The average air humidity in Sarmi Regency is highest in January, at 158 percent, and lowest in May, at 77 percent. The average surface air pressure above the runway (QFF) is 10821 mb, and the average surface pressure above sea level (QFE) is 10809 mb. The average sunshine duration is 10.2 hours, and the wind speed is 0.4 knots.

Table 3.3. Temperature and Air Humidity in Sarmi Regency 2021

Month	Temperature (⁰C)		Air Humidity (%)			Average
	Max	Min	Average	Max	Min	
January	32.90	23.00	27.60	96.00	62.00	80.00
February	33.70	23.00	27.50	97.00	61.00	83.00
March	33.30	22.40	27.70	98.00	60.00	81.00
April	34.20	22.50	27.80	95.00	80.00	81.00
May	30.60	22.50	27.80	94.00	65.00	82.00
June	33.30	23.00	27.70	95.00	62.00	81.00
July	32.80	22.50	27.60	95.00	59.00	82.00
August	32.00	22.30	28.00	98.00	66.00	81.00
September	32.50	23.30	28.50	99.00	64.00	80.00
October	32.70	22.30	28.50	99.00	58.00	80.00
November	33.80	23.00	28.30	99.00	57.00	79.00
December	35.30	22.80	28.10	100.00	57.00	83.00

Source: Sarmi in Figures 2022

The climate of Sarmi Regency falls within the tropical rainforest climate category, characterized by the influence of the monsoon seasons, rainfall, and prevailing winds. Determining the distinct rainy and dry seasons in Sarmi Regency can be somewhat challenging because, during the dry season, rainfall remains relatively high for some time. Nevertheless, the dry season in Sarmi Regency generally occurs from June to September, while the rainy season spans from December to March, with

transitional periods in April-May and October-November. The Southeast Monsoon wind significantly affects the coastal areas of Sarmi Regency, prevailing from May to November. Conversely, from December to November, Sarmi Regency is influenced by the Northwest Monsoon wind.

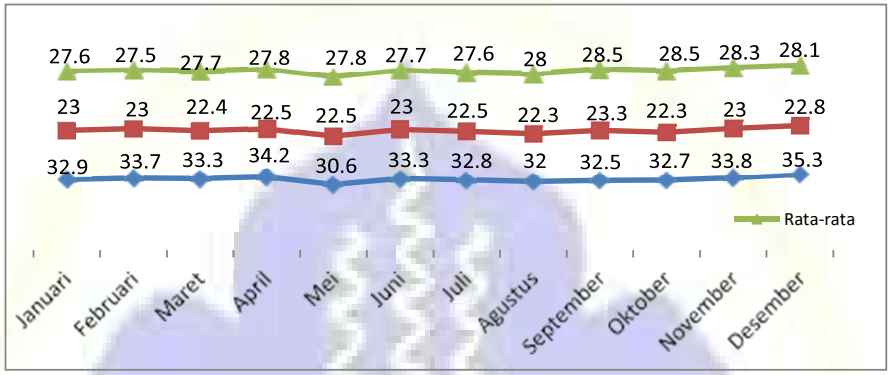


Figure 3.2. Air Temperature Graph of Sarmi Regency in 2021
Source: Sarmi in Figures 2022

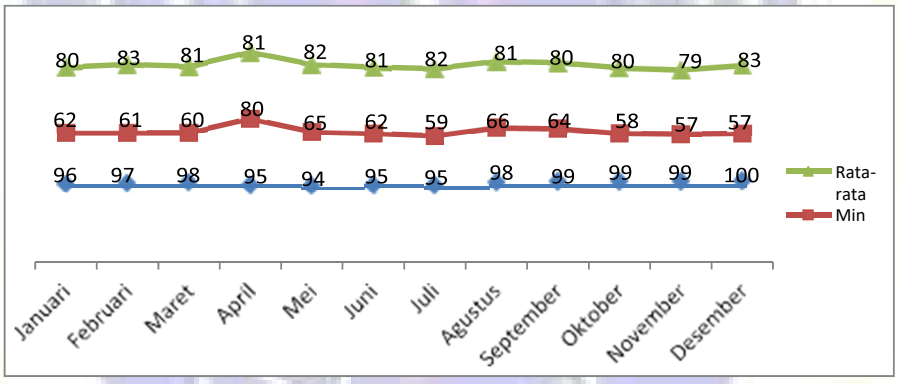


Figure 3.3. Air Humidity Graph of Sarmi Regency 2021
Source: Sarmi in Figures 2022

3.2.4. Land Area

Sarmi Regency covers an area of 18,034 km², with the largest district being Pantai Timur Barat, spanning 2,455 km² or 13.61 percent of the total area. Meanwhile, Sobey district is the smallest, covering 127 km² or 0.70 percent of the entire Sarmi Regency region. The district with the highest elevation above sea level is Apawer Hulu, standing at 92.03 meters above sea level. On the other hand, Apawer Hilir district is the lowest-

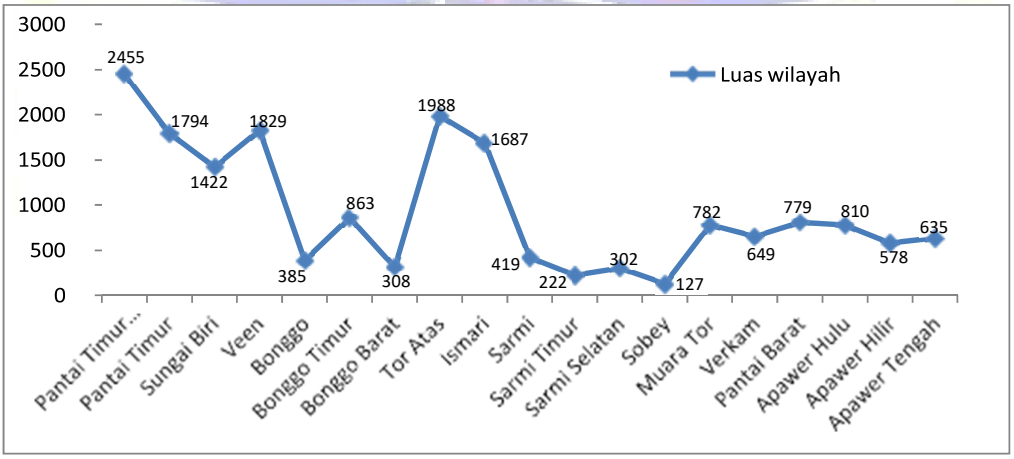
lying area, with an elevation of 5.60 meters above sea level.

Table 3.4. Distirct-Based Land Area in Sarmi Regency

District	District Capital	Area (km^2)
Pantai Timur Barat	Burtin/Asyaf	2,455
Pantai Timur	Betaf III	1,794
Sungai Biri	Ansudu	1,422
Veen	Wakde I	1,829
Bonggo	Kiren	385
Bonggo Timur	Mawesmukti	863
Bonggo Barat	Podena	308
Tor Atas	Samanente	1,988
Ismari	Waaf I	1,687
Sarmi	Sarmi	419
Sarmi Timur	Waskey	222
Sarmi Selatan	Wapoania	302
Sobey	Bagaiserwar II	127
Muara Tor	Ebram	782
Verkam	Amsira	649
Pantai Barat	Arbais	810
Apawer Hulu	Aurimi	779
Apawer Hilir	Burgena	578
Apawer Tengah	Airoran	635
Sarmi		18,034

Source : Sarmi Regency in Figures 2022

Figure 3.4. Graph of Land Area by District in Sarmi Regency



Source: Sarmi Regency in Figures 2022

3.3. Demographics

3.3.1. Population

The population is a crucial factor in the development of a region and plays a significant role in economic development. The population represents the total number of people inhabiting a specific area at a given time. The population size is typically associated with the economic growth (income per capita) of a country or region, which roughly reflects the economic progress of that area. Regarding the population size of Sarmi Regency, based on the results of the 2021 population census, it is recorded as 41,849, as shown in Table 3.6 below.

Table 3.5. The population of Sarmi Regency in 2022

District	Population Count		Total	Percentage (%)	Sex Ratio (Male/Female)
	Male	Female			
Pantai Timur Barat	1,649	1,454	3,103	7.41	113.4
Pantai Timur	1,134	1,081	2,215	5.29	104.9
Sungai Biri	378	323	701	1.68	117.0
Veen	1,009	926	1,935	4.62	109.0
Bonggo	1,660	1,472	3,132	7.48	112.8
Bonggo Timur	1,789	1,501	3,290	7.86	119.2
Bonggo Barat	653	571	1,224	2.92	114.4
Tor Atas	508	427	935	2.23	119.0
Ismari	199	168	367	0.88	118.5
Sarmi	7,416	6,528	13,944	33.32	113.6
Sarmi Timur	424	356	780	1.86	119.1
Sarmi Selatan	1,160	1,051	2,211	5.28	110.4
Sobey	1,015	866	1,881	4.49	117.2
Muara Tor	580	500	1,080	2.58	116.0
Verkame	603	460	1,063	2.54	131.1
Pantai Barat	689	599	1,288	3.08	115.0
Apawer Hulu	642	597	1,239	2.96	107.5
Apawer Hilir	456	432	888	2.12	105.6
Apawer Tengah	295	278	573	1.37	106.1
Total	22.259	19.590	41.849	100	113.6

Source: Sarmi Regency in Figures 2022

A total of 22,259 individuals are male, while 19,590 individuals are female. Compared to the projected population in 2020, the population of Sarmi has grown by 0.80 percent. Meanwhile, the sex ratio in Kabupaten Sarmi in 2021 is 113.6, indicating 114 male residents for every 100 female residents. Furthermore, the ratio of male and female populations by district in Kabupaten Sarmi can be seen in Figure 3.5 below.

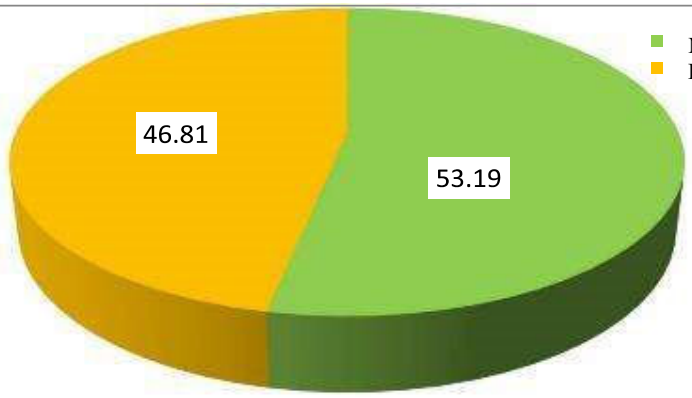


Figure 3.5. Percentage of Population in Sarmi Regency by Gender

Based on age groups, the population of Kabupaten Sarmi continues to increase, influenced by various factors such as economic improvement, which can impact the well-being of its residents. The population of Kabupaten Sarmi based on age groups is presented in Table 3.7 below.

Table 3.7. Population by Age Group (Individuals).

Age Group	Male		Female		Total		%
	2019	2021	2019	2021	2019	2021	
0-4	2 382	3 196	2 314	3 176	4696	6372	1.36
5-9	1 861	2 890	1 741	2 817	3602	5707	1.58
10-14	1 570	2 046	1 574	1 755	3144	3801	1.21
Total	**3836**	**3836**	**7672**	**15344**	**11442**	**15880**	**4.15**
15-19	1 762	1 444	1 458	1 166	3220	2610	0.81
20-24	2 265	1 598	1 577	1 456	3842	3054	0.79
25-29	2 339	1 639	1 519	1 496	3858	3135	0.81
30-34	1 760	1 941	1 343	1 637	3103	3578	1.15
35-39	1 452	1 711	1 207	1 310	2659	3021	1.14
40-44	1 560	1 304	1 406	1 129	2966	2433	0.82
45-49	1 594	1 217	1 443	1 010	3037	2227	0.73
50-54	1 460	892	1 101	791	2561	1683	0.66
55-59	1 078	882	671	661	1749	1543	0.88
60-64	624	556	453	529	1077	1085	1.01
65-69	327	454	216	298	543	752	1.38
70-74	166	247	112	191	278	438	1.58
75+	96	242	84	168	180	410	2.28
Total	**22296**	**22 259**	**18 219**	**19 590**	**40 515**	**41 849**	**1.03**

Source: Sarmi Regency in Figures, 2022

The population density of Sarmi in 2021 was 2.32 people per square kilometer, meaning there were only two inhabitants within an area of 1 square kilometer. The district with the highest population density is Sarmi District, with a density of 32 people per square kilometer, while other districts have a population density of less than 15 people per square kilometer. Relatively low population density can be found in Pantai Timur Barat District, Pantai Timur District, Tor Atas District, Pantai Barat District, and Apawer Hulu District. The population density for each district in Sarmi Regency in 2021 is presented in Table 3.8 below.

Table 3.6. Population Density of Sarmi Regency in 2021

District	The Annual Growth Rate	Population Density/ km²
Pantai Timur Barat	0.84	1.26
Pantai Timur	1.65	1.23
Sungai Bir	0.86	0.49
Veen	0.83	1.06
Bonggo	0.55	8.14
Bonggo Timur	0.15	3.96
Bonggo Barat	0.25	3.81
Tor Atas	0.54	0.47
Ismar	0.55	0.22
Sarmi	0.95	32.97
Sarmi Timur	0.39	3.50
Sarmi Selatan	1.52	7.21
Sobey	1.02	14.66
Muara Tor	0.09	1.38
Apawer Hulu	0.09	1.58
Verkam	0.55	1.64
Pantai Barat	0.57	1.58
Apawer Hilir	1.14	1.52
Apawer Tengah	1.06	0.89
Sarmi Regency	0.80	2.32

Source: Sarmi Regency in Figures 2022

3.3.2. Employment

According to the results of the National Labor Force Survey in Sarmi Regency in 2021, there were 13,089 individuals aged 15 and above who were employed, while there were 586 individuals classified as openly

unemployed. From the perspective of labor force productivity, this represents a favorable situation as a more significant labor force is expected to contribute to higher productivity. The relatively low unemployment rate, approximately 3.50%, further supports it. The economically active population (those engaged in the labor force) in Sarmi Regency numbered 20,709 individuals, while those not economically active, including individuals primarily involved in education, household management, or other non-economic activities, totaled 18,986. In terms of gender, there exists an imbalance between males and females, with the participation rate for females significantly lower at 65.25% compared to males at 85.79%. It indicates a notable gender disparity in economic participation within the Sarmi Regency.

Table 3.9. Population Aged 15 and Above by Past Activity and Gender in Sarmi Regency, 2021

Main Activity	Gender		Total
	Male	Female	
Labor Force	13089	7620	20709
Employed	12503	7481	19984
Open Unemployment	586	139	725
Not in the Labor Force	288	6205	9493
School	1082	1400	2482
Household	467	4429	4896
Other	1739	376	2115
Total	29754	27650	60404
Labor Force Participation Rate	79.92	55.12	68.57
Unemployment Rate	4.48	1.82	3.50

Source: Sarmi Regency in Figures 2022

When looking at the sectors of economic activity in Sarmi Regency, the agricultural sector is the largest employer, absorbing a significant portion of the workforce, totaling 10,490 individuals (79.77%). Employment in other sectors, such as industry and services, remains relatively low, with 255 individuals (1.94%) and 2,405 individuals

(18.29%), respectively. The high number of people working in the agricultural sector necessitates greater attention from the government to ensure the development and success of agriculture in Sarmi. It is important to note that this sector includes subsectors such as forestry, food crop farming, plantation farming, livestock, and fisheries.

Table 3.9 shows that the number of individuals aged 15 and above who are part of the labor force fluctuates yearly, as does the number of employed individuals. This fluctuation is partly due to the increasing population of Sarmi Regency, as rural residents seek employment opportunities. However, the available job opportunities in Sarmi Regency are insufficient to meet the demand from job seekers.

Table 3.10. Population Aged 15 and Above by Educational Attainment in Sarmi Regency, 2021

Educational Attainment	Workforce			%
	Employed	Unemployed	Total Workforce	
No diploma, Elementary School	7097	62	7159	99.13
Junior High School	3464		3464	100
Senior High School	6862	366	7 228	94.94
Vocational High School				
Diploma I, II, III, IV	-			
Bachelor's degree	2 561	297	2 858	89.61

Source: Sarmi in Figures 2022

Table 3.7. Primary Occupation and Gender in Sarmi Regency, 2021

Primary Occupation Status	Male	Female	Total
Self-employed	3 514	2054	5568
Assisted by non-permanent labor/unpaid labor	2434	1247	3681
Assisted by permanent labor/paid labor	315	-	315
Worker/Employee/Civil Servant	4 351	1 915 6	266
Independent Worker	813	-	813

Family worker/unpaid	1 076	2 265	3 341
Total	12503	6152	19984

Source: Sarmi in Figures 2022

Table 3.8. Population Aged 15 Years and Above Employed by Age Group and Gender in Sarmi Regency, 2021

Age Group	Gender		Total
	Male	Female	
15−19	307	159	466
20−24	775	444	1 219
25−29	1520	934	2 454
30−34	1 339	784	2 123
35−39	1 649	832	2 481
40−44	1 369	772	2 141
45−49	1 536	1 099	2 635
50−54	1 527	1 176	2 703
55−59	925	700	1 625
60−64	750	332	1 082
65+	806	249	1 055
Total	**12 503**	**7 481**	**19 984**

Source: Sarmi in Figures 2022

Table 3.9. Population Aged 15 Years and Above Employed by Main Field of Work in Sarmi Regency, 2021

Field of Work	Male	Female	Total
Agriculture, Forestry, Fishing, Hunting, and Fishery	5782	3529	9311
Manufacturing Industry	142	546	688
Construction	965	-	965
Wholesale and Retail Trade	1286	1508	2794
Transportation, Warehousing, and Communication	697	77	774
Financial and Insurance Services	183	-	183
Government Administration, Defense, and Social Security	2788	714	3502
Education Services	363	796	1159
Health and Social Work Activities	297	311	608
Total	1 503	7481	19984

Source: Sarmi Regency in Figures, BPS, National Labor Force Survey (Sakernas), August 2021

The National Labor Force Survey (Sakernas) data in August 2021 indicates that nearly three-quarters of the working-age population in Sarmi Regency are employed (73.35%). From the perspective of labor productivity, this is quite positive, as the high number of workers is expected to increase productivity. This condition is supported by a relatively low unemployment rate of approximately 2.54%. The economically active population (those in the labor force) in Sarmi Regency amounts to 76.48%, while those who are economically inactive, including individuals primarily engaged in schooling, housekeeping, or other activities, account for 23.52%. When viewed through a gender lens, there is still an imbalance between men and women, with respective participation rates of 65.25% and 85.79%. It indicates a significant gender disparity in economic activities.

Table 3.10. Population Aged 15 and Above by Number of Working Hours in the Main Occupation in Sarmi Regency, 2020

Working Hours	Gender		Total
	Male	Female	
Temporarily Not Working	106	60	166
1-4	106	260	366
5-9	452	213	665
10-14	874	399	1 273
15-19	1261	823	2 084
20-24	1746	1384	3 130
25-34	2825	2185	5 010
35-44	3031	1073	4 104
45+	2102	1084	3 186
Total	12503	7481	19984

Source: Sarmi Regency in Figures 2020

By field of employment, agriculture is the sector that employs the most workers, absorbing a total of 10,490 individuals (79.77%). The absorption of labor in other sectors, such as industry and services, remains relatively low, with 255 individuals (1.94%) and 2,405 individuals (18.29%), respectively. The high number of people employed in the

agricultural sector necessitates increased government attention to promote the development and advancement of agriculture in Sarmi. It should be noted that this sector includes sub-sectors such as forestry, food crop agriculture, plantation crop agriculture, livestock farming, and fisheries.

3.3.3. Education

The level of education in Sarmi Regency in 2021, as measured by the School Participation Rate (APS), indicates that APS for the Elementary School (SD) level reached 91.02%, while for Junior High School (SMP) it was 91.37%, and for Senior High School (SMA) or Vocational School (SMK) it was 71.74%. These figures are reflected in the School Participation Rate (APS) values. The highest Pure Participation Rate (APM) is at the Elementary School (SD) level, reaching 91.02%. In 2021, the number of schools registered with the Ministry of National Education was 101 schools. The number of school units comprises 9 Kindergartens (TK), 65 Elementary Schools (SD), 18 Junior High Schools (SMP), 4 Senior High Schools (SMA), and 5 Vocational Schools (SMK).

Table 3.11. Percentage of Population Aged 7–24 Years by Gender, School-Age Group, and School Participation in Sarmi Regency in 2021

Gender and School-Age Group	School Participation		
Male	Not/Have Never Attended School	Still Attending School	No Longer in School
7-12	3.96	89.86	6.17
13-15	-	95.95	4.05
16-18	-	64.45	35.55
19-24	3.33	30.45	66.22
7-24	2.29	65.63	32.08
Female			
7-12	5.61	91.85	2.54
13-15	-	87.15	12.85
16-18	-	80.85	19.15
19-24	2.41	19.06	78.53
7-24	2.86	70.51	26.63
Male and Female			

7-12	4.92	91.02	4.06
13-15	-	91.37	8.63
16-18	-	71.74	28.26
19-24	2.94	25.56	71.50
7-24	2.58	68.07	29.35

Source: Sarmi Regency in Figures 2021

Furthermore, based on the Pure Participation Rate (APM) and Gross Participation Rate (APK), it is found that the APM for the Elementary School/MI level is 91.02, and the APK is 108.46. Next, the APM for Junior High School (SMP) and Madrasah Tsanawiya (MTs) education levels are 77.70, with APK being 102.79. Finally, the APM for Senior High School (SMA)/Vocational School (SMK)/Islamic Senior High School (MA) education level is 87.52, with APK being 89.64. The Pure Participation and Gross Participation Rates can be seen in the table below.

Table 3.12. Pure Participation Rate (APM) and Gross Participation Rate (APK) by Education Level in Sarmi Regency in 2020 and 2021

Education Level	Pure Participation Rate		Gross Participation Rate	
	2020	2021	2020	2021
SD/MI	91,61	91,02	107,49	108,46
SMP/MTs	77,07	77,70	101,28	102,79
SMA/SMK/MA	49,53	50,17	87,52	89,64

Source: Statistics of Sarmi Regency in Figures 2022

Additionally, the Pure Participation Rate (APM) represents the proportion of the population of a specific school-age group who are currently enrolled in the appropriate educational level (in line with the age of the population and the regulations for attending school at that level) compared to the population of that school-age group who are eligible. The APM is used to indicate how many of the school-age population are attending school at the right time or how many are attending school at an age appropriate for the regulations of the school-age group they are in. The APM indicates how many of the school-age population can utilize educational facilities according to their education level. If all school-age

children attend school on time, the APM will reach 100%. In general, the APM will always be lower than the APK because the APK takes into account the number of people outside the school-age group at that level of education.

Table 3.13. Number of Schools by Education Level in Sarmi Regency in 2020 and 2021

District	Education Level					Total
	SD	SMP	SMK	SMA	Higher Education (PT)	
Pantai Timur Barat	**5**	**1**	**–**	**1**	**–**	**7**
Pantai Timur	3	1	1	–	–	5
Sungai Biri	2	–	–	–	–	2
Veen	4	2	2	–	–	8
Bonggo	5	1	–	–	–	6
Bonggo Timur	6	2	–	1	–	9
Bonggo Barat	3	2	–	–	–	5
Tor Atas	**3**	**1**	**–**	**–**	**–**	**4**
Ismari	2	–	–	–	–	2
Sarmi	5	4	–	2	–	11
Sarmi Timur	2	1	1	–	–	4
Sarmi Selatan	3	1	–	–	–	4
Sobey	2	–	–	–	–	2
Muara Tor	3	–	–	–	–	3
Verkam	3	–	–	–	–	3
Pantai Barat	3	2	1	–	–	6
Apawer Hulu	2	1	–	–	–	4
Apawer Hilir	2	–	–	–	–	2
Apawer Tengah	1	–	–	–	–	1
Jumlah	59	18	5	4	–	59

Source: Statistics of Sarmi Regency in Figures 2022

3.3.4. Health

Life Expectancy (LE) estimates the average number of years an individual can expect to live. Based on the 2021 Susenas data analysis, the LE in Sarmi Regency is 66.46 years old. It means that, on average, the residents of Sarmi Regency can expect to live for about 66 years, categorizing it as a moderate life expectancy. Sarmi Regency ranks 20th

out of 29 regencies/cities in Papua Province regarding Life Expectancy.

In 2021, the healthcare facilities in Sarmi Regency comprised 1 General Hospital, 11 Community Health Centers (Puskesmas), 24 Sub-district Health Centers (Puskesmas Pembantu), and 5 clinics/health centers. Meanwhile, the number of healthcare professionals in Sarmi Regency in 2021 consisted of 18 doctors, 177 nurses, 124 midwives, 14 pharmacists, and 13 non-medical personnel.

3.3.5. Economy

The economic status of Sarmi Regency can be indicated by the growth rate of Gross Regional Domestic Product (GRDP). The GRDP of Sarmi Regency has been consistently increasing since 2017. Gross Regional Domestic Product (GRDP) is one of the economic development indicators for a region. It represents the total value added by economic activities encompassed in the GRDP. At current prices, the GRDP of Sarmi Regency in 2021 was 3,113.05 billion Indonesian Rupiah, indicating a growth of 5.38 percent compared to the previous year. The GRDP at constant 2010 prices for 2021 was 1,862.59 billion Indonesian Rupiah, showing an increase of 1.48 percent from the previous year.

The agricultural sector contributed the highest share to the GRDP of Sarmi Regency in 2021, accounting for 30.44 percent. However, this sector experienced a growth rate slowdown of 1.01 percent. The slowdown in the growth rate of the agricultural sector's contribution was influenced by increased value added in other sectors, particularly in the construction sector. This phenomenon is typical in newly established regencies where significant physical construction activities such as office buildings, housing, roads, and other infrastructure projects are undertaken to support regional development acceleration. In 2021, the construction sector contributed 20.76 percent, with a positive growth rate of 0.59 percent. The increase in the value and growth of the GRDP at constant prices was lower

than that at current prices due to significant price changes in the region from year to year, affecting the increase in the GRDP at current prices.

As part of Papua Province, the economic system of Sarmi Regency is considered sustainable when every individual in the community can meet their livelihood needs, enabling all individuals to achieve the highest possible quality of life without exceeding agreed-upon maximum limits, with the following principles:

- Self-reliant: Self-sufficiency should be achieved using natural resources from the nearest region. The lower the need for material imports from outside, the more sustainable an economic system is.
- Equitable: Each individual in the community has equal access to livelihood needs without depending on money ownership and residential location.
- Sustainable: The economic system should ensure the sustainability of natural resources and environmental quality for hundreds of years.

The economic development strategy prioritizing the acceleration of economic growth to a certain level, with the expectation that it will lead to economic redistribution through the trickle-down effect, has proven ineffective. Disparities and economic inequalities have not shown signs of decreasing. Therefore, it is time to adopt an alternative approach and strategy. This alternative approach involves shifting development priorities towards strengthening the local economy from village to village, resulting in an upward push phenomenon. It, in aggregate, will enhance the national economy, underpinned by a locally equitable, resilient, and sustainable economic framework.

The strategy for developing the economic model of Sarmi Regency involves the following:

1) Enhancing the community's ability to self-organize to meet their livelihood needs independently.
2) Boosting innovation capacity to meet village-scale livelihood needs.

3) Ensuring community access to land and local resources.
4) Increasing the sustainability of material self-sufficiency in villages and reducing the need for imports.
5) Strengthening the capacity of the people of Sarmi Regency to produce their food.
6) Prioritizing small-scale and value-added investments based on village resources (natural and human resources).

3.4. Social and Cultural

3.4.1. Local Communities of Sarmi Regency

C. Van Vollen Houven, a Dutch anthropologist, is credited with naming the area now known as Sarmi Regency. Sarmi is an abbreviation derived from the first letters of the names of the five major ethnic groups inhabiting Sarmi Regency: the Sobey, Armati, Rumbuai, Manirem, and Isirawa tribes (SARMI).

The **S**obey tribe resides in the eastern part of the West Coast, extending eastward from Masab Village on the West Coast, the Kumamba Islands (Liki Island, Tengah Island, and Armo Island), Sarmi Island (Kasirem), and up to Wakde Island, Masimasi, Yamna, Anus, and Podena. The **A**rmati tribe is scattered from Mount Munukaina, Aurimi, Airoran, Kapesu, and the Mamberamo River Basin, as well as the western part of Tor Atas, including Bora-bora, Segafor, Segar Mebo, and Safron. The **R**umbuai tribe is spread in the eastern part of the Sarmi District, bordering Tor Atas, including Ansudu, Bonggo, Taronta, Tarwasi, Mawesweres, Mawesday, and Kaptiau. The **M**arinem tribe is scattered in the southern Sarmi District, including Holmafen, Sewan, Keder, and the eastern Tor Atas, which speaks the Berik and Kwesten languages. The **I**sirawa tribe is spread in the western part of Sarmi Regency, including the Kafasia area in the West Coast District, up to Mararena Village.

In addition to these five major tribes, various smaller tribes are

subgroups of these significant tribes. After being identified based on the languages they use, it is estimated that there are around 87 languages spoken in the Sarmi Regency, indicating the presence of 87 tribes and subtribes, each with its language, inhabiting the region.

Cultural diversity within Sarmi Regency includes the Anus, Airoran, Bagusa, Bauyzi, Barik, Betaf, Bonerif, Bonggo, Burmeso, Dabe, Dabra, Foya, Isirawa, Itik, Kaptiaw, Kauwerawek, Keder, Kwerba, Kwesten, Liki, Maremgi, Masi-masi, Mawes, Podena, Samarokena, Sobei, Tarfia, Warembori, Wakde, Wares, Yamna, and Warsun cultures. According to 2021 village data, there are 92 villages in Sarmi Regency, with 55 villages in coastal areas and 37 in the hinterland. When associated with forest areas, only eight villages are located outside forest areas, 33 villages are situated around forest areas, and 45 villages are within forest areas.

The multiethnic population of Sarmi Regency engages in diverse livelihoods. For residents in easily accessible areas with transportation options other than civil servants, police, and military personnel, their livelihoods include farming, fishing, livestock raising, hunting, construction labor, entrepreneurship/contracting, trading, and service occupations. However, most residents in remote and inland areas rely on farming, hunting, and gathering for their sustenance.

The forest provides various livelihood needs, including various types of sago palms, which serve as the staple food for a significant portion of the population in Sarmi Regency. Various types of sago palms thrive in almost all areas. The development of agricultural commodities such as rice, legumes, and vegetables is on a small scale, primarily for household consumption. Cultivated land producing food crops is found in the Bonggo District, where rice can be harvested. Likewise, the production of legumes is mainly concentrated in Bonggo. Commodities that penetrate the external market include cocoa beans and coconuts in copra. Local

livestock products, especially cattle and pigs, are in demand locally and in the Jayapura market.

The sea, which borders several districts in Sarmi, also holds its wealth. Unfortunately, foreign fishermen with modern equipment often steal fish in the area, while local fishermen still rely on traditional tools.

After World War II, Sarmi became the colony's central administrative city and a small port, the gateway for various imported goods. It was also one of the sub-districts under the Hollandia Division, established at the end of 1961. Sarmi was a part of the local government unity ("*Kesatuan Pemerintahan Setempat*" or KPS) when Indonesia used this administrative system, and it was one of the 23 KPSs in Papua. Before World War II, the Sarmi region had already become a plantation area managed by various plantation companies. Individuals from Japan, China, Germany, and the Netherlands managed these companies. Notable areas at that time included:

1) Fumou in the vicinity of present-day Sarmi City, where yute (kapok) plantations had been promoted since the 1930s;
2) In the Wakde, Masi-masi, Yamna, and Anus Podena areas and Keder, copra was cultivated;
3) In the Bagaiserwar, Sawar, and Waskei areas, cocoa plantations had been established since the 1950s. Trade at that time was not limited to neighboring islands around Sarmi or even just Papua; it involved trade in copra, bialola skin, sea cucumbers, crocodile skin, damar resin, and chocolate, which were exported to Singapore, Germany, and the Netherlands. Geographically, this area was strategically crucial for defense during wartime, as evidenced by its use as a Japanese defense base during World War II. Several important airfields, such as the Wakde airfield, were located here. The history of development in various fields, including education, economics, plantations, and governance, has played a crucial role in shaping the socio-economic

conditions of Sarmi today.

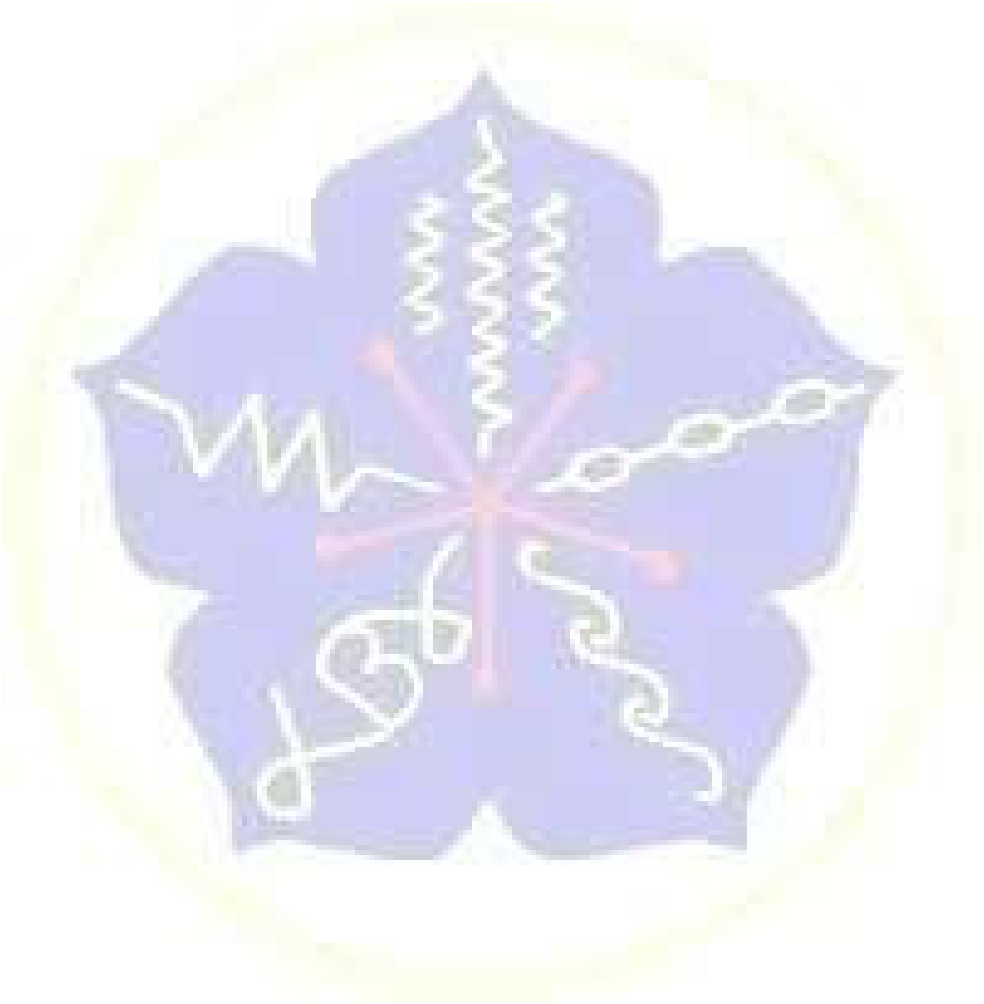
3.4.2. Remote Indigenous Communities

The Department of Social Affairs and Labor of Sarmi Regency has identified the presence of 12 Remote Indigenous Communities (Komunitas Adat Terpencil or KAT). These 12 KATs are located in Pina Village, Maniwa Village, Kwawitiania Village, Murara Village, Tamaja Village, Sasawa Pece Village, Syoremania Village (Apawer Hulu District), Samorkena Village, Siantoa Village, Maseb Village (West Coast District), Segar Mebor Hamlet, and Segar Tor Waf Village (Tor Atas District). The primary characteristic of KATs is their limited infrastructure connectivity with other communities, resulting in restricted communication and relations with other communities. As an illustration of the conditions in KATs, here is some information about the situation in Pina Village.

Pina Village is located north of Apawer Hulu District, approximately 30 km from the district's capital. The village covers an area of about 2 km² and is used for settlement, hunting, and gathering. Swamps surround Pina Village, and there is minimal dry land. Transportation to reach Pina Village involves using motorized boats or rafts along the Apawer River and walking on footpaths created by the community to connect the district capital with other villages and Pina Village. Pina Village is inhabited by 16 households (KK) with a total population of 60 people, consisting of 34 males and 26 females. The entire population of Pina Village adheres to the Protestant Christian faith. Before embracing Christianity, their belief system was animism, which involved belief in supernatural objects that they believed could bring happiness, prosperity, and other benefits. Even though there is now religious teaching, many residents of Pina Village still hold or follow these traditional beliefs.

Most people in Pina Village engage in subsistence hunting and gathering with relatively simple tools. Public facilities in Pina Village are

virtually nonexistent due to its challenging geographical and environmental conditions, which limit government services. Educational facilities do not exist in Pina Village, so many school-aged children do not receive adequate education. Those who wish to attend school must travel to the district capital or Airoran Village.



CHAPTER IV
SOCIAL, CULTURAL, AND ECONOMIC CONDITIONS IN THE LOCATION OF PT. IMM SIDUARSI NICKEL MINING EXPLORATION PROJECT, SARMI REGENCY

4.1. Location of PT. INM Nickel Mining Project Activities

The location of PT. IMM's nickel mining exploration project in Siduarsi, Sarmi Regency, is in the Siduarsi mountainous region. Administratively, this location falls under two districts, namely Tor Atas District and Pantai Timur Barat District. While the company's operational area is closer in terms of distance and administration to Tor Atas District, in terms of accessibility, Pantai Timur Barat District is the easiest to reach—the only access road to the PT. IMM's operational area is a company-owned logging road.

The location of this nickel mining exploration project is within two administrative regions, namely Tor Atas District and Pantai Timur Barat District, with the majority of the operational area falling within Tor Atas District. The administrative boundary of Pantai Timur Barat District is to the north, adjacent to the Pacific Ocean. To the east, it borders Pantai Timur District; to the south, it borders Mamberamo Ulu District, Mamberamo Raya Regency; and to the west, it borders Veen District, Tor Atas District, and Ismari District.

Currently, there are no existing villages or settlements in this location. However, before the 1970s, a village named Kampung Bodem was near the exploration area. Based on interviews with indigenous leaders, community leaders, and customary landowners, during a period when the price of damar resin was high, and it served as the primary economic source for the community, the Dutch government built Bevack in the area, which became a residence for damar resin collectors. Over time, this settlement developed into a village known as Kampung Bodem.

However, the village is currently abandoned and devoid of inhabitants.

According to interviews with indigenous leaders, community leaders, and customary landowners, during the 1950s, there was a village in the vicinity called Kampung Bodem, inhabited by the Marya ethnic group. However, as the price of damar resin plummeted to the point of having no value, and as the community's economy relied heavily on collecting damar resin, the people's livelihoods became increasingly difficult. Since access to the location was challenging for the government to provide services and support, the community gradually began seeking better opportunities in neighboring areas with more promising economic prospects. Consequently, in the 1970s, the Marya community left the village, relocated by the Indonesian government through the Local Government Unit (KPS) led by a Bistir (Sub-District Head) to several villages in the coastal and Tor Atas areas. This relocation was made to facilitate better services to the community.

The Marya community members are now dispersed among several villages, one in the Tor Atas District and three in Pantai Timur Barat District. The reasons for choosing these locations were related to economic interests and social and kinship factors, such as marriage and employment. Therefore, as previously explained, the Marya ethnic group has settled in the following villages (four villages) to this day:

No.	*Village*	*District*
1.	Betaf	Pantai Timur Barat
2.	Kamora	Pantai Timur Barat
3.	Srum	Pantai Timur Barat
4.	Tor	Tor Atas

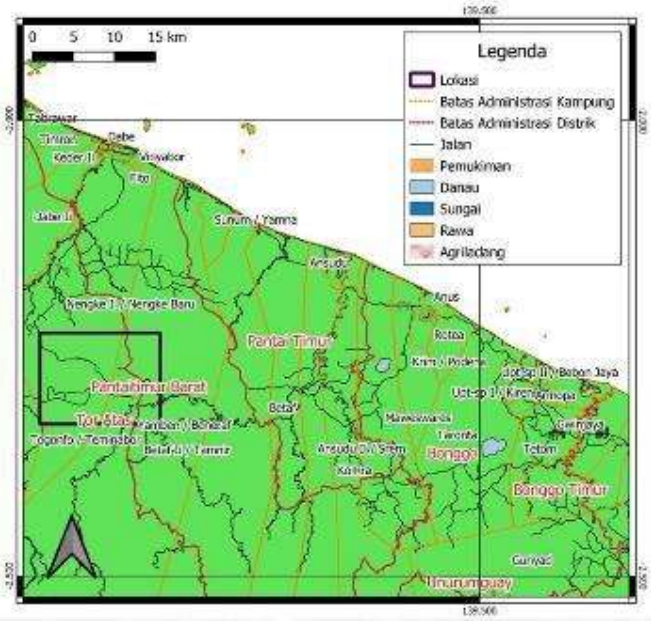


Figure 4.1. Map of the Nickel-Cobalt Mining Project Location in Siduarsi

4.2. Boundary Mapping Based on the Customary Land Rights of the Local Community

Based on the results of interviews and discussions with customary leaders, community leaders, and the community with customary land rights over the location of PT's nickel mining exploration activities. IMM, it is established that the land in question falls under the customary land rights of the Marya tribe. The boundaries of this working area with customary land rights are as follows:

- ✓ Western Part: Borders with the customary land rights of the Etik and Berik tribes.
- ✓ Eastern Part: Borders with the customary land rights of the Foya and Etik tribes.
- ✓ Southern Part: Borders with the customary land rights of the Noker tribe.
- ✓ Northern Part: Borders with the customary land rights of the Sendua tribe.

Based on surveys and interviews with the customary landowners and the company, as of now, the exploration activities of the nickel mining project are still within the customary land rights territory of the Marya tribe. However, this does not rule out the possibility that with ongoing development, the exploration area for nickel mining may expand and extend into the territories of other tribal communities neighboring the Marya tribe due to the expansion/addition of mining areas. Therefore, when expanding/adding mining areas, the boundaries between tribal territories must be considered.

Furthermore, access to the PT IMM mining site is via the East-West Coast District, passing through Nengke Baru Village, with a road length from the Sarmi-Jayapura highway to the PT IMM basecamp of 42 km² with a width of ±5 meters. This road axis traverses the customary land of several tribes, including:

- Kilometer (KM) 1 - KM 15 is the customary land of the Syef and Abi tribes.
- Kilometer (KM) 15 - KM 27 is the customary land of the Wenken tribe.
- Kilometer (KM) 27 - KM 37 is the customary land of the Namwaram tribe.
- Kilometer (KM) 37 - KM 42 is the customary land of the Oisba tribe.
- Kilometer (KM) 42 – to the summit is the customary land of the Noker tribe.

Interviews with Mr. Ayub Marya and Mr. Daud Marya, as well as other community leaders who used to reside in Bodem Village and are now community leaders and customary landowners in the area where the nickel mining project operates, convey the aspirations of the community, especially the Marya tribe. They express their desire to gather and unite once again with the Government's and the company's assistance to relocate them to a single village around the company or the old village of Bodem.

Establishing a single settlement in the form of a village is the wish of the Marya tribe because, until now, they have been scattered in several villages. They also lack self-confidence or low self-esteem because they do not have rights in the village where they currently reside, making it challenging to build a community with its own identity. With the formation of a separate village for them, it is hoped that it will facilitate interaction among the Marya tribe members and with other tribes. Additionally, relocation can make it easier for the company to provide assistance in the form of the company's social responsibility to the community, especially the landowners of the nickel mining operational area.

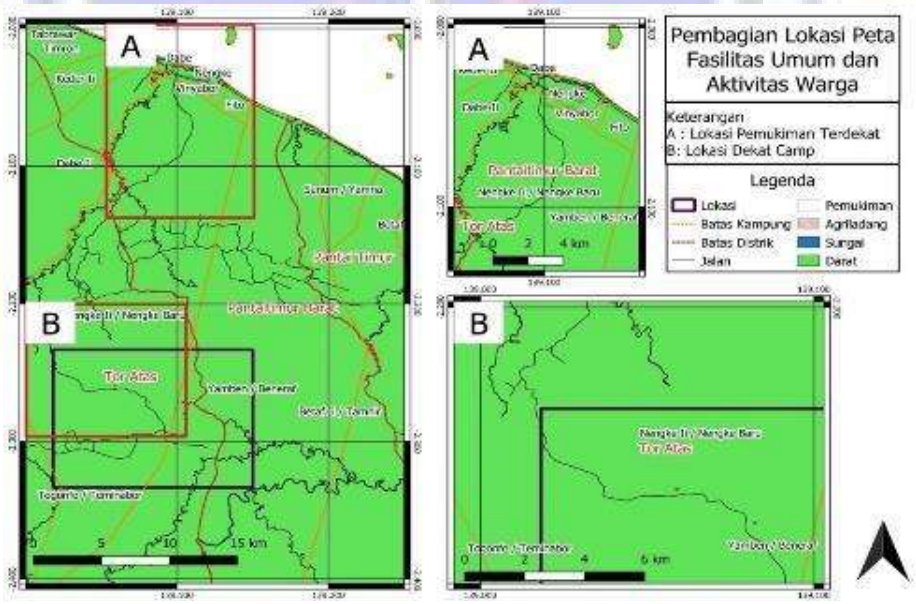


Figure 4.2. Map of the Community Distribution Locations

4.3. Religion and Beliefs

Although the inhabitants of the villages around the area of the PT. IMM Siduarsi Sarmi nickel mining exploration activity embraces Christianity. The influence of ancestral beliefs in the form of animism cannot be wholly disregarded. Almost all of the community members still firmly adhere to the teachings of their ancestors or combine them with

Christianity in their daily lives. It is evident in the continued practice of various beliefs that conflict with Christian teachings, such as making offerings in specific places or at specific times. These practices persist because the community still believes in the existence of forces beyond human control, attributing power to specific sacred locations. It demonstrates that the community connects with all the resources in their environment.

4.3.1. Religious Practices

Religious activities represent a conscious effort to manifest or apply faith into a form of religious behavior in daily life. Therefore, the support of facilities and infrastructure is necessary to facilitate these religious activities. According to statistical data from the Negke Village office, there are two religious facilities: one Protestant Christian church and one Catholic church.

The number of Protestant Christian adherents is 26,119. Meanwhile, there are 10,168 followers of Islam and 1,850 adherents of the Catholic faith. The places of worship for the Protestant Christian faith are the most abundant in the Sarmi Regency, with 145 churches. Islamic places of worship consist of 13 mosques and 13 prayer halls, while there are 5 Catholic churches. The indigenous population in the Pantai Timur Barat District and Tor Atas District predominantly follows the Protestant Christian faith, with some adhering to Catholicism. However, in recent times, especially in the Pantai Timur Barat District, there have been reports of newcomers practicing Islam. The worship facilities in these two districts consist of 23 church buildings in the Pantai Timur Barat District and ten church buildings in the Tor Atas District.

For the communities residing in the vicinity of the PT. IMM Siduarsi Sarmi nickel mining exploration activity, which lives near the forests and coastlines, has a long-standing concept of utilizing and

preserving natural resources based on their beliefs. These communities still believe that all elements of nature possess a life force similar to humans and can be communicated with through specific rituals designated individuals perform. The relationship between humans and their natural surroundings is seen as harmonious. If humans treat nature kindly, nature reciprocates with kindness, and conversely, if humans mistreat nature, they will face calamities caused by their actions. Consequently, the indigenous communities firmly believe that any disasters result from human misconduct towards their environment.

In their daily lives, in maintaining harmony with their natural environment, these communities follow customary norms, including prohibitions or taboos regarding certain activities in specific places and times. For instance, certain locations are considered sacred, where activities such as farming, hunting, or gathering natural resources are strictly prohibited except for ritual ceremonies. Actions that contravene these community norms or violate their established order can disrupt the cosmic balance, leading to misfortune or disasters. Thus, the indigenous Papuan communities have been traditionally taught that human existence should not be solely about dominating nature but should instead focus on adapting to the mysterious world of their environment, emphasizing actions that promote harmony between human life and the natural world.

Various stages in developing their culture illustrate how these communities seek the most appropriate connection with the supernatural forces in their surroundings. In their mystical worldview, these supernatural forces are tangible elements humans can interact with, such as in rituals, dances, and so on. Here, humans strive to find a balance between themselves and their environment. When a person dies, their spirit resides in other objects or natural resources around them without ever leaving the individual. Preserving a harmonious environment ensures the well-being of those who have passed away. Consequently, the community believes

that human prosperity can only be achieved by maintaining harmony with their natural surroundings.

Some community members in these two villages still believe in the existence of forces beyond human comprehension (supernatural). They believe that the natural world is inhabited by visible human beings, other tangible creatures, and invisible beings. These intangible beings are believed to reside near human habitation, in the forests, ravines, capes, trees, rocks, and ponds, among others. These invisible beings can take on various forms, including the form of a Cenderawasih bird. Therefore, the community always thinks, speaks, and acts cautiously.

While it is true that the entire community in these villages adheres to Christianity and no longer believes in the mentioned practices, the influence of their ancestral beliefs cannot be entirely discarded. Virtually all members of the community still hold on to the teachings of their ancestors or incorporate them into their daily lives. Various belief rituals can still be observed, such as offering ceremonies at specific locations or during specific times. These practices are conducted because the community continues to believe in forces beyond human control, attributing power to locations they consider sacred. These ritual activities are performed to attain peace and harmony with their environment.

Ritual ceremonies are closely intertwined with religious significance and the emotional devotion of community members. These ceremonies arise from fear and an inner need for spiritual peace while navigating life's challenges. Failure to conduct these rituals following the practices of their ancestors or elders is believed to evoke fear and anxiety among community members. The beliefs held by these individuals are deeply rooted, and failing to carry out traditional ceremonies in the manner handed down through generations can lead to undesirable consequences.

The presence of Christianity in the villages near the PT. IMM Siduarsi Sarmi nickel mining exploration area has also influenced the

community's perspective on their natural surroundings, shifting from an ecocentric to an anthropocentric ethic. As known, Christian doctrine believes that all natural resources are created to fulfill human welfare, placing humans at the center of preserving these resources. Consequently, humans tend to think primarily about their immediate needs and often sacrifice other natural elements. This view undoubtedly affects the community's long-standing perspective that humans and natural resources share an equal position in the ecosystem.

4.4. Community Activities in Natural Resource Utilization

The communities residing in the vicinity of the PT.IMM Siduarsih nickel mining exploration project in Sarmi Regency maintains a simple and traditional way of life. They rely on the environment for their daily sustenance, adhering to a subsistence lifestyle that involves foraging, hunting, and fishing. These communities have established customary norms and rules for sustainable utilization of their natural resources, encompassing activities such as gardening, hunting, and harvesting both timber and non-timber forest products, all guided by the principle of sufficiency.

4.4.1. Horticultural/Farming Activities

Based on observations made by the team, it is evident that local community farming activities near the company's operational area are generally subsistence-based. The communities primarily rely on foraging and hunting for their livelihoods. Farming activities remain traditional, involving shifting cultivation practices with mixed crops such as root vegetables, vegetables, bananas, and other staple foods, following a social forestry concept. The tools used are pretty rudimentary, including machetes and shovels. Land selection for cultivation is typically identified during hunting activities. Suitable land is marked and cleared by felling

trees and cutting through undergrowth. Once the land is cleared, it is planted with various crops to meet daily needs.

The extent of land allocated for farming depends mainly on the available labor force. However, based on observations, the communities typically have farm plots ranging from half a hectare to one hectare. Each family may have multiple garden plots in different locations, corresponding to their daily activities as foragers and hunters. Some communities maintain sago groves as food reserves, typically consisting of wild sago palms that are not cultivated. These sago palms are harvested when ready, and sago starch is extracted using traditional methods. However, recently, some communities have begun cultivating sago in the lowland swamps that are abundant in the region.

Monoculture farming practices have been initiated alongside mixed farming, particularly in the Kampung Nengke Baru/II area, which is very close to the city of the Pantai Timur Barat District. In this case, forested land was cleared by the TNI/Polri authorities and subsequently planted with paddy rice. However, this activity is still experimental as the community lacks knowledge of paddy cultivation, resulting in limited success. Additionally, despite being a lowland area with swamps, the land lacks irrigation infrastructure to supply water to the rice fields on time, hindering the expected yields.

The community places strict limits on land clearing around water sources to preserve the environment. Community members are prohibited from establishing gardens near water sources, with gardens only allowed to be developed at least 500 meters away from existing water sources. This prohibition ensures that the water supply remains undisturbed by community activities around water sources. Community gardens near the PT IMM Siduarsih exploration project area for nickel mining still follow the subsistence farming pattern, with mixed crops cultivated in forested areas. When the land is no longer deemed sufficiently productive, shifting

cultivation is employed, with some families having their land near the forest.

The size of the land cultivated by each family depends on the labor force within that family. If a family has many members, the farm size will be larger and more numerous. It is feasible because, in general, land availability has not been a limiting factor for the village up to this point. Thus, the community enjoys relative freedom in cultivating available land in the forest for their ownership.

4.4.2. Hunting activity

In several villages within the vicinity of the PT. IMM Siduarsih exploration project area for nickel mining, as in other areas in the Sarmi Regency, the local communities still observe various customary practices. These practices often involve using paraphernalia made from the feathers of the Bird of Paradise (Cenderawasih). Some of these customary activities include traditional dances, ceremonies to confirm new ondoafi/tribal chiefs, and the welcoming of esteemed guests. Consequently, indigenous communities continue hunting for the Bird of Paradise in the forests. This hunting activity is predominantly carried out by men using traditional and rudimentary tools such as bows, snares, and tree resins. However, in recent times, hunting the Bird of Paradise with air rifles has become more common. Consequently, many illegal Bird of Paradise markets in Jayapura sources their birds from the Sarmi Regency.

In the lives of indigenous communities, symbols with meanings understood only by the local population are frequently used. These symbols are relatively simple, yet the general populace adheres to their intended meanings. For example, symbols indicate the prohibition of entering a particular area for various activities, including hunting and others. These symbols are often created using tree branches or twigs found in the vicinity. They signify that individuals without business there are not

allowed to enter the area (see example in Figure 4.5). However, customary values appear to be declining for some members of the community. While these individuals still engage in Bird of Paradise hunting within their customary lands, the purpose of these hunts has shifted toward commercial interests, such as involvement in the illegal wildlife trade.

Some hunted animals include Cassowaries, tree kangaroos, flying squirrels, and the Mambruk bird (Kum-kum or forest pigeon), primarily for consumption to meet their dietary protein needs. Additionally, the Bird of Paradise is hunted for use in customary ceremonies. The results of these hunts are sometimes consumed within the family, and when the game is abundant, the surplus is taken to local markets, either fresh or preserved to meet other needs.



Figure 4.3. Various Spilocuscus maculatus (red and white) species in the village are nurtured by the community.

4.4.3. Sago Extraction

Sago holds significant cultural and nutritional value for the local community. Besides being a staple food alongside tubers, sago is a customary food inseparable from the Papua community, especially among coastal and lowland areas. Sago processing remains a traditional practice, directly harvested from the forest using rudimentary technology and simple methods, including felling, splitting, pounding, kneading, soaking, and straining. In addition to serving as a primary food source, sago palm leaves and trunks can be used as construction materials for houses, such as walls and roofs, utilizing both the fronds and the leaves. Another valuable

resource derived from the sago plant is sago grubs, which offer an exceptionally high protein content with low cholesterol levels, making them a health-friendly protein source.

4.4.4. Collection of Dammar Resin

Dammar resin is the first forest product of economic value for the community. Collecting dammar resin has had its heyday since the Dutch era in Irian. As is known, the dammar tree is a dominant tree species in the forests surrounding the company, with a substantial diameter of up to one meter and an average height of around 40 meters. This plant species grows abundantly in protected forests and production forests directly bordering the company's area/location.

4.4.5. Wood Cutting/Chainsaw

Several activities undertaken by the community to utilize the forest include collecting wood for construction, boat building, firewood, and other general purposes. These activities are typically carried out traditionally using cutting tools like axes and machetes. However, in recent times, there has been a significant increase in modern wood-cutting efforts using machinery, particularly chainsaws. Newcomers from outside Papua also undertake wood cutting with chainsaws. Residents are typically only involved in loading the cut wood onto trucks, which are then ready for transportation to the sawmill. The community generally receives compensation through permits to conduct these wood-cutting activities.

4.4.6. Extraction of Other Forest Products

Apart from hunting and gardening activities, people living around the work area of nickel mining exploration activities. PT. IMM Siduarsi Sarmi also uses the forest to meet other daily needs, for example, for fruits such as matoa, breadfruit and vegetables such as ferns and melinjo leaves

(Genemo). Harvesting of forest products is carried out only to meet daily needs and is rarely sold, except for matoa fruit.



Figure 4.4. Photo of Illegal Miners' Camp Source: Team Documentation 2022.

4.4.7. Gold Panning

Migrants from outside of Papua typically carry out gold panning activities. These illegal activities often lead to challenges from government authorities through operations to disband and expel miners who can harm the environment. However, these panning activities cannot be completely halted due to the exceptionally high price of gold.

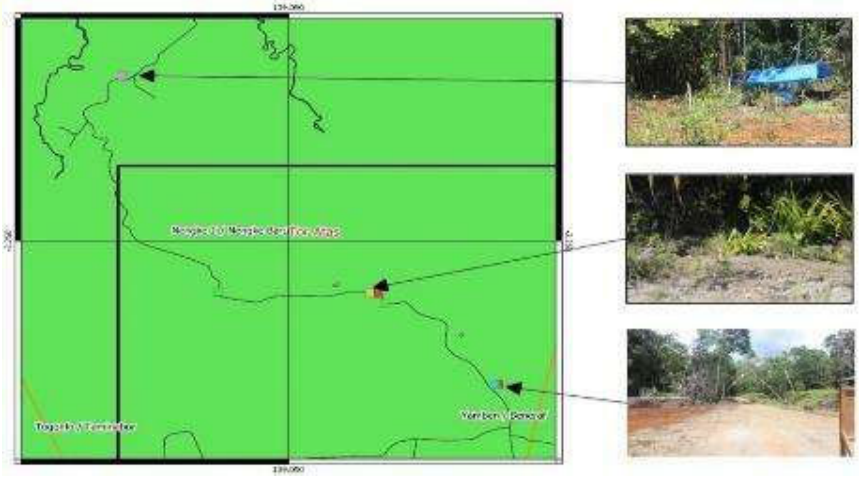


Figure 4.5. Map of Roads and Gold Panners' Basecamp Locations in the Area

4.4.8. Clean Water Collection

Some companies and other communities with activities in the vicinity also utilize the area to meet their clean water needs. At the hill's summit, a protected forest can serve as a water source, especially during the dry season.

4.5. Demographics

4.5.1. Population

Population data in the study area for PT. IMM's planned nickel mining exploration activities mainly focus on two districts closely related to the company's location: the Pantai Timur Barat District, with its capital, Burtin, and the Tor Atas District, with its capital, Samanenete. Data were obtained through secondary data and primary data sources. Secondary data were obtained from available records in relevant government agencies, especially from the Pantai Timur Barat District in the Population Development Data Report for the western part of Pantai Timur District and the Tor Atas District Sarmi Regency in Figures for the year 2022, as well as the Welfare Indicator and Gross Regional Domestic Product (PDRB) books published by the Central Bureau of Statistics of Sarmi Regency.

As both the subject and object of activities in the Pantai Timur Barat District and the Tor Atas District, the population is crucial in assessing population-related aspects. This is because every development activity plan can create population dynamics, including population size by gender, population structure by age group, livelihoods of the population, population by education level, population growth and development, and workforce participation.

4.5.2. Population

The population of the Pantai Timur District is 3,103 people, consisting of 1,649 males and 1,454 females, with a sex ratio of 113.4. Meanwhile, the Tor Atas District has a population of 935, comprising 508

males and 427 females, with a sex ratio of 119.0 (Sarmi Regency in Figures, 2022).

Table 4.1. Population by Gender and Sex Ratio in Sarmi Regency, Year 2022.

District	Population			Sex Ratio(%)
	Male	Female	Total	
Pantai Timur Barat	1,649	1,454	3,103	113.4
Tor Atas	508	427	935	119.0
Total	2,157	1,881	4,038	232.4

Source: BPS, Sarmi Regency in Figures, Year 2022.

Based on population data obtained from the Head of the Pantai Timur Barat District, it is known that the population of Nengke Baru Village, the nearest village and the gateway to the mining location, consists of 95 households (HH), with a total of 323 individuals, comprising 159 males and 164 females. Furthermore, the percentage of Nengke Baru Village population by age group can be seen in the table below.

Table 4.2. Population in the Pantai Timur Barat District by Village, Year 2022

No.	**Village**	**Head of Household (KK)**	**Male**	**Female**	**Total**
1.	Vinabor	114	216	211	427
2.	Nengke	210	402	379	781
3.	Vinabor II	91	188	167	355
4.	Nengke Baru	95	159	164	323
5.	Ayaf	99	179	185	365
6	Kwentor	57	106	88	196
7	Artibe	44	98	83	181
Total		710	1,348	1,277	2,628

Source: BPS, District in Figure, Year 2022

4.5.3. Population Growth

On the one hand, population growth in a region serves as a development asset due to the availability of a workforce in line with the population's growth. On the other hand, it can become a burden for the government as every individual requires necessities such as clothing, food, infrastructure, educational facilities, and employment opportunities. However, providing employment opportunities, especially creating new jobs or entrepreneurship, has become increasingly challenging for the workforce, whether in urban areas, suburban areas, or rural villages. This situation has created an imbalance between active job seekers and job vacancies.

According to the Official Report of the Central Statistics Agency of Sarmi Regency (2022), the population growth rate is 1.38 percent. It indicates an increase in births (fertility) and population migration. The comparison of the average population growth rates in the two districts of the study area over the past two years is presented in the following table.

Table 4.3. Population Density of Pantai Timur Barat and Tor Atas Districts, Sarmi Regency, in 2021

District	Annual Growth Rate	Population Density (individuals/km²)
Pantai Timur Barat	0.84	1.26
Tor Atas	0.54	0.47
Total	1.38	1.73

Source: Sarmi Regency in Figures 2022

Based on the data above, it is observed that the population growth rate during the year 2021 in Pantai Timur Barat District was 0.84, while in Tor Atas District, it was 0.54.

4.5.4. Population-Based on Age Groups

In the context of classifying the population based on productivity levels, the Central Bureau of Statistics divides the population into three (3)

age groups: individuals aged less than 15 years (young/less productive population), individuals aged 15 - 64 years (productive population), and individuals aged 65 years and above (non-productive population). Data and information about the population in the study area based on age groups are presented in the following table.

Table 4.4. Population Structure Based on Age Groups and Productivity Levels in Sarmi Regency

Age Group	Gender		Total	Percentage (%)
	Male	Female		
0 -14	3836	3836	7672	4.15
15 - 64	11,697	7,232	18,929	94.00
> 65	806	249	1055	5
Total	16,339	11,317	27,656	100

Source: BPS Sarmi in Figures, Year 2022.

The dependency ratio in the district is classified as moderate, with a rate of only 54.3 percent (meaning that for every 100 working individuals, there are 54 others to support with their livelihood). The age distribution of the respondents is depicted in the following table.

Table 4.5. Average Age of Respondents in the Study Area

No.	Age (Years)	Number of Respondents (N=40)	Percentage (%)
1.	15 - 25	4	10%
2.	26 - 35	7	18%
3.	36 - 45	7	18%
4.	46 - 55	6	15%
5.	56 - 65	8	20%
6.	> 65	8	20%
Total Respondents		40	100.00

Source: Primary Data Processed, 2022

4.6. Socio-Economic and Welfare

4.6.1. Employment

The primary occupations of the working population in the Pantai Timur Barat District of Sarmi Regency can be observed in the following table.

Table 4.6. Types of Livelihoods of the Population (Respondents) in the Vicinity of the Planned Activities in Sarmi Regency

No.	Livelihood Type	Number of Respondents (N=40)	Percentage (%)
1.	Farmer / Horticulturist	15	38
2.	Fisherman	8	20
3.	Civil Servant / Military / Police	3	8
4	Seller / Vendor / Small Shop Owner	3	8
5.	Construction Workers / Laborers	2	5
6.	Driver, Motorcycle Taxi Driver	2	5
7	Odd Jobs / Unspecified Employment	7	18
	Total	40	100

Source: Primary Data Processed, 2022

Based on the questionnaires distributed to 40 respondents, it is evident that most of the Pantai Timur Barat of Sarmi Regency population are farmers/horticulturists, comprising 38%, followed by fishermen at 20%. The remaining respondents have uncertain or miscellaneous employment. Additionally, 8% of the respondents work as civil servants.

4.6.2. Income Levels of the Population

The income levels of the population in the study area of nickel mining exploration activities by PT.IMM Siduarsih is closely related to the livelihoods that serve as the community's source of sustenance. To

determine the magnitude of the income levels obtained each month or year by the population in the study area, we can examine the reflection of the respondents' income levels. More specifically, the range of respondents' income levels can be seen in the following table:

Table 4.7. Range of Average Monthly Income Levels of Respondents in the Planned Activity Area

No	Income Level (IDR)	Number of Respondents (N = 40)	Percentage (%)
1.	< 500,000		
2.	500,000 – 1,000,000	14	35
3.	1,000,000 – 1,500,000	22	55
4	1,500,000 – 2,000,000	4	10
5	2,000,000 – 2,500,000	7	17.5
6.	> 2,500,000	3	7.5
	Total	40	100

Source: Primary Data Processed, 2022

4.6.3. Economic Facilities and Infrastructure

The provision of development facilities and infrastructure is essential for regional development, notably to support economic growth and development directly or indirectly related to improving the socioeconomic conditions of the population. Therefore, it is expected that the provision of these facilities, both directly and indirectly, can adequately meet the population's needs. The development of these facilities and infrastructure is intended to fulfill the increasing needs of rural populations and the organization of villages and towns as part of an efficient central and hinterland system according to their functions, as well as to enhance the mobility of the population in accessing service facilities and socioeconomic opportunities. The following is a summary of economic facilities and infrastructure.

Table 4.8. Economic Facilities and Infrastructure by Nengke II Village in Pantai Timur Barat District, 2022

Retail Stores/Kiosks	Permanent Market Buildings	Semi-Permanent Market Buildings	Mini Markets
2	-	1	-

Source: Statistics from the Nengke II Village Office

4.6.4. Natural Resources with Economic Value

The communities residing in the villages within the study area in the Pantai Timur Barat District and Tor Atas District have a long-standing presence in the forested areas, riverbanks, and coastal regions, spanning generations. Over time, these communities have managed the coastal and forested areas as sources of their daily livelihoods. Natural resources that hold economic value for these communities include:

1. Customary land rights: Customary land rights can be transferred through mutual agreements, typically involving compensation for these rights.
2. Timber forest products: This category includes ironwood, damar wood, and various types of meranti wood.
3. Non-timber forest products: These encompass damar resin, matoa, sago, breadfruit, orchids, and others.
4. Wildlife: Wild species such as cassowaries, deer, wild boar, tree kangaroos, and various bird species.
5. River produce: This category comprises prawns, squid, mud crabs, and various river fish species.
6. Marine resources: Several marine fish species are part of the marine resources available to these communities.

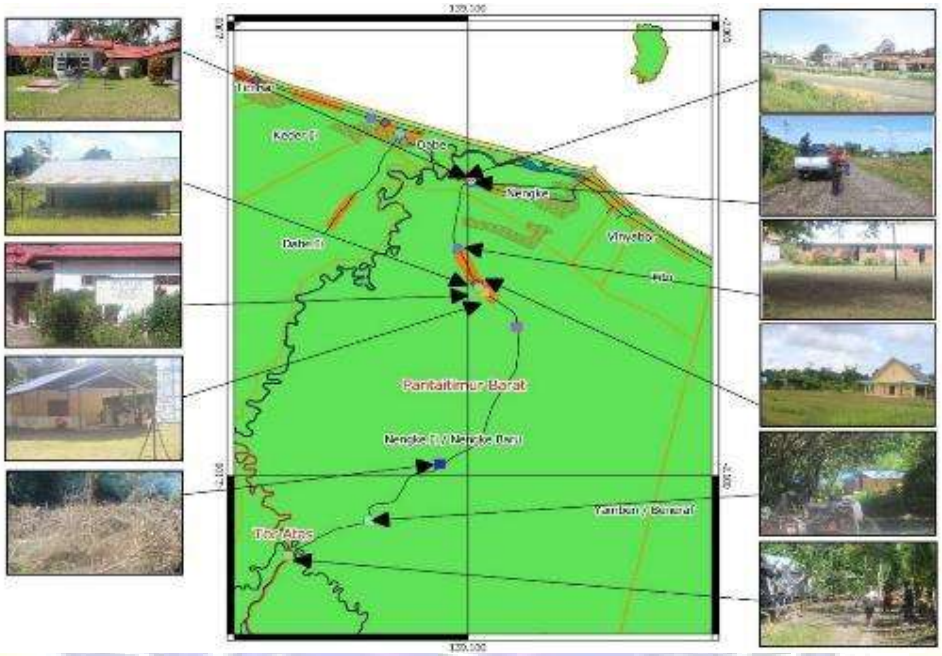


Figure 4.4. Map and Location of Activities of Residents around the Company's Location

4.6.5. Education

The highest school participation rate in Sarmi Regency in 2021 occurred at 13-15 years old, reaching 91.38 percent. It is indicated by the Value of School Participation (APS). The highest Gross School Participation (APM) is at the Elementary School (SD) level, reaching 91.02 percent. In 2021, there were a total of 101 registered schools under the Department of National Education, consisting of 9 kindergartens (TK), 65 elementary schools (SD), 18 junior high schools (SMP), 4 senior high schools (SMA), and 5 vocational schools (SMK).

The availability of educational facilities is a benchmark for assessing a region's education progress. Educational facilities support the smooth conduct of teaching and learning activities, both directly and indirectly. In the Pantai Timur Barat and Tor Atas Districts, the availability of school buildings is still relatively inadequate, especially

for senior high schools and their equivalent levels. The availability of school buildings that are considered adequate is the Elementary Schools (SD), which are evenly distributed in almost every village in the Pantai Timur Barat district, with each village having one to two SD buildings. The overview of educational facilities in the two districts can be seen in the table below.

Table 4.9. Types of Educational Facilities in Pantai Barat and Tor Atas Districts, Sarmi Regency 2022

No	District	School Building				Total
		PAUD/TK	SD	SLTP	SLTA/SMK	
1	Pantai Timur Baarat	3	5	1	1	10
2	Tor Atas	-	3	1	-	4
Total		3	8	2	1	14

Source: BPS, Sarmi in Figures, Year 2022

Facilities and infrastructure for learning are tools or components that play a crucial role in the success and smoothness of a process, particularly within the scope of education. Educational facilities and infrastructure are essential to support the implementation of teaching and learning processes directly and indirectly. Therefore, educational facilities and infrastructure are highly instrumental in achieving educational goals. Based on statistical data from the Nengke Baru Village Office, there are three educational facilities: one Early Childhood Education (PAUD) and one Elementary School (SD).

Table 4.10. Number of Schools in Pantai Timur Barat District and Tor Atas District, Sarmi Regency

No	District	Status		Total
		Public	Private	
1	Pantai Timur Barat	5	2	7
2	Tor Atas	6	-	6

Total	11	2	13

Source: BPS, Sarmi in Figures, 2022

Table 4.11. Number of Teachers in Pantai Barat and Tor Atas Districts, Sarmi Regency

No	District	Teachers' Status		Total
		Public	Private	
1	Pantai Timur Baarat	33	15	48
2	Tor Atas	32	-	32
Total		65	15	80

Source: BPS, Sarmi in Figures, 2022

Table 4.12. Number of Students in Pantai Barat and Tor Atas Districts, Sarmi Regency

No	District	Teachers' Status		Total
		Public	Private	
1	Pantai Timur Baarat	393	215	608
2	Tor Atas	304	-	304
Total		707	215	912

Source: BPS, Sarmi in Figures, 2022

Table 4.13. Gross and Net Enrollment Rates by Education Level in Sarmi Regency

Education Level	APM	APK
SD	91,02	1108,46
SLTP	77,70	102,79
SLTA	50,17	89,64

Source: BPS, Sarmi in Figures, 2022

Table 4.14. Percentage of Population Aged 7-24 Years by Gender, School-Age Group, and School Participation in Sarmi Regency, 2021

Gender and Age Group	Participation		
	Never Attended School	Currently Enrolled	Not Enrolled and Not in School

Male			
7-12	3.96	9.86	6.17
13-15	-	95.95	4.05
16-18	-	64.45	35.55
19-24	3.33	30.45	66.22
7-24	2.29	65.63	32.08
Female			
7-12	5.61	91.85	2.54
13-15	-	87.15	12.85
16-18	-	80.85	19.15
19-24	2.41	19.06	78.53
7-24	2.86	70.51	26.63
Male and Female			
7-12	4.92	91.02	4.06
13-15	-	91.37	8.63
16-18	-	71.74	28.26
19-24	2.94	25.56	71.50
7-24	2.58	68.07	29.35

Source: BPS, Sarmi in Figures, 2022

4.7. Health Components

Health facilities play a crucial role in the well-being of the community. Health facilities provide services for both Individual Health Efforts (IHE) and Public Health Efforts (PHE), including outpatient and inpatient care. Several health facilities are available in Nengke Village, including one community health center (puskesmas).

Access to healthcare services that are equitable, convenient, and affordable is the aspiration of the entire community. The government has provided various healthcare facilities and infrastructure to enhance healthcare services. The government also continues to increase the quantity and quality of healthcare personnel. The effectiveness of healthcare services is greatly influenced by the availability of adequate facilities, a sufficient and professional healthcare workforce, and ease of access to healthcare services.

4.7.1. Healthcare Facilities

In 2022, Sarmi Regency had one hospital, 2 clinics, 11 community health centers (puskesmas), 24 sub-district health centers, and 4 pharmacies. Furthermore, to facilitate community access to healthcare services, Sarmi Regency has additional healthcare facilities supporting the region's health services. Sarmi Regency has 19 doctors, 177 nurses, 124 midwives, 14 pharmacists, and 13 nutritionists to support the existing healthcare facilities.

Table 4.16. Number of Healthcare Facilities in Pantai Timur Barat District and Tor Atas District, Sarmi Regency, 2022

District	Hospitals	Community Health Centers	Sub-District Health Centers	Clinics	Total
Pantai Timur Barat	1	1	0	1	3
Tor Atas	-	1	1	0	2
Total	1	2	1	1	4

Source: Sarmi Regency in Figures 2022

4.7.2. Healthcare Personnel

Meanwhile, for a detailed breakdown of healthcare personnel in the two districts adjacent to the working area of nickel mining exploration by PT. IMM can be seen in the following table.

Table 4.17. Number of Healthcare Personnel by District in Sarmi Regency, 2022

District	Doctors	Nursing Staff	Midwifery Staff	Pharmacy Staff	Total
Pantai Timur Barat	1	10	7	1	19
Tor Atas	-	13	15	1	29
Jumlah	1	23	22	2	48

Source: BPS Sarmi Regency in Figures, 2022

4.7.3. Sanitation and Environmental Health

1) Housing

Housing is a basic human need and serves as a place of residence and a means of family development. The condition of a house as a place of dwelling significantly impacts the quality of its occupants. Houses that do not meet the criteria of a healthy dwelling can contribute to spreading diseases and health problems.

According to Riskesdas criteria, a healthy house meets seven criteria: roof, ceiling, permanent walls, non-earth floors, availability of windows, adequate ventilation, sufficient natural lighting, and not overcrowded (≥ 8 m^2/person). Based on the survey results in the study area, the percentage of houses that meet the criteria for a healthy dwelling is only 85%.

Table 4.18. Types of Local Housing in Pantai Timur Barat District, 2022

Type of House	Number (units)	Percentage (%)
Elevated Houses	6	15
Semi-Permanent Houses	13	32.5
Permanent Houses	21	52.5
Jumlah	40	100

Source: Primary Data Processed, 2022

2) Toilet Facilities

The survey results among 40 residents indicate that only about 25% of the population in the activity area uses pit latrines for defecation. Meanwhile, those who use sanitary toilet facilities make up only 65%.

Table 4.19. Types of Toilet Facilities in Pantai Timur Barat District, Sarmi Regency, 2022

Toilet Facility	**Users**	
	Number	**%**
Latrines (private/communal)	26	65
Riverbanks/stream (open defecation)	5	12.5
Bushes around the house	9	22.5
Total	40	100

Source: Primary Data Processed, 2022

3) Waste Management

The waste handling reflects the community's behavior in supporting a healthy lifestyle. The community itself entirely manages waste generated from each household in the vicinity of the activity area. It is due to the absence of a body/agency/institution responsible for waste management in that location. The waste management practices of the community essentially involve disposing of waste in designated areas and subsequently burning it. However, a small portion of the population still dispose of waste in fields or empty land near their homes.

Table 4.20. Waste Management Practices in Pantai Timur Barat District, Sarmi Regency, 2022

Waste Management Method	Users	
	Jumlah	%
Burned	11	27.5
Buried	26	65
Dispose of anywhere	3	7.7
Total	40	100

Source: Primary Data Processed, 2022

4) Drinking Water Facilities

The survey results indicate that approximately 55% of the population utilizes dug wells to meet their drinking water needs. These dug wells are accessed directly by some, and for others, water is accessed through water terminals located in Kampung Nengke Baru Village.

Table 4.21. Sources of Drinking Water in Pantai Timur District, 2022

Source of Drinking Water	Users	
	Number	%
Dug wells (water terminals)	22	55
River/stream water	14	35
Swamp water	-	0
Rainwater (PAH)	4	10
Total	40	100

Source: Primary Data Processed, 2022

Table 4.22. Water Treatment Before Consumption

Water Treatment Method	Users	
	Number	%
Boiled	32	80
Settled	3	7.5
Untreated (consumed directly)	5	12.5
Total	40	100

Source: Primary Data Processed, 2022

To meet their clean water needs, the population generally utilizes river/stream water, accounting for approximately 55% of the population. When river water levels are high during the rainy season, it is sometimes even used for drinking.

4.8. Public Knowledge of Nickel Mining Exploration Activities

The socialization process is crucial in determining an idea or

concept's internalization and social adaptation within a community. The knowledge of the community regarding Nickel Mining Exploration activities in Gunung Siduarsi, Pantai Timur Barat District, can be observed in Table 4.23.

Table 4.23. Community Knowledge (Respondents) around the Activity Location and Information Sources Regarding Nickel Mining Exploration Activities

No.	Description	Respondents (N = 40 People)	Percentage (%)
1	Do the Community members know about the Plan for Nickel Mining Exploration Activities in Siduarsi:		
	a. Yes	38	95
	b. Do not Know	2	5
	Total	40	40
2.	Sources of information about the plan:		
	a. District Government	8	20
	b. Project Initiators	0	0
	c. Head of the Tribe	15	37,5
	d. Other Residents	7	17,5
	Total	40	40

Source: Primary Data Processed, 2022

The following table shows the opinions or perceptions of the community (respondents) regarding traditional community activities and events that are still ongoing and commonly occurring in the study area of planned activities.

Table 4.24. Community Perceptions (Respondents) Regarding Traditional Activities and Events around the Planned Activity Location

No.	Description	Respondents (N = 40 People)	Percentage (%)

1	Cooperation or mutual assistance activities: a. Yes, always b. Rarely	38 2	95
2.	Community Meetings: a. Often b. Rarely	25 15	62.5 37.5
3.	The community still practices customs and traditions: a. Yes, still b. Rarely	38 2	95 5
4.	Criminal acts that occur: a. Yes, often b. Very rare	3 4 33	7.5 10 82.5

Source: Primary Data Processed, 2020

The results of interviews with respondents indicate that the community's opinions regarding community activities in the form of traditional customs and traditions are still being practiced in the community. Ninety-five percent of the respondents stated that residents are still upholding customary traditions. Similarly, residents still regularly carry out cooperative or mutual assistance activities, with 95% still participating in their daily lives around the planned activity location.

Furthermore, approximately 7.5% of respondents stated that criminal activities rarely occur in the planned activity area, such as fights among residents, excessive drinking, and theft. It indicates that the community in this area continues to lead a peaceful and safe life, free from various disturbances or issues, allowing residents to carry out their daily activities with peace of mind.

This situation is not unrelated to the presence and role of the government and customary rules that have long been agreed upon and

practiced collectively by the community in the study area. Customary rules that govern community life and social interaction contribute significantly to maintaining the residents' peace. The rules and sanctions for any violations in community life serve as lessons for each resident not to break the established rules.

4.9. Attitudes and Perceptions of the Community Regarding the Plan for Nickel Mining Exploration Activities

The plan for nickel mining exploration activities by PT IMM in Siduarsi has elicited various responses and perceptions from the residents. These include concerns about the potential disruption of amenities or comfort and tranquility due to mining development activities. There are also worries about environmental pollution resulting from nickel mining exploration activities. Table 4.25 below illustrates the various community perceptions regarding the plan for nickel mining exploration activities at the project site.

Table 4.25. Attitudes and Perceptions of the Community (Respondents) around the Activity Location Regarding the Plan for Nickel Mining Exploration Activities

No.	Description	Respondents (N = 40 People)	Percentage (%)
1.	Attitudes and perceptions of the community toward the existing nickel mining exploration activities		
	a) Supportive	35	87.5
	b) Not Supportive	2	5
	c) Leave it to the Government/Custodians	3	7.5
2.	Concerns about disturbances due to noise and dust as well as pollution from bridge construction activities		
	a) Yes, Concerned	12	30
	b) Not Concerned	28	70

3.	Creating job opportunities and businesses for residents a) Yes, Open b) Do not know	 14 26	 35 65

Source: Primary Data Processed, 2022

4.10. Public Facilities

Based on the observations conducted around Kampung Nengke Baru and the district town closest to the location of PT IMM Siduarsi's nickel mining exploration activities, several public facilities have been utilized by the community, including:

a. Roadways

The main road from Jayapura to Sarmi leads to the nickel mining exploration site. The condition of the road is gravel with situ surfacing. This road is the only route to access the company, apart from being used by PT. IMM Siduarsi's mining exploration company is also utilized by other parties and the community for various activities such as logging, gold panning, hunting, gardening, etc.

b. Places of Worship

In the Nengke Baru Village location, two places of worship in the form of churches were found. One church is an older one, while the new church is a newly constructed building to meet the growing needs of the congregation. The construction of the new church was a community initiative in Nengke Baru Village.

c. Educational Facilities

In Nengke Lama Village, two schools were founded: one Early Childhood Education (PAUD) facility and one Elementary School (Sekolah Dasar). Meanwhile, Junior High School (SMP) and Senior High School (SMA) facilities are located in Burtin, the district capital. The distance from Nengke Baru Village to Burtin, the district capital, is relatively close and can be reached by walking, according to the

residents.

d. Village Hall

To facilitate community activities in Kampung Nengke Baru, an austere building is used as the Village Hall. This space has been used for various government activities and social events within the community. The current condition of the Village Hall is aging and requires renovation.

e. Electrical Grid

Nengke Baru Village currently benefits from an electrical grid, and the electricity supply is available 24 hours a day. This provision of electricity has undoubtedly facilitated various aspects of daily life for the community.

f. District Office

The district office is located in Burtin, the district capital, which is relatively close to Kampung Nengke Baru. The presence of this office significantly aids the community in accessing government services, such as obtaining Family Cards (Kartu Keluarga) and National Identification Cards (KTP), which are essential for various purposes.

g. Puskesmas

The Community Health Center (Puskesmas) is situated in Burtin Village. This facility is equipped with doctors, other medical staff, and inpatient facilities. Consequently, should any community members require medical services, they can promptly visit the Puskesmas in Burtin Village.

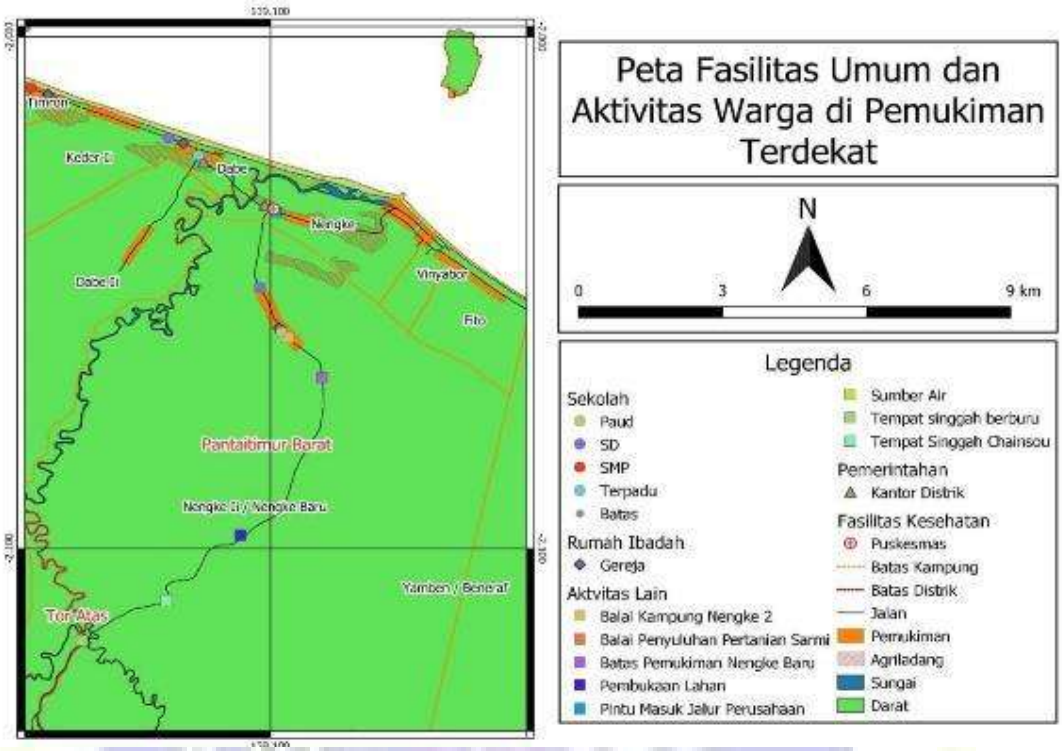


Figure 4.5. Public Facilities Map

4.11. Key Stakeholders

Stakeholder Identification

The social study team carried out the identification of the community and other stakeholders through stakeholder mapping. The focus of this identification was on stakeholders who not only have an influence but also have a high level of interest in the policies, plans, and/or programs to be formulated and are concerned about the environment. Based on the results of the discussions, key actors have been identified as listed in the table below.

Table 4.26. Stakeholders in Sarmi Regency

Decision Makers	Bupati (Regent)	Plays a role in spatial planning policy decisions.

Influence	People's Consultative Assembly (DPRD), Provincial Government, and Heads of Regency-level Work Units (SKPD).	This group has a significant influence in directing decision-makers legally.
Policy Makers	Regional Development Planning Agency (Bappeda)	They play the most dominant role in directing policy.
Policy Users	Regency Government, Regency-level Work Units (SKPD), district heads, village heads, private entities, and other related parties.	As policy users, this group needs to understand the background, objectives, policy provisions, and implications. Furthermore, the parties in this group deeply understand the situation, issues, and data and information essential for policy formulation.
Affected Groups	All residents from various professions around the Nikel Siduarsi mining project site.	This group needs an understanding of the background, objectives, policy provisions, and implications.
Information-Rich Stakeholders	Universities, experts, community leaders, donor institutions, and non-governmental organizations (NGOs).	This group is relatively independent but can have a significant influence on substance.

4.12. Existing Community Development Programs

Community development programs in Sarmi Regency, especially in Nengke II Village, Pantai Timu Barat District, which serves as the main access road to the project site, include:

- Development of horticultural seedlings in the community.
- Rice field development (rice) is currently under implementation.

The village government carries out the development of these programs through village funds. Additionally, the community receives horticultural seedlings such as rambutan, durian, and mango from the Sarmi Regency government through relevant agencies. According to

interviews with the residents of Kampung Nangke II, this program has been ongoing since 2015, primarily focusing on community empowerment through horticultural development, while rice field development is a relatively new program initiated in mid-2022.

4.13. Social Risks and Conflict Potential

The results of the team's social risk and conflict potential identification show that road access is one source of social risk and potential conflict, especially between the community and the company. As previously explained, even though the project location is not part of the ancestral rights of the local tribes and clans, the only road to the company's location must pass through this area. Therefore, the company has no choice but to maintain good communication with the community, who are the owners of the customary rights in the area and the general community of Kampung Nengke Baru. Some communities have customary rights along and along the road to the PT. IMM's nickel mining exploration company, which passes through the territory of several clans/tribes and could potentially lead to social conflict, including:

a. Km 5 to 15: Syef and Abi
b. Km 15 to 27: Wenken
c. Km 27 to 37: Namwaram
d. Km 37 to 42: Oisba
e. Km 42 to 62: Maria
f. Km 62 to the peak: Noker

In addition to these clan/tribal groups, the communities in Tor Atas District also have conflict potential with the company. It is because, despite most of the company's operational areas falling under Tor Atas District from an administrative governance perspective, many communities with customary rights reside in Tor Atas. Although these issues have been previously addressed and resolved through negotiations, there is a possibility that this potential will re-emerge. Thus, active

communication efforts with all communities in the vicinity of the company and the customary rights owners, government officials, religious leaders, and the company are necessary to minimize potential conflicts.



Figure 4. Map of Conflict Potential Areas

CHAPTER V
SOCIAL AND CULTURAL ASPECTS OF THE COMMUNITY AROUND PT. INM EXPLORATION WORK AREA FOR NICKEL MINING

5.1. Social and Cultural

5.1.1. Customs and Traditions

The people of Sarmi originate from five tribal groups residing in the Sarmi Regency. The name "SARMI" is an abbreviation of the five tribal groups inhabiting the region: Sobey, Armati, Rumbuai, Manirem, and Isirawa. These five tribal groups in the Sarmi Regency are spread across several districts, as follows:

1) The Sobey tribal group inhabits the Sarmi Kota district and the eastern Sarmi region.
2) The Armati tribal group resides in the Tor Atas and Apawer Hulu districts.
3) The Rumbuai tribal group is found in the Bonggo and Bonggo Timur districts.
4) The Manirem tribal group inhabits the Pantai Timur Barat and Pantai Timur districts.
5) The Isirawa tribal group resides in the Pantai Barat (Arbais) and Sarmi Selatan districts.

The ethnic groups residing in the Sarmi Regency primarily adhere to a patrilineal kinship system, significantly influencing their ownership and inheritance rights system.

5.1.2. Social Structure

The local Papuan community in the study area forms strong ethnic groups, where each ethnic group establishes a social structure that strengthens the bonds among its members. This structure includes

the traditional tribal leader or tribal chief at the top level, followed by the village head or clan leader, family head, and family members successively.

Migrants do not have a social structure like the local population. The social structure among migrant communities follows a formal governmental structure, such as the village administration. The highest level is the village head, and below the village head are the head of the community unit (RW), the head of the neighborhood unit (RT), family heads, and family members.

5.1.3. Leadership and Decision-Making

In the tribes located in the Pantai Timur Barat and Tor Atas districts, traditional leadership held by tribal chiefs is recognized. Tribal chiefs are traditionally passed down to the eldest son of the tribal chief. It is important to note that the position of tribal chief is synonymous with that of the tribal leader, and both have the same role, which is to resolve various social and cultural issues that arise internally among members of the ethnic group. They also handle issues between members of the same ethnic group and between different ethnic groups.

Besides tribal chiefs and tribal leaders, the tribes in the study area also have a formal leadership structure known as the village head. Village heads are officially selected through village head elections and are subsequently appointed by the district head.

5.1.4. Native Land Rights at the Activity Location

The customary land rights system in Sarmi generally covers land, hamlets, rivers, and all plants growing on them. Sarmi also adheres to a patrilineal system, meaning that land inheritance is based on the paternal line, which applies to all clans or families within the

Sarmi tribe. According to customary rules, a person cannot enter another person's or clan's land without permission. It means that every person can live on and cultivate their land, and there is a prohibition against crossing it without permission or knowledge of the landowner's clan, especially if they are from a different tribe. For the Sarmi tribe, the children of sisters or their nephews are allowed to work on their uncles' land with their uncles' permission, and even in-laws can manage land owned by the female side with their consent. Violating this prohibition disrupts the social order of the community.

The Sarmi community in the Tor Atas and Pantai Timur Barat districts culturally belongs to the Armati tribe, whose territory stretches from the Tor Atas region to Apawer Hulu in the past, where their ancestors lived separately according to their respective tribal territories. However, over time, with increased contact with outsiders and improved access to their territory, there has been a desire among the population to settle in a particular area.

5.1.5. Pattern of Land and Forest Ownership

In the study area of the Pantai Timur Barat and Tor Atas districts, it is evident that land, forests, and other natural resources are clan or family-based customary rights. Each clan or family belonging to the major tribes in the study area has customary rights distinct from one another. It is worth noting that some Papuan people prefer to use the term "customary rights" instead of "land rights." Both terms, customary and land rights, essentially refer to the communal ownership of natural resources such as land and forests.

The control of natural resources such as land by an individual member of a clan or family is obtained as an inheritance from previous generations based on paternal lineage. The ultimate authority over natural resources rests with the Head of the Clan/Family, thus making

decisions regarding their management. Each clan/family possesses its customary land area, demarcated by natural boundaries inherited from previous generations. However, currently, there are land areas claimed as customary rights by more than one clan/family. A member of a clan/family has the right to manage or utilize natural resources and harvest the yields for the benefit of their family. This right is granted to each member of the clan/family after obtaining the approval of their clan/family head. Outsiders do not have the right to control natural resources such as land and forests. Their rights are limited to usage rights granted by the clan/family head based on mutual agreements with other members of their clan/family. Furthermore, if an outsider vacates the land they have been using, the land will revert to the clan/family holding customary rights over it.

5.1.6. Utilization Patterns of Natural Resources

Natural resources such as land and forests are utilized by individuals within specific clans or family groups who hold customary rights over these resources. Each individual within these clan or family groups can utilize natural resources within the territorial boundaries of their clan or family, subject to the permission of the clan or family head. Some members of one clan or family may feel uncomfortable utilizing natural resources like land and forests traditionally controlled by another clan or family. The community's primary types of utilization include settlement, wildlife hunting, fishing, gathering forest products, and farming. Settlements are one form of land utilization in all villages within the Tor Atas District. Geographically, most of the villages in the Tor Atas District are located around forested areas and along riverbanks. Wildlife hunting is carried out by clan or family members in grasslands and forested areas controlled by their respective clans or families. The community performs the gathering of forest

products for consumption and other subsystem needs, including wood for various constructions, in forested areas. Farming or agriculture is conducted using traditional methods and subsistence-oriented techniques.

The communities residing near the PT.IMM Siduarsih nickel mining exploration area in the Sarmi Regency maintains a simple and traditional way of life. In utilizing natural resources for their daily needs, they still heavily depend on the natural resources in their surroundings, living as subsistence communities involved in foraging, hunting, and fishing. Furthermore, they adhere to rules and norms for sustainable utilization of their local natural resources, including gardening, hunting, and harvesting both wood and non-wood forest products, based on the concept of sufficiency.

1) Horticultural/Farming Activities

Based on our observations, the local community's agricultural activities near the mining exploration company's operational area are primarily subsistence-oriented. These communities rely on foraging and hunting for their livelihoods. Agricultural activities are still in traditional farming, involving shifting cultivation with mixed crops such as tubers, vegetables, bananas, and other hardy plants with a social forestry concept. The equipment used remains very rudimentary, consisting of machetes, hoes, and stakes. Land selection for gardening is typically identified during hunting expeditions. Suitable gardening sites are marked and cleared by cutting down trees and undergrowth. Once the land is cleared, various types of crops are planted for daily consumption.

The size of the land designated for gardening depends mainly on the available labor force within each family. Based on our observations, families have garden plots ranging from half a hectare to

a hectare. However, each family may have gardens in multiple locations, depending on their daily activities as foragers and hunters. Some communities have sago groves as their food reserves. Sagu palms grow naturally without cultivation, and sago palms are harvested when they contain sufficient sago flour. Community members identify sago palms ready for harvest by examining the fronds; the shorter the fronds, the closer the palm is to being harvested traditionally for its sago flour. However, some communities have recently started cultivating sagu in the swampy lowland areas.

In particular, monoculture farming has been initiated alongside mixed farming in the location of Nengke Baru/II Village, which is very close to the Pantai Timur Barat District. Forested land was opened by military and police personnel and then planted with wetland rice. This activity is still experimental, as the local community lacks knowledge of rice farming, making the success of this endeavor uncertain. Additionally, despite wetlands in the lowlands, the land does not yet have irrigation systems to supply water to the rice fields on time, resulting in less successful yields than anticipated.

The community strictly limits land clearing around water sources to preserve the environment. Communities are prohibited from opening gardens near water sources, with gardens only allowed at a minimum distance of 500 meters from existing water sources. This restriction is intended to ensure that community activities near water sources do not disrupt the available water supply. Farming by communities near the PT IMM Siduarsih nickel mining exploration area remains subsistence-oriented, following a shifting cultivation pattern within forested areas. If the land is no longer productive, the community will relocate to a new area (shifting cultivation). Agricultural land within forested areas is managed as customary land

owned by each family.

The size of land cultivated by each family depends on the labor force available within that family. If there are more family members, the number and size of gardens will be more significant. It is possible because, in general, the availability of land has not been a limiting factor in these villages. Consequently, communities have more leeway in developing the available land in the forest for their use.

2) Hunting Activities

In some villages near the PT. IMM Siduarsih nickel mining exploration area, as in other regions of the Sarmi Regency, various traditional customs and rituals are still practiced by the community, involving bird-of-paradise (Cenderawasih) parts and accessories. These customs include traditional dances, the inauguration ceremonies for new tribal chiefs (ondoafi), and welcoming essential guests. Therefore, the indigenous people continue to hunt birds of paradise in the forest. Men mainly carry out bird-of-paradise hunting using traditional and simple equipment such as bows, snares, and glue. However, in recent times, bird-of-paradise hunting has also been carried out using air rifles, resulting in a significant illegal bird-of-paradise market in Jayapura, sourced from the Sarmi Regency. In the indigenous people's way of life, symbols play a significant role, and their meanings are understood only by the local community. These symbols are relatively simple, but the community generally adheres to their intended meanings. For example, a symbol indicating a prohibition on entering an area for certain activities, including hunting and other actions, is created using tree branches or twigs in that location. This symbol indicates that unrelated people should not enter that area (see Figure 5.1). However, for some community members, these traditional values appear to be eroding, as some are increasingly engaging in commercial activities, such as illegal trade,

regarding the use of bird-of-paradise parts.



Figure 5.1. The symbol of the cross (X) made from tree branches indicates restricted area access.

5.2. Perceptions Based on Traditional Values

The viewpoints of the communities around the PT. IMM Siduarsih nickel mining exploration area in the Sarmi Regency, regarding themselves, their environment, their behavior towards one another, and their environment, are shaped by the norms and values embedded in their culture. Through their local wisdom, the communities act following the wisdom they possess. Therefore, in sustaining their lives, the communities cannot detach themselves from their environment; they continuously depend on and interact with it. From their life experiences and journeys, the communities around the PT. IMM Siduarsih nickel mining exploration area in the Sarmi Regency receives consistent guidance on what is permissible and impermissible concerning their surrounding environment to achieve a better life. Through their environment, these communities learn about their entire existence, which depends on nature and is perceived as a power that can determine the salvation or destruction of humanity. Thus, the communities believe they will suffer if the natural

environment is damaged. Therefore, even though the natural environment is a resource for human livelihood, they endeavor to use it carefully. The same applies to bird-of-paradise, as although the communities utilize it in various ritual ceremonies, they do so cautiously to maintain harmony. Hence, the communities' interaction with bird-of-paradise is not exploitative for maximal gain but tends to focus on preserving harmony. It is because, in general, the Papuan communities still believe that violating cultural norms will result in sanctions within the community and through supernatural forces.

These views of the community are transmitted orally from one generation to the next by the elders. While these teachings are oral, they are respected and obeyed. Aspects such as relationships with the natural environment are highly respected, as evidenced by the attitudes and actions that reflect adherence to norms governing the use of environmental resources. These principles are still firmly held by the communities around the PT. IMM Siduarsih nickel mining exploration area in the Sarmi Regency. However, it cannot be denied that, for some community members, traditional values are starting to erode with increasing access to transportation and information from outside the region.

In the communities around the PT. IMM Siduarsih nickel mining exploration area, there are specific cultural values that, when taken together, form a system. The collection of various cultural values in the community serves as a guide for the ideal concept that drives a harmonious life for community members with specific objects, in this case, the bird of paradise. Therefore, the cultural values in the community also determine an individual's attitude towards the bird of paradise and the objects they encounter. Thus, some aspects of local wisdom that significantly contribute to community-based conservation efforts can be found in indigenous communities, particularly those that are strong.

5.3. Belief Systems

While the residents of the villages around the PT. IMM Siduarsih nickel mining exploration area all adhere to Christianity, but the influence of ancestral beliefs, including animism, persists to some extent. Almost all community members still hold on to the teachings of their ancestors or incorporate these beliefs into their daily lives. It can be observed in various beliefs and rituals contradicting Christian teachings, such as making offerings in specific places or times. These actions are performed because the community still believes in supernatural forces beyond human beings present in sacred places. These beliefs signify that the community can communicate with all the resources in their environment.

5.3.1 Community Beliefs in Mythical Beings and Myths

For the communities in the villages around the PT. IMM Siduarsih nickel mining exploration area, located near forests and coastlines, has a long-standing concept of utilizing and preserving natural resources based on their beliefs. The communities still believe that all components of nature possess spirits like humans and can be communicated with by specific individuals. The relationship between humans and their surrounding environment is harmonious: when humans treat the environment well, the environment will treat humans well in return, and vice versa. If humans mistreat the environment, it can result in calamity, and disasters are believed to be caused by human misconduct towards their surroundings. Therefore, all disasters are thought to be caused by human actions that violate the norms of the local culture.

In their daily lives, to maintain harmony with their surroundings, the communities have customary norms that include prohibitions, taboos, or restrictions on certain activities in specific places and at specific times. For example, certain places are considered sacred, and community members are prohibited from engaging in activities like gardening,

hunting, or harvesting natural resources except during ritual ceremonies. Actions by the community that contradict prevailing norms or violate natural laws are believed to disrupt the cosmic order, resulting in upheaval or disaster. Thus, communities are taught from generation to generation that humans must not merely dominate nature but must always strive to adapt to the mysterious and unpredictable natural environment and focus on actions that maintain a harmonious coexistence between human life and the environment.

Various stages in the cultural development process demonstrate how communities seek the most appropriate relationship with the forces in their environment. In a mystical mindset, supernatural forces are considered tangible, as humans can participate in these forces, such as in rituals, dances, and more. Here, humans seek a balance between themselves and their environment. When humans die, their spirits reside in other objects or natural resources around them, never leaving. Maintaining a good environment ensures the well-being of those who have passed away. Thus, communities believe that a harmonious life for humans can only be achieved if humans maintain harmony with their environment.

The presence of forces beyond human understanding (supernatural) continues to be believed by some community members. They believe that nature is not inhabited solely by visible creatures but also by invisible beings. These invisible beings are believed to reside near human dwellings, in forests, ravines, capes, trees, rocks, pools, and more. These invisible beings include the spirits of their ancestors, which can take various forms, including bird-of-paradise. Thus, the community believes they should always think, speak, and act cautiously.

Indeed, even though the entire village community adheres to the Christian faith and no longer believes in the practices above, the influence of their ancestral beliefs cannot be easily discarded. Nearly all members of the community still adhere to the teachings of their ancestors or blend

them with their daily lives. It is evident in the continued presence of ritualistic beliefs, such as offering sacrifices at specific locations or during particular times. These practices persist because the community still believes in powers beyond human control, believing that sacred places hold unique forces. The community conducts ritual activities to attain peace and harmony with their environment.

Ritual ceremonies are closely tied to religious significance and emotional devotion among the community members. All these ceremonies stem from fear and a sense of unease in navigating life. Failing to conduct these traditional rituals following the practices of their ancestors can evoke fear among the community members, as it may lead to unwanted consequences. These beliefs are deeply ingrained within the community, and failing to uphold these traditional ceremonies as passed down through generations can generate apprehension due to the potential for adverse outcomes.

Nevertheless, the presence of the Christian faith in the villages surrounding the working area of the nickel mining exploration by PT. IMM Siduarsih in Sarmi has significantly influenced the community's perspective on their surrounding environment, shifting from an ecocentric ethic to an anthropocentric one. As known in Christian teachings, it is believed that all natural resources were created for the well-being of humanity, making humans the central and primary focus in preserving these resources. In this context, humans prioritize immediate needs for their pleasure, potentially sacrificing other elements of the environment. This viewpoint undoubtedly affects the long-held perspective of the community, which previously regarded humans and natural resources as having equal standing within the ecosystem.

CHAPTER VI
CONCLUSION

Based on the results of the social study conducted around the Nickel Mining Exploration Project in Siduarsi by PT. IMM in Sarmi Regency, several vital pieces of information have been gathered for use as a basis for policy-making related to the social, cultural, and economic aspects of the surrounding communities, as outlined below

a. The people of Sarmi belong to five tribal groups inhabiting Sarmi Regency: Sobey, Armati, Rumbuai, Manirem, and Isirawa.
b. The working area for nickel mining exploration by PT. IMM is within the customary land rights of the Marya tribe, with the following boundaries:
    - Western Part: bordering the customary land rights of the Etik and Berik tribes.
    - Eastern Part: bordering the customary land rights of the Foya and Etik tribes.
    - Southern Part: bordering the customary land rights of the Noker tribe.
    - Northern Part: bordering the customary land rights of the Sendua tribe.
c. The access road to the nickel mining exploration site passes through the customary lands of several tribes, including:
    - Kilometer (KM) 1 to KM 15 constitutes the customary land of the Syef and Abi tribes.
    - Kilometer (KM) 15 to KM 27 comprises the customary land of the Wenken tribe.
    - Kilometer (KM) 27 to KM 37 encompasses the customary land of the Namwaram tribe.
    - Kilometer (KM) 42 to 62 is designated as the customary land of

the Noker/Oisba/Maria tribes.

- Kilometer (KM) 62 and beyond is recognized as the customary land of the Noker tribe.

d. The farming activities of the local community in and around the Nickel Mining Exploration Project area in Sarmi Regency are generally subsistence-based, where people rely on hunting and gathering for their livelihoods. However, for those near urban districts, farming and animal husbandry activities have started under the guidance of the local government.

e. The presence of a population that has long adhered to customary traditions, where all social activities are closely linked to local customs, is noteworthy. Despite recent demographic changes, with the influx of settled communities engaged in gold mining and wood cutting, the entry of investors, including mining and timber activities, has contributed to the transformation of this area towards a more open society.

f. The team's social risk and potential conflict identification revealed that road access is one of the main sources of risk and potential conflict, especially between the community and the company. Besides the aforementioned tribal groups, the community in the Tor Atas District also has the potential for conflict with the company. It is because the area falls under the Tor Atas District administratively, and many people also have customary land rights within Tor Atas.

g. The economic sources of the local community around the project area include the following activities:

1) Gathering
2) Farming and Gardening
3) Hunting
4) Sago Extraction
5) Collecting Dammar Resin

6) Wood Cutting
7) Gold Panning

h. Public facilities available in the area, especially in the neighboring settlements near the project, include:
   1) Project Roads with Coral Pavement
   2) Two Church Buildings for Worship
   3) Educational Institutions: Early Childhood Education (PAUD), Elementary School (SD), Junior High School (SMP), and Senior High School (SMA)
   4) Healthcare Facilities: Community Health Centers (Puskesmas) and Hospitals
   5) Village Hall
   6) District Office
   7) PLN (State Electricity Company) Power Supply
   8) Telecommunication Network

i. Community development programs in existence, particularly in Nengke Baru Village, Pantai Timur Barat District, which serves as the main access road to the project site, include:
   - Development of horticultural seedlings for the community
   - Livestock breeding support
   - Religious assistance in the form of worship facility construction
   - Educational support for impoverished communities
   - Operation of village health posts
   - Paddy field (rice) development is ongoing.

j. Critical stakeholders in the project area include:
   1) The Regent (Bupati), responsible for spatial planning policy decisions
   2) Regional Parliament (DPRD), Provincial Government, and Heads of Sarmi Regency Government Agencies (SKPD), who play a legal role and have significant influence in directing

decision-makers

3) Regional Development Planning Agency (Bappeda), the most dominant party in directing policies
4) District Government, District SKPD, District Heads, Village Heads, private entities, and other related parties. As policy users, this group needs to understand the background, objectives, policy decisions, and implications.
5) The entire community from various professions around the Nickel Siduarsi mining project site. This group must comprehend the context, objectives, policy decisions, and implications.
6) Universities, experts, community leaders, donor organizations, and non-governmental organizations (NGOs). While relatively independent, this group can significantly influence substance matters.

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APPENDIX





The



The activities of the women who have been empowered by the company to support exploration activities.



The team held discussions with the indigenous landowners to hear the community's expectations and hopes regarding the company.



The village towards the project site.



The condition of the road that serves as the sole access to the project.

APPENDIX 4

FORESTRY PERMITS

MENTERI LINGKUNGAN HIDUP DAN KEHUTANAN
REPUBLIK INDONESIA

KEPUTUSAN MENTERI LINGKUNGAN HIDUP DAN KEHUTANAN
REPUBLIK INDONESIA
NOMOR SK 463/MENLHK/SETJEN/PLA 0/5/2022

TENTANG

PERPANJANGAN PERSETUJUAN PENGGUNAAN KAWASAN HUTAN UNTUK KEGIATAN EKSPLORASI NIKEL DMP ATAS NAMA PT IRIANA MUTIARA MINING SELUAS ± 3 776,73 HA (TIGA RIBU TUJUH RATUS TUJUH PULUH ENAM DAN TUJUH PULUH TIGA PERSERATUS HEKTARE) PADA KAWASAN HUTAN PRODUKSI TETAP DI KABUPATEN SARMI, PROVINSI PAPUA

DENGAN RAHMAT TUHAN YANG MAHA ESA

MENTERI LINGKUNGAN HIDUP DAN KEHUTANAN REPUBLIK INDONESIA,

Menimbang a bahwa PT Iriana Mutiara Mining sebagai perusahaan pertambangan pemegang perizinan, berdasarkan

1) Kontrak Karya antara Pemerintah Republik Indonesia dengan PT Iriana Mutiara Mining tanggal 28 April 1997, sebagaimana telah diamandemen tanggal 23 Desember 2015 seluas 16 470 Ha (enam belas ribu empat ratus tujuh puluh hektare) di Kabupaten Sarmi, Provinsi Papua,
2) Keputusan Menteri Energi dan Sumber Daya Mineral Nomor 459 K/30/DJB/2017 tanggal 13 Desember 2017 tentang Penyesuaian Tahap Kegiatan Kontrak Karya PT Iriana Mutiara Mining Menjadi Tahap Kegiatan Eksplorasi seluas 16 470 Ha (enam belas ribu empat ratus tujuh puluh hektare), berlaku sejak tanggal 13 Desember 2017 sampai dengan tanggal 29 April 2019, sebagaimana telah diubah dengan Keputusan Menteri Energi dan Sumber Daya Mineral Nomor 254 K/30/ DJB/2018 tanggal 25 Mei 2018,
3) Surat Direktur Jenderal Mineral dan Batubara Nomor 1631/30/DJB/2016 tanggal 17 November 2016 hal Penundaan Kegiatan (Suspensi) pada Tahap Kegiatan eksplorasi Wilayah Kontrak Karya PT Iriana Mutiara Mining,
4) Surat Direktur Jenderal Mineral dan Batubara Nomor 1256/30/DJB/2017 tanggal 13 Juni 2017 hal Penundaan Kegiatan (Suspensi) PT Iriana Mutiara Mining,
5) Surat Direktur Jenderal Mineral dan Batubara Nomor 2329/30 07/DJB/2018 tanggal 26 Desember 2018 hal Persetujuan Perpanjangan Penundaan Kegiatan

(Suspensi I, terhitung mulai tanggal 27 April 2018 sampai dengan tanggal 21 April 2019),

6) Surat Direktur Jenderal Mineral dan Batubara Nomor 870/30 07/DJB/2019 tanggal 23 April 2019 hal Penundaan Kegiatan (Suspensi) Pada Tahap Kegiatan Eksplorasi PT Iriana Mutiara Mining (terhitung mulai tanggal 27 April 2019 sampai dengan tanggal 26 April 2020),

7) Surat Direktur Jenderal Mineral dan Batubara Nomor 841/30 07/DJB/2020 tanggal 16 April 2020 hal Penundaan Kegiatan (Suspensi) Pada Tahap Kegiatan Eksplorasi PT Iriana Mutiara Mining, berlaku sampai dengan tanggal 16 April 2021,

8) Surat Direktur Jenderal Mineral dan Batubara Nomor 941/30 04/DJB/2021 tanggal 23 April 2021 hal Pengaktifan Kembali Tahap Kegiatan Eksplorasi PT Iriana Mutiara Mining,

b bahwa berdasarkan Keputusan Kepala Badan Koodinasi Penanaman Modal atas nama Menteri Lingkungan Hidup dan Kehutanan Nomor SK 77/1/KLHK/2020 tanggal 15 Mei 2020, kepada PT Iriana Mutiara Mining diberikan Izin Pinjam Pakai Kawasan Hutan untuk Kegiatan Eksplorasi Nikel DMP seluas 3 776,73 Ha (tiga ribu tujuh ratus tujuh puluh enam dan tujuh puluh tiga perseratus hektare) pada Kawasan Hutan Produksi Tetap di Kabupaten Sarmi, Provinsi Papua sebagaimana telah diubah dengan Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK 191/MenLHK/ Setjen/PLA 0/4/2021 tanggal 29 April 2021, berlaku sampai dengan tanggal 26 April 2022,

c bahwa Presiden Direktur PT Iriana Mutiara Mining dengan surat Nomor 29/IMM/II/22 tanggal 10 Februari 2022, mengajukan permohonan perpanjangan Izin Pinjam Pakai Kawasan Hutan untuk kegiatan eksplorasi nikel dmp seluas ± 3 776,73 Ha (tiga ribu tujuh ratus tujuh puluh enam dan tujuh puluh tiga perseratus hektare) di Kabupaten Sarmi, Provinsi Papua,

d bahwa Plt Direktur Jenderal Planologi Kehutanan dan Tata Lingkungan dengan surat Nomor S 638/PKTL/ REN/PLA 0/4/2022 tanggal 22 April 2022, menyampaikan telaah terhadap permohonan Perpanjangan Persetujuan Penggunaan Kawasan Hutan a n PT Iriana Mutiara Mining

1) berdasarkan hasil penilaian permohonan perpanjangan persetujuan Penggunaan Kawasan Hutan a n PT Iriana Mutiara Mining telah dilengkapi persyaratan sesuai ketentuan Pasal 407 ayat (2) Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor 7 Tahun 2021 tentang Perencanaan Kehutanan, Perubahan Peruntukan Kawasan Hutan dan Perubahan Fungsi Kawasan Hutan serta Penggunaan Kawasan Hutan,

2) berdasarkan Peta Kawasan Hutan dan Konservasi Perairan serta Wilayah Tertentu yang Ditunjuk Sebagai

Kawasan Hutan Provinsi Papua lampiran Keputusan Menteri Kehutanan Nomor SK 782/Menhut-II/2012 dan Peta Perkembangan Pengukuhan Provinsi Papua sesuai Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK 6632/MenLHK-PKTL/KUH/PLA 2/10/2021 tanggal 27 Oktober 2021, areal seluas ± 3 776,73 Ha (tiga ribu tujuh ratus tujuh puluh enam dan tujuh puluh tiga perseratus hektare) seluruhnya berada pada kawasan Hutan Produksi Tetap dan berada pada KPHP Unit XXIII Provinsi Papua, diantaranya

a) seluas ± 3 567,48 Ha (tiga ribu lima ratus enam puluh tujuh dan empat puluh delapan perseratus hektare) berada pada areal PBPH PT Mondialindo Setya Pratama,

b) seluas ± 209,25 Ha (dua ratus sembilan dan dua puluh lima perseratus hektare) berada pada areal PBPH PT Salaki Mandiri Sejahtera,

3) berdasarkan hasil penilaian dan penelaahan, maka permohonan perpanjangan persetujuan penggunaan kawasan hutan untuk kegiatan eksplorasi nikel dmp a n PT Iriana Mutiara Mining secara teknis dapat dipertimbangkan untuk diproses lebih lanjut seluas ± 3 776,73 Ha (tiga ribu tujuh ratus tujuh puluh enam dan tujuh puluh tiga perseratus hektare) di Kabupaten Sarmi, Provinsi Papua, dengan jangka waktu sampai dengan tanggal 26 April 2023,

e bahwa berdasarkan

1) Peraturan Pemerintah Nomor 23 Tahun 2021 tentang Penyelenggaraan Kehutanan

a) Pasal 90 ayat (2), Penggunaan Kawasan Hutan dilakukan tanpa mengubah fungsi pokok Kawasan Hutan dengan mempertimbangkan batasan luas dan jangka waktu tertentu serta kelestarian lingkungan,

b) Pasal 91 ayat (1) dan ayat (2) huruf b, Penggunaan Kawasan Hutan untuk kepentingan pembangunan di luar kegiatan Kehutanan hanya dapat dilakukan untuk kegiatan yang mempunyai tujuan strategis yang tidak dapat dielakkan meliputi kegiatan pertambangan,

c) Pasal 94 ayat (1) dan Pasal 96 ayat (1), Penggunaan Kawasan Hutan untuk kepentingan pembangunan di luar kegiatan Kehutanan dilakukan berdasarkan Persetujuan Penggunaan Kawasan Hutan dan Persetujuan Penggunaan Kawasan Hutan diberikan oleh Menteri berdasarkan permohonan,

d) Pasal 94 ayat (8) huruf b, Persetujuan Penggunaan Kawasan Hutan untuk kegiatan survei dan eksplorasi dikecualikan dari kewajiban membayar PNBP Penggunaan Kawasan Hutan, membayar PNBP kompensasi dan melakukan penanaman dalam rangka rehabilitasi DAS,

2) Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor 7 Tahun 2021 tentang Perencanaan Kehutanan, Perubahan Peruntukan Kawasan Hutan dan Perubahan Fungsi Kawasan Hutan, serta Penggunaan Kawasan Hutan

a) Pasal 366 ayat (1) dan ayat (2) huruf a, Penggunaan Kawasan Hutan untuk kepentingan pembangunan di luar kegiatan Kehutanan hanya dapat dilakukan untuk kegiatan yang mempunyai tujuan strategis yang tidak dapat dielakkan dilakukan dengan mekanisme Persetujuan Penggunaan Kawasan Hutan dengan keputusan Menteri,

b) Pasal 367 huruf b, Penggunaan Kawasan Hutan dengan mekanisme Persetujuan Penggunaan Kawasan Hutan dengan keputusan Menteri sebagaimana dimaksud dalam Pasal 366 ayat (2) huruf a meliputi pertambangan mineral, batubara, minyak dan gas bumi, pertambangan lain, termasuk sarana dan prasarana antara lain jalan, pipa, conveyor dan smelter,

c) Pasal 369 ayat (2) huruf b, Persetujuan Penggunaan Kawasan Hutan tanpa kewajiban membayar PNBP Penggunaan Kawasan Hutan, membayar PNBP Kompensasi, dan melakukan penanaman dalam rangka Rehabilitasi DAS, diantaranya untuk kegiatan survei dan eksplorasi,

d) Pasal 372 ayat (10) huruf a, Ketentuan kuota 10% (sepuluh perseratus) diantaranya tidak berlaku bagi permohonan Persetujuan Penggunaan Kawasan Hutan untuk kegiatan eksplorasi atau eksplorasi lanjutan pertambangan,

e) Pasal 406 ayat (2) huruf a, Persetujuan Penggunaan Kawasan Hutan diberikan dalam jangka waktu paling lama sesuai perizinan di bidangnya atau keputusan tentang tahap kegiatan untuk kegiatan eksplorasi dan operasi produksi pertambangan meliputi pertambangan minyak dan gas bumi, mineral, dan batubara termasuk sarana dan prasarana,

f) Pasal 406 ayat (3), Persetujuan Penggunaan Kawasan Hutan diberikan dalam jangka waktu paling lama 2 (dua) tahun untuk kegiatan eksplorasi lanjutan pada tahap operasi produksi dan dapat diperpanjang,

g) Pasal 407 ayat (1), ayat (2) huruf c dan ayat (5) huruf a, Permohonan perpanjangan Persetujuan Penggunaan Kawasan Hutan diajukan kepada Menteri melalui Direktur sebelum Persetujuan Penggunaan Kawasan Hutan berakhir dengan dilengkapi diantaranya hasil evaluasi terhadap pemenuhan kewajiban dalam persetujuan penggunaan kawasan hutan dan Pemberian perpanjangan Persetujuan Penggunaan Kawasan

Hutan tidak wajib dilakukan evaluasi untuk kegiatan eksplorasi, dan eksplorasi lanjutan pada tahap operasi produksi,

f bahwa berdasarkan pertimbangan tersebut huruf a sampai dengan huruf e, perlu menetapkan Keputusan Menteri Lingkungan Hidup dan Kehutanan tentang Perpanjangan Persetujuan Penggunaan Kawasan Hutan untuk Kegiatan Eksplorasi Nikel DMP atas nama PT Iriana Mutiara Mining seluas ± 3 776,73 Ha (tiga ribu tujuh ratus tujuh puluh enam dan tujuh puluh tiga perseratus hektare) pada Kawasan Hutan Produksi Tetap di Kabupaten Sarmi, Provinsi Papua,

Mengingat

1 Undang-Undang Nomor 5 Tahun 1990 tentang Konservasi Sumberdaya Alam Hayati dan Ekosistemnya,

2 Undang-Undang Nomor 41 Tahun 1999 tentang Kehutanan, sebagaimana telah diubah beberapa kali, terakhir dengan Undang-Undang Nomor 11 Tahun 2020 tentang Cipta Kerja,

3 Undang-Undang Nomor 26 Tahun 2007 tentang Penataan Ruang, sebagaimana telah diubah dengan Undang-Undang Nomor 11 Tahun 2020 tentang Cipta Kerja,

4 Undang-Undang Nomor 32 Tahun 2009 tentang Perlindungan dan Pengelolaan Lingkungan Hidup, sebagaimana telah diubah dengan Undang-Undang Nomor 11 Tahun 2020 tentang Cipta Kerja,

5 Undang-Undang Nomor 18 Tahun 2013 tentang Pencegahan dan Pemberantasan Perusakan Hutan, sebagaimana telah diubah dengan Undang-Undang Nomor 11 Tahun 2020 tentang Cipta Kerja,

6 Undang-Undang Nomor 23 Tahun 2014 tentang Pemerintahan Daerah, sebagaimana telah diubah beberapa kali, terakhir dengan Undang-Undang Nomor 11 Tahun 2020 tentang Cipta Kerja,

7 Peraturan Pemerintah Nomor 26 Tahun 2008 tentang Rencana Tata Ruang Wilayah Nasional, sebagaimana telah diubah beberapa kali, terakhir dengan Peraturan Pemerintah Nomor 21 Tahun 2021 tentang Penyelenggaraan Penataan Ruang,

8 Peraturan Pemerintah Nomor 26 Tahun 2020 tentang Rehabilitasi dan Reklamasi Hutan,

9 Peraturan Pemerintah Nomor 22 Tahun 2021 tentang Penyelenggaraan Perlindungan dan Pengelolaan Lingkungan Hidup,

10 Peraturan Pemerintah Nomor 23 Tahun 2021 tentang Penyelenggaraan Kehutanan,

11 Peraturan Pemerintah Nomor 24 Tahun 2021 tentang Tata Cara Pengenaan Sanksi Administratif dan Tata Cara Penerimaan Negara Bukan Pajak yang berasal dari Denda Administratif Bidang Kehutanan,

12 Peraturan Pemerintah Nomor 43 Tahun 2021 tentang Penyelesaian Ketidaksesuaian Tata Ruang, Kawasan Hutan, Izin dan/atau Hak atas Tanah,

13 Peraturan Presiden Nomor 68 Tahun 2019 tentang Organisasi Kementerian Negara, sebagaimana telah diubah dengan Peraturan Presiden Nomor 32 Tahun 2021,

14 Peraturan Presiden Nomor 92 Tahun 2020 tentang Kementerian Lingkungan Hidup dan Kehutanan,

15 Keputusan Presiden Nomor 113/P Tahun 2019 tentang Pembentukan Kementerian Negara dan Pengangkatan Menteri Negara Kabinet Indonesia Maju Periode Tahun 2019-2024, sebagaimana telah diubah beberapa kali, terakhir dengan Keputusan Presiden Nomor 72/P Tahun 2021 tentang Pembentukan dan Pengubahan Kementerian serta Pengangkatan beberapa Menteri Negara Kabinet Indonesia Maju Periode Tahun 2019-2024,

16 Instruksi Presiden Nomor 5 Tahun 2019 tentang Penghentian Pemberian Izin Baru dan Penyempurnaan Tata Kelola Hutan Alam Primer dan Lahan Gambut,

17 Peraturan Menteri Kehutanan Nomor P 60/Menhut-II/2009 tentang Pedoman Penilaian Keberhasilan Reklamasi Hutan,

18 Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor P 32/MenLHK/Setjen/Kum 1/3/2016 tentang Pengendalian Kebakaran Hutan dan Lahan,

19 Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor 4 Tahun 2021 tentang Daftar Usaha dan/atau Kegiatan yang Wajib Memiliki Analisis Mengenai Dampak Lingkungan Hidup, Upaya Pengelolaan Lingkungan Hidup dan Upaya Pemantauan Lingkungan Hidup atau Surat Pernyataan Kesanggupan Pengelolaan dan Pemantauan Lingkungan Hidup,

20 Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor 7 Tahun 2021 tentang Perencanaan Kehutanan, Perubahan Peruntukan Kawasan Hutan dan Perubahan Fungsi Kawasan Hutan, Serta Penggunaan Kawasan Hutan,

21 Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor 8 Tahun 2021 tentang Tata Hutan dan Penyusunan Rencana Pengelolaan Hutan, Serta Pemanfaatan Hutan di Hutan Lindung dan Hutan Produksi,

22 Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor 15 Tahun 2021 tentang Organisasi dan Tata Kerja Kementerian Lingkungan Hidup dan Kehutanan,

23 Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK 5050/MenLHK-PKTL/KUH/PLA 2/9/2020 tentang Peta Indikatif Alokasi Kawasan Hutan untuk Penyediaan Sumber Tanah Obyek Reforma Agraria /TORA (Revisi V),

24 Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK 5446/MENLHK-PKTL/IPSDH/PLA 1/8/2021

tentang Penetapan Peta Indikatif Penghentian Pemberian Perizinan Berusaha, Persetujuan Penggunaan Kawasan Hutan, atau Persetujuan Perubahan Peruntukan Kawasan Hutan Baru pada Hutan Alam Primer dan Lahan Gambut Tahun 2021 Periode II,

25 Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK 8878/MENLHK-PKTL/REN/PLA 0/12/2021 tentang Peta Indikatif dan Areal Perhutanan Sosial (Revisi VII),

Memperhatikan

1 Dokumen UKL-UPL Kegiatan Eksplorasi PT Iriana Mutiara Mining, Juni 2018,

2 Keputusan Kepala Dinas Lingkungan Hidup Provinsi Papua Nomor 14 Tahun 2018 tanggal 20 Juli 2018 tentang Rekomendasi UKL UPL Rencana Kegiatan Eksplorasi Nikel dmp oleh PT Iriana Mutiara Mining, Luas Wilayah 16 470 Ha di Distrik Tor Atas dan Pantai Timur Barat Kabupaten Sarmi Provinsi Papua,

3 Keputusan Kepala Dinas Penanaman Modal dan Pelayanan Terpadu Satu Pintu Provinsi Papua Nomor 29 Tahun 2018 tanggal 28 Agustus 2018 tentang Izin Lingkungan Rencana Kegiatan Eksplorasi Nikel dmp oleh PT Iriana Mutiara Mining, Luas Wilayah 16 470 Ha di Distrik Tor Atas dan Pantai Timur Barat Kabupaten Sarmi Provinsi Papua,

4 Pakta Integritas sesuai Akta Nomor 13 tanggal 25 Januari 2022 yang dibuat di hadapan Edi Priyono, SH Notaris di Kota Jakarta Pusat,

5 Kronologis dan Telaah Permohonan Perpanjangan Persetujuan Penggunaan Kawasan Hutan untuk Kegiatan Eksplorasi Nikel DMP pada Kawasan Hutan Produksi Tetap a n PT Iriana Mutiara Mining seluas ± 3 776,73 Ha di Kabupaten Sarmi, Provinsi Papua, Lampiran surat Plt Direktur Jenderal Planologi Kehutanan dan Tata Lingkungan Nomor S 638/PKTL/REN/PLA 0/4/2022 tanggal 22 April 2022,

MEMUTUSKAN

Menetapkan KEPUTUSAN MENTERI LINGKUNGAN HIDUP DAN KEHUTANAN TENTANG PERPANJANGAN PERSETUJUAN PENGGUNAAN KAWASAN HUTAN UNTUK KEGIATAN EKSPLORASI NIKEL DMP ATAS NAMA PT IRIANA MUTIARA MINING SELUAS ± 3 776,73 HA (TIGA RIBU TUJUH RATUS TUJUH PULUH ENAM DAN TUJUH PULUH TIGA PERSERATUS HEKTARE) PADA KAWASAN HUTAN PRODUKSI TETAP DI KABUPATEN SARMI, PROVINSI PAPUA

KESATU Memberikan Perpanjangan Persetujuan Penggunaan Kawasan Hutan untuk Kegiatan Eksplorasi Nikel DMP kepada PT Iriana Mutiara Mining seluas ± 3 776,73 Ha (tiga ribu tujuh ratus tujuh puluh enam dan tujuh puluh tiga perseratus hektare) pada Kawasan Hutan Produksi Tetap di Kabupaten Sarmi, Provinsi Papua, sebagaimana peta lampiran Keputusan ini, dengan rincian penggunaan kawasan hutan

a Pengeboran (*drilling*) interval 200 m sebanyak 194 titik,
b Pengeboran (*drilling*) interval 400 m sebanyak 69 titik,
c *Camp*

KEDUA Pemberian Persetujuan Perpanjangan sebagaimana dimaksud dalam Amar KESATU adalah untuk Kegiatan Eksplorasi Nikel DMP atas nama PT Iriana Mutiara Mining, bukan untuk kegiatan lain serta arealnya tetap berstatus sebagai kawasan hutan

KETIGA PT Iriana Mutiara Mining berhak
a berada, menempati dan mengelola serta melakukan kegiatan-kegiatan yang meliputi Kegiatan Eksplorasi Nikel DMP, serta melakukan kegiatan-kegiatan lainnya yang berhubungan dengan kegiatan tersebut dalam kawasan hutan yang digunakan,
b melakukan penebangan pohon dalam rangka pembukaan lahan yang tidak dapat dielakkan dengan membayar Provisi Sumber Daya Hutan (PSDH) dan/atau Dana Reboisasi (DR) sesuai dengan ketentuan peraturan perundang-undangan

KEEMPAT PT Iriana Mutiara Mining wajib
a melaksanakan reklamasi pada kawasan hutan yang sudah tidak dipergunakan tanpa menunggu selesainya jangka waktu Persetujuan Penggunaan Kawasan Hutan,
b melakukan inventarisasi tegakan pada areal yang direncanakan untuk dilakukan pembukaan lahan sebagai dasar pembayaran Provisi Sumber Daya Hutan (PSDH) dan/atau Dana Reboisasi (DR),
c membayar PSDH dan/atau DR sesuai ketentuan peraturan perundang-undangan,
d membayar ganti rugi nilai tegakan kepada pemerintah apabila areal yang dimohon merupakan hutan tanaman hasil rehabilitasi seluas yang digunakan sesuai ketentuan peraturan perundang-undangan,
e melaksanakan perlindungan hutan pada areal Persetujuan Penggunaan Kawasan Hutan dan areal sekitar persetujuan sesuai dengan ketentuan peraturan perundang-undangan,
f melakukan pengendalian kebakaran hutan dan lahan, berupa antara lain
  f 1 menempatkan sekurang-kurangnya 1 (satu) Regu Inti Pengendali Kebakaran Hutan,
  f 2 merekrut karyawan pada perusahaan sebagai anggota Regu Pendukung Pengendali Kebakaran Hutan,
  f 3 menyiapkan Sumberdaya Manusia pengendalian kebakaran hutan dalam Brigade Pengendalian Kebakaran Hutan dan Lahan (Brigdalkarhutla) dalam organisasi kelompok-kelompok Masyarakat Peduli Api,
  f 4 menyiapkan sarana dan prasarana (sarpras) untuk menunjang kegiatan Brigdalkarhutla antara lain sarpras pencegahan kebakaran hutan dan pemadaman kebakaran hutan

g memberikan kemudahan bagi aparat Kementerian Lingkungan Hidup dan Kehutanan baik pusat maupun daerah pada saat melakukan monitoring dan evaluasi di lapangan,

h mengkoordinasikan kegiatan kepada instansi Lingkungan Hidup dan Kehutanan setempat,

i melakukan pemberdayaan masyarakat sekitar areal Persetujuan Penggunaan Kawasan Hutan,

j melakukan kegiatan persiapan penggunaan kawasan hutan secara bertahap untuk menjaga penurunan emisi karbon sampai dengan 0 % (nol persen) sesuai rencana tahun 2030,

k melaksanakan kewajiban lain yang ditetapkan oleh Menteri,

l membuat laporan berkala setiap 6 (enam) bulan sekali secara *online* dan menyampaikan bukti pelaporan kepada Menteri mengenai Penggunaan Kawasan Hutan yang dipergunakan dengan tembusan disampaikan kepada Direktur Jenderal Planologi Kehutanan dan Tata Lingkungan, Direktur Jenderal Pengelolaan Hutan Lestari, Direktur Jenderal Konservasi Sumber Daya Alam dan Ekosistem, Direktur Jenderal Pengendalian Daerah Aliran Sungai dan Rehabilitasi Hutan, Kepala Dinas Kehutanan Provinsi Papua, Kepala Balai Pemantapan Kawasan Hutan Wilayah X Jayapura, dan Kepala Balai Pengelolaan Daerah Aliran Sungai dan Hutan Lindung Mamberamo

KELIMA PT Iriana Mutiara Mining dilarang

a memindahtangankan Persetujuan Penggunaan Kawasan Hutan kepada pihak lain atau melakukan perubahan nama pemegang Persetujuan Penggunaan Kawasan Hutan tanpa persetujuan Menteri Lingkungan Hidup dan Kehutanan,

b menjaminkan atau mengagunkan areal Persetujuan Penggunaan Kawasan Hutan kepada pihak lain,

c menggunakan merkuri dalam kegiatan pertambangan,

d melakukan kegiatan lainnya yang dilarang sesuai ketentuan peraturan perundang-undangan

KEENAM PT Iriana Mutiara Mining wajib menyelesaikan hak-hak pihak ketiga, apabila terdapat hak-hak pihak ketiga di dalam areal Persetujuan Penggunaan Kawasan Hutan dengan meminta bimbingan dan fasilitasi Pemerintah Daerah setempat

KETUJUH Perpanjangan Persetujuan Penggunaan Kawasan Hutan untuk Kegiatan Eksplorasi Nikel DMP ini dicabut dan pemegang Persetujuan dikenakan sanksi sesuai ketentuan peraturan perundang-undangan, apabila pemegang persetujuan tidak memenuhi kewajiban dan/atau melakukan pelanggaran atas ketentuan-ketentuan sebagaimana dimaksud dalam Keputusan ini

KEDELAPAN Perpanjangan Persetujuan Penggunaan Kawasan Hutan diberikan dengan mempertimbangkan hasil evaluasi terhadap pemenuhan kewajiban dalam Persetujuan Penggunaan Kawasan Hutan dan diajukan oleh pemegang Persetujuan Penggunaan Kawasan Hutan sebelum Persetujuan Penggunaan Kawasan Hutan berakhir

KESEMBILAN Keputusan ini mulai berlaku pada tanggal ditetapkan dan berlaku efektif sejak tanggal 26 April 2022 untuk jangka waktu paling lama sampai dengan tanggal 26 April 2023, kecuali apabila dicabut oleh Menteri Lingkungan Hidup dan Kehutanan

Ditetapkan di Jakarta
pada tanggal 11 Mei 2022

Salinan sesuai dengan aslinya
KEPALA BIRO HUKUM,

SUPARDI

MENTERI LINGKUNGAN HIDUP DAN KEHUTANAN REPUBLIK INDONESIA,

ttd

SITI NURBAYA

Salinan Keputusan ini disampaikan kepada Yth
1 Menteri Koordinator Bidang Kemaritiman dan Investasi,
2 Menteri Investasi/Kepala Badan Koordinasi Penanaman Modal,
3 Gubernur Papua,
4 Sekretaris Jenderal Kementerian Lingkungan Hidup dan Kehutanan,
5 Direktur Jenderal Planologi Kehutanan dan Tata Lingkungan,
6 Direktur Jenderal Pengelolaan Hutan Lestari,
7 Direktur Jenderal Pengendalian Daerah Aliran Sungai dan Rehabilitasi Hutan,
8 Direktur Jenderal Konservasi Sumber Daya Alam dan Ekosistem,
9 Direktur Jenderal Penegakan Hukum Lingkungan Hidup dan Kehutanan,
10 Direktur Jenderal Mineral dan Batubara, Kementerian Energi dan Sumber Daya Mineral,
11 Bupati Sarmi,
12 Kepala Dinas Kehutanan dan Konservasi Provinsi Papua,
13 Kepala Balai Pemantapan Kawasan Hutan Wilayah X Jayapura,
14 Kepala Balai Pengelolaan Hutan Produksi Wilayah XV Jayapura,
15 Kepala Balai Pengelolaan Daerah Aliran Sungai dan Hutan Lindung Mamberamo,
16 Kepala KPHP Unit XXIII Provinsi Papua,
17 Direktur PBPH PT Mondialindo Setya Pratama,
18 Direktur PBPH PT Salaki Mandiri Sejahtera,
19 Presiden Direktur PT Iriana Mutiara Mining

PETA
PERPANJANGAN PERSETUJUAN PENGGUNAAN KAWASAN HUTAN UNTUK KEGIATAN EKSPLORASI NIKEL DMP PADA KAWASAN HUTAN PRODUKSI TETAP (HP)

a.n. PT IRIANA MUTIARA MINING

KABUPATEN SARMI
PROVINSI PAPUA
SELUAS ± 3.776,73 HA
SKALA 1 : 50.000

0 0,5 1 1,5 2 2,5 5 Km
0 1 2 3 4 5 10 Cm

U

LAMPIRAN KEPUTUSAN MENTERI LINGKUNGAN HIDUP DAN KEHUTANAN REPUBLIK INDONESIA

NOMOR : SK.463/MENLHK/SETJEN/PLA.0/5/2022
TANGGAL : 11 Mei 2022

MENTERI LINGKUNGAN HIDUP DAN KEHUTANAN REPUBLIK INDONESIA,

SITI NURBAYA

KETERANGAN :

- Batas areal kontrak karya a.n. PT Iriana Mutiara Mining
- Batas areal persetujuan penggunaan kawasan hutan untuk kegiatan eksplorasi nikel dmp a.n. PT Iriana Mutiara Mining seluas ± 3.776,73 Ha, dengan rincian penggunaan :
  - a. Pengeboran *(drilling)* interval 200 meter sebanyak 194 titik
  - b. Pengeboran *(drilling)* interval 400 meter sebanyak 69 titik
  - c. Camp
- HL Hutan Lindung
- HPT Hutan Produksi Terbatas
- HP Hutan Produksi Tetap
- Areal IUPHHK-HA
- Sungai dan anak sungai
- Jalan

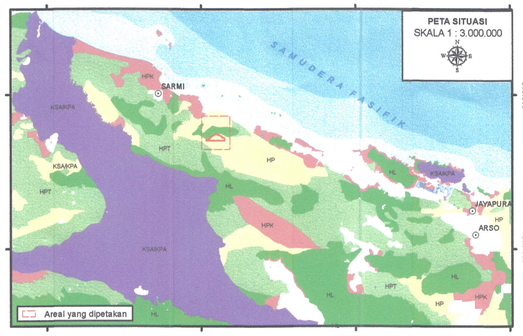
Catatan :
- Batas areal izin pemanfaatan hutan yang tergambar dalam peta tidak sepenuhnya dapat dijadikan acuan batas di lapangan
- Berdasarkan Pasal 294 huruf b Peraturan Pemerintah Nomor 23 Tahun 2021 tentang Penyelenggaraan Kehutanan, bahwa Kawasan Hutan Produksi Terbatas sebelum berlakunya Peraturan Pemerintah ini, dinyatakan tetap berlaku sesuai dengan tahap pengukuhannya serta diberlakukan peruntukan dan fungsinya sebagai Hutan Produksi Tetap

DASAR :
- Kontrak Karya antara Pemerintah Republik Indonesia dengan PT. Iriana Mutiara Mining tanggal 28 April 1997 yang diperbaharui dengan Kontrak Karya tanggal 23 Desember 2015
- Keputusan Menteri Kehutanan Nomor SK.782/Menhut-II/2012 tanggal 27 Desember 2012
- Keputusan Menteri Energi dan Sumber Daya Mineral Nomor 459.K/30/DJB/2017 tanggal 13 Desember 2017
- Keputusan Kepala BKPM a.n. Menteri LHK Nomor SK.177/1/KLHK/2020 tanggal 15 Mei 2020 sebagaimana telah diubah dengan Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK.191/MenLHK/Setjen/PLA.0/4/2021 tanggal 29 April 2021
- Surat Direktur Jenderal Mineral dan Batubara Nomor 1631/30/DJB/2016 tanggal 17 Nopember 2016
- Surat Direktur Jenderal Mineral dan Batubara Nomor 1256/30/DJB/2017 tanggal 13 Juni 2017
- Surat Direktur Jenderal Mineral dan Batubara Nomor 2329/30.07/DJB/2018 tanggal 26 Desember 2018
- Surat Direktur Jenderal Mineral dan Batubara Nomor 870/30.07/DJB/2019 tanggal 23 April 2019
- Surat Direktur Jenderal Mineral dan Batubara Nomor 841/30.07/DJB/2020 tanggal 16 April 2020
- Surat Direktur Jenderal Mineral dan Batubara Nomor 941/MB.04/DJB/2021 tanggal 23 April 2021
- Surat Presiden Direktur PT Iriana Mutiara Mining Nomor 29/IMM/I/22 tanggal 10 Februari 2022

SUMBER :
- Peta Rupa Bumi Indonesia (RBI), skala 1 : 50.000
- Peta Kawasan Hutan dan Konservasi Perairan Serta Wilayah Tertentu Yang Ditunjuk Sebagai Kawasan Hutan di Provinsi Papua Skala 1 : 250.000 (lampiran Keputusan Menteri Kehutanan Nomor SK.782/Menhut-II/2012 tanggal 27 Desember 2012)
- Peta Perkembangan Pengukuhan Provinsi Papua sampai dengan Tahun 2020 (Lampiran Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK.6632/MenLHK-PKTL/KUH/PLA.2/10/2021 tanggal 27 Oktober 2021)
- Daftar Koordinat, Lampiran I Keputusan Menteri Energi dan Sumber Daya Mineral Nomor 459.K/30/DJB/2017 tanggal 13 Desember 2017
- Keputusan Kepala BKPM a.n. Menteri LHK Nomor SK.177/1/KLHK/2020 tanggal 15 Mei 2020
- Data digital (.shp) lampran surat Presiden Direktur PT Iriana Mutiara Mining Nomor 29/IMM/I/22 tanggal 10 Februari 2022

138°0'0"E 139°0'0"E 140°0'0"E 141°0'0"E

PETA SITUASI
SKALA 1 : 3.000.000



2°0'0"S
3°0'0"S

Sumber : Peta Kawasan Hutan dan Konservasi Perairan Serta Wilayah Tertentu Yang Ditunjuk Sebagai Kawasan Hutan di Provinsi Papua Skala 1 : 250.000

KEMENTERIAN LINGKUNGAN HIDUP DAN KEHUTANAN

KEPALA BADAN KOORDINASI PENANAMAN MODAL
REPUBLIK INDONESIA

KEPUTUSAN KEPALA BADAN KOORDINASI PENANAMAN MODAL
REPUBLIK INDONESIA
NOMOR : SK.77 / 1 / KLHK / 2020

TENTANG

IZIN PINJAM PAKAI KAWASAN HUTAN UNTUK KEGIATAN EKSPLORASI NIKEL DMP ATAS NAMA PT. IRIANA MUTIARA MINING SELUAS ± 3.776,73 HA (TIGA RIBU TUJUH RATUS TUJUH PULUH ENAM DAN TUJUH PULUH TIGA PERSERATUS HEKTARE) PADA KAWASAN HUTAN PRODUKSI TETAP DI KABUPATEN SARMI, PROVINSI PAPUA

DENGAN RAHMAT TUHAN YANG MAHA ESA

KEPALA BADAN KOORDINASI PENANAMAN MODAL,

Menimbang : a. bahwa PT. Iriana Mutiara Mining merupakan Perusahaan Pemegang, sesuai:

1) Kontrak Karya antara Pemerintah Republik Indonesia dengan PT. Iriana Mutiara Mining tanggal 28 April 1997, sebagaimana telah diamandemen tanggal 23 Desember 2015 seluas 16.470 Ha (enam belas ribu empat ratus tujuh puluh hektare) di Kabupaten Sarmi, Provinsi Papua;
2) Keputusan Menteri Energi dan Sumber Daya Mineral Nomor 459.K/30/DJB/2017 tanggal 13 Desember 2017 tentang Penyesuaian Tahap Kegiatan Kontrak Karya PT. Iriana Mutiara Mining Menjadi Tahap Kegiatan Eksplorasi seluas 16.470 Ha (enam belas ribu empat ratus tujuh puluh hektare), berlaku sejak tanggal 13 Desember 2017 sampai dengan tanggal 29 April 2019, sebagaimana telah diubah dengan Keputusan Menteri Energi dan Sumber Daya Mineral Nomor 254.K/30/DJB/2018 tanggal 25 Mei 2018;
3) Surat Direktur Jenderal Mineral dan Batubara Nomor 2329/30.07/DJB/2018 tanggal 26 Desember 2018 Hal Persetujuan Perpanjangan Penundaan Kegiatan Suspensi I, terhitung sejak tanggal 27 April 2018 sampai dengan tanggal 21 April 2019;
4) Surat Direktur Jenderal Mineral dan Batubara Nomor 870/30.07/DJB/2019 tanggal 23 April 2019 Hal Penundaan Kegiatan (Suspensi) Pada Tahap Kegiatan Eksplorasi PT. Iriana Mutiara Mining, terhitung sejak tanggal 27 April 2019 sampai dengan tanggal 26 April 2020,

dengan masa berlaku selama 1 (satu) tahun 2 (dua) hari sejak tanggal 27 April 2020 sampai dengan tanggal 29 April 2021, atau sejak suspensi dicabut;

b. bahwa Presiden Direktur PT. Iriana Mutiara Mining sesuai surat Nomor 49/IMM/IX/19 tanggal 2 September 2019, mengajukan permohonan Izin Pinjam Pakai Kawasan Hutan (IPPKH) untuk Kegiatan Eksplorasi Nikel Dmp seluas ± 4.153 Ha (empat ribu seratus lima puluh tiga hektare) di Kabupaten Sarmi, Provinsi Papua;

c. bahwa sesuai surat Direktur Jenderal Planologi Kehutanan dan Tata Lingkungan Nomor S.149/PKTL/REN/PLA.0/2/2020 tanggal 11 Februari 2020, terhadap permohonan IPPKH tersebut huruf b:

1) telah memenuhi persyaratan administrasi dan teknis sesuai ketentuan Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor P.27/Menlhk/Setjen/Kum.1/7/2018 tentang Pedoman Pinjam Pakai Kawasan Hutan sebagaimana telah diubah dengan Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor P.7/Menlhk/Setjen/Kum.1/2/2019;

2) Permohonan IPPKH PT. Iriana Mutiara Mining berada pada IUPHHK-HA PT. Mondialindo Setya Pratama seluas ± 3.944,17 Ha (tiga ribu sembilan ratus empat puluh empat dan tujuh belas perseratus hektare) dan telah memiliki sertifikat PHPL Nomor LPPHPL 26/DIRSERTF/V/2018 dengan predikat "Baik" dan IUPHHK-HA PT. Salaki Mandiri Sejahtera seluas ± 209,25 Ha (dua ratus sembilan dan dua puluh lima perseratus hektare) telah memiliki sertifikat PHPL Nomor LPPHPL IMS-SPHPL-021 dengan predikat "Sedang";

3) Terkait angka 2), Plt. Direktur Jenderal Pengelolaan Hutan Produksi Lestari sesuai surat Nomor S.494/PHPL/KPHP/HPL.0/11/2019 tanggal 20 November 2019, menyampaikan pertimbangan teknis permohonan IPPKH PT. Iriana Mutiara Mining di areal IUPHHK-HA PT. Mondialindo Setya Pratama, permohonan yang ditelaah lebih lanjut seluas ± 3.567,48 Ha (tiga ribu lima ratus enam puluh tujuh dan empat puluh delapan perseratus hektare). Terdapat areal seluas ± 376,69 Ha (tiga ratus tujuh puluh enam dan enam puluh sembilan perseratus hektare) merupakan kawasan lindung di areal IUPHHK-HA PT. Mondialindo Setya Pratama, tidak diberikan IPPKH;

4) Perhitungan Quota 10%, tidak berlaku bagi permohonan IPPKH untuk kegiatan survei atau eksplorasi pertambangan;

5) Permohonan IPPKH untuk Kegiatan Eksplorasi Nikel Dmp PT. Iriana Mutiara Mining secara teknis dapat dipertimbangkan untuk diproses lebih lanjut seluas ± 3.776,73 Ha (tiga ribu tujuh ratus tujuh puluh enam dan tujuh puluh tiga perseratus hektare) seluruhnya berada pada kawasan Hutan Produksi Tetap yang dibebani IUPHHK-HA PT. Mondialindo Setya Pratama seluas ± 3.567,48 Ha (tiga ribu lima ratus enam puluh tujuh dan empat puluh delapan perseratus hektare) dan IUPHHK-HA PT. Salaki Mandiri Sejahtera seluas ± 209,25 Ha (dua ratus sembilan dan dua puluh lima perseratus hektare)

serta seluruhnya berada pada KPHP Unit XXIII di Kabupaten Sarmi, Provinsi Papua;

d. bahwa sesuai ketentuan Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor P.27/Menlhk/Setjen/Kum.1/7/2018 tentang Pedoman Pinjam Pakai Kawasan Hutan sebagaimana telah diubah dengan Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor P.7/Menlhk/Setjen/Kum.1/2/2019:
   1) Pasal 10 ayat (9) huruf a, Ketentuan kuota 10% (sepuluh perseratus) dari luas kawasan hutan yang diperkenankan sebagaimana dimaksud pada ayat (1) sampai dengan ayat (6) tidak berlaku bagi permohonan IPPKH untuk eksplorasi pertambangan;
   2) Pasal 12 ayat (1) huruf b dan ayat (2) huruf b dan c, IPPKH untuk kegiatan pertambangan mineral dan batubara tidak diberikan pada Kawasan Hutan Produksi yang dibebani Izin Usaha Pemanfaatan Hasil Hutan Kayu yang telah memperoleh sertifikat Pengelolaan Hutan Produksi Lestari (PHPL) dengan nilai "baik", dikecualikan untuk permohonan yang telah mendapat IPPKH untuk kegiatan eksplorasi sejak berlakunya Peraturan Pemerintah Nomor 24 Tahun 2010 tentang Penggunaan Kawasan Hutan dan kegiatan yang berdasarkan pertimbangan teknis tidak mengganggu kelestarian dan kelanjutan Usaha Pemanfaatan Hasil Hutan Kayu;
   3) Pasal 12 ayat (3), Pertimbangan teknis sebagaimana dimaksud pada ayat (2) huruf c dan huruf c1 yang berada pada Izin Usaha Pemanfaatan Hasil Hutan Kayu diberikan oleh Direktur Jenderal yang diserahi tugas dan bertanggung jawab di bidang Pengelolaan Hutan Produksi Lestari;

e. bahwa berdasarkan pertimbangan tersebut huruf a sampai dengan huruf d, perlu menetapkan Keputusan Kepala Badan Koordinasi Penanaman Modal tentang Izin Pinjam Pakai Kawasan Hutan untuk Kegiatan Eksplorasi Nikel Dmp atas nama PT. Iriana Mutiara Mining seluas ± 3.776,73 Ha (tiga ribu tujuh ratus tujuh puluh enam dan tujuh puluh tiga perseratus hektare) pada Kawasan Hutan Produksi Tetap di Kabupaten Sarmi, Provinsi Papua.

Mengingat : 1. Undang-Undang Nomor 5 Tahun 1990 tentang Konservasi Sumberdaya Alam Hayati dan Ekosistemnya;

2. Undang-Undang Nomor 41 Tahun 1999 tentang Kehutanan, sebagaimana telah diubah dengan Undang-Undang Nomor 19 Tahun 2004;

3. Undang-Undang Nomor 26 Tahun 2007 tentang Penataan Ruang;

4. Undang-Undang Nomor 18 Tahun 2013 tentang Pencegahan dan Pemberantasan Perusakan Hutan;

5. Undang-Undang Nomor 23 Tahun 2014 tentang Pemerintahan Daerah, sebagaimana telah beberapa kali diubah terakhir dengan Undang-Undang Nomor 9 Tahun 2015;

6. Peraturan Pemerintah Nomor 44 Tahun 2004 tentang Perencanaan Kehutanan;
7. Peraturan Pemerintah Nomor 45 Tahun 2004 tentang Perlindungan Hutan, sebagaimana telah diubah dengan Peraturan Pemerintah Nomor 60 Tahun 2009;
8. Peraturan Pemerintah Nomor 6 Tahun 2007 tentang Tata Hutan dan Penyusunan Rencana Pengelolaan Hutan Serta Pemanfaatan Hutan, sebagaimana telah diubah dengan Peraturan Pemerintah Nomor 3 Tahun 2008;
9. Peraturan Pemerintah Nomor 26 Tahun 2008 tentang Rencana Tata Ruang Wilayah Nasional, sebagaimana telah diubah dengan Peraturan Pemerintah Nomor 13 Tahun 2017;
10. Peraturan Pemerintah Nomor 76 Tahun 2008 tentang Rehabilitasi dan Reklamasi Hutan;
11. Peraturan Pemerintah Nomor 24 Tahun 2010 tentang Penggunaan Kawasan Hutan, sebagaimana telah beberapa kali diubah terakhir dengan Peraturan Pemerintah Nomor 105 Tahun 2015;
12. Peraturan Pemerintah Nomor 27 Tahun 2012 tentang Izin Lingkungan;
13. Peraturan Presiden Nomor 44 Tahun 2016 tentang Daftar Bidang Usaha Yang Tertutup dan Bidang Usaha Yang Terbuka Dengan Persyaratan di Bidang Penanaman Modal;
14. Peraturan Presiden Nomor 68 Tahun 2019 tentang Organisasi Kementerian Negara;
15. Keputusan Presiden Nomor 113/P Tahun 2019 tentang Pembentukan Kementerian Negara dan Pengangkatan Menteri Negara Kabinet Indonesia Maju Periode Tahun 2019-2024;
16. Instruksi Presiden Nomor 5 Tahun 2019 tentang Penghentian Pemberian Izin Baru dan Penyempurnaan Tata Kelola Hutan Alam Primer dan Lahan Gambut;
17. Peraturan Menteri Kehutanan Nomor P.60/Menhut-II/ 2009 tentang Pedoman Penilaian Keberhasilan Reklamasi Hutan;
18. Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor P.18/Menlhk-II/2015 tentang Organisasi dan Tata Kerja Kementerian Lingkungan Hidup dan Kehutanan;
19. Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor P.62/Menlhk-Setjen/2015 tentang Izin Peman faatan Kayu;
20. Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor P.32/MenLHK/Setjen/Kum.1/3/2016 tentang Pengendalian Kebakaran Hutan dan Lahan;
21. Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor P.71/MenLHK/Setjen/HPL.3/8/2016 tentang Tata Cara Pengenaan, Pemungutan, dan Penyetoran Provisi Sumber Daya Hutan dan Dana Reboisasi, Ganti Rugi Tegakan, Denda Pelanggaran Eksploitasi Hutan dan Iuran Izin Usaha Pemanfaatan Hutan;

22. Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor P.27/Menlhk/Setjen/Kum.1/7/2018 tentang Pedoman Pinjam Pakai Kawasan Hutan sebagaimana telah diubah dengan Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor P.7/Menlhk/Setjen/Kum.1/2/2019;
23. Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor P.22/Menlhk/Setjen/Kum.1/7/2018 tentang Norma, Standar, Prosedur, dan Kriteria Pelayanan Perizinan Terintegrasi Secara Elektronik Lingkup Kementerian Lingkungan Hidup dan Kehutanan, sebagaimana telah diubah dengan Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor P.5/ Menlhk/Setjen/Kum.1/1/2020;
24. Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor P.59/Menlhk/Setjen/Kum.1/10/2019 tentang Penanaman Dalam Rangka Rehabilitasi Daerah Aliran Sungai;
25. Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor P.66/Menlhk/Setjen/Kum.1/10/2019 tentang Penatausahaan Hasil Hutan Kayu Yang Berasal dari Hutan Alam;
26. Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor P.67/Menlhk/Setjen/Kum.1/10/2019 tentang Penatausahaan Hasil Hutan Kayu Yang Berasal dari Hutan Tanaman Pada Hutan Produksi;
27. Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor P.6/Menlhk/Setjen/Kum.1/1/2020 tentang Pelimpahan Kewenangan Penerbitan Perizinan Berusaha Bidang Lingkungan Hidup dan Kehutanan Kepada Kepala Badan Koordinasi Penanaman Modal;
28. Keputusan Menteri Lingkungan Hidup dan Kehutanan Kehutanan Nomor SK.6394/MENLHK-PKTL/REN/PLA.0/7/2019 tentang Peta Indikatif dan Areal Perhutanan Sosial (Revisi IV);
29. Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK.7099/MENLHK-PKTL/IPSDH/PLA.1/8/2019 tentang Penetapan Peta Indikatif Penghentian Pemberian Izin Baru Hutan Alam Primer dan Lahan Gambut Tahun 2019.

Memperhatikan: 1. Keputusan Kepala Dinas Pengelola Lingkungan Hidup Provinsi Papua Nomor 14 Tahun 2018 tanggal 20 Juli 2018 tentang Rekomendasi UKL UPL Rencana Kegiatan Eksplorasi Nikel dmp oleh PT. Iriana Mutiara Mining, Luas Wilayah 16.470 Ha di Distrik Tor Atas dan Pantai Timur Barat, Kabupaten Sarmi, Provinsi Papua;
2. Keputusan Kepala Dinas Penanaman Modal dan Pelayanan Terpadu Satu Pintu Provinsi Papua Nomor 29 Tahun 2018 tanggal 28 Agustus 2018 tentang Izin Lingkungan Rencana Kegiatan Eksplorasi Nikel dmp oleh PT. Iriana Mutiara Mining, Luas Wilayah 16.470 Ha di Distrik Tor Atas dan Pantai Timur Barat, Kabupaten Sarmi, Provinsi Papua;
3. Surat Kepala Dinas Penanaman Modal dan Pelayanan Terpadu Satu Pintu Provinsi Papua atas nama Gubernur Papua Nomor 02-Rekom-IPPKH/DPMPTSP/I/2019 tanggal

28 Januari 2019 Hal Rekomendasi Izin Pinjam Pakai Kawasan Hutan seluas ± 11.053 Ha untuk Kegiatan Izin Usaha Pertambangan Eksplorasi atas nama PT. Iriana Mutiara Mining di Kabupaten Sarmi, Provinsi Papua;

4. Surat Plt. Direktur Jenderal Pengelolaan Hutan Produksi Lestari Nomor S.494/PHPL/KPHP/HPL.0/11/2019 tanggal 20 November 2019 Hal Pertimbangan Teknis Permohonan IPPKH PT. Iriana Mutiara Mining untuk Kegiatan Eksplorasi Nikel Dmp dalam areal IUPHHK-HA PT. Mondialindo Setya Pratama.

MEMUTUSKAN:

Menetapkan : KEPUTUSAN KEPALA BADAN KOORDINASI PENANAMAN MODAL TENTANG IZIN PINJAM PAKAI KAWASAN HUTAN UNTUK KEGIATAN EKSPLORASI NIKEL DMP ATAS NAMA PT. IRIANA MUTIARA MINING SELUAS ± 3.776,73 HA (TIGA RIBU TUJUH RATUS TUJUH PULUH ENAM DAN TUJUH PULUH TIGA PERSERATUS HEKTARE) PADA KAWASAN HUTAN PRODUKSI TETAP DI KABUPATEN SARMI, PROVINSI PAPUA

KESATU : Memberikan Izin Pinjam Pakai Kawasan Hutan untuk Kegiatan Eksplorasi Nikel Dmp kepada PT. Iriana Mutiara Mining seluas ± 3.776,73 Ha (tiga ribu tujuh ratus tujuh puluh enam dan tujuh puluh tiga perseratus hektare) pada Kawasan Hutan Produksi Tetap di Kabupaten Sarmi, Provinsi Papua, sebagaimana peta lampiran Keputusan ini.

KEDUA : Izin Pinjam Pakai Kawasan Hutan sebagaimana dimaksud dalam Amar KESATU adalah untuk Kegiatan Eksplorasi Nikel Dmp atas nama PT. Iriana Mutiara Mining, bukan untuk kegiatan lain serta arealnya tetap berstatus sebagai kawasan hutan.

KETIGA : PT. Iriana Mutiara Mining berhak:

a. berada, menempati dan mengelola serta melakukan kegiatan-kegiatan yang meliputi kegiatan Eksplorasi Nikel Dmp, serta melakukan kegiatan-kegiatan lainnya yang berhubungan dengan kegiatan tersebut dalam kawasan hutan yang dipinjam pakai;
b. melakukan penebangan pohon dalam rangka pembukaan lahan yang tidak dapat dielakan dengan membayar Provisi Sumber Daya Hutan (PSDH) dan/atau Dana Reboisasi (DR) sesuai dengan ketentuan Peraturan Perundang-Undangan.

KEEMPAT : PT. Iriana Mutiara Mining wajib:

a. melaksanakan reklamasi pada kawasan hutan yang sudah tidak dipergunakan tanpa menunggu selesainya jangka waktu izin pinjam pakai kawasan hutan;
b. melakukan inventarisasi tegakan pada areal yang direncanakan untuk dilakukan pembukaan lahan sebagai dasar pembayaran Provinsi Sumber Daya Hutan (PSDH) dan/atau Dana Reboisasi (DR);
c. membayar PSDH dan/atau DR sesuai peraturan perundang-undangan;
d. membayar ganti rugi nilai tegakan kepada pemerintah apabila areal yang dimohon merupakan hutan tanaman hasil rehabilitasi seluas yang digunakan sesuai peraturan perundang-undangan;

e. melaksanakan perlindungan hutan pada areal Izin Pinjam Pakai Kawasan Hutan dan areal sekitar izin sesuai dengan peraturan perundang-undangan;

f. melakukan pengendalian kebakaran hutan dan lahan, berupa antara lain:

f.1. menempatkan sekurang-kurangnya 1 (satu) Regu Inti Pengendali Kebakaran Hutan;

f.2. merekrut karyawan pada perusahaan sebagai anggota Regu Pendukung Pengendali Kebakaran Hutan;

f.3. menyiapkan Sumberdaya Manusia pengendalian kebakaran hutan dalam Brigade Pengendalian Kebakaran Hutan dan Lahan (Brigdalkarhutla) dalam organisasi kelompok-kelompok Masyarakat Peduli Api;

f.4. menyiapkan sarpras untuk menunjang kegiatan Brigdalkarhutla antara lain sarpras pencegahan kebakaran hutan dan sarpras pemadaman kebakaran hutan.

g. memberikan kemudahan bagi aparat Kementerian Lingkungan Hidup dan Kehutanan baik pusat maupun daerah pada saat melakukan monitoring dan evaluasi di lapangan;

h. mengkoordinasikan kegiatan kepada instansi lingkungan hidup dan kehutanan setempat;

i. melakukan pemberdayaan masyarakat sekitar areal Izin Pinjam Pakai Kawasan Hutan;

j. membuat laporan secara berkala setiap 6 (enam) bulan sekali kepada Menteri Lingkungan Hidup dan Kehutanan mengenai penggunaan kawasan hutan yang dipinjam pakai dengan tembusan: Direktur Jenderal Planologi Kehutanan dan Tata Lingkungan, Direktur Jenderal Pengelolaan Hutan Produksi Lestari, Direktur Jenderal Konservasi Sumber Daya Alam dan Ekosistem, Direktur Jenderal Pengendalian Daerah Aliran Sungai dan Hutan Lindung, Kepala Dinas Kehutanan dan Konservasi Provinsi Papua, Kepala Balai Pemantapan Kawasan Hutan Wilayah X Jayapura, dan Kepala Balai Pengelolaan Daerah Aliran Sungai dan Hutan Lindung Mamberamo.

KELIMA : PT. Iriana Mutiara Mining dilarang:

a. memindahtangankan Izin Pinjam Pakai Kawasan Hutan kepada pihak lain atau perubahan nama pemegang Izin Pinjam Pakai Kawasan Hutan tanpa persetujuan Menteri Lingkungan Hidup dan Kehutanan;

b. menjaminkan atau mengagunkan areal Izin Pinjam Pakai Kawasan Hutan kepada pihak lain;

c. menggunakan merkuri dalam kegiatan pertambangan;

d. melakukan kegiatan lainnya yang dilarang sesuai peraturan perundang-undangan.

KEENAM : PT. Iriana Mutiara Mining menyelesaikan hak-hak pihak ketiga, apabila terdapat hak-hak pihak ketiga di dalam areal Izin Pinjam Pakai Kawasan Hutan dengan meminta bimbingan dan fasilitasi Pemerintah Daerah setempat.

KETUJUH : Izin Pinjam Pakai Kawasan Hutan untuk kegiatan Eksplorasi Nikel Dmp ini dicabut dan pemegang izin dikenakan sanksi sesuai peraturan perundang-undangan, apabila pemegang izin tidak memenuhi kewajiban dan/atau melakukan pelanggaran atas ketentuan-ketentuan sebagaimana dimaksud dalam izin ini.

KEDELAPAN : Permohonan perpanjangan Izin Pinjam Pakai Kawasan Hutan untuk kegiatan eksplorasi diajukan oleh pemegang izin dalam jangka waktu paling lambat 2 (dua) bulan sebelum berakhirnya izin.

KESEMBILAN: Keputusan ini mulai berlaku pada tanggal ditetapkan untuk jangka waktu paling lama 1 (satu) tahun 2 (dua) hari sejak tanggal 27 April 2020 sampai dengan tanggal 29 April 2021, kecuali apabila dicabut oleh Menteri Lingkungan Hidup dan Kehutanan.

KESEPULUH: Apabila dikemudian hari terdapat kekeliruan dalam keputusan ini, akan dilakukan perbaikan sebagaimana mestinya.

Ditetapkan di Jakarta
Pada tanggal 15 MAY 2020

a.n. MENTERI LINGKUNGAN HIDUP DAN KEHUTANAN REPUBLIK INDONESIA,
KEPALA BADAN KOORDINASI PENANAMAN MODAL,

BAHLIL LAHADALIA

Salinan Keputusan ini disampaikan kepada Yth:
1. Menteri Koordinator Bidang Kemaritiman dan Investasi;
2. Menteri Lingkungan Hidup dan Kehutanan;
3. Gubernur Papua;
4. Sekretaris Jenderal Kementerian Lingkungan Hidup dan Kehutanan;
5. Direktur Jenderal Planologi Kehutanan dan Tata Lingkungan;
6. Direktur Jenderal Pengelolaan Hutan Produksi Lestari;
7. Direktur Jenderal Konservasi Sumber Daya Alam dan Ekosistem;
8. Direktur Jenderal Pengendalian Daerah Aliran Sungai dan Hutan Lindung;
9. Direktur Jenderal Penegakan Hukum Lingkungan Hidup dan Kehutanan;
10. Direktur Jenderal Mineral dan Batubara, Kementerian Energi dan Sumber Daya Mineral;
11. Bupati Sarmi;
12. Kepala Dinas Kehutanan dan Konservasi Provinsi Papua;
13. Kepala Balai Pemantapan Kawasan Hutan Wilayah X Jayapura;
14. Kepala Balai Pengelolaan Hutan Produksi Wilayah XV Jayapura;
15. Kepala Balai Pengelolaan Daerah Aliran Sungai dan Hutan Lindung Mamberamo;
16. Presiden Direktur PT. Iriana Mutiara Mining.

PETA

IZIN PINJAM PAKAI KAWASAN HUTAN UNTUK KEGIATAN EKSPLORASI NIKEL DMP PADA KAWASAN HUTAN PRODUKSI TETAP (HP)

a.n. PT. IRIANA MUTIARA MINING

KABUPATEN SARMI
PROVINSI PAPUA
SELUAS ± 3.776,73 HA
SKALA 1 : 50.000

0 0.5 1 2 3 4 Km
0 1 2 4 6 8 Cm

U

LAMPIRAN KEPUTUSAN MENTERI LINGKUNGAN HIDUP DAN KEHUTANAN REPUBLIK INDONESIA

NOMOR : SK.77 / 1 / KLHK / 2020
TANGGAL : 15 MAY 2020

a.n. MENTERI LINGKUNGAN HIDUP DAN KEHUTANAN REPUBLIK INDONESIA
KEPALA BADAN KOORDINASI PENANAMAN MODAL,

BAHLIL LAHADALIA

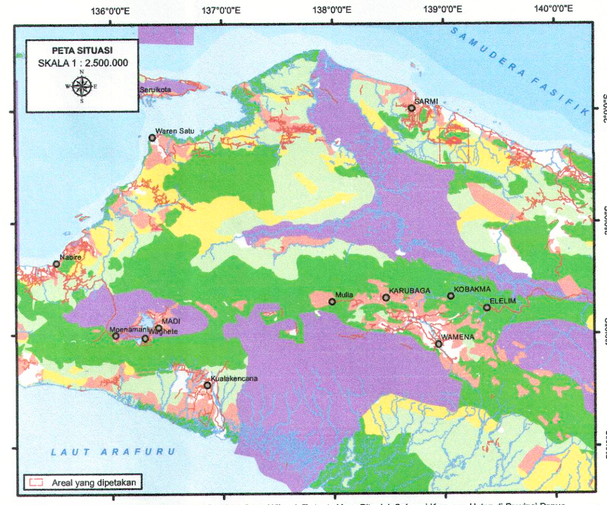
KETERANGAN :

- Batas areal kontrak karya a.n. PT. Iriana Mutiara Mining
- Batas areal izin pinjam pakai kawasan hutan untuk kegiatan eksplorasi nikel dmp a.n. PT. Iriana Mutiara Mining seluas ± 3.776,73 Ha, dengan rincian penggunaan :
  - a. Pengeboran *(drilling)* interval 200 meter sebanyak 194 titik
  - b. Pengeboran *(drilling)* interval 400 meter sebanyak 70 titik
  - c. Camp
- Areal IUPHHK-HA
- HL Hutan Lindung
- HPT Hutan Produksi Terbatas
- HP Hutan Produksi Tetap
- Sungai dan anak sungai
- Jalan

Catatan :
Batas areal izin pemanfaatan hutan yang tergambar dalam peta tidak sepenuhnya dapat dijadikan acuan batas di lapangan.

DASAR :
- Instruksi Presiden Republik Indonesia Nomor 5 Tahun 2019 tanggal 7 Agustus 2019
- Kontrak Karya antara Pemerintah Republik Indonesia dengan PT. Iriana Mutiara Mining tanggal 28 April 1997 yang diperbaharui dengan Kontrak Karya tanggal 23 Desember 2015
- Surat Kepala Dinas Penanaman Modal dan Pelayanan Terpadu Satu Pintu Provinsi Papua a.n. Gubernur Papua Nomor 02-Rekom-IPPKH/DPMPTSP/I/2019 tanggal 28 Januari 2019
- Surat Direktur Jenderal Pengelolaan Hutan Produksi Lestari Nomor S.494/PHPL/KPHP/HPL.0/11/2019 tanggal 20 November 2019
- Surat Presiden Direktur PT. Iriana Mutiara Mining Nomor 49/IMM/IX/19 tanggal 2 September 2019

SUMBER :
- Peta Rupa Bumi Indonesia (RBI), skala 1 : 50.000
- Peta Kawasan Hutan dan Konservasi Perairan Serta Wilayah Tertentu Yang Ditunjuk Sebagai Kawasan Hutan di Provinsi Papua Skala 1 : 250.000 (lampiran Keputusan Menteri Kehutanan Nomor SK.782/Menhut-II/2012 tanggal 27 Desember 2012)
- Data digital (.shp) lampran surat Presiden Direktur PT. Iriana Mutiara Mining Nomor 49/IMM/IX/19 tanggal 2 September 2019



Sumber : Peta Kawasan Hutan dan Konservasi Perairan Serta Wilayah Tertentu Yang Ditunjuk Sebagai Kawasan Hutan di Provinsi Papua Skala 1 : 250.000

KEMENTERIAN LINGKUNGAN HIDUP DAN KEHUTANAN



MENTERI LINGKUNGAN HIDUP DAN KEHUTANAN
REPUBLIK INDONESIA

KEPUTUSAN MENTERI LINGKUNGAN HIDUP DAN KEHUTANAN
REPUBLIK INDONESIA
NOMOR : SK.191/Menlhk/Setjen/PLA.0/4/2021

TENTANG

PERUBAHAN ATAS KEPUTUSAN KEPALA BADAN KOORDINASI PENANAMAN MODAL ATAS NAMA MENTERI LINGKUNGAN HIDUP DAN KEHUTANAN NOMOR SK.77/1/KLHK/2020 TANGGAL 15 MEI 2020 TENTANG IZIN PINJAM PAKAI KAWASAN HUTAN UNTUK KEGIATAN EKSPLORASI NIKEL DMP ATAS NAMA PT. IRIANA MUTIARA MINING SELUAS ± 3.776,73 HA (TIGA RIBU TUJUH RATUS TUJUH PULUH ENAM DAN TUJUH PULUH TIGA PERSERATUS HEKTARE) PADA KAWASAN HUTAN PRODUKSI TETAP DI KABUPATEN SARMI, PROVINSI PAPUA

DENGAN RAHMAT TUHAN YANG MAHA ESA

MENTERI LINGKUNGAN HIDUP DAN KEHUTANAN REPUBLIK INDONESIA,

Menimbang : a. bahwa PT. Iriana Mutiara Mining merupakan Perusahaan Pemegang :

1) Kontrak Karya antara Pemerintah Republik Indonesia dengan PT. Iriana Mutiara Mining tanggal 28 April 1997, sebagaimana telah diamandemen tanggal 23 Desember 2015 seluas 16.470 Ha (enam belas ribu empat ratus tujuh puluh hektare) di Kabupaten Sarmi, Provinsi Papua;
2) Keputusan Menteri Energi dan Sumber Daya Mineral Nomor 459.K/30/DJB/2017 tanggal 13 Desember 2017 tentang Penyesuaian Tahap Kegiatan Kontrak Karya PT. Iriana Mutiara Mining Menjadi Tahap Kegiatan Eksplorasi seluas 16.470 Ha (enam belas ribu empat ratus tujuh puluh hektare), berlaku sejak tanggal 13 Desember 2017 sampai dengan tanggal 29 April 2019, sebagaimana telah diubah dengan Keputusan Menteri Energi dan Sumber Daya Mineral Nomor 254.K/30/DJB/2018 tanggal 25 Mei 2018;
3) Surat Direktur Jenderal Mineral dan Batubara Nomor 2329/30.07/DJB/2018 tanggal 26 Desember 2018 Hal Persetujuan Perpanjangan Penundaan Kegiatan Suspensi I, terhitung sejak tanggal 27 April 2018 sampai dengan tanggal 21 April 2019;
4) Surat Direktur Jenderal Mineral dan Batubara Nomor 870/30.07/DJB/2019 tanggal 23 April 2019 Hal Penundaan Kegiatan (Suspensi) Pada Tahap Kegiatan Eksplorasi PT. Iriana Mutiara Mining, terhitung sejak

tanggal 27 April 2019 sampai dengan tanggal 26 April 2020;

5) Surat Direktur Jenderal Mineral dan Batubara Nomor 841/30.07/DJB/2020 tanggal 16 April 2020 hal Penundaan Kegiatan (Suspensi) pada Tahap Kegiatan Eksplorasi PT. Iriana Mutiara Mining;

b. bahwa Presiden Direktur PT. Iriana Mutiara Mining dengan surat Nomor 13/IMM/II/21 tanggal 15 Februari 2021, mengajukan permohonan perpanjangan Izin Pinjam Pakai Kawasan Hutan untuk Kegiatan Eksplorasi Nikel DMP seluas ± 3.776,73 Ha (tiga ribu tujuh ratus tujuh puluh enam dan tujuh puluh tiga perseratus hektare) di Kabupaten Sami, Provinsi Papua;

c. bahwa sesuai surat Direktur Jenderal Planologi Kehutanan dan Tata Lingkungan Nomor S.266/PKTL/ REN/PLA.0/4/ 2021 tanggal 16 April 2021, menyampaikan telaah terhadap permohonan IPPKH PT. Iriana Mutiara Mining:

1) permohonan PT. Iriana Mutiara Mining telah melampirkan persyaratan administrasi dan teknis sesuai ketentuan Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor P.27/Menlhk/ Setjen/Kum.1/7/ 2018 tentang Pedoman Pinjam Pakai Kawasan Hutan sebagaimana telah diubah dengan Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor P.7/Menlhk/ Setjen/Kum.1/2/ 2019;

2) areal seluas ± 3.776,73 Ha (tiga ribu tujuh ratus tujuh puluh enam dan tujuh puluh tiga perseratus hektare) berada pada Kawasan Hutan Produksi Tetap, berada pada IUPHHK-HA PT. Mondialindo Setya Pratama dan berada pada IUPHHK-HA PT. Salaki Mandiri Sejahtera serta berada pada KPHP Unit XXIII di Kabupaten Sarmi, Provinsi Papua dengan ketentuan kuota untuk permohonan Izin Pinjam Pakai Kawasan Hutan bagi kegiatan survei atau eksplorasi pertambangan tidak berlaku;

3) mengingat tidak adanya pencabutan suspensi, maka meskipun telah memiliki IPPKH, namun berdasarkan ketentuan peraturan perundang-undangan dibidang pertambangan mineral dan batubara, PT. Iriana Mutiara Mining tidak diperkenankan melakukan kegiatan di lapangan. Dengan demikian permohonan perpanjangan IPPKH untuk kegiatan eksplorasi Nikel DMP a.n. PT. Iriana Mutiara Mining diproses menjadi perubahan masa berlaku IPPKH dari semula terhitung sejak tanggal 27 April 2020 sampai dengan tanggal 29 April 2021, berdasarkan sisa masa kegiatan eksplorasi selama 364 hari, terhitung sejak tanggal 27 April 2021 sampai dengan tanggal 26 april 2022 sesuai surat Direktur Jenderal Mineral dan Batubara Nomor 841/ 30.07/DJB/2020 tanggal 16 April 2020;

4) perubahan masa berlaku persetujuan penggunaan kawasan hutan untuk Kegiatan Eksplorasi Nikel DMP a.n. PT. Iriana Mutiara Mining secara teknis dapat dipertimbangkan untuk diproses lebih lanjut seluas ± 3.776,73 Ha (tiga ribu tujuh ratus tujuh puluh enam dan tujuh puluh tiga perseratus hektare), dengan jangka waktu terhitung sejak tanggal 27 April 2021 sampai dengan tanggal 26 April 2022;

d. bahwa berdasarkan :

1) Peraturan Pemerintah Nomor 23 Tahun 2021 tentang Penyelenggaraan Kehutanan:

a) Pasal 94 ayat (1) dan Pasal 96 ayat (1), Penggunaan Kawasan Hutan untuk kepentingan pembangunan di luar kegiatan Kehutanan dilakukan berdasarkan Persetujuan Penggunaan Kawasan Hutan dan Persetujuan Penggunaan Kawasan Hutan diberikan oleh Menteri berdasarkan permohonan;

b) Pasal 296 huruf c, permohonan izin pinjam pakai Kawasan Hutan yang diajukan sebelum berlakunya Peraturan Pemerintah ini dan telah memenuhi persyaratan dapat diterbitkan Persetujuan Penggunaan Kawasan Hutan dengan kewajiban sesuai dengan Peraturan Pemerintah ini;

c) Pasal 300 huruf c, pada saat Peraturan Pemerintah ini berlaku, peraturan pelaksanaan dari Peraturan Pemerintah Nomor 24 Tahun 2010 tentang Penggunaan Kawasan Hutan sebagaimana telah beberapa kali diubah, terakhir dengan Peraturan Pemerintah Nomor 105 Tahun 2015 tentang Perubahan Kedua atas Peraturan Pemerintah Nomor 24 Tahun 2010 tentang Penggunaan Kawasan Hutan dinyatakan tetap berlaku sepanjang tidak bertentangan dengan Peraturan Pemerintah ini;

2) Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor P.27/Menlhk/Setjen/ Kum.1/7/2018 tentang Pedoman Pinjam Pakai Kawasan Hutan sebagaimana telah diubah dengan Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor P.7/ Menlhk/Setjen/ Kum.1/2/2019:

a) Pasal 5 ayat (2) huruf c. huruf d); Izin Pinjam Pakai Kawasan Hutan untuk kepentingan pembangunan di luar kegiatan kehutanan dilakukan dengan ketentuan tanpa kompensasi lahan atau tanpa kompensasi membayar PNBP penggunaan kawasan hutan dan tanpa melakukan penanaman dalam rangka rehabilitasi daerah aliran sungai, dengan ketentuan hanya untuk kegiatan penyelidikan umum, eksplorasi, studi kelayakan dan eksplorasi lanjutan;

b) Pasal 10 ayat (9) huruf a, Ketentuan kuota 10% (sepuluh perseratus) dari luas kawasan hutan yang diperkenankan tidak berlaku bagi permohonan IPPKH untuk eksplorasi pertambangan;

3) huruf F angka 2 bagian huruf c Surat Edaran Menteri Lingkungan Hidup dan Kehutanan Nomor SE.2/ Menlhk/Setjen/Kum.1/3/2021 tanggal 12 Maret 2021 tentang Pengaturan Peralihan Peraturan Pemerintah Nomor 5 Tahun 2021, Peraturan Pemerintah Nomor 22 Tahun 2021, dan Peraturan Pemerintah Nomor 23 Tahun 2021, Permohonan perpanjangan dan/atau perubahan Izin Pinjam Pakai Kawasan Hutan yang diajukan baik sebelum maupun setelah tanggal 2 Februari 2021, dipersamakan sebagai permohonan perpanjangan dan/atau perubahan Persetujuan Penggunaan Kawasan Hutan, dan ditelaah berdasarkan Peraturan Pemerintah Nomor 23 Tahun 2021 tentang Penyelenggaraan Kehutanan;

e. bahwa berdasarkan pertimbangan tersebut huruf a sampai dengan huruf d, perlu menetapkan Keputusan Menteri Lingkungan Hidup dan Kehutanan tentang Perubahan atas Keputusan Kepala Badan Koordinasi Penanaman Modal atas nama Menteri Lingkungan Hidup dan Kehutanan Nomor SK.77/1/KLHK/2020 tanggal 15 Mei 2020 tentang Izin Pinjam Pakai Kawasan Hutan untuk Kegiatan Eksplorasi Nikel Dmp atas nama PT. Iriana Mutiara Mining seluas ± 3.776,73 Ha (tiga ribu tujuh ratus tujuh puluh enam dan tujuh puluh tiga perseratus hektare) pada Kawasan Hutan Produksi Tetap di Kabupaten Sarmi, Provinsi Papua;

Mengingat :

1. Undang-Undang Nomor 5 Tahun 1990 tentang Konservasi Sumberdaya Alam Hayati dan Ekosistemnya;
2. Undang-Undang Nomor 41 Tahun 1999 tentang Kehutanan, sebagaimana telah diubah beberapa kali, terakhir dengan Undang-Undang Nomor 11 Tahun 2020 tentang Cipta Kerja;
3. Undang-Undang Nomor 26 Tahun 2007 tentang Penataan Ruang, sebagaimana telah diubah dengan Undang-Undang Nomor 11 Tahun 2020 tentang Cipta Kerja;
4. Undang-Undang Nomor 32 Tahun 2009 tentang Perlindungan dan Pengelolaan Lingkungan Hidup, sebagaimana telah diubah dengan Undang-Undang Nomor 11 Tahun 2020 tentang Cipta Kerja;
5. Undang-Undang Nomor 18 Tahun 2013 tentang Pencegahan dan Pemberantasan Perusakan Hutan, sebagaimana telah diubah dengan Undang-Undang Nomor 11 Tahun 2020 tentang Cipta Kerja;
6. Undang-Undang Nomor 23 Tahun 2014 tentang Pemerintahan Daerah, sebagaimana telah diubah beberapa kali, terakhir dengan Undang-Undang Nomor 11 Tahun 2020 tentang Cipta Kerja;

7. Peraturan Pemerintah Nomor 26 Tahun 2008 tentang Rencana Tata Ruang Wilayah Nasional, sebagaimana telah diubah beberapa kali, terakhir dengan Peraturan Pemerintah Nomor 21 Tahun 2021 tentang Penyelenggaraan Penataan Ruang;
8. Peraturan Pemerintah Nomor 26 Tahun 2020 tentang Rehabilitasi dan Reklamasi Hutan;
9. Peraturan Pemerintah Nomor 22 Tahun 2021 tentang Penyelenggaraan Perlindungan dan Pengelolaan Lingkungan Hidup;
10. Peraturan Pemerintah Nomor 23 Tahun 2021 tentang Penyelenggaraan Kehutanan;
11. Peraturan Pemerintah Nomor 24 Tahun 2021 tentang Tata Cara Pengenaan Sanksi Administratif dan Tata Cara Penerimaan Negara Bukan Pajak yang berasal dari Denda Administratif Bidang Kehutanan;
12. Peraturan Pemerintah Nomor 43 Tahun 2021 tentang Penyelesaian Ketidaksesuaian Tata Ruang, Kawasan Hutan, Izin dan/atau Hak atas Tanah;
13. Peraturan Presiden Nomor 68 Tahun 2019 tentang Organisasi Kementerian Negara;
14. Peraturan Presiden Nomor 92 Tahun 2020 tentang Kementerian Lingkungan Hidup dan Kehutanan;
15. Keputusan Presiden Nomor 113/P Tahun 2019 tentang Pembentukan Kementerian Negara dan Pengangkatan Menteri Negara Kabinet Indonesia Maju Periode Tahun 2019-2024, sebagaimana telah diubah dengan Keputusan Presiden Nomor 133/P Tahun 2020 tentang Pengisian dan Penggantian beberapa Menteri Negara Kabinet Indonesia Maju Periode Tahun 2019-2024;
16. Instruksi Presiden Nomor 5 Tahun 2019 tentang Penghentian Pemberian Izin Baru dan Penyempurnaan Tata Kelola Hutan Alam Primer dan Lahan Gambut;
17. Peraturan Menteri Kehutanan Nomor P.60/Menhut-II/2009 tentang Pedoman Penilaian Keberhasilan Reklamasi Hutan;
18. Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor P.18/Menlhk-II/2015 tentang Organisasi dan Tata Kerja Kementerian Lingkungan Hidup dan Kehutanan;
19. Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor P.62/MenLHK-Setjen/2015 tentang Izin Pemanfaatan Kayu;
20. Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor P.32/MenLHK/Setjen/Kum.1/3/2016 tentang Pengendalian Kebakaran Hutan dan Lahan;
21. Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor P.71/MenLHK/Setjen/HPL.3/8/2016 tentang Tata Cara Pengenaan, Pemungutan, dan Penyetoran Provisi Sumber Daya Hutan dan Dana Reboisasi, Ganti Rugi Tegakan, Denda Pelanggaran Eksploitasi Hutan dan Iuran Izin Usaha Pemanfaatan Hutan;

22. Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor P.27/Menlhk/Setjen/Kum.1/7/2018 tentang Pedoman Pinjam Pakai Kawasan Hutan sebagaimana telah diubah dengan Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor P.7/Menlhk/Setjen/ Kum.1/2/2019;
23. Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor P.66/Menlhk/Setjen/Kum.1/10/2019 tentang Penatausahaan Hasil Hutan Kayu yang Berasal dari Hutan Alam;
24. Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor P.67/Menlhk/Setjen/Kum.1/10/2019 tentang Penatausahaan Hasil Hutan Kayu yang Berasal dari Hutan Tanaman Pada Hutan Produksi;
25. Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK.2111/MENLHK-PKTL/REN/PLA.0/4/2020 tentang Peta Indikatif dan Areal Perhutanan Sosial (Revisi V);
26. Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK.4945/MENLHK-PKTL/IPSDH/PLA.1/8/2020 tentang Penetapan Peta Indikatif Penghentian Pemberian Izin Baru Hutan Alam Primer dan Lahan Gambut Tahun 2020 Periode II;
27. Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK.5050/MenLHK-PKTL/KUH/PLA.2/9/2020 tentang Peta Indikatif Alokasi Kawasan Hutan untuk Penyediaan Sumber Tanah Obyek Reforma Agraria/ TORA (Revisi V);

Memperhatikan: 1. Keputusan Kepala Dinas Pengelola Lingkungan Hidup Provinsi Papua Nomor 14 Tahun 2018 tanggal 20 Juli 2018 tentang Rekomendasi UKL UPL Rencana Kegiatan Eksplorasi Nikel dmp oleh PT. Iriana Mutiara Mining, Luas Wilayah 16.470 Ha di Distrik Tor Atas dan Pantai Timur Barat, Kabupaten Sarmi, Provinsi Papua;
2. Keputusan Kepala Dinas Penanaman Modal dan Pelayanan Terpadu Satu Pintu Provinsi Papua Nomor 29 Tahun 2018 tanggal 28 Agustus 2018 tentang Izin Lingkungan Rencana Kegiatan Eksplorasi Nikel dmp oleh PT. Iriana Mutiara Mining, Luas Wilayah 16.470 Ha di Distrik Tor Atas dan Pantai Timur Barat, Kabupaten Sarmi, Provinsi Papua;
3. Kronologis dan telaah perubahan Masa Berlaku Persetujuan Penggunaan Kawasan Hutan untuk Kegiatan Eksplorasi Nikel DMP pada Kawasan Hutan Produksi Tetap a.n. PT. Iriana Mutiara Mining Kabupaten Sarmi, Provinsi Papua seluas ± 3.776,73 Ha, Lampiran surat Direktur Jenderal Planologi Kehutanan dan Tata Lingkungan Nomor S.266/PKTL/REN/PLA.0/4/2021 tanggal 16 April 2021;

MEMUTUSKAN:

Menetapkan : KEPUTUSAN MENTERI LINGKUNGAN HIDUP DAN KEHUTANAN TENTANG PERUBAHAN ATAS KEPUTUSAN KEPALA BADAN KOORDINASI PENANAMAN MODAL ATAS NAMA MENTERI LINGKUNGAN HIDUP DAN KEHUTANAN NOMOR SK.77/1/KLHK/2020 TANGGAL 15 MEI 2020 TENTANG IZIN PINJAM PAKAI KAWASAN HUTAN UNTUK KEGIATAN EKSPLORASI NIKEL DMP ATAS NAMA PT. IRIANA MUTIARA MINING SELUAS ± 3.776,73 HA (TIGA RIBU TUJUH RATUS TUJUH PULUH ENAM DAN TUJUH PULUH TIGA PERSERATUS HEKTARE) PADA KAWASAN HUTAN PRODUKSI TETAP DI KABUPATEN SARMI, PROVINSI PAPUA.

Pasal I

Mengubah beberapa ketentuan dalam Keputusan Kepala Badan Koordinasi Penanaman Modal atas nama Menteri Lingkungan Hidup dan Kehutanan Nomor SK.77/1/KLHK/2020 tanggal 15 Mei 2020 tentang Izin Pinjam Pakai Kawasan Hutan untuk Kegiatan Eksplorasi Nikel DMP atas nama PT. Iriana Mutiara Mining seluas ± 3.776,73 Ha (tiga ribu tujuh ratus tujuh puluh enam dan tujuh puluh tiga perseratus hektare) pada Kawasan Hutan Produksi Tetap di Kabupaten Sarmi, Provinsi Papua, sebagai berikut:

1. Ketentuan Amar KESATU diubah sehingga berbunyi sebagai berikut:

   KESATU : Memberikan Persetujuan Penggunaan Kawasan Hutan untuk Kegiatan Eksplorasi Nikel DMP kepada PT. Iriana Mutiara Mining seluas ± 3.776,73 Ha (tiga ribu tujuh ratus tujuh puluh enam dan tujuh puluh tiga perseratus hektare) pada Kawasan Hutan Produksi Tetap di Kabupaten Sarmi, Provinsi Papua, sebagaimana peta lampiran Keputusan ini.

2. Ketentuan Amar KESEMBILAN diubah sehingga berbunyi sebagai berikut:

   KESEMBILAN : Keputusan ini mulai berlaku pada tanggal 27 April 2021 untuk jangka waktu paling lama sampai dengan tanggal 26 April 2022, kecuali apabila dicabut oleh Menteri Lingkungan Hidup dan Kehutanan.

Pasal II

1. Dengan ditetapkannya Keputusan ini, maka:
   a. Keputusan Kepala Badan Koordinasi Penanaman Modal atas nama Menteri Lingkungan Hidup dan Kehutanan Nomor SK.77/1/KLHK/2020 tanggal 15 Mei 2020 tentang Izin Pinjam Pakai Kawasan Hutan untuk Kegiatan Eksplorasi Nikel DMP atas nama PT. Iriana Mutiara Mining seluas ± 3.776,73 Ha (tiga ribu tujuh ratus tujuh puluh enam dan tujuh puluh tiga perseratus hektare) pada Kawasan Hutan Produksi Tetap di Kabupaten Sarmi, Provinsi Papua, dinyatakan tetap berlaku sepanjang tidak diubah dengan Keputusan ini.

b. Peta Lampiran Keputusan Kepala Badan Koordinasi Penanaman Modal atas nama Menteri Lingkungan Hidup dan Kehutanan Nomor SK.77/1/KLHK/2020 tanggal 15 Mei 2020 tentang Izin Pinjam Pakai Kawasan Hutan untuk Kegiatan Eksplorasi Nikel DMP atas nama PT. Iriana Mutiara Mining seluas ± 3.776,73 Ha (tiga ribu tujuh ratus tujuh puluh enam dan tujuh puluh tiga perseratus hektare) pada Kawasan Hutan Produksi Tetap di Kabupaten Sarmi, Provinsi Papua, dinyatakan tetap berlaku;

2. Keputusan ini mulai berlaku pada tanggal ditetapkan.

Ditetapkan di Jakarta
pada tanggal 29 April 2021

Salinan sesuai dengan aslinya
Plt. KEPALA BIRO HUKUM,

MAMAN KUSNANDAR

MENTERI LINGKUNGAN HIDUP DAN KEHUTANAN REPUBLIK INDONESIA,

ttd.

SITI NURBAYA

Salinan Keputusan ini disampaikan kepada Yth:
1. Menteri Koordinator Bidang Kemaritiman dan Investasi;
2. Gubernur Papua;
3. Sekretaris Jenderal Kementerian Lingkungan Hidup dan Kehutanan;
4. Direktur Jenderal Planologi Kehutanan dan Tata Lingkungan;
5. Direktur Jenderal Pengelolaan Hutan Produksi Lestari;
6. Direktur Jenderal Konservasi Sumber Daya Alam dan Ekosistem;
7. Direktur Jenderal Pengendalian Daerah Aliran Sungai dan Hutan Lindung;
8. Direktur Jenderal Penegakan Hukum Lingkungan Hidup dan Kehutanan;
9. Direktur Jenderal Mineral dan Batubara, Kementerian Energi dan Sumber Daya Mineral;
10. Bupati Sarmi;
11. Kepala Dinas Kehutanan dan Konservasi Provinsi Papua;
12. Kepala Balai Pemantapan Kawasan Hutan Wilayah X Jayapura;
13. Kepala Balai Pengelolaan Hutan Produksi Wilayah XV Jayapura;
14. Kepala Balai Pengelolaan Daerah Aliran Sungai dan Hutan Lindung Mamberamo;
15. Direktur IUPHHK-HA PT. Mondialindo Setya Pratama;
16. Direktur IUPHHK-HA PT. Salaki Mandiri Sejahtera;
17. Kepala KPHP Unit XXIII di Kabupaten Sarmi, Provinsi Papua
18. Presiden Direktur PT. Iriana Mutiara Mining.

