Ministry of Energy and Mineral Resources

Directorate of Natural Resources Studies

TECHNICAL REPORT OF AL RISHA PHOSPHATE PROJECT, NORTH EAST JORDAN/ PHASE I

Initial Report

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List of Abbreviations

A	Area bearing (Influence Area)
BD	Bulk density
Ce	cerium
cps	counts per second
E	East
Fig.	Figure
GR	gamma radiation
GIS	Geografic Information System
ICP-MS	Inductively Coupled Plasma Mass Spectrometry
km	kilo meter
km^2	square kilo meter
La	lanthanum
Lu	lutetium
m	meter
m^2	square meter
m^3	cubic meter
Max.	Maximum
mg/kg	milligram per kilo gram
Min.	Minimum
mm/year	millimeter per year
mt	metric tonne
N	North
Nd	neodymium
NGMP	National Geological Mapping Project
No.	Number
NRA	Natural Resources Authority
ºC	degrees Celsius
ppm	part per million
R	Resource of element
REEs	Rare Earth Element(s)
Rph	Risha phosphate
St.D.	Standard Deviation
S	South
T	Thickness of element bed.
TCP	Tri calcium phosphate
TD	Total Depth
Th	thorium
U	uranium
URC	Umm Rijam Chert Limestone Formation
UTM	Universal Transverse Mercator
W	West

Abstract

The study area lies within geological map Sheet No. 375-VI “Tal’at Q’aiyid’, located 260 km east of Amman, and 26 km east of Ar Ruweishid Municipality. The area was divided into several blocks, which in turn block 01 defined as phase-I with an approximate area of 120km^2.

All of the study area is covered mainly by URC Formation of Paleogene and Neogene ages. The Phosphorite layers that were observed in the study area are mostly in massive limestone beds with some of chert, chalk, chalky limestone & silicified limestone.

According to the prospecting activites, the chemical results of the collected samples revealed the phosphate ore contains interesting content of P_2O_5 ranged between 18% and 36% with an average thickness ranges from 4m to 6m with high quality TCP and low Fe2O3, Al2O3 and MgO impurities. On the other hand, by using lithological, chemical assay and gamma geophysical data, the optimal phosphate layer was found in three to five zones. In addition to that, there are good indications that the concentrations of P_2O_5 and phosphate layers thicknesses are increasing toward the north and north east of the study area.

The preliminary prospecting activities in the Risha phosphate have indicated economic potential deposits of phosphate ore where the resource estimation has been calculated using drilling & chemical data in phase I. The total volume of the phosphate deposit and tonnage of phosphate were measured to be approximately 750 million meteric tons covers around 90 km2.

CHAPTER 1

1. INTRODUCTION

1.1 Background

Phosphate rocks in Jordan are considered on of the strategic materials that are viewed as key resources that have many applications.

The term phosphate rock (or phosphorite) is used to denote any rock with high phosphorus content. Phosphorus is involved in numerous plant functions, but its most important role is helping plants to capture the sun's energy and begin the photosynthesis process.

Most of the phosphate rock is chemically processed into soluble fertilizer products, such as single superphosphate (SSP), triple superphosphate (TSP), nitrophosphate (NP) and phosphoric acid (H_3PO_4). Phosphoric Acid is the basic intermediate product used for the production of high analysis fertilizers, such as monoammonium phosphate (MAP), diammonium phosphate (DAP) and compound fertilizers (NPK) (JPMC, 2005).

The most detailed prospecting studies for Phosphate deposits in Jordan were reported for known occurrences that are located in the central and Northern part of Jordan in particular, Al-Hisa Phosphorite of Balqa group was identified in the Upper Cretaceous, Campanian age. Afterward, Reconnaissance trips were carried out and reported further phosphate deposits in the Northeast of Jordan, Risha area. Basha (1987) published a paper indicated phosphate layers within stratigraphy extended from middle-late Eocen to Oligocene over outcroped beds along Wadi Ar Ruweishid

and Wadi Umm Qusair with a range of thicknesses 20-50 cm. Furthermore, geological studies were conducted during the geological mapping performed by the Ministry of Energy & Mineral Resources “MEMR”, which produced a map with a scale of 1:50,000, and indicated distinctive phosphate layers interbedded with chert & phosphatic chert as a part of Umm Rijam formation of Balqa group.

Afterward, and in response to the high demand of phosphate deposits globally, the Natural Resources Studies Department of “MEMR” has inistiated the Risha Phosphate Project. The Exploration included outcrop sampling, drilling boreholes and Geophysical survey in order to determine layers of phosphate at different rank according to their content P2O5, thicknesses, distribution and quality cross over the Risha area. The priliminary prospecting results revealed promising phosphate resources are deposited the area.

1.2 Location and Access

Tal'at Q'aiyid and Jabal Umm Al Wi'al areas cover arround 2886 km^2 and form part of the northeastern Jordan Plateau. The study area is located within geological map Sheet No. 375-VI of “Tal’at Q’aiyid”, which is 260 km east of Amman and 26 km east of Ar Ruweishid Municipality. The area was divided into blocks, which in turn block 01 was defined as phase 01; with an approximate area of 120km2.The area that has been selected for phosphate prospecting activities extend along the following coordinates (UTM, WGS 1984)

Easting 504972, 495777

Northing 3564029, 3554248.

The area can be reached from Ar Ruweishid via Safawi-Ar Ruweishid Highway and it is crossed by numerous non-asphaltic tracks that can be easily crossed by 4-wheel drive vehicles.

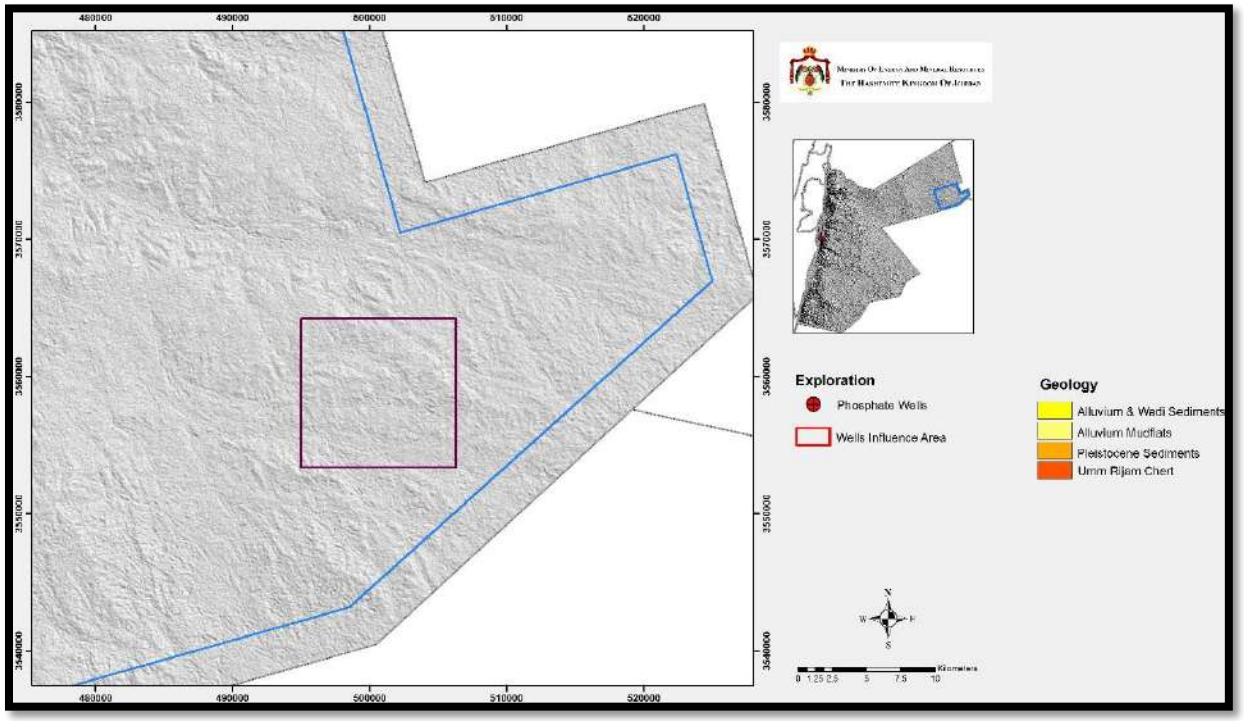

Figure 1: location of the study area in Jordan.

1.3 Climate and Vegetation

Jordan is influenced by a relatively rainy Mediterranean climate in the northwest and dry Sahara climate to the South and east of the country. The region has a short rainy winter (December to March) whereas it records high temperature in the summer. Generally, the majority of rain falls in December, January, February and March. Rain during April and May is rare and most of the days in summer are clear. The area gets an annual precipitation of less than 100mm. The temperature on the highlands is generally lower than the pediplain and higher in the southern part of

Jordan. The annual range of temperature in the study area is less than 18 °C. Vegetation is insufficient to prevent movement of sediments by wind, particularly during dry periods of the year. Vegetation in the study area is sparse and comprises mainly annual grasses in wadi courses and mudflats; Artemis and shrub in ephemeral wadis (Abdelghafoor, 2011).

1.4 Previous studies

Numerous workers have been attracted to the phosphate deposits in Jordan because of their economic value and wide geological distribution. Blankenhorn first discovered phosphorite-bearing beds in (1903). While at Al Hasa area, phosphorite was first discovered in 1908, during the construction of the Hijazi Railway. The formation is equivalent to the upper part of "Calaires silex" of Wetzel and Morton (1959), and to the upper B2 of Wolfrat (1959), the upper part (B2b) of the B2 Silicified Limestone and Phosphorite Formation of MacDonald and Partners (1965), and the upper part of the Amman Formation (north of Jordan) of Parker (1970). Bender (1974) used the term Phosphorite Member to describe the succession of the limestone beds, silicified phosphorite, phosphorite-bearing oyster lumachelle, and phosphate layers, also he mentioned that the thickness of this member attain a 90m thick in Wadi Mujib and decreases in thickness towards the east and south. He also assigned Campanian age for this member according to abundant fossils found in it. Systematic detailed geological mapping of 1:25000 scale of the entire phosphate-prospective areas in Jordan was carried out between the years 1961-1966 by the German Geological Mission. During the National Geological mapping Project at scale 1:50000, Hiyari, (1985) and Khalil, (1986) divided Al Hasa Phosphorite Formation into three members; the lower Qatrana Phosphorite Member, the middle Bahiya Coquina Member and the upper Sultani Phosphorite Member. Barjous (1986), divided the formation into four member in Siwaqa area, he added Siwaqa

Coquina Member. Fakhoury, (1987) concluded in a study of Jordanian phosphate, that the pellets and intraclasts seem to have similar chemistry and that they were derived during reworking from the phosphate mud. Al Jallad, (1997) discussed the varieties, mining, benefit, uses and manufacturing of the phosphates. Jordan Phosphate Mines Company (JPMC) was established as a private company in 1949 to exploit phosphate deposits in Al-Rusifa. In 1953, it was registered as a public share holding company with an initial share capital of JD 250,000. Further mining operations were established at Al-Hisa, approximately 135 km to the south of Amman in 1962, at Al-Abiad, 20 km north of the Al-Hisa mine in 1979. JPMC commenced exploration at Shidiyya area, 125 km to the northeast of Aqaba in 1988 and started production in 1989. JPMC produces up to 7 million tonnes of phosphate rock annualy, making it the world's sixth largest phosphate rock producer and the second largest exporter (JPMC, 2005).

It has been proved that Jordan phosphate rock has many attractions and natural advantages over the phosphate rock mined elsewhere, since it is used as a fertilizer in most countries worldwide without the need of any kind of treatment.

One of the significant environmental and competitive aspects of Jordanian phosphate rock, its relatively low concentration of heavy metals such as cadmium, lead, mercury, arsenic and zinc, all of which are considered to be environmentally hazardous, particularly cadmium. Generally, the main characteristics of Jordan phosphate rock are low grinding cost, high reactivity, good filterability, low corrosion rates, low content of impurities, high responses in direct application, very low content of heavy metals, suitability for uses in all phosphoric acid processes (JPMC, 2005).

Al Bashish in 2015 studied a hundred and sixty three boreholes that were drilled in the Shidiyya area to explore new occurrences of phosphate in the area. Samples from 17 boreholes were shown more than 25% of P_2O_5. He painted thickness of the phosphate layers in the study area, as well as mapped the thickness of the overburden. Approximate resource accounted in the study area reached ten million tons.

Geologist Dr. Mohammad Abdelghafoor studied Risha project area during the Jordanian National Geological Mapping Project in 2008. He referred to the discoveries of the Umm Rajam Formation, with a thickness of up to 61 meters, and indicated in its attached report in 2011 the presence of multiple levels of silicate phosphate (trays) and layers of phosphate unearthed in some sections, (in the northwestern part) with multiple thicknesses. In addition, the Jordanian Geologists Association (JGA) studied the area in 2012. Nine wells were drilled, and the results showed good and economically promising thicknesses of phosphate layers, with a quality that reached more than 27% for P_2O_5 with thicknesses ranging from several meters up to than 12 meters in some wells.

1.5 Purpose of the study

This project aims to dicover more sites with appealing phosphate resources in term of its quality and quantity, and provide them to the interested investors. This project is important to attract other companies to invest in phosphate ores. The Government of Jordan is keen to open the investment opportunities and expand the Minerals and Mining Sector.

In response to the prospecting plans, exploratory wells, sampling and chemical analysis were recommended to implement in the study area for the following purposes:

A. Delineation the phosphate ores in term of thicknesses and horizontal extents.
B. Core and cuttings sampling for lithology determination.
C. Determine the content of phosphorous oxides, and other associated impurities, specific weight and other components that could be suitable for the use in various industries, either in local or and export purposes.
D. Estimate the amount of phosphate resources in the area.

CHAPTER 2

2. GEOLOGY OF THE STUDY AREA

2.1 Regional Geology:

The study area covered mainly by sedimentary rocks of Paleogene and Neogene ages. Sedimentation determined by the disposition of the Tethys Ocean and eustatic fluctuations of The Arabian-Nubian Shield during the Cenozoic times. Ajlun and Belqa groups in north and central Jordan occurred by major transgression in early Cenomanian and followed by early Cenozoic to deposit the marine carbonate sediments (Abdelghafoor, 2011). Umm Rijam Chert Limestone Formation of Eocene age is one of the Belqa Group and covers the entire study area. The formation consists of limestone, chert, chalk, phosphate, chalky limestone and marly limestone that were formed in a shallow to moderate pelagic climate. The structure of the area is characterized by the presence of four major faults trends; NW-SE, NNWSSE, NE-SW and E-W.

2.2 Stratigraphy of Formation: Members & Thickness:

2.2.1 Lithostratigraphical Nomenclature

Holland et al. (1978) and the North American Commission on Strati-graphic Nomenclature (NACSN, 1983) recommended the stratigraphic nomenclature and terminology used in this report and throughout the National 1:50,000 Geological Mapping Project. Formal descriptions named Powell (1989). The geological map of the study areas called Tal'at Quayid sheet, and Geo. Mohamed AbdelGhafoor from the Ministry of Energy and Mineral Resources prepared it in 2011.

2.2.2 Lithostratigraphy

Phosphorite found in the study area mostly in massive limestone beds with some of chert. Sometimes, phosphorite is found singly and friable, and found with a few chalk, chalky limestone, silicified limestone, and chert. Fish fragments and shark teeth are some microfossils that associated with phosphorite in target beds (Fig. 2).

Umm Rijam Chert Limestone Formation (Eocene) characterized by the Paleogene succession and is consider a lithostratigraphic unit of the Balqa Group. It is predominantly composed of Quaternary sediments cover considerable parts of the study area (Fig. 2).

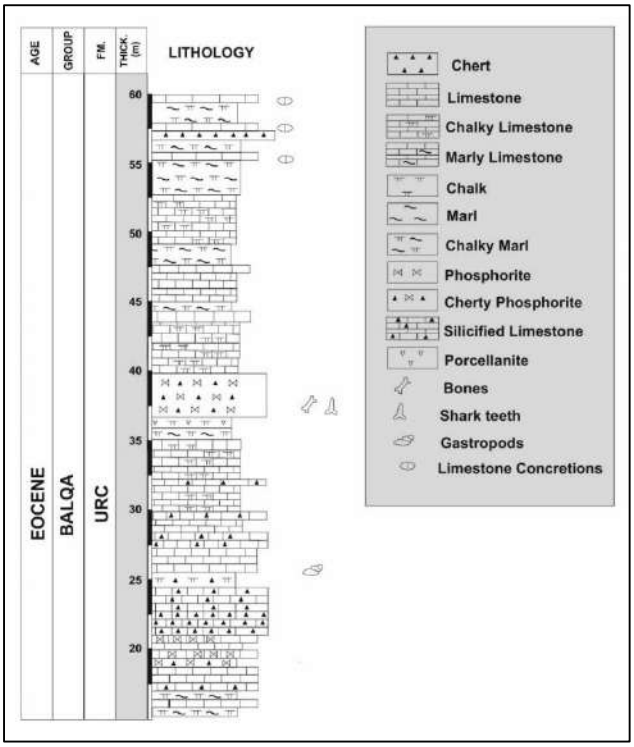

Figure 2: Composite graphic log of URC Formation in study area (After Abdelghafoor, 2011).

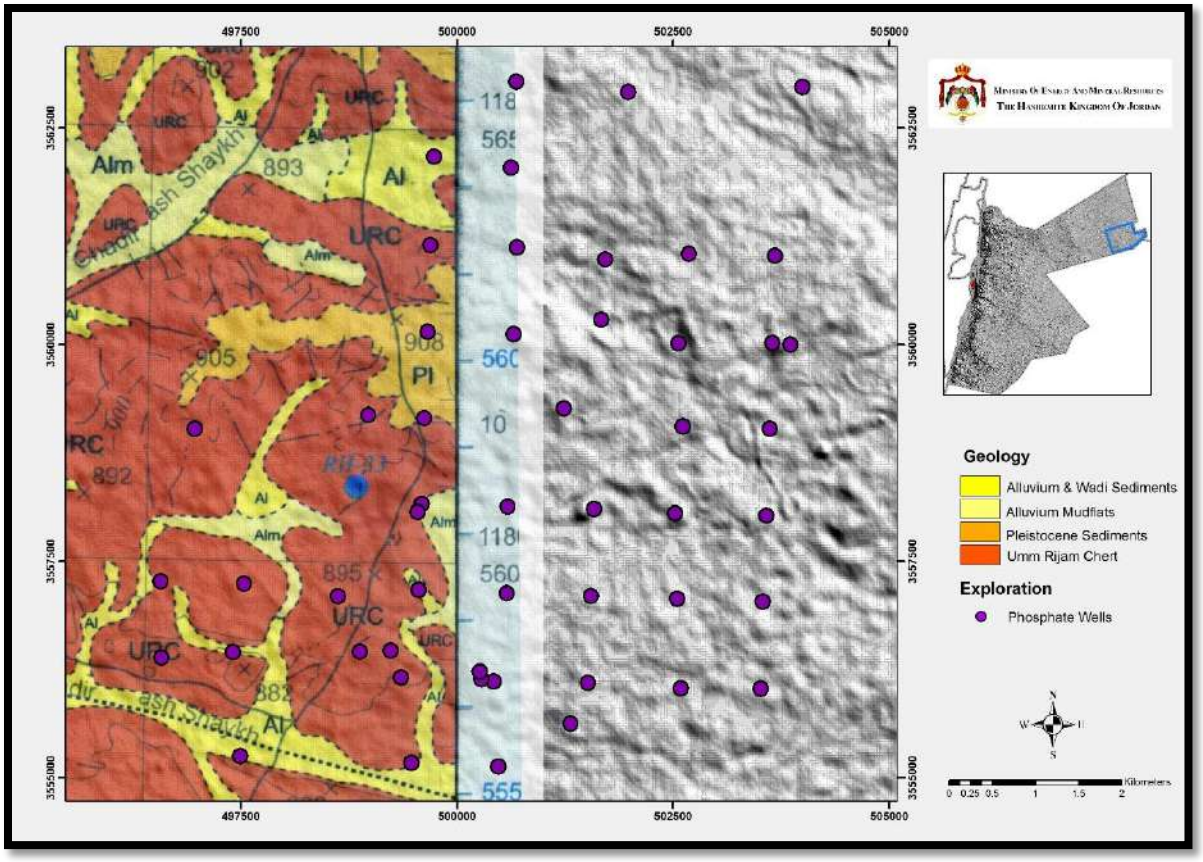

Figure 3: Geological Map of a part of the study area (Abdelghafoor, 2011).

2.2.3 Umm Rijam Chert Limestone Formation (URC)

The Umm Rijam Chert Limestone (URC) Formation is early to middle Eocene in age, only exposed rock unit and up to 61 m thick in the study area. The formation either covered by a thin blanket of superficial deposits mainly Pleistocene gravels or capped by hard, massive chert beds. URC Formation consists mainly of chert, chalk and limeston with distinctive hard bed of cherty phosphate. Fish fragments, shark teeth and gastropods are the remarkable macrofossils of this formation.

2.3 Stratigraphy of phosphate-bearing beds

Phosphorite found in the study area mostly in massive limestone beds with some of chert. Sometimes, phosphorite is found singly and friable, and found with a few chalk, chalky limestone, silicified limestone, and chert. Fish fragments, bones and shark teeth are some microfossils that associated with phosphorite in target beds. The depth of target beds (Overburden beds) ranged between 0 to 16 m. The thickness of phosphorite-bearing beds reached sometimes about 22 m for beds in which the percentage of P_2O_5 exceeds 18% of the total major oxides.

CHAPTER 3

3. FIELD WORK

3.1 Drilling Techniques

All boreholes were drilled by SD300 rig owned by MEMR and Massenza that was borrowed from Al Manaseer group. Using two types of rigs, two different types of drilling systems were used, core and cutting drilling systems. The core drilling consisted of tubes "helco" with 5m length and 3-inch diameter; "HQ" tubes which have 4.1m length and 3.8-inch diameter. The drilling bit was "Diamond Tungsten" conjugate with flat bit with a size of 4-inch diameter. Whereas, the cutting drilling used hummer rod with length 1.60 m and was utilized with other drilling pieces similar to the component of the core drilling.

Total of two Holman compressor with air pressure (250-300) psi were available on location; in addition, spare rig parts were available as well as maintenance work was implemented periodically.

3.3 Drilling Activities of Boreholes

Drilling activities were commenced in December 2021 and extended to September 2022, 55 boreholes were drilled over an area reached to 120 km2.

49 boreholes were drilled using the Hammer bit and produced cuttings samples, where only 6 boreholes were cored using the diamond bit (Figure 4).

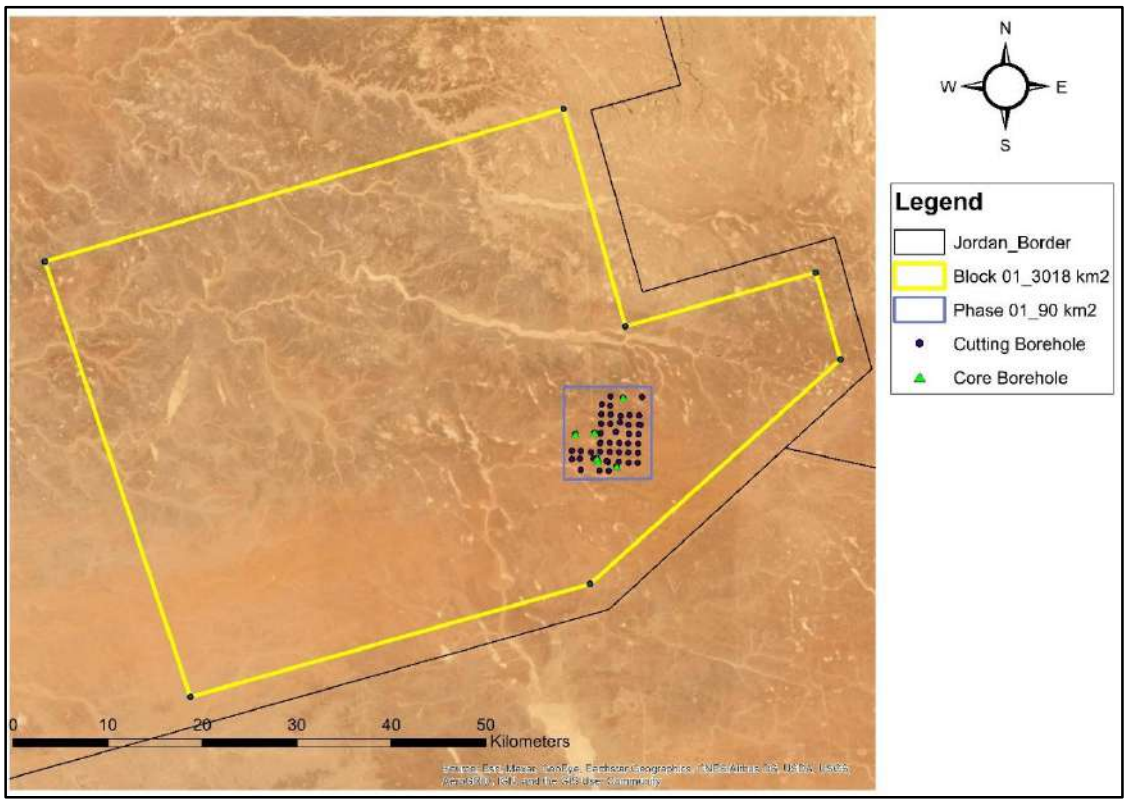

Figure 4: Phosphate Risha Study Area.

The total length of cuttings boreholes reached 1172m and total length of core boreholes reached 68m. More details about drilled boreholes are listed in (Table 01) & (Table 02).

Table 1: Cutting Boreholes drilling records.

No.	BH	X	Y	Total depth m	Cutting depth m	Start date	End date
1	RPh1-BHBH01	501233.62	3559266.556	35	35		
2	RPh1-BH02A	501233.62	3559266.556	16	16	12/12/2021	14/12/2021
3	RPh1-BH02B	501583.444	3558103.225	26	21	14/12/2021	22/12/2021
4	RPh1-BH03	501583.295	3558105.025	21	21	23/12/2021	23/12/2021
5	RPh1-BH04	502523.642	3558056.729	30	30	23/12/2021	24/12/2021
6	RPh1-BH05	502611.139	3559056.145	31	31	29/12/2021	31/12/2021
7	RPh1-BH06	502561.291	3560021.716	15	15	3/1/2022	3/1/2022
8	RPh1-BH07	501669.23	3560290.634	18	18	4/1/2022	4/1/2022
9	RPh1-BH08	500656.335	3560125.332	18	18	5/1/2022	5/1/2022
10	RPh1-BH09	500693.586	3561127.223	19	19	5/1/2022	5/1/2022
11	RPh1-BH10	499690.436	3561153.704	14	14	6/1/2022	6/1/2022
12	RPh1-BH11	499733.654	3562174.712	24	24	6/1/2022	7/1/2022
13	RPh1-BH12	500622.287	3562047.375	20	20	10/1/2022	10/1/2022
14	RPh1-BH13	499659.304	3560150.17	23	23	24/2/2022	25/1/2022
15	RPh1-BH14	499619.686	3559153.499	21	21	24/1/2022	25/1/2022
16	RPh1-BH15A	500586.412	3558132.282	9	9	25/1/2022	25/1/2022
17	RPh1-BH15B	499592.264	3558163.504	18	18	26/1/2022	26/1/2022
18	RPh1-BH16	499546.068	3558070.232	18	18	3/2/2022	7/2/2022
19	RPh1-BH17	499558.26	3557169.588	24	24	7/2/2022	8/2/2022
20	RPh1-BH18	500574.686	3557132.24	24	24	8/2/2022	9/2/2022
21	RPh1-BH19	501546.652	3557100.703	21	21	9/2/2022	10/2/2022
22	RPh1-BH20	502544.14	3557071.842	22	22	10/2/2022	14/2/2022
23	RPh1-BH21	501712.563	3560986.66	29	29	14/2/2022	15/2/2022
24	RPh1-BH22	502679.851	3561053.548	25	25	15/2/2022	16/2/2022
25	RPh1-BH23A	503680.028	3561029.651	18	18	16/2/2022	21/2/2022
26	RPh1-BH23B	503646.674	3560025.208	27	27	22/2/2022	22/2/2022
27	RPh1-BH24	503854.711	3560003.725	24	24	23/2/2022	23/2/2022

No.	BH	X	Y	Total depth m	Cutting depth m	Start date	End date
28	RPh1-BH25	503615.834	3559030.817	24	24	24/2/2022	24/2/2022
29	RPh1-BH26	503576.816	3558028.192	29	29	24/2/2022	30/3/2022
30	RPh1-BH27	503536.797	3557034.313	24	24	4/4/2022	8/4/2022
31	RPh1-BH28	503512.028	3556028.216	27	27	12/4/2022	13/4/2022
32	RPh1-BH29	502587.748	3556032.666	29	29	19/4/2022	20/4/2022
33	RPh1-BH30A	501512.288	3556101.195	15	15	20/4/2022	25/4/2022
34	RPh1-BH30B	500424.386	3556115.073	13	13	25/4/2022	25/4/2022
35	RPh1-BH30C	500281.662	3556142.1	25	25	10/5/2022	11/5/2022
36	RPh1-BH31A	500263.798	3556228.407	17	17	26/4/2022	26/4/2022
37	RPh1-BH31B	499351.321	3556161.818	21	21	27/4/2022	28/4/2022
38	RPh1-BH32	499230.729	3556469.243	29	29	9/5/2022	10/5/2022
39	RPh1-BH33	499351.321	3556161.818	28	28	12/5/2022	12/5/2022
40	RPh1-BH34	499230.729	3556469.243	21	21	26/5/2022	26/5/2022
41	RPh1-BH35	498874.605	3556459.372	30	30	20/5/2022	20/5/2022
42	RPh1-BH36	498622.336	3557098.242	28	28	24/5/2022	24/5/2022
43	RPh1-BH37	497408.2	3556454.859	27	27	26/5/2022	28/5/20222
44	RPh1-BH39	497532.24	3557245.02	32	32	15/6/2022	15/6/2022
45	RPh1-BH41	496571.542	3557272.488	33	33	28/6/2022	30/6/2022
46	RPh1-BH42	496580.104	3556388.499	30	30	6/7/2022	5/8/2022
47	RPh1-BH47	497492.057	3555254.028	18	18		
Total					1050		

Table 2: Core Boreholes drilling records.

No.	BH	X	Y	Total depth m	Core depth m	Cutting depth m	Start date	End date
1	RC-A1	498971	3559189	14	10	4	6/6/2022	9/6/2022
2	RC-31A	499351.3	3556162	14.1	0.7	13.4	20/6/2022	22/6/2022
3	RC-31B	499230.7	3556469	16.7	5.7	11	22/6/2022	24/6/2022
4	RC-31C	499230.7	3556469	15.5	1.5	14	7/7/2022	8/7/2022
5	RC-43	501313	3555626	16.75	12.75	4	2/8/2022	8/8/2022
6	RC-44	500685	3563040	28	5.5	22.5	8/8/2022	14/8/2022
7	RC-45	501982	3562920	22.4	17.4	5	15/8/2022	1/9/2022
8	RC-46	496965	3559029	22.2	2	20.2	19/7/2022	22/7/2022

3.4 Litholigical Sections of the Study Area

As per mentioned in the geology section, the predominant stratigraphy in the study area belongs to Umm Rijam Chert “URC” formation of the Paleogene age. The URC is the only formation that was encountered over the prospecting operations conducted in the study area targeting the Phosphate layers. URC Formation consists of interbedded lithologies including chert, limestone, chalky limestone, marly limestone, phosphate, silica phosphate, silicified limestone and marl.

In total, 19 lithologies were noticed across drilling boreholes, 9 of them were considered in term of phosphate rocks. Consequently, the bulk density for every phosphatic rock lithology was determined in MEMR labs (Table 03). As a matter of fact, the depostion environment of various types of lithology have to be modeled and projected into sections where Rockwork v.16 was used for that purposes in order to

define their extension. The encountered lithified rocks and bulk density of the phosphate rocks are documented in the table below.

Table 3: Lithified rock types encountered in the study area.

Types of lithology were encountered from the drilled boreholes		
Lithified rock_non Phospahtic	**Lithified rock_Phosphatic**	**Bulk Density g/cm^3)_Phospahtic rock**
Alluvial	Chalk /Tr Phosphate interbedded in parts	1.36
Chalk	Chalk limestone Phosphate	1.40
Chalk Limestone	Chalk limestone Apatite	1.36
Chert/chert interbedded in parts	Limestone Phosphate	1.40
Clay	Phosphatic Limestone	1.85
Chert	Phosphorous/fecal type	1.44
Limestone	Silica Phosphate	2.30
Marly Limestone	Silicified limestone/phosphate interbedded in parts	2.66
Silicified limestone	Silicified chalk limestone/phosphate interbedded in parts	2.66
Silicified chalk limestone		

Moreover, and for the puposes of this project, the stratigraphic sequense has been divided into three member based on the drilling records: the overburden layer, the Phosphate layer and the URC layer. Consequently, projected section and model were created to distinguish the phosphate layer as a bulk regardless of lithology type of phosphate. Furthermore, P_2O_5 wt.% results have been represented in fence diagrams and projected in sections. The majority results of P_2O_5 wt.% are placed within range 10 wt.% to 50 wt.%.

Lithology, stratigraphy and P_2O_5 concentrations have been represented using projected sections over NS and EW directions over the study area. The following examples show some of these section with their locations.

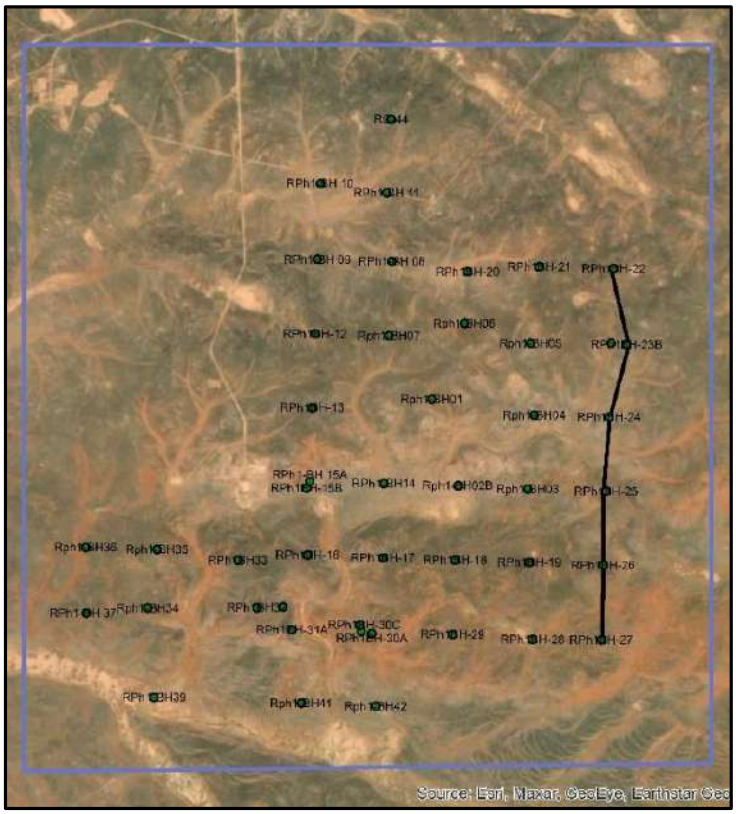

Figure 5: Section N-S RPh1-BH22-RPh1-BH27.

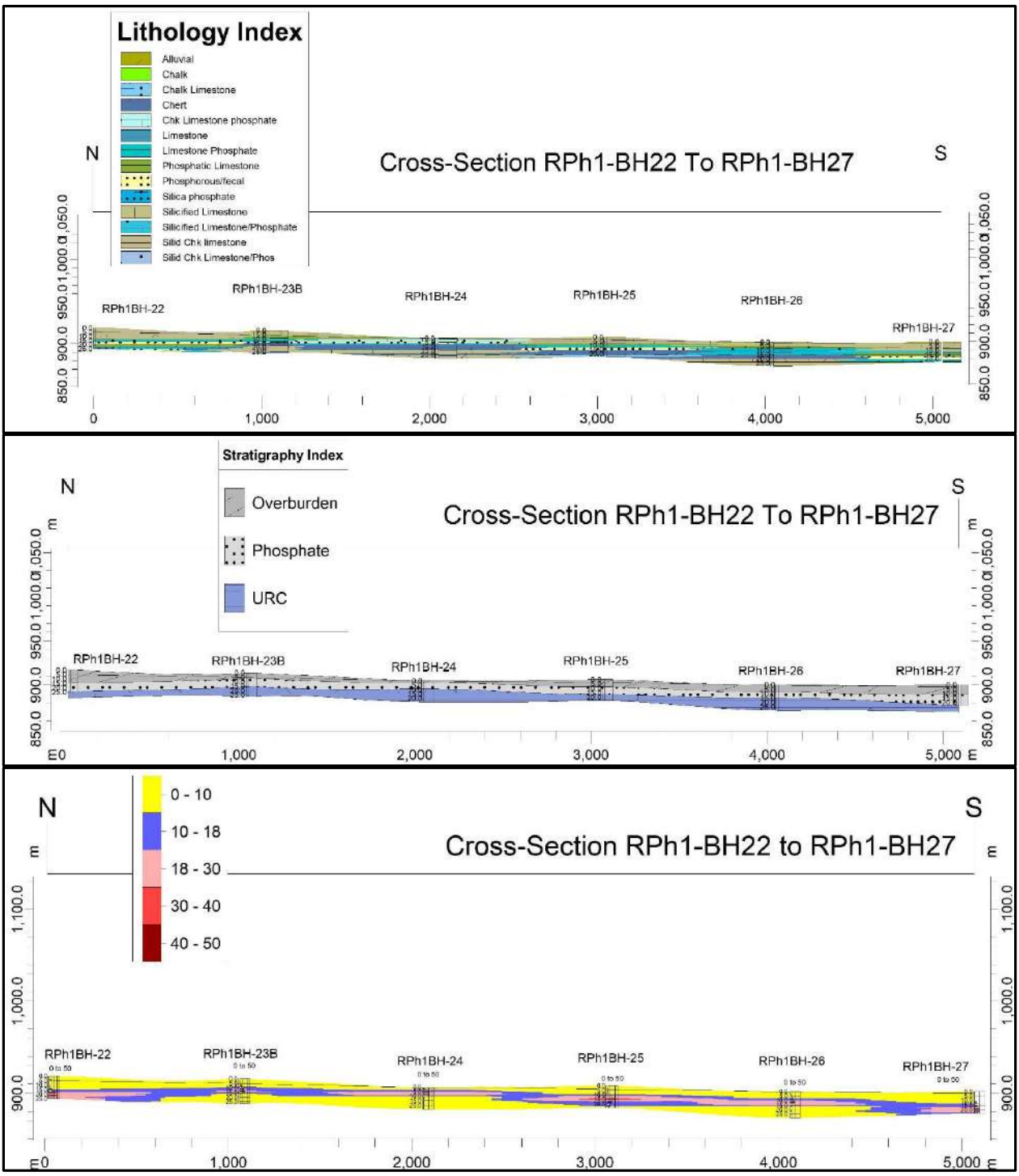

Figure 6: Projected section lithology, stratigraphy & P2O5%wt over section RPh1-BH22_RPh1-BH27.

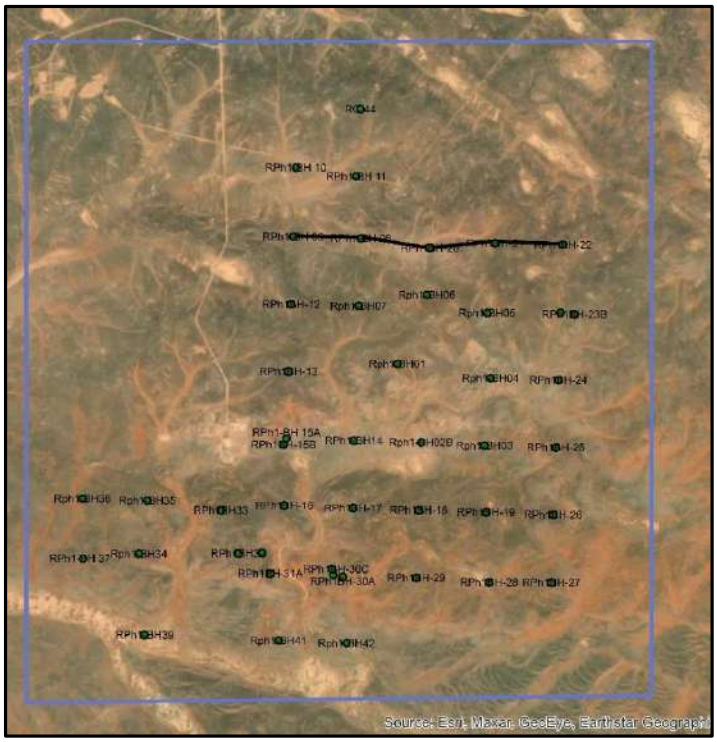

Figure 9: Section W-E RPh1-BH09_RPh1-22.

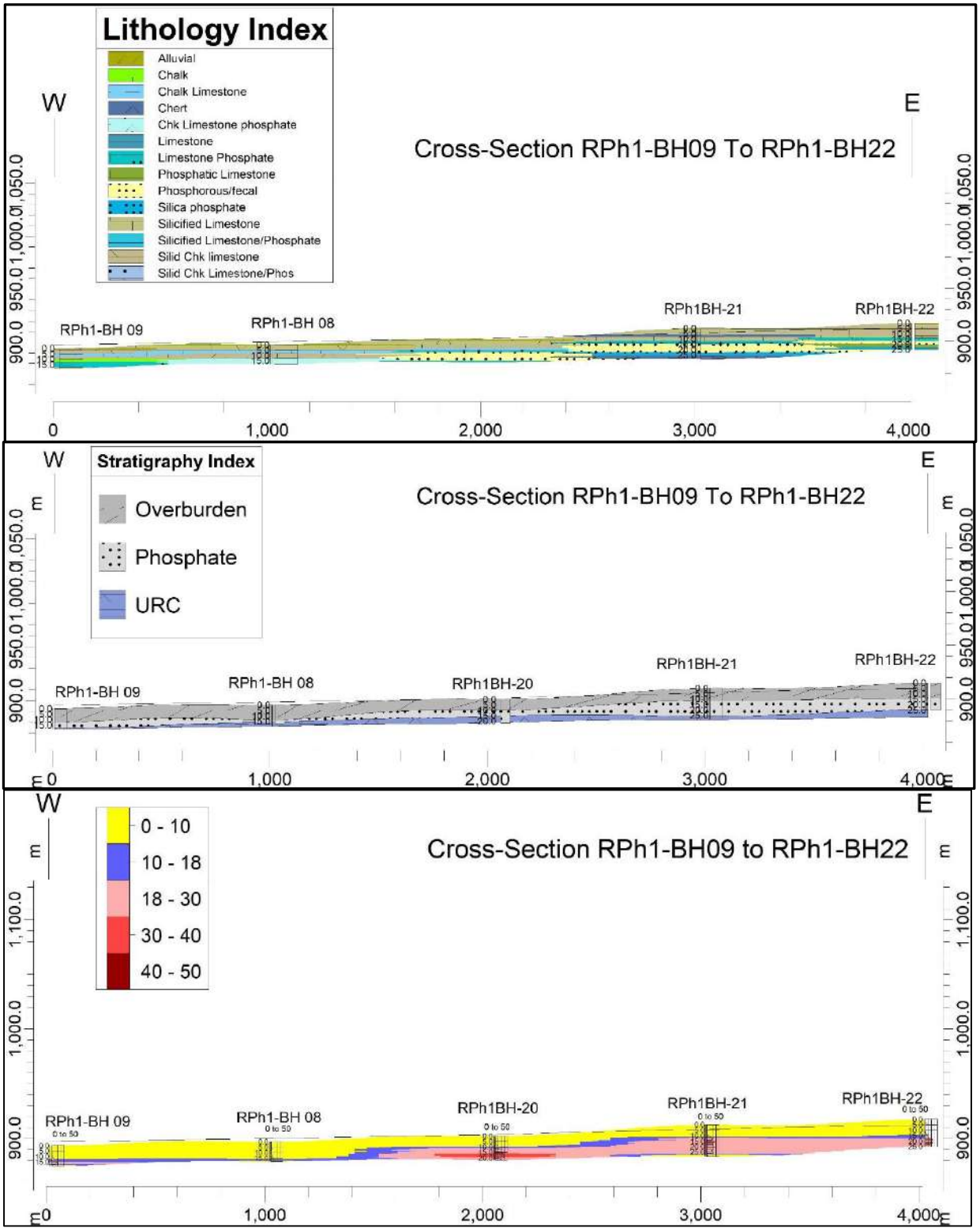

Figure 10: Projected section lithology, stratigraphy and P2O5%wt over section RPh1-BH09_RPh1-BH22.

CHAPTER 4

4. GEOPHYSICAL SURVEY (WELL LOGGING)

4.1 Introduction

Well-logging (Total Natural Gamma Logging) refers to the collection of geologic and hydrologic information by lowering and raising probes on a wire. The radioactivity of rocks has been used for many years to help derive lithologies. Natural occurring radioactive materials include the elements uranium, thorium, potassium, radium, and radon, along with the minerals that contain them. There is usually no fundamental connection between different rock types and measured gamma ray intensity, but there exists a strong general correlation between the radioactive isotope content and mineralogy. Logging tools have been developed to read the gamma rays emitted by these elements and interpret lithology from the information collected.

4.2 Methodology

Well-logging survey conducted in February 2022, the vertical logging of variation in natural gamma radiation (GR) measured in counts per second (cps). Natural gamma logging surveys were carried out using a Mount Sopris Matrix borehole logging system. A portable gasoline generator provided isolated 220 volt AC power for the instrument. The system used poly probe technology that allowed the acquisition of multiple logs simultaneously on a single conductor pair. A motorized matrix winch with a 1/8” diameter steel armoured single cable was used for borehole logging.

Equipment was set up adjacent to the borehole to be logged and calibrated to establish the datum at the ground level. All boreholes were logged top to bottom, and bottom to top.

Logging was carried out at speed of 3 meters per minute or less. This multiple passing procedure was adopted to ensure high resolution and repeatability of data. Records were monitored in real time for quality assurance during the logging operation.

The natural gamma logs were recorded with sopris matrix log software. Borehole geophysical logs were presented using the strater (3.2.637) program.

4.3 Total Gamma Logging Survey

Over the period of February-2022 to August-2022, the total gamma logging have been carried out for the drilled boreholes in the study area. The depth of the boreholes ranged from 14 to 35 m. The drilled boreholes are open hole; the majority of these boreholes were logged top to bottom, and bottom to top. The coordinates of boreholes, total drilling depth, and log depth are listed in the (Table 04).

Table 4: Coordinates and depth of boreholes were logged in the study area (Risha).

No.	Borehole ID	East	North	TD (m)	Log Depth (m)
1	Rph1-BH01	501233.624	3559266.56	35	33
2	Rph1-BH02B	501583.295	3558105.03	26	22
3	Rph1-BH03	502523.642	3558056.73	21	20
4	Rph1-BH04	502611.139	3559056.15	30	28
5	Rph1-BH05	502561.291	3560021.72	31	19.55
6	Rph1-BH06	501669.23	3560290.63	15	13
7	Rph1-BH07	500656.335	3560125.33	18	16.5
8	Rph1-BH08	500693.586	3561127.22	18	17.5
9	Rph1-BH09	499690.436	3561153.7	19	17.5
10	Rph1-BH10	499733.654	3562174.71	14	13
11	Rph1-BH11	500622.287	3562047.38	24	22

12	Rph1-BH12	499659.304	3560150.17	20	18
13	Rph1-BH13	499619.686	3559153.5	23	22.5
14	Rph1-BH15B	499546.068	3558070.23	18	10.6
15	Rph1-BH16	499558.26	3557169.59	18	16
16	Rph1-BH17	500574.686	3557132.24	24	20
17	Rph1-BH18	501546.652	3557100.7	24	20.15
18	Rph1-BH22	503680.028	3561029.65	25	20
19	Rph1-BH23A	503646.674	3560025.21	18	11.75
20	Rph1-BH24	503615.834	3559030.82	24	23.5
21	Rph1-BH25	503576.816	3558028.19	24	21.5
22	Rph1-BH26	503536.797	3557034.31	29	28.5
23	Rph1-BH27	503512.028	3556028.22	24	21.5
24	Rph1-BH28	502587.748	3556032.67	27	12.7
25	RC-A1-Core	498971	3559189	14	12.25
26	RC-31A-Core	499351.321	3556161.818	14.1	14
27	RC-31B-Core	499230.729	3556469.243	16.7	14
28	RC-31C-Core	499230.729	3556469.243	15.5	13.75
29	RC-43-Core	501313	3555626	16.75	13.75

4.4 Results

Twenty-nine natural gamma logs were conducted in the study area, remarkably, the measured natural gamma commenced at zero depth 1.8 m, see appendix no 2. 118. They were logged top to bottom, and bottom to top. Often, the total gamma records for logged borehole were fully documented long over its measured depth, occasionally, the logging tool has not able to reach the total measured depth due to borehole collapse (see table 04). Therefore, the rest prospecting in these boreholes were conducted based on chemical and drilling data.

The results of the laboratory analysis of the ratio of P_2O_5 wt.% were compared with total gamma ray log.

4.5 Discussion

The logged boreholes are taken into account to figure out total gamma ray variance using cross section extends either north-south or and East-West. In fact, the gamma ray consists of peaks where every one is representing particular type of lithology. Hence, as a result of the encountered phosphate lithology layers which are the dominant in the study area the diversity in gamma peaks are attributed to the variance content of P_2O_5 wt. %.

According to the inputs of the logged boreholes in the strater (3.2.637) program, four section were established with considering the top of phosphate layer commences from cut off grade 100 cps and vanishes below 100cps.

4.5.1 Cross Section Norht - South

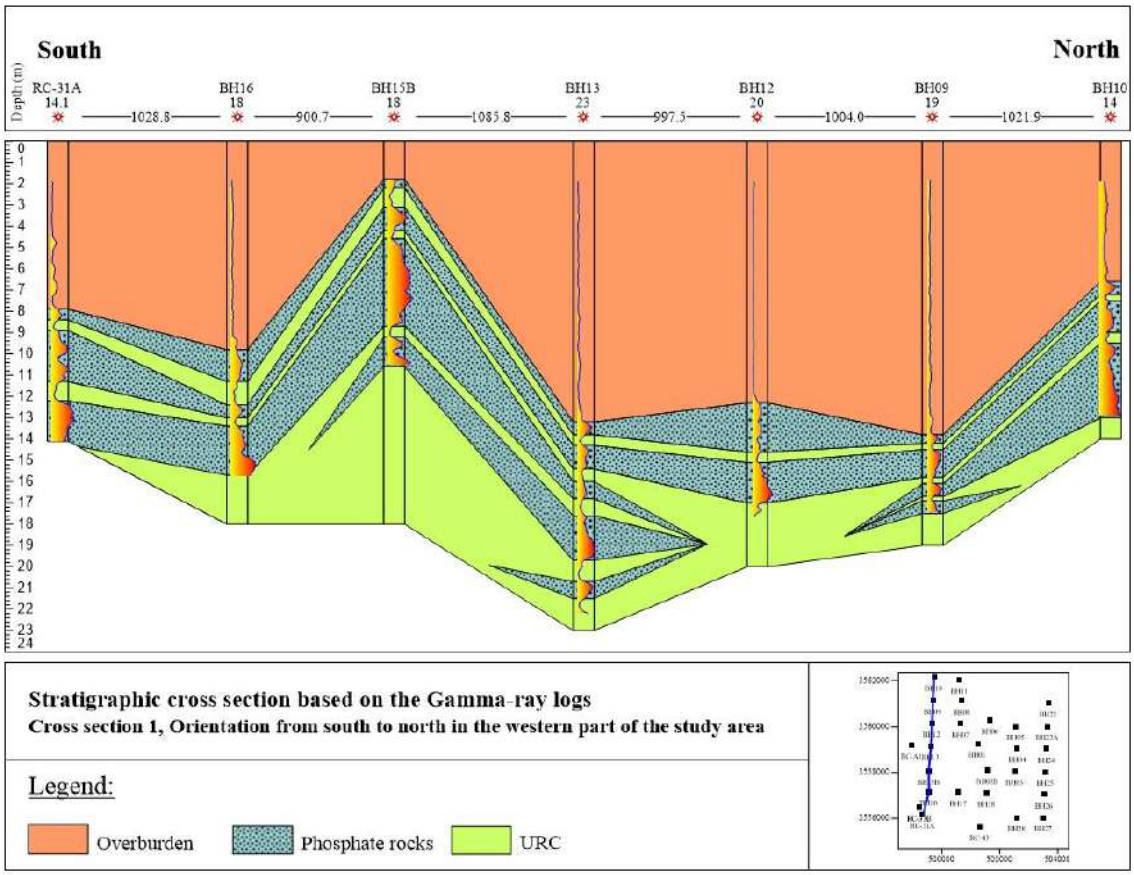

Figure 7: N-S Cross section gamma ray RPh1-Bh10_RC-31A

As shown in the (fig. 10), the gamma ray is more steady with less variance as well as the high values are more common in the north direction which in turn indicated into interesting thicknesses of phosphate lithology layers are placed within the same direction.

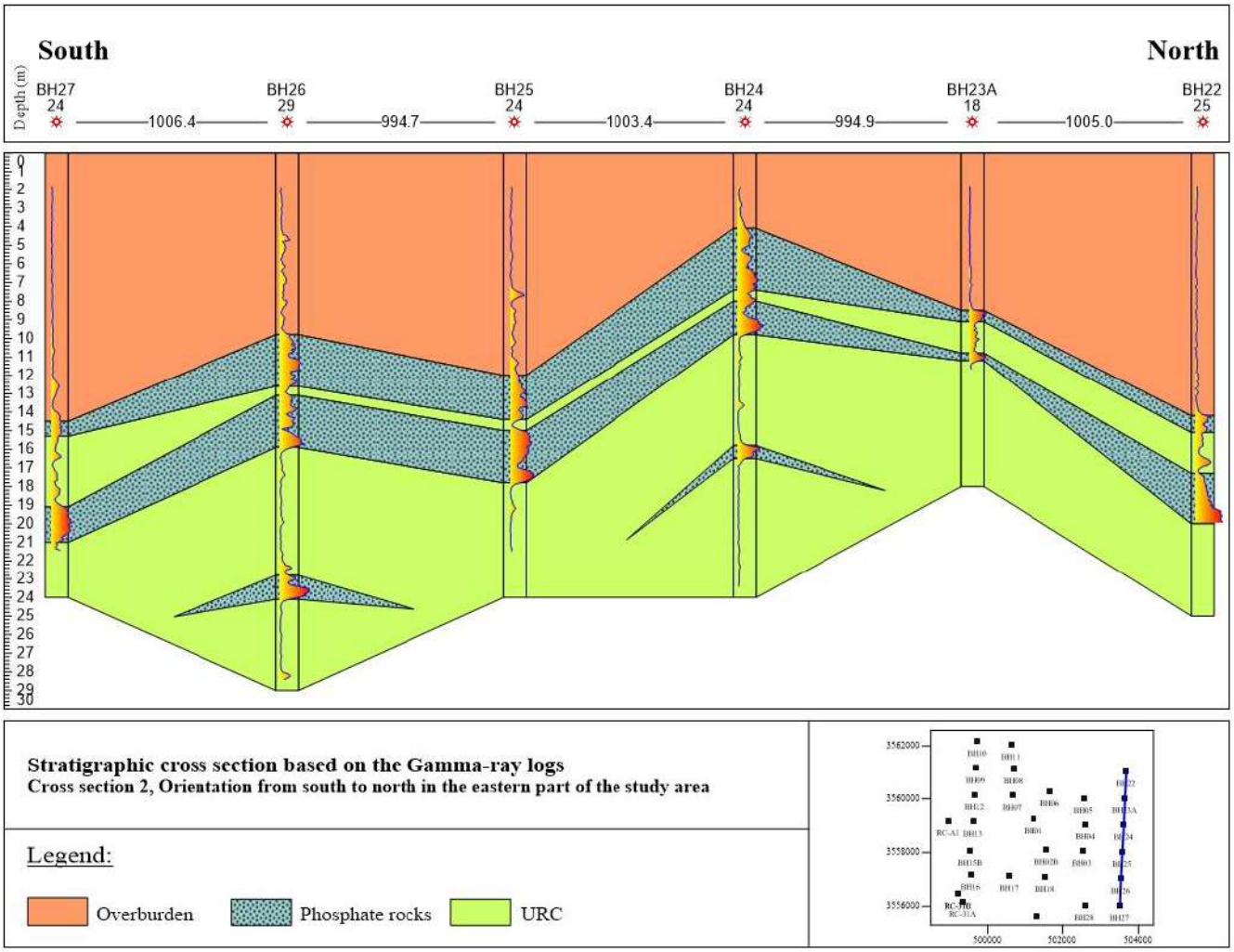

Figure 8: N-S Cross section gamma ray RPh1-Bh22_RPh1-27.

Furthermore, as shown in the (Fig. 11) the gamma ray is thicker in the middle than both of sides of the section that might expresses deformed lenses of phosphate lithology layers resulted by tectonic movements.

4.5.2 Cross Section East – West

As a mater of fact, the variance in gamma ray is similar to the variance in phospahtic layers which is insignificant over cross section east – west except few changes have occurred due to the geological structure reasons (Fig. 12). Remarckbly, the east part records lower thickneses of overburden than west part. Approximatly, the phosphate layer has equel thicknesses over the section.

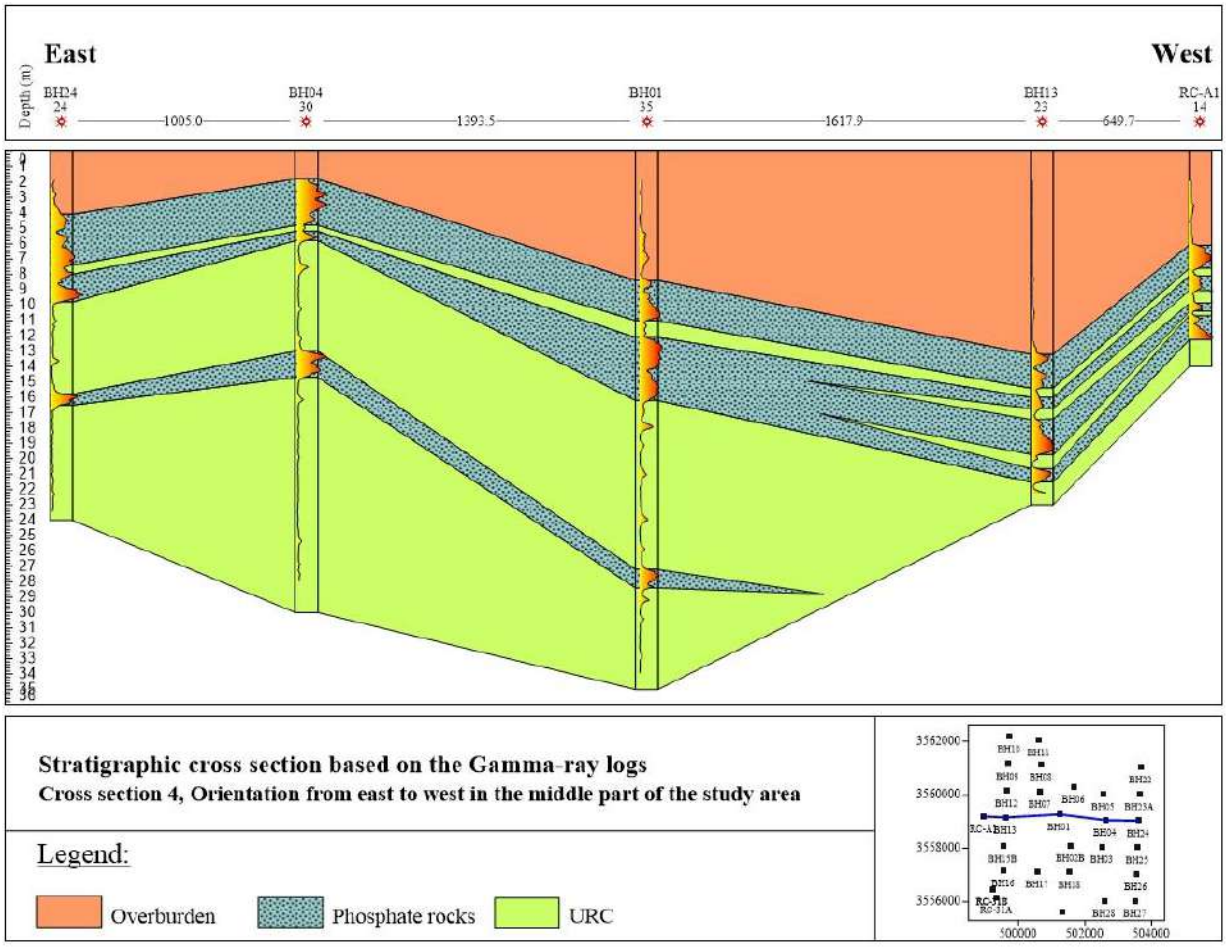

Figure 9: E-W Cross section gamma ray RPh1-BH24_RC-A1.