APPENDIX 5

PT GEOSERVICES QA/QC REPORTS

PT GEOSERVICES LTD

GEOASSAY LABORATORY QA/QC PROTOCOLS

Komite Akreditasi Nasional
LABORATORIUM PENGUJI | LP-1364-IDN

General QA/QC Requirements

1. Complying with ISO I7025:2017 requirement
2. Up to date Work Instruction
3. Calibration of Lab equipment is maintained
4. Development of Competencies
5. Supply availability
6. Housekeeping

SAMPLES RECEIVING

Chain of Custody (COC)

Chain of Custody QA/QC

1. Check poly-weave bag Or sample tag condition
2. Takes photo of sample bag or tag
3. Record and report the signs of tampering

Sample Reconciliation

Sample Reconciliation QA/QC

1. Comparison of sample received and samples list
2. Record and confirm missing or extra samples (RNL or LNR)
3. Damaged samples - Photo
4. Complete sample submission form

LIMS QA/QC

1. Job Booked based on submission form
2. Assign CRM/blank/replicates/Duplicates
3. Sample Receipt Advice Printed
4. Job cover sheet printed
5. Worksheet and barcode samples label printed

Laboratory Information Management System (LIMS)

Sample Drying and Weighing QA/QC

1. Check oven temperature
2. Check balance verification
3. Check the cleanliness of tray
4. Pulp sample re-dried for 4 hours
5. Weigh and record wet and dry Weight of samples

Sample Drying

Sample Crushing QA/QC

1. Clean the crusher (jaw and Boyd) before and after job with barren rock or silica sand
2. Clean the crusher between samples with compressed air
3. 5% QA/QC checks on JC quality Duplicate (DR) ~ (1:25)
4. 5% Mass Loss Control on split and rejects
5. Sieve Test pass ≥ 95% for
   a. Jaw Crusher ~ 2.5 Mesh (8 mm)
   b. Boyd Crusher ~ 10 Mesh (2.00 mm)

Sample Crushing

Sample Pulverizing QA/QC

1. Clean bowl set with barren rock or silica sand before and after job
2. Clean bowl set with compressed air between samples
3. Roll mix ~ 20 times or milling sample ~ ± 6-10 minutes and split sample for analysis and retain sample
4. 5% QA/QC checks on grind quality Duplicate (DA) ~ (1:15)
5. 6. 5% Mass Loss Control on split and rejects
6. Sieve Test pass ≥ 95% for 200 Mesh (75 µm)
7. Re-milling for received Sample pulp if not pass sieve test

Sample Pulverizing

Chemical Analysis

Gold Analysis QA/QC

1. Balances daily verification
2. Furnace Temperature verification
3. Annual calibration or PM of equipment
4. Standard controls is inserted as per worksheet
5. Unique identification by Copper Sulphate addition
6. New pot crucibles, cupel and test tubes is used
7. Pre-heat cupel prior used
8. Dispensette daily verification
9. Monitoring of water bath temperature
10. lab instruments calibration as per guidelines

Gold

Multi element

Multi-element QA/QC

1. Annual calibration or PM of equipment
2. Standard controls is inserted as per worksheet
3. Balances daily verification
4. Furnace Temperature verification
5. Dispensette daily verification
6. Monitoring of hot plate temperature
7. lab instruments calibration as per guidelines.
8. Cleanliness of Lab apparatus

REPORT OF ANALYSIS

Report of Analysis

1. Sample weights
2. Sieve test data
3. Assay data
4. Analysis schemes
5. Standard control if required
6. Client profile

Prepared by	Approved by
Sally Purwada	Wayne Turner
Quality Manager	Head of Division

PT GEOSERVICES

CIKARANG LABORATORY
QC Report

1 Apr 2022 to 31 Jul 2023

for

PT. IRIANA MUTIARA MINING

Siduarsi Project

GLOSSARY

Defining Control Limits On Analytical Accuracy

Two types of tests for accuracy are carried out within CCLAS. Firstly, checks on the accuracy of routine readings of standard samples and secondly checks on the readings of blank samples ensuring that they are lower than a stated limit.

The acceptable accuracy of standard sample determinations vary with sample type and method of analysis (scheme) and individual control limits must be stored as a tolerance in % above and below the expected value.

The acceptable accuracy on blank sample determinations is dependent on the detection limit for the scheme.

The accuracy on blanks is tested for both positive and negative bias compared with zero.

X-Chart – Blanks and Standards

This performance chart is a graph of the value of a standard or blank sample within the given control limits, plotted against the number of observations. This is very useful in assessing the variation of analyses with time. Variation between batches, instruments and operators are often most clearly shown on this chart. Both bias and precision can be observed from this chart.

Control Charts for Analytical Precision

The Replicate, Duplicate and Replicate/Duplicate analysis options within the QC module can be used to generate several control charts for analytical precision, including the Scatter Plot, Correlation Chart and PCurve (Precision Curve).

The Scatter Plot provides a convenient control chart on analytical precision. Any points falling above the ACTION line are out of control, and the scatter of points should be sub-parallel to and below the ACTION line. The ACTION line is the theoretical absolute difference for the scheme based on the detection limit and the limiting repeatability entered into the database.

The Correlation Chart provides a convenient control for comparison of the original sample to the check (REP/DUP). The regression line on the plot should have a slope of 1. Both the least squares regression line and the line with slope = 1 are shown on the chart. The correlation coefficient for the regression line should approach 1.0.

The Precision Curve provides a control chart that displays the precision (% relative standard deviation %RSD) for the data pairs. The ACTION line is the theoretical precision calculated from the detection limit and the limiting repeatability for the analyte as entered into the database. It can be seen on the chart that the precision value increases exponentially as the concentration decreases. Note that the concentration scale is logarithmic to provide more resolution at low concentration. In this chart, anything in the area above the ACTION line are out of control.

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X-Chart – Blanks and Standards 2
Control Charts for Analytical Precision 2
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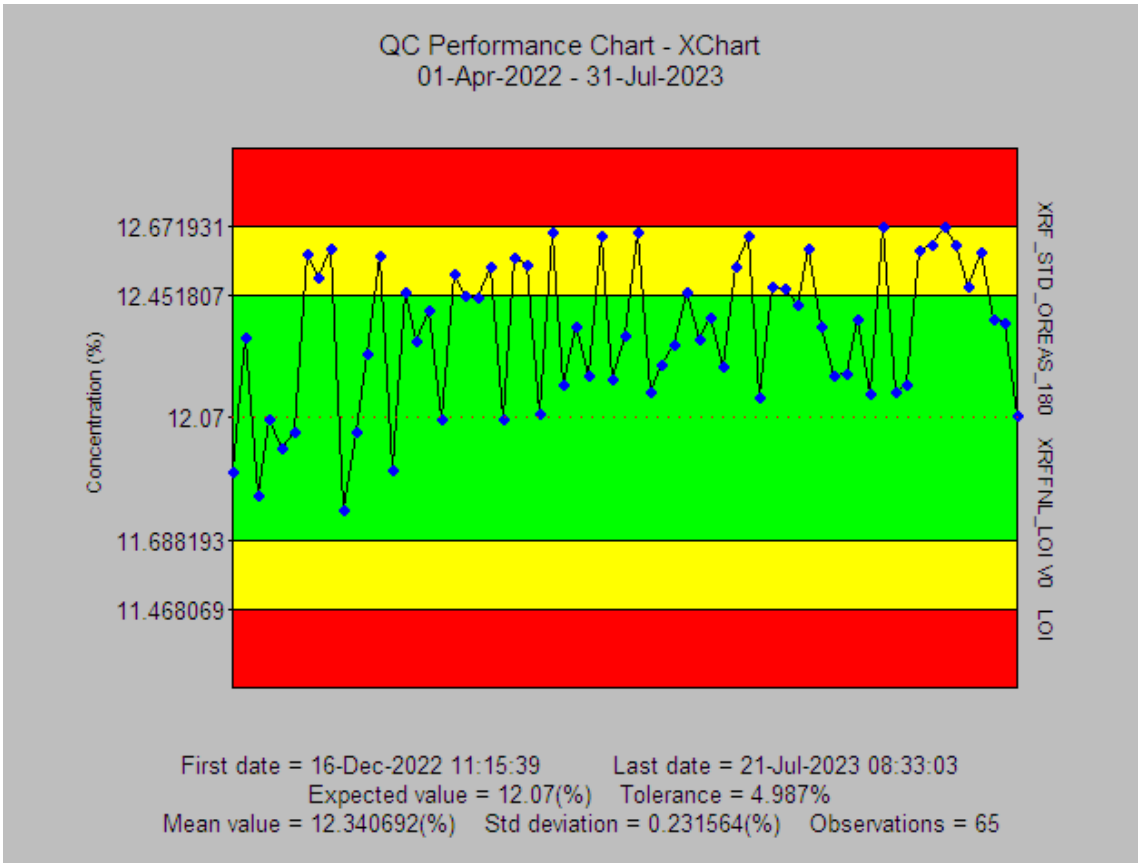
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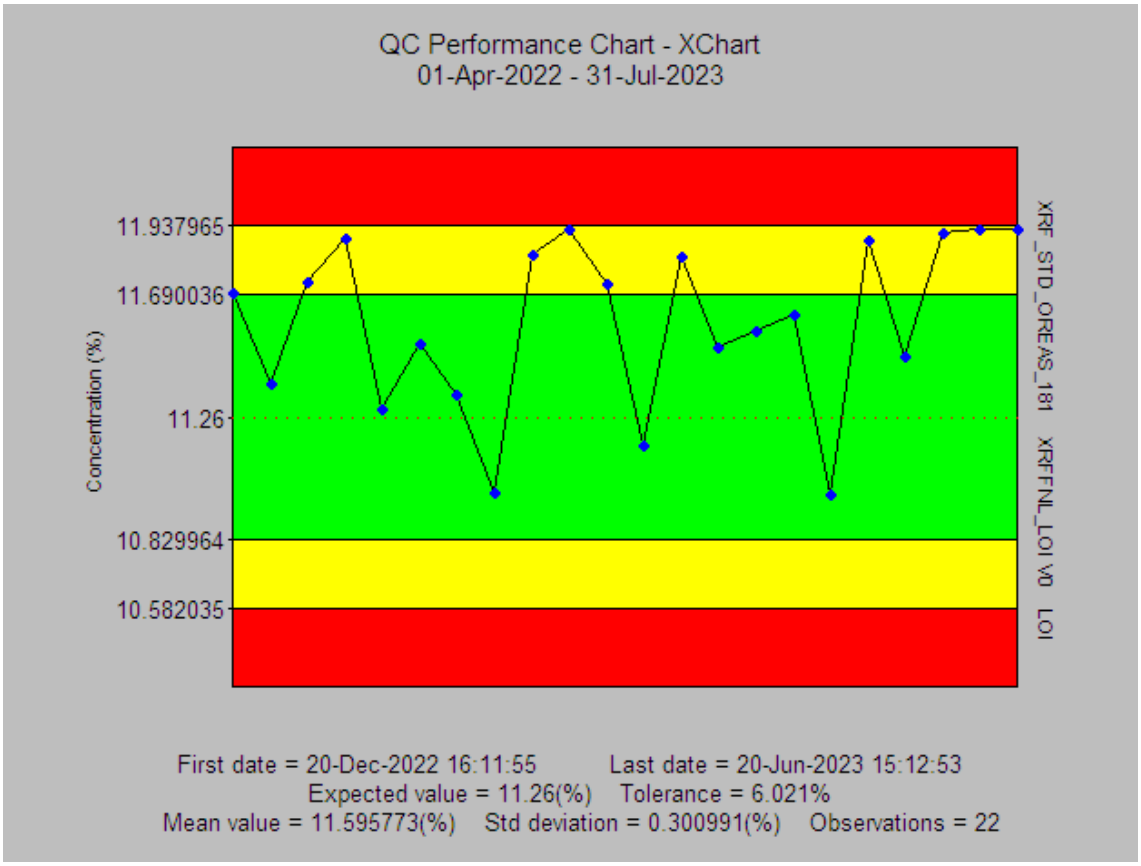
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REFERENCE MATERIAL QUALITY CONTROL - XRFFNL_LOI

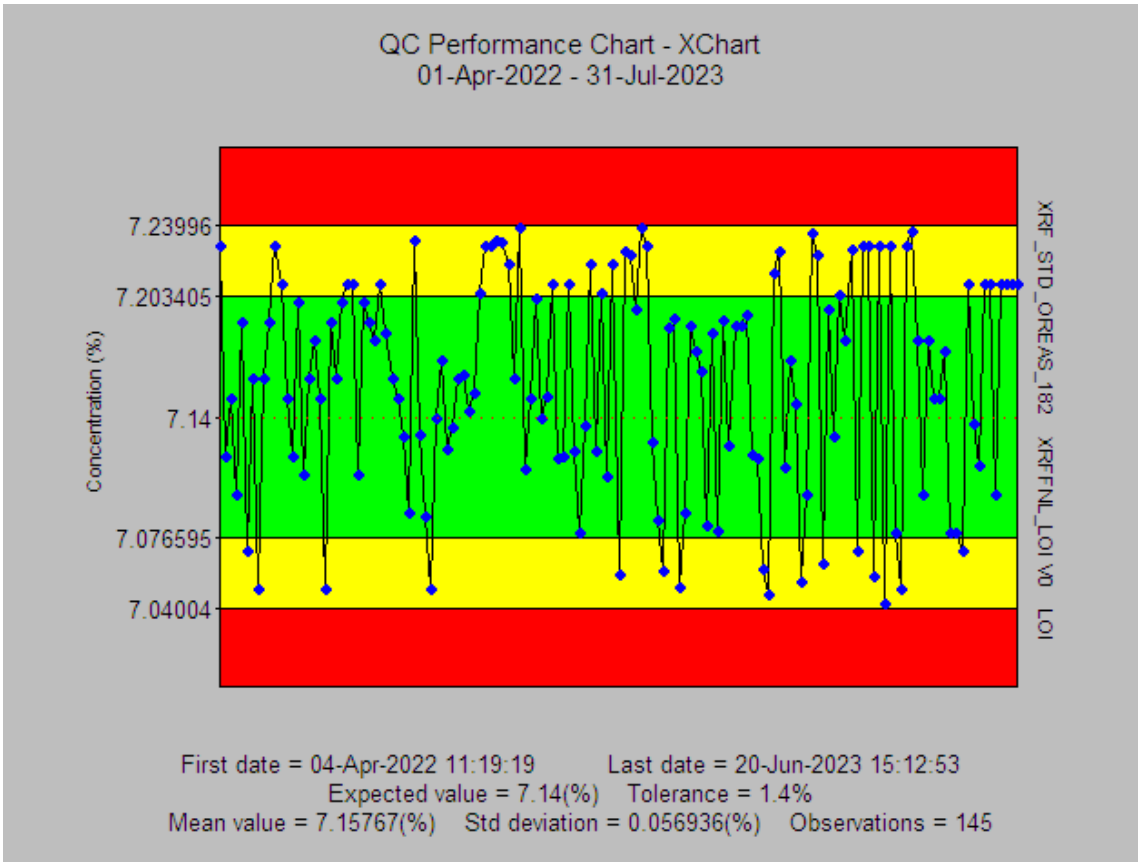
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XRF_STD_OREAS_181 - LOI

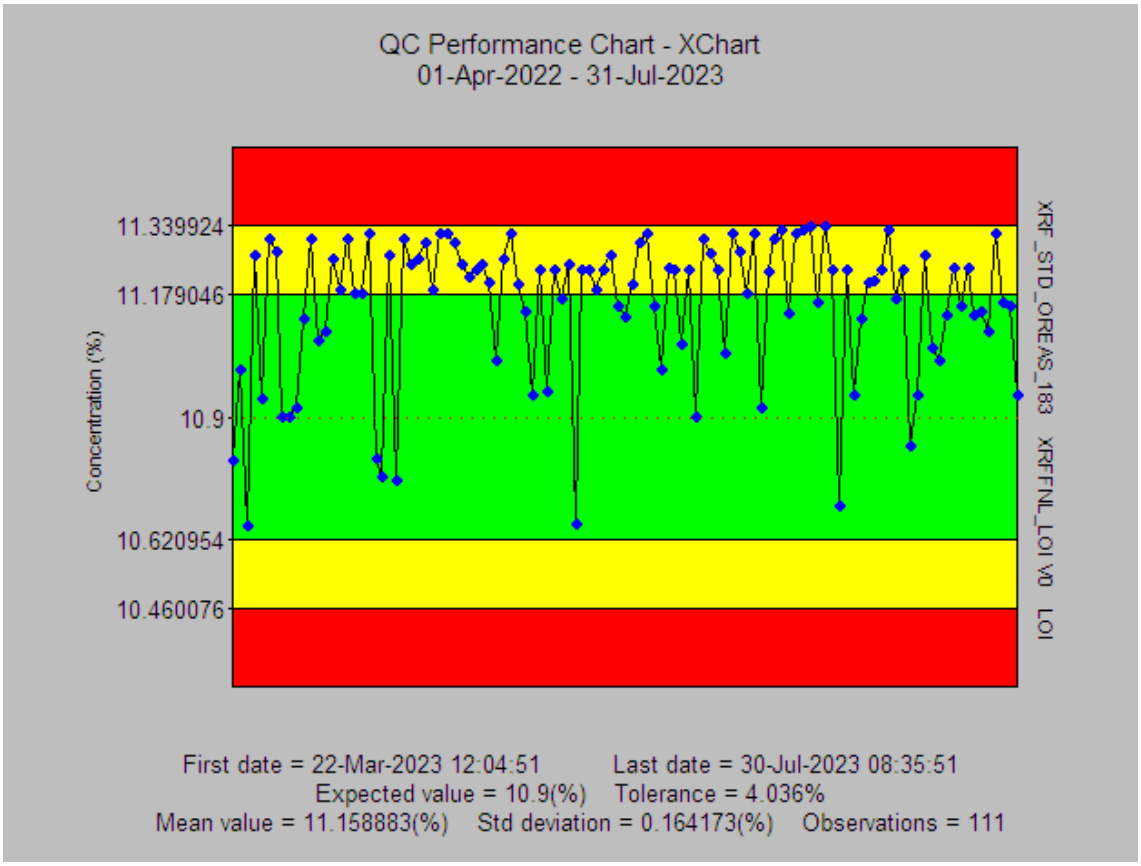


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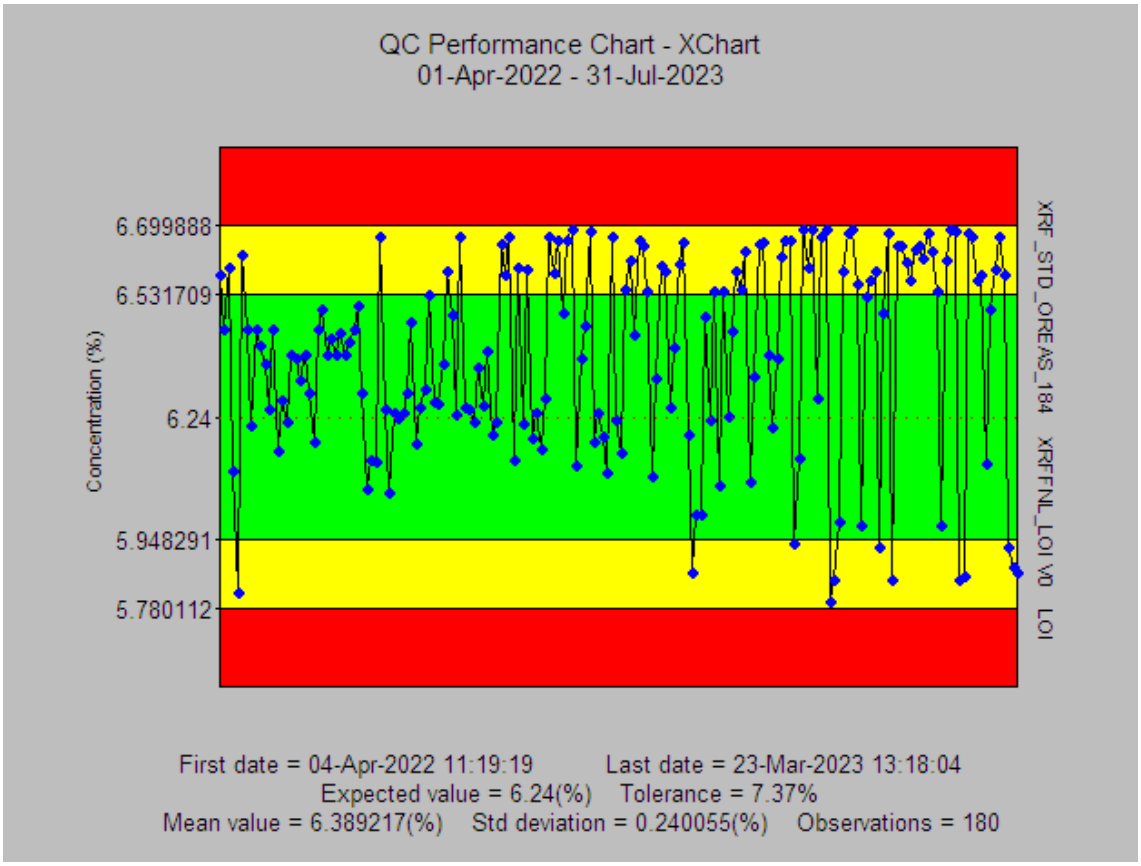


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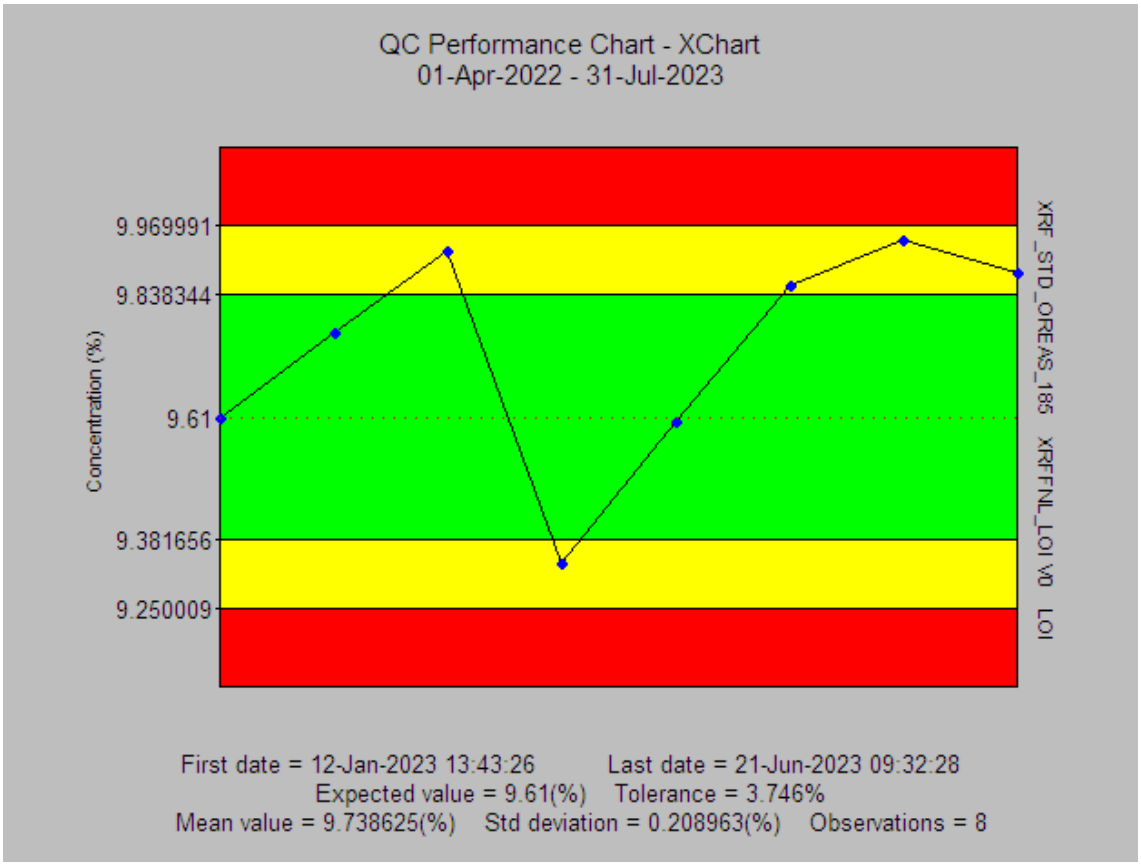


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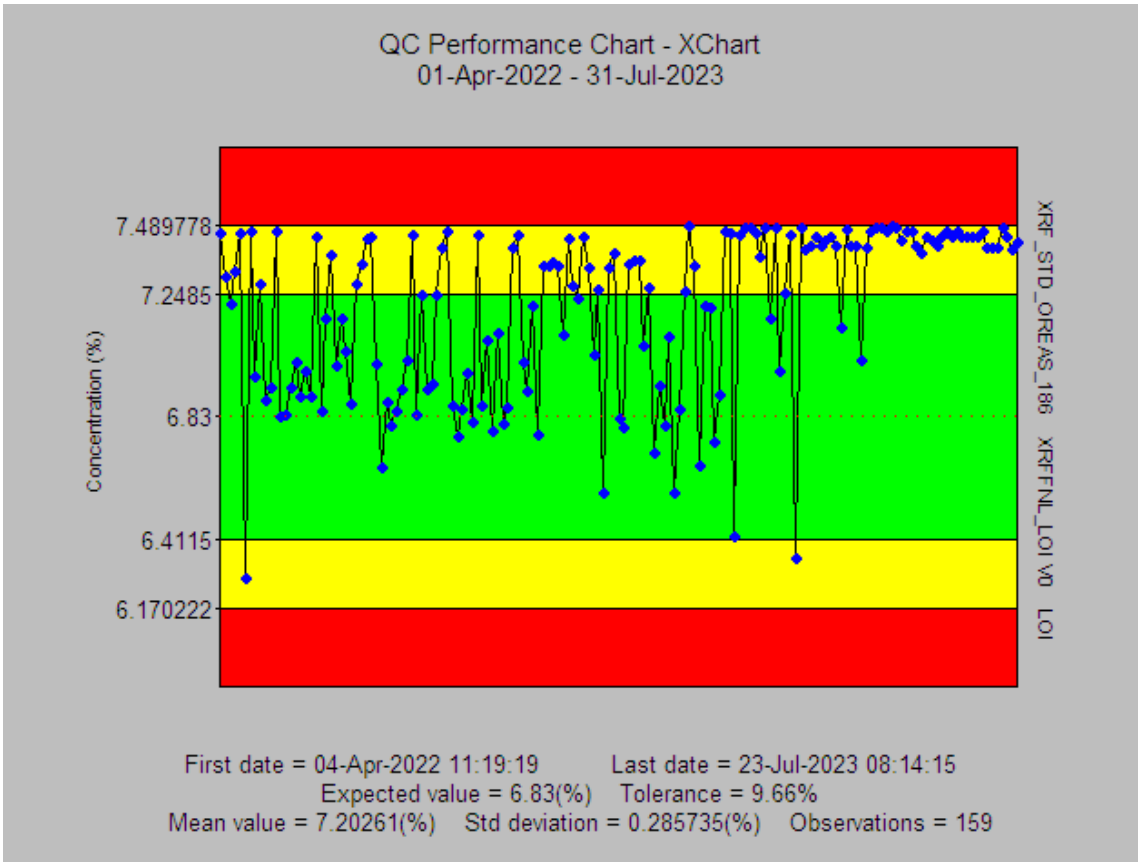


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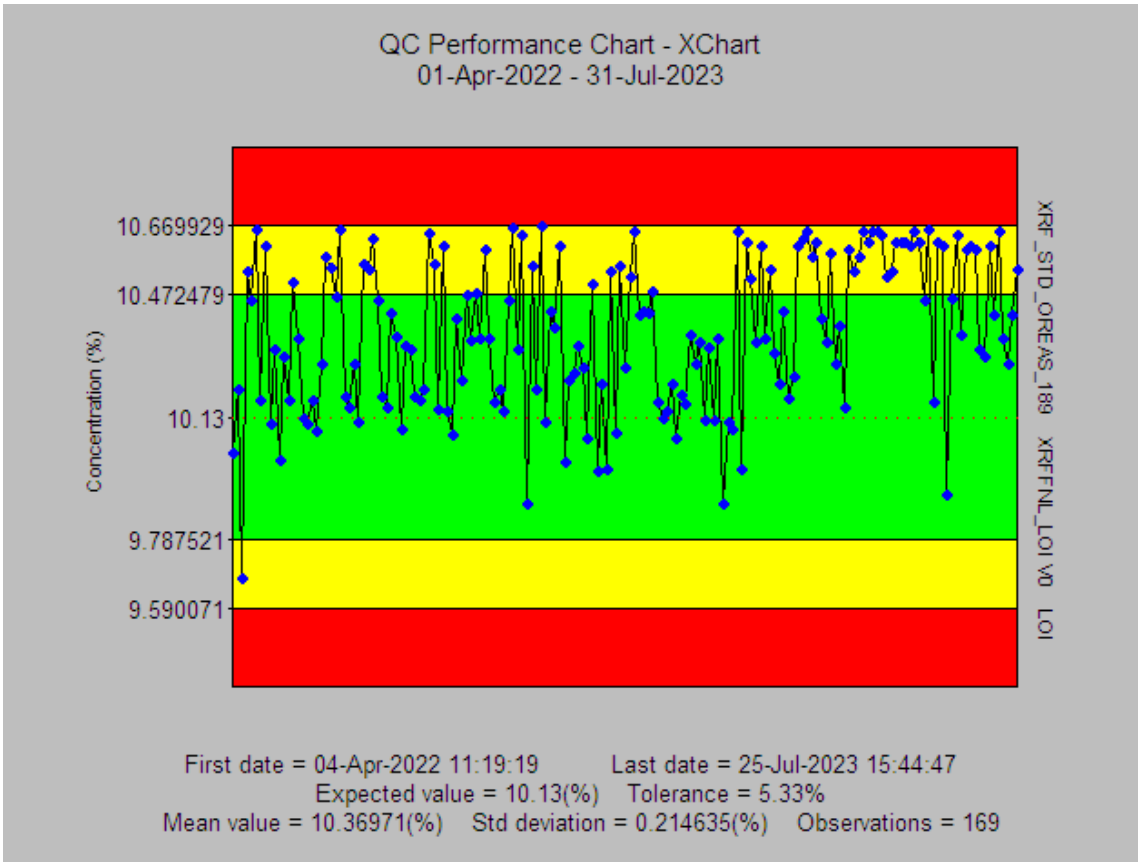
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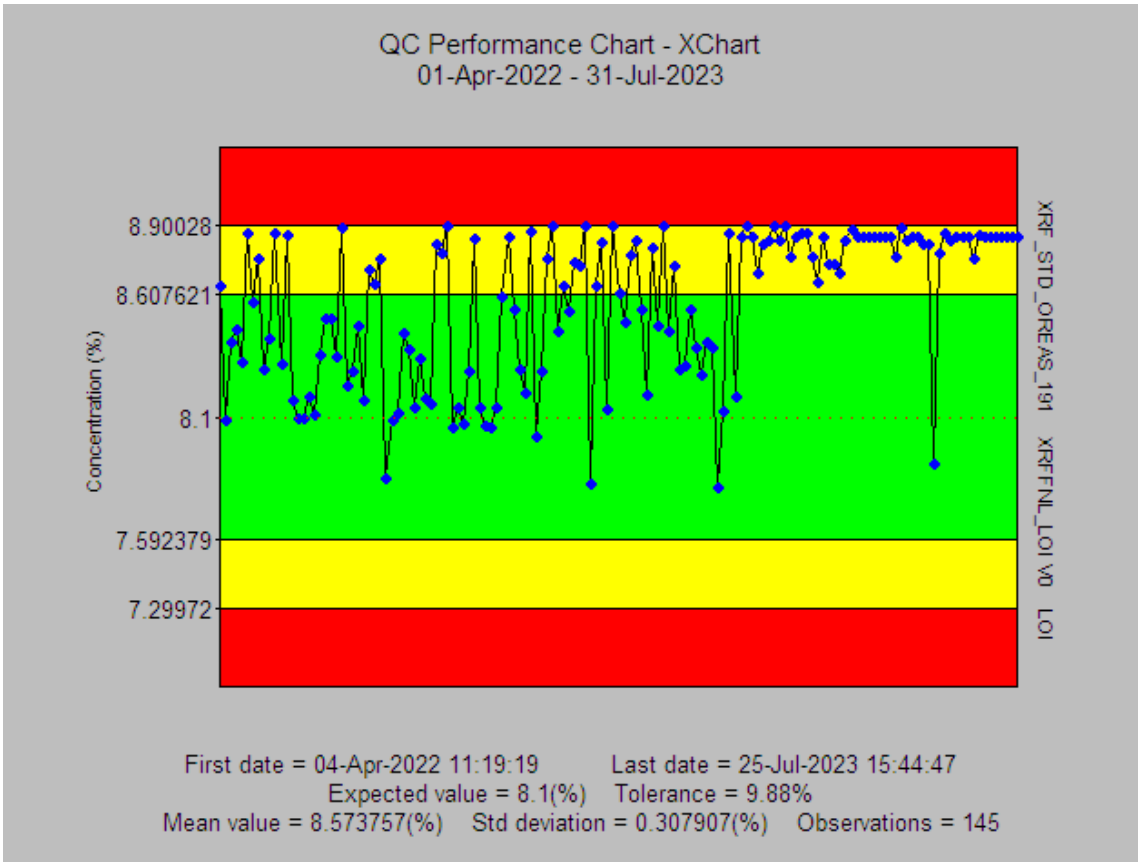
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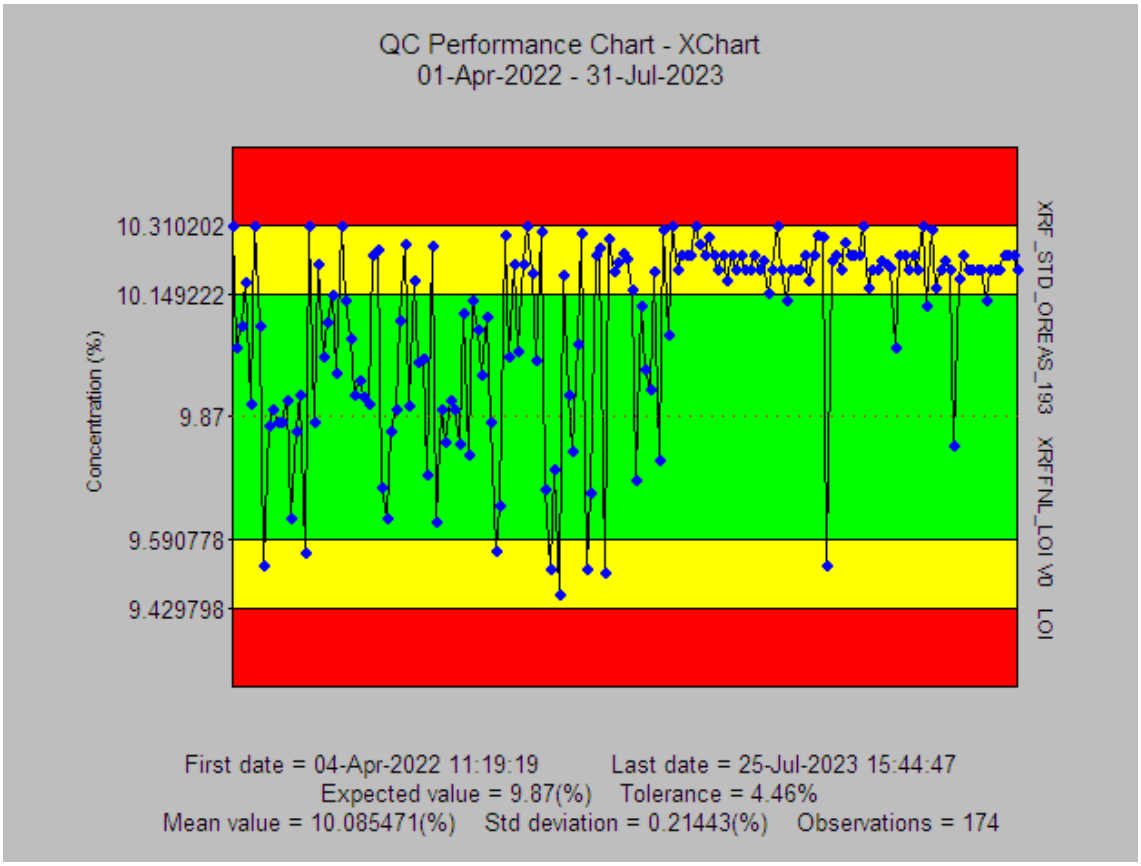


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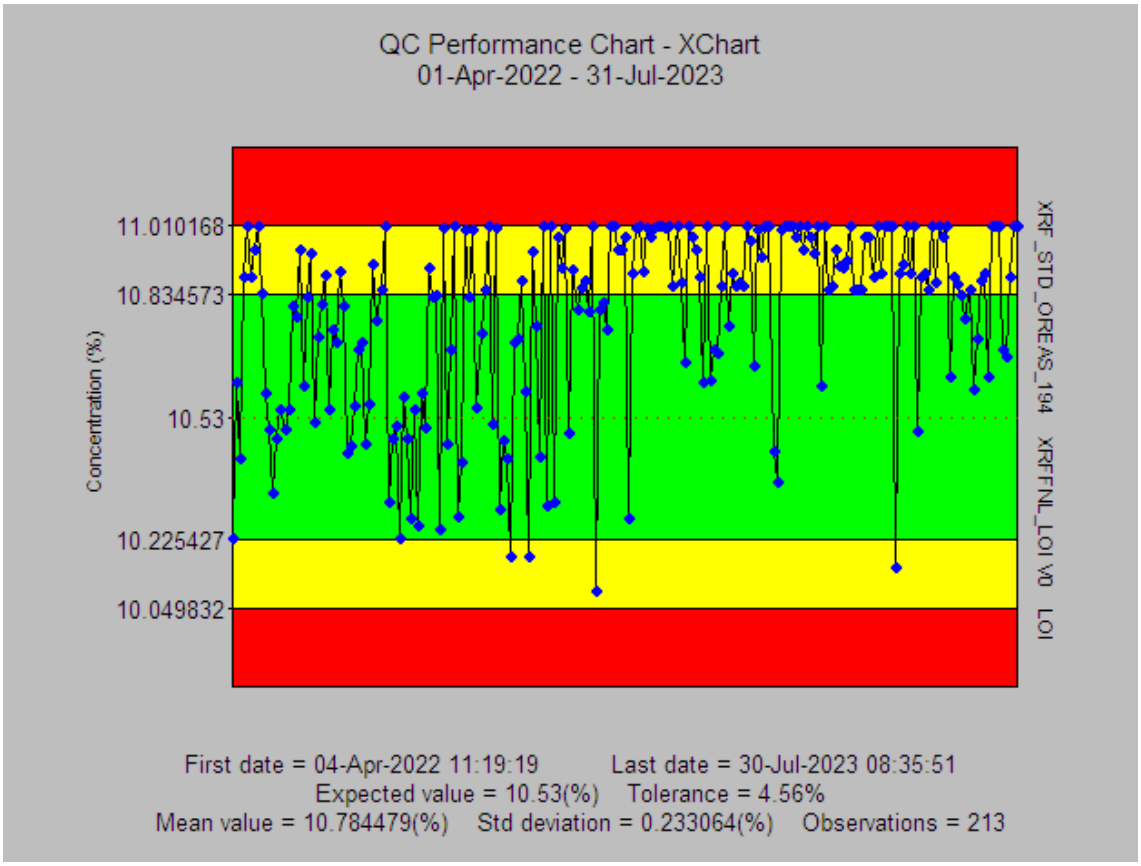


PT. GEOSERVICES - CIKARANG LABORATORY

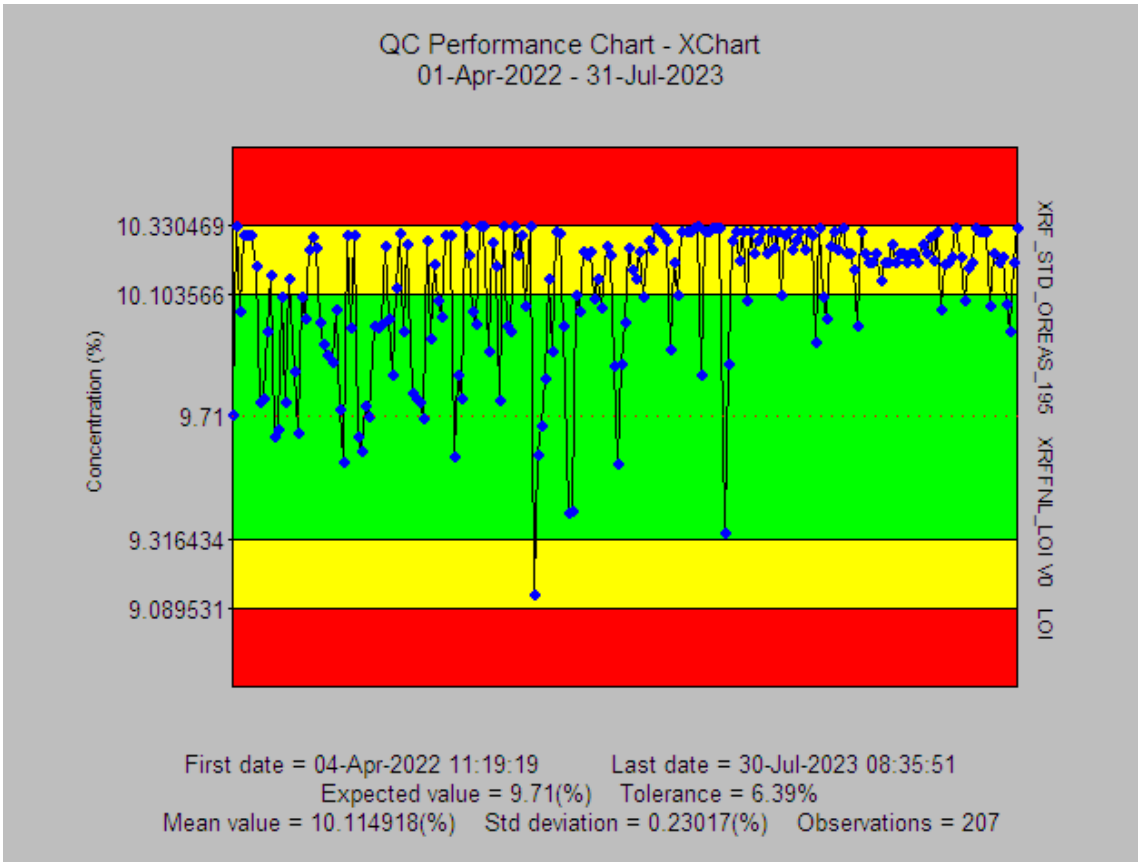
XRF_STD_OREAS_193 - LOI



XRF_STD_OREAS_194 - LOI



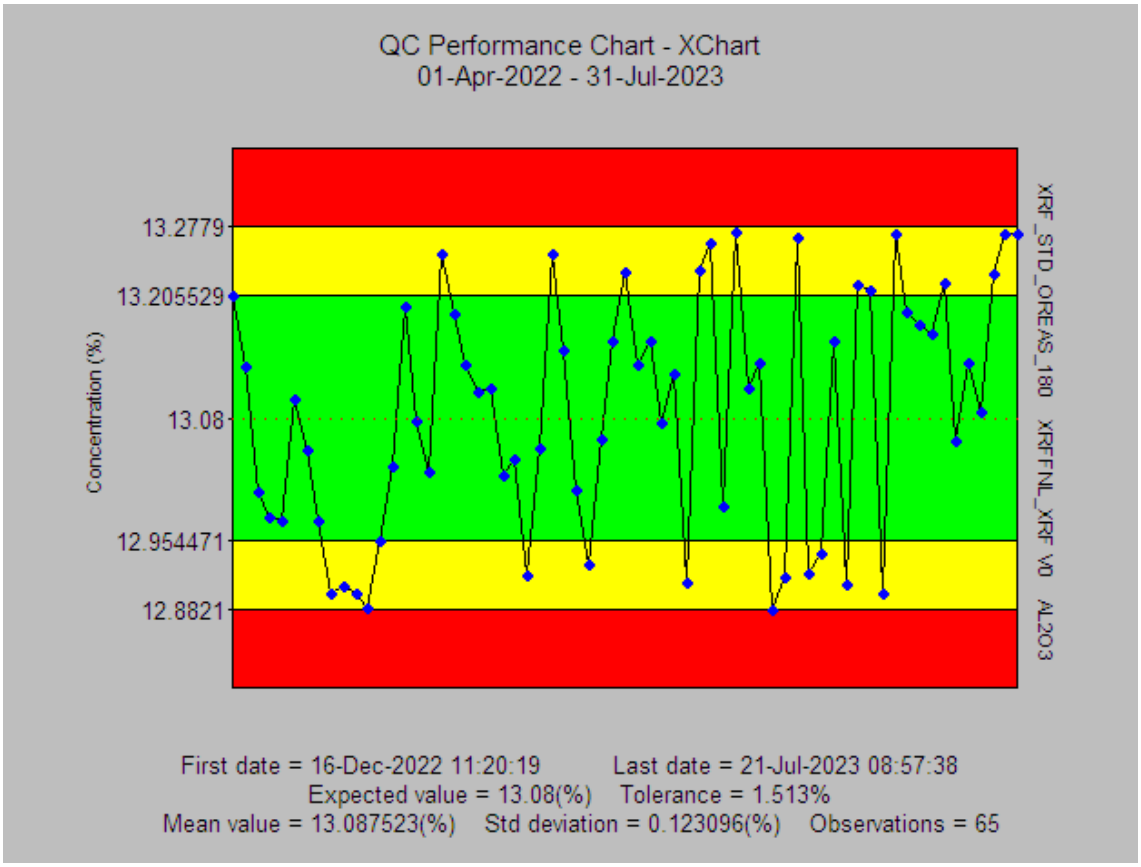
XRF_STD_OREAS_195 - LOI



PT. GEOSERVICES - CIKARANG LABORATORY

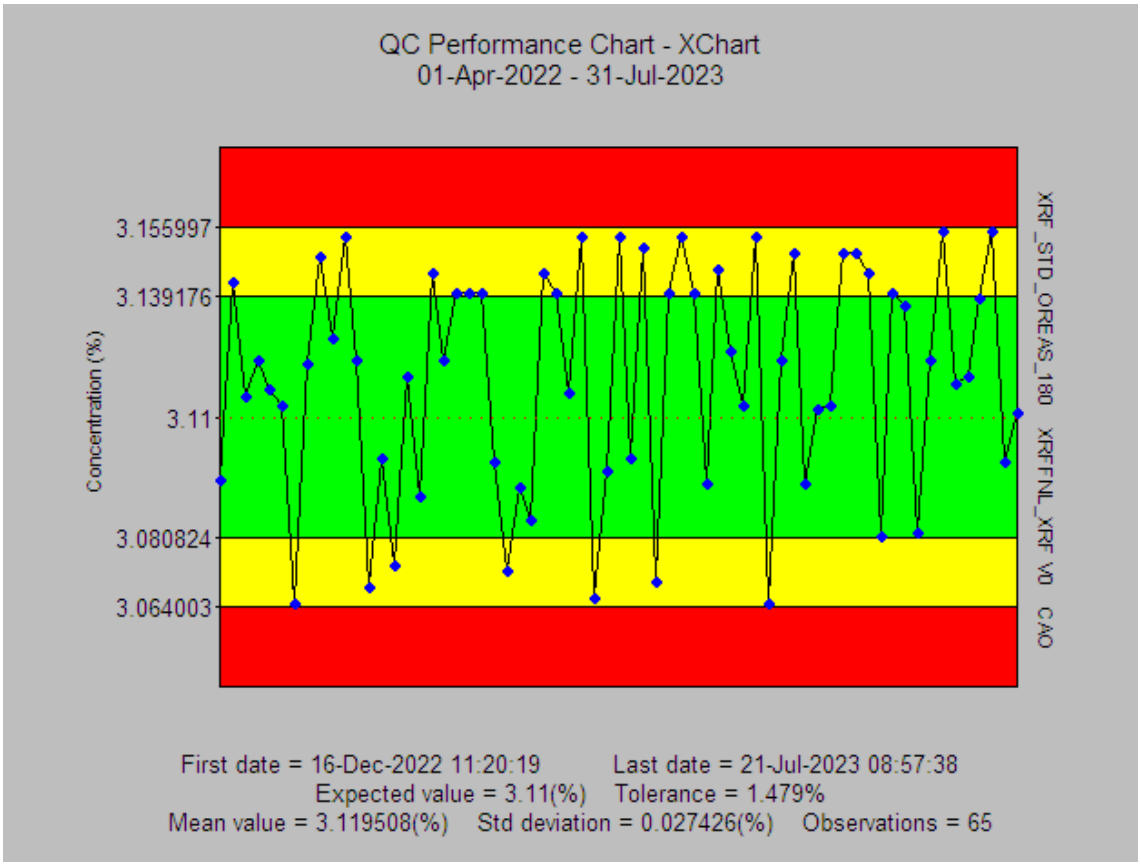
REFERENCE MATERIAL QUALITY CONTROL - XRFFNL_XRF

XRF_STD_OREAS_180 - AL2O3



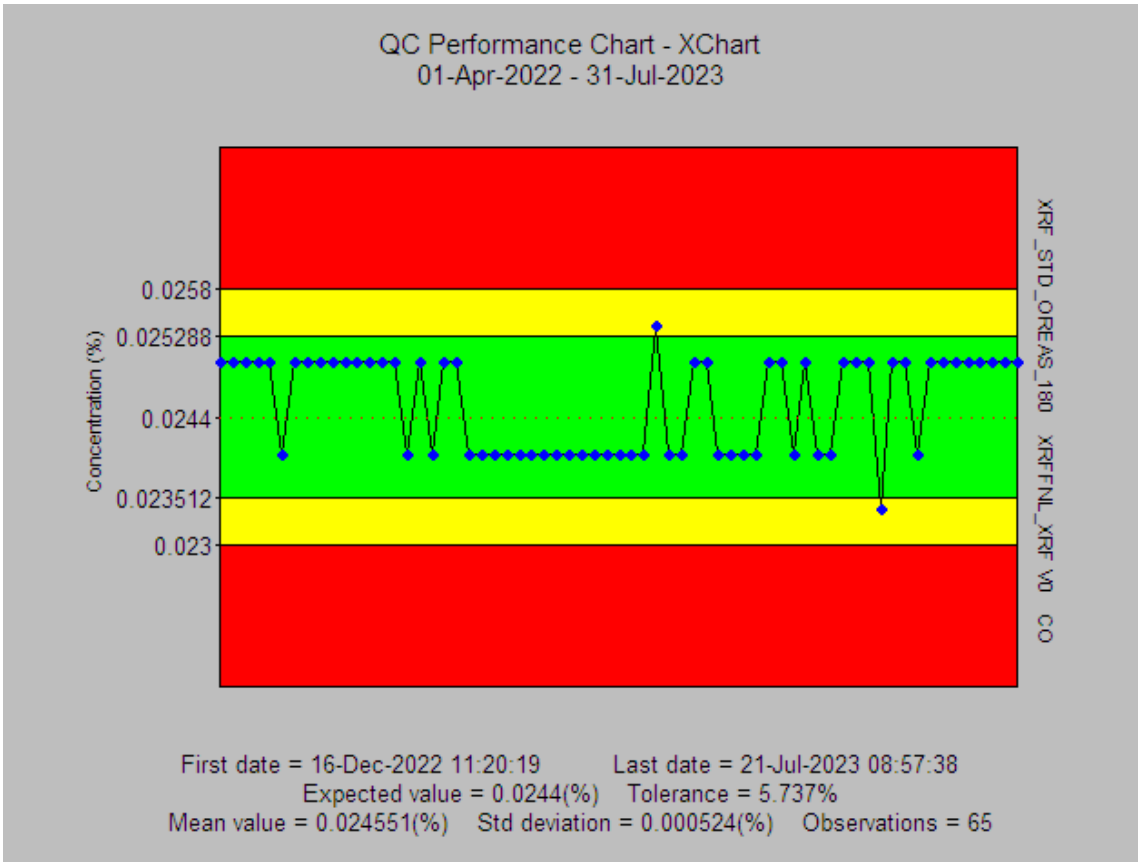
PT. GEOSERVICES - CIKARANG LABORATORY

XRF_STD_OREAS_180 - CAO



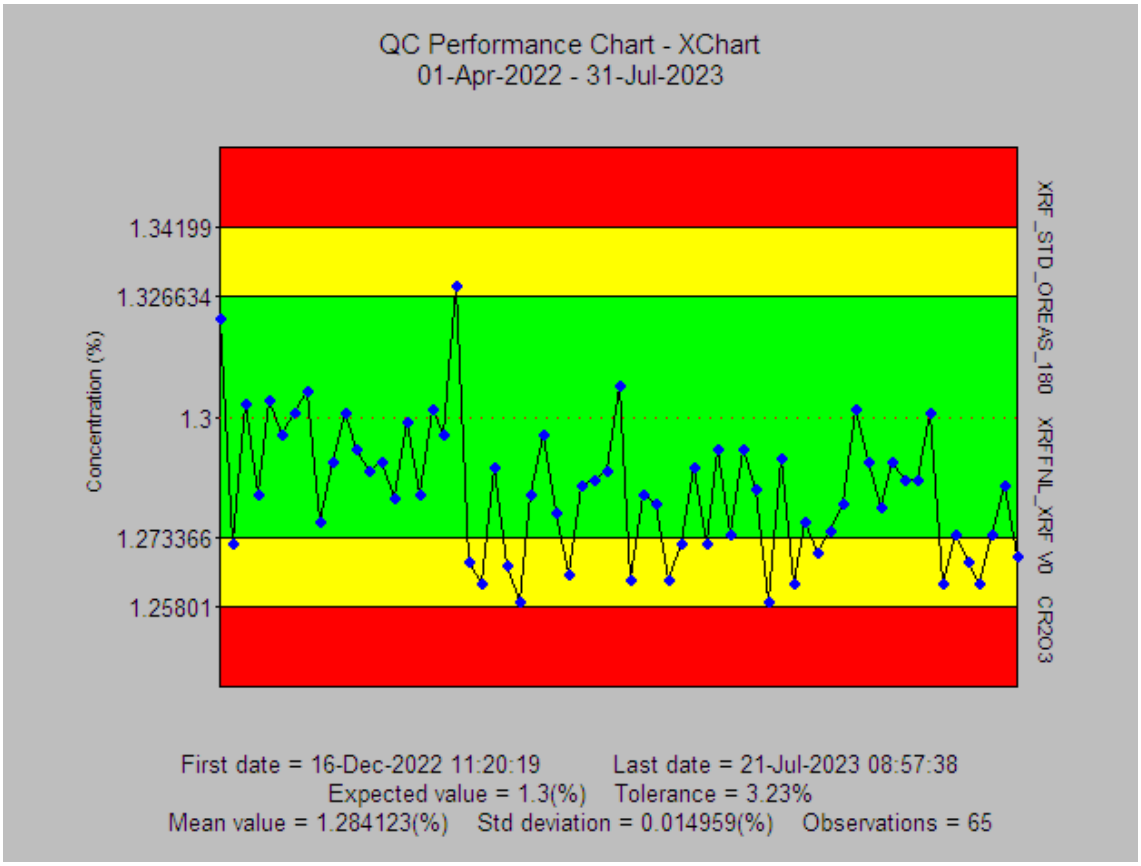
PT. GEOSERVICES - CIKARANG LABORATORY

XRF_STD_OREAS_180 - CO

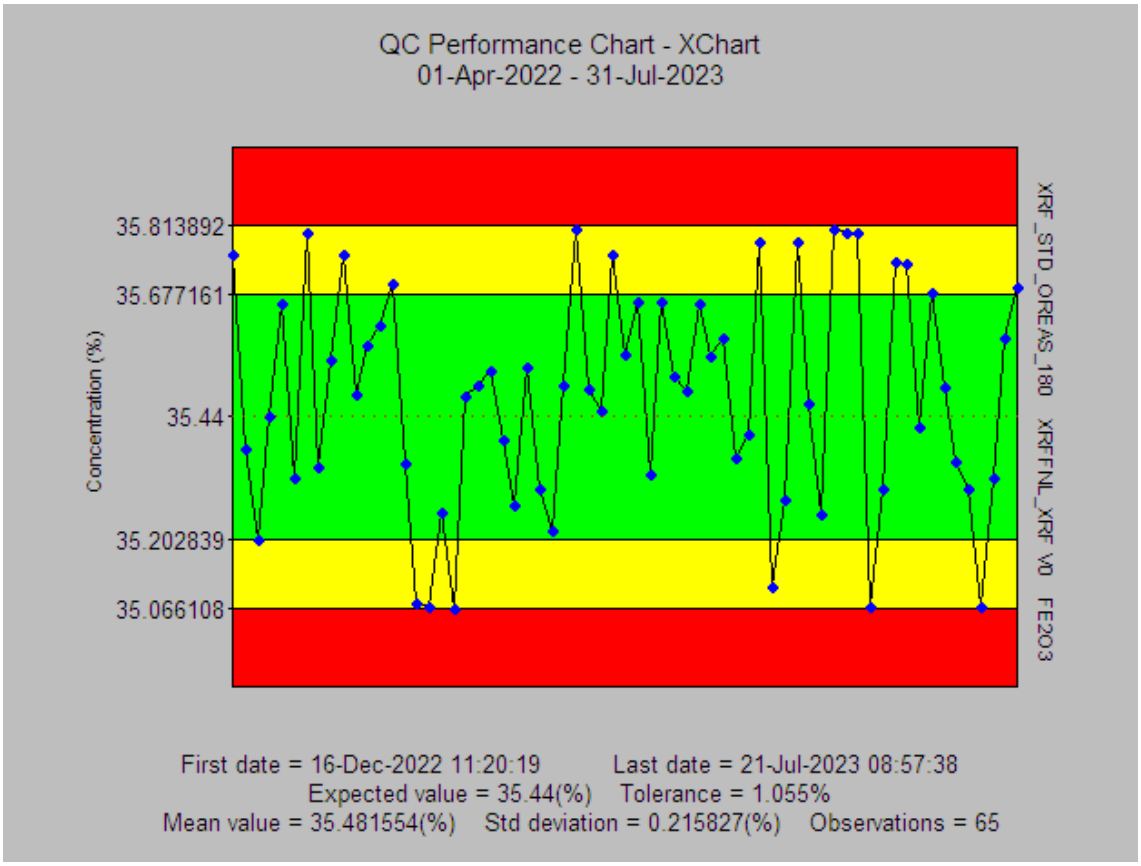


PT. GEOSERVICES - CIKARANG LABORATORY

XRF_STD_OREAS_180 - CR2O3

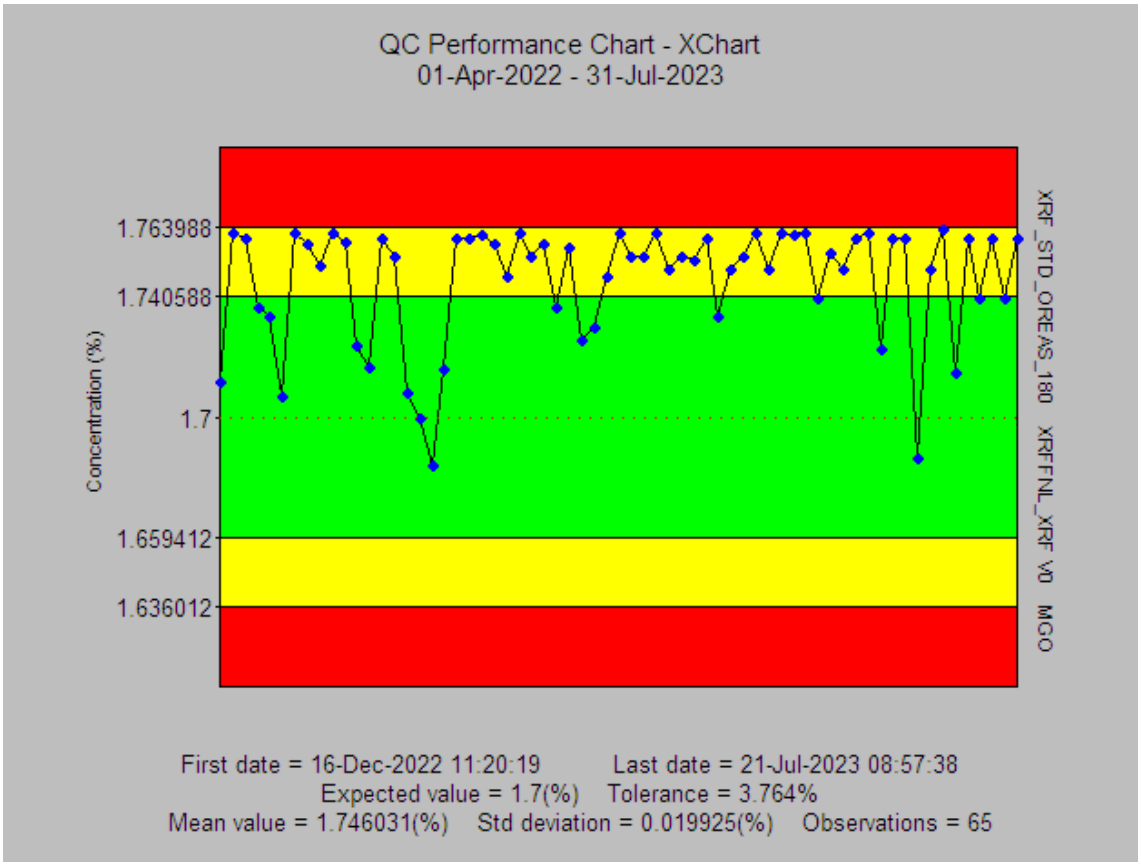


XRF_STD_OREAS_180 - FE2O3



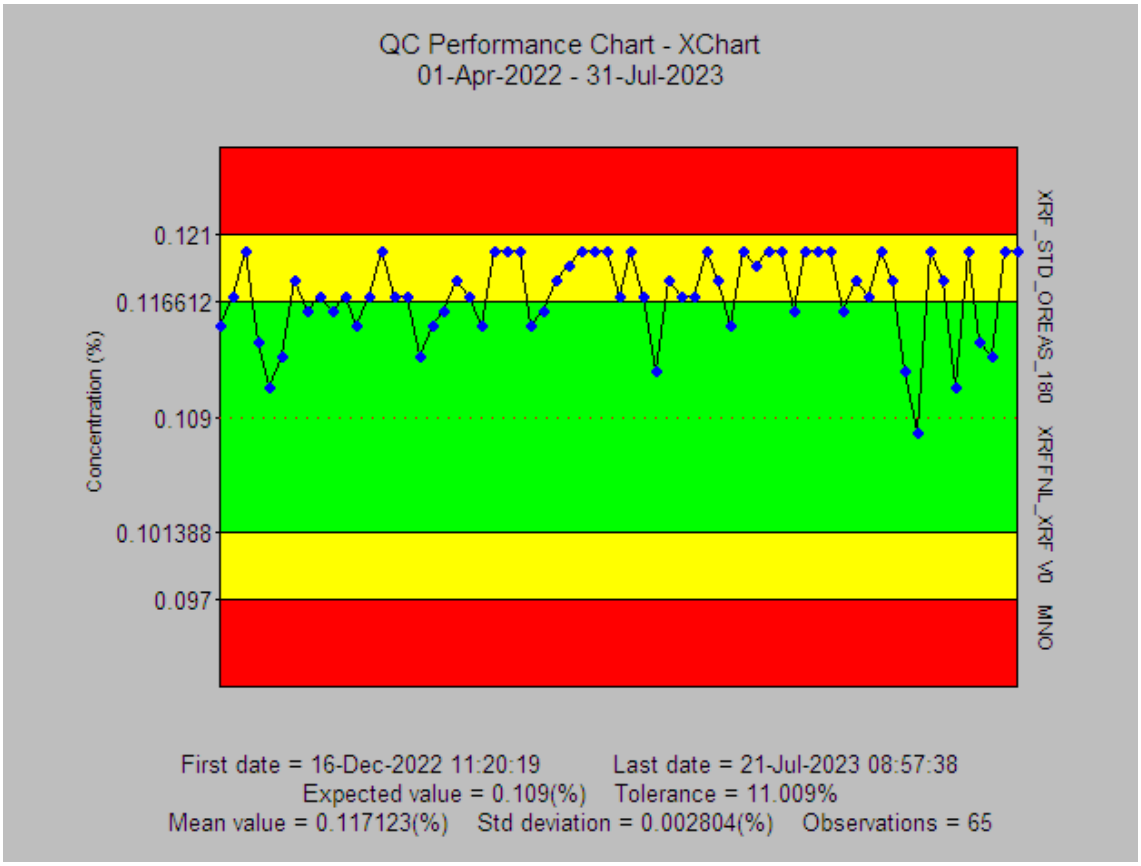
PT. GEOSERVICES - CIKARANG LABORATORY

XRF_STD_OREAS_180 - MGO



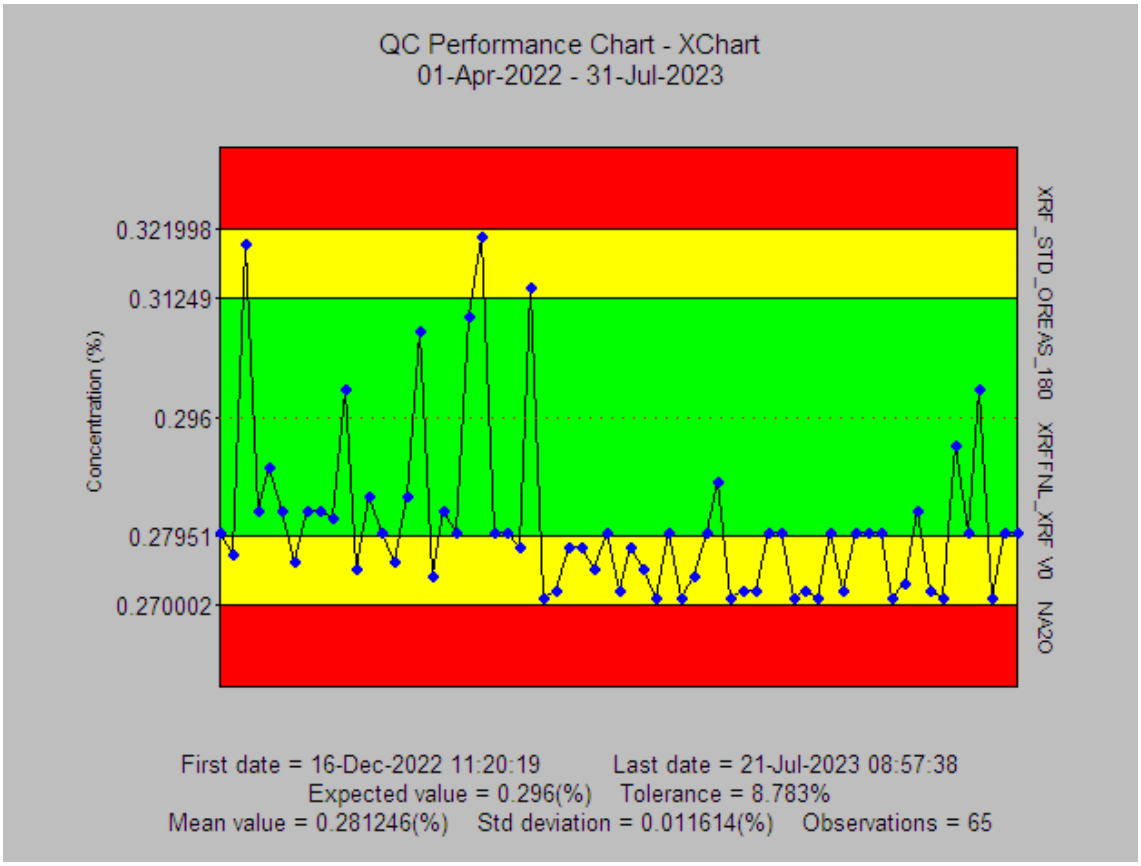
PT. GEOSERVICES - CIKARANG LABORATORY

XRF_STD_OREAS_180 - MNO

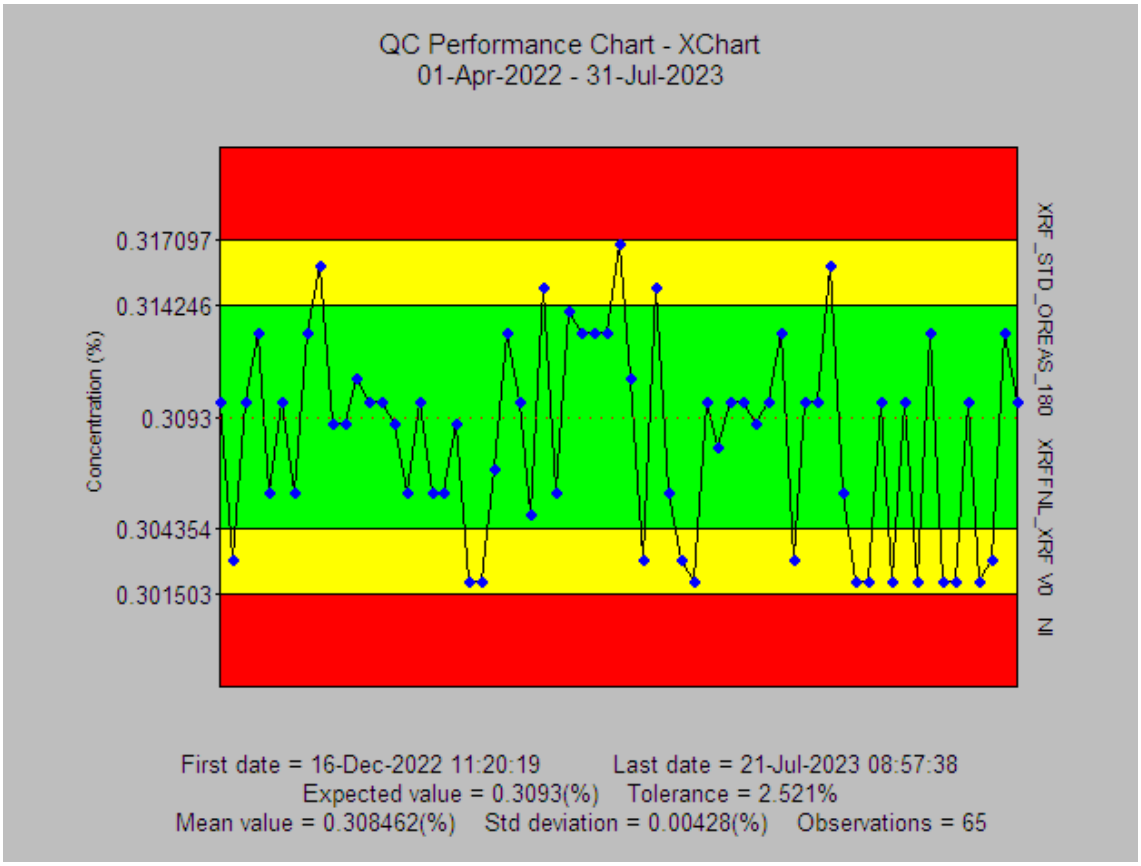


PT. GEOSERVICES - CIKARANG LABORATORY

XRF_STD_OREAS_180 - NA2O

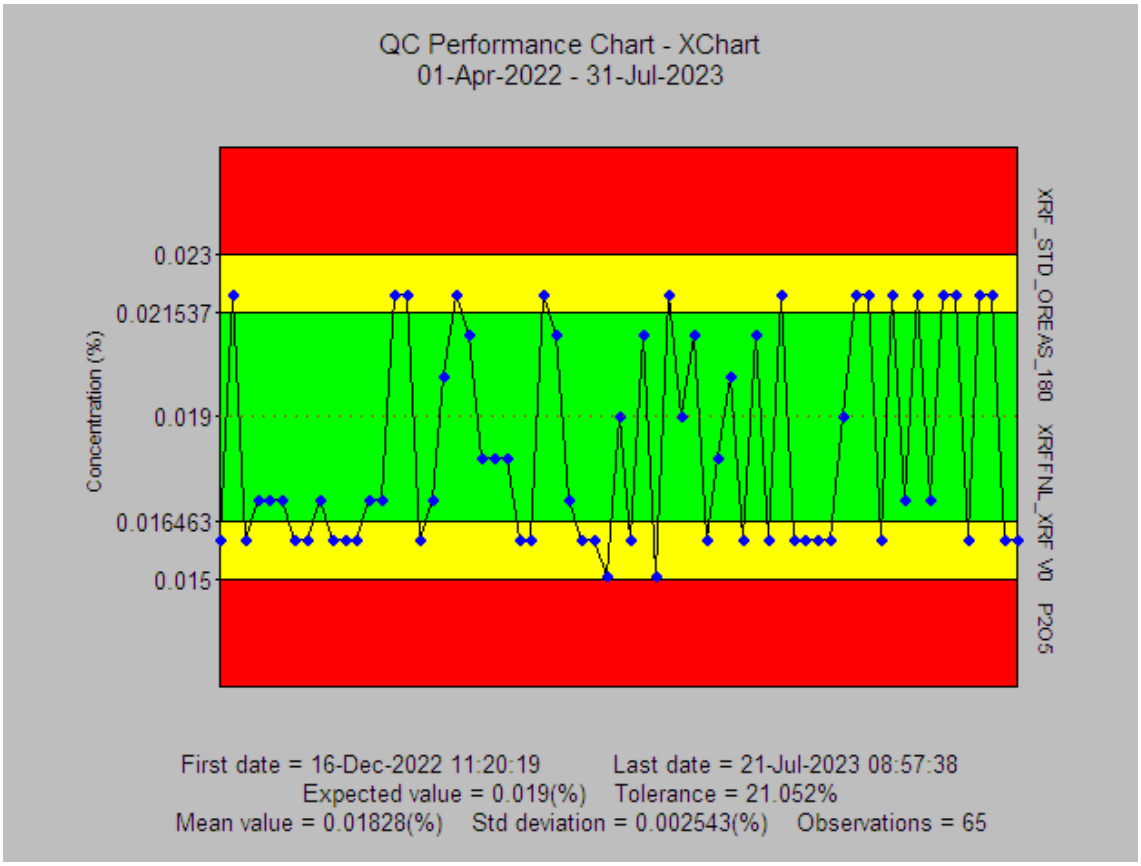


XRF_STD_OREAS_180 - NI

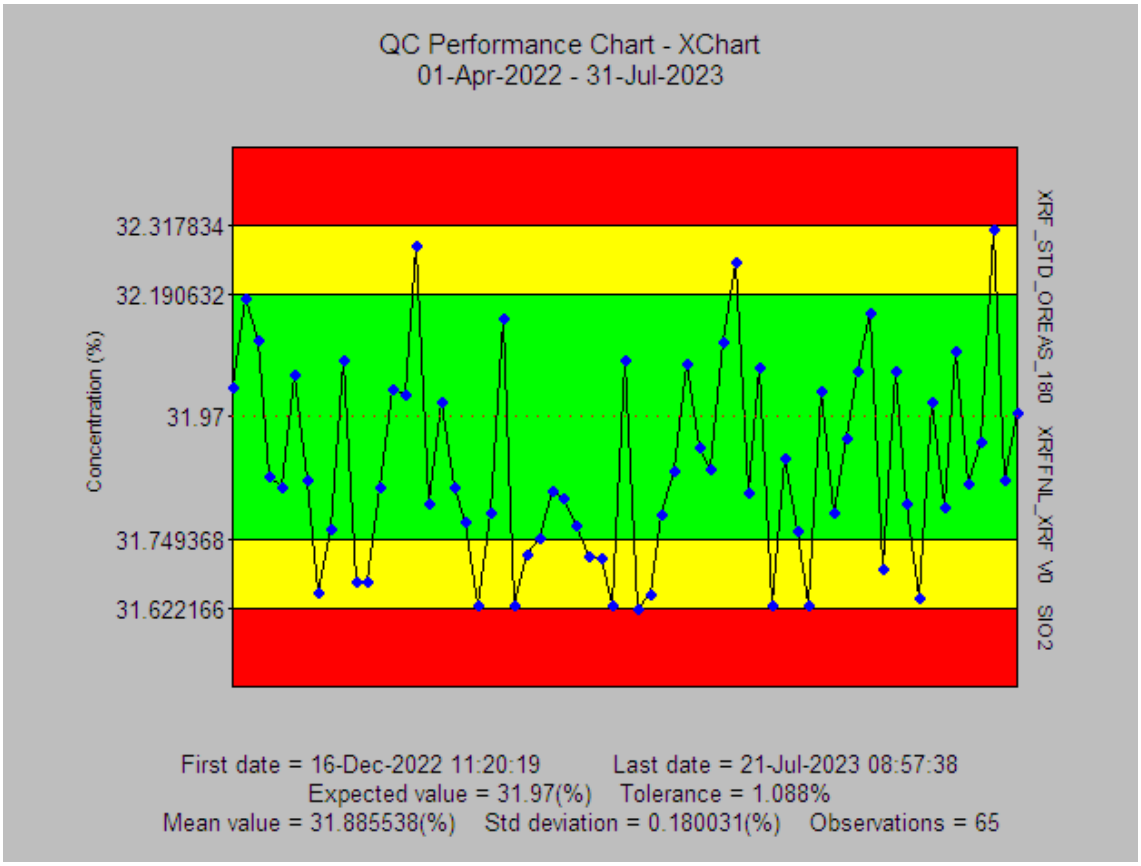


PT. GEOSERVICES - CIKARANG LABORATORY

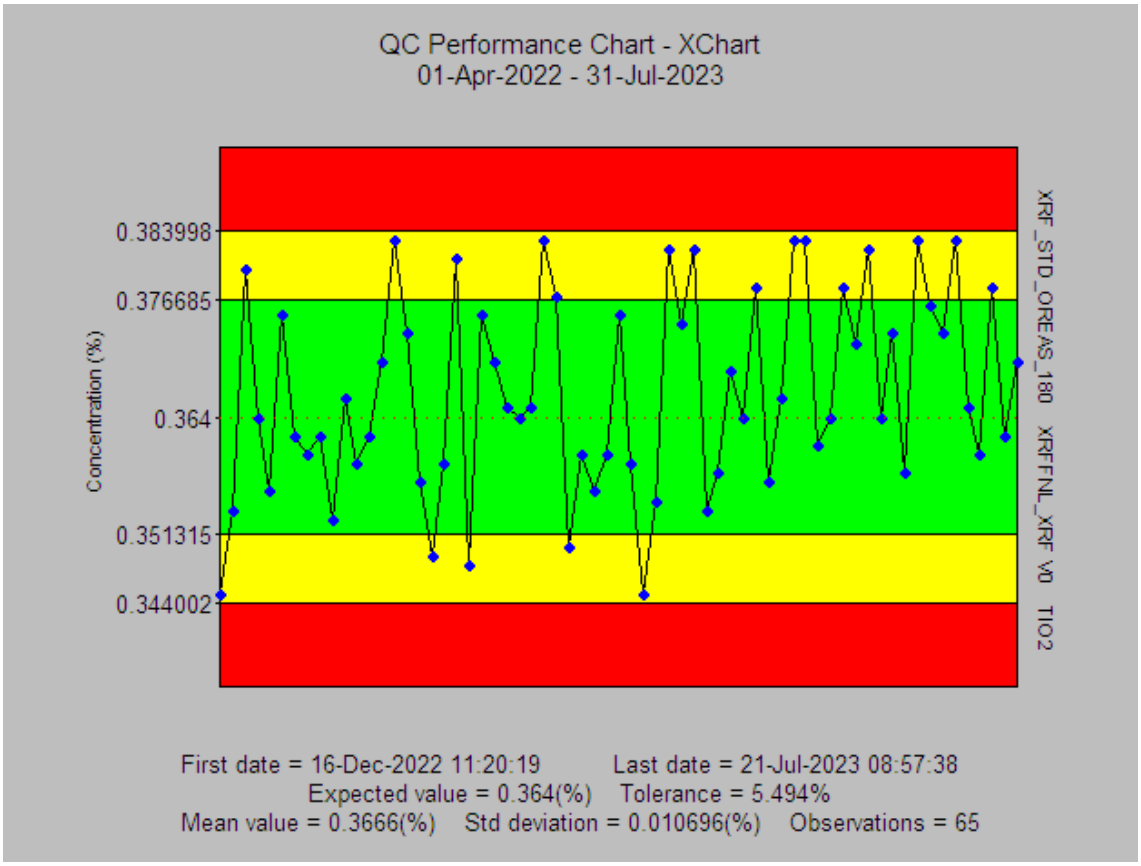
XRF_STD_OREAS_180 - P2O5



XRF_STD_OREAS_180 - SIO2



XRF_STD_OREAS_180 - TIO2

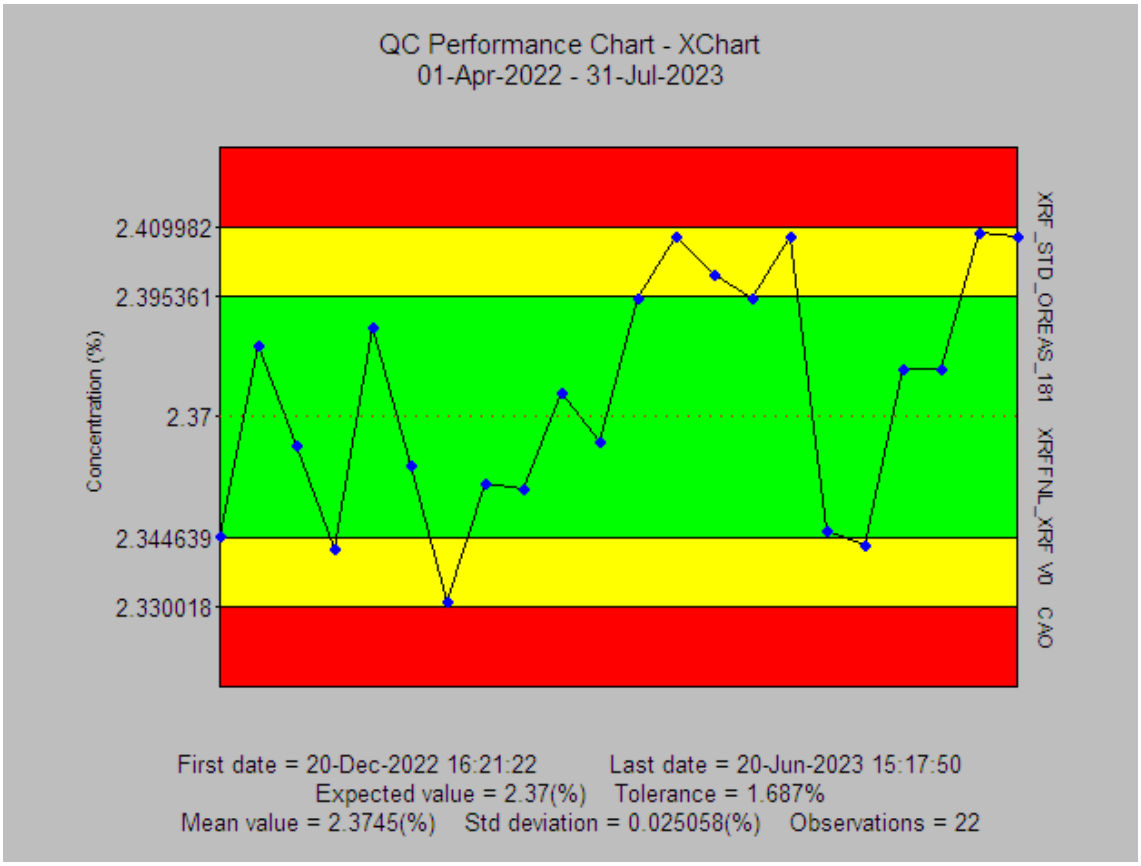


PT. GEOSERVICES - CIKARANG LABORATORY

XRF_STD_OREAS_181 - AL2O3

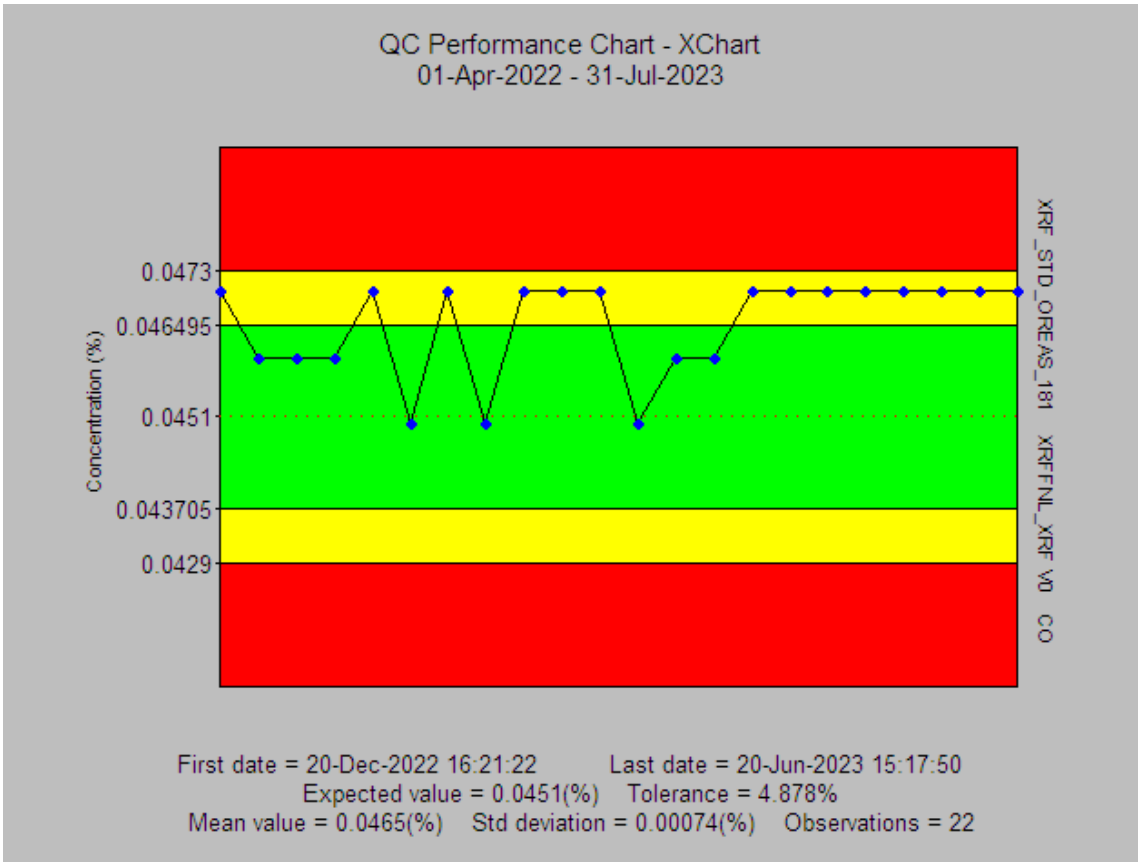


XRF_STD_OREAS_181 - CAO



PT. GEOSERVICES - CIKARANG LABORATORY

XRF_STD_OREAS_181 - CO



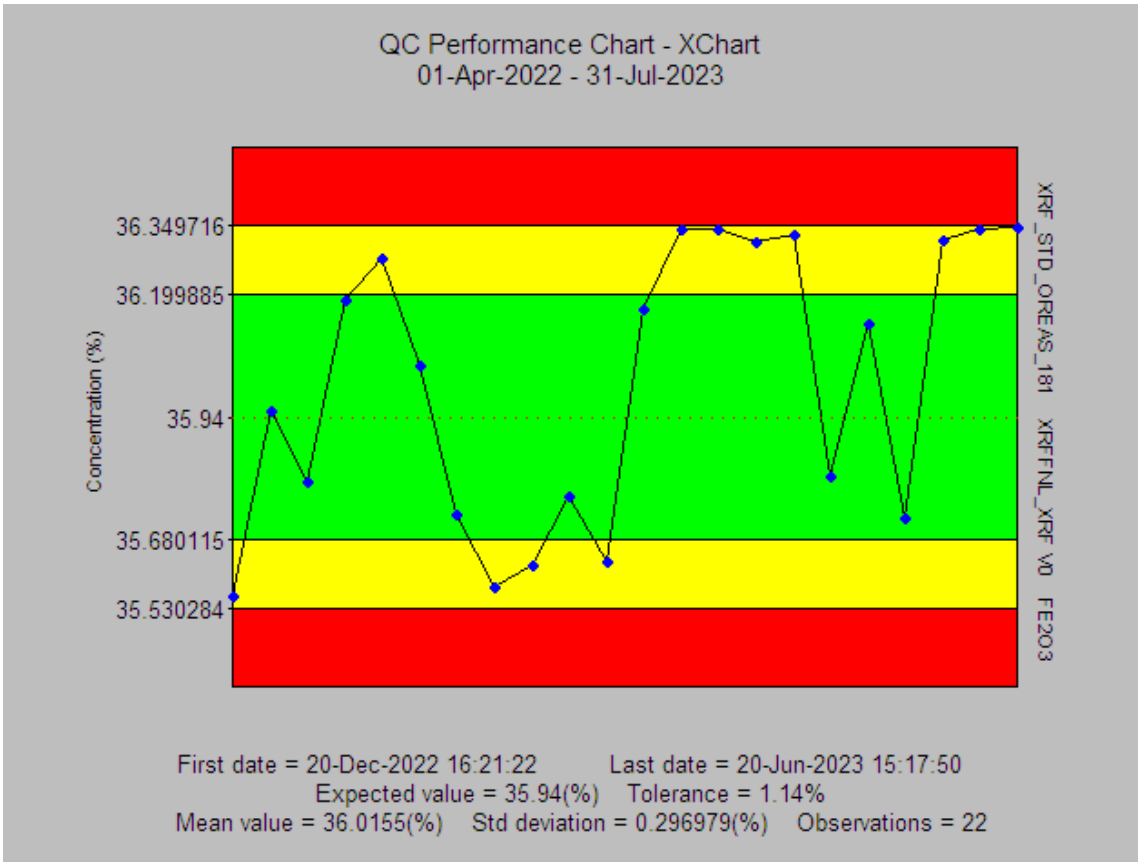
PT. GEOSERVICES - CIKARANG LABORATORY

XRF_STD_OREAS_181 - CR2O3



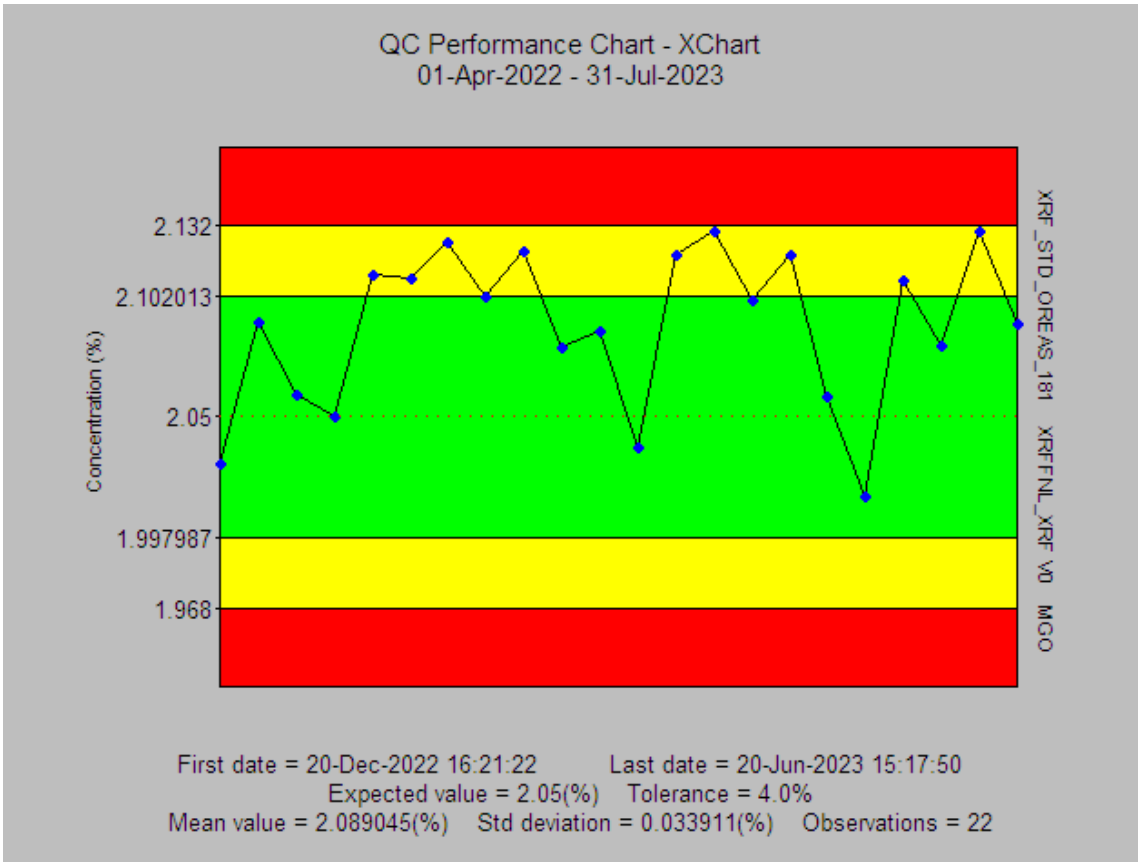
PT. GEOSERVICES - CIKARANG LABORATORY

XRF_STD_OREAS_181 - FE2O3

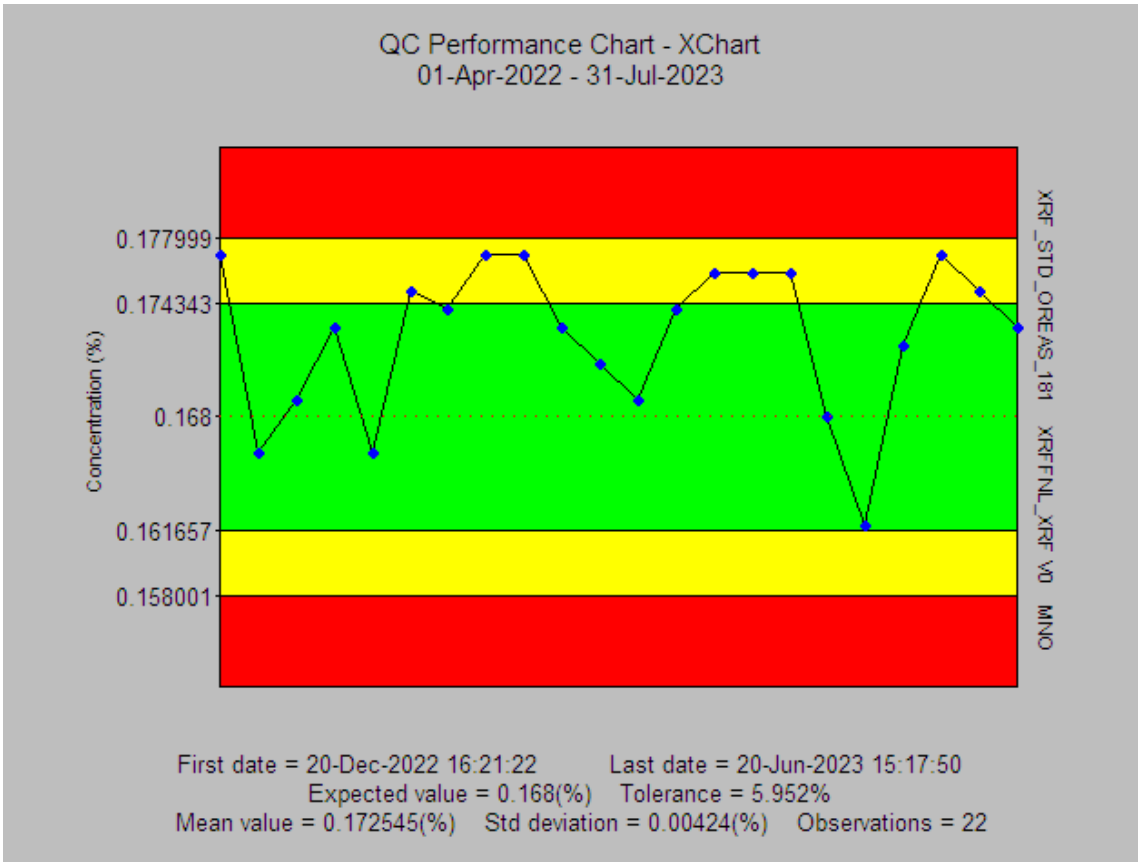


PT. GEOSERVICES - CIKARANG LABORATORY

XRF_STD_OREAS_181 - MGO

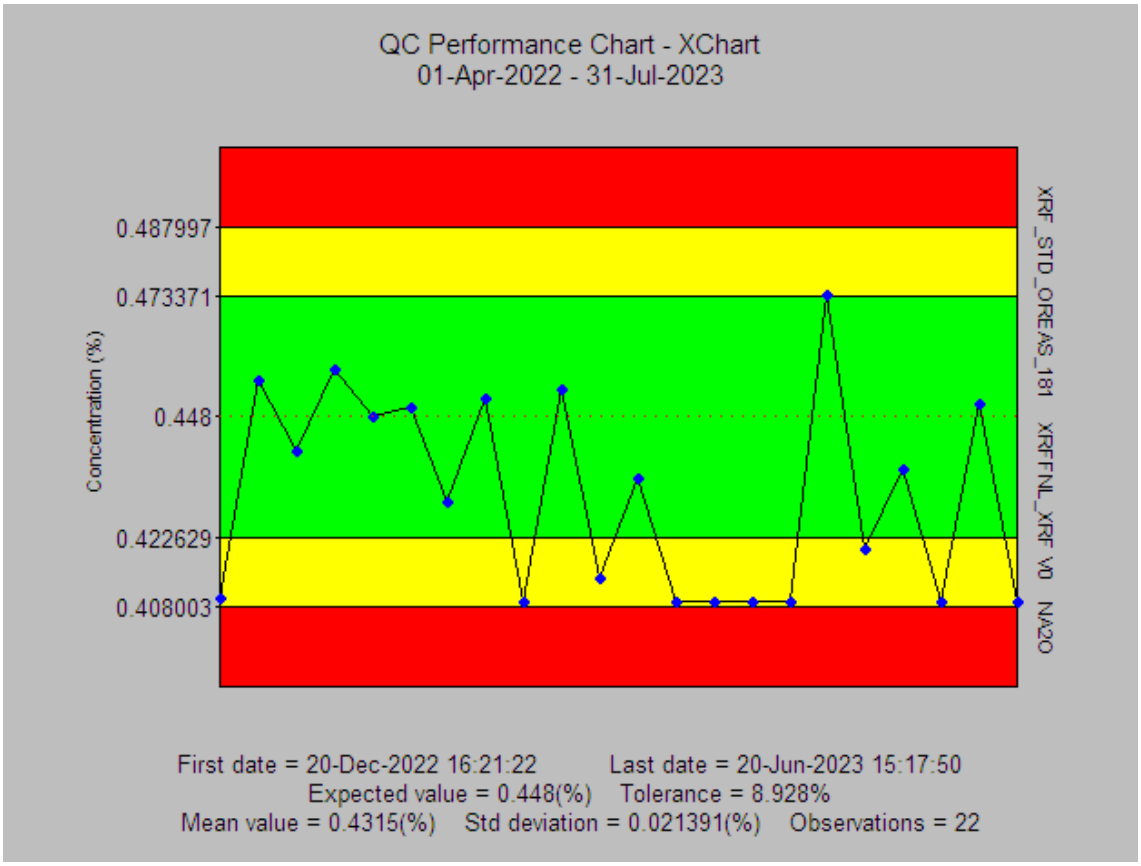


XRF_STD_OREAS_181 - MNO

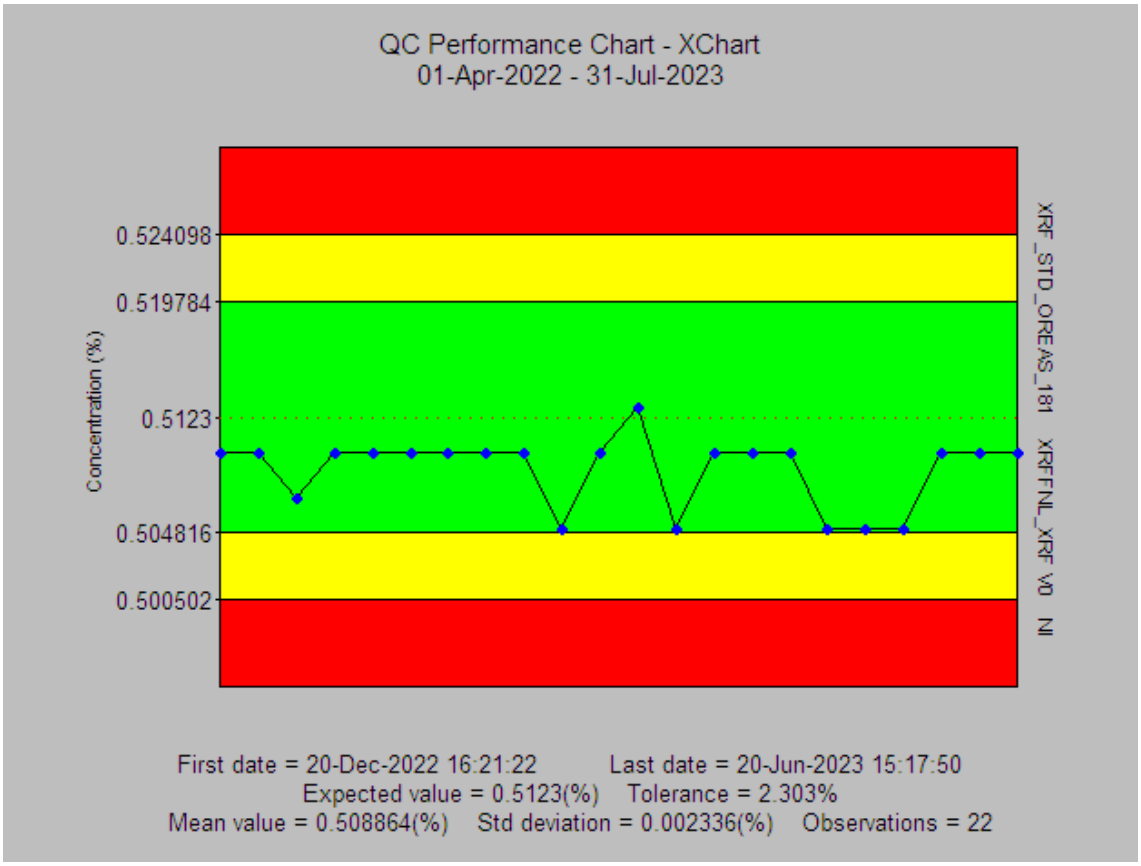


PT. GEOSERVICES - CIKARANG LABORATORY

XRF_STD_OREAS_181 - NA2O

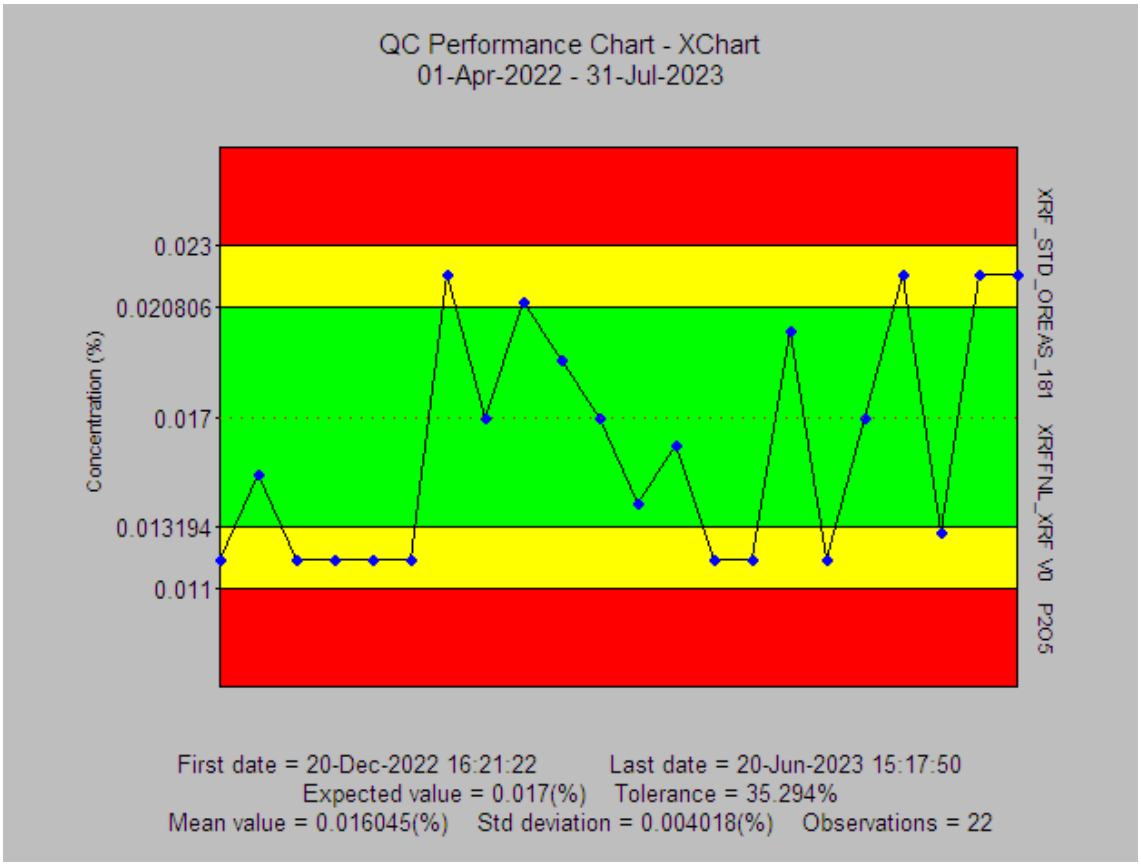


XRF_STD_OREAS_181 - NI



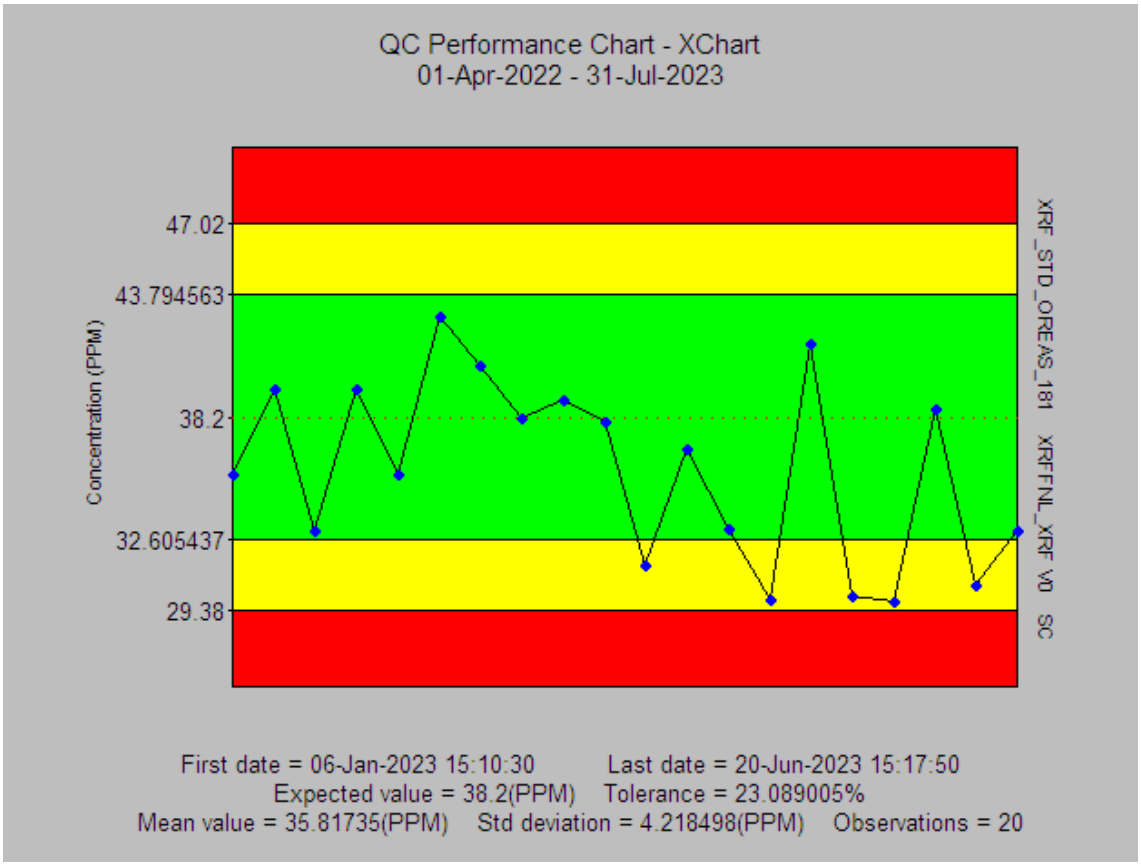
PT. GEOSERVICES - CIKARANG LABORATORY

XRF_STD_OREAS_181 - P2O5

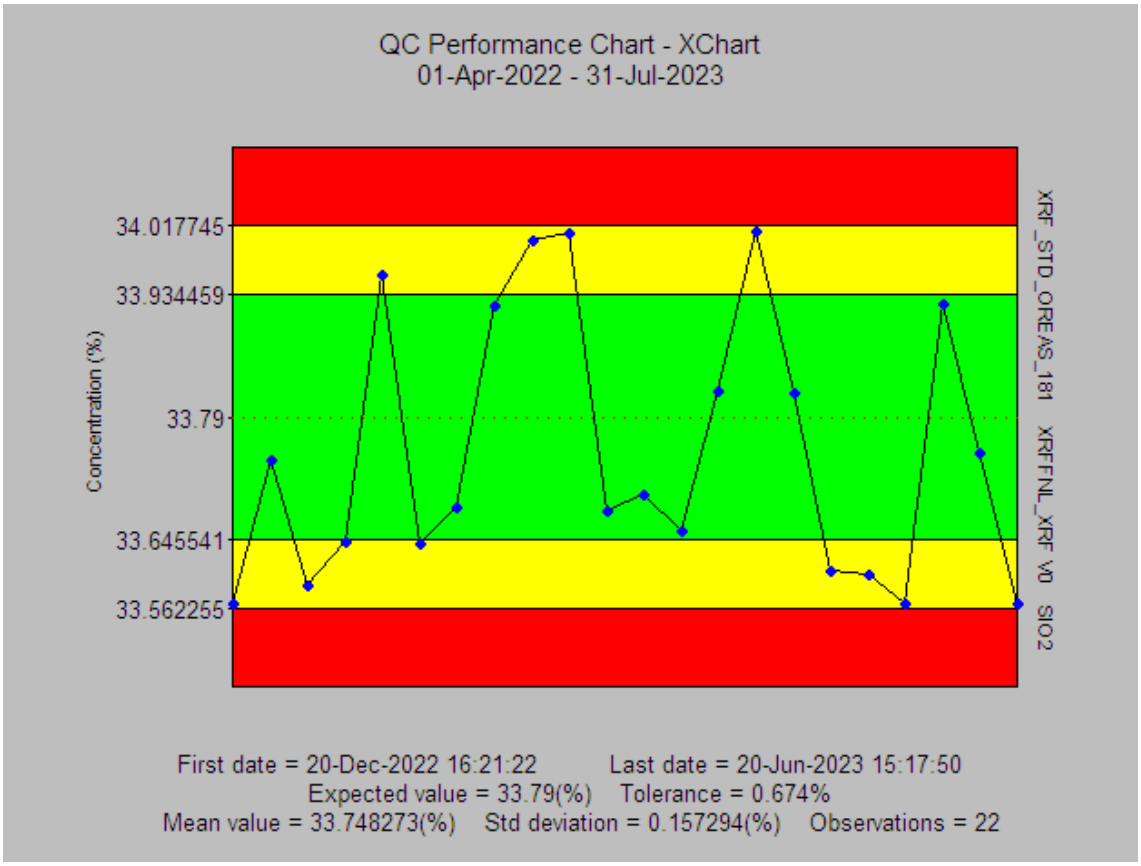


PT. GEOSERVICES - CIKARANG LABORATORY

XRF_STD_OREAS_181 - SC

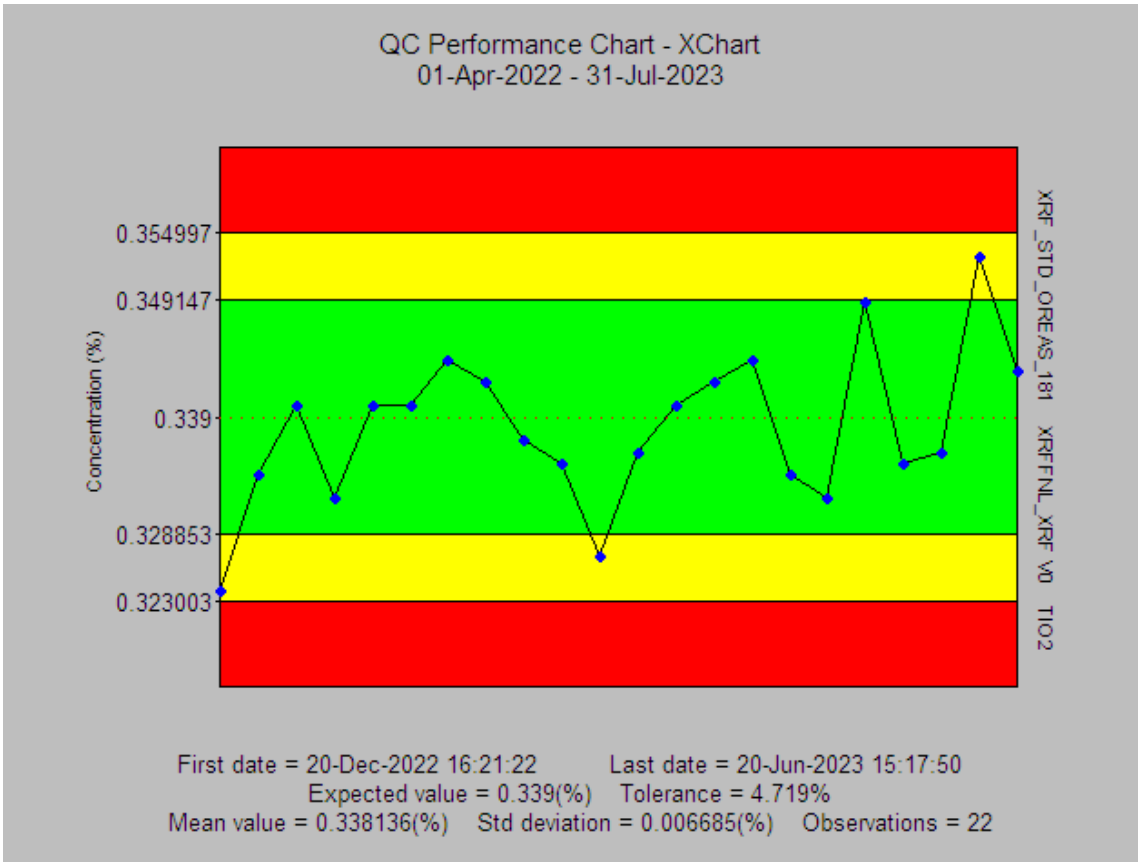


XRF_STD_OREAS_181 - SIO2



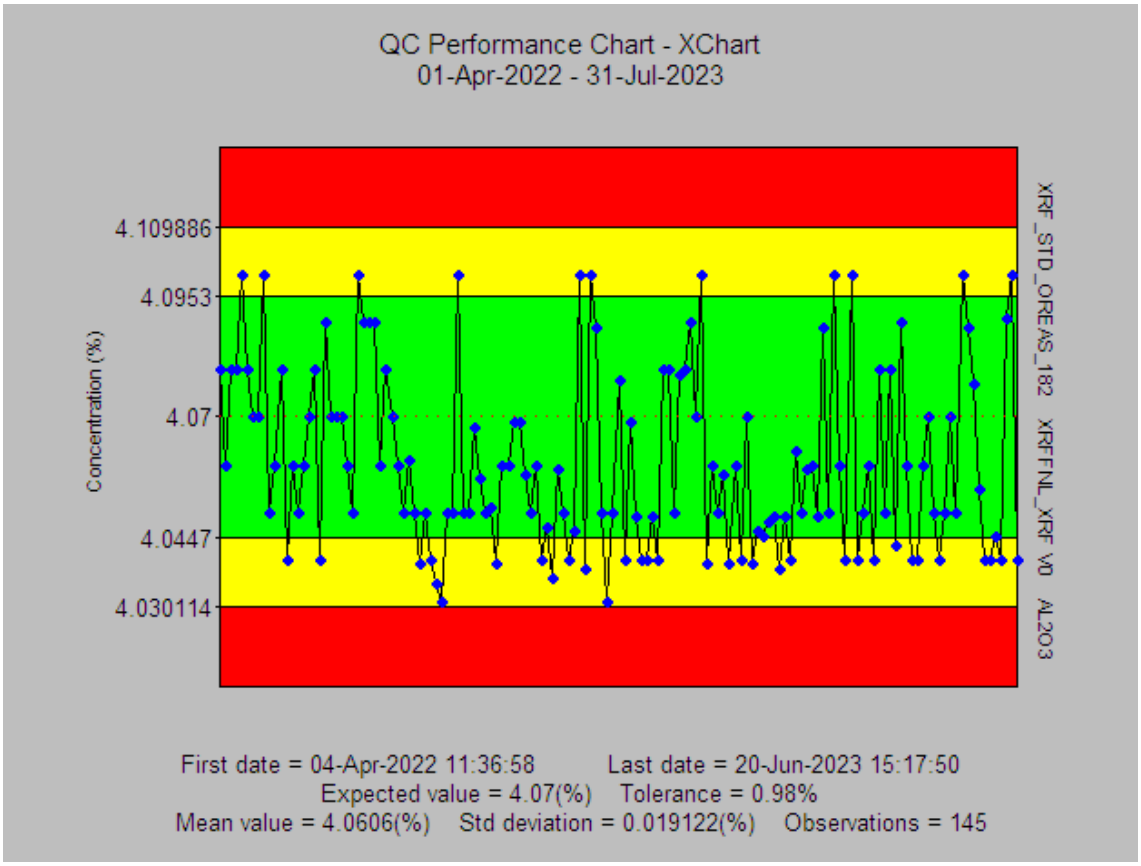
PT. GEOSERVICES - CIKARANG LABORATORY

XRF_STD_OREAS_181 - TIO2

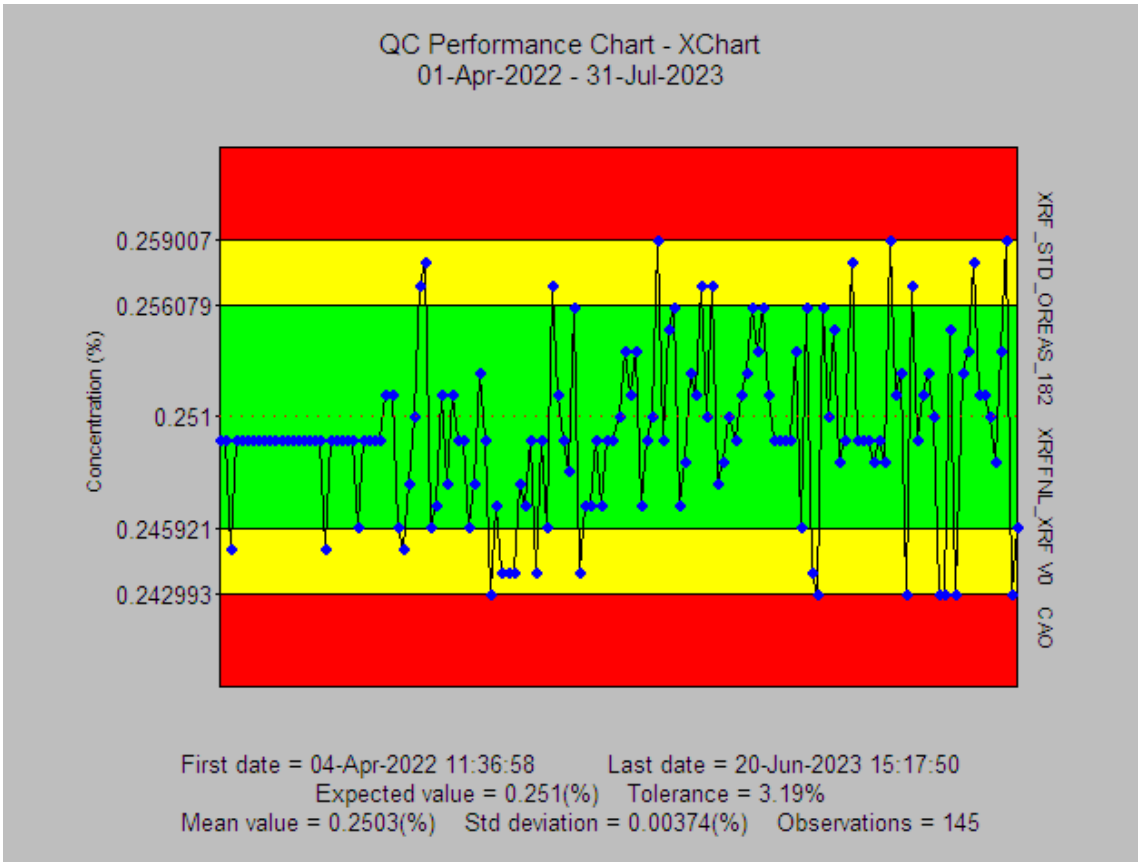


PT. GEOSERVICES - CIKARANG LABORATORY

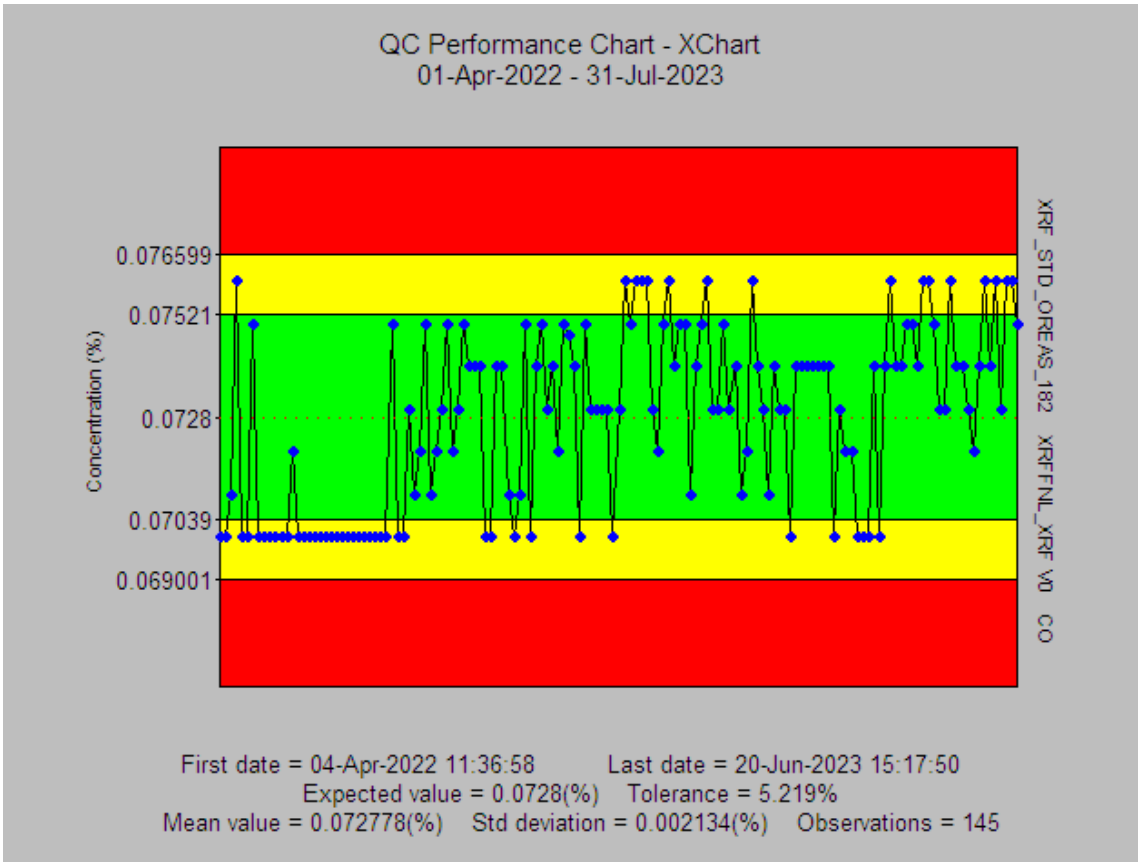
XRF_STD_OREAS_182 - AL2O3



XRF_STD_OREAS_182 - CAO

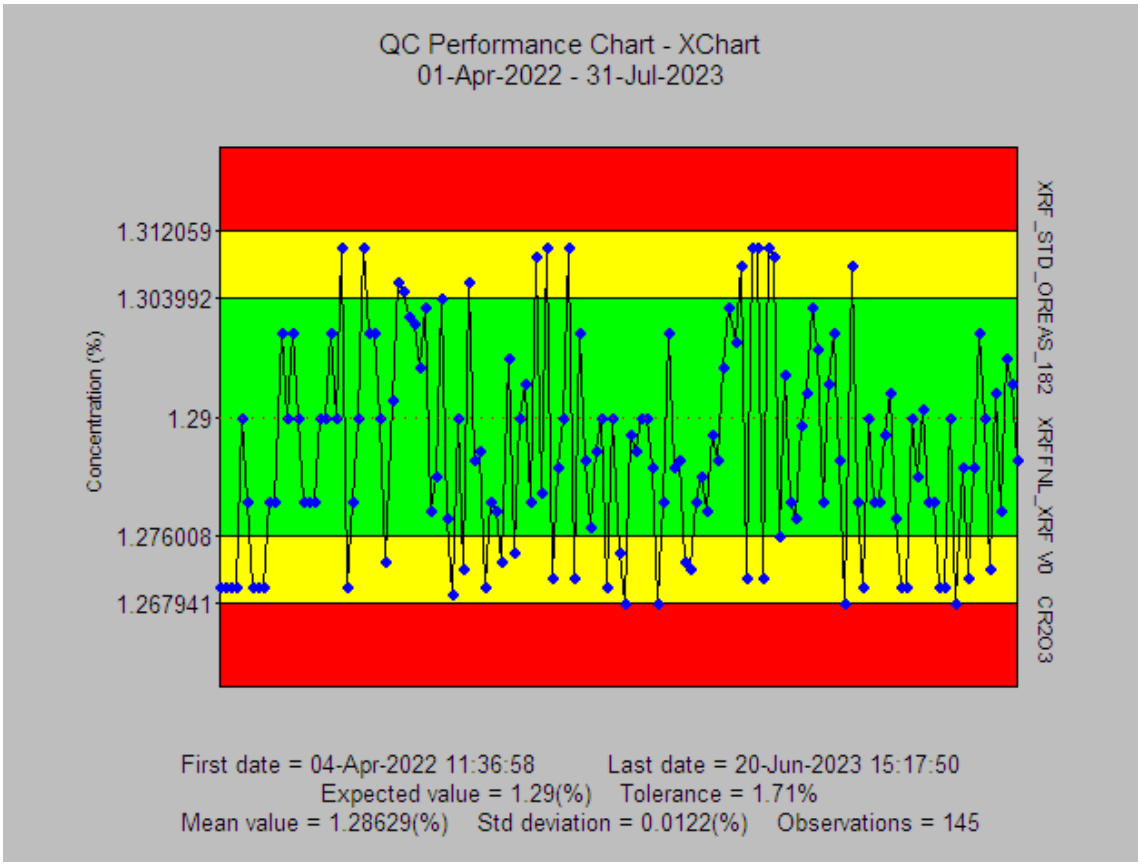


XRF_STD_OREAS_182 - CO



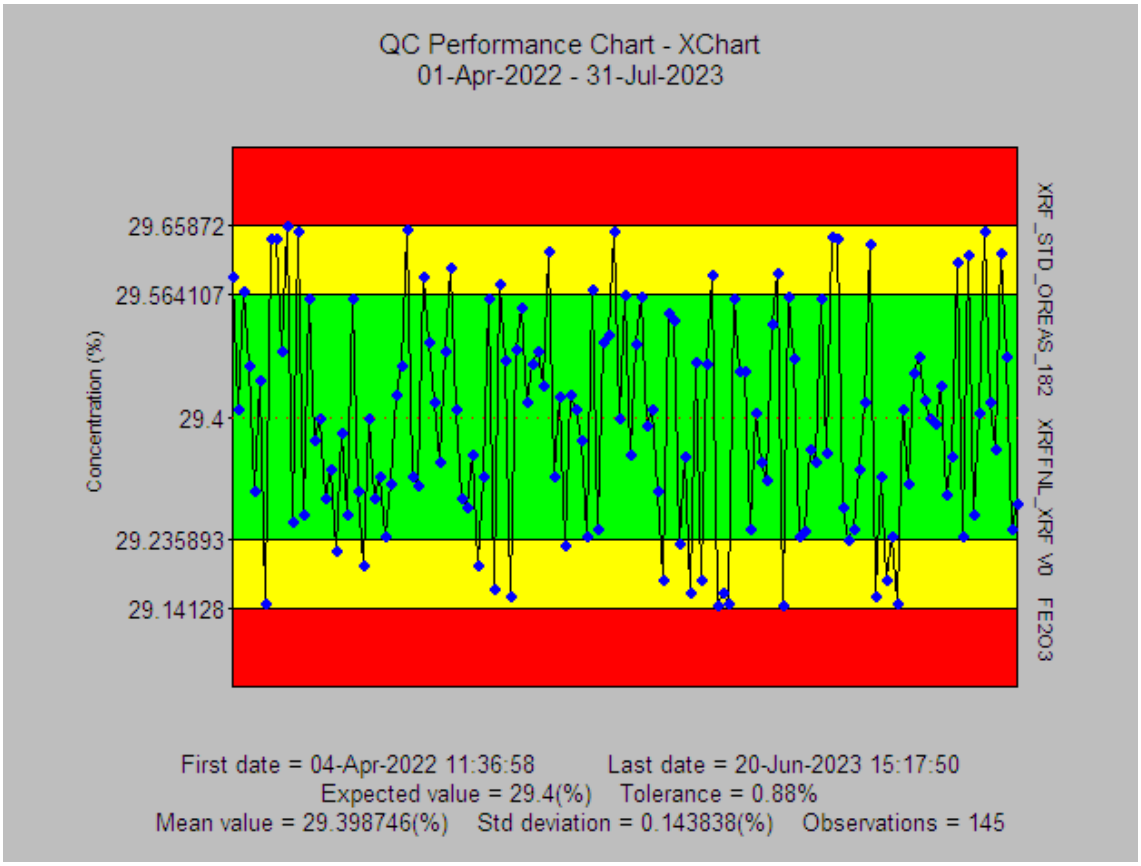
PT. GEOSERVICES - CIKARANG LABORATORY

XRF_STD_OREAS_182 - CR2O3



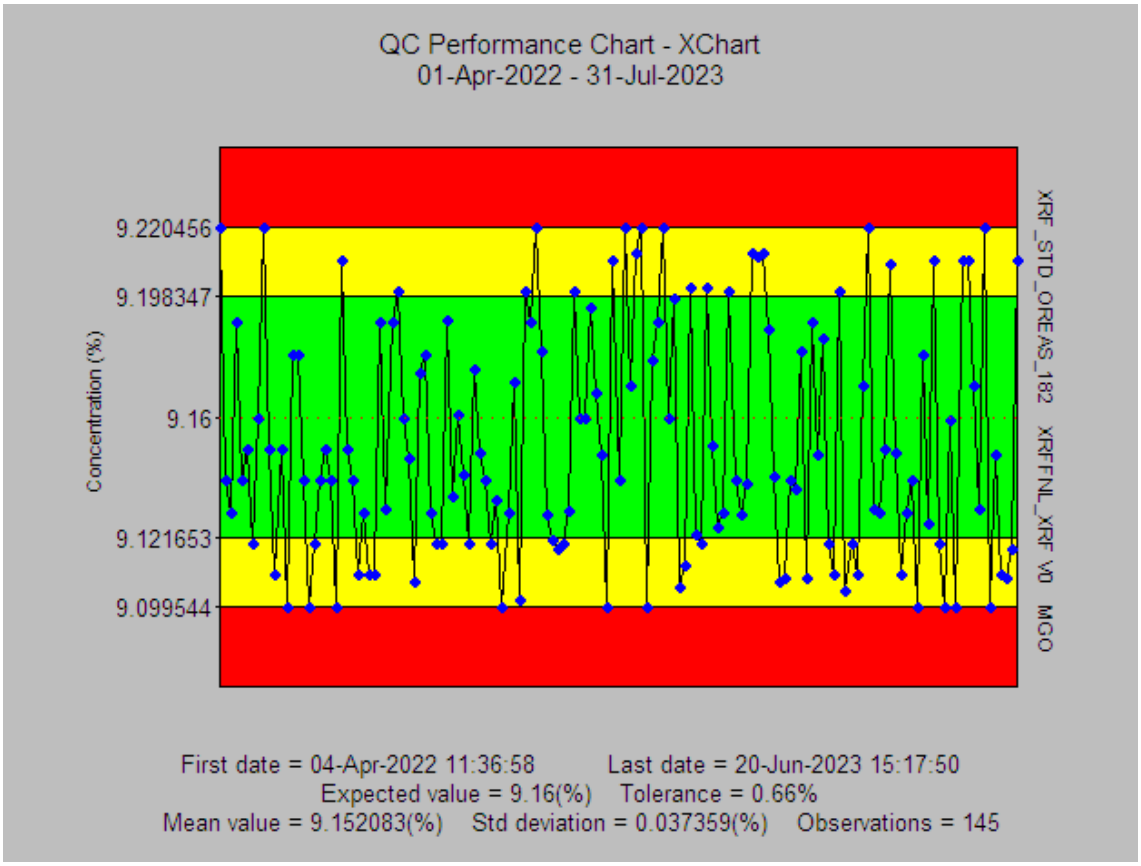
PT. GEOSERVICES - CIKARANG LABORATORY

XRF_STD_OREAS_182 - FE2O3

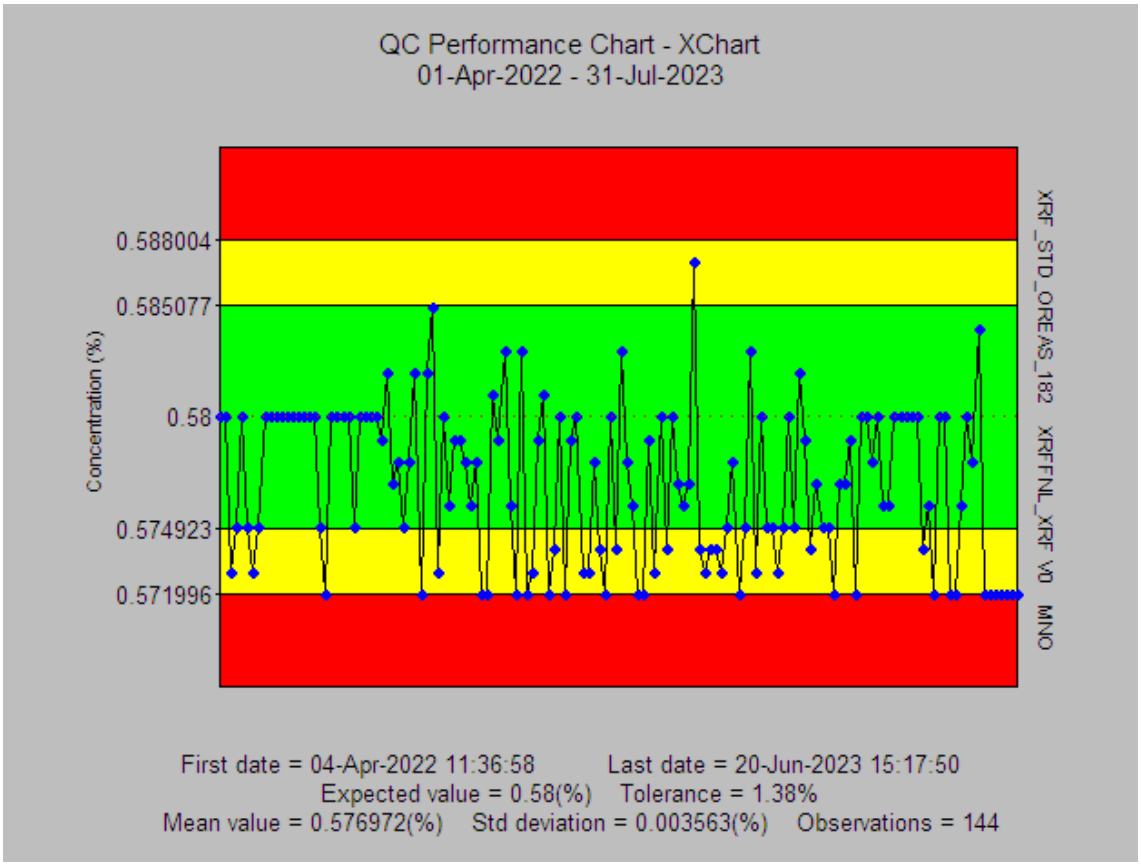


PT. GEOSERVICES - CIKARANG LABORATORY

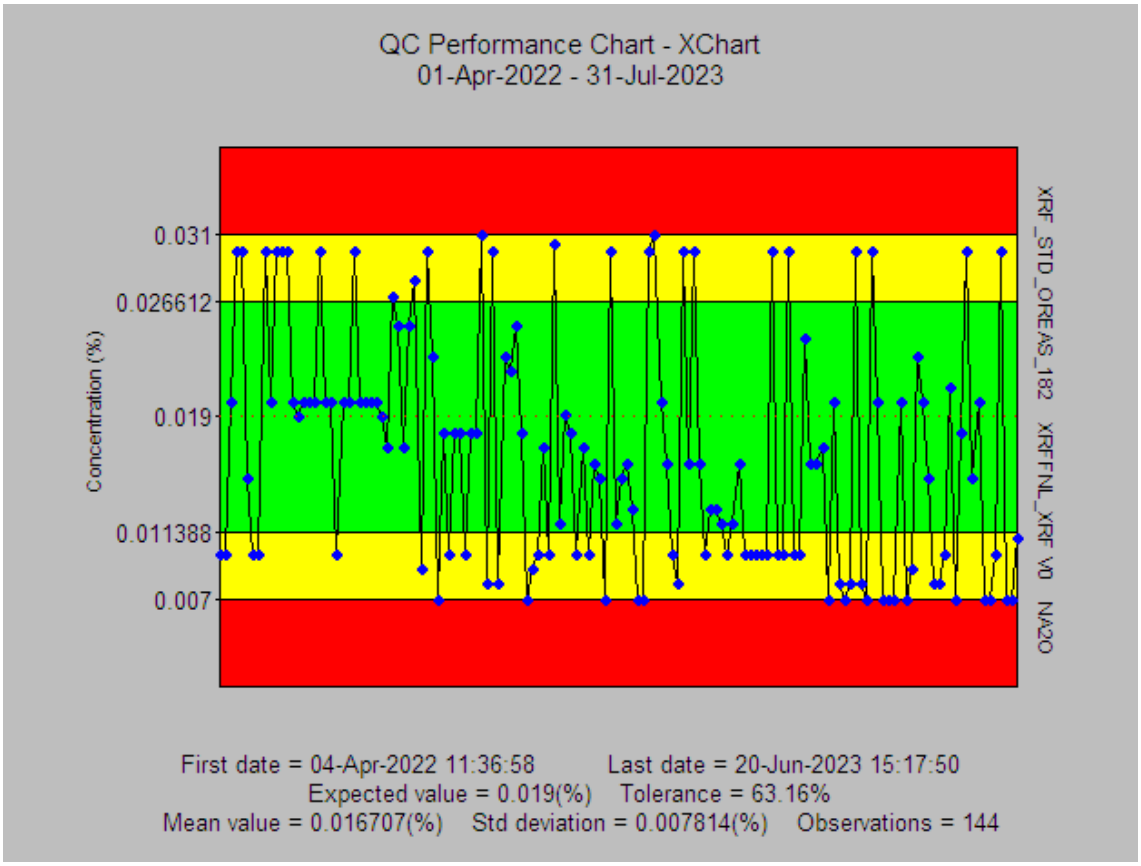
XRF_STD_OREAS_182 - MGO



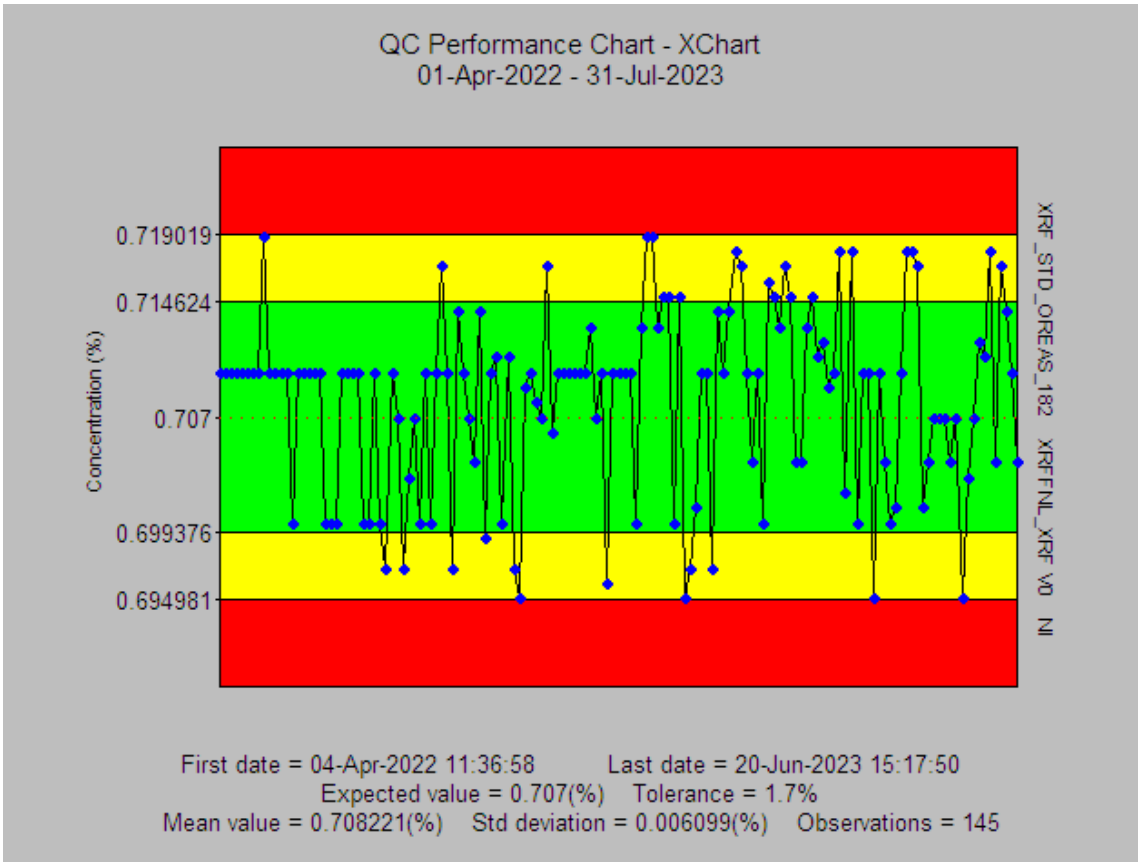
XRF_STD_OREAS_182 - MNO



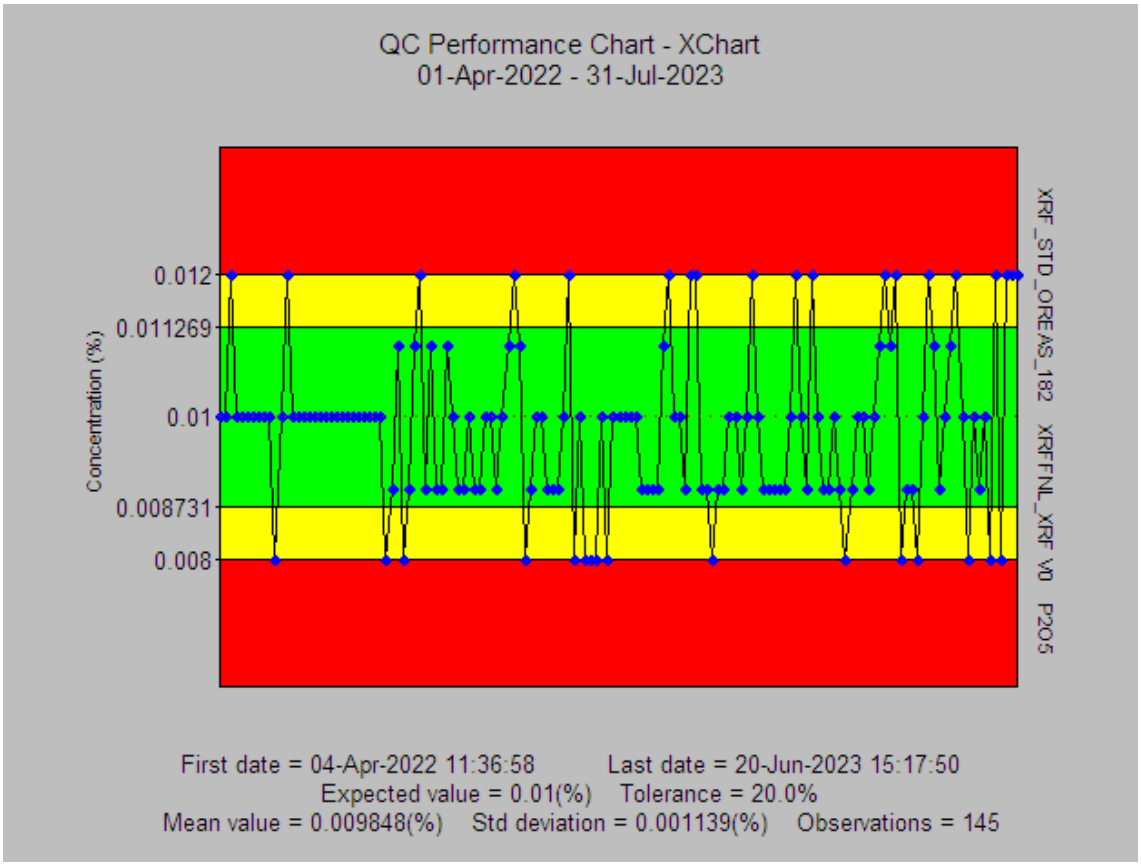
XRF_STD_OREAS_182 - NA2O



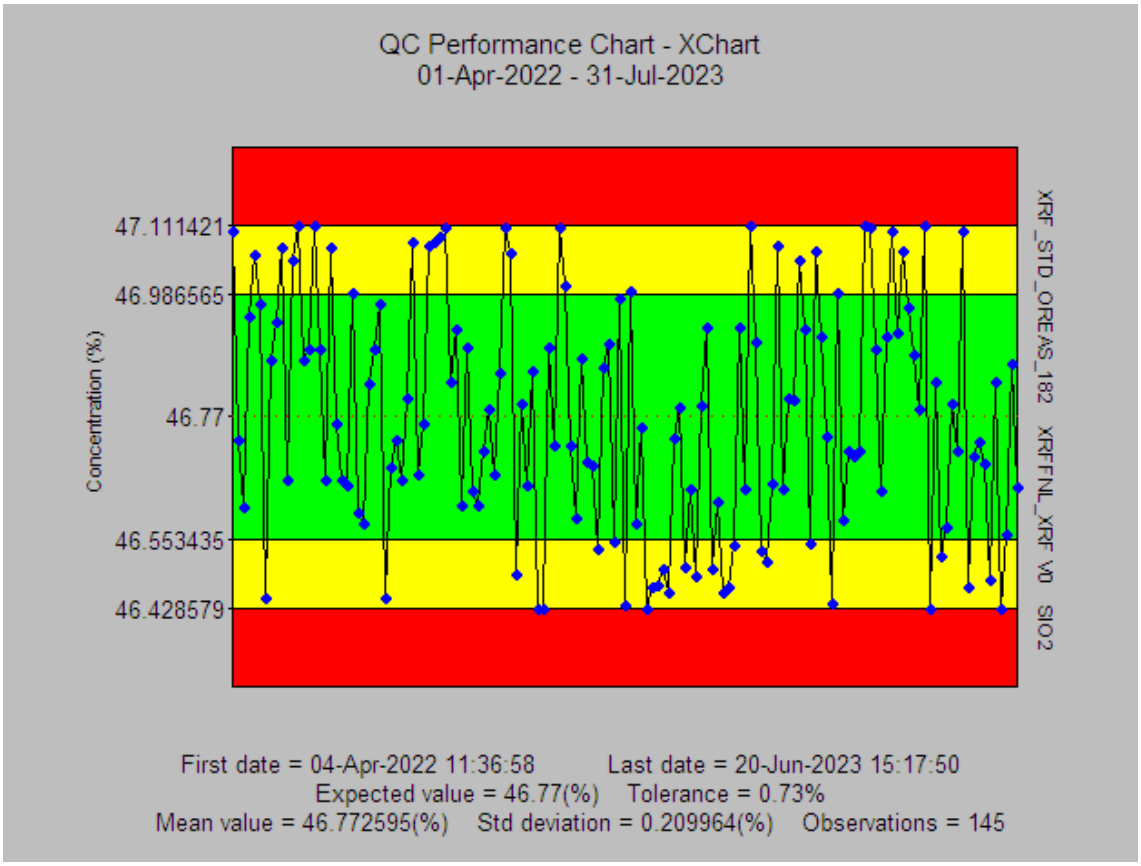
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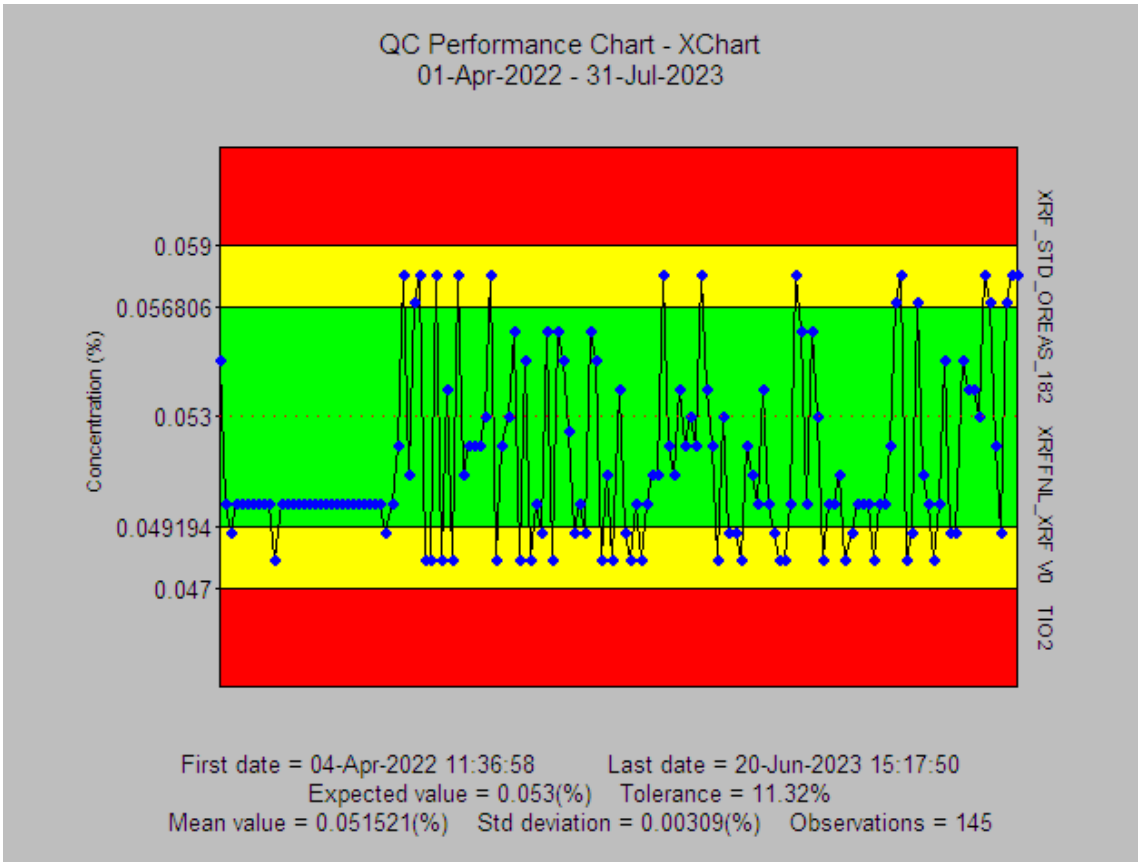
XRF_STD_OREAS_182 - P2O5



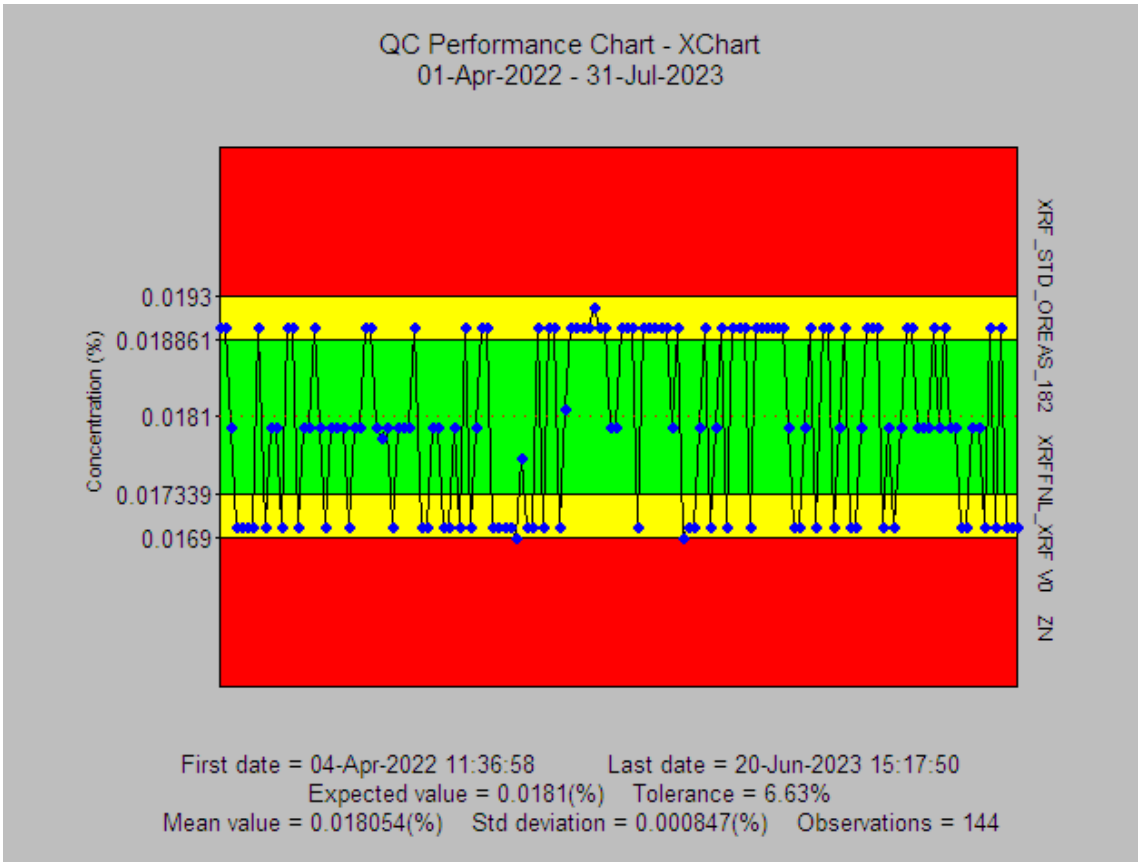
XRF_STD_OREAS_182 - SIO2



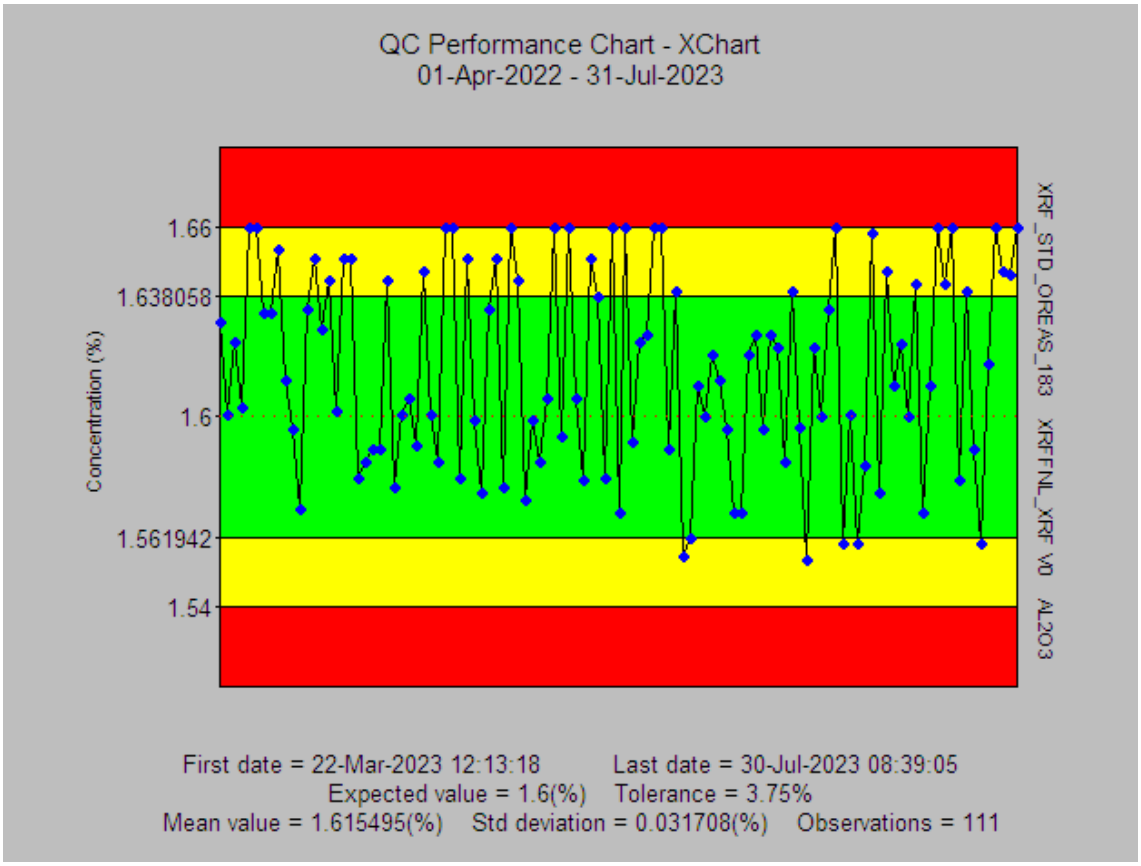
XRF_STD_OREAS_182 - TIO2



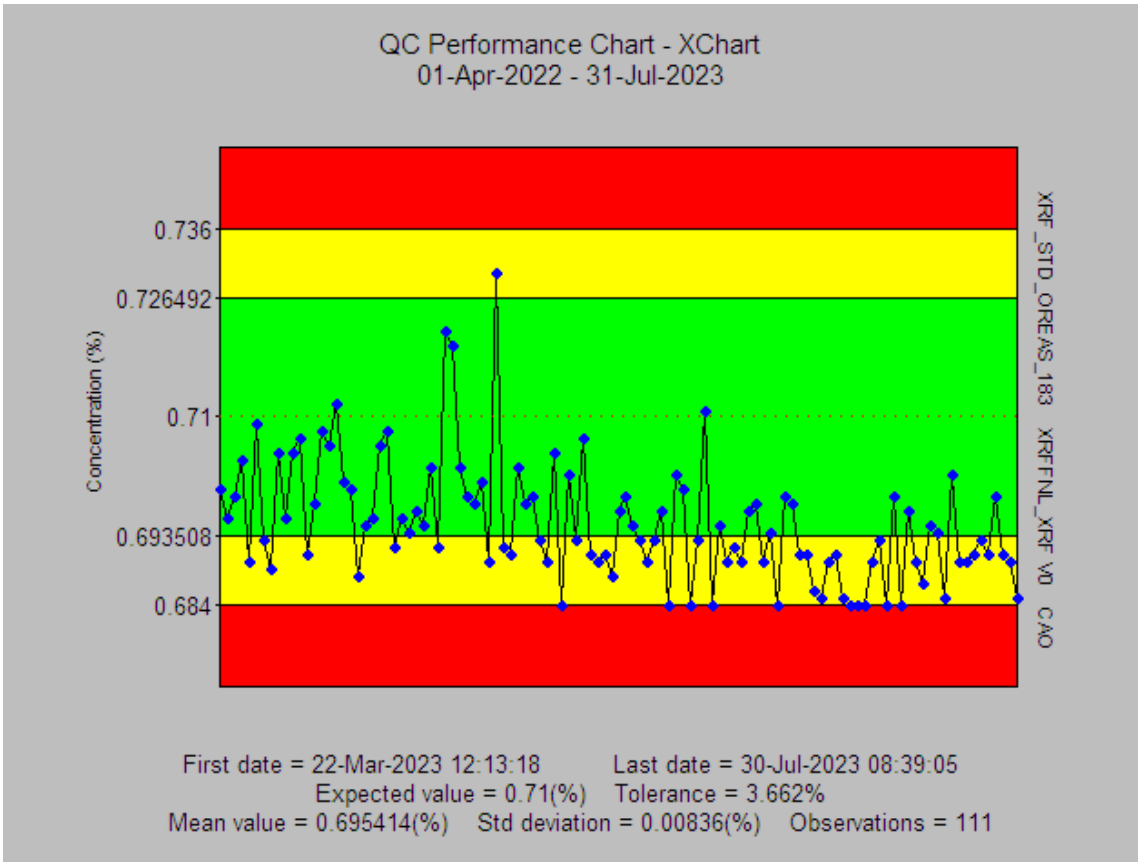
XRF_STD_OREAS_182 - ZN



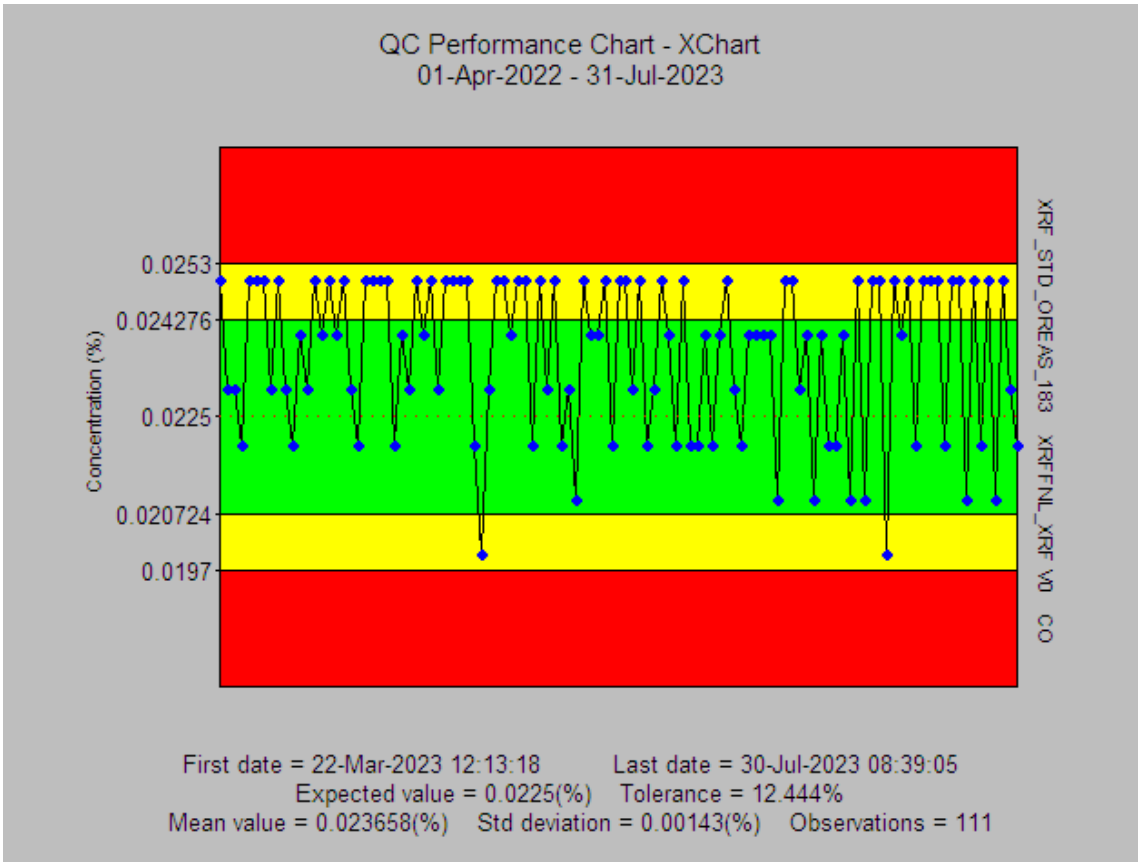
XRF_STD_OREAS_183 - AL2O3



XRF_STD_OREAS_183 - CAO

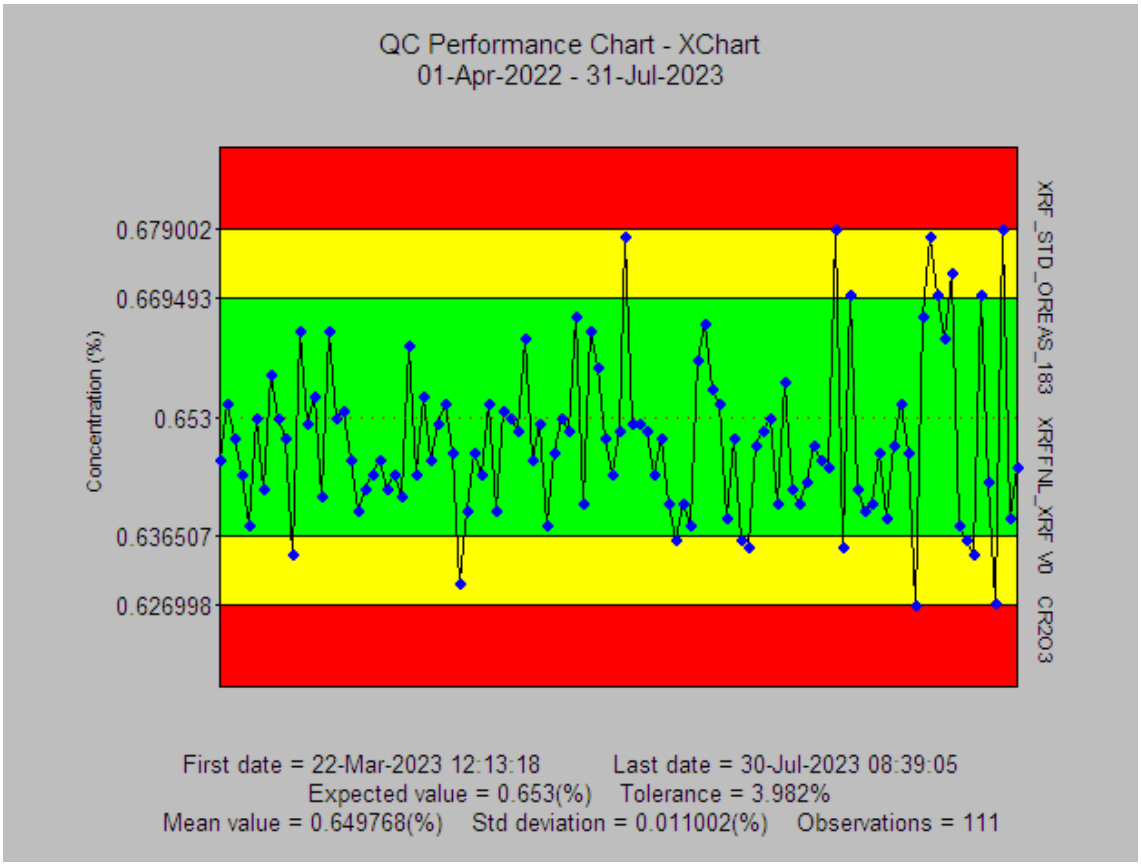


XRF_STD_OREAS_183 - CO

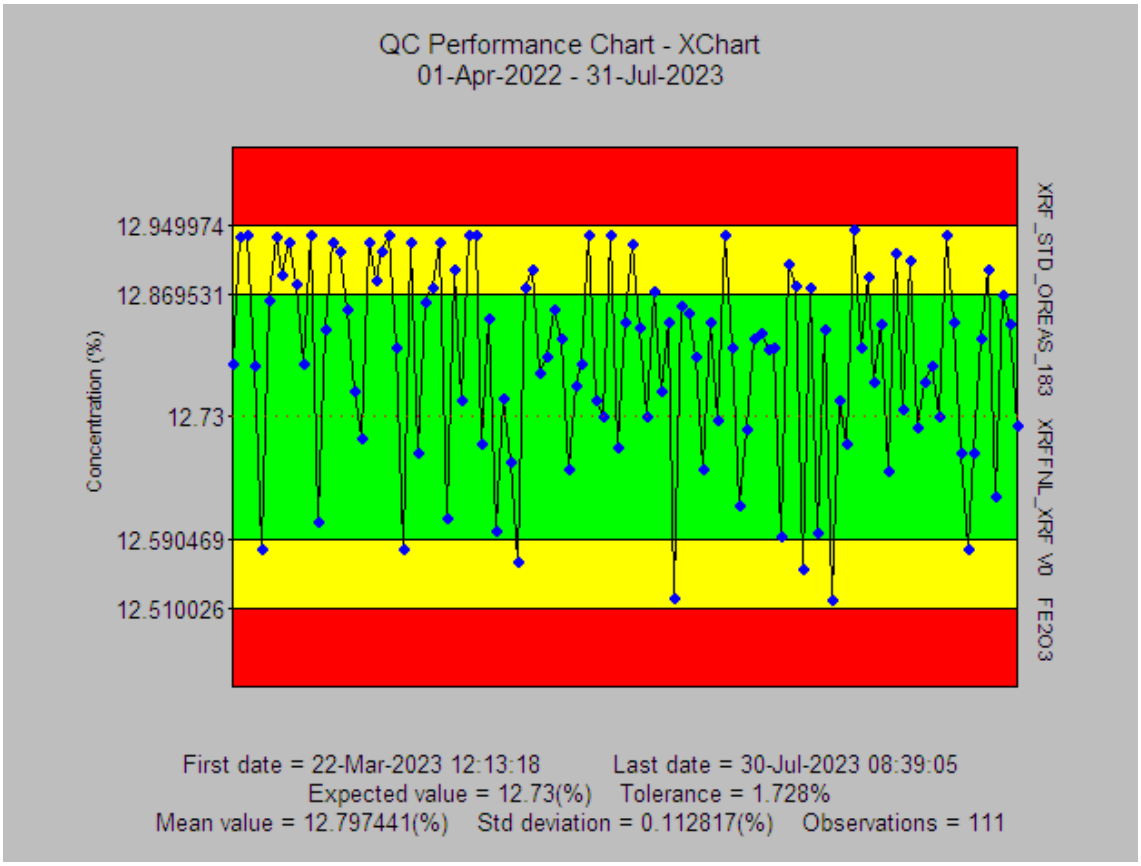


PT. GEOSERVICES - CIKARANG LABORATORY

XRF_STD_OREAS_183 - CR2O3

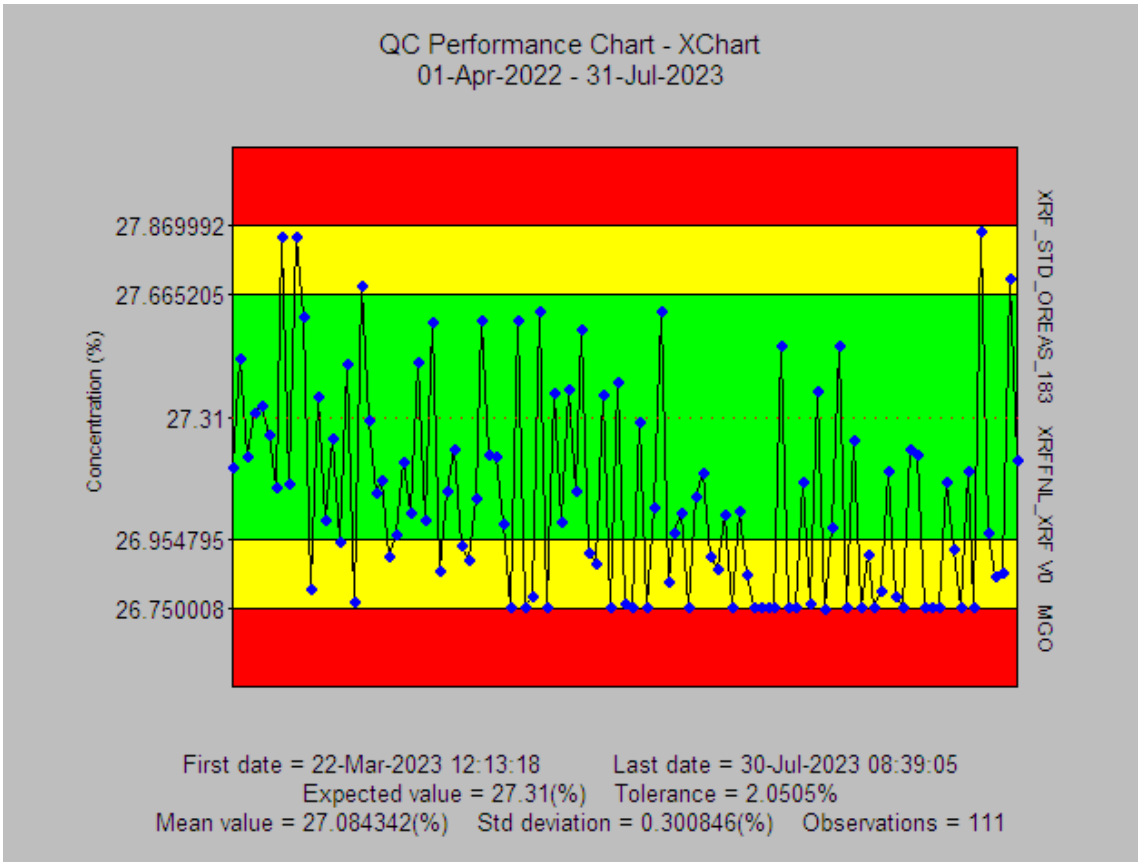


XRF_STD_OREAS_183 - FE2O3



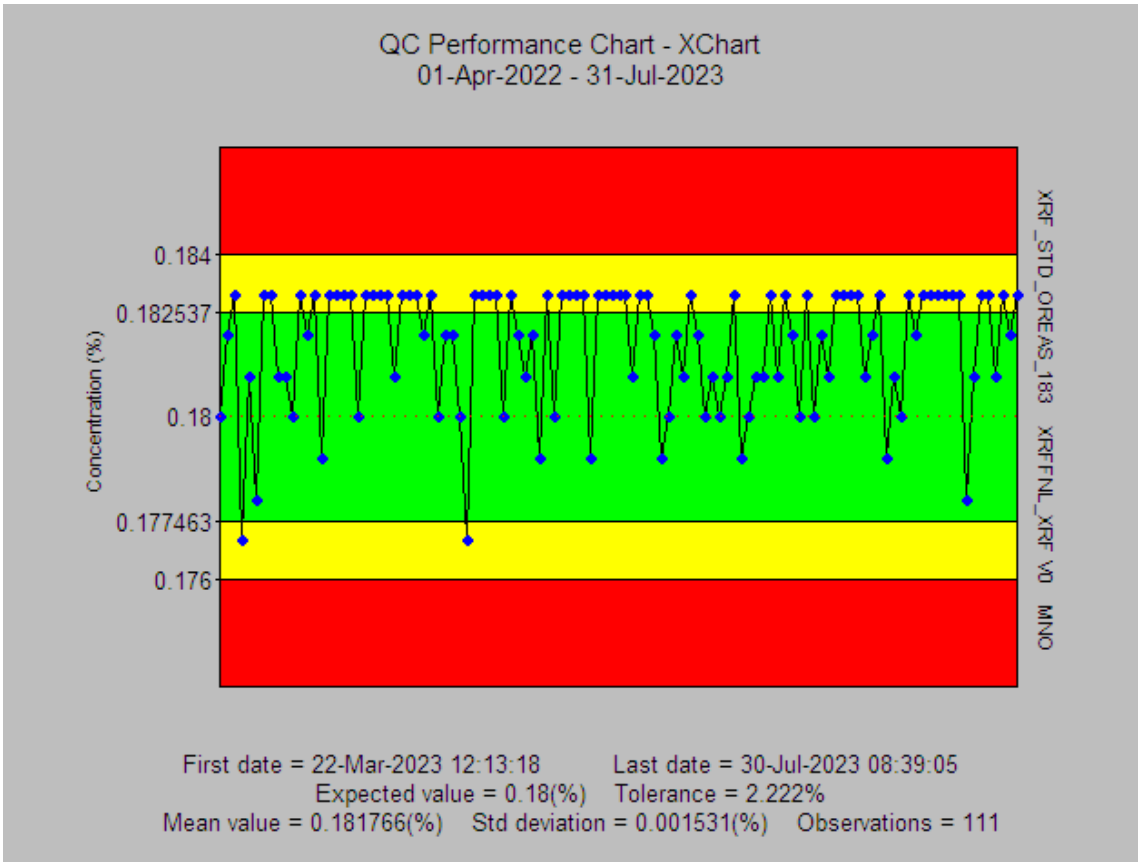
PT. GEOSERVICES - CIKARANG LABORATORY

XRF_STD_OREAS_183 - MGO

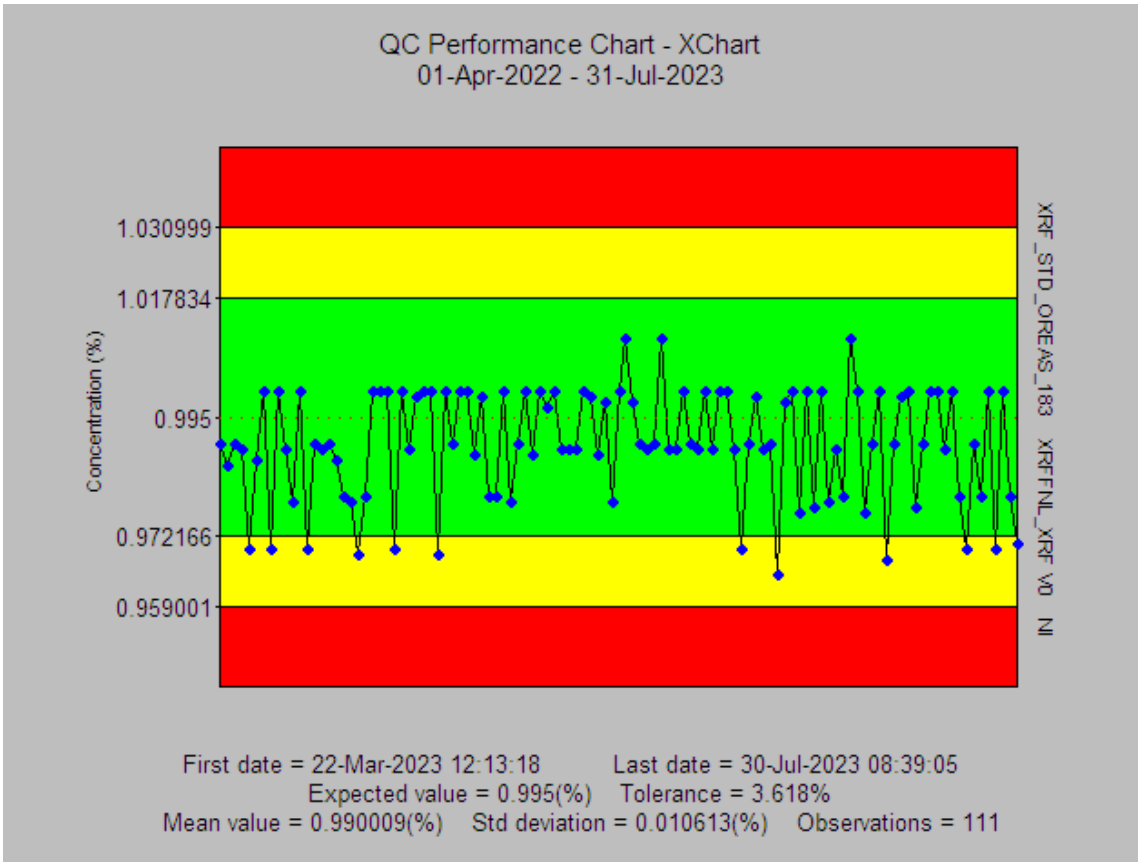


PT. GEOSERVICES - CIKARANG LABORATORY

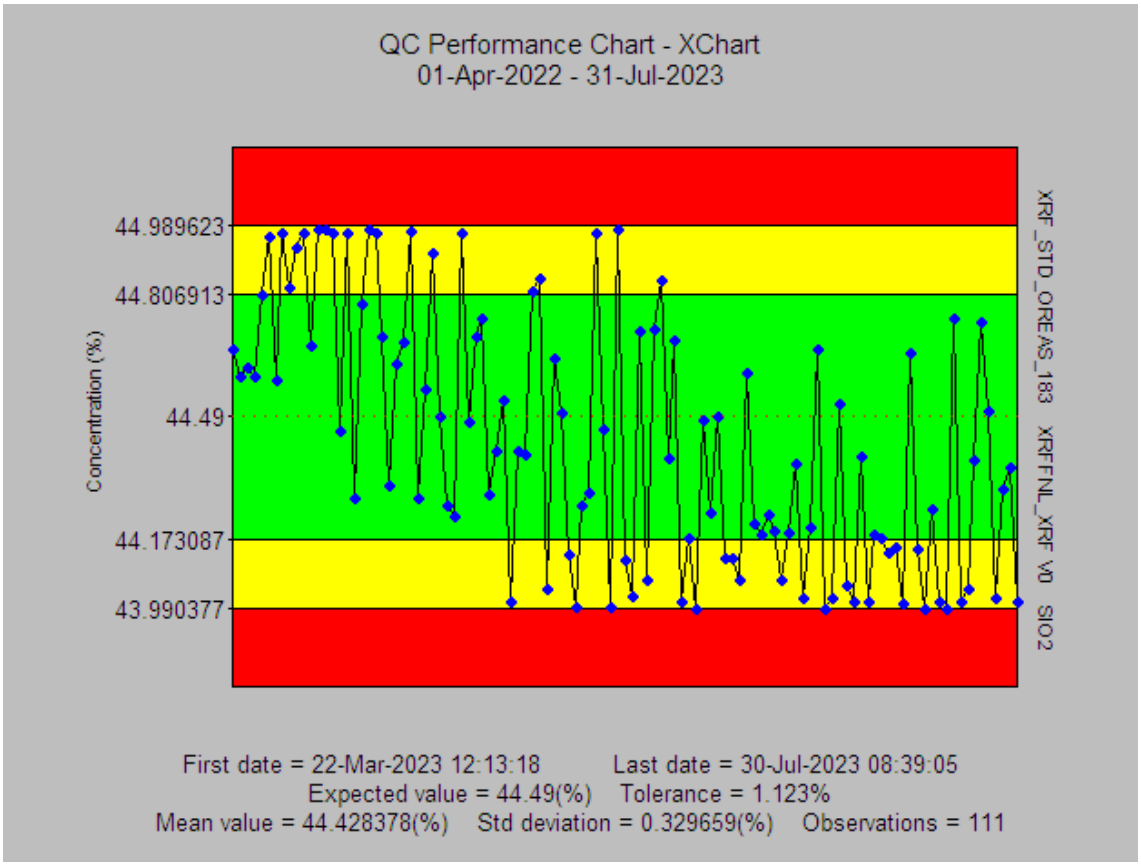
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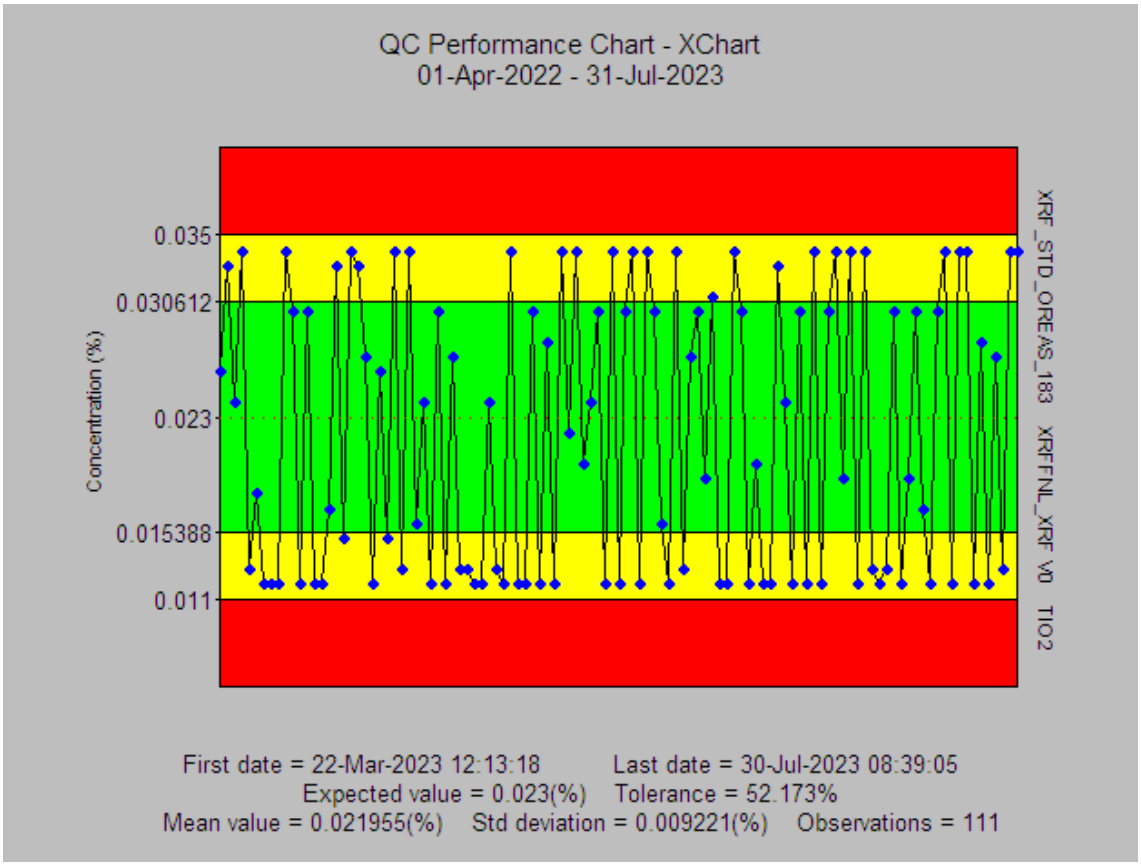
XRF_STD_OREAS_183 - NI



XRF_STD_OREAS_183 - SIO2

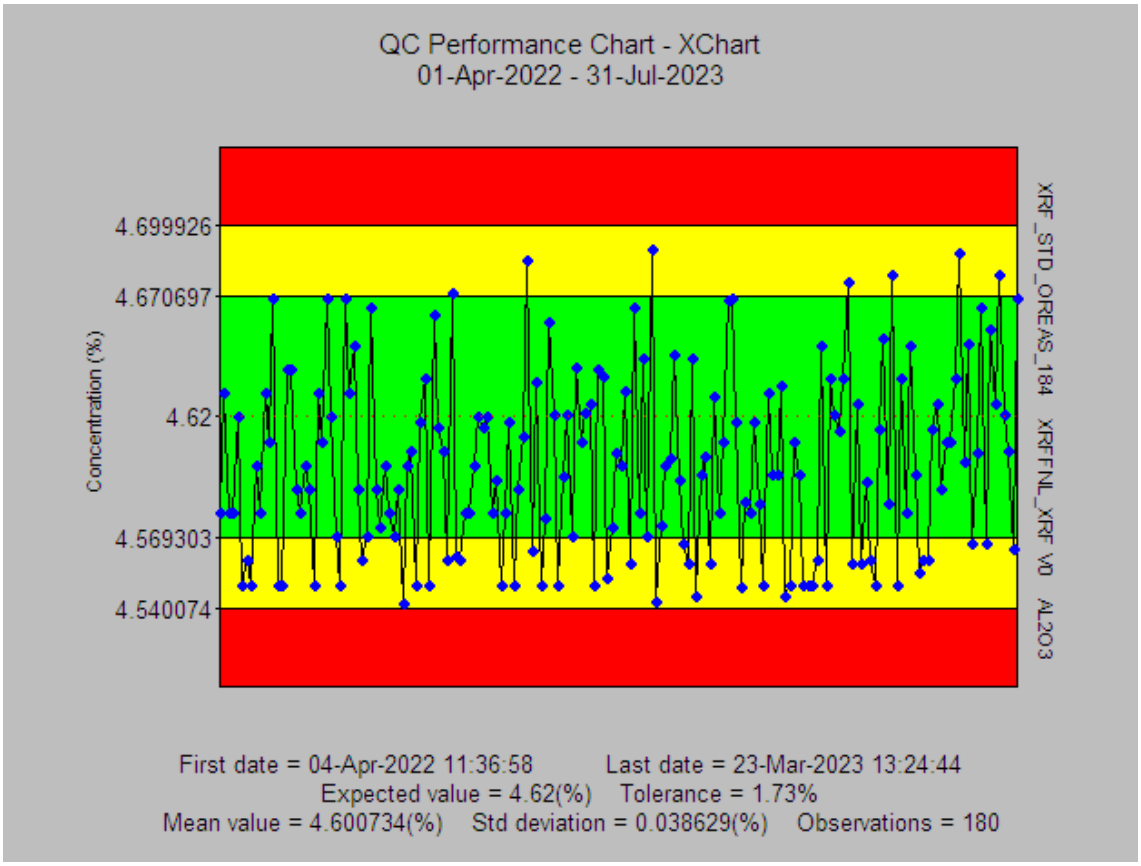


XRF_STD_OREAS_183 - TIO2

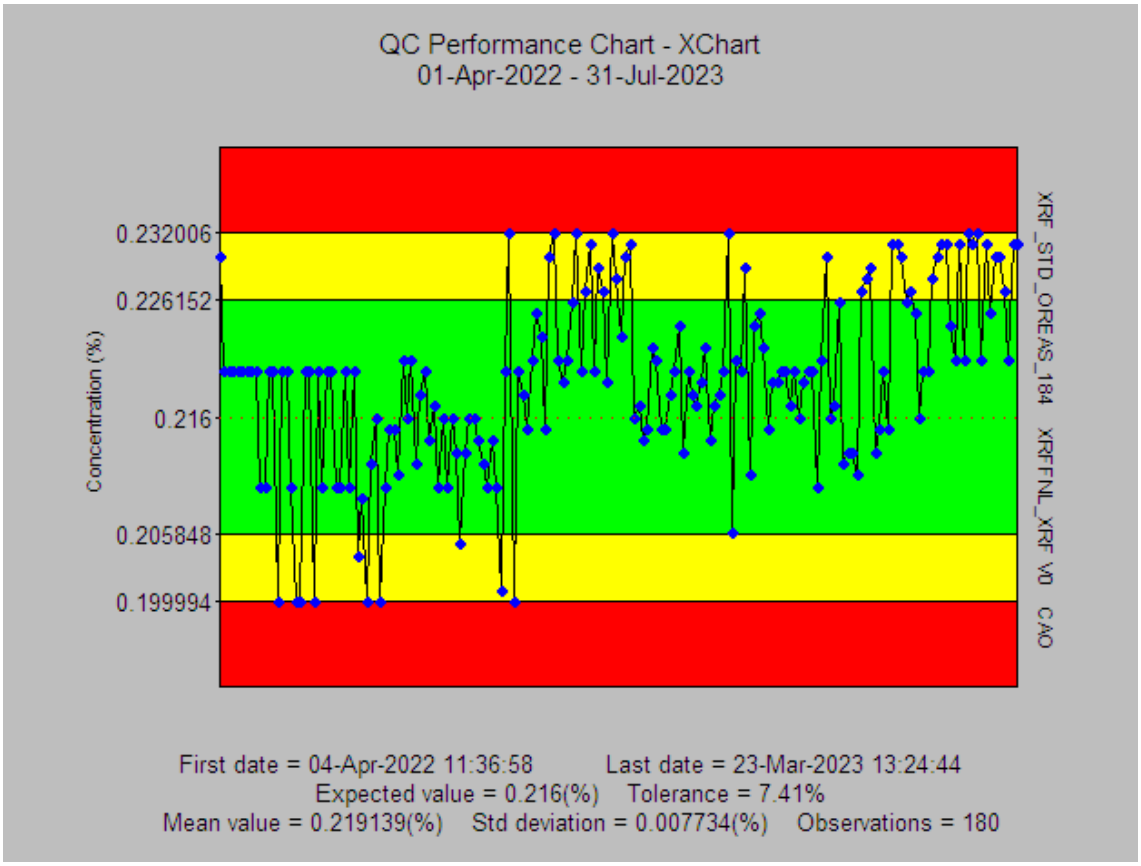


PT. GEOSERVICES - CIKARANG LABORATORY

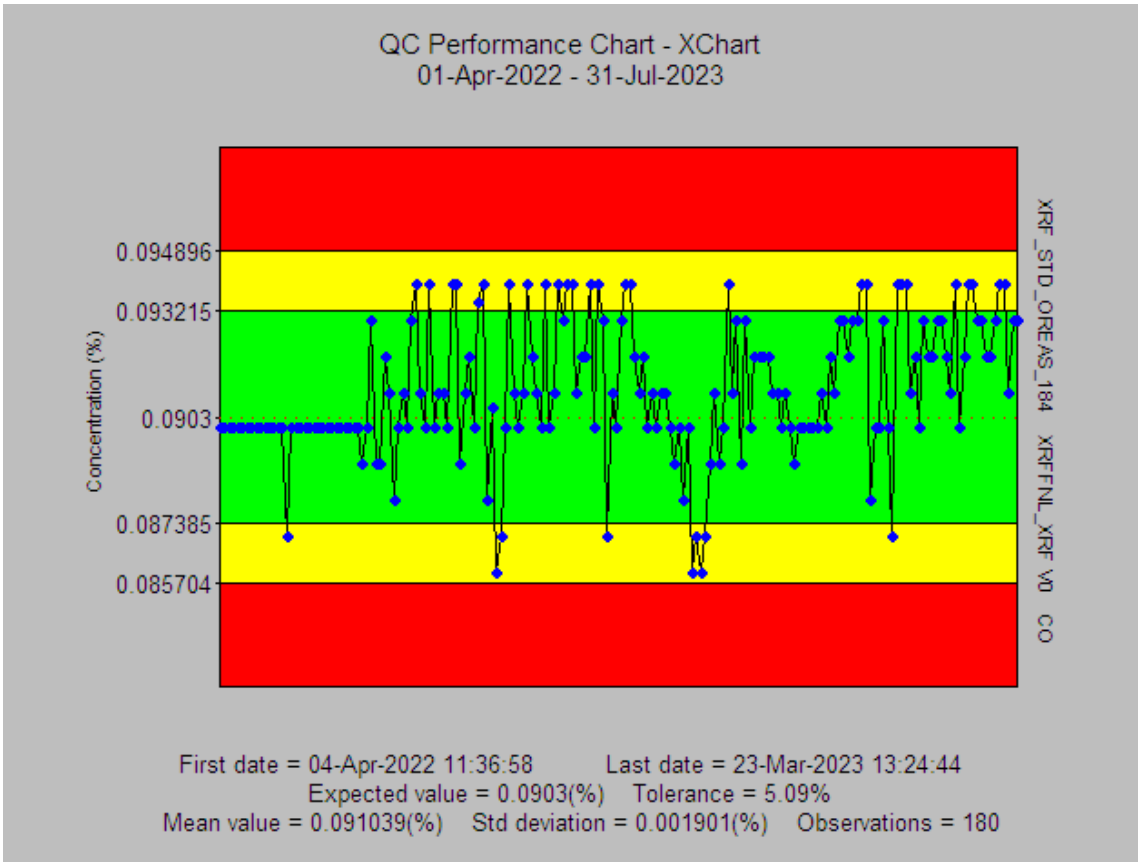
XRF_STD_OREAS_184 - AL2O3



XRF_STD_OREAS_184 - CAO

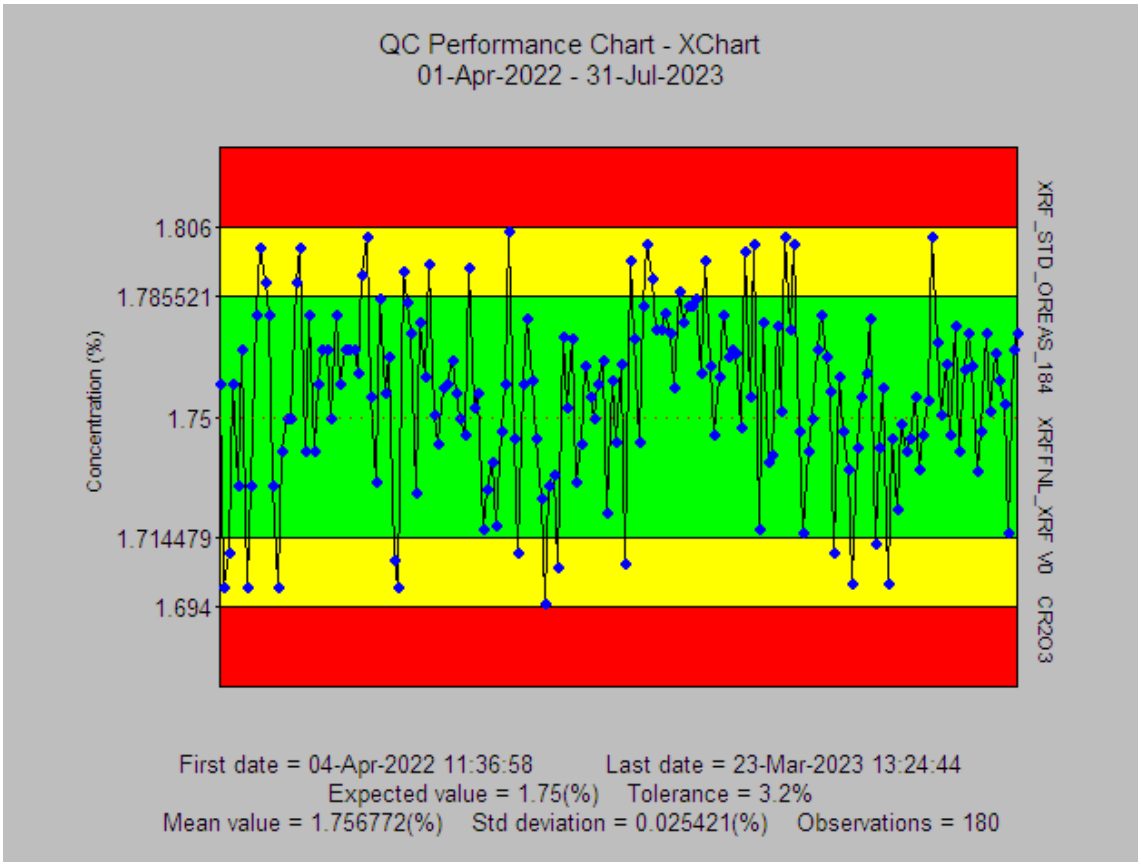


XRF_STD_OREAS_184 - CO



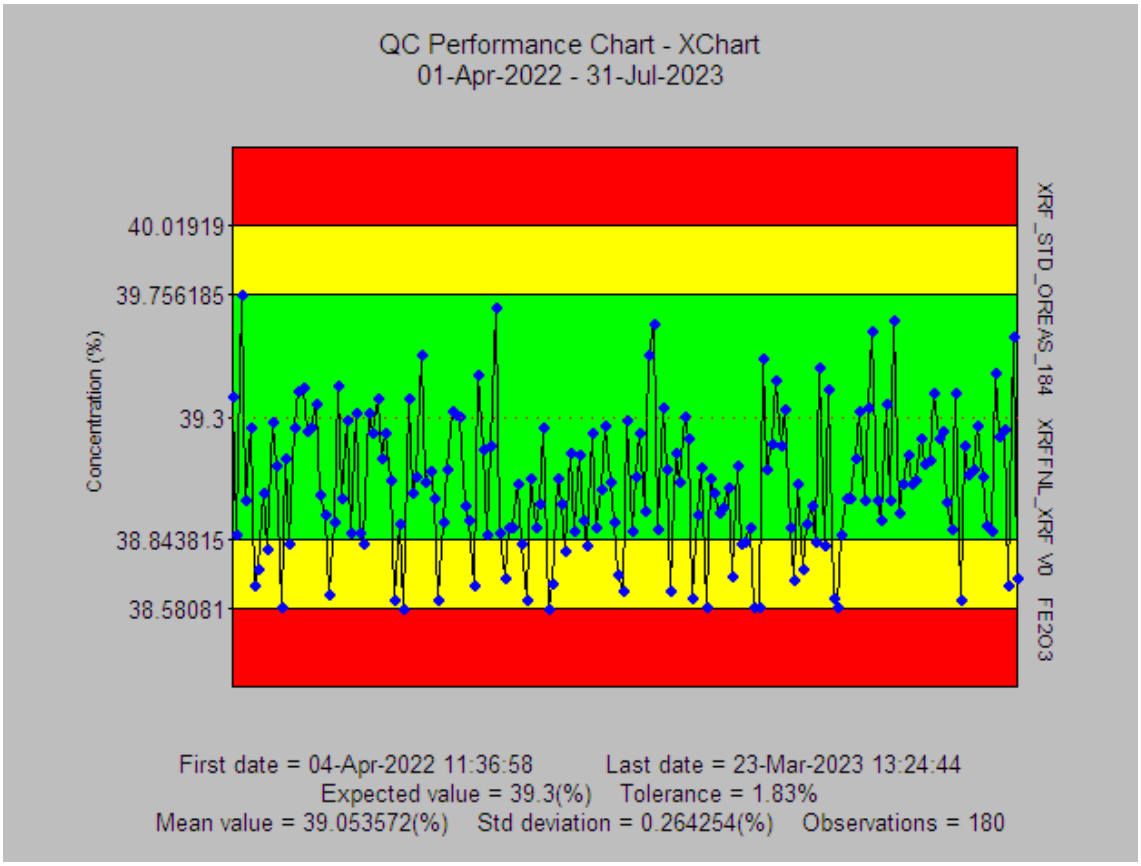
PT. GEOSERVICES - CIKARANG LABORATORY

XRF_STD_OREAS_184 - CR2O3



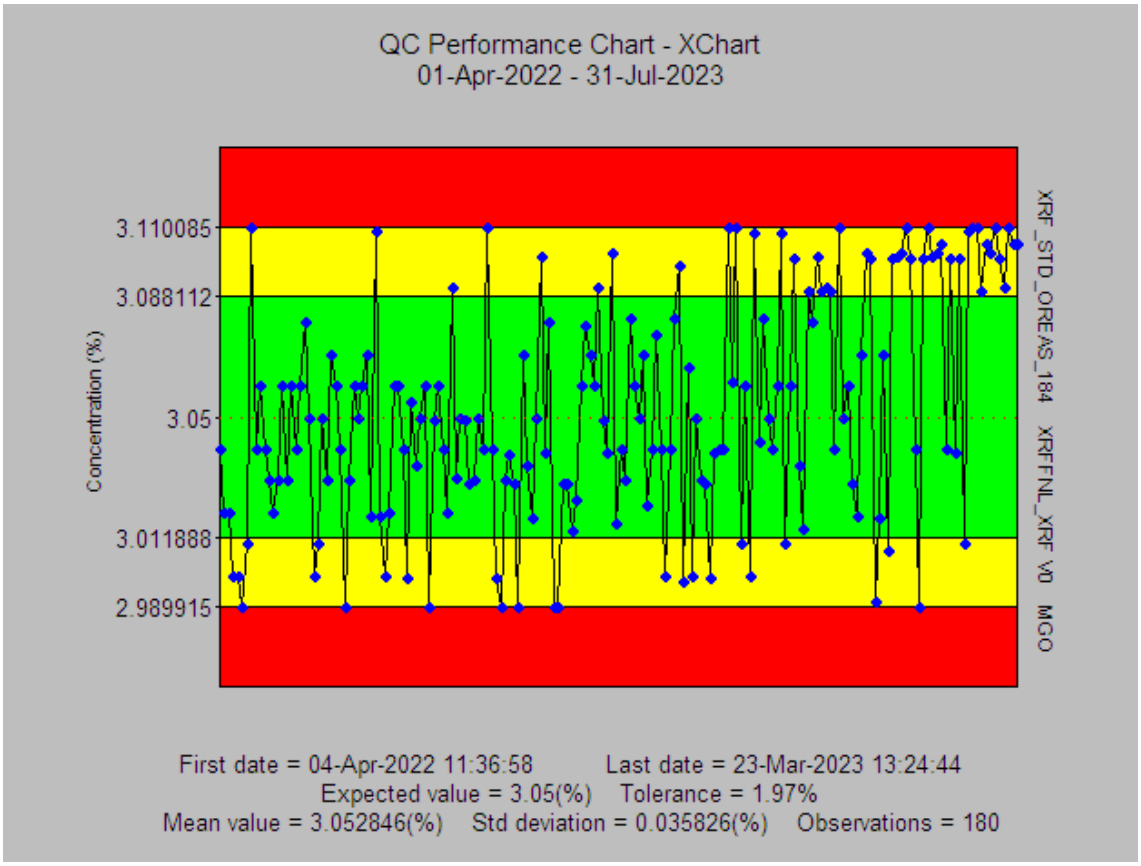
PT. GEOSERVICES - CIKARANG LABORATORY

XRF_STD_OREAS_184 - FE2O3



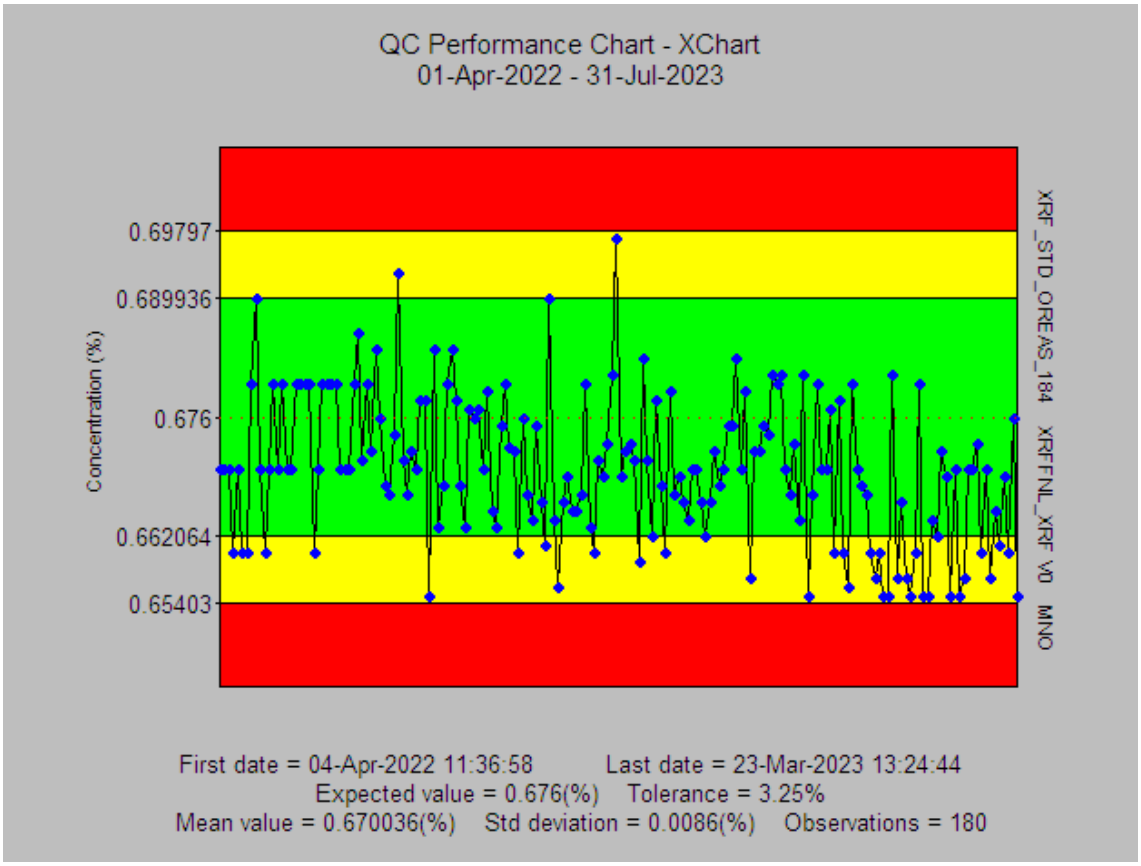
PT. GEOSERVICES - CIKARANG LABORATORY

XRF_STD_OREAS_184 - MGO



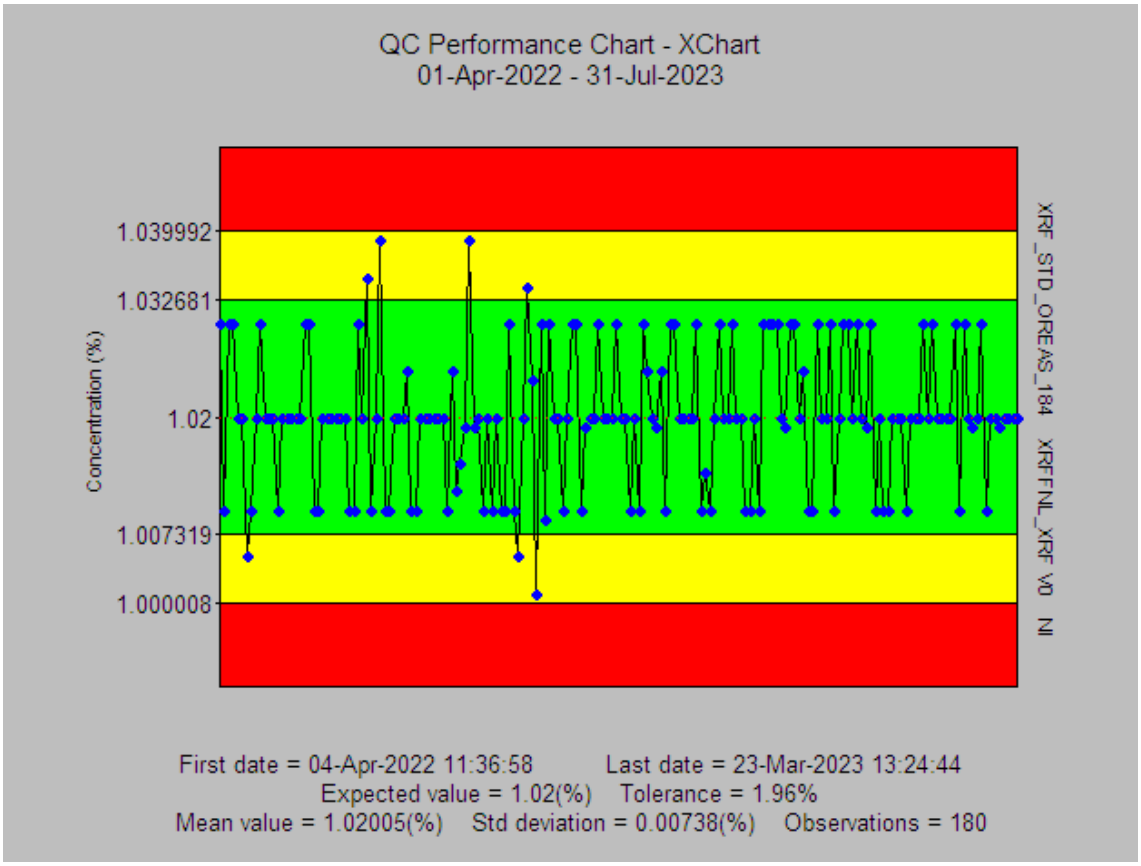
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XRF_STD_OREAS_184 - MNO

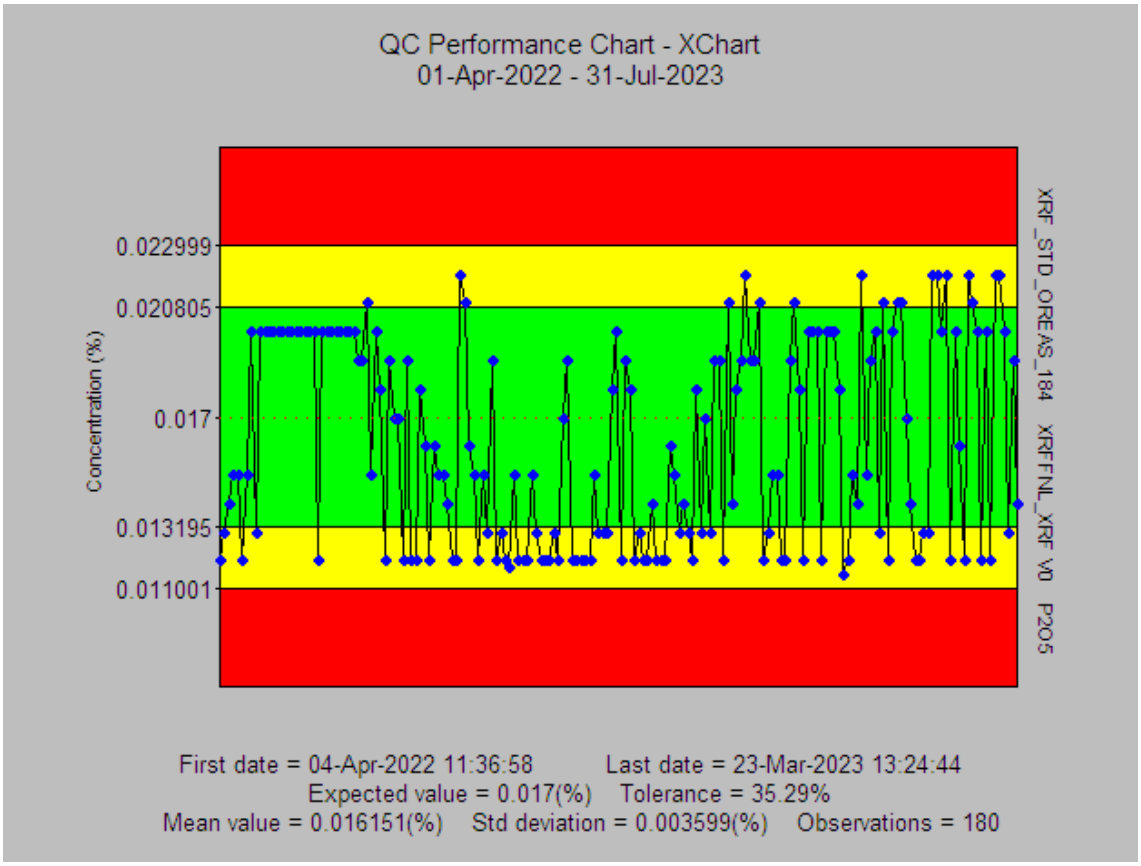


PT. GEOSERVICES - CIKARANG LABORATORY

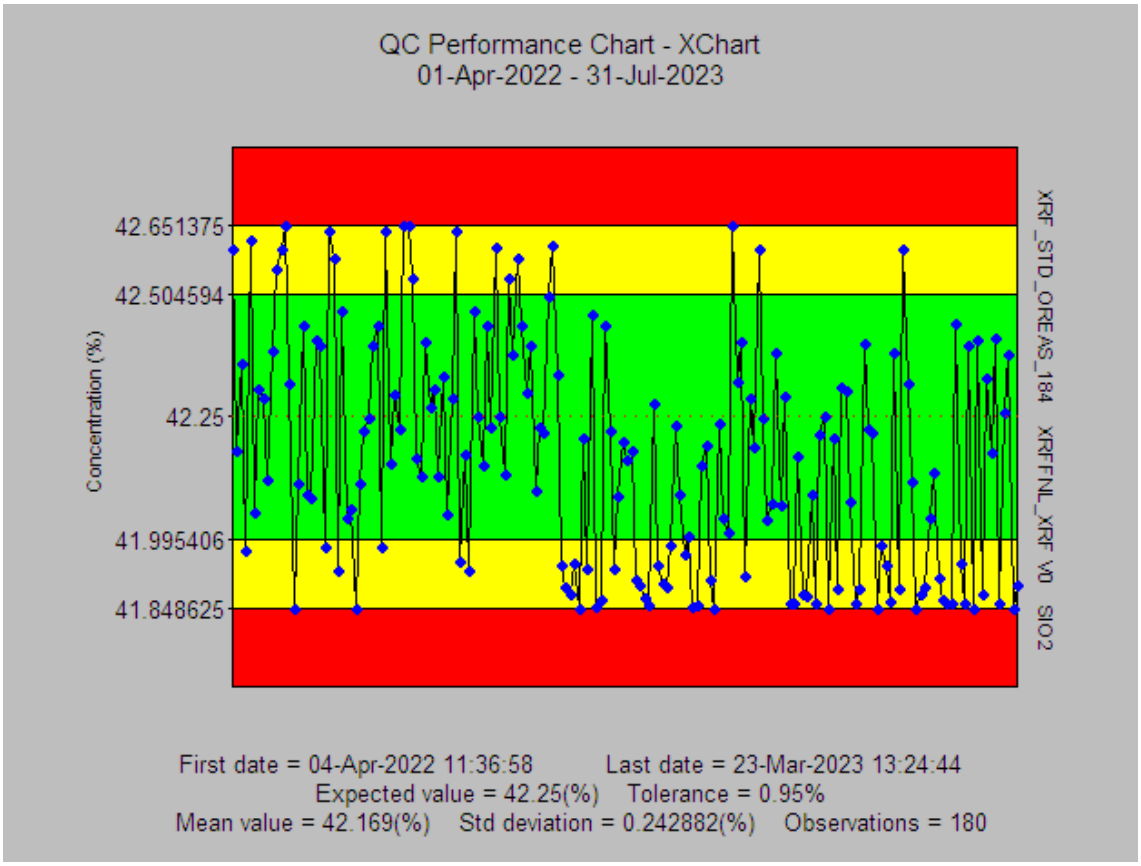
XRF_STD_OREAS_184 - NI



XRF_STD_OREAS_184 - P2O5

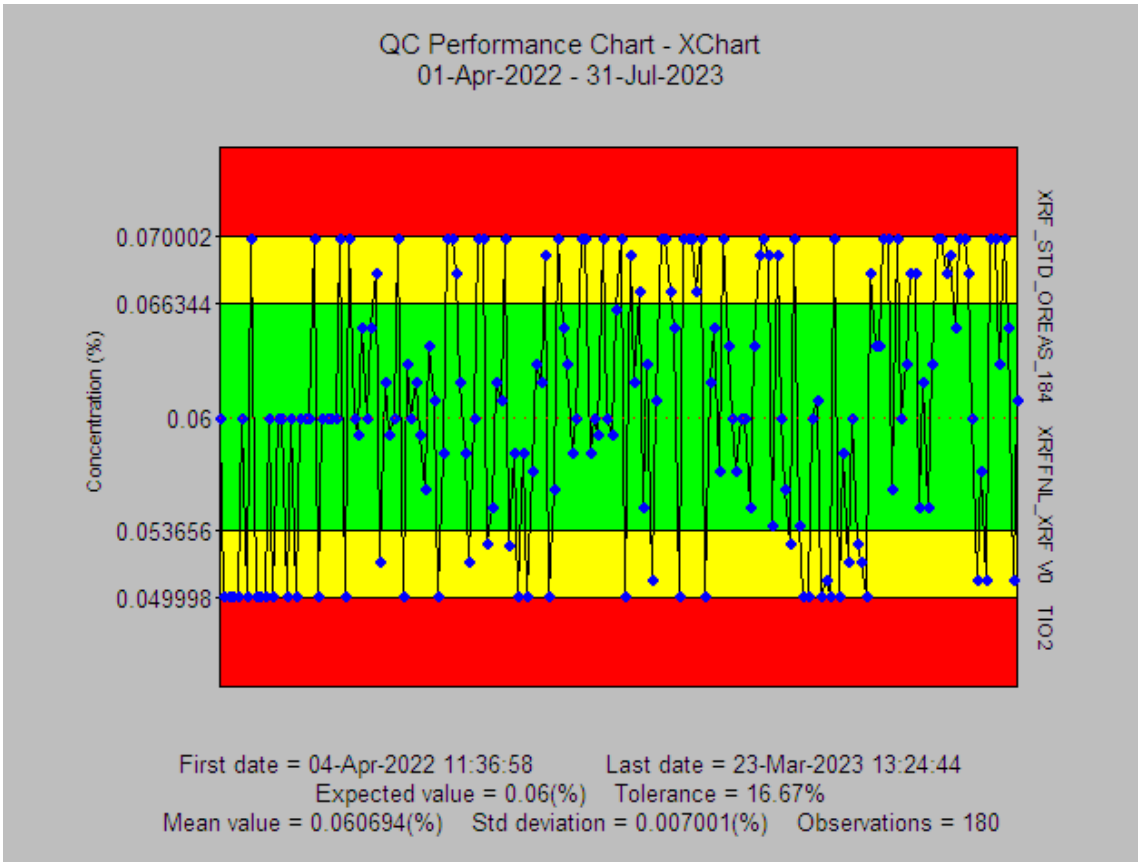


XRF_STD_OREAS_184 - SIO2

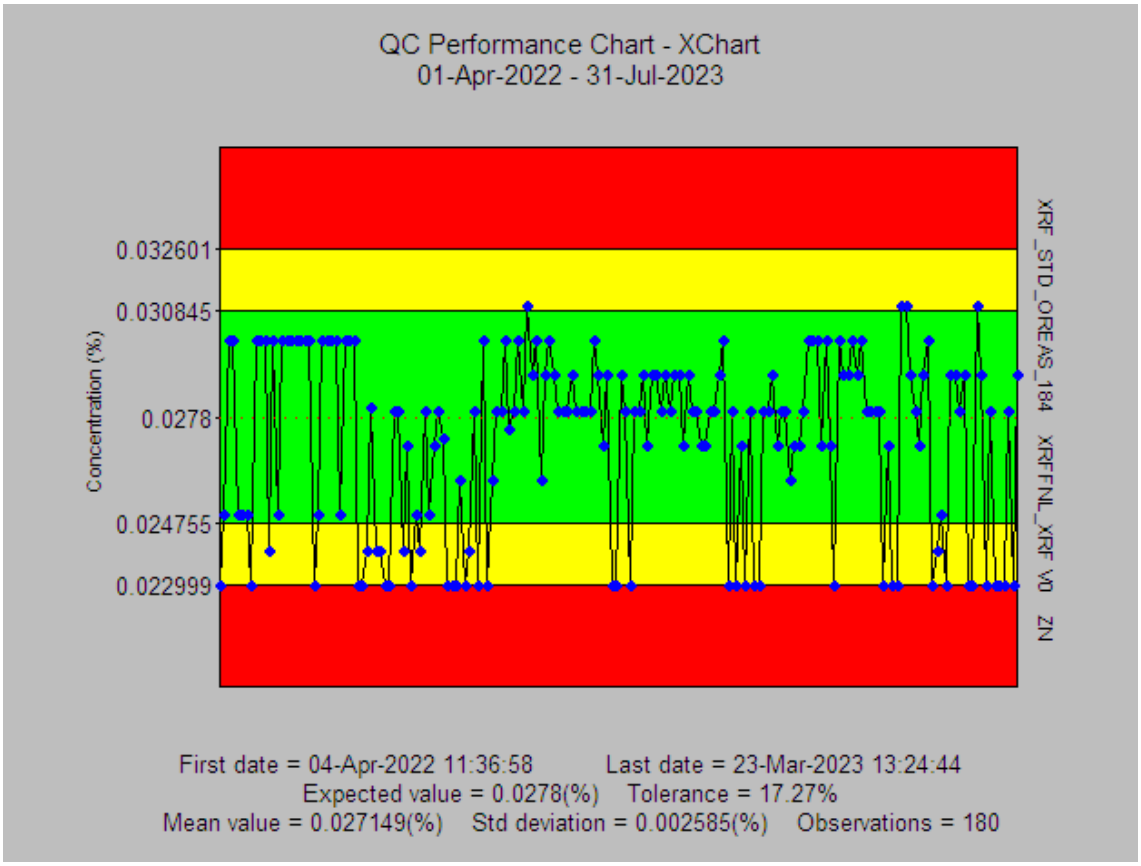


PT. GEOSERVICES - CIKARANG LABORATORY

XRF_STD_OREAS_184 - TIO2

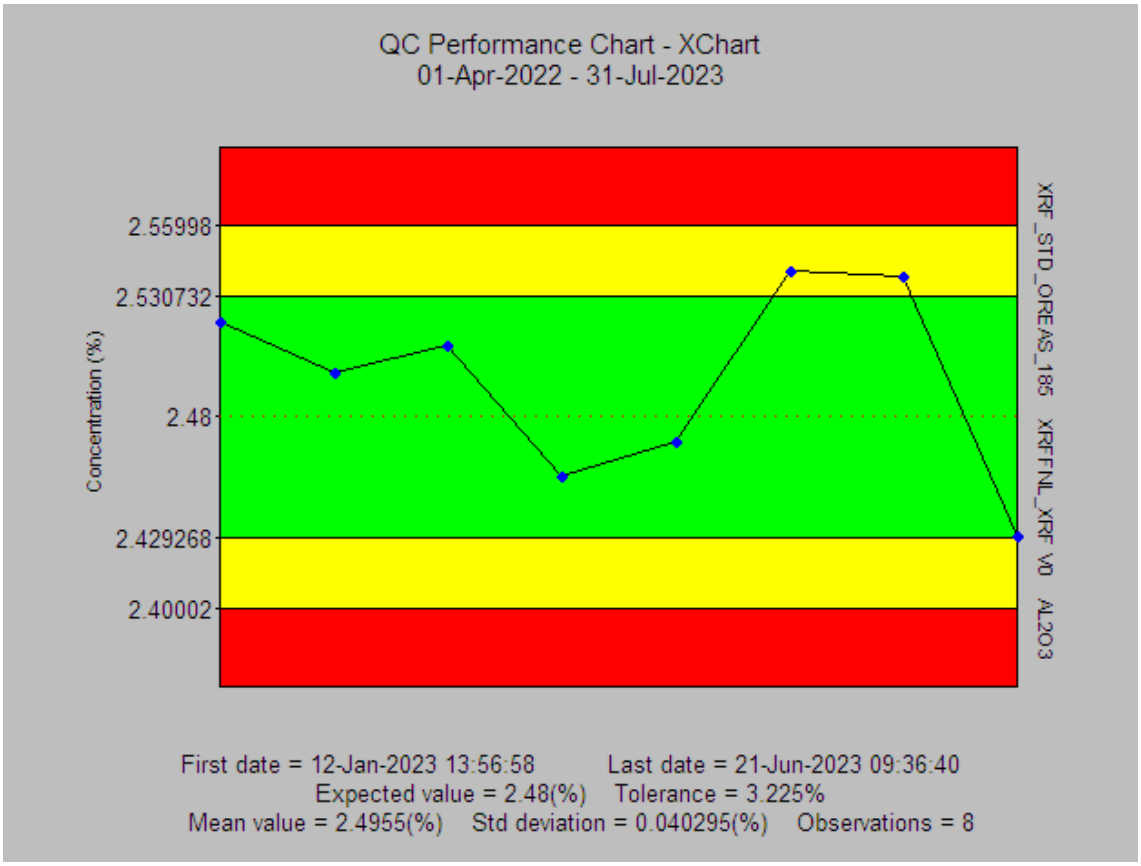


XRF_STD_OREAS_184 - ZN



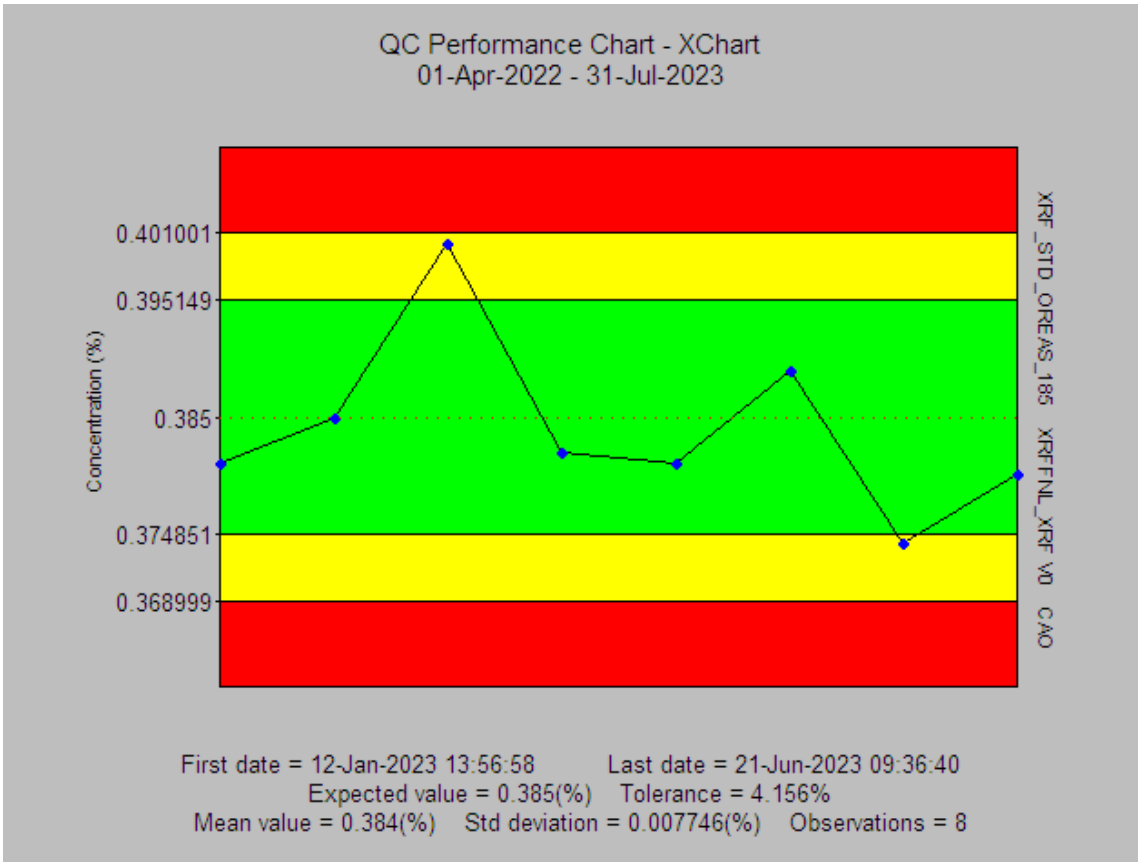
PT. GEOSERVICES - CIKARANG LABORATORY

XRF_STD_OREAS_185 - AL2O3

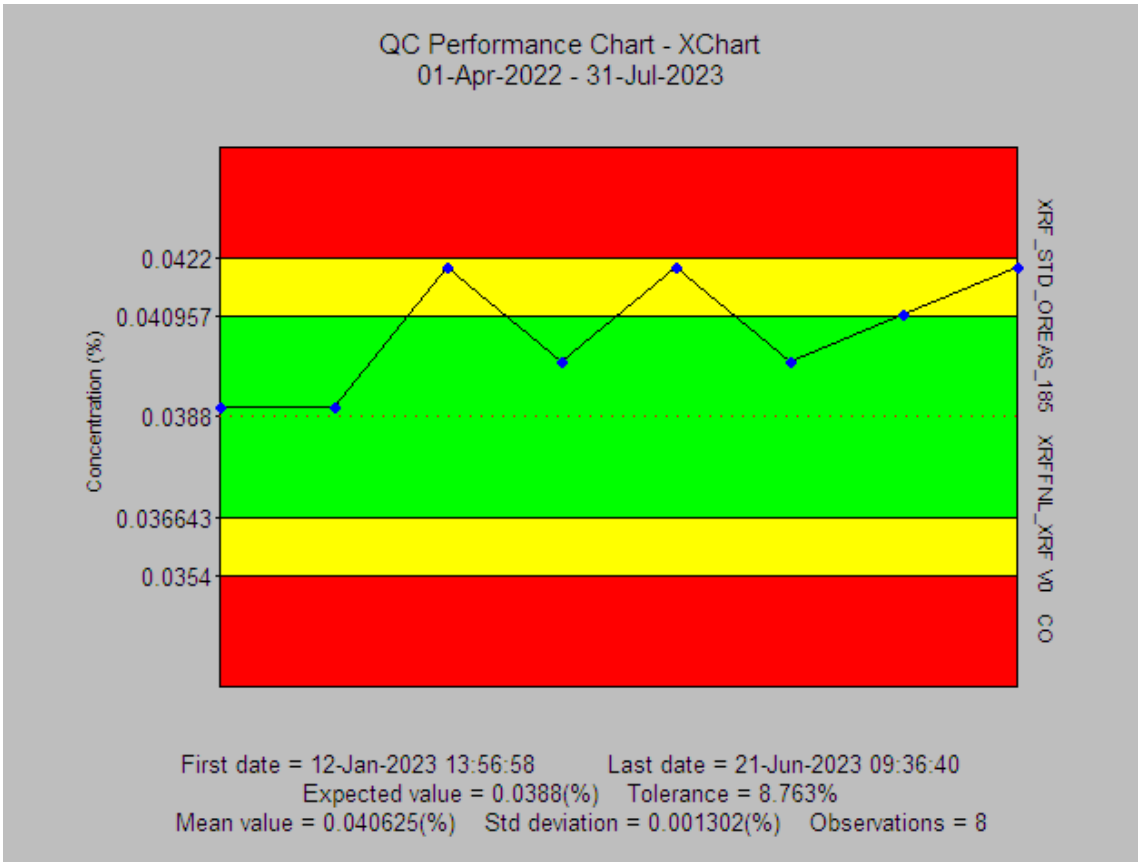


PT. GEOSERVICES - CIKARANG LABORATORY

XRF_STD_OREAS_185 - CAO

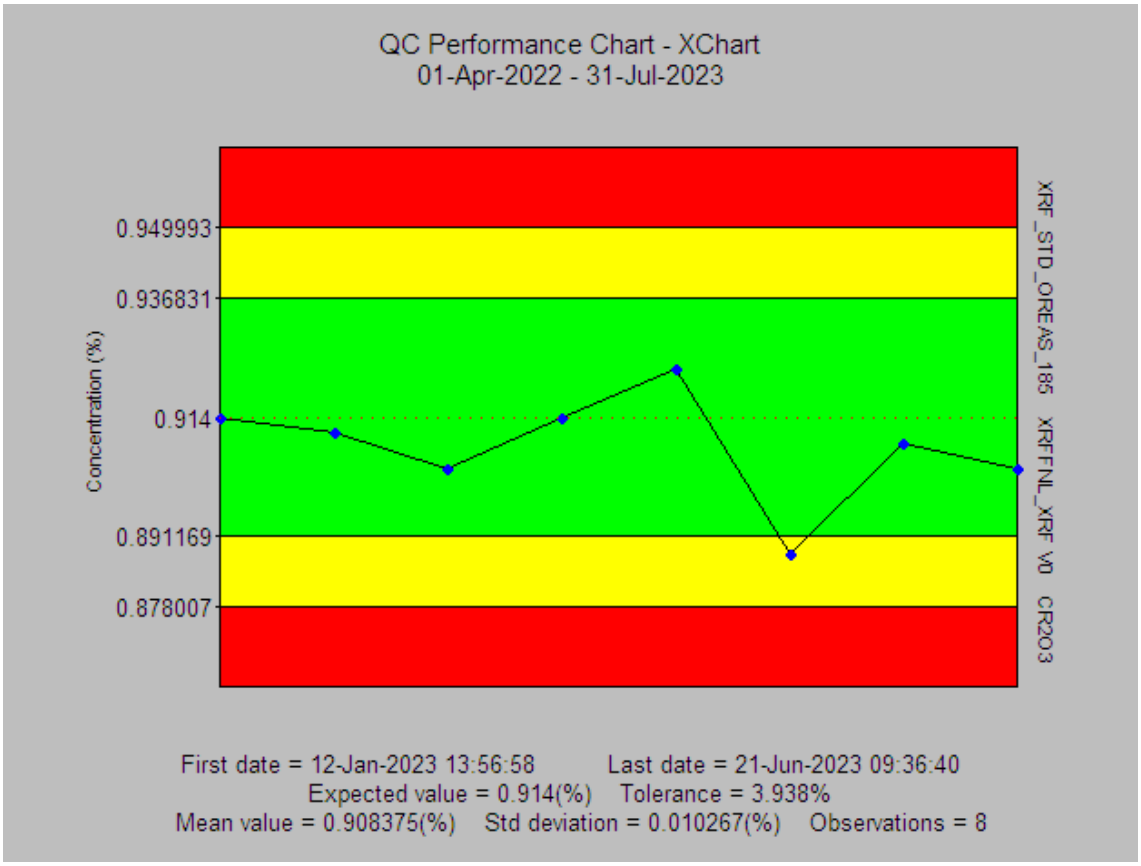


XRF_STD_OREAS_185 - CO



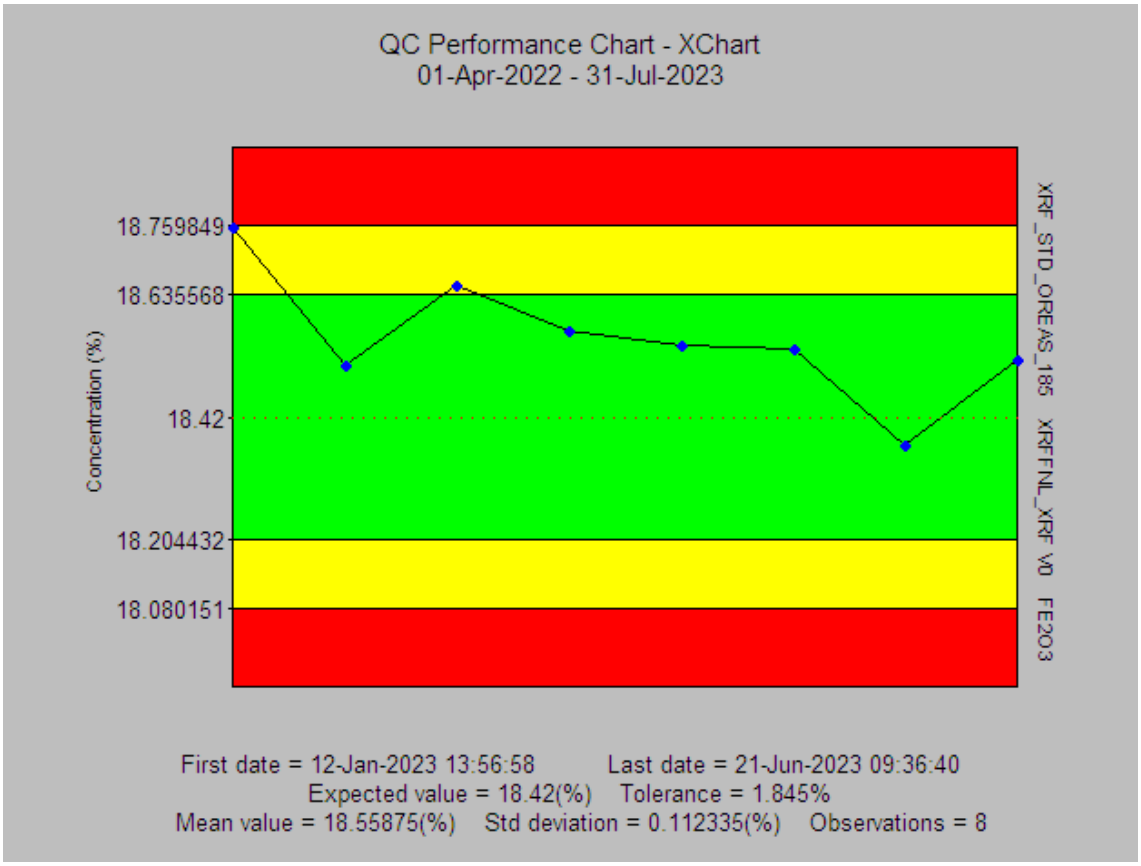
PT. GEOSERVICES - CIKARANG LABORATORY

XRF_STD_OREAS_185 - CR2O3



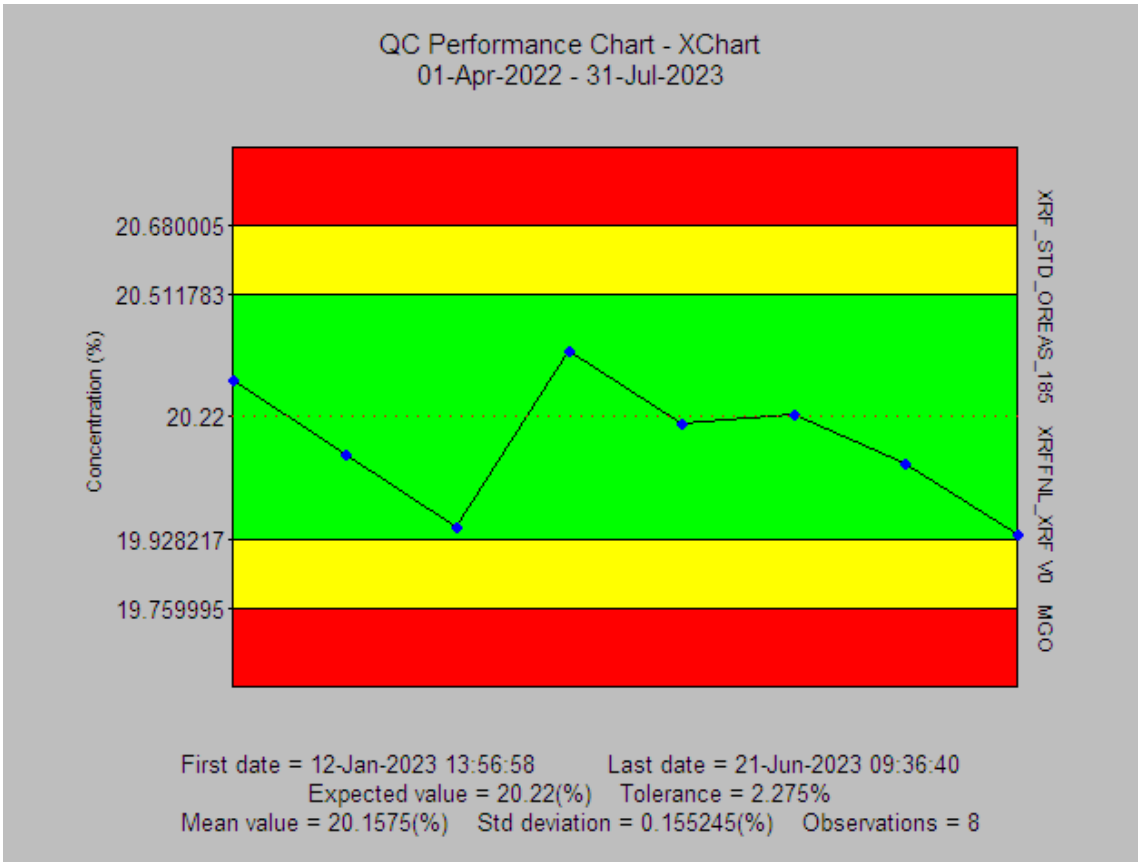
PT. GEOSERVICES - CIKARANG LABORATORY

XRF_STD_OREAS_185 - FE2O3



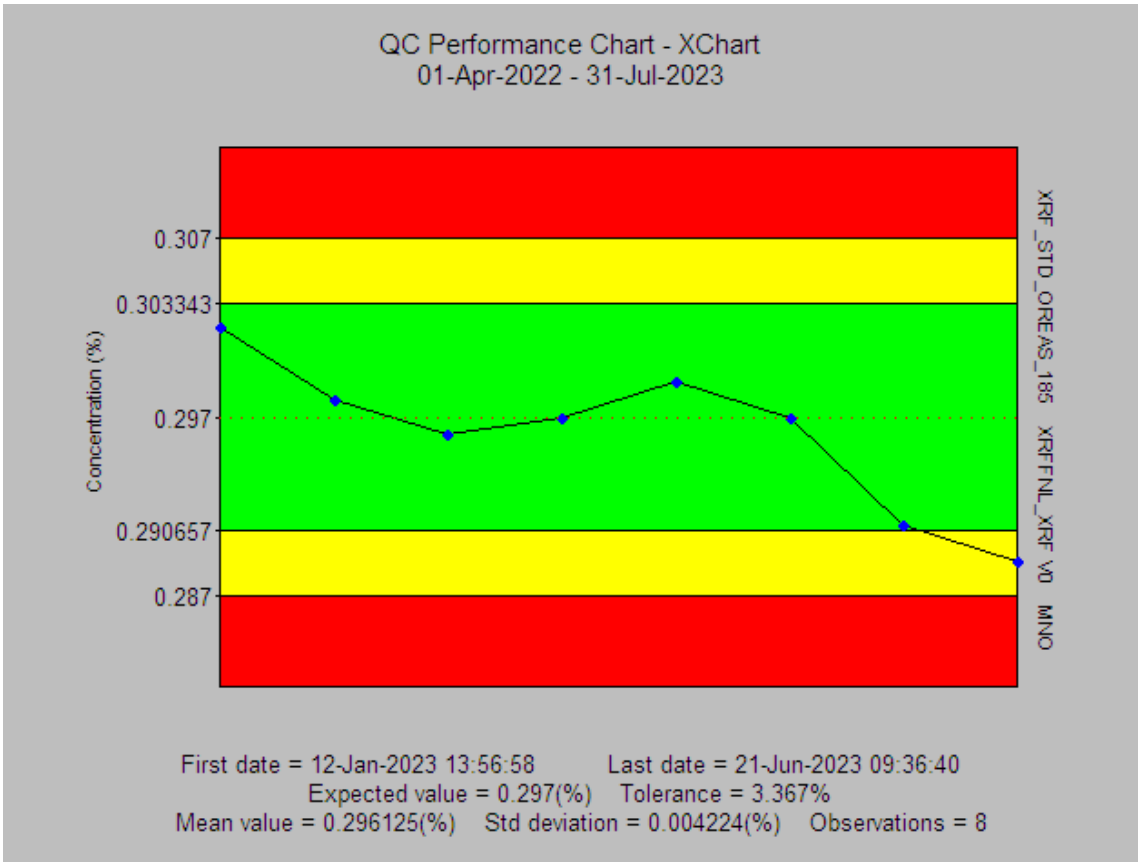
PT. GEOSERVICES - CIKARANG LABORATORY

XRF_STD_OREAS_185 - MGO



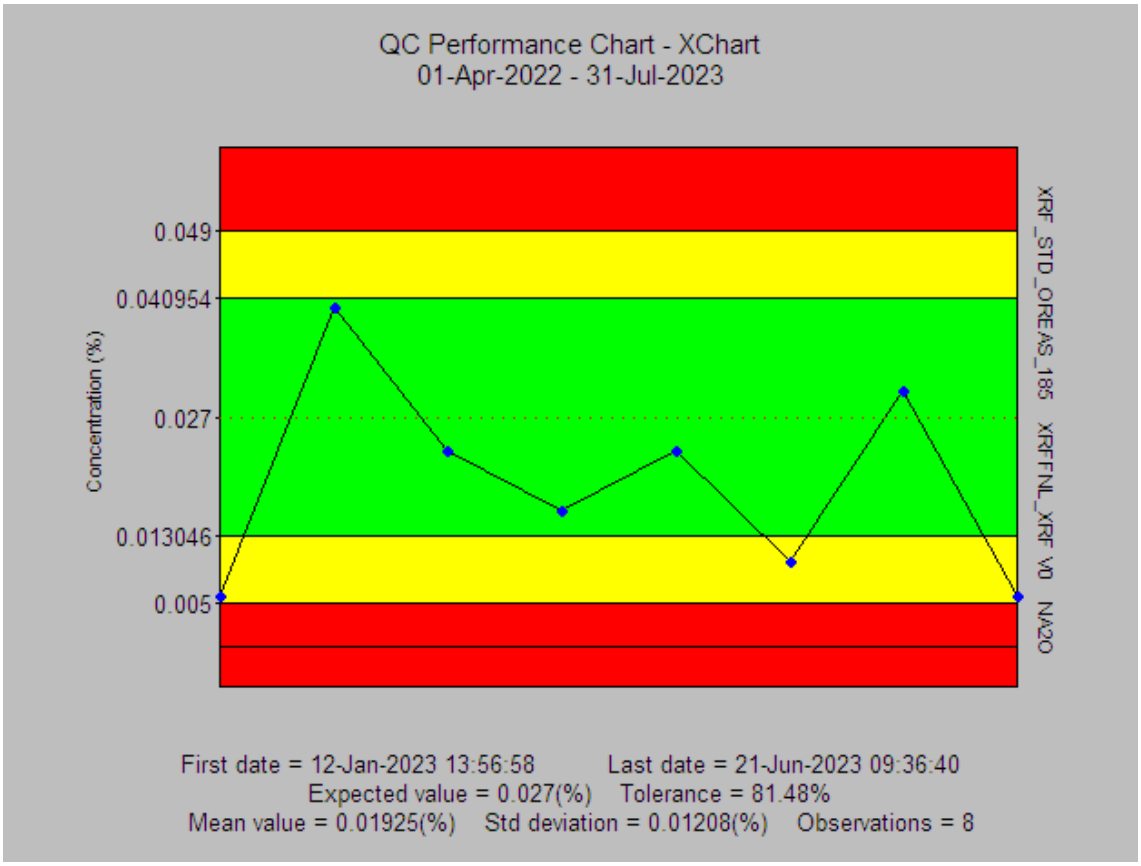
PT. GEOSERVICES - CIKARANG LABORATORY

XRF_STD_OREAS_185 - MNO



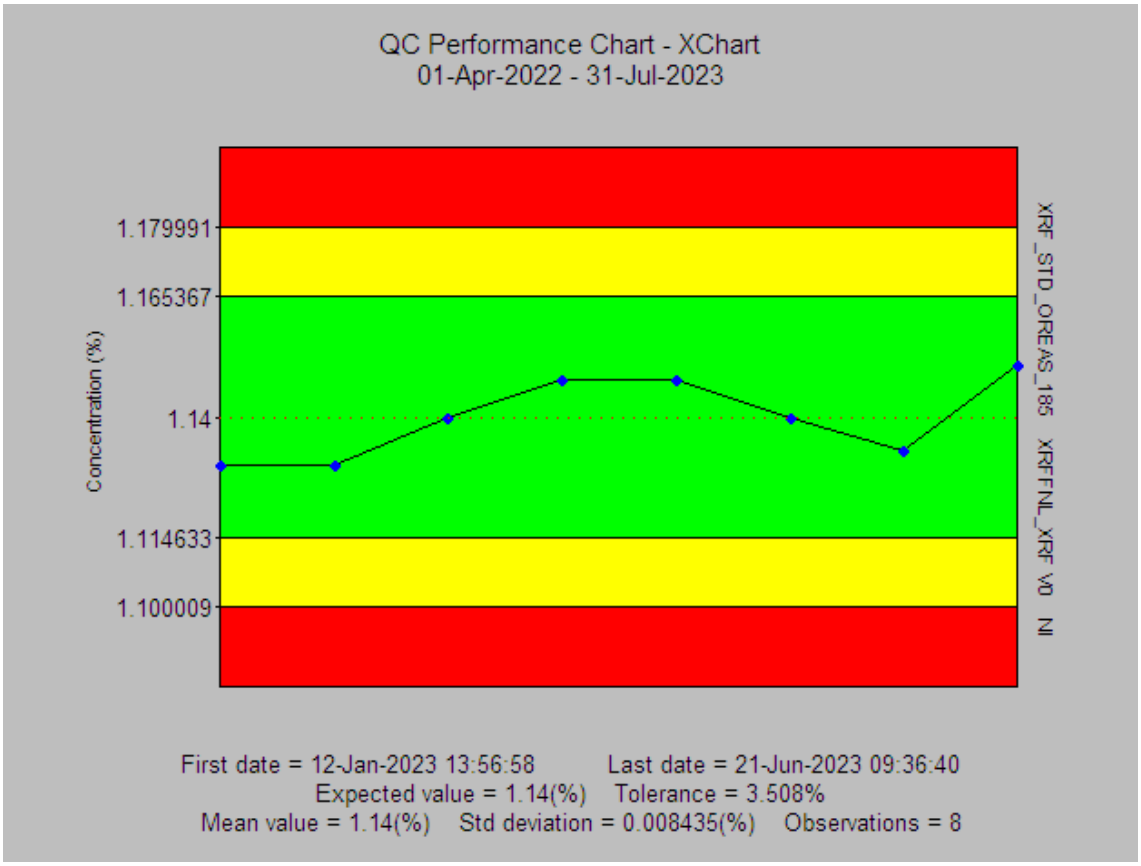
PT. GEOSERVICES - CIKARANG LABORATORY

XRF_STD_OREAS_185 - NA2O

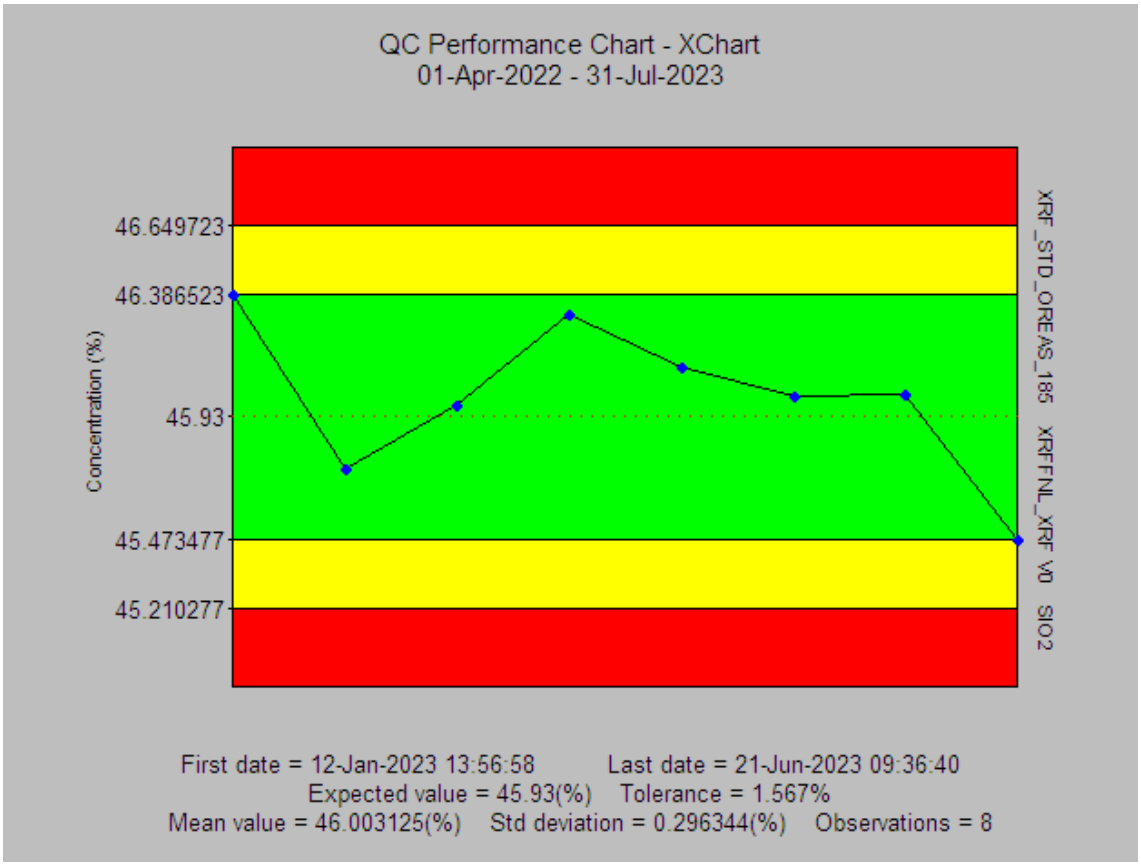


PT. GEOSERVICES - CIKARANG LABORATORY

XRF_STD_OREAS_185 - NI

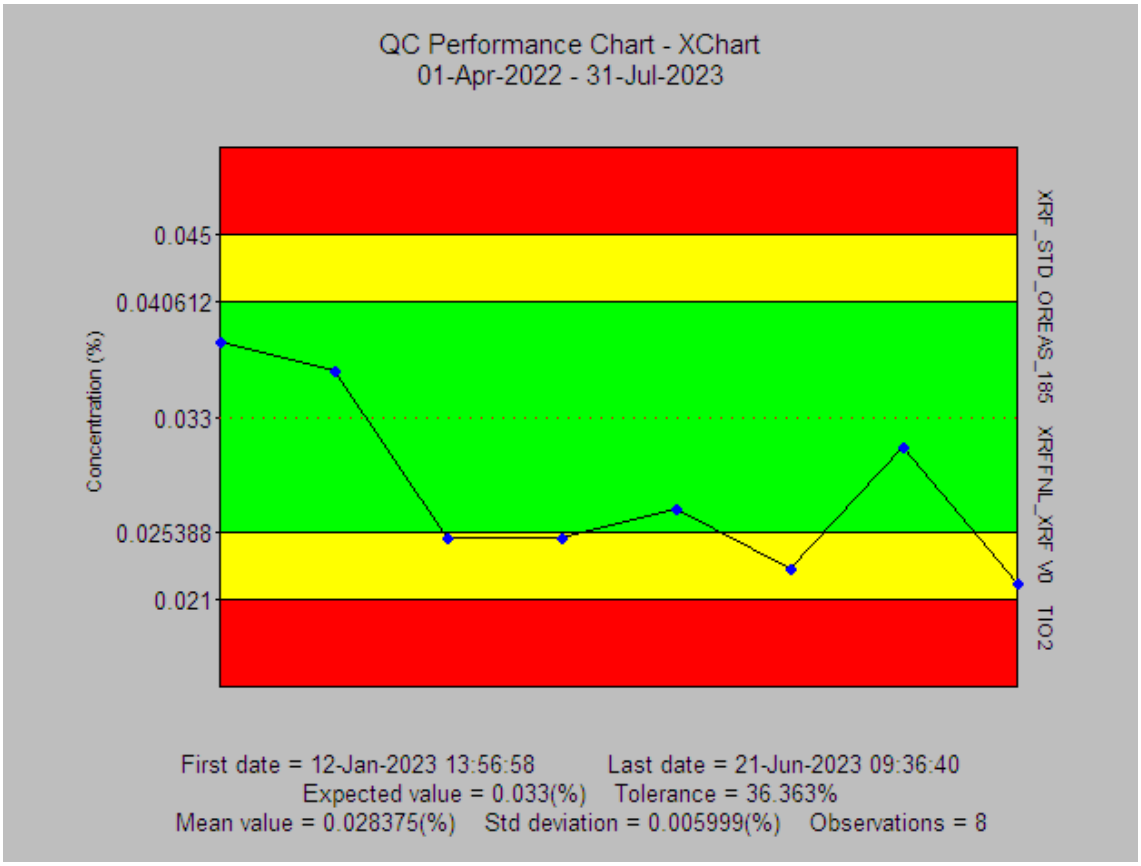


XRF_STD_OREAS_185 - SIO2



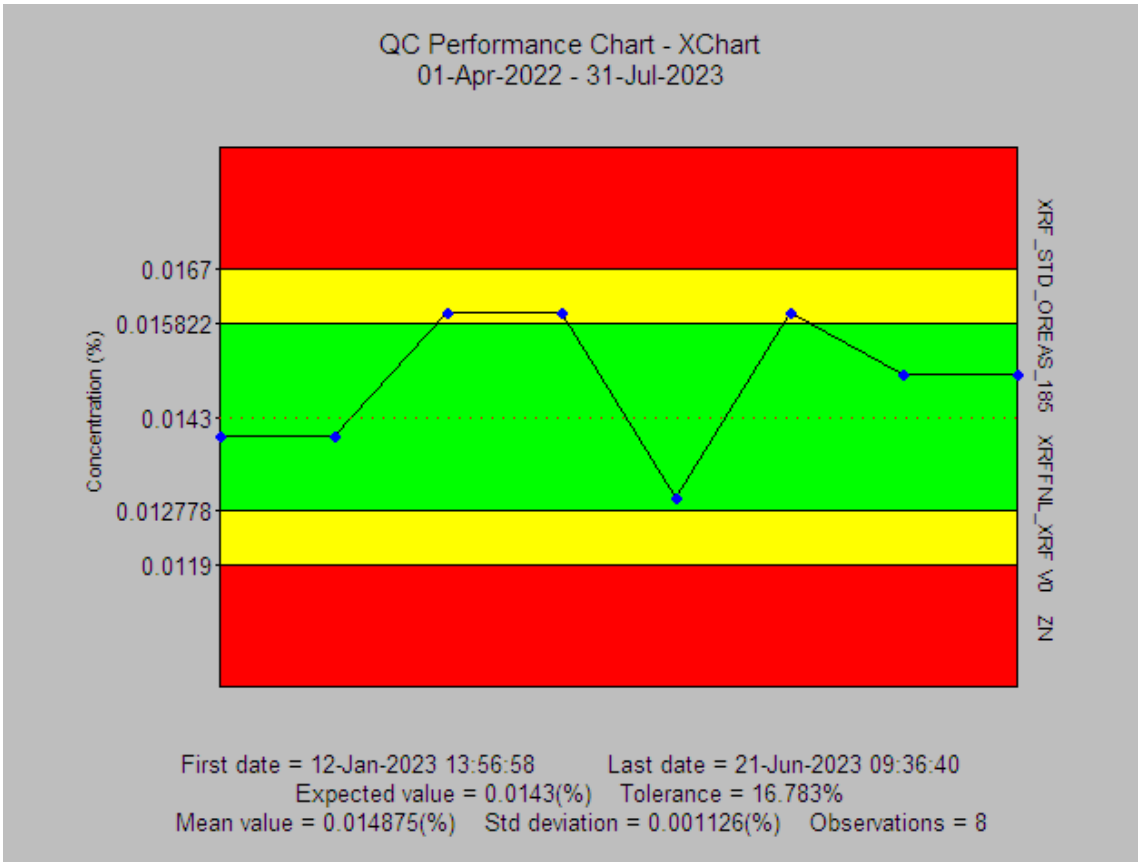
PT. GEOSERVICES - CIKARANG LABORATORY

XRF_STD_OREAS_185 - TIO2



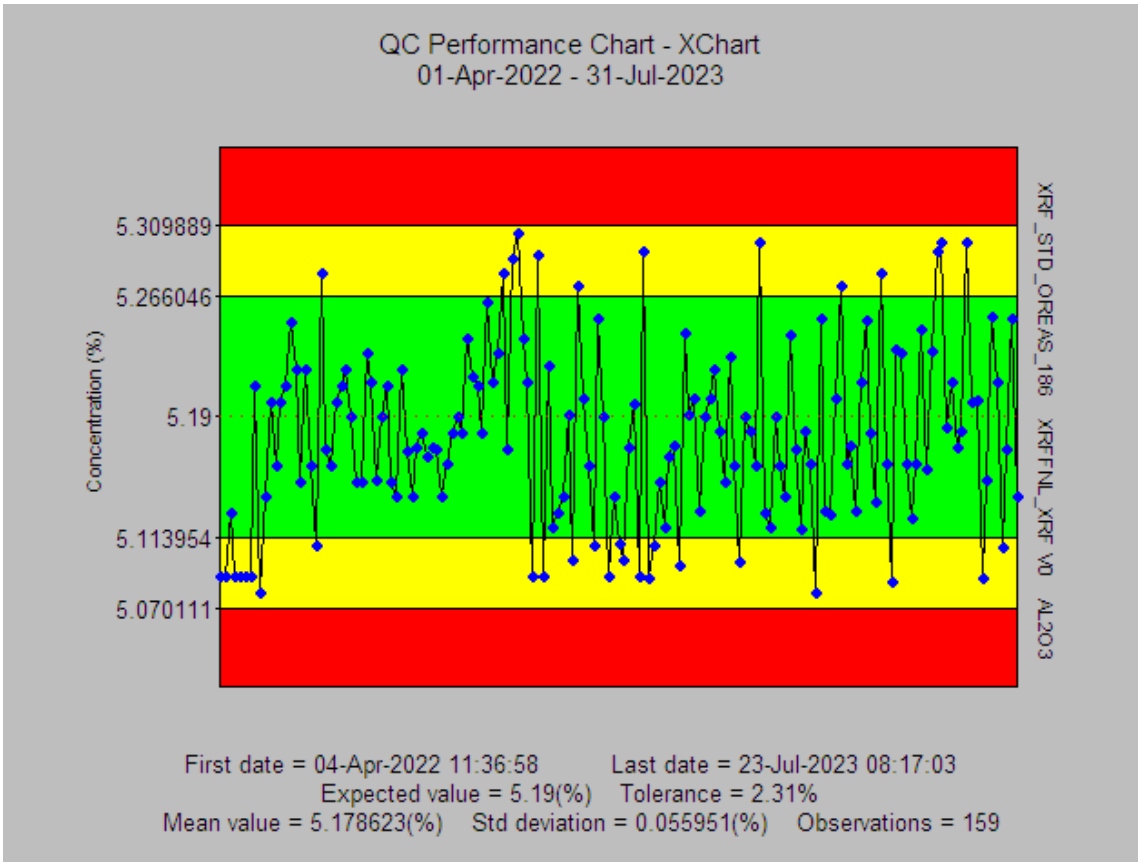
PT. GEOSERVICES - CIKARANG LABORATORY

XRF_STD_OREAS_185 - ZN



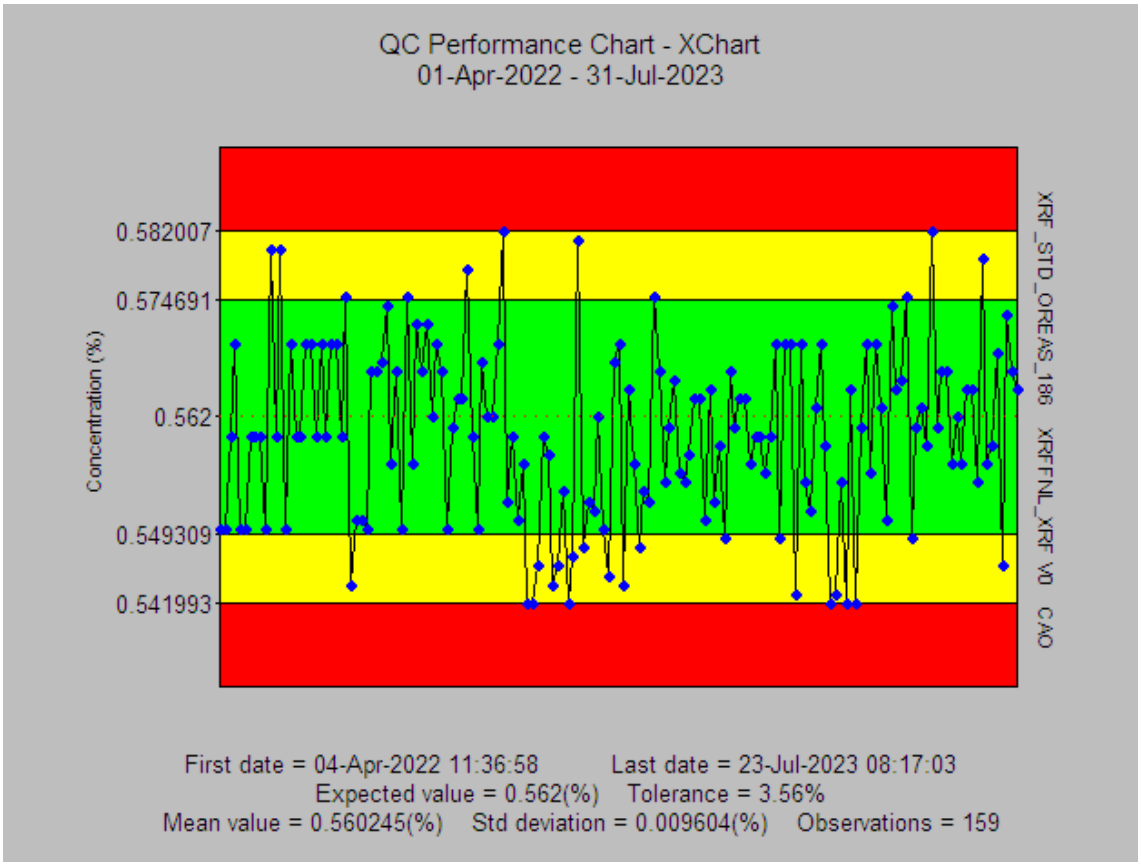
PT. GEOSERVICES - CIKARANG LABORATORY

XRF_STD_OREAS_186 - AL2O3

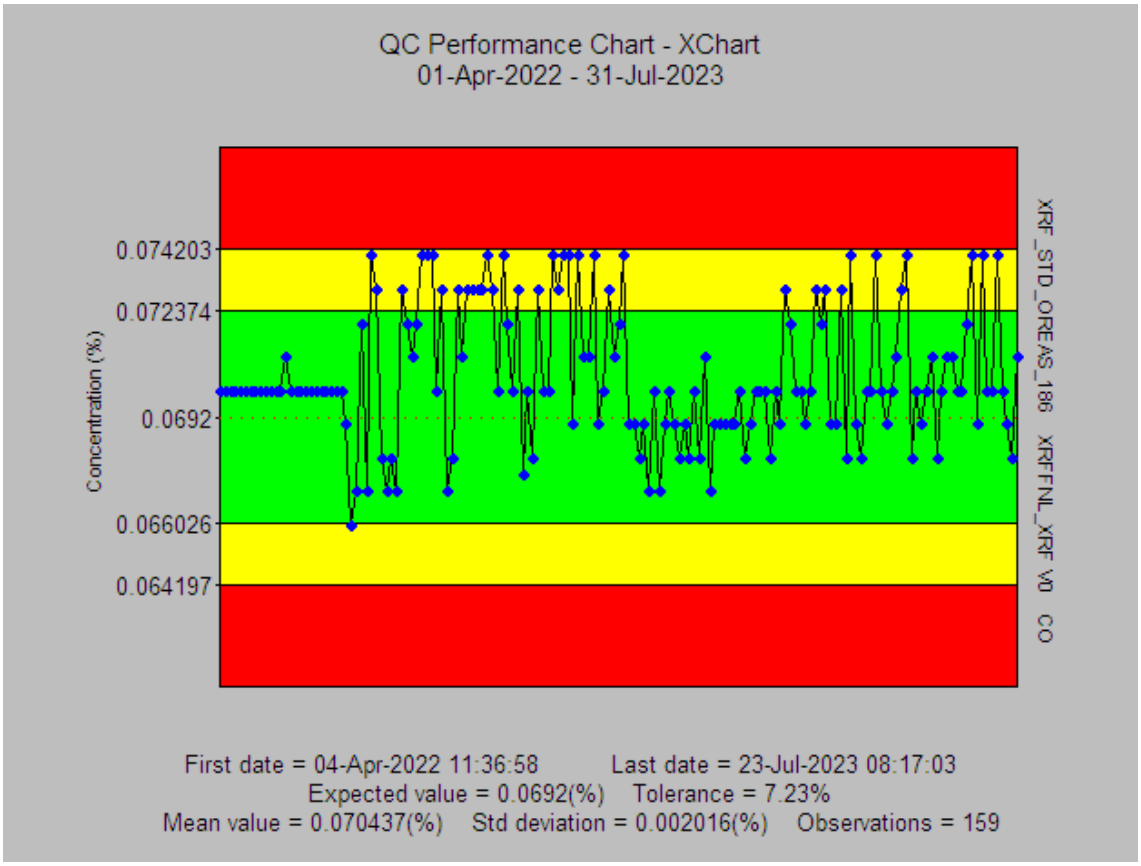


PT. GEOSERVICES - CIKARANG LABORATORY

XRF_STD_OREAS_186 - CAO

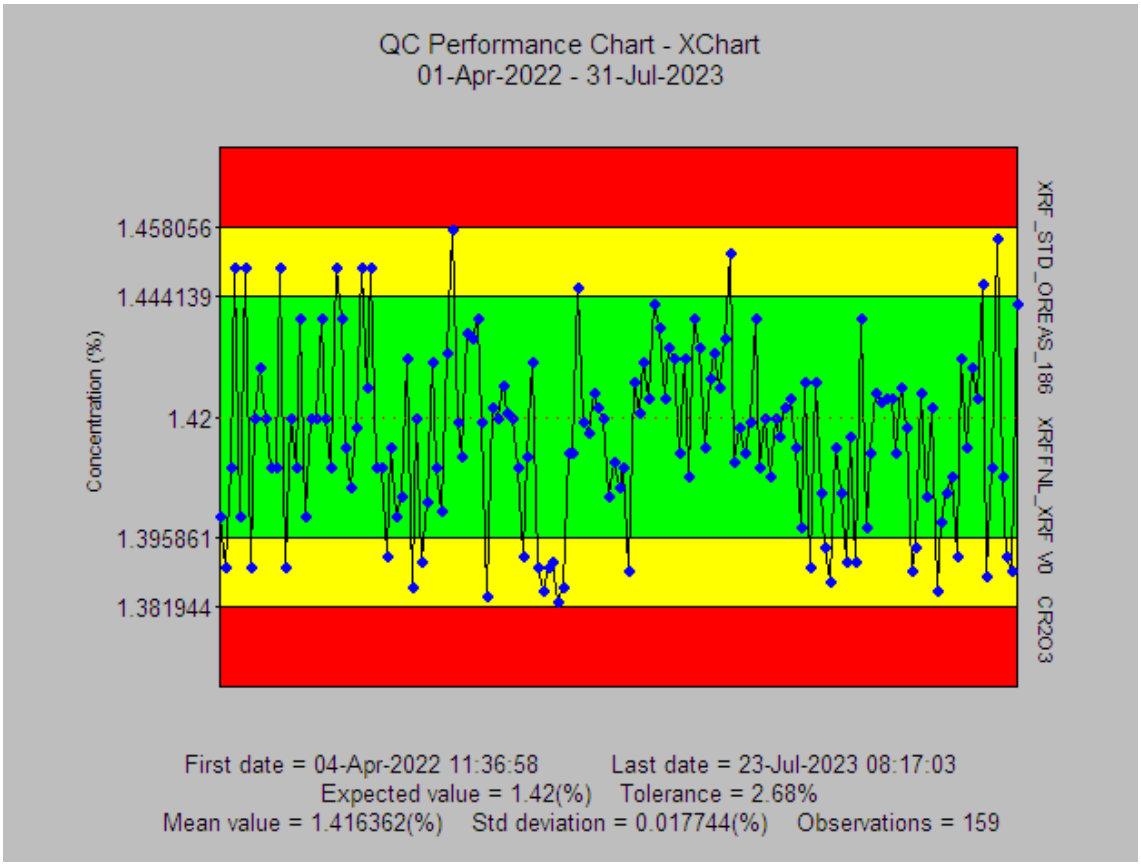


XRF_STD_OREAS_186 - CO



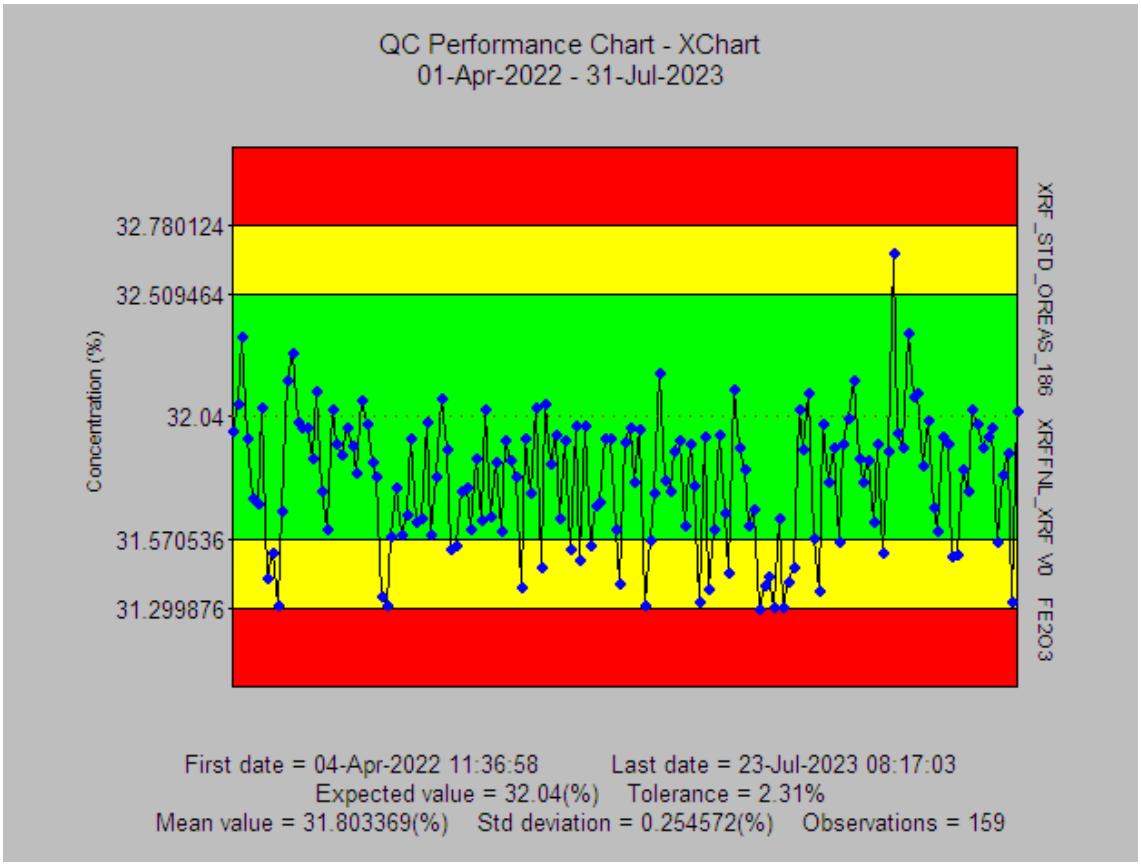
PT. GEOSERVICES - CIKARANG LABORATORY

XRF_STD_OREAS_186 - CR2O3

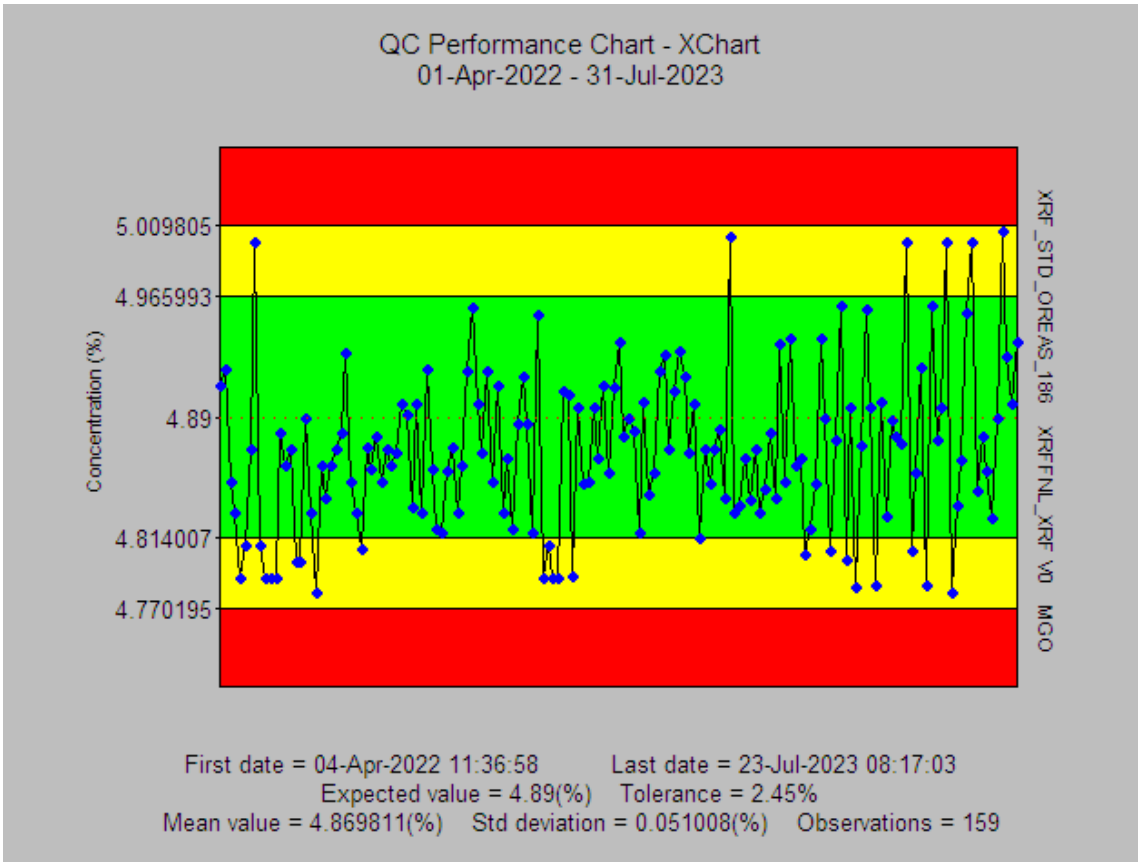


PT. GEOSERVICES - CIKARANG LABORATORY

XRF_STD_OREAS_186 - FE2O3

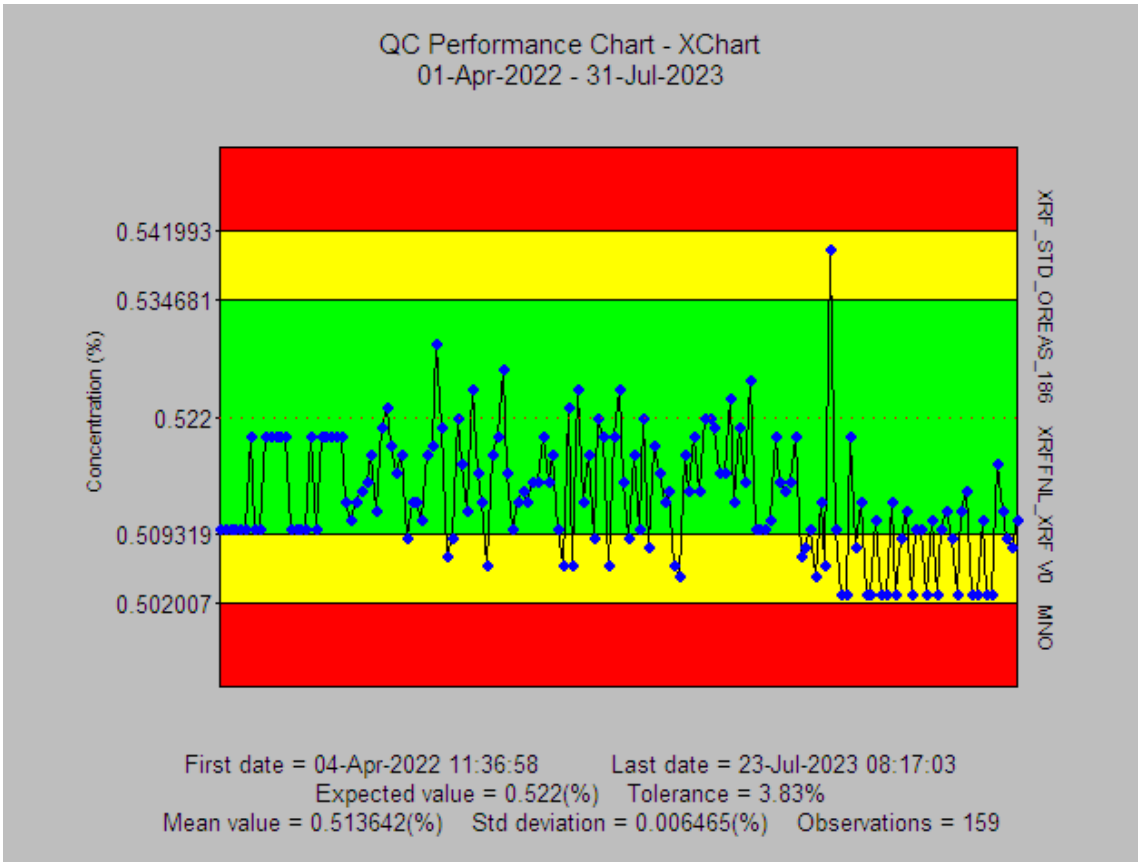


XRF_STD_OREAS_186 - MGO

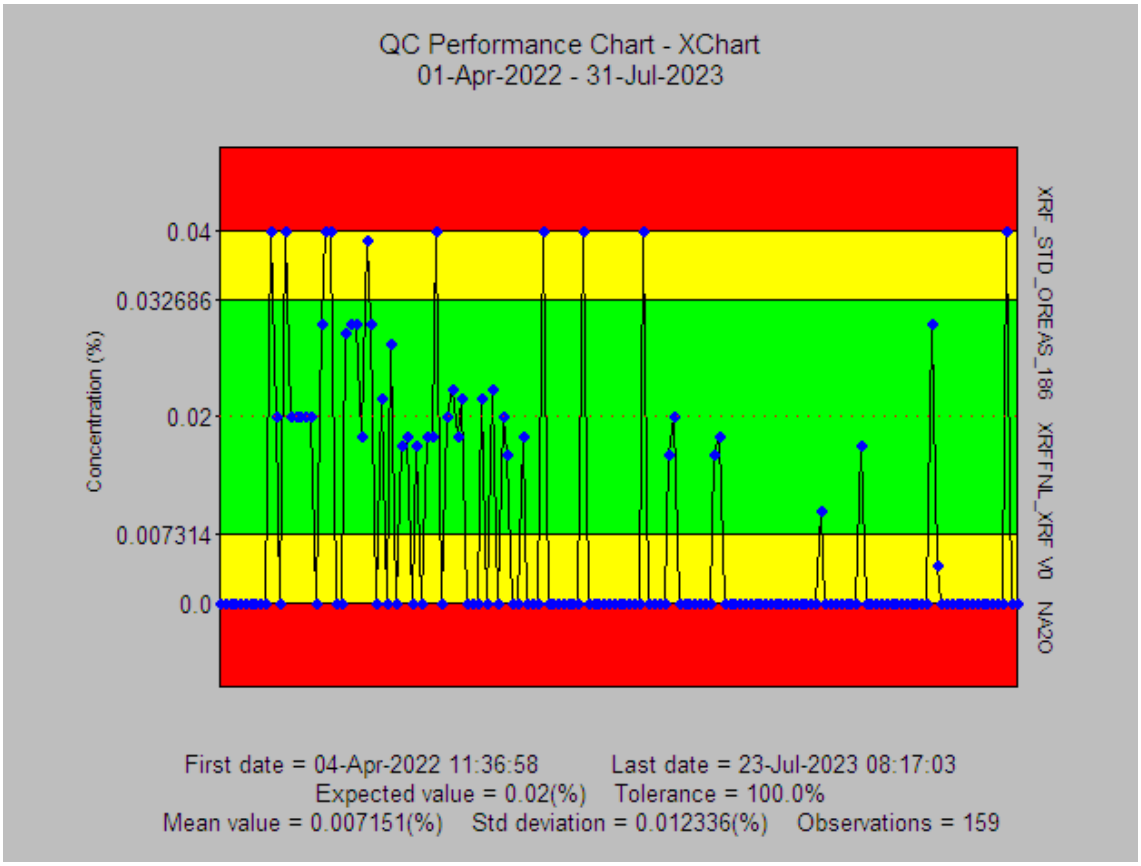


PT. GEOSERVICES - CIKARANG LABORATORY

XRF_STD_OREAS_186 - MNO

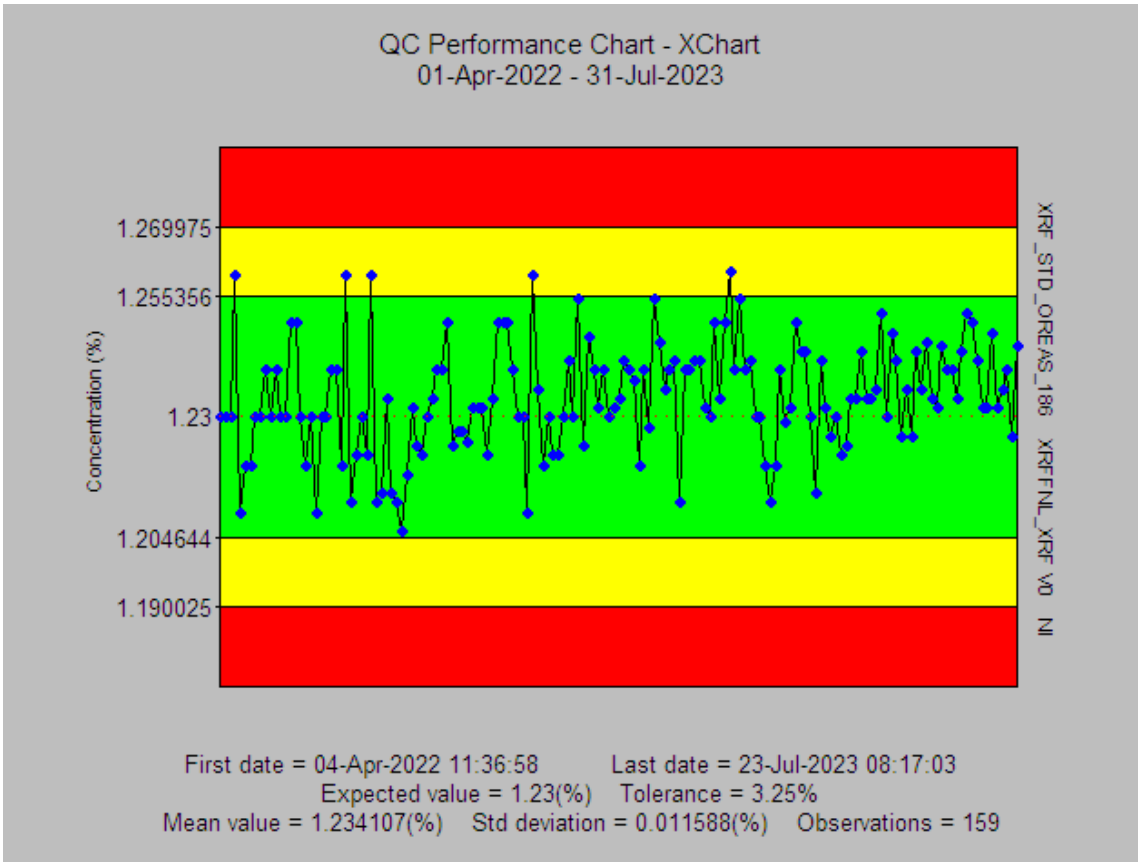


XRF_STD_OREAS_186 - NA2O



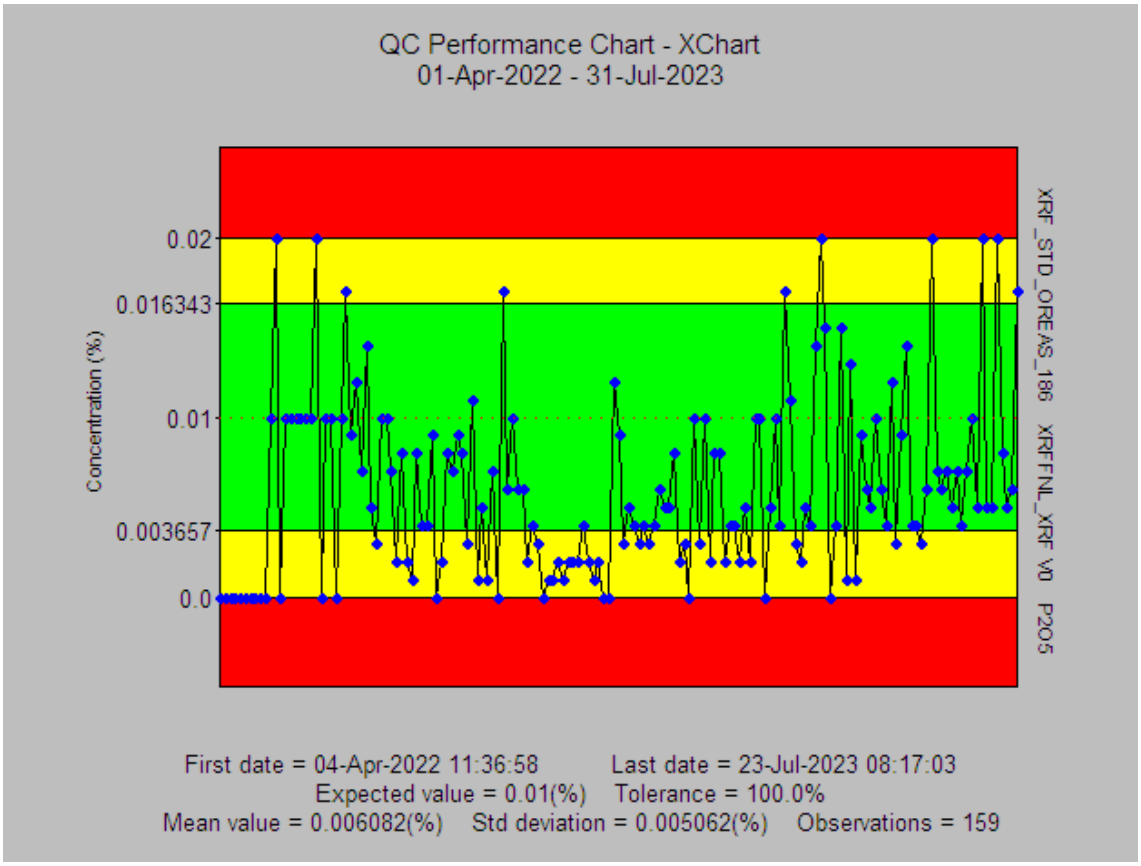
PT. GEOSERVICES - CIKARANG LABORATORY

XRF_STD_OREAS_186 - NI

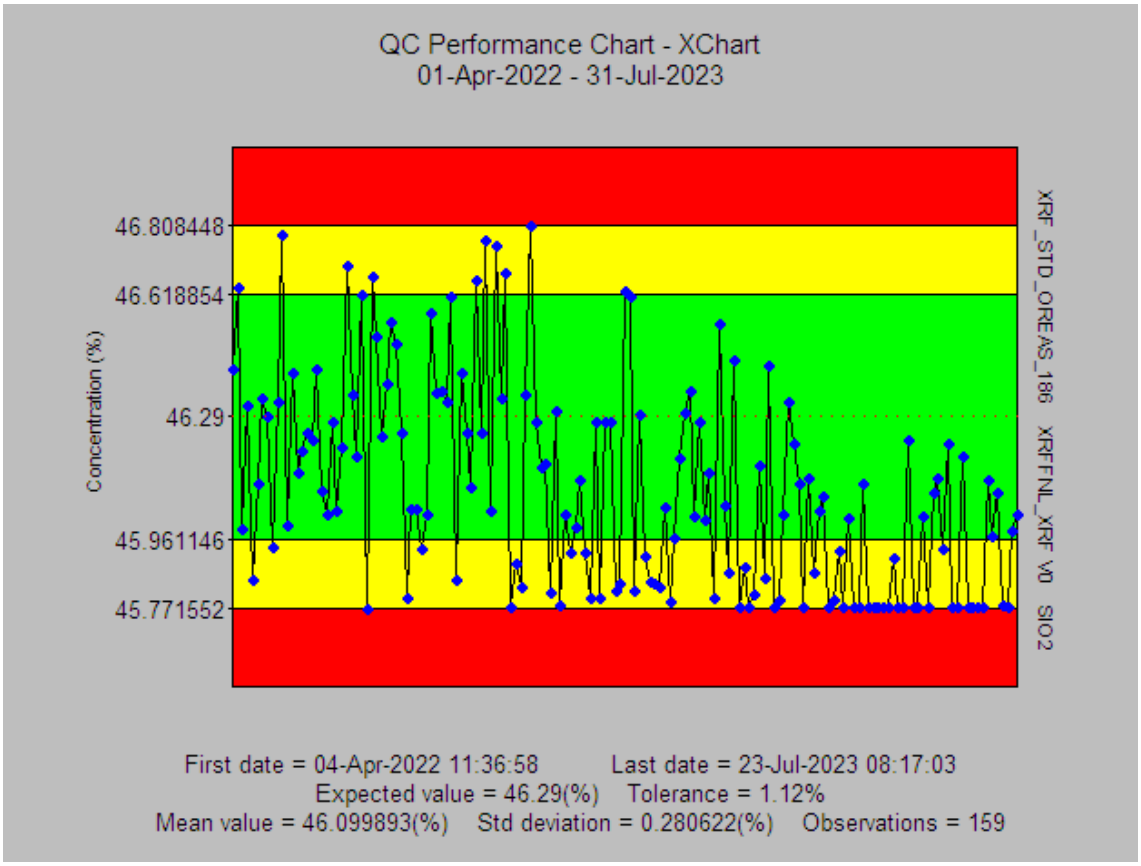


PT. GEOSERVICES - CIKARANG LABORATORY

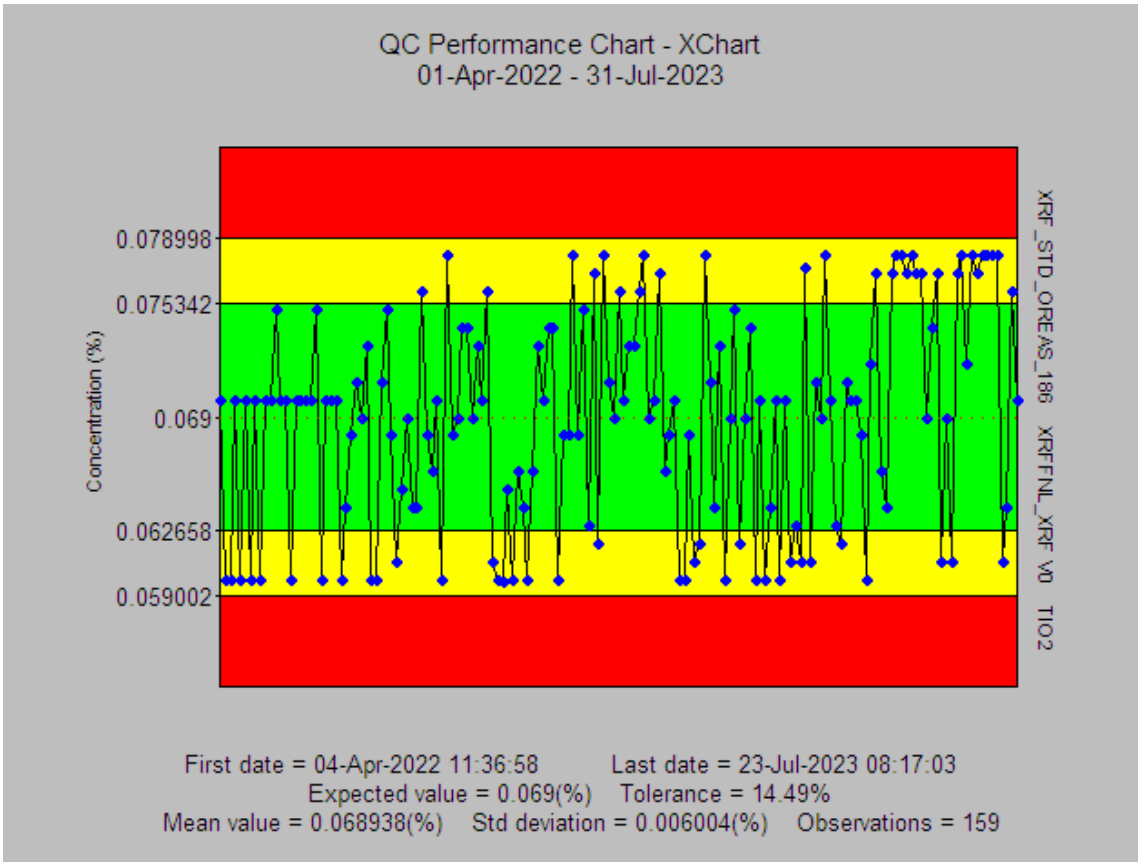
XRF_STD_OREAS_186 - P2O5



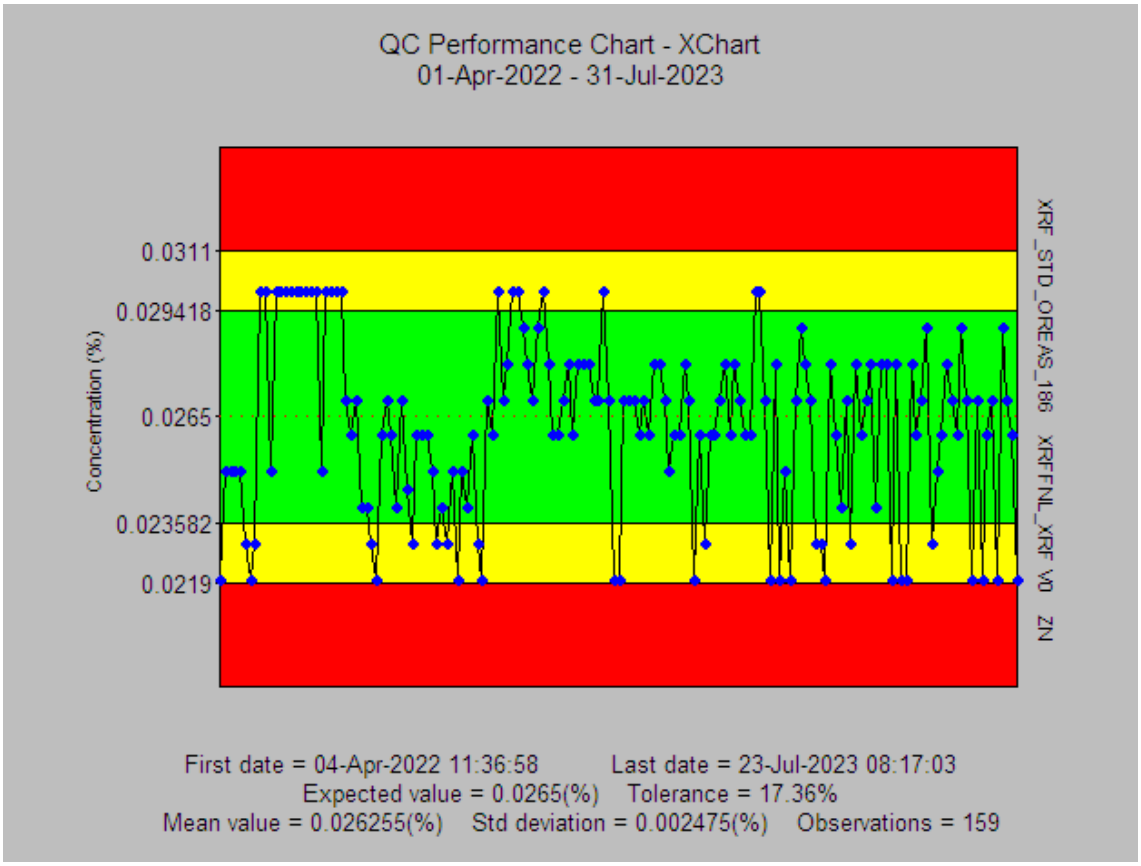
XRF_STD_OREAS_186 - SIO2



XRF_STD_OREAS_186 - TIO2

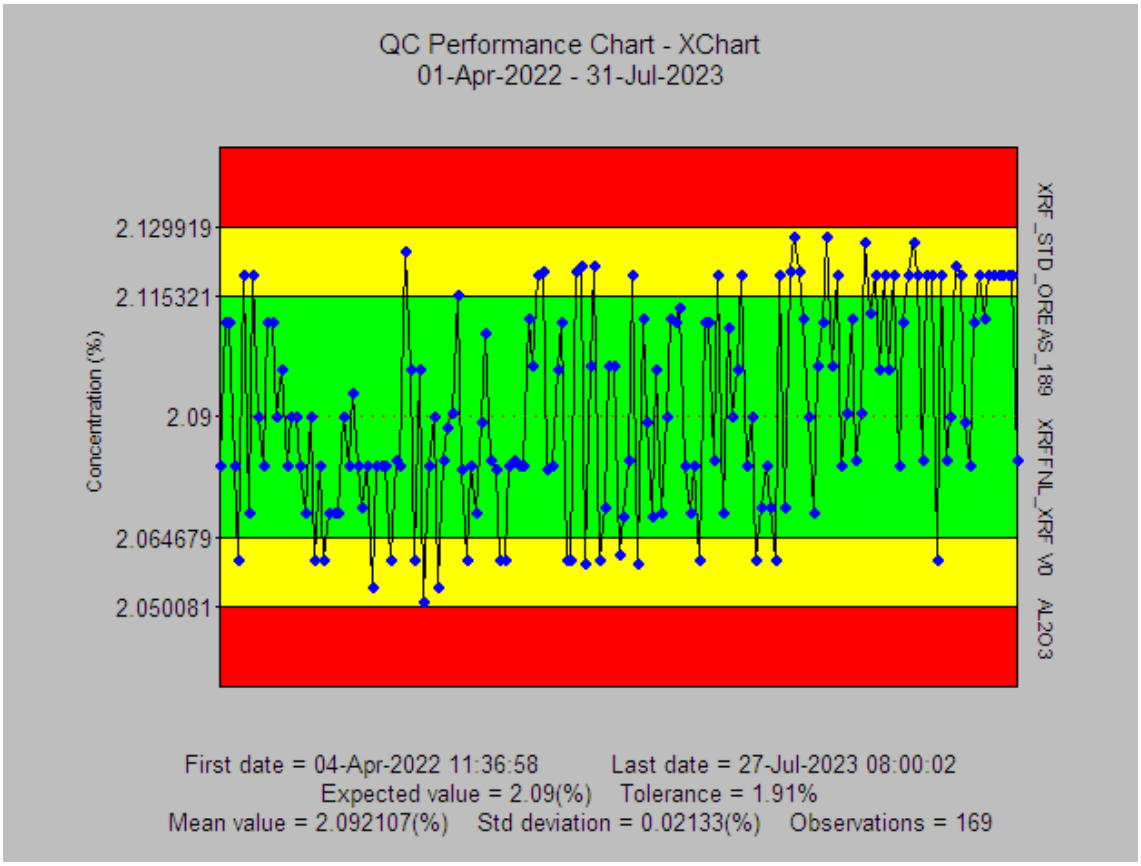


XRF_STD_OREAS_186 - ZN

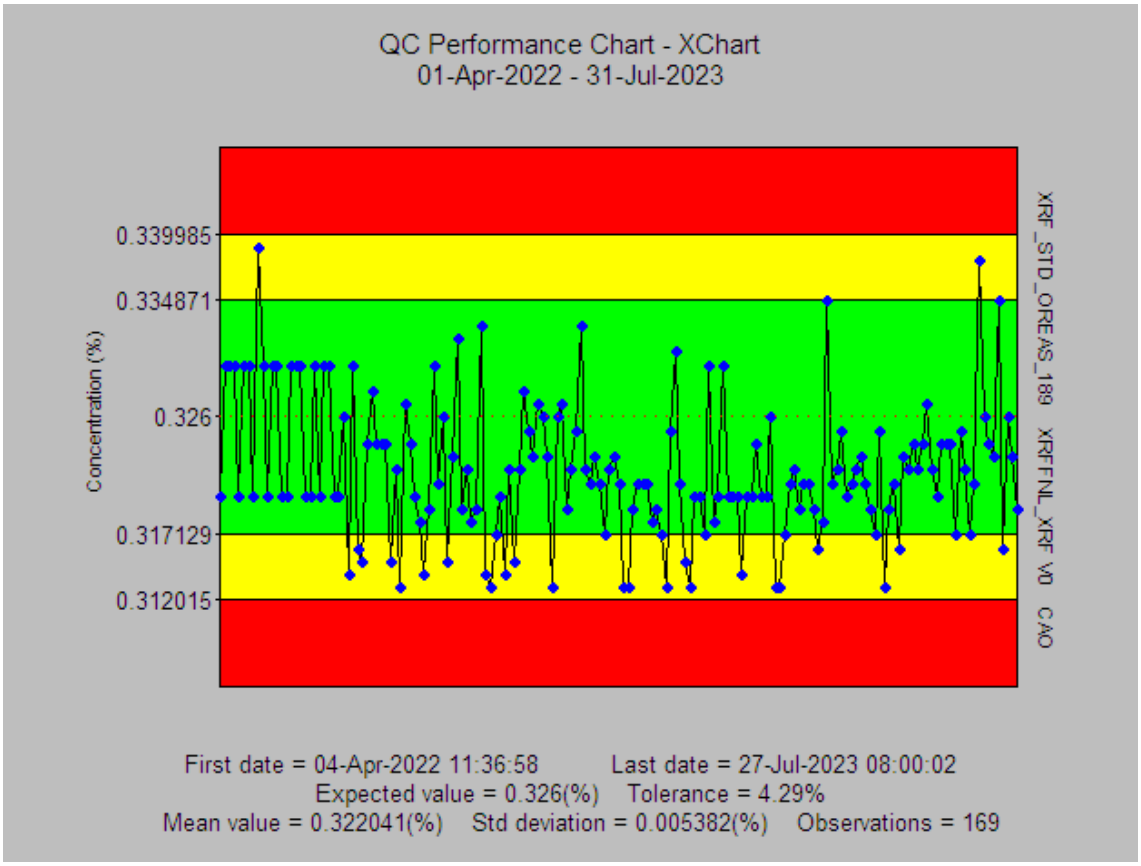


PT. GEOSERVICES - CIKARANG LABORATORY

XRF_STD_OREAS_189 - AL2O3

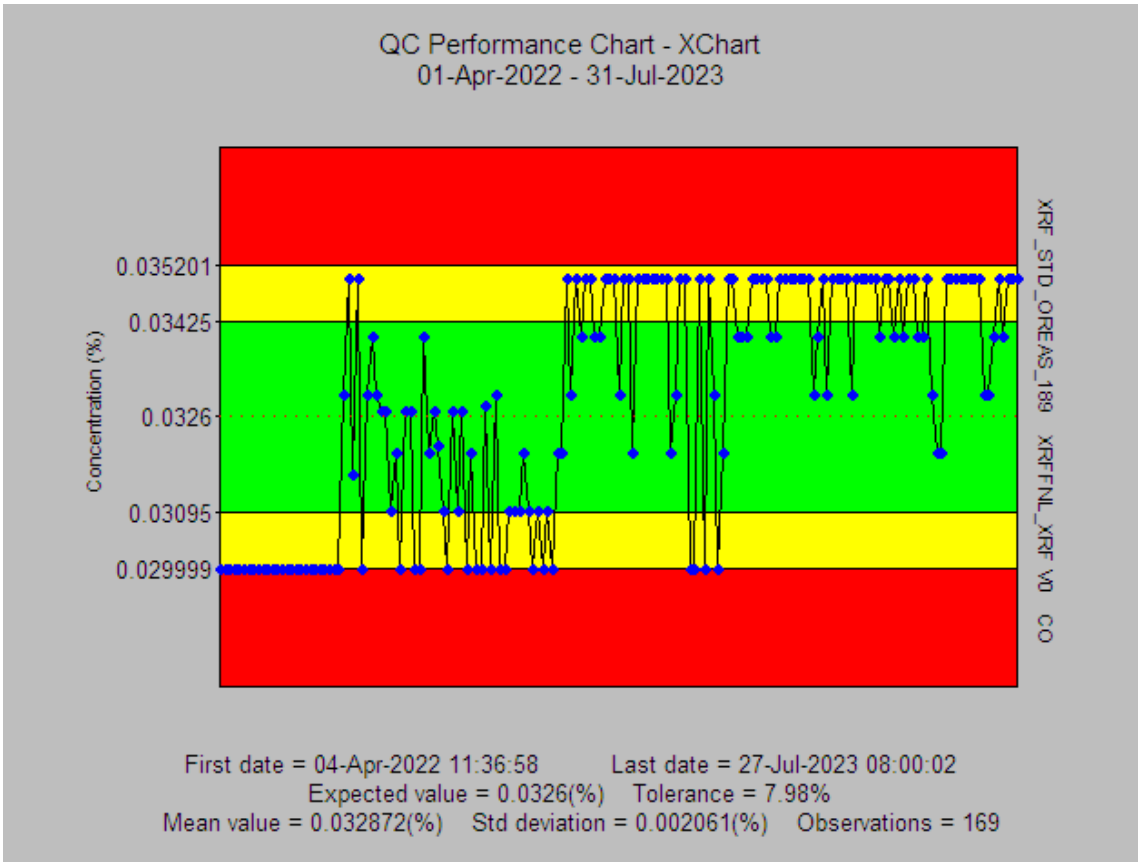


XRF_STD_OREAS_189 - CAO

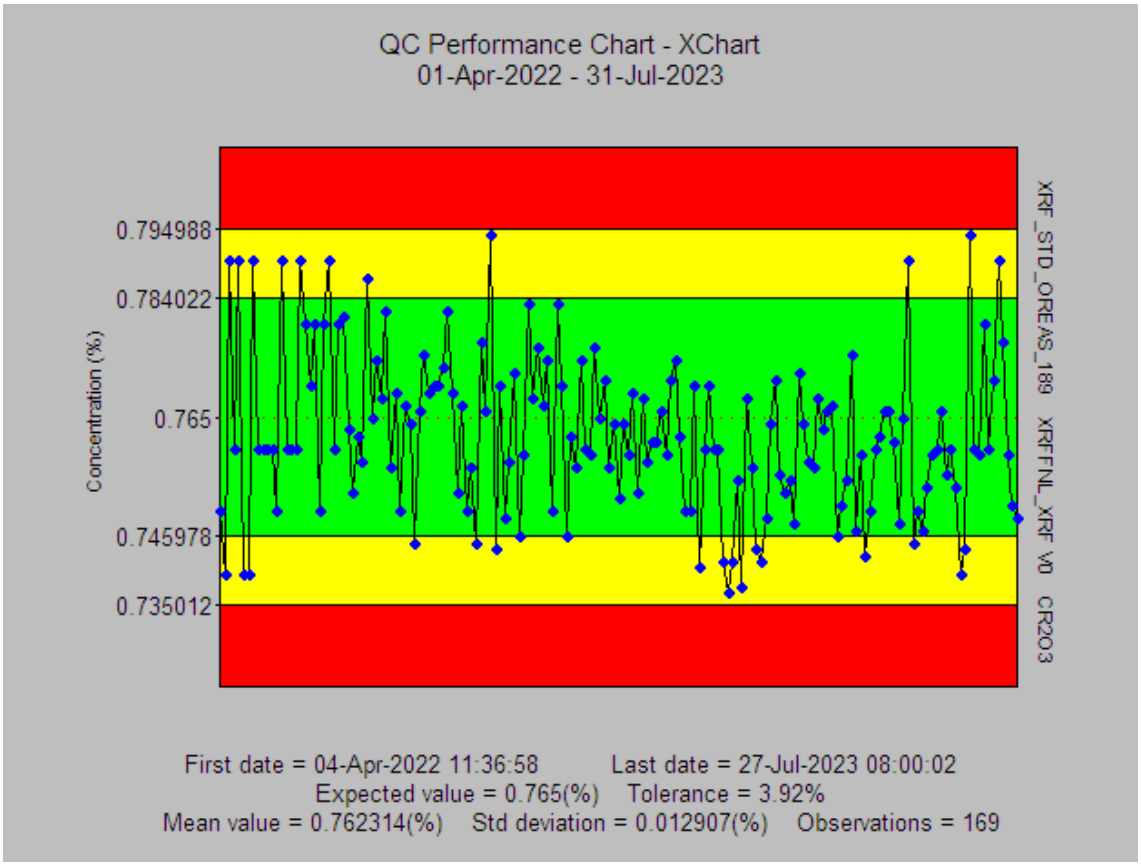


PT. GEOSERVICES - CIKARANG LABORATORY

XRF_STD_OREAS_189 - CO

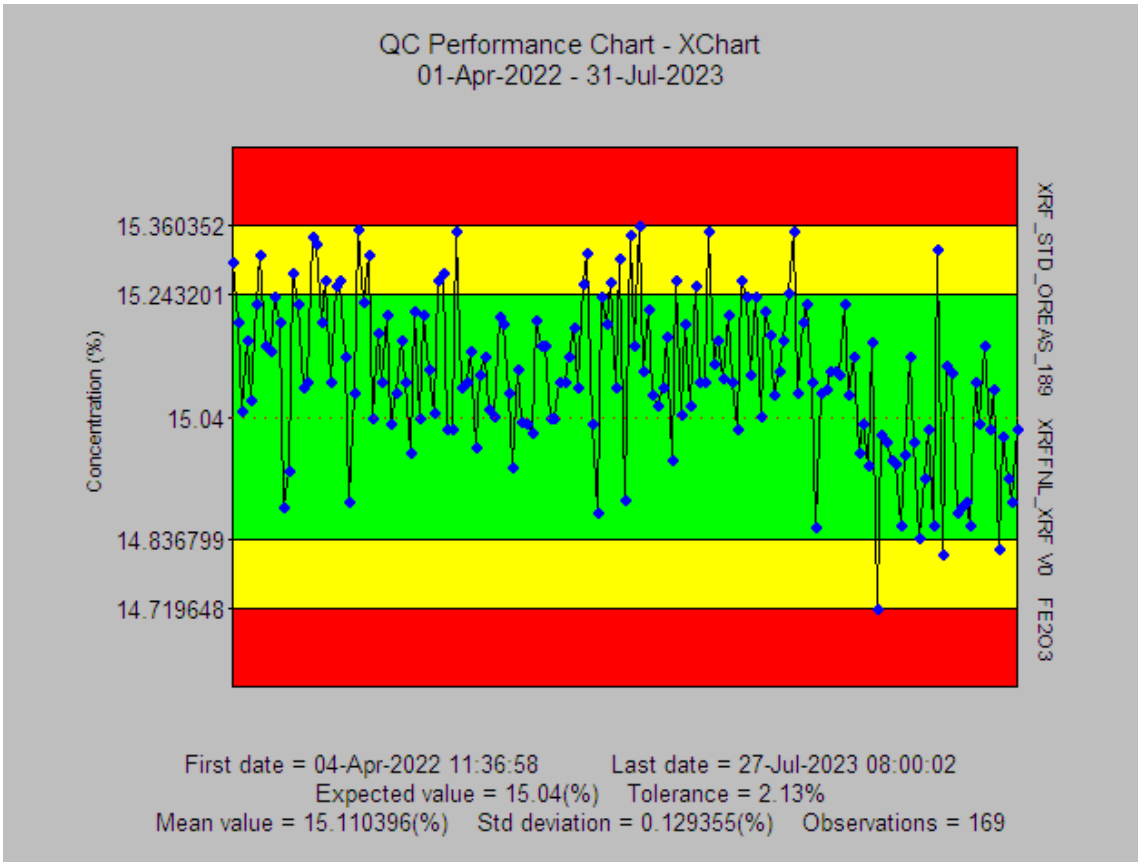


XRF_STD_OREAS_189 - CR2O3



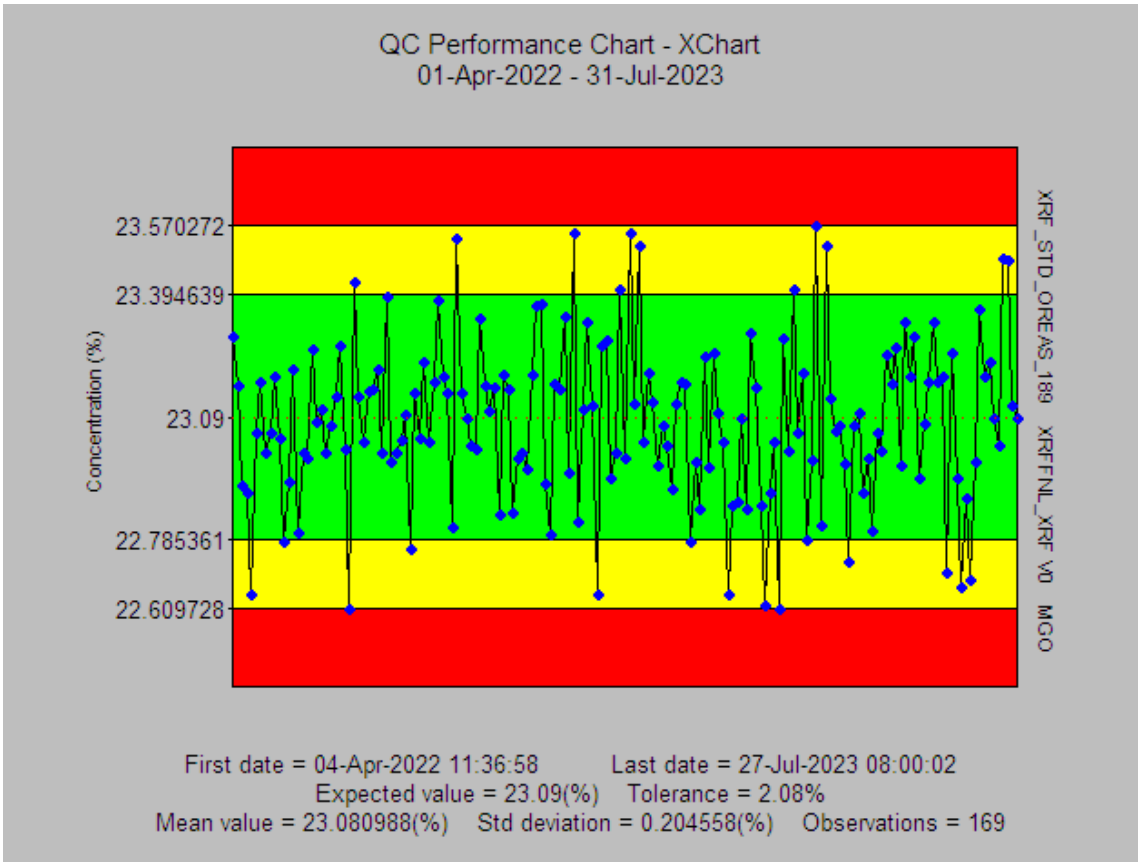
PT. GEOSERVICES - CIKARANG LABORATORY

XRF_STD_OREAS_189 - FE2O3



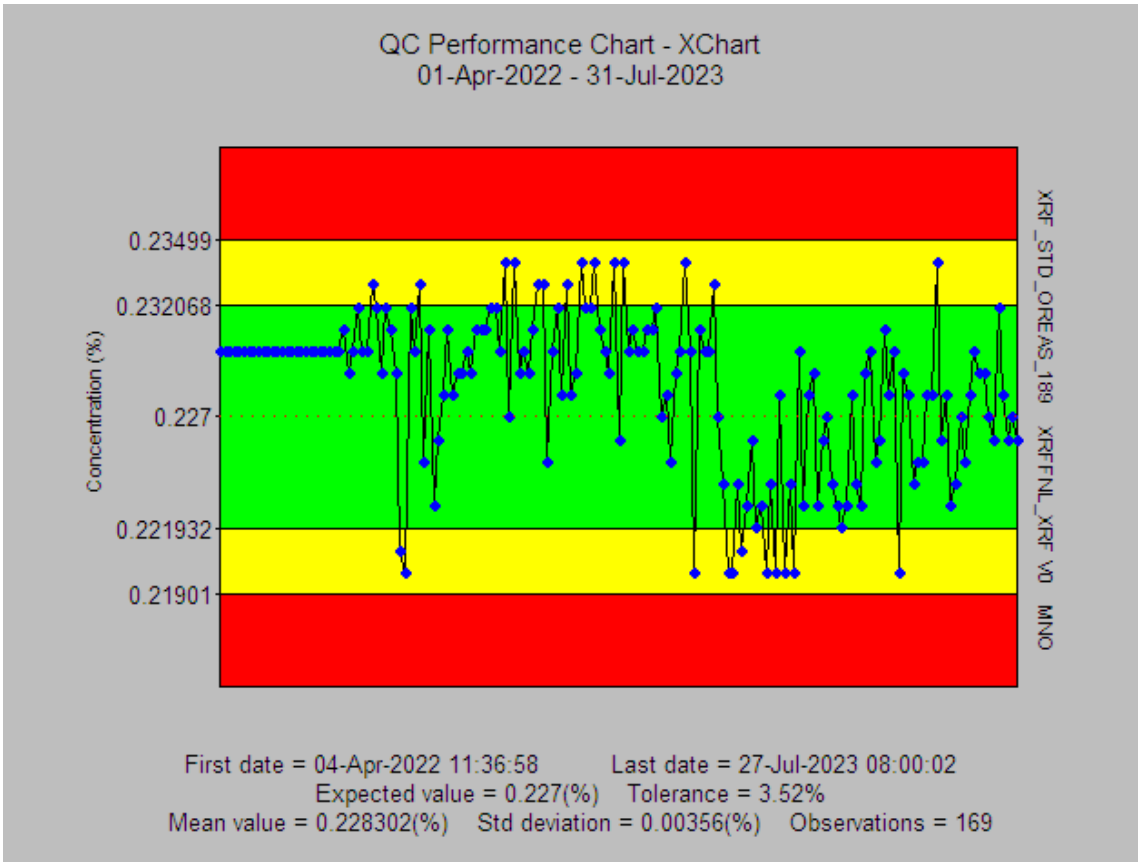
PT. GEOSERVICES - CIKARANG LABORATORY

XRF_STD_OREAS_189 - MGO

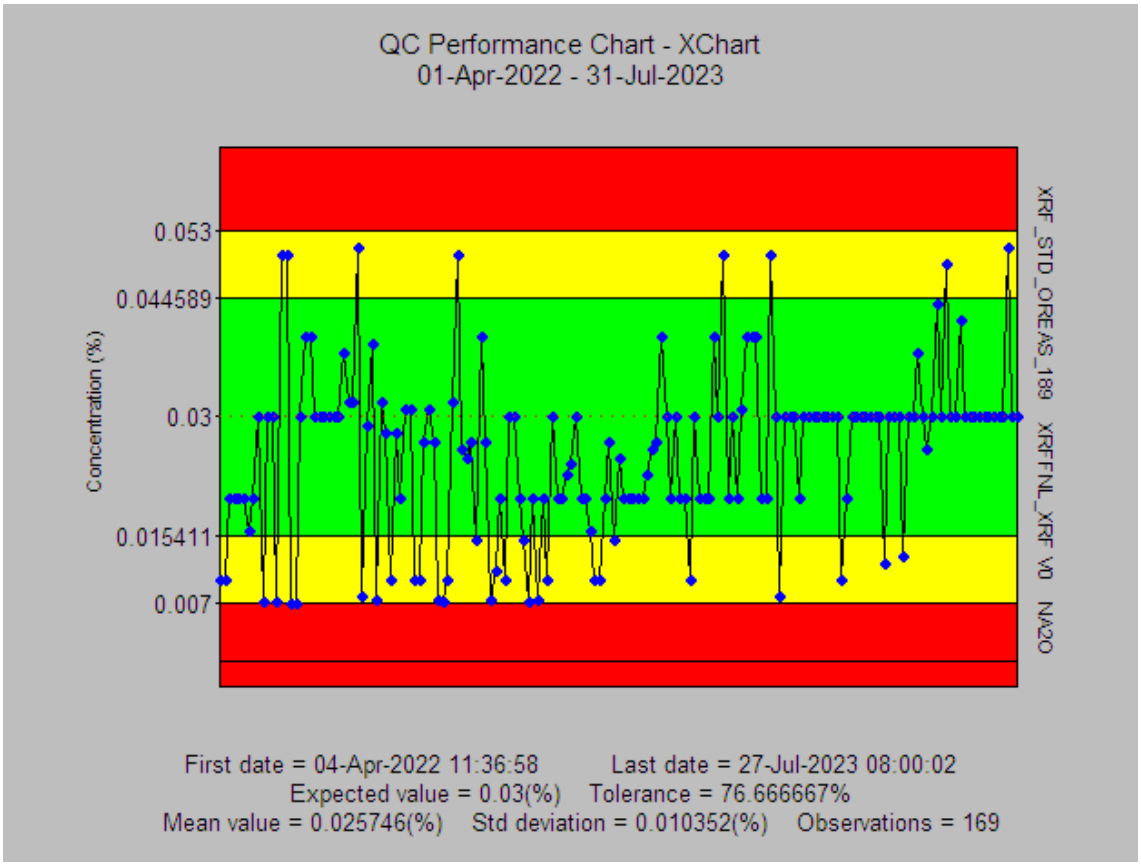


PT. GEOSERVICES - CIKARANG LABORATORY

XRF_STD_OREAS_189 - MNO

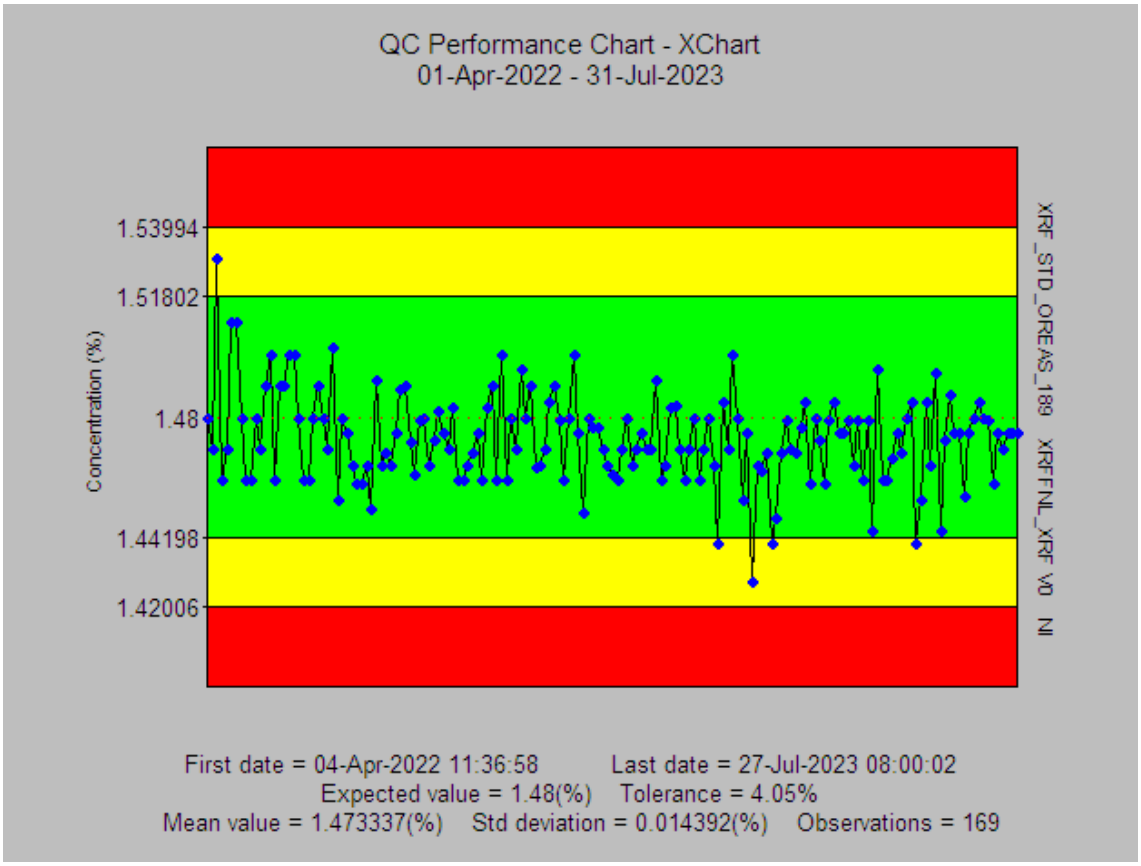


XRF_STD_OREAS_189 - NA2O

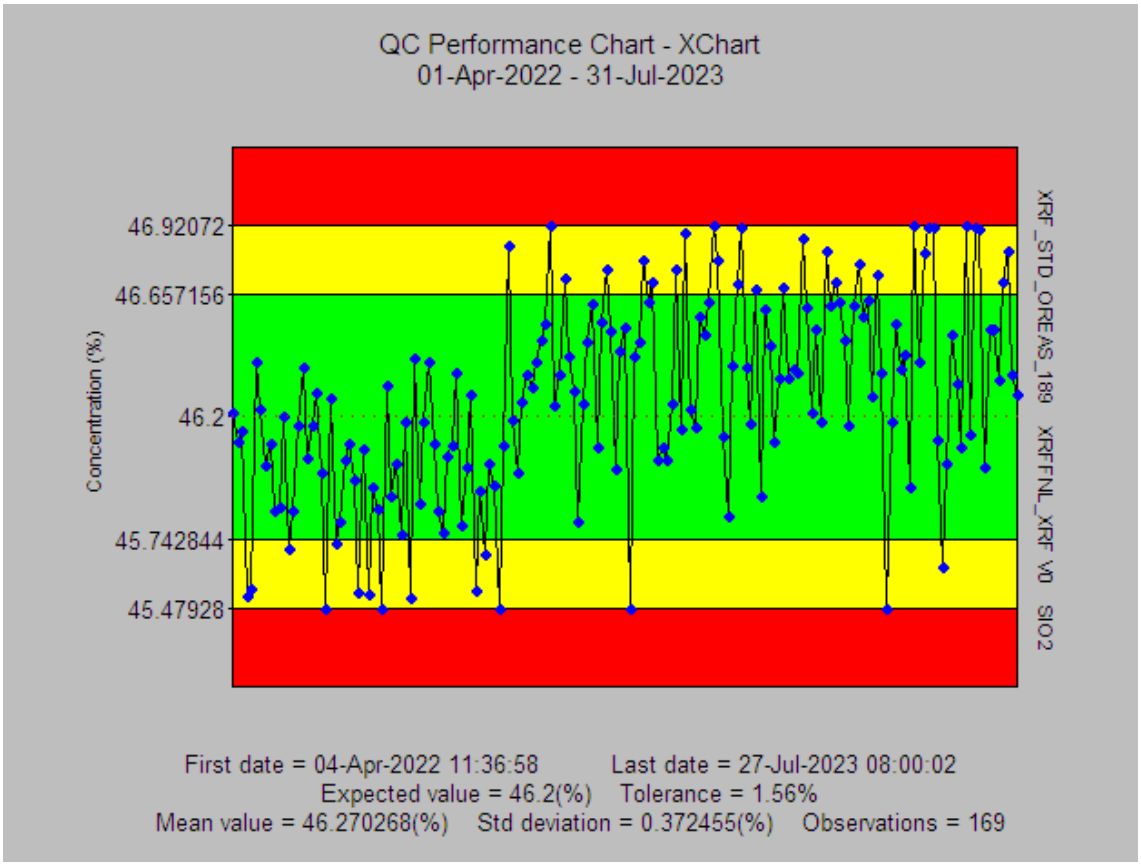


PT. GEOSERVICES - CIKARANG LABORATORY

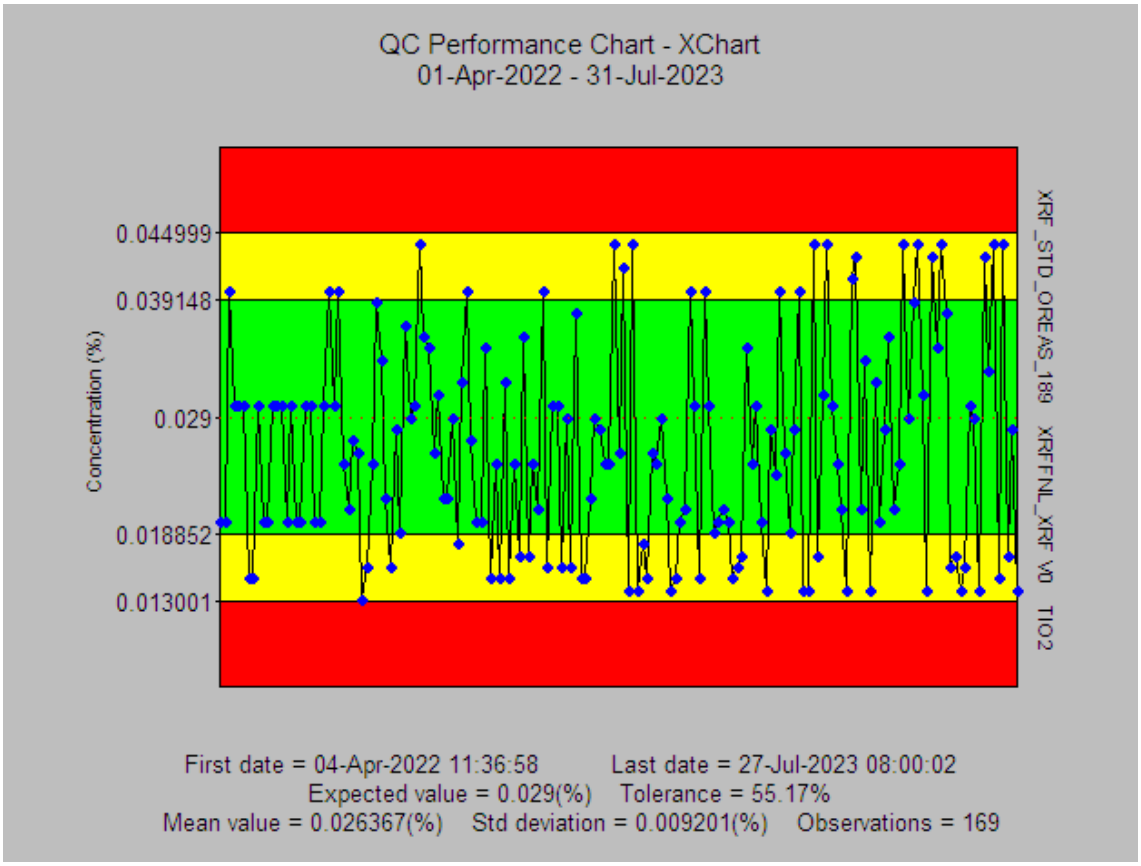
XRF_STD_OREAS_189 - NI



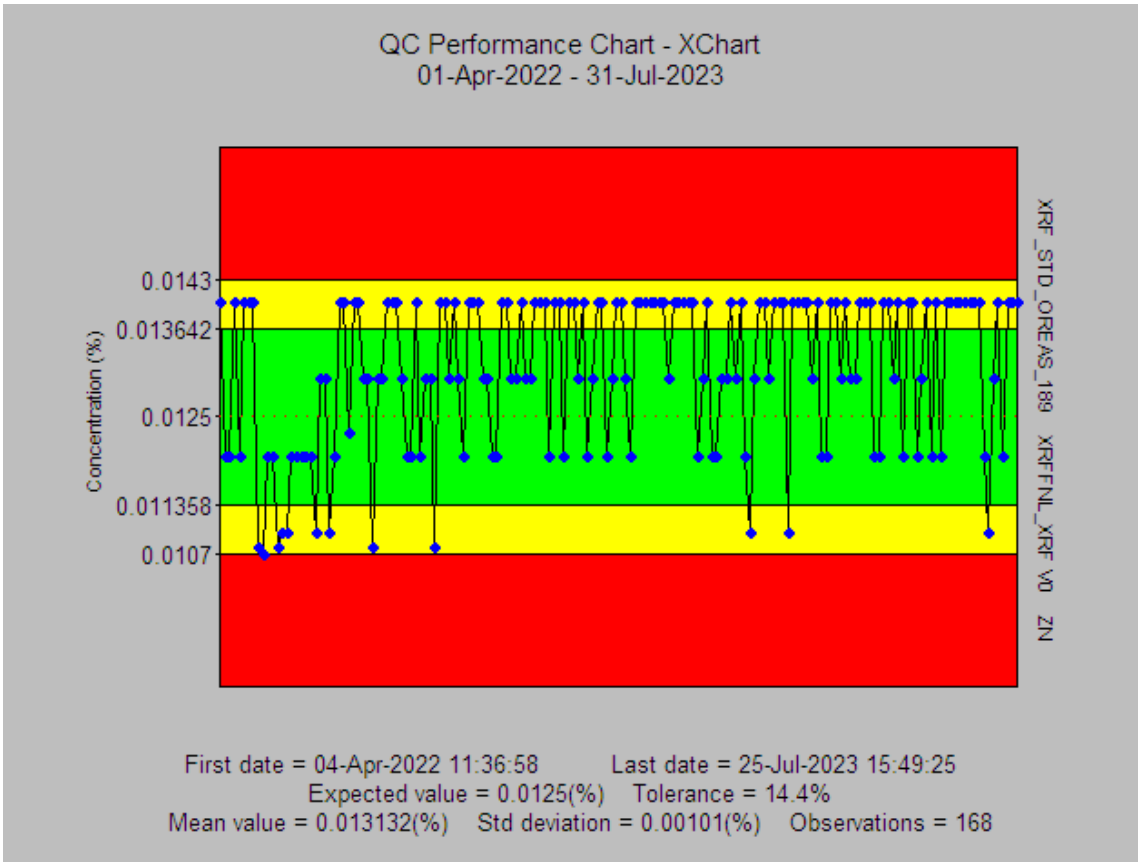
XRF_STD_OREAS_189 - SIO2



XRF_STD_OREAS_189 - TIO2

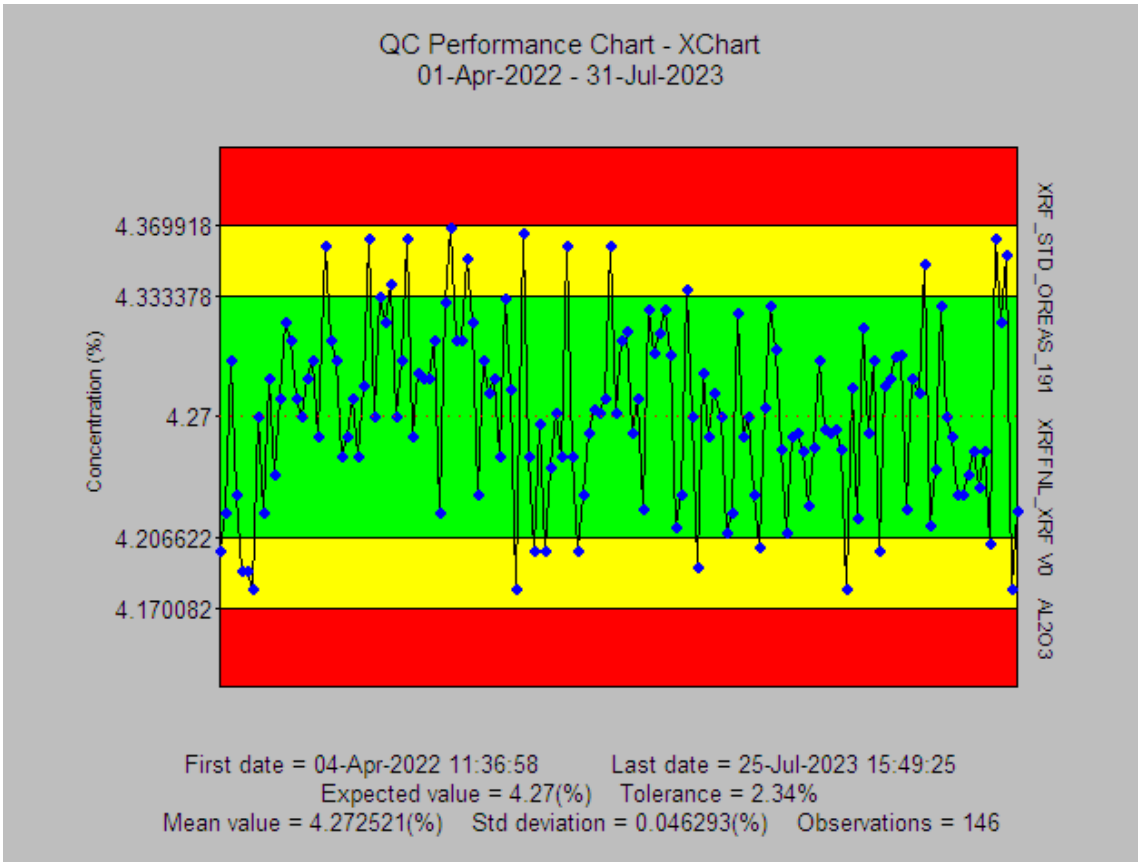


XRF_STD_OREAS_189 - ZN



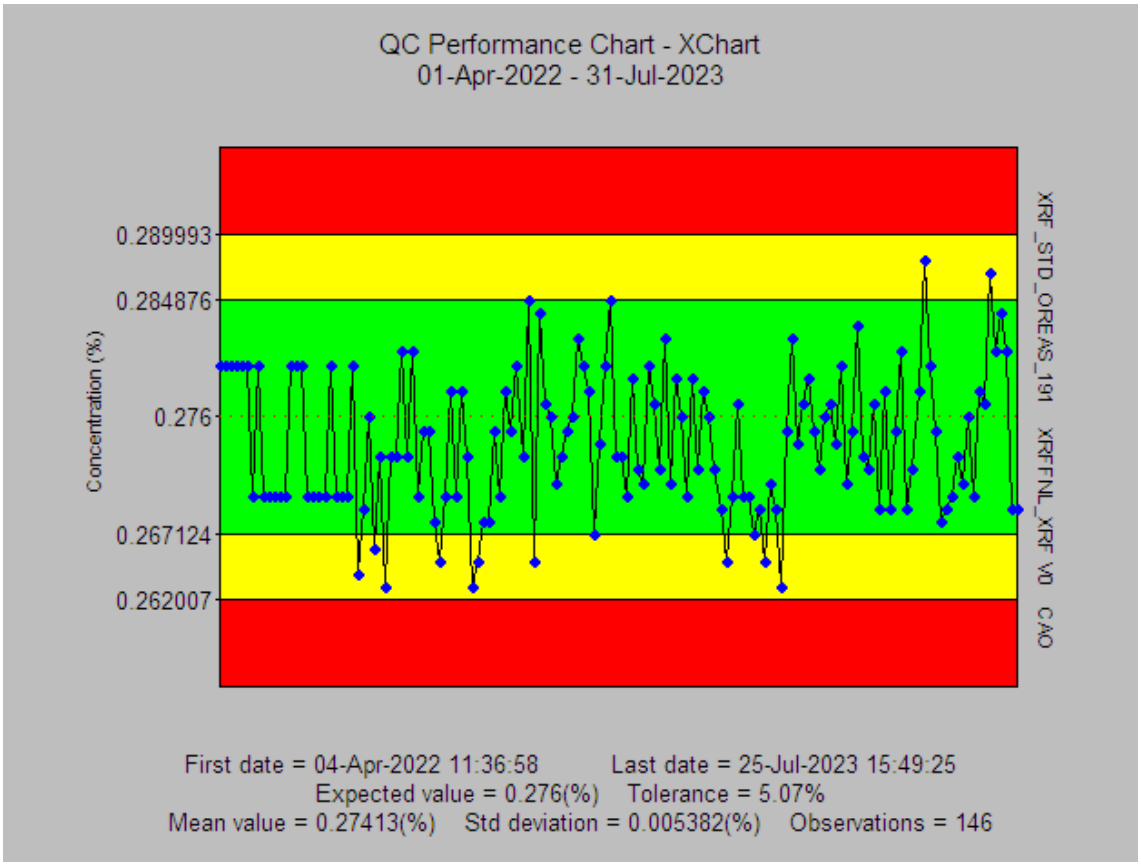
PT. GEOSERVICES - CIKARANG LABORATORY

XRF_STD_OREAS_191 - AL2O3



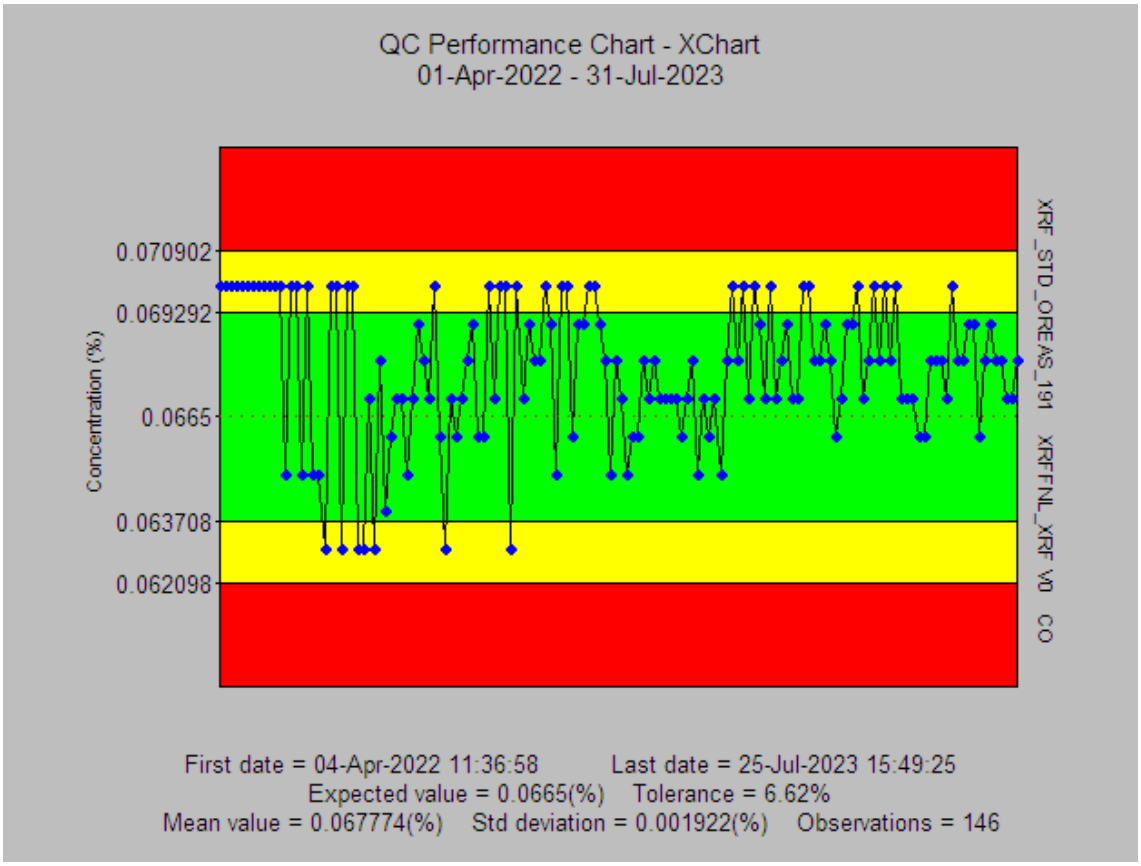
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XRF_STD_OREAS_191 - CAO



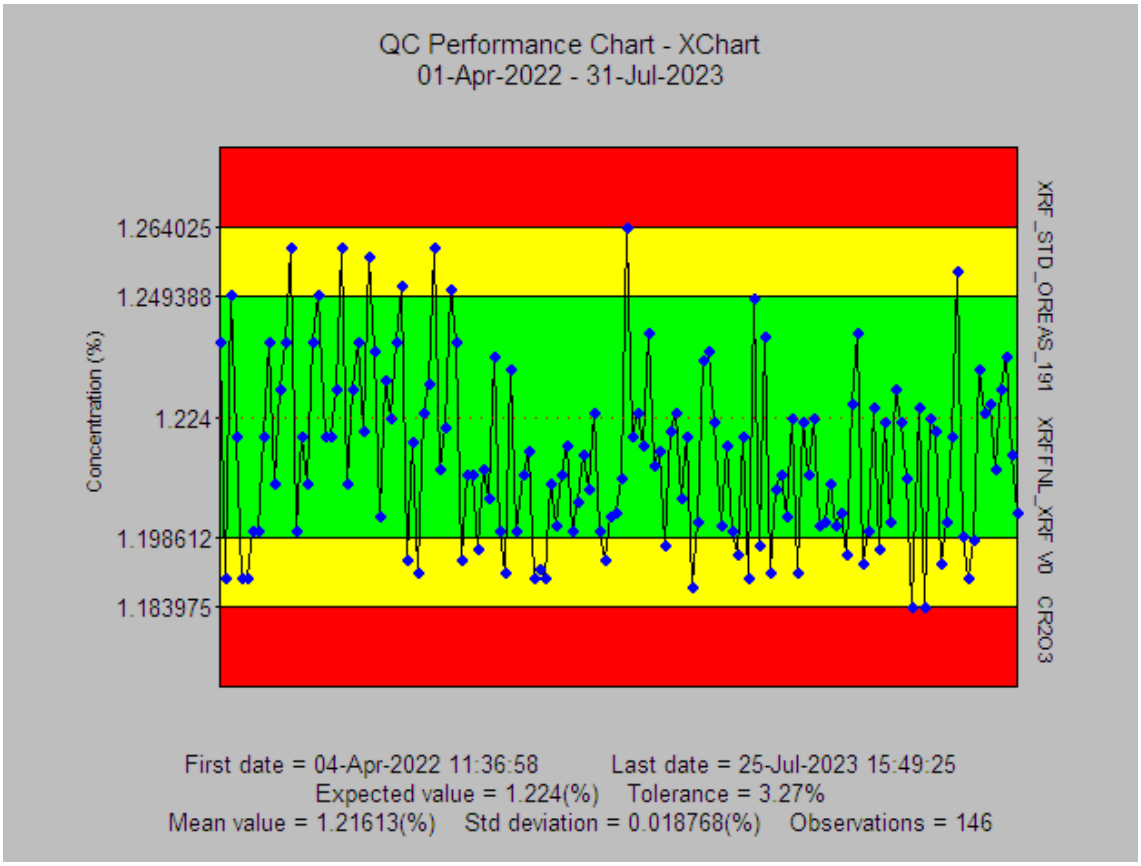
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XRF_STD_OREAS_191 - CO



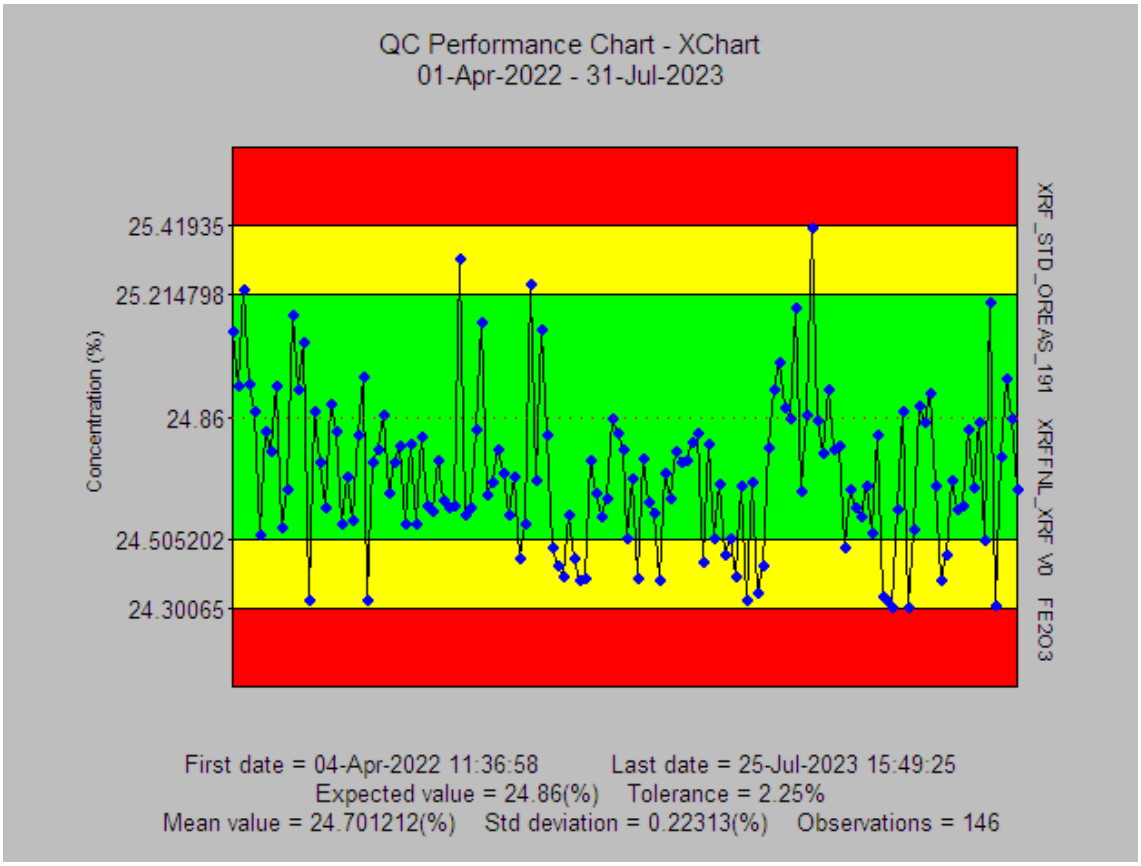
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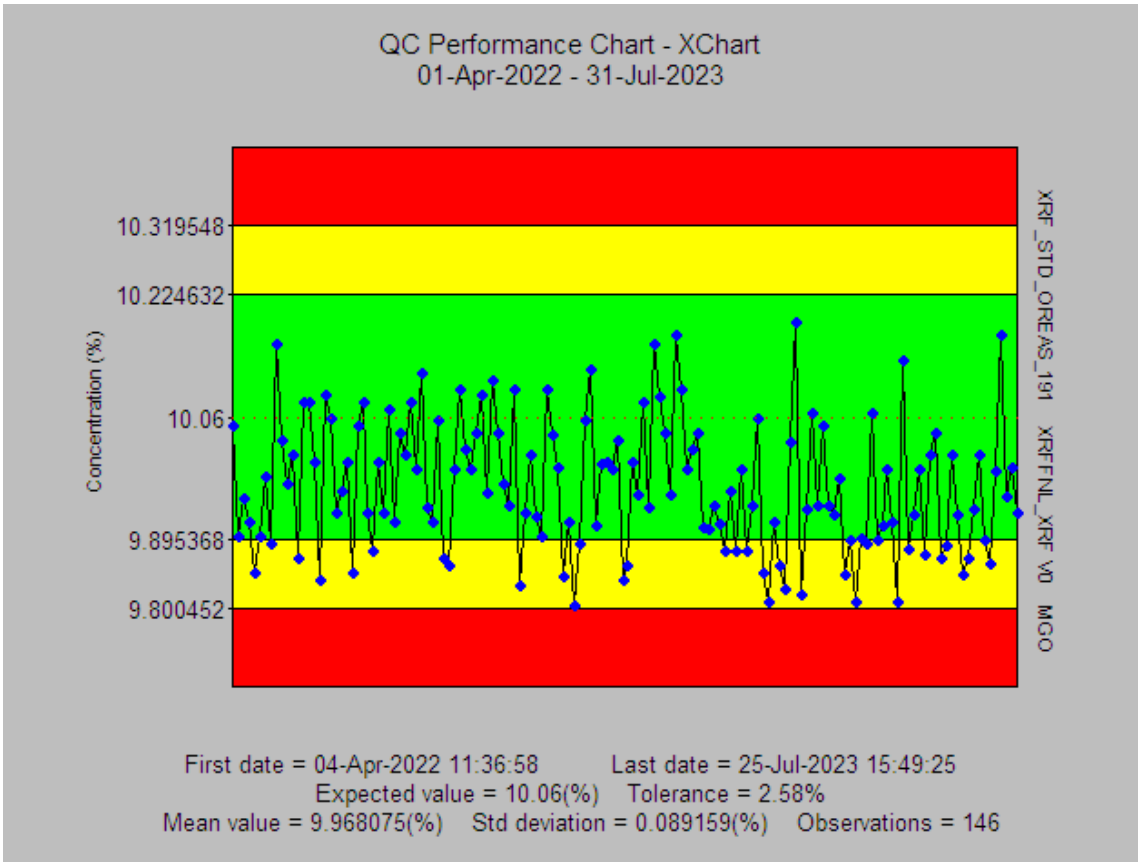
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XRF_STD_OREAS_191 - FE2O3



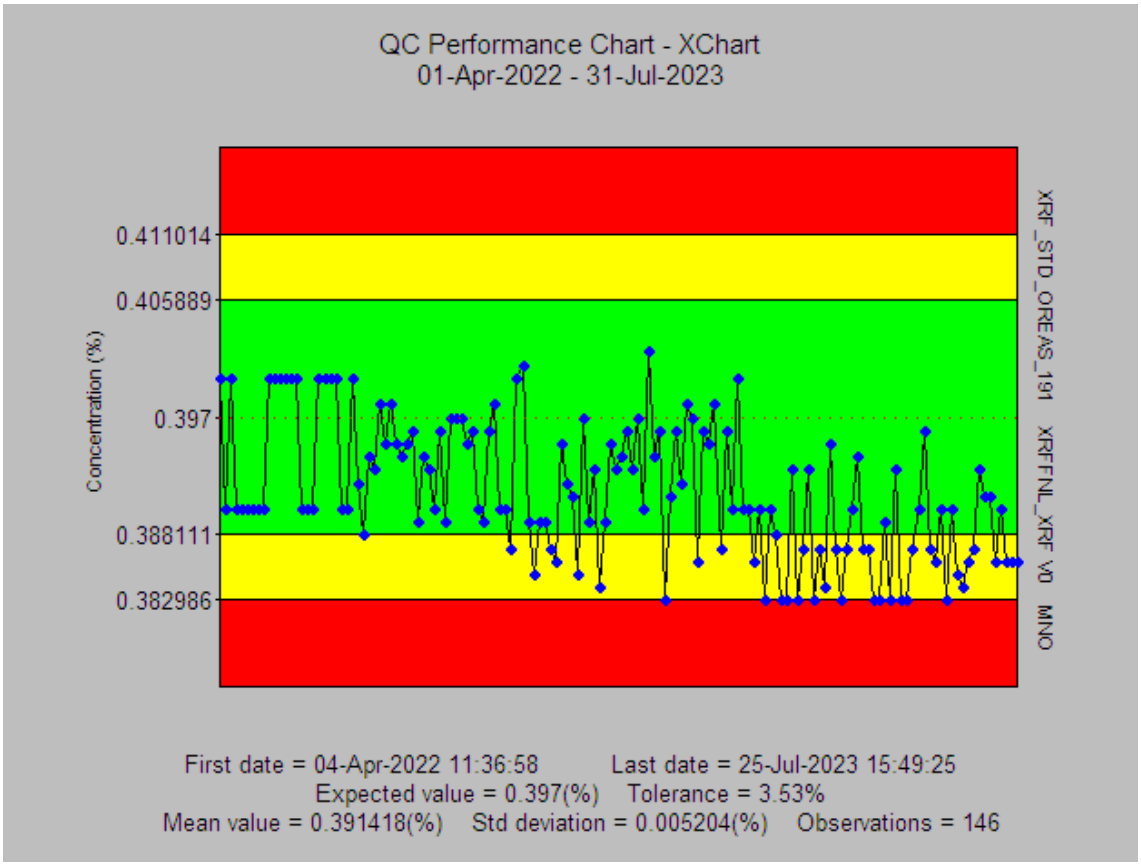
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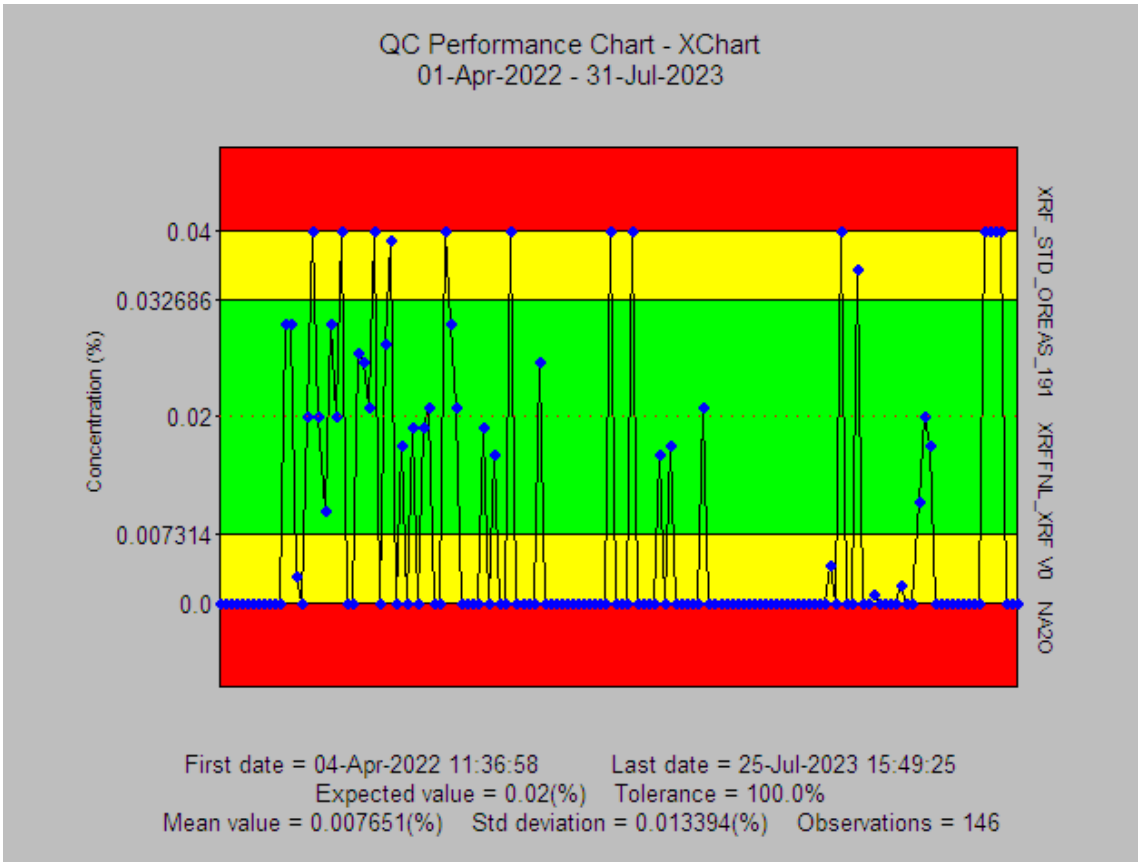
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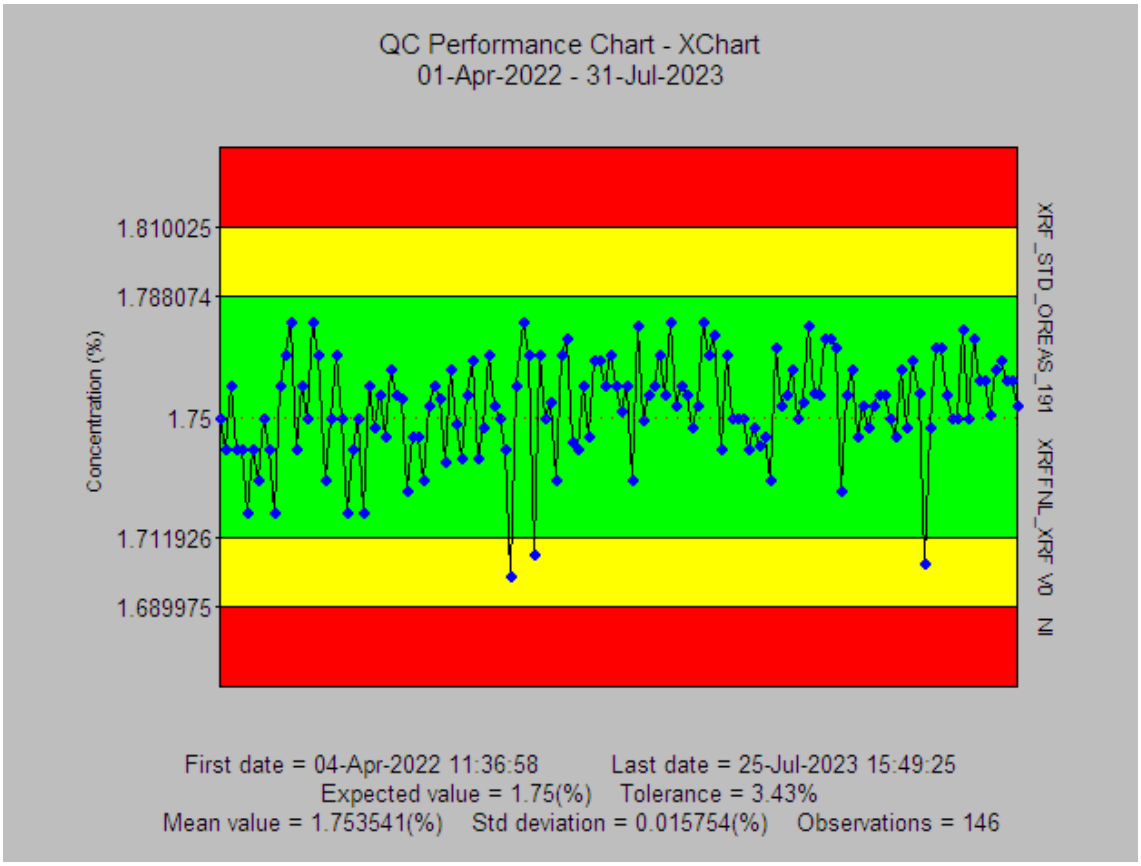
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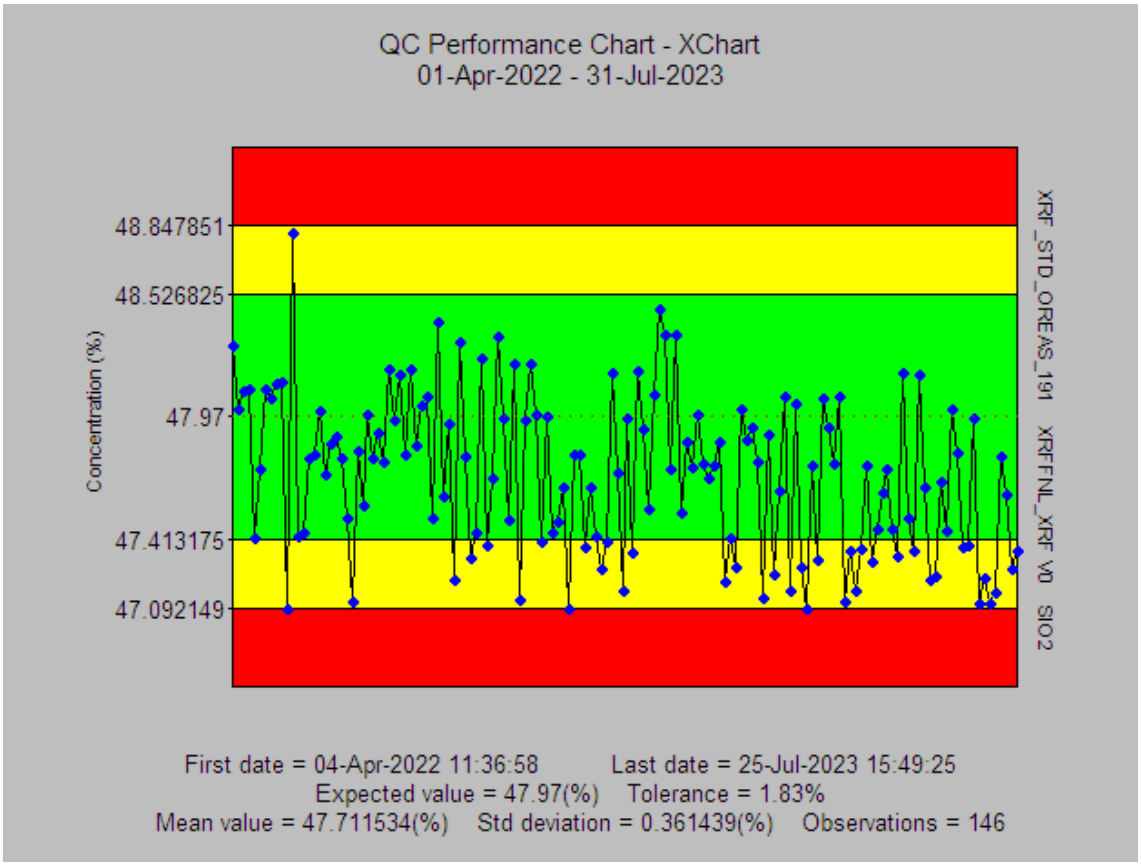
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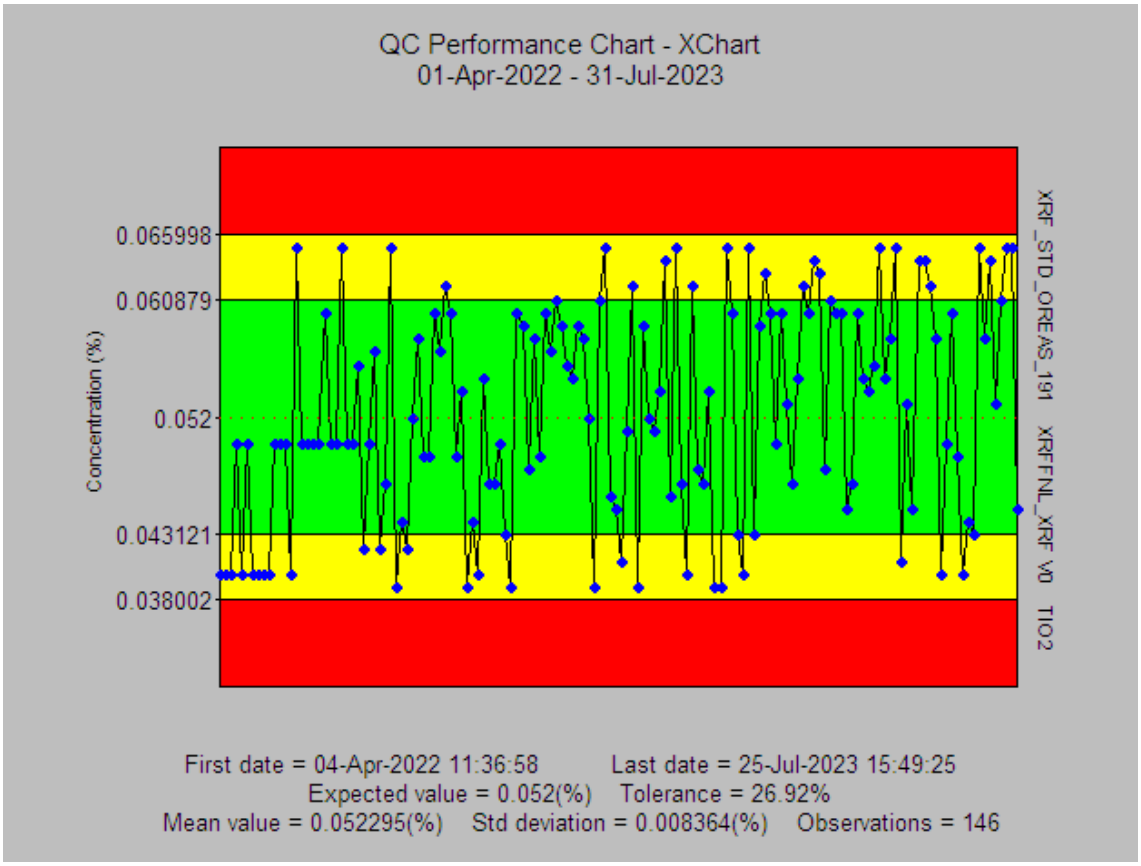


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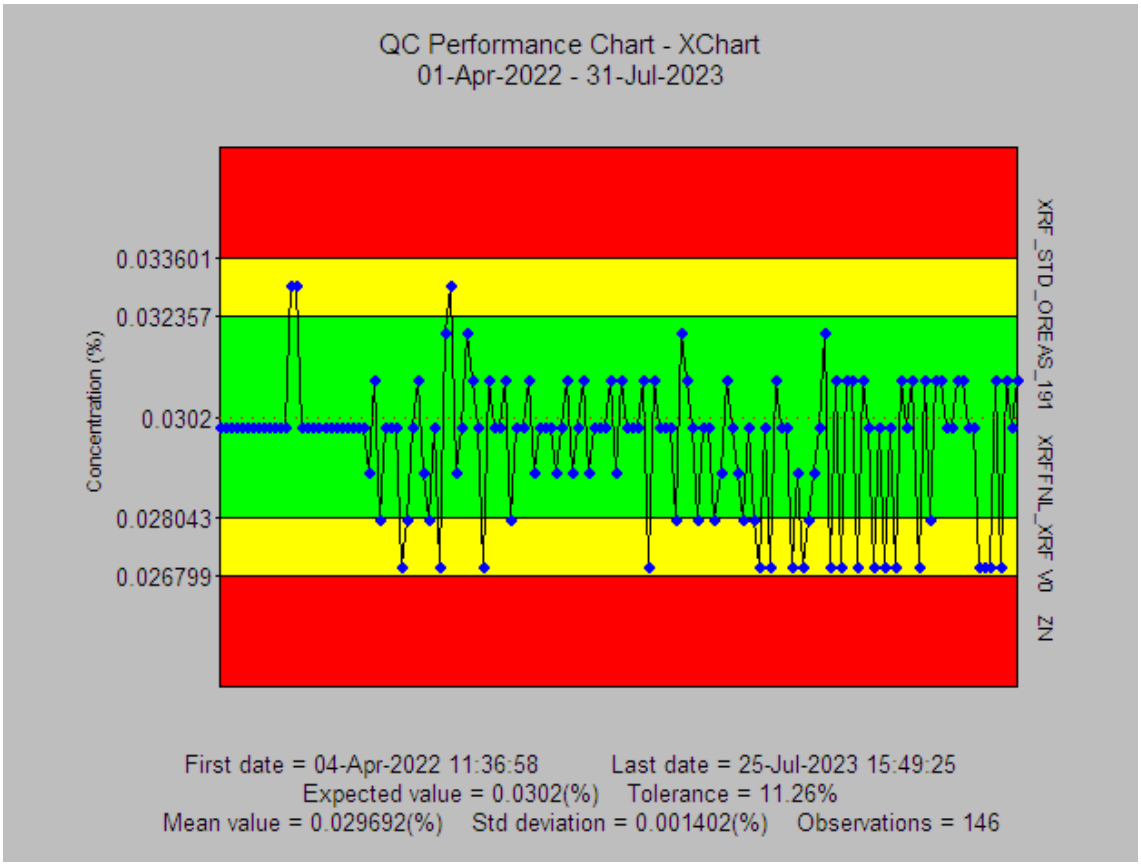
XRF_STD_OREAS_191 - SIO2



XRF_STD_OREAS_191 - TIO2

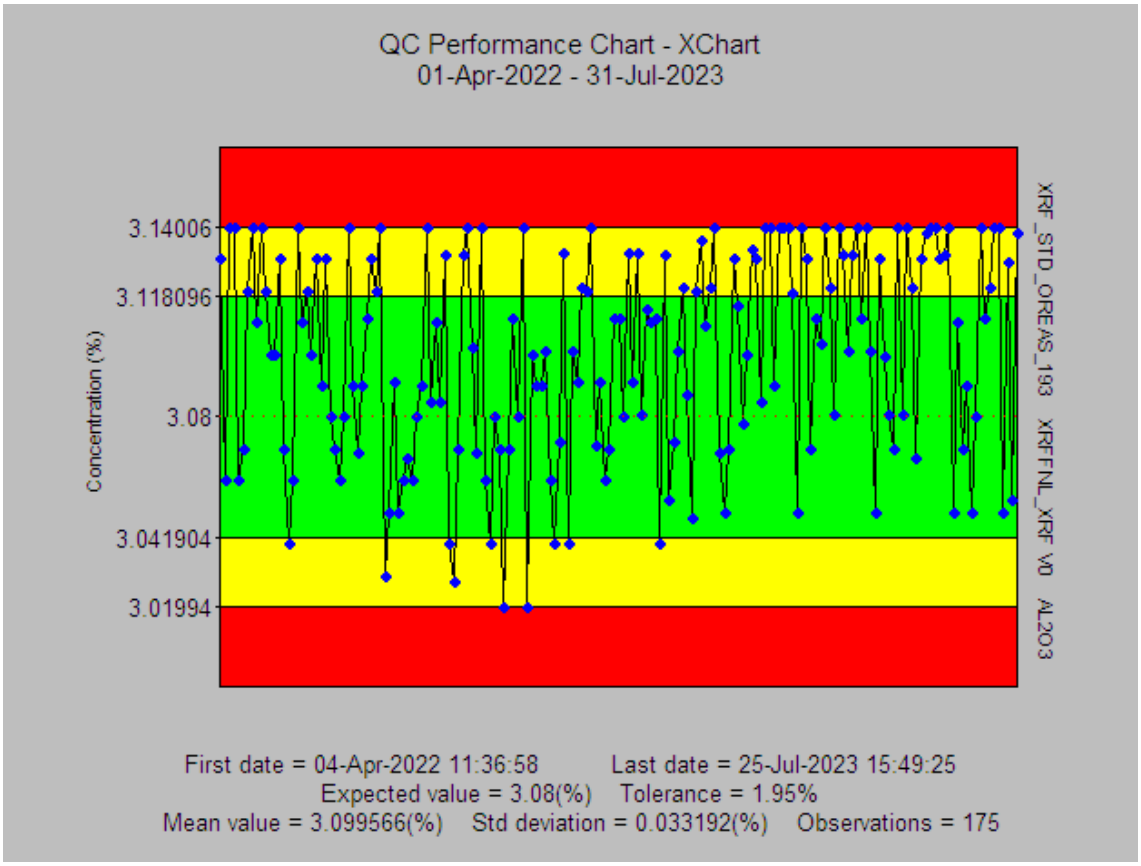


XRF_STD_OREAS_191 - ZN

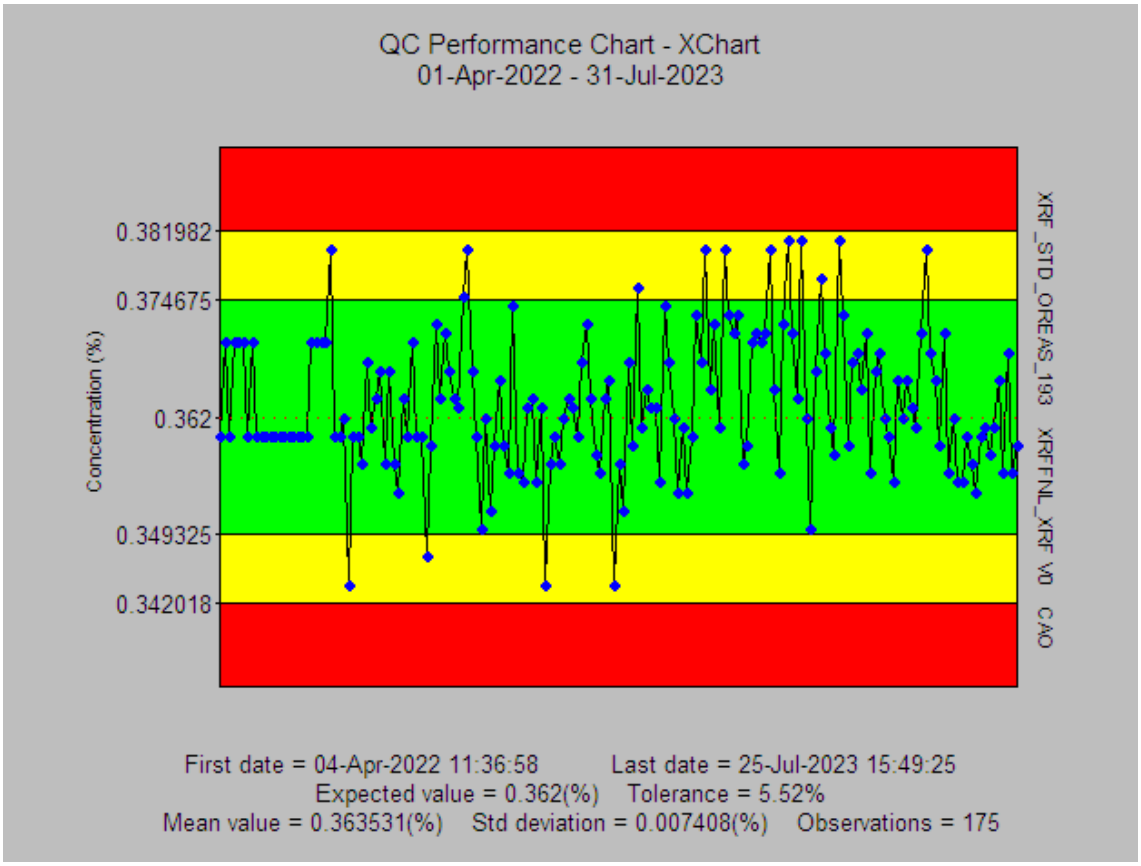


PT. GEOSERVICES - CIKARANG LABORATORY

XRF_STD_OREAS_193 - AL2O3

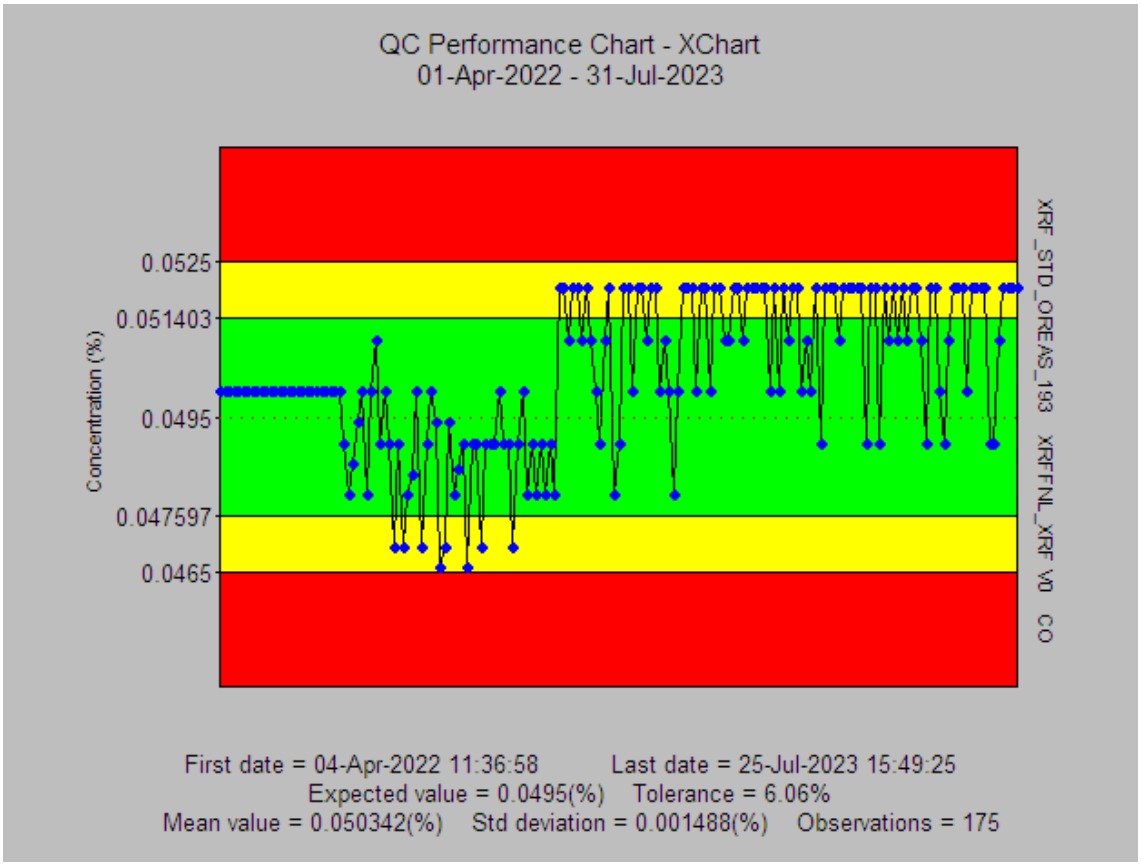


XRF_STD_OREAS_193 - CAO

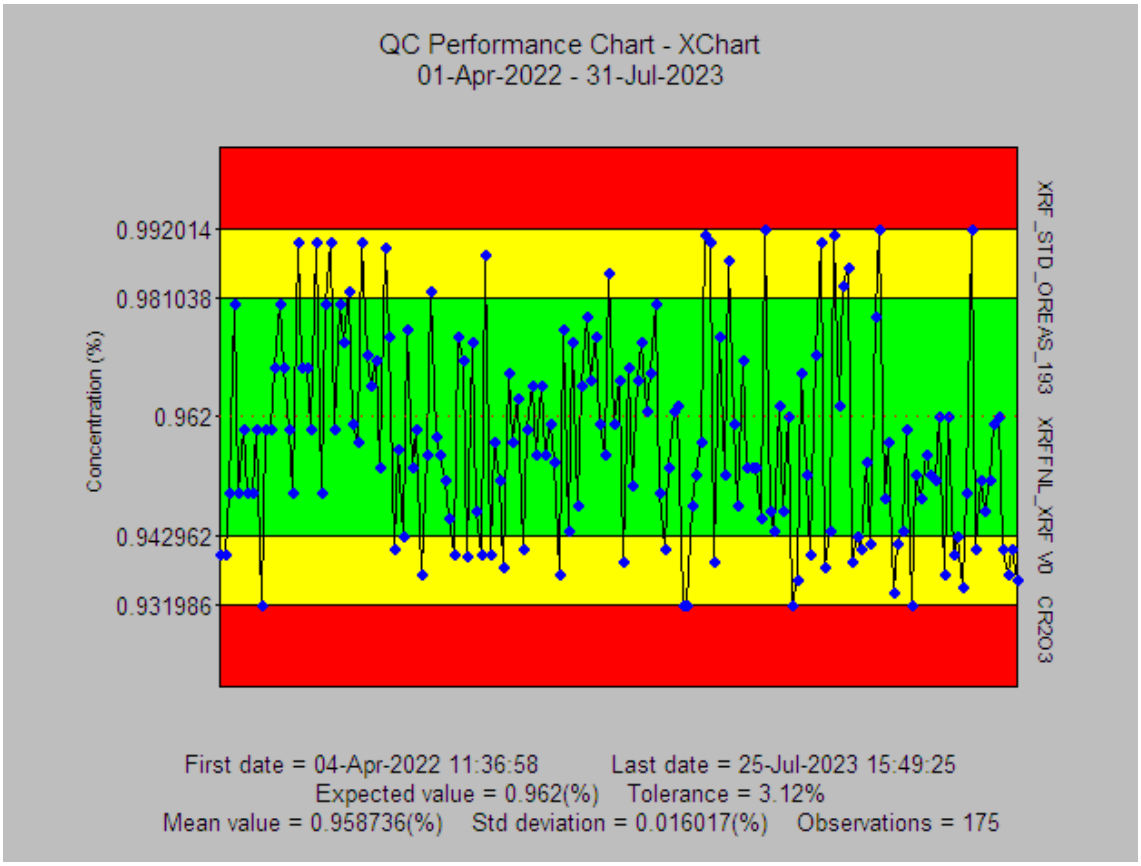


PT. GEOSERVICES - CIKARANG LABORATORY

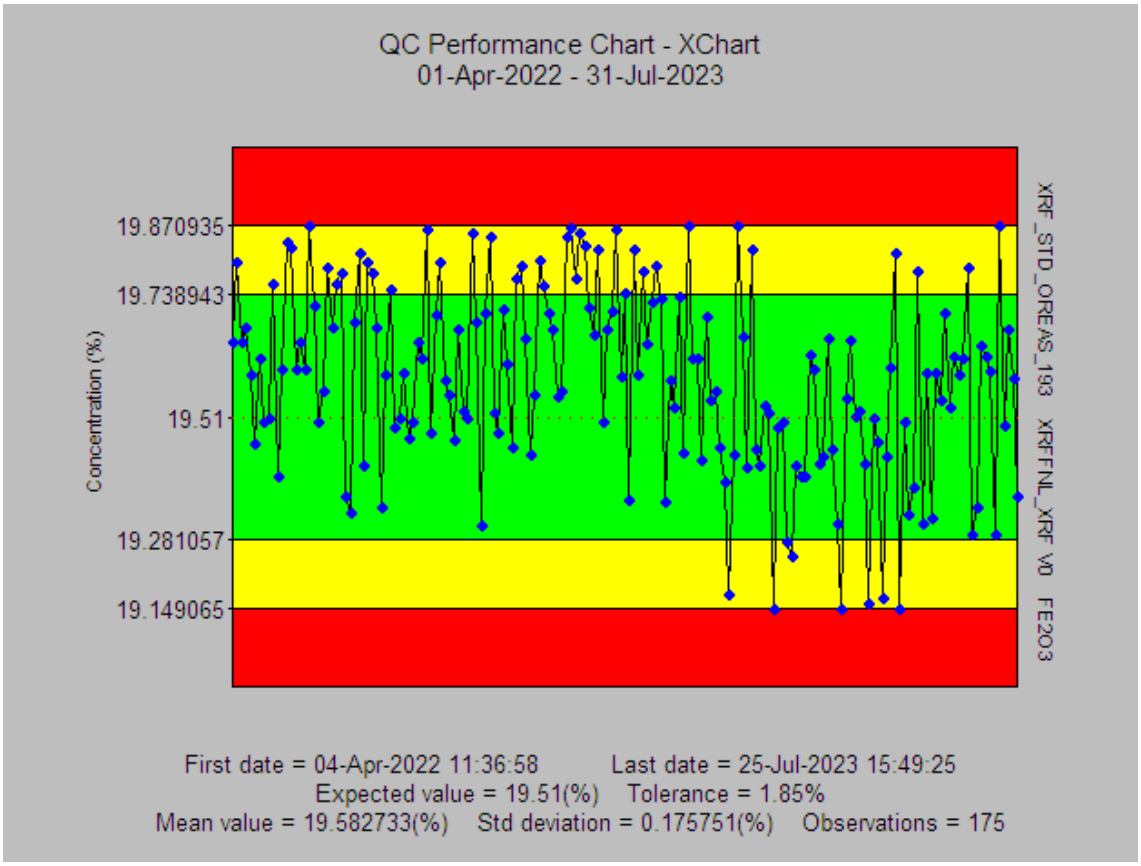
XRF_STD_OREAS_193 - CO



XRF_STD_OREAS_193 - CR2O3

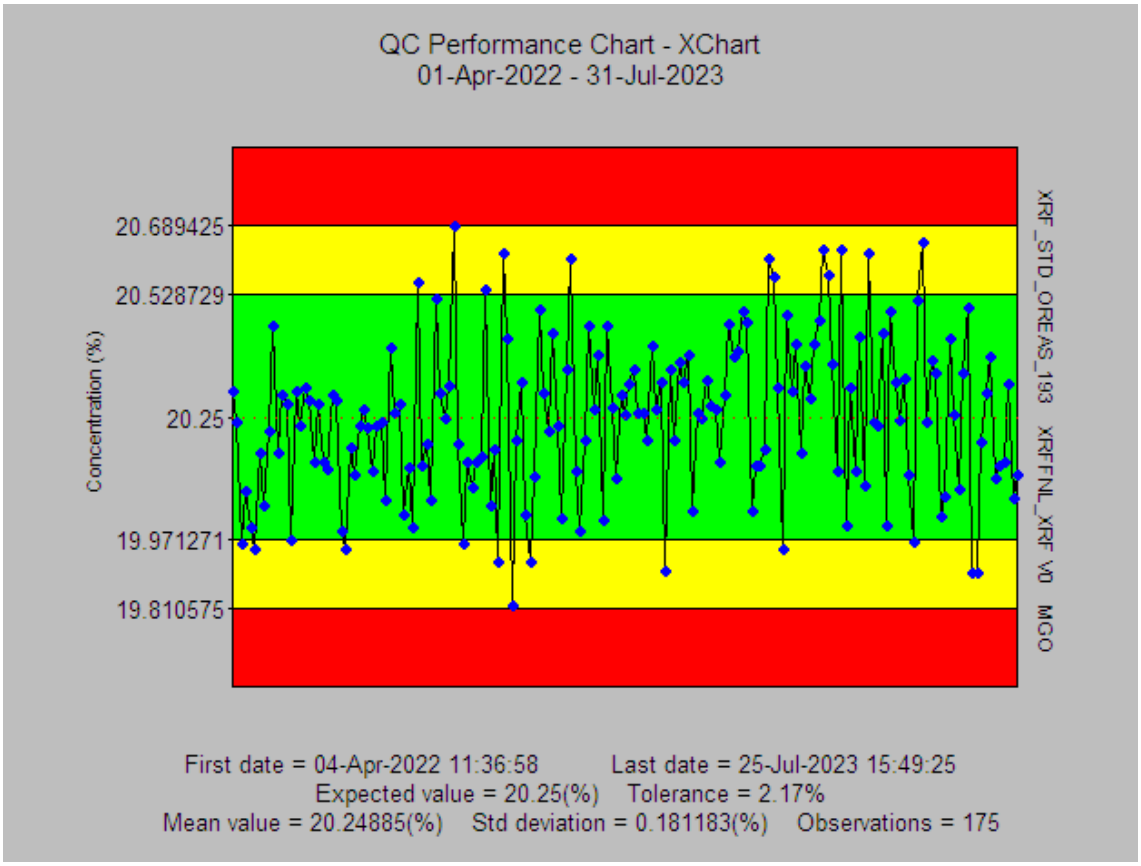


XRF_STD_OREAS_193 - FE2O3



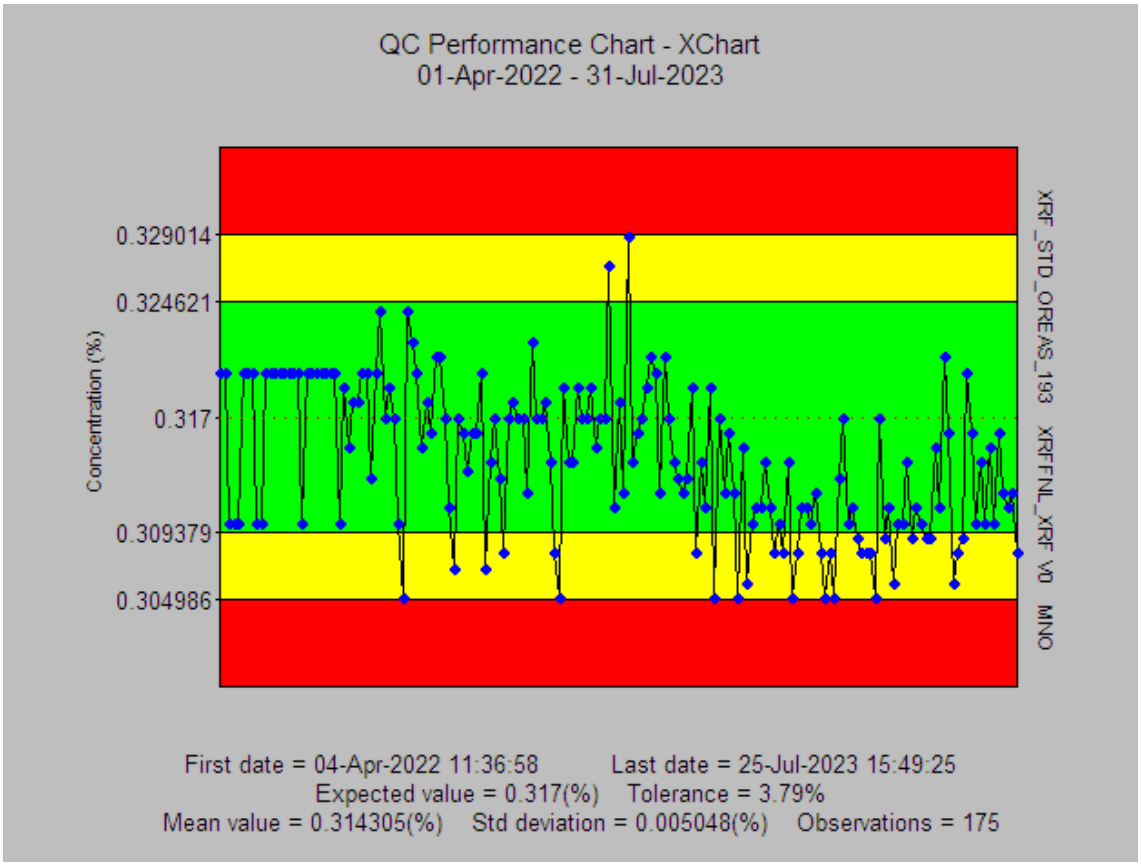
PT. GEOSERVICES - CIKARANG LABORATORY

XRF_STD_OREAS_193 - MGO



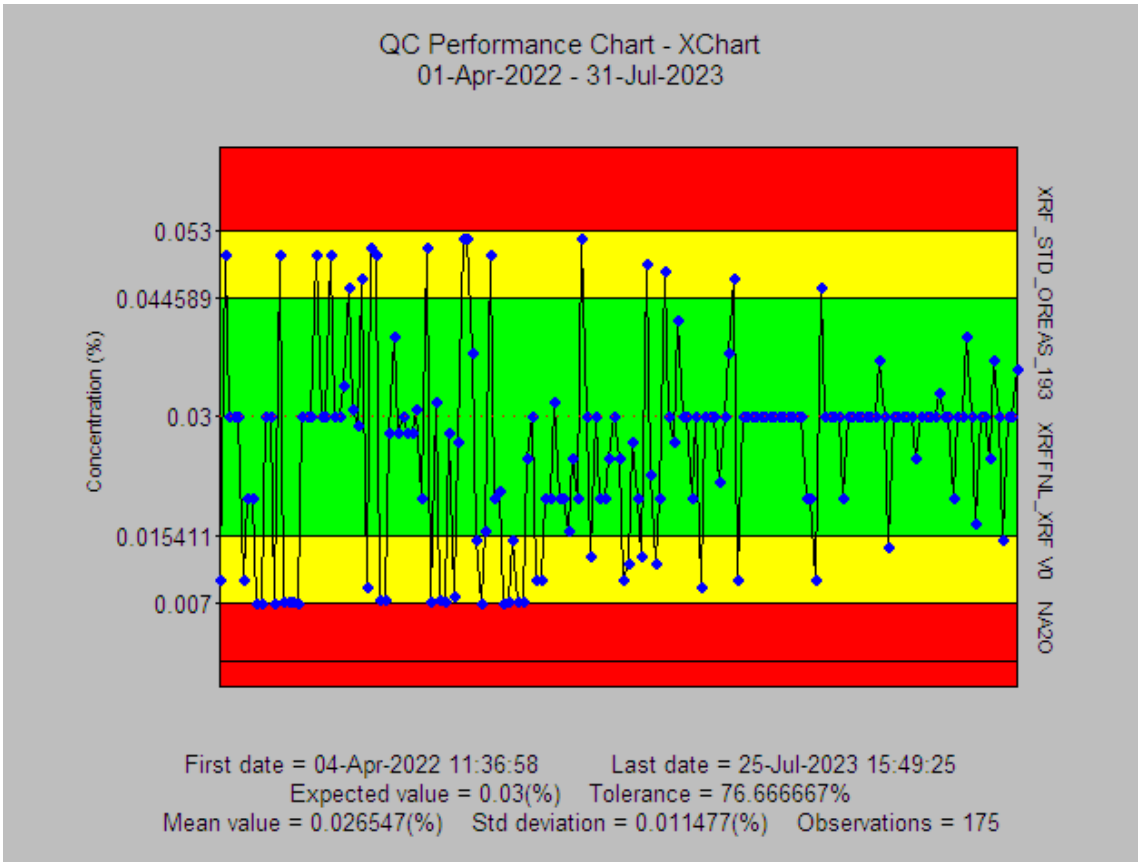
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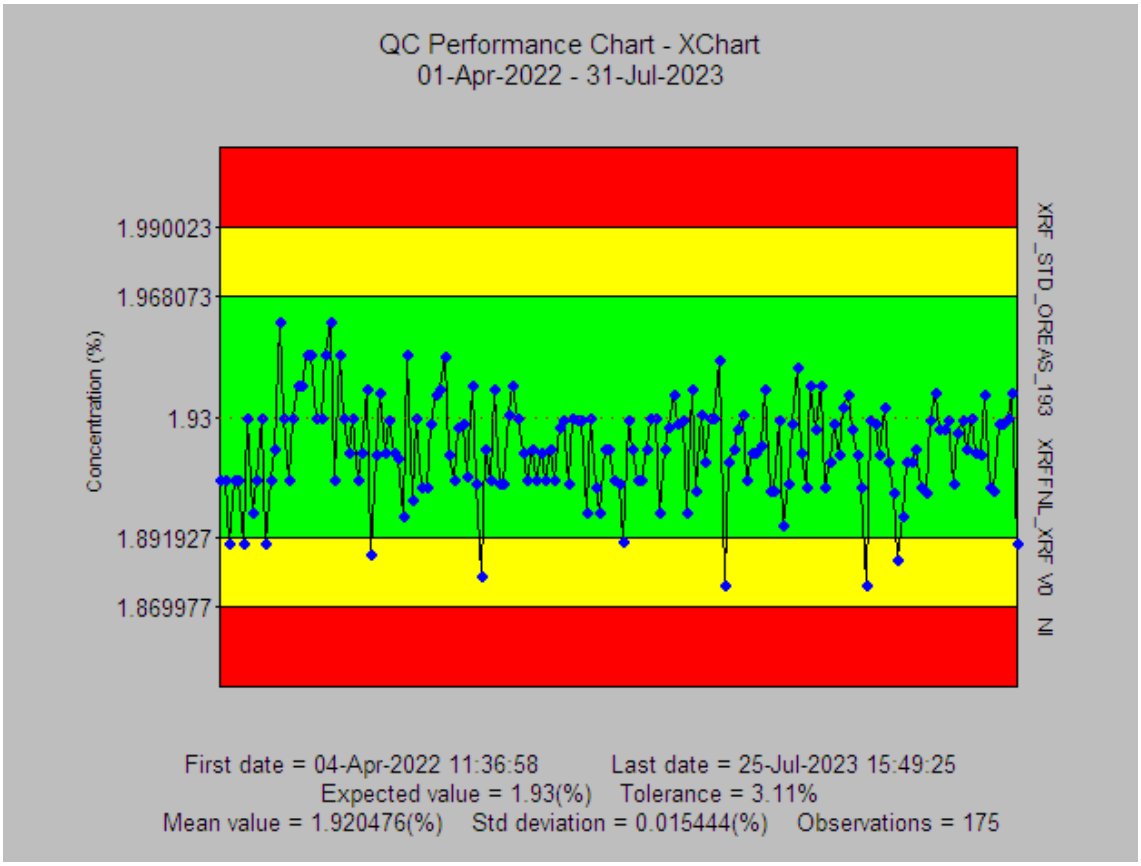
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XRF_STD_OREAS_193 - NA2O