As aforementioned in the cross section N-S, the phosphate layer is decreasing toarwd the south direction therefore the cross section in the (Fig. 13) is showing altered gamma ray at different depth records, consequently, the correlation between the highest of gamma ray records are not corresponding.

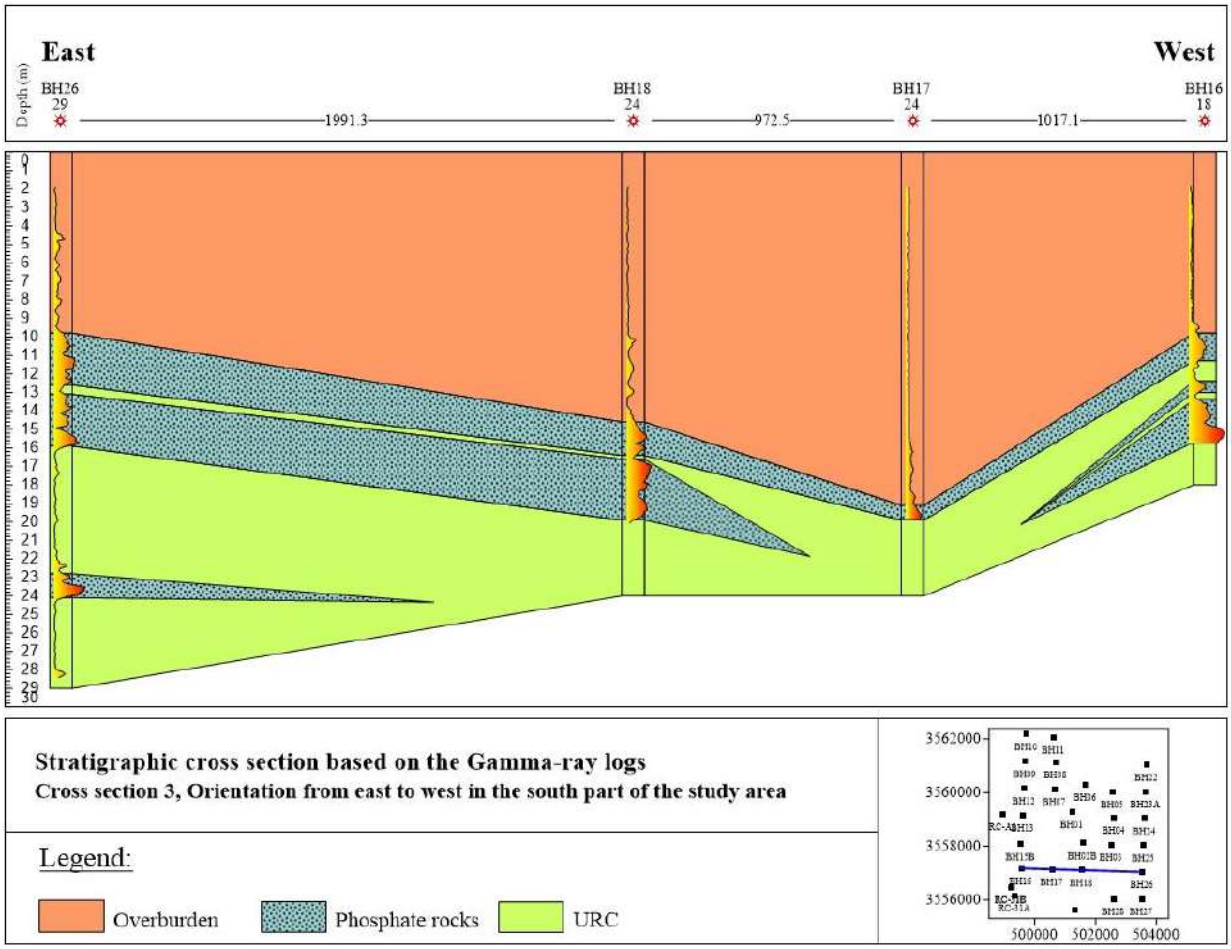

Figure 10: E-W Cross section gamma ray RPh1-BH26_RPh1-BH16.

4.5.3 Gamma Ray Model

The logged boreholes are located within area amounted roughly 40km^2 (Fig. 14).

Ultimately, corresponding to the discussion in chapter # 7, the phosphate layer that

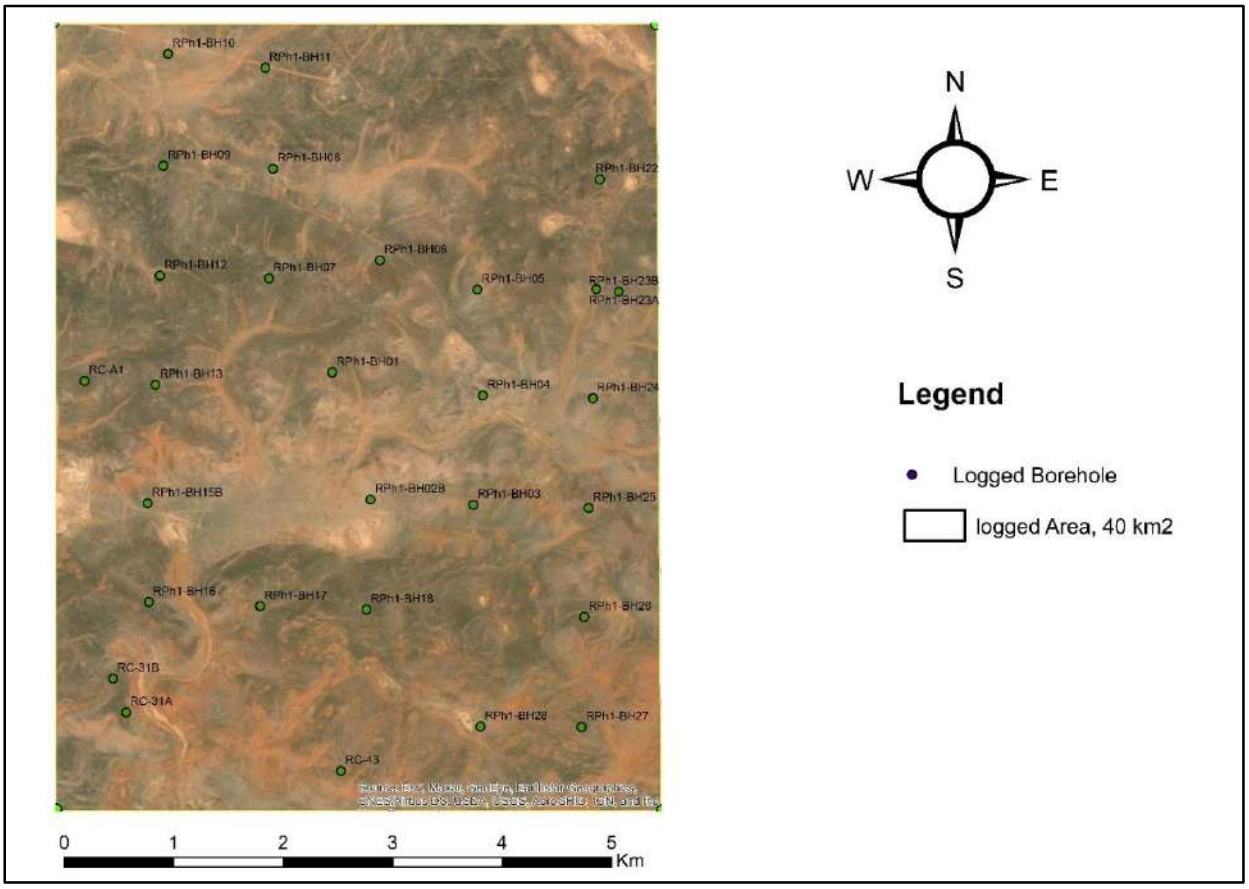

Figure 11: 29-logged boreholes within area amounted 40km^2

is placed in the north and north east of the study area is more commercial and tradable in term of its quality and quantity. Substantially, the (Fig. 15) as shown below is revealed the highest vector of gamma ray exceeds 350cps is situated in the same of the proposed direction.

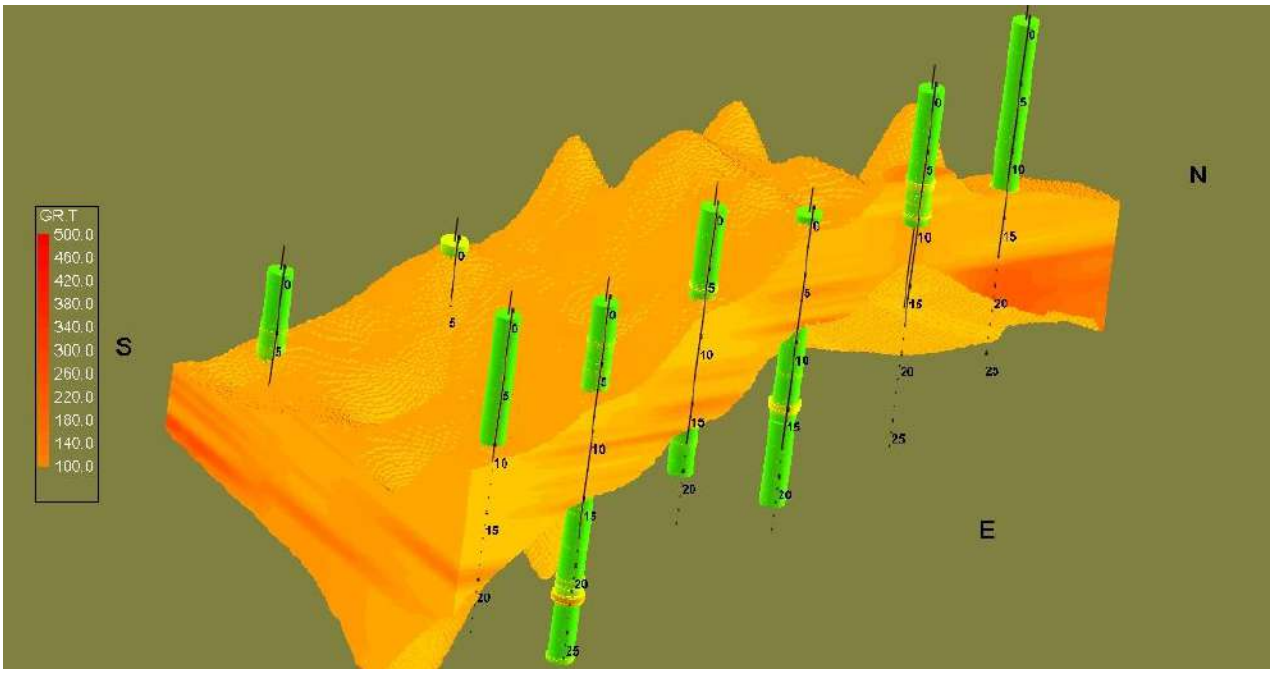

Figure 12: Gamma ray 3D view at cut off grade 100cps.

CHAPTER 5

5. SAMPLING & LABORATORY ANALYSES

5.1 Sampling

The geologist (or geo-technician) supervised the collection of all core and cutting samples at the drill site and the transfer of the sample boxes to the storage warehouse.

In total, 1190 samples were collected from the drilled boreholes in the study area. The samples were classified to 1119 cutting samples and 71 core samples (Fig. 16). The aim was to obtain chemical analysis for the phosphate concentration and other oxides, where all of the preparation and analydis process were done in MEMR labs.

Figure 13: Images illustrating the collection procedures of Core & Cutting sample kinds

The cutting samples were collected every one meter whereas the core samples were collected based on the lithological changes of layers in the drilled depths (Table 05).

Table 5: The sum of the cutting samples, the coring and total taken from Al Risha phosphate boreholes.

BH	Cutting Samples	Core Samples	Total samples
RPh1-BHBH01	19	1	20
RPh1-BH02A	16	0	16
RPh1-BH02B	18	2	20
RPh1-BH03	21	0	21
RPh1-BH04	30	0	30
RPh1-BH05	31	0	31
RPh1-BH06	15	0	15
RPh1-BH07	18	0	18
RPh1-BH08	18	0	18
RPh1-BH09	19	0	19
RPh1-BH10	14	0	14
RPh1-BH11	24	0	24
RPh1-BH12	20	0	20
RPh1-BH13	23	0	23
RPh1-BH14	21	0	21
RPh1-BH15A	9	0	9
RPh1-BH15B	18	0	18
RPh1-BH16	18	0	18
RPh1-BH17	24	0	24
RPh1-BH18	24	0	24
RPh1-BH19	21	0	21
RPh1-BH20	22	0	22
RPh1-BH21	29	0	29
RPh1-BH22	25	0	25
RPh1-BH23A	18	0	18
RPh1-BH23B	27	0	27
RPh1-BH24	24	0	24
RPh1-BH25	24	0	24
RPh1-BH26	29	0	29
RPh1-BH27	24	0	24
RPh1-BH28	27	0	27
RPh1-BH29	29	0	29
RPh1-BH30A	15	0	15
RPh1-BH30B	13	0	13
RPh1-BH30C	25	0	25

BH	Cutting Samples	Core Samples	Total samples
RPh1-BH31A	17	0	17
RPh1-BH31B	21	0	21
RPh1-BH32	29	0	29
RPh1-BH33	28	0	28
RPh1-BH34	21	0	21
RPh1-BH35	30	0	30
RPh1-BH36	28	0	28
RPh1-BH37	27	0	27
RPh1-BH39	32	0	32
RPh1-BH41	33	0	33
RPh1-BH42	30	0	30
RPh1BH46-Core	0	16	16
RPh1-BH47	18	0	18
RC-A1	0	10	10
RC-31A	15	1	16
RC-31B	11	4	15
RC-31C	0	1	1
RC-43	0	14	14
RC-44	22	8	30
RC-45	5	14	19
Total	1119	71	1190

The sampling process included indications to core recovery, gamma log and core and cutting samples description with marking the sample intervals through the Phosphate zones. The core to be sampled was photographed in the core box with sample markers in place. Sample sheets with preprinted sample numbers were used to record the project, borehole number, date, sample interval, a soil/rock description, and the appropriate sample index. The sample index was provided for each sample to track the type of sample and to distinguish how it should be processed at the laboratory. The following index codes were assigned:

A. Pulp Sample.
B. Quarter Core.
C. Density Sample.

D. For QA/QC, duplicate samples were selected from different depths to be analyzed.

Sampling proceeded with the following steps:

1. A preprinted sample number tag was chosen for each core and cutting sample and the tag placed inside the sample bag. This sample number was then written on the sample bag.
2. QA/QC duplicate samples were put with appropriate tags and labeles.
3. Core samples designated to be quarter samples. The cores were wrapped in plastic, then wet cut with an electric saw. Core samples were placed in the appropriately tagged and labeled sample bags.

All of the bagged samples were laid out in numerical order and the chain-of-custody form was checked as each sample was placed in a grain sack. A uniquely numbered security zip tie was immediately placed on each grain sack. The security seal number was recorded on the chain-of-custody form. The security seal remained in place until it was checked and removed at the laboratory.

Initial samples resulted from the drilling program were processed and prepared by MEMR Lab in Jordan, between December 2021 and September 2022.

It was determined that MEMR analysis showed high bias in samples with higher phosphorus pent-oxide (P2O5) percentages (greater than 30 wt.%).Therefore, total of 39 duplicate samples were collected and inserted to MEMR lab to check the analysis results which have shown acceptable results when compared with the initial sample results.

Responding to high radiation determined by Handheld Gamma-Ray Scintillometer, total of 28 samples were collected randomly and analyzed in the Jordan Atomic

Energy Commission (JAEC) lab, these samples have revealed values of Uranium (U), Thorium (Th), and Rare Earth Elements (REEs) are exceeding its background concentration.

5.2 Laboratory Analysis

The majority of collected samples are chemically investigated using the following tests:

- XRD (X-ray Poweder Diffraction)
- XRF (X-ray Fluorescence)

These tests were used to determine the content in terms of minerals and oxides. In the other hand, a total of 14 samples were selected to investigate their content of chlorine (Cl) which is used to define the quality of phosphates regarding its industrial processing.

Moreover, 6 samples are labelled (RPh1-BH46-17, RC-31B-23, RC-31C-2, RC-43-12, RC-43-16, and RC-43-11) were analyzed in MEMR labs for relative density, as well as 28 representative samples were selected to measure the concentrations of uranium, thorium and other rare earth elements (REEs) using ICP-MS in the laboratories of the Jordan Atomic Energy Commission (JAEC).

5.3 Quality Assurance/Quality Control Program

Shortly after the assay results were received from the laboratory, they were combined with the drill hole intervals (gamma log adjusted) to create an assay database. These results were copied from the laboratory spreadsheets to the assay database matching the unique sample identifiers from the drill borehole intervals to the unique sample identifiers from the laboratory. The database was checked for data entry errors against the laboratory's assay certificates. Once the assay database was

created, the data were reviewed for quality assurance for the main results and duplicates.

After monitoring and reviewing the initial results with the duplicate samples, they shown generally good agreement with minimum differences of 0 and maximum of 8.7, one sample with ID no. RPD 27 showed a huge difference. The following table6 shows general data of P_2O_5.

Table 6: Chemical P_2O_5 test agreement Duplicate Samples versus Main Samples.

Target	Main Samples			Duplicate Samples		
	Min. (Wt. %)	Max. (Wt. %)	Avg. (Wt. %)	Min. (Wt. %)	Max. (Wt. %)	Avg. (Wt. %)
P_2O_5	30	36	32.56	23.7	34.9	31.63

The duplicate samples tracking for P_2O_5 demonstrates good agreement between results. Results are considered valid and applicable initially for resource estimation and were used in the resource model.

Chapter 6

6. Geochemistry

6.1 Introduction

In general, the phosphorites are recognized to those rocks when containing P_2O_5 wt.% more than 18 wt.%, in this regard, the drilled boreholes in the study area are varying in terms of P_2O_5 wt.% content along with the depth as well as the major minerals are varying from fluroapatite to apatite.

The predominant components of fluro-apatite are CaO and P_2O_5 equal 57 wt.% and 36 wt.%, respectively, with minor quantities of F & CO_2 amounted 3.9 wt.% & 4.52 wt.%, respectively. In the other hand, the apatite mineral is composed of similar components of fluroapatite mineral with absence of CO_2. However, the impurity is caused by the presence of variables amounts of SiO_2, Fe_2O_3, MgO, Al_2O_3, MnO and F.

6.2 Chemical Results

As per mentioned in chapter 05, the major oxides were analyzed using XRF to determine their content in percent by weight. Table 07 below shows the average content for each measured oxide whereas the average content of P_2O_5 wt.% was detected based on values of P_2O_5 larger than 18 wt.%.

Table 7: The average results of major oxides concentrations for all drilled boreholes analyzed using XRF Spectrometer (the considered value for sample contains P2O5%wt larger than 18%).

S.ID.	Avg. Fe_2O_3 Wt.%	Avg. CaO Wt. %	Avg. SiO_2 Wt. %	Avg. MgO Wt. %	Avg. Al_2O_3 Wt.%	Avg. P_2O_5 Wt.%	Max. P_2O_5 Wt.%	Avg. F Wt.%	Avg. Fe_2O_3+AL_2O_3+ MgO/P_2O_5	Avg. T.C.P %	Max. T.C.P %
RPh1-BH1	0.23	48.30	9.77	0.20	0.50	24.55	34.20	2.20	0.04	53.64	74.73
RPh1-BH2A	0.23	45.78	16.60	0.21	0.55	21.45	24.70	2.12	0.05	46.87	53.97
RPh1-BH2B	0.25	48.30	11.24	0.20	0.50	23.72	31.20	2.49	0.04	51.82	68.17
RPh1-BH3	0.23	52.70	2.54	0.21	0.55	24.70	26.40	2.55	0.04	53.97	57.68
RPh1-BH4	0.35	48.53	9.05	0.30	0.70	20.73	24.30	2.32	0.07	45.30	53.10
RPh1-BH5	0.23	52.08	4.87	0.21	0.55	26.62	31.10	2.35	0.04	58.17	67.95
RPh1-BH6	0.23	51.36	5.53	0.21	0.55	27.36	33.80	3.01	0.04	59.78	73.85
RPh-BH7	0.23	52.85	2.99	0.21	0.55	26.97	33.30	3.13	0.04	58.92	72.76
RPh-BH9	0.23	51.13	6.97	0.19	0.55	19.95	24.30	2.14	0.05	43.59	53.10
RPh-BH10	0.23	51.18	6.30	0.21	0.55	22.90	25.90	2.41	0.04	50.04	56.59
RPh-BH11	0.23	51.72	5.26	0.21	0.55	26.56	33.30	2.90	0.04	58.03	72.76
RPh-BH12	0.25	47.53	12.15	0.21	0.60	23.57	27.90	2.45	0.05	51.50	60.96
RPh-BH13	0.24	44.34	21.09	0.21	0.55	20.58	25.00	2.00	0.05	44.97	54.63
RPh-BH15A	0.23	50.14	6.84	0.21	0.55	24.81	30.00	2.71	0.04	54.22	65.55
RPh-BH15B	0.23	46.65	14.24	0.21	0.55	24.37	31.50	2.52	0.04	53.24	68.83
RPh-BH16	0.23	51.96	3.18	0.21	0.55	29.50	33.80	3.37	0.03	64.46	73.85
RPh-BH17	0.33	45.10	12.00	0.24	0.68	19.00	19.00	1.99	0.07	41.52	41.52
RPh-BH18	0.23	48.57	12.39	0.21	0.55	25.02	31.20	0.96	0.04	54.66	68.17
RPh-BH19	0.23	41.20	26.37	0.21	0.55	21.17	22.00	0.51	0.05	46.25	48.07
RPh-BH20	0.23	53.49	3.06	0.21	0.55	31.49	36.00	1.86	0.03	68.80	78.66
RPh-BH21	0.23	50.55	7.76	0.21	0.55	24.70	32.10	1.92	0.04	53.97	70.14
RPh-BH22	0.23	50.88	6.82	0.21	0.55	24.45	32.40	2.58	0.04	53.42	70.79
RPh-BH23A	0.24	53.43	1.56	0.21	0.56	25.12	27.40	2.52	0.04	50.55	59.87
RPh-BH23B	0.24	46.90	13.64	0.21	0.58	21.48	27.00	2.15	0.05	46.93	59.00
RPh-BH24	0.23	48.80	12.12	0.21	0.55	26.50	27.50	0.78	0.04	57.90	60.09
RPh-BH25	0.23	46.82	14.40	0.21	0.47	26.35	32.20	1.55	0.04	57.57	70.36

S.ID.	Avg. Fe_2O_3 Wt.%	Avg. CaO Wt. %	Avg. SiO_2 Wt. %	Avg. MgO Wt. %	Avg. Al_2O_3 Wt.%	Avg. P_2O_5 Wt.%	Max. P_2O_5 Wt.%	Avg. F Wt.%	Avg. Fe_2O_3+AL_2O_3+ MgO/P_2O_5	Avg. T.C. P %	Max. T.C.P %
RPh-BH26	0.23	48.43	11.40	0.21	0.55	23.83	24.80	2.39	0.04	52.06	54.19
RPh-BH27	0.23	52.27	4.70	0.21	0.55	21.50	25.50	2.22	0.05	46.98	55.72
RPh-BH28	0.23	49.96	8.58	0.21	0.55	22.25	28.20	2.28	0.05	48.62	61.62
RPh-BH29	0.23	52.58	5.69	0.21	0.55	25.56	29.70	1.30	0.04	55.85	64.89
RPh-BH30A	0.23	51.20	6.79	0.21	0.55	26.90	29.10	1.20	0.03	58.78	63.58
RPh-BH30B	0.23	52.17	3.26	0.21	0.55	25.48	30.30	2.89	0.04	55.68	66.21
RPh-BH30C	0.23	46.47	14.72	0.21	0.55	24.12	27.90	2.46	0.04	52.70	60.96
RPh-BH31B	0.23	51.98	3.00	0.21	0.55	32.94	34.60	3.72	0.03	71.97	75.60
RPh-BH32	0.23	51.35	5.61	0.21	0.55	26.55	28.20	2.64	0.04	58.01	61.62
RPh-BH33	0.23	46.35	14.85	0.21	0.55	28.80	32.80	3.19	0.04	62.93	71.67
RPh-BH34	0.24	51.70	5.44	0.21	0.55	21.53	25.20	2.17	0.05	47.03	55.06
RPh-BH35	0.23	41.75	23.26	0.21	0.55	20.98	21.90	2.00	0.05	45.83	47.85
RPh-BH36	0.26	48.40	9.91	0.21	0.55	19.23	21.20	1.91	0.05	42.02	46.32
RPh-BH47	0.23	53.40	2.64	0.21	0.55	21.95	22.30	2.23	0.05	47.96	48.73
RC-A1	0.24	48.32	11.22	0.21	0.55	22.50	24.60	2.30	0.05	49.16	53.75
RC31A	0.24	47.97	11.76	0.21	0.55	21.16	30.70	2.11	0.05	46.24	67.08
RC31B	0.24	49.02	9.74	0.21	0.55	23.96	21.90	2.48	0.04	52.35	47.85
RC-43	0.24	49.42	9.05	0.21	0.55	21.76	21.60	2.21	0.05	47.55	47.20
RC-44	0.24	49.06	9.68	0.21	0.55	23.76	26.40	2.45	0.04	51.91	57.68
RC-45	0.24	48.78	10.30	0.21	0.55	21.87	33.80	2.21	0.05	47.78	73.85

6.3 Correlation Matrix

The oxides of analyzed samples have been correlated using correlation matrix diagram (Fig. 17). It is showing the type of relationship between two different measured items. In this regard, the negative relationship expresses two oxides have relatively low importance to place in the one mineral, whereas vice versa with such positive relationship that expresses high importance to preview among two oxides

are placed in one mineral. In respond to the Correlation matrix, P_2O_5%wt has been compared with most predominant impurities versus SiO_2, Fe_2O_3, MgO, Al_2O_3, MnO, Cl and F that could effect on the Phosphate mining industry.

	Fe2O3	*MnO*	*TiO2*	*CaO*	*K2O*	*SO3*	*P2O5*	*SiO2*	*Al2O3*	*MgO*	*Na2O*	*F*	*U*	*L.O.I*
Fe2O3	1													
MnO	0.79064702	1												
TiO2	0.03551595	0.02073266	1											
CaO	-0.30926162	-0.25430832	0.00089408	1										
K2O	0.79940794	0.67140411	0.02327104	-0.22869214	1									
SO3	0.00961357	-0.04073849	-0.01078777	0.12318797	-0.00992135	1								
P2O5	-0.26755806	-0.19402085	-0.03763326	0.3705897	-0.13126761	0.08441214	1							
SiO2	0.20263677	0.17272807	-0.00456945	-0.98960936	0.14362608	-0.1832599	-0.3930717	1						
Al2O3	0.98571179	0.8112289	0.02805321	-0.28227526	0.82001505	-0.00309806	-0.24213725	0.17665821	1					
MgO	0.91658086	0.70628869	0.04896936	-0.23507481	0.68871439	0.01558083	-0.30624548	0.13359154	0.90592205	1				
Na2O	0.06481961	0.09908846	0.00057714	-0.02474865	0.02461188	-0.01075781	-0.03195902	0.01695735	0.05805104	0.08021219	1			
F	-0.10570343	-0.07558802	-0.01437519	0.22225802	-0.05059391	0.03981711	0.38542434	-0.23753426	-0.09419414	-0.11990861	-0.01506698	1		
U	-0.01014442	-0.00698578	-0.00135082	0.03003992	-0.00485475	-0.00525772	0.00780863	-0.02791631	-0.00888153	-0.01102707	-0.00166962	-0.0115067	1	
L.O.I	0.07271117	0.03098605	0.04163895	0.43916576	-0.00970485	-0.00583154	-0.65970588	-0.41942074	0.06769445	0.17005268	0.01684199	-0.19327803	0.01528738	1

Figure 14: Correlation matrix among oxides results.

6.4 Scatter Plot

Based on realized relationships among the oxides in the correlation matrix, scatter plot was drawn to figure out the behavior of the most predominant impurities versus P_2O_5 wt.%.

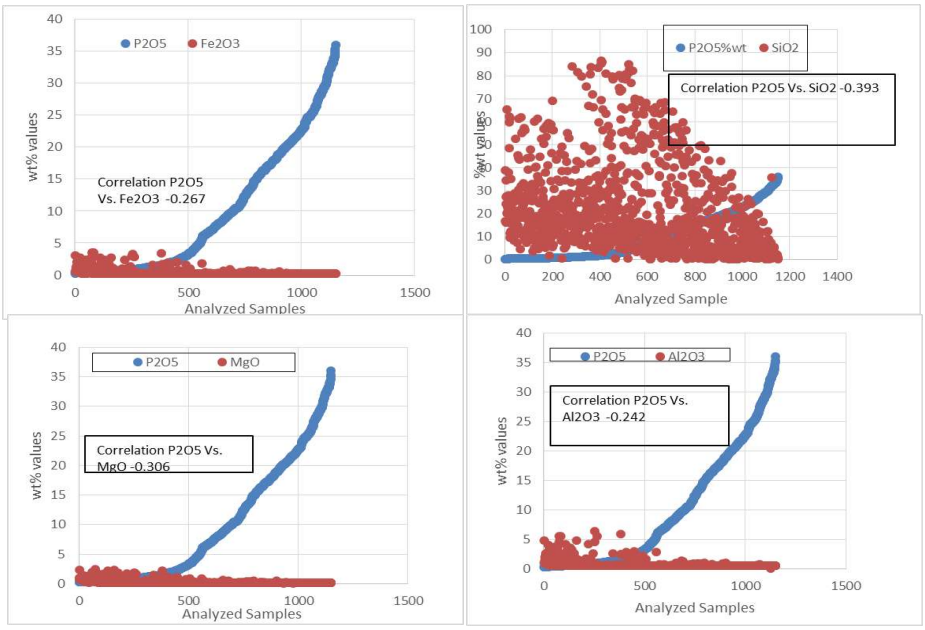

Figure 15: Scatter plot P2O5%wt vs Fe2O3%wt, SiO2%wt, MgO%wt & Al2O3%wt.

As seen the in (Fig. 18) the content of SiO_2 caused in reworked phosphate which is figured out in particular south of the study area, hence the inverse relationship between P_2O_5 wt.% and SiO_2 wt.% was determined in correlation matrix equal -~0.4 with an average content of SiO2 ~ 20%wt overall the area. The average MgO content in the analyzed samples is 0.3%wt whereas its average content in the Phospahte of Shidiya is equal 0.33%wt, remarkably, the importance of Mg content is impeded in term of Mg can replace Ca either Fluro-apatite or and apatite, consequently, inverse relationship between the P_2O_5%wt and MgO%wt in the analyzed samples equal -~0.306 which in turn indicated low potential to place them in one mineral.

Non-significant relationship between P_2O_5%wt and Al_2O_3%wt as well as between P_2O_5%wt and Fe_2O_3%wt with an average content Al_2O_3%wt and Fe_2O_3%wt 0.7%wt and 0.4%wt, respectively, while the minor contents of Fe_2O_3%wt attributed to the presence amounts of iron oxides. In other hand, positive relationship between

MgO%wt and Al_2O_3%wt equal 0.9 that may indicate in one mineralogical phase such as clay mineral.

As aforementioned, the MgO, Fe_2O_3 & Al_2O_3 oxides are considering impurities impeded in phosphate with minor amounts. Generally, the average of $(Al_2O_3+Fe_2O_3+MgO)/P_2O_5$ in the analyzed samples is about 0.04 expressing commercial value in the global market range between 0.027 and 0.12 which in turn makes Al Risha phosphate one of the distinctive quality phosphates in the world

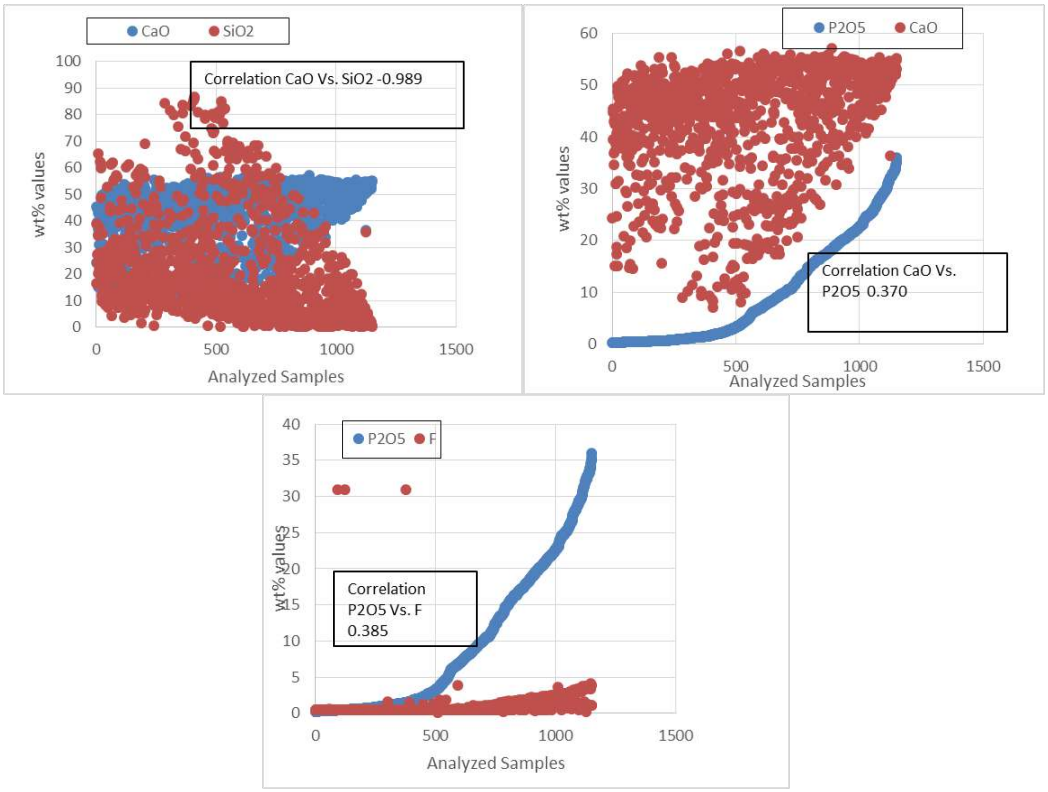

Figure 16: Scatter plot P2O5%wt vs. CaO%wt & F%wt, Scatter plot CaO%wt vs SiO2%wt.

As seen in the (Fig. 19) the P_2O_5%wt and CaO%wt are the main structure component of the phosphate minerals, accordingly, positive relationship is relatively high, nevertheless, silica content causing disturbance in respond to its substitute instead of lime. Hence, the positive relationship is declared between the P_2O_5%wt and

CaO%wt equal ~0.4. In other side, the negative relationship was occurred between Cao%wt and SiO2%wt equal -~0.989 (Fig. 20).

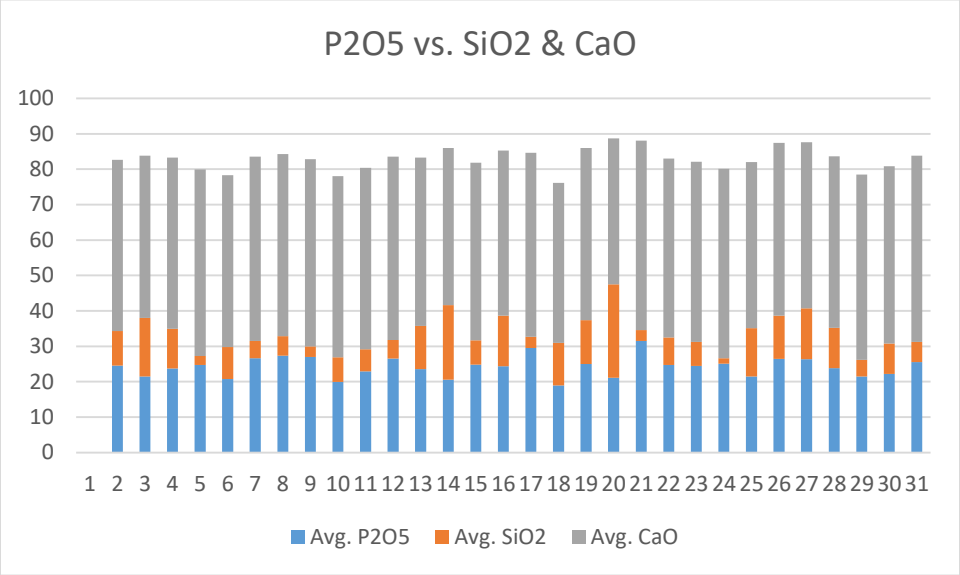

Figure 17: The Predominant componants oxides in the rocks bearing phospahte.

Regarding the fluorine, its make up 4.13%wt with an average equal 1.1%wt, remarkably, this value is lower than the fluorine content average 2.83 that was calculated for the phosphate located in the south east of Jordan.

In addition, due to importance chlorine content in the phosphate ore total of 14 samples were analyzed (Table 08). The results have revealed the chlorine lies within allowable boarders upon phosphate industries geomarket demands.

Table 8: Results total of 14 samples P2O5 wt. % versus Cl wt. % content

S.ID	P_2O_5	Cl
RPH1- BH2A-9	24.7	0.03
RPH1- BH3-13	26.4	0.19
RPH1-BH4-4	24.3	0.31
RPH1 BH5-21	31.1	0.13
RPH1-10-12	25.9	0.11
RPH1-11-16	33.3	0.15
RPH1 BH12-19	28.1	0.14
RPH1 -BH13-23	31.23	0.08

RPH1-BH14-11	17.1	0.14
RPH1-BH15-A7	30	0.28
RPH1 BH15B-10	31.5	0.09
RPH1 BH16- 18	33.8	0.25
RPH1 BH17-21	19	0.10
RPH1 BH18- 18	31.2	0.19
An average		**0.16**

Ultimately, Geochemistry analysis of the impurities factors are declared that Risha Phospahte has harmony characteristics with the current commercial phospahate range (Table 09).

Table 9: Impurities averages content in the Phospahte ore globally versus Risha Phospahte.

Constituent	**Commercial**		**Average of Al Risha Phosphate samples**
	Range	**Median**	
P_2O_5	20-40	30	28
CaO	45-54	51	49.3
Al_2O_3+Fe_2O_3	0.4-3.4	1.4	0.81
MgO	0.05-0.8	0.5	0.21
Na_2O	0.1-0.9	0.5	0.34
F	2.2-4.35	3.7	2.26
Cl	0.0-0.5	0.02	0.16
SO_3	0.0-3.0	1	0.9
MgO/P_2O_5	0.002-0.03	0.015	0.009
(Fe_2O_3 +Al_2O_3+ MgO)/P_2O_5	0.027-0.12	0.06	0.034

6.5 Uranium & other REEs

The chemical results are showing good concentrations of uranium (U), yttrium (Y), Yetterbium (Yb), Neodymium (Nd) and Lanthanum (La) in Al-Risha area. On the other hand, the concentrations of thorium (Th), Cerium (La), Europium (Eu) and Gaolinium (Gd) are relatively low in Al-Risha region (Table 10).

Table 10: ICP REE results for total of 28 selective samples.

Client ID	Sample ID	Ce ppm	Dy ppm	Er ppm	Eu ppm	Gd ppm	Ho ppm	La ppm	Lu ppm	Nd ppm	Pr ppm	Sm ppm	Tb ppm	Th ppm	U ppm	Y ppm	Yb ppm
RP1BH 18	U2208001024	49.20	9.80	10.95	11.20	9.75	10.95	28.33	10.45	17.50	47.45	11.80	3.65	17.50	71.24	81.44	4.04
RP1BH 19	U2208001025	49.20	9.80	10.95	11.20	9.75	10.95	30.50	10.45	17.50	47.45	11.80	3.65	17.50	99.25	90.08	4.11
RP1BH 20	U2208001026	49.20	9.80	10.95	11.20	9.75	10.95	28.09	10.45	17.50	47.45	11.80	3.65	17.50	79.84	83.47	4.33
RP1BH 21	U2208001027	49.20	9.80	10.95	11.20	9.75	10.95	37.72	10.45	18.39	47.45	11.80	3.65	17.50	86.88	112.67	5.52
RP1BH 22	U2208001028	49.20	9.80	10.95	11.20	9.75	10.95	34.10	10.45	17.50	47.45	11.80	3.65	17.50	83.62	101.81	5.07
RP1BH 23	U2208001029	49.20	9.80	10.95	11.20	9.75	10.95	29.27	10.45	17.50	47.45	11.80	3.65	17.50	67.79	90.38	4.18
RP1BH 24	U2208001030	49.20	9.80	10.95	11.20	9.75	10.95	36.61	10.45	18.77	47.45	11.80	3.65	17.50	66.12	98.57	4.83
RP1BH 25	U2208001031	49.20	9.80	10.95	11.20	9.75	10.95	35.44	10.45	17.50	47.45	11.80	3.65	17.50	69.80	103.57	4.83
R1	U2207901004	49.2	9.8	10.95	11.2	9.75	10.95	36.37	10.45	17.54	47.45	11.8	3.65	17.5	75.58	113.83	0.22
R2	U2207901005	49.2	9.8	10.95	11.2	9.75	10.95	26.26	10.45	17.5	47.45	11.8	3.65	17.5	60.26	75.67	0.17
R3	U2207901006	49.2	9.8	10.95	11.2	9.75	10.95	32.06	10.45	17.5	47.45	11.8	3.65	17.5	100.06	88.53	0.20
R4	U2207901007	49.2	9.8	10.95	11.2	9.75	10.95	29.19	10.45	17.5	47.45	11.8	3.65	17.5	97.91	87.72	0.18
R5	U2207901008	49.2	9.8	10.95	11.2	9.75	10.95	29.59	10.45	17.5	47.45	11.8	3.65	17.5	69.19	81.75	0.19
R6	U2207901009	49.2	9.8	10.95	11.2	9.75	10.95	27.77	10.45	17.5	47.45	11.8	3.65	17.5	119.69	85.48	0.20
R7	U2207901010	49.2	9.8	10.95	11.2	9.75	10.95	26.85	10.45	17.5	47.45	11.8	3.65	17.5	100.58	67.88	
R8	U2207901011	49.2	9.8	10.95	11.2	9.75	10.95	23.70	10.45	17.5	47.45	11.8	3.65	17.5	99.06	68.07	
R9	U2207901012	49.2	9.8	10.95	11.2	9.75	10.95	28.22	10.45	17.5	47.45	11.8	3.65	17.5	77.57	78.16	0.19
R10	U2207901013	49.2	9.8	10.95	11.2	9.75	10.95	27.55	10.45	17.5	47.45	11.8	3.65	17.5	53.23	87.02	0.19
R11	U2207901014	49.2	9.8	10.95	11.2	9.75	10.95	33.78	10.45	17.5	47.45	11.8	3.65	17.5	89.39	104.92	0.21
R12	U2207901015	49.2	9.8	10.95	11.2	9.75	10.95	35.78	10.45	18.88	47.45	11.8	3.65	17.5	103.16	106.33	0.24
R13	U2207901016	49.2	9.8	10.95	11.2	9.75	10.95	28.51	10.45	17.5	47.45	11.8	3.65	17.5	81.07	84.71	0.17
R14	U2207901017	49.2	9.8	10.95	11.2	9.75	10.95	28.80	10.45	17.5	47.45	11.8	3.65	17.5	89.28	95.54	0.21
R15	U2207901018	49.2	9.8	10.95	11.2	9.75	10.95	26.68	10.45	17.5	47.45	11.8	3.65	17.5	62.53	84.46	0.19
R16	U2207901019	49.2	9.8	10.95	11.2	9.75	10.95	26.60	10.45	17.5	47.45	11.8	3.65	17.5	75.44	84.65	0.18
R17	U2207901020	49.2	9.8	10.95	11.2	9.75	10.95	25.00	10.45	17.5	47.45	11.8	3.65	17.5	81.66	78.17	
R18	U2207901021	49.2	9.8	10.95	11.2	9.75	10.95	22.9	10.45	17.5	47.45	11.8	3.65	17.5	39.74	45.71	
R19	U2207901022	49.2	9.8	10.95	11.2	9.75	10.95	22.9	10.45	17.5	47.45	11.8	3.65	17.5	76.30	63.29	
R20	U2207901023	49.2	9.8	10.95	11.2	9.75	10.95	23.66	10.45	17.5	47.45	11.8	3.65	17.5	83.89	69.27	

In addition, Figure 21 Table 11 are showing comparision concentrations of uranium and phosphorite situated in different parts of Jordan included Eshidiyya, Mujib, NW Jordan, Ruseifa & Central Jordan versus Al Risha phosphorite proportions. The uranium values of Risha phospahte are relatively close to the values of uranium phosphate ores in other parts of Jordan (Abed, 2011) which in turn makes uranium Risha phosphate minable as byproduct.

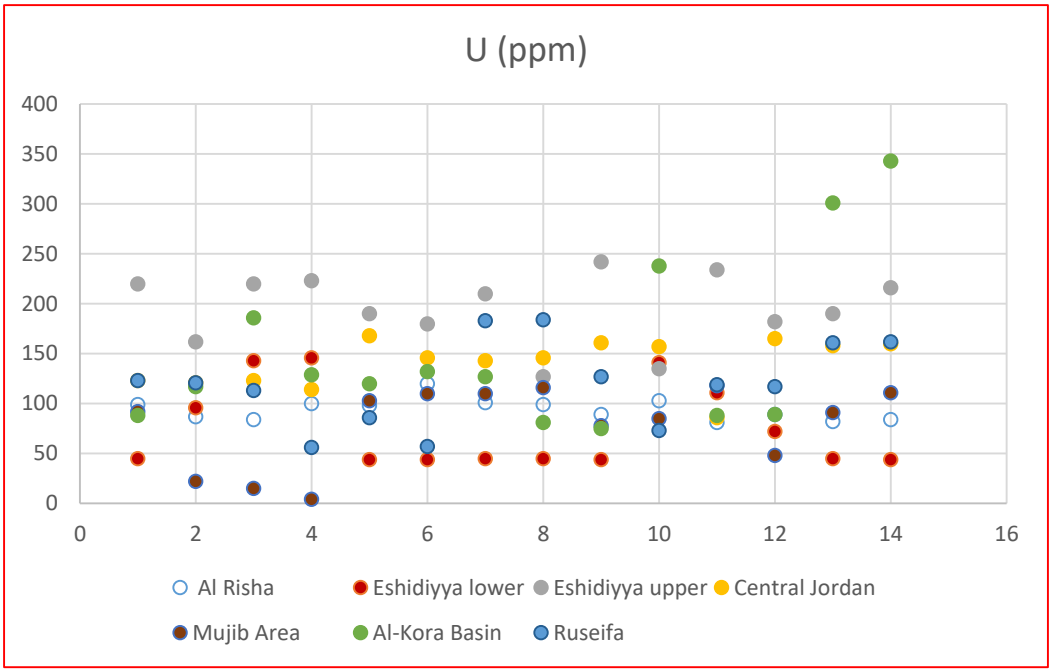

Figure 18: Uranium concentration comparision situated in different parts of Jordan.

Table 11: Comparision between Phospahte & Uranium among different areas located in Jordan.

Al Risha	**P_2O_5 (wt. %)**	28.2	31.1	30.7	32.4	33.3	31.5	33.3	31.8	32.9	35.3	32.1	32.4	24.8	29.5
	U (ppm)	99	87	84	100	98	120	101	99	89	103	81	89	82	84
Eshidiyya (L. phos. member)	**P_2O_5 (wt. %)**	23.96	21.93	33.13	23.98	27.22	23.16	25.68	22.18	27.63	32.63	25.33	19.99	26.14	33.82
	U (ppm)	45	96	143	146	44	44	45	45	44	141	111	72	45	44
Eshidiyya (U. phos. member)	**P_2O_5 (wt. %)**	20.82	28.16	32.04	32.95	20.82	29.83	27.92	29.67	30.44	30.66	21.19	29.52	30.66	32.95
	U (ppm)	123	121	123	114	168	146	143	146	161	157	86	165	158	160
Mujib Area	**P_2O_5 (wt. %)**	22.94	16.85	14.8	16.81	13.16	18.95	23.18	29.72	26.81	23.69	30.1	17.94	24.85	22.92
	U (ppm)	92	22	15	4	103	110	110	116	78	85	118	48	91	111
Al-Kora Basin	**P_2O_5 (wt. %)**	24.09	30.23	32.7	18	14.22	30.18	24.37	21.08	31.5	34.16	26.25	24.05	20.92	18.95
	U (ppm)	88	117	186	129	120	132	127	81	75	238	88	89	301	343
Ruseifa	**P_2O_5 (wt. %)**	17.25	26.66	13.26	24.67	24.59	25.31	29.79	17.25	17.25	17.25	17.25	17.31	30.5	31.11
	U (ppm)	123	121	113	56	86	57	183	184	127	73	119	117	161	162

CHAPTER 7

7. DISCUSSION (MODELING AND INTERPRETATION)

7.1 Introduction

Based on the interpretation analysis of the subsurface projected sections for Lithology, Stratigraphy and P2O5%wt over directions north-south and west-east, the major lithology layers bearing phosphate are concentrated with interesting thicknesses on the north and north east directions rather than south of the study area.

Upon field data records included boreholes locations and encountered lithology layers, the lithology and stratigraphy model 3D were created using Rockware v.16. In other hand, geophysical wire line logging was proceeded in the field with interesting outcomes of gamma ray measurements that were studied in details.

Remarkably, the P_2O_5 wt.% percentages are displayed for the study area in 3D fences model that was created using Rockware v.16.

As aforementioned, the following models are interpreted in details as much as total of prospecting studies results were modeled precisely.

7.2 Distribution of phosphate in the study area

In spite of Umm Rijam formation is only stratigraphy was encountered in the study area, the subsurface layers have been subdivided into three bulk layers based on their phosphate content, overburden layer overlie phosphate layer and Umm Rijam layer (formation) underlie phosphate layer.

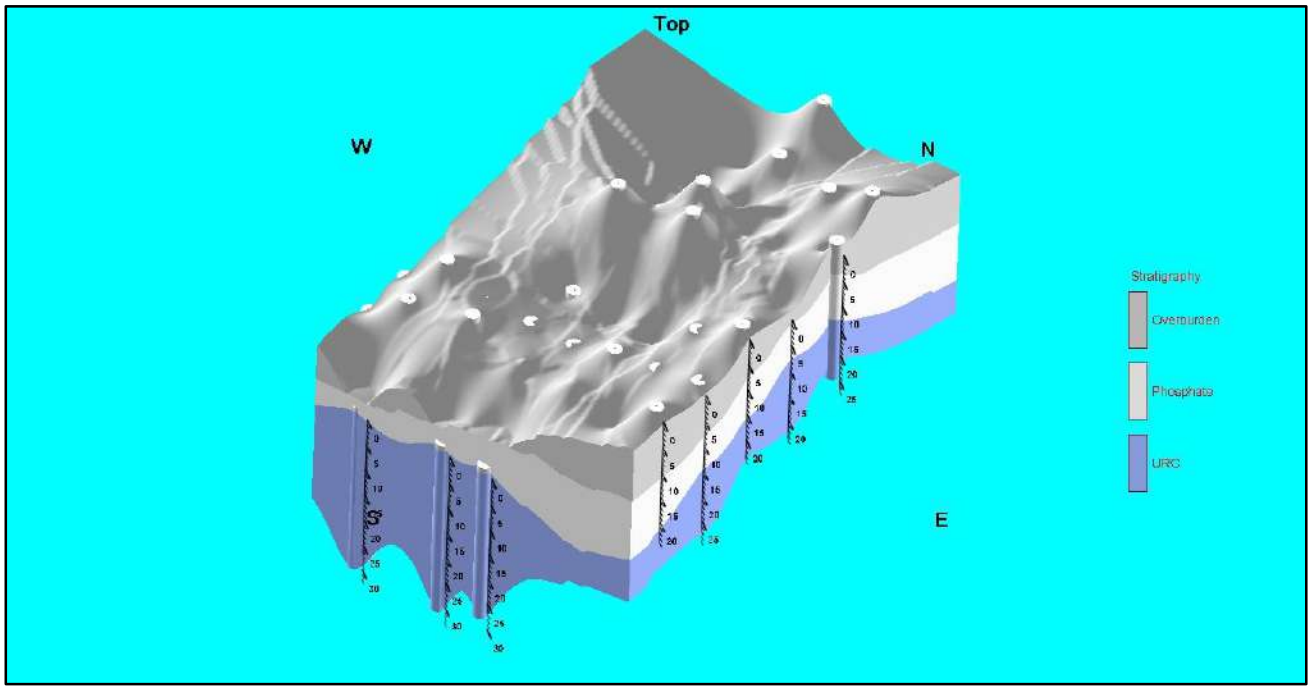

Figure 19: Stratigraphy model of the study area.

As shown in (Fig. 22), overburden thicknesses are gently increasing from south to north and north-east of the study area from 0 m to 16 m, whereas the utmost overburden was encountered in the drilled boreholes is 16 m. The most phosphate

layers lithology are exposed on surface with 0 m thicknesses overburden which in turn would makes mining operations easier (Fig. 23).

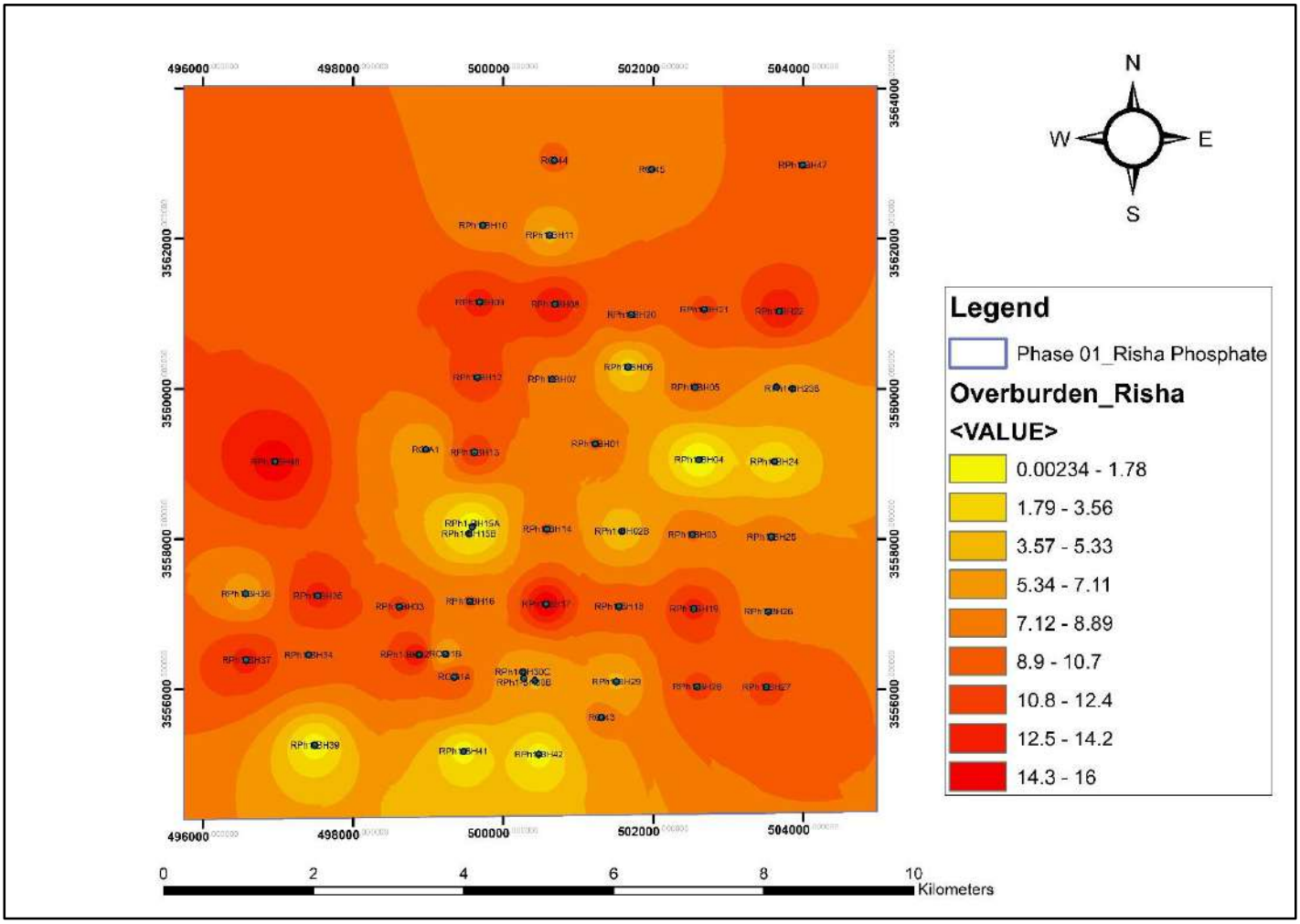

Figure 20: Overburden thicknesses distribution in the study area.

In other hand, the Phosphate stratigraphy layer has even thicknesses increasing from south toward the north and north-east of the study area from 1m to 22 m, it contains different type of phosphate lithology layers where the most predominant lithology layers are Fecal type, limestone phosphate, Phosphatic limestone and silica phosphate, see appendices no. 0 .

As shown in (Fig. 41) the 3D phosphate layer stratigraphy extend continuously over the study area placed in thickening toward the north and north-east. In addition, the thickening was proven in 2D map (Fig. 24) with interesting thicknesses exceed 20 m of phosphate stratigraphy layer.

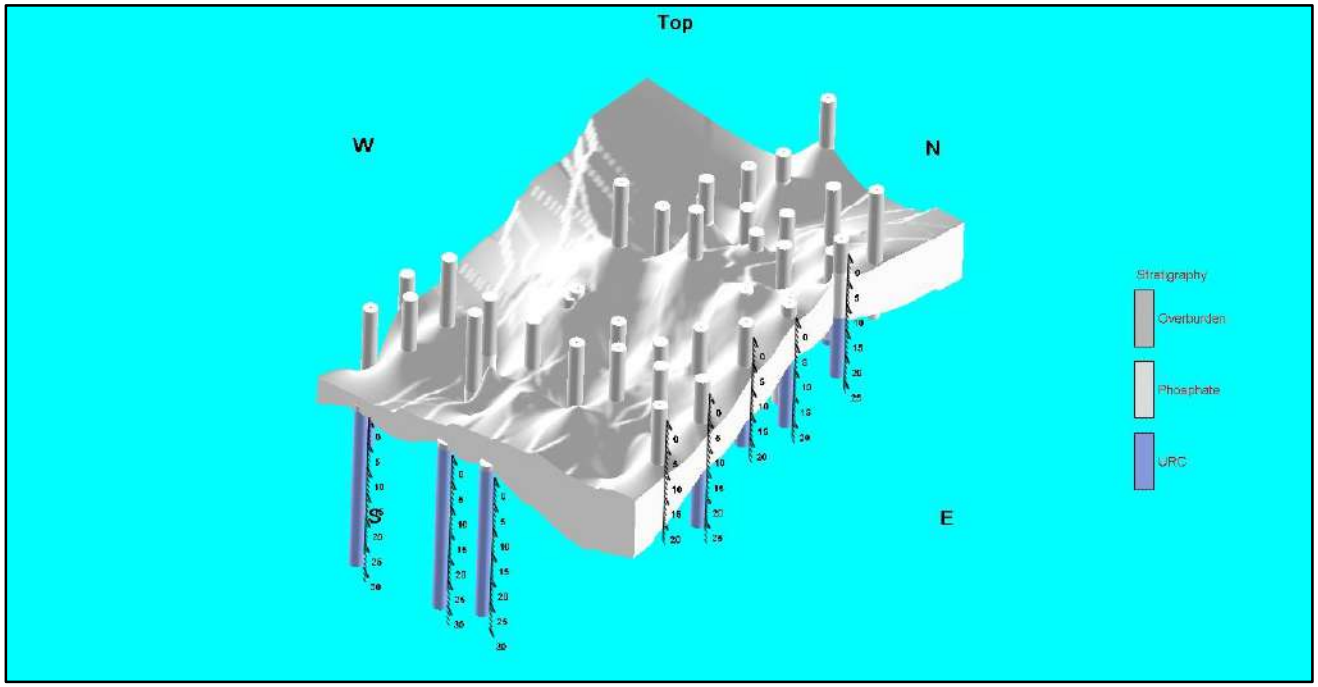

Figure 21: Phospahte Layer Stratigraphy.

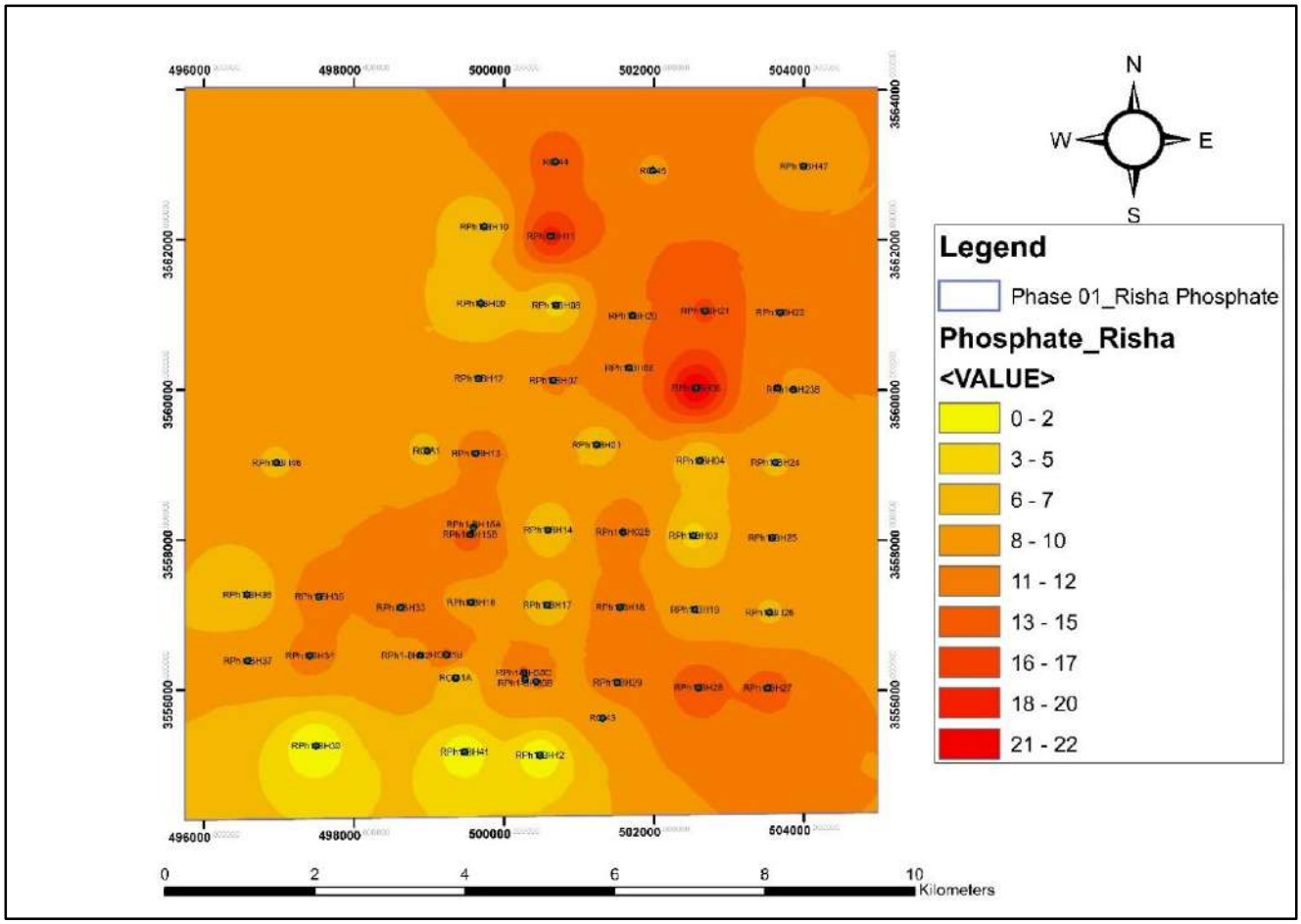

Figure 22: The phospahte layer stratigraphy distribution.

In other hand, stripping ratio; which is average thicknesses comparison between overburden layer versus phosphate layer; is showing not outweigh 1m over the study area (Fig. 25).

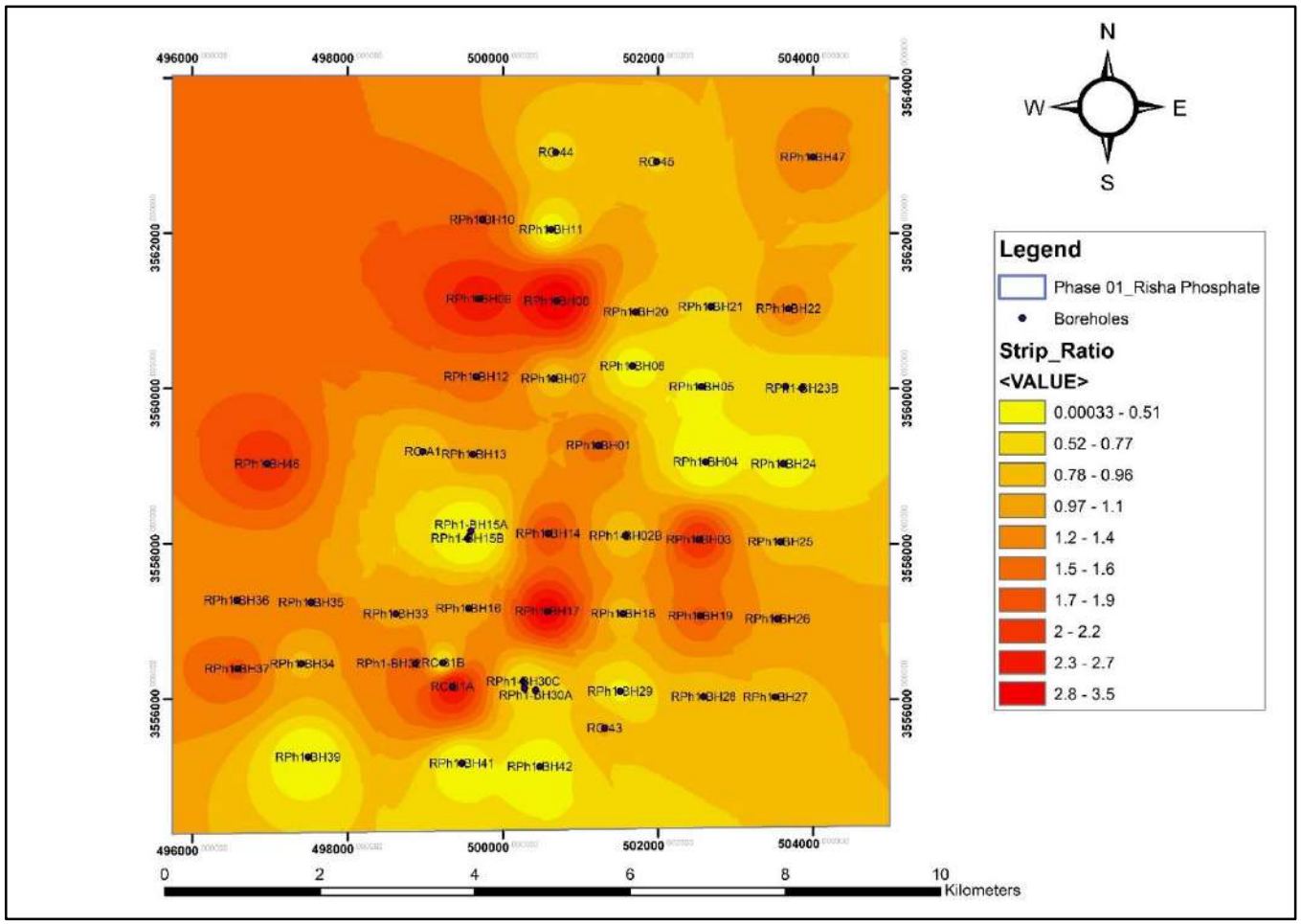

Figure 23: Stripping ratio overburden layer vs. phosphate layer.

7.3 Evaluating chemical abundances of phosphates

According to the section 3.4 “Geological section of the study area” the phosphate layer stratigraphy was subdivided into lithology layers bearing phosphate upon total of beds were encountered from the drilled boreholes.

After identification top and base as well as delineation phosphates deposits the delineate dimensions of phosphatic layers lithology are sensible tracked, therefore, 3D model was created using Rockware v.16 (Fig. 27).

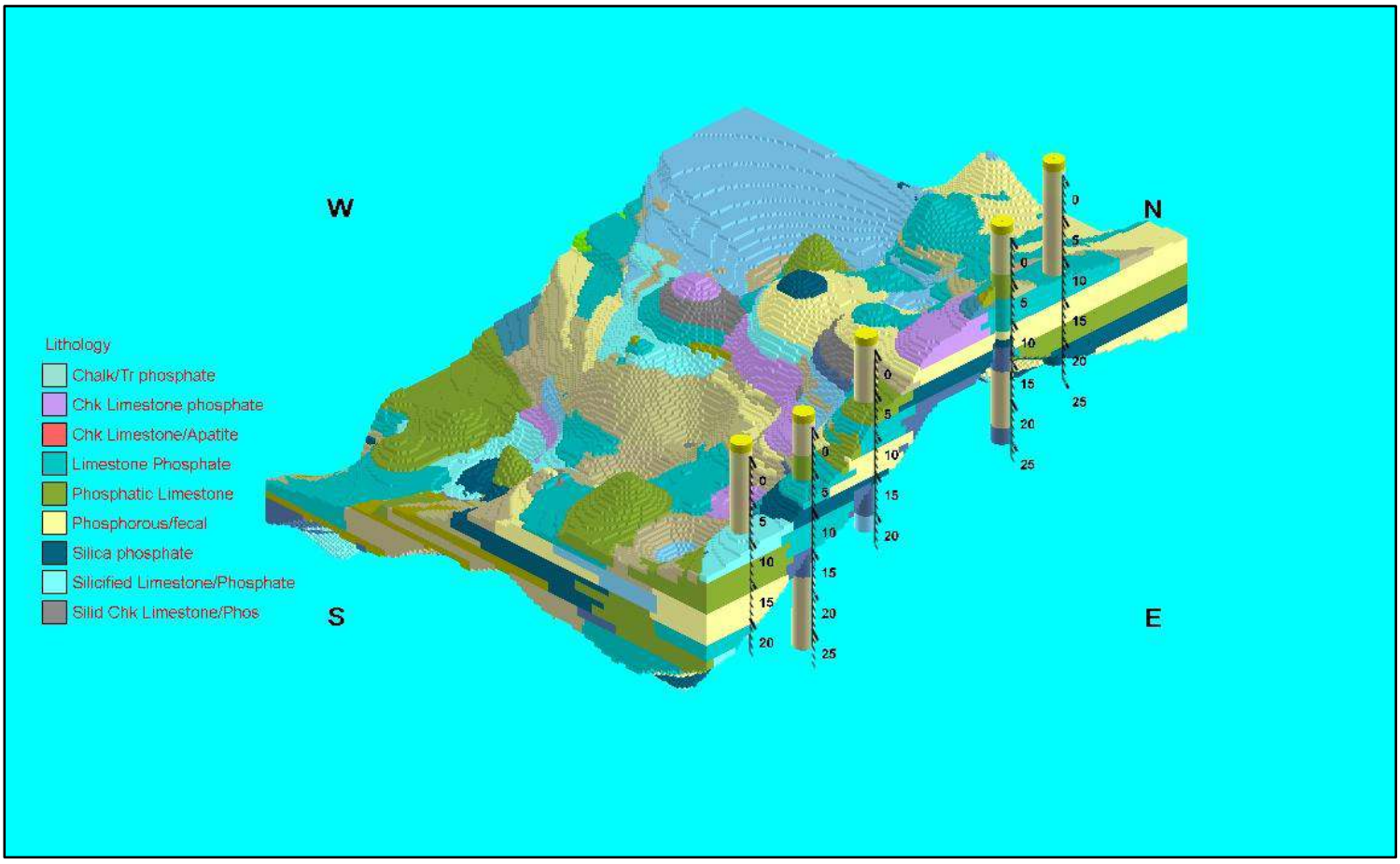

Figure 24: lithology delineation model.

As shown in (Fig. 27) the phosphorous fecal, phosphatic limestone, limestone phosphate and silica phosphate are the common lithologies in the study area, whereas the phosphorous lithology is the predominant type contains highest values of P_2O_5%wt content exceeds 36%wt in some places of the study area.

Fence P_2O_5%wt Model

Upon Overall chemical results of P2O5%wt, the commercial phosphatic layers are concentrated and correspond within the same direction Increment thicknesses of Phosphatic layers which are discovered in north and north-east direction of the study area.

Fence diagram for P2O5%wt is representing identical view to determine the shape flow of phosphatic layers bearing phosphorous oxides larger than 18 wt.% which in turn been a classified layer has commercial benefits. (Fig. 28).

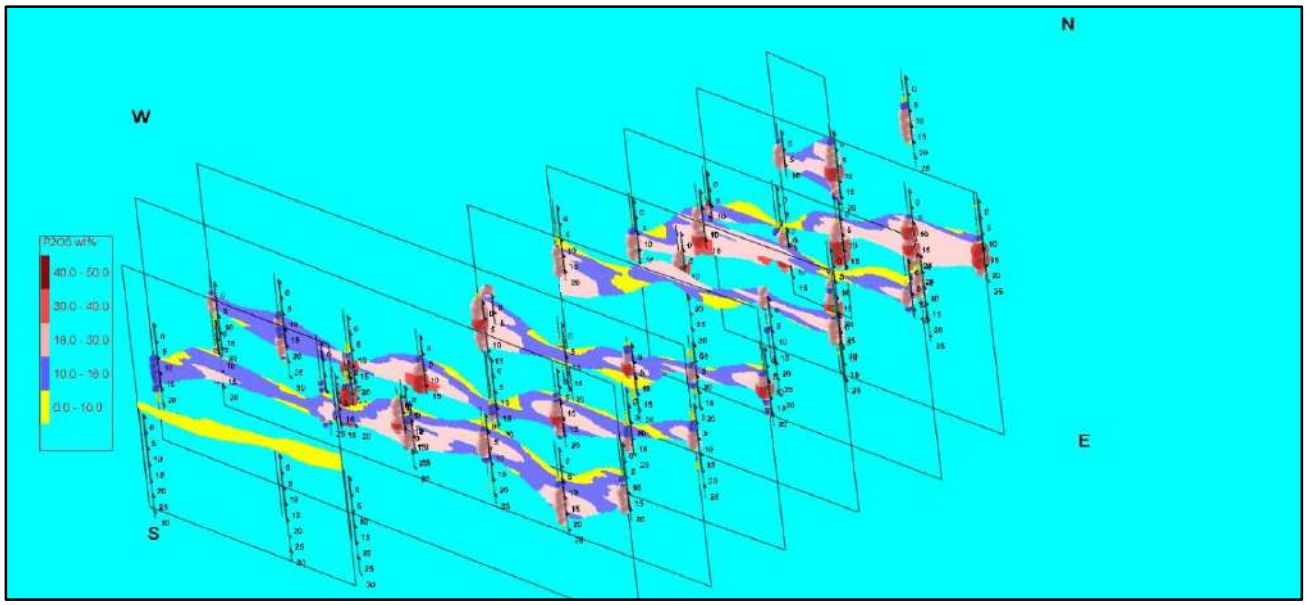

Figure 25: Fence diagram P_2O_5%wt of the study area.

As shown in (Fig. 45) the range of commercial percentages of P_2O_5 wt.% are denser in the north and north-east rather than south of the study area where that

attributed to drined out of P_2O_5%wt caused by high content of silica which is the main factor of reworked phospahate.

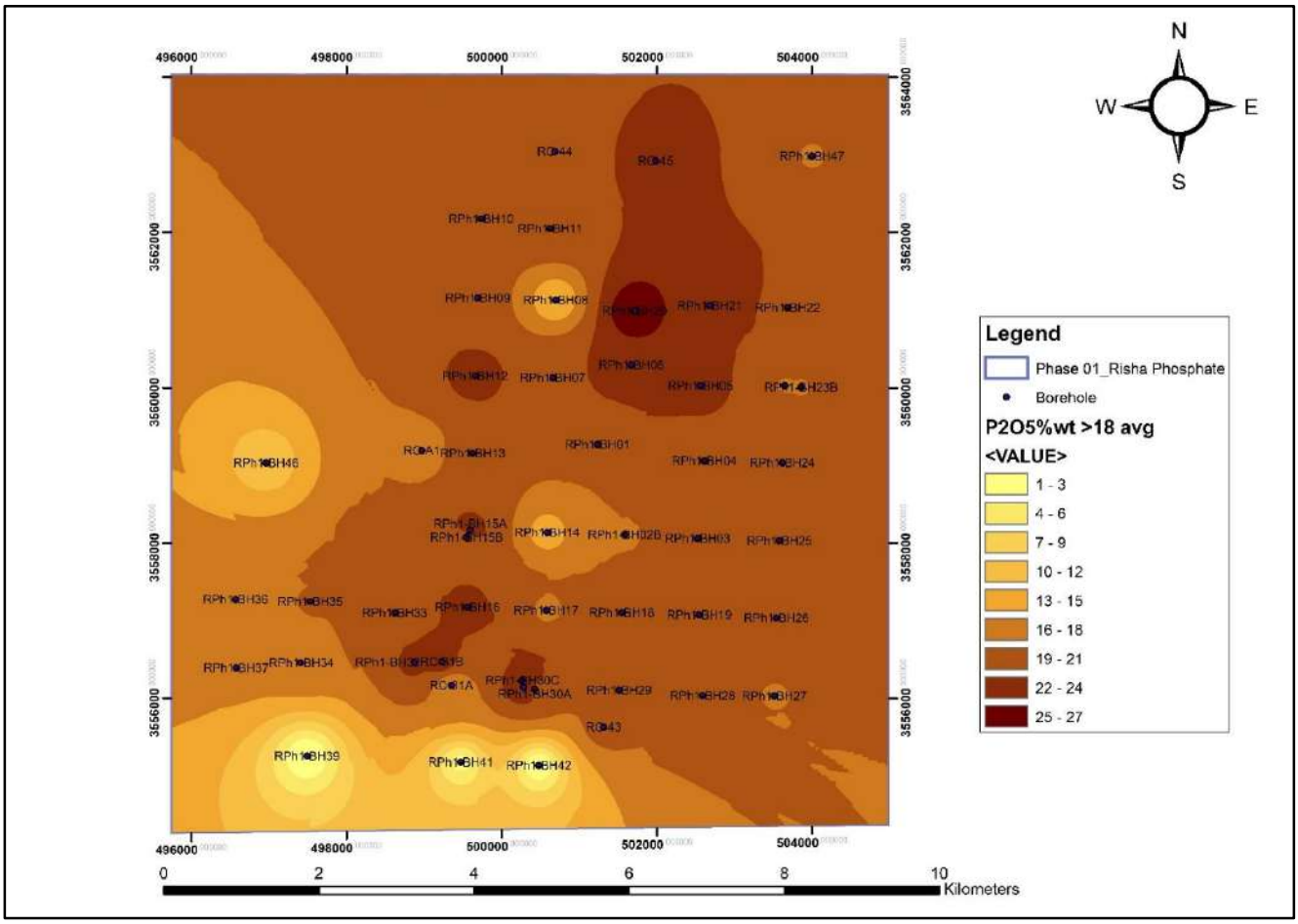

Figure 26: Distance weight for thicknesses contain P2O5%wt with averages larger than 18%wt.

In addition, in (Fig. 29) is showing inverse distance weight for distribution of phosphate layers thicknesses contain P_2O_5%wt percentages that are overwhelmed average content 18%wt. The similarity in Fig. 45 is embedded in Fig. 46 as well in term of high commercial percentages are growing when move to north and north east of the study area.

7.4 Mineralogical composition

The mineralogical compositions of 5 representative coring samples and 44 cutting samples were determined by X-ray Diffraction (XRD) in the Minestry of Energy and Mineral Resources laboratory. The XRD data are listed in Tables 12 and 13.

The main components of the coring samples were found:

- Calcite almost in all samples as a major mineral.
- Carbonate and fluorapatite were detected as a minor mineral in three samples.
- Gypsum was detected as trace mineral in one sample.

Table 12: XRD results of Core samples.

Sample ID	phase identification		
	major	minor	trace
RCA1-AC1	Calcite, Carbonate-fluorapatite	-	Gypsum
RC-31-B (8)	Calcite	Carbonate-fluorapatite	-
RC-31-B (11)	Calcite	-	Carbonate-fluorapatite, Quartz
RC-31-B (12)	Quartz	Carbonate-fluorapatite	Calcite
RC-31-B (14)	Calcite	Carbonate-fluorapatite	-

The main components of the cutting samples were found:

- Calcite almost in all samples as a major mineral, and in 22 samples also; carbonate and fluorapatite were detected as a major minerals.
- Also carbonate and fluorapatite were detected as a minor mineral in 15 samples.
- Gypsum, quartz, and anhydrite were detected as trace minerals in most samples.

Table 13: XRD results of Cutting samples.

Sample ID	phase identification		
	major	minor	trace
Rph-01-S2	calcite, quartz	carbonate-fluorapatite	-
Rph-01-S3	calcite, carbonate-fluorapatite	quartz	-
Rph-01 -S4	calcite, carbonate-fluorapatite	quartz	-
Rph-01-S5	calcite, carbonate-fluorapatite	-	quartz
Rph-01-S6	calcite, carbonate-fluorapatite	quartz	-
Rph-01-S7	quartz, calcite	Carbonate-fluorapatite	-
Rph-01-S8	quartz, calcite	Carbonate-fluorapatite	-
Rph-01-S9	quartz, calcite	Carbonate-fluorapatite	-
Rph-01-S10	quartz	calcite, carbonate-fluorapatite	-
Rph-02-S4	calcite, quartz	-	carbonate-fluorapatite
Rph-02-S5	calcite, carbonate-fluorapatite	-	quartz
Rph-02-S6	calcite, carbonate-fluorapatite, quartz	-	-
Rph-02-S7	carbonate-fluorapat ite, Apatite, Calcite	-	quartz
Rph1-BH02-S8	calcite, carbonate-fluorapatite	quartz	-
Rph1-BH02-S9	calcite	carbonate-fluorapatite	quartz
Rph1-BH06-08	Calcite ,Fluorapatite	-	Quartz, Gypsum
Rph1-BH07-08	Calcite	-	Quartz
Rph1-BH08- 08	Calcite	-	Quartz
Rph1-BH16 13	Calcite	Carbonate-fluorapatite	Quartz
Rph1-BH 17-21	Calcite, fluorapatite	Quartz	-
Rph1-BH 21 16	Carbonate-fluorapatite, Calcite	-	Anhydrite
Rph1-BH 22 21	Carbonate-fluorapatite, Calcite	Quartz	Anhydrite
Rph1-BH23A 15	Carbonate-fluorapatite, Calcite	Quartz	Anhydrite
Rphl-BH23A 18	Quartz	Carbonate-fluorapatite, Calcite	Feldspar
Rph1-BH24 6	Carbonate-fluorapatite, Calcite	Quartz	Anhydrite
Rph1-BH24 24	Calcite	Quartz	-
Rph1-BH-25 15	Calcite, Quartz	Carbonate-fluorapatite	-
Rph1-BH-25 24	Carbonate-fluorapatite	Calcite	Quartz, Anhydrite
Rphl-BH26 10	Calcite	Carbonate-fluorapatite	Quartz
Rphl-BH27 16	Calcite	Carbonate-fluorapatite	Quartz
Rphl-BH27 24	Calcite, Quartz	Carbonate-fluorapatite	-
Rphl-BH28 (19)	Calcite	Carbonate-fluorapatite	Quartz
Rphl-BH28 (21)	Carbonate-fluorapatite, Calcite	-	Quartz

Sample ID	phase identification		
	major	minor	trace
Rphl-BH28 (25)	Carbonate-fluorapatite, Calcite	Quartz	-
Rphl-BH29 (12)	Carbonate-fluorapatite, Calcite	Quartz	- .
BH-30C (13)	Carbonate-fluorapatite	Calcite, Quartz	Anhydrite
Rph1-BH 31A (15)	Calcite	Carbonate-fluorapatite	Quartz
Rph1-BH 31B (20)	Carbonate-fluorapatite	Calcite	Quartz, Anhydrite
BH-32 (25)	Calcite, Carbonate-fluorapatite	-	Quartz, Anhydrite
BH-32 (26)	Calcite, Carbonate-fluorapatite	-	Quartz, Anhydrite
BH-33 (16)	Calcite	Carbonate-fluorapatite	Quartz
Rphl-BH 34 (20)	Carbonate-fluorapatite, Calcite	-	Quartz
Rph1-BH 35 (22)	Carbonate-fluorapatite Calcite, Quartz	-	Anhydrite
Rph1-BH 36 (22)	Quartz	-	Calcite, Carbonate-fluorapatite

7.5 Resource Estimation

Risha Phosphate has been subjected into resource estimation calculation after applied prospecting activities within an area amounted ~ 90 km2 whereas the indicated reserve was determined earlier throughout previous studies that are included Mapping Tal'et Qa'ed (Abdalkhafour, Geological Division Survey) and total of eight boreholes were drilled upon considered prospecting proposal implemented by Jordanian Geological Association targeted phosphate layers. In respond to the indicated resource, total of 49 cutting boreholes and 6 boreholes were agreed within a grid located between 950 m to 1000 m to determine the resource estimation.

In order to measure the resource estimation the following procedures were adopted:

1. Extract and measure the influence area for each drilled borehole using Thiessen Polygon creation in ArcGIS (Fig. 47).

2. Determine encountered phosphatic layers thicknesses.
3. Calculate the volume (m^3) of the phosphate resourse in each of the influense areas.
4. Multiply the volume (m^3) by the Density (g/cm^3) in order to obtain the Geological Resourse of the phosphate deposit in the study area.

   - Volume of Ore = influence area (m^2) * Thicknesses phosphate layers (average content of P_2O_5%wt 18%).
   - Geological Resource = influence area (m^2) * Weighted average (every borehole g/cm^3*wt %).

5. A total of 47 boreholes were used to estimate the phosphate deposit in the area.
6. The ore (phosphate) resource and the ore volume calculations were carried out using Excel sheets for each borehole.
7. The estimated resource of phosphate deposit is 750 million meteric tons with an average thicknesses ranging between 6-14m.

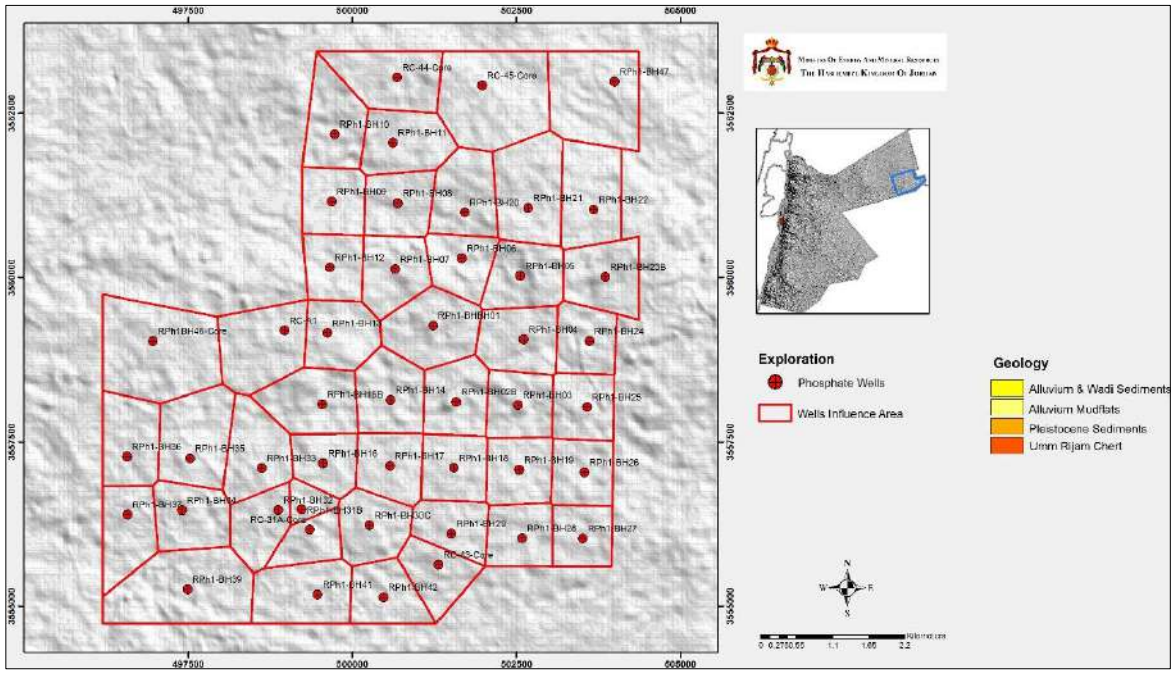

Figure 27: Thiessen Polygon, Influence area.

Conclusion

According to an earlier prospecting studies were embarked targeting phosphate ore deposits in the Risha area (Tal'et Qa'ied 3018 km2, east of Jordan), it has indicated to varieties rocks of phosphate lithology that have been considering commercial quantities. Afterward, intense prospecting activities were launched and carried out by the natural resources studies directorate affiliated to the Ministry of Energy & Mineral Resources (MEMR). Consequently, Tal'et Qa'ied was divided into blocks, each block has determined area. The first block was amounted 90 km2, covered by total of 55 boreholes were drilled within grid network ranged from 950 m to 1000m, they consist of 49 boreholes and another 6 boreholes that are representing cutting recovery and core recovery, respectively, with measured total length 1172 m and 68 m, respectively.

In spite of geological map sheet record that has indicated Umm Rijam formation is the only formation predominant in the study are, the drilling activities have encountered varieties of phosphate lithology type deposited over the area where the most predominant are Phosphorous (fecal type), Phospahtic limestone (Fecal, bones, peliods), limestone phosphate, silica phosphate and chalk limestone phosphate and less common are silicified limestone phosphate and chalk limestone apatite. In other hand, drilling data has indicated to thickness of phosphate layer, which is a bulk consist of different type of phosphate lithology, increases from south to the north and north east of the study area from 1 m to 22m, respectively, with an overburden ranged between 0 m to 16 m. Remarkably, the relationship percentages between overburden thicknesses and versus phosphate thicknesses are entitled "stripping ration" doesn't exceed 1:1 cross over the area which in turn makes mining operation more easier.

According to geophysical studies; total of twenty nine natural gamma logs were conducted in the study area, remarkably, the measured natural gamma commenced at zero depth 1.8 m. They were logged top to bottom, and bottom to top. Often, the total gamma records for logged borehole were fully documented long over its measured depth, occasionally, the logging tool has not able to reach the total measured depth due to borehole collapse. Therefore, the rest prospecting in these boreholes were conducted based on chemical and drilling data. The results of the laboratory analysis of the ratio of P_2O_5 wt.% were compared with total gamma ray log.

All study area covered mainly by URC Formation of Paleogene and Neogene ages. Phosphorite found in the study area mostly in massive limestone beds with some of chert, chalk, chalky limestone & silicified limestone.

The results of XRF showed good concentrations of P_2O_5 (22-36%), TCP (with an average 62%), Cao &SiO_2.

Al-Risha phosphate is characterized by very few percentages of impurities, so that the ratio of iron, aluminum and magnesium oxides to phosphate is bound approximately between 0.027 and 0.12, while the average percentage of fluorine is 2.26 & chlorine is 0.16, and positioned within the allowable borders for phosphate investment in the global market.

REE analysis results showed good concentrations of uranium (U) and yttrium (Y) and low concentrations of thorium (Th), lanthanum (La), Neodymium (Nd) and Cerium (Ce).

The percentages of uranium are very close to the percentages of uranium in phosphate ores in various parts of Jordan, which indicates the strong evidence of uranium presence in Al Risha area.

The main components of the coring and cutting samples of mineral were found calcite which is almost in all samples as a major mineral. And the main components of the cutting samples of mineral were found in 22 samples also; carbonate and fluorapatite were detected as a major minerals.

Furthermore, the P_2O_5%wt percentages are outweigh and overwhelmed in the north and north east rather than south of the study area corresponding to expand of phosphate layers in term of its thicknesses and concentrate of phosphorous oxides within ranged between 18%wt to 30wt.%.

The estimated resource of phosphate deposit is 750 million meteric tons with an average thicknesses ranging between 6-14m.

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Appendices

Appendix No.1

Chemical Results

The Hashemite Kingdom of Jordan

Ministry of Energy and Mineral Resources/ Laboratories & Quality Directorate

TEST REPORT

X-RAY SPECTROMETRIC& LOI ANALYSIS

Division Chemical & Mineral Analysis/Lab. X.R.F
Client Name & Address: مديرية دراسات المصادر الطبيعية
Sample Type: صلبة
Sample Method: By Client ***Date of Receipt: 26/12/ 2021***

Reporting Date: 03/01/2022
Test Report No.: 00240/12/2021-CH001-002
Sample Location:-
Testing Date: 29/12/2021

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO_3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
1	Rph-01 (1)	<0.23	<0.012	<0.037	52.80	<0.09	0.92	18.30	2.21	<0.498	<0.20	<0.33	1.45	<0.0125	24.07
2	Rph-01 (2)	<0.23	<0.012	<0.037	39.70	<0.09	0.83	18.10	26.50	<0.498	<0.20	<0.33	1.48	<0.0125	12.69
3	Rph-01 (3)	<0.23	<0.012	<0.037	51.00	<0.09	1.27	28.70	4.06	<0.498	<0.20	<0.33	2.84	<0.0125	11.91
4	Rph-01 (4)	<0.23	<0.012	<0.037	45.70	<0.09	1.12	24.80	14.10	<0.498	<0.20	<0.33	2.23	<0.0125	11.09
5	Rph-01 (5)	<0.23	<0.012	<0.037	52.00	<0.09	1.22	34.20	1.42	<0.498	<0.20	<0.33	3.36	<0.0125	7.00
6	Rph-01 (6)	<0.23	<0.012	<0.037	48.60	<0.09	0.86	23.20	10.30	<0.498	<0.20	<0.33	1.81	<0.0125	14.38
7	Rph-01 (7)	<0.23	<0.012	<0.037	22.80	<0.09	0.22	8.23	58.20	<0.498	<0.20	0.55	<0.50	<0.0125	8.76
8	Rph-01 (8)	<0.23	<0.012	<0.037	24.00	<0.09	0.34	11.60	55.10	<0.498	<0.20	0.89	0.54	<0.0125	6.66
9	Rph-01 (9)	<0.23	<0.012	<0.037	35.80	<0.09	0.24	10.20	35.70	<0.498	<0.20	<0.33	0.54	<0.0125	16.90
10	Rph-01 (10)	<0.23	<0.012	<0.037	23.30	<0.09	0.27	10.90	57.40	<0.498	<0.20	<0.33	0.59	<0.0125	6.71
11	Rph-01 (11)	<0.23	<0.012	<0.037	10.90	<0.09	<0.058	3.56	79.80	<0.498	<0.20	0.56	<0.50	<0.0125	4.37
12	Rph-01 (12)	<0.23	<0.012	<0.037	9.79	<0.09	<0.058	4.49	82.20	<0.498	<0.20	0.53	<0.50	<0.0125	2.80
13	Rph-01 (13)	<0.23	<0.012	<0.037	11.90	<0.09	<0.058	3.21	79.00	<0.498	<0.20	0.37	<0.50	<0.0125	5.38
14	Rph-01 (15)	<0.23	<0.012	<0.037	28.50	<0.09	<0.058	1.30	49.30	<0.498	<0.20	<0.33	<0.50	<0.0125	20.69
15	Rph-01 (16)	<0.23	<0.012	<0.037	44.40	<0.09	<0.058	0.80	22.70	<0.498	<0.20	<0.33	<0.50	<0.0125	31.92
16	Rph-01 (17)	<0.23	<0.012	<0.037	34.10	<0.09	<0.058	1.07	39.30	<0.498	<0.20	<0.33	<0.50	<0.0125	24.74
17	Rph-01 (18)	<0.23	<0.012	<0.037	37.40	<0.09	<0.058	0.77	33.70	<0.498	<0.20	<0.33	<0.50	<0.0125	27.67

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Page 1 of 2

Example of XRF Assay results as obtained from MEMR labs.

The Hashemite Kingdom of Jordan

Ministry of Energy and Mineral Resources/ Laboratories & Quality Directorate

TEST REPORT

X-RAY SPECTROMETRIC& LOI ANALYSIS

Division Chemical & Mineral Analysis/Lab. X.R.F
Client Name & Address: مديرية دراسات المصادر الطبيعية
Sample Type: صلبة
Sample Method: By Client
Date of Receipt: 26/12/ 2021

Reporting Date: 03/01/2022
Test Report No.: 00240/12/2021-CH001-002
Sample Location:-
Testing Date: 29/12/2021

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO_3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
1	Rph-01 (1)	<0.23	<0.012	<0.037	52.80	<0.09	0.92	18.30	2.21	<0.498	<0.20	<0.33	1.45	<0.0125	24.07
2	Rph-01 (2)	<0.23	<0.012	<0.037	39.70	<0.09	0.83	18.10	26.50	<0.498	<0.20	<0.33	1.48	<0.0125	12.69
3	Rph-01 (3)	<0.23	<0.012	<0.037	51.00	<0.09	1.27	28.70	4.06	<0.498	<0.20	<0.33	2.84	<0.0125	11.91
4	Rph-01 (4)	<0.23	<0.012	<0.037	45.70	<0.09	1.12	24.80	14.10	<0.498	<0.20	<0.33	2.23	<0.0125	11.09
5	Rph-01 (5)	<0.23	<0.012	<0.037	52.00	<0.09	1.22	34.20	1.42	<0.498	<0.20	<0.33	3.36	<0.0125	7.00
6	Rph-01 (6)	<0.23	<0.012	<0.037	48.60	<0.09	0.86	23.20	10.30	<0.498	<0.20	<0.33	1.81	<0.0125	14.38
7	Rph-01 (7)	<0.23	<0.012	<0.037	22.80	<0.09	0.22	8.23	58.20	<0.498	<0.20	0.55	<0.50	<0.0125	8.76
8	Rph-01 (8)	<0.23	<0.012	<0.037	24.00	<0.09	0.34	11.60	55.10	<0.498	<0.20	0.89	0.54	<0.0125	6.66
9	Rph-01 (9)	<0.23	<0.012	<0.037	35.80	<0.09	0.24	10.20	35.70	<0.498	<0.20	<0.33	0.54	<0.0125	16.90
10	Rph-01 (10)	<0.23	<0.012	<0.037	23.30	<0.09	0.27	10.90	57.40	<0.498	<0.20	<0.33	0.59	<0.0125	6.71
11	Rph-01 (11)	<0.23	<0.012	<0.037	10.90	<0.09	<0.058	3.56	79.80	<0.498	<0.20	0.56	<0.50	<0.0125	4.37
12	Rph-01 (12)	<0.23	<0.012	<0.037	9.79	<0.09	<0.058	4.49	82.20	<0.498	<0.20	0.53	<0.50	<0.0125	2.80
13	Rph-01 (13)	<0.23	<0.012	<0.037	11.90	<0.09	<0.058	3.21	79.00	<0.498	<0.20	0.37	<0.50	<0.0125	5.38
14	Rph-01 (15)	<0.23	<0.012	<0.037	28.50	<0.09	<0.058	1.30	49.30	<0.498	<0.20	<0.33	<0.50	<0.0125	20.69
15	Rph-01 (16)	<0.23	<0.012	<0.037	44.40	<0.09	<0.058	0.80	22.70	<0.498	<0.20	<0.33	<0.50	<0.0125	31.92
16	Rph-01 (17)	<0.23	<0.012	<0.037	34.10	<0.09	<0.058	1.07	39.30	<0.498	<0.20	<0.33	<0.50	<0.0125	24.74
17	Rph-01 (18)	<0.23	<0.012	<0.037	37.40	<0.09	<0.058	0.77	33.70	<0.498	<0.20	<0.33	<0.50	<0.0125	27.67

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

Reporting Date: 03/01/2022 *Test Report No.: 00240/12/2021-CH001-002*

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO_3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
18	Rph-01 (19)	<0.23	<0.012	<0.037	46.50	<0.09	<0.058	1.26	18.00	<0.498	<0.20	<0.33	<0.50	<0.0125	33.90
19	Rph-01 (20)	<0.23	<0.012	<0.037	40.00	<0.09	<0.058	0.83	28.70	<0.498	<0.20	<0.33	<0.50	<0.0125	30.01
20	Rph-02 (1)	0.67	<0.012	0.11	46.00	<0.09	0.38	13.70	14.10	0.94	0.42	<0.33	1.27	<0.0125	22.32
21	Rph-02 (2)	0.64	<0.012	0.11	46.00	<0.09	0.31	13.10	14.50	0.91	0.39	<0.33	1.09	<0.0125	22.92
22	Rph-02 (3)	0.35	<0.012	0.050	44.40	<0.09	0.56	20.10	17.60	0.50	0.20	<0.33	2.03	<0.0125	14.13
23	Rph-02 (4)	0.95	0.015	0.14	35.70	<0.09	0.19	9.59	32.50	1.35	0.51	<0.33	0.63	<0.0125	18.33
24	Rph-02 (5)	<0.23	<0.012	<0.037	46.10	<0.09	0.72	22.80	14.80	<0.498	<0.20	<0.33	2.68	<0.0125	12.38
25	Rph-02 (6)	<0.23	<0.012	<0.037	45.50	<0.09	0.44	21.50	15.00	<0.498	<0.20	<0.33	2.17	<0.0125	15.26
26	Rph-02 (7)	<0.23	<0.012	<0.037	52.10	<0.09	0.65	31.20	4.39	<0.498	<0.20	<0.33	3.30	<0.0125	8.14
27	Rph-02 (8)	<0.23	<0.012	<0.037	49.60	<0.09	0.63	25.90	9.14	<0.498	<0.20	<0.33	2.82	<0.0125	11.62
28	Rph-02 (9)	<0.23	<0.012	<0.037	52.10	<0.09	0.34	20.80	6.49	<0.498	<0.20	<0.33	1.92	<0.0125	18.21
29	Rph-02 (10)	<0.23	<0.012	<0.037	40.10	<0.09	0.19	11.20	29.30	<0.498	<0.20	<0.33	0.73	<0.0125	18.31
30	Rph-02 (11)	<0.23	<0.012	<0.037	36.00	<0.09	0.078	8.45	36.70	<0.498	<0.20	<0.33	<0.50	<0.0125	18.08
31	Rph-02 (12)	<0.23	<0.012	<0.037	19.10	<0.09	<0.058	4.83	66.40	<0.498	<0.20	<0.33	<0.50	<0.0125	9.03
32	Rph-02 (13)	<0.23	<0.012	<0.037	26.10	<0.09	0.10	8.31	54.00	<0.498	<0.20	<0.33	<0.50	<0.0125	10.67
33	Rph-02 (14)	<0.23	<0.012	<0.037	23.00	<0.09	<0.058	7.74	59.60	<0.498	<0.20	<0.33	<0.50	<0.0125	8.60
34	Rph-02 (15)	<0.23	<0.012	<0.037	23.10	<0.09	<0.058	5.18	59.40	<0.498	<0.20	<0.33	<0.50	<0.0125	11.54
35	Rph-02 (16)	<0.23	<0.012	<0.037	28.10	<0.09	0.062	7.30	50.30	<0.498	<0.20	<0.33	<0.50	<0.0125	13.11
36	Rph-02 (17)	<0.23	<0.012	<0.037	26.10	<0.09	0.066	6.44	53.60	<0.498	<0.20	<0.33	<0.50	<0.0125	13.02
37	Rph-02 (18)	<0.23	<0.012	<0.037	24.20	<0.09	<0.058	4.70	57.00	<0.498	<0.20	<0.33	<0.50	<0.0125	13.31

Note: The results were done on dry basis.

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Analyzed by: Eng. Nidal Tayyem
Eng. Feryal Yosef

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وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

The Hashemite Kingdom of Jordan

Ministry of Energy and Mineral Resources/ Laboratories & Quality Directorate

TEST REPORT

X-RAY SPECTROMETRIC& LOI ANALYSIS

Division Chemical & Mineral Analysis/Lab. X.R.F
Client Name & Address: مديرية دراسات المصادر الطبيعية
Sample Type: صلبة
Sample Method: By Client
Date of Receipt: 01/02/ 2022

Reporting Date: 08/02/2022
Test Report No.: 00037/02/2022-CH001-022
Sample Location:-
Testing Date: 07/02/2022

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO_3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
1	RPH1- BH2A-1	3.38	0.043	0.48	30.50	0.73	< 0.058	1.52	29.00	5.85	2.23	< 0.33	< 0.51	< 0.0125	26.26
2	RPH1- BH2A-2	0.76	< 0.012	0.11	47.00	< 0.09	< 0.058	2.37	14.30	1.23	0.63	< 0.33	< 0.51	< 0.0125	33.53
3	RPH1- BH2A-3	0.31	< 0.012	0.06	48.70	< 0.09	0.16	9.70	11.60	< 0.55	0.28	< 0.33	0.95	< 0.0125	27.68
4	RPH1- BH2A-4	< 0.23	< 0.012	0.049	52.80	< 0.09	0.39	16.30	3.84	< 0.55	0.26	< 0.33	1.73	< 0.0125	24.09
5	RPH1- BH2A-5	< 0.23	< 0.012	0.047	49.80	< 0.09	0.53	16.90	9.16	< 0.55	0.24	< 0.33	1.61	< 0.0125	21.19
6	RPH1- BH2A-6	< 0.23	< 0.012	0.029	25.20	< 0.09	0.14	7.86	54.6	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	11.22
7	RPH1- BH2A-7	< 0.23	< 0.012	< 0.029	51.20	< 0.09	0.62	20.50	6.67	< 0.55	< 0.21	< 0.33	2.18	< 0.0125	18.57
8	RPH1- BH2A-8	< 0.23	< 0.012	< 0.029	38.40	< 0.09	0.44	19.00	30.20	< 0.55	< 0.21	< 0.33	1.69	< 0.0125	10.16
9	RPH1- BH2A-9	< 0.23	< 0.012	< 0.029	51.00	< 0.09	0.68	24.70	6.83	< 0.55	< 0.21	< 0.33	2.65	< 0.0125	13.94
10	RPH1- BH2A-10	< 0.23	< 0.012	< 0.029	42.50	< 0.09	0.55	21.60	22.70	< 0.55	< 0.21	< 0.33	1.96	< 0.0125	10.47
11	RPH1- BH2A-11	< 0.23	< 0.012	< 0.029	35.50	< 0.09	< 0.058	4.95	37.70	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	21.51
12	RPH1- BH2A-12	< 0.23	< 0.012	< 0.029	19.20	< 0.09	< 0.058	4.43	66.20	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	10.04
13	RPH1- BH2A-13	< 0.23	< 0.012	< 0.029	9.65	< 0.09	< 0.058	4.07	82.90	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	3.21
14	RPH1- BH2A-14	< 0.23	< 0.012	< 0.029	15.00	< 0.09	< 0.058	3.05	73.90	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	7.94
15	RPH1- BH2A-15	< 0.23	< 0.012	< 0.029	18.10	< 0.09	< 0.058	6.93	68.00	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	6.59
16	RPH1- BH2A-16	< 0.23	< 0.012	< 0.029	8.15	< 0.09	< 0.058	3.99	85.00	< 0.55	< 0.21	0.75	< 0.51	< 0.0125	2.07

Note: The results were done on dry basis.

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مديرية المختبرات والجودة

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Eng. Feryal Yosef

Division Head: Eng .Maysoon Alkhzahee

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The Hashemite Kingdom of Jordan

Ministry of Energy and Mineral Resources/ Laboratories & Quality Directorate

TEST REPORT

X-RAY SPECTROMETRIC& LOI ANALYSIS

Division Chemical & Mineral Analysis/Lab. X.R.F
Client Name & Address: مديرية دراسات المصادر الطبيعية
Sample Type: صلبة
Sample Method: By Client
Date of Receipt: 23/01/ 2022

Reporting Date: 02/02/2022
Test Report No.: 00026/01/2022-CH001-018
Sample Location:-
Testing Date: 01/02/2022

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO_3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
1	RPH1- BH3-1	1.09	0.015	0. 15	40.00	0.12	< 0.058	0.58	23.30	1.67	0.98	< 0.33	< 0.51	< 0.0125	32.16
2	RPH1- BH3-2	0.66	< 0.012	0.11	44.10	< 0.09	< 0.058	0.41	18.60	0.97	0.68	< 0.33	< 0.51	< 0.0125	34.45
3	RPH1- BH3-3	0.55	< 0.012	0.071	39.60	< 0.09	6.10	1.51	23.00	0.76	0.26	< 0.33	< 0.51	< 0.0125	27.92
4	RPH1- BH3-4	< 0.23	< 0.012	< 0.029	44.00	< 0.09	0.77	1.36	20.80	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	31.89
5	RPH1- BH3-5	< 0.23	< 0.012	< 0.029	48.90	< 0.09	0.22	4.00	13.50	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	32.62
6	RPH1- BH3-6	0.39	< 0.012	0.054	46.40	< 0.09	0.60	8.75	15.30	0.63	0.26	< 0.33	0.75	< 0.0125	26.91
7	RPH1- BH3-7	< 0.23	< 0.012	< 0.029	51.80	< 0.09	0.15	6.63	8.22	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	32.36
8	RPH1- BH3-8	< 0.23	< 0.012	< 0.029	53.10	< 0.09	0.063	4.07	5.96	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	35.97
9	RPH1- BH3-9	< 0.23	< 0.012	< 0.029	50.80	< 0.09	0.084	4.70	10.60	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	33.12
10	RPH1- BH3-10	< 0.23	< 0.012	< 0.029	50.50	< 0.09	0.65	14.70	7.37	< 0.55	< 0.21	0.85	1.30	< 0.0125	24.34
11	RPH1- BH3-11	< 0.23	< 0.012	< 0.029	39.60	< 0.09	0.40	9.48	28.80	< 0.55	< 0.21	< 0.33	0.58	< 0.0125	20.84
12	RPH1- BH3-12	< 0.23	< 0.012	< 0.029	53.90	< 0.09	1.06	23.00	0.86	< 0.55	< 0.21	< 0.33	2.35	< 0.0125	18.68
13	RPH1- BH3-13	< 0.23	< 0.012	< 0.029	51.50	< 0.09	1.12	26.40	4.22	< 0.55	< 0.21	< 0.33	2.75	< 0.0125	13.70
14	RPH1- BH3-14	< 0.23	< 0.012	< 0.029	48.60	< 0.09	0.28	9.54	13.10	< 0.55	< 0.21	< 0.33	0.84	< 0.0125	27.45

وزارة الطاقة والثروة المعدنية
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Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO_3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
15	RPH1- BH3-15	< 0.23	< 0.012	< 0.029	44.80	< 0.09	0.12	4.53	21.70	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	28.51
16	RPH1- BH3-16	< 0.23	< 0.012	< 0.029	48.90	< 0.09	0.76	16.40	11.70	< 0.55	< 0.21	< 0.33	1.45	< 0.0125	20.70
17	RPH1- BH3-17	< 0.23	< 0.012	< 0.029	25.80	< 0.09	0.19	6.29	54.00	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	13.33
18	RPH1- BH3-18	< 0.23	< 0.012	< 0.029	28.60	< 0.09	0.23	8.98	48.70	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	12.92
19	RPH1- BH3-19	< 0.23	< 0.012	< 0.029	8.60	< 0.09	< 0.058	1.80	85.20	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	4.16
20	RPH1- BH3-20	< 0.23	< 0.012	< 0.029	10.20	< 0.09	< 0.058	1.12	81.50	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	6.25
21	RPH1- BH3-21	< 0.23	< 0.012	< 0.029	29.00	< 0.09	< 0.058	3.37	49.40	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	18.12

Note: The results were done on dry basis.

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Eng. Feryal Yosef فريال

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وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

The Hashemite Kingdom of Jordan

Ministry of Energy and Mineral Resources/ Laboratories & Quality Directorate

TEST REPORT

X-RAY SPECTROMETRIC& LOI ANALYSIS

Division Chemical & Mineral Analysis/Lab. X.R.F
Client Name & Address: مديرية دراسات المصادر الطبيعية
Sample Type: صلبة
Sample Method: By Client

Date of Receipt: 23/01/ 2022

Reporting Date: 03/02/2022
Test Report No.: 00027/01/2022-CH001-019
Sample Location:-
Testing Date: 01/02/2022

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO_3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
1	RPH1- BH4-1	0.58	< 0.012	0.091	48.00	< 0.09	0.80	18.90	9.32	1.00	0.47	< 0.33	2.21	< 0.0125	18.58
2	RPH1- BH4-2	0.36	< 0.012	0.055	44.50	< 0.09	1.56	12.40	17.50	0.64	0.27	< 0.33	0.97	< 0.0125	21.73
3	RPH1- BH4-3	< 0.23	< 0.012	< 0.029	47.50	< 0.09	2.54	19.00	11.00	< 0.55	< 0.21	< 0.33	2.07	< 0.0125	17.29
4	RPH1- BH4-4	< 0.23	< 0.012	< 0.029	50.10	< 0.09	1.59	24.30	6.83	< 0.55	< 0.21	< 0.33	2.67	< 0.0125	14.05
5	RPH1- BH4-5	< 0.23	< 0.012	< 0.029	46.40	< 0.09	1.05	17.00	16.00	< 0.55	< 0.21	< 0.33	1.51	< 0.0125	17.83
6	RPH1- BH4-6	< 0.23	< 0.012	< 0.029	28.20	< 0.09	0.40	11.20	49.40	< 0.55	< 0.21	< 0.33	0.70	< 0.0125	10.00
7	RPH1- BH4-7	< 0.23	< 0.012	< 0.029	20.30	< 0.09	0.16	6.61	63.10	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	8.91
8	RPH1- BH4-8	< 0.23	< 0.012	< 0.029	7.11	< 0.09	< 0.058	1.85	86.70	< 0.55	< 0.21	0.47	< 0.51	< 0.0125	3.22
9	RPH1- BH4-9	< 0.23	< 0.012	< 0.029	11.40	< 0.09	< 0.058	1.25	79.80	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	6.84
10	RPH1- BH4-10	< 0.23	< 0.012	< 0.029	39.40	< 0.09	< 0.058	2.78	31.40	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	26.33
11	RPH1- BH4-11	< 0.23	< 0.012	< 0.029	36.50	< 0.09	< 0.058	1.90	36.20	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	25.34
12	RPH1- BH4-12	< 0.23	< 0.012	< 0.029	29.10	< 0.09	0.34	6.49	48.00	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	15.58
13	RPH1- BH4-13	< 0.23	< 0.012	< 0.029	47.10	< 0.09	0.73	13.50	14.50	< 0.55	< 0.21	< 0.33	1.34	< 0.0125	22.71
14	RPH1- BH4-14	< 0.23	< 0.012	< 0.029	54.20	< 0.09	< 0.058	2.20	11.70	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	31.85

وزارة الطاقة والثروة المعدنية
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Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO_3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
15	RPH1- BH4-15	< 0.23	< 0.012	< 0.029	50.80	< 0.09	< 0.058	2.07	10.90	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	36.21
16	RPH1- BH4-16	< 0.23	< 0.012	< 0.029	51.70	< 0.09	< 0.058	1.17	9.56	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	37.51
17	RPH1- BH4-17	< 0.23	< 0.012	< 0.029	40.20	< 0.09	< 0.058	1.43	29.80	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	28.33
18	RPH1- BH4-18	< 0.23	< 0.012	< 0.029	48.00	< 0.09	< 0.058	1.07	16.90	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	34.05
19	RPH1- BH4-19	< 0.23	< 0.012	< 0.029	48.40	< 0.09	< 0.058	0.84	15.80	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	34.93
20	RPH1- BH4-20	< 0.23	< 0.012	< 0.029	48.80	< 0.09	< 0.058	0.70	14.80	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	35.24
21	RPH1- BH4-21	< 0.23	< 0.012	< 0.029	37.30	< 0.09	< 0.058	1.36	34.90	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	26.11
22	RPH1- BH4-22	< 0.23	< 0.012	< 0.029	44.40	< 0.09	< 0.058	0.70	23.20	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	31.55
23	RPH1- BH4-23	< 0.23	< 0.012	< 0.029	43.70	< 0.09	< 0.058	0.95	24.10	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	31.16
24	RPH1- BH4-24	< 0.23	< 0.012	< 0.029	52.10	< 0.09	< 0.058	2.70	9.11	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	35.92
25	RPH1- BH4-25	< 0.23	< 0.012	< 0.029	51.00	< 0.09	< 0.058	1.95	10.80	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	36.10
26	RPH1- BH4-26	< 0.23	< 0.012	< 0.029	52.10	< 0.09	< 0.058	1.97	9.70	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	36.09
27	RPH1- BH4-27	< 0.23	< 0.012	< 0.029	51.70	< 0.09	< 0.058	1.94	10.50	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	35.78
28	RPH1- BH4-28	< 0.23	< 0.012	< 0.029	54.00	< 0.09	< 0.058	3.17	6.24	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	36.49
29	RPH1- BH4-29	< 0.23	< 0.012	< 0.029	54.10	< 0.09	< 0.058	1.55	3.85	< 0.55	1.37	< 0.33	< 0.51	< 0.0125	39.12
30	RPH1- BH4-30	< 0.23	< 0.012	< 0.029	52.40	< 0.09	< 0.058	1.30	5.83	< 0.55	1.47	< 0.33	< 0.51	< 0.0125	38.85

Note: The results were done on dry basis.