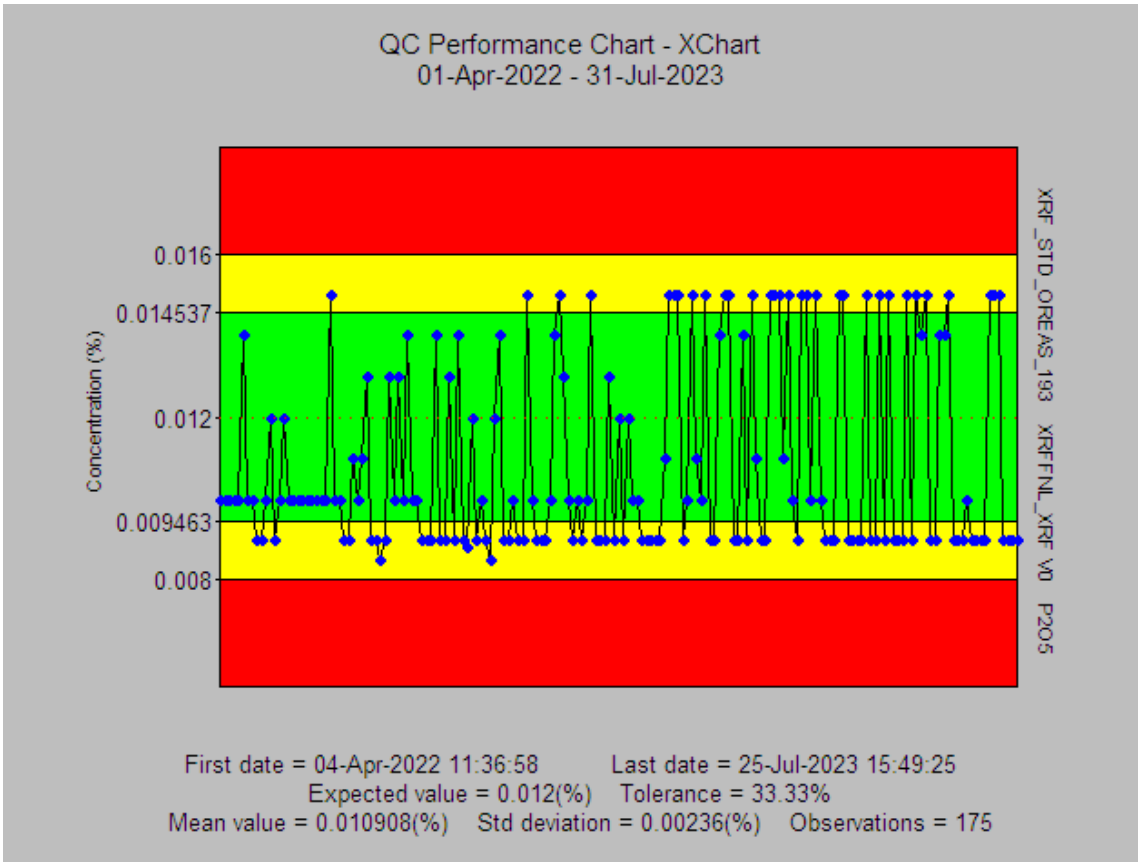
PT. GEOSERVICES - CIKARANG LABORATORY

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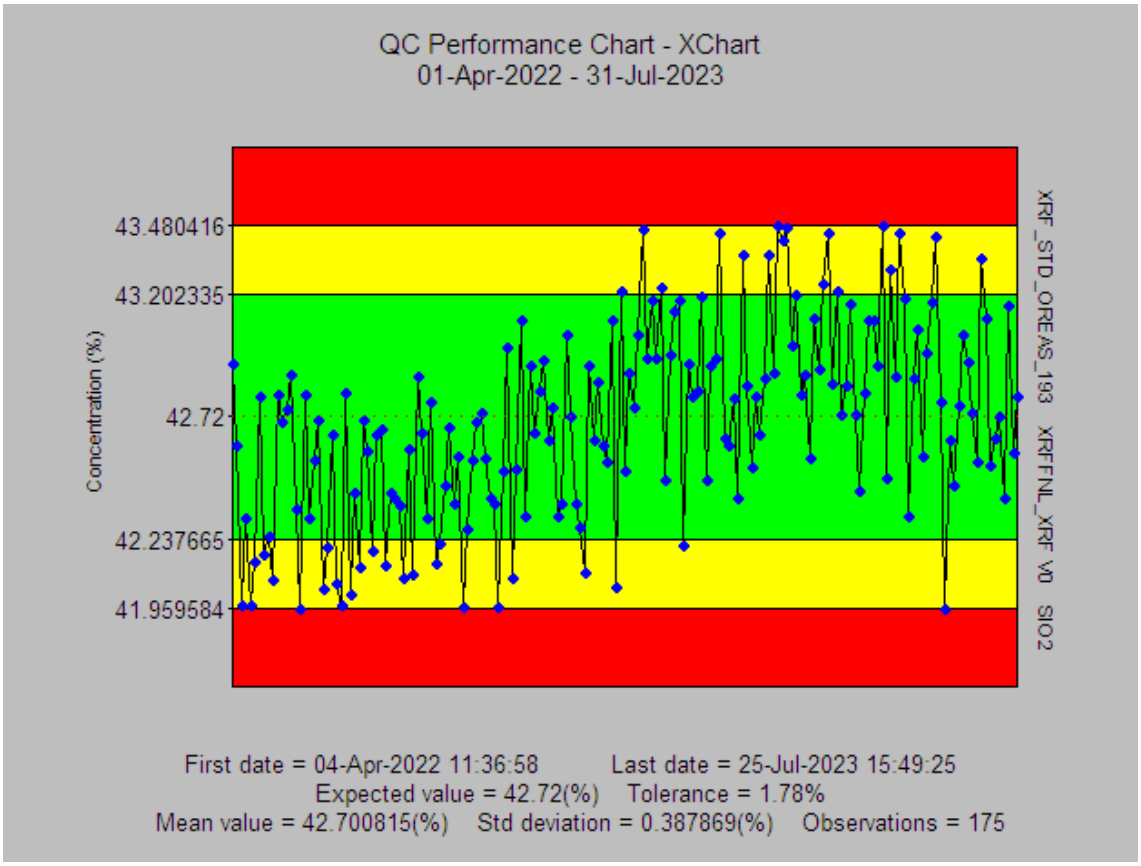


PT. GEOSERVICES - CIKARANG LABORATORY

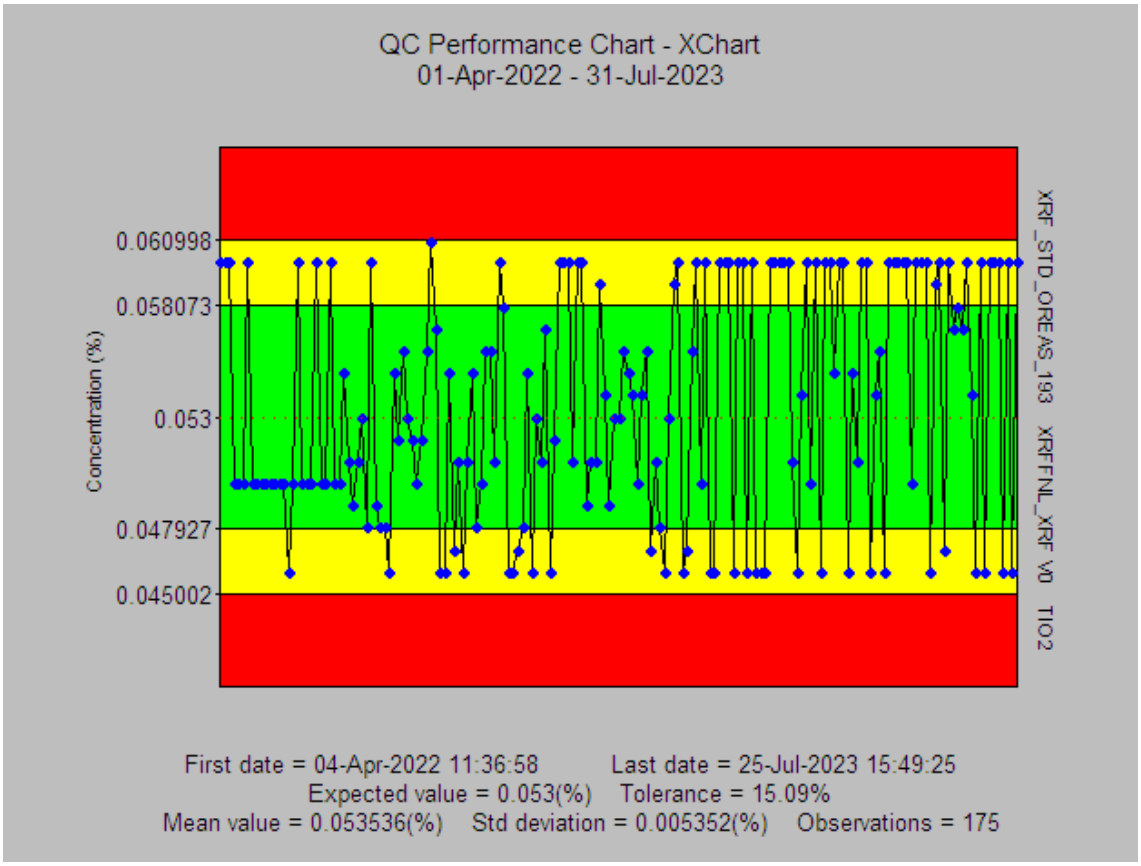
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XRF_STD_OREAS_193 - SIO2

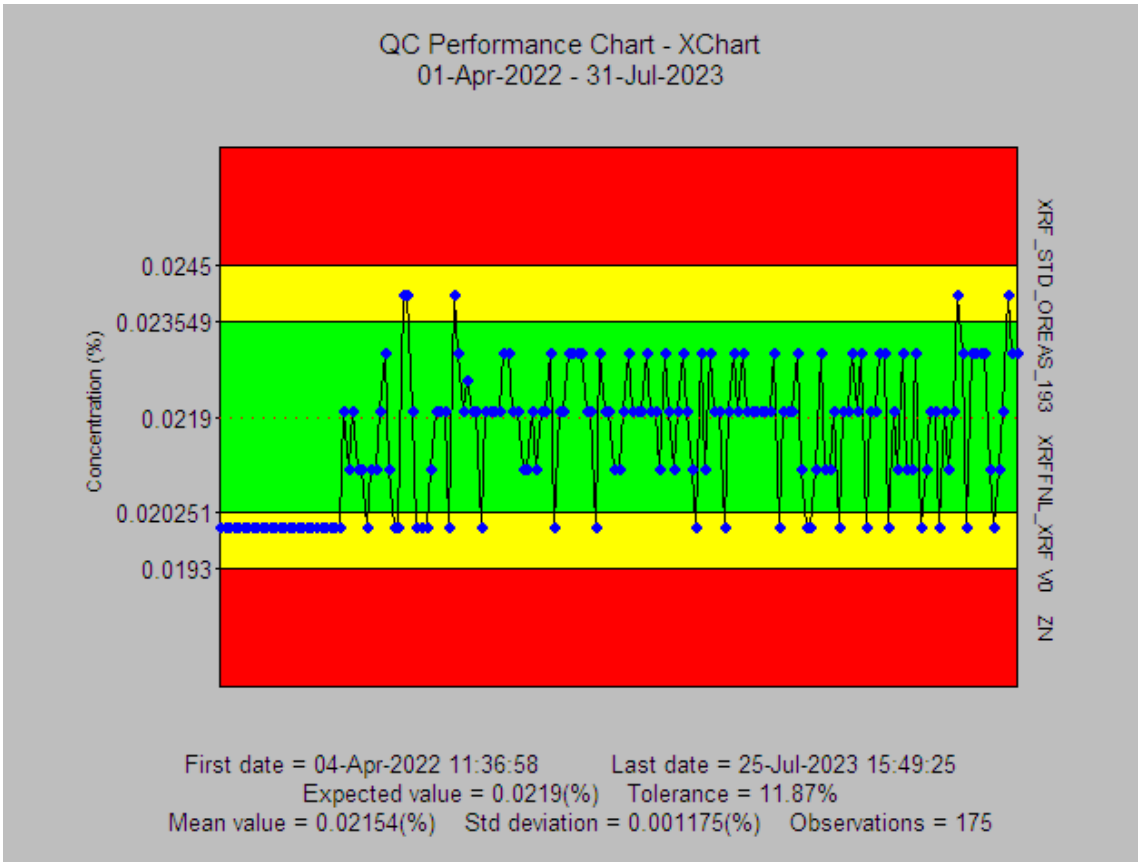


XRF_STD_OREAS_193 - TIO2



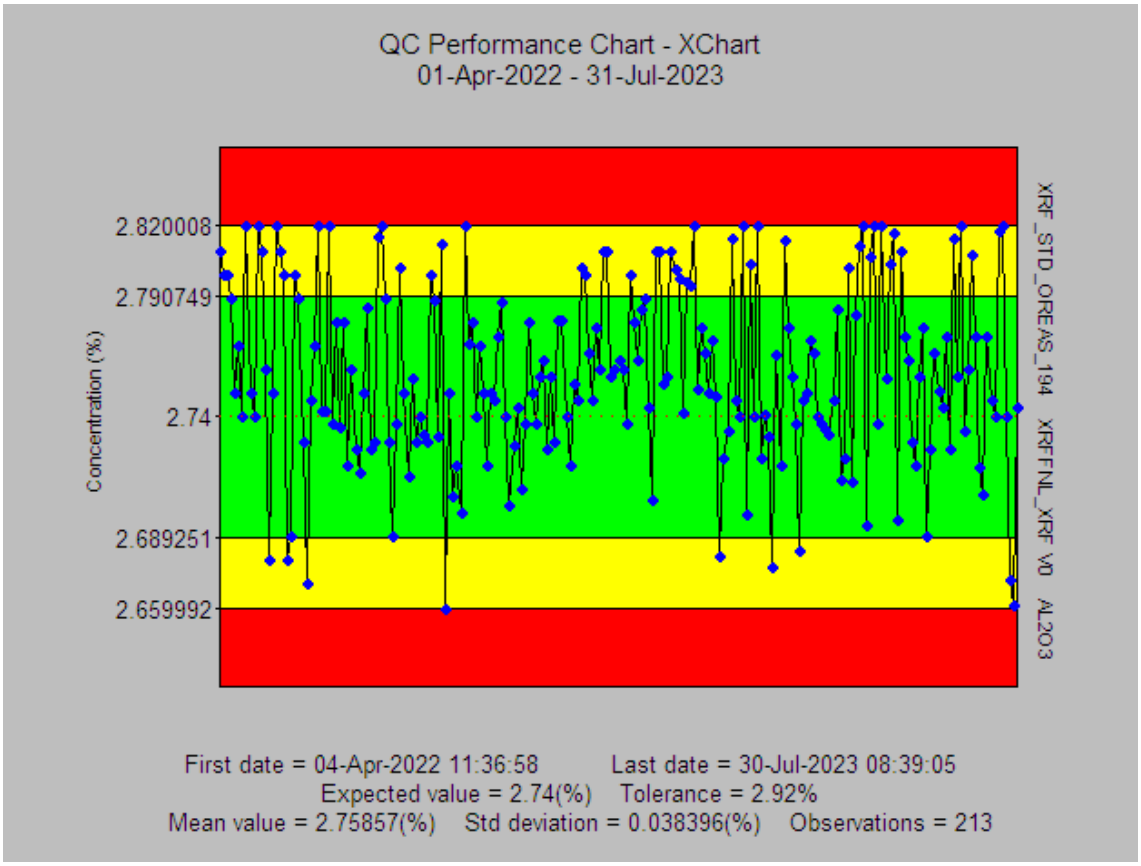
PT. GEOSERVICES - CIKARANG LABORATORY

XRF_STD_OREAS_193 - ZN



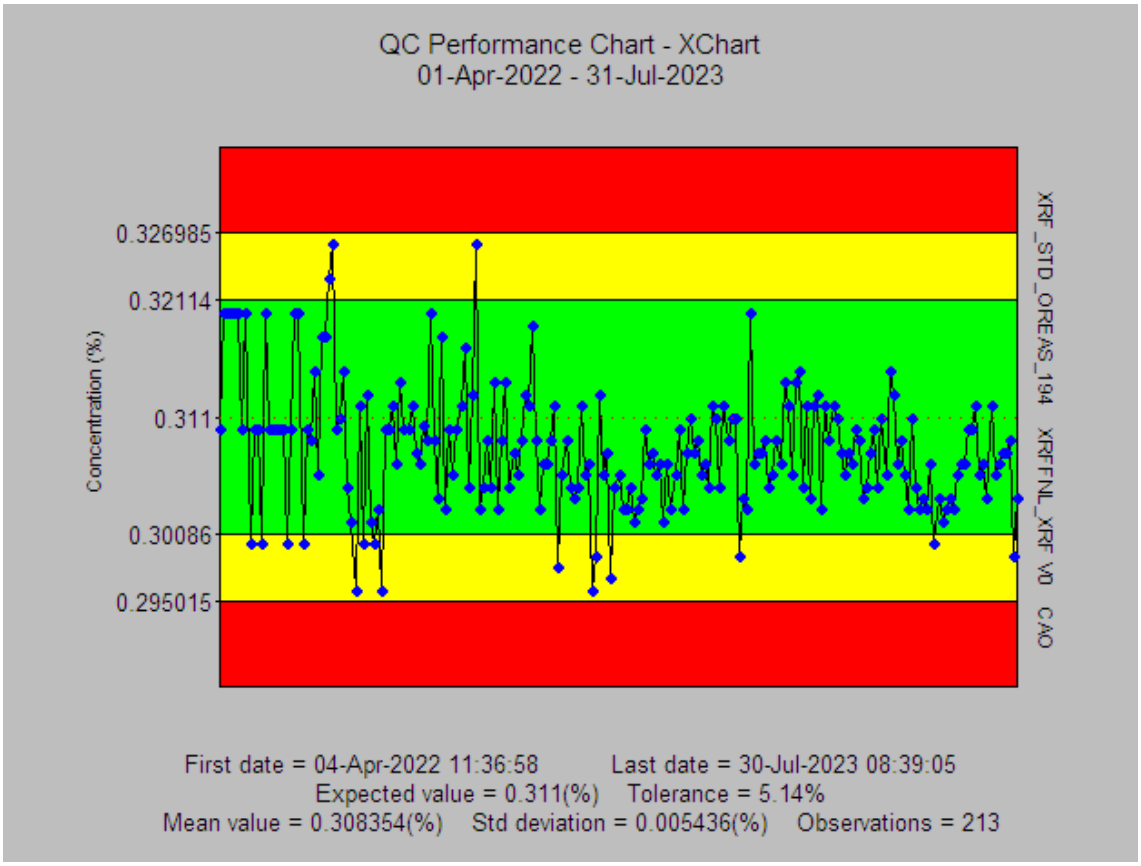
PT. GEOSERVICES - CIKARANG LABORATORY

XRF_STD_OREAS_194 - AL2O3

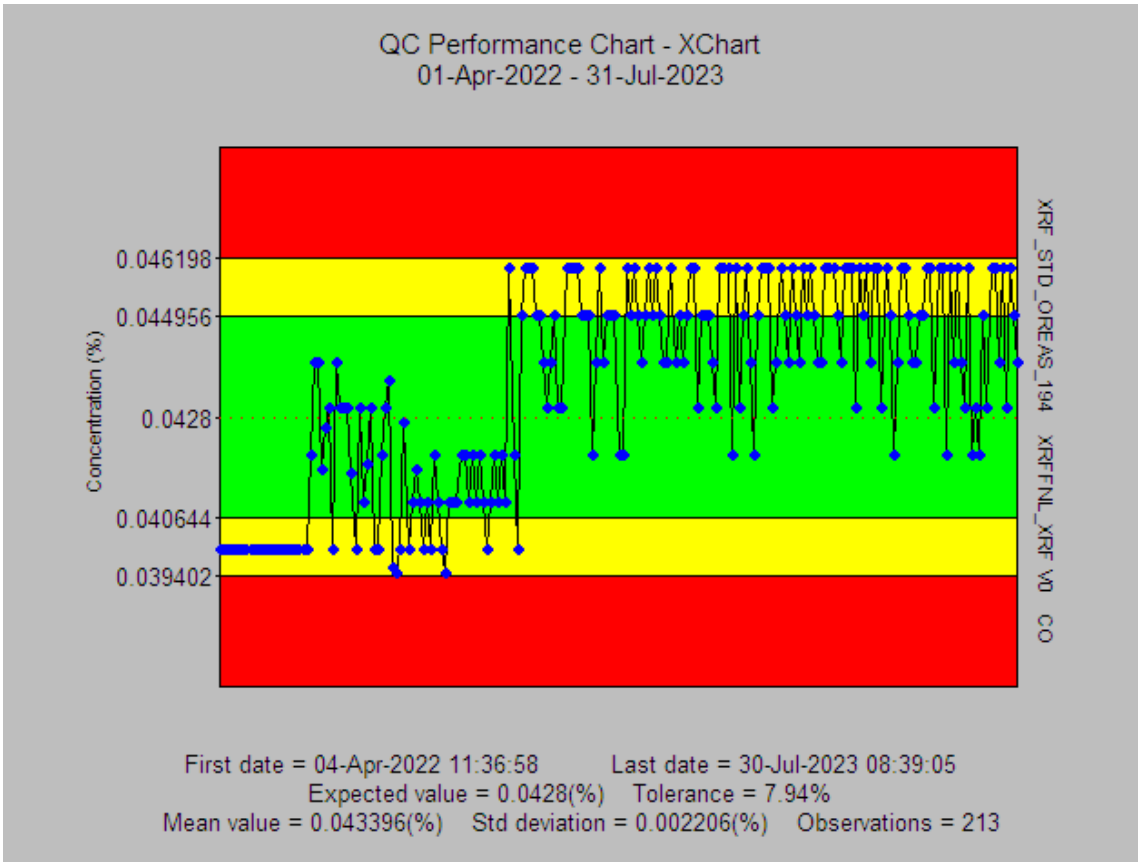


PT. GEOSERVICES - CIKARANG LABORATORY

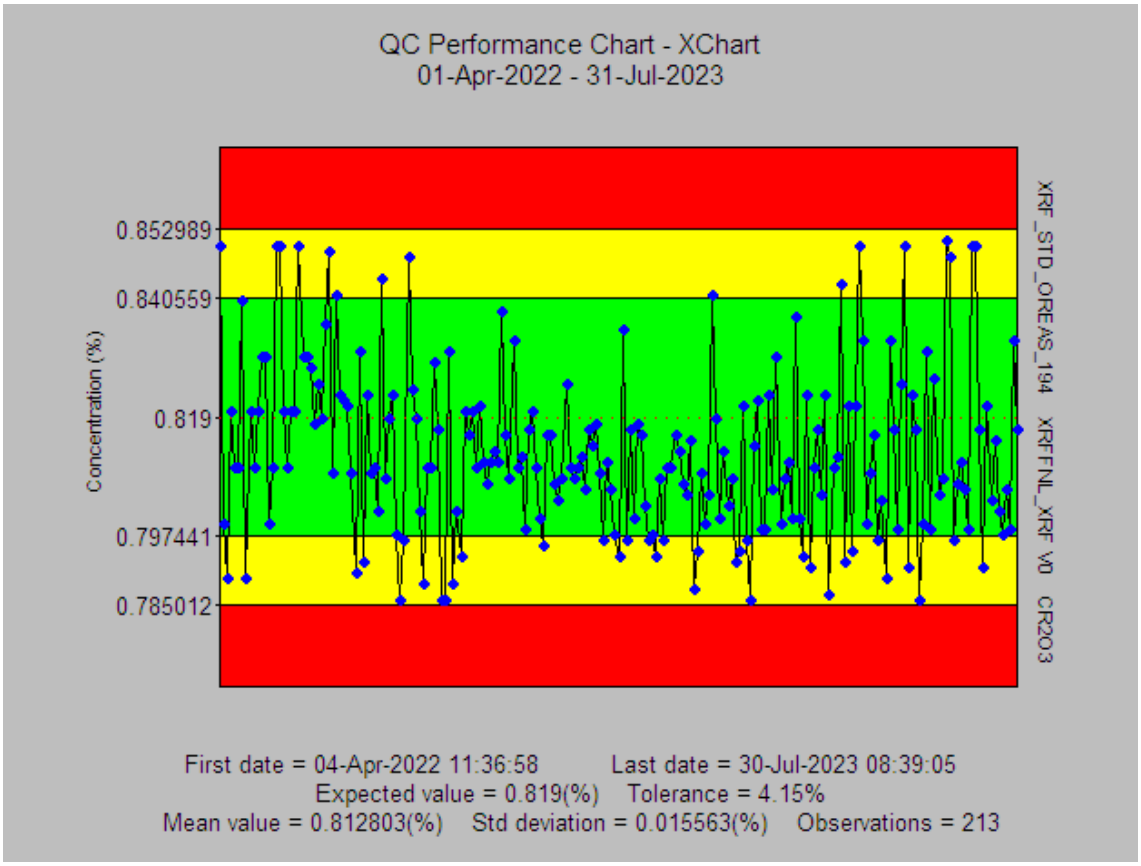
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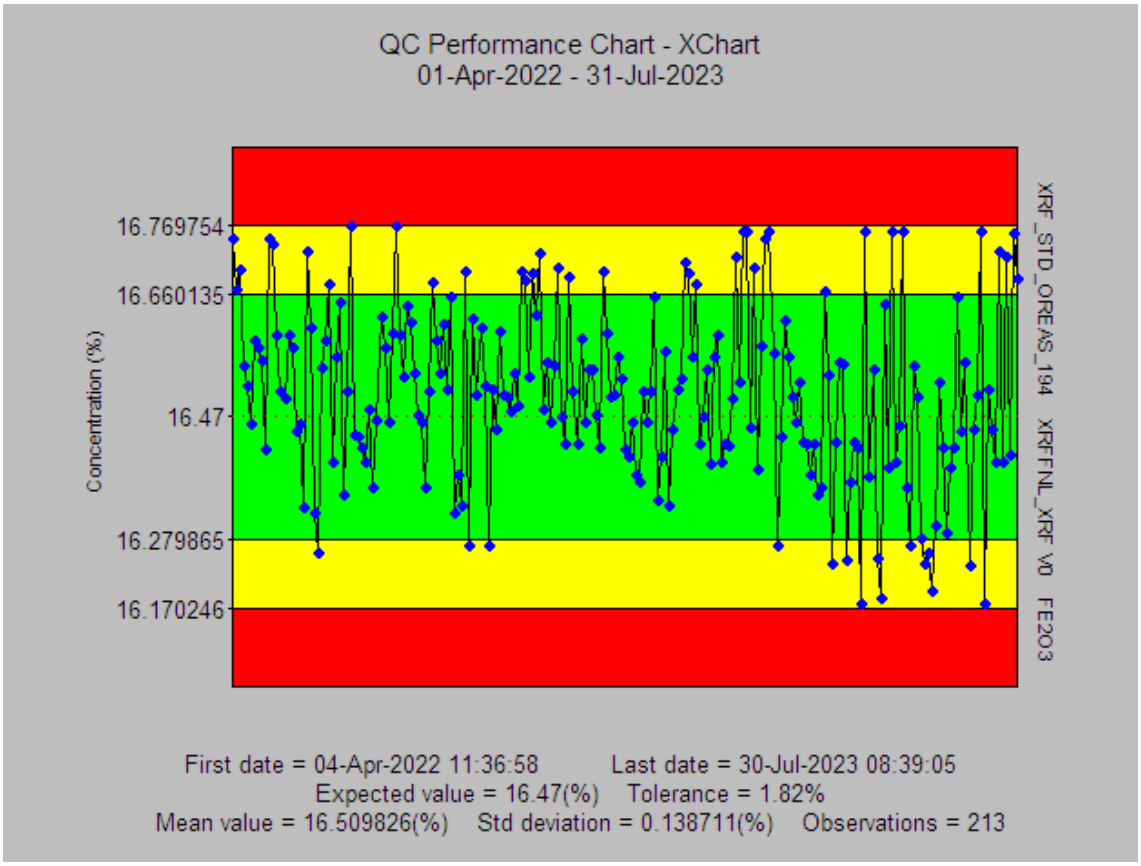
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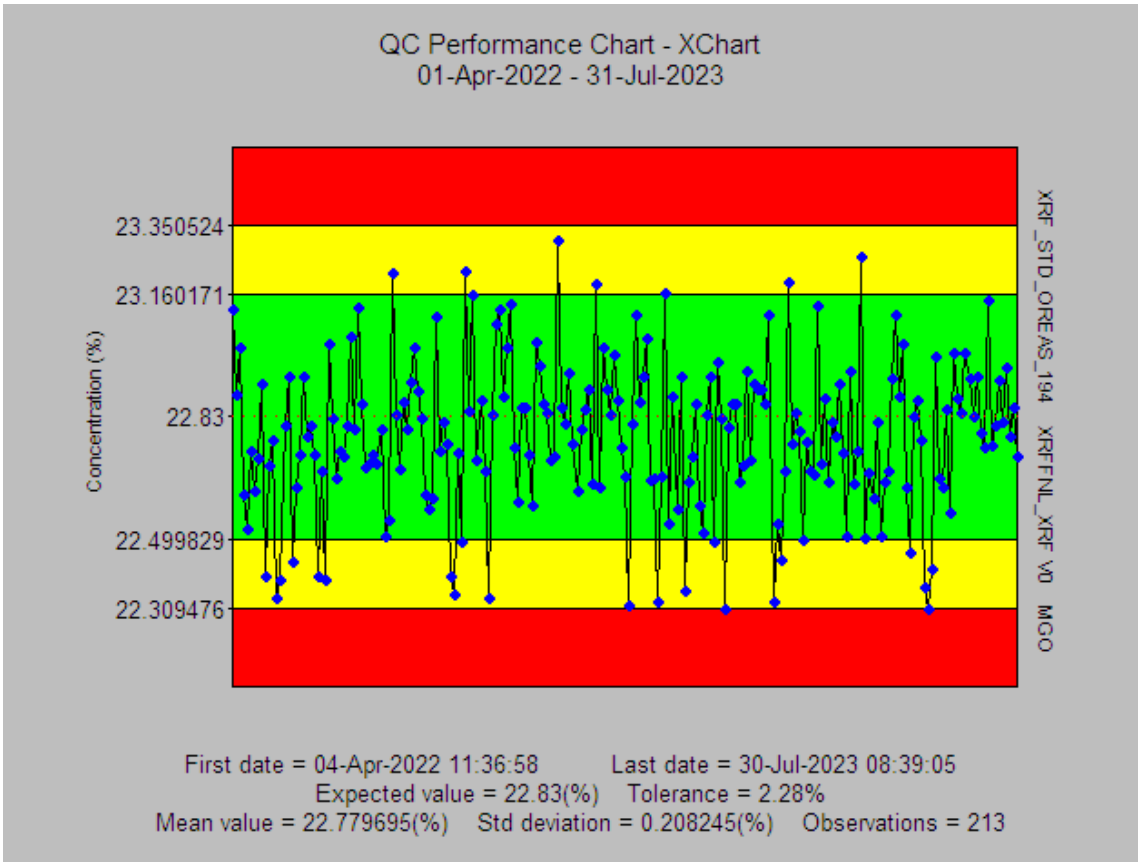
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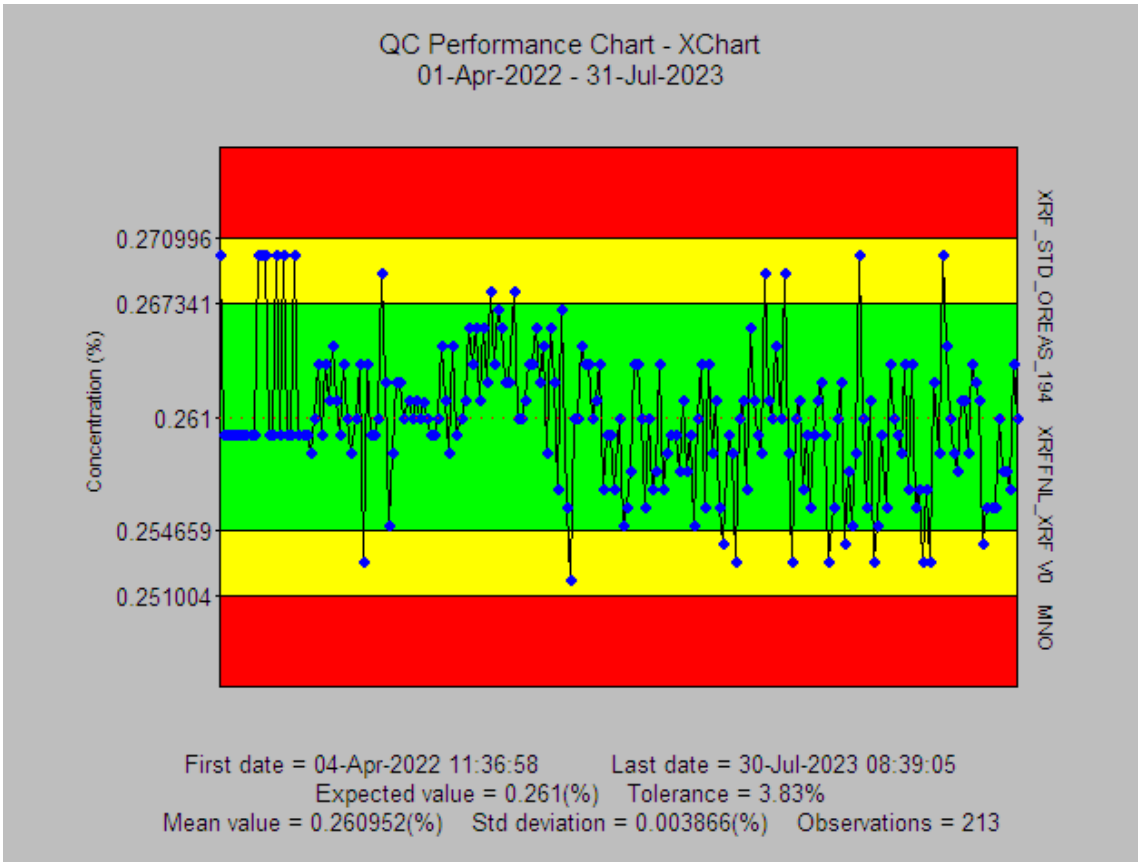


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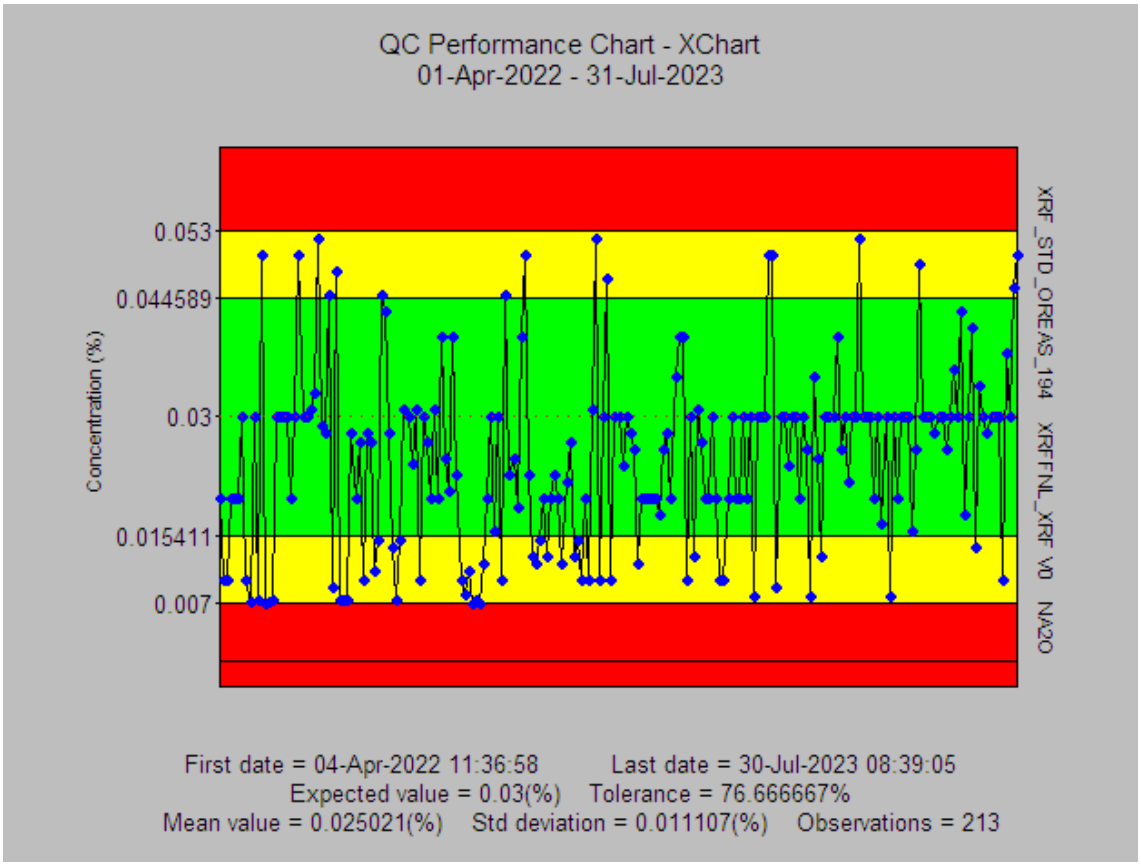
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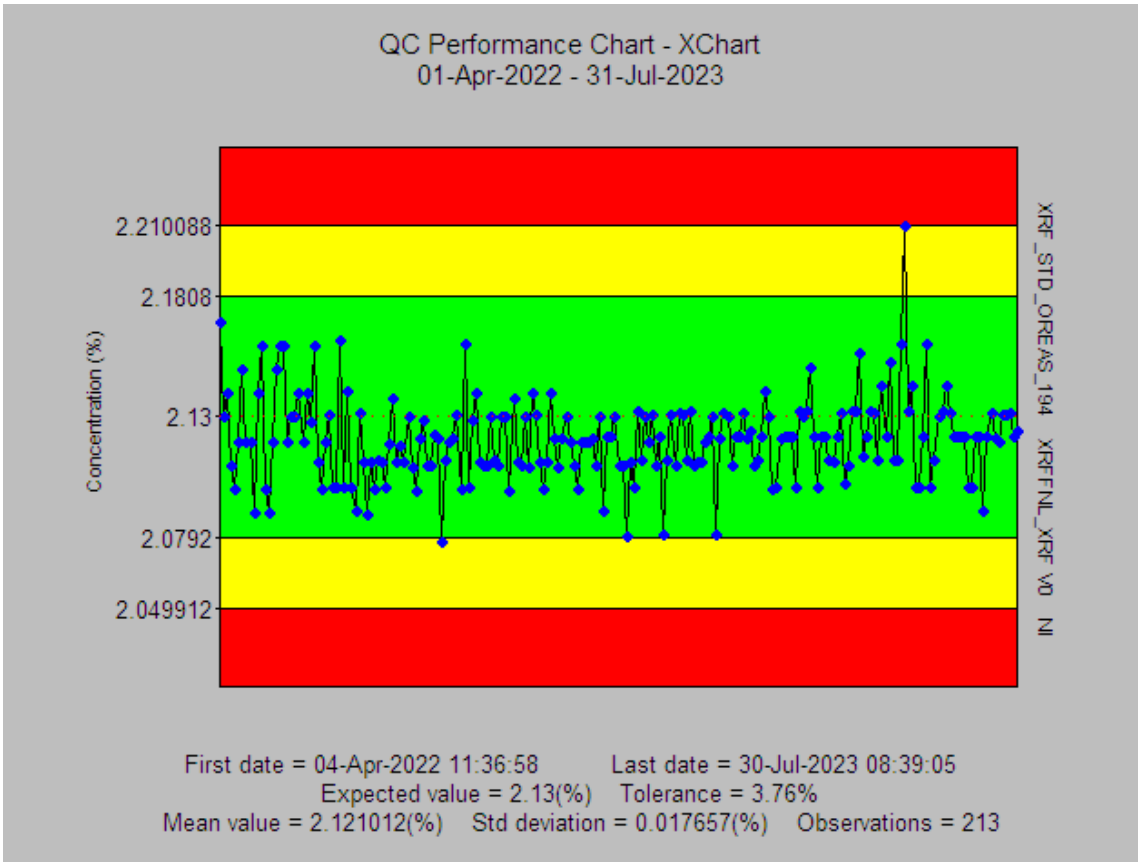
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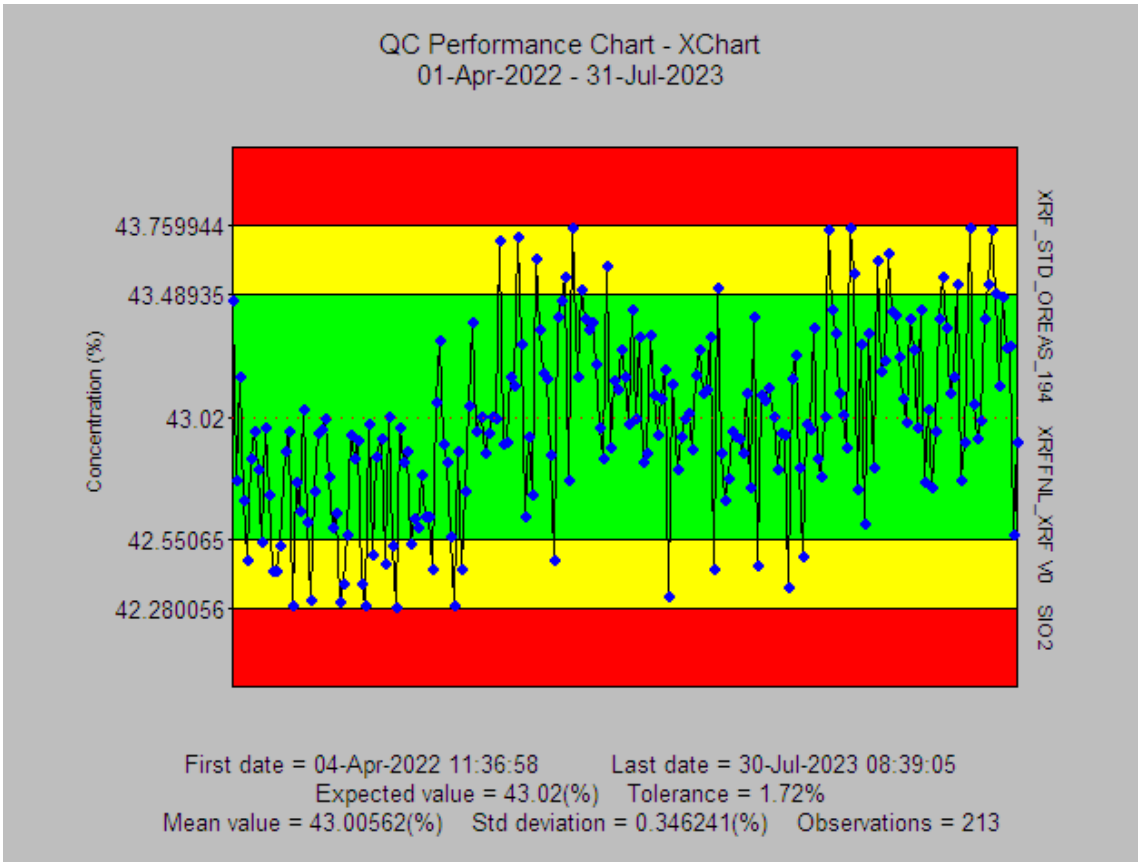


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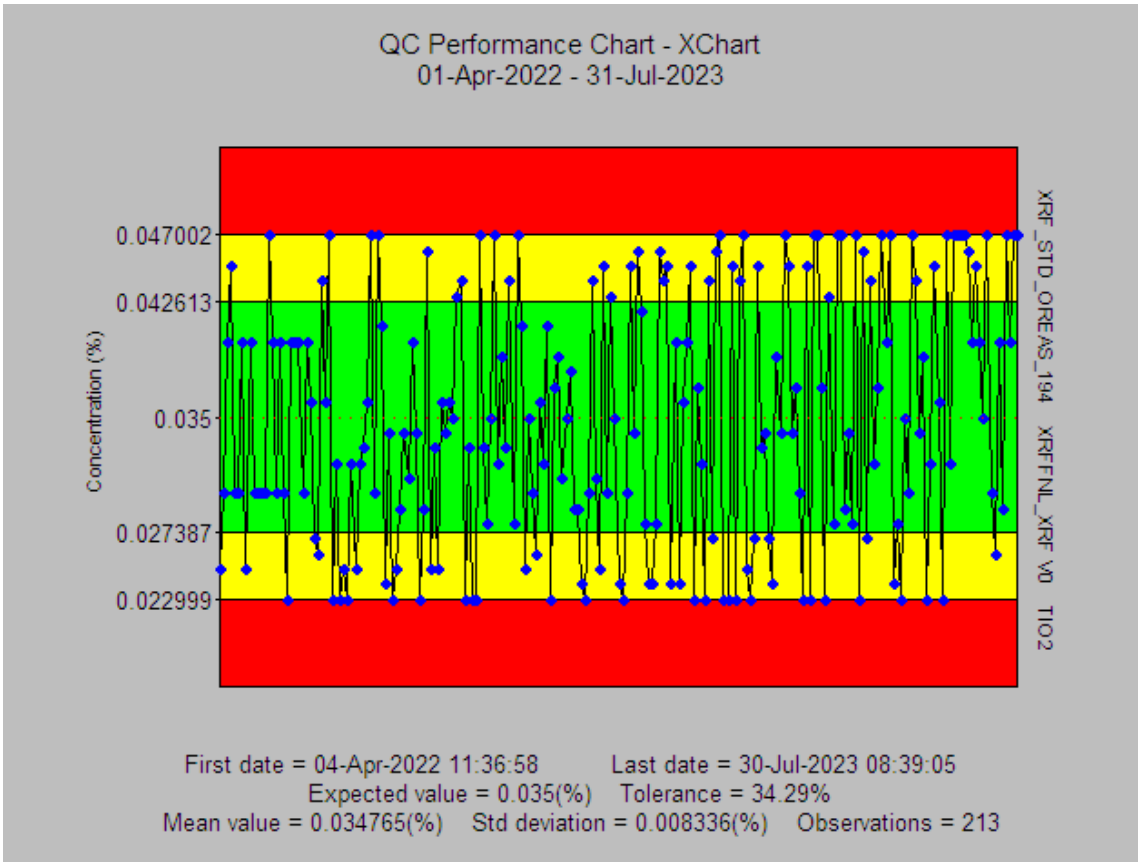
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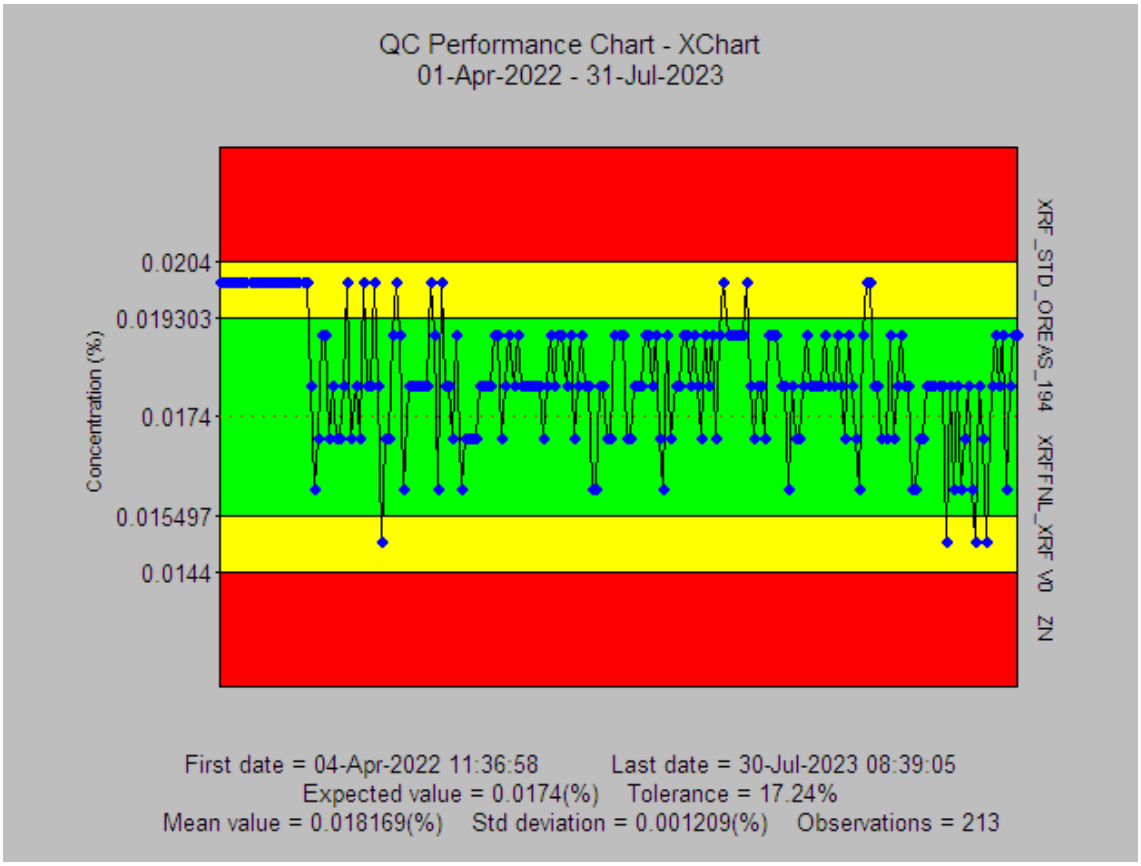
XRF_STD_OREAS_194 - SIO2



XRF_STD_OREAS_194 - TIO2

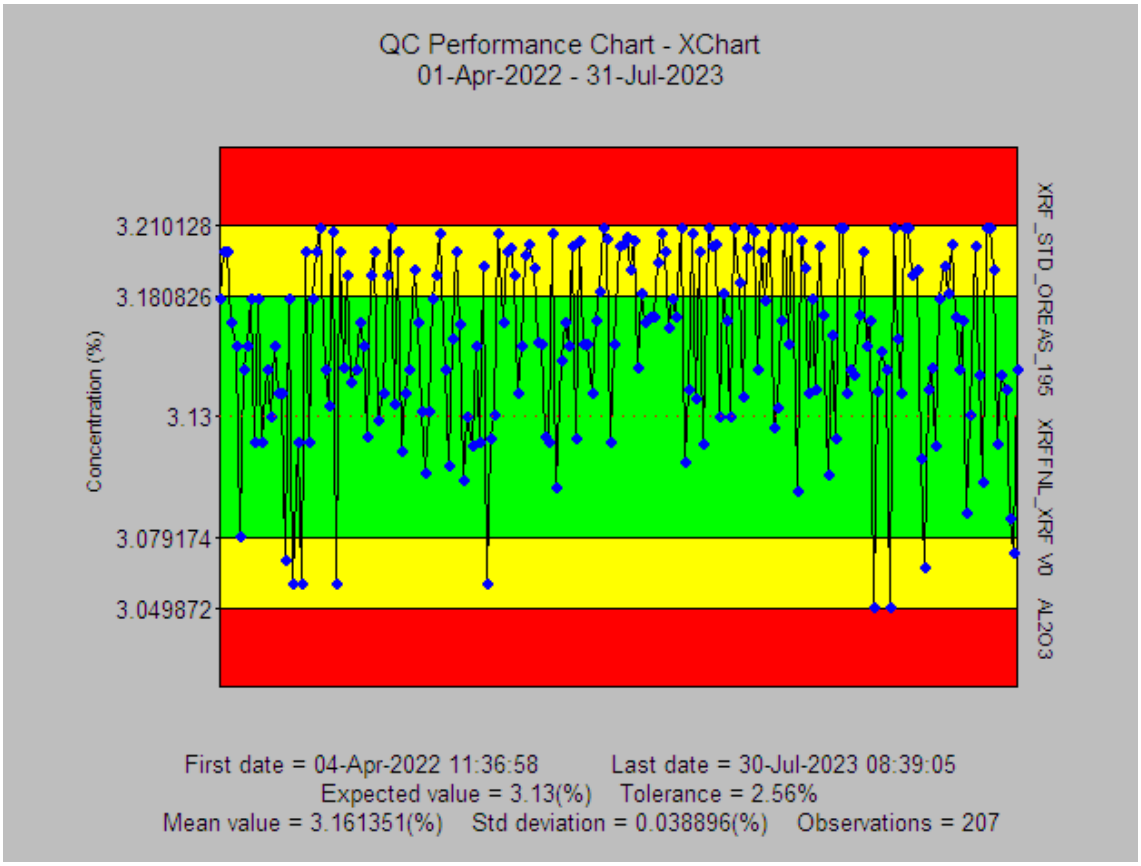


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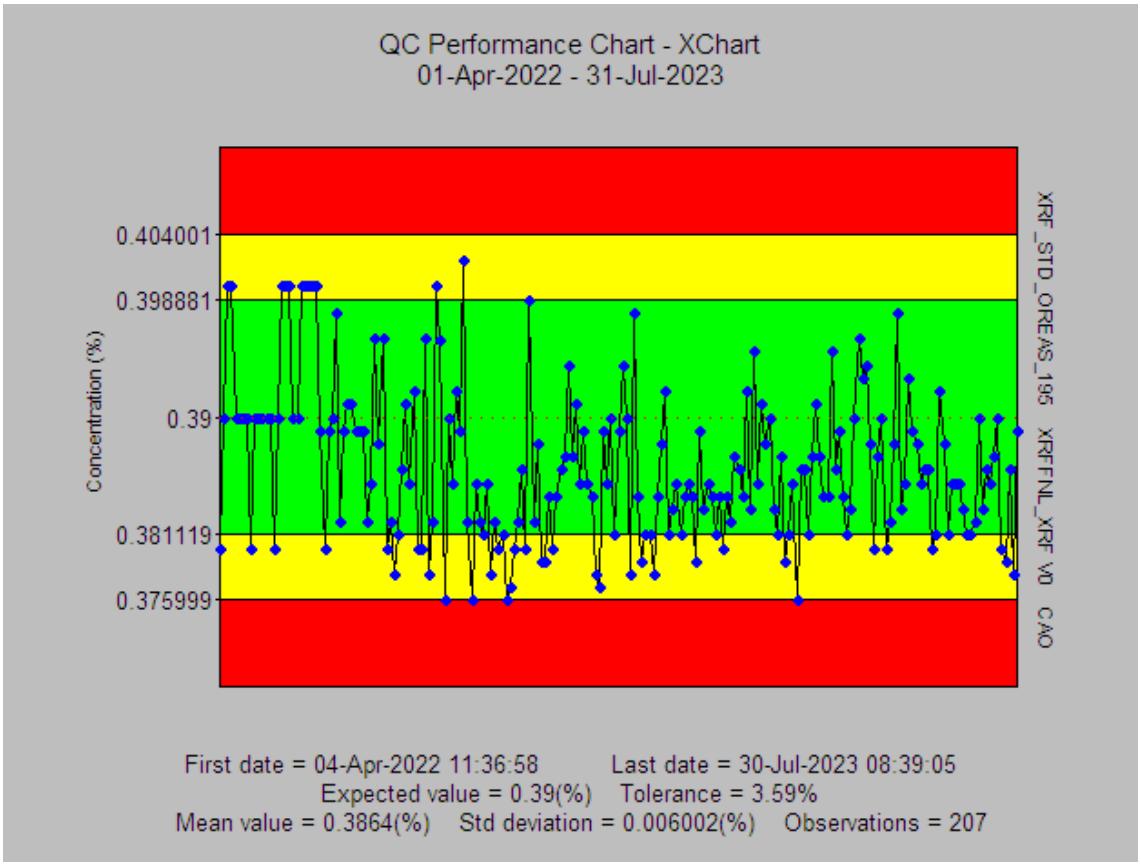
PT. GEOSERVICES - CIKARANG LABORATORY

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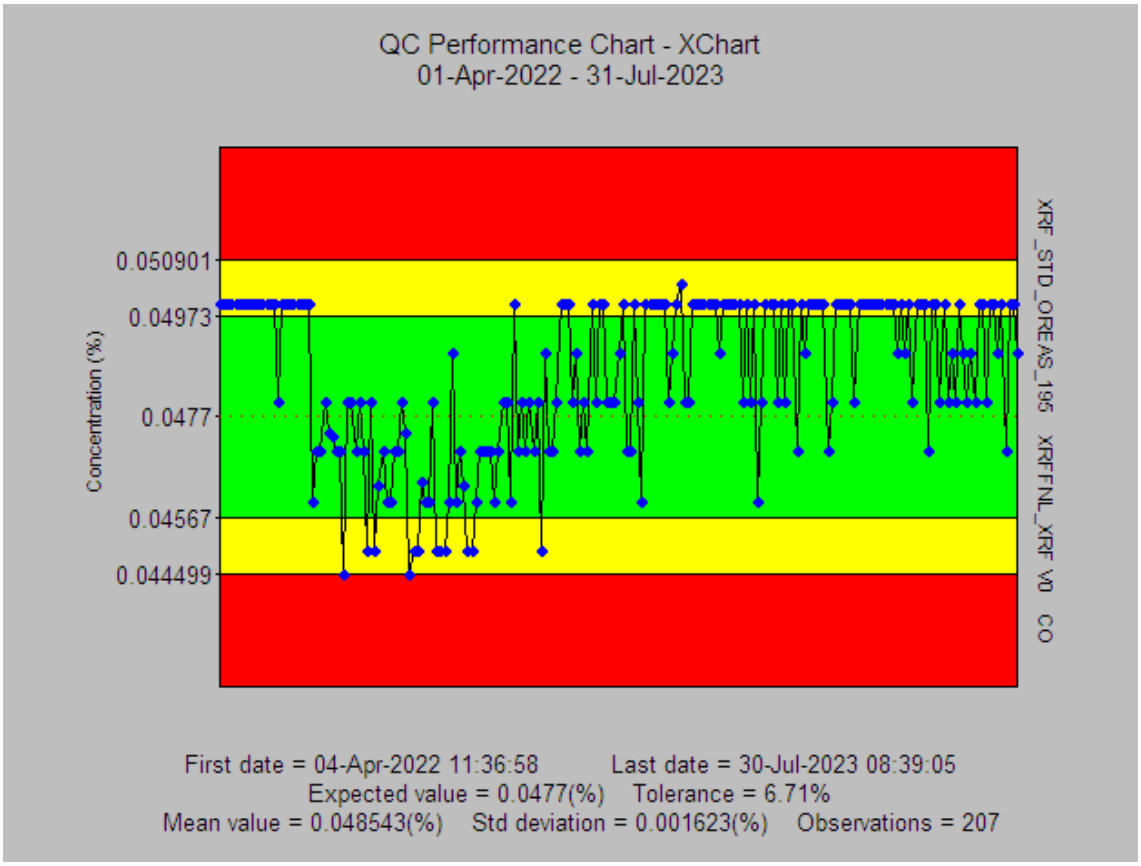


PT. GEOSERVICES - CIKARANG LABORATORY

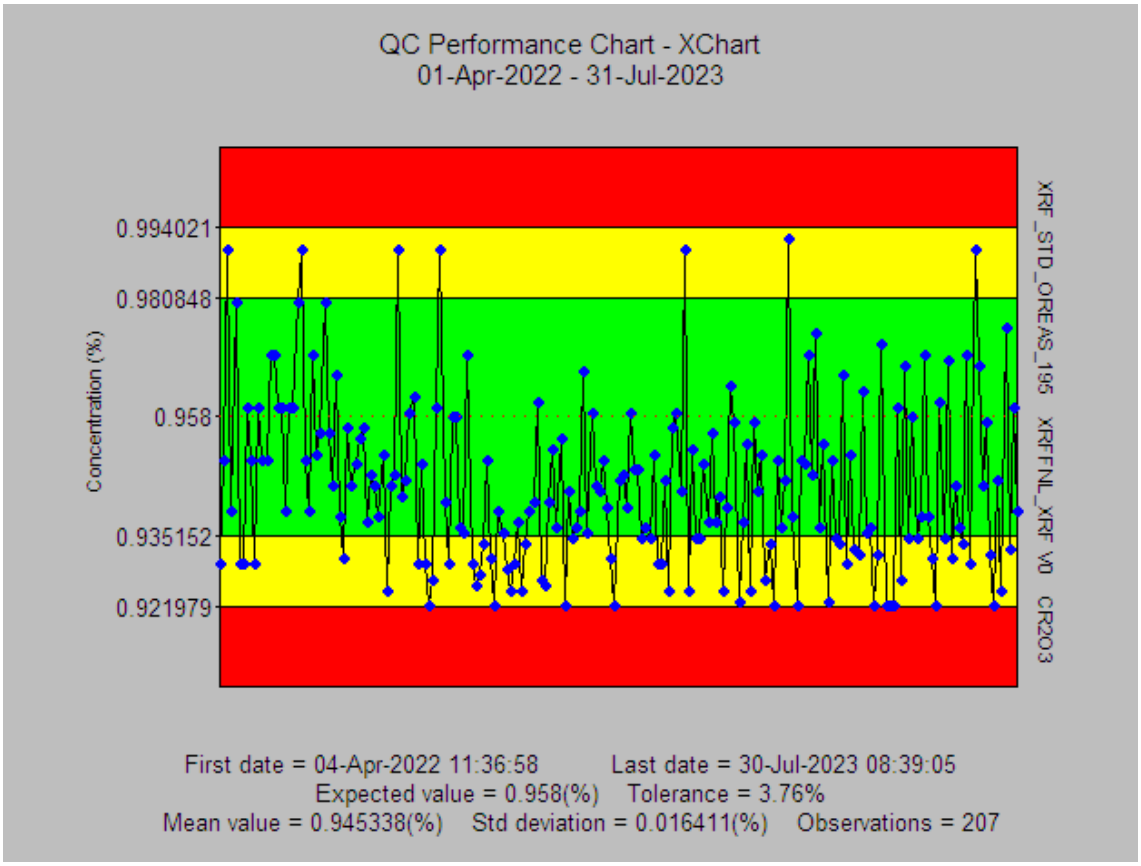
XRF_STD_OREAS_195 - CAO



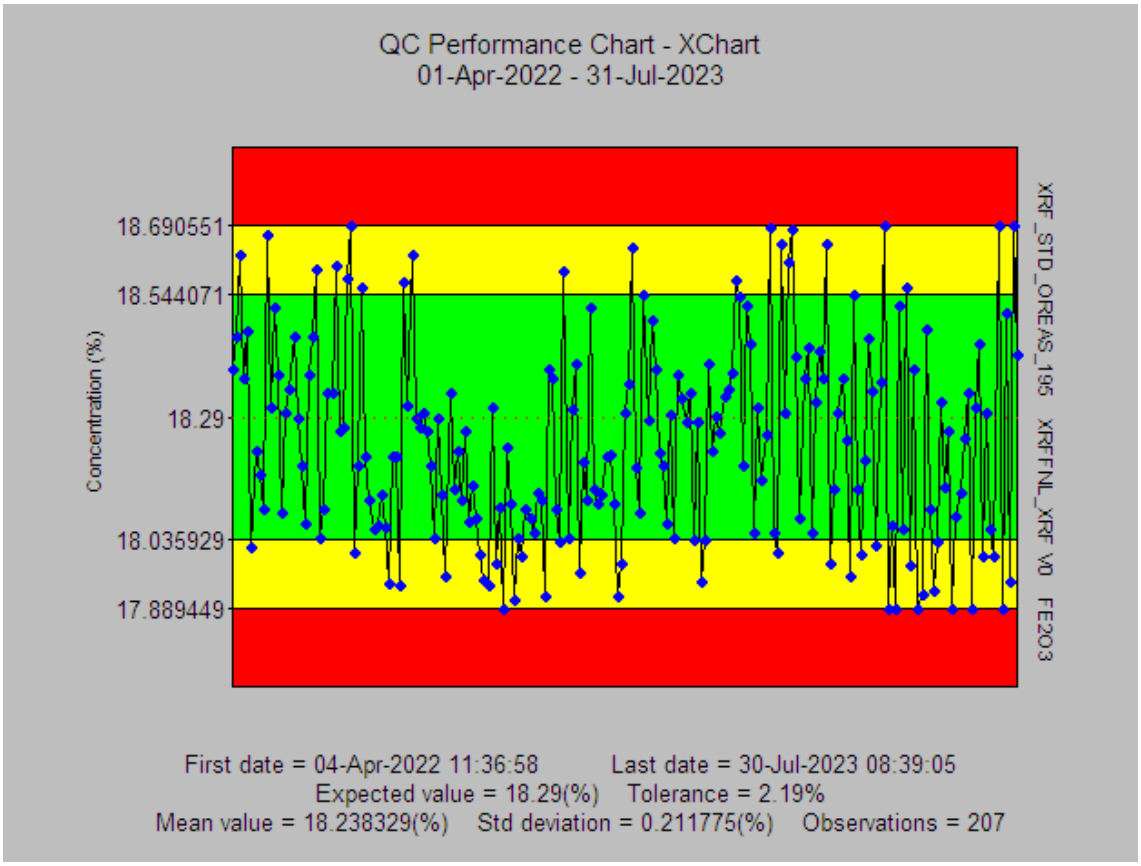
XRF_STD_OREAS_195 - CO



XRF_STD_OREAS_195 - CR2O3

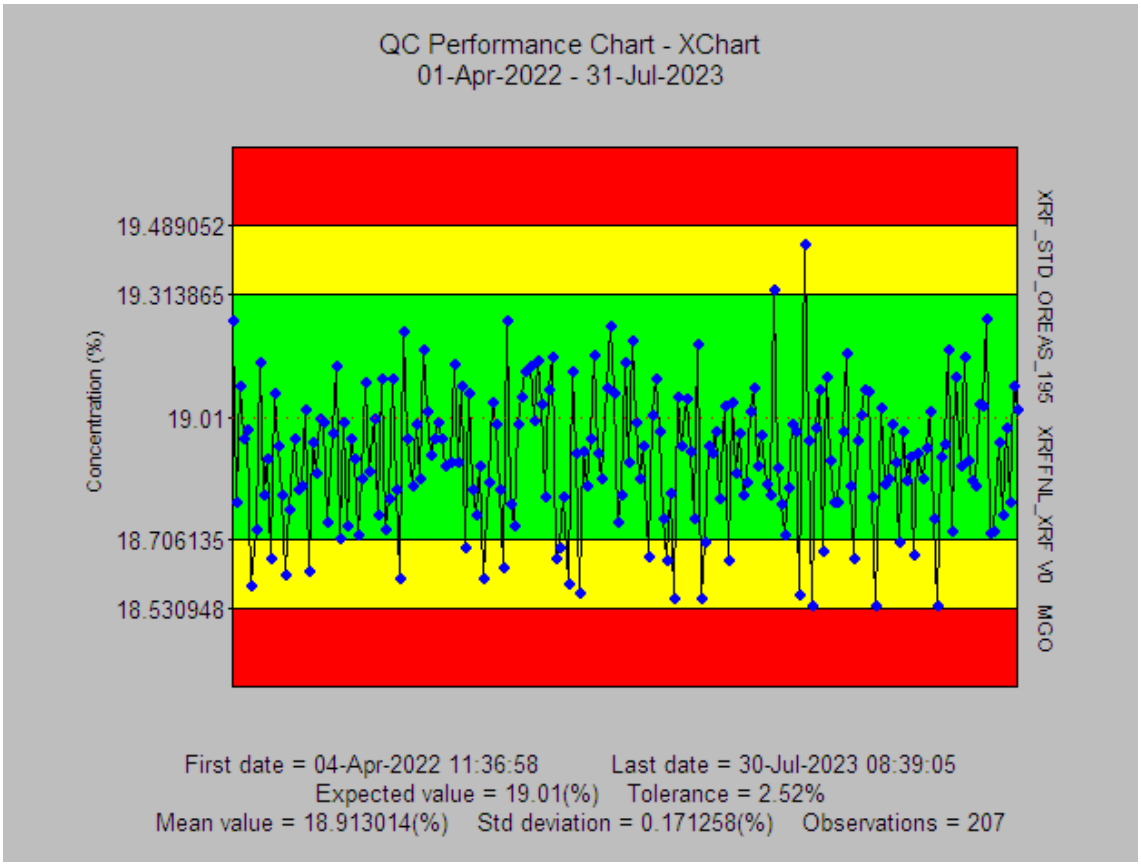


XRF_STD_OREAS_195 - FE2O3



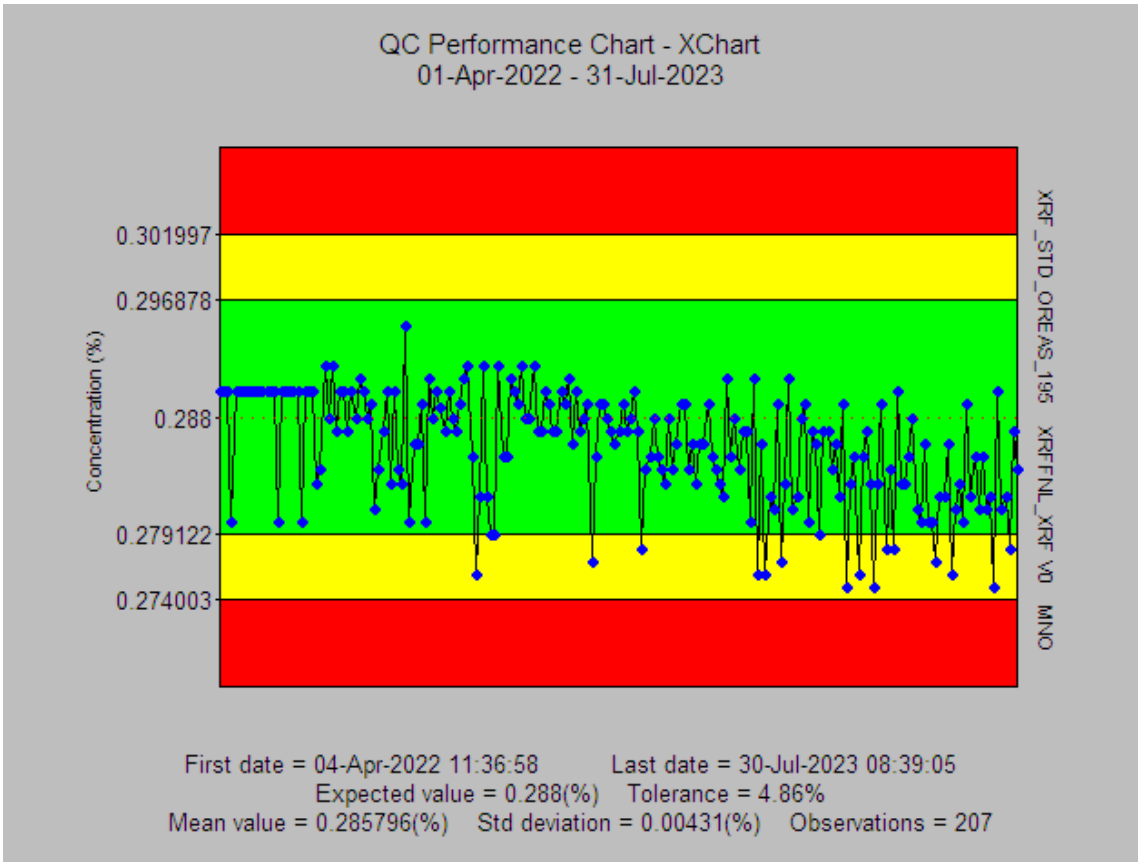
PT. GEOSERVICES - CIKARANG LABORATORY

XRF_STD_OREAS_195 - MGO

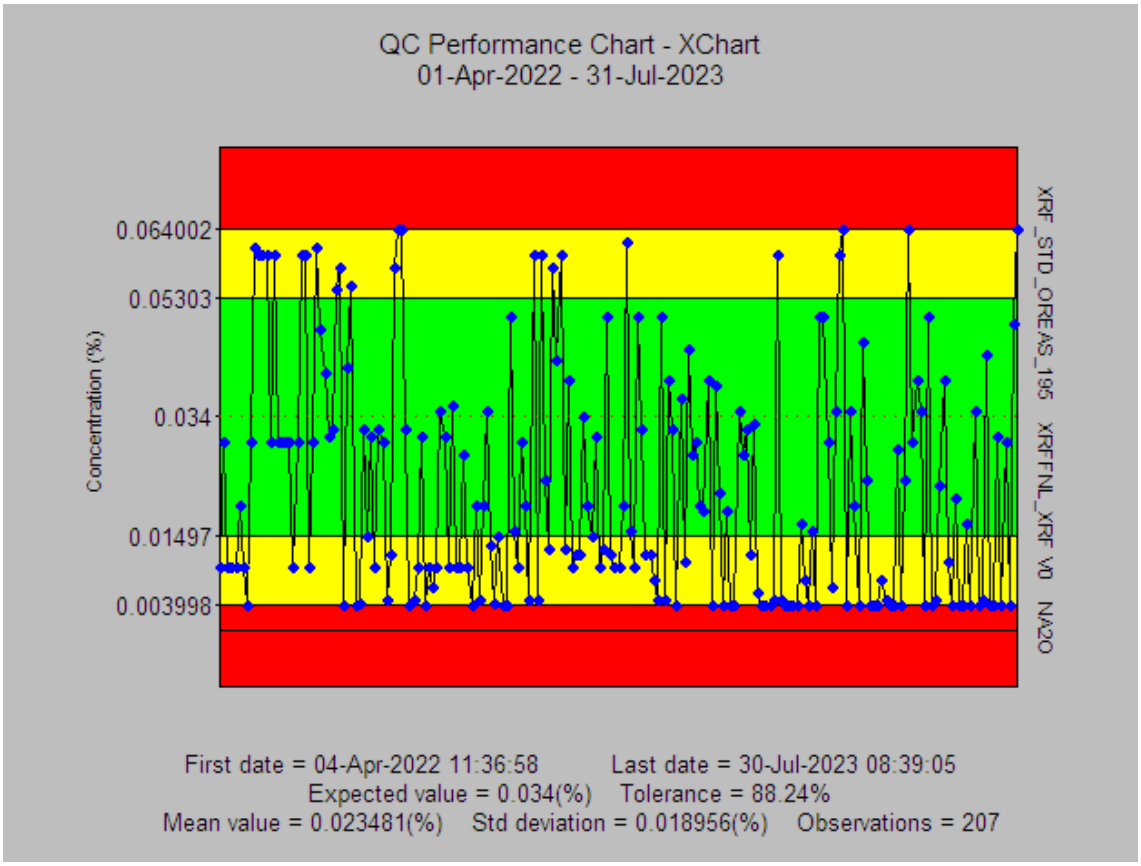


PT. GEOSERVICES - CIKARANG LABORATORY

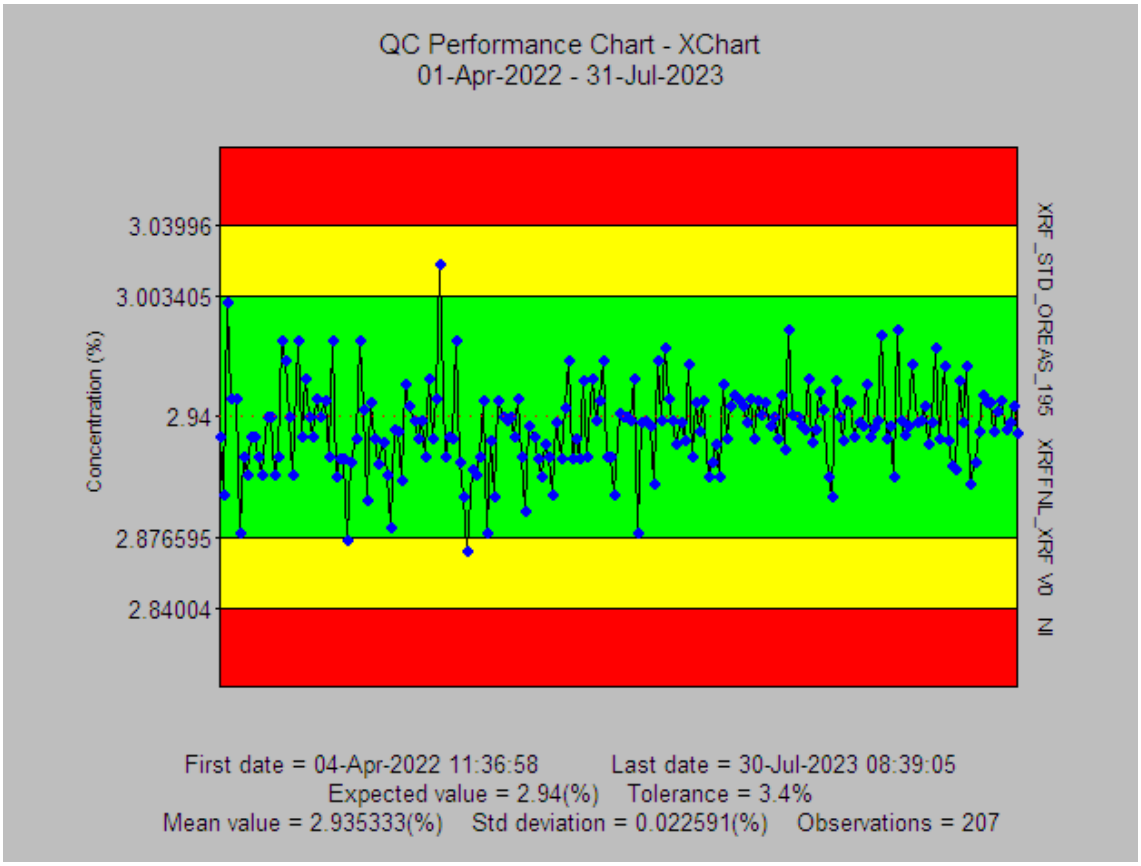
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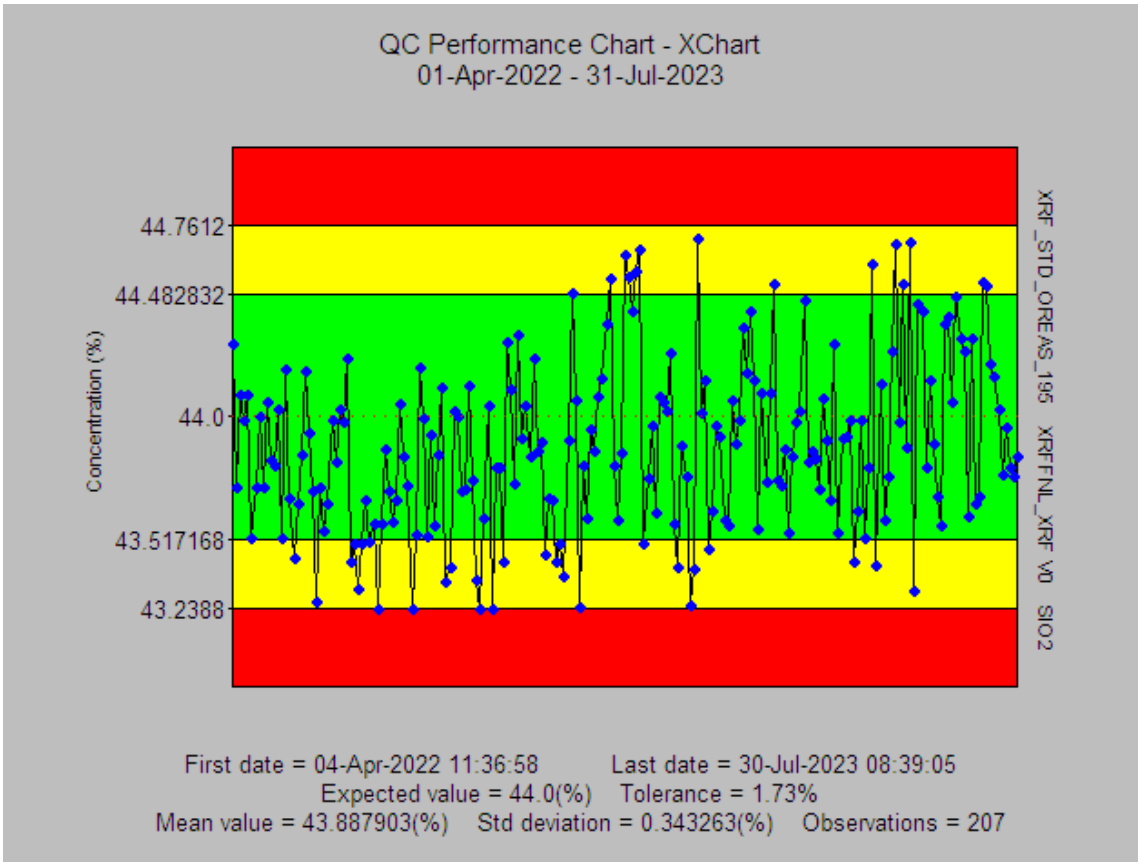
XRF_STD_OREAS_195 - NA2O



XRF_STD_OREAS_195 - NI

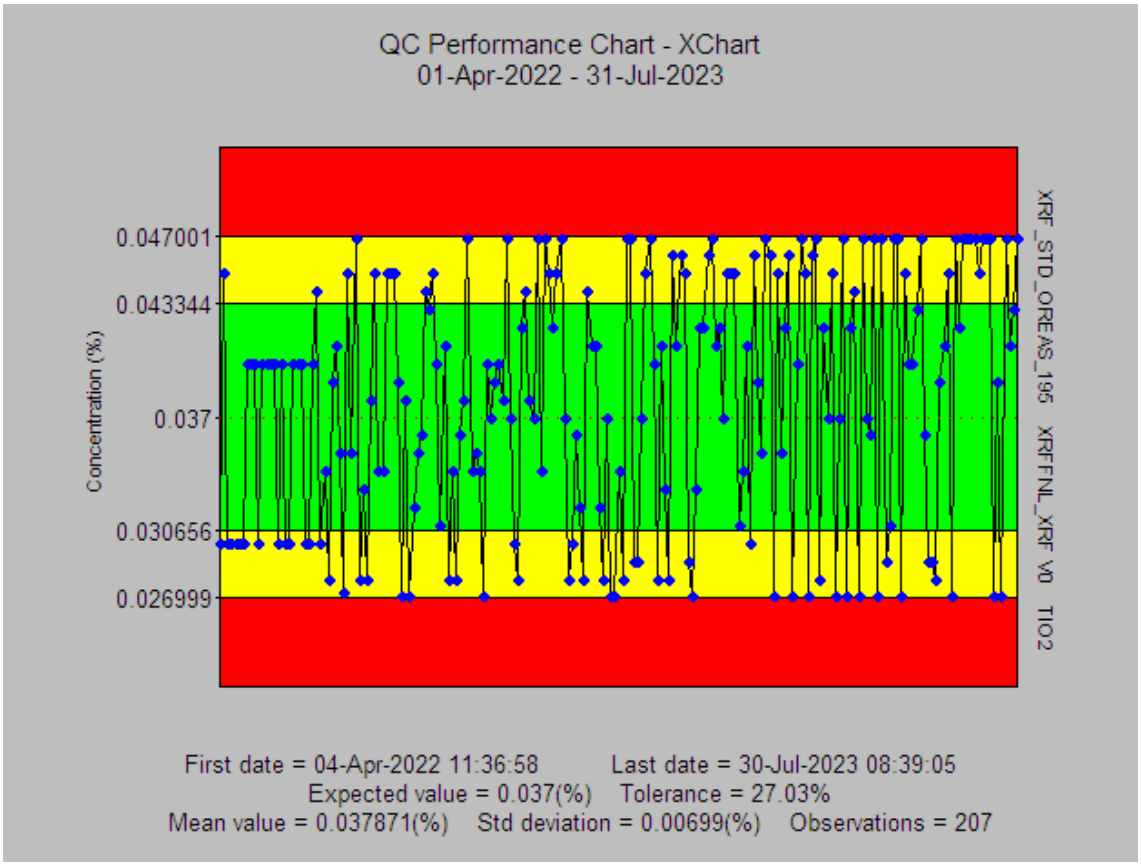


XRF_STD_OREAS_195 - SIO2

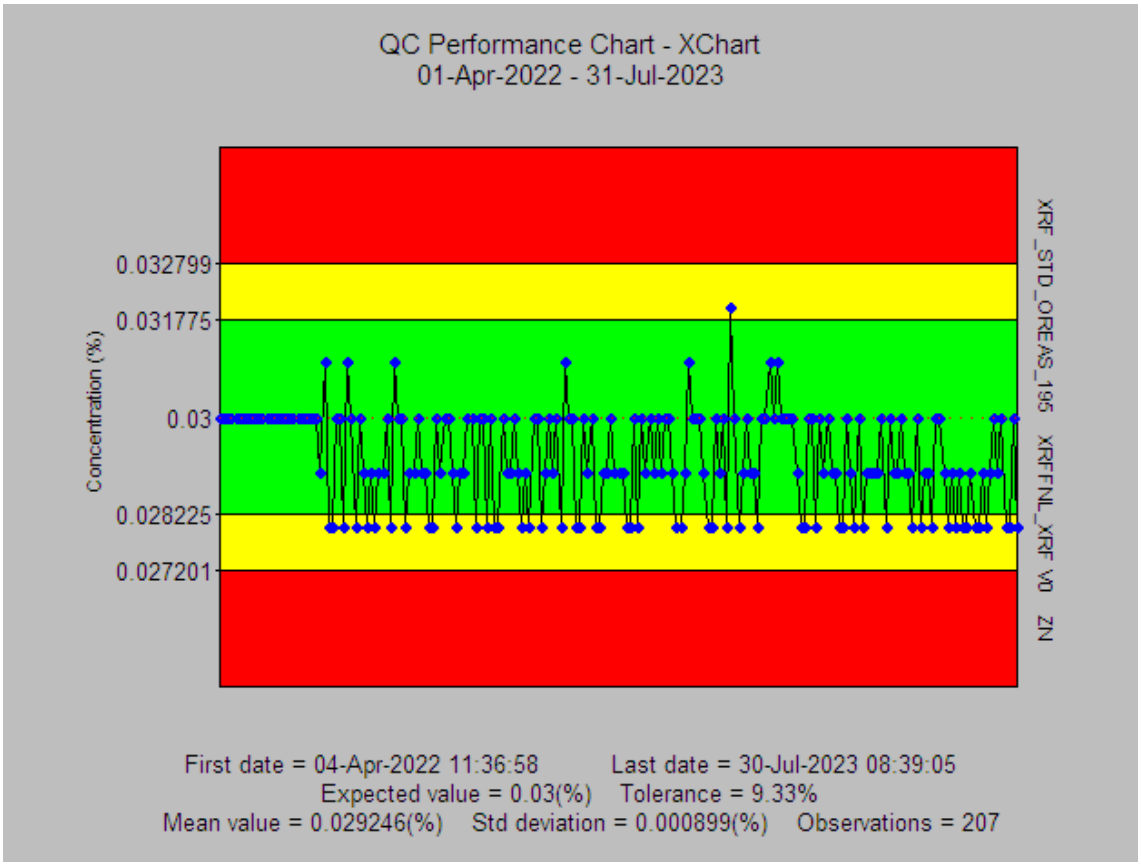


PT. GEOSERVICES - CIKARANG LABORATORY

XRF_STD_OREAS_195 - TIO2



XRF_STD_OREAS_195 - ZN



APPENDIX 6

GEOTECHNICAL ANALYSIS RESULTS

PT. GEOSERVICES – GEOTECHNICAL LABORATORY
Jl. Industri Selatan 2, Blok MM1, Jababeka 2, Cikarang, Bekasi 17520, Indonesia

Geotechnical Technical Report

for

PT. Iriana Mutiara Mining

Report Number GTK.00384

The results contained in this report relate only to the sample(s) submitted for testing. Geoservices Laboratory accepts no responsibility for the representativeness of the sample(s) submitted for testing.

SUMMARY

From April 26 to August 06 2023, a defined Geotechnical testwork program was carried out on sample originating from PT. Iriana Mutiara Mining.

The key findings arising from the testwork program are summarized below:

Testwork 1 Geotechnical

The key finding from Geotechnical Testwork are summarized in the following table:

Table 1 - Testwork 1 Summary of Geotechincal

Sample ID:	GT-16-S-01 (1.85-2.05)	GT-16-S-02 (2.60-2.80)	GT-16-S-03 (3.70-3.90)	GT-16-S-04 (4.90-5.10)	GT-16-S-05 (6.60-6.80)	GT-16-S-06 (10.05-10.30)	
GEOTECHNICAL TESTWORK							Unit
Uniaxial Compressive Strength of Rock							
Et (50)							Gpa
Es (100)							Gpa
σC							Mpa
Unconfined Compressive Strength of Cohesive Soil							
qu	0.870		0.185	0.397		0.498	kg/cm2
Cu	0.435		0.093	0.199		0.249	kg/cm2
Triaxial Compression - Unconsolidated, Undrained (UU)							
C		34.70					Kpa
φ		9.80					(°)
Triaxial Compression - Consolidated, Undrained (CU-BP)							
C					25.91		Kpa
φ					14.60		(°)
C'					2.55		Kpa
φ'					36.20		(°)

Sample ID:	GT-16-S-07 (12.55-12.76)	GT-16-S-08 (19.86-20.06)	GT-14-S-01 (1.00-1.20)	GT-14-S-02 (2.70-2.90)	GT-14-S-03 (5.00-5.10)	GT-14-S-04 (7.10-7.30)	
GEOTECHNICAL TESTWORK							Unit
Uniaxial Compressive Strength of Rock							
Et (50)	1.26						Gpa
Es (100)	1.69						Gpa
σC	13.10						Mpa
Unconfined Compressive Strength of Cohesive Soil							
qu		0.280	1.195	0.542		0.337	kg/cm2
Cu		0.140	0.598	0.271		0.168	kg/cm2
Triaxial Compression - Unconsolidated, Undrained (UU)							
C							Kpa
φ							(°)
Triaxial Compression - Consolidated, Undrained (CU-BP)							
C					46.73		Kpa
φ					8.90		(°)
C'					40.67		Kpa
φ'					19.80		(°)

Sample ID:	GT-14-S-05 (10.05-10.30)	GT-14-S-06 (10.80-11.15)	GT-14-S-07 (12.30-12.55)	GT-14-S-08 (14.60-14.82)	GT-14-S-09 (15.40-15.67)	GT-14-S-10 (22.98-23.30)	
GEOTECHNICAL TESTWORK							Unit
Uniaxial Compressive Strength of Rock							
Et (50)							Gpa
Es (100)							Gpa
σC							Mpa
Unconfined Compressive Strength of Cohesive Soil							
qu		0.765	0.344	0.278	0.911	0.896	kg/cm2
Cu		0.382	0.172	0.139	0.455	0.448	kg/cm2
Triaxial Compression - Unconsolidated, Undrained (UU)							
C							Kpa
φ							(°)
Triaxial Compression - Consolidated, Undrained (CU-BP)							
C	71.67						Kpa
φ	18.00						(°)
C'	106.98						Kpa
φ'	16.60						(°)

Remark : Not Analyze

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PT. Geoservices Ltd has performed the Services and prepared this Report based only upon the sample material that the Client provided to PT. Geoservices Ltd.

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1. The drilling, collection, or transportation of the samples: and
2. The handling of the samples prior to their delivery to Geoservices

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The results presented in this report pertain only to the sample(s) as received.

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1 INTRODUCTION

The objective of this testing program was to provide Geotechnical testwork data on client submitted samples.

A total of 18 sample were received at Cikarang Laboratory on 26/04/2023

The test program is shown as workflow diagram in paragraph 3 (Testwork Flowchart – Figure 1) and includes testwork provision as follows:

- Sample Preparation
- Geotechnical Testwork

Testwork method summaries are provided in paragraph 4 with paragraph 5 containing the summary results of the individual testwork methods provided. Worksheets and other information relating to the test program are provided in the appendices.

Testwork results were communicated to the client when available to enable the testwork program to progress on a fully informed basis.

This report summarizes key results from the test program, using data summaries and graphical displays.

Wayne Turner

Mineral Division

2 SAMPLE INFORMATION

A total 18 of samples were submitted for testwork as per following table :

Table 2 - Sample Identification

PT. Iriana Mutiara Mining - Sample Identification											
No	Based on the Sample received			Sample Dimension		Testwork on the Sample received				Testwork on Sample	LITHOLOGY
						ROCK	SOIL				
	Sample ID	Depth (m)		Length of Massive Sample (cm)	Diameter (mm)	UCS Rock	UCS Soil	TRIAXIAL UU	TRIAXIAL CU		
		From	To								
BATCH 9		BOX 1									
1	GT-16-S-01	1.85	2.05	19	61		✓			UCT	LIMONIT
2	GT-16-S-02	2.60	2.80	18.5	61.88			✓		TRX UU	LIMONIT
3	GT-16-S-03	3.70	3.90	20	61		✓			UCT	LIMONIT
4	GT-16-S-04	4.90	5.10	20.5	61.5		✓			UCT	LIMONIT
5	GT-16-S-05	6.60	6.80	18.5	61.3				✓	TRX CU	SAPROLIT
6	GT-16-S-06	10.05	10.30	25	60		✓			UCS	SAPROLIT
7	GT-16-S-07	12.55	12.76	17.5	57.6	✓				UCS	CORESTONE
8	GT-16-S-08	19.86	20.06	19.5	61.5		✓			UCS	SAPROLIT
BATCH 9		BOX 2									
1	GT-14-S-01	1.00	1.20	22	62.3		✓			UCT	LIMONIT
2	GT-14-S-02	2.70	2.90	21.2	60.4		✓			UCT	LIMONIT
3	GT-14-S-03	5.00	5.10	22.5	61.6				✓	TRX CU	SAPROLIT
4	GT-14-S-04	7.10	7.30	21.5	62.7		✓			UCS	SAPROLIT
5	GT-14-S-05	10.05	10.30	25	60.5				✓	TRX CU	SAPROLIT
6	GT-14-S-06	10.80	11.15	31.5	61.58		✓			UCS	SAPROLIT
7	GT-14-S-07	12.30	12.55	25	60		✓			UCS	SAPROLIT
8	GT-14-S-08	14.60	14.82	27	59		✓			UCS	SAPROLIT
9	GT-14-S-09	15.40	15.67	26.5	55.8		✓			UCS	SAPROLIT
10	GT-14-S-10	22.98	22.30	32.5	58.5		✓			UCS	SAPROLIT
						1	13	1	3		
Note :			Not Analyzed								

Photos of the received samples provided below:



GT-16-S-01 (1.85-2.05)



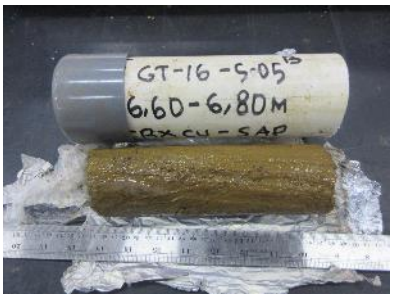
GT-16-S-02 (2.60-2.80)



GT-16-S-03 (3.70-3.90)



GT-16-S-04 (4.90-5.10)



GT-16-S-05 (6.60-6.80)



GT-16-S-06 (10.05-10.30)



GT-16-S-07 (12.55-12.76)



GT-16-S-08 (19.86-20.06)



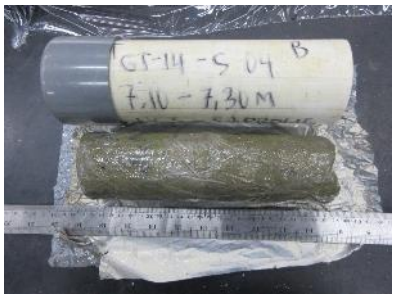
GT-14-S-01 (1.00-1.20)



GT-14-S-02 (2.70-2.90)



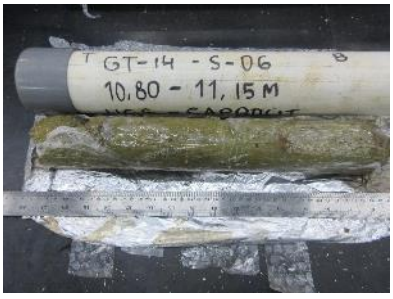
GT-14-S-03 (5.00-5.10)



GT-14-S-04 (7.10-7.30)



GT-14-S-05 (10.05-10.30)



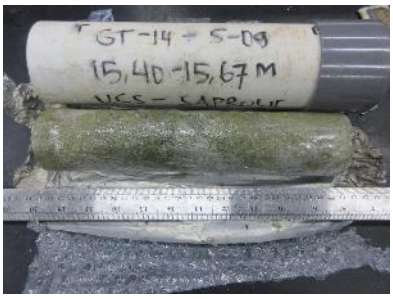
GT-14-S-06 (10.80-11.15)



GT-14-S-07 (12.30-12.55)



GT-14-S-08 (14.60-14.82)



GT-14-S-09 (15.40-15.67)



GT-14-S-10 (22.98-23.30)

Photo 1 - Received sample photo

3 TEST FLOWCHART

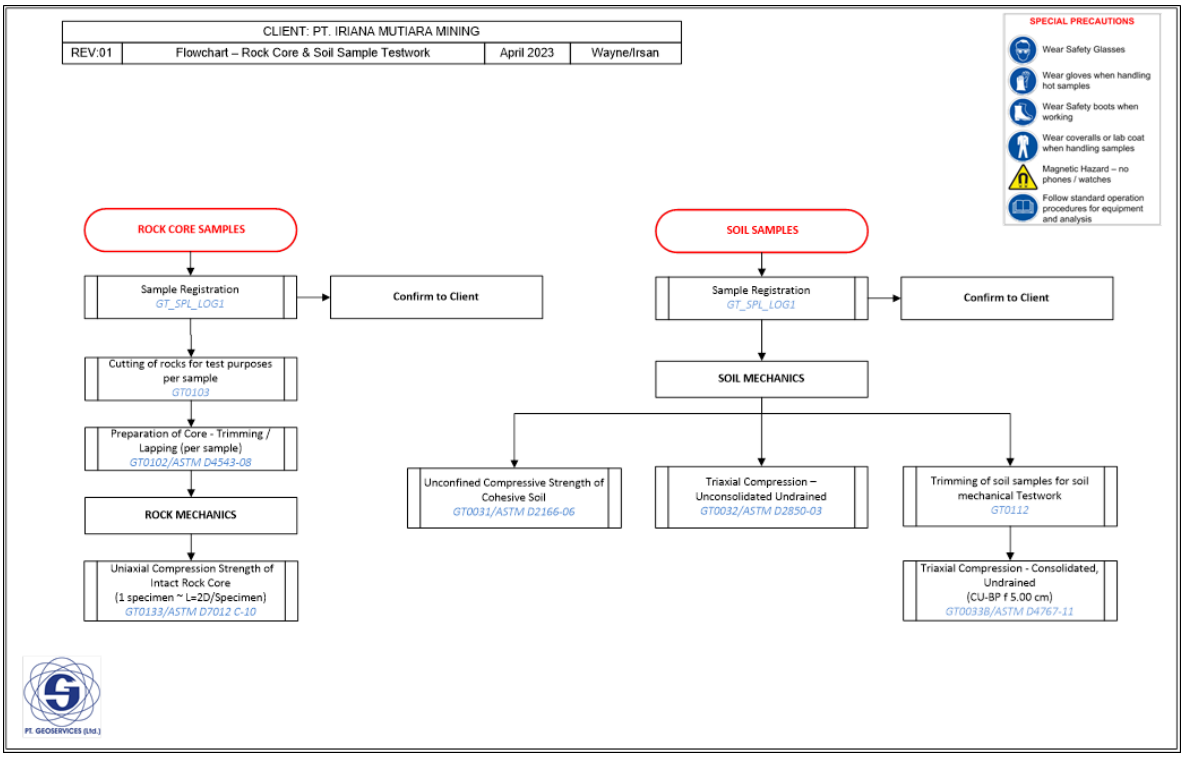


Figure 1 - Testwork Flowchart 1

4 TEST WORK METHOD SUMMARIES

The following method summaries were applied to the client samples for the project.

4.1 Testwork 1 – Geotechnical

4.1.1 GT0101/ASTM D4543-08 - Rock Samples Preparation

GT0103 Cutting of Rocks for Test Purposes per Sample - This test method covers the preparation of rock core sample is cut to length and the ends are machined flat.

GT0102 Preparation of Core - Lapping (per sample) - This test method covers the preparation of core samples to be flat both ends of the core using lapping machine.

4.1.2 GT0134/ASTM D7012 C-10- Uniaxial Compressive Strength of Intact Rock Core Specimens

Elastic Moduli of Intact Rock Core Specimens in Uniaxial Compression. This method determine compressive strength, elastic module.

4.1.3 GT0031/ASTM D2166-06 - Unconfined Compressive Strength of Cohesive Soil

This test method is applicable only to cohesive materials which will not expel or bleed water (water expelled from the soil due to deformation or compaction) during the loading portion of the test and which will retain intrinsic strength after removal of confining pressures, such as clays or cemented soils. Dry and crumbly soils, fissured or varved materials, silts, peats, and sands cannot be tested with this method to obtain valid unconfined compression strength values.

4.1.4 GT0032/ ASTM D2850-03- Triaxial Compression - Unconsolidated, Undrained (UU)

This test method covers determination of the strength and stress-strain relationships of a cylindrical specimen of either undisturbed or remolded cohesive soil. Specimens are subjected to a confining fluid pressure in a triaxial chamber. No drainage of the specimen is permitted during the test. The specimen is sheared in compression without drainage at a constant rate of axial deformation (strain controlled).

4.1.5 GT0033B/ASTM D4767-11 - Triaxial Compression - Consolidated, Undrained (CU-BP f 5.00 cm)

This test method covers the determination of strength and stress-strain relationships of a cylindrical specimen of either an undisturbed or remolded saturated cohesive soil. Specimens are isotropically consolidated and sheared in compression without drainage at a constant rate of axial deformation (strain controlled).

5.0 TESTWORK RESULT SUMMARIES

5.1 Testwork 1 Geotechnical

Table 3 - Uniaxial Compressive Strength (UCS) of Rock Results

Uniaxial Compression Strength (UCS) Result					
No	Sample ID	Depth (m)	Results		
			Et (50)	Es (100)	σC
1	GT-16 S-07	12.55-12.76	1.26	1.69	13.10
Unit			Gpa	Gpa	Mpa

Table 4 - Unconfined Compressive Strength (UCS) of Cohesive Soil Results

UCS Soil Results				
No	Sample ID	Depth (m)	Results	
			q_u	cu
1	GT-16-S-01	1.85-2.05	**0.870**	**0.435**
2	GT-16-S-03	3.70-3.90	**0.185**	**0.093**
3	GT-16-S-04	4.90-5.10	**0.397**	**0.199**
4	GT-16-S-06	10.05-10.30	**0.498**	**0.249**
5	GT-16-S-08	19.86-20.06	**0.280**	**0.140**
6	GT-14-S-01	1.00-1.20	**1.195**	**0.598**
7	GT-14-S-02	2.70-2.90	**0.542**	**0.271**
8	GT-14-S-04	7.10-7.30	**0.337**	**0.168**
9	GT-14-S-06	10.80-11.15	**0.765**	**0.382**
10	GT-14-S-07	12.30-12.55	**0.344**	**0.172**
11	GT-14-S-08	14.60-14.82	**0.278**	**0.139**
12	GT-14-S-09	15.40-15.67	**0.911**	**0.455**
13	GT-14-S-10	22.98-23.30	**0.896**	**0.448**
Unit			kg/cm^2	kg/cm^2

Table 5 - Triaxial Compression - Unconsolidated, Undrained (UU) Results

Triaxial UU Result					
No	Sample ID	Depth (m)		Total Stress	
		From	To	C	φ
1	GT-16 S-02	2.60	2.80	34.7	9.8
Unit				kPa	(°)

Table 6 - Triaxial Compression - Consolidated, Undrained (CU-BP) Results

Triaxial CU-BP Results					
No	Sample ID	Total Stress		Effective Stress	
		C	φ	C'	φ'
1	GT-16-S-05 (6.60-6.80)	25.91	14.6	2.55	36.2
2	GT-14-S-03 (5.00-5.10)	46.73	8.9	40.67	19.8
3	GT-14-S-05 (10.05-10.30)	71.67	18.0	106.98	16.6
Unit		kPa	(°)	kPa	(°)

APPENDICES

Appendix A – Testwork 1 Worksheets

Appendix A.1 Uniaxial Compressive Strength (UCS) of Rock Worksheets

GT-16-S-07 (12.55-12.76)

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UNIAXIAL COMPRESSION STRENGTH

Test Standard : ASTM D7012-D 10 / SNI 03-2825-1992

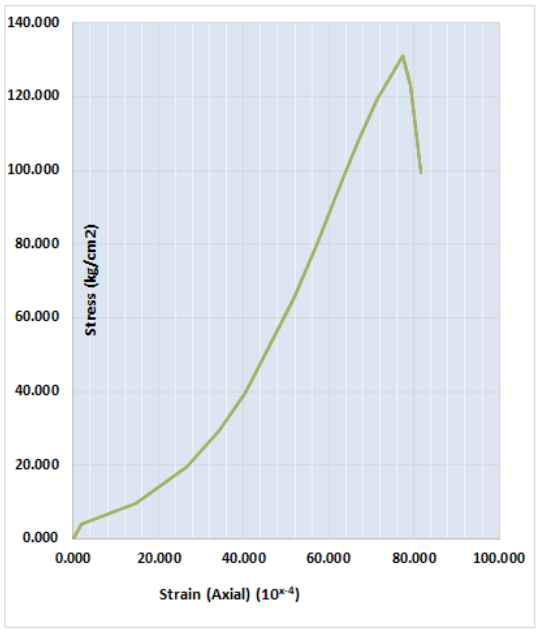
Client	: PT. Iriana Mutiara Mining	Sample ID	: GT-16 S-07
Job ID	: GTK.00384	Depth	: 12.55-12.76

Specimen :

Condition	Length (cm)	Diameter (cm)	Area (cm^2)	Volume (cm^3)	LD Correction	Weight (g)	Density (g/cm^3)
Natural	11.640	5.784	26.262	305.689	1.009119836	713.400	2.334

NO	Load (kg)	Stress (kg/cm^2)	Axial Measurement ((X10-3)mm) Axial	Strain (x10-4) Axial
1	0.00	0.000	0	0.000
2	103.23	4.048	23	1.976
3	250.90	9.838	171	14.691
4	500.37	19.619	310	26.632
5	746.97	29.288	399	34.278
6	1010.77	39.632	470	40.378
7	1661.68	65.154	601	51.632
8	1783.55	69.932	622	53.436
9	2040.18	79.994	664	57.045
10	2292.52	89.888	706	60.653
11	2563.49	100.513	747	64.175
12	2754.18	107.990	778	66.838
13	3039.49	119.177	829	71.220
14	3342.00	131.038	901	77.405
15	3139.85	123.112	923	79.296
16	2534.82	99.389	949	81.529

Stress vs Strain Graphic



Results

Tangent Modulus (Axial),Et (50)	1.26E+04	=	1.26	Gpa
Secant Modulus (Axial), Es (100)	1.69E+04	=	1.69	Gpa
Compresive Strength, τc	131.04 (kg/cm^2)	=	13.10	Mpa
Failure Type - Mode Assessment	Single Shear			

Comment

Specimen Image

Before	After
	

Apparatus

Machine	: Universal Testing Machine (JTM)
Capacity	: 200 ton
Latest Calibration Date	: December 28, 2022

Tested by Geotechnical Team

Tested date	: 12 June 2023
Tested by	: Ali
Checked by	: Fakhri/Irsan

Worksheet 1 - UCS Rock of GT-16-S-07 (12.55-12.76)

Appendix A.2 Unconfined Compressive Strength (UCS) of Cohesive Soil Worksheets

GT-16-S-01 (1.85-2.05)

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Geotechnical Laboratory

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166/SNI 03-3638-1994

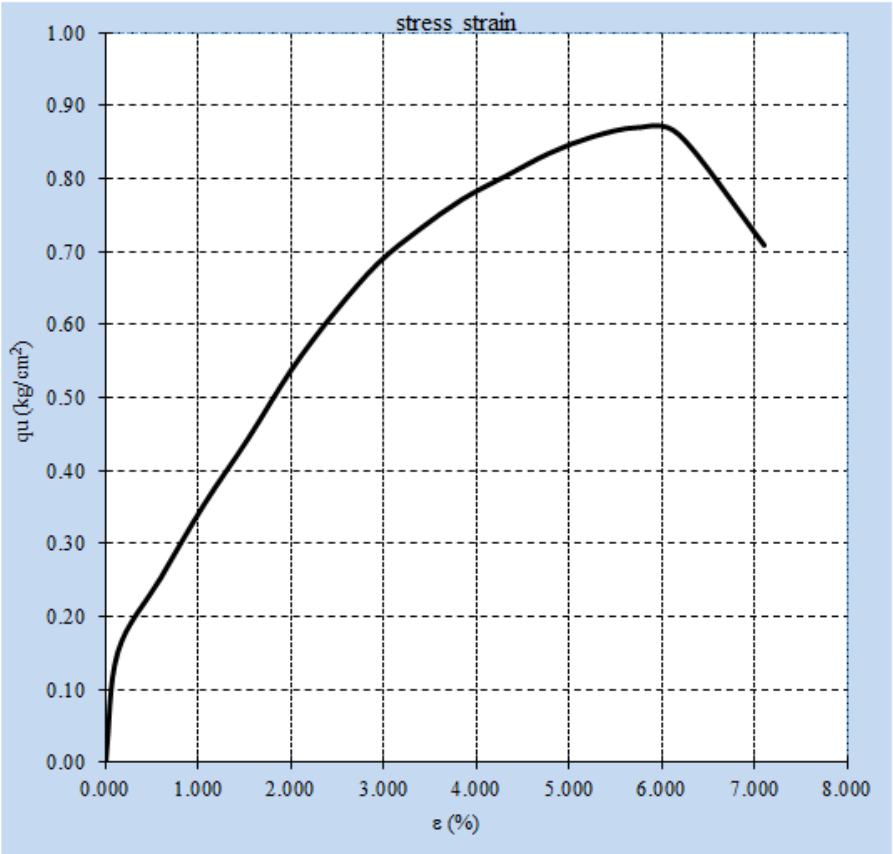
Client	: PT. Iriana Mutiara Mining	**Sample ID**	: GT-16-S-01
Job ID	: GTK.00384	**Depth (m)**	: 1.85-2.05

Apparatus : Tri Scan 50 Vj Tech

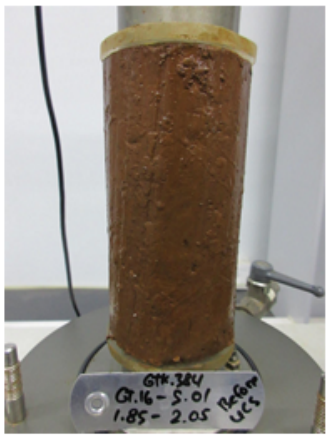
Soil Specimen			Measurement		
Water content	: **54.68**	%	Initial diameter (ϕ)	: **6.11**	cm
Dry Weight	: **446.60**	gr	Initial height (H)	: **12.32**	cm
Specific gravity (G_s)	: -	gr/cm^3	Initial area (A)	: **29.321**	cm^2
Unit weight (γ_n)	: **1.91**	gr/cm^3	Initial volume (V)	: **361.23**	cm^3
Dry density (γ_d)	: **1.24**	gr/cm^3	**Proving Ring No.**		
Degree of saturation (S_r)	: -	%	Calibration factor	: **1.00**	kg/div
Initial weight (W_0)	: **690.80**	gr	Strain rate	: **0.50**	mm/min

RESULT		
q_u	0.870	kg/cm^2
cu	0.435	kg/cm^2

Graph



Documentation
Before Test



Documentation
After Test



PT. Geoservices
Geotechnical Laboratory

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166/SNI 03-3638-1994

Client : PT. Iriana Mutiara Mining **Sample ID** : GT-16-S-01
Job ID : GTK.00384

MEASUREMENT

Calibration factor : 1.000 kg/div

Initial diameter (ϕ) : **6.11** cm
Initial height (H) : **12.32** cm
Initial area (A) : **29.321** cm^2
Initial volume (V) : **361.23** cm^3

Time	ΔH	Gaya F	Strain ε	Correction Area A_1	Load P	Stress q_u	Cohesion c
Second	mm	Newton	%	cm^2	kg	kg/cm^2	kg/cm^2
0	0	0	0.000	29.321	0.000	0.000	0.000
20	0.156	43	0.127	29.358	4.400	0.150	0.075
90	0.726	73	0.589	29.494	7.424	0.252	0.126
160	1.306	103	1.060	29.635	10.464	0.353	0.177
230	1.892	129	1.535	29.778	13.197	0.443	0.222
300	2.465	158	2.000	29.919	16.077	0.537	0.269
370	3.051	182	2.476	30.065	18.563	0.617	0.309
440	3.615	202	2.934	30.207	20.637	0.683	0.342
510	4.172	217	3.386	30.348	22.162	0.730	0.365
580	4.742	231	3.848	30.494	23.522	0.771	0.386
650	5.316	241	4.314	30.643	24.607	0.803	0.402
720	5.892	252	4.782	30.793	25.686	0.834	0.417
790	6.465	260	5.247	30.944	26.512	0.857	0.428
860	7.064	265	5.733	31.104	27.048	0.870	0.435
930	7.622	263	6.186	31.254	26.877	0.860	0.430
1070	8.756	219	7.106	31.563	22.354	0.708	0.354

Worksheet 2 - Unconfined Compressive Strength (UCS) Soil of GT-16-S-01 (1.85-2.05)

GT-16-S-03 (3.70-3.90)

PT. Geoservices
Geotechnical Laboratory

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166/SNI 03-3638-1994

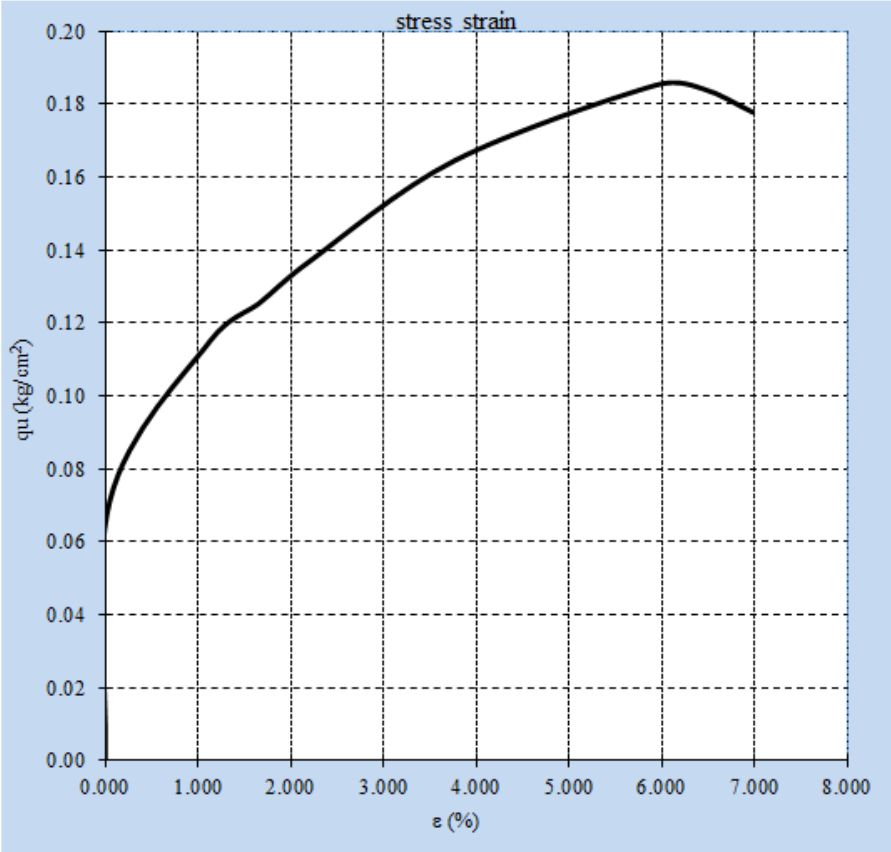
Client	: PT. Iriana Mutiara Mining	**Sample ID**	: GT-16-S-03
Job ID	: GTK.00384	**Depth (m)**	: 3.70-3.90

Apparatus : Tri Scan 50 Vj Tech

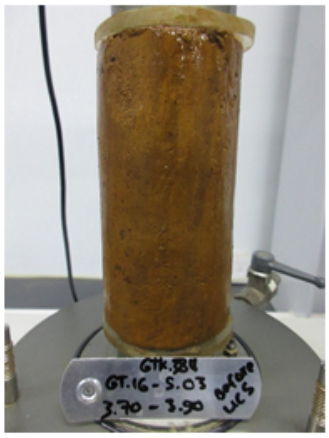
Soil Specimen			Measurement		
Water content	: **106.53**	%	Initial diameter (ϕ)	: **6.14**	cm
Dry Weight	: **255.80**	gr	Initial height (H)	: **12.32**	cm
Specific gravity (G_s)	: -	gr/cm^3	Initial area (A)	: **29.609**	cm^2
Unit weight (γ_n)	: **1.45**	gr/cm^3	Initial volume (V)	: **364.79**	cm^3
Dry density (γ_d)	: **0.70**	gr/cm^3	**Proving Ring No.**		
Degree of saturation (S_r)	: -	%	Calibration factor	: **1.00**	kg/div
Initial weight (W_o)	: **528.30**	gr	Strain rate	: **0.50**	mm/min

RESULT		
q_u	0.185	kg/cm^2
cu	0.093	kg/cm^2

Graph



Documentation
Before Test



Documentation
After Test



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Geotechnical Laboratory

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166/SNI 03-3638-1994

Client : PT. Iriana Mutiara Mining **Sample ID** : GT-16-S-03
Job ID : GTK.00384

MEASUREMENT

Calibration factor : 1.000 kg/div

Initial diameter (ϕ) : **6.14** cm
Initial height (H) : **12.32** cm
Initial area (A) : **29.609** cm^2
Initial volume (V) : **364.79** cm^3

Time	ΔH	Gaya F	Strain ε	Correction Area A_1	Load P	Stress q_u	Cohesion c
Second	mm	Newton	%	cm^2	kg	kg/cm^2	kg/cm^2
0	0	0	0.000	29.609	0.000	0.000	0.000
10	0.06	21	0.049	29.624	2.109	0.071	0.036
170	1.388	34	1.127	29.947	3.442	0.115	0.057
250	2.045	37	1.660	30.109	3.775	0.125	0.063
330	2.707	41	2.197	30.274	4.140	0.137	0.068
570	4.64	50	3.766	30.768	5.061	0.164	0.082
890	7.303	57	5.928	31.475	5.827	0.185	0.093
970	7.934	57	6.440	31.647	5.826	0.184	0.092
1050	8.587	55	6.970	31.828	5.657	0.178	0.089

Worksheet 3 - Unconfined Compressive Strength (UCS) Soil of GT-16-S-03 (3.70-3.90)

GT-16-S-04 (4.90-5.10)

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Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166/SNI 03-3638-1994

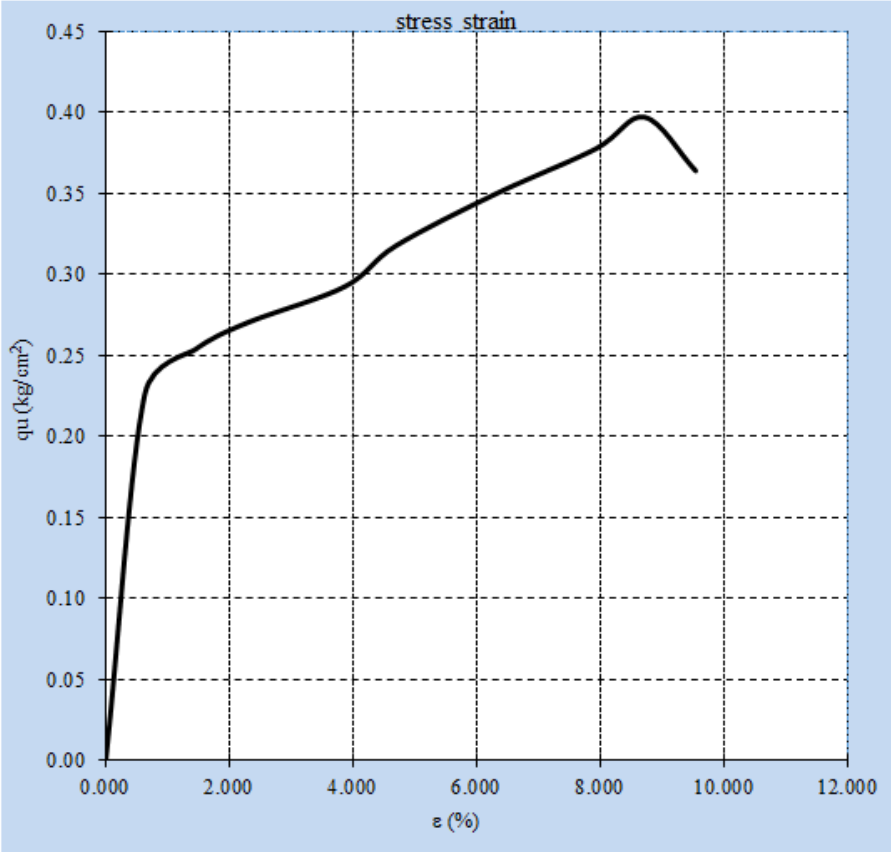
Client	: PT. Iriana Mutiara Mining	**Sample ID**	: GT-16-S-04
Job ID	: GTK.00384	**Depth (m)**	: 4.90-5.10

Apparatus : Tri Scan 50 Vj Tech

Soil Specimen			Measurement		
Water content	: **99.14**	%	Initial diameter (ϕ)	: **5.91**	cm
Dry Weight	: **257.20**	gr	Initial height (H)	: **12.10**	cm
Specific gravity (G_s)	: -	gr/cm^3	Initial area (A)	: **27.432**	cm^2
Unit weight (γ_n)	: **1.54**	gr/cm^3	Initial volume (V)	: **331.93**	cm^3
Dry density (γ_d)	: **0.77**	gr/cm^3	**Proving Ring No.**		
Degree of saturation (S_r)	: -	%	Calibration factor	: **1.00**	kg/div
Initial weight (W_0)	: **512.20**	gr	Strain rate	: **0.50**	mm/min

RESULT		
q_u	0.397	kg/cm^2
cu	0.199	kg/cm^2

Graph



Documentation
Before Test



Documentation
After Test



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Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166/SNI 03-3638-1994

Client : PT. Iriana Mutiara Mining **Sample ID** : GT-16-S-04
Job ID : GTK.00384

MEASUREMENT

Calibration factor : 1.000 kg/div

Initial diameter (ϕ) : **5.91** cm
Initial height (H) : **12.10** cm
Initial area (A) : **27.432** cm^2
Initial volume (V) : **331.93** cm^3

Time	ΔH	Gaya F	Strain ε	Correction Area A_1	Load P	Stress q_u	Cohesion c
Second	mm	Newton	%	cm^2	kg	kg/cm^2	kg/cm^2
0	0	0	0.000	27.432	0.000	0.000	0.000
130	0.764	61	0.631	27.607	6.245	0.226	0.113
250	1.749	69	1.445	27.835	7.059	0.254	0.127
370	2.749	74	2.272	28.070	7.575	0.270	0.135
610	4.682	82	3.869	28.537	8.346	0.292	0.146
730	5.685	90	4.698	28.785	9.145	0.318	0.159
970	7.66	100	6.331	29.286	10.250	0.350	0.175
1210	9.597	110	7.931	29.796	11.246	0.377	0.189
1330	10.565	117	8.731	30.057	11.933	0.397	0.199
1450	11.562	108	9.555	30.331	11.037	0.364	0.182

Worksheet 4 - Unconfined Compressive Strength (UCS) Soil of GT-16-S-04 (4.90-5.10)

GT-16-S-06 (10.05-10.30)

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Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166/SNI 03-3638-1994

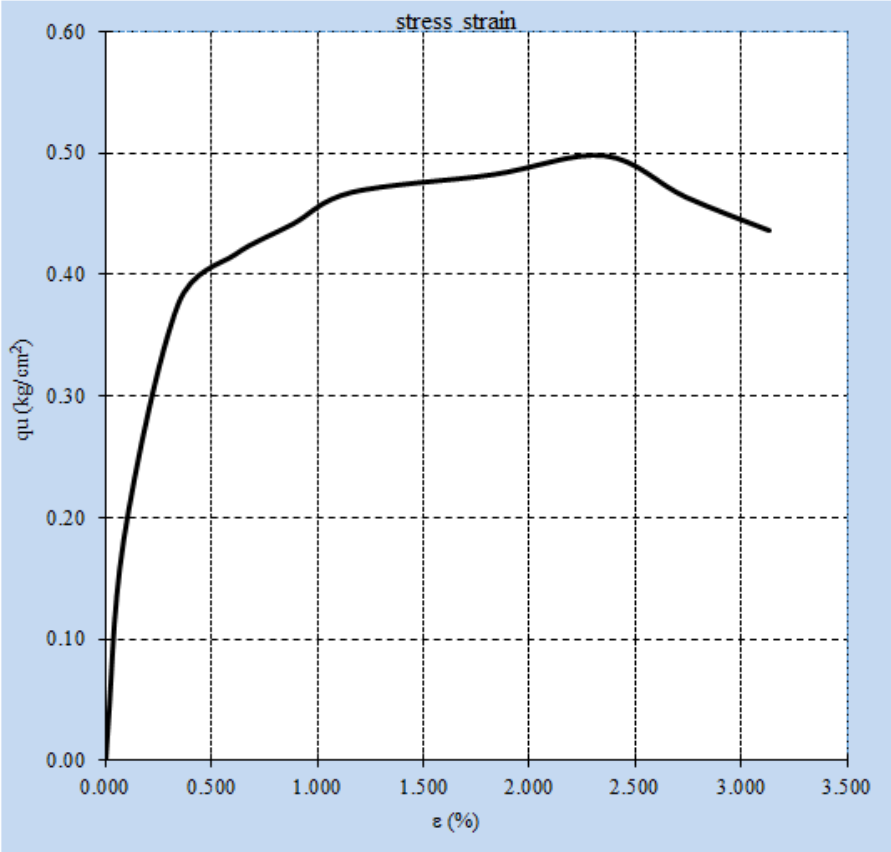
Client	: PT. Iriana Mutiara Mining	**Sample ID**	: GT-16-S-06
Job ID	: GTK.00384	**Depth (m)**	: 10.05-10.30

Apparatus : Tri Scan 50 Vj Tech

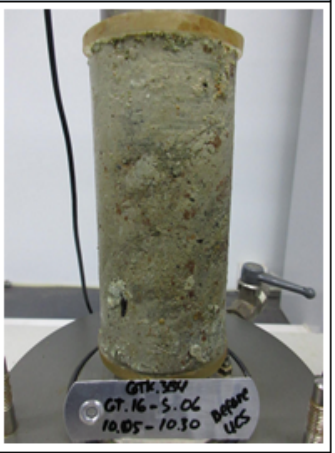
Soil Specimen			Measurement		
Water content	: **20.88**	%	Initial diameter (ϕ)	: **6.01**	cm
Dry Weight	: **609.70**	gr	Initial height (H)	: **12.44**	cm
Specific gravity (G_s)	: -	gr/cm^3	Initial area (A)	: **28.369**	cm^2
Unit weight (γ_n)	: **2.09**	gr/cm^3	Initial volume (V)	: **352.91**	cm^3
Dry density (γ_d)	: **1.73**	gr/cm^3	**Proving Ring No.**		
Degree of saturation (S_r)	: -	%	Calibration factor	: **1.00**	kg/div
Initial weight (W_0)	: **737.00**	gr	Strain rate	: **0.50**	mm/min

RESULT		
q_u	0.498	kg/cm^2
cu	0.249	kg/cm^2

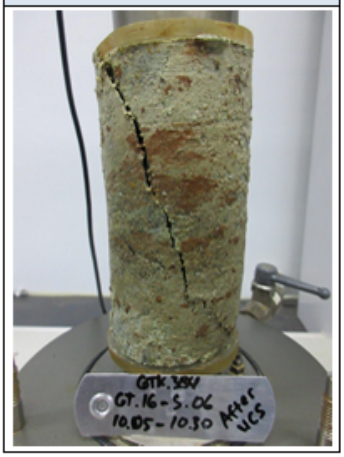
Graph



Documentation
Before Test



Documentation
After Test



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Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166/SNI 03-3638-1994

Client : PT. Iriana Mutiara Mining **Sample ID** : GT-16-S-06
Job ID : GTK.00384

MEASUREMENT

Calibration factor : 1.000 kg/div

Initial diameter (ϕ) : **6.01** cm
Initial height (H) : **12.44** cm
Initial area (A) : **28.369** cm^2
Initial volume (V) : **352.91** cm^3

Time	ΔH	Gaya F	Strain ε	Correction Area A_1	Load P	Stress q_u	Cohesion c
Second	mm	Newton	%	cm^2	kg	kg/cm^2	kg/cm^2
0	0	0	0.000	28.369	0.000	0.000	0.000
20	0.105	51	0.084	28.393	5.161	0.182	0.091
60	0.424	105	0.341	28.466	10.688	0.375	0.188
100	0.758	117	0.609	28.543	11.891	0.417	0.208
140	1.092	124	0.878	28.620	12.630	0.441	0.221
180	1.443	132	1.160	28.702	13.427	0.468	0.234
280	2.265	137	1.821	28.895	13.935	0.482	0.241
360	2.927	142	2.353	29.052	14.466	0.498	0.249
420	3.402	133	2.735	29.166	13.530	0.464	0.232
480	3.892	125	3.129	29.285	12.777	0.436	0.218

Worksheet 5 - Unconfined Compressive Strength (UCS) Soil of GT-16-S-06 (10.05-10.30)

GT-16-S-08 (19.86-20.06)

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Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166/SNI 03-3638-1994

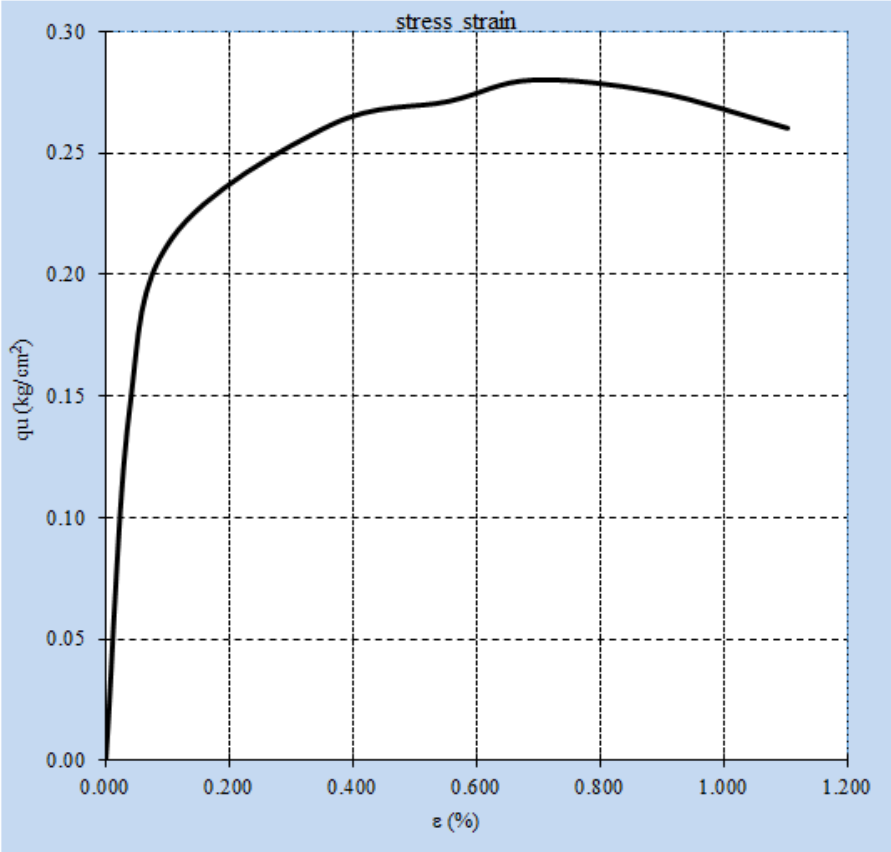
Client	: PT. Iriana Mutiara Mining	**Sample ID**	: GT-16-S-08
Job ID	: GTK.00384	**Depth (m)**	: 19.86-20.06

Apparatus : Tri Scan 50 Vj Tech

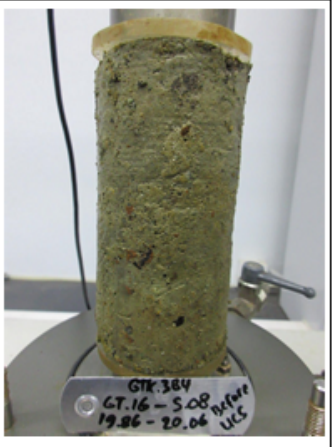
Soil Specimen			**Measurement**		
Water content	: **30.95**	%	Initial diameter (ϕ)	: **6.23**	cm
Dry Weight	: **609.70**	gr	Initial height (H)	: **12.56**	cm
Specific gravity (G_s)	: -	gr/cm^3	Initial area (A)	: **30.484**	cm^2
Unit weight (γ_n)	: **2.09**	gr/cm^3	Initial volume (V)	: **382.87**	cm^3
Dry density (γ_d)	: **1.59**	gr/cm^3	**Proving Ring No.**		
Degree of saturation (S_r)	: -	%	Calibration factor	: **1.00**	kg/div
Initial weight (W_o)	: **798.40**	gr	Strain rate	: **0.50**	mm/min

RESULT		
q_u	0.280	kg/cm^2
cu	0.140	kg/cm^2

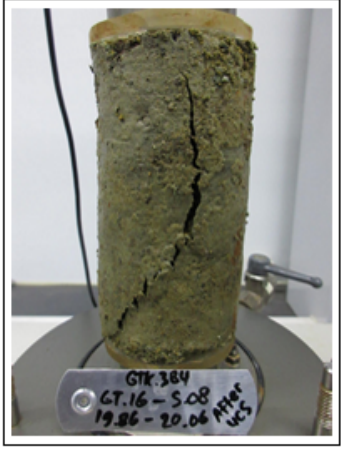
Graph



Documentation
Before Test



Documentation
After Test



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Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166/SNI 03-3638-1994

Client : PT. Iriana Mutiara Mining **Sample ID** : GT-16-S-08
Job ID : GTK.00384

MEASUREMENT

Calibration factor : 1.000 kg/div

Initial diameter (ϕ) : **6.23** cm
Initial height (H) : **12.56** cm
Initial area (A) : **30.484** cm^2
Initial volume (V) : **382.87** cm^3

Time	ΔH	Gaya F	Strain ε	Correction Area A_1	Load P	Stress q_u	Cohesion c
Second	mm	Newton	%	cm^2	kg	kg/cm^2	kg/cm^2
0	0	0	0.000	30.484	0.000	0.000	0.000
10	0.047	43	0.037	30.495	4.343	0.142	0.071
20	0.133	64	0.106	30.516	6.545	0.214	0.107
60	0.455	78	0.362	30.594	7.994	0.261	0.131
90	0.697	81	0.555	30.654	8.316	0.271	0.136
110	0.866	84	0.689	30.695	8.594	0.280	0.140
140	1.118	83	0.890	30.757	8.462	0.275	0.138
170	1.385	79	1.103	30.823	8.019	0.260	0.130

Worksheet 6- Unconfined Compressive Strength (UCS) Soil of GT-16-S-08 (19.86-20.06)

GT-14-S-01 (1.00-1.20)

PT. Geoservices
Geotechnical Laboratory

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166/SNI 03-3638-1994

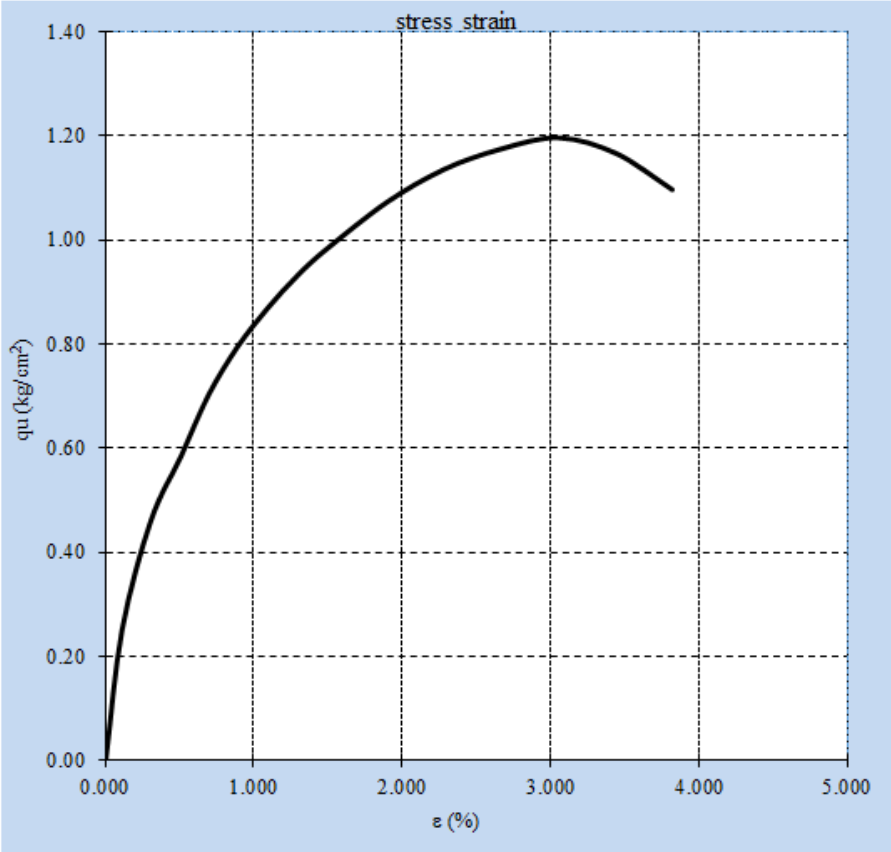
Client	: PT. Iriana Mutiara Mining	**Sample ID**	: GT-14-S-01
Job ID	: GTK.00384	**Depth (m)**	: 1.00-1.20

Apparatus : Tri Scan 50 Vj Tech

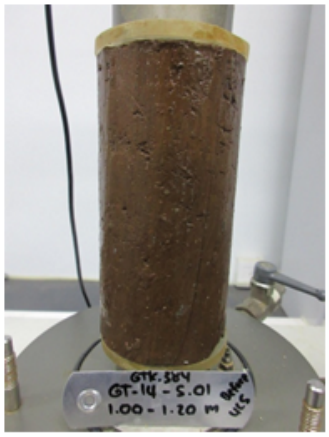
Soil Specimen			Measurement		
Water content	: **40.25**	%	Initial diameter (ϕ)	: **6.25**	cm
Dry Weight	: **582.10**	gr	Initial height (H)	: **12.57**	cm
Specific gravity (G_s)	: -	gr/cm^3	Initial area (A)	: **30.680**	cm^2
Unit weight (γ_n)	: **2.12**	gr/cm^3	Initial volume (V)	: **385.64**	cm^3
Dry density (γ_d)	: **1.51**	gr/cm^3	**Proving Ring No.**		
Degree of saturation (S_r)	: -	%	Calibration factor	: **1.00**	kg/div
Initial weight (W_o)	: **816.40**	gr	Strain rate	: **0.50**	mm/min

RESULT		
q_u	1.195	kg/cm^2
cu	0.598	kg/cm^2

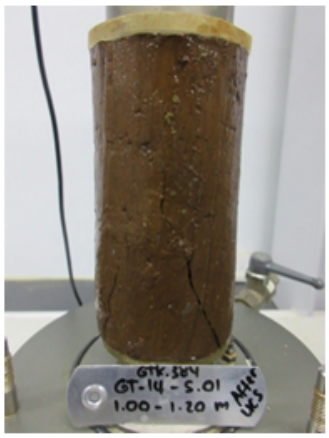
Graph



Documentation
Before Test



Documentation
After Test



PT. Geoservices
Geotechnical Laboratory

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166/SNI 03-3638-1994

Client : PT. Iriana Mutiara Mining **Sample ID** : GT-14-S-01
Job ID : GTK.00384

MEASUREMENT

Calibration factor : 1.000 kg/div

Initial diameter (ϕ) : **6.25** cm
Initial height (H) : **12.57** cm
Initial area (A) : **30.680** cm^2
Initial volume (V) : **385.64** cm^3

Time	ΔH	Gaya F	Strain ε	Correction Area A_1	Load P	Stress q_u	Cohesion c
Second	mm	Newton	%	cm^2	kg	kg/cm^2	kg/cm^2
0	0	0	0.000	30.680	0.000	0.000	0.000
20	0.137	75	0.109	30.713	7.663	0.250	0.125
50	0.382	139	0.304	30.773	14.159	0.460	0.230
80	0.64	177	0.509	30.837	18.035	0.585	0.292
110	0.869	212	0.691	30.893	21.658	0.701	0.351
140	1.118	241	0.889	30.955	24.591	0.794	0.397
170	1.372	264	1.091	31.018	26.931	0.868	0.434
200	1.618	283	1.287	31.080	28.882	0.929	0.465
230	1.869	299	1.487	31.143	30.555	0.981	0.491
290	2.382	328	1.895	31.272	33.503	1.071	0.536
350	2.866	349	2.280	31.395	35.619	1.135	0.567
410	3.357	363	2.671	31.521	37.014	1.174	0.587
470	3.841	371	3.056	31.647	37.829	1.195	0.598
530	4.325	363	3.441	31.773	37.030	1.165	0.583
590	4.803	342	3.821	31.898	34.948	1.096	0.548

Worksheet 7 - Unconfined Compressive Strength (UCS) Soil of GT-14-S-01 (1.00-1.20)

GT-14-S-02 (2.70-2.90)

PT. Geoservices
Geotechnical Laboratory

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166/SNI 03-3638-1994

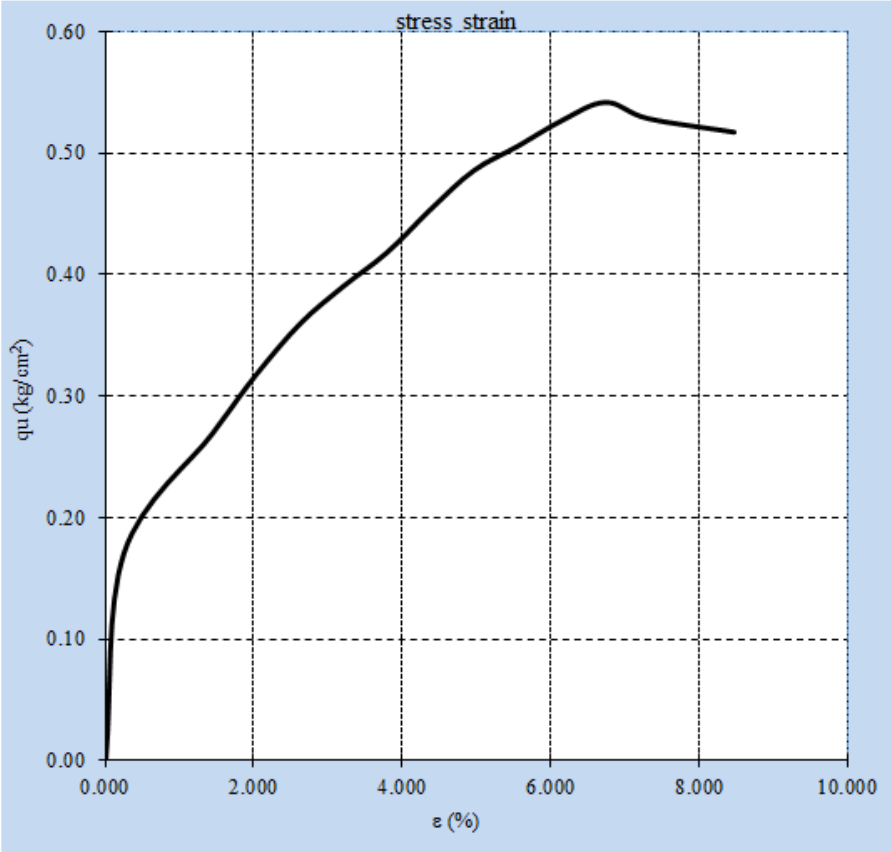
Client	: PT. Iriana Mutiara Mining	**Sample ID**	: GT.14-S.02
Job ID	: GTK.00384	**Depth (m)**	: 2.70-2.90

Apparatus : Tri Scan 50 Vj Tech

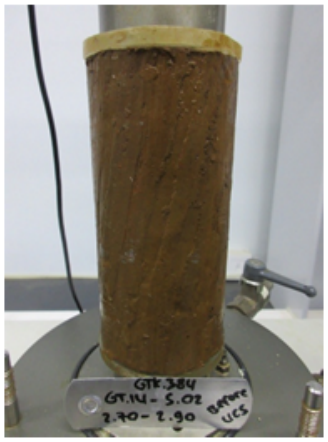
Soil Specimen			Measurement		
Water content	: **72.39**	%	Initial diameter (ϕ)	: **6.11**	cm
Dry Weight	: **368.00**	gr	Initial height (H)	: **12.48**	cm
Specific gravity (G_s)	: -	gr/cm^3	Initial area (A)	: **29.321**	cm^2
Unit weight (γ_n)	: **1.73**	gr/cm^3	Initial volume (V)	: **365.92**	cm^3
Dry density (γ_d)	: **1.01**	gr/cm^3	**Proving Ring No.**		
Degree of saturation (S_r)	: -	%	Calibration factor	: **1.00**	kg/div
Initial weight (W_0)	: **634.40**	gr	Strain rate	: **0.50**	mm/min

RESULT		
q_u	0.542	kg/cm^2
cu	0.271	kg/cm^2

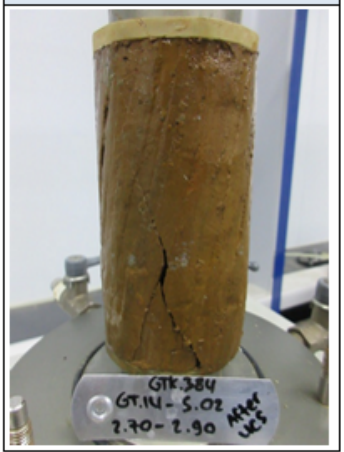
Graph



Documentation
Before Test



Documentation
After Test



PT. Geoservices
Geotechnical Laboratory

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166/SNI 03-3638-1994

Client : PT. Iriana Mutiara Mining **Sample ID** : GT.14-S.02
Job ID : GTK.00384

MEASUREMENT

Calibration factor : 1.000 kg/div

Initial diameter (ϕ) : **6.11** cm
Initial height (H) : **12.48** cm
Initial area (A) : **29.321** cm^2
Initial volume (V) : **365.92** cm^3

Time	ΔH	Gaya F	Strain ε	Correction Area A_1	Load P	Stress q_u	Cohesion c
Second	mm	Newton	%	cm^2	kg	kg/cm^2	kg/cm^2
0	0	0	0.000	29.321	0.000	0.000	0.000
40	0.303	49	0.243	29.392	5.007	0.170	0.085
220	1.8	79	1.442	29.750	8.018	0.270	0.135
310	2.545	93	2.039	29.931	9.539	0.319	0.159
400	3.274	106	2.623	30.110	10.840	0.360	0.180
490	3.991	116	3.198	30.289	11.825	0.390	0.195
580	4.73	125	3.790	30.476	12.749	0.418	0.209
670	5.463	136	4.377	30.663	13.919	0.454	0.227
760	6.195	147	4.964	30.852	14.998	0.486	0.243
850	6.944	154	5.564	31.048	15.723	0.506	0.253
940	7.673	161	6.148	31.241	16.471	0.527	0.264
1030	8.409	167	6.738	31.439	17.050	0.542	0.271
1120	9.125	164	7.312	31.634	16.731	0.529	0.264
1300	10.575	163	8.474	32.035	16.586	0.518	0.259

Worksheet 8 - Unconfined Compressive Strength (UCS) Soil of GT-14-S-02 (2.70-2.90)

GT-14-S-04 (7.10-7.30)

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Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166/SNI 03-3638-1994

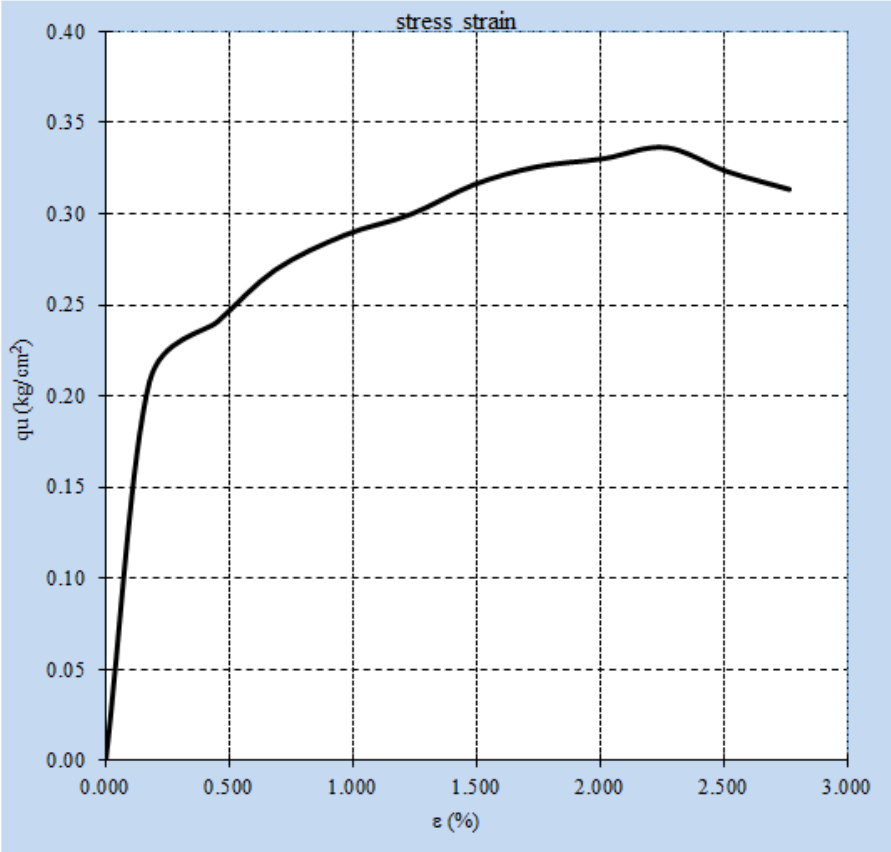
Client	: PT. Iriana Mutiara Mining	**Sample ID**	: GT-14-S-04
Job ID	: GTK.00384	**Depth (m)**	: 7.10-7.30

Apparatus : Tri Scan 50 Vj Tech

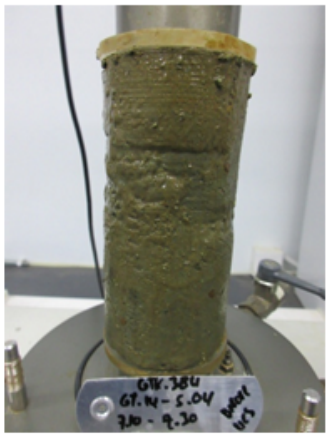
Soil Specimen			Measurement		
Water content	: **42.44**	%	Initial diameter (ϕ)	: **6.18**	cm
Dry Weight	: **464.70**	gr	Initial height (H)	: **12.77**	cm
Specific gravity (G_s)	: -	gr/cm^3	Initial area (A)	: **29.996**	cm^2
Unit weight (γ_n)	: **1.73**	gr/cm^3	Initial volume (V)	: **383.05**	cm^3
Dry density (γ_d)	: **1.21**	gr/cm^3	**Proving Ring No.**		
Degree of saturation (S_r)	: -	%	Calibration factor	: **1.00**	kg/div
Initial weight (W_o)	: **661.90**	gr	Strain rate	: **0.50**	mm/min

RESULT		
q_u	0.337	kg/cm^2
cu	0.168	kg/cm^2

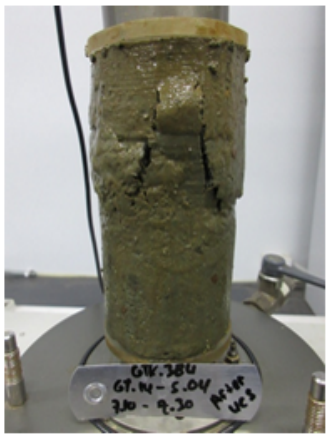
Graph



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Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166/SNI 03-3638-1994

Client : PT. Iriana Mutiara Mining **Sample ID** : GT-14-S-04
Job ID : GTK.00384

MEASUREMENT

Calibration factor : 1.000 kg/div

Initial diameter (ϕ) : **6.18** cm
Initial height (H) : **12.77** cm
Initial area (A) : **29.996** cm^2
Initial volume (V) : **383.05** cm^3

Time	ΔH	Gaya F	Strain ε	Correction Area A_1	Load P	Stress q_u	Cohesion c
Second	mm	Newton	%	cm^2	kg	kg/cm^2	kg/cm^2
0	0	0	0.000	29.996	0.000	0.000	0.000
30	0.226	61	0.177	30.049	6.258	0.208	0.104
70	0.577	71	0.452	30.132	7.261	0.241	0.120
110	0.876	80	0.686	30.203	8.140	0.269	0.135
150	1.236	86	0.968	30.289	8.742	0.289	0.144
190	1.577	89	1.235	30.371	9.113	0.300	0.150
230	1.902	94	1.489	30.450	9.631	0.316	0.158
270	2.226	98	1.743	30.528	9.955	0.326	0.163
310	2.57	99	2.013	30.612	10.120	0.331	0.165
350	2.892	101	2.265	30.691	10.335	0.337	0.168
390	3.211	98	2.514	30.770	9.955	0.324	0.162
430	3.532	95	2.766	30.849	9.677	0.314	0.157

Worksheet 9 - Unconfined Compressive Strength (UCS) Soil of GT-14-S-04 (7.10-7.30)

GT-14-S-06 (10.80-11.15)

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Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166/SNI 03-3638-1994

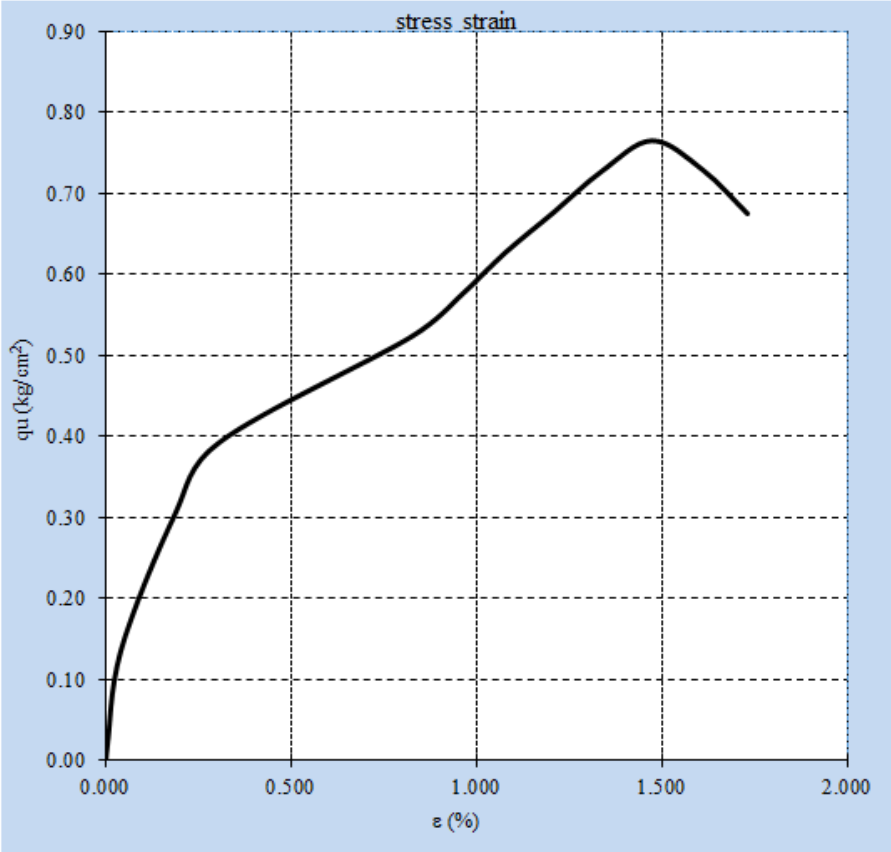
Client	: PT. Iriana Mutiara Mining	**Sample ID**	: GT-14-S-06
Job ID	: GTK.00384	**Depth (m)**	: 10.80-11.15

Apparatus : Tri Scan 50 Vj Tech

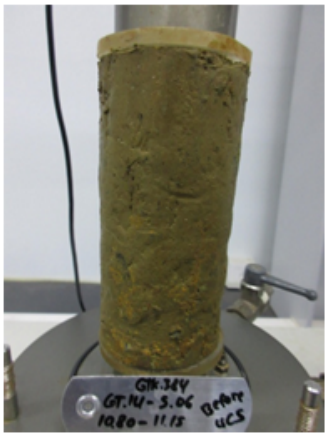
Soil Specimen			Measurement		
Water content	: **48.30**	%	Initial diameter (ϕ)	: **6.23**	cm
Dry Weight	: **435.80**	gr	Initial height (H)	: **12.75**	cm
Specific gravity (G_s)	: -	gr/cm^3	Initial area (A)	: **30.484**	cm^2
Unit weight (γ_n)	: **1.66**	gr/cm^3	Initial volume (V)	: **388.67**	cm^3
Dry density (γ_d)	: **1.12**	gr/cm^3	**Proving Ring No.**		
Degree of saturation (S_r)	: -	%	Calibration factor	: **1.00**	kg/div
Initial weight (W_o)	: **646.30**	gr	Strain rate	: **0.50**	mm/min

RESULT		
q_u	0.765	kg/cm^2
cu	0.382	kg/cm^2

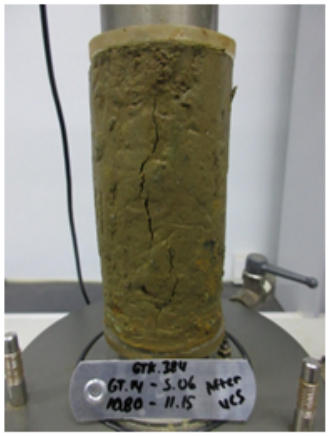
Graph



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Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166/SNI 03-3638-1994

Client : PT. Iriana Mutiara Mining **Sample ID** : GT-14-S-06
Job ID : GTK.00384

MEASUREMENT

Calibration factor : 1.000 kg/div

Initial diameter (ϕ) : **6.23** cm
Initial height (H) : **12.75** cm
Initial area (A) : **30.484** cm^2
Initial volume (V) : **388.67** cm^3

Time	ΔH	Gaya F	Strain ε	Correction Area A_1	Load P	Stress q_u	Cohesion c
Second	mm	Newton	%	cm^2	kg	kg/cm^2	kg/cm^2
0	0	0	0.000	30.484	0.000	0.000	0.000
10	0.051	40	0.040	30.496	4.092	0.134	0.067
30	0.236	90	0.185	30.540	9.225	0.302	0.151
50	0.395	118	0.310	30.578	12.029	0.393	0.197
130	1.051	157	0.824	30.737	16.065	0.523	0.261
150	1.226	174	0.962	30.780	17.706	0.575	0.288
170	1.373	189	1.077	30.815	19.297	0.626	0.313
190	1.542	205	1.209	30.857	20.880	0.677	0.338
210	1.704	220	1.336	30.897	22.442	0.726	0.363
230	1.879	232	1.474	30.940	23.660	0.765	0.382
250	2.055	221	1.612	30.983	22.553	0.728	0.364
270	2.207	205	1.731	31.021	20.921	0.674	0.337

Worksheet 10 - Unconfined Compressive Strength (UCS) Soil of GT-14-S-06 (10.80-11.15)

GT-14-S-07 (12.30-12.55)

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Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166/SNI 03-3638-1994

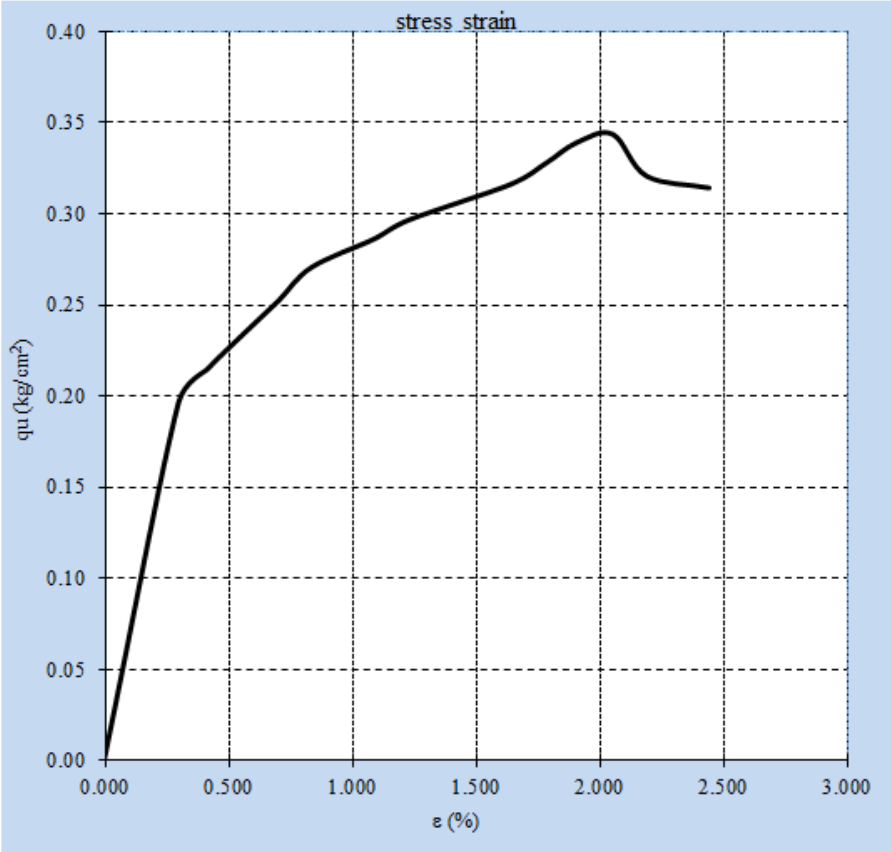
Client	: PT. Iriana Mutiara Mining	**Sample ID**	: GT-14-S-07
Job ID	: GTK.00384	**Depth (m)**	: 12.30-12.55

Apparatus : Tri Scan 50 Vj Tech

Soil Specimen			Measurement		
Water content	: 23.29	%	Initial diameter (ϕ)	: 5.92	cm
Dry Weight	: 552.10	gr	Initial height (H)	: 12.22	cm
Specific gravity (G_s)	: -	gr/cm^3	Initial area (A)	: 27.525	cm^2
Unit weight (γ_n)	: 2.02	gr/cm^3	Initial volume (V)	: 336.36	cm^3
Dry density (γ_d)	: 1.64	gr/cm^3	**Proving Ring No.**		
Degree of saturation (S_r)	: -	%	Calibration factor	: 1.00	kg/div
Initial weight (W_0)	: 680.70	gr	Strain rate	: 0.50	mm/min

RESULT		
q_u	0.344	kg/cm^2
cu	0.172	kg/cm^2

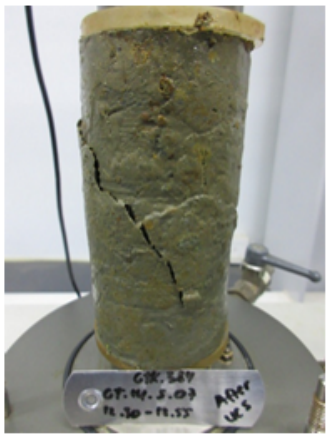
Graph



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Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166/SNI 03-3638-1994

Client : PT. Iriana Mutiara Mining **Sample ID** : GT-14-S-07

Job ID : GTK.00384

MEASUREMENT

Calibration factor : 1.000 kg/div

Initial diameter (ϕ) : **5.92** cm

Initial height (H) : **12.22** cm

Initial area (A) : **27.525** cm^2

Initial volume (V) : **336.36** cm^3

Time	ΔH	Gaya F	Strain ε	Correction Area A_1	Load P	Stress q_u	Cohesion c
Second	mm	Newton	%	cm^2	kg	kg/cm^2	kg/cm^2
0	0	0	-0.003	27.524	0.000	0.000	0.000
60	0.367	53	0.297	27.607	5.421	0.196	0.098
80	0.51	58	0.414	27.640	5.936	0.215	0.107
100	0.682	63	0.555	27.679	6.462	0.233	0.117
120	0.86	69	0.700	27.720	6.993	0.252	0.126
140	1.02	74	0.831	27.756	7.505	0.270	0.135
180	1.329	78	1.084	27.827	7.959	0.286	0.143
200	1.504	81	1.227	27.867	8.265	0.297	0.148
260	2.004	87	1.637	27.983	8.846	0.316	0.158
280	2.176	90	1.777	28.023	9.180	0.328	0.164
300	2.329	93	1.903	28.059	9.511	0.339	0.169
320	2.507	95	2.048	28.101	9.655	0.344	0.172
340	2.673	88	2.184	28.140	9.022	0.321	0.160
380	2.982	87	2.437	28.213	8.862	0.314	0.157

Worksheet 11 - Unconfined Compressive Strength (UCS) Soil of GT-14-S-07 (12.30-12.55)

GT-14-S-08 (14.60-14.82)

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Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166/SNI 03-3638-1994

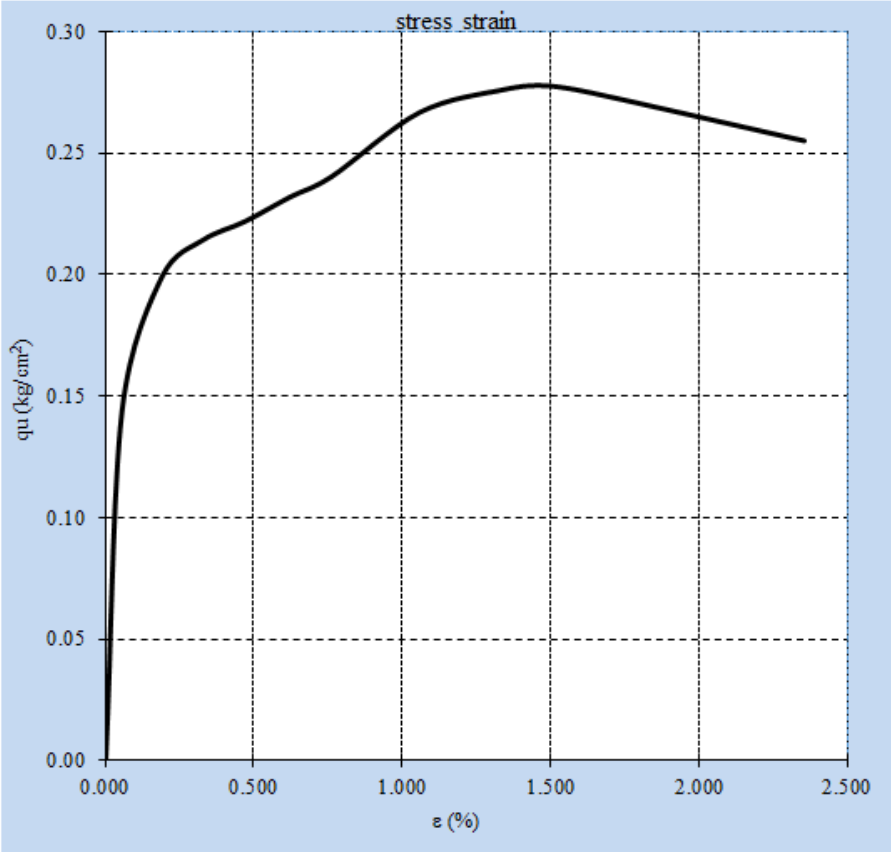
Client	: PT. Iriana Mutiara Mining	**Sample ID**	: GT-14-S-08
Job ID	: GTK.00384	**Depth (m)**	: 14.60-14.82

Apparatus : Tri Scan 50 Vj Tech

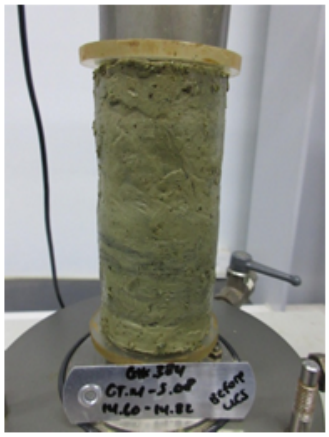
Soil Specimen			Measurement		
Water content	: **24.94**	%	Initial diameter (ϕ)	: **5.59**	cm
Dry Weight	: **450.30**	gr	Initial height (H)	: **11.55**	cm
Specific gravity (G_s)	: -	gr/cm^3	Initial area (A)	: **24.542**	cm^2
Unit weight (γ_n)	: **1.98**	gr/cm^3	Initial volume (V)	: **283.46**	cm^3
Dry density (γ_d)	: **1.59**	gr/cm^3	**Proving Ring No.**		
Degree of saturation (S_r)	: -	%	Calibration factor	: **1.00**	kg/div
Initial weight (W_o)	: **562.60**	gr	Strain rate	: **0.50**	mm/min

RESULT		
q_u	0.278	kg/cm^2
cu	0.139	kg/cm^2

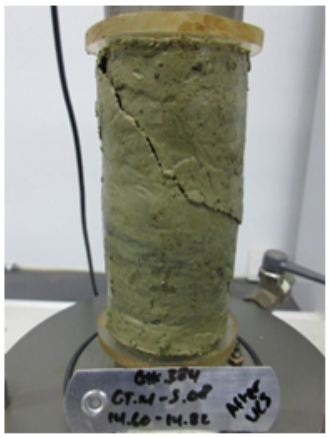
Graph



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Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166/SNI 03-3638-1994

Client : PT. Iriana Mutiara Mining **Sample ID** : GT-14-S-08

Job ID : GTK.00384

MEASUREMENT

Calibration factor : 1.000 kg/div

Initial diameter (ϕ) : **5.59** cm

Initial height (H) : **11.55** cm

Initial area (A) : **24.542** cm^2

Initial volume (V) : **283.46** cm^3

Time	ΔH	Gaya F	Strain ε	Correction Area A_1	Load P	Stress q_u	Cohesion c
Second	mm	Newton	%	cm^2	kg	kg/cm^2	kg/cm^2
0	0	0	0.000	24.542	0.000	0.000	0.000
10	0.063	35	0.055	24.556	3.532	0.144	0.072
30	0.219	48	0.190	24.589	4.900	0.199	0.100
50	0.379	52	0.328	24.623	5.278	0.214	0.107
70	0.544	54	0.471	24.658	5.475	0.222	0.111
90	0.716	56	0.620	24.695	5.728	0.232	0.116
110	0.879	58	0.761	24.730	5.945	0.240	0.120
150	1.223	65	1.059	24.805	6.621	0.267	0.133
190	1.548	67	1.340	24.876	6.871	0.276	0.138
210	1.716	68	1.486	24.912	6.922	0.278	0.139
230	1.892	67	1.638	24.951	6.859	0.275	0.137
330	2.72	63	2.355	25.134	6.414	0.255	0.128

Worksheet 12 - Unconfined Compressive Strength (UCS) Soil of GT-14-S-08 (14.60-14.82)

GT-14-S-09 (15.40-15.67)

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Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166/SNI 03-3638-1994

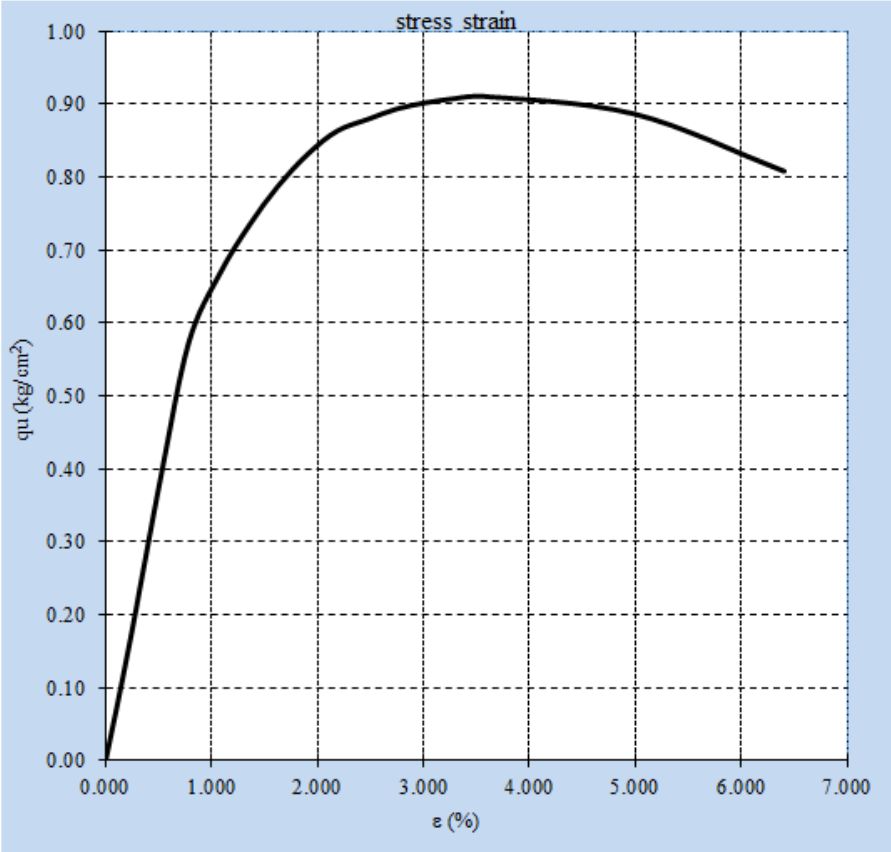
Client	: PT. Iriana Mutiara Mining	**Sample ID**	: GT-14-S-09
Job ID	: GTK.00384	**Depth (m)**	: 15.40-15.67

Apparatus : Tri Scan 50 Vj Tech

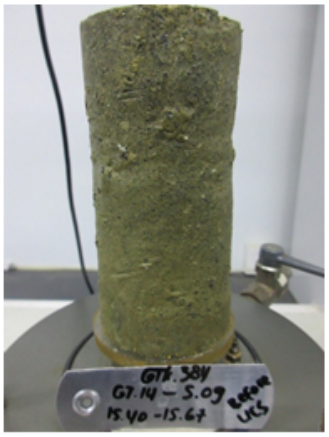
Soil Specimen			Measurement		
Water content	: **19.78**	%	Initial diameter (ϕ)	: **5.67**	cm
Dry Weight	: **508.20**	gr	Initial height (H)	: **11.66**	cm
Specific gravity (G_s)	: -	gr/cm^3	Initial area (A)	: **25.250**	cm^2
Unit weight (γ_n)	: **2.07**	gr/cm^3	Initial volume (V)	: **294.41**	cm^3
Dry density (γ_d)	: **1.73**	gr/cm^3	**Proving Ring No.**		
Degree of saturation (S_r)	: -	%	Calibration factor	: **1.00**	kg/div
Initial weight (W_o)	: **608.70**	gr	Strain rate	: **0.50**	mm/min

RESULT		
q_u	0.911	kg/cm^2
cu	0.455	kg/cm^2

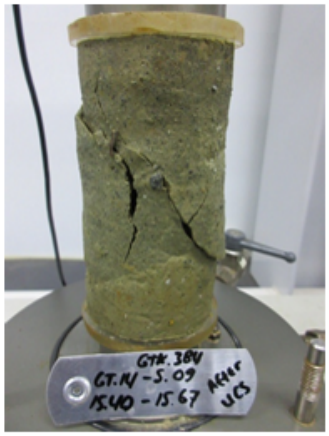
Graph



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Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166/SNI 03-3638-1994

Client : PT. Iriana Mutiara Mining **Sample ID** : GT-14-S-09
Job ID : GTK.00384

MEASUREMENT

Calibration factor : 1.000 kg/div

Initial diameter (ϕ) : **5.67** cm
Initial height (H) : **11.66** cm
Initial area (A) : **25.250** cm^2
Initial volume (V) : **294.41** cm^3

Time	ΔH	Gaya F	Strain ε	Correction Area A_1	Load P	Stress q_u	Cohesion c
Second	mm	Newton	%	cm^2	kg	kg/cm^2	kg/cm^2
0	0	0	0.000	25.250	0.000	0.000	0.000
40	0.252	38	0.216	25.304	3.920	0.155	0.077
80	0.605	97	0.519	25.381	9.878	0.389	0.195
120	0.911	143	0.781	25.449	14.580	0.573	0.286
160	1.252	167	1.074	25.524	17.032	0.667	0.334
200	1.573	184	1.349	25.595	18.772	0.733	0.367
240	1.895	198	1.625	25.667	20.228	0.788	0.394
280	2.226	210	1.909	25.741	21.426	0.832	0.416
320	2.545	218	2.183	25.813	22.293	0.864	0.432
360	2.886	223	2.475	25.891	22.778	0.880	0.440
400	3.198	227	2.743	25.962	23.204	0.894	0.447
440	3.523	230	3.021	26.036	23.498	0.903	0.451
480	3.857	232	3.308	26.113	23.720	0.908	0.454
520	4.169	234	3.575	26.186	23.852	0.911	0.455
720	5.813	231	4.985	26.575	23.570	0.887	0.443
920	7.463	214	6.401	26.976	21.802	0.808	0.404

Worksheet 13 - Unconfined Compressive Strength (UCS) Soil of GT-14-S-09 (15.40-15.67)

GT-14-S-10 (22.98-23.30)

PT. Geoservices
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Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166/SNI 03-3638-1994

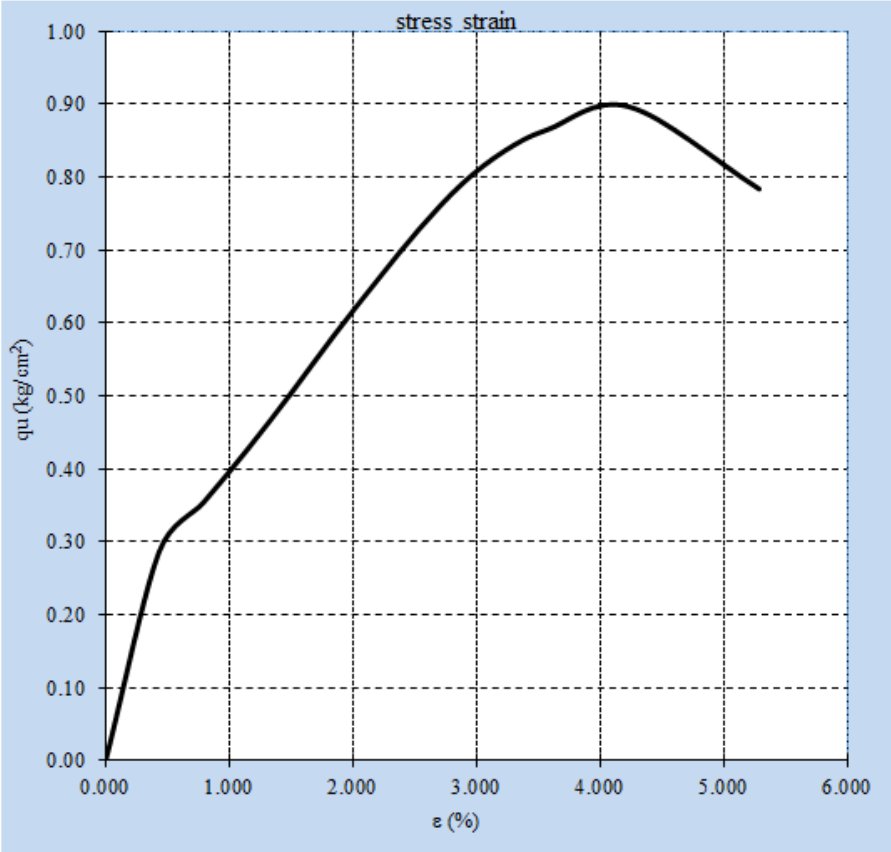
Client	: PT. Iriana Mutiara Mining	**Sample ID**	: GT-14-S-10
Job ID	: GTK.00384	**Depth (m)**	: 22.98-23.30

Apparatus : Tri Scan 50 Vj Tech

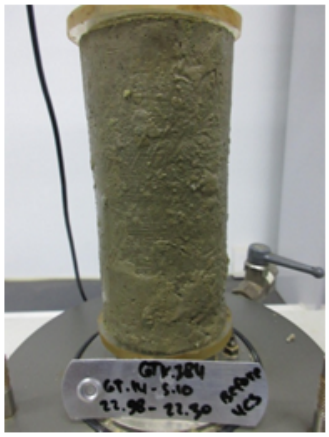
Soil Specimen			**Measurement**		
Water content	: **21.96**	%	Initial diameter (ϕ)	: **5.65**	cm
Dry Weight	: **505.10**	gr	Initial height (H)	: **11.79**	cm
Specific gravity (G_s)	: -	gr/cm^3	Initial area (A)	: **25.072**	cm^2
Unit weight (γ_n)	: **2.08**	gr/cm^3	Initial volume (V)	: **295.60**	cm^3
Dry density (γ_d)	: **1.71**	gr/cm^3	**Proving Ring No.**		
Degree of saturation (S_r)	: -	%	Calibration factor	: **1.00**	kg/div
Initial weight (W_0)	: **616.00**	gr	Strain rate	: **0.50**	mm/min

RESULT		
q_u	0.896	kg/cm^2
cu	0.448	kg/cm^2

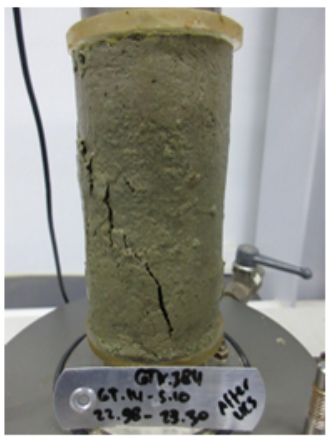
Graph



Documentation
Before Test



Documentation
After Test



PT. Geoservices
Geotechnical Laboratory

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166/SNI 03-3638-1994

Client : PT. Iriana Mutiara Mining **Sample ID** : GT-14-S-10
Job ID : GTK.00384

MEASUREMENT

Calibration factor : 1.000 kg/div

Initial diameter (ϕ) : **5.65** cm
Initial height (H) : **11.79** cm
Initial area (A) : **25.072** cm^2
Initial volume (V) : **295.60** cm^3

Time	ΔH	Gaya F	Strain ε	Correction Area A_1	Load P	Stress q_u	Cohesion c
Second	mm	Newton	%	cm^2	kg	kg/cm^2	kg/cm^2
0	0	0	0.000	25.072	0.000	0.000	0.000
70	0.506	70	0.429	25.180	7.183	0.285	0.143
120	0.927	87	0.786	25.271	8.915	0.353	0.176
170	1.353	106	1.148	25.363	10.826	0.427	0.213
220	1.774	126	1.505	25.455	12.858	0.505	0.253
270	2.178	146	1.847	25.544	14.902	0.583	0.292
320	2.589	165	2.196	25.635	16.885	0.659	0.329
370	2.984	184	2.531	25.723	18.728	0.728	0.364
420	3.395	200	2.880	25.815	20.409	0.791	0.395
470	3.796	212	3.220	25.906	21.640	0.835	0.418
520	4.207	220	3.568	26.000	22.481	0.865	0.432
620	4.988	230	4.231	26.179	23.462	0.896	0.448
770	6.227	203	5.282	26.470	20.735	0.783	0.392

Worksheet 14 - Unconfined Compressive Strength (UCS) Soil of GT-14-S-10 (22.98-23.30)

Appendix A.3 Triaxial Compression - Unconsolidated, Undrained of Cohesive Soil Worksheets

GT-16-S-02 (2.60-2.80)

PT. Geoservices
Geotechnical Laboratory

TRIAXIAL UNCONSOLIDATED UNDRAINED (UU) - LOAD 1

Test Standard : ASTM D2850

Client	**: PT. Iriana Mutiara Mining**	**Sample ID**	**: GT-16 S-02**
Job ID	**: GTK.00384**	**Depth (m)**	**: 2.60-2.80**

Specimen :

Condition	Length (mm)	Diameter (mm)	Area (mm^2)	Weight (g)	Volume (cm^3)	Density (g/cm^3)
UDS	101.840	49.880	1953.091	328.000	198.903	1.649

TX-1 Test

No	Time (s)	Displacement Input (mm)	Axial Strain (%)	Load Input (N)	Deviator Stress (Kpa)	Cell Pressure Input (Kpa)
1	0	0.000	0.000	0.000	0.000	6
2	70	0.299	0.294	50.435	25.714	47
3	120	0.698	0.686	60.952	30.953	48
4	200	1.389	1.364	75.309	37.983	48
5	250	1.812	1.780	84.939	42.660	48
6	330	2.472	2.428	100.467	50.125	48
7	380	2.889	2.838	108.897	54.103	48
8	460	3.529	3.467	122.506	60.470	49
9	510	3.927	3.858	130.237	64.026	49
10	590	4.574	4.493	142.296	69.492	50
11	640	5.004	4.916	149.432	72.654	51
12	720	5.650	5.550	160.949	77.731	51
13	770	6.061	5.954	168.505	81.033	51
14	850	6.737	6.618	178.398	85.185	51
15	900	7.154	7.028	184.120	87.531	51
16	980	7.807	7.669	191.980	90.638	51
17	1030	8.234	8.088	197.184	92.672	51
18	1110	8.867	8.710	202.446	94.501	51
19	1160	9.275	9.111	205.602	95.553	51
20	1240	9.918	9.743	211.385	97.559	51
21	1290	10.339	10.156	215.387	98.950	51
22	1370	11.011	10.816	220.122	100.382	51
23	1420	11.415	11.213	222.697	101.105	51
24	1500	12.078	11.864	226.705	102.169	51
25	1550	12.476	12.255	228.730	102.625	51
26	1550	12.476	12.255	228.690	102.606	51

Tested by Geotechnical Team

Apparatus

Machine : Triaxial Tri-Scan 50 (VJ Tech)

Capacity : 5 ton

Tested by Geotechnical Team

Tested date : 08/06/2023

Tested by : Ali

Checked by : Fakhri/Irsan

Approved by : Wayne

Worksheet 15 - Triaxial - Unconsolidated, Undrained (UU) of GT-16-S-02 (2.60-2.80) (Load 1)

PT. Geoservices
Geotechnical Laboratory

TRIAXIAL UNCONSOLIDATED UNDRAINED (UU) - LOAD 2

Test Standard : ASTM D2850

Client	**: PT. Iriana Mutiara Mining**	**Sample ID**	**: GT-16 S-02**
Job ID	**: GTK.00384**	**Depth (m)**	**: 2.60-2.80**

Specimen :

Condition	Length (mm)	Diameter (mm)	Area (mm^2)	Weight (g)	Volume (cm^3)	Density (g/cm^3)
UDS	101.840	49.880	1953.091	328.000	198.903	1.649

TX-2 Test

No	Time (s)	Displacement Input (mm)	Axial Strain (%)	Load Input (N)	Deviator Stress (Kpa)	Cell Pressure Input (Kpa)
1	0	12.486	12.265	228.527	102.522	51
2	20	12.677	12.453	235.556	105.449	97
3	60	12.998	12.768	246.572	109.983	98
4	100	13.314	13.079	253.691	112.756	98
5	140	13.629	13.388	260.656	115.439	98
6	180	13.970	13.723	266.352	117.505	98
7	220	14.279	14.027	271.731	119.457	98
8	260	14.617	14.359	275.554	120.669	98
9	300	14.935	14.671	279.301	121.864	98
10	340	15.282	15.012	282.089	122.589	98
11	380	15.598	15.322	285.763	123.732	99
12	420	15.929	15.647	289.571	124.900	99
13	460	16.250	15.963	293.192	125.989	100
14	500	16.594	16.301	298.576	127.787	101
15	540	16.919	16.620	303.410	129.360	101
16	580	17.254	16.949	309.439	131.410	101
17	620	17.579	17.268	313.113	132.459	101
18	660	17.923	17.606	316.099	133.176	101
19	700	18.206	17.884	318.718	133.826	101
20	740	18.534	18.206	321.339	134.397	101
21	780	18.878	18.544	323.701	134.826	101
22	820	19.190	18.851	325.926	135.242	101
23	850	19.426	19.083	326.258	134.993	101

Tested by Geotechnical Team

Apparatus

Machine : Triaxial Tri-Scan 50 (VJ Tech)

Capacity : 5 ton

Tested by Geotechnical Team

Tested date : 08/06/2023

Tested by : Ali

Checked by : Fakhri/Irsan

Approved by : Wayne

Worksheet 16 - Triaxial - Unconsolidated, Undrained (UU) of GT-16-S-02 (2.60-2.80) (Load 2)

PT. Geoservices
Geotechnical Laboratory

TRIAXIAL UNCONSOLIDATED UNDRAINED (UU) - LOAD 3

Test Standard : ASTM D2850

Client	**: PT. Iriana Mutiara Mining**	**Sample ID**	**: GT-16 S-02**
Job ID	**: GTK.00384**	**Depth (m)**	**: 2.60-2.80**

Specimen :

Condition	Length (mm)	Diameter (mm)	Area (mm^2)	Weight (g)	Volume (cm^3)	Density (g/cm^3)
UDS	101.840	49.880	1953.091	328.000	198.903	1.649

TX-3 Test

No	Time (s)	Displacement Input (mm)	Axial Strain (%)	Load Input (N)	Deviator Stress (Kpa)	Cell Pressure Input (Kpa)
1	0	19.436	19.092	326.366	135.021	102
2	10	19.534	19.189	316.914	130.954	177
3	30	19.700	19.352	338.775	139.706	193
4	50	19.872	19.521	352.293	144.976	196
5	70	20.034	19.680	359.566	147.676	197
6	90	20.181	19.824	365.599	149.884	197
7	110	20.350	19.990	371.475	151.978	197
8	130	20.509	20.146	375.903	153.489	197
9	150	20.678	20.312	379.764	154.743	197
10	170	20.828	20.460	381.859	155.309	198
11	190	21.006	20.635	383.530	155.646	198
12	210	21.168	20.794	384.729	155.819	198
13	230	21.324	20.947	386.763	156.340	198
14	250	21.503	21.123	389.959	157.282	198
15	270	21.672	21.289	394.172	158.646	198
16	290	21.812	21.426	398.965	160.295	199
17	310	21.981	21.592	403.581	161.806	199
18	330	22.133	21.742	406.642	162.723	199
19	350	22.283	21.889	409.651	163.619	200
20	370	22.433	22.036	411.964	164.232	200
21	390	22.592	22.193	413.358	164.458	201
22	410	22.758	22.356	413.680	164.241	201
23	430	22.920	22.515	412.861	163.580	201
24	450	23.083	22.675	412.104	162.943	202
25	470	23.248	22.837	411.544	162.380	202
26	490	23.395	22.981	412.035	162.270	201
27	510	23.560	23.143	412.539	162.126	202

Tested by Geotechnical Team

Apparatus

Machine : Triaxial Tri-Scan 50 (VJ Tech)

Capacity : 5 ton

Tested by Geotechnical Team

Tested date : 08/06/2023

Tested by : Ali

Checked by : Fakhri/Irsan

Approved by : Wayne

Worksheet 17 - Triaxial - Unconsolidated, Undrained (UU) of GT-16-S-02 (2.60-2.80) (Load 3)

PT. Geoservices
Geotechnical Laboratory

TRIAXIAL UNCONSOLIDATED UNDRAINED (UU) TEST

Test Standard : ASTM D2850

Client	: PT. Iriana Mutiara Mining	Sample ID	: GT-16 S-02
Job ID	: GTK.00384	Depth (m)	: 2.60-2.80