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مديرية المختبرات والجودة

The Hashemite Kingdom of Jordan

Ministry of Energy and Mineral Resources/ Laboratories & Quality Directorate

TEST REPORT

X-RAY SPECTROMETRIC& LOI ANALYSIS

Division Chemical & Mineral Analysis/Lab. X.R.F
Client Name & Address: مديرية دراسات المصادر الطبيعية
Sample Type: صلبة
Sample Method: By Client

Date of Receipt: 25/01/ 2022

Reporting Date: 07/02/2022
Test Report No.: 00033/01/2022-CH001-021
Sample Location:-
Testing Date: 03/02/2022

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO_3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
1	RPH1 BH5-1	1.45	0.017	0.19	31.00	0.17	< 0.058	0.32	37.80	2.16	1.22	< 0.33	< 0.51	< 0.0125	25.56
2	RPH1 BH5-2	1.06	< 0.012	0.15	39.30	0.09	0.124	0.42	24.80	1.61	1.06	< 0.33	< 0.51	< 0.0125	31.38
3	RPH1 BH5-3	1.08	< 0.012	0.16	37.90	0.09	0.112	0.42	27.50	1.60	0.98	< 0.33	< 0.51	< 0.0125	30.14
4	RPH1 BH5-4	0.76	< 0.012	0.11	42.2	< 0.09	0.257	0.41	21.50	1.17	0.73	< 0.33	< 0.51	< 0.0125	32.83
5	RPH1 BH5-5	0.93	< 0.012	0.13	38.30	< 0.09	0.816	0.36	27.70	1.42	0.81	< 0.33	< 0.51	< 0.0125	29.44
6	RPH1 BH5-6	0.72	< 0.012	0.10	46.80	< 0.09	1.06	0.43	12.70	1.20	0.81	< 0.33	< 0.51	< 0.0125	36.11
7	RPH1 BH5-7	<0.23	< 0.012	<0.029	42.80	< 0.09	< 0.058	1.16	24.80	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	30.44
8	RPH1 BH5-8	< 0.23	< 0.012	< 0.029	51.40	< 0.09	< 0.058	1.87	9.26	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	37.05
9	RPH1 BH5-9	<0.23	< 0.012	< 0.029	54.10	< 0.09	< 0.058	2.92	4.94	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	37.57
10	RPH1 BH5-10	<0.23	< 0.012	< 0.029	54.00	< 0.09	< 0.058	10.5	4.52	< 0.55	< 0.21	< 0.33	0.51	< 0.0125	30.15
11	RPH1 BH5-11	<0.23	< 0.012	< 0.029	54.20	< 0.09	< 0.058	9.96	3.62	< 0.55	< 0.21	< 0.33	0.60	< 0.0125	30.94
12	RPH1 BH5-12	<0.23	< 0.012	< 0.029	52.50	< 0.09	< 0.058	6.95	7.66	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	32.61
13	RPH1 BH5-13	<0.23	< 0.012	< 0.029	55.40	< 0.09	< 0.058	6.64	1.65	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	35.69
14	RPH1 BH5-14	<0.23	< 0.012	< 0.029	54.70	< 0.09	< 0.058	18.30	2.88	< 0.55	< 0.21	< 0.33	0.89	< 0.0125	22.71

Reporting Date: 07/02/2022

Test Report No.: 00033/01/2022-CH001-021

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO_3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
15	RPH1 BH5-15	<0.23	<0.012	< 0.029	55.00	<0.09	<0.058	13.00	2.97	<0.55	<0.21	<0.33	0.65	< 0.0125	28.18
16	RPH1 BH5-16	< 0.23	< 0.012	< 0.029	54.90	< 0.09	0.57	18.00	1.11	< 0.55	< 0.21	< 0.33	1.42	< 0.0125	23.85
17	RPH1 BH5-17	< 0.23	< 0.012	< 0.029	54.10	< 0.09	< 0.058	18.10	3.52	< 0.55	< 0.21	< 0.33	0.72	< 0.0125	22.91
18	RPH1 BH5-18	< 0.23	< 0.012	< 0.029	50.90	< 0.09	< 0.058	24.00	9.45	< 0.55	< 0.21	< 0.33	1.27	< 0.0125	14.30
19	RPH1 BH5-19	< 0.23	< 0.012	< 0.029	55.30	< 0.09	< 0.058	28.20	1.78	< 0.55	< 0.21	< 0.33	1.54	< 0.0125	13.83
20	RPH1 BH5-20	< 0.23	< 0.012	< 0.029	54.10	< 0.09	< 0.058	25.30	3.18	< 0.55	< 0.21	< 0.33	1.25	< 0.0125	15.97
21	RPH1 BH5-21	< 0.23	< 0.012	< 0.029	53.00	< 0.09	1.06	31.10	1.12	< 0.55	< 0.21	< 0.33	3.62	< 0.0125	9.43
22	RPH1 BH5-22	< 0.23	< 0.012	< 0.029	52.70	< 0.09	1.03	30.70	2.03	< 0.55	< 0.21	< 0.33	3.53	< 0.0125	9.78
23	RPH1 BH5-23	< 0.23	< 0.012	< 0.029	52.30	< 0.09	0.84	28.60	3.38	< 0.55	< 0.21	< 0.33	3.42	< 0.0125	11.33
24	RPH1 BH5-24	< 0.23	< 0.012	< 0.029	49.30	< 0.09	0.81	30.20	9.02	< 0.55	< 0.21	< 0.33	3.27	< 0.0125	7.28
25	RPH1 BH5-25	< 0.23	< 0.012	< 0.029	49.70	< 0.09	0.83	29.60	8.22	< 0.55	< 0.21	< 0.33	3.26	< 0.0125	8.22
26	RPH1 BH5-26	< 0.23	< 0.012	< 0.029	50.90	< 0.09	0.98	29.40	5.39	< 0.55	< 0.21	< 0.33	3.23	< 0.0125	9.92
27	RPH1 BH5-27	< 0.23	< 0.012	< 0.029	51.30	< 0.09	0.97	27.30	5.20	< 0.55	< 0.21	< 0.33	2.97	< 0.0125	12.00
28	RPH1 BH5-28	< 0.23	< 0.012	< 0.029	51.10	< 0.09	0.98	29.40	5.82	< 0.55	< 0.21	< 0.33	3.13	< 0.0125	9.35
29	RPH1 BH5-29	< 0.23	< 0.012	< 0.029	51.30	< 0.09	1.01	28.30	5.46	< 0.55	< 0.21	< 0.33	2.99	< 0.0125	10.67
30	RPH1 BH5-30	< 0.23	< 0.012	< 0.029	49.80	< 0.09	0.92	26.70	7.74	< 0.55	< 0.21	< 0.33	2.88	< 0.0125	11.55
31	RPH1 BH5-31	< 0.23	< 0.012	< 0.029	49.90	< 0.09	0.95	29.40	7.51	< 0.55	< 0.21	< 0.33	< 0.51	3.23	8.64

Note: The results were done on dry basis.

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Analyzed by: Eng. Nidal Tayyem
Eng. Feryal Yosef

Division Head: Eng .Maysoon Alkhzahee

Laboratories & Quality Director : Eng .Maysoon Alkhzahee

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وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

The Hashemite Kingdom of Jordan

Ministry of Energy and Mineral Resources/ Laboratories & Quality Directorate

TEST REPORT

X-RAY SPECTROMETRIC& LOI ANALYSIS

Division Chemical & Mineral Analysis/Lab. X.R.F ***Reporting Date: 12/01/2022***

Client Name & Address: ***مديرية دراسات المصادر الطبيعية*** ***Test Report No.: 00010/01/2022-CH001-009***

Sample Type: ***صلبة*** ***Sample Location:-***

Sample Method: By Client ***Date of Receipt: 09/01/ 2022*** ***Testing Date: 11/01/2022***

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO_3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
1	**RPH1-06-01**	3.02	0.037	0.43	24.30	0.41	0.64	0.22	38.90	4.77	2.39	1.43	< 0.51	< 0.0125	23.47
2	**RPH1-06-02**	0.73	< 0.012	0.12	45.90	< 0.09	9.16	0.79	8.27	1.15	0.42	< 0.33	< 0.51	< 0.0125	33.33
3	**RPH1-06-03**	0.24	< 0.012	0.038	44.20	< 0.09	5.99	6.54	15.80	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	26.31
4	**RPH1-06-04**	< 0.23	< 0.012	< 0.029	54.10	< 0.09	1.28	9.89	2.28	< 0.55	< 0.21	< 0.33	0.93	< 0.0125	31.18
5	**RPH1-06-05**	< 0.23	< 0.012	< 0.029	48.60	< 0.09	1.26	15.00	11.60	< 0.55	< 0.21	< 0.33	1.32	< 0.0125	21.76
6	**RPH1-06-06**	< 0.23	< 0.012	< 0.029	50.60	< 0.09	0.80	24.70	7.83	< 0.55	< 0.21	< 0.33	2.73	< 0.0125	13.15
7	**RPH1-06-07**	< 0.23	< 0.012	< 0.029	52.40	< 0.09	1.06	22.30	4.22	< 0.55	< 0.21	< 0.33	2.57	< 0.0125	17.11
8	**RPH1-06-08**	< 0.23	< 0.012	< 0.029	53.80	< 0.09	0.97	20.40	1.89	< 0.55	< 0.21	< 0.33	2.17	< 0.0125	20.68
9	**RPH1-06-09**	< 0.23	< 0.012	< 0.029	47.60	< 0.09	0.69	21.00	13.30	< 0.55	< 0.21	< 0.33	2.14	< 0.0125	15.15
10	**RPH1-06-10**	< 0.23	< 0.012	< 0.029	53.20	< 0.09	1.33	33.10	0.77	< 0.55	< 0.21	< 0.33	3.70	< 0.0125	7.66
11	**RPH1-06-11**	< 0.23	< 0.012	< 0.029	53.60	< 0.09	1.24	32.30	0.74	< 0.55	< 0.21	< 0.33	3.56	< 0.0125	8.54
12	**RPH1-06-12**	< 0.23	< 0.012	< 0.029	53.50	< 0.09	1.17	33.80	0.77	< 0.55	< 0.21	< 0.33	3.92	< 0.0125	6.77
13	**RPH1-06-13**	< 0.23	< 0.012	< 0.029	53.00	< 0.09	1.15	32.50	1.82	< 0.55	< 0.21	< 0.33	3.68	< 0.0125	7.74
14	**RPH1-06-14**	< 0.23	< 0.012	< 0.029	50.80	< 0.09	0.95	28.80	6.38	< 0.55	< 0.21	< 0.33	3.33	< 0.0125	9.65
15	**RPH1-06-15**	< 0.23	< 0.012	< 0.029	45.10	< 0.09	0.80	24.70	17.60	< 0.55	< 0.21	< 0.33	2.34	< 0.0125	9.24

Note: The results were done on dry basis.

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Eng. Feryal Yosef

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The Hashemite Kingdom of Jordan

Ministry of Energy and Mineral Resources/ Laboratories & Quality Directorate

TEST REPORT

X-RAY SPECTROMETRIC& LOI ANALYSIS

Division Chemical & Mineral Analysis/Lab. X.R.F
Client Name & Address: مديرية دراسات المصادر الطبيعية
Sample Type: صلبة
Sample Method: By Client

Date of Receipt: 09/01/ 2022

Reporting Date: 12/01/2022
Test Report No.: 00010/01/2022-CH001-009
Sample Location:-
Testing Date: 11/01/2022

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO_3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
1	RPH1-06-01	3.02	0.037	0.43	24.30	0.41	0.64	0.22	38.90	4.77	2.39	1.43	< 0.51	< 0.0125	23.47
2	RPH1-06-02	0.73	< 0.012	0.12	45.90	< 0.09	9.16	0.79	8.27	1.15	0.42	< 0.33	< 0.51	< 0.0125	33.33
3	RPH1-06-03	0.24	< 0.012	0.038	44.20	< 0.09	5.99	6.54	15.80	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	26.31
4	RPH1-06-04	< 0.23	< 0.012	< 0.029	54.10	< 0.09	1.28	9.89	2.28	< 0.55	< 0.21	< 0.33	0.93	< 0.0125	31.18
5	RPH1-06-05	< 0.23	< 0.012	< 0.029	48.60	< 0.09	1.26	15.00	11.60	< 0.55	< 0.21	< 0.33	1.32	< 0.0125	21.76
6	RPH1-06-06	< 0.23	< 0.012	< 0.029	50.60	< 0.09	0.80	24.70	7.83	< 0.55	< 0.21	< 0.33	2.73	< 0.0125	13.15
7	RPH1-06-07	< 0.23	< 0.012	< 0.029	52.40	< 0.09	1.06	22.30	4.22	< 0.55	< 0.21	< 0.33	2.57	< 0.0125	17.11
8	RPH1-06-08	< 0.23	< 0.012	< 0.029	53.80	< 0.09	0.97	20.40	1.89	< 0.55	< 0.21	< 0.33	2.17	< 0.0125	20.68
9	RPH1-06-09	< 0.23	< 0.012	< 0.029	47.60	< 0.09	0.69	21.00	13.30	< 0.55	< 0.21	< 0.33	2.14	< 0.0125	15.15
10	RPH1-06-10	< 0.23	< 0.012	< 0.029	53.20	< 0.09	1.33	33.10	0.77	< 0.55	< 0.21	< 0.33	3.70	< 0.0125	7.66
11	RPH1-06-11	< 0.23	< 0.012	< 0.029	53.60	< 0.09	1.24	32.30	0.74	< 0.55	< 0.21	< 0.33	3.56	< 0.0125	8.54
12	RPH1-06-12	< 0.23	< 0.012	< 0.029	53.50	< 0.09	1.17	33.80	0.77	< 0.55	< 0.21	< 0.33	3.92	< 0.0125	6.77
13	RPH1-06-13	< 0.23	< 0.012	< 0.029	53.00	< 0.09	1.15	32.50	1.82	< 0.55	< 0.21	< 0.33	3.68	< 0.0125	7.74
14	RPH1-06-14	< 0.23	< 0.012	< 0.029	50.80	< 0.09	0.95	28.80	6.38	< 0.55	< 0.21	< 0.33	3.33	< 0.0125	9.65
15	RPH1-06-15	< 0.23	< 0.012	< 0.029	45.10	< 0.09	0.80	24.70	17.60	< 0.55	< 0.21	< 0.33	2.34	< 0.0125	9.24

Note: The results were done on dry basis.

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Eng. Feryal Yosef

Division Head: Eng .Maysoon Alkhzahee

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وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

The Hashemite Kingdom of Jordan

Ministry of Energy and Mineral Resources/ Laboratories & Quality Directorate

TEST REPORT

X-RAY SPECTROMETRIC& LOI ANALYSIS

Division Chemical & Mineral Analysis/Lab. X.R.F
Client Name & Address: مديرية دراسات المصادر الطبيعية
Sample Type: صلبة
Sample Method: By Client

Date of Receipt: 09/01/ 2022

Reporting Date: 16/01/2022
Test Report No.: 00011/01/2022-CH001-010
Sample Location:-
Testing Date: 11/01/2022

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO_3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
1	RPH2-07-01	0.40	< 0.012	0.061	48.20	< 0.09	3.45	0.90	9.76	0.71	0.36	< 0.33	< 0.51	< 0.0125	36.10
2	RPH2-07-02	0.28	< 0.012	0.044	44.80	< 0.09	12.00	0.95	9.68	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	31.60
3	RPH2-07-03	< 0.23	< 0.012	< 0.029	46.10	< 0.09	3.92	1.31	15.30	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	32.86
4	RPH2-07-04	< 0.23	< 0.012	< 0.029	40.80	< 0.09	1.10	1.63	27.10	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	28.79
5	RPH2-07-05	< 0.23	< 0.012	< 0.029	48.40	< 0.09	0.33	1.68	13.70	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	35.16
6	RPH2-07-06	0.33	< 0.012	0.031	43.80	< 0.09	<	3.12	21.40	0.64	< 0.21	< 0.33	< 0.51	< 0.0125	30.42
7	RPH2-07-07	< 0.23	< 0.012	< 0.029	43.90	< 0.09	0.13	1.79	21.70	0.55	< 0.21	< 0.33	< 0.51	< 0.0125	31.59
8	RPH2-07-08	0.28	< 0.012	0.053	51.40	< 0.09	<	1.49	8.56	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	37.65
9	RPH2-07-09	< 0.23	< 0.012	< 0.029	52.20	< 0.09	0.28	7.70	5.86	< 0.55	< 0.21	< 0.33	0.67	< 0.0125	32.51
10	RPH2-07-10	< 0.23	< 0.012	< 0.029	54.80	< 0.09	0.98	21.60	0.44	< 0.55	< 0.21	< 0.33	2.27	< 0.0125	19.79
11	RPH2-07-11	< 0.23	< 0.012	< 0.029	42.80	< 0.09	0.33	9.95	24.00	< 0.55	< 0.21	< 0.33	0.71	< 0.0125	22.01

Reporting Date: 16/01/2022 *Test Report No.: 00011/01/2022-CH001-010*

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO_3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
12	RPH2-07-12	< 0.23	< 0.012	< 0.029	49.30	< 0.09	0.42	13.60	11.50	< 0.55	< 0.21	< 0.33	1.15	< 0.0125	23.73
13	RPH2-07-13	< 0.23	< 0.012	< 0.029	54.00	< 0.09	1.24	29.30	0.30	< 0.55	< 0.21	< 0.33	3.35	< 0.0125	11.75
14	RPH2-07-14	< 0.23	< 0.012	< 0.029	54.30	< 0.09	1.10	23.00	0.51	< 0.55	< 0.21	< 0.33	3.67	< 0.0125	18.31
15	RPH2-07-15	< 0.23	< 0.012	< 0.029	28.10	< 0.09	0.58	13.60	47.50	< 0.55	< 0.21	0.67	0.90	< 0.0125	8.13
16	RPH2-07-16	< 0.23	< 0.012	< 0.029	49.00	< 0.09	1.15	25.50	9.94	< 0.55	< 0.21	< 0.33	2.59	< 0.0125	11.69
17	RPH2-07-17	< 0.23	< 0.012	< 0.029	52.10	< 0.09	0.91	29.10	4.50	< 0.55	< 0.21	< 0.33	3.14	< 0.0125	10.21
18	RPH2-07-18	< 0.23	< 0.012	< 0.029	52.90	< 0.09	1.20	33.30	2.24	< 0.55	< 0.21	< 0.33	3.76	< 0.0125	6.54

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Ministry of Energy and Mineral Resources/ Laboratories & Quality Directorate

TEST REPORT

X-RAY SPECTROMETRIC& LOI ANALYSIS

Division Chemical & Mineral Analysis/Lab. X.R.F
Client Name & Address: مديرية دراسات المصادر الطبيعية
Sample Type: صلبة
Sample Method: By Client
Date of Receipt: 09/01/ 2022

Reporting Date: 18/01/2022
Test Report No.: 00012/01/2022-CH001-011
Sample Location:-
Testing Date: 11/01/2022

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO_3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
1	RPH1-08-01	1.60	0.025	0.216	26.60	0.16	0.25	0.40	43.60	2.28	1.25	< 0.33	< 0.51	< 0.0125	23.58
2	RPH1-08-02	0.69	< 0.012	0.093	35.90	< 0.09	1.03	0.50	32.20	1.05	0.70	< 0.33	< 0.51	< 0.0125	27.78
3	RPH1-08-03	0.54	< 0.012	0.080	40.30	< 0.09	3.37	0.43	23.90	0.75	0.48	< 0.33	< 0.51	< 0.0125	30.19
4	RPH1-08-04	< 0.23	< 0.012	0.039	45.70	< 0.09	0.85	0.50	17.20	< 0.55	0.27	< 0.33	< 0.51	< 0.0125	34.83
5	RPH1-08-05	< 0.23	< 0.012	0.026	39.00	< 0.09	0.50	0.51	29.90	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	29.45
6	RPH1-08-06	< 0.23	< 0.012	< 0.029	47.30	< 0.09	< 0.058	0.95	14.80	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	36.46
7	RPH1-08-07	0.29	< 0.012	0.029	41.50	< 0.09	0.072	2.42	24.80	0.58	< 0.21	< 0.33	< 0.51	< 0.0125	30.16
8	RPH1-08-08	< 0.23	< 0.012	< 0.029	50.30	< 0.09	< 0.058	0.70	10.80	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	37.77
9	RPH1-08-09	< 0.23	< 0.012	< 0.029	43.10	< 0.09	< 0.058	0.71	24.10	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	31.78
10	RPH1-08-10	< 0.23	< 0.012	< 0.029	47.20	< 0.09	0.12	1.30	16.00	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	34.79
11	RPH1-08-11	< 0.23	< 0.012	< 0.029	50.50	< 0.09	< 0.058	1.07	9.71	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	37.92

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO_3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
12	RPH1-08-12	< 0.23	< 0.012	< 0.029	47.90	< 0.09	< 0.058	1.28	14.50	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	35.40
13	RPH1-08-13	0.25	< 0.012	< 0.029	49.10	< 0.09	< 0.058	2.72	12.20	0.58	< 0.21	< 0.33	< 0.51	< 0.0125	34.97
14	RPH1-08-14	< 0.23	< 0.012	< 0.029	53.30	< 0.09	< 0.058	1.47	5.18	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	39.37
15	RPH1-08-15	< 0.23	< 0.012	< 0.029	53.60	< 0.09	0.26	7.67	3.27	< 0.55	< 0.21	< 0.33	0.65	< 0.0125	33.75
16	RPH1-08-16	< 0.23	< 0.012	< 0.029	52.40	< 0.09	0.13	5.82	5.74	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	34.86
17	RPH1-08-17	0.37	< 0.012	0.053	51.80	< 0.09	0.46	16.40	5.00	0.75	< 0.21	< 0.33	1.76	< 0.0125	23.33
18	RPH1-08-18	0.23	< 0.012	0.033	49.10	< 0.09	0.14	7.36	11.40	< 0.55	< 0.21	< 0.33	0.67	< 0.0125	30.54

Note: The results were done on dry basis.

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Analyzed by: Eng. Nidal Tayyem
Eng. Feryal Yosef

Division Head: Eng .Maysoon Alkhzahee

Laboratories & Quality Director : Eng .Maysoon Alkhzahee

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وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

The Hashemite Kingdom of Jordan

Ministry of Energy and Mineral Resources/ Laboratories & Quality Directorate

TEST REPORT

X-RAY SPECTROMETRIC& LOI ANALYSIS

Division Chemical & Mineral Analysis/Lab. X.R.F ***Reporting Date: 16/01/2022***

Client Name & Address: مديرية دراسات المصادر الطبيعية ***Test Report No.: 0001 1/01/2022-CH001-010***

Sample Type: صلبة ***Sample Location:-***

Sample Method: By Client ***Date of Receipt: 09/01/ 2022*** ***Testing Date: 11/01/2022***

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO_3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
1	**RPH2-07-01**	0.40	< 0.012	0.061	48.20	< 0.09	3.45	0.90	9.76	0.71	0.36	< 0.33	< 0.51	< 0.0125	36.10
2	**RPH2-07-02**	0.28	< 0.012	0.044	44.80	< 0.09	12.00	0.95	9.68	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	31.60
3	**RPH2-07-03**	< 0.23	< 0.012	< 0.029	46.10	< 0.09	3.92	1.31	15.30	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	32.86
4	**RPH2-07-04**	< 0.23	< 0.012	< 0.029	40.80	< 0.09	1.10	1.63	27.10	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	28.79
5	**RPH2-07-05**	< 0.23	< 0.012	< 0.029	48.40	< 0.09	0.33	1.68	13.70	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	35.16
6	**RPH2-07-06**	0.33	< 0.012	0.031	43.80	< 0.09	<	3.12	21.40	0.64	< 0.21	< 0.33	< 0.51	< 0.0125	30.42
7	**RPH2-07-07**	< 0.23	< 0.012	< 0.029	43.90	< 0.09	0.13	1.79	21.70	0.55	< 0.21	< 0.33	< 0.51	< 0.0125	31.59
8	**RPH2-07-08**	0.28	< 0.012	0.053	51.40	< 0.09	<	1.49	8.56	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	37.65
9	**RPH2-07-09**	< 0.23	< 0.012	< 0.029	52.20	< 0.09	0.28	7.70	5.86	< 0.55	< 0.21	< 0.33	0.67	< 0.0125	32.51
10	**RPH2-07-10**	< 0.23	< 0.012	< 0.029	54.80	< 0.09	0.98	21.60	0.44	< 0.55	< 0.21	< 0.33	2.27	< 0.0125	19.79
11	**RPH2-07-11**	< 0.23	< 0.012	< 0.029	42.80	< 0.09	0.33	9.95	24.00	< 0.55	< 0.21	< 0.33	0.71	< 0.0125	22.01

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO_3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
12	**RPH2-07-12**	< 0.23	< 0.012	< 0.029	49.30	< 0.09	0.42	13.60	11.50	< 0.55	< 0.21	< 0.33	1.15	< 0.0125	23.73
13	**RPH2-07-13**	< 0.23	< 0.012	< 0.029	54.00	< 0.09	1.24	29.30	0.30	< 0.55	< 0.21	< 0.33	3.35	< 0.0125	11.75
14	**RPH2-07-14**	< 0.23	< 0.012	< 0.029	54.30	< 0.09	1.10	23.00	0.51	< 0.55	< 0.21	< 0.33	3.67	< 0.0125	18.31
15	**RPH2-07-15**	< 0.23	< 0.012	< 0.029	28.10	< 0.09	0.58	13.60	47.50	< 0.55	< 0.21	0.67	0.90	< 0.0125	8.13
16	**RPH2-07-16**	< 0.23	< 0.012	< 0.029	49.00	< 0.09	1.15	25.50	9.94	< 0.55	< 0.21	< 0.33	2.59	< 0.0125	11.69
17	**RPH2-07-17**	< 0.23	< 0.012	< 0.029	52.10	< 0.09	0.91	29.10	4.50	< 0.55	< 0.21	< 0.33	3.14	< 0.0125	10.21
18	**RPH2-07-18**	< 0.23	< 0.012	< 0.029	52.90	< 0.09	1.20	33.30	2.24	< 0.55	< 0.21	< 0.33	3.76	< 0.0125	6.54

Note: The results were done on dry basis.

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Analyzed by: Eng. Nidal Tayyem
Eng. Feryal Yosef

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The Hashemite Kingdom of Jordan

Ministry of Energy and Mineral Resources/ Laboratories & Quality Directorate

TEST REPORT

X-RAY SPECTROMETRIC& LOI ANALYSIS

Division Chemical & Mineral Analysis/Lab. X.R.F
Client Name & Address: مديرية دراسات المصادر الطبيعية
Sample Type: صلبة
Sample Method: By Client
Date of Receipt: 16/01/ 2022

Reporting Date: 20/01/2022
Test Report No.: 00017/01/2022-CH001-012
Sample Location:-
Testing Date: 20/01/2022

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO_3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
1	RPH1-09-01	1.97	0.042	0.26	32.6	0.19	0.081	0.48	33.00	3.09	1.47	< 0.33	< 0.51	< 0.0125	26.85
2	RPH1-09-02	0.69	0.021	0.090	44.00	< 0.09	0.16	0.42	19.00	1.08	0.59	< 0.33	< 0.51	< 0.0125	33.98
3	RPH1-09-03	0.23	< 0.012	0.036	48.20	< 0.09	0.18	0.48	14.00	< 0.55	0.23	< 0.33	< 0.51	< 0.0125	36.17
4	RPH1-09-04	< 0.23	< 0.012	0.036	49.60	< 0.09	< 0.058	0.50	11.20	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	37.91
5	RPH1-09-05	< 0.23	< 0.012	< 0.029	50.50	< 0.09	< 0.058	0.63	10.60	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	37.86
6	RPH1-09-06	< 0.23	< 0.012	< 0.029	49.40	< 0.09	< 0.058	0.80	12.80	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	36.61
7	RPH1-09-07	< 0.23	< 0.012	< 0.029	50.50	< 0.09	0.14	1.36	10.40	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	37.03
8	RPH1-09-08	< 0.23	< 0.012	0.029	51.60	< 0.09	< 0.058	0.46	7.26	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	40.00
9	RPH1-09-09	< 0.23	< 0.012	< 0.029	47.30	< 0.09	< 0.058	1.04	15.80	< 0.55	0.21	< 0.33	< 0.51	< 0.0125	34.94
10	RPH1-09-10	0.30	< 0.012	< 0.029	46.60	< 0.09	< 0.058	2.75	16.90	0.57	0.26	< 0.33	< 0.51	< 0.0125	32.59
11	RPH1-09-11	< 0.23	< 0.012	< 0.029	52.70	< 0.09	< 0.058	1.52	6.47	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	38.77

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

Reporting Date: 20/01/2022

Test Report No.: 00017/01/2022-CH001-012

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO_3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
12	RPH1-09-12	< 0.23	< 0.012	< 0.029	53.60	< 0.09	0.060	3.55	4.07	< 0.55	0.29	< 0.33	< 0.17	< 0.0125	37.51
13	RPH1-09-13	< 0.23	< 0.012	< 0.029	51.90	< 0.09	0.36	8.40	6.47	< 0.55	0.27	< 0.33	0.67	< 0.0125	31.58
14	RPH1-09-14	< 0.23	< 0.012	< 0.029	53.50	< 0.09	0.88	20.80	2.27	< 0.55	< 0.21	< 0.33	2.44	< 0.0125	19.91
15	RPH1-09-15	< 0.23	< 0.012	< 0.029	49.10	< 0.09	0.59	14.90	11.70	< 0.55	< 0.21	< 0.33	1.46	< 0.0125	22.08
16	RPH1-09-16	< 0.23	< 0.012	< 0.029	49.10	< 0.09	0.70	19.80	10.80	< 0.55	< 0.21	< 0.33	1.95	< 0.0125	17.22
17	RPH1-09-17	< 0.23	< 0.012	< 0.029	52.80	< 0.09	1.01	24.30	3.12	< 0.55	< 0.13	< 0.33	2.70	< 0.0125	15.93
18	RPH1-09-18	< 0.23	< 0.012	< 0.029	53.40	< 0.09	0.74	15.60	3.35	< 0.55	< 0.13	< 0.33	1.56	< 0.0125	25.06
19	RPH1-09-19	< 0.23	< 0.012	< 0.029	38.40	< 0.09	0.086	4.90	32.60	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	23.57

Note: The results were done on dry basis.

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Analyzed by: Eng. Nidal Tayyem Nedal
Eng. Feryal Yosef

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وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

The Hashemite Kingdom of Jordan

Ministry of Energy and Mineral Resources/ Laboratories & Quality Directorate

TEST REPORT

X-RAY SPECTROMETRIC& LOI ANALYSIS

Division Chemical & Mineral Analysis/Lab. X.R.F
Client Name & Address: مديرية دراسات المصادر الطبيعية
Sample Type: صلبة
Sample Method: By Client
Date of Receipt: 16/01/ 2022

Reporting Date: 30/01/2022
Test Report No.: 00018/01/2022-CH001-014
Sample Location:-
Testing Date: 26/01/2022

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO_3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
1	RPH1-10-01	2.40	0.036	0.31	24.90	0.21	1.00	0.51	40.30	3.57	2.22	1.62	< 0.51	< 0.0125	22.93
2	RPH1-10-02	1.06	0.013	0.14	32.70	< 0.09	3.80	0.53	34.70	1.51	1.05	< 0.33	< 0.51	< 0.0125	24.45
3	RPH1-10-03	0.49	< 0.012	0.07	38.20	< 0.09	18.8	0.82	17.8	0.78	0.31	< 0.33	< 0.51	< 0.0125	22.71
4	RPH1-10-04	< 0.23	< 0.012	0.03	50.80	< 0.09	2.70	1.00	8.06	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	36.61
5	RPH1-10-05	< 0.23	< 0.012	0.03	46.30	< 0.09	1.49	3.58	16.8	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	30.84
6	RPH1-10-06	< 0.23	< 0.012	< 0.029	51.30	< 0.09	1.36	10.3	6.69	< 0.55	< 0.21	< 0.33	0.90	< 0.0125	28.87
7	RPH1-10-07	< 0.23	< 0.012	< 0.029	51.90	< 0.09	0.23	7.00	7.50	< 0.55	< 0.21	< 0.33	0.63	< 0.0125	32.48
8	RPH1-10-08	< 0.23	< 0.012	0.03	51.30	< 0.09	0.042	1.16	8.32	< 0.55	0.30	< 0.33	< 0.51	< 0.0125	38.17
9	RPH1-10-09	< 0.23	< 0.012	< 0.029	52.10	< 0.09	0.72	22.20	5.17	< 0.55	< 0.21	< 0.33	2.35	< 0.0125	17.05
10	RPH1-10-10	< 0.23	< 0.012	< 0.029	50.50	< 0.09	0.59	20.30	8.72	< 0.55	< 0.21	< 0.33	1.81	< 0.0125	17.73
11	RPH1-10-11	< 0.23	< 0.012	< 0.029	52.80	< 0.09	0.75	23.80	3.56	< 0.55	< 0.21	< 0.33	2.73	< 0.0125	16.27
12	RPH1-10-12	< 0.23	< 0.012	< 0.029	47.10	< 0.09	1.15	25.90	12.70	< 0.55	< 0.21	< 0.33	2.78	< 0.0125	10.01
13	RPH1-10-13	< 0.23	< 0.012	< 0.029	53.40	< 0.09	1.02	22.30	1.33	< 0.55	< 0.21	< 0.33	2.40	< 0.0125	19.34
14	RPH1-10-14	< 0.23	< 0.012	< 0.029	18.60	< 0.09	0.20	6.58	65.5	< 0.55	< 0.21	0.41	< 0.51	< 0.0125	7.62

Note: The results were done on dry basis.

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مديرية المختبرات والجودة

The Hashemite Kingdom of Jordan

Ministry of Energy and Mineral Resources/ Laboratories & Quality Directorate

TEST REPORT

X-RAY SPECTROMETRIC& LOI ANALYSIS

Division Chemical & Mineral Analysis/Lab. X.R.F
Client Name & Address: مديرية دراسات المصادر الطبيعية
Sample Type: صلبة
Sample Method: By Client
Date of Receipt: 16/01/ 2022

Reporting Date: 31/01/2022
Test Report No.: 00019/01/2022-CH001-015
Sample Location:-
Testing Date: 30/01/2022

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO_3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
1	RPH1-11-01	1.71	0.019	0.24	35.20	0.19	0.36	0.49	27.10	2.57	1.70	0.79	< 0.51	< 0.0125	29.65
2	RPH1-11-02	0.63	< 0.012	0.091	42.90	< 0.09	1.86	0.43	19.50	0.99	0.68	< 0.33	< 0.51	< 0.0125	32.91
3	RPH1-11-03	0.34	< 0.012	0.050	40.30	< 0.09	2.18	0.41	26.10	0.61	0.39	< 0.33	< 0.51	< 0.0125	29.69
4	RPH1-11-04	0.29	< 0.012	0.035	44.90	< 0.09	0.51	1.40	20.00	0.58	< 0.21	< 0.33	< 0.51	< 0.0125	32.22
5	RPH1-11-05	< 0.23	< 0.012	< 0.029	48.80	< 0.09	0.017	1.40	14.80	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	34.29
6	RPH1-11-06	< 0.23	< 0.012	< 0.029	48.10	< 0.09	0.82	15.90	12.30	< 0.55	< 0.21	< 0.33	1.60	< 0.0125	20.49
7	RPH1-11-07	< 0.23	< 0.012	< 0.029	51.20	< 0.09	0.48	10.70	8.51	< 0.55	< 0.21	< 0.33	1.08	< 0.0125	27.82
8	RPH1-11-08	< 0.23	< 0.012	< 0.029	53.5	< 0.09	0.59	20.50	3.40	< 0.55	< 0.21	< 0.33	2.12	< 0.0125	19.89
9	RPH1-11-09	< 0.23	< 0.012	< 0.029	54.00	< 0.09	0.64	17.40	2.04	< 0.55	< 0.21	< 0.33	1.88	< 0.0125	23.95
10	RPH1-11-10	< 0.23	< 0.012	< 0.029	54.50	< 0.09	0.89	25.50	0.46	< 0.55	< 0.21	< 0.33	2.70	< 0.0125	15.83
11	RPH1-11-11	< 0.23	< 0.012	< 0.029	52.00	< 0.09	0.69	23.10	5.36	< 0.55	< 0.21	< 0.33	2.46	< 0.0125	15.96
12	RPH1-11-12	< 0.23	< 0.012	< 0.029	52.80	< 0.09	1.12	27.70	2.46	< 0.55	< 0.21	< 0.33	3.23	< 0.0125	12.63
13	RPH1-11-13	< 0.23	< 0.012	< 0.029	53.40	< 0.09	1.39	25.60	0.97	< 0.55	< 0.21	< 0.33	2.83	< 0.0125	15.61
14	RPH1-11-14	< 0.23	< 0.012	< 0.029	30.80	< 0.09	0.34	9.71	44.90	< 0.55	< 0.21	< 0.33	0.53	< 0.0125	13.49

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

Reporting Date: 31/01/2022

Test Report No.: 00019/01/2022-CH001-015

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO_3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
15	RPH1-11-15	< 0.23	< 0.012	< 0.029	51.70	< 0.09	1.15	32.40	3.87	< 0.55	< 0.21	< 0.33	3.74	< 0.0125	6.84
16	RPH1-11-16	< 0.23	< 0.012	< 0.029	53.00	< 0.09	1.02	33.30	1.87	< 0.55	< 0.21	< 0.33	3.91	< 0.0125	6.66
17	RPH1-11-17	< 0.23	< 0.012	< 0.029	47.70	< 0.09	0.84	29.80	12.30	< 0.55	< 0.21	< 0.33	3.06	< 0.0125	6.25
18	RPH1-11-18	< 0.23	< 0.012	< 0.029	46.90	< 0.09	0.73	25.00	14.50	< 0.55	< 0.21	< 0.33	2.68	< 0.0125	10.15
19	RPH1-11-19	< 0.23	< 0.012	< 0.029	51.70	< 0.09	0.67	22.70	7.40	< 0.55	< 0.21	< 0.33	2.29	< 0.0125	15.15
20	RPH1-11-20	< 0.23	< 0.012	< 0.029	53.80	< 0.09	0.23	10.40	3.97	< 0.55	< 0.21	< 0.33	0.80	< 0.0125	30.70
21	RPH1-11-21	< 0.23	< 0.012	< 0.029	51.30	< 0.09	0.31	11.50	8.59	< 0.55	< 0.21	< 0.33	0.94	< 0.0125	27.22
22	RPH1-11-22	< 0.23	< 0.012	< 0.029	46.10	< 0.09	0.60	19.20	16.30	< 0.55	< 0.21	< 0.33	1.77	< 0.0125	15.91
23	RPH1-11-23	< 0.23	< 0.012	< 0.029	45.60	< 0.09	0.67	17.80	17.30	< 0.55	< 0.21	< 0.33	1.63	< 0.0125	16.81
24	RPH1-11-24	< 0.23	< 0.012	< 0.029	44.30	< 0.09	0.22	8.65	21.20	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	24.98

Note: The results were done on dry basis.

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Analyzed by: Eng. Nidal Tayyem
Eng. Feryal Yosef

Division Head: Eng .Maysoon Alkhzahee

Laboratories & Quality Director : Eng .Maysoon Alkhzahee

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وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

The Hashemite Kingdom of Jordan

Ministry of Energy and Mineral Resources/ Laboratories & Quality Directorate

TEST REPORT

X-RAY SPECTROMETRIC& LOI ANALYSIS

Division Chemical & Mineral Analysis/Lab. X.R.F
Client Name & Address: مديرية دراسات المصادر الطبيعية
Sample Type: صلبة
Sample Method: By Client

Date of Receipt: 25/01/ 2022

Reporting Date: 06/02/2022
Test Report No.: 00032/01/2022-CH001-020
Sample Location:-
Testing Date: 02/02/2022

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO_3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
1	RPH1 BH12 1	0.39	< 0.012	0.066	49.80	< 0.09	6.03	0.53	4.53	0.71	0.28	< 0.33	< 0.51	< 0.0125	37.61
2	RPH1 BH12 2	0.35	< 0.012	0.062	52.20	< 0.09	1.69	0.41	4.38	0.66	0.35	< 0.33	< 0.51	< 0.0125	39.85
3	RPH1 BH12 3	0.30	< 0.012	0.053	48.50	< 0.09	3.31	0.43	10.30	< 0.55	0.22	< 0.33	< 0.51	< 0.0125	36.32
4	RPH1 BH12 4	< 0.23	< 0.012	< 0.029	51.20	< 0.09	1.17	0.49	8.68	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	38.00
5	RPH1 BH12 5	0.35	< 0.012	0.06	51.00	< 0.09	0.57	0.53	8.12	0.67	0.24	< 0.33	< 0.51	< 0.0125	38.46
6	RPH1 BH12 6	< 0.23	< 0.012	0.035	49.1	< 0.09	0.51	0.72	12.8	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	36.24
7	RPH1 BH12 7	< 0.23	< 0.012	0.036	51.6	< 0.09	0.60	0.84	8.35	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	37.96
8	RPH1 BH12 8	< 0.23	< 0.012	< 0.029	51.6	< 0.09	< 0.058	0.87	8.48	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	38.27
9	RPH1 BH12 9	0.24	< 0.012	< 0.029	46.2	< 0.09	0.08	1.50	17.7	0.61	0.31	< 0.33	< 0.51	< 0.0125	33.37
10	RPH1 BH12 10	0.41	< 0.012	0.048	46.5	< 0.09	0.08	2.63	16.8	0.82	< 0.21	< 0.33	< 0.51	< 0.0125	32.53
11	RPH1 BH12 11	< 0.23	< 0.012	< 0.029	52.8	< 0.09	< 0.058	1.22	6.32	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	39.42
12	RPH1 BH12 12	0.24	< 0.012	< 0.029	53.5	< 0.09	< 0.058	3.40	4.32	0.57	< 0.21	< 0.33	< 0.51	< 0.0125	37.35
13	RPH1 BH12 13	< 0.23	< 0.012	< 0.029	53.5	< 0.09	0.63	15.8	3.09	< 0.55	< 0.21	< 0.33	1.50	< 0.0125	24.77
14	RPH1 BH12 14	0.35	< 0.012	0.047	46.5	< 0.09	0.68	18.2	14.1	0.89	< 0.21	< 0.33	1.77	< 0.0125	17.30

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO_3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
15	**RPH1 BH12 15**	0.26	< 0.012	0.035	48.00	< 0.09	0.96	26.10	10.50	0.59	< 0.21	< 0.33	2.82	< 0.0125	10.69
16	**RPH1 BH12 16**	< 0.23	< 0.012	< 0.029	52.20	< 0.09	1.26	27.90	2.62	< 0.55	< 0.21	< 0.33	3.13	< 0.0125	12.18
17	**RPH1 BH12 17**	< 0.23	< 0.012	< 0.029	52.70	< 0.09	1.41	18.10	3.26	< 0.55	< 0.21	< 0.33	1.84	< 0.0125	22.23
18	**RPH1 BH12 18**	< 0.23	< 0.012	< 0.029	42.00	< 0.09	1.03	22.60	22.60	< 0.55	< 0.21	< 0.33	2.21	< 0.0125	9.25
19	**RPH1 BH12 19**	< 0.23	< 0.012	< 0.029	49.60	< 0.09	1.12	28.10	8.24	< 0.55	< 0.21	< 0.33	3.25	< 0.0125	9.53
20	**RPH1 BH12 20**	< 0.23	< 0.012	< 0.029	41.70	< 0.09	0.76	24.00	23.70	< 0.55	< 0.21	< 0.33	2.12	< 0.0125	7.60

Note: The results were done on dry basis.

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Division Head: Eng .Maysoon Alkhzahee

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The Hashemite Kingdom of Jordan

Ministry of Energy and Mineral Resources/ Laboratories & Quality Directorate

TEST REPORT

X-RAY SPECTROMETRIC& LOI ANALYSIS

Division Chemical & Mineral Analysis/Lab. X.R.F
Client Name & Address: مديرية دراسات المصادر الطبيعية
Sample Type: صلبة
Sample Method: By Client

Date of Receipt: 03/02/ 2022

Reporting Date: 13/02/2022
Test Report No.: 00042/02/2022-CH001-027
Sample Location:-
Testing Date: 10/02/2022

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO_3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
1	RPH1 –BH13-1	0.89	0.012	0.13	42.40	< 0.09	10.40	0.70	12.10	1.40	0.76	< 0.33	< 0.51	< 0.0125	31.13
2	RPH1 –BH13-2	< 0.23	< 0.012	< 0.029	53.80	< 0.09	2.81	0.49	3.60	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	39.01
3	RPH1 –BH13-3	< 0.23	< 0.012	< 0.029	51.00	< 0.09	0.43	0.49	10.20	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	37.57
4	RPH1 –BH13-4	< 0.23	< 0.012	0.042	47.90	< 0.09	0.88	0.39	15.20	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	34.95
5	RPH1 –BH13-5	< 0.23	< 0.012	< 0.029	47.80	< 0.09	0.61	0.96	15.60	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	34.56
6	RPH1 –BH13-6	< 0.23	< 0.012	< 0.029	50.20	< 0.09	0.21	1.03	11.50	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	36.60
7	RPH1 –BH13-7	< 0.23	< 0.012	< 0.029	50.20	< 0.09	< 0.058	1.10	11.00	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	36.85
8	RPH1 –BH13-8	< 0.23	< 0.012	< 0.029	48.50	< 0.09	0.51	1.60	13.60	0.62	0.23	< 0.33	< 0.51	< 0.0125	34.78
9	RPH1 –BH13-9	< 0.23	< 0.012	< 0.029	48.20	< 0.09	< 0.058	2.14	14.50	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	34.19
10	RPH1 –BH13-10	0.33	< 0.012	0.037	48.20	< 0.09	< 0.058	2.49	14.00	0.79	< 0.21	< 0.33	< 0.51	< 0.0125	33.97
11	RPH1 –BH13-11	< 0.23	< 0.012	< 0.029	49.70	< 0.09	< 0.058	1.90	11.80	0.58	< 0.21	< 0.33	< 0.51	< 0.0125	35.63
12	RPH1 –BH13-12	< 0.23	< 0.012	< 0.029	53.10	< 0.09	0.22	6.20	4.50	< 0.55	0.25	< 0.33	0.51	< 0.0125	34.59
13	RPH1 –BH13-13	< 0.23	< 0.012	< 0.029	53.80	< 0.09	0.27	8.27	4.15	< 0.55	< 0.21	< 0.33	0.66	< 0.0125	32.61
14	RPH1 –BH13-14	< 0.23	< 0.012	< 0.029	54.80	< 0.09	0.31	7.77	2.24	< 0.55	< 0.21	< 0.33	0.61	< 0.0125	34.12

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Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO_3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
15	**RPH1 –BH13-15**	< 0.23	< 0.012	< 0.029	44.20	< 0.09	< 0.058	4.90	21.60	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	28.40
16	**RPH1 –BH13-16**	< 0.23	< 0.012	< 0.029	47.60	< 0.09	0.40	13.10	14.30	< 0.55	< 0.21	< 0.33	1.13	< 0.0125	23.17
17	**RPH1 –BH13-17**	< 0.23	< 0.012	< 0.029	53.40	< 0.09	1.00	23.00	1.29	< 0.55	< 0.21	< 0.33	2.73	< 0.0125	18.44
18	**RPH1 –BH13-18**	< 0.23	< 0.012	< 0.029	53.10	< 0.09	0.87	16.70	3.22	< 0.55	< 0.21	< 0.33	1.72	< 0.0125	24.09
19	**RPH1 –BH13-19**	< 0.23	< 0.012	< 0.029	40.40	< 0.09	0.77	19.60	26.90	< 0.55	< 0.21	< 0.33	1.77	< 0.0125	10.43
20	**RPH1 –BH13-20**	0.30	< 0.012	0.045	39.50	< 0.09	0.80	18.80	27.20	< 0.55	< 0.21	< 0.33	1.78	< 0.0125	11.04
21	**RPH1 –BH13-21**	< 0.23	< 0.012	< 0.029	42.30	< 0.09	0.61	18.10	32.60	< 0.55	< 0.21	< 0.33	1.55	< 0.0125	13.72
22	**RPH1 –BH13-22**	< 0.23	< 0.012	< 0.029	50.00	< 0.09	0.65	21.40	9.28	< 0.55	< 0.21	< 0.33	2.22	< 0.0125	16.33
23	**RPH1 –BH13-23**	< 0.23	< 0.012	< 0.029	49.50	< 0.09	0.74	25.00	9.49	< 0.55	< 0.21	< 0.33	2.70	< 0.0125	12.38

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وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

The Hashemite Kingdom of Jordan

Ministry of Energy and Mineral Resources/ Laboratories & Quality Directorate

TEST REPORT

X-RAY SPECTROMETRIC& LOI ANALYSIS

Division Chemical & Mineral Analysis/Lab. X.R.F
Client Name & Address: مديرية دراسات المصادر الطبيعية
Sample Type: صلبة
Sample Method: By Client
Date of Receipt: 02/02/ 2022

Reporting Date: 10/02/2022
Test Report No.: 00040/02/2022-CH001-025
Sample Location:-
Testing Date: 09/02/2022

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO_3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
1	RPH1-BH14-1	1.59	0.022	0.21	38.60	0.22	< 0.058	1.31	23.60	2.55	1.20	< 0.33	< 0.51	< 0.0125	30.74
2	RPH1-BH14-2	1.60	0.017	0.22	34.60	0.18	< 0.058	1.53	31.00	2.45	1.14	< 0.33	< 0.51	< 0.0125	27.23
3	RPH1-BH14-3	1.43	0.016	0.19	35.10	0.15	< 0.058	1.60	31.10	2.17	1.00	< 0.33	< 0.51	< 0.0125	27.24
4	RPH1-BH14-4	1.70	0.016	0.25	32.00	0.18	< 0.058	1.54	36.10	2.48	1.08	< 0.33	< 0.51	< 0.0125	24.68
5	RPH1-BH14-5	1.88	0.021	0.30	35.00	0.25	< 0.058	1.85	29.60	2.83	1.13	< 0.33	< 0.51	< 0.0125	27.18
6	RPH1-BH14-6	2.02	0.020	0.31	28.90	0.22	< 0.058	2.22	40.30	2.93	1.10	< 0.33	< 0.51	< 0.0125	21.93
7	RPH1-BH14-7	2.08	0.020	0.41	23.90	0.23	< 0.058	2.30	49.30	2.72	0.99	< 0.33	< 0.51	< 0.0125	18.02
8	RPH1-BH14-8	1.64	0.017	0.30	29.40	0.17	< 0.058	3.00	41.10	2.20	0.82	< 0.33	< 0.51	< 0.0125	21.17
9	RPH1-BH14-9	1.82	0.022	0.24	33.90	0.19	< 0.058	5.59	31.60	2.80	0.85	< 0.33	< 0.51	< 0.0125	22.69
10	RPH1-BH14-10	0.33	< 0.012	0.050	44.90	< 0.09	0.21	8.56	18.30	0.55	0.22	< 0.33	0.57	< 0.0125	26.34
11	RPH1-BH14-11	< 0.23	< 0.012	< 0.029	51.90	< 0.09	0.62	17.1	5.82	< 0.55	< 0.21	< 0.33	1.77	< 0.0125	22.41
12	RPH1-BH14-12	< 0.23	< 0.012	0.030	46.80	< 0.09	0.45	13.8	15.30	< 0.55	< 0.21	< 0.33	1.24	< 0.0125	21.77
13	RPH1-BH14-13	< 0.23	< 0.012	< 0.029	45.20	< 0.09	0.29	13.4	17.70	< 0.55	< 0.21	< 0.33	1.28	< 0.0125	21.73
14	RPH1-BH14-14	< 0.23	< 0.012	< 0.029	50.60	< 0.09	0.20	9.81	9.03	< 0.55	< 0.21	< 0.33	0.77	< 0.0125	29.11

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

Reporting Date: 10/02/2022

Test Report No.: 00040/02/2022-CH001-025

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO_3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
15	RPH1-BH14-15	< 0.23	< 0.012	0.038	41.70	< 0.09	0.085	6.30	25.00	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	25.84
16	RPH1-BH14-16	< 0.23	< 0.012	< 0.029	34.40	< 0.09	0.094	7.17	38.40	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	19.40
17	RPH1-BH14-17	< 0.23	< 0.012	< 0.029	29.90	< 0.09	< 0.058	3.59	47.50	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	18.72
18	RPH1-BH14-18	< 0.23	< 0.012	< 0.029	19.60	< 0.09	< 0.058	1.90	65.30	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	12.89
19	RPH1-BH14-19	< 0.23	< 0.012	< 0.029	19.30	< 0.09	< 0.058	1.49	66.20	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	12.70
20	RPH1-BH14-20	< 0.23	< 0.012	< 0.029	19.00	< 0.09	< 0.058	1.36	66.90	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	12.41
21	RPH1-BH14-21	< 0.23	< 0.012	< 0.029	13.20	< 0.09	< 0.058	1.32	75.40	< 0.55	< 0.21	1.12	< 0.51	< 0.0125	8.72

Note: The results were done on dry basis.

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Analyzed by: Eng. Nidal Tayyem
Eng. Feryal Yosef

Division Head: Eng .Maysoon Alkhzahee

Laboratories & Quality Director : Eng .Maysoon Alkhzahee

Jordan–Amman- Al Byader- 8th Circle . – Telefax +96265504409 – P.O. Box.7
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وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

The Hashemite Kingdom of Jordan

Ministry of Energy and Mineral Resources/ Laboratories & Quality Directorate

TEST REPORT

X-RAY SPECTROMETRIC& LOI ANALYSIS

Division Chemical & Mineral Analysis/Lab. X.R.F
Client Name & Address: مديرية دراسات المصادر الطبيعية
Sample Type: صلبة
Sample Method: By Client
Date of Receipt: 02/02/ 2022

Reporting Date: 10/02/2022
Test Report No.: 00039/02/2022-CH001-024
Sample Location:-
Testing Date: 09/02/2022

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO_3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
1	RPH1-BH15-A1	< 0.23	< 0.012	< 0.029	40.20	< 0.09	5.94	14.70	22.6	< 0.55	< 0.21	< 0.33	1.39	< 0.0125	14.54
2	RPH1-BH15-A2	< 0.23	< 0.012	< 0.029	51.80	< 0.09	4.73	26.00	1.65	< 0.55	< 0.21	< 0.33	3.04	< 0.0125	12.59
3	RPH1-BH15-A3	< 0.23	< 0.012	< 0.029	52.20	< 0.09	1.77	19.90	3.97	< 0.55	< 0.21	< 0.33	1.94	< 0.0125	19.92
4	RPH1-BH15-A4	< 0.23	< 0.012	< 0.029	51.80	< 0.09	1.76	21.90	3.36	< 0.55	< 0.21	< 0.33	2.53	< 0.0125	18.28
5	RPH1-BH15-A5	< 0.23	< 0.012	< 0.029	48.10	< 0.09	0.93	15.70	12.2	< 0.55	< 0.21	< 0.33	1.44	< 0.0125	21.24
6	RPH1-BH15-A6	< 0.23	< 0.012	< 0.029	40.70	< 0.09	0.91	18.60	25.2	< 0.55	< 0.21	< 0.33	1.94	< 0.0125	12.47
7	RPH1-BH15-A7	< 0.23	< 0.012	< 0.029	51.50	< 0.09	1.08	30.00	4.54	< 0.55	< 0.21	< 0.33	3.24	< 0.0125	9.46
8	RPH1-BH15-A8	< 0.23	< 0.012	< 0.029	52.40	< 0.09	1.14	28.70	2.91	< 0.55	< 0.21	< 0.33	3.19	< 0.0125	11.46
9	RPH1-BH15-A9	< 0.23	< 0.012	< 0.029	50.60	< 0.09	1.08	28.60	6.27	< 0.55	< 0.21	< 0.33	3.10	< 0.0125	10.19

Note: The results were done on dry basis.

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Analyzed by: Eng. Nidal Tayyem
Eng. Feryal Yosef

Laboratories & Quality Director : Eng .Maysoon Alkhzahee

Division Head: Eng .Maysoon Alkhzahee

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Ministry of Energy and Mineral Resources/ Laboratories & Quality Directorate

TEST REPORT

X-RAY SPECTROMETRIC& LOI ANALYSIS

Division Chemical & Mineral Analysis/Lab. X.R.F
Client Name & Address: مديرية دراسات المصادر الطبيعية
Sample Type: صلبة
Sample Method: By Client
Date of Receipt: 01/02/ 2022

Reporting Date: 09/02/2022
Test Report No.: 00038/02/2022-CH001-023
Sample Location:-
Testing Date: 06/02/2022

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO_3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
1	RPH1- BH 15-B1	0.69	0.019	0.096	44.70	< 0.09	0.83	8.70	15.80	1.04	0.61	< 0.33	1.12	< 0.0125	26.35
2	RPH1- BH 15-B2	0.45	< 0.012	0.072	48.80	< 0.09	6.81	6.27	5.23	0.77	0.35	< 0.33	0.65	< 0.0125	30.58
3	RPH1- BH 15-B3	< 0.23	< 0.012	< 0.029	49.90	< 0.09	2.28	19.20	7.42	< 0.55	< 0.21	< 0.33	2.06	< 0.0125	18.62
4	RPH1- BH 15-B4	< 0.23	< 0.012	< 0.029	49.40	< 0.09	1.56	19.80	9.47	< 0.55	< 0.21	< 0.33	2.11	< 0.0125	17.35
5	RPH1- BH 15-B5	< 0.23	< 0.012	< 0.029	53.20	< 0.09	1.21	29.90	1.53	< 0.55	< 0.21	< 0.33	3.30	< 0.0125	10.81
6	RPH1- BH 15-B6	< 0.23	< 0.012	< 0.029	52.30	< 0.09	1.38	28.80	2.42	< 0.55	< 0.21	< 0.33	3.24	< 0.0125	11.47
7	RPH1- BH 15-B7	< 0.23	< 0.012	< 0.029	52.40	< 0.09	1.27	24.60	3.09	< 0.55	< 0.21	< 0.33	2.60	< 0.0125	15.78
8	RPH1- BH 15-B8	< 0.23	< 0.012	< 0.029	29.90	< 0.09	0.54	11.20	45.30	< 0.55	< 0.21	0.41	0.85	< 0.0125	11.61
9	RPH1- BH 15-B9	< 0.23	< 0.012	< 0.029	28.20	< 0.09	0.39	10.10	48.80	< 0.55	< 0.21	0.68	0.56	< 0.0125	11.23
10	RPH1- BH 15-B10	< 0.23	< 0.012	< 0.029	50.00	< 0.09	1.01	31.50	7.46	< 0.55	< 0.21	< 0.33	3.47	< 0.0125	6.45
11	RPH1- BH 15-B11	< 0.23	< 0.012	< 0.029	37.00	< 0.09	0.40	16.30	33.10	< 0.55	< 0.21	< 0.33	1.52	< 0.0125	11.64
12	RPH1- BH 15-B12	< 0.23	< 0.012	< 0.029	40.10	< 0.09	0.56	22.00	27.00	< 0.55	< 0.21	< 0.33	2.11	< 0.0125	8.17
13	RPH1- BH 15-B13	< 0.23	< 0.012	< 0.029	44.50	< 0.09	0.60	25.40	18.70	< 0.55	< 0.21	< 0.33	2.47	< 0.0125	8.17
14	RPH1- BH 15-B14	< 0.23	< 0.012	< 0.029	45.30	< 0.09	0.77	28.30	16.50	< 0.55	< 0.21	< 0.33	3.01	< 0.0125	6.02

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO_3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
15	**RPH1- BH 15-B15**	< 0.23	< 0.012	< 0.029	40.30	< 0.09	0.61	21.00	26.5	< 0.55	< 0.21	< 0.33	2.04	< 0.0125	9.49
16	**RPH1- BH 15-B16**	< 0.23	< 0.012	< 0.029	46.20	< 0.09	0.53	23.10	16.4	< 0.55	< 0.21	< 0.33	2.14	< 0.0125	11.55
17	**RPH1- BH 15-B17**	< 0.23	< 0.012	< 0.029	36.20	< 0.09	0.36	18.80	34.4	< 0.55	< 0.21	< 0.33	1.65	< 0.0125	8.48
18	**RPH1- BH 15-B18**	< 0.23	< 0.012	< 0.029	24.70	< 0.09	0.19	12.20	55.6	< 0.55	< 0.21	< 0.33	0.80	< 0.0125	6.43

Note: The results were done on dry basis.

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Analyzed by: Eng. Nidal Tayyem
Eng. Feryal Yosef

Division Head: Eng .Maysoon Alkhzahee

Laboratories & Quality Director : Eng .Maysoon Alkhzahee

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

The Hashemite Kingdom of Jordan

Ministry of Energy and Mineral Resources/ Laboratories & Quality Directorate

TEST REPORT

X-RAY SPECTROMETRIC& LOI ANALYSIS

Division Chemical & Mineral Analysis/Lab. X.R.F
Client Name & Address: مديرية دراسات المصادر الطبيعية
Sample Type: صلبة
Sample Method: By Client

Date of Receipt: 14/02/ 2022

Reporting Date: 16/02/2022
Test Report No.: 00053/02/2022-CH001-028
Sample Location:-
Testing Date: 15/02/2022

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO_3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
1	RPH1-BH16-1	0.84	0.012	0.12	43.30	< 0.09	< 0.058	0.69	19.30	1.33	0.66	< 0.33	< 0.51	< 0.0125	33.71
2	RPH1-BH16-2	0.37	< 0.012	0.07	48.80	< 0.09	< 0.058	0.34	11.40	0.63	0.37	< 0.33	< 0.51	< 0.0125	37.98
3	RPH1-BH16-3	< 0.23	< 0.012	0.043	49.40	< 0.09	< 0.058	0.40	11.00	< 0.55	0.28	< 0.33	< 0.51	< 0.0125	38.29
4	RPH1-BH16-4	< 0.23	< 0.012	< 0.029	46.40	< 0.09	0.45	0.54	17.50	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	34.57
5	RPH1-BH16-5	< 0.23	< 0.012	0.032	44.70	< 0.09	0.29	0.60	20.30	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	33.36
6	RPH1-BH16-6	< 0.23	< 0.012	< 0.029	45.70	< 0.09	0.11	0.92	18.70	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	33.91
7	RPH1-BH16-7	< 0.23	< 0.012	0.031	44.50	< 0.09	0.14	1.32	21.00	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	32.27
8	RPH1-BH16-8	0.23	< 0.012	0.041	46.40	< 0.09	< 0.058	2.00	17.60	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	33.17
9	RPH1-BH16-9	< 0.23	< 0.012	< 0.029	50.30	< 0.09	0.10	5.00	10.30	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	33.53
10	RPH1-BH16-10	< 0.23	< 0.012	0.037	51.20	< 0.09	0.52	14.80	6.67	< 0.55	< 0.21	< 0.33	1.51	< 0.0125	24.80
11	RPH1-BH16-11	< 0.23	< 0.012	0.052	48.80	< 0.09	0.21	8.91	12.70	< 0.55	< 0.21	< 0.33	0.62	< 0.0125	28.12
12	RPH1-BH16-12	< 0.23	< 0.012	0.035	46.70	< 0.09	0.35	12.10	15.40	< 0.55	< 0.21	< 0.33	1.21	< 0.0125	23.70
13	RPH1-BH16-13	< 0.23	< 0.012	< 0.029	49.50	< 0.09	0.84	22.70	8.89	< 0.55	< 0.21	< 0.33	2.46	< 0.0125	15.46
14	RPH1-BH16-14	< 0.23	< 0.012	< 0.029	53.20	< 0.09	1.24	25.9	1.50	< 0.55	< 0.21	< 0.33	2.86	< 0.0125	15.15

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO_3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
15	RPH1-BH16-15	< 0.23	< 0.012	< 0.029	40.40	< 0.09	0.66	16.70	26.30	< 0.55	< 0.21	< 0.33	1.47	< 0.0125	14.24
16	RPH1-BH16-16 *	< 0.23	< 0.012	< 0.029	52.40	< 0.09	1.24	33.30	1.75	< 0.55	< 0.21	< 0.33	3.88	< 0.0125	7.26
17	RPH1-BH16-17	< 0.23	< 0.012	< 0.029	52.60	< 0.09	1.35	31.80	1.42	< 0.55	< 0.21	< 0.33	3.58	< 0.0125	9.16
18	RPH1-BH16-18	< 0.23	< 0.012	< 0.029	52.10	< 0.09	1.07	33.80	2.32	< 0.55	< 0.21	< 0.33	4.06	< 0.0125	6.36

Note: The results were done on dry basis.

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Analyzed by: Eng. Nidal Tayyem
Eng. Feryal Yosef

Division Head: Eng .Maysoon Alkhzahee

Laboratories & Quality Director : Eng .Maysoon Alkhzahee

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

The Hashemite Kingdom of Jordan

Ministry of Energy and Mineral Resources/ Laboratories & Quality Directorate

TEST REPORT

X-RAY SPECTROMETRIC& LOI ANALYSIS

Division Chemical & Mineral Analysis/Lab. X.R.F
Client Name & Address: مديرية دراسات المصادر الطبيعية
Sample Type: صلبة
Sample Method: By Client
Date of Receipt: 14/02/ 2022

Reporting Date: 23/02/2022
Test Report No.: 00054/02/2022-CH001-029
Sample Location:-
Testing Date: 22/02/2022

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO_3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
1	RPH1-BH17-1	1.08	0.013	0.150	39.20	< 0.09	0.085	0.69	25.30	1.72	0.96	< 0.33	< 0.51	< 0.0125	30.73
2	RPH1-BH17-2	0.58	< 0.012	0.088	43.60	< 0.09	< 0.058	0.58	20.40	0.95	0.58	< 0.33	< 0.51	< 0.0125	33.18
3	RPH1-BH17-3	0.45	< 0.012	0.074	43.70	< 0.09	0.44	0.34	21.10	0.73	0.44	< 0.33	< 0.51	< 0.0125	32.69
4	RPH1-BH17-4	< 0.23	< 0.012	0.035	47.80	< 0.09	1.11	0.56	13.90	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	35.74
5	RPH1-BH17-5	< 0.23	< 0.012	< 0.029	47.70	< 0.09	0.53	0.79	14.80	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	35.58
6	RPH1-BH17-6	0.29	< 0.012	0.040	44.80	< 0.09	0.53	0.64	19.10	< 0.55	0.31	< 0.33	< 0.51	< 0.0125	33.79
7	RPH1-BH17-7	0.25	< 0.012	0.032	42.20	< 0.09	0.30	0.62	23.80	< 0.55	< 0.21	0.94	< 0.51	< 0.0125	31.32
8	RPH1-BH17-8	< 0.23	< 0.012	< 0.029	48.80	< 0.09	< 0.058	0.72	13.60	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	36.18
9	RPH1-BH17-9	0.24	< 0.012	0.037	46.90	< 0.09	< 0.058	0.95	16.80	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	34.33
10	RPH1-BH17-10	0.27	< 0.012	0.035	44.30	< 0.09	< 0.058	0.97	21.30	0.56	< 0.21	< 0.33	< 0.51	< 0.0125	32.45
11	RPH1-BH17-11	0.27	< 0.012	0.035	45.20	< 0.09	< 0.058	0.58	20.30	0.62	0.22	< 0.33	< 0.51	< 0.0125	32.71
12	RPH1-BH17-12	0.31	< 0.012	0.040	40.90	< 0.09	< 0.058	0.98	23.30	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	33.66
13	RPH1-BH17-13	0.36	< 0.012	0.043	41.20	< 0.09	< 0.058	1.40	22.50	0.73	< 0.21	< 0.33	< 0.51	< 0.0125	33.60
14	RPH1-BH17-14	0.38	< 0.012	0.046	47.10	< 0.09	< 0.058	1.90	11.20	0.78	< 0.21	< 0.33	< 0.51	< 0.0125	38.38

وزارة الطاقة والثروة المعدنية
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Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO_3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
15	RPH1-BH17-15	0.37	< 0.012	0.050	46.20	< 0.09	< 0.058	3.30	14.10	0.72	0.29	< 0.33	< 0.51	< 0.0125	34.77
16	RPH1-BH17-16	0.36	< 0.012	0.054	48.50	< 0.09	0.11	6.94	7.77	0.75	0.29	< 0.33	< 0.51	< 0.0125	34.72
17	RPH1-BH17-17	0.37	< 0.012	0.051	35.40	< 0.09	0.21	9.74	30.50	0.70	0.40	< 0.33	0.71	< 0.0125	21.93
18	RPH1-BH17-18	0.29	< 0.012	0.046	46.40	< 0.09	0.46	15.00	11.00	0.61	< 0.21	< 0.33	1.36	< 0.0125	24.57
19	RPH1-BH17-19	0.46	< 0.012	0.063	37.40	< 0.09	0.38	13.2	26.10	0.86	0.29	< 0.33	1.04	< 0.0125	20.23
20	RPH1-BH17-20	0.43	< 0.012	0.058	38.20	< 0.09	0.50	16.3	24.90	0.77	0.25	< 0.33	1.33	< 0.0125	17.22
21	RPH1-BH17-21	0.33	< 0.012	0.054	45.10	< 0.09	0.64	19.00	12.00	0.68	0.24	< 0.33	1.99	< 0.0125	20.00
22	RPH1-BH17-22	0.27	< 0.012	0.040	25.20	< 0.09	0.35	9.36	49.60	< 0.55	< 0.21	< 0.33	0.60	< 0.0125	14.06
23	RPH1-BH17-23	0.39	< 0.012	0.046	27.20	< 0.09	0.19	8.02	46.00	0.66	< 0.21	< 0.33	< 0.51	< 0.0125	16.90
24	RPH1-BH17-24	< 0.23	< 0.012	< 0.029	30.70	< 0.09	0.11	6.73	40.80	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	20.61

Note: The results were done on dry basis.

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Analyzed by: Eng. Nidal Tayyem
Eng. Feryal Yosef

Division Head: Eng .Maysoon Alkhzahee

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وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

The Hashemite Kingdom of Jordan

Ministry of Energy and Mineral Resources/ Laboratories & Quality Directorate

TEST REPORT

X-RAY SPECTROMETRIC& LOI ANALYSIS

Division Chemical & Mineral Analysis/Lab. X.R.F
Client Name & Address: مديرية دراسات المصادر الطبيعية
Sample Type: صلبة
Sample Method: By Client
Date of Receipt: 20/02/ 2022

Reporting Date: 24/02/2022
Test Report No.: 00056/02/2022-CH001-031
Sample Location:-
Testing Date: 22/02/2022

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO_3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
1	RPH1-BH18-01	0.33	< 0.012	0.061	50.60	< 0.09	0.080	0.38	8.27	0.65	0.43	< 0.33	< 0.51	< 0.0125	39.10
2	RPH1-BH18-02	0.34	< 0.012	0.063	47.00	< 0.09	2.71	0.39	13.90	0.62	0.36	< 0.33	< 0.51	< 0.0125	34.65
3	RPH1-BH18-03	< 0.23	< 0.012	0.032	50.80	< 0.09	2.30	0.52	8.48	< 0.55	0.28	< 0.33	< 0.51	< 0.0125	37.20
4	RPH1-BH18-04	< 0.23	< 0.012	< 0.029	51.50	< 0.09	0.36	0.59	8.49	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	38.55
5	RPH1-BH18-05	< 0.23	< 0.012	<0.029	43.40	< 0.09	0.22	0.71	23.90	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	31.34
6	RPH1-BH18-06	< 0.23	< 0.012	0.040	39.30	< 0.09	0.048	0.69	30.80	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	28.44
7	RPH1-BH18-07	0.33	< 0.012	0.053	38.70	< 0.09	0.41	1.18	30.80	0.65	< 0.21	< 0.33	< 0.51	< 0.0125	27.75
8	RPH1-BH18-08	< 0.23	< 0.012	0.040	42.90	< 0.09	0.40	2.33	24.00	0.59	< 0.21	< 0.33	< 0.51	< 0.0125	29.42
9	RPH1-BH18-09	< 0.23	< 0.012	0.045	44.30	< 0.09	0.73	2.72	21.10	0.58	< 0.21	< 0.33	< 0.51	< 0.0125	30.22
10	RPH1-BH18-10	< 0.23	< 0.012	< 0.029	42.70	< 0.09	< 0.058	2.17	25.70	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	29.14
11	RPH1-BH18-11	< 0.23	< 0.012	< 0.029	53.40	< 0.09	0.55	10.50	5.13	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	29.93
12	RPH1-BH18-12	< 0.23	< 0.012	< 0.029	54.50	< 0.09	0.18	6.98	4.24	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	33.85
13	RPH1-BH18-13	< 0.23	< 0.012	< 0.029	50.80	< 0.09	0.36	15.50	9.32	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	23.24
14	RPH1-BH18-14	< 0.23	< 0.012	< 0.029	53.10	< 0.09	0.77	20.90	5.01	< 0.55	< 0.21	< 0.33	0.66	< 0.0125	19.34

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

Reporting Date: 24/02/2022

Test Report No.: 00056/02/2022-CH001-031

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO_3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
15	RPH1-BH18-15	< 0.23	< 0.012	< 0.029	44.40	< 0.09	0.54	17.10	20.70	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	16.72
16	RPH1-BH18-16	< 0.23	< 0.012	< 0.029	51.20	< 0.09	1.08	29.00	7.16	< 0.55	< 0.21	< 0.33	0.85	< 0.0125	10.56
17	RPH1-BH18-17	< 0.23	< 0.012	< 0.029	51.40	< 0.09	0.94	25.50	7.48	< 0.55	< 0.21	< 0.33	0.69	< 0.0125	13.86
18	RPH1-BH18-18	< 0.23	< 0.012	< 0.029	53.70	< 0.09	0.96	31.20	3.37	< 0.55	< 0.21	< 0.33	0.90	< 0.0125	9.68
19	RPH1-BH18-19	< 0.23	< 0.012	< 0.029	43.90	< 0.09	0.75	22.60	19.60	< 0.55	< 0.21	< 0.33	2.16	< 0.0125	10.88
20	RPH1-BH18-20	< 0.23	< 0.012	< 0.029	32.00	< 0.09	0.34	14.30	42.60	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	10.00
21	RPH1-BH18-21	< 0.23	< 0.012	< 0.029	36.30	< 0.09	0.34	14.90	34.70	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	12.40
22	RPH1-BH18-22	< 0.23	< 0.012	< 0.029	38.10	< 0.09	0.51	20.90	31.70	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	7.98
23	RPH1-BH18-23	< 0.23	< 0.012	< 0.029	27.90	< 0.09	0.30	16.10	49.70	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	5.23
24	RPH1-BH18-24	< 0.23	< 0.012	< 0.029	20.00	< 0.09	0.11	10.40	64.30	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	4.52

Note: The results were done on dry basis.

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- THE TEST WAS PERFORMED ACCORDING TO YOUR REQUEST.

Analyzed by: Eng. Nidal Tayyem
Eng. Feryal Yosef

Division Head: Eng .Maysoon Alkhzahee

Laboratories & Quality Director : Eng .Maysoon Alkhzahee

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

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The Hashemite Kingdom of Jordan

Ministry of Energy and Mineral Resources/ Laboratories & Quality Directorate

TEST REPORT

X-RAY SPECTROMETRIC& LOI ANALYSIS

Division Chemical & Mineral Analysis/Lab. X.R.F
Client Name & Address: مديرية دراسات المصادر الطبيعية
Sample Type: صلبة
Sample Method: By Client
Date of Receipt: 20/02/ 2022

Reporting Date: 28/02/2022
Test Report No.: 00057/02/2022-CH001-032
Sample Location:-
Testing Date: 23/02/2022

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO_3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
1	RPH1-BH 19 1	1.36	0.017	0.19	44.60	0.12	< 0.058	0.47	13.70	2.23	1.20	< 0.33	< 0.51	< 0.0125	36.08
2	RPH1-BH 19 2	0.69	< 0.012	0.11	48.00	< 0.09	< 0.058	0.37	11.50	1.16	0.70	< 0.33	< 0.51	< 0.0125	37.45
3	RPH1-BH 19 3	0.41	< 0.012	0.073	49.50	< 0.09	2.37	0.44	8.98	0.73	0.43	< 0.33	< 0.51	< 0.0125	37.02
4	RPH1-BH 19 4	0.25	< 0.012	0.050	47.80	< 0.09	4.39	0.61	12.00	< 0.55	0.27	< 0.33	< 0.51	< 0.0125	34.15
5	RPH1-BH 19 5	< 0.23	< 0.012	0.031	52.40	< 0.09	0.33	0.68	6.40	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	39.48
6	RPH1-BH 19 6	< 0.23	< 0.012	< 0.029	41.80	< 0.09	0.16	0.72	24.60	< 0.55	< 0.21	0.69	< 0.51	< 0.0125	31.38
7	RPH1-BH 19 7	< 0.23	< 0.012	< 0.029	41.00	< 0.09	0.075	0.69	26.00	< 0.55	< 0.21	0.84	< 0.51	< 0.0125	30.50
8	RPH1-BH 19 8	< 0.23	< 0.012	0.030	43.50	< 0.09	< 0.058	0.96	22.90	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	31.88
9	RPH1-BH 19 9	< 0.23	< 0.012	< 0.029	46.60	< 0.09	< 0.058	1.27	17.20	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	34.18
10	RPH1-BH 19 10	< 0.23	< 0.012	< 0.029	48.60	< 0.09	< 0.058	2.56	13.90	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	34.23
11	RPH1-BH 19 11	< 0.23	< 0.012	0.035	45.10	< 0.09	0.25	6.96	19.50	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	27.45
12	RPH1-BH 19 12	< 0.23	< 0.012	0.031	49.10	< 0.09	0.12	6.22	12.60	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	31.31
13	RPH1-BH 19 13	< 0.23	< 0.012	0.03	51.30	< 0.09	< 0.058	4.54	9.17	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	34.30
14	RPH1-BH 19 14	< 0.23	< 0.012	< 0.029	51.20	< 0.09	0.19	9.92	8.42	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	29.16

وزارة الطاقة والثروة المعدنية
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Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO_3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
15	**RPH1-BH 19 15**	< 0.23	< 0.012	< 0.029	53.20	< 0.09	0.34	12.80	5.45	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	27.54
16	**RPH1-BH 19 16**	< 0.23	< 0.012	< 0.029	46.00	< 0.09	0.44	15.40	17.10	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	19.77
17	**RPH1-BH 19 17**	< 0.23	< 0.012	< 0.029	49.20	< 0.09	0.44	15.70	12.00	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	21.91
18	**RPH1-BH 19 18**	< 0.23	< 0.012	< 0.029	38.40	< 0.09	0.28	12.50	30.90	< 0.55	< 0.21	0.69	< 0.51	< 0.0125	16.75
19	**RPH1-BH 19 19**	< 0.23	< 0.012	< 0.029	41.50	< 0.09	0.50	21.40	26.00	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	9.93
20	**RPH1-BH 19 20**	< 0.23	< 0.012	< 0.029	42.80	< 0.09	0.56	22.00	23.30	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	10.70
21	**RPH1-BH 19 21**	< 0.23	< 0.012	< 0.029	39.30	< 0.09	0.50	20.10	29.80	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	9.67

Note: The results were done on dry basis.

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وزارة الطاقة والثروة المعدنية
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Ministry of Energy and Mineral Resources/ Laboratories & Quality Directorate

TEST REPORT

X-RAY SPECTROMETRIC& LOI ANALYSIS

Division Chemical & Mineral Analysis/Lab. X.R.F
Client Name & Address: مديرية دراسات المصادر الطبيعية
Sample Type: صلبة
Sample Method: By Client
Date of Receipt: 23/02/ 2022

Reporting Date: 2/03/2022
Test Report No.: 00065/02/2022-CH001-036
Sample Location:-
Testing Date: 27/02/2022

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO_3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
1	RPH1-BH 20 01	1.79	0.033	0.27	30.70	0.33	5.20	0.55	33.40	2.64	1.00	< 0.33	< 0.51	< 0.0125	24.14
2	RPH1-BH 20 02	< 0.23	< 0.012	0.030	44.40	< 0.09	6.52	0.81	15.80	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	31.91
3	RPH1-BH 20 03	< 0.23	< 0.012	< 0.029	41.70	< 0.09	1.15	1.35	25.60	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	29.62
4	RPH1-BH 20 04	< 0.23	< 0.012	< 0.029	47.00	< 0.09	0.92	1.15	15.90	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	34.16
5	RPH1-BH 20 05	< 0.23	< 0.012	< 0.029	44.90	< 0.09	0.53	1.32	20.00	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	32.49
6	RPH1-BH 20 06	< 0.23	< 0.012	0.032	44.50	< 0.09	0.26	2.19	20.90	0.60	< 0.21	< 0.33	< 0.51	< 0.0125	31.27
7	RPH1-BH 20 07	< 0.23	< 0.012	< 0.029	52.40	< 0.09	< 0.058	2.02	7.27	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	37.55
8	RPH1-BH 20 08	< 0.23	< 0.012	< 0.029	46.30	< 0.09	< 0.058	1.63	18.40	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	33.06
9	RPH1-BH 20 09	< 0.23	< 0.012	< 0.029	53.50	< 0.09	0.29	8.43	4.37	< 0.55	< 0.21	< 0.33	0.68	< 0.0125	32.54
10	RPH1-BH 20 10	< 0.23	< 0.012	< 0.029	53.60	< 0.09	0.21	5.60	5.21	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	34.74
11	RPH1-BH 20 11	< 0.23	< 0.012	< 0.029	51.00	< 0.09	0.58	20.10	7.96	< 0.55	< 0.21	< 0.33	2.10	< 0.0125	18.16
12	RPH1-BH 20 12	< 0.23	< 0.012	< 0.029	54.60	< 0.09	0.55	15.60	1.87	< 0.55	< 0.21	< 0.33	1.50	< 0.0125	25.73
13	RPH1-BH 20 13	< 0.23	< 0.012	< 0.029	52.10	< 0.09	0.81	29.80	4.79	< 0.55	< 0.21	< 0.33	3.17	< 0.0125	9.27
14	RPH1-BH 20 14	< 0.23	< 0.012	< 0.029	54.30	< 0.09	0.98	29.80	2.44	< 0.55	< 0.21	< 0.33	1.10	< 0.0125	11.25

وزارة الطاقة والثروة المعدنية
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Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO_3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
15	RPH1-BH 20 15	< 0.23	< 0.012	< 0.029	52.00	< 0.09	0.67	15.70	7.07	< 0.55	< 0.21	< 0.33	0.58	< 0.0125	23.74
16	RPH1-BH 20 16	< 0.23	< 0.012	< 0.029	52.70	< 0.09	0.92	32.90	5.11	< 0.55	< 0.21	< 0.33	1.23	< 0.0125	7.04
17	RPH1-BH 20 17	< 0.23	< 0.012	< 0.029	54.90	< 0.09	1.19	36.00	0.70	< 0.55	< 0.21	< 0.33	1.13	< 0.0125	5.99
18	RPH1-BH 20 18	< 0.23	< 0.012	< 0.029	55.20	< 0.09	1.28	35.30	0.16	< 0.55	< 0.21	< 0.33	1.13	< 0.0125	6.90
19	RPH1-BH 20 19	< 0.23	< 0.012	< 0.029	54.70	< 0.09	1.17	33.00	1.34	< 0.55	< 0.21	< 0.33	1.09	< 0.0125	8.59
20	RPH1-BH 20 20	< 0.23	< 0.012	< 0.029	53.00	< 0.09	1.00	35.00	1.94	< 0.55	< 0.21	< 0.33	3.9	< 0.0125	5.06
21	RPH1-BH 20 21	< 0.23	< 0.012	< 0.029	52.10	< 0.09	0.45	16.50	5.39	< 0.55	< 0.21	< 0.33	1.71	< 0.0125	23.75
22	RPH1-BH 20 22	< 0.23	< 0.012	< 0.029	49.70	< 0.09	0.66	22.80	9.81	< 0.55	< 0.21	< 0.33	2.34	< 0.0125	14.66

Note: The results were done on dry basis.

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Division Head: Eng .Maysoon Alkhzahee

Laboratories & Quality Director : Eng .Maysoon Alkhzahee

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The Hashemite Kingdom of Jordan

Ministry of Energy and Mineral Resources/ Laboratories & Quality Directorate

TEST REPORT

X-RAY SPECTROMETRIC& LOI ANALYSIS

Division Chemical & Mineral Analysis/Lab. X.R.F
Client Name & Address: مديرية دراسات المصادر الطبيعية
Sample Type: صلبة
Sample Method: By Client
Date of Receipt: 24/02/ 2022

Reporting Date: 6/03/2022
Test Report No.: 00066/02/2022-CH001-037
Sample Location:-
Testing Date: 28/02/2022

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO_3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
1	RPH1-PH 21-1	1.10	0.013	0.15	38.50	0.096	< 0.058	0.77	25.70	1.78	1.03	< 0.33	< 0.51	< 0.0125	30.84
2	RPH1-PH 21-2	0.65	< 0.012	0.096	44.20	< 0.09	0.23	0.52	18.90	1.05	0.58	< 0.33	< 0.51	< 0.0125	33.67
3	RPH1-PH 21-3	0.66	< 0.012	0.095	37.10	< 0.09	4.89	0.77	26.60	1.09	0.46	< 0.33	< 0.51	< 0.0125	28.02
4	RPH1-PH 21-4	< 0.23	< 0.012	< 0.029	49.70	< 0.09	1.80	0.81	11.10	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	36.12
5	RPH1-PH 21-5	< 0.23	< 0.012	0.031	46.30	< 0.09	2.46	0.70	16.20	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	33.77
6	RPH1-PH 21-6	< 0.23	< 0.012	< 0.029	47.70	< 0.09	0.56	1.23	14.00	< 0.55	< 0.21	0.79	< 0.51	< 0.0125	35.13
7	RPH1-PH 21-7	< 0.23	< 0.012	< 0.029	37.90	< 0.09	< 0.058	1.28	33.30	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	27.02
8	RPH1-PH 21-8	< 0.23	< 0.012	< 0.029	35.90	< 0.09	< 0.058	1.62	36.60	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	25.23
9	RPH1-PH 21-9	0.24	< 0.012	< 0.029	44.00	< 0.09	< 0.058	1.56	21.40	0.61	0.40	< 0.33	< 0.51	< 0.0125	31.73
10	RPH1-PH 21-10	0.36	< 0.012	0.034	36.70	< 0.09	< 0.058	2.62	34.60	0.71	< 0.21	< 0.33	< 0.51	< 0.0125	24.82
11	RPH1-PH 21-11	< 0.23	< 0.012	< 0.029	44.70	< 0.09	< 0.058	2.09	20.50	0.58	< 0.21	< 0.33	< 0.51	< 0.0125	31.49
12	RPH1-PH 21-12	< 0.23	< 0.012	< 0.029	49.20	< 0.09	0.57	14.00	11.80	< 0.55	< 0.21	< 0.33	0.54	< 0.0125	23.42
13	RPH1-PH 21-13	< 0.23	< 0.012	< 0.029	52.20	< 0.09	0.94	22.60	5.56	< 0.55	< 0.21	< 0.33	0.97	< 0.0125	17.45
14	RPH1-PH 21-14	< 0.23	< 0.012	< 0.029	54.00	< 0.09	0.54	20.20	3.15	< 0.55	< 0.21	< 0.33	1.00	< 0.0125	20.95

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO_3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
15	RPH1-PH 21-15	< 0.23	< 0.012	0.03	50.70	< 0.09	0.48	16.40	8.34	0.57	< 0.21	< 0.33	0.67	< 0.0125	22.49
16	RPH1-PH 21-16	< 0.23	< 0.012	< 0.029	54.60	< 0.09	0.95	31.50	0.57	< 0.55	< 0.21	< 0.33	1.57	< 0.0125	10.65
17	RPH1-PH 21-17	< 0.23	< 0.012	< 0.029	54.60	< 0.09	0.55	21.00	0.53	< 0.55	< 0.21	< 0.33	2.38	< 0.0125	20.73
18	RPH1-PH 21-18	< 0.23	< 0.012	< 0.029	54.30	< 0.09	0.81	25.20	0.69	< 0.55	< 0.21	< 0.33	2.81	< 0.0125	16.00
19	RPH1-PH 21-19	< 0.23	< 0.012	< 0.029	53.10	< 0.09	1.07	26.70	0.37	< 0.55	< 0.21	< 0.33	2.99	< 0.0125	15.72
20	RPH1-PH 21-20	< 0.23	< 0.012	< 0.029	48.10	< 0.09	0.83	23.80	11.80	< 0.55	< 0.21	< 0.33	2.59	< 0.0125	12.75
21	RPH1-PH 21-21	< 0.23	< 0.012	< 0.029	53.50	< 0.09	1.26	32.10	0.42	< 0.55	< 0.21	< 0.33	3.77	< 0.0125	8.89
22	RPH1-PH 21-22	< 0.23	< 0.012	< 0.029	50.50	< 0.09	0.77	24.20	7.67	< 0.55	< 0.21	< 0.33	2.40	< 0.0125	14.36
23	RPH1-PH 21-23	< 0.23	< 0.012	< 0.029	51.80	< 0.09	0.86	27.90	4.68	< 0.55	< 0.21	< 0.33	3.08	< 0.0125	11.46
24	RPH1-PH 21-24	< 0.23	< 0.012	< 0.029	46.20	< 0.09	0.56	19.80	17.30	< 0.55	< 0.21	< 0.33	0.47	< 0.0125	15.40
25	RPH1-PH 21-25	< 0.23	< 0.012	< 0.029	39.60	< 0.09	0.55	19.40	28.30	< 0.55	< 0.21	< 0.33	0.32	< 0.0125	11.12
26	RPH1-PH 21-26	< 0.23	< 0.012	< 0.029	44.70	< 0.09	0.77	26.70	19.90	< 0.55	< 0.21	< 0.33	0.58	< 0.0125	7.33
27	RPH1-PH 21-27	< 0.23	< 0.012	< 0.029	31.60	< 0.09	0.42	17.30	43.20	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	6.94
28	RPH1-PH 21-28	< 0.23	< 0.012	< 0.029	13.00	< 0.09	0.011	4.21	76.80	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	5.35
29	RPH1-PH 21-29	< 0.23	< 0.012	< 0.029	39.00	< 0.09	1.04	2.92	29.30	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	26.80

Note: The results were done on dry basis.

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Analyzed by: Eng. Nidal Tayyem
Eng. Feryal Yosef

Division Head: Eng .Maysoon Alkhzahee

Laboratories & Quality Director : Eng .Maysoon Alkhzahee

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

وزارة الطاقة والثروة المعدنية
المملكة الأردنية الهاشمية

X-Ray Diffraction Analysis Test Report

JAS
Jordanian Accreditation System
نظام الاعتماد الأردني
Accreditation Unit
TEST-061

Test Report No.	:00066/02/2022 CH07-18			Test Report Date: 07/03/2022	
Lab Name	: Laboratories of Quality Directorate at the Ministry of Energy and Mineral Resources				
Lab Address	: Ministry of Energy and Mineral Resources - 8th Circle Bayader Wadi Al Seer, Amman – Jordan (www.memr.gov.jo)				
Client Name	: مديرية دراسات المصادر الطبيعية				
Client Address	:				
Division	: Chemical & Mineral Analysis Lab			Testing Location	: At the Lab facility.
Methods Used	: MEMR002-2020	Lab Ref. Work Instruction	: WI-REP-02	Used for: X Ray diffraction analysis	
Sampling Method	: By the customer			Sample Reception Date: 24/02/2022	
Sample Type	: Solid			Sample Location: -	
Testing Date	:24/02/2022				
Tension (KV)	: 40			Radiation	: Cu
Current (mA)	: 30			Angle Range(2θ)	: (5-70)°

Item	Serial No.	Sample ID	Phase Identification			Uncertainty (if required)
			Major	Minor	Trace	
1	1651	Rph1-BH 21 16	Carbonate-fluorapatite , Calcite	-	Anhydrite	NA

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

وزارة الطاقة والثروة المعدنية
المملكة الأردنية الهاشمية

X-Ray Diffraction Analysis Test Report

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Jordanian Accreditation System
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Accreditation Unit
TEST-061

Test Report No. :00066/02/2022 CH07-18 Test Report Date: 07/03/2022

This test is traceable to SI units and is following ISO/IEC 17025:2017. While measurement uncertainty is evaluated in accordance with ASTM standards. The coverage factor (k=2) so that the coverage probability is approximately 95%.

Notes:

- The results stated in this test report relates only to the tested sample.
- This test report is only valid with stamp and signature.
- The results stated in this test report shall not be reproduced except in full, without written approval of the lab.
- Based on relative XRD high peak data: (Major, Minor, Trace)
-XRD Diffractogram will be attached with the report
- The laboratory does not apply the decision rule.

Opinions and Interpretations:

N/A.....

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Additional Comments:

N/A.....

.....

Analyzed by *(Name and Sign)*: ***Eng.Kholoud Ayyash***

Eng.linda Al-Makadmeh

Division Head *(Name and Sign)*: ***Eng.Maysoon Al-Khzahee***

Technical Manager *(Name and Sign)*: ***Chem. Hanady Al Sharif***

Lab Manager *(Name and Sign)*: ***Eng.Maysoon Al-Khzahee***

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

The Hashemite Kingdom of Jordan

Ministry of Energy and Mineral Resources/ Laboratories & Quality Directorate

TEST REPORT

X-RAY SPECTROMETRIC& LOI ANALYSIS

Division Chemical & Mineral Analysis/Lab. X.R.F
Client Name & Address: مديرية دراسات المصادر الطبيعية
Sample Type: صلبة
Sample Method: By Client
Date of Receipt: 23/02/ 2022

Reporting Date: 09/03/2022
Test Report No.: 00063/02/2022-CH001-035
Sample Location:-
Testing Date: 01/03/2022

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO_3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
1	RPH1-BH 22-1	1.39	0.018	0.20	41.80	0.11	< 0.058	0.35	19.30	2.19	1.14	< 0.33	< 0.51	< 0.0125	33.48
2	RPH1-BH 22-2	1.06	0.015	0.16	39.20	< 0.09	< 0.058	0.53	24.60	1.68	1.00	< 0.33	< 0.51	< 0.0125	31.66
3	RPH1-BH 22-3	0.60	< 0.012	0.090	41.50	< 0.09	< 0.058	0.66	24.50	0.97	0.53	< 0.33	< 0.51	< 0.0125	31.07
4	RPH1-BH 22-4	< 0.23	< 0.012	< 0.029	43.70	< 0.09	< 0.058	0.70	23.20	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	31.86
5	RPH1-BH 22-5	< 0.23	< 0.012	0.043	42.30	< 0.09	0.090	7.20	15.60	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	34.11
6	RPH1-BH 22-6	< 0.23	< 0.012	< 0.029	47.00	< 0.09	0.080	0.55	17.20	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	34.81
7	RPH1-BH 22-7	< 0.23	< 0.012	< 0.029	44.20	< 0.09	< 0.058	0.68	22.30	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	32.59
8	RPH1-BH 22-8	< 0.23	< 0.012	< 0.029	46.80	< 0.09	< 0.058	0.70	19.20	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	32.98
9	RPH1-BH 22-9	< 0.23	< 0.012	< 0.029	47.10	< 0.09	< 0.058	1.01	17.20	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	34.32
10	RPH1-BH 22-10	< 0.23	< 0.012	< 0.029	39.20	< 0.09	< 0.058	1.29	30.60	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	28.45
11	RPH1-BH 22-11	< 0.23	< 0.012	< 0.029	39.00	< 0.09	< 0.058	1.36	30.10	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	28.80
12	RPH1-BH 22-12	< 0.23	< 0.012	< 0.029	39.30	< 0.09	< 0.058	2.07	30.00	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	27.83
13	RPH1-BH 22-13	< 0.23	< 0.012	< 0.029	49.00	< 0.09	< 0.058	2.01	12.90	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	35.33
14	RPH1-BH 22-14	< 0.23	< 0.012	< 0.029	48.00	< 0.09	0.15	5.46	13.80	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	31.51

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO_3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
15	RPH1-BH 22-15	< 0.23	< 0.012	< 0.029	54.60	< 0.09	0.43	13.10	1.64	< 0.55	< 0.21	< 0.33	1.24	< 0.0125	28.87
16	RPH1-BH 22-16	< 0.23	< 0.012	< 0.029	54.90	< 0.09	0.26	9.62	1.20	< 0.55	< 0.21	< 0.33	0.88	< 0.0125	32.81
17	RPH1-BH 22-17	< 0.23	< 0.012	< 0.029	53.40	< 0.09	0.25	10.00	4.49	< 0.55	< 0.21	< 0.33	0.79	< 0.0125	30.86
18	RPH1-BH 22-18	< 0.23	< 0.012	< 0.029	54.20	< 0.09	0.67	19.60	1.52	< 0.55	< 0.21	< 0.33	1.94	< 0.0125	21.98
19	RPH1-BH 22-19	< 0.23	< 0.012	< 0.029	53.80	< 0.09	1.26	31.00	0.21	< 0.55	< 0.21	< 0.33	3.57	< 0.0125	10.02
20	RPH1-BH 22-20	< 0.23	< 0.012	< 0.029	54.20	< 0.09	1.11	26.40	0.41	< 0.55	< 0.21	< 0.33	2.86	< 0.0125	14.97
21	RPH1-BH 22-21	< 0.23	< 0.012	< 0.029	48.60	< 0.09	0.72	25.20	10.80	< 0.55	< 0.21	< 0.33	2.61	< 0.0125	11.90
22	RPH1-BH 22-22	< 0.23	< 0.012	< 0.029	51.10	< 0.09	1.03	32.40	5.37	< 0.55	< 0.21	< 0.33	3.45	< 0.0125	6.59
23	RPH1-BH 22-23	< 0.23	< 0.012	< 0.029	52.40	< 0.09	0.60	18.80	5.04	< 0.55	< 0.21	< 0.33	1.93	< 0.0125	21.16
24	RPH1-BH 22-24	< 0.23	< 0.012	< 0.029	46.70	< 0.09	0.52	18.10	15.30	< 0.55	< 0.21	< 0.33	1.72	< 0.0125	17.51
25	RPH1-BH 22-25	< 0.23	< 0.012	< 0.029	46.00	< 0.09	0.67	24.10	15.90	< 0.55	< 0.21	< 0.33	2.59	< 0.0125	10.61

Note: The results were done on dry basis.

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Analyzed by: Eng. Nidal Tayyem
Eng. Feryal Yosef

Division Head: Eng .Maysoon Alkhzahee

Laboratories & Quality Director : Eng .Maysoon Alkhzahee

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

The Hashemite Kingdom of Jordan

Ministry of Energy and Mineral Resources/ Laboratories & Quality Directorate

TEST REPORT

X-RAY SPECTROMETRIC& LOI ANALYSIS

Division Chemical & Mineral Analysis/Lab. X.R.F
Client Name & Address: مديرية دراسات المصادر الطبيعية
Sample Type: صلبة
Sample Method: By Client
Date of Receipt: 28/02/ 2022

Reporting Date: 14/03/2022
Test Report No.: 00067/02/2022-CH001-042
Sample Location:-
Testing Date: 9/03/2022

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO_3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
1	RPH1-PH 23A-1	2.74	0.026	0.34	31.10	0.44	0.54	0.57	27.30	4.82	2.32	0.66	< 0.51	< 0.0125	29.06
2	RPH1-PH 23A-2	2.65	0.025	0.36	34.50	0.33	0.59	0.42	23.0	4.54	2.51	0.41	< 0.51	< 0.0125	30.69
3	RPH1-PH 23A-3	1.85	0.015	0.24	39.50	0.17	0.24	0.40	18.20	3.06	2.03	< 0.33	< 0.51	< 0.0125	34.22
4	RPH1-PH 23A-4	1.21	< 0.012	0.16	43.60	0.11	0.076	0.46	15.40	2.01	1.43	< 0.33	< 0.51	< 0.0125	35.52
5	RPH1-PH 23A-5	0.42	< 0.012	0.054	47.00	< 0.09	0.082	0.66	14.40	0.80	0.54	< 0.33	< 0.51	< 0.0125	36.03
6	RPH1-PH 23A-6	< 0.23	< 0.012	0.030	51.00	< 0.09	< 0.058	1.29	8.47	0.59	0.24	< 0.33	< 0.51	< 0.0125	38.19
7	RPH1-PH 23A-7	0.27	< 0.012	0.034	49.70	< 0.09	0.064	3.07	11.10	0.64	< 0.21	< 0.33	< 0.51	< 0.0125	34.89
8	RPH1-PH 23A-8	< 0.23	< 0.012	< 0.029	52.60	< 0.09	< 0.058	1.26	6.51	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	39.04
9	RPH1-PH 23A-9	< 0.23	< 0.012	< 0.029	53.90	< 0.09	0.30	7.45	3.66	< 0.55	< 0.21	< 0.33	0.65	< 0.0125	33.43
10	RPH1-PH 23A-10	< 0.23	< 0.012	< 0.029	54.20	< 0.09	0.18	8.07	2.28	< 0.55	< 0.21	< 0.33	0.85	< 0.0125	33.95
11	RPH1-PH 23A-11	< 0.23	< 0.012	< 0.029	54.50	< 0.09	0.28	9.14	2.25	< 0.55	< 0.21	< 0.33	1.02	< 0.0125	32.63
12	RPH1-PH 23A-12	< 0.23	< 0.012	< 0.029	53.70	< 0.09	0.25	13.50	2.62	< 0.55	< 0.21	< 0.33	1.47	< 0.0125	28.11
13	RPH1-PH 23A-13	< 0.23	< 0.012	< 0.029	54.10	< 0.09	0.53	21.60	1.05	< 0.55	< 0.21	< 0.33	2.30	< 0.0125	20.32
14	RPH1-PH 23A-14	< 0.23	< 0.012	< 0.029	54.30	< 0.09	0.55	20.40	0.55	< 0.55	< 0.21	< 0.33	2.24	< 0.0125	21.84

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO_3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
15	**RPH1-PH 23A-15**	0.25	< 0.012	0.039	51.90	< 0.09	0.70	27.40	3.07	0.66	< 0.21	< 0.33	3.03	< 0.0125	12.78
16	**RPH1-PH 23A-16**	< 0.23	< 0.012	< 0.029	54.10	< 0.09	0.33	17.20	2.13	< 0.55	< 0.21	< 0.33	1.71	< 0.0125	24.32
17	**RPH1-PH 23A-17**	0.60	< 0.012	0.077	39.70	< 0.09	0.15	9.78	25.90	1.23	< 0.21	0.38	0.74	< 0.0125	21.20
18	**RPH1-PH 23A-18**	0.24	< 0.012	0.034	29.10	< 0.09	0.25	15.20	44.50	< 0.55	< 0.21	0.72	1.28	< 0.0125	7.95

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Eng. Feryal Yosef

Division Head: Eng .Maysoon Alkhzahee

Laboratories & Quality Director : Eng .Maysoon Alkhzahee

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The Hashemite Kingdom of Jordan

Ministry of Energy and Mineral Resources/ Laboratories & Quality Directorate

TEST REPORT

X-RAY SPECTROMETRIC& LOI ANALYSIS

Division Chemical & Mineral Analysis/Lab. X.R.F
Client Name & Address: مديرية دراسات المصادر الطبيعية
Sample Type: صلبة
Sample Method: By Client

Date of Receipt: 29/02/ 2022

Reporting Date: 15/03/2022
Test Report No.: 00068/02/2022-CH001-041
Sample Location:-
Testing Date: 9/03/2022

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO_3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
1	RPH1-PH 23B-1	0.81	< 0.012	0.12	42.20	< 0.09	7.58	0.70	16.40	1.39	0.71	< 0.33	< 0.51	< 0.0125	29.95
2	RPH1-PH 23B-2	0.48	< 0.012	0.066	36.70	< 0.09	15.10	0.90	20.90	0.88	0.25	0.41	< 0.51	< 0.0125	24.70
3	RPH1-PH 23B-3	0.28	< 0.012	0.037	43.60	< 0.09	3.25	1.40	20.30	0.66	< 0.21	< 0.33	< 0.51	< 0.0125	30.56
4	RPH1-PH 23B-4	< 0.23	< 0.012	< 0.029	40.70	< 0.09	0.95	1.48	27.70	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	28.47
5	RPH1-PH 23B-5	< 0.23	< 0.012	< 0.029	41.90	< 0.09	0.90	2.77	25.80	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	28.12
6	RPH1-PH 23B-6	< 0.23	< 0.012	< 0.029	42.50	< 0.09	0.61	4.48	26.00	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	26.16
7	RPH1-PH 23B-7	< 0.23	< 0.012	< 0.029	50.20	< 0.09	0.48	6.58	11.50	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	30.97
8	RPH1-PH 23B-8	< 0.23	< 0.012	< 0.029	52.70	< 0.09	0.43	8.96	6.31	< 0.55	< 0.21	< 0.33	0.71	< 0.0125	30.66
9	RPH1-PH 23B-9	< 0.23	< 0.012	< 0.029	52.70	< 0.09	0.19	9.19	6.42	< 0.55	< 0.21	< 0.33	0.79	< 0.0125	30.54
10	RPH1-PH 23B-10	< 0.23	< 0.012	< 0.029	53.40	< 0.09	0.83	18.30	2.78	< 0.55	< 0.21	< 0.33	1.98	< 0.0125	22.43
11	RPH1-PH 23B-11	< 0.23	< 0.012	< 0.029	44.90	< 0.09	0.85	22.00	17.20	< 0.55	< 0.21	< 0.33	2.13	< 0.0125	12.49
12	RPH1-PH 23B-12	< 0.23	< 0.012	< 0.029	52.30	< 0.09	0.85	20.10	4.82	< 0.55	< 0.21	< 0.33	2.04	< 0.0125	19.63
13	RPH1-PH 23B-13	< 0.23	< 0.012	< 0.029	51.10	< 0.09	0.52	16.30	6.81	< 0.55	< 0.21	< 0.33	1.68	< 0.0125	23.00
14	RPH1-PH 23B-14	0.26	< 0.012	< 0.029	49.20	< 0.09	1.05	27.00	8.00	0.71	< 0.21	< 0.33	3.02	< 0.0125	10.52

وزارة الطاقة والثروة المعدنية
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Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO_3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
15	RPH1-PH 23B-15	< 0.23	< 0.012	< 0.029	34.70	< 0.09	0.74	20.00	35.40	< 0.55	< 0.21	0.94	1.60	< 0.0125	6.50
16	RPH1-PH 23B-16	< 0.23	< 0.012	< 0.029	23.70	< 0.09	0.39	10.70	56.90	< 0.55	< 0.21	< 0.33	0.61	< 0.0125	7.19
17	RPH1-PH 23B-17	< 0.23	< 0.012	< 0.029	11.90	< 0.09	<.058	3.11	78.80	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	5.69
18	RPH1-PH 23B-18	< 0.23	< 0.012	< 0.029	31.60	< 0.09	<.058	2.25	44.00	< 0.55	0.39	< 0.33	< 0.51	< 0.0125	21.60
19	RPH1-PH 23B-19	< 0.23	< 0.012	< 0.029	38.90	< 0.09	<.058	2.39	32.50	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	25.98
20	RPH1-PH 23B-20	< 0.23	< 0.012	< 0.029	45.00	< 0.09	<.058	3.56	21.90	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	29.35
21	RPH1-PH 23B-21	< 0.23	< 0.012	< 0.029	32.20	< 0.09	<.058	1.53	43.10	< 0.55	< 0.21	1.12	< 0.51	< 0.0125	21.91
22	RPH1-PH 23B-22	< 0.23	< 0.012	< 0.029	46.10	< 0.09	<.058	1.38	20.80	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	31.60
23	RPH1-PH 23B-23	< 0.23	< 0.012	< 0.029	41.40	< 0.09	<.058	1.09	28.50	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	28.83
24	RPH1-PH 23B-24	< 0.23	< 0.012	< 0.029	38.10	< 0.09	<.058	1.35	34.30	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	26.11
25	RPH1-PH 23B-25	< 0.23	< 0.012	< 0.029	43.00	< 0.09	<.058	0.90	25.40	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	30.26
26	RPH1-PH 23B-26	< 0.23	< 0.012	< 0.029	38.60	< 0.09	<.058	1.25	33.00	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	26.86
27	RPH1-PH 23B-27	< 0.23	< 0.012	< 0.029	37.70	< 0.09	<.058	1.16	33.50	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	27.34

Note: The results were done on dry basis.

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Analyzed by: Eng. Nidal Tayyem
Eng. Feryal Yosef

Division Head: Eng .Maysoon Alkhzahee

Laboratories & Quality Director : Eng .Maysoon Alkhzahee

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

The Hashemite Kingdom of Jordan

Ministry of Energy and Mineral Resources/ Laboratories & Quality Directorate

TEST REPORT

X-RAY SPECTROMETRIC& LOI ANALYSIS

Division Chemical & Mineral Analysis/Lab. X.R.F
Client Name & Address: مديرية دراسات المصادر الطبيعية
Sample Type: صلبة
Sample Method: By Client
Date of Receipt: 28/02/ 2022

Reporting Date: 17/03/2022
Test Report No.: 00069/02/2022-CH001-043
Sample Location:-
Testing Date: 9/03/2022

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO_3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
1	RPH1-PH 24-1	0.99	0.018	0.14	43.60	0.12	0.14	3.42	18.40	1.63	0.84	< 0.33	< 0.51	< 0.0125	30.73
2	RPH1-PH 24-2	0.38	< 0.012	0.071	51.30	< 0.09	0.20	2.45	7.70	0.71	0.43	< 0.33	< 0.51	< 0.0125	36.79
3	RPH1-PH 24-3	< 0.23	< 0.012	< 0.029	53.10	< 0.09	1.15	7.36	4.68	< 0.55	< 0.21	< 0.33	0.57	< 0.0125	32.75
4	RPH1-PH 24-4	< 0.23	< 0.012	< 0.029	49.20	< 0.09	1.03	13.90	12.10	< 0.55	< 0.21	< 0.33	0.19	< 0.0125	23.30
5	RPH1-PH 24-5	< 0.23	< 0.012	< 0.029	41.30	< 0.09	0.88	10.40	25.60	< 0.55	< 0.21	< 0.33	0.94	< 0.0125	20.67
6	RPH1-PH 24-6	< 0.23	< 0.012	< 0.029	50.80	< 0.09	0.95	27.50	8.51	< 0.55	< 0.21	< 0.33	0.81	< 0.0125	11.12
7	RPH1-PH 24-7	< 0.23	< 0.012	< 0.029	51.10	< 0.09	0.83	24.80	8.58	< 0.55	< 0.21	< 0.33	0.76	< 0.0125	13.77
8	RPH1-PH 24-8	< 0.23	< 0.012	< 0.029	49.10	< 0.09	0.78	27.50	11.40	< 0.55	< 0.21	< 0.33	0.82	< 0.0125	9.82
9	RPH1-PH 24-9	< 0.23	< 0.012	< 0.029	44.20	< 0.09	1.07	26.20	20.00	< 0.55	< 0.21	< 0.33	0.73	< 0.0125	7.36
10	RPH1-PH 24-10	< 0.23	< 0.012	< 0.029	17.30	< 0.09	0.15	8.81	68.20	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	4.08
11	RPH1-PH 24-11	< 0.23	< 0.012	< 0.029	17.40	< 0.09	< 0.058	9.29	68.40	< 0.55	< 0.21	0.34	< 0.51	< 0.0125	3.82
12	RPH1-PH 24-12	< 0.23	< 0.012	< 0.029	10.60	< 0.09	< 0.058	2.87	80.20	< 0.55	< 0.21	0.62	< 0.51	< 0.0125	4.58
13	RPH1-PH 24-13	< 0.23	< 0.012	< 0.029	25.20	< 0.09	< 0.058	1.87	56.40	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	16.18
14	RPH1-PH 24-14	< 0.23	< 0.012	< 0.029	28.60	< 0.09	< 0.058	2.04	50.40	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	18.93

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO_3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
15	RPH1-PH 24-15	< 0.23	< 0.012	< 0.029	36.00	< 0.09	0.13	6.09	36.50	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	20.88
16	RPH1-PH 24-16	< 0.23	< 0.012	< 0.029	42.60	< 0.09	< 0.058	1.48	22.70	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	33.18
17	RPH1-PH 24-17	< 0.23	< 0.012	< 0.029	43.10	< 0.09	< 0.058	1.15	25.30	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	30.39
18	RPH1-PH 24-18	< 0.23	< 0.012	< 0.029	46.30	< 0.09	< 0.058	1.27	19.40	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	33.05
19	RPH1-PH 24-19	< 0.23	< 0.012	< 0.029	39.90	< 0.09	< 0.058	1.25	33.30	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	25.50
20	RPH1-PH 24-20	< 0.23	< 0.012	< 0.029	26.70	< 0.09	< 0.058	2.16	52.70	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	17.80
21	RPH1-PH 24-21	< 0.23	< 0.012	< 0.029	29.90	< 0.09	< 0.058	1.41	48.10	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	20.48
22	RPH1-PH 24-22	< 0.23	< 0.012	< 0.029	46.30	< 0.09	< 0.058	1.37	18.80	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	33.26
23	RPH1-PH 24-23	< 0.23	< 0.012	< 0.029	33.30	< 0.09	< 0.058	1.40	41.90	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	23.20
24	RPH1-PH 24-24	< 0.23	< 0.012	< 0.029	41.80	< 0.09	< 0.058	0.95	26.90	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	30.27

Note: The results were done on dry basis.

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Analyzed by: Eng. Nidal Tayyem
Eng. Feryal Yosef

وزارة الطاقة والثروة المعدنية
مديرية المختبرات

Division Head: Eng .Maysoon Alkhzahee

Laboratories & Quality Director : Eng .Maysoon Alkhzahee

The Hashemite Kingdom of Jordan

Ministry of Energy and Mineral Resources/ Laboratories & Quality Directorate

TEST REPORT

X-RAY SPECTROMETRIC& LOI ANALYSIS

Division Chemical & Mineral Analysis/Lab. X.R.F
Client Name & Address: مديرية دراسات المصادر الطبيعية
Sample Type: صلبة
Sample Method: By Client
Date of Receipt: 28/02/ 2022

Reporting Date: 21/03/2022
Test Report No.: 00070/02/2022-CH001-044
Sample Location:-
Testing Date: 14/03/2022

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO_3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
1	RPH1-PH 25-1	0.83	0.013	0.12	41.50	< 0.09	0.69	0.62	19.80	1.39	1.91	< 0.33	< 0.51	< 0.0125	32.96
2	RPH1-PH 25-2	0.27	< 0.012	0.049	44.20	< 0.09	9.72	1.09	13.20	0.57	0.50	< 0.33	< 0.51	< 0.0125	30.37
3	RPH1-PH 25-3	< 0.23	< 0.012	< 0.029	47.00	< 0.09	1.09	1.30	16.40	< 0.55	0.35	< 0.33	< 0.51	< 0.0125	33.25
4	RPH1-PH 25-4	< 0.23	< 0.012	< 0.029	39.00	< 0.09	0.41	1.26	29.00	< 0.55	0.36	< 0.33	< 0.51	< 0.0125	29.31
5	RPH1-PH 25-5	0.27	< 0.012	0.033	38.70	< 0.09	0.23	2.36	30.40	0.68	0.37	< 0.33	< 0.51	< 0.0125	26.90
6	RPH1-PH 25-6	0.27	< 0.012	0.042	40.00	< 0.09	0.17	1.98	28.60	0.62	0.27	< 0.33	< 0.51	< 0.0125	28.04
7	RPH1-PH 25-7	< 0.23	< 0.012	< 0.029	49.70	< 0.09	0.23	4.00	11.5	< 0.55	0.24	< 0.33	< 0.51	< 0.0125	33.48
8	RPH1-PH 25-8	< 0.23	< 0.012	< 0.029	50.70	< 0.09	0.062	3.80	9.80	< 0.55	0.38	< 0.33	< 0.51	< 0.0125	34.71
9	RPH1-PH 25-9	< 0.23	< 0.012	< 0.029	51.10	< 0.09	0.062	5.28	9.37	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	33.70
10	RPH1-PH 25-10	< 0.23	< 0.012	< 0.029	49.90	< 0.09	0.16	8.14	11.70	< 0.55	< 0.21	< 0.33	0.60	< 0.0125	29.43
11	RPH1-PH 25-11	< 0.23	< 0.012	< 0.029	52.40	< 0.09	0.57	17.70	5.50	< 0.55	< 0.21	< 0.33	1.79	< 0.0125	21.77
12	RPH1-PH 25-12	< 0.23	< 0.012	< 0.029	53.40	< 0.09	0.86	20.40	2.09	< 0.55	< 0.21	< 0.33	2.32	< 0.0125	20.68
13	RPH1-PH 25-13	< 0.23	< 0.012	< 0.029	49.00	< 0.09	0.76	19.60	10.30	< 0.55	< 0.21	< 0.33	2.09	< 0.0125	18.10
14	RPH1-PH 25-14	< 0.23	< 0.012	< 0.029	50.10	< 0.09	0.74	29.40	7.87	< 0.55	< 0.21	< 0.33	3.25	< 0.0125	8.52

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO_3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
15	**RPH1-PH 25-15**	< 0.23	< 0.012	0.03	36.40	< 0.09	0.16	6.80	35.70	0.061	< 0.21	< 0.33	0.21	< 0.0125	20.61
16	**RPH1-PH 25-16**	< 0.23	< 0.012	< 0.029	51.30	< 0.09	1.12	32.10	4.16	< 0.55	< 0.21	1.76	0.95	< 0.0125	8.37
17	**RPH1-PH 25-17**	< 0.23	< 0.012	< 0.029	40.70	< 0.09	0.74	24.40	26.30	< 0.55	< 0.21	0.71	0.48	< 0.0125	6.50
18	**RPH1-PH 25-18**	< 0.23	< 0.012	< 0.029	24.40	< 0.09	0.27	13.20	56.20	< 0.55	< 0.21	0.55	< 0.51	< 0.0125	5.29
19	**RPH1-PH 25-19**	< 0.23	< 0.012	< 0.029	28.10	< 0.09	0.37	15.90	49.30	< 0.55	< 0.21	0.75	< 0.51	< 0.0125	5.45
20	**RPH1-PH 25-20**	< 0.23	< 0.012	< 0.029	26.10	< 0.09	0.26	12.40	52.50	< 0.55	< 0.21	1.19	< 0.51	< 0.0125	7.47
21	**RPH1-PH 25-21**	< 0.23	< 0.012	< 0.029	33.70	< 0.09	0.18	9.53	40.70	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	15.83
22	**RPH1-PH 25-22**	< 0.23	< 0.012	< 0.029	32.90	< 0.09	0.30	10.50	40.10	< 0.55	< 0.21	0.95	0.71	< 0.0125	14.51
23	**RPH1-PH 25-23**	< 0.23	< 0.012	< 0.029	37.80	< 0.09	0.40	10.80	32.70	< 0.55	< 0.21	< 0.33	0.73	< 0.0125	17.53
24	**RPH1-PH 25-24**	< 0.23	< 0.012	< 0.029	50.60	< 0.09	1.23	32.20	5.11	< 0.55	< 0.21	< 0.33	3.84	< 0.0125	6.77

Note: The results were done on dry basis.

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Analyzed by: Eng. Nidal Tayyem
Eng. Feryal Yosef

Division Head: Eng .Maysoon Alkhzahee

Laboratories & Quality Director : Eng .Maysoon Alkhzahee

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

The Hashemite Kingdom of Jordan

Ministry of Energy and Mineral Resources/ Laboratories & Quality Directorate

TEST REPORT

X-RAY SPECTROMETRIC& LOI ANALYSIS

Division Chemical & Mineral Analysis/Lab. X.R.F
Client Name & Address: مديرية دراسات المصادر الطبيعية
Sample Type: صلبة
Sample Method: By Client

Date of Receipt: 03/04/ 2022

Reporting Date: 14/04/2022
Test Report No.: 00104/04/2022-CH001-049
Sample Location:-
Testing Date: 10/04/2022

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO_3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
1	RPH1-BH26-1	1.37	0.02	0.18	37.20	0.15	< 0.058	0.31	26.70	2.01	1.16	< 0.33	< 0.51	< 0.0125	30.80
2	RPH1-BH26-2	0.74	< 0.012	0.11	39.40	< 0.09	< 0.058	0.33	26.20	1.10	0.85	< 0.33	< 0.51	< 0.0125	31.25
3	RPH1-BH26-3	0.49	< 0.012	0.083	43.60	< 0.09	0.082	0.56	20.70	0.74	0.49	< 0.33	< 0.51	< 0.0125	33.24
4	RPH1-BH26-4	0.40	< 0.012	0.067	46.80	< 0.09	1.21	3.50	15.00	0.59	0.36	< 0.33	< 0.51	< 0.0125	31.96
5	RPH1-BH26-5	< 0.23	< 0.012	0.030	43.60	< 0.09	0.32	3.95	22.80	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	28.58
6	RPH1-BH26-6	< 0.23	< 0.012	0.035	50.80	< 0.09	0.28	9.63	8.93	< 0.55	< 0.21	< 0.33	0.74	< 0.0125	29.03
7	RPH1-BH26-7	< 0.23	< 0.012	0.033	51.00	< 0.09	0.22	7.87	8.56	< 0.55	< 0.21	< 0.33	0.57	< 0.0125	31.21
8	RPH1-BH26-8	0.24	< 0.012	0.049	49.20	< 0.09	0.14	7.00	11.60	< 0.55	0.21	< 0.33	< 0.51	< 0.0125	30.69
9	RPH1-BH26-9	< 0.23	< 0.012	< 0.029	52.70	< 0.09	0.50	17.00	4.43	< 0.55	< 0.21	< 0.33	1.88	< 0.0125	23.13
10	RPH1-BH26-10	< 0.23	< 0.012	0.031	53.00	< 0.09	0.59	16.40	3.28	< 0.55	< 0.21	< 0.33	1.67	< 0.0125	24.32
11	RPH1-BH26-11	< 0.23	< 0.012	< 0.029	46.10	< 0.09	0.62	17.10	16.00	< 0.55	< 0.21	< 0.33	1.38	< 0.0125	18.53
12	RPH1-BH26-12	< 0.23	< 0.012	< 0.029	46.40	< 0.09	0.61	23.20	14.50	< 0.55	< 0.21	< 0.33	2.34	< 0.0125	12.50
13	RPH1-BH26-13	< 0.23	< 0.012	< 0.029	48.70	< 0.09	0.60	22.80	11.30	< 0.55	< 0.21	< 0.33	2.35	< 0.0125	14.09
14	RPH1-BH26-14	< 0.23	< 0.012	< 0.029	49.80	< 0.09	0.72	24.50	9.21	< 0.55	< 0.21	< 0.33	2.40	< 0.0125	13.17

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

Reporting Date: 14/04/2022 *Test Report No.: 00104/04/2022-CH001-049*

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO_3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
15	RPH1-BH26-15	< 0.23	< 0.012	< 0.029	48.80	< 0.09	0.76	24.80	10.60	< 0.55	< 0.21	< 0.33	2.46	< 0.0125	12.24
16	RPH1-BH26-16	< 0.23	< 0.012	< 0.029	23.20	< 0.09	0.16	8.89	58.10	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	8.50
17	RPH1-BH26-17	< 0.23	< 0.012	< 0.029	16.50	< 0.09	< 0.058	6.20	69.50	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	6.77
18	RPH1-BH26-18	< 0.23	< 0.012	< 0.029	9.29	< 0.09	< 0.058	1.61	83.30	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	4.86
19	RPH1-BH26-19	< 0.23	< 0.012	< 0.029	19.40	< 0.09	< 0.058	3.02	66.30	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	11.07
20	RPH1-BH26-20	< 0.23	< 0.012	< 0.029	33.60	< 0.09	< 0.058	1.21	41.50	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	23.67
21	RPH1-BH26-21	< 0.23	< 0.012	< 0.029	35.70	< 0.09	0.15	5.50	37.00	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	21.23
22	RPH1-BH26-22	< 0.23	< 0.012	< 0.029	39.70	< 0.09	0.26	7.61	28.80	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	22.44
23	RPH1-BH26-23	< 0.23	< 0.012	< 0.029	48.00	< 0.09	< 0.058	2.98	15.50	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	33.24
24	RPH1-BH26-24	< 0.23	< 0.012	< 0.029	40.60	< 0.09	< 0.058	2.85	28.90	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	27.52
25	RPH1-BH26-25	< 0.23	< 0.012	< 0.029	40.80	< 0.09	< 0.058	1.41	28.90	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	28.80
26	RPH1-BH26-26	< 0.23	< 0.012	< 0.029	35.70	< 0.09	< 0.058	3.58	37.30	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	23.07
27	RPH1-BH26-27	< 0.23	< 0.012	< 0.029	40.80	< 0.09	< 0.058	3.01	28.10	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	27.50
28	RPH1-BH26-28	< 0.23	< 0.012	0.033	46.80	< 0.09	< 0.058	1.04	18.50	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	33.36
29	RPH1-BH26-29	< 0.23	< 0.012	< 0.029	46.40	< 0.09	< 0.058	1.24	18.30	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	33.60

Note: The results were done on dry basis.