Specimen Test

Specimen ID	Axial Strain (%)	Load (N)	Deviator Stress (Kpa)	Cell Pressure (Kpa)
1	12.26	228.73	102.62	50
2	18.85	325.93	135.24	100
3	22.19	413.36	164.46	200

Result

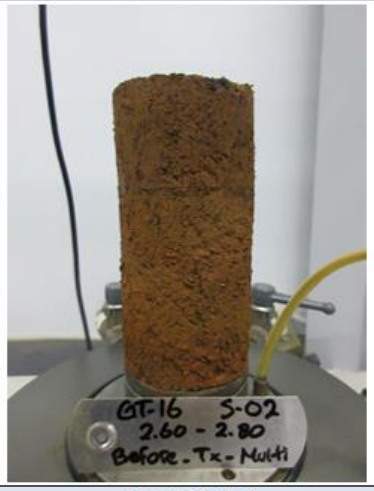
	Total Stress	Unit
C	34.700	kPa
φ	9.800	(°)

Stress Strain Curve

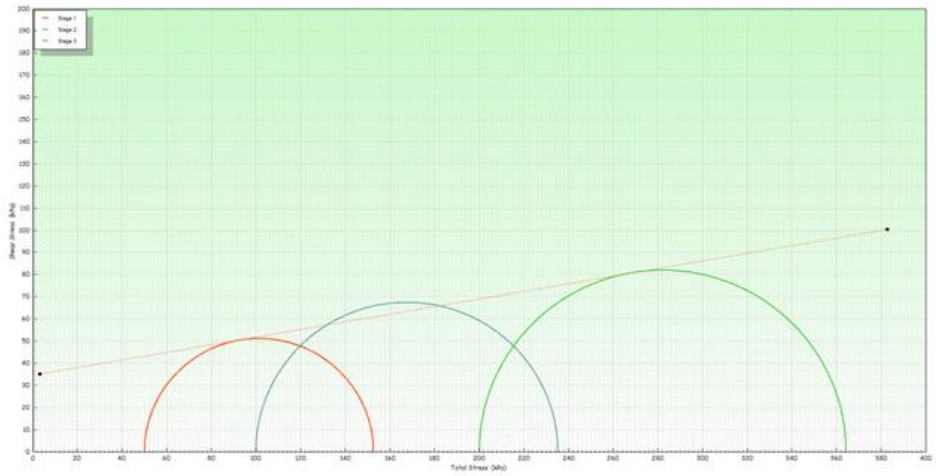


Documentation

Before Test

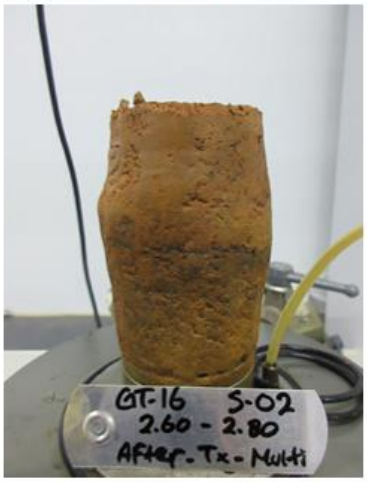


Total Stress Mohr Circles



Documentation

After Test



Tested by Geotechnical Team

Apparatus

Machine : Triaxial Tri-Scan 50 (VJ Tech)
Capacity : 5 ton

Tested by Geotechnical Team

Tested date : 08/06/2023
Tested by : Ali
Checked by : Fakhri/Irsan
Approved by : Wayne

Worksheet 18 - Triaxial - Unconsolidated, Undrained (UU) of GT-16-S-02 (2.60-2.80) (Graph & Result)

Appendix A.4 Triaxial Compression - Consolidated, Undrained (CU-BP) Worksheets

GT-16-S-05 (6.60-6.80)

PT. Geoservices
Geotechnical Laboratory

TRIAXIAL COMPRESSION - CONSOLIDATED, UNDRAINED (CU-BP) - SPECIMEN TEST 1

Test Standard : ASTM D4767

Client : PT. Iriana Mutiara Mining | **Sample ID : GT-16-S-05**

Job ID : GTK.00384 | **Depth (m) : 6.60-6.80**

Specimen :

Condition	Length (mm)	Diameter (mm)	Area (mm^2)	Weight (g)	Volume (cm^3)	Density (g/cm^3)
UDS	68.900	34.600	939.771	93.800	64.750	1.449

TX-1 Test

No	Time (s)	Displacement Input (mm)	Load Input (N)	Deviator Stress (kPa)	Axial Strain (%)	Minor Effective Stress (kPa)	Major Effective Stress kPa)	Cell Pressure Input (kPa)	Back Pressure Input (kPa)	Pore Pressure Input (kPa)
1	0	0	0.000	0.000	0.000	100.000	100.000	540	440	440
2	120	0.395	23.700	25.074	0.573	102.000	127.074	540	440	438
3	240	0.774	53.100	55.868	1.123	100.000	155.868	540	440	440
4	360	1.172	80.700	84.411	1.701	96.000	180.411	540	440	444
5	480	1.593	94.200	97.920	2.312	92.000	189.920	540	440	448
6	600	1.981	100.700	104.073	2.875	87.000	191.073	540	440	453
7	720	2.386	105.600	108.477	3.463	81.000	189.477	540	440	459
8	840	2.777	109.000	111.311	4.030	77.000	188.311	540	440	463
9	960	3.192	112.800	114.469	4.633	71.000	185.469	540	440	469
10	1080	3.577	115.000	116.017	5.192	68.000	184.017	540	440	472
11	1200	3.959	117.300	117.646	5.746	66.000	183.646	540	440	474
12	1320	4.322	119.900	119.581	6.273	61.000	180.581	540	440	479
13	1440	4.724	122.600	121.513	6.856	59.000	180.513	540	440	481
14	1560	5.119	125.200	123.326	7.430	57.000	180.326	540	440	483
15	1680	5.51	127.600	124.920	7.997	55.000	179.920	540	440	485
16	1800	5.901	131.000	127.457	8.565	54.000	181.457	540	440	486
17	1920	6.3	132.600	128.197	9.144	51.000	179.197	540	440	489
18	2040	6.686	133.700	128.463	9.704	51.000	179.463	540	440	489
19	2160	7.087	135.400	129.258	10.286	50.000	179.258	540	440	490
20	2400	7.87	137.500	129.600	11.422	47.000	176.600	540	440	493
21	2520	8.256	138.500	129.717	11.983	46.000	175.717	540	440	494
22	2640	8.648	139.700	129.995	12.552	46.000	175.995	540	440	494
23	2760	9.03	141.300	130.650	13.106	45.000	175.650	540	440	495
24	2880	9.415	143.100	131.464	13.665	44.000	175.464	540	440	496
25	3120	10.202	146.700	132.988	14.807	42.000	174.988	540	440	498
26	3240	10.587	148.800	134.007	15.366	42.000	176.007	540	440	498
27	3300	10.794	149.700	134.339	15.666	43.000	177.339	540	440	497
28	3480	11.387	150.600	133.767	16.527	41.000	174.767	540	440	499
29	3720	12.174	151.000	132.287	17.669	42.000	174.287	540	440	498
30	3960	12.957	152.300	131.584	18.806	41.000	172.584	540	440	499

Tested by Geotechnical Team

Apparatus

Machine : Triaxial Tri-Scan 50 (VJ Tech)

Capacity : 5 ton

Tested by Geotechnical Team

Tested date : 30 July - 1 August 2023 | Checked by : Irsan

Tested by : Fakhri, Aprian | Approved by : Wayne

Worksheet 19 - Triaxial Consolidated, Undrained (CU-BP) of GT-16-S-05 (6.60-6.80) (Spec.1)

PT. Geoservices
Geotechnical Laboratory

TRIAXIAL COMPRESSION - CONSOLIDATED, UNDRAINED (CU-BP) - SPECIMEN TEST 2

Test Standard : ASTM D4767

Client : PT. Iriana Mutiara Mining
Job ID : GTK.00384

Sample ID : GT-16-S-05
Depth : 6.60-6.80

Specimen :

Condition	Length (mm)	Diameter (mm)	Area (mm^2)	Weight (g)	Volume (cm^3)	Density (g/cm^3)
UDS	69.100	34.540	936.514	92.500	64.713	1.429

TX-2 Test

No	Time (s)	Displacement Input (mm)	Load Input (N)	Deviator Stress (kPa)	Axial Strain (%)	Minor Effective Stress (kPa)	Major Effective Stress kPa)	Cell Pressure Input (kPa)	Back Pressure Input (kPa)	Pore Pressure Input (kPa)
1	0	0	0.000	0.000	0.000	199.000	199.000	640	440	441
2	60	0.188	1.100	1.171	0.272	198.000	199.171	640	440	442
3	300	0.959	16.200	17.058	1.388	199.000	216.058	640	440	441
4	360	1.166	35.700	37.477	1.687	193.000	230.477	640	440	447
5	420	1.363	49.100	51.394	1.973	190.000	241.394	640	440	450
6	480	1.535	71.200	74.338	2.221	181.000	255.338	640	440	459
7	540	1.72	117.800	122.655	2.489	170.000	292.655	640	440	470
8	600	1.946	141.800	147.148	2.816	155.000	302.148	640	440	485
9	660	2.159	153.400	158.681	3.124	145.000	303.681	640	440	495
10	720	2.344	161.000	166.082	3.392	130.000	296.082	640	440	510
11	780	2.573	165.600	170.242	3.724	120.000	290.242	640	440	520
12	840	2.758	169.600	173.869	3.991	112.000	285.869	640	440	528
13	900	2.981	172.300	176.043	4.314	105.000	281.043	640	440	535
14	960	3.179	176.300	179.591	4.601	98.000	277.591	640	440	542
15	1020	3.379	179.500	182.296	4.890	94.000	276.296	640	440	546
16	1080	3.589	181.500	183.738	5.194	88.000	271.738	640	440	552
17	1140	3.784	183.500	185.210	5.476	85.000	270.210	640	440	555
18	1200	3.965	185.800	187.011	5.738	82.000	269.011	640	440	558
19	1260	4.166	188.200	188.842	6.029	78.000	266.842	640	440	562
20	1320	4.373	190.500	190.541	6.329	77.000	267.541	640	440	563
21	1380	4.574	192.900	192.342	6.619	74.000	266.342	640	440	566
22	1440	4.778	195.300	194.120	6.915	73.000	267.120	640	440	567
23	1500	4.965	196.800	195.042	7.185	72.000	267.042	640	440	568
24	1560	5.166	198.900	196.505	7.476	70.000	266.505	640	440	570
25	1620	5.357	200.100	197.100	7.753	70.000	267.100	640	440	570
26	1680	5.577	202.200	198.481	8.071	68.000	266.481	640	440	572
27	1740	5.752	203.800	199.501	8.324	67.000	266.501	640	440	573
28	1800	5.953	206.200	201.210	8.615	66.000	267.210	640	440	574
29	1860	6.166	206.600	200.920	8.923	66.000	266.920	640	440	574

Tested by Geotechnical Team

Apparatus

Machine : Triaxial Tri-Scan 50 (VJ Tech)
Capacity : 5 ton

Tested by Geotechnical Team

Tested date : 1-4 August 2023
Tested by : Fakhri, Aprian

Checked by : Irsan
Approved by : Wayne

Worksheet 20 - Triaxial Consolidated, Undrained (CU-BP) of GT-16-S-05 (6.60-6.80) (Spec.2)

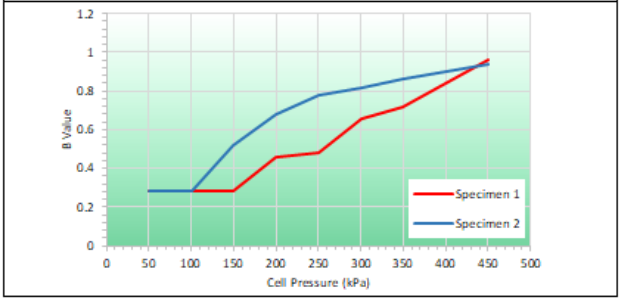
TRIAXIAL COMPRESSION - CONSOLIDATED, UNDRAINED (CU-BP)

ASTM D4767

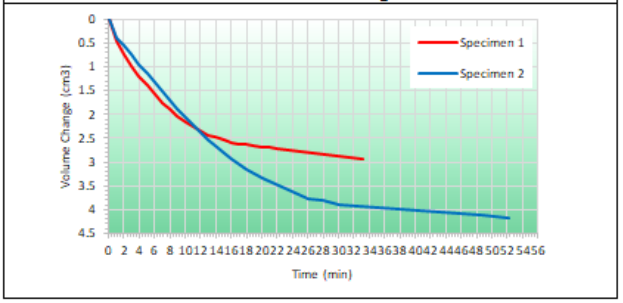
Request from : PT. Iriana Mutiara Mining
Job ID : GTK.00384
Sample ID : GT-16-S-05 (6.60-6.80 m)

Tested date : 30 July - 4 August 2023
Tested by : Fakhri/Aprian
Checked by : Irsan

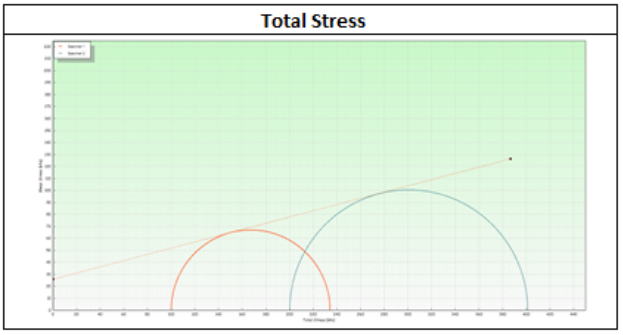
Saturation Stage



Consolidation Stage



Total Stress



Effective Stress



Result

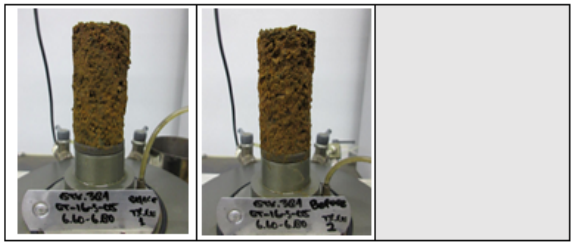
	Total	Effective	Unit
C	25.910	2.550	kPa
φ	14.600	36.200	(°)

Specimen			1	2	
Before Test	Density	g/cm^3	1.449	1.429	
	Water Content	%	59.86	59.67	
	Dry Density	g/cm^3	0.906	0.895	
Saturation Stage	Initial Pore Pressure	kPa	0	0	
	Final Pore Pressure		440	440	
	Final Cell Pressure		450	450	
	B Value		0.96	0.90	
Consolidation Stage	Cell Pressure	kPa	540	640	
	Back Pressure		440	440	
	Initial Pore Pressure		520	617	
	Final Pore Pressure		440	441	
Compression Stage	Cell Pressure	kPa	540	640	
	Back Pressure		440	440	
	σ'$_3$		100	200	
	Strain Rate	mm / min	0.200	0.200	
Failure Condition	Strain	%	15.67	8.62	
	(σ1 - σ3) f	kPa	134	201	
	σ' 3f		43	66	
	Uf		57	134	
	σ' 1f		177	267	

Documentation

Specimen 1 | Specimen 2

Before Test



After Test



Worksheet 21 - Triaxial Consolidated, Undrained (CU-BP) of GT-16-S-05 (6.60-6.80) (Graph & Result)

GT-14-S-03 (5.00-5.10)

PT. Geoservices
Geotechnical Laboratory

TRIAXIAL COMPRESSION - CONSOLIDATED, UNDRAINED (CU-BP) - SPECIMEN TEST 1

Test Standard : ASTM D4767

Client : PT. Iriana Mutiara Mining | **Sample ID : GT-14-S-03**

Job ID : GTK.00384 | **Depth (m) : 5.00-5.10**

Specimen :

Condition	Length (mm)	Diameter (mm)	Area (mm^2)	Weight (g)	Volume (cm^3)	Density (g/cm^3)
UDS	75.120	35.220	973.752	101.000	73.148	1.381

TX-1 Test

No	Time (s)	Displacement Input (mm)	Load Input (N)	Deviator Stress (kPa)	Axial Strain (%)	Minor Effective Stress (kPa)	Major Effective Stress kPa)	Cell Pressure Input (kPa)	Back Pressure Input (kPa)	Pore Pressure Input (kPa)
1	0	0	0.000	0.000	0.000	100.000	100.000	490	390	390
2	120	0.312	32.100	32.828	0.415	100.000	132.828	490	390	390
3	240	0.713	55.800	56.760	0.949	96.000	152.760	490	390	394
4	360	1.131	60.300	60.993	1.506	87.000	147.993	490	390	403
5	480	1.513	115.800	116.526	2.014	63.000	179.526	490	390	427
6	600	1.905	131.700	131.820	2.536	47.000	178.820	490	390	443
7	720	2.325	138.500	137.831	3.095	38.000	175.831	490	390	452
8	840	2.717	141.200	139.761	3.617	34.000	173.761	490	390	456
9	960	3.109	143.800	141.564	4.139	32.000	173.564	490	390	458
10	1080	3.5	146.400	143.341	4.659	29.000	172.341	490	390	461
11	1200	3.969	149.200	145.126	5.284	28.000	173.126	490	390	462
12	1320	4.277	150.200	145.466	5.694	26.000	171.466	490	390	464
13	1440	4.669	150.700	145.143	6.215	27.000	172.143	490	390	463
14	1560	5.071	153.300	146.805	6.751	26.000	172.805	490	390	464
15	1680	5.466	155.300	147.881	7.276	28.000	175.881	490	390	462
16	1800	5.854	156.900	148.573	7.793	27.000	175.573	490	390	463
17	1920	6.326	159.900	150.382	8.421	27.000	177.382	490	390	463
18	2100	6.867	160.000	149.292	9.141	28.000	177.292	490	390	462
19	2220	7.246	160.400	148.835	9.646	29.000	177.835	490	390	461
20	2340	7.631	161.000	148.544	10.158	27.000	175.544	490	390	463
21	2460	8.033	161.500	148.118	10.694	28.000	176.118	490	390	462
22	2580	8.421	163.600	149.176	11.210	29.000	178.176	490	390	461
23	2700	8.81	165.600	150.119	11.728	29.000	179.119	490	390	461
24	2820	9.242	167.000	150.402	12.303	29.000	179.402	490	390	461
25	3000	9.842	169.700	151.441	13.102	30.000	181.441	490	390	460
26	3120	10.176	171.300	152.087	13.546	28.000	180.087	490	390	462
27	3240	10.645	175.200	154.426	14.171	29.000	183.426	490	390	461
28	3360	11.008	174.700	153.119	14.654	31.000	184.119	490	390	459
29	3480	11.371	173.700	151.380	15.137	30.000	181.380	490	390	460
30	3600	11.788	174.600	151.169	15.692	30.000	181.169	490	390	460

Tested by Geotechnical Team

Apparatus

Machine : Triaxial Tri-Scan 50 (VJ Tech)

Capacity : 5 ton

Tested by Geotechnical Team

Tested date : 25-27 July 2023 | Checked by : Irsan

Tested by : Fakhri, Aprian | Approved by : Wayne

Worksheet 22 - Triaxial Consolidated, Undrained (CU-BP) of GT-14-S-03 (5.00-5.10) (Spec.1)

PT. Geoservices
Geotechnical Laboratory

TRIAXIAL COMPRESSION - CONSOLIDATED, UNDRAINED (CU-BP) - SPECIMEN TEST 2

Test Standard : ASTM D4767

Client : PT. Iriana Mutiara Mining
Job ID : GTK.00384

Sample ID : GT-14-S-03
Depth : 5.00-5.10

Specimen :

Condition	Length (mm)	Diameter (mm)	Area (mm^2)	Weight (g)	Volume (cm^3)	Density (g/cm^3)
UDS	74.920	35.340	980.399	101.400	73.451	1.381

TX-2 Test

No	Time (s)	Displacement Input (mm)	Load Input (N)	Deviator Stress (kPa)	Axial Strain (%)	Minor Effective Stress (kPa)	Major Effective Stress kPa)	Cell Pressure Input (kPa)	Back Pressure Input (kPa)	Pore Pressure Input (kPa)
1	0	0	0.000	0.000	0.000	200.000	200.000	590	390	390
2	60	0.204	23.300	23.701	0.272	199.000	222.701	590	390	391
3	120	0.388	22.900	23.237	0.518	197.000	220.237	590	390	393
4	180	0.592	23.400	23.679	0.790	199.000	222.679	590	390	391
5	240	0.79	28.900	29.167	1.054	196.000	225.167	590	390	394
6	300	0.99	42.200	42.475	1.321	194.000	236.475	590	390	396
7	360	1.207	46.400	46.565	1.611	189.000	235.565	590	390	401
8	420	1.385	54.000	54.061	1.849	185.000	239.061	590	390	405
9	480	1.583	64.200	64.100	2.113	179.000	243.100	590	390	411
10	540	1.774	94.600	94.207	2.368	168.000	262.207	590	390	422
11	600	1.984	118.900	118.066	2.648	153.000	271.066	590	390	437
12	660	2.185	134.900	133.584	2.916	136.000	269.584	590	390	454
13	720	2.376	146.000	144.196	3.171	123.000	267.196	590	390	467
14	780	2.567	154.900	152.583	3.426	113.000	265.583	590	390	477
15	840	2.774	161.800	158.924	3.703	104.000	262.924	590	390	486
16	900	2.981	167.600	164.149	3.979	96.000	260.149	590	390	494
17	960	3.166	172.100	168.123	4.226	92.000	260.123	590	390	498
18	1020	3.363	175.800	171.266	4.489	86.000	257.266	590	390	504
19	1080	3.57	178.700	173.587	4.765	81.000	254.587	590	390	509
20	1140	3.742	181.200	175.591	4.995	78.000	253.591	590	390	512
21	1200	3.956	183.500	177.286	5.280	75.000	252.286	590	390	515
22	1260	4.134	185.700	178.961	5.518	74.000	252.961	590	390	516
23	1320	4.344	187.300	179.968	5.798	69.000	248.968	590	390	521
24	1380	4.529	188.200	180.358	6.045	69.000	249.358	590	390	521
25	1440	4.726	189.700	181.287	6.308	67.000	248.287	590	390	523
26	1500	4.917	190.300	181.366	6.563	66.000	247.366	590	390	524
27	1560	5.131	191.500	181.951	6.849	65.000	246.951	590	390	525
28	1620	5.3	190.900	180.942	7.074	63.000	243.942	590	390	527
29	1680	5.507	189.500	179.081	7.351	65.000	244.081	590	390	525
30	1740	5.701	188.900	178.015	7.609	62.000	240.015	590	390	528

Tested by Geotechnical Team

Apparatus

Machine : Triaxial Tri-Scan 50 (VJ Tech)
Capacity : 5 ton

Tested by Geotechnical Team

Tested date : 27-29 July 2023
Tested by : Fakhri, Aprian

Checked by : Irsan
Approved by : Wayne

Worksheet 23 - Triaxial Consolidated, Undrained (CU-BP) of GT-14-S-03 (5.00-5.10) (Spec.2)

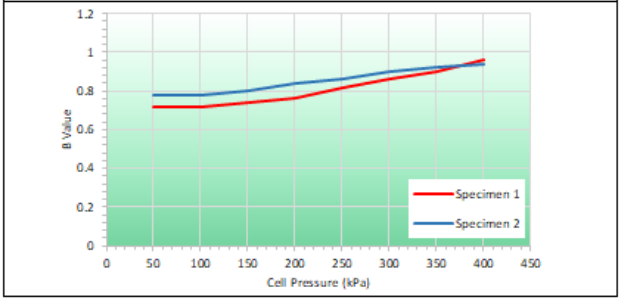
TRIAXIAL COMPRESSION - CONSOLIDATED, UNDRAINED (CU-BP)

ASTM D4767

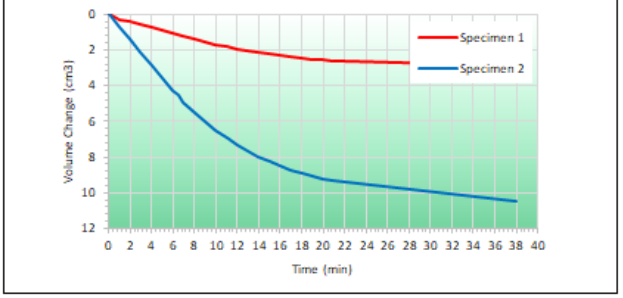
Request from : PT. Iriana Mutiara Mining
Job ID : GTK.00384
Sample ID : GT-14-S-03 (5.00-5.10 m)

Tested date : 25-29 July 2023
Tested by : Fakhri/Aprian
Checked by : Irsan

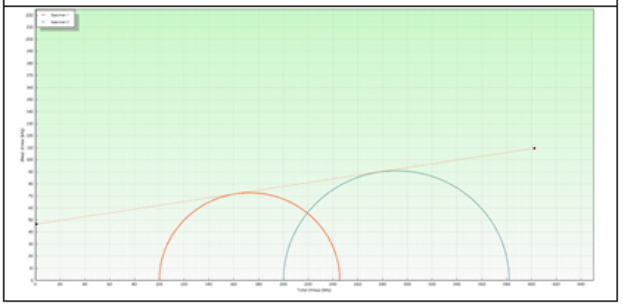
Saturation Stage



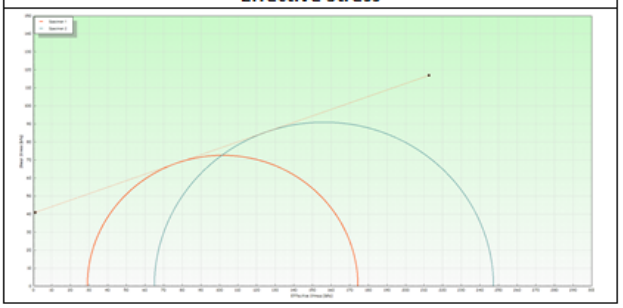
Consolidation Stage



Total Stress



Effective Stress



Result

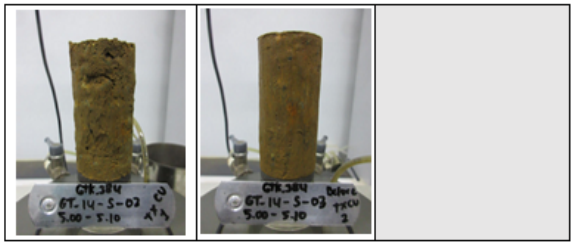
	Total	Effective	Unit
C	46.730	40.670	kPa
φ	8.900	19.800	(°)

Specimen			1	2	
Before Test	Density	g/cm^3	1.381	1.381	
	Water Content	%	94.82	120.60	
	Dry Density	g/cm^3	0.709	0.626	
Saturation Stage	Initial Pore Pressure	kPa	0	0	
	Final Pore Pressure		388	390	
	Final Cell Pressure		400	400	
	B Value		0.96	0.94	
Consolidation Stage	Cell Pressure	kPa	490	590	
	Back Pressure		390	390	
	Initial Pore Pressure		464	573	
	Final Pore Pressure		390	390	
Compression Stage	Cell Pressure	kPa	490	590	
	Back Pressure		390	390	
	σ'_3		100	200	
	Strain Rate	mm / min	0.200	0.200	
Failure Condition	Strain	%	14.17	6.85	
	(σ1 - σ3) f	kPa	154	182	
	σ' 3f		29	65	
	Uf		71	135	
	σ' 1f		183	247	

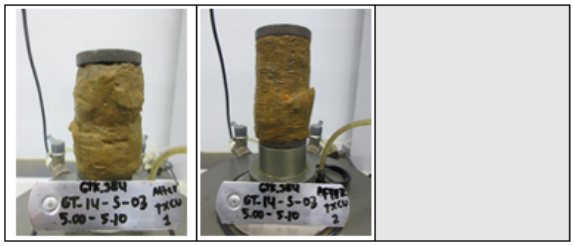
Documentation

Specimen 1 | Specimen 2

Before Test



After Test



Worksheet 24 - Triaxial Consolidated, Undrained (CU-BP) of GT-14-S-03 (5.00-5.10) (Graph & Result)

GT-14-S-05 (10.05-10.30)

PT. Geoservices
Geotechnical Laboratory

TRIAXIAL COMPRESSION - CONSOLIDATED, UNDRAINED (CU-BP) - SPECIMEN TEST 1

Test Standard : ASTM D4767

Client : PT. Iriana Mutiara Mining | **Sample ID : GT-14-S-05**

Job ID : GTK.00384 | **Depth (m) : 10.05-10.30**

Specimen :

Condition	Length (mm)	Diameter (mm)	Area (mm^2)	Weight (g)	Volume (cm^3)	Density (g/cm^3)
UDS	76.000	38.000	1133.540	165.380	86.149	1.920

TX-1 Test

No	Time (s)	Displacement Input (mm)	Load Input (N)	Deviator Stress (kPa)	Axial Strain (%)	Minor Effective Stress (kPa)	Major Effective Stress kPa)	Cell Pressure Input (kPa)	Back Pressure Input (kPa)	Pore Pressure Input (kPa)
1	0	0.000	0.000	0.000	0.000	100.000	100.000	240	140	140
2		0.200	22.440	21.386	0.274	100.000	121.386	240	140	140
3		0.400	38.760	36.839	0.547	100.000	136.839	240	140	140
4		0.600	40.800	38.671	0.821	100.000	138.671	240	140	140
5		0.800	44.880	42.420	1.095	98.000	140.420	240	140	142
6	1260	1.000	71.400	67.300	1.369	98.000	165.300	240	140	142
7		1.200	99.960	93.959	1.642	90.000	183.959	240	140	150
8		1.400	114.240	107.083	1.916	80.000	187.083	240	140	160
9		1.600	122.400	114.411	2.190	76.000	190.411	240	140	164
10		1.800	132.600	123.599	2.464	70.000	193.599	240	140	170
11	2880	2.000	138.720	128.940	2.737	67.000	195.940	240	140	173
12		2.200	144.840	134.250	3.011	65.000	199.250	240	140	175
13		2.400	153.000	141.413	3.285	61.000	202.413	240	140	179
14		2.600	163.200	150.414	3.559	60.000	210.414	240	140	180
15		2.800	169.320	155.611	3.832	60.000	215.611	240	140	180
16	4200	3.000	173.400	158.907	4.106	60.000	218.907	240	140	180
17		3.200	173.400	158.454	4.380	60.000	218.454	240	140	180
18		3.400	173.400	158.000	4.654	60.000	218.000	240	140	180
19		3.600	173.400	157.546	4.927	60.000	217.546	240	140	180
20		3.800	171.360	155.245	5.201	60.000	215.245	240	140	180
21	5520	4.000	167.280	151.111	5.475	60.000	211.111	240	140	180

Tested by Geotechnical Team

Apparatus

Machine : Triaxial Tri-Scan 50 (VJ Tech)

Capacity : 5 ton

Tested by Geotechnical Team

Tested date : 14-15 July 2023 | Checked by : Fakhri/Irsan

Tested by : Rizki | Approved by : Wayne

Worksheet 25 - Triaxial Consolidated, Undrained (CU-BP) of GT-14-S-05 (10.05-10.30) (Spec.1)

PT. Geoservices
Geotechnical Laboratory

TRIAXIAL COMPRESSION - CONSOLIDATED, UNDRAINED (CU-BP) - SPECIMEN TEST 2

Test Standard : ASTM D4767

Client : PT. Iriana Mutiara Mining
Job ID : GTK.00384

Sample ID : GT-14-S-05
Depth : 10.05-10.30

Specimen :

Condition	Length (mm)	Diameter (mm)	Area (mm^2)	Weight (g)	Volume (cm^3)	Density (g/cm^3)
UDS	76.000	38.000	1133.540	168.800	86.149	1.959

TX-2 Test

No	Time (s)	Displacement Input (mm)	Load Input (N)	Deviator Stress (kPa)	Axial Strain (%)	Minor Effective Stress (kPa)	Major Effective Stress kPa)	Cell Pressure Input (kPa)	Back Pressure Input (kPa)	Pore Pressure Input (kPa)
1	0	0.000	0.000	0.000	0.000	200.000	200.000	340	140	140
2		0.200	8.160	7.661	0.272	200.000	207.661	340	140	140
3		0.400	42.840	40.113	0.544	193.000	233.113	340	140	147
4		0.600	153.000	142.868	0.815	186.000	328.868	340	140	154
5		0.800	204.000	189.969	1.087	172.000	361.969	340	140	168
6	1920	1.000	230.520	214.075	1.359	163.000	377.075	340	140	177
7		1.200	257.040	238.046	1.631	151.000	389.046	340	140	189
8		1.400	283.560	261.880	1.902	147.000	408.880	340	140	193
9		1.600	297.840	274.307	2.174	130.000	404.307	340	140	210
10		1.800	318.240	292.280	2.446	120.000	412.280	340	140	220
11	3300	2.000	328.440	300.808	2.718	117.000	417.808	340	140	223
12		2.200	334.560	305.557	2.990	117.000	422.557	340	140	223
13		2.400	346.800	315.849	3.261	115.000	430.849	340	140	225
14		2.600	357.000	324.225	3.533	112.000	436.225	340	140	228
15		2.800	365.160	330.701	3.805	110.000	440.701	340	140	230
16	4680	3.000	375.360	338.978	4.077	110.000	448.978	340	140	230
17		3.200	389.640	350.877	4.348	110.000	460.877	340	140	230
18		3.400	403.920	362.703	4.620	110.000	472.703	340	140	230
19		3.600	403.920	361.670	4.892	110.000	471.670	340	140	230
20		3.800	420.240	375.208	5.164	110.000	485.208	340	140	230
21	6060	4.000	420.240	374.132	5.436	110.000	484.132	340	140	230
22		4.200	416.160	369.435	5.707	110.000	479.435	340	140	230
23		4.400	410.040	362.953	5.979	110.000	472.953	340	140	230
24	6720	4.600	401.880	354.702	6.251	110.000	464.702	340	140	230

Tested by Geotechnical Team

Apparatus

Machine : Triaxial Tri-Scan 50 (VJ Tech)
Capacity : 5 ton

Tested by Geotechnical Team

Tested date : 14-15 July 2023
Tested by : Rizki

Checked by : Fakhri/Irsan
Approved by : Wayne

Worksheet 26 - Triaxial Consolidated, Undrained (CU-BP) of GT-14-S-05 (10.05-10.30) (Spec.2)

PT. Geoservices
Geotechnical Laboratory

TRIAXIAL COMPRESSION - CONSOLIDATED, UNDRAINED (CU-BP) - SPECIMEN TEST 3

Test Standard : ASTM D4767

Client : PT. Iriana Mutiara Mining | **Sample ID : GT-14-S-05**

Job ID : GTK.00384 | **Depth : 10.05-10.30**

Specimen :

Condition	Length (mm)	Diameter (mm)	Area (mm^2)	Weight (g)	Volume (cm^3)	Density (g/cm^3)
UDS	76.000	38.000	1133.540	170.340	86.149	1.977

TX-3 Test

No	Time (s)	Displacement Input (mm)	Load Input (N)	Deviator Stress (kPa)	Axial Strain (%)	Minor Effective Stress (kPa)	Major Effective Stress kPa)	Cell Pressure Input (kPa)	Back Pressure Input (kPa)	Pore Pressure Input (kPa)
1	0	0.000	0.000	0.000	0.000	300.000	300.000	440	140	140
2		0.200	91.800	86.763	0.273	300.000	386.763	440	140	140
3		0.400	171.360	161.515	0.545	283.000	444.515	440	140	157
4		0.600	175.440	164.907	0.818	278.000	442.907	440	140	162
5		0.800	214.200	200.787	1.091	270.000	470.787	440	140	170
6	1500	1.000	252.960	236.466	1.363	260.000	496.466	440	140	180
7		1.200	285.600	266.240	1.636	255.000	521.240	440	140	185
8		1.400	314.160	292.052	1.909	249.000	541.052	440	140	191
9		1.600	338.640	313.935	2.181	240.000	553.935	440	140	200
10		1.800	346.800	320.603	2.454	237.000	557.603	440	140	203
11	2880	2.000	359.040	330.991	2.726	235.000	565.991	440	140	205
12		2.200	379.440	348.817	2.999	235.000	583.817	440	140	205
13		2.400	401.880	368.407	3.272	230.000	598.407	440	140	210
14		2.600	426.360	389.747	3.544	230.000	619.747	440	140	210
15		2.800	444.720	405.381	3.817	230.000	635.381	440	140	210
16	4440	3.000	459.000	417.212	4.090	230.000	647.212	440	140	210
17		3.200	477.360	432.667	4.362	230.000	662.667	440	140	210
18		3.400	489.600	442.496	4.635	224.000	666.496	440	140	216
19		3.600	497.760	448.584	4.908	224.000	672.584	440	140	216
20		3.800	507.960	456.464	5.180	224.000	680.464	440	140	216
21	5760	4.000	514.080	460.635	5.453	224.000	684.635	440	140	216
22		4.200	520.200	464.775	5.726	224.000	688.775	440	140	216
23		4.400	526.320	468.883	5.998	224.000	692.883	440	140	216
24		4.600	526.320	467.523	6.271	224.000	691.523	440	140	216
25		4.800	520.200	460.742	6.544	224.000	684.742	440	140	216
26	6960	5.000	512.040	452.192	6.816	224.000	676.192	440	140	216

Tested by Geotechnical Team

Apparatus

Machine : Triaxial Tri-Scan 50 (VJ Tech)

Capacity : 5 ton

Tested by Geotechnical Team

Tested date : 17-18 July 2023

Tested by : Rizki

Checked by : Fakhri/Irsan

Approved by : Wayne

Worksheet 27 - Triaxial Consolidated, Undrained (CU-BP) of GT-14-S-05 (10.05-10.30) (Spec.3)

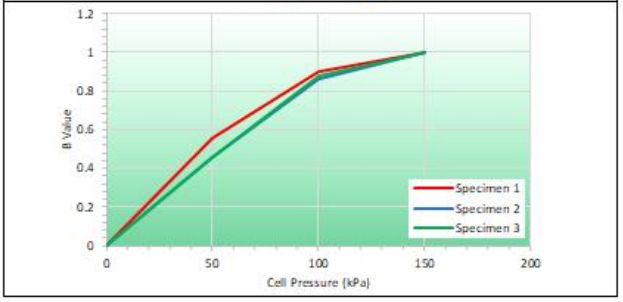
TRIAXIAL COMPRESSION - CONSOLIDATED, UNDRAINED (CU-BP)

ASTM D4767

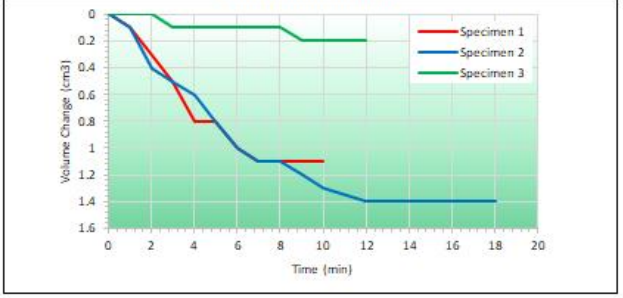
Request from : PT. Iriana Mutiara Mining
Job ID : GTK.00384
Sample ID : GT-14-S-05 (10.05-10.30 m)

Tested date : 14-18 July 2023
Tested by : Rizki
Checked by : Fakhri/Irsan

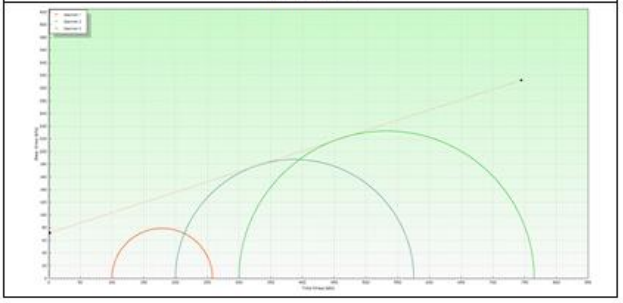
Saturation Stage



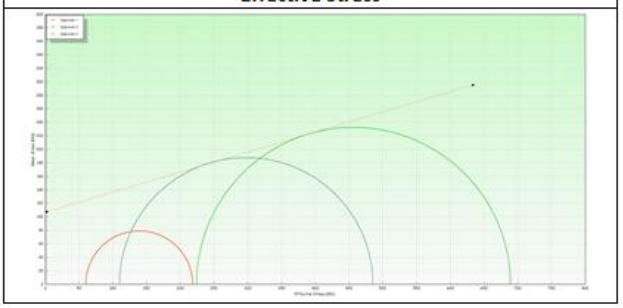
Consolidation Stage



Total Stress



Effective Stress



Result

	Total	Effective	Unit
C	71.670	106.980	kPa
φ	18.000	16.600	(°)

Specimen			1	2	3
Before Test	Density	g/cm³	1.920	1.959	1.977
	Water Content	%	15.59	17.39	19.48
	Dry Density	g/cm³	1.661	1.669	1.655
Saturation Stage	Initial Pore Pressure	kPa	0	0	0
	Final Pore Pressure		140	140	140
	Final Cell Pressure		150	150	150
	B Value		1.00	1.00	1.00
Consolidation Stage	Cell Pressure	kPa	240	340	440
	Back Pressure		140	140	140
	Initial Pore Pressure		190	350	240
	Final Pore Pressure		140	140	140
Compression Stage	Cell Pressure	kPa	240	340	440
	Back Pressure		140	140	140
	σ'_3		100	200	300
	Strain Rate	mm / min	0.045	0.045	0.045
Failure Condition	Strain	%	4.11	5.16	6.00
	(σ1 - σ3) f	kPa	159	375	469
	σ' 3f		60	110	224
	Uf		40	90	76
	σ' 1f		219	485	693

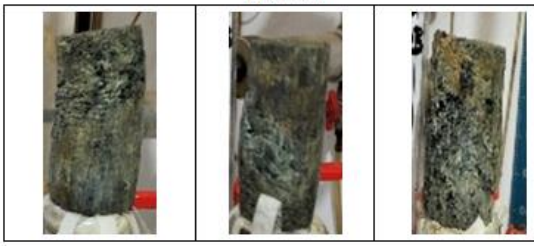
Documentation

Specimen 1	Specimen 2	Specimen 3

Before Test



After Test



Worksheet 28 - Triaxial Consolidated, Undrained (CU-BP) of GT-14-S-05 (10.05-10.30) (Graph & Result)

APPENDIX 7

IMM METALLURGICAL TEST RESULTS

PT. GEOSERVICES – METALLURGY LABORATORY
Jl Industri Selatan 2, Blok MM1, Jababeka 2, Cikarang Bekasi 17520, Indonesia

Metallurgy Technical Report

For

PT. Iriana Mutiara Mining

For Project

Siduarsi

Report Number CIK.MET.01699_INV1

The results contained in this report relate only to the sample(s) submitted for testing. Geoservices Metallurgy Laboratory accepts no responsibility for the representativeness of the sample(s) submitted for testing.

SUMMARY

From December 2022, a defined metallurgical testwork program was carried out on composite ores originating from PT. Iriana Mutiara Mining – Siduarsi project site.

The key findings arising from the testwork program are summarized below:

Moisture & Bulk Density

The key results from the project samples are summarized in the following table:

Table 1 – Moisture & bulk density summary

Sample ID	Bulk density (g/cm3)	% Moisture
SAPROLITE	1.55	27.6
LEMONITE	1.63	31.5

Head Grade Analysis

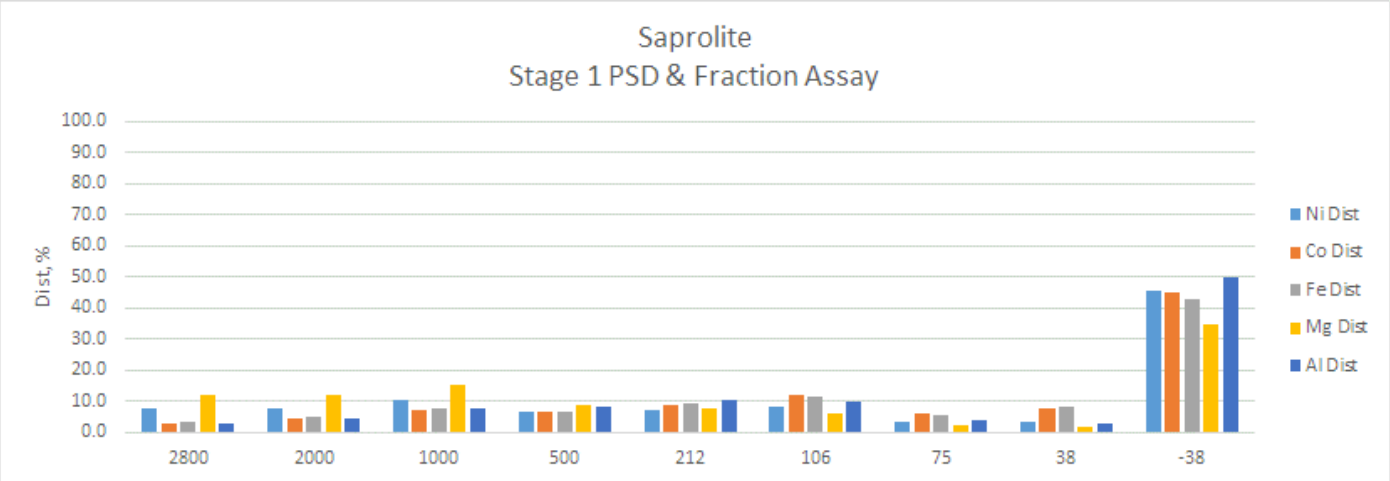
The key metal grades from the project samples are summarized in the following table:

Table 2 – Head grade analysis summary

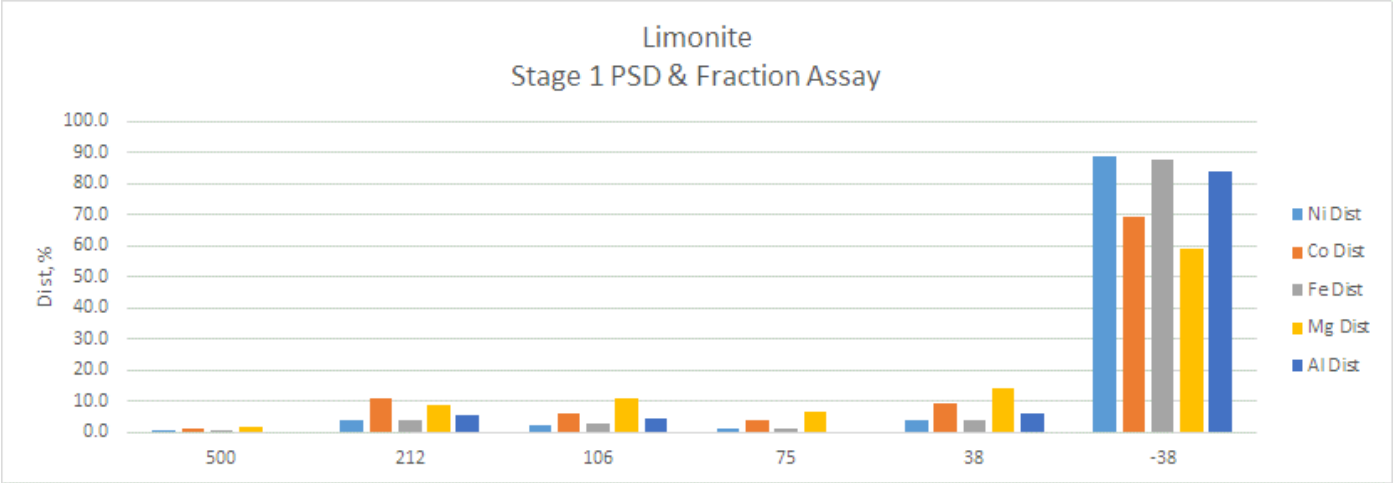
Analyte :	Scheme :	Analysis Unit :	SAPROLITE_HG	LIMONITE_HG
Al	**GAI04_ICP36**	**%**	1.06	2.66
Co	**GAI04_ICP36**	**ppm**	471	1302
Fe	**GAI04_ICP36**	**%**	>25	>25
Mg	**GAI04_ICP36**	**%**	10.88	0.52
Ni	**GAI04_ICP36**	**ppm**	13295	8571
Fe	**GOI04_ICP**	**%**	26.60	42.20
Mg	**GOI04_ICP**	**%**	10.88	--
Ni	**GOI04_ICP**	**%**	1	--
Ni	**XRFFNL**	**%**	1.45	1.06
Co	**XRFFNL**	**%**	0.06	0.16
Si	**XRFFNL**	**%**	11.81	1.36
Cr	**XRFFNL**	**%**	1.08	2.40
Al	**XRFFNL**	**%**	0.96	2.87

Stage 1: PSD, Fraction Assay & Mineralogy

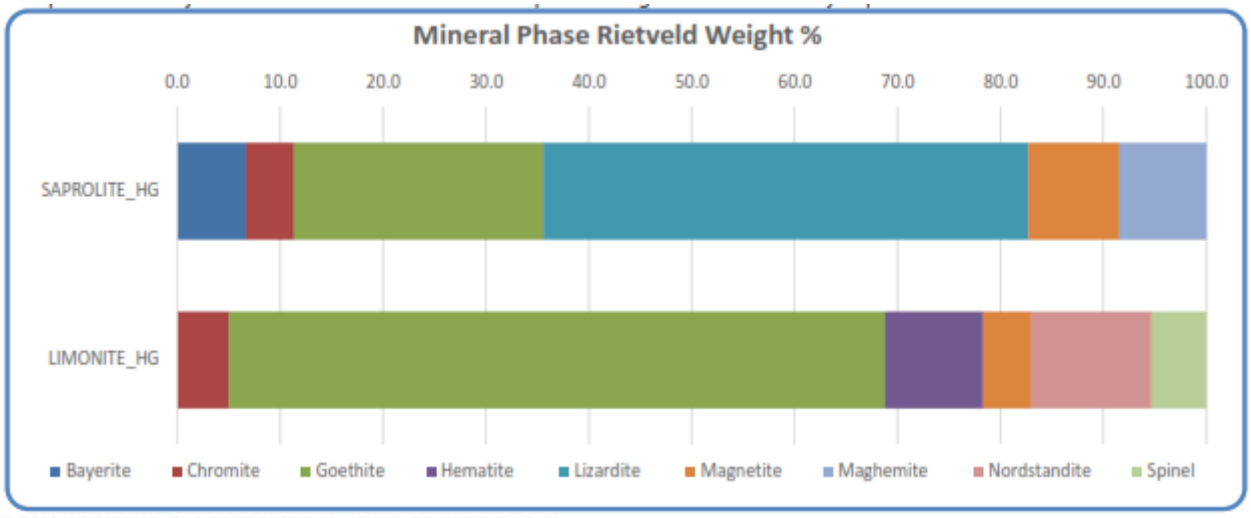
The key findings from Stage 1: PSD & fraction assay are summarized in the following:



Graph 1 – Stage 1 PSD fraction assay of Saprolite



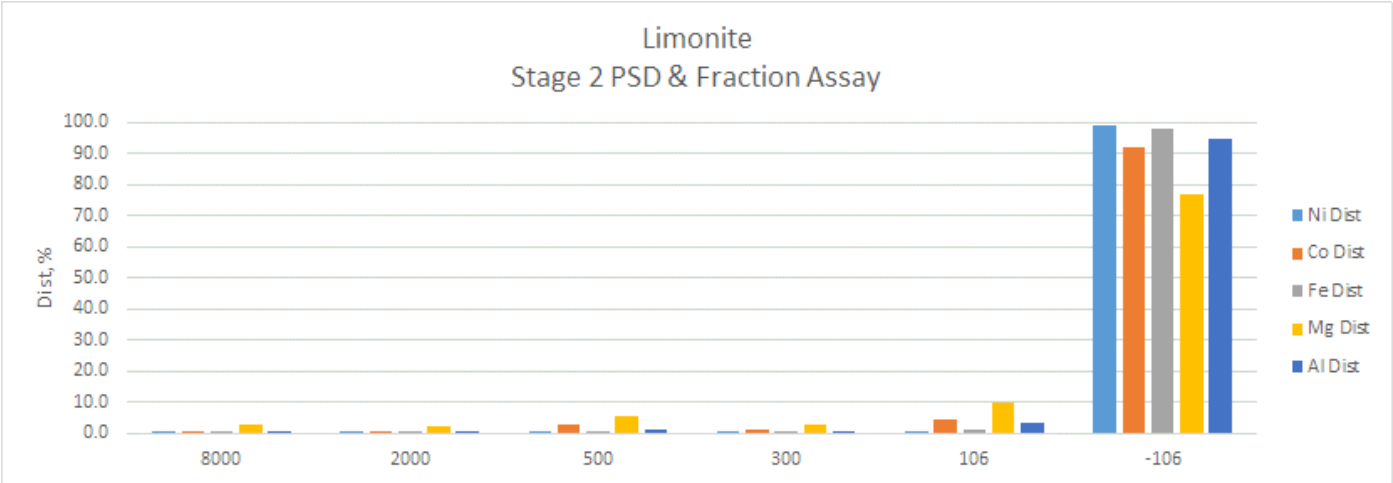
Graph 2 – Stage 1 PSD fraction assay of Limonite



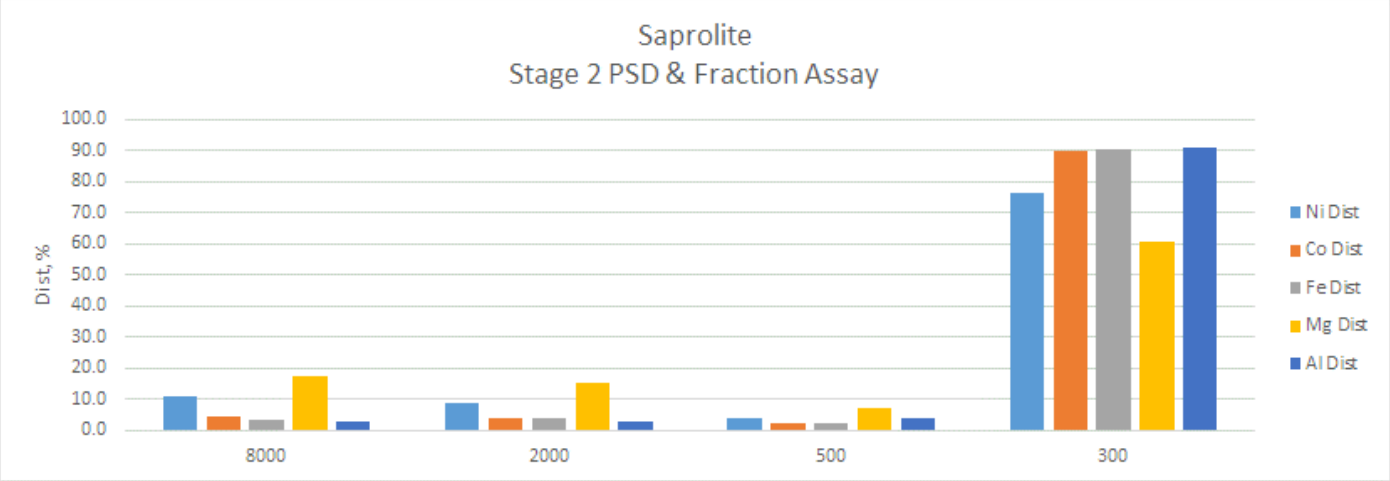
Graph 3 – Head mineralogy results

Stage 2: Attrition, PSD, Fraction Assay

The key findings from Stage 1: PSD & fraction assay are summarized in the following:



Graph 4 – Stage 2 PSD & fraction assay of Limonite



Graph 5 – Stage 2 PSD & fraction assay of Saprolite

DISCLAIMER

This report has been prepared for the Client by PT. Geoservices Metallurgy Laboratory Division. Other parties, at the discretion of the Client may be given access to the report or receive copies of the report, but only in full including this page, the title page, and appendices.

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PT. Geoservices Ltd is not responsible for any loss or damage arising out of the performance or non-performance in connection with the Services by any third party that PT. Geoservices Ltd engages to assist it in performing the Services.

PT. Geoservices Ltd has performed the Services and prepared this Report based only upon the sample material that the Client provided to PT. Geoservices Ltd.

PT. Geoservices was not involved in:

1. The drilling, collection, or transportation of the samples: and
2. The handling of the samples prior to their delivery to Geoservices

PT. Geoservices Laboratory Services, nor its agents or subcontractors shall be liable for any loss, deterioration, or destruction of, or damage to, any of the client's samples or property, but at all times the samples or property shall be at the risk of the client, who shall indemnify the Laboratory and its agents or subcontractors against any action, claim, suit or demand arising from any loss, deterioration, destruction or damage.

Samples considered to be radioactive will be returned to the client or sent to a regulated third party for disposal at client's expense. Geoservices is not licensed for long term storage of radioactive material.

The results presented in this report pertain only to the sample(s) as received.

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1 INTRODUCTION

The objective of this testing program was to provide metallurgical testwork data on client submitted samples.

A total of 2 samples were received at Cikarang Laboratory on December 2022.

The test program is shown as workflow diagram in paragraph 3 Testwork Flowcharts – Figure 1 and includes testwork provision as follows:

- Sample Preparation
- Stage 1: PSD & fraction assay
- Stage 2: Attrition, PSD & fraction assay

Testwork method summaries are provided in paragraph 4 with paragraph 5 containing the summary results of the individual testwork methods provided. Worksheets and other information relating to the test program are provided in the appendices.

Testwork results were communicated to the client when available to enable the testwork program to progress on a fully informed basis.

This report summarizes key results from the test program, using data summaries and graphical displays.

Diyah Farida Ulya
Operation Metallurgy Laboratory

2 SAMPLE INFORMATION

A total of 2 samples were submitted for testwork as per following table:

Table 3 – Sample Identification

No	SAMPLE ID		NUMBER OF SAMPLE (pcs)	NUMBER OF BAG/BOX	WET WEIGHT (kg)	Composite Wet Weight (Kg)	WET WEIGHT +BOX (kg)	Wet Received Actual Weight (kg)	Total Composites Wet Weight (kg)
1	IMM_DE1643_LIM.14.10.22-1		1	L1	26.55		44.35	23.6	
2	IMM_DE1643_LIM.14.10.22-2		1	L2	27.3		45.1	22.6	
3	IMM_DE1643_LIM.14.10.22-3		1	L3	30.75		48.55	26.9	
4	IMM_DE1643_LIM.14.10.22-4		1	L4	27.7		45.5	26.8	
5	IMM_DE1643_LIM.14.10.22-5		1	L5	26.25		44.05	25.3	
6	IMM_DE1643_LIM.14.10.22-6	IMM_DE1643_LIM.14.10.22	1	L6	27.05	303.75	44.85	26.2	277
7	IMM_DE1643_LIM.14.10.22-7		1	L7	25.65		43.45	24.9	
8	IMM_DE1643_LIM.14.10.22-8		1	L8	27.35		45.15	27.4	
9	IMM_DE1643_LIM.14.10.22-9		1	L9	29.25		47.05	23.9	
10	IMM_DE1643_LIM.14.10.22-1		1	L10	28.7		46.5	25.6	
11	IMM_DE1643_LIM.14.10.22-1		1	L11	27.2		45	23.8	
12	IMM_DE1106_SAP.15.10.22-1		1	S1	28.2		46	23.6	
13	IMM_DE1106_SAP.15.10.22-2		1	S2	29.9		47.7	29.3	
14	IMM_DE1106_SAP.15.10.22-3		1	S3	32.15		49.95	26.4	
15	IMM_DE1106_SAP.15.10.22-4		1	S4	35		52.8	29.4	
16	IMM_DE1106_SAP.15.10.22-5		1	S5	28.55		46.35	23.7	
17	IMM_DE1106_SAP.15.10.22-6	IMM_DE1106_SAP.15.10.22	1	S6	28.25	338.25	46.05	28.1	296.3
18	IMM_DE1106_SAP.15.10.22-7		1	S7	32.15		49.95	28.9	
19	IMM_DE1106_SAP.15.10.22-8		1	S8	31.55		49.35	24.5	
20	IMM_DE1106_SAP.15.10.22-9		1	S9	29.5		47.3	26.9	
21	IMM_DE1106_SAP.15.10.22-1		1	S10	31.3		49.1	30	
22	IMM_DE1106_SAP.15.10.22-1		1	S11	31.7		49.5	25.5	

3 TEST FLOWCHARTS

3.1 Testwork Flowchart Stage 1

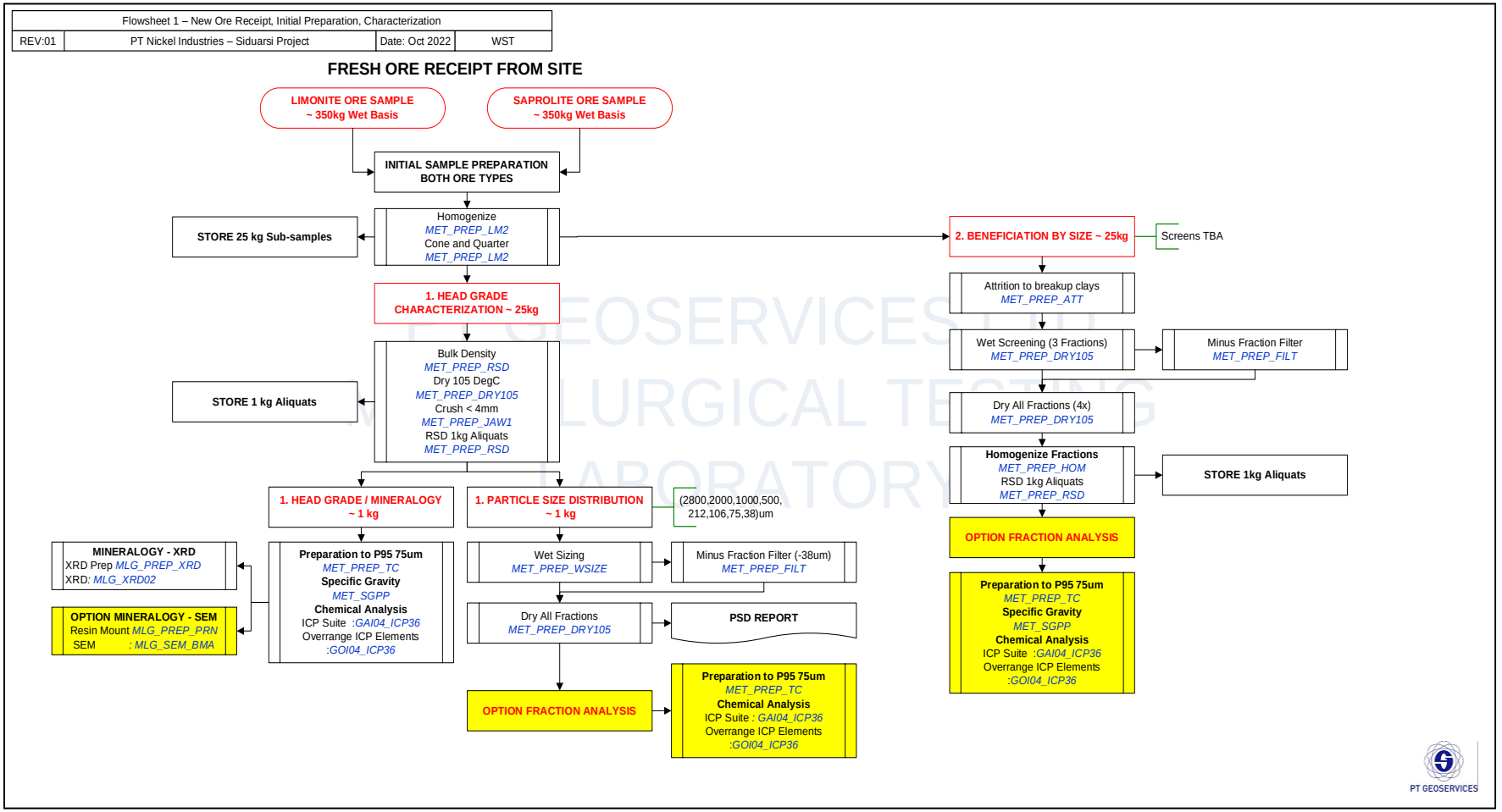


Figure 1- Testwork Flowchart Stage 1

The results contained in this report relate only to the sample(s) submitted for testing. Geoservices Metallurgy Laboratory accepts no responsibility for the representativeness of the sample(s) submitted for testing.

3.2 Testwork Flowchart Stage 2

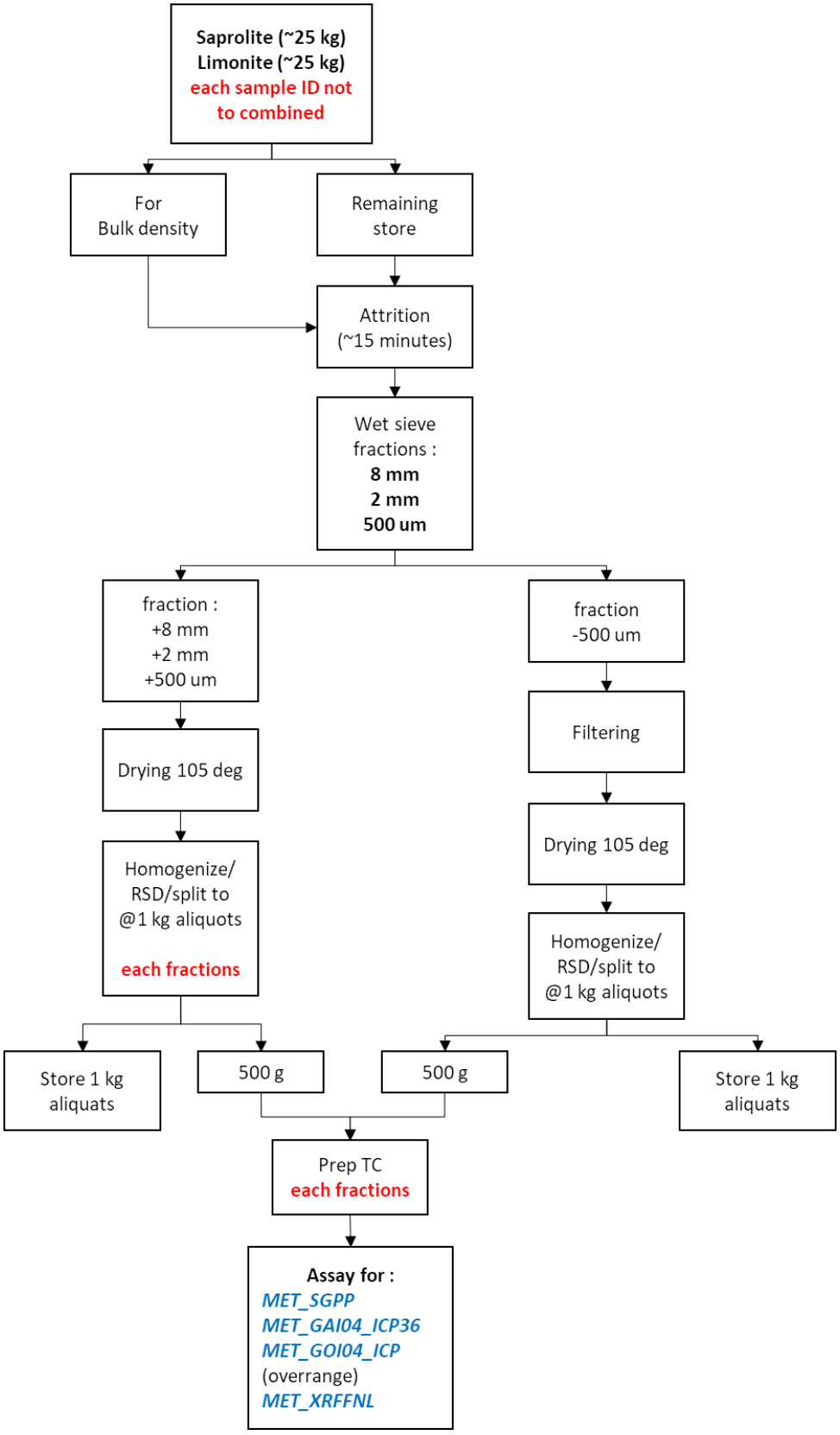


Figure 2 – Testwork Flowchart Stage 2

The results contained in this report relate only to the sample(s) submitted for testing. Geoservices Metallurgy Laboratory accepts no responsibility for the representativeness of the sample(s) submitted for testing.

4 TEST WORK METHOD SUMMARIES

The following method summaries were applied to the client samples for the project.

4.1 Sample Preparation

MET_PREP_BD - Bulk density of materials by weighing a measured volume of sample.

MET_PREP_SGPP - The method employs a small volumetric flask or pycnometer which is weighed empty, then filled with water to a designated mark and reweighed. The flask is emptied, and a known weight of the pulverized sample is put in the dry flask, water is then added to the graduation mark, and the flask is again weighed. The ratio between the weight of a given sample and the weight of an equal volume of water displaced by the sample is the specific gravity.

MET_PREP_DRY105 - Received samples are dried a 105°C until constant weight in a temperature controlled oven. Gravimetric determination of water content of the samples is calculated.

Sieving –Typical dried samples were passed through a nominated screen then continue to the next preparation stage.

Particle Size Distribution - The distribution of particle sizes of sample is determined by sieving through a series of certified sieves. The mass retained on the sieves and bottom pan is determined and the weight % retained on the sieves and pan calculated. The D80 and D90 is determined from the particle size distribution data.

4.2 Head Grade Chemical and Mineralogy

MET_XRFFXX - A calcined or ignited sample is added to Lithium Borate Flux, mixed well and fused between 1050 - 1100°C. A flat molten glass disc is prepared from the resulting melt. The fused-glass diskspecimen is irradiated by a high-energy X-ray beam. Concentrationsof the elements for the different ore type packages (XX) are determined by relating the measured radiation of unknown specimens to analytical curvesprepared from reference materials of known composition

XRD02 - The XRD technique is non-destructive and involves placing a powdered sample in a holder, then illuminate with x-rays of a fixed wave-length. X-ray diffraction relies on the dual wave/particle nature of X-rays to obtain information about the structure of crystalline materials. Qualitative analysis is performed using Reitveld Correction with Bruker Diffrac Suite Search/Match software with the ICDD PDF-4 database. XRD mineralogy results are also determined by Crystallinity calculation with amorphous content determined.

The equipment is operated under for following conditions.

XRD OPERATING CONDITIONS					
Info	XRD Equipment	Bruker XRD D8 Davinci	**Drives**	Thets- Drive Number	1
	Software	TOPAS Diffrac Suite, ICDD PDF4		Theta - Encoder used	No
	Xray Tube	Cobalt		Theta - Position	5.0000(°)
	Generator Voltage	40 Kv		Theta - Oscillation	No
	Generator Current	25 mA		2Theta- Drive Number	2
	Measurement Time	1:21:23 (h:mm:ss)		2Theta - Encoder used	No
Ranges	Scan Mode	Continuous Scan		2Theta - Position	2.5000(°)
	Start Position	5		2Theta - Oscillation	No
	Increment	0.0194603		Phi- Drive Number	3
	# Steps	4882		Phi - Encoder used	No
	Time per Step	1 (s)		Phi - Position	0.0(°)
	Motorized Slit Changer	OUT		Phi - Oscillation	no
	Synchronous Rotation	OFF	**LYNSEYE**	Electronic Window	2.95 (deg)
	Spinner Rotation 10 (rpm)	10(rpm)			

5.0 TESTWORK RESULT SUMMARIES

5.1 Sample Preparation

5.1.1 Moisture Determination

The received samples were dried at 105°C to constant weight and moisture loss calculated. Results tabled below:

Table 4 – Moisture determination results

Sample ID	Received Weight	Dried Weight	% Moisture
	g	g	%
COMP SAP IMM	25,140	18,200	27.6
COMP LIM IMM	25,040	17,160	31.5

5.1.2 Bulk Density

The bulk density were determined, results are tabled below:

Table 5 – Bulk density measurement results

Sample ID	Volume (mL)	Mass (g)	Mass (g)	Bulk density (g/cm3)
SAPROLITE	100	387.88	1550.45	1.55
LEMONITE	100	388.51	1634.95	1.63

5.2 Head Assay

Head assay were determined on the received samples. Table below presents the full results.

Table 6 – Full head assay

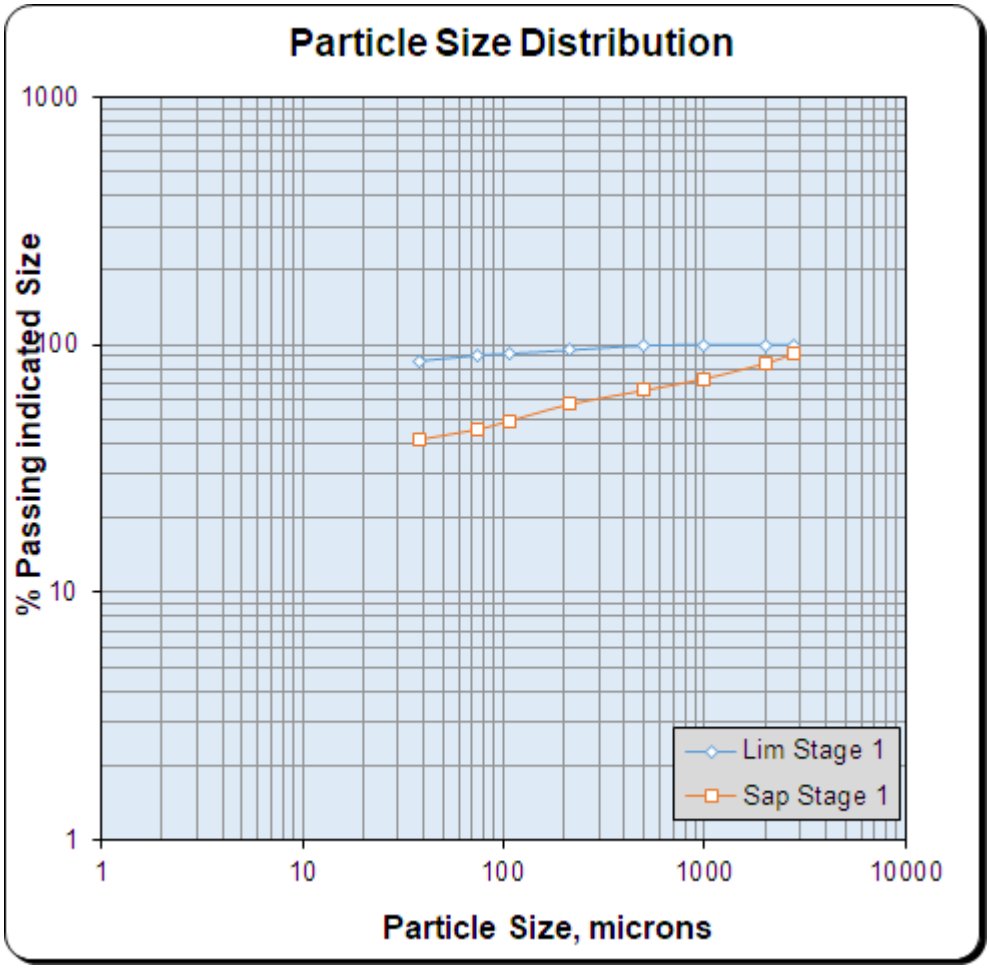
Analyte :	Scheme :	Analysis Unit :	SAPROLITE_HG	LIMONITE_HG
SG	MET_SGPP	g/cc	2.64	3.32
Al	GAI04_ICP36	%	1.06	2.66
As	GAI04_ICP36	ppm	<2	<2
Ba	GAI04_ICP36	ppm	<2	<2
Be	GAI04_ICP36	ppm	<5	<5
Bi	GAI04_ICP36	ppm	<5	<5
Ca	GAI04_ICP36	%	0.02	<0.01
Cd	GAI04_ICP36	ppm	<0.5	<0.5
Co	GAI04_ICP36	ppm	471	1302
Cr	GAI04_ICP36	ppm	>10000	>10000
Cu	GAI04_ICP36	ppm	143	264
Fe	GAI04_ICP36	%	>25	>25
Ga	GAI04_ICP36	ppm	20	29
K	GAI04_ICP36	%	0.01	<0.01
La	GAI04_ICP36	ppm	<5	<5
Mg	GAI04_ICP36	%	10.88	0.52
Mn	GAI04_ICP36	ppm	4142	6493
Mo	GAI04_ICP36	ppm	<2	<2
Na	GAI04_ICP36	%	<0.01	<0.01
Nb	GAI04_ICP36	ppm	<5	9
Ni	GAI04_ICP36	ppm	13295	8571
P	GAI04_ICP36	ppm	140	232
Pb	GAI04_ICP36	ppm	19	21
Rb	GAI04_ICP36	ppm	22	30
S	GAI04_ICP36	%	0.01	0.12

Analyte :	Scheme :	Analysis Unit :	SAPROLITE_HG	LIMONITE_HG
Sb	GAI04_ICP36	ppm	<5	<5
Sc	GAI04_ICP36	ppm	39	59
Sn	GAI04_ICP36	ppm	26	31
Sr	GAI04_ICP36	ppm	106	167
Ta	GAI04_ICP36	ppm	25	43
Ti	GAI04_ICP36	%	0.02	0.05
V	GAI04_ICP36	ppm	60	207
W	GAI04_ICP36	ppm	34	40
Y	GAI04_ICP36	ppm	<5	<5
Zn	GAI04_ICP36	ppm	360	363
Zr	GAI04_ICP36	ppm	13	20
Cr	GOI04_ICP	%	1.01	1.87
Fe	GOI04_ICP	%	26.60	42.20
Mg	GOI04_ICP	%	10.88	--
Ni	GOI04_ICP	%	1	--
LOI	XRFFNL	%	9.86	11.37
Ni	XRFFNL	%	1.45	1.06
Co	XRFFNL	%	0.06	0.16
Al2O3	XRFFNL	%	1.82	5.42
CaO	XRFFNL	%	0.05	0.01
Cr2O3	XRFFNL	%	1.57	3.51
Cu	XRFFNL	%	<0.01	<0.01
Fe2O3	XRFFNL	%	38.37	72.42
K2O	XRFFNL	%	<0.01	<0.01
MgO	XRFFNL	%	20.55	1.08
MnO	XRFFNL	%	0.50	0.96
Na2O	XRFFNL	%	<0.01	<0.01
P2O5	XRFFNL	%	<0.01	0.03
SO3	XRFFNL	%	<0.01	<0.01
SiO2	XRFFNL	%	25.27	2.90
TiO2	XRFFNL	%	0.03	0.12
LOI	XRFFNL	%	9.86	11.37
SUM	XRFFNL	%	99.98	99.41
Ti	XRFFNL	%	0.02	0.07
P	XRFFNL	%	<0.01	0.01
Zn	XRFFNL	%	0.03	0.03
Mg	XRFFNL	%	12.39	0.65
Mn	XRFFNL	%	0.39	0.75
K	XRFFNL	%	<0.01	<0.01
S	XRFFNL	%	<0.01	<0.01
Sc	XRFFNL	ppm	35	66
Si	XRFFNL	%	11.81	1.36
Cr	XRFFNL	%	1.08	2.40
Al	XRFFNL	%	0.96	2.87

5.3 Stage 1: PSD & Fraction Assay

5.3.1 PSD

The PSD of received samples were determined with key results summarized below. Full results available in Appendix A – Stage 1 PSD.



Graph 6 – Stage 1 PSD

5.3.2 Fraction Assay

The base metal grades were determined on the head samples with key results summarized below. Full results available in Appendix B – Stage 1 Fraction Assay.

Table 7 – Stage 1 fraction assay of Saprolite

Analyte Code : / Analysis Unit :	Weight Dist %	Co ppm	Fe %	Mg %	Ni ppm	Al %	Ni Dist %	Co Dist %	Fe Dist %	Mg Dist %	Al Dist %
SAPROLITE_PSD_2800um	7.7	145	12.00	18.50	12230	0.37	7.6	2.8	3.4	12.2	2.9
SAPROLITE_PSD_2000um	8.2	203	15.80	16.86	11846	0.52	7.8	4.1	4.8	11.8	4.4
SAPROLITE_PSD_1000um	11.0	257	19.10	16.25	11755	0.69	10.5	7.0	7.8	15.3	7.8
SAPROLITE_PSD_500um	7.6	335	23.90	13.40	10894	1.02	6.7	6.3	6.7	8.6	8.0
SAPROLITE_PSD_212um	8.0	441	30.50	11.07	10746	1.27	7.0	8.8	9.1	7.6	10.5
SAPROLITE_PSD_106um	8.2	595	36.60	8.59	11958	1.16	8.0	12.2	11.2	6.0	9.8
SAPROLITE_PSD_75um	3.5	714	43.20	6.99	12443	1.04	3.5	6.2	5.6	2.1	3.8
SAPROLITE_PSD_38um	4.2	734	53.60	4.98	10335	0.63	3.5	7.7	8.4	1.8	2.7
SAPROLITE_PSD_-38um	41.5	437	27.70	9.79	13535	1.17	45.4	45.0	42.8	34.6	50.0
Calc'd Head	100.0	**403**	**26.9**	**11.7**	**12372**	**0.97**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Head Assay		**471**	**26.6**	**10.9**	**13295**	**0.96**					

Table 8 – Stage 1 fraction assay of Limonite

Analyte Code : / Analysis Unit :	Weight Dist %	Co ppm	Fe %	Mg %	Ni ppm	Al %	Ni Dist %	Co Dist %	Fe Dist %	Mg Dist %	Al Dist %
LIMONITE_PSD_500um	0.7	2257	48.20	1.36	7591	IS	0.6	1.2	0.7	1.6	--
LIMONITE_PSD_212um	4.1	3704	48.70	1.27	8499	3.58	3.6	10.7	3.8	8.6	5.2
LIMONITE_PSD_106um	3.1	2824	42.80	2.10	6636	4.21	2.1	6.2	2.5	10.7	4.6
LIMONITE_PSD_75um	1.6	3161	38.60	2.38	6444	IS	1.1	3.6	1.2	6.3	--
LIMONITE_PSD_38um	4.5	2798	46.30	1.85	8162	3.84	3.8	9.1	4.1	14.0	6.3
LIMONITE_PSD_-38um	86.1	1128	52.50	0.41	9985	2.71	88.9	69.3	87.7	58.9	83.9
Calc'd Head	100.0	**1400**	**51.5**	**0.6**	**9667**	**2.78**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Head Assay		**1302**	**42.2**	**0.5**	**8571**	**2.87**					

5.3.3 Mineralogy

The head samples were analysed by X-Ray Diffraction (XRD) for bulk mineralogy. The results of mineralogy for the samples provided in the following table: Diffractograms provided in Appendix C – Mineralogy.

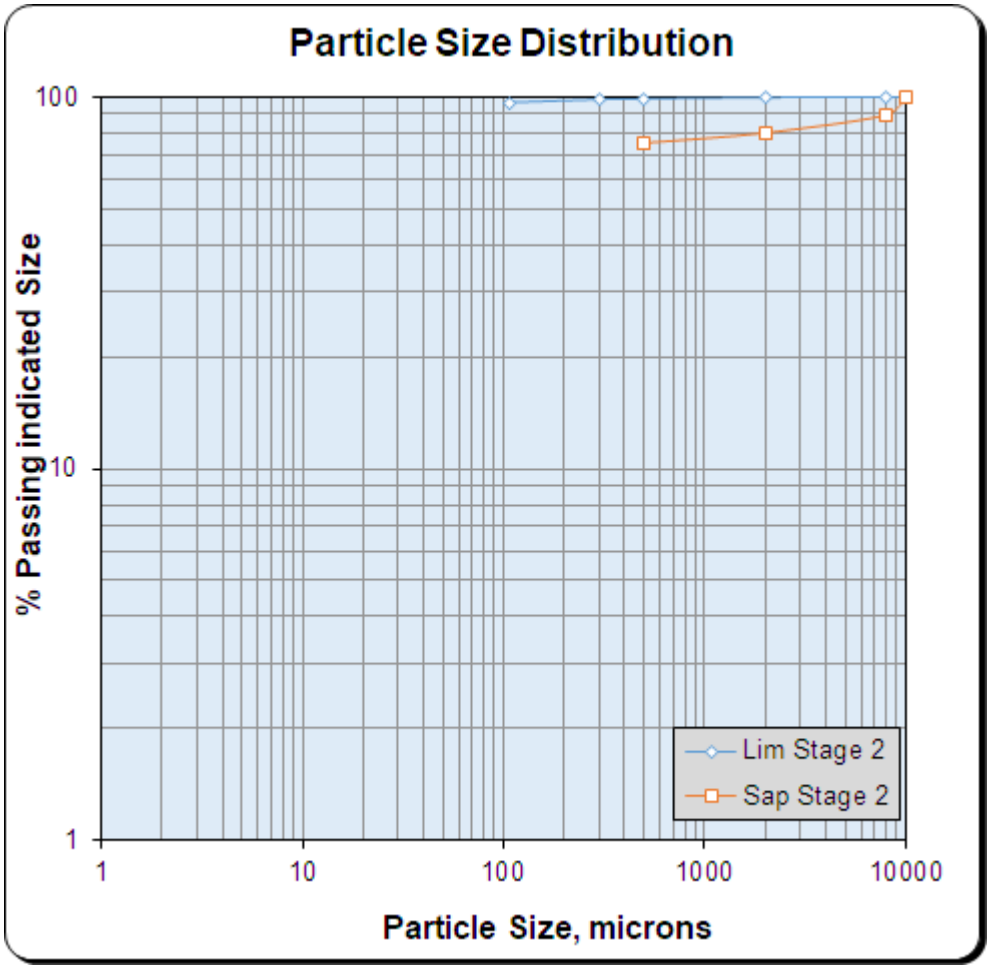
Table 9 – Bulk XRD mineral identification summary

				RIETVELD REFINEMENT WT%	
Mineral Phase Identification	**Mineral Chemical Formula**	**Mineral Classification**	**Mineral Group**	**SAPROLITE_HG**	**LIMONITE_HG**
Bayerite	Al (O H)3	Oxides/Hydroxides	No Group	6.7	
Chromite	Fe Cr2 O4	Oxides/Hydroxides	Spinel	4.6	5.0
Goethite	Fe O (O H)	Oxides/Hydroxides	Diaspore	24.3	63.8
Hematite	Fe2 O3	Oxides/Hydroxides	Hematite		9.5
Lizardite	Mg3 Si2 O5 (O H)4	Silicates	Serpentine	47.1	
Magnetite	Fe3 O4	Oxides/Hydroxides	Spinel	8.8	4.7
Maghemite	Fe2 O3	Oxides/Hydroxides	Spinel	8.4	
Nordstandite	Al (O H)3	Oxides/Hydroxides	No Group		11.7
Spinel	Mg0.66 Cr0.77 Fe0.39 Al1.18 O4	Oxides/Hydroxides	Spinel		5.3
			Total	**100.0**	**100.0**

5.3 Stage 2: Attrition, PSD & Fraction Assay

5.3.1 PSD

The PSD of received samples were determined with key results summarized below. Full results available in Appendix D – Stage 2 PSD.



Graph 7 – Stage 2 PSD

5.3.2 Fraction Assay

The base metal grades were determined on the head samples with key results summarized below. Full results available in Appendix E – Stage 2 Fraction Assay.

Table 10 – Stage 2 fraction assay of Saprolite

Analyte Code :	Weight Dist	Ni	Co	Al	Fe	Mg	Ni Dist	Co Dist	Fe Dist	Mg Dist	Al Dist
Analysis Unit :	%	%	%	%	%	%	%	%	%	%	%
SAPROLITE_PSD_8000um	10.5	1.50	0.02	0.25	8.64	16.70	11.0	4.2	3.5	17.3	2.5
SAPROLITE_PSD_2000um	9.4	1.34	0.02	0.33	9.85	16.18	8.8	3.8	3.6	14.9	2.9
SAPROLITE_PSD_500um	4.8	1.13	0.02	0.82	12.39	15.02	3.8	1.9	2.3	7.2	3.8
SAPROLITE_PSD_-500um	75.2	1.46	0.06	1.28	31.27	8.21	76.4	90.1	90.6	60.6	90.8
Calc'd Head	**100.0**	**1.44**	**0.05**	**1.06**	**25.96**	**10.18**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Head Assay		**1.45**	**0.06**	**1.06**	**26.60**	**10.88**					

Table 11 – Stage 2 fraction assay of Limonite

Analyte Code :	Weight Dist	Ni	Co	Al	Fe	Mg	Ni Dist	Co Dist	Fe Dist	Mg Dist	Al Dist
Analysis Unit :	%	%	%	%	%	%	%	%	%	%	%
LIMONITE_PSD_8000um	0.1	1.85	0.06	0.43	11.24	15.18	0.2	0.0	0.0	2.9	0.0
LIMONITE_PSD_2000um	0.2	1.30	0.15	1.51	28.24	8.66	0.2	0.2	0.1	2.4	0.1
LIMONITE_PSD_500um	0.8	0.37	0.50	5.09	30.97	3.74	0.3	2.7	0.5	5.3	1.3
LIMONITE_PSD_300um	0.4	0.24	0.33	5.52	28.48	3.07	0.1	1.0	0.3	2.5	0.8
LIMONITE_PSD_106um	1.8	0.26	0.35	5.65	27.87	3.05	0.4	4.3	1.0	10.0	3.3
LIMONITE_PSD_-106um	96.7	1.08	0.14	3.05	50.03	0.44	98.8	91.8	98.1	77.0	94.6
Calc'd Head	**100.0**	**1.06**	**0.15**	**3.12**	**49.31**	**0.55**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Head Assay		**1.06**	**0.16**	**2.66**	**42.20**	**0.52**					

APPENDICES

Appendix A – Stage 1 PSD

Worksheet 1 – Stage 1 PSD Limonite

MET-WS-013	Rev 02	DFU

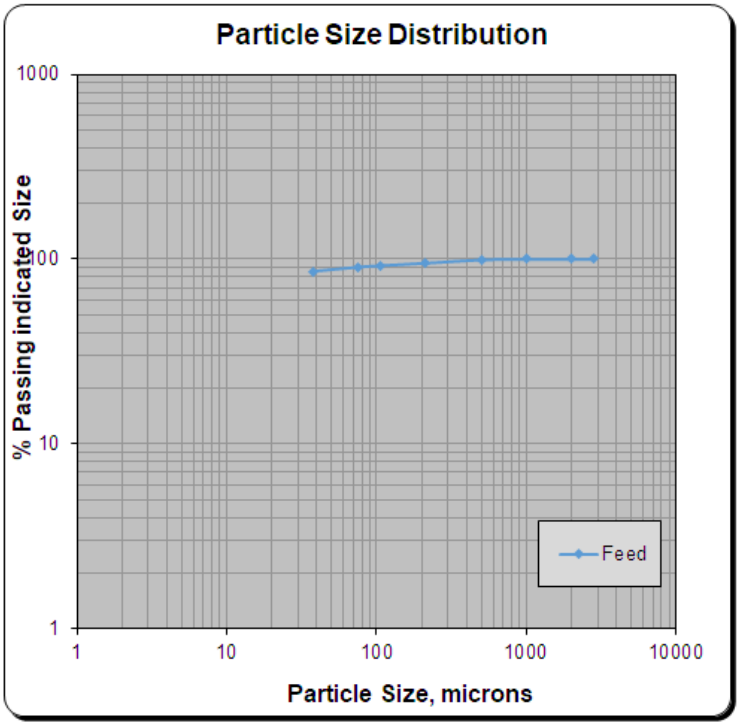
PT. GEOSERVICES - GEOMETALLURGICAL LABORATORY

PARTICLE SIZE DISTRIBUTION

PT GEOSERVICES

Job No :	CIK.MET.01699	Sample ID :	COMP LIMONITE	Date :	11-Nov-22
Client :	IRIANA MUTIARA MINING	Method :	Wet Sizing	Operator :	Anto
Project :	SIDUARSI PROJECT	Grind Size :	As Is	Approver :	Wayne Turner

i	Mesh #	Screen Opening (um)	Retained Weight (g)	Retained Weight (%)	Cumm. Passing (%)
1					100.00
2					100.00
3					100.00
4					100.00
5					100.00
6					100.00
7					100.00
8					100.00
9					100.00
10					100.00
11					100.00
12					100.00
13		2800	0.00	0.00	100.00
14		2000	0.00	0.00	100.00
15		1000	0.30	0.03	99.97
16		500	6.97	0.72	99.25
17		212	39.27	4.05	95.20
18		106	29.57	3.05	92.15
19		75	15.31	1.58	90.57
20		38	43.90	4.53	86.04
21	PAN	-38	834.19	86.04	



TOTAL 969.51

D90 = 69 um

Worksheet 2 – Stage 2 PSD Saprolite

MET-WS-013	Rev 02	DFU

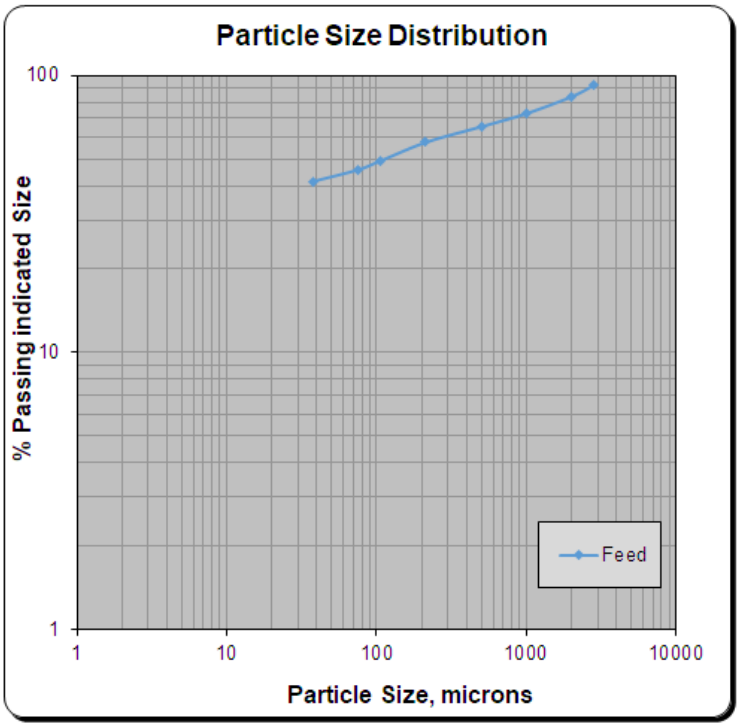
PT. GEOSERVICES - GEOMETALLURGICAL LABORATORY

PARTICLE SIZE DISTRIBUTION

PT GEOSERVICES

Job No :	CIK.MET.01699	Sample ID :	COMP SAPROLITE	Date :	13-Nov-22
Client :	IRIANA MUTIARA MINING	Method :	Wet Sizing	Operator :	Aji
Project :	SIDUARSI PROJECT	Grind Size :	As Is	Approver :	Wayne Turner

i	Mesh #	Screen Opening (um)	Retained Weight (g)	Retained Weight (%)	Cumm. Passing (%)
1					100.00
2					100.00
3					100.00
4					100.00
5					100.00
6					100.00
7					100.00
8					100.00
9					100.00
10					100.00
11					100.00
12					100.00
13		2800	73.54	7.72	92.28
14		2000	78.07	8.19	84.09
15		1000	105.03	11.02	73.06
16		500	72.14	7.57	65.49
17		212	76.68	8.05	57.45
18		106	78.48	8.24	49.21
19		75	33.46	3.51	45.70
20		38	40.08	4.21	41.49
21	PAN	-38	395.33	41.49	



TOTAL	952.81	D80 =	1564 um	D90 =	2557 um

Appendix B – Stage 1 Fraction Assay

Table 12 – Stage 1 fraction assay of Saprolite

Analyte Code :	Scheme Code :	Analysis Unit :	SAPROLITE PSD 2800um	SAPROLITE PSD 2000um	SAPROLITE PSD 1000um	SAPROLITE PSD 500um	SAPROLITE PSD 212um	SAPROLITE PSD 106um	SAPROLITE PSD 75um	SAPROLITE PSD 38um	SAPROLITE PSD -38um
SG	MET SGPP	g/cc	2.46	2.55	2.61	2.71	2.85	3.00	3.13	3.26	2.51
Al	GAI04 ICP36	%	0.49	0.54	0.74	1.12	1.39	1.22	1.17	0.73	1.19
As	GAI04_ICP36	ppm	<2	<2	<2	<2	<2	<2	<2	<2	<2
Ba	GAI04_ICP36	ppm	<2	<2	<2	<2	<2	<2	<2	<2	<2
Be	GAI04_ICP36	ppm	<5	<5	<5	<5	<5	<5	<5	<5	<5
Bi	GAI04_ICP36	ppm	<5	<5	<5	<5	<5	<5	<5	<5	<5
Ca	GAI04_ICP36	%	0.01	0.01	0.03	0.04	0.05	0.10	0.15	0.14	0.14
Cd	GAI04_ICP36	ppm	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Co	GAI04_ICP36	ppm	145	203	257	335	441	595	714	734	437
Cr	GAI04_ICP36	ppm	5434	6948	9426	19738	24076	12195	8896	7747	5316
Cu	GAI04_ICP36	ppm	29	37	3	24	15	33	22	90	27
Fe	GAI04_ICP36	%	12.00	15.80	19.10	23.90	30.50	36.60	43.20	53.60	27.70
Ga	GAI04_ICP36	ppm	9	12	18	25	32	23	25	28	16
K	GAI04_ICP36	%	0.01	<0.01	0.01	<0.01	<0.01	0.01	0.01	0.01	0.01
La	GAI04_ICP36	ppm	<5	<5	<5	<5	<5	<5	<5	<5	<5
Mg	GAI04_ICP36	%	18.50	16.86	16.25	13.40	11.07	8.59	6.99	4.98	9.79
Mn	GAI04_ICP36	ppm	980	1466	1938	2579	3511	5267	6335	5808	4450
Mo	GAI04_ICP36	ppm	<2	<2	<2	<2	<2	<2	<2	<2	<2
Na	GAI04_ICP36	%	0.01	0.01	0.01	0.01	0.01	0.02	0.03	0.03	0.05
Nb	GAI04_ICP36	ppm	<5	<5	<5	<5	<5	<5	<5	<5	<5
Ni	GAI04_ICP36	ppm	12230	11846	11755	10894	10746	11958	12443	10335	13535
P	GAI04_ICP36	ppm	83	94	132	87	157	171	219	211	136
Pb	GAI04_ICP36	ppm	<5	<5	<5	10	7	7	15	17	7
Rb	GAI04_ICP36	ppm	35	33	22	22	12	34	47	20	24
S	GAI04_ICP36	%	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sb	GAI04_ICP36	ppm	<5	<5	<5	<5	<5	<5	<5	<5	<5
Sc	GAI04_ICP36	ppm	15	20	25	30	35	42	41	23	48
Sn	GAI04_ICP36	ppm	<10	<10	<10	<10	<10	<10	<10	<10	<10
Sr	GAI04_ICP36	ppm	56	66	87	113	145	157	183	225	121
Ta	GAI04_ICP36	ppm	19	20	22	31	35	25	24	24	20

The results contained in this report relate only to the sample(s) submitted for testing. Geoservices Metallurgy Laboratory accepts no responsibility for the representativeness of the sample(s) submitted for testing.

Analyte Code :	Scheme Code :	Analysis Unit :	SAPROLITE PSD 2800um	SAPROLITE PSD 2000um	SAPROLITE PSD 1000um	SAPROLITE PSD 500um	SAPROLITE PSD 212um	SAPROLITE PSD 106um	SAPROLITE PSD 75um	SAPROLITE PSD 38um	SAPROLITE PSD -38um
Ti	GAI04_ICP36	%	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.01	0.02
V	GAI04_ICP36	ppm	21	32	41	66	86	72	76	61	64
W	GAI04_ICP36	ppm	29	28	14	21	26	17	40	20	16
Y	GAI04_ICP36	ppm	<5	<5	<5	<5	<5	<5	<5	<5	<5
Zn	GAI04_ICP36	ppm	126	156	203	296	373	343	351	282	387
Zr	GAI04_ICP36	ppm	13	6	7	10	12	14	20	21	21
Cr	GOI04_ICP	%	--	--	--	1.97	2.41	1.22	--	--	--
Fe	GOI04_ICP	%	--	--	--	--	30.50	36.60	43.20	53.60	27.70
Mg	GOI04_ICP	%	--	--	--	--	--	--	--	--	--
Ni	GOI04_ICP	%	1.22	1.18	1.18	1.09	1.07	1.20	1.24	1.03	1.35
Mn	GOI04_ICP	%	--	--	--	--	--	--	--	--	--
LOI	XRFFNL	%	11.04	10.70	10.32	9.41	8.39	8.36	7.33	4.32	10.76
Ni	XRFFNL	%	1.38	1.36	1.33	1.21	1.13	1.35	1.39	1.21	1.64
Co	XRFFNL	%	0.02	0.03	0.04	0.05	0.06	0.08	0.09	0.10	0.06
Al2O3	XRFFNL	%	0.71	0.99	1.30	1.93	2.40	2.19	1.96	1.20	2.22
CaO	XRFFNL	%	0.04	0.05	0.07	0.08	0.10	0.18	0.24	0.24	0.25
Cr2O3	XRFFNL	%	0.85	1.06	1.54	5.03	8.60	2.58	1.44	1.22	0.92
Cu	XRFFNL	%	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Fe2O3	XRFFNL	%	16.93	22.69	26.68	33.41	40.66	51.60	59.72	70.77	41.69
K2O	XRFFNL	%	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.02	0.01	0.02
MgO	XRFFNL	%	31.30	28.86	27.08	22.52	18.00	14.54	11.54	8.90	17.52
MnO	XRFFNL	%	0.13	0.20	0.25	0.33	0.44	0.72	0.86	0.83	0.65
Na2O	XRFFNL	%	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
P2O5	XRFFNL	%	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
SO3	XRFFNL	%	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
SiO2	XRFFNL	%	36.65	33.83	31.80	25.92	20.47	18.23	15.21	10.97	23.97
TiO2	XRFFNL	%	0.02	0.02	0.01	0.03	0.04	0.04	0.04	0.04	0.04
LOI	XRFFNL	%	11.04	10.70	10.32	9.41	8.39	8.36	7.33	4.32	10.76
SUM	XRFFNL	%	99.48	100.19	100.80	100.30	100.66	100.31	100.28	100.17	100.24
Ti	XRFFNL	%	0.01	0.01	<0.01	0.02	0.02	0.02	0.03	0.02	0.03
P	XRFFNL	%	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Zn	XRFFNL	%	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.02	0.04
Mg	XRFFNL	%	18.88	17.41	16.33	13.58	10.85	8.77	6.96	5.37	10.56

Analyte Code :	Scheme Code :	Analysis Unit :	SAPROLITE PSD 2800um	SAPROLITE PSD 2000um	SAPROLITE PSD 1000um	SAPROLITE PSD 500um	SAPROLITE PSD 212um	SAPROLITE PSD 106um	SAPROLITE PSD 75um	SAPROLITE PSD 38um	SAPROLITE PSD -38um
Mn	**XRFFNL**	**%**	0.10	0.15	0.19	0.26	0.34	0.56	0.67	0.64	0.50
K	**XRFFNL**	**%**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.01	0.02
S	**XRFFNL**	**%**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sc	**XRFFNL**	**ppm**	17	22	26	32	34	38	43	27	47
Si	**XRFFNL**	**%**	17.14	15.82	14.87	12.12	9.57	8.52	7.11	5.13	11.20
Cr	**XRFFNL**	**%**	0.58	0.73	1.05	3.44	5.89	1.77	0.98	0.83	0.63
Al	**XRFFNL**	**%**	0.37	0.52	0.69	1.02	1.27	1.16	1.04	0.63	1.17

Table 13 – Stage 1 fraction assay of Limonite

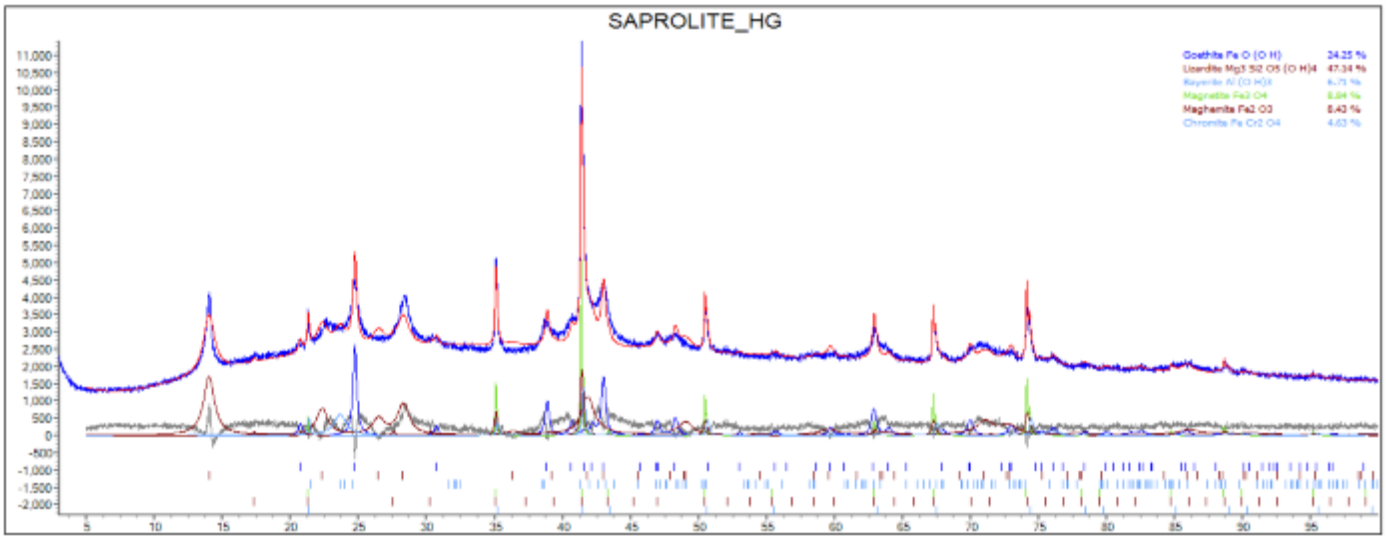
Analyte Code :	Scheme Code :	Analysis Unit :	LIMONITE PSD 500um	LIMONITE PSD 212um	LIMONITE PSD 106um	LIMONITE PSD 75um	LIMONITE PSD 38um	LIMONITE PSD -38um
SG	**MET SGPP**	**g/cc**	3.38	3.45	3.62	3.47	3.48	3.21
Al	**GAI04 ICP36**	**%**	3.90	3.16	4.56	4.60	4.07	2.86
As	**GAI04_ICP36**	**ppm**	16	<2	21	14	24	<2
Ba	**GAI04_ICP36**	**ppm**	<2	<2	<2	<2	<2	<2
Be	**GAI04_ICP36**	**ppm**	<5	<5	<5	<5	<5	<5
Bi	**GAI04_ICP36**	**ppm**	10	<5	25	28	22	<5
Ca	**GAI04_ICP36**	**%**	0.01	0.02	0.01	0.01	0.02	0.01
Cd	**GAI04_ICP36**	**ppm**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Co	**GAI04_ICP36**	**ppm**	2257	3704	2824	3161	2798	1128
Cr	**GAI04_ICP36**	**ppm**	46870	23356	69846	68908	60956	12456
Cu	**GAI04_ICP36**	**ppm**	52	55	21	21	28	36
Fe	**GAI04_ICP36**	**%**	48.20	48.70	42.80	38.60	46.30	52.50
Ga	**GAI04_ICP36**	**ppm**	59	34	81	78	71	32
K	**GAI04_ICP36**	**%**	<0.01	<0.01	<0.01	0.01	<0.01	<0.01
La	**GAI04_ICP36**	**ppm**	<5	<5	<5	<5	<5	<5
Mg	**GAI04_ICP36**	**%**	1.36	1.27	2.10	2.38	1.85	0.41
Mn	**GAI04_ICP36**	**ppm**	8982	12759	10403	11321	10918	6253
Mo	**GAI04_ICP36**	**ppm**	<2	<2	<2	<2	<2	<2
Na	**GAI04_ICP36**	**%**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nb	**GAI04_ICP36**	**ppm**	15	13	27	29	16	10
Ni	**GAI04_ICP36**	**ppm**	7591	8499	6636	6444	8162	9985
P	**GAI04_ICP36**	**ppm**	306	295	271	226	293	349

Analyte Code :	Scheme Code :	Analysis Unit :	LIMONITE PSD 500um	LIMONITE PSD 212um	LIMONITE PSD 106um	LIMONITE PSD 75um	LIMONITE PSD 38um	LIMONITE PSD - 38um
Pb	GAI04_ICP36	ppm	16	12	14	25	<5	17
Rb	GAI04_ICP36	ppm	25	31	22	31	20	36
S	GAI04_ICP36	%	0.10	0.10	0.10	<0.01	0.10	0.10
Sb	GAI04_ICP36	ppm	<5	<5	<5	<5	<5	<5
Sc	GAI04_ICP36	ppm	59	65	46	38	48	73
Sn	GAI04_ICP36	ppm	<10	<10	<10	<10	<10	<10
Sr	GAI04_ICP36	ppm	230	210	230	210	241	217
Ta	GAI04_ICP36	ppm	62	35	102	100	86	27
Ti	GAI04_ICP36	%	0.07	0.06	0.07	0.06	0.06	0.06
V	GAI04_ICP36	ppm	370	252	509	550	451	224
W	GAI04_ICP36	ppm	105	211	131	88	70	31
Y	GAI04_ICP36	ppm	<5	5	5	6	6	<5
Zn	GAI04_ICP36	ppm	572	467	771	802	716	435
Zr	GAI04_ICP36	ppm	25	25	24	19	25	27
Cr	GOI04_ICP	%	4.69	2.34	6.95	6.89	6.10	1.25
Fe	GOI04_ICP	%	48.20	48.70	42.80	38.60	46.30	52.50
Mg	GOI04_ICP	%	--	--	--	--	--	--
Ni	GOI04_ICP	%	--	--	--	--	--	--
Mn	GOI04_ICP	%	--	1.28	1.04	1.13	1.09	--
LOI	XRFFNL	%	IS	9.57	7.54	IS	7.87	11.95
Ni	XRFFNL	%	IS	0.78	0.62	IS	0.80	1.11
Co	XRFFNL	%	IS	0.25	0.31	IS	0.30	0.13
Al2O3	XRFFNL	%	IS	6.76	7.95	IS	7.25	5.13
CaO	XRFFNL	%	IS	0.06	0.07	IS	0.07	0.05
Cr2O3	XRFFNL	%	IS	9.04	18.02	IS	12.74	2.11
Cu	XRFFNL	%	IS	<0.01	<0.01	IS	<0.01	<0.01
Fe2O3	XRFFNL	%	IS	66.11	56.80	IS	61.70	74.08
K2O	XRFFNL	%	IS	<0.01	<0.01	IS	<0.01	<0.01
MgO	XRFFNL	%	IS	2.29	3.43	IS	3.14	0.75
MnO	XRFFNL	%	IS	1.22	1.29	IS	1.42	0.88
Na2O	XRFFNL	%	IS	<0.01	<0.01	IS	<0.01	<0.01
P2O5	XRFFNL	%	IS	0.02	0.02	IS	0.02	0.03
SO3	XRFFNL	%	IS	<0.01	<0.01	IS	<0.01	<0.01

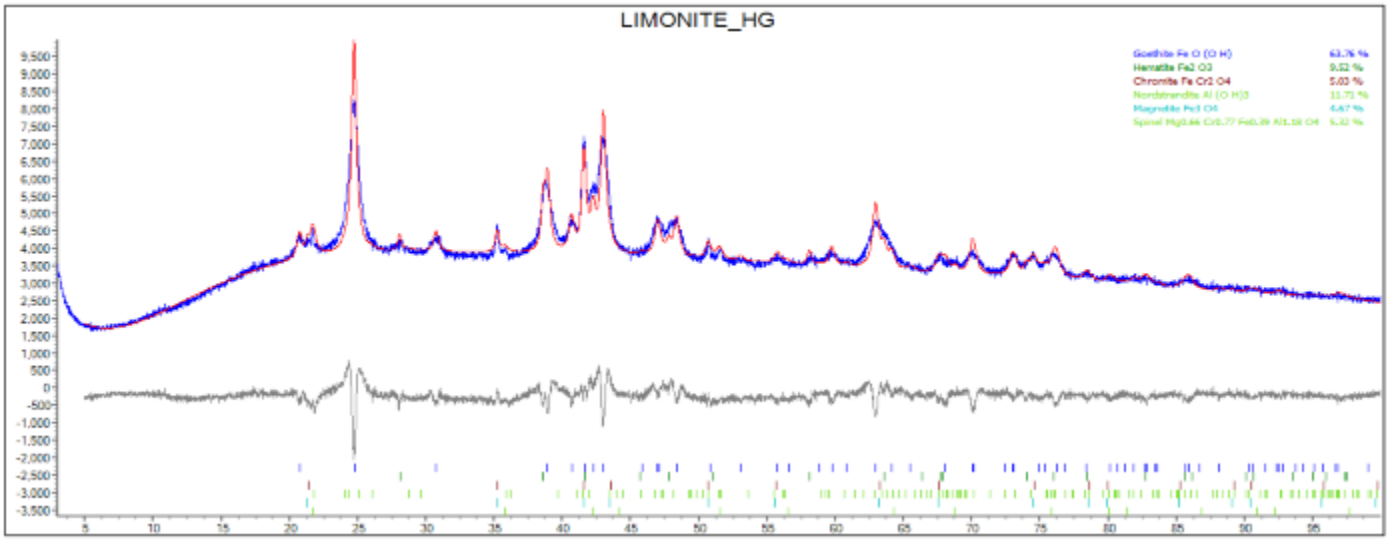
Analyte Code :	Scheme Code :	Analysis Unit :	LIMONITE PSD 500um	LIMONITE PSD 212um	LIMONITE PSD 106um	LIMONITE PSD 75um	LIMONITE PSD 38um	LIMONITE PSD - 38um
SiO2	**XRFFNL**	**%**	IS	2.72	2.64	IS	3.81	2.99
TiO2	**XRFFNL**	**%**	IS	0.14	0.13	IS	0.11	0.12
LOI	**XRFFNL**	**%**	IS	9.57	7.54	IS	7.87	11.95
SUM	**XRFFNL**	**%**	IS	99.27	99.12	IS	99.59	99.71
Ti	**XRFFNL**	**%**	IS	0.08	0.08	IS	0.07	0.07
P	**XRFFNL**	**%**	IS	0.01	<0.01	IS	0.01	0.01
Zn	**XRFFNL**	**%**	IS	0.04	0.06	IS	0.05	0.03
Mg	**XRFFNL**	**%**	IS	1.38	2.07	IS	1.89	0.45
Mn	**XRFFNL**	**%**	IS	0.94	1.00	IS	1.10	0.68
K	**XRFFNL**	**%**	IS	<0.01	<0.01	IS	<0.01	<0.01
S	**XRFFNL**	**%**	IS	<0.01	<0.01	IS	<0.01	<0.01
Sc	**XRFFNL**	**ppm**	IS	49	34	IS	42	71
Si	**XRFFNL**	**%**	IS	1.27	1.23	IS	1.78	1.40
Cr	**XRFFNL**	**%**	IS	6.18	12.33	IS	8.71	1.45
Al	**XRFFNL**	**%**	IS	3.58	4.21	IS	3.84	2.71

The results contained in this report relate only to the sample(s) submitted for testing. Geoservices Metallurgy Laboratory accepts no responsibility for the representativeness of the sample(s) submitted for testing.

Appendix C – Mineralogy



Graph 8 – Diffractogram of Saprolite



Graph 9 – Diffractogram of Limonite

Appendix D – Stage 2 PSD

Worksheet 3 – Stage 2 PSD Limonite

MET-WS-013	Rev 02	DFU

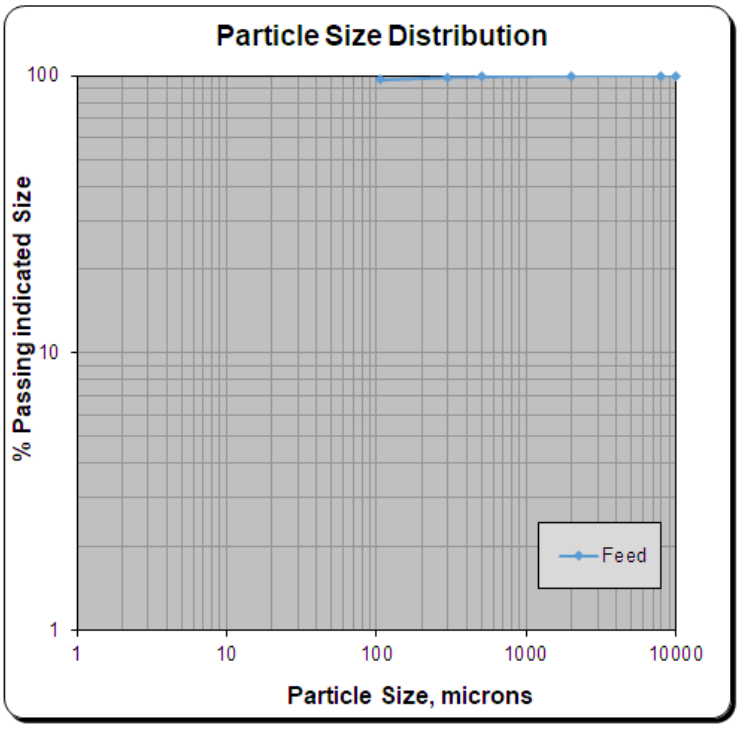
PT GEOSERVICES

PT. GEOSERVICES - GEOMETALLURGICAL LABORATORY

PARTICLE SIZE DISTRIBUTION

Job No :	CIK.MET.01699	Sample ID :	COMP LIMONITE	Date :	17-Nov-22
Client :	IRIANA MUTIARA MINING	Method :	Wet Sizing	Operator :	Anto
Project :	SIDUARSI PROJECT	Grind Size :	As Is	Approver :	Wayne Turner

i	Mesh #	Screen Opening (um)	Retained Weight (g)	Retained Weight (%)	Cumm. Passing (%)
1					100.00
2					100.00
3					100.00
4					100.00
5					100.00
6					100.00
7					100.00
8					100.00
9					100.00
10					100.00
11					100.00
12					100.00
13					100.00
14					100.00
15		10000	0.00	0.00	100.00
16		8000	14.18	0.10	99.90
17		2000	20.55	0.15	99.75
18		500	106.97	0.79	98.96
19		300	61.26	0.45	98.51
20		106	247.18	1.81	96.70
21	PAN	-106	13175.87	96.70	
	TOTAL		13626.01		



Worksheet 4 – Stage 2 PSD Saprolite

MET-WS-013	Rev 02	DFU

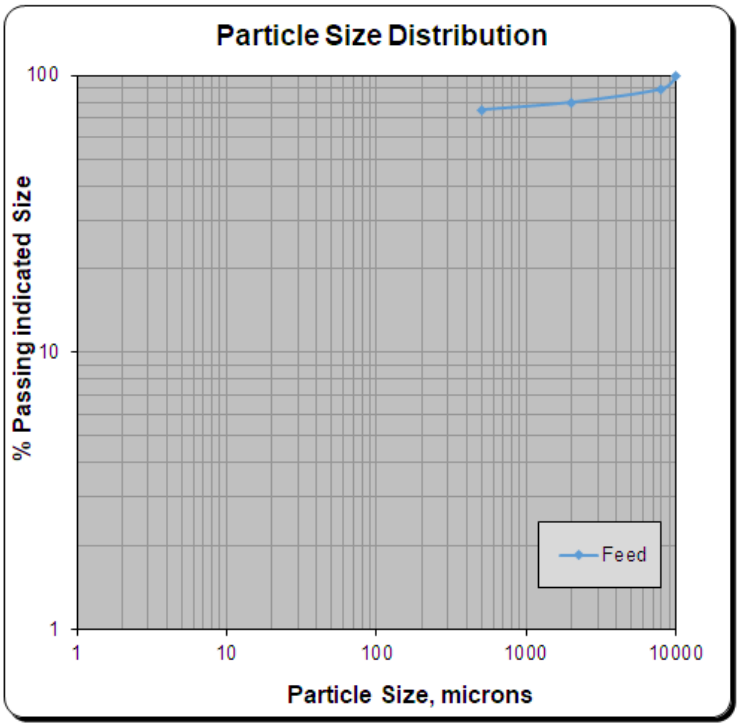
PT. GEOSERVICES - GEOMETALLURGICAL LABORATORY

PARTICLE SIZE DISTRIBUTION

PT GEOSERVICES

Job No :	CIK.MET.01699	Sample ID :	COMP SAPROLITE	Date :	17-Nov-22
Client :	IRIANA MUTIARA MINING	Method :	Wet Sizing	Operator :	Nessan
Project :	SIDUARSI PROJECT	Grind Size :	As Is	Approver :	Wayne Turner

i	Mesh #	Screen Opening (um)	Retained Weight (g)	Retained Weight (%)	Cumm. Passing (%)
1					100.00
2					100.00
3					100.00
4					100.00
5					100.00
6					100.00
7					100.00
8					100.00
9					100.00
10					100.00
11					100.00
12					100.00
13					100.00
14					100.00
15					100.00
16					100.00
17		10000	0.00	0.00	100.00
18		8000	1605.98	10.54	89.46
19		2000	1431.99	9.40	80.07
20		500	738.84	4.85	75.22
21	PAN	-500	11463.00	75.22	



TOTAL	15239.81	D80 =	1964 um	D90 =	8097 um

Appendix E – Stage 2 Fraction Assay

Table 14 – Stage 2 fraction assay of Saprolite

Analyte Code :	Scheme Code :	Analysis Unit :	SAPROLITE PSD 8000um	SAPROLITE PSD 2000um	SAPROLITE PSD 500um	SAPROLITE PSD -500um
Ni	MET XRFFNL	%	1.50	1.34	1.13	1.46
Co	MET_XRFFNL	%	0.02	0.02	0.02	0.06
Al2O3	MET_XRFFNL	%	0.44	0.60	1.53	2.25
CaO	MET_XRFFNL	%	0.03	0.03	0.06	0.11
Cr2O3	MET_XRFFNL	%	0.68	0.87	5.25	1.86
Cu	MET_XRFFNL	%	<0.01	<0.01	<0.01	<0.01
Fe2O3	MET_XRFFNL	%	12.76	14.80	18.25	47.35
K2O	MET_XRFFNL	%	<0.01	<0.01	<0.01	0.01
MgO	MET_XRFFNL	%	33.71	32.52	29.62	16.15
MnO	MET_XRFFNL	%	0.11	0.10	0.15	0.68
Na2O	MET_XRFFNL	%	<0.01	<0.01	<0.01	<0.01
P2O5	MET_XRFFNL	%	<0.01	<0.01	<0.01	<0.01
SO3	MET_XRFFNL	%	<0.01	<0.01	<0.01	<0.01
SiO2	MET_XRFFNL	%	38.70	37.87	33.47	20.76
TiO2	MET_XRFFNL	%	<0.01	<0.01	<0.01	0.04
Zn	MET_XRFFNL	%	<0.01	0.02	0.03	0.03
LOI	MET_XRFFNL	%	11.79	11.64	10.41	9.81
SUM	MET_XRFFNL	%	100.16	100.19	100.23	100.99
Sc	MET_XRFFNL	ppm	27	16	17	42
SG	MET_SGPP	g/cc	2.42	2.42	2.51	2.83
Al	MET_GAI04_ICP	%	0.25	0.33	0.82	1.28
As	MET_GAI04_ICP	ppm	<2	<2	<2	<2
Ba	MET_GAI04_ICP	ppm	6	8	6	7
Be	MET_GAI04_ICP	ppm	<5	<5	<5	<5
Bi	MET_GAI04_ICP	ppm	<5	<5	<5	<5
Ca	MET_GAI04_ICP	%	0.03	0.03	0.04	0.07
Cd	MET_GAI04_ICP	ppm	<0.5	<0.5	<0.5	<0.5
Co	MET_GAI04_ICP	ppm	138	118	180	673
Cr	MET_GAI04_ICP	ppm	4474	5905	27467	12580

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Analyte Code :	Scheme Code :	Analysis Unit :	SAPROLITE PSD 8000um	SAPROLITE PSD 2000um	SAPROLITE PSD 500um	SAPROLITE PSD -500um
Cu	**MET_GAI04_ICP**	**ppm**	37	30	48	37
Fe	**MET_GAI04_ICP**	**%**	8.64	9.85	12.39	31.27
Ga	**MET_GAI04_ICP**	**ppm**	8	9	21	21
K	**MET_GAI04_ICP**	**%**	0.01	0.01	0.01	0.01
La	**MET_GAI04_ICP**	**ppm**	<5	<5	<5	<5
Mg	**MET_GAI04_ICP**	**%**	16.70	16.18	15.02	8.21
Mn	**MET_GAI04_ICP**	**ppm**	671	640	970	4753
Mo	**MET_GAI04_ICP**	**ppm**	<2	<2	<2	<2
Na	**MET_GAI04_ICP**	**%**	0.01	0.01	0.02	0.04
Nb	**MET_GAI04_ICP**	**ppm**	<5	<5	<5	<5
Ni	**MET_GAI04_ICP**	**ppm**	14446	13312	11333	14239
P	**MET_GAI04_ICP**	**ppm**	90	82	81	263
Pb	**MET_GAI04_ICP**	**ppm**	19	17	20	21
S	**MET_GAI04_ICP**	**%**	0.01	<0.01	<0.01	0.01
Sc	**MET_GAI04_ICP**	**ppm**	10	13	13	44
Sn	**MET_GAI04_ICP**	**ppm**	<10	<10	<10	<10
Sr	**MET_GAI04_ICP**	**ppm**	42	48	76	143
Ta	**MET_GAI04_ICP**	**ppm**	<5	<5	47	23
Ti	**MET_GAI04_ICP**	**%**	<0.01	<0.01	0.01	0.02
V	**MET_GAI04_ICP**	**ppm**	17	17	62	75
Y	**MET_GAI04_ICP**	**ppm**	<5	<5	<5	<5
Zn	**MET_GAI04_ICP**	**ppm**	119	140	232	396
Zr	**MET_GAI04_ICP**	**ppm**	<5	<5	<5	13
Cr	**MET_GOI04_ICP**	**%**	0.01	0.59	2.75	1.26
Fe	**MET_GOI04_ICP**	**%**	--	--	--	31.27
Mn	**MET_GOI04_ICP**	**%**	--	--	--	--
Ni	**MET_GOI04_ICP**	**%**	1.44	1.33	1.13	1.42

Table 15 – Stage 2 fraction assay of Limonite

Analyte Code :	Scheme Code :	Analysis Unit :	LIMONITE PSD 8000um	LIMONITE PSD 2000um	LIMONITE PSD 500um	LIMONITE PSD 300um	LIMONITE PSD 106um	LIMONITE PSD -106um
Ni	MET XRFFNL	%	1.85	1.30	0.37	0.24	0.26	1.08
Co	MET_XRFFNL	%	0.06	0.15	0.50	0.33	0.35	0.14
Al2O3	MET_XRFFNL	%	0.78	2.69	9.69	11.04	11.52	5.36
CaO	MET_XRFFNL	%	0.05	0.06	0.07	0.07	0.08	0.05
Cr2O3	MET_XRFFNL	%	0.93	3.46	23.23	29.26	30.44	2.74
Cu	MET_XRFFNL	%	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Fe2O3	MET_XRFFNL	%	15.90	40.53	44.27	43.94	43.06	72.73
K2O	MET_XRFFNL	%	<0.01	<0.01	0.04	0.02	0.01	<0.01
MgO	MET_XRFFNL	%	29.29	16.47	7.53	6.48	6.51	0.85
MnO	MET_XRFFNL	%	0.09	0.55	1.87	1.19	1.25	0.98
Na2O	MET_XRFFNL	%	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
P2O5	MET_XRFFNL	%	<0.01	<0.01	<0.01	<0.01	0.01	0.03
SO3	MET_XRFFNL	%	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
SiO2	MET_XRFFNL	%	38.19	20.92	4.98	3.07	2.39	3.04
TiO2	MET_XRFFNL	%	0.01	0.08	0.06	0.11	0.11	0.12
Zn	MET_XRFFNL	%	0.08	0.06	0.07	0.09	0.10	0.03
LOI	MET_XRFFNL	%	12.78	13.31	6.36	3.49	3.21	11.73
SUM	MET_XRFFNL	%	100.52	99.96	99.28	99.49	99.46	99.20
Sc	MET_XRFFNL	ppm	25	29	29	24	22	62
SG	MET_SGPP	g/cc	IS	IS	3.80	4.06	4.09	3.28
Al	MET_GAI04_ICP	%	0.43	1.51	5.09	5.52	5.65	3.05
As	MET_GAI04_ICP	ppm	<2	<2	28	32	22	<2
Ba	MET_GAI04_ICP	ppm	8	<2	6	7	2	4
Be	MET_GAI04_ICP	ppm	<5	<5	<5	<5	<5	<5
Bi	MET_GAI04_ICP	ppm	<5	<5	44	37	35	<5
Ca	MET_GAI04_ICP	%	0.08	0.08	0.02	0.03	0.02	0.04
Cd	MET_GAI04_ICP	ppm	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Co	MET_GAI04_ICP	ppm	520	1445	4860	2897	2990	1356
Cr	MET_GAI04_ICP	ppm	6622	25362	110985	106415	103975	18989
Cu	MET_GAI04_ICP	ppm	43	61	61	54	68	60

Analyte Code :	Scheme Code :	Analysis Unit :	LIMONITE PSD 8000um	LIMONITE PSD 2000um	LIMONITE PSD 500um	LIMONITE PSD 300um	LIMONITE PSD 106um	LIMONITE PSD - 106um
Fe	**MET_GAI04_ICP**	**%**	11.24	28.24	30.97	28.48	27.87	50.03
Ga	**MET_GAI04_ICP**	**ppm**	10	26	68	65	65	35
K	**MET_GAI04_ICP**	**%**	0.01	0.01	0.01	0.01	0.01	0.01
La	**MET_GAI04_ICP**	**ppm**	<5	<5	<5	<5	<5	<5
Mg	**MET_GAI04_ICP**	**%**	15.18	8.66	3.74	3.07	3.05	0.44
Mn	**MET_GAI04_ICP**	**ppm**	558	4053	17283	10602	11376	7325
Mo	**MET_GAI04_ICP**	**ppm**	<2	<2	<2	<2	<2	<2
Na	**MET_GAI04_ICP**	**%**	0.01	0.05	<0.01	<0.01	<0.01	<0.01
Nb	**MET_GAI04_ICP**	**ppm**	<5	5	29	38	41	8
Ni	**MET_GAI04_ICP**	**ppm**	18800	13551	4146	2466	2766	11023
P	**MET_GAI04_ICP**	**ppm**	95	266	239	252	183	424
Pb	**MET_GAI04_ICP**	**ppm**	10	14	17	19	18	31
S	**MET_GAI04_ICP**	**%**	<0.01	0.06	0.04	0.03	0.02	0.08
Sc	**MET_GAI04_ICP**	**ppm**	17	35	28	18	17	72
Sn	**MET_GAI04_ICP**	**ppm**	<10	<10	<10	<10	<10	<10
Sr	**MET_GAI04_ICP**	**ppm**	55	137	197	175	176	233
Ta	**MET_GAI04_ICP**	**ppm**	7	38	240	224	219	34
Ti	**MET_GAI04_ICP**	**%**	0.01	0.04	0.05	0.07	0.07	0.06
V	**MET_GAI04_ICP**	**ppm**	54	166	642	732	764	240
Y	**MET_GAI04_ICP**	**ppm**	14	8	<5	<5	<5	6
Zn	**MET_GAI04_ICP**	**ppm**	720	649	840	920	976	475
Zr	**MET_GAI04_ICP**	**ppm**	6	14	13	11	18	27
Cr	**MET_GOI04_ICP**	**%**	0.66	2.54	11.10	10.64	10.40	1.90
Fe	**MET_GOI04_ICP**	**%**	--	28.24	30.97	28.48	27.87	50.03
Mn	**MET_GOI04_ICP**	**%**	--	--	1.73	1.06	1.14	0.73
Ni	**MET_GOI04_ICP**	**%**	1.88	1.36	--	--	--	1.10

The results contained in this report relate only to the sample(s) submitted for testing. Geoservices Metallurgy Laboratory accepts no responsibility for the representativeness of the sample(s) submitted for testing.

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Technical Memorandum

To:	Tony Green
Company:	Nickel Industries Ltd
Subject:	NIC001 – Preliminary HPAL Testwork December 2022 Progress Update

File Reference: EP-TM-NIC001-01-0

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1 Introduction

Nickel Industries is conducting Siduarsi Project resource estimation activities including drilling, metallurgical testwork and resource modelling.

This memorandum summaries metallurgical testwork outcomes to-date.

2 Sample Collection

Metallurgical testwork sample collection was by excavator from test pits for separate limonite and saprolite samples in October 2022. 304 wet kg of limonite were collected from drill point DE 1643 from surface to 2m depth, grading approximately as follows (highlighted red):

id_assay	hole_id	sample_id	depth_from	depth_to	thick	recovery	weight	genlith	modgenlith	ni	co	fe2o3	mgo	sio2	comments
4752	**DE1643**	**IMM4325**	**0**	**1**	**1**	**100**	**4.2**		**LIM**	**0.77**	**0.08**	**71.42**	**0.70**	**2.33**	**ROOT MATERIALS**
4753	**DE1643**	**IMM4326**	**1**	**2**	**1**	**100**	**4.75**	**LIM**	**LIM**	**1.09**	**0.13**	**63.30**	**5.08**	**8.01**	
4754	DE1643	IMM4327	2	3	1	100	4.55	SAP	SAP	1.93	0.03	19.86	25.88	36.58	SOFTSAP
4755	DE1643	IMM4328	3	4	1	100	4.05	SAP	SAP	1.78	0.005	11.16	32.62	40.28	SAPROCK
4756	DE1643	IMM4329	4	5	1	80	3.15	SAP	SAP	1.43	0.005	11.12	33.75	40.64	SAPROCK
4757	DE1643	IMM4330	5	6	1	100	3.75	SAP	BRK	0.48	0.005	9.73	35.76	39.86	ROCKYSAP
4758	DE1643	IMM4331	6	7	1	100	3.95	CST	BRK	0.25	0.005	7.73	38.11	39.56	BROKEN CORE
4759	DE1643	IMM4332	7	8	1	100	4.25	SAP	BRK	0.28	0.005	8.61	37.66	40.30	ROCKYSAP
4760	DE1643	IMM4333	8	9	1	100	4	SAP	BRK	0.31	0.005	8.33	38.90	40.36	ROCKYSAP
4761	DE1643	IMM4334	9	10	1	100	4.2	SAP	BRK	0.24	0.005	8.15	38.91	40.56	ROCKYSAP
4762	DE1643	IMM4335	10	11	1	100	3.2	BRK	BRK	0.34	0.005	9.11	38.29	39.80	BROKEN CORE
4763	DE1643	IMM4336	11	12	1	100	3.25	BRK	BRK	0.27	0.005	8.03	38.10	39.63	BROKEN CORE
AVERAGE									**LIM**	**0.93**	**0.11**	**67.36**	**2.89**	**5.17**	

338 wet kg of saprolite sample were collected from a separate test pit at drill point DE 1106 from 1-3m depth, grading approximately as follows (highlighted red):

id_assay	hole_id	sample_id	depth_from	depth_to	thick	recovery	weight	genlith	modgenlith	ni	co	fe2o3	mgo	sio2	comments
3566	DE1106	IMM3401	0	1	1	100	5.1		LIM	1.1	0.11	62.67	8.35	11.16	roots material
3567	**DE1106**	**IMM3402**	**1**	**2**	**1**	**100**	**4.85**	**SAP**	**SAP**	**1.39**	**0.03**	**14.91**	**33.25**	**37.12**	**soft saprolite**
3568	**DE1106**	**IMM3403**	**2**	**3**	**1**	**100**	**4.7**	**SAP**	**SAP**	**0.57**	**0.03**	**13.18**	**35.55**	**38.46**	**rocky saprolite**
3569	DE1106	IMM3404	3	4	1	100	3.9	SAP	BRK	0.33	0.02	10.18	37.37	39.41	rocky saprolite
3570	DE1106	IMM3405	4	5	1	100	4.25	SAP	BRK	0.2	0.02	9.99	33.92	40.77	rocky saprolite
3571	DE1106	IMM3406	5	6	1	100	4.25	SAP	BRK	0.33	0.02	9.33	37.61	40.04	rocky saprolite
3572	DE1106	IMM3407	6	7	1	100	4.1		BRK	0.24	0.02	7.47	38.41	39.61	broken core
3573	DE1106	IMM3408	7	8	1	100	4.75		BRK	0.19	0.02	7.9	37.66	41.23	broken core
3574	DE1106	IMM3409	8	9	1	100	3.85	SAP	BRK	0.04	0.01	7.85	33.52	45.58	rocky saprolite
3575	DE1106	IMM3410	9	10	1	100	4.85	SAP	BRK	0.01	0.01	7.67	31.92	46.22	rocky saprolite

Material was bagged in ~25 kg lots and dispatched to PT Geoservices (GS) on 17 October 2022.

3 Testwork

GS combined the limonite and saprolite bagged lots into respective bulk composites, and sub-sampled for head characterisation. These composites are hereafter referred to in full as the 2022 DE1643 Limonite Bulk Composite and the 2022 DE1106 Saprolite Bulk Composite, or abbreviations thereof depending on context.

Assays of key elements are compared to notional resource grades in the following table:

	Ni (%w/w)	Co (%w/w)	Fe (%w/w)	Mg (%w/w)	Si (%w/w)
Limonite					
2022 Resource Est. (>0.7% Ni)	1.03	0.12	45.7	2.8	4.0
2022 Bulk Composite	0.86	0.13	42.2	0.5	1.4
Comp. / Resource	83%	109%	92%	18%	34%
Saprolite					
2022 Resource Est. (>0.7% Ni)	1.11	0.03	12.3	17.5	17.5
2022 Bulk Composite	1.33	0.05	26.6	10.9	11.8
Comp. / Resource	120%	157%	216%	62%	67%

Good
Accepable
Unacceptable

The bulk density of moist material was also measured:

	Bulk Density (t/m^3)
Limonite BC	1.63
Saprolite BC	1.55

As-received particle size distribution (PSD) was measured, indicating the limonite in particular is extremely fine:

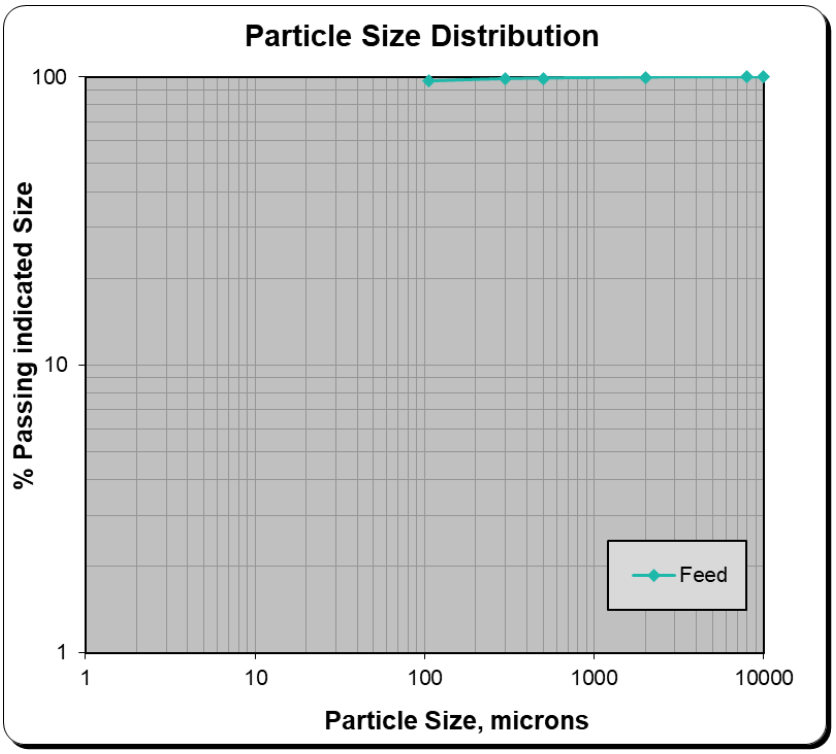


Figure 1: Limonite BC As-Received PSD

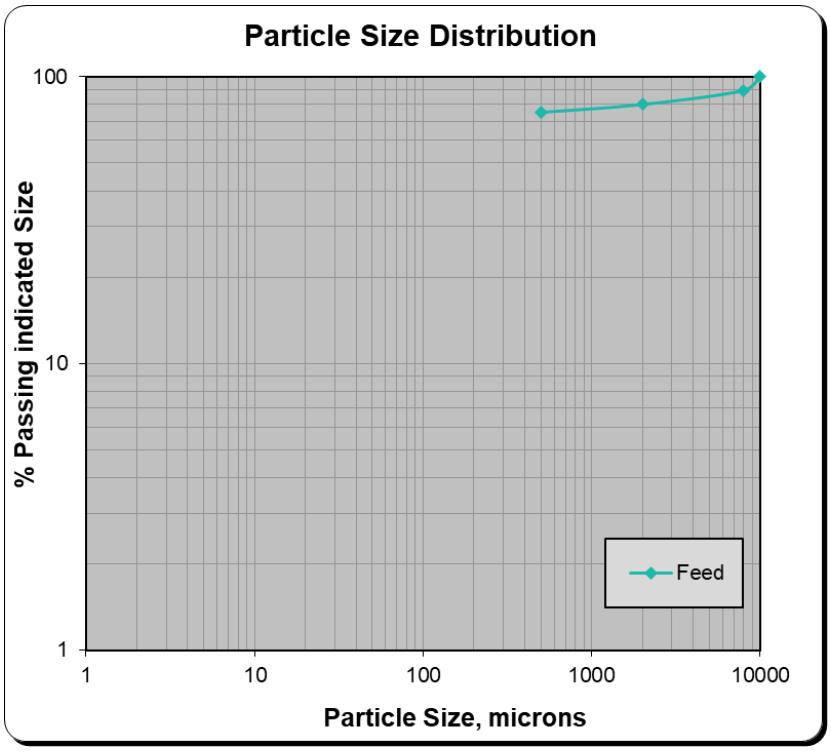


Figure 2: Saprolite BC As-Received PSD

4 Discussion

4.1 Limonite Grades

Magnesium grade in limonite is a key driver of HPAL acid consumption. Silica grade in limonite can be important if it is predominantly associated with clays, because it can then be expected to leach and potentially cause colloidal silica problems. Consequently, it is important to get both of these grades in any sample for HPAL testwork right.

4.2 Limonite Particle Size Distribution

The very fine nature of the limonite sample is unusual. Based on information received this is unlikely to have been due to the sample collection or preparation methods, and so is likely to be natural.

Size fraction assays and mineralogical investigation currently underway will help determine the nature of the fines. In any case, with 96% of material passing 100 microns it is likely that significant nickel exists in the fine fraction, and so would need to be processed by any downstream plant. Such a fine feed material:

1. removes any possibility of upgrading autoclave feed, and
2. increases slurry viscosity relative to a coarser material at the same % solids, and as such will present mixing and settling challenges to the front end of any HPAL flowsheet.

A further possibility is that, since the sample was taken from a single test pit, it may be anomalous.

5 Recommendations

Given the strange and possibly problematic PSD of the limonite bulk composite, together with the fact that some key grades are significantly different to notional resource grades, Element recommends:

1. Pausing work on these bulk composites for the time being
2. Asking GS to generate new limonite and saprolite bulk composites from drilling interval samples already on site at GS
3. If the PSD of new composites is coarser than current sample, then good; if not (possibly because intervals have already been crushed by the lab) then nothing has been lost and at least the grades will be closer to target

Oliver Kloiber-Deane, BEng, MSc, MAusIMM

Principal Process Engineer – Element Process

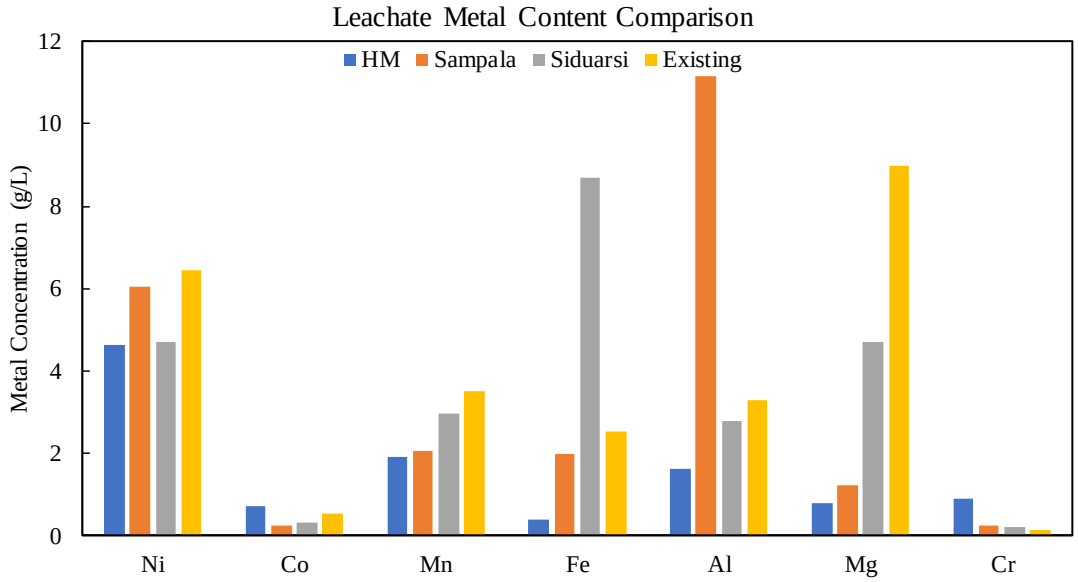
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- Nil

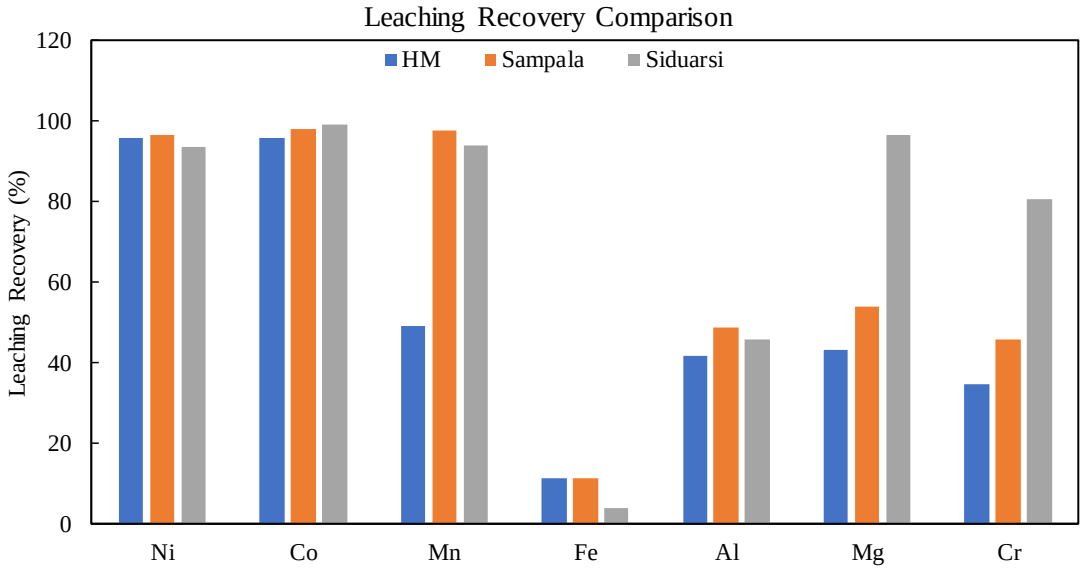
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Graphical Summary for HM, Sampala and Siduarsi Sample



Sample	Residence Time (h)	Acid-to-ore Ratio (kg acid/ t dry ore)	Metal Concentration on Leachate (g/L)						
			Ni	Co	Mn	Fe	Al	Mg	Cr
HM	1.5	250	4.62	0.73	1.93	0.41	1.64	0.80	0.91
Sampala	1.5	250	6.04	0.27	2.07	2.00	11.16	1.23	0.25
Siduarsi	1	250	4.70	0.34	2.96	8.70	2.78	4.71	0.21
Existing	1.5 - 2.5	250 - 350	6.45	0.53	3.51	2.54	3.30	8.99	0.14



Sample	Residence Time (h)	Acid-to-ore Ratio	Metal Recovery (%)						
			Ni	Co	Mn	Fe	Al	Mg	Cr
HM	1.5	250	95.91	95.80	49.01	11.32	41.71	43.25	34.73
Sampala	1.5	250	96.67	98.21	97.57	11.27	48.89	53.89	45.90
Siduarsi	1	250	93.65	99.09	93.86	3.82	46.00	96.43	80.70

This Graphical Summary prepare the highlight of HM, Sampala and Siduarsi Sample

Summary of Acid Consumption and Leaching Time of H.M Sample

Particle size of HM samples dominated by fine particle (less than 0.074 mm) with frequency 90.23% (See Fig. 1a). Fine particle is required for HPAL method due to its surface properties and reaction time. Raw material analysis was conducted to identify the metal composition on each sample **(see Fig.2).** In order to identify the acid consumption, metal recovery and residence time, there are two parameters were variations such as acid-to-dry ore ratio and residence time. The acid-to-dry ore ratio were varied at 150, 250 and 350 kg-acid/t-ore and residence time or reaction time were 0.5 h, 1 h and 1.5 h. All the leaching process were conducted at temperature 250 ^{0}C using 2 L titanium autoclave and stirring speed at 300 rpm using magnetic stirred and use 30% solid content slurry. After the leaching process density of leachate (g/cm), leaching liquid (H_2SO_4g/L) and leaching solution pH were recorded to identify the solution condition after leaching process **(see Fig 3)**.

The influence of acid-to-ore ratio as seen **Figure 4** can identify that in increasing ration of acid-to-dry ore ratio form 150kg/t to 250 kg/t were significantly increase the metal leaching specially for Ni, Co, Mn and Al. They were from 64.25%, 76.44%, 17.76% and 29.33% to 95.91%, 85.80%, 49.01% and 41.71% respectively for Ni, Co, Mn and Al at reaction time 1.5 h. Increasing acid-to-ore ratio until 350 kg/t did not provide any significant affect. The trend of Ni and Co leaching decrease slowly but for Mn, Mg and Al still increase significantly. This could be effect by the reactivity of these metals and also high content in the raw materials. Silicate always on the low concentration trend during the variation process such as residence time and acid-to-ore ratio. Its indicate that adding number of sulfuric acids did not affected significantly by the acid. For Al and Fe trends shows that the higher acid ratio the hinger Al and Fe dissolve. Based on the acid-to-ore ratio, it can be concluded that the optimum acid-to-ore ratio is 250 kg/t with residence time 1.5 h at the pH leachate at 1.53. As shown on **Figure 3** show that "*important zone*" at this condition achieve the higher recovery of Ni and Co (95.91% and 95.80%) and another metals as impurities below 50%. At this variable, the leaching residue of Ni and Co are 0.066 % and 0.009% respectively but higher composition for impurities.

The influence of leaching times was conducted under various residence time such as 0.5 h, 1 h and 1.5 h at acid-to-ore ratio 250kg/t. Based in the analysis result **(see Fig 5)**, its shows that Ni and Co were fast reaction at first 0.5 h reaction. Its 97.89% and 97.51% respectively for No and Co. Increasing leaching time to 1h and 1.5 h did not show any significant trend. For Mn metals shows that leaching time was quick reaction at 0.5 h reaction time and relatively stable until 1 h. However, at the 1.5 h leaching time were dropped until 49.01 % from 70.98%. Another metal such as Al shows that the recovery of Al was slightly decrease from 57.59%, 49.21% and 41.71% respectively for 0.5 h, 1 h and 1.5 h. For Cr metals shows that slightly increase at first 1 h. Regarding to this experiment, it can be concluded that the optimum leaching time for HM sample is 1.5 h with recovery of Ni and Co is 95.91% and 95.8% respectively and low impurities at low concentration. However, 0.5 h shows the higher recovery of N and Co but the longer time until 1 h will continue to hydrolyze and release acid and the leachate pH will gradually decrease and control in 2.0. When the reaction time lower than 1 h, solution pH will be higher than 2, at this will affect the Fe and Al removal at the pre-neutralization stage (after leaching).

In addition, Chromium as one of important impurities was identify using Gibbs energy related to the reaction temperature. Manganese is one of the metals which able to reduce the Cr^{6+} to become Cr^{3+}. These experiments shows that cooling period below 165 ^{0}C (when $\Delta G = 0$) when the hexavalent chromium re-oxidizes manganese ions in the solution into manganese dioxide and precipitate as leaching residue (**see Fig.7**).

Based on the explanation above, for HM sample can conclude that the acid-to-ore ratio is **250 kg/t and 1.5 h** leaching time. When this laboratory data compares with another existing factory (HPAL technology), it can find that the acid ratio-to-ore is mostly similar. The existing factories ratio is around 250 – 350 kg/t. As show in Fig 5, it shows that HM sample at residence time 1.5 h is mostly similar with existing factory at Ni and Co concentration. On the other hand, HM samples have low concentration of impurities such as Mn, Fe and Mg.

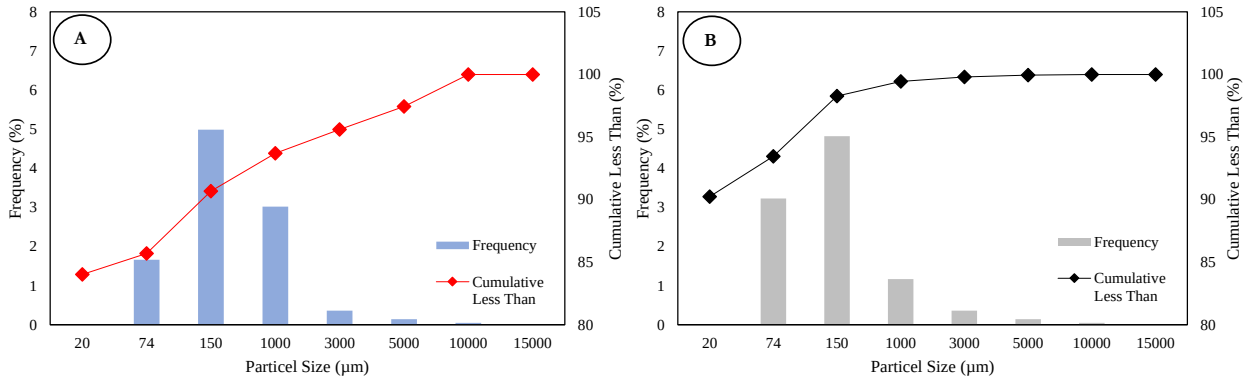


Figure 1. Particle size distribution and cumulative pass: (A) for HM Sample and (B) for Sampala Sample *(Note: Particle size less than 0.074 mm did not plot because the frequency very high 84.04 % for HM and 90.23% for Sampala. Therefore D_{90}, D_{50} as median and D_{10} did not identified)*

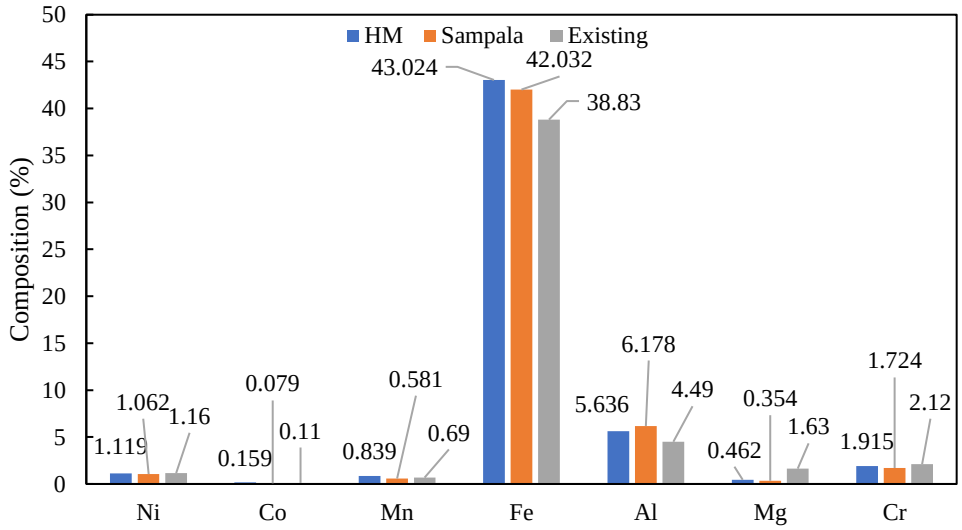


Figure 2. Raw material analysis: Composition of each metal on raw materials

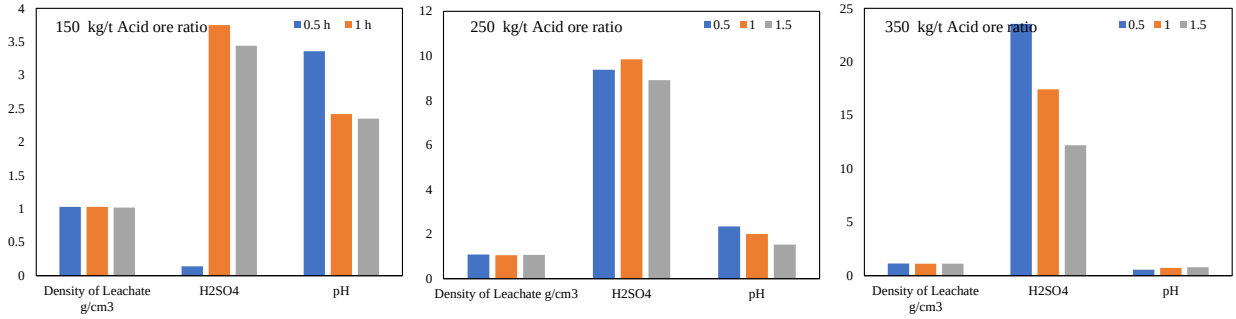


Figure 3. Leachate density, residual and pH

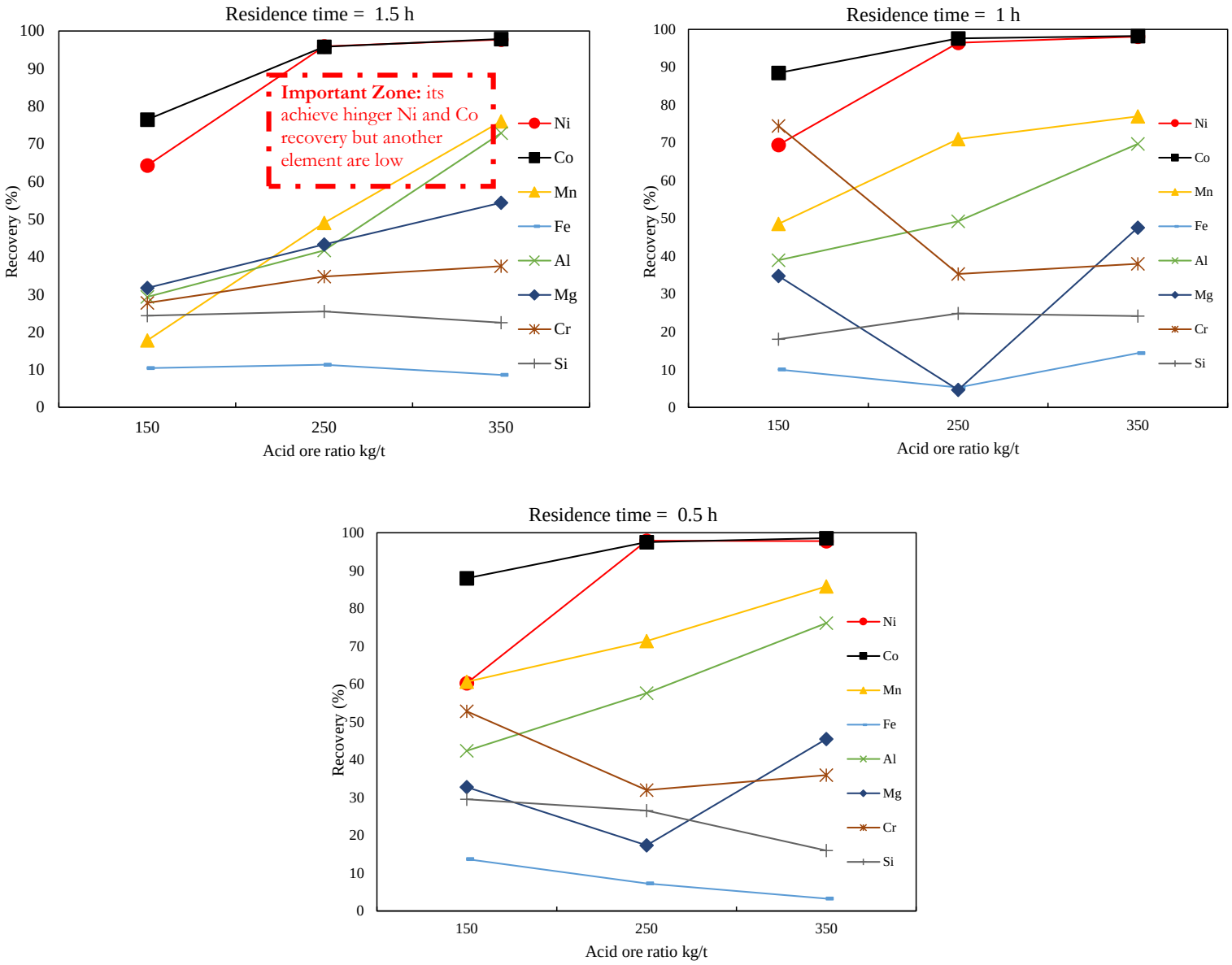


Figure 4. Metal Leaching rate/ recovery at various acid-to-ore ratio and residence time

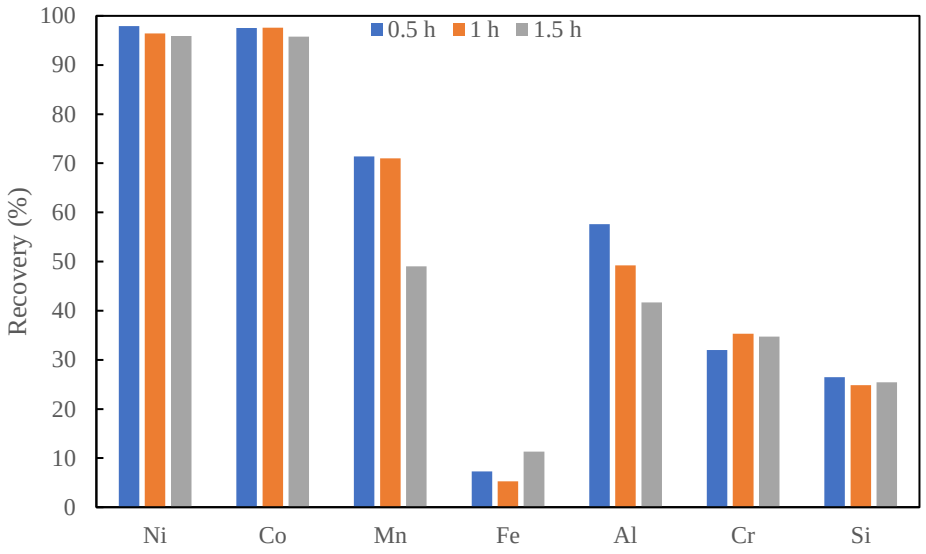


Figure 5. Effect of different time on leaching rate on acid-to-ore ratio 250kg/t

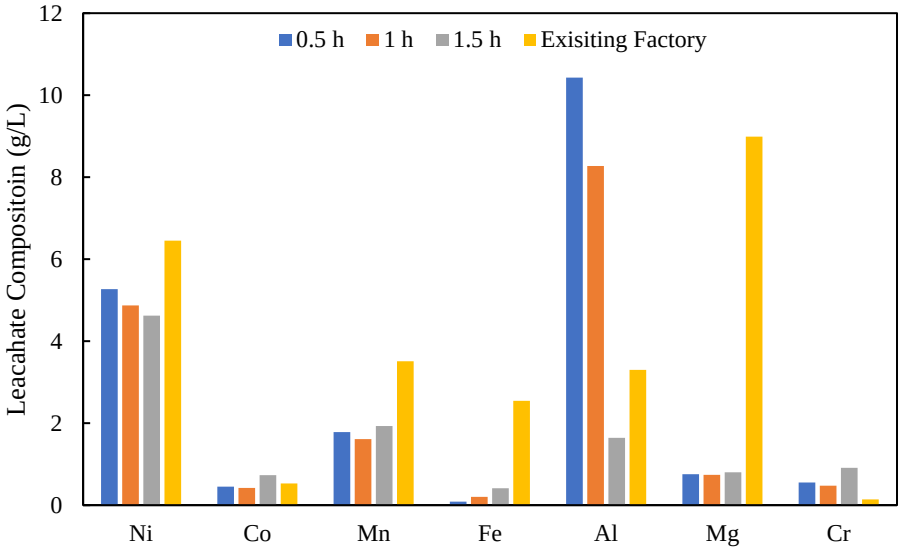


Figure 6. The leachate composition of each element on various leaching time and existing factory

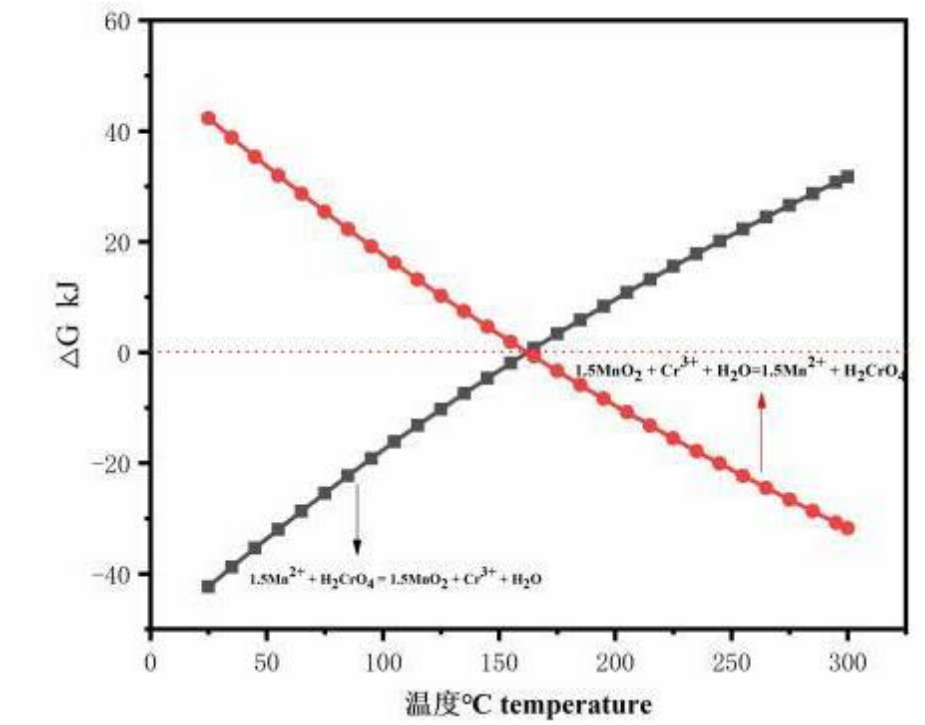


Figure 7. Reduction of Cr^{6+} to Cr^{3+} and precipitation of Mn at the hinger acid-to-ore ratio

Summary of Acid Consumption and Leaching Time of Sampala Sample

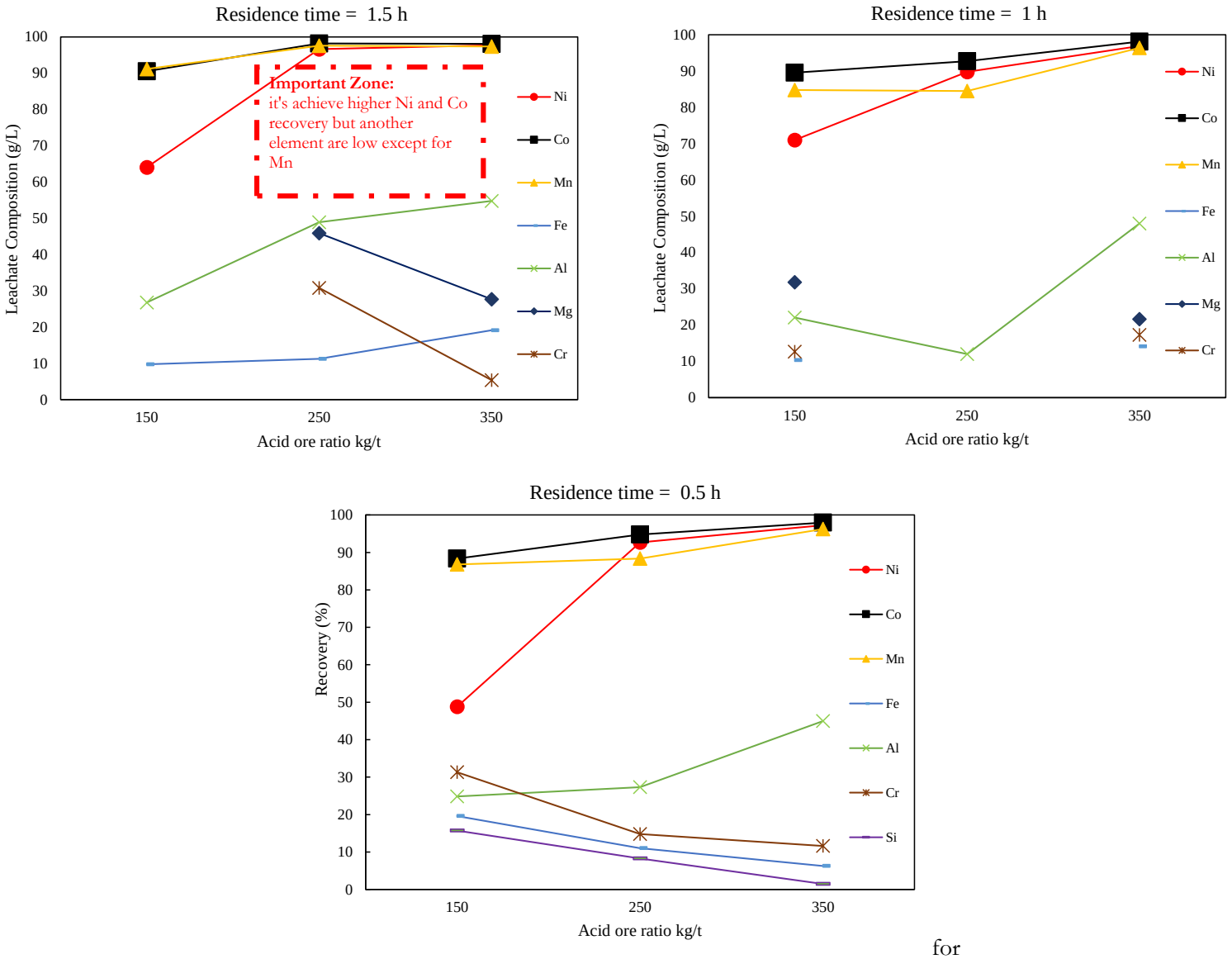
Sampala Samples is another batch sample were originated from Sulawesi. Based on the particle size distribution analysis shows that the Sampala samples is dominated by fine particle which is 90.23% particle size less than 0.074 mm (**see Figure. 1b**). Regarding to identity the acid consumption, raw material preparation was conducted to identify the raw material composition **(see Figure. 2)**. The composition of Ni, Co, Mn, Mg and Cr were 1.062%, 0,079%, 0.581%, 0.354% and 1.724 respectively. Optimization leaching process conducted by some variations such as leaching time 0.5 h, 1 h, 1,5 h and acid-to-ore ratio 150, 250 and 350 kg-acid/t-dry ore. Besides these two variables, another process parameter were constants such as solid-to-liquid ratio 30%, using 2 L titanium autoclave, 250 ^{0}C and stirring at 300 rpm using magnetic stirrer.

The influence of acid consumption kg/t-dry ore (acid-to-liquid ratio) shows that it plays an important role for the leaching process. Increasing acid to ore ratio from 150 kg acid/t dry to 250 kg acid/t dry ore were in increase the leaching rate 43.89%, 18.79% and 32.62% respectively for residence time 0.5 h, 1h and 1.5 h. However, increasing acid-to-ore ratio from 250 kg/t to 350 kg/t only slightly increase the leaching rate 4.56%, 7,11 and 1.05% respectively for residence time 0.5 h, 1h and 1.5 h. This indicated that the more acid added didn't react significantly to metals content.

According to the leachate analysis shows that sulfuric acid has a good selectivity where only three elements such as Ni, Co and Mn achieved a high recovery during increasing acid to ore ratio. Other metals such as Mg, Fe, Al and Cr were below 50%. It means that leachate solution mostly dominated by Ni, Co and Mn. For Sampala ore, it has a phenomenon for impurities or undesired metal where increasing acid to ore ratio from 150 kg/t to 250 kg/t and 350 kg/t. The metal leaching recovery for Fe, Al, Cr, Mg and Si were slightly decrease gradually when increasing the acid to liquid ratio. However, leaching rate for Ni, Co and Mn increase gradually. This phenomenon could occur due to the addition of too much acid, resulting in a further reaction which can result in some metals being precipitated. This can be seen from the graph which decreases as the acid concentration increases. Nevertheless, for other metals such as nickel and cobalt still on leaching time.

The higher Ni leaching rate achieved at acid to ore ratio 350 kg/t at residence time 1.5 h with leaching recovery 97.72%. However, when the acid to ore ratio adjust to 250 kg acid/ ton ore can achieved 96.72% leaching recovery. This result shows that the more acid added the nickel recovery is mostly stable. This result could be used to adjust the optimum leaching rate for Sampala samples. it can be adjusted at acid to ore ratio 250 kg/t with residence time 1.5 h with recovery 96.67 % and 98.21% respectively for Ni and Co where other metals such as Fe, Al Mg and Cr leaching rate below 50% **(See Figure 8)**. The lower leaching rate of other impurities will made an advantage on the separation stage. This called as important zone, this zone didn't exist in all variable or parameter. On HM sample only exist on the residence time 1.5 h and for Siduarsi sample didn't have an important zone foe the whole leaching test variable.

Based on the explanation above, it can be concluded that the optimum process condition for Sampala sample is 1.5 h leaching time with 250 kg/t acid-to-ore ratio. The metal contained on the liquid can see in **Figure 9** with contain 6.043 g/L, 0.265 g/L, 2.07 g/L, 0.95 g/L, 1.228 g/L and 0.251 g/L respectively for Ni, Co, Mn, Mg and Cr with pH 1.96. **Figure 10** show the comparison of optimum HM and Sampala compare with Existing Factory, the leachate composition of HM and Sampala sample is below the existing but lower impurities content such as Mn, Fe and Mg. Normal leachate Ni concentration is equal or more than 5 g/L (HM: 4.87 g/L and Sampala 6.043 g/L). Sampala samples shows a good result for leaching test compare to HM and Siduarsi samples.



for

Figure 8 Metal Leaching Recovery at various acid to ore ratio and residence time for Sampala Samples

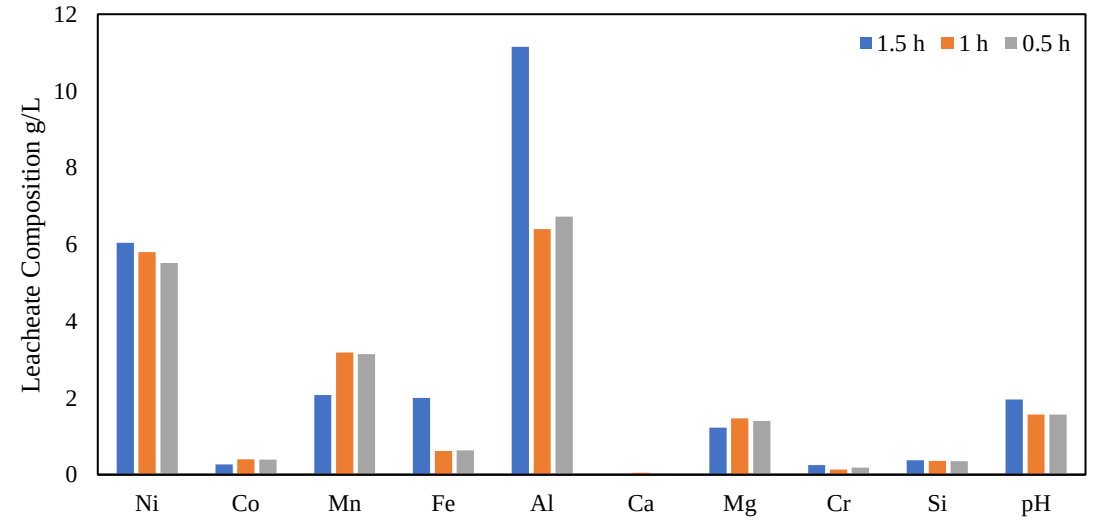


Figure 9 Metals composition for various leaching time at acid to ore ratio 250 kg/t

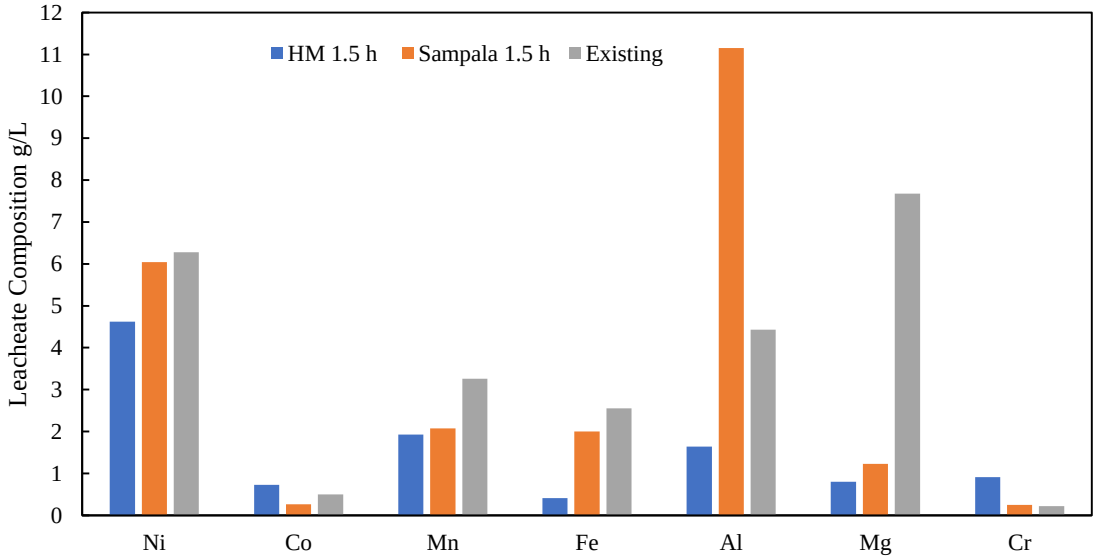


Figure 10. Comparison of higher metal composition from HM sample (1.5 h), Sampala sample (1.5 h) and existing factory

Summary of Acid Consumption and Leaching Time of Siduarsi Sample

Siduarsi sample is originated from East Indonesia were located in Papua island. Material characterization and particle size analysis were conducted to identify the ore characterization. For advance, acid consumption test also conducted to find the availability for hydrometallurgical processing. Based on the PSD (particle size distribution) analysis shows that Siduarsi sample dominated by fine particles which is 84.99% less than 20 μm (**see Figure 11**). According to the mineral characterization analysis it's found that major element composition was 1.34%, 0.12%, 1.18% and 4.85% respectively for Ni, Co, Mg and Mn. Based on the geological study and preliminary study, Siduarsi ore should be dominated by limonite ore. However, this result shows that Ni and Mg has quite high (1.34% and 4.85%) **due to the limonite layer is quite thin so that others mineral affect the concentration on the same depth**. Acid consumption test also conducted in various acid concentration (150, 250 and 350 kg-H_2SO_4/ t-$_{dry\ ore}$) and residence time (30, 60 and 90 minutes).

The effect of acid-to-ore ratio for Siduarsi samples as seen on **Figure 13** shows that ratio of acid-to-ore ratio influence the leaching rate of nickel and another metals. At residence time 0.5h shows that nickel leaching rate were 70.54%, 88.26% and 91.53% respectively for 150, 250 and 350 kg acid/ dry ore. It's similar to another residence time such as 1 hour it was 79.27%, 93.65% and 94.1% and for 1.5 h was 57.06%, 89.67% and 90.76%. This data shows that increasing acid ratio from 150 kg acid to dry ore to 250 kg acid to dry ore show a significant effect on the leaching rate. It was increase 17.71%, 14.38% and 32.6% of Ni leaching when acid ratio increases from 150 kg/dry ore respectively for residence time 0.5h, 1h and 1.5h. However, increasing acid ratio from 250 kg/ ore ratio to 350 kg/ore only slightly increase the nickel recovery 3.27%, 0.45% and 1.09% respectively for residence time 0.5h, 1h and 1.5h. Nevertheless, all the leaching condition also contain high other metals such as Mn, Mg, Fe and Cr. All these undesired metals were leached almost above 80%. Siduarsi sample has a different characteristic compare to HM and Sampala samples, where HM and Sampala sample has the optimum condition where Ni and Co has a high recovery while other metals such as Mn, Mg, Fe and Cr are low below 50% for HM samples (**See Figure 4**) and below 50% for Sampala sample (**See Figure 8**).

Based on the previous explanation, the higher nickel recovery was 94.1% achieve at leaching condition at acid to ore ratio 350 kg/ ton ore at residence time 1 h. If this leaching rate compares to the HM and Sampala sample, both achieved 97% leaching rate. The optimum condition of Siduarsi sample could be adjust at acid to ore ratio 350 kg/ton with residence time 1h. At this leaching situation nickel leching rate didn't increasing significantly when the acid to ore ratio increase to 350 kg/ton ore and increase residence time 1.5h. Cobalt as desired metal also already achieved the maximum leaching rate. In addition, at this condition both Mn and Mg has high leaching rate 93.86% and 96.43% respectively. This could be affected by the metal contain in the raw ore. The comparison of Mn metal 0.83%, 0.58 and 1.18% respectively for HM, Sampala and Siduarsi. Similar as Mg metals, it was 0.46%, 0.35% and 4.85% respectively for HM, Sampala and Siduarsi Sample (**See Figure 12**). It shows that **Mn content in Siduarsi sample is higher almost twice and for Mg higher 10 times**. Another undesired metal is Chromite, Siduarsi sample has a high rate leaching for chromite, when its compare with another sample 35.31%, 11.63% and 80.70 % respectively for HM, Sampala and Siduarsi. if its compare on the raw material composition, it was 1.91%, 1.72% and 2.3% respectively for HM, Sampala and Siduarsi.

Following the explanation above, it can be concluded that the optimum leaching process for Siduarsi sample achieved at acid to ore ratio 250 kg/ ton ore with residence time 1 h. The leachate metal concentration is 4.7 g/L, 0.34 g/L, 2.96 g/L, 4.71 g/L and 0.21 g/L respectively for Ni, Co, Mn, Mg and Cr. If this leachate composition compares with existing factory, this metal (Ni and Co) concentration is lower (existing factory above 5 and 6 g/L). Otherwise, the acid consumption is lower than existing factory 250 -350 kg-acid/ ton-dry ore. **On the other hand, Siduarsi leachate solution still contain a lot of impurities** such as Mn, Mg and Cr which is need a special handling to separate this metal before final product.

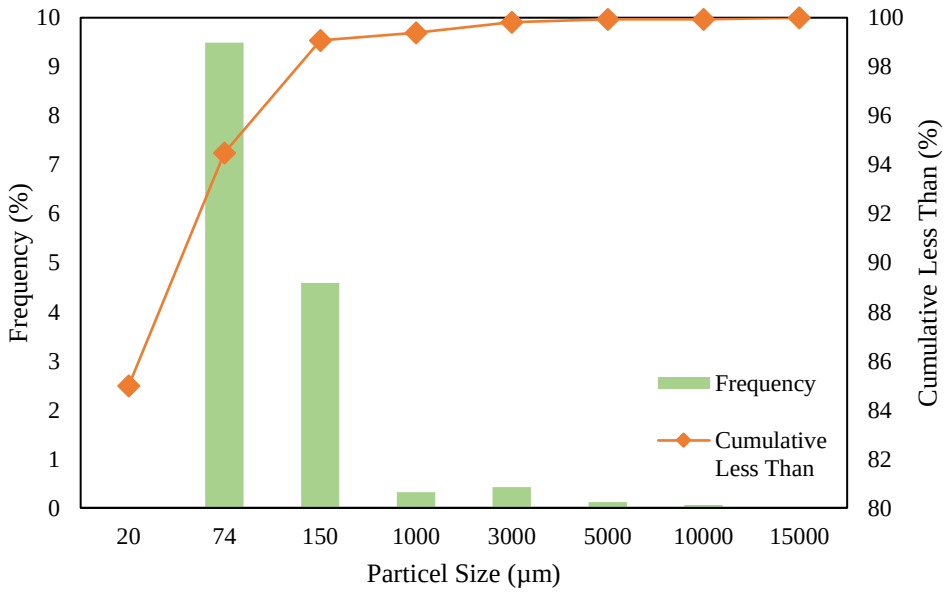


Figure 11 Particle size frequency and Cumulative Less Than for Siduarsi Sample. Paticle size less than 74 mm didn't plotted due to frequency is high 84.99 %.

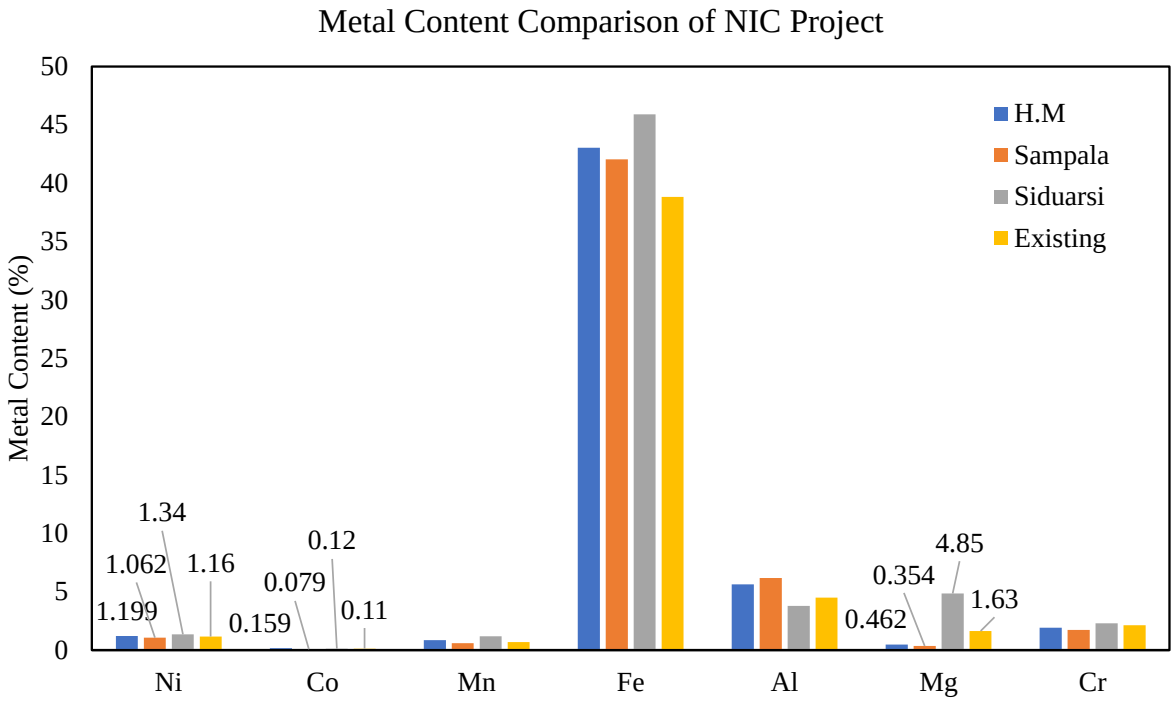


Figure 12. Metal Composition of Siduarsi Sample compare to another Sample and existing HPAL project

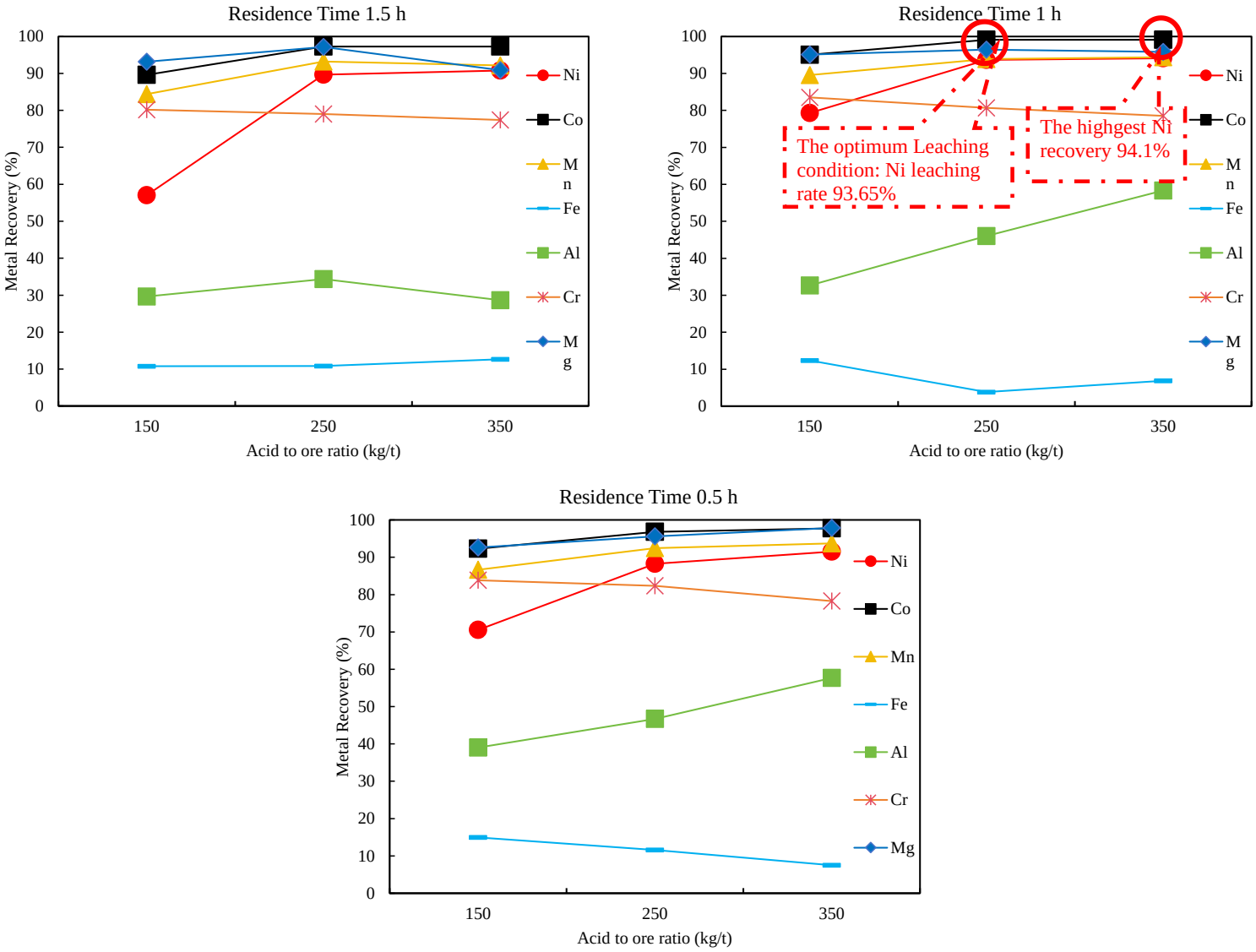


Figure 13 Metal Leaching Recovery at various acid to ore ratio and residence time

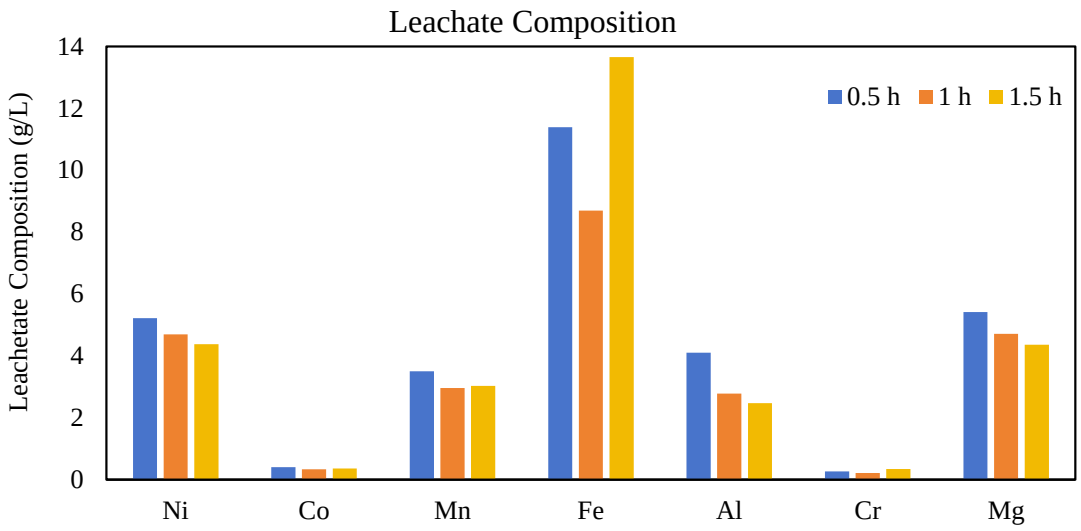


Figure 14 The Metal Concentration on the Leachate at acid to ore ratio 250 kg/to at various residence time.

APPENDIX 8

LiDAR SURVEY REPORT

DRONE LIDAR DATA PROCESSING REPORT

Name : Sigit Riyanto

Post : MicroUAV

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E-mail : sr.sigit.riyanto@gmail.com

WORKFLOW

Import raw laser data & trajectory

Create Block

Strip Adjusment

Hz & Vt Correction from multiple flight

Classify ground & non-ground point

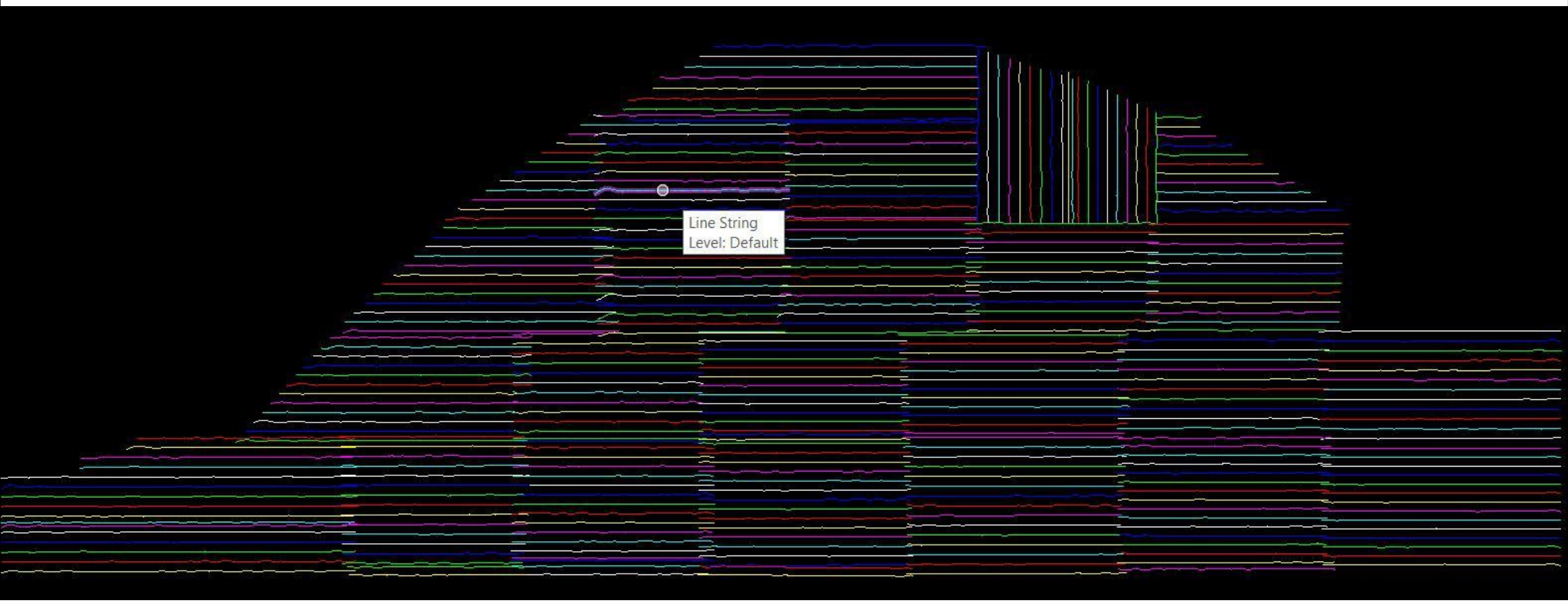
Build 3D model

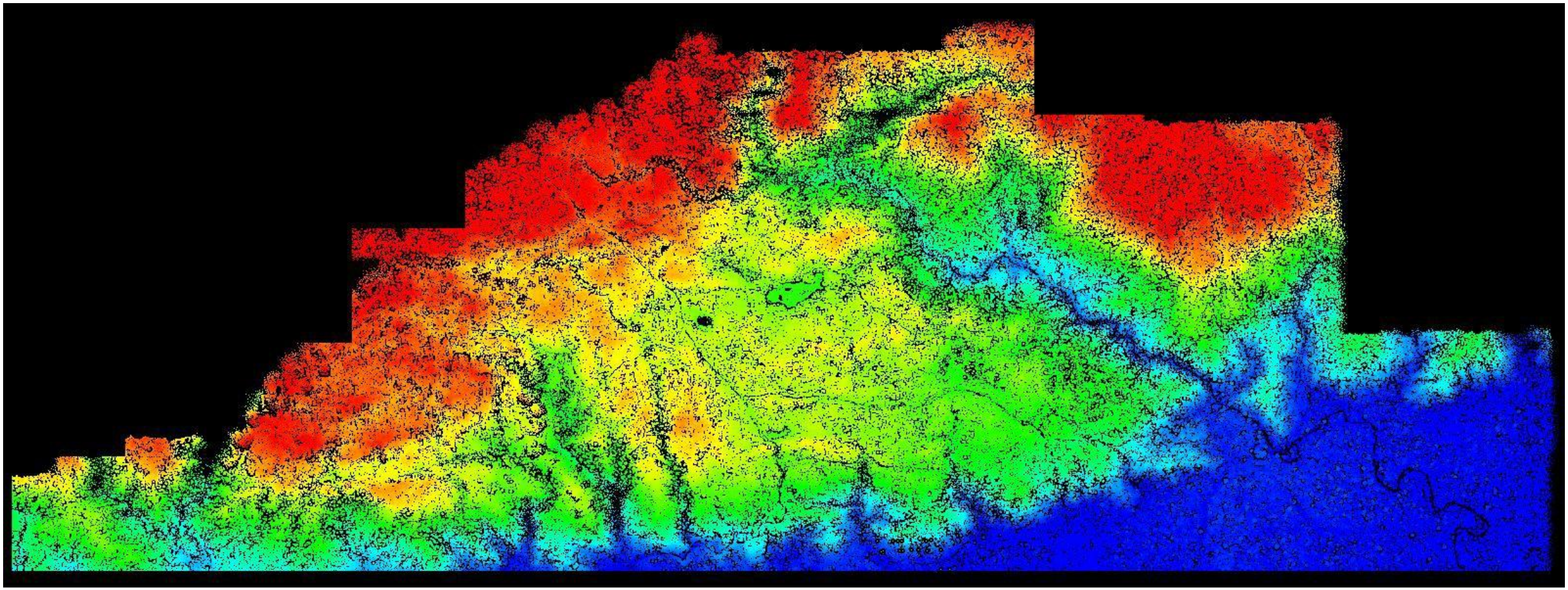
DSM & DTM

Generate contour intv. 1 m per block

Import raw laser data & trajectory

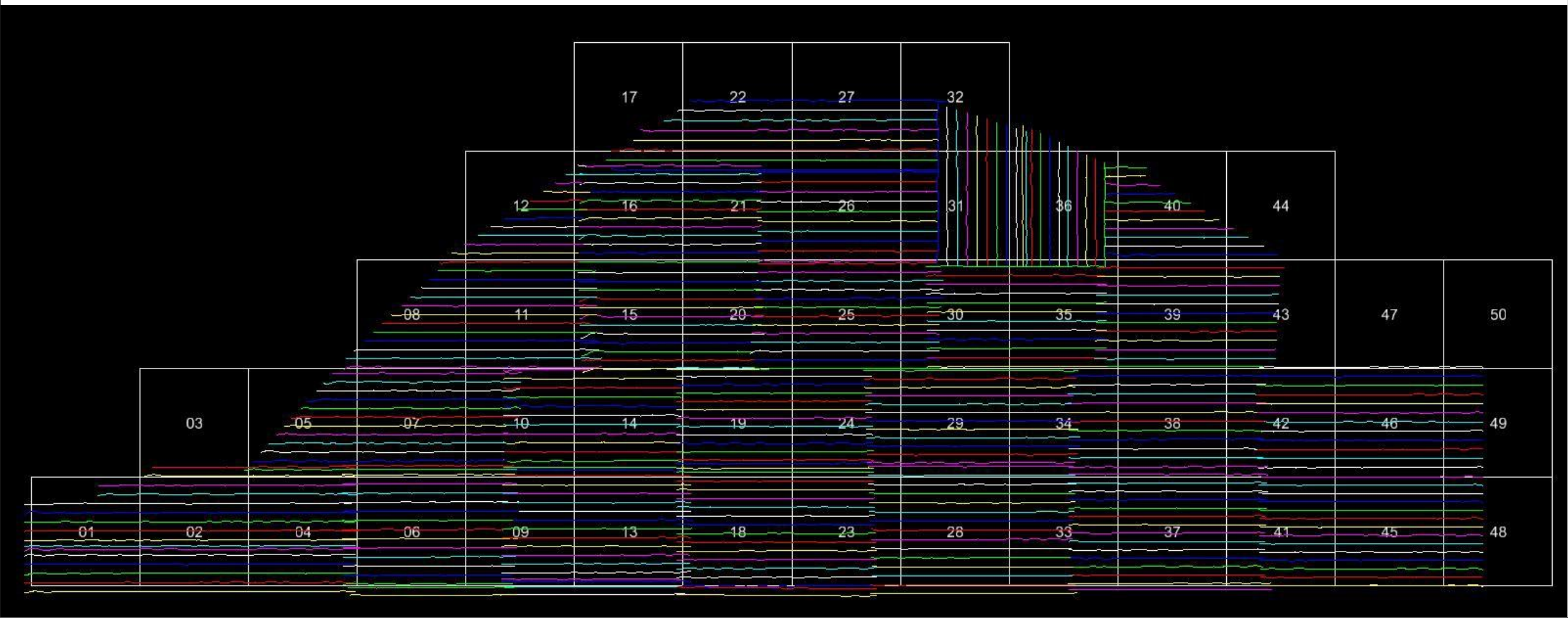
- Editing all flight paths to make sure no overlapping lines, the total truncated line is 316 without any intersection or overlap either above or below the flight path.



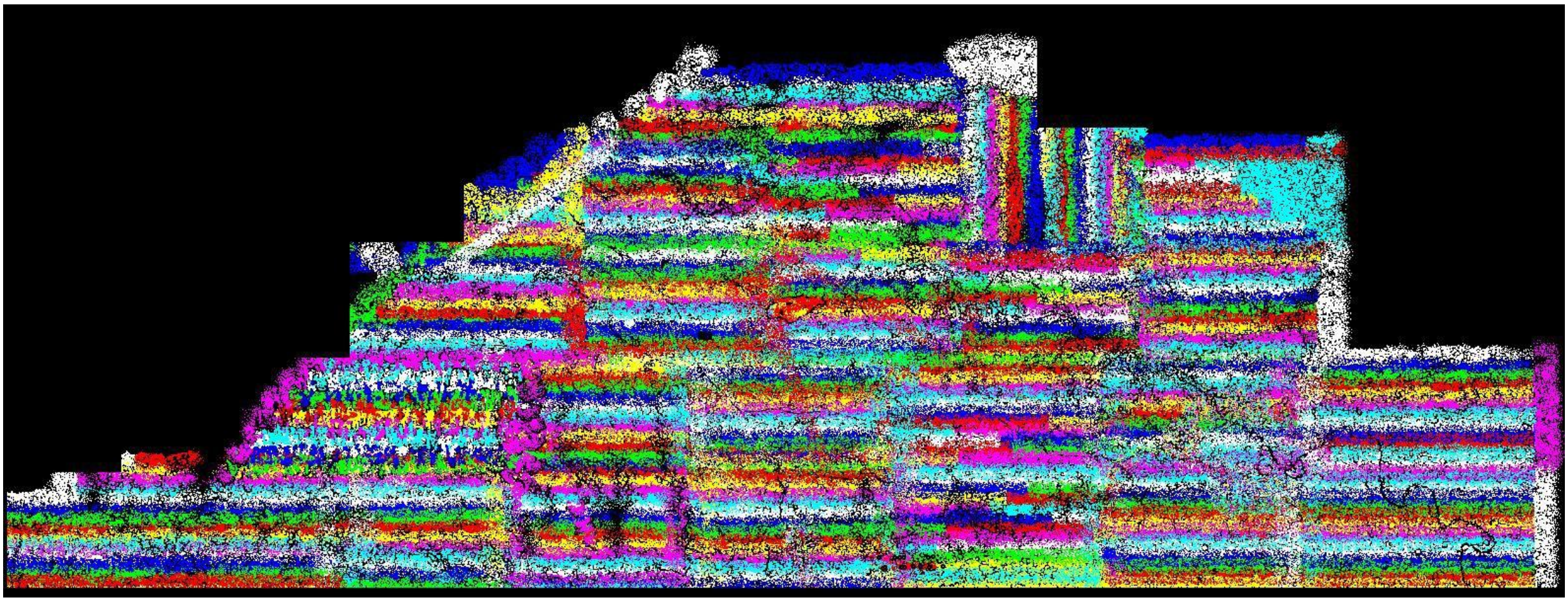


Create Block

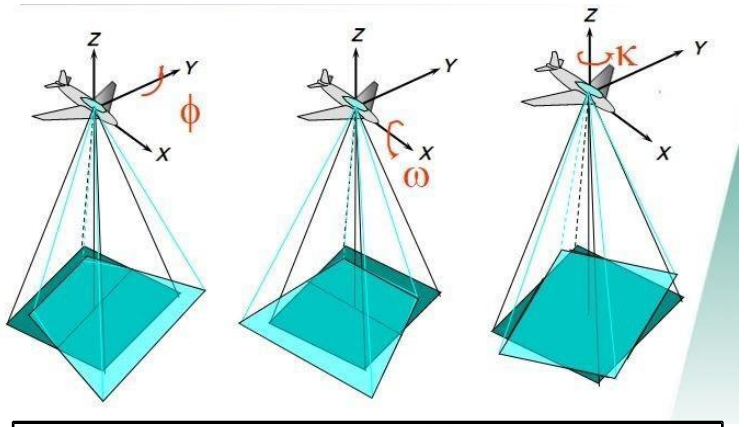
Creating a 1 x 1 km block size according to the boundary (3,800ha), this method used to speed up and lighten the computer load during processing.



Matching raw Laser with Flight Trajectory



Strip Adjusment Horizontal & Vertical Correction from multiple flight



- Correcting pitch, yaw and roll of the UAV during data acquisition
- The results of the corrections are shown below
- The average magnitude number can be used to describe the accuracy of the trajectory data

```
Laser project: D:\prj\prj_tscan.prj
Trajectories: D:\trj\
No known points
Observe every 5th point
Solution for whole data set

Starting dz RMS:                    0.0790
Final dz RMS:                       0.0806

Standard error of unit weight:      0.0360

Execution time: 10776.8 sec
Number of iterations: 3

Points          298980
H shift        +0.0001     Std dev   0.0001
R shift        -0.0005     Std dev   0.0001
P shift        +0.0067     Std dev   0.0012
Scale         +0.00001
```

```
Laser project: D:\prj\prj_tscan.prj
Trajectories: D:\trj\
No known points
Observe every 5th point
Solution for individual strips

Execution time: 2707.9 sec
Number of iterations: 101

Flightline  Points Z shift
1             5261   -0.025
2              824   -0.019
3             1042   -0.013
4              230   -0.013
5             1886   -0.015
6             1783   -0.011
7             1357   +0.006
8             1483   +0.006
9             1497   +0.000
10            1965   -0.015
11            1292   -0.010
12            1877   -0.040
13            2194   -0.024
14            4714   +0.005
```

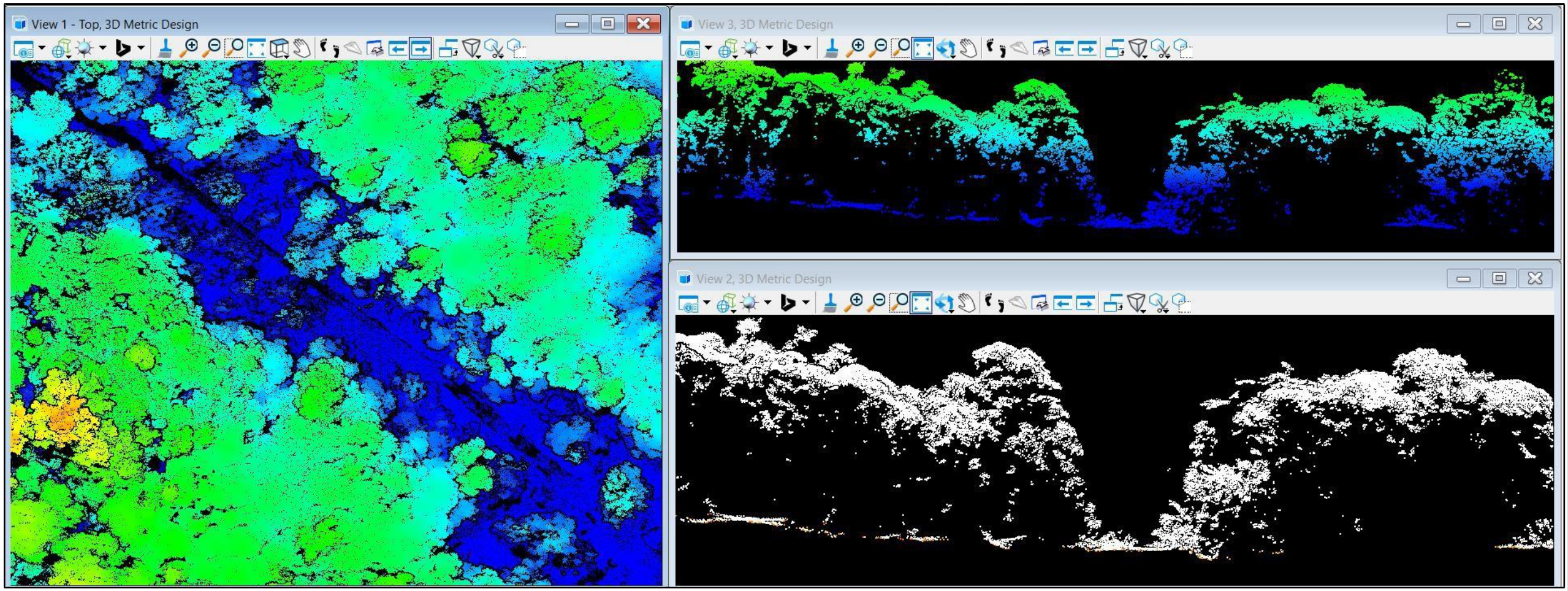
```
Laser project: D:\prj\prj_tscan.prj

Average magnitude:      0.06144

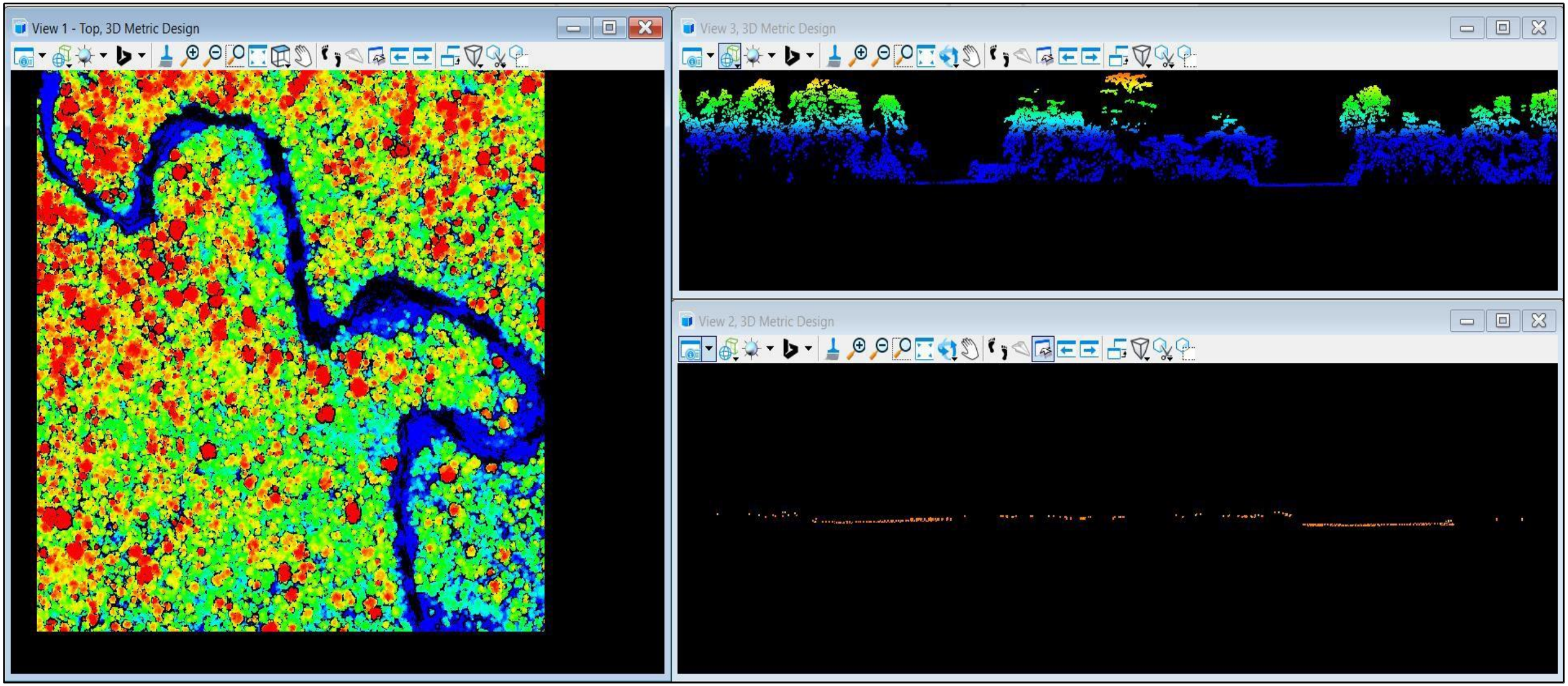
Flightline   Points Magnitude        Dz
89               216    0.0941   -0.0029
90               471    0.0890   +0.0030
91               606    0.0906   -0.0075
92               448    0.0907   +0.0058
93               250    0.0909   -0.0063
94               135    0.0846   -0.0101
95               643    0.0880   -0.0009
96              2316    0.0884   -0.0053
97              1712    0.0853   -0.0054
98               913    0.0948   +0.0098
99               511    0.0935   +0.0192
100              123    0.1134   -0.0442
101             4609    0.0761   -0.0008
102             4234    0.0681   -0.0016
1001          800353    0.0539   -0.0036
2001          746515    0.0521   +0.0027
8001             553    0.0960   -0.0097
87                13    0.0815   +0.0349
88               314    0.0967   +0.0160
58             11853    0.0880   +0.0386
```

Classify ground & non-ground point

- Classifying all the points based on indication of ground and non-ground surface
- The image below shows the point cloud condition. The bottom right image shown the brown colour points is ground while the white colour is non-ground. It can be seen in the images that the vegetation is very dense so some areas are not covered by LiDAR laser sight. If this condition occur the ground data will not exist.



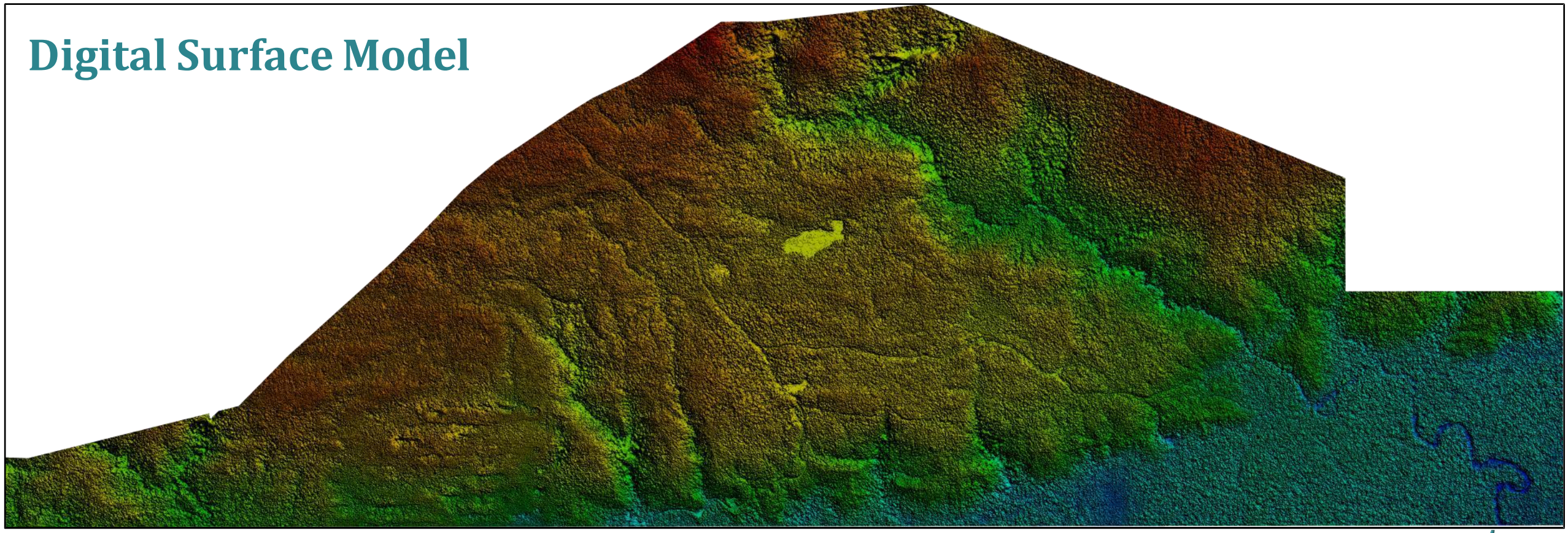
- View 1 is point cloud
- View 2 brown colour points are ground
- View 3 cross section of the point clouds



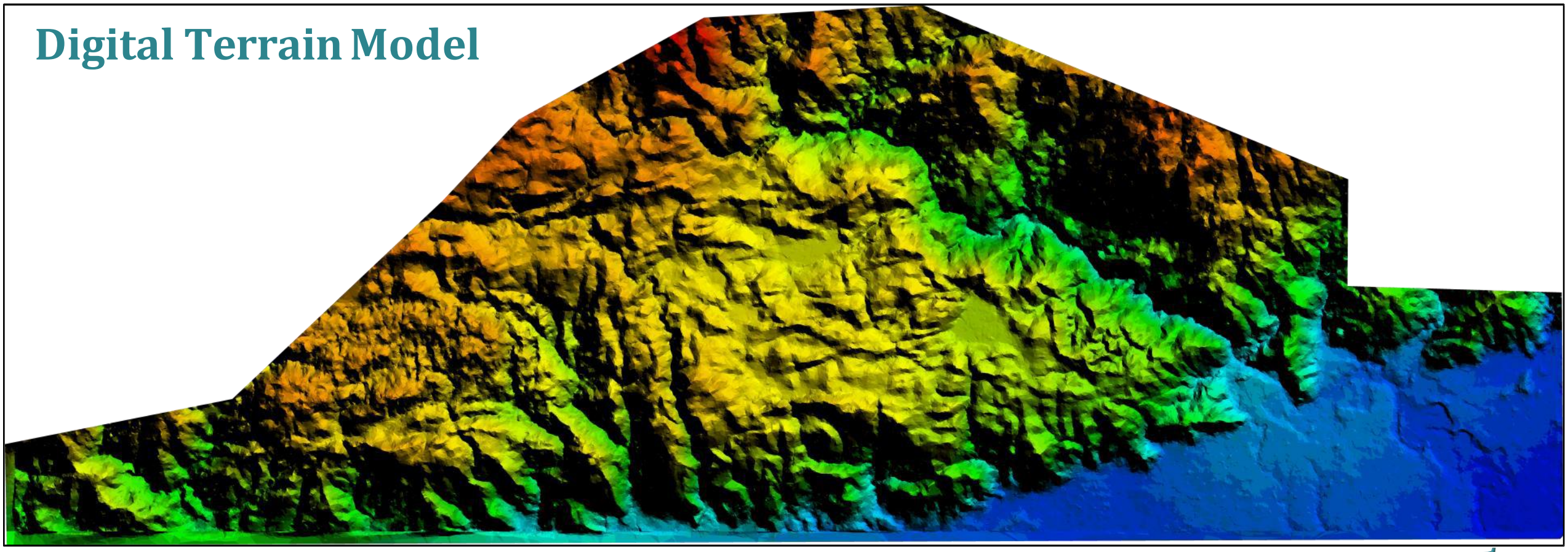
Build 3D model DSM & DTM

- The following are the results of point cloud data processing in Digital Surface Model (DSM) which contains whole data points and Digital Terrain Model (DTM) which is the ground surface.

Digital Surface Model

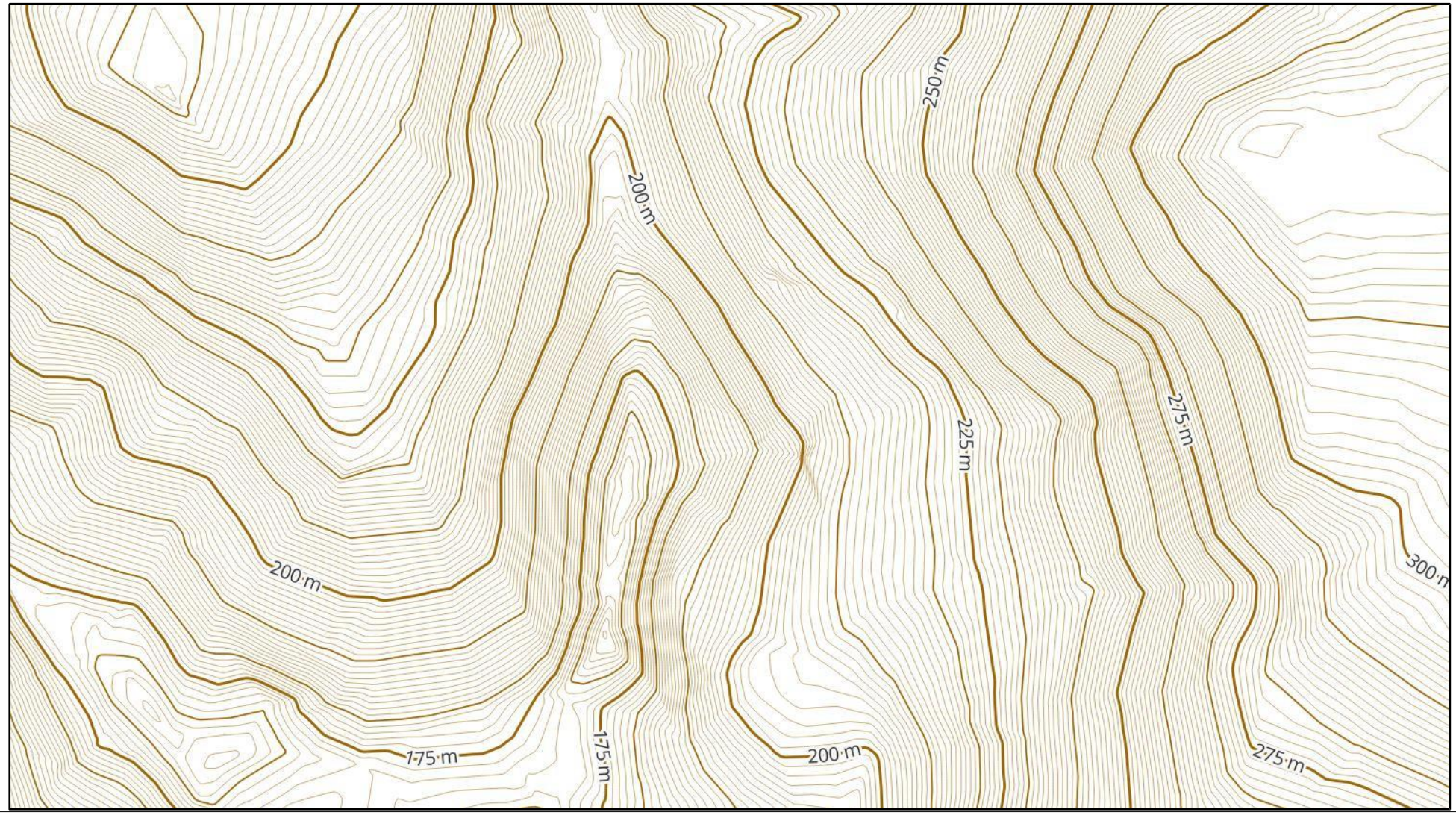


Digital Terrain Model

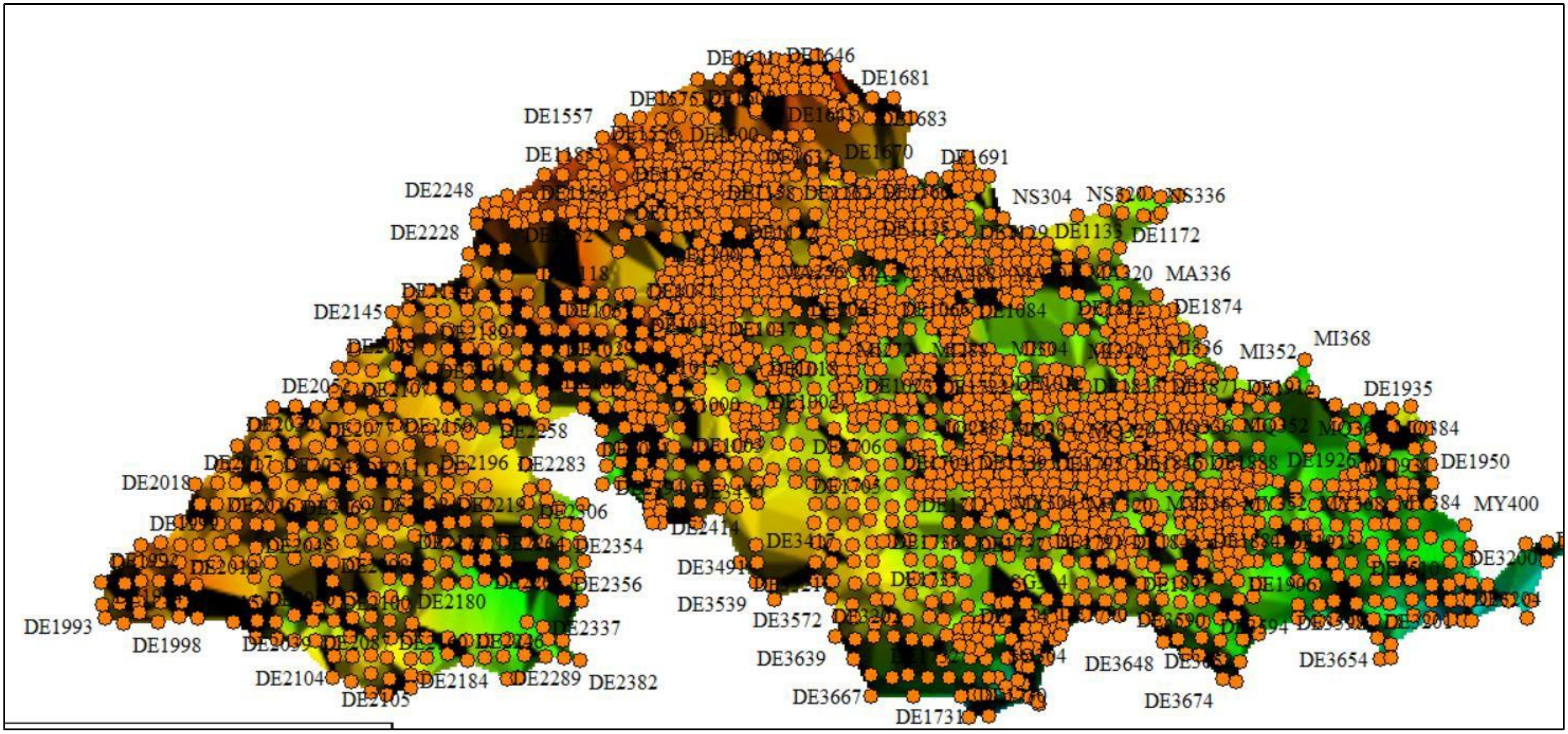


Generate contour intv. 1 m per block

- Contour generation was carried out from the DTM Data. We attached the DTM in geotiff and .dtm format so they can be used in Surpac software.

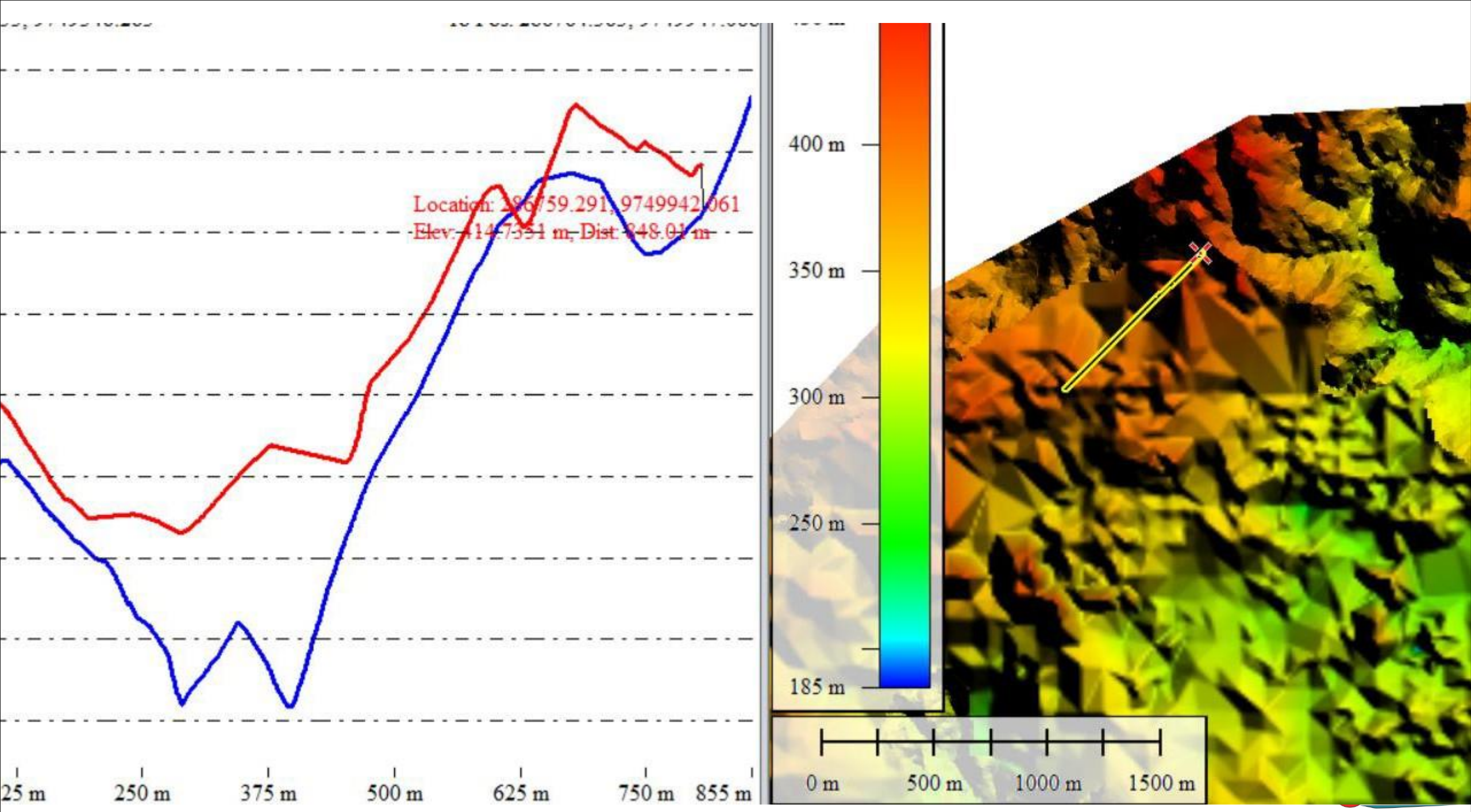


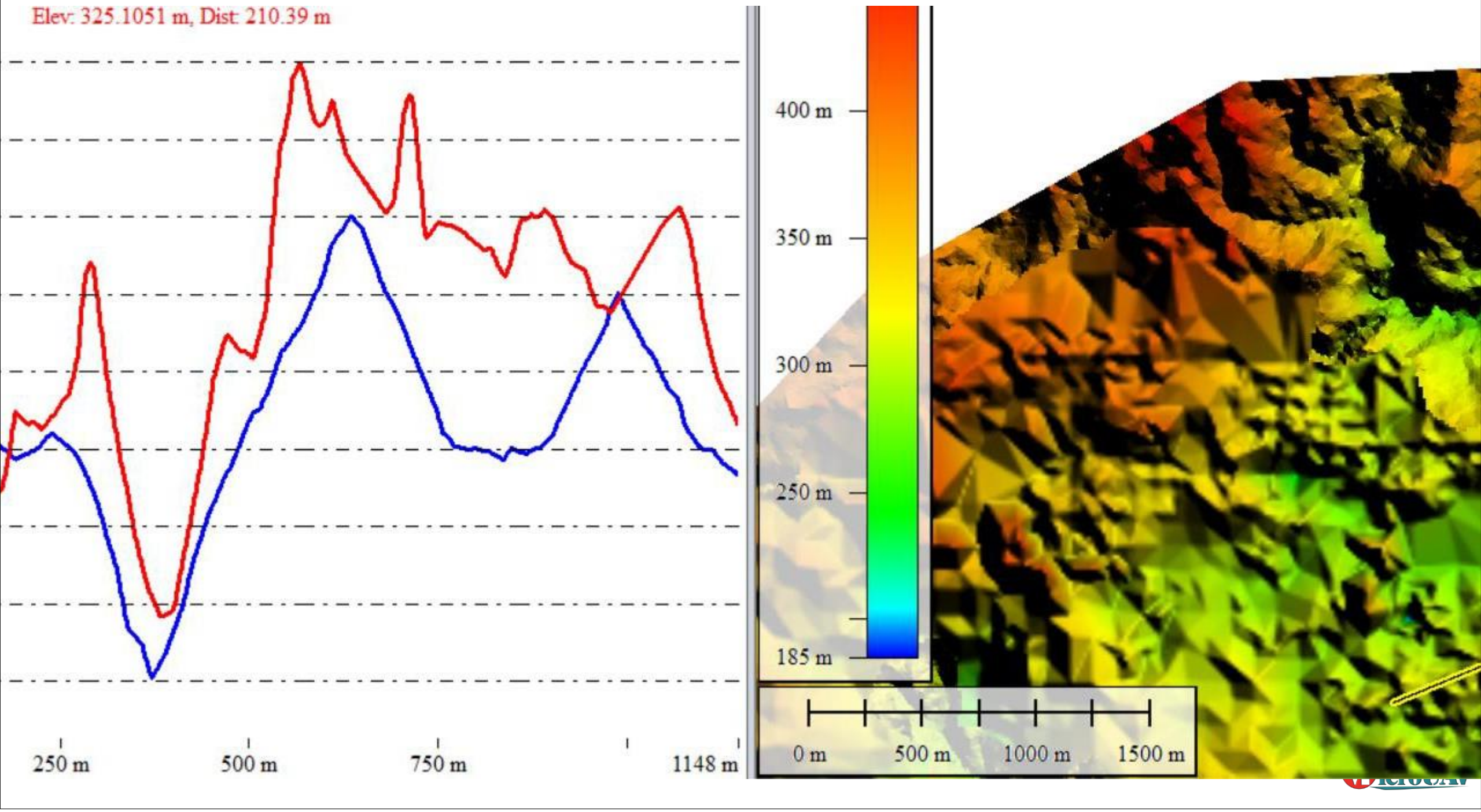
Hasil Plotting titik Coral

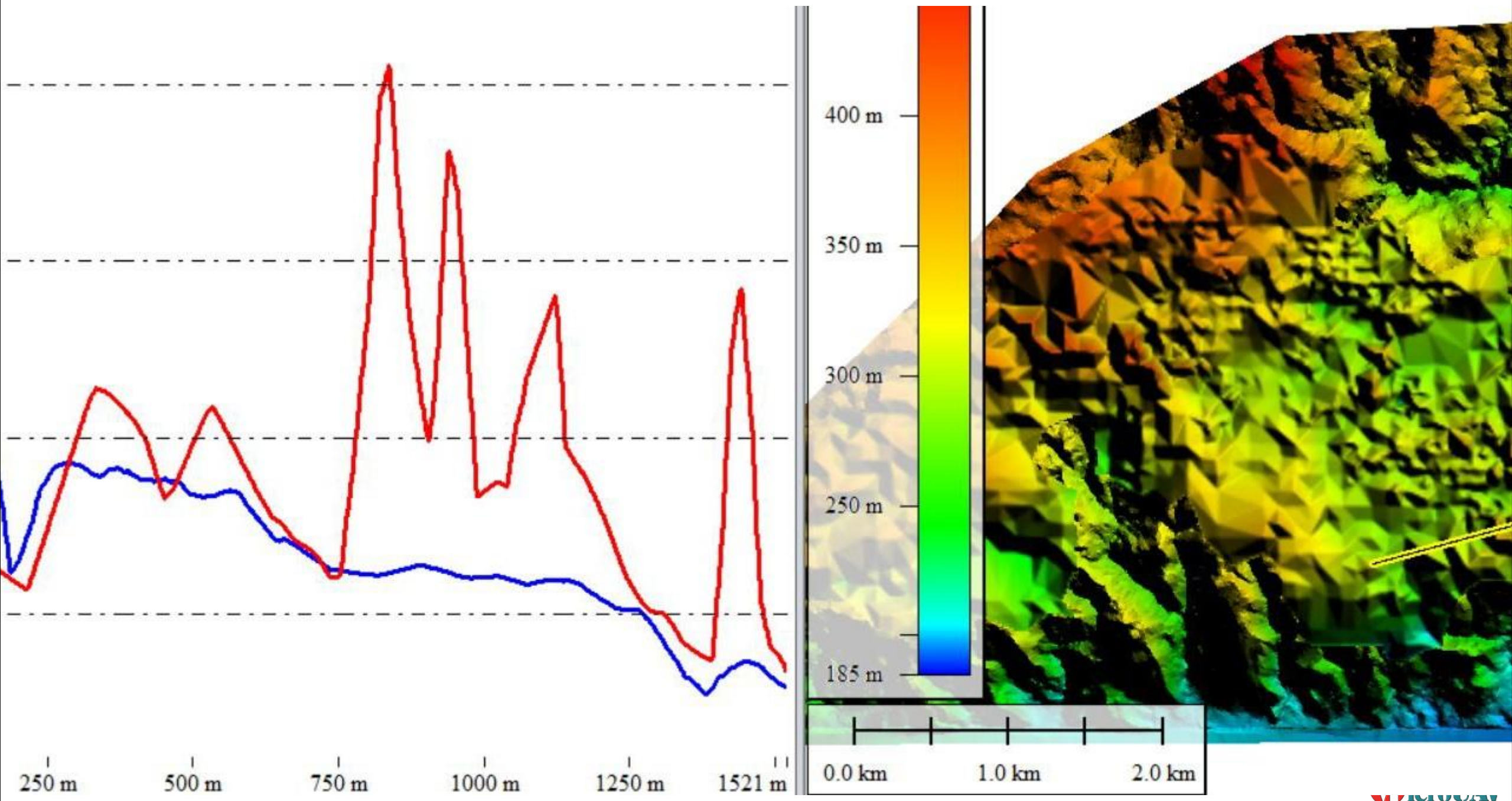


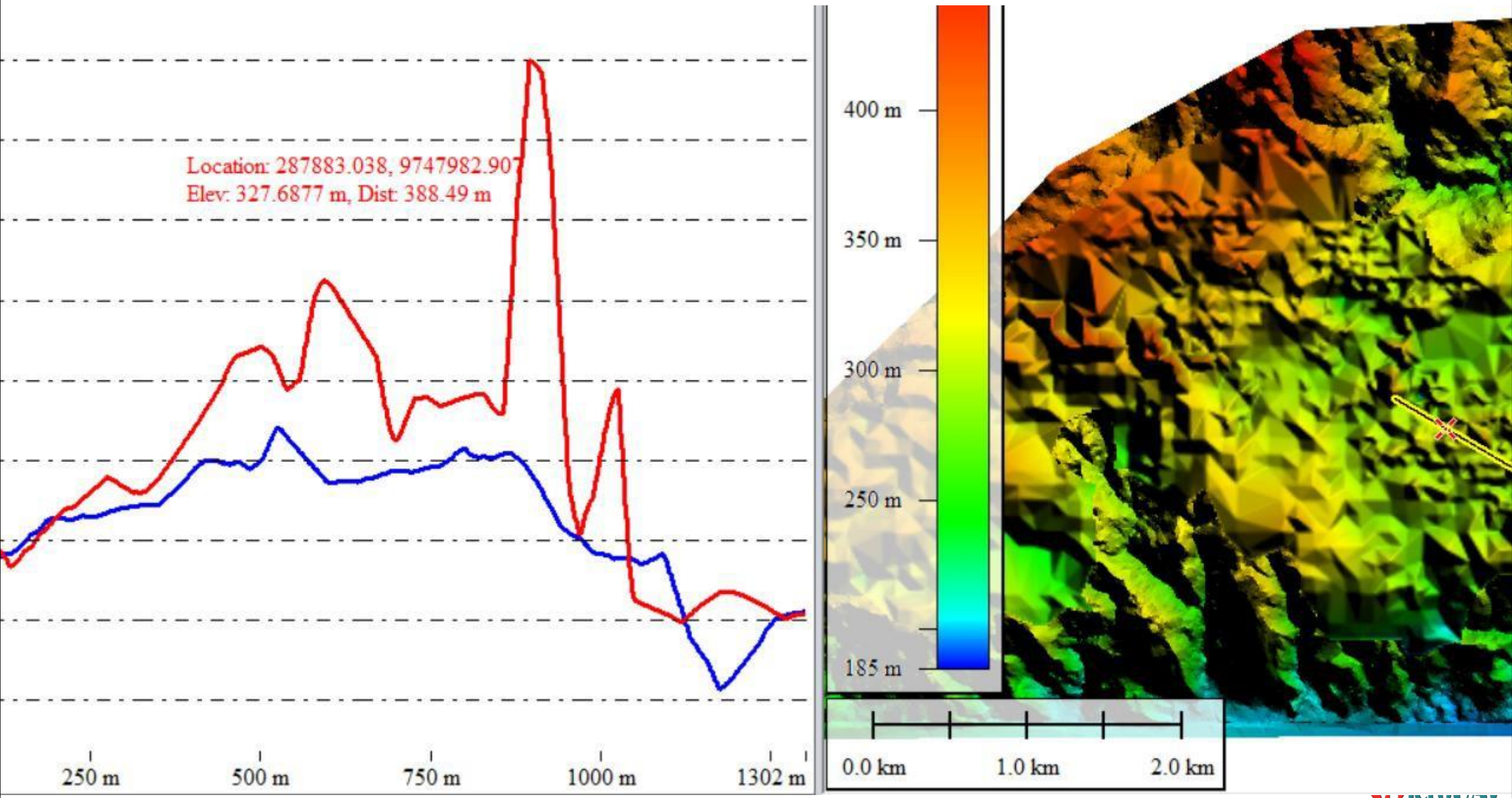

380 m
370 m
360 m
350 m
340 m
330 m
320 m
250 m
500 m
750 m
1000 m
1250 m
1492 m
Location: 285083.603, 9748139.329
Elev: 349.8861 m, Dist: 1.378 km
DTM LIDAR
TITIK COLAR

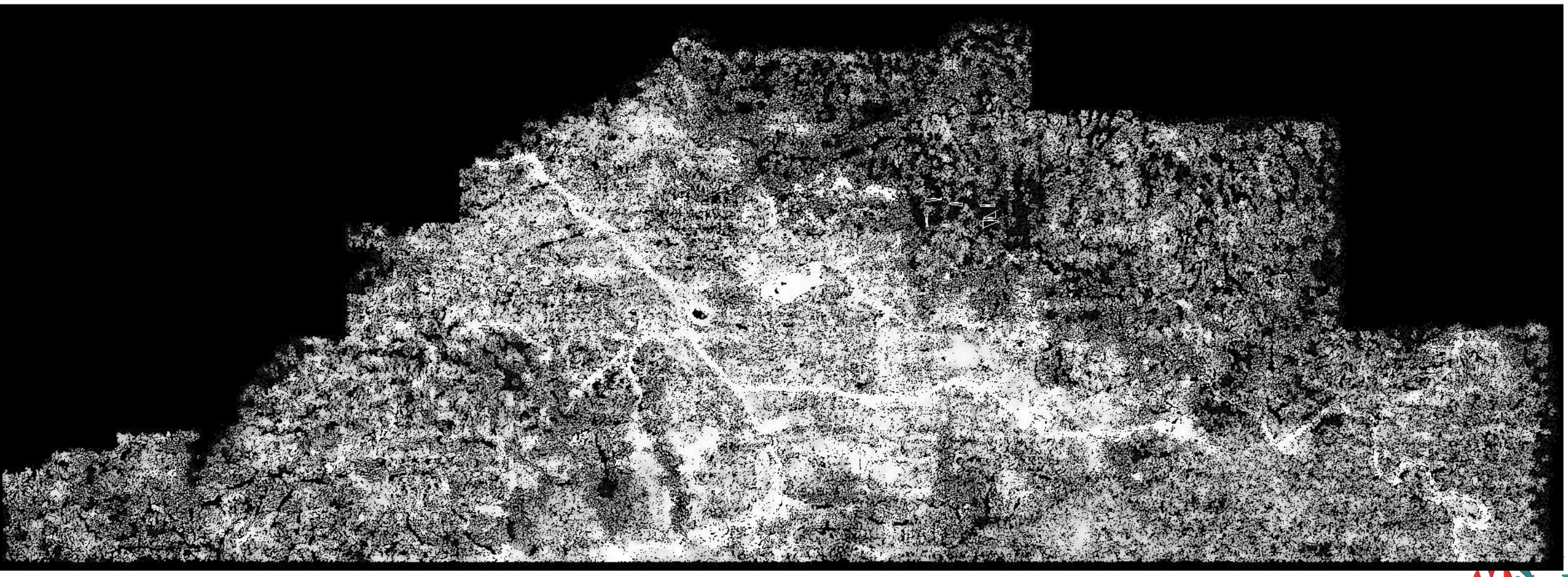

440 m
430 m
420 m
410 m
400 m
390 m
380 m
370 m
360 m
125 m
250 m
375 m
500 m
625 m
750 m
855 m


Location: 286759.291, 9749942.061
Elev: 414.7331 m, Dist: 848.01 m
400 m
350 m
300 m
250 m
185 m
0 m
500 m
1000 m
1500 m
25 m
250 m
375 m
500 m
625 m
750 m
855 m


Elev: 325.1051 m, Dist: 210.39 m
250 m
500 m
750 m
1148 m
400 m
350 m
300 m
250 m
185 m
0 m
500 m
1000 m
1500 m

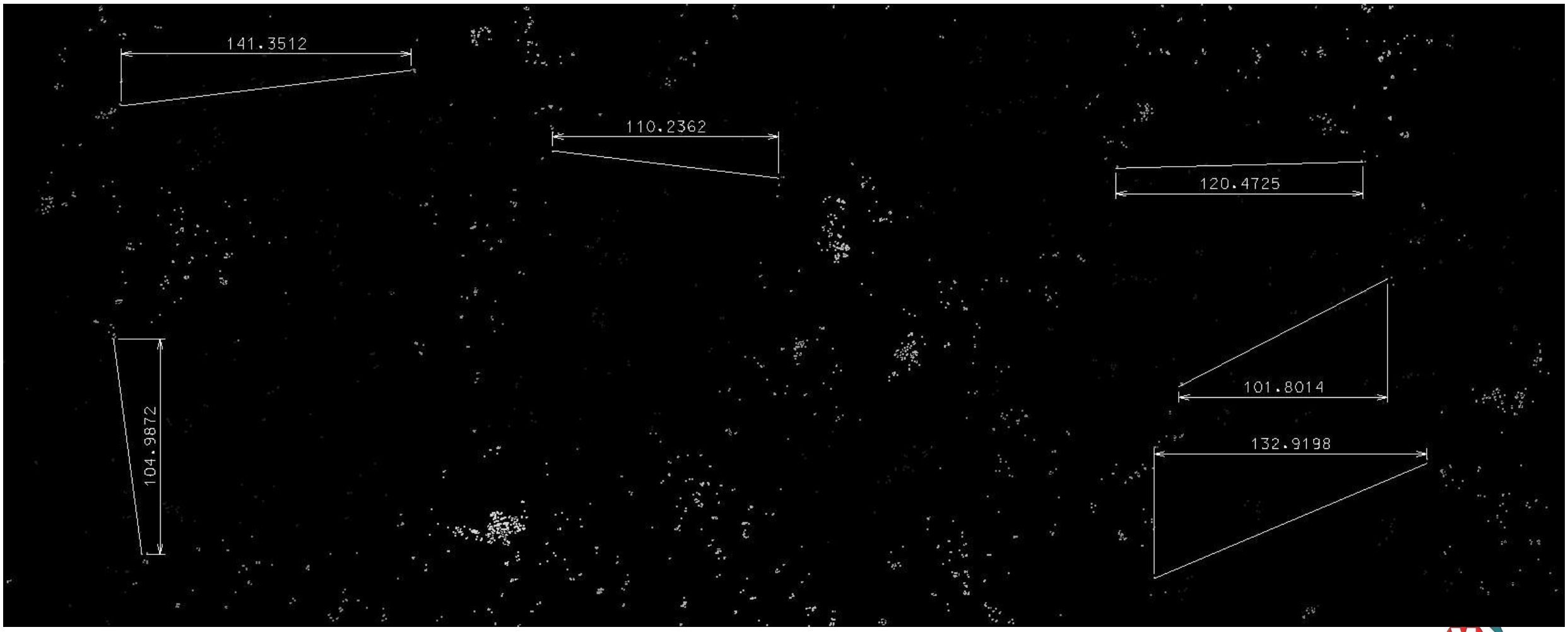

400 m
350 m
300 m
250 m
185 m
250 m
500 m
750 m
1000 m
1250 m
1521 m
0.0 km
1.0 km
2.0 km


Location: 287883.038, 9747982.907
Elev: 327.6877 m, Dist: 388.49 m
250 m
500 m
750 m
1000 m
1302 m
400 m
350 m
300 m
250 m
185 m
0.0 km
1.0 km
2.0 km

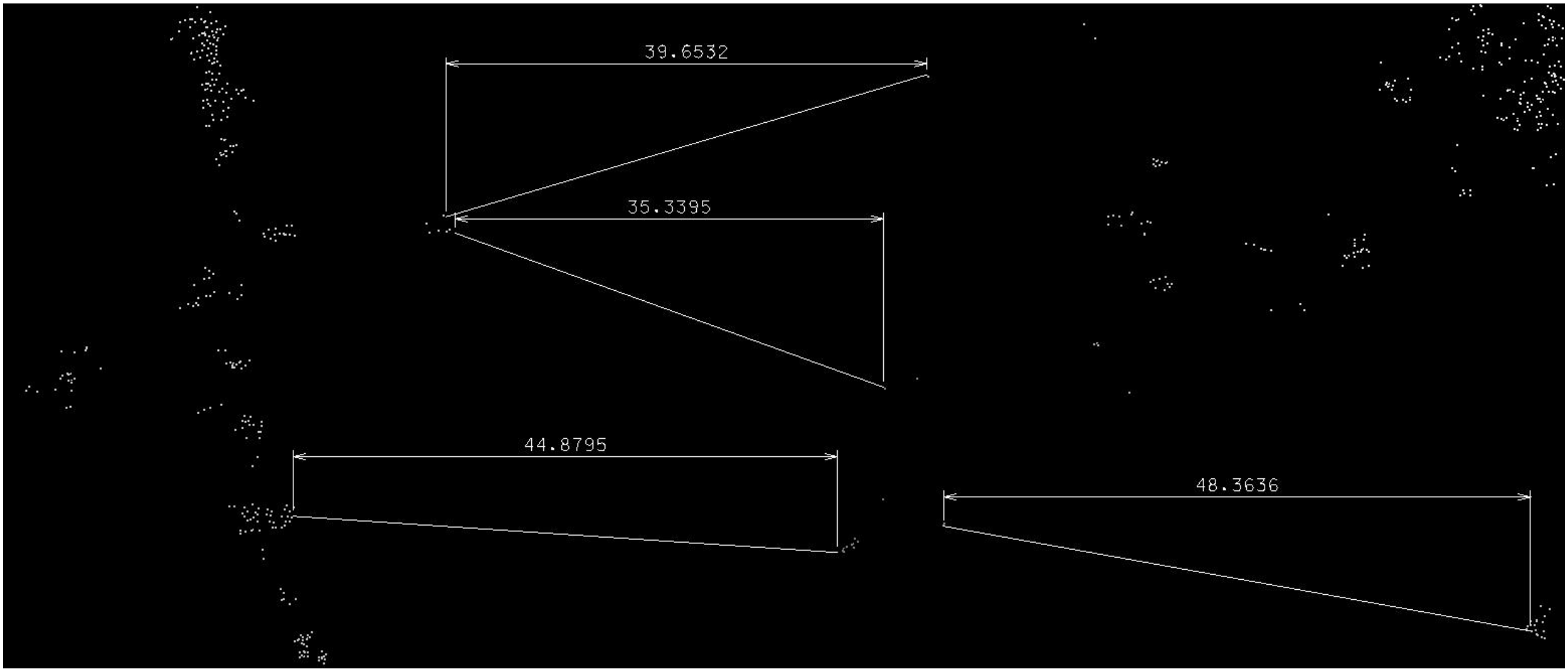


The distribution of points represented by the brighter color of white indicates the density in 1 square meter are 4-6 points, these are ideal conditions for LiDAR points that penetrate to the ground surface. While the gray area the point density is less than 4 LiDAR points per square meter. The black areas, the LiDAR can not reach the ground level.

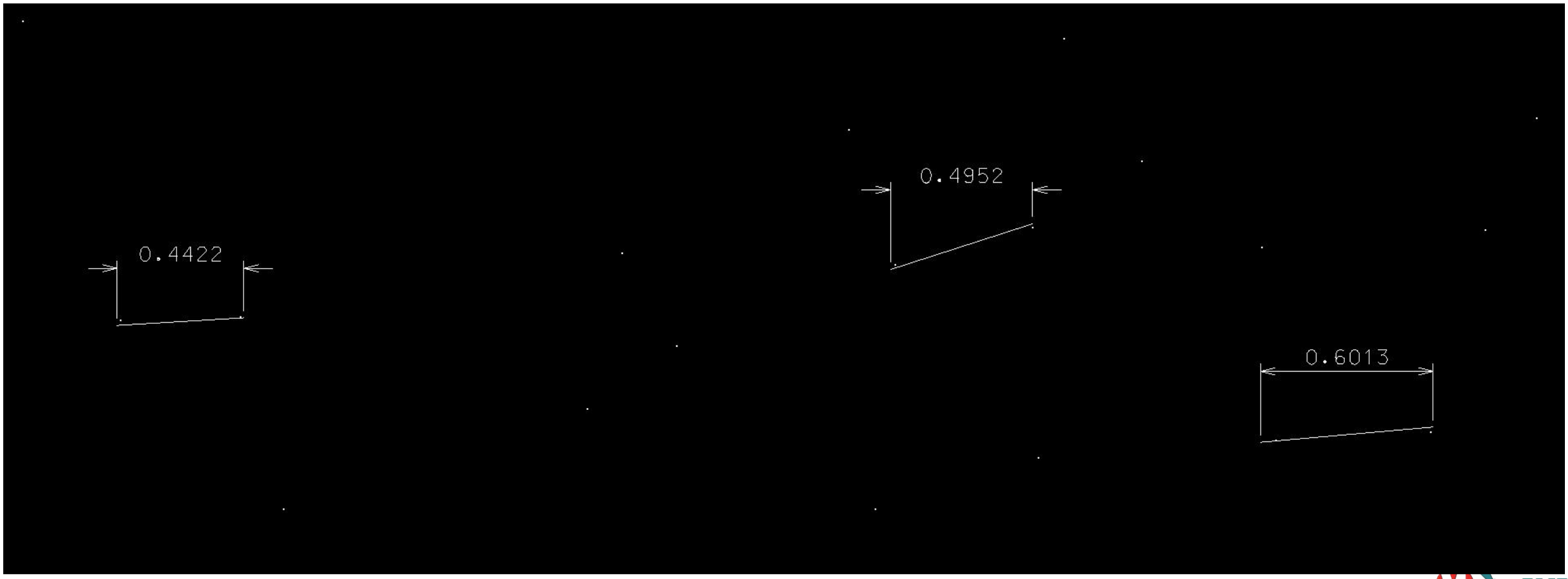
Sampling 1 area 0 titik/m2

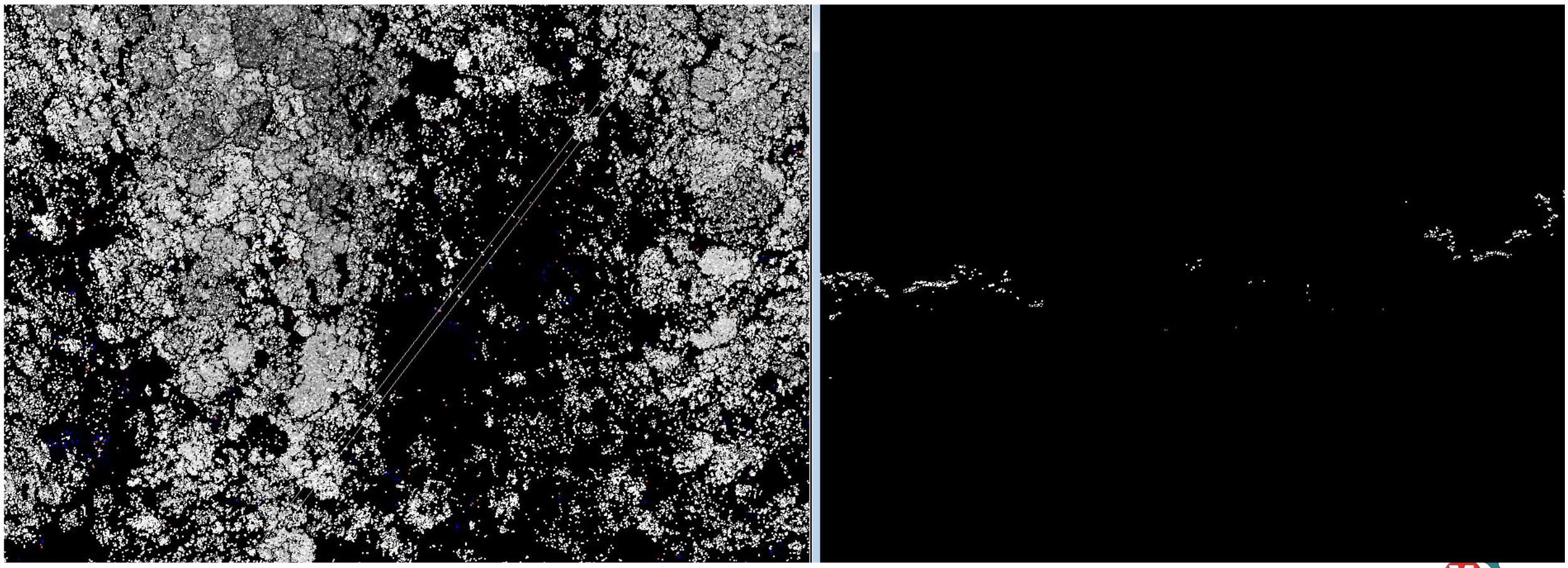


Sampling 2 area 0 titik/m2

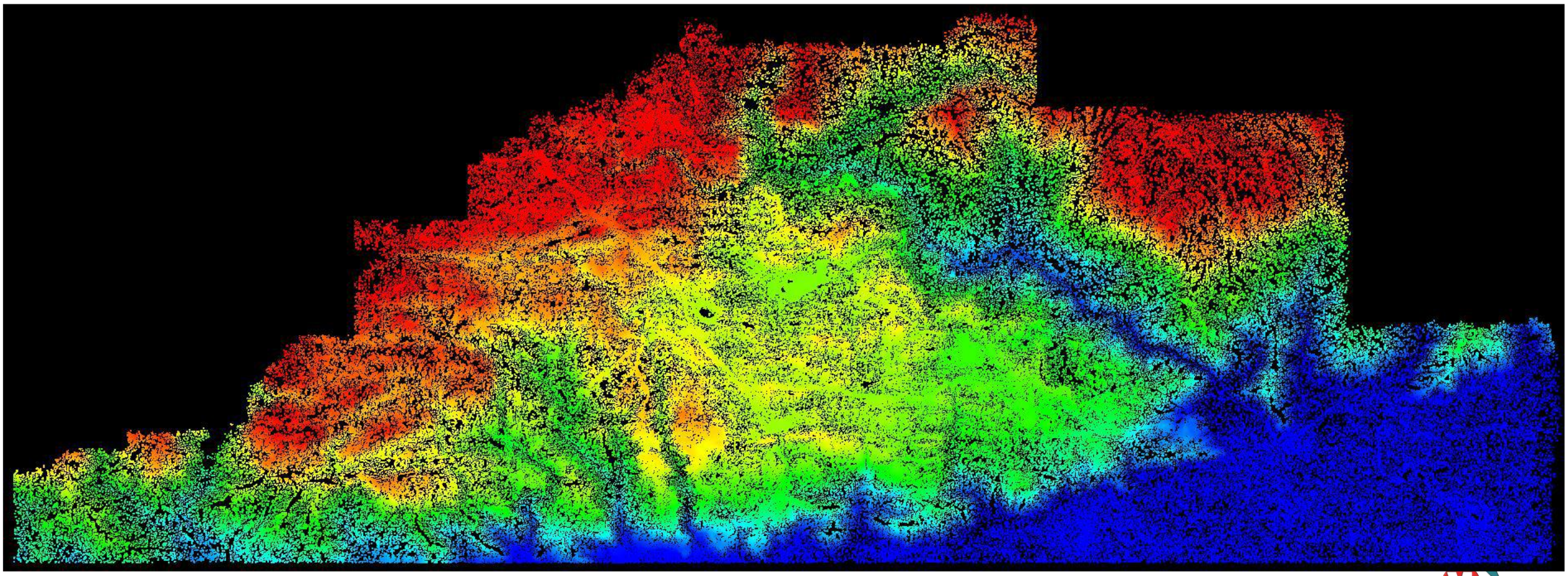


Sampling 3 ideal 4 - 6 titik/m2





The left image is the LiDAR raw data point before classification. The right image is a cross section in the square box drawn in the left image. The cross section shows that the LiDAR data points are not available for the ground level, the blank data will be interpolated during the DTM model creation.



All LiDAR data points has been classified to select only the ground level to generate the DTM and contour lines. The total data points used are 4.9 million points. The total points is considered enough to generate the DTM, although in some areas the interpolation still occurs.

Thank you!

APPENDIX 9

IMM BLOCK MODEL DOCUMENTATION



PT DANMAR EXPLORINDO

BLOCK MODEL DOCUMENTATION FOR PT IMM NICKEL PROJECT SEPTEMBER 2023

AUTHOR:

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2. Agus Sutrisno
3. Harman Adhityo
4. Yorris Wibriana

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1 EAST100

1.1 Block Model Geometry

Table 1 Block model size and geometry East100 Block

Type	Y	X	Z
Minimum Coordinates	9746183.843	282812.54	-20
Maximum Coordinates	9750258.843	291712.54	750
User Block Size	25	25	1
Min. Block Size	25	25	1
Rotation	0	0	0

1.2 Extrapolatory Data Analysis

The Damar block divided into two domain based on data topography, they are Damar East and Damar South.

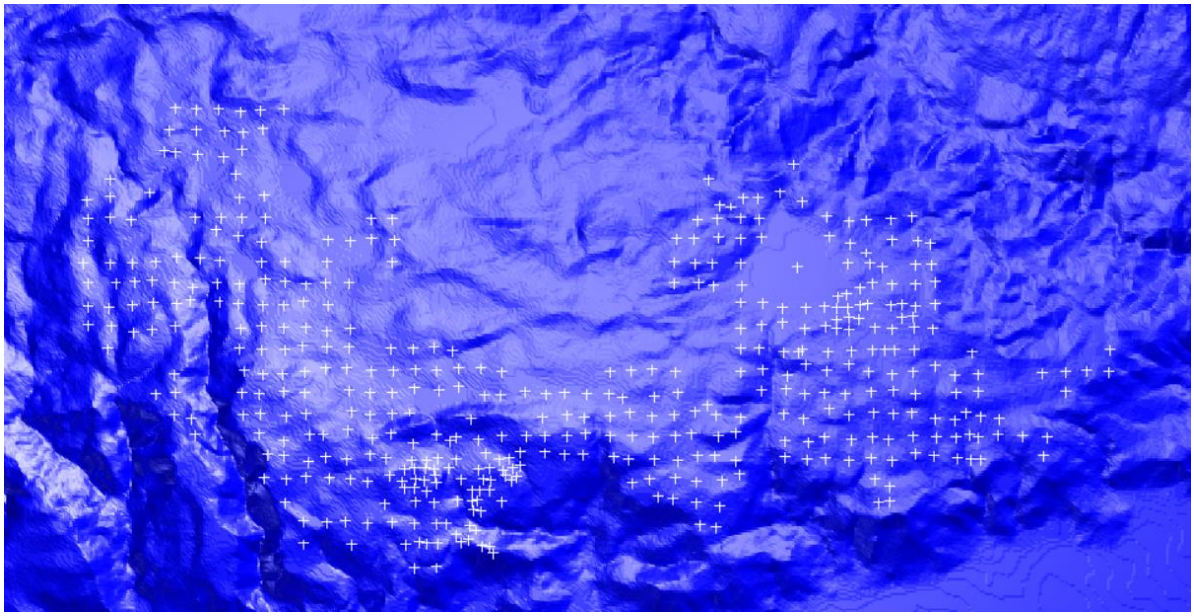
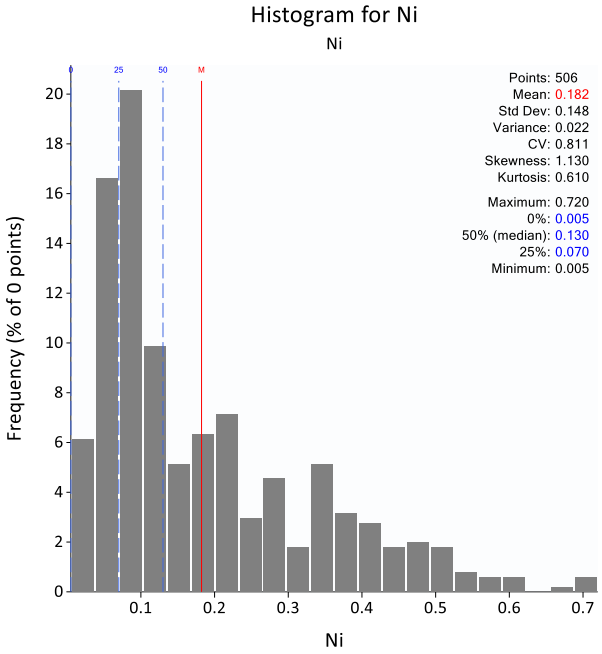
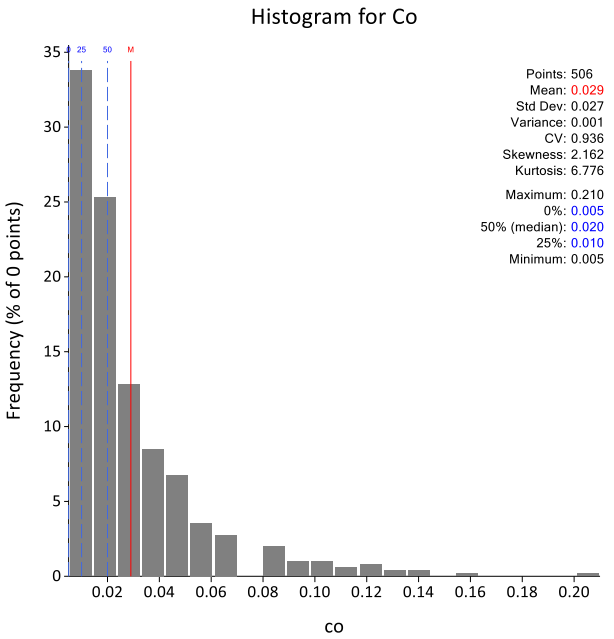
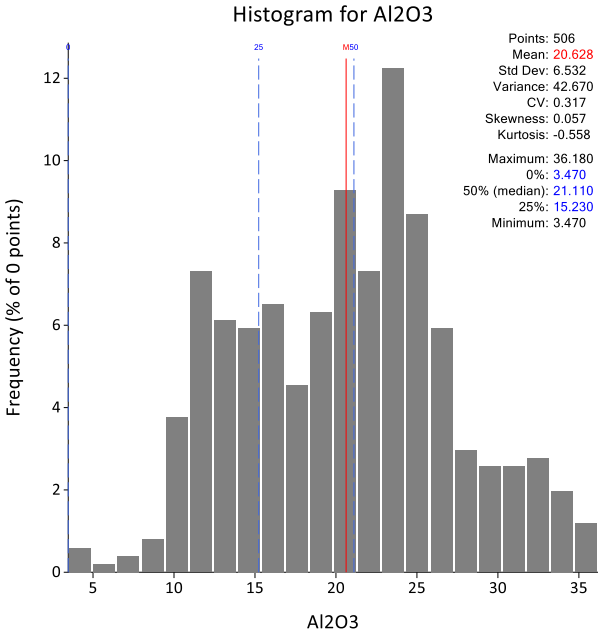
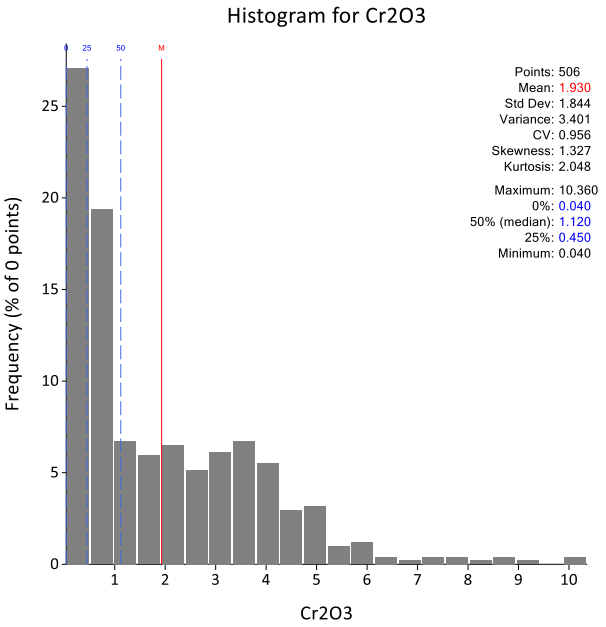


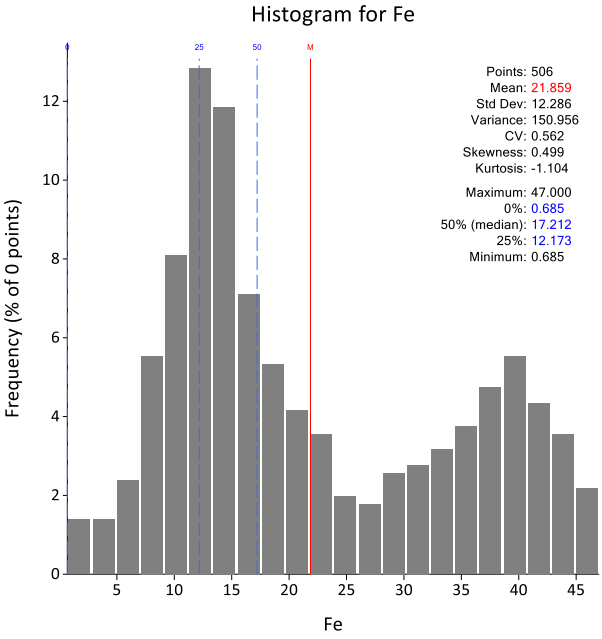
Figure 1 East100 block

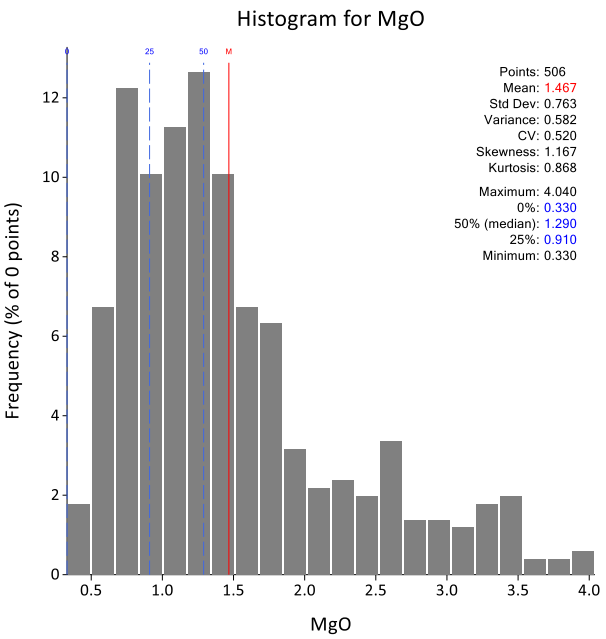

Histogram for Ni
Ni
Points: 506
Mean: 0.182
Std Dev: 0.148
Variance: 0.022
CV: 0.811
Skewness: 1.130
Kurtosis: 0.610
Maximum: 0.720
0%: 0.005
50% (median): 0.130
25%: 0.070
Minimum: 0.005
Frequency (% of 0 points)
Ni

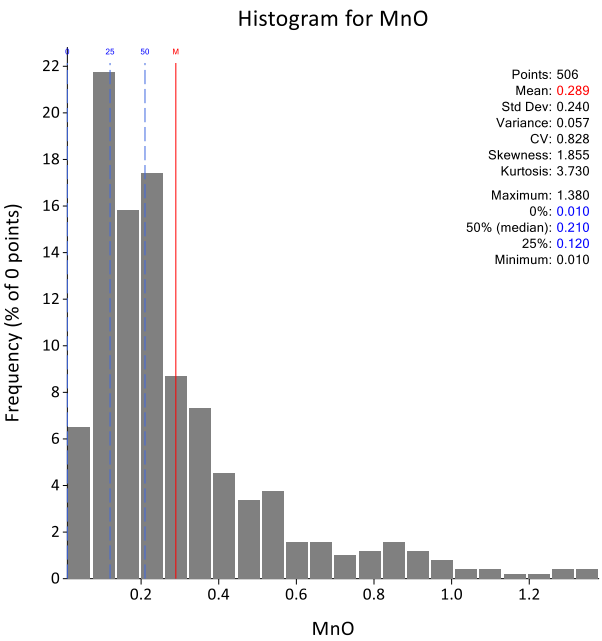

Histogram for Co
Points: 506
Mean: 0.029
Std Dev: 0.027
Variance: 0.001
CV: 0.936
Skewness: 2.162
Kurtosis: 6.776
Maximum: 0.210
0%: 0.005
50% (median): 0.020
25%: 0.010
Minimum: 0.005
Frequency (% of 0 points)
co

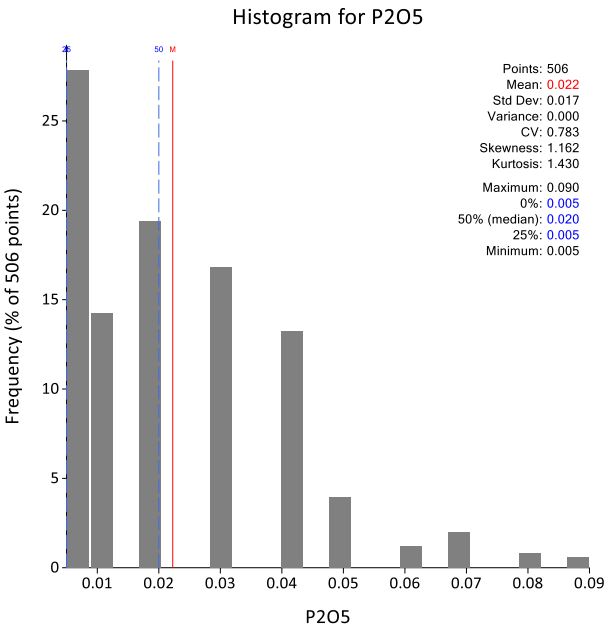

Histogram for Al2O3
Points: 506
Mean: 20.628
Std Dev: 6.532
Variance: 42.670
CV: 0.317
Skewness: 0.057
Kurtosis: -0.558
Maximum: 36.180
0%: 3.470
50% (median): 21.110
25%: 15.230
Minimum: 3.470
Frequency (% of 0 points)
Al2O3


Histogram for Cr2O3
Points: 506
Mean: 1.930
Std Dev: 1.844
Variance: 3.401
CV: 0.956
Skewness: 1.327
Kurtosis: 2.048
Maximum: 10.360
0%: 0.040
50% (median): 1.120
25%: 0.450
Minimum: 0.040
Frequency (% of 0 points)
Cr2O3


Histogram for Fe
Points: 506
Mean: 21.859
Std Dev: 12.286
Variance: 150.956
CV: 0.562
Skewness: 0.499
Kurtosis: -1.104
Maximum: 47.000
0%: 0.685
50% (median): 17.212
25%: 12.173
Minimum: 0.685
Frequency (% of 0 points)
Fe


Histogram for MgO
Points: 506
Mean: 1.467
Std Dev: 0.763
Variance: 0.582
CV: 0.520
Skewness: 1.167
Kurtosis: 0.868
Maximum: 4.040
0%: 0.330
50% (median): 1.290
25%: 0.910
Minimum: 0.330
Frequency (% of 0 points)
MgO


Histogram for MnO
Points: 506
Mean: 0.289
Std Dev: 0.240
Variance: 0.057
CV: 0.828
Skewness: 1.855
Kurtosis: 3.730
Maximum: 1.380
0%: 0.010
50% (median): 0.210
25%: 0.120
Minimum: 0.010
Frequency (% of 0 points)
MnO


Histogram for P2O5
Points: 506
Mean: 0.022
Std Dev: 0.017
Variance: 0.000
CV: 0.783
Skewness: 1.162
Kurtosis: 1.430
Maximum: 0.090
0%: 0.005
50% (median): 0.020
25%: 0.005
Minimum: 0.005
Frequency (% of 506 points)
P2O5

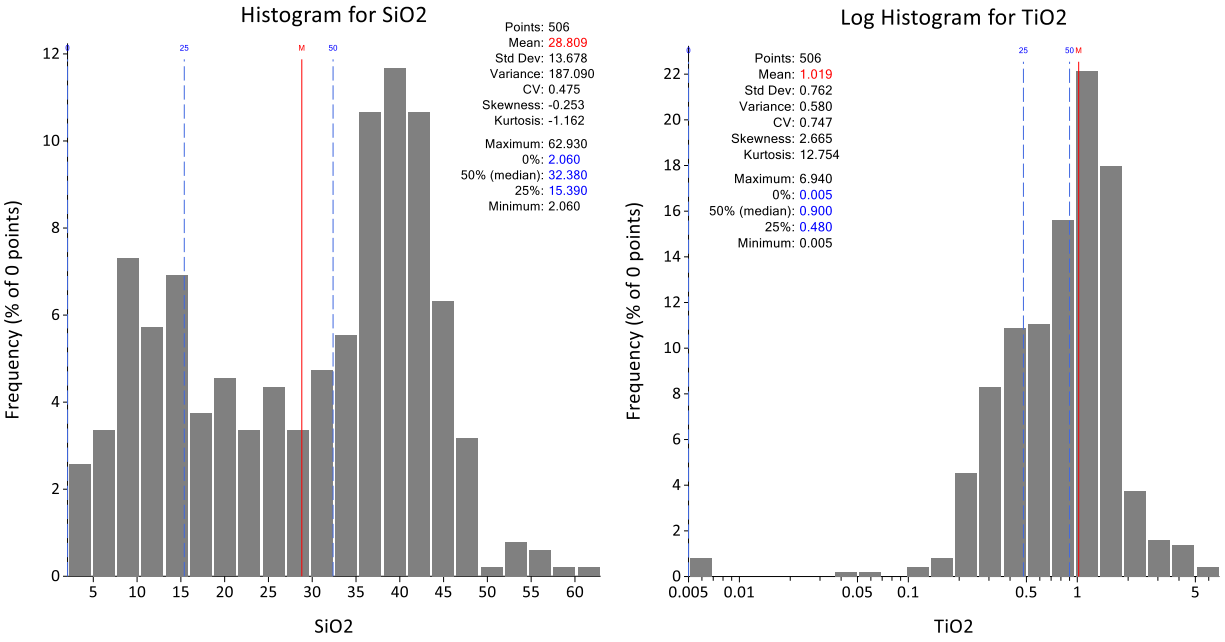
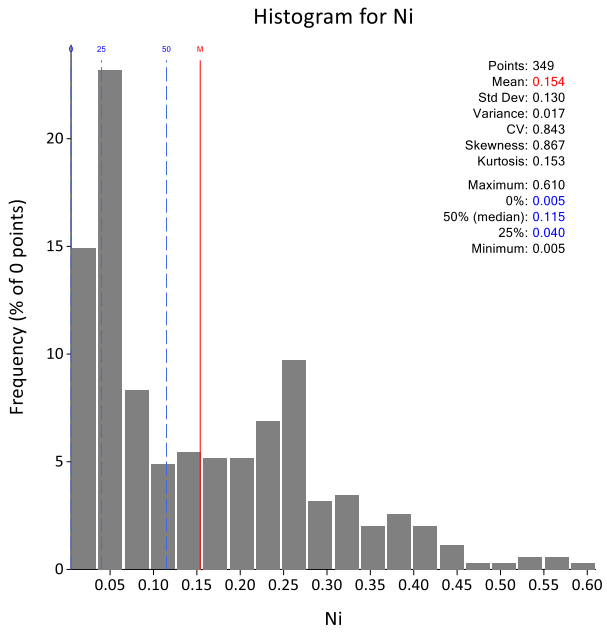
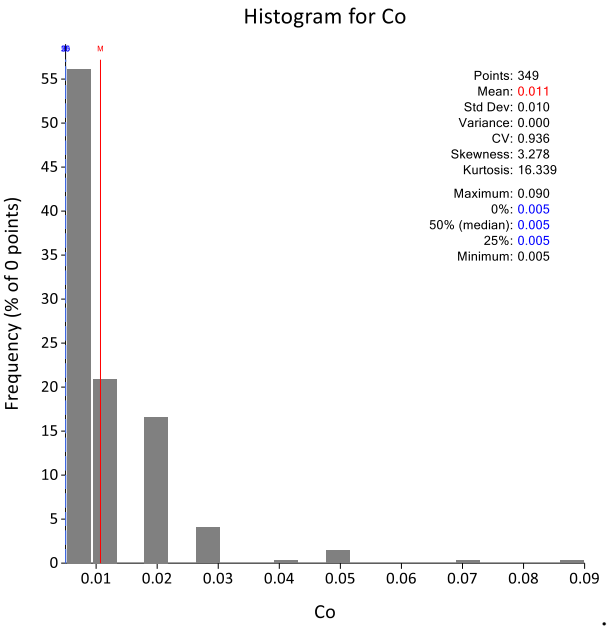
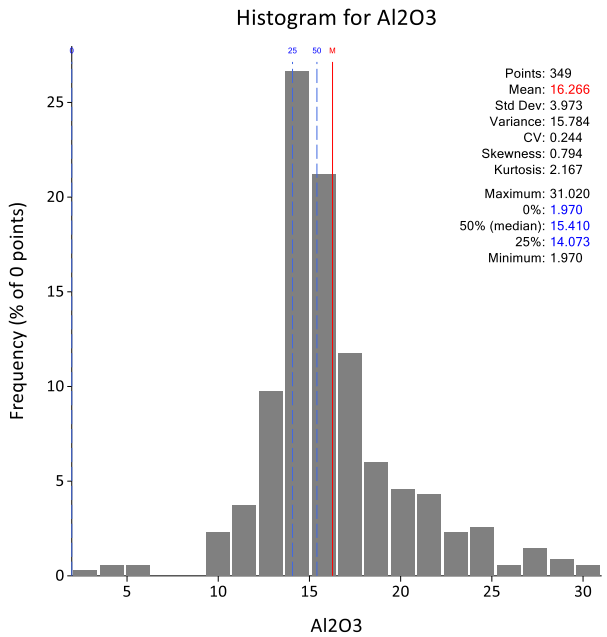
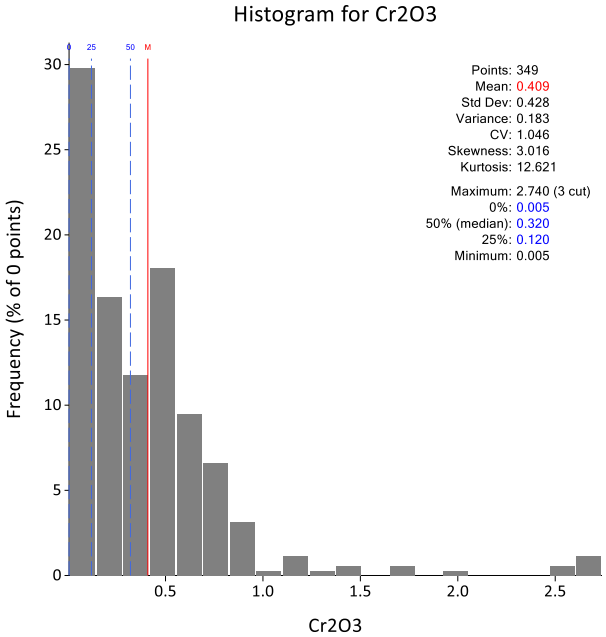


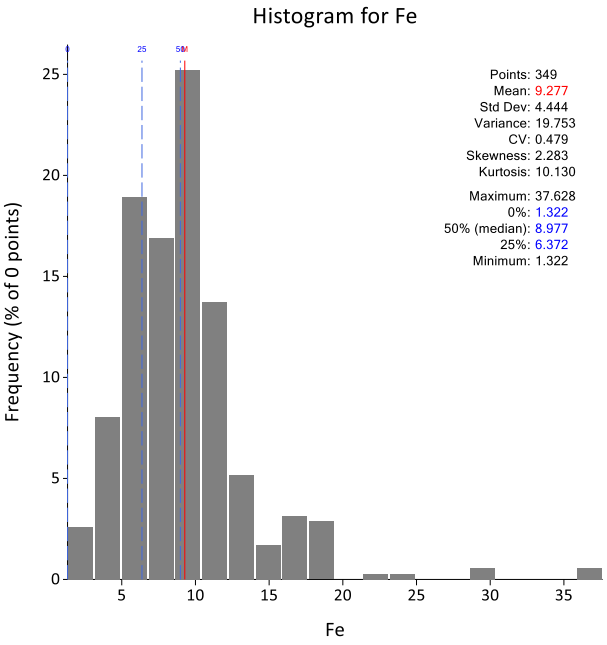
Figure 2 Histogram and Descriptive Statistic of Mud Upper in East100 Block

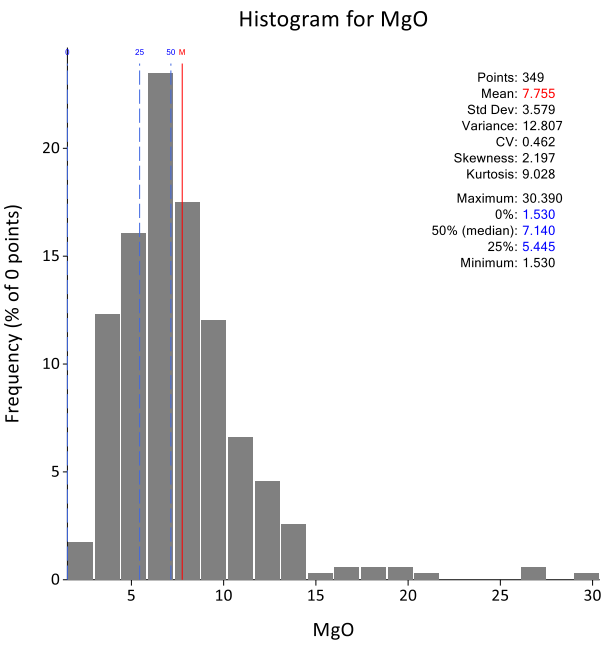

Histogram for Ni
Points: 349
Mean: 0.154
Std Dev: 0.130
Variance: 0.017
CV: 0.843
Skewness: 0.867
Kurtosis: 0.153
Maximum: 0.610
0%: 0.005
50% (median): 0.115
25%: 0.040
Minimum: 0.005
Frequency (% of 0 points)
Ni

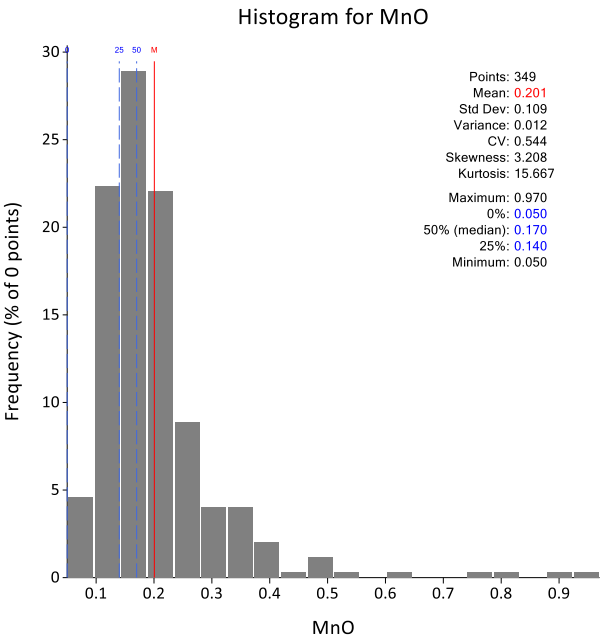

Histogram for Co
Points: 349
Mean: 0.011
Std Dev: 0.010
Variance: 0.000
CV: 0.936
Skewness: 3.278
Kurtosis: 16.339
Maximum: 0.090
0%: 0.005
50% (median): 0.005
25%: 0.005
Minimum: 0.005
Frequency (% of 0 points)
Co

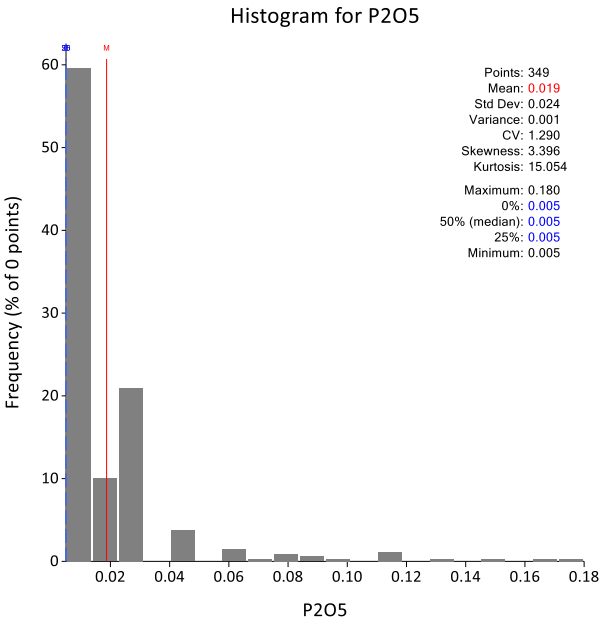

Histogram for Al2O3
Points: 349
Mean: 16.266
Std Dev: 3.973
Variance: 15.784
CV: 0.244
Skewness: 0.794
Kurtosis: 2.167
Maximum: 31.020
0%: 1.970
50% (median): 15.410
25%: 14.073
Minimum: 1.970
Frequency (% of 0 points)
Al2O3


Histogram for Cr2O3
Points: 349
Mean: 0.409
Std Dev: 0.428
Variance: 0.183
CV: 1.046
Skewness: 3.016
Kurtosis: 12.621
Maximum: 2.740 (3 cut)
0%: 0.005
50% (median): 0.320
25%: 0.120
Minimum: 0.005
Frequency (% of 0 points)
Cr2O3


Histogram for Fe
Points: 349
Mean: 9.277
Std Dev: 4.444
Variance: 19.753
CV: 0.479
Skewness: 2.283
Kurtosis: 10.130
Maximum: 37.628
0%: 1.322
50% (median): 8.977
25%: 6.372
Minimum: 1.322
Frequency (% of 0 points)
Fe


Histogram for MgO
Points: 349
Mean: 7.755
Std Dev: 3.579
Variance: 12.807
CV: 0.462
Skewness: 2.197
Kurtosis: 9.028
Maximum: 30.390
0%: 1.530
50% (median): 7.140
25%: 5.445
Minimum: 1.530
Frequency (% of 0 points)
MgO


Histogram for MnO
Points: 349
Mean: 0.201
Std Dev: 0.109
Variance: 0.012
CV: 0.544
Skewness: 3.208
Kurtosis: 15.667
Maximum: 0.970
0%: 0.050
50% (median): 0.170
25%: 0.140
Minimum: 0.050
Frequency (% of 0 points)
MnO


Histogram for P2O5
Points: 349
Mean: 0.019
Std Dev: 0.024
Variance: 0.001
CV: 1.290
Skewness: 3.396
Kurtosis: 15.054
Maximum: 0.180
0%: 0.005
50% (median): 0.005
25%: 0.005
Minimum: 0.005
Frequency (% of 0 points)
P2O5

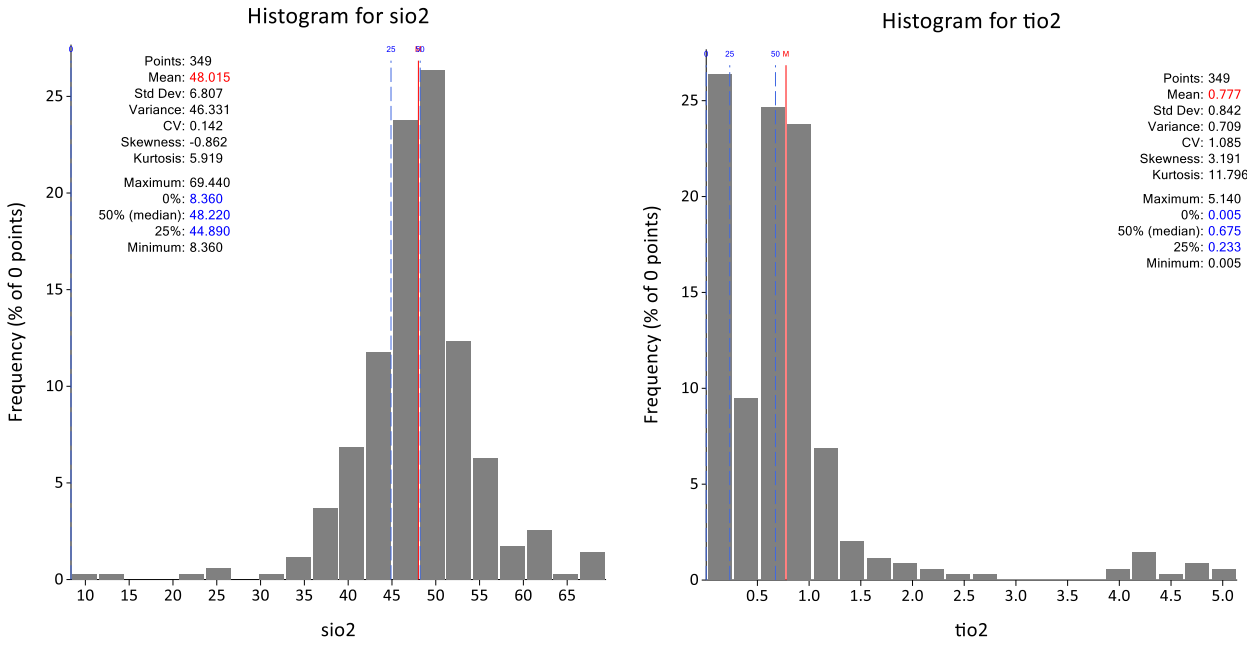
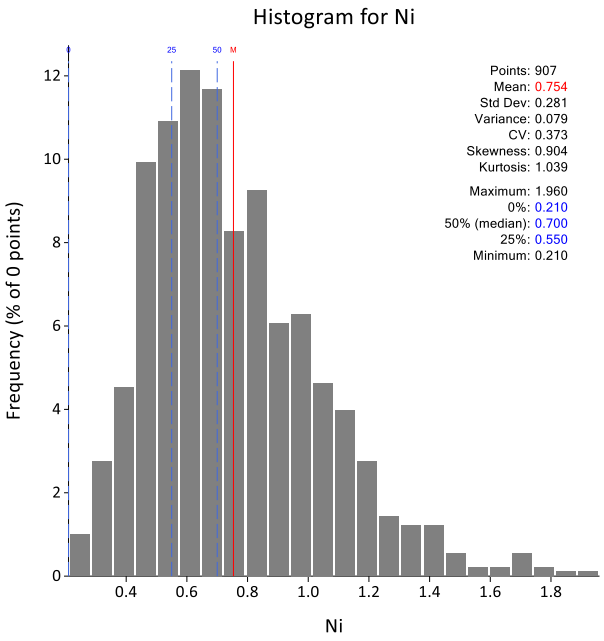
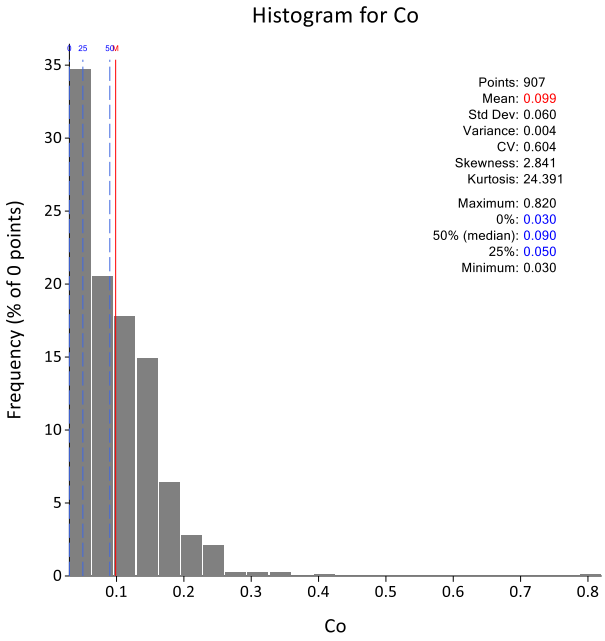
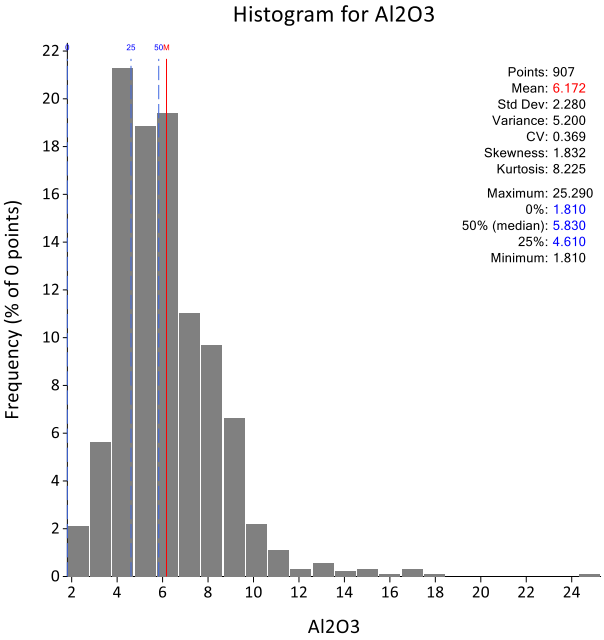
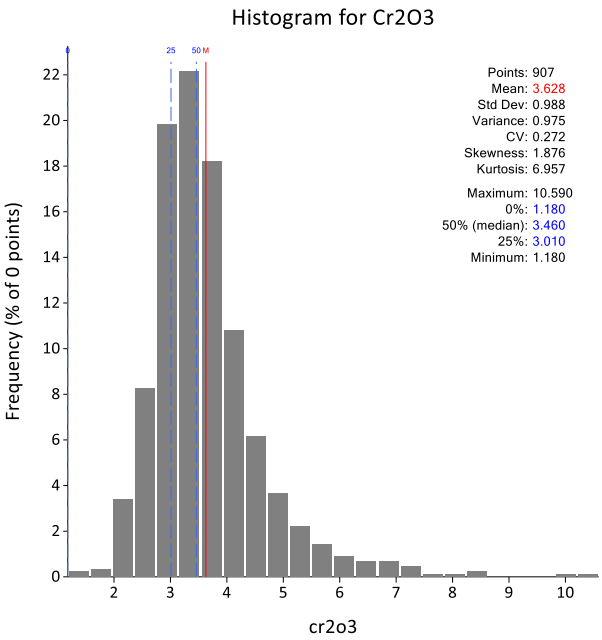


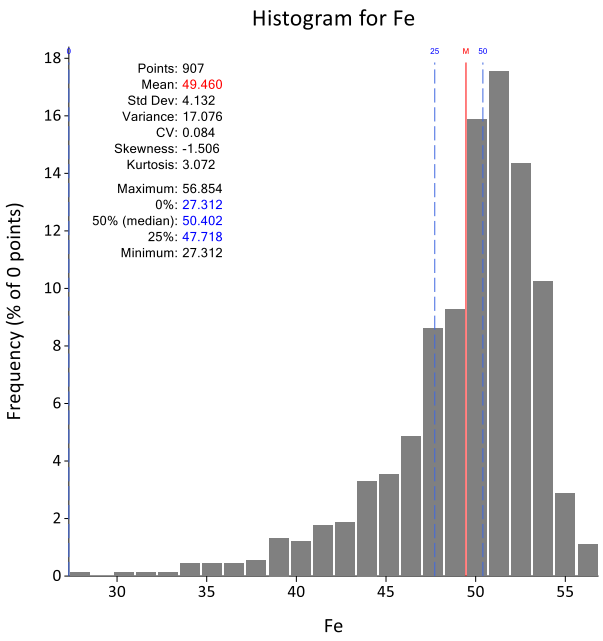
Figure 3 Histogram of Ni Mud Lower in East100 Block

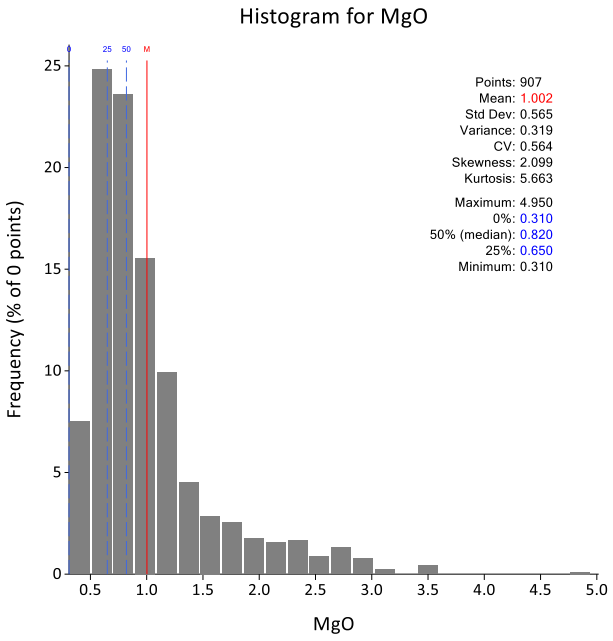

Histogram for Ni
Points: 907
Mean: 0.754
Std Dev: 0.281
Variance: 0.079
CV: 0.373
Skewness: 0.904
Kurtosis: 1.039
Maximum: 1.960
0%: 0.210
50% (median): 0.700
25%: 0.550
Minimum: 0.210
Frequency (% of 0 points)
Ni

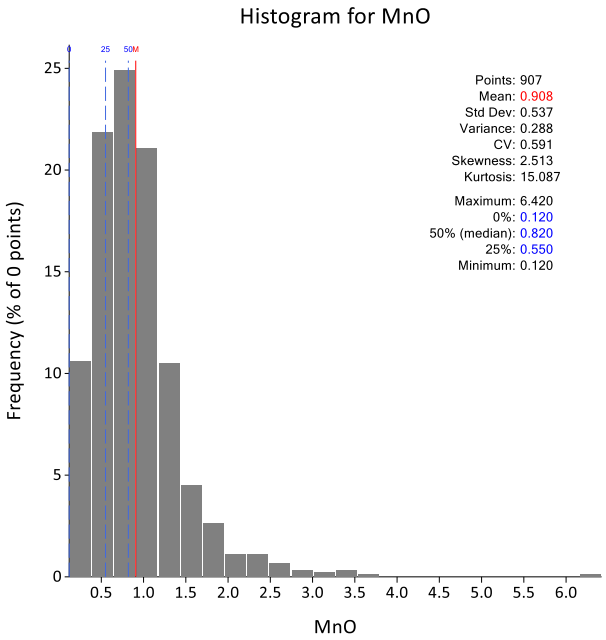

Histogram for Co
Points: 907
Mean: 0.099
Std Dev: 0.060
Variance: 0.004
CV: 0.604
Skewness: 2.841
Kurtosis: 24.391
Maximum: 0.820
0%: 0.030
50% (median): 0.090
25%: 0.050
Minimum: 0.030
Frequency (% of 0 points)
Co

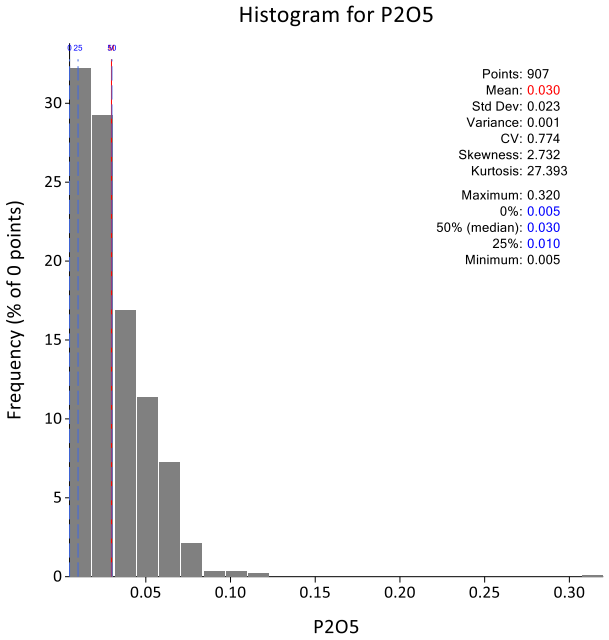

Histogram for Al2O3
Points: 907
Mean: 6.172
Std Dev: 2.280
Variance: 5.200
CV: 0.369
Skewness: 1.832
Kurtosis: 8.225
Maximum: 25.290
0%: 1.810
50% (median): 5.830
25%: 4.610
Minimum: 1.810
Frequency (% of 0 points)
Al2O3


Histogram for Cr2O3
Points: 907
Mean: 3.628
Std Dev: 0.988
Variance: 0.975
CV: 0.272
Skewness: 1.876
Kurtosis: 6.957
Maximum: 10.590
0%: 1.180
50% (median): 3.460
25%: 3.010
Minimum: 1.180
Frequency (% of 0 points)
cr2o3


Histogram for Fe
Points: 907
Mean: 49.460
Std Dev: 4.132
Variance: 17.076
CV: 0.084
Skewness: -1.506
Kurtosis: 3.072
Maximum: 56.854
0%: 27.312
50% (median): 50.402
25%: 47.718
Minimum: 27.312
Frequency (% of 0 points)
Fe


Histogram for MgO
Points: 907
Mean: 1.002
Std Dev: 0.565
Variance: 0.319
CV: 0.564
Skewness: 2.099
Kurtosis: 5.663
Maximum: 4.950
0%: 0.310
50% (median): 0.820
25%: 0.650
Minimum: 0.310
Frequency (% of 0 points)
MgO


Histogram for MnO
Points: 907
Mean: 0.908
Std Dev: 0.537
Variance: 0.288
CV: 0.591
Skewness: 2.513
Kurtosis: 15.087
Maximum: 6.420
0%: 0.120
50% (median): 0.820
25%: 0.550
Minimum: 0.120
Frequency (% of 0 points)
MnO


Histogram for P2O5
Points: 907
Mean: 0.030
Std Dev: 0.023
Variance: 0.001
CV: 0.774
Skewness: 2.732
Kurtosis: 27.393
Maximum: 0.320
0%: 0.005
50% (median): 0.030
25%: 0.010
Minimum: 0.005
Frequency (% of 0 points)
P2O5

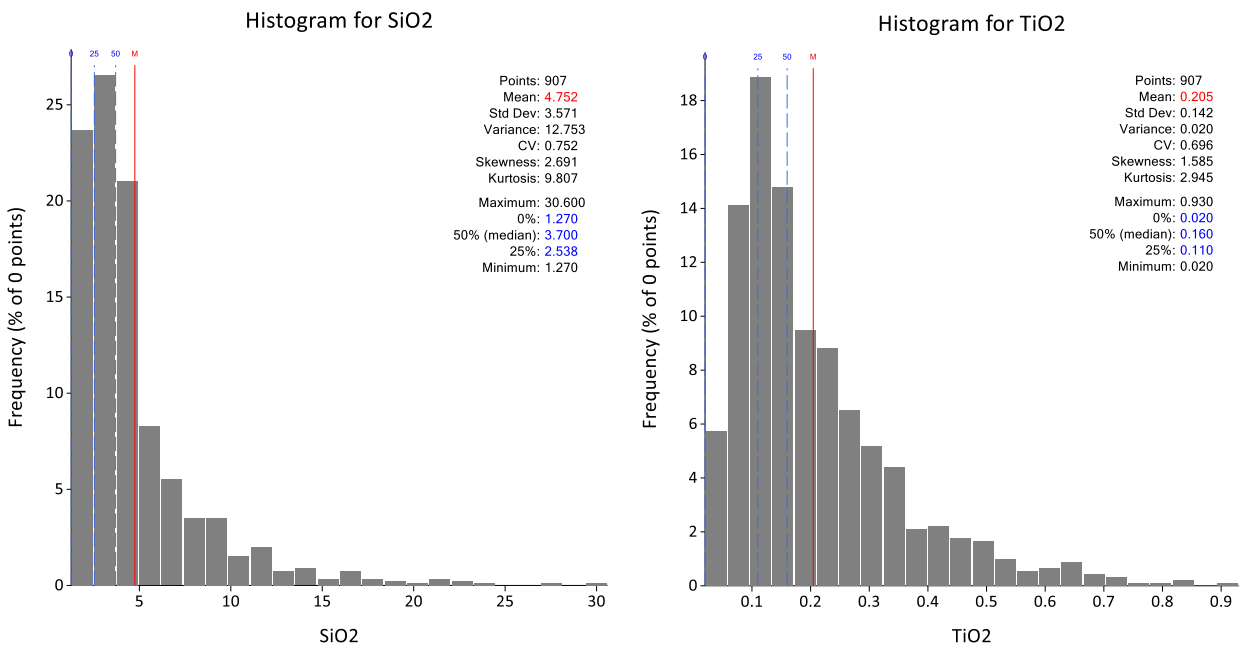
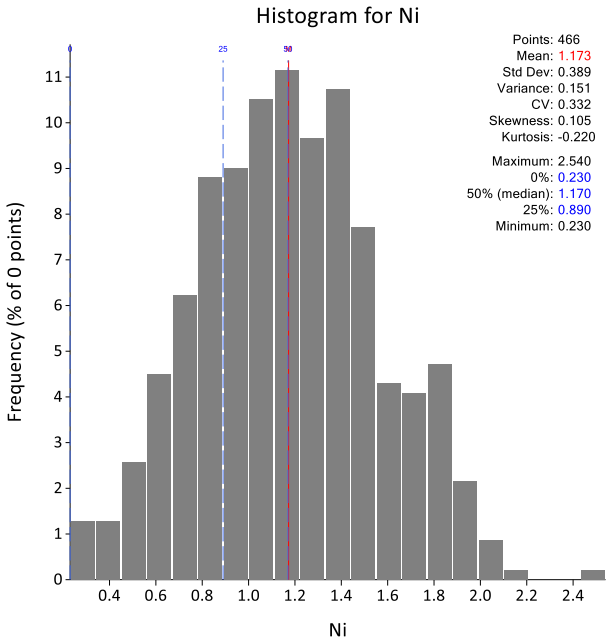
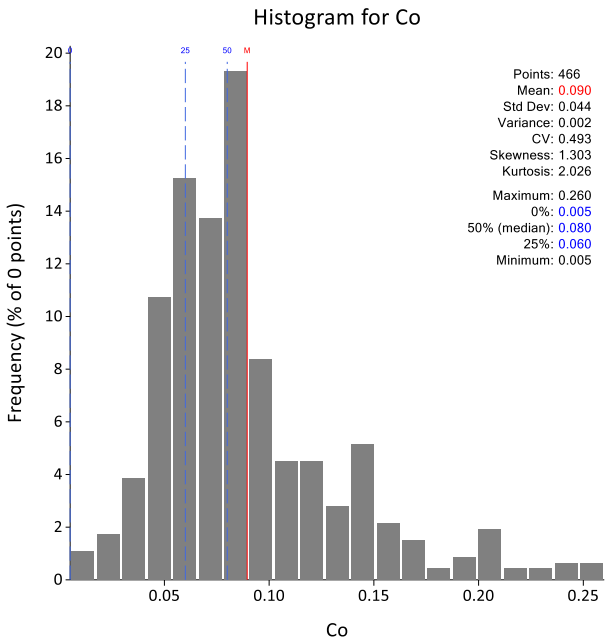
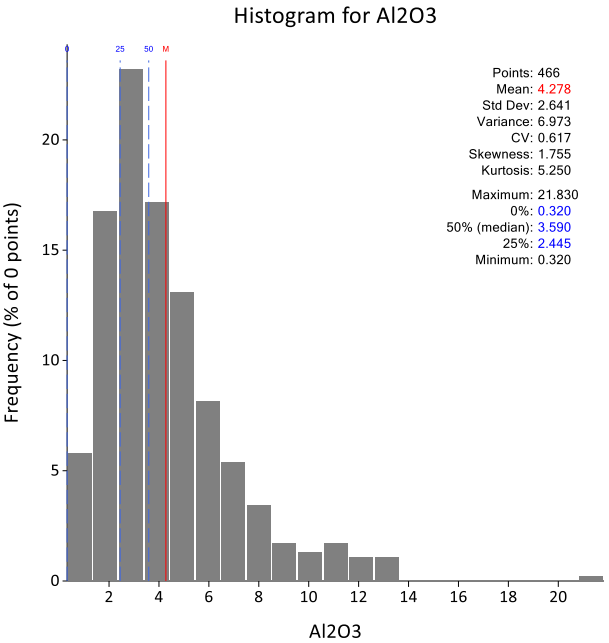
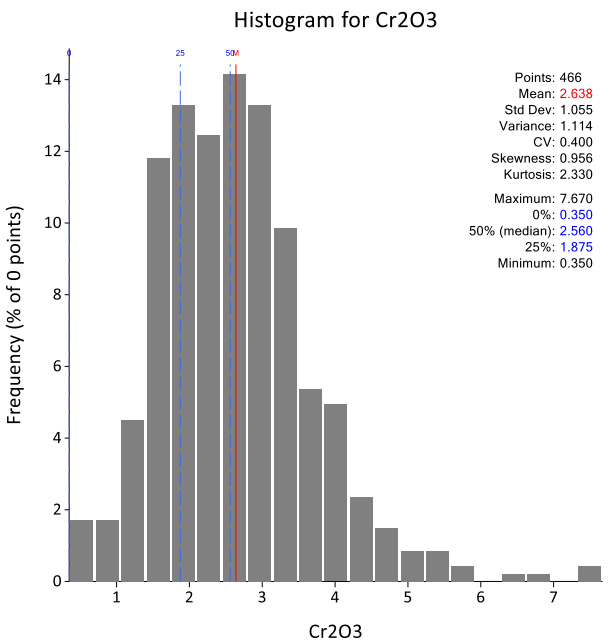


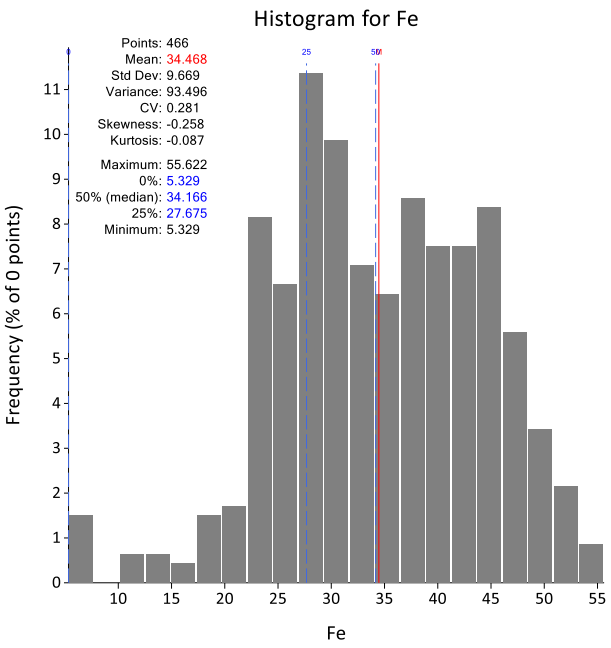
Figure 4 Histogram and Descriptive Statistic of Upper Limonite in East100 Block

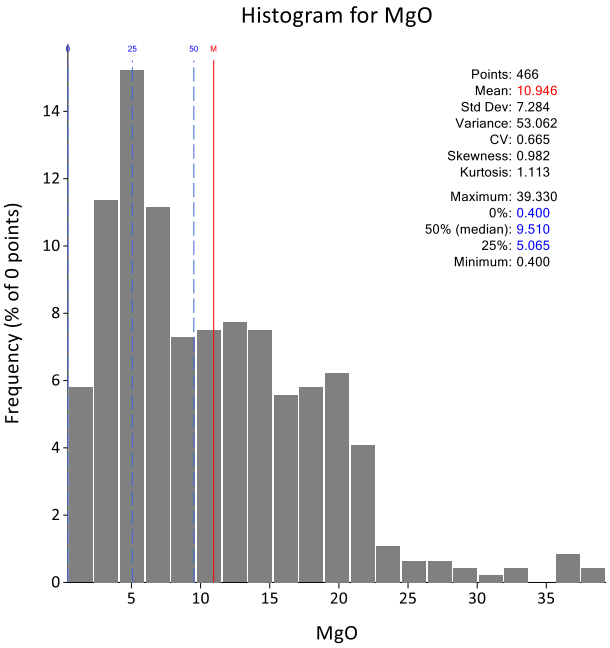

Histogram for Ni
Points: 466
Mean: 1.173
Std Dev: 0.389
Variance: 0.151
CV: 0.332
Skewness: 0.105
Kurtosis: -0.220
Maximum: 2.540
0%: 0.230
50% (median): 1.170
25%: 0.890
Minimum: 0.230
Frequency (% of 0 points)
Ni

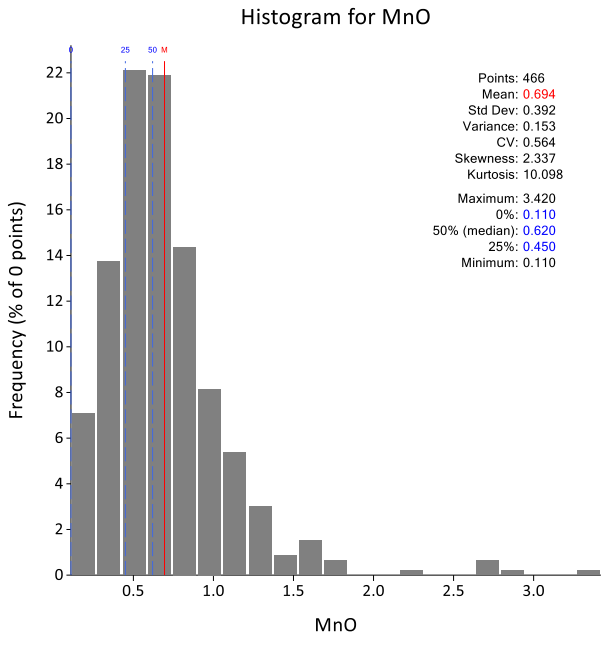

Histogram for Co
Points: 466
Mean: 0.090
Std Dev: 0.044
Variance: 0.002
CV: 0.493
Skewness: 1.303
Kurtosis: 2.026
Maximum: 0.260
0%: 0.005
50% (median): 0.080
25%: 0.060
Minimum: 0.005
Frequency (% of 0 points)
Co

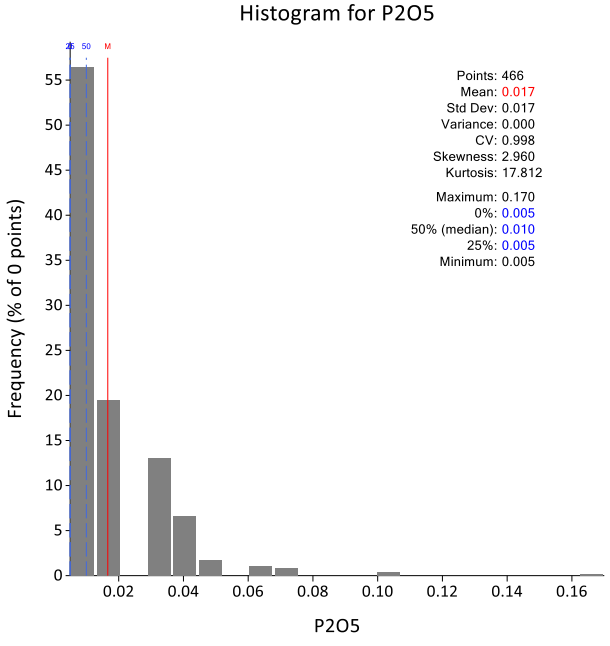

Histogram for Al2O3
Points: 466
Mean: 4.278
Std Dev: 2.641
Variance: 6.973
CV: 0.617
Skewness: 1.755
Kurtosis: 5.250
Maximum: 21.830
0%: 0.320
50% (median): 3.590
25%: 2.445
Minimum: 0.320
Frequency (% of 0 points)
Al2O3


Histogram for Cr2O3
Points: 466
Mean: 2.638
Std Dev: 1.055
Variance: 1.114
CV: 0.400
Skewness: 0.956
Kurtosis: 2.330
Maximum: 7.670
0%: 0.350
50% (median): 2.560
25%: 1.875
Minimum: 0.350
Frequency (% of 0 points)
Cr2O3


Histogram for Fe
Points: 466
Mean: 34.468
Std Dev: 9.669
Variance: 93.496
CV: 0.281
Skewness: -0.258
Kurtosis: -0.087
Maximum: 55.622
0%: 5.329
50% (median): 34.166
25%: 27.675
Minimum: 5.329
Frequency (% of 0 points)
Fe


Histogram for MgO
Points: 466
Mean: 10.946
Std Dev: 7.284
Variance: 53.062
CV: 0.665
Skewness: 0.982
Kurtosis: 1.113
Maximum: 39.330
0%: 0.400
50% (median): 9.510
25%: 5.065
Minimum: 0.400
Frequency (% of 0 points)
MgO


Histogram for MnO
Points: 466
Mean: 0.694
Std Dev: 0.392
Variance: 0.153
CV: 0.564
Skewness: 2.337
Kurtosis: 10.098
Maximum: 3.420
0%: 0.110
50% (median): 0.620
25%: 0.450
Minimum: 0.110
Frequency (% of 0 points)
MnO


Histogram for P2O5
Points: 466
Mean: 0.017
Std Dev: 0.017
Variance: 0.000
CV: 0.998
Skewness: 2.960
Kurtosis: 17.812
Maximum: 0.170
0%: 0.005
50% (median): 0.010
25%: 0.005
Minimum: 0.005
Frequency (% of 0 points)
P2O5

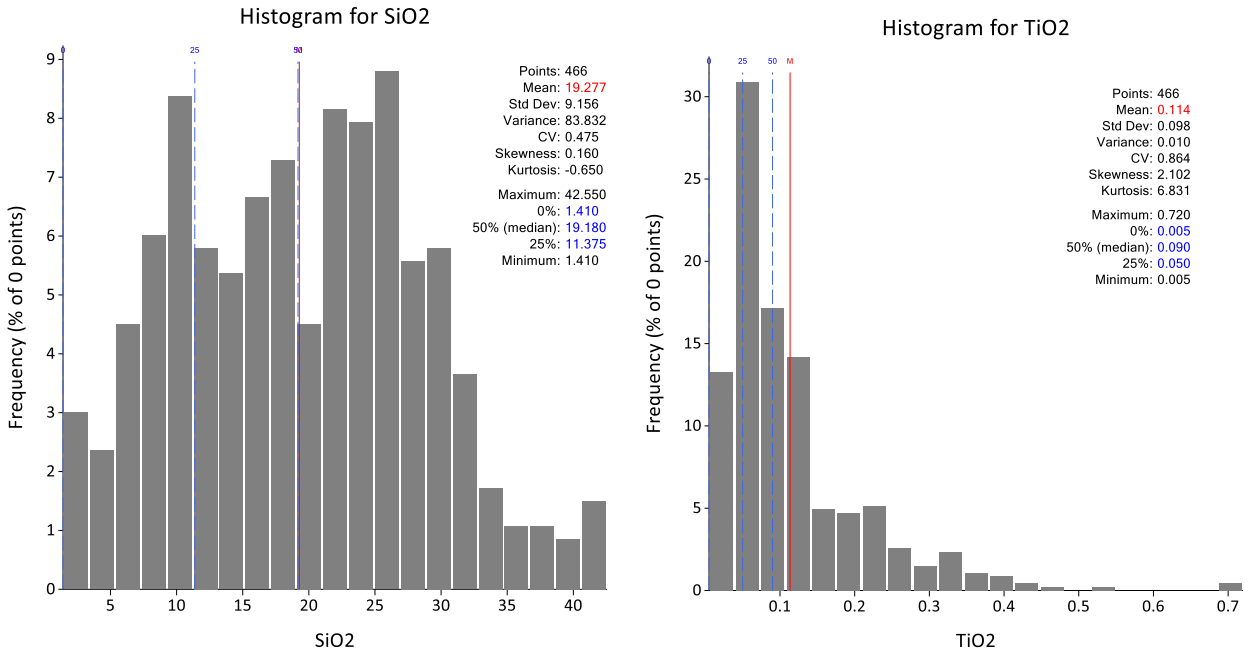
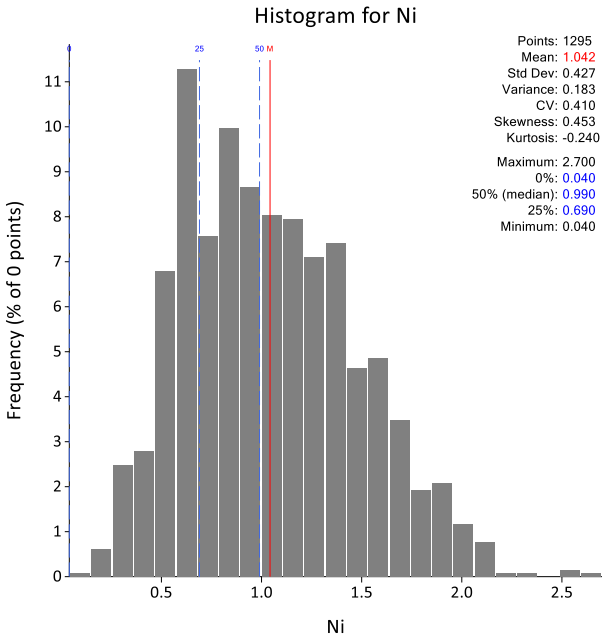
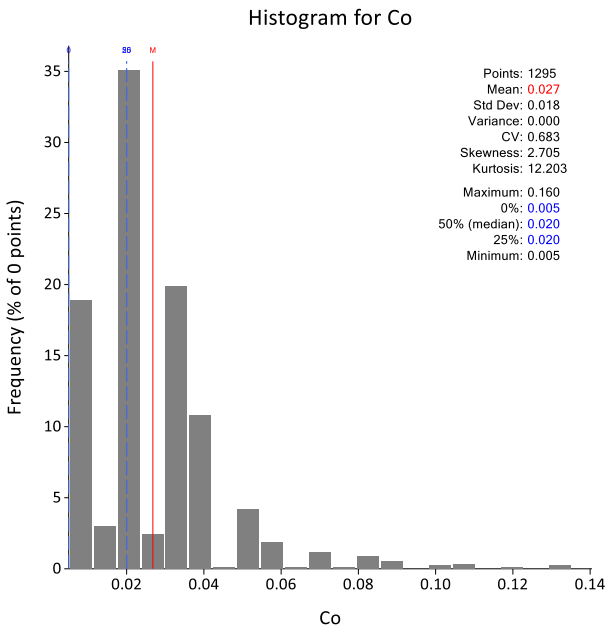
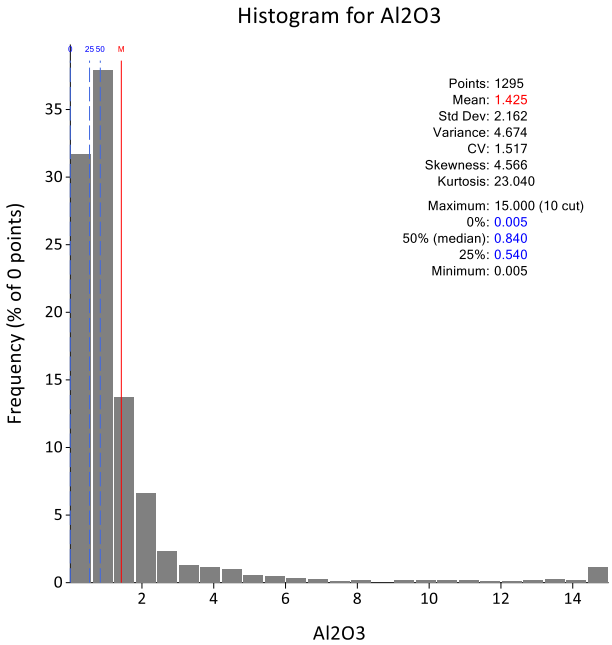
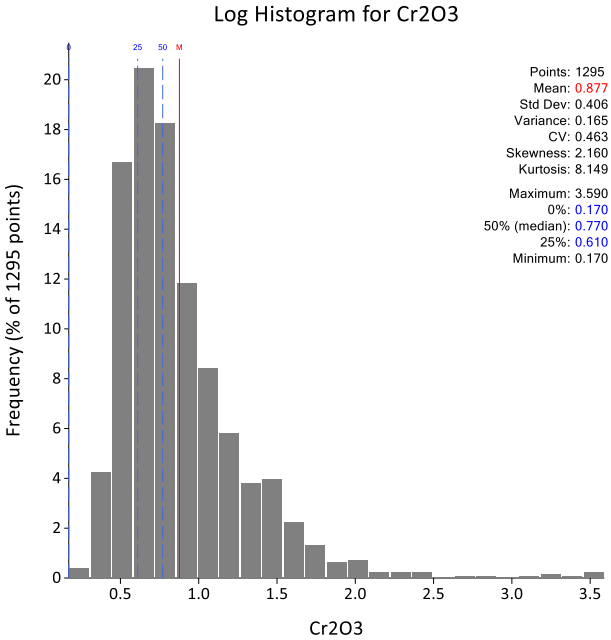


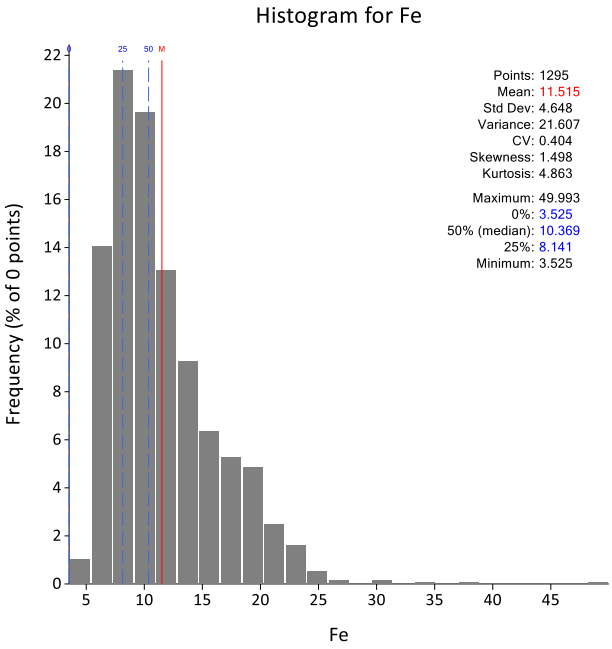
Figure 5 Histogram and Descriptive Statistic of of Lower Limonite in East100 Block

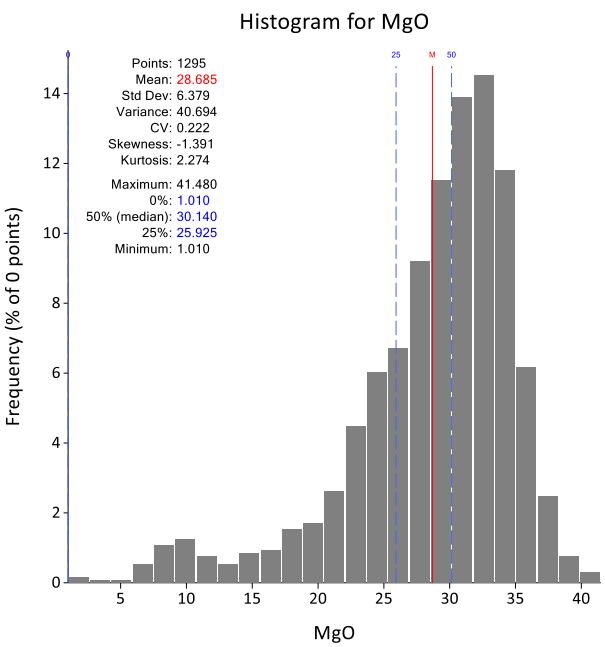

Histogram for Ni
Points: 1295
Mean: 1.042
Std Dev: 0.427
Variance: 0.183
CV: 0.410
Skewness: 0.453
Kurtosis: -0.240
Maximum: 2.700
0%: 0.040
50% (median): 0.990
25%: 0.690
Minimum: 0.040
Frequency (% of 0 points)
Ni

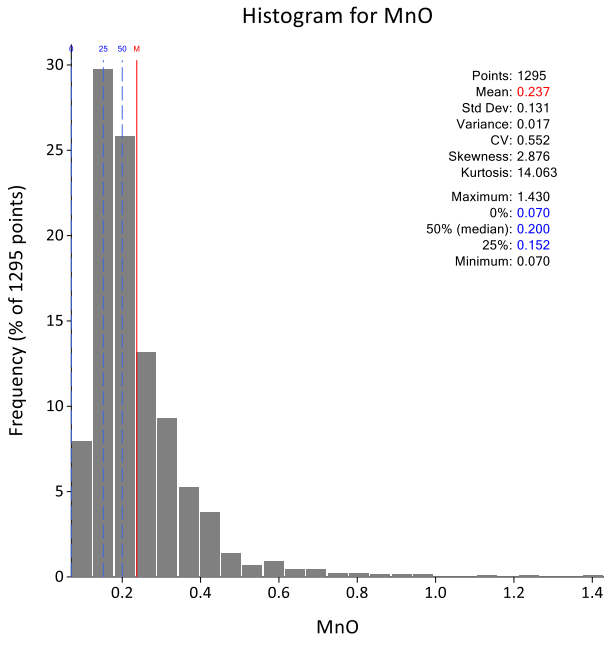

Histogram for Co
Points: 1295
Mean: 0.027
Std Dev: 0.018
Variance: 0.000
CV: 0.683
Skewness: 2.705
Kurtosis: 12.203
Maximum: 0.160
0%: 0.005
50% (median): 0.020
25%: 0.020
Minimum: 0.005
Frequency (% of 0 points)
Co

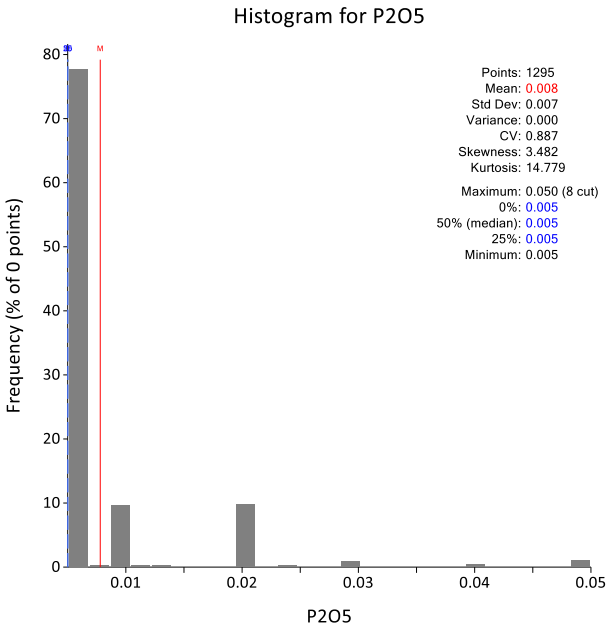

Histogram for Al2O3
Points: 1295
Mean: 1.425
Std Dev: 2.162
Variance: 4.674
CV: 1.517
Skewness: 4.566
Kurtosis: 23.040
Maximum: 15.000 (10 cut)
0%: 0.005
50% (median): 0.840
25%: 0.540
Minimum: 0.005
Frequency (% of 0 points)
Al2O3


Log Histogram for Cr2O3
Points: 1295
Mean: 0.877
Std Dev: 0.406
Variance: 0.165
CV: 0.463
Skewness: 2.160
Kurtosis: 8.149
Maximum: 3.590
0%: 0.170
50% (median): 0.770
25%: 0.610
Minimum: 0.170
Frequency (% of 1295 points)
Cr2O3


Histogram for Fe
Points: 1295
Mean: 11.515
Std Dev: 4.648
Variance: 21.607
CV: 0.404
Skewness: 1.498
Kurtosis: 4.863
Maximum: 49.993
0%: 3.525
50% (median): 10.369
25%: 8.141
Minimum: 3.525
Frequency (% of 0 points)
Fe


Histogram for MgO
Points: 1295
Mean: 28.685
Std Dev: 6.379
Variance: 40.694
CV: 0.222
Skewness: -1.391
Kurtosis: 2.274
Maximum: 41.480
0%: 1.010
50% (median): 30.140
25%: 25.925
Minimum: 1.010
Frequency (% of 0 points)
MgO


Histogram for MnO
Points: 1295
Mean: 0.237
Std Dev: 0.131
Variance: 0.017
CV: 0.552
Skewness: 2.876
Kurtosis: 14.063
Maximum: 1.430
0%: 0.070
50% (median): 0.200
25%: 0.152
Minimum: 0.070
Frequency (% of 1295 points)
MnO


Histogram for P2O5
Points: 1295
Mean: 0.008
Std Dev: 0.007
Variance: 0.000
CV: 0.887
Skewness: 3.482
Kurtosis: 14.779
Maximum: 0.050 (8 cut)
0%: 0.005
50% (median): 0.005
25%: 0.005
Minimum: 0.005
Frequency (% of 0 points)
P2O5

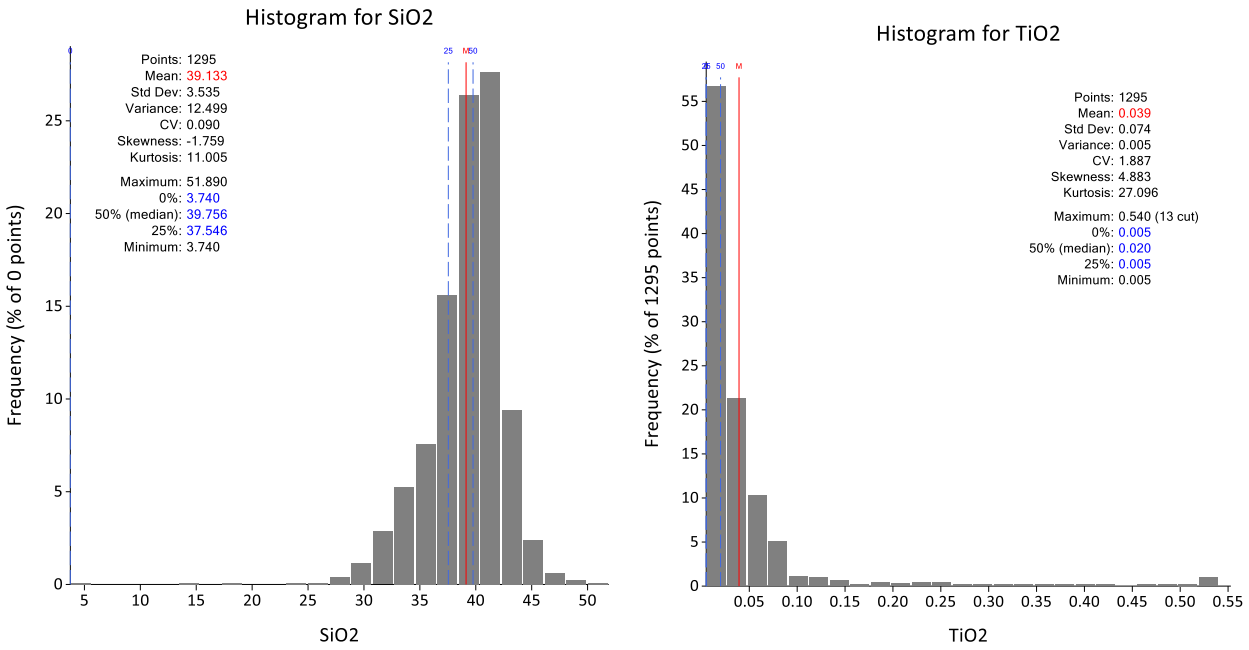


Figure 6 Histogram and Descriptive Statistic of of Saprolite in East100 Block

1.3 Variography

Since East100 block has been one of statistical domain base on drill hole spacing, the variography and also the Variogram

1.3.1 Variogram

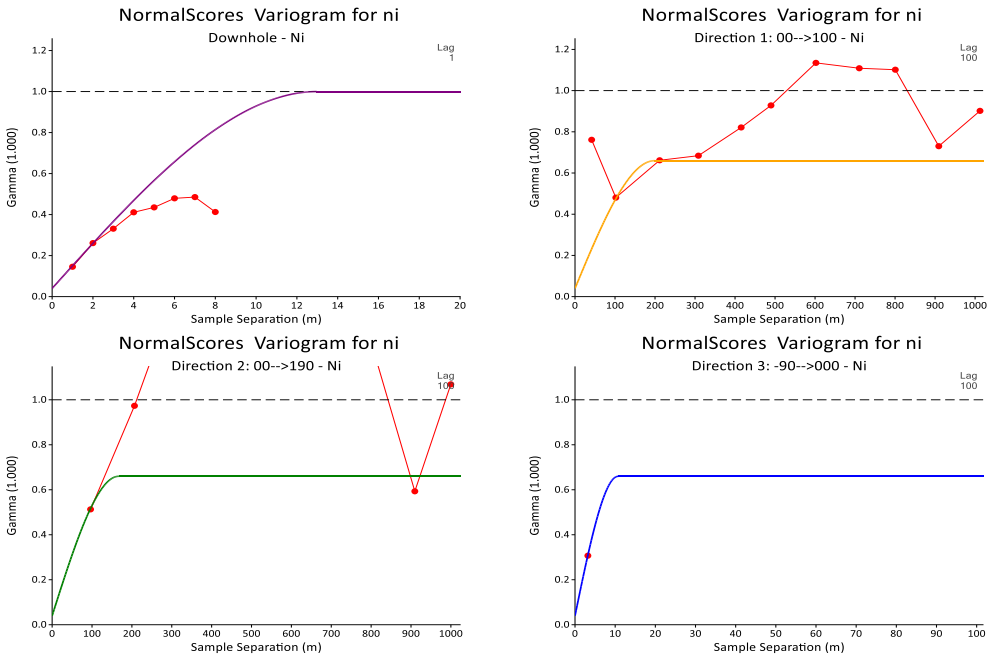


Figure 7 Variogram of Ni Mud Upper in East100 Block

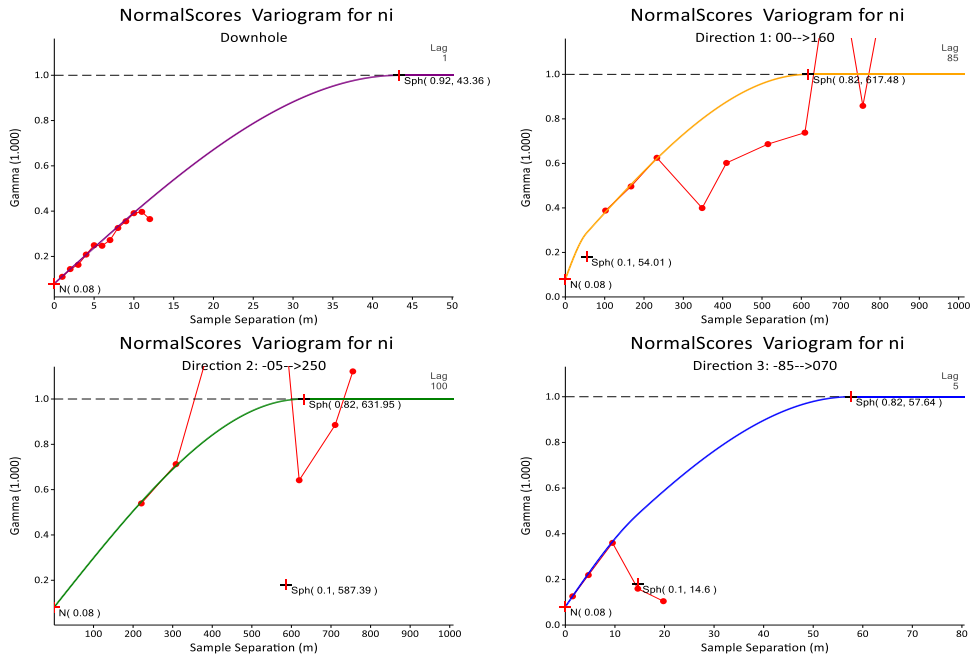


Figure 8 Variogram of Ni Mud Lower in East100 Block

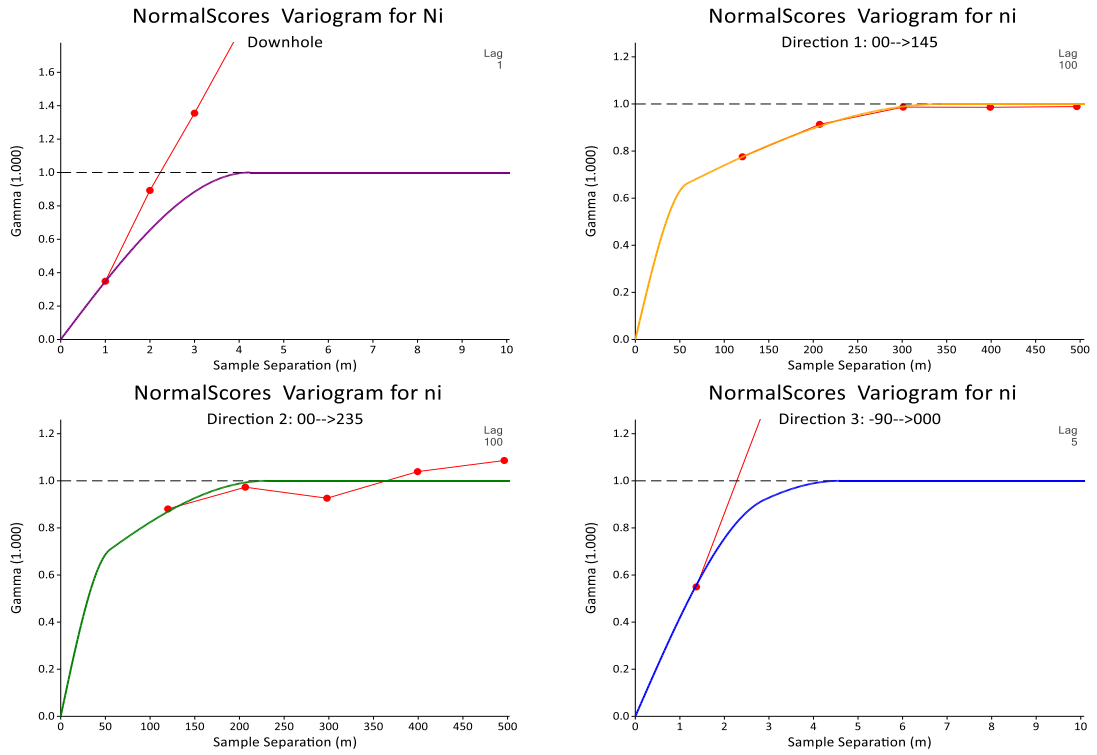


Figure 9 Variogram of Ni Upper Limonte in East100 Block

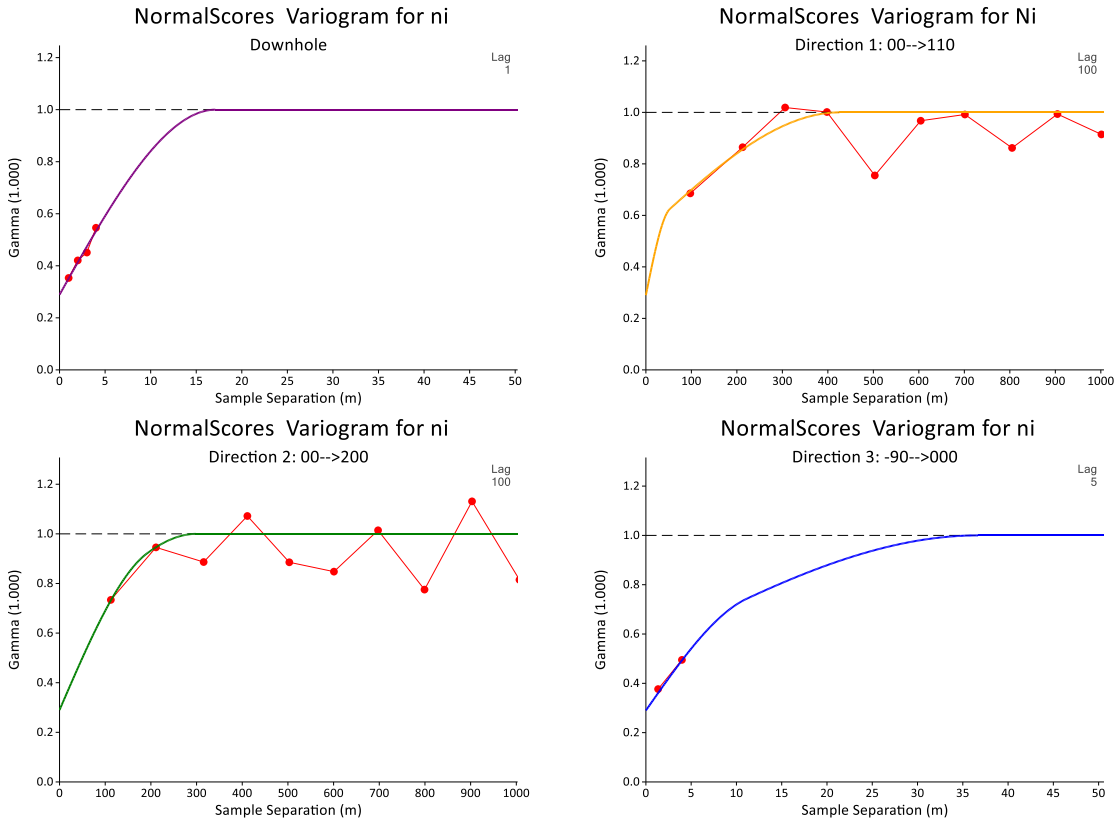


Figure 10 Variogram of Ni Lower Limonite in East100 Block

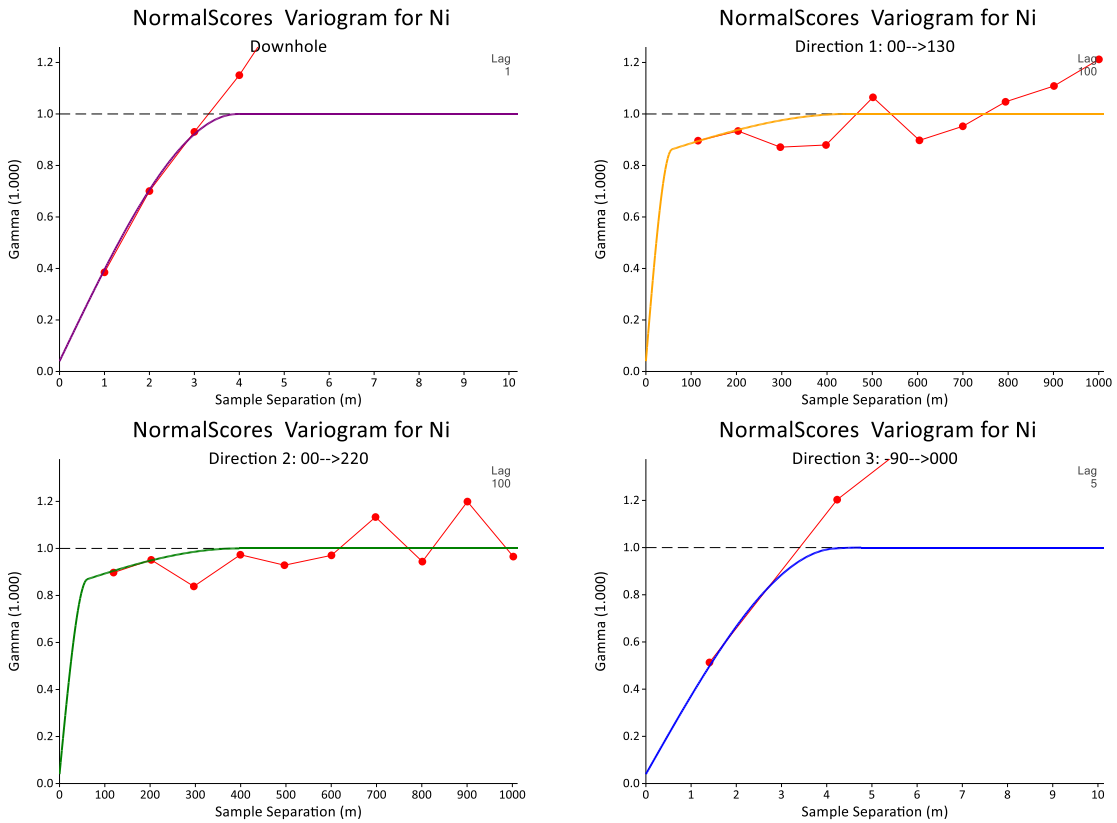


Figure 11 Variogram of Ni Saprolite in East100 Block

1.3.2 Krigging Neighbourhood Analysis

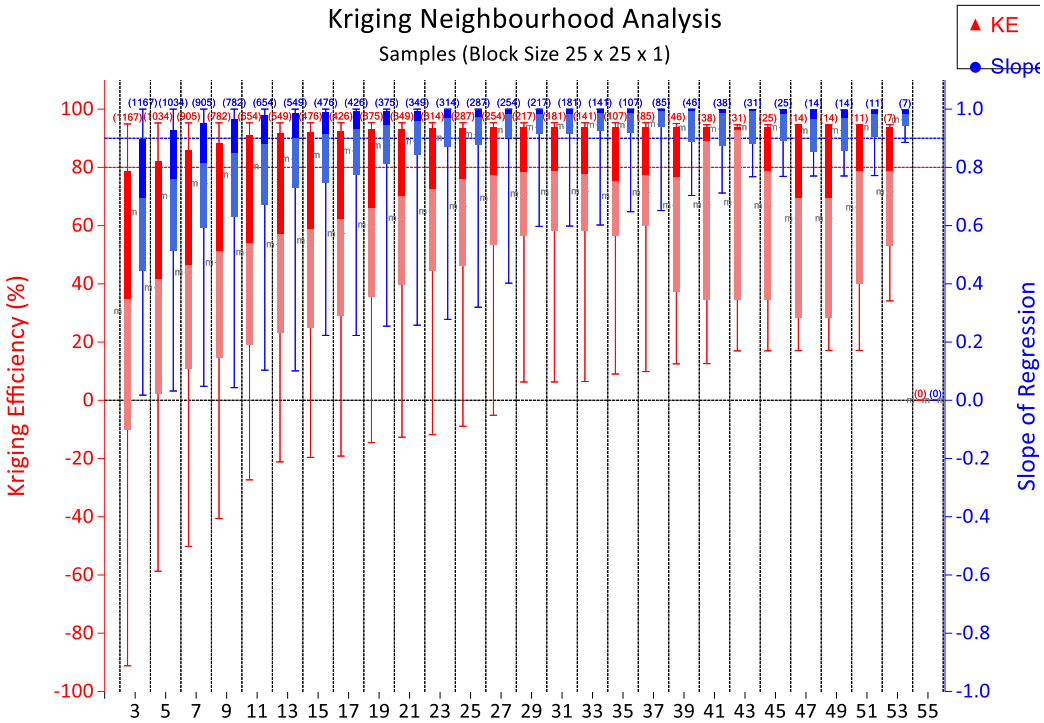


Figure 12 Optimum Number of samples of Mud Upper in East100 Block

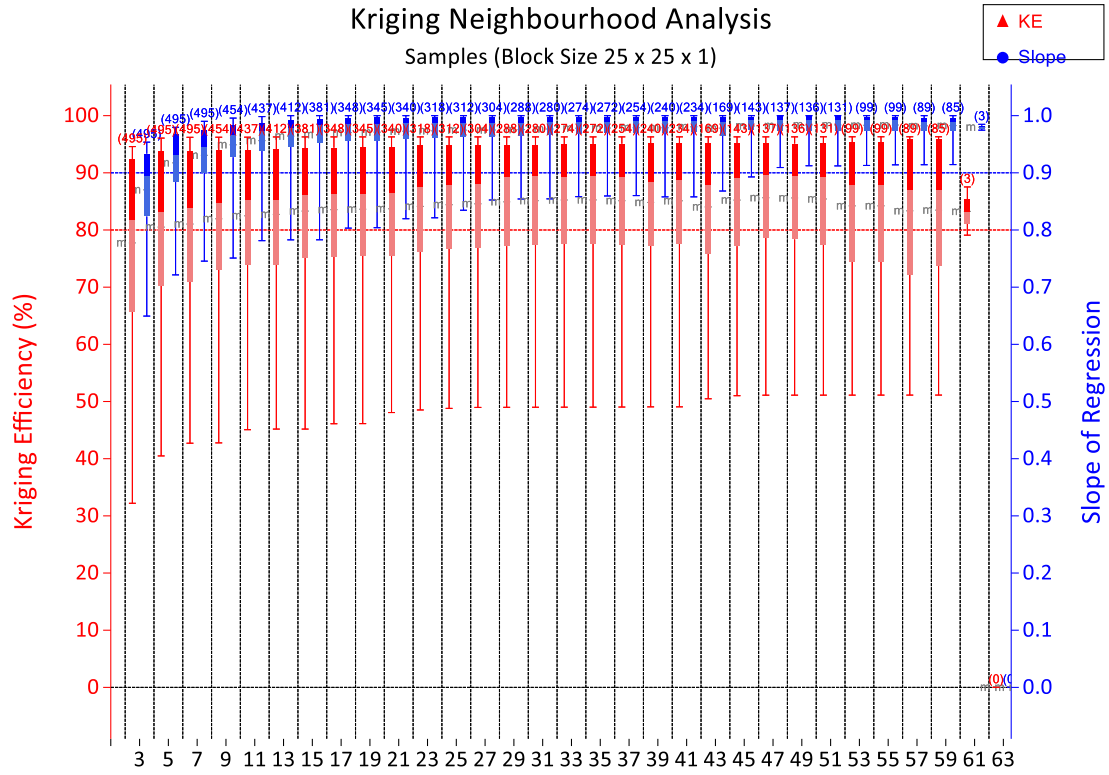


Figure 13 Optimum Number of samples of Mud Lower in East100 Block

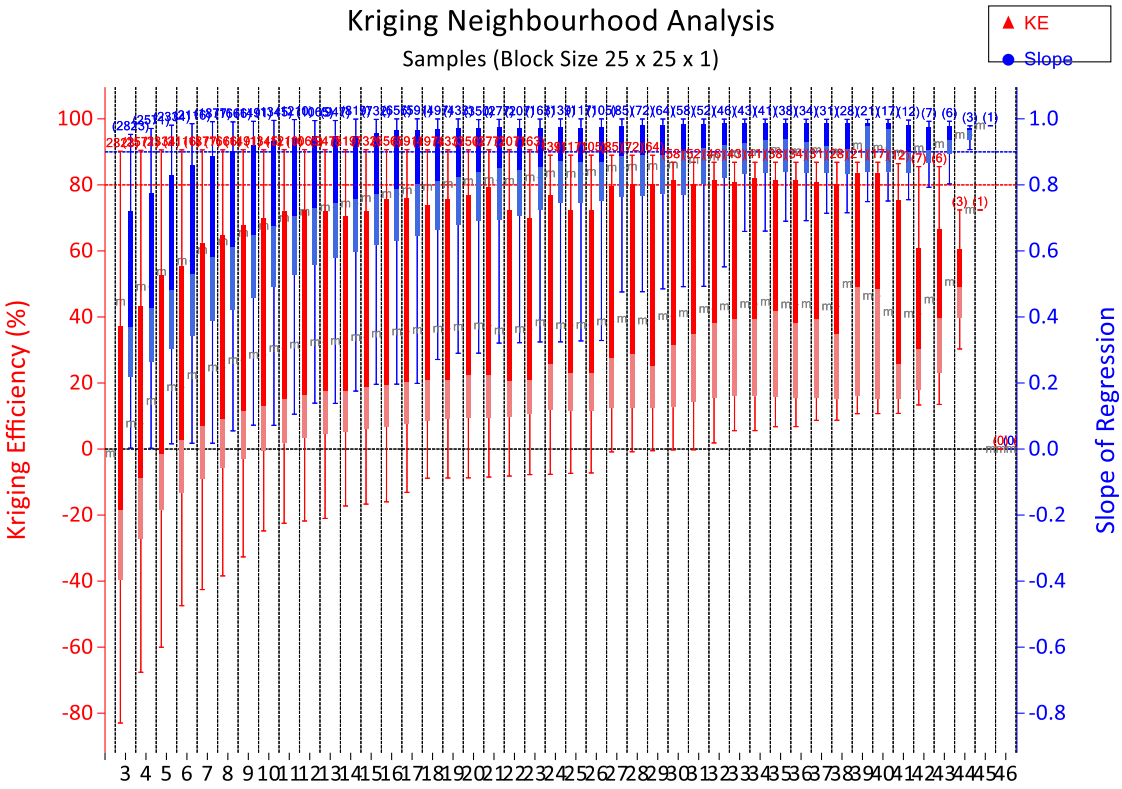


Figure 14 Optimum Number of samples of Upper Limonite in East100 Block

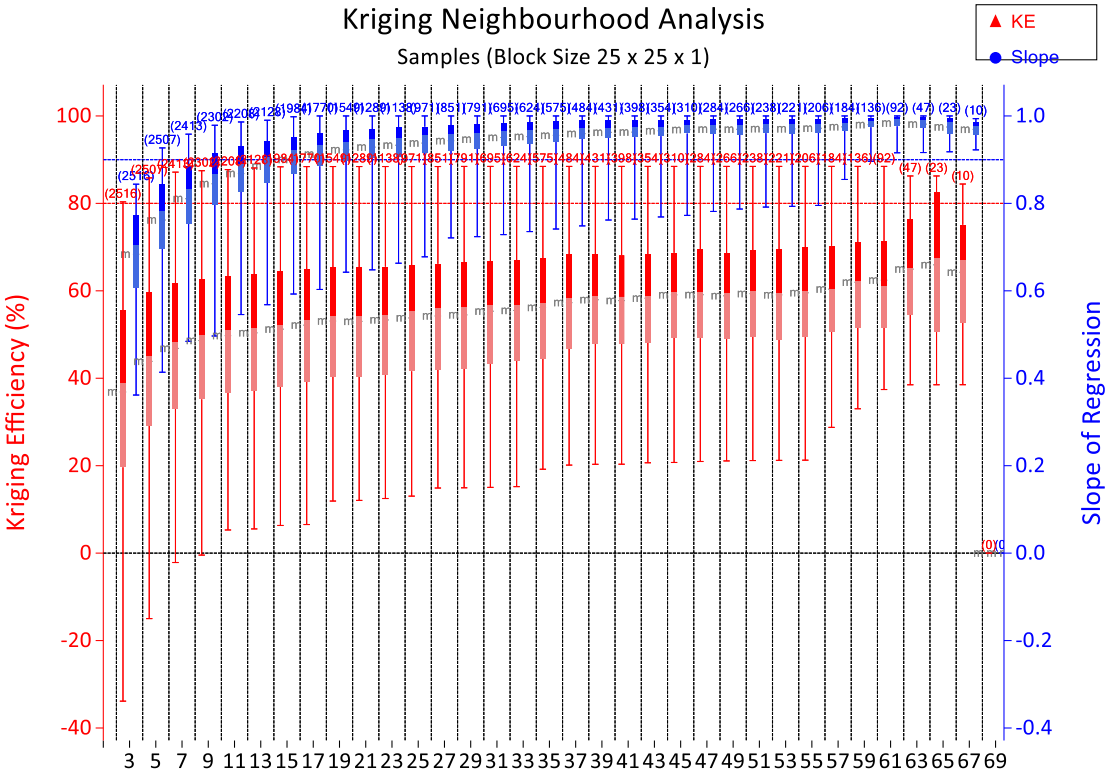


Figure 15 Optimum Number of samples of Lower Limonite in East100 Block

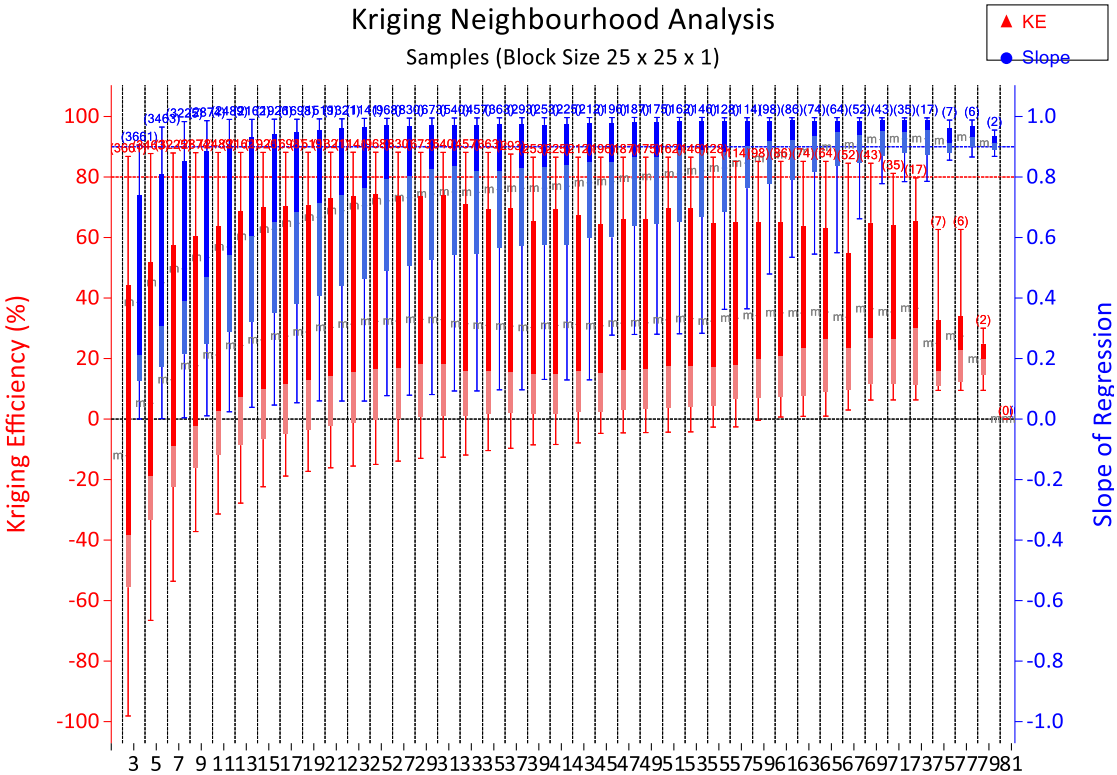


Figure 16 Optimum Number of samples of Saprolite in East100 Block

1.4 Grade Estimation

Table 2 Search parameter of Mud Upper in East100 Block

Parameter	Ni				Co				Al_2O_3				Cr_2O_3				Fe			
	Pass 1	Pass 2	Pass 3	Pass 4	Pass 1	Pass 2	Pass 3	Pass 4	Pass 1	Pass 2	Pass 3	Pass 4	Pass 1	Pass 2	Pass 3	Pass 4	Pass 1	Pass 2	Pass 3	Pass 4
Minimum Sample	3	3	2	1	3	3	2	1	3	3	2	1	3	3	2	1	3	3	2	1
Maximum Sample	47				35				35				43				47			
Max. Search Radius	150	300	600	1200	150	300	600	1200	150	300	600	1200	150	300	600	1200	150	300	600	1200
Max. Vertical Distance	7	14	27	54	4	8	16	32	9	18	37	74	11	22	44	88	8	16	33	66
Bearing	100				115				100				100				100			
Plunge	0				0				0				0				0			
Dip	0				0				-5				0				-5			
Major/Semi-major	1.192				1.331				1.325				1.019				1.360			
Major/Minor	18.530				36.720				16.380				13.740				18.120			
Nugget	0.047				0.049				0.022				0.025				0.013			
Structure 1	0.953				0.951				0.978				0.975				0.987			
Range	199				213				163				146				143			

Parameter	MgO				MnO				P_2O_5				SiO_2				TiO2			
	Pass 1	Pass 2	Pass 3	Pass 4	Pass 1	Pass 2	Pass 3	Pass 4	Pass 1	Pass 2	Pass 3	Pass 4	Pass 1	Pass 2	Pass 3	Pass 4	Pass 1	Pass 2	Pass 3	Pass 4
Minimum Sample	3	3	2	1	3	3	2	1	3	3	2	1	3	3	2	1	3	3	2	1
Maximum Sample	31				29				29				25				29			
Max. Search Radius	150	300	600	1200	150	300	600	1200	150	300	600	1200	150	300	600	1200	150	300	600	1200
Max. Vertical Distance	5	10	19	38	7	14	27	54	12	24	49	99	14	28	55	110	12	24	46	92
Bearing	100				95				130				100				110			
Plunge	0				0				0				0				0			
Dip	-5				-5				0				-5				-5			
Major/Semi-major	1.120				1.000				1.000				1.501				1.060			
Major/Minor	31.340				17.690				12.130				10.950				12.930			
Nugget	0.125				0.037				0.128				0.012				0.010			
Structure 1	0.875				0.963				0.872				0.988				0.990			
Range	180				115				174				188				178			

Range	180	115	174	188	178

Table 3 Search parameter of Mud Lower in East100 Block

Parameter	Ni				Co				Al_2O_3				Cr_2O_3				Fe			
	Pass 1	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**
Minimum Sample	3	3	2	1	3	3	2	1	3	3	2	1	3	3	2	1	3	3	2	1
Maximum Sample	47				23				53				27				25			
Max. Search Radius	150	300	600	1200	150	300	600	1200	150	300	600	1200	150	300	600	1200	150	300	600	1200
Max. Vertical Distance	14	28	56	112	12	24	49	98	7	14	29	58	26	52	102	204	25	50	100	200
Bearing	160				120				135				160				100			
Plunge	0				0				0				0				0			
Dip	-5				-5				0				0				0			
Major/Semi-major 1	0.092				1.078				1.178				1.002				1.035			
Major/Semi-major 2	0.977				-				-				-				-			
Major/Minor 1	3.699				12.140				20.800				5.874				6.017			
Major/Minor 2	10.710				-				-				-				-			
Nugget	0.091				0.104				0.170				0.094				0.038			
Structure 1	0.017				0.896				0.830				0.906				0.962			
Structure 2	0.972				-				-				-				-			
Range 1	54				-				-				-				-			
Range 2	618				192				195				191				139			

Parameter	MgO				MnO				P_2O_5				SiO_2				TiO_2			
	Pass 1	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**
Minimum Sample	3	3	2	1	3	3	2	1	3	3	2	1	3	3	2	1	3	3	2	1
Maximum Sample	39				35				29				25				30			
Max. Search Radius	150	300	600	1200	150	300	600	1200	150	300	600	1200	150	300	600	1200	150	300	600	1200
Max. Vertical Distance	9	18	37	74	16	32	65	130	7	14	27	54	12	24	47	94	30	60	118	236
Bearing	140				110				135				140				120			
Plunge	0				0				0				0				0			
Dip	0				-5				5				0				-5			
Major/Semi-major 1	1.180				1.592				1.294				1.305				1.265			
Major/Semi-major 2	-				-				-				-				-			
Major/Minor 1	16.140				9.250				22.190				12.740				5.070			
Major/Minor 2	-				-				-				-				-			
Nugget	0.132				0.236				0.146				0.012				0.020			
Structure 1	0.868				0.764				0.854				0.988				0.980			
Structure 2	-				-				-				-				-			
Range 1	-				-				-				-				-			
Range 2	251				248				251				205				219			

Table 4 Search parameter of Upper Limonite East100 Block

Parameter	Ni				Co				Al_2O_3				Cr_2O_3				Fe			
	Pass 1	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**
Minimum Sample	4	4	2	1	3	3	2	1	3	3	2	1	3	3	2	1	3	3	2	1
Maximum Sample	39				11				29				17				27			
Max. Search Radius	150	300	600	1200	150	300	600	1200	150	300	600	1200	150	300	600	1200	150	300	600	1200
Max. Vertical Distance	2	4	8	16	3	6	10	20	4	8	16	32	3	6	12	24	5	10	20	40
Bearing	145				130				110				130				100			
Plunge	0				0				0				0				0			
Dip	0				-5				0				-5				0			
Major/Semi-major 1	1.063				1.066				1.000				1.046				1.048			
Major/Semi-major 2	1.499				-				-				-				-			
Major/Minor 1	20.240				58.760				37.850				50.270				30.230			
Major/Minor 2	75.470				-				-				-				-			
Nugget	0.000				0.127				0.012				0.114				0.034			
Structure 1	0.564				0.873				0.988				0.886				0.966			
Structure 2	0.436				-				-				-				-			
Range 1	59				-				-				-				-			
Range 2	346				165				171				195				171			

Parameter	MgO				MnO				P_2O_5				SiO_2				TiO_2			
	Pass 1	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**
Minimum Sample	3	3	2	1	3	3	2	1	3	3	2	1	3	3	2	1	3	3	2	1
Maximum Sample	24				26				29				25				25			
Max. Search Radius	150	300	600	1200	150	300	600	1200	150	300	600	1200	150	300	600	1200	150	300	600	1200
Max. Vertical Distance	3	6	11	22	3	6	10	20	5	10	21	42	4	8	17	34	3	6	13	26
Bearing	105				125				110				130				130			
Plunge	0				0				0				0				0			
Dip	0				0				0				0				-10			
Major/Semi-major 1	1.294				1.077				1.128				1.000				1.000			
Major/Semi-major 2	-				-				-				-				-			
Major/Minor 1	52.290				59.540				28.410				35.870				46.000			
Major/Minor 2	-				-				-				-				-			
Nugget	0.013				0.119				0.015				0.026				0.114			
Structure 1	0.987				0.881				0.985				0.974				0.886			
Structure 2	-				-				-				-				-			
Range 1	-				-				-				-				-			
Range 2	168				185				167				160				184			

Table 5 Search parameter of Lower Limonite in East100 Block

Parameter	Ni				Co				Al_2O_3				Cr_2O_3				Fe			
	Pass 1	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**
Minimum Sample	3	3	2	1	4	3	2	1	3	3	2	1	4	3	2	1	3	3	2	1
Maximum Sample	65				10				11				13				7			
Max. Search Radius	150	300	600	1200	150	300	600	1200	150	300	600	1200	150	300	600	1200	150	300	600	1200
Max. Vertical Distance	13	26	52	104	4	8	17	34	7	14	28	56	4	8	16	32	1	2	4	8
Bearing	110				100				100				100				110			
Plunge	0				0				0				0				0			
Dip	0				0				0				-5				0			
Major/Semi-major 1	0.274				1.246				1.204				1.287				1.035			
Major/Semi-major 2	1.422				-				-				-				-			
Major/Minor 1	4.719				40.200				21.250				37.630				147.000			
Major/Minor 2	11.600				-				-				-				-			
Nugget	0.292				0.242				0.329				0.322				0.106			
Structure 1	0.250				0.758				0.671				0.668				0.894			
Structure 2	0.459				-				-				-				-			
Range 1	53				-				-				-				-			
Range 2	426				163				181				175				176			

Parameter	MgO				MnO				P_2O_5				SiO_2				TiO_2			
	Pass 1	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**
Minimum Sample	4	3	2	1	3	3	2	1	3	3	2	1	3	3	2	1	3	3	2	1
Maximum Sample	7				14				17				11				13			
Max. Search Radius	150	300	600	1200	150	300	600	1200	150	300	600	1200	150	300	600	1200	150	300	600	1200
Max. Vertical Distance	1	2	5	10	4	8	16	32	21	42	84	168	2	4	9	18	4	8	15	30
Bearing	110				105				100				120				100			
Plunge	0				0				0				0				0			
Dip	0				0				-5				0				-5			
Major/Semi-major 1	1.053				1.173				1.391				1.085				1.338			
Major/Semi-major 2	-				-				-				-				-			
Major/Minor 1	115.000				38.930				7.153				67.530				39.430			
Major/Minor 2	-				-				-				-				-			
Nugget	0.111				0.012				0.201				0.104				0.119			
Structure 1	0.889				0.878				0.799				0.896				0.881			
Structure 2	-				-				-				-				-			
Range 1	-				-				-				-				-			
Range 2	138				151				169				183				173			

Table 6 Search parameter of Saprolite in East100 Block

Parameter	Ni				Co				Al_2O_3				Cr_2O_3				Fe			
	Pass 1	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**
Minimum Sample	5	4	2	1	3	3	2	1	3	3	2	1	3	3	2	1	3	3	2	1
Maximum Sample	73				44				44				38				26			
Max. Search Radius	150	300	600	1200	150	300	600	1200	150	300	600	1200	150	300	600	1200	150	300	600	1200
Max. Vertical Distance	2	4	6	13	8	16	33	66	8	16	33	66	5	10	20	40	5	10	22	44
Bearing	130				90				90				95				105			
Plunge	0				0				0				0				0			
Dip	0				0				0				-5				-5			
Major/Semi-major 1	0.939				1.000				1.000				1.079				1.061			
Major/Semi-major 2	1.126				-				-				-				-			
Major/Minor 1	13.810				17.910				17.910				29.040				28.360			
Major/Minor 2	93.390				-				-				-				-			
Nugget	0.041				0.284				0.284				0.382				0.387			
Structure 1	0.792				0.716				0.716				0.618				0.613			
Structure 2	0.167				-				-				-				-			
Range 1	58				-				-				-				-			
Range 2	446				197				197				151				156			

Parameter	MgO				MnO				P_2O_5				SiO_2				TiO_2			
	Pass 1	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**
Minimum Sample	3	3	2	1	3	3	2	1	3	3	2	1	3	3	2	1	3	3	2	1
Maximum Sample	32				17				61				47				47			
Max. Search Radius	150	300	600	1200	150	300	600	1200	150	300	600	1200	150	300	600	1200	150	300	600	1200
Max. Vertical Distance	8	16	30	60	6	12	23	46	16	32	63	126	4	8	17	34	11	22	44	88
Bearing	110				115				100				95				105			
Plunge	0				0				0				0				0			
Dip	-5				-10				-5				0				-5			
Major/Semi-major 1	1.204				1.615				1.393				1.034				1.240			
Major/Semi-major 2	-				-				-				-				-			
Major/Minor 1	19.740				26.430				4.351				22.540				13.680			
Major/Minor 2	-				-				-				-				-			
Nugget	0.274				0.245				0.130				0.295				0.244			
Structure 1	0.726				0.755				0.870				0.705				0.756			
Structure 2	-				-				-				-				-			
Range 1	-				-				-				-				-			
Range 2	158				111				196				151				170			

1.5 Model Validation

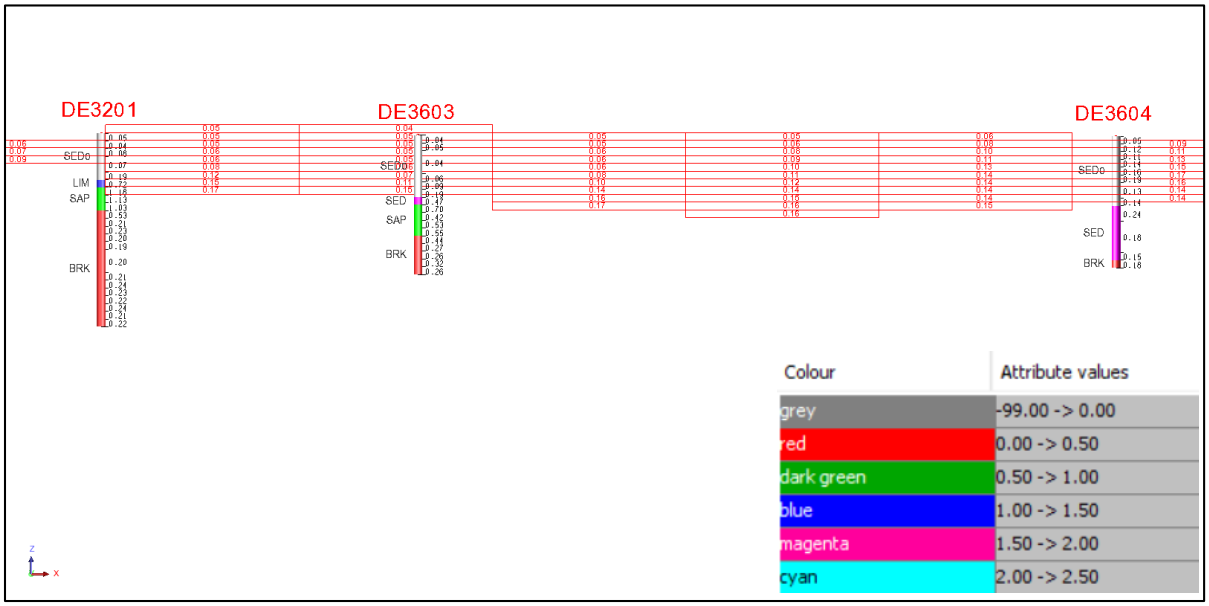


Figure 17 Cross section of Ni Mud Upper in East100 Block

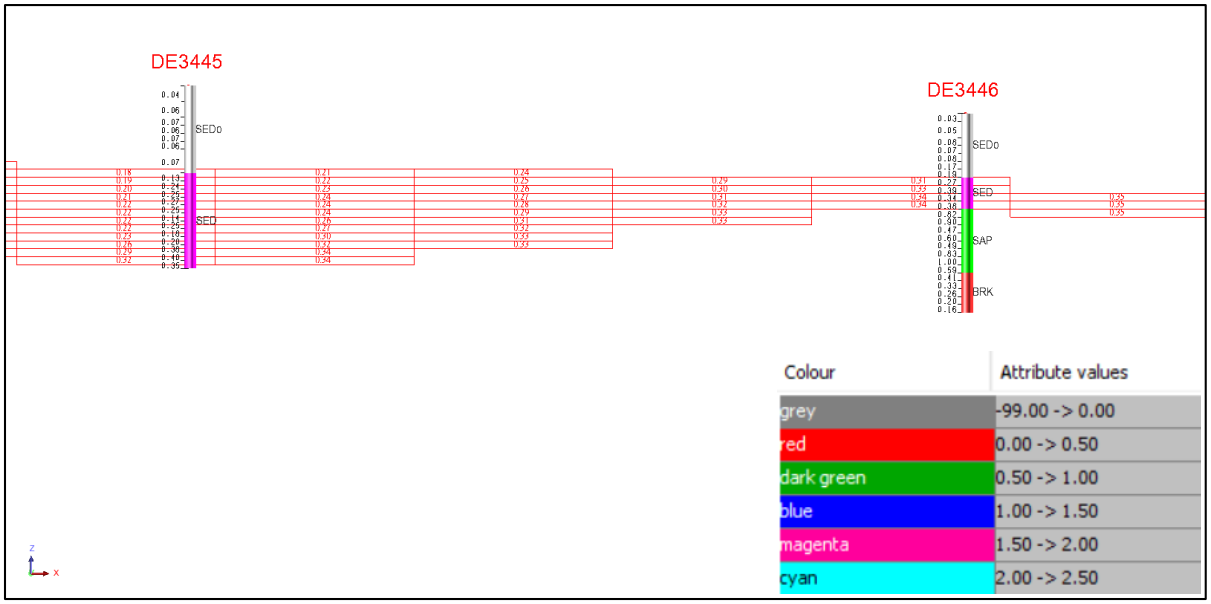


Figure 18 Cross section of Ni Mud Lower in East100 Block

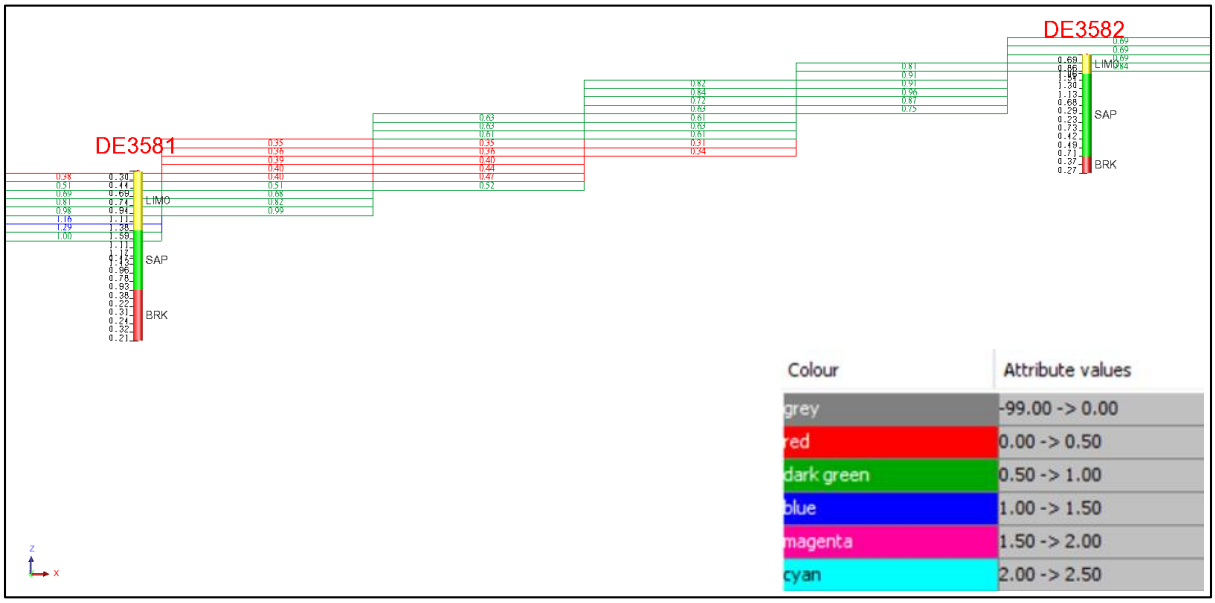


Figure 19 Cross section of Ni Upper Limonite in East100 Block

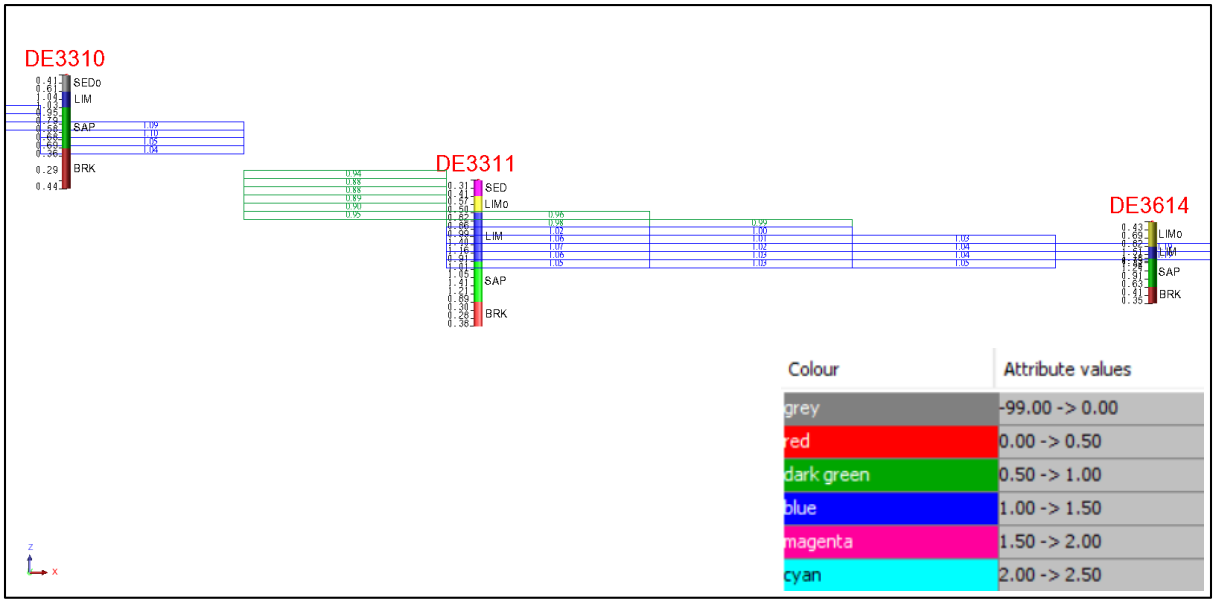


Figure 20 Cross section of Ni Lower Limonite in East100 Block

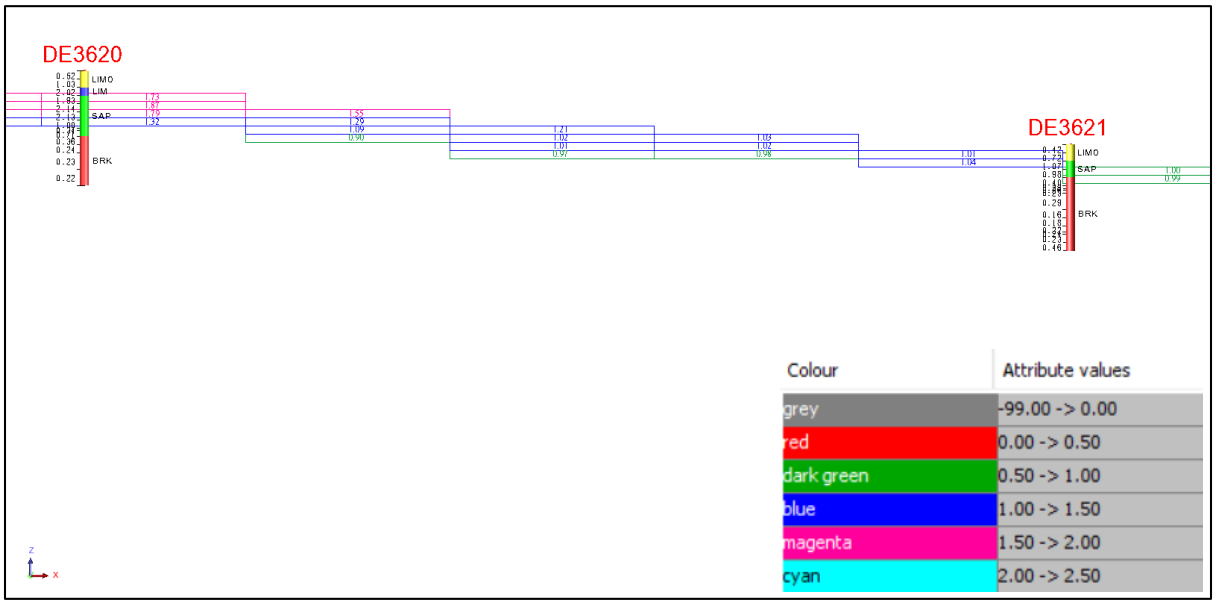
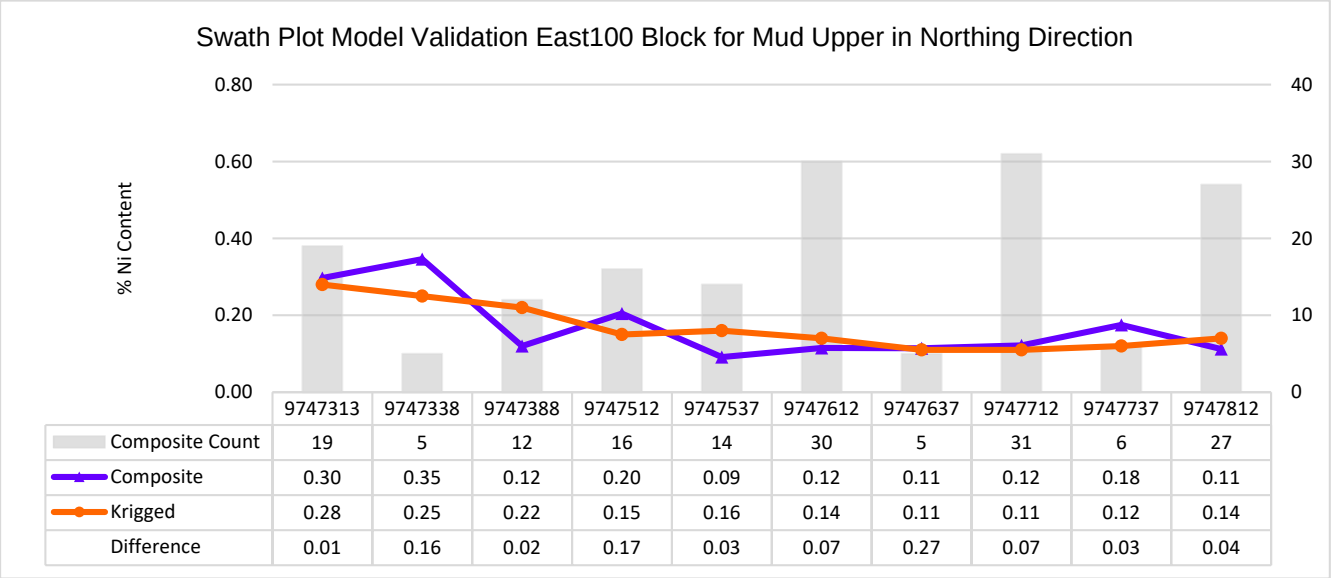
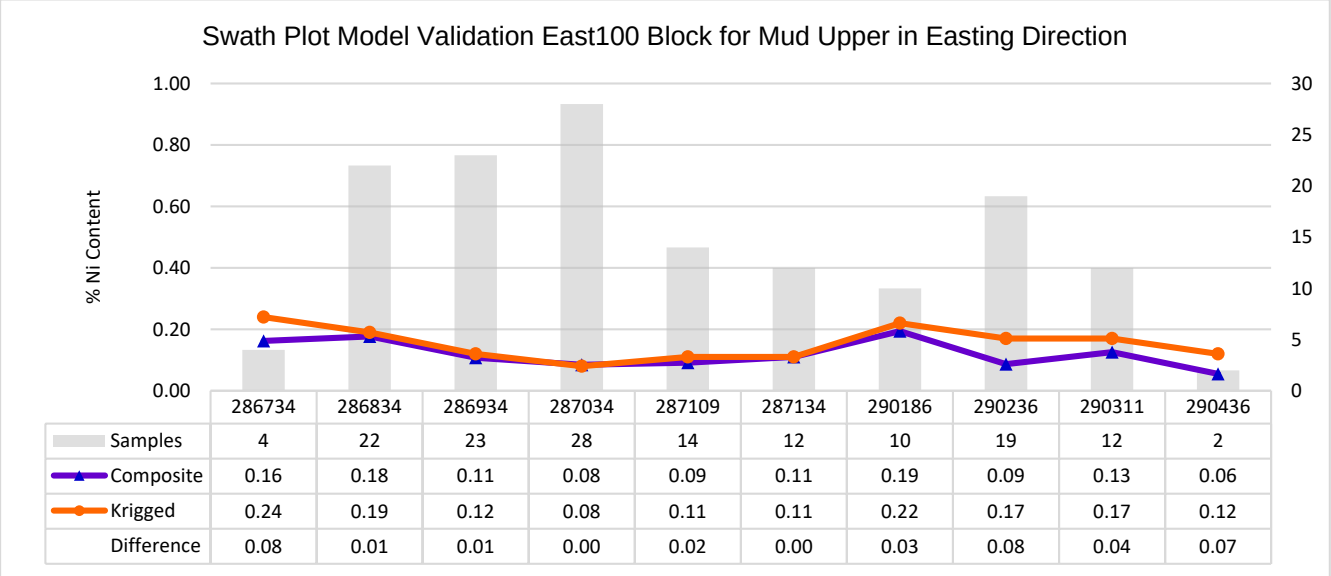