- THE TEST RESULTS RELATE ONLY TO THE ITEMS TESTED & BROUGHT BY CLIENT
- TEST REPORT IS ONLY VAILD WITH MEMR STAMP & SIGNATURES.
- THE TEST WAS PERFORMED ACCORDING TO YOUR REQUEST.

Analyzed by: Eng. Nidal Tayyem
Eng. Feryal Yosef

Division Head: Eng .Maysoon Alkhzahee

Laboratories & Quality Director : Eng .Maysoon Alkhzahee

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

Jordan –Amman- Al Byader- 8th Circle . – Telefax +96265504409 – P.O. Box.7
(Web site: www.memr.gov.jo)

X-Ray Spectrometric Analysis Test Report

Test Report No. : 00115/04/2022 -CH001-055 Test Report Date : 17/04/2022

Lab Name : Laboratories of Quality Directorate at the Ministry of Energy and Mineral Resources
Lab Address : Ministry of Energy and Mineral Resources - 8th Circle Bayader Wadi Al Seer, Amman – Jordan (www.memr.gov.jo)

Client Name : مديرية دراسات المصادر الطبيعية
Client Address : -

Division : Chemical & Mineral Analysis Lab / XRF Lab Testing Location : At the Lab facility.

Methods Used : BS EN 15309-2007 Lab Ref. Work Instruction : WI-REP-01 Used for : XRF spectrometric analysis & LOI

Sampling Method : By the customer Sample Reception Date : 10/04/2022
Sample Type : صلبة Sample Location : -
Testing Date : 11/04/2022

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
1	RPH1-BH27-1	2.70	0.038	0.36	23.70	0.48	0.44	0.47	44.60	4.17	1.62	< 0.33	< 0.51	< 0.0125	21.37
2	RPH1-BH27-2	1.39	0.016	0.19	36.80	0.13	0.065	0.30	27.70	2.12	1.16	< 0.33	< 0.51	< 0.0125	30.15
3	RPH1-BH27-3	1.00	< 0.012	0.14	40.70	< 0.09	< 0.058	0.33	23.00	1.52	1.02	< 0.33	< 0.51	< 0.0125	32.25
4	RPH1-BH27- 4	0.32	< 0.012	0.055	45.00	< 0.09	0.62	0.43	18.70	0.56	0.39	< 0.33	< 0.51	< 0.0125	33.91
5	RPH1-BH27- 5	< 0.23	< 0.012	< 0.029	46.50	< 0.09	0.19	0.46	17.80	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	34.71
6	RPH1-BH27- 6	< 0.23	< 0.012	< 0.029	47.60	< 0.09	0.33	0.65	16.10	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	34.97
7	RPH1-BH27- 7	< 0.23	< 0.012	< 0.029	47.00	< 0.09	0.42	0.98	16.90	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	34.16
8	RPH1-BH27- 8	< 0.23	< 0.012	0.034	44.90	< 0.09	0.33	0.99	19.80	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	33.02
9	RPH1-BH27 -9	< 0.23	< 0.012	0.032	41.90	< 0.09	0.46	1.49	25.30	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	29.92
10	RPH1-BH27-10	< 0.23	< 0.012	< 0.029	46.20	< 0.09	0.13	2.21	18.30	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	32.40
11	RPH1-BH27-11	< 0.23	< 0.012	< 0.029	43.90	< 0.09	< 0.058	1.95	22.50	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	30.86
12	RPH1-BH27- 12	< 0.23	< 0.012	< 0.029	50.10	< 0.09	0.24	7.26	10.70	< 0.55	< 0.21	< 0.33	0.58	< 0.0125	30.72

وزارة الطاقة والثروة المعدنية
المملكة الأردنية الهاشمية

X-Ray Spectrometric Analysis Test Report

Test Report No. : 00115/04/2022 -CH001-055 Test Report Date : 17/04/2022

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
13	RPH1-BH27- 13	< 0.23	< 0.012	< 0.029	48.80	< 0.09	0.16	6.61	13.50	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	30.29
14	RPH1-BH27- 14	< 0.23	< 0.012	< 0.029	51.20	< 0.09	0.38	14.90	8.05	< 0.55	< 0.21	< 0.33	1.57	< 0.0125	23.79
15	RPH1-BH27- 15	< 0.23	< 0.012	< 0.029	52.10	< 0.09	0.22	9.92	7.04	< 0.55	< 0.21	< 0.33	0.87	< 0.0125	29.78
16	RPH1-BH27- 16	< 0.23	< 0.012	< 0.029	51.50	< 0.09	0.25	11.30	8.15	< 0.55	< 0.21	< 0.33	0.90	< 0.0125	27.74
17	RPH1-BH27- 17	< 0.23	< 0.012	< 0.029	49.50	< 0.09	0.30	13.60	12.30	< 0.55	< 0.21	< 0.33	1.17	< 0.0125	22.97
18	RPH1-BH27- 18	< 0.23	< 0.012	< 0.029	52.20	< 0.09	0.83	25.50	4.28	< 0.55	< 0.21	< 0.33	2.76	< 0.0125	14.28
19	RPH1-BH27- 19	< 0.23	< 0.012	< 0.029	51.50	< 0.09	0.55	18.90	6.68	< 0.55	< 0.21	< 0.33	1.86	< 0.0125	20.29
20	RPH1-BH27- 20	< 0.23	< 0.012	< 0.029	53.20	< 0.09	0.76	21.40	2.90	< 0.55	< 0.21	< 0.33	2.37	< 0.0125	19.26
21	RPH1-BH27- 21	< 0.23	< 0.012	< 0.029	53.00	< 0.09	0.76	20.80	2.68	< 0.55	< 0.21	< 0.33	2.02	< 0.0125	20.61
22	RPH1-BH27-22	< 0.23	< 0.012	< 0.029	52.40	< 0.09	0.61	18.80	5.45	< 0.55	< 0.21	< 0.33	1.82	< 0.0125	20.85
23	RPH1-BH27-23	< 0.23	< 0.012	< 0.029	51.30	< 0.09	0.83	23.60	6.18	< 0.55	< 0.21	< 0.33	2.48	< 0.0125	15.46
24	RPH1-BH27-24	< 0.23	< 0.012	< 0.029	36.80	< 0.09	0.46	15.30	33.30	< 0.55	< 0.21	< 0.33	1.12	< 0.0125	12.86
Uncertainty (if required):		-	-	-	-	-	-	-	-	-	-	-	-	-	-

This test is traceable to SI units and is following ISO/IEC 17025:2017. While measurement uncertainty is evaluated in accordance with ASTM standards. The coverage factor (k=2) so that the coverage probability is approximately 95%.

وزارة الطاقة والثروة المعدنية
المملكة الأردنية الهاشمية

X-Ray Spectrometric Analysis Test Report

Test Report No. : 00115/04/2022 -CH001-055 Test Report Date : 17/04/2022

Notes:

- **The results were done on dry basis.**
- The results stated in this test report relates only to the tested sample.
- This test report is only valid with stamp and signature.
- The results stated in this test report shall not be reproduced except in full, without written approval of the lab.
- The laboratory does not apply the decision rule.

Opinions and Interpretations:
NA.....
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Additional Comments:
NA.....
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.....

Analyzed by *(Name and Sign)* : Eng. Nidal Tayyem
Eng. Feryal Yosef

Division Head *(Name and Sign)* : Eng .Maysoon Alkhzahee

Technical Manager *(Name and Sign)* : Chemist Hanady Al Sharif

Lab Manager *(Name and Sign)* : Eng .Maysoon Alkhzahee

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

وزارة الطاقة والثروة المعدنية
المملكة الأردنية الهاشمية

X-Ray Spectrometric Analysis Test Report

Test Report No. : 00117/04/2022 -CH001-056 Test Report Date : 12/05/2022

Lab Name : Laboratories of Quality Directorate at the Ministry of Energy and Mineral Resources
Lab Address : Ministry of Energy and Mineral Resources - 8th Circle Bayader Wadi Al Seer, Amman – Jordan (www.memr.gov.jo)

Client Name : مديرية دراسات المصادر الطبيعية
Client Address : عمان

Division : Chemical & Mineral Analysis Lab / XRF Lab Testing Location : At the Lab facility.

Methods Used : BS EN 15309-2007 Lab Ref. Work Instruction : WI-REP-01 Used for : XRF spectrometric analysis & LOI

Sampling Method : By the customer
Sample Type : صلبة
Testing Date : 10/05/2022

Sample Reception Date : 17/04/2022
Sample Location :

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
1	RPH1-BH28-1	3.57	0.040	0.41	14.50	0.54	< 0.058	0.43	57.30	5.46	1.90	0.61	< 0.51	< 0.0125	15.27
2	RPH1-BH28-2	2.64	0.022	0.30	14.70	0.26	0.14	0.41	62.00	3.92	1.40	< 0.33	< 0.51	< 0.0125	14.20
3	RPH1-BH28-3	1.98	0.015	0.24	20.00	0.16	0.36	0.42	55.10	2.82	1.15	< 0.33	< 0.51	< 0.0125	17.72
4	RPH1-BH28- 4	0.98	< 0.012	0.13	27.20	< 0.09	< 0.058	0.47	47.80	1.42	0.59	< 0.33	< 0.51	< 0.0125	21.30
5	RPH1-BH28- 5	0.82	< 0.012	0.13	38.70	< 0.09	< 0.058	0.33	27.90	1.26	0.67	< 0.33	< 0.51	< 0.0125	30.20
6	RPH1-BH28- 6	0.85	< 0.012	0.13	36.10	< 0.09	0.090	0.40	30.50	1.33	0.82	0.91	< 0.51	< 0.0125	28.86
7	RPH1-BH28- 7	< 0.23	< 0.012	0.030	49.10	< 0.09	< 0.058	0.38	12.60	< 0.55	0.24	< 0.33	< 0.51	< 0.0125	37.12
8	RPH1-BH28- 8	< 0.23	< 0.012	< 0.029	49.80	< 0.09	< 0.058	1.13	12.20	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	36.28
9	RPH1-BH28 -9	0.27	< 0.012	0.044	41.10	< 0.09	< 0.058	1.65	26.80	< 0.55	0.21	< 0.33	< 0.51	< 0.0125	29.43
10	RPH1-BH28-10	< 0.23	< 0.012	0.032	49.00	< 0.09	< 0.058	0.65	12.90	< 0.55	0.22	< 0.33	< 0.51	< 0.0125	36.59
11	RPH1-BH28-11	< 0.23	< 0.012	< 0.029	53.80	< 0.09	< 0.058	0.85	4.75	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	40.19
12	RPH1-BH28- 12	< 0.23	< 0.012	< 0.029	48.40	< 0.09	0.14	8.09	13.80	< 0.55	< 0.21	< 0.33	0.58	< 0.0125	28.45

وزارة الطاقة و... للمعدنية
مديرية الم... ات والجودة

وزارة الطاقة والثروة المعدنية
المملكة الأردنية الهاشمية

X-Ray Spectrometric Analysis Test Report

Test Report No. : 00117/04/2022 -CH001-056 Test Report Date : 12/05/2022

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
13	RPH1-BH28- 13	< 0.23	< 0.012	0.029	50.20	< 0.09	0.075	8.18	10.60	< 0.55	< 0.21	< 0.33	0.62	< 0.0125	29.76
14	RPH1-BH28- 14	< 0.23	< 0.012	< 0.029	53.30	< 0.09	0.16	15.40	3.87	< 0.55	< 0.21	< 0.33	1.55	< 0.0125	25.29
15	RPH1-BH28- 15	< 0.23	< 0.012	< 0.029	54.10	< 0.09	< 0.058	8.35	3.65	< 0.55	< 0.21	< 0.33	0.72	< 0.0125	32.97
16	RPH1-BH28- 16	< 0.23	< 0.012	< 0.029	54.80	< 0.09	0.069	10.00	2.18	< 0.55	< 0.21	< 0.33	0.84	< 0.0125	31.86
17	RPH1-BH28- 17	< 0.23	< 0.012	< 0.029	52.70	< 0.09	0.35	21.00	4.18	< 0.55	< 0.21	< 0.33	2.19	< 0.0125	19.27
18	RPH1-BH28- 18	< 0.23	< 0.012	< 0.029	52.90	< 0.09	0.36	21.40	3.52	< 0.55	< 0.21	< 0.33	2.40	< 0.0125	19.22
19	RPH1-BH28- 19	< 0.23	< 0.012	< 0.029	54.30	< 0.09	0.50	22.40	0.99	< 0.55	< 0.21	< 0.33	2.36	< 0.0125	19.24
20	RPH1-BH28- 20	< 0.23	< 0.012	< 0.029	50.30	< 0.09	0.58	22.40	7.44	< 0.55	< 0.21	< 0.33	2.25	< 0.0125	16.43
21	RPH1-BH28- 21	< 0.23	< 0.012	< 0.029	51.60	< 0.09	0.72	28.20	4.42	< 0.55	< 0.21	< 0.33	3.10	< 0.0125	11.75
22	RPH1-BH28-22	< 0.23	< 0.012	< 0.029	44.70	< 0.09	0.37	18.50	18.40	< 0.55	< 0.21	< 0.33	1.71	< 0.0125	16.07
23	RPH1-BH28-23	< 0.23	< 0.012	< 0.029	44.90	< 0.09	0.45	21.80	17.80	< 0.55	< 0.21	< 0.33	1.95	< 0.0125	12.79
24	RPH1-BH28-24	< 0.23	< 0.012	< 0.029	40.00	< 0.09	0.20	12.50	28.60	< 0.55	< 0.21	< 0.33	0.96	< 0.0125	17.54
25	RPH1-BH28-25	< 0.23	< 0.012	< 0.029	48.30	< 0.09	0.48	22.30	11.90	< 0.55	< 0.21	< 0.33	2.26	< 0.0125	14.60
26	RPH1-BH28-26	< 0.23	< 0.012	< 0.029	18.50	< 0.09	< 0.058	8.03	66.30	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	6.21
27	RPH1-BH28-27	< 0.23	< 0.012	< 0.029	20.00	< 0.09	< 0.058	8.60	63.50	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	6.65
Uncertainty (if required):		-	-	-	-	-	-	-	-	-	-	-	-	-	-

This test is traceable to SI units and is following ISO/IEC 17025:2017. While measurement uncertainty is evaluated in accordance with ASTM standards. The coverage factor (k=2) so that the coverage probability is approximately 95%.

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

وزارة الطاقة والثروة المعدنية
المملكة الأردنية الهاشمية

X-Ray Spectrometric Analysis Test Report

Test Report No. : 00117/04/2022 -CH001-056

Test Report Date : 12/05/2022

Notes:

- **The results were done on dry basis.**
- The results stated in this test report relates only to the tested sample.
- This test report is only valid with stamp and signature.
- The results stated in this test report shall not be reproduced except in full, without written approval of the lab.
- The laboratory does not apply the decision rule.

Opinions and Interpretations:

NA.....

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Additional Comments:

NA.....

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Analyzed by *(Name and Sign)* : Eng. Nidal Tayyem

Eng. Feryal Yosef

Division Head *(Name and Sign)* : Eng .Maysoon Alkhzahee

Technical Manager *(Name and Sign)* : Chemist Hanady Al Sharif

Lab Manager *(Name and Sign)* : Eng .Maysoon Alkhzahee

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

وزارة الطاقة والثروة المعدنية
المملكة الأردنية الهاشمية

X-Ray Spectrometric Analysis Test Report

Test Report No. : 00128/04/2022 -CH001-061 Test Report Date : 18/05/2022

Lab Name : Laboratories of Quality Directorate at the Ministry of Energy and Mineral Resources
Lab Address : Ministry of Energy and Mineral Resources - 8th Circle Bayader Wadi Al Seer, Amman – Jordan (www.memr.gov.jo)

Client Name : مديرية دراسات المصادر الطبيعية
Client Address :

Division : Chemical & Mineral Analysis Lab / XRF Lab Testing Location : At the Lab facility.

Methods Used : BS EN 15309-2007 Lab Ref. Work Instruction : WI-REP-01 Used for : XRF spectrometric analysis & LOI

Sampling Method : By the customer
Sample Type : صلبة
Testing Date : 15/05/2022

Sample Reception Date : 26/04/2022
Sample Location : -

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
1	RPH1-BH29-1	1.31	0.016	0.18	34.80	0.12	< 0.058	0.41	32.00	1.91	1.06	< 0.33	< 0.51	< 0.0125	28.19
2	RPH1-BH29-2	0.46	< 0.012	0.71	46.50	< 0.09	3.27	0.39	14.10	0.72	0.46	< 0.33	< 0.51	< 0.0125	34.01
3	RPH1-BH29-3	0.24	< 0.012	0.048	47.30	< 0.09	3.25	0.49	14.30	< 0.55	0.29	< 0.33	< 0.51	< 0.0125	33.64
4	RPH1-BH29- 4	0.23	< 0.012	0.040	47.20	< 0.09	2.11	7.51	14.30	< 0.55	0.25	< 0.33	0.61	< 0.0125	27.33
5	RPH1-BH29- 5	< 0.23	< 0.012	< 0.029	49.30	< 0.09	0.61	4.67	13.80	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	30.86
6	RPH1-BH29- 6	< 0.23	< 0.012	< 0.029	54.40	< 0.09	0.37	7.58	3.81	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	33.07
7	RPH1-BH29- 7	< 0.23	< 0.012	< 0.029	54.30	< 0.09	< 0.058	2.19	5.79	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	37.43
8	RPH1-BH29- 8	< 0.23	< 0.012	< 0.029	54.80	< 0.09	0.53	13.80	2.22	< 0.55	< 0.21	< 0.33	1.54	< 0.0125	26.82
9	RPH1-BH29-9	< 0.23	< 0.012	< 0.029	54.40	< 0.09	1.09	19.00	1.61	< 0.55	< 0.21	< 0.33	1.97	< 0.0125	21.76
10	RPH1-BH29-10	< 0.23	< 0.012	< 0.029	48.70	< 0.09	0.68	15.00	13.7	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	21.12
11	RPH1-BH29-11	< 0.23	< 0.012	< 0.029	53.30	< 0.09	0.88	22.10	5.79	< 0.55	< 0.21	< 0.33	0.98	< 0.0125	16.67
12	RPH1-BH29- 12	< 0.23	< 0.012	< 0.029	52.90	< 0.09	1.03	27.50	4.92	< 0.55	< 0.21	< 0.33	1.13	< 0.0125	12.35

وزارة الطاقة والثروة المعدنية
المملكة الأردنية الهاشمية

X-Ray Spectrometric Analysis Test Report

Test Report No. : 00128/04/2022 -CH001-061 Test Report Date : 18/05/2022

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
13	RPH1-BH29- 13	< 0.23	< 0.012	< 0.029	53.50	< 0.09	1.04	29.70	4.05	< 0.55	< 0.21	< 0.33	1.30	< 0.0125	10.35
14	RPH1-BH29- 14	< 0.23	< 0.012	< 0.029	48.80	< 0.09	0.97	29.50	12.10	< 0.55	< 0.21	< 0.33	1.12	< 0.0125	7.29
15	RPH1-BH29- 15	< 0.23	< 0.012	< 0.029	35.30	< 0.09	0.49	15.40	36.80	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	10.93
16	RPH1-BH29- 16	< 0.23	< 0.012	< 0.029	32.60	< 0.09	0.33	12.70	41.10	< 0.55	< 0.21	< 0.33	1.06	< 0.0125	11.58
17	RPH1-BH29- 17	< 0.23	< 0.012	< 0.029	33.40	< 0.09	0.46	16.50	39.00	< 0.55	< 0.21	< 0.33	1.48	< 0.0125	8.55
18	RPH1-BH29- 18	< 0.23	< 0.012	< 0.029	19.50	< 0.09	0.073	7.63	65.40	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	6.79
19	RPH1-BH29- 19	< 0.23	< 0.012	< 0.029	12.50	< 0.09	< 0.058	3.47	78.40	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	4.94
20	RPH1-BH29- 20	< 0.23	< 0.012	< 0.029	8.32	< 0.09	< 0.058	1.85	86.00	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	3.77
21	RPH1-BH29- 21	< 0.23	< 0.012	< 0.029	12.60	< 0.09	< 0.058	2.38	78.40	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	6.49
22	RPH1-BH29-22	< 0.23	< 0.012	< 0.029	22.50	< 0.09	< 0.058	1.62	59.60	< 0.55	< 0.21	< 0.33	1.44	< 0.0125	14.57
23	RPH1-BH29-23	< 0.23	< 0.012	< 0.029	31.90	< 0.09	< 0.058	1.09	43.00	< 0.55	< 0.21	< 0.33	1.66	< 0.0125	22.27
24	RPH1-BH29-24	< 0.23	< 0.012	< 0.029	25.20	< 0.09	< 0.058	2.29	55.10	< 0.55	< 0.21	< 0.33	1.29	< 0.0125	15.92
25	RPH1-BH29-25	< 0.23	< 0.012	< 0.029	28.80	< 0.09	0.18	4.77	47.40	< 0.55	< 0.21	< 0.33	1.85	< 0.0125	16.94
26	RPH1-BH29-26	< 0.23	< 0.012	< 0.029	34.30	< 0.09	< 0.058	3.74	37.80	< 0.55	< 0.21	< 0.33	1.90	< 0.0125	22.13
27	RPH1-BH29-27	< 0.23	< 0.012	< 0.029	24.60	< 0.09	< 0.058	3.03	55.40	< 0.55	< 0.21	< 0.33	1.42	< 0.0125	15.35
28	RPH1-BH29-28	< 0.23	< 0.012	< 0.029	34.80	< 0.09	< 0.058	2.75	40.20	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	22.04
29	RPH1-BH29-29	< 0.23	< 0.012	< 0.029	36.50	< 0.09	< 0.058	2.51	37.20	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	23.59
Uncertainty (if required):		-	-	-	-	-	-	-	-	-	-	-	-	-	

This test is traceable to SI units and is following ISO/IEC 17025:2017. While measurement uncertainty is evaluated in accordance with ASTM standards. The coverage factor (k=2) so that the coverage probability is approximately 95%.

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

وزارة الطاقة والثروة المعدنية
المملكة الأردنية الهاشمية

X-Ray Spectrometric Analysis Test Report

Test Report No. : 00128/04/2022 -CH001-061 Test Report Date : 18/05/2022

Notes:

- **The results were done on dry basis.**
- The results stated in this test report relates only to the tested sample.
- This test report is only valid with stamp and signature.
- The results stated in this test report shall not be reproduced except in full, without written approval of the lab.
- The laboratory does not apply the decision rule.

Opinions and Interpretations:
NA.....
.....
.....

Additional Comments:
NA.....
.....
.....

Analyzed by *(Name and Sign)* : Eng. Nidal Tayyem
Eng. Feryal Yosef

Division Head *(Name and Sign)* : Eng .Maysoon Alkhzahee

Technical Manager *(Name and Sign)* : Chemist Hanady Al Sharif

Lab Manager *(Name and Sign)* : Eng .Maysoon Alkhzahee

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

وزارة الطاقة والثروة المعدنية
المملكة الأردنية الهاشمية

X-Ray Spectrometric Analysis Test Report

Test Report No. : 00172/05/2022 -CH001-076

Test Report Date : 06/06/2022

Lab Name : Laboratories of Quality Directorate at the Ministry of Energy and Mineral Resources

Lab Address : Ministry of Energy and Mineral Resources - 8th Circle Bayader Wadi Al Seer, Amman – Jordan (www.memr.gov.jo)

Client Name : مديرية دراسات المصادر الطبيعية

Client Address : -

Division : Chemical & Mineral Analysis Lab / XRF Lab

Testing Location : At the Lab facility.

Methods Used : BS EN 15309-2007 Lab Ref. Work Instruction : WI-REP-01 Used for : XRF spectrometric analysis & LOI

Sampling Method : By the customer

Sample Type : صلبة

Testing Date : 05/06/2022

Sample Reception Date : 30/05/2022

Sample Location :

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
1	RPH1-BH31A-1	1.00	0.016	0.13	29.20	< 0.09	0.16	0.40	44.00	1.48	0.76	< 0.33	< 0.51	< 0.0125	22.78
2	RPH1-BH31A-2	0.69	< 0.012	0.090	22.80	< 0.09	< 0.058	0.44	56.40	0.81	0.43	< 0.33	< 0.51	< 0.0125	18.36
3	RPH1-BH31A-3	0.47	< 0.012	0.074	30.60	< 0.09	< 0.058	0.78	46.30	0.63	0.30	< 0.33	< 0.51	< 0.0125	20.80
4	RPH1-BH31A-4	0.33	< 0.012	0.061	37.40	< 0.09	< 0.058	0.43	33.20	< 0.55	0.23	< 0.33	< 0.51	< 0.0125	27.83
5	RPH1-BH31A-5	0.37	< 0.012	0.066	39.90	< 0.09	0.16	0.38	28.80	< 0.55	0.28	< 0.33	< 0.51	< 0.0125	29.60
6	RPH1-BH31A-6	< 0.23	< 0.012	0.051	46.20	< 0.09	< 0.058	0.36	18.10	< 0.55	0.24	< 0.33	< 0.51	< 0.0125	34.41
7	RPH1-BH31A-7	< 0.23	< 0.012	0.036	50.00	< 0.09	< 0.058	0.47	12.20	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	36.72
8	RPH1-BH31A-8	<0.28	< 0.012	0.036	49.80	< 0.09	< 0.058	0.46	12.20	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	36.93
9	RPH1-BH31A-9	< 0.23	< 0.012	0.030	45.80	< 0.09	< 0.058	0.70	19.60	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	33.17
10	RPH1-BH31A-10	< 0.23	< 0.012	0.030	45.40	< 0.09	< 0.058	0.65	19.70	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	33.50
11	RPH1-BH31A-11	< 0.23	< 0.012	< 0.029	42.90	< 0.09	< 0.058	0.81	22.10	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	33.50
12	RPH1-BH31A-12	< 0.23	< 0.012	0.032	47.50	< 0.09	< 0.058	1.66	14.50	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	34.46

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

وزارة الطاقة والثروة المعدنية
المملكة الأردنية الهاشمية

X-Ray Spectrometric Analysis Test Report

Test Report No. : 00172/05/2022 -CH001-076 Test Report Date : 06/06/2022

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
13	RPH1-BH31A-13	0.26	< 0.012	0.040	46.20	< 0.09	< 0.058	2.45	18.80	0.57	< 0.21	< 0.33	< 0.51	< 0.0125	31.46
14	RPH1-BH31A-14	< 0.23	< 0.012	< 0.029	45.70	< 0.09	< 0.058	1.58	20.20	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	31.88
15	RPH1-BH31A-15	0.42	< 0.012	0.060	48.30	< 0.09	0.25	10.90	11.80	0.79	0.27	< 0.33	0.89	< 0.0125	26.25
16	RPH1-BH31A-16	0.47	< 0.012	0.067	48.10	< 0.09	0.29	11.80	12.20	0.82	0.29	< 0.33	1.14	< 0.0125	24.84
17	RPH1-BH31A-17	0.31	< 0.012	0.045	49.90	< 0.09	0.20	8.99	9.75	0.60	0.22	< 0.33	0.76	< 0.0125	29.07
Uncertainty (if required):		-	-	-	-	-	-	-	-	-	-	-	-	-	-

This test is traceable to SI units and is following ISO/IEC 17025:2017. While measurement uncertainty is evaluated in accordance with ASTM standards. The coverage factor (k=2) so that the coverage probability is approximately 95%.

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

وزارة الطاقة والثروة المعدنية
المملكة الأردنية الهاشمية

X-Ray Spectrometric Analysis Test Report

Test Report No. : 00172/05/2022 -CH001-076 Test Report Date : 06/06/2022

Notes:

- **The results were done on dry basis.**
- The results stated in this test report relates only to the tested sample.
- This test report is only valid with stamp and signature.
- The results stated in this test report shall not be reproduced except in full, without written approval of the lab.
- The laboratory does not apply the decision rule.

Opinions and Interpretations:
NA.....
.....
.....

Additional Comments:
NA.....
.....
.....

Analyzed by *(Name and Sign)* : Eng. Nidal Tayyem
Eng. Feryal Yosef

Division Head *(Name and Sign)* : Eng .Maysoon Alkhzahee

Technical Manager *(Name and Sign)* : Chemist Hanady Al Sharif

Lab Manager *(Name and Sign)* : Eng .Maysoon Alkhzahee

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

وزارة الطاقة والثروة المعدنية
المملكة الأردنية الهاشمية

X-Ray Spectrometric Analysis Test Report

Test Report No. : 00173/05/2022 -CH001-077 Test Report Date : 06/06/2022

Lab Name : Laboratories of Quality Directorate at the Ministry of Energy and Mineral Resources
Lab Address : Ministry of Energy and Mineral Resources - 8th Circle Bayader Wadi Al Seer, Amman – Jordan (www.memr.gov.jo)

Client Name : مديرية دراسات المصادر الطبيعية
Client Address : -

Division : Chemical & Mineral Analysis Lab / XRF Lab Testing Location : At the Lab facility.

Methods Used : BS EN 15309-2007 Lab Ref. Work Instruction : WI-REP-01 Used for : XRF spectrometric analysis & LOI

Sampling Method : By the customer Sample Reception Date : 30/05/2022
Sample Type : صلبة Sample Location : -
Testing Date : 05/06/2022

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
1	RPH1-BH31B-1	0.82	< 0.012	0.12	44.70	< 0.09	< 0.058	0.29	16.20	1.33	0.85	< 0.33	< 0.51	< 0.0125	35.67
2	RPH1-BH31B-2	0.35	< 0.012	0.058	49.80	< 0.09	< 0.058	0.34	9.57	0.62	0.62	< 0.33	< 0.51	< 0.0125	38.59
3	RPH1-BH31B-3	0.47	< 0.012	0.075	46.20	< 0.09	0.72	0.70	14.50	0.76	0.86	< 0.33	< 0.51	< 0.0125	35.71
4	RPH1-BH31B-4	< 0.23	< 0.012	< 0.029	51.30	< 0.09	< 0.058	0.62	9.42	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	38.09
5	RPH1-BH31B-5	< 0.23	< 0.012	0.030	50.70	< 0.09	0.37	1.06	9.69	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	37.34
6	RPH1-BH31B-6	< 0.23	< 0.012	0.029	51.40	< 0.09	0.19	1.15	8.43	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	37.99
7	RPH1-BH31B-7	< 0.23	< 0.012	< 0.029	54.60	< 0.09	0.30	7.06	2.01	< 0.55	< 0.21	< 0.33	0.54	< 0.0125	35.06
8	RPH1-BH31B-8	< 0.23	< 0.012	< 0.029	53.40	< 0.09	0.12	4.07	4.42	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	37.05
9	RPH1-BH31B-9	< 0.23	< 0.012	< 0.029	53.10	< 0.09	0.17	7.16	5.35	< 0.55	< 0.21	< 0.33	0.63	< 0.0125	33.22
10	RPH1-BH31B-10	< 0.23	< 0.012	< 0.029	49.50	< 0.09	0.19	8.20	11.40	< 0.55	< 0.21	< 0.33	0.47	< 0.0125	29.97
11	RPH1-BH31B-11	< 0.23	< 0.012	< 0.029	42.20	< 0.09	0.38	13.40	23.80	< 0.55	< 0.21	< 0.33	1.12	< 0.0125	18.62
12	RPH1-BH31B-12	< 0.23	< 0.012	< 0.029	44.60	< 0.09	0.40	13.90	19.90	< 0.55	< 0.21	< 0.33	1.12	< 0.0125	19.82

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

X-Ray Spectrometric Analysis Test Report

Test Report No. : 00173/05/2022 -CH001-077 Test Report Date : 06/06/2022

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
13	RPH1-BH31B-13	< 0.23	< 0.012	< 0.029	30.70	< 0.09	0.27	12.40	42.80	< 0.55	< 0.21	< 0.33	0.94	< 0.0125	12.69
14	RPH1-BH31B-14	< 0.23	< 0.012	< 0.029	52.40	< 0.09	1.25	32.90	2.03	< 0.55	< 0.21	< 0.33	3.55	< 0.0125	7.82
15	RPH1-BH31B-15	< 0.23	< 0.012	< 0.029	52.30	0.16	1.15	32.60	1.47	< 0.55	< 0.21	1.28	3.65	< 0.0125	7.24
16	RPH1-BH31B-16	< 0.23	< 0.012	< 0.029	52.50	< 0.09	1.07	33.40	2.46	< 0.55	< 0.21	< 0.33	3.62	< 0.0125	6.90
17	RPH1-BH31B-17	< 0.23	< 0.012	< 0.029	53.50	< 0.09	1.01	34.60	0.51	< 0.55	< 0.21	< 0.33	4.13	< 0.0125	6.23
18	RPH1-BH31B-18	< 0.23	< 0.012	< 0.029	53.20	< 0.09	0.99	34.10	1.02	< 0.55	< 0.21	< 0.33	4.08	< 0.0125	6.53
19	RPH1-BH31B-19	< 0.23	< 0.012	< 0.029	50.50	< 0.09	0.88	31.40	6.10	< 0.55	< 0.21	< 0.33	3.51	< 0.0125	7.46
20	RPH1-BH31B-20	< 0.23	< 0.012	< 0.029	51.10	< 0.09	1.07	32.40	4.62	< 0.55	< 0.21	< 0.33	3.82	< 0.0125	6.84
21	RPH1-BH31B-21	< 0.23	< 0.012	< 0.029	50.30	< 0.09	1.04	32.10	5.75	< 0.55	< 0.21	0.44	3.43	< 0.0125	6.72
Uncertainty (if required):		-	-	-	-	-	-	-	-	-	-	-	-	-	-

This test is traceable to SI units and is following ISO/IEC 17025:2017. While measurement uncertainty is evaluated in accordance with ASTM standards. The coverage factor (k=2) so that the coverage probability is approximately 95%.

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

وزارة الطاقة والثروة المعدنية
المملكة الأردنية الهاشمية

X-Ray Spectrometric Analysis Test Report

Test Report No. : 00173/05/2022 -CH001-077 Test Report Date : 06/06/2022

Notes:

- **The results were done on dry basis.**
- The results stated in this test report relates only to the tested sample.
- This test report is only valid with stamp and signature.
- The results stated in this test report shall not be reproduced except in full, without written approval of the lab.
- The laboratory does not apply the decision rule.

Opinions and Interpretations:
NA.....
.....
.....

Additional Comments:
NA.....
.....
.....

Analyzed by *(Name and Sign)* : Eng. Nidal Tayyem
Eng. Feryal Yosef

Division Head *(Name and Sign)* : Eng .Maysoon Alkhzahee

Technical Manager *(Name and Sign)* : Chemist Hanady Al Sharif

Lab Manager *(Name and Sign)* : Eng .Maysoon Alkhzahee

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

وزارة الطاقة والثروة المعدنية
المملكة الأردنية الهاشمية

X-Ray Spectrometric Analysis Test Report

Test Report No. : 00150/05/2022 -CH001-068 Test Report Date : 29/05/2022

Lab Name : Laboratories of Quality Directorate at the Ministry of Energy and Mineral Resources
Lab Address : Ministry of Energy and Mineral Resources - 8th Circle Bayader Wadi Al Seer, Amman – Jordan (www.memr.gov.jo)

Client Name : مديرية دراسات المصادر الطبيعية
Client Address : -

Division : Chemical & Mineral Analysis Lab / XRF Lab Testing Location : At the Lab facility.

Methods Used : BS EN 15309-2007 Lab Ref. Work Instruction : WI-REP-01 Used for : XRF spectrometric analysis & LOI

Sampling Method : By the customer
Sample Type : صلبة
Testing Date : 25/05/2022

Sample Reception Date : 19/05/2022
Sample Location :

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
1	RPH1-BH32-1	1.20	0.019	0.18	40.90	0.12	< 0.058	0.40	21.50	1.84	0.89	< 0.33	< 0.51	< 0.0125	32.92
2	RPH1-BH32-2	0.77	< 0.012	0.13	45.60	< 0.09	0.37	0.66	14.30	1.31	0.71	< 0.33	< 0.51	< 0.0125	36.10
3	RPH1-BH32-3	0.31	< 0.012	0.060	44.10	< 0.09	1.42	0.39	18.70	< 0.55	0.33	< 0.33	< 0.51	< 0.0125	34.16
4	RPH1-BH32- 4	< 0.23	< 0.012	0.037	47.80	< 0.09	0.96	0.39	13.90	< 0.55	0.23	< 0.33	< 0.51	< 0.0125	36.21
5	RPH1-BH32- 5	< 0.23	< 0.012	0.031	46.30	< 0.09	0.51	0.48	16.70	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	35.37
6	RPH1-BH32- 6	< 0.23	< 0.012	< 0.029	51.90	< 0.09	0.25	0.62	7.87	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	39.09
7	RPH1-BH32- 7	< 0.23	< 0.012	< 0.029	51.90	< 0.09	0.17	0.46	7.58	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	39.59
8	RPH1-BH32- 8	< 0.23	< 0.012	< 0.029	50.30	< 0.09	< 0.058	0.57	11.00	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	37.83
9	RPH1-BH32-9	< 0.23	< 0.012	< 0.029	47.70	< 0.09	< 0.058	0.75	16.30	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	34.92
10	RPH1-BH32-10	< 0.23	< 0.012	< 0.029	47.00	< 0.09	< 0.058	0.71	16.80	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	34.83
11	RPH1-BH32-11	< 0.23	< 0.012	< 0.029	37.40	< 0.09	< 0.058	0.97	33.60	0.57	< 0.21	< 0.33	< 0.51	< 0.0125	27.11
12	RPH1-BH32- 12	< 0.23	< 0.012	0.035	39.90	< 0.09	< 0.058	0.95	28.90	0.56	< 0.21	< 0.33	< 0.51	< 0.0125	29.19

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

وزارة الطاقة والثروة المعدنية
المملكة الأردنية الهاشمية

X-Ray Spectrometric Analysis Test Report

Test Report No. : 00150/05/2022 -CH001-068 Test Report Date : 29/05/2022

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
13	RPH1-BH32- 13	0.28	< 0.012	0.033	38.00	< 0.09	< 0.058	2.21	31.50	0.66	< 0.21	< 0.33	< 0.51	< 0.0125	27.16
14	RPH1-BH32- 14	< 0.23	< 0.012	< 0.029	45.80	< 0.09	< 0.058	1.21	19.00	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	33.21
15	RPH1-BH32- 15	< 0.23	< 0.012	< 0.029	46.40	< 0.09	0.16	4.07	16.70	< 0.55	0.29	< 0.33	< 0.51	< 0.0125	31.45
16	RPH1-BH32- 16	< 0.23	< 0.012	< 0.029	52.90	< 0.09	0.49	11.70	3.68	< 0.55	< 0.21	< 0.33	1.16	< 0.0125	29.70
17	RPH1-BH32- 17	< 0.23	< 0.012	< 0.029	47.10	< 0.09	0.16	5.61	16.40	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	29.95
18	RPH1-BH32- 18	< 0.23	< 0.012	< 0.029	54.40	< 0.09	0.35	10.50	3.19	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	31.08
19	RPH1-BH32- 19	< 0.23	< 0.012	< 0.029	40.20	< 0.09	0.20	7.03	28.80	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	23.42
20	RPH1-BH32- 20	< 0.23	< 0.012	< 0.029	39.50	< 0.09	0.23	9.53	29.10	< 0.55	< 0.21	< 0.33	0.66	< 0.0125	20.60
21	RPH1-BH32- 21	< 0.23	< 0.012	< 0.029	54.10	< 0.09	0.66	17.40	4.66	< 0.55	< 0.21	< 0.33	1.82	< 0.0125	21.12
22	RPH1-BH32-22	< 0.23	< 0.012	< 0.029	51.90	< 0.09	0.44	11.60	7.59	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	27.82
23	RPH1-BH32-23	< 0.23	< 0.012	< 0.029	28.50	< 0.09	0.11	6.15	48.60	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	15.54
24	RPH1-BH32-24	< 0.23	< 0.012	< 0.029	31.40	< 0.09	0.21	8.53	43.00	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	16.53
25	RPH1-BH32-25	< 0.23	< 0.012	< 0.029	50.00	< 0.09	1.04	28.20	7.81	< 0.55	< 0.21	< 0.33	2.93	< 0.0125	9.96
26	RPH1-BH32-26	< 0.23	< 0.012	< 0.029	52.70	< 0.09	0.93	24.90	3.40	< 0.55	< 0.21	< 0.33	2.35	< 0.0125	15.70
27	RPH1-BH32-27	< 0.23	< 0.012	< 0.029	30.40	< 0.09	0.34	13.20	44.80	< 0.55	< 0.21	< 0.33	1.01	< 0.0125	10.20
28	RPH1-BH32-28	< 0.23	< 0.012	< 0.029	17.60	< 0.09	0.059	6.27	68.70	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	7.14
29	RPH1-BH32-29	< 0.23	< 0.012	< 0.029	23.20	< 0.09	0.24	10.60	57.70	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	7.22
Uncertainty (if required):		-	-	-	-	-	-	-	-	-	-	-	-	-	-

This test is traceable to SI units and is following ISO/IEC 17025:2017. While measurement uncertainty is evaluated in accordance with ASTM standards. The coverage factor (k=2) so that the coverage probability is approximately 95%.

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

X-Ray Spectrometric Analysis Test Report

Test Report No. : 00150/05/2022 -CH001-068

Test Report Date : 29/05/2022

Notes:

- **The results were done on dry basis.**
- The results stated in this test report relates only to the tested sample.
- This test report is only valid with stamp and signature.
- The results stated in this test report shall not be reproduced except in full, without written approval of the lab.
- The laboratory does not apply the decision rule.

Opinions and Interpretations:

NA.....

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Additional Comments:

NA.....

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Analyzed by *(Name and Sign)* : Eng. Nidal Tayyem
Eng. Feryal Yosef

Division Head *(Name and Sign)* : Eng .Maysoon Alkhzahee

Technical Manager *(Name and Sign)* : Chemist Hanady Al Sharif

Lab Manager *(Name and Sign)* : Eng .Maysoon Alkhzahee

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

وزارة الطاقة والثروة المعدنية
المملكة الأردنية الهاشمية

X-Ray Diffraction Analysis Test Report

JAS
Jordanian Accreditation System
نظام الاعتماد الأردني
Accreditation Unit
TEST-061

Test Report No.	: 00150/05/2022 CH07-37		Test Report Date: 30/05/2022		
Lab Name	: Laboratories of Quality Directorate at the Ministry of Energy and Mineral Resources				
Lab Address	: Ministry of Energy and Mineral Resources - 8th Circle Bayader Wadi Al Seer, Amman – Jordan (www.memr.gov.jo)				
Client Name	: مديرية دراسات المصادر الطبيعية				
Client Address	: -				
Division	: Chemical & Mineral Analysis Lab			Testing Location	: At the Lab facility.
Methods Used	: MEMR002-2020	Lab Ref. Work Instruction	: WI-REP-02	Used for: X Ray diffraction analysis	
Sampling Method	: By the customer			Sample Reception Date: 19/05/2022	
Sample Type	: Solid			Sample Location: -	
Testing Date	: 22/05/2022				
Tension (KV)	: 40			Radiation	: Cu
Current (mA)	: 30			Angle Range(2θ)	: (5-70)°

Item	Serial No.	Sample ID	Phase Identification			Uncertainty (if required)
			Major	Minor	Trace	
1	1698	BH-32 (25)	Calcite, Carbonate-fluorapatite	-	Quartz , Anhydrite	NA
2	1699	BH-32 (26)	Calcite, Carbonate-fluorapatite	-	Quartz , Anhydrite	NA

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

وزارة الطاقة والثروة المعدنية
المملكة الأردنية الهاشمية

X-Ray Diffraction Analysis Test Report

JAS
Jordanian Accreditation System
نظام الاعتماد الأردني
Accreditation Unit
TEST-061

Test Report No. : 00150/05/2022 CH07-37 Test Report Date: 30/05/2022

This test is traceable to SI units and is following ISO/IEC 17025:2017. While measurement uncertainty is evaluated in accordance with ASTM standards. The coverage factor (k=2) so that the coverage probability is approximately 95%.

Notes:
- The results stated in this test report relates only to the tested sample.
- This test report is only valid with stamp and signature.
- The results stated in this test report shall not be reproduced except in full, without written approval of the lab.
- Based on relative XRD high peak data: (Major, Minor, Trace)
-XRD Diffractogram will be attached with the report
- The laboratory does not apply the decision rule.

Opinions and Interpretations:
N/A.....
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Additional Comments:
N/A.....
.....

Analyzed by *(Name and Sign)*: ***Eng.Kholoud Ayyash***

Eng.linda Al-Makhadmeh

Division Head *(Name and Sign)*: ***Eng.Maysoon Al-Khzahee***

Technical Manager *(Name and Sign)*: ***Chem. Hanady Al Sharif***

Lab Manager *(Name and Sign)*: ***Eng.Maysoon Al-Khzahee***

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

وزارة الطاقة والثروة المعدنية
المملكة الأردنية الهاشمية

X-Ray Spectrometric Analysis Test Report

Test Report No. : 00151/05/2022 -CH001-071 Test Report Date : 30/05/2022

Lab Name : Laboratories of Quality Directorate at the Ministry of Energy and Mineral Resources
Lab Address : Ministry of Energy and Mineral Resources - 8th Circle Bayader Wadi Al Seer, Amman – Jordan (www.memr.gov.jo)

Client Name : مديرية دراسات المصادر الطبيعية
Client Address : -

Division : Chemical & Mineral Analysis Lab / XRF Lab Testing Location : At the Lab facility.

Methods Used : BS EN 15309-2007 Lab Ref. Work Instruction : WI-REP-01 Used for : XRF spectrometric analysis & LOI

Sampling Method : By the customer
Sample Type : صلبة
Testing Date : 29/05/2022

Sample Reception Date : 19/05/2022
Sample Location : -

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
1	RPH1-BH33-1	1.42	0.019	0.19	37.70	0.16	< 0.058	0.38	26.30	2.21	1.11	< 0.33	< 0.51	< 0.0125	30.49
2	RPH1-BH33-2	0.60	< 0.012	0.098	47.70	< 0.09	0.26	0.34	12.30	0.98	0.64	< 0.33	< 0.51	< 0.0125	37.02
3	RPH1-BH33-3	< 0.23	< 0.012	0.043	48.70	< 0.09	0.68	0.47	13.60	< 0.55	< 0.23	< 0.33	< 0.51	< 0.0125	35.71
4	RPH1-BH33- 4	< 0.23	< 0.012	< 0.029	35.20	< 0.09	0.17	0.60	37.90	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	25.84
5	RPH1-BH33- 5	< 0.23	< 0.012	< 0.029	37.40	< 0.09	0.33	0.66	34.10	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	27.13
6	RPH1-BH33- 6	< 0.23	< 0.012	< 0.029	47.50	< 0.09	0.10	0.88	16.40	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	34.63
7	RPH1-BH33- 7	< 0.23	< 0.012	< 0.029	46.20	< 0.09	< 0.058	0.76	18.40	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	34.14
8	RPH1-BH33- 8	0.28	< 0.012	0.036	50.00	< 0.09	< 0.058	1.60	10.70	0.69	0.22	< 0.33	< 0.51	< 0.0125	36.41
9	RPH1-BH33-9	< 0.23	< 0.012	0.030	40.30	< 0.09	< 0.058	2.02	28.40	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	28.30
10	RPH1-BH33-10	< 0.23	< 0.012	< 0.029	52.40	< 0.09	< 0.058	1.05	7.52	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	38.55
11	RPH1-BH33-11	0.27	< 0.012	< 0.029	53.10	< 0.09	0.065	3.20	4.73	< 0.55	0.31	< 0.33	< 0.51	< 0.0125	37.53
12	RPH1-BH33- 12	< 0.23	< 0.012	< 0.029	52.80	< 0.09	0.23	6.91	5.69	< 0.55	< 0.21	< 0.33	0.77	< 0.0125	33.30

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

وزارة الطاقة والثروة المعدنية
المملكة الأردنية الهاشمية

X-Ray Spectrometric Analysis Test Report

Test Report No. : 00151/05/2022 -CH001-071 Test Report Date : 30/05/2022

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
13	RPH1-BH33- 13	< 0.23	< 0.012	< 0.029	52.90	< 0.09	0.24	9.24	5.36	< 0.55	< 0.21	< 0.33	0.86	< 0.0125	31.23
14	RPH1-BH33- 14	< 0.23	< 0.012	< 0.029	36.30	< 0.09	0.22	8.51	35.90	< 0.55	< 0.21	< 0.33	0.68	< 0.0125	18.17
15	RPH1-BH33- 15	< 0.23	< 0.012	< 0.029	50.40	< 0.09	0.43	12.00	9.75	< 0.55	< 0.21	< 0.33	1.03	< 0.0125	26.14
16	RPH1-BH33- 16	< 0.23	< 0.012	< 0.029	50.70	< 0.09	0.42	10.60	8.34	< 0.55	< 0.21	< 0.33	0.83	< 0.0125	28.35
17	RPH1-BH33- 17	< 0.23	< 0.012	< 0.029	29.70	< 0.09	0.39	11.20	46.10	< 0.55	< 0.21	< 0.33	0.77	< 0.0125	11.33
18	RPH1-BH33- 18	< 0.23	< 0.012	< 0.029	41.60	< 0.09	0.41	24.80	24.30	< 0.55	< 0.21	< 0.33	2.57	< 0.0125	6.30
19	RPH1-BH33- 19	< 0.23	< 0.012	< 0.029	51.10	< 0.09	0.92	32.80	5.40	< 0.55	< 0.21	< 0.33	3.81	< 0.0125	5.87
20	RPH1-BH33- 20	< 0.23	< 0.012	< 0.029	34.30	< 0.09	0.44	17.20	37.80	< 0.55	< 0.21	< 0.33	1.29	< 0.0125	8.92
21	RPH1-BH33- 21	< 0.23	< 0.012	< 0.029	41.60	< 0.09	0.43	16.40	25.10	< 0.55	< 0.21	< 0.33	1.38	< 0.0125	14.91
22	RPH1-BH33-22	< 0.23	< 0.012	< 0.029	34.90	< 0.09	0.37	14.70	37.20	< 0.55	< 0.21	< 0.33	1.04	< 0.0125	11.66
23	RPH1-BH33-23	< 0.23	< 0.012	< 0.029	26.00	< 0.09	0.15	9.77	52.20	< 0.55	< 0.21	< 0.33	0.57	< 0.0125	10.67
24	RPH1-BH33-24	< 0.23	< 0.012	< 0.029	35.50	< 0.09	0.29	12.30	36.50	< 0.55	< 0.21	< 0.33	0.81	< 0.0125	14.47
25	RPH1-BH33-25	< 0.23	< 0.012	< 0.029	27.40	< 0.09	0.14	9.20	50.70	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	11.47
26	RPH1-BH33-26	< 0.23	< 0.012	< 0.029	27.40	< 0.09	0.27	12.40	50.70	< 0.55	< 0.21	< 0.33	0.77	< 0.0125	8.35
27	RPH1-BH33-27	< 0.23	< 0.012	< 0.029	10.80	< 0.09	< 0.058	3.81	81.10	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	4.18
28	RPH1-BH33-28	< 0.23	< 0.012	< 0.029	11.30	< 0.09	< 0.058	3.45	80.70	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	4.51
Uncertainty (if required):		-	-	-	-	-	-	-	-	-	-	-	-	-	-

This test is traceable to SI units and is following ISO/IEC 17025:2017. While measurement uncertainty is evaluated in accordance with ASTM standards. The coverage factor (k=2) so that the coverage probability is approximately 95%.

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

وزارة الطاقة والثروة المعدنية
المملكة الأردنية الهاشمية

X-Ray Spectrometric Analysis Test Report

Test Report No. : 00151/05/2022 -CH001-071	Test Report Date : 30/05/2022

Notes:

- **The results were done on dry basis.**
- The results stated in this test report relates only to the tested sample.
- This test report is only valid with stamp and signature.
- The results stated in this test report shall not be reproduced except in full, without written approval of the lab.
- The laboratory does not apply the decision rule.

Opinions and Interpretations:
NA.....
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Additional Comments:
NA.....
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.....

Analyzed by *(Name and Sign)* : Eng. Nidal Tayyem
Eng. Feryal Yosef

Division Head *(Name and Sign)* : Eng .Maysoon Alkhzahee

Technical Manager *(Name and Sign)* : Chemist Hanady Al Sharif

Lab Manager *(Name and Sign)* : Eng .Maysoon Alkhzahee

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

وزارة الطاقة والثروة المعدنية
المملكة الأردنية الهاشمية

X-Ray Diffraction Analysis Test Report

JAS
Jordanian Accreditation System
نظام الاعتماد الأردني
Accreditation Unit
TEST-061

Test Report No.	:00151/05/2022 CH07-38		Test Report Date: 30/05/2022		
Lab Name	: Laboratories of Quality Directorate at the Ministry of Energy and Mineral Resources				
Lab Address	: Ministry of Energy and Mineral Resources - 8th Circle Bayader Wadi Al Seer, Amman – Jordan (www.memr.gov.jo)				
Client Name	: مديرية دراسات المصادر الطبيعية				
Client Address	: -				
Division	: Chemical & Mineral Analysis Lab			Testing Location	: At the Lab facility.
Methods Used	: MEMR002-2020	Lab Ref. Work Instruction	: WI-REP-02	Used for: X Ray diffraction analysis	
Sampling Method	: By the customer			Sample Reception Date:19 /05/2022	
Sample Type	: Solid			Sample Location: -	
Testing Date	:22 /05/2022				
Tension (KV)	: 40			Radiation	: Cu
Current (mA)	: 30			Angle Range(2θ)	: (5-70)°

Item	Serial No.	Sample ID	Phase Identification			Uncertainty (if required)
			Major	Minor	Trace	
1	1700	BH-33 (16)	Calcite	Carbonate-fluorapatite	Quartz	NA

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

X-Ray Diffraction Analysis Test Report

Test Report No. :00151/05/2022 CH07-38 Test Report Date: 30/05/2022

This test is traceable to SI units and is following ISO/IEC 17025:2017. While measurement uncertainty is evaluated in accordance with ASTM standards. The coverage factor (k=2) so that the coverage probability is approximately 95%.

Notes:

- The results stated in this test report relates only to the tested sample.
- This test report is only valid with stamp and signature.
- The results stated in this test report shall not be reproduced except in full, without written approval of the lab.
- Based on relative XRD high peak data: (Major, Minor, Trace)
-XRD Diffractogram will be attached with the report
- The laboratory does not apply the decision rule.

Opinions and Interpretations:

N/A.....

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Additional Comments:

N/A.....

.....

Analyzed by *(Name and Sign)*: ***Eng.Kholoud Ayyash***

Eng.linda Al-Makadmeh

Division Head *(Name and Sign)*: ***Eng.Maysoon Al-Khzahee***

Technical Manager *(Name and Sign)*: ***Chem. Hanady Al Sharif***

Lab Manager *(Name and Sign)*: ***Eng.Maysoon Al-Khzahee***

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

وزارة الطاقة والثروة المعدنية
المملكة الأردنية الهاشمية

X-Ray Spectrometric Analysis Test Report

Test Report No. : 00174/05/2022 -CH001-082 Test Report Date : 09/06/2022

Lab Name : Laboratories of Quality Directorate at the Ministry of Energy and Mineral Resources
Lab Address : Ministry of Energy and Mineral Resources - 8th Circle Bayader Wadi Al Seer, Amman – Jordan (www.memr.gov.jo)

Client Name : مديرية دراسات المصادر الطبيعية
Client Address : -

Division : Chemical & Mineral Analysis Lab / XRF Lab Testing Location : At the Lab facility.

Methods Used : BS EN 15309-2007 Lab Ref. Work Instruction : WI-REP-01 Used for : XRF spectrometric analysis & LOI

Sampling Method : By the customer
Sample Type : صلبة
Testing Date : 07/06/2022

Sample Reception Date : 30/05/2022
Sample Location : -

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
1	RPH1-BH34 -1	2.91	0.038	0.41	22.20	0.54	< 0.058	0.84	45.50	4.60	1.86	< 0.33	< 0.51	< 0.0125	20.48
2	RPH1-BH34- 2	0.643	< 0.012	0.095	44.80	< 0.09	0.13	0.54	16.10	1.04	0.73	< 0.33	< 0.51	< 0.0125	35.93
3	RPH1-BH34- 3	0.36	< 0.012	0.061	48.10	< 0.09	0.33	0.38	11.90	0.62	0.45	< 0.33	< 0.51	< 0.0125	37.74
4	RPH1-BH34- 4	0.23	< 0.012	0.048	49.70	< 0.09	2.03	0.37	10.20	< 0.55	0.36	< 0.33	< 0.51	< 0.0125	36.69
5	RPH1-BH34- 5	< 0.23	< 0.012	< 0.029	53.00	< 0.09	0.51	0.60	5.19	< 0.55	0.22	< 0.33	< 0.51	< 0.0125	40.02
6	RPH1-BH34 -6	< 0.23	< 0.012	< 0.029	53.40	< 0.09	0.19	0.87	5.82	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	39.26
7	RPH1-BH34- 7	< 0.23	< 0.012	0.031	53.30	< 0.09	< 0.058	0.67	5.35	< 0.55	0.22	< 0.33	< 0.51	< 0.0125	39.78
8	RPH1-BH34 -8	< 0.23	< 0.012	< 0.029	44.70	< 0.09	< 0.058	1.43	20.90	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	32.26
9	RPH1-BH34- 9	< 0.23	< 0.012	< 0.029	45.20	< 0.09	0.27	1.08	19.60	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	33.11
10	RPH1-BH34 -10	0.26	< 0.012	< 0.029	49.70	< 0.09	< 0.058	2.00	12.00	0.56	< 0.21	< 0.33	< 0.51	< 0.0125	35.38
11	RPH1-BH34 -11	< 0.23	< 0.012	< 0.029	51.10	< 0.09	0.22	7.00	8.01	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	32.22
12	RPH1-BH34- 12	< 0.23	< 0.012	< 0.029	53.80	< 0.09	0.38	10.20	4.23	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	30.32

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

وزارة الطاقة والثروة المعدنية
المملكة الأردنية الهاشمية

X-Ray Spectrometric Analysis Test Report

Test Report No. : 00174/05/2022 -CH001-082 Test Report Date : 09/06/2022

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
13	RPH1-BH34- 13	< 0.23	< 0.012	< 0.029	54.10	< 0.09	0.73	19.20	1.28	< 0.55	< 0.21	< 0.33	2.08	< 0.0125	22.30
14	RPH1-BH34 -14	< 0.23	< 0.012	< 0.029	53.30	< 0.09	0.61	14.80	3.99	< 0.55	< 0.21	< 0.33	1.61	< 0.0125	25.61
15	RPH1-BH34- 15	< 0.23	< 0.012	< 0.029	53.70	< 0.09	0.57	18.00	2.30	< 0.55	< 0.21	< 0.33	1.88	< 0.0125	23.43
16	RPH1-BH34 -16	< 0.23	< 0.012	< 0.029	46.20	< 0.09	0.14	6.17	16.40	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	30.31
17	RPH1-BH34 -17	0.27	< 0.012	< 0.029	48.80	< 0.09	0.91	25.20	10.80	< 0.55	< 0.21	< 0.33	2.41	< 0.0125	11.06
18	RPH1-BH34 -18	< 0.23	< 0.012	0.030	52.00	< 0.09	0.95	23.10	4.72	< 0.55	< 0.21	< 0.33	2.56	< 0.0125	16.04
19	RPH1-BH34 -19	< 0.23	< 0.012	< 0.029	50.90	< 0.09	0.57	17.00	8.97	< 0.55	< 0.21	< 0.33	1.63	< 0.0125	20.42
20	RPH1-BH34- 20	< 0.23	< 0.012	< 0.029	52.30	< 0.09	0.90	19.80	3.94	< 0.55	< 0.21	< 0.33	1.83	< 0.0125	20.66
21	RPH1-BH34- 21	0.33	< 0.012	0.035	48.60	< 0.09	0.76	17.60	10.80	< 0.55	< 0.21	< 0.33	1.78	< 0.0125	19.61
Uncertainty (if required):		-	-	-	-	-	-	-	-	-	-	-	-	-	-

This test is traceable to SI units and is following ISO/IEC 17025:2017. While measurement uncertainty is evaluated in accordance with ASTM standards. The coverage factor (k=2) so that the coverage probability is approximately 95%.

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

X-Ray Spectrometric Analysis Test Report

Test Report No. : 00174/05/2022 -CH001-082 Test Report Date : 09/06/2022

Notes:

- **The results were done on dry basis.**
- The results stated in this test report relates only to the tested sample.
- This test report is only valid with stamp and signature.
- The results stated in this test report shall not be reproduced except in full, without written approval of the lab.
- The laboratory does not apply the decision rule.

Opinions and Interpretations:
NA.....
.....
.....

Additional Comments:
NA.....
.....
.....

Analyzed by *(Name and Sign)* : Eng. Nidal Tayyem
Eng. Feryal Yosef

Division Head *(Name and Sign)* : Eng .Maysoon Alkhzahee

Technical Manager *(Name and Sign)* : Chemist Hanady Al Sharif

Lab Manager *(Name and Sign)* : Eng .Maysoon Alkhzahee

مديرية المختبرات والجودة

وزارة الطاقة والثروة المعدنية
المملكة الأردنية الهاشمية

X-Ray Spectrometric Analysis Test Report

Test Report No. : 00180/06/2022 -CH001-083 Test Report Date : 09/06/2022

Lab Name : Laboratories of Quality Directorate at the Ministry of Energy and Mineral Resources
Lab Address : Ministry of Energy and Mineral Resources - 8th Circle Bayader Wadi Al Seer, Amman – Jordan (www.memr.gov.jo)

Client Name : مديرية دراسات المصادر الطبيعية
Client Address : -

Division : Chemical & Mineral Analysis Lab / XRF Lab Testing Location : At the Lab facility.

Methods Used : BS EN 15309-2007 Lab Ref. Work Instruction : WI-REP-01 Used for : XRF spectrometric analysis & LOI

Sampling Method : By the customer
Sample Type : صلبة
Testing Date : 08/06/2022
Sample Reception Date : 02/06/2022
Sample Location : -

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
1	RPH1-BH35-1	0.74	< 0.012	0.12	41.50	< 0.09	4.35	0.50	18.80	1.12	0.72	< 0.33	< 0.51	< 0.0125	32.10
2	RPH1-BH35-2	0.69	< 0.012	0.12	42.80	< 0.09	4.81	0.35	16.60	0.99	0.64	< 0.33	< 0.51	< 0.0125	32.90
3	RPH1-BH35-3	0.86	< 0.012	0.14	41.50	< 0.09	5.16	0.35	16.50	1.28	0.81	< 0.33	< 0.51	< 0.0125	33.36
4	RPH1-BH35-4	< 0.23	< 0.012	< 0.029	39.60	< 0.09	1.51	0.50	28.80	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	29.16
5	RPH1-BH35-5	< 0.23	< 0.012	< 0.029	41.90	< 0.09	0.54	0.58	26.10	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	30.72
6	RPH1-BH35-6	< 0.23	< 0.012	< 0.029	49.10	< 0.09	0.49	0.46	13.30	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	36.31
7	RPH1-BH35-7	< 0.23	< 0.012	< 0.029	49.40	< 0.09	0.24	0.75	12.90	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	36.44
8	RPH1-BH35-8	0.28	< 0.012	< 0.029	48.10	< 0.09	0.25	0.95	15.00	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	35.15
9	RPH1-BH35-9	< 0.23	< 0.012	< 0.029	51.70	< 0.09	< 0.058	0.88	7.69	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	38.96
10	RPH1-BH35-10	< 0.23	< 0.012	< 0.029	47.20	< 0.09	< 0.058	0.97	16.70	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	34.46
11	RPH1-BH35-11	< 0.23	< 0.012	< 0.029	48.00	< 0.09	< 0.058	2.00	14.00	0.58	0.35	< 0.33	< 0.51	< 0.0125	34.86
12	RPH1-BH35-12	< 0.23	< 0.012	< 0.029	52.50	< 0.09	0.085	2.59	9.45	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	34.53

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

وزارة الطاقة والثروة المعدنية
المملكة الأردنية الهاشمية

X-Ray Spectrometric Analysis Test Report

Test Report No. : 00180/06/2022 -CH001-083 Test Report Date : 09/06/2022

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
13	RPH1-BH35-13	< 0.23	< 0.012	< 0.029	53.70	< 0.09	< 0.058	1.70	4.83	< 0.55	0.21	< 0.33	< 0.51	< 0.0125	38.98
14	RPH1-BH35-14	< 0.23	< 0.012	< 0.029	52.90	< 0.09	0.76	15.10	3.44	< 0.55	< 0.21	< 0.33	1.76	< 0.0125	25.74
15	RPH1-BH35-15	< 0.23	< 0.012	< 0.029	54.80	< 0.09	0.48	10.50	0.86	< 0.55	< 0.21	< 0.33	1.00	< 0.0125	32.12
16	RPH1-BH35-16	< 0.23	< 0.012	< 0.029	54.20	< 0.09	0.84	20.50	0.95	< 0.55	< 0.21	< 0.33	2.25	< 0.0125	21.07
17	RPH1-BH35-17	< 0.23	< 0.012	< 0.029	39.30	< 0.09	0.27	6.39	29.20	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	24.08
18	RPH1-BH35-18	< 0.23	< 0.012	< 0.029	48.10	< 0.09	0.80	17.90	12.20	< 0.55	< 0.21	< 0.33	1.75	< 0.0125	19.02
19	RPH1-BH35-19	< 0.23	< 0.012	< 0.029	47.10	< 0.09	0.42	11.00	14.80	< 0.55	< 0.21	< 0.33	1.00	< 0.0125	25.44
20	RPH1-BH35-20	< 0.23	< 0.012	< 0.029	47.30	< 0.09	0.71	15.00	14.20	< 0.55	< 0.21	< 0.33	1.31	< 0.0125	21.19
21	RPH1-BH35-21	< 0.23	< 0.012	< 0.029	25.90	< 0.09	0.23	6.37	50.50	< 0.55	< 0.21	1.36	< 0.51	< 0.0125	15.30
22	RPH1-BH35-22	< 0.23	< 0.012	< 0.029	43.90	< 0.09	1.07	21.90	18.40	< 0.55	< 0.21	< 0.33	2.23	< 0.0125	12.37
23	RPH1-BH35-23	< 0.23	< 0.012	< 0.029	26.70	< 0.09	0.37	9.56	51.80	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	10.35
24	RPH1-BH35-24	< 0.23	< 0.012	< 0.029	35.00	< 0.09	0.61	20.60	36.00	< 0.55	< 0.21	< 0.33	1.73	< 0.0125	5.99
25	RPH1-BH35-25	< 0.23	< 0.012	< 0.029	33.90	< 0.09	0.65	20.90	37.70	< 0.55	< 0.21	< 0.33	1.78	< 0.0125	4.70
26	RPH1-BH35-26	< 0.23	< 0.012	< 0.029	23.50	< 0.09	0.23	9.77	56.70	< 0.55	< 0.21	< 0.33	0.70	< 0.0125	8.12
27	RPH1-BH35-27	< 0.23	< 0.012	< 0.029	27.00	< 0.09	0.27	10.50	50.90	< 0.55	< 0.21	< 0.33	0.66	< 0.0125	9.81
28	RPH1-BH35-28	< 0.23	< 0.012	< 0.029	26.30	< 0.09	0.15	7.00	52.70	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	12.81
29	RPH1-BH35-29	< 0.23	< 0.012	< 0.029	25.10	< 0.09	< 0.058	3.45	56.10	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	14.89
30	RPH1-BH35-30	< 0.23	< 0.012	< 0.029	19.50	< 0.09	< 0.058	3.37	65.40	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	10.67
Uncertainty (if required):		-	-	-	-	-	-	-	-	-	-	-	-	-	-

This test is traceable to SI units and is following ISO/IEC 17025:2017. While measurement uncertainty is evaluated in accordance with ASTM standards. The coverage factor (k=2) so that the coverage probability is approximately 95%.

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

وزارة الطاقة والثروة المعدنية
المملكة الأردنية الهاشمية

X-Ray Spectrometric Analysis Test Report

Test Report No. : 00181/06/2022 -CH001-084 Test Report Date : 16/06/2022

Lab Name : Laboratories of Quality Directorate at the Ministry of Energy and Mineral Resources
Lab Address : Ministry of Energy and Mineral Resources - 8th Circle Bayader Wadi Al Seer, Amman – Jordan (www.memr.gov.jo)

Client Name : مديرية درسات المصادر الطبيعية
Client Address : -

Division : Chemical & Mineral Analysis Lab / XRF Lab Testing Location : At the Lab facility.

Methods Used : BS EN 15309-2007 Lab Ref. Work Instruction : WI-REP-01 Used for : XRF spectrometric analysis & LOI

Sampling Method : By the customer
Sample Type : صلبة
Testing Date : 05/06/2022

Sample Reception Date : 02/06/2022
Sample Location : -

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
1	RPH1-BH36-1	0.36	< 0.012	0.056	49.50	< 0.09	5.92	0.56	5.84	0.64	0.47	< 0.33	< 0.51	< 0.0125	36.64
2	RPH1-BH36-2	0.50	< 0.012	0.077	44.50	< 0.09	7.34	0.45	12.30	0.82	0.63	< 0.33	< 0.51	< 0.0125	33.02
3	RPH1-BH36-3	0.29	< 0.012	0.050	50.50	< 0.09	1.38	0.66	9.22	< 0.55	0.42	< 0.33	< 0.51	< 0.0125	36.91
4	RPH1-BH36-4	0.24	< 0.012	0.040	49.80	< 0.09	1.78	1.30	8.70	0.56	0.31	< 0.33	< 0.51	< 0.0125	36.57
5	RPH1-BH36-5	0.25	< 0.012	< 0.029	50.30	< 0.09	0.81	3.28	8.78	< 0.55	0.38	< 0.33	< 0.51	< 0.0125	35.00
6	RPH1-BH36-6	< 0.23	< 0.012	< 0.029	53.40	< 0.09	0.68	10.50	3.04	< 0.55	< 0.21	< 0.33	1.04	< 0.0125	30.37
7	RPH1-BH36-7	< 0.23	< 0.012	< 0.029	42.70	< 0.09	0.37	5.74	23.90	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	26.67
8	RPH1-BH36-8	0.28	< 0.012	< 0.029	52.10	< 0.09	0.93	21.20	4.12	< 0.55	< 0.21	< 0.33	2.18	< 0.0125	19.18
9	RPH1-BH36-9	< 0.23	< 0.012	< 0.029	44.50	< 0.09	0.84	18.10	14.40	< 0.55	< 0.21	< 0.33	1.73	< 0.0125	20.31
10	RPH1-BH36-10	< 0.23	< 0.012	< 0.029	28.90	< 0.09	0.40	10.60	45.80	< 0.55	< 0.21	< 0.33	0.67	< 0.0125	13.24
11	RPH1-BH36-11	0.27	< 0.012	< 0.029	48.60	< 0.09	0.94	18.40	11.20	< 0.55	< 0.21	< 0.33	1.83	< 0.0125	18.72
12	RPH1-BH36-12	< 0.23	< 0.012	< 0.029	18.90	< 0.09	0.17	5.24	63.10	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	11.46

وزارة الطاقة والثروة المعدنية
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وزارة الطاقة والثروة المعدنية
المملكة الأردنية الهاشمية

X-Ray Spectrometric Analysis Test Report

Test Report No. : 00181/06/2022 -CH001-084 Test Report Date : 16/06/2022

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
13	RPH1-BH36-13	< 0.23	< 0.012	< 0.029	17.20	< 0.09	0.16	6.71	67.20	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	7.98
14	RPH1-BH36-14	< 0.23	< 0.012	< 0.029	18.60	< 0.09	0.13	6.72	66.50	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	7.06
15	RPH1-BH36-15	< 0.23	< 0.012	< 0.029	19.60	< 0.09	0.22	7.96	63.70	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	7.55
16	RPH1-BH36-16	< 0.23	< 0.012	< 0.029	27.00	< 0.09	0.34	9.25	51.20	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	11.14
17	RPH1-BH36-17	< 0.23	< 0.012	< 0.029	22.70	< 0.09	0.22	7.88	58.60	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	9.24
18	RPH1-BH36-18	< 0.23	< 0.012	< 0.029	37.50	< 0.09	< 0.058	3.36	34.60	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	24.30
19	RPH1-BH36-19	< 0.23	< 0.012	< 0.029	16.90	< 0.09	< 0.058	1.82	69.40	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	10.58
20	RPH1-BH36-20	< 0.23	< 0.012	< 0.029	10.30	< 0.09	< 0.058	1.40	80.50	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	7.15
21	RPH1-BH36-21	< 0.23	< 0.012	< 0.029	9.00	< 0.09	< 0.058	0.98	84.10	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	5.34
22	RPH1-BH36-22	< 0.23	< 0.012	< 0.029	15.20	< 0.09	< 0.058	2.92	73.20	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	8.04
23	RPH1-BH36-23	< 0.23	< 0.012	< 0.029	16.30	< 0.09	< 0.058	1.47	71.80	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	10.32
24	RPH1-BH36-24	< 0.23	< 0.012	< 0.029	30.30	< 0.09	< 0.058	1.39	47.40	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	20.75
25	RPH1-BH36-25	< 0.23	< 0.012	< 0.029	20.70	< 0.09	< 0.058	2.00	63.40	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	13.24
26	RPH1-BH36-26	< 0.23	< 0.012	< 0.029	32.50	< 0.09	0.50	8.81	42.00	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	15.71
27	RPH1-BH36-27	< 0.23	< 0.012	< 0.029	22.60	< 0.09	< 0.058	3.00	61.00	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	13.34
28	RPH1-BH35-28	< 0.23	< 0.012	< 0.029	25.60	< 0.09	0.17	4.34	54.20	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	14.58
Uncertainty (if required):		-	-	-	-	-	-	-	-	-	-	-	-	-	-

This test is traceable to SI units and is following ISO/IEC 17025:2017. While measurement uncertainty is evaluated in accordance with ASTM standards. The coverage factor (k=2) so that the coverage probability is approximately 95%.

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

وزارة الطاقة والثروة المعدنية
المملكة الأردنية الهاشمية

X-Ray Spectrometric Analysis Test Report

Test Report No. : 00206/06/2022 -CH001-096 Test Report Date : 03/07/2022

Lab Name : Laboratories of Quality Directorate at the Ministry of Energy and Mineral Resources
Lab Address : Ministry of Energy and Mineral Resources - 8th Circle Bayader Wadi Al Seer, Amman – Jordan (www.memr.gov.jo)

Client Name : مديرية دراسات المصادر الطبيعية
Client Address : -

Division : Chemical & Mineral Analysis Lab / XRF Lab Testing Location : At the Lab facility.

Methods Used : BS EN 15309-2007 Lab Ref. Work Instruction : WI-REP-01 Used for : XRF spectrometric analysis & LOI

Sampling Method : By the customer
Sample Type : صلبة
Testing Date : 27/06/2022

Sample Reception Date : 21/06/2022
Sample Location : -

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
1	RPH1-BH37-1	0.90	0.013	0.14	36.80	< 0.09	1.90	0.57	30.00	1.32	0.67	< 0.33	< 0.51	< 0.0125	27.56
2	RPH1-BH37-2	0.67	< 0.012	0.11	42.20	< 0.09	2.09	0.47	20.90	1.00	0.57	< 0.33	< 0.51	< 0.0125	31.93
3	RPH1-BH37-3	0.29	< 0.012	0.059	47.10	< 0.09	1.24	0.48	14.90	< 0.55	0.30	< 0.33	< 0.51	< 0.0125	35.18
4	RPH1-BH37-4	< 0.23	< 0.012	0.052	46.30	< 0.09	1.21	0.58	16.50	< 0.55	0.22	< 0.33	< 0.51	< 0.0125	34.46
5	RPH1-BH37-5	< 0.23	< 0.012	0.050	48.10	< 0.09	1.24	0.64	13.60	< 0.55	0.24	< 0.33	< 0.51	< 0.0125	35.55
6	RPH1-BH37-6	< 0.23	< 0.012	0.031	48.50	< 0.09	0.71	0.67	14.20	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	35.29
7	RPH1-BH37-7	< 0.23	< 0.012	0.030	50.30	< 0.09	0.33	0.92	9.42	0.63	0.39	< 0.33	< 0.51	< 0.0125	37.76
8	RPH1-BH37-8	< 0.23	< 0.012	< 0.029	45.60	< 0.09	0.46	1.05	18.00	0.56	0.39	< 0.33	< 0.51	< 0.0125	33.61
9	RPH1-BH37-9	< 0.23	< 0.012	0.031	47.90	< 0.09	0.55	1.12	13.70	0.62	0.43	< 0.33	< 0.51	< 0.0125	35.35
10	RPH1-BH37-10	< 0.23	< 0.012	0.030	45.50	< 0.09	0.098	1.51	19.00	< 0.55	0.30	< 0.33	< 0.51	< 0.0125	32.86
11	RPH1-BH37-11	0.26	< 0.012	< 0.029	49.00	< 0.09	< 0.058	1.56	12.70	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	35.70
12	RPH1-BH37-12	< 0.23	< 0.012	< 0.029	52.40	< 0.09	< 0.058	1.70	7.38	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	37.81

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

وزارة الطاقة والثروة المعدنية
المملكة الأردنية الهاشمية

X-Ray Spectrometric Analysis Test Report

Test Report No. : 00206/06/2022 -CH001-096 Test Report Date : 03/07/2022

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
13	RPH1-BH37-13	< 0.23	< 0.012	< 0.029	48.00	< 0.09	< 0.058	2.70	8.40	< 0.55	0.28	< 0.33	< 0.51	< 0.0125	39.95
14	RPH1-BH37-14	< 0.23	< 0.012	< 0.029	45.00	< 0.09	0.84	16.00	17.70	< 0.55	< 0.21	< 0.33	1.38	< 0.0125	18.64
15	RPH1-BH37-15	< 0.23	< 0.012	< 0.029	51.70	< 0.09	0.56	10.50	6.92	< 0.55	< 0.21	< 0.33	0.86	< 0.0125	28.93
16	RPH1-BH37-16	< 0.23	< 0.012	< 0.029	48.50	< 0.09	0.90	17.90	10.90	< 0.55	< 0.21	< 0.33	1.91	< 0.0125	19.59
17	RPH1-BH37-17	< 0.23	< 0.012	< 0.029	43.10	< 0.09	0.60	12.90	22.30	< 0.55	< 0.21	< 0.33	1.05	< 0.0125	19.80
18	RPH1-BH37-18	< 0.23	< 0.012	< 0.029	46.40	< 0.09	0.77	17.30	15.40	< 0.55	< 0.21	< 0.33	1.63	< 0.0125	18.15
19	RPH1-BH37-19	< 0.23	< 0.012	< 0.029	43.10	< 0.09	0.62	15.70	21.90	< 0.55	< 0.21	< 0.33	1.26	< 0.0125	17.18
20	RPH1-BH37-20	< 0.23	< 0.012	< 0.029	50.50	< 0.09	0.76	13.40	7.87	< 0.55	0.28	< 0.33	1.41	< 0.0125	25.34
21	RPH1-BH37-21	< 0.23	< 0.012	< 0.029	37.80	< 0.09	0.78	11.60	31.50	< 0.55	< 0.21	< 0.33	0.78	< 0.0125	17.11
22	RPH1-BH37-22	< 0.23	< 0.012	< 0.029	23.80	< 0.09	0.43	9.02	56.10	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	9.21
23	RPH1-BH37-23	< 0.23	< 0.012	< 0.029	34.40	< 0.09	0.71	17.10	36.60	< 0.55	< 0.21	< 0.33	1.45	< 0.0125	9.27
24	RPH1-BH37-24	< 0.23	< 0.012	< 0.029	16.50	< 0.09	0.085	4.85	69.10	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	8.41
25	RPH1-BH37-25	< 0.23	< 0.012	< 0.029	26.40	< 0.09	0.19	6.38	52.30	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	13.80
26	RPH1-BH37-26	< 0.23	< 0.012	< 0.029	26.30	< 0.09	0.17	6.08	52.30	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	14.08
27	RPH1-BH37-27	< 0.23	< 0.012	< 0.029	27.40	< 0.09	0.24	6.62	50.50	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	14.28
Uncertainty (if required):		-	-	-	-	-	-	-	-	-	-	-	-	-	-

This test is traceable to SI units and is following ISO/IEC 17025:2017. While measurement uncertainty is evaluated in accordance with ASTM standards. The coverage factor (k=2) so that the coverage probability is approximately 95%.

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

وزارة الطاقة والثروة المعدنية
المملكة الأردنية الهاشمية

X-Ray Spectrometric Analysis Test Report

Test Report No. : 00206/06/2022 -CH001-096 Test Report Date : 03/07/2022

Notes:

- **The results were done on dry basis.**
- The results stated in this test report relates only to the tested sample.
- This test report is only valid with stamp and signature.
- The results stated in this test report shall not be reproduced except in full, without written approval of the lab.
- The laboratory does not apply the decision rule.

Opinions and Interpretations:
NA.....
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Additional Comments:
NA.....
.....
.....

Analyzed by *(Name and Sign)* : Eng. Nidal Tayyem
Eng. Feryal Yosef

Division Head *(Name and Sign)* : Eng .Maysoon Alkhzahee

Technical Manager *(Name and Sign)* : Chemist Hanady Al Sharif

Lab Manager *(Name and Sign)* : Eng .Maysoon Alkhzahee

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

وزارة الطاقة والثروة المعدنية
المملكة الأردنية الهاشمية

X-Ray Spectrometric Analysis Test Report

Test Report No. : 00202/06/2022 -CH001-094 Test Report Date : 26/06/2022

Lab Name : Laboratories of Quality Directorate at the Ministry of Energy and Mineral Resources
Lab Address : Ministry of Energy and Mineral Resources - 8th Circle Bayader Wadi Al Seer, Amman – Jordan (www.memr.gov.jo)

Client Name : مديرية دراسات المشاريع الطبيعية
Client Address : -

Division : Chemical & Mineral Analysis Lab / XRF Lab Testing Location : At the Lab facility.

Methods Used : BS EN 15309-2007 Lab Ref. Work Instruction : WI-REP-01 Used for : XRF spectrometric analysis & LOI

Sampling Method : By the customer Sample Reception Date : 19/06/2022
Sample Type : صلبة Sample Location : –
Testing Date : 20/06/2022

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
1	RPH1-BH39-1	3.57	0.051	0.47	15.40	0.78	< 0.058	0.42	55.70	5.55	1.89	< 0.33	< 0.51	< 0.0125	15.56
2	RPH1-BH39-2	2.41	0.026	0.29	20.80	0.30	< 0.058	0.38	52.70	3.63	1.38	< 0.33	< 0.51	< 0.0125	18.10
3	RPH1-BH39-3	2.76	0.024	0.35	15.10	0.28	< 0.058	0.33	61.70	4.00	1.40	< 0.33	< 0.51	< 0.0125	14.03
4	RPH1-BH39-4	1.90	0.017	0.23	24.60	0.18	0.092	0.33	48.50	2.67	1.04	< 0.33	< 0.51	< 0.0125	20.43
5	RPH1-BH39-5	2.07	0.017	0.30	15.10	0.17	0.25	0.30	65.20	2.64	0.93	< 0.33	< 0.51	< 0.0125	13.02
6	RPH1-BH39-6	1.72	0.014	0.25	17.40	0.12	0.14	0.33	62.30	2.14	0.82	< 0.33	< 0.51	< 0.0125	14.69
7	RPH1-BH39-7	1.83	0.014	0.28	18.70	0.13	< 0.058	0.33	59.80	2.35	0.91	< 0.33	< 0.51	< 0.0125	15.67
8	RPH1-BH39-8	1.36	< 0.012	0.21	18.60	< 0.09	< 0.058	0.40	61.30	1.68	0.63	< 0.33	0.60	< 0.0125	15.11
9	RPH1-BH39-9	0.52	< 0.012	0.075	20.60	< 0.09	< 0.058	0.52	61.30	0.70	0.22	< 0.33	< 0.51	< 0.0125	15.53
10	RPH1-BH39-10	0.69	< 0.012	0.10	29.60	< 0.09	< 0.058	0.40	45.40	0.95	0.35	< 0.33	< 0.51	< 0.0125	22.44
11	RPH1-BH39-11	0.65	0.020	0.072	30.20	< 0.09	< 0.058	0.46	44.00	0.92	0.58	< 0.33	< 0.51	< 0.0125	23.09
12	RPH1-BH39-12	0.48	0.014	0.061	37.90	< 0.09	< 0.058	0.45	31.30	0.69	0.43	< 0.33	< 0.51	< 0.0125	28.70

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

وزارة الطاقة والثروة المعدنية
المملكة الأردنية الهاشمية

X-Ray Spectrometric Analysis Test Report

Test Report No. : 00202/06/2022 -CH001-094 Test Report Date : 26/06/2022

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
13	RPH1-BH39-13	0.59	0.022	0.067	38.90	< 0.09	< 0.058	0.40	28.70	0.85	0.58	< 0.33	< 0.51	< 0.0125	29.96
14	RPH1-BH39-14	0.39	0.017	0.036	23.90	< 0.09	< 0.058	0.58	57.00	0.56	0.23	< 0.33	< 0.51	< 0.0125	16.82
15	RPH1-BH39-15	0.36	0.016	0.030	21.50	< 0.09	< 0.058	0.50	60.20	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	16.18
16	RPH1-BH39-16	0.57	0.015	0.055	23.60	< 0.09	< 0.058	0.91	55.10	0.80	0.37	< 0.33	< 0.51	< 0.0125	18.07
17	RPH1-BH39-17	0.77	0.037	0.056	15.60	< 0.09	< 0.058	0.67	69.00	0.90	0.34	< 0.33	< 0.51	< 0.0125	12.10
18	RPH1-BH39-18	0.41	0.026	0.033	23.50	< 0.09	< 0.058	0.65	56.80	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	17.41
19	RPH1-BH39-19	0.30	0.016	0.029	25.70	< 0.09	< 0.058	0.93	52.80	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	19.23
20	RPH1-BH39-20	0.23	0.015	< 0.029	23.20	< 0.09	< 0.058	0.64	58.20	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	16.81
21	RPH1-BH39-21	0.27	0.014	< 0.029	22.60	< 0.09	< 0.058	0.64	59.40	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	15.96
22	RPH1-BH39-22	0.29	< 0.012	0.030	25.90	< 0.09	< 0.058	0.60	53.60	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	18.74
23	RPH1-BH39-23	0.31	< 0.012	0.034	26.30	< 0.09	< 0.058	0.56	52.70	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	19.05
24	RPH1-BH39-24	0.43	< 0.012	0.048	30.80	< 0.09	< 0.058	0.55	44.70	0.68	< 0.21	< 0.33	< 0.51	< 0.0125	22.73
25	RPH1-BH39-25	0.49	< 0.012	0.058	27.20	< 0.09	< 0.058	0.58	50.40	0.79	< 0.21	< 0.33	< 0.51	< 0.0125	20.37
26	RPH1-BH39-26	0.32	< 0.012	0.037	23.10	< 0.09	< 0.058	0.61	58.10	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	16.75
27	RPH1-BH39-27	0.43	< 0.012	0.051	22.50	< 0.09	< 0.058	0.66	58.80	0.69	< 0.21	< 0.33	< 0.51	< 0.0125	16.38
28	RPH1-BH39-28	0.42	< 0.012	0.046	24.20	< 0.09	< 0.058	0.68	56.40	0.66	< 0.21	< 0.33	< 0.51	< 0.0125	17.62
29	RPH1-BH39-29	0.31	< 0.012	0.036	23.80	< 0.09	< 0.058	0.65	56.90	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	17.28
30	RPH1-BH39-30	0.47	< 0.012	0.052	29.80	< 0.09	< 0.058	0.66	46.40	0.74	< 0.21	< 0.33	< 0.51	< 0.0125	21.83
31	RPH1-BH39-31	0.63	0.016	0.069	32.70	< 0.09	< 0.058	0.63	40.90	0.92	< 0.21	< 0.33	< 0.51	< 0.0125	24.04
32	RPH1-BH39-32	0.55	0.019	0.055	31.40	< 0.09	< 0.058	0.70	43.40	0.78	< 0.21	< 0.33	< 0.51	< 0.0125	23.03
Uncertainty (if required):		-	-	-	-	-	-	-	-	-	-	-	-	-	-

This test is traceable to SI units and is following ISO/IEC 17025:2017. While measurement uncertainty is evaluated in accordance with ASTM standards. The coverage factor (k=2) so that the coverage probability is approximately 95%.

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

X-Ray Spectrometric Analysis Test Report

Test Report No. : 00202/06/2022 -CH001-094 Test Report Date : 26/06/2022

Notes:

- **The results were done on dry basis.**
- The results stated in this test report relates only to the tested sample.
- This test report is only valid with stamp and signature.
- The results stated in this test report shall not be reproduced except in full, without written approval of the lab.
- The laboratory does not apply the decision rule.

Opinions and Interpretations:
NA.....
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.....

Additional Comments:
NA.....
.....
.....

Analyzed by *(Name and Sign)* : Eng. Nidal Tayyem
Eng. Feryal Yosef

Division Head *(Name and Sign)* : Eng .Maysoon Alkhzahee

Technical Manager *(Name and Sign)* : Chemist Hanady Al Sharif

Lab Manager *(Name and Sign)* : Eng .Maysoon Alkhzahee

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

وزارة الطاقة والثروة المعدنية
المملكة الأردنية الهاشمية

X-Ray Spectrometric Analysis Test Report

Test Report No. : 00217/07/2022 -CH001-101 Test Report Date : 13/07/2022

Lab Name : Laboratories of Quality Directorate at the Ministry of Energy and Mineral Resources
Lab Address : Ministry of Energy and Mineral Resources - 8th Circle Bayader Wadi Al Seer, Amman – Jordan (www.memr.gov.jo)

Client Name : مديرية دراسات المصادر الطبيعية
Client Address : -

Division : Chemical & Mineral Analysis Lab / XRF Lab Testing Location : At the Lab facility.

Methods Used : BS EN 15309-2007 Lab Ref. Work Instruction : WI-REP-01 Used for : XRF spectrometric analysis & LOI

Sampling Method : By the customer
Sample Type : صلبة
Testing Date : 13/07/2022
Sample Reception Date : 05/072022
Sample Location : -

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
1	RPH1-BH 41 -02	0.66	< 0.012	0.10	32.70	< 0.09	0.18	0.46	39.10	0.95	0.49	< 0.33	< 0.51	< 0.0125	25.36
2	RPH1-BH 41 -05	0.50	< 0.012	0.068	42.40	< 0.09	< 0.058	0.36	22.10	0.83	0.61	< 0.33	< 0.51	< 0.0125	33.10
3	RPH1-BH 41 -07	0.34	< 0.012	0.049	38.20	< 0.09	< 0.058	0.47	31.20	0.58	0.37	< 0.33	< 0.51	< 0.0125	28.81
4	RPH1-BH 41 -13	0.97	0.038	0.11	43.90	< 0.09	< 0.058	0.47	17.70	1.50	0.77	< 0.33	< 0.51	< 0.0125	34.50
5	RPH1-BH 41 -21	< 0.23	< 0.012	0.032	49.00	< 0.09	< 0.058	0.52	10.80	0.62	0.69	< 0.33	< 0.51	< 0.0125	38.11
6	RPH1-BH 41 -26	0.28	< 0.012	0.036	38.50	< 0.09	< 0.058	2.54	30.80	0.59	0.27	< 0.33	< 0.51	< 0.0125	26.98
7	RPH1-BH 41 -27	< 0.23	< 0.012	< 0.029	37.10	< 0.09	< 0.058	2.18	34.00	< 0.55	< 0.21	< 0.33	< 0.51	< 0.0125	25.94
Uncertainty (if required):		-	-	-	-	-	-	-	-	-	-	-	-	-	-

This test is traceable to SI units and is following ISO/IEC 17025:2017. While measurement uncertainty is evaluated in accordance with ASTM standards. The coverage factor (k=2) so that the coverage probability is approximately 95%.

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

X-Ray Spectrometric Analysis Test Report

Test Report No.	: 00217/07/2022 -CH001-101	Test Report Date	: 13/07/2022

Notes:

- **The results were done on dry basis.**
- The results stated in this test report relates only to the tested sample.
- This test report is only valid with stamp and signature.
- The results stated in this test report shall not be reproduced except in full, without written approval of the lab.
- The laboratory does not apply the decision rule.

Opinions and Interpretations:
NA.....
.....
.....

Additional Comments:
NA.....
.....
.....

Analyzed by *(Name and Sign)* : Eng. Nidal Tayyem
Eng. Feryal Yosef

Division Head *(Name and Sign)* : Eng .Maysoon Alkhzahee

Technical Manager *(Name and Sign)* : Chemist Hanady Al Sharif

Lab Manager *(Name and Sign)* : Eng .Maysoon Alkhzahee

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

وزارة الطاقة والثروة المعدنية
المملكة الأردنية الهاشمية

X-Ray Spectrometric Analysis Test Report

Test Report No. : 00248/08/2022 -CH001-119 Test Report Date : 17/08/2022

Lab Name : Laboratories of Quality Directorate at the Ministry of Energy and Mineral Resources
Lab Address : Ministry of Energy and Mineral Resources - 8th Circle Bayader Wadi Al Seer, Amman – Jordan (www.memr.gov.jo)

Client Name : مديرية دراسات المصادر الطبيعية
Client Address : -

Division : Chemical & Mineral Analysis Lab / XRF Lab Testing Location : At the Lab facility.

Methods Used : BS EN 15309-2007 Lab Ref. Work Instruction : WI-REP-01 Used for : XRF spectrometric analysis & LOI

Sampling Method : By the customer
Sample Type : صلبة
Testing Date : 10/08/2022

Sample Reception Date : 08/08/2022
Sample Location : -

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
1	RPH1-BH42-13	3.24	0.048	0.50	27.20	0.26	< 0.058	0.85	34.60	6.43	1.84	0.50	< 0.51	< 0.0125	24.60
2	RPH1-BH42-14	1.39	0.065	0.18	40.40	< 0.09	< 0.058	0.80	22.70	2.55	0.75	< 0.34	< 0.51	< 0.0125	31.08
3	RPH1-BH42-15	0.58	0.043	0.074	46.50	< 0.09	< 0.058	0.40	14.80	1.04	0.42	< 0.34	< 0.51	< 0.0125	35.80
4	RPH1-BH42-16	0.30	0.020	0.045	52.70	< 0.09	< 0.058	0.50	5.09	0.73	0.45	< 0.34	< 0.51	< 0.0125	40.21
5	RPH1-BH42-17	< 0.23	< 0.012	0.035	47.20	< 0.09	< 0.058	0.48	15.90	0.56	0.36	< 0.34	< 0.51	< 0.0125	35.23
6	RPH1-BH42-18	0.27	< 0.012	0.037	44.50	< 0.09	< 0.058	0.62	21.20	0.56	0.36	< 0.34	< 0.51	< 0.0125	32.46
7	RPH1-BH42-19	0.24	< 0.012	0.033	47.90	< 0.09	< 0.058	0.51	14.60	< 0.55	0.46	< 0.34	< 0.51	< 0.0125	35.74
8	RPH1-BH42-20	0.23	< 0.012	0.033	48.70	< 0.09	< 0.058	1.09	11.80	0.56	0.59	< 0.34	< 0.51	< 0.0125	36.95
9	RPH1-BH42-21	0.38	< 0.012	0.036	48.60	< 0.09	< 0.058	0.38	11.80	0.64	0.84	< 0.34	< 0.51	< 0.0125	37.29
10	RPH1-BH42-22	0.31	< 0.012	0.030	41.60	< 0.09	< 0.058	0.38	25.10	< 0.55	0.60	< 0.34	< 0.51	< 0.0125	31.46
11	RPH1-BH42-23	0.31	< 0.012	< 0.029	47.30	< 0.09	< 0.058	0.56	13.80	< 0.55	0.54	< 0.34	< 0.51	< 0.0125	36.70

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

وزارة الطاقة والثروة المعدنية
المملكة الأردنية الهاشمية

X-Ray Spectrometric Analysis Test Report

Test Report No. : 00248/08/2022 -CH001-119 Test Report Date : 17/08/2022

Item	S.ID.	Fe_2O_3 Wt.%	MnO Wt.%	TiO_2 Wt.%	CaO Wt.%	K_2O Wt.%	SO3 Wt.%	P_2O_5 Wt.%	SiO_2 Wt.%	Al_2O_3 Wt.%	MgO Wt.%	Na_2O Wt.%	F Wt.%	U Wt.%	L.O.I Wt.%
12	RPH1-BH42-24	0.43	< 0.012	0.047	51.00	< 0.09	< 0.058	0.39	7.30	0.70	0.52	< 0.34	< 0.51	< 0.0125	39.55
13	RPH1-BH42-25	0.34	< 0.012	0.039	51.30	< 0.09	< 0.058	0.52	7.51	0.62	0.49	< 0.34	< 0.51	< 0.0125	39.15
14	RPH1-BH42-26	0.32	< 0.012	0.043	46.40	< 0.09	< 0.058	0.50	16.50	0.66	0.45	< 0.34	< 0.51	< 0.0125	35.07
15	RPH1-BH42-27	1.06	0.021	0.13	38.40	< 0.09	< 0.058	1.95	27.70	1.85	0.87	< 0.34	< 0.51	< 0.0125	28.00
16	RPH1-BH42-28	0.34	< 0.012	0.042	32.20	< 0.09	< 0.058	0.80	38.50	0.62	0.27	< 0.34	< 0.51	< 0.0125	27.26
17	RPH1-BH42-29	< 0.23	< 0.012	< 0.029	32.10	< 0.09	< 0.058	0.90	42.60	< 0.55	< 0.21	< 0.34	< 0.51	< 0.0125	23.27
18	RPH1-BH42-30	< 0.23	< 0.012	< 0.029	28.50	< 0.09	< 0.058	0.80	49.00	< 0.55	0.38	< 0.34	< 0.51	< 0.0125	21.01
Uncertainty (if required):		-	-	-	-	-	-	-	-	-	-	-	-	-	-

This test is traceable to SI units and is following ISO/IEC 17025:2017. While measurement uncertainty is evaluated in accordance with ASTM standards. The coverage factor (k=2) so that the coverage probability is approximately 95%.

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

وزارة الطاقة والثروة المعدنية
المملكة الأردنية الهاشمية

X-Ray Spectrometric Analysis Test Report

Test Report No. : 00248/08/2022 -CH001-119	Test Report Date : 17/08/2022

Notes:

- **The results were done on dry basis.**
- The results stated in this test report relates only to the tested sample.
- This test report is only valid with stamp and signature.
- The results stated in this test report shall not be reproduced except in full, without written approval of the lab.
- The laboratory does not apply the decision rule.

Opinions and Interpretations:
NA.....
.....
.....

Additional Comments:
NA.....
.....
.....

Analyzed by *(Name and Sign)* : Eng. Nidal Tayyem
Eng. Feryal Yosef

Division Head *(Name and Sign)* : Eng .Maysoon Alkhzahee

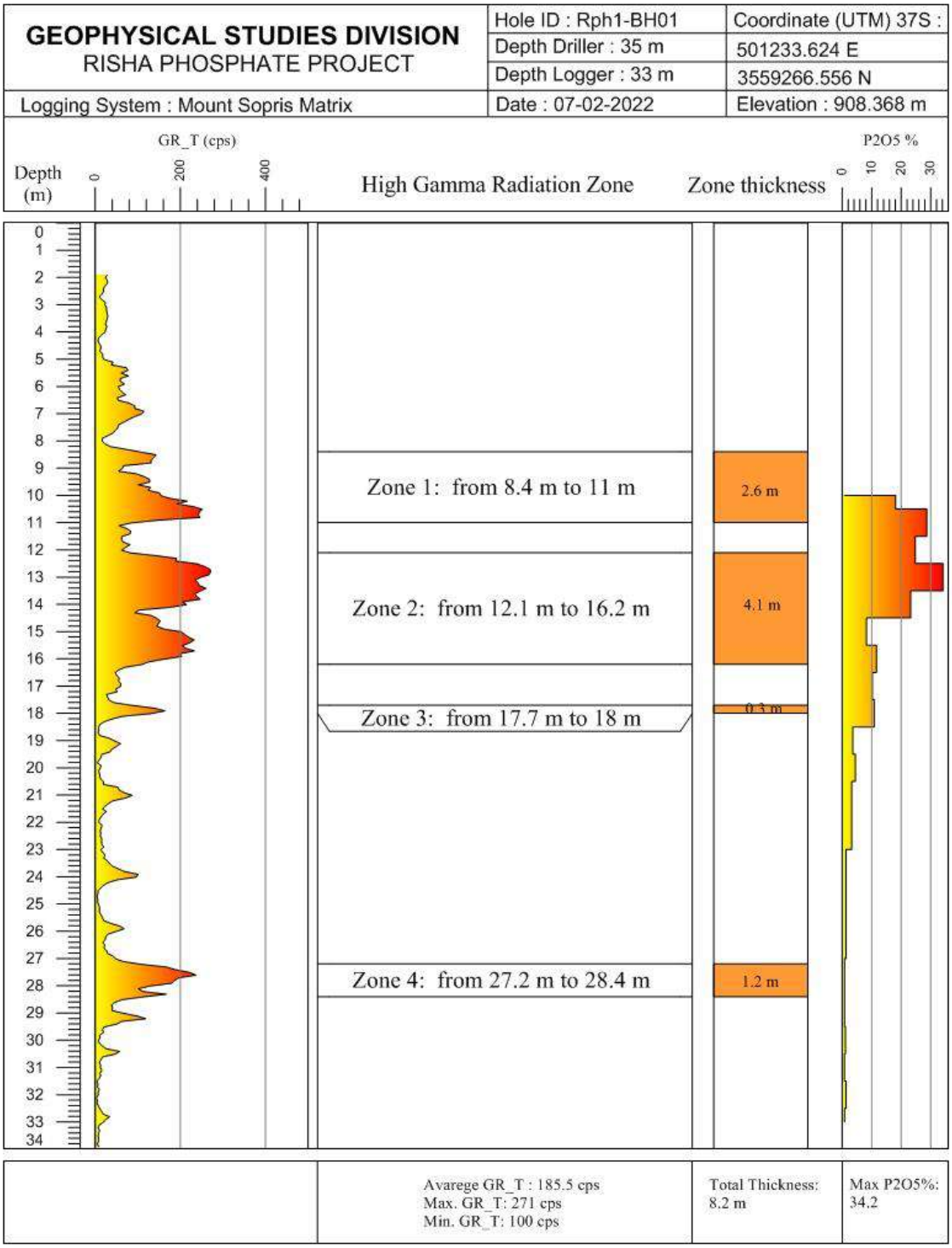
Technical Manager *(Name and Sign)* : Chemist Hanady Al Sharif

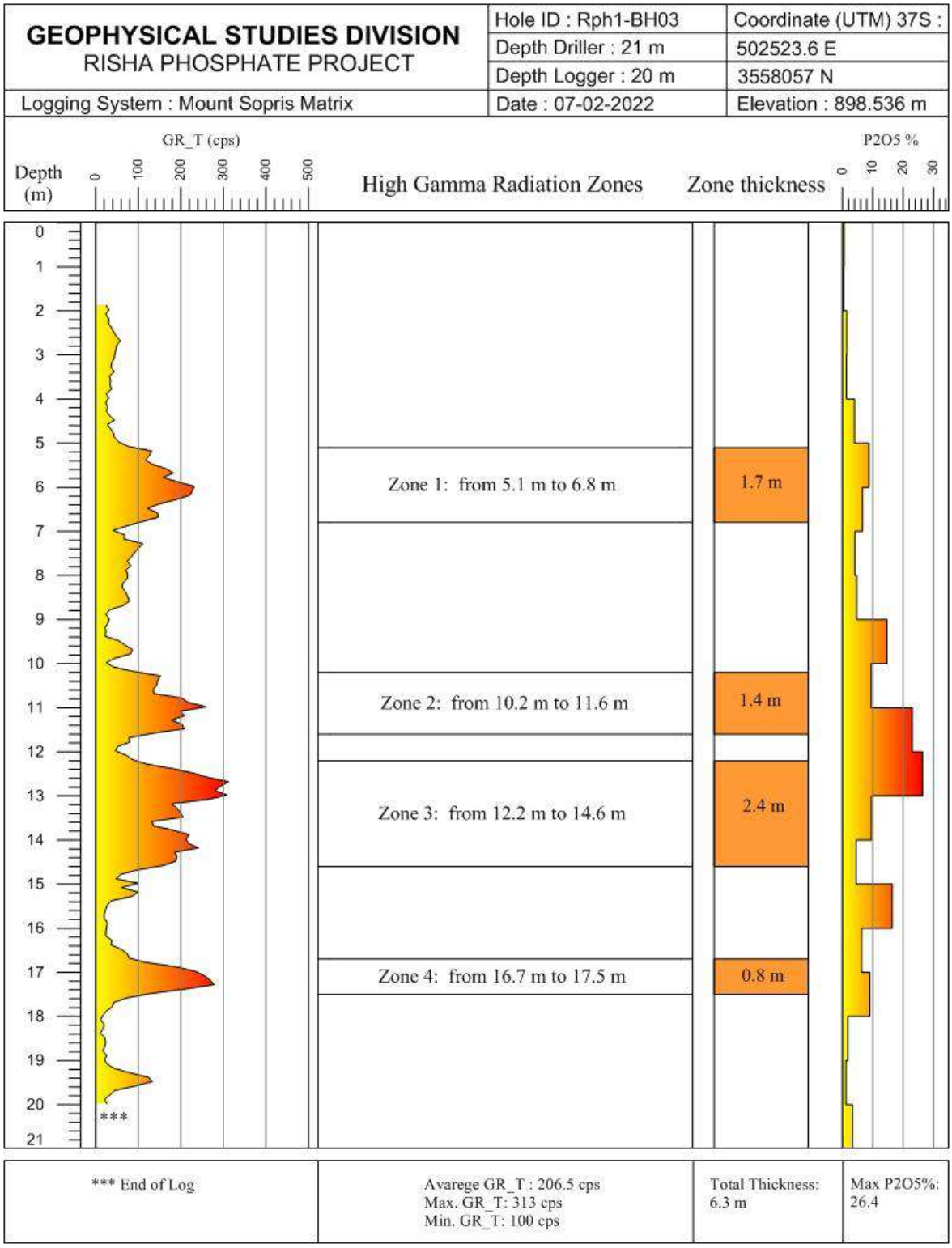
Lab Manager *(Name and Sign)* : Eng .Maysoon Alkhzahee

وزارة الطاقة والثروة المعدنية
مديرية المختبرات والجودة

Appendix No. 2

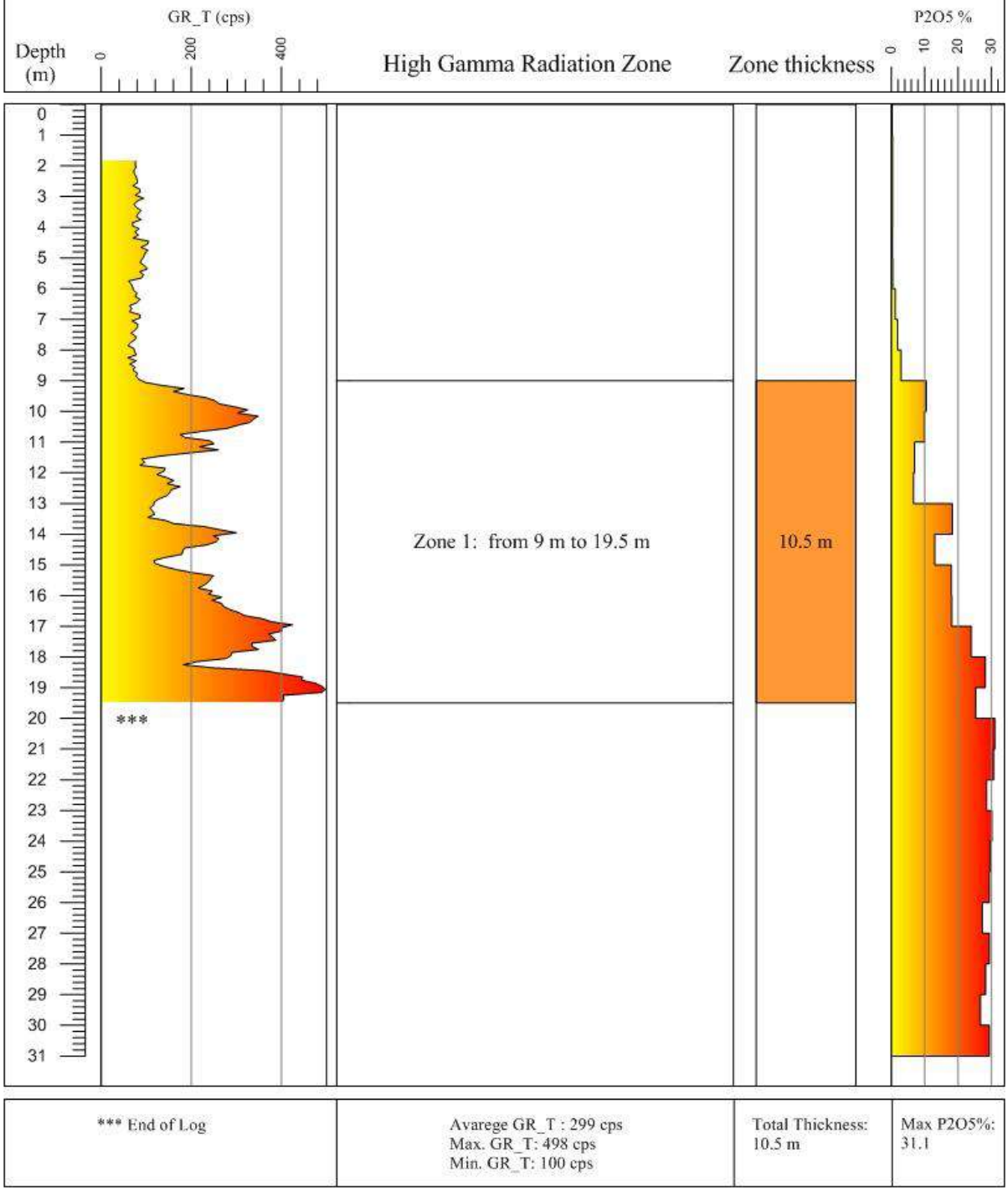
Geophysical Gamma Log


GEOPHYSICAL STUDIES DIVISION
RISHA PHOSPHATE PROJECT
Hole ID : Rph1-BH01
Depth Driller : 35 m
Depth Logger : 33 m
Date : 07-02-2022
Coordinate (UTM) 37S :
501233.624 E
3559266.556 N
Elevation : 908.368 m
Logging System : Mount Sopris Matrix
GR_T (cps)
Depth (m)
High Gamma Radiation Zone
Zone thickness
P2O5 %
Zone 1: from 8.4 m to 11 m
Zone 2: from 12.1 m to 16.2 m
Zone 3: from 17.7 m to 18 m
Zone 4: from 27.2 m to 28.4 m
2.6 m
4.1 m
1.2 m
Avarege GR_T : 185.5 cps
Max. GR_T: 271 cps
Min. GR_T: 100 cps
Total Thickness: 8.2 m
Max P2O5%: 34.2

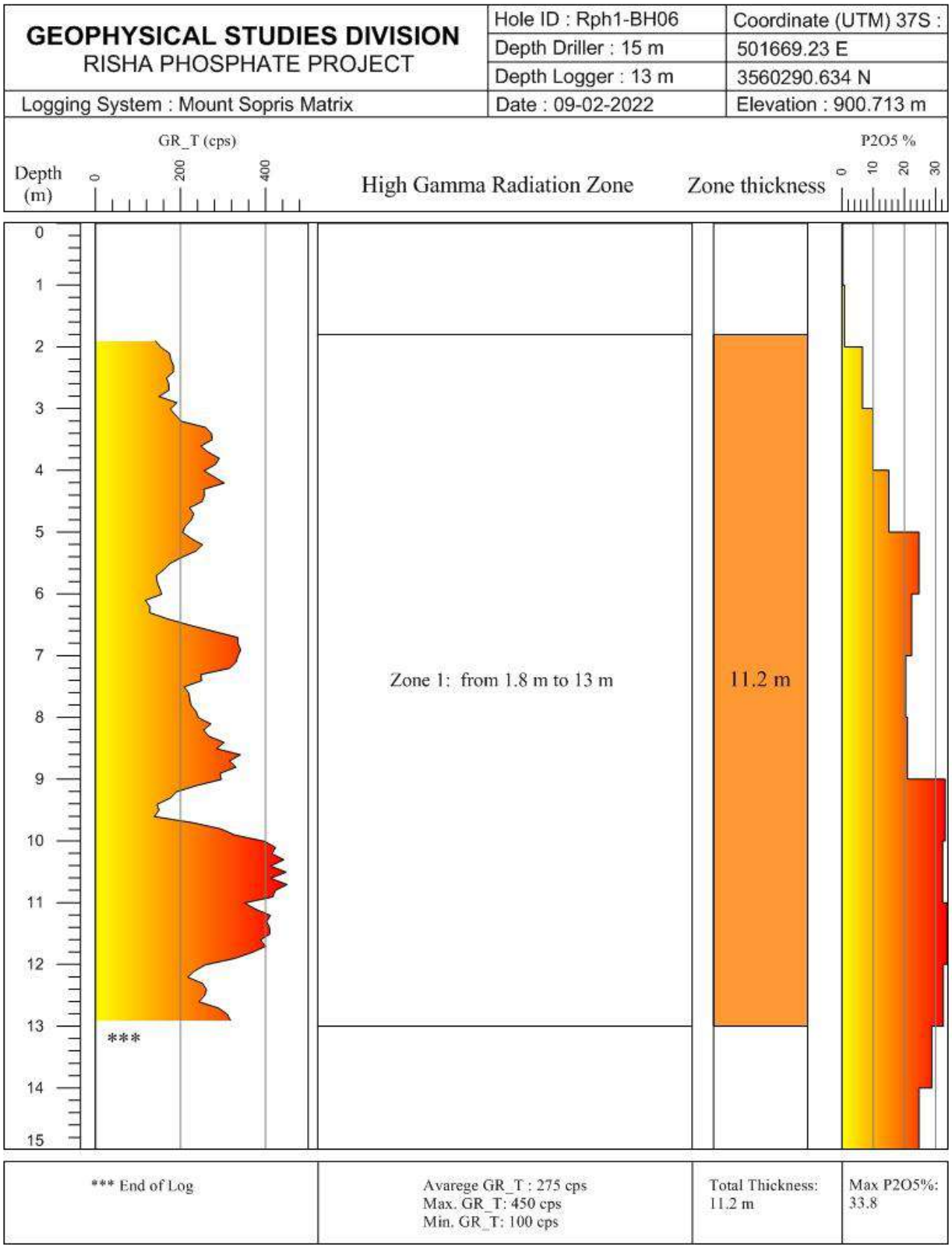

GEOPHYSICAL STUDIES DIVISION
RISHA PHOSPHATE PROJECT
Hole ID : Rph1-BH03
Depth Driller : 21 m
Depth Logger : 20 m
Coordinate (UTM) 37S :
502523.6 E
3558057 N
Logging System : Mount Sopris Matrix
Date : 07-02-2022
Elevation : 898.536 m
GR_T (cps)
P2O5 %
Depth (m)
High Gamma Radiation Zones
Zone thickness
Zone 1: from 5.1 m to 6.8 m
1.7 m
Zone 2: from 10.2 m to 11.6 m
1.4 m
Zone 3: from 12.2 m to 14.6 m
2.4 m
Zone 4: from 16.7 m to 17.5 m
0.8 m
*** End of Log
Avarege GR_T : 206.5 cps
Max. GR_T: 313 cps
Min. GR_T: 100 cps
Total Thickness: 6.3 m
Max P2O5%: 26.4

GEOPHYSICAL STUDIES DIVISION	Hole ID : Rph1-BH04	Coordinate (UTM) 37S :
	Depth Driller : 30 m	502611.139 E

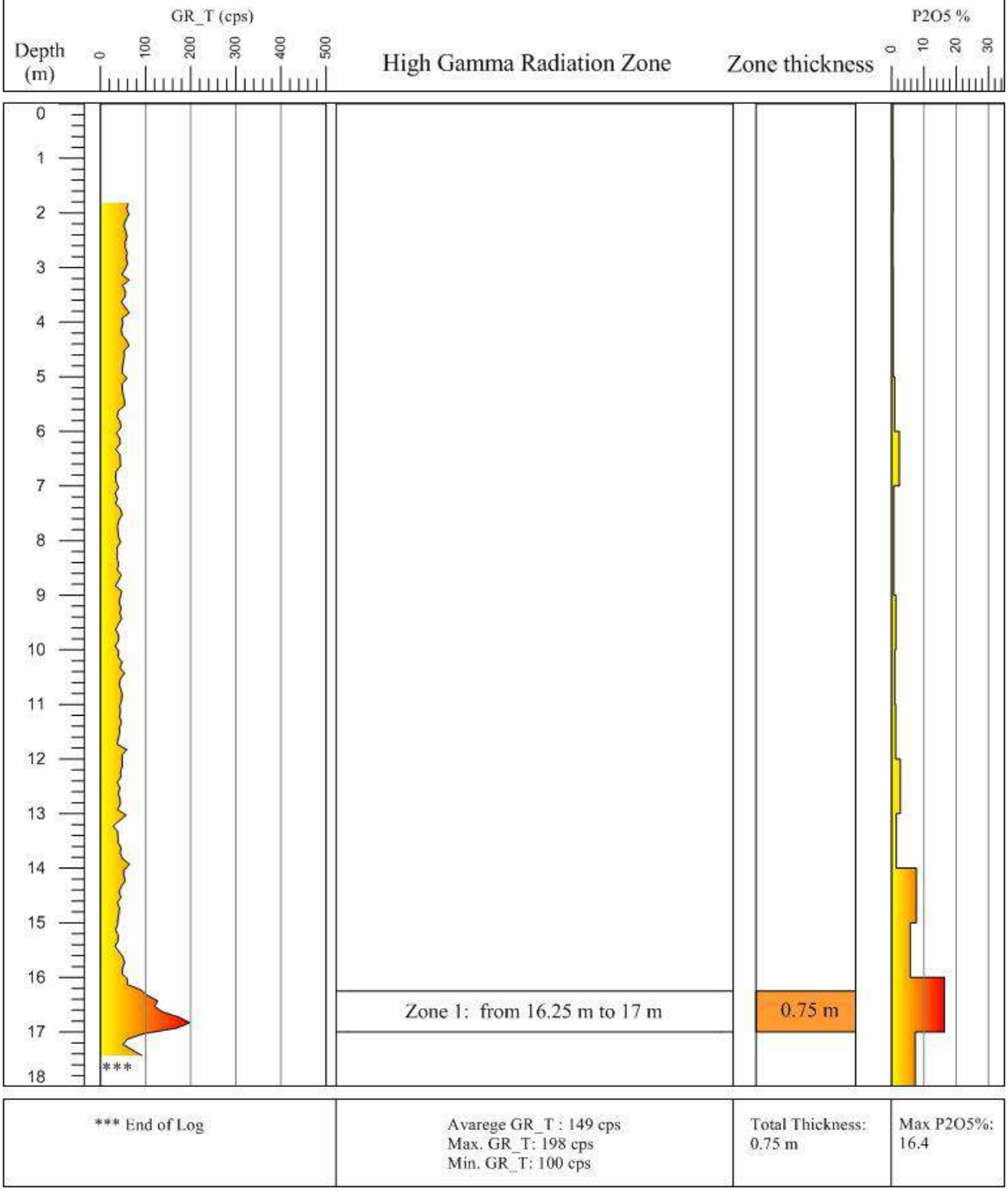
GEOPHYSICAL STUDIES DIVISION RISHA PHOSPHATE PROJECT	Hole ID : Rph1-BH05	Coordinate (UTM) 37S :
	Depth Driller : 31 m	502561.291 E
	Depth Logger : 19.55 m	3560021.716 N
Logging System : Mount Sopris Matrix	Date : 10-02-2022	Elevation : 904.467 m