Figure 21 Cross section of Ni Saprolite in in East100 Block



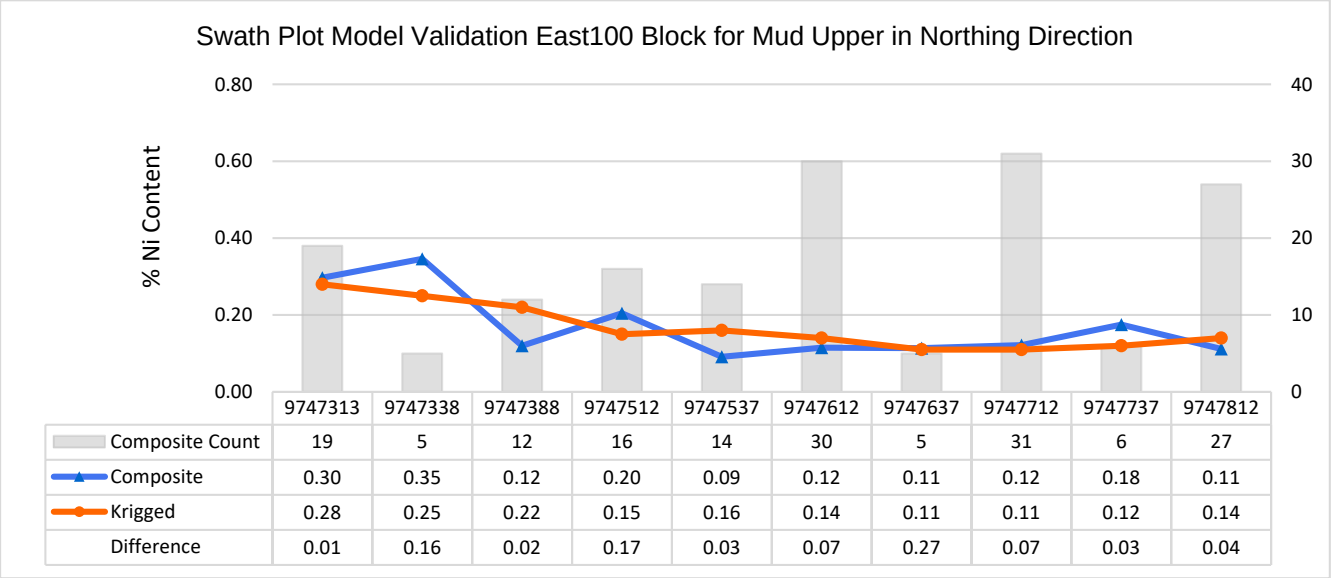
	9747313	9747338	9747388	9747512	9747537	9747612	9747637	9747712	9747737	9747812
Composite Count	19	5	12	16	14	30	5	31	6	27
Composite	0.30	0.35	0.12	0.20	0.09	0.12	0.11	0.12	0.18	0.11
Krigged	0.28	0.25	0.22	0.15	0.16	0.14	0.11	0.11	0.12	0.14
Difference	0.01	0.16	0.02	0.17	0.03	0.07	0.27	0.07	0.03	0.04

Figure 22 Swath plot of Ni Mud Upper in East100 block with Northing Direction



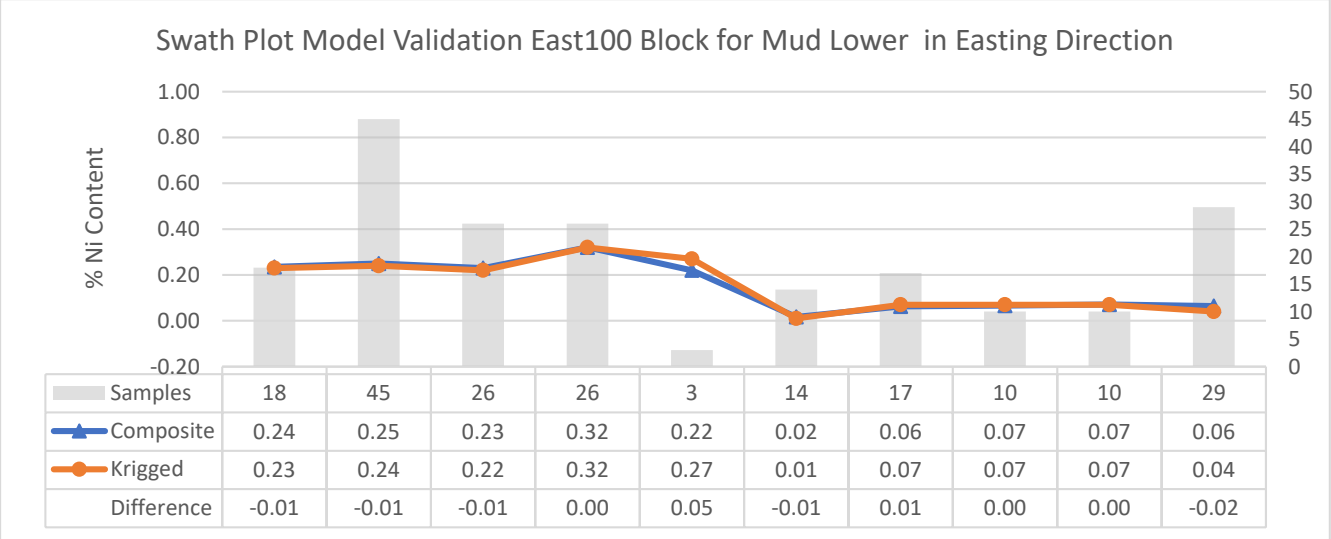
	286734	286834	286934	287034	287109	287134	290186	290236	290311	290436
Samples	4	22	23	28	14	12	10	19	12	2
Composite	0.16	0.18	0.11	0.08	0.09	0.11	0.19	0.09	0.13	0.06
Krigged	0.24	0.19	0.12	0.08	0.11	0.11	0.22	0.17	0.17	0.12
Difference	0.08	0.01	0.01	0.00	0.02	0.00	0.03	0.08	0.04	0.07

Figure 23 Swath plot of Ni Mud Upper in East100 block with Easting Direction



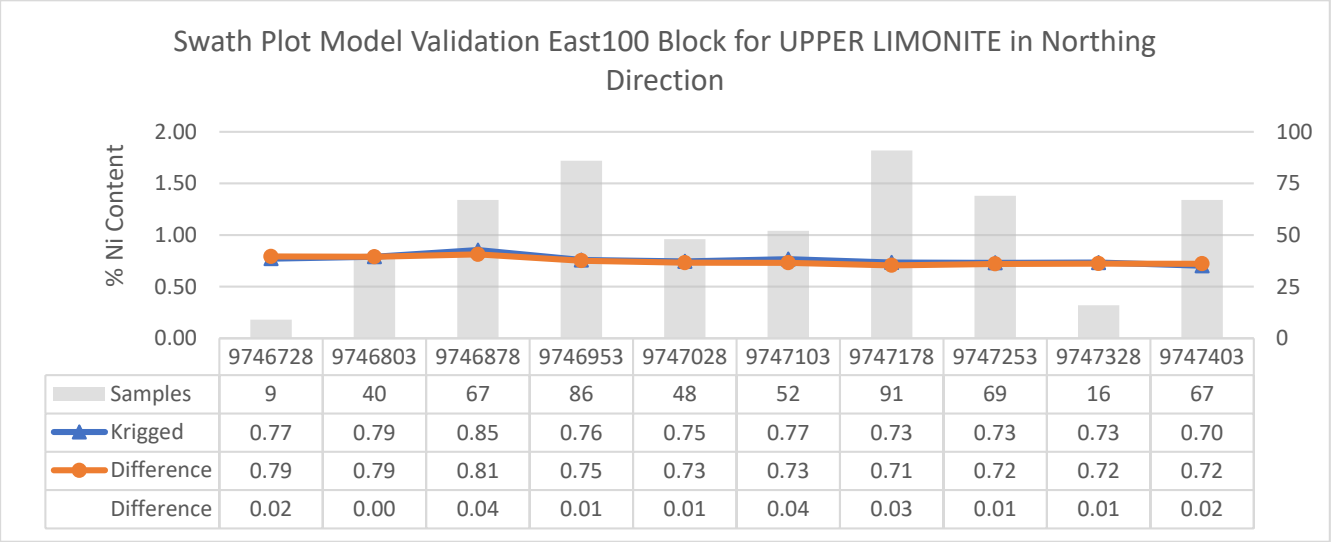
	9747313	9747338	9747388	9747512	9747537	9747612	9747637	9747712	9747737	9747812
Composite Count	19	5	12	16	14	30	5	31	6	27
Composite	0.30	0.35	0.12	0.20	0.09	0.12	0.11	0.12	0.18	0.11
Krigged	0.28	0.25	0.22	0.15	0.16	0.14	0.11	0.11	0.12	0.14
Difference	0.01	0.16	0.02	0.17	0.03	0.07	0.27	0.07	0.03	0.04

Figure 24 Swath plot of Ni Mud Lower in East100 block with Northing Direction



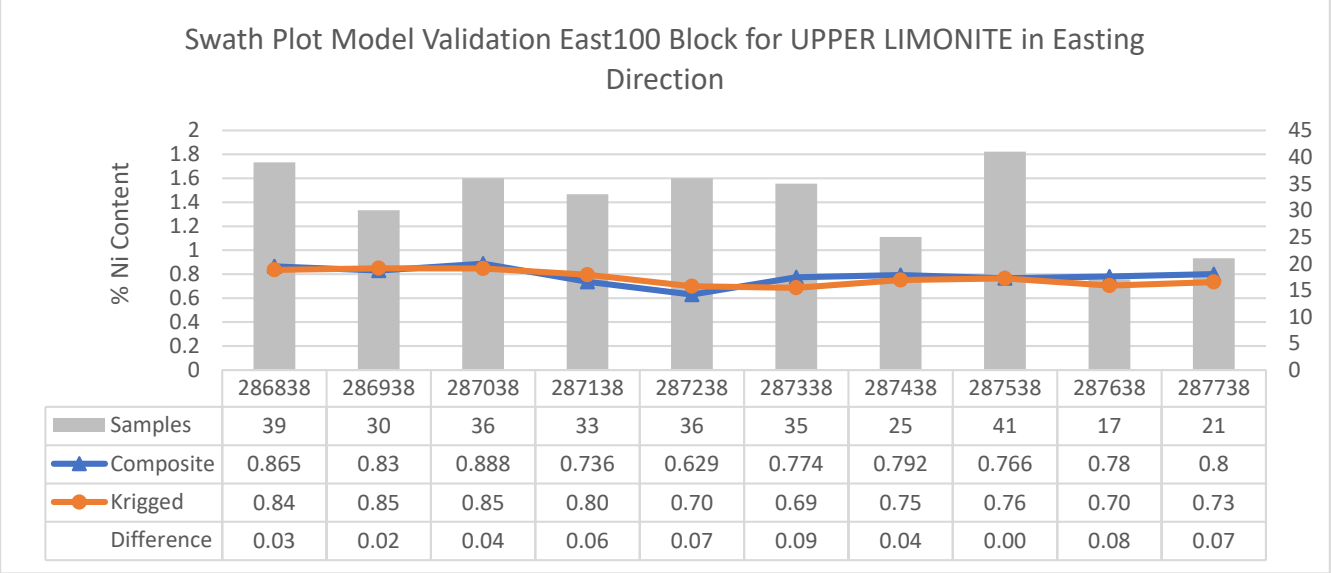
	18	45	26	26	3	14	17	10	10	29
Samples										
Composite	0.24	0.25	0.23	0.32	0.22	0.02	0.06	0.07	0.07	0.06
Krigged	0.23	0.24	0.22	0.32	0.27	0.01	0.07	0.07	0.07	0.04
Difference	-0.01	-0.01	-0.01	0.00	0.05	-0.01	0.01	0.00	0.00	-0.02

Figure 25 Swath plot of Ni Mud Lower in East100 block with Easting Direction



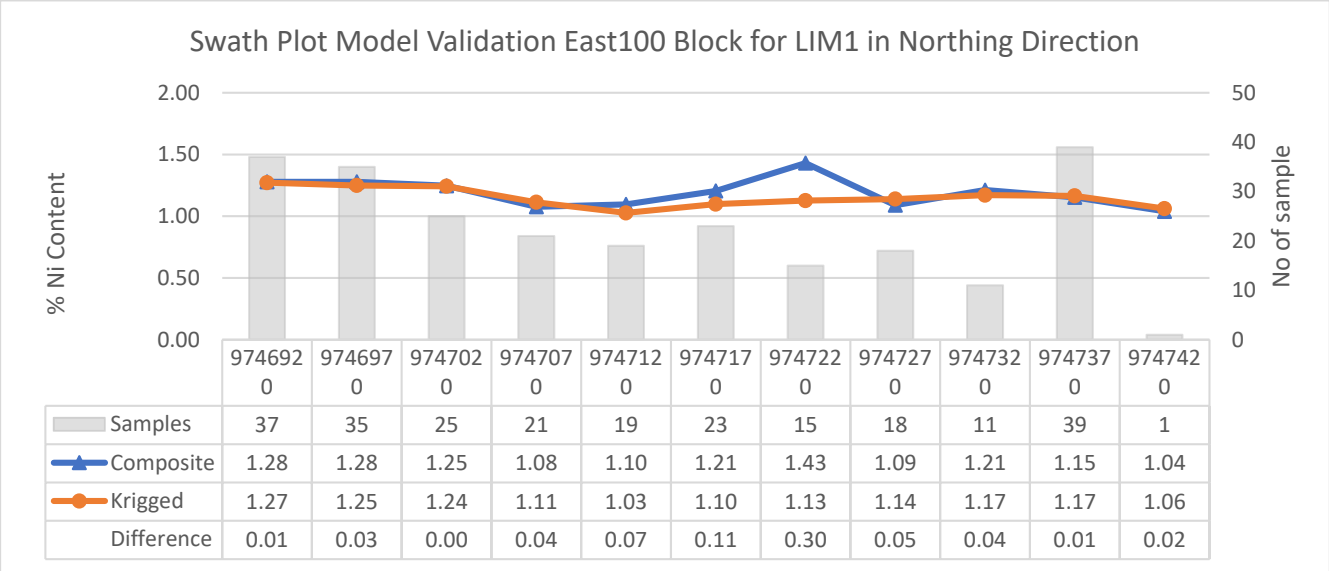
	9746728	9746803	9746878	9746953	9747028	9747103	9747178	9747253	9747328	9747403
Samples	9	40	67	86	48	52	91	69	16	67
Krigged	0.77	0.79	0.85	0.76	0.75	0.77	0.73	0.73	0.73	0.70
Difference	0.79	0.79	0.81	0.75	0.73	0.73	0.71	0.72	0.72	0.72
Difference	0.02	0.00	0.04	0.01	0.01	0.04	0.03	0.01	0.01	0.02

Figure 26 Swath plot of Ni Upper Limonite in East100 block with Northing Direction



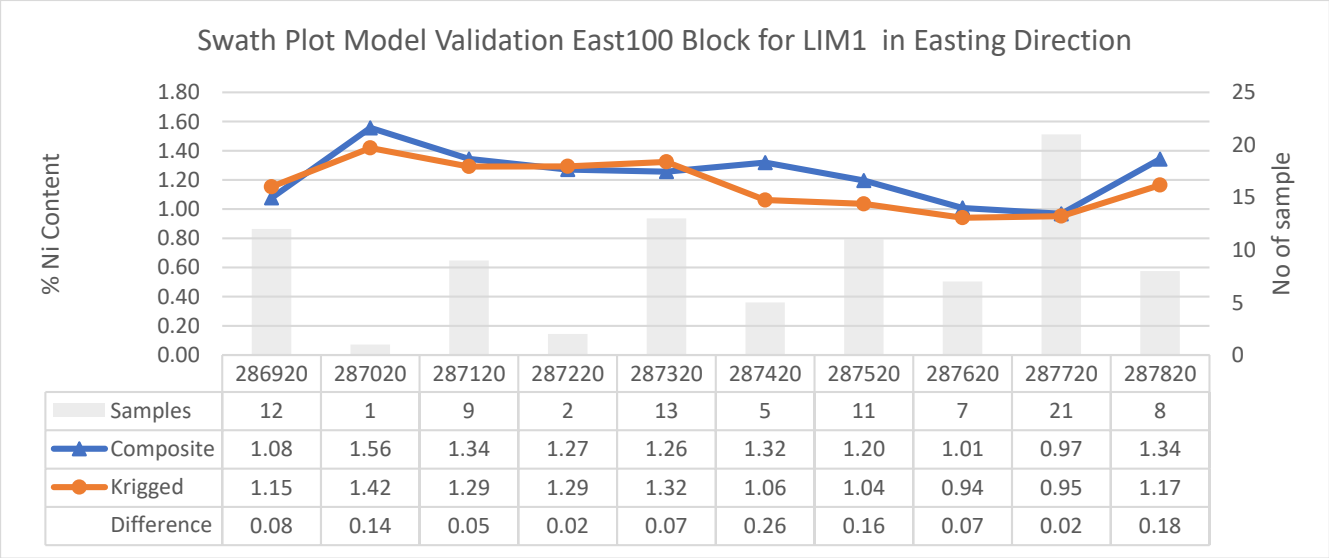
	286838	286938	287038	287138	287238	287338	287438	287538	287638	287738
Samples	39	30	36	33	36	35	25	41	17	21
Composite	0.865	0.83	0.888	0.736	0.629	0.774	0.792	0.766	0.78	0.8
Krigged	0.84	0.85	0.85	0.80	0.70	0.69	0.75	0.76	0.70	0.73
Difference	0.03	0.02	0.04	0.06	0.07	0.09	0.04	0.00	0.08	0.07

Figure 27 Swath plot of Ni Upper Limonite in East100 block with Easting Direction



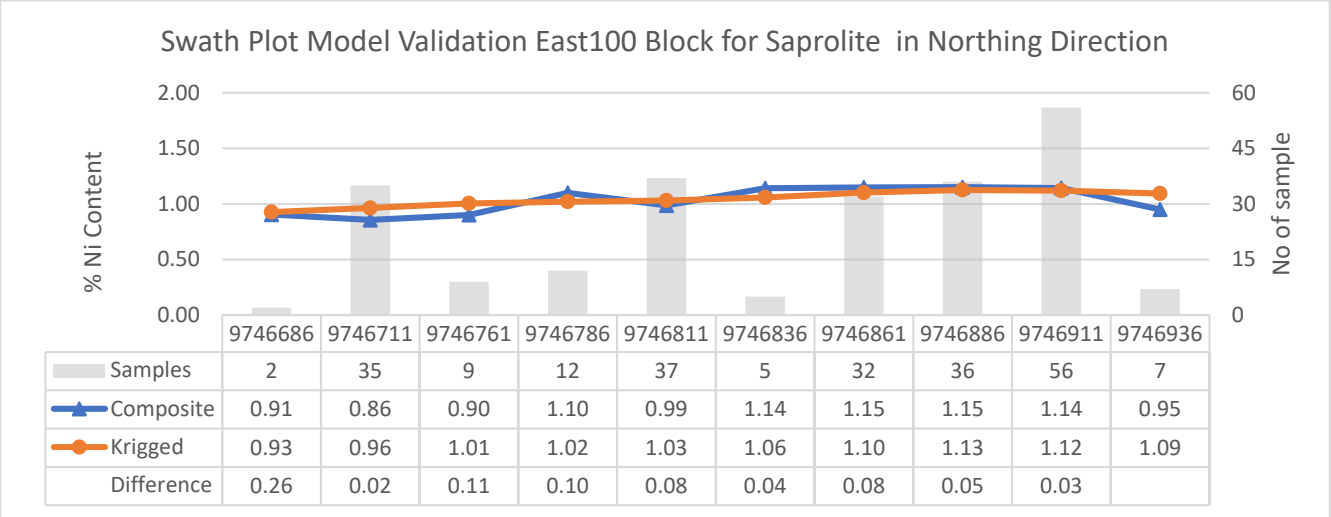
	9746920	9746970	9747020	9747070	9747120	9747170	9747220	9747270	9747320	9747370	9747420
Samples	37	35	25	21	19	23	15	18	11	39	1
Composite	1.28	1.28	1.25	1.08	1.10	1.21	1.43	1.09	1.21	1.15	1.04
Krigged	1.27	1.25	1.24	1.11	1.03	1.10	1.13	1.14	1.17	1.17	1.06
Difference	0.01	0.03	0.00	0.04	0.07	0.11	0.30	0.05	0.04	0.01	0.02

Figure 28 Swath plot of Ni Lower Limonite in East100 block with Northing Direction



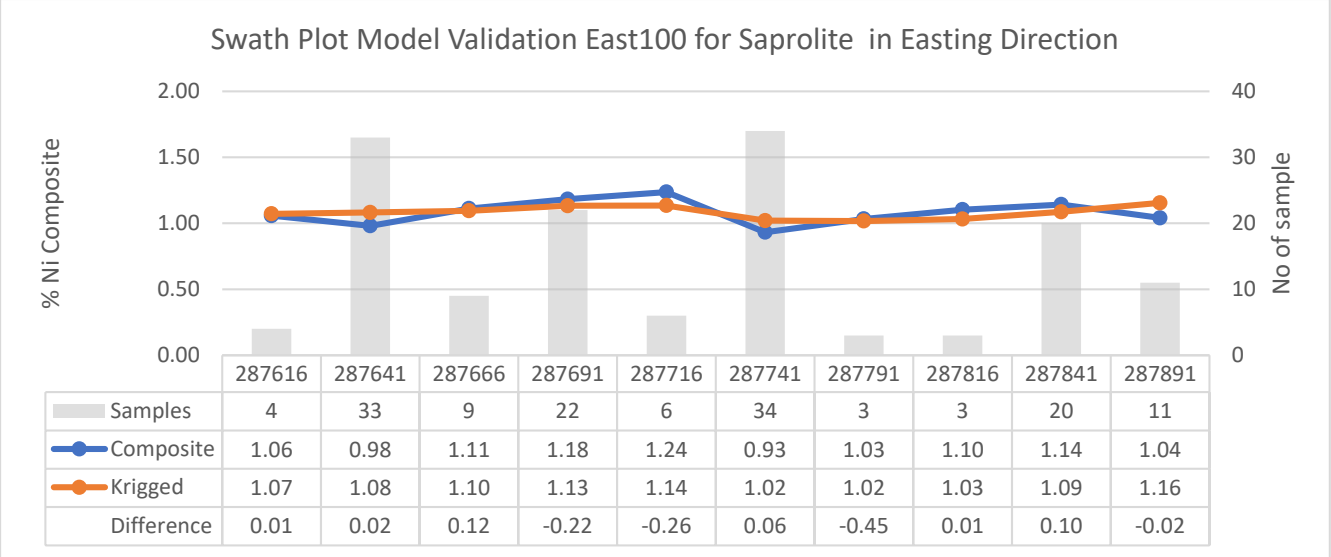
	286920	287020	287120	287220	287320	287420	287520	287620	287720	287820
Samples	12	1	9	2	13	5	11	7	21	8
Composite	1.08	1.56	1.34	1.27	1.26	1.32	1.20	1.01	0.97	1.34
Krigged	1.15	1.42	1.29	1.29	1.32	1.06	1.04	0.94	0.95	1.17
Difference	0.08	0.14	0.05	0.02	0.07	0.26	0.16	0.07	0.02	0.18

Figure 29 Swath plot of Ni Lower Limonite in East100 block with Easting Direction



	9746686	9746711	9746761	9746786	9746811	9746836	9746861	9746886	9746911	9746936
Samples	2	35	9	12	37	5	32	36	56	7
Composite	0.91	0.86	0.90	1.10	0.99	1.14	1.15	1.15	1.14	0.95
Krigged	0.93	0.96	1.01	1.02	1.03	1.06	1.10	1.13	1.12	1.09
Difference	0.26	0.02	0.11	0.10	0.08	0.04	0.08	0.05	0.03	

Figure 30 Swath plot of Ni Saprolite in East100 block with Northing Direction



	287616	287641	287666	287691	287716	287741	287791	287816	287841	287891
Samples	4	33	9	22	6	34	3	3	20	11
Composite	1.06	0.98	1.11	1.18	1.24	0.93	1.03	1.10	1.14	1.04
Krigged	1.07	1.08	1.10	1.13	1.14	1.02	1.02	1.03	1.09	1.16
Difference	0.01	0.02	0.12	-0.22	-0.26	0.06	-0.45	0.01	0.10	-0.02

Figure 31 Swath plot of Ni Saprolite in East100 block with Easting Direction

2 NORTH50

2.1 Block Model Geometry

Table 7 Block model size and geometry of North50 Block

Type	Y	Z	Z
Minimum Coordinates	9746183	282812	-20
Maximum Coordinates	9750258	291712	750
User Block Size	25	25	1
Min. Block Size	25	25	1
Rotation	0	0	0

2.2 Extrapolatory Data Analysis

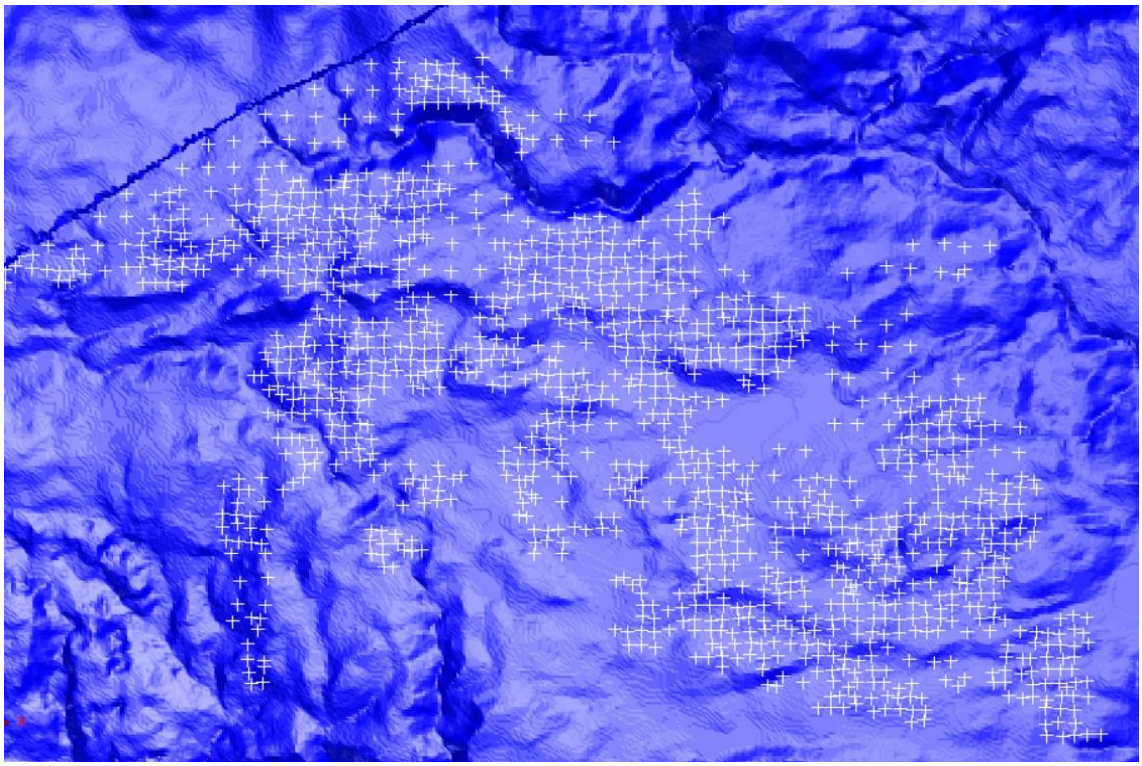
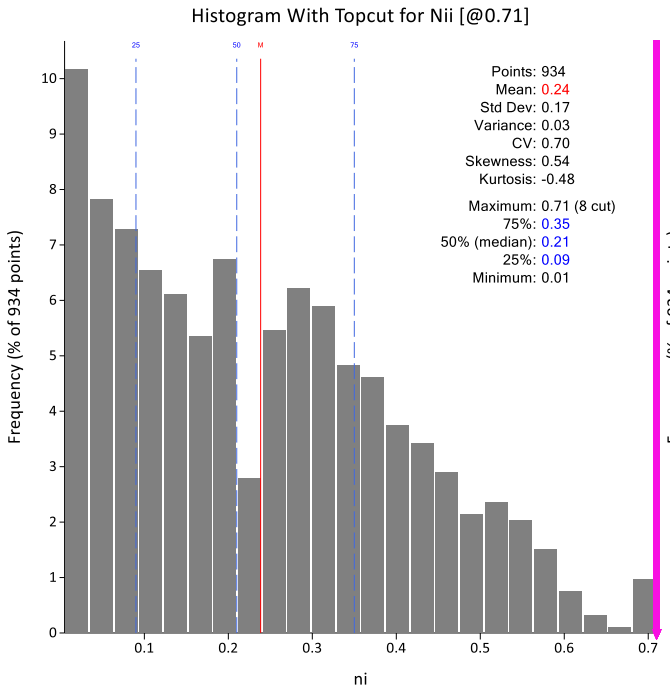
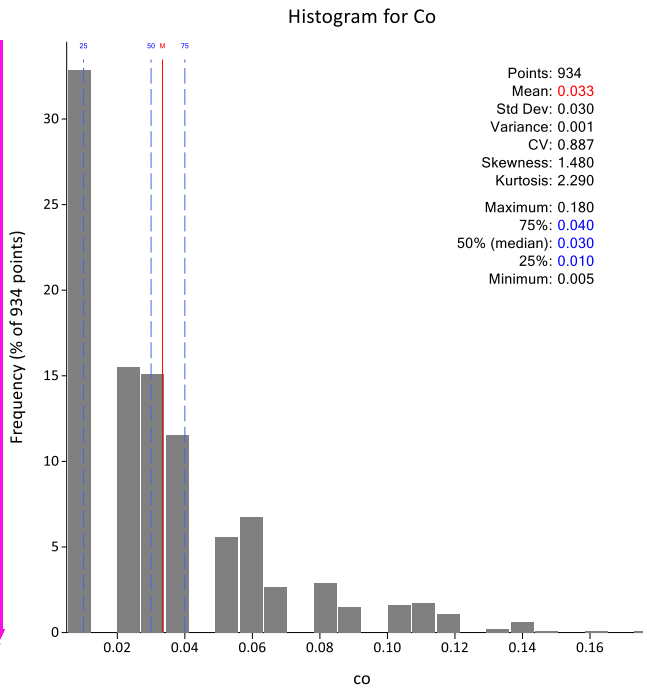
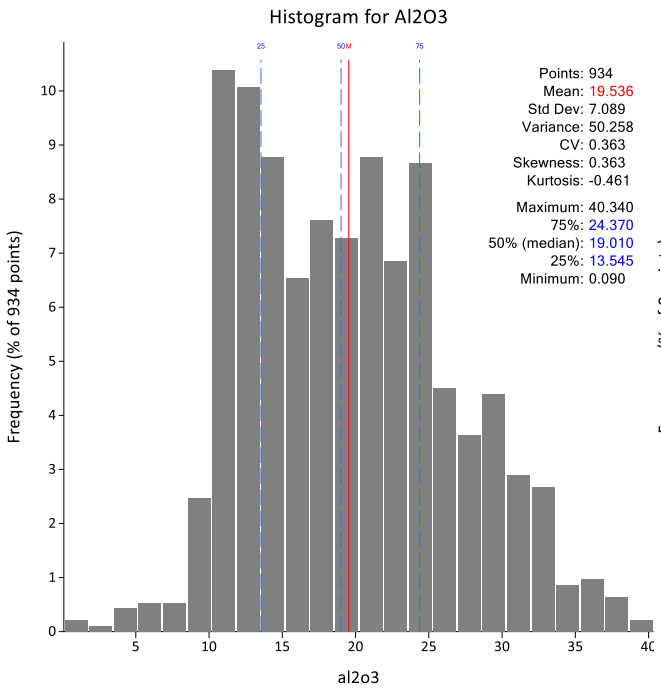
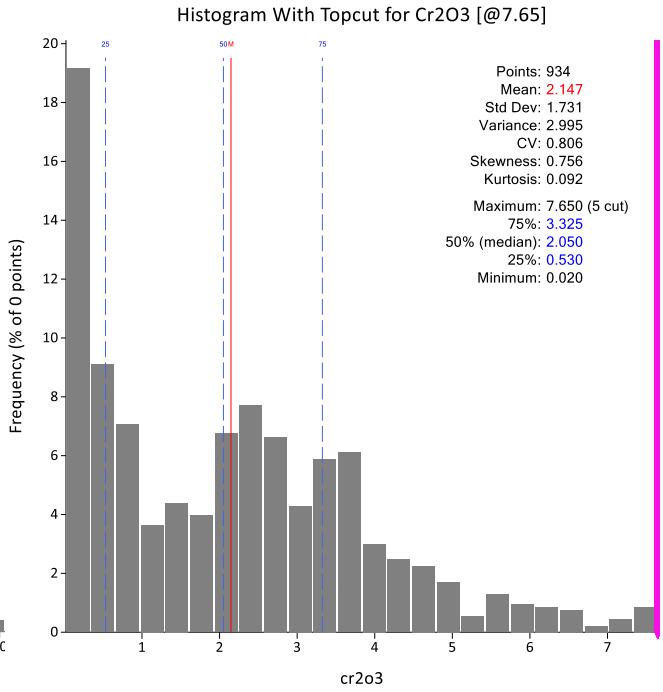


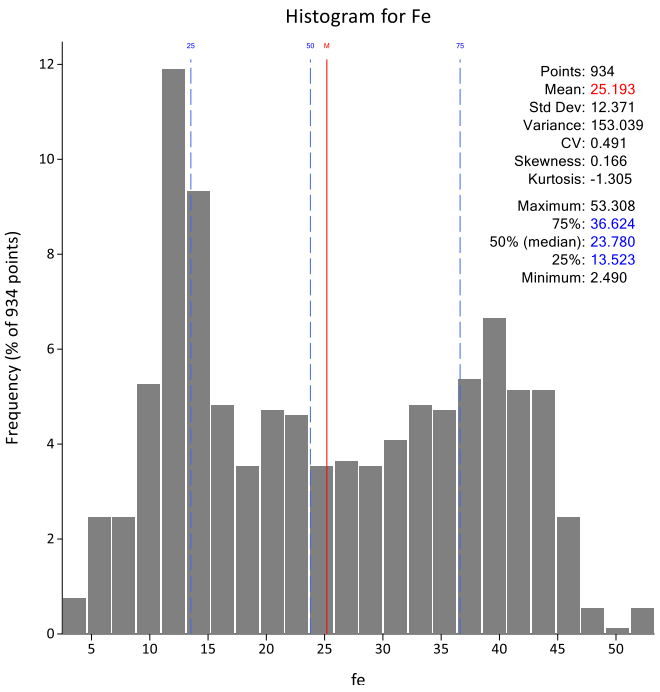
Figure 32 North50 Block

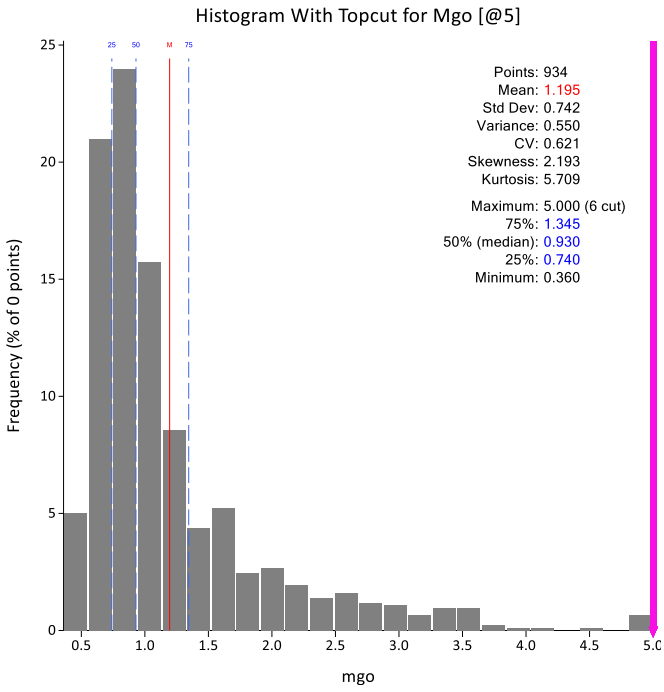

Histogram With Topcut for Nii [@0.71]
Points: 934
Mean: 0.24
Std Dev: 0.17
Variance: 0.03
CV: 0.70
Skewness: 0.54
Kurtosis: -0.48
Maximum: 0.71 (8 cut)
75%: 0.35
50% (median): 0.21
25%: 0.09
Minimum: 0.01
Frequency (% of 934 points)
ni

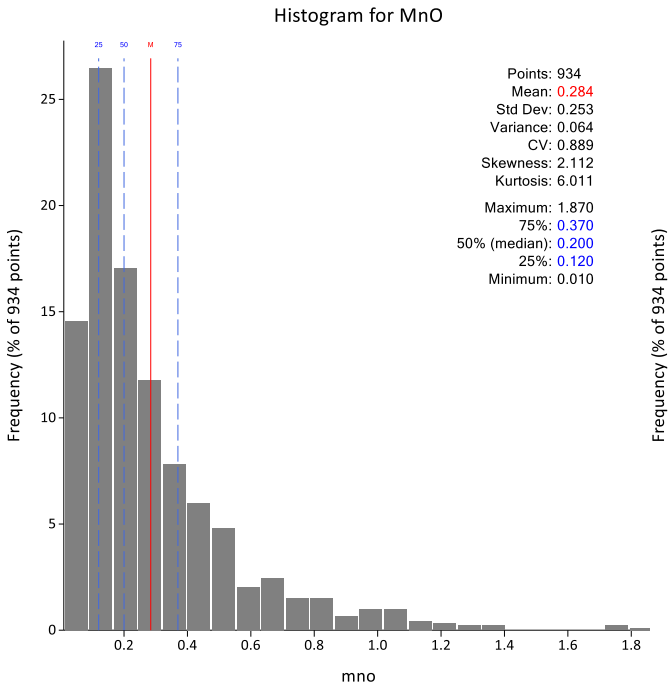

Histogram for Co
Points: 934
Mean: 0.033
Std Dev: 0.030
Variance: 0.001
CV: 0.887
Skewness: 1.480
Kurtosis: 2.290
Maximum: 0.180
75%: 0.040
50% (median): 0.030
25%: 0.010
Minimum: 0.005
Frequency (% of 934 points)
co

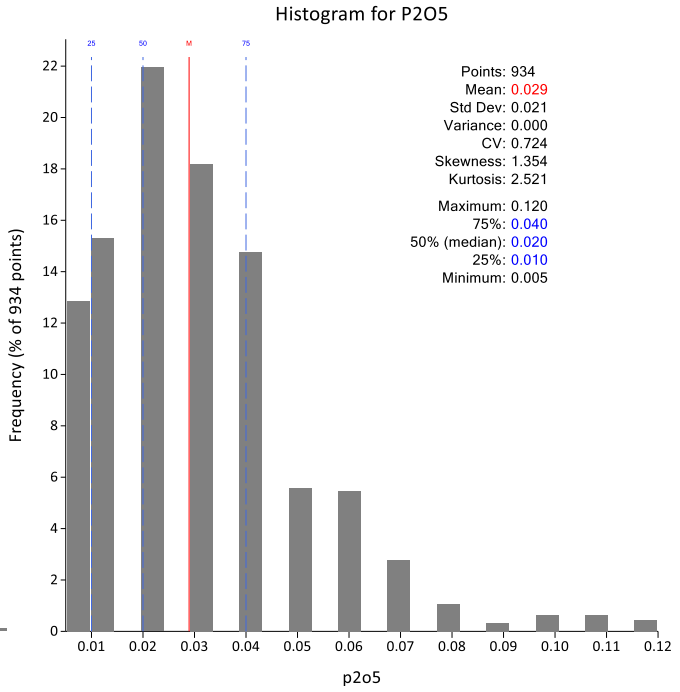

Histogram for Al2O3
Points: 934
Mean: 19.536
Std Dev: 7.089
Variance: 50.258
CV: 0.363
Skewness: 0.363
Kurtosis: -0.461
Maximum: 40.340
75%: 24.370
50% (median): 19.010
25%: 13.545
Minimum: 0.090
Frequency (% of 934 points)
al2o3


Histogram With Topcut for Cr2O3 [@7.65]
Points: 934
Mean: 2.147
Std Dev: 1.731
Variance: 2.995
CV: 0.806
Skewness: 0.756
Kurtosis: 0.092
Maximum: 7.650 (5 cut)
75%: 3.325
50% (median): 2.050
25%: 0.530
Minimum: 0.020
Frequency (% of 0 points)
cr2o3


Histogram for Fe
Points: 934
Mean: 25.193
Std Dev: 12.371
Variance: 153.039
CV: 0.491
Skewness: 0.166
Kurtosis: -1.305
Maximum: 53.308
75%: 36.624
50% (median): 23.780
25%: 13.523
Minimum: 2.490
Frequency (% of 934 points)
fe


Histogram With Topcut for Mgo [@5]
Points: 934
Mean: 1.195
Std Dev: 0.742
Variance: 0.550
CV: 0.621
Skewness: 2.193
Kurtosis: 5.709
Maximum: 5.000 (6 cut)
75%: 1.345
50% (median): 0.930
25%: 0.740
Minimum: 0.360
Frequency (% of 0 points)
mgo


Histogram for MnO
Points: 934
Mean: 0.284
Std Dev: 0.253
Variance: 0.064
CV: 0.889
Skewness: 2.112
Kurtosis: 6.011
Maximum: 1.870
75%: 0.370
50% (median): 0.200
25%: 0.120
Minimum: 0.010
Frequency (% of 934 points)
mno


Histogram for P2O5
Points: 934
Mean: 0.029
Std Dev: 0.021
Variance: 0.000
CV: 0.724
Skewness: 1.354
Kurtosis: 2.521
Maximum: 0.120
75%: 0.040
50% (median): 0.020
25%: 0.010
Minimum: 0.005
Frequency (% of 934 points)
p2o5

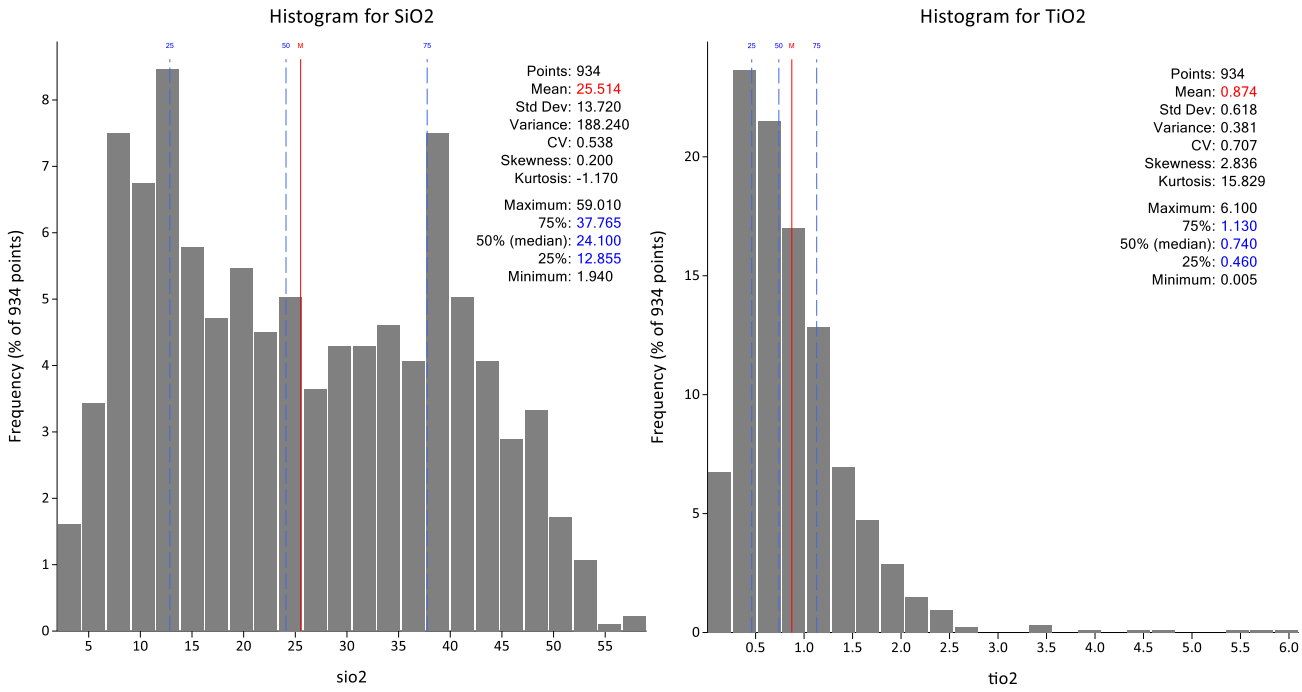
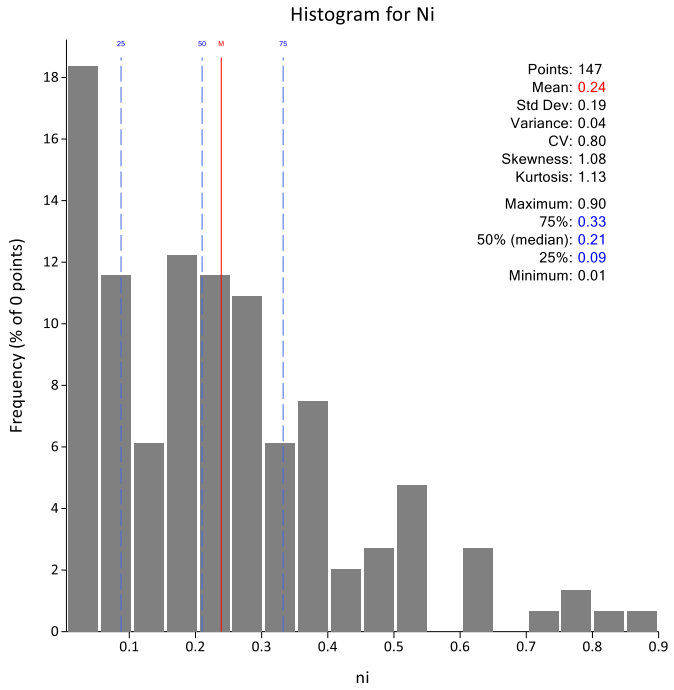
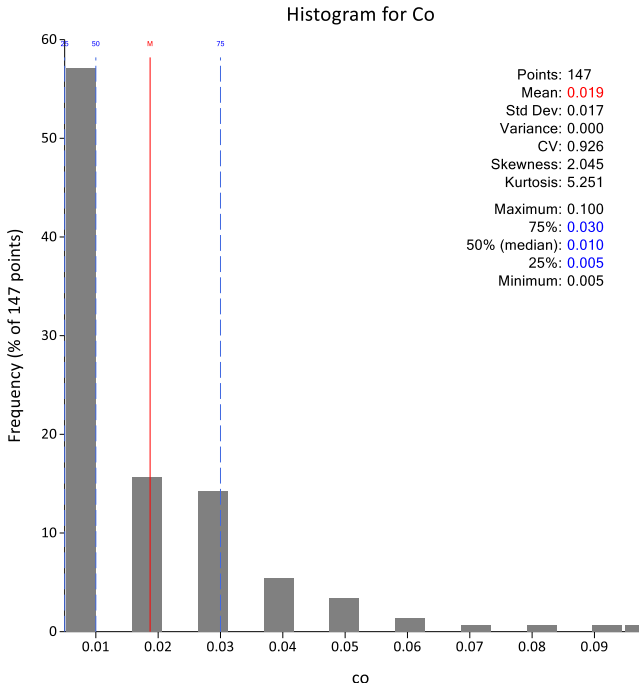
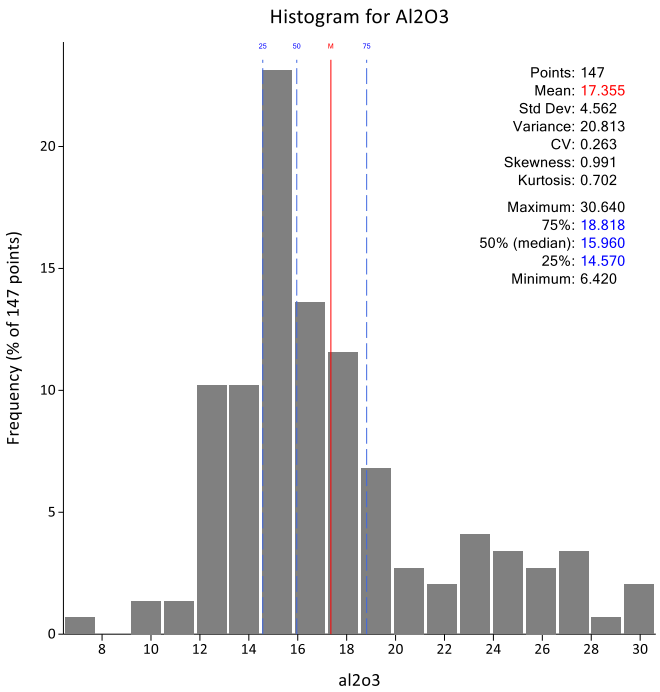
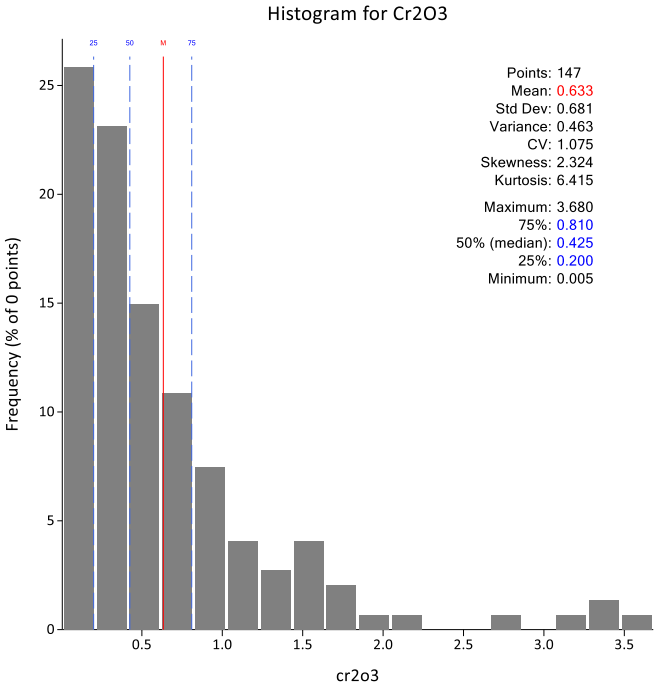


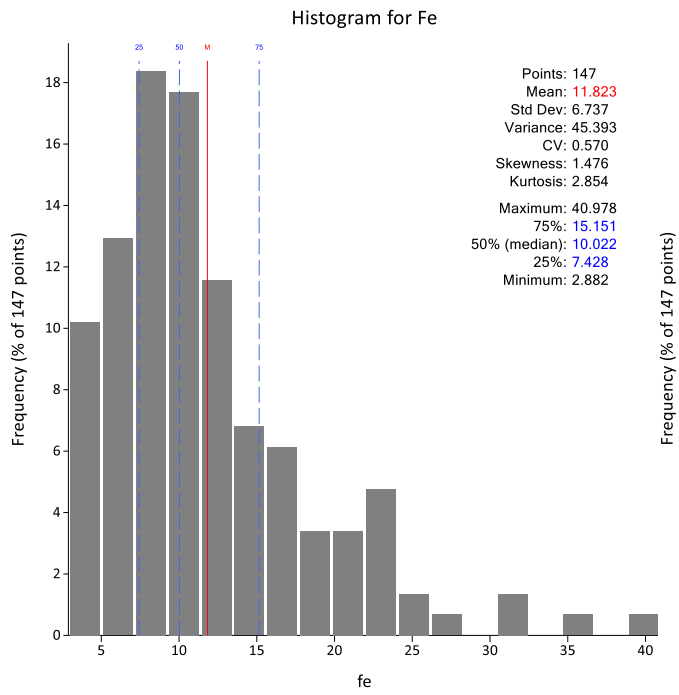
Figure 33 Histogram and Descriptive Statistic of Mud Upper in North50 Block

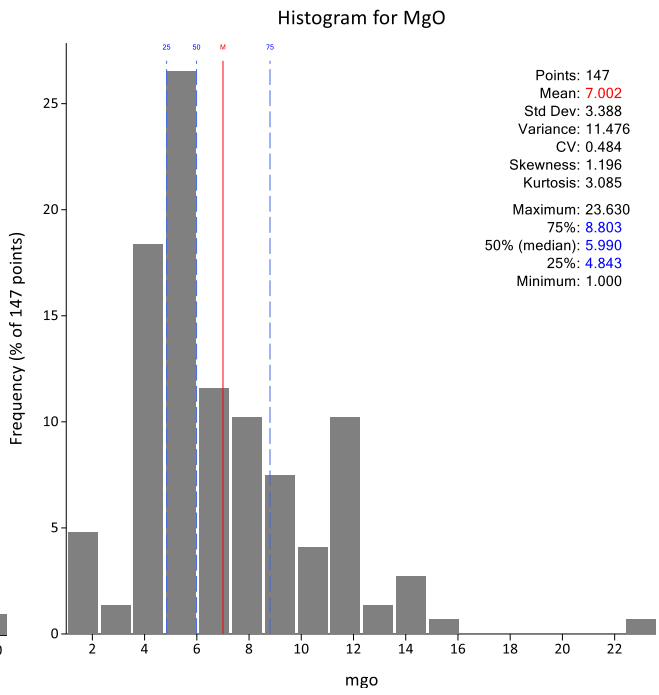

Histogram for Ni
Points: 147
Mean: 0.24
Std Dev: 0.19
Variance: 0.04
CV: 0.80
Skewness: 1.08
Kurtosis: 1.13
Maximum: 0.90
75%: 0.33
50% (median): 0.21
25%: 0.09
Minimum: 0.01
Frequency (% of 0 points)
ni

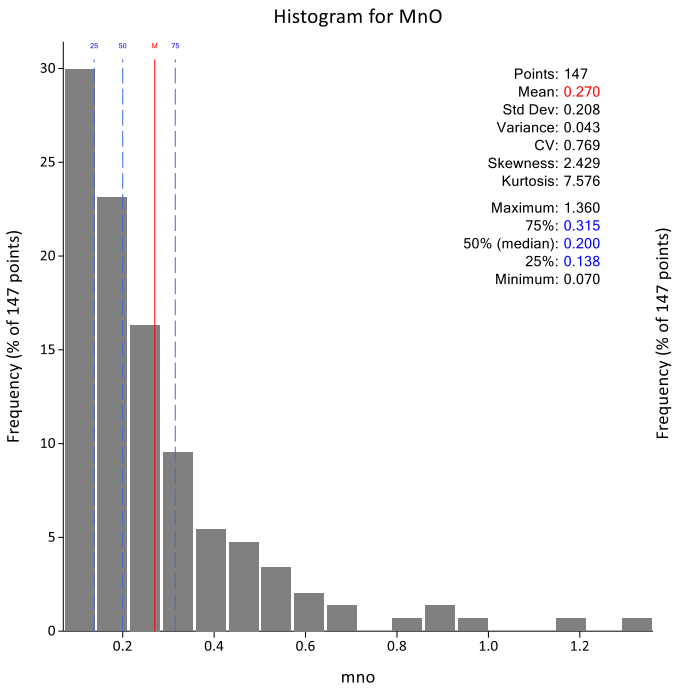

Histogram for Co
Points: 147
Mean: 0.019
Std Dev: 0.017
Variance: 0.000
CV: 0.926
Skewness: 2.045
Kurtosis: 5.251
Maximum: 0.100
75%: 0.030
50% (median): 0.010
25%: 0.005
Minimum: 0.005
Frequency (% of 147 points)
co

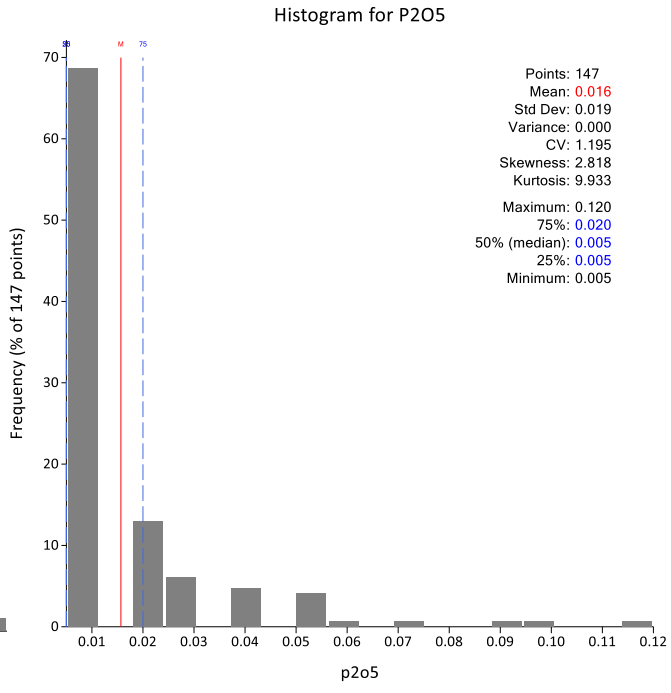

Histogram for Al2O3
Points: 147
Mean: 17.355
Std Dev: 4.562
Variance: 20.813
CV: 0.263
Skewness: 0.991
Kurtosis: 0.702
Maximum: 30.640
75%: 18.818
50% (median): 15.960
25%: 14.570
Minimum: 6.420
Frequency (% of 147 points)
al2o3


Histogram for Cr2O3
Points: 147
Mean: 0.633
Std Dev: 0.681
Variance: 0.463
CV: 1.075
Skewness: 2.324
Kurtosis: 6.415
Maximum: 3.680
75%: 0.810
50% (median): 0.425
25%: 0.200
Minimum: 0.005
Frequency (% of 0 points)
cr2o3


Histogram for Fe
Points: 147
Mean: 11.823
Std Dev: 6.737
Variance: 45.393
CV: 0.570
Skewness: 1.476
Kurtosis: 2.854
Maximum: 40.978
75%: 15.151
50% (median): 10.022
25%: 7.428
Minimum: 2.882
Frequency (% of 147 points)
fe


Histogram for MgO
Points: 147
Mean: 7.002
Std Dev: 3.388
Variance: 11.476
CV: 0.484
Skewness: 1.196
Kurtosis: 3.085
Maximum: 23.630
75%: 8.803
50% (median): 5.990
25%: 4.843
Minimum: 1.000
Frequency (% of 147 points)
mgo


Histogram for MnO
Points: 147
Mean: 0.270
Std Dev: 0.208
Variance: 0.043
CV: 0.769
Skewness: 2.429
Kurtosis: 7.576
Maximum: 1.360
75%: 0.315
50% (median): 0.200
25%: 0.138
Minimum: 0.070
Frequency (% of 147 points)
mno


Histogram for P2O5
Points: 147
Mean: 0.016
Std Dev: 0.019
Variance: 0.000
CV: 1.195
Skewness: 2.818
Kurtosis: 9.933
Maximum: 0.120
75%: 0.020
50% (median): 0.005
25%: 0.005
Minimum: 0.005
Frequency (% of 147 points)
p2o5

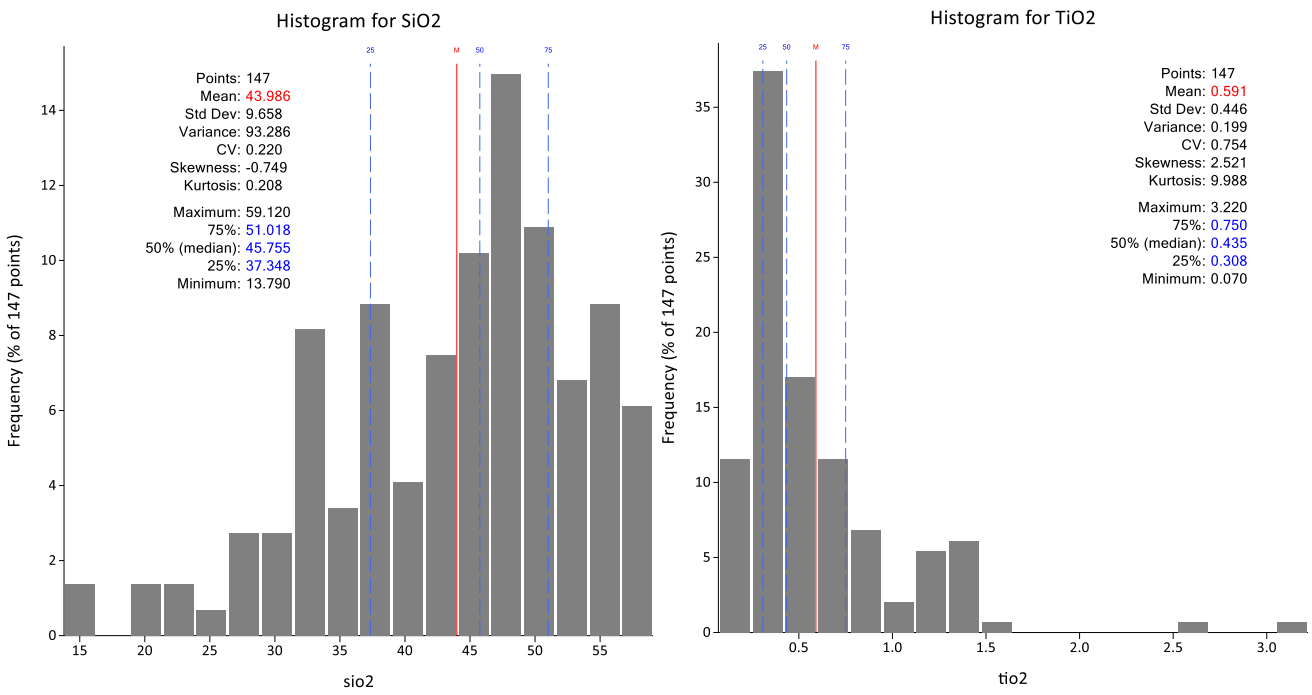
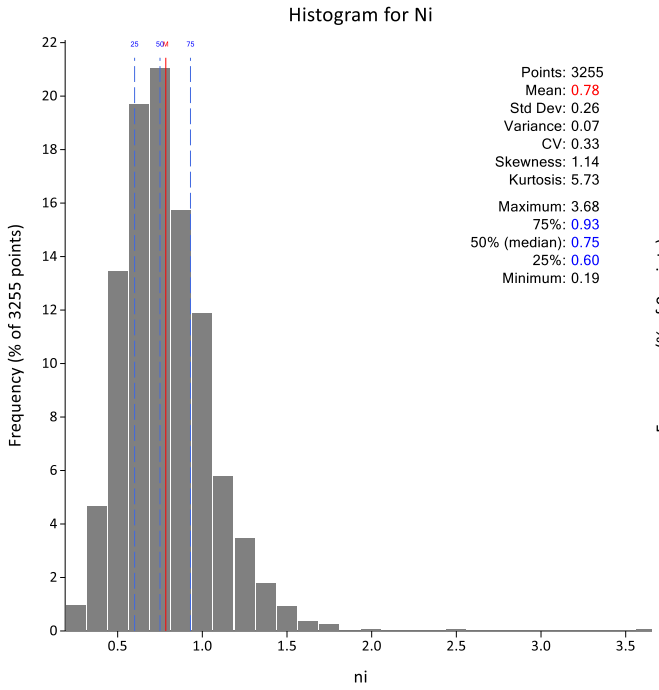
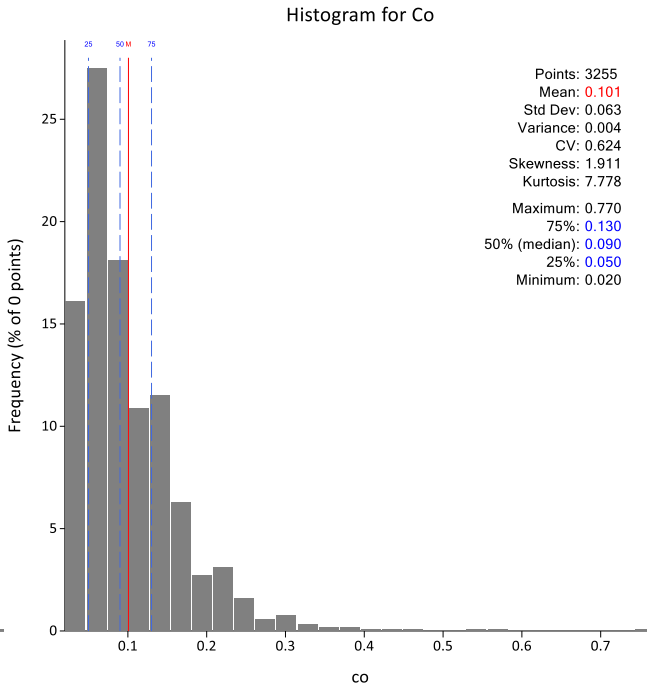
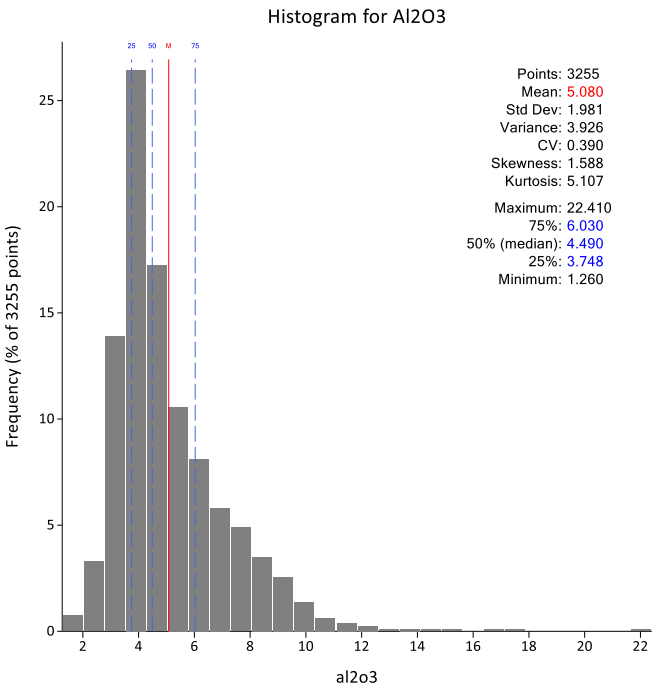
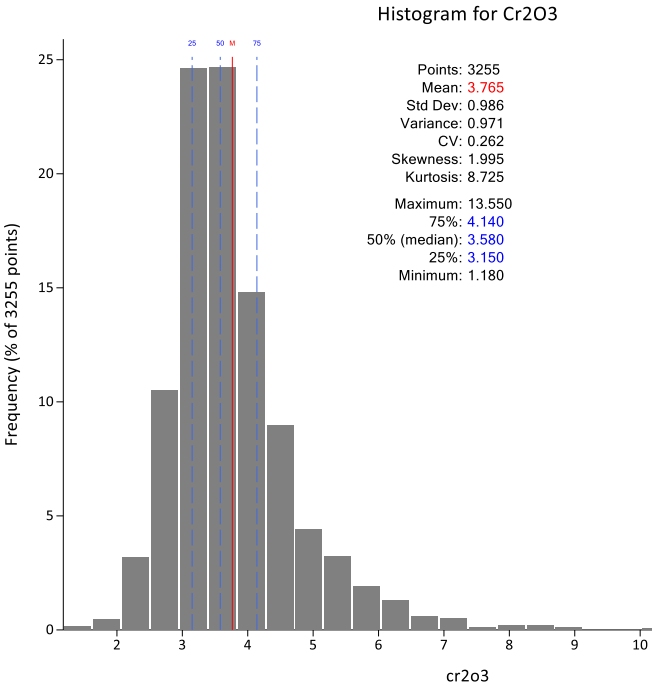


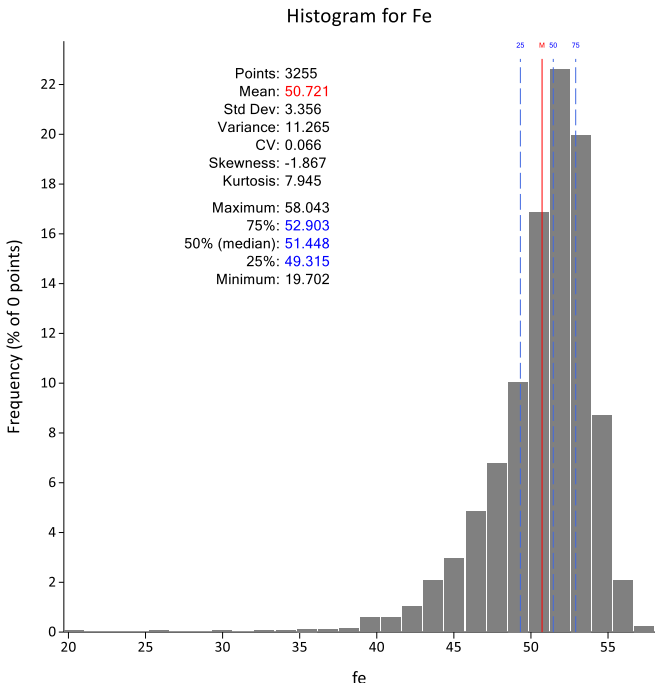
Figure 34 Histogram and Descriptive Statistic of Mud Lower in North50 Block

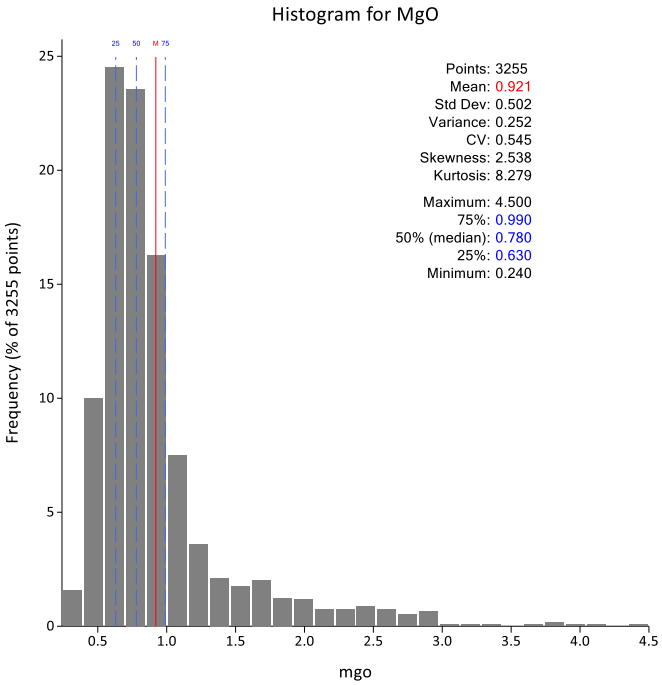

Histogram for Ni
Points: 3255
Mean: 0.78
Std Dev: 0.26
Variance: 0.07
CV: 0.33
Skewness: 1.14
Kurtosis: 5.73
Maximum: 3.68
75%: 0.93
50% (median): 0.75
25%: 0.60
Minimum: 0.19
Frequency (% of 3255 points)
ni

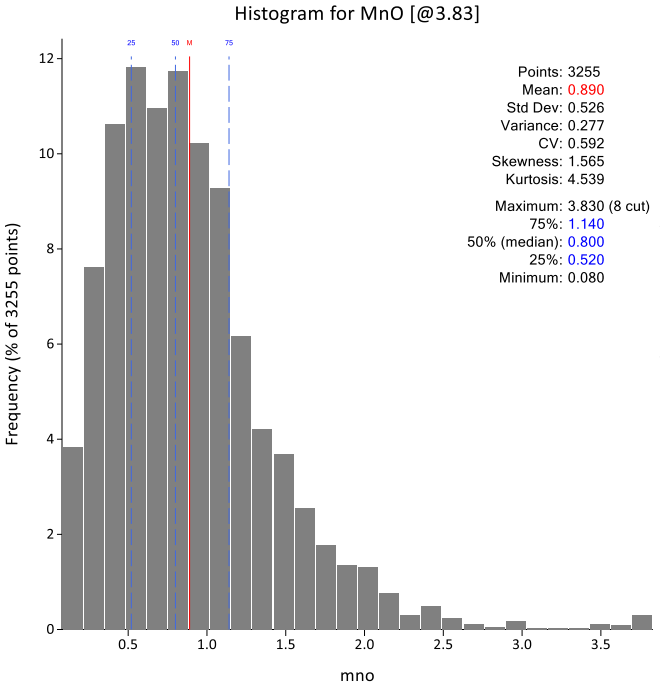

Histogram for Co
Points: 3255
Mean: 0.101
Std Dev: 0.063
Variance: 0.004
CV: 0.624
Skewness: 1.911
Kurtosis: 7.778
Maximum: 0.770
75%: 0.130
50% (median): 0.090
25%: 0.050
Minimum: 0.020
Frequency (% of 0 points)
co

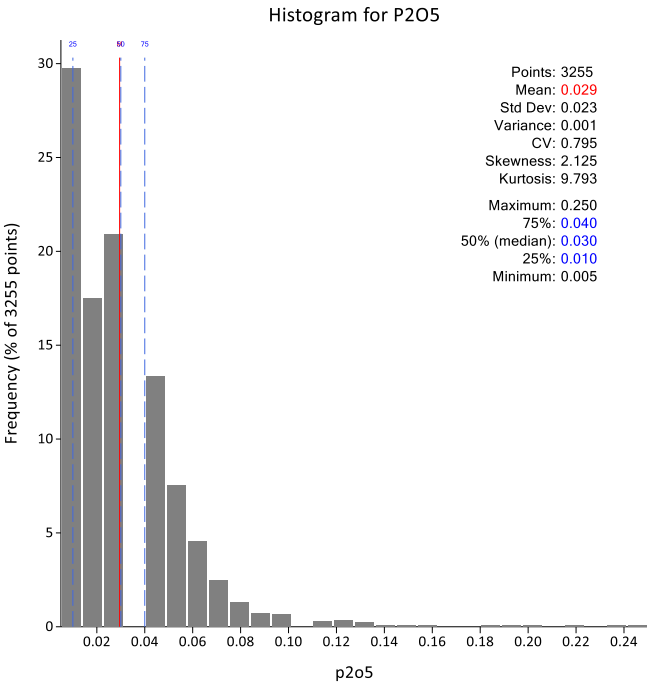

Histogram for Al2O3
Points: 3255
Mean: 5.080
Std Dev: 1.981
Variance: 3.926
CV: 0.390
Skewness: 1.588
Kurtosis: 5.107
Maximum: 22.410
75%: 6.030
50% (median): 4.490
25%: 3.748
Minimum: 1.260
Frequency (% of 3255 points)
al2o3


Histogram for Cr2O3
Points: 3255
Mean: 3.765
Std Dev: 0.986
Variance: 0.971
CV: 0.262
Skewness: 1.995
Kurtosis: 8.725
Maximum: 13.550
75%: 4.140
50% (median): 3.580
25%: 3.150
Minimum: 1.180
Frequency (% of 3255 points)
cr2o3


Histogram for Fe
Points: 3255
Mean: 50.721
Std Dev: 3.356
Variance: 11.265
CV: 0.066
Skewness: -1.867
Kurtosis: 7.945
Maximum: 58.043
75%: 52.903
50% (median): 51.448
25%: 49.315
Minimum: 19.702
Frequency (% of 0 points)
fe


Histogram for MgO
Points: 3255
Mean: 0.921
Std Dev: 0.502
Variance: 0.252
CV: 0.545
Skewness: 2.538
Kurtosis: 8.279
Maximum: 4.500
75%: 0.990
50% (median): 0.780
25%: 0.630
Minimum: 0.240
Frequency (% of 3255 points)
mgo


Histogram for MnO [@3.83]
Points: 3255
Mean: 0.890
Std Dev: 0.526
Variance: 0.277
CV: 0.592
Skewness: 1.565
Kurtosis: 4.539
Maximum: 3.830 (8 cut)
75%: 1.140
50% (median): 0.800
25%: 0.520
Minimum: 0.080
Frequency (% of 3255 points)
mno


Histogram for P2O5
Points: 3255
Mean: 0.029
Std Dev: 0.023
Variance: 0.001
CV: 0.795
Skewness: 2.125
Kurtosis: 9.793
Maximum: 0.250
75%: 0.040
50% (median): 0.030
25%: 0.010
Minimum: 0.005
Frequency (% of 3255 points)
p2o5

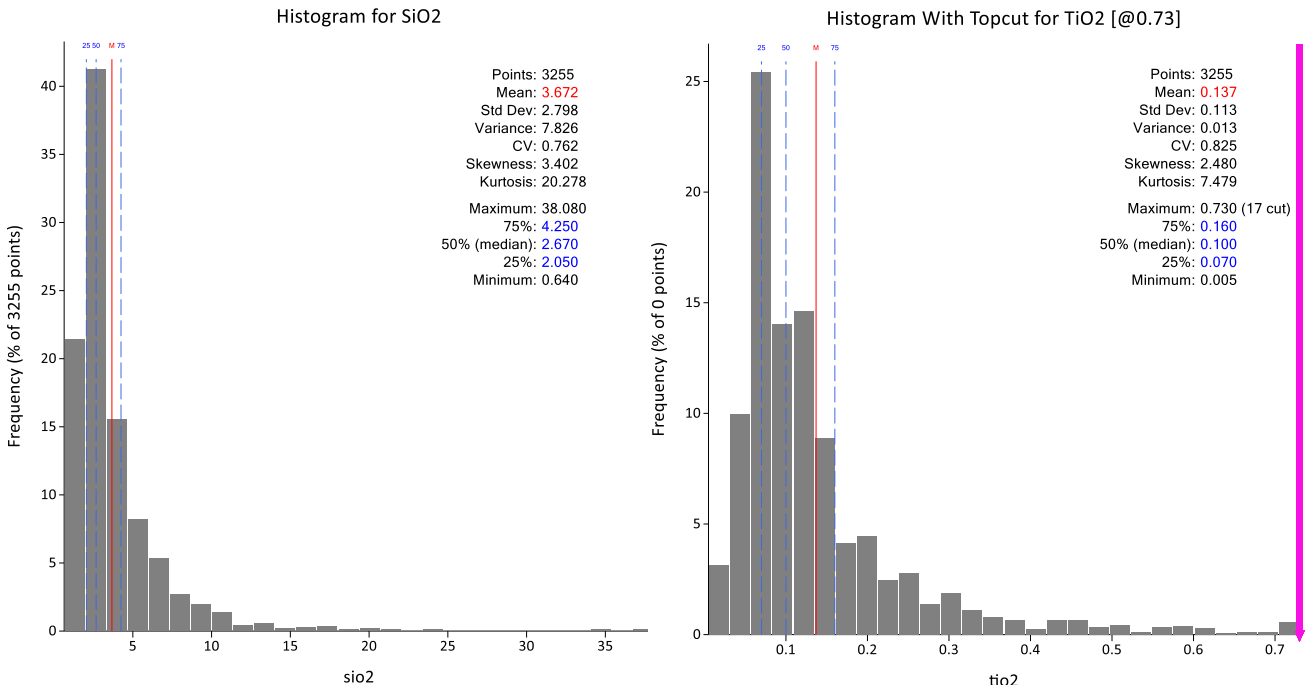
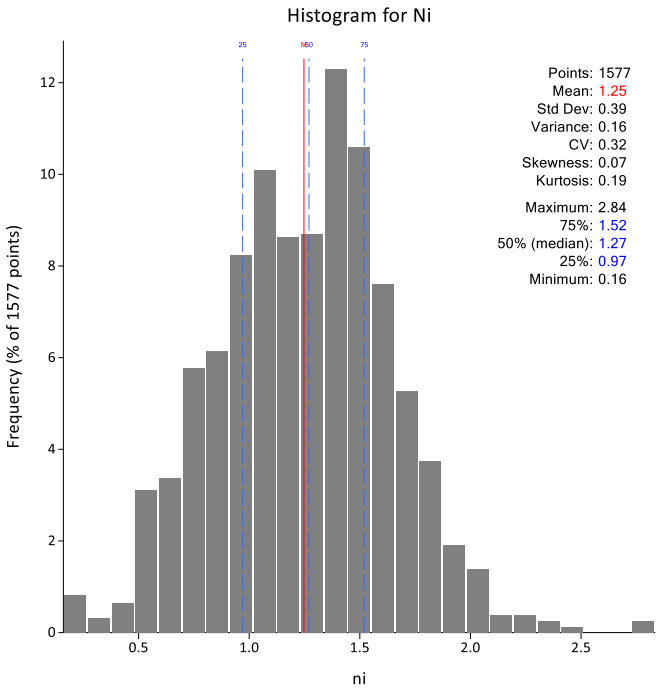
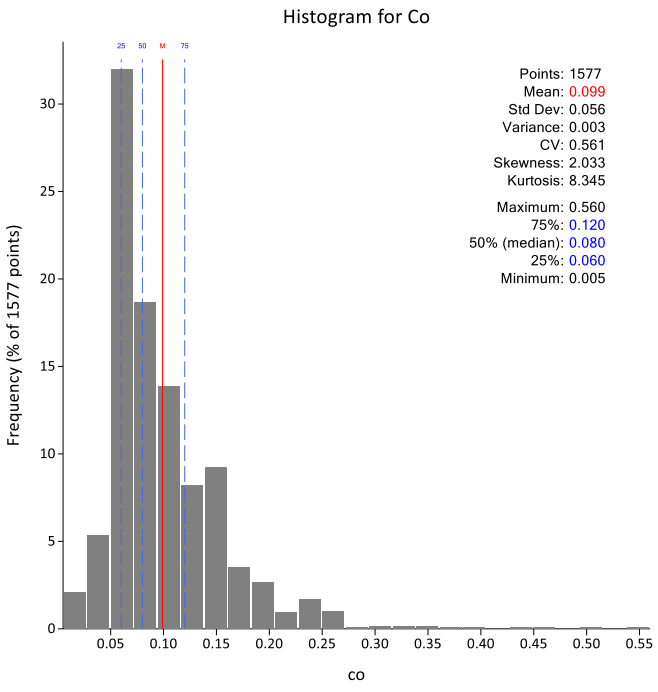
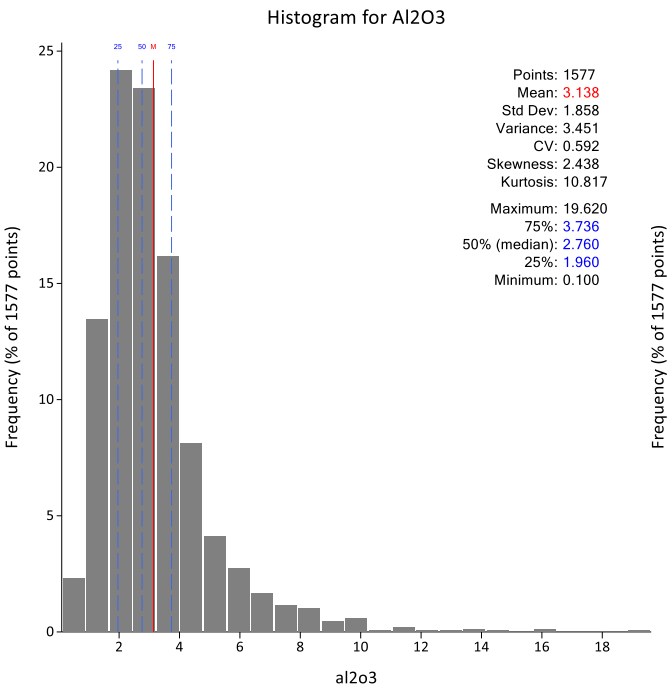
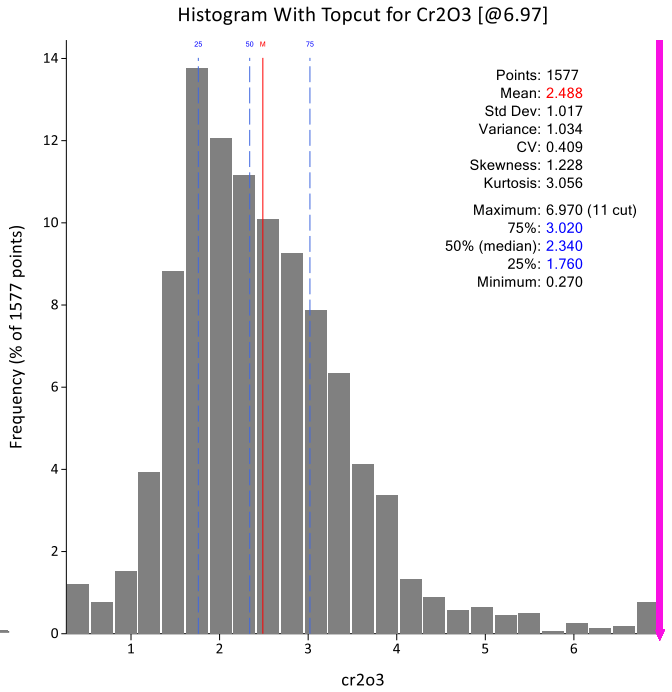


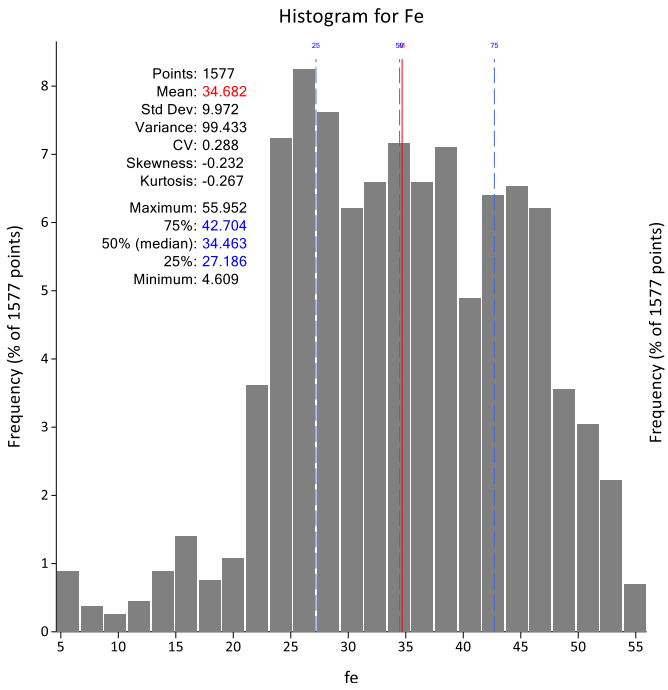
Figure 35 Histogram and Descriptive Statistic of Upper Limonite North50 Block

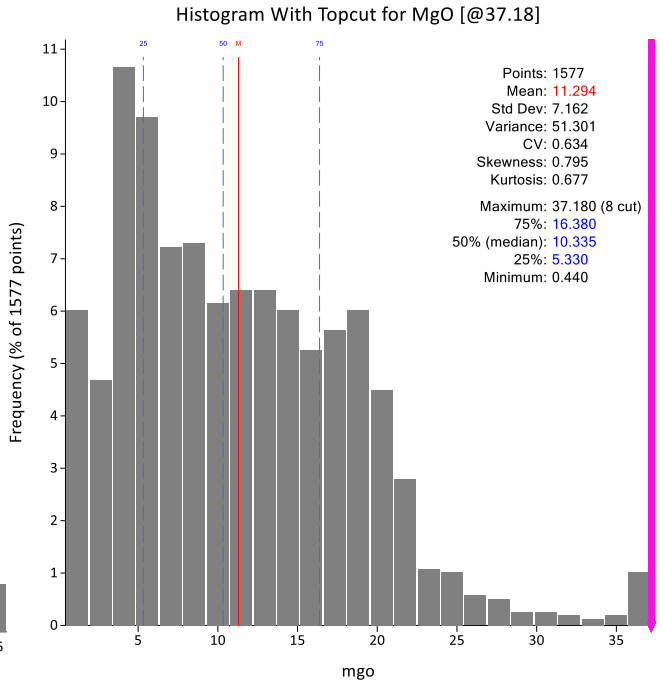

Histogram for Ni
Points: 1577
Mean: 1.25
Std Dev: 0.39
Variance: 0.16
CV: 0.32
Skewness: 0.07
Kurtosis: 0.19
Maximum: 2.84
75%: 1.52
50% (median): 1.27
25%: 0.97
Minimum: 0.16
Frequency (% of 1577 points)
ni

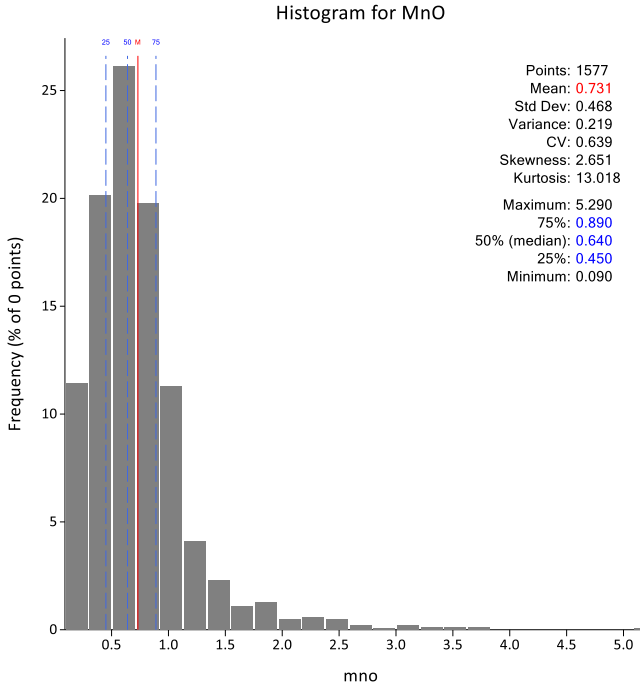

Histogram for Co
Points: 1577
Mean: 0.099
Std Dev: 0.056
Variance: 0.003
CV: 0.561
Skewness: 2.033
Kurtosis: 8.345
Maximum: 0.560
75%: 0.120
50% (median): 0.080
25%: 0.060
Minimum: 0.005
Frequency (% of 1577 points)
co

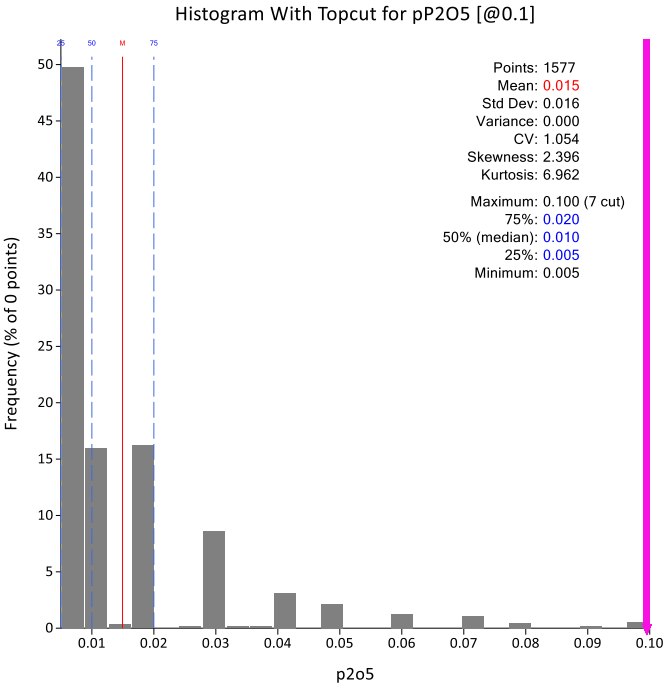

Histogram for Al2O3
Points: 1577
Mean: 3.138
Std Dev: 1.858
Variance: 3.451
CV: 0.592
Skewness: 2.438
Kurtosis: 10.817
Maximum: 19.620
75%: 3.736
50% (median): 2.760
25%: 1.960
Minimum: 0.100
Frequency (% of 1577 points)
al2o3


Histogram With Topcut for Cr2O3 [@6.97]
Points: 1577
Mean: 2.488
Std Dev: 1.017
Variance: 1.034
CV: 0.409
Skewness: 1.228
Kurtosis: 3.056
Maximum: 6.970 (11 cut)
75%: 3.020
50% (median): 2.340
25%: 1.760
Minimum: 0.270
Frequency (% of 1577 points)
cr2o3


Histogram for Fe
Points: 1577
Mean: 34.682
Std Dev: 9.972
Variance: 99.433
CV: 0.288
Skewness: -0.232
Kurtosis: -0.267
Maximum: 55.952
75%: 42.704
50% (median): 34.463
25%: 27.186
Minimum: 4.609
Frequency (% of 1577 points)
fe


Histogram With Topcut for MgO [@37.18]
Points: 1577
Mean: 11.294
Std Dev: 7.162
Variance: 51.301
CV: 0.634
Skewness: 0.795
Kurtosis: 0.677
Maximum: 37.180 (8 cut)
75%: 16.380
50% (median): 10.335
25%: 5.330
Minimum: 0.440
Frequency (% of 1577 points)
mgo


Histogram for MnO
Points: 1577
Mean: 0.731
Std Dev: 0.468
Variance: 0.219
CV: 0.639
Skewness: 2.651
Kurtosis: 13.018
Maximum: 5.290
75%: 0.890
50% (median): 0.640
25%: 0.450
Minimum: 0.090
Frequency (% of 0 points)
mno


Histogram With Topcut for pP2O5 [@0.1]
Points: 1577
Mean: 0.015
Std Dev: 0.016
Variance: 0.000
CV: 1.054
Skewness: 2.396
Kurtosis: 6.962
Maximum: 0.100 (7 cut)
75%: 0.020
50% (median): 0.010
25%: 0.005
Minimum: 0.005
Frequency (% of 0 points)
p2o5

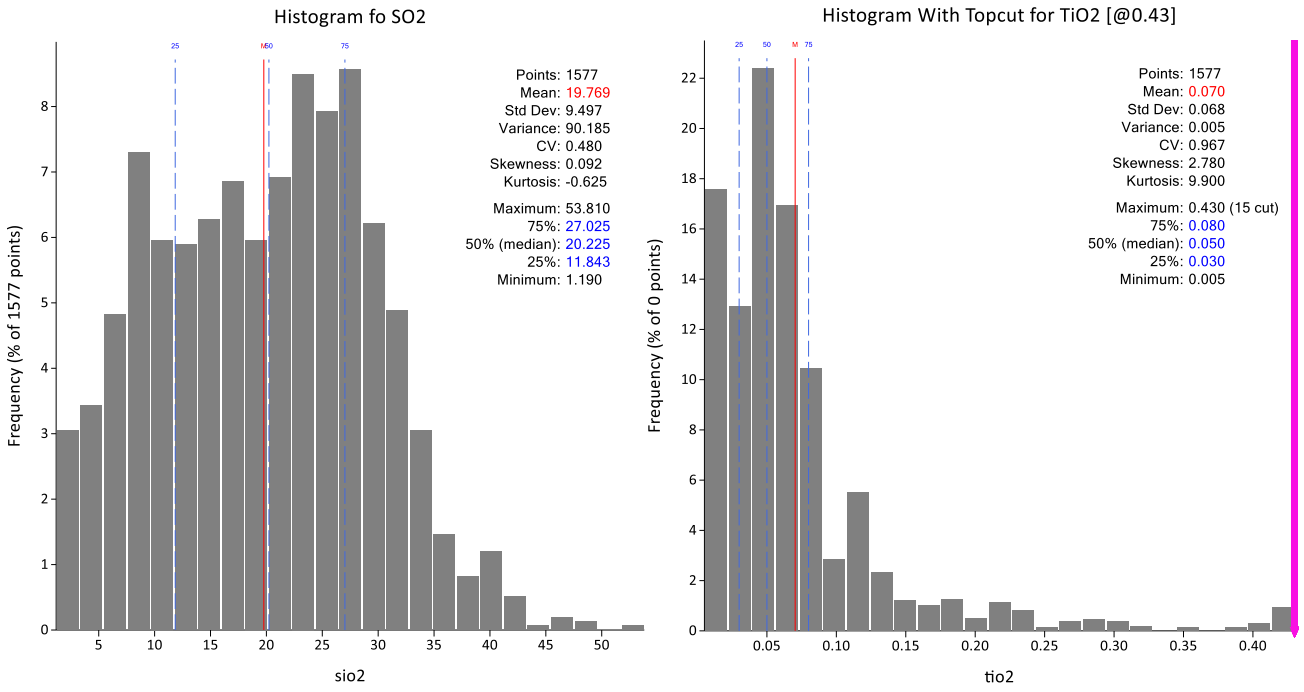
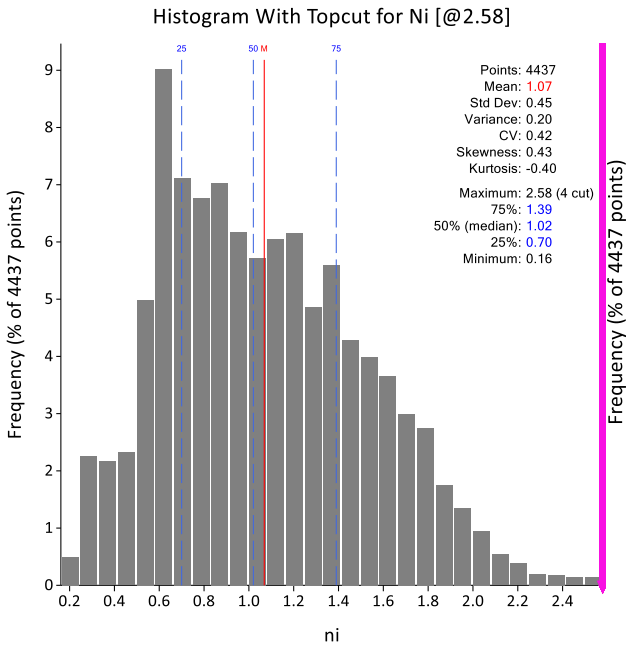
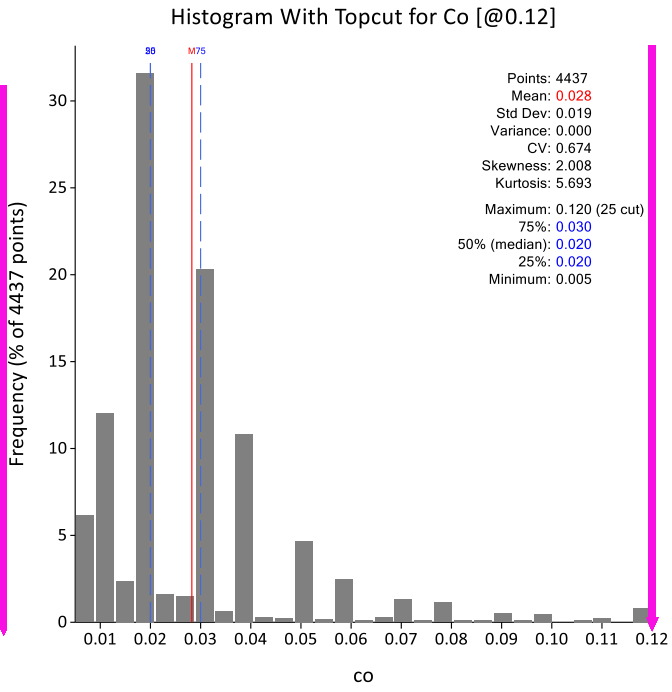
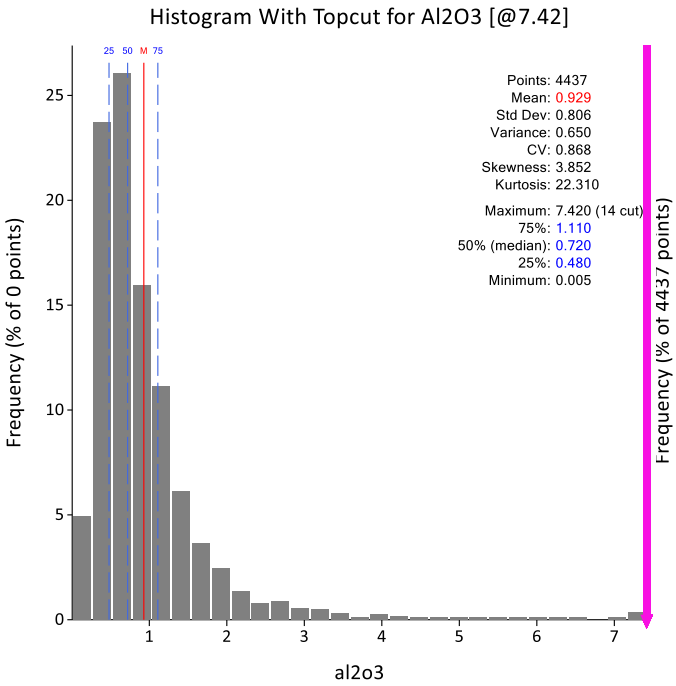
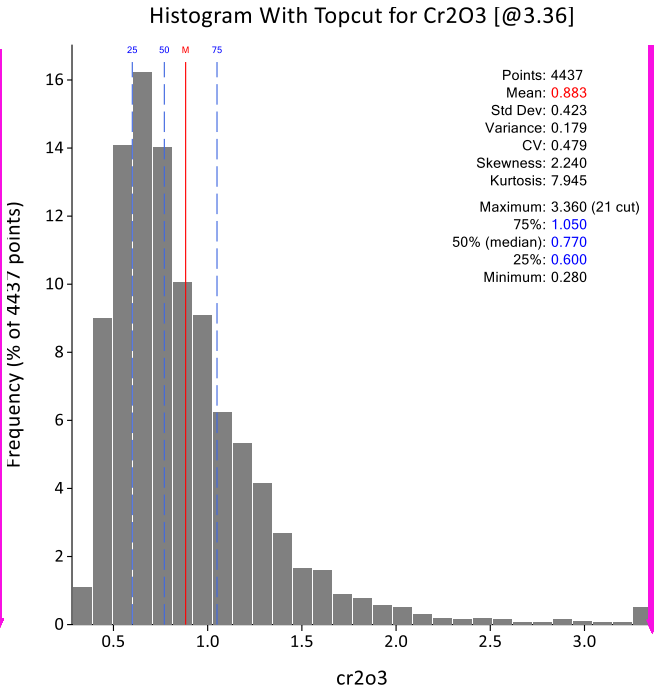


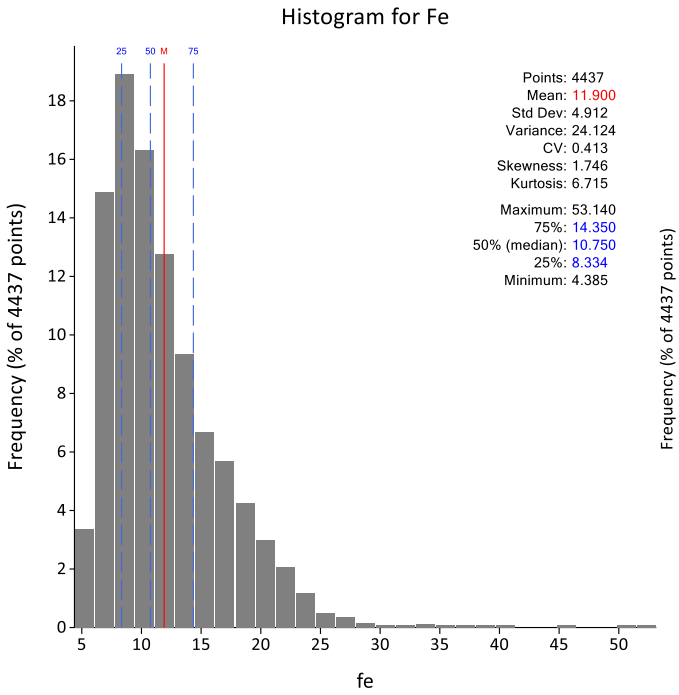
Figure 36 Histogram and Descriptive Statistic of Lower Limonite in North50 Block

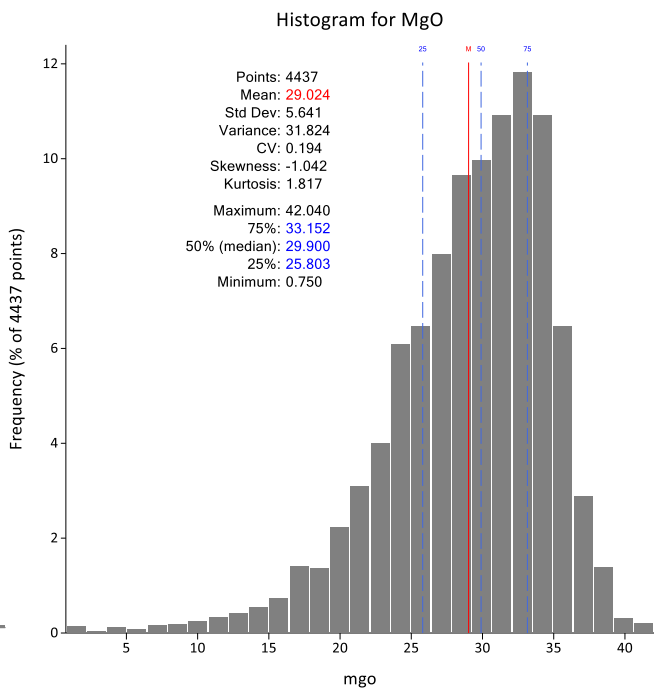

Histogram With Topcut for Ni [@2.58]
Points: 4437
Mean: 1.07
Std Dev: 0.45
Variance: 0.20
CV: 0.42
Skewness: 0.43
Kurtosis: -0.40
Maximum: 2.58 (4 cut)
75%: 1.39
50% (median): 1.02
25%: 0.70
Minimum: 0.16
Frequency (% of 4437 points)
ni

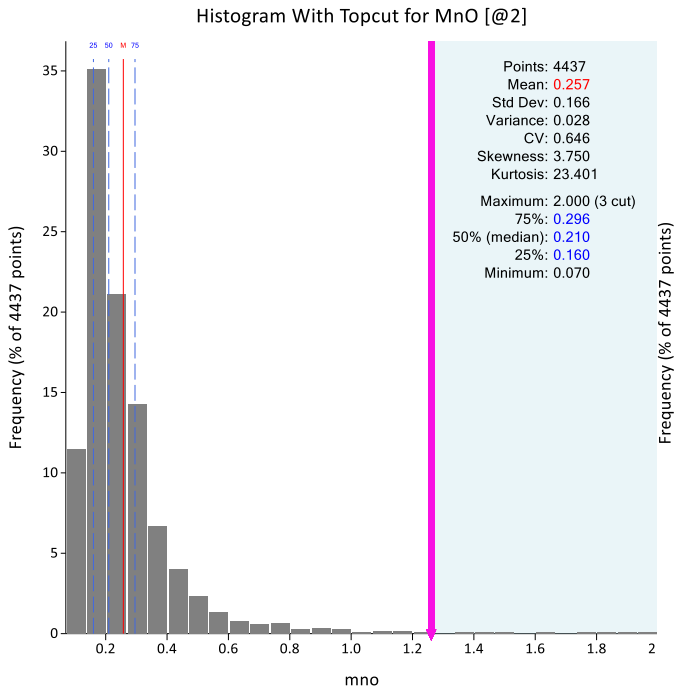

Histogram With Topcut for Co [@0.12]
Points: 4437
Mean: 0.028
Std Dev: 0.019
Variance: 0.000
CV: 0.674
Skewness: 2.008
Kurtosis: 5.693
Maximum: 0.120 (25 cut)
75%: 0.030
50% (median): 0.020
25%: 0.020
Minimum: 0.005
Frequency (% of 4437 points)
co

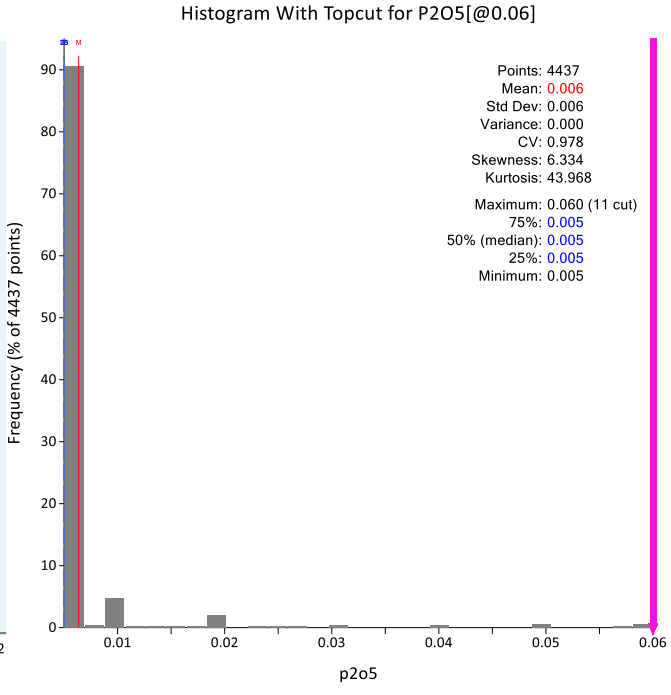

Histogram With Topcut for Al2O3 [@7.42]
Points: 4437
Mean: 0.929
Std Dev: 0.806
Variance: 0.650
CV: 0.868
Skewness: 3.852
Kurtosis: 22.310
Maximum: 7.420 (14 cut)
75%: 1.110
50% (median): 0.720
25%: 0.480
Minimum: 0.005
Frequency (% of 0 points)
al2o3


Histogram With Topcut for Cr2O3 [@3.36]
Points: 4437
Mean: 0.883
Std Dev: 0.423
Variance: 0.179
CV: 0.479
Skewness: 2.240
Kurtosis: 7.945
Maximum: 3.360 (21 cut)
75%: 1.050
50% (median): 0.770
25%: 0.600
Minimum: 0.280
Frequency (% of 4437 points)
cr2o3


Histogram for Fe
Points: 4437
Mean: 11.900
Std Dev: 4.912
Variance: 24.124
CV: 0.413
Skewness: 1.746
Kurtosis: 6.715
Maximum: 53.140
75%: 14.350
50% (median): 10.750
25%: 8.334
Minimum: 4.385
Frequency (% of 4437 points)
fe


Histogram for MgO
Points: 4437
Mean: 29.024
Std Dev: 5.641
Variance: 31.824
CV: 0.194
Skewness: -1.042
Kurtosis: 1.817
Maximum: 42.040
75%: 33.152
50% (median): 29.900
25%: 25.803
Minimum: 0.750
Frequency (% of 4437 points)
mgo


Histogram With Topcut for MnO [@2]
Points: 4437
Mean: 0.257
Std Dev: 0.166
Variance: 0.028
CV: 0.646
Skewness: 3.750
Kurtosis: 23.401
Maximum: 2.000 (3 cut)
75%: 0.296
50% (median): 0.210
25%: 0.160
Minimum: 0.070
Frequency (% of 4437 points)
mno


Histogram With Topcut for P2O5[@0.06]
Points: 4437
Mean: 0.006
Std Dev: 0.006
Variance: 0.000
CV: 0.978
Skewness: 6.334
Kurtosis: 43.968
Maximum: 0.060 (11 cut)
75%: 0.005
50% (median): 0.005
25%: 0.005
Minimum: 0.005
Frequency (% of 4437 points)
p2o5

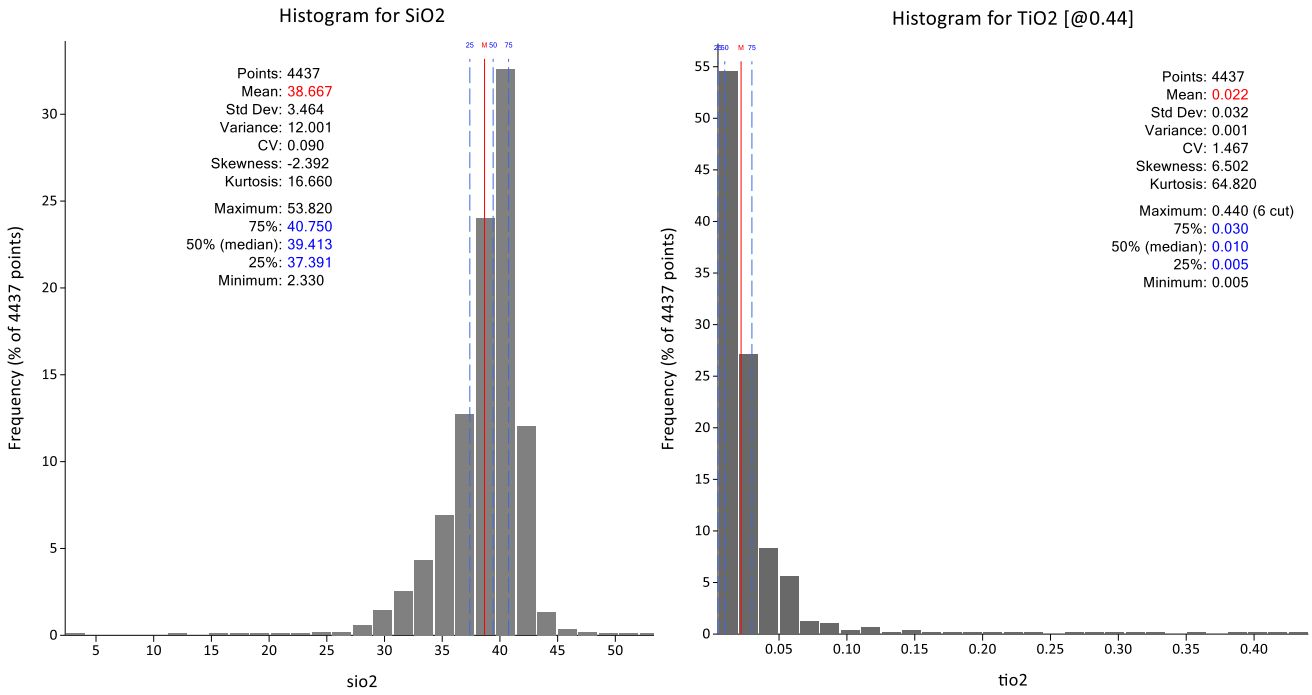


Figure 37 Histogram and Descriptive Statistic of Saprolite in North50 Block

2.3 Variography

Since North50 block has been one of statistical domain base on drill hole spacing, the variography and also the Variogram

2.3.1 Variogram

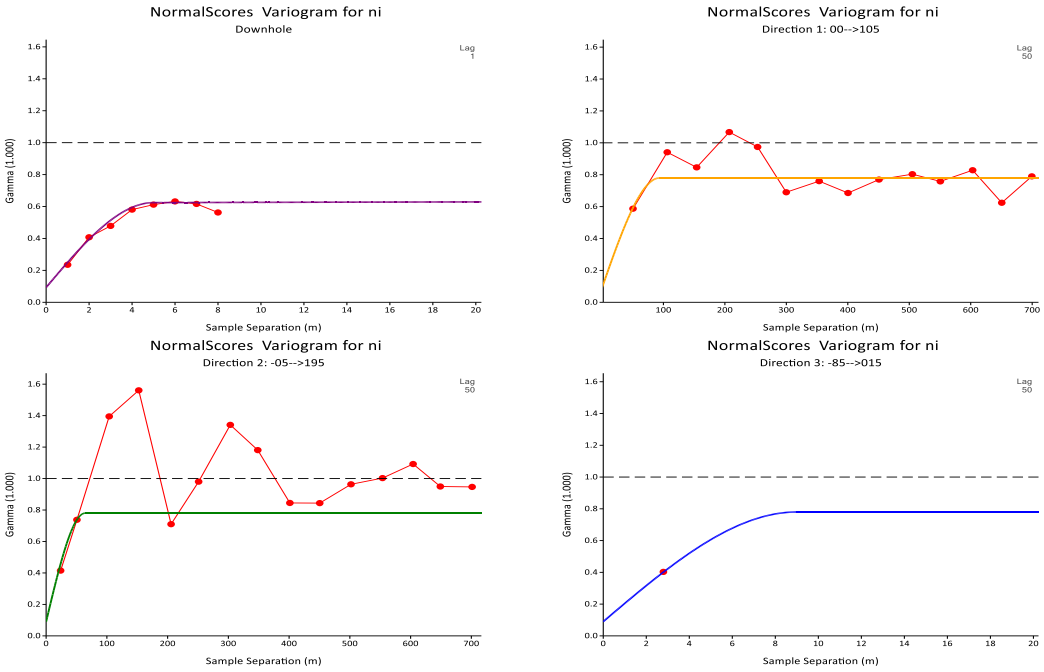


Figure 38 Variogram of Ni Mud Upper in North50 Block

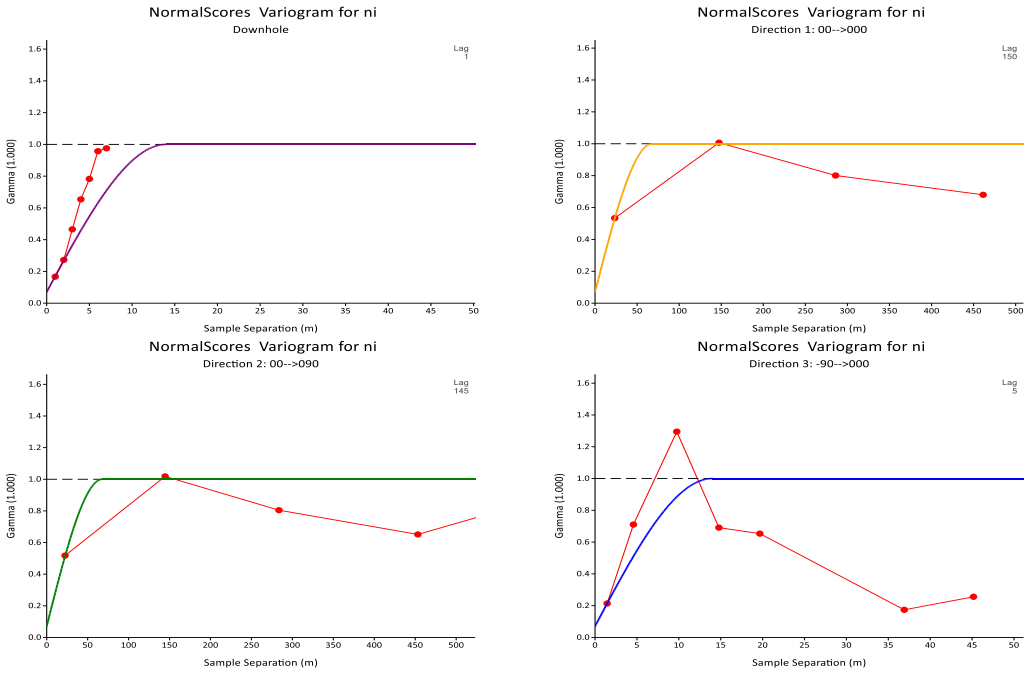


Figure 39 Variogram of Ni Mud Lower in North50 Block

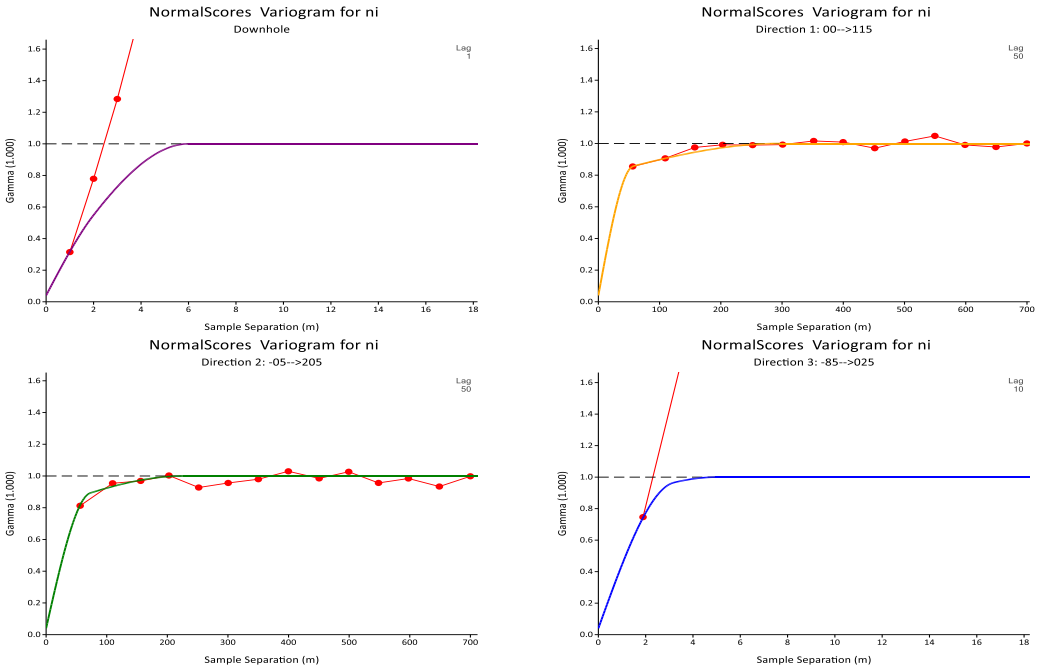


Figure 40

Variogram of Ni lower Limonite North50 Block

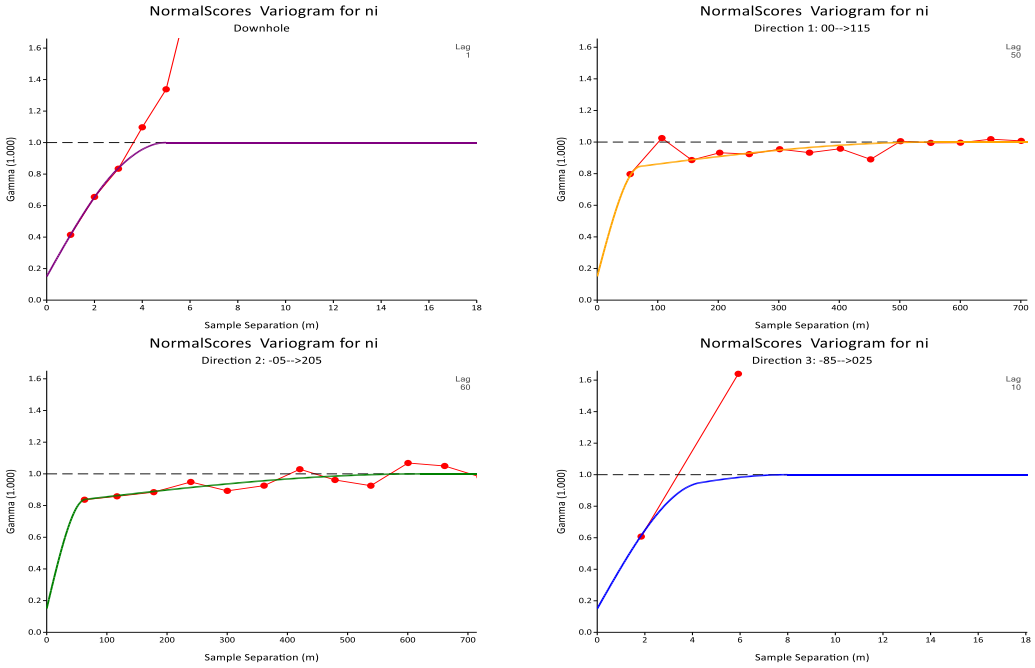


Figure 41 Variogram of Ni Upper Limonite North50 Block

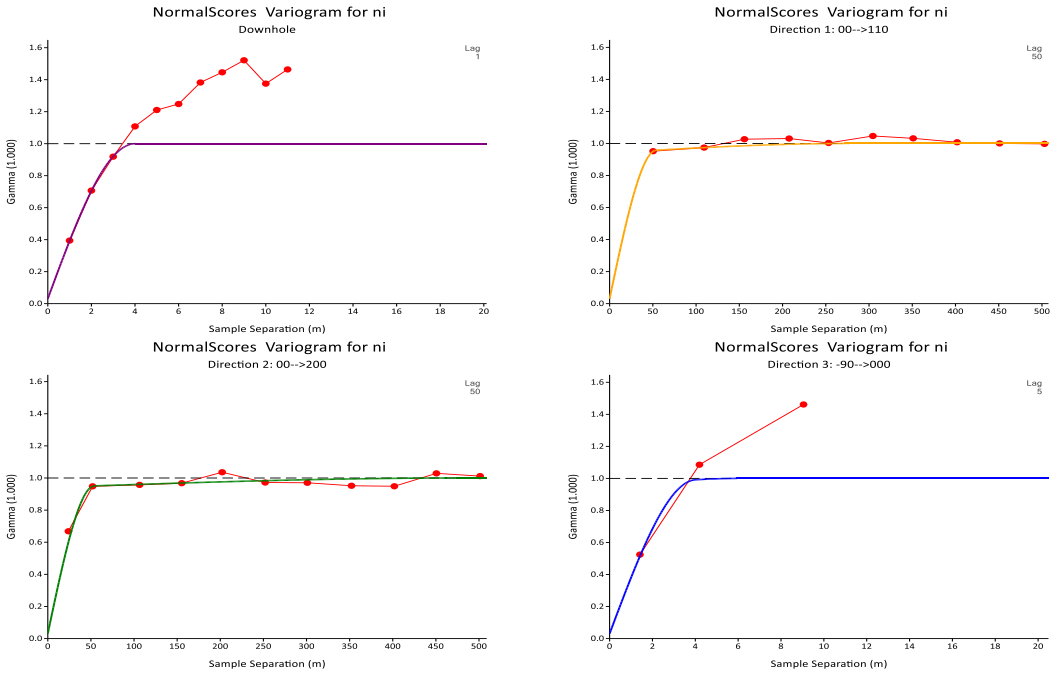


Figure 42 Variogram of Ni Saprolite in North50 Block

2.3.2 Krigging Neighbourhood Analysis

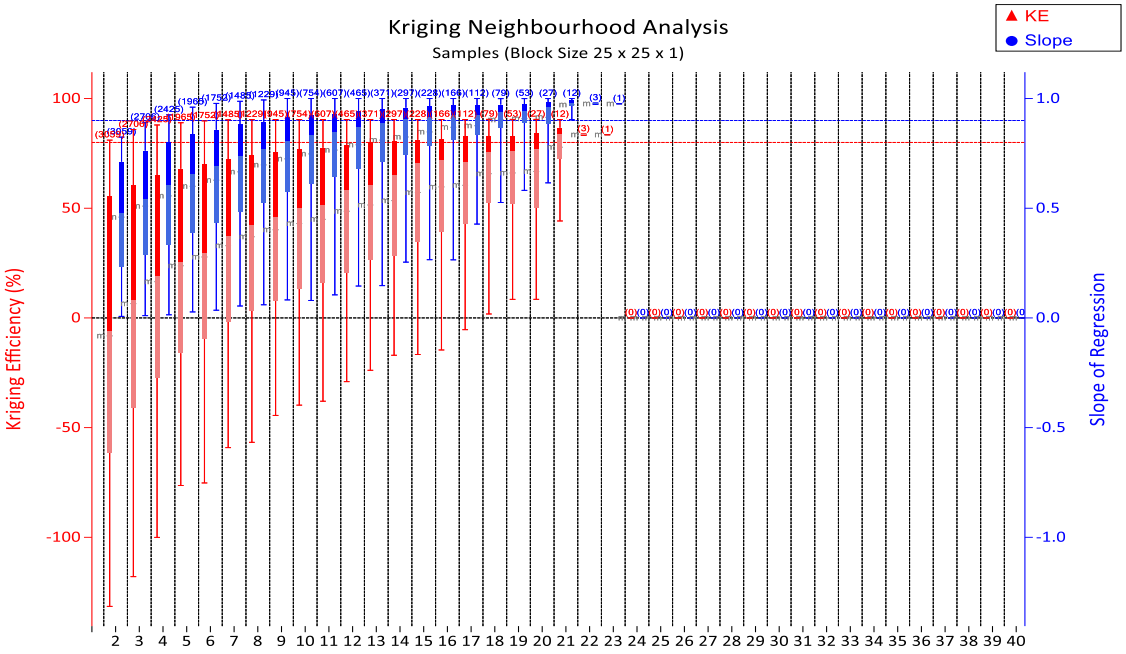


Figure 43 Optimum Number of samples of Mud Upper in North50 Block

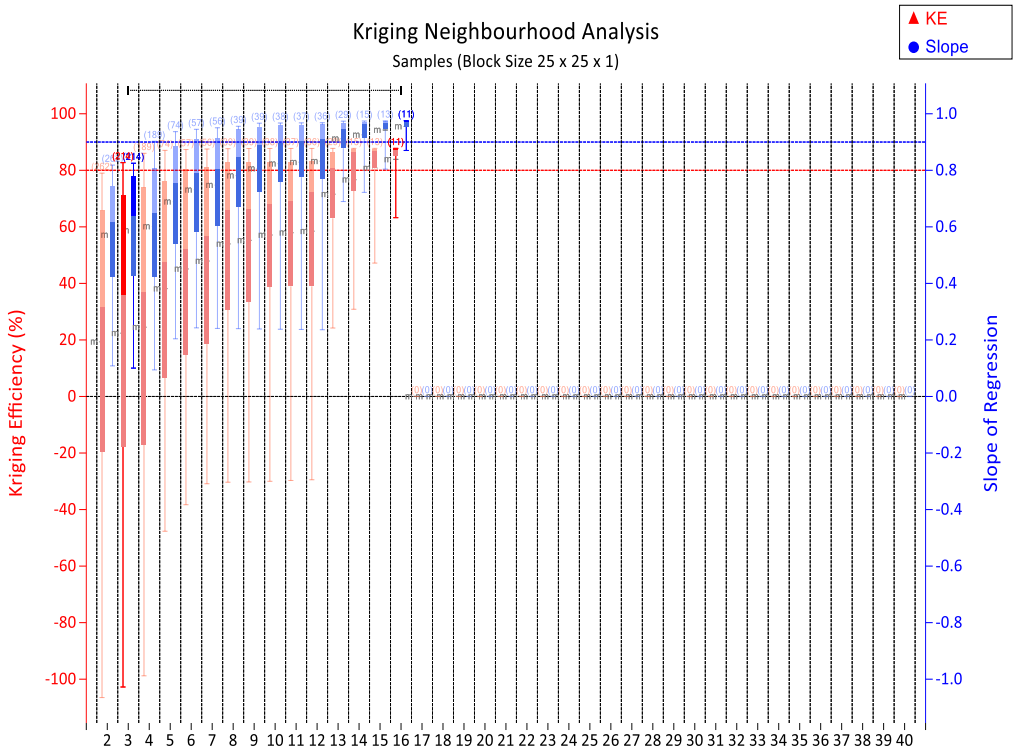


Figure 44 Optimum Number of samples of Mud Lower in North50 Block

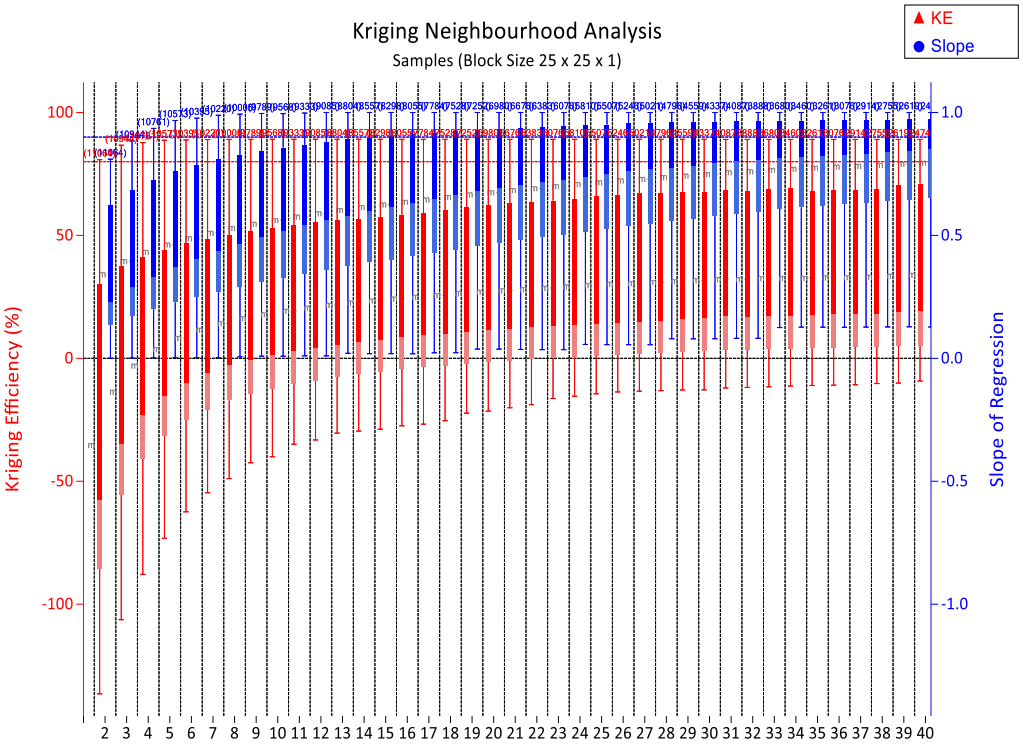


Figure 45 Optimum Number of samples of Upper Limonite in North50 Block

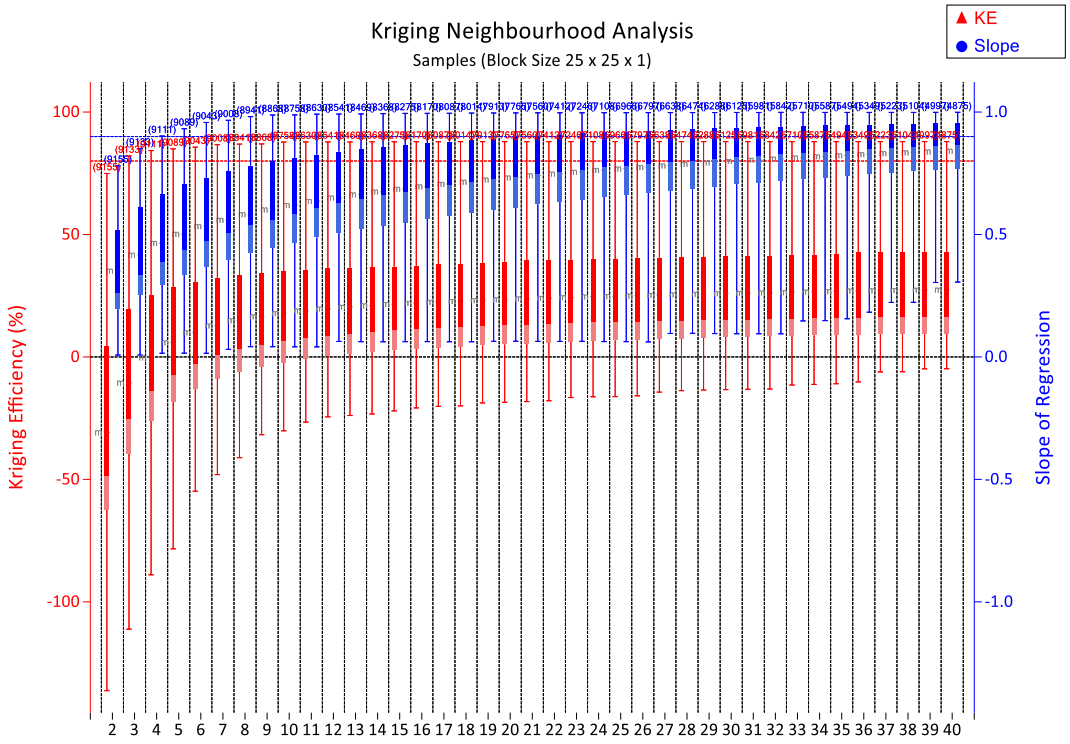


Figure 46 Optimum Number of samples of Lower Limonite in North50 Block

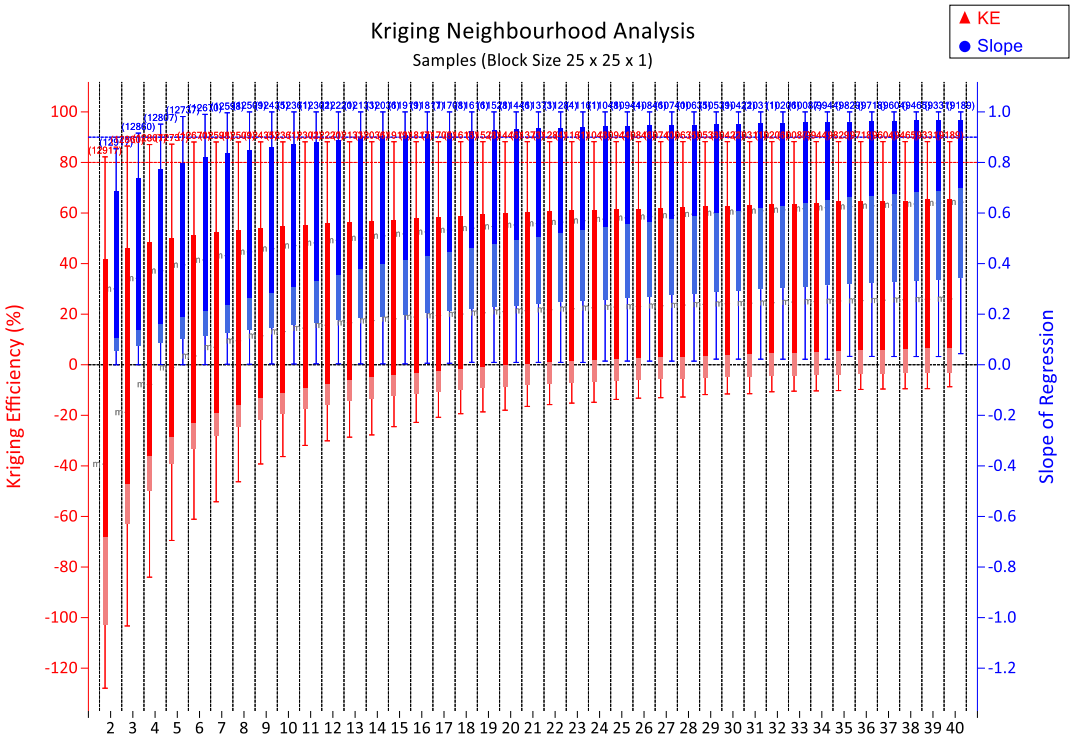


Figure 47 Optimum Number of samples of Saprolite in North50 Block

2.4 Grade Estimation

Table 8 Search parameter of Mud Upper in North50 Block

Parameter	Mud Upper0 (Ni)				Mud Upper (Co)				Mud Upper (Al2O3)				Mud Upper (Cr2O3)				Mud Upper (Fe)			
	Pass 1	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**
Minimum Sample	3	3	2	1	3	3	2	1	3	3	2	1	3	3	2	1	3	3	2	1
Maximum Sample	22				28				22				18				22			
Max. Search Radius	75	150	300	600	75	150	300	600	75	150	300	600	75	150	300	600	75	150	300	600
Max. Vertical Distance	7	14	29	57	6	11	22	44	7	13	26	53	6	13	26	52	6	12	24	49
Bearing	105				105				95.055				110.019				105.149			
Plunge	0				0				1.293				0.435				1.728			
Dip	-5				0				-4.83				-4.981				-9.851			
Major/Semi-major	1.469				1.188				1.012				1.328				1.278			
Major/Minor	10.44				13.57				11.33				11.56				12.27			
Nugget	0.09				0.08				0.1				0.02				0.02			
Structure 1	0.69				0.92				0.63				0.75				0.78			
Range	94				95				85				89				92			
Block Discretisation	5 X 5 X 2				5 X 5 X 2				5 X 5 X 2				5 X 5 X 2				5 X 5 X 2			

Parameter	Mud Upper (MgO)				Mud Upper (MnO)				Mud Upper (P2O5)				Mud Upper (SiO2)				Mud Upper (TiO2)			
	Pass 1	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**
Minimum Sample	4	4	2	1	4	4	2	1	3	3	2	1	3	3	2	1	3	3	2	1
Maximum Sample	16				12				29				28				18			
Max. Search Radius	75	150	300	600	75	150	300	600	75	150	300	600	75	150	300	600	75	150	300	600
Max. Vertical Distance	4	7	15	30	5	10	21	41	7	15	29	59	6	12	23	47	6	12	24	48
Bearing	100.149				100.218				100.037				105				100.019			
Plunge	1.728				2.576				0.867				0				0.435			
Dip	-9.851				-9.666				-4.924				-5				-4.981			
Major/Semi-major	1.466				1.554				1.022				1.055				1.354			
Major/Minor	20.19				14.50				10.22				12.80				12.57			
Nugget	0.07				0.04				0.04				0.01				0.1			
Structure 1	0.66				0.96				0.78				0.73				0.58			
Range	107				87				92				96				88			
Block Discretisation	5 X 5 X 2				5 X 5 X 2				5 X 5 X 2				5 X 5 X 2				5 X 5 X 2			

Table 9 Search parameter of Mud Lower in North50 Block

Parameter	Mud Lower (Ni)				Mud Lower(Co)				Mud Lower (Al2O3)				Mud Lower (Cr2O3)				Mud Lower (Fe)			
	Pass 1	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**
Minimum Sample	3	3	2	1	3	3	2	1	3	3	2	1	3	3	2	1	3	3	2	1
Maximum Sample	16				15				16				16				14			
Max. Search Radius	75	150	300	600	75	150	300	600	75	150	300	600	75	150	300	600	75	150	300	600
Max. Vertical Distance	15	31	62	124	6	11	22	44	4	7	14	28	5	9	18	37	6	11	23	45
Bearing	0				0				0				0				0			
Plunge	0				0				0				0				0			
Dip	0				0				0				0				0			
Major/Semi-major	1.000				1.000				1.000				1.000				1.000			
Major/Minor	4.86				13.6				21.16				16.40				13.20			
Nugget	0.07				0.05				0.17				0.02				0.05			
Structure 1	0.93				0.76				0.83				0.77				0.66			
Range	68				68				91				82				66			
Block Discretisation	5 X 5 X 2				5 X 5 X 2				5 X 5 X 2				5 X 5 X 2				5 X 5 X 2			

Parameter	Mud Lower (MgO)				Mud Lower (MnO)				Mud Lower (P2O5)				Mud Lower (SiO2)				Mud Lower (TiO2)			
	Pass 1	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**
Minimum Sample	3	3	2	1	3	3	2	1	3	3	2	1	3	3	2	1	3	3	2	1
Maximum Sample	16				16				14				14				17			
Max. Search Radius	75	150	300	600	75	150	300	600	75	150	300	600	75	150	300	600	75	150	300	600
Max. Vertical Distance	7	13	27	53	6	12	23	46	4	9	17	34	6	12	23	46	8	15	31	62
Bearing	0				0				0				0				0			
Plunge	0				0				0				0				0			
Dip	0				0				0				0				0			
Major/Semi-major	1.000				1.000				1.000				1.000				1.000			
Major/Minor	11.23				13.00				17.50				13.00				9.75			
Nugget	0.11				0.18				0.12				0.02				0.02			
Structure 1	0.73				0.77				0.43				0.96				0.64			
Range	73				78				70				65				78			
Block Discretisation	5 X 5 X 2				5 X 5 X 2				5 X 5 X 2				5 X 5 X 2				5 X 5 X 2			

Table 10 Search parameter of Upper Limonite in North50 Block

Parameter	Upper Limonite(Ni)					Upper Limonite(Co)				Upper Limonite(Al2O3)				Upper Limonite(Cr2O3)				Upper Limonite(Fe)			
	Pass 1	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 5**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**
Minimum Sample	5	4	2	1	1	4	4	2	1	3	3	2	1	3	3	2	1	3	3	2	1
Maximum Sample	40					20				28				18				25			
Max. Search Radius	75	150	300	600	1200	75	150	300	600	75	150	300	600	75	150	300	600	75	150	300	600
Max. Vertical Distance	2	3	5	10	20	2	4	8	17	5	10	19	39	4	9	18	35	4	8	17	34
Bearing	115					120				115				110.037				105.037			
Plunge	0					0				0				0.867				0.867			
Dip	0					-5				0				-4.924				-4.924			
Major/Semi-major 1	0.781					1.162				1.000				1.140				1.086			
Major/Semi-major 2	1.300									-				-				-			
Major/Minor 1	17.81					35.83				15.5				17.11				17.67			
Major/Minor 2	59.00					-				-				-				-			
Nugget	0.04					0.1				0.01				0.01				0.04			
Structure 1	0.76					0.9				0.67				0.92				0.71			
Structure 2	0.2					-				-				-				-			
Range 1	5					86				93				65				76			
Range 2	295					-				-				-				-			
Block Discretisation	5 X 5 X 2					5 X 5 X 2				5 X 5 X 2				5 X 5 X 2				5 X 5 X 2			

Parameter	Upper Limonite(MgO)				Upper Limonite(MnO)				Upper Limonite(P2O5)				Upper Limonite(SiO2)				Upper Limonite(TiO2)			
	Pass 1	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**
Minimum Sample	3	3	2	1	3	3	2	1	3	3	2	1	3	3	2	1	3	3	2	1
Maximum Sample	27				22				22				25				25			
Max. Search Radius	75	150	300	600	75	150	300	600	75	150	300	600	75	150	300	600	75	150	300	600
Max. Vertical Distance	3	7	14	28	4	8	16	32	7	14	27	55	5	9	19	37	4	9	17	35
Bearing	105.037				110.019				105.037				100				115			
Plunge	0.867				0.435				0.867				0				0			
Dip	-4.924				-4.981				-4.924				0				0			
Major/Semi-major	1.037				1.038				1.000				1.052				1.000			
Major/Minor	21.54				18.88				10.93				16.2				17.29			
Nugget	0.03				0.1				0.04				0.03				0.01			
Structure 1	0.97				0.9				0.91				0.74				0.75			
Range	84				81				82				81				83			
Block Discretisation	5 X 5 X 2				5 X 5 X 2				5x5x2				5 X 5 X 2				5 X 5 X 2			

Table 11 Search parameter of Lower Limonite in North0 Block

Parameter	Lower Limonite(Ni)					Lower Limonite(Co)				Lower Limonite(Al2O3)				Lower Limonite(Cr2O3)				Lower Limonite(Fe)			
	Pass 1	Pass 2	Pass 3	Pass 4	Pass 5	Pass 1	Pass 2	Pass 3	Pass 4	Pass 1	Pass 2	Pass 3	Pass 4	Pass 1	Pass 2	Pass 3	Pass 4	Pass 1	Pass 2	Pass 3	Pass 4
Minimum Sample	5	4	2	1	1	4	3	2	1	3	3	2	1	5	4	2	1	3	3	2	1
Maximum Sample	40					11				18				17				12			
Max. Search Radius	75	150	300	600	1200	75	150	300	600	75	150	300	600	75	150	300	600	75	150	300	600
Max. Vertical Distance	2	2	4	9	17	3	7	13	27	2	5	9	19	2	4	8	15	2	4	9	17
Bearing	105.037					105.019				110				105.037				100.037			
Plunge	0.867					0.435				0				0.867				0.867			
Dip	-4.924					-4.981				0				-4.924				-4.924			
Major/Semi-major 1	1.109					1.000				1.085				1.406				1.000			
Major/Semi-major 2	0.893					-				-				-				-			
Major/Minor 1	16.51					22.33				32.08				38.8				34.5			
Major/Minor 2	69.63					-				-				-				-			
Nugget	0.15					0.09				0.15				0.32				0.1			
Structure 1	0.66					0.91				0.66				0.68				0.9			
Structure 2	0.19					-				-				-				-			
Range 1	71					67				77				97				69			
Range 2	557					-				-				-				-			
Block Discretisation	5 X 5 X 2					5 X 5 X 2				5 X 5 X 2				5 X 5 X 2				5 X 5 X 2			

Parameter	Lower Limonite(MgO)				Lower Limonite(MnO)				Lower Limonite(P2O5)				Lower Limonite(SiO2)				Lower Limonite(TiO2)			
	Pass 1	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**
Minimum Sample	3	3	2	1	5	4	2	1	4	4	2	1	4	4	2	1	4	4	2	1
Maximum Sample	40				15				19				14				17			
Max. Search Radius	75	150	300	600	75	150	300	600	75	150	300	600	75	150	300	600	75	150	300	600
Max. Vertical Distance	16	33	65	130	3	5	11	21	7	14	29	58	2	3	6	13	4	9	17	35
Bearing	120				110.076				100.149				110				120			
Plunge	0				0.867				1.728				0				0			
Dip	-5				-9.963				-9.851				-5				-5			
Major/Semi-major 1	0.899				1.366				1.000				1.441				1.062			
Major/Semi-major 2	1.010				-				-				-				-			
Major/Minor 1	1.40				28.53				10.43				47.22				17.2			
Major/Minor 2	4.61				-				-				-				-			
Nugget	0.14				0.17				0.12				0.26				0.21			
Structure 1	0.58				0.77				0.83				0.74				0.55			
Structure 2	0.28				-				-				-				-			
Range 1	80				97				73				85				86			
Range 2	304				-				-				-				-			
Block Discretisation	5 X 5 X 2				5 X 5 X 2				5x5x2				5 X 5 X 2				5 X 5 X 2			

Table 12 Search parameter of Saprolite in North50 Block

Parameter	Saprolite (Ni)					Saprolite (Co)				Saprolite (Al2O3)				Saprolite (Cr2O3)				Saprolite (Fe)			
	Pass 1	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 5**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**
Minimum Sample	6	4	2	1	1	4	3	2	1	4	4	2	1	5	4	2	1	4	4	2	1
Maximum Sample	40					22				31				21				19			
Max. Search Radius	75	150	300	600	1200	75	150	300	600	75	150	300	600	75	150	300	600	75	150	300	600
Max. Vertical Distance	2	3	7	13	26	6	11	23	46	6	12	24	47	6	12	24	48	6	11	22	45
Bearing	110					110				115				115				110			
Plunge	0					0				0				0				0			
Dip	0					-10				-5				-5				-5			
Major/Semi-major 1	1.000					1.154				1.232				1.250				1.138			
Major/Semi-major 2	0.58					-				-				-				-			
Major/Minor 1	13.5					13.16				12.69				12.5				13.47			
Major/Minor 2	46.0					-				-				-				-			
Nugget	0.03					0.13				0.18				0.26				0.16			
Structure 1	0.91					0.88				0.68				0.74				0.84			
Structure 2	0.06					-				-				-				-			
Range 1	54					75				85				70				66			
Range 2	276					-				-				-				-			
Block Discretisation	5 X 5 X 2					5 X 5 X 2				5 X 5 X 2				5 X 5 X 2				5 X 5 X 2			

Parameter	Saprolite (MgO)				Saprolite (MnO)				Saprolite (P2O5)				Saprolite (SiO2)				Saprolite (TiO2)			
	Pass 1	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**
Minimum Sample	4	4	2	1	4	4	2	1	3	3	2	1	3	3	2	1	3	3	2	1
Maximum Sample	25				23				35				26				29			
Max. Search Radius	75	150	300	600	75	150	300	600	75	150	300	600	75	150	300	600	75	150	300	600
Max. Vertical Distance	5	11	21	43	7	13	26	53	37	73	146	292	4	9	17	35	12	24	47	94
Bearing	115				120				120.019				115				100.055			
Plunge	0				0				0.435				0				1.293			
Dip	-5				-5				-4.981				0				-4.83			
Major/Semi-major	1.132				1.000				1.040				1.000				1.236			
Major/Minor	14.00				11.33				2.05				17.17				6.357			
Nugget	0.15				0.16				0.08				0.12				0.17			
Structure 1	0.83				0.84				0.91				0.87				0.83			
Range	77				68				78				79				89			
Block Discretisation	5 X 5 X 2				5 X 5 X 2				5 X 5 X 2				5 X 5 X 2				5 X 5 X 2			

2.5 Model Validation

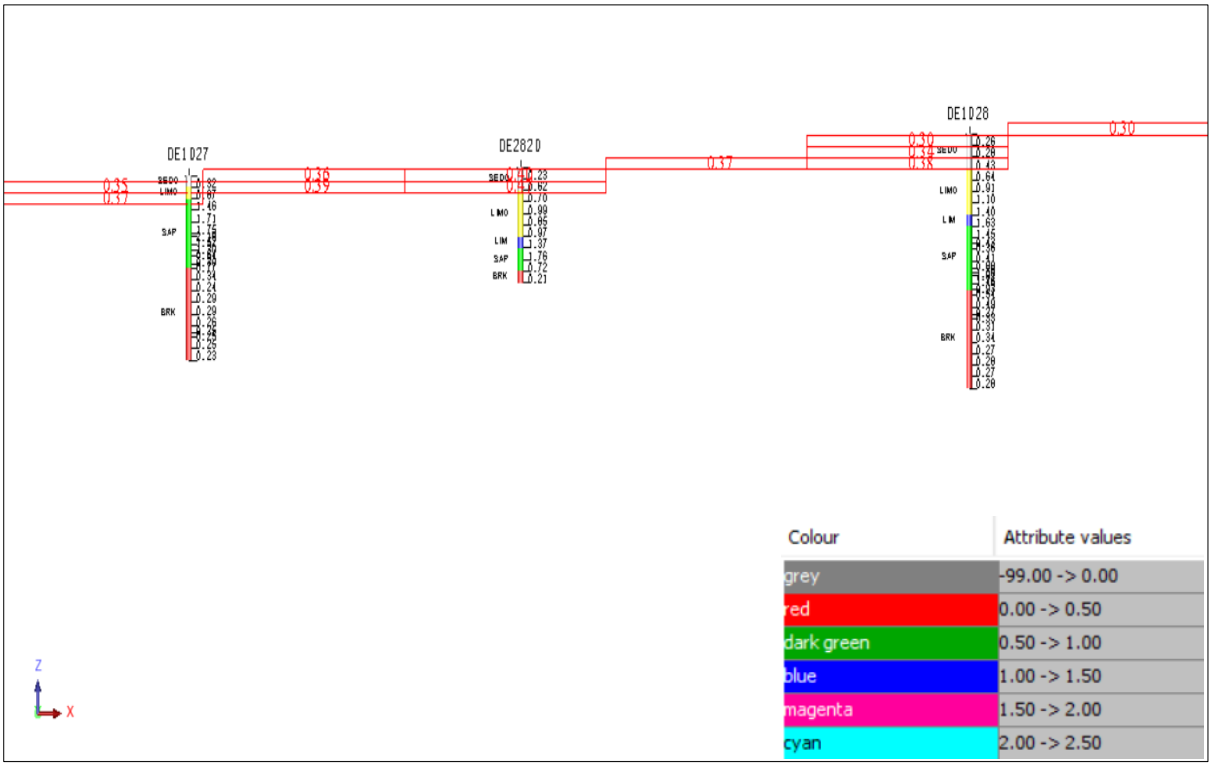


Figure 48 Cross section of Ni Mud Upper in North50 Block

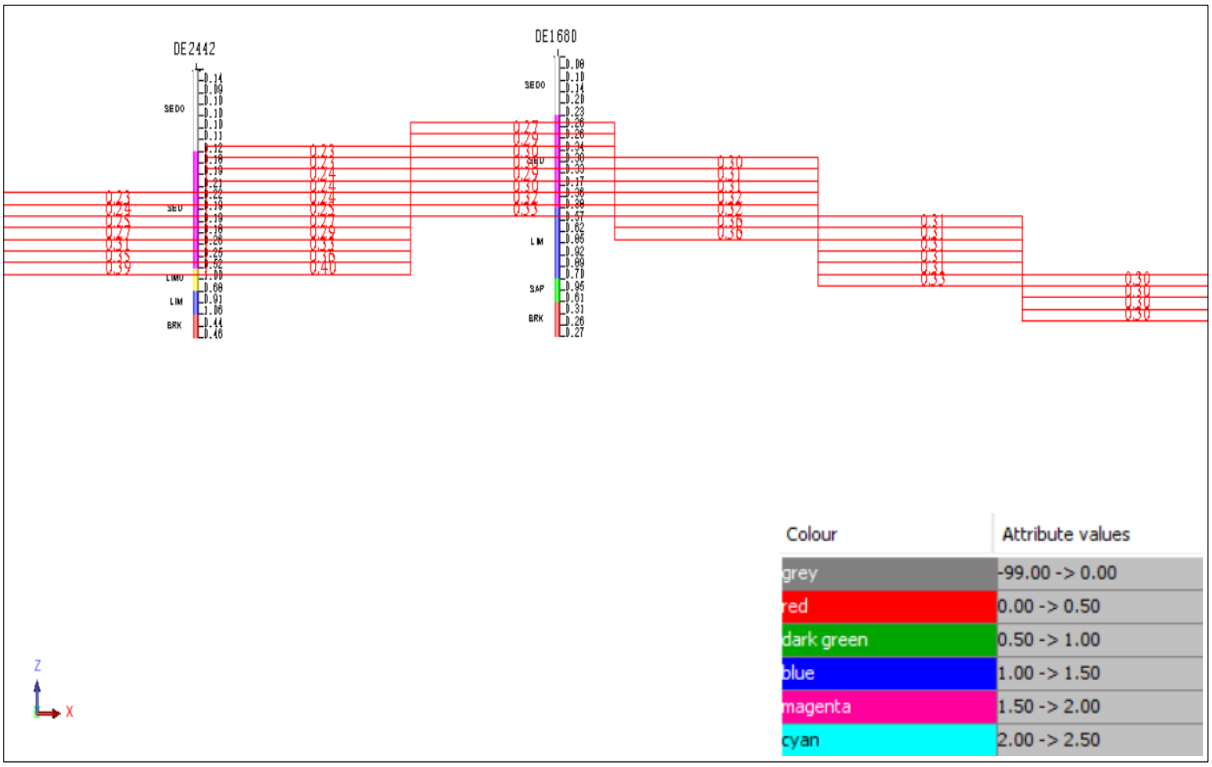


Figure 49 Cross section of Ni Mud Upper in North50 Block

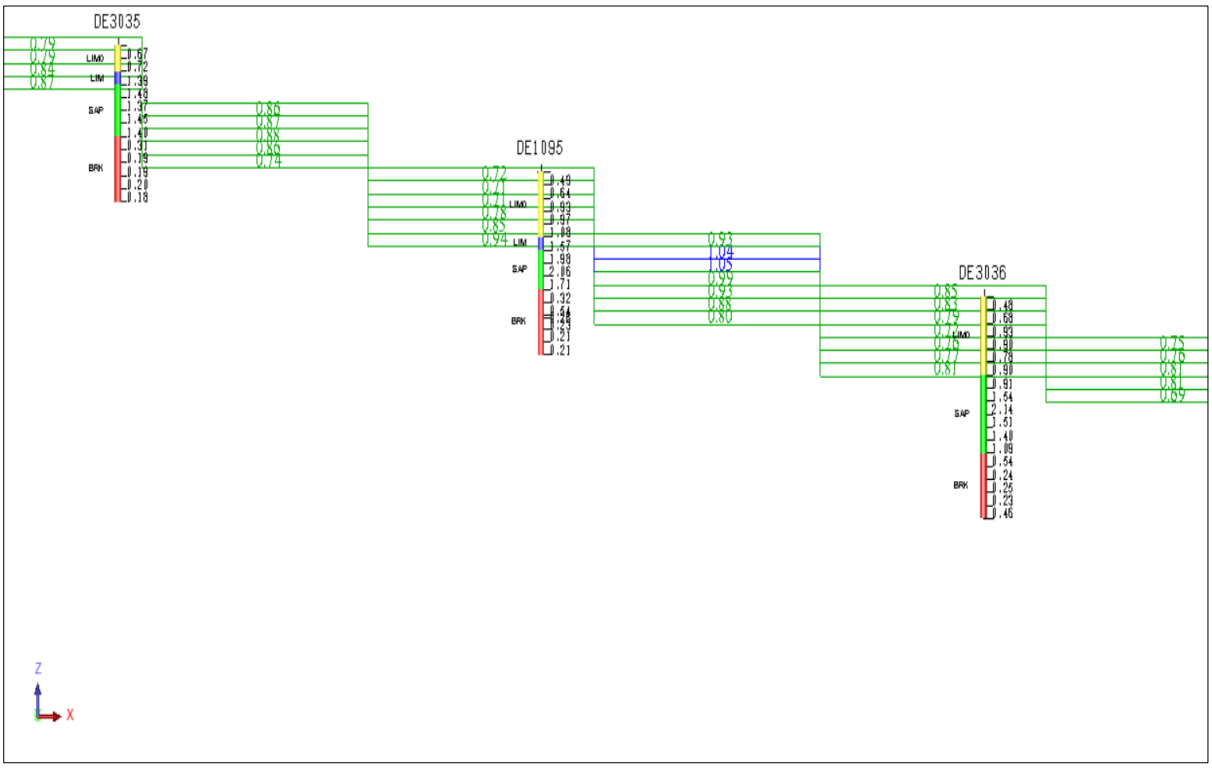


Figure 50 Cross section of Ni Upper Limonite in North50 Block

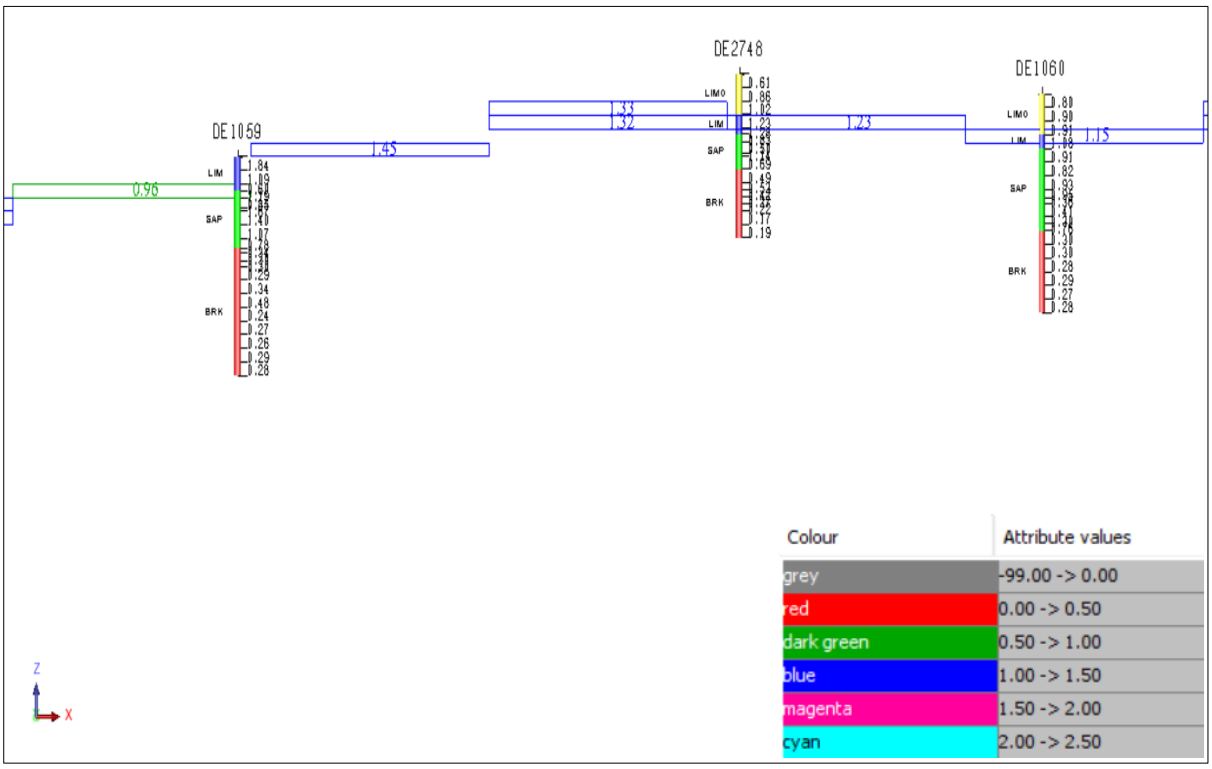


Figure 51 Cross section of Ni Lower Limonite in North50 Block

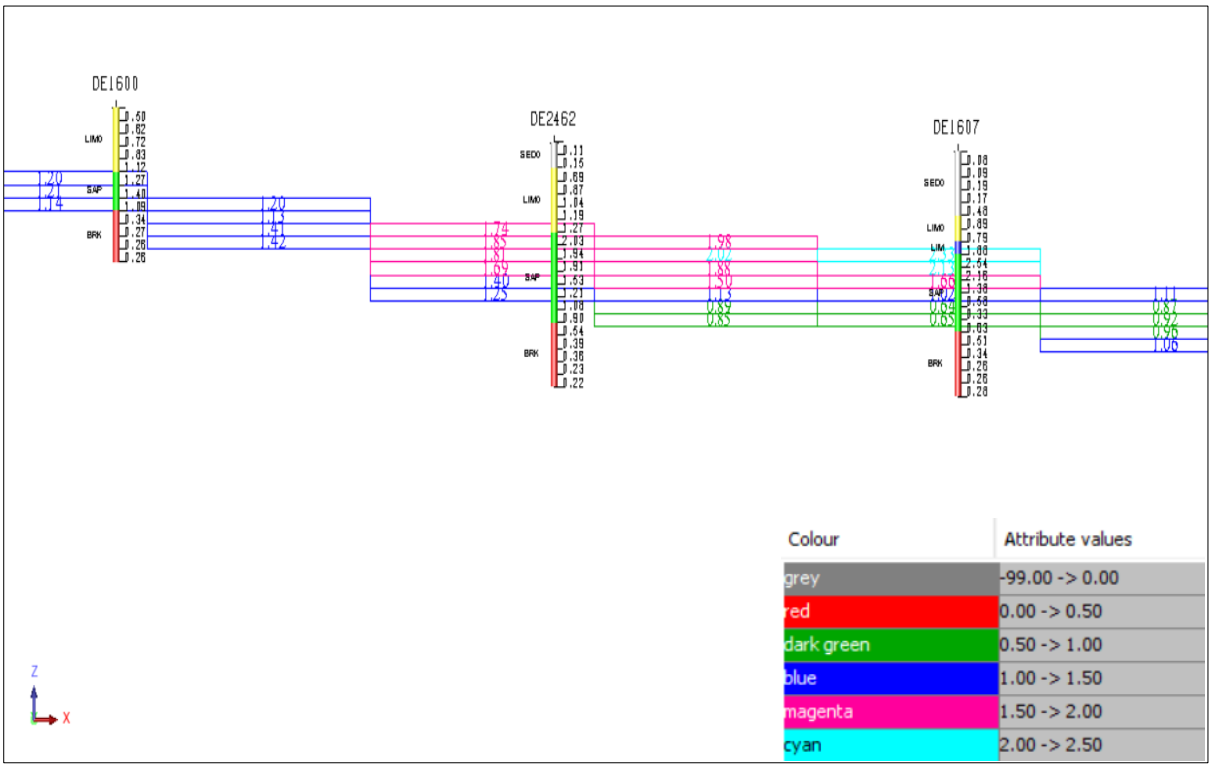
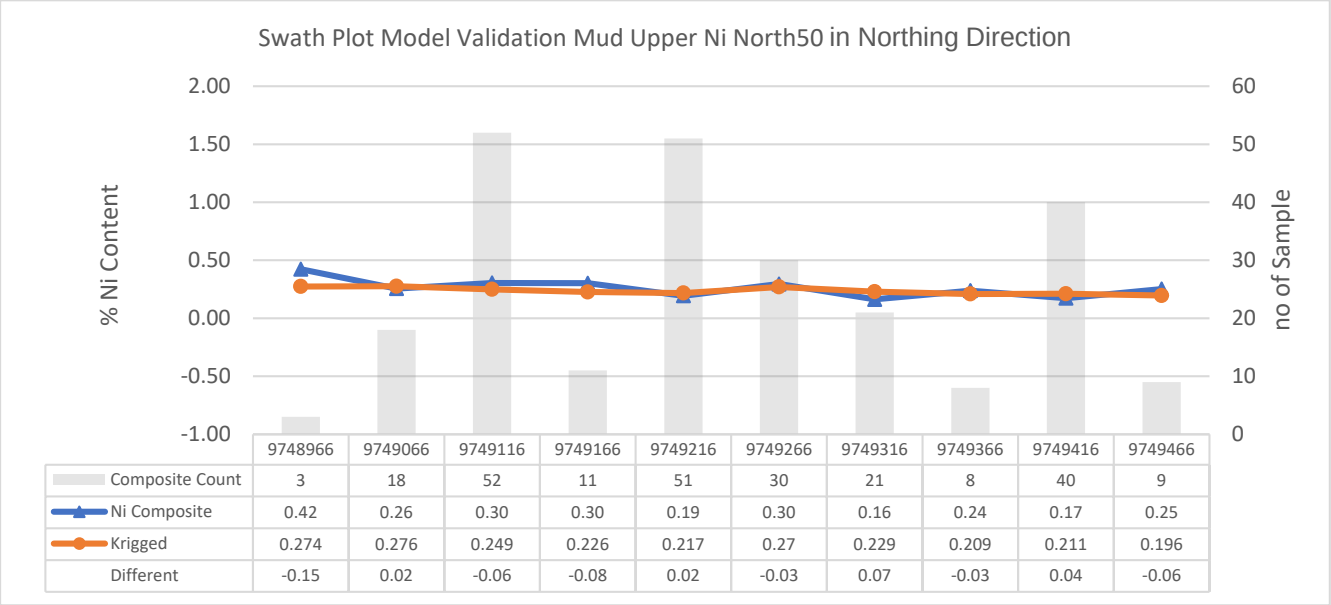
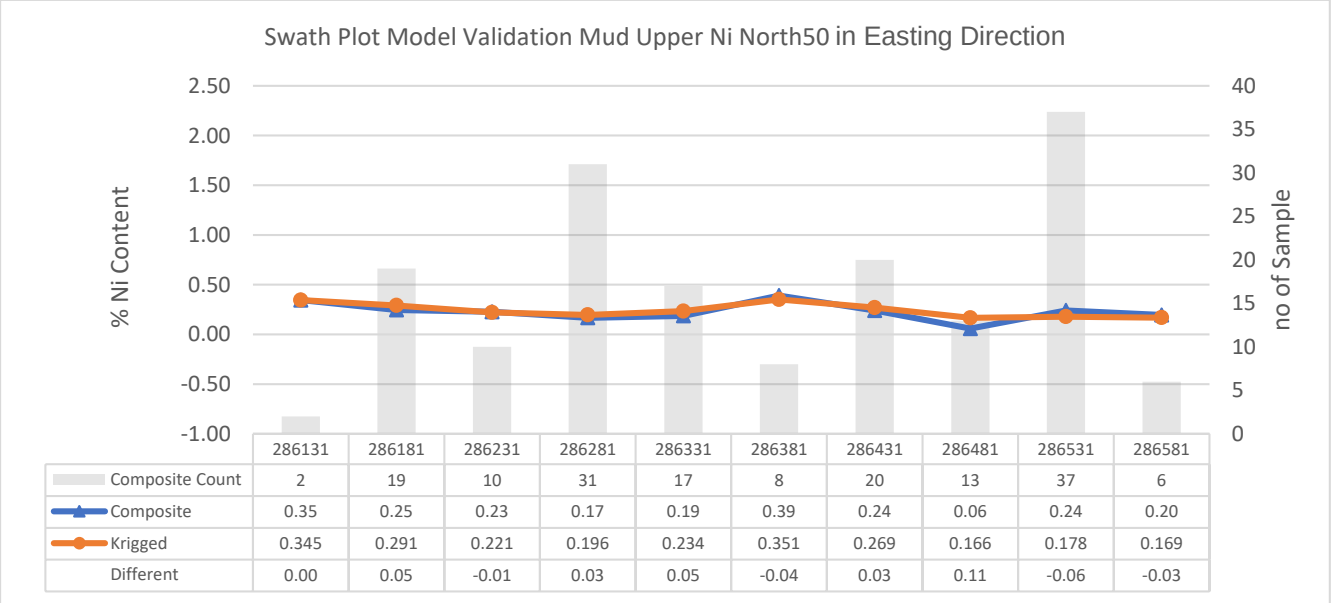


Figure 52 Cross section of Ni Saprolite in North50 Block



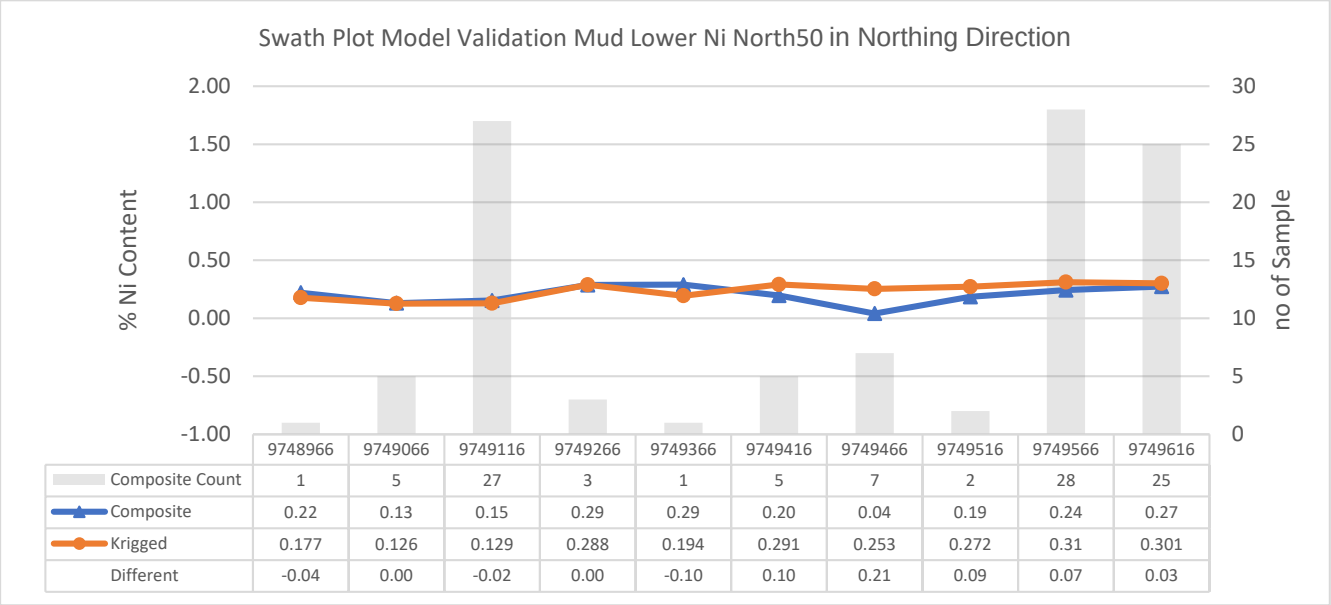
	9748966	9749066	9749116	9749166	9749216	9749266	9749316	9749366	9749416	9749466
Composite Count	3	18	52	11	51	30	21	8	40	9
Ni Composite	0.42	0.26	0.30	0.30	0.19	0.30	0.16	0.24	0.17	0.25
Krigged	0.274	0.276	0.249	0.226	0.217	0.27	0.229	0.209	0.211	0.196
Different	-0.15	0.02	-0.06	-0.08	0.02	-0.03	0.07	-0.03	0.04	-0.06

Figure 53 Swath plot of Ni Mud Upper in North50 block with Northing Direction



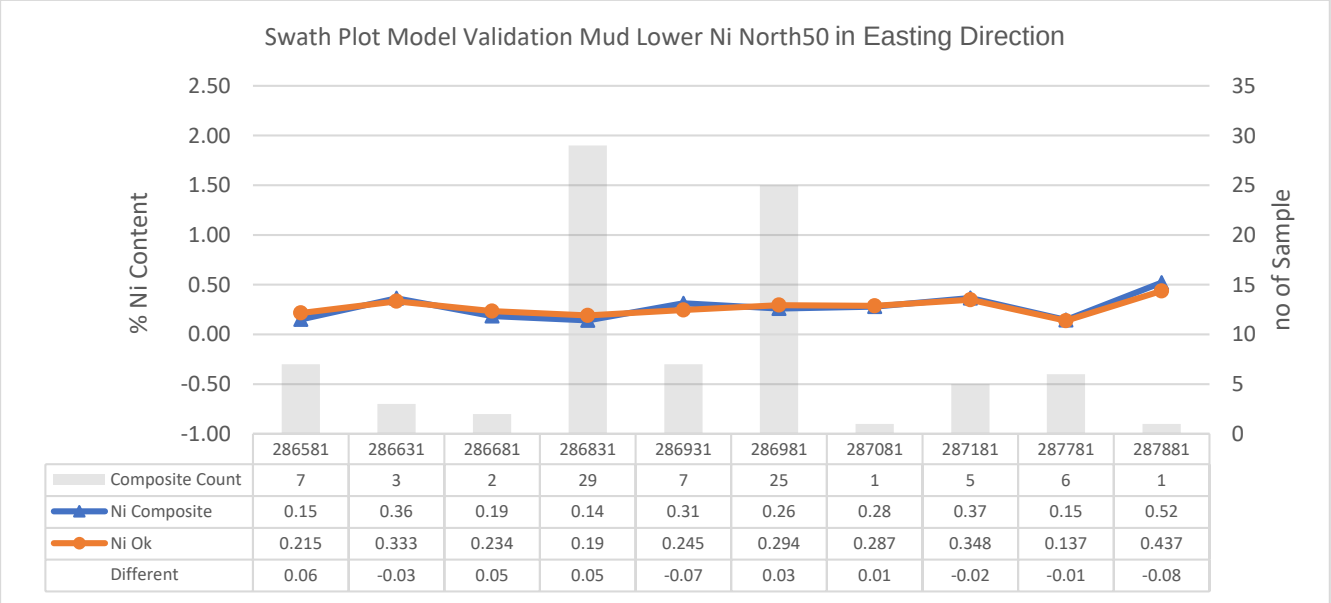
	286131	286181	286231	286281	286331	286381	286431	286481	286531	286581
Composite Count	2	19	10	31	17	8	20	13	37	6
Composite	0.35	0.25	0.23	0.17	0.19	0.39	0.24	0.06	0.24	0.20
Krigged	0.345	0.291	0.221	0.196	0.234	0.351	0.269	0.166	0.178	0.169
Different	0.00	0.05	-0.01	0.03	0.05	-0.04	0.03	0.11	-0.06	-0.03

Figure 54 Swath plot of Ni Mud Upper in North50 block with Easting Direction



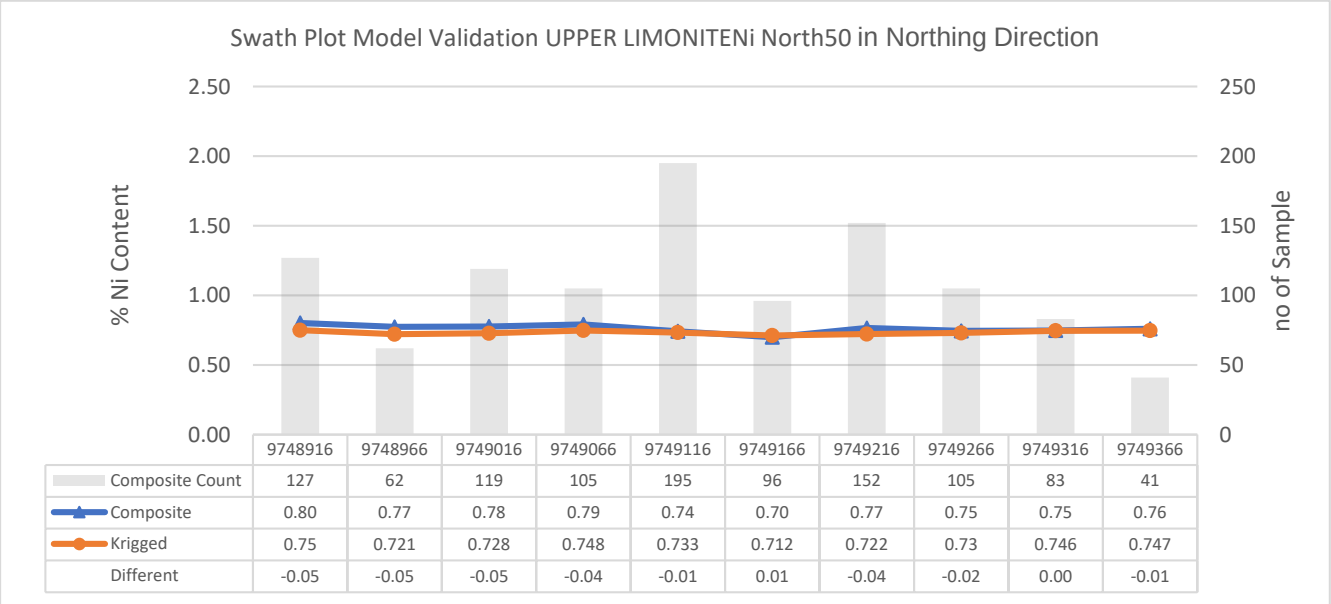
	9748966	9749066	9749116	9749266	9749366	9749416	9749466	9749516	9749566	9749616
Composite Count	1	5	27	3	1	5	7	2	28	25
Composite	0.22	0.13	0.15	0.29	0.29	0.20	0.04	0.19	0.24	0.27
Krigged	0.177	0.126	0.129	0.288	0.194	0.291	0.253	0.272	0.31	0.301
Different	-0.04	0.00	-0.02	0.00	-0.10	0.10	0.21	0.09	0.07	0.03

Figure 55 Swath plot of Ni Mud Lower in North50 block with Northing Direction



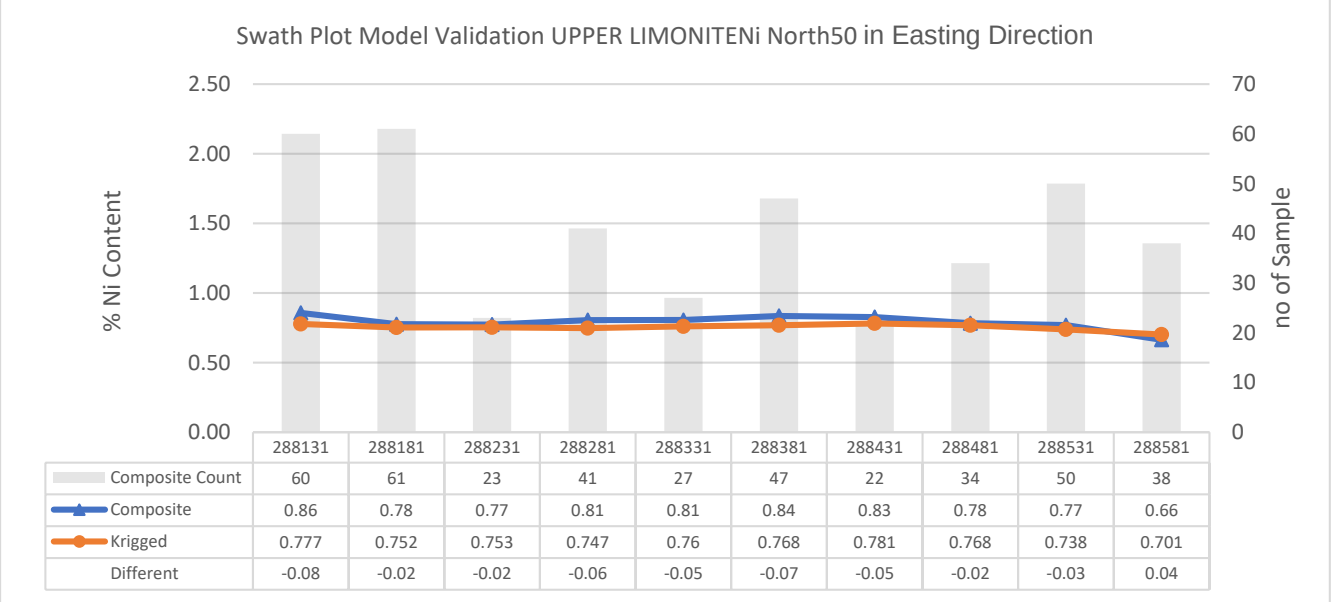
	286581	286631	286681	286831	286931	286981	287081	287181	287781	287881
Composite Count	7	3	2	29	7	25	1	5	6	1
Ni Composite	0.15	0.36	0.19	0.14	0.31	0.26	0.28	0.37	0.15	0.52
Ni Ok	0.215	0.333	0.234	0.19	0.245	0.294	0.287	0.348	0.137	0.437
Different	0.06	-0.03	0.05	0.05	-0.07	0.03	0.01	-0.02	-0.01	-0.08

Figure 56 Swath plot of Ni Mud Lower in North50 block with Easting Direction



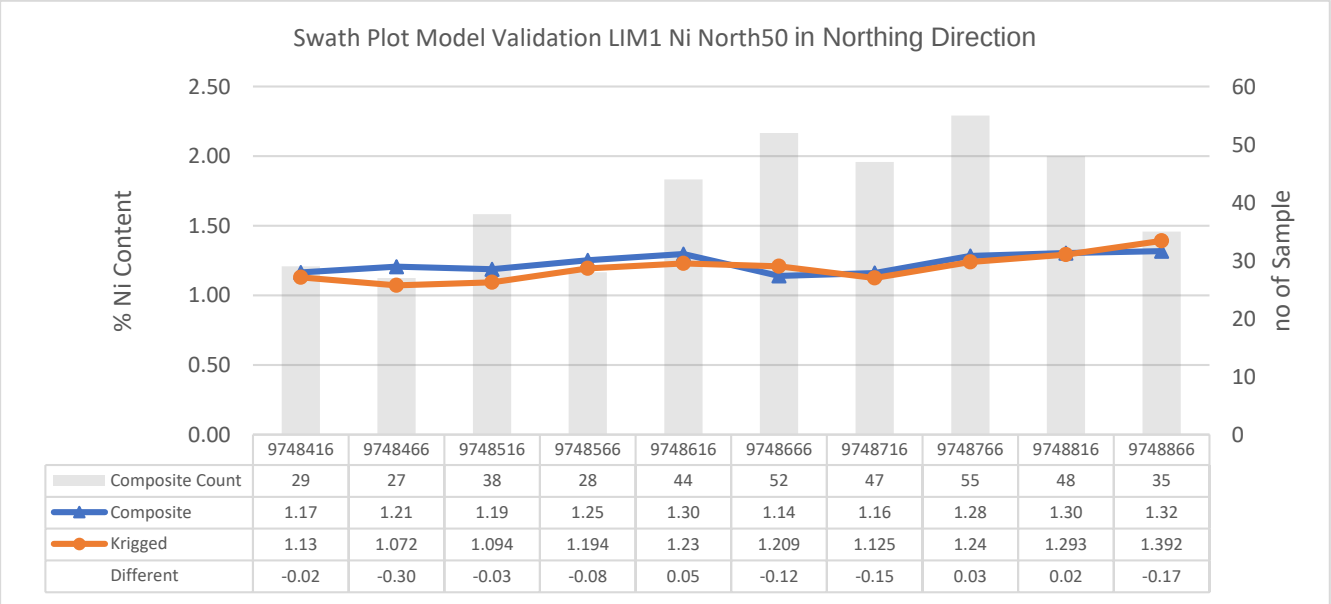
	9748916	9748966	9749016	9749066	9749116	9749166	9749216	9749266	9749316	9749366
Composite Count	127	62	119	105	195	96	152	105	83	41
Composite	0.80	0.77	0.78	0.79	0.74	0.70	0.77	0.75	0.75	0.76
Krigged	0.75	0.721	0.728	0.748	0.733	0.712	0.722	0.73	0.746	0.747
Different	-0.05	-0.05	-0.05	-0.04	-0.01	0.01	-0.04	-0.02	0.00	-0.01

Figure 57 Swath plot of Ni Upper Limonite in North50 block with Northing Direction



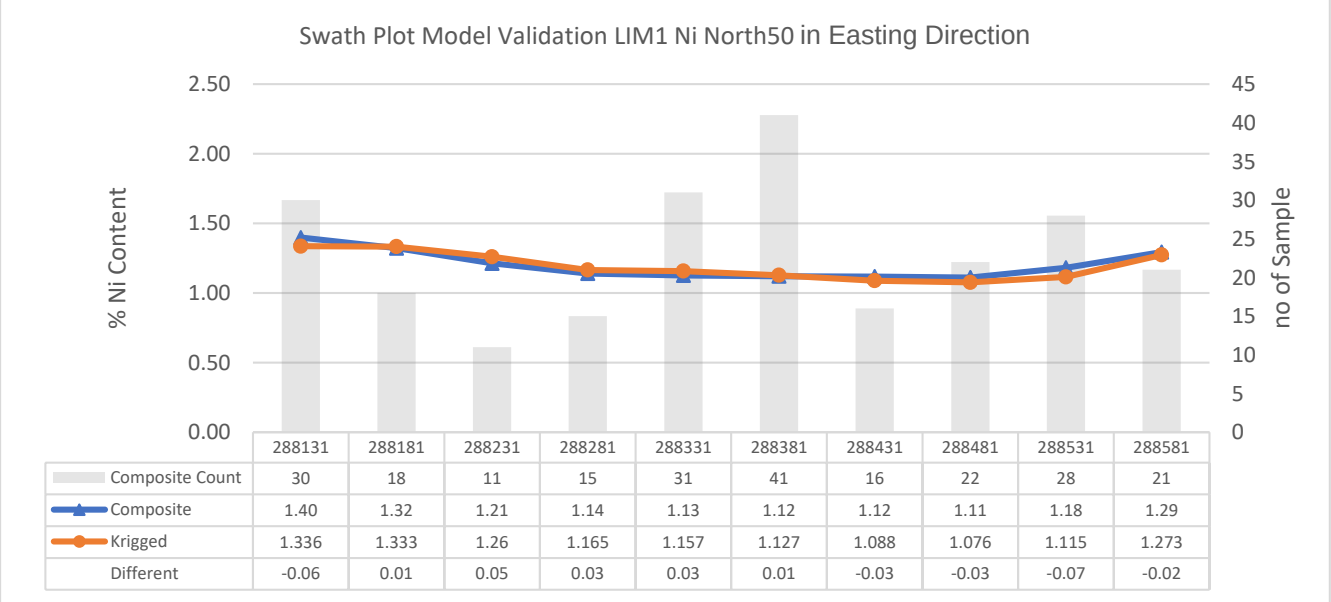
	288131	288181	288231	288281	288331	288381	288431	288481	288531	288581
Composite Count	60	61	23	41	27	47	22	34	50	38
Composite	0.86	0.78	0.77	0.81	0.81	0.84	0.83	0.78	0.77	0.66
Krigged	0.777	0.752	0.753	0.747	0.76	0.768	0.781	0.768	0.738	0.701
Different	-0.08	-0.02	-0.02	-0.06	-0.05	-0.07	-0.05	-0.02	-0.03	0.04

Figure 58 Swath plot of Ni Upper Limonite in North50 block with Easting Direction



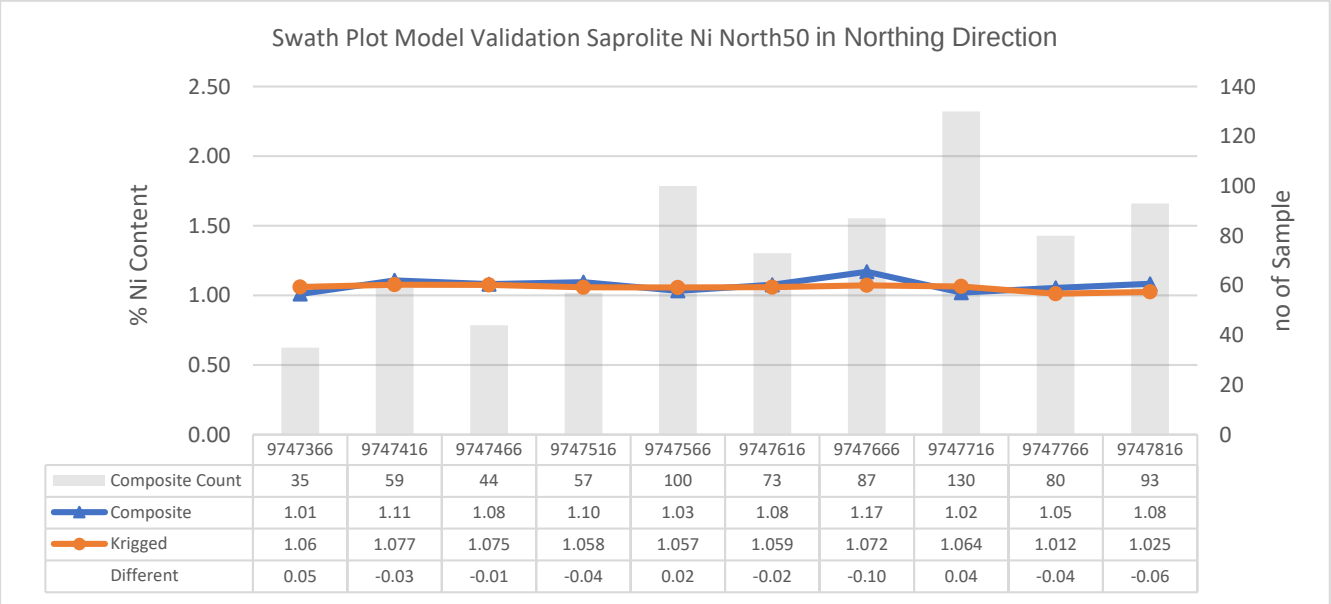
	9748416	9748466	9748516	9748566	9748616	9748666	9748716	9748766	9748816	9748866
Composite Count	29	27	38	28	44	52	47	55	48	35
Composite	1.17	1.21	1.19	1.25	1.30	1.14	1.16	1.28	1.30	1.32
Krigged	1.13	1.072	1.094	1.194	1.23	1.209	1.125	1.24	1.293	1.392
Different	-0.02	-0.30	-0.03	-0.08	0.05	-0.12	-0.15	0.03	0.02	-0.17

Figure 59 Swath plot of Ni Lower Limonite North50 block with Northing Direction



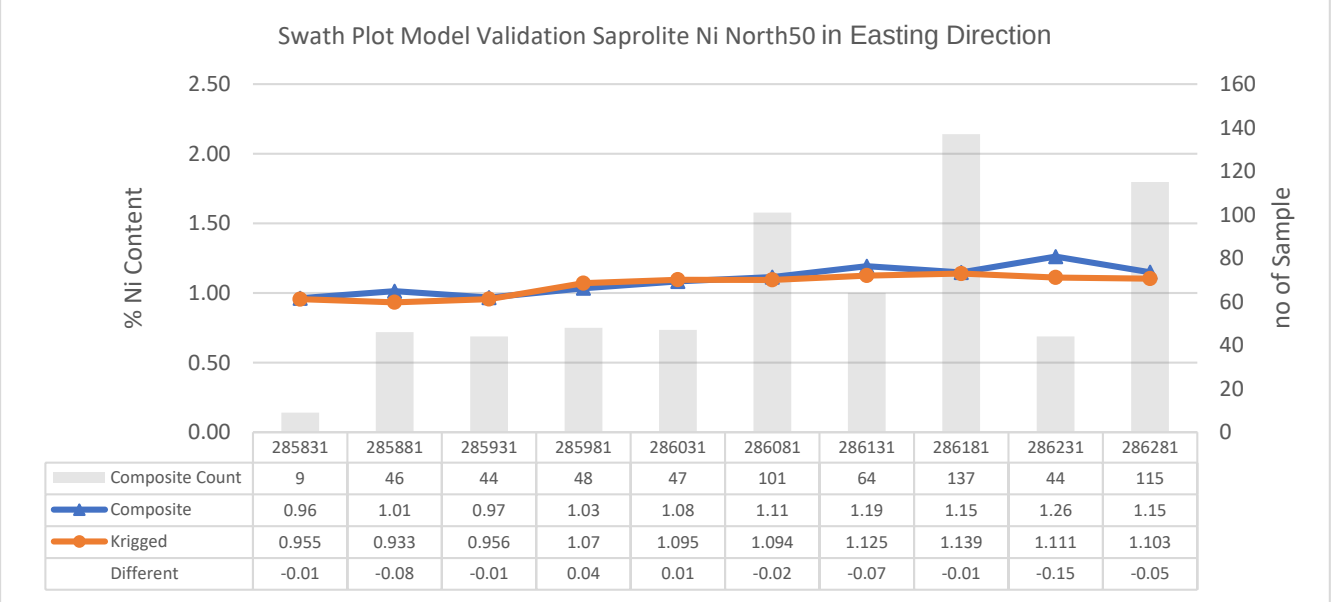
	288131	288181	288231	288281	288331	288381	288431	288481	288531	288581
Composite Count	30	18	11	15	31	41	16	22	28	21
Composite	1.40	1.32	1.21	1.14	1.13	1.12	1.12	1.11	1.18	1.29
Krigged	1.336	1.333	1.26	1.165	1.157	1.127	1.088	1.076	1.115	1.273
Different	-0.06	0.01	0.05	0.03	0.03	0.01	-0.03	-0.03	-0.07	-0.02

Figure 60 Swath plot of Ni Lower Limonite in North50 block with Easting Direction



	9747366	9747416	9747466	9747516	9747566	9747616	9747666	9747716	9747766	9747816
Composite Count	35	59	44	57	100	73	87	130	80	93
Composite	1.01	1.11	1.08	1.10	1.03	1.08	1.17	1.02	1.05	1.08
Krigged	1.06	1.077	1.075	1.058	1.057	1.059	1.072	1.064	1.012	1.025
Different	0.05	-0.03	-0.01	-0.04	0.02	-0.02	-0.10	0.04	-0.04	-0.06

Figure 61 Swath plot of Ni Saprolite in North50 block with Northing Direction



	285831	285881	285931	285981	286031	286081	286131	286181	286231	286281
Composite Count	9	46	44	48	47	101	64	137	44	115
Composite	0.96	1.01	0.97	1.03	1.08	1.11	1.19	1.15	1.26	1.15
Krigged	0.955	0.933	0.956	1.07	1.095	1.094	1.125	1.139	1.111	1.103
Different	-0.01	-0.08	-0.01	0.04	0.01	-0.02	-0.07	-0.01	-0.15	-0.05

Figure 62 Swath plot of Ni Saprolite in North50 block with Easting Direction

3 WEST100

3.1 Block Model Geometry

Table 13 Block model size and geometry of West100 Block

Type	Y	Z	Z
Minimum Coordinates	9746183	282812	-20
Maximum Coordinates	9750258	291712	750
User Block Size	25	25	1
Min. Block Size	25	25	1
Rotation	0	0	0

3.2 Extrapolatory Data Analysis

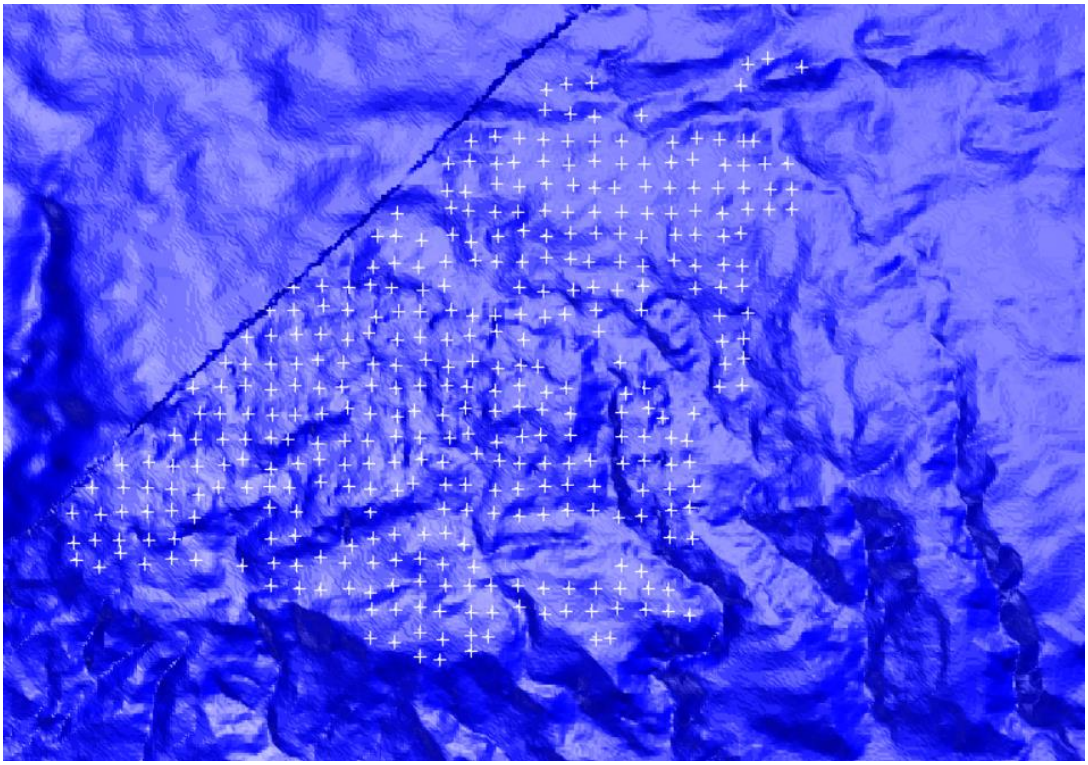
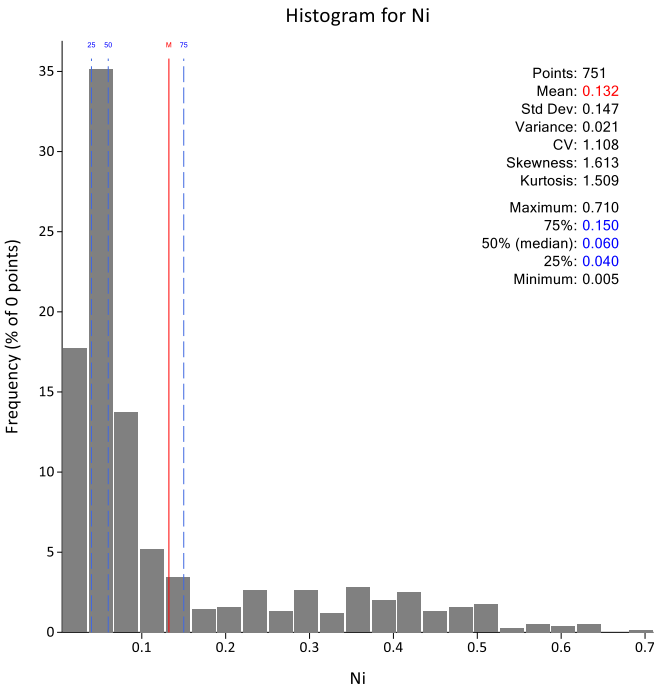
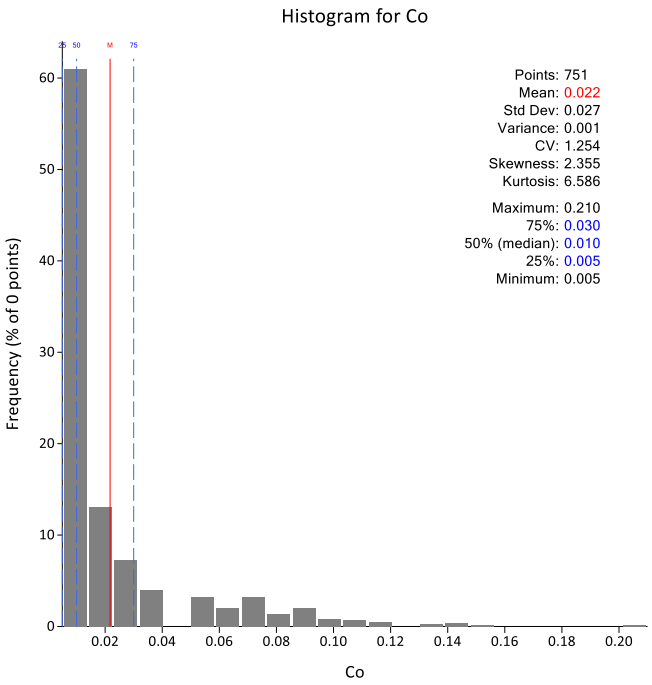
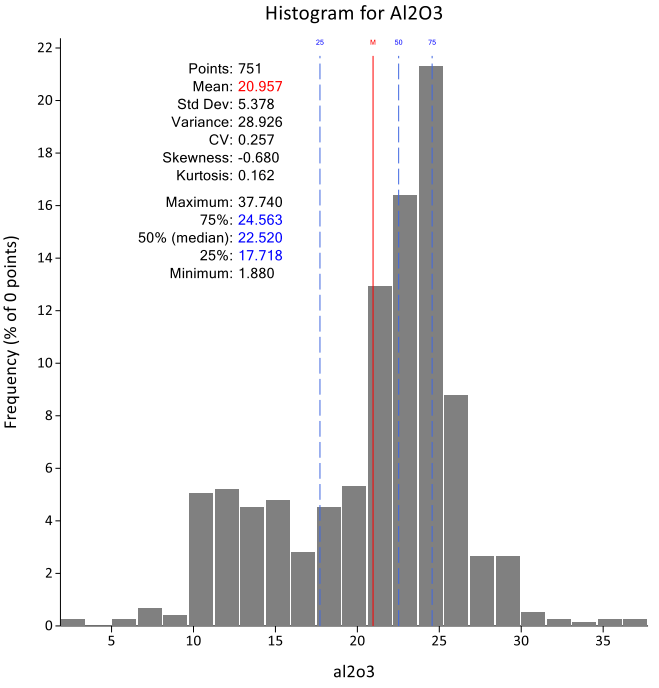
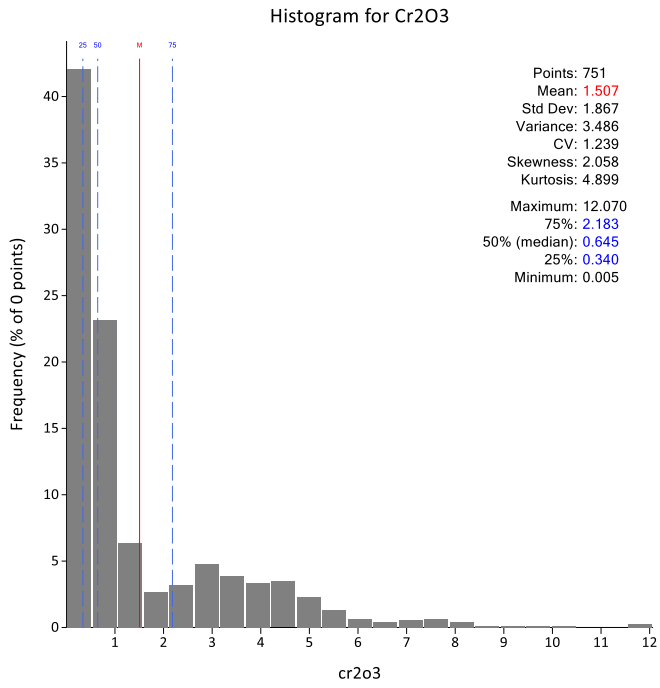


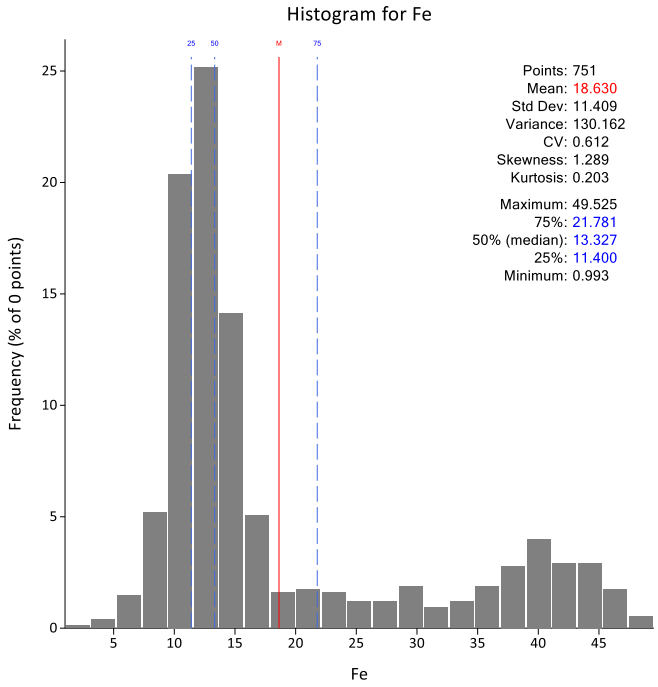
Figure 63 West100 Block

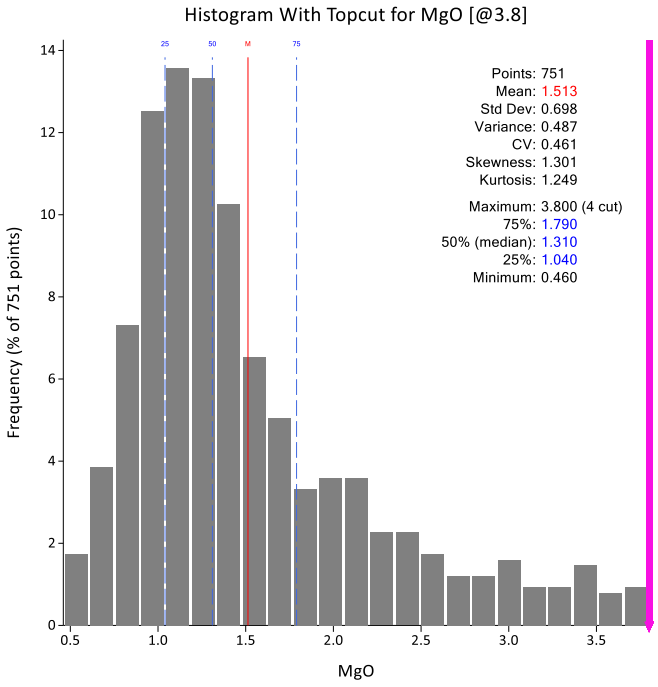

Histogram for Ni
Points: 751
Mean: 0.132
Std Dev: 0.147
Variance: 0.021
CV: 1.108
Skewness: 1.613
Kurtosis: 1.509
Maximum: 0.710
75%: 0.150
50% (median): 0.060
25%: 0.040
Minimum: 0.005
Frequency (% of 0 points)
Ni

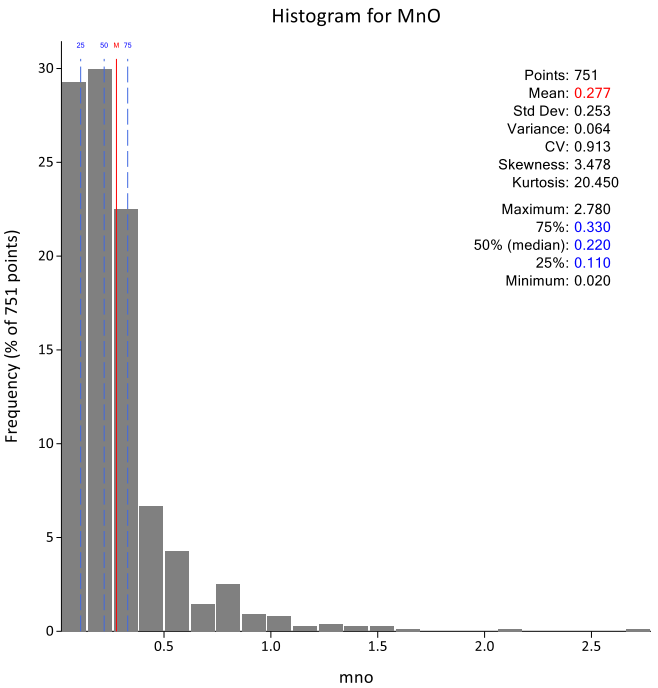

Histogram for Co
Points: 751
Mean: 0.022
Std Dev: 0.027
Variance: 0.001
CV: 1.254
Skewness: 2.355
Kurtosis: 6.586
Maximum: 0.210
75%: 0.030
50% (median): 0.010
25%: 0.005
Minimum: 0.005
Frequency (% of 0 points)
Co

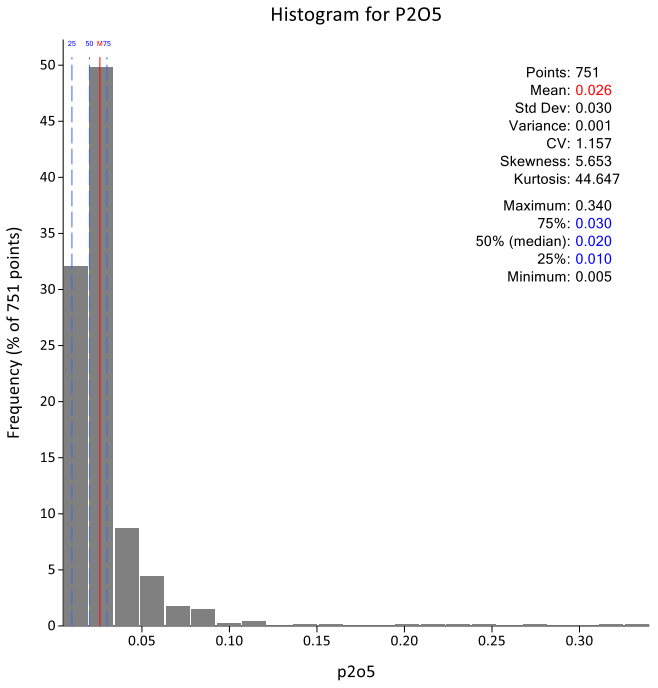

Histogram for Al2O3
Points: 751
Mean: 20.957
Std Dev: 5.378
Variance: 28.926
CV: 0.257
Skewness: -0.680
Kurtosis: 0.162
Maximum: 37.740
75%: 24.563
50% (median): 22.520
25%: 17.718
Minimum: 1.880
Frequency (% of 0 points)
al2o3


Histogram for Cr2O3
Points: 751
Mean: 1.507
Std Dev: 1.867
Variance: 3.486
CV: 1.239
Skewness: 2.058
Kurtosis: 4.899
Maximum: 12.070
75%: 2.183
50% (median): 0.645
25%: 0.340
Minimum: 0.005
Frequency (% of 0 points)
cr2o3


Histogram for Fe
Points: 751
Mean: 18.630
Std Dev: 11.409
Variance: 130.162
CV: 0.612
Skewness: 1.289
Kurtosis: 0.203
Maximum: 49.525
75%: 21.781
50% (median): 13.327
25%: 11.400
Minimum: 0.993
Frequency (% of 0 points)
Fe


Histogram With Topcut for MgO [@3.8]
Points: 751
Mean: 1.513
Std Dev: 0.698
Variance: 0.487
CV: 0.461
Skewness: 1.301
Kurtosis: 1.249
Maximum: 3.800 (4 cut)
75%: 1.790
50% (median): 1.310
25%: 1.040
Minimum: 0.460
Frequency (% of 751 points)
MgO


Histogram for MnO
Points: 751
Mean: 0.277
Std Dev: 0.253
Variance: 0.064
CV: 0.913
Skewness: 3.478
Kurtosis: 20.450
Maximum: 2.780
75%: 0.330
50% (median): 0.220
25%: 0.110
Minimum: 0.020
Frequency (% of 751 points)
mno


Histogram for P2O5
Points: 751
Mean: 0.026
Std Dev: 0.030
Variance: 0.001
CV: 1.157
Skewness: 5.653
Kurtosis: 44.647
Maximum: 0.340
75%: 0.030
50% (median): 0.020
25%: 0.010
Minimum: 0.005
Frequency (% of 751 points)
p2o5

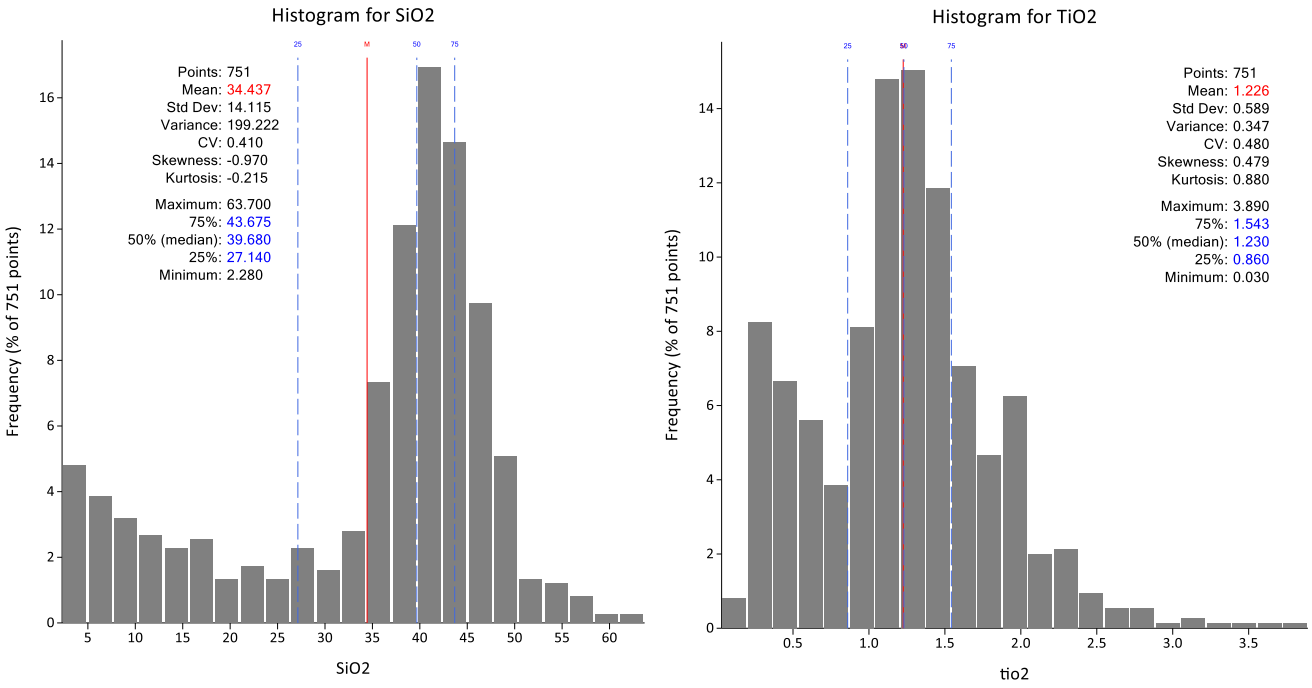
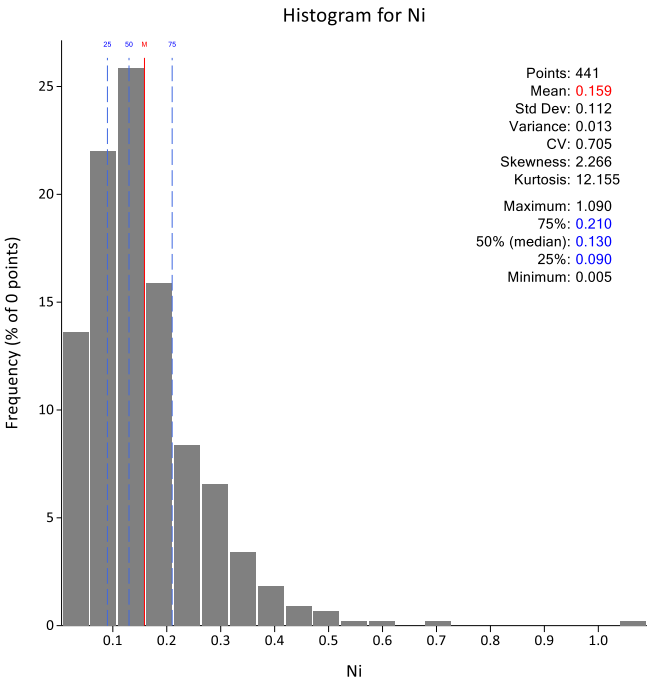
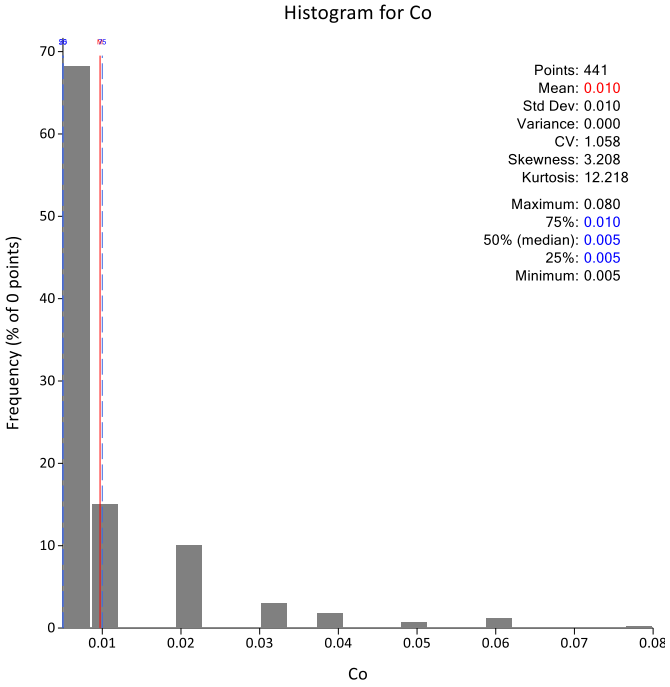
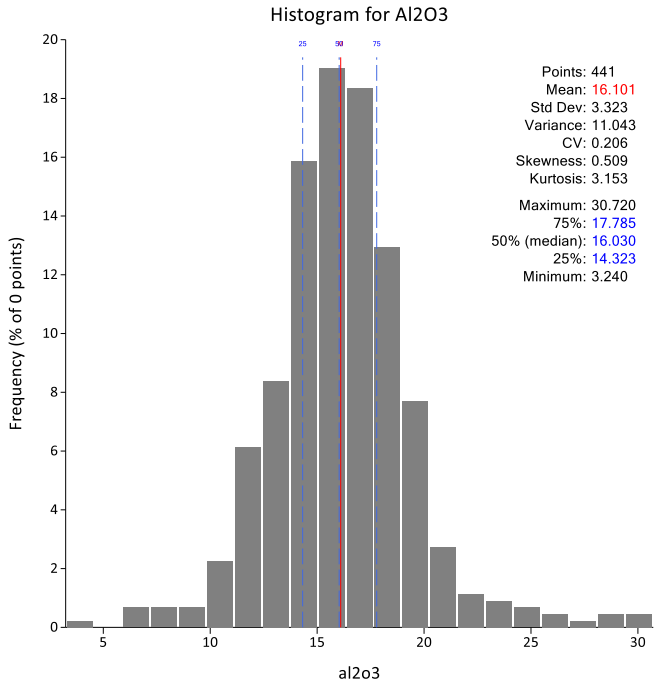
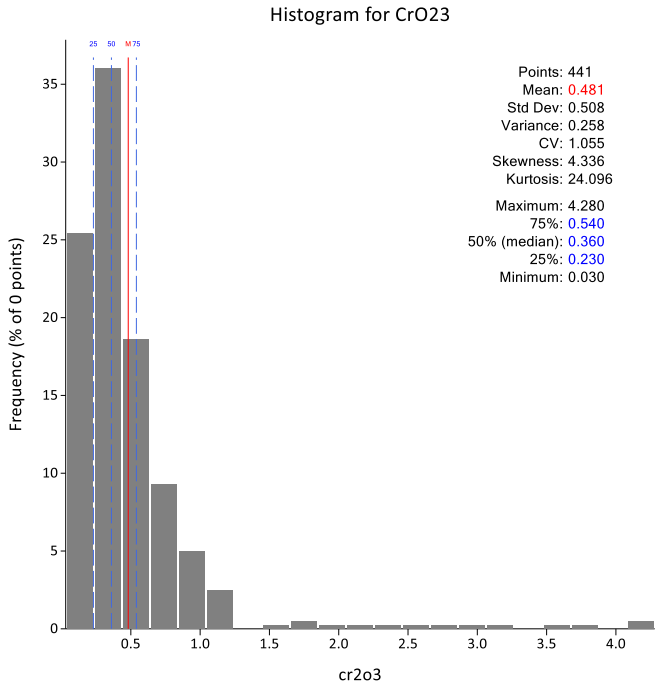


Figure 64 Histogram and descriptive statistic of Mud Lower in West100 Block

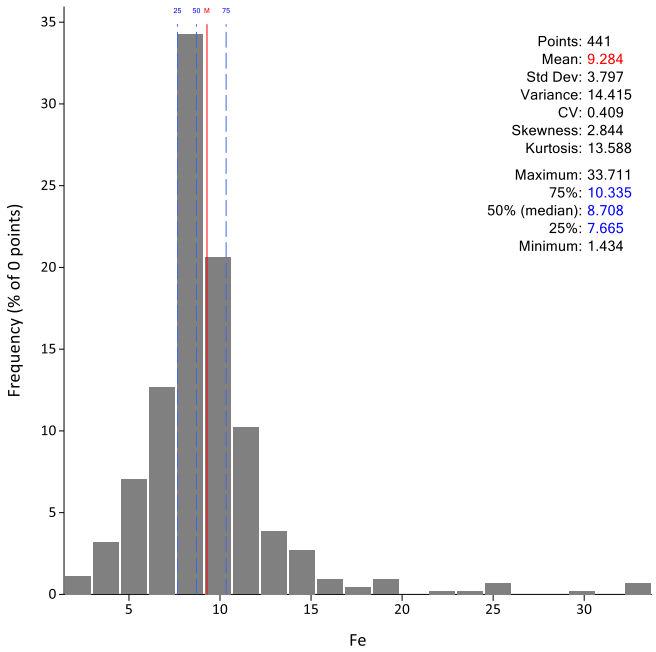

Histogram for Ni
Points: 441
Mean: 0.159
Std Dev: 0.112
Variance: 0.013
CV: 0.705
Skewness: 2.266
Kurtosis: 12.155
Maximum: 1.090
75%: 0.210
50% (median): 0.130
25%: 0.090
Minimum: 0.005
Frequency (% of 0 points)
Ni


Histogram for Co
Points: 441
Mean: 0.010
Std Dev: 0.010
Variance: 0.000
CV: 1.058
Skewness: 3.208
Kurtosis: 12.218
Maximum: 0.080
75%: 0.010
50% (median): 0.005
25%: 0.005
Minimum: 0.005
Frequency (% of 0 points)
Co

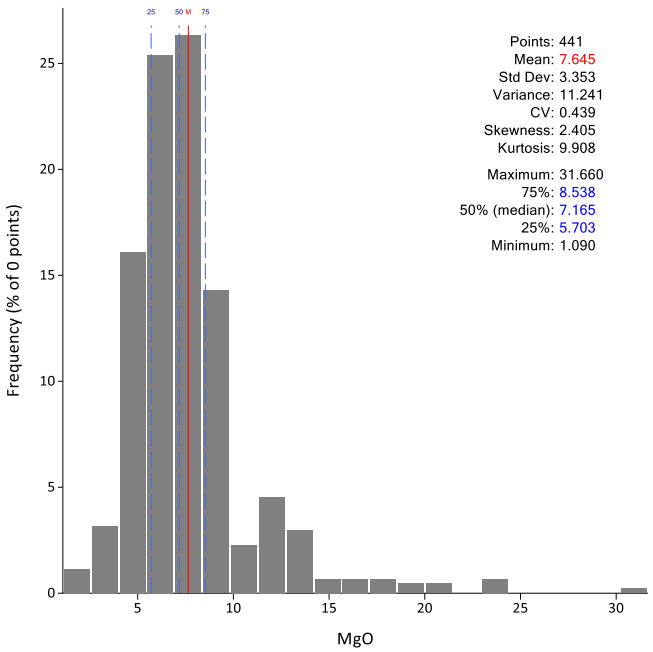

Histogram for Al2O3
Points: 441
Mean: 16.101
Std Dev: 3.323
Variance: 11.043
CV: 0.206
Skewness: 0.509
Kurtosis: 3.153
Maximum: 30.720
75%: 17.785
50% (median): 16.030
25%: 14.323
Minimum: 3.240
Frequency (% of 0 points)
al2o3


Histogram for CrO23
Points: 441
Mean: 0.481
Std Dev: 0.508
Variance: 0.258
CV: 1.055
Skewness: 4.336
Kurtosis: 24.096
Maximum: 4.280
75%: 0.540
50% (median): 0.360
25%: 0.230
Minimum: 0.030
Frequency (% of 0 points)
cr2o3

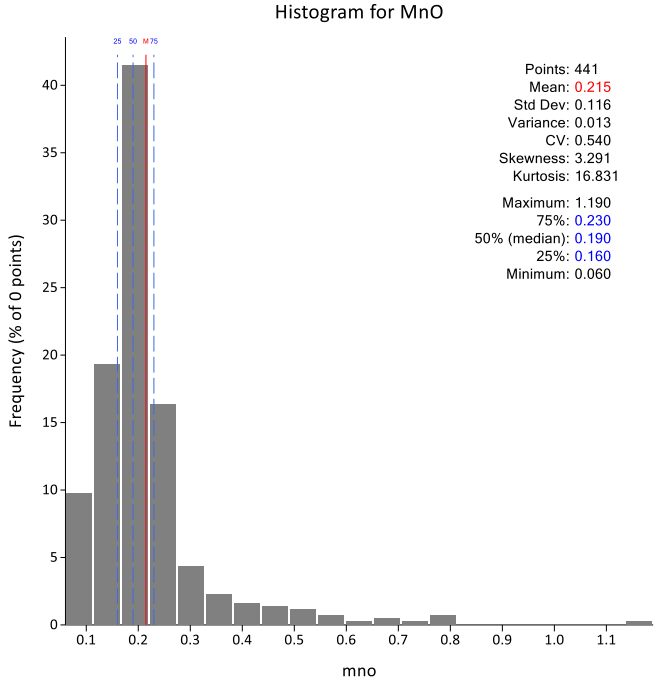
Histogram for Fe



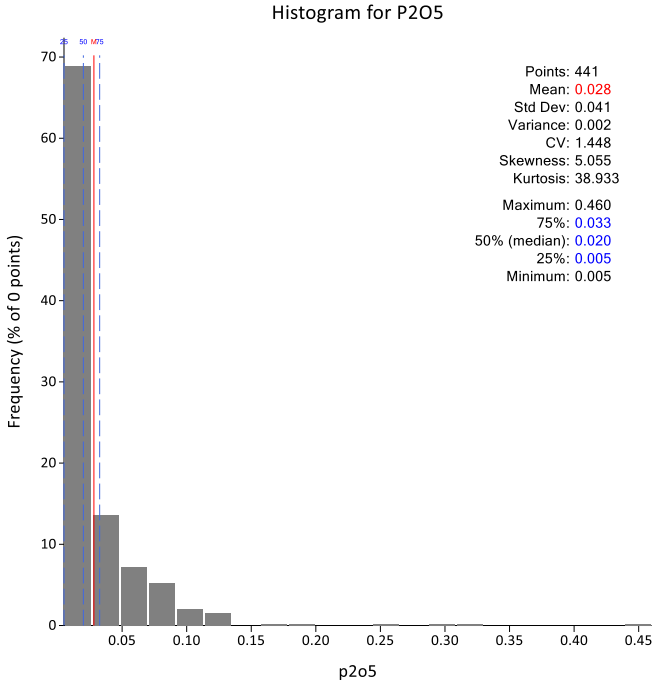
Histogram for MgO



Histogram for MnO



Histogram for P2O5



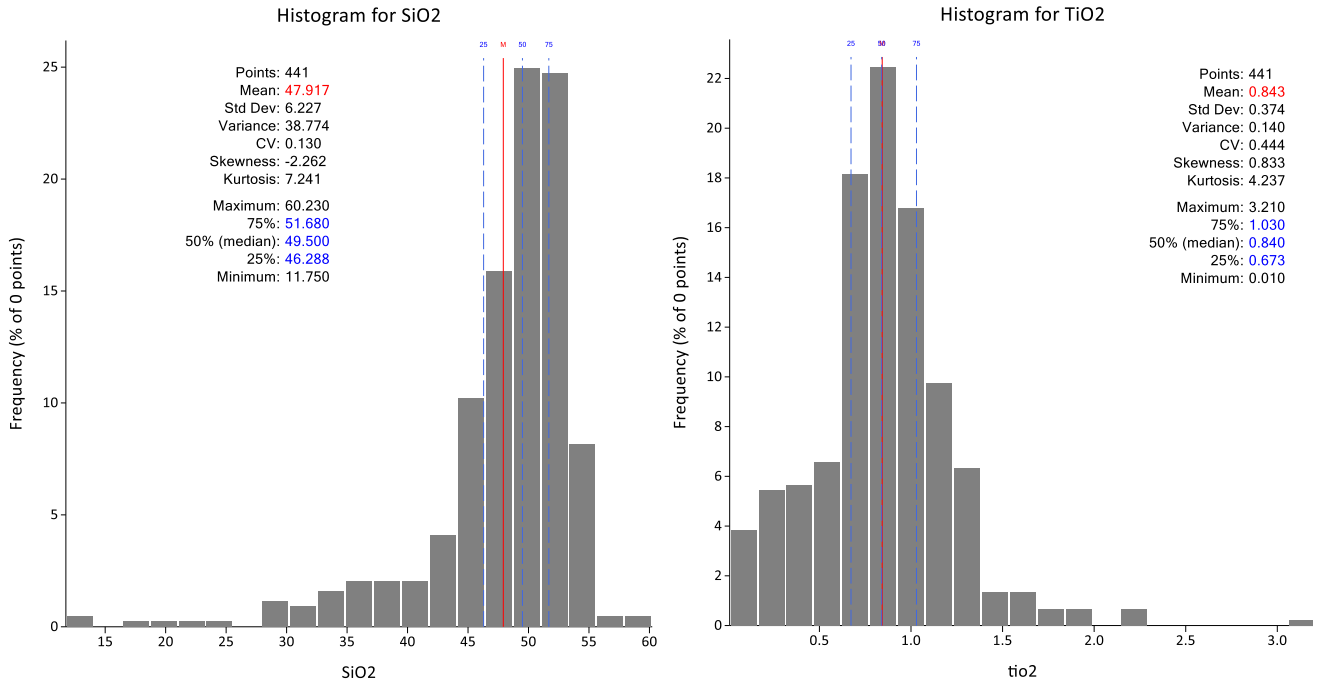
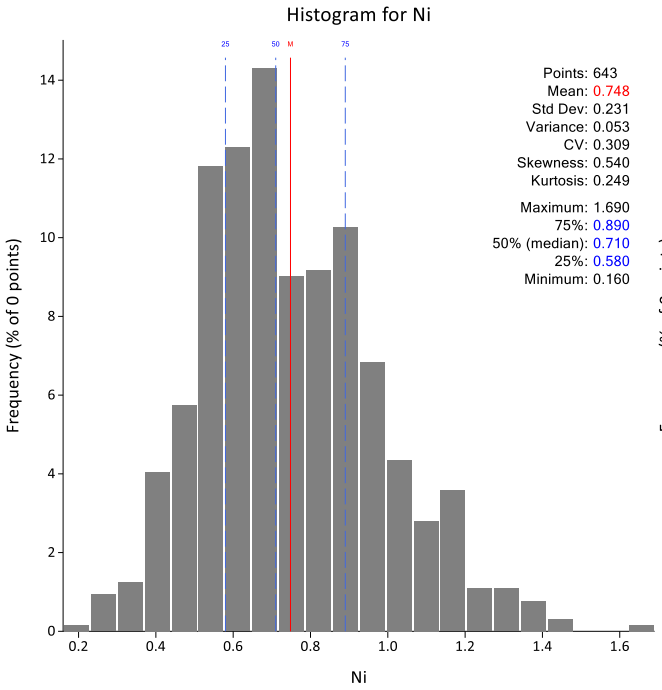
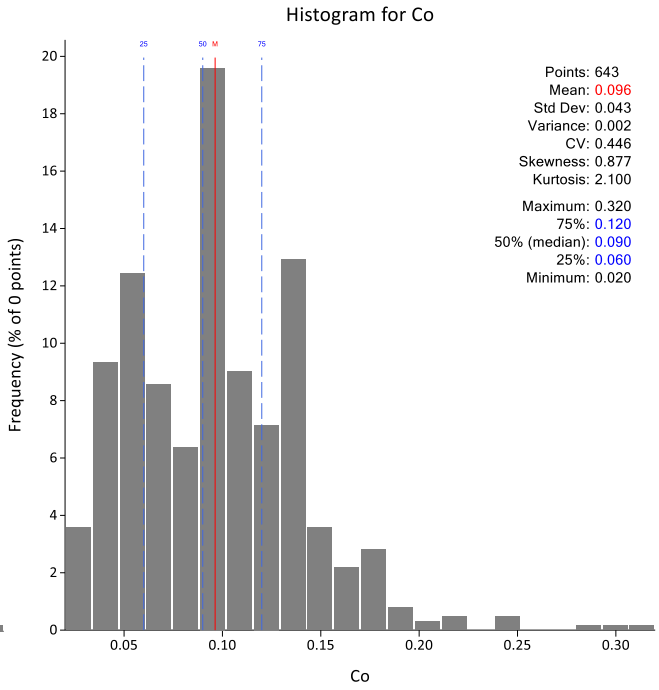
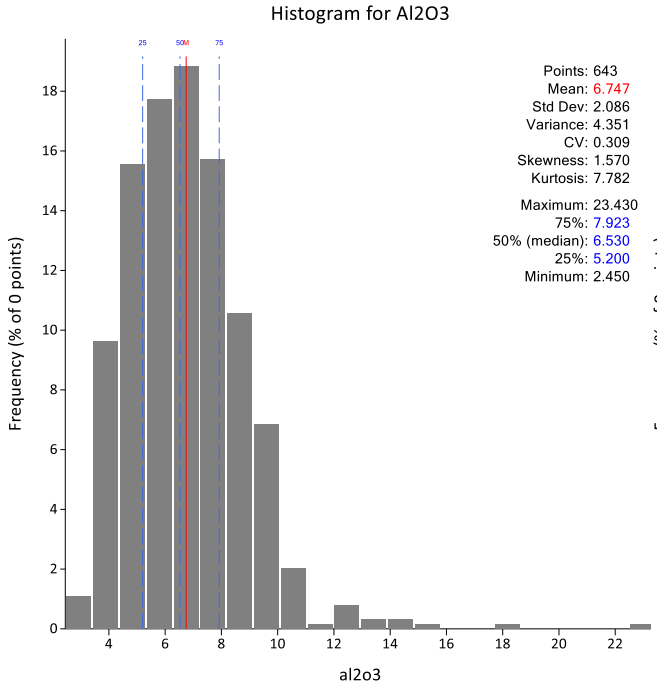
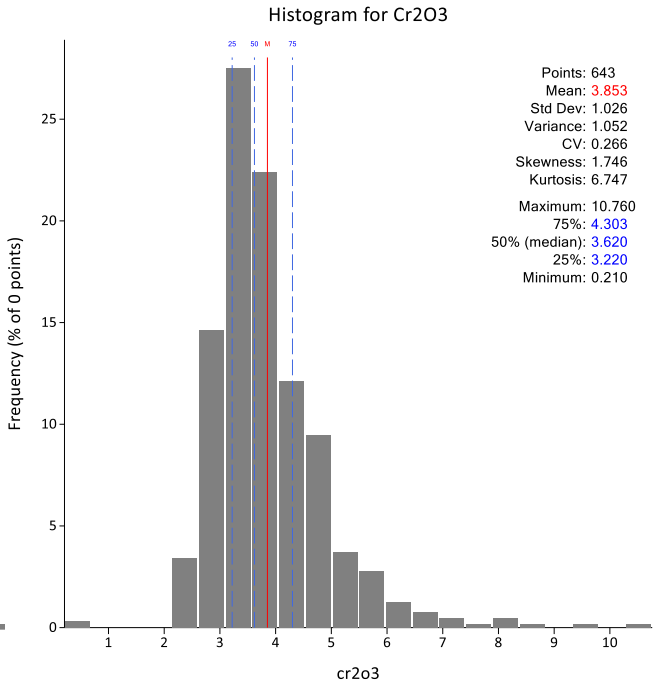


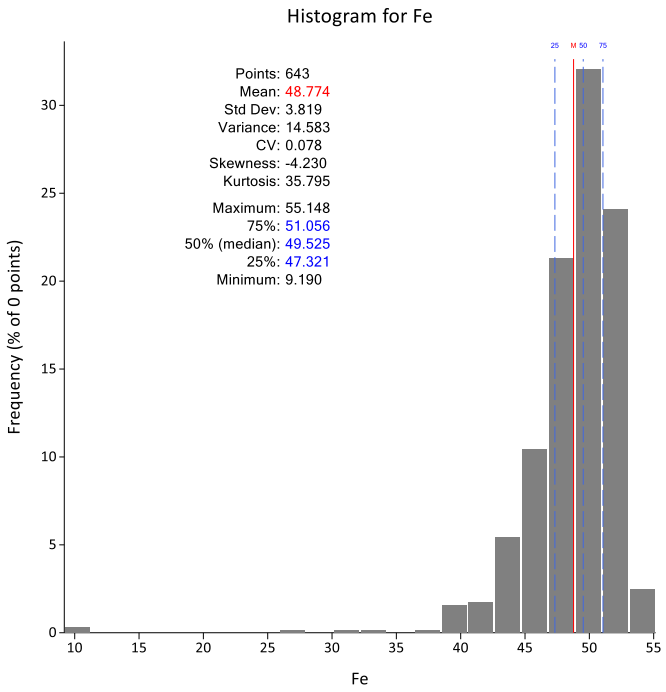
Figure 65 Histogram and descriptive statistic of Mud Upper in West100 Block

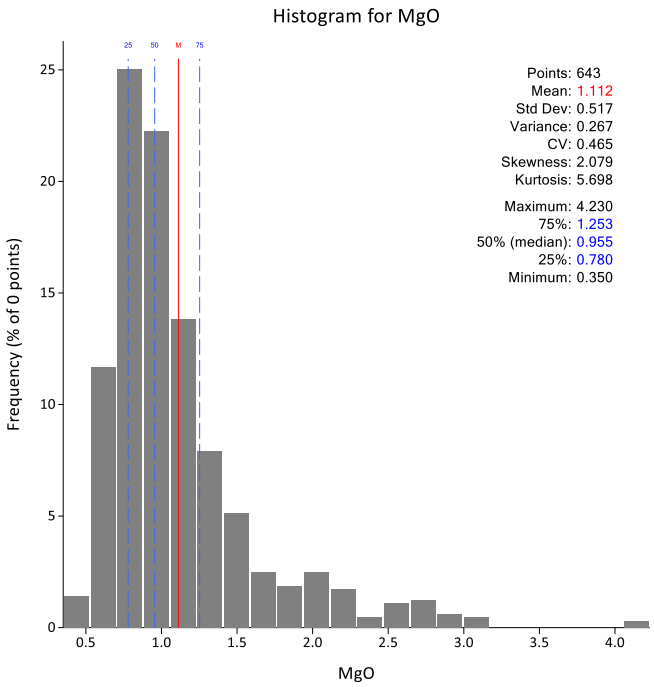

Histogram for Ni
Points: 643
Mean: 0.748
Std Dev: 0.231
Variance: 0.053
CV: 0.309
Skewness: 0.540
Kurtosis: 0.249
Maximum: 1.690
75%: 0.890
50% (median): 0.710
25%: 0.580
Minimum: 0.160
Frequency (% of 0 points)
Ni

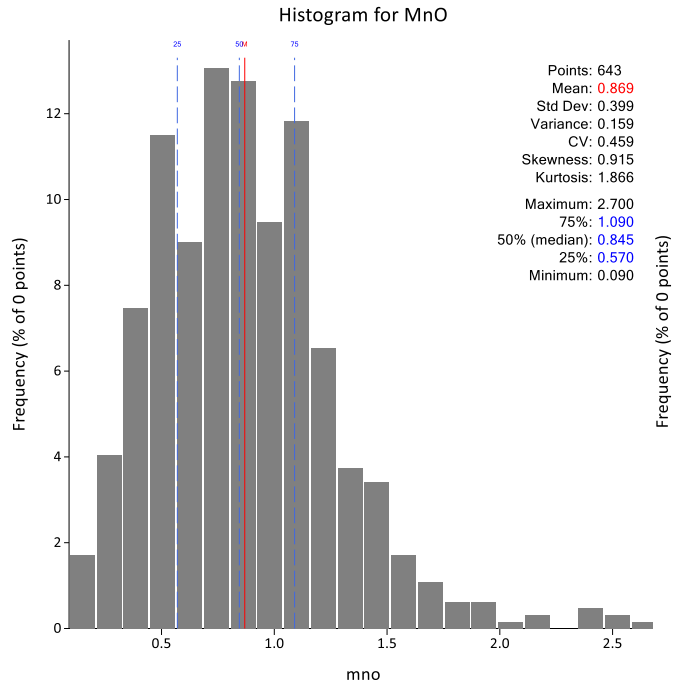

Histogram for Co
Points: 643
Mean: 0.096
Std Dev: 0.043
Variance: 0.002
CV: 0.446
Skewness: 0.877
Kurtosis: 2.100
Maximum: 0.320
75%: 0.120
50% (median): 0.090
25%: 0.060
Minimum: 0.020
Frequency (% of 0 points)
Co

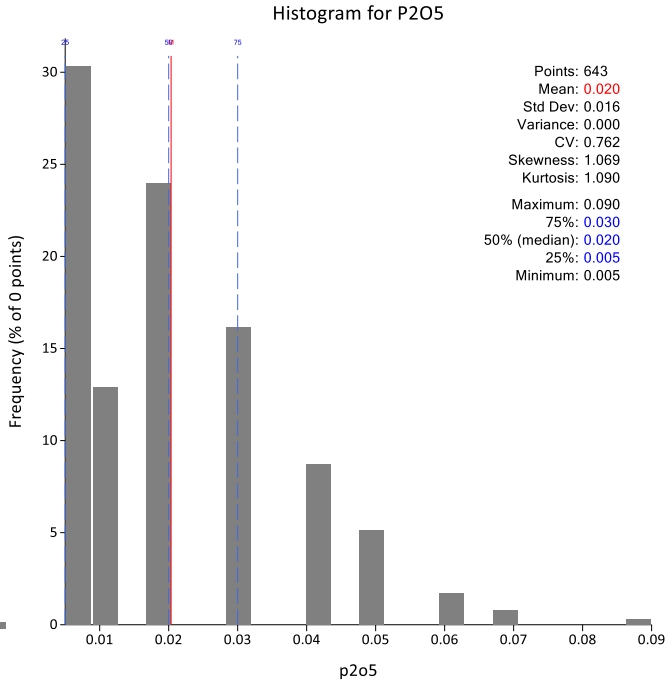

Histogram for Al2O3
Points: 643
Mean: 6.747
Std Dev: 2.086
Variance: 4.351
CV: 0.309
Skewness: 1.570
Kurtosis: 7.782
Maximum: 23.430
75%: 7.923
50% (median): 6.530
25%: 5.200
Minimum: 2.450
Frequency (% of 0 points)
al2o3


Histogram for Cr2O3
Points: 643
Mean: 3.853
Std Dev: 1.026
Variance: 1.052
CV: 0.266
Skewness: 1.746
Kurtosis: 6.747
Maximum: 10.760
75%: 4.303
50% (median): 3.620
25%: 3.220
Minimum: 0.210
Frequency (% of 0 points)
cr2o3


Histogram for Fe
Points: 643
Mean: 48.774
Std Dev: 3.819
Variance: 14.583
CV: 0.078
Skewness: -4.230
Kurtosis: 35.795
Maximum: 55.148
75%: 51.056
50% (median): 49.525
25%: 47.321
Minimum: 9.190
Frequency (% of 0 points)
Fe


Histogram for MgO
Points: 643
Mean: 1.112
Std Dev: 0.517
Variance: 0.267
CV: 0.465
Skewness: 2.079
Kurtosis: 5.698
Maximum: 4.230
75%: 1.253
50% (median): 0.955
25%: 0.780
Minimum: 0.350
Frequency (% of 0 points)
MgO


Histogram for MnO
Points: 643
Mean: 0.869
Std Dev: 0.399
Variance: 0.159
CV: 0.459
Skewness: 0.915
Kurtosis: 1.866
Maximum: 2.700
75%: 1.090
50% (median): 0.845
25%: 0.570
Minimum: 0.090
Frequency (% of 0 points)
mno


Histogram for P2O5
Points: 643
Mean: 0.020
Std Dev: 0.016
Variance: 0.000
CV: 0.762
Skewness: 1.069
Kurtosis: 1.090
Maximum: 0.090
75%: 0.030
50% (median): 0.020
25%: 0.005
Minimum: 0.005
Frequency (% of 0 points)
p2o5

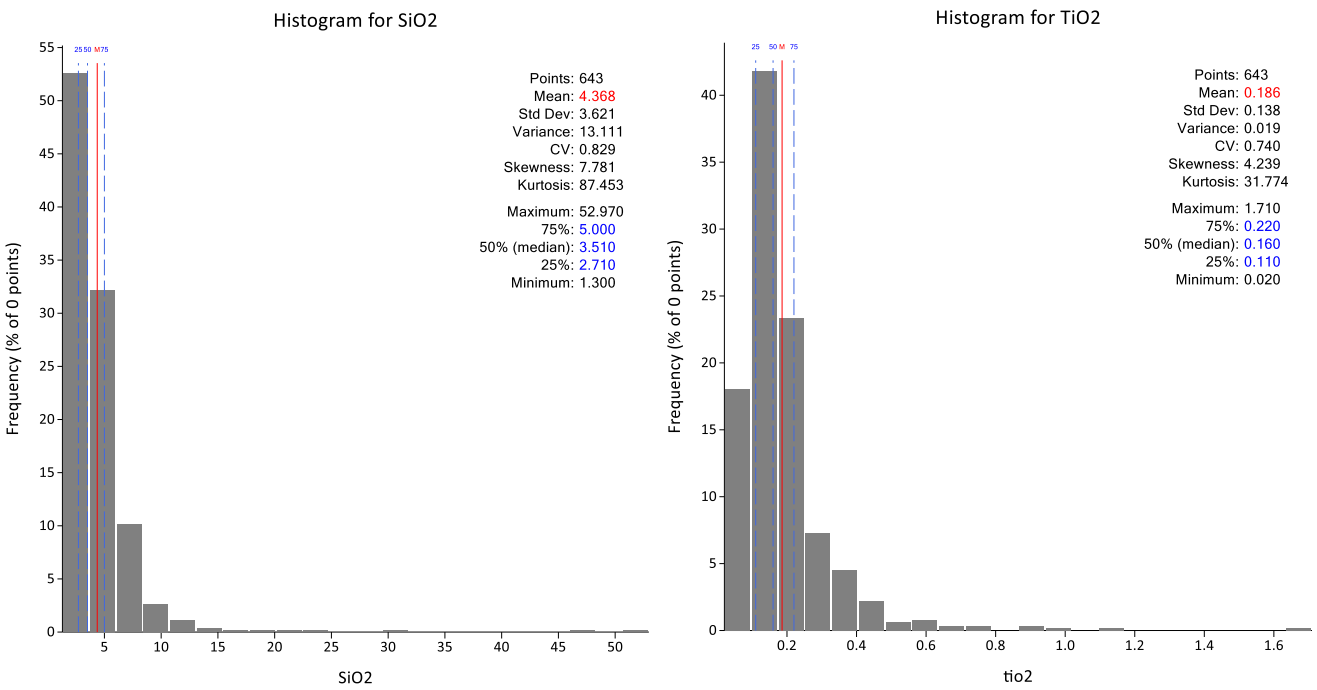
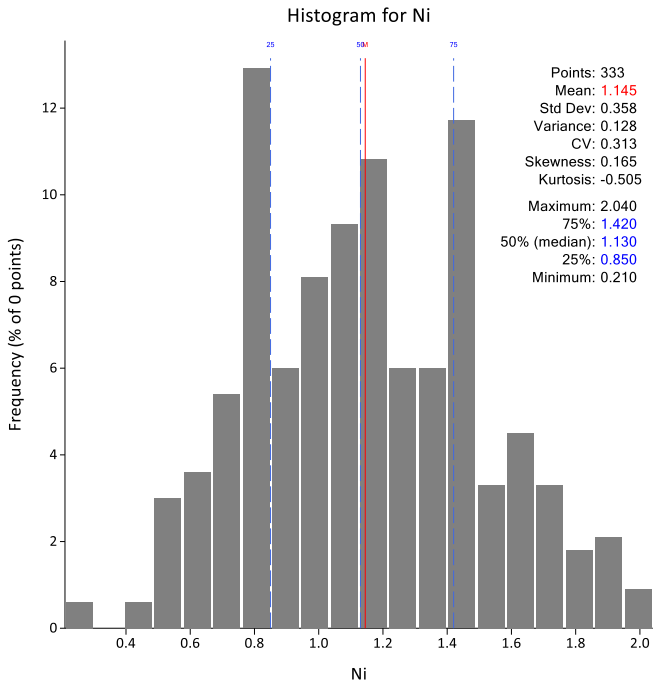
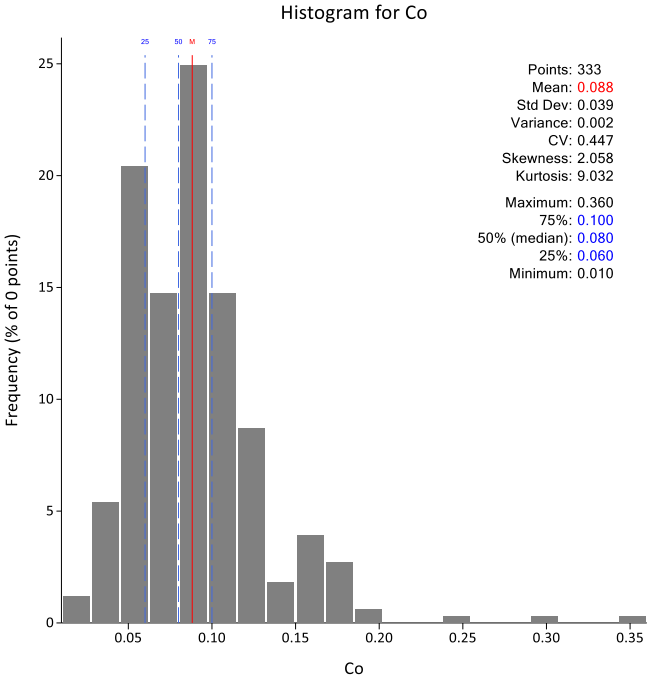
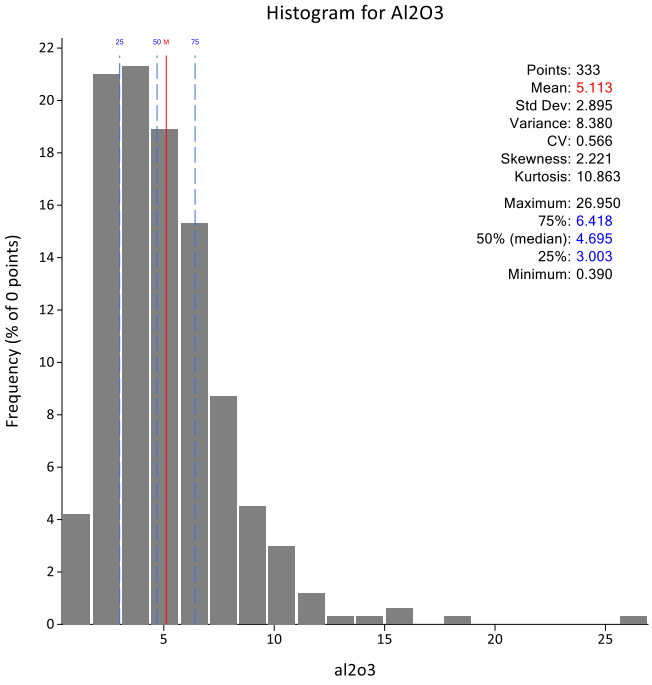
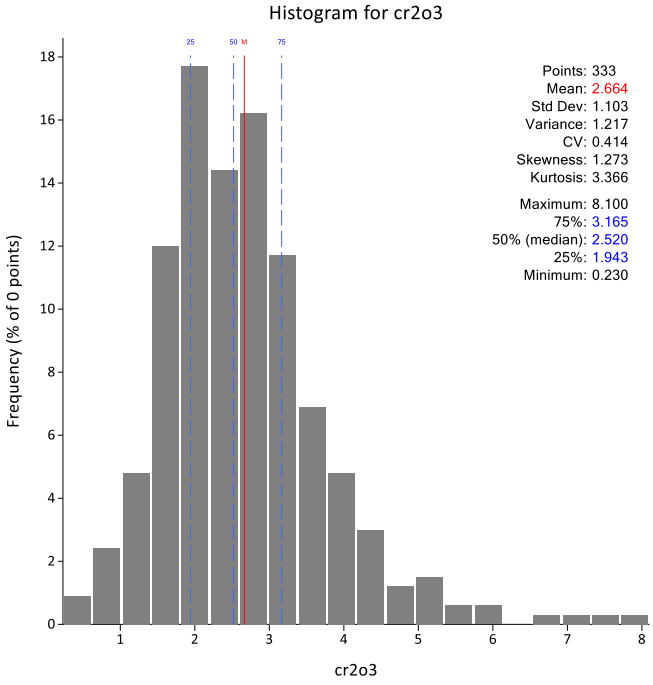


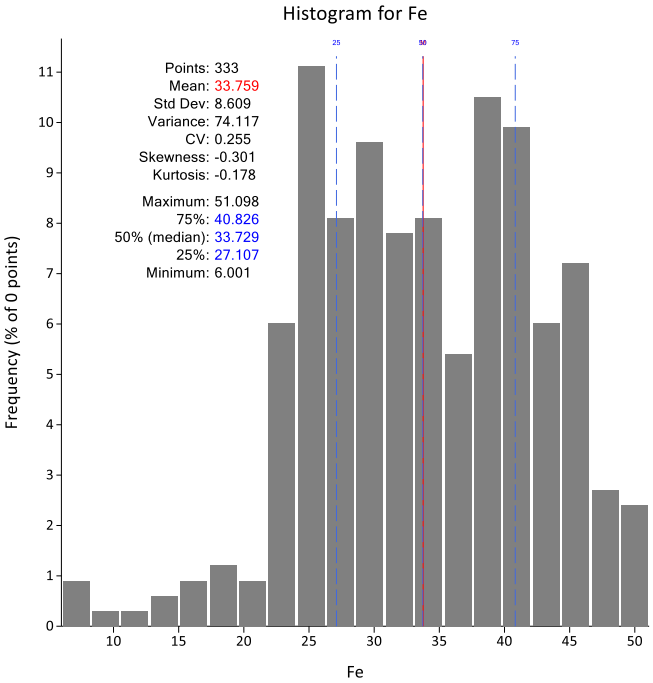
Figure 66 Histogram and descriptive statistic of Upper Limonite in West100 Block

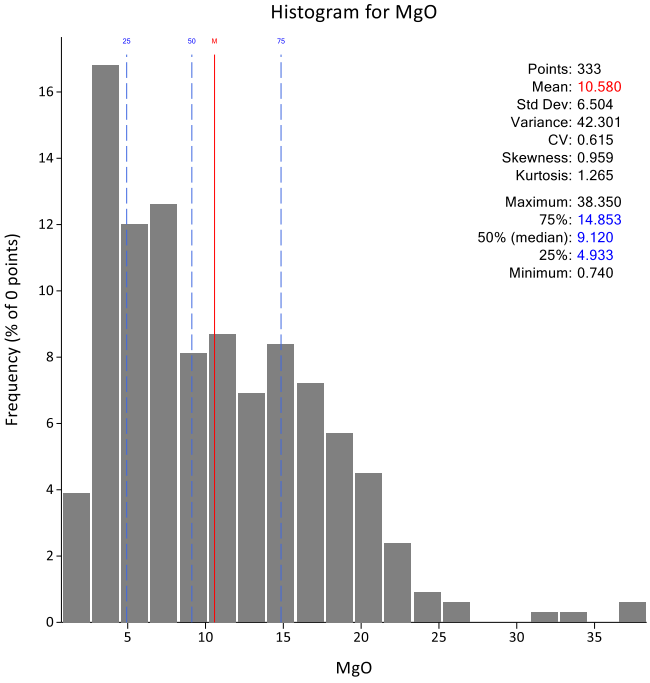

Histogram for Ni
Points: 333
Mean: 1.145
Std Dev: 0.358
Variance: 0.128
CV: 0.313
Skewness: 0.165
Kurtosis: -0.505
Maximum: 2.040
75%: 1.420
50% (median): 1.130
25%: 0.850
Minimum: 0.210
Frequency (% of 0 points)
Ni

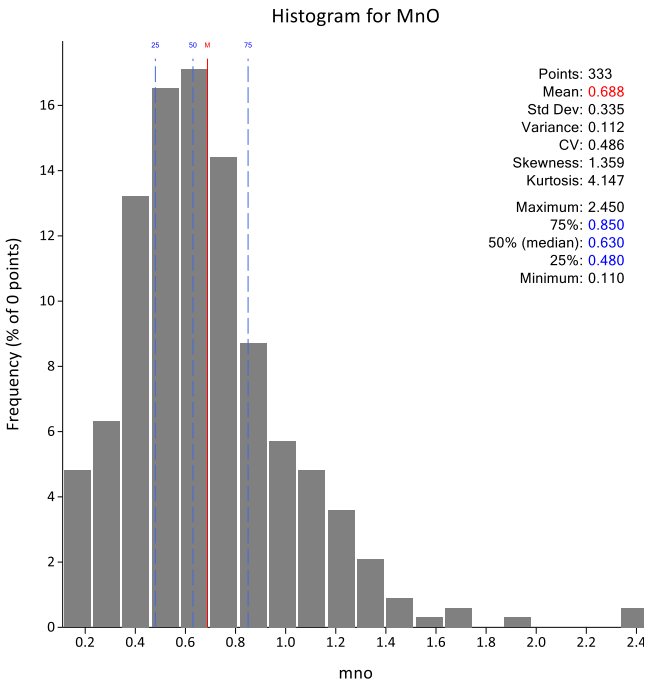

Histogram for Co
Points: 333
Mean: 0.088
Std Dev: 0.039
Variance: 0.002
CV: 0.447
Skewness: 2.058
Kurtosis: 9.032
Maximum: 0.360
75%: 0.100
50% (median): 0.080
25%: 0.060
Minimum: 0.010
Frequency (% of 0 points)
Co

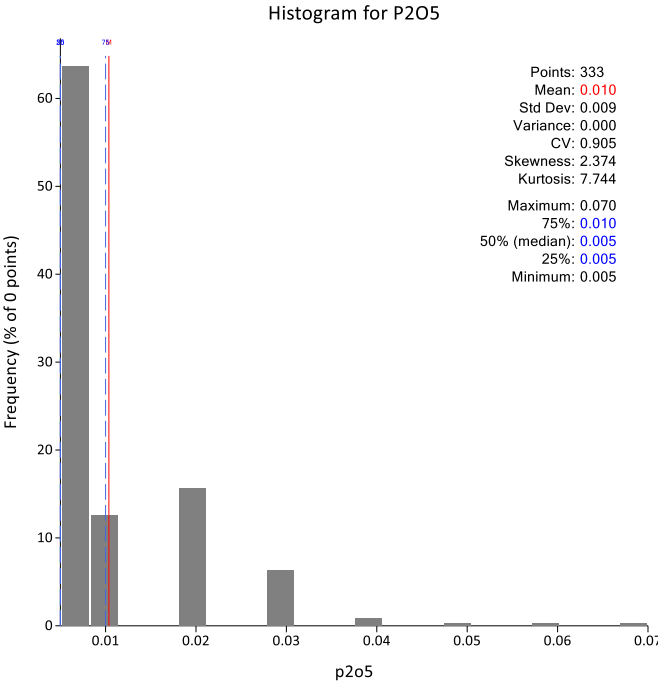

Histogram for Al2O3
Points: 333
Mean: 5.113
Std Dev: 2.895
Variance: 8.380
CV: 0.566
Skewness: 2.221
Kurtosis: 10.863
Maximum: 26.950
75%: 6.418
50% (median): 4.695
25%: 3.003
Minimum: 0.390
Frequency (% of 0 points)
al2o3


Histogram for cr2o3
Points: 333
Mean: 2.664
Std Dev: 1.103
Variance: 1.217
CV: 0.414
Skewness: 1.273
Kurtosis: 3.366
Maximum: 8.100
75%: 3.165
50% (median): 2.520
25%: 1.943
Minimum: 0.230
Frequency (% of 0 points)
cr2o3


Histogram for Fe
Points: 333
Mean: 33.759
Std Dev: 8.609
Variance: 74.117
CV: 0.255
Skewness: -0.301
Kurtosis: -0.178
Maximum: 51.098
75%: 40.826
50% (median): 33.729
25%: 27.107
Minimum: 6.001
Frequency (% of 0 points)
Fe


Histogram for MgO
Points: 333
Mean: 10.580
Std Dev: 6.504
Variance: 42.301
CV: 0.615
Skewness: 0.959
Kurtosis: 1.265
Maximum: 38.350
75%: 14.853
50% (median): 9.120
25%: 4.933
Minimum: 0.740
Frequency (% of 0 points)
MgO


Histogram for MnO
Points: 333
Mean: 0.688
Std Dev: 0.335
Variance: 0.112
CV: 0.486
Skewness: 1.359
Kurtosis: 4.147
Maximum: 2.450
75%: 0.850
50% (median): 0.630
25%: 0.480
Minimum: 0.110
Frequency (% of 0 points)
mno


Histogram for P2O5
Points: 333
Mean: 0.010
Std Dev: 0.009
Variance: 0.000
CV: 0.905
Skewness: 2.374
Kurtosis: 7.744
Maximum: 0.070
75%: 0.010
50% (median): 0.005
25%: 0.005
Minimum: 0.005
Frequency (% of 0 points)
p2o5

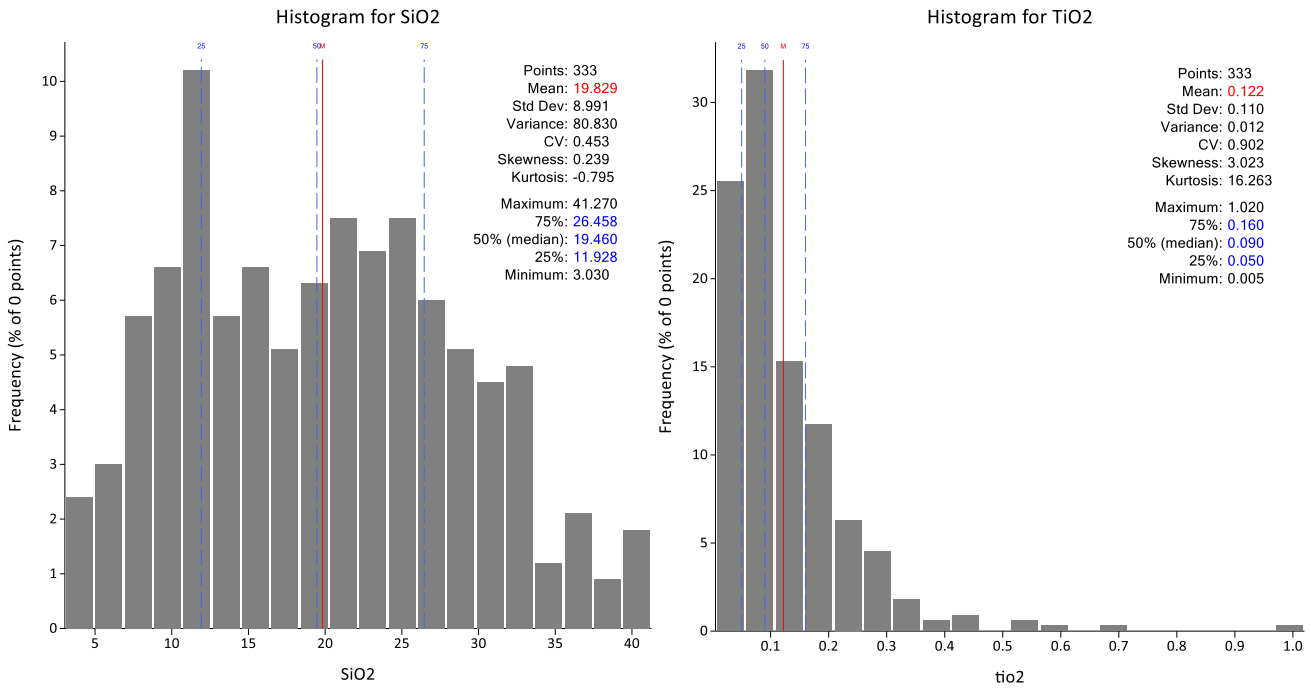
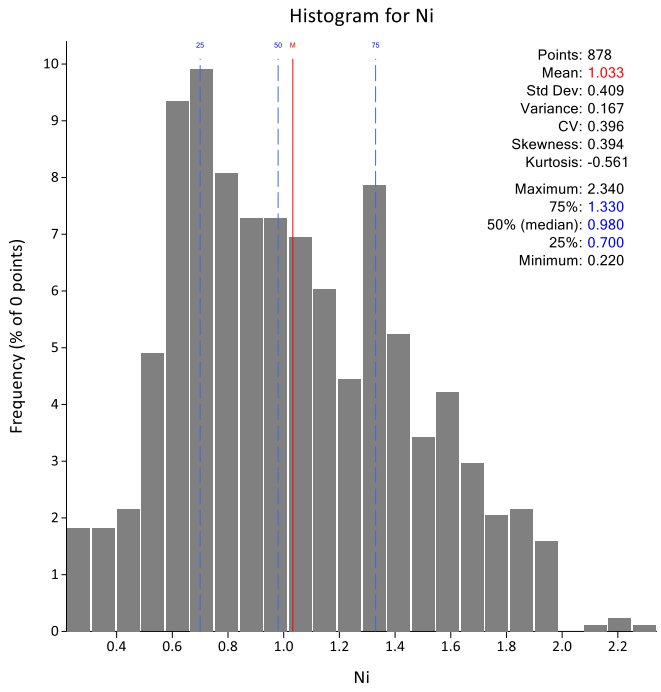
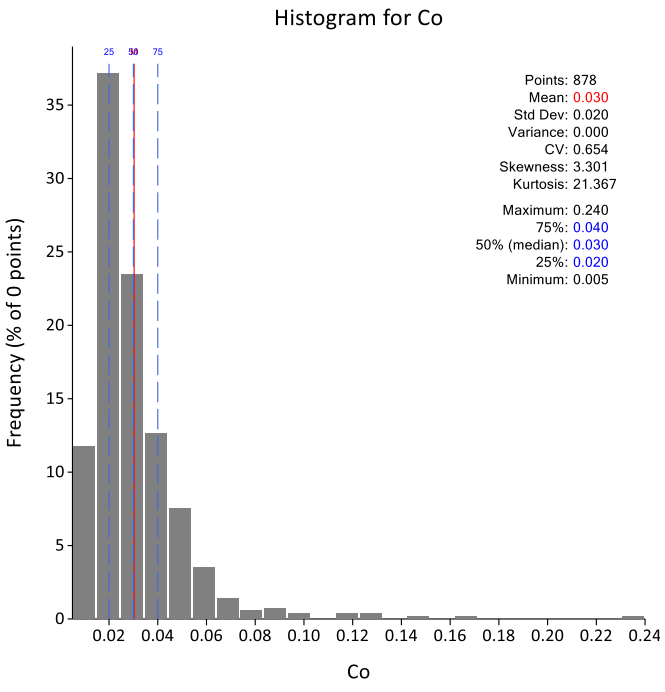
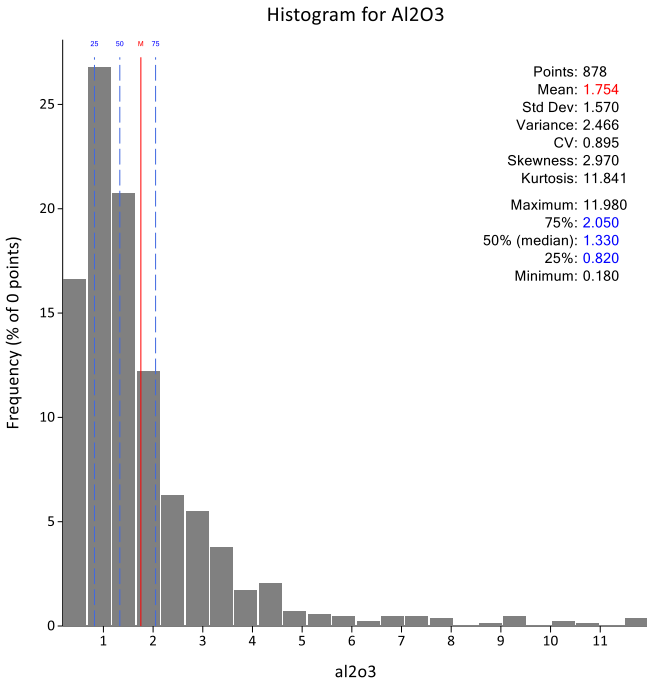
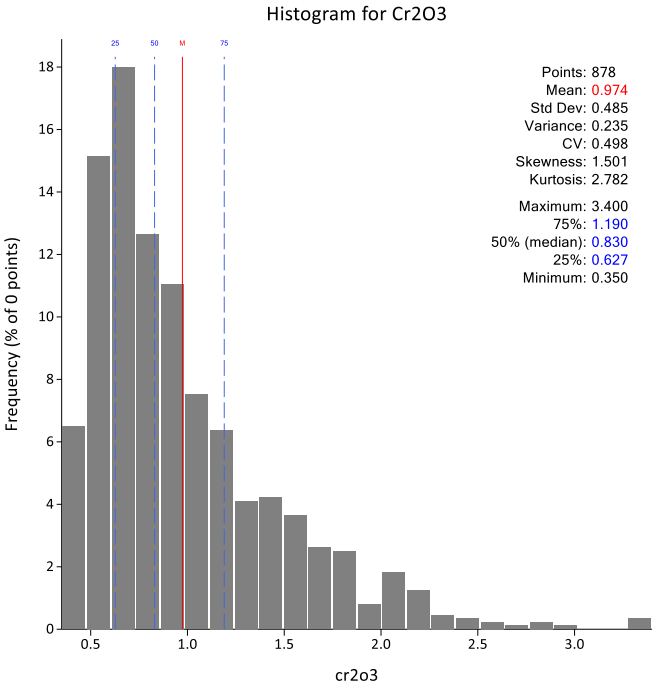


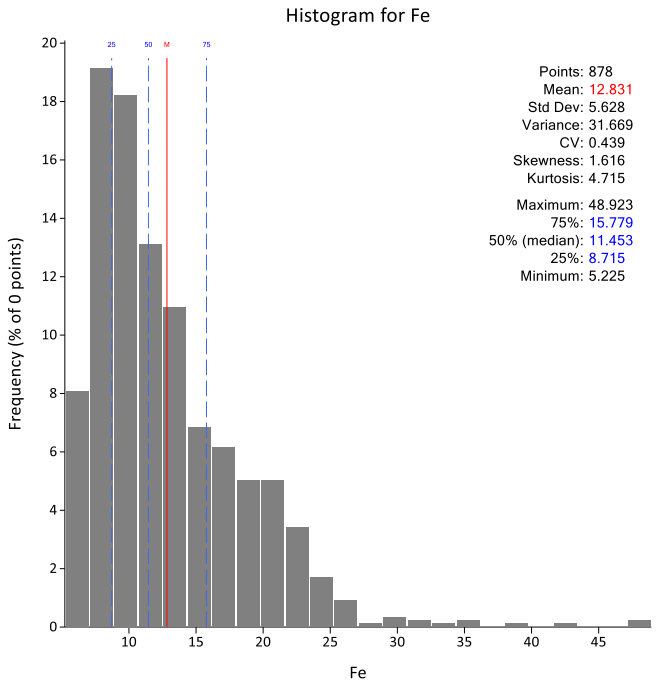
Figure 67 Histogram and descriptive statistic of Lower Limonite in West100 Block

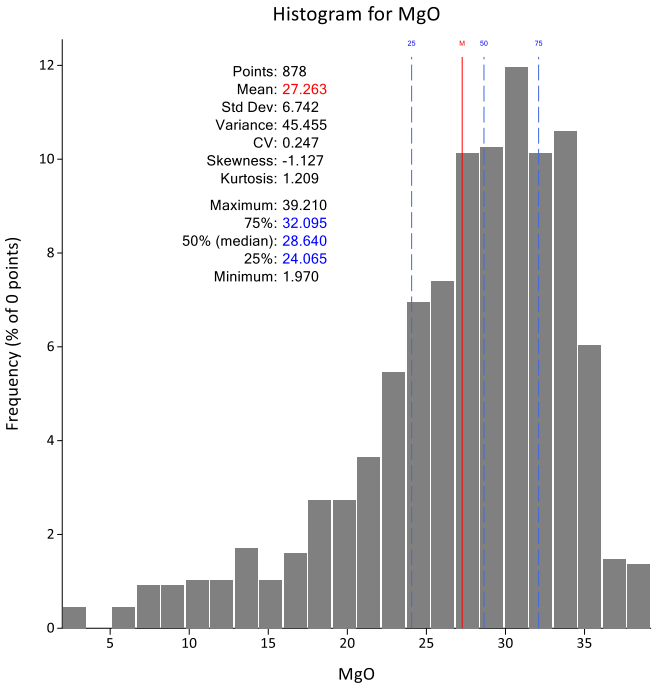

Histogram for Ni
Points: 878
Mean: 1.033
Std Dev: 0.409
Variance: 0.167
CV: 0.396
Skewness: 0.394
Kurtosis: -0.561
Maximum: 2.340
75%: 1.330
50% (median): 0.980
25%: 0.700
Minimum: 0.220
Frequency (% of 0 points)
Ni

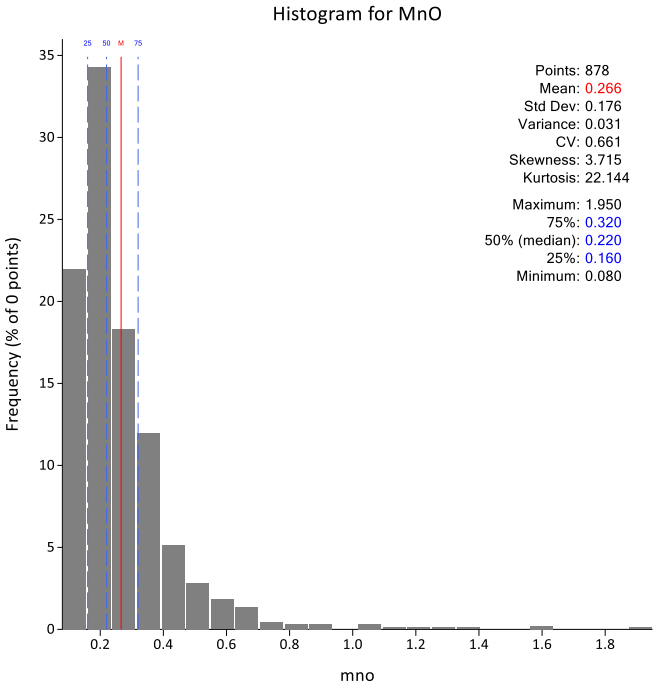

Histogram for Co
Points: 878
Mean: 0.030
Std Dev: 0.020
Variance: 0.000
CV: 0.654
Skewness: 3.301
Kurtosis: 21.367
Maximum: 0.240
75%: 0.040
50% (median): 0.030
25%: 0.020
Minimum: 0.005
Frequency (% of 0 points)
Co

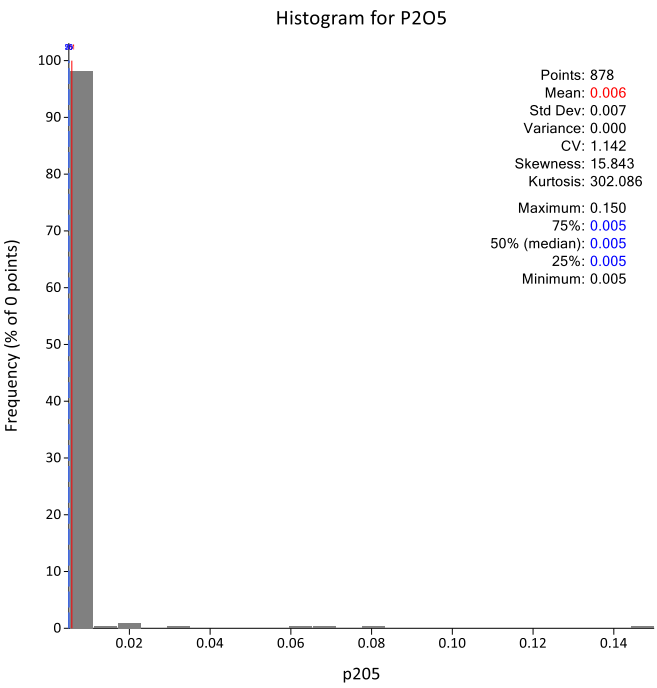

Histogram for Al2O3
Points: 878
Mean: 1.754
Std Dev: 1.570
Variance: 2.466
CV: 0.895
Skewness: 2.970
Kurtosis: 11.841
Maximum: 11.980
75%: 2.050
50% (median): 1.330
25%: 0.820
Minimum: 0.180
Frequency (% of 0 points)
al2o3


Histogram for Cr2O3
Points: 878
Mean: 0.974
Std Dev: 0.485
Variance: 0.235
CV: 0.498
Skewness: 1.501
Kurtosis: 2.782
Maximum: 3.400
75%: 1.190
50% (median): 0.830
25%: 0.627
Minimum: 0.350
Frequency (% of 0 points)
cr2o3


Histogram for Fe
Points: 878
Mean: 12.831
Std Dev: 5.628
Variance: 31.669
CV: 0.439
Skewness: 1.616
Kurtosis: 4.715
Maximum: 48.923
75%: 15.779
50% (median): 11.453
25%: 8.715
Minimum: 5.225
Frequency (% of 0 points)
Fe


Histogram for MgO
Points: 878
Mean: 27.263
Std Dev: 6.742
Variance: 45.455
CV: 0.247
Skewness: -1.127
Kurtosis: 1.209
Maximum: 39.210
75%: 32.095
50% (median): 28.640
25%: 24.065
Minimum: 1.970
Frequency (% of 0 points)
MgO


Histogram for MnO
Points: 878
Mean: 0.266
Std Dev: 0.176
Variance: 0.031
CV: 0.661
Skewness: 3.715
Kurtosis: 22.144
Maximum: 1.950
75%: 0.320
50% (median): 0.220
25%: 0.160
Minimum: 0.080
Frequency (% of 0 points)
mno


Histogram for P2O5
Points: 878
Mean: 0.006
Std Dev: 0.007
Variance: 0.000
CV: 1.142
Skewness: 15.843
Kurtosis: 302.086
Maximum: 0.150
75%: 0.005
50% (median): 0.005
25%: 0.005
Minimum: 0.005
Frequency (% of 0 points)
p205

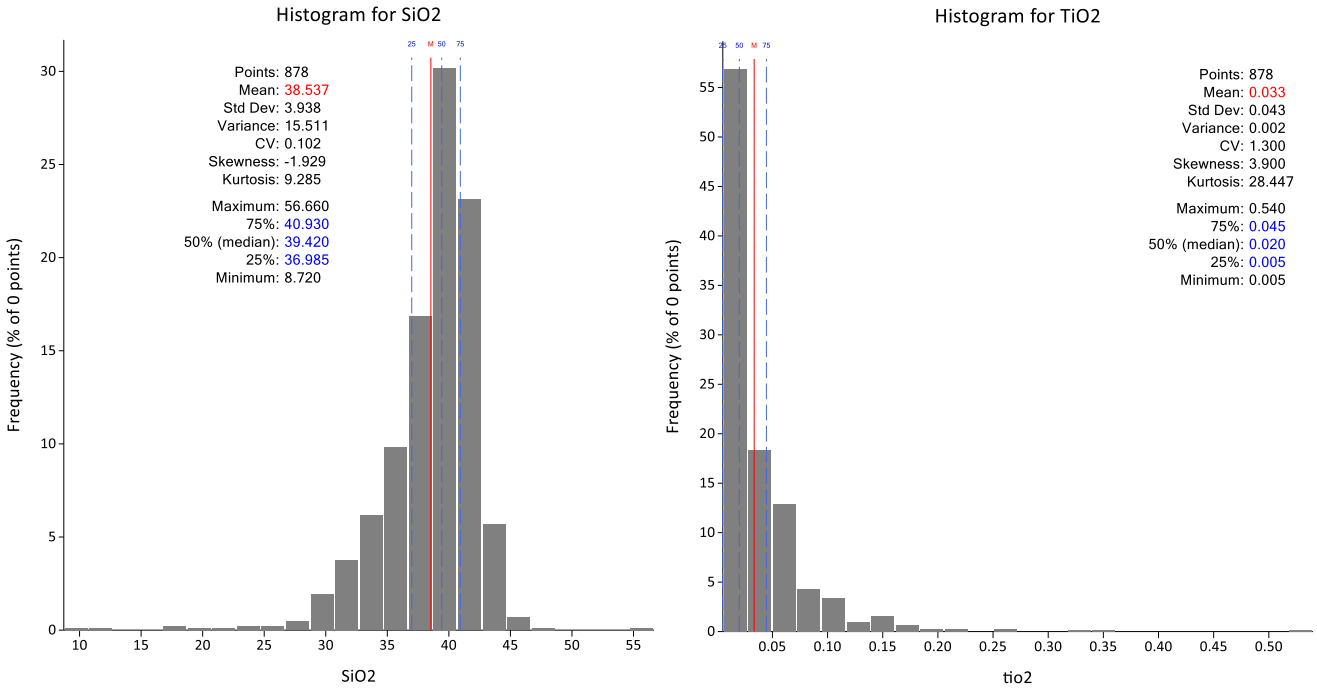


Figure 68 Histogram and descriptive statistic of Saprolite in West100 Block

3.3 Variography

Since West100 block has been one of statistical domain base on drill hole spacing, the variography and also the Variogram

3.3.1 Variogram

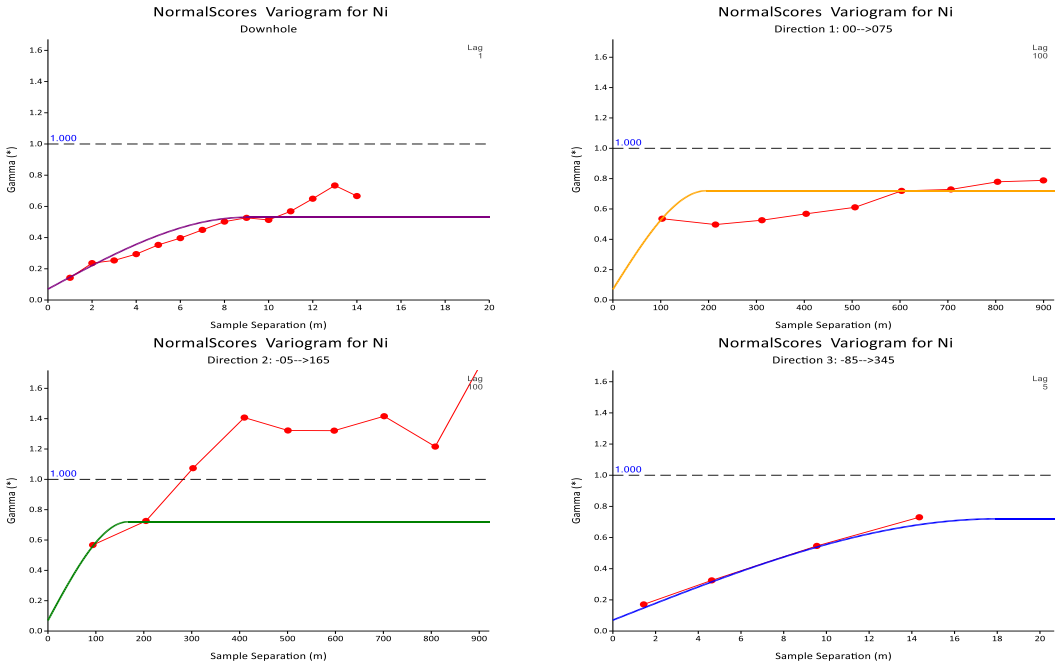


Figure 69 Variogram of Ni Mud Upper in West100 Block

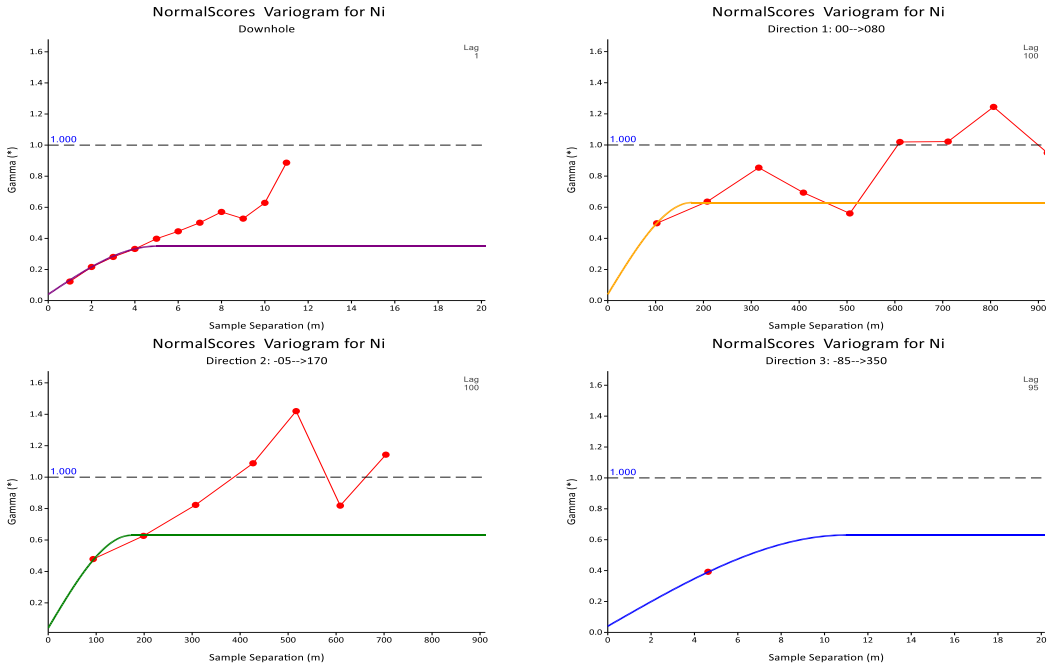


Figure 70

Variogram of Ni Mud Lower in West100 Block

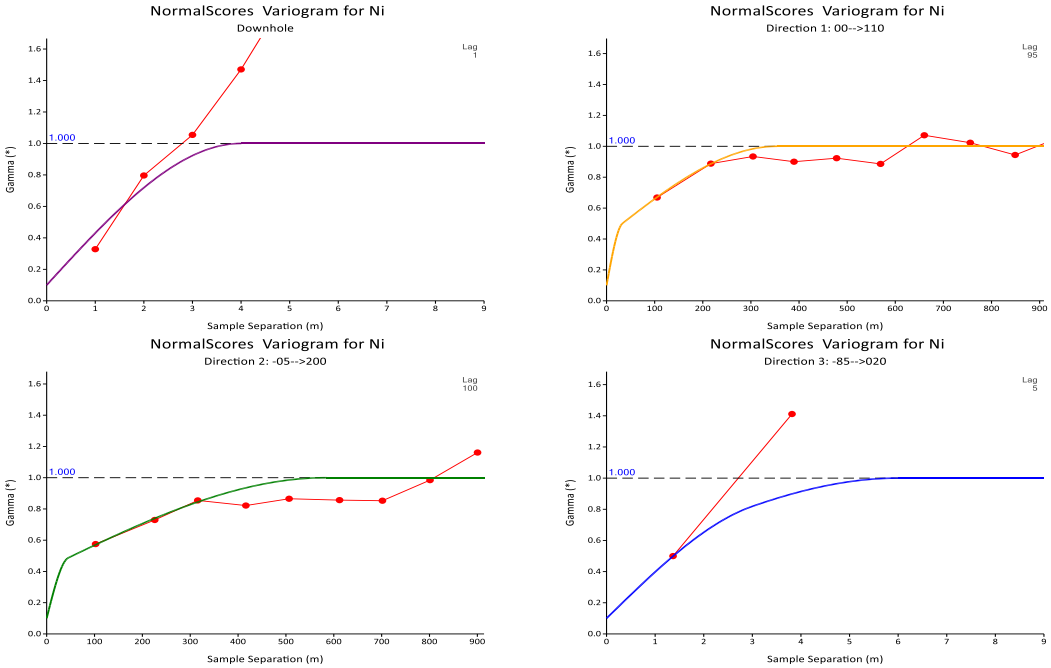


Figure 71 Variogram of Ni Upper Limonite in West100 Block

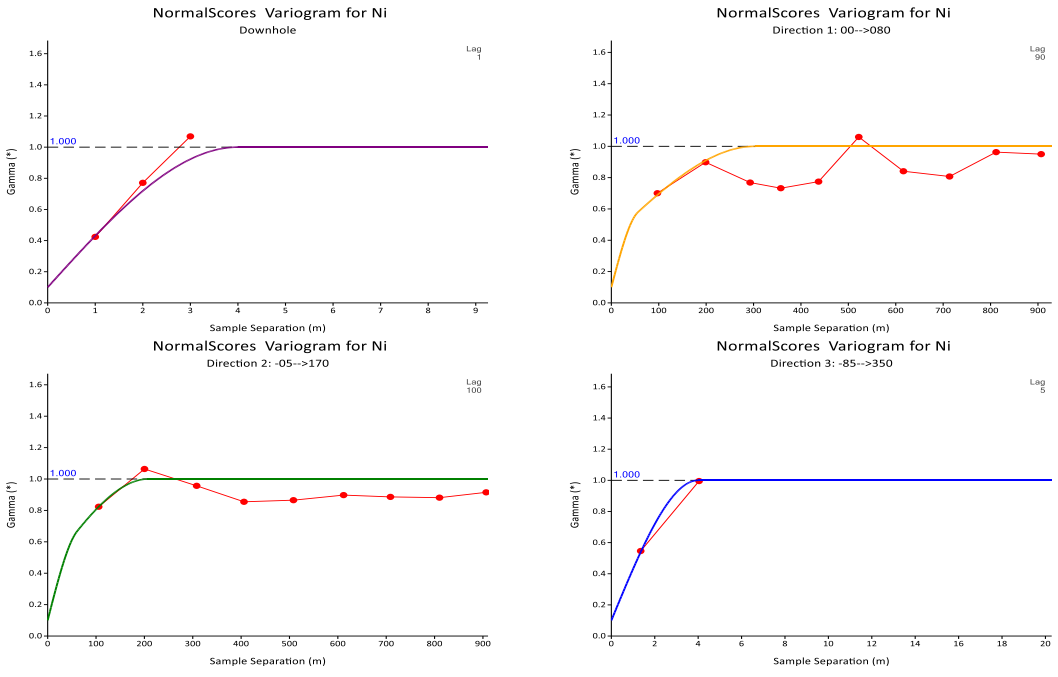


Figure 72 Variogram of Ni Lower Limonite in West100 Block

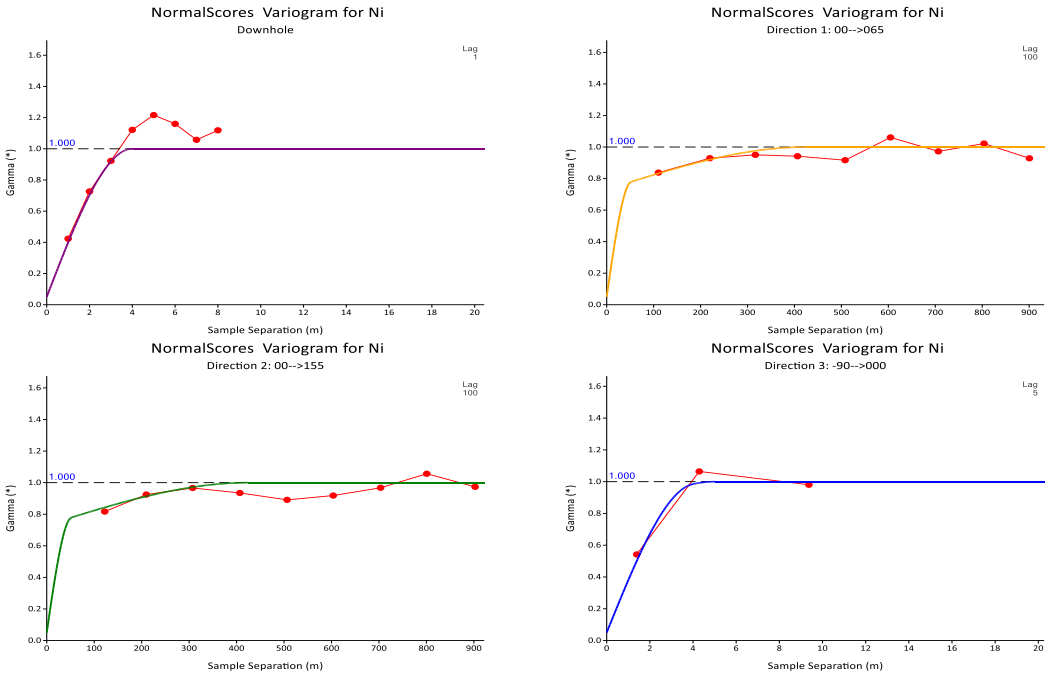


Figure 73 Variogram of Ni Saprolite in West100 Block

3.3.2 Krigging Neighbourhood Analysis

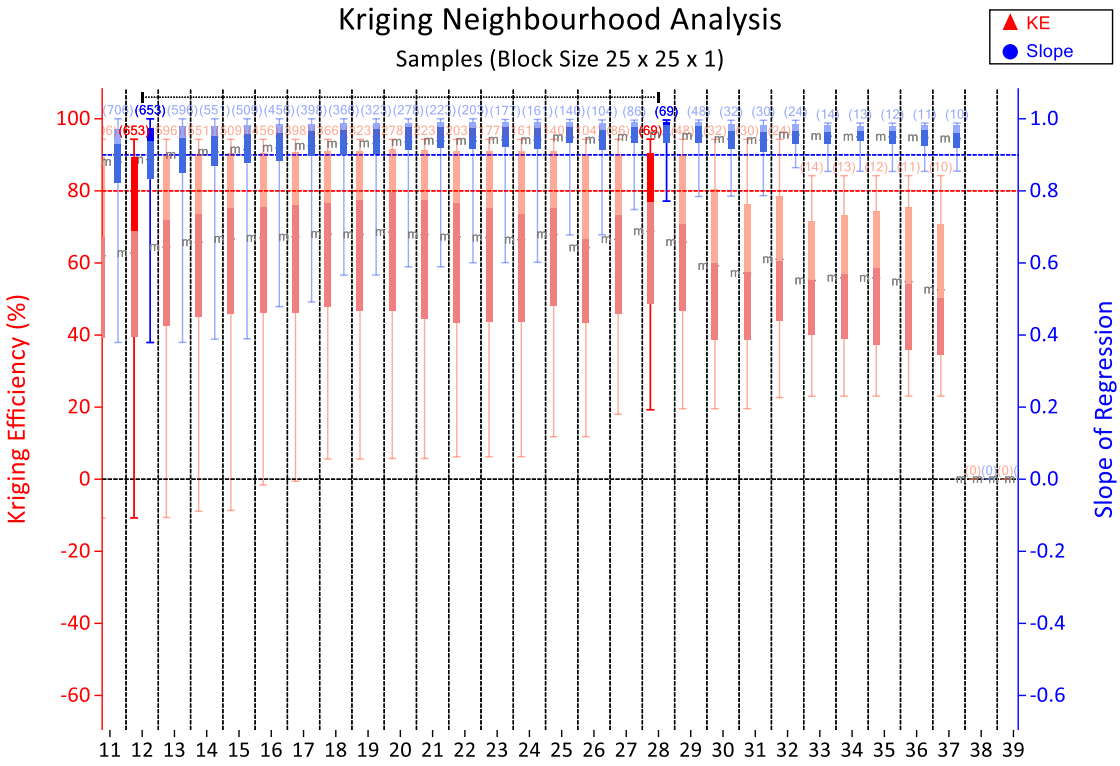


Figure 74 Optimum Number of samples of Mud Upper in West100 Block

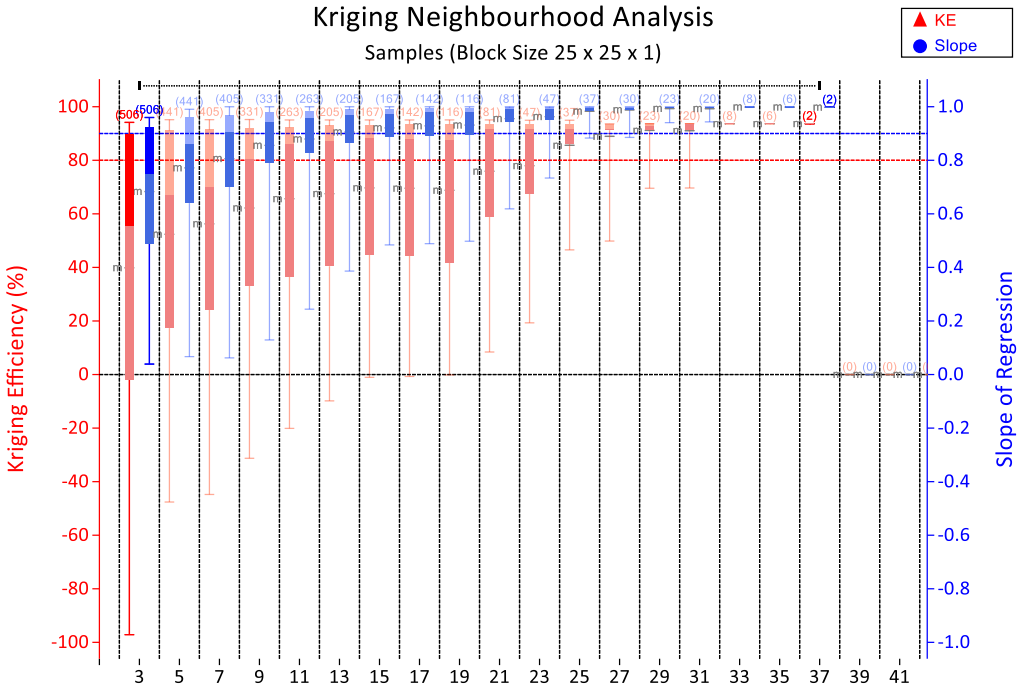


Figure 75 Optimum Number of samples of Mud Lower in West100 Block

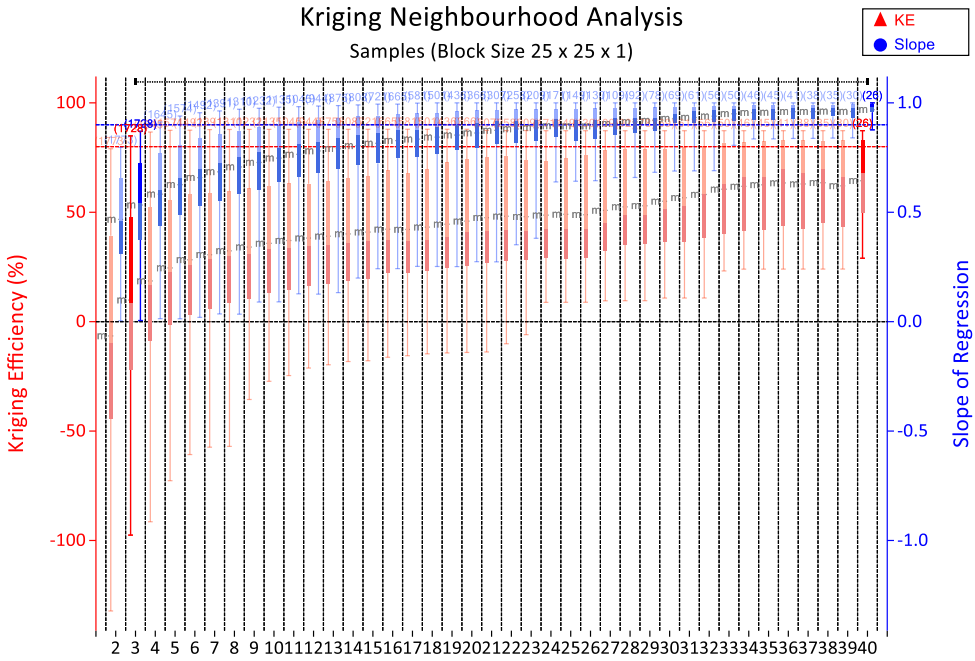


Figure 76 Optimum Number of samples of Upper Limonite in West100 Block

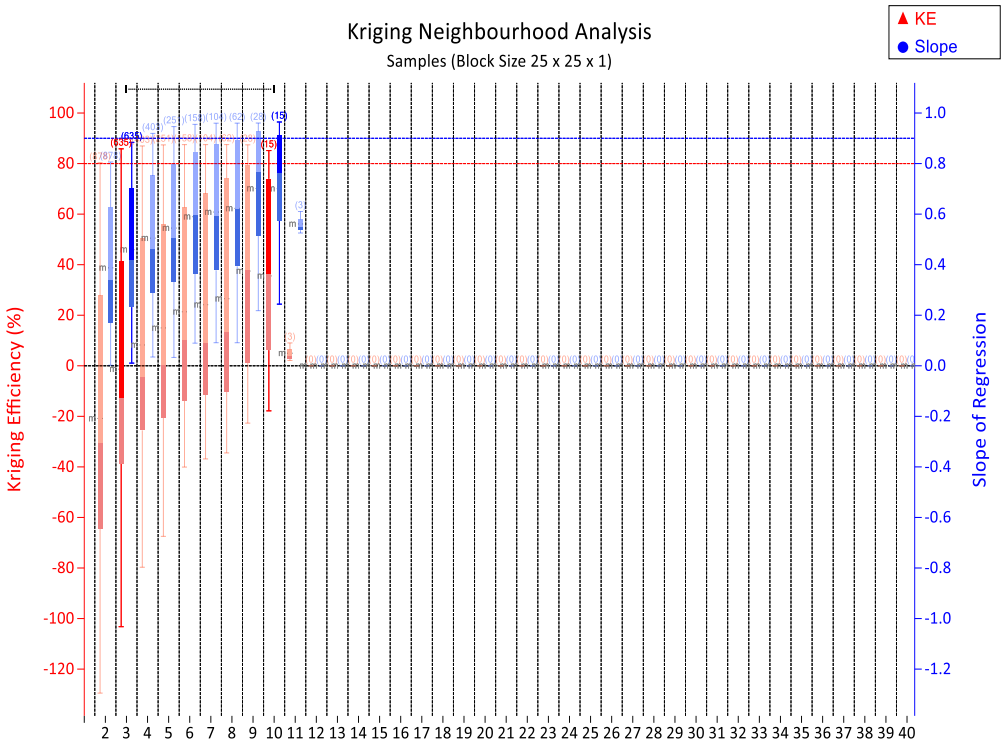


Figure 77

Optimum Number of samples of Lower Limonite in West100 Block

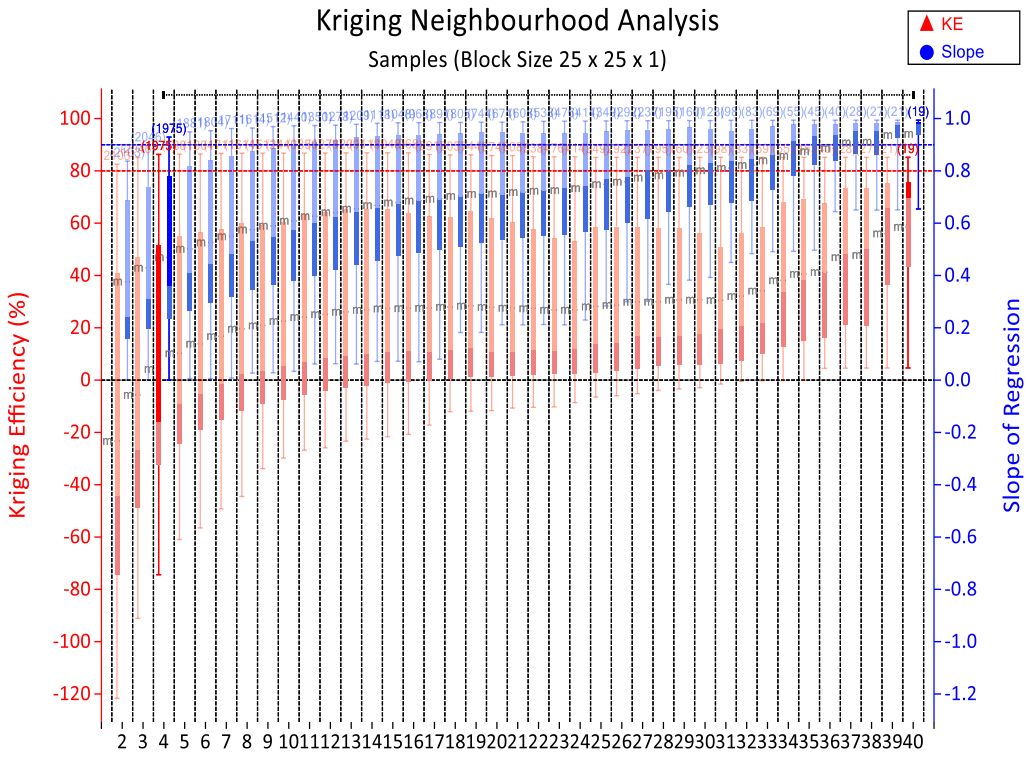


Figure 78 Optimum Number of samples of Saprolite in West100 Block

3.4 Grade Estimation

Table 14 Search parameter of Mud Upper in West100 Block

Parameter	Mud Upper (Ni)				Mud Upper (Co)				Mud Upper (Al2O3)				Mud Upper (Cr2O3)				Mud Upper (Fe)			
	Pass 1	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**
Minimum Sample	3	3	2	1	3	3	2	1	3	3	2	1	3	3	2	1	3	3	2	1
Maximum Sample	28				27				20				20				25			
Max. Search Radius	150	300	600	1200	150	300	600	1200	150	300	600	1200	150	300	600	1200	150	300	600	1200
Max. Vertical Distance	14	28	55	111	10	19	38	77	12	23	46	93	16	31	63	126	7	15	30	60
Bearing	75				0				80				75				70			
Plunge	0				0				0				0				0			
Dip	-5				0				-5				-5				-5			
Major/Semi-major	1.168				1.000				1.230				1.202				1.052			
Major/Minor	10.83				15.64				12.92				9.53				20.11			
Nugget	0.102				0.134				0.105				0.068				0.108			
Structure 1	0.898				0.866				0.895				0.932				0.892			
Range	195				172				155				143				181			
Block Discretisation	5 X 5 X 2				5 X 5 X 2				5 X 5 X 2				5 X 5 X 2				5 X 5 X 2			

Parameter	Mud Upper (MgO)				Mud Upper (MnO)				Mud Upper (P2O5)				Mud Upper (SiO2)				Mud Upper (TiO2)			
	Pass 1	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**
Minimum Sample	3	3	2	1	3	3	2	1	3	3	2	1	3	3	2	1	3	3	2	1
Maximum Sample	19				25				25				25				28			
Max. Search Radius	150	300	600	1200	150	300	600	1200	150	300	600	1200	150	300	600	1200	150	300	600	1200
Max. Vertical Distance	9	17	34	69	10	20	40	81	16	32	64	127	13	27	53	106	10	20	41	81
Bearing	75				60				65				80				0			
Plunge	0				0				0				0				0			
Dip	-5				-5				-5				-5				0			
Major/Semi-major	1.000				1.299				1.026				1.168				1.020			
Major/Minor	17.5				14.83				9.41				11.31				14.75			
Nugget	0.047				0.028				0.145				0.062				0.076			
Structure 1	0.953				0.972				0.855				0.938				0.924			
Range	140				178				160				181				177			
Block Discretisation	5 X 5 X 2				5 X 5 X 2				5 X 5 X 2				5 X 5 X 2				5 X 5 X 2			

Table 15 Search parameter of Mud Lower in West100 Block

Parameter	Mud Lower (Ni)				Mud Lower (Co)				Mud Lower (Al2O3)				Mud Lower (Cr2O3)				Mud Lower (Fe)			
	Pass 1	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**
Minimum Sample	3	3	2	1	3	3	2	1	3	3	2	1	3	3	2	1	3	3	2	1
Maximum Sample	37				39				36				50				39			
Max. Search Radius	150	300	600	1200	150	300	600	1200	150	300	600	1200	150	300	600	1200	150	300	600	1200
Max. Vertical Distance	9	19	38	75	16	32	64	128	7	15	30	59	10	19	38	76	11	23	46	91
Bearing	80				55				60				70				65			
Plunge	0				0				0				0				0			
Dip	-5				-5				-5				-5				-5			
Major/Semi-major	1.017				1.182				1.022				1.000				1.000			
Major/Minor	16.00				9.4				20.22				15.79				13.14			
Nugget	0.049				0.233				0.067				0.182				0.141			
Structure 1	0.951				0.767				0.933				0.818				0.859			
Range	176				188				182				221				184			
Block Discretisation	5 X 5 X 2				5 X 5 X 2				5 X 5 X 2				5 X 5 X 2				5 X 5 X 2			

Parameter	Mud Lower (MgO)				Mud Lower (MnO)				Mud Lower (P2O5)				Mud Lower (SiO2)				Mud Lower (TiO2)			
	Pass 1	Pass 2	Pass 3	Pass 4	Pass 1	Pass 2	Pass 3	Pass 4	Pass 1	Pass 2	Pass 3	Pass 4	Pass 1	Pass 2	Pass 3	Pass 4	Pass 1	Pass 2	Pass 3	Pass 4
Minimum Sample	3	3	2	1	3	3	2	1	3	3	2	1	3	3	2	1	3	3	2	1
Maximum Sample	39				20				13				40				35			
Max. Search Radius	150	300	600	1200	150	300	600	1200	150	300	600	1200	150	300	600	1200	150	300	600	1200
Max. Vertical Distance	8	15	31	62	6	12	25	49	14	28	55	111	11	22	45	90	10	20	40	80
Bearing	60				55				55				70				75			
Plunge	0				0				0				0				0			
Dip	-5				0				0				-5				-5			
Major/Semi-major	1.084				1.000				1.000				1.000				1.018			
Major/Minor	19.4				24.33				10.82				13.36				15.09			
Nugget	0.087				0.138				0.271				0.227				0.09			
Structure 1	0.913				0.862				0.729				0.773				0.91			
Range	194				146				119				187				166			
Block Discretisation	5 X 5 X 2				5 X 5 X 2				5 X 5 X 2				5 X 5 X 2				5 X 5 X 2			

Table 16 Search parameter of Upper Limonite in West100 Block

Parameter	Upper Limonite(Ni)					Upper Limonite(Co)				Upper Limonite(Al2O3)				Upper Limonite(Cr2O3)				Upper Limonite(Fe)			
	Pass 1	Pass 2	Pass 3	Pass 4	Pass 5	Pass 1	Pass 2	Pass 3	Pass 4	Pass 1	Pass 2	Pass 3	Pass 4	Pass 1	Pass 2	Pass 3	Pass 4	Pass 1	Pass 2	Pass 3	Pass 4
Minimum Sample	3	3	2	1	1	3	3	2	1	3	3	2	1	3	3	2	1	3	3	2	1
Maximum Sample	40					10				18				12				14			
Max. Search Radius	150	300	600	1200	1200	150	300	600	1200	150	300	600	1200	150	300	600	1200	150	300	600	1200
Max. Vertical Distance	3	5	10	20	20	3	6	12	24	5	11	22	44	3	5	10	20	4	8	17	34
Bearing	110					70				70				20				80			
Plunge	0					0				0				0				0			
Dip	-5					-5				-5				-5				-5			
Major/Semi-major 1	0.733					1.042				1.000				1.214				1.188			
Major/Semi-major 2	0.606																				
Major/Minor 1	11.00					49.67				27.57				58.67				35.4			
Major/Minor 2	59.00																				
Nugget	0.101					0.274				0.069				0.116				0.158			
Structure 1	0.324					0.726				0.931				0.884				0.842			
Structure 2	0.575																				
Range 1	33					149				193				176				171			
Range 2	354																				
Block Discretisation	5 X 5 X 2					5 X 5 X 2				5 X 5 X 2				5 X 5 X 2				5 X 5 X 2			

Parameter	Upper Limonite(MgO)				Upper Limonite(MnO)				Upper Limonite(P2O5)				Upper Limonite(SiO2)				Upper Limonite(TiO2)			
	Pass 1	Pass 2	Pass 3	Pass 4	Pass 1	Pass 2	Pass 3	Pass 4	Pass 1	Pass 2	Pass 3	Pass 4	Pass 1	Pass 2	Pass 3	Pass 4	Pass 1	Pass 2	Pass 3	Pass 4
Minimum Sample	3	3	2	1	3	3	2	1	3	3	2	1	4	3	2	1	3	3	2	1
Maximum Sample	12				14				12				12				11			
Max. Search Radius	150	300	600	1200	150	300	600	1200	150	300	600	1200	150	300	600	1200	150	300	600	1200
Max. Vertical Distance	3	7	13	26	4	9	18	35	4	9	17	34	5	10	20	39	6	11	23	45
Bearing	55				55				60				80				70			
Plunge	0				0				0				0				0			
Dip	-5				-5				-5				-5				-5			
Major/Semi-major	1.117				1.069				1.030				1.216				1.000			
Major/Minor	45.5				34				34.8				30.4				26.6			
Nugget	0.156				0.069				0.091				0.26				0.059			
Structure 1	0.844				0.931				0.909				0.74				0.941			
Range	182				170				174				152				133			
Block Discretisation	5 X 5 X 2				5 X 5 X 2				5 X 5 X 2				5 X 5 X 2				5 X 5 X 2			

Table 17 Search parameter of Lower Limonite in West100 Block

Parameter	Lower Limonite(Ni)					Lower Limonite(Co)				Lower Limonite(Al2O3)				Lower Limonite(Cr2O3)				Lower Limonite(Fe)			
	Pass 1	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 5**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**
Minimum Sample	4	4	2	1	1	4	3	2	1	3	3	2	1	3	3	2	1	4	3	2	1
Maximum Sample	10					8				7				8				7			
Max. Search Radius	150	300	600	1200	2000	150	300	600	1200	150	300	600	1200	150	300	600	1200	150	300	600	1200
Max. Vertical Distance	2	4	8	16	26	3	6	12	23	4	8	15	30	4	9	18	35	7	13	26	52
Bearing	80					70				25				80				20			
Plunge	0					0				0				0				0			
Dip	-5					-5				-5				-5				-5			
Major/Semi-major 1	0.918					1.007				1.006				0.951				1.062			
Major/Semi-major 2	1.457																				
Major/Minor 1	14.00					51.33				39.5				34.25				23			
Major/Minor 2	75.75																				
Nugget	0.102					0.185				0.119				0.109				0.209			
Structure 1	0.322					0.815				0.881				0.891				0.791			
Structure 2	0.576																				
Range 1	56					154				158				137				138			
Range 2	303																				
Block Discretisation	5 X 5 X 2					5 X 5 X 2				5 X 5 X 2				5 X 5 X 2				5 X 5 X 2			

Parameter	Lower Limonite(MgO)				Lower Limonite(MnO)				Lower Limonite(P2O5)				Lower Limonite(SiO2)				Lower Limonite(TiO2)			
	Pass 1	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**
Minimum Sample	3	3	2	1	3	3	2	1	3	3	2	1	3	3	2	1	3	3	2	1
Maximum Sample	7				7				9				6				14			
Max. Search Radius	150	300	600	1200	150	300	600	1200	150	300	600	1200	150	300	600	1200	150	300	600	1200
Max. Vertical Distance	2	4	8	16	3	6	13	25	7	15	29	59	2	4	8	16	7	15	29	59
Bearing	80				15				70				70				20			
Plunge	0				0				0				0				0			
Dip	-5				-5				-5				0				-5			
Major/Semi-major	1.035				1.038				1.157				1.000				0.818			
Major/Minor	73.5				47.25				20.44				77				20.44			
Nugget	0.371				0.111				0.147				0.105				0.328			
Structure 1	0.629				0.889				0.853				0.895				0.672			
Range	147				189				184				154				184			
Block Discretisation	5 X 5 X 2				5 X 5 X 2				5 X 5 X 2				5 X 5 X 2				5 X 5 X 2			

Table 18 Search parameter of Saprolite in West100 Block

Parameter	Saprolite(Ni)					Saprolite (Co)				Saprolite (Al2O3)				Saprolite (Cr2O3)				Saprolite (Fe)			
	Pass 1	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 5**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**
Minimum Sample	4	4	2	1	1	4	3	2	1	3	3	2	1	3	3	2	1	4	3	2	1
Maximum Sample	40					24				24				25				22			
Max. Search Radius	150	300	600	1200	2000	150	300	600	1200	150	300	600	1200	150	300	600	1200	150	300	600	1200
Max. Vertical Distance	2	4	7	14	23	7	13	27	53	9	18	35	71	6	12	24	49	5	10	19	39
Bearing	65					60				55				65				70			
Plunge	0					0				0				0				0			
Dip	0					-5				-5				-5				-5			
Major/Semi-major 1	1.000					1.097				1.000				1.371				1.409			
Major/Semi-major 2	1.00																				
Major/Minor 1	13.0					22.63				17				24.5				31			
Major/Minor 2	85.2																				
Nugget	0.052					0.337				0.198				0.276				0.278			
Structure 1	0.683					0.663				0.802				0.724				0.722			
Structure 2	0.265																				
Range 1	52					181				170				196				186			
Range 2	426																				
Block Discretisation	5 X 5 X 2					5 X 5 X 2				5 X 5 X 2				5 X 5 X 2				5 X 5 X 2			

Parameter	Saprolite (MgO)				Saprolite (MnO)				Saprolite (P2O5)				Saprolite (SiO2)				Saprolite (TiO2)			
	Pass 1	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**	**Pass 1**	**Pass 2**	**Pass 3**	**Pass 4**
Minimum Sample	3	3	2	1	3	3	2	1	3	3	2	1	4	3	2	1	3	3	2	1
Maximum Sample	27				19				22				15				30			
Max. Search Radius	150	300	600	1200	150	300	600	1200	150	300	600	1200	150	300	600	1200	150	300	600	1200
Max. Vertical Distance	6	13	25	51	5	11	22	44	11	22	43	87	7	13	27	54	15	30	60	120
Bearing	70				25				0				65				60			
Plunge	0				0				0				0				0			
Dip	-5				-5				0				0				-5			
Major/Semi-major	1.068				1.331				1.000				1.053				1.044			
Major/Minor	23.63				27.57				13.85				22.38				10			
Nugget	0.194				0.198				0.191				0.39				0.373			
Structure 1	0.806				0.802				0.809				0.61				0.627			
Range	189				193				180				179				190			
Block Discretisation	5 X 5 X 2				5 X 5 X 2				5 X 5 X 2				5 X 5 X 2				5 X 5 X 2			

3.5 Model Validation

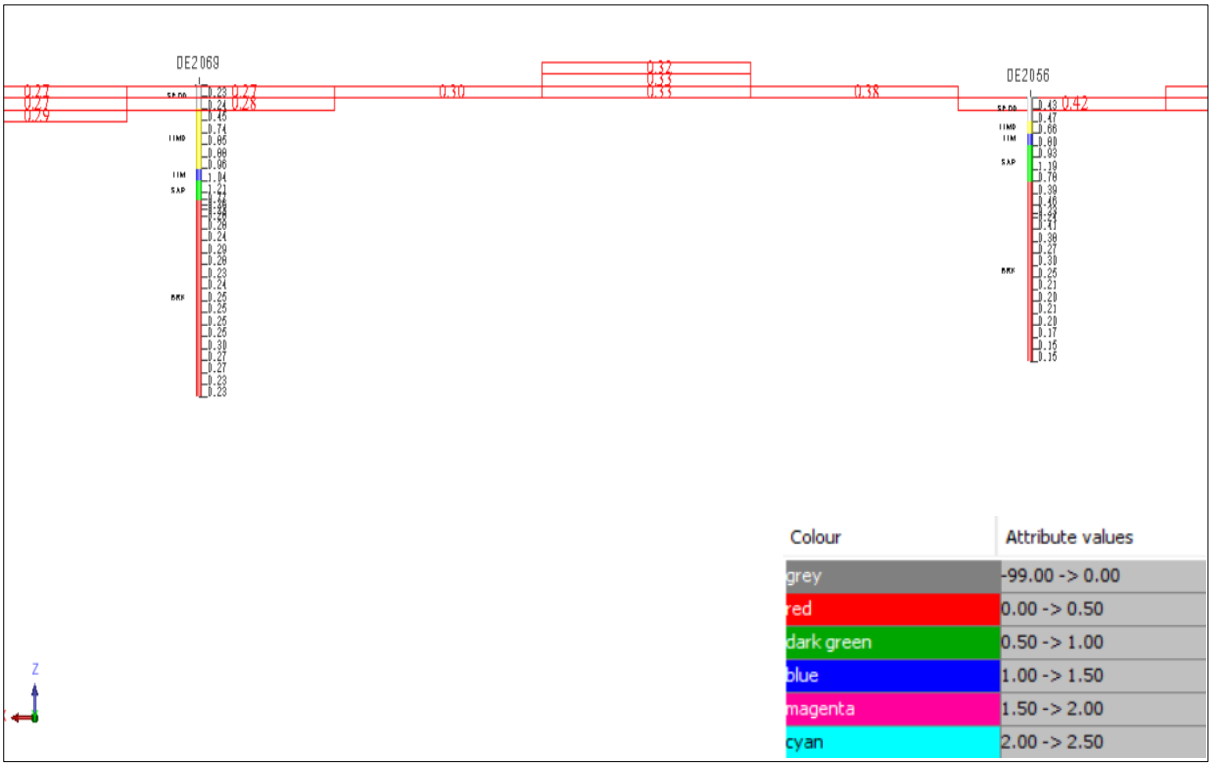


Figure 79 Cross section of Ni Mud Upper in West100 Block

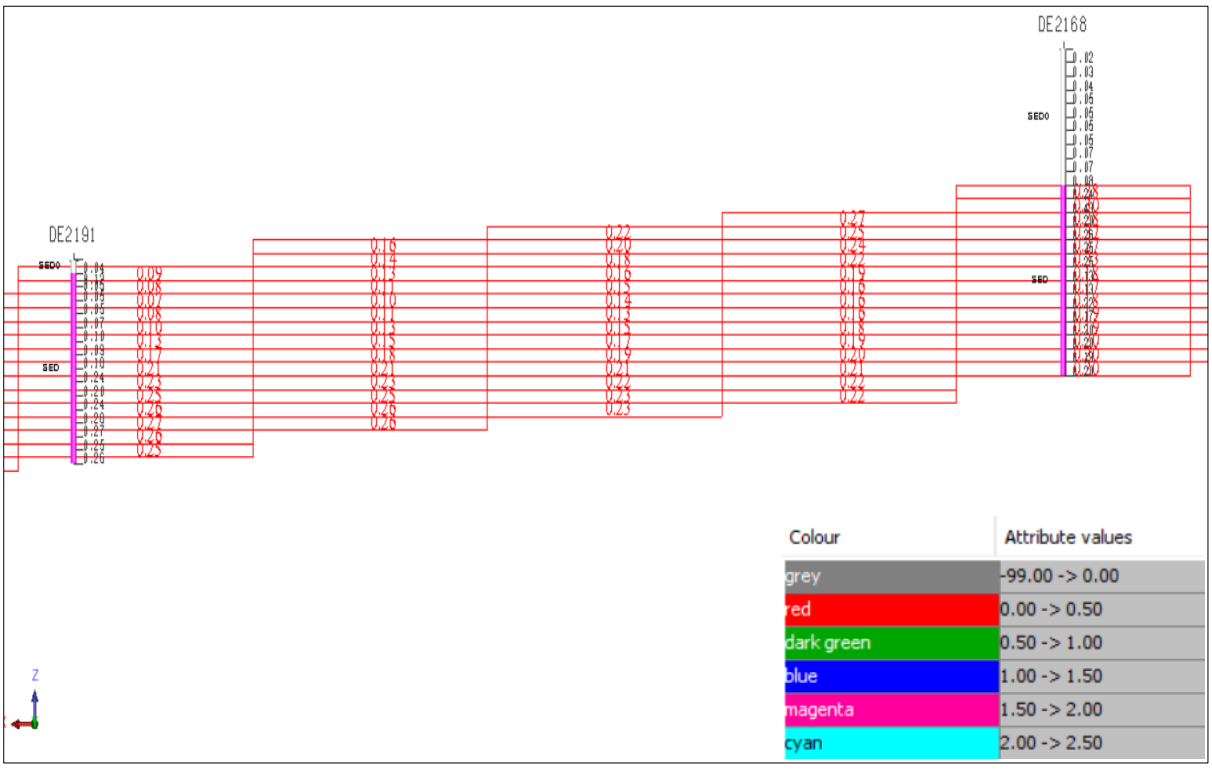


Figure 80 Cross section of Ni Mud Lower in West100 Block

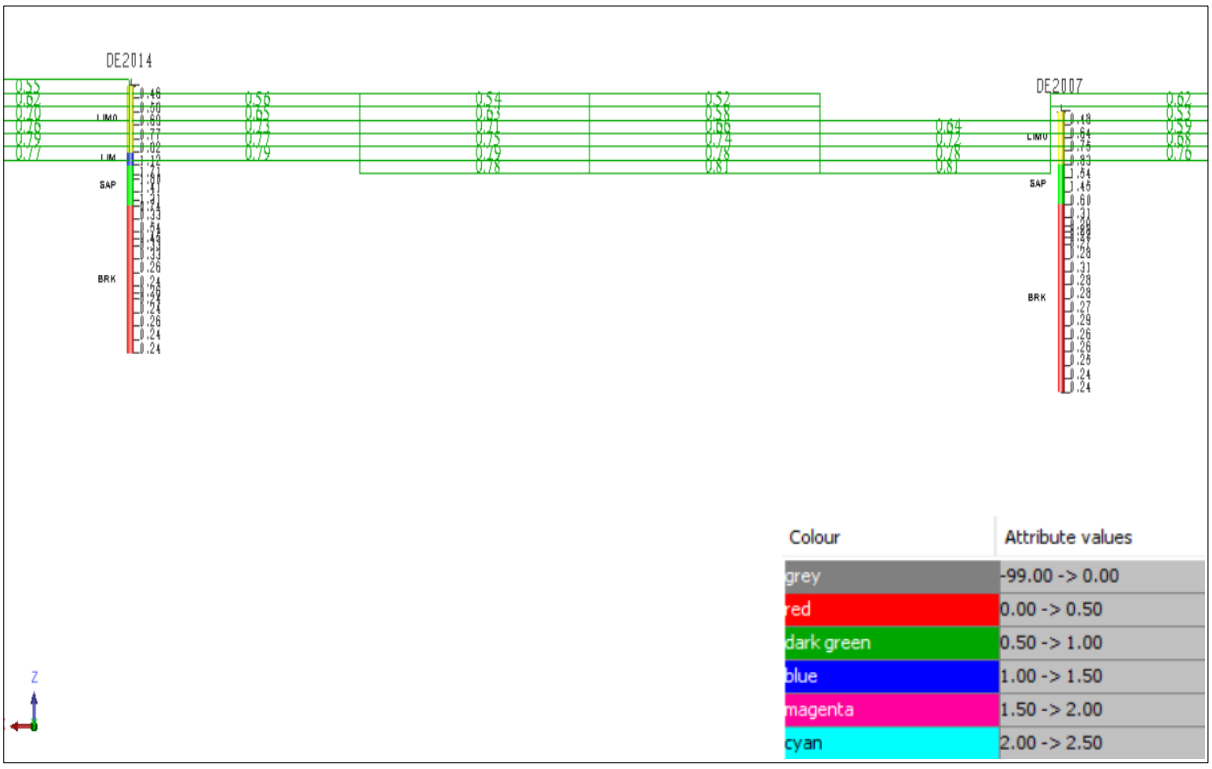


Figure 81 Cross section of Ni Upper Limonitein West100 Block

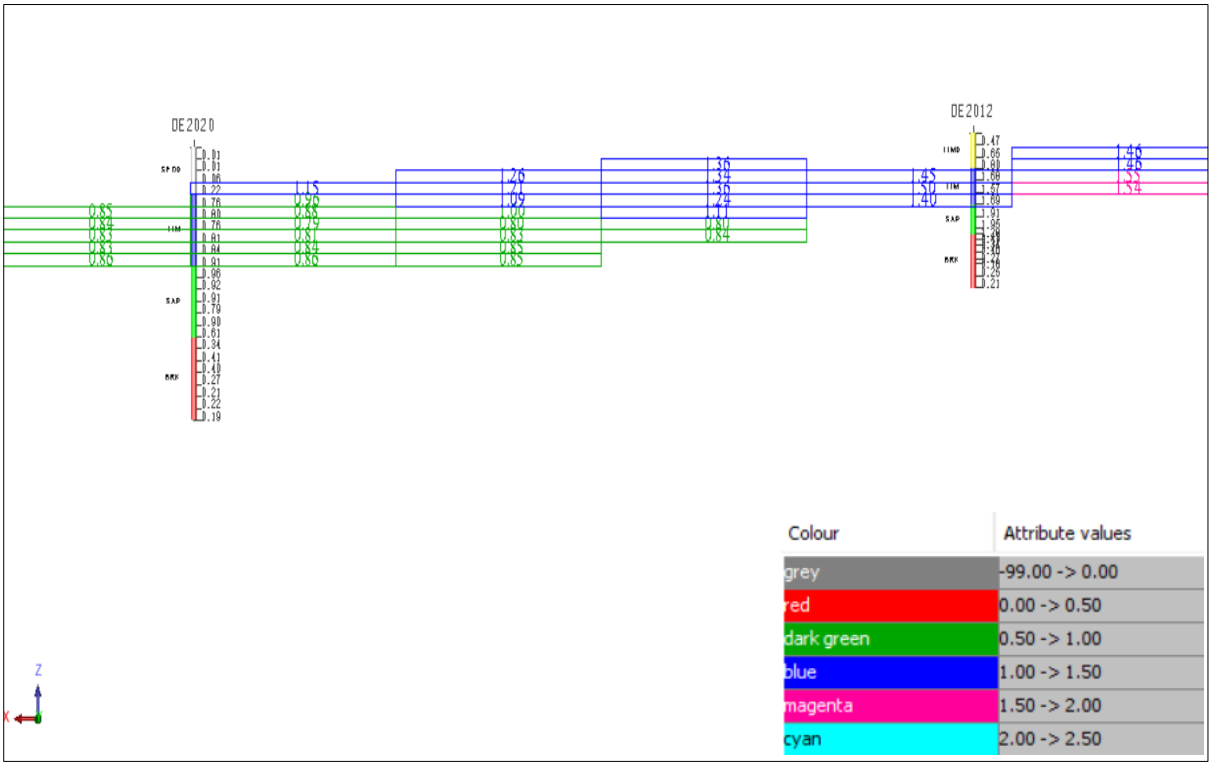


Figure 82 Cross section of Ni Lower Limonite in West100 Block

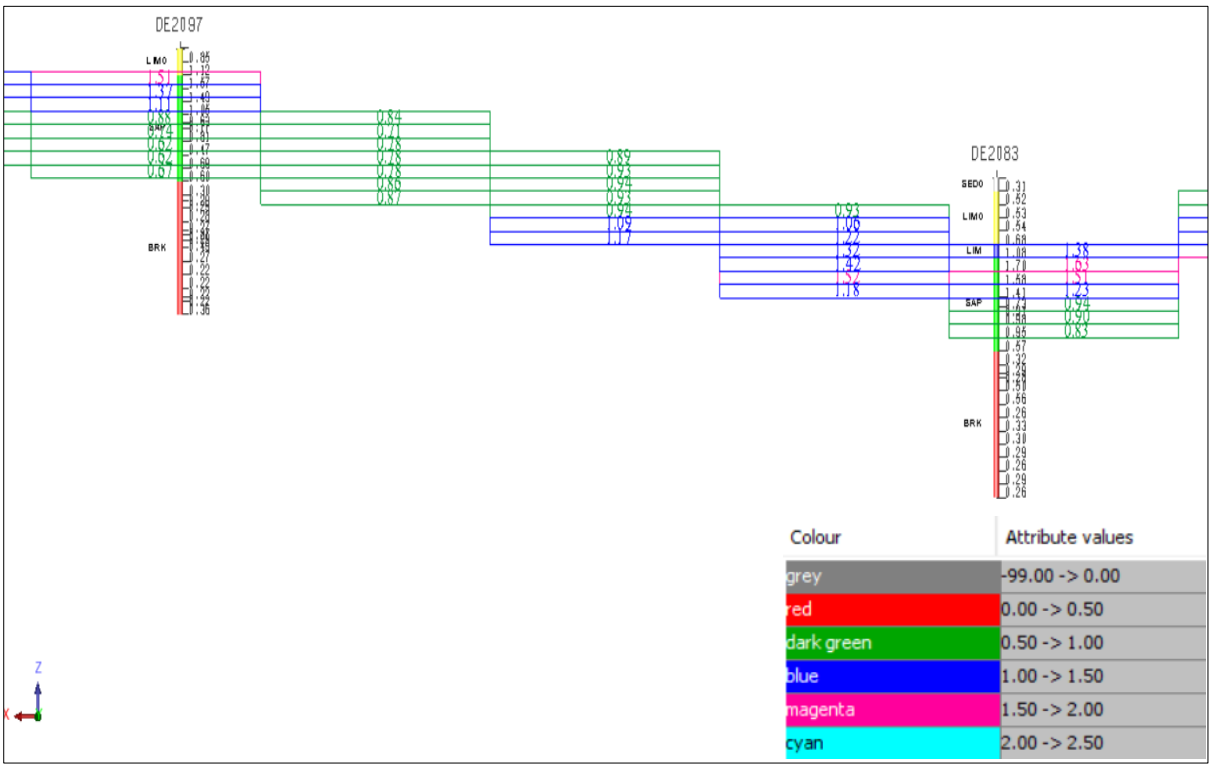
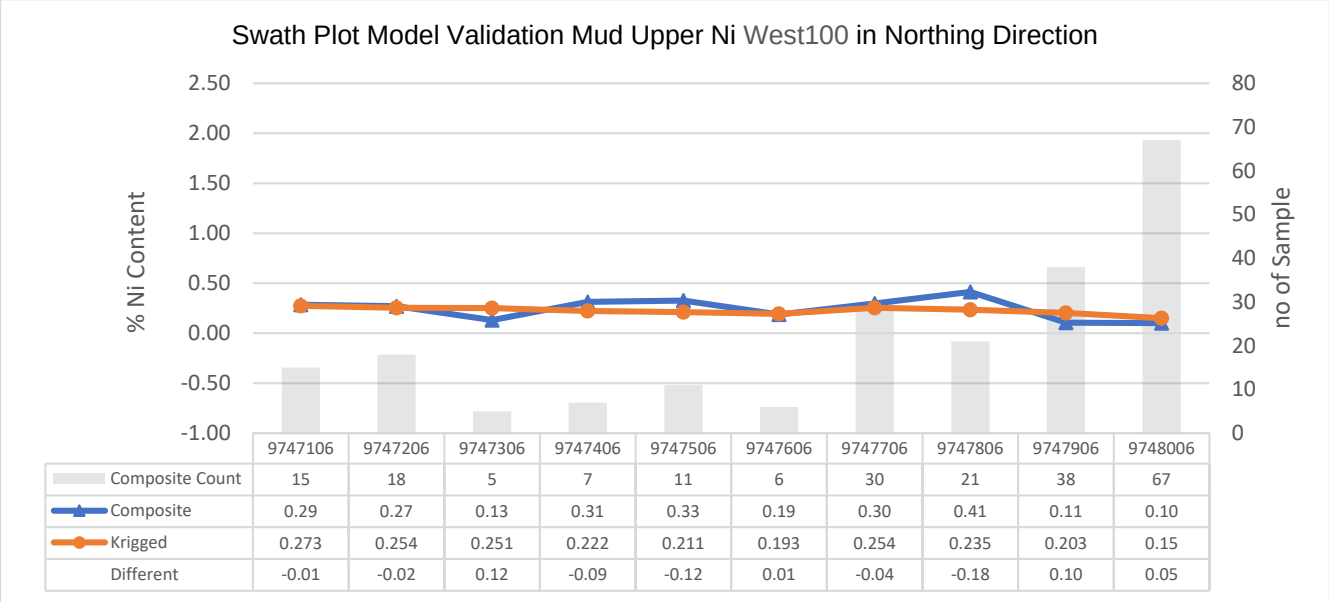
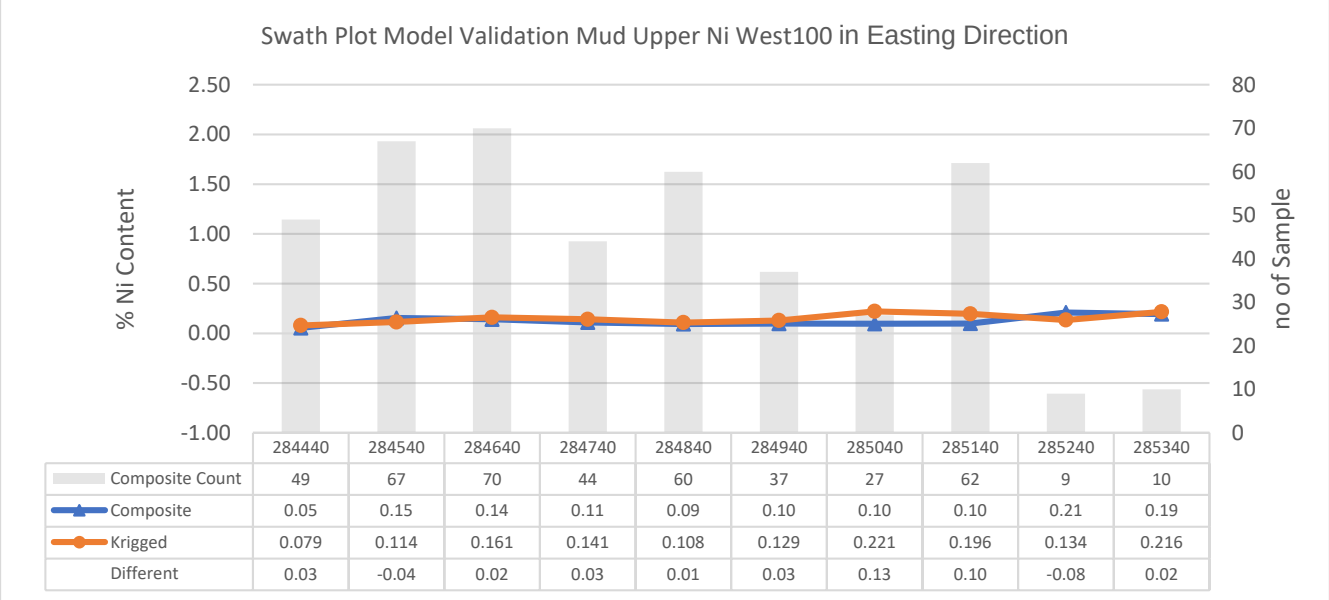


Figure 83 Cross section of Ni Saprolite in West100 Block



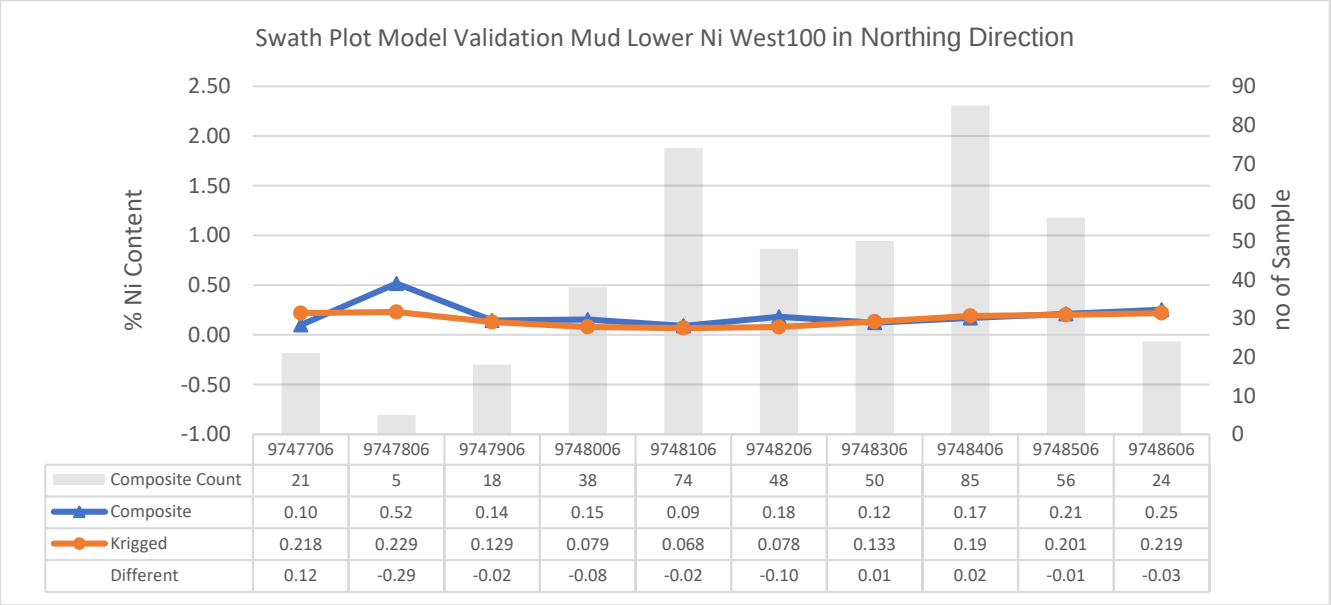
	9747106	9747206	9747306	9747406	9747506	9747606	9747706	9747806	9747906	9748006
Composite Count	15	18	5	7	11	6	30	21	38	67
Composite	0.29	0.27	0.13	0.31	0.33	0.19	0.30	0.41	0.11	0.10
Krigged	0.273	0.254	0.251	0.222	0.211	0.193	0.254	0.235	0.203	0.15
Different	-0.01	-0.02	0.12	-0.09	-0.12	0.01	-0.04	-0.18	0.10	0.05

Figure 84 Swath plot of Ni Mud Upper in West100 block with Northing Direction



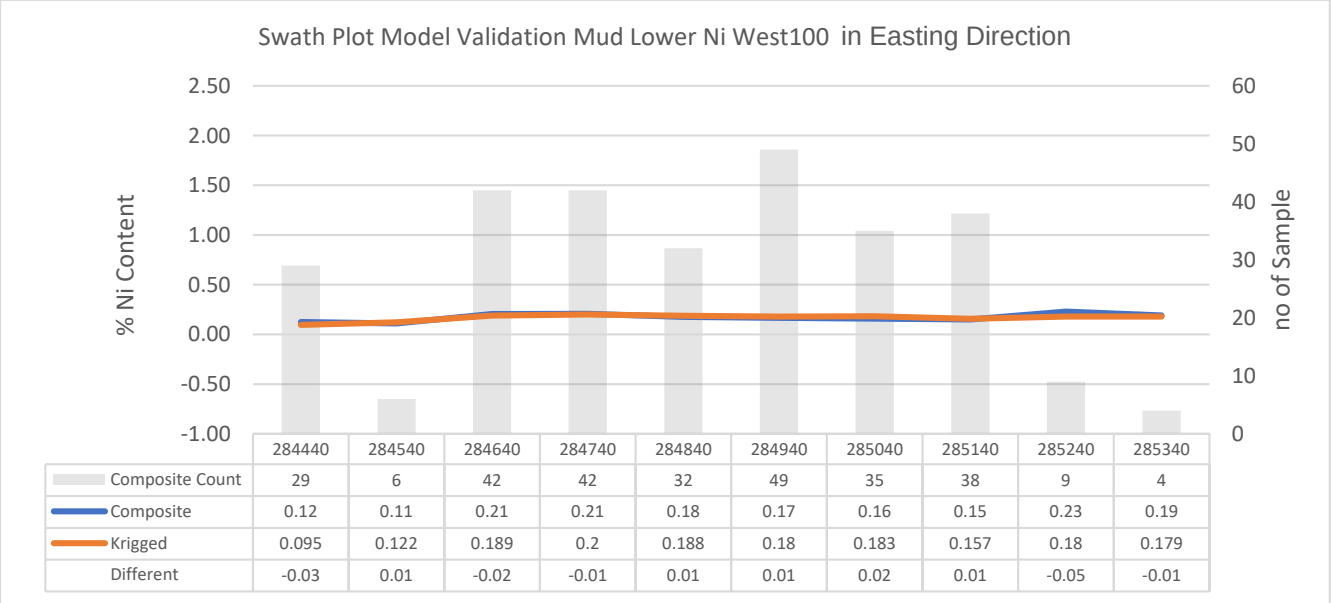
	284440	284540	284640	284740	284840	284940	285040	285140	285240	285340
Composite Count	49	67	70	44	60	37	27	62	9	10
Composite	0.05	0.15	0.14	0.11	0.09	0.10	0.10	0.10	0.21	0.19
Krigged	0.079	0.114	0.161	0.141	0.108	0.129	0.221	0.196	0.134	0.216
Different	0.03	-0.04	0.02	0.03	0.01	0.03	0.13	0.10	-0.08	0.02

Figure 85 Swath plot of Ni Mud Upper in West100 block with Easting Direction



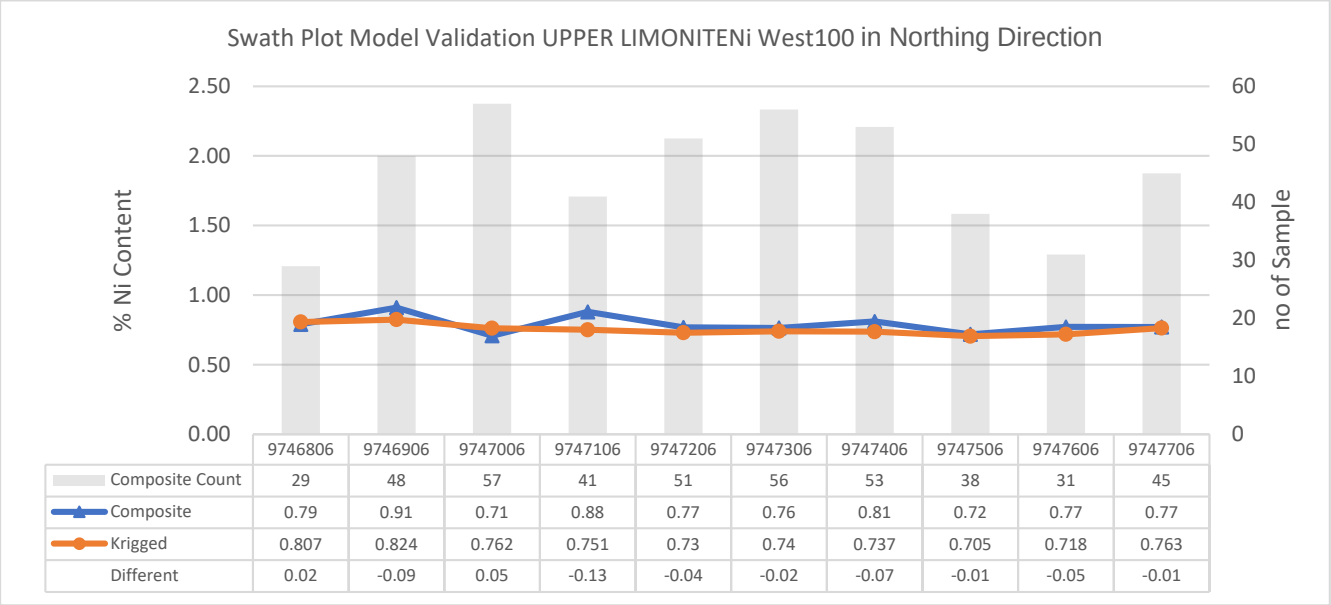
	9747706	9747806	9747906	9748006	9748106	9748206	9748306	9748406	9748506	9748606
Composite Count	21	5	18	38	74	48	50	85	56	24
Composite	0.10	0.52	0.14	0.15	0.09	0.18	0.12	0.17	0.21	0.25
Krigged	0.218	0.229	0.129	0.079	0.068	0.078	0.133	0.19	0.201	0.219
Different	0.12	-0.29	-0.02	-0.08	-0.02	-0.10	0.01	0.02	-0.01	-0.03

Figure 86 Swath plot of Ni Mud Lower in West100 block with Northing Direction



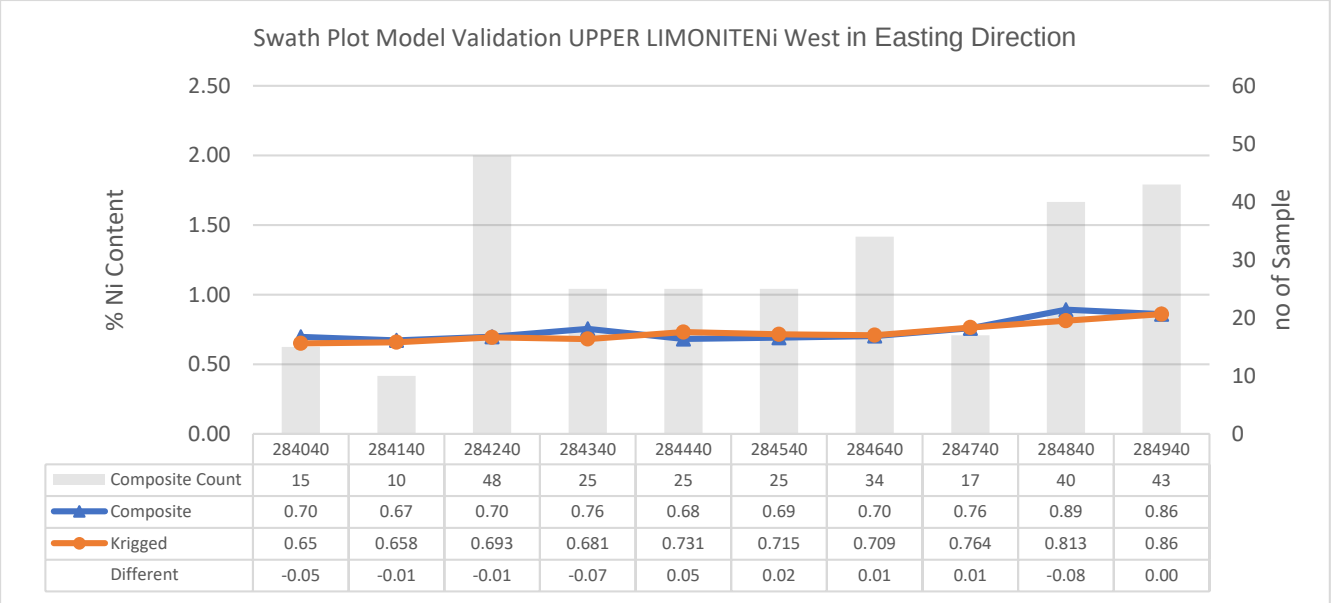
	284440	284540	284640	284740	284840	284940	285040	285140	285240	285340
Composite Count	29	6	42	42	32	49	35	38	9	4
Composite	0.12	0.11	0.21	0.21	0.18	0.17	0.16	0.15	0.23	0.19
Krigged	0.095	0.122	0.189	0.2	0.188	0.18	0.183	0.157	0.18	0.179
Different	-0.03	0.01	-0.02	-0.01	0.01	0.01	0.02	0.01	-0.05	-0.01

Figure 87 Swath plot of Ni Mud Lower in West100 block with Easting Direction



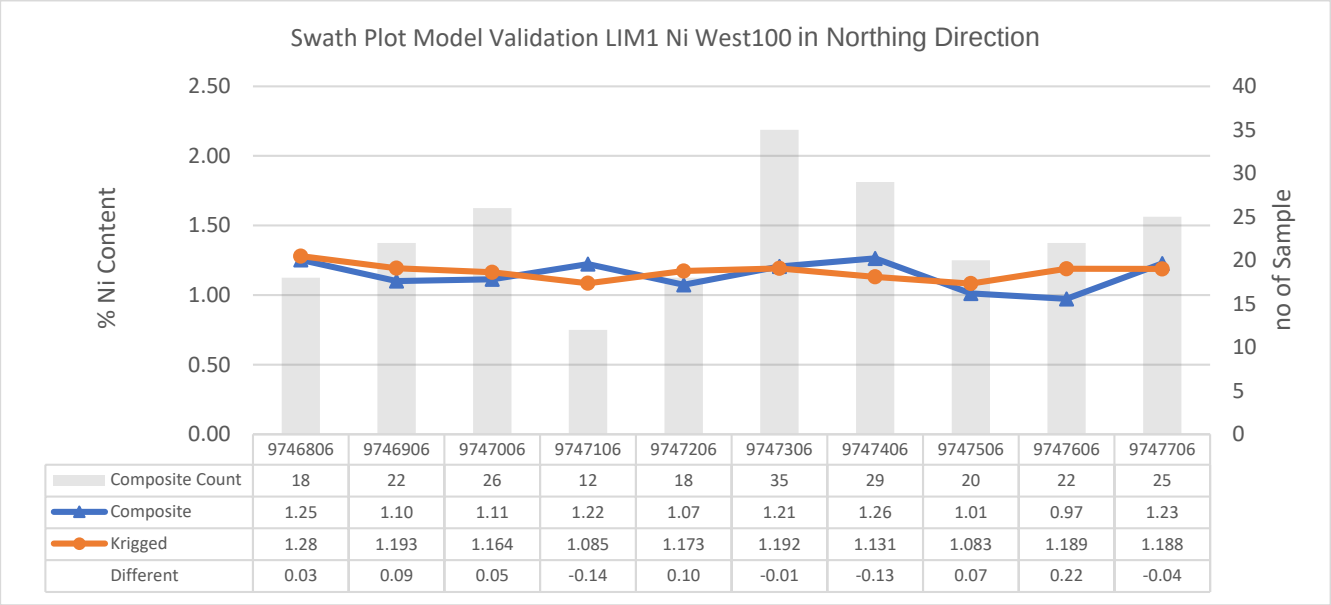
	9746806	9746906	9747006	9747106	9747206	9747306	9747406	9747506	9747606	9747706
Composite Count	29	48	57	41	51	56	53	38	31	45
Composite	0.79	0.91	0.71	0.88	0.77	0.76	0.81	0.72	0.77	0.77
Krigged	0.807	0.824	0.762	0.751	0.73	0.74	0.737	0.705	0.718	0.763
Different	0.02	-0.09	0.05	-0.13	-0.04	-0.02	-0.07	-0.01	-0.05	-0.01

Figure 88 Swath plot of Ni Upper Limonite in West100 Block block with Northing Direction



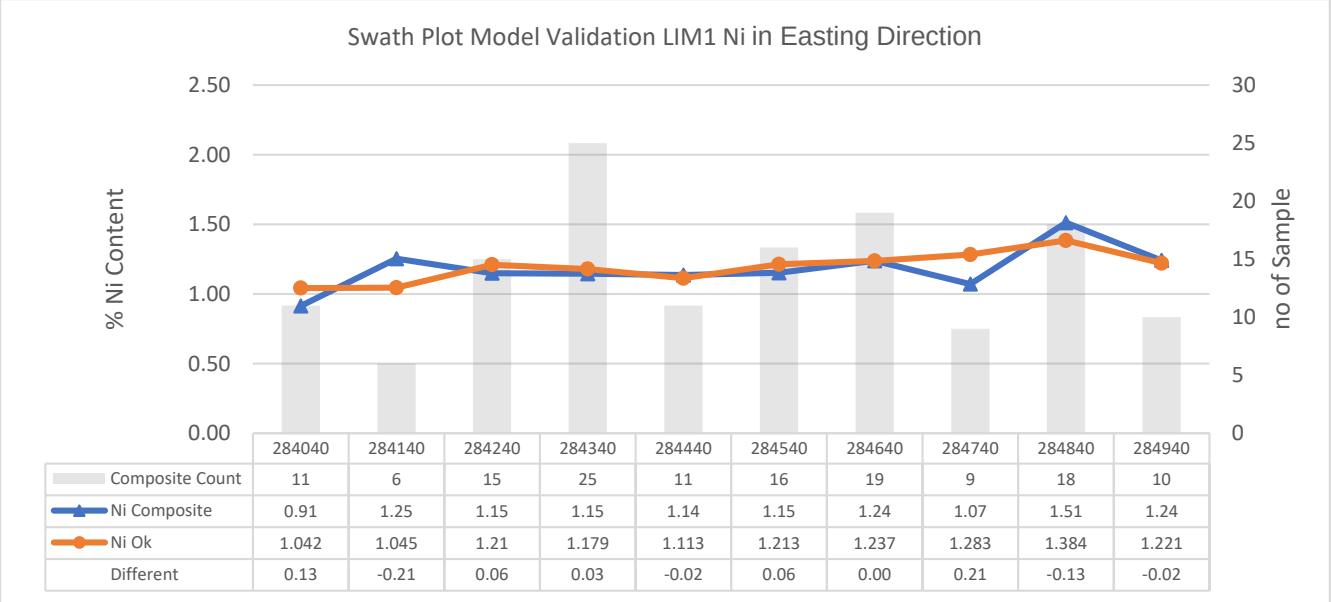
	284040	284140	284240	284340	284440	284540	284640	284740	284840	284940
Composite Count	15	10	48	25	25	25	34	17	40	43
Composite	0.70	0.67	0.70	0.76	0.68	0.69	0.70	0.76	0.89	0.86
Krigged	0.65	0.658	0.693	0.681	0.731	0.715	0.709	0.764	0.813	0.86
Different	-0.05	-0.01	-0.01	-0.07	0.05	0.02	0.01	0.01	-0.08	0.00

Figure 89 Swath plot of Ni Upper Limonite in West100 block with Easting Direction



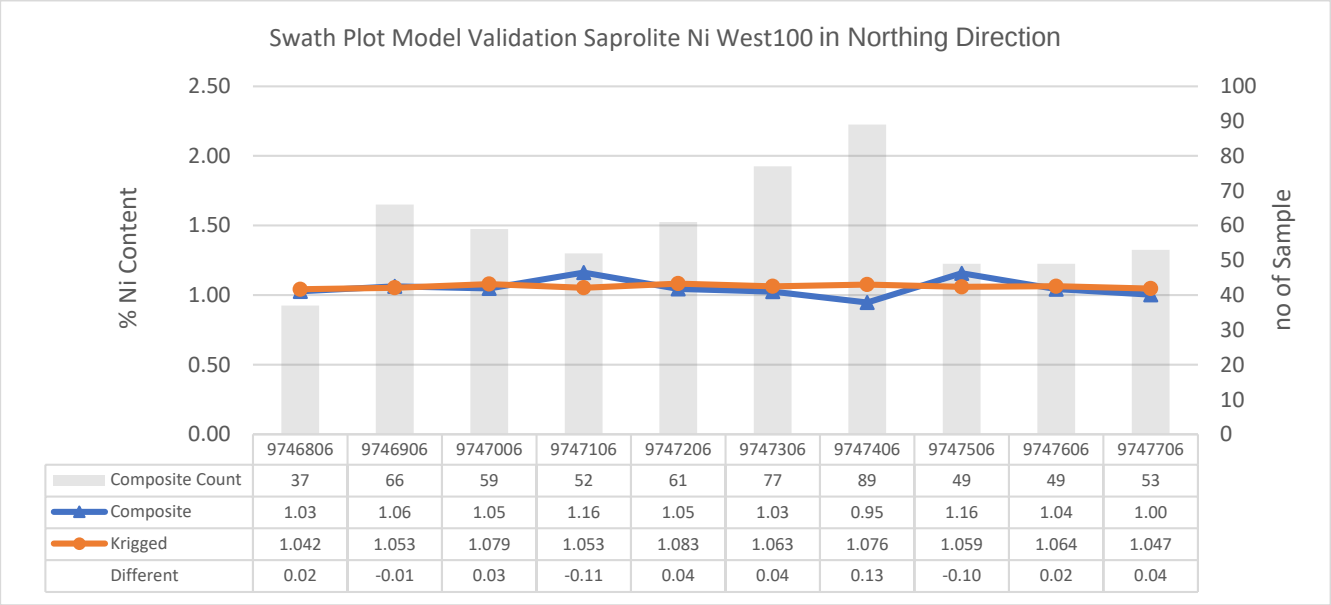
	9746806	9746906	9747006	9747106	9747206	9747306	9747406	9747506	9747606	9747706
Composite Count	18	22	26	12	18	35	29	20	22	25
Composite	1.25	1.10	1.11	1.22	1.07	1.21	1.26	1.01	0.97	1.23
Krigged	1.28	1.193	1.164	1.085	1.173	1.192	1.131	1.083	1.189	1.188
Different	0.03	0.09	0.05	-0.14	0.10	-0.01	-0.13	0.07	0.22	-0.04

Figure 90 Swath plot of Ni Lower Limonite in West100 Block block with Northing Direction



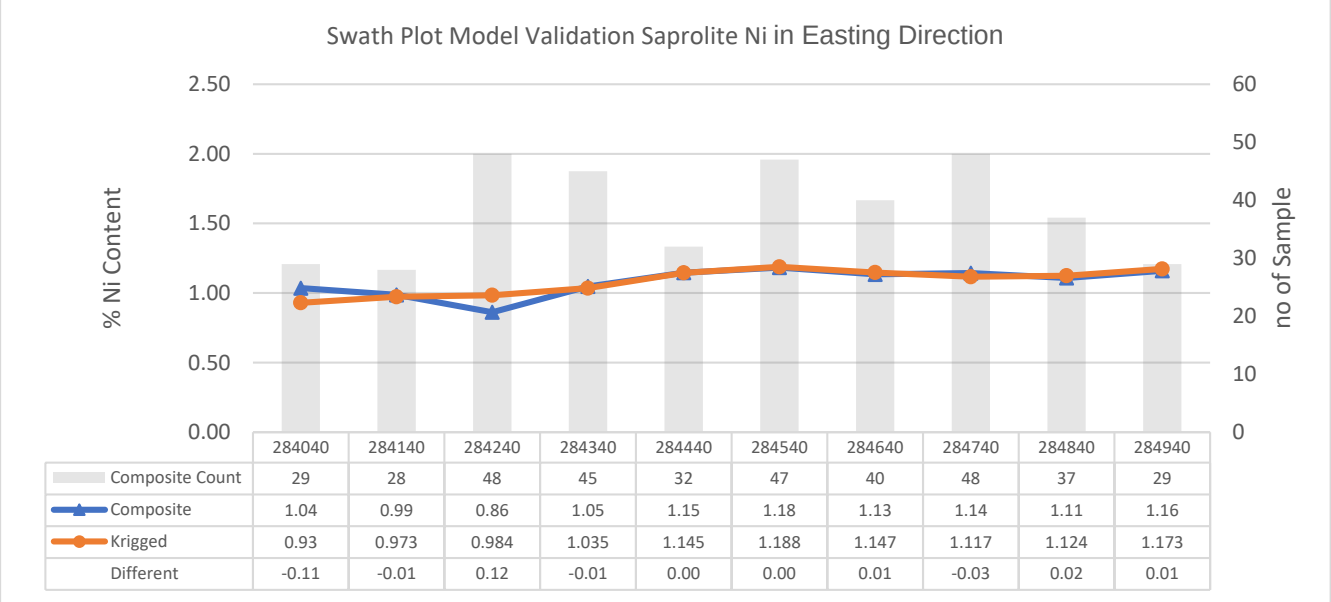
	284040	284140	284240	284340	284440	284540	284640	284740	284840	284940
Composite Count	11	6	15	25	11	16	19	9	18	10
Ni Composite	0.91	1.25	1.15	1.15	1.14	1.15	1.24	1.07	1.51	1.24
Ni Ok	1.042	1.045	1.21	1.179	1.113	1.213	1.237	1.283	1.384	1.221
Different	0.13	-0.21	0.06	0.03	-0.02	0.06	0.00	0.21	-0.13	-0.02

Figure 91 Swath plot of Ni Lower Limonite in West100 Block block with Easting Direction



	9746806	9746906	9747006	9747106	9747206	9747306	9747406	9747506	9747606	9747706
Composite Count	37	66	59	52	61	77	89	49	49	53
Composite	1.03	1.06	1.05	1.16	1.05	1.03	0.95	1.16	1.04	1.00
Krigged	1.042	1.053	1.079	1.053	1.083	1.063	1.076	1.059	1.064	1.047
Different	0.02	-0.01	0.03	-0.11	0.04	0.04	0.13	-0.10	0.02	0.04

Figure 92 Swath plot of Ni Saprolite in West100 block with Northing Direction



	284040	284140	284240	284340	284440	284540	284640	284740	284840	284940
Composite Count	29	28	48	45	32	47	40	48	37	29
Composite	1.04	0.99	0.86	1.05	1.15	1.18	1.13	1.14	1.11	1.16
Krigged	0.93	0.973	0.984	1.035	1.145	1.188	1.147	1.117	1.124	1.173
Different	-0.11	-0.01	0.12	-0.01	0.00	0.00	0.01	-0.03	0.02	0.01

Figure 93 Swath plot of Ni Saprolite in West100 block with Easting Direction

APPENDIX 10

RESUME:

DANIEL MADRE,

TOBIAS MAYA,

YORRIS WIBRIANA,

HARMAN ADHITTYO

DANIEL MADRE , MSc (GEOLOGY)



EXPLORATION SPECIALIST

Summary

Daniel Madre has been an Australian coal and mineral geologist since 1980, with full time work experience in Indonesia since 1988. He is specialist in exploration and for this reason is familiar with most coal and mineral projects in the country since their earliest stage of development. He has a diverse network of professionals throughout the industry. Daniel has a Master of Science degree in Geology. Daniel Madre is a member of the Australasian Institute of Mining and Metallurgy (no: 100878), the Australian Institute of Geoscientists (no: 5632), Ikatan Ahli Geologi Indonesia (no: 5000) and Masyarakat Geologi, Ekonomi Indonesia (no: B-0718). Daniel is a Competent Person in Indonesia for KCMI Code for Coal Resources.

Daniel runs a successful exploration consultancy and has in-house capabilities that range from geology, geophysics, drilling, geological modelling, mine design and planning. The company has discovered coal in East Kalimantan and Sumatra which has resulted in numerous coal mine developments. The company is formally registered by the Indonesian Department of Minerals and Energy to carry out exploration surveys and report coal and mineral resources.

Since 2005, the company diversified into nickel and mineral sands exploration and resource development. This work resulted in the development of the first nickel mine in Kalimantan. Other nickel projects investigated by the company are located in Sulawesi, Halmahera and Papua. Mineral sands projects have been investigated in Sumatra and Papua.

Commodities

Coal, oil shale, nickel laterites, phosphate, gold, manganese and mineral sands

Countries

Indonesia, Australia, USA, PNG, Kenya

Experience

Nov, 2000 - present	PT Danmar Explorindo	Jakarta, Indonesia	
Managing Director			
1996–Nov 2000	Independent Consultant	Jakarta, Indonesia	
Consultant Geologist			
1988–1996	PT Petrosea	Jakarta, Indonesia	
Manager of Geology			
1982–1988	Greenvale/Esperance group	Sydney, Australia	
Exploration Manager			
1981–1982	Oil Refining & Exploration PL	Sydney, Australia	
Field geologist			
1980 – 1981	NSW Coastal Engineers	Sydney, Australia	
Lab attendant			

Education

1986- 1989	University of Wollongong	Australia
Master of Science (geology)		
1978- 1980	University of Sydney	Australia
Bachelor of Science (geology and marine science)		

Some Articles & Publications

- 1987, The Geology of the Alpha Oil Shale Deposit, Fuel, Vol.66, Butterworths UK
- 1990, Torbanite Deposits of the World, Thesis: University of Wollongong
- 2000, Coal Geology of the Bengkulu Block, Journal Asian Earth Science, Elsevier Advances in Sedimentology Series, Elsevier Special editions
- 2005, Coal Geology of the Bengkulu Block. Proc. SE Asian Coal Geology Conference, Bandung
- 2012, Coal Deposits of Sumatra, Coal Trans Conference Bali
- 2012, Low Rank Coal Deposits of Indonesia, Coal Trans Conference Bali
- 2013, Tectonic Framework of Sumatra & the Distribution of Coal Deposits, Ozmine Conference, Jakarta
- 2014, Coal Potential of Sumatra, Coal Markets Workshop, Singapore
- 2014 Adding Value Through Optimizing Exploration Techniques, 2nd Asian Nickel Conference
- 2014 Coal Potential of Sumatra, World Coal Magazine volume 23
- 2016 The Exploration Potential of Sumatra, Sumatra Miner Conference, Palembang Sumatra
- 2016 Why Things are Improving in the Indonesian Coal Industry, RTC Kalimantan, Conference Balipapan, Indonesia
- 2019 The Coal and Mineral Potential of Sumatra, Sumatra Miner Conference, Palembang Sumatra

Resume

Name: Tobias Geoffrey Maya
Date of Birth: 26 March 1981
Marital Status: Married
Nationality: Australian

Address: Jl. H. Saidi II No. 16 RT.011 RW.07,
Cipete Utara, Kebayoran Baru,
Jakarta Selatan 12150,

Mobile: (+62) 0812 3869379 ;
Email : tobiasmaya@yahoo.com.au
tobias.maya@danmar.asia



Since 2004, Tobias has been working full time in the Indonesian coal and minerals exploration industry specializing in exploration geology, regional mineral studies, due diligence work, database validation and resource development. Tobias has a Bachelor of Science degree from the Charles Sturt University in NSW, Australia. He has also held a membership with the AusIMM since 2009.

Tobias has more than 18 years exploration experience throughout the country. This work includes the exploration and development of numerous nickel laterite projects. providing a key role in the optimization of exploration techniques that can be used to minimize costs & maximize project value, increasing confidence in estimation of Nickel laterite volumes to determine what are the controlling factors for project development within Indonesian deposits.

EDUCATION AND TRAINING

2006-2013	Completed BSc with major in Spatial Science with 2 minors in information technology and management Charles Sturt University, Wagga Wagga, NSW
2013	Certificate for successful completion of Valuation and Technical-Economic Assessment of Mining Projects, SRK Consultacy
2009	Certificate for successful completion of Mining and Minerals optimization course, Whittle Consultacy
1999-2001	Completed Geographic Information Systems (GIS)Diploma Wollongong TAFE
1998	Higher School Certificate; Bulli High School
1996	School Certificate; Bulli High School
1994	St Johns Ambulance First Aid Certificate

MEMBERSHIP OF PROFESSIONAL ORGANIZATIONS

Since 2009 Member of the AusIMM (No.304661)

EMPLOYMENT & WORK EXPERIENCE

2013 – Present **PT. Geo Search (full-time) part of the Danmar Group**

- President Director.
- Geophysical surveys
- Principle Geological consultant to PT Danmar Explorindo

2004 – 2013 **PT. Danmar Explorindo (full-time)**

- Head GIS/Resource Geologist (SURPAC).
- Management Coal and Mineral Exploration, (Drilling, Survey, Resource Estimates).
- Business development / client relationship manager
- Mine Reconciliations of Ongoing operations (monthly)
- Database validation (JORC)
- Training Personnel in Software (SURPAC, GIS,).
- Drafting JORC reports under Principle Mr Daniel Madre, MSc (AusIMM member - 100878)

Provided above Consultancy services for following projects:

2018-present **PT.Hengjaya Mineralindo (HM) -** Morowali, Sulawesi. for **Nickel Industries Limited (ASX : NIL)**
-Laterite Nickel Exploration and database validation
-Resource Geology assessments
-Mine planning and production reconciliations
-UltraGPR survey 265km
-JORC (2012) compliant reports 2020 & 2022

2018-present **PT.Halmahera Sukses Minerals (HSM)** - Halmahera, Maluku.
-Laterite Nickel Exploration and database validation
-Resource Geology assessments
-UltraGPR survey 75km

2018-Present **PT.Sulawesi Cahaya Mineral (SCM)** – North Konawe, Sulawesi
-Laterite Nickel Exploration and Project support
-UltraGPR survey 2,000km

2020-Present **PT.Iriana Mutiara Mining (IMM) -** Sarmi, Papua for **Nickel Industries Limited (ASX : NIL)**
- Laterite Nickel Exploration and database validation
-Resource Geology assessments
-UltraGPR survey 185km

2022-Present **PT.Vale Indonesia (PTVI)** – Sorowako, Sulawesi
-Laterite Nickel Exploration and Project support
-UltraGPR survey 300km

2020-Present **PT.Abadi Nikel Nusantara (ANN) -** Routa, Sulawesi for **Nickel Industries Limited (ASX : NIL)**
- Laterite Nickel Exploration and database validation
-Resource Geology assessments
-UltraGPR survey 485km

2018-Present **PT.Kumamba Mining (KM**) **-** Sarmi, Papua, Indonesia
-Exploration management and database validation
- Geology assessments
- Trial UltraGPR survey 30km
- Trial Ground Magnetometer survey 30km

2019-2021 **PT.Bumi Liputan Teknik (BLT)** - Ketapang, West kalimantan
-Laterite Bauxite Exploration and project Due diligence
-UltraGPR survey 80km

2017-2019 **PT.Sarana Mineralindo Perkasa (SMP) -** Morowali, Sulawesi..
- Laterite Nickel Exploration and database validation
-Resource Geology assessments
-Mine planning and pit optimization
-UltraGPR survey 85km

2017-2018 **PT.Ceria Nugraha Indotama (CNI)** - Kolaka, Sulawesi..
-Laterite Nickel Exploration and database validation
-UltraGPR survey 175km

2017-2018 **PT.Tiga Samudra Perkasa (TPS)** - Malili, Sulawesi
-Laterite Nickel Exploration and database validation
-Resource Geology assessments
-UltraGPR survey 75km

2005-2019 **PT.Ratu Samban Mining (RSM) -** Bengkulu, Sumatra.
-Thermal Coal Exploration management and database validation
-Resource Geology assessments
-Mine planning and production reconciliations
-Nedo regional study 2011
-Jogmec regional study 2013
-Bathymetric survey

2009-2018 **PT.Gunung Bara Utama (GBU) -** Kutai Barat, East Kalimantan.
-Thermal Coal Exploration management and database validation
-Resource Geology assessments
-Pre-JORC study 2010
-JORC (2004) compliant reports 2011 & 2012

2005-2011 **PT.Itamatra Nusantara (ITM) -** Morowali, Central Sulawesi.
-Laterite Nickel Exploration management and database validation
-Resource Geology assessments
-Bathymetric survey

2004-2010 **PT.Telen Indoclay (TIC) Long Ikis Nickel** - Pasir, East Kalimantan
-Laterite Nickel Exploration management
-database validation
-Resource Geology assessments
-Mine Construction and Production
-Mine planning, Grade control and production reconciliations -
-Bathymetric survey

2010-2016 **PT.Trisula Kencana Sakti (TKS)** - Barito Utara, Central Kalimantan
for **Golden Energy Mines (GEMS)**
-Thermal Coal Exploration management and database validation
-Resource Geology assessments
-JORC (2004) compliant reports 2010 & 2012
-JORC (2012) compliant reports 2013

2010-2018 **PT.Moa Maju Kurina Utama (MMKU)** - Bulungan, North Kalimantan
-Lignite Exploration management and database validation
-Resource Geology assessments
-Mine planning
-JORC (2004) compliant reports 2010 & 2011
-JORC (2012) compliant reports 2013

2011-2015 **PT.Delta Samudra (DS)** - Kutai Barat, East Kalimantan
-Lignite Exploration management and database validation
-Resource Geology assessments
-JORC (2004) compliant reports 2013

2012-2018 **PT.Berau Usaha Mandiri (BUM)** - Berau, East Kalimantan
-Lignite database validation
-Resource Geology assessments
-Mine planning

2010-2015 **PT.Inti Putera Kanaan (IPK)** - Musi banyuisn, South Sumatra
-Lignite Exploration management and database validation
-Resource Geology assessments
-Mine planning
-JORC (2004) compliant report 2012

2006-2014 **PT.Mulawarman Putra Abadi Sakti (MPAS)** - East Kalimantan
-PCI Coal Exploration management and database validation
-Resource Geology assessments
-JORC (2012) compliant reports 2014

2011-2013 **PT.Satria Lestari (SL)** - Tenggarong, East Kalimantan
-Thermal Coal exploration management and database validation
- Resource Geology assessment

2013 **Jingella Resources Pty Ltd** - Dingo, Queensland, Australia
-PCI Coal database validation
-Resource Geology assessments

2013 **Greenvale Mining Pty Ltd - (Alpha Oil shale)**
Alpha, Queensland, Australia
-Torbanite / Cannel Coal database validation
-Resource Geology assessments

2013 **PT.Bumi Merapi Energi (BME)** - Lahat, South Sumatra
-Thermal Coal database validation
-Resource Geology assessments
-Mine planning
-JORC (2004) compliant report 2012

2010-2012 **PT.Komunitas Bangun Bersama (KBB)** - Samarinda, East Kalimantan
-Lignite Resource Geology assessment
-JORC (2004) compliant reports 2010 & 2012

2012 **PT.Delma Mining Corporation (DMC)** - Bulungan, North Kalimantan
-Lignite database validation
-Resource Geology assessments
-JORC (2004) compliant report 2012

2012 **PT.Indonesia Pacific Energy (IPE) & PT.Mega Multi Cemerlang (MMC)** - Meulaboh, Aceh Barat & Nagan Raya, Aceh
-Lignite database validation
-Resource Geology assessments
-JORC (2004) compliant report 2012

2012 **Draig Resources Pty. Ltd** - Teeg & Nariin Teeg mining license, ovorhangay Province, Central Mongolia
-PCI COAL database validation
-Resource Geology assessments
-JORC (2004) compliant report 2012

2004-2010 **PT.Tunas Inti Abdai (TIA)** - Tanah Bumbu, South Kalimantan for **ABM investama (ABM)**
-Thermal Coal Exploration management and database validation
-Resource Geology assessments
-JORC (2004) compliant reports 2010 & 2011

2010 **PT.Bukit Utama Sehjatera (BUS)** - Sorong, West Papua
-Lignite Exploration management and database validation
-Resource Geology assessments

2006-2010 **PT.Mifa Bersaudara (MIFA) & PT.Bara Energy Leastari (BEL)**
- Meulaboh, Aceh Barat & Nagan Raya, Aceh
-Lignite Exploration management and database validation
-Resource Geology assessments
-Mine planning
-JORC (2004) compliant report 2010

2009 **PT.Bakti Pertiwi Nusantara (BPN)** –
Weda Utara, Central Halmahera, maluku
-Laterite Nickel database validation
-Resource Geology assessments
-JORC (2004) compliant report 2009

2009 **Bildan.Pty.Ltd -** Pulau Talud, North sulawesi
-Manganese Exploration management

2008 **PT.Berau Bara Energy (BBE)** - Berau, East Kalimantan
-Thermal Coal database validation
-Resource Geology assessments
-JORC (2004) compliant report 2008

2007-2008 **PT.Ratu Samban Mining (RSM) -** Krui, Lampung. Sumatra.
-Iron Sand Exploration management

2006-2008 **PT.Tekno Marina Cipta (TMC)** - Kota Bangun, East Kalimantan
-Thermal Coal Exploration management and database validation
-Resource Geology assessments

2004-2007 **CV. Gudang Hitam Prima (GHP/BBM)** - Sanga Sanga Coal Mine, Samarinda, East Kalimantan
-Thermal Coal Exploration management and database validation
-Resource Geology assessments
-Mine planning and production reconciliations

2006 **PT.Borneo Indobara (BIB) -** Tanah Bumbu, south kalimantan for SINAR MAS MINING
- Project Due diligence study Grimulya Block

2004-2006 **PT. Multi Prima Energy (MPE) -** Loa Raya Coal Mine, Tenggarong, East Kalimantan.
-Thermal Coal Exploration management and database validation
-Resource Geology assessments
-Mine planning and production reconciliations

Previous Employment

1999- 2004 Natural Beauty Floor Sanding (full-time)
- Surface preparation; punch & fill, sanding & edging
- Applying coating products

September 2000 Hydrographic Sciences Australia (2 weeks work experience)
- Re-editing Hydrographic charts
- Hydrographic chart compilation
- Sounding selection

CONFERENCE PAPER PRESENTATIONS

August 2022	**"Nickel Laterites – Adding Value by Optimizing Exploration"** - Nickel Summit by Indonesia Miner, Jakarta, Indonesia
November 2018	**"Indoneisa, Hi-CV coal supply?"** - 7th annual Coaltrans Emerging Asia Markets, Hanoi, Vietnam
May 2018	**" Developing efficiency in the Indonesian coal supply chain"** - 24th annual Coaltrans Asia, Bali,
September 2017	" **Exploration potential for new Nickel supplies in Indonesia"** - Metal Bulletin: 5th Asian Nickel Conference, Jakarta,
July 2016	**" Which Indonesian coal energy projects will attract Korean investors through 2020?"** - Korea Coaltrans Asia, Seoul,
March 2015	**"The Coal Potential of Sumatra"** - Sumatra Miner 2015 conference
September 2014	**"Adding value through optimizing exploration techniques"** - 2nd Asian Nickel Conference
December 2012	**"Low Rank Coal Deposits of Indonesia"** - IHS Mcloskey Asia Pacific Coal Outlook Conference 2012, Bali
June 2012	**"The Coal Deposits of Sumatra"** - 18th annual Coaltrans Asia, Bali

SOFTWARE EXPERIENCE

- SURPAC Mining software – Expert Knowledge of Geodatabase, Surface modelling, Block Modelling, Pit optimisation, Pit design modules.
- WHITTLE Pit optimisation Software – good knowledge of Pit optimisation procedure and analysis of results
- ArcGIS 9.3 GIS Software – Good knowledge of Spatial interpolation techniquies and map design
- MapINFO, Global mapper and Surfer GIS software
- Microsoft 7-10, VISTA, XP and NT operation systems
- Microsoft office 2003, 2007 & 2010 Word, Excel, Access, Powerpoint
- Adobe acrobat 8 Professional
- AutoCAD 2009

REFERENCES

Daniel Madre (Director)
PT.Danmar Explorindo
SANUR, BALI
Ph. +62 81 23851151
daniel.madre@danmar.asia

YORRIS WIBRIANA

Resource Geologist, Competent Person Indonesia

yorris@gmail.com | +62-8122-1795-84

PROFILE

I am qualified as Competent Person Indonesia (CPI) for public reporting of Coal Exploration and Resource Estimation under KCMI Code with more than 19 years of professional experience in geological exploration and mining development across Indonesia & Australia. I have strong knowledge in exploration data validation, geological modelling and Resource estimation for several mining commodities.

SKILLS

- Minescape Stratmodel (5/5)
- Qgis & Arcgis (5/5)
- Surpac (4/5)
- Leapfrog (4/5)
- MySQL and PostgreSQL Database (4/5)

EDUCATION

Bachelor of Geological Engineering, Padjadjaran University Indonesia
Graduated 2004

AWARDS

Best Technical Discovery in IAGI Exploration Award 2021 under PT Antang Gunung Meratus

WORK EXPERIENCE

- PT DANMAR EXPLORINDO (2021 – current)
  Resource Estimation, Geological Exploration Manager
- PT BARAMULTI SUGIH SENTOSA (2020 – 2021)
  Senior Geologist, Mining Business Development
- PT DANMAR EXPLORINDO & PT GEOSEARCH (2015 – 2020)
  Resource Estimation, Geological Exploration Manager
- PT MINESERVE CITRA TEKNIK (2012 – 2015)
  Coal Resource & Geological Exploration
- PT CSA GLOBAL (2012)
  Coal Resource Geologist
- PT RIDA JAYA MANDIRI (2011 – 2012)
  Coal Resource Geologist
- PT MINESERVE CITRA TEKNIK (2007- 2011)
  Field & Coal Resource Geologist, Short term mine planning
- PT KALTIM BATU MANUNGGAL (2006 – 2007)
  Coal Mine Geologist
- PT BUMI MAKMUR SELARAS (2005 – 2006)

GEOLOGICAL MODELING & EXPLORATION REPORT

1. **PT Halmahera Sukses Mineral, Halmahera (2023)**
   Contributor Geological model and Nickel Resource Estimation Report (JORC Report)

2. **PT Ratu Samban Mining (Blok 9), Bengkulu (2023)**
   Geological modeling and Coal Exploration and Resouce Estimation Report (KCMI Report)

3. **PT Komunitas Bangun Bersama, East Kalimantan (2022)**
   Geological modeling and Coal Exploration and Resource Estimation Report (KCMI Report)

4. **PT Petroindo Utama (2021)**

   PT Multi Tambangjaya Utama (MUTU) Due Diligence of Remaining Coal Resources and Reserves

5. **PT Pada Idi, East Kalimantan (2021)**
   Geological modeling and Coal Exploration and Resource Estimation Report (KCMI Report)

6. **PT Chaido Mega Mineral, East Kalimantan (2021)**
   Preliminary Coal Mapping Report (SNI Report)

7. **PT Borneo Indo Bara, South Kalimantan (2021)**

   Geological model validation and Coal Resource Estimation Report (KCMI Report)

8. **PT Dayak Membangun Pratama, Central Kalimantan (2021)**

   Geological model validation and Coal Resource Estimation Report (KCMI Report)

9. **PT Bima Putra Abadi Citranusa, South Sumatera (2021)**

   Contributor Geological model validation and Coal Resource Estimation Report (JORC Report)

10. **PT Komunitas Bangun Bersama, East Kalimantan (2019)**

    Geological modeling and Coal Exploration and Resource Estimation Report (KCMI Report)

11. **PT Bangun Banua Persada Kalimantan (2019)**

    Geological modeling and Coal Exploration and Resource Estimation Report of Block Banta & Batu Tungku (KCMI Report)

12. **PT Dinasty Maha Karya & PT Bukit Eno Persada, East Kalimantan (2018)**

Geological modeling and Due Diligence Study of KPR Coal Project

13. PT Kalimantan Energi Lestari, South Kalimantan (2018)

Geological modeling and Coal Exploration and Resource Estimation Report (KCMI Report)

14. PT Gunung Bara Utama, East Kalimantan (2017)

Geological modeling and Coal Resource Estimation Report (KCMI Report)

15. PT Borneo Indo Bara, South Kalimantan (2017)

Geological model validation and Coal Resource Estimation Report (KCMI Report)

16. PT Mantimin Coal Mining, South Kalimantan (2016)

Contributor to PT Mantimin Coal Mining Qualified Person's Report of Coal Resources & Reserves of Coal

17. PT Mantimin Coal Mining, South Kalimantan (2016)

Mantimin Coal Mapping Exploration Report

18. PT Wira Rimba Lestari, South Sumatera (2016)

Geological modeling and contributor to PT Wira Rimba Lestari Coal Resource & Reserve Report (JORC Report)

19. PT Minemex Indonesia, South Sumatera (2015)

Geological modeling and contributor to PT Minemex Indonesia Coal Resource & Reserve Report (JORC Report)

20. PT Bukit Bara Alam, South Sumatera (2013)

Geological modeling and contributor to PT Bukit Bara Alam Coal Resource Report (JORC Report)

21. PT Bara Alam Utama, South Sumatera (2012)

Geological modeling and contributor to PT Bara Alam Utama Coal Resource & Reserve Report (JORC Report)

22. CV Datra Katama Jaya, South Kalimantan (2011)

Geological modeling and Coal Resource & Reserve Report

23. PT Laskar Semesta Alam, South Kalimantan (2011)

Geological modeling and Coal Exploration & Resource Estimation Report

24. PT Rida Jaya Mandiri, West Kalimantan (2011)

Geological modeling and Coal Exploration & Resource Estimation Report

25. CV Prima Mandiri, East Kalimantan (2011)

Geological modeling and contributor to CV Prima Mandiri Coal Resource & Reserve Report (JORC Report)

26. PT Kartika Sela Bumi Mining, East Kalimantan (2011)

Geological modeling and contributor to PT Kartika Sela Bumi Mining Coal Resource & Reserve Report (JORC Report)

27. PT Bara Indah Lestari, Bengkulu (2010)

Geological modeling and Coal Exploration & Resource Estimation Report

28. PT Nusa Kencana Riau, Riau (2010)

Geological modeling and Coal Exploration & Resource Estimation Report

29. PT Inti Bara Perdana, Bengkulu (2008-2010)

Exploration manager, geological modeling, Coal Exploration & Resource Estimation Report, and short term mine planning

30. PT Dian Rana Petrojasa, South Sumatera (2009)

Geological modeling and Coal Exploration & Resource Estimation Report

31. PT Semesta Centramas, South Kalimantan (2007)

Geological modeling and Coal Exploration & Resource Estimation Report

Harman Adhittyo

Resource Geologist

Jl. Pengantin Ali II No. 26, Ciracas
East Jakarta 13740
DKI Jakarta, Indonesia

Tel (M) : +62 813 1951 3181 (Indonesia)

e-mail : harmanadhittyo@gmail.com



Place and date of birth	: Jakarta, February 6th 1987
Sex	: Male
Religion	: Islam
Marital Status	: Married
Nationality	: Indonesian

Geologist with 8+ years of experience in epithermal low sulphidation deposit and 4 years of experience in modelling and resource estimating nickel laterite deposit. Expertise from exploration to mining. Core competencies include:

Exploration Mapping and Sampling ● Core and RC Logging ● Grade Control Mapping and Sampling ● Wireframing ● Block Modeling ● Resource Estimation ● Database

Professional Experience

PT Danmar Explorindo

Resource Geologist, January 2019 – Present, South Jakarta, DKI Jakarta

Primary Duties Include:

- Responsible for quality control of database
- Responsible for updating database
- Responsible for updating wireframe, composite data, statistics and domaining
- Responsible for updating resource estimation in Surpac software

Sumatra Copper and Gold, Plc.

Mine Geologist, September 2017 – August 2018, Tembang, South Sumatra

Primary Duties Include:

- Responsible for quality control of database
- Responsible for updating wireframe, composite data, data statistics and domaining
- Responsible for updating open pit block model using GCX module in Surpac software
- Responsible for updating underground block model manually in Surpac software
- Responsible for monthly reconciliation report
- Responsible for grade control mapping and sampling (face, floor, wall) in underground
- Responsible for production data (tonnes production, ore to crusher, ore stock)

Harman Adhittyo
Resource Geologist

Jl. Pengantin Ali II No. 26, Ciracas
East Jakarta 13740
DKI Jakarta, Indonesia

Tel (M) : +62 813 1951 3181 (Indonesia)

e-mail : harmanadhittyo@gmail.com

Junior Resource Mine Geologist, January 2016 – September 2017, Tembang, South Sumatra
Primary Duties Include:

- Responsible for quality control of database
- Responsible for updating wireframe, composite data, data statistics and domaining
- Responsible for updating open pit block model using GCX module in Surpac software
- Responsible for updating underground block model manually in Surpac software
- Responsible for monthly reconciliation report
- Responsible for grade control mapping and sampling (trench, blast hole, RC drill, channel) in open pit
- Responsible for grade control mapping and sampling (face, floor, wall) in underground
- Responsible for logging both RC drilling and blast hole drilling
- Responsible for density and moisture sampling project

Junior Mine Geologist, June 2015 – January 2016, Tembang, South Sumatra
Primary Duties Include:

- Responsible for grade control mapping, sampling and geology interpretation
- Responsible for logging both RC drilling and blast hole drilling
- Responsible for plotting data to map
- Responsible for density and moisture sampling project
- Responsible for monthly report to Senior Geologist

Junior Exploration Geologist, July 2012 – June 2015, Lebong Tandai, Bengkulu
Primary Duties Include:

- Responsible for mapping, sampling and geology interpretation
- Responsible for quick logging and detail logging diamond drill
- Responsible for plotting data to map
- Responsible for monthly report to Project Geologist and Senior Geologist
- Supervised activities for fly camp

Junior Exploration Geologist, June 2010 – July 2012, Pasaman, West Sumatra
Primary Duties Include:

- Responsible for mapping, sampling and geology interpretation
- Responsible for quick logging and detail logging diamond drill
- Responsible for plotting data to map
- Responsible for monthly report to Project Geologist and Senior Geologist

Graduate Geologist, April 2010 - June 2010

Harman Adhittyo

Resource Geologist

Jl. Pengantin Ali II No. 26, Ciracas
East Jakarta 13740
DKI Jakarta, Indonesia

Tel (M) : +62 813 1951 3181 (Indonesia)

e-mail : harmanadhittyo@gmail.com

Formal Education

Bachelor of Geological Engineering, Bandung Institute of Technology, Indonesia, 2010

Languages

English : Enough
Bahasa Indonesia : Fluent

Computer Software Literacy

MapInfo ● ArcGis ● QGIS ● GlobalMapper ● Microsoft Office Applications ● Surpac ● Micromine ● Minescape