*** End of Log	Avarege GR_T : 299 cps Max. GR_T: 498 cps Min. GR_T: 100 cps	Total Thickness: 10.5 m	Max P2O5%: 31.1


GEOPHYSICAL STUDIES DIVISION
RISHA PHOSPHATE PROJECT
Hole ID : Rph1-BH06
Depth Driller : 15 m
Depth Logger : 13 m
Coordinate (UTM) 37S :
501669.23 E
3560290.634 N
Logging System : Mount Sopris Matrix
Date : 09-02-2022
Elevation : 900.713 m
GR_T (cps)
Depth (m)
0
200
400
High Gamma Radiation Zone
Zone thickness
P2O5 %
0
10
20
30
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
***
Zone 1: from 1.8 m to 13 m
11.2 m
*** End of Log
Avarege GR_T : 275 cps
Max. GR_T: 450 cps
Min. GR_T: 100 cps
Total Thickness:
11.2 m
Max P2O5%:
33.8

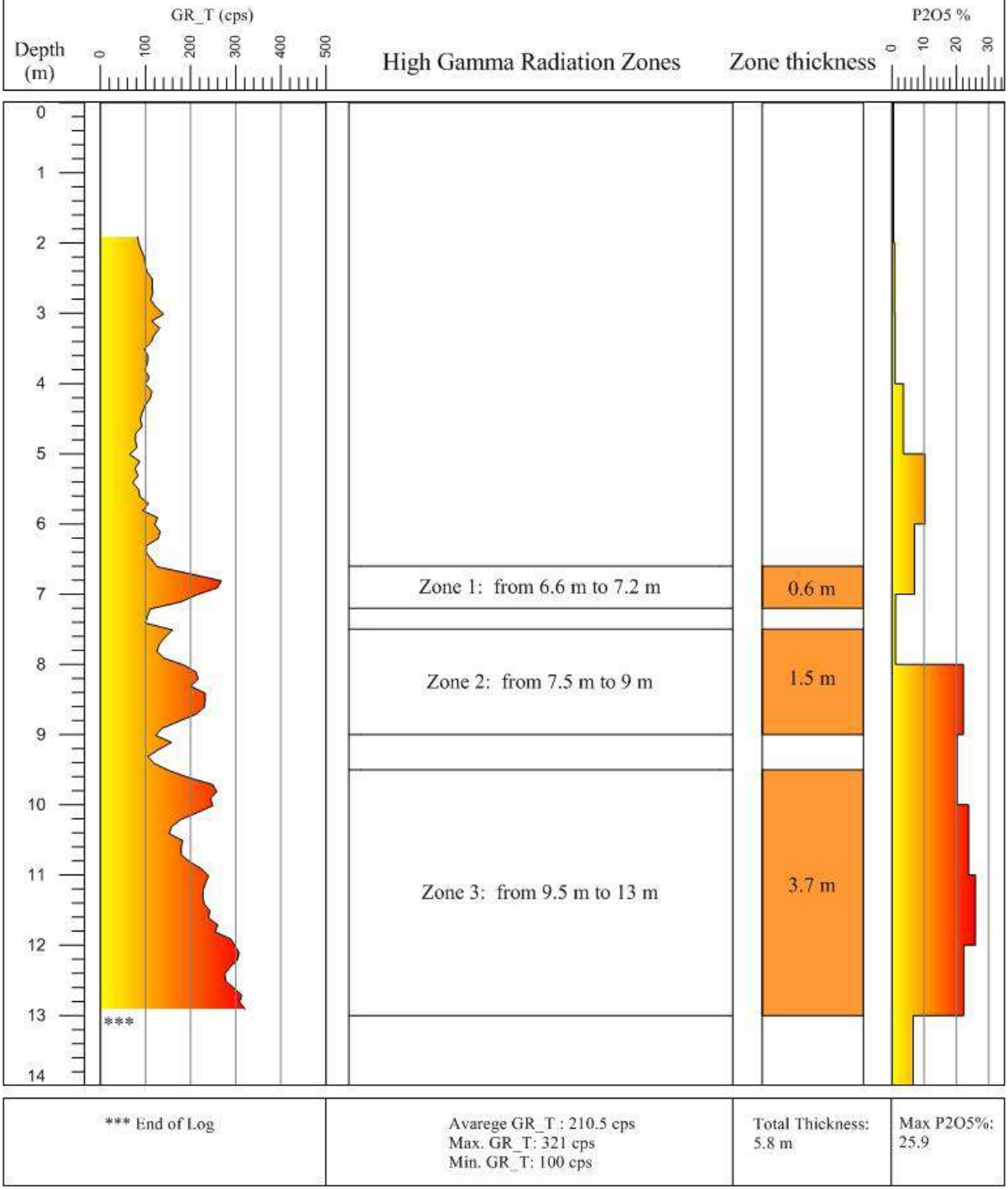
GEOPHYSICAL STUDIES DIVISION RISHA PHOSPHATE PROJECT	Hole ID : Rph1-BH08	Coordinate (UTM) 37S :
	Depth Driller : 18 m	500693.586 E
	Depth Logger : 17.5 m	3561127.223 N
Logging System : Mount Sopris Matrix	Date : 09-02-2022	Elevation : 895.669 m



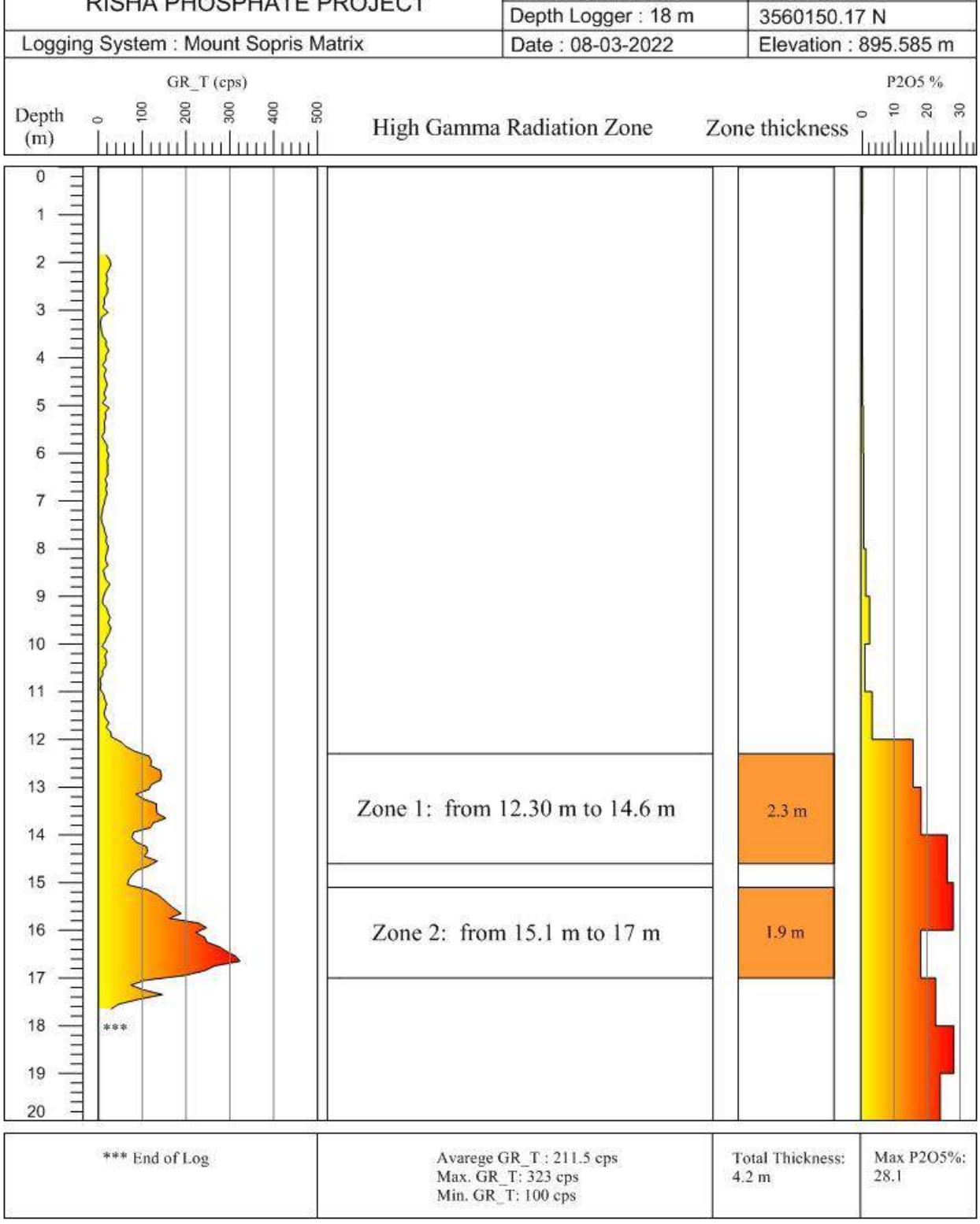
*** End of Log	Avarege GR_T : 149 cps Max. GR_T: 198 cps Min. GR_T: 100 cps	Total Thickness: 0.75 m	Max P2O5%: 16.4

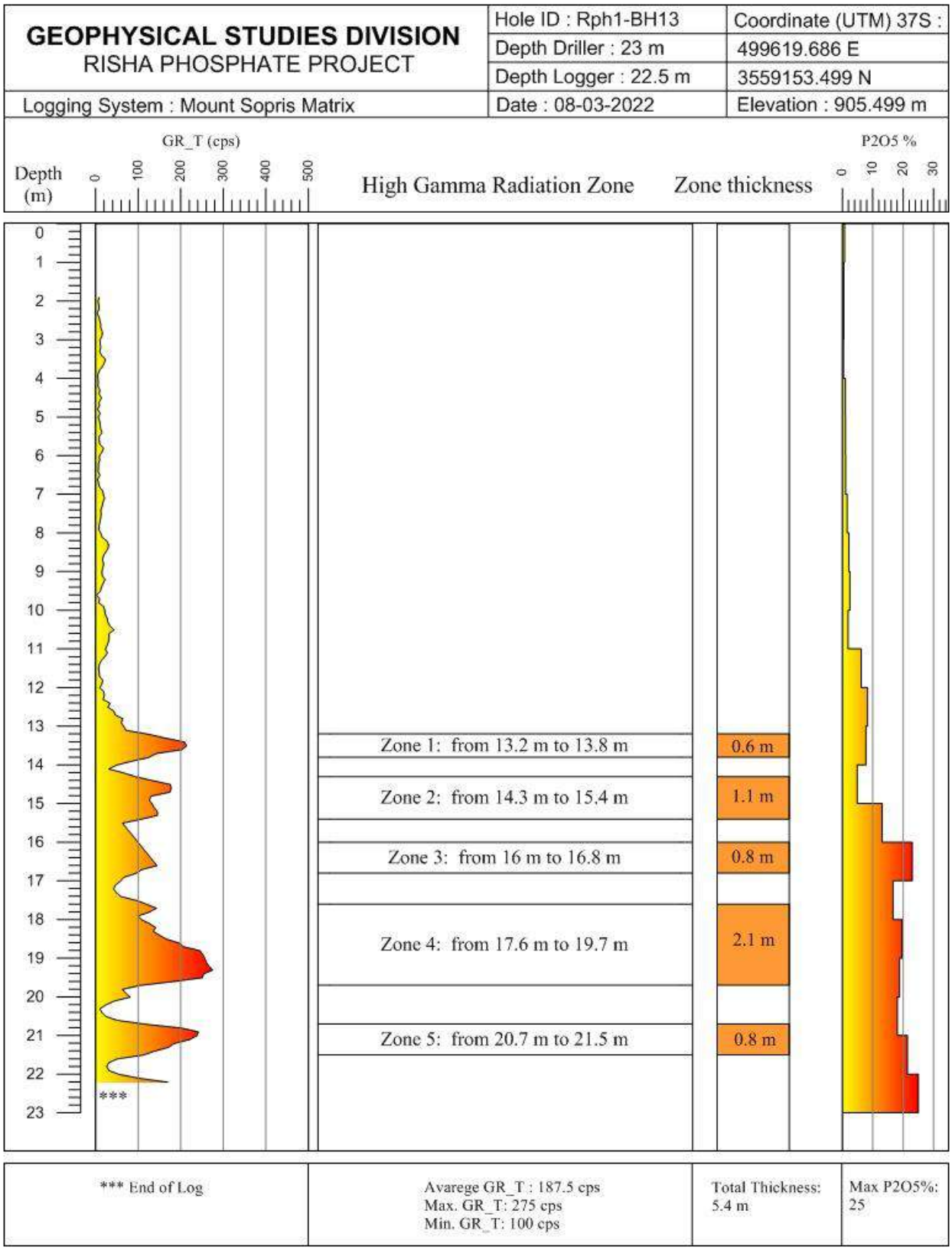
GEOPHYSICAL STUDIES DIVISION	Hole ID : Rph1-BH09	Coordinate (UTM) 37S :
	Depth Driller : 19 m	499690.436 E

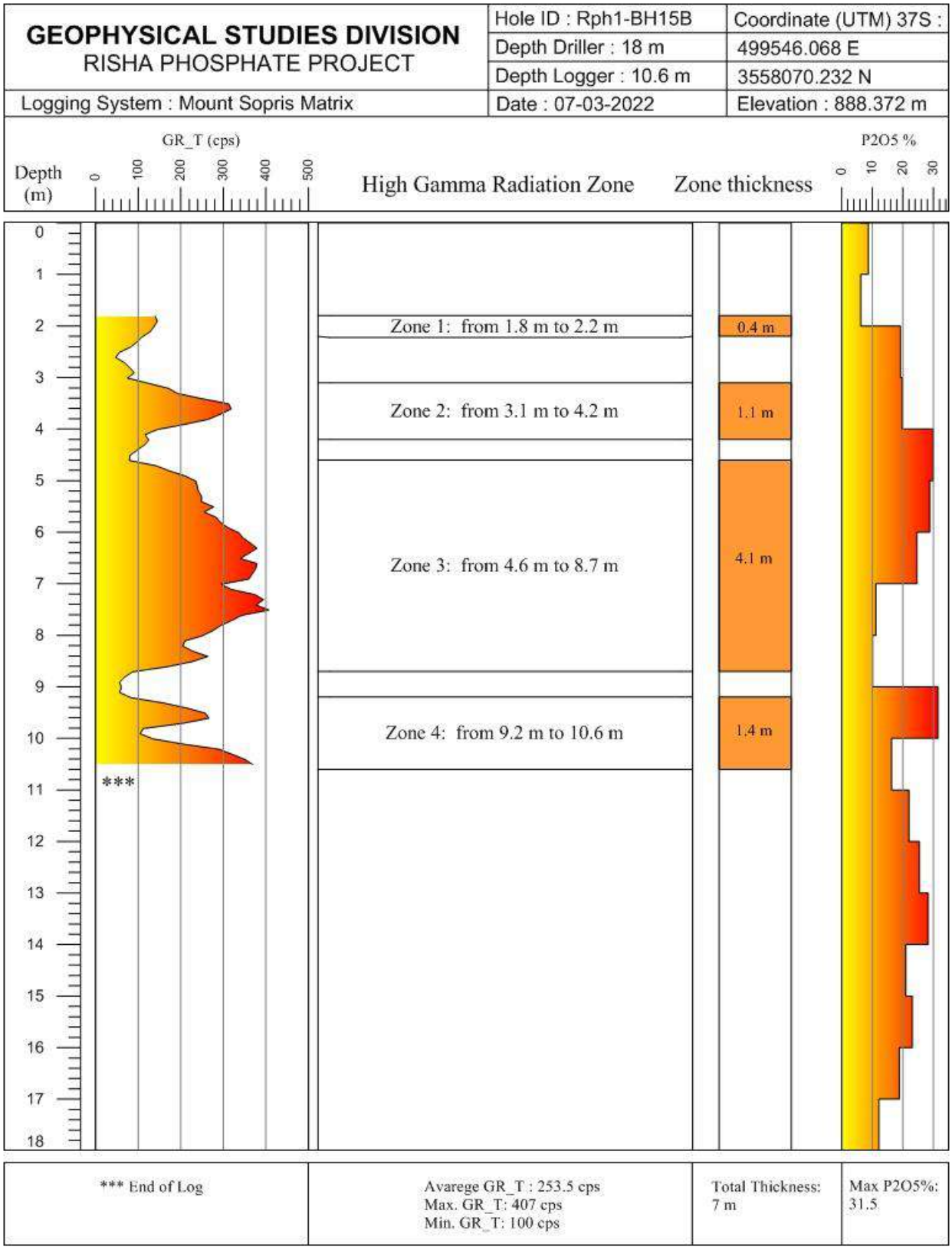
GEOPHYSICAL STUDIES DIVISION RISHA PHOSPHATE PROJECT	Hole ID : Rph1-BH10	Coordinate (UTM) 37S :
	Depth Driller : 14 m	499733.654 E
	Depth Logger : 13 m	3562174.712 N
Logging System : Mount Sopris Matrix	Date : 10-02-2022	Elevation : 892.95 m



*** End of Log	Avarege GR_T : 210.5 cps Max. GR_T: 321 cps Min. GR_T: 100 cps	Total Thickness: 5.8 m	Max P2O5%: 25.9

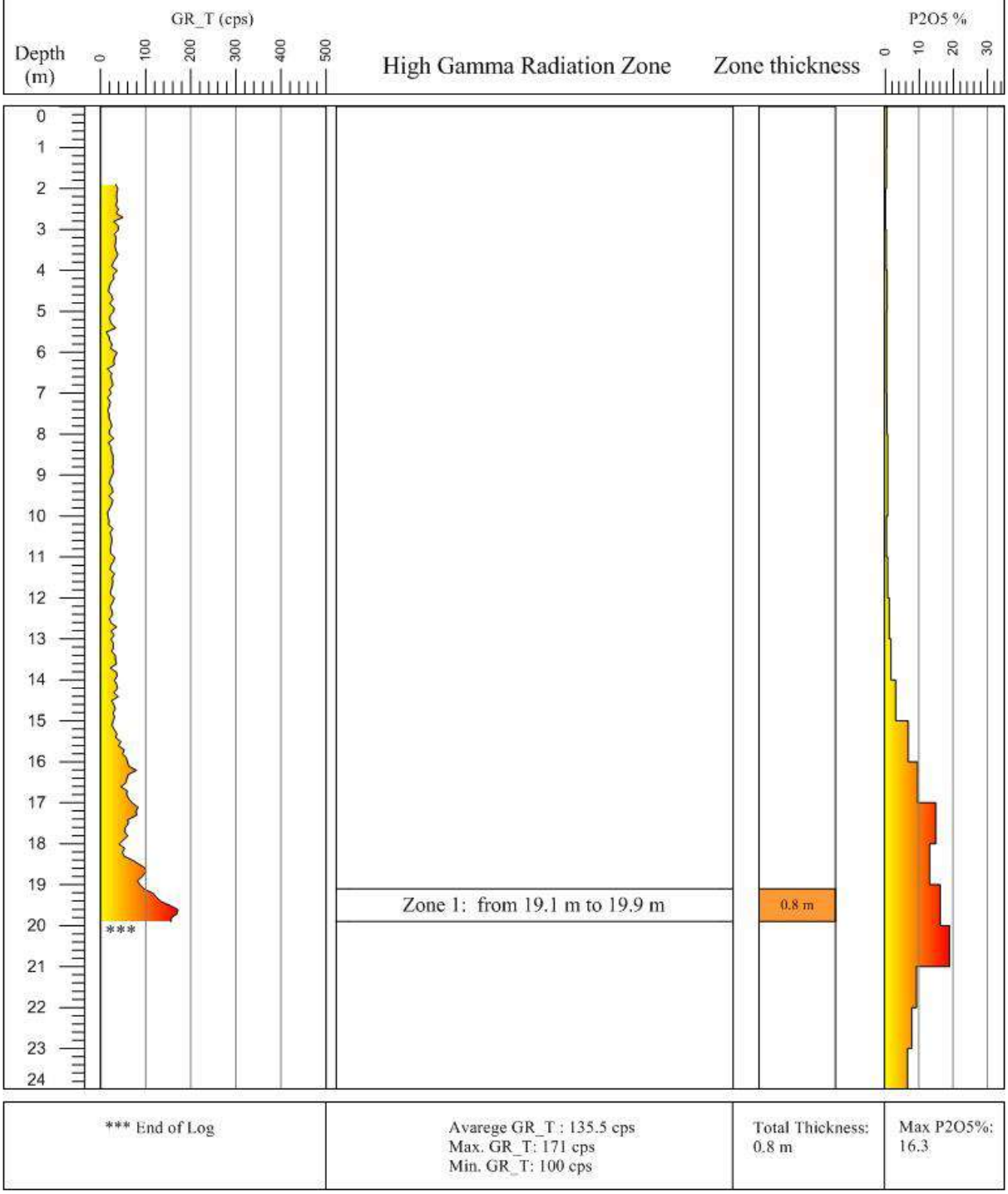

GEOPHYSICAL STUDIES DIVISION
RISHA PHOSPHATE PROJECT
Hole ID : Rph1-BH12
Depth Driller : 20 m
Depth Logger : 18 m
Coordinate (UTM) 37S :
499659.304 E
3560150.17 N
Logging System : Mount Sopris Matrix
Date : 08-03-2022
Elevation : 895.585 m
GR_T (cps)
Depth (m)
High Gamma Radiation Zone
Zone thickness
P2O5 %
Zone 1: from 12.30 m to 14.6 m
2.3 m
Zone 2: from 15.1 m to 17 m
1.9 m
*** End of Log
Avarege GR_T : 211.5 cps
Max. GR_T: 323 cps
Min. GR_T: 100 cps
Total Thickness: 4.2 m
Max P2O5%: 28.1


GEOPHYSICAL STUDIES DIVISION
RISHA PHOSPHATE PROJECT
Hole ID : Rph1-BH13
Depth Driller : 23 m
Depth Logger : 22.5 m
Coordinate (UTM) 37S :
499619.686 E
3559153.499 N
Logging System : Mount Sopris Matrix
Date : 08-03-2022
Elevation : 905.499 m
GR_T (cps)
Depth (m)
High Gamma Radiation Zone
Zone thickness
P2O5 %
Zone 1: from 13.2 m to 13.8 m
0.6 m
Zone 2: from 14.3 m to 15.4 m
1.1 m
Zone 3: from 16 m to 16.8 m
0.8 m
Zone 4: from 17.6 m to 19.7 m
2.1 m
Zone 5: from 20.7 m to 21.5 m
0.8 m
*** End of Log
Avarege GR_T : 187.5 cps
Max. GR_T: 275 cps
Min. GR_T: 100 cps
Total Thickness: 5.4 m
Max P2O5%: 25

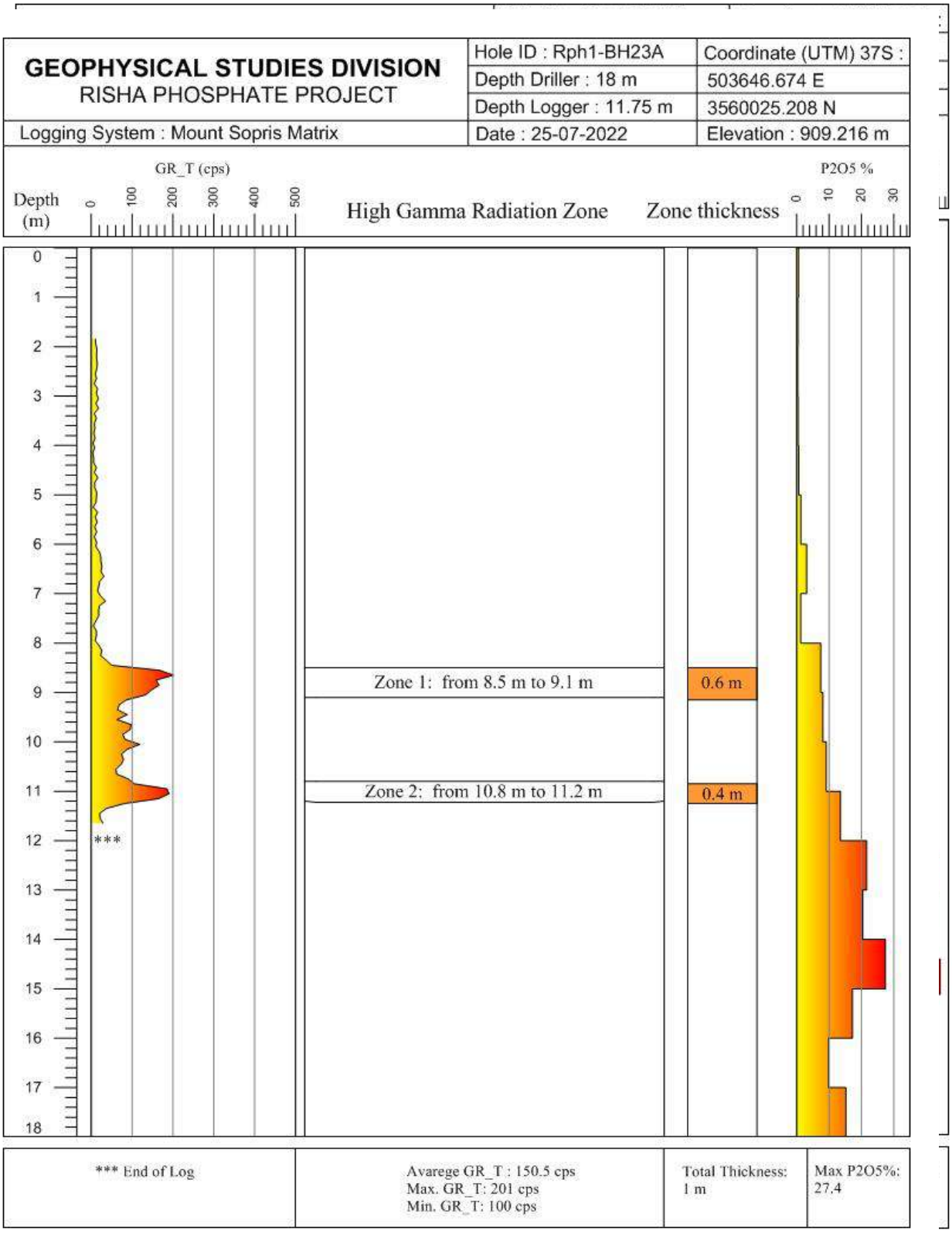

GEOPHYSICAL STUDIES DIVISION
RISHA PHOSPHATE PROJECT
Hole ID : Rph1-BH15B
Depth Driller : 18 m
Depth Logger : 10.6 m
Coordinate (UTM) 37S :
499546.068 E
3558070.232 N
Logging System : Mount Sopris Matrix
Date : 07-03-2022
Elevation : 888.372 m
GR_T (cps)
Depth (m)
High Gamma Radiation Zone
Zone thickness
P2O5 %
Zone 1: from 1.8 m to 2.2 m
Zone 2: from 3.1 m to 4.2 m
Zone 3: from 4.6 m to 8.7 m
Zone 4: from 9.2 m to 10.6 m
0.4 m
1.1 m
4.1 m
1.4 m
***
*** End of Log
Avarege GR_T : 253.5 cps
Max. GR_T: 407 cps
Min. GR_T: 100 cps
Total Thickness: 7 m
Max P2O5%: 31.5

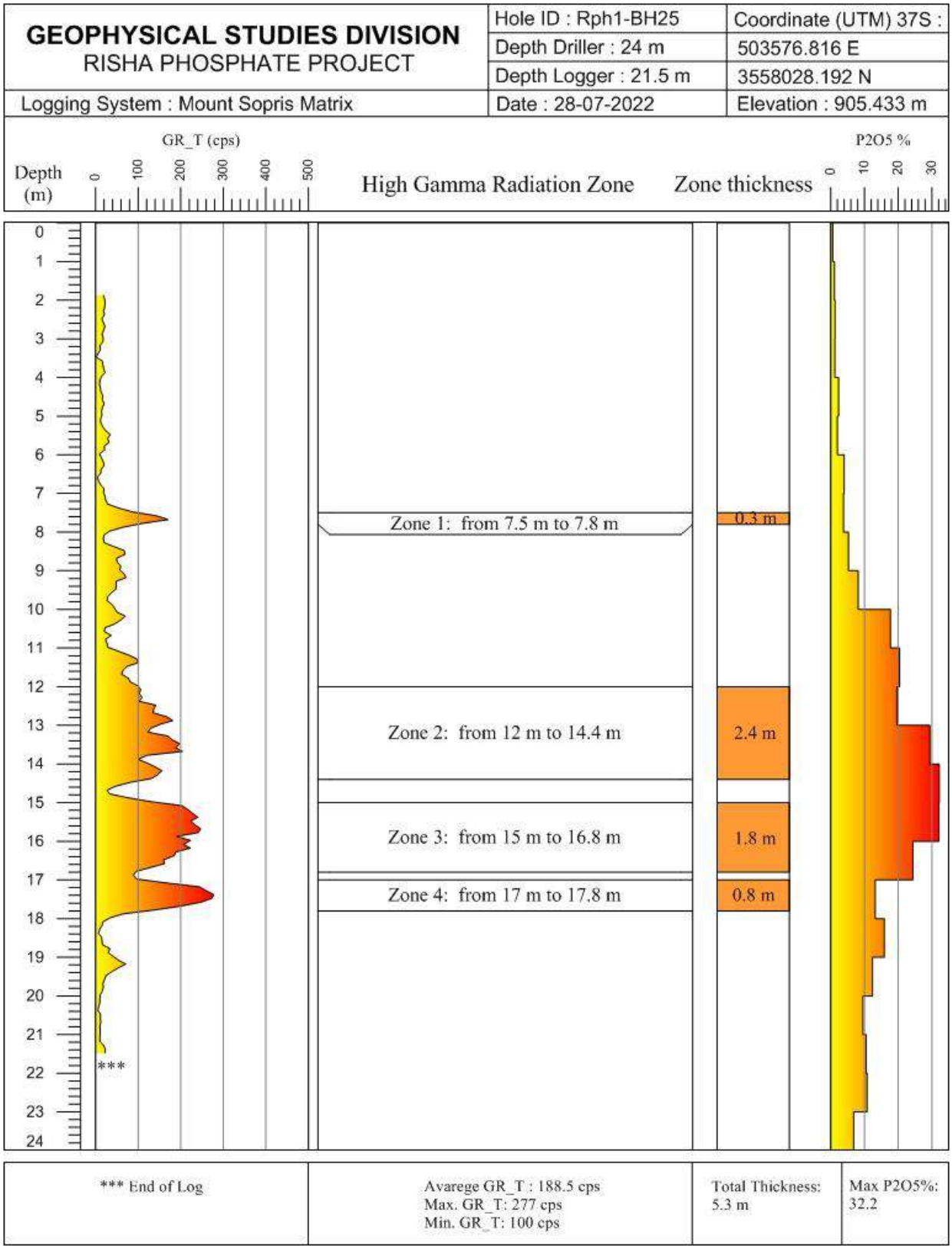
	Hole ID : Rph1-BH16	Coordinate (UTM) 37S :

GEOPHYSICAL STUDIES DIVISION RISHA PHOSPHATE PROJECT	Hole ID : Rph1-BH17	Coordinate (UTM) 37S :
	Depth Driller : 24 m	500574.686 E
	Depth Logger : 20 m	3557132.24 N
Logging System : Mount Sopris Matrix	Date : 10-03-2022	Elevation : 889.756 m



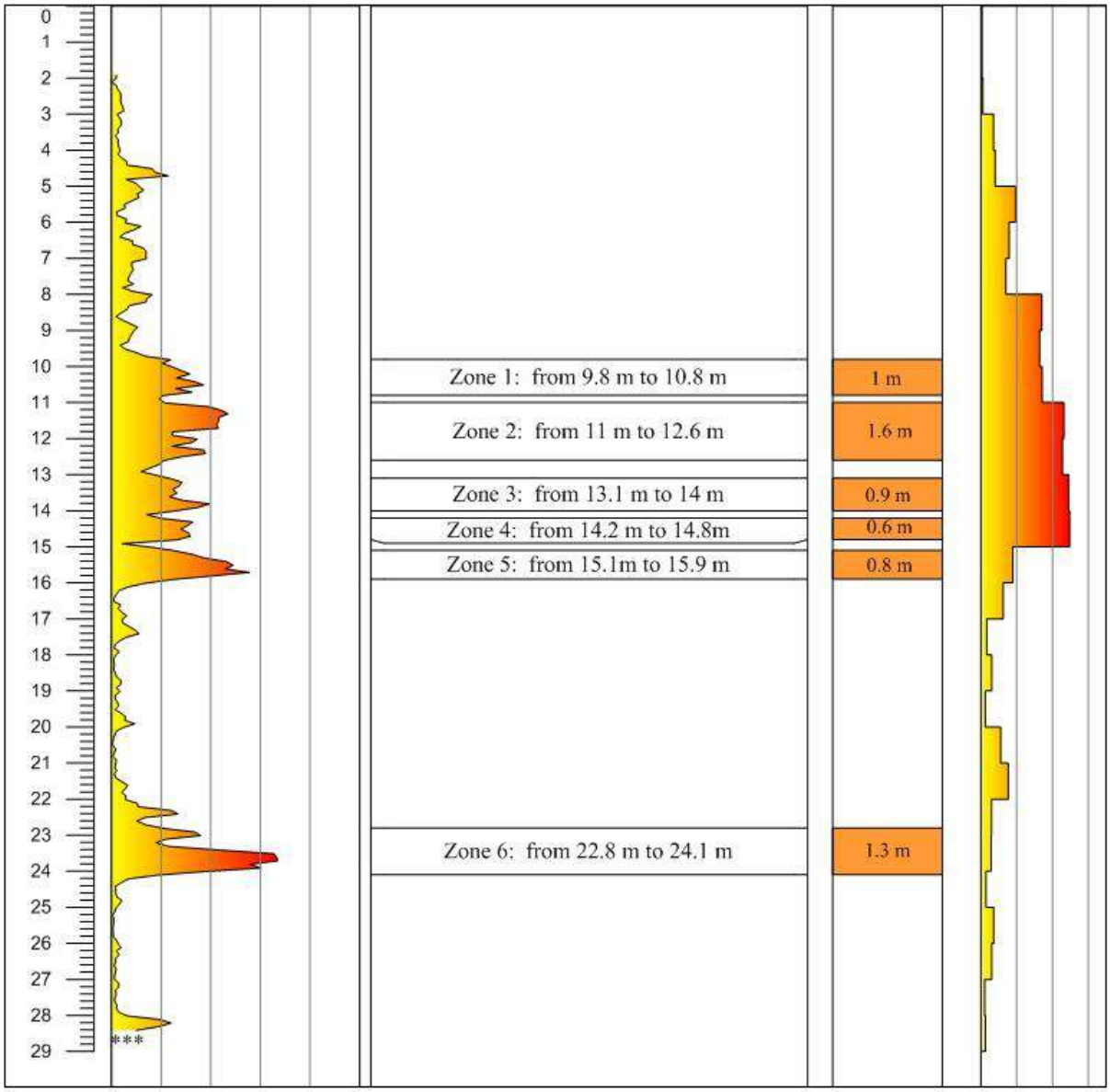
*** End of Log	Avarege GR_T : 135.5 cps Max. GR_T: 171 cps Min. GR_T: 100 cps	Total Thickness: 0.8 m	Max P2O5%: 16.3


GEOPHYSICAL STUDIES DIVISION
RISHA PHOSPHATE PROJECT
Hole ID : Rph1-BH23A
Depth Driller : 18 m
Depth Logger : 11.75 m
Coordinate (UTM) 37S :
503646.674 E
3560025.208 N
Logging System : Mount Sopris Matrix
Date : 25-07-2022
Elevation : 909.216 m
GR_T (cps)
Depth (m)
High Gamma Radiation Zone
Zone thickness
P2O5 %
Zone 1: from 8.5 m to 9.1 m
0.6 m
Zone 2: from 10.8 m to 11.2 m
0.4 m
*** End of Log
Avarege GR_T : 150.5 cps
Max. GR_T: 201 cps
Min. GR_T: 100 cps
Total Thickness:
1 m
Max P2O5%:
27.4


GEOPHYSICAL STUDIES DIVISION
RISHA PHOSPHATE PROJECT
Hole ID : Rph1-BH25
Depth Driller : 24 m
Depth Logger : 21.5 m
Coordinate (UTM) 37S :
503576.816 E
3558028.192 N
Logging System : Mount Sopris Matrix
Date : 28-07-2022
Elevation : 905.433 m
GR_T (cps)
Depth (m)
High Gamma Radiation Zone
Zone thickness
P2O5 %
Zone 1: from 7.5 m to 7.8 m
0.3 m
Zone 2: from 12 m to 14.4 m
2.4 m
Zone 3: from 15 m to 16.8 m
1.8 m
Zone 4: from 17 m to 17.8 m
0.8 m
*** End of Log
Avarege GR_T : 188.5 cps
Max. GR_T: 277 cps
Min. GR_T: 100 cps
Total Thickness: 5.3 m
Max P2O5%: 32.2

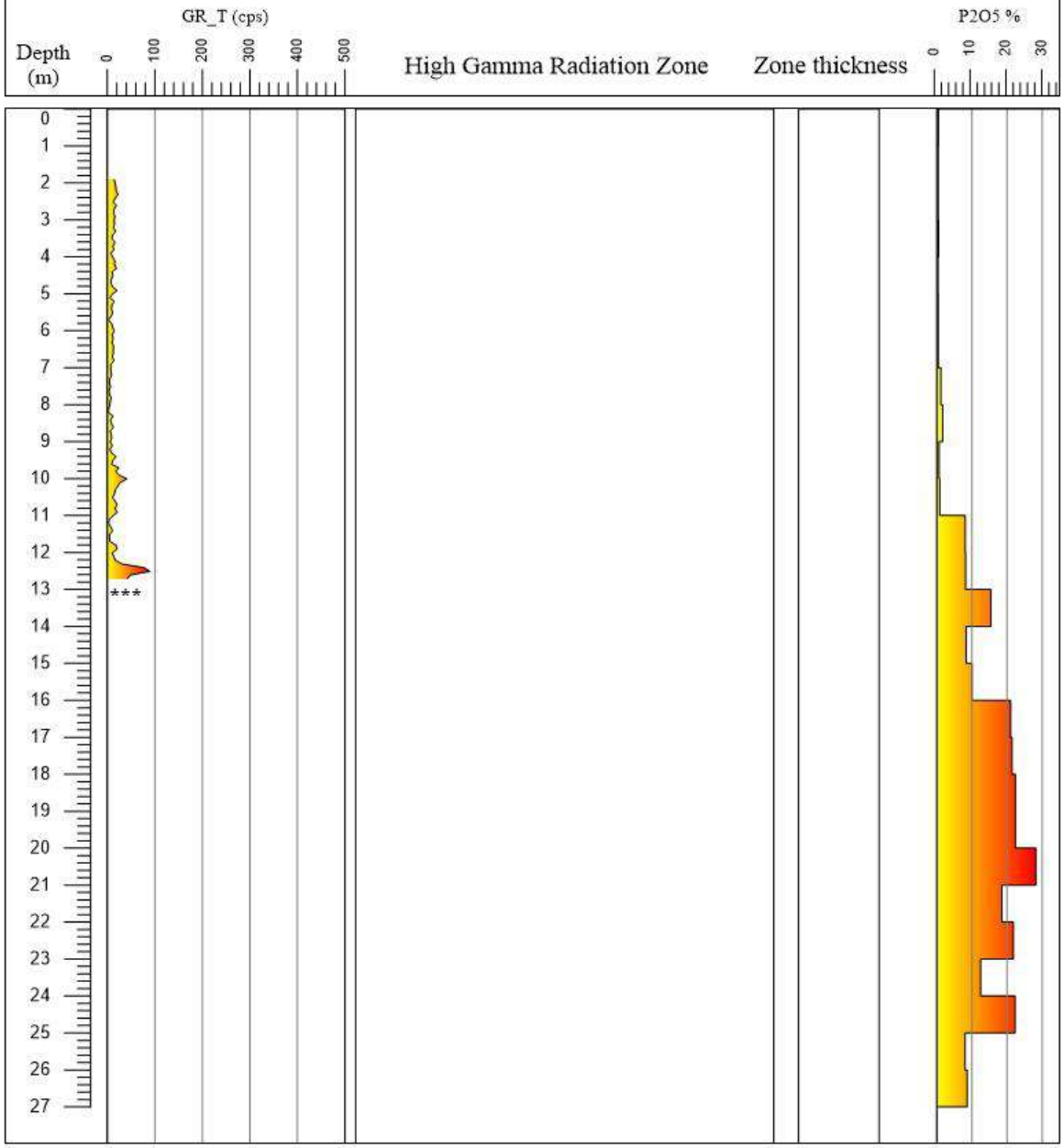
GEOPHYSICAL STUDIES DIVISION	Hole ID : Rph1-BH24	Coordinate (UTM) 37S :

GEOPHYSICAL STUDIES DIVISION RISHA PHOSPHATE PROJECT	Hole ID : Rph1-BH26	Coordinate (UTM) 37S :
	Depth Driller : 29 m	503536.797 E
	Depth Logger : 28.5 m	3557034.313 N
Logging System : Mount Sopris Matrix	Date : 28-07-2022	Elevation : 899.397 m



*** End of Log	Avarege GR_T : 212.5 cps Max. GR_T: 335 cps Min. GR_T: 100 cps	Total Thickness: 4.4 m	Max P2O5%: 24.8

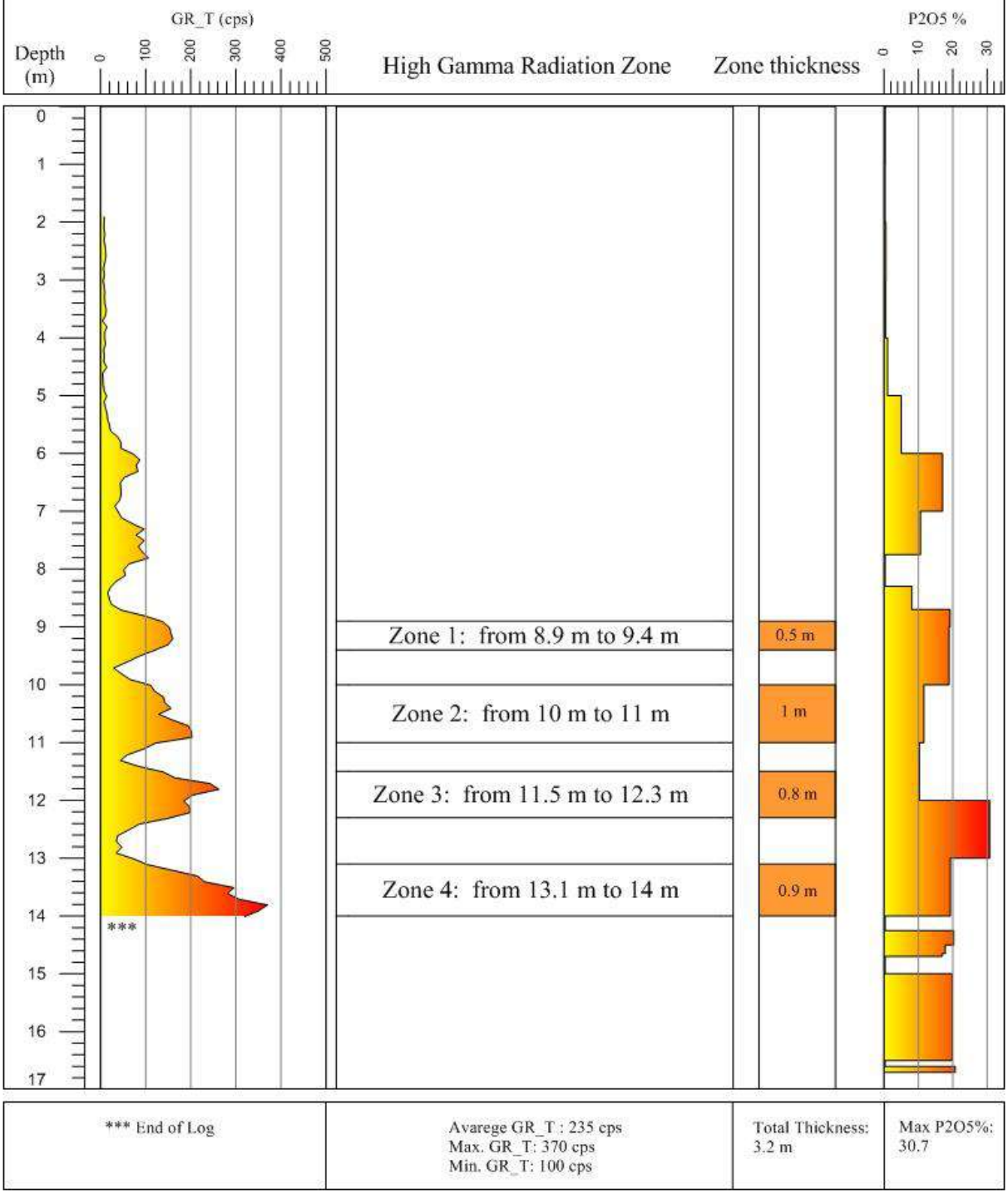
GEOPHYSICAL STUDIES DIVISION RISHA PHOSPHATE PROJECT	Hole ID : Rph1-BH28	Coordinate (UTM) 37S :
	Depth Driller : 27 m	502587.748 E
	Depth Logger : 12.7 m	3556032.67 N
Logging System : Mount Sopris Matrix	Date : 30-08-2022	Elevation : 890.617 m



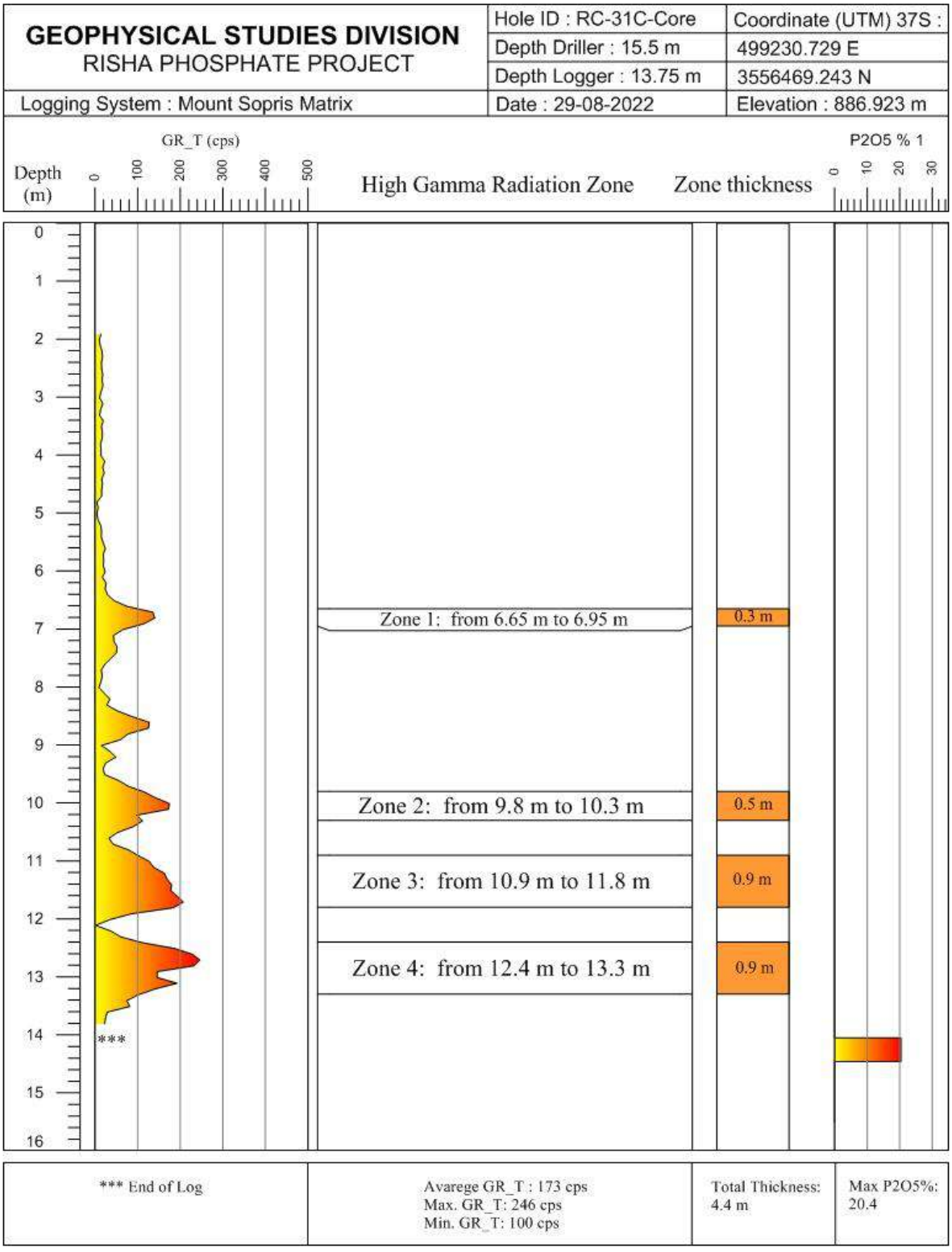
*** End of Log	**Remark:** From ground level to 12.7 m depth, no zones of a high gamma radiation.	Max P2O5%: 28.2

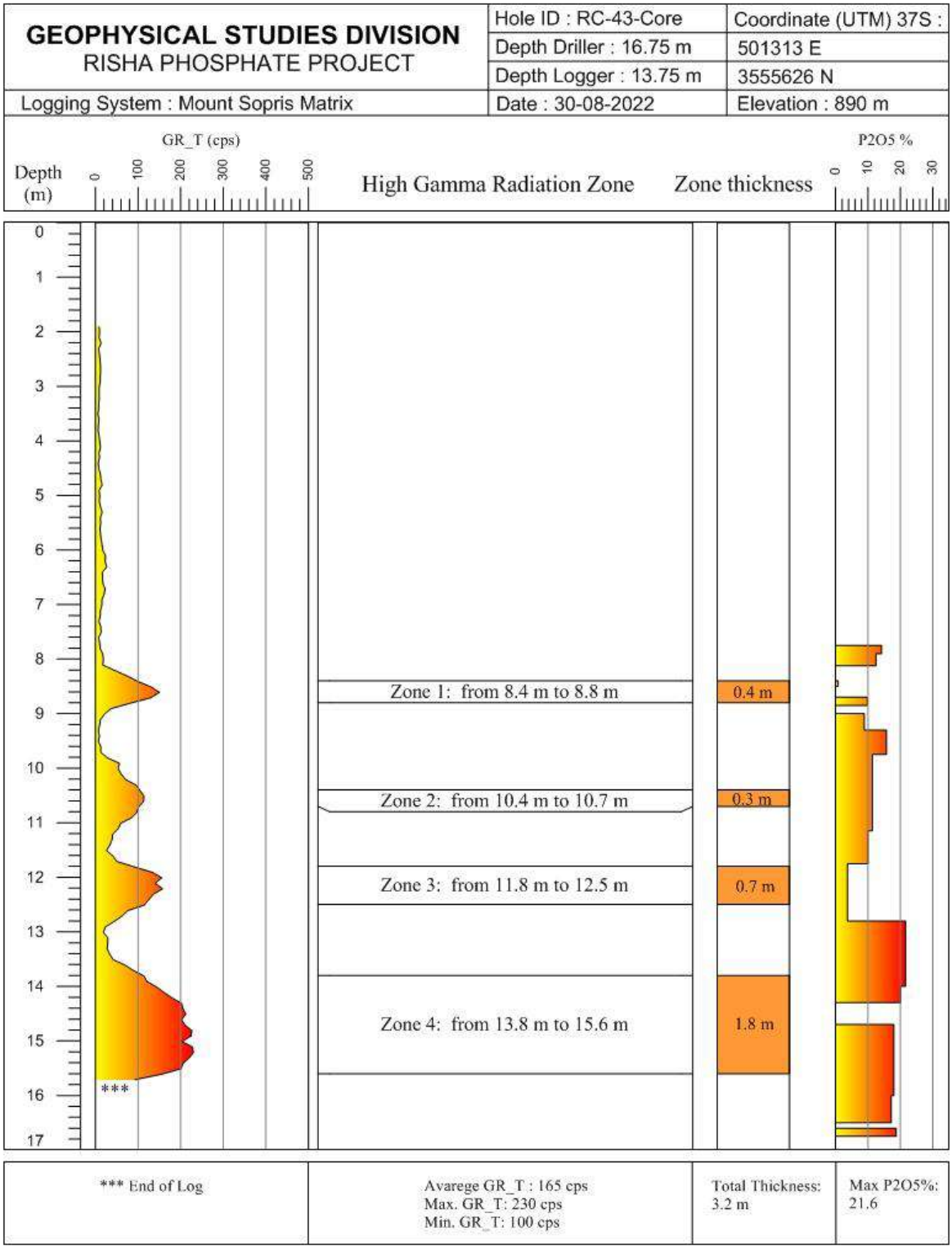
	Hole ID : RC-31A-Core	Coordinate (UTM) 37S :

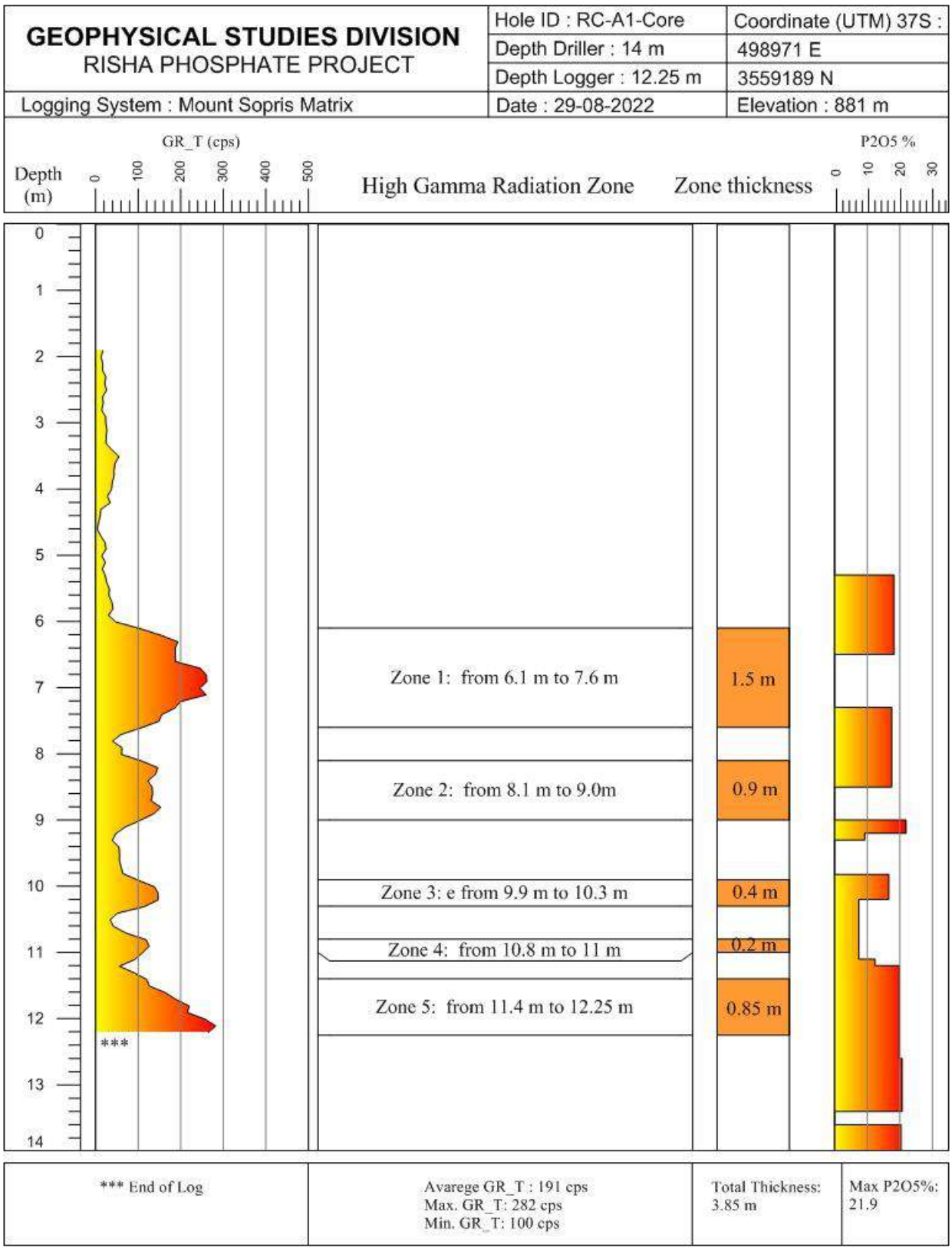
GEOPHYSICAL STUDIES DIVISION RISHA PHOSPHATE PROJECT	Hole ID : RC-31-B	Coordinate (UTM) 37S :
	Depth Driller : 16.7 m	499230.729 E
	Depth Logger : 14 m	3556469.243 N
Logging System : Mount Sopris Matrix	Date : 29-08-2022	Elevation : 884 m



*** End of Log	Avarege GR_T : 235 cps Max. GR_T: 370 cps Min. GR_T: 100 cps	Total Thickness: 3.2 m	Max P2O5%: 30.7


GEOPHYSICAL STUDIES DIVISION
RISHA PHOSPHATE PROJECT
Hole ID : RC-31C-Core
Depth Driller : 15.5 m
Depth Logger : 13.75 m
Coordinate (UTM) 37S :
499230.729 E
3556469.243 N
Logging System : Mount Sopris Matrix
Date : 29-08-2022
Elevation : 886.923 m
GR_T (cps)
Depth (m)
0
100
200
300
400
500
High Gamma Radiation Zone
Zone thickness
P2O5 % 1
0
10
20
30
Zone 1: from 6.65 m to 6.95 m
0.3 m
Zone 2: from 9.8 m to 10.3 m
0.5 m
Zone 3: from 10.9 m to 11.8 m
0.9 m
Zone 4: from 12.4 m to 13.3 m
0.9 m
*** End of Log
Avarege GR_T : 173 cps
Max. GR_T: 246 cps
Min. GR_T: 100 cps
Total Thickness: 4.4 m
Max P2O5%: 20.4


GEOPHYSICAL STUDIES DIVISION
RISHA PHOSPHATE PROJECT
Hole ID : RC-43-Core
Depth Driller : 16.75 m
Depth Logger : 13.75 m
Coordinate (UTM) 37S :
501313 E
3555626 N
Logging System : Mount Sopris Matrix
Date : 30-08-2022
Elevation : 890 m
GR_T (cps)
Depth (m)
High Gamma Radiation Zone
Zone thickness
P2O5 %
Zone 1: from 8.4 m to 8.8 m
0.4 m
Zone 2: from 10.4 m to 10.7 m
0.3 m
Zone 3: from 11.8 m to 12.5 m
0.7 m
Zone 4: from 13.8 m to 15.6 m
1.8 m
*** End of Log
Avarege GR_T : 165 cps
Max. GR_T: 230 cps
Min. GR_T: 100 cps
Total Thickness: 3.2 m
Max P2O5%: 21.6


GEOPHYSICAL STUDIES DIVISION
RISHA PHOSPHATE PROJECT
Hole ID : RC-A1-Core
Depth Driller : 14 m
Depth Logger : 12.25 m
Coordinate (UTM) 37S :
498971 E
3559189 N
Logging System : Mount Sopris Matrix
Date : 29-08-2022
Elevation : 881 m
GR_T (cps)
Depth (m)
0 100 200 300 400 500
High Gamma Radiation Zone
Zone thickness
P2O5 %
0 10 20 30
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
***
Zone 1: from 6.1 m to 7.6 m
1.5 m
Zone 2: from 8.1 m to 9.0m
0.9 m
Zone 3: e from 9.9 m to 10.3 m
0.4 m
Zone 4: from 10.8 m to 11 m
0.2 m
Zone 5: from 11.4 m to 12.25 m
0.85 m
*** End of Log
Avarege GR_T : 191 cps
Max. GR_T: 282 cps
Min. GR_T: 100 cps
Total Thickness: 3.85 m
Max P2O5%: 21.